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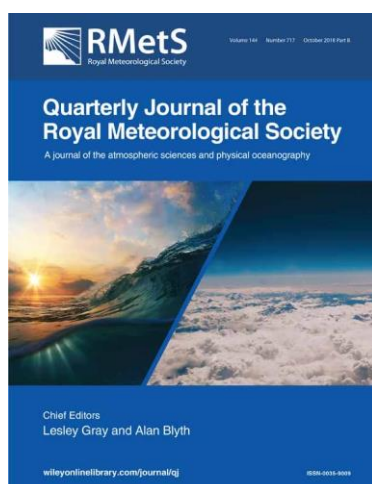
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Revista: Quarterly Journal of the Royal Meteorological Society

Estimating the displacement in precipitation forecasts using the Fractions Skill Score

Gregor Skok, Nigel Roberts

Vol. 144, Number 711, January 2019 Part B.
p. 414 – 425. 15 July 2018.

Abstract

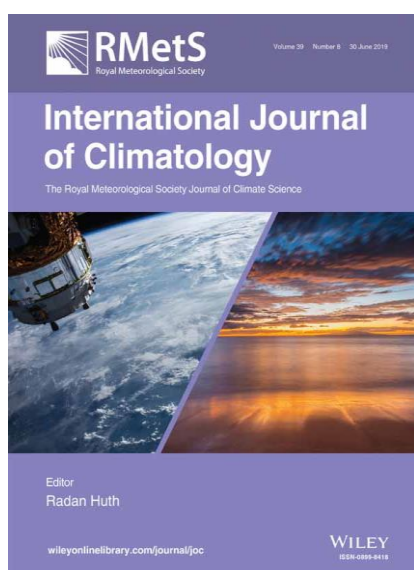
The Fractions Skill Score (FSS) is a popular spatial verification metric commonly used for precipitation verification. In this study we focus on analysing the ability of FSS to provide meaningful information about the displacement between precipitation in one field compared to another. A simple overlap-adjusted use of the FSS is introduced and a number of relevant idealized cases are analysed that show that the FSS can indeed be used to determine displacement in a meaningful way. It was found that the displacement provided by the FSS is directly related to the true displacements of precipitation but with larger contiguous precipitation objects having a much larger influence. Overall, the displacement provided via the FSS compares well with the average distance to the closest neighbouring precipitation object (assuming the objects are of similar size). It is recommended that the user should use a frequency (percentile) threshold when focussing on spatial differences unless biases are known to be small and adopt the overlap-adjusted variant of the FSS displacement. If the frequency bias is very large the FSS-derived displacements become less reliable. The same is true of any spatial comparison. A recipe for the use of the FSS for determining displacements is provided.

DOI: <https://doi.org/10.1002/qj.3212>

Texto completo disponible en la biblioteca.

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Revista: International Journal of Climatology

Process-based evaluation of the VALUE perfect predictor experiment of statistical downscaling methods

P. M. M. Soares, D. Maraun, S. Brands, M. W. Jury, J. M. Gutiérrez, D. San-Martín, E. Hertig, R. Huth, A. Belušić Vozila, Rita M. Cardoso, S. Kotlarski, P. Drobinski, A. Obermann-Hellhund

Volume 39, Issue 9
July 2019
Pages 3868-3893

Abstract

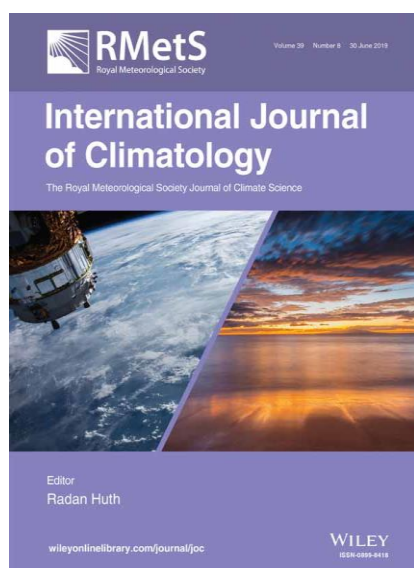
Statistical downscaling methods (SDMs) are techniques used to downscale and/or bias-correct climate model results to regional or local scales. The European network VALUE developed a framework to evaluate and inter-compare SDMs. One of VALUE's experiments is the perfect predictor experiment that uses reanalysis predictors to isolate downscaling skill. Most evaluation papers for SDMs employ simple statistical diagnostics and do not follow a process-based rationale. Thus, in this paper, a process-based evaluation has been conducted for the more than 40 participating model output statistics (MOS, mostly bias correction) and perfect prognosis (PP) methods, for temperature and precipitation at 86 weather stations across Europe.

