



## **Benchmarking results of the homogenization of daily Essential Climatic Variables within the INDECIS project**

José A. Guijarro (1), Enric Aguilar (2), Peter Domonkos (3), Javier Sigró (2), Petr Štěpánek (4), Victor Venema (5), and Pavel Zahradníček (4)

(1) AEMET (State Meteorological Agency), Palma de Mallorca office, Spain (jguijarrop@aemet.es), (2) Center for Climate Change (C3), Universitat Rovira i Virgili, Tarragona, Spain (Enric.Aguilar@urv.cat), (3) Climate researcher, Tortosa, Spain (dpeterfree@gmail.com), (4) Global Change Research Institute, Czech Academy of Sciences (GCRI), Brno, Czech Republic (stepanek.p@czechglobe.cz), (5) Meteorological Institute, University of Bonn, Bonn, Germany (Victor.Venema@uni-bonn.de)

The European project INDECIS\* (Integrated approach for the development across Europe of user oriented climate indicators for GFCS high-priority sectors: agriculture, disaster risk reduction, energy, health, water and tourism) needs quality controlled and homogenized daily series of several essential climate variables to produce climate indices for their target economical sectors. Work Package 3 is the project team dedicated to provide these high quality series from their raw versions stored at the European Climate Assessment and Dataset (ECA&D).

As a first step, a benchmarking exercise was designed in order to test available methodologies on two target areas: Southern Sweden and Slovenia. After considering other alternatives, the Royal Netherlands Meteorological Institute (KNMI) Regional Atmospheric Climate Model (RACMO) version 2 driven by Hadley Global Environment Model 2 - Earth System (MOHC-HadGEM2-ES) was selected as benchmark homogeneous data-set because of its high spatial resolution ( $0.11^\circ$ ), daily time step and a correspondence of the output variables with the studied ECA&D variables.

Relocation inhomogeneities and other perturbations were then applied to the homogeneous data-set to compile different benchmark flavors with varied difficulties. These benchmarks were released to be used by developers and users of homogenization packages in order to test their performances when applied to daily climatic series, not only of extreme temperatures and precipitation as has been customary in past benchmarking efforts, but also of cloud cover, wind speed, relative humidity, sea level pressure, sunshine duration and snow depth.

The performance of the applied methodologies are evaluated by comparing errors in the corrected series, their trends and monthly indices relevant to the project objectives. The discussion includes considerations about the difficulties found when homogenizing the different variables and prospects for the homogenization of the complete set of ECA&D series, which will be used by the rest of the INDECIS teams.

---

\* Project INDECIS is part of ERA4CS, an ERA-NET initiated by JPI Climate, and funded by FORMAS (SE), DLR (DE), BMFWF (AT), IFD (DK), MINECO (ES), ANR (FR) with co-funding by the European Union (Grant 690462).