



Integrated Water Resource Services

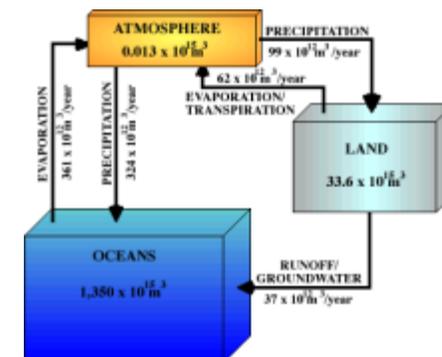


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NOAA National Ocean Service

SWRR Meeting, Arlington VA (June 26-27, 2008)

[POC for IWRS: Gary Carter, NWS]





Integrated Water Resource Services



1. A NOAA initiative to focus its considerable expertise, resources and capabilities in the broader context of water resources for:
 - a. Linking its weather, water and ecological research, assessment and monitoring activities
 - b. Delivering essential products and services through regional collaborative projects
 - c. Increasing outreach and education, and enhancing socio-economic benefits
2. A precursor for NOAA's Water Theme - under development [integrating water science and services]



Terms of Reference



- NOAA Executive Council (NEC) decided (2006) to emphasize programmatic integration across NOAA and improve the value and efficiency of NOAA's products and services by a collaborative approach at a regional scale
 - Showcasing NOAA's extensive expertise, products and capabilities on a regional scale
 - Offering place-based and user-specified products and services that are consistent with its responsibilities as a federal agency



An Example: Forecast changes in salinity and temperature resulting from increased freshwater withdrawal



Proposal - increase water withdrawal from the upper Delaware River to increase "cold water" ecological flows in support of trout fishing (NY and PA)

Concern: Increased salinity and temperature will promote parasitic infestations (Dermo and MSX) in oysters - extensive and very important oyster seed beds are located in the upper Delaware Bay





Current Capabilities



- Extensive observational systems and monitoring programs in the region
- Modeling Capabilities
 - ACOE model simulations: deepening of shipping channel, increased consumptive use, projected sea level rise
 - DRBC integration of 3 different models: reservoir operations model, hydrodynamics model, chloride transport model
 - NOAA: 3-dimensional water circulation model for the bay
 - Oyster population dynamics and disease vulnerability models (NSF)

Currently working on refining the problem statement





Another, a bit simpler example:

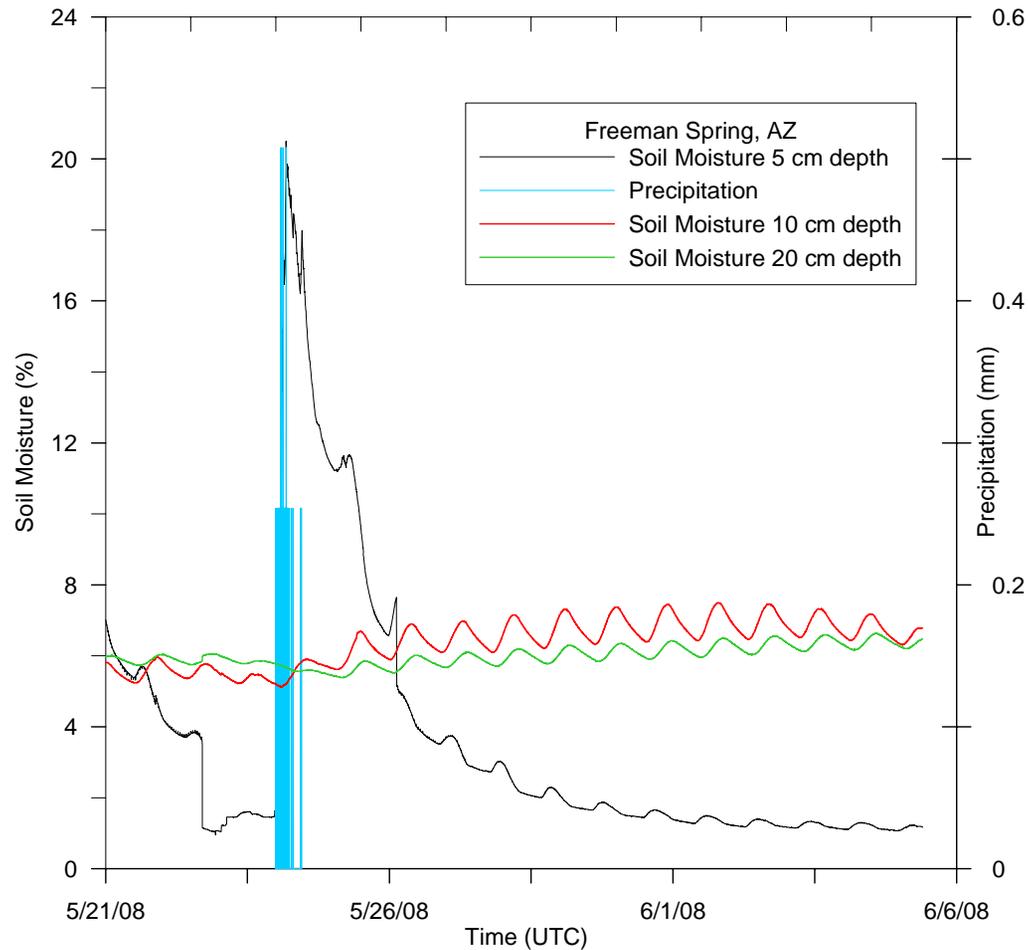
Enhance the Potomac River basin stream gauge network and integrate NOAA and USGS data



