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Global HF Radar – in the GEO Context

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Outline: Goals

- GEO/GEOSS
- GEO Work plan 2012-2015
- Global HF Radar Component

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What is GEO?

- The intergovernmental Group on Earth Observations (GEO) is a voluntary partnership of 88 Member governments and the European Commission, working with 61 Participating Organizations
- GEO is coordinating efforts to build a Global Earth Observation System of Systems, or GEOSS
- A forum to develop new projects, coordinate strategies and investments

What is GEOSS?

- A distributed system of systems
  - Improves coordination of strategies & observation systems
  - Links all platforms: in situ, aircraft, & satellite networks
  - Identifies gaps in our global capacity
  - Facilitates exchange of data & information
  - Improves decision-makers' abilities to address pressing policy issues

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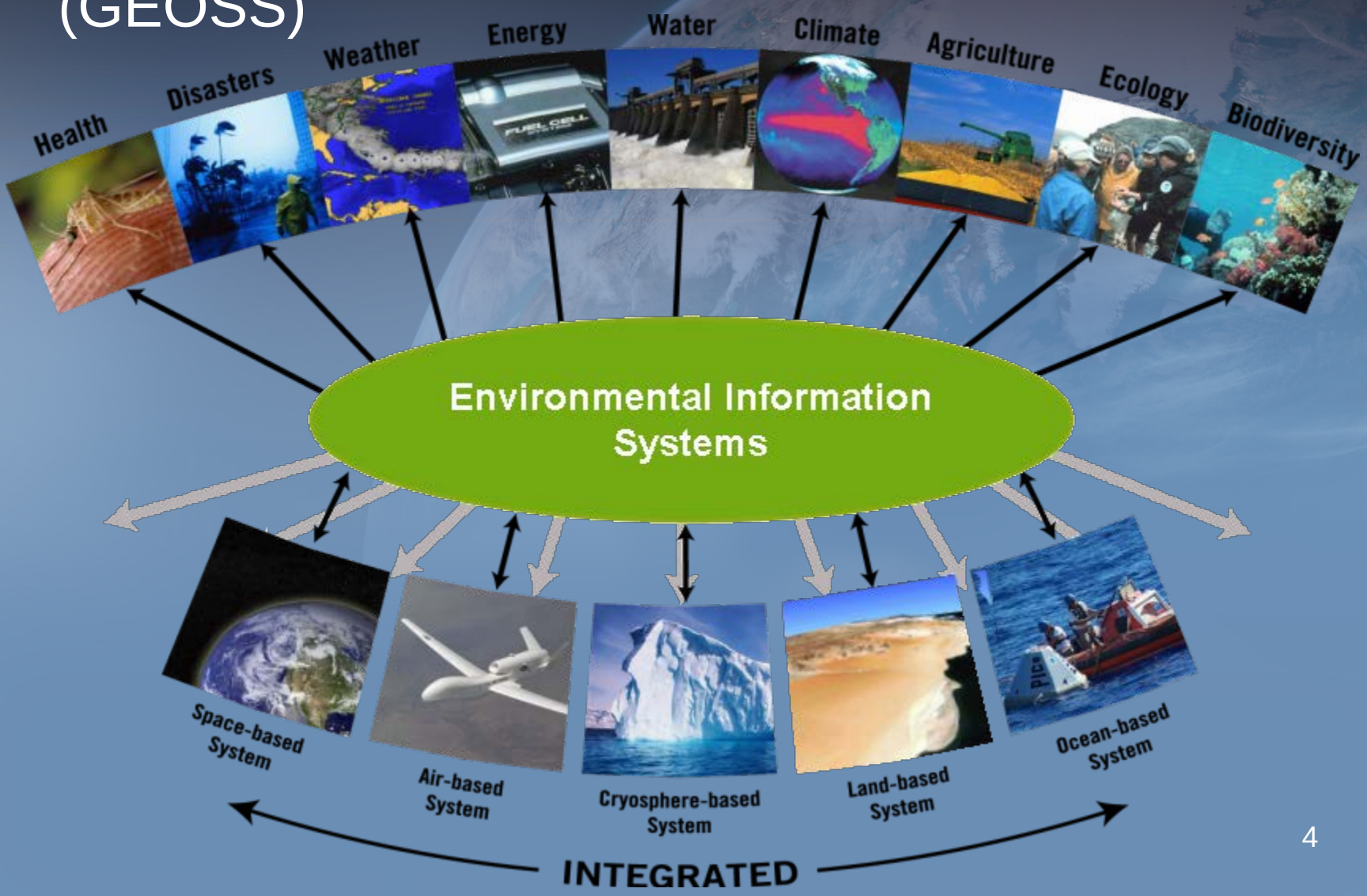
A Global Earth Observation System of Systems (GEOSS)



