

CEOS Ocean Variables Enabling Research and Applications for GEO (COVERAGE)

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Vision:

- **International collaboration via the Committee on Earth Observation Satellites (CEOS) and diverse stakeholder engagement for a global COVERAGE “portal product” developed around a priority set of community-driven themes and use cases**
- **Enhance multidisciplinary use of 4 CEOS Ocean Constellations, sea surface temperature, sea level anomaly, winds, ocean color. A major goal would be to enhance the use of Remote Sensing Data in applications that support understanding changes in Marine Biodiversity.**
- **Utilize established earth science data standards/protocols & emerging data management/cloud capabilities where necessary**
- **Assemble and present satellite and in situ ocean data in a compelling web-based format**
- **Demonstrate the value-added of multivariate ocean data integration in support of the Group on Earth Observations (GEO), science, applications, and public engagement.**

• **Develop a global co-located virtual constellation of the 4 CEOS Ocean Virtual Constellation**

- **COVERAGE Motivations**

COVERAGE is a response to:

- **Need for improved, unified access to data from the 4 CEOS ocean virtual constellations (VCs) for the Group on Earth Observations (GEO) (SSH, SST, Color, Ocean Vector Winds (OVW), but also potentially other parameters including sea surface salinity and Ocean Currents)**
- **Need for improved access/integration of multivariate, multi-platform ocean observations, thematically organized and in a common frame (including those from the Ocean VCs), available in near real-time where possible in support of GEO-Blue Planet & MBON initiatives in particular.**
- **Need for easily accessible data to use in multidisciplinary applications.**

Stakeholder Beneficiaries

- **Internal CEOS : Ocean VCs, Working Group on Information Systems and Services (WGISS), Space Agencies**
- **External: GEO-Blue Planet, GEO-MBON, Global Ocean Observing System (GOOS)**

Develop a data rich platform for delivery and access to integrated, analysis ready ocean data:

- **Multi-parameter observations, easily discoverable and usable, thematically organized, available in near real-time (where possible), collocated to a common grid and including climatologies.**
- **Complemented by a set of value-added data services available via the COVERAGE portal including:**
 - **an advanced Web-based visualization interface**
 - **data discovery**
 - **subsetting/extraction**
 - **data collocation/matchup**
 - **other potentially relevant on demand processing capabilities (examples trend analysis, anomaly detection, dynamic regridding).**
- **Establish technical interfaces and data delivery and aggregation pipelines**
- **Community & Use Case Driven**

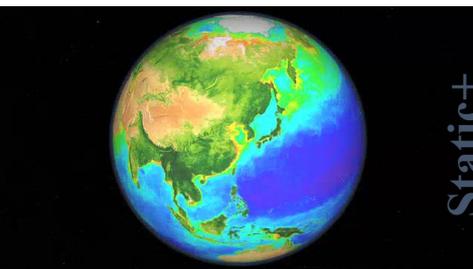
Leverage relevant existing/emerging technologies (several open source) and successful program & project implementation models (examples GHRSSST, [NASA Sea Level](#))

One application support “Dynamic seascapes: biogeographic framework for a global marine” BON

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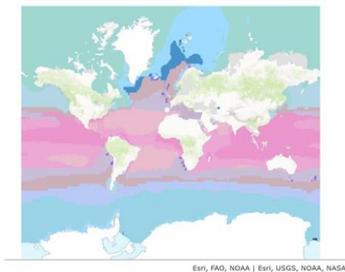
J. Grebmeier (U. MD), D. Otis, E. Montes, F. Muller Karger (USF),
D. Wright (ESRI), R. Sayre (USGS), G. Canonico (NOAA), V. Tsonos & J. Vasquez (NASA JPL)

