Senamhi

Servicio Nacional de Meteorología e Hidrología del Perú - SENAMHI

TOURIST CLIMATE GUIDE

MINISTERIO DE MEDIO AMBIENTE

Servicio Nacional de Meteorología e Hidrología del Perú - SENAMHI

TOURIST CLIMATE GUIDE

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Tourist Climate Guide

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Foreword

Peru, a territory of geographic contrasts, consists of eight natural regions: chala or coast, yunga or gorges, quechua or temperate, suni, puna or high andean plain, janca or cordillera or mountain chain, selva alta or high forest and selva baja or low forest. In these regions there is a variety of climates and micro climates ranging from the warm and arid coastal climate, going through the temperate, frigid and polar climate of the inter-andean valleys, up to the warm and rainy climate of the jungle. All these regions constitute tourist destinations that include in its surroundings, archaeological sites, beaches, rivers, forests, mangrove swamps and valleys where a biodiversity of flora and fauna unique in the world evolves.

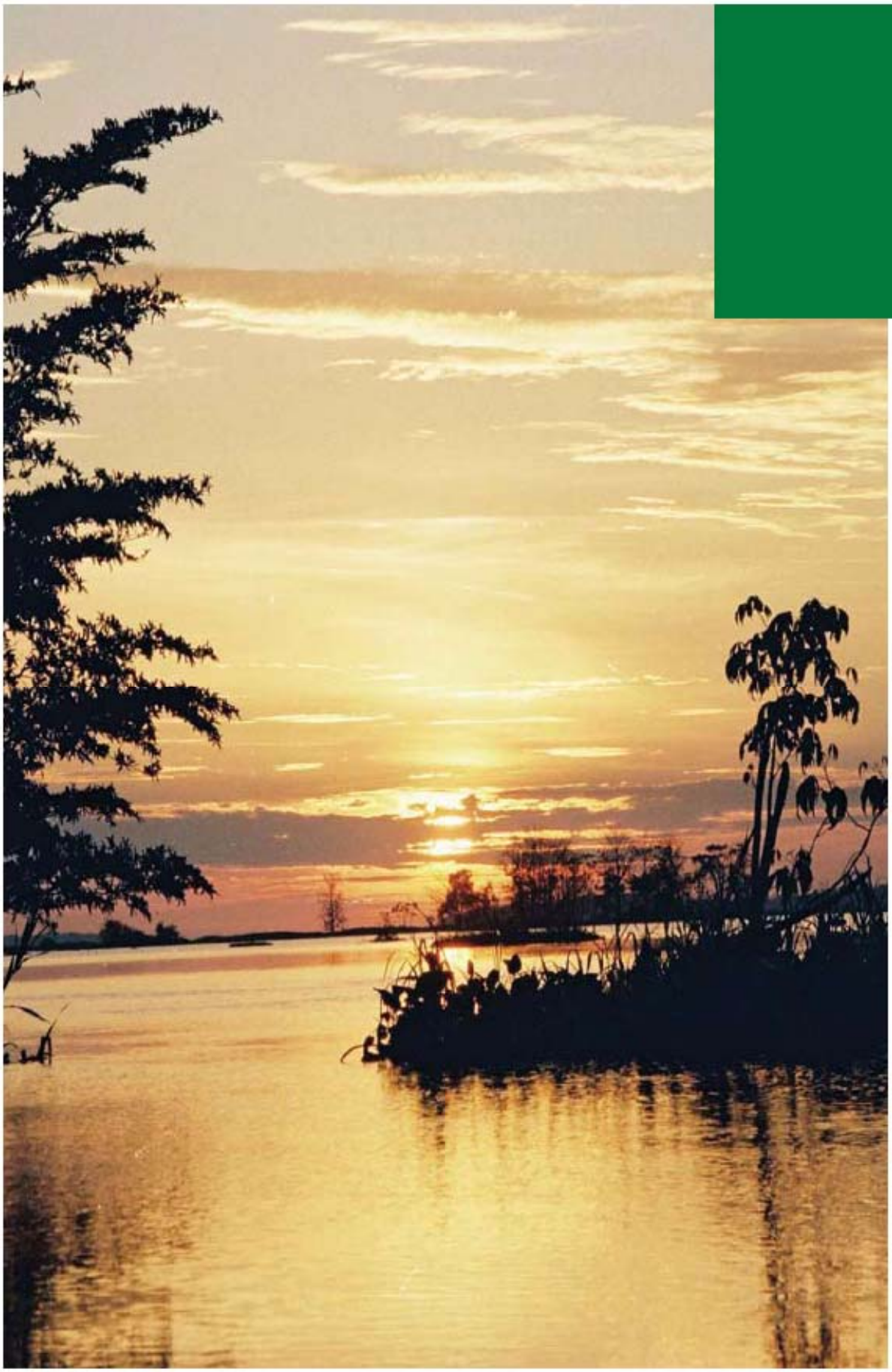
The three main factors that basically determine the climate of Peru are: the location of the country in the intertropical zone, the altitudinal modifications caused by the Andes Mountain Range and the Humboldt Current or Peruvian Current that flows along the coast of the country.

In the last few years, the tourist activity in Peru has increased in a sustainable way; for this reason, the weather and climate information of tourist places in Peru has become essential to the different agents related to this activity, such as tourist agencies, hotels and the tourists themselves, who are always interested to know how the weather will be in such places.

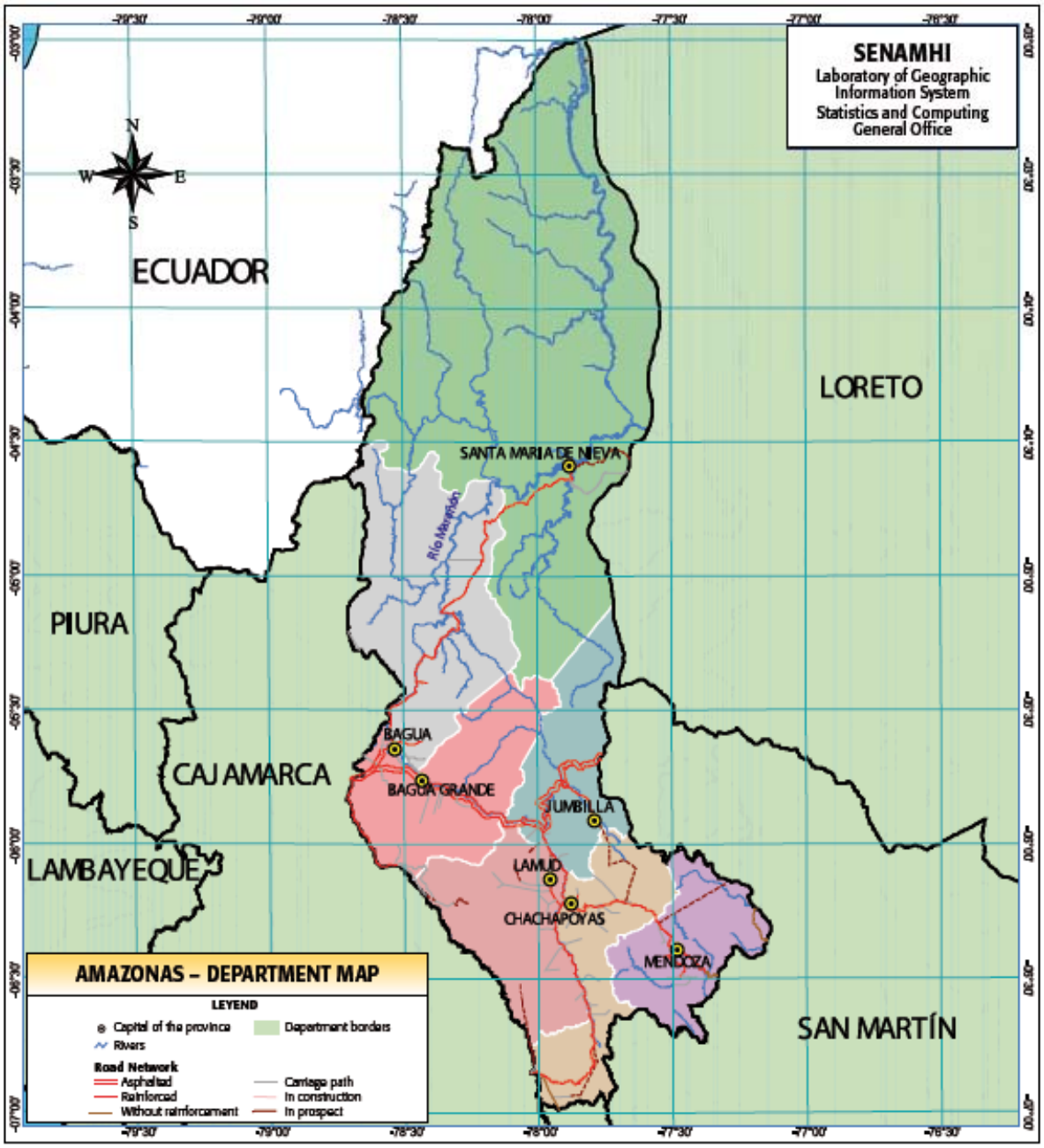
This way, tourists require information about temperature, rainfall, cloudiness, winds and other parameters that should be taken into account, for example, for the practice of adventure sports, or just for a proper planning of their next vacations.

From this point of view, SENAMHI has edited the present Tourist Climate Guide that contains a brief geographical description of the tourist places and the description of the main weather and climate characteristics. For this purpose, climate classification maps, elaborated according to Thornthwaite's climate classification; for the 24 Departments of Peru are included.

With this publication, SENAMHI expects to provide its support to all tourists, to the promoters of tourist activities, to municipalities and regional governments.



Amazonas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Río Marañón
PIURA
BAGUA
BAGUA GRANDE
CAJAMARCA
JUMBILLA
LAMUD
LAMBAYEQUE
CHACHAPOYAS
MENDOZA
SAN MARTÍN
AMAZONAS – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphaltad
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The Amazonas Department is located in the north-eastern part of the Peruvian territory. To the north it is bordered by Ecuador, to the east, by Loreto and San Martin, to the south it is bordered by San Martin and La Libertad, and to the west by Cajamarca and Ecuador. In relation to the central and southern departments of the country, it has a varied and slightly hilly geography, with great valleys and plains in the jungle zone (Marañon and Utcubamba valleys).

Taking into account the orientation of its territory and the drainage of its waters, the Amazonas department shows a relief divided in two big sectors. The first sector, called the Amazon Andean region, includes territories of the Condor Mountain Range, while the second sector comprises the Companquis Mountain Range.

CLIMATE CLASSIFICATION

The Amazonas Department has a variety of climates that includes the following and most important types:

A semi-dry, cold and temperate climate in autumn and winter, and dry in spring.

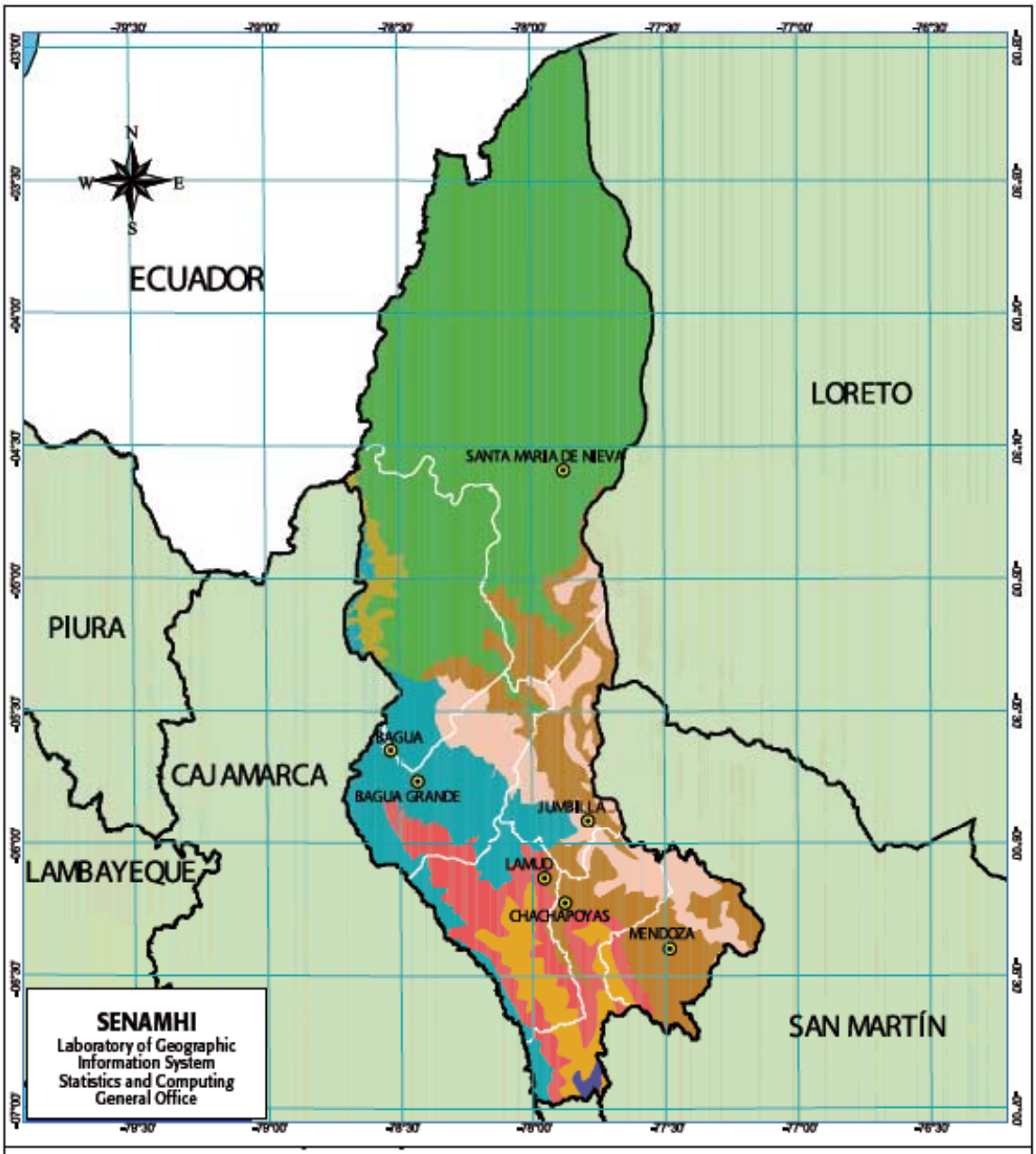
It is typical of the Amazon Andean region.

A rainy, semi-cold, temperate, semi-warm and humid climate with scarce rainfall in autumn and winter. This type of climate corresponds to the high forest zone.

A very rainy, warm and humid climate with abundant rainfall almost throughout the year. This climate is typical of tropical forest areas and it can be experienced in Puerto Galilea and San María de Nieva locations (Condorcanqui province). In the summer time it rains ten times more than in the winter time.

WEATHER AND CLIMATE

As in all the departments of Peru, daytime and night temperatures decrease in relation to the altitude, but the local variation basically depends on the cloud cover, which is relatively abundant throughout the year, due to its nearness to the east and north-east fluxes coming from the Amazon basin and to the north-east humid fluxes coming of the Intertropical Convergence Zone (ITCZ). These characteristics are more evident in valleys with a windward slopes or east or north-east oriented slopes. In the high locations of the Chachapoyas, Bongará and Rodriguez de Mendoza provinces there is a convergence of daytime warming throughtout the year in the valleys and air is induced to flow up to higher parts where, due to adiabatic cooling it forms clouds. If the flux is strong, the clouds increase in a vertical way and they cause rainfall. This



Description	Coding
Semi-dry, warm and humid, with dry autumn, winter and spring	C(o,i,p) A'1 H3
Rainy, cold, humid, with dry autumns and winters	B(o,i,) C' H3
Rainy, semi-cold and humid, with dry autumns and winters	B(o,i,) B'3 H3
Semi-dry, semi-cold and humid, with dry autumns, winters and springs	C(o,i,p) B'3 H3
Semi-dry, cold and humid, with dry winter	C(i) C' H3
Rainy, semi-warm and humid, with dry winters	B(i,) B'1 H3
Semi-dry, temperate and humid, with dry autumns and winters	C(o,i) B'2 H3
Very rainy, warm and humid with dry summer	A(r) A' H4

CHART 1
Extreme Temperatures and Rainfall
Monthly average in Chachapoyas
(Lat 6º Long 77º49'W Alt 834 m.a.s.l.)

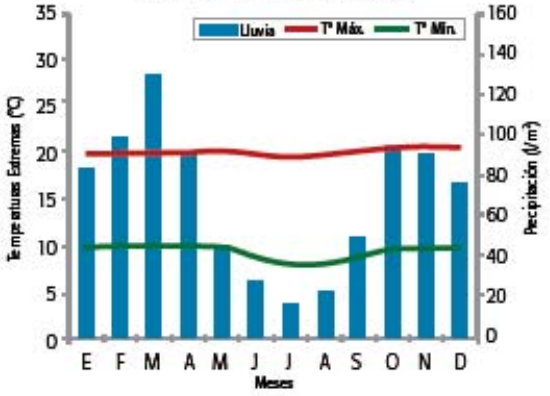
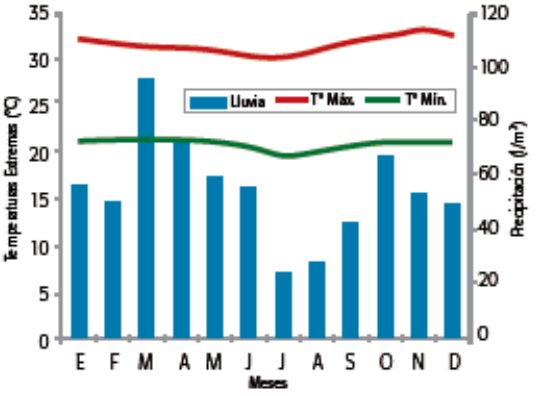


CHART 2
Extreme Temperatures and Rainfall
Monthly average in Bagua
(Lat 5º 36'S Long 78º'W Alt 522 m.a.s.l.)



mechanism can be clearly appreciated in the places where the Mayo, Saposoa and Humbo Rivers originate in the south, and the Utcubamba, Chiriaco or Imaza Rivers in the northern part.

During the year there are no important variations in the maximum and minimum temperature averages – typical of any equatorial location-, as it can be seen in the chart corresponding to the Chachapoyas airport, where maximum temperatures fluctuate around 19°C. However, Chachapoyas city, due to its location at a lower altitude, has in average of 4 °C more during all the months of the year. On the other hand, cooling temperatures rarely occur in this department except for the places located over 3 500 m.a.s.l. which are very few.

Eighty percent of rainfall occurs from September to April, period in which they are more frequent, intense and prolonged. February and March are the rainiest months. Rainfall generally starts in the afternoon and ends approximately at 10:00 at night. It very seldom rains the whole day.

In some locations of the jungle belonging to the Condorcanqui province, the central and northern part of the Bagua province, maximum average temperatures exceed 30°C during the whole year. Southern locations, such as the Bagua province, and the lower locations of the Utcubamba, Luya and Chachapoyas provinces, located in the western slope of the Central Mountain Range (leeward), are protected from humid winds coming from the Amazon Basin and they have in general, little cloud coverage during the year; consequently, there is scarce rainfall and high temperatures during the day, reaching 30°C almost every day, they even exceed 36°C in some days in October and November, which are the months with higher maximum average temperatures as it can be seen in the graphic corresponding to Bagua, located at 522 m.a.s.l.

The highest temperatures also occur in lower places located on the right side of the Marañon river bank, where minimum temperatures do not vary from one day to another and they fluctuate around 21°C, and its annual range is approximately 2°C. Relative humidity in these locations is very low, at noon it can decrease to 20% or less. Conversely, during the months from January to April it increases due to rainfall, because in this time of the year they become more intense, frequents and prolonged.

TABLE 1
Sunrise and sunset hours and duration of daylight throughout a year in the city of Chachapoyas

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	06:01	06:13	06:15	06:14	06:16	06:23	06:28	06:21	06:04	05:47	05:39	05:45
Sunset	18:38	18:36	18:24	18:07	17:57	17:58	18:05	18:09	18:07	18:05	18:11	18:26
Time light	12:20	12:25	12:19	12:10	12:07	12:11	12:16	12:15	12:06	11:56	11:55	12:05

The province of Condorcanqui, located north of Bagua, is exposed to the humid flux of the east, same one that caused abundant rainfall in any locality of this area during the whole year it even exceeds 200 l/m² per month. Maximum temperatures fluctuate around 30 °C, and minimum temperature around 20 °C. Atmospheric humidity during the day exceeds 80%, and during the night it reaches 95%. The wind is weak and cloud cover is abundant. Dew water has not been quite well studied and evaluated in our territory, but it is apparently available in a high level in the eastern slope of the Condor and Central Mountain range, where it is produced mainly during the night, when the air temperature decreases down to saturation point. Some authors estimate dew water values over 700 l/m² per year at certain places of the fog forest.

TOURIST ATTRACTIONS

The Marañon River originates in the Yerupaja snow peak, in the Huanuco department; it runs 1414 km across the north-eastern territory until it flows into the Amazonas River, in Nauta town. As it runs through the Amazonas department it is a navigable river, it crosses the Rentema, Mayo, Mayasita, Cumbinama, Huaracayo and Manseriche Pongos (narrow canyon).

BAGUA

Bagua's geography is slightly hilly, in relation to the central and southern physiography of the national territory. Its capital is Bagua Chica, located on the right bank of the Utcubamba River. In the districts of Imaza, Aramango and CapallÍn there is a reservation area called the Colan Mountain Range, which is suitable for ecological tourism.

Bagua has scarce rainfall even though it is close to the humidity source which is the Amazon basin and the Equatorial region. This peculiarity is due to the fact that it is protected from the humid winds by the Central Mountain range, located at the east side with a northeast-southeast orientation.

Bagua is a potential tourist place because of its natural attractions, it is ideal for practicing adventure sports. In the district of Aramango there is the Numbparket

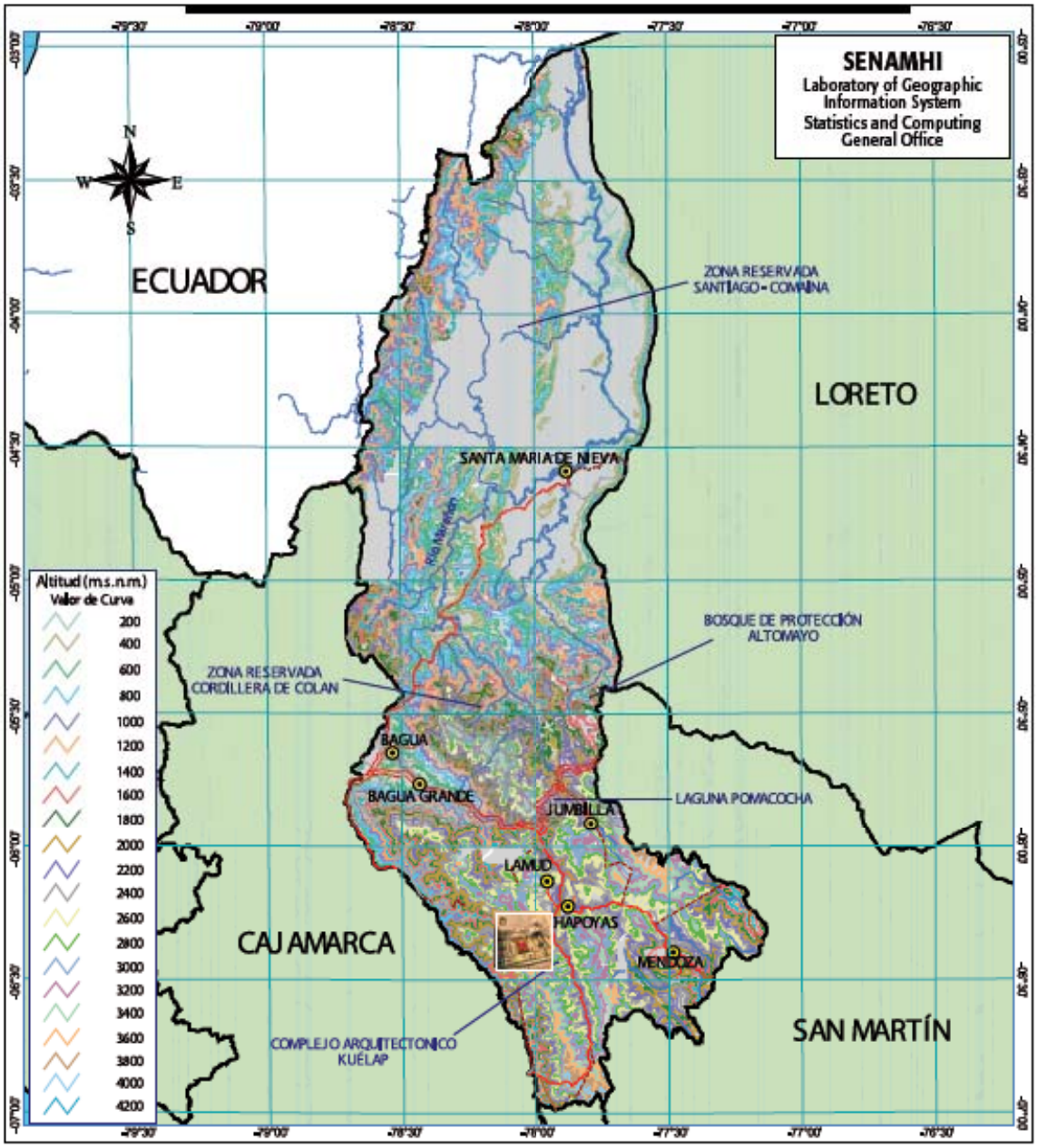
waterfall that has a vertical drop of 90 mts. height. In the Copián location there is the Cambio-Pítec Cave, a calcareous rock cavern.

CHACHAPOYAS

Chachapoyas is the capital of the Amazonas department, it is located on the left side of the Utcubamba Valley, at 2 330 m.a.s.l. A city that preserves its spacious colonial houses. Chachapoyas is located in a transition area between the Andes and the Front-Forest region, characterized for having a pleasant climate during the day, mainly during the months of scarce rainfall (May – September), although it can be a little bit cold in the nights. Two important places that one shouldn't miss visiting are: the Guayamil Viewpoint and the Yanayuco Well, and of course Urco. In Chachapoyas, clear sky conditions do not occur so frequently, even in the periods of scarce rainfall.

BONGARÁ

Bongará is located in the central southern part of the Amazonas department. Bongará is a zone of dense mountain forest. Pedro Ruiz and Pomacocha towns are located in this area. The capital of the province is Jumbilla, which has a very pleasant climate, since its maximum temperatures oscillate around 25 °C, and minimum temperature oscillates around 15 °C. This province is exposed to humid winds coming from the Low forest of Bagua and Condorcanqui, for this reason it is rainier here than in Utcubamba. There is a paved road from Pedro Ruiz up to Moyobamba and Tarapoto, and a reinforced road that leads to the south and runs through Chachapoyas.



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

UTCUBAMBA

Its capital, Bagua Grande, is in the central zone, where the Utcubamba River flows and it is located in the surrounding area of the Olmos – Chachapoyas road. The main towns are: Cajaruro, El Milagro, Lonya Grande and Yamón. Its main tourist attraction is the Tourist Corridor of Utcubamba. In this province, there is a protected area known as Colán Cordillera or Mountain Range, that includes the dry forest territories of the Marañon valley. Also in this province there is an important archaeological place called Kuélap, located on the top of the Morcapampa Hill. El Tintero (The Inkpot), la Atalaya (The Tower) and El Castillo (The Castle) are the most important constructions of the ruins.

The weather in the city is similar to the one in Bagua: very hot and dry during the period of rainfall absence (May – September), with early morning sun bright.

CONDORCANQUI

Its capital is Santa María de Nieva city, located on the right bank of the Marañon River, at an altitude of 230 m.a.s.l. To the west it is bordered by Ecuador and to the east by Loreto. Condorcanqui is known as the "Land of the rainbow", because of the continuous presence of this phenomenon. Along its territory it runs the Marañon River and Comaina, Cenepa and Santiago tributary rivers In this province, there is located Santiago Comaina Natural Protected Area, that is suitable for ecological tourism since it offers the possibility to observe a wide variety of flora and fauna. This area is inhabited by the aguaruna and huambisa ethnia. In its forest territory, it rains throughout the year. Most of the locations register annual values close to 2 500 l/m². Storms are very frequent, and they are associated to thunder storms and lightning, mainly during the last hours of the day and the first hours of the night. Maximum temperatures in the daytime oscillate around 30°C, relative humidity is high all the year round. Inside the forest and under shadow, temperatures can be 5°C lower than the ones registered at the top of the trees or in the deforested areas. The months with less rainfall occurrence are June to August.

LUYA

Luya is the southern province of the Amazonas department, it is located in a territory characterized by a hilly relief, that extends between the Utcubamba and the Marañon Rivers, Balsas and Leimebamba towns are located in this province. In the last mentioned, there is an onsite museum that keeps the mummies of the Condor Lagoons and the sarcophagus of Carajía. The city has a pleasant climate throughout the year, since it rains a lot less than in the provinces of Bongará and Rodríguez de Mendoza, but it rains more than it does in Bagua.

RODRÍGUEZ DE MENDOZA

This city is located at 1 650 m.a.s.l., on the left bank of the Huambo River, and its territory includes the south-east end of the Amazonas. The weather is rainy throughout the year, because this province is exposed to humid winds coming form the Amazon basin. In the city, average monthly maximum temperatures range from 20°C to 25°C, and minimum temperatures, around 15°C. The cloud coverage is relatively high because of the aforementioned reason. In consequence, all its territory is covered with vegetation, making it suitable for ecological adventure tourism and agro-tourism. The main rivers that run through this province are San Antonio, Aiña, Pacha, Omia and Shocol rivers.

Áncash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CHACAS
CARHUAZ
HUARI
CASMA
HUARAZ
HUÁNUCO
RECUAY
ANCA
OCÉANO PACÍFICO
HUARMEY
CHIQUIAN
OCROS
PASCO
LIMA
Río Tauli
Río Cañete
Río Yanamayo
Río Santa
Río Grande
Río Huarmey
Río Llamac
Río Pativilca
N
S
W
E
ÁNCASH – DEPARTMENT MAP
LEYEND
Capital of the province
Department border
Rivers
Road Network
Asphaltad
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

Ancash is a department of geographical contrasts. It comprises the ocean, the coastal desert, the Callejón de Huaylas and the Callejón de Conchucos. Two Mountain Ranges: the White Mountain Range and the Black Mountain Range pass through, from its abrupt territory, from north to south, and between these two Mountains runs the Santa River. To the west it is bordered by the Pacific Ocean, to the north by La Libertad, to the east with Huanuco and to the south with Lima. Along the Ancash territory, we find beaches and a strip of desert through which the Santa, Casma, Culebras and Huarmey rivers run. Further inland are the western slopes that form the valleys and ravines until they reach the summit of the Black Mountain Range. To the east there are the glaciers and snow peaks of the White Mountain Range, and to the east there is the Callejón de Conchucos and the eastern slope, bordered by the Marañon River.

The Santa River is one of the most important rivers in the region. It is 350 km long and it is the one that covers a large distance. It turns into a torrential river in the rainy period (December to March) and its discharge exceeds 900 m^3/s in the rivermouth. During the winter months, its discharge is over 50 m^3/s, which is suitable for canoeing practices.

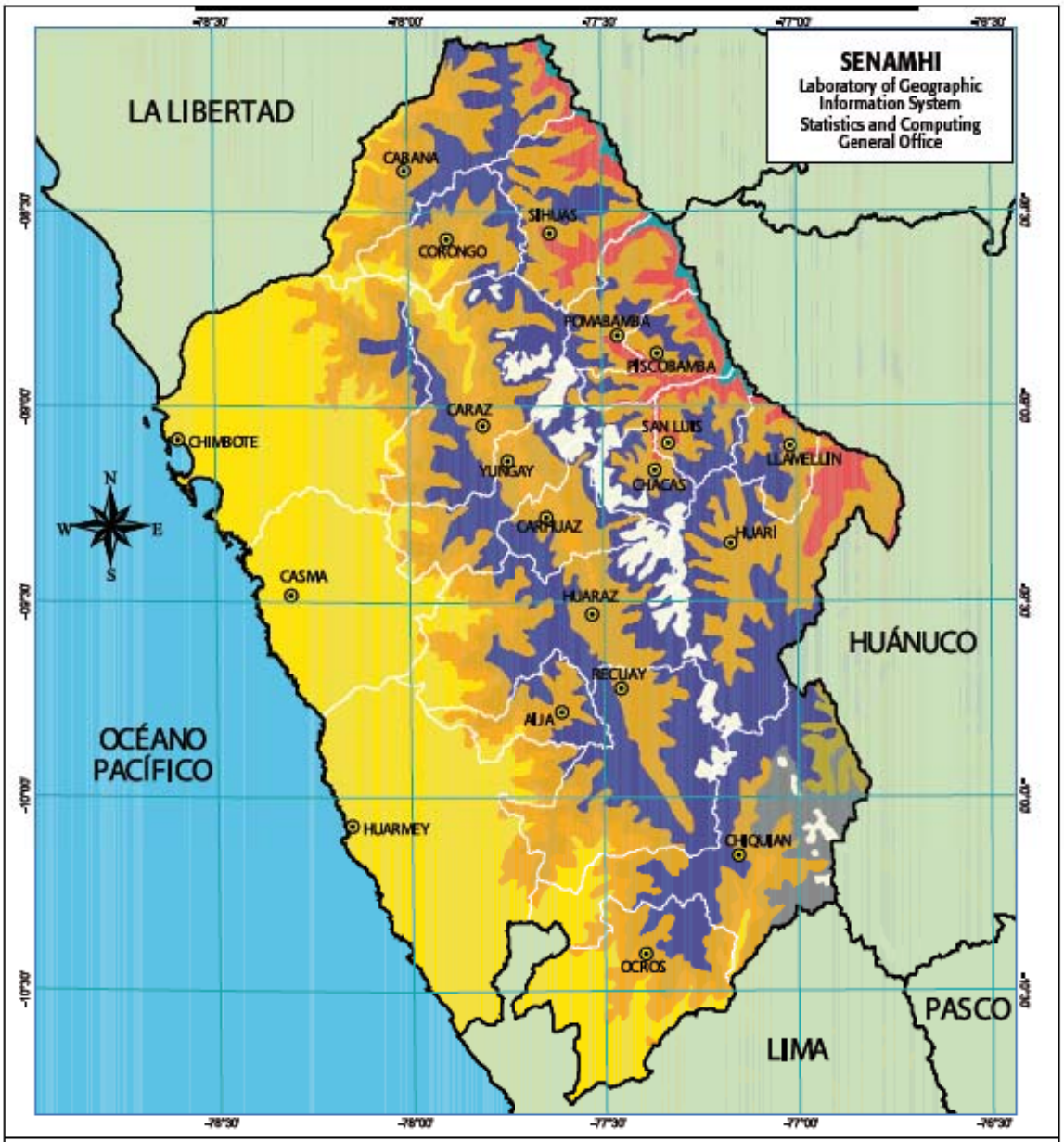
CLIMATE CLASSIFICATION

The climate in the department is influenced by factors related to ocean, continent, orientation of the White and Black Mountain Ranges, exposure to solar radiation and wind fluxes. According to Thornthwaite's climate classification, the department has the following types of climate:

An arid, semi-warm and dry climate, with rainfall shortages throughout the year and high air humidity due to its nearness to the sea. Its average annual temperature is 18°C, with scarce drizzles in the winter time. Santa, Casma and Huarmey coastal locations have this kind of climate.

A semi-warm and temperate climate, with absence of rainfall in autumn, winter and spring time, however there is some rainfall during the summer. This kind of climate correspond to locations in the lower zones of the western slope, between 500 and 2 500 m.a.s.l., with an average annual temperature of 17°C. This climate is typical of the Santa, Huarmey, Casma Ocros and Aija provinces.

A semi-dry and temperate climate and abundant rainfall in the summer, with scarce rainfall in autumn, winter and spring. This kind of climate is typical of the provinces located in the Callejón de Huaylas and in the Callejón de Conchucos. This kind of climate is typical of localities as Cabana, Pallasca, Corongo, Sihuas, Huaylas,Pomabamba, Piscobamba, Yungay,



⊙ Capital

Department borders

Description	Coding
Rainy; dry in winter; very cold and humid	B(i) D' H3
Rainy, dry in autumn and winter; semi-cold and humid	B(o,i) B'3 H3
Rainy, dry in autumn and winter; cold and humid	B(i) B'2 H3
Semi-dry; dry in winter; cold and humid	C(i) C' H3
Semi-dry; with dry autumn, winter and spring; warm and humid	C(o,i,p) A' H3
Semi-dry; with dry autumn, winter and spring, temperate and humid	C(o,i,p) B'2 H3
Arid with rain shortage all the year; semi-warm and humid	E(d) B'1 H3
Snow, frigid and polar	Snow

TABLE 2
Sunrise and sunset hours and duration of daylight throughout a year in the city of Huaraz

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	06:01	06:13	06:15	06:14	06:16	06:23	06:28	06:21	06:04	05:47	05:39	05:45
Sunset	18:38	18:36	18:24	18:07	17:57	17:58	18:05	18:09	18:07	18:05	18:11	18:26
Time light	12:20	12:25	12:19	12:10	12:07	12:11	12:16	12:15	12:06	11:56	11:55	12:05

CHART 3
Extreme Temperatures and Precipitation
Monthly average in Caraz
(Lat 9°03'S Long 77°49'W Alt 2 205 m.a.s.l.)

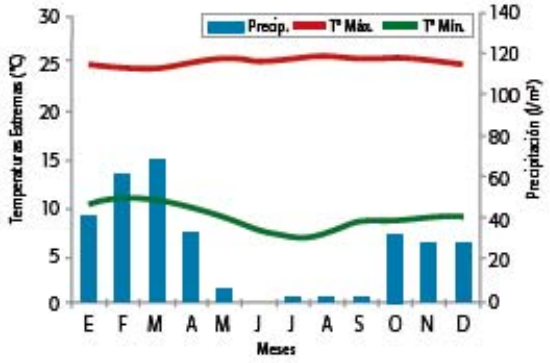
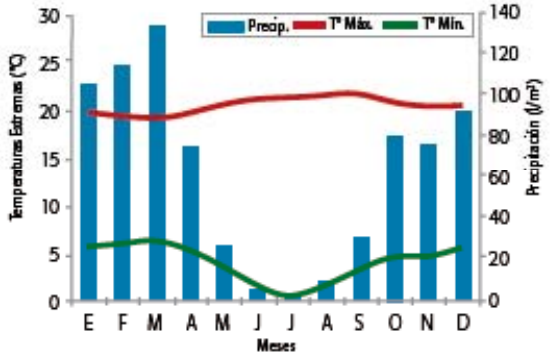


CHART 4
Extreme Temperatures and Precipitation
Monthly average in Recuay
(Lat 9°43'S Long 77°27'W Alt 3 394 m.a.s.l.)



Carhuaz, Huaraz, Recuay, Aija, Asunción, Llamellín, Huari and Bolognesi.

In the high parts of the Black Mountain Range, between 3 500 m.a.s.l. and 4 500 m.a.s.l, the climate is semi-dry, very cold, with rainfall shortages in the winter and heavy rain in the summer that exceed up to ten times the ones occurred in the driest month. The average temperatures are lower than 10°C. From April to September the atmosphere is very dry, and the sky shows no clouds either during the day or at night.

Above 4 500 m.a.s.l., the climate is snowy, frigid, typical of the White Mountain Range glaciers, where the average annual temperatures are lower than 0°C throughout the year.

CHART 5
Extreme Temperatures and Precipitation
Monthly average in Chimbote
(Lat 9°04'S Long 78°35'W Alt 4 000 m.a.s.l.)

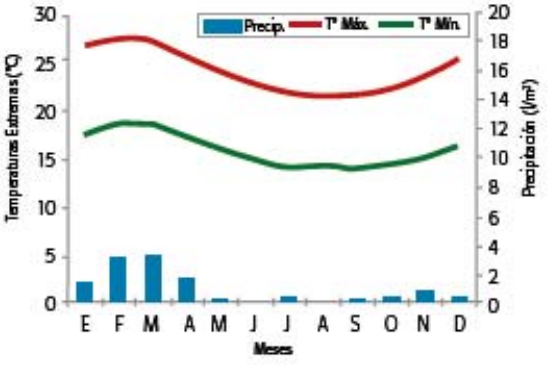


CHART 6
Extreme Temperatures and Precipitation
Monthly Average in Huaraz
(Lat 9°32'S Long 77°32'W Alt 3 091 m.a.s.l.)

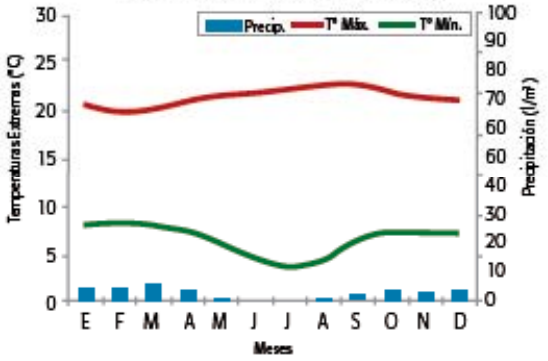
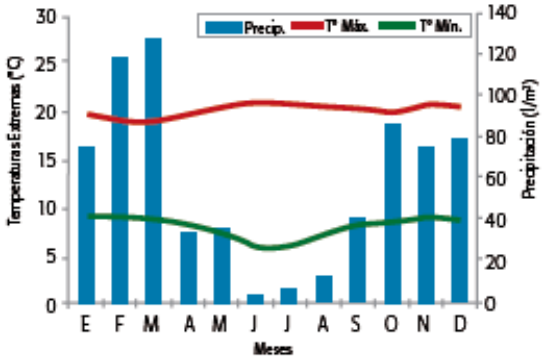


CHART 7
Extreme Temperatures and Precipitation
Monthly average in Huari
(Lat 9° 21'S Long 77° 10'W Alt 3 149 m.a.s.l.)



WEATHER AND CLIMATE

There is a slight monthly variation of temperature in the coastal strip, same thing happens with the inter-daily variations. This is due to the thermoregulating

CHART 8
Hourly Temperature and relative humidity in Chavin
15/07/2003
(Lat 9°25'S Long 77°15'W Alt 3 210 m.a.s.l.)

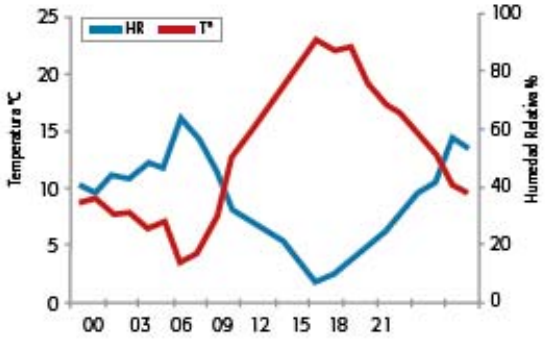


CHART 9
Hourly temperature and relative humidity in Chavin
08/10/2003
(Lat 9°25' Long 77°15' Alt 3 210 m.a.s.l.)

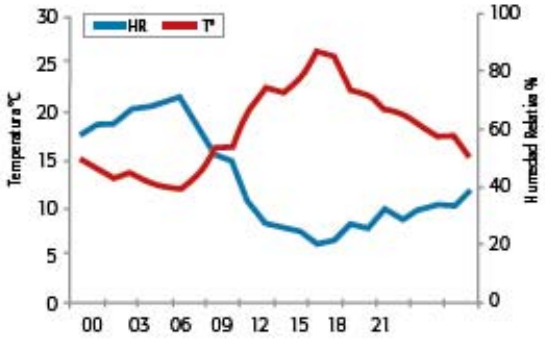


CHART 10
Hourly temperature in Huascaran Snow peak
March 1999

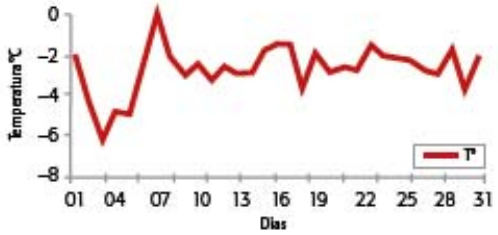
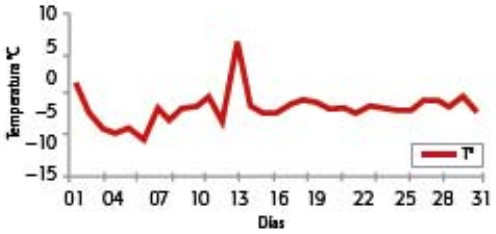


CHART 11
Hourly Temperature in Huascaran Snow peak
August 1999



effect of sea water, which is more evident in the small annual ranges of maximum and minimum temperature of 7 °C and 5 °C, respectively. Conversly, daily ranges are of higher magnitude, reaching values of 9 °C and 7 °C during the summer and winter, respectively, see chart 5 corresponding the Chimbote.

In Chimbote and other coastal cities such as Santa, Casma, and Huarmey, the highest temperatures occur in the month of February. In Chimbote, maximum average temperature reaches 28 °C, and in the aforementioned cities, the values are very similar. Ocassionally, maximum daily temperatures of 30°C or more are experienced, when there are changes in the wind direction. This means that when the sea surface is warm and the wind comes from the north, there is a strong atmospheric stability (the wind is calm (quitar and) or very light, same thing happens when the El Niño events of moderate to strong intensity occur. When the El Niño is weak, the weather in this department is almost normal.

Sun bright in the city of Chimbote and in the surrounding locations is permanent; it only decreases in the winter at noon and in following hours. Besides, as we move south, the sun bright diminishes.

In the sierra or mountain region, daily and night time temperatures vary depending on the altitude and the cloud cover, at a rate of approximately 0.6 °C per each 100 meters over the limit of.

Going from north to south, along the Callejón de Huaylas, it can be observed that temperatures decrease gradually. Thus, in Caraz, Huaraz, and Recuay maximum temperatures are 28 °C, 25 °C and 21 °C in the winter season, respectively; and minimum temperatures are 9 °C, 4 °C and 2 °C for the same period of time, as it can be seen in the corresponding charts to the locations of Caraz, Huaraz and Recuay. In general minimum temperatures are lower 10 °C. On the other hand, form May to September in the locations above 3 500 m.a.s.l. there are freezing temperatures during the night time.

it increases from west to east. 80% of rainfall occur form December to March, with the characteristic that to higher altitude, higher rainfall, as it can be deducted from the previous charts. Rainfall commonly occurs after noon.

In the Callejón de Huaylas and in all the Andean region, from the month of May to September, there are clear sky conditions with little cloudiness during

the daytime and at nights. The wind speed increases in the afternoons, and it gets windy, it seldom reaches 50 km/h or more, especially in July and September. Relative humidity decreases down to 30% or less due to turbulence mixture.

In the eastern slope of the White Mountain Range (Callejón de Conchucos), daily temperatures are similar to the ones in the Callejón de Huaylas, in places located also at similar heights, as it can be seen in the charts that corresponds to Recuay and Huari locations.

The following charts show the evolution of temperature and relative humidity per hour, registered in the Chavin location, during the months of February and July in 2003.

THE HUASCARAN SNOW PEAK

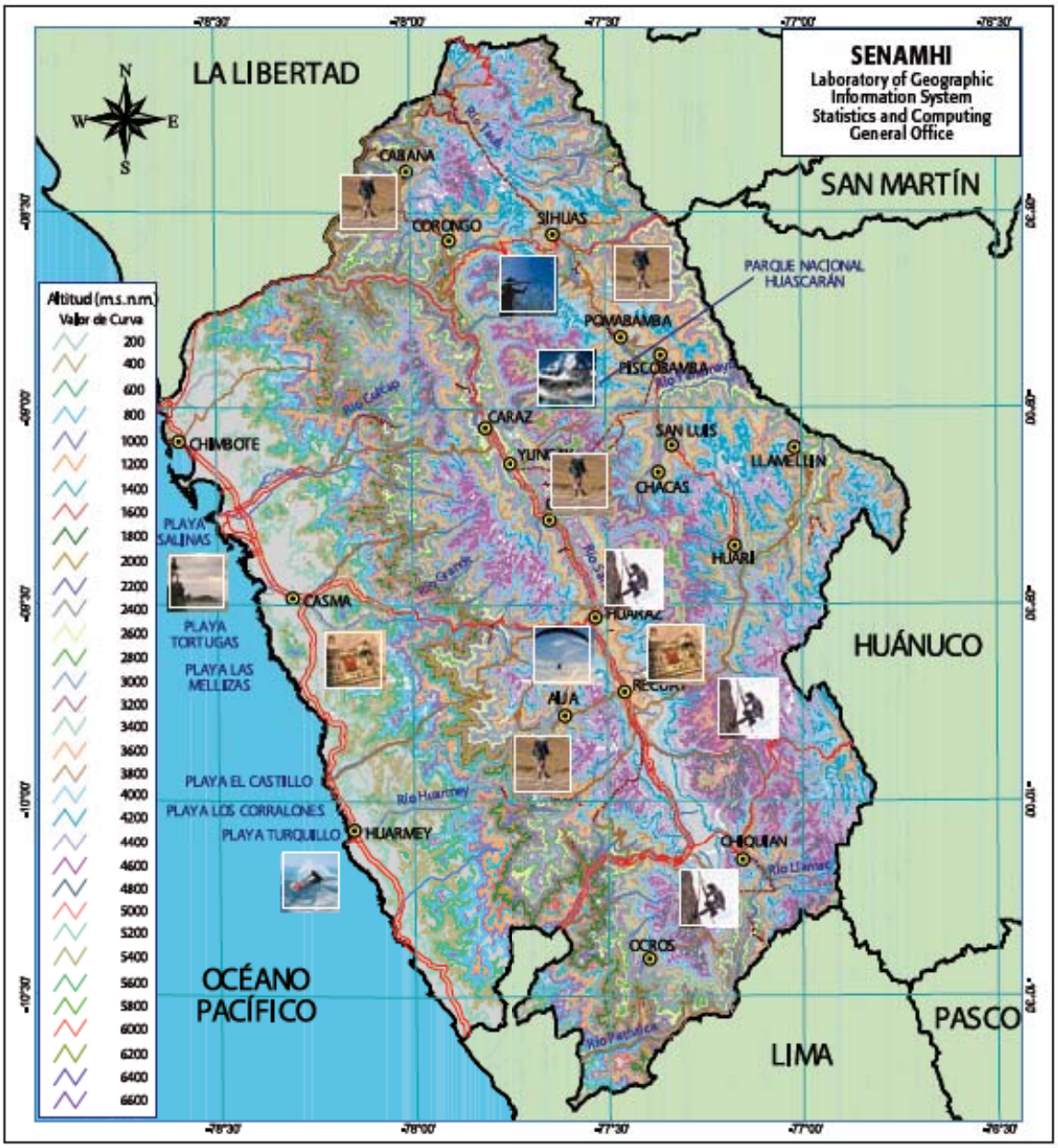
Graphs 10 and 11 show the behavior of air temperature per hour, which was registered in a meteorological field stations installed at 6 200 m.a.s.l, in the Huascarán snow peak corresponding to the months of March and August 1999. In March, average daily temperatures oscillates between -6 °C and 0 °C, while in August temperatures range from -10 °C to -6 °C. In general, temperatures are negatives. Between June and September it is the most favorable time to climb up the snow peaks of the White Mountain Range and to practice high mountain sports; but it is also the period of strong winds.

TOURIST ATTRACTIONS

BEACHES

The Ancash territory has beautiful beaches such as Besique, Samanco, Tortugas (Casma), El Huaso, La Gramita, Las Aldas, Tuquillo, Tamboraso and Bermejo.

In the beaches, sea water average monthly temperature varies from 15°C to 21°C. The daytime variation depends basically on the daily change of solar radiation that reaches the water surface, the exchange of heat on the surface and the mixing processes, due to waves and tides. In general, there is little variation, i.e., temperatures are similar during the day time and at night. During the winter, in the coast of the Santa province, an area of intense upwelling is located, causing that sea water temperature show lower values. Sea water temperatures in small and shallow bays, such as Tortuga beach, are higher.



Province Capital

Rivers

Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

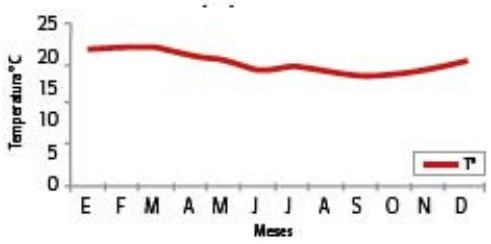
 Diving

 Snowpeak

 Paragliding

 Hunting

CHART 12
Sea surface temperature in Ancash beaches



In general, temperatures in the beaches of this department are slightly higher than the temperatures in the beaches of Ica and Lima, due to less intense upwelling. Likewise, as in all the beaches of the territory, sea water transparency is low. In the summer, temperature oscillates around 21°C, and at the end of the winter time, they oscillate around 15°C. It is worth mentioning, that in these beaches the presence of sun bright is more frequent than in Lima. Daily oscillation of average temperature is less than 1°C.

CALLEJÓN DE HUAYLAS

The Callejón de Huaylas is the result of the erosion caused by the waters of the Santa River that runs between two mountain ranges along a distance of 360 km, from Conococha Lagoon up to El Cañon del Pato.
The Black Mountain Range is located in the western slope, with some mountains that reach up to 5 000 m.a.s.l. It has no snow peaks and rainfall is scarce due to low humidity that is brought by winds coming from the Amazon basin during the summer season, and to the influence of the west and north-west winds, prevailing in the autumn, winter and spring seasons, and that do not carry enough humidity to cause rainfall.
The White Mountain Range consists of almost one hundred snow peaks, 35 of them have an altitude higher than 6 000 m.a.s.l., for which reason they are considered to be the highest tropical mountains on Earth. The most important snow peaks, from a tourist point of view, are the Huascarán, Huandoy, Alpamayo, Chopicalqui and Chacraraju, among others.
Along the Callejón de Huaylas there are some towns with beautiful landscapes of tourist interest, such as Recuay, Huaraz, Carhuaz, Yungay and Caraz, each place has a slightly different weather.
Due to its altitude and orientation (north-south) this mountain range works as a barrier, limiting the entrance of humid air into the Black Mountain Range and its western slope.

HUARAZ

Is the capital of the department and it is located at 3 091 m.a.s.l. It is the main center of the tourist activities. The weather is characterized for presenting clear sky and scarce cloudiness conditions from April to November. During the day the weather is pleasant, but cold during the nights.

THE LLANGANUCO LAGOON

It is located between the ravines of the Huascarán and the Huandoy that form two lagoons;Chinancocha and Orconcocha.

The weather is cold in the day, and cold or very cold during the night, especially from June to September.

CALLEJÓN DE CONCHUCOS

The Callejón de Conchucos, located on the eastern slope of the White Mountain Range, consists of a series of valleys linked by the Chavin-Sihuas road; its route is enhanced by a variety of beautiful landscpes and splendid views of the eastern snow peaks, such as the Shaqsha, Cashán, Uruasraju, Pucaraju and Yanamaray. At the foot of the last mentioned sow peak, there is the Querococha Lagoon.

Chavín de Huántar is the point of entrance to the Callejón de Conchucos. In this tourist itinerary there are several towns such as San Marcos, Huari, San Luis, Chacas, Pumallacuy, Llampa, Piscobamba, Pomabamba and Sihuas. In Chavín de Huántar there is located the archaeological ruins called Castillo de Chavín, a stone castle that was built by the ancient Peruvians to celebrate their religious ceremonies.

Chiquián is another destination for high mountain tourism, because it is very close to the Cara Cara and Huara Pasca snow peaks.

It is advisable to take some precautions to deal with the height illness called "soroche", that affects some tourists when then travel across the high plains of Conococha, Pastoruri and other similar places. This illness is caused by the diminish in the concentration of oxygen in the air, in relation to the one at sea level. This way, at 2 000 m.a.s.l., 3 000 m.a.s.l. and 4 000 m.a.s.l., the air has 20%, 30% and 40% less oxygen than it does in the coast.

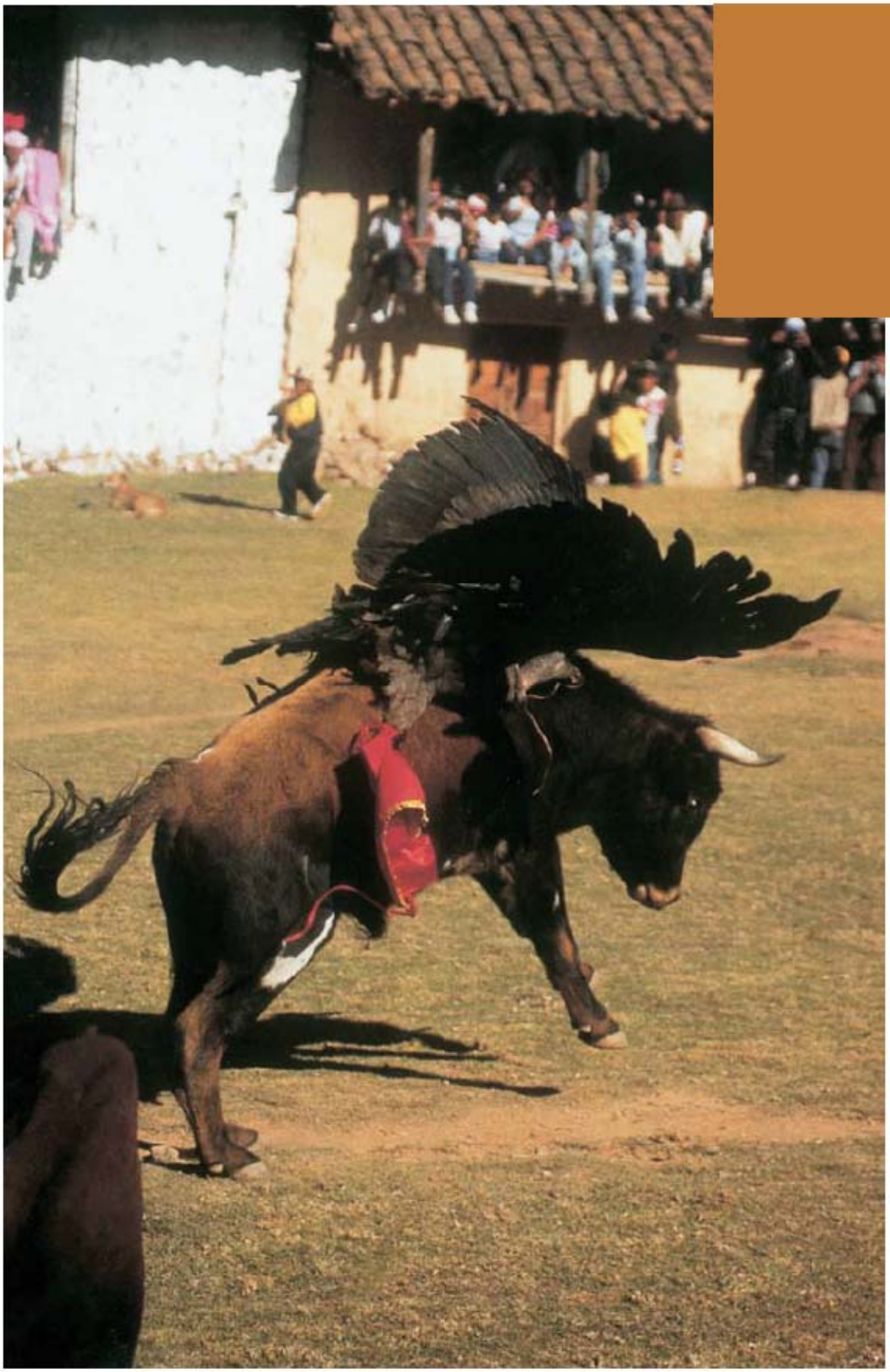
Persons that have overweight, high blood pressure, or heart conditions must have a medical checkup before they plan a trip to high mountain locations. It is also recommended to use glasses and a cap or hat to protect themselves from solar radiation that is very intense from May to November due to the scarce cloudiness and water vapor in the atmosphere.

THE BLACK MOUNTAIN RANGE OR CORDILLERA NEGRA

The Black Mountain Range is home to several places located on the eastern side, such as the privinces of Santa, Casma, Huarmey and Aija.

The main summits of the Black Mountain Range are: Huancapetí, Huinac and Cuncush, suitable to practice hiking, cycling, climbing and paragliding. The province of Aija is the most representative town of the western slopes.

The prevailing weather condition is scarce cloudiness from April to September, this means that there is early morning sun bright. The average temperature decreases with height, that is a rate of about 0,6 °C for every 100 mts in altitude.



Apurímac


APURÍMAC – DEPARTMENT MAP
LEYEND
Capital of the province
Rivers
Department bc
Road Network
Asphelted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
CHINCHEROS
ANDAHUAYLAS
ABANCAY
CUSCO
TAMBOBAMBA
CHUQUIBAMBILLA
CHALHUANCA
AYACUCHO
ANTABAMBA
AREQUIPA
N
S
W
E
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office

GEOGRAPHY

The Department of Apurimac is located in the southeastern part of the Central Andean Mountains, with a relief that is characterized for the presence of deep valleys and inter-andean ravines with high steep and arid slopes. Through its valleys run rivers that originate in the summit of the Andes mountains. To the north it is bordered by Ayacucho and Cusco, to the east and southeast it is bordered by Arequipa and Ayacucho and to the west by Ayacucho.

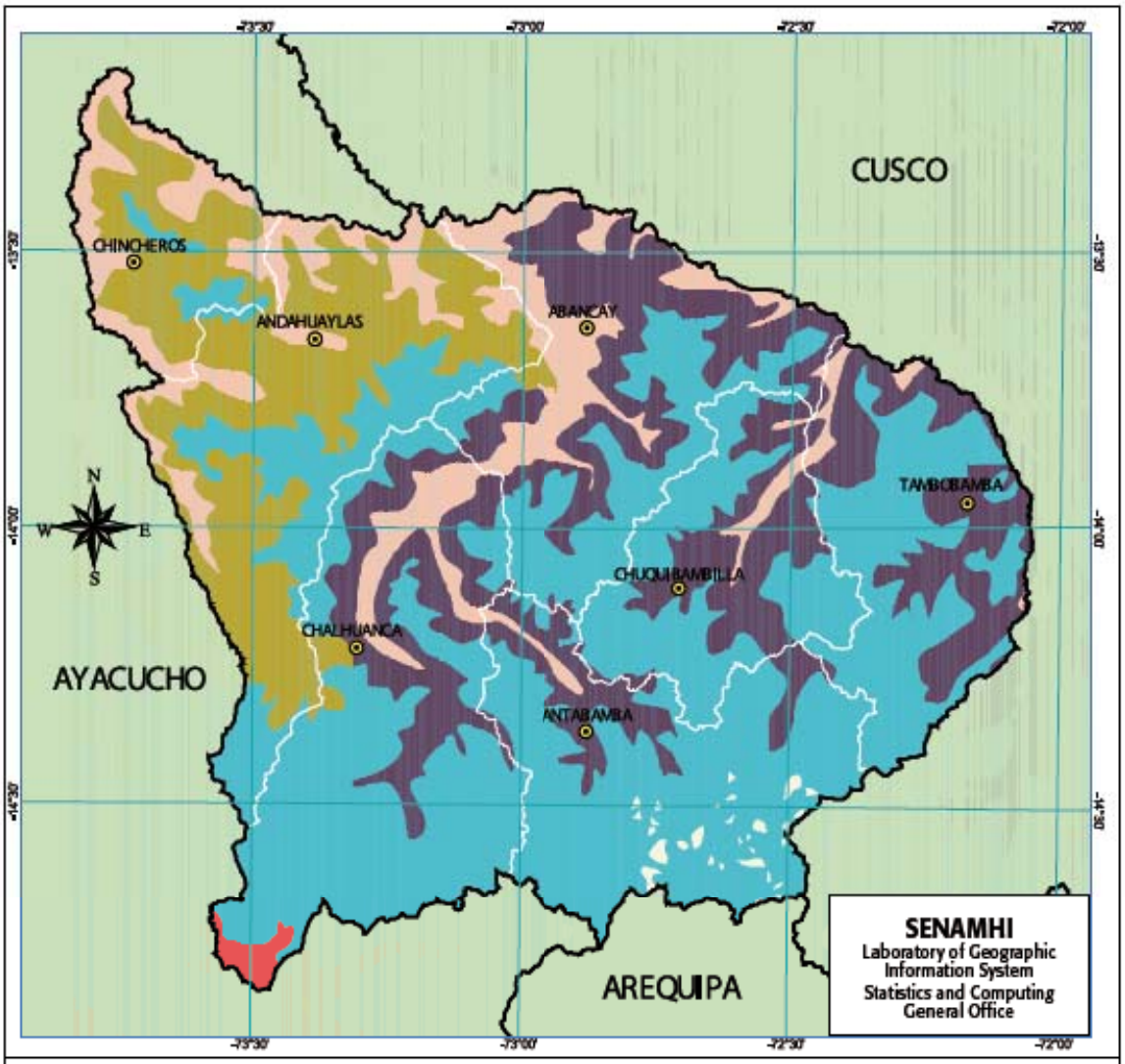
High localities, at the bottom of the snow-covered hills, are lands that have a hostile landscape. Prevailing conditions here in this land are low temperature at nights, and wind sheers during the afternoons, besides there is plenty of high-andean straw fields. It is the habitat for animals such as: the vicuñas, tarucas, cóndores, and zorrinos, and also is a place where crystal blue-water lagoons of peerless beauty, such as the Pacucha, Antaccocha, Uspaccocha and Santacocha lagoons can be found.

CLIMATE CLASSIFICATION

The Department of Apurimac has a diversity of climates. According to Thornthwaite's climate classification, it has the following main climates:

A rainy, semi-frigid climate with rainfall shortage in autumn and winter and with low relative humidity. This type of climate corresponds to the high parts and Andean plains, as in Andahuaylas, Abancay, Grau, Cotabambas, Aymaraes and Antabamba. This is the widest climate zone in the Department of Apurimac, characterized for presenting average monthly temperatures that range from 0 °C to 7 °C, with an important rainfall period between November and April. This rainfall is more intense between December and February. Between May and August there are some frosts periods, and in certain occasion they are very intense.

A semi-dry cold climate with low relative humidity and scarce rainfall in autumn and winter. This type of climate is typical of the sharp slopes located between 2 000 m.a.s.l. and 4 000 m.a.s.l., as well as in the locations of the provinces of Antabamba, Abancay, Grau and Cotabambas, where average monthly



temperature range from 7 °C to 13 °C, and at least during four months a year it exceeds 10 °C.

A semi-dry temperate and humid climate in autumn and winter. This type of climate is typical of places located on the steep slopes that range from 2 000 m.a.s.l. to 3 000 m.a.s.l., as in Chincheros, Andahuaylas, Abancay and Antabamba, where mean temperature oscillates from 7 °C and 13 °C. In the low parts of these slopes, temperature oscillates around 16 °C. Between December and February, it rains almost ten times more than in the driest months.

WEATHER AND CLIMATE

Maximum and minimum temperatures decrease with altitude and it depends on cloud cover, the amount of incident solar radiation on surface, the humidity in town and intensity of the wind. In low locations of the valleys formed by the Apurimac, Pampas and Pachachaca rivers, temperatures in the day time can exceed 30 °C any month of the year. Minimum temperatures can possibly drop to 10 °C during the winter months (June, July and August) providing that conditions of clear sky remains during the nights and low amounts of water in the atmosphere and that the wind remains calm. Average monthly maximum temperatures show little variations, the annual range is approximately 4 °C. High temperature during day time occur from October to December, because cloud cover is not abundant, the greater amount of solar radiation reaching the surface – during those months sun rays reach the earth's surface at a less inclination– and finally due to the dryness of the soil. The graphs showing the variations of maximum

CHART 15
Extreme Temperature and Precipitation
Monthly average in Abancay
(Lat 13°38S Long 72°53'W Alt 2 377 m.a.s.l.)

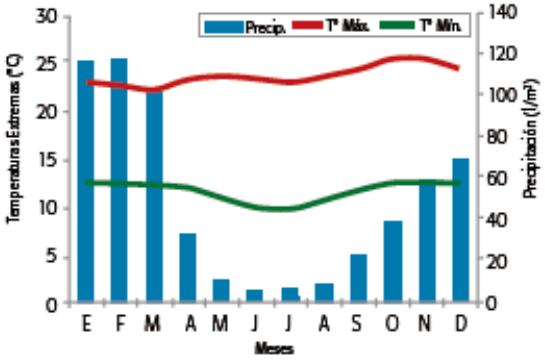


CHART 13
Extreme Temperature and Precipitation
Monthly average in Chalhuanca
(Lat 14°17'S Long 73°15'W Alt 2 902 m.a.s.l.)

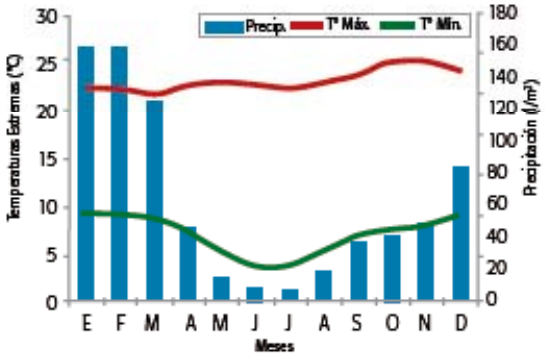


CHART 16
Extreme Temperature and Precipitation
Monthly Average in Curahuasi
(Lat 13°33'S Long 72°42'W Alt 2 687 m.a.s.l.)

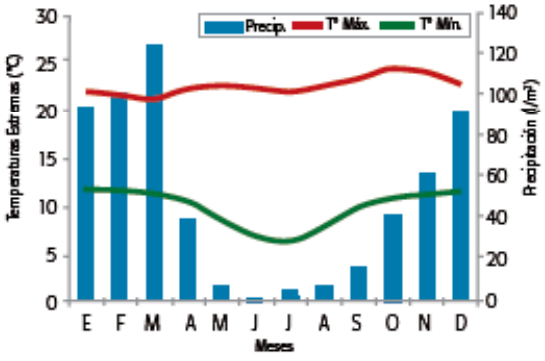


CHART 14
Hourly temperature and relative humidity
During July in Abancay
(Lat 13°36'S Long 71°52'W Alt 2 377 m.a.s.l.)

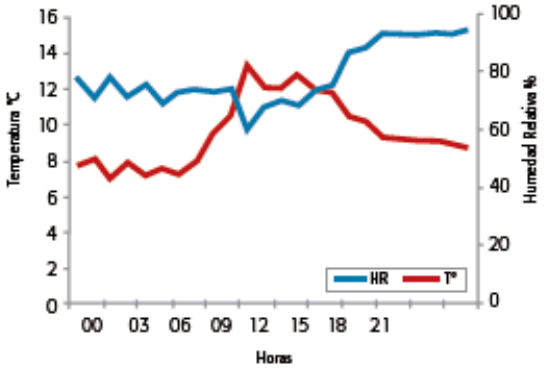


CHART 17
Hourly temperature and relative humidity
During September in Abancay
(Lat 13°36'S Long 72°52'W Alt 2 377 m.a.s.l.)

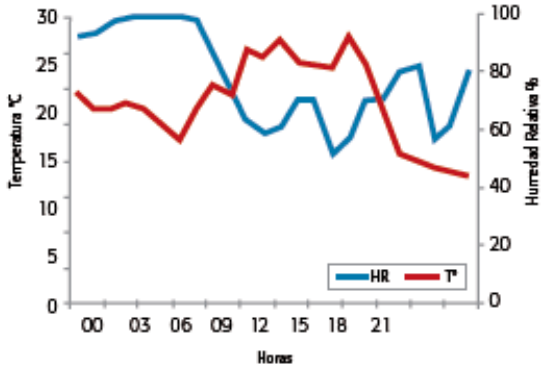
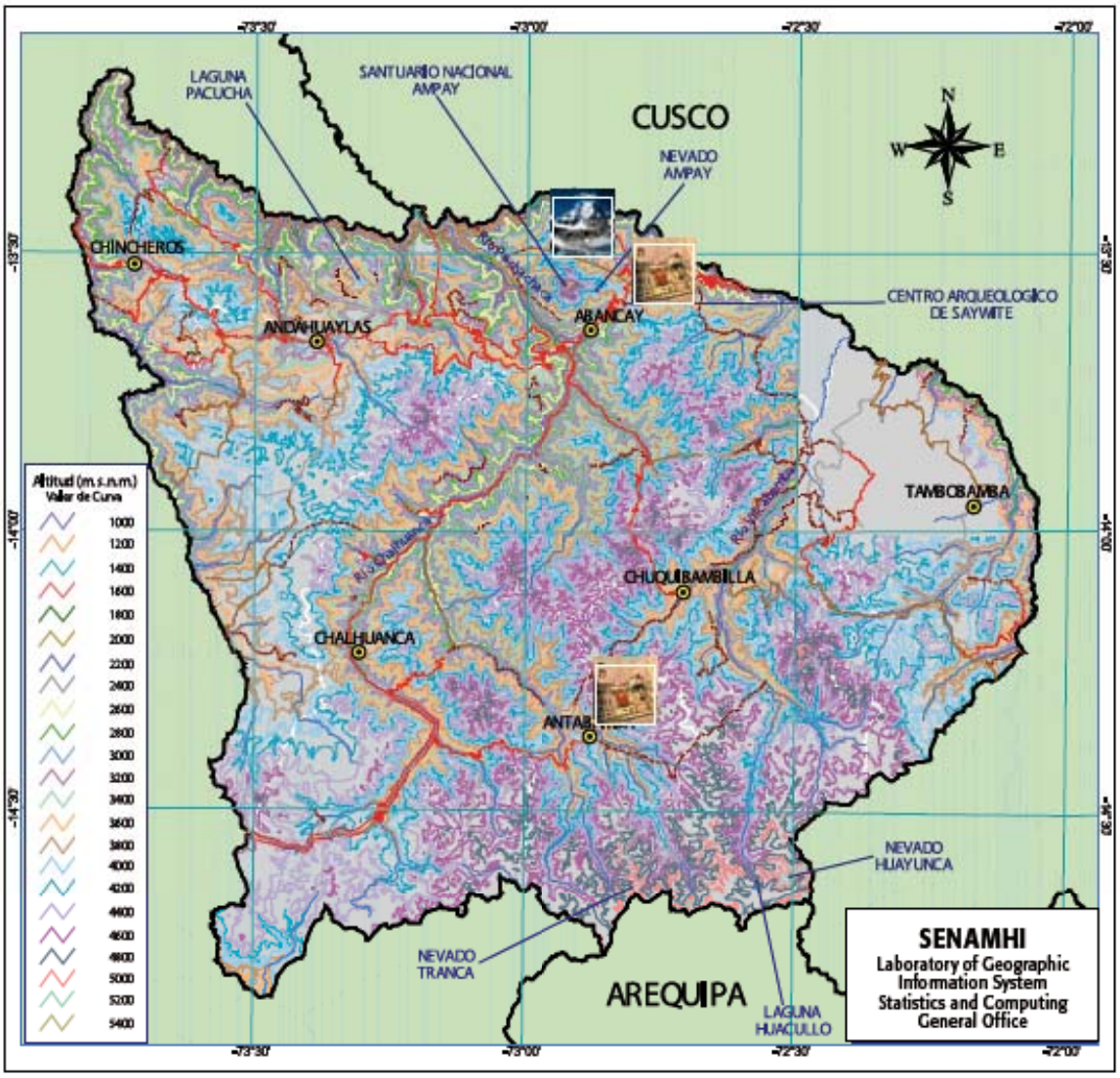


TABLE 3
Sunrise and sunset hours and duration of daylight throughout a year in the city of Abancay

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:38	05:52	05:57	06:00	06:05	06:14	06:18	06:08	05:48	05:28	05:16	05:21
Sunset	18:28	8:23	18:08	17:47	17:34	17:34	17:41	17:48	17:49	17:51	18:00	18:16
Time light	12:03	12:08	12:02	11:54	11:50	11:54	11:59	11:58	11:49	11:39	11:38	11:49



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

and minimum temperatures and the average monthly rainfall of Abancay, Andahuaylas, Curahuasi and Chalhuanca are shown below.

Minimum temperatures have an annual range of approximately 6 °C, and the lowest temperatures occur between the months of May and August. These are the months in which temperatures reach 0°C or less, depending on the altitude of the location. More than 50% of the territory of this Department has altitudes higher than 3 600 m.a.s.l. (andean high plain), where maximum temperatures fluctuate between 10 °C and 15 °C, and minimum temperatures fluctuate between -5 °C and 5 °C from June to September; however, they can frequently drop to -10 °C in places located over 4 000 m.a.s.l. such as the provinces of Antabamba and Aymaraes; when there is an entrance of dry air from the west and south-west over 5 000 m.a.s.l., or when the sky is clear during the night and the content of water vapor in the atmosphere is low.

Rainfall occurs only from December to March, and is more abundant in the provinces located at the border zone next to Arequipa and on the wind-ward oriented slopes, from the warm and humid winds coming form the Amazon region; that is, that in the slopes oriented to the east and northeast, such as the Andahuaylas province, where the annual amount of rainfall can exceed 1 200 l/m^2 above 4 000 m.a.s.l., precipitation frequently occurs in the form of snow and hail, associated to lightning. Most of the time rainfall starts in the afternoon and ends at midnight.

In general, during the night and very early in the morning is windy, and they increase during the first hours in the afternoon. In the months of winter, winds are relatively intense almost every day, and occasionally they can exceed 70 km/h in high locations. Additionally, in these zones there is a permanent cold sensation, even at noon and with clear sky; also this sensation increases in the shade. Relative humidity is high during rainfall period, and it is low or very low in the period from May to October. At noon, relative humidity is 30% or less, due to a turbulent mixture, dryness of soil and limited green vegetation coverage.

Fogs during rainfall periods are frequent, especially after midnight and alter continuous periods of rainfall. Las nieblas durante los perfodos de lluvia son frecuentes, principalmente después de la medianoche y tras los episodios de lluvias sostenidas.

The evolution of temperature and relative humidity in the air in the city of Abancay during the months of July and September are shown in the corresponding graphs.

TOURIST ATTRACTIONS

In order to visit the Ampay National Sanctuary, one should depart from Abancay and continue along a bridleway until you reach the base of the Ampay Glacier. In the way, you will find the Intimpa forest, located at 3 300 m.a.s.l., where average maximum temperatures fluctuate around 18 °C, and minimum temperatures are around 5 °C. Ampay in quechua means "hidden" or "covered with fog". And precisely this fog is an essential meteorological variable of the microclimate in this reserve that is characterized by high humidity, same one that permanently flows from the Amazon basin to the valleys and basins of the Apurimac and Pachachaca rivers. As this cold air moves upward along the north, west and east

hillside it gets condensed and forms a permanent cloud cover that later turns into rainfall, especially if the upward displacement is strong and continuous, as it frequently happens from October to March. The Ampay glacier is a key indicator of the occurrence of heavy rainfall in the hillsides of this range, of which it is an important part. The Intimpa forests constitute a singular vegetation area where it shelters a variety of species of flora and fauna. It is home to 500 species of plants and more than a hundred of birds belonging to 29 different families.

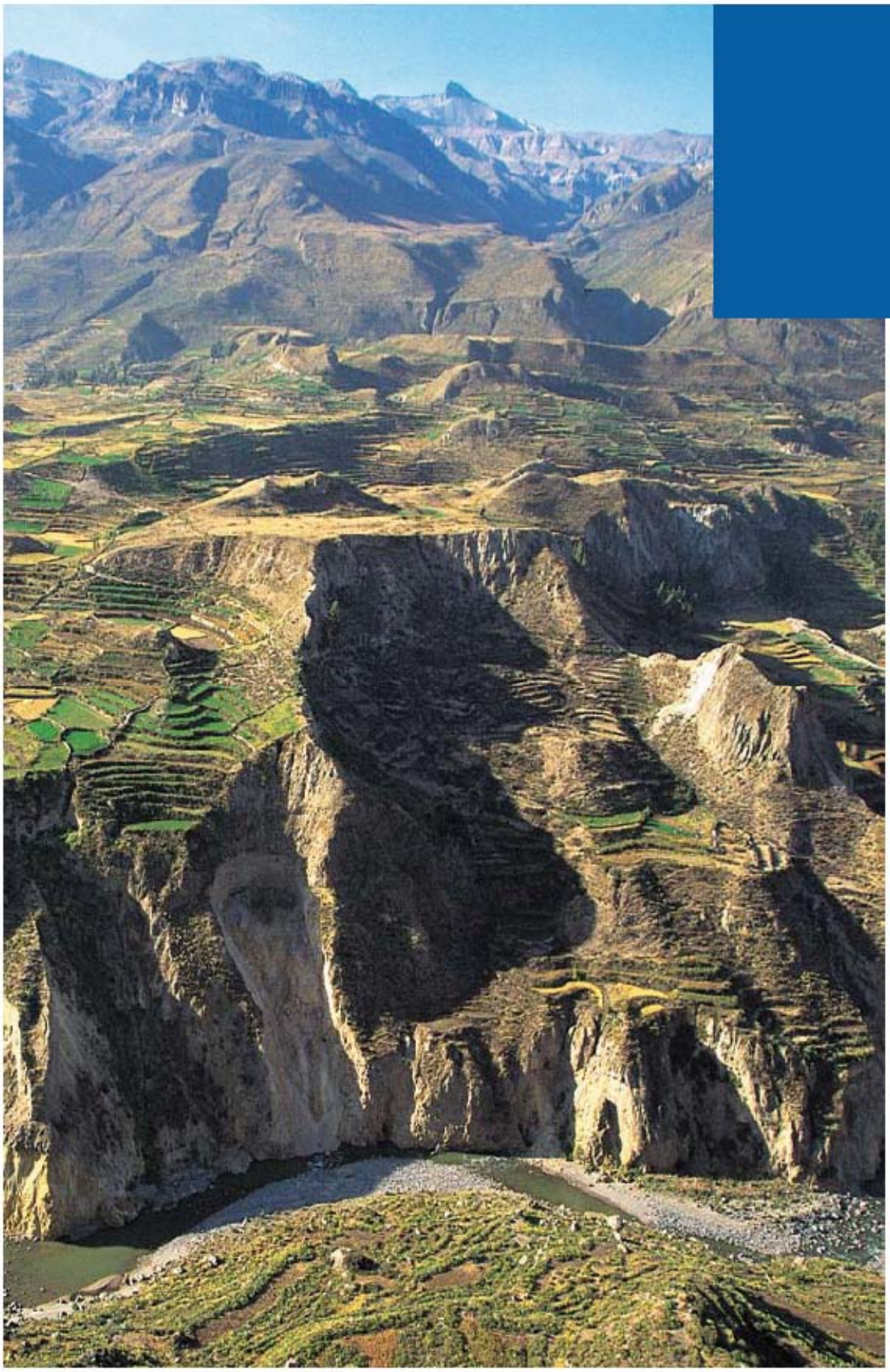
ABANCAY

Abancay is the capital of the Department of Apurimac. It is located on the Central Andean Mountains, on the south west part of the Western Mountain Range, at an altitude of 2 378 m.a.s.l. The climate in the city is temperate and dry from April to November, months in which maximum temperatures fluctuate around 27 °C, while minimum temperatures are around 10 °C. During this period, rainfall occurrence is sporadic. Abancay has a great variety of natural landscapes, such as the Usnomocco viewpoint (district of Tamburco), the ecological complex of Taraccasa and attractive place for the practice of ecotourism, climbing, mountaineering and hiking. There are also some archaeological ruins such as the Sayhuite, and Cconoc thermal baths located in Curahuasi.

