UF IFAS Extension UNIVERSITY of FLORIDA
Sea Grant Florida
NOAA
SGEF 222

OYSTERS *for the* FUTURE

The Value of Science-Based Management in the Oyster Fishery[1]

Erik Lovestrand[2]

The eastern oyster (*Crassostrea virginica*) provides many important functions in coastal environments, from serving a crucial role in the estuary's food web to improving water quality for beachgoers and wildlife. Oysters are also a popular food choice for people —at times the commercial industry landings value has topped $8 million annually in Florida. This publication is one in a series that highlights some of the key ecological and human factors important to the long-term sustainability of this valuable fishery.

Good science is not always easy, but it is always valuable

The sentiment that a natural resource issue has been "studied to death" and "something just needs to be done" is often heard in discussions about restoring depleted resources. Frustrations run high and people who are impacted are sometimes desperate for relief. The following information summarizes the value of science-based management and why "just doing something" is not the best option in the long run.

The key to "good science" lies in a study procedure that accurately links cause and effect and eliminates as many unknowns as possible related to the questions you want to answer. The **scientific method** is designed to do this through the following steps:

- Asking a question
- Doing background research
- Constructing a hypothesis
- Testing the hypothesis by doing an experiment
- Analyzing data to draw a conclusion
- Communicating the results

Neglecting any of these steps places study results in question. Another aspect to consider is the time frame it takes to do research and the time frame for which study results will be valid. Scientists are usually looking at a snapshot of time with their data. The dynamic nature of *nature* itself requires an honest assessment by the scientist of how valid results may be as time passes. Some research focuses on well-defined questions and answers. Likewise, the importance of long-term monitoring should never be undervalued.

Understanding the factors impacting juvenile oyster recruitment in an estuary is a critical research need. Photo by Keith Kolasa, Florida Sea Grant

Historic benefits of oyster research: Many things we know about oysters are a result of scientific study. Specialists in the areas of microbiology, ecology, parasitology, pathology, and many other disciplines have contributed to our understanding in the following areas:

- **Oyster biology and mortality facts:** Through scientific research

1. This document is SGEF-222, one of a series of the Florida Sea Grant College Program, UF/IFAS Extension. Original publication date April 2017. Visit the EDIS website at http://edis.ifas.ufl.edu.

2. Erik Lovestrand, Florida Sea Grant agent, UF/IFAS Extension Franklin County, Apalachicola, FL 32320-1775.

Sound scientific work informs good policy and leads to solid fisheries management for the long term. Photo by Florida Sea Grant

Local harvesters participate in restoration efforts in an Apalachicola Bay project. Photo by Erik Lovestrand, UF/IFAS Extension/Florida Sea Grant

various disease-causing organisms, predators, and parasites have been identified as the culprits in historic oyster declines. This goes hand in hand with scientific understanding gained by studying the oyster life cycle, food and feeding behavior, spawning and juvenile oyster "spat-set" requirements, and oyster growth patterns under various conditions.

- **Oysters providing ecosystem services:** Scientists have demonstrated that an oyster filters as much as 50 gallons of water per day, which removes some excess nitrogen and other pollutants from the water that may help to fuel harmful algal blooms. Oyster reefs also provide habitat for other filter feeders such as mussels, barnacles, and tunicates that add dramatically to filtering capacity. The structure of the reef itself traps fine silt from runoff and reduces its resuspension. These factors are no substitute for sound storm and waste water management policies, but they do improve water quality and clarity.
- **Oysters as food:** Food scientists have discovered that oysters and mollusks in general are high in zinc, an important mineral in many human metabolic processes. Pathologists have studied health risks associated with a product that is traditionally eaten raw and discovered the specific temperature requirements that will limit harmful bacteria growth. This has led to important harvest, storage, and transport procedures that minimize risks for consumers.

Important current research topics: In light of a recent historic fishery collapse in Apalachicola Bay, where 90% of Florida's oysters were traditionally harvested, intensive research and restoration efforts are ongoing. Due to the magnitude and importance of this oyster fishery, many different professionals are participating in research related to water quality and freshwater inflow, hard-bottom substrate suitability, the amount of substrate material necessary for restoration efforts, oyster shell parasites, oyster spat recruitment and survival, and oyster population surveys. All of these studies fill information gaps that allow resource managers to make better choices regarding management options.

Protection of study sites: Researchers need to account for many variables in field studies. When a variable that affects the results cannot be identified or measured, results may not be accurate. Pinpointing natural factors and keeping track of them is challenging enough, but there is one other factor that can sabotage an important study: unaccounted human activity on a research site.

Shellfish research often requires counts to determine the effect of management strategies. It is crucial that harvesters support valid science by protecting the sanctity of study sites. This allows researchers to accurately measure oyster population responses. Illegal harvesting on study sites will produce bad data, and bad data means incorrect assumptions. Policy decisions on the future of the oyster fishery must be based on solid science. This provides for the most effective and efficient use of public resources needed for the recovery of this fishery.

For additional titles in this series, visit: http://franklin.ifas.ufl.edu/

Contact: Erik Lovestrand
UF/IFAS Extension/Florida Sea Grant
ELovestrand@ufl.edu
April 2016