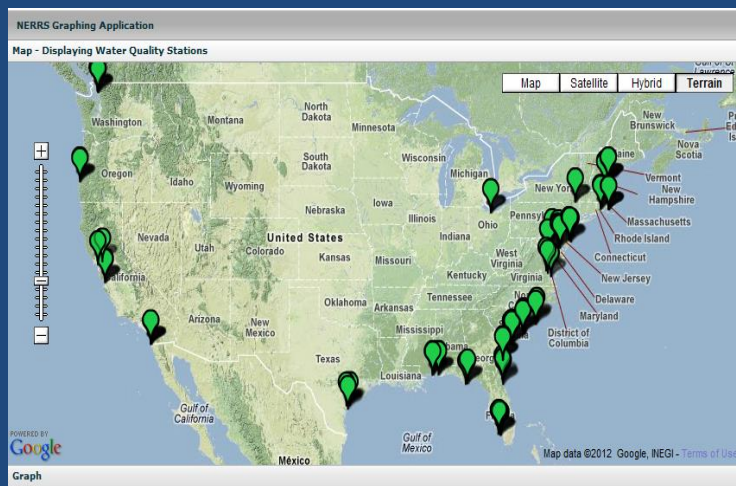


The Role of Environmental Monitoring and Data Management in Supporting Science to Inform Decision Making: Integrating NAML, NERRS and IOOS Activities



ADVISORY INFORMATION

SC DHEC routinely collects water samples at over 100 locations on South Carolina's beaches. If high numbers of bacteria are found, an advisory is issued for that portion of the beach. An advisory means that DHEC advises you to NOT swim in certain areas. This is especially true for young children and those with compromised immune systems. Advisories do not mean that the beach is closed. Wading, fishing, and shell collecting do not pose a risk. Advisories may be issued due to high bacteria counts or rainfall. Advisories are lifted when sample results fall below the limit of 104/100mL. Check the local newspaper and television news stations. Look for advisory signs when you go to the beach.

SC DHEC Beach Monitoring System

[Know before you go!](#)

Presented by:

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Baruch Institute and the Arnold School of Public Health at the University of South Carolina

And the NOAA NERRS Centralized Data Management Office

*With a lot of input from folks at NOAA OCM/NERRS, IPO, CCHEBR,

SECOORA, NANOOS, NERACOOS, GCOOS, Baruch Institute, CMS/UNC-W, CMWS/CCU, FL FWC, SkIO, Duke Marine Lab, SCDNR MRRI, etc.

NAML/NERRS/IOOS Integration Discussion

12 May 2016

Outline

- An overview of the NERRS System-wide Monitoring Program data management activities
- The value of integrating monitoring programs to address societal issues
- Considerations for the integration of monitoring activities to address...

System-Wide Monitoring Program (SWMP)



Established in 1995, SWMP is a national coastal observing system...

- Designed to identify and track **short-term variability**, and **long-term changes** in representative estuarine ecosystems and coastal watersheds