- Determine water flow and contaminant flux from the Potomac River Basin into Chesapeake Bay [essentially fill spatial sampling gaps] that meet key partner and customer needs
 - Review of existing network and capabilities
 - Delivery of stream-flow, water-level and water quality data through data portals and web visualization tools.
 - Support design elements of the National Water Quality Monitoring Network
 - Fill gaps

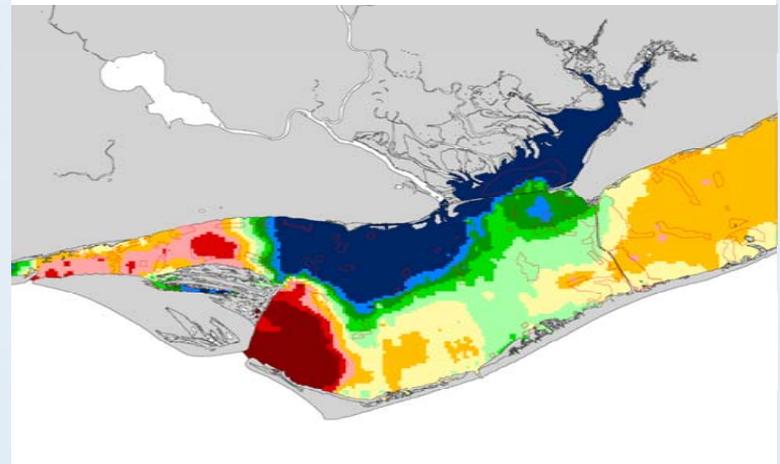
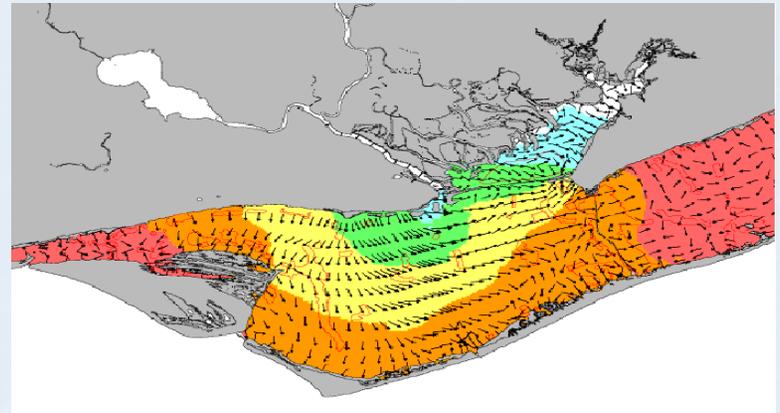
Soil Moisture Observations

