



# **US - Mexico Bi-National Harmful Algal Blooms Observing System (HABSOS)**

**Presented to  
GEOSS in the Americas Forum  
Focus on Coastal Zones**

***“How does your program use  
earth observations to inform  
decisions about the coastal  
zone management”***

**20 November, 2009  
Russell H Beard, Director,  
NOAA's National Coastal Data  
Development Center, Stennis  
Space Center, Ms**

# Harmful Algal Bloom Impacts on Human Activities



**AEROSOLS**



**TOXIC SHELLFISH**

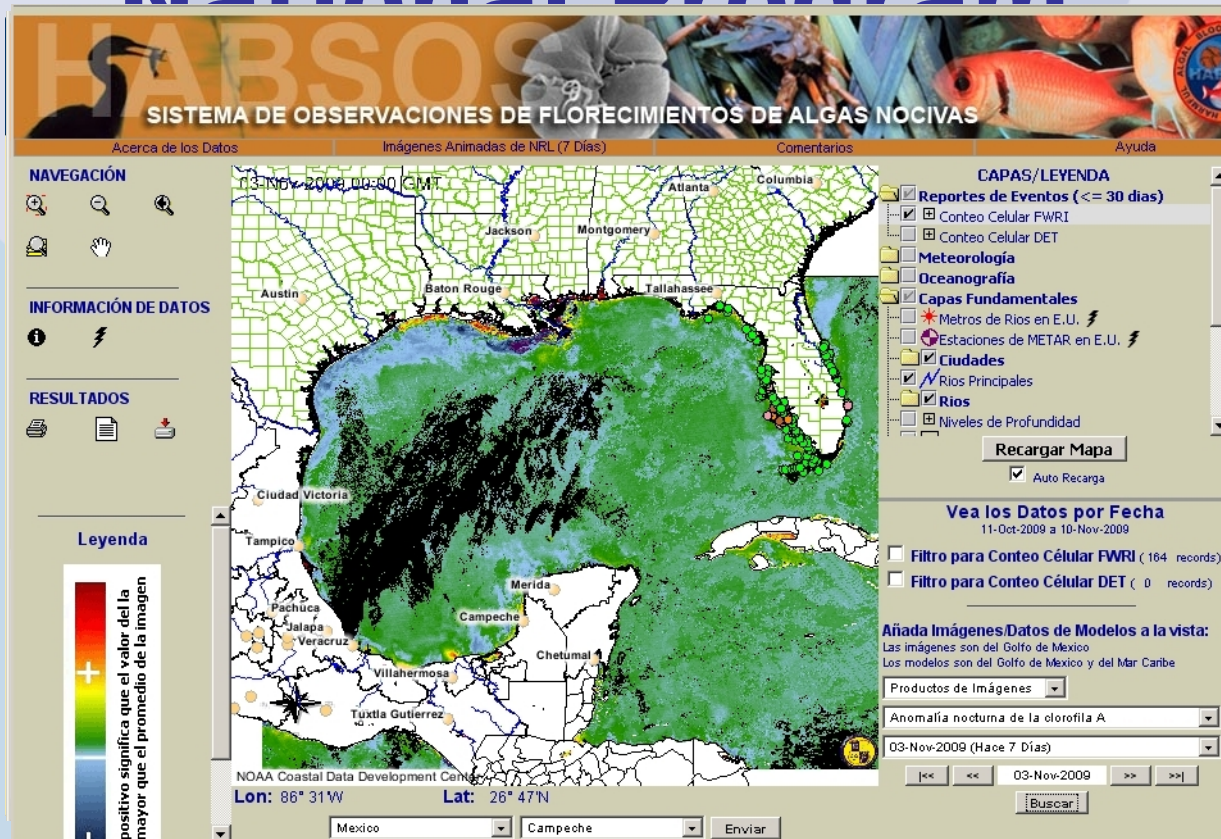


**RECREATIONAL ACTIVITIES**



**ECONOMY**

# History Leading to the Bi- National Program

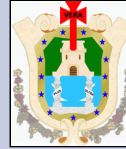


HABSOB ABOS 6 initiated (2000-2-current  
2003) HABSOB Spanish language  
HABSOB website 2000