PACUCHA LAGOON

Northeast of Andahuaylas is located the beautiful Lagoon of Pacucha, it is a blue-water lagoon, and it is an important tourist attraction. Temperatures are similar to the ones in Andahuaylas. Near this lagoon, is located the Sondor architectonic complex, from where one can enjoy the view of beautiful landscapes that surround the Pacucha lagoon and the Vilcanota snow peak.

The atmosphere in Apurimac has less concentration of oxygen with regard to the one existing at sea level, this originates some discomfort to the tourists. For this reason, persons that have overweight, high blood pressure must have a medical checkup before they plan a trip to places in this Department. Between April and September there is scarce cloudiness and the atmosphere offers less protection against solar radiation, for which it is recommended to use a cap or hat and sun protecting glasses.



Arequipa


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
APURÍMAC
CUSCO
AYACUCHO
PUNO
COTAHUASI
CHIVAY
CARAVELI
CHUQUIBAMBA
APLAO
AREQUIPA
CAMANA
MOLLENDO
MOQUEGUA
OCÉANO PACÍFICO
Río Chapara
Río Ocoña
Río Colca
Río Yura
N
W
E
S
AREQUIPA – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Arequipa is located in the southern part of the Peruvian territory. To the northwest it is bordered by Ica, to the north by Ayacucho, Apurímac and Cusco, to the northeast it is bordered by Puno, to the southeast by Moquegua and to the west it is bordered by the Pacific Ocean. Its territory consists of coastal and mountain regions, with a geography characterized for presenting strong physiographic contrasts. Thus, we have a narrow and desert coast, a mountain region with a vast plateau with deep canyons and volcanic summits.

CLIMATE CLASSIFICATION

According to the climate classification of Thornthwaite, the Department of Arequipa has the following climates:

An arid climate, with scarce rainfall during the whole year, it is characterized for being semi-warm, humid and cloudy. It is typical of places located in the coastal provinces of Caravelí, Camaná and Islay.

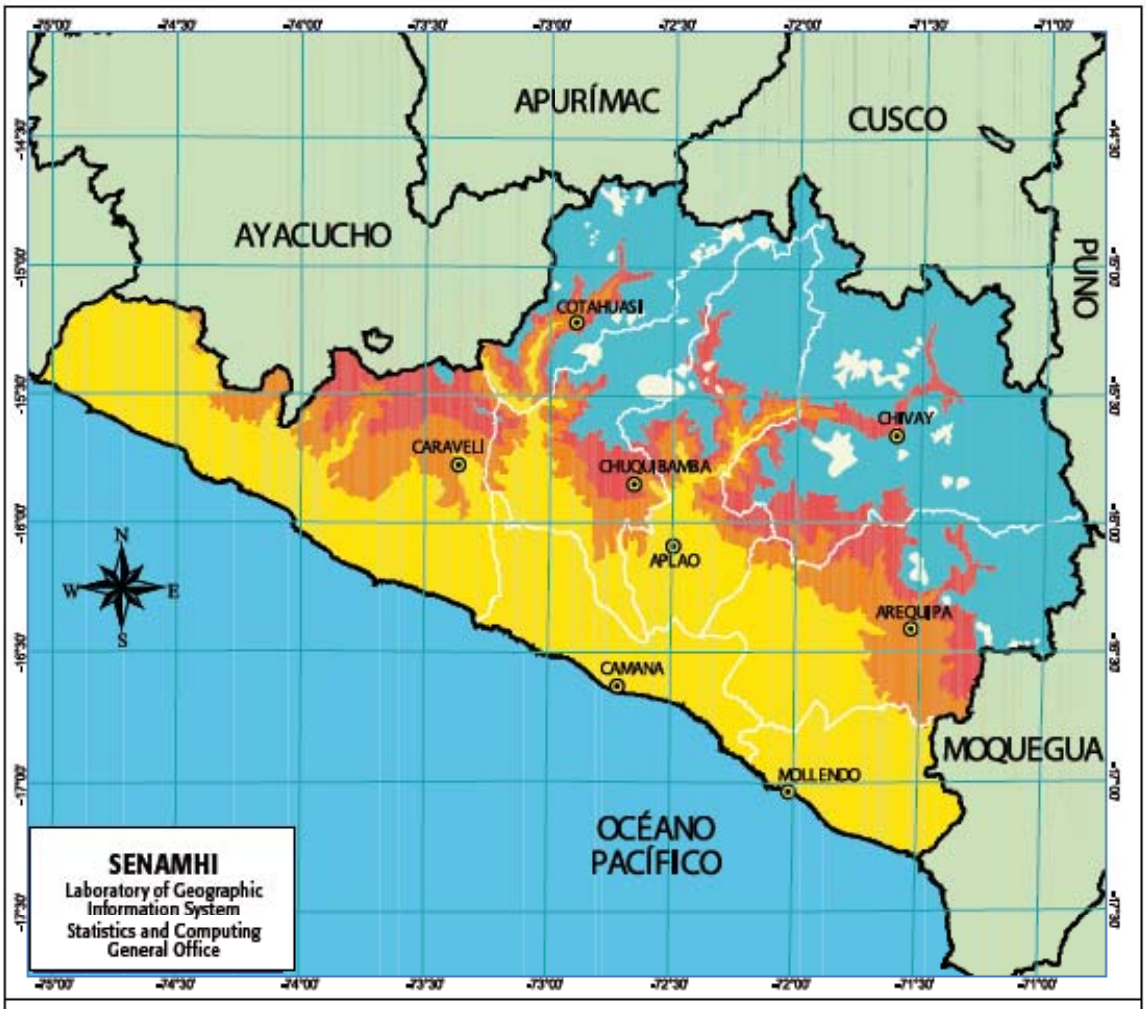
A semi-dry, dry in autumn, winter and spring, temperate and humid. This kind of climate is typical of places located in the Andean foothill between 1 000 m.a.s.l. and 2 500 m.a.s.l., as there is in the provinces of Caravelí, Aplao and Arequipa.

A semi-arid climate, dry in autumn, winter and spring, temperate and with low air humidity. It is typical of places located between 2 500 m.s.n.m. y 3 000 m.s.n.m., as in the provinces of Condesuyos, Castilla, Caylloma and Arequipa.

A semi-dry, climate and cold climate, dry in autumn, winter and spring, with a low relative humidity. It is characteristic of places located in the provinces of La Union (Cotahuasi), Castilla (Machaguay), Caylloma (Huambo, Huanca and Chivay).

A rainy and smi-frigid climate, dry in autumn and winter. This climate is typical of places located in the provinces of La Unión (Puyca), Castilla (Orcopampa) and Caylloma (San Antonio de Chuca).

A polar type of climate, typical of the snow-covered peaks such as the Firua, Solimana, Coropuna, Hualca Hualca, Ampato, Ananta, Mismi, Chucura, Chachani, and of the volcanoes Misti and Pichu Pichu



⊙ Capital

Department borders

Description	Coding
Arid, semi-warm and humid, rainfall shortage during the year	E(d) B'1 H3
Semi-dry, temperate and humid, rainfall in autumn, winter and spring	C(o,i,p) B'2 H3
Semi-dry, temperate and humid, rainfall shortage in autumn, winter and spring	D(o,i,p) B'2 H2
Semi-arid, temperate and humid; rainfall shortage in autumn, winter and spring	C(o,i,p) C' H2
Rainy, semi-frigid and humid; rainfall shortage in autumn and winter	B(o,i) D' H3
Snow type	Snow
Semi-dry, cold, shortage rainfall in autumn and winter, with dry air	C(o,i) C' H2

WEATHER AND CLIMATE

Its territory is formed by three geographical features: the coastal mountain chain, the desert pampas, and the mountain region.

The coast of Arequipa is a narrow strip that has a climate associated to the coastal seaboard, characterized for presenting cloudy sky and scarce or absence of precipitation, which makes it a typical arid zone. Average monthly Maximum and Minimum extreme temperatures along the coast of the Department do not show important changes; the isotherms are almost parallel to the coast. In the autumn and winter, this strip is cloudy or covered at dawn, and towards noon the clouds easily drive away allowing an "intense" sun bright all day long. The physical mechanism that generates this meteorological condition is a source of atmospheric turbulence, originated by the warming of the steep, rocky and narrow relief of this narrow strip, which gives rise to the process of turbulent mixture between sea humid air masses from low levels and dry air located above limits, this process results in a clear and shining sky with intense sun bright.

In the chart the average monthly maximum and minimum temperatures is shown and also average monthly precipitation in Punta Ático, a typical place of the coastal strip.

The thermoregulating effect of the ocean is evident in the temperatures of places such as Punta Ático and La Haciendita (Islay), located at 20 m.a.s.l. and 250 m.a.s.l., respectively. The second mentioned, has the highest average maximum temperatures and the lowest average minimum temperatures, because it s located at a larger distance and higher altitude, as it can be seen in the corresponding charts.

Average maximum temperatures in the southern coast of Arequipa (province of Islay, Haciendita) oscillate between 22 °C and 28 °C, and average minimum temperatures are between 12 °C and 18 °C. There is practically absence of rainfall, although exceptionally, there is some drizzle during the night and at dawn. In the northern and central coast (Punta Ático), average

maximum temperatures fluctuate between 19 °C and 26 °C, and average minimum temperatures oscillate around 14 °C and 19 °C, this values correspond to the winter and the summer respectively.

The climate and the weather along the coastal locations are influenced also by the ocean dynamics; that is, when surface temperature of sea waters decrease due to upwelling, cloud coverage or the advection cold waters of the south, or other factors; then air temperatures en the coastal strip also decrease. The inverse process is also confirmed. This correlation is evident in the minimum temperature variable, and even more in the case of the occurrence of El Niño phenomenon.

Rainfall in the coastal region is generally the kind similar to a drizzle, and they are frequent during the months of the winter time. They start specially after midnight and stop at dawn. Rainfall become persistent when sea breeze intensifies in the locations exposed to humid winds coming from the ocean, as it happens in the Atiquipa hills, where drizzle is frequent during autumn and winter, amounting significant values.

The desert pampas located at 1 000 m.a.s.l. which is a higher altitude than the limit of the stratus clouds, receive a very high incidence of solar radiation all the year, this place registers maximum values compared to other places in Peru. Over the pampas the sky is free of cloudiness almost every day of the year, it is generally sunny from very early in the morning and every day of the year. Maximum temperatures are relatively high throughout the year, they oscillate between 22 °C and

CHART 18
Extreme Temperature and Precipitation
Monthly Average in La Haciendita
(Lat 17°00'S Long 71° 37'W Atl 400 m.a.s.l.)

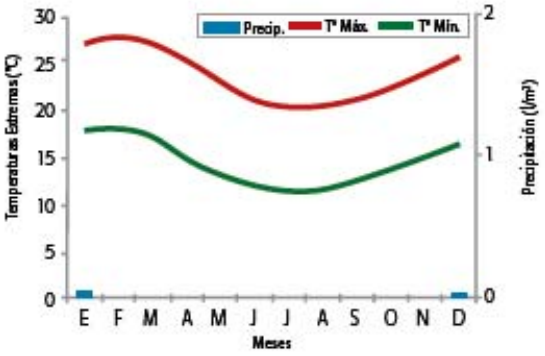


CHART 19
Extreme Temperature and Precipitation
Monthly average in La Pampilla
(Lat 16° 25'S Long 71° 31W Alt 2 350 m.a.s.l.)

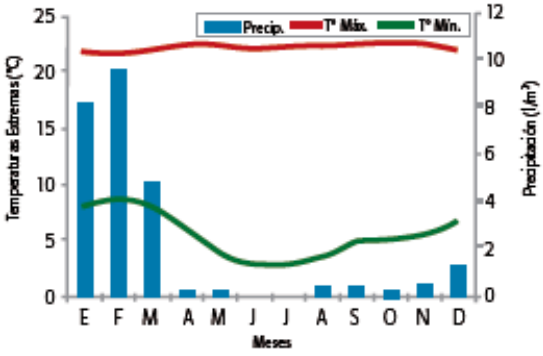


CHART 20
Extreme Temperature and Precipitation
Monthly average in Angostura
(Lat 15°11'S Long 71° 39'W Alt 4 155 m.a.s.l.)

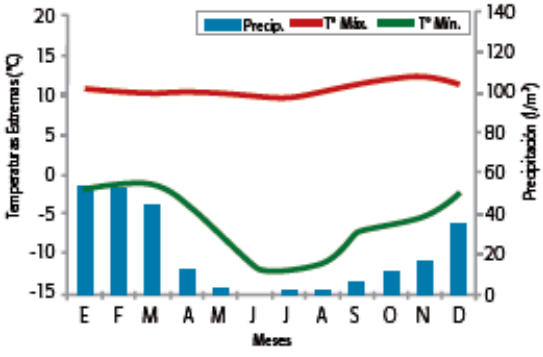


CHART 21
Extreme Temperatures and Preciptation
Monthly average in Punta Atico
(Lat 16°14'S Long 73°42'W Alt 20 m.a.s.l.)

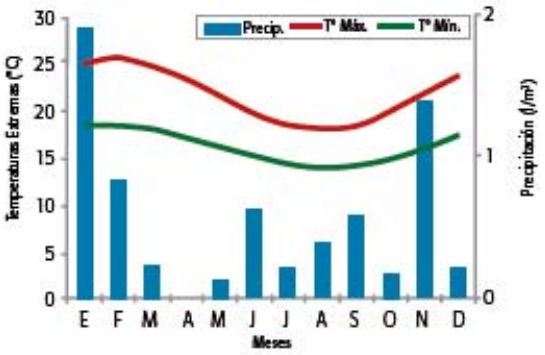


CHART 22
Extreme Temperatures and Precipitation
Monthly average in La Joya
(Lat 16°35'S Long 71°55'W Alt 268 m.a.s.l.)

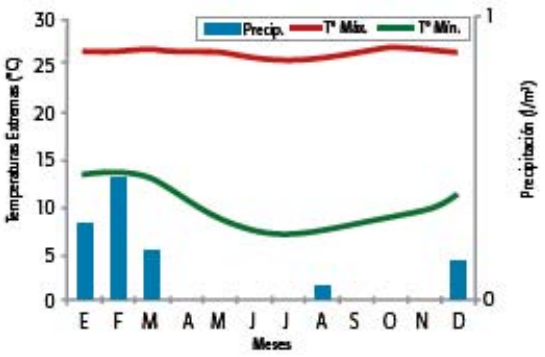


CHART 23
Extreme Temperatures and Precipitation
Monthly average in Arequipa
(Lat 16°24'S Logn 71°32'W Alt 2 330 m.s.a.l.)

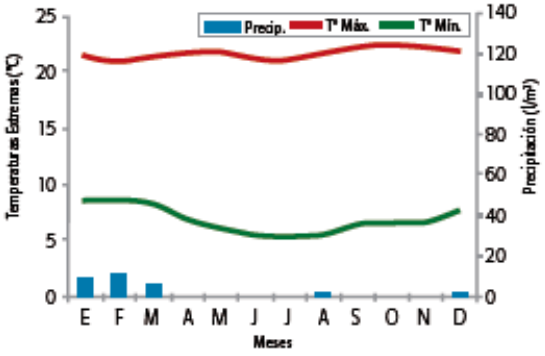


CHART 24
Extreme Temperature and Precipitation
Monthly average in Imata
(Lat 15°50'S Long 71°05'W Alt 4 436 m.a.s.l.)

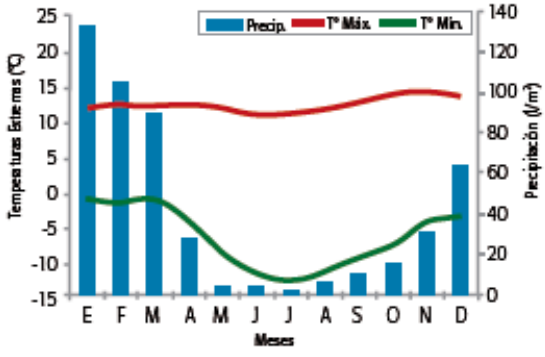


CHART 25
Hourly temperature and humidity in Chivay
August
(Lat 15°38'S Long 71°36'W Alt 3 619 m.a.s.l.)

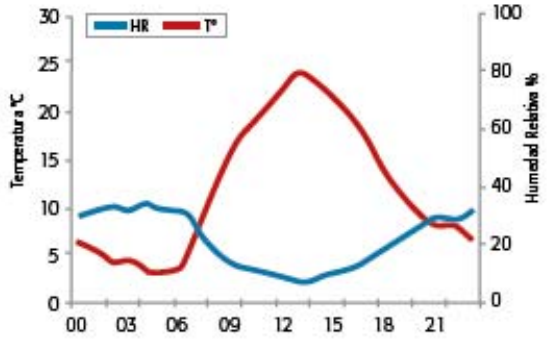


CHART 26
Hourly temperature and humidity in Chivay
October
(Lat 15°38'S Long 71°36'W Alt 3 619 m.a.s.l.)

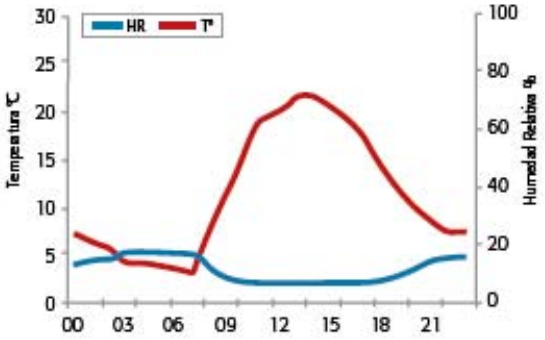


TABLE 4
Sunrise and sunset hours and duration of daylight throughout a year in the city of Arequipa

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:26	05:42	05:49	05:54	06:02	06:12	06:15	06:04	05:42	05:19	05:05	05:08
Sunset	18:25	18:19	18:01	17:38	17:23	17:21	17:29	17:38	17:42	17:46	17:57	18:14
Time light	11:56	12:00	11:55	11:46	11:43	11:47	11:52	11:51	11:42	11:32	11:31	11:41

27 °C respectively. The annual range is approximately 2 °C, and minimum temperatures are relatively low, ranging from 8 °C to 14 °C in the winter and summer respectively. In La Joya and in La Pampilla, however, temperatures oscillate between 3 °C and 9 °C, due to scarce cloudiness during the night, to the dryness of the soil and the atmosphere, and to calm wind.

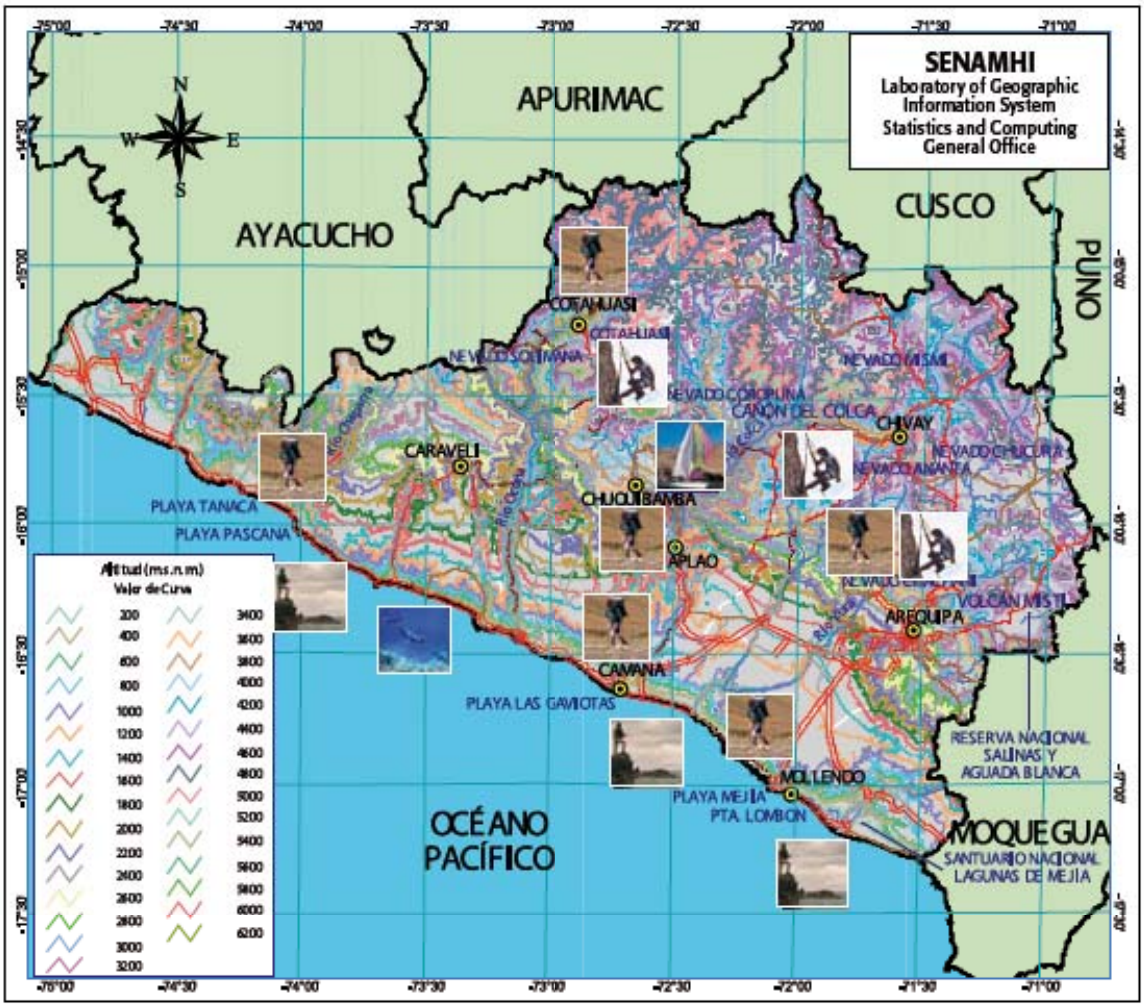
The mountain region of Arequipa is formed by the high-andean plateau, the chain of volcanoes and the summits of the western mountain chain. It is characterized for presenting isotherms of average monthly maximum and minimum temperatures, following a distribution almost parallel to the coast. Average temperatures decrease gradually 0,6 °C for every 100 m in height, and thermal variations between day and night are very high, exceeding 25 °C permanently form June to August.

Over 3 800 m.a.s.l. in the high-andean plateau night freezing temperatures are observed throughout the year, as it can be observed in the charts corresponding to the locations of Angostura and Imata.

Average maximum temperatures are relatively high, due to the intense incidence of solar radiation, to the dryness of the air and scarce cloud coverage and to dryness of the soil. Thus, in Angostura, average maximum temperatures in the summer fluctuate between 14 °C, and in spring around 16 °C. In Imata, a place located at 4 520 m.a.s.l., maximum temperatures in the summer fluctuate around 12 °C, while in the spring they fluctuate around 14 °C.

In the mountain region, rainfall increases gradually with the altitude. In the high-andean plateau rainfall values around 700 l/m² a year, from which 70% occurs between the months of January and March. Rainfall occurs generally at the end of daylight and first hours of the night.time, and almost always last a short time. They are frequently associated to lightning and thunder, although some precipitations as snow, hail and sleet occur.

In the months of winter, occassionaly occur intense snow precipitations over large areas, as it happened in the first 10 days of July 2002. The altitude of the location as well as the valleys orientation with regard to the flux of humid wind are decisive factors to incentivate the occurrence of rainfall, as it can be seen in the above charts corresponding to Angostura and Imata, located at 4 155 m.a.s.l. and 4 436 m.a.s.l. respectively. This last one, despite the fact that is



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

located at a higher altitude, receives less annual average of rainfall, because it is leeward-oriented with regard to humid winds

Winds are relatively strong in autumn and winter, and it may occur some gust winds with speed higher 20 m/s (72 km/h) in the coast and mountain region. In the coast, especially over the desert pampas, these winds may transports dust particles and fine sand particles for a few hours.

In the graphs, the hourly evolution of air temperature and relative humidity for one day of the months of August and October in Chivay town is illustrated.

TOURIST ATTRACTIONS

CAMANÁ

Camaná is located in the coastal strip, the Camana and Ocoña rivers run along its territory. It has important ports such as Matarani and Quilca. Its main economical activities are agriculture and fishery. Among its most beautiful beaches are: Mejía, Mollendo, La Punta, La Dehesa and El Chorro, splendid places for tourism in the summer time.

CARAVELÍ

Located at the northern part of the seaboard, it is a province that produces grapefruit and olives. It has two important hills: Átlco and Atiquita, both get covered with vegetation during the winter time. The main agricultural valley are Bella Union and Yauca. The beaches of Tanaca, Lomos and Chala are considered by the people living in this place, as the most beautiful beaches of the Peruvian coastal seaboard.

CASTILLA

Its capital is Aplao city, is tis located in the way to the Cotahuasi Canyon. In the district of Pampacolca is located the Coropuna snow peak, the third highest peak of Peru, with 6 425 mts of altitude. Castilla is a province with an important tourist potential, because it is in this place where the Andagua, The Colca Canyon and the petroglifs of Toro Muerto can be visited. It has suitable transportation and lodging for people that love adventure sports such as canoeing and paragliding.

CAYLLOMA

Is a province located over 4 332 m.a.s.l., with an adverse climate for agro-fishery development. In the lower part (over 2 000 m.a.s.l.) is located the Majes Valley. Caylloma is a province with tourist potencial, both ecological and adventure. The tourist activity in the Colca Valley has increased due to the Salinas and Aguada Blanca National Reserves. This last one is located 3 700 m.a.s.l. you can get there by road, the one that takes you to the Colca Valley. Maximum temperatures range from 20°C to 12 °C, and minimum temperatures range from 0°C to -15°C, and in occasions it drops to -20°C in locations above 4 500 m.a.s.l. In all the province , sun bright is permanent from April to December, during autumn, winter strong winds are observed. In the nights,

freezing temperatures in the autumn and winter seasons are registered at night.

CONDESUYOS

Its capital is Chuquibamba city, located near the Coropuna snow peak. It has a pleasant climate and it is a province with little agricultural development.

ISLAY

Islay is a coastal province that has two important maritime ports: Mollendo and Matarani. The capital of Islay is Mollendo, a torurist city with beautiful beaches that are not too crowded. Here there is a protected area, the Mejía Lagoons, a wetland ecosystem located at the rivermouth of the Tambo river, it is home to 84 species of birds and 57 species of migratory birds. The prevailing flora is the totora and wicker. The climate is cool in autumn and spring and hot and humid in the summer.

LA UNIÓN

It is a province with a complex and rough geography, consisting of a large area of high andean plain, where freezing temperatures are very frequent. Its capital is the city of Cotahuasi. The Cotahuasi Canyon is a peaceful place appropriate for the persons that enjoy adventure tourism.

AREQUIPA

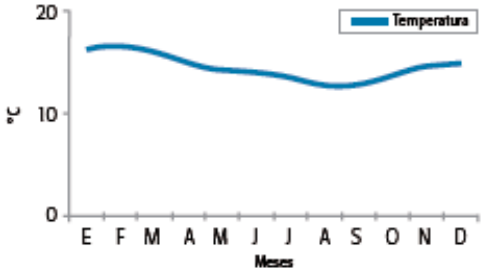
Arequipa is the capital, it is located at 2 304 m.a.s.l. It is a tourist city that offers transportation, lodging, hotels facilities and tourist agencies. Since it was first established in the colonial period, it offers important historical monuments, and also beautiful countryside and an excellent cuisine. The city has available urban tourist routes, such as the Santa Clara Convent, the Plaza de Armas or Main Square and its Cathedral, the Casa del Fundador or House of the Founder and a number of colonial temples. The climate is pleasant throughout the year.

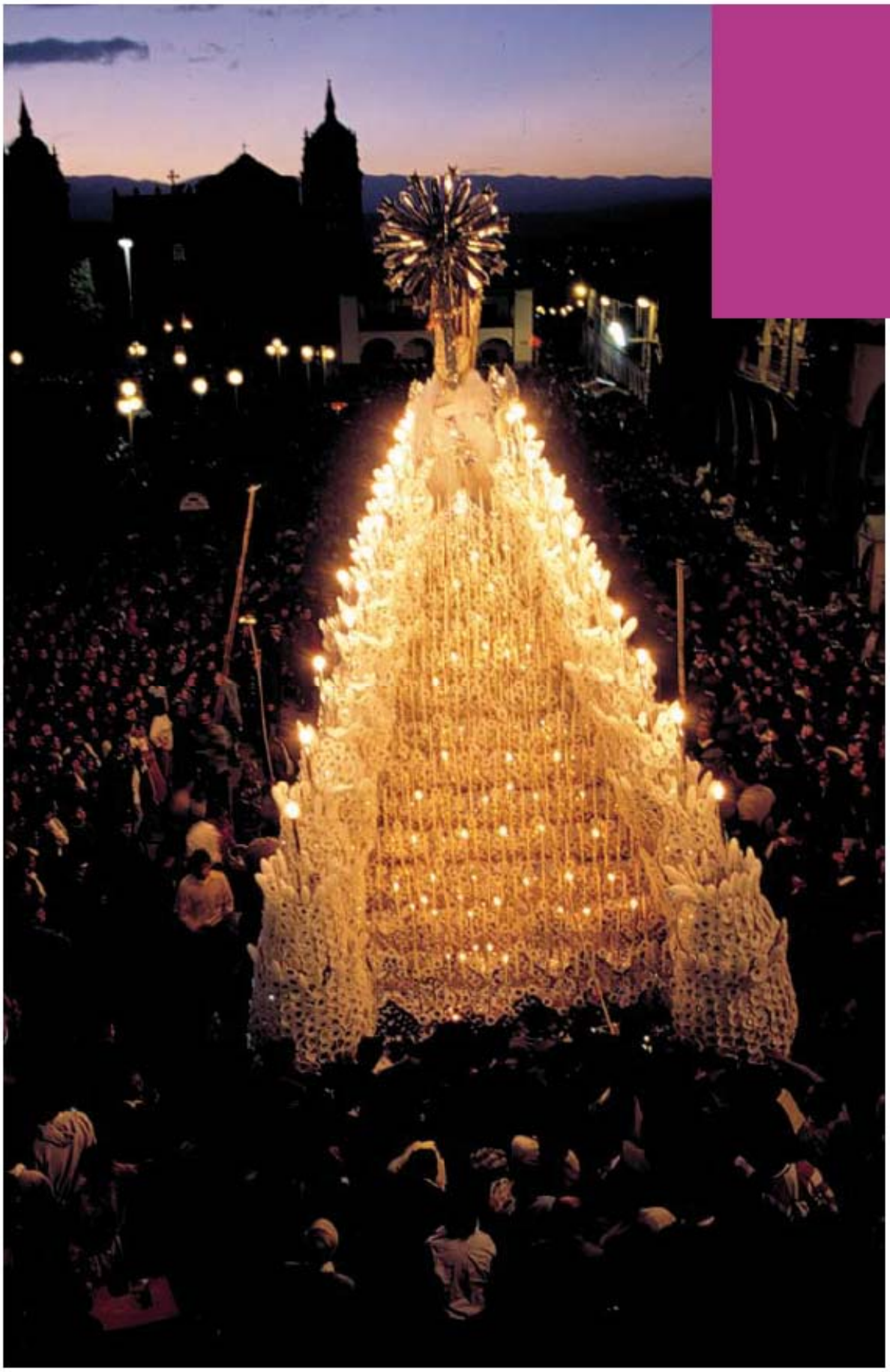
BEACHES

In general, sea water temperature in the beaches of this department is slightly higher than the one in the beaches of Ica and Lima, mainly because of a less intensity of upwelling. Likewise, as in all the beaches of

the territory the transparency of the waters is very low; in the summer sea water temperature in the beaches fluctuate around 21 °C, and by the end of the winter it fluctuates around 15 °C. It is worth mentioning that in these beaches the presence of sun bright is more frequent than in the beaches of the central departments. Daily oscillation of temperature is less than 1 °C. Chart 27 shows the average monthly temperature behavior in the beaches of this department.

CHART 27
Sea surface temperature in Arequipa beaches





Ayacucho


AYACUCHO – DEPARTMENT MAP
LEYEND
Capital of the province
Department borde
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
JUNÍN
LIMA
HUANCAVELICA
CUSCO
APURÍMAC
ICA
AREQUIPA
OCÉANO PACÍFICO
HUANTA
SAN MIGUEL
AYACUCHO
CANGALLO
VILCAS HUAMAN
HUANCAPI
HUANCA SANCOS
QUEROBAMBA
PUQUIO
CORACORA
PAUSA
Río Pampas
Río Urubamba
Río Grande
Río Trancas
Río Pallancata
Río Paralimpo
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office

GEOGRAPHY

The Department of Ayacucho is located in the central-south part of the Andean Mountain Chain; the northerm part of its territory is run through by the Rasuhuilca mountain chain, and the central part by the Huanzo Mountain Chain, geographical formations that shape the reflief of this territory, they also form three large geographical zones: the high plateau, to the south, an abrupt mountain zone at the center and a front-forest at the northeastern part.

The high plateau zone consists of large pampas such as the Anjoya and Galeras, and the Parinacochas plateau, surrounded by the Sara Sara 5 522 m..a.s.l. In these high plateaus originate the Acará, Lampalla, Huanca Huanca, and Marán rivers. In Lucanas is located the Parinacochas lagoon.

This abrupt mountain zone is formed by a complex geography, with high plateaus, steep slopes and narrow inter-andean valleys, where the main rivers run through, they are the Apurimac, Mantaro, Pampas, Vinchos and Pongará.

The front-forest zone, formed by the provinces of Huanta and La Mar, is characterized for presenting an abrupt relief, with a landscape and climate typical of the front-forest region.

The capital of the department is the city of Ayacucho, it is located in the province of Huamanga, above 2 760 m.a.s.l. It has a pleasant climate, characterized for presenting an atmospheric pressure, with values ranging around 733 hPa, and that has no significant variation during the year. The winds blow from the low lands to the highlands during the day, it becomes more intense in the afternoon hours, prevailing the north-wind component. The predominant wind speed, mostly calm, ranges between 0 m/s and 0,2 m/s.

One of the most important rivers of the department, with a significant discharge value during all the year, is the Acarí river, it runs across the province of Lucanas and it has a regular regime between December and April, with maximum floods of up to 400 m^3/s, and discharge during the dry period (May – November) that fluctuate around 5 m^3/s. This river has a slope of 2,16% and it is suitable for the practice of canoeing and the kayak in the summer months.

⊙ Capital Department borders

Description	Coding
Arid, semi-warm and humid, rainfall shortage in all the seasons	E(d) B'1 H3
Semi-dry, temperate and humid, rainfall in autumn, dry winter and spring	C(o,i,p) B'2 H3
Semi-dry, semi-cold and humid, with dry autumns, winters and springs	C(o,i,p) B'3 H3
Semi-arid, temperate and dry, with dry autumns, winters and spring	D(o,i,p) B'2 H2
Semi-dry, cold and dry, with dry autumns, winters and spring	C(o,i,p) C' H2
Rainy, semi-frigid and humid, with dry autumn and winter	B(o,i) D' H3
Snowy	Snow
Rainy, semi-frigid and humid, with dry winter	B(i) D' H3
Semi-dry, temperate and humid, with dry autumns and winters	C(o,i) B'2 H3
Rainy, temperate and humid, with dry winter	B(i) B'2 H3
Very rainy, temperate and humid, with plenty of rainfall in the seasons	A(r) B'2 H3
Rainy, semi-warm and very humid, with plenty of rainfall in the seasons	B(r) B'1 H4
Rainy, warm and very humid, with plenty of rainfall in the seasons	B(r) A' H4
Very rainy, warm and very humid, with plenty of rainfall in the seasons	A(r) A' H4

CLIMATE CLASSIFICATION

The Department has a diversity of climates that range form a warm to a frigid one. According to the climate classification of Thornthwaite, it has the following climates:

An arid, semi-warm climate with a relative humidity that ranges from 65% to 84%, with absence of rainfall in all the seasons of the year. This climate is typical of the places located in the provinces of Huancasancos and Lucanas.

A semi-dry and cold climate, with absence of rainfall in autumn, winter and spring. This kind of climate is typical of places located in the provinces of Lucanas y Huancasancos.

A rainy and semi-frigid climate with rainfall shortage in autumn and winter. This kind of climate is typical of the provinces of Huancasancos, Cangallo, Vilcashuamán, Lucanas, Parinacochas and Paucar of the Sara Sara.

A very rainy, warm and temperate climate, with a high relative humidity, between 85% and 100%, abundant precipitation throughout the year. This type of climate is typical of places located in the provinces of Huanta and La Mar.

WEATHER AND CLIMATE

Ninety percent of the territory of the department corresponds to a mountain region, and its central part is one of the driest zones in the Peruvian territory, a characteristic that is originated due to the presence of mountain chains located at the northeastern part, with peaks higher than 4 000 m.s.n.m. These mountain chains prevent the displacement of humid air masses coming from the east or northeast to the south or west. Thus, we can observe that Ayacucho bearly receives and annual average of 550 l/m², while in Cora Cora rainfall contribution is 380l/m² and in Puquio 377 l/m². These two places are located on the western slope and above 3 000 m.a.s.l., they receive relatively low average amounts of rainfall, because they are influenced by the subsidence of the South Pacific Anticyclone and because it is far from the source of humidity , that is to say the Amazon basin. In the high plains there are occasional precipitations in the form of snow.

Daily temperatures decrease with altitude. Cloud coverage and rainfall are scarce with respect to other departments; consequently, there is sun bright throughout the year and daily temperatures are relatively high, as it can be seen in the graphs corresponding to the locations of Ayacucho, Puquio and Cora Cora.

⊙ Province Capital

Rivers

— Main road

═══ Asphalted

═══ Reinforced

═══ Without reinforcement

═══ Carriage path

═══ In construction

----- In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

In the city of Ayacucho and in all the department, maximum temperatures occur in October and November, reaching up to 30 °C, due to higher amount of incident solar radiation on the surface during this period and to the dryness of the soil.

Freezing temperatures in locations above 3 000 m of altitude are frequent from April to November, specially in the andean high plains, because of the absence of clouds and water vapor in the atmosphere during the nights and also due to the dryness of the soil. In this region, winds in the winter, become more intense and they can exceed 50 km/h.

The following charts show the changes in daily temperature and relative humidity corresponding to Cora Cora, during the month of June.

TOURIST ATTRACTIONS

AYACUCHO

Ayacucho, is the capital of the department, it is a colonial-type of city that preserves its architecture in the 33 churches built of stone and wooden and gold-leaf decorations inside of them. The climate is dry and temperate, and the average maximum temperature slightly varies from 23 °C to 28°C, and minimum temperature fluctuates between 6°C and 11°C. High-precipitations times are between December and March reaching values of 117 l/m² in January. The most popular and traditional feast is the Holy Week, it attracts thousands of visitors. Other tourist places near the city of Ayacucho are Pikimachay cave and the architectural complex known as Wari.

CHAR 28
Extreme Temperatures and Precipitation
Monthly average in the city of Ayacucho
(Lat 13°09'S Long 74°12'W Alt 2 761 m.a.s.l.)

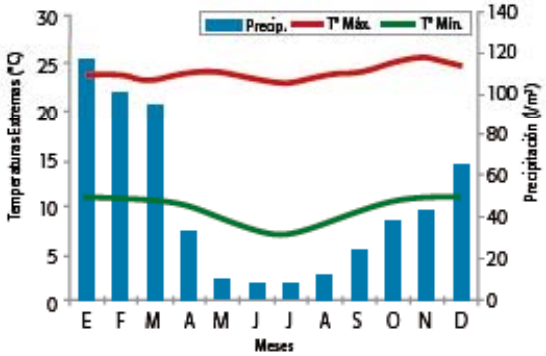


CHART 29
Extreme Temperature and Precipitation
Monthly average in Puquio
(Lat 14°42'S Long 74°08'W Alt 203 m.a.s.l.)

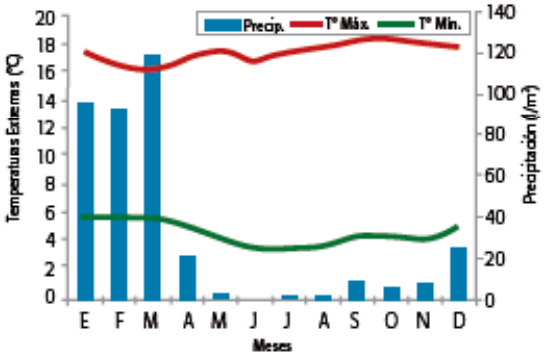


CHART 30
Extreme Temperature and Precipitation
Monthly average in Cora Cora
(Lat 15°01'S Long 73°47'W Alt 3,200 m.a.s.l.)

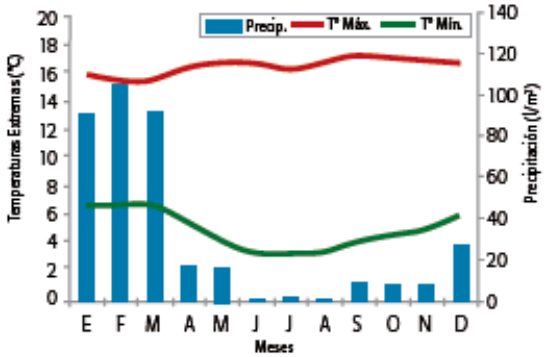


CHART 31
Daily Temperature and Humidity in Cora Cora
June
(Lat 15°1'S Long 73°47'W Alt 3 200 m.a.s.l.)

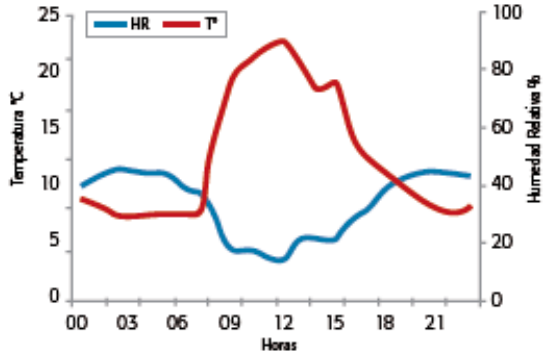


TABLE 5
Sunrise and sunset hours and duration of daylight throughout a year

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:42	05:55	06:00	06:03	06:08	06:17	06:20	06:11	05:52	05:31	05:20	05:25
Sunset	18:31	18:26	18:11	17:51	17:38	17:38	17:45	17:51	17:53	17:54	18:03	18:19
Time light	12:06	12:11	12:06	11:57	11:53	11:57	12:03	12:01	11:52	11:43	11:41	11:52

The Valley of Huanta, also known as the "Emerald of the Andes" is located 51km north of the city of Ayacucho. It has a rainy climate from December to March, and the weather is cool and pleasant throughout the year. Maximum and Minimum temperatures are approximately 1 °C higher than the values registered in Ayacucho city.

THE PAMPA OF LA QUINUA

It is located at an altitude of 3 400 m.sa.s.l., and 32 km from Ayacucho, with average maximum temperatures of 19 °C and average minimum temperatures of 5 °C. It has its higher precipitation regime from the months of December to March. In this province we can visit the Puya Plant Forest (Titankayoc) and the Temples of the Sun and the Moon.

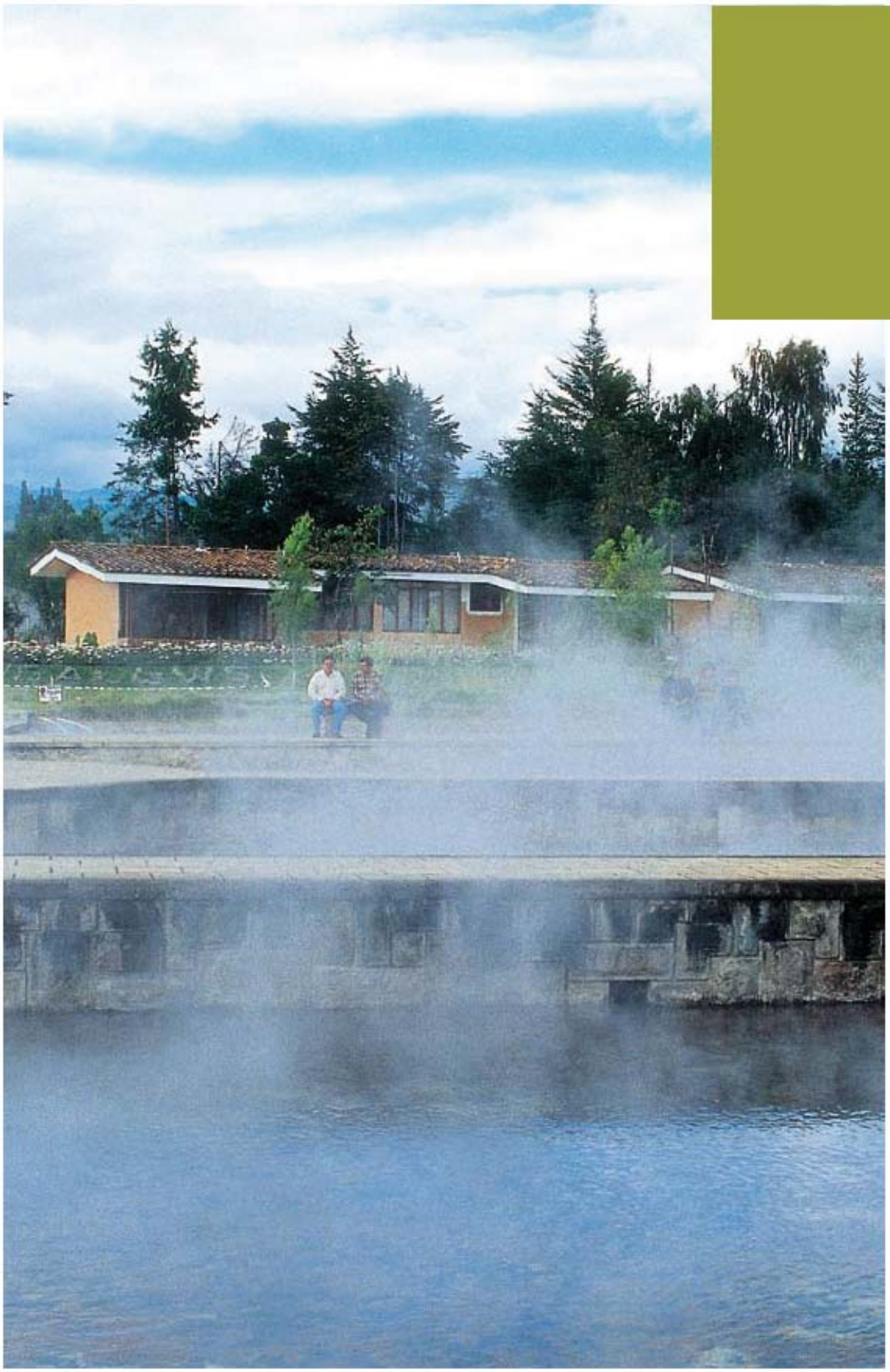
PAMPA GALERAS NATIONAL RESERVE

It is located in the province of Lucanas, at an average height of 4 000 m.a.s.l. and is the biggest habitat of vicuñas living in their natural state in Peru. Its average maximum temperatures are around 15 °C, and minimum are around 6 °C in the summer, they could occasionally decrease down to -10°C during the months of June and August The high precipitation period occurs from the December to March, drastically decreasing in intensity and frequency during the rest of the year.

PARINACOCHAS

It is located in the southern part of the department, and it is where the Parinacochas Lagoon is located at a height of 3 300 m.a.s.l. It is the habitat of parihuanas or white-pinkish feather flamingos. Precipitations occur during the months of December and March. The snow peak Sara Sara is located east of this lagoon in the province of Paucar del Sara Sara, at a maximum altitude of approximately 5 522 m.a.s.l. Precipitations in this area are frequently snow and hail. Average annual maximum temperature in the lagoon and its surroundings is around 18 °C, and average annual minimum temperature is lower than 0 °C, during autumn and winter or mainly when there is absence of clouds in the sky at night.

Ca



ajamarca


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
CAJAMARCA – DEPARTMENT MAP
LEYEND
Capital of the province
Department bc
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
ECUADOR
PIURA
LAMBAYEQUE
AMAZONAS
SAN MARTÍN
LA LIBERTAD
OCÉANO PACÍFICO
SAN IGNACIO
JAEN
CUTERVO
CHOTA
SANTA CRUZ DE SUCCHABAM
BAMBAMARCA
CELENDIN
SAN MIGUEL DE PALLAQUES
SAN PABLO
CAJAMARCA
CONTUMAZA
SAN MARCOS
CAJABAMBA
Río Chinchipe
Río Llapa
Río de Las Yangas
Río Cajamarca
N
S
W
E

GEOGRAPHY

Cajamarca is one of the departments with a territory affected by erosion and it has a variety of climates. It is located on the lowest regions of the Andes Mountain Chain, where the mountain pass "El Paso Porculla" is located; a point where the coast and mountain regions of Cajamarca converge. In this region there are located abrupt mountains, oriented toward the Amazon region. The most special attration is the Fog Forest, a paradisiac place for ecological tourism. There is a large area of ever-green straw field above 3 500 m.a.s.l which is the habitat of the tapir called "pichaqui".

The mountain region of Cajamarca, generous in flora and fauna, is considered to be a natural botanic garden. In the eastern slope, 3 500 m.a.s.l. and 2 000 m.a.s.l. are located the fog forest, with and adequate micro-climate to grow palm trees, orchids, fern and moss. In general, it can be stated that Cajamarca has a great tourist potential.

CLIMATE CLASSIFICATION

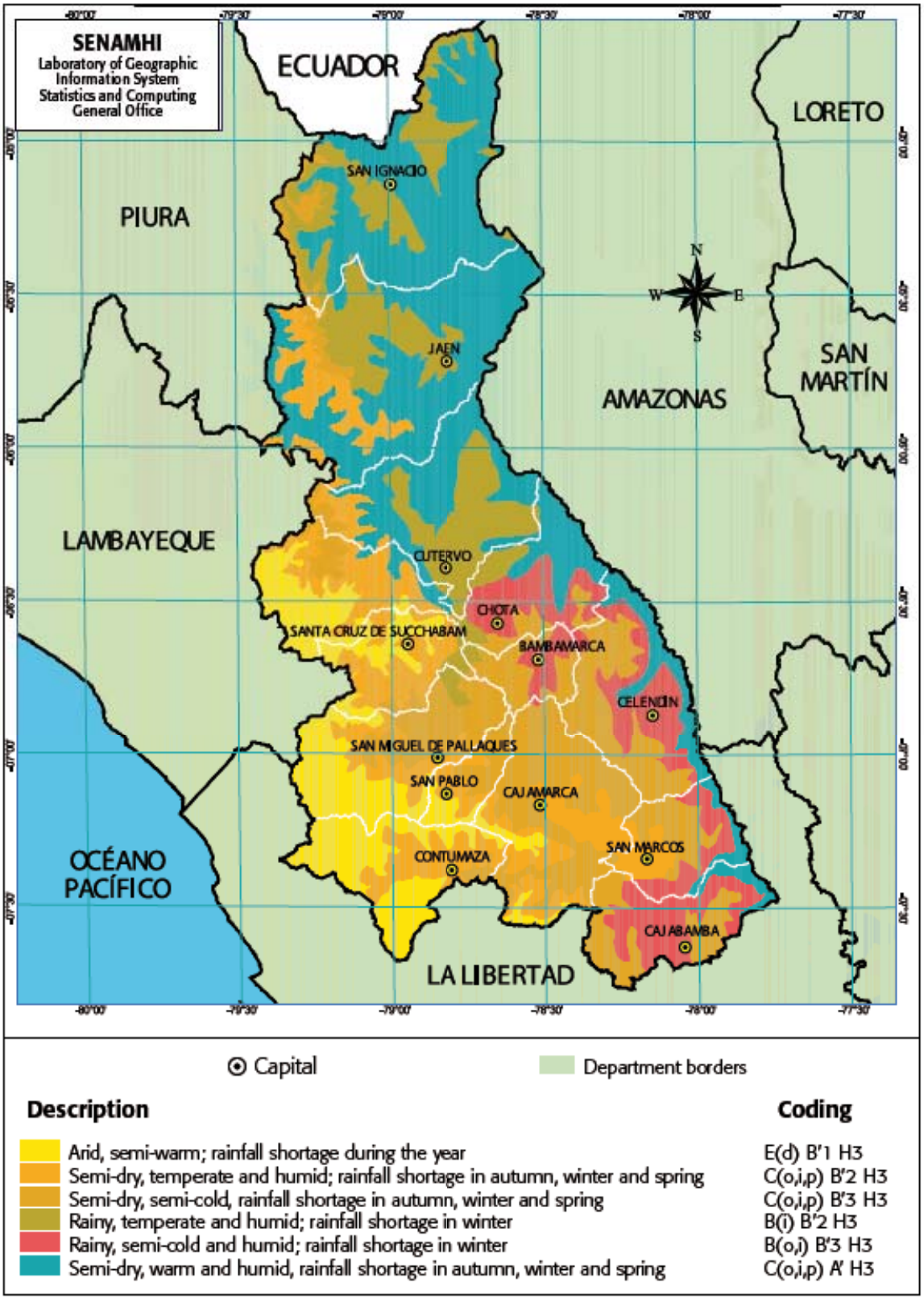
The territory of Cajamarca consists of two different climate regions: one located to the north and characterized by a semi-tropical system (San Ignacio, the high parts of Jaén, Cutervo and Chota), and another one to the south, which can be called quechua, in which we can find "islands" with a semi-tropical ecosystem. Its low altitude and its proximity to the meteorological Equator, characterizes this city for having climate and weather conditions relatively different form the rest of the departments in Peru.

According to the climate classification of Thornthwaite, this department has the following climates:

An arid, semi-warm climate with absence of rainfall during all the seasons of the year. This type of climate corresponds to locations belonging to the provinces of Contumazá, San Miguel and Santa Cruz.

A semi-dry, temperate and semi-cold climate with absence of rainfall in autumn, winter and spring. This type of climate corresponds to locations belonging to the provinces of Contumazá, San Miguel, Cajamarca and Santa Cruz.

A rainy, semi-cold and humid climate, with absence of rainfall during autumn and winter. This climate corresponds to the provinces of Cajabamba, San Marcos, Celendín, Chota and Hualgayoc.



Description	Coding
Arid, semi-warm; rainfall shortage during the year	E(d) B'1 H3
Semi-dry, temperate and humid; rainfall shortage in autumn, winter and spring	C(o,i,p) B'2 H3
Semi-dry, semi-cold, rainfall shortage in autumn, winter and spring	C(o,i,p) B'3 H3
Rainy, temperate and humid; rainfall shortage in winter	B(i) B'2 H3
Rainy, semi-cold and humid; rainfall shortage in winter	B(o,i) B'3 H3
Semi-dry, warm and humid, rainfall shortage in autumn, winter and spring	C(o,i,p) A' H3

A semi-dry, warm, humid climate, with absence of precipitations in autumn, winter and spring. This kind of climate is typical of the locations in the provinces of San Ignacio, Jaén and Cutervo, and the highest peaks in the mountain chain.

WEATHER AND CLIMATE

In the mountain region, average maximum and minimum temperatures gradually decrease with height, as it can be observed in the charts corresponding to the locations of Santa Cruz, Cajamarca and Granja Porcón, located at 2 000 m.a.s.l., 2 620 m.a.s.l. and 3 150 m.a.s.l. respectively. Average maximum temperatures are approximately constant during the year, they fluctuate around 22°C, 21°C and 16°C, respectively. The steadiness of average maximum temperatures is due to the considerable cloud coverage that occur between the months of February-March and October – November, and to the annual variation time of incident solar radiation.

CHART 32
Extreme Temperature and Precipitation
Monthly average in Cajamarca
(Lat 7°09'S Long 78°29'W Alt 2 620 m.a.s.l)

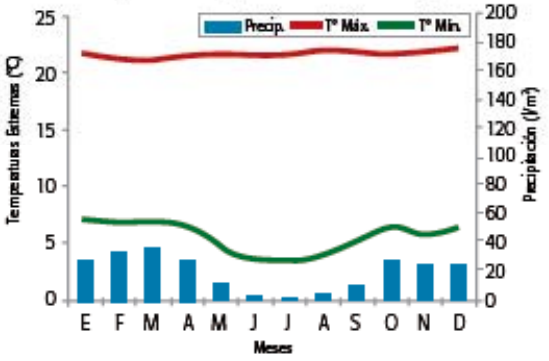


CHART 34
Extreme Temperature and Precipitation
Monthly average in Santa Cruz
(Lat 06°37'S Long 78°57'W Alt 2 000 m.a.s.l.)

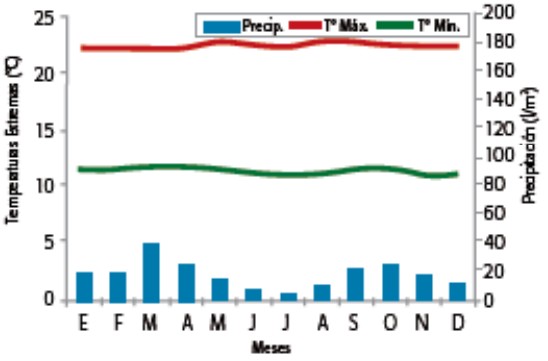


CHART 33
Extreme Temperature and Precipitation
Monthly average in Granja Porcón
(Lat 7°02'S, Long 78°38'W Alt 3 150 m.a.s.l.)

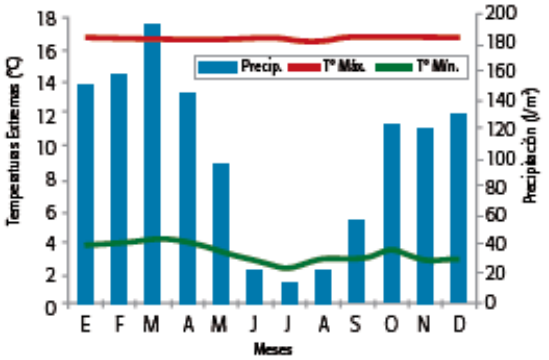


CHART 35
Extreme Temperature and Precipitation
Monthly average in Jaén
Lat 5°40'S Long 78°45'W Alt 740 m.a.s.l.

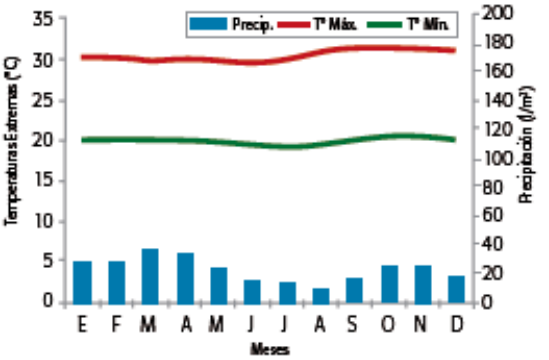


TABLE 6
Sunrise and sunset hours and duration of daylight throughout a year in the city of Cajamarca

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	6:09	6:18	6:19	6:16	6:16	6:23	6:23	6:22	6:07	5:52	5:45	5:53
Sunset	18:38	18:38	18:27	18:12	18:04	18:06	18:06	6:15	18:11	18:07	18:12	18:25
Time light	12:23	12:28	12:23	12:14	12:10	12:14	12:14	12:18	12:09	12:00	11:58	12:09

Average minimum temperatures vary more than maximum temperatures do, and the lowest temperatures occur in the months of July and August. Temperatures below 0°C are not very frequent in the provinces of Cutervo, Chota, Santa Cruz and Contumazá, but they are more frequent in high locations such as Cajarmarca, Cajabamba and Celendín provinces during the winter mixture. However, the occurrence of frosts is not very frequent in this department, and when they do occur, are less intense compared to the ones in the central and southern departments of Peru.

Rainfall occurs all year round, but they are less frequent in the months starting January until April. A particular characteristic of rainfall in this department is that they show two maximums one in October and the other one in March, accumulating more than 1 000 l/m² in one year, as it can be seen in the aforementioned chart corresponding to Granja Porcón. Constant rainfall during the year is due to the low altitude of the Andean chain and to air convergence in the high parts of the provinces of Cajamarca, Hualgayoc, San Miguel, Chota and San Pablo as a consequence of the valley/mountain breeze. Such convergence is also due to the different orientation of the valleys formed by the rivers (Chotano, Llaucano, Chancay, etc.) that originate in the high parts of the aforementioned provinces.

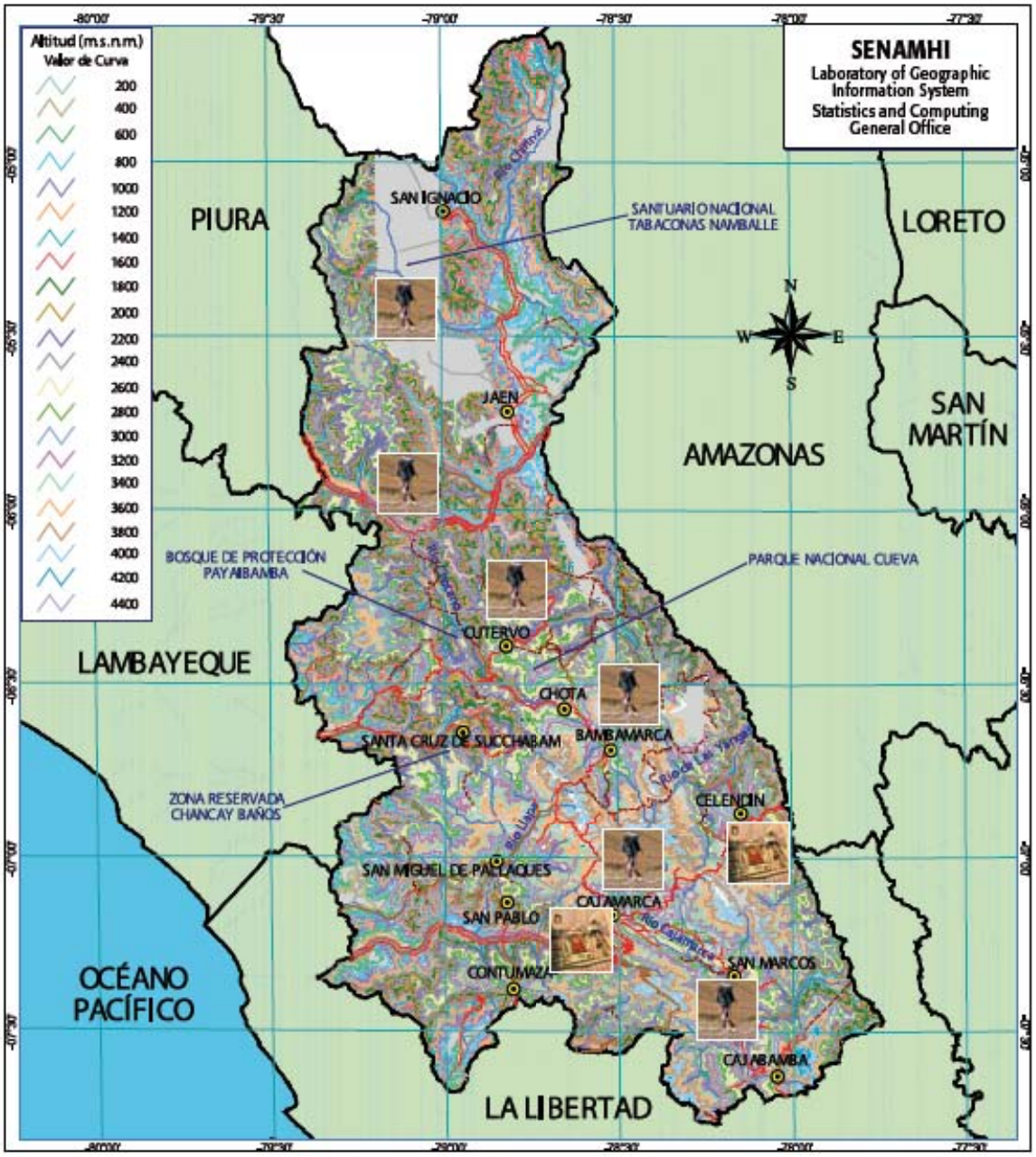
The province of Jaen and San Ignacio – to a lesser extend – are isolated from the direct humid air flux coming from the east, by the central mountain chain, for this reason rainfall is scarce, especially when the solar radiation reaching the surface is high, a characteristic that results in high daily temperatures, their average maximums can oscillate 32 °C almost all year round. Occasionally, during some days of November or December, maximum temperatures can reach 35°C or more. Minimum temperatures oscillate around 20 °C, and they show no monthly or daily sudden changes.

Even though Jaén is near the meteorological Equator, it has scarce rainfall occurence, basically due to the presence of the central and east mountain chain, with a north-south orientation and with summits above 3 000 m.s.n.m., which prevents the free entance of humid flux from the Amazon region. Likewise, the mountain chain prevents the entrance of cool air masses "friaje" coming from the southern part of the continent.

TOURIST ATTRACTIONS

CAJAMARCA

Cajamarca is the capital city and it is located in the valley of the Mashcón river, on the western mountain chain of the northern Andean Mountain Chain. The



⊙ Province Capital

Rivers

— Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

weather is characterirzed for presenting average maximum and minimum temperatures of 22 °C and 5 °C, with heavy rainfall between November and April. During the day, the weather is pleasant, and it is cool at night and dawn. It has important tourist attractions, such as a beautiful countryside with colorful and striking landscapes, antique houses, and colonial temples, besides it has archaeological ruins from the Inca's civilization such as the Baños del Inca or the Inca's Bathing Place.

SANTA APOLONIA

Santa Apolonia is a natural viewpoint from which one can observe the horizon of the city, and for this reason it is know as the Inca's chair. The weather is similar to the one in Cajamarca.

VENTANILLAS DE OTUZCO

Ventanillas de Otuzco (Otuzco's windows) is located at 2 650 m.a.s.l., in the surroundings of Cajamarca city. A necropolis made up of hunderes of cripts craved on a volcanic rock wall, made by ancient inhabitants of this land, where they buried the funeral "wraps" or "fardos funerarios" of their authorities called "caciques". Since this place is located at the same altitude of Cajamarca city, it has the same weather, that is, a pleaseant temperatures at noon and cold during the nights and at dawn.

EL CANAL DE CUMBEMAYO

Forty five minutes from Cajamarca city, there is a gigantic megalithic construction that dates back from the year 1 200 D.C., built by the Cajamarca-Marañon civilization. This architectonic building consists of a Sanctuary, the petroglifs caves and an aqueduct. Near this place there is located a rock forest known as the Frailotes, that have been formed by wind and rainfall erosion, daily thermal fluctuations of approximately 20 °C during some winter days. These processes, through time, have originated some fanciful, whimsical forms. In the ebb tide period (May to September) minimum temperatures oscillated around 2 °C, and the wind becomes more intense.

LA COLPA

Colpa is an agricultural production association, dedicated to agricultural activities and cattle farming. They produce cheese and butter

KUNTUR WASI

The Kuntur Wasi is the name given to the ruins of a ceremonial-administration center that lies on the top

of the La Copa Hill, in the small town of San Plablo. It consists of three stone platforms of different shapes and forms. Some monoliths in Kuntur Wasi have anthropomorphus outlines, while others are similar to a "stele" or "upward pillar". Formerly, it was the religious center of the Chavin Culture. In attention to the kind of images represented in the monoliths, Julio C. Tello, considered that this place could have been and adoration place dedicated to the condor's cult (Kuntur = cóndor, wasi = casa). Here there is located the most important onsite museum of the Department. The weather is pleasant and slightly cooler than in Cajamarca city.

CUTERVO NATIONAL PARK

It is located in the province of Cutervo, on the Tarros Mountain chain. It is covered with vegetation typical of the High forest, where there are plenty of orchids, bromilaceaes, fern and bushes species, besides it is the shelter of a night bird "guácharo", the andean bear, and the otter. In this reserve we find a large cave complex with underground rivers, from which the most attractive ones are the "Guacharos" and the San Andrés caves.

Rainfall exceeds 900 l/m² a year and they occur all year round and are more intense, frequent and prolonged between February and April; maximum temperatures oscilalte around 20 °C and minimum temperatures around .

GRANJA PORCÓN

Granja Porcón is a small town located 20 km from Cajamarca city. This colorful town shelters a popultion that specializes in stone carving. The weather and climate are very similar to the other cities in Cajamarca.

CHANCAY BATHS

Chancay Baths is located in the province of Santa Cruz. Here one can visit the hot and thermal water upwellings. Beside, in this Reserve there is a diversity of wild species. The climate is very pleasant, maximum temperatures oscillate around 20°C and minimum around 10°C

TABACONES – NAMBALLE NATIONAL SANCTUARY

It is located in San Ignacio settlement at a 3 200 m.a.s.l. It has attractive fog forests, a variety of flora and dauna, water falls and healing-water lagoons called "arrebiatadas". The weather is pleasant, with occasionall sudden rainfall. The sky is always cloudy.

CELENDÍN

Is located in the Quechua region, for this reason it has a temperate climate, especially from May to November. In its lands you can find several eucalyptus plantations and fields. It is surrounded by the towns of Sorocucho and Balsas, this last one, has beautiful landscapes at the banks of the Marañon river. There are also some archaeological ruins in Oxamarca and Llanguat thermal waters in Mamac that can be visited.

Since Celendín is relatively close to the Amazon basin an due to the low altitude of the central mountain chain to the east, it has heavy rainfall conditions all year round.

CHART 36
Hourly temperature and relative humidity in Balsas
23/01/2003
(Lat 78°01'S Long 06°50'W Alt 2 225 m.s.a.l.)

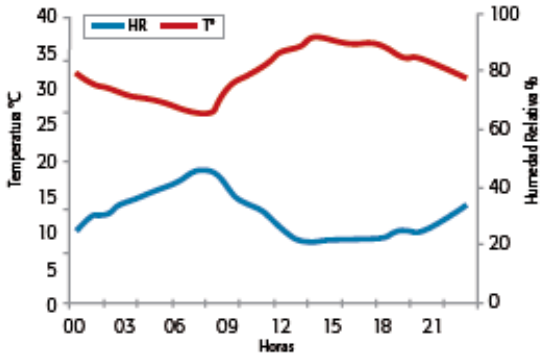
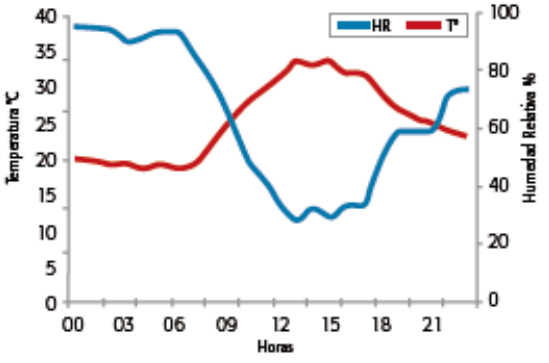
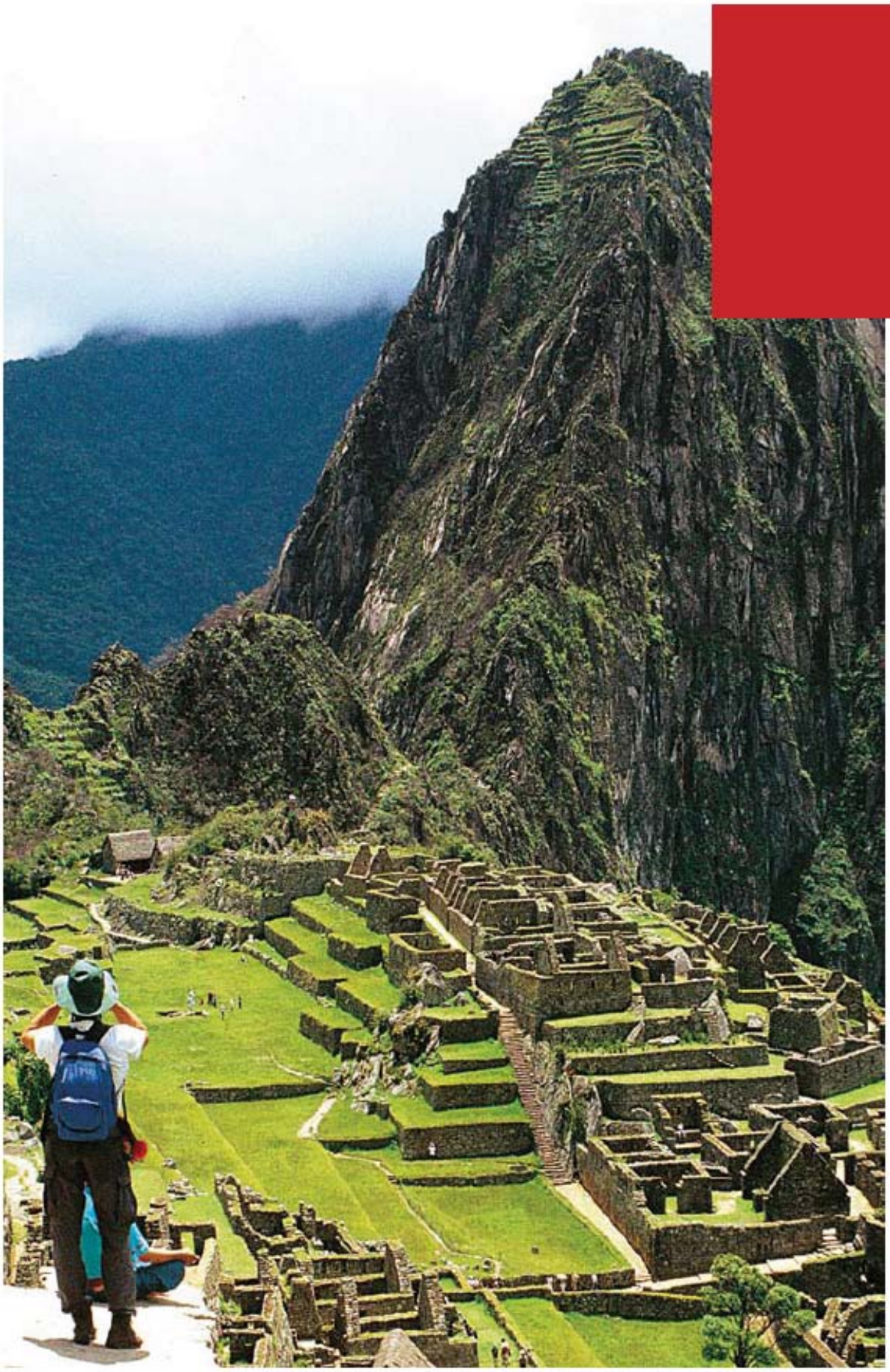


CHART 37
Hourly temperature and relative humidity in Balsas
21/01/2003
(Lat 78°01'S Long 06°50'W Alt 2 225 m.s.a.l.)



JAÉN

Jaen is an agricultural and livestock farming area, with a hot climate throughout the year and pleasant after midnight. Maximum and minimum temperatures have slight variations. It rains more intensively between December and April.



Cusco


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
JUNÍN
MADRE DE DIOS
AYACUCHO
APURÍMAC
PUNO
AREQUIPA
Río Urubamba
Río Mantaro
Río Paucartambo
Río Apurímac
Río Vilcanota
Río Salcca
N
S
W
E
QUILLABAMBA
URUBAMBA
CALCA
PAUCARTAMBO
ANTA
CUSCO
URCOS
PARURO
ACOMAYO
YANAOCA
SICUANI
SANTO TOMAS
ESPINAR
CUSCO – DEPARTMENT MAP
LEYEND
Capital of the province
Department bordes
Rivers
Road Network
Asphaltad
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Cuzco is located in the southern mountain region of Peru. Its territory is formed by three mountain chains. The Vilcabamba Mountain Chain, located in the north- eastern part of the department; to the west it is bordered by the Apurimac river basin, and to the east it is bordered by the Urubamba river basin. In this mountain chain are located the Salkantay, Pumasillo and the Sajsarajoc peaks. Then there is the Vilcanota Mountain Chain that lies to the east and that holds the Ausangate peak, the highest one in Cuzco and the fourth highest one in Peru. In the Paucartambo Mountain Chain, that is located at the border of the department of Madre de Dios, lies the Nudo de Vilcanota" the most important one in this mountain Caln. In the surrounding of this chain are located the Longuiloyo, Sibinacocha and Salunta lagoons.

It is bordered, to the north, by Junin and Ucyali, to the east by Madre de Dios and Puno and to the south it is bordered by Arequipa and to the west by Apurimac and Ayacucho.

CLIMATE CLASSIFICATION

The climate in Cusco depends on some factors such as the altitude and relief. Its orography, formed by mountains, knots, high plateaus, plateus and deep valleys, is the reason for its varied climate. According to the climate classification of Thornthwaite, it has the following type of climates:

A semi-dry, cold, climate, dry in autumn and winter, with average relative humidity that ranges between 45% adn 64%. This type of climate is typical of places located in the provinces of Anta, Paruro, Urcos, Acomayo, Canas and Sicuani.

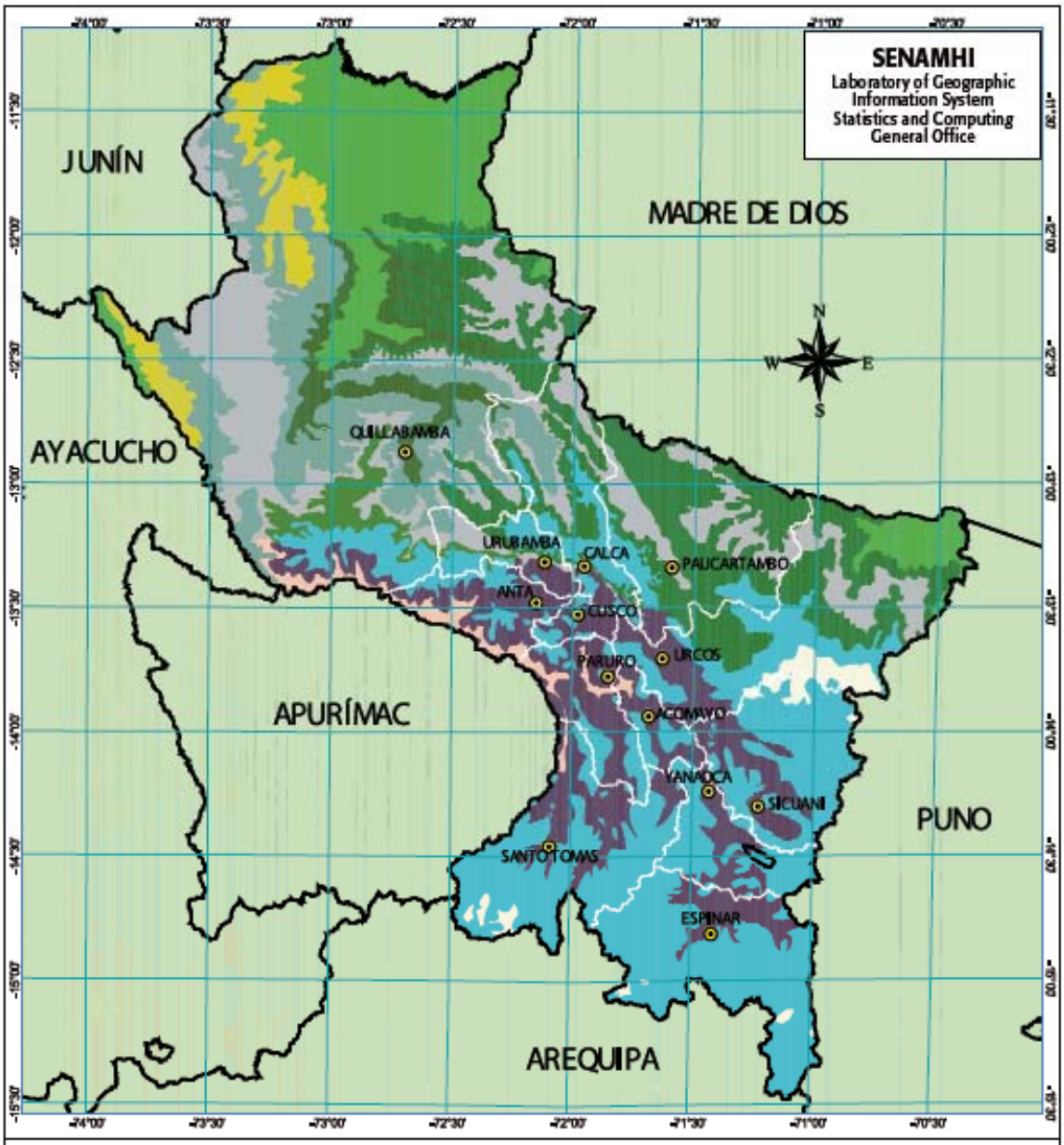
A rainy , semi-frigid climate, wiht average relative humidity that ranges between 65% and 84%, dry in autumn and winter. This type of climate is typical of locations such as in the provinces of Espinar, Chumbivilcas, Canas, Canchis, Acomayo, Calca and Urubamba.