National Integrated Drought Information System



Simulating changes in temperature and salinity regimes and predicting impacts on oyster mortality under reduced freshwater availability

- Integration of a suite of hydrodynamic and biological models
- Projected estimates of increased oyster mortality with reduced freshwater inflow
- Simulations under normal, flood, drought and future (Year 2050) flow conditions

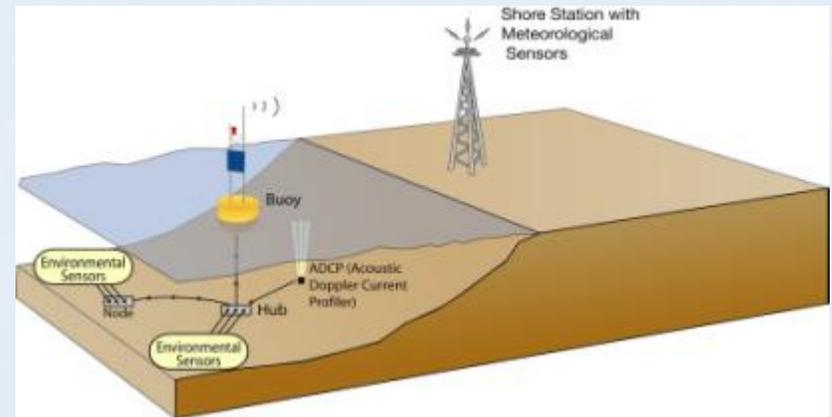
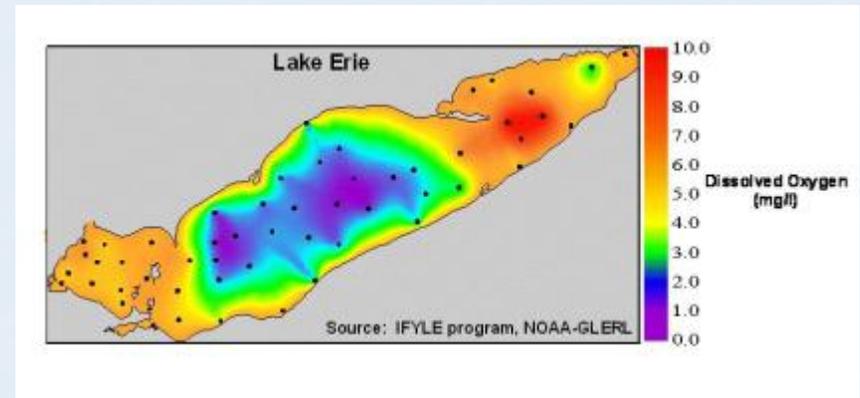


Forecasting onset of hypoxic conditions – Lake Erie

Early warning system for Cleveland Water District to adjust water intake, storage and processing due to low-oxygen water

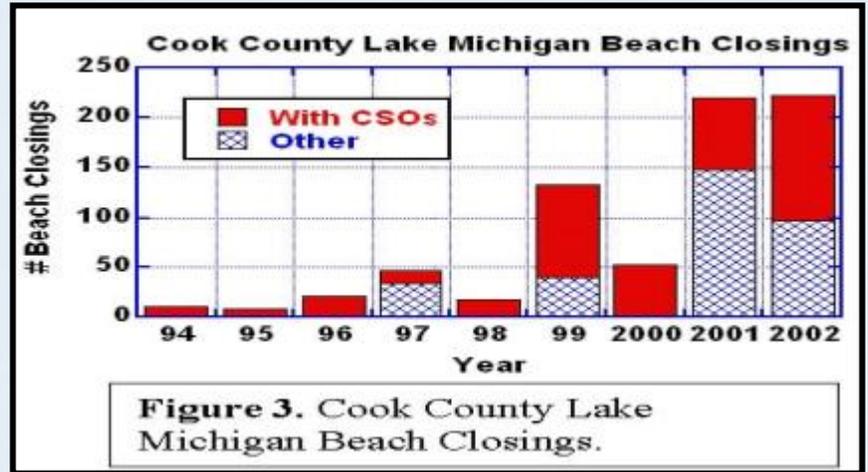
- Lower temperature
- Lower pH
- Possible manganese precipitation