The SDMs are analysed following the so-called "regime-oriented" technique, focussing on relevant features of the atmospheric circulation at large to local scales. These features comprise the North Atlantic Oscillation, blocking and selected Lamb weather types and at local scales the bora wind and the western Iberian coastal-low level jet.

The representation of the local weather response to the selected features depends strongly on the method class. As expected, MOS is unable to generate process sensitivity when it is not simulated by the predictors (ERA-Interim). Moreover, MOS often suffers from an inflation effect when a predictor is used for more than one station. The PP performance is very diverse and depends strongly on the implementation. Although conditioned on predictors that typically describe the large-scale circulation, PP often fails in capturing the process sensitivity correctly. Stochastic generalized linear models supported by well-chosen predictors show improved skill to represent the sensitivities.

DOI: <https://doi.org/10.1002/joc.5911>

Texto completo disponible en la biblioteca.



Revista: International Journal of Climatology

Uncertainty in gridded precipitation products: Influence of station density, interpolation method and grid resolution

Sixto Herrera, Sven Kotlarski, Pedro M. M. Soares, Rita M. Cardoso, Adam Jacewski, José M. Gutiérrez, Douglas Maraun

Volume 39, Issue 9

July 2019

Pages 3717-3729

Abstract

his work analyses three uncertainty sources affecting the observation-based gridded data sets: station density, interpolation methodology and spatial resolution. For this purpose, we consider precipitation in two countries, Poland and Spain, three resolutions (0.11, 0.22 and 0.44°), three interpolation methods, both areal- and point-representative implementations, and three different densities of the underlying station network (high/medium/low density). As a result, for each resolution and interpolation approach, nine different grids have been obtained for each country and inter-compared using a variance decomposition methodology.

Results indicate larger differences among the data sets for Spain than for Poland, mainly due to the larger spatial variability and complex orography of the former region. The variance decomposition points out to station density as the most influential factor, independent of the season, the areal- or point-representative implementation and the country considered, and slightly increasing with the spatial resolution. In contrast, the decomposition is stable when extreme precipitation indices are considered, in particular for the 50-year return value.

Finally, the uncertainty due to station sub-sampling inside a particular grid box decreases with the number of stations used in the averaging/interpolation. In the case of spatially homogeneous grid boxes, the interpolation approach obtains similar results for all the parameters, excepting the wet day frequency, independently of the number of stations. When there is a more significant internal variability in the grid box, the interpolation is more sensitive to the number of stations, pointing out to a minimum stations' density for the target resolution (six to seven stations).

DOI: <https://doi.org/10.1002/joc.5878>

Texto completo disponible en la biblioteca.