Multiple NASA assets



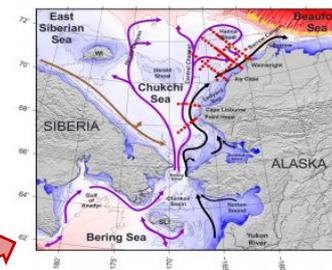
3D

Global classification



Ecological Marine Units

Regional downscaling

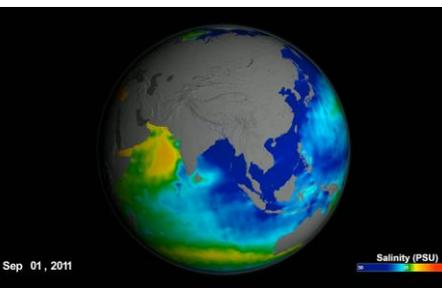


AMBON, DBO

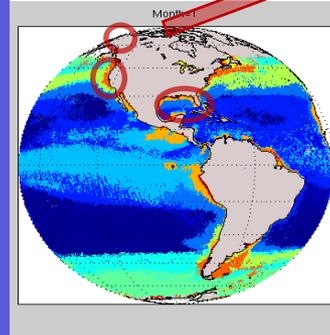
Objectives

- Global classification of dynamic seascapes
- EMU intercalibration
- Case Study: Arctic DBO (polar, temperate,

