

# Monitoring of Inundation Dynamics in the North-American Prairie Pothole Region using Sentinel-1 Time Series

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## **Abstract:**

Monitoring of wetland inundation dynamics is important for flood management and the characterisation of hydrological connectivity. SAR-based inundation extent monitoring in wetlands is often challenging due to different factors, such as waves, vegetation cover and wet snow. The presented study targets the mapping of inundation dynamics in the Prairie Pothole Region (PPR) of North Dakota, USA. A 3-year water extent time series was derived from Sentinel-1 SAR data by first delineating permanent water bodies using a clustering approach. In a second step, water body dynamics were mapped using region growing and automatic thresholding. Results suggest that there is considerable potential for mapping surface water dynamics in late spring, summer and autumn, whereas confusion with wet snow may take place in early spring.

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## **Keywords**

### • **IEEE Keywords**

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  - [North Dakota](#),
  - [3-year water extent time series](#),
  - [Sentinel-1 SAR data](#),
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