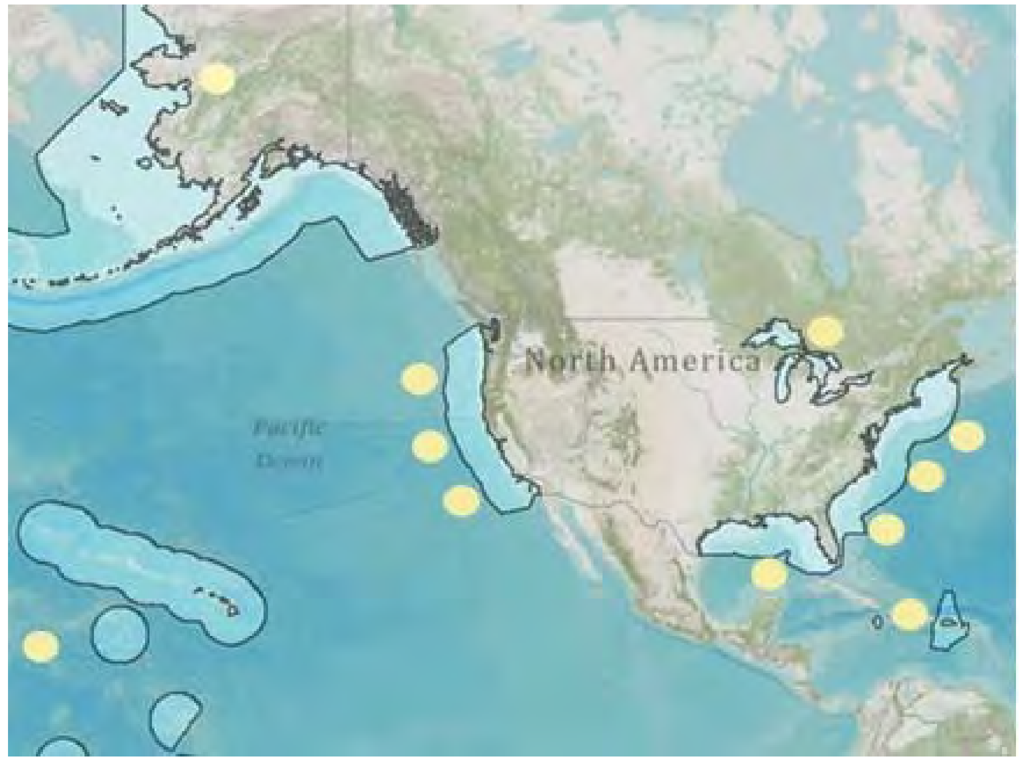
INTEGRATED OCEAN OBSERVING SYSTEM

The Gulf of Mexico Coastal Ocean Observing System

IOOS

What is GCOOS?

- GCOOS is one of 11 regions that comprise the U.S. Integrated Ocean Observing System (IOOS).
- It is a stakeholder-driven partnership, dedicated to acquiring, integrating, and serving oceanographic and meteorological information for the benefit of society.
- GCOOS is governed by the GCOOS Regional Association (RA)

