

HAB Monitoring and Tracking

Gary & Barb Kirkpatrick
&
Many Others

This Talk

- **Review current HABIOS monitoring plan**
- Review current resources
- List needs
- Future vision
- Impediments

Current Plan Terms of Reference

July 12, 2008

- Multiple systems exist that are operated by state, federal, and local agencies and by researchers for the purpose of monitoring
- Many operate independently of each other so that full advantage of all observations is not achieved
- Seek an integrated approach that will improve our ability to detect HABs more rapidly and provide more accurate and timely predictions of potential impacts

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Monitoring Tools

Environmental Variables

***Robust: **Accepted: *New

Parameter	Examples
Wave height ***	Teledyne, Nortek, FSI
Current **	ADCP, CODAR, WERA
Temperature ***	YSI, Sea-Bird, FSI, Chelsea SeaWiFS, MODIS
Salinity (conductivity) ***	YSI, Sea-Bird, FSI, Chelsea
pH ***	YSI, Sea-Bird, FSI, Chelsea
Dissolved oxygen (electrode or optrode) ***	YSI, Sea-Bird, Ocean Optics, Aanderaa

Environmental Variables (cont.)

***Robust: **Accepted: *New

CDOM fluorescence **	WETLabs, Turner, YSI
CDOM absorption **	WETLabs, OPD
Turbidity **	YSI, Seapoint, Campbell Sci.
Particle size **	Sequoia
Irradiance or reflectance ***	Satlantic, WETlabs, HOBI, Biospherical, Li-Cor
Light attenuation/transmission **	WETLabs, TriOS, HOBI, OPD
Nutrient (optical and wet chemistry) **	Satlantic, Envirotech, SubChem

Bulk Biology

***Robust: **Accepted: *New

Parameter	Examples
Algal biomass (photopigment fluorescence) ***	Turner, WETLabs, LIDAR
Algal biomass & taxonomy (photopigment fluorescence) *	Moldaenke
Algal photophysiology (photopigment fluorescence) **	Chelsea, Satlantic, Walz
Near-surface algal distribution *	FLH MODIS,
Chlorophyll absorption **	OPD, WETLabs, SatLantic, MODIS, SeaWiFS

Biological Sub-assemblage

***Robust: **Accepted: *New

Technique	Example
Remote sensing reflectance **	SeaWiFS, MODIS, AVIRIS, HyperSAS
Gene probes *	Environmental Sample Processor, Autonomous Microbial Genosensor
Absorption signature *	Optical Phytoplankton Discriminator
Imaging flow cytometry *	FlowCam, FlowCytobot

Deployment Mode

- Shore-based
- Satellite
- Aircraft
- Autonomous vehicles
- Buoys and floats
- Bottom-mounted
- Ferry boats, yachts, commercial and research vessels

Nontraditional Oceanography

- Beach Conditions Report
- Marine and Freshwater Toxin Hotline
- CDC HABISS (Illness Surveillance System)
- Fisherman/boater reports
- Phytoplankton Monitoring Network
- SeaKeepers, FerryBox

Monitoring by Institutions and Individuals

- Organisms
- Toxins
- Environmental parameters
- Manual or Automated
- Proprietary or public databases

States Monitoring

USA	Mexico
Alabama	Campeche
Florida	Quintana Roo
Louisiana	Tabasco
Mississippi	Tamaulipas
Texas	Veracruz
	Yucatan

Federal Monitoring

USA

- HAB Bulletin
- Phytoplankton Monitoring Network
- CO-OPS
- IOOS/GCOOS
- HABSOS
- HABISS