Biology: Ocean Color

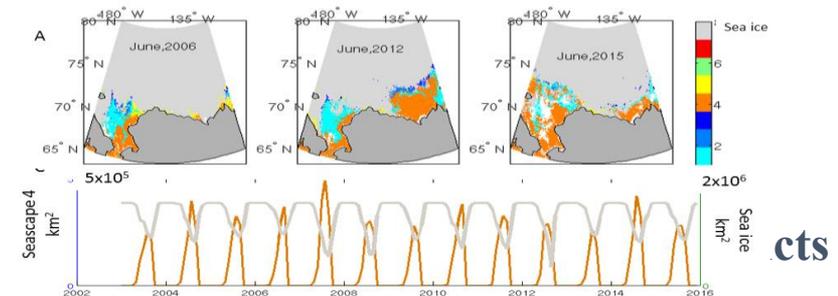


Dynamic+
2D



Dynamic Seascapes- see also E. Montes et al. P2P

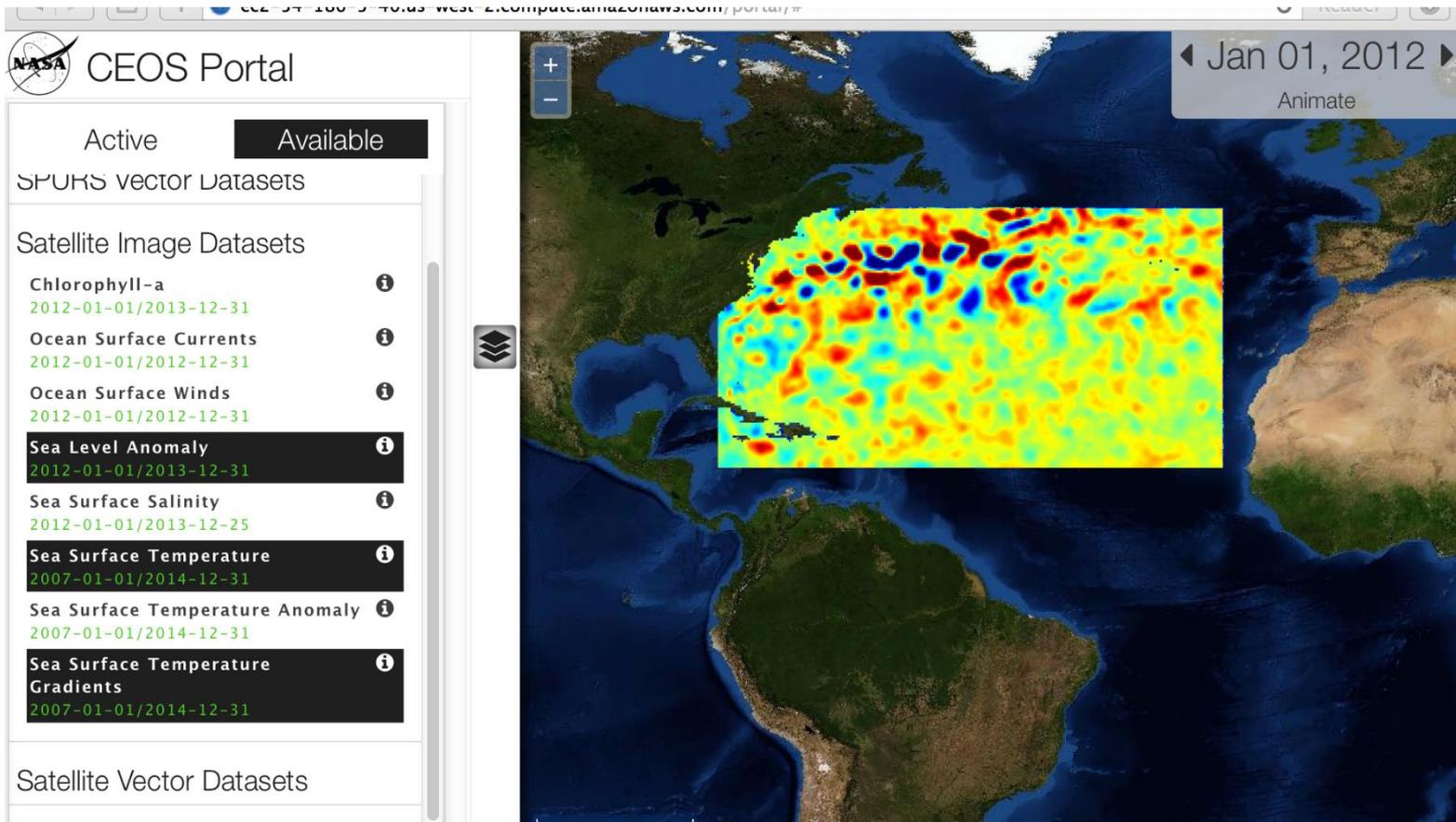
Physics: e.g.
SSS, SST,
winds, SSHa



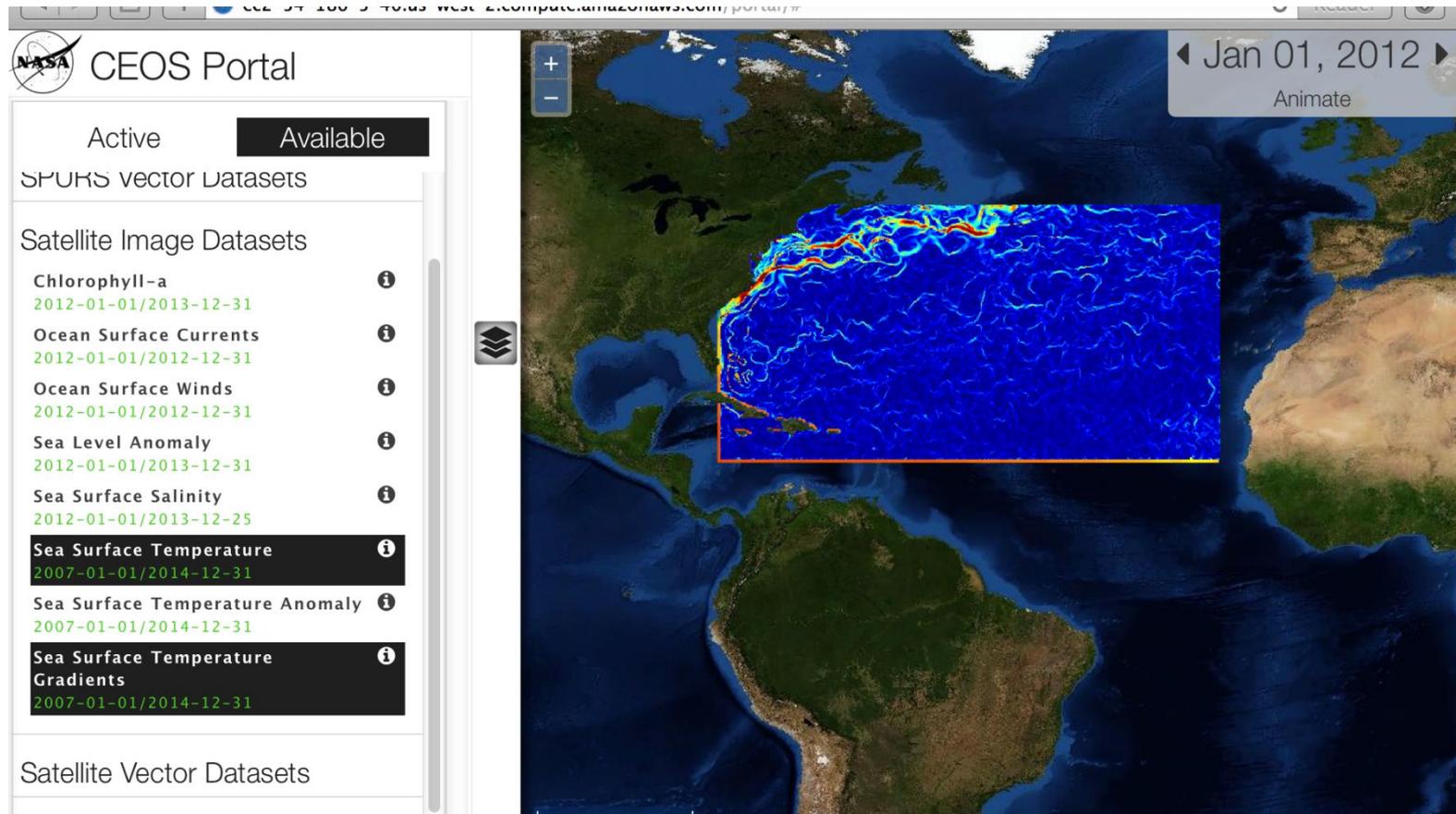
Dynamic habitat maps

- **Regional application in the Sargasso Sea (North Atlantic)**
- **An initial (Demo only) pilot project was developed in collaboration with the Sargasso Sea Commission**