Revista: Meteorological Applications

Brazilian Northeast Jet Stream: association with synoptic-scale systems

Natalia Fedorova , Vladimir Levit, Antonio Marcos Vianna Campos

Volume 25, Issue 2

April 2018

Pages 261-268

Open Access

Abstract

The association of the Brazilian Northeast Jet Stream (BNEJS) with synoptic-scale systems was analysed over 16 years (1994–2009) using reanalysis data from the National Center for Environmental Prediction – National Center for Atmospheric Research (NCEP-NCAR). BNEJS events were divided into three groups, which show the location of the jet stream between synoptic systems at high levels: Type I, a southerly BNEJS between the Bolivian High and upper tropospheric cyclonic vortices (UTCVs) and/or the trough (UTT) over the ocean; Type II, a northerly BNEJS between the South Atlantic Subtropical High (SASH) and the UTCV (and/or the UTT) over the continent; and Type III, a westerly BNEJS between the UTCV in the Northern Hemisphere and a UTT in the Southern Hemisphere. Throughout the year depending on the characteristics of the BNEJS, three distinct meteorological features were observed. A dry period from December to February in the coastal region was characterized by a relatively small number of fast BNEJSs with a low wind speed in the core, with a dominant southeast direction and with the BNEJS's location between the UTCV and the Bolivian High. A period between April and October (a rainy period and the transition to a dry season in the coastal region) was characterized by a rather high number of fast BNEJSs, with high wind speed in the core, a predominant northwesterly direction, and the location of the BNEJS between the UTT and the SASH. Transitional periods (March and November) have a moderate number of BNEJSs without a high wind speed in the core, with a predominant southwesterly direction, and the BNEJS's position between the UTT and the Bolivian High.

DOI: <https://doi.org/10.1002/met.1693>



Revista: Meteorological Applications

Compensation of solar radiation and ventilation effects on the temperature measurement of radiosondes using dual thermistors

Sang-Wook Lee , Eun Uk Park , Byung Il Choi , Jong Chul Kim,
Sang-Bong Woo, Woong Kang , Seongchong Park , Seung Gu Yang ,
Yong-Gyoo Kim

Volume 25, Issue 2

April 2018

Pages 209-216

Open Access

Abstract

The temperature measurement in the upper air by radiosondes is affected by various environmental factors such as solar irradiation, ventilation and air pressure. Among them, solar irradiation induces radiative heating of sensors whereas ventilation causes convective cooling. Here, the effect of these opposite factors on air temperature measurement is studied to obtain a correction formula using an experimental set-up consisting of a wind tunnel, a solar simulator and dual thermistors with different emissivities. The relationship between the temperature difference between the dual thermistors, irradiance and ventilation speed is first established in order to calculate irradiance *in-situ* by solely using the temperature difference. The temperature difference between dual thermistors is linearly proportional to the irradiance up to 1500 W m^{-2} and the slope of the linear function is decreased as the wind speed is increased up to 10 m s^{-1} at a fixed pressure level (about 1000 hPa). The uncertainty of the calculated irradiance using dual thermistors is 12.2% at the coverage factor $k = 2$. The calculated irradiance is then used for the correction of temperature of thermistors relative to the reference temperature in the shade inside the wind tunnel. The combined uncertainty of corrected temperature including uncertainty factors due to the compensation of wind and irradiance as well as the reference temperature is 0.19 K ($k = 2$). The dual thermistor-based technique can provide the traceability of the temperature measurement in upper air through *in-situ* compensation of the solar radiation effect.

DOI: <https://doi.org/10.1002/met.1683>



Revista: Meteorological Applications

Influence of meteorological phenomena on worldwide aircraft accidents, 1967–2010

J. Mazon, JI Rojas, M. Lozano, D. Pino, X. Prats , MM Miglietta

Volume 25, Issue 2

April 2018

Pages 236–245

Open Access

Abstract

Based on the information available in databases from relevant national and international organizations from 1967 to 2010, an Aviation Weather Accidents Database (AWAD) was built. According to the AWAD, the weather is the primary cause in a growing percentage of annual aircraft accidents: from about 40% in 1967 to almost 50% in 2010. While the absolute number of fatalities and injured people due to aircraft accidents has decreased significantly, the percentage of fatalities and injured people in accidents attributed to the weather shows a slight increase in the studied period. The influence of turbulence, clear air turbulence, wind shear, low visibility, rain, icing, snow and storms on aircraft accidents was analysed, considering the different phases of flight, the meteorological seasons of the year and the spatial distribution over four zones of the Earth. These zones were defined following meteorological and climatological criteria, instead of using the typical political criteria. A major part of the accidents and accidents attributed to the weather occur in latitudes between 12° and 38° in both hemispheres. It is concluded that actions aimed at reducing the risk associated with low visibility, rain and turbulence, in this order, should have priority to achieve the most significant improvements in air transport safety.

