Geophysical Research Abstracts
Vol. 20, EGU2018-13855, 2018
EGU General Assembly 2018

Future hydroclimatic challenges for Africa: Beyond the Paris Agreement

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Climate change is expected to put great pressure on Africa, already struggling with challenges such as population growth, malnutrition and water scarcity. The Paris Agreement recently set global targets to reduce the impact of global warming but, to date, very few studied assessed the effect of this policy on African water resources in a comprehensive way. Here we present a quantitative overview of the hydroclimatic changes expected in Africa following two development pathways, the: the Paris Agreement (PA) and the business as usual. By analysing climate models' ensemble of precipitation, evapotranspiration and temperature, weWe find that 51/53 largest African basins will become more arid, with hotspots in the Mediterranean, West African and Southern African basins. The water partitioning of water on land will shift towards more evaporation in arid and semi-arid regions of Northern and Southern Africa, whereas it will lead to increased runoff in tropical basins. Some of the social-ecological implications of a business as usual scenario involve unsustainable irrigation and food production in North Africa, possible social tensions over water resources in the Sahel, increasing flood risk in Central Africa and widespread aridification of Southern Africa. In contrast, the PA AgreementAgreement scenarioscenario is likely to keep hydroclimatic conditions mostly unaltered, with only 4/53 basins with more arid conditions. However, we argue that compliance with the Paris agreementPA needs to be complemented by soil and water conservation practices to make the best use of water resources in agriculture, especially in the most arid regions already struggling with severe water-related issues.