Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06579, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06579
EGU General Assembly 2008

Assessing the impact of Climate Change on continental surface hydrology and discharge in France

P. Quintana Seguí (1), E. Martin (1), F. Habets (2), J. Boe (3), A. Ribes (1), S. Somot (1), J. Noilhan (1)

(1) CNRM-GAME Météo-France CNRS, (2) UMR 7619 Sisyphe, (3) European Centre for Research and Advanced Training in Scientific Computation (CERFACS)

The assessment of the impacts of climate change on the water cycle has become a very important issue, due to the public interest on climate change and to the economic and social importance of water resources. Furthermore, some regions of France, like the Mediterranean region, are specially vulnerable, due to the possibility of an intensification of the summer dry period and, at the same time, an increase in intense precipitation events (Cevennes) on a highly populated region. This work is done under the framework of the CYPRIM project (Cyclogénèse et précipitations intenses en Méditerranée) which has the objective to study the systems that produce intense precipitation on this region and to study their impacts and their future evolution.

The impact of climate change on the hydrological cycle was assessed using the SAFRAN-ISBA-MODCOU suite (SIM). This model allows the simulation of the land surface hydrology at a resolution of 8x8 km2 and the simulation of the discharge associated at more than 800 gauging stations using a distributed hydrological model. In this study, an improved version of the SIM model was used in conjunction to a disaggregated regional climate change scenario to assess the impact of future climate on the water cycle. The climate scenario was provided by the Sea Atmosphere Mediterranean Model (SAMM). SAMM is a stretched-grid global atmosphere model locally coupled with a regional ocean circulation model. In this model, the atmosphere is simulated by the spectral ARPEGE-Climate model, which has a resolution of 50 km over the Mediterranean area. The ocean is simulated by the Mediterranean Sea limited area OGCM OPAMED, whose resolution is of 10 km. The resulting SAMM model

was run for 140 years, starting in 1960. Up to year 2000, forcing was prescribed from observed values, whereas , beyond 2000, forcing followed a SRES-A2 scenario. The climate scenario was disaggregated to the resolution of SIM using a new statistical method based on weather types.

The impact of the climate change will be assessed for selected periods of the 21st century or as trends over the whole period. Results concerning evaporation, soil wetness, snow pack and river discharge (on ˜800 points) will be highlighted. Specific diagnostics on extreme precipitation (and flooding) in the mediterranean area will be detailed, as well as specific diagnostic on drought periods.