National Institute of Technology Rourkela

Defence Seminar

Seminar Title	: A Study on Drought Characterization and its Propagation including Terrestrial Water Storage Dynamics under the Influence of Climate Variability
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Supervisor	: Prof. Kanhu Charan Patra
Venue	: Civil Engineering Department Seminar Room
Date and Time	: 18 Oct 2024 (10 am)
Abstract	: This study aimed to evaluate terrestrial water storage (TWS) dynamics and its response to climate variation using the Gravity Recovery and Climate Experiment (GRACE) mission data. Results showed that the decrease in TWS in both Deccan plateau (DP) and RS region during 2010-2016 was partly due to the reduced rate of climate moistening. Artificial Neural Network (ANN) model was used to reconstruction of TWSA to fill up the existing gap between GRACE and GRACE- Follow on mission. Results showed that the ANN-based reconstructed data performed well compared to the observed TWSA data across all meteorological sub-divisions, and outperformed the results of several well-known previous studies. Drought characterization was carried out using two GRACE-based drought indices, namely GRACE Drought Severity Index (GRACE-DSI) and Combined Climatological Deviation Index (CCDI) in eleven meteorological sub-divisions of DP. Majority of sub-divisions showed decrease in dryness except south interior Karnataka, Costal Andhra Pradesh, and Rayalseema sub-divisions. Drought propagation among meteorological, hydrological, agricultural, and groundwater drought is analyzed. Moreover, the influence of large scale teleconnection factors was also analyzed. The propagation time is shorter between the agricultural and hydrological droughts, while it is generally longer for sub-surface region. There is relatively weak link between groundwater and hydrological/agricultural droughts in the SI. All three large-scale climatic factors (ENSO, PSO, and IOD) have significant contribution on the drought propagation.