EGU2020-13386
https://doi.org/10.5194/egusphere-egu2020-13386
EGU General Assembly 2020

Accounting for the spatial support-effect on modelling a temperature field from different sources of experimental data

Steven R. Fassnacht[1], **Antonio-Juan Collados-Lara**[2], Eulogio Pardo-Igúzquiza[3], and David Pulido-Velazquez[2]

[1]ESS-Watershed Science, Colorado State University, Fort Collins, CO 80523-1476, USA. e-mail: Steven.Fassnacht@colostate.edu

[2]Instituto Geológico y Minero de España, Urb. Alcázar del Genil, 4. Edificio Zulema Bajo, 18006, Granada (Spain). e-mails: aj.collados@igme.es; d.pulido@igme.es

[3]Instituto Geológico y Minero de España, Ríos Rosas, 23, 28003 Madrid (Spain). e-mail: e.pardo@igme.es

Each experimental data measured by an instrument has an associated spatial (and temporal) support to which the measurement is assigned. In this sense a logger provides the temperature at a particular spatial location and has a point-support while satellite derived temperatures have an areal support equal to the size of the pixel of the satellite image (i.e. the spatial resolution of the image). Thus, when combining or merging both types of measurement, their support must be taken into account. In fact, in nature there is a continuous temperature field that is only accessible from empirical data with its associated support. In this work three sources of data have been considered to model the variability of temperature at two scales in the Southern Rocky Mountains across the northern Front Range of Colorado (NFRC). The coarse scale uses the NRCS SNOTEL stations across the NFRC and the fine scale uses iButton sensors at the Colorado State University Mountain Campus (CSUMC) located within the NFRC. The MODIS-based land surface temperature (LST), which has a spatial resolution of about 1 km, has been considered for both scales. The SNOTEL stations and the iButton sensors have a point support while satellite LST has an areal support. The main goal of this work is to assess the variability of the temperature field at both scales, taking into account the support effect of each set of experimental data, by using a geostatistical approach.

This research has been partially supported by the SIGLO-AN project from the Spanish Ministry of Science, Innovation and Universities (Programa Estatal de I+D+I orientada a los Retos de la Sociedad).