



Product to address U.N. Sustainable Development Goal 14



SUSTAINABLE DEVELOPMENT GOAL 14

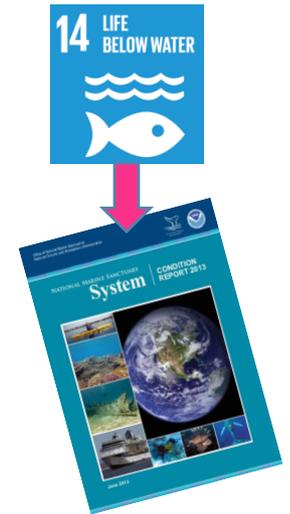
Conserve and sustainably use the oceans, seas and marine resources for sustainable development



10 targets that require scientific information and capacity building on biodiversity

GOAL:

- Develop a prototype 'product':
 - Regional to global scope
 - Actions will depend on a country/agency
- USGEO to present at at GEO Plenary
 - October 25-26, 2017 / Washington, DC
- Incorporate into BON in a Box



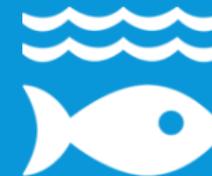
Sustainable Development Goal 14

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

1. By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
2. By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.
3. Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.
4. By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.
5. By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
6. By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.
7. By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.
 - a. Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.
 - b. Provide access for small-scale artisanal fishers to marine resources and markets.
 - c. Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want.

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2. By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans
 - a. Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.

Approach

- Assume requirements of National Marine Sanctuaries to assess 'condition' reflect requirements of stakeholders of other marine areas elsewhere
- Product is scalable from local to global
- Product may be used to address other national and international requirements

Acronym	Full name	Key activity
CBD	Convention on Biological Diversity	Aichi Targets
IMO	International Maritime Organisation	Protection of biodiversity and detection of invasive species
IUCN (WCPA, SSC)	International Union for the Conservation of Nature	World Commission on Protected Areas, Species Survival Commission
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora	Protection of biodiversity
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services	Assessments of biodiversity



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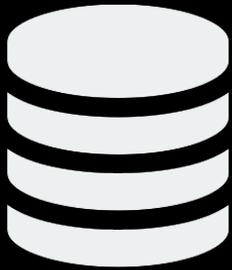
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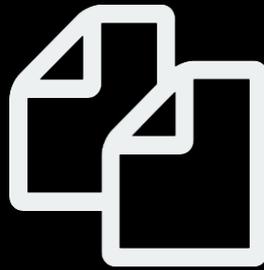
10 targets that require scientific information and capacity building on biodiversity

Approach

A collaborative NETWORK that links



Databases



Datasets

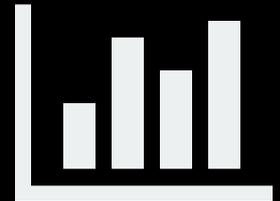


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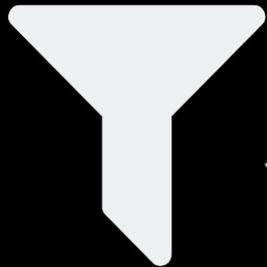
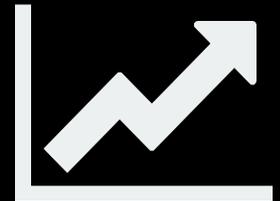
Maps



Abundance



Trends



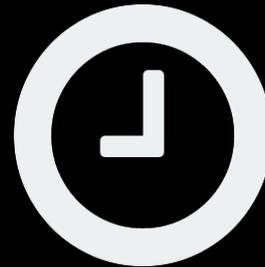
Filters:



Taxa



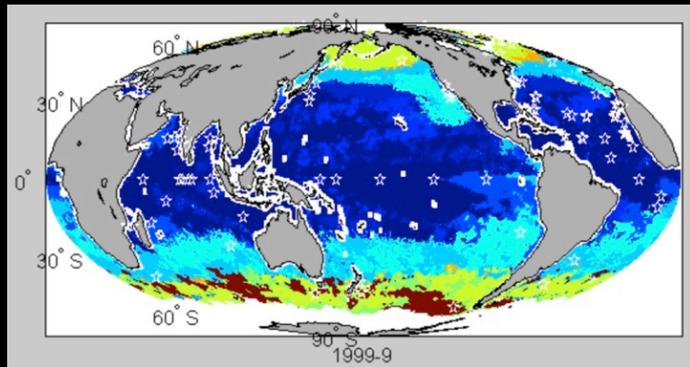
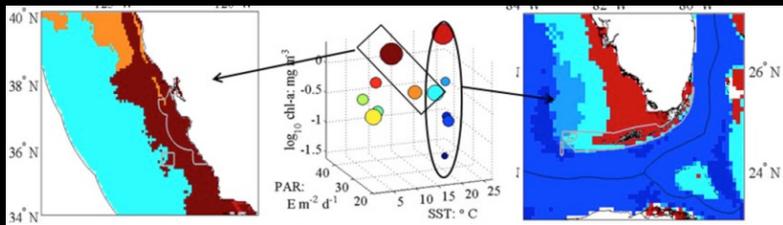
Space