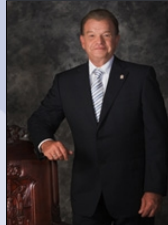
**Governor of Tamaulipas  
Eugenio Hernandez Flores**



**Governor of Veracruz  
Fidel Herrera Beltran**



**Governor of Tabasco  
Andres Rafael Granier Melo**



**Governor of Campeche  
Jorge Carlos Hurtado Valdez**



**Governor of Yucatan  
Ivonne Ortega Pacheco**



**Governor of Quintana Roo  
Feliz Gonzalez Canto**



## Partners

**USEPA GOMP**

**NOAA**

**Naval Research Lab -  
Stennis**

**University South  
Florida**

**Acuario de Veracruz**

**Center for Advanced  
Studies (CINVESTAV,  
Merida)**

**Ecology Institute  
(INECOL)**

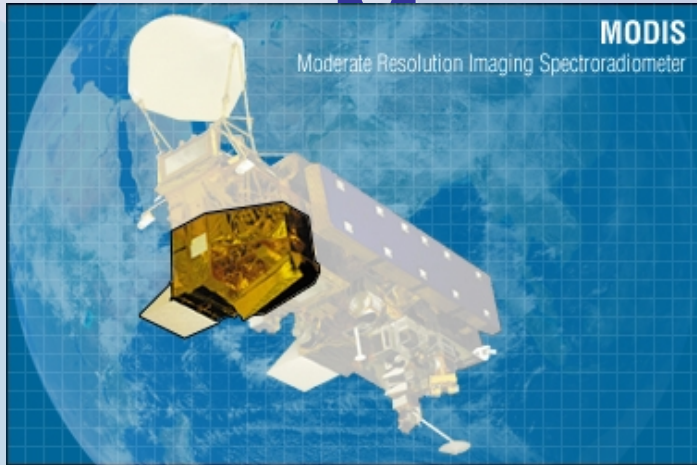
**Mexican Navy**

**National Institute of  
Fisheries**

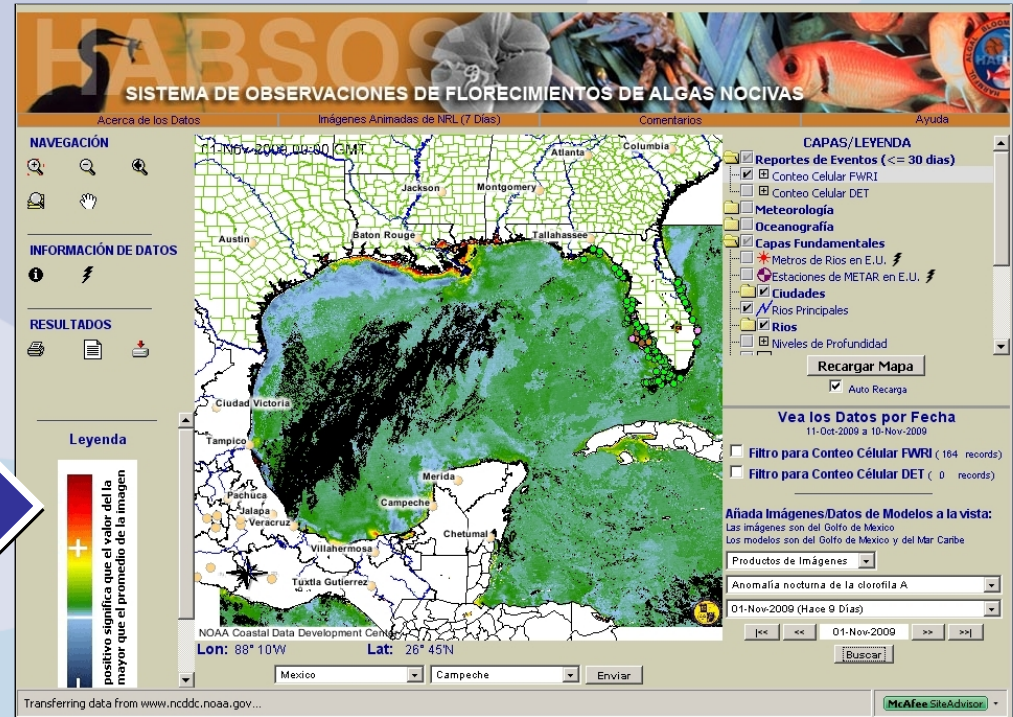
**University of  
Veracruz**

**Laboratories of Public**

# Sensors used to Support Coastal Zone Management - HABS



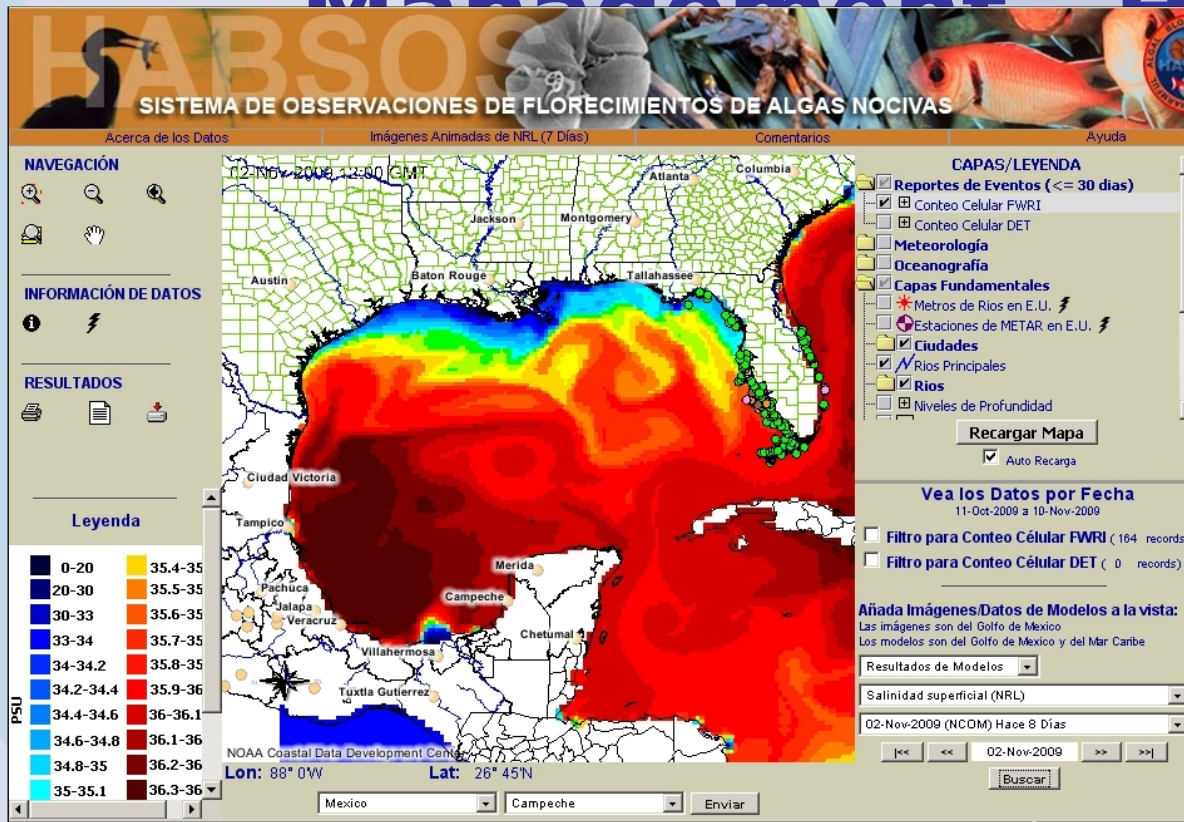
Sensor NASA  
MODIS Aqua  
Scan  
NRL Observational  
Data/Products



NRL Product Chlorophyll a  
Anomaly (PM)  
2 November 2009

Ocean color,  
absorption by CDOM,  
Chl a, SST, Chl a  
anomalies,  
backscatter