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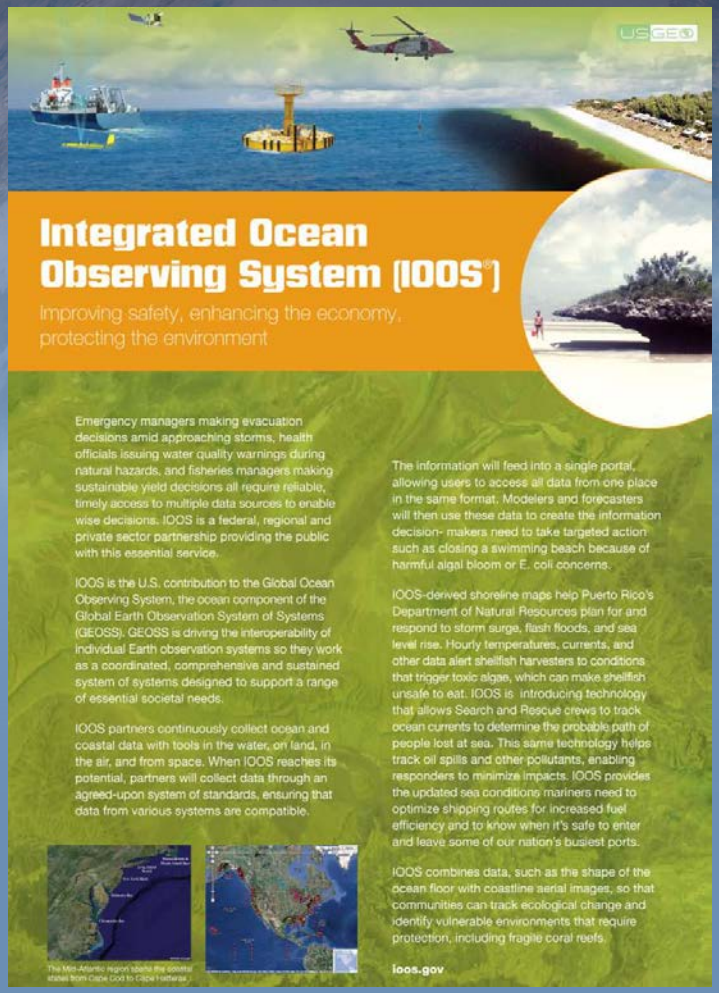
GEONETCast

- GEONETCast is a low-cost, global environmental information delivery system by which remotely sensed and *in situ* data and services from GEOSS are transmitted to users through communications satellites offering near-global coverage.
- Using a multicast, broadband capability, GEONETCast provides information essential to protecting lives allowing for faster decision-making and policy response.