Time

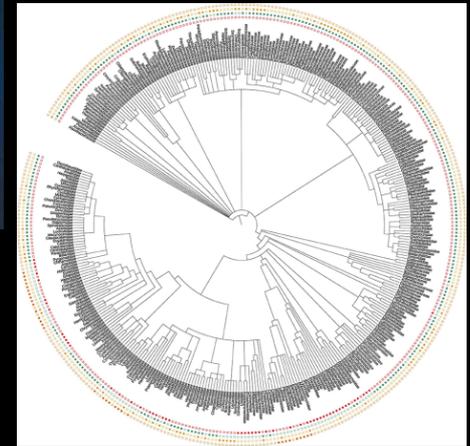
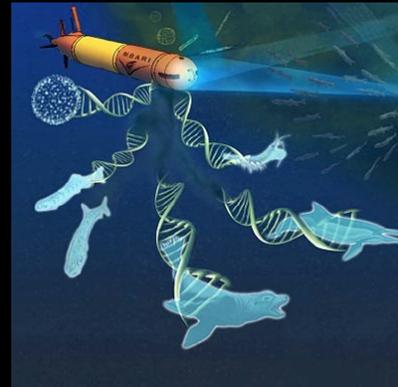
MBON Novel Data Types

Seascapes



Kavanaugh et al (2016) Seascapes as a new vernacular for pelagic ocean monitoring, management and conservation. *ICES*

eDNA



Kelly et al (2016) Genetic and Manual Survey Methods Yield Different and Complementary Views of an Ecosystem. *Frontiers in Marine Mol Bio & Ecol*

SDG14 Product: Satellite-derived environmental fields



Marineregions.org

towards a standard for georeferenced marine names

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Gazetteer

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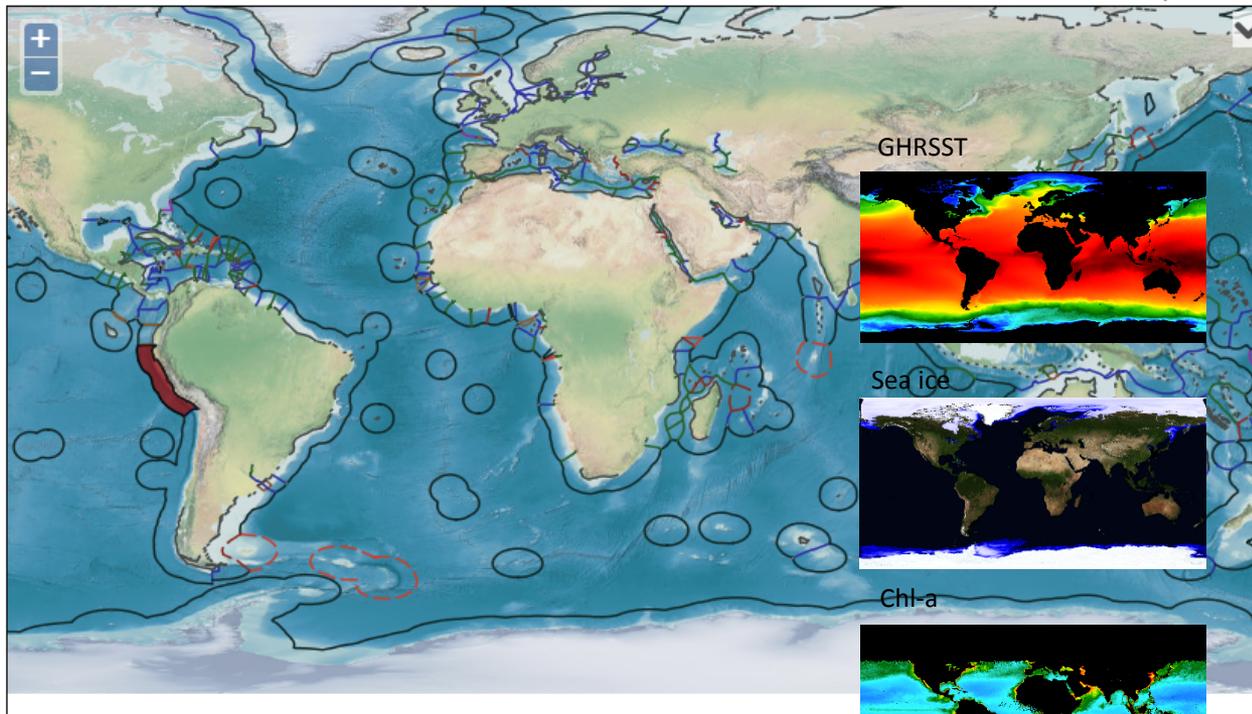
Map interface