# Models used to Support Coastal Zone Management HABS



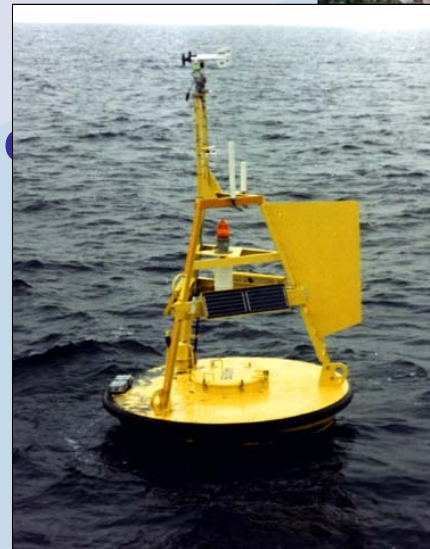
For daily nowcast/forecast, the model is restarted from previous nowcast. Once the model is restarted, it continuously assimilates the synthetic temperature & salinity profiles generated by a data analysis model called MODAS to produce nowcast.

**Gulf of Mexico Salinity Forecast  
NRL Inter-Americas Sea Ocean Nowcast  
Forecast System**

# In Situ Observations used to Support Coastal Zone Management Coastal HABs Observations



**Air Temperature**  
**SST**  
**Dissolved Oxygen**  
**Currents**  
**Tides**  
**Winds**  
**River gauging**



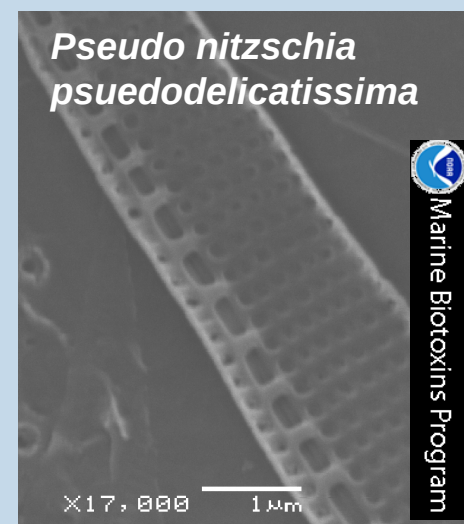
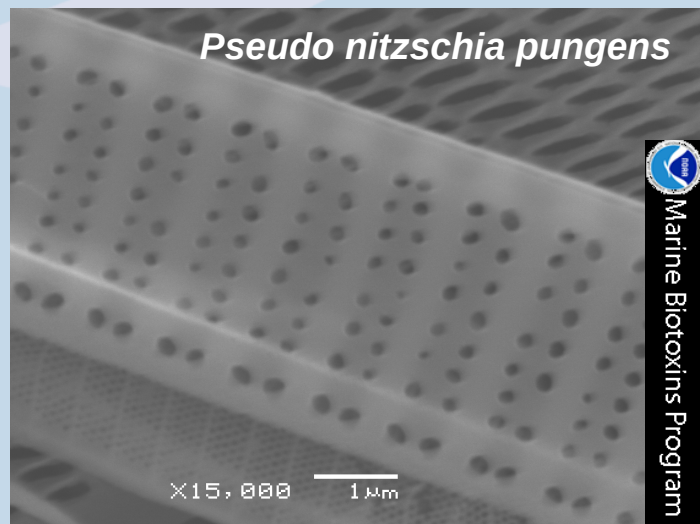
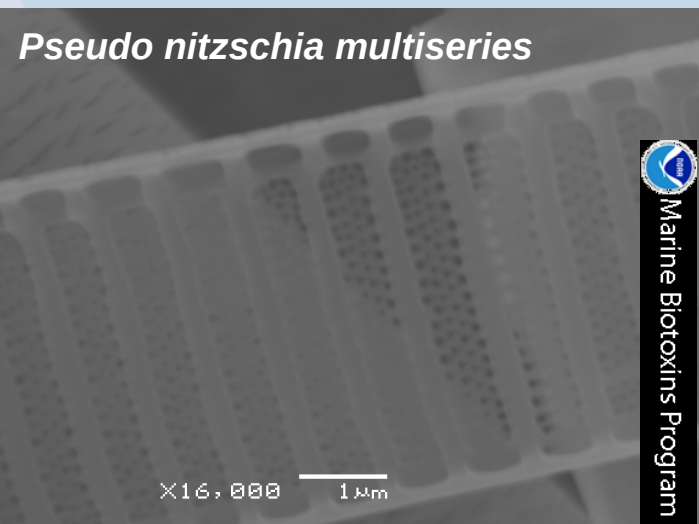
# Volunteer Phytoplankton Monitoring Network Goals