Mexico

- SEMARNAT-Mexico
- CINVESTAV-IPN



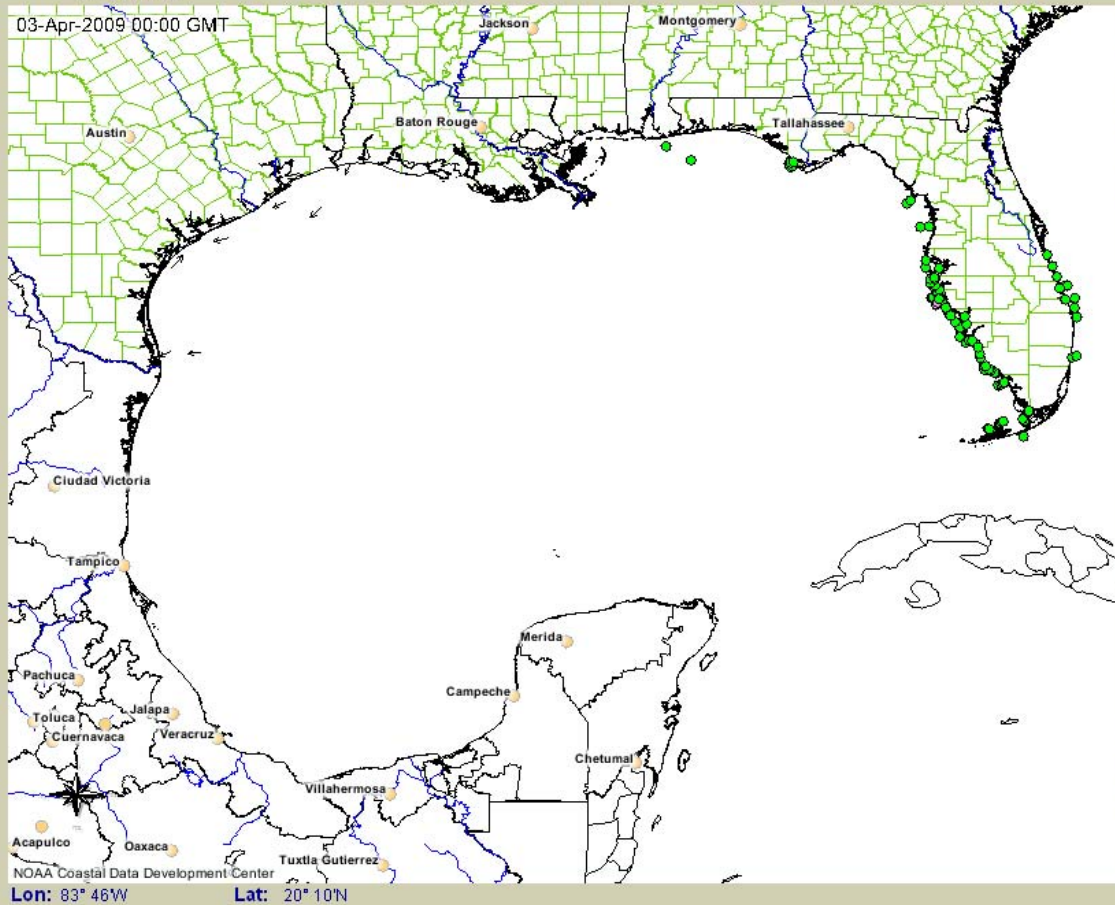
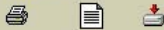
NAVIGATION



DATA INFORMATION



OUTPUT



LAYERS/LEGEND

- Event Reports (<= 30 days)
 - FWRI Cell Counts
 - DET Cell Counts
- Meteorology
- Oceanography
 - PORTS Surface Currents
 - TABS Surface Currents
- Foundation Layers
 - U.S. River Gages
 - U.S. METAR Stations
- Cities
 - Major Rivers
- Rivers
 - Bathymetry
 - Estuarine Reserves
 - Marine Sanctuaries
 - Shellfish Areas
- Water Bodies
- Counties
- States
- Other Land Masses

Refresh Map

Auto Refresh

View Data By Date

21-Mar-2009 to 20-Apr-2009

- Filter FWRI Cell Counts Data (164 records)
- Filter DET Cell Counts Data (0 records)

Add Imagery/Model Data To Display:

Imagery available for Gulf of Mexico only
Models available for Gulf of Mexico and Caribbean only