A very rainy, temperate climate, with average relative humidity between 65% and 85%, and with abundant precipitation in all the seasons of the year. This type of climate corresponds to the provinces of La Convención, Urubamba and Paucartambo.

A very rainy, warm and semi-warm climate, with average relative humidity betwee 85% and 100%, with abundant rainfall during the year. This type of climate is typical of the provinces of La Convención, Urubamba and Paucartambo.

WEATHER AND CLIMATE

The charts on the upper part of this page show the behavior of maximuñm and minimum tempertures, as well as the average monthly precipitation in the city



⊙ Capital Department borders

Description	Coding
Rainy, semi-warm and very humid, with plenty of rainfall in all the seasons	B(r) B'1 H4
Semi-dry, temperate and humid, with dry autumn and winter	C(o,i) B'2 H3
Semi-dry, cold and dry in autumn and winter	C(o,i) C' H2
Rainy, semi-frigid and humid with dry autumn and winter	B(o,i) D' H3
Rainy, cold and humid, with plenty of rainfall in all the seasons	B(r) C' H3
Snowy	Snow
Very rainy, temperate and humid, with plenty of rainfall in all the seasons	A(r) B'2 H3
Very rainy, semi-warm and very humid, with plenty of rainfall in all the seasons	A(r) B'1 H4
Rainy, warm and humid, with plenty of rainfall in all the seasons	B(r) A'H3
Rainy, warm and very humid, with plenty of rainfall in all the seasons	B(r) A' H4
Very rainy, warm and very humid, with plenty of rainfall in all the seasons	A(r) A' H4

CHART 38
Extreme Temperatures and Precipitation
Monthly average in Cusco
(Lat 13º32'S Long 71º58'W Alt 3 399 m.a.s.l.)

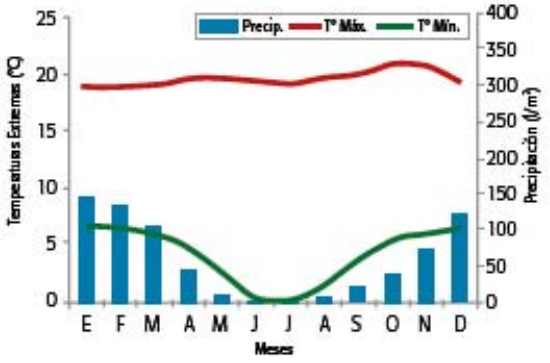


CHART 39
Extreme Temperature and Precipitation
Monthly average in Machu Picchu
(Lat 13º09'S Long 72º31'W Alt 2 080 m.a.s.l.)

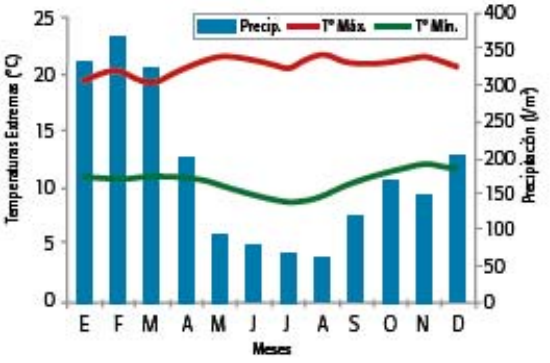
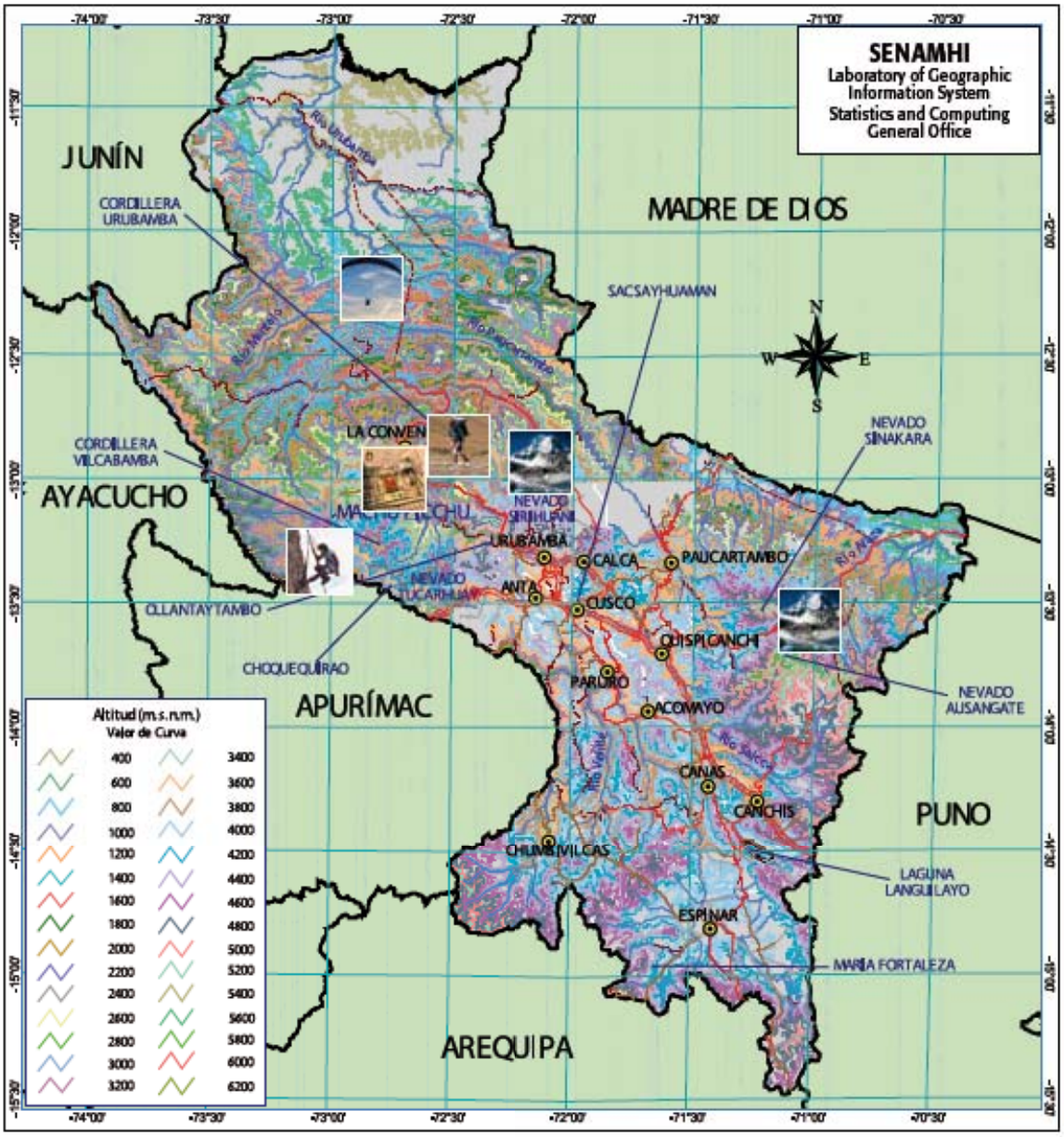


TABLE 7
Sunrise and sunset hours and duration of daylight throughout a year in the city of Cusco

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:40	05:46	05:51	05:54	05:59	06:08	06:12	06:03	05:43	05:22	05:10	05:15
Sunset	18:22	18:18	18:0	17:42	17:29	17:28	17:36	17:42	17:44	17:45	17:55	18:11
Time light	11:57	12:02	11:57	11:48	11:44	11:48	11:54	11:52	11:43	11:34	11:32	11:43

of Cuzco. We can observe that the average maximum temperature ranges from 19 °C and 21 °C, and minimum fluctuates between 1 °C and 6 °C from May to September, although in some occasions it drops below 0 °C. The proximity of the high plateaus and mountains, where the cold air masses flow during the nights is the main cause for these low temperatures; besides, the cold conditions turn more intense if the sky is clear and there is predominance of dry air coming from the west or north through the Vilcanota valley.

The days are warm at noon between April and September, because of the strong daytime insulation, the transparency and dryness of the atmosphere. During the night, for the same reasons, the loss of terrestrial solar radiation (heat or energy) is quite



Province Capital

Rivers

Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

intense, causing frosts and a very cold environment. The period of rainfall occurs from November to March, the most intense rainfall occurs between December and March. January is the rainiest month, reaching 145 l/m² of accumulated rainfall. The ebb tide period occurs between April and November, the driest months are June and July, with rainfall values of 1,5 l/m².

CHART 40
Hourly Temperature and Relative Humidity in Pisac
(Lat 13°25'S Long 71°50'W Alt 2 070 m.a.s.l.)

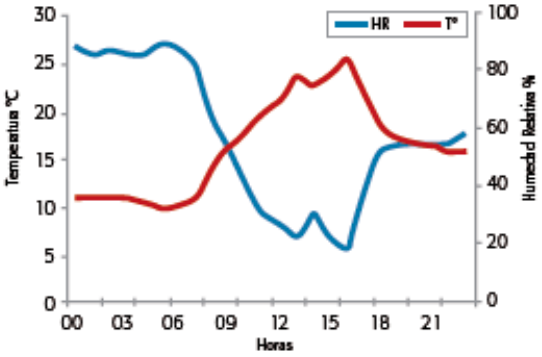
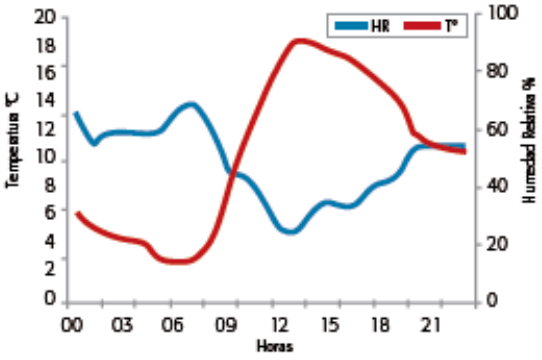


CHART 41
Hourly Temperature and Relative Humidity in Pisac
(Lat 13°25'S Long 71°50'W Alt 2 070 m.a.s.l.)



TOURIST ATTRACTIONS

MACHU PICCHU

Is located in the Urubamba valley, on the mountains of the Vilcanota river. It was built between the 1450 and 1540, it is one of the most important archaeological places in South America and the main tourist destination in Peru. It is supposed that Machu Picchu was a center where some sun adorations rituals took place and used for astronomic observations. This citadel consists of the "andenes" or "terraces" built for agricultural pruposes, and the urban area that is divided in sacred places, temples, monuments, funeral chambers and other spaces such as rooms, precincts, silos and an hydraulic system based on aqueducts used to channelize rainfall water for human consumption and agriculture. Machu Picchu constructions are the evidence of an amazing spatial domain and techniques used to work on carved stone. Among the most relevant architectonic precincts are the Royal Grave, The Temple of the Sun, The Priests Mansión, The Three Window Temple, The Central Temple, The Sunken Plaza, the fountains and hydraulic channels, the steps, the Intihuatana or solar clock.

The surrounding lanscape next to the Machu Picchu citadel consists of a low forest covered by fogs that even cover the mountains, especially during the early hours of the day. The forest is home to a great variety of flora and fauna. Average monthly maximum temperature in the citadel has little variations during the year, reaching values that range from 8 °C to 12 °C. The afternoons are mostly windy with light moderate winds. February is the rainiest month with 370 l/m^2 of precipitation. Between June and August, rainfall is relatively low, reaching values 70 l/m^2. Precipitations generally occur in the afternoon and early at night. Since Machu Picchu is near the jungle, it rarely has a clear sky and high relative humidity (60% a 100%).

THE SACRED VALLEY OF THE INCAS

The Sacred Valley of the Incas (crossed by the Urubamba river) is one of the most important tourist places, because of its beautiful landscape and climate, specially from April to November. The valley has a south-east and norhtwest orientation, at 2 900 m.a.s.l. It has a tourist itinerary that includes the following places: Pisac, Lamay, Coya, Yucay, Urubamba, Naras, Chinchero and Ollantaytambo.

Pisac, a town located 32 km from Cusco, has archaeological evidence such as the "andenes" and the Intihuatana solar clock. Here the weather is a little bit warmer than in Cusco city, due to its low altitude.

Maximum temperatures fluctuate between 20 °C and 25 °C, and minimum temperatures around 5 °C.

URUBAMBA

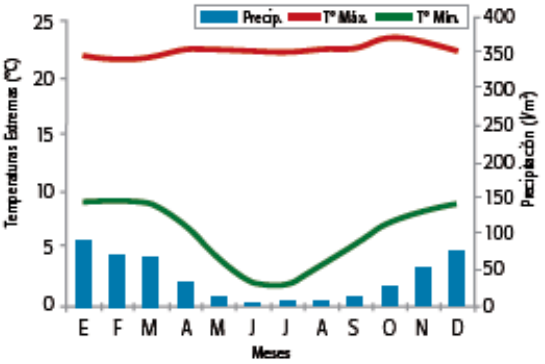
It is located 78 km from Cusco, it is a place with agriculture potential, with a pleasant climate, suitable por ecological and mystic tourism and the practice of adventrure sports as canoeing in the river, paragliding from its hillsides and hiking. It is known as the Pearl of the Vilcanota. Average monthly maximum and minimum temperature are shown in the corresponding chart, as well as precipitation in Urubamba. It can be observed the maximum temperature varies between 21 °C and 24 °C, and minimum ranges between 2 °C and 10 °C. The most intense periods of precipitation occur from December to March. The months from April to October correspond to the ebb-tide period (absence of rain), time in which the days show sun bright since early morning hours. Atmospheric dryness is intense from July to October. Its main tourist attractions are the Sanctuary of Machu Picchu and the Ollantaytambo ruins.

OLLANTAYTAMBO

Ollantaytambo is located at 79 km from Cusco, a fortress that was built to protect Cusco from invasions. It is located in the uplands of the Urubamba valley.

The district of Yucay, at 48 Km from Cusco city, was a place where the Incas rested. It has a good climate, with a temperature that ranges from 4 °C to 25°C between April and October. Relative humidity at noon drops up to 30% or less, and the sky frequently show scarce cloud cover during the day and night. Eigthy eight km from the railway that takes you to La Convencion valley, on

CHART 42
Extreme Temperature and Precipitation
Monthly average in Urubamba
(Lat 13°18'S Long 72°07'W Alt 2 863 m.a.s.l.)



the left margin of the Urubamba, is located the initial point to the Inca's Trial, after walking 44 km during 3 or 4 days you will get to the Inti Punko or the Sun's Gate, which is the entrance point to Machu Picchu. The Inca's Trial, that links serveral archaeological sites, start in Chillca (km 76 of the railway that links Cusco and Machu Picchu). Taking the Cusco-Quillabamba train you get in four hours to km 88 (Coriwayrachirana), from where you start the hike. The total distance is 48 km, and it can be done in five days and four nights. The best time for this hiking experience is from May to October. The trail, which is totally signposted, starts from Cusichaca, it continues thruough a dense eucalyptus forest, then it runs by some archaeological sites as Q'ente, Pulpitoyoc, Cusichaca y Pata'llaca. After four hours you will get to Huayllabamba, and spend the night in Llullacha. The next day you will go up to Warmiwañusca, the highest point in the route (4 200 m..a.s.l.), and you can camp in the Pacaymayo valley. The third day you cross the Runcuracay Pass (3 800 m.a.s.l.) then you descend to the Yanacocha Lagoon and go up the stone steps until you get to the archaeological sites of Sayacmarca, Phuyupatamarca and Huiñay Huayna, a place where you find all kinds of facilities for travelers. On the fourth day, walking through the esplanade of Inti Punku you finally get to the Sacred City.

THE HUATANAY VALLEY

This valley is situated south of Cusco, 23 km from it. Through this valley you get to the archaeological site of Tipon, considered as the Inca Ceremonial Centre. Continuing the trip you will get to Huasao town, famous for its well-know wizards. Near the valley

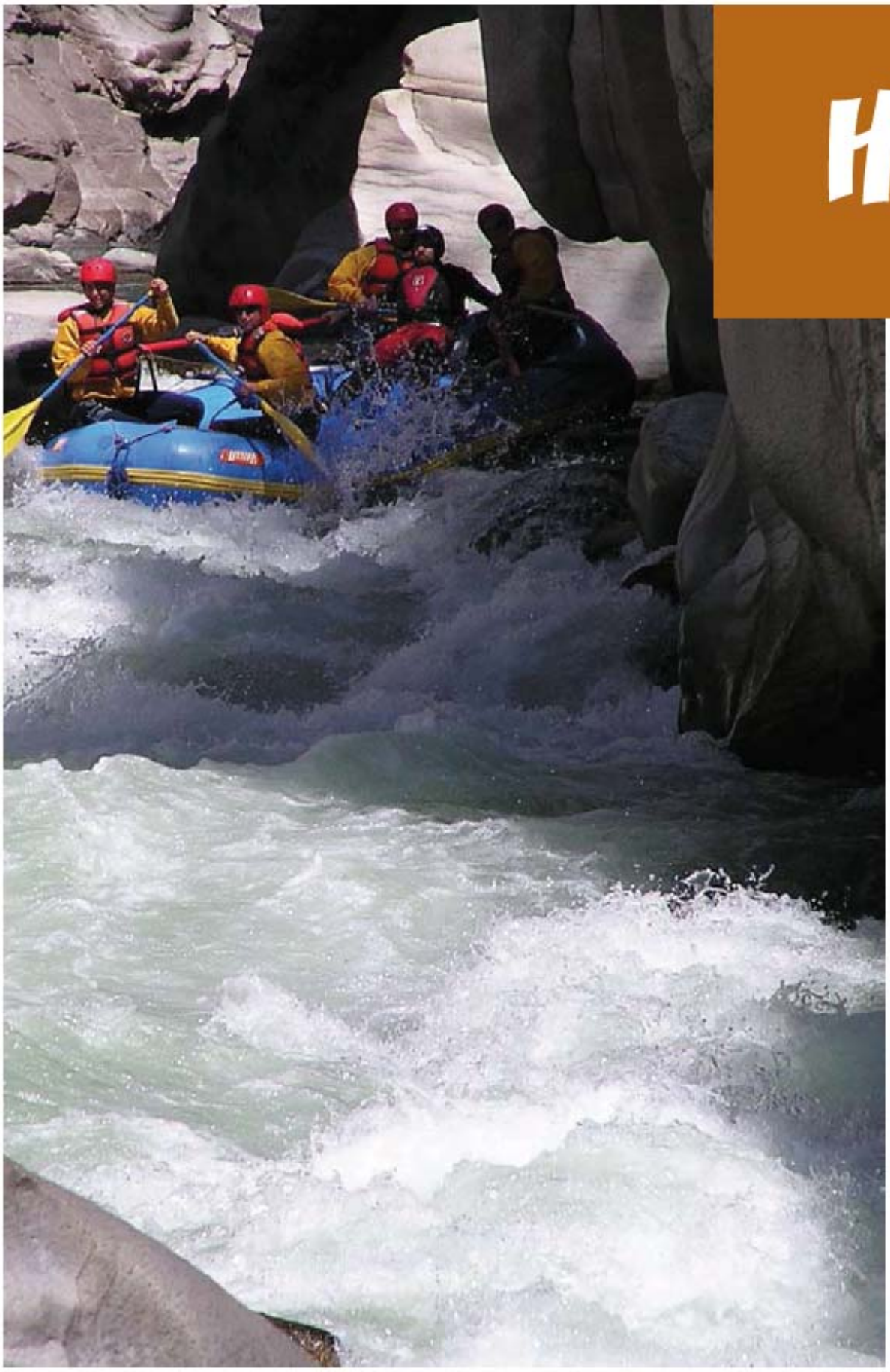
are located the Oropesa and Andahuaylillas towns, with their colonial temples, very important for their architecture and murals.

This touristic trip ends with a visit to the architectonic complex of Choquequirao, situated at the bottom of the Yanama Hill, at 3 033 m.a.s.l., the last peak on the Salkantay mountain chain. To get to the Choquequirao citadel, the traveler has to walk a 30 km path starting from Cachora town.

ANDAHUAYLILLAS

Andahuaylillas is a district of Quispicanchis province, 40 km from Cusco city: Andahuaylillas is an easeful town, it has a colonial church and it is considered as "The Sistine Chapel of South America". It is the most representative temple of the andean popular art, baroque style decorated, with gold leafing or "pan de oro" and a lot of expressive murals and paintings. The climate in Andahuaylillas is rainy from December to March, and rainfall is scarce and of short duration, basically during the last hours of the day. In this period, the sun bright is permanent from early hours of the day until it gets dark. During the night the sky is clear.

The air in Cusco has less amount of oxygen with respect to the one at sea level. Thus, at 2 000 m.a.s.l., 3 000 m.a.s.l. and 4 000 m.a.s.l. there is 20%, 30% and 40% less oxygen, which can cause certain discomfort to the tourists. The persons that have overweight or high blood pressure, drepanocitic anemia, or have a heart condition must have a medical check up before planning a trip to a place at a high altitude. It is also recommended to use a cap or hat to protect themselves from intense solar radiation.



Hua

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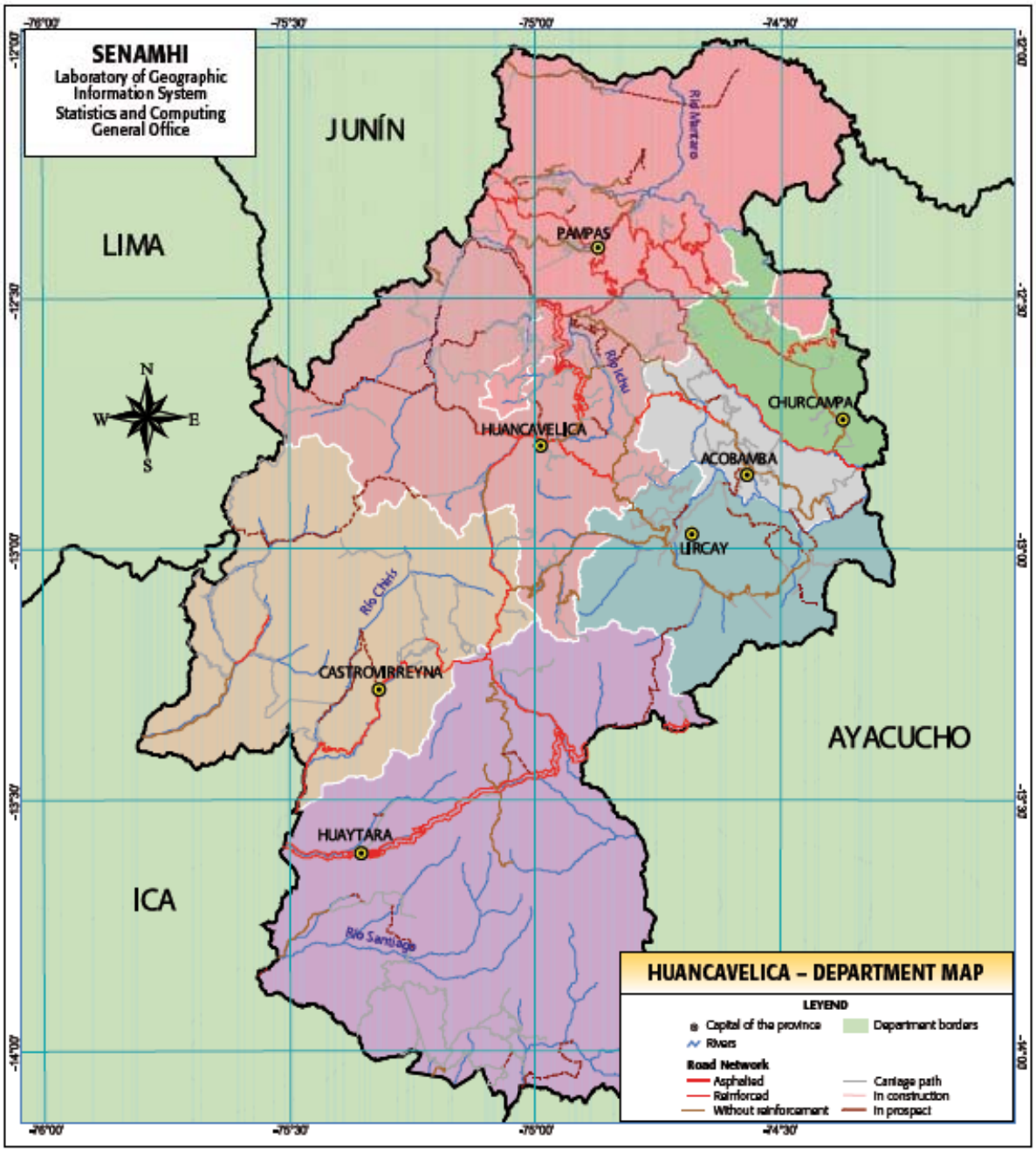

SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
JUNÍN
LIMA
AYACUCHO
ICA
PAMPAS
HUANCAVELICA
CHURCAMPA
ACOBAMBA
LIRCAY
CASTROVIRREYNA
HUAYTARA
Río Mantaro
Río Ichu
Río Chiris
Río Santiago
N
S
E
W
-76°00'
-75°30'
-75°00'
-74°30'
-12°00'
-12°30'
-13°00'
-13°30'
-14°00'
HUANCAVELICA – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Huancavelica is located in the central mountain region of Peru. To the north it is bordered by Junin, to the east is bordered by Ayacucho, to the south with Ayacucho and Ica and to the west with Junin and Ica. Its territory is quite uneven with high mountains and large rivers as the Mantaro, Pampas and Huarpa, that run along it forming valleys, narrow plateaus and important basins. Two large mountain ranges lie along its territory: the Western Mountain Chain and the Central Mountain Chain, at the same time they form three large geographical formations: the mountain chains situated between the central and northern part of the department, the high andean plain and the western slope

The Western Mountain Chain of the Andes, known as the Chonta Mountain Chain, reaches altitudes above 5 000 m.a.s.l., and it holds the Citac, Huamanrazo, Altar and Antarazo snow peaks. The Western Mountain Chain, northwest-southeast oriented in the central region of Huancavelica defines the watershed that takes the rainfall water to the rivers of the Pacific basin, if it falls on the western side, otherwise it takes them to the Amazon region. The Central Mountain is situated on the northeastern end and it is northeast -southeast oriented, which limits the entrance of humid air into the southeastern part of the department. The second formation is the high andean plain which has a wavy-plain relief and consists of narrow pampas and deep ravines. The third formation is the one formed by the western slope that consists of territories located west of the watershed and it is influenced by the subsident motion of the South Pacific Anticyclone.

CLIMATE CLASSIFICATION

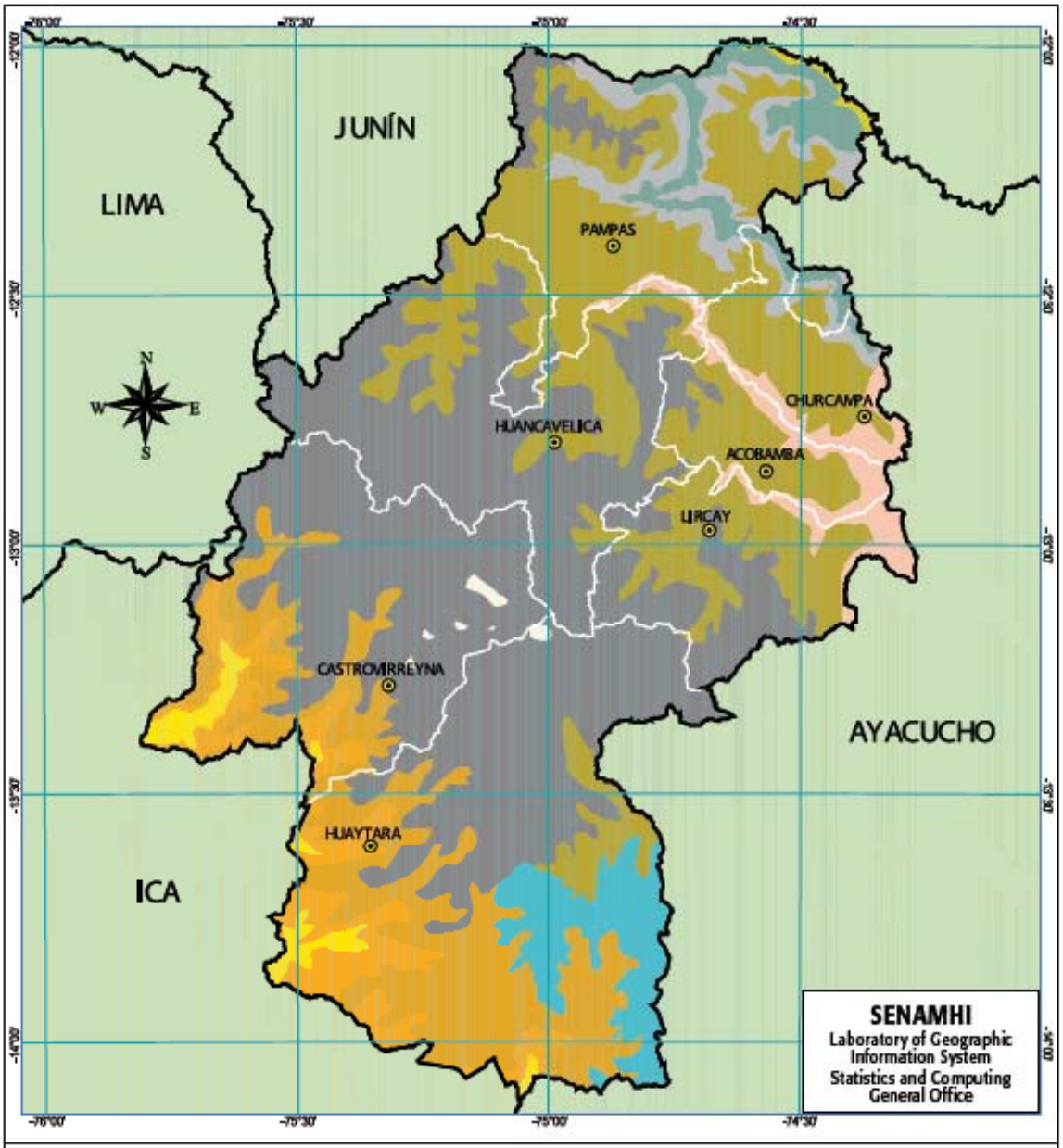
Due to its heterogenous physiography, the department has a great variety of climates. According to the climate classification of Thornthwaite, Huancavelica has the following kinds of climates:

A semi-dry, temperate, semi-cold climate, dry in the autumn, winter and spring, with a relative humidity that ranges between 65% and 84%. This kind of climate corresponds to locations in the provinces of Huaytará, Castrovirreyna, Pampas, Acobamba and Churcampa.

A rainy and semi-frigid climate, dry in the winter, with a relative humidity between 65% and 84%. This climate is typical of places located in the provinces of Huaytará, Castrovirreyna, Huancavelica and Angaraes, with a relief formed by high andean plains, with low temperatures all year round that range between -10 °C and 10 °C and that may decrease up to -16 °C at night during winter time

A rainy, semifrigid climate, dry in autumn and winter. This type of climate is typical in the province of Huaytará.

A semi-dry climate, dry in autumn, winter and spring, with a relative humidy between 65% and 84%. This



⊙ Capital

Department borders

Description	Coding
Arid, semi-warm, rainfall shortage in the year	E(d) B'1 H3
Semi-dry, temperate; dry in autumn, winter and spring	C(o,i,p) B'2 H3
Semi-dry, semi-cold; dry in autumn, winter and spring	C(o,i,p) B'3 H3
Rainy, semi-frigid; dry in autumn and winter	B(o,i) D' H3
Rainy and semi-frigid; dry in winter	B(i) D' H3
Snowy	Snow
Rainy, cold; dry in autumn and winter	B(i) B'2 H3
Semi-dry, temperate, dry in autumn and winter	C(o,i) B'2 H3
Very rainy, temperate; plenty of rainfall in the year	A(r) B'2 H3
Rainy, semi-warm and very humid; plenty of rainfall in the year	B(r) B'1 H4
Rainy, warm and very humid; plenty of rainfall in the year	B(r) A' H4

CHART 43
Extreme Temperatures and Precipitation
Monthly Average in Huancavelica
(Lat 12°47'S Long 74°59'W Alt 3 670 m.a.s.l.)

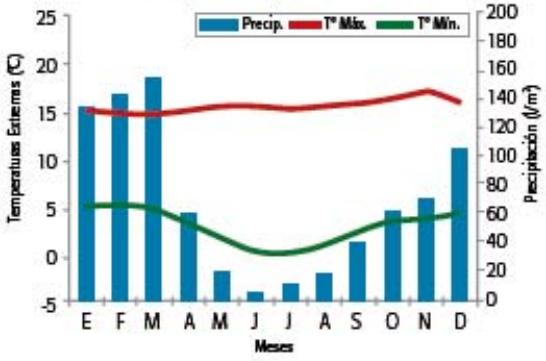


CHART 45
Extreme Temperature and Precipitation
Monthly average in Lircay
(Lat 12°59'S Long 74°43'W Alt 3 271 m.a.s.l.)

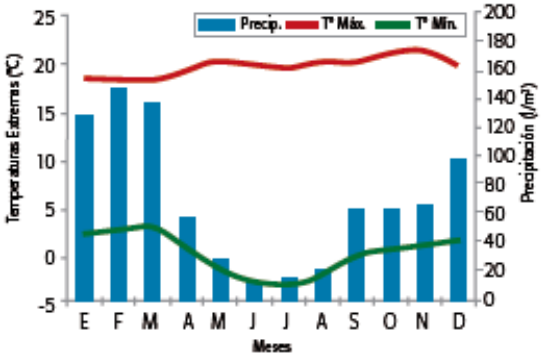


CHART 44
Extreme Temperature and Precipitation
Monthly average in Acobamba
(Lat 12°50'S Long 74°34'W Alt 3 436 m.a.s.l.)

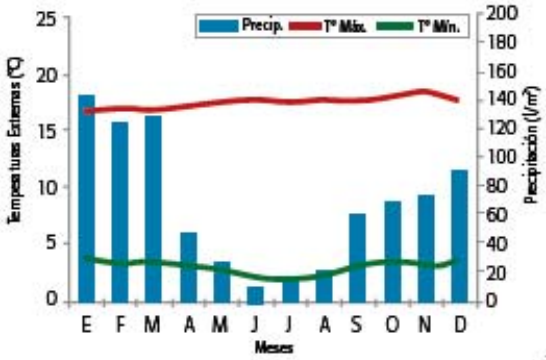


CHART 46
Extreme Temperature and Precipitation
Monthly average in Acobamba
(Lat 13°07S, Long 75°32'W Alt 3 336 m.a.s.l.)

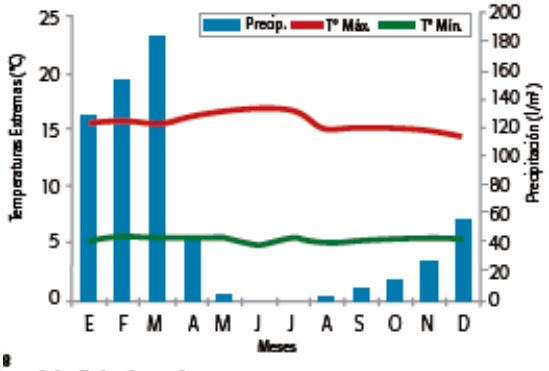


TABLE 8
Sunrise and sunset hours and duration of daylight throughout a year in the city Huancavelica

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:45	05:59	06:04	06:06	06:10	06:19	06:23	06:14	05:55	05:35	05:23	05:25
Puesta de sol	18:33	18:29	18:14	17:54	17:42	17:42	17:49	17:55	17:56	17:57	18:06	18:06
Time light	12:09	12:14	12:09	12:00	11:56	12:00	12:06	12:04	11:55	11:46	11:45	11:45

climate is typical of places located in the provinces of Acobamba and Churcampa.

A rainy, temperate and humid climate, with plenty of rainfall during all the seasons. This climate is typical of locations as Pampas and Churcampa.

WEATHER AND CLIMATE

The territory of the department of Huancavelica is situated on the eastern and western slope of the Andes. In this last one, the weather is dry, due to the influence of the subsidence (descending motion of air masses) of the South Pacific Anticyclone, same one that inhibits the development of convective clouds increasing to the west. This characteristic is consistent with the increase of east- oriented rainfall, which is not so abundant in the central and south part of the department, because it is far from the source of humidity (Amazon basin) and the altitude of mountain ranges situated above 4 500 m.a.s.l., northeast-southeast oriented, located at the northeast part of the department. This topographic configuration limits the entrance of humid warm air flux coming from the east or northeast, reaching the south part of the department with reduced humidity, as it can be observed in the monthly distribution of rainfall for the locations of Huancavelica, Lircay, Acobamba and Arma (Castrovirreyna), this last one is located on the western slope. The rainiest months are from December to March and the least rainiest are from April to August. An important details to mention is the sudden fall of precipitations during the month of April.

In autumn and winter in the high andean plain (above 3 800 m.a.s.l.) there is occasionally some precipitation as snow; also there are some strong winds and freezing temperatures at dawn are frequent during these seasons; during the day and night there is scarce cloudiness or clear sky because of west or northeast wind prevailing above 4 000 m.a.s.l., winds that have little humidity and is not enough to form convective clouds.

In charts corresponding to the locations of Huancavelica, Lircay, Acobamba and Arma it can be seen that average monthly maximum and minimum temperatures and rainfall. It is observed that maximum and minimum temperture experiment less variations than the minimum ones, which normally occur after midnight. The lowest minimum temperatures mostly occur in the winter season.

TOURISTIC ATTRACTIONS

CASTROVIRREYNA

Its territory consists of andean plateaus and cordillera counterforts, where there are located the Agnococha, Orcococha and Choclococha lagoons, this last one is located above 4 605 m.a.s.l. and 14 meters depth. Castrovirreyna is located on the western slope of the mountain chain, at 3 950 m.a.s.l., on the left bank of the Chiris river.

The climate is characterized for presenting maximum temperatures that oscillate aroung 14 °C, while the minimum temperatures are around 3 °C in the summer. Freezing temperature are very frequent between the months of May and September; occasionally they can decrease down to 8 °C or less.

HUAYTARA

It is located in the southern part of the department, above 2 930 m.a.s.l., this city is eminently agricultural. The church of Saint John the Baptist has been built on top of a stone base of and antique Inca temple. Maximum temperatures oscillate arround 18 °C and minimum temperatures around 4 °C. The lowest temperatures occur between July and August. They occasionally decrease down to -8 °C. Here there is located the architectonic complex called Incahuasi, 20 km from the capital city. At 300 km is located a place called Incahuayco, which is 12 m long and 8 m wide, and it could have been an adoration place dedicated to the water.

ANGARAES

It is located at the western end of Huancavelica; and its capital Lircay is situated at 3 270 m.a.s.l., on the right side of the ravine. It is an agricultural province that occupies the valleys and lower zones. The high zones are pasture lands. Daily maximum temperatures oscillate around 20 °C, and minimum around 7 °C in the summer and around 2 °C in the winter. Precipitations are scarce even in the summer time.

HUANCAVELICA

This city is the capital of the department, and is situated in its central part. It is a city with antique houses and colonial temples, in its surrounding are located the San Cristobal thermal waters and the stone forest of Schapite and Toccyac. It has a dry temperate climate, sunny during the day and very cold at night. Average monthly maximim temperature is 15°C and minimum

Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

temperature is 0 ºC, in the winter time. The rainfall period is from November to March, they normally occur after noon and gnerally stop before midnight.

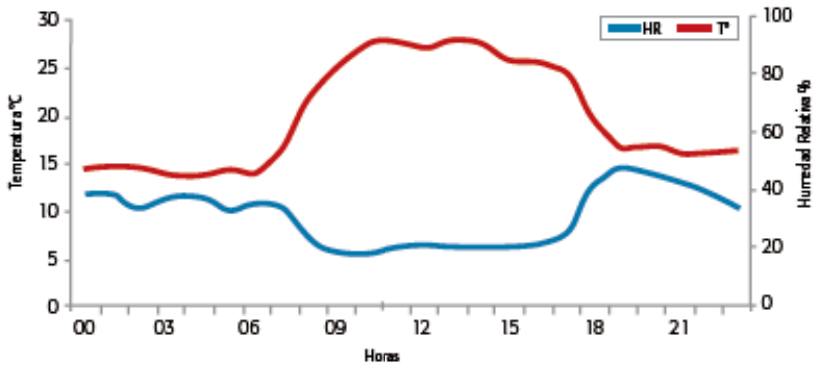
TAYACAJA

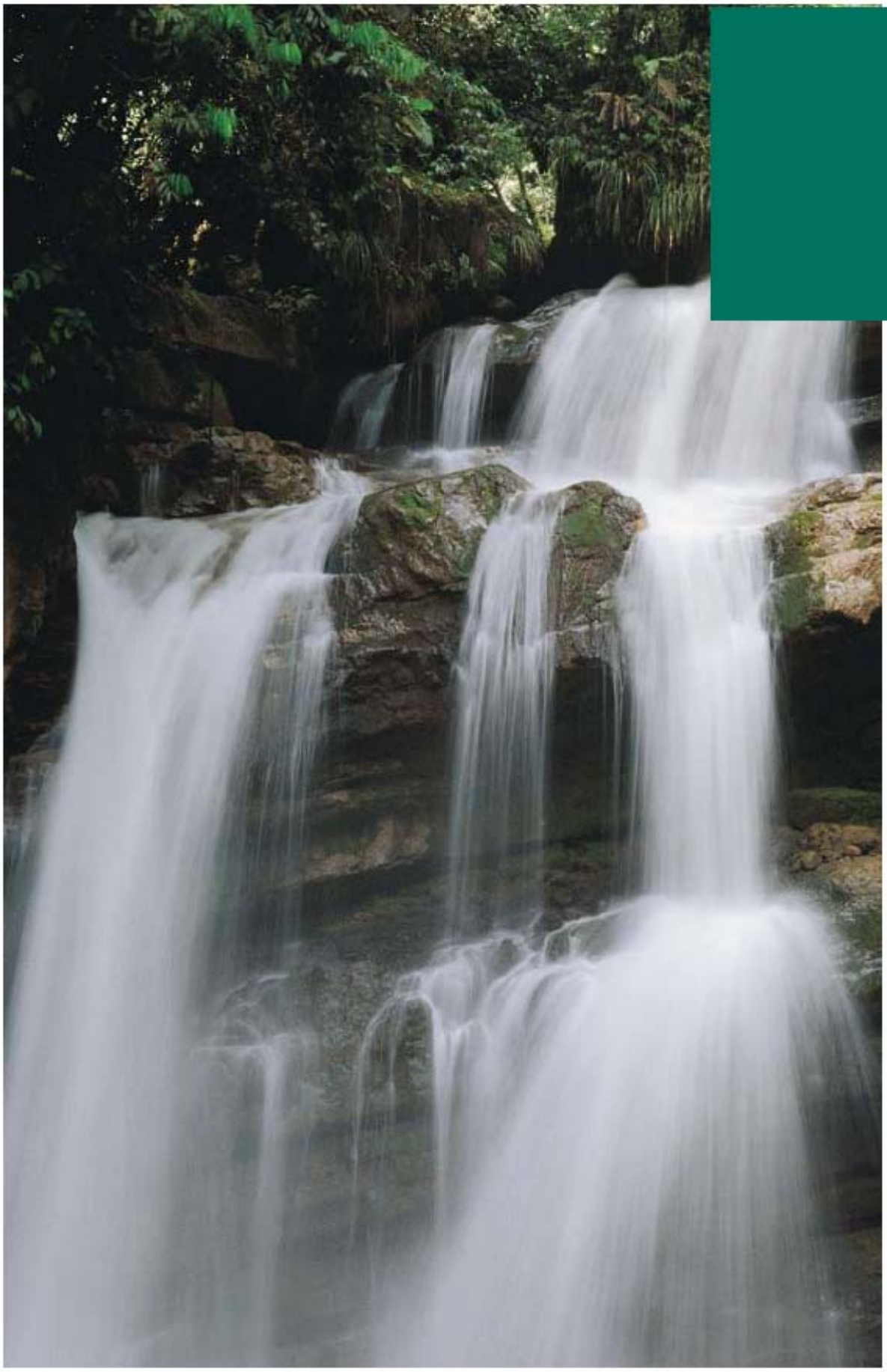
Its capital is Pampas, situated at 3 270 m.a.s.l.. It is a city of commercial importance among the towns in the valley and uplands. Maximum temperatures oscillate around 18 ºC, sun bright is permanent from April to November.

ACOBAMBA

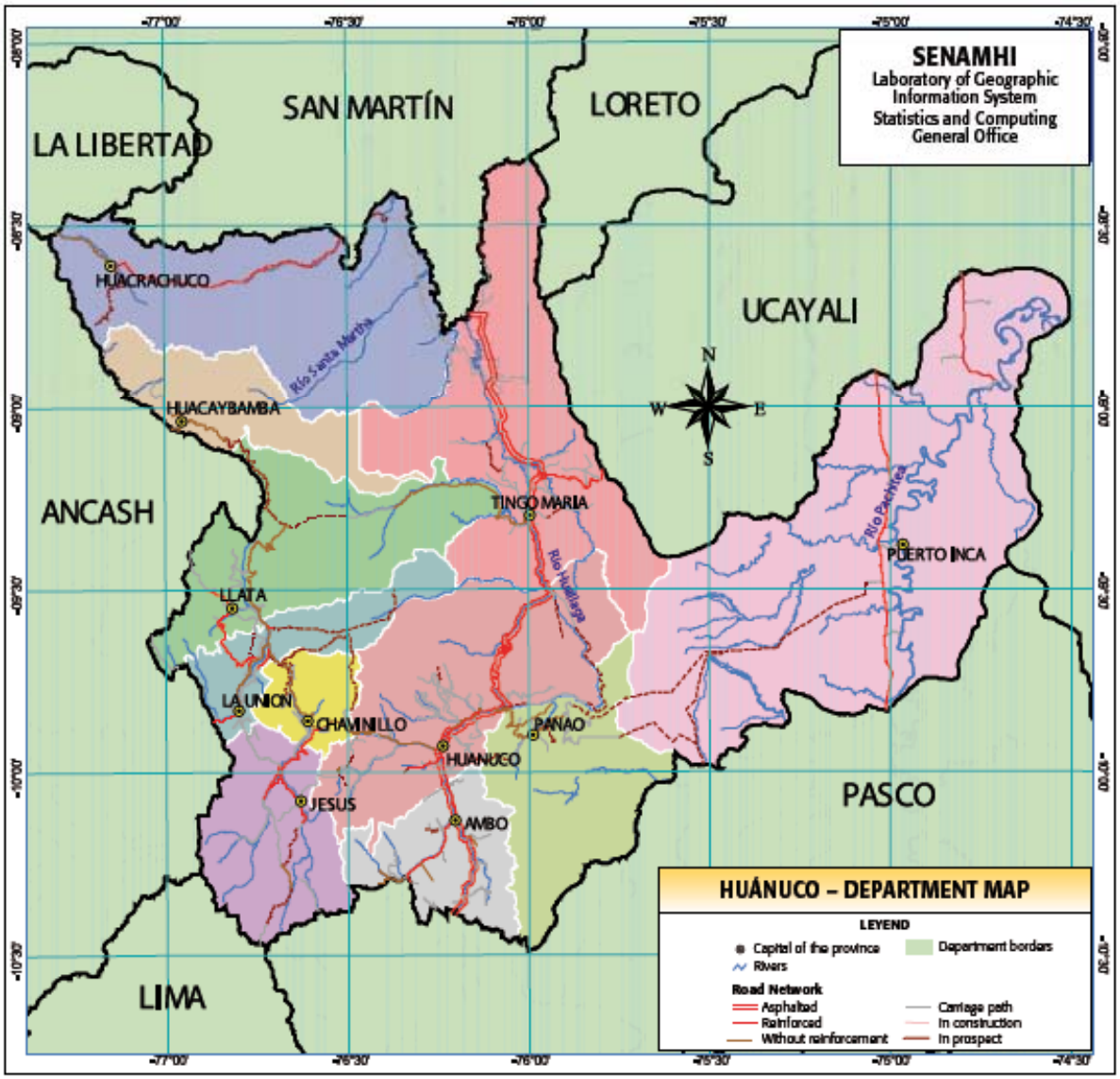
Acobamba means "sandy plain", and it is famous for its populous cattle fairs that take place on Fridays. Average monthly maximum temperature oscillates around 17 ºC and minimum around 3 ºC. The most important rainfall period is between January and March. The corresponding charts show the evolution of temperature and relative humidity on hourly basis for a typical spring day, in September of 2003 in Acora.

CHART 47
Hourly Temperature and Relative Humidity in Acora
15/09/2003
(Lat 13º47'S Long 75º22'W Alt 1 890 m.a.s.l.)





Huánuco


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
SAN MARTÍN
LORETO
LA LIBERTAD
UCAYALI
ANCASH
PASCO
LIMA
HUACRACHUCO
HUACAYBAMBA
TINGO MARIA
PUERTO INCA
LLATA
LA UNION
CHAVINILLO
PANAO
HUANUCO
JESUS
AMBO
Río Santa Martha
Río Huallaga
Río Pachitea
N
W
E
S
HUÁNUCO – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Huánuco is located in the central and eastern part of Peru. To the north it is bordered by La Libertad and San Martin, to the northeast by San Martin, Loreto and Ucyali, to the south it is bordered by Pasco, and to the southeast by Lima, to the west it is bordered by Ancash. Its territory is traversed from north to south by three mountain chains of the Northern Andes, they are: the Western, Central and Eastern. This mountain chains were formed as a result of the andean uplifting and they were carved by the erosion of the Marañón, Huallaga and Pachitea rivers, that flow from south to north and that have molded the physiographic configuration of the department through millions of years. Here there are located important tourist attractions situated on the mountain ranges, in the inter-andean valleys and in the uplands of the jungle. The snow peaks of the Huayhuash mountain chain as the Ninashanco (5 630 m), Yerupajá (6 632 m) and Sihia (6356 m) are especially visited by tourists and climbers.

The Marañon river originates in the Yerupajá peak, where it takes the name of Gayco river. Along its course to the north, this river receives many tributaries. After it runs through the city of La union, it continues its course to the north and reaches Jircan village, in the province of Huamalíes, from which it takes a bend to the northeast, running through a deep canyon. In this sectors the river is very torrential, which turns into a challenge for the tourist that enjoy canoeing.

The Huallaga river originates in Cerro de Pasco, and along its north-south course crossed the department of Huanuco from one end to the other, dividing it into two halves: to the west a dry temperate region and to the east a rainy, hot and humid region. Along its course toward the Amazon region, the river flows through rough mountains, and fog forests. It is a navigable to small boats from Tingo Maria and upstream.

The Pachitea river originates in the department of Cerro de Pasco, along its south-north course it crosses the province of Puerto Inca, and as it flows through the low forest region its course turns winding (meanders). From here on, it takes bends eastward until it meets the Ucayali river. It is navigable to small boats.

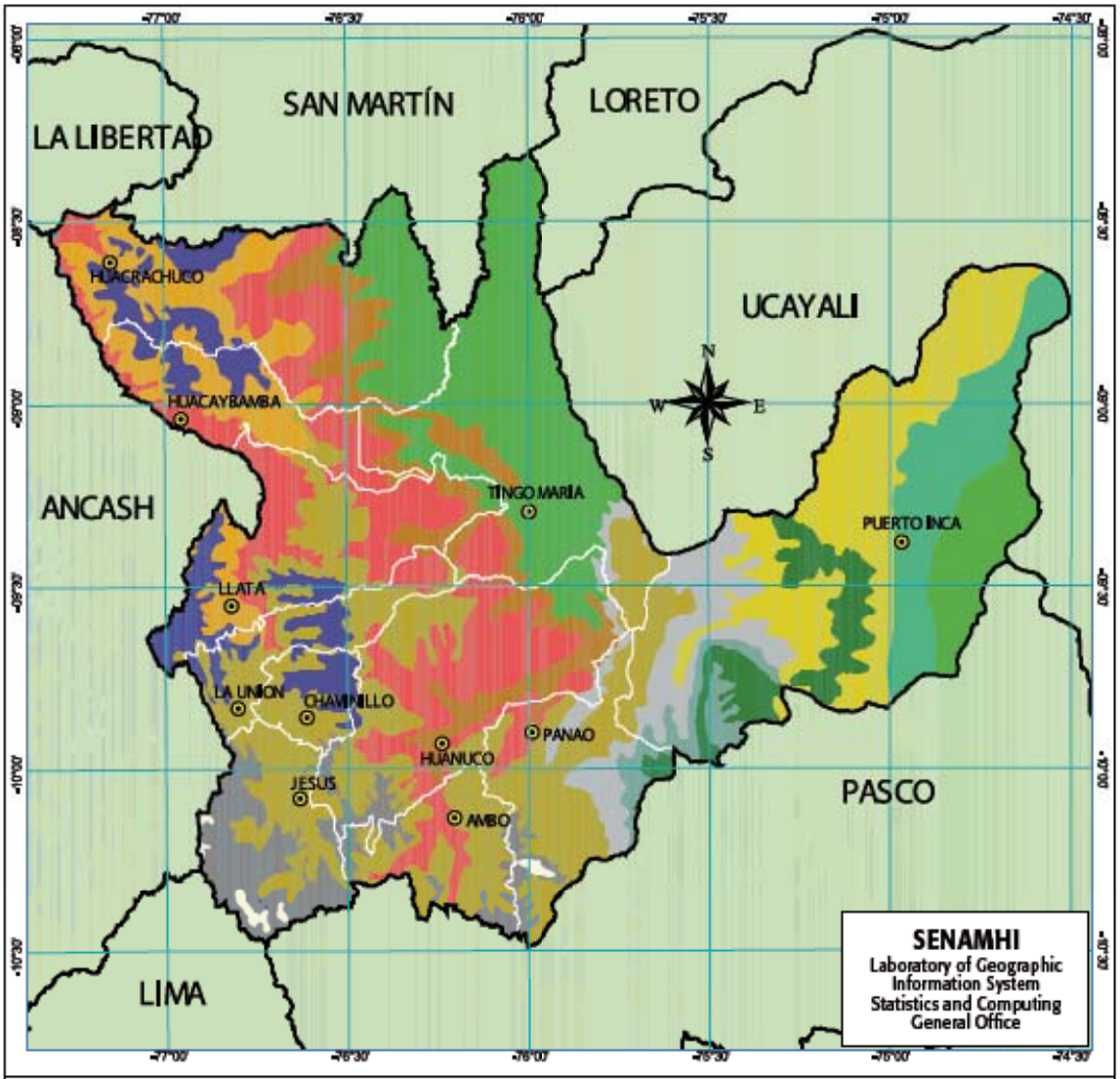
CLIMATE CLASSIFICATION

This department presents a diversity of clamtes, the most important according to the climate classification of Thornthwite are:

A rainy, warm and semi-warm climate, with plenty of rainfall in all the seasons. This type of climate is typical of the locations in the provinces of Tingo María, Puerto Inca and Pachitea.

A rainy, semi-cold and humid climate, dry in autumn and winter. This kind of climate corresponds to zones located in the provinces of Huánuco, Ambo, Panao, Jesús and La Unión, among others.

A semi-dry, semi-cold and humid climate. This climate is typical of locations such as Huacrachuco, Llata, Chavanillo, among others.



Description	Coding
Rainy, semi-frigid and humid; dry in winter	B(i) D' H3
Snow	B(o,i) C' H3
Rainy; cold and humid; dry in autumn and winter	C(i) C' H3
Semi-dry, cold and humid; dry in winter	C(o,i,p) A' H3
Semi-dry, warm and humid; dry in autumn, winter and spring	B(o,i) B'3 H3
Rainy, semi-cold and humid; dry in autumn and winter	C(o,i,p) B'3 H3
Semi-dry, semi-cold; dry in autumn, winter and spring	C(o,i,p) C' H3
Rainy; semi-warm and humid; dry in winter	A(r) A' H4
Very rainy; warm and very humid; a lot of rainfall in the year	A(r) B'2 H3
Very rainy; temperate and very humid with a lot of rainfall in the year	A(r) B'1 H4
Rainy, semi-warm and humid with a lot of rainfall in the year	B(r) B'1 H4
Very rainy; semi-war and humid with a lot of rainfall in the year	A(r) B'1 H4
Rainy, warm and very humid with a lot of rain in the year	B(r) A' H4
Rainy, warm and humid, dry in winter	B(i) A' H3

WEATHER AND CLIMATE

The weather and the climate in the department are basically determined by the InterTropical Convergence Zone, the Low Amazon Pressure, the wedge of the South Atlantic Anticyclone, the High Bolivian and the westerly winds of the middle and high levels of the atmosphere.

Temperatures, as in all the territory, decrease with the altitude, the highest ones occur in the valleys of the jungle, where they frequently exceed 30ºC at noon and afternoon hours. In the months from May to November, under certain atmospheric conditions as a remarkable atmospheric stability (calm wind and clear sky), temperatures may reach 35ºC or more in the lowest parts of the Marañon and Huallaga rivers basins. During the months of October and November, which is the period with the highest amount of incident solar radiation reaching the surface and with scarce cloudiness, the highest average monthly temperatures are registered, as it can be seen in the charts corresponding to the locations of Huánuco, Ambo and Tingo María. The highest minimum temperatures occur in the rainy period.

In the high forest (provinces of Pachitea and Puerto Inca), the lowest night temperatures oscillate between 20ºC all year round, except during the periods of "friaje" (incursion of cold and dry air masses from the Subantharctic region in the months of autumn and winter), when night temperatures decrease down to 15 ºC or less, in the low forest region of the province of Pachitea (depending on the intensity of the "friaje").

Generally, the middle part of the Huallaga river basin is not directly affected by the "friaje", because it is protected by a mountain chain located south and east of the basin.

Rainfall is abundant in the high and low forest during all the year. In certain locations exposed to the humid and warm winds form the east or norhteast, such as in the jungle area of Pachitea or in the valleys, that due to their physiographic configuration accumulate high amounts of atmospheric humidity when the humid wind flows parallel to the valleys axis, as it happen in he Huallaga; rainfall is frequent and prolonged. The annual amounts exceed 3 000 l/m², as it is observed in the chart corresponding to the city of Tingo María, which is characterized by the occurrence of storms during all the year and more frequently between January and March, up to the extend that one day it might rain upt to 100 l/m² or more.

Conversely, the city of Huánuco and the locations situated to the east and south, rainfall is scarce and are restricted to the months of December to March,

CHART 49
Extreme Temperature and Precipitation
Monthly average in Huanuco
(Lat 09º48'S Long 76º18'W Alt 859 m.a.s.l)

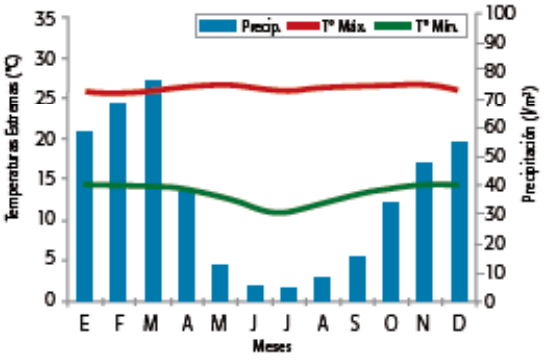


CHART 48
Extreme Temperature and Precipitation
Monthly average in Ambo
(Lat 10º08'S Long 76º12'W Alt 2 064 m.a.s.l.)

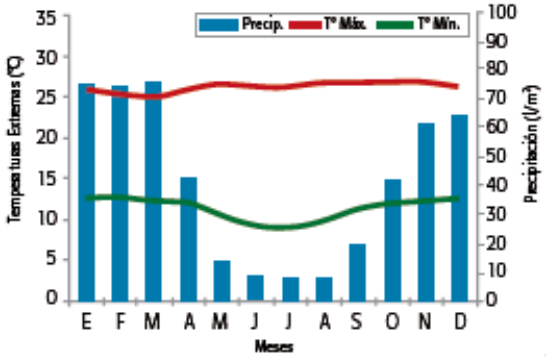


CHART 50
Extreme Temperature and Precipitation
Monthly average in Tingo María
(Lat 09º18'S Long 76º01'W Alt 664 m.a.s.l.)

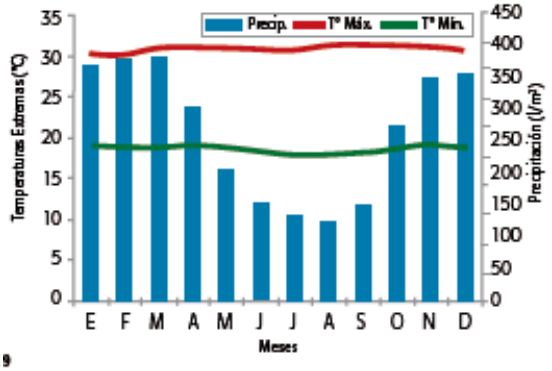


TABLE 9
Sunrise and sunset hours and duration of daylight throughout a year in the city Huánuco

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:56	06:07	06:09	06:09	06:11	06:19	06:23	06:16	05:59	05:42	05:33	05:39
Sunset	18:34	18:32	18:19	18:02	17:52	17:52	17:59	18:03	18:02	18:00	18:07	18:21
Time light	12:15	12:19	12:14	12:05	12:02	12:06	12:11	12:10	12:00	11:51	11:50	12:00

with annual amounts that reach about 500 l/m², although thery are close to the Amazon basin. This is because the mountain chains, located north and east of these locations, prevent the entrante of humid air into the middle and high parts of the vallley of the Huallaga river. Thus, in Huanuco, rains less than 400 l/m² a year, while in Tingo María, which is near Huánuco, it rains more than 3 000 l/m² a year.

In the andean high plain, rainfall is more frequent from Decembeer to March, and it generally starts in the afternoon and stops before midnight. Slight preciptaions as snow in locations situated above 4 000 m.a.s.l. are frequent during alll the year. On the border with the department of Lima, where the provinces of Lauricocha, Dos de Mayo and Yaruvilca are located, which are part of the Pasco Knot, cloud cover is partial or total all the year round. This characteristic is due to the forced ascent of air masses through the valleys located to the north, east, south and west, same ones that join at the Pasco Knot

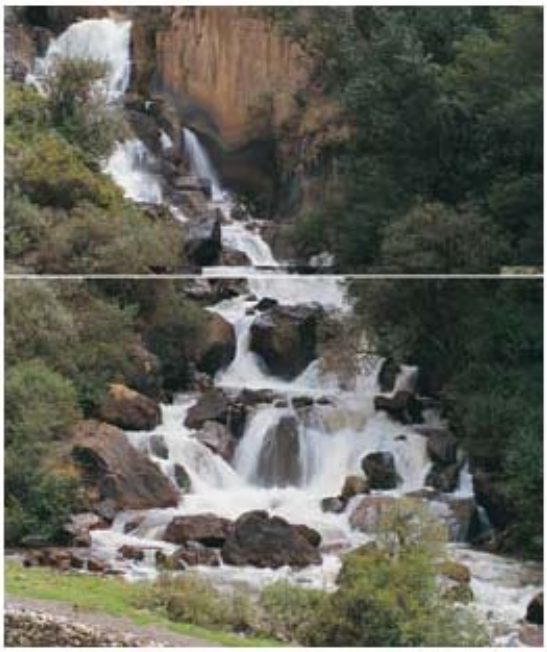
TOURISTIC ATTRACTIONS

HUÁNUCO

The city of Huanuco is located at 1 859 m.a.s.l. (fluvial gorge region), on the left bank of the Huallaga river. It has a pleasant climate, and average monthly maximum and minimum temperatures in the months of January and June are 28 °C and 15 °C; and 27 °C and 12 °C, respectively. From April to December, rainfall are very scarce, sun bright is permanent and relative humidity is low. The tourist attractions are the archaeological sanctuary of Kótosh and also some temples and antique colonial houses

AMBO

Is located at 2 065 m.a.s.l., between the confluence of the Huertas, Huariaca and Huallaga rivers. Vichaycoto farm, and Tumayquichua village are the tourist places in this province. The city has a pleasant climate from April to November, with average maximum temperature that fluctuates around 27°C, and the minimum around 10°C. The rainy period is from October to March and little rainfall in autumn and winter time; likewise, cloud cover in these seasons is very scarce, for which reason there is an intense sun bright.



DOS DE MAYO

Its capital is the city of La Union, located on the Pasco Knot. Its topographic configuration favors the occurrence of abundant and frequent precipitations between November and March. In autumn and winter precipitation decreses in intensity and frequency. In this period, the scarce cloud cover before noon contributes to increase maximum temperatures up to approximately 18 °C, while minimum temperatures are approximately 6 °C or less. The tourist place are the district of Sipán, that has the thermal baths of Cónoc and Huanucopampa ruins.

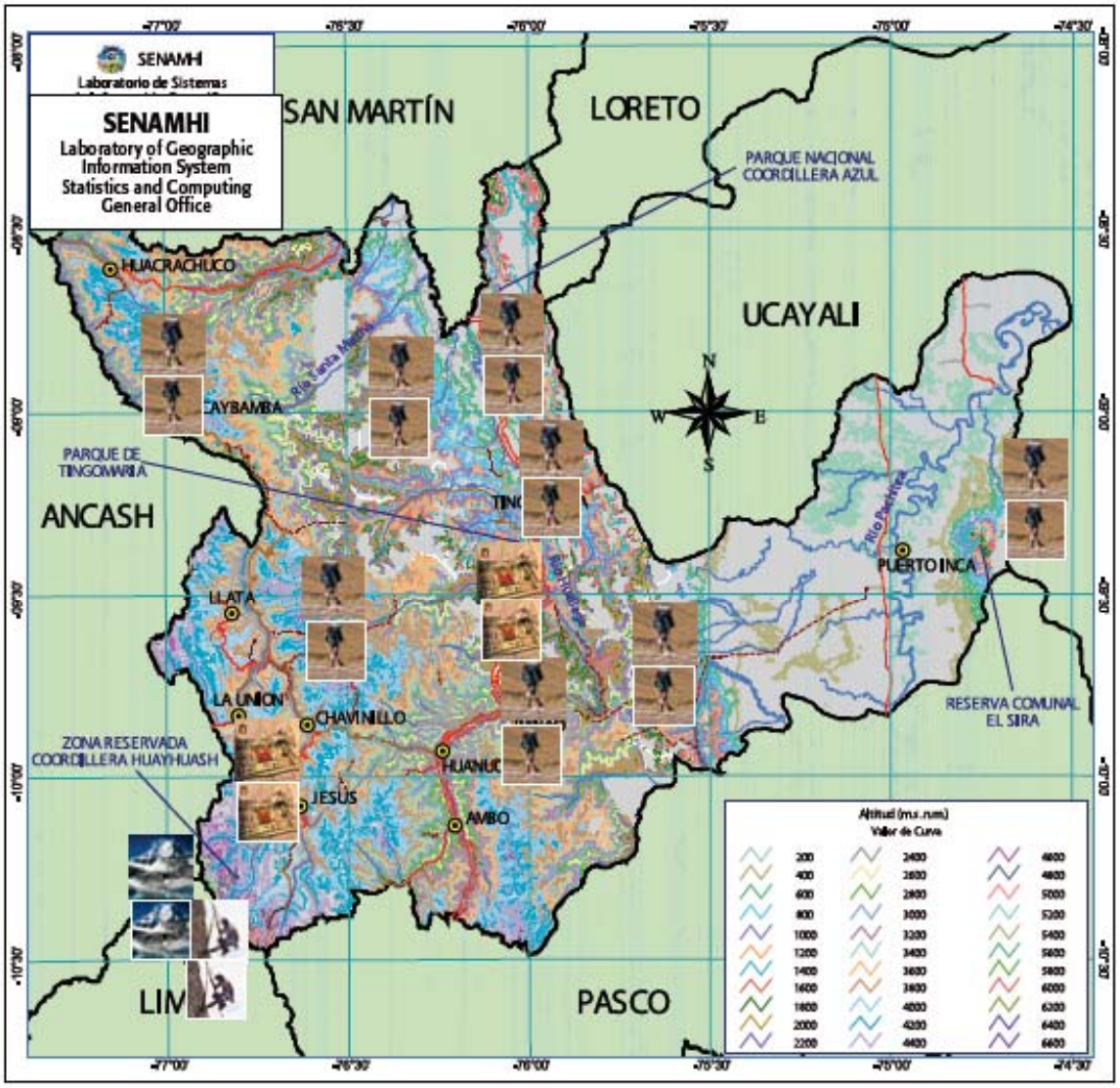
HUAMALÍES

Llata is the capital city ("Flacon House"), which is the Folklore Capital of Huanuco, situated at 3 249 m.a.s.l. and 72 km from the city of Huánuco. In the region called Front-forest, that includes the Monzoon zone is characterized for being rainy and humid, with a sky permanently covered with low clouds or fogs, same ones that under certain conditions and during the night, due to the atmospheric air cooling, humidity condenses over the forest; in the Monsoon valley average maximum temperatures fluctuate around 25 °C and minimum around 14 °C. The foggy forests are of interest for those who love ecological or adventure tourism. Other tourist attractions are: Tantamayo citadel, located on the right bank of the Marañon river at 3 400 m.a.s.l., the Hucampata bridge, built in 1879;

the Rumichaca lagoon, the natural cave of Satunchko, and Tomayquichua, situated in the middle of a beautiful valley of reedbed. From this rock buildings of up to five stores, corresponding to the pre-inca period, the most representative ones are: Susupillo, Selmín Castillo, Piruru, among others.

LAURICOCHA

This province belongs to the Pasco Know, it is located in the jurisdiction of the Huayhuash Mountain Chain, in which it is located the Yerupajá snow peak (district of Querecotillo, Dos de Mayo). Here we find the beautiful Lauricocha lagoon and the Reserved Zone of



the Huayhuash Mountain chain. The weather is windy and sunny from May to October, and rainy the rest of the year. Maximum daily temperatures are lower than 16ºC and night temperature are less than 5ºC.

Height decease affects travelers due to the atmosphere of the mountain region that has less amount of oxygen with respect to the amount at sea level; thus, at 2 000 m.a.s.l., 3 000 m.a.s.l., and 4 000 m.a.s.l., there is 20%, 30% and 40% less oxygen that may affect some visitors, since the impact of less concentration of oxygen does not affect everybody in the same way, The persons that have overweight or high blood pressure, drepanocitic anemia, or have a heart condition must have a medical check up before planning a trip to a place at a high altitude.During the months of scarce cloud cover (from May to October) the mountain region atmosphere offers less protection against solar radiation, so it is recommended to use a cap or hat to protect themselves from intense solar radiation.

PUERTO INCA

This province has a relief traversed by the Pachitea River. It has tourist potential to be exploited in the future. Here there is located part of the "El Sira" Community Reserve. Its territory is located at the easternmost forest point of the department, for this reason its climate is characterized for being very rainy and hot, with average maximum temperatures of 32 ºC and minimum temperatures of 22 ºC. Their monthly variation is very little.

YAROWILCA

Here there is the located the "El Sira" Community Reserve of the Huayhuash Mountain Chain. In general, the climate is cold in the day and very cold at night. Winter is sunny and dry, with relatively strong winds, with average maximum temperatures around 12 ºC, and minimum below 0 ºC.

TINGO MARÍA

Tingo Maria is situated at 691 m.a.s.l., at the Huallaga River banks. Is the capital of the province of Leoncio Prado, it is a tropial city with a rainy and hot climate, with average monthly maximum and minimum temperatures of 29 ºC and 20 ºC in the summer, and in the winter 30 ºC and 19 ºC, respectively. The most significant rainfall period is from November to April, with average monthly values of 260 l/m² in January and 74 l/m² in June. Annual rainfall exceeds 3 100 l/m².

The charts show the daily evolution of the temperature and relative humidity in Tingo Maria, corresponding to the typical months of March and July 2003.

Tingo Maria has as a tourist attraction, the "Tingo Maria National Park", which consists of a mountain called "Sleeping Beauty", a typical cordillera massif that has the silhouette of a woman resting on the grass and it can be seen form the city of Tingo Maria. The Park has an excellent natural landscape suitable for ecological tourism, where the "Owls Cave" is located and there is a wide variety of flora and fauna. Other touristic places are: Las Pavas ravine, La Quinceañera and Leon Encantado water falls, the Rio de Oro corridor and the tourist place Tres de Mayo-Rio Perdido.

CHART 51
Daily Maximum temperature and humidity in Tingo María
27/03/2003
(Lat 09°17'S Long 75°59'W Alt 691 m.a.s.l.)

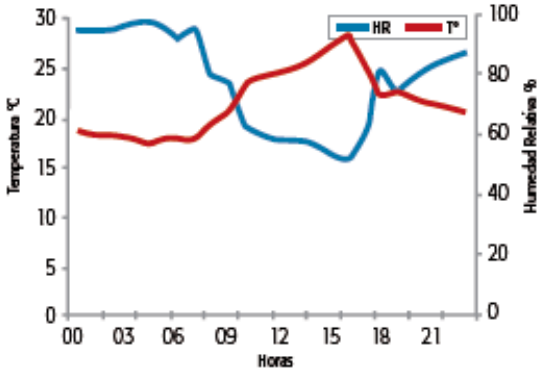
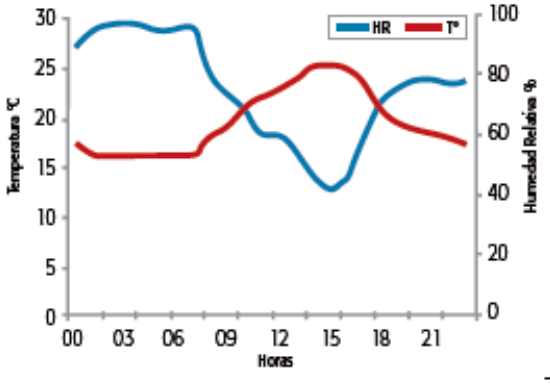
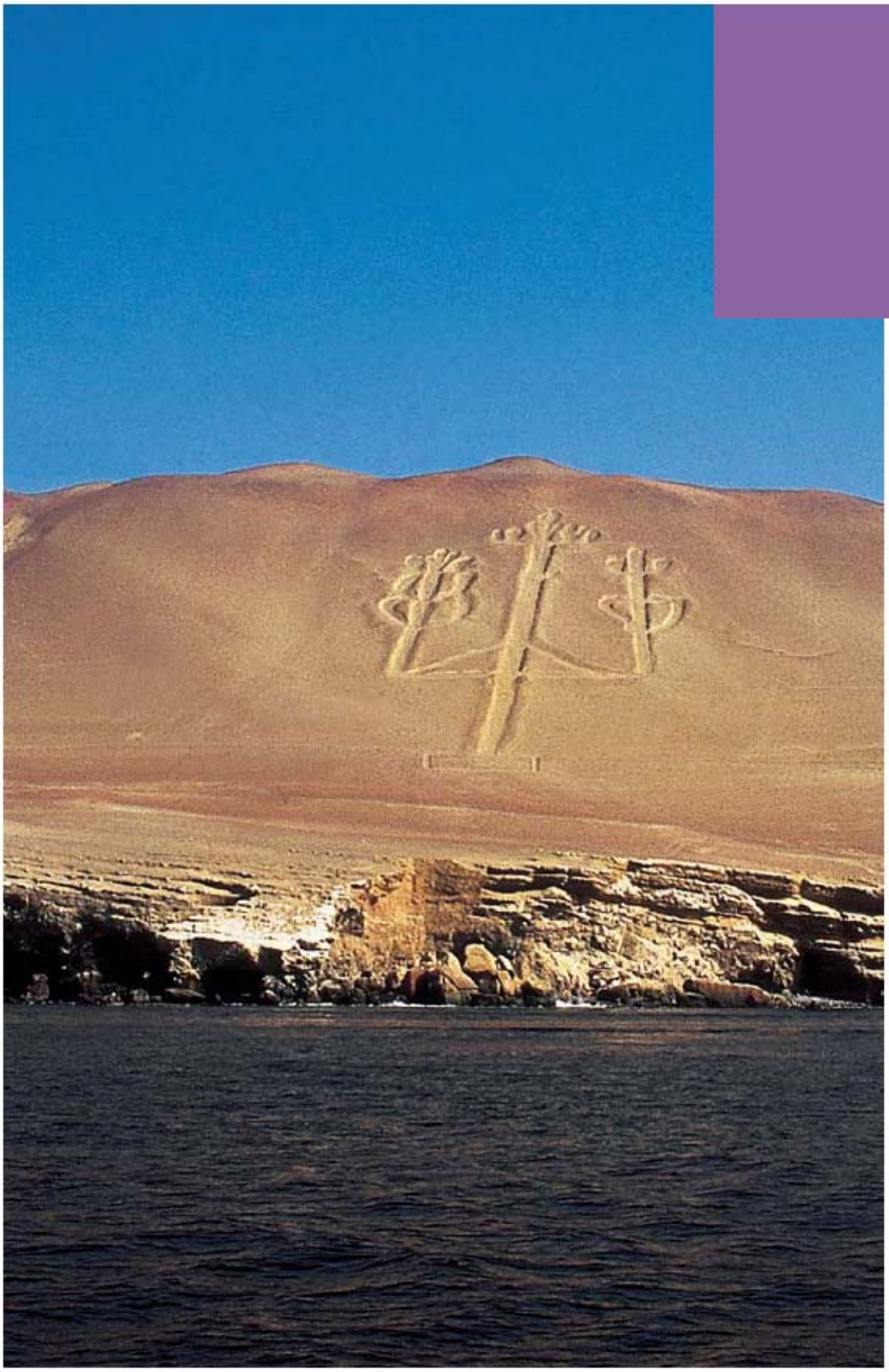


CHART 52
Daily maximum temperature and humidity in Tingo María
15/07/2003
Lat 09°17'S Long 75°59'W Alt 691 m.a.s.l.





Ica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PALPA
NAZCA
Río Chico
Río Pisco
Río Ica
Río Grande
N
S
E
W
ICA – DEPARTMENT MAP
LEYEND
Capital of the province
Department bo
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

Ica is the typical coast departament, per excellence, it is formed by three well-defined geographical spaces: the coast, the coastal plain and the western andean slopes.

The coast consists of the port of Pisco, the Paracas peninsula – one of widest along the coastline – the La Independencia bay, the Laguna Grande inlet and San Nicolas and San Juan bays.

The coast plain is formed by vast deserts that cover an area of 60km, it is traversed by the Chincha, Pisco, Ica, Río Grande and San Juan rivers, watering the fertile valleys along their course.

This peculiar geographical configuration favors the circulation of air masses that give rise to the "paracas winds". These winds are originated because of the difference in temperatures of the dry-warm air masses from the desert and the cold-humid air masses coming form the ocean, besides there are some other dynamical reasons such as the strong increase in the atmospheric pressure in the coastline, originated by an intense subsidence, which causes changes in the air masses circulation, that generally occur in the afternoon. The "paracas winds" reach speeds higher than 40 km/h.

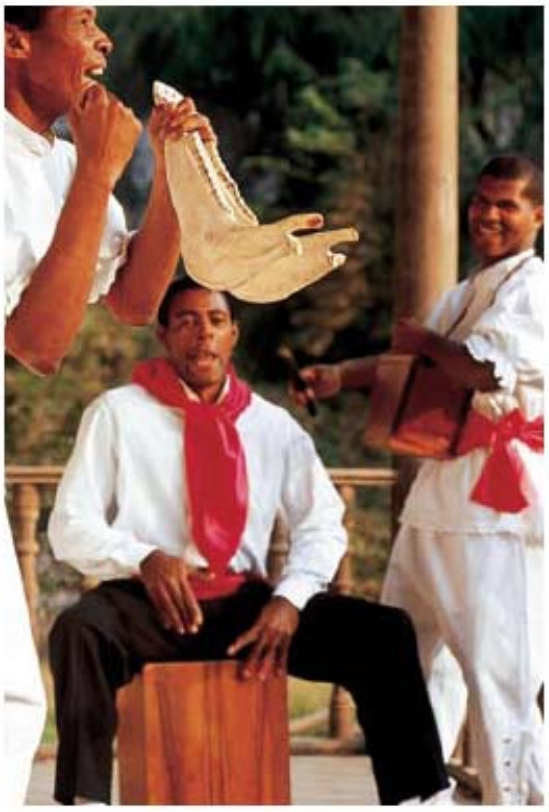
A systems of lagoons generate the Pampas and Pilpichaca rivers, that also model the Huancavelica landscpae. The Pilpichaca river runs to the east, although the Chocloccha lagoon is situated west of the watershed of the western moutain range. But this geographical mistake has been fixed with a tunnel and a reservoir that allow to divert the stream into the Ica river basin.

