Session: C2 Poster: T133B

The hydrological regime of the Iber· and Pantanal wetlands and the potential impacts of Climate Change

Natalia Montroull[†]; Ramiro Saurral; Ines Camilloni
[†] CIMA (CONICET/UBA), Argentina
Leading author: nmontroull@cima.fcen.uba.ar

The La Plata Basin (LPB) in southeastern South America hosts the Pantanal and Iber· wetlands, the largest continuous freshwater wetlands in South America. They host several flora and fauna species unique in the world, some of them vulnerable and threatened. Wetlands are ecosystems characterized for being covered or saturated by water for all or part of the year. Therefore, the hydrological regime is determinant for their presence and permanence. Both land use changes and climate variability and change modify the hydrological conditions of the systems and consequently could affect the wetlands biodiversity. A detailed knowledge of the hydrological variability in the region will be an important tool for the development of better management practices and adaptation strategies for the conservation of the region. For this purpose, the Variable Infiltration Capacity (VIC) hydrology model is used to simulate the streamflow annual cycle over these two wetlands. This model successfully represents the annual cycles, although it has been found to perform better in basins with larger slopes and high runoff ratios rather than in basins with flat topography and low runoff ratios, like these two basins. The potential impacts of climate change on the hydrology of the Pantanal and Iber· wetlands are assessed by using the "delta change" approach which is a widely accepted and relatively simple method for constructing climate change scenarios data sets for impact studies. This method consists in adding a change factor to the baseline period time series of climate observations. The change factors (percentage change in precipitation and absolute change in temperature) were derived by calculating the differences between annual mean projected and baseline daily maximum and minimum temperature and precipitation simulated by the ECHAM5/MPI-OM General Circulation Model. These model outputs were chosen for this study as it is one of the best GCM in representing the present climate in LPB as compared with others included in the WCRP-CMIP3 multi- model dataset. Three future time slices (2020-2029, 2050-2059 and 2080-2089) and three emissions scenarios (A1B, A2 and B1) were considered. The model was able to reproduce the streamflow annual cycle of the Corriente and Paraguay rivers at the outlet of the Iber· and Pantanal wetlands with mean discharge errors of 0.1% and 4.5% respectively and also showed an acceptable representation of the interannual variability of the Corriente River with a NSE of 0.68. All scenarios show an increment in runoff in the Iber· wetlands during the 21st century, whereas in the Pantanal the different scenarios show much less agreement in the magnitude of change in runoff. Results indicate that for both basins, precipitation rather than temperature has the major effect on changes in runoff.