


Stability consistency and trend mapping of seasonally inundated wetlands in Moribund deltaic part of India

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Abstract

The Ganga-Padma moribund deltaic zone contains plenty of small seasonal wetlands. In this paper we mapped the temporal hydrological dynamics of floodplain wetlands in the Ganga-Padma moribund deltaic zone. To evaluate the trend in wetland changes over time we used a time-series of Landsat images from 1987 to 2016 and adopted Water Presence Frequency (WPF), Standard Deviation, and Trend Analysis for stability and trend of water presence and change over time. Normalized Difference Water Index is used for wetland mapping for both pre- and post-monsoon seasons using the 30 years Landsat images. The result shows sequential changes in trend of wetland area and nature of deviation in water availability in wetland over time. More than 85% wetland area is prone to shallowing of depth and out of which 25% area is highly infected to this problem as found from wetland trend analysis. Standard deviation approach and trend analysis approach are used for detecting pixel-wise dynamics of wetland and trend of wetland change over the selected period of time based on the same images. The entire time spectrum is subdivided into three phases for detecting phasal change of water presence frequency (WPF) or stability of wetland. Among the total wetland area, 21.22% appeared as highly stable (high WPF) and 43.71% emerged as instable (low WPF). Only 14.56% wetland area recorded low departure