The western andean slopes constitute a territory whose relief reach up to an altitude of 500 meters, they lie on the border of the Huancavelica and Ayacucho departments.

The Pisco river originates in the Chaycho hill at 5 050 m.a.s.l., in the department of Huancavelica, and only during the rainfall period its discharge run into the sea. It has a total length of 170km and an average discharge of 50 m^3/s in the rainy period and it is torrential.

The Ica river originates in the department of Huancavelica, at 4 500 m.a.s.l., an it has a length of approximately 200 km. Its waters reach the ocean during the rainfall period, and it has an average

Description	Coding
Arid, with shortage during the year; temperate and humid	E(d) B'1 H3
Semi-dry; dry in autumn, winter and spring; temperate and humid	C(o,i,p) B'2 H3
Semi-dry, dry in autumn, winter and spring; semi-cold and humid	C(o,i,p) B'3 H3
Rainy, dry in winter, semi-frigid and humid	B(i) D' H3



discharge of 40 m³/s, and the river is quite torrential. Another important river is Rio Grande.

CLIMATE CLASSIFICATION

According to Thornthwaite , the department of Ica has the following type of diamates:

An arid, semi-warm climate, with absence of rains during all the seasons of the year and with an average relative humidity of 75%. This type of climate correspondes to most part of the territory in the department, such as in the privinces of Chincha, Pisco, Ica and Nazca.

A semi-dry, temperate climate, with absence of rainfall in autumn, winter and spring. Corresponds this type of climate to places located in the andean provinces of Chinca, Pisco, Ica and Palpa.

A rainy, semi-frigid and humid climate, dry in the winter. This kind of climate corresponds to high locations such San Juan de Yánac and San Pedro de Huacarpana, in the province of Chincha.

WEATHER AND CLIMATE

The climate of the department of Ica is characterized for being arid, with scarce precipitations. The topography of the Ica department has generated a peculiar climate region, mainly due to the presence of remainings from the western mountain range adjacent to the coastline, and that extend form the peninsula of Paracas up to the border with Arequipa. In this chain are located some summits that exceed 800 mts altitude.

The altitud of the coast mountain range and its northeast-southeast orientation contribute to the significant increase of the winds over the coastline at low levels, which at the same time originate strong upwelling of cold waters in the ocean.

The highest average monthly maximum temperature in the city of Ica is 32 °C in the summer and 25 °C in the winter; minimum oscillates between 18 °C and 9 °C in the summer and winter, as it can be observed from the chart corresponding to the meteorological station of San Camilo. On the other hand, precipitation is very scarce all the year round, and only in the summer some slight rainfall of 1,5 l/ m² is registered.

On certain days, maximum temperatures exceed 35 °C, especially during the occurence of a El Niño phenomenon of moderate to strong intensity, or when the winds comes from the northeast. The lowest temperatures are registerd in the winter; however, maximum temperatures are higher than the ones of Lima; this is due to breakup of cloud layer by strong processes of mixture between low-level marine humid air and warm dry air from the inversion layer, situated above cloud limit.

From the peninsula of Paracas up to Chincha, the weather is sunny throughout the year, and it can be considered as one of the sunniest locations in the central coast, because it is protected from the coast mountain chain, a barrier that prevents the entrance of marine breeze and at the same time it channelizes the wind flux to the southeast-northwest direction.

CHART 53
Extreme Temperature and Precipitation
Monthly average in San Camilo
(Lat 14°05'S Long 75°13'W Alt 378 m.a.s.l.)

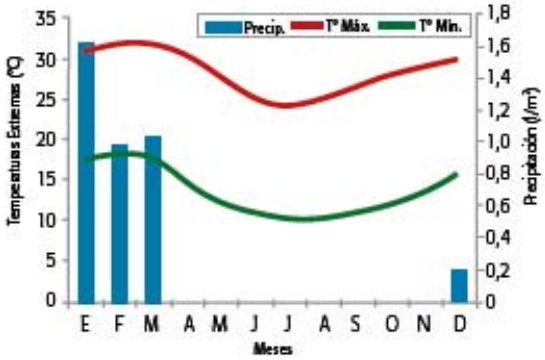


CHART 55
Extreme Temperature and Precipitation
Monthly average in Pisco
(Lat 13°44'S Long 76°13'W Alt 6 m.a.s.l.)

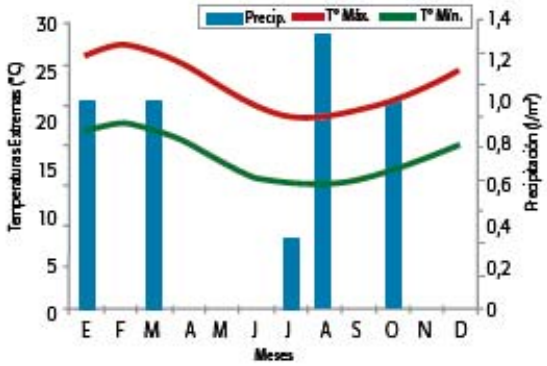


CHART 54
Hourly maximum temperature and humidity in Ocucaje
25/05/2002
(Lat 74°2'S Long 74°40'W Alt 300 m.a.s.l.)

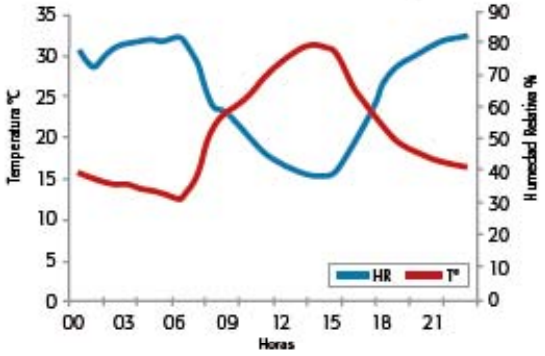
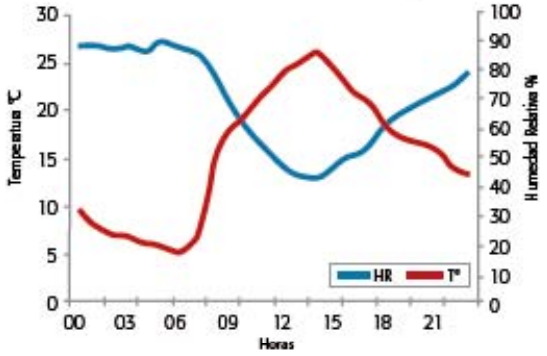


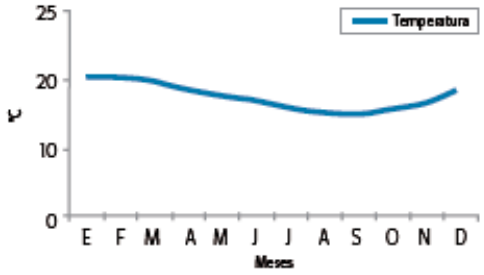
CHART 56
Hourly maximum temperature and humidity in Ocucaje
08/06/2002
(Lat 74°2'S Long 74°40'W Alt 300 m.a.s.l.)



In Pisco average maximum temperatures fluctuates around 28 °C in the summer. In the occurrence of an El Niño phenomenon, maximum temperatures oscillate around 32 °C; also when there are the following conditions: predominance of northern winds or sea surface temperatrue shows positive local variations from 2 °C to 3 °C, and when the atmosphere presents a strong stability (calm or light wind), temperatures are higher than normal.

The lowest temperatures are registered in the month of August or September, when they reach values of 13 °C and 20 °C (minimum and maximum), due to La Niña phenomenon (cooling of sea) or when there are local and regional sea coolings.

CHART 57
Sea water temperature in Ica beaches



The climatic characteristics of the wind continue until October depending on the intensity of the cooling they can be prolonged.

TABLE 10
Sunrise and sunset hours and duration of daylight throughout a year in the city Ica

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:42	05:57	06:03	06:07	06:13	06:23	06:26	06:16	05:55	05:33	05:20	05:25
Sunset	18:36	18:31	18:14	17:53	17:39	17:38	17:46	17:53	17:55	17:58	18:08	18:25
Time light	12:09	12:14	12:09	12:00	11:56	12:00	12:06	12:04	11:55	11:46	11:44	11:55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PTA. PARACAS
ISLA SAN GALLÁN
PTA. SALINAS
PTA. GALLINAZOS
LAGUNA DE LA HUACACHINA
BAHÍA DE LA INDEPENDENCIA
ICA
OCUCAJE
PLAYA INFIERNILLO
PLAYA LA HIERBA
PALPA
LÍNEAS DE NAZCA
NAZCA
PTA. CABALLO
CAHUACHI
CHAUCHILLO
PTA. SAN FRANCISCO
BAHÍA SAN NICOLÁS
BAHÍA SAN JUAN
Altitud (m.s.n.m.)
Province Capital
Rivers
Main road
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
Fishing
Surfing
Skiing
Archaeology
Sailing
Climbing
Hiking
Cycling
Diving
Snowpeak
Paragliding
Hunting

The coastal plains, situated north and south of Ica city, have a sunny and dry weather throughtout the year, for they are protected from the marine breeze by the coastal moutain chain, to the west and south; with average maximim temperatures of 32°C in the summer, and 25°C in the winter; average minimum temperatures in the summer fluctuate around 18°C and 9°C in the winter, so the winter is also sunny and pleasant temperatures during the day, although at nights the weatehr is cold, especially when the sky is clear or when there is little water vapour in the air; and also when weak katabatic winds (mountain breeze) can develop from midnight until 7 in the morning on the eastern side of the coastal plains.

In the coastline there are some strong winds called "paracas" from May to October, their speed exceed 12 m/s. This generally happens when there is a strong persistent thermal inversion for serveral days, same one that generates an important pressure gradient along the coast.

Precipitation is sporadic and light during the summer months or when the warm and humid eastern winds intensify and cross the Andes (trasvases). Relative humidity in the coastal plains at noon can descend to values lower than 30%, generally during all the year the variation is low. In the beaches of Ica, sea surface temperature has the lowest values of all the Peruvian coastline due to the intense upwelling, considered the most intense ones in the world.

Average monthly sea water temperatures in the winter months fluctuate around 14 °C, while during the summer months vary around 16 °C. As it can be seen, the annual variation range is low (2 °C), the waters are not too transparent and swell is more intense, due to the predominance of relatively strong winds, except for the beaches of Pisco province, where there are moderate and weak.

The following charts show the hourly evolution of temperature and relative humidity in Ocucaje registered in a day of May and June 2002.

TOURIST ATTRACTIONS

ICA

It is the capital of the department, is a land with a great agricultural potential and it produces wine and pisco. It has a dry and sunny climate throughout the year. Average monthly temperatures fluctuate between 9 °C and 26 °C in the winter, and between 17 °C and 32 °C in the summer.

In the surroundings of Ica, there are some countryside vineyards and some wine and pisco cellars. The most important wine cellars to visit in a local tour are: Vista

Alegre, Ocucaje, Tacama and 85 smaller wine cellars (craft production) located in the countryside of Ica. Every year in March, there is the Vendimia Festival, and the second week of October the Señor de Luren Feast Day.

HUACACHINA LAGOON

It is an oasis surrounded by palm trees, hurangos, dunes and hotels. The waters of this lagoon have healing properties. The surrounding sand dunes are suitable for the practice of sandboard and motocross.

CHINCHA

It is situated 198 Km from Lima, it has average monthly temperatures that fluctuate from 13ºC to 21ºC in the winter and between 18ºC and 29ºC in the summer. Ther is sun bright during most part of the year, although there is some persistent mist. This province has some tourist attractive beaches such as Hawai, La Peña, Carrizal, La Viña de Mar and Totoritas, as well as, the Chincha Islands. The Casa Hacienda San José is an antique colonial house located in the El Carmen town. Finally there is the archaeological ruins of Huaca Centinela, located in Tambo de Mora town and the petroglifs of Huancor.

PISCO

This province is situated 236 kms from Lima. It has average monthly temperatures that ranged from 30 °C to 17 °C in the summer, and from 24 °C to 11 °C in the winter. Sun bright is almost permanent all year round. Its tourist attractions are the Julio C. Tello Museum and the archaeological place of Tambo Colorado.

PARACAS NATIONAL RESERVE

It is formed by a group of beaches, rocky sites, cliffs, islands and bays. Temperatures are very similar to the ones in Pisco, and the sun bright is present all year round. The tourist itineray of this reserve includes:

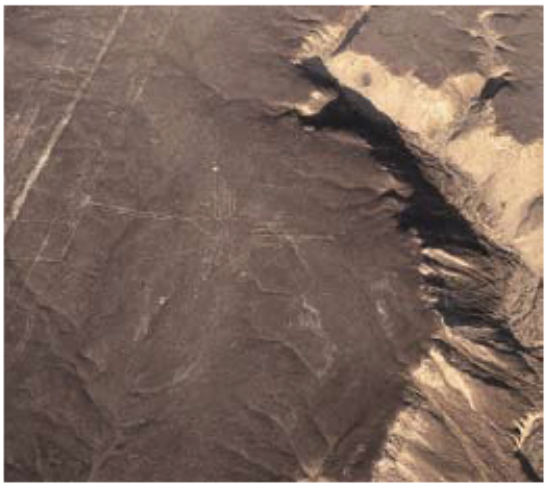
La Catedral, is an erosion-carved rocky formation, due to action of the wind and tides, they have carved the rocks in the form of a catedral with a tower.

The Punta Arquillo which is a natural viewpoint is a sucesión of cliffs of aproximately 40 to 100 meters height, suitable to match the seals and the cóndor.

The Candelabro, which is a geogliph in the form a candelabrum, situated on a hill in front of the Paracas peninsula, which served as a referencial place and a guide to sailors and fishermen.

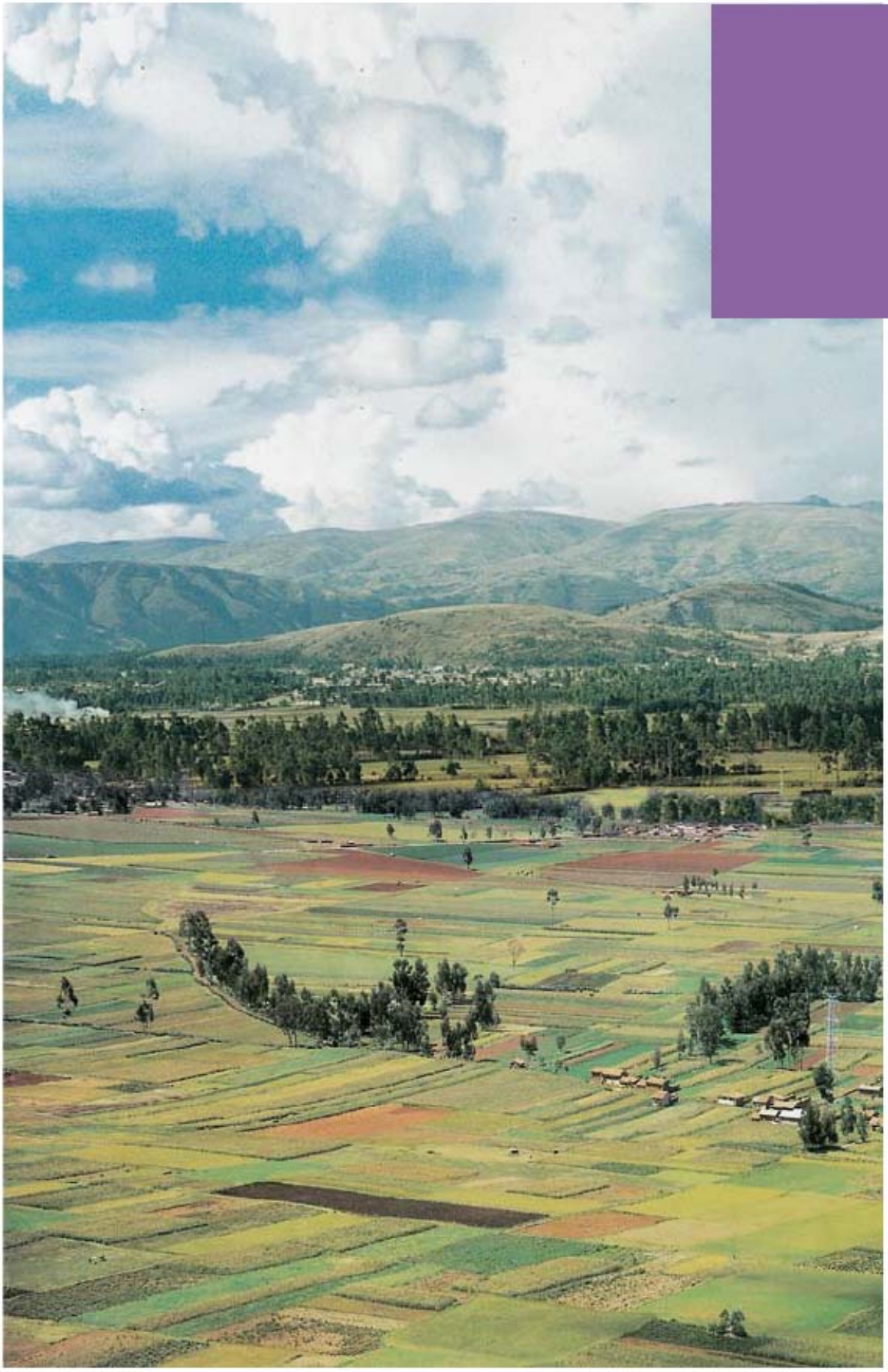
PALPA

Is located 391 km from Lima, with a sunny and dry climate throughtout the year, it is characterized for presenting average monthly maximum and minimum temperatures of 32 °C and 10 °C, in the summer, respectively, while in the winter they are 27 °C and 9 °C. Its tourist attraction if the Solar Clock, located in Sacramento town. The petroglyphs of Casablanca, Chichictara and the Lost City or "Ciudad Perdida" of Huayurí, considered as the Machu Picchu of the Peruvian coast, are also important tourist attractions.

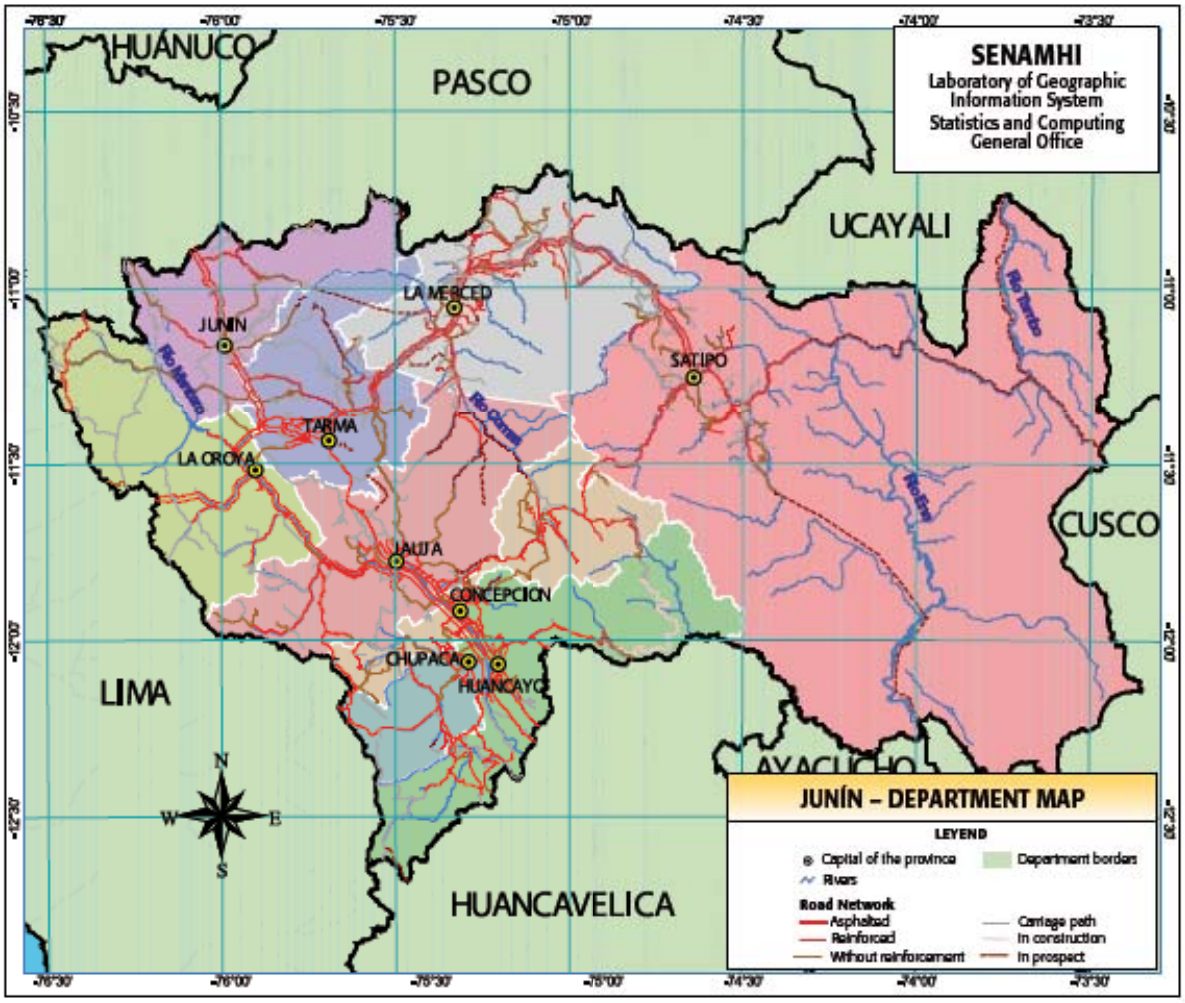


THE NAZCA LINES

The lines and figures of the Pampas de San Jose located between Km 419 and 465 of the Panamericana Sur highway cover an extension of 350 km². They were made by the ancient people of Nazca and its origin is a mystery. They consist of a group of lines and geometrical forms of plants and animals, it is composed of 10 000 lines and 70 figures of animals of colosal size. According to Maria Reiche Newman, these lines and figures were and astromic observatory. In the Nazca province there are the archaeological ruins of necropolis called La Necrópolis de Chauchilla and Los Paredones. The climate is similar to the one in Palpa, sunny and dry all year round.



Junín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AYACUCHO
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JUNIN
SATIPO
TARMA
LA OROYA
JAUJA
CONCEPCION
CHUPACA
HUANCAYO
Río Mantaro
Río Ene
Río Tambo
Río Perene
N
S
E
W
JUNÍN – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Junin is situated in the central part of Peru, its relief is formed by two sectors: the andean and the high forest. The western andean sector is formed by the La Viuda and Chonta moutain chains; the eastern sector if formed by the Huaytapallana mountain chain, that has snow peaks as the Mariarazo, Yanaja, Pacaco, Chispi, Huaytapallana and Cochas, among other. Between the La Viuda-Chonta and the Huaytapallana there is a vast agricultural valley named Mantaro, which provides Lima with food. To the east of the department, the borders of the Amazon plains extend as far as the Ene and Tambo river banks. To the north it is bordered by Pasco and Ucayali, to the east with Cusco, to the south it is bordered by Huancavelica and Ayacucho and to the west with Lima. In this department originated the Tambo, Mantaro, Ene and Perené rivers. At the northernmost point of Bombón plateau is situated the Junin or Chinchaycocha Lagoon, the second one after the Titicaca Lake.

CLIMATE CLASSIFICATION

The department is located in a transition region between the Andes and the Amazonia. Its geography consists of mountains, snow peaks, high Andean plateaus, lagoons, valleys and tropical forest. Its territory includes a diversity of climates, from the freezing high andean plain and glacial to the warm high forest jungles, with dense, humid forest covered with fogs.

According to the climate classification of Thornthwaite, the department of Junin has the following climates:

A rainy, semi-frigid climate, with a relative humidity between 65% and 84%m dry in the winter. This type of climate corresponds to the high zones of the provinces of Yauli, Junín, Jauja, Chupaca and Huancayo.

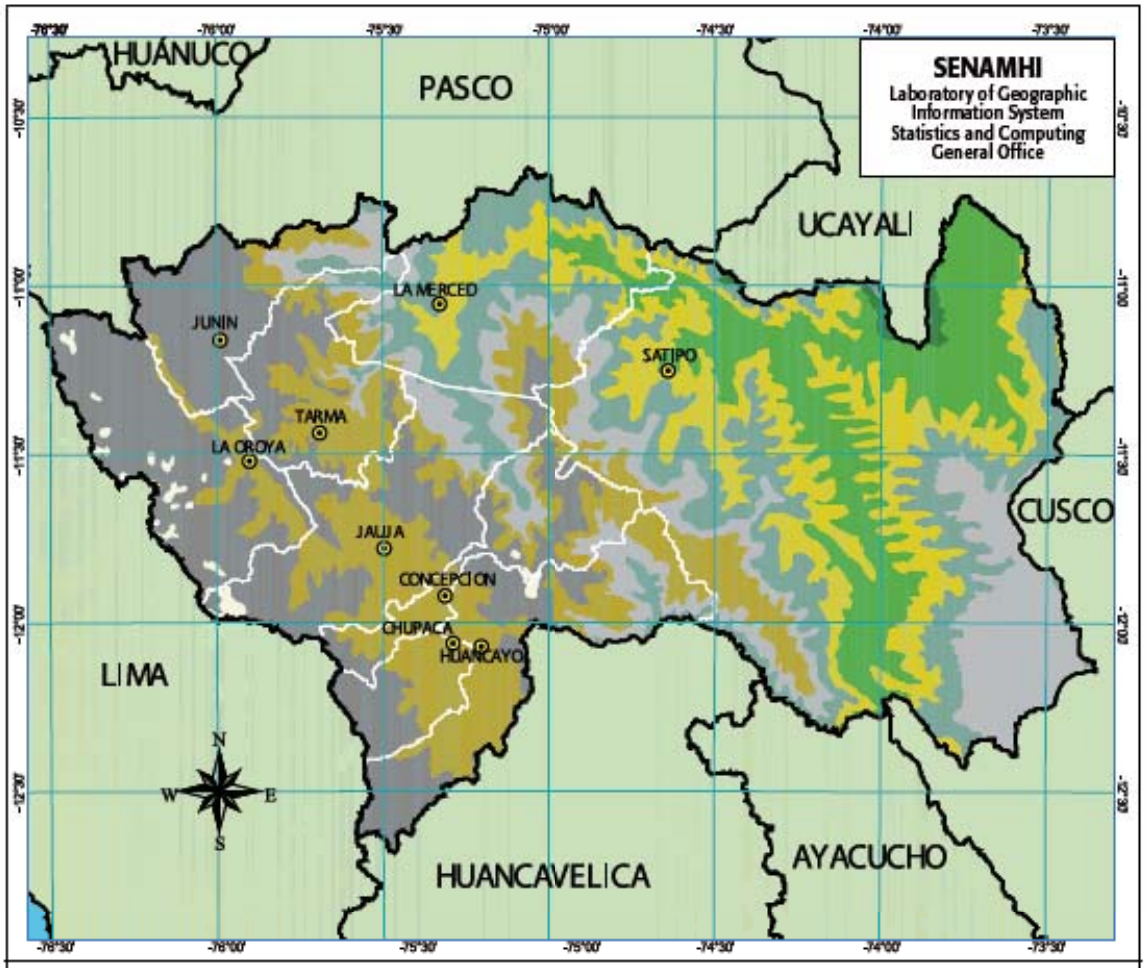
A rainy, cold climate, with a moderate relative humidity between 65% and 84%, dry in autumn and winter. This type of climate is typical of the valleys in the provinces of Yauli, Junín, Tarma, Jauja, Concepción, Chupaca, Huancayo and high parts in Satipo.

A rainy, temperate climate, with abundant rainfall in all the seasons of the year. This climate corresponds to high zones in the provinces of Chanchamayo and Satipo.

A rainy, warm and semi-warm climate, with high relative humidity and abundant rainfall in all the seasons. This type of climate corresponds to the high forest zones of La Merced and Satipo.

THE MANTARO RIVER

It is the main river and it originates in the Alcacocha Lagoon, situated in Pasco. It flows into Junin Lake, and then it flows in a southeast direction toward the cold high andean plain, receiving contributions from several small rivers.



Description	Coding
Rainy; semi-frigid, dry in autumn and winter	B(i) D' H3
Snowy	Snow
Rainy; cold and humid; dry in autumn and winter	B(o,i) C H3
Very rainy; temperate; plenty of rainfall in the year	A(r) B'2 H3
Rainy; semi-warm and very humid; plenty of rainfall in the year	B(r) B'1 H4
Rainy; war and very humid; plenty of rainfall in the year	B(r) A H4
Very rainy; warm; plenty of rain in the year	A(r) A H4
Very rainy; semi-warm; plenty of rainfall in the year	A(r) B'1 H4

CHART 58
Extreme Temperature and Precipitation
Monthly average in Laive
(Lat 12°18'S Long 75°24'W Alt 4 096 m.a.s.l.)

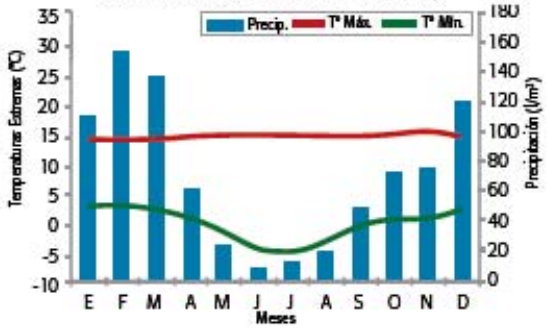


CHART 59
Extreme Temperature and Precipitation
Monthly average in Huancayo
(Lat 12°02'S Long 75°19'W Alt 3 350 m.a.s.l.)

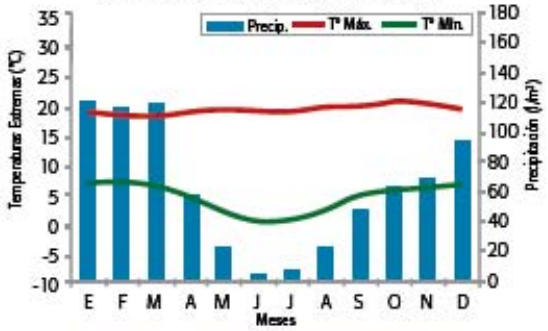


CHART 60
Hourly temperature and relative humidity in Tarma
August
(Lat 11°23'S Long 75°41'W Alt 3 045 m.a.s.l.)

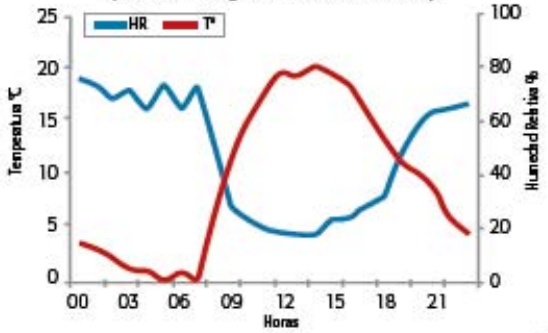


CHART 61
Extreme Temperature and Precipitation
Monthly average in Jauja
(Lat 11°45'S Long 75°30'W Alt 3 410 m.a.s.l.)

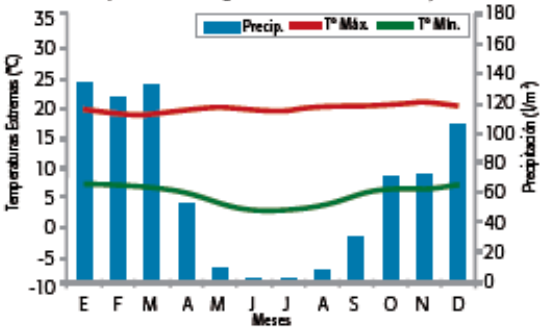


CHART 62
Extreme Temperatures and Precipitation
Monthly average in Tarma
(Lat 11°25'S Long 75°42'W Alt 3 045 m.a.s.l)

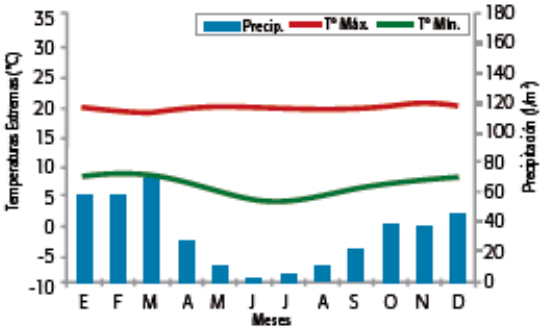


CHART 63
Monthly average precipitation in Satipo

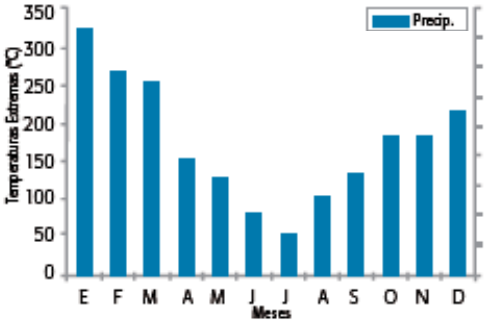


CHART 64
Hourly temperature and relative humidity in Tarma
October
(Lat 11°23'S Long 75°41'W Alt 3 045 m.a.s.l.)

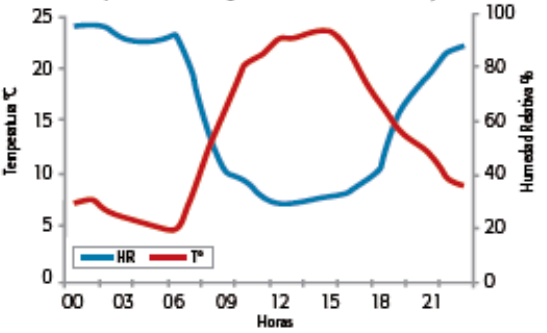


TABLE 11
Sunrise and sunset hours and duration of daylight throughout a year in the city Huancayo

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:48	06:01	06:05	06:06	06:11	06:19	06:23	06:15	05:56	05:36	05:26	05:32
Sunset	18:33	18:30	18:15	17:56	17:44	17:44	17:52	17:57	17:57	17:58	18:06	18:21
Time light	12:11	12:15	12:10	12:01	11:58	12:02	12:07	12:06	11:57	11:47	11:46	11:56

WEATHER AND CLIMATE

The Mantaro valley and the territory of Junin are very peculiar for tourism, the first one is situated 3 200 m.a.s.l., with a pleasant weather during the day. The climate is dry from May to October and with rainfalls from November to April, with an annual precipitation between 700 l/m² y 1 000 l/m². The valley is covered by eucalyptus forests and fertile lands for agriculture, forming a beautiful landscape for ecological and farming agricultural tourism.

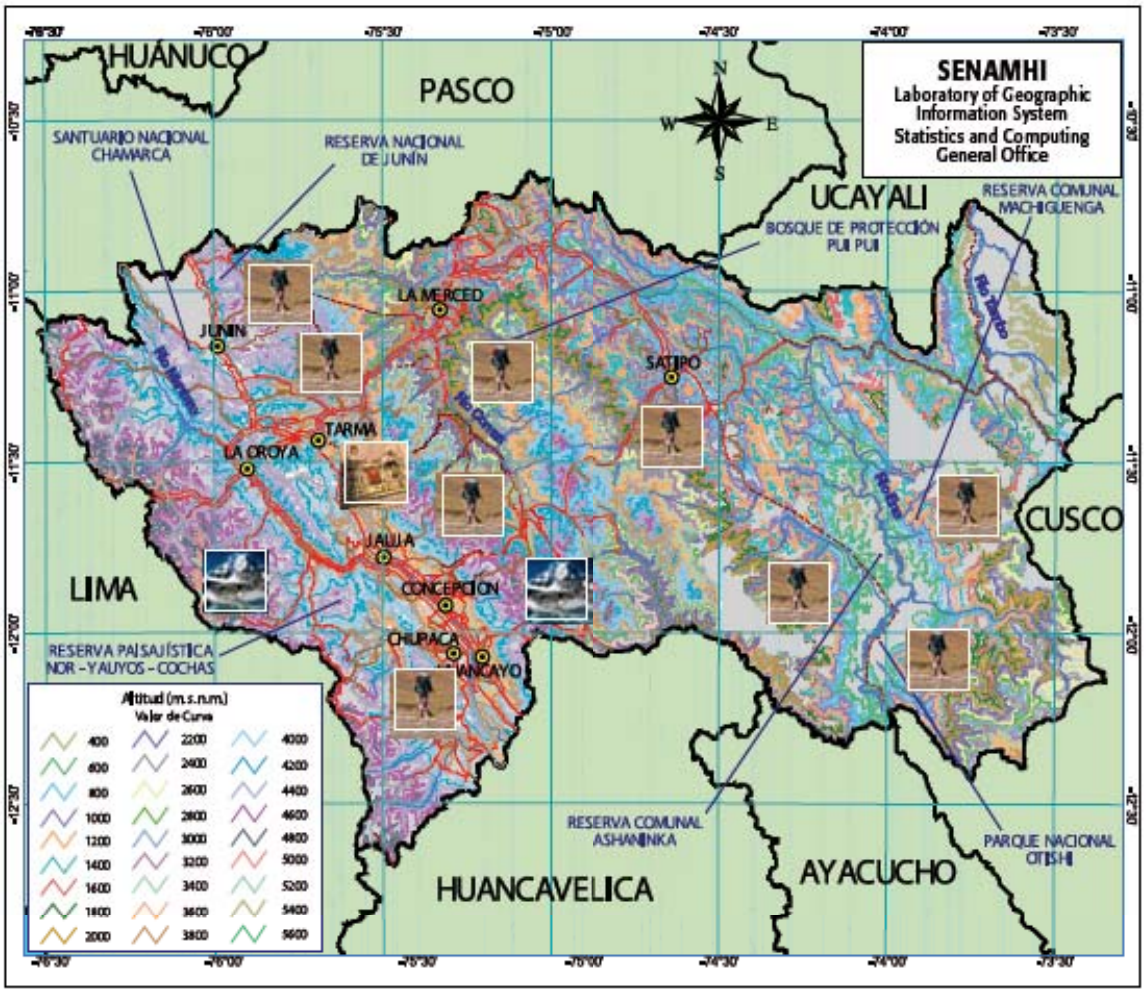
The weather and climate of this department are basically influenced by the Inter-tropical Convergence Zone (ITCZ) during the summer, and by the South Atlantic Anticyclone Wedge during the autumn and winter seasons.

Extreme temperatures (maximum and minimum) basically vary with the altitude and the cloud coverage, that in general increse from west to east. The annual variation range of the maximum temperatures is low (2 °C), while the range of the minimum temperatures is approximately 8 °C, as it can be seen from the charts corresponding to the locations of Laive, Jauja, Huancayo and Tarma. Freezing temperatures occur generally alter midnight, and they are more frequent and reach lower values in locations situated above 4 000 m.a.s.l., where temperatures are -5 °C or less, especially in the winter months (June to August). In this time of the year, the sky during the day and night show scarce cloudiness or is clear, with little water vapour in the atmosphere, due to the predominance of the western or northwestern dry winds in the middle and high level of the atmosphere. These characteristics originate loss of energy through the surface during the night. The dryness of the soil and the scarce vegetation coverage also contribute to the occurrence of night freezing temperatures.

In the high forest (Satipo and Chanchamayo provinces), maximum temperatures exceed 30 °C all year round, except for the periods of days with continuous rainfall. Minimum temperatures in this region oscillate around 18 °C.

In the mountain region or sierra, the rainfall are frequent from December to March, and a very important factor that decesively influences in the amount of rainfall in a place is its locations with respect to the norhteast or east humid winds, that is to say, if it is located windward or leeward. The province of Tarma is a paradigmatic example, since it is leeward of the east, northeast or southeast humid winds, it has rainfall with less amount (approximately 380 l/m² a year, compared to Jauja or Huancayo where rainfall is 750 l/m² al año, although they are located at similar altitudes). Above 4 500 m.a.s.l., snow is frequent, ther is even some short periods of precipitations in form of sleet, storm associated to hail, lightning and thunders. The winds are more intense from May to September, likewise atmospheric dryness increases in this period.

In the jungle, rainfall is abundant, they even exceed 2 000 l/m² a year. As in all the jungle, the rainiest months are from December to March, it gradually increases in frequency since August. Starting April, en all the locations it is observed a sudden decrease of rainfall, due to the change in the directions of the tradewinds of the Amazonia, that is, when the winds start to have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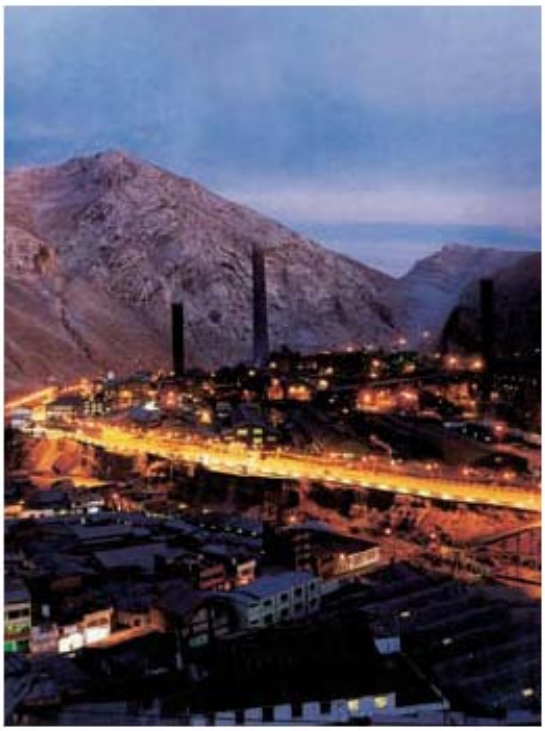
RESERVA NACIONAL DE JUNÍN
BOSQUE DE PROTECCIÓN PUI PUI
RESERVA COMUNAL MACHIGUENGA
RESERVA PAISAJÍSTICA NOR - YAUYOS - COCHAS
RESERVA COMUNAL ASHANINKA
PARQUE NACIONAL OTISHI
LA MERCED
JUNÍN
SATIPO
TARMA
LA OROYA
JAUJA
CONCEPCIÓN
CHUPACA
Altitud (m.s.n.m.)
Province Capital
Rivers
Main road
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
Fishing
Surfing
Skiing
Archaeology
Sailing
Climbing
Hiking
Cycling
Diving
Snowpeak
Paragliding
Hunting



a persistent and intense south component, while the winds in the mountain change start to be from the west.

TOURIST ATTRACTIONS

JUNÍN

Is located in the northeastern part of the department, at 4 105 m.a.s.l., on the Bombón plateau. The Junin or Chinchaycocha lake, with more than 80 000 hectares of extension, exerts a thermoregulating effect on its surroundings. Together with the stone forest of Huayllay (Pasco) form the Nations Reserve of Junin, constituing an ecosystem of high andean aquatic birds , with more than 50 species of resident and migratory birds, as well as frogs and fishe. The lake and its surroundings have a variety of aquatic and gramineous plants

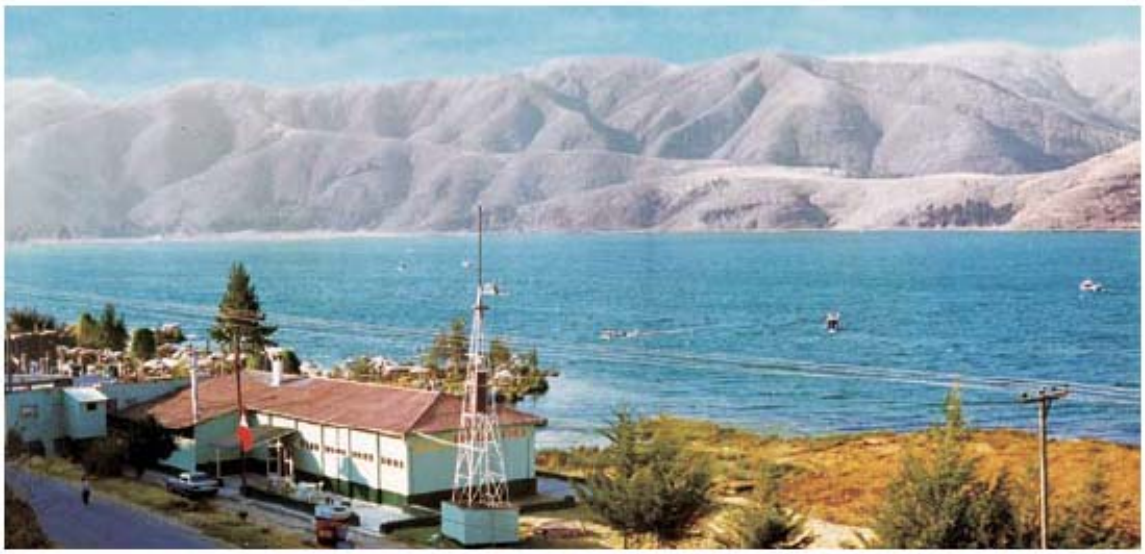
At the river banks, there is the city of Junin, which is the capital of the province and identified as the "Heroica Villa de Junin" or Heroic Village of Junin by the liberator Simon Bolivar. Its climate is frigid, although almost always it shows a blue sky and sunny from April to November, average maximum temperatures oscillate around 12°C and minimum around 0°C.

TARMA

A city located at 3 045 m.a.s.l., Denominated as the "Perla de los Andes" or Pearl of the Andes, with potential lands for agriculture and flower growing, it has a pleasant climate during the year, provinding the rainfall frequency en this province is significantly less in relation to the surrounding provinces. The most important feasts are the Holy Week and the worship to el Señor de Muruhuay. Tarma is the tourist starting point to the Pilcomayo valley, to the Guagapo cave and to the archaeological sites of Tarmatambo, Shoquemarca, Yanamarca, Huayipirca, Yaumompota, Muralla Juta and the Fortress of Vilcabamba.

JAUJA

Is an andean province with a popultion dedicated to stockbreeding. La city is located on the left bank of the Mantaro river at 3 357 m.a.s.l. Jauja also called Tumanmarca, is the entrance door to the Mantaro valley. It is also a colonial city of singular architecture, where on October 17th the feast of the Virgen del Rosario is celebrated. The climate is pleasant during the period of rainfall absence (April to October). Because it is dry, this climate is ideal for the persons that suffer from bronchitis



and need a treatment. Temperatures are similar to the ones of the city of Huancayo (see chart). From Jauja you go to the Paca Lagoon, its name means "Laguna escondida" or hidden lagoon. This lagoon of outstanding beauty is surrounded by rush or totora field, and cultivated hills.

HUANCAYO

Is one of the main cities in the mountain region or sierra of Peru, situated at 3 249 m.a.s.l., in the southernmost part of the Mantaro valley, its economy is predominantly agricultural and fishery. It produces maize, barley, braod bean and all kinds of tubers. In its territory ther are several agricultural communities and handcraft centres. One of the tourists destinations is the Sanctuary of Huarivilca, where the Huarivilca god (god of the andean waters) was worshipped, and from whom depended the control of the atmospheric phenomena, such as rain.

Huancayo is the starting point to travel to La Oroya, Jauja, Huancavelica and Ayacucho. Each Sunday there is a fair of handcrafts, cattle farming, typical food and folklore in Huancayo. From Huancayo you can also go the stone forest of Torre-Torre, to the San Jeronima village, to the Ingenio, to Ñahuimpuquio and to the Huaytapallana mountain chain, which still has glaciers affected by glacial retreat.

CONCEPCIÓN

The province of Concepciòn is traversed by the Mantaro valley and by the Comas river basin. Its main towns are located along the penetration route that runs from the Mantaro valley down to the low lands of the east. The weather is similar to the one in Huancayo city.

CHUPACA

Its relief is formed by cordillera massifs and snow-covered summits. The main activity is agriculture and fishery. Its districts Chupaca (the capital), Mantaro, Sicaya, Pilcomayo and Chongos Bajos, with a good climate mainly from April to November, period in which there is little rainfall, the air is dry, the sky is clear and sun bright is guaranteed.

SATIPO

Is the most extense jungle province of the department, and its territory is drained by the Perené, Ene and Tambo rivers. Satipo is the linking centre for transportation and trading among the towns of the central mountain region or sierra and the Cutivireni region; but it also has links with the native community of the asháninka settled in the locations of Cuti, a place with evergreens and decorated with waterfalls as the Parijaroni waterfall. The highest daily temperatures fluctuate between 25 °C and the 30 °C, and minimum are 15 °C and 20 °C, for this is a province exposed to the humid winds of the Amazon region. The rains are frequent in the summer and in the winter, and generarlly occur after noon. Relative humidity is high due to the rains and evapotranspiration of vegetation.

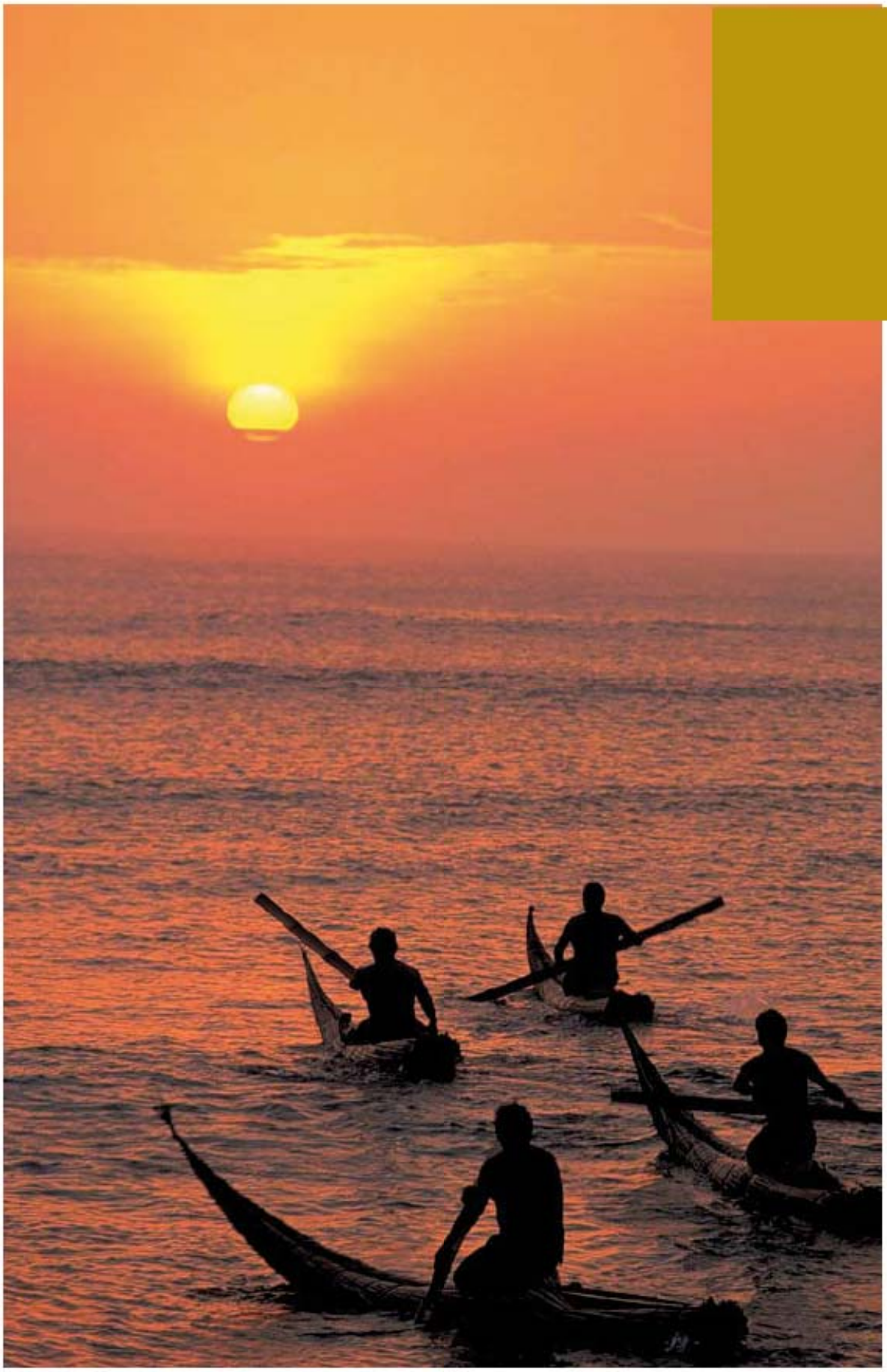
CHANCHAMAYO

This city was originally inhabited by the asháninkas, this province with a semi-tropical climate, covers territories in the sierra or mountain and in the high forest. Its capital is La Merced. Its simple but attractive main square or Plaza de Armas in which there is the church of la Virgen de Las Mercedes, patron saint of the city, is main tourist attraction

At 48 km from La Merced, there is the thermal bath of Huatzirok, to where it is said the the Incas arrived when they wanted be healed from their sickness.

It is a province that has a small andean strip and a vast exntension of high forest. It is traversed by the most plentiful river: El Perené followed by the Tulumayo and Chanchamayo. Is the entrance door to the central jungle region. The cities of San Ramon and La Merced are the most attractive places for the tourists who are looking for a place to enjoy nature. The weather during the day is pleasant, and daily maximum temperatures are between 25 °C and 30 °C, while at night the weather is generally cool. It rains all year round, but more frequently from December to March, when the storms associated to lightning and thunder are commom every day.

The geography of the Chanchamayo Valley is formed by hills covered with vegetation as in the jungle and by agricultural fields. La Merced is located on the Chanchamayo river banks, it has an aerodrome from where some light aircrafts departure to Iscozasin and Puerto Bermúdez. By road you can also get to Vítoc and Monobamba towns. FromSan Ramon you can go to La Merced, tropical city and from there you can go to Satipo, Villa Rica, Oxapampa and Pozuzo.



La

Libertad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ASCOPE
OTUZCO
HUAMACHUCO
TRUJILLO
JULCAN
SANTIAGO DE CHUCO
TAYABAMBA
VIRU
BOLIVAR
Río Grande
Río Marañón
Río Moche
N
W
E
S
LA LIBERTAD – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of La Libertad is situated in the north of Peru. Its geography is complex and diverse, it consists of three natural regions: coast, sierra or mountain, and a high forest sector in the northeast part of the department.

In its coastline there are several peninsulas such as Punta Chérrepe, Urricape, Prieta, Guiñape Island (part of a group of island that form a ecological reserve similar to Paracas), Cerro Alto, El Brujo, El Barco Perdido. It is worth mentioning also the Ports of Malabrigo and Salaverry, as well as the beautiful beaches of La Punta, Chicama, Huanchaco and Las Delicias, whose large waves are preferred by surfists.

La Libertad has a tourist and agricultural potential in the vast fertile valleys of Chao, Virú, Moche, Chicama and Jequetepeque. This valleys are crossed by torrential rivers, in their middle and upper river bed, they have a seasonal regime with high floods in the summer and with low discharges in the ebb tide period (May to November).

The Chicama river is 172 km long and between February and April its discharge exceeds 70 m^3/s, which is a suitable time for canoeing. During the ebb tide period it has a discharge value lower than 10 m^3/s. In certain rainfall periods, the discharge value excepcionally exceeds 240 m^3/s.

The Moche river is 100 km long and its discharge in rainfall periods sometimes exceeds 150 m^3/s, although between July and August it has no discharge.

The Jequetepeque river is 160 km, long and its discharge can reach 160 m^3/s in the summer, but in the winter is remains completely dry.

CLASIFICACIÓN CLIMÁTICA

According to the climate classification of Thornthwaite, the department has the following climates:

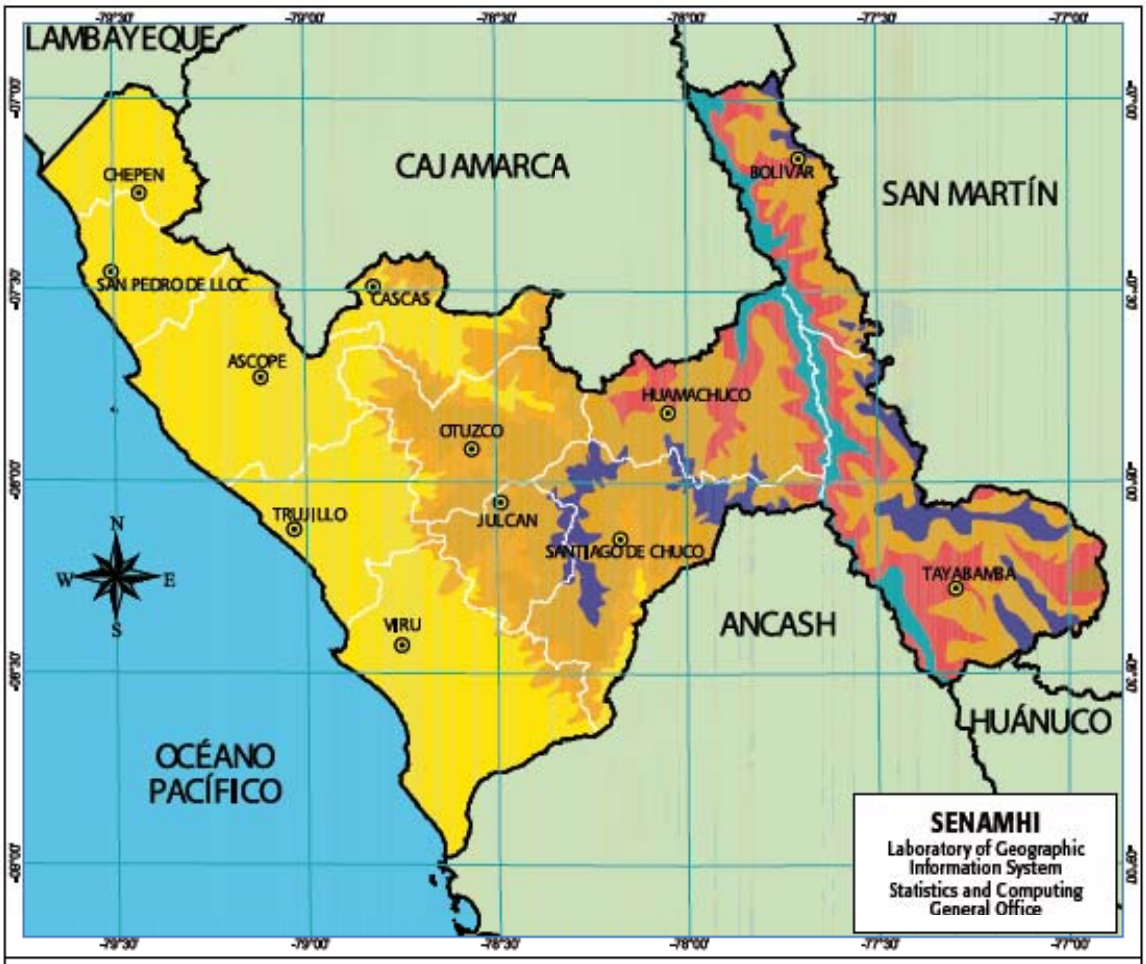
An arid, semi-warm climate, with reabsence of rainfall during all the seasons. This type of climate corresponds to parts of the provinces of Chepén, Pacasmayo, Ascope, Trujillo and Virú.

A semi-dry, temperate and humid climate, with absence of rainfall in autumn, winter and spring. This type of climate is typical in the places located between 1 000 m.a.s.l. and 2 000 m.a.s.l, as in the locations of the provinces of Chepén, Pacasmayo, Ascope, Trujillo and Virú.

A semi-dry, temperate and humid climate, with absence of rainfall in autumn, winter and spring. This type of climate is typical of the locations of Gran Chimú, Julcán, Santiago de Chuco and Huamachuco.

A semi-dry, semi-cold and humid climate, with absence of rainfll in autumn, winter and spring. This type of climate corresponds to the zones of Julcán, Santiago de Chuco, Bolívar and Huamachuco.

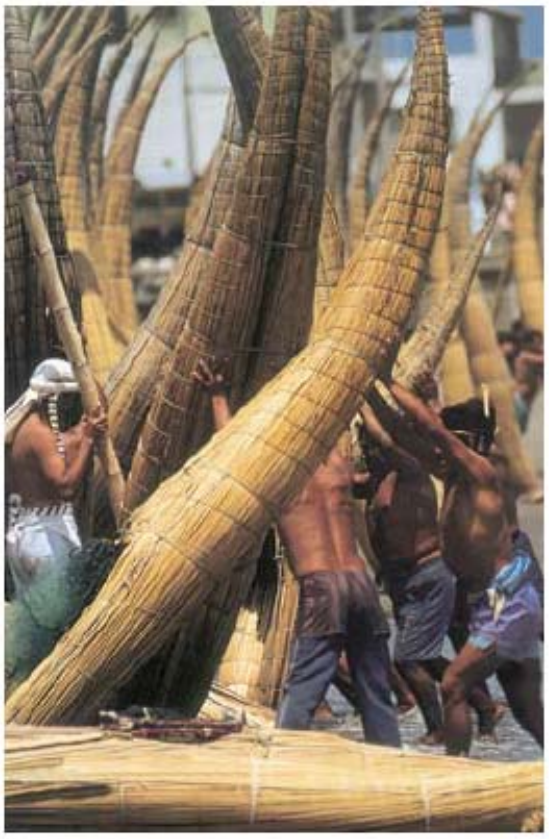
A semi-dry, cold and humid climate, with rainfall shortage in winter. This climate corresponds to places as in the locations of Julcán, Santiago de Chuco, Bolívar and Pataz.



⊙ Capital

Department borders

Description	Coding
Arid, semi-warm and humid, with rainfall shortage in all seasons	E(d) B'1 H3
Semi-dry, temperate and humid, with dry autumn, winter and spring	C(o,i,p) B'2 H3
Semi-dry, semi-cold and humid, with dry autumn, winter and spring	C(o,i,p) B'3 H3
Semi-dry, cold and humid, with dry winter	C(i) C' H3
Semi-dry, cold and dry, with dry autumn, winter and spring	C(o,i,p) C' H2
Semi-dry, warm and humid, with dry autumn, winter and spring	C(o,i,p) A' H3
Rainy, semi-warm and humid, with dry winter	B(i) B'1 H3



WEATHER AND CLIMATE

In the summer average maximum temperatures fluctuate around 25ºC and 20ºC in winter. Very seldom there are maximum temperatures of 30 ºC (El Niño phenomenon, or when the surface ocean currents coming from the west or northeast reach the coast), Also temperature increase when there is an entrance of warm air masses coming from the north (advection) into the coastline of La Libertad. In general, in the coast there are daytime temperatures that do not vary in time, they happen to be pleasant from May to November. Minimum temperature oscillate 18 °C in the summer and 14 °C in winter, with a cold sensation after midnight. The chart shows the variation average monthly extreme temperatures and precipitation in the city of Trujillo. It is important to mention that due to the thermo-regulating effect of the ocean, the daitime temperatures in the locations near the coastline are lower than the ones located inland. However, at night it happens all the way around.

Relative humidity is high at nights and during the first hours of the day and in summer is relatively low towards noon.

In the winter, the cloud cover during the day at night is permanent, although after noon there is sun bright. The winds are generally weak and moderate.

The charts show the hourly evelution of temperature and relative humidity registered in Salaverry in a typical day of the months of March and September 2003.

In La Libertad, more especifically in the zone of the capital city (Trujillo), the western Andes and its foothills are very close to the coast, and since they are at a lower altitude with relation to the central and southern Andes of Peru, they favor the incursion of humid air coming form the Amazon region, which converges with the breeze from the western slope, favoring more frequency of light rainfall or garúas in the summer in the coast of La Libertad. For the same reason, rainfall in the surrounding provinces, as it can be seen in the charts for Huamachuco (chart 66) and Otuzco (chart 67) located at 3 220 m.a.s.l. and 2 620 m.a.s.l., respectively

In general, precipitation increases with the altitude, while temperatures decrease, as it can be observed in the charts corresponding to the locations of Huamachuco (chart 66) and El Salpo (Otuzco) (chart 64).

As in many places of Peru, in the high parts of the province of Santiago de Chuco, during the day there is a permanent convergence of air masses, which in turn are channelize up to these altitudes throught the Grande, Pachachaca and Santiago river valleys, generating important cloud formations and intense and more frequent rainfall during the months of summer, reaching annual amounts of 1 000 l/m².

In this department above 3 000 m.a.s.l. there is a moderate rainfall in spring, even during April and May. The decrease in the average magnitude of rainfall from March to April is not as abrupt as it is in the central and southern regions of Peru.

CHART 65
Extreme Temperature and Precipitation
Monthly Average in Trujillo
(Lat 08°07'S Long 79°01'W Alt 33 m.a.s.l.)

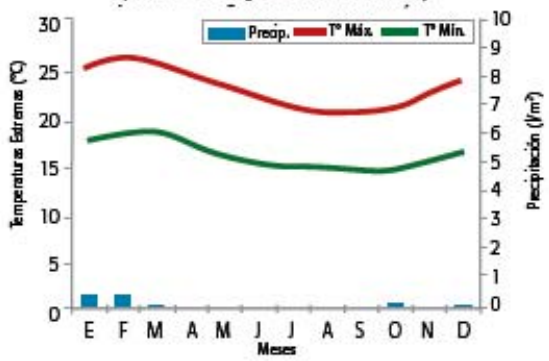


CHART 66
Extreme Temperature and Precipitation
Monthly Average in Salpo
(Lat 08°00'S Long 78°36'W Alt 3 395 m.a.s.l.)

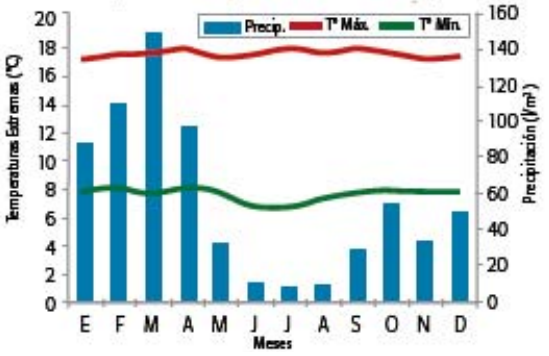


CHART 67
Hourly temperature and humidity in Salaverry
Registered on one day in March
(Lat 7°41'S Long 79°26'W Alt 2 m.a.s.l.)

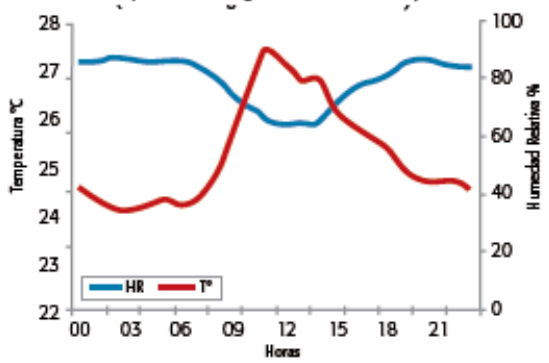


CHART 68
Extreme Temperature and Precipitation
Monthly Average in Huamachuco
(Lat 07°49'S Long 78°03'W Alt 3 220 m.a.s.l.)

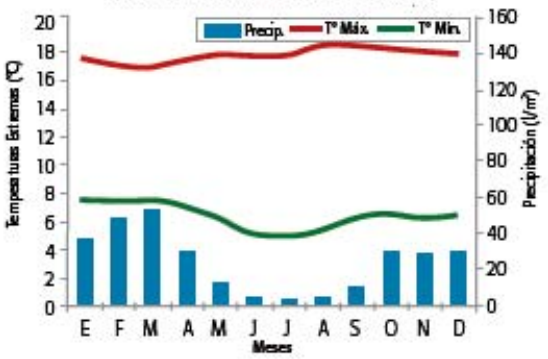


CHART 69
Extreme Temperature and Precipitation
Monthly Average in Otuzco
(Lat 07°54'S Long 78°34'W Alt 2 620 m.a.s.l.)

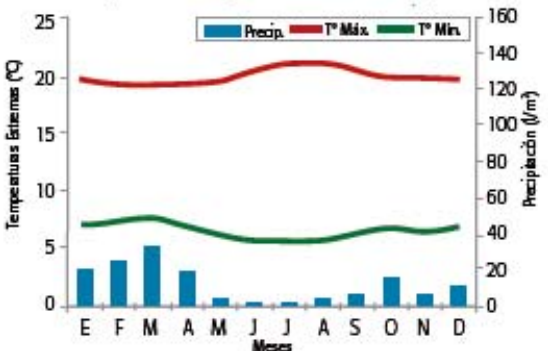


CHART 70
Hourly temperature and humidity in Salaverry
Registered on one day in September
(Lat 7°41'S Long 79°26'W Alt 2 m.a.s.l.)

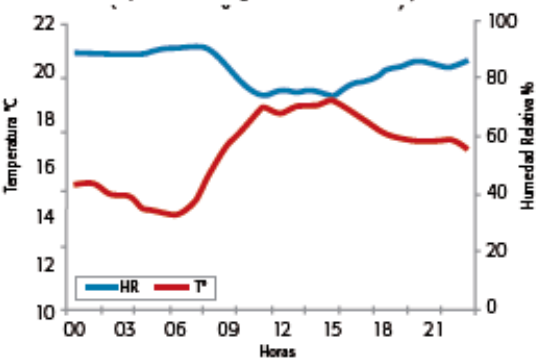


TABLE 12
Sunrise and sunset hours and duration of daylight throughout a year in the city of Trujillo

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	06:20	6.28	06:27	06:23	06:22	06:28	06:33	06:29	06:16	06:02	05:57	06:05
Sunset	12:32	12:37	12:31	12:23	12:19	12:23	12:28	12:27	12:18	12:08	12:17	12:18
Time light	18:44	18:45	18:35	18:22	18:15	18:18	18:24	18:25	18:20	18:15	18:18	18:30

Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

TOURISTS ATTRACTIONS

BEACHES

A set of beaches in this departement are characterized for having average monthly temperatures that fluctuate between 16 °C and 22 °C in the winter and summer, respectively. The waters of the coast are not too transparent, the swell is relatively weak, and the tides have have very littly significance, with an averaage height of 1,5 m.

During the occurrence of El Niño phenomenon, sea surface temperatures exceed 27 °C, and during cooling periods it reaches 14 °C. At approximately 7 °C south latitude there is an permanent upwelling area in which some cold water tongues are formed.

THE CHICAMA BEACH

The Chicama beach, its name is Malabrigo, has the shape of a horseshoe of fine sand. In this beach south or southeast winds allow the formation of waves suitalbe for the practice of hawaiian board.

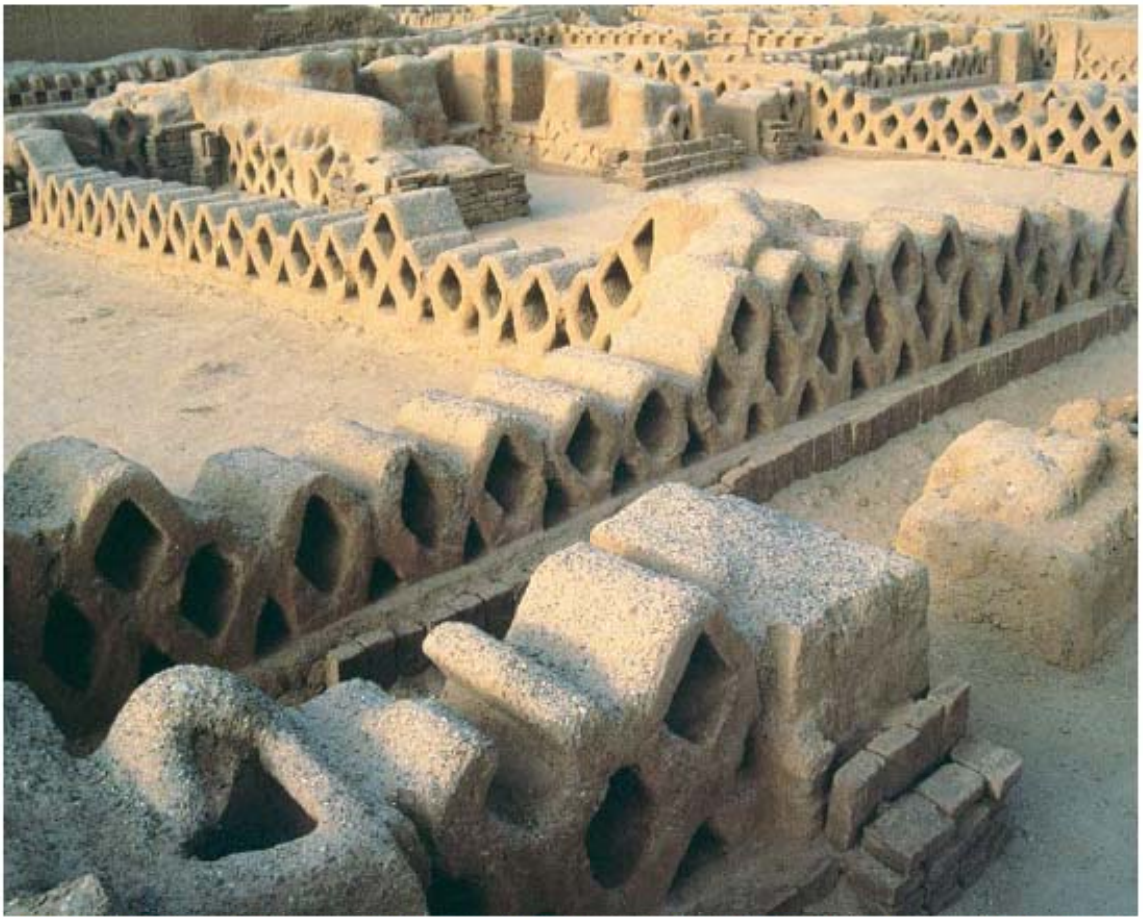
TRUJILLO

Trujillo is the capital of the department, a tourist city that preserves its colonial architecture and the practice of its folklore; besides it has the titles of "Capital of the everlasting Sping" and "Capital of the Marinera" which is a typical dance in the region. It is considered as the capital of the marinera and cradle of the typical walking Peruvian horse. Its Main Square or Plaza de Armas (one the biggest in Peru), its churchces and beaches, from which the most outstanding are Huanchaco, Buenos Aires and Las Delicias with their "totora horse" boats constitute a tourist destination that one should not miss visiting.

Trujillo has a warm climate in the summer days and cool and pleasant during the night due to the effect of marine breeze. Average annual temperature is 18 °C, and extreme maximum and minimum temperatures fluctuate around 17 °C and 28 °C in the summer, respectively. Rainfall (drizzles) are light, sporadic and they occur during the afternoon or at night. In this city the International Spring Festival takes place every year. The most important archaeological places are the citadel of Chan Chan, La Huaca, the Brujo and the Huacas of The Sun and the Moon.

THE EL MORO CAROB TREE RESERVE

The El Moro carob tree reserve is located in Chepén, it preserves some carob tree especies, some of them have and average of 100 years old, associated to



an important biodiversity of wild fauna. Maximum temperatures fluctuate around 28ºC in the summer. Except for some winter days, the presence of sun bright is permanent

THE SANTA ROSA PUQUIAL PROTECTION FOREST

The Santa Rosa Puquial Protection Forest, situated in Viru town, is an oasis in the middle of the arid and warm desert, generated by the process of coming up to surface of underground waters. The highest daily temperatures in the summer fluctuate around 28°C.

CALIPUY NATIONAL RESERVE AND SANCTUARY

It is located in Santiago de Chuco, covers and area of 64ha, it constitutes an important tourist center for adventure tourism. It was created to protect valuable Peruvian species of flora and fauna. It is the habitat of the guanaco and of the Raimondi puya, a plant that has the biggest inflorescence in the world. The best time to visit this place is during the winter and spring, seasons in which the cloud cover is scarce and the sun bright is permanent during the day.

OTUZCO

Otuzco is located at 2 620 m.a.s.l., in the inter-andean valley. Extreme maximum and minimum temperatures fluctuate around 20 ºC and 6 ºC, respectively. Rainfall is light, sporadic and of short duration, and 80% of it occurs after noon. The weather is pleasant suitable for hiking and visit the Ventanillas necropolis, especially from May to November, when rainfall is are scarce and sun bright is permanent. The patron Saint feast is on December 15th, in honor of the Virgen de la Puerta, which attracts a lot of parishioners and tourists.

SANTIAGO DE CHUCO

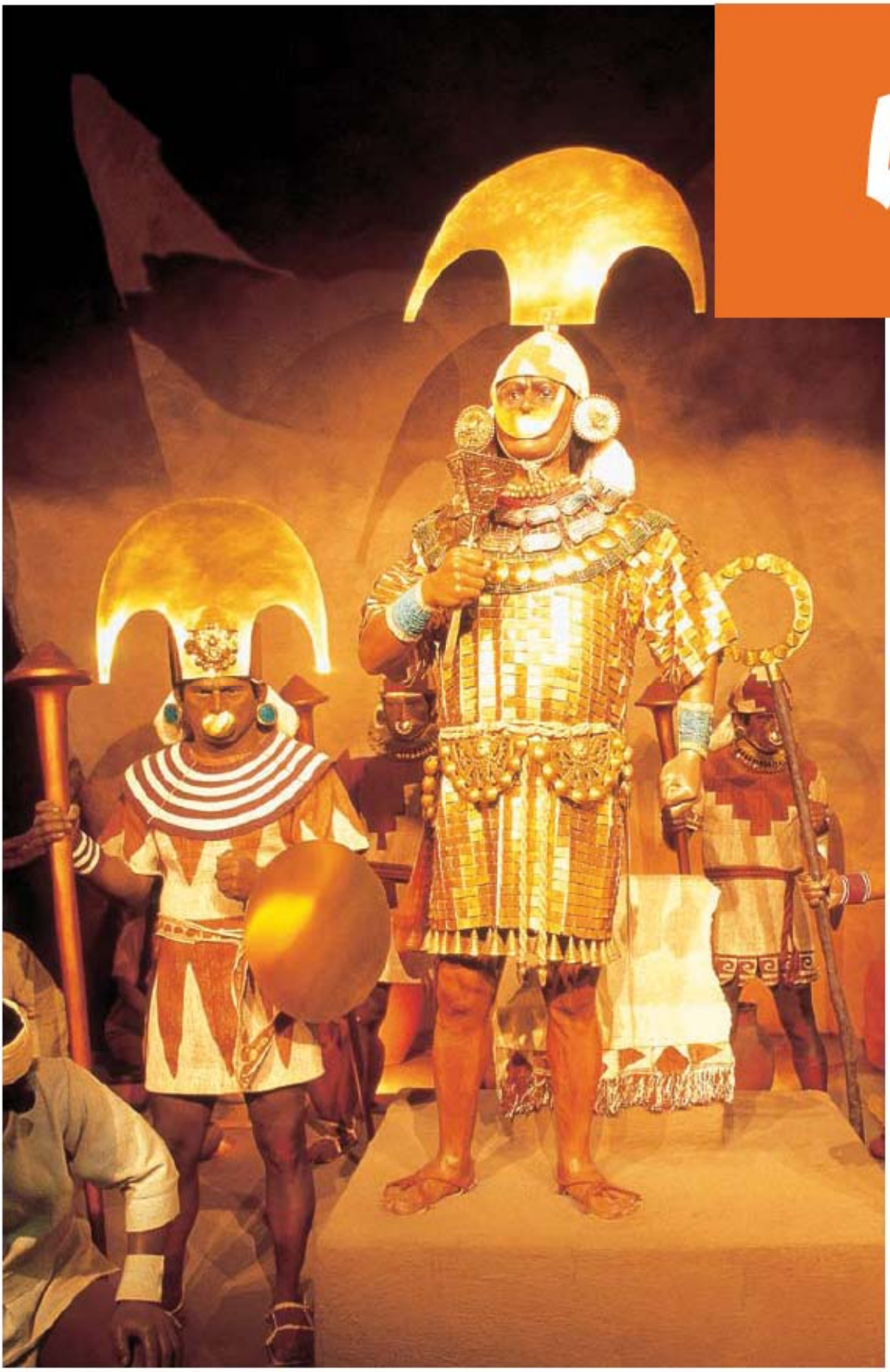
Santiago de Chuco is located at 3 115 m.a.s.l., with a pleasant weather at noon characterized for presenting extreme temperatures of 18ºC and 5ºC, and rainfall in the summer time. The main feast i son July 15, on Santiago's honor.

