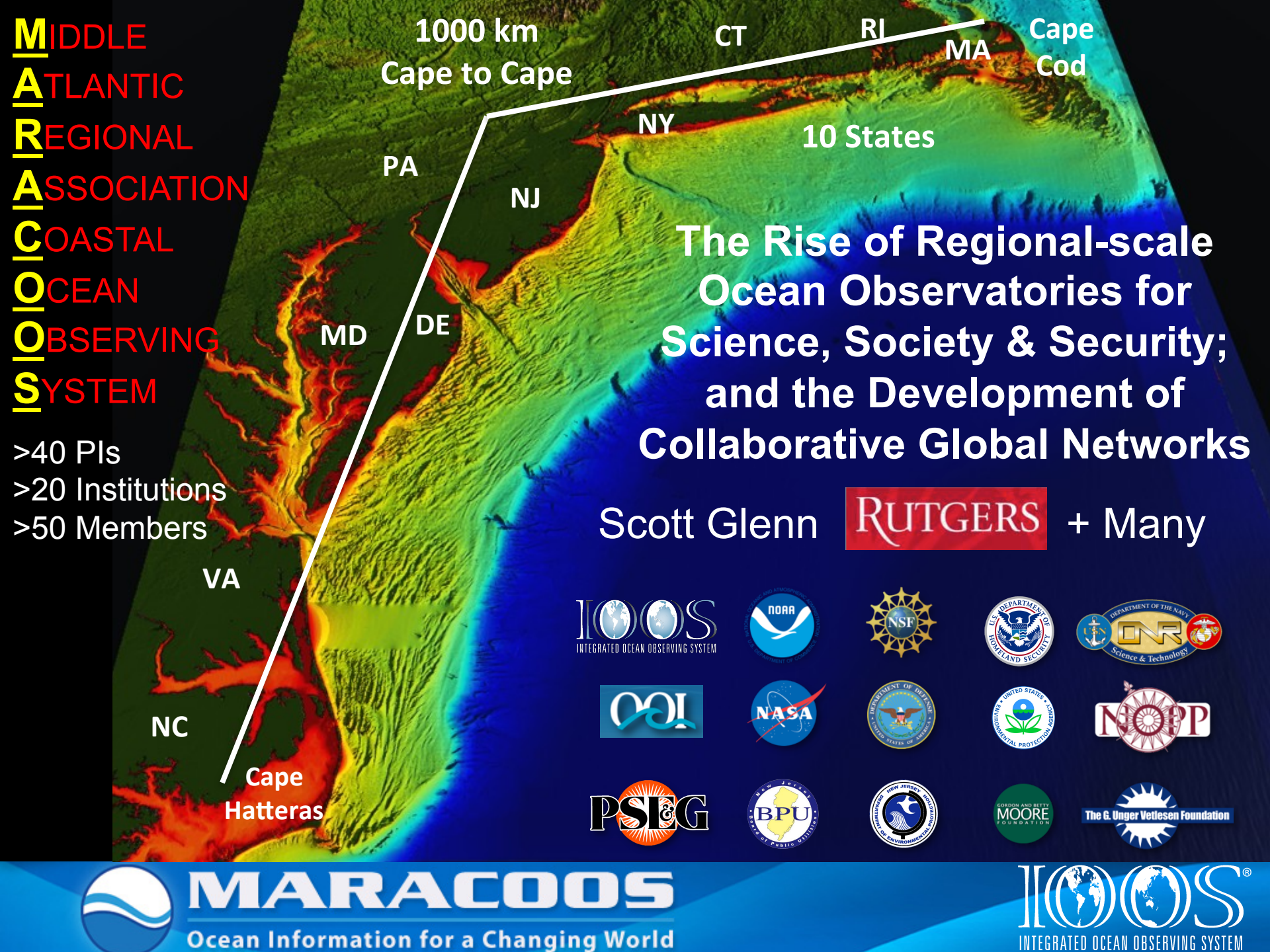
MIDDLE ATLANTIC REGIONAL ASSOCIATION COASTAL OCEAN OBSERVING SYSTEM
>40 PIs
>20 Institutions
>50 Members
1000 km
Cape to Cape
CT
RI
MA
Cape Cod
NY
10 States
PA
NJ
MD
DE
VA
NC
Cape Hatteras
The Rise of Regional-scale Ocean Observatories for Science, Society & Security; and the Development of Collaborative Global Networks
Scott Glenn
RUTGERS
+ Many
IOOS
INTEGRATED OCEAN OBSERVING SYSTEM
NOAA
NSF
U.S. DEPARTMENT OF HOMELAND SECURITY
DEPARTMENT OF THE NAVY
ONR
Science & Technology
OOI
NASA
DEPARTMENT OF DEFENSE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NOPP
PSE&G
BPU
GORDON AND BETTY MOORE FOUNDATION
The G. Unger Vetlesen Foundation
MARACOOS
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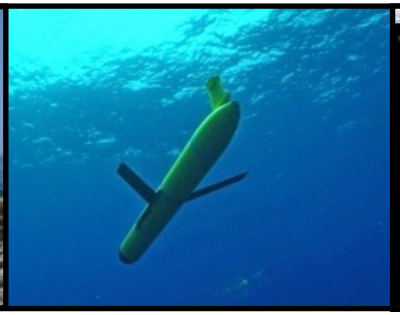
MARACOOS Operations Center