Monitoring by Real Time Coastal Observation Network (ReCON) with automated, multiple sensor data



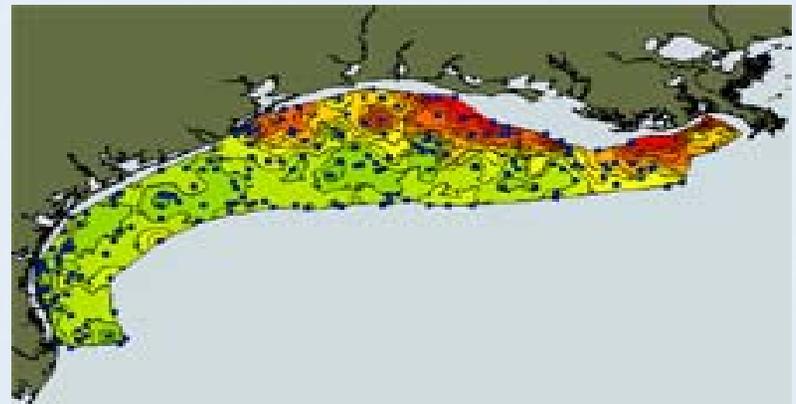
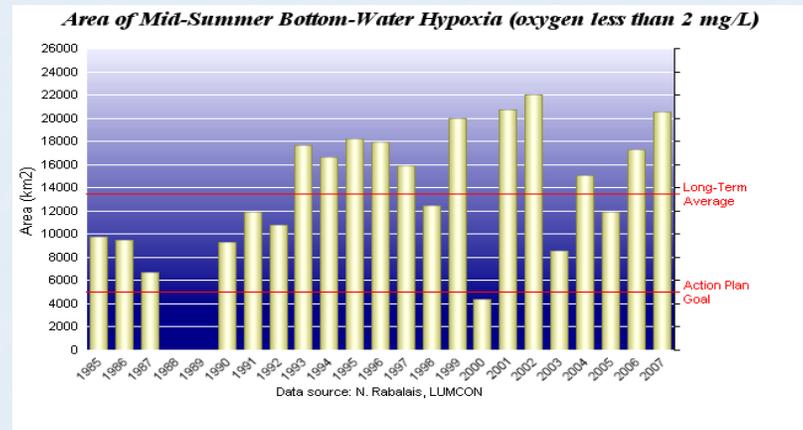
Forecasting Beach Closures

- Major health risk of microbial contamination by bacteria, viruses and protozoa in recreational waters
- Real-time modeling of coastal circulation and pathogen transport (NOAA, GLERL)



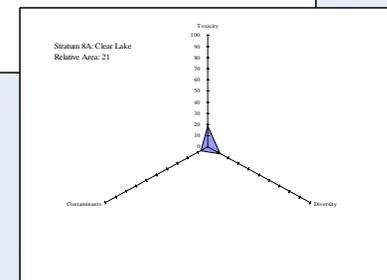
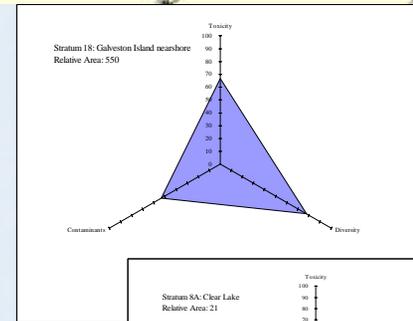
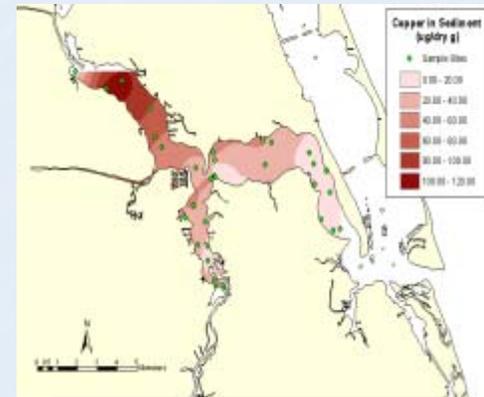
Forecasting size of the Gulf of Mexico hypoxic zone