CHAVIMÓCHIC SPECIAL PROJECT

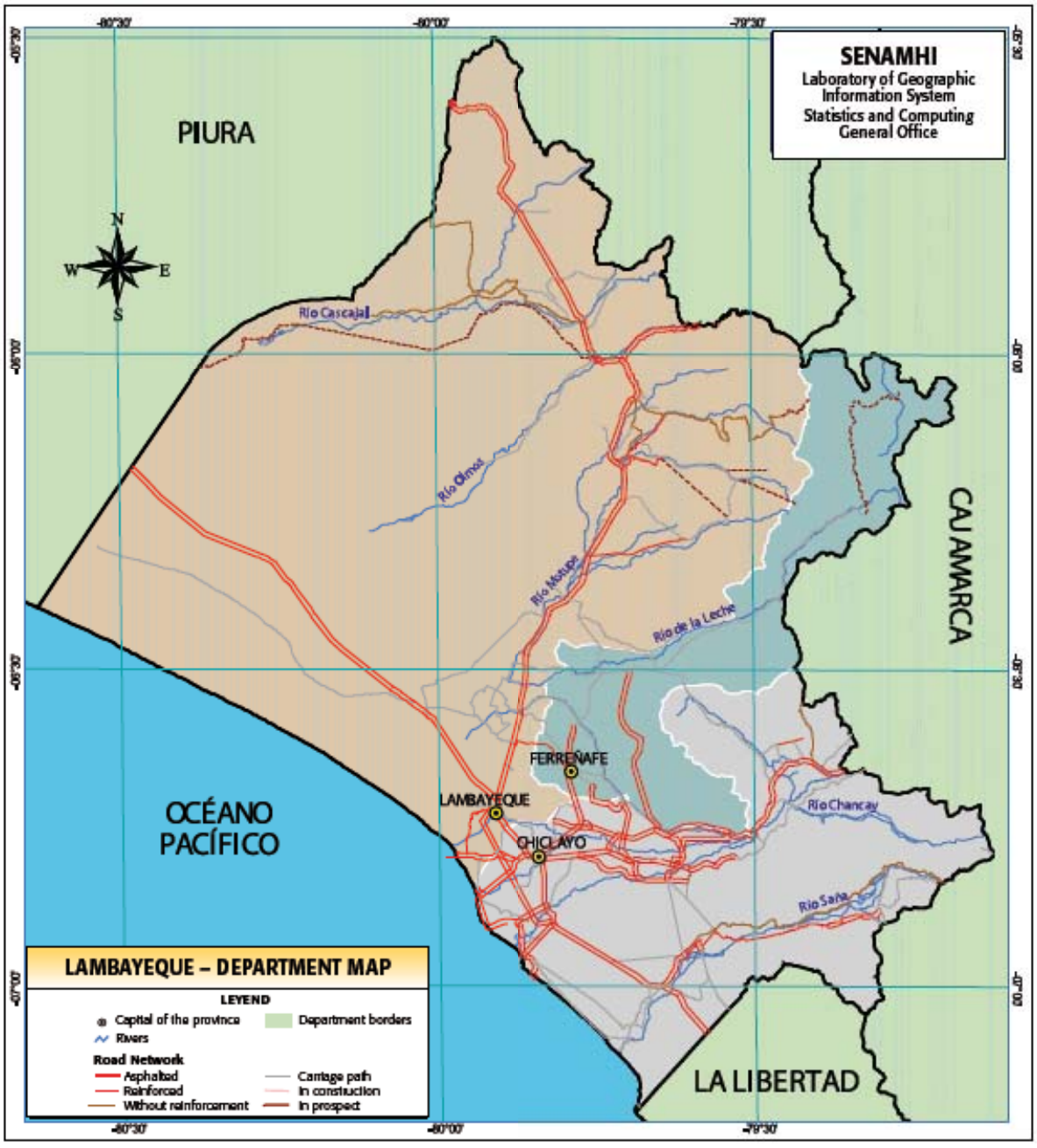
The project started in 1968, for energetic purposes and to supply potable water for domestic and industrial use in the city of Trujillo and surrounding towns. It is planned to extend the agricultural feast is on promote the increase of production and creativity in the Chao, Virú, Moche and Chicama valleys.

Chavimóchic is a dam that supplies water to the valleys of Chao, Virú and Moche, it is used to irrigate 144 385 hectares of agro-industrial crops for exportation. This agro-industrial center also develops agro-tourism by visits to the dam, to the channels, and hydraulic and energetic production plants, as well as to the biotechnological laboratorios and to greenhouses. It has a modern camp field in San José to host visitors. Daily maximum temperatures fluctuate between 25 °C and 30 °C in the summer, and around 20 °C in the winter. From September to May, sun bright is permanent during the day.

Lar



mbayeque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PIURA
CAJAMARCA
LA LIBERTAD
OCÉANO PACÍFICO
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Río Cascajal
Río Olmos
Río Motupe
Río de la Leche
Río Chancay
Río Saña
FERREÑAFE
LAMBAYEQUE
CHICLAYO
-80°30'
-80°00'
-79°30'
-06°30'
-06°00'
-05°30'
-07°00'
LAMBAYEQUE – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Lambayeque is located in the north of Peru, its geography consists of three physiographic formations that run parellel to each other: the coastline, the coastal plain and the mountain region or sierra, in the zone of Cañaris (2 000 m.a.s.l.) and Incahuasi (3 100 m.a.s.l.).

Lambayeque is the land of the mythic Naylamp and cradle of the luxurious Chimu Empire. It has vast plains of fertile land, but insufficient irrigation.

Along the coastline there are located the ports of Pimentel and Eten, and also the beautiful beaches such Lobos, Mal Paso, Calanloche, La Punta, Chérrepe and Santa Rosa, among others.

This coastal plain has terraces lies parallel to the coastline, traversed by fertile valleys watered by the Saña, Lambayeque, and Jayanca rivers, that generates an agricultural tourist thriving potential. This coastal plain and terraces with vast deserts decorated with dunes.

The sierra or mountain region starts at 500 metros and it goes up to an altitude of 3 000 metrers. It has an uneven relief and inter-andean valley with big hill and deep ravines.

The Andean Mountain Range or the Andes has the lowest altitude at the mountain pass called Porcullat (2 144 m.a.s.l., which is the most important penetration route to the east and the entrance door from Lambayque to the Marañon river basin.

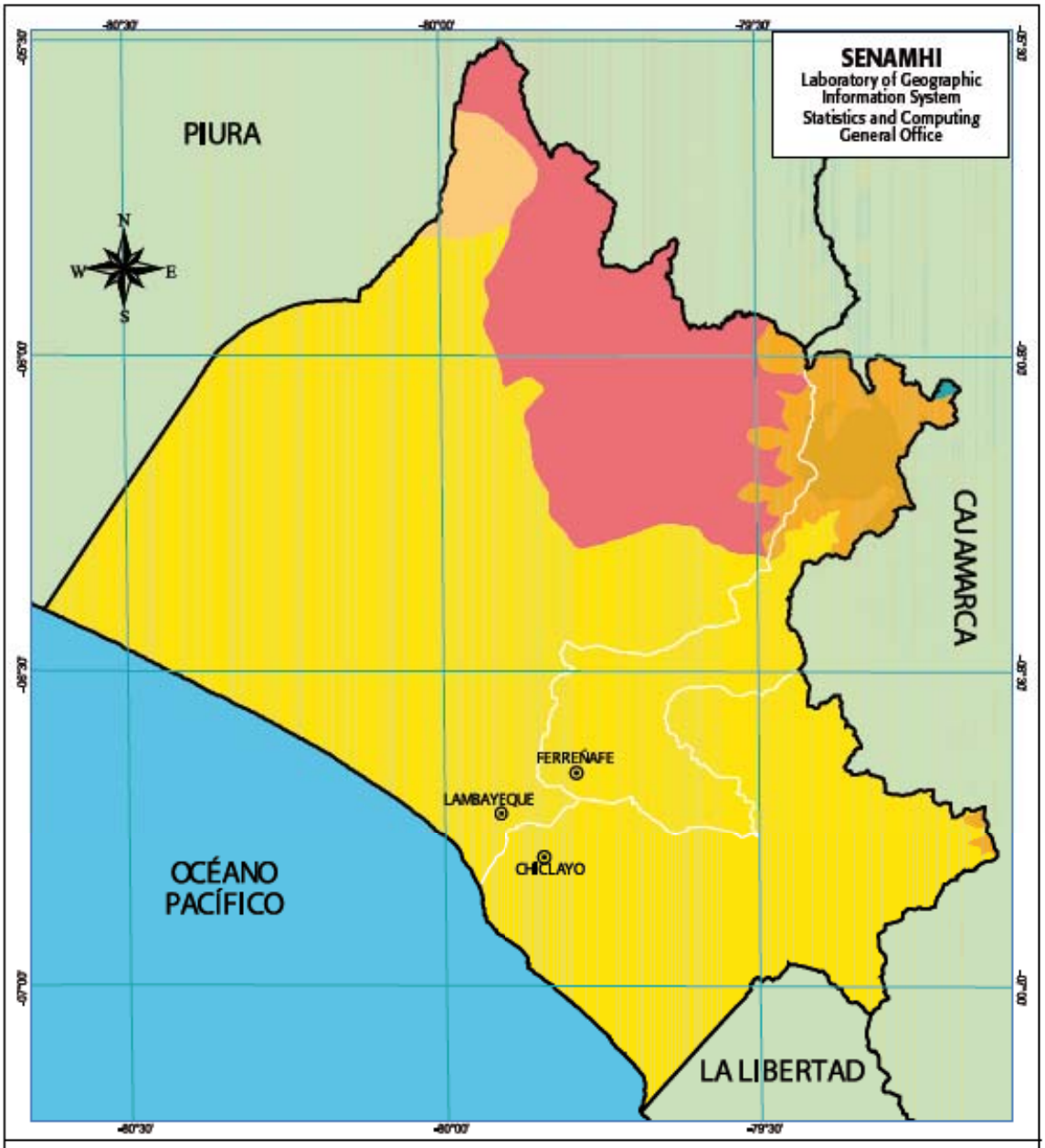
The main rivers are: Chancay and Lambayeque. The first one is almost 200 km long, and its discharge before it reaches the Tinajones reservoir exceeds 50 m^3/s, from February to April. It is not very torrential compared to the ones of the central coast.

The Chancay river is approximately 160 Km long, and it has a discharge that 50 m^3/s between February and April, and on special occasions it 300 m^3/s. In its river bed the Gallito Ciego reservoir has been built. In the middle and low part of the basin the river is not torrential.

The orographyc system of Lambayeque is mainly formed by the Saña, Lambayeque and Jayanca rivers.

CLIMATE CLASSIFICATION

According to Thornthwaite climate classification, the department of Lambayeque has the following kinds of climate: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LA LIBERTAD
OCÉANO PACÍFICO
FERREÑAFE
LAMBAYEQUE
CHICLAYO
N
S
W
E
-80°30'
-80°00'
-79°30'
-05°30'
-06°00'
-06°30'
-07°00'
Capital
Department borders
Description
Coding
Arid climate; rainfall shortage all the year; semi-warm and humid
E(d) B'1 H3
Arid climate; rainfall shortage all the year; warm and dry
E(d) A' H2
Arid climate; rainfall shortage all the year; warm and humid
E(d) A' H3
Semi-dry climate; dry autumn, winter and spring; semi-warm and humid
C(o,i,p) B'2 H3
Semi-dry climate; dry autumn, winter and spring; semi-cold and humid
C(o,i,p) B'3 H3
Semi-dry climate; dry autumn, winter and spring; warm and humid
C(o,i,p) A' H3

CHART 71
Extreme Temperature and Precipitation
Monthly average in Chiclayo
(Lat 07º54'S Long 78º34'W Alt 2 620 m.a.s.l.)

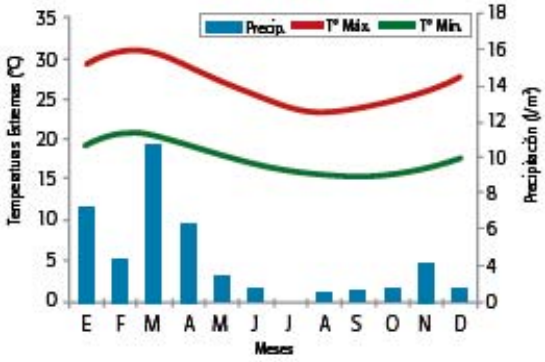


CHART 73
Extreme Temperature and Precipitation
Monthly average in Lambayeque
(Lat 06º42'S Long 79º54'W Alt 18 m.a.s.l.)

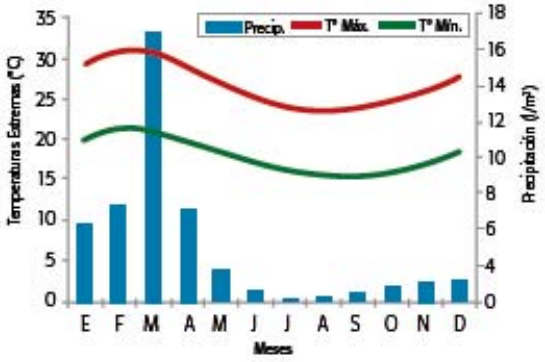


CHART 72
Hourly temperature and relative humidity in Olmos
March
(Lat 5º59'S Long 79º43'W Alt 367 m.a.s.l.)

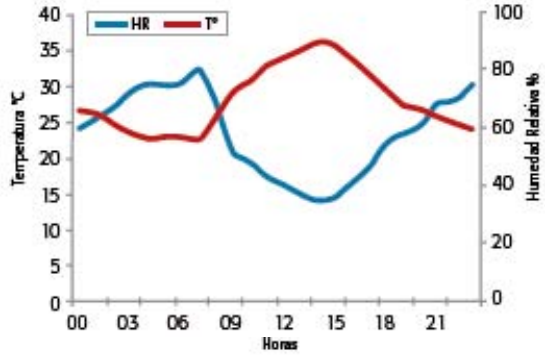


CHART 74
Hourly temperature and relative humidity in Olmos
July
(Lat 5º59'S Long 79º43'W Alt 367 m.a.s.l.)

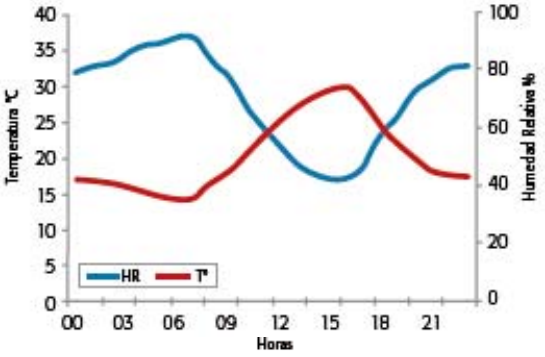


CHART 75
Sea surface temperature in Lambayeque beaches

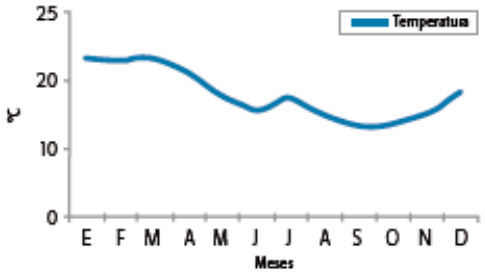
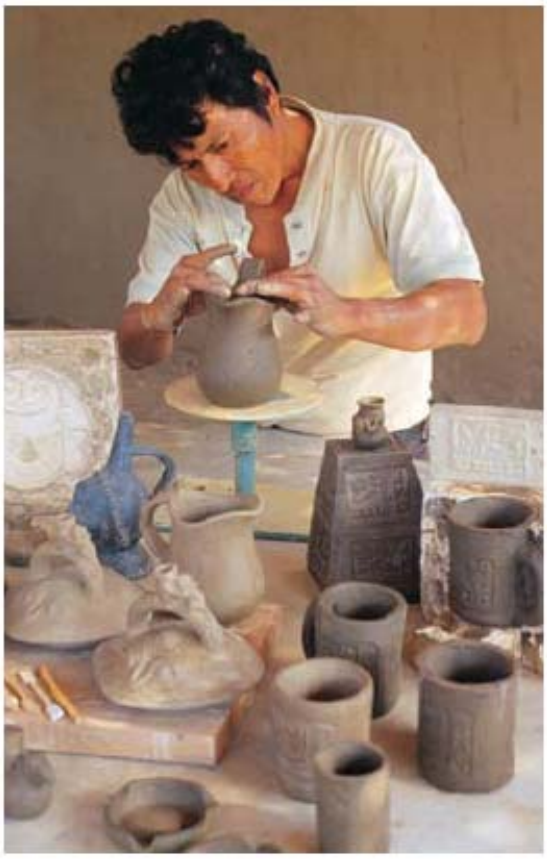


TABLE 13
Sunrise and sunset hours and duration of daylight throughout a year in the city of Chiclayo

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	06:14	06:24	06:24	06:21	06:21	06:28	06:32	06:27	06:13	05:58	05:51	05:59
Sunset	18:43	18:43	18:33	18:18	18:10	18:12	18:18	18:20	18:16	18:13	18:17	18:30
Time light	12:29	12:33	12:28	12:19	12:16	12:20	12:25	12:24	12:15	12:05	12:04	12:14

An arid, semi-warm climate with absence of rainfall during all the seasons. Corresponds this kind of climate to most part of the territory of this department, including the location in the provinces of Chiclayo, Ferreñafe and Lambayeque.

An arid, warm climate, with absence of rainfall in all the seasons of the year. This climate corresponds to the locations situated in the provinces of Lambayeque and Ferreñafe.



A semi-dry, temperate and humid climate, with rainfall shortage in autumn, winter and spring. Corresponds this kind of climate to locations in the provinces of Ferreñafe, situated at the andean foothills on the border of Cajamarca.

WEATHER AND CLIMATE

According to its geographical location, it is supposed to have a tropical climate, but it is dry and arid basically due to the influence of the Pacific Ocean Anticyclone, that with its vertical descending motion (subsidence) above 1 000 m.a.s.l, prevents the development of rain-producing clouds. Average maximum temperatures in the coast fluctuate around 30 °C and minimum, around 19°C in the summer. In the winter extreme temperatures fluctuate around 23 °C and 15 °C, maximum and minimum respectively.

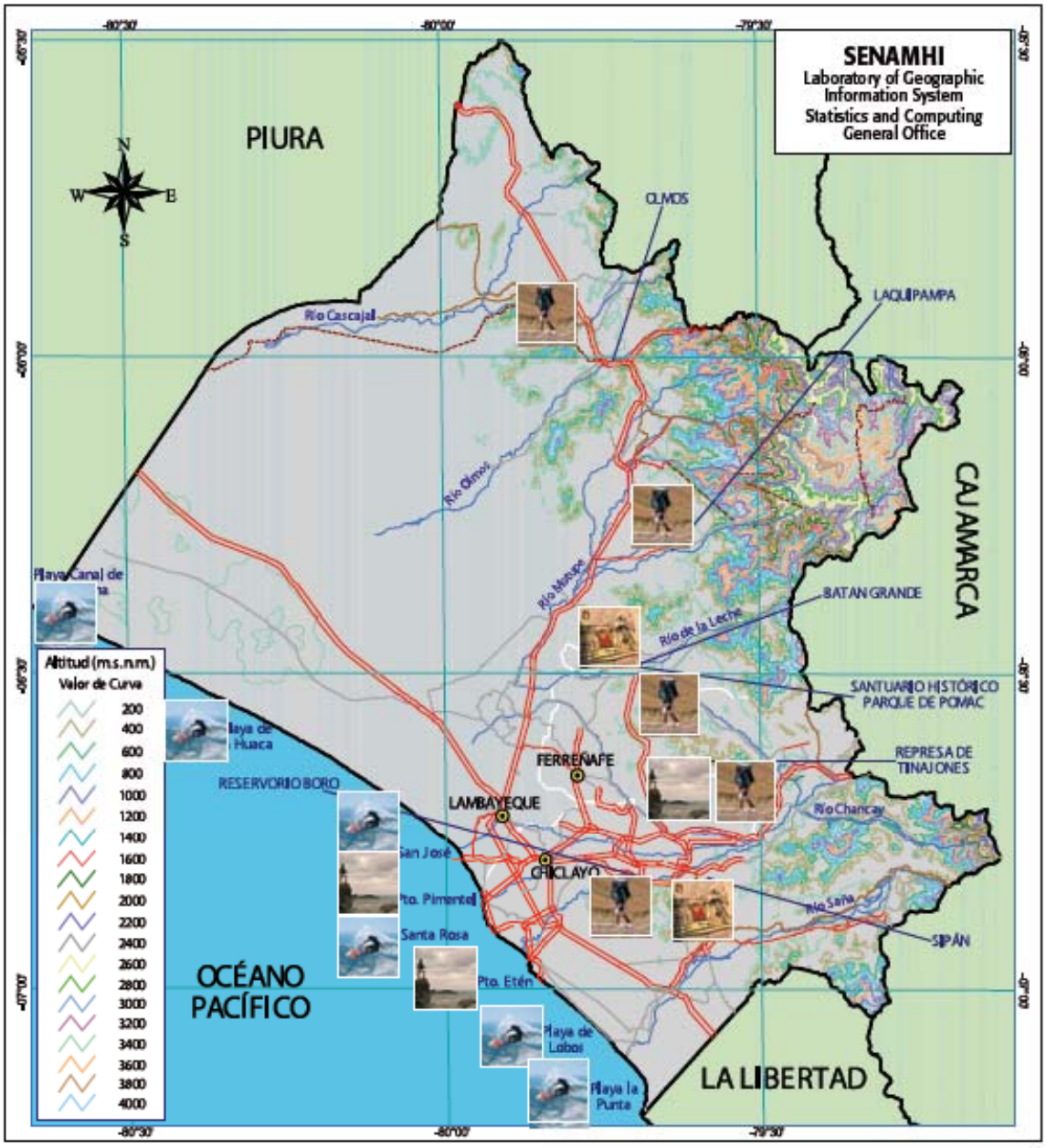
Rainfall, as it corresponds to the Peruvian coast, is very scarce during most part of the year, except for the years in which the meteorological conditions generated by El Niño phenomenon create a tropical environment in all the northern region, causing rainfall from moderate to strong intensity Thus, in Chiclayo rainfall of up to 300 l/m2 (annual accumulation) was registered in 1998, a year in which an intense El Niño event occured. In 1999, (normal year) rainfall was only 38 l/m².

Relative humidity of the air in Lambayeque is very variable during the day, registering values of approximately 90% of humidyt in the morning hours, and 40% at noon, a time with high insolation mixed with high temperatures, generating a warm or hot environment.

The following chart shows the hourly evolution of the air temperature and relative humidity registered in the months of March and July in Olmos town.

Average monthly temperature of sea water in the beaches of Lambayeque vary between 16°C and 22°C, corresponding to the winter and summer seasons. Seasonal changes are progressive (see correponding chart) and slow, temperatures in the winter are similar to the ones in the beaches of Lima in the summer time

Costal waters are not too transparent and swell is relatively weak. In the case of an El Niño phenomenon, temperatures exceed 27°C and in cooling periods temperatures fluctuate around 14°C. At approximately 7° south latitude (between Pimentel and Chicama) there is a zone of permanent upwelling in which there are formed some water tongues of cold water. Tides are relatively of little significance, and the reach in average, 1,5 meters.



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

Fishing

Surfing

Skiing

Archaeology

Sailing

Climbing

Hiking

Cycling

Diving

Snowpeak

Paragliding

Hunting

TOURISTS ATTRACTIONS

CHICLAYO

It is called the City of Friendship, and it is the center of communications, commerce and cultural activities. The tourist attractions in Chiclayo are: agricultural landscapes, archaeological sites, hunting reserves, and towns specialized in hadncraft production.

The climate in Chiclayo is hot in the summer and cool in the winter. It has extreme maximum and minimum tempertures of 32 °C and 19 °C. In the summer is a sunny place with an average humidity of 80% and moderate winds in the afternoon. In the summer, during the period of a moderate-strong El Niño event, there is light to heavy rainfall.

At 30 km from Chiclayo there is the biggest concentration of pyramids made of "adobe" (a mixture of clay, mud and straw) in the Peruvian coast, in the desert of Túcume. In the onsite museum, there is a detailed explanation of the origin of these pyramids and of the story of the legendary Naylamp and his descendants. In this province there is also located the archaeological ruins of Pampa Grande, formed by two pyramids connected by a huge and high ramp of more than 300 mts. long. In Huaca Rajada, the archaeologist Walter Alva discovered the Señor de Sipan and founded this museum that has thematic compartments of the Mochica Culture, the Sanctuary of the Señor de Sipan and the Royal Tombs.

FERREÑAFE

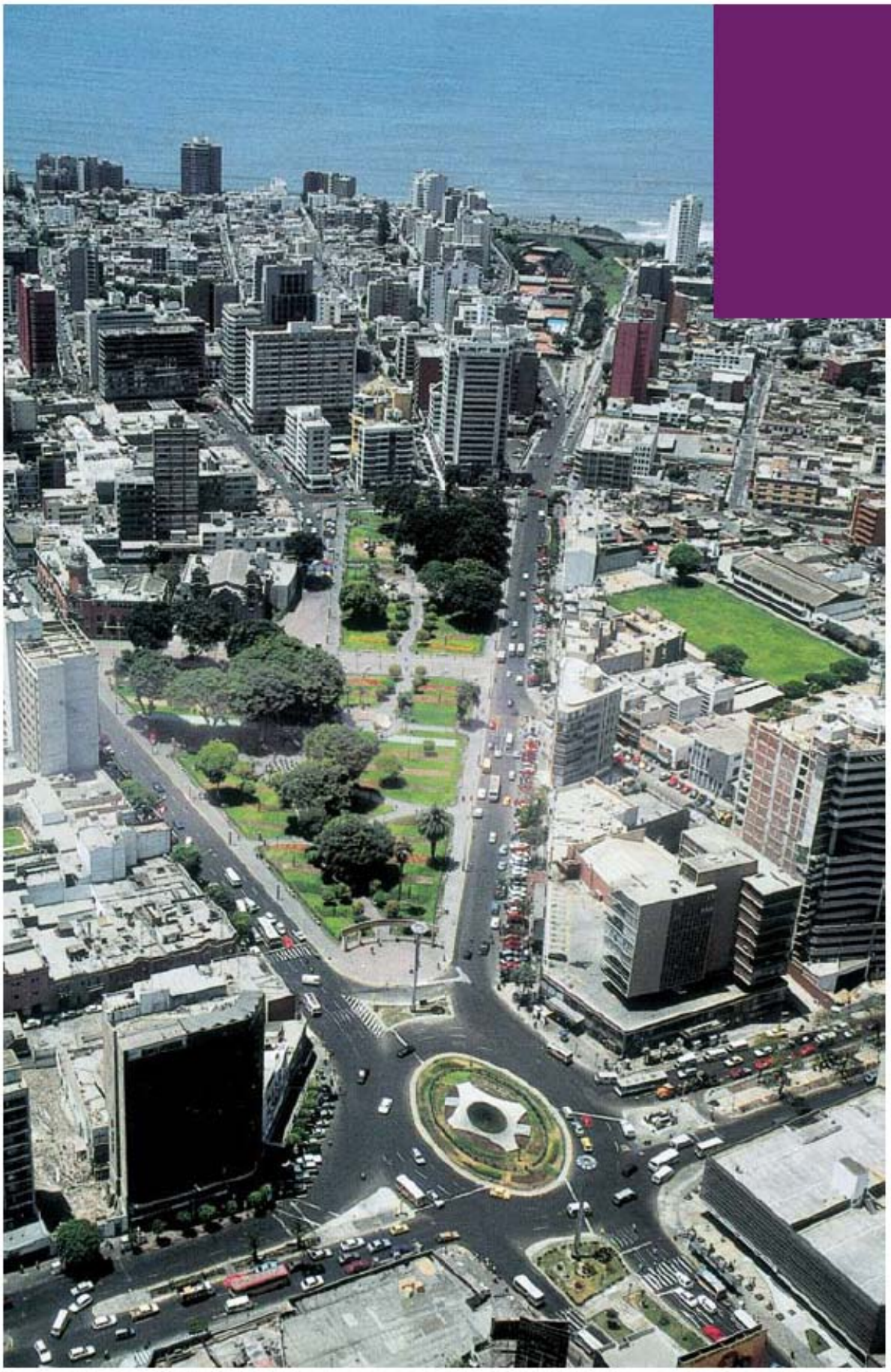
This province has and archaeological site colled Batán Grande, formed by a set of pyramidla structures, as the Huaca de Oro or Golden Huaca and the Huaca de la Ventana or the Window Huaca. The weather is hot in the summer and warm in the winter, with maximum tempeatures that range from 25°C to 30°C in the summer and minimum, that range between 15°C and 20°C in the summer and winter, respectively. In a normal year, there is light and sporadic rainfall of short duration and they occur at night

LAMBAYEQUE

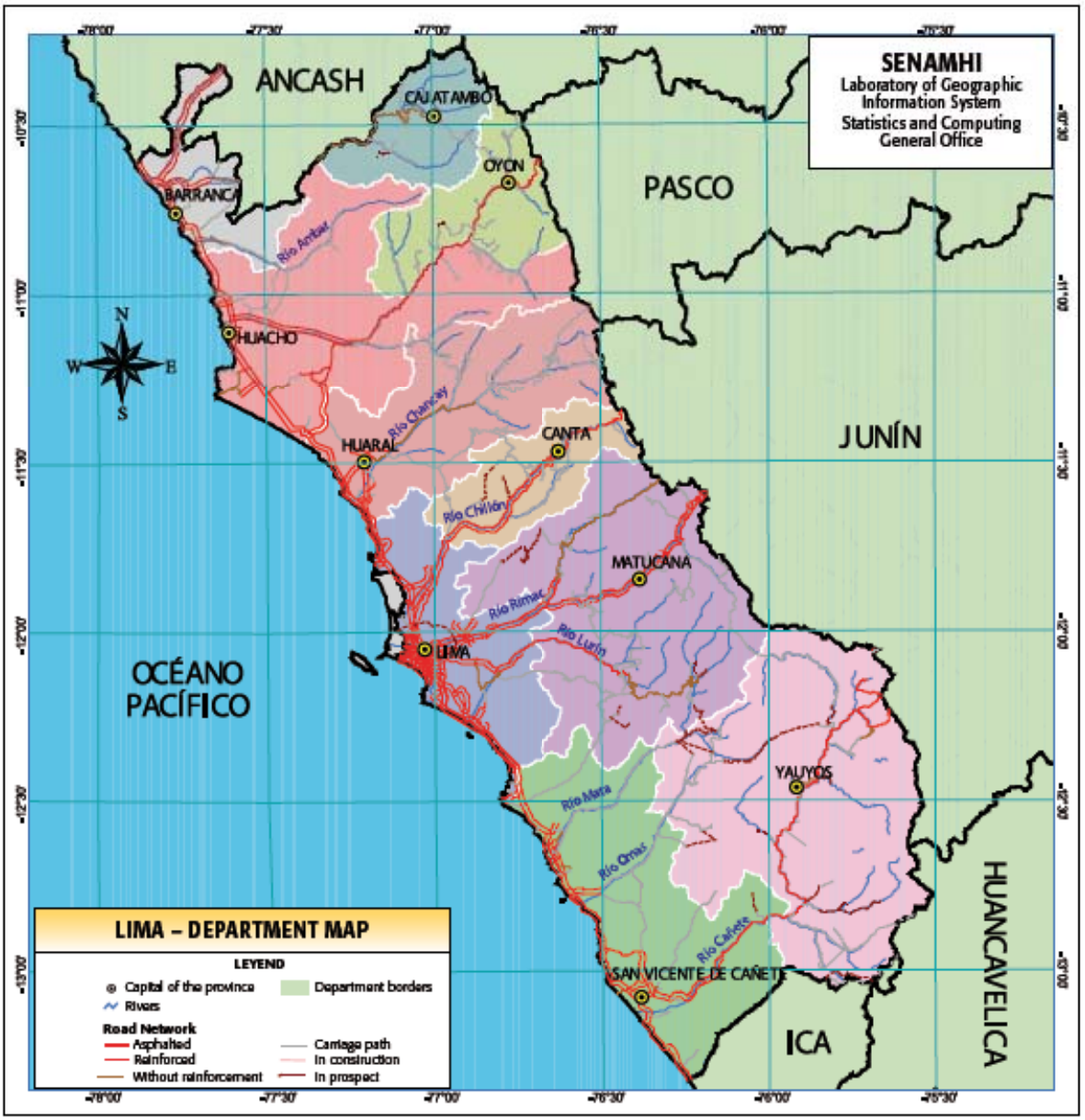
The tourist attraction of this province is the location called Túcume. Where there are distributed 25 pyramids that were built with adobe, the most important ones are the Huaca Larga, Las Estacas and El Mirador. The climate is very hot in the summer, and cool in the winter. Maximum and minimum temperatures in the summer fluctuate between 31 °C and 23 °C and between 21 °C and 16 °C in the winter.

BEACHES

Along the coastline of the department there is a beautiful beach circuit formed by La Punta, Los Lobos, Pimental, La Huaca beaches, among others.



Lima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OYON
BARRANCA
HUACHO
HUARAL
CANTA
MATUCANA
LIMA
YAUYOS
SAN VICENTE DE CAÑETE
Río Ambar
Río Chancay
Río Chillón
Río Rimac
Río Lurín
Río Mala
Río Omas
Río Cañete
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W
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LIMA – DEPARTMENT MAP
LEYEND
Capital of the province
Rivers
Department borders
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Lima has the most andean-like geography in the coast region, with a sharp drop between its beaches and its highest summits. It is located in the central and western part of the Peruvian territory; to the west it is bordered by the Pacific ocean, to the north by Ancash, to the northeast it is bordered by Huánuco, to the east by Pasco and Junin, to the sourtheast it is bordered by Huancavelica and to the south by Ica. In its territory can be identify three big geographical regions: the coastline, the desert zone, the valleys and andean zones.

The coastline is formed by of low and medium height terraces, as in Lima, the capital and the coastal districts. In the close northern zone predominates a plain relief, almost at sea level, as in Barranca, Huaura and Chancay beaches. Other terraces of significant height are situated in the beaches south of Asia, as Chepeconde, Puerto Fiel and Gallardo. Along the coastline there are a series of islands, the most important ones are San Lorenzo, Chiquitina, Brava, Mazorca, Islote and Farallones.

The desert zone is a sucession of pampas, hills and marine terraces, that originated from the coastline beaches and extended to the east, up to the border with the andean foothill. It has a variable width, in average, 10 Km, where there are hills, named like this because of their locations on the hillsides, that retain the humid air, during the winter, this conditions allows the development of a lush vegetation, and the most important one is the Lomas de Lachay, located 105 km north of Lima, (exit Panamericana Norte highway on 105 km).

The coastal vallyes are: Pativilca, Huaura, Chancay, Chillón, Rímac, Lurín and Cañete, their riivers are torrential in the summer and with a variable discharge throughtout the year. At the end of the valleys many ravines meet and remain dry periodically or for years, but in the rainfall period (December to March) they abruptly react with torrential fluxes of mud, called "huaycos".

The andean zone has an uneven and steep relief that extends up to the divide of the andean summits, which mark the borders of the department. The andean zone has deep fluvial canyons, such as the El Infiernillo in the Rimac river and other formed by the the basin of the Pativilca, Huaura, Chancay, Chillón, Cañete rivers situated between 1000 and 4 000 meters altitude.

The continent divide defines the border of the department and it is the origen of the Fortaleza, Pativilca, Huaura, Chancay, Chillón, Rímac, Lurín, Mala and Cañete rivers. These rivers have a short course, they flow as narrow torrential courses in the high and middle parts; in the low zones they form wide valleys. Due to the marked steep of these rivers and their irregular regime none of them is navigable

The Pativilca river has a permanent discharge, and in the months of rainfall it exceeds 100 m^3/s, but in the ebb-tide months it is around 10 m^3/s. In very rainy periods, it can exceed 400 m^3/s.

The Huaura river is very with an average discharge of more than 50 m^3/s, between January and April, and between July and October it reaches 10 m^3/s.

⊙ Capital

Department borders

Description	Coding
Arid, semi-warm and humid, with rainfall shortage in all seasons	E(d) B'1 H3
Semi-dry, temperate and humid, with dry autumn, winter and spring	C(o,i,p) B'2 H3
Semi-dry, semi-cold and humid, with dry autumn, winter and spring	C(o,i,p) B'3 H3
Rainy, semi-frigid and humid, with dry winter	B(i) D' H3
Snow occurrence	Snow

The Chancay river is very torrential, with an average discharge that exceeds 30 m³/s in the rainfall period.

The Rimac river is approximately 100 km long, with an average discharge over 40 m³/s in the rainy period, and more than 10 m³/s between the months of July and September.

The Cañete river is 900 Km long and it is very torrential. Average discharge in the rainfall period is 80 m³/s, and it is more than 10 m3/s in the winter. Here canoeing is practiced thorughtout the year.

CLİMATE CLASSIFICATION

According to the climate classification of Thornthwite, the department has a diversity of climates, the most important ones are:

An arid climate, with rainfall shortage during the whole year, there is a light drizzle between April and December, with an humid atmosphere. This type of climate is typical of places as in the provinces of Barranca, Huaura, Huaral, Lima and Cañete, located in the coastline.

A semi-dry, temperate and humid climate, with rainfall shartage almost troughtout the year. This type of climate corresponds to the coastal valleys situated between 500 and 2 500 m.a.s.l., in the provinces of Barranca, Huaura, Huaral, Lima and Cañete.

A rainy, dry climate in the winter, semi-frigid and humid. This climate is typical of the andean areas situated between 2 500 and 3 500 m.a.s.l., corresponding to the provinces of Huaura, Cajatambo, Oyón, Huaral, Canta, Huarochirí and Yauyos.

A polar, frigid and dry climate, typical of places above 4 500 m.a.s.l. This climate corresponds to places such as: Cajatambo, Oyón, Canta, Huarochirí and Yauyos provinces.

WEATHER AND CLIMATE

The variation in altitude starting from sea leavel up to higher andean zones, directly linfluences the behavior of temperature and atmospheric humidity. Mean annual temperature at sea leve is 18 °C and it decreases as you ascend into the andean summits, until it reach 0 °C (freezing temperature). In the same way, air humidty next to the sea is higher than 90%, it frequently gets saturated during the nights in autumn and winter, while in the same period, in the high andean locations and in the high andean plains humidity decreases at noon down to 40%.

Lima city and other coastal locations have a very peculiar climate, characterized for presenting the least sunny days in all the coastal Peruvian region throughout the year. Cloud cover is almost permanent day and night, from June to September. Form January to April, sun bright mostly occurs at mid-morning hours, relative humidity during the night and early morning hours fluctuate around 90%, decreasing to 80% at noon in the winter, and to 70% in the summer..

Maximum and mininum temperatures in the coastal locations are influenced by the Sea Surface water Temperature (SST), the incursion of warm air masses form the north or by the intensification of southern

CHART 76
Extreme Temperature and Precipitation
Monthly Average at Jorge Chavez International Airport
8Lat 12º00'S Long 77º07'W Alt 13 m.a.s.l.)

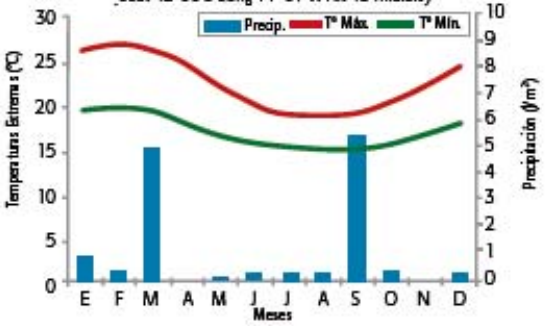


CHART 77
Extreme Temperature and Precipitation
Monthly average in Paramonga
8Lat 10º40S Long 77º47'W Alt 60 m.a.s.l.)

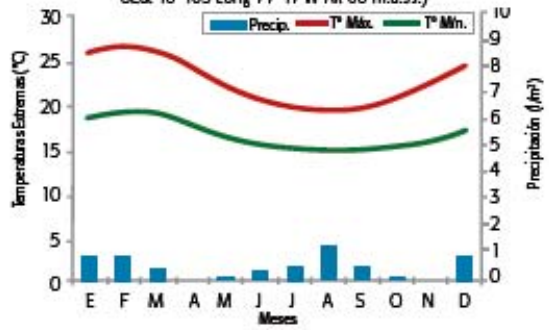


CHART 78
Extreme Temperature and Precipitation
Monthly average in Matucana
(Lat 11º50'S Long 76º23'W Alt 64 m.a.s.l.)

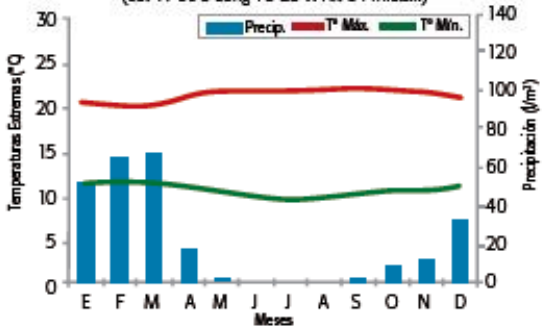


CHART 79
Hourly Temperature and relative humidity in East Lima
20/03/2003
(Lat 12º31'S Long 77º51'W Alt 100 m.a.s.l.)

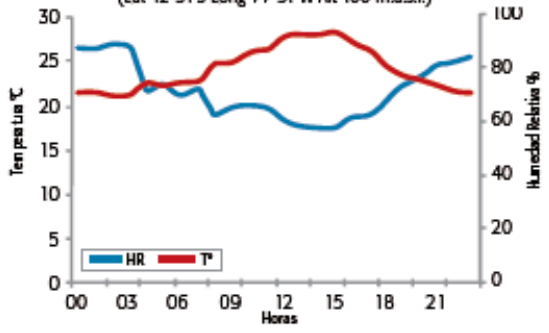


CHART 80
Extreme Temperature and Precipitation
Monthly average in Cañete
(Lat 13º04'S Long 76º20'W Alt 150 m.a.s.l.)

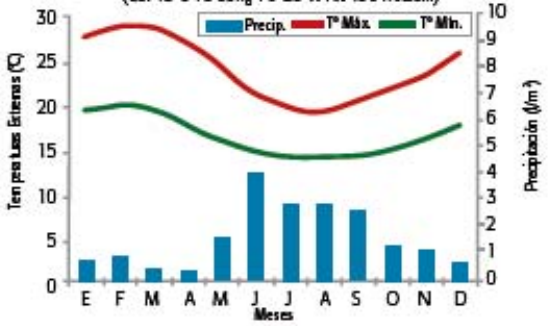


CHART 81
Extreme Temperature and Precipitation
Monthly average in Oyón
(Lat 10º40'S Long 76º46'W Alt 3 631 m.a.s.l.)

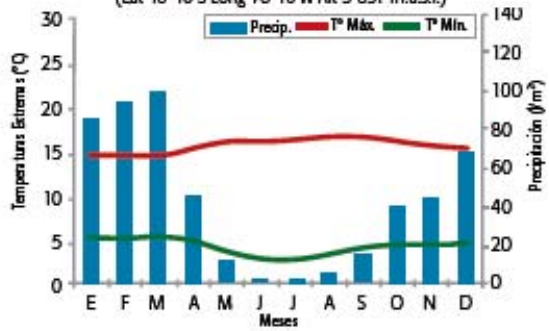


CHART 82
Hourly temperature and relative humidity in East Lima
22/08/2003
(Lat 12º31'S Long 77º51'W Alt 100 m.a.s.l.)

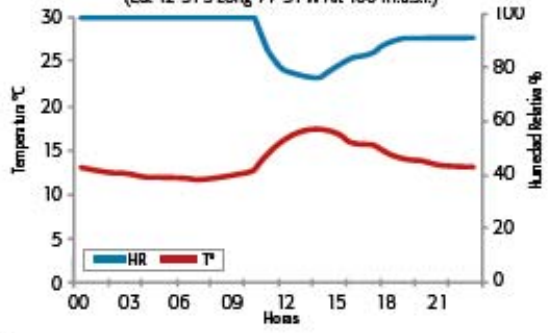


TABLE 14
Sunrise and sunset hours and duration of daylight throughout a year in Lima city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:55	06:08	06:12	06:13	06:18	06:26	06:30	06:22	06:03	05:44	05:33	05:39
Sunset	18:40	18:37	18:22	18:03	17:52	17:52	17:59	18:04	18:05	18:05	18:13	18:28
Time light	12:18	12:23	12:17	12:09	12:05	12:09	12:14	12:13	12:04	11:54	11:53	12:04

winds, which generally worsen the weather in the coast of Lima

The highest temperatures occur in February, as it can be seen from the following charts, reaching an average montly maximum and minimum values of 27°C and 20°C at the Jorge Chavez International Airport, and 29°C and 20°C for the maximum and minimum temperatuers in Cañete, and 27°C and 19°C in Paramonga.

The lowest temperatures occur in August, reaching average maximum values of 19°C and 20°C and minimum 14°C or 15°C, as it can be seen form the charts corresponding to Cañete and Lima; besides, in this months prevails a cloud covered sky, during day and night; high humidity, drizzles during the night and early morning and low temperatures, that favour a generally cloudly winter. For all these reason, the climate of the capital city is considered as the worst climate in the Peruvian coast.

In the sierra or mountain region, temperatures decrease gradually with the altitude and precipitations increase, as it can be seen from the charts corresponding to Matucana and Oyón.

Precipitations are limited to the period between December and March, accumulating approximately 80% of the total annual value. In Oyón and in all the locations of the Sierra of Lima, rainfall is moderate and it occurs in the afternoon or early night and it is generally of short duration. There are some lightning events associated to thunderstorms.

The highest temperature occur towards noon or few hours later, and their magnitude mainly depend on the cloud cover, as it can be seen from the chart corresponding to Oyón, where the maximimum averages recorded correpond to the rainy season that is in the summer.

In general, night temperature descrease as it gets higher until it reaches freezing values of 0 °C or less. From June to September in Oyón and higher locations, almost every night there are recorded freezing temperatures. Sporadic precipitations may occur in form of snow or hail, with lightning.

Generally, from May to December, the sierra of Lima, shows a clear sky or with scarce cloudiness, low or very low relative humidity towards noon (30% or less) and moderate wind in the afternoon, occassionlly during early morning hours in August or September there are some strong eastern winds, this occurs when a layer of steady air is formed over the cordillera or mountain chain.

During the periods of El Niño phenomenon of moderate or strong intensity, there is a significant increase of daily and night temperatures. In the summer, temperatures frequently reach 30°C and minimum 25°C. On certain days when the atmosphere is steady, as it happened on April 2nd, 1939; in the meteorological station of Campo de Marte, when the temperature reached 33.8°C. On January 20, 1941 (El Niño Year) temperature reached 31.4°C. During this event the probability of rainfall occurrence, over any coastal location increases significantly. The chart shows the hourly evolution of air temperature and relative humidity for a typical winter and summer day.

TOURIST ATTRACTIONS

HISTORIC CENTER OF LIMA

Lima is the capital of Peru and also of the department. It was founded on January 18, 1535, it was given the name of Ciudad de los Reyes or City of the Kings. The Historic Center of Lima is the colonial part of city, with constructions and colonial architectonic monuments

⊙ Province Capital

Rivers

Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

expressed in its churches, as La Catedral or the Catedral, Santo Domingo, San Francisco, San Pedro, La Merced, etc. It also has colonial houses such as. the Torre Tagle Palace, La Casa Osambela y La Casa Aliaga, there are also the Paseo de Los Descalzos, the Plaza de Acho (bullfight arena), etc., which can be visited in a city tour.

Lima is now a megacity with a population of 7,5 millons inhabitants, is a commercial, industrial centrer, and where there is tourist transportation to any place in the interior of the country. Callao is the most important port of Peru and also the Jorge Chavez International Airport, important center for the tourist flux. Other tourist destinations in Lima are: Pachacamac Ruins, the Sanctuary of Santa Rosa de Quives, Chosica, Cienenguilla, Lunahuana, beautiful places with a pleasant climate and suitable por ecotourism and the practice of adventure sprots, such as canoeing in the Cañete river.

Along the coastline of Lima, there are a lot of beaches to enjoy the freshness of their cold waters,

and for the practice of nautical sports. Some of the most importants are. Caleta Vidal, El Paraíso, El Palmero, Ancón, La Punta, La Herradura, Los Delfines, Agua Dulce, Punta Hermosa, San Bartolo, Santa María, Pucusana, Naplo, Puerto Viejo, Cerro Azul, El Silencio, etc.

Callao

The sea water temperature in the beaches are influenced by the form of the coast (bay, peninsula), for their orientation according to the predominant winds and deepness of the water with respect to the continental zocalo, for which reason the variations of the water properties (temperataure, transparency, salinity) and the motions are of greater magnitude than those at open sea. Maximum sea water temperatures occur from February to March and minimum in September with 18 °C and 15 °C respectively, the swell is relatively weak.

During warm periods (El Niño event), sea water temperature reaches 27°C, and even with this temperature there is very little probability the occurrence of rainfall, which basically depends on the rate of atmospheric stability. Chart 81 shows the average monthly variations of sea water temperature in the beaches of Lima.

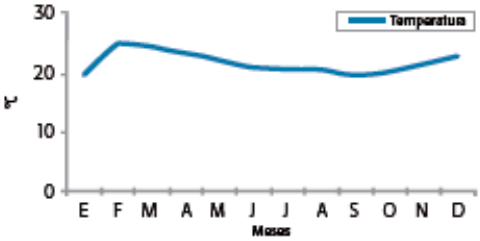
LOMAS DE LACHAY

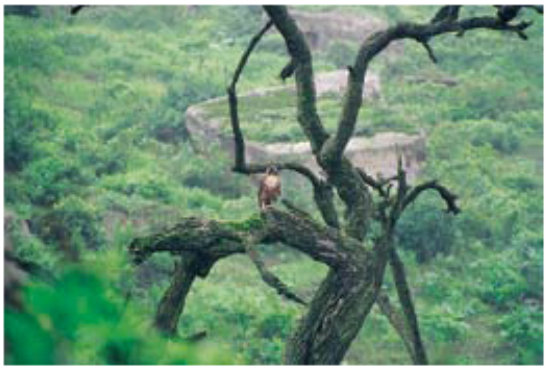
The coastal hillocks are ecosystmes that depend on the humidity of winter fogs and mists, that condense over surface (dry soil) and vegetation by aggregation. Las Lomas constitute a special environment for the survival of a particular flora and fauna. Among the main ones there is the Lomas de Lachay.

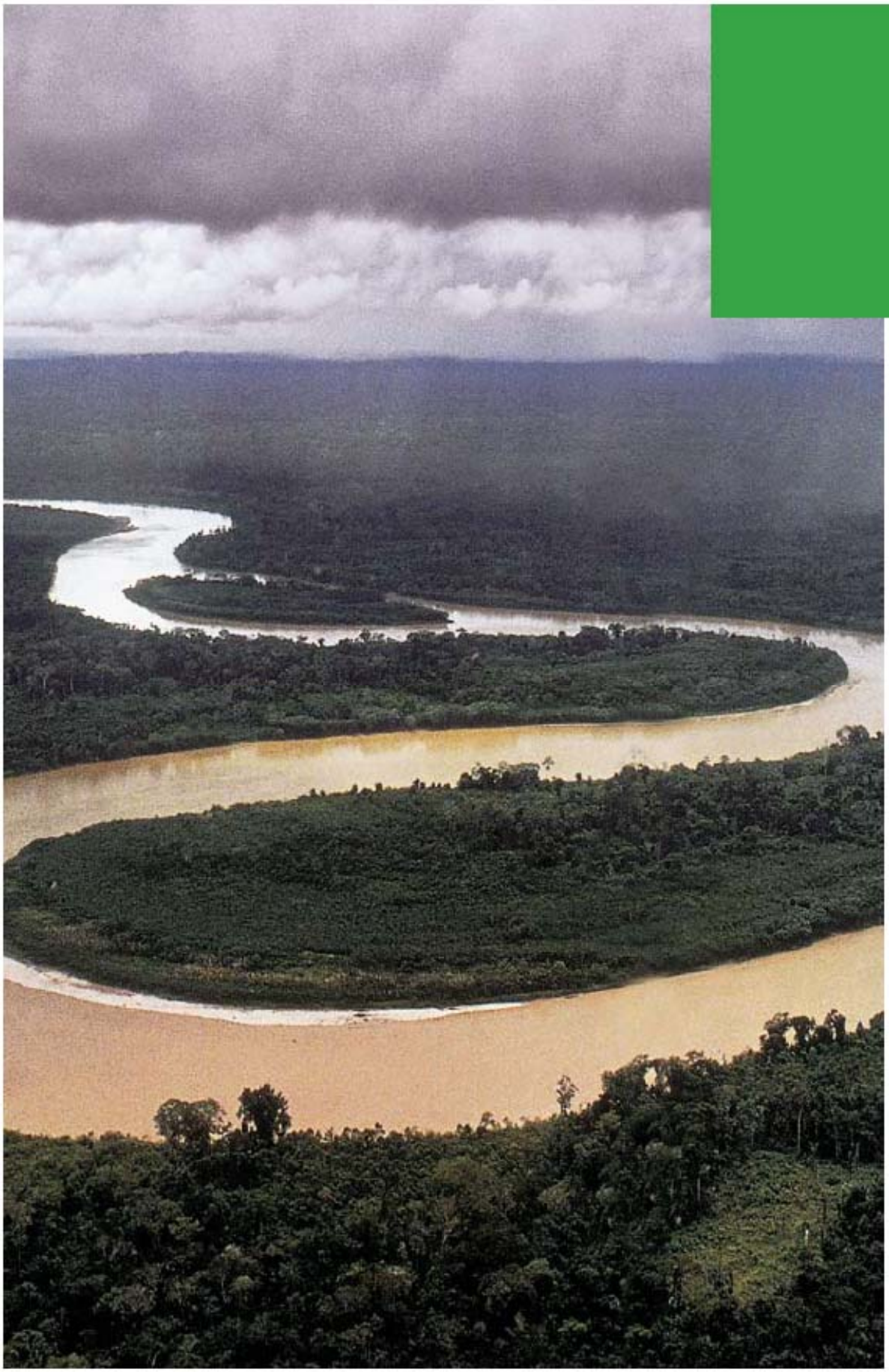
The coast of the department of Lima has also plenty of wetlands originated by a freatic layer, that form some water mirror at a few metres form the sea. This way the swamps as : Medio Mundo, Ventanilla, Villa, Puerto Viejo, Chilca and Cerro Azul were formed, which are environments where species such as the reed and totora grow.

For ecotourism, it is recommended to visit the Pativilca valley, Paramonga Fortress, the valleys of Huaura, Sayán, the thermal baths of Churín, as well as the locations of Huaral, Huarochirí, Marcahuasi, Cañete, Viñak and Yauyos.

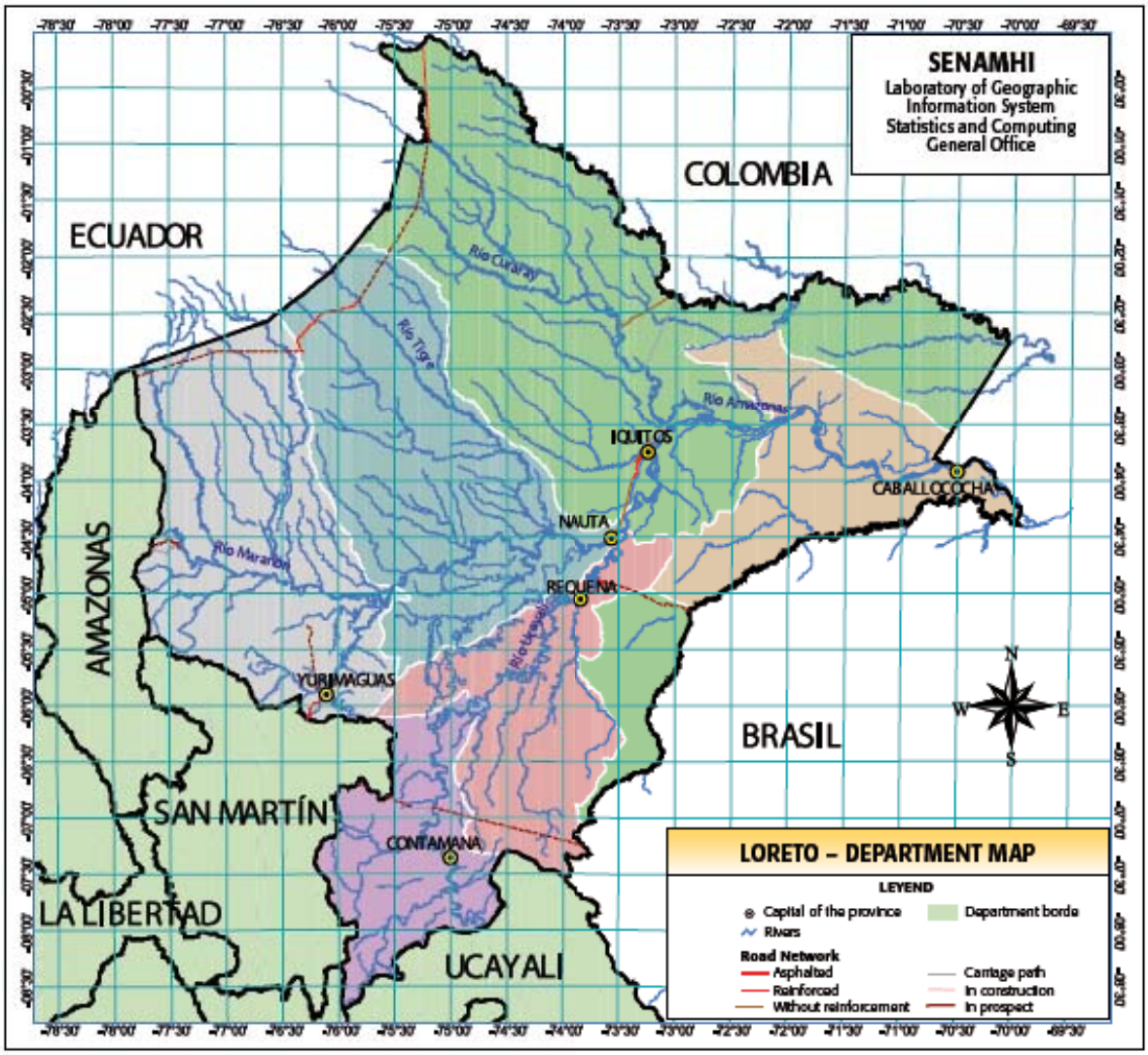
CHART 83
Sea surface temperature in Lima beaches

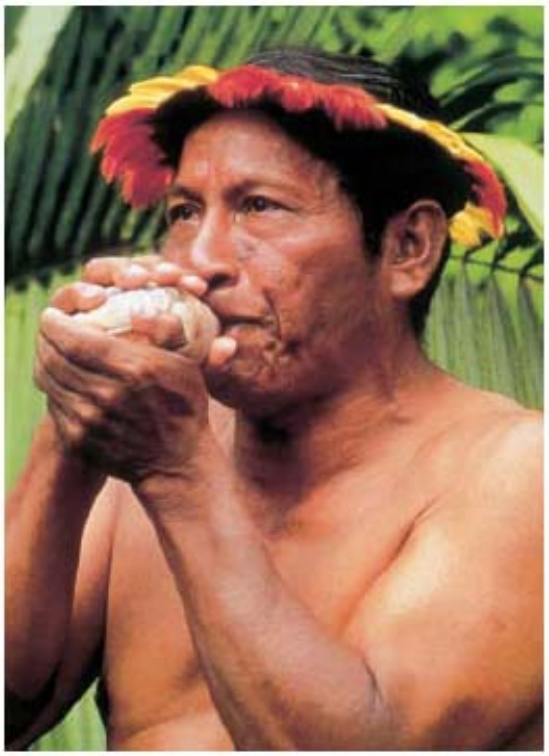






Loreto


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
COLOMBIA
ECUADOR
BRASIL
AMAZONAS
SAN MARTÍN
LA LIBERTAD
UCAYALI
Río Curaray
Río Tigre
Río Amazonas
Río Marañón
Río Ucayali
IQUITOS
NAUTA
REQUENA
YURIMAGUAS
CONTAMANA
CABALLOCOCHA
N
W
E
S
LORETO – DEPARTMENT MAP
LEYEND
Capital of the province
Department borde
Rivers
Road Network
Asphaltad
Reinforced
Without reinforcement
Carriage path
In construction
In prospect



GEOGRAPHY

Loreto is the largest department of Peru, it covers 29% of the national territory it consists of the low forest (humid tropic). Its orography is plain, although it has some low height hills covered by tropical forest, where the Amazonas, Ucayali, Marañon, Huallaga, Napo, Putumayo rivers flow; which constitute a fluvial transportation network. To the west it is bordered by Ecuador, to the north and northeast with Colombia, to the east it is bordered by Brasil, to the south with Ucayali and to the west it is bordered by San Martin and Amazonas.

CLIMATE CLASSIFICATION

According to the climate classification of Thornthwaite, the department of Loreto has the following type climates:

A rrainy, warm and humid climate, with abundant precipitation throughout the year, permanently humid due to the high concentration of water vapor in the atmosphere. This type of climate corresponds to most part of the territory of Loreto, such as the provinces of Requena, mariscal Ramón Castilla, etc.

A rainy semi-warm, humid climate, with a dry winter. This climate is typical of locations in the provinces of Ucayali and Alto Mayo

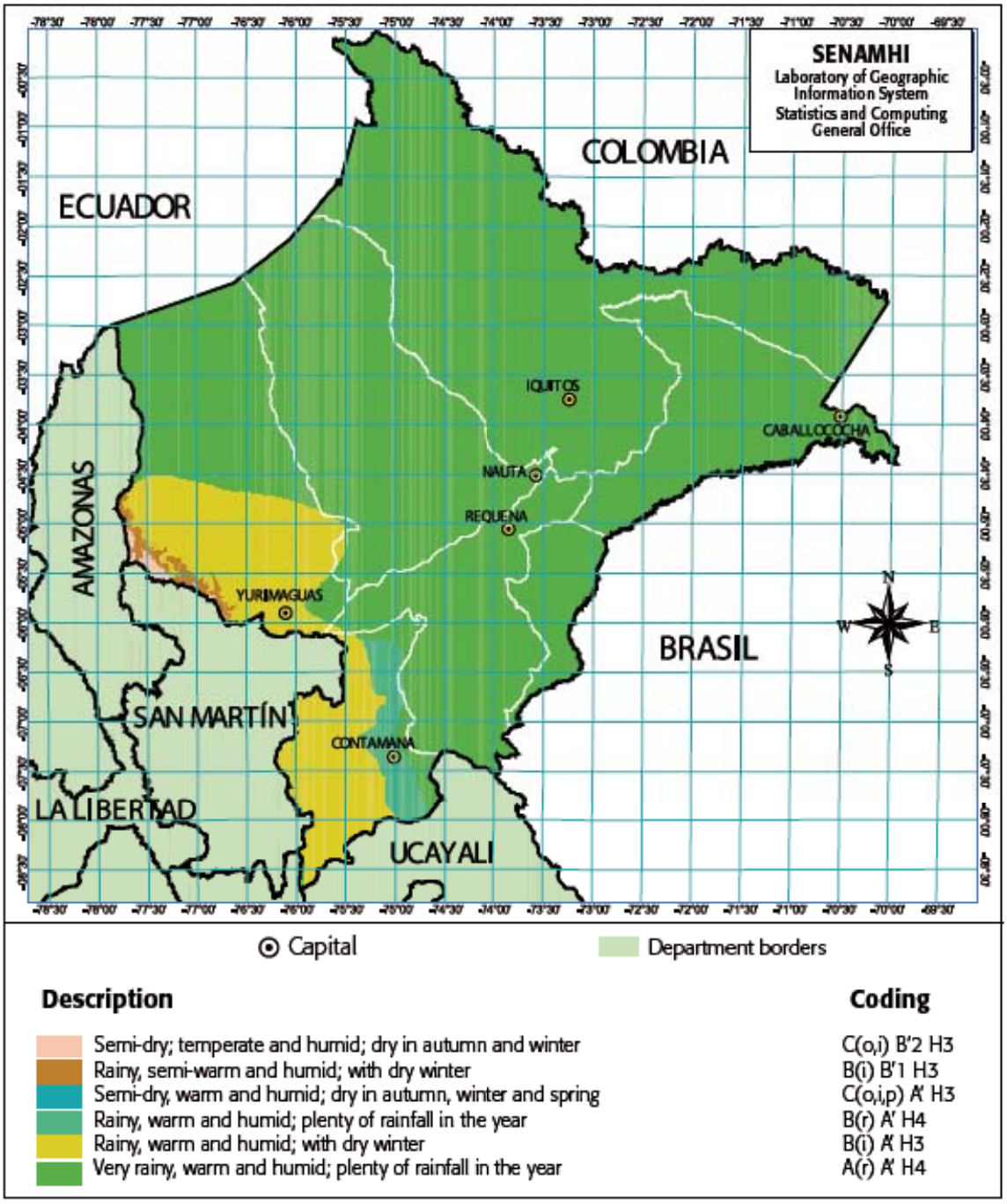
A rainy, warm, humid climate, dry in the winter. This type of climate corresponds to locations such as Balsapuerto and Santa Cruz.

A very rainy and humid, warm climate with abundant rainfall throughout the year. This type of climate is typical of places such as Yurimaguas, Ucayal and Alto Amazonas.

WEATHER AND CLIMATE

The weather and climate of Loreto are determined by the South Atlantic Anticyclone, the Low Equatorial Pressure linked to the Intertropical Convergence Zone (ITCZ), the Extratropical Fronts, the low pressure of the Amazon region, and in a lower extend by the East wave, the North Atlantic Anticyclone and the instability line.

Contrary to the atmosphere in the coast, the one in the jungle (as in Loreto) is characterized for showing



permanent instability (decrease of temperature with height) except for some periods during autumn and winter when precipitations drastically drecrease.

In the summer and winter the average annual temperatrue in most parts of the deparment varies from 29 °C to 33 °C and from 20 °C to 22 °C, respectively. The average oscillation of maximum and minimum temperature is 3 °C approximately.

The annual maximum absolute temperature exceeds 35 °C at any location, and minimum reach up to 10 °C during periods of intense "friaje" or coldness in locations of the provinces of Ucayali and north of Requena; up north, the temperatures are less. The variation of temperature per hour is perceptible and the environment is very hot and suffocating at noon and warm at night.

March is the rainiest month, it records up to a value of 360 l/m², and less rainfall in July with 100 l/m². Annual rainfall is more than 2 000 l/m² but less than 3 500 l/m².

Since Loreto has an almost uniform orography and because most part of its territory is located within the Equatorial zone, it shows similar values with little variation in temperature, humidity, rainfall, winds and cloudiness, etc. Maximum temperatures are high throughtout the year, they exceed 30°C, as it can be seen from the charts corresponding to Yurimaguas (chart 84) and Iquitos (chart 85), where the annual range does not exceed 2°C, while the daily range fluctuates around 10°C, inter-daily variations of temperature are little in spring and winter, but in autumn and winter there are abrupt changes in the weather mainly when there is entrance of cold and dry air masses coming form latitudes close to the antarctic, causing unusual drops of maximimum and minimum temperatures of 25 °C and 15 °C, respectively. These cold periods generally last 2 or 3 days, and occasionally they could last one week

There is also a decrease in maximum temperatures when at dawn there is a large and deep cloud cover (vertical extension over 10 Km) or when it rains all the day. There is also a significant increase that occur during the months of October and November, when daily maximum temperatures exceed 35°C. They occur when the sky is clear, the wind is clam (absence of horizontal winds) and it is relatively dry,

CHART 84
Extreme Temperature and Precipitation
Monthly average in Iquitos
(Lat 3°45'S Long 75°15'W Alt 126 m.a.s.l.)

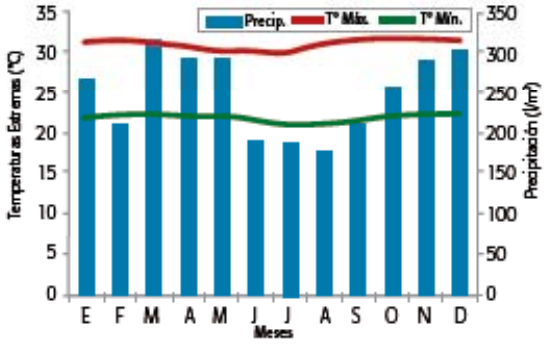


CHART 86
Extreme Temperature and Precipitation
Monthly average in Yurimaguas
(Lat 3°52'S Long 73°07'W Alt 184 m.a.s.l.)

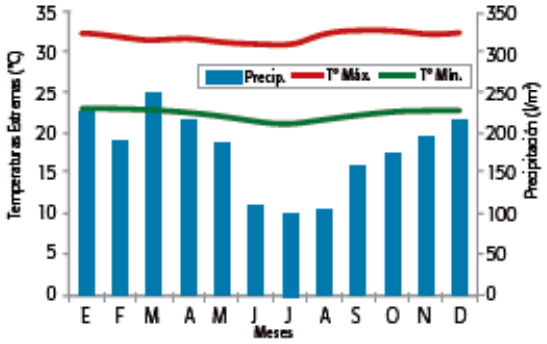


CHART 85
Hourly temperature and relative humidity in Caballococha
18/04/2003
(Lat 3°54'S Long 70°40'W Alt 84 m.a.s.l.)

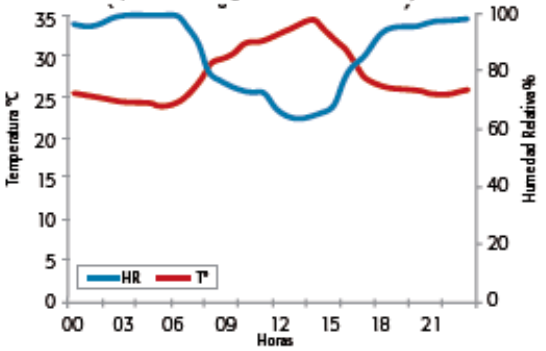


CHART 87
Hourly temperature and relative humidity in Caballococha
30/08/2003
(Lat 3°54'S Long 70°40'W Alt 84 m.a.s.l.)

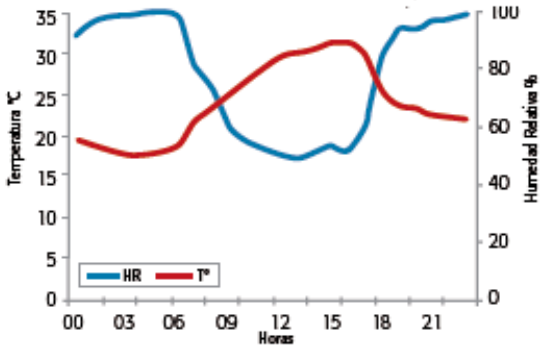


TABLE 15
Sunrise and sunset hours and duration of daylight throughout a year in Iquitos city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:53	06:00	05:58	05:52	05:51	05:56	06:01	05:58	05:46	05:33	05:29	05:38
Sunset	18:12	18:14	18:06	17:54	17:48	17:51	17:57	17:57	17:51	17:44	17:46	17:58
Time light	12:02	12:07	12:02	11:53	11:49	11:53	11:59	11:57	11:48	11:39	11:38	11:48

there is also a downward motion of air at middle and low levels of the atmosphere (subsidence), for which there is more incident solar radiation on the surface; minimum temperature normally occur very early in the morning, and its value oscillates around 21°C; relative humidity is high throughout the year, at night it exceeds 90% and in the day it drops to 80%; when it rains, relative humidity es close to 100%; the wind is calm early morning and its speed increases 4 km/h, in avergae, in the afternoon, but when there is a storm, the wind increases its speed up to 60 km/h for short periods of time, but enough to cause damage on properties.

In Loreto, due to the permanent contribution of humidity from the North and South Atlantic trade winds, to the transpiration of forest, the evaporation of the streams and water bodies, there is rainfall occurence throughout the year, which is more frequent, intense and prolonged during summer months, as it can be inferred form the corresponding charts. As in all the regions close to the Equator, there are two maximum periods of rainfall, one in October and the other one in March; the annual amount exceeds 2000 l/m² in any location, and the amount increases as we approach the border with Colombia, where the annual amount is close to 3 000 l/m². Morning mist is frequent in the summer; after rainy afternoons and nights, cloud cover increases from December to March, as well as from the morning to the afternoon; very seldom there is clear sky, except for some days in the winter and spring time.

In the north of Alto Amazonas province the occurrence of mist is very frequent, which has originated the so called "Mist Forests", with a unique flora and fauna.

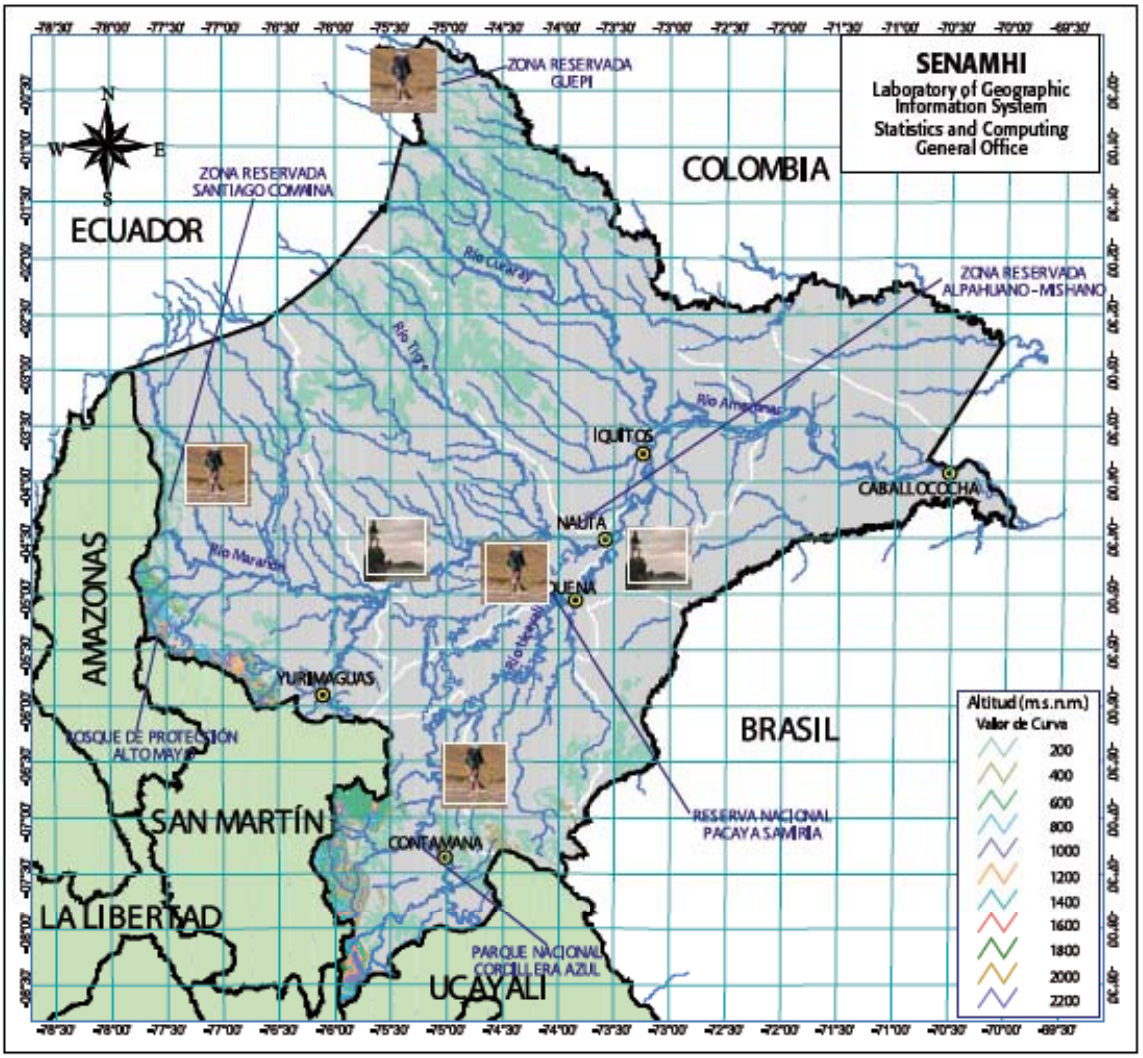
The charts show the hourly variations of air temperature and relative humidity for two typical days in April and August 2003 in Caballococha, where there is occurrence of high temperatures between 10:00 am and 15:00 hours, reaching values of 35°C. It is a very hot environment and relative humidity at these same hours drops to 70%.

TOURISTS ATTRACTIONS

IQUITOS

Iquitos, which is the capital of the department, is situated at the Amazonas river banks and it is surrounded by the Nanay and Itaya rivers. It was founded in 1757, and it was given the name of San Pablo de los Napeanos, its origen dates back to 1729, when the Jesuit priest, Pablo Morani, founded the first misionery center at the river banks of the Itaya river, where the natives iquitos people lived, from whom the place got its name later. At the end of the XIX century, Iquitos was influenced by the economic boom due to the "rubber fever"; which favored urban development with the construction of modern buildings and hotels. The main commercial activities are the timber exploitation and tourism.

In the surrounding areas of the city, one can visit Moronacocha, at 3 km, with a stunning lake, the Bellavista pier located at the Nanay river banks; the Quistococha lagoon, at 16 km from the city; on the way to Nauta. Other places of interest in the surroundings of the city are: Santo Tomás, at 16 km, a town at the banks of Mapacocha lake; Santa Clara, at 12 km, at the banks of the Nanay river, with white sandy beaches; Puerto Almendra, at 30 km, where there is an Experimental Farm of the National University of the Peruvian Amazon Region and the Zungarococha lagoon, located upstream Nanay river.



⊙ Province Capital

Rivers

— Main road

═ Asphalted

═ Reinforced

═ Without reinforcement

— Carriage path

— In construction

- - - In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

QUISTOCOCHA LAGOON

Quistococha is a lagoon situated near the city. In its surrounding there are lodgings, typical food restaurants, onsite museums and zoos with a variety of native fauna species. The weather is similar to the one in Iquitos.

LAGUNA SANTO TOMÁS

It is a tourist place surrounded by a lush tropical forest on the borders of the native community Cocama. This lagoon is peaceful and suitable for resting and practice aquatic sports such as fishing, jet ski, water skiing, and boat rides.

BEACHES

The most visited beaches, formed in the ebb tide period, mainly in July to September, are: Bellavista, Nanay and Moronacocha, located in the surrouniding of the city, covered with white sandy beaches, excellent to enjoy a sunbath and for resting. River water temperature oscillates between 25°C and 28°C (hotter than the Peruvian coasts) and it changes very little from day to night. These beaches offer the tourists a pier to start a boat ride in a peque peques (small boat).

PACAYA-SAMIRIA NATIONAL RESERVE

The Pacaya-Samiria National Reserve is located at the confluence of the Marañon and the Ucayali rivers. It is a vast natural area formed by forests ecosystems and aquatic zones distributed in the form of cochas (small lagoons) distributary channels, swamps and wetlands, where the waters are calm. This reserve is home to a diversity of flora and fauna. In areas where there are no trees or bushes, the highest daily temperatures in days with no rainfall can reach 32°C or more; inside the forest, where very little solar radiation can reach the surface due to the dense foliage, temperatures can be up to 5°C less; relative humidity fluctuates from 85% to 100%. In most of the cases, rainfall occurs after noon, the winds are generally light.

INDIANA

In order to visit Indiana, departure point is Bellavista or Nanay, following the route to Varadero de Mazàn, and from this point you go hiking through the countryside and the jungle to Mazán town, then finally you reach Indiana, a town of settlers and communities situated on the Napo river banks.

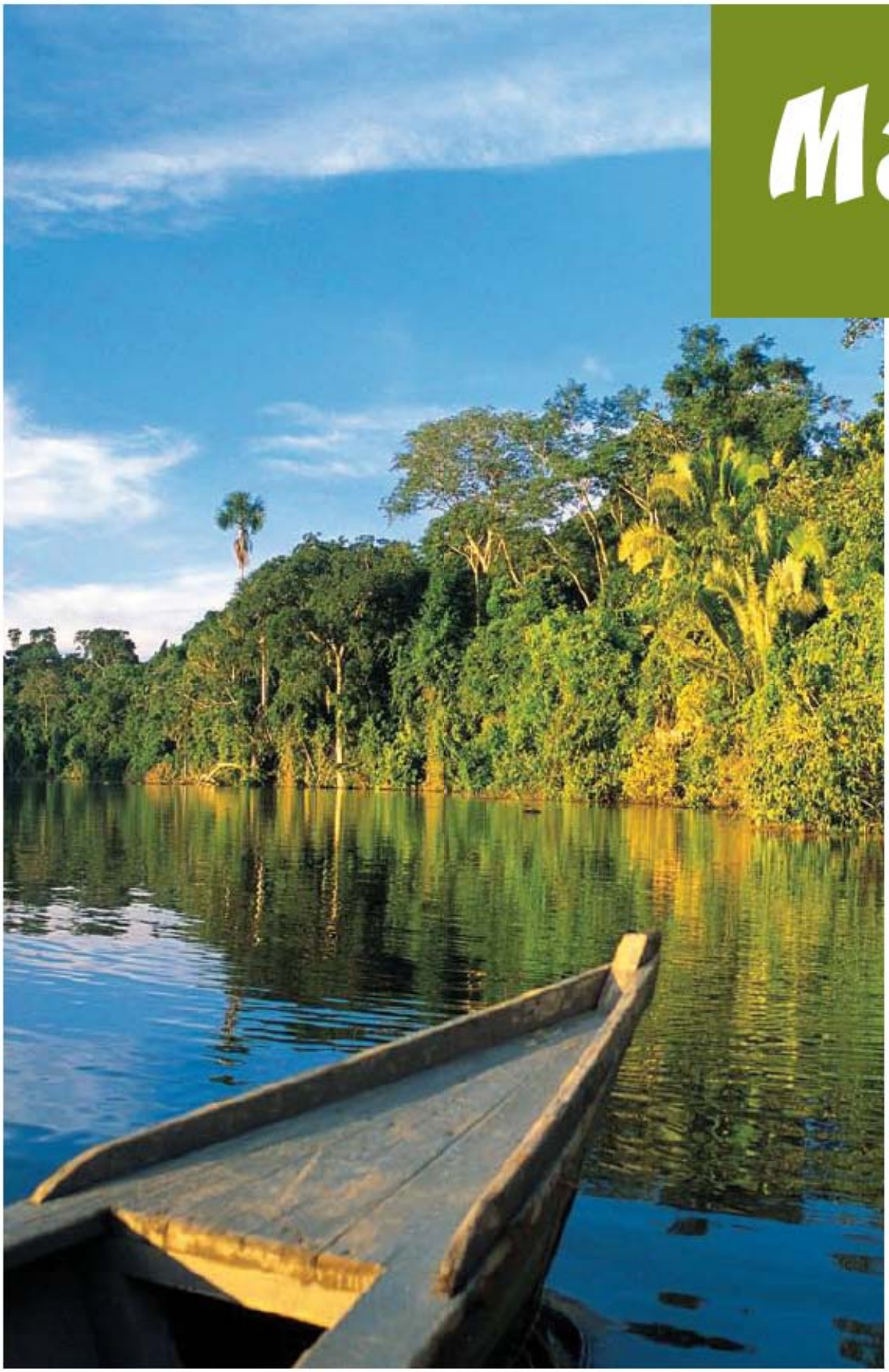
YURIMAGUAS

It is situated on the Huallaga river banks and at the confluence of the Paranapura and Shanuzi rivers, above 150 m.a.s.l., in the middle of the Amazon rainforest. The climate is characterized for having two well-defined seasons: a dry or ebb tide season, from May to October, and a rainfall season from December to March. Maximum temperatures exceed 30°C. Rainfall generallly occurs in the afternoon, and they are intense, sudden and of short duration (heavy shower), and they occur all the year round. A road that runs through the Alto Mayo valley takes you to Yurimaguas, passing by the route to the Cordillera Azul or Blue Mountain Chain, Las Escaleras Hill, the Ahuashiyacu waterfalls, the Santa Rosa Túnel, El Progreso (from where you can get to the Tiraco, Haturuyacu and La Chorrera cascades), San José and the Carpishoyku waterfalls. Following the same route, it takes you to El Paredón town and to the Pongo of Caynarachi (pongo is a narrow canyon).