Methodology

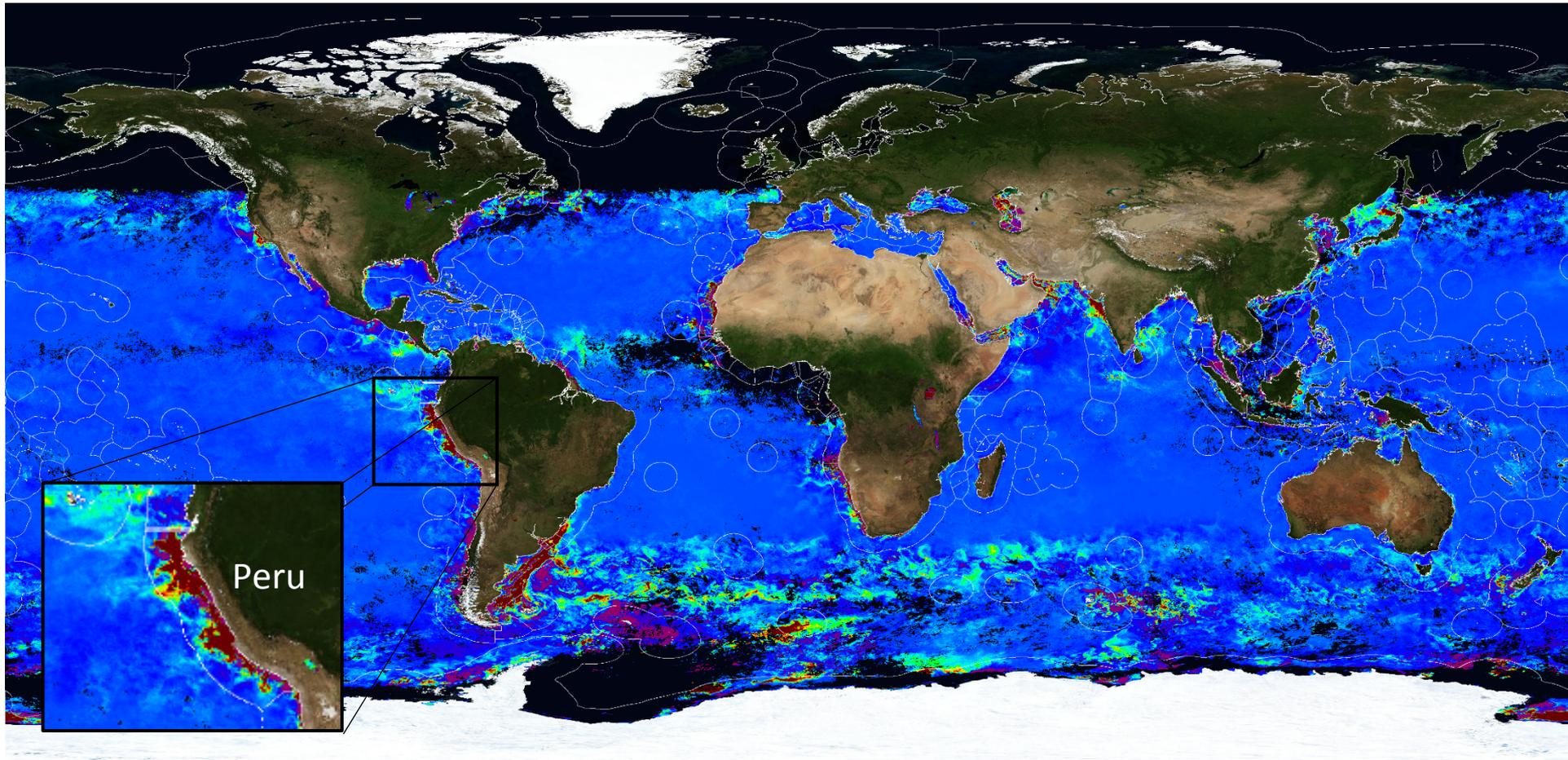
About

Peru · MRGID [8432](#)

