

North Perry Marina Impacts

North Perry, Ohio

Project Characteristics:

- *Evaluation of waves currents, and sediment, transport*
- *Development of a sediment budget*
- *Long-term shoreline change*
- *Evaluate impacts of coastal engineering structures on sediment transport system*
- *Assessment of downdrift impacts of Marina*
- *Develop structure remediation plan*

Woods Hole Group worked for Gallager Sharp Attorneys on behalf of the Village of North Perry, Ohio to assess the impacts of a marina constructed along the southern shores of Lake Erie. The marina was constructed for access to the Lake for the North Perry residents, and as a safe harbor for boats cruising the southern shores of Lake Erie. After the marina was constructed, the western groin began trapping large quantities of sediment. This required the Village to bypass sand around the marina on a monthly schedule, which was completed mechanically from the updrift side and from within the marina. The Village was concerned by the mounting costs of the sand bypassing and the downdrift effect of the marina on the stakeholder's properties. The Village contacted Woods Hole Group to determine the effects of the Marina on the littoral system including downdrift shorelines.

The Woods Hole Group first assessed the impacts of lake level variation on shoreline erosion. A long-term shoreline change analysis was performed that removed the effects of lake level from the analysis. This required the Woods Hole Group to quantify the short- and decadal variations in lake level so they could be removed from the shoreline change analysis. Once the true shoreline change was known, a sediment budget was developed. These data were used in a two-dimensional wave, current, and sediment transport model to quantify sediment transport along this shoreline. The results of the numerical model were used to assess the impacts of the marina on the downdrift shorelines.



The stakeholders claimed construction of the marina destabilized the previously stable shorelines. The Woods Hole Group used the results of the long-term and short-term shoreline change along with the results of the numerical model to evaluate these claims.

The analysis showed the downdrift shorelines had not been stable. These shorelines were shown to have been steadily eroding over the past 25 years. The analysis also showed construction of the marina accelerated downdrift erosion and that by-passing sand was mitigating erosion of these shorelines. Woods Hole Group developed an integrated downdrift mitigation plan that incorporated bluff protection, beach nourishment, and sand bypassing. Structural modifications were recommended to enhance the updrift sand trapping to make sand bypassing easier and more cost-effective, and also to minimize sand from entering the marina.

This is an on-going project that is expected to continue until 2017.

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