- **Pilot included the 4 Ocean Virtual Constellations**
- **Included also OSCAR Ocean Currents, Aquarius Salinity, Sea Surface Temperature Anomaly, Sea Surface Temperature Gradients from NASA's Multi-Scale Ultra-High Resolution Sea Surface Temperature Data (MUR) Data Set.**
- **Integrated of biological data: tracking data (sharks, tuna, eel)**

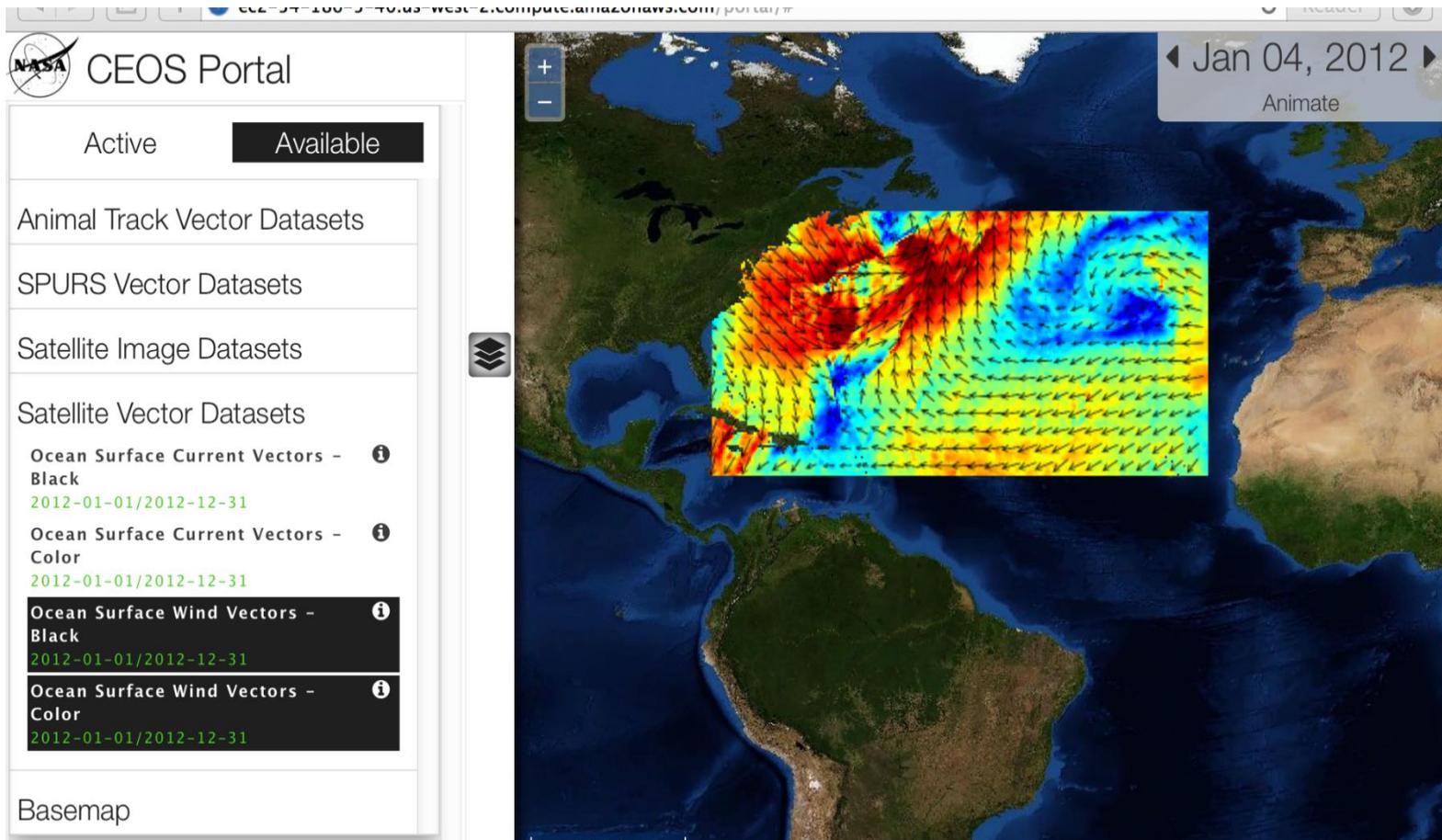
Sea Level Anomaly (AVISO)