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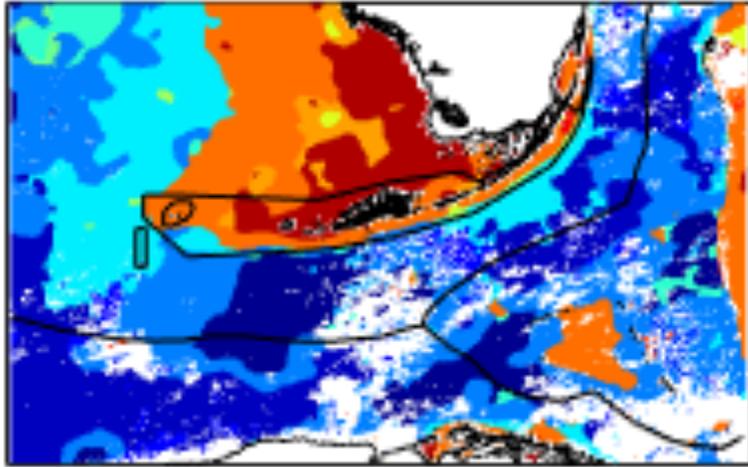


SDG14 Product: satellite environmental data products (example)

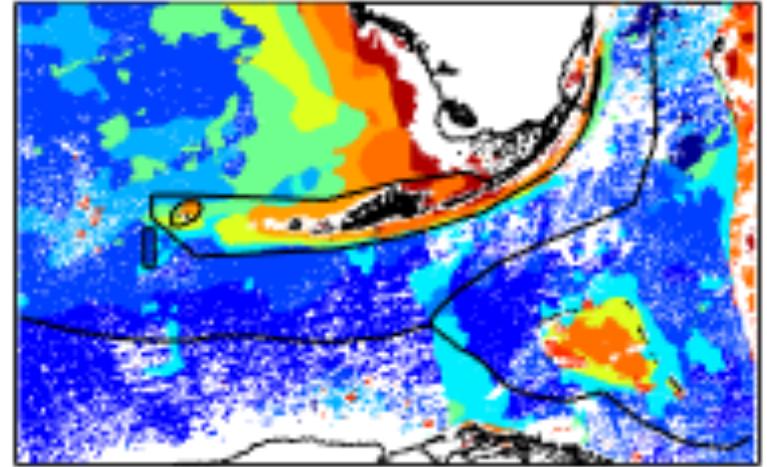