Data Management

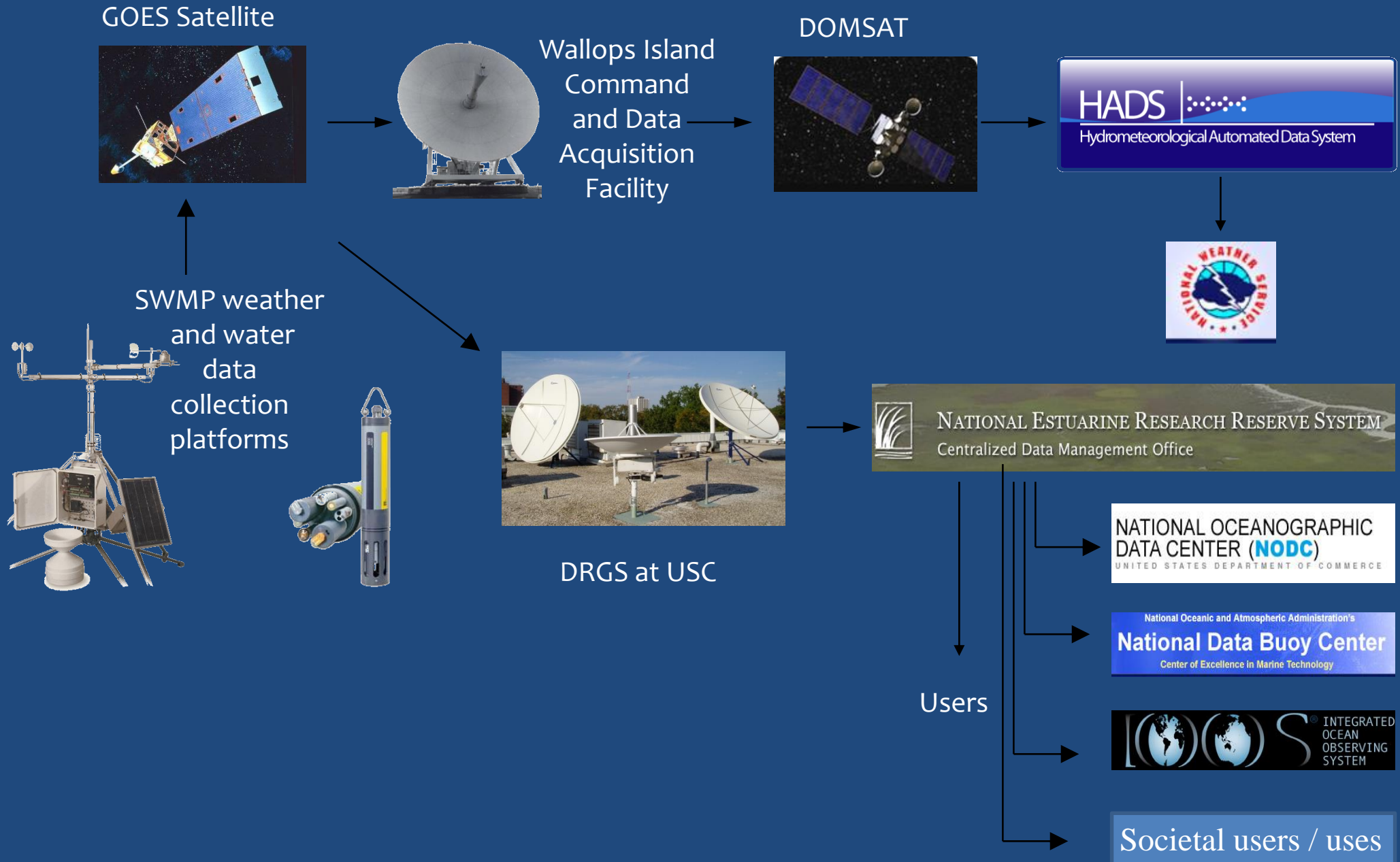
The **Centralized Data Management Office (CDMO)** was established in 1995 in support of the NERRS System-wide Monitoring Program (SWMP) in order to:

develop, implement and manage the basic infrastructure and data protocol of the NERRS SWMP,

support the assimilation and exchange of high-quality data and metadata within the NERRS framework, and

support the ingestion of high-value data with other local to global monitoring efforts via data push and pull services.

SWMP Near-real-time Data Flow



Data Management

High-quality data require rigorous data collection protocols, QA/QC, documentation and must involve the data provider:

Provisional data have been run through the automated QA/QC process (primary review) and data values flagged as appropriate but have not been manually reviewed or edited (secondary review). Provisional data are available via the data portal and web services.

Provisional plus data have been through primary and secondary review and are awaiting final tertiary review by the CDMO. Provisional plus data are available via the data portal and web services and replace the provisional data.

Authoritative data refer to data that have gone through final tertiary review at the CDMO. Authoritative data are available via the data portal and web services and replace provisional plus data. Authoritative data are archived with the NODC.