DOI: <https://doi.org/10.1002/met.1686>



Revista: Meteorological Applications

A novel approach to statistical-dynamical downscaling for long-term wind resource predictions

Roberto Chávez-Arroyo , Pedro Fernandes-Correia, Sergio Lozano-Galiana, Pedro Fernandes-Correia, Sergio Lozano-Galiana, Javier Sanz-Rodrigo , Javier Amezcua, Oliver Probst

Volume 25, Issue 2
April 2018
Pages 171-183

Open Access Abstract

A new method for the long-term prediction of the wind resource based on the concept of statistical-dynamical downscaling is presented. This new approach uses mean sea level pressure maps from global reanalysis data (National Centers for Environmental Prediction Department of Energy Atmospheric Model Intercomparison Project (NCEP-DOE AMIP-II)) and image processing techniques to identify a synthetic reference period which optimally matches the corresponding long-term maps. Four different image processing techniques, averaged into one image similarity error index, are used to evaluate image similarity. A representative set of days is selected by requiring the error index to be minimal. Validation of representativeness in terms of the wind resource for the Iberian domain is performed against 10 years of measured wind data from Navarra (Spain), as well as mesoscale simulations of the Iberian Peninsula. The new approach is shown to outperform not only the industry-standard method but also other recently proposed methods in its capability to achieve mesoscale level representativeness. A particular advantage of the new method is its capability of simultaneously providing a representative period for all potential wind farm sites located within large regional domains without requiring re-running of the method for different candidate sites.

DOI: <https://doi.org/10.1002/met.1678>



Peatland and wetland ecosystems in Peruvian Amazonia: indigenous classifications and perspectives

Schulz, C., M. Martín Brañas, C. Núñez Pérez, M. Del Aguila Villacorta, N. Laurie, IT Lawson y KH Roucoux. 2019.

Ecology and Society, Volume 24, Issue 2

Abstract

Many indigenous people hold detailed ecological knowledge about their environment and have developed complex classifications of ecosystem types in their own languages. These classification systems may be based on characteristics including the availability of key resources, salient plant species, and cultural factors, among others. Indigenous environmental knowledge has been of interest to (ethno-)ecologists, geographers, anthropologists, and other scientists looking to learn from indigenous people, especially in newly emerging research topics. We identified and interpreted an ecosystem classification system of the Urarina, a small indigenous nation based in the Chambira River basin, a peatland-rich area of Peruvian Amazonia. Our findings, based on semistructured interviews, participatory mapping exercises, and site visits, indicate that the Urarina distinguish between ecosystems according to vegetation physiognomy, certain (palm) tree species, hydrology, and soil appearance, and that their use of natural resources varies between different ecosystems. Two Urarina ecosystems, *jiiri* and *alaka*, are almost certainly associated with the presence of peat soils and are of special cultural significance. The Urarina ecosystem classification system thus offers insights and inspiration for ecologists studying peatlands and other wetlands in the Peruvian Amazon who, thus far, have mostly focused on floristic and structural analyses only. Not least, our research highlights the importance of the peatlands for local people, beyond their role for the global climate system as a substantial carbon store.

DOI: <https://doi.org/10.5751/ES-10886-240212>





Uso de biofertilizantes en el desarrollo vegetativo y productivo de plantas de camu-camu en Ucayali, Perú

Carlos Abanto-Rodríguez, Gerson Manuel Soregui Mori, Mario Herman Pinedo Panduro, Ena Vilma Velazco Castro, Elvis Javier Paredes Dávila, Eduardo Medeiros de Oliveira

