

What is the Restore Lagoon Inflow (RLI) research project?

Faculty researchers and graduate students at the Florida Institute of Technology have been contracted by the Florida Department of Education, in support of a local project appropriation secured by the Brevard County legislative delegation, to study the potential effects of enhanced seawater exchange between the Indian River Lagoon and coastal ocean. This multi-year research effort is designed to provide data analysis and a summary report to help policymakers, agencies and stakeholders determine if enhanced seawater exchange should be considered as a viable partial restoration technique in the Indian River Lagoon.

Why do this?

The health of the Indian River Lagoon is seriously imperiled, and Florida policymakers and agencies need more information and scientific perspective to help determine if allowing controlled seawater inflow into the lagoon on a permanent basis, could be a viable method for improving the situation. Legislators, community organizations and agencies are involved in multiple efforts to help restore the complex lagoon ecosystem through a variety of projects and changes in law.

Has a permanent ocean water exchange structure been completed before?

Yes. The Destin Harbor pump site in Destin, Florida, has been operating since 1992 to increase ocean water circulation for improved water quality and prevention of fish kills resulting from low dissolved oxygen levels. However, the Destin Harbor ecosystem is different from the Indian River Lagoon ecosystem, which necessitates further review and research.

The first phase is now complete. Where can I find the information?

The RLI Phase 1 executive summary and full report are available in the **Reports Section** of the Florida Tech Indian River Lagoon Research Institute site: <https://www.fit.edu/indian-river-lagoon/>.

What are some of the areas being researched?

Given the complexity of the lagoon ecosystem, the team needs to evaluate modeling, geochemical and biological data. Research areas include, but are not limited to, lagoon circulation and residence time, salinity and temperature gradients, water and sediment chemistry, submerged aquatic vegetation cover, composition of animal life on the lagoon bottom, fish community structure, and pumping system engineering.

What are the steps involved in the RLI research efforts?

The estimated four-year research effort is multi-phased. The initial phases will summarize existing data and generate new environmental monitoring, modeling and research data to improve understanding of the Indian River Lagoon and how its ecosystem might respond to enhanced seawater exchange. Candidate sites for a small-scale temporary inflow pumping system are being considered to provide a permitted experimental field test of the feasibility and impacts of a larger system. Agency and regulatory reviews with stakeholder input will influence further phases of RLI study design, schedule and priorities.

Where would the temporary inflow pilot system potentially be installed to continue research?

The three primary research sites are Port Canaveral (at or near the locks), Patrick Air Force Base at the north border, and Bethel Creek in Indian River County. Port Canaveral is seen as the initial preferred temporary inflow pilot site due in part to the relative lower cost and ease of access for a temporary pumping system, as well as the existing exchange of seawater from port access at the locks.

Would introducing more seawater into the Indian River Lagoon for the project raise the water level of the lagoon?

No. The inflow rates being discussed would be controlled and limited in relative volume. As it is, the lagoon water level fluctuates with winds, tides in some areas, atmospheric pressure, storm surge, and water runoff from the land. Lagoon water levels also rise and fall seasonally in response to coastal ocean sea level caused by regular changes in Gulf Stream flow. Gulf Stream dynamics already result in a water level difference of as much two feet inside the lagoon from season to season.

Would a permanent controlled inflow of seawater actually be beneficial?

There is not enough data or analysis to date to make that determination. A field study in the next research phase using a temporary pilot inflow system will help researchers gather data to extrapolate effects across a potential full-scale permanent system in the lagoon. The RLI Phase 1 virtual modeling shows the IRL water could slowly exchange with the coastal ocean with limited controlled volumes in the Brevard County locations and much faster in the Indian River County location.

Would a controlled seawater inflow solve the Indian River Lagoon's water quality issues?

Not by itself. If warranted, enhanced seawater exchange could potentially augment both ongoing and proposed efforts to reduce lagoon nutrient sources and nutrient legacy loads and increase aquatic community restoration.

What could happen after the research project concludes?

Once research efforts conclude, data summaries and assessments will be provided to policy makers, permitting agencies and other stakeholders. Policy makers could then begin the process leading to the potential construction of a permanent seawater inflow structure as one approach to restoring IRL water quality. This process would involve public discussions, site engineering, cost and maintenance feasibility studies, site selection, permitting and monitoring.

What agencies and organizations are involved or will have an interest?

Permitting and consulting agencies and stakeholder organizations include the St. Johns River Water Management District, Florida Fish and Wildlife Conservation Commission, U.S. Army Corps of Engineers, Florida Department of Environmental Protection, the Indian River Lagoon National Estuary Program, Marine Resources Council, Port Canaveral, Brevard County, Indian River County and several municipalities.

Is there a danger that manatees and other wildlife could get trapped in an inflow system?

The temporary inflow pilot system for research or any future infrastructure would be designed with safety features to prevent manatees and other wildlife from being trapped or impeded and will also feature automatic and manual emergency shutoff features.

Has a new navigable inlet been proposed as part of the research discussion? Is this project supporting the creation of a new navigable inlet?

No new navigable inlet has been proposed, and the RLI research efforts do not advocate for a specific outcome.

How can I learn more?

Media may contact Florida Tech Director of Media Communications Adam Lowenstein at adam@fit.edu. Academic or other interests may contact Dr. Jeff Eble at jeble@fit.edu or Robert Salonen at rsalonen@fit.edu.