SWMP Datasets

32 Meteorological Datasets (13,014,425 records)

29 active and 3 inactive

29 are reporting data via telemetry and 3 being repaired

5 additional non-SWMP stations reporting via telemetry

150 Water Quality Datasets (42,855,637 records)

114 are active 36 inactive

56 are capable of reporting data via telemetry

3 additional non-SWMP stations reporting via telemetry

144 Nutrient Datasets (93,465 records)

130 active and 14 inactive

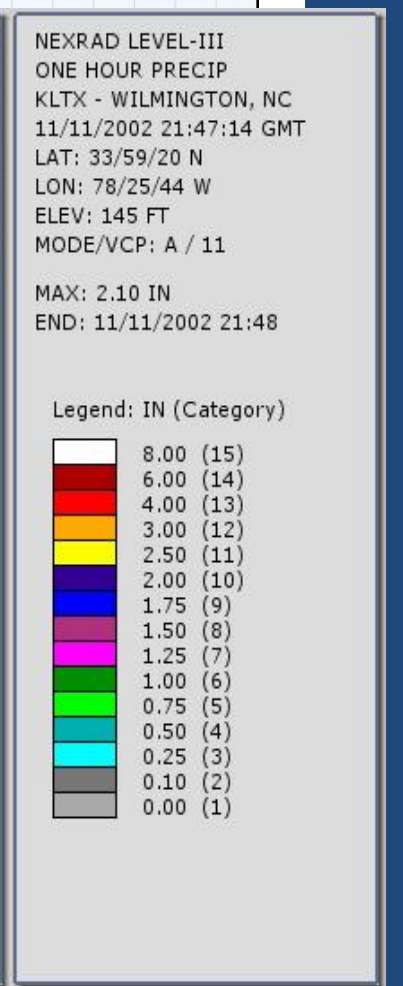
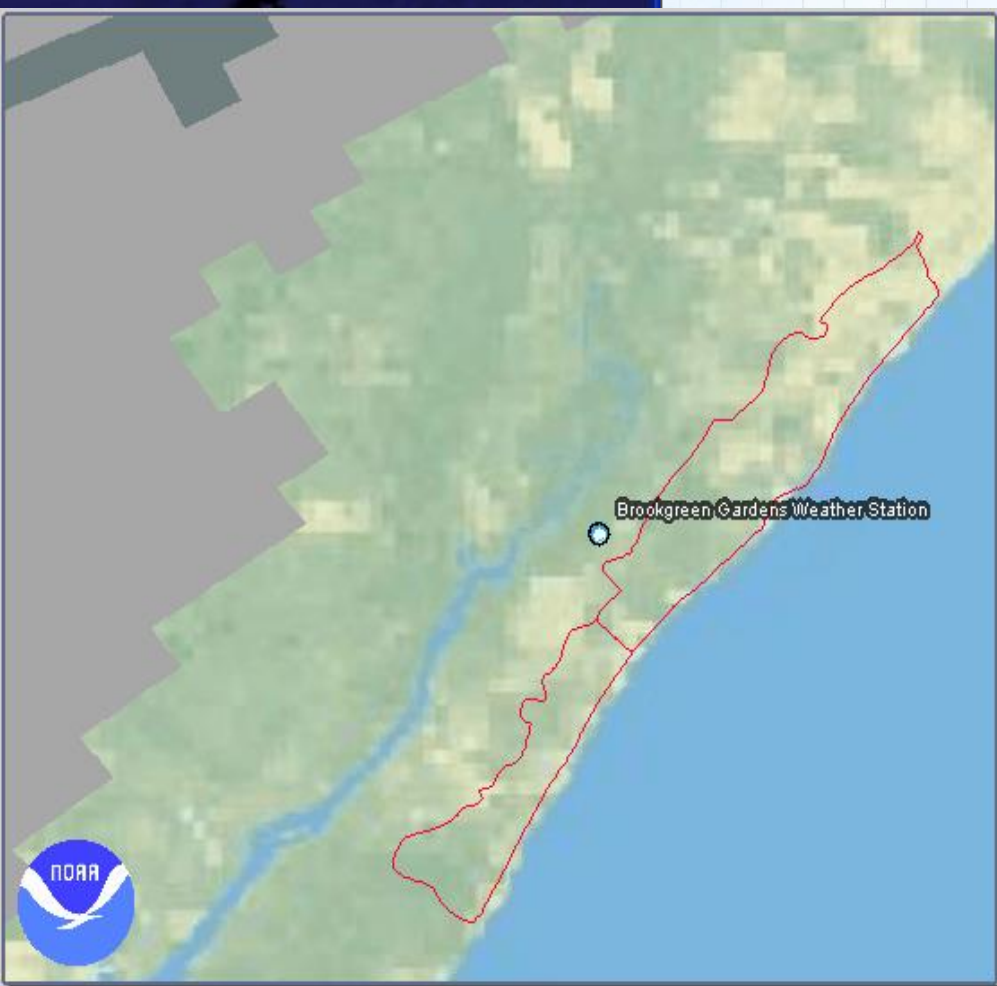
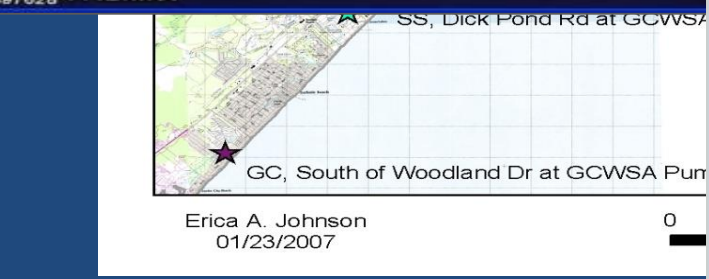
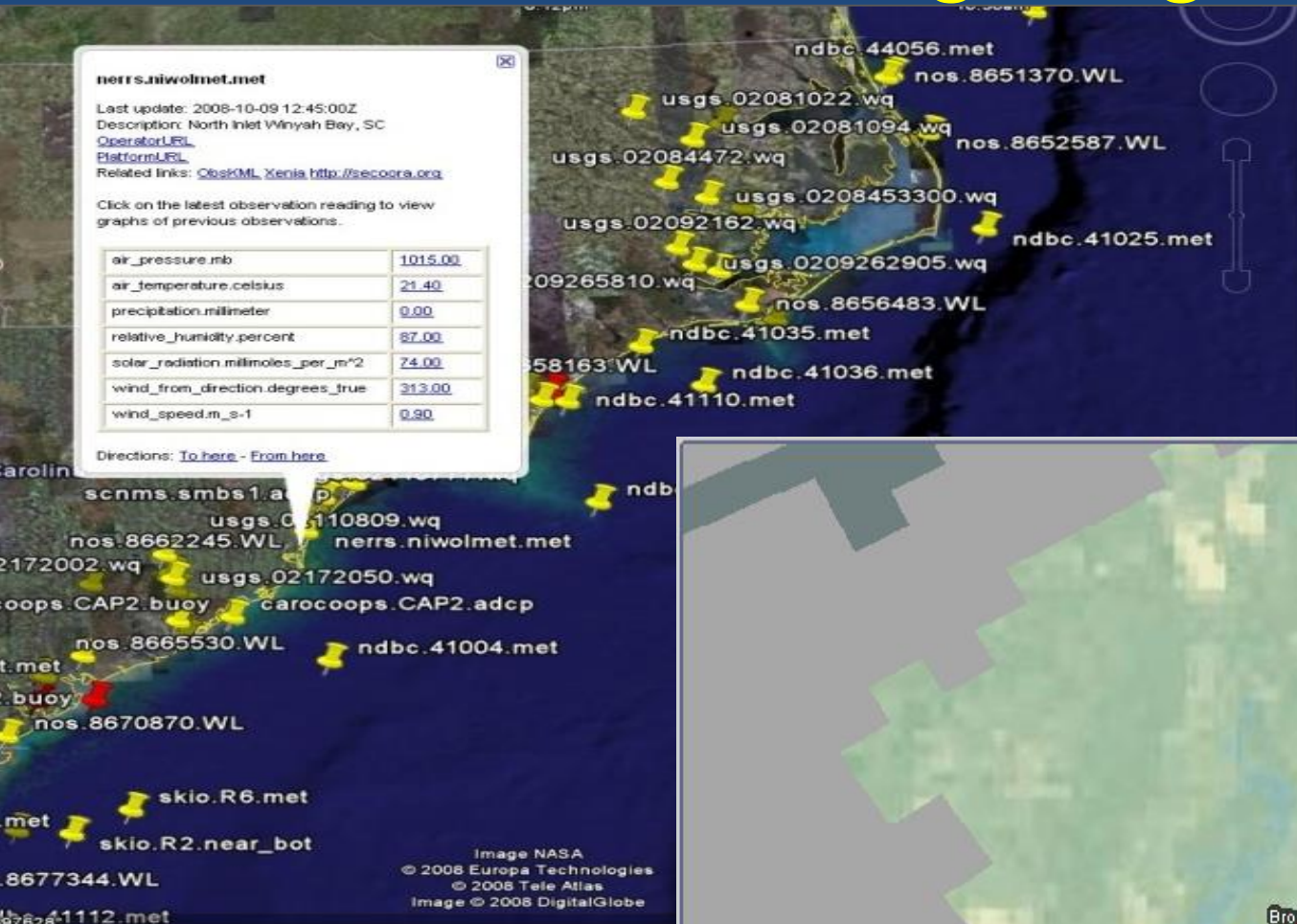
Data Management