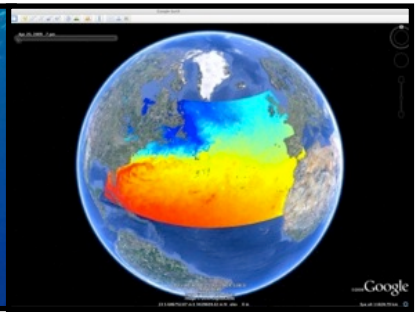
Rutgers University - Coastal Ocean Observation Lab

Satellite Data Acquisition Stations

CODAR Network



Glider Fleet



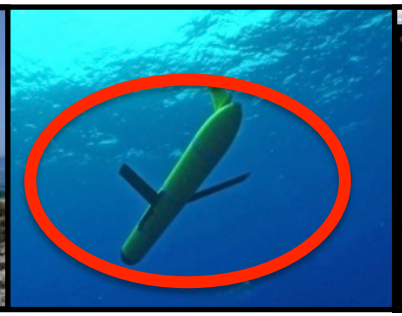
3-D Forecasts

MARACOOS Operations Center

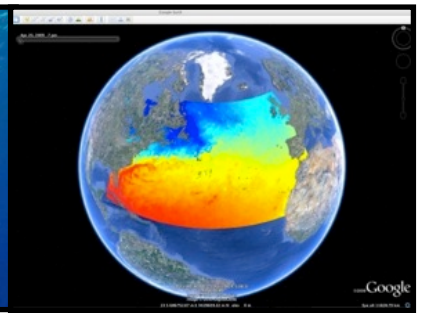
Rutgers University - Coastal Ocean Observation Lab