9-km MODISA mean monthly Chl-a anomaly. EEZ's are delineated with white lines

SGD14 Product: Seascape dominance within jurisdictions

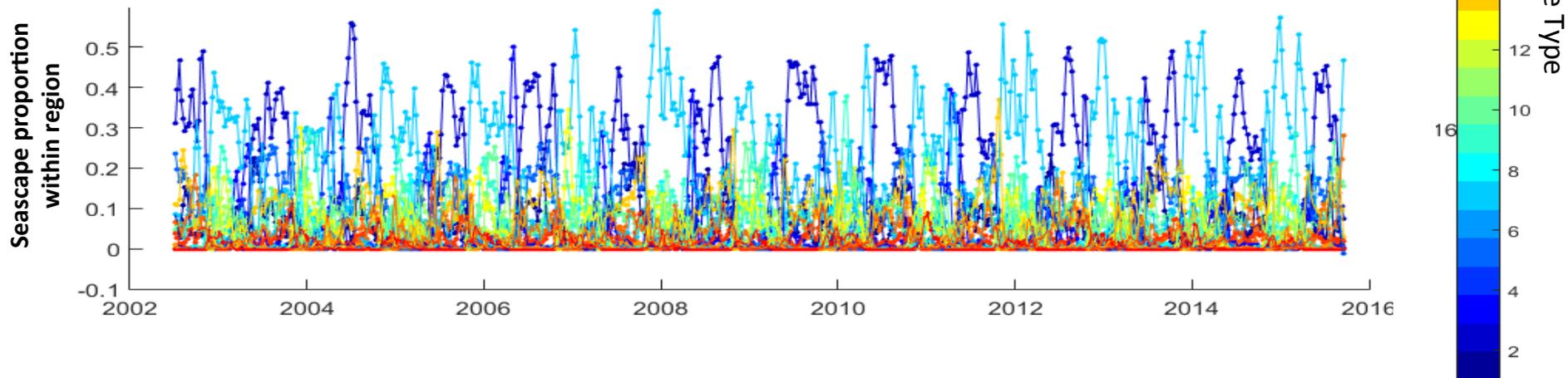