High-value data must be of **high quality** AND **shared** with others!

Users of SWMP data include:

Oceans and Human Health Initiative, National Data Buoy Center, Data in the Classroom (www.dataintheclassroom.org), Chesapeake Bay Interpretive Buoy System (www.buoybay.org), National Coastal Data Development Center, National Ocean Service, National Weather Service Hydrometeorological Automated Data System, NWS Regional Forecast Offices, NANOOS, NERACOOS, SECOORA, AOOS, MARACOOS, GCOOS, Estuaries.Gov, Pacific Shellfish Growers Association, San Diego State University Field Stations Program, Stockton College, Maryland DNR, Chesapeake Bay Eyes on the Bay, Georgia Forestry Commission, Georgia Coastal Ecosystems LTER, Center for Integrative Coastal Observation, Research and Education, Environmental Monitoring Sensor Intelligence Corp, SC Department of Health and Environmental Control, Smithsonian Institute, Insurance companies, Attorneys, MBARI EARTH, South Brunswick High School, etc.

The Real Value is in Integrating Observing Systems!



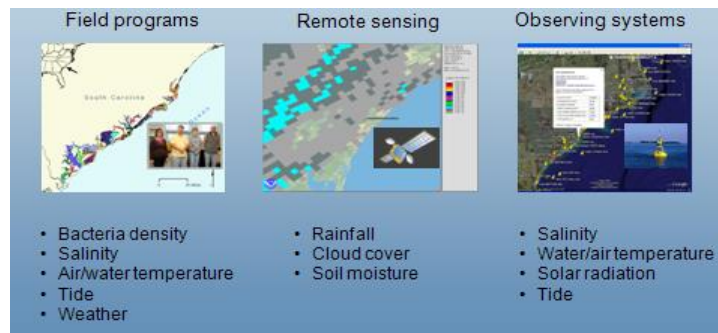
Examples of Integrating
Monitoring Programs and Sound Science
to
Inform Decision Making

Beach Water Quality Assessment and Modeling Activities

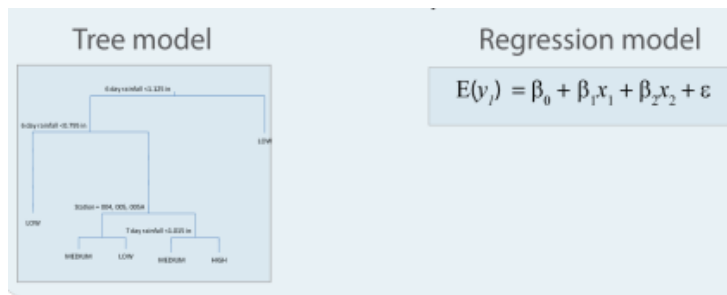
Issue: Exposure to beach swimming waters with elevated bacterial levels is a public health concern and one of economic vitality.