Satellite Data Acquisition Stations

CODAR Network



Glider Fleet



3-D Forecasts

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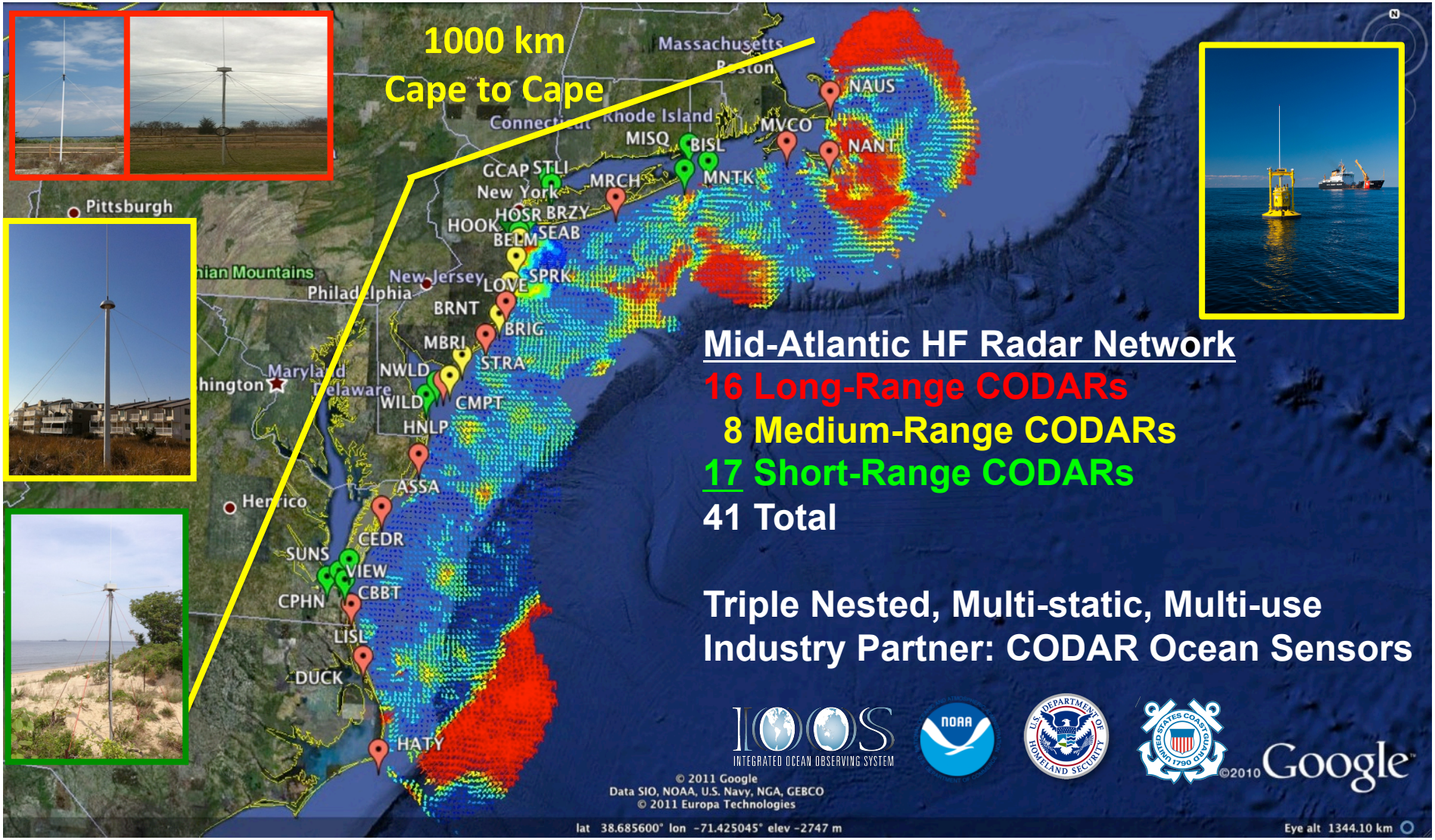
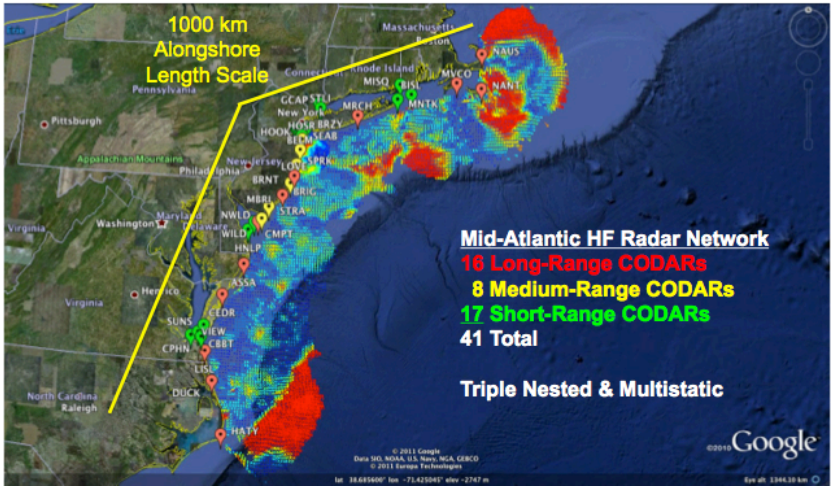
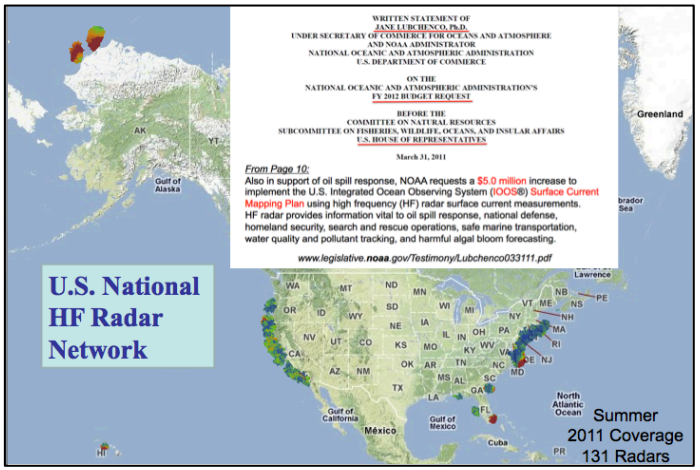
Mid-Atlantic Bight HF Radar Network