October 19, 2010

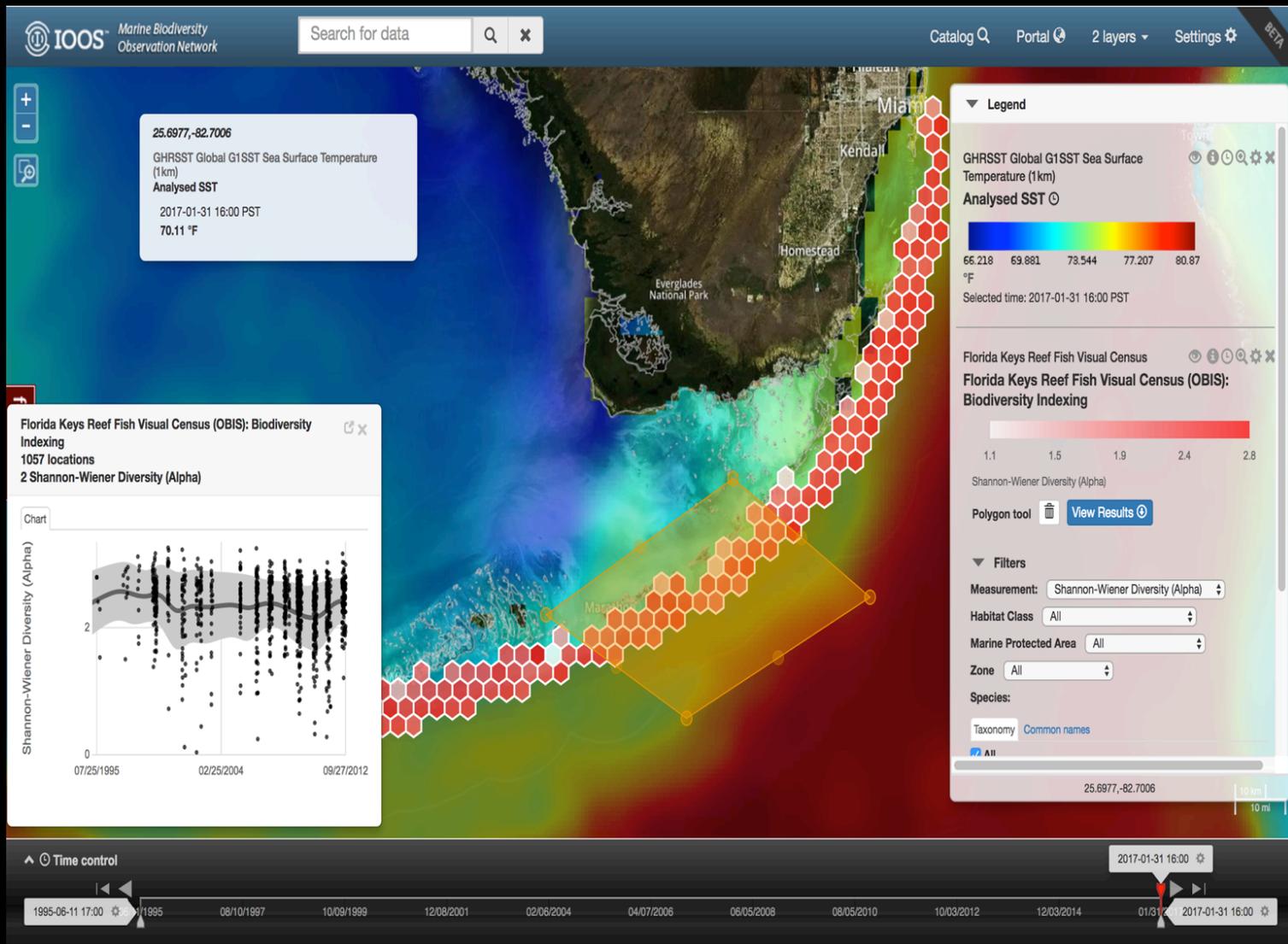


April 2, 2011

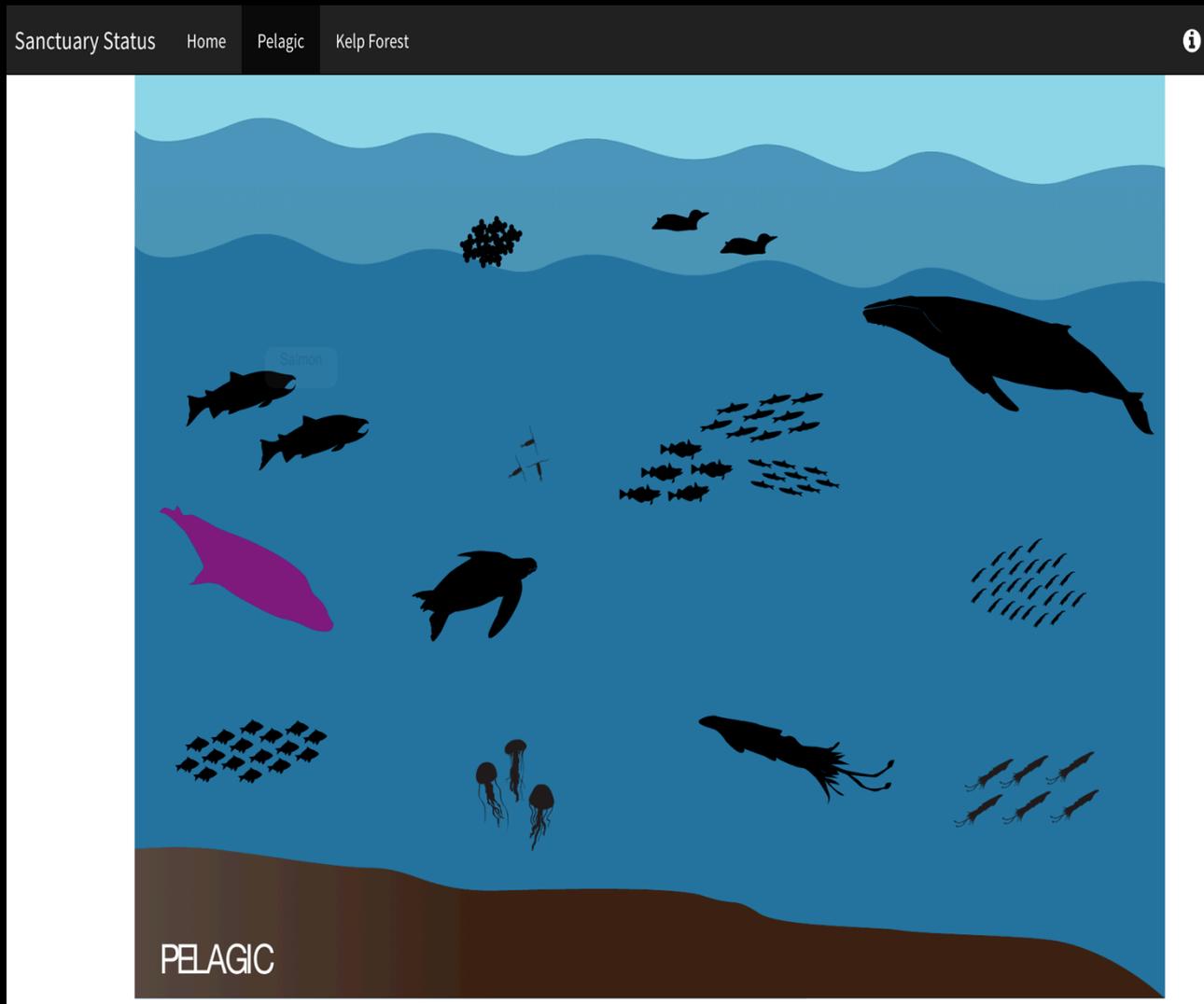
Seasonal succession is evident in the seascapes