Goal: Develop and implement scientifically-justified, decision-support tools for accurate and defensible preemptive advisory issuance decisions.

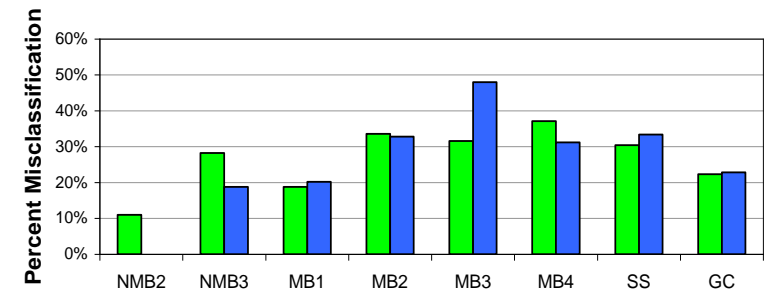
Process 1.) Data integration and fusion



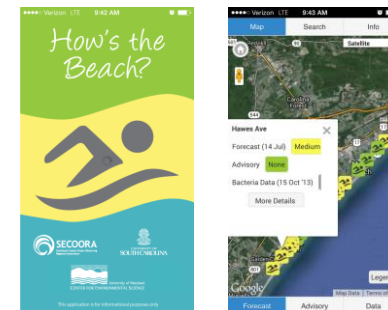
2.) Ensemble model development



3.) Model validation



4.) Operational decision-support tool



Who is doing it: A partnership among beach managers, tourism interests, public health officials and the general public including...

Monitoring Water Conditions in Shellfish Harvesting Waters

Issue: Commercial shellfish growers in the Pacific Northwest depend on good water quality data in order to make informed decisions that have economic implications.

Goal: To provide critical information about water temperature, chlorophyll levels, salinity, turbidity, and dissolved oxygen so that better decisions can be made about managing mariculture operations.

Process: 1.) Data collection



2.) Data integration and fusion



3.) Decision support



Who is doing it: A partnership between NANOOS, the KAT, PAD and SOS NERRS, Pacific Coast Shellfish Growers Association, Pacific Shellfish Institute, University of Washington and the CDMO (support from CSC and NERRA).

Supporting Safe Marine Activities

Issue: Mariners need dependable access to current and forecasted information on winds, waves and weather.

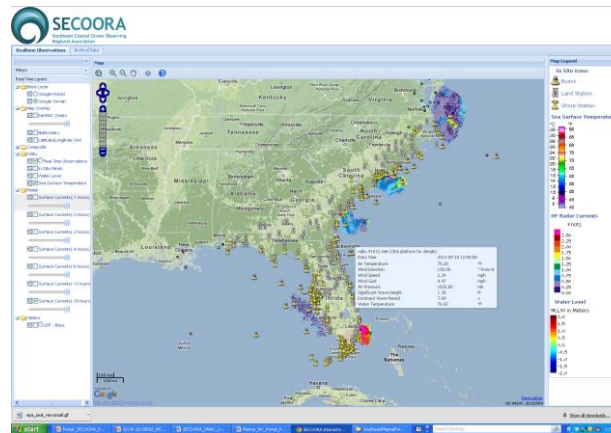
Goal: To provide 24/7 access to critical marine information for the commercial and recreational marine communities within the SECOORA region.

