Session: C41 Poster: Th123B

Attribution and predictability of high floods in the Okavango Delta, Botswana

Piotr Wolski[†]; D·ithi Stone; Mark Tadross; Bruce Hewitson
[†] Okavango Research Institute, University of Botswana, Botswana
Leading author: pwolski@orc.ub.bw

During the period of 2009-2010 several parts of the world have experienced remarkably extreme meteorological events. In the charismatic wetlands of the Okavango Delta, Botswana, 2009-2010 floods reached magnitude last seen 20-30 years ago, considerably affecting life of local populations and the economically important tourism industry. In this on-going study, we are attempting to identify the climatological causes of these events in the context of their predictability using seasonal weather forecasts and to assess the extent to which these events are attributable to GHG-driven climate change as opposed to natural variability. The study is based on an ensemble of runs of the HadAM3P model, forced by a) observed SST fields (GHG world) and b) SSTs with effects of historical anthropogenic forcings removed (non-GHG world). The climate fields produced by this model were used to run a rainfall-runoff model of the Okavango catchment and inundation model of the Okavango Delta. Due to specificity of the analysed hydrological system in which response to short term weather conditions (rainfall and temperature) is integrated into a single annual flood wave, the analyses focused on representation and capturing of interannual variability. Preliminary results indicate that probability of occurrence of high floods during 2009 and 2010 in GHG world is lower than that in the non-GHG world simulations, with the implication that anthropogenic climate change actually moderated high flood conditions in the Okavango Delta in 2009 and 2010. The skill of the suite of models to represent Okavango flood varies from year to year, but increases with increasing convergence of the ensemble. As a next step, synoptic conditions in the analysed region and SST anomalies distribution for years with various predictability will be identified, with the outlook to increasing confidence in results of seasonal flood forecasting.