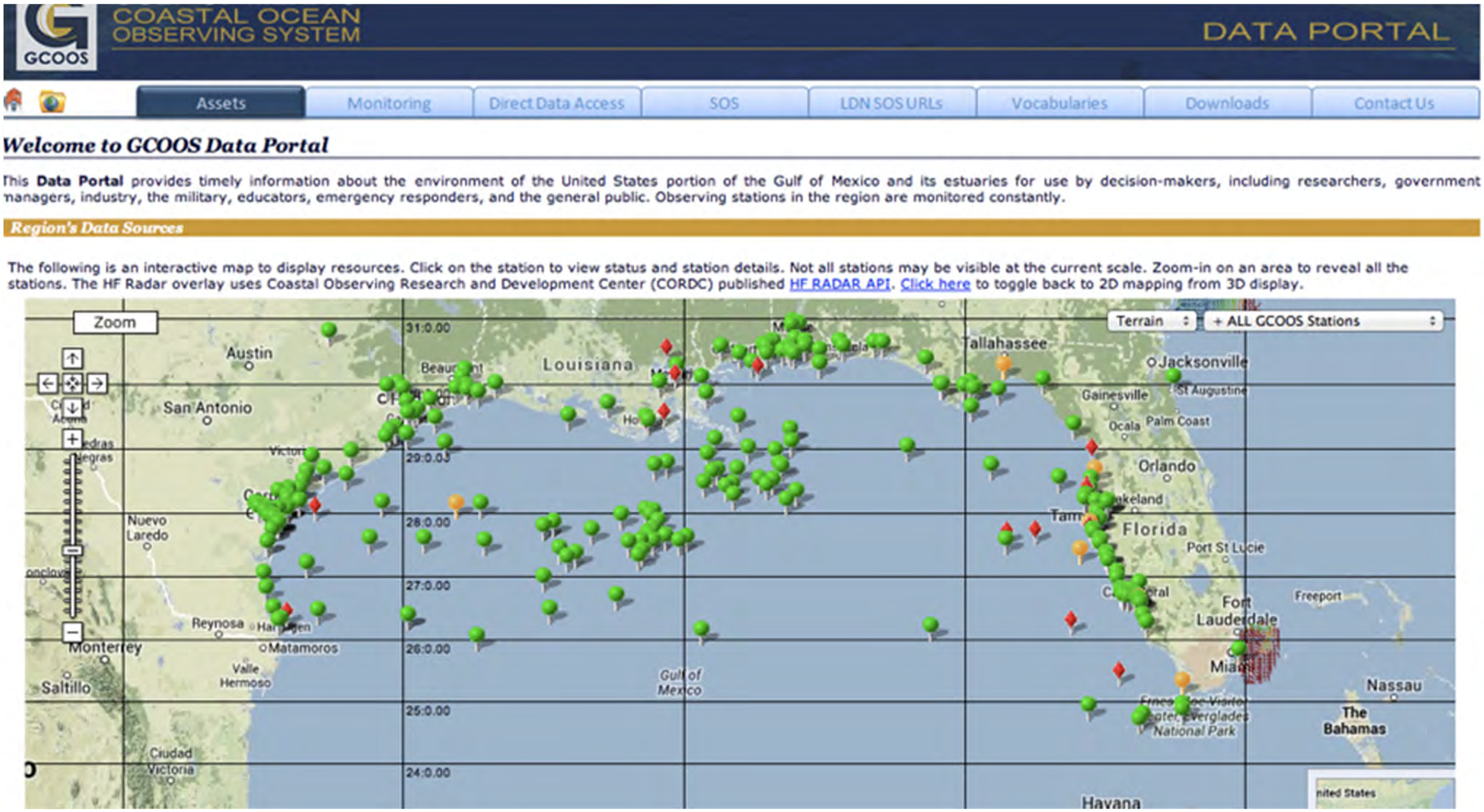


GCOOS is an End to End System

- GCOOS aggregates, integrates, and serves data and products derived from a combination of instruments on buoys, satellites, ships, drifters and underwater vehicles.

- In addition to the near-real-time, integrated, and sustained observations of the ocean and atmosphere at the air-sea interface, computer models and other data sets are part of the system, used to understand the Gulf and make forecasts.

GCOOS Data Portal
Goal: Integration



Areas to Engage

- GCOOS Board of Directors
- Products and Services Advisory Council
- Education and Outreach Council
- Data Management and Communications Committee
- Observing Systems Committee
- Membership Committee
- Task Team on Public Health
- Modeling Task Team
- Gulf Glider Task Team
- Government Relations Task Team

Examples of Successful Collaborations

- **GCOOS Data Portal**
  - EPA Gulf Guardian Award for contributions during the Deepwater Horizon spill.
- **GOM Pilot Prediction Project**
  - Partnered with the DOE's Research Partnership to Secure Energy for America and CASE-EJIP to evaluate requirements for the operational prediction of deep water circulation.
- **Ocean Acidification Pilot Study**
  - Partnered with USM and Liquid Robotics to compare and evaluate data from different platforms, acquired with different sensors.
- **Establish Protocols for Glider Data**
  - Work with USF, Mote Marine Lab, TAMU and Shell have enabled GCOOS to establish protocols for glider data acquisition by numerical models and integration with satellite data.

Chapter in review: Near Real-Time Oceanic Glider Mission Viewer in Ocean Solutions, Earth Solutions, ESRI Press, (S. Kobara, Simoniello, C., Perry, R., Watson, S., Jochens, A., Howden, S., Howard, M.)

IOOS

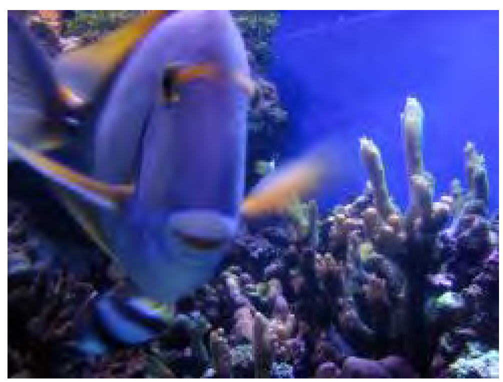
There is no 'one-size-fits-all' solution!

