

Monitoring episodic river inflow plumes using in-situ and remote sensing data

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We are proposing to address the following hypothesis: The nutrient load from rivers to Lake Michigan is disproportionately higher from episodic river flow plumes and therefore may exceed maximum allowable levels on an episodic level not captured by traditional synoptic monitoring. We will make use of a nested sampling strategy to monitor nutrient inputs from episodic river inflows using lake and river water sampling, an autonomous underwater vehicle and remote sensing imagery, supported by the collection of additional lake data through ship based grab sampling and spectral measurements. This data will be used to complete the following research objectives:

- Objective 1: To quantify the transport of sediment and nutrients into Lake Michigan from rivers following heavy precipitation events, including the magnitude and frequency of significant nutrient loads into the lake and the relative distribution of loads between episodic inputs and those from baseline conditions.
- Objective 2: To quantify the transport and fate of nutrients within the episodic