Geophysical Research Abstracts
Vol. 16, EGU2014-137-1, 2014
EGU General Assembly 2014

MOnthly TEmperature DAtabase of Spain 1951-2010: MOTEDAS. (1) Quality control

Dhais Peña-Angulo (1,2), Nicola Cortesi (1,2), Claudia Simolo (3), Peter Stepanek (4), Michele Brunetti (3), José Carlos González-Hidalgo (1,2)

(1) University Zaragoza, Geography, Zaragoza, Spain, (2) IUCA-Univsertity of Zaragoza, Spain, (3) ISAC-CNR, Bologna,Italy, (4) GCRC AS CR, v. v. i., Czech Republic

The HIDROCAES project (Impactos Hidrológicos del Calentamiento Global en España, Spanish Ministery of Research CGL2011-27574-C02-01) is focused on the high resolution in the Spanish continental land of the warming processes during the 1951-2010. To do that the Department of Geography (University of Zaragoza, Spain), the Hydrometeorological Service (Brno Division, Chezck Republic) and the ISAC-CNR (Bologna, Italy) are developing the new dataset MOTEDAS (MOnthly TEmperature DAtabase of Spain), from which we present a collection of poster to show (1) the general structure of dataset and quality control; (2) the analyses of spatial correlation of monthly mean values of maximum (Tmax) and minimum (Tmin temperature; (3) the reconstruction processes of series and high resolution grid developing; (4) the first initial results of trend analyses of annual, seasonal and monthly range mean values.

- MOTEDAS has been created after exhaustive analyses and quality control of the original digitalized data of the Spanish National Meteorological Agency (Agencia Estatal de Meteorología, AEMET).
- Quality control was applied without any prior reconstruction, i.e. on original series. Then, from the total amount of series stored at AEMet archives (more than 4680) we selected only those series with at least 10 years of data (i.e. 120 months, 3066 series) to apply a quality control and reconstruction processes (see Poster MOTEDAS 3). Length of series was <30 year in 2097 cases (66%). In 328 cases the series recorded more than 600 months (i.e. 50 years). The monthly distribution of series varies in time, with a maximum at the end of the XXth century.
- Quality control on original series was developed iteratively in two steps.
  (a) Firstly identified anomalous data in the original series by using coherence analyses (Tmax>Tmin, upper and lower thresholds of absolute data, etc), and by comparison with reference series (see Poster MOTEDAS 3, about reconstruction). Anomalous data were considered when difference between Candidate and Reference series were higher than three times the interquartile distance. The total amount of monthly suspicious data recognized and discarded at the end of this analyses was 7832 data for Tmin, and 8063 for Tmax data; they represent less than 0,8% of original total monthly data, for both Tmax and Tmin. No spatial pattern was detected in the suspicious data; month by month Tmin shows maximum detection in summer months, while Tmax does not show any monthly pattern.
  (b) Secondly, the homogeneity analyses was performed on the list of series free of anomalous data by using an arrays of test (SNHT, Bivariate, T de Student and Pettit) after new reference series calculated with data free of anomalous. The tests were applied at monthly, seasonal and annual scale (i.e. 17 times per method). Statistical inhomogeneity detections were accepted as follows:
     i. Three annual detections (monthly, seasonal, annual) must be found in SNHT or Bivariate test.
     ii. The total amount of detections by the four tests was greater than 5% of the total possible detection per year.
     iii. Before any correction we examined the Candidate and reference series chart.
  (c) Proclim and Anclim software were used during all the processes
- The total amount of series affected by inhomogeneities was 1013 (Tmax) and 1011 (Tmin), i.e. 1/3 of original series was considered as inhomogeneous. We notice that identified inhomogeneous series in Tmax and Tmin usually do not coincide. This apparently small amount of series compared with previous work could be originated because of the mean length of series is around 15-20 years.

References.

Stepánek P. 2008a. AnClim – software for time series analysis (for Windows 95/NT). Department of Geography, Faculty of Natural Sciences, MU, Brno, 1.47 B.

Stepánek P.. 2008b. ProClimDB – Software for Processing Climatological Datasets. CHMI, Regional office, Brno.