Geophysical Research Abstracts
Vol. 14, EGU2012-6605, 2012
EGU General Assembly 2012

The climate of the Venetian and North Adriatic region: variability, trends and future change

P. Lionello (1,2)
(1) Salento, Material Science, Italy (piero.lionello@unisalento.it), (2) CMCC, Italy

This contribution analyzes the evolution of the climate of the Venetian region on the basis of a workshop that was organized in Venice (27-29 October 2008) by CORILA (COnsorzio RIcerche LAguna). The workshop has considered past and future evolution of the regional climate, sea level, storminess, and has allowed to widely discuss important scientific results and to identify existing gaps in the present knowledge. In the Venetian plane an unprecedented warming (3.2oC/century) and a moderate decrease of annual precipitation (-3%/century) are expected, with no analogy in the past 250 years during which there was no sustained centennial trend. The understanding of past sea level evolution is in part problematic. The analysis of tide gauges in Venice and Trieste suggests a centennial trend of relative sea level rise (about 1.1mm/year) comparable to, but smaller than, the global sea level trend. However, past relative sea level in Venice has been strongly affected by tectonic motions and isostatic adjustment. If their estimated effects are subtracted from the tide gauge observation, the sea surface height in Venice would show a centennial trend (0.3mm/year) that is much smaller than the global value. Unless a physical explanation for this low value is found, estimates of vertical land motions for this century need to be reconsidered. Future evolution of sea level is uncertain. Glaciers and ice sheet melting, its regional implications, regional steric effects associated with changes of temperature and salinity are all expected to be important in future and are not adequately known. A large future halosteric contribution is peculiar of the Mediterranean Sea, where future increased salinity and consequent contraction of the water column could compensate for water mass addition and thermosteric expansion. The time series of storminess is dominated by large interannual and interdecadal variability and there is no evidence of its past or future changes on centennial time scale. Relative sea level trends are very likely to be the main cause of future changes of flood frequency and height, which will, anyway, continue being strongly affected by interannual and interdecadal fluctuations.