Imagery Products

<<< 03-Apr-2009 >>>

Search

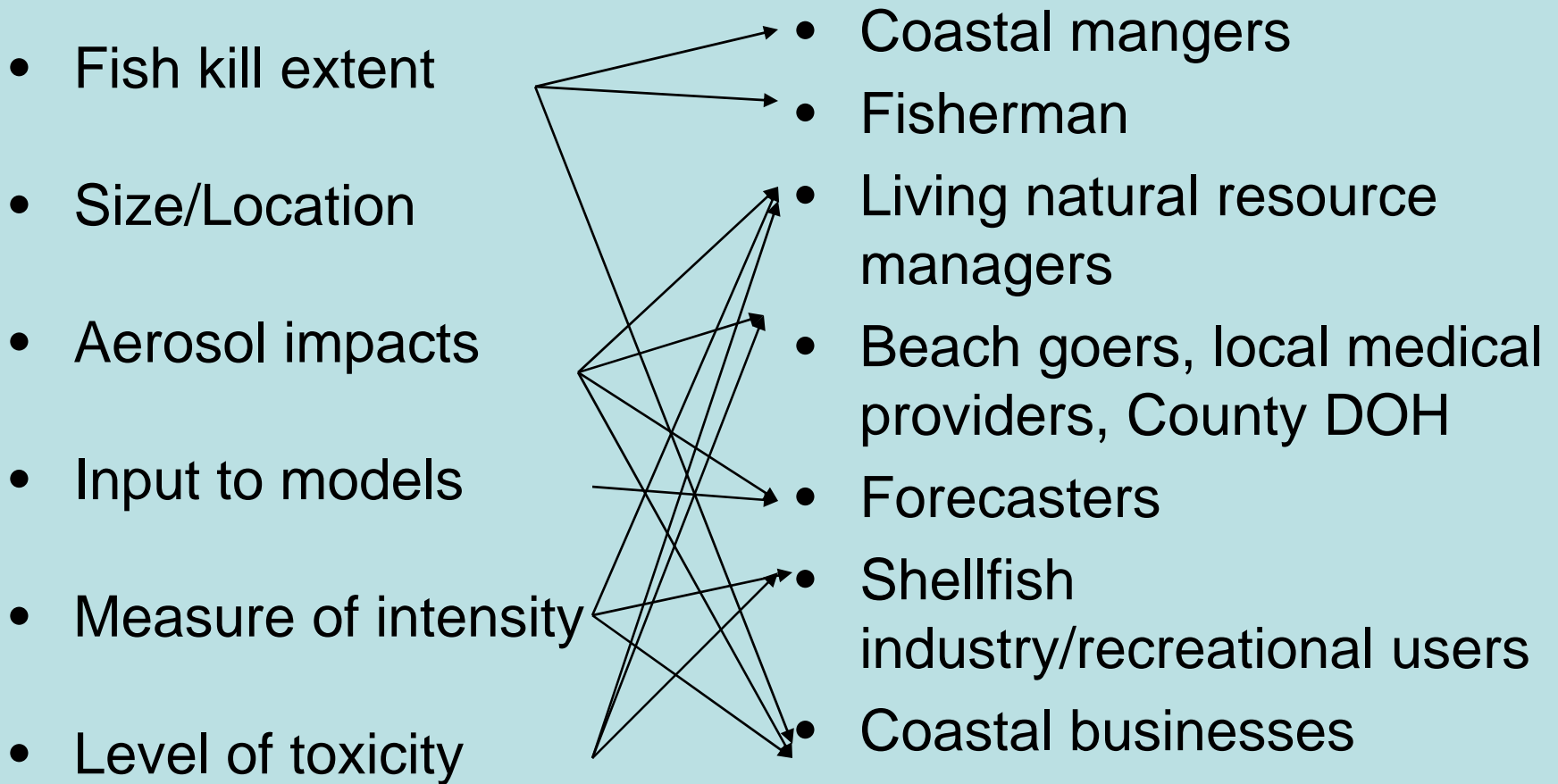
United States Submit

HABIOS Workshop, April 2009, St Petersburg, FL

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- **List needs**
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Different Needs by Different Stakeholders



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Current Plan Vision Statement

July 12, 2008


- To establish a sustained observing system as part of the U.S. IOOS (Integrated Ocean Observing System) that will facilitate and enhance efforts to monitor, manage, and **reduce detrimental effects** of harmful algal blooms (HABs) on human health and living marine resources (non-human animals and plants) and to **mitigate impacts** of HABs on coastal communities

Plan Vision Statement

July 12, 2008

- 'end-to-end', i.e. efficiently links:
 - observations (in situ and remotely-sensed)
 - data management
 - analysis
 - modeling
 - communications
- performance assessments by both system operators and users

Current GCOOS Data Portal



**GULF OF MEXICO
COASTAL OCEAN
OBSERVING SYSTEM**

DATA PORTAL

Resources Regional Assoc. Monitoring Maps Advanced Search ...

GCOOS Data Portal

- Home
- Data and Resources
 - Station Monitoring
 - Collection of Maps/Models
 - Advance Data Search
 - Vocabulary/Data Dictionary
- Utilities and Guides

GCOOS Regional Association

- Mission Statement
- Resolution
- Board of Directors
- Councils/Committees

Links of Interest


- Regional Data Nodes
 - TABS
 - TCOON
 - USF/COMPS
 - LUMCON
 - WVAVCIS
 - DISL
 - USM/CenGOOS
 - MOTE
 - LSU/ESL
 - USF/IMaRS
- Regional COOS
- Federal Efforts
- Global Efforts
 - Global Ocean Observing
 - GEOSS
- Contact Us

Welcome to GCOOS Data Portal

This **Data Portal** provides timely information about the environment of the United States portion of the Gulf of Mexico and its estuaries for use by decision-maker including researchers, government managers, industry, the military, educators, emergency responders, and the general public. Observing stations in the region are monitored constantly. Please visit the GCOOS main web site at <http://www.gcoos.org/> for more information on this regional association.

