



Automatic data quality control using spatial interpolation with statistical methods

C. Lussana (1), M. Ranci (1), M.R. Salvati (1) and F. Ubaldi (2)

(1) Servizio Meteorologico Regionale - ARPA Lombardia, Milano, Italy
(c.lussana@arpalombardia.it; m.salvati@arpalombardia.it; maria.ranci@gmail.com)

(2)consultant, Novate Milanese (MI), Italy (ubaldi@magritte.it)

Data quality control (DQC) is a fundamental step for any kind of data analysis; in particular it's important to have a reliable automatic DQC for numerical elaboration purposes, objective analysis included.

The automatic high resolution meteorological network managed by Lombardia's Regional Weather Service is distributed over complex terrain in orography and land use. Furthermore, station sites are not optimized and observations are differently affected by representativity errors.

For these reasons there is a strong need of robust, reliable, automatic DQC procedures. Simple tests based on climatology and on increments or persistence thresholds have been successfully implemented.

Additionally, statistical interpolation methods (as Optimal Interpolation) provide a valuable tool for spatial consistency test in automatic DQC. Simple analytical representation of a-priori error covariances allow for analysis estimates with satisfactory cross-validation scores. A-posteriori evaluation of error probability density functions can be used estimate representativity errors of the observations and to reject data affected by gross errors through appropriate DQC tests.

This automatic DQC is an operational tool for the Regional Weather Service and it is used both as a filter for numerical procedures and as a support for the daily human DQC.