USGS NSF GRIP Opportunity

USGS Center:	Upper Midwest Environmental Sciences Center
Project Title:	Evaluating potential ecosystem indicators of Great Lakes restoration success
Project Hypothesis or Objectives:	One of the focus areas for the Great Lakes Restoration Initiative's (GLRI) Action Plan is to implement a science-based adaptive management approach. Here, we propose to monitor ecosystem processes across the Great Lakes to identify ecosystem response to local and watershed-wide restoration activities. Biodiversity, secondary production and habitat quality (in terms of resource quality available to consumers) will be measured using ecological process monitoring stations, along with other parameters to be developed as possible. Ecological process monitoring is a measurement of the functional response of the Great Lakes to restoration activities and is needed to evaluate whether restoration activities are having the desired effects on ecosystem services. These ecological process monitoring stations have been deployed for three years to estimate the influence of harmful algal blooms on ecosystem processes (see Larson et al. 2015, Ecological Applications for an example of the approach). Over the next year, we will be deploying similar stations in nearshore areas influenced by Priority Watersheds to evaluate how implementation of best management practices leads to changes in the nearshore ecosystem. Other stations will be placed in habitats undergoing local restoration activities and across other gradients in environmental conditions. The specific objectives associated with the overall project are: 1: Identify the extent to which watershed characteristics, nearshore morphology and proximity to rivermouths influence nearshore benthic biodiversity, secondary production and habitat quality (in terms of resource quality for consumers) 2: Monitor biodiversity, secondary production and habitat quality in response to restoration efforts in Priority Watersheds 3: Estimate variability in biodiversity, secondary production and habitat quality across nearshore zones that differ in anthropogenic manipulation (heavily impacted v. restored v. more natural)
Duration:	12 months

Internship Location:	La Crosse, WI
Area of Discipline:	Biology, Ecology, Aquatic ecology, Conservation biology
Expected Outcome:	This project will benefit the USGS by assisting in our efforts to achieve the objectives set out in a Great Lakes Restoration Initiative project (Project 19, James Larson lead PI, described above). The project will benefit the intern by providing them an opportunity to gain experience participating in a collaborative effort to determine controls over ecosystem process and get an opportunity to co-author a manuscript.
Special skills/training Required:	Experience in small boats is preferable (although boater safety training will be provided), as is experience on large lakes ecosystems.
Duties/Responsibilities:	Duties will be determined in part by when the intern will be able to begin working on the project, but will ideally include assisting the lead PI and other project PI's in site selection, determination of particular processes to measure, assisting a field crew with deployment and retrieval of samples and processing samples post-retrieval. The intern will also be asked to lead or participate in the development of manuscripts associated with the project, although completion of manuscripts may take longer than the actual duration of the internship.
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