- Educate volunteers on harmful algal blooms (HABs)
- Create list of harmful species in coastal waters
- Identify trends where HABs occur



# Significant Blooms found by the PMN

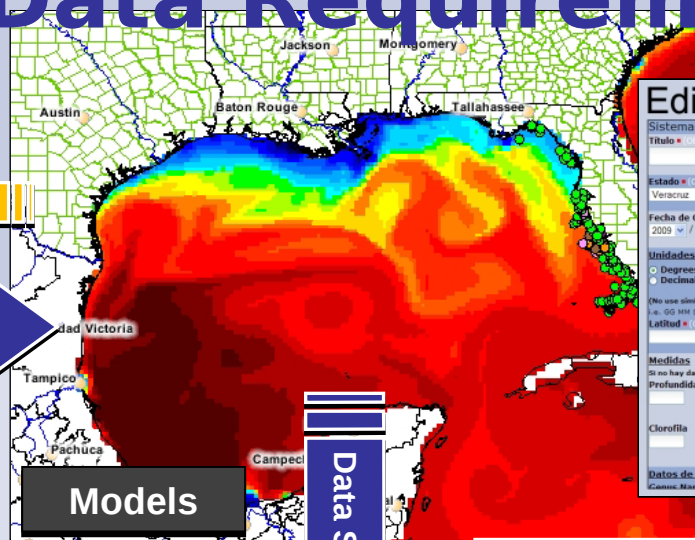
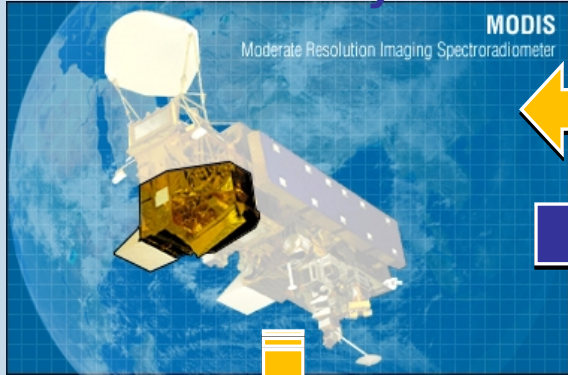
Date	Species	Found by...	Interesting Info
May '05	<i>Pseudo nitzschia pseudodelicatissima</i>	NC - First Flight HS College of the Albemarle	First time species found in SE Atlantic!
November '06	<i>Pseudo nitzschia pungens</i> <i>Pseudo nitzschia multiseriis</i>	NC - First Flight HS College of the Albemarle	First time domoic acid found in SE Atlantic! Oysters and water sample tested positive for domoic acid.
September '07	<i>Pseudo nitzschia pungens</i>	NC - First Flight HS	Mussels and water samples tested positive for domoic acid.



# Data Architecture Supporting Bi-National HABs Data Requirements

Satellite Observing Systems

In-Situ Observations



### Editar Cell Counts

Sistema de Colección de Datos de FAN del Golfo de México (Required field)

Título (Obligatorio):

Estado (Obligatorio): Veracruz Agencia (Obligatorio): Instituto de la Ecología

Fecha de Colección (Obligatorio): 2009 / / Fecha Para Hacer Público (Obligatorio): 2009 / /

Unidades de Coordenadas

Degrees Minutes Seconds Example: 28 25 55 (latitud) 96 26 00 (longitud)

Decimal Degrees Example: 27.3318 (latitud) 82.5765 (longitud)

Latitud (Obligatorio): Norte Longitud (Obligatorio):

Medidas

Profundidad de la Muestra: Unidades: m

Clorofila: Unidades: mg/L, µg/L Salinidad:

Datos de FAN

Models

Data Streams

NOAA HABs Forecast

### Gulf of Mexico Harmful Algal Bloom Bulletin

Region: Southeast Florida  
2 November 2009  
NOAA Ocean Service  
NOAA Satellite and Information Service  
NOAA National Weather Service  
Last Update: November 2, 2009

