Geophysical Research Abstracts
Vol. 12, EGU2010-2893, 2010
EGU General Assembly 2010

Simulation of the 19th and 20th century

adeline bichet, christoph schaer, martin wild, and doris folini
ETH Zürich, Switzerland (bichetadeline@yahoo.fr)

Climate simulations with an atmospheric general circulation model (GCM) driven with natural and anthropogenic forcings have been carried out from 1870 to 2000. The atmospheric GCM ECHAM5 is interactively coupled to the atmospheric aerosol module HAM, while the sea surface temperatures (SSTs) are based on data from the Hadley Center dataset. Other forcings include aerosol emissions, changes in greenhouse gases, DMS, solar output and volcanic activities. Global simulations allow a general overview of the climate evolution since the end of the nineteenth century, and results will be further used to set the lateral boundary conditions for a future regional study in Europe. We aim to understand the behavior of the hydrological cycle in Europe for the last 140 years, its dynamic, its relation to large scale atmospheric circulation and to its main drivers. Sets of sensitivity experiments are carried out to understand the hydrological cycle changes under different forcings. Our results reproduce precipitation close to observations at global, hemispheric and to some extent at European scales, and our first results suggest that SSTs have a major influence on global and hemispheric precipitation. Results are also discussed with a particular emphasis on the mechanisms behind the high precipitation observed (and simulated) in Central Europe in the late nineteenth century.