Geophysical Research Abstracts
Vol. 19, EGU2017-15459, 2017
EGU General Assembly 2017

Advances toward developing a global wetland delineation method using geomorphological information

Ardalan Tootchi, Agnès Ducharne, and Anne Jost
UMR 7619 METIS, Sorbonne Universités, UPMC, CNRS, EPHE, 75005 Paris, France

Wetland hydrology is an important player in the Earth climate system because of its feedbacks to the atmosphere and its role in methane emission. Wetlands interact with the surrounding environments and affect them considerably. To include wetlands in climate models globally, both their geographic distribution and hydrology should be known. There exists a number of global datasets that either compile national/regional maps together to generate global maps (as in GLWD) or, employ satellite imagery to identify inundated areas (e.g. GLC2000 and ESA-CCI). These datasets are mostly often in spatial discordance and, as result, wetlands are the land type with the lowest agreement (Nakaegawa, 2012). The global coverage of wetlands in these datasets ranges from 3.5% to more than 13%.
In this study, in order to prepare a global wetland dataset to be employed as input to climate models, several methods are tested with the use of GIS softwares. These methods are based on TI [topographic index derived from TOPMODEL (Beven & Kirkby, 1979)] to identify potentially wet areas. They rely on global scale DEMs at different resolution (HYDRO1K at 30"$\sim$ 1km, to HydroSHEDS at 3"$\sim$100m), with variant forms of TI combined with climatic properties (i.e. effective rainfall and evapotranspiration rates) and soil transmissivity. The results of the presented method are in good agreement with the geographic distribution of observed wetlands, while capable of delineating very small wetlands.