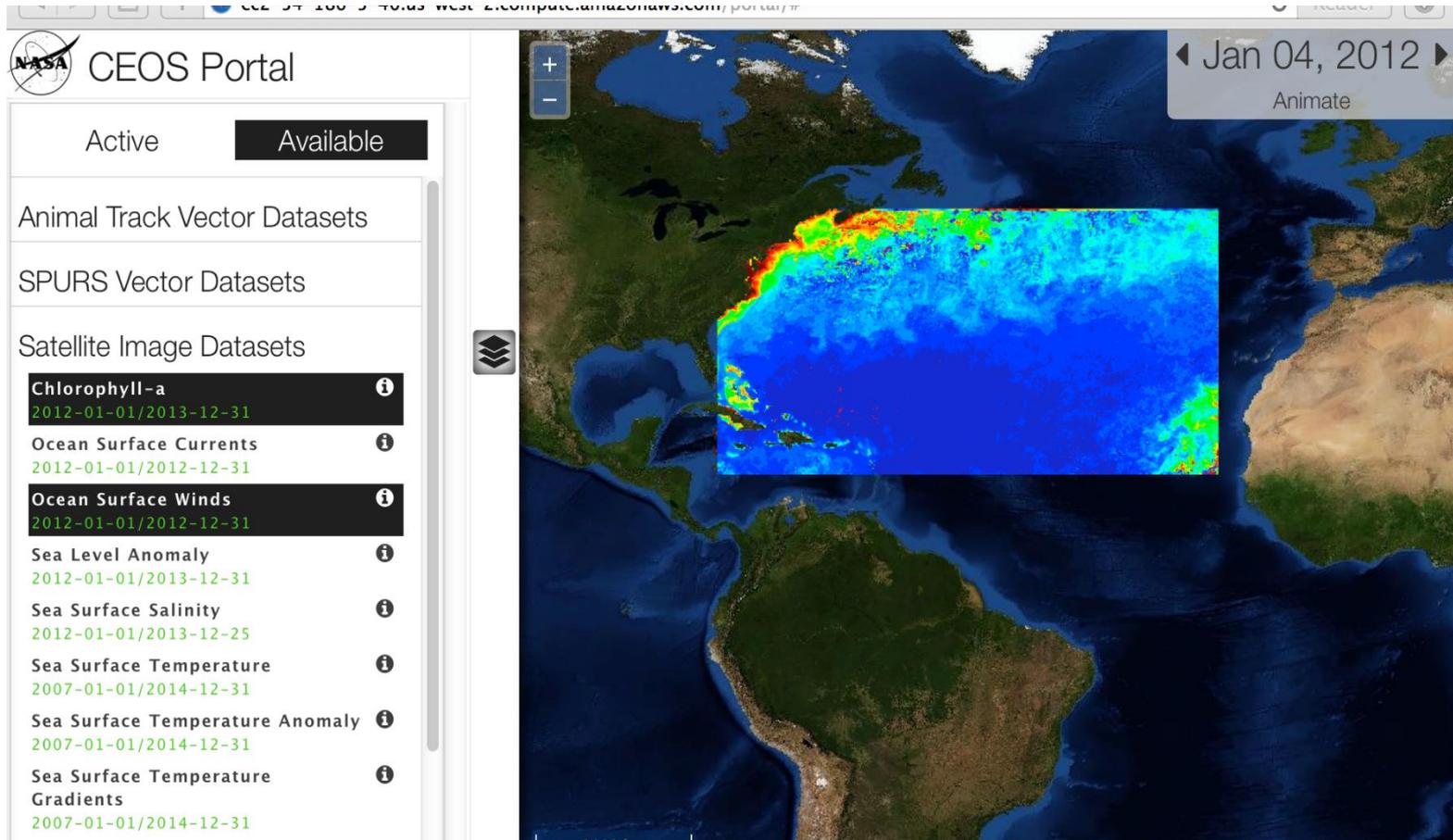
NASA Sea Surface Temperature Gradients MUR