mbon.ioos.us (Axiom) Mapper

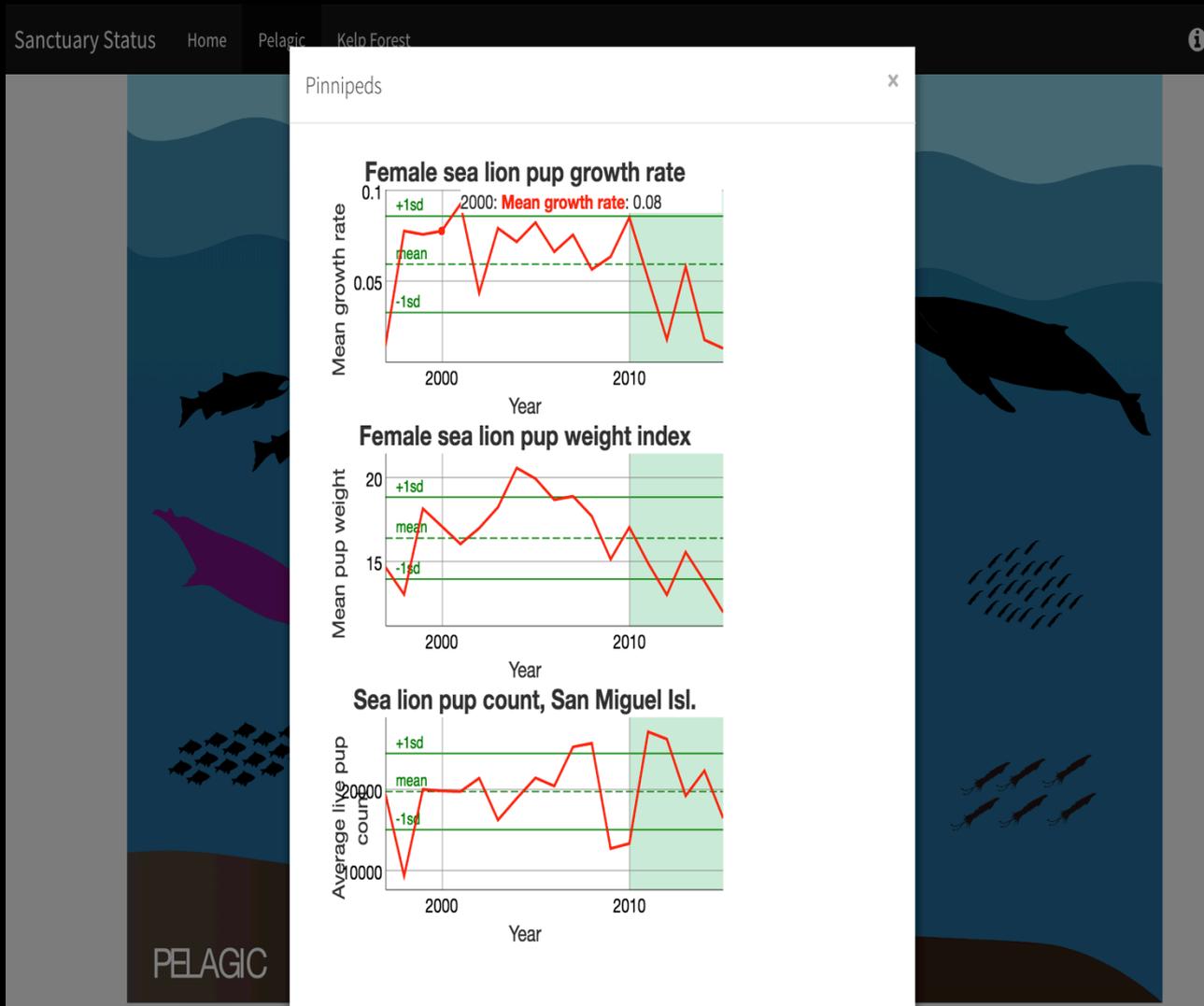


Interactive Infographic



marinebon.github.io/cr-metrics/pelagic.html

Interactive Infographic

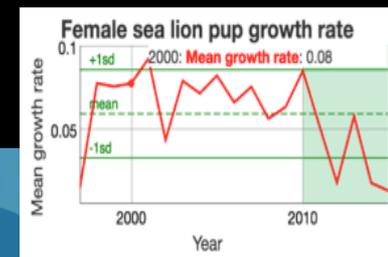
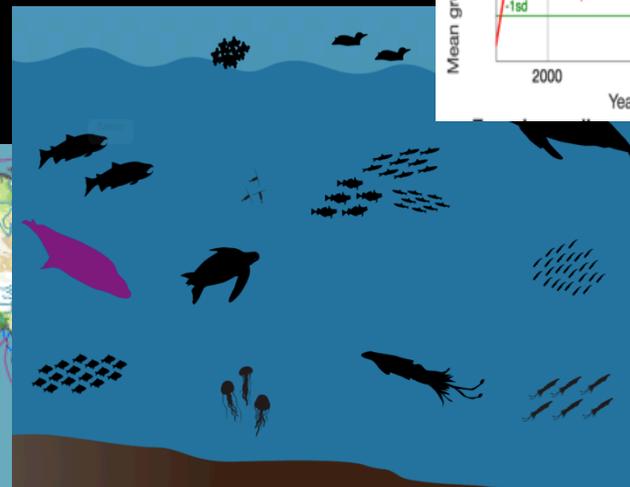


Extending Infographic to Global

Ecosystems

Beach
Coral Reefs
Deep Hard Bottom
Deep Soft Benthic
Deep Waters
Hard Shelf
Hard Slope
Intertidal Mud
Kelp
Mangroves
Rocky Intertidal
Rocky Reef
Salt Marsh
Seagrass
Seamounts
Soft Shelf
Soft Slope
Sub-tidal Soft
Bottom
Surface Waters
Suspension-Feeder
Reef

