Geophysical Research Abstracts
Vol. 20, EGU2018-1149, 2018
EGU General Assembly 2018

Detection and attribution of surface temperature changes to anthropogenic forcing in a major river basin of India

Sonali Pattanayak (1), Ravi S Nanjundiah (2,1), Nagesh Kumar Dasika (3,1)

(1) Divecha Centre for Climate Change, Indian Institute of Science, Bangalore, 560012, India (iisc.sonali@gmail.com), (2) Indian Institute of Tropical Meteorology (IITM), Pune, 411008, India, (3) Department of Civil Engineering, Indian Institute of Science, Bangalore, 560012, India

Many observations and studies have shown that the water availability in most the major river basins of Asia are perilled by climate change. Hence, an insight into the hydroclimatological change and variability at a river basin scale is crucial and is important for efficient water resource management and planning strategies. An increase in global average surface temperature has been experienced over the past few decades, causing irregularities in hydro-climatic parameters such as, precipitation and evapotranspiration.
Mahanadi, a major river basin of India provides fresh water for approximately seventy million people. It is recognized as a climatically vulnerable region because of the geo-climatic setting (located adjacent to the northwest Bay of Bengal: longitudes 800 25' to 870 East & latitudes 19015' to 23035' North) and frequent occurrence of flood.
Present study focused on the spatio-temporal variation of hydroclimatology of the Mahanadi river basin. Initially, spatio-temporal variations of hydroclimatological parameters are analyzed by employing the block bootstrapped based Mann- Kendall method at annual, seasonal and monthly time scales.
The detection and attribution of climate change are not researched extensively in India. In this paper, a fingerprint based change detection and attribution analysis has been attempted to extensively study the hydroclimatological changes in the Mahanadi river basin. CMIP5 climate model simulations based on different Representative Concentration Pathways are utilized to understand the future hydroclimatological changes by end of 21st century using change factor methodology. Strong seasonality patterns have been observed in monthly, seasonal precipitation. Large scale circulation indices such as, El Niño–Southern Oscillation (ENSO), Indian Ocean Dipole (IOD) which influences the variability of monsoon is analyzed in detail.