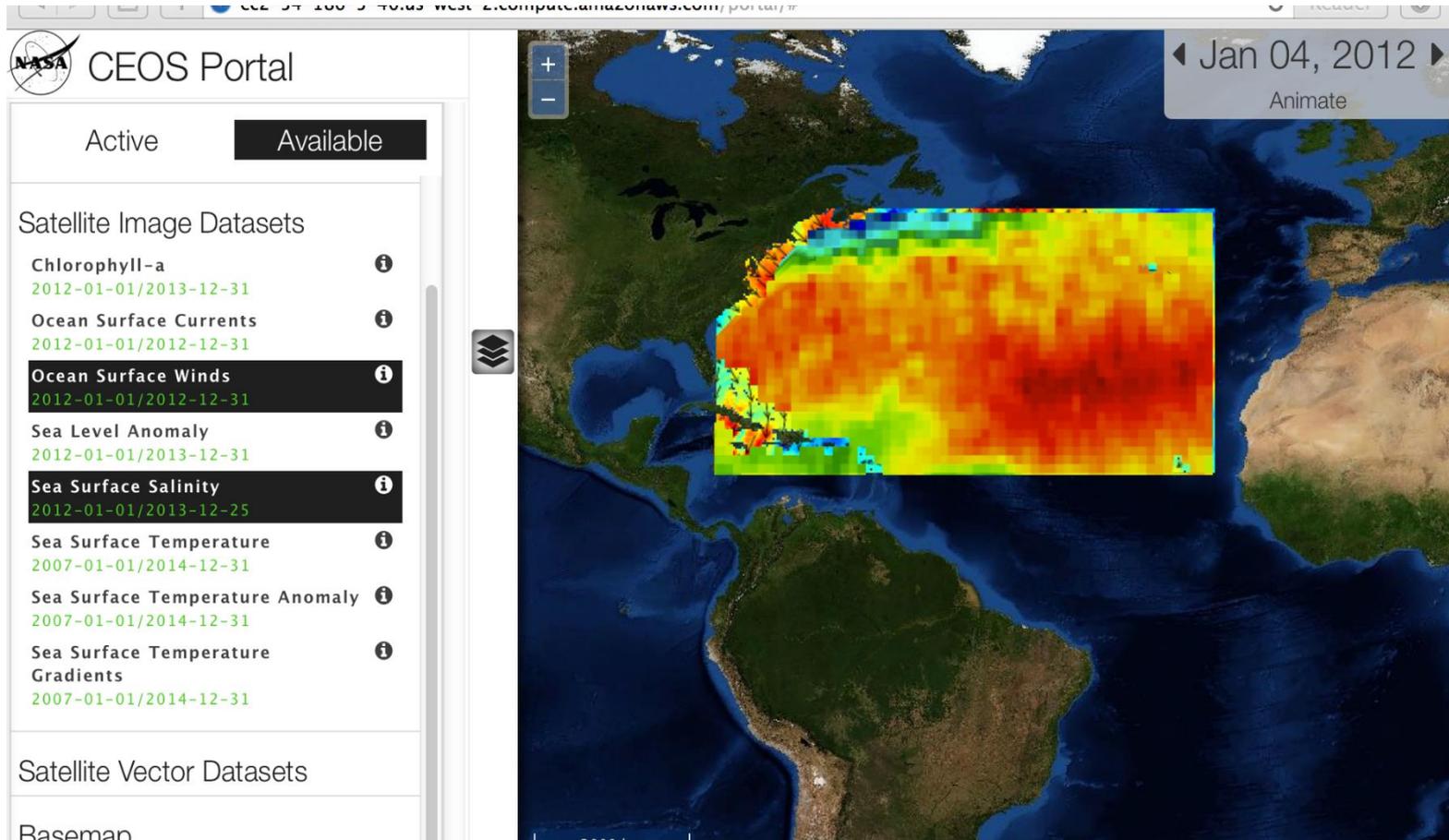
Ocean Surface Winds (ASCAT)



