

## **Sentinel HABs Station Transects A Recommended GCOOS Regional Enhancement**

### **Project Description**

This project involves the specification, acquisition, placement, operational integration and data management/archive of sentinel monitoring stations (fixed and/or moored) located throughout the coastal zone of the Gulf of Mexico. These stations will be grouped to form cross-shelf transects, with at least three stations per transect. The long-term goal is to have a minimum of three transects for each US State and one pilot transect located along the Mexican Gulf Coast State of Veracruz.

The goal of this strategic station placement is to increase and enhance the existing observational capacity for data use and product development currently operating in the Gulf. The observational data will also provide context for regional changes and help validate satellite observations and products. As an initial step an inventory of existing stations, shown schematically in Figure 1, will be conducted; this inventory will provide background for potential incorporation of existing stations into the new transect network.

Some of the capabilities the users would like to see include: advance notice of a HAB event (e.g., 2 weeks), species/toxins present, the action levels for these species and toxins, and the associated risks, marine animal mortality, the ability to forecast trajectory in time/space (occurrence and movement), data and information for control and mitigation as well as data and information for adaptive sampling and rapid response. Users also stressed the need for relational databases and the timely availability of synthesized data (not raw data) and maps.

For more detailed justification see the report of the HABSOS-GCOOS Workshop held 13-15 April 2004 in St. Petersburg, FL.  
([http://ocean.tamu.edu/GCOOS/Office/documents/HAB\\_GCOOS\\_report.pdf](http://ocean.tamu.edu/GCOOS/Office/documents/HAB_GCOOS_report.pdf))

### **Steps in implementing this HABs monitoring station program**

1. Obtain additional information regarding known users and uses of HABs information. (12 months)

The user groups include a variety of state, federal, and international living resource managers, public health officials, and environmental regulators. Local governments involved in projecting cleanup needs, as well as the aquaculture industry, tourism, and local businesses also have a vested interest. Other users of the systems include the media, the public, educators, students, and forecasters. Many of these user groups have expressed a need for decision making capabilities of these systems in order to minimize risks and impacts.

2. Develop an implementation plan for sentinel stations (12 – 36 months)
  - Establish agreed upon standards and protocols for sampling, laboratory analysis, and data management.

- Inventory observing stations currently in place and determine modifications needed to utilize them in the HABs transect network
- Deploy, operate, and maintain instruments needed to upgrade stations. Stations will be implemented with a potential suite of instruments to collect a standardized range of real-time data to include optical, physical, meteorological, biological and chemical factors. The specific instrumentation profile for the sentinel stations will be finalized in a workshop, to be conducted within the GCOOS region.

3. Establish the station network (3-5 years)

Use a tiered approach to establish an infrastructure of sentinel monitoring stations (fixed and/or moored) and transects for the purpose of extending the developing predictive capacity of HABs in the Gulf of Mexico. A minimum of three transects per U.S. state and one transect along the Mexican Gulf Coast State of Veracruz with the proviso of at least three sentinel stations per transect. Establish transect sampling partners and work with states to determine the best locations for the sentinel stations. The maximum number of stations needed to begin this effort would be 51—including any existing infrastructure

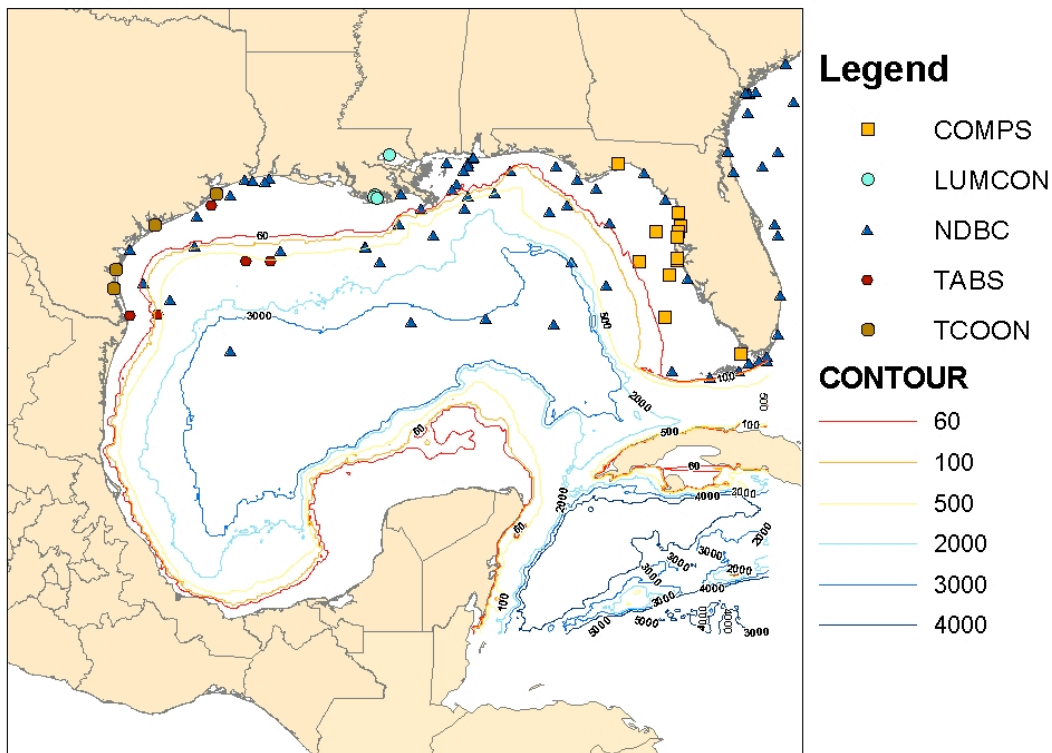


Figure 1. Observing stations in the Gulf of Mexico (schematic)

<b>Activities</b>	<b>Lead Agency</b>	<b>Budget</b>
Develop Background information <ul style="list-style-type: none"> <li>• Canvass agencies &amp; Universities for existing buoy infrastructure and planned deployments</li> <li>• Define maintenance schedules for current infrastructure</li> </ul>	EPA	200K
Workshop to develop specifications, instrumentation needs and maintenance plans for sentinel stations	EPA, States, NOAA/NDBC, Universities	75K
Continued testing and validation of <ul style="list-style-type: none"> <li>•Automated real-time sensors</li> <li>•Molecular probes</li> <li>•Toxin analysis</li> </ul>	States and Universities	200K
Optical characterization and research	Universities	200K
Add instruments to existing buoys	USF, NDBC	500K
Data Management	NCDDC	200K
Capacity Building to include equipment, training, and infrastructure		931K (one year)
Bi-national Pilot Program	NCDDC	100K

Table 1. Estimated activities and initial costs for steps to be carried in years one and two.

Estimated operating costs for a five-year period are:

- 51 stations at \$125,000 per station = \$6,375,000.
- Assuming 25% of those stations already exist, the cost for infrastructure deployment would be \$4,781,250.

<b>STATE</b>	<b>NEARSHORE</b>		<b>MID-SHELF</b>		<b>EDGE OF SHELF</b>	
	EXISTING	NEEDED	EXISTING	NEEDED	EXISTING	NEEDED
Florida	~2	2	~2	2	~1	3
Alabama	~1	1	0	2	0	2
Mississippi	~1	1	0	2	0	2
Louisiana	~2	1	~1	2	~1	2
Texas	~2	1	0	3	~2	1
Veracruz	3	0	0	3	0	3
Total	11	6	3	14	4	13

Table 2. Estimates of needed stations by state.