**Introduction:** Whitehall Dam and Mill is located on the Middle Oconee River in the Whitehall Forest property. The University of Georgia purchased the 840 acre property in the 1930s and uses the land for numerous academic purposes. The dam is approximately 160 feet wide with two openings located 80 feet apart. Current concerns about the quality of the dam are held by stakeholders including: the University of Georgia's Warnell School of Forestry, Odum College of Ecology, and the GA DNR.

**Objective:** Model the river system with Hec-RAS software in order to analyze and determine the best removal strategies while factoring in cost, ecological parameters such as improved fish passage, and increasing safety for recreational paddler passage downstream.

**Methods:**
1. Utilize Athens-Clarke County Lidar topographic survey information to identify necessary river network around the Whitehall Dam.
2. Create import file for Hec-RAS with Arc-Map GIS software and Hec-GEORAS extension.
3. Survey the surrounding area of the dam to gather information about the dam structure and cross sections immediately upstream and downstream of the dam.
4. After importing geometry of river network into Hec-RAS, determine and input key parameters such as Manning’s roughness coefficients, overbank flood stages, and dam structure specifications.
5. Model the river in a quasi-steady flow analysis for a minimum flow, median flow, and flood event with different configurations of the dam.
6. Interpret the analysis output of river parameters including velocity, discharge, and cross sectional flow areas.

**Results:** From the figure on the left, the velocity throughout the channel increases with larger breaches of the dam. This is due to water pooling behind the dam, which causes more shear pressure through the opening.

The dam is currently in an obstructed condition with the second opening blocked by storm debris as seen above.

Below are the three dam configurations modeled in Hec-RAS. The unobstructed model portrays the second opening clean from debris, and the partial breach model represents removal of the dam between the two openings.

**Conclusion:** Based upon the analysis, the best design solution is the partial breach option. This solution optimizes cost, safety for recreational paddlers, historic preservation of the mill, fish passage and minimizes flood events. Opening up the river will return it to a more natural state.