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Dynamics of plant communities and the impact of saltwater intrusion on the floodplains of Kakadu National Park

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Abstract

The distribution of vegetation communities on floodplains within Kakadu National Park, in tropical northern Australia, is related to micro-topography and, therefore, water depth and duration of flooding. Floodplains of the Kakadu Region, because of their proximity to the coast, are most vulnerable to the impacts of climate change, with saltwater intrusion, as a result of sea-level rise, being a serious risk. Our main objectives were to determine the variability of the distribution of plant communities on the floodplains and understand the potential risk of increased saltwater intrusion to these communities. We present data on the natural salinity-tolerance range of selected floodplain plants and discuss the likely effects of saltwater intrusion on floodplain plant distributions and productivity. The results of change analysis using high spatial-resolution satellite data showed the importance of the variation of water availability in determining patterns of plant communities. Hydrodynamic modelling suggests that sea level rises will result in 40% of the floodplain transformed into saline habitats by 2070. The most obvious effect of this would be the conversion of the freshwater vegetation to salt-tolerant mangroves and other salt-marsh plants, with a concomitant change in animals and their use of these areas.

Additional keywords: aquatic plants, macrophytes, productivity, sea level rise, salt tolerance

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