ECOHAB: Florida
Ecology and Oceanography of Harmful Algal Blooms in Florida

ECOHAB: FLORIDA PROJECT MILESTONES

2001

- Refurbish physical oceanographic instrument arrays, conduct reduced monthly sampling and conduct fourth research cruise
- Emphasize validation of patch-size models
- Initiate red tide forecast model
- As knowledge increases about *K. brevis*'s photo-physiology, couple a spectral radiative transfer model to an enhanced small-scale biological-physical model
- Interpret all data and assimilate toxin distribution into biological-physical models
- Analyze data, finalize the report to funding agencies, and prepare and submit manuscripts for peer-reviewed publication of ECOHAB results

2000

- Recover physical oceanographic instrument arrays, continue monthly sampling, continue volunteer sampling, and conduct the third three-week research cruise
- Install a reduced data assimilation array
- Conduct monthly small boat transects
- Conduct *in situ* experiments during the research cruise to determine physiology, productivity, and growth of *K. brevis* responses to chemical and physical conditions during the specific bloom stages
- Complete all inorganic nitrogen experiments
- Conduct experiments in the uptake of labeled phosphorus
- Measure uptake of labeled nitrogen
- Continue limited toxin studies and establish toxin distribution chart
- Determine loss rates of brevetoxins from larval and juvenile fish
- Develop patch initiation/frontal model at smallest grid scale
- Compare biological-physical model with data from 1999

1999

- Refurbish physical oceanographic instrument arrays, continue monthly sampling, continue volunteer sampling, and conduct the second three-week research cruise
- Complete laboratory and field life cycle work to determine type and origin of source stocks (sediments?)
- Identify cell signaling pathways involved in diel cycle entrainment; if cyclins are found in *K. brevis*, a cell-specific probe will be developed
- Determine toxin accumulation in larval and juvenile fish when they are fed brevetoxin-laden zooplankton
- Determine background brevetoxin contamination in larval fish; this will serve as a field control
- Archive biological samples for toxin analyses
- Conduct growth studies to determine *K. brevis*'s use of inorganic nitrogen; examine nutrient uptake using labeled substrate
- Test *K. brevis* for the utilization of urea
- Refine ecological submodels and instrumentation
- Develop HAB maintenance model
- Validate the biological-physical model with 1998 ECOHAB data
- Continue monthly transects

- Characterize swimming behavior in various bloom stages: initiation, maintenance, growth, and transport
- Extend small-scale model to include *K. brevis* population dynamics
- Continue field sampling and laboratory studies; determine the specifics of toxin transport, accumulation, and degradation

1998

- Deploy physical oceanographic instrument arrays in May 1998 and initiate monthly sampling
- Plan and conduct experimental cruise for three weeks in October 1998
- Continue *K. brevis* monitoring by volunteer network
- Determine zooplankton grazing rates on *K. brevis* and brevetoxin accumulation in zooplankton
- Conduct crosses of different *K. brevis* isolates to initiate sexual cycle
- Monitor blooms for presence and timing of sexual stages
- Isolate *K. brevis* cysts from sediments
- Study growth rates and diel migrations of a bloom in a mesocosm
- Identify cell regulatory apparatus in cultures
- Develop coupled biological-physical models at 10-km grid scale of the West Florida Shelf HAB initiation regions (based on historical data)
- Conduct nutrient uptake studies
- Conduct monthly transects (small boat) to survey *K. brevis* concentrations, water quality, and hydrographic conditions in the area of the physical oceanographic instrument array
- Use samples collected at discrete depths in natural water columns and mesocosms to characterize the temporal pattern of vertical distribution of *K. brevis*
- Combine biological and physical data into a small-scale model of time-dependent carbon-fixation
- Collect water, sediment, and animal samples for brevetoxin analyses to determine the fate and distribution of the suite of toxins