Region's Current Condition

NOTE: The following is an interactive map to display resources and status of coastal and ocean observing stations. Green markers represent stations in full operation, orange markers are those with defective sensors and red-marked stations are those that are currently not transmitting data. Click on the station to view station details. Not all stations may be visible at the current scale. Zoom-in on an area to reveal all the stations.

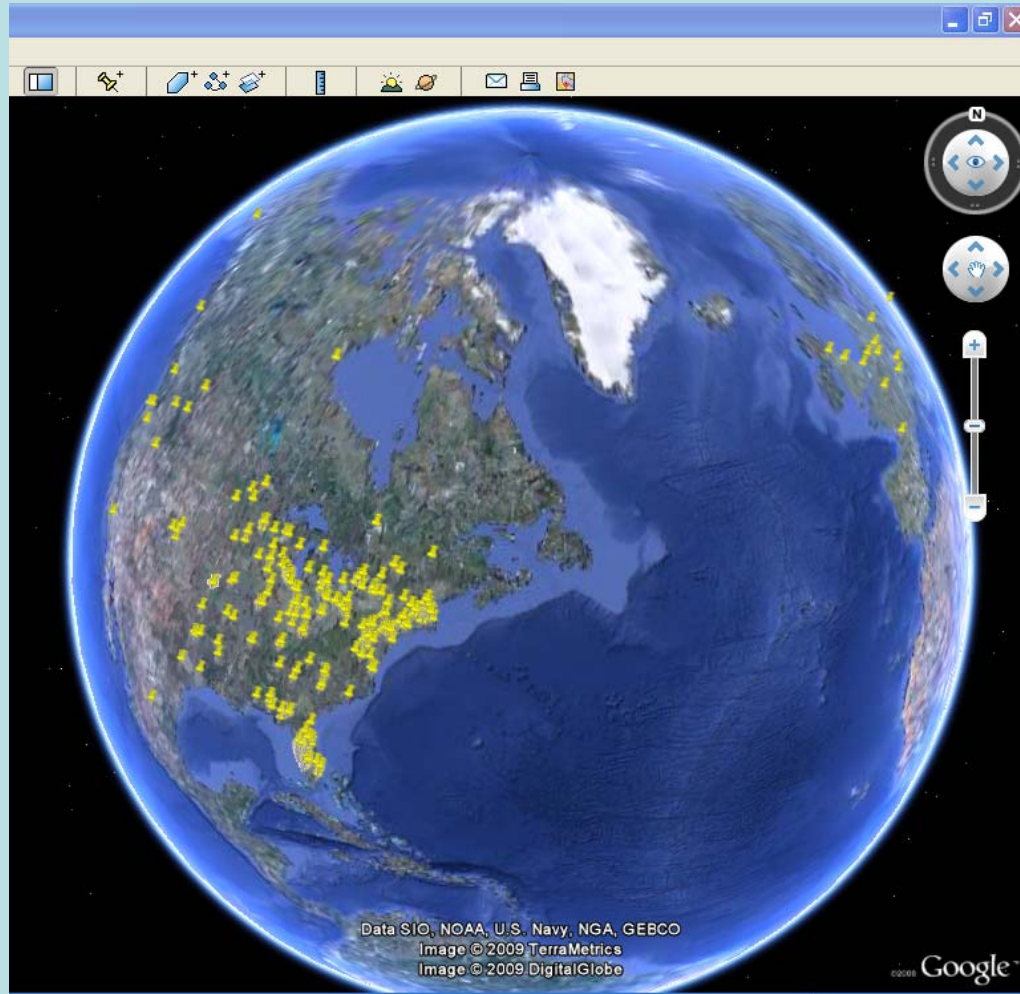


Zoom Terrain No Overlays

Map data ©2009 Tele Atlas, LeadDog Consulting, Europa Technologies - [Terms of Use](#)

Mouse LatLon: 24.621385, -91.054688 Mouse Click: 27.835043, -97.003098

Where are the users?



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- **Challenges**

What are the challenges to achieve the vision?

- Coherent, integrated plan GoMex-wide
- Variety of tools/ strategies to minimize impacts to stakeholders
- Regionally appropriate tools and strategies
- Monitoring programs are not sexy - time, personnel, equipment intensive
- Need for continued resources for episodic events
- Linkage between monitoring and prediction not always straightforward

Questions/Comments