ECOHAB: Karenia

FWRI ECOHAB PROJECT COMPONENTS

Laboratory and Field Studies

Laboratory studies will be conducted to:

- Evaluate the importance of the microbial loop as a regulator of nutrient availability and nutrient quality (or nutrient form);
- Examine the role of migratory behavior and photochemistry on nutrient acquisition by *Karenia brevis*; and
- Compare the nutritional physiology (carbon, nitrogen, and phosphorus) of *K. brevis* cultures grown under a range of environmentally relevant conditions.

Field studies will be conducted to:

- Compare the nutritional physiology of *K. brevis* within various bloom stages and across environments where blooms occur (estuarine, coastal, and offshore areas);
- Evaluate potential sources of new and regenerated nutrients from multiple sources, including nitrogen-fixing organisms (e.g., *Trichodesmium*, *Lyngbya*, and unicellular diazotrophs) and other microbes, zooplankton, particulate and dissolved inorganic and organic material from estuaries and coastal waters, atmospheric deposition, benthic sources, and photochemical reactions; and
- Collect physical, biological, chemical, and oceanographic data from waters in southwest Florida as well as *K. brevis* blooms during annual cooperative research cruises.
Physical Measurements and Models

Data will be collected to examine the physical environment of the West Florida Shelf and the influence of ocean and estuarine inputs on *K. brevis* movement and concentration ([http://ocgweb.marine.usf.edu/index.shtml](http://ocgweb.marine.usf.edu/index.shtml)).

Circulation models of the West Florida Shelf ([http://ocgmod1.marine.usf.edu/pyocean-web/](http://ocgmod1.marine.usf.edu/pyocean-web/)) will be coupled with nearshore nutrient monitoring measurements to quantify the flux of estuarine nutrients to a nearshore bloom and further develop a biological red tide model to predict the evolution and movements of red tides.

Water Quality Monitoring

Three autonomous water quality monitoring platforms, or MARVINs ([MERHAB Autonomous Research Vessel for *IN situ* sampling](http://www.marvindata.org)), will be stationed in southwest Florida coastal and estuarine waters to measure chemical, biological, and physical water quality parameters 24 hours a day, 7 days a week. MARVIN real-time data are provided at [http://www.marvindata.org](http://www.marvindata.org).

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