USGEO
UNITED STATES GROUP ON EARTH OBSERVATIONS

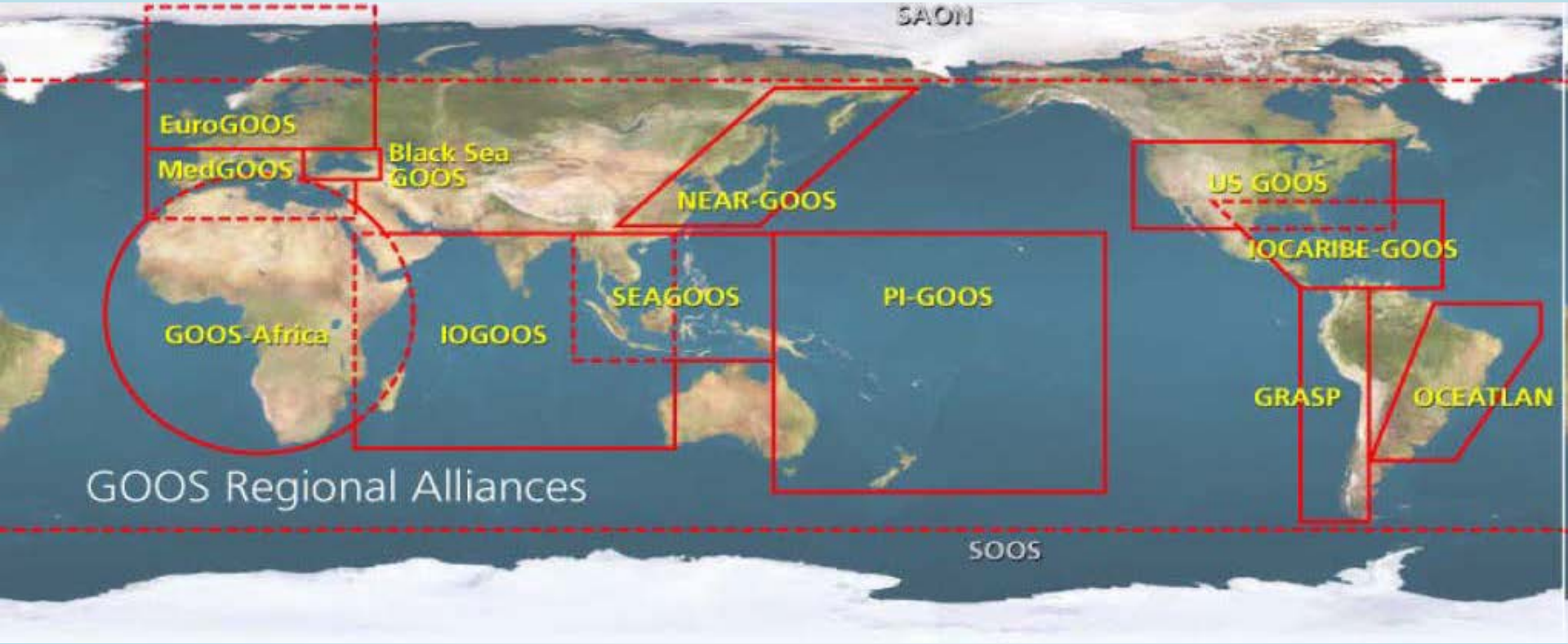
US IOOS®

- Integrated Ocean Observing System (IOOS) provides new tools and forecasts to improve safety, enhance the economy, and protect our environment.
  - Has a coastal and global component
  - Is a National and Regional framework
  - Provides observations, data management, modeling and analysis, education and outreach and research and development
- Supports 7 goals with one integrated system



Global Ocean Observing System

GOOS – Regional Alliance



Program Overview: NEAR-GOOS

- Partnership between China, Japan, the Republic of Korea and the Russian Federation
- The primary aim of the project in its first phase was to facilitate the sharing of oceanographic data in order to improve the availability of information and ocean services in the region

Data/Product Availability

- NEAR-GOOS Data Management
- Each country establishes a National Real Time Data Base (RTDB) and a National Delayed Mode Data Base (DMDB) to collect all the available oceanographic data in the country, and to make them available to users.
- The Regional Real Time Database , http://goos.kishou.go.jp/ collects the real time data in the region from the national RTDBs or directly from the data producers. The Regional RTDB is maintained by the Japan Meteorological Agency (JMA) for on-line access by NEAR-GOOS users via the Internet. Data in the data base are kept for 30 days and then transferred to the Regional Delayed Mode Data Base.
- The Regional Delayed Mode Database , http://near-goos1.jodc.go.jp/,also exists for archiving data. The Regional DMDB is maintained by the Japan Oceanographic Data Center (JODC).

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GEO Work Plan 2012-2015

- Adopted at GEO Plenary VIII in Istanbul Turkey, Nov 2011
- Includes component for a Global HF Radar Network for data sharing and delivery and to promote the proliferation of HF radar surface current velocity measurements in two tasks:
- **IN-01 Earth Observing Systems**
  - C1 Development, Maintenance and Coordination of Surface-based Observing Networks (in-situ and airborne)
    - Promote rapid development of a global high frequency radar network to measure coastal surface currents (see also SB-01)
- **SB-01 Oceans and Society: Blue Planet**
  - C2 Operational Systems for Monitoring of Marine and Coastal Ecosystems
    - Promote rapid development of a global high frequency radar network to measure coastal surface currents. High frequency radar is recognized as a cost-effective solution to augment *in situ* measurements and provide increased spatial and temporal resolution

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Global HF Radar Component

- **Who:** Co-Chairs: Enrique Alvarez-Fanjul (Spain), Jack Harlan (USA), Lucy Wyatt (Australia)
  - More are welcome
- What: HF radar data available in a single standardized format in near real time; Worldwide QA/QC standard; Easy-to-use standard products; HF radar data assimilated in ocean and ecosystem modelling; Develop emerging uses of HF radar in the areas of ecosystem, tsunami, and climate
- Why:
  - We have individually begun to move from individual radars, to clusters of radars to a comprehensive national networked tied together through a common data architecture and set of practices
  - Informal coordination and collaboration can be accelerated under GEO
  - IT infrastructure is scalable