- Multi-year, inter-disciplinary research program on causes and effects of the hypoxic zone
 - Improved forecasting capability
 - Adaptive management framework
 - Multi-agency participation



Defining the spatial extent and severity of sediment contamination

- Identify areas of concern for remediation, restoration, focused research and monitoring
- Recent studies
 - Chesapeake Bay
 - Puget Sound
 - St. Lucie Estuary, FL



Forecasting onset of Harmful Algal Blooms: information critical to public health and safety

Current Capability:

- West Coast of Florida
- Lake Erie



Harmful Algal Bloom Operational Forecast System supporting coastal managers and users



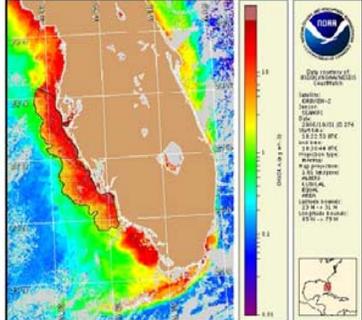


Gulf of Mexico Harmful Algal Bloom Bulletin
2 October 2006
NOAA Ocean Service
NOAA Satellite and Information Service
Last bulletin: September 28, 2006

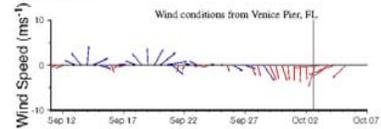
Conditions Report
A harmful algal bloom has been identified from Pinellas to central Collier County. Patchy low impacts are possible from Pinellas to northern Charlotte County through Thursday. Patchy very low impacts are possible from southern Charlotte to northern Collier County through Thursday. No impacts expected in central Collier County through Thursday.

Analysis
The ongoing harmful algal bloom persists from Pinellas to central Collier County. Recent imagery indicates continued high chlorophyll concentrations along the majority of the southwest Florida Coast. Medium to high concentrations of *K. brevis* have been identified offshore from Clearwater to Englewood Beach (FWRL 9/26-28). South of Englewood Beach, concentrations range from present to low, as far south as Caxambas Pass in Collier County (FWRL 9/25-28). Last week, the offshore portion of the bloom extended from 11 miles west of Anclote Key to 10 miles west of Marco Island, with medium to high concentrations extending from 19 miles west of Anclote Key to 13 miles west of Wiggins Pass in Collier County (FWRL 9/21-27). Wind conditions over the past few days have been favorable for upwelling; concentrations at the coast may have intensified. Continued sampling recommended. Dead fish have been reported in Pinellas, Manatee, Sarasota, and Lee Counties in the last 3 days, and respiratory irritation was reported yesterday in Sarasota County. Northeasterly winds through Friday may intensify the bloom, although coastal impacts will be minimized. Minimal transport of the bloom expected through Thursday.

- Allen, Fisher



Satellite chlorophyll image with possible HAB areas shown by red polygons. Cell concentration categories and corresponding values from Florida Fish and Wildlife Research Institute. For a key to the cell concentration descriptions, visit <http://resurhayfw.com>.



Wind conditions from Venice Pier, FL.

Wind speed and direction are averaged over 12 hours from buoy measurements. Length of line indicates speed, angle indicates direction. Red indicates that the wind direction favors upwelling near the coast. Values to the left of the dotted vertical line are measured values; values to the right are forecasts.

Northeast winds today building from 10-15 knots (5-8 m/s) by this afternoon, becoming easterly tonight. Northeasterly winds Thursday through Thursday at 15 knots (8 m/s) with

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1. Data are restricted to civil marine applications only, i.e. federal, state, and local government use/ distribution is permitted.
2. Image products may be published in newspapers. Any other publishing

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Thank You

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