Process:

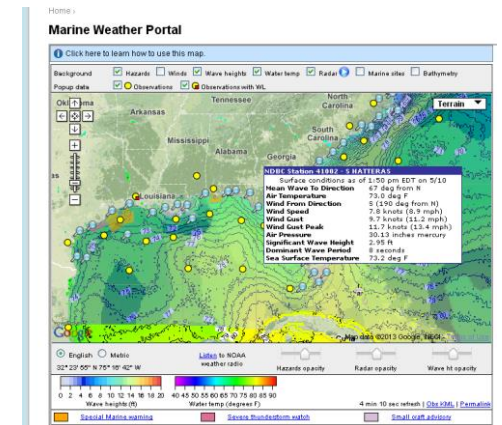
1.) Determine user needs



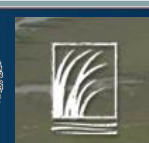
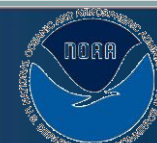
2.) Data integration and fusion



3.) Decision support



Who is doing it: A partnership between SECOORA, UNC-W, USC, USF and the NWS Office of the CIO, NWS Eastern and Southern Region Headquarters and WFOs, NERRS and Second Creek Consulting.



Supporting Marine Spatial Planning

Issue: Local to regional resource managers and planners needs access to spatially and temporally relevant data and to planning tools in support of healthy ecosystems, clean coastal and ocean waters, disaster planning and recovery, and working waterfronts.

Goal: To provide access to regional coastal and ocean data and planning tools in support of the Governors' South Atlantic Alliance (GSAA).

Process:

1.) Determine user needs



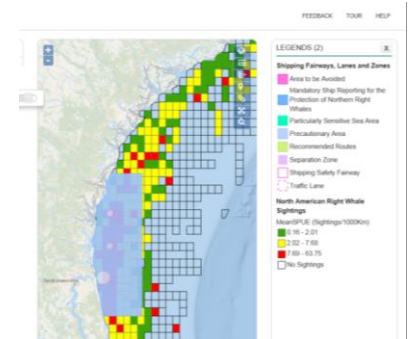
2.) Data development and fusion



- LEARN
 - EXPLORE
 - Data Catalog
 - VISUALIZE
- Jurisdictions and Boundaries / 27
 - Marine Habitat / 23
 - Marine Species / 60
 - Oceanographic Features / 5
 - Ocean Uses / 27
 - Upland Uses / 3



3.) Decision support



Who is doing it: A partnership involving NC, SC, GA, FL agencies and academic institutions, SECOORA, TNC, EcoTrust and NOAA.

Supporting Improved Decision Making Globally

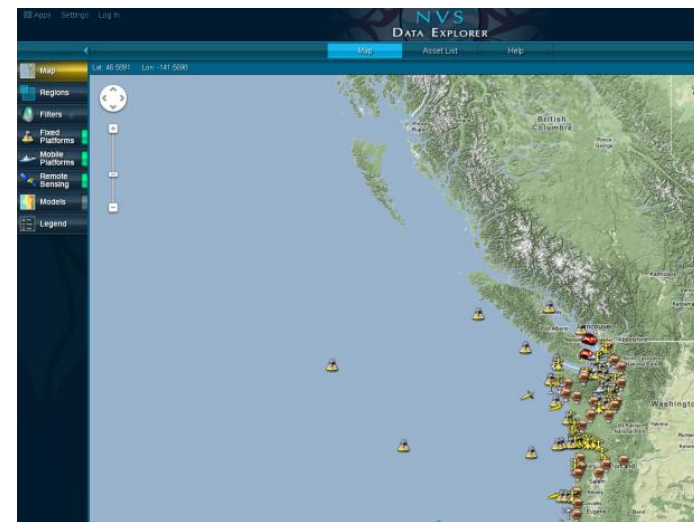
Issue: In support of addressing global issues such as ocean acidification, there is a need for a public information network for creating and sharing environmentally relevant data and information online.

Goal: To improve the global environment by sharing information and knowledge.

Process: 1.) Data assimilation



2.) Decision support



Who is doing it: IOOS Program Office, NERRS, NANOOS, SECOORA, European Environment Agency and ESRI.

Considerations for the Integration of Monitoring Activities

Do the data have:

- relevance to local to national information needs?
 - Yes!
- a well designed and adhered to data management program?
 - Yes.
- demonstrated use in management decisions?
 - Examples provided, and user base is growing.
- existing funding for data collection?
 - Yes ... but never enough.
- the ability for additional leveraging to assist with scale-up?
 - Absolutely!
- the backing of an operational (24/7) backbone?
 - Oh cr...!

For more information

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