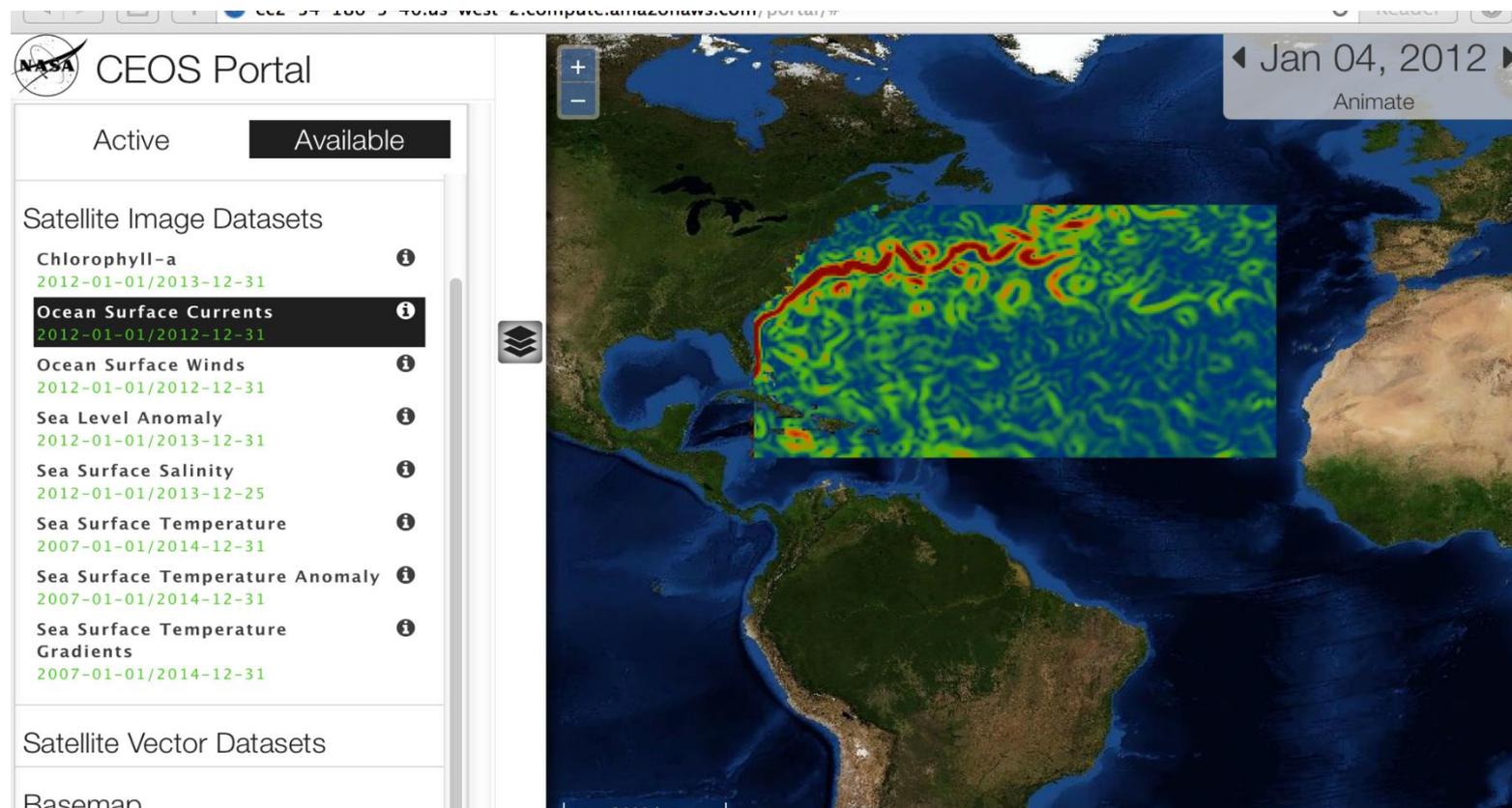
Chlorophyll-A (MODIS Ocean Color)