- The GCOOS-RA has a 10-year history of working with a variety of data providers.
- Various organizations have different requirements, proprietary issues, and deal with sensitive information, (e.g., deep-water circulation for the oil and gas industry, AIS information for homeland security, position location of protected species).
- A comprehensive ATN will require a nested approach to handle sensitive data sets.

The GCOOS-RA is cognizant of the concerns related to publicly sharing in real-time location data of tagged animals!

Developing an ATN/IOOS Partnership

- Previous workshops have identified elements needed for a sustainable U.S. Animal Telemetry Network.
  - E.g., IOOS Animal Telemetry Observations Workshop, 3/2011
- The main benefits are obvious.
  - Unprecedented opportunities for EBM
  - Understanding animal life histories
  - Data to drive numerical models



Early Stages of Handling Biological Data

IOOS Biological Data Services Implementation Project

- US IOOS has developed and implemented data content and access standards for IOOS biological core variables (Fish and Zooplankton species and abundance) to promote interoperability.

- Following the implementation of these data services in the Pacific Islands Fisheries Science Center through PacIOOS, IOOS extended this project to the GCOOS-RA and SECOORA.

IOOS Biological Data Project Objective

Extend the IOOS DMAC biological data services (i.e. content standards for IOOS biological core variables (i.e. Fish/Zooplankton species and abundance) and common access standards using NOAA Environmental Research Division's Data Access Program (ERDDAP) as the access service to new geography, partners, dataset sources and/or applications

GCOOS Pilot Project for Biological Observations – The Comparative Assessment of Gulf Estuarine ecoSystems (CAGES) Program

Source Observations

- NOAA Fisheries' Southeast Science Center Cooperative Comparative Assessment of Gulf Estuarine ecoSystems (CAGES) created by NMFS-Galveston that compiles estuarine trawl data collected independently by the five Gulf States (TX, LA, MS, AL, & FL)

- Fish and Wildlife Commission Fisheries Independent Monitoring Surveys (FWC/FIM) data

- South Carolina Department of Natural Resources (SCDNR), Marine Resources Monitoring, Assessment and Prediction (MARMAP) program data

ERDDAP
Easier access to scientific data

Brought to you by NOAA NMFS SWFSC ERD

ERDDAP > List of All Datasets

Or, Do a Full Text Search for Datasets: Search

Or, Search for Datasets by Category:
cdm_data_type, institution, ioos_category, keywords, long_name, standard_name, variableName

Or, Search for Datasets with Advanced Search

Pick a Dataset

7 matching datasets, listed in alphabetical order.

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	WMS	Title	Sum-mary	FGDC, ISO, Metadata	Back-ground Info	RSS	E mail	Institution	Dataset ID
	set	data	graph		CAGES Alabama Lengths CPUE IOOS Standard 20130829		F I M	background	RSS		GCOOS	CAGES_Alabama_Lengths_CPUE_IOOS_Standard_20130829
	set	data	graph		CAGES Louisiana Lengths CPUE IOOS Standard		F I M	background	RSS		GCOOS	CAGES_Louisiana_Lengths_CPUE_IOOS_Standard_20130822
	set	data	graph		CAGES Mississippi Lengths CPUE IOOS Standard		F I M	background	RSS		GCOOS	CAGES_Mississippi_Lengths_CPUE_IOOS_Standard_20130827
	set	data	graph		CAGES Texas Lengths CPUE IOOS Standard		F I M	background	RSS		GCOOS	CAGES_Texas_Trawls_Lengths_IOOS_Standard
	set	data	graph		Time-series discharge data for rivers emptying in the Gulf of Mexico.		F I M	background	RSS		TAMU	rivers_c356_96e2_45a3
data			graph	M	Topography, ETOPO1, 0.0166667 degrees, Global (longitude -180 to 180), (Ice Sheet Surface)		F I M	background	RSS		NOAA NGDC	etopo180
data			graph	M	Topography, ETOPO1, 0.0166667 degrees, Global (longitude 0 to 360), (Ice Sheet Surface)		F I M	background	RSS		NOAA NGDC	etopo360