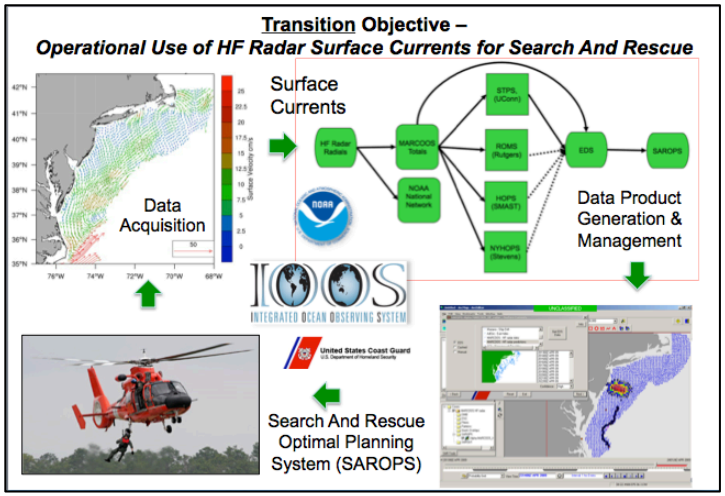
Regional to Global Scale – High Frequency Radar



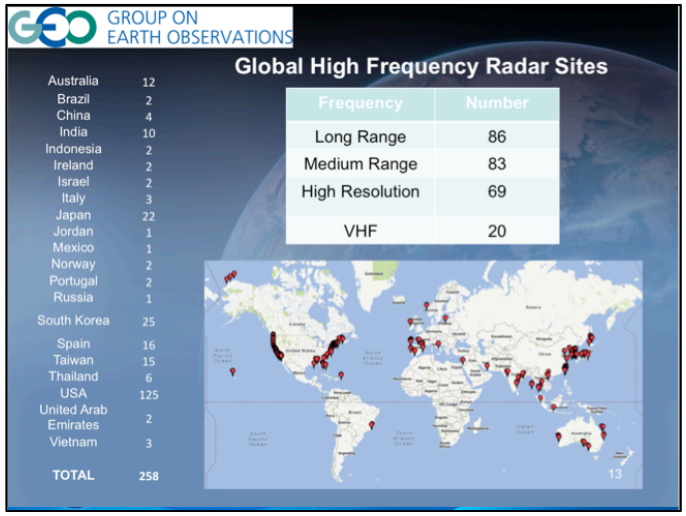
Mid-Atlantic Regional Scale HFR Network



U.S. National HFR Network

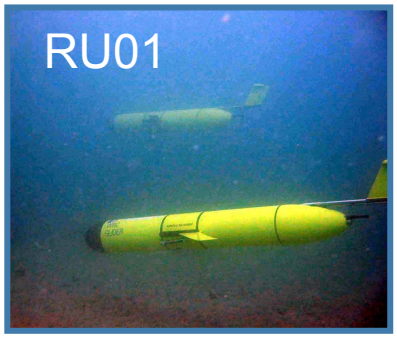


Search And Rescue Operational 2009

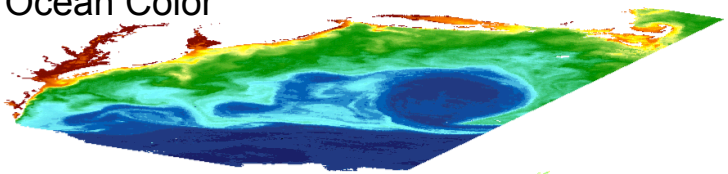