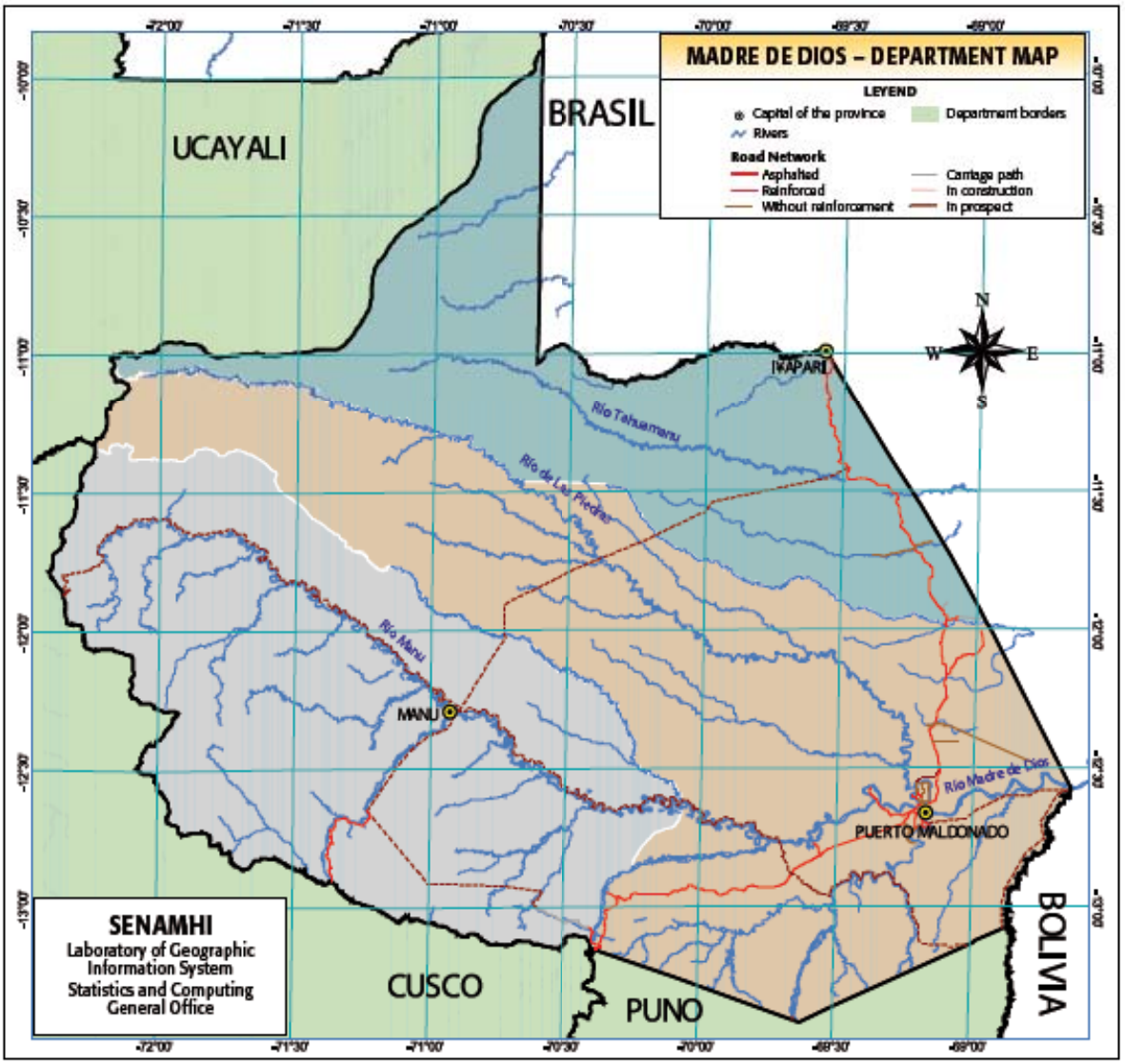
MARISCAL CASTILLA

This province is located near the boundaries with Colombia and Brasil. Its territory is demarcated by the Yavarí river and is traversed by the great Amazonas river, on its river banks are situated towns as Pebas, inhabited by the "yaguas" a native community, who are visited by the tourists. Maximum daytime temperature fluctuates around 32°C, and minimum around 22°C. Minimum relative humidity fluctuates around 85%, while the maximum at dawn or when there is rainfall or mist, reaches 100%. In the afternoon, sudden rainfall (heavy showers) occur and it can be stated that this is the province in the low forest region where it rains the most.

Madi



re de Dios


MADRE DE DIOS – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
BRASIL
UCAYALI
IÑAPARI
Río Tahuamanu
Río de Las Piedras
Río Manu
MANU
Río Madre de Dios
PUERTO MALDONADO
BOLIVIA
CUSCO
PUNO
N
S
W
E
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office

GEOGRAPHY

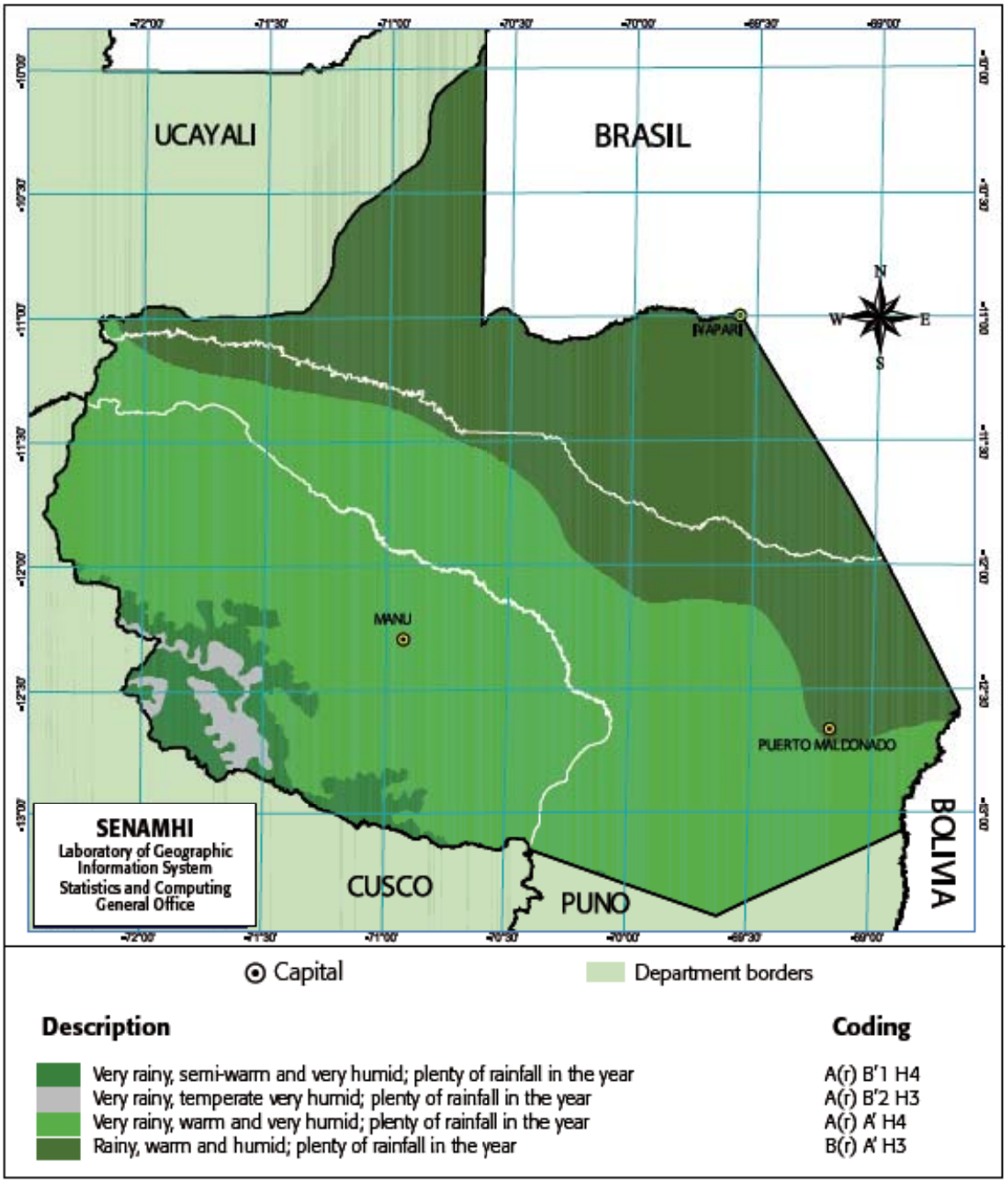
The department of Madre de Dios is located in the southeastern part of Peru. It is bounded to the north by the Federal Republic of Brasil and the department of Ucayali, to the east by the Republic of Bolivia, to the west with Ucayali and Cusco, and to the south by Puno and Cusco. Its territory es geographycally formed by two regions: high forest and low forest.

The High forest territory is located between 3 932 m.a.s.l. and 1 000 m.a.s.l., to the easternmost side of the Paucartambo cordillera or mountain chain, which covers the front forest zone around 2 500 m.a.s.l. The high forest is characterized for having a relief that consists of deep and moderate ravines, covered with vegetation and mist. It is in this region where the rise of the most torrential rivers originate and that are tributaries of the main rivers, they are: Pilkopata, Madre de Dios, Tahuamanú, Las Piedras, Los Amigos, Purús, Acre and Heath.

The low forest is situated between 1000 y 200 m.a.s.l., it si formed by terraces, small hills and a vast plain; it is an intrincate region of forests, rivers, small lagoons or cochas, with a lushing diversity of flora and fauna and stunning landscapes, for which it was given the name of the capital of biodiversity. This department is a huge natural reserve that is now dominated by mountain forests where 1 000 different kind of species of birds have been found, 200 species of mammals, 500 species of fish, hundreds of reptile species, thousands of insects, 1 300 varieties of butterflies, 650 species of bugs. In summary, it can be concluded that exists around 50 000 different kinds of species per hectare of amazon forest, which constitutes a natural laboratory for explorers, ecologists and any scientist interested in life science.

CLIMATE CLASSIFICATION

According to the climate classification of Thornthwaite, the territory of this department has the following types of climate:



The climate in the high forest is rainy and temperate, with a dry winter, and in the summer the amount of rainfall exceeds this amount by as much as ten times the rainfall the occurs in the winter; also it is frequent the occurence of mist. This type of climate corresponds to locations in the provinces of Manu (Fitzcacarral and Boca de Colorado).

The low forest climate is very rainy, warm as in the savannah and very humid, with average annual rainfall of 1 000 l/m² in the summer (December to March); in the winter rainfall considerably decreases. This type of climate corresponds to locations in the provinces of Tambopata, (Puerto Maldonado), Tambopata (Plantón, Las Piedras), Tahuamanu (Iberia, Iñapari and San Lorenzo).

WEATHER AND CLIMATE

The weather in this department is the most variable of all the departments in the jungle, because it is situated in the proximity of the eastern slope of the Andes Mountain Chain or Cordillera, also for its latitudinal location, that is for its closeness to the trajectories of the frontal systems and to the low pressure systems form the northeast of Argentina. Besides, it is affected by the meteorological systems as the Intertropial Convergence Zone (ITCZ), the Amazon Low Pressure and the trade winds of the South Atlantic Anticyclone (SAA).

Due to the high water vapor content in the air over the surface and to the intense absorption of long wave solar radiation to the east, besides, the limited horizontal and vertical motion of the air (turbulence), high temperatures occur all the year round, as it can be seen in the chart corresponding to Puerto Maldonado, the temperatures exceed 29 °C. The annual range es small (3 °C), and the daily range frequently exceeds 10 °C.

The higest temperatures occur in the months of September, October and November, with values close to 38 °C, conversely, in autumn and winter, low temperatures occurence is due to the incursion of cold and dry air masses coming from the pampas of Argentina or from subantarctic latitudes (50 °C to 60 °C south latitude). In these events maximum temperatures may reach 20 °C and minimum to 10°C or less. Thesse phenomena occur all the years between the months of June and August, and they are called "friajes".

In the nights, the weather is generally cool average minimum temperatures oscillate between 18°C and 22°C; the first one is registered during the winter months, and the second one in the remaining seasons, autumn, spring and summer. In general, temperatures slightly decrese towards the west.

Rainfall occurs throughtout the year, with maximum precipitation from December to March, period in which rainfall is frequent and intense and they can last several hours. They generally star in the afternoon hours and stop before midnight, the least rainy months are: June, July and August and their amounts are equivalent to one sixth of that of the rainiest month (February). Total annual for any location exceeds 2 000 l/m².

Relative humidity es high all year round, maximum is higher than 90% and minimum over 70%, occasionally it can drop to 50% or less, due to the incursion of cold dry air masses coming from regions close to the South Pole. Wind is generally light. On certain occasions there are strong winds when there are storms associated to lightning.

In the Manu National Reserve, in the Iñambari river basin, and in all the high forest, precipitation is abundant, more frequent and they last longer than those occurring to the east or southeast of the department; that means that rainfall increases towards west and it frequently rains during the nights.

The charts show hourly variations of temperature and relative humidity in Iberia for two typical days in August and June, where it can be seen that

TABLE 16
Sunrise and sunset hours and duration of daylight throughout a year in Puerto Maldonado city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:23	06:36	05:40	05:42	05:47	05:55	05:59	05:51	05:32	05:12	05:01	05:06
Sunset	18:10	18:06	17:51	17:31	17:19	17:19	17:26	17:32	17:33	17:34	17:42	17:58
Time light	11:46	11:51	11:46	11:37	11:33	11:37	11:43	11:41	11:32	11:23	11:21	11:32

CHART 88
Extreme Temperature and Precipitation
Monthly average in Puerto Maldonado
(Lat 12°35'S Long 69°12'W Alt 256 m.a.s.l.)

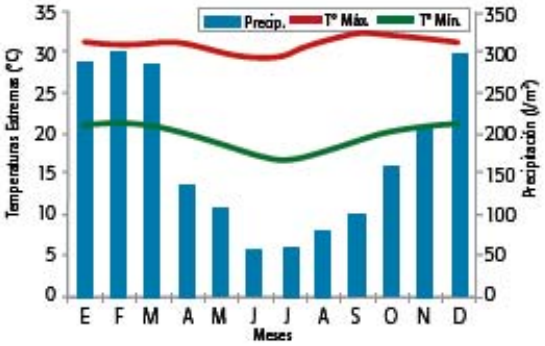


CHART 89
Maximum hourly temperature and humidity in Iberia
27/08/2003
(Lat 11°21'S Long 69°35'W Alt 345 m.a.s.l.)

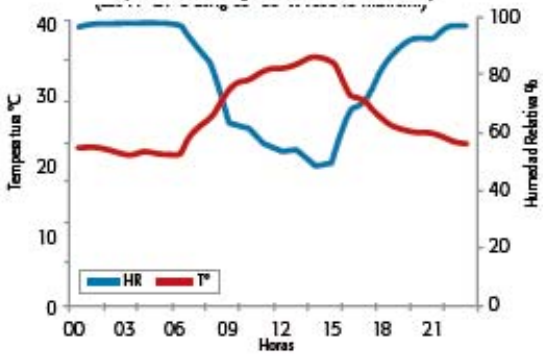
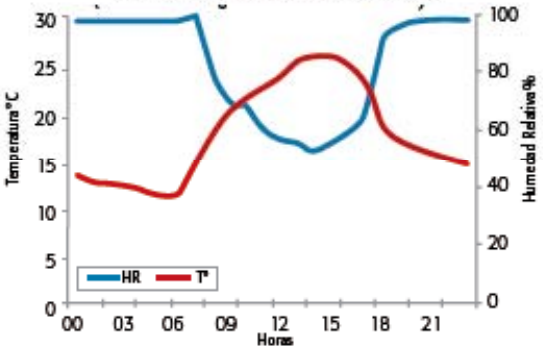
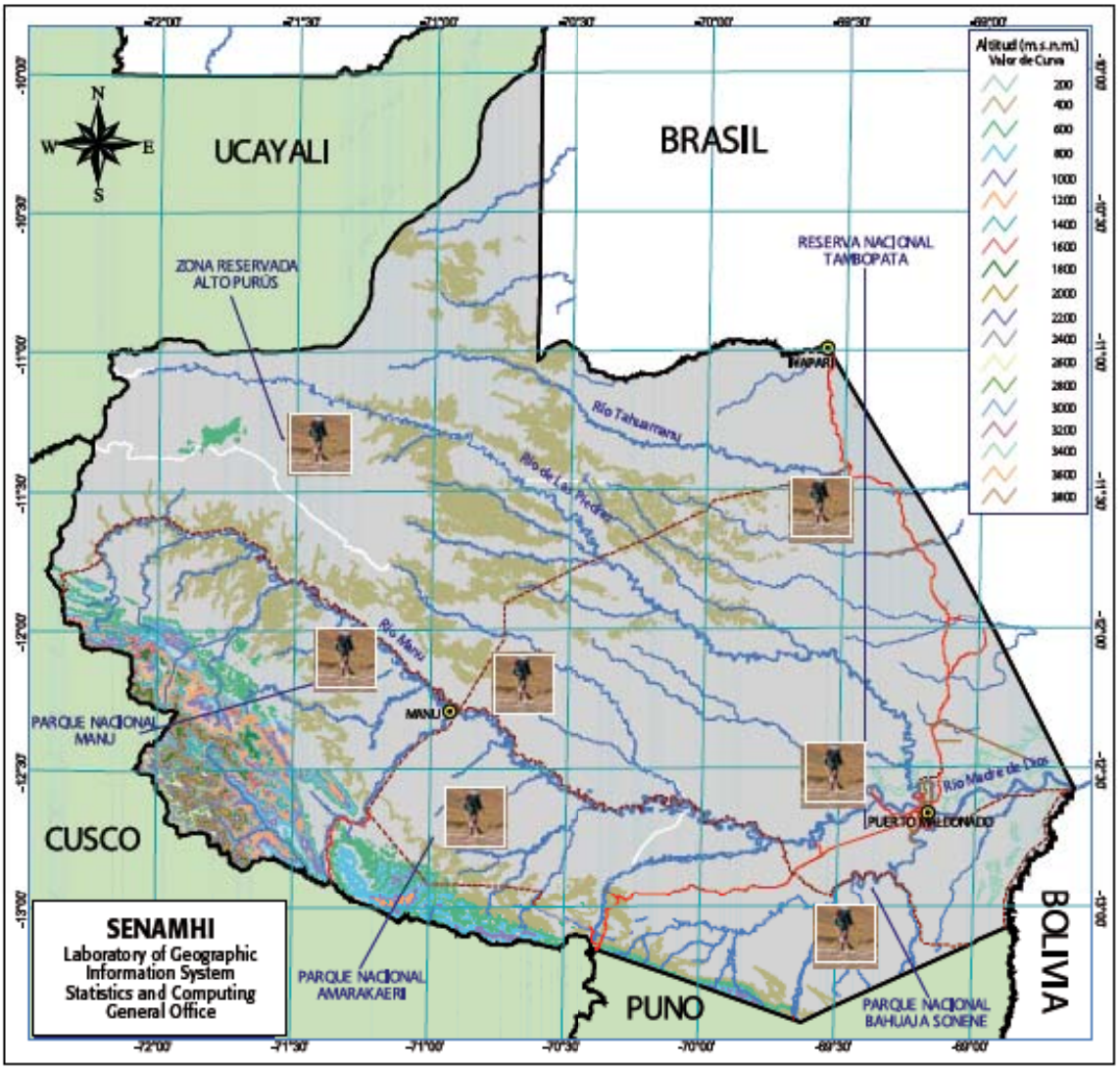


CHART 90
Maximum hourly temperature and humidity in Iberia
27/06/2003
(Lat 11°21'S Long 69°35'W Alt 345 m.a.s.l.)



for August 27, 2003, a temperature of 35 °C was registerd between 10:00 and 15:00 hours and a relative humidity of 55% for the same period, originating a hot and suffocating environment. In the second chart, corresponding to 26th June, 2002, temperature of 28 °C was registered between 10:00 and 15:00 hours and a relative humidity of 45% originating a warm environment.



⊙ Province Capital

Rivers

— Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing
 Surfing
 Skiing
 Archaeology
 Sailing
 Climbing
 Hiking
 Cycling
 Diving
 Snowpeak
 Paragliding
 Hunting

TOURIST ATTRACTIONS

PUERTO MALDONADO

It is the capital of the department. This city is the convergence point for explorers, tourists, settlers etc. It is the departure place for the visitors who take tourists itineraries to the jungle. Sailing along the Madre de Dios river, during two days, will take you into the heart of the Madre de Dios National Reserve , considered as the center of genetic diversity in the world, where a great number of species of wild plants and animals live. The temperature values at any place of this jungle are similar to the ones in Puerto Maldonado.

BAHUAJA SONENE NATIONAL PARK

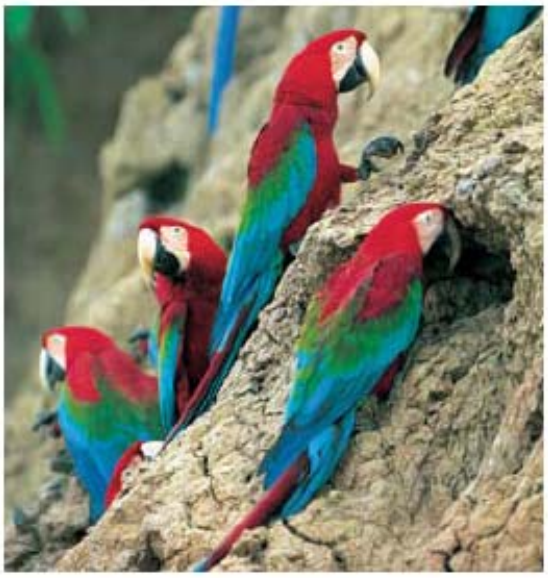
The Tambopata river traverses this reserve. The park protects a complex and extraordinary variety of species, both wild flora and fauna.

Departing from Puerto Maldonado and after three hours of sailing along the river, you will find the native community call El Infierno, integrated by the eséja ethnic group, where there are also tourists lodging surrounded by small lagoons called "cochas", bird observatorios, collpas for macaws, exclusive for ecotourism.

You can also start a tourist trip along the river from Puerto Maldonado to Sandoval Lake, which is surrounded by "aguajales" like plam trees where the aguaje grows, and lushing tropical vegetation. Another important place for tourism is Valencia Lake, ideal for nature watching activities and fishing. Following this tourist itinerary you can get to the Heath pampas, a singular ecosystem of humid tropical climate in the middle of the amazon forest. Daytime temperatures generally exceed 30°C at noon; the lowest temperatures occur in early morning hours, at dawn and they oscilate around 20°C. The period with less rainfall occurrence is the one from May to September.

MANU NATIONAL PARK

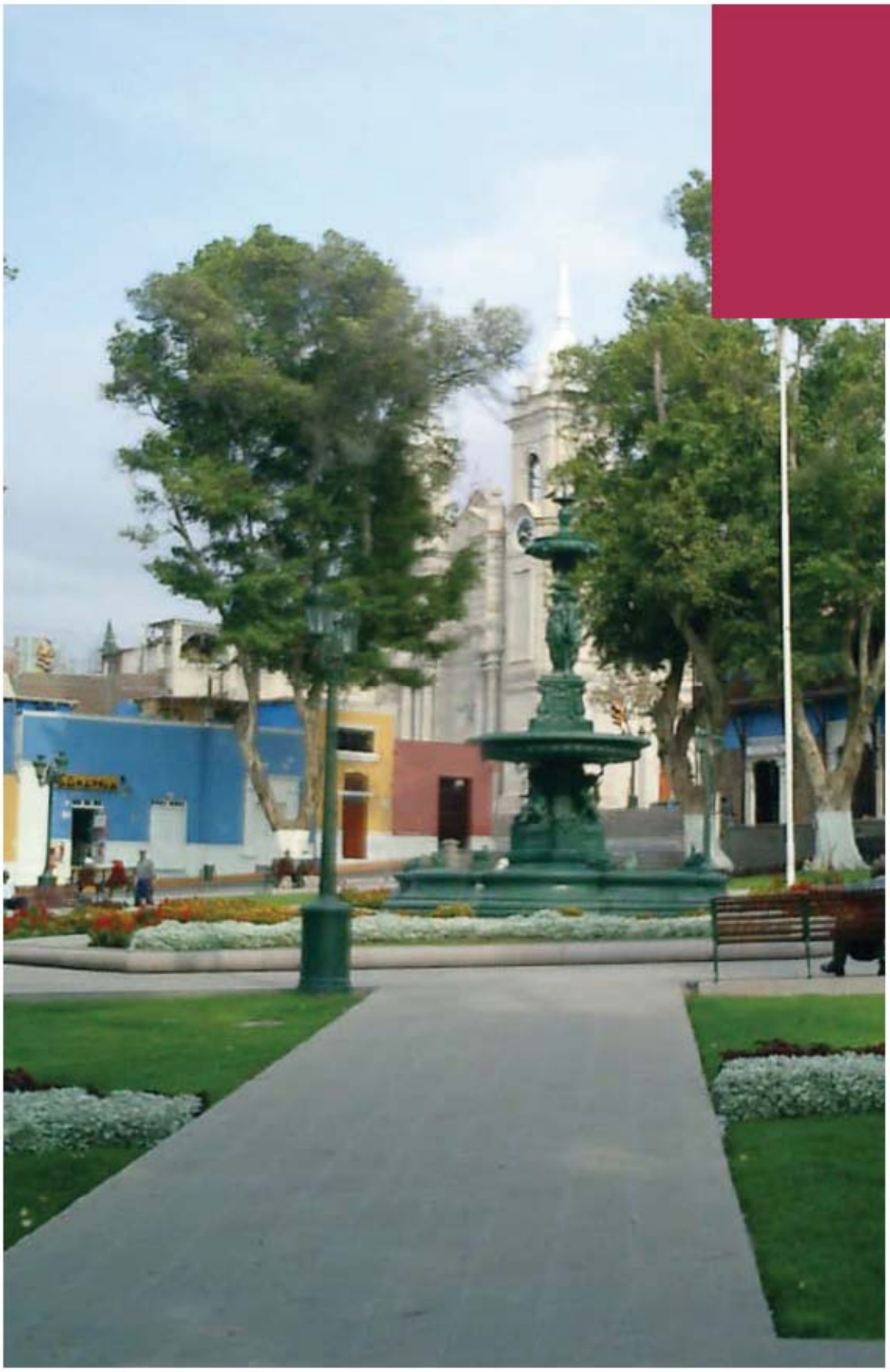
In order to get to the Manu National Park you start the trip from Cusco, by road, until you reach Atalaya town. From here you continue your trip along the Alto Madre de Dios and Manu rivers, also you can get to the park by airplane departing from Cusco.



Extreme Temperatures are generally 01 to 2°C lower than those of Puerto Maldonado, when there are the same weather conditions.

BOSQUE DE LOS AMIGOS NATIONAL RESERVE

This reserve is a jewlery at global level, for its diversity of wild flora and fauna. The access to this reserve is very difficult, for this reason it is considered as the last refuge to preserve endangered species of plants and animals, whose habitat is the vast tropipcal forest, land of the anacondas, jaguars, macaws, black cayman, river wolves etc. In this jungle lives the native community that belongs to the ethnic group called Mashcos-Piro, who live a nomad life according to seasonal changes of the weather and tropical climate, to migration patterns of wild fauna species and to the riversbeds. This way these communities develop their hunting and recolection activities in the high parts of the rivers during the rainfall period and they go downstream to lower parts of the river as the river discharge decreases. This ethnic groups has no contact with other communities or settlers. Other tourist places are: Sandoval, Valencia Tres Chimbdas, SachavOtros lakes, and the El Gato ravine. The weather is similar as in the Manu.



Moquegua


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
AREQUIPA
PUNO
TACNA
OCÉANO PACÍFICO
OMATE
MOQUEGUA
ILO
Río Ichuña
Río Viscachas
Río Tambo
Río de Ilo
N
S
W
E
MOQUEGUA – DEPARTMENT MAP
LEYEND
Capital of the province
Department border
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The physiography of the department is diverse. The coast is a desert covering an extension that starts at sea level up to 1000 meters altitude; along its coastline there are beaches and "puntas" or small peninsulas such as Punta Negra, El Peñón, Coles, Huaca Luna etc. Then, going east there are zones of a plain an undulating relief where there are vast valleys such as Tambo and Moquegua

The andean zone is located between 1000 and 5000 meters altitude, and it is formed by the western slopes and the punas or high andean plains where there are the Coalque, Hualcane, Cerco Cerco, Arundayo peaks and the Ticsani, Ubinas and Huayna Putina volcanoes. The most important river is the Tambo, that originates in the Conacunani and Hualcane peaks at 5 342 m.a.s.l. adn 5 344 m.a.s.l, respectively. It is also the longest river of the Pacific basin, it is 535 km long and it has a discharge of 80 m^3/s.

CLIMATE CLASSIFICATION

The department of Moquegua has a diversity of climates, due to the influence of the Peru (Humboldt) Current which is a cold water current, and to its physiography formed by the coastal plains, the western foothills and the high andean cordillera o mountain chain.

According to the climate classification of Thornthwaite, Moquegua has the following climates:

An arid, semi-warm and humid climate, with scarce rainfall throughout the year. This climate is typical of zones situated between 0 m.a.s.l. and 1 000 m.a.s.l., in locations of Ilo and Moquegua.

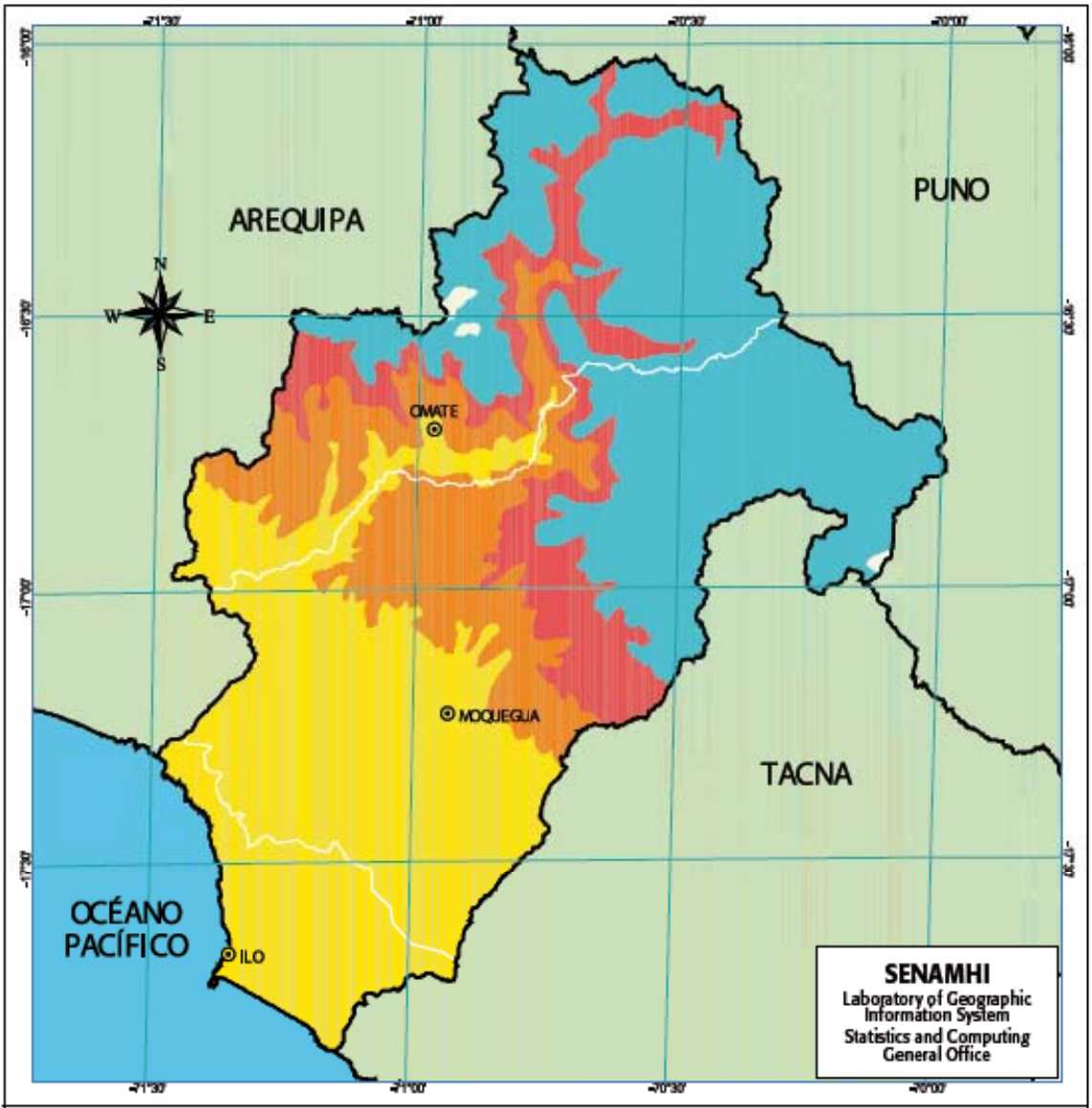
A semi-arid, temperate climate, dry in autumn, winter and spring. This climate corresponds to areas located between 1000 m.a.s.l. and 2 500 m.a.s.l, covering locations in the provinces of General Sánchez Cerro (Omate) and Mariscal Nieto (Moquegua). This climate is characterized for having an average monthly maximum temperature of 27°C in December and 25°C in July, its annual range is 2°C, this indicates a slight variation so it can be stated that is a pleasant climate.

A semi-dry, cold and dry climate, with scarce rainfall in autumn, winter and spring, typical of places located between 2 500 m.a.s.l. and 3 500 m.a.s.l. This climate corresponds to the high lands in Omate, Carumas, Puquina and Cuchumbaya, all of them located in the Mariscal Nieto province.

A rainy, semi-frigid and dry climate, with rainfall shortage in autumn and winter, it is typical of places situated between 3 500 m.a.s.l. and 4 500 m.a.s.l. This climate corresponds to Carumas location in the province of General Sanchez Cerro.

WEATHER AND CLIMATE

Air temperature, in the beaches situated along the coastline of this department, depends on cloud



⊙ Capital

Department borders

Description	Coding
Arid, semi-warm and humid; rainfall shortage all the year	E(d) B'1 H3
Semi-arid, temperate and dry; rainfall shortage in autumn, winter and spring	D(o,i,p) B'2 H2
Semi-dry, cold; rainfall shortage in autumn, winter and spring	C(o,i,p) C' H2
Rainy, semi-frigid and humid, with dry autumn and winter	B(o,i) D' H3
Snowy	Snow

CHART 91
Extreme Temperature and Precipitation
Monthly average in Moquegua
(Lat 17°10'S Long 70°56'W Alt 1142 m.a.s.l.)

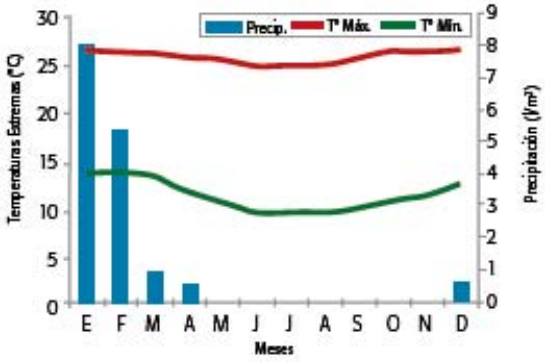


CHART 93
Extreme Temperature and Precipitation
Monthly average in Moquegua
(Lat 17°39'S Long 71°21'W Alt 8 m.a.s.l.)

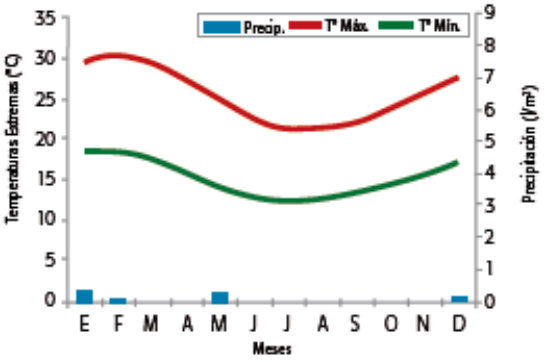


CHART 92
Hourly temperature and humidity in Moquegua
16/09/2003
(Lat 10°35'S Long 75°38'W Alt 1 814 m.a.s.l.)

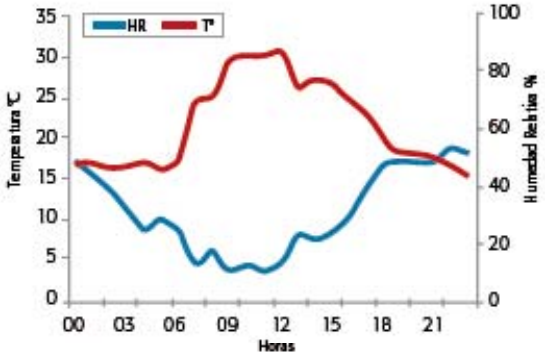
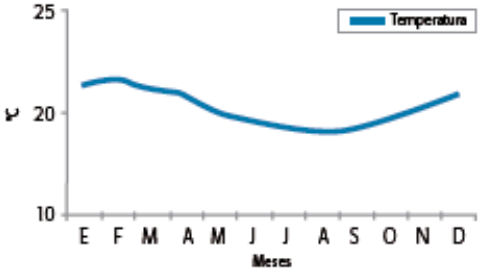


CHART 94
Sea surface temperature in Moquegua beaches



cover, the sea surface temperature, the atmospheric instability (thermal inversion) and the amount of incident solar radiation on the surface.

Average monthly temperature of sea water in the beaches shows little variation (3 °C), the lowest values occur in the month of September and the highest values in February; the daily range is also very little, of approximately 0,5 °C, except for the times when there are strong swell conditions, the transparency of water is low, and this characteristic is due to the presence of plankton, organic detritus and particles in suspension due to upwelling process.

The marine area of the department together with the one of Tacna are the least affected by the El Niño events; when this event is weak, there isn't any warming of the water (see chart). In Ilo town, located at 15 m.a.s.l, The highes average monthly maximum temperatures occur in the month of February, reaching 30 °C, and the lowest occur in July, reaching only 22 °C ; average monthly minimum temperatures oscillate between 18 °C and 12 °C. Similar temperatures occur in the other locations along the coastline.

In the winter, after midday, there is sun bright over the coastal strip, and in the summer the sun shines every

TABLE 17
Sunrise and sunset hours and duration of daylight throughout a year in Moquegua city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:23	05:39	05:48	05:54	06:03	06:13	06:16	06:05	05:41	05:17	05:02	05:05
Sunset	18:27	18:19	18:00	17:36	17:20	17:18	17:26	17:35	17:40	17:46	17:58	18:16
Time light	11:55	11:59	11:54	11:45	11:42	11:46	11:51	11:50	11:41	11:31	11:30	11:40

day since early morning hours, the wind intensifies in the coast as well as in the sierra or mountain during autumn and winter. In places located at higher altitudes such as Moquegua, which is at 1 412 m.a.s.l, the highest average monthly maximum temperature is 27 °C in December and the lowest fluctuates between 14 °C and 10 °C, with an annual range of 4 °C. This annual slight oscillation characteristic is basically due to the sparse cloud cover that occurs all the year round, even in the rainfall periods, for this reason locations in the departments of Arequipa and Moquegua, located at similar altitudes, have almost the same average daytime temperature values, as it can be seen in charts 89 and 92.

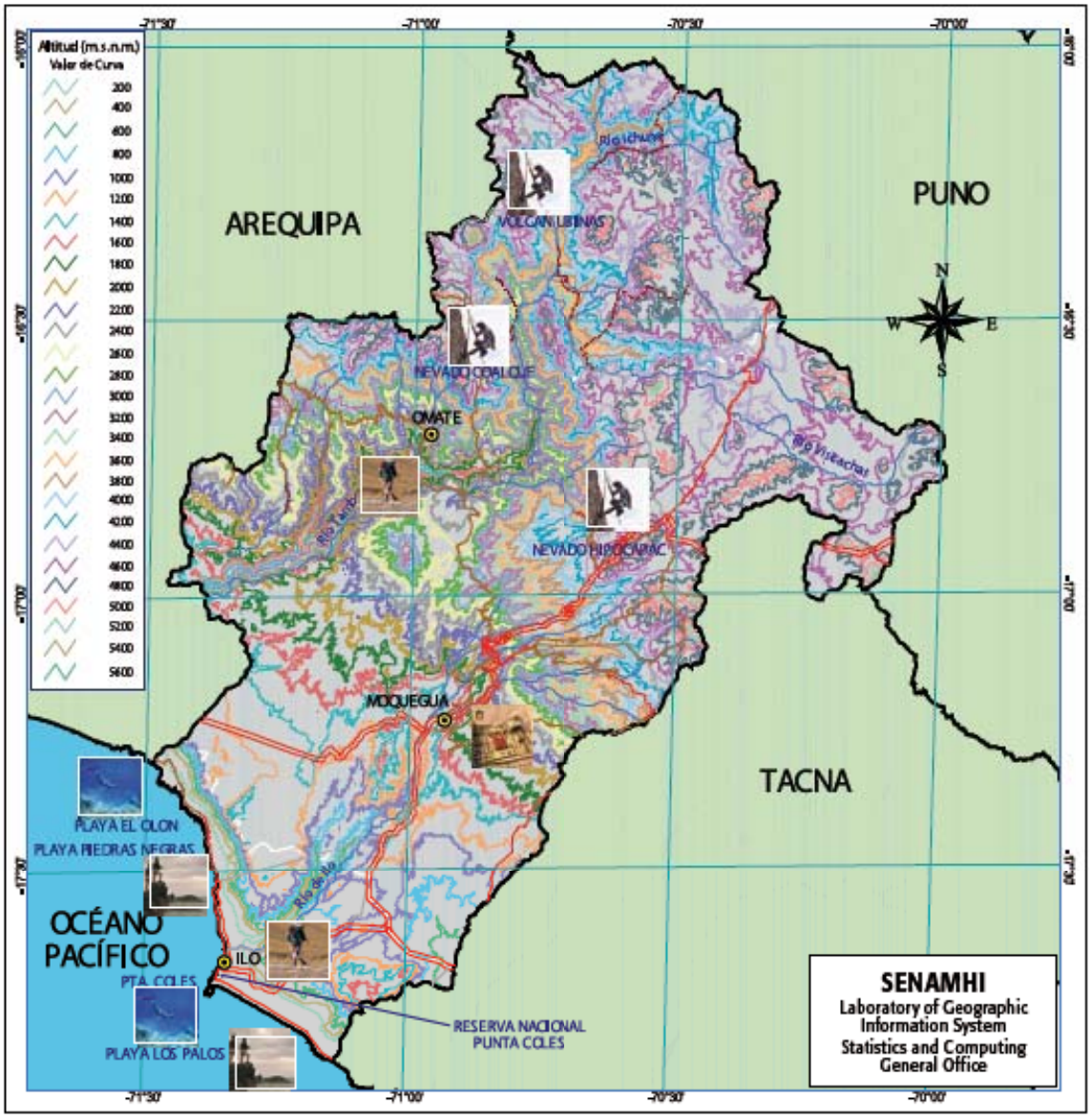
In the coastal strip, rainfall is light and scarce and it generally occurs during the night. Form May to September it only drizzles, and it intensifies when the trade winds from the southeast increase their speed and their flux is parallel to the coast line; the wind flux facing perpendicular to the slopes or locations, cause persistent drizzles.

Occasionally, the humid air form the Pacific Ocean (marine breeze) es forced to flow through the valleys, originating drizzles, providing that thermal inversion is weak or there is no thermal inversion at all. This meteorological situation occurs in the summer and in the occurrence of El Niño Phenomenon.

The locations situated at 3 000 m.a.s.l., such as Ornate, Puquina and Corumas, maximum temperatures oscillae between 15°C and 20°C, and minimum between 5°C and 7°C, which is a very slight variation of the average monthly temperatures, due to the scarce cloud cover that occurs during the rainy season.

In the high andean plains of Moquegua, above 3 800 m.a.s.l, maximum temperatures oscillate around 12°C and between May and October, freezing temperature occur every night and they can drop down to -20°C or less during some days in the winter.

Precipitation in the sierra or mountain up to 4 000 m.a.s.l., is generally light and of short duration, it occurs in the last hours of the day and first hours at night. The orientation of the valleys also influence on the amount of rainfall, such as it is the case of Carumas, a location whose valley with a north-south orientation, favors the convergence of humid air masses cominog from the north or northeast during the summer. This physiographic characteristic explains the reason why is there more precipitation than in other locations situated at the same altitude of the south-western sierra or mountain.



⊙ Province Capital

Rivers

— Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

In the high andean plains there are some wind gusts of up to 20 m/s or more in the months of autumn or winter. Lightning and snowfall are frequent from January to March; however, these events sporadically occur in the winter; but thery can be very intense.

The charts whose the evolution of daily temperature and relative humidity registered in Moquegua.

TOURISTIC ATTRACTIONS

Beaches

The coastline of Moquegua has beutiful beaches, such as the Tres Hermanas, Punta Coles, La Poza de las Lizas, La Cruz, Ite, Meca Grande and Meca Chica, famours for their good qualities for fishing and diving. The climate of Ilo is very dry, with almost non fluvial precipitation; but in the winter it shows a dense low fog, especially at dawn, that extends up to the hills, and the people living in this location calls it "camanchaca".

Binational Highway

It is an asphalted road that starts in Ilo and runs by the Titicaca Lake banks, it is 400 kms long, traversing the majestic sierra landscapes such as the perhistoric terraces of Camata , the vast pampas of Cuella, with andean lakes that are the habitat of some camelids and flamingos.

Baúl Hill

It is located on route Moquegua-Tarata, in the center of the Osmore river valley; it is a natural fortress that includes more than 500 archaeological places of aproximately 10 000 years old and also there are the remains of an antique city and ceremonial rooms.

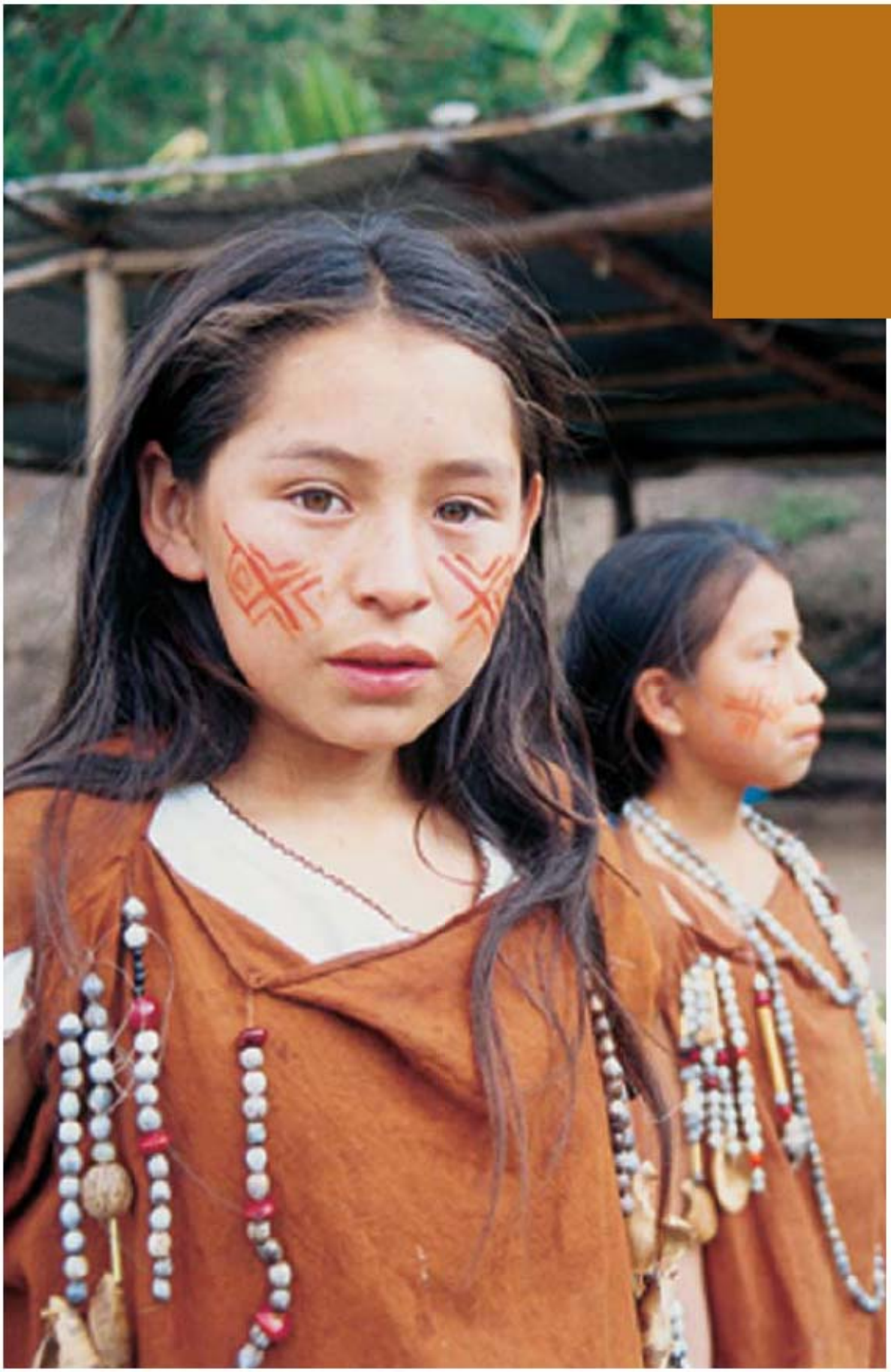
Punta Coles National Reserve

It is 7 km from Ilo. It is peninsula guanera, (where guano is deposited) the habitat of guanayes, piqueros, pelicans and the potoyunco. Here there also lives sea dogs and otters. To the north there is a stunning beach called Piedras Negras, with swells or tides and weak winds; to the south there are the beaches called La Poza de Lizas and La Curz, with moderate to strong swells, suitable for nautic sports.

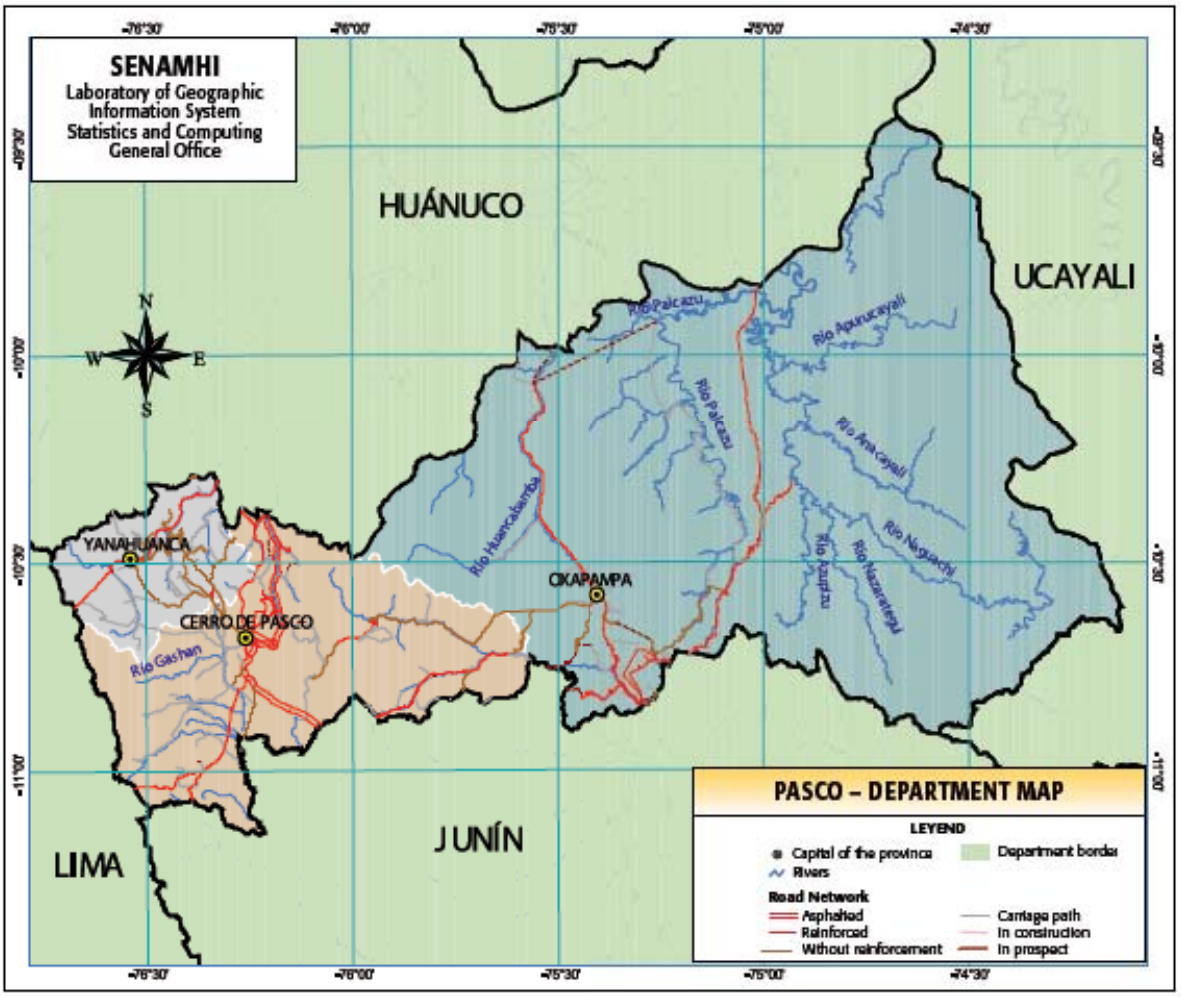
The charts show the hourly evolution of air temperature and relative humidity in the city of Moquegua for two typical days in the months of August and September.

THE PORT OF ILO

Ilo is a city located between two puntas or small peninsulas: Bombón and Coles. Because of their closeness to the sea, the humid air causes drizzles in the winter and a dense mist at dawn; which covers a great part of the coast and favors the growth of plants on the hills. Ilo is the first fishing and tourist port in the southern part of Peru.



Pasco


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing
General Office
HUÁNUCO
UCAYALI
JUNÍN
LIMA
YANAHUANCA
CERRO DE PASCO
OXAPAMPA
Río Gashan
Río Huancabamba
Río Palcazu
Río Apurucayali
Río Amacayali
Río Negro
Río Pichis
Río Nazareteyal
N
S
W
E
PASCO – DEPARTMENT MAP
LEYEND
Capital of the province
Rivers
Department border
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Pasco is located in the central part of Peru, it extends up to the eastern foothills of the front forest. Its geogaphy is formed by three large sectors: the andean, the eastern slopes and the high forest.

The andean sector includes the areas located in the southern and northern parto f the Huayhuash and La Viuda cordillera or mountain chain, it consists of snow peaks, pampas, lagoons and the Knot of Pasco.

Pasco has an extensio of 25 320 km², from which three-fourths correspond to the privince of Oxapampa, a rough jungle region, where there is located the Gran Pajonal.

The geographic relief of this department is of great singularity, because it is in this department where the hydrographic regime of the whole national territory is defined.

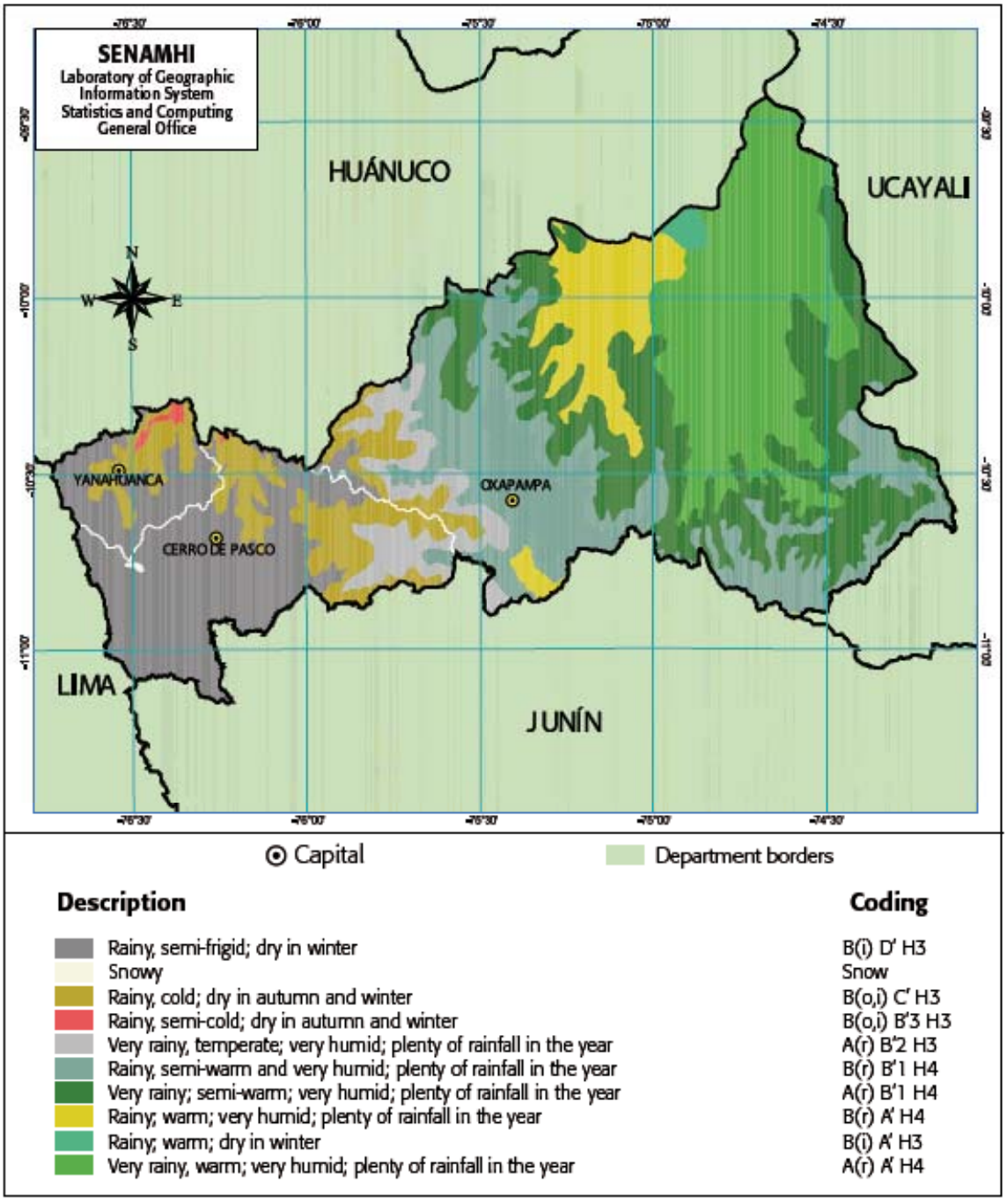
The sector of the eastern slopes is characterized because it shows a marked landscape contrast, mainly determined by the exposure to the humid eastern winds, from 5 000 m.a.s.l., to 1 500 m.a.s.l., It is a transition zone between the peaks and the high front forest.

Finally, there is the sector of the High Forest that extends to the east of the Oxampampa province, it is formed by covered hills, humid and rainy forests. The altitude of the department is between 300 m.a.s.l. (Puerto Bermúdez) and 4 333 m.a.s.l. (Chaupimarca).

CLIMATE CLASSIFICATION

According to the climate classifiation of Thornthwaite, the department of Pasco has a diversity of climates. The main climates are described:

A rainy, semi-frigid climate, with a relative humidity between 65% and 84%m dry in the summer. Corresponds to climate zones located in the provinces of Daniel Alcides Carrión and Cerro de Pasco.



A rainy, cold climate, with a relative humidity between 65% and 84%, dry in the autumn and winter. This climate corresponds to the provinces of Daniel Alcides Carrión and Pasco, and locations of Yanahuanca and Cerro de Pasco.

A very rainy, temperate, very humid climate, with plenty of rainfall throughout the year and in all the seasons. This type of climate is typical of locations as Pozuzo, Huancabamba and Villa Rica.

A very rainy, warm, very humid climate, with plenty of rainfall throughout the year and in all the seasons. This climate corresponds to the province of Oxapampa, and Puerto Bermúdez.

WEATHER AND CLIMATE

The sierra or mountain of Pasco is located relatively close to the Amazon region and due to the presence of the Knot of Pasco, (a huge elevation in the Andes

Cordillera or Mountain range, a place where the discharge of the waters is distributed into the different rivers that run to west, east, north and south); its weather is not too variable. The geographic configuration of the Knot of Pasco favors the convergence of the air flux (breeze of the vallye) during the day in high locations, causing the formation of cloud cover and rainfall, provinding there is enough humidity in the environment and atmospheric instability; which is evident due to the presence of abundant rainfall in the summer and even in the winter, as it can be seen in the chart corresponding to Cerro de Pasco. As in all the sierra or mountain region of Peru, the heaviest rainfall occurs between October and March, when the monthly accumulated amounts exceed 100 l/m², while from June to August the amounts vary from 20 l/m² to 40 l/m².

In the high andean plain (3 800 m.a.s.l.) it is frequent the occurrence of snowfalls during any period of the year. The strong winds occur in the winter months. The humidity is high during the rainfall period and not too low during the winter, as it does occur in the sierra or mountain region of the departments in the south of the country.

Temperatures decrease gradually with the altitutde, approximately 0,6 °C per 100 meters in the levels close to surface. In the low parts of the valleys daytime temperatures reach 30 °C, and at 4 000 meters, maximum temperature fluctuates around 12°C. Above this elevation, freezing temperatures after midnight are permanent throughout the year.

In the high forest, maximum temperatures fluctuate around 30 °C, and minimum around 20 °C. The annual range is minimum. There are some sudden and occasional drops of temperature in autumn and winter, when there is the incursion of cold and dry air masses coming form subantarctic latitudes or from the pampas of Argentina. Atmospheric humidity is high all year round, and the winds are generally weak, except when a storm is developing or when there is a "friaje". Rainfall occurs all year round, and from May to September they are less frequent; an important climate factor that significantly influences on the less frequency and amount of rainfall is the presence of mountain ranges at very high altitudes, north-south oriented or from northeast to southeast, in such a way that they prevent the entrance of humidity, coming from the east, into locations situated west of the mountain chain, as it happens with Oxapampa, since the Yanachaga cordillera or mountain chain (Yanachaga-Chemilén National Park) is located northeast of this town, with altitudes higher than 3 000 m.a.s.l. for this reason the annual accumulated rainfall do not reach 1 500 l/m², while east of the park rainfall exceeds 2 000 l/m².

TOURIST ATTRACTIONS

CERRO DE PASCO CITY

It is located at 4 338 m.a.s.l., and is the highest city in Latin America and the capital of mining activity in Peru. It has the most severe climate of all the cities in the country, with an average temperature of 8°C throughout the year. Its subsoil is one of the richest

in the worls, and it has been exploited since the pre-incas time.

It is a mining city with a frigid climate during most part of the year. The tourist attraction of this province is the Bosque de Piedras de Huayllay, a stone forest, situated southeast of Cerro de Pasco. It is a group of geological formations naturally carved by the combined erosional action of wind and rain.

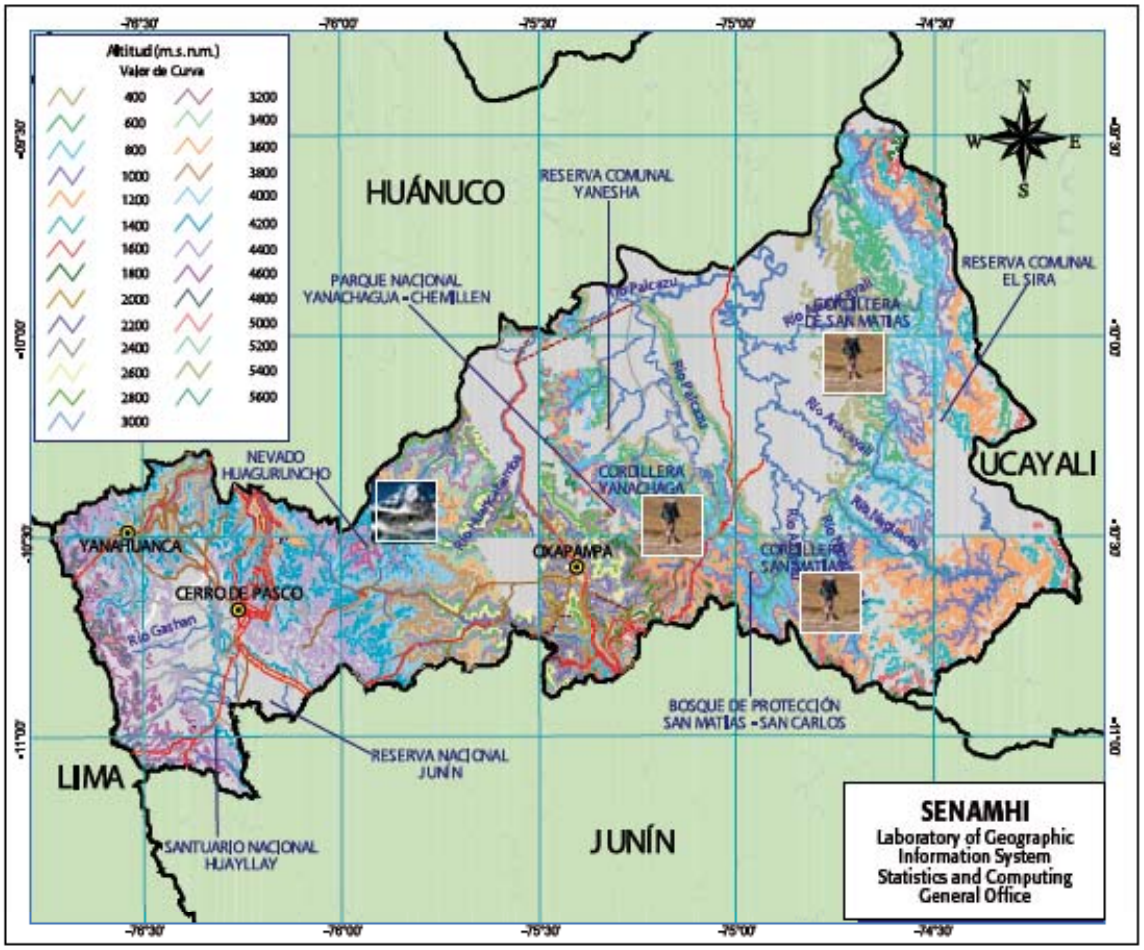
Temperatures fluctuate around 12°C. Night temperatures between April and November are generally negative, but very seldom they drop to -10°C. The sky in autumn and winter is frequently clear.

Traveling along the Carretera Central or Central Road, passing by the highest parts of the cordillera or mountain chain, (which is Tidio), travelers are affected by the "height sickness" or " mal de altura", because in the high andean plains the concentration of oxygen decreases in comparison to the amount of oxygen at sea level; thus, at 2 000 m.a.s.l., 3 000 m.a.s.l.and 4 000 m.a.s.l., there is 20%, 30% and 40% less amount of oxygen, respectively, This, as natural, affects the health conditions of some tourists.

The persons that have overweigth, or have high blood pressure, or drepanocutic anemia or have some cardiovascular conditions, must have a medical check up before planning a trip to places located at a high altitude. During the months of sparse cloudiness (May to October) in the sierra the atmosphere offers less protection against solar radiation, for which is advisable to use caps or protecting glasses.

OXAPAMPA

It was founded in 1891 by german inmigrants, who built their houses resembling the european style and they introduced modern farming practices as agroforestry techniques. The climate is very rainy, warm and plenty of rainfall, sunny and hot in the day and cool at night. The sky is rarely clear. The corresponding chart shows the variation of maximum, minimum temperature and average monthly rainfall in Oxapampa. In this province



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

is located the Yanachaga Chemillén Nacional Park, the Bosque de Protecciòn San Matías-San Carlos, the Llaneza Community Reserve and the El Sira Nacional Reserve, formed by forests, habitats of birds, such as the Gallito de las Rocas and plants as the orchid.

Chart 95 shows the hourly evolution of the temperature and relative humidity per hour in Oxapampa for a typical day in January and October 2003

TABLE 18
Sunrise and sunset hours and duration of daylight throughout a year
In Cerro de Pasco city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:54	06:06	06:09	06:09	06:13	06:20	06:24	06:17	05:59	05:41	05:32	05:38
Sunset	18:35	18:32	18:19	18:01	17:50	17:50	17:58	18:02	18:01	18:01	18:08	18:23
Time light	12:14	12:19	12:14	12:05	12:01	12:05	12:11	12:10	12:00	11:51	11:50	12:00

CHART 95
Extreme Temperature and Precipitation
Monthly average in Cerro de Pasco
(Lat 10º 41'S Long 76º15'W Alt 4 333 m.a.s.l)

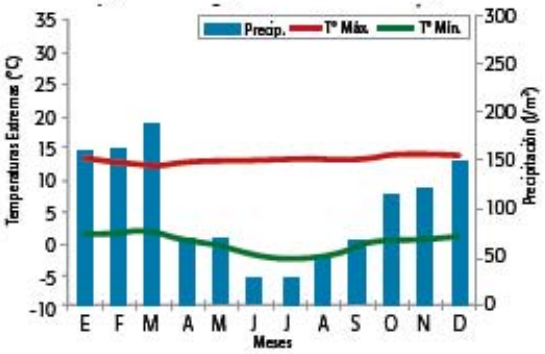


CHART 97
Extreme Temperature and Precipitation
Monthly average in Oxapampa

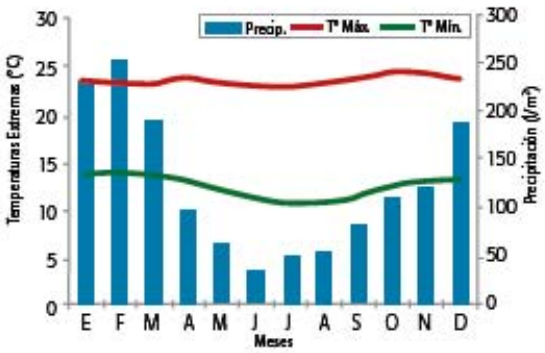


CHART 96
Daily minimum temperature and humidity in Oxapampa
02/09/2003
(Lat 17º39'S Long 71º21'W Alt 1 814 m.a.s.l.)

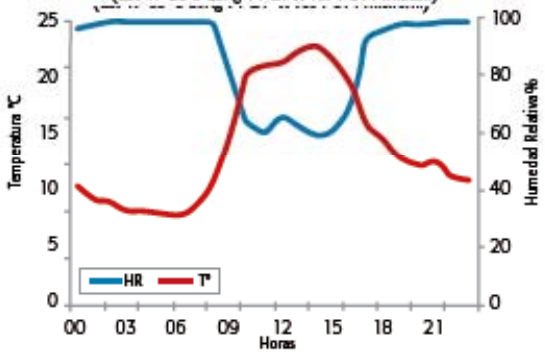
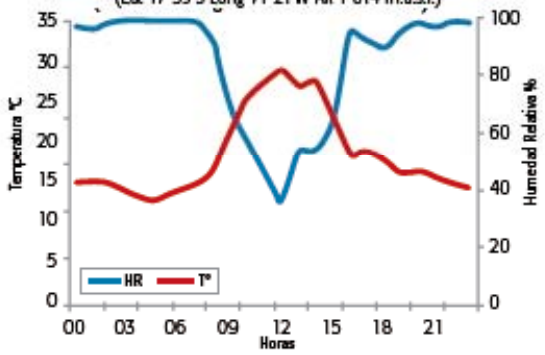


CHART 98
Daily maximum temperature and humidity in Oxapampa
25/10/2003
(Lat 17º39'S Long 71º21'W Alt 1 814 m.a.s.l.)



POZUZO

Situated at 76 km from Oxapampa, it was founded by settlers from Austria and Germany whose main activity was agriculture. The weather and climate are similar to the ones in Oxapampa

The district of Pozuzo is also known as "the promised land" and there you can visit the Francisco Shaferer Museum and Vogt, suspensión bridge, over the Huancabamba river, that was a present from the Emperor Guillermo I from Prusia in 1914

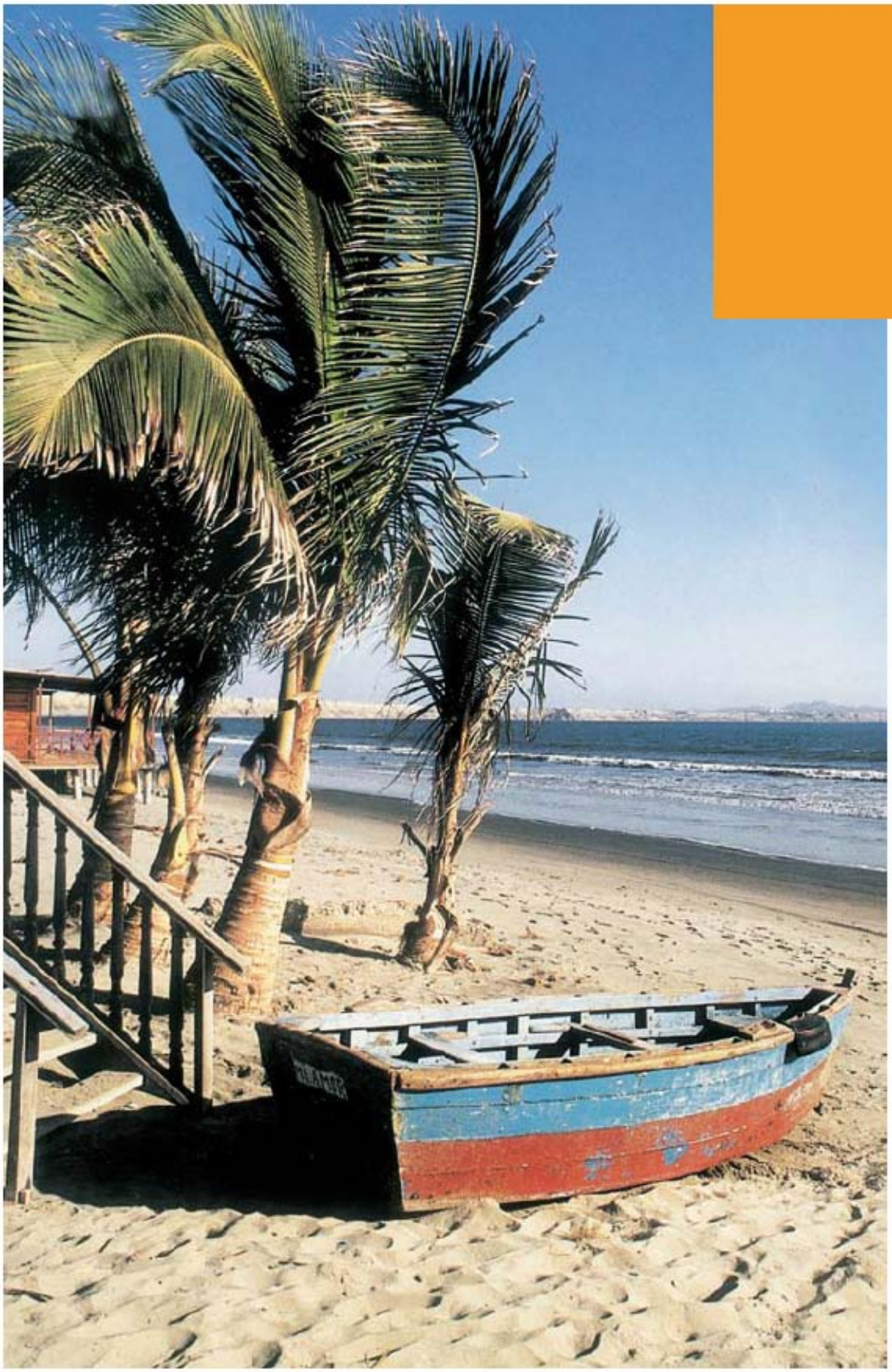
Maximum temperatures fluctuate around 30ºC and minimum around 20ºC.

VILLA RICA

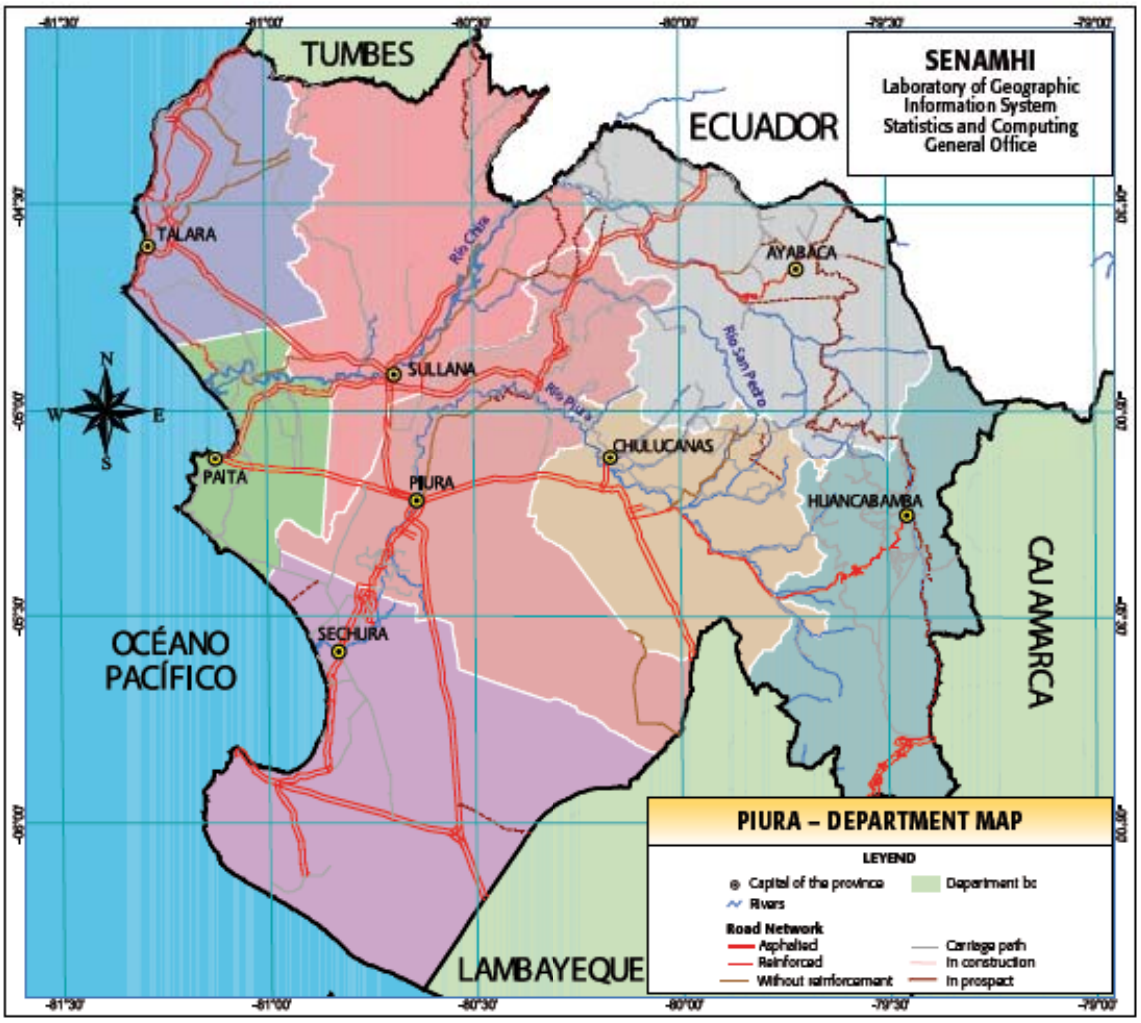
It was founded by italian settlers, it is located 51 km from La Merced. It is considered as the capital of coffee, and it is a city especially attractive for ecological tourism, because it offers very pleasant climate and landscapes. Highest temperatures fluctuate around 30 ºC.