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Kick off Meeting in London

- Oceanology 2012 – London, England: Australia, Brazil, Belgium, France, Germany, Japan, Malta, Norway, Spain, Sweden, United Kingdom, United States
- Discussed forming the following working groups:
  - Information Management: Data Management; Products and Modeling
  - Capacity building: Building new networks
  - Radio Frequency management
- Near term activities:
  - Form working groups
  - Create template for each country to fill in with details of their Radars e.g. site identifier, geographic name, latitude, longitude, transmit frequency, bandwidth, land owner, Radar owner, Radar operator.
  - Create template for each country to fill in with details of successful applications of HF Radar data

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Global High Frequency Radar Sites

Frequency	Number
Long Range	86
Standard Range	83
High Resolution	69
VHF	20

Australia	12
Brazil	2
China	4
India	10
Indonesia	2
Ireland	2
Israel	2
Italy	3
Japan	22
Jordan	1
Mexico	1
Norway	2
Portugal	2
Russia	1
South Korea	25
Spain	16
Taiwan	15
Thailand	6
USA	125
United Arab Emirates	2
Vietnam	3
TOTAL	**258**

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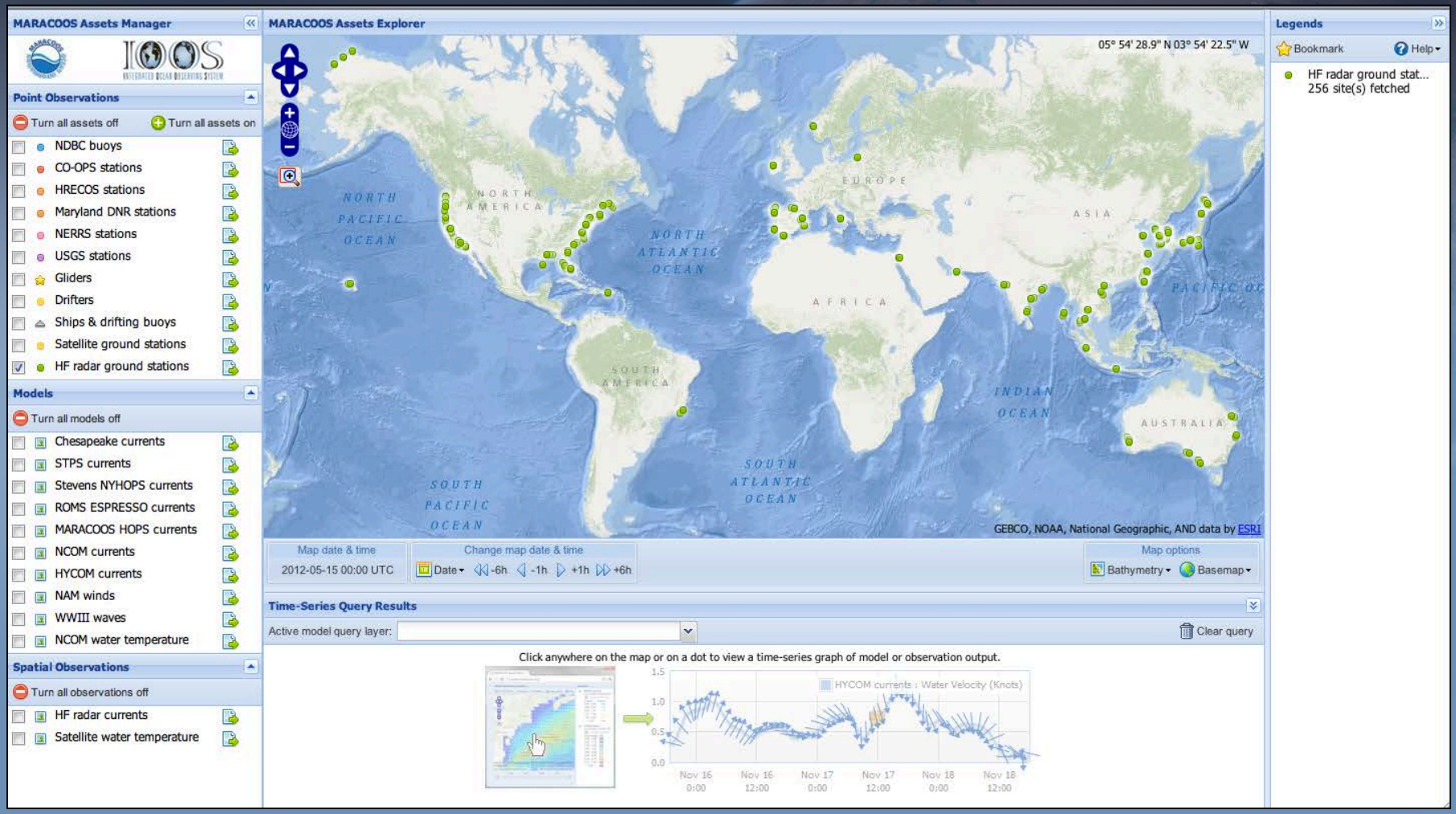
Global HF Radar Assets