**Conditions Report**

A harmful algal bloom has been identified offshore northern and central Lee County, in the Pine Island Sound/San Carlos Bay region in Lee County, and offshore southern Lee and northern Collier counties. Recent sample results indicate a decrease in *Karenia brevis* concentrations at several sampling locations in the Pine Island Sound region. Samples collected on 11/2 indicate a very low concentration between Long Point and York Island and at Redfish Pass, and a very low concentration at Cariva Pass (FWRI). A sample from Buck Key indicates low *K. brevis* concentration (FWRI: 11/2). Two other samples in the Pine Island sound region, including Mariner Key, indicate background concentrations (FWRI: 11/2). A sample collected throughout northern Lee County identified a very low concentration (FWRI: 11/2/09). Samples collected 12 miles offshore northern Lee County indicate high concentrations of *K. brevis* at the surface and low concentrations at 2m depth (FWRI: 10/31), and recent samples indicate *K. brevis* is no longer present in Boca Grande Pass (FWRI: 11/2).

**Analysis**

A harmful algal bloom has been identified offshore northern and central Lee County, in the Pine Island Sound/San Carlos Bay region in Lee County, and offshore southern Lee and northern Collier counties. Recent sample results indicate a decrease in *Karenia brevis* concentrations at several sampling locations in the Pine Island Sound region. Samples collected on 11/2 indicate a very low concentration between Long Point and York Island and at Redfish Pass, and a very low concentration at Cariva Pass (FWRI). A sample from Buck Key indicates low *K. brevis* concentration (FWRI: 11/2). Two other samples in the Pine Island sound region, including Mariner Key, indicate background concentrations (FWRI: 11/2). A sample collected throughout northern Lee County identified a very low concentration (FWRI: 11/2/09). Samples collected 12 miles offshore northern Lee County indicate high concentrations of *K. brevis* at the surface and low concentrations at 2m depth (FWRI: 10/31), and recent samples indicate *K. brevis* is no longer present in Boca Grande Pass (FWRI: 11/2).

Samples collected in the Sanibel Island region of Lee County on 10/30 indicate low *K. brevis* concentration (FWRI). High *K. brevis* concentrations were also identified 2 miles south of Sanibel Island (FWRI: 10/30). Samples collected 7 miles west of Brown Bridge on the

### SISTEMA DE OBSERVACIONES DE FLORECIMIENTOS DE ALGAS NOCIVAS

Acerca de los Datos Imágenes Aerializadas de NRL (7 Días) Concentraciones

NAVIGACION

INFORMACION DE DATOS

RESULTADOS

Legenda

1-16	24-25
16-17	25-26
17-18	26-27
18-19	27-28
19-20	28-29
20-21	29-30
21-22	30-31
22-23	31-32
23-24	>32

NOAA Coastal Data Development Center  
Lon: 88° 31'W Lat: 27° 17'N



Researchers & Scientists

Archive & Stewardship

Warnings, Forecasts & Alerts

Coastal Zone Managers

ArcIMS English/Spanish HABSOS website for data integration & visualization

Data Centers &

# **November 2009 Bi-National HABS Status**

- **Spanish language website completed 2008**
- **Spanish language data entry tool completed 2008**
- **2 service boats donated by Gulf Governor's Alliance 2009**
- **Construction of pilings and tower foundation underway (completion date late November) 2009**
- **Upon completion NDBC ships equipment and installs (mid-December) 2009**
- **BreveBuster will be maintained locally by scientists**
- **Microscopes w/digital cameras and mounts, laptops, and lab supplies were given to Acuario de Veracruz, Center of Research and Advanced Studies (Cinvestav, Merida), Ecology Institute in Xalapa (INECOL), Laboratory of Public Health in Veracruz, and the Laboratory of Public Health in Tabasco. Additional microscopes with digital cameras and mounts, laptops, and lap supplies will be given to State Health Services in Campeche, Yucatan, Tamaulipas, and Quintana Roo**

# Future Data and Science with HAB Applications



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monitoring of phytoplankton population dynamics

# **Questions?? Contact Information**

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rost.parsons@noaa.gov**

**<http://www.ncddc.noaa.gov/interactivemaps/sistema-de-observaciones-de-florecimientos-de-algas-nocivas-habsos>**