Geophysical Research Abstracts
Vol. 13, EGU2011-8840, 2011
EGU General Assembly 2011

Study of intense precipitation events during the last 40 years in Sardinia (Italy) by dynamical downscaling and regional climate modeling.

Marino Marrocu (1), Antioco Vargiu (1), Gabriella Pusceddu (1), and Paolo Boi (2)

(1) CRS4, Environmental Sciences, Pula (CA) - Italy, (marino@crs4.it), (2) ARPAS, Dipartimento Idrometeoclimatico, Sassari - Italy (pboi@arpas.sardegna.it)

As outlined in recent guidelines of WMO on climate change, the study of variability and occurrence of extreme events at regional scale in the last century is of crucial importance for the proper management of local resources and the mitigation of impacts.
In line with these objectives in the present work we discuss results obtained studying in detail 40 flooding events that happened in Sardinia between 1958 and 2001. These events are triggered by intense Mediterranean cyclones and where characterized by cumulative daily precipitation greater than 200mm measured at least by one ground station. The aim of the work was, not only the study and comparison of the dynamics of these events, but also the verification of the predictability of such events on a state of the art mesoscale chain modeling and the verification of event frequency obtained by a regional climate model.
Since the ERA40 climatic dataset, for its relatively low resolution, is not suitable for the study of intense mesoscale phenomena, we set up a dynamic downscaling in three steps, using the limited area meteorological models developed at ISAC-CNR Bologna (Italy). For each run (and for each model) a validation of results was made using standard precipitation skill indicators (ETS, BIAS, POD, FAR, HK). The ability to describe the frequency of these intense events was also investigated running the RegCM climatic model driven by the ERA40 boundary conditions for a period of 10 years (1982-1991) in a extended European domain. Verification was made against pluviometric data operated by the Sardinian Meteorological Service (ARPA Sardegna) and the E-OBS gridded dataset of observations at the resolution of 0.25 degrees.
Preliminary results show in general a good ability of the mesoscale chain to describe this kind of events, however, high values of BIAS and FAR at higher thresholds indicate a low accuracy in the location of the peaks, due perhaps to false orographic triggering.
Since most of the events are associated with moist easterly winds at ground on Sardinia, during the months of October and November, that are in general associated with a well defined large scale configuration, despite the low resolution of the climatic model there seems to be some chance to describe them with the correct frequency.