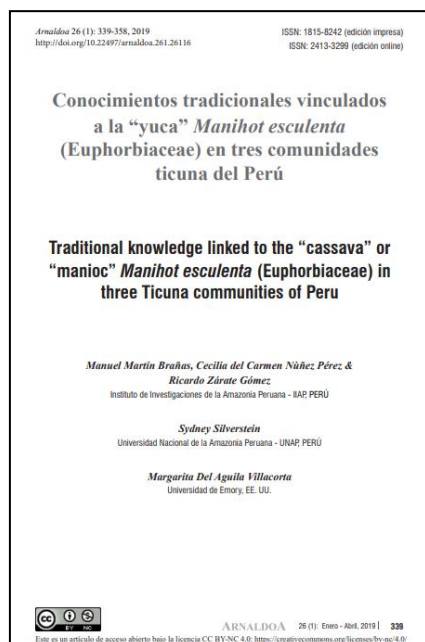
Revista Ceres, Volumen 66, Número 2, Páginas 108-116

Resumen:

Para aumentar la calidad y el rendimiento de frutos en plantaciones de camu-camu, actualmente se viene buscando alternativas de producción orgánica. En ese sentido, el presente trabajo tuvo por objetivo determinar el efecto de diferentes biofertilizantes en el desarrollo vegetativo y productivo de plantas de camu-camu. Para ello, fue conducido un experimento mediante un diseño de bloques completamente al azar (DBCA) en esquema factorial (5Bx5C), con cuatro repeticiones y una planta por unidad experimental. El primer factor (B) estuvo constituido por 5 tipos de biofertilizantes: B1) vacaza (estiércol de vaca), B2) gallinaza (estiércol de gallina de postura), B3) guano de isla (estiércol de aves de mar), B4) pollinaza (estiércol de pollo) y B5) sedimentos de río, y el segundo factor (C) por cinco concentraciones de biofertilizante: C1) 0, C2) 2, C3) 4, C4) 6 y C5) 8%. Después de 210 días, fue verificado que, el biofertilizante guano de isla estimuló mayor emisión de brotes nuevos (1773,73) y el biofertilizante vacaza presentó los mejores resultados de botones florales, número de frutos de cosecha y rendimiento de frutos (t ha⁻¹) con 4611,67; 2926,85 y 28,8 en las dosis 6; 8 y 8%, respectivamente. Se concluye que, el biofertilizante vacaza (VA) incrementó la calidad y el rendimiento de frutos de camu-camu en suelos de restinga. Así también, el biofertilizante guano de isla (GI) fue el segundo en presentar los mejores resultados, sin embargo, el alto contenido de N retardó el desarrollo normal de las fases fenológicas.

DOI: [10.1590/0034-737x201966020005](https://doi.org/10.1590/0034-737x201966020005)





Conocimientos tradicionales vinculados a la “yuca” manihot esculenta (euphorbiaceae) en tres comunidades ticuna del Perú

Arnaldoa, Volumen 26, Número 1, Páginas 339-358

Manuel Martín Brañas, Cecilia del Carmen Núñez Pérez, Ricardo Zárate Gómez, Sydney Silverstein, Margarita Del Águila Villacorta

Resumen:

El pueblo ticuna ocupa la triple frontera de Brasil, Colombia y Perú. La especie más importante en su chacra es la “yuca” *Manihot esculenta* (Euphorbiaceae), una de las más vulnerables a la pérdida de conocimientos sobre su cultivo. No existe información sobre la diversidad de “yuca” en las comunidades ticuna, ni sobre la tecnología usada para su procesamiento. En este sentido, se llevó a cabo una investigación para describir las variedades, tecnologías de procesamiento y su uso en la culinaria tradicional en tres comunidades del distrito Ramón Castilla, provincia Mariscal Ramón Castilla, región Loreto. Se desarrollaron encuestas semiestructuradas, talleres participativos y colecta e identificación de muestras biológicas, determinándose 23 variedades de “yuca”, 14 clasificadas por los ticuna como “yucas dulces” y 9 clasificadas como “yucas bravas”. Se identificaron tres bebidas tradicionales y cinco alimentos elaborados con estas variedades, utilizando para ello cuatro tecnologías propias del pueblo ticuna.

DOI: [10.22497/arnaldoa.261.26116](https://doi.org/10.22497/arnaldoa.261.26116)



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