BERMÚDEZ PORT

It is situated at the Pichis river banks, and its population main activity is cattle farming and apiculture. From this city you can visit, sailing along the Pichis river, some native communities as the campas from San Juan, passing by some stunning waterfalls. Its weather is typical of the high forest region, with daytime maximum temperatures that generally oscillate around 30 ºC and minimum around 20 ºC.



Piura


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
TUMBES
ECUADOR
TALARA
AYABACA
SULLANA
CHULUCANAS
PAITA
PIURA
HUANCABAMBA
SECHURA
OCÉANO PACÍFICO
CAJAMARCA
LAMBAYEQUE
Río Chira
Río Piura
Río San Pedro
N
S
E
W
PIURA – DEPARTMENT MAP
LEYEND
Capital of the province
Department bc
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

Piura is located in the northeastern part of the country, it is bounded to the north by Tumbes, and the Republic of Ecuador, to the east by Ecuador and the department of Cajamarca, to the south by Lambayeque and part of the Pacific Ocean, that flows along its coast

Two of its eight provinces belong to the sierra or mountain: Ayabaca and Huancabamba; three belong to the coast: Paita, Talara and Sechura; two are located in the plains: Piura and Sullana, and the province of Morropon includes coast and sierra. Its territory is traversed, from north to south, by the most extensive desert strip called Sechura; in the middle and low Piura there are located extensive pampas watered by the Chira and Piura rivers. It has a coastal cordillera o mountain chain, represented by the Amotape Hills. To the east it is located the inter-andean and high andean cordillera or mountain chain.

CLIMATE CLASSIFICATION

According to the climate classification of Thornthwaite, the department of Piura has a diversity of climates, the most important are:

An arid, semi-warm climate, with an average relative humidity of 85% with absence of rainfall throughout the year. This climate correponds to locations such as Talara, Paita and Sechura.

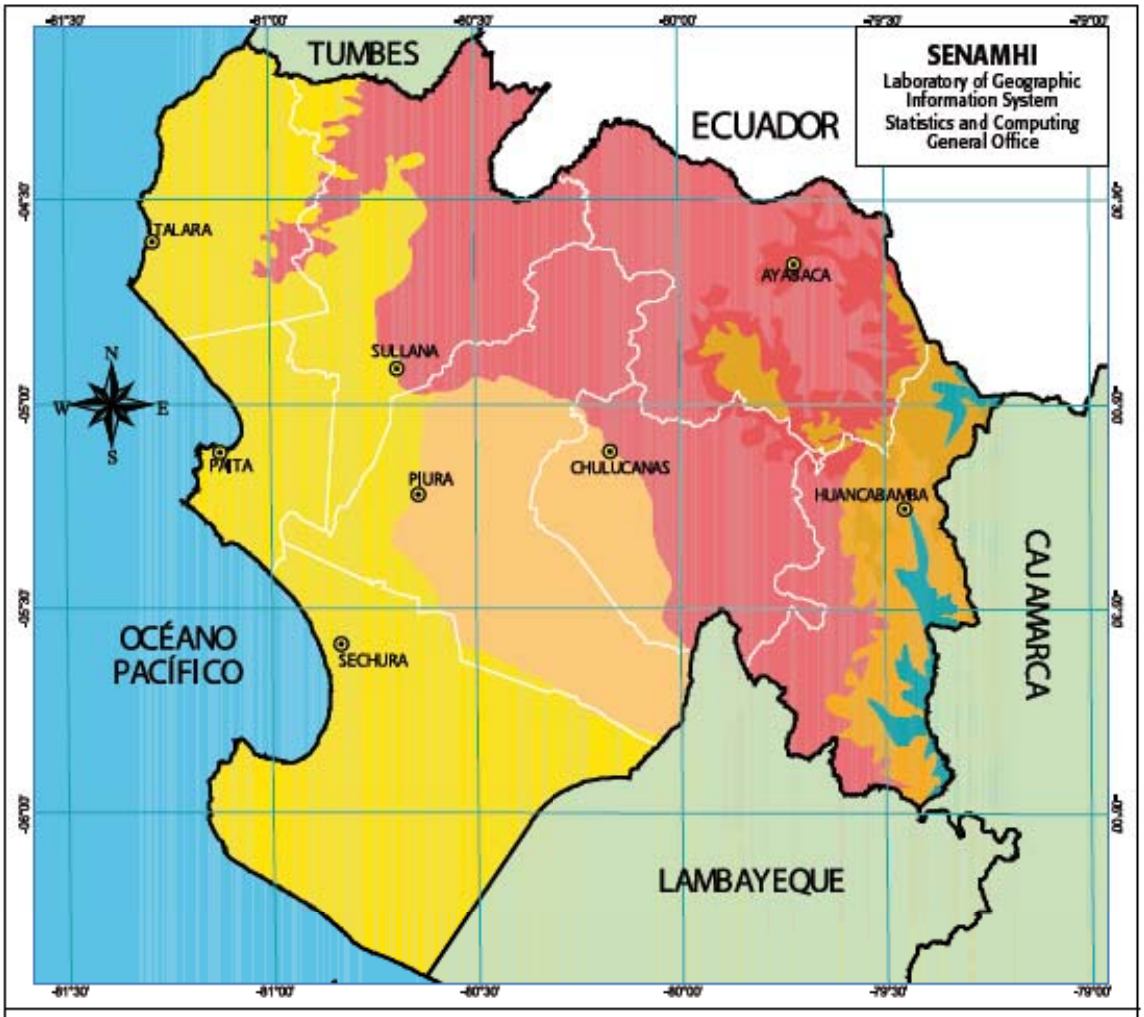
An arid, warm climate, with an average relative humidity of 64% with absence of rainfall in all the seasons of the year. This type of climate is typical of areas located in Piura, Chulucanas and Morropón.

An arid, warm climate, with a relative humidity of 84% with absence of rainfall throughout the seasons of the year. This type of climate is typical of locations such as Sullana, Bellavista, Morropón and Ayabaca.

A semi-dry, temperate climate, with an average relative humidity of 64% and absence of rainfall in autumn, winter and spring. This type of climate corresponds to locatiions in the province of Huancabamba.

WEATHER AND CLIMATE

The departments of Piura, Ucayali and San Martin show the highest temperature values in Peru. Due to the slight variation in the relief of the coast of Piura, it shows similar average extreme temperature values; thus, temperatures in the locations near the coastline are similar to the locations situated at 50km or 100 km inside the department. The daily range (maximum temperature – minimum temperature) fluctuate around 10°C, it tends to be slightly higher in the summer. In the locations near the coastline, the thermoregularing effect of the ocean, is evident because maximum temperatures are slightly lower in the locations near the ocean. This is due to the marine breeze that intensify, transporting cold humid air towards the coastline, so the range of the temperatures, compared to the ones in the locations inside de department, are lower; thus, in Paita and Talara the range is approximately 9°C while in Piura it is 13°C.



⊙ Capital Department borders

Description	Coding
Arid, semi-warm and humid, rainfall shortage in all seasons	E(d) B'1 H3
Arid, warm and dry, rainfall shortage in all seasons	E(d) A' H2
Arid, warm humid, rainfall shortage in all seasons	E(d) A' H3
Rainy, semi-cold and humid, with dry autumn and winter	B(o,i) B'3 H3
Semi-dry, semi-cold humid, with dry autumn and winter and rainfall shortage	C(o,i,p) B'3 H3
Semi-dry, temperate and humid, with dry autumn and winter and rainfall shortage	C(o,i,p) B'2 H3
Semi-dry, warm and humid, with dry autumn and winter and rainfall shortage	C(o,i,p) A' H3
Rainy, temperate and humid, with dry winter	B(i) B'2 H3

CHART 99
Extreme Temperature and Precipitation
Monthly average in Talara
(Lat 04°34'S Long 81°16'W Alt 50 m.a.s.l.)

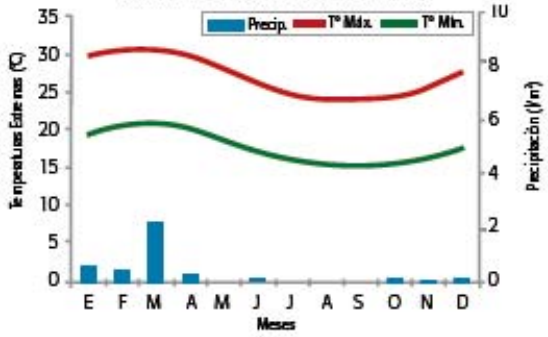


CHART 100
Extreme Temperature and Precipitation
Monthly average in Huamarca
(Lat 05°14'S Long 79°31'W Alt 2 100 m.a.s.l.)

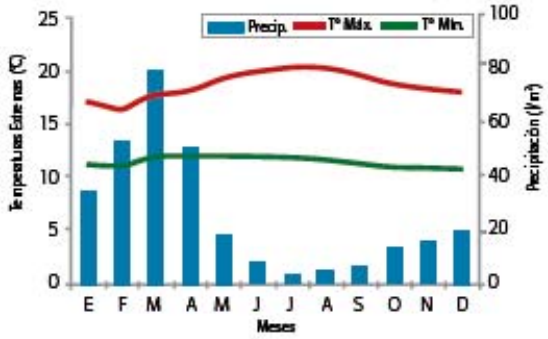


CHART 101
Hourly maximum temperature and humidity in Paita
01/03/2003
(Lat 05°05'S Long 81°07'W Alt 6 m.a.s.l)

CHART 102
Sea surface temperature in Piura beaches

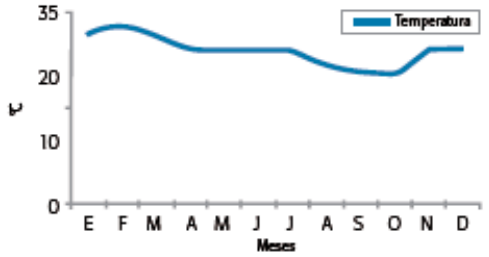


CHART 103
Extreme Temperature and Precipitation
Monthly average in Talara
(Lat 05°12'S Long 80°37'W Alt 49 m.a.s.l.)

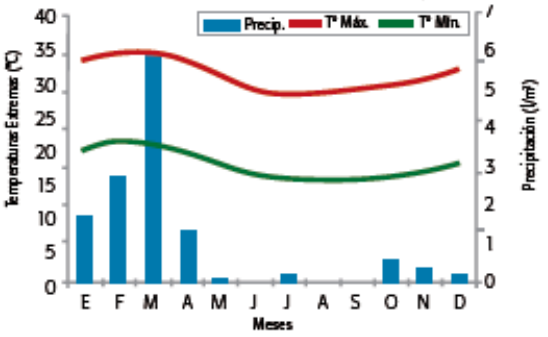


CHART 104
Extreme Temperature and Precipitation
Monthly average in Huancabamba
(Lat 05°23'S Long 79°29'W Alt 1 552 m.a.s.l.)

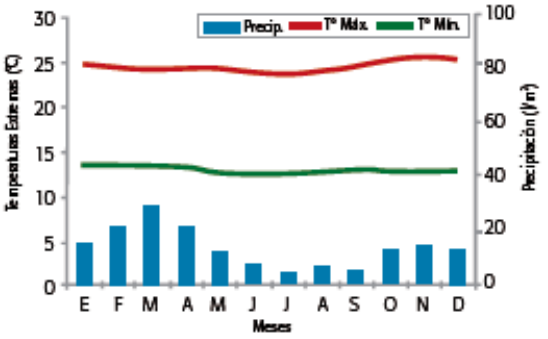


CHART 105
Hourly maximum temperature and humidity in Paita
02/07/2003
(Lat 05°05'S Long 81°07'W Alt 6 m.a.s.l)

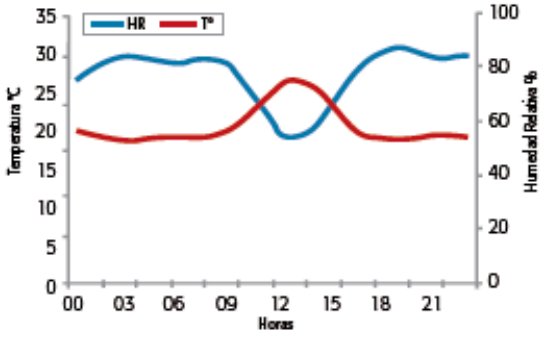


TABLA 19
Sunrise and sunset hours and duration of daylight throughout a year in Piura city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	6:20	6,28	6:27	6:23	6:22	6:28	6:33	6:29	6:16	6:02	5:57	6:05
Sunset	18:44	18:45	18:35	18:22	18:15	18:18	18:24	18:25	18:20	18:15	18:18	18:30
Time light	12:32	12:37	12:31	12:23	12:19	12:23	12:28	12:27	12:18	12:08	12:17	12:18

In general, the highest temperatures occur between the months of February and March, with maximum values higher than 30°C and minimum values around 21°C. In the winter, maximum temperatures in locations close to the coastline fluctuate around 25°C, and inside the contintent are slightly higher. It can be stated that in these locations the temperatures in the winter are similar to the summer temperatures in Lima.

In the sierra, the climate shows some regional variations as a result of altitude. Thus, temperature depends on the altitude of the locations, the cloud cover and mainly of water vapor content in the atmosphere (dryness). This causes that higher daytime values are registered in the months of July, August and September. The lowest night temperatures (minimum) occur in the rainfall period from January to April, as it can be seen from the Charts 102 and 98, corresponding to the locations of Huancabamba and Huamarca. In these places, minimum temperatures are constant throughout the year.

In certain locations of the desert, during the summer and when the atmosphere is very stable (calm or very light wind), daytime temperatures can occasionally reach 39°C at the meteorological station (1.50 m). On the sand surface, temperature can exceed 50°C toward midday.

In the coastal strip, rainfall occurs generally in the summer months, including April. When a moderate-to-strong intensity El Niño event occurs, the amount of rainfall in 24 hours can exceed 100 l/m², especially in locations such as Morropón, Chulucanas and Santo Domingo.

Relative humidity in coastal locations is moderate, due to the turbulent mixture that occurs when the trade winds and the marine breeze are intensified. It slightly increases in the winter, while inland, as in the Piura city, this variable at midday drops to 50% or less every day of the year. When a moderate-to-strong El Niño occurs, humidity increases up to values higher than 85%. This together with high temperatures causes the weather to be hot and suffocating.

Sea water temperature at the beaches of the department is influenced by the intensity of swell, (mixture) and by the ocean currents that prevail in a determined period; so in the summer, and when the El Niño current is present in the northern beaches of the department, temperatures increase to 22°C or 23°C and in the winter they drop to 16°C, but they are also influenced by the intense upwelling that occur between 5° and 7° south latitude. There is sun bright all year round, in these beches, swell is weak and occasionally there are moderate to strong winds. During the winter, the water is not too transparent in the southern beaches.

The charts show the hourly variation of temperature and relative humidity for two typial days of March and July in Paita..

Sun bright in the coast of Piura is almost permanent, except for short period in the months of winter, when the sky is covered by stratiform clouds during the night and early morning hours. Int the sierra, from January to April, cloud cover is permanent and it descreases form May to December. In the sierra, the air is dry in the months of winter and humid in the summer months.

In general, it can be stated that the weather and climate in the department of Piura are influenced by two ocean systems: the cold Humboldt current and the warm current of the El Niño phenomenon

Th Humboldt current is associated to the process of upwelling, that means, the raising of sub-surface water to the surface, that flow along the coastline of Piura before they divert to the west, cooling the air in contact with the surface water. This process limits convection. Howeveer, in the summer time, when upwelling process decreases, water temperatures rises, atmospheric pressure diminish and there is a flux of humidty from the east to the cordillera, where atmospheric conditions are suitable for the occurrence of rainfall.

In times of a strong El Niño evento, in some locations (Morropón and Chulucanas) rainfall values reach 3 000 l/m2, which affects the marine and terrestrial ecosystems, among others.

The high reflectivity of certian sandy soils in the Low Piura cause visual disruptions, for which it is necessary to use glasses.

TOURIST ATTRACTIONS

The department of Piura, has a coastline that include bays, peninsulas, puntas (small peninsula) and capes, which constitute an attractive landscape of natural beauty, essential for tourism, such a the Sechura Bay, Punta de Foca, Punta Aguja and Punta Pariñas.

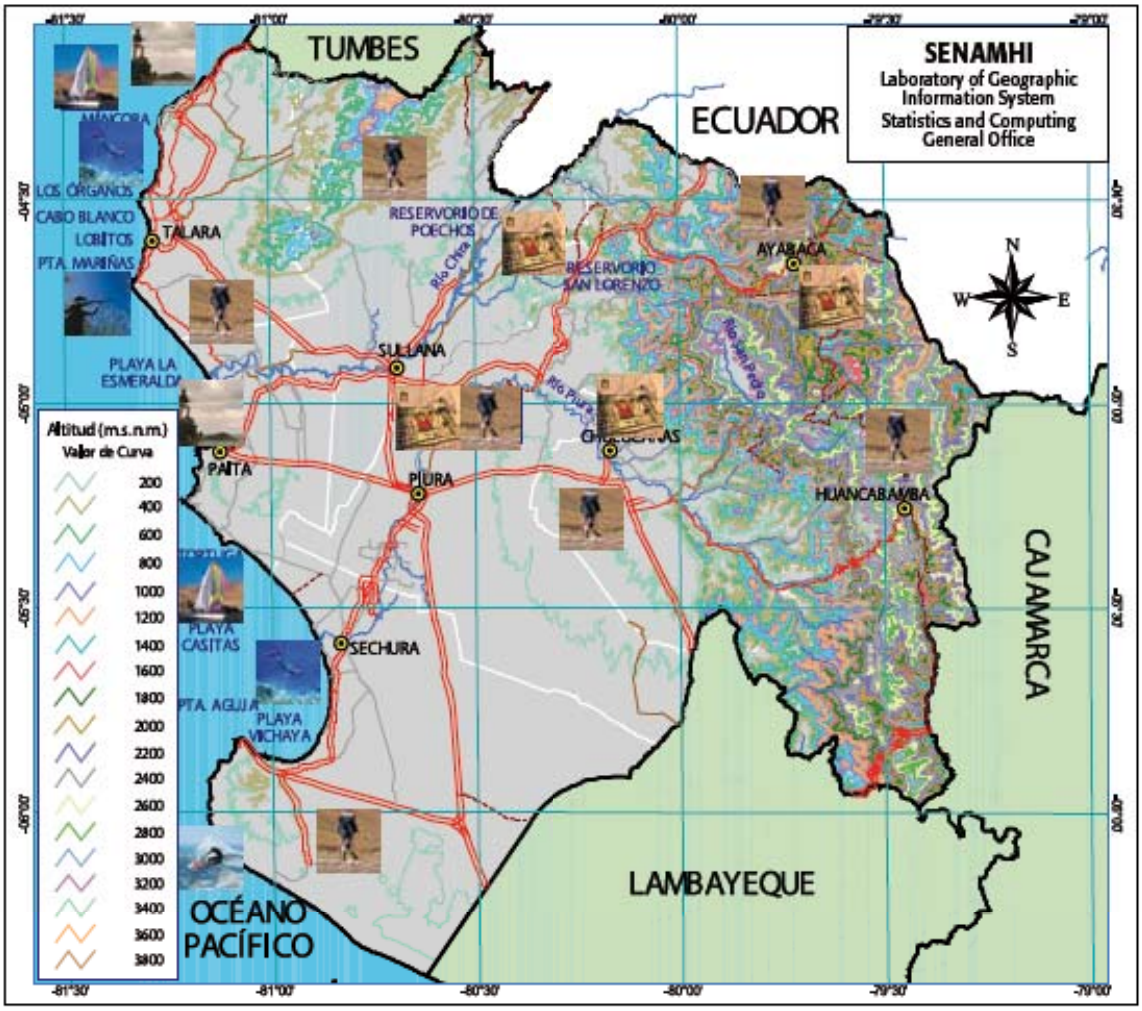
The La Chira river forms a delta between Vichayal y Colán, south of the delta there are located the Bay and Port of Paita, with many islands and islets laved by ocean waves. The Port of Paita is the warmest port in Perú.

The cove of Màncora is followed by a series of gullies and large marine terraces, from which the most importants are: Los örganos, and la Punta de Cabo Blanco, which is a small peninsula, then there are the Lobitos, Talara, Negritos and Pariñas Bays.

SULLANA

It is a province with a warm climate, that produces rice, cotton and fruits. Sullana is located in a narrow strip of land, compared to an inclined plane, its highest point is located at he Plazuela Chica and its deepest depression in the Cementery.

Among its tourist attractions we can mention the El Angolo Game Preserve, a protected zone of wild fauna, situated in the province of Sullana. It is an area of natural beauty that belongs to the dry forests



⊙ Province Capital

Rivers

— Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

of the norhteast of Peru. This reserve is the habitat of mamal species such as the grey deer, the puma, the white-naped squirrel and also reptiles and birds. Regarding the fauna, there are species such as the angolo, the cock spur coral tree, the carob tree, and the hualtaco.

The Chira river valley, with many palmtrees, it is ideal for aquatic sports and trips. The Poechos reservoir, situated in the district of Lancones, was built to promote agricultural development in the Low and Middle Chira valley. This reservoir is a stunning water mirror suitable for fishing, specially paiche and sea bass. Temperatures are similar to the ones registered in Piura.

TALARA

Province of the coastline, it has a territory consisting of large marine terraces and carob tree forests that grow in the dry ravines.

Its climate is hot during the summer with maximum and minimum temperatures of 32 °C and 23 °C, respectively. In Talara there are beautiful beaches such as Máncora, Las Pocitas, Vichayito, Los Órganos,

El Ñuro, Cabo Blanco, Lobitos, Punta Lobos, Malacas, Punta Pariñas and Punta Balcones. In the winter temperature is approximately 05 °C less.

PAITA

It is located betwee Talara and Sechura. Its geography is traversed by the Chira river, that as it flows forms the San Pedro mangrove swamp. In Paita extreme temperatures in the summer are 32 °C and 22 °C and an intense sun bright in the beaches of La Bocana, Colán, Yasila, Cangrejos and la Casita.

SECHURA

Sechura is laved by the coastline, and its largest desert territory in Peru. The weather is hot in the summer an relative humidity is moderate. The weather in the winter is similar to the summer time in Lima city. To the south it is located the Virrilá estuary, a shelter for migratory birds.

This province is located in the Sechura desert, it has a undulating relief due to the presence o a huge number of dunes of different sizes. However, it is not absolutely a desert, because the water of the underground has originated beautiful and strange vegetation that are observed, and the most outstanding are the small forest of carob trees.

The beaches in this province are: San Pedro, Los Barrancos, Vichayo, Tic Tac, Nomura, Punta Arenas, Punta Negra, etc. Extreme temperatures in the summer oscillates around 35 °C and 22 °C, respectively.

MORROPÓN

It is situated north of Piura, and its physiography is divided by the Piura river (the largest and plentiful river of the Pacific basin) It has a warm climate with extreme maximum and minimum temperatures of 29°C and 19°C in the summer; it consists of desert super-arid tripical zones, arid desert, and tropical jungel, with vegetations of the kind that are grown in the coastal aera, and a dry forest. Its main tourist attractions, besides the well-known ceramic of Chulucanas, are the antique city of Piura and the archaeological ruins of Vicús.

AYABACA

Is situated at the westernmost part of the Andes, at 2 715 m.a.s.l., it is bordered by the Republic of Ecuador. The weather is pleasant at midday, with extreme temperatures of 22 °C and 12 °C. Rainfall occurs between January and April On October 13 is the feast day for the pilgrimage of tourists and relious congregation to the Sanctuary of the Señor Cautivo, also known as El Cristo de los Andes

HUANCABAMBA

It is located between the western mountain chain, the Tabacones mountain chain and the eastern slopes of the Andes; up in its summits the Huamcabamba river rises, which is a tributary to the Marañon river.

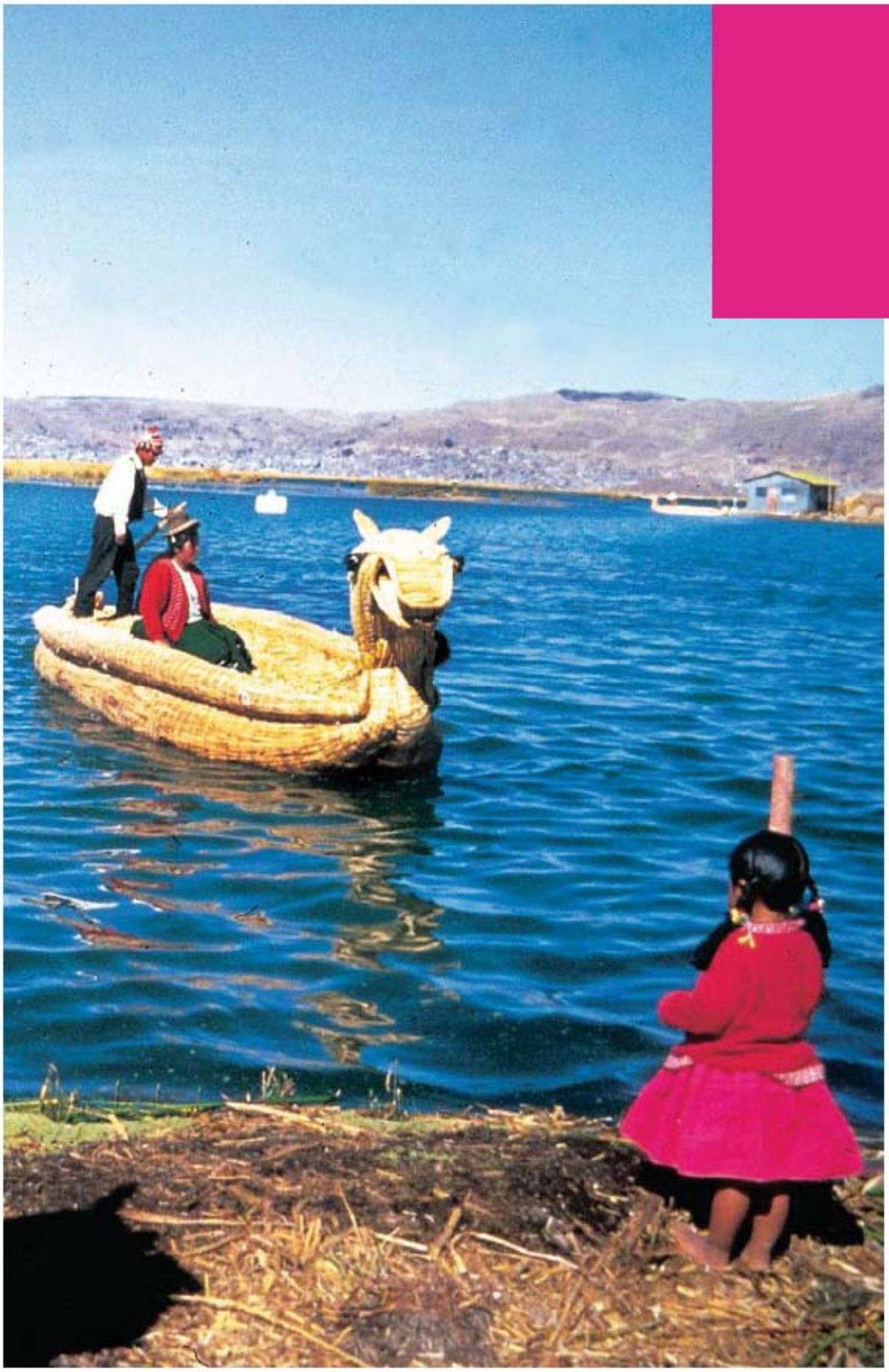
Its famous lagoons, called "Huaringas", are located in the high zones of Huancabamba. These lagoons are famous for their healing properties, they are the point of meeting of wizards, healers and chamanes from all over the country, that get there looking for magical visions that would help them to do their job.

The 14 lagoons are in the north of the province at 395 m.a.s.l. The most visited are Shimbe and La Negra, in which the patients submerge totally naked.

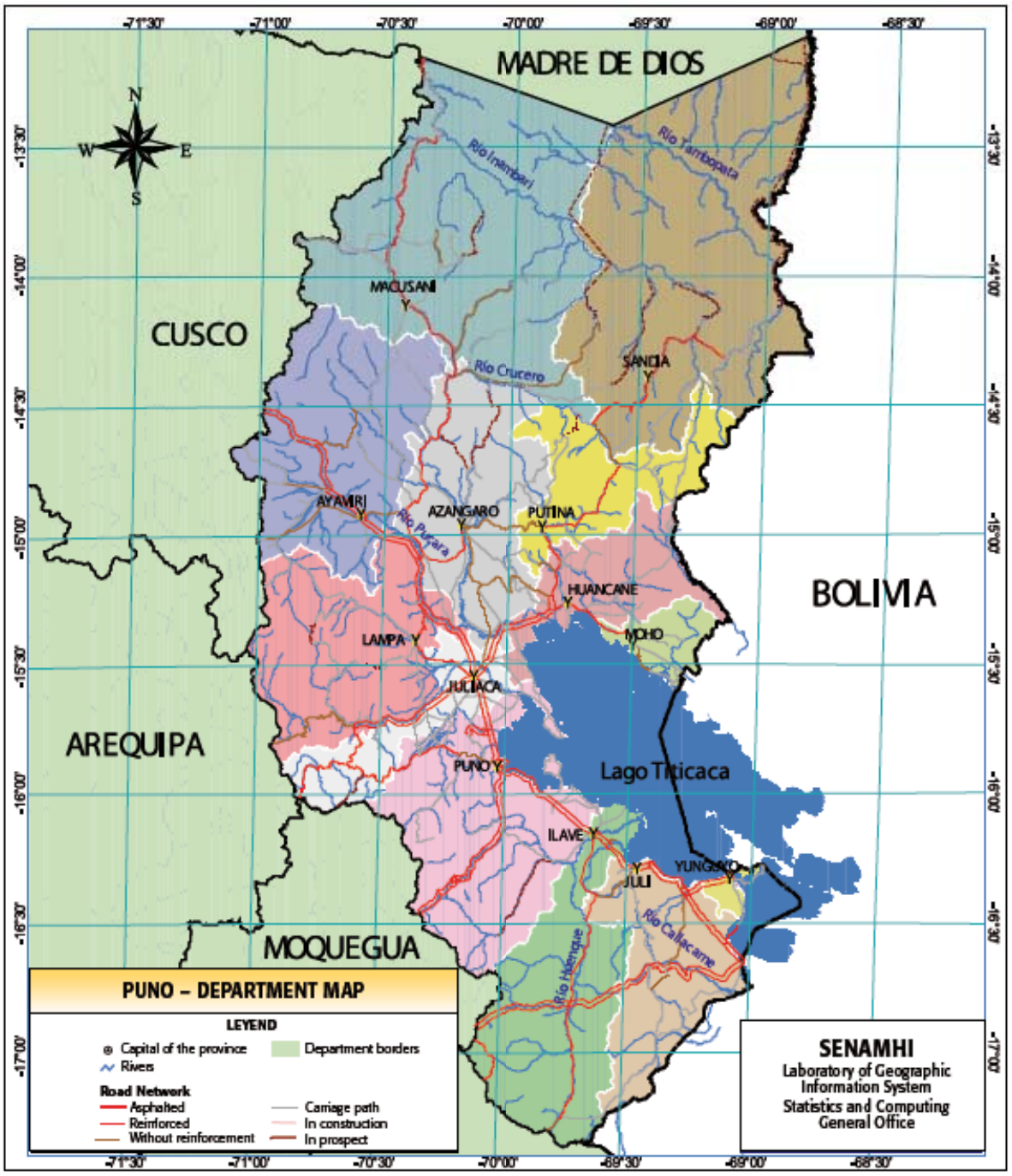
The weather is pleasant, with extreme temperatures of 27 °C and 13 °C in october and november, months in which the highest daytime values are registered and rainfall is from 3 to 29 l/m².

PIURA, THE CAPITAL

The province of Piura is located in the central part of the Sechura desert, on the right bank of the Piura river. Its climate is hot and dry at midday, during the summer, spring and autumn. There is absence of rainfall throughout the year, except for periods of El Niño event, when rainfall reaches up to 1 500 l/m² from January to April. Extreme temperatures are 33 °C and 23 °C in the summer, in the winter they fluctuate around 25 °C and 16 °C maximum and minimum respectively.



Puno


MADRE DE DIOS
CUSCO
BOLIVIA
AREQUIPA
MOQUEGUA
Lago Titicaca
Río Inambari
Río Tambopata
Río Crucero
Río Pinipara
Río Huenque
Río Callacame
MACUSANI
SANDIA
AYAVIRI
AZANGARO
PUTINA
HUANCANE
MOHO
LAMPA
JULIACA
PUNO
ILAVE
YUNGUYO
JULI
-71°30'
-71°00'
-70°30'
-70°00'
-69°30'
-69°00'
-68°30'
-13°30'
-14°00'
-14°30'
-15°00'
-15°30'
-16°00'
-16°30'
-17°00'
N
W
E
S
PUNO – DEPARTMENT MAP
LEYEND
Capital of the province
Department borders
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office

GEOGRAPHY

Puno lies on the south-southeast region of Peru. Its geography consists of three vast high andean plains. that surround the Titicaca Lake, the highest nivigable lake in the world, at 3 800 m.a.s.l., which is 280 m depth. Its location in the central region of the Andes mountatins forms the huge plateau known as "Meseta del Collao", which is constituted by a diversity of ecosystems that are located from the snowpeaks down to the hot tropical valleys. The Ramis, Ilave and Coata rivers flow into the Titicaca Lake basin.

CLIMATE CLASSIFICATION

Puno is a region with a variety of climates. According to Thornthwaite classification, it has the following main types of climates:

A very rainy, warm climate, with plenty of rainfall throughout the year and a relative humidity classiffied as very humid. This type of climate is typical of the eastern part of Sandia province.

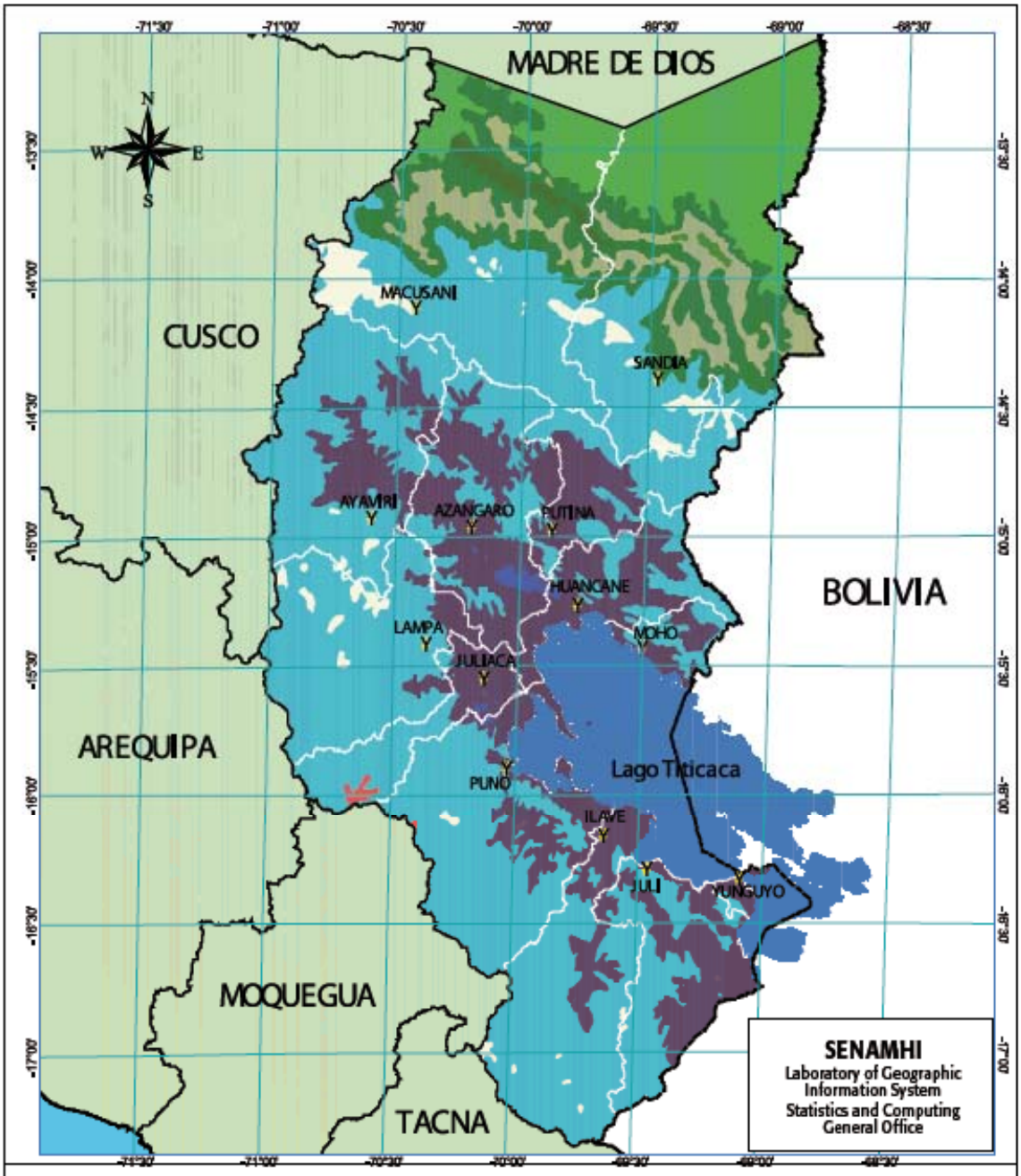
A rainy, semi-warm, temperate climate, with plenty of rainfall during all the season. This type of climate corresponds to areas located in the eastern slope of the province of Sandia.

A semi-dry, cold climate, dry in autumn and spring. Corresponds this type of climate to most part of the territory in this department, such as in the provinces of: Lampa, Melgar, Carabaya, Azángaro, San Antonio de Putina, Puno, Collao and Chucuito.

WEATHER AND CLIMATE

The climate in Puno and in all the locations that surround the Titicaca Lake are strongly influenced by the thermoregulating effect of the waters of the lake. This effect can be seen specially in the nearest locations to the lake, and during the nights, as it can be seen form the charts for maximum and minumum temperature and average monthly rainfall corresponding to the cities of Punto, Yunguyo and Arapa, where the lowest temperatures reach -1,0 °C, -2,0 °C and -1,0 °C respectively, for July, month in which the average maximum temperatures are also the lowest, they fluctuate around 15 °C in all the locations situated in the surrounding of the lake and in islands of the same lake.

The sensation of coldness depends if the person is standing under the sun or under the shade, since the simple displacement of clouds can diminish solar energy.



⊙ Capital

Department borders

Description	Coding
Rainy; semi-cold and humid; dry in autumn and winter	B(o.i) D' H3
Snowy	Snow
Semi-dry, cold, dry in the year	C(o,i,p) C' H2
Semi-dry, cold, dry in autumn and winter	C(o.i) C' H2
Lake	Lake
Very rainy; semi-warm and very humid, with plenty of rainfall in the year	A(r) B'1 H4
Rainy, temperate and humid, with plenty of rainfall in the year	B(r) B'2 H3
Lluvioso; cálido y húmedo; con abundante lluvia en el año	B(r) A' H3
Rainy, warm and humid, with plenty of rainfall in the year	A(r) B'2 H3
Very rainy, warm and very humid, with plenty of rainfall in the año	A(r) A' H4
Titicaca Lake	

CHART 106
Extreme Temperature and Precipitation
Monthly average in Puno
(Lat 15º25'S Long 70º00'W Alt 3 875 m.a.s.l)

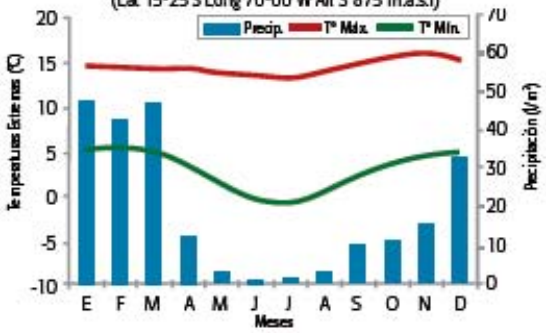


CHART 107
Extreme Temperature and Precipitation
Monthly average in Arapa
(Lat 15º08'S Long 70º07'W Alt 3 880 m.a.s.l)

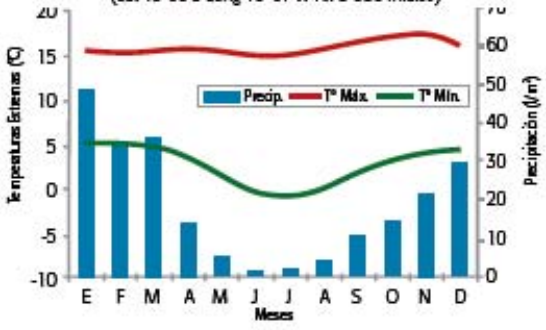


CHART 108
Extreme Temperture and Precipitation
Monthly average in Juliaca
(Lat 15º28'S Long 70º09'W Alt 3 824 m.a.s.l)

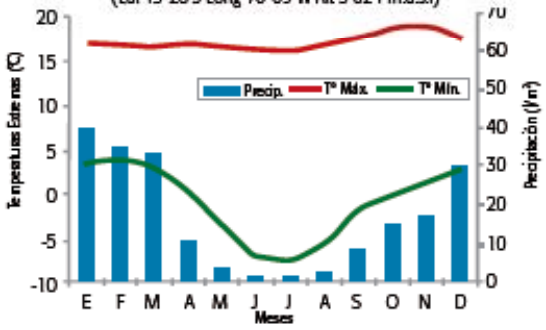


CHART 109
Hourly maximum temperature and humidity in Ayaviri
07/08/2003
(Lat 14º53'S Long 70º35'W Alt 3 906 m.a.s.l.)

CHART 110
Extreme Temperature and Precipitation
Monthly average in Moyobamba
(Lat 06º02'S Long 76º58'W Alt 860 m.a.s.l.)

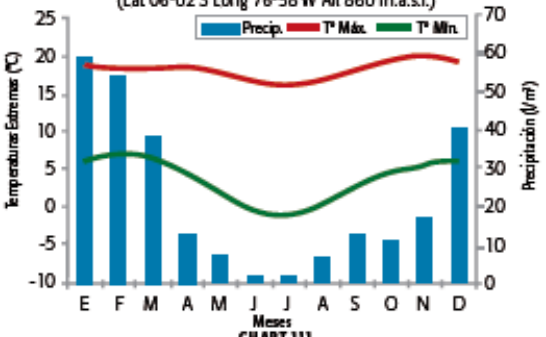


CHART 111
Extreme Temperature and Precipitation
Monthly average in Ayaviri
(Lat 14º53'S Long 70º35'W Alt 3 906 m.a.s.l.)

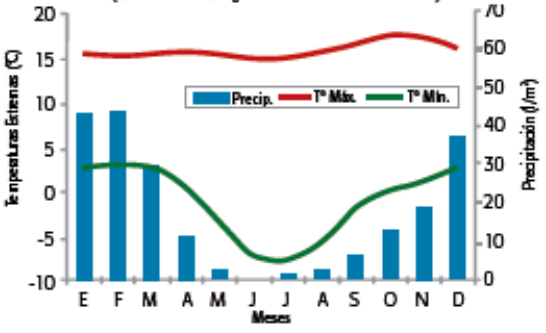


CHART 112
Extreme Temperature and Precipitation
Monthly average in Lampa
(Lat 15º22'S Long 70º23'W Alt 3 852 m.a.s.l.)

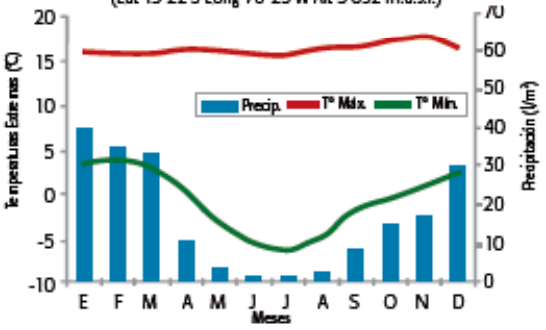


CHART 113
Hourly minimum temperature and humidity in Ayaviri
05/08/2003
(Lat 14º53'S Long 70º35'W Alt 3 906 m.a.s.l.)

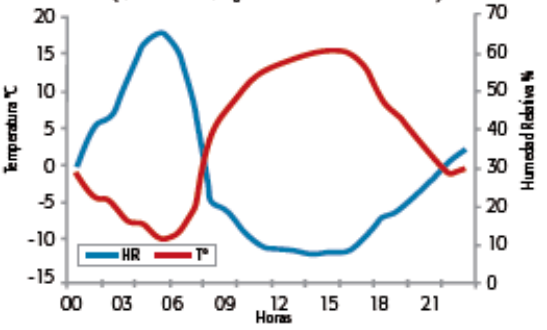


TABLA 20
Sunrise and sunset hours and duration of dayfight throughout a year in Puno city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:22	05:37	05:44	05:48	05:55	06:05	06:08	05:58	05:36	05:14	05:00	05:04
Sunset	18:18	18:12	17:55	17:33	17:19	17:17	17:25	17:33	17:36	17:39	17:50	18:07
Time light	11:50	11:55	11:50	11:41	11:37	11:41	11:47	11:45	11:36	11:26	11:25	11:36

In places located far from the lake, average minimum temperatures are much lower; thus, in Ayaviri, Juliaca, and Lampa, the lowest average minimum temperatures in July -8,0 °C, -8,0 °C and -7,0 °C respectively; between June and August, minimum temperatures of -10 °C and -15 °C occur more frequently, even -20 °C in places situated on the boudaries with Bolivia.

In November the highest daytime temperatures are registered due to the sparse cloud cover and to a greater amount of incident solar radiation that reaches this latitudes for the apparently movement of the Sun towards the south. In the surrounding of the lake, average maximum temperature oscillates around 16 °C, as it can be seen from the charts corresponding to Puno (Chart 104) and Yunguyo; while in places located far Hawai form the lake such as Juliaca (chart 106), and Ayaviri (chart 109), average maximum temperatures reach 18 °C; in October and November, occasionally temperatures exceed 20 °C.

Rainfall is limited to the period between Dicember and March, months in which it rains 70% of the total annual (see previous charts). Rainfall mostly occur during the last hours of the day and they are generally moderate; occasionally there is rainfall occurence associated to lightning and hailstorms.

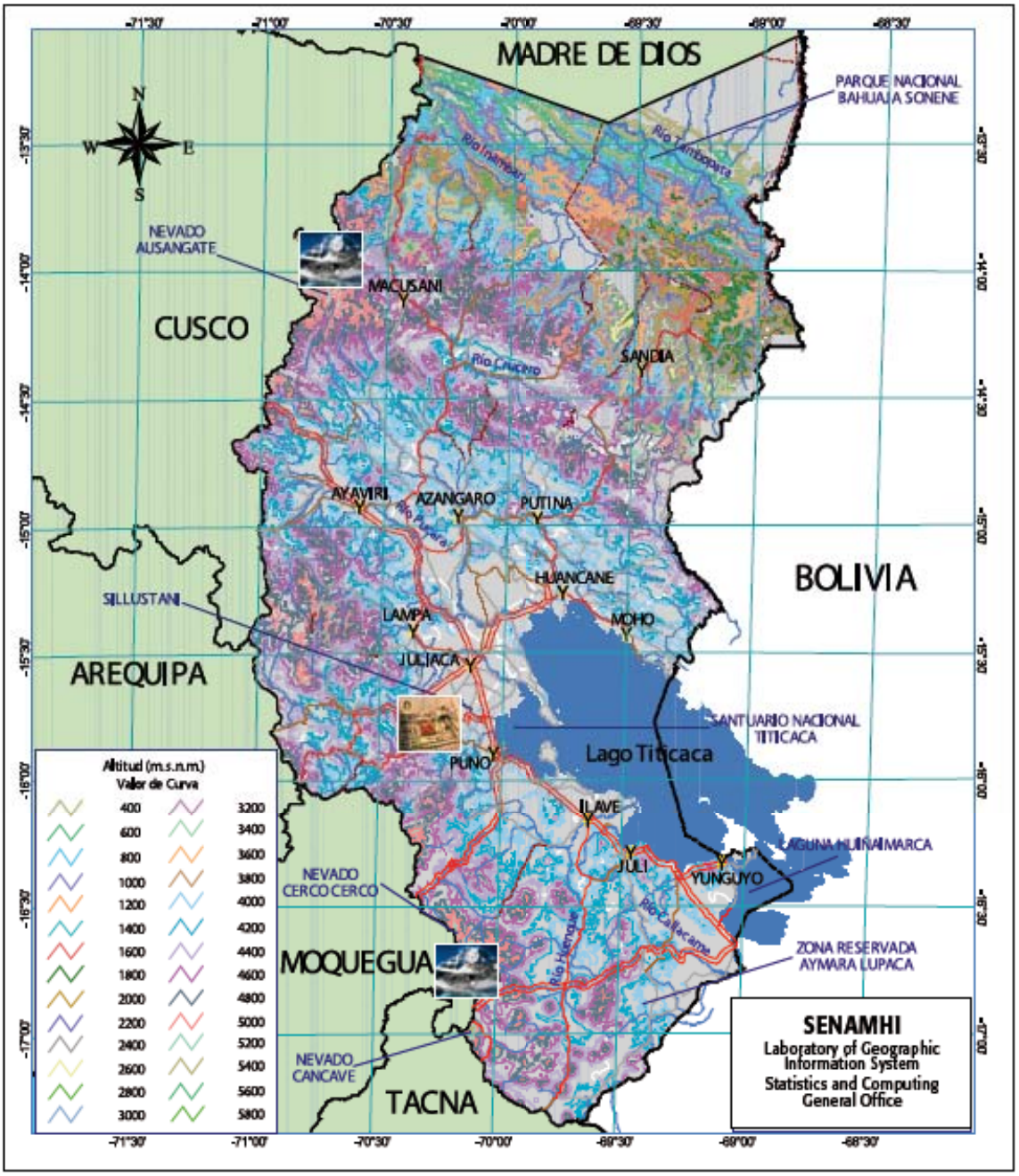
In the winter, precipitation is scarce and mostly solid (snow and hail); sporadically it is intense when cold and dry air masses from middle latitudes enter the atmosphere, that when interacting with warm and humid air from the tropical region, they give rise to these hydrometeors. Relative humidity from May to November during the day, reaches 20% or less. Likewise, winds intensifiy from July to September , it could some gusts reaching 20 m/s or more. During the night, winds are generally light.

The Titicaca Lake has a total surface of 820 000 hectares (8 200 km²), from which 470 000 belong to the Peruvian territory. It has a surface temperature between 12 °C and 13 °C. More than 32 000 000 m3 evaporate, which is enough to supply water to all the population in Lima for two weeks. This huge dam of water regulates temperatures, mainly during the night, preventing them from dropping ; likewise, it is a source of humidity for precipitation that occur in the surrounding locations, specially the ones located to the north and northeast. Lately, the beaches are being used for recreational purposes since water temperature in some bays is relatively warm, from 13 °C or more at midday.

The annual range of the maximum temperatures in the islands on the lake is less than 02 °C, while the minimum are approximately 03 °C; likewise, minimum temperatures do not generally drop to freezing temperatures, this is due to the thermoregulating effect of the waters of the lake.

As it can be seen, precipitation is abundant during summer months, and in general they are heavier than the ones occurring outside the lake.

To the north, on the border with Madre de Dios department, the territory of Puno shows a narrow strip of quechua and yunga regions along the provinces of Sandia and Carabaya, following the course of the Tambopata river, and a high forest or rupa rupa region



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

on the northwest slope of the eastern cordillera or montain range. Along this abrupt geographical descent to the Amazon plains, the climate changes varies from cold, to temperate, warm and rainy.

Chart 109 shows the hourly variation of air temperature and relative humidity for two typical days in February and June in Ayaviri location.

The tourist attractions of this department are situated between 3 500 m.a.s.l. and 4 000 m.a.s.l. The air that one breathes in these places have a less concentration of oxygen with respecto to the one at sea level. Thus, places located at 2 000 m.a.s.l., 3 000 m.a.s.l., and 4 000 m.a.s.l., show up to 20%, 30% and 40% less oxygen, repectively, which causes an illness called "mal de altura" or "height sickness": For this reason it is advisable to have a medical checkup before traveling to these places, especially if you have overweight; besides solar radiation is intense during the day, it is recommended to user dark glasse and a hat.

TOURIST ATTRACTIONS

The department of Puno has a wide range of tourist attractions. They consist of important archaeological ruins and popular festivities related to folklore expressed in their music, dances and typical clothing; besides it has a varied gastronomy to offer the tourists.

The tourist itinerary by road starts in Cusco, and after a trip you arrive at the Altiplano or high plain passing by the La Raya snowpeak and the thermal fountain called Santa Rosa. Following the route it takes you to Ayaviri, located between extensive plains covered with "ichu" a typical plant in the area, and the stone forest of TImajani. Further south ther is the town of Pucará, a place of potters who created the "toritos de Pucará". Following the itinerary, you arrive to Lama which is a colonial city.

They you arrive at Juliaca, a commercial cithy where the airport is located. Then you get to the Titacaca Lake, from here, by serveral routes you can go to several towns, to the northeast you get to Taraco (San Antonio de Putina), Huancanè Moho, Coima and the beautiful island of Suasi, ideal for ecotourism

Other tourist destinations are the Carabaya and Apolobamba peaks, places of traditiona towns which are the prelude to the tropial region of Sandia, San Juan de Oro and the Inambari and Tambopata headwaters.

THE CHULPAS OF SILLUSTANI

The chulpas of Sillustani are located 4 km from Atucolla, it is formed by a set of tombs made from stone that have the shape of a ciruclar vase. Sillustani is a special place for mystic tourism. At the banks of the Titicaca Lake, there is the city of Puno, capital of the department and a colonial city, that has big colonial houses, and churches from the virreynato period. From here you can sail on the Titicaca Lake to the Amantani and Taquile islands, the most important ones on the Peruvian side.

TAQUILE

Taquile is the most visited island of Puno. Several communities of ancestral traditions whose main actitiviteis are agriculture, fishing and handicraft, live in this island. This island is situated in front of the Chucuito peninsula, 35 Km from the city of Puno and three hours travelling by boat. Its people itself, represent a tourist attraction, about 300 families disperse in the island still preserve their ancestral way of living, customs and typical clothing, as well as their languague (quechua), traditions and folklore.

Following the route, you pass by the archaeological places of Chucuito, Acora, Ilave, Juli, Pomata, Yunguyo, Zepita and Desaguadero.

SUASI

Suasi is an island of the Titicaca Lake. It has an extension of 43 hectares and it is an ideal place for ecotourism, in harmony with the nature, without the presence of TV, cars, pollutions and the stress. This island is a mini world, dedicated to enjoying peace, inspiration and meditation.

LLACCHÓN

The Association for the Promotion of Tourism, is an enterprise that hostess tourists in their daily community life. This community is constituted by the quechuas, who preserve their milenary traditions and they let the tourist stay and participated of their customs, when they arrive at their terrotiry.

ANAPIA

The district of Anapia is an anchipelago constituted by a group of islands: Patahuata, Ccaño, Yuspique and Anapia. Communal and anthropologic ecotourims are both developed in this place..

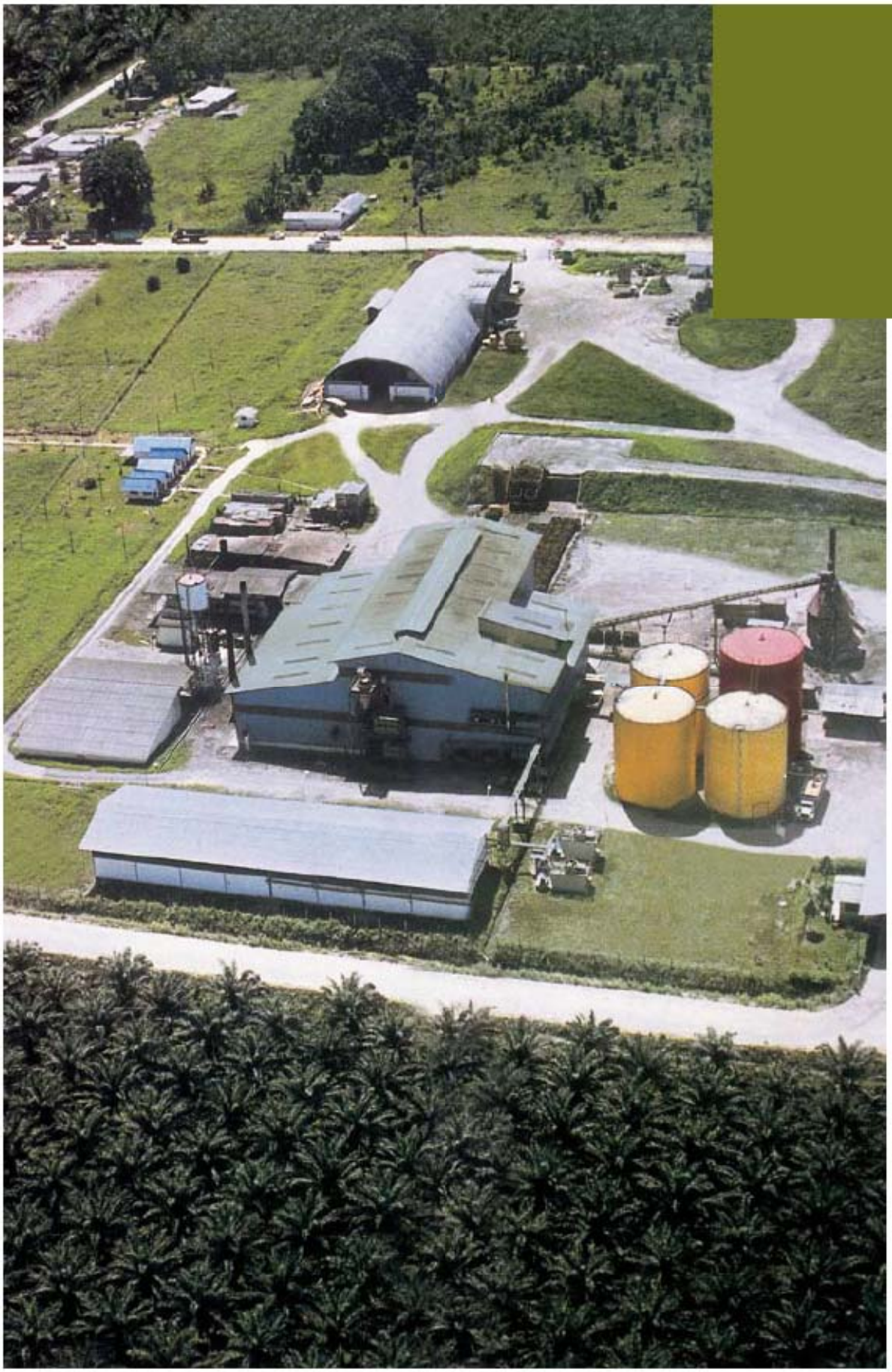
In all the islands, maximum temperature oscillates around 15 °C and minimum around 4 °C in the summer and 2 °C in the winter. Precipitation is more frequent in the north part of the lake and less frequent in the south.

TABLE 21

Isla Taquille

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Max. °C	14,7	14,9	14,6	14,5	14,5	13,8	13,8	13,5	14,3	14,9	15,3	15,0
Min. °C	6,1	6,4	6,4	6,2	5,2	3,9	3,2	3,5	4,7	5,6	6,4	6,4
Prec. m.m.	321	249	231	99	28	19	9	23	67	80	97	171

Sa



an Martín


SAN MARTÍN – DEPARTMENT MAP
LEYEND
Capital of the province
Department bc
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
N
W
E
S
MOYOBAMBA
RIOJA
LAMAS
TARAPOTO
SAN JOSE DE SISA
SAPOSOA
PICOTA
BELLAVISTA
JUANJUI
Río Mayo
Río Saposoa
Río Huallaga
Río Huallaga
Río Huallaga
Río Huallaga
Río Bombonaje
Río Biabo
AMAZONAS
LORETO
CAJAMARCA
LA LIBERTAD
ANCASH
HUÁNUCO
UCAYALI
TOCACHE
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office
-78°00'
-77°30'
-77°00'
-76°30'
-76°00'
-75°30'
-05°30'
-06°00'
-06°30'
-07°00'
-07°30'
-08°00'
-08°30'

GEOGRAPHY

The department of San Martin is located in the northeastern part of Peru, its territory is situated on the eastern slope of the cordilllera or mountain chain, its territory mostly belongs to the high forest region. However, towards its western border, certain areas reach the eastern border of the high Andean plain. Its climate is predominantly warm humid, and it varies according to the altitude, which turns it into a pleasant temperate climate; it is cold in areas near the border with the high mountain and the eastern border of the andean plain. The territory of San Martin lies in the middle part of the valley formed by the Huallaga river.

Its relief is varied. The western zone shows a hilly topography with several Andean counterforts and deep ravines. It also has wide valleys, with terraces in the form of steps, formed by the Huallaga river and its main tributaries. This is the agricultural sector and where most of the San Martin population has concentrated. The southeast zone, with a relief that is the continuation of the Cordillera Azul, has peaks that exceed 3 000 m in the southern sector. The northeast zone is part of the provinces of Lamas and San Martin; thus, it forms a small low forest region.

The territory is covered by the humid tropical forests, so important for ecological and adventure tourism. To the north it is bordered by Loreto, to the south with Huanuco, to the west by La Libertad and to the northeast with Amazonas.

CLIMATE CLASSIFICATION

The department of San Martinhas a diversity of climates and microclimates. The main types of climates accoring to Thronthwaite are:

A semi-dry, cold, temperate climate, with scarce rainfall in autumn, winter and spring, and a relative humidity of 65% and 84%. Corresponds this type of climate to locations in the provinces of Rioja, Mariscal Cáceres and Tocache.

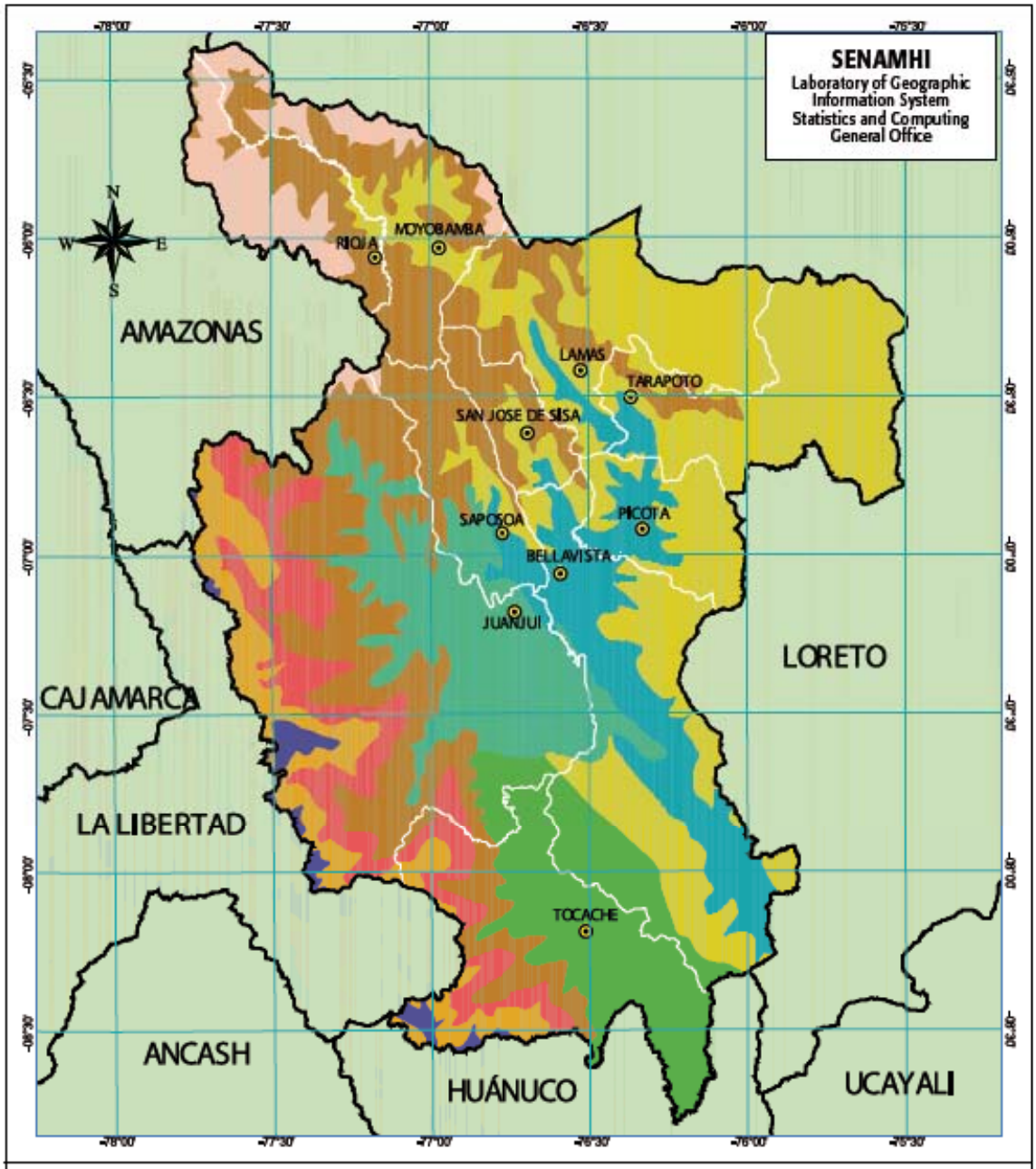
A rainy, temperate and semi-warm climate, dry in autumn and winter, with a relative humidity of 65% and 84%. This type of climate corresponds to locations in the provinces of Rioja, Moyobamba, Ucayali, Mariscal Cáceres and Tocache.

A very rainy, warm, and humid climate, with plenty of rainfall in all the seasons of the year. This type of climate corresponds to locations in the provinces of Moyabamba, El Dorado and Tocache.

A rainy, warm, very humid climate, with plenty of rainfall in all the seasons. This type of climate corresponds to locations in the provinces of Mariscal Cáceres, Bellavista, Picota, Tarapoto and Lamas.

WEATHER AND CLIMATE

Ninety percent of the territory is located in the jungle region, from which 40% belongs to the high forest. Maximum and minimum temperatures reach



⊙ Capital

Department borders

Description	Coding
Semi-dry and semi-cold, dry in autumn, winter and spring	C(o.i.p) B'3 H3
Semi-dry cold, dry in winter	C(i) C' H3
Rainy and semi-cold, dry in autumn and winter	B(o.i) B'3 H3
Rainy, semi-warm and humid, dry in winter	B(i) B'1 H3
Very rainy, warm and very humid, plenty of rainfall in the year	A(r) A' H4
Rainy, warm and humid, dry in winter	B(i) A' H3
Semi-dry, warm and humid, dry in autumn, winter and spring	C(o,i,p) A' H3
Semi-dry, temperate and humid, dry in autumn and winter	C(o.i) B'2 H3
Rainy, warm and very humid, plenty of rainfall in the year	B(r) A' H4

CHART 114
Extreme Temperature and Precipitation
Monthly average in Tarapoto
(Lat 06°31'S Long 76°23'W Alt 56 m.a.s.l.)

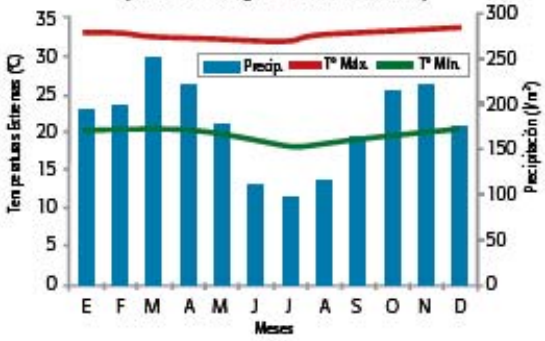


CHART 117
Extrema Temperature and Precipitation
Monthly average in Juanjuí
(Lat 07°06'S Long 76°44'W Alt 314 m.a.s.l.)

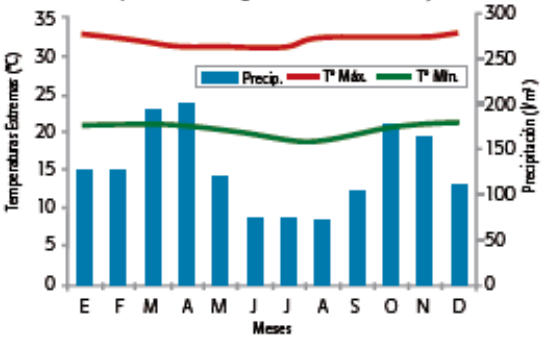


CHART 115
Extreme Temperature and Precipitation
Monthly average in Rioja
(Lat 06°02'S Long 77°09'W Alt 848 m.a.s.l.)

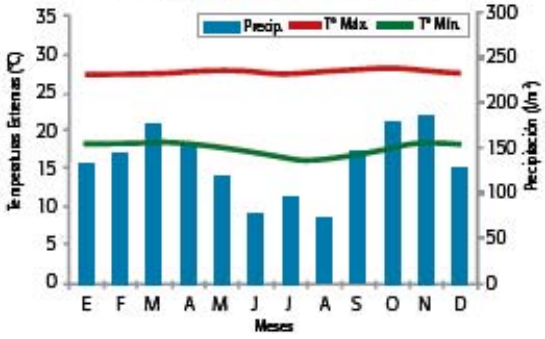


CHART 118
Extreme Temperature and Precipitation
Monthly average in Moyobamba
(Lat 06°02'S Long 76°58'W Alt 860 m.a.s.l.)

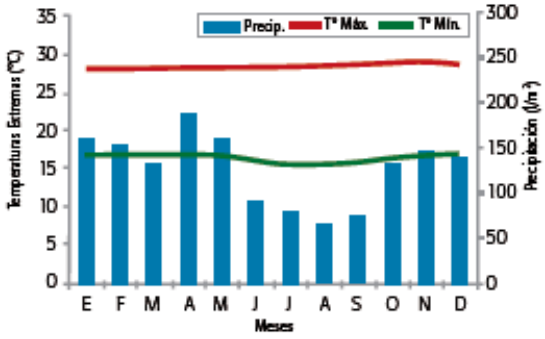


CHART 116
Temperature and Relative humidity in Puente TOcache
January 2003
(Lat 08°10'S Long 76°30'W Alt 508 m.a.s.l.)

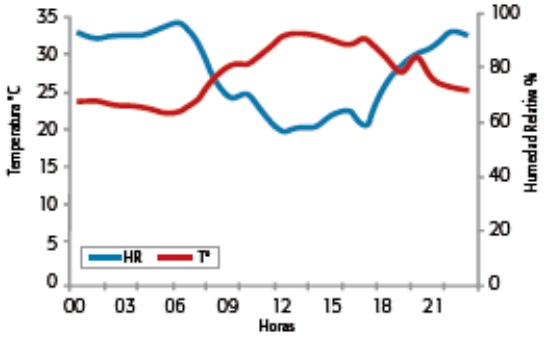
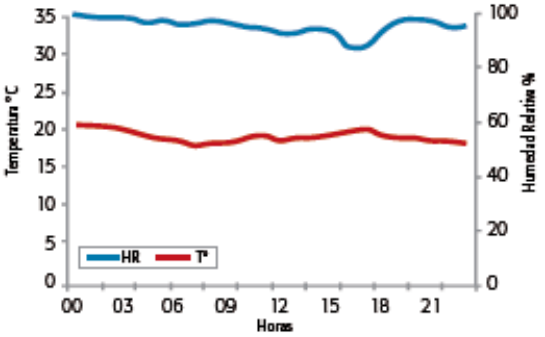


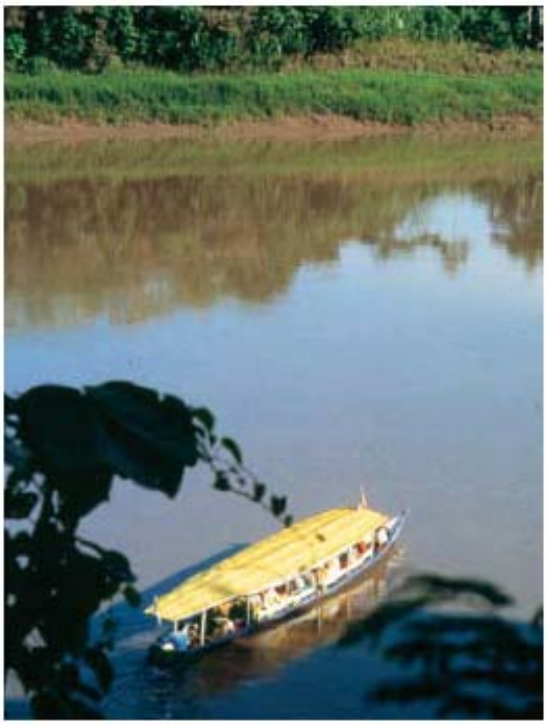
CHART 119
Temperature and relative humidity in Puente tocache
September 2003
(Lat 08°10'S Long 76°30'W Alt 508 m.a.s.l.)



average values of 33 °C and 22 °C, respectively, with an annual range from 1 °C to 2 °C in both cases. During the months of October and November, temperatures of 38 °C or more are registered; due to the scarce cloudiness during the mornings and in the afternoon hours. In these months, solar radiation on the surface reaches the highest values. The scarce cloudiness and the atmospheric stability, that is, the little vertical and horizontal motion of the air near the surface, influence the occurrence of the highest temperatures in the year. These high temperatures occur in the zones located below 500 m.a.s.l.,such

TABLE 22
Sunrise and sunset hours and duration of daylight throughout a year in Moyobamba city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	6:04	6:13	6:13	6:09	6:09	6:15	6:20	6:15	6:01	5:47	5:41	5:49
Sunset	18:30	18:31	18:21	18:07	17:59	18:02	18:08	18:10	18:05	18:01	18:04	18:17
Time light	12:17	12:22	12:17	12:08	12:04	12:08	12:14	12:12	12:03	11:54	11:52	12:03



as the locations of Juanjuí, Bellavista, La Picota, Tarapoto, etc.

In general, average monthly maximum temperatures decrease with the altitude, as it can be seen in the chart correponding to Tarapoto, Juanjuí, Moyobamba and Rioja, located at 333 m.a.s.l., 314 m.a.s.l., 874 m.a.s.l. and 1 400 m.a.s.l., respectively, in which it is evident the slight monthly variation specially in the case of the maximum temperatures. At nation level, this is one of the three departments that have the highest temperatures values.

Rainfall occurs throughout the year, but are less frequent and of short duration in the winter time (June to August). As in all the territory, 80% of precipitation occurs in the afternoon and during the first hours at night, very seldom do they last 12 hours or more. The charts clearly show two maximum values corresponding to the spirng and summer, their monthly accumulated values are 180 l/m².

At any location in this department, the amount of annual rainfall exceeds 1000 l/m². Besides, it would have to be mentioned that the contribution of dew during the nights in the mist forest, which are located on the sidehills of the high forest that are east-oriented in the direction of the humid winds. These forests are covered by clouds and mist all year round; that is why it is called "bosque de niebla" or mist forest, which are mainly located to the west part of the department.

Relative humidity is high in the rainfall period, but it decrease in the winter. The winds are generally light, although, occasionally there are some strong winds that reach up to 60 km/h, when they are associated to the development of storms.

The charts show the hourly variation of air temperature and relative humidity for the months of January, and September 2003 in Tocache.

TOURIST ATTRACTIONS

TARAPOTO

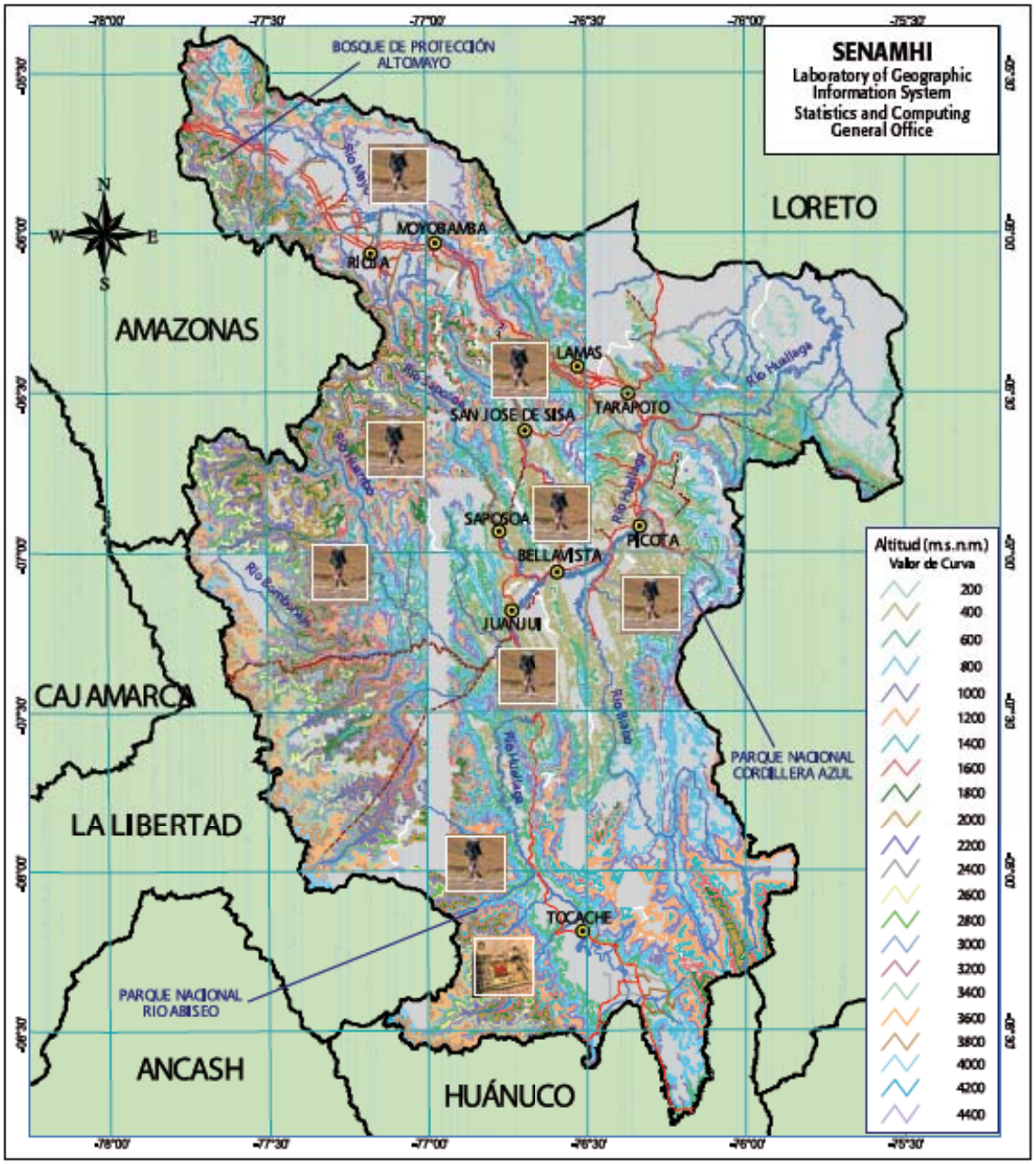
It is the capital of the province of San Martin, it lies on the valley formed by the Cumbaza and Shilcayo rivers at 426 m.a.s.l. Its climate is warm and humid. It is known as the land of the waterfalls, from which the most important to be mentioned are: Ahuashiyaku, Carpishayaku, Huacamaillo, Mamonaquihua, Tununtunumba and Silcayo.
The aeras of interest are the archaeologial ruins of Polish, where there are diseminated petroglifs that represent animals and plants from the place. The persons who loved canoeing, may practice some adventure sports in the "malos pasos" of the Huallaga river.
It is an areas where the Huallaga rivers flows, and there are located the towns of San Antonio, El Sauce and Chazuta. Near to the city of Tarapoto there are located: La Escalera hill, the natural viewpoint of the city, the El Sauca and Laguna Azul lagoons. In all the mentioned locations, temperatures are similar to those in Tarapoto.

BELLAVISTA

Here there is located the Cordillera Azul National Park. This city is situated on the left margen of the Huallaga river, it is surrounded by forest proper of the high jungle region. Temperatures are similar to those in Tarapoto, that is; the days are hot or very hot.

RIOJA

It is located in the Alto Mayo valley, it is an agricultural and cattle farming area. Here it is loated the Alto



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

In construction

In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting

Mayo National Park, that preserves importante species of flora and fauna. Other natural attractions are the Mashuyacu lagoon and the carve of La Union. Temperatures are pleasant, with maximum values around 25°C and minimum 15°C after midnight.

MOYOBAMBA

It is located in the Alto Mayo valley, in a transition zone to the Amazon plain, with a rainy and warm climate during the day and cool at night, with average maximum temperatures of 28 °C and 17 °C.

Its main tourist attrctions are the thermal bathe of San Mateo (65 km from the city); the sulfur bathe of Oromina, its waters are recomended to treat skin problems and the digestive system; the Asnacyacu cascade, where some bungalows have been built.

The water falls of el Gera are located 20 km south of the city. The Mono de la Calzada, of 400 m height, is very easy to see from any point in the city, and from its top it can be practiced the ala delta and parapente, and also enjoy a stunning view of the landscape.

MARISCAL CÁCERES

Here we find the Rios Abiseo national Park, it has a very rainy and humid climate, covered with forest with permanent mist during the afternoons and at night, causing lateral precipitations (dew water) and high rainfall values

Temperatures decrease with altitude, thus, maximum average reach 32 °C near the Huallaga river, up to 12 °C in the high andean plain; while average minimum temperature range from 22 °C to 0 °C in the highest locations.