Sea Surface Salinity Aquarius



Ocean Surface Currents (OSCAR)



CEOS Portal

Active

Available

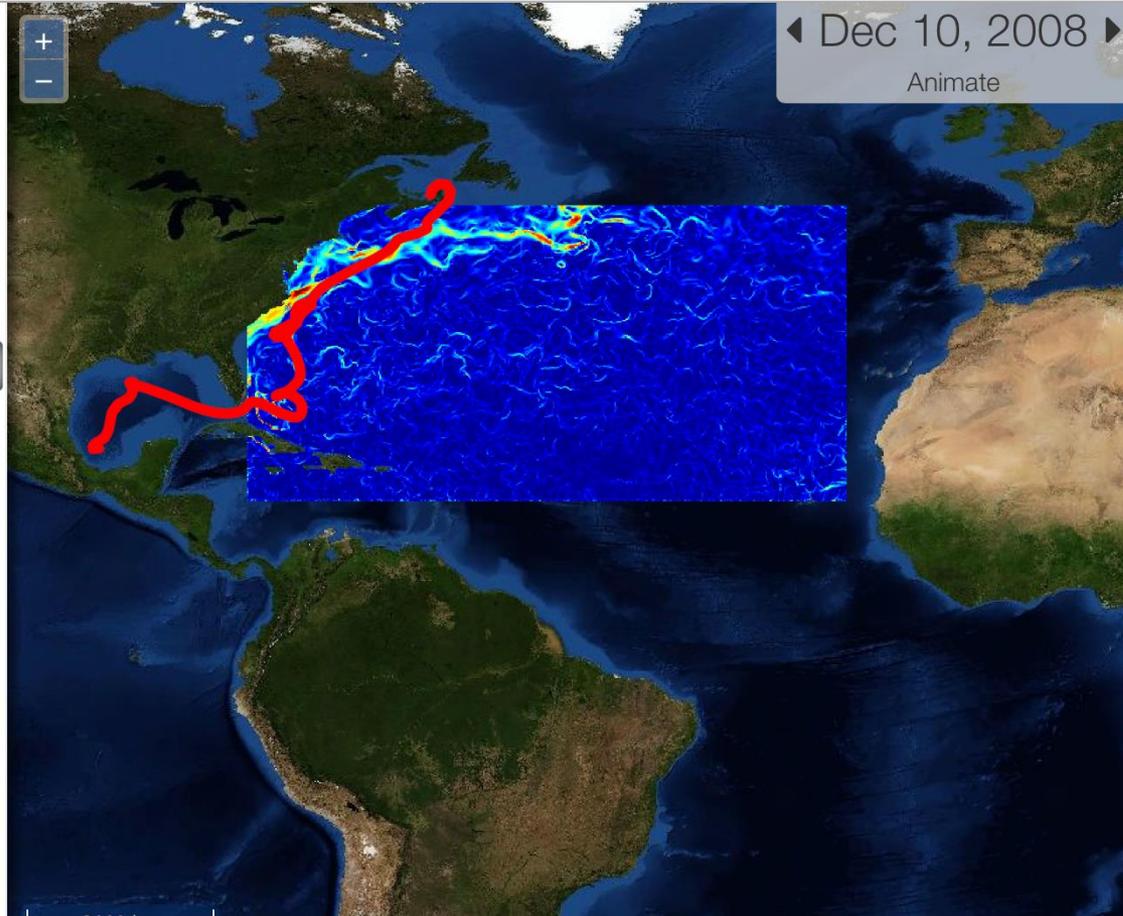
Global Track Vector Datasets

- n Tuna - A** ⓘ
10-18/2008-03-20
- n Tuna - B ⓘ
10-24/2009-06-14
- n Tuna - C ⓘ
10-24/2008-04-23
- n Tuna - D ⓘ
10-24/2009-06-14
- n Tuna - E ⓘ
10-19/2009-06-8
- n Tuna - F ⓘ
10-24/2009-05-27
- Shark Tag** ⓘ
05-31/2014-07-10

GIS Vector Datasets

Image Datasets

Point Vector Datasets



COVERAGE Implementation Schedule

Initial 6 Month Project Planning Period.

- **Engagement with stockholders**
- **Formation of Advisory Board**
- **Decisions on data set**
- **Implementation**
- **Initial prototype development and implementation**

Full implementation at end of three year initiative. Transition from prototype to operations.