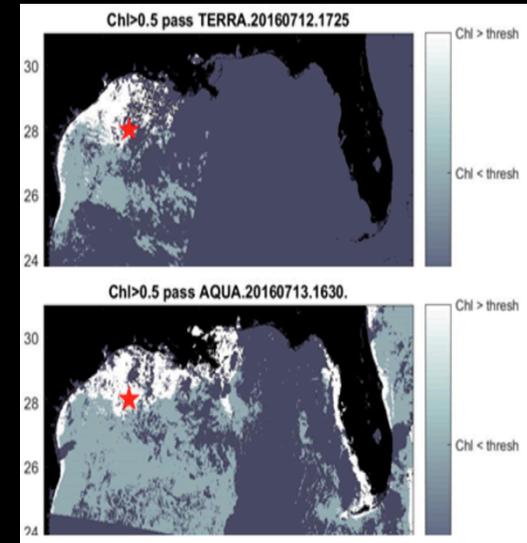
- [Deep Hard Bottom](#)
- [Pelagic](#)



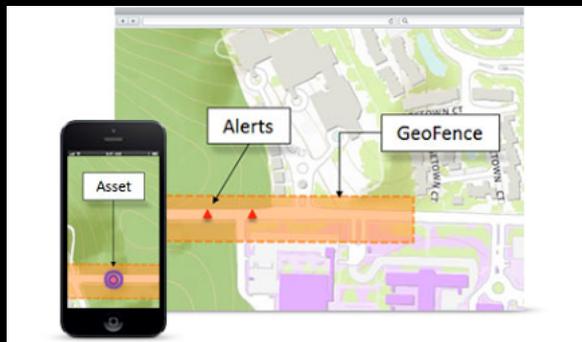
Notification Service

- Users sign up for email notification of conditions beyond some threshold
- Examples: degree heating days for coral reef, % level anoxia over % area of sanctuary persisting over # days
- Range expansion / contraction of bio obs?

Redmap Australia (redmap.org.au)



Inspiration: Digna RS on Flower Garden Banks
invert die off 2016-07



GeoEvent



Email

Example signup form:

waterqualitycheck.com

Time table

- Weekly telecons: Fridays 2 pm US eastern
 - Additional conversations as needed
- Ft. Lauderdale: Feb 8-10 (Implementation of Multi-disciplinary Sustained Ocean Observations/IMS00)
 - GOOS EOY panels
- St. Petersburg: March 15-17 (MBON, products)
- College Park: May 26 (MBON programmatic review)
- Costa Rica: AmeriGEOSS meeting and training
- Monterey, CA: **August 7-9**
- September: delivery of product to USGEO

Sustainable Development Goal 14 (United Nations)	Condition Report Questions (Sanctuary)	Essential Biodiversity Variables (GEO BON)	Essential Ocean Variables (GOOS)	Aichi Targets (CBD)	Marine Biodiversity Observation Network (NASA, NOAA, IOOS, BOEM)
<p>14.2) By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.</p>	<p>1) What is the eutrophic condition of the sanctuary waters and how is it changing? 2) Do sanctuary waters pose risks to human health and how are they changing? 3) Have recent changes in climate alter water conditions and how are they changing? 4) Are other stressors, individually or in combination, affecting water quality, and how are they changing? 5) What is the integrity of major habitat types and how are they changing? 6) What are contaminant concentrations in sanctuary habitats and how are they changing? 7) What is the status and trend of keystone and foundation species and how is it changing? 8) What is the status and trend of other focal species and how is it changing? 9) What is the status of non-indigenous species and how is it changing? 13-14-15) What are the levels of human activities that may adversely influence water quality/habitats/living resources and how are they changing?</p>	<p>Species/population abundance, biomass, distributoin</p> <p>-Ecosystem function</p> <ul style="list-style-type: none"> •Net primary productivity •secondary productivity: functional groups •Disturbance regime <p>- Ecosystem structure</p> <ul style="list-style-type: none"> •Habitat structure •Ecosystem extent and fragmentation •Ecosystem composition by functional type 	<ul style="list-style-type: none"> - Sea surface temperature - Sea surface salinity - Sea surface height - Surface currents - Suspended particles - Dissolved oxygen - inorganic macronutrients - Nitrous oxide - Dissolved organic carbon - Carbonate system - Transient tracers - Carbon isotope 13C - seagrass cover - mangrove cover - macroalgal canopy - live coral 	<p>10) By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.</p> <p>12) By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.</p>	<ol style="list-style-type: none"> 1) Seascapes 2) invasive species - abundance/ density 3) coral data - % cover, % diseased 4) seagrass data - % cover 5) salinity 6) CDOM 7) Fertilizer concentration) 8) hypoxia 9) temperature 10) DO 11) Diversity Indices 12) keystone species abundance 13) foundation species abundance 14) focal species abundance