These forest preserve a diversityof wild flora and fauna especillay atractive. Here there are also the Gran Pajatén ruins, consisting of a circular room, towers and the Mausoleos de los Pinchudos, whichis like a cementery.

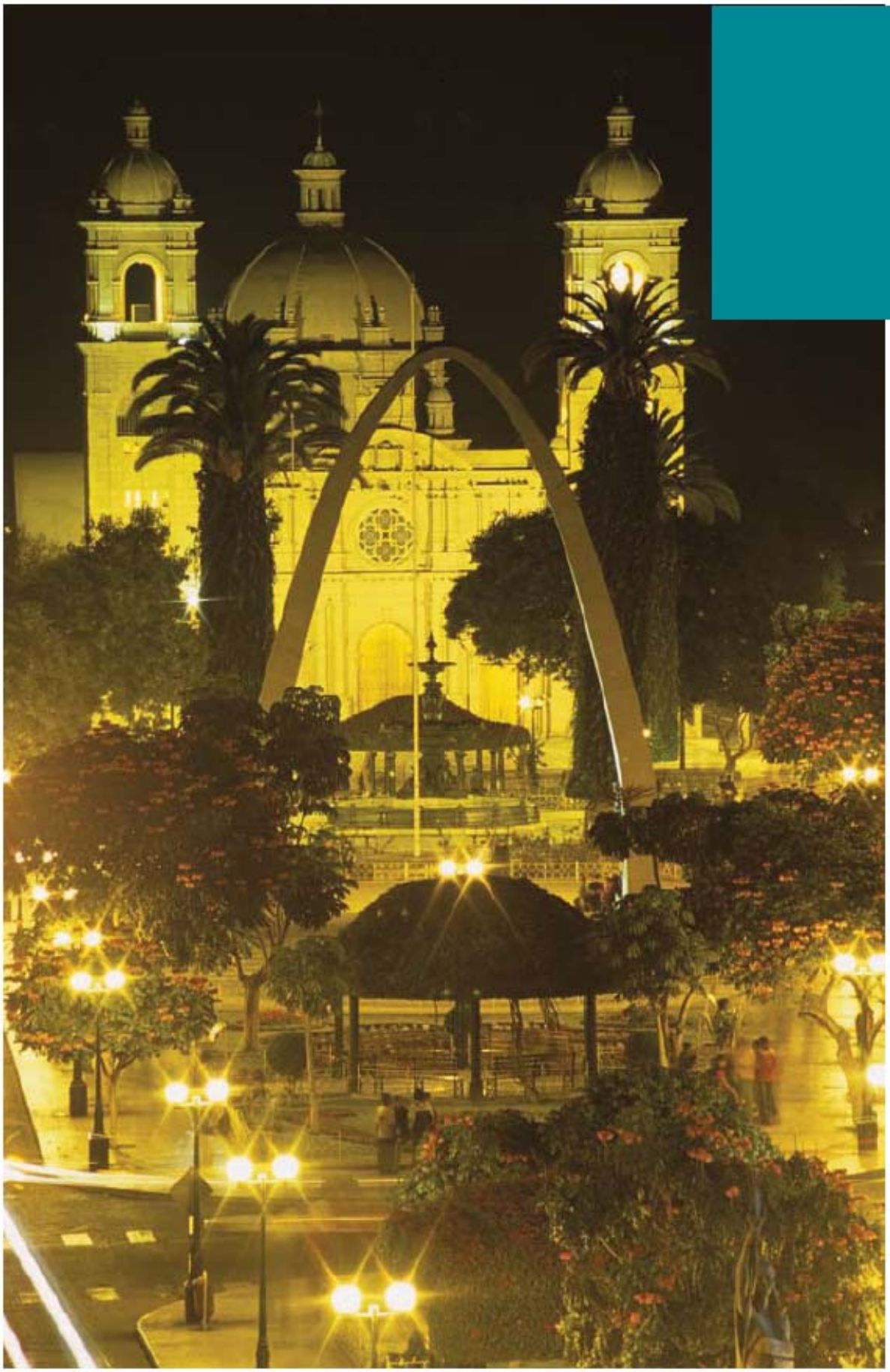
The Gran Pajatén is located in the district of Huicungo, approximately at 93 km northeast of Pataz (La Libertad): The ruins are situated on the steep eastern hill sides of the Andean Cordillera, covered with a dense humid tropical forest above 3 500 m.a.s.l. The circular towers are the main feature of the Gran Pajaten ruins, with a variable diameter of 2 m and 15 m, and its large stone steps. The constructions stand at a different level, but close, to each other in a surface of about one hectare.

HUALLAGA

It is located in the left margen of the Piscoyacu river, in an agricultural and cattle farming zone. Saposoa, is the capital and it is located in the middle of the Huallaga river valley, at 252 km from Moyabamba, and it is known as the "City of the hills". It is characterized for having a regular climate, cooler than in the other cities of the region. The Saposoa river, that surrounds the city from north to south, forms three big codos of low lands, which are very fertile: Chaulla, Balsayaca and Bushilca. In the district of Saposoa there is located the archaeologial site called the Gran Saposoa. The climate is very similar to the one in Mariscal Cáceres

EL DORADO

The el Dorado province is located in the central part of the department, it has a rainy and warm climate. Its capitar is San Jose de Sisa.



Tacna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TACNA – DEPARTMENT MAP
LEYEND
Capital of the province
Rivers
Department borders
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
-71°00
-70°30
-70°00
-69°30
-17°00
-17°30
-18°00
PUNO
N
W
E
S
MOQUEGUA
BOLIVIA
CHILE
OCÉANO PACÍFICO
CANDARAVE
TARATA
LOCUMBA
TACNA
Río Salado
Río Ilabaya
Río Sama
Río Locumba
Río Uchusuma
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office




GEOGRAPHY

The department of Tacna is located in the southernmost point of Peru Its territory includes geographical spaces proper of the desear coast up to the impressive high andean plains and peaks. To the north it is bordered by Moquegua and Puno, to the east it is bordered by Puno and the Republics of Chile and Bolivia, to the south by Chile and to the west by the Pacific Ocean.

The western branch of the Andean Cordillera or Mountain Chain divides the department into two basins: the Pacific Ocean, where the Locumba, Sama and Caplina rivers flow downstream; and the Titicaca basin, which is formed by the Maure river (tributary of the Desaguadero river) and its tributray the Ucshuma river

The Locumba river originates in the uplands of Moquegua with the name of Umapalca (in Oquelaca and Chonone, at 5 100 m.a.s.l.), and it empties its waters into the Suche or Huaitiro lagoon, when it flows out it takes the name of Callaza. Once the watercourse has reached Tacna, at the Turún-Turún pampa, it divides into several watercourses, one of them drains its waters into the Aricota lagoon at 2 842 m.a.s.l. As it flows out it takes the name of Cumbayá river and it then converges with the Ilabaya – nexto to the Merave town- to form the Salado River. This last one, as it receives its right-margin tributary, the Cinto river, takes the name of Locumba, until it flows into the ocean north of the peninsula of Ite.

CLIMATE CLASSIFICATION

According to the climate classification fo Thornthwaite, the department of Tacna has the following types of climate:

An arid, semi-warm and humid climate with scarce rainfall throughout the year. This type of climate is typical of zones located between 0 and 1 000 m.a.s.l., as the locations of Ite, La Yarada, Tacna, Sama Grande and Locumba, that belong to the provinces of Jorge Basadre and Tacna.

A semi-arid, temperate and dry climate, with scarce rainfall in autumn, winter and spring. This type of climate corresponds to places situated between 1 000 m.a.s.l, and 2 000 m.a.s.l, at the andean foothills of the provinces of Jorge Basadre and Tacna.

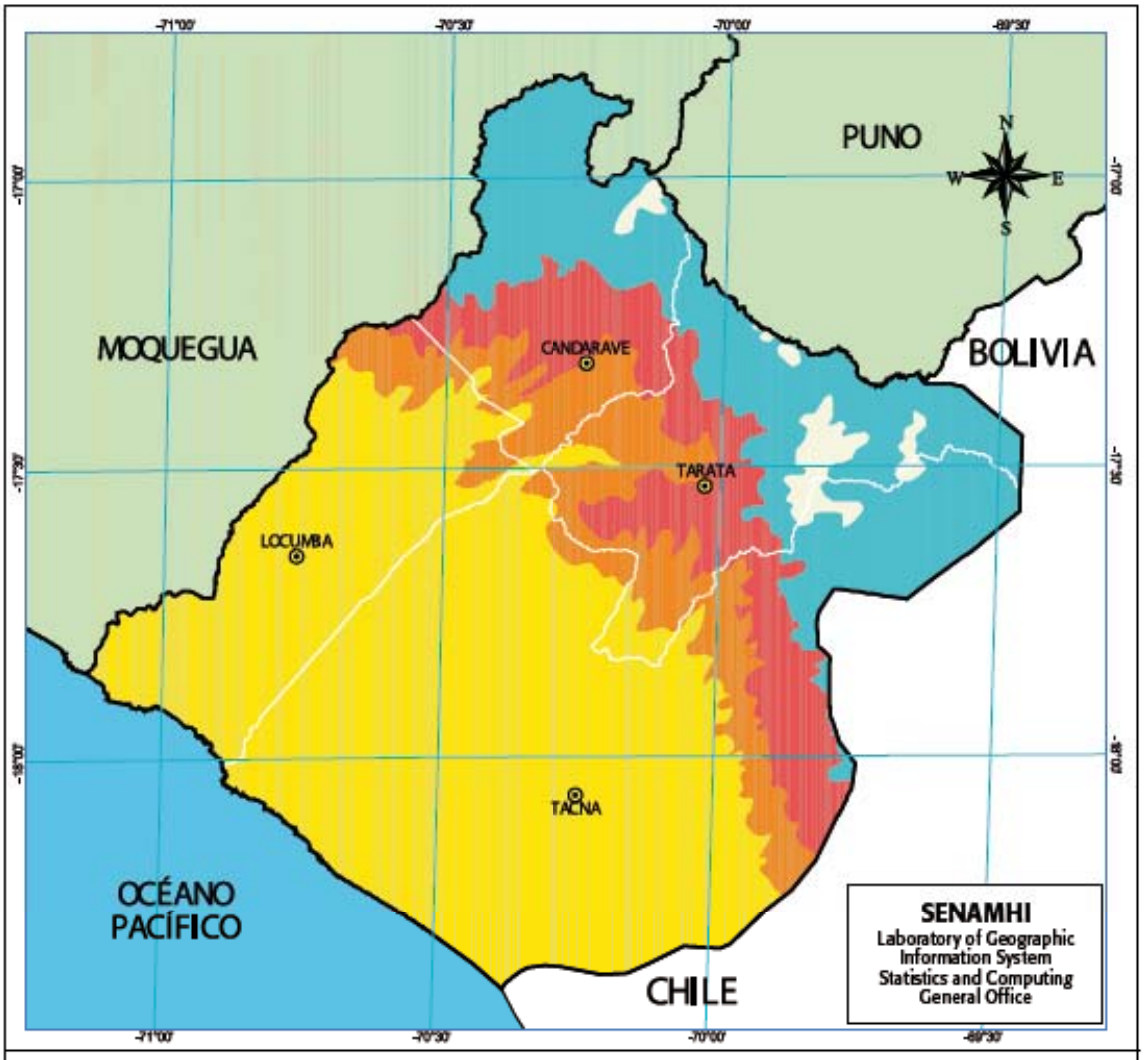
A semi-dry, cold climate, with scarce rainfall, in autumn, winter and spirng. This type of clamte corresponds to the locations of the provinces of Jorge Basadre, Candarave, and Tarata, situated between 2 000 m.a.s.l., and 4 000 m.a.s.l.

A rainy, semi-frigid climate, with scarce rainfall in autumn, winter and spirng. This type of climate corresponds to the high zones in the provinces of Candarave and Tarata situated between 4 000 m.a.s.l, and 5 000 m.a.s.l.

WEATHER AND CLIMATE

In the coastline of the department, average monthly maximum temperatures range betwee 18°C and 26°C, which are influenced by the thermoregulating effect of the ocean surface and due the cloud cover; average monthly minimum temperatures vary between 10°C and 17°C. The chart shows the variation of maximum and minumum temperatures and the average monthly rainfall in the city of Tacna

The sea surface temperature in the beaches of Tacna, during the summer months, oscillate around 16 °C (see chart). Their water is not too transparent, due to the marine upwelling- In the winter the weather is very varible, that is, there are days with a cloud covered sky, while in the summer predominates days with scarce cloudiness, clear sky and intense sun bright. The tides, in general, are light; sea surface temperature is higher than in the central departments (Lima and Ica). When an weak El Niño event occurs, does not influence this zones, and if an El Niño event, of greater magnitude, occurs sea surface water increases between 4 °C to 5 °C. When a strong El Niño event occurs or when the wind comes from the north, maximum temperatures higher or equal to 30 °C are registered in several locations of the coast of Tacna. The same thing happens when the winds coming from the south intensify, maximum temperatures in the winter can drop down to 15 °C.



Precipitation in the coastal locations is generally in the form of persistent drizzles, in the months of August and September, when the south trade wind and the thermal inversion are intensified. The locations more exposed to marine breeze are prone to the occurence of drizzles, same ones that favor the growth of herbaceous plants.

Extreme temperatures decrease gradually with height. Thus, in the location of Tarata, average monthly maximum temperatures fluctuate around 18 °C, the annual range is approximately 3 °C, due to the intense variablility of the cloud cover in the rainy period, similar behavior occurs in the location of Candarave, where maximum temperature fluctuates around 15 °C and average minimum temperatures fluctuates around 3 °C (see chart).

In the sierra or mountain region, rainfall increases with the altitude reaching annual values of 400 l/m^2 in the locations situtated in the high andean plains of the department; however, this amount is lower, approximately 50% of what it rains in the high plains of Arequipa. This

CHART 120
Extreme Temperature and Precipitation
Monthly average in Tacna
(Lat 18°35'S Long 70°16'W Alt 562 m.a.s.l.)

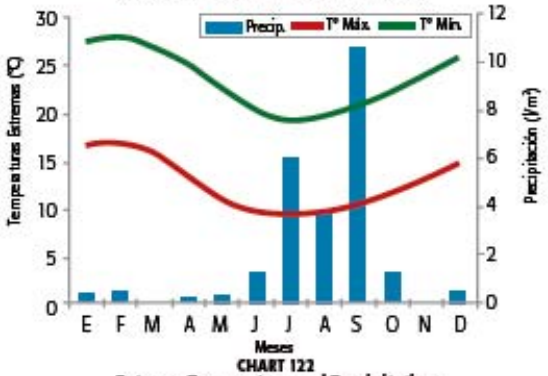


CHART 121
Extreme Temperature and Precipitation
Monthly average in Tarata
(Lat 17°05'S Long 70°25'W Alt 3 070 m.a.s.l.)

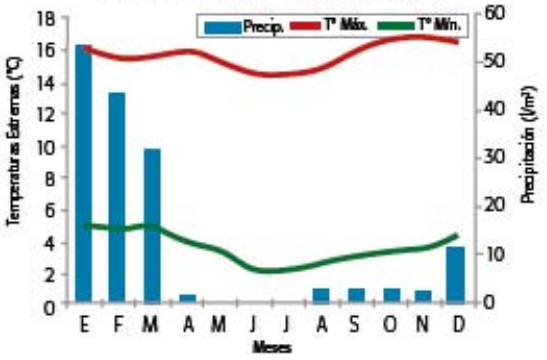


CHART 122
Extreme Temperature and Precipitation
Monthly average in Candarave
(Lat 17°16'S Long 70°15'W Alt 3 415 m.a.s.l.)

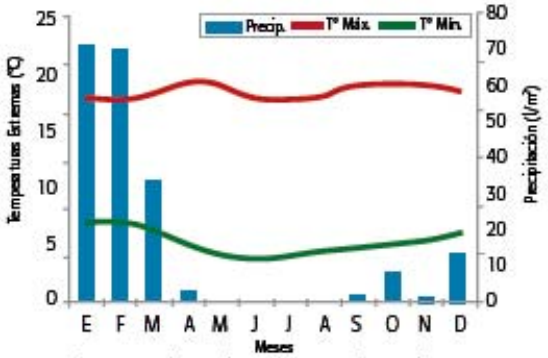
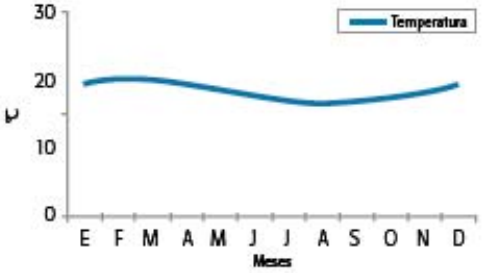


CHART 123
Sea surface temperature in Tacna beaches



occurs because humid air masses from the Amazonia have to travel over long distances, constantly losing humidity on their way; therefore, when the air reaches the high plains of Tacna contains a reduced amount of moisture, resulting in scarce rainfall

In the locations of Tarata and Candarave, there is light rainfall between January and February and they don't last long especially during the afternoon and at night. In the high andean plains there are some storms between January and March; in the remaining months, occasionally can occur some snow storms due to the incursion of cold air from the south above 3 000 m.a.s.l., and due to the incursion of humid air from the norh or from the Amazon Basin above 4 000 m.a.s.l.

The sierra or mountain region, shows a skly with scarce cloudiness or clear sky conditions from April to September, at the same time atmospheric humidity es very low during the day due to the presence of dry air, as a result of the vertical descending motion (subsidence), associated to the dynamics of the Southeast Pacific Anticyclone. The speed of the wind frequently intensifies and there are gusts with velocities higher thatn 20 m/s. The sky is very transparente above 1 200 m.a.s.l. for the aforementioned reason (subsidence), likewise above this height, the amount of incident solar radiation on the surface is one of highest values registered in the country and of the world.

TOURIST ATTRACTIONS

THE CITY OF TACNA

It is the capital of the province of Tacna, and also of the department. It is traversed by the Caplina and Sama

TABLE 23
Sunrise and sunset hours and duration of daylight throughout a year in Tacna city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:18	05:35	05:44	12:00	05:59	06:10	06:13	06:01	05:37	05:12	04:57	05:00
Sunset	18:23	18:15	17:56	17:32	17:15	17:13	17:21	17:31	17:36	17:42	17:55	18:12
Time light	11:50	11:55	11:50	11:41	11:37	11:41	11:47	11:46	11:36	11:27	11:26	11:36

rivers, that form fertile vallyes and several ravines such as the Quebrada Honda or Deep Ravine.

Due to its location (568 m.a.s.l.), during normal times, mean monthly temperature is 23 °C. Average monthly maximum temperatures fluctuate between 19 °C and 27 °C, and minimum temperatures between 9 °C and 17 °C.

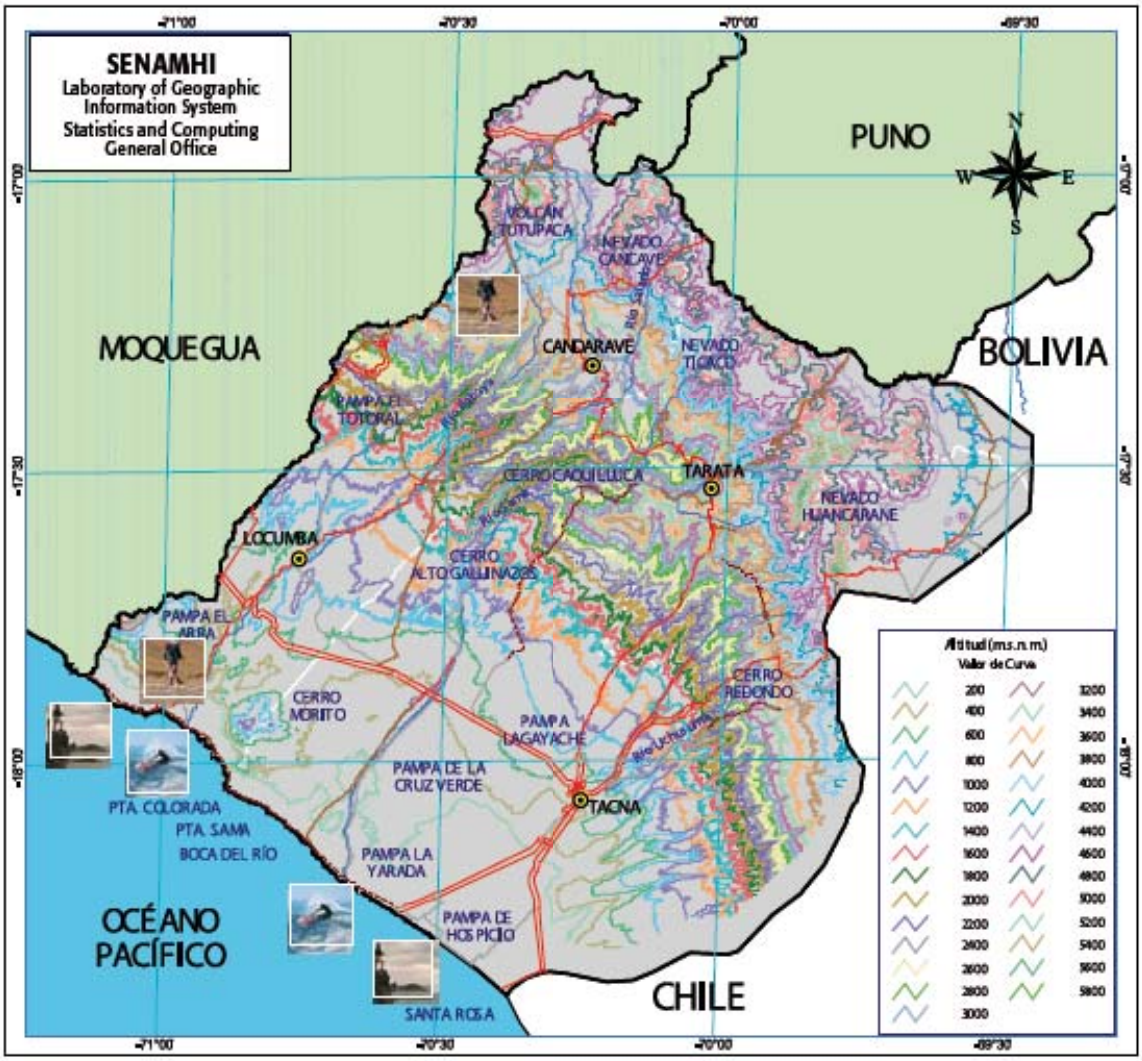
At present, trade is the main activity in Tacna, which incentivates tourism for purchasing and recreational purposes.

BEACHES

Along the coastline of Tacna, there are located a series of beaches such as: Punta de Icuy y Picota, Santa Rosa, Ite, Los Claveles, Criadero, Bomba, La Lancha, El Toro, Cerro Cortado, etc.

TARATA

In this province there is located the Barroso Cordillera or Mountain Caln, with its beautiful peaks. Its capital is Tarata (3 070 m.a.s.l.), it is surrounded by a vast countryside, in which there are located the famous Eucalytus Forest. Another important attractions are the Toquepala Caves, where there can be observed rupestrian paintings, made of mineral pigments, that show hunting scenes, colored in dark-red, and also some figures in green and yellow.



Province Capital

Rivers

Main road

Asphalted

Reinforced

Without reinforcement

Carriage path

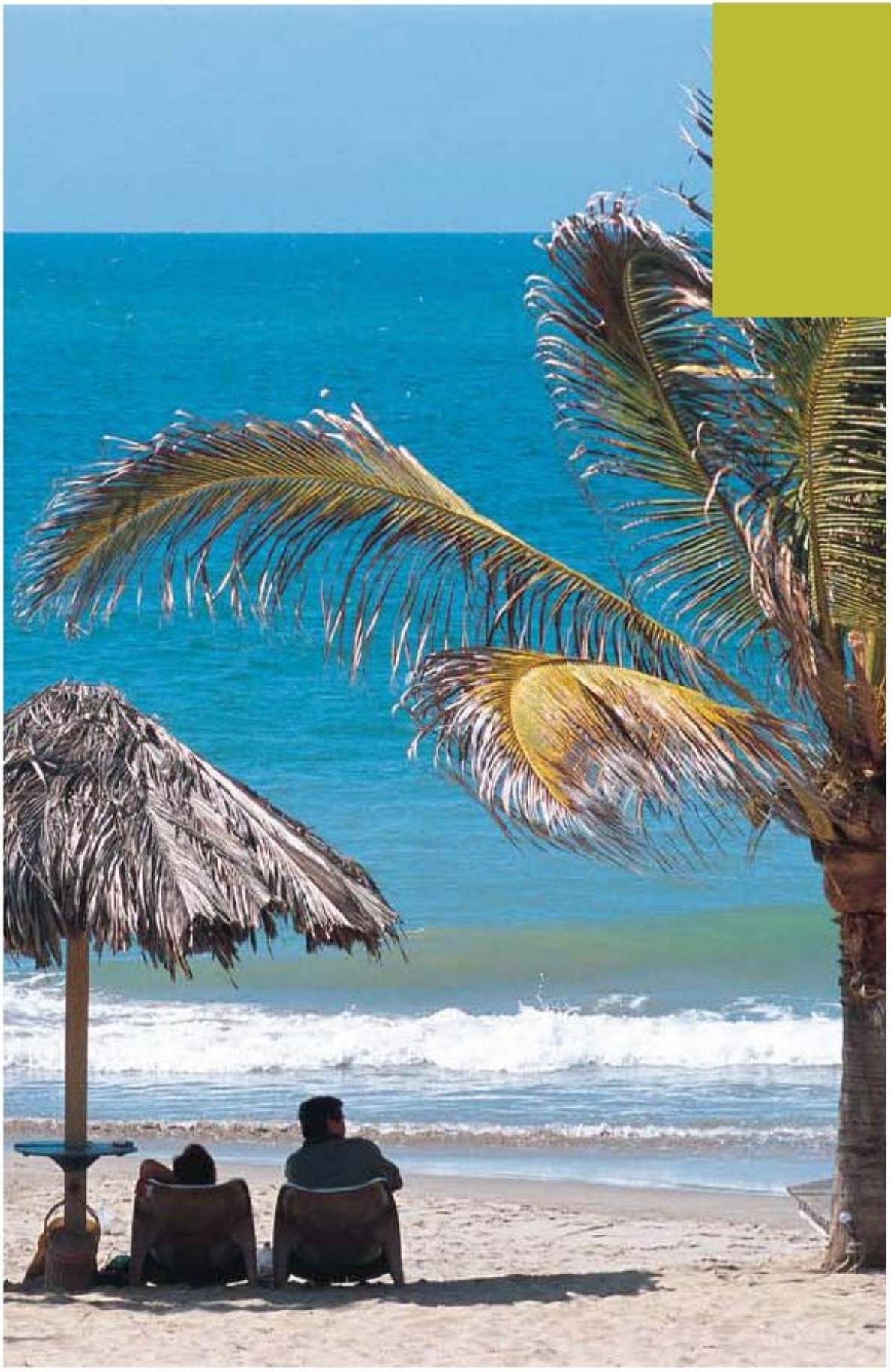
In construction

In prospect

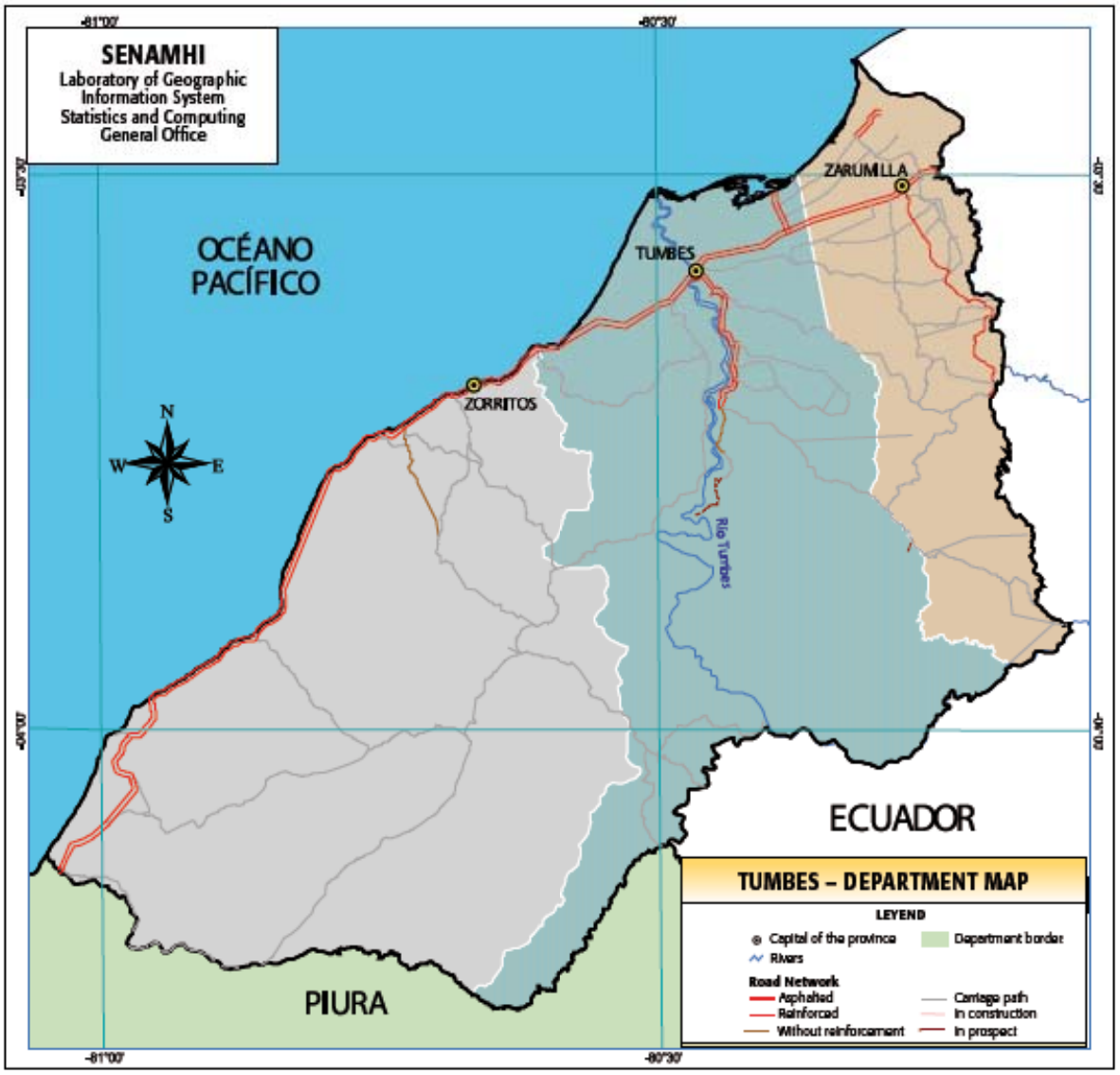
Fishing | Surfing | Skiing | Archaeology

Sailing | Climbing | Hiking | Cycling

Diving | Snowpeak | Paragliding | Hunting



Tumbes


SENAMHI
Laboratory of Geographic Information System
Statistics and Computing
General Office
OCÉANO PACÍFICO
ZARUMILLA
TUMBES
ZORRITOS
Río Tumbes
N
W
E
S
ECUADOR
PIURA
TUMBES – DEPARTMENT MAP
LEYEND
Capital of the province
Department border
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect

GEOGRAPHY

The department of Tumbes is located at the northernmost point of Peru, in the transition zone between the rainy and hot equatorial zone and the coastal deserts. It has an extension of 4 657 km², and its territory has arid, desert regions with a few carob trees; but, it is worth mentioning that it is the least arid of all the costal departments. The most outstanding is the Cerros de Amotape National Park, located between the coastal desert and the dry equatorial forest.

RIVERS

The Tumbes River is torrential in middle part of the basin. In the Peruvian territory its length is 130 km. During El Niño events, of strong intensity, its discharge can exceed 1 000 m³/s. The river discharge during dry periods can reach 10 m³/s. Traveling along the Tumbes riverwill take you to mangroves and arrive at the Gaviotas Island at the river mouth, then you continue along the river bank until you arrive at Corrales and Playa Hermosa, where you can enjoy the typical landscape of the region, inhabittet by native bird species such as the seagull.

The Tumbes river originates in Ecuador with the name of Puyango, form by the convergence of the Amarillo and Calera rivers. It runs east-west up to a place known as Rica Playa, where it changes its course and runs northward and flows into the Pacific Ocean. Its total length in Peru, is more or less 130 km. Its course is divide into four sections of extremely beautiful landscapes, suitable to go on a trip during any time of the year:

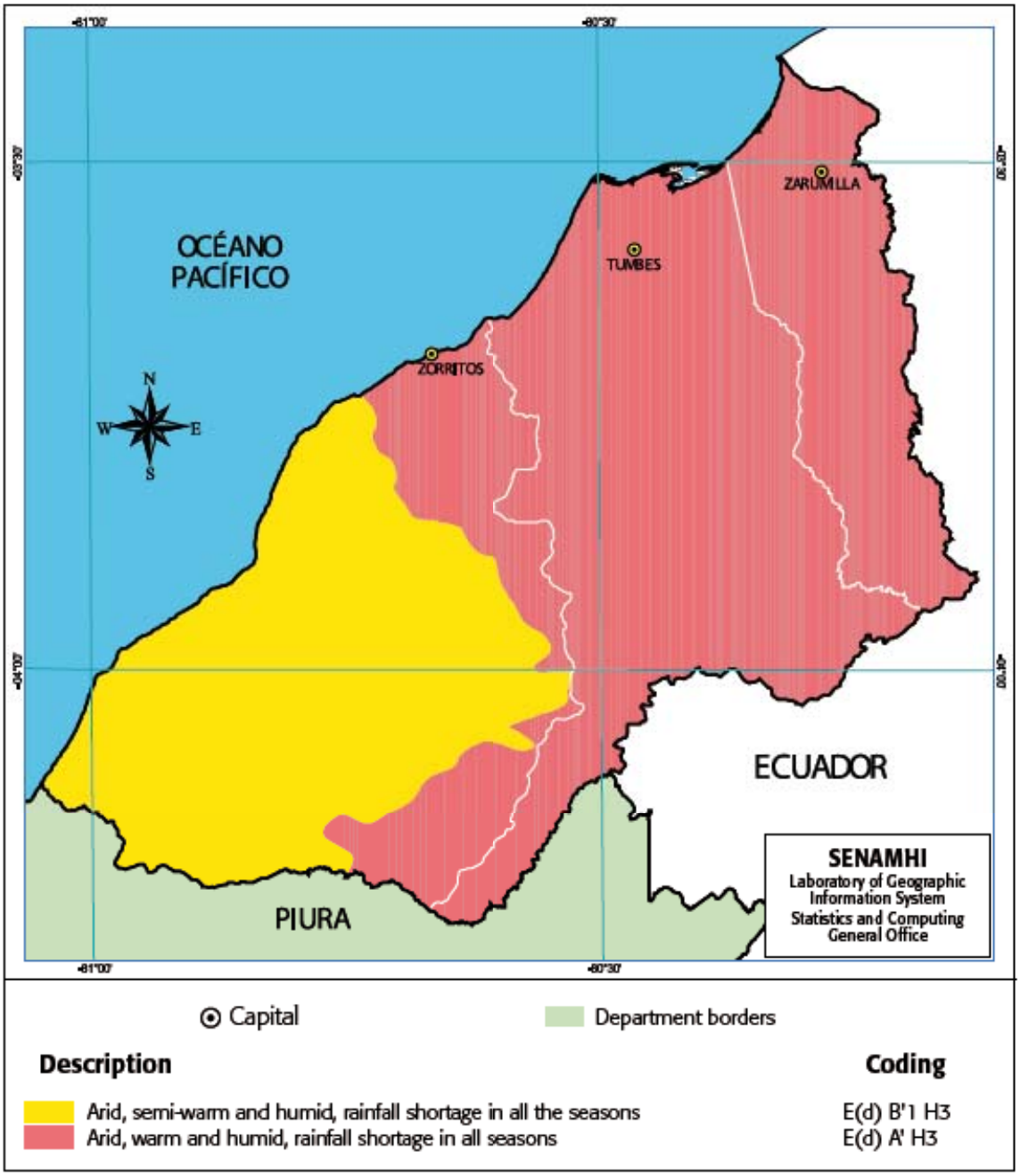
- The inter-mountain from its origen upt the Zapallal Pongo (narrow canyon)
- The canyons and cascades, between the Zapallal Pongo and the El Tigre waterfall
- The plains, from the El Tigre waterfall up to the city of Tumbes
- The estuaries until it flows into the Pacific Ocean, it is covered by plenty of vegetation, and it is the natural habitat of a great variety of fish and mollusks.

The geography of Tumbes is the most interesting and picturesque of the Peruvian coast, not only for being situated in the transition zone between the hot equatorial zone and the coastal desert; but, for the extraordinary configuration of its coast, which is different form the others in the country. Its topography is a little uneven, with dry ravines, shallow water courses, low -altitude hills (Amotape Hills). The so called Cordillera Larga, or long cordillera, which constitutes one of the largest relieves of its geographical space.

Due to its proximity to the equatorial line, it is the most warm and rainy department, and the one who has the most fertile lands in the coast, in which cotton, rice, fruits and especially tobbacco, are grown.

The Cerros de Amotape National Park is situated in the transition zone between the coastal desert and the dry equatorial forest, it has four living zones distributed between 200 m.a.s.l., and 1 600 m.a.s.l.

The Zarumilla river marks the border zone with Ecuador, it covers an extension of 50 km and it has a discharge, that from December to March is scarce; but it increases



during the summer. Its discharge varies sustancially during the year, with maximum discharges fo 100 m3/s in the summer, and that even exceed 200 m3/s during strong El Niño events : In this last case, there are floodings on the lowest point of the valley. The Tumbes river is the only navigable river in the Peruvian coast, downstream from the Zapallal pongo and by small boats until the place known as Bellavista.

CLIMATE CLASSIFICATION

According to the clamte classification of Thornthwaite, the department has the following climates:

An arid, warm, sumid climate, with scarce rainfall during all the seasons. This type of clamte corresponds to locations in the provinces of Zarumilla and Tumbes.

An arid, rainy and humid climate, with rainffall shrotage in all the seasons. This type of climate corresponds to location in the provinces of Contralmirante Villar.

CHART 124
Extreme and Temperature and Precipitation
Monthly average in Tumbes
(Lat 3°33'S Long 80°23'W Alt 6 m.a.s.l.)

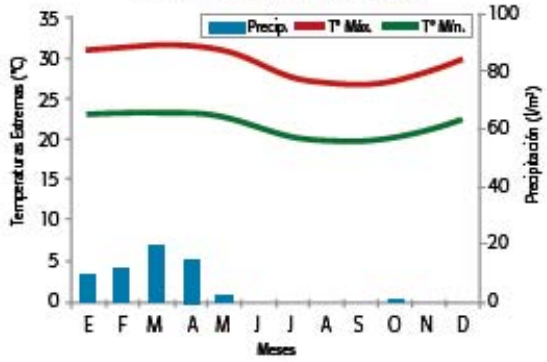


CHART 126
Extreme Temperature and Precipitation
Monthly average in Puerto Pizarro
(Lat 3°30'S Long 80°28'W Alt 74 m.a.s.l.)

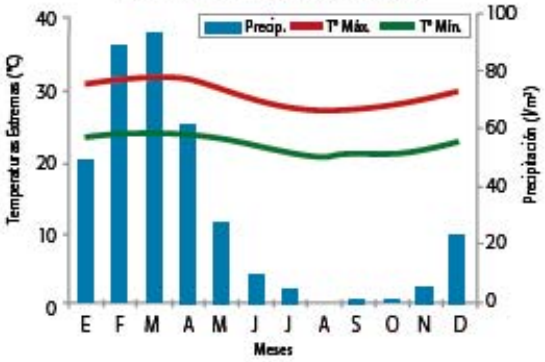


CHART 125
Daily minimum Temperature and Humidity in El Tigre
16/07/2003
(Lat 3°46'S Long 80°27'W Alt 45 m.a.s.l.)

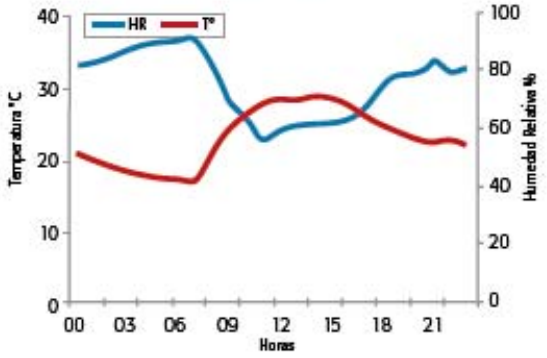
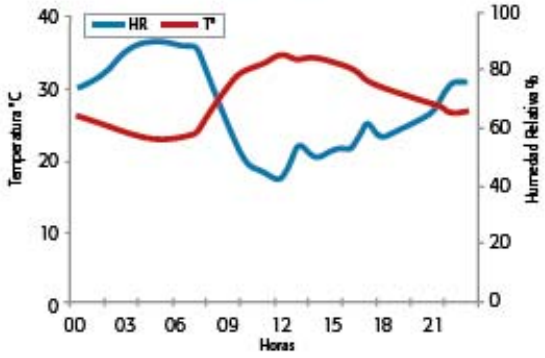


CHART 127
Minimum Temperature and Humidity in El Tigre
21/03/2003
(Lat 3°46'S Long 80°27'W Alt 45 m.a.s.l.)



WEATHER AND CLIMATE

The weather is hot from October to May and from June to September it can be considered cool. Average maximum temperature in locations somewhat distant from the sea is 33 °C, and minimum is 21 °C. The annual average is 24 °C. Sun bright is pemanent during the year. Since it has an almost even surface, it does not show significant variations in the monthly averages of maximum and minimum temperatures in all the different locations, as it can be seen from the charts on the previous page.

Rainfall occurs between January and April and stops abruptly in May. March is he rainiest month in all the department, due to the proximity of the Inter-tropical Convergence Zone (ITCZ) – that in this month is in the closest position near our territory, to the influence of the sea surface water temperature, - that in this month reach the highest values, and to the flux of air masses coming form middle levels of the atmosphere.

CHART 128
Sea surface temperature in Tumbes beaches

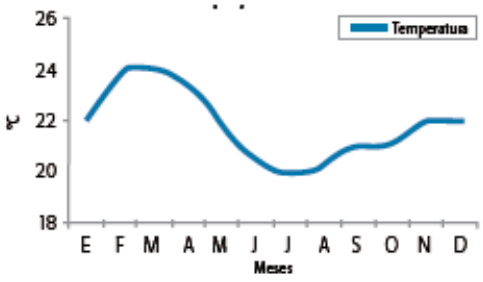


TABLE 24
Sunrise and sunset hours and duration of daylight throughout a year in Tumbes city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	06:22	06:29	06:27	06:21	06:19	06:24	06:29	06:26	05:54	05:51	05:58	06:07
Sunset	18:40	18:42	18:34	18:22	18:17	18:20	06:00	18:26	18:19	18:13	18:14	18:26
Time light	12:31	12:36	12:31	12:22	12:18	12:22	12:27	12:26	12:17	12:07	12:06	12:17

Sea water tempeature in the beaches show interanual, seasonal and daily variations; caused by marine currents, upwellings, subsidence, convection (upward, downward vertical movements), turbulence mixture and heat release by chemical processes. In general, in the beaches of Tumbes, there is sun bright all year round. The wind is relatively weak and swell is of not significant, and the ocean currents ar not strong.

The ocean waters are not too transparent. In general, average monthly temperature is 20 °C in the winter and 24 °C in the summer, it can be verified that temperatures can occassionally reach 28 °C or even 30°C. in the case of the ocurrence of an El Niño event of strong intensity. It can show some moderate increases of 2 °C to 3 °C for brief periods, at any time of the year, when there is an incursión of surface ocean currentes from the northeast.

In the summer, temperatures can exceed 33 °C, which contributes to the occurrence of rainfall between January and April. However, when there is an El Niño event of strong intensity, the amount of rainfall as well as the frequency increases, then it is common to have daily rainfall higher than 5 l/m² in any location. Heavy rainfall occurrence happened in 1925-26, 1982-83, 1997-98, when annual rainfall values were registered 1 500 l/m² in several locations.

TOURISTS ATTRACTIONS

PORT OF PIZARRO

It is located at the km 11th of the Panamericana Norte highway. It has an impressive view in the mangroves A trip by boat allows the visitor to watch the mangroves landscape and enjoy the climate, with an average maximum temperature of 30 °C, reaching values of 31 °C or more in the months of February and March. In August the maximum temperature reaches their lowest values (27 °C). Concerning minimum temperature its montly variation range is 4 °C.

The annual temperature range is little due to the thermoregulating effect of the ocean. Relative humidty is high all the year, reching values of 85% in average. Strong winds are not fequent, and sun bright is permanent throughout the year, except for some short periods in the winter season, when there is a partial

cloudy sky with sun bright. It can be stated that the winter climate in the department of Tumbes is similar to the summer climate in Lima, capital of Peru.

In front of Port of Pizarro there is the Amor Island and the Pajaros Island, which are surrounded by lushing mangroves.

Port of Pizarro is a well visited place by tourists. From this point one can initiate a travel to the interior of the department, to the Papayal and Matapalo villages, located in the dry forest of the western foothills, Other important places in Zarumilla are the locations of Aguas Verdes and Huaquillas.

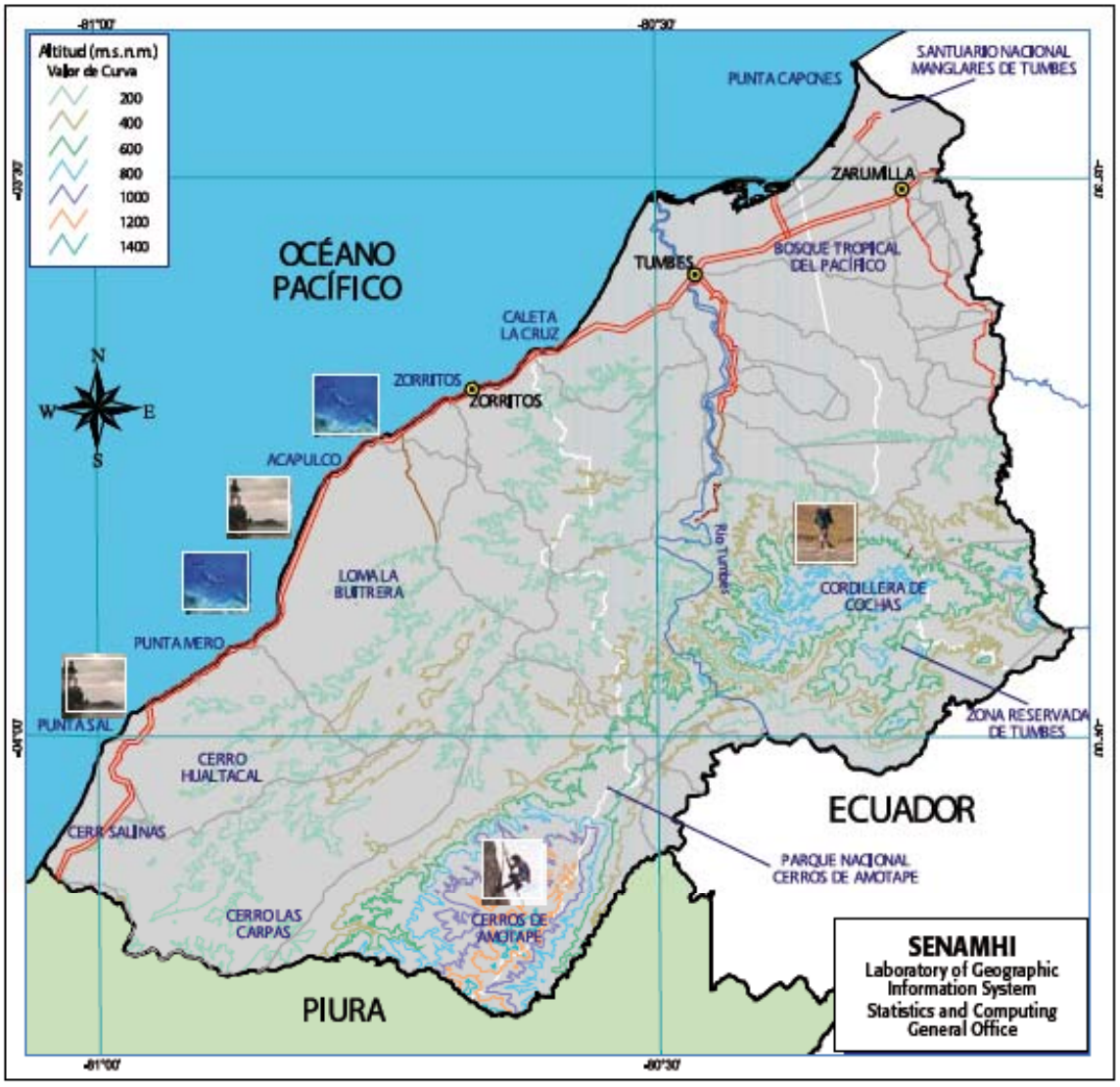
The charts show the daily variation of temperature and relataive humidity in the location of El Tigre (District of San Jacinto, Tumbes) for two typical days in March and July.

MANGLARES DE TUMBES NATIONAL SANCTUARY

Its territory covers 2 972 ha of the peninsula of Zarumilla, where it is preserved the unique sample of a mangrove forest in Peru. The mangrove grows and develops in salty water, and its plants are characterized because of its stilt-shaped roots, with seeds that germinate in the tree, and optimally adapted to the environmental conditions. Several species of mangrove are developed: the red mangrove, the salty, the white, the sprout, and the black. It is an extraordinary aquatic forest that constitutes the natural habitat of "black shells" and another 23 species of shells, 23 species of winkles, 34 of crustaceans and 105 species of fish. Also it can be found some herons, seagulls, eagles, anteaters, otters, iguanas and crocodiles.

CERROS DE AMOTAPE NATIONAL RESERVE

It is formed by a chain of hills southeast-northeast oriented, it separates the basins of the Chira and Tumbes rivers. This zones includes the equatorial dry forest, a



⊙ Province Capital

Rivers

— Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing
 Surfing
 Skiing
 Archaeology
 Sailing
 Climbing
 Hiking
 Cycling
 Diving
 Snowpeak
 Paragliding
 Hunting

transition between the coastal desert and the high forest. Maximum extreme temperatures is generally 32°C nd minimum is 20°C. It is the habitat of a diversity of trees, cactus, climbing and creeping bushes. It also predominates the cock spur coral tree and carb tree forests. Fauna consists of mamal, birds and reptiles.

TUMBES RESERVED ZONE

It was established in an area of 75 102 ha. the prevailing living zone is the rain forest, which turns it into a jungle. The species of fauna are: mono coto, the otorongo from the coast, the crocrodile form Tumbes, the tigrillo, and the sajino. Among the plants

species there are: the cedar tree, the ebony, the guayacán, and the hualtaco. This reserve is located in the provinces of Tumbes and Zarmilla.

ZARUMILLA

It is situated on the border with Ecuador. It is a city with a hot and humid climate, with absence of rainall in autumn, winter and spring. In the summer there is some moderate rainfall except when it occurs an El Niño event, when rainfall exceeds 1 500 l/m² a year, generating a dramatic change in the landscape because it favors the development of vegetation . The coastline of Zarumilla is coverd by a mangrove forest, such as the El Bendito and El Salto.

TUMBES

Is the capital of the department it is traversed by the river of the same name.

Among its tourist attractions it is worth mentioning, the main square, wide and modern where there is located the Matriz Church, one of its most antiques constructions. It is also of interest the pedestrian walk called "La Concordia Peruano Ecuatoriana". Besides, there also exists some colonial houses of the renacimiento style, among which we can mentioned are the Feijoó house, the Cabrera-Garcia Feijoò house, the Cabrera-Garcia house, the house of Cabrera Garcia, the house of Noblecilla.

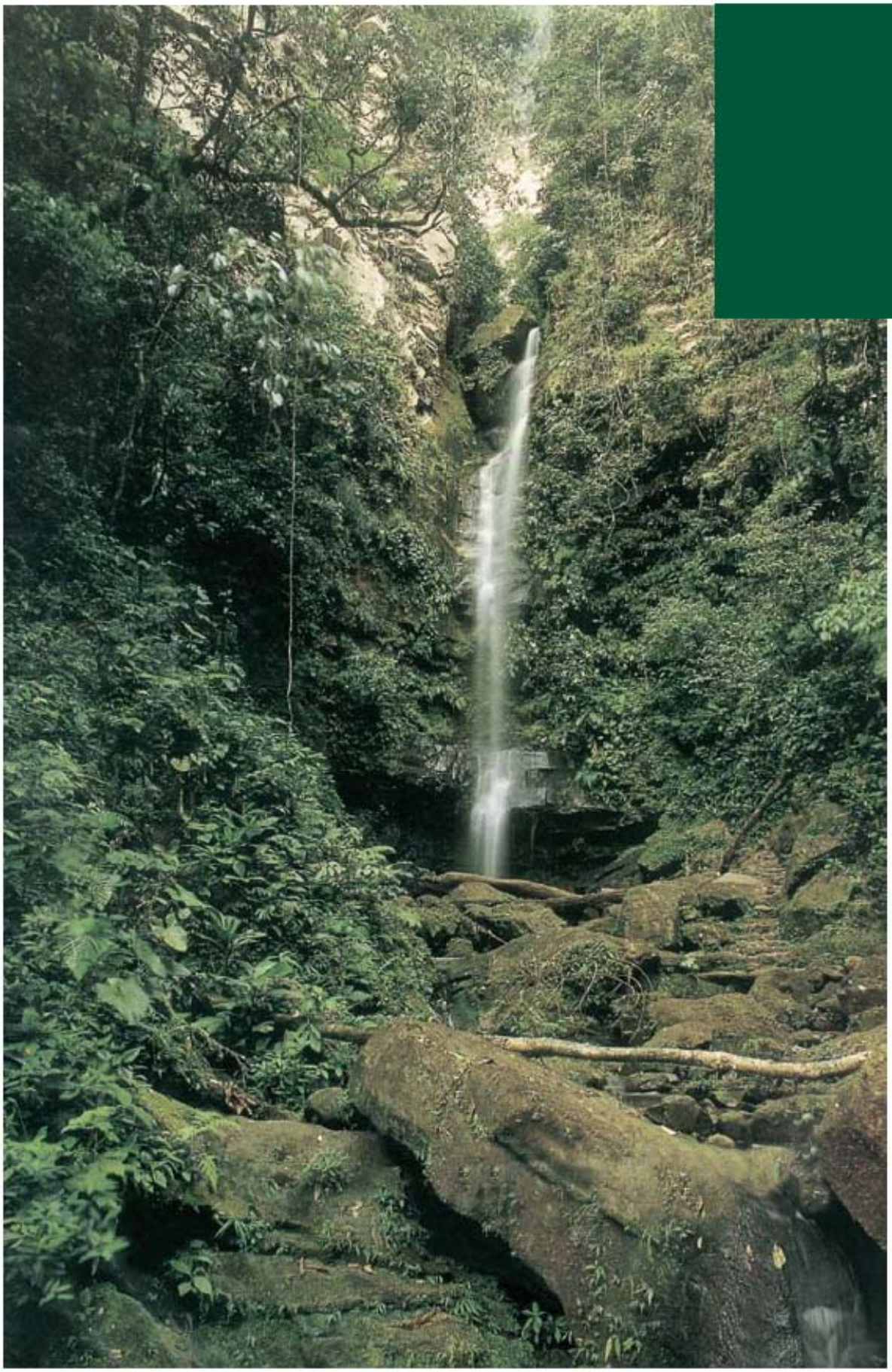
The climate of the city of Tumbes is typically hot and humid, with average extreme temperatures of 32°C and 22°C, respectively, rainfall occurs from January to April.

CONTRALMIRANTE VILLAR

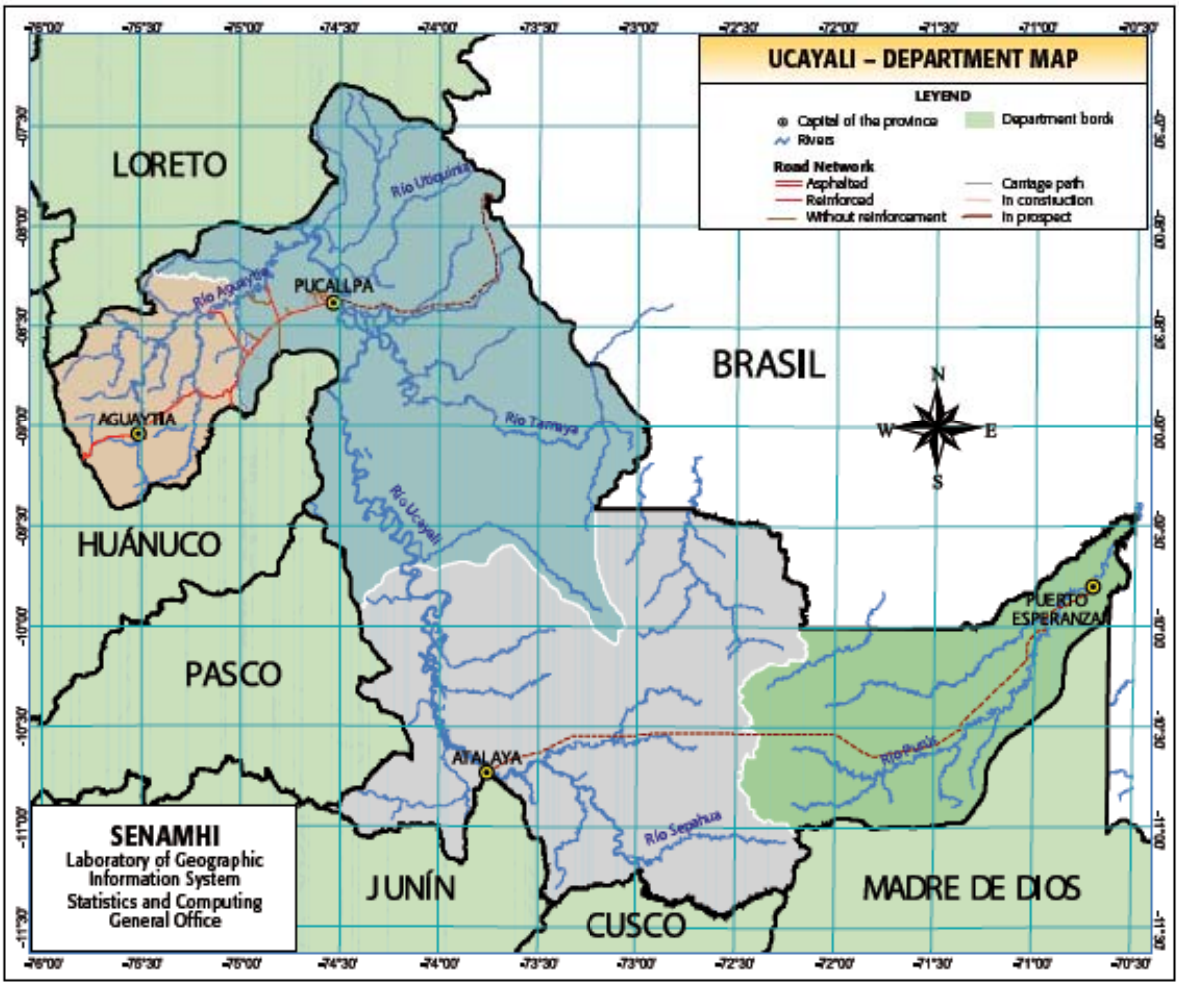
It has a plain relief with large marine terraces that approach the coastline forming ravines. Its climateis hot and humid, with extreme temperatures of 32 °C adn 22 °C, with no rainfall most part of the year. Sea water temperature is 24 °C in the beaches in the summer. Here there are located some of the most beautiful and famouns beaches of the Peruvian coast, such as Punta Mero and Punta Sal.

Chart 127 shows the hourly variation of air temperature and relative humidity in the Caleta Cruz, a location at the sea shore, for a typical day of the winter, where temperatures toward midday reaches 25 °C and humidity 70%, which makes it a pleasant and cool environment.

CHART 129
Temperature and relative humidity in Caleta Cruz
(Lat 3º 37'S Long 80º35'W Alt 0 m.a.s.l.)



Ucayali


UCAYALI – DEPARTMENT MAP
LEYEND
Capital of the province
Department borde
Rivers
Road Network
Asphalted
Reinforced
Without reinforcement
Carriage path
In construction
In prospect
LORETO
PUCALLPA
AGUAYTIA
BRASIL
HUÁNUCO
PASCO
ATALAYA
PUERTO ESPERANZA
JUNÍN
CUSCO
MADRE DE DIOS
N
S
W
E
SENAMHI
Laboratory of Geographic Information System
Statistics and Computing General Office

GEOGRAPHY

The department of Ucayali is located in the central and east part of Peru. To the north it is bordered by the department of Loreto, to the east it is bordered by the Federal Republic of Brasil, to the south by Cusco and Madre de Dios, and to the west it is bordered by Huánuco, Junín and Pasco. Its territory includes two large geographical sectors: the eastern sector of the andean foothills and the Pucallpa plain sector

The first sector is situated between 1 200 m.a.s.l. and 500 m.a.s.l, forming ravines covered with vegetation and traversed by torrential rivers; this sector is also called "front forest". Continuing to the east, the relief is formed by extensive hills, covered with tropical rain forest, called high forest.

The sector of the Pucallpa plain, includes territories situated between 500 m.a.s.l. and 100 m.a.s.l., forming extensive plains, hills and fluvial terraces covered with forests and drained by the Ucayali river and its tributaries.

The Ucayali river traverses along its course, sectors of the High and Low Ucayali, receiving in its way serveral tributaries. Its course is winding or meandric. The level of its waters has little variation as the year goes by, but in the rainfall period, form November to March, it forms lagoons or cochas, and when the rainfall decrease, at the river banks are formed the Barrizales, which are fertile soils suitable to grow rice.

CLIMATE CLASSIFICATION

The department of Ucayali has a diversity of climates. According to the climate classification of Thornthwaite, its territory has the following climates:

A rainy, warm and humid climate, with plenty of rainfall in all the seasons. This climate coresponds to the locations of Aguaytia in the province of Padre Abad.

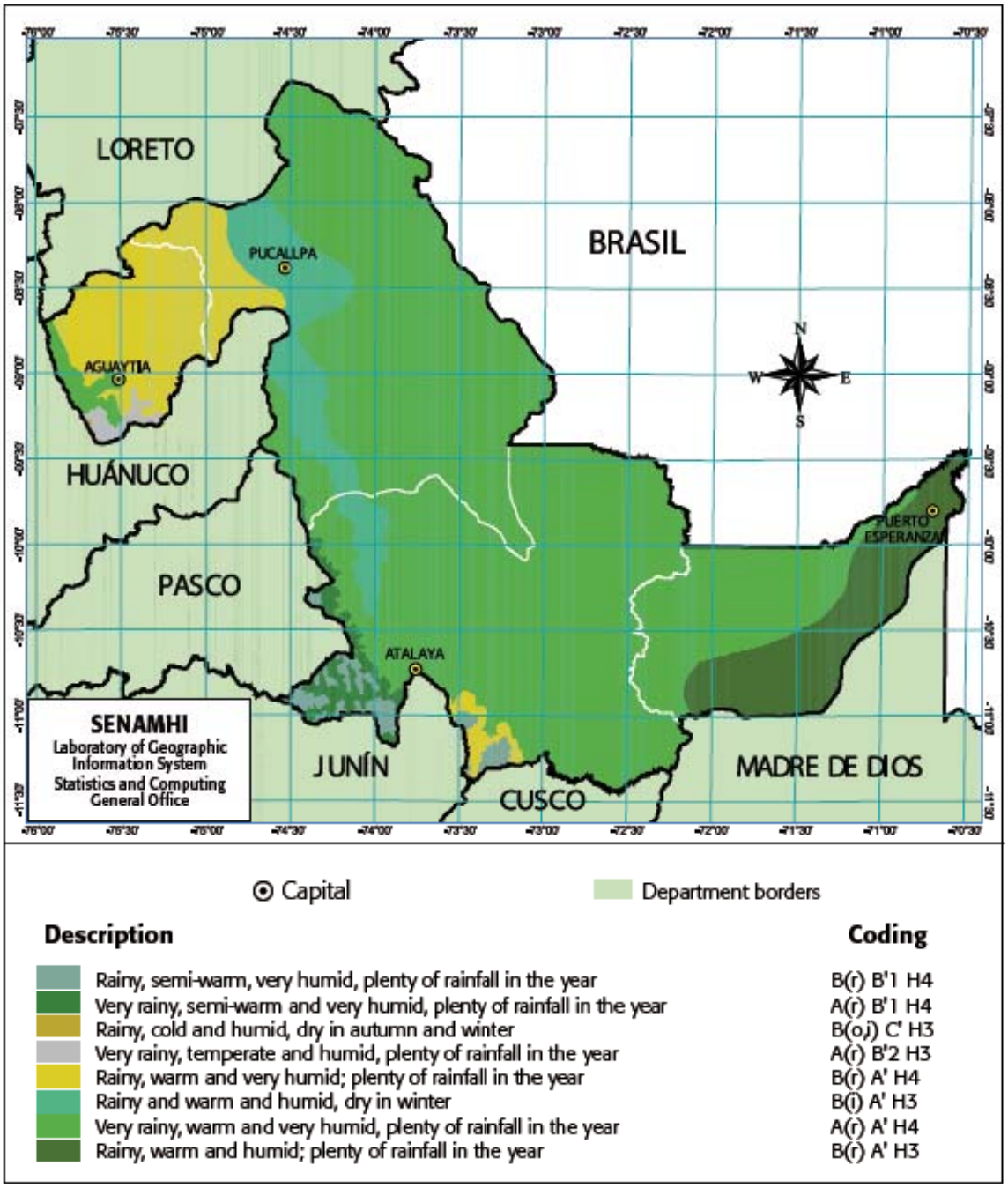
A rainy, semi-warm and humid climate, with plenty of rainfall in all the seasons. This climate corresponds to locations in the provinces of Pucallpa, Coronel Portillo, Atalaya and Purús.

A rainy, warm and humid climate, dry in the winter. This type of climate corresponds to locations in the provinces of Pucallpa and Atalaya.

A rainy, warm, and very humid climate, with plenty of rainfall in all the seasons. This type of climate corresponds to locations of the province of Padre Abad and Atalaya.

WEATHER AND CLIMATE

The territory of the department belongs in more than 90%, to the low forest, for which reason the weather is very hot and humid. Due to its relatively orography evenness and low altitude, temperatures are high throughout the year in any location, exceeding 30 °C almost every day. Except for the very rainy days or when there is the incursion of cold and dry air mases



from subantarctic latitudes (friaje), in which case maximum temperatures decrease to 25 °C or less and minimum decrease to 15 °C or less. Friajes occur from May to September

The annual range of maximum and minimum temperatures is approximately 2 °C, the highest maximum temperatures occur during the months of August, September and October, months is which temperatures can reach 39 °C. In the departments of Ucayali, San Martin and Piura, are registered the highest temperatures at national level.

Minimum tempertures oscillate around 20 °C, but the lowest occur in June, July and August, as it can be seen in chart 128 corresponding to Pucallpa city.

Precipitation is abundant all the year round, the annual average is 20% less than in Iquitos (Loreto) and Puerto Maldonado (Madre de Dios). The chart

shows two maximums in the year, one in October and the other one in March, accumulating amounts over 200 l/m². Rainfall occuring in the winter months are approximately 30% of the rainiest months. Rainfall is generally originated by storms, which are associated to lightning. It develops in the afternoon and the first hours at night. After midnight, very seldom do rainfall occurs, except in the valley of the province of Padre Abad, where there is rainfall during the nights and when there are relatively strong eastern winds

Relative humidity is high all the year round, except for some winter day, when relative humidity decreases to 50% or less due to the important increase of temperature and intense mixture processes, that occur between the air close to surface and the ones at higher altitude.

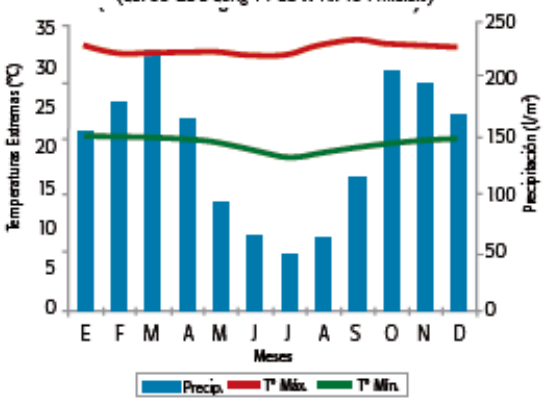
The winds are light all the year, except when there are storms or when there is incursion of cold and dry air masses coming form higher altitudes. During these events, the winds can reach 50 km/h or more. Cloudiness is abundant in the summer and scarce in autumn, winter and spring. In special cases, the sky remains clear up to three consecutive days during the winter and spring time

TOURISTS ATTRACTIONS

PADRE ABAD

It is located in the northwesternmost point, between Loreto and Huanuco. As the Yuracyacu river traverses

CHART 130
Extreme Temperature and Precipitation
Monthly average in Pucallpa
(Lat 08°23'S Long 74°33'W Alt 154 m.a.s.l)



the eastern subandean sector, it forms the Boqueron del Padre Abad, a narrow canyon, formed by water erosion on the rock wall, decorated with waterfalls. The most important ones are El velo de la Novia, or the Bride's veil, La ducha del diablo, the devil's shower, among others. The cliante is rainy, hot with average maximum and minimum temperatures of 32 °C and 19 °C, respectively. The territory is suitable for ecologicla tourism.

CORONEL PORTILLO

It occupies most part of the Ucayali river basin, its main tributaries are; the Aguaytía, Tamaya and Tahuanía rivers. The climate in this province is the rainy, hot and humid kind, with abundant rainfall during all the seasons, and it is characterized for registering the average maximum and minimum temperatures of 33 °C and 21 °C respectivley.

Pucallpa, the capital of the department, is located at 154 m.a.s.l. and it is a comercial city with a rainy and warm climate. Average monthly maximum and minimum temperatures fluctuate around 32 °C and 22 °C, respectively. Here we find the Yarinacocha, Cashibococha, Barboncocha, Mashangai, Imiria and Chauya lagoons, apart form the thermal waters of Aguas Calientes and the Pacacocha Lake.

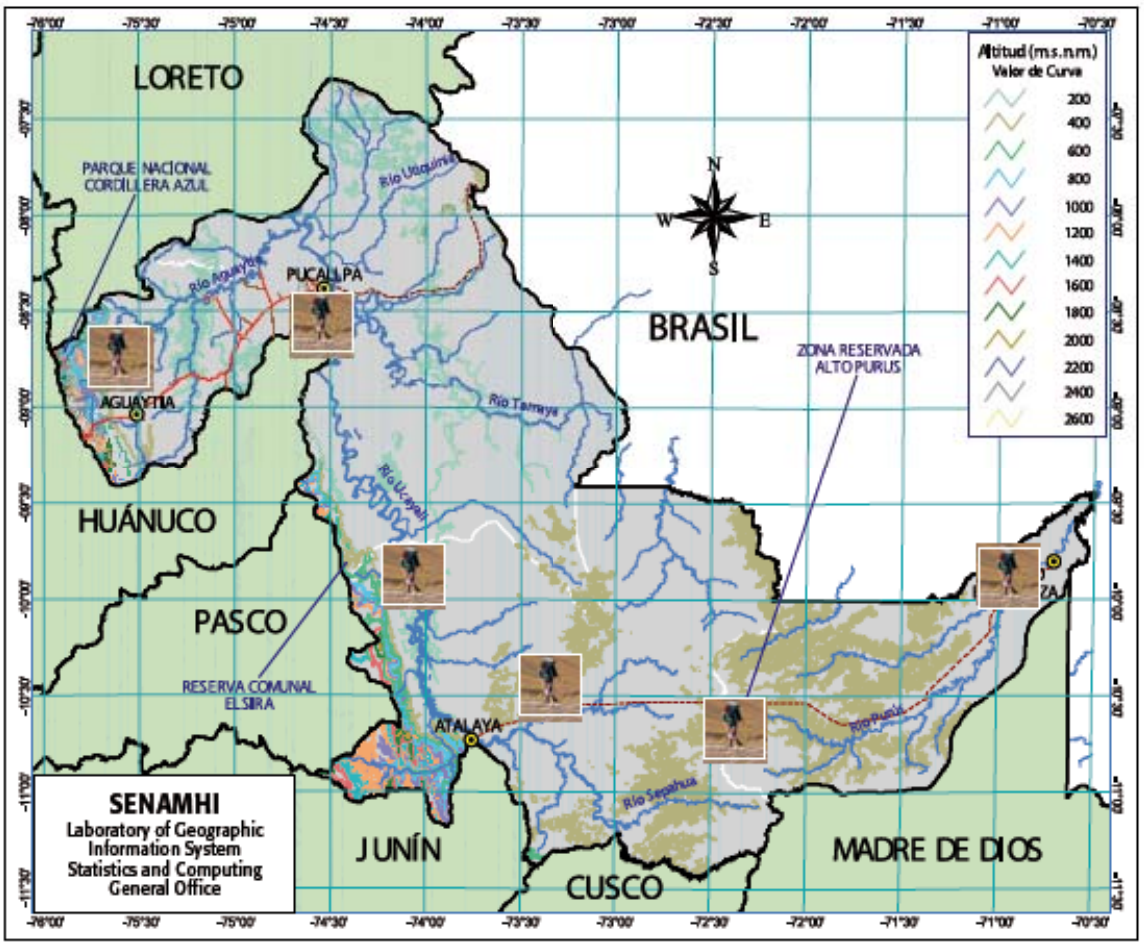
TABLE 25
Sunrise and sunset hours and duration of daylight throughout a year in Ucayali city

	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
Sunrise	05:51	06:01	06:03	06:01	06:03	06:09	06:14	06:08	05:52	05:36	05:28	05:35
Sunset	18:24	18:23	18:12	17:56	17:46	17:48	17:54	17:58	17:55	17:52	17:58	18:12
Time light	12:08	12:12	12:07	11:58	11:55	11:59	12:04	12:03	11:53	11:44	11:43	11:53

ATALAYA

It is located in the High Ucayali and the Low Urubamba rivers basin. This province is home to native communities such as the asháninkas, piros and nahuas. Near Atalaya we can find some important tourist places such as the Toro Echado, Piedra Caracol, Piedra Caruja, monoliths, besides there is the Encantada lagoon or Enchanted Lagoon.

The climate in this province is similar to the one in the province of Coronel Portillo, that is, maximum temperatures that fluctuate around 35 °C, and minimum temperatures oscillate around 21 °C in the spring time. The territory of this province is affected every year by the incursión of southern cold air coming from the south, under this circumstances minimum temperatures drop down to 12 °C or less when the incursión of cold air is intense.



⊙ Province Capital

Rivers

— Main road

Asphalted
Reinforced
Without reinforcement

Carriage path
In construction
In prospect

 Fishing

 Surfing

 Skiing

 Archaeology

 Sailing

 Climbing

 Hiking

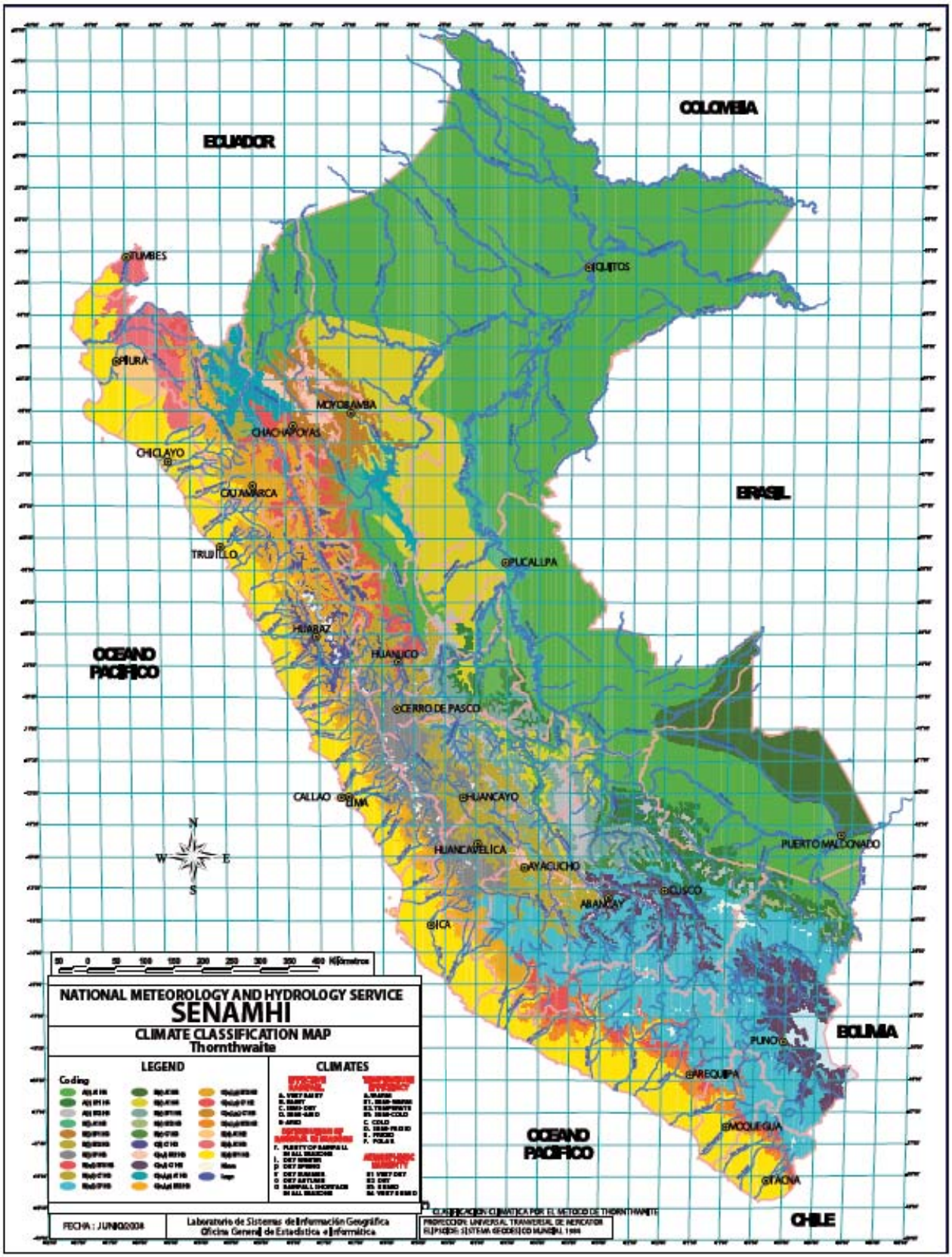
 Cycling

 Diving

 Snowpeak

 Paragliding

 Hunting


COLOMBIA
ECUADOR
BRASIL
BOLIVIA
CHILE
OCEANO PACIFICO
OCEANO PACIFICO
TUMBES
PIURA
CHICLAYO
MOYOBAMBA
CHACHAPOYAS
CAJAMARCA
TRUJILLO
IQUITOS
PUCALLPA
HUARAZ
HUANUCO
CERRO DE PASCO
CALLAO
LIMA
HUANCAYO
HUANCAVELICA
AYACUCHO
ABANCAY
CUSCO
ICA
PUERTO MALDONADO
PUNO
AREQUIPA
MOQUEGUA
TACNA
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NATIONAL METEOROLOGY AND HYDROLOGY SERVICE
SENAMHI
CLIMATE CLASSIFICATION MAP
Thornthwaite
LEGEND
Coding
CLIMATES
FECHA : JUNIO/2004
Laboratorio de Sistemas de Información Geográfica
Oficina General de Estadística e Informática
CLASIFICACION CLIMATICA POR EL METODO DE THORNTHWAITE
PROYECCION: UNIVERSAL TRANSVERSAL DE MERCATOR
ELIPSOIDE: SISTEMA GEODESICO MUNDIAL 1984

NATIONAL METEOROLOGY AND HYDROLOGY SERVICE
SENAMHI

CLIMATE CLASSIFICATION MAP
Thornthwaite

LEGEND

Coding

- A(r) A' H4
- A(r) B'1 H4
- A(r) B'2 H3
- B(r) A' H3
- B(r) B'1 H3
- B(r) B'2 H3
- B(r) C' H3
- C(r) C' H3
- C(o,r) B'2 H3
- C(o,r) C' H2
- C(o,r,p) A' H3
- C(o,r,p) B'2 H3
- C(o,r,p) B'3 H3
- C(o,r,p) C' H2
- C(o,r,p) C' H3
- D(o,r,p) B'2 H2
- E(d) A' H2
- E(d) A' H3
- E(d) B'1 H3
- Nieve
- Lago

CLIMATES

EFFECTIVE RAINFALL

A. VERY RAINY
B. RAINY
C. SEMI-DRY
D. SEMI-ARID
E- ARID

DISTRIBUTION OF RAINFALL IN SEASONS

r. PLENTY OF RAINFALL IN ALL SEASONS
l. DRY WINTER
p DRY SPRING
v DRY SUMMER
o DRY AUTUMN
d RAINFALL SHORTAGE IN ALL SEASONS

TEMPERATURE EFFICIENCY

A. WARM
B1. SEMI-WARM
B2. TEMPERATE
B3 SEMI-COLD
C. COLD
D. SEMI-FRIGID
E. FRIGID
F. POLAR

ATMOSPHERIC HUMIDITY

H1 VERY DRY
H2 DRY
H3 HUMID
H4 VERY HUMID

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