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## Near Real-Time Flood Impact Analysis on Road Networks

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Traditional flood risk studies often focus on direct economic impact, such as property damage or agricultural loss. However, the impact of floods is not limited to these direct damages. In fact societal costs and/or cascading effects are often much higher than the direct impact of floods. Cascading effects, such as access to healthcare and infrastructure accessibility are vital components for efficient emergency response management. This requires methodologies to quickly analyze the impact of large-scale floods on infrastructure networks.

In this case study, the use of satellite-based flood maps are examined in combination with network criticality in the Mandalay region in central Myanmar. This region was severely affected by flooding after heavy monsoon rains in 2019. Many regions in the world are affected by this type of floods every year, resulting in large scale evacuations and limited access to health care. During these type of events, the transportation network is a crucial part for emergency response, as it is used for the delivery of goods, evacuation and deployment of emergency hospitals.

The core of this study is a methodology to assess near real-time flood extents based on Sentinel-1 satellite imagery and the impact on network criticality. These tools were used to analyze the redundancy of the infrastructure network and quantify cascading impacts of flood hazards such as road accessibility and access to medical services. The methodology shows potential for operational use by linking with flood early warning systems (e.g. Delft-FEWS) enabling impact-based forecasting.