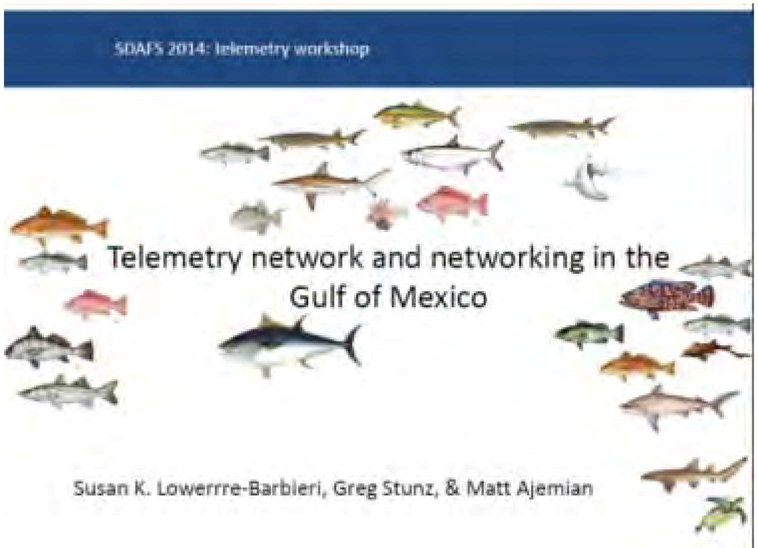
This information is also available in other file formats (.csv, .htmlTable, .json, .mat, .nc, .tsv, .xhtml) via a RESTful web service.

ERDDAP, Version 1.46
Disclaimers | Privacy Policy | Contact

Multi-Institutional Approach

- NOAA/IOOS (Hassan Moustahfid)
- GCOOS-RA (Matthew Howard, Steven Baum)
- SECOORA (Vembu Subramanian)
- USGS/OBIS-USA (Philip Goldstein)
- SWFSC/ERD (Bob Simons)
- NOAA NCDDC (Julie Bosch, Scott Cross)
- NOAA SEFSC-Galveston (Harmon Brown)
- SCDNR (Tracy Smart)

One goal for this workshop is to build on existing work!



White Paper
TOWARD A US ANIMAL TELEMETRY OBSERVING NETWORK (US ATN) FOR OUR OCEANS, COASTS AND GREAT LAKES

B. A. Block, K. Holland, D. Costa, J. Kocik, D. Fox, B. Mate, C. Grimes, H. Moustahfid, A. Seitz, M. Behzad, C. Holbrook, S. Lindley, C. Alexander, S. Simmons, J. Payne, M. Weise and R. Kochevar

IOOS National ATN Strategic plan

- Implement a range of operational telemetry technologies that enable monitoring of a host of aquatic species over multiple temporal and spatial scales.
- Provide short and long-term benefits, including enhancing fisheries and ecosystem-based management, filling oceanographic knowledge gaps and improving ocean modeling and forecasting.

IOOS National ATN Strategic Plan

- Benefits of using animals as ocean observing platforms to carry remote-sensing devices
- Vision to integrate data on aquatic ecosystems from species to environment and complement existing IOOS infrastructure.
- Support the National Ocean Policy which calls for strengthening the U.S. capacity to observe our nation’s oceans, coastal waters, estuaries, rivers and great lakes.
- Value of national data management capacity by establishing common data standards

Are Existing AT Programs Sustainable?

- US Northeast/ NERACOOS Region (John Kocik, NOAA)
- Mid-Atlantic/ MARACOOS (Dewayne Fox, ACT)
- US Southeast and Caribbean/SECOORA/CARA (Eric Prince, NOAA)
- Gulf of Mexico/GCOOS (Behzad Mahmoudi, FWC/FWRI)
- Great Lakes/GLOS (Christopher Holbrook, USGS)
- US Southwest SCCOOS and CeNCOOS (Sean Hayes NOAA)
- Northwest/NANOOS (John Ferguson, NOAA)
- Mid Pacific/Hawaii/PacIOOS (Kim Holland, UH/HIMB)
- Alaska/AOOS (Andy Seitz, UAF)
- TOPP (Barbara Block, Stanford Univ)
- POST (John Payne UW)
- OTN (CoML/Dalhousi

Challenges to Consider Moving Forward

- Data ownership: what happens if a researcher owns a transmitter and IOOS owns the receiver?
- Quality control for data misuse, false detections and erroneous conclusions.
- Placing limits on data use (e.g., student data, sensitive species data)
- People and equipment in flux if data are primarily from transient research projects. How best to sustain?
- If sharing receivers and other equipment, how do you ensure equality—all tags are not created equally! Some with a high ping rate can drown out others.
- Is there a precedence for shared data management/storage?

GCOOS Build-out Plan Mooring Lines, Glider/AUV Tracks, High Frequency Radar Sites