IOOS INTEGRATED OCEAN OBSERVING SYSTEM

MARACOOS Ocean Information for a Changing World

http://assets.maracoos.org/

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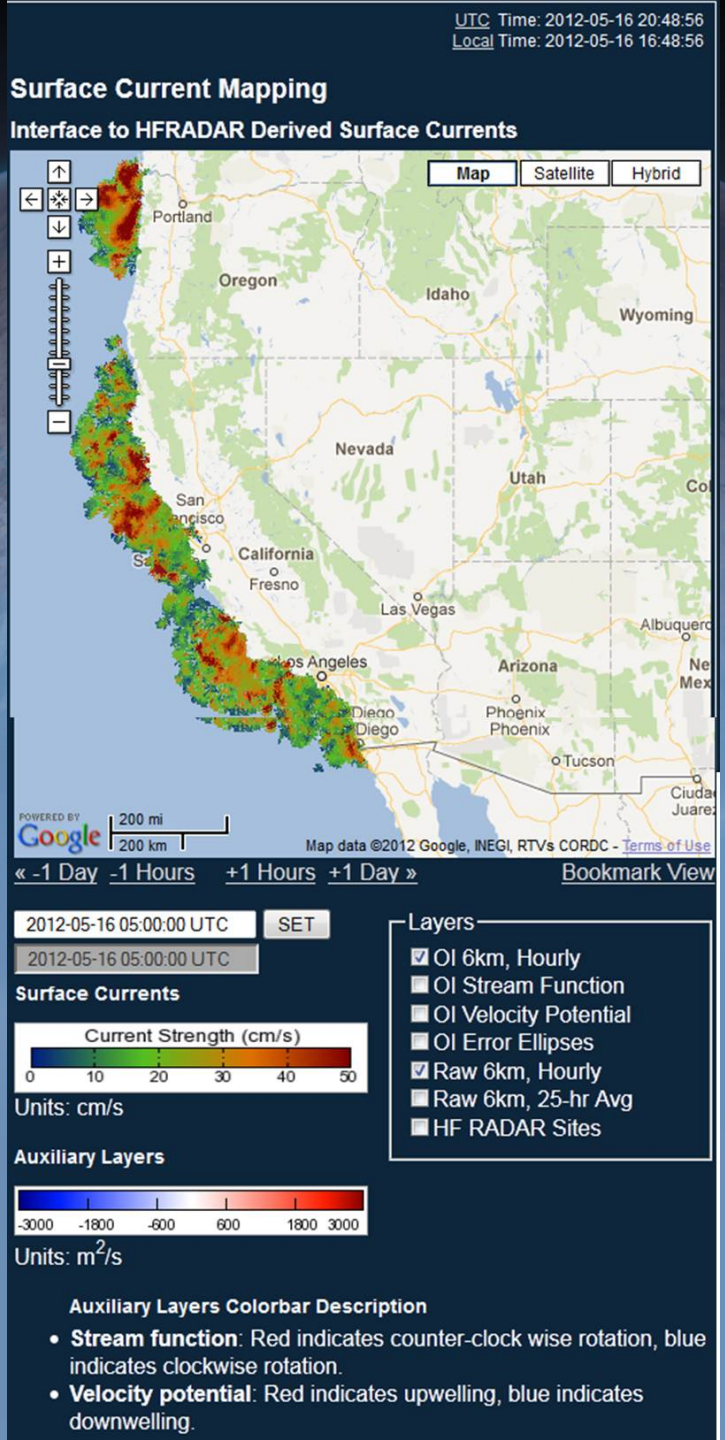
HF Radar Data management

- Standard interoperable self-describing netCDF format
- Standard metadata ISO 19115 format
- Quality control
  - Radar level
  - Radial velocity level
  - Total vector velocity level
- 1,2, 6 KM data
- Optimal Interpolation



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Radio Frequencies

- World Radiocommunications Conference Feb 2012
- Provide HF Radar (oceanographic) with Primary Frequencies but with a caveat for future systems.
- Simultaneous sharing (synchronization) of frequency use
- Call sign during transmission
- Important that we as oceanography community work together to provide a strong position.

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Why Care About GEOSS?

The goal is to access the right information,
in the right format, at the right time,
for the right people, to make the right decisions.