



Enabling Climate Information Services for Europe

Report

DELIVERABLE 5.3

High resolution gridded precipitation dataset for past decades for the Sicily Region

Activity:	<i>WP5 – Water</i>
Activity number:	<i>Task 5.3 Water availability in Sicily, Italy</i>
Deliverable:	<i>High resolution gridded precipitation dataset for past decades for the Sicily Region</i>
Deliverable number:	<i>5.3</i>
Authors:	<i>Michele BRUNETTI, Claudia SIMOLO - ISAC-CNR; Maurizio MAUGERI - University of Milan</i>

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Summary

The deliverable consists of maps showing the distribution of monthly and yearly precipitation normal values over Sicily for five consecutive 10-year periods starting from 1951-1960 and for the 2001-2008 period. The spatial resolution is 30-arc-second.

1. Introduction

Spatial climate data sets in digital form are currently in great demand and gridded estimates of monthly temperature and precipitation climatological normals are requested by a variety of models and decision support tools, such as those used in agriculture, engineering, hydrology, ecology and natural resource conservation (Daly et al., 2002; Daly, 2006). Beside the spatial distribution of the climatological normals, it is also important to describe the spatio-temporal behaviour of climate variability and change. Such information turns out to be fundamental within climate impact-related researches which may concern local scales such as, e.g., a winter resort or an experimental crop field.

2. Description of the procedure

We have recently developed a methodology to construct high resolution precipitation grids (30-arc-second-resolution) over complex terrain (Brunetti et al., 2009; 2012). It assumes that the spatio-temporal structure of the signal of a meteorological variable over a given area can be described by the superimposition of two fields (New et al., 2000; Mitchell and Jones, 2005): the climatological normals over a given reference period (i.e. the climatologies) and the departures from them (i.e. the anomalies). The former are basically linked to the geographical features (elevation in particular) of the territory and they can manifest remarkable spatial gradients. On the contrary, the latter are linked to climate variability and change and they are generally characterized by higher spatial coherence.

This methodology has been applied to a set of 424 Sicily stations with mean precipitation data. It allowed to obtain high resolution fields both for precipitation climatologies (the Local Weighted Linear Regression of Temperature versus Elevation method was used) and for the corresponding time-dependent anomalies (a subset of 225 quality checked and homogenised anomaly records was used). The superimposition of the two fields allowed to get high-resolution monthly virtual records for any point of Sicily. These records were obtained to calculate the 10-year average fields which are provided in this deliverable.

Figure 1 show the maps of the yearly normal values for the five consecutive 10-year periods starting from 1951-1960 and for the 2001-2008 period.

2. Conclusions

A methodology which allows to obtain virtual precipitation records for any cell of a high resolution grid covering the whole Sicily territory has been developed. The results allow both to describe the spatial distribution of precipitation over Sicily and to show the spatio-temporal behaviour of precipitation variability and change.

References

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Links to concrete results: <http://www.eclise-project.eu/>

References to activity meetings: The objectives of these maps have been presented at the ECLISE Kick-off meeting (De Bilt - 09 March 2011); the methods and results have been presented at the First ECLISE meeting (Norrkoping - 6-7 March 2012).

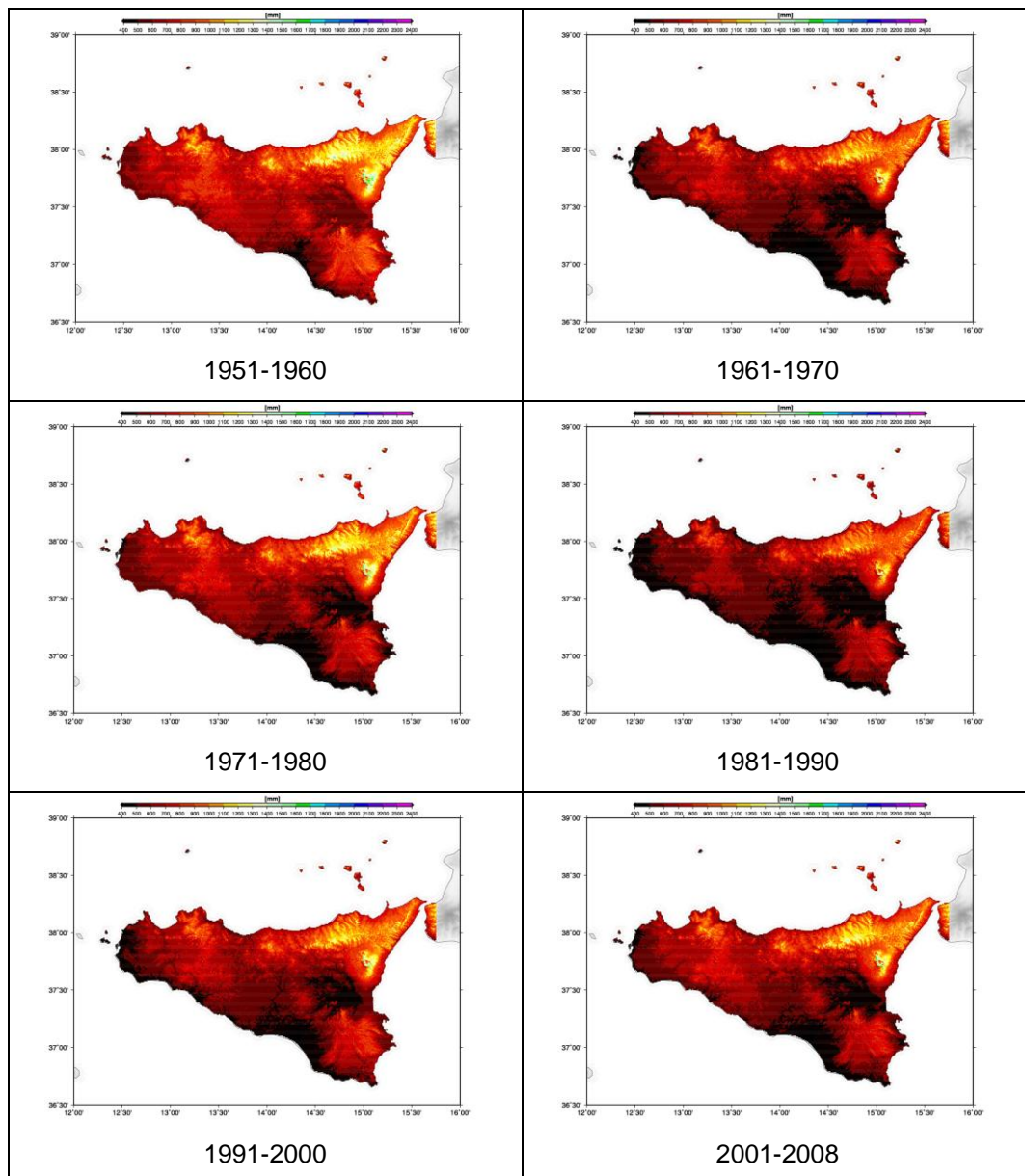


Figure 1 - yearly precipitation normal values over Sicily for five consecutive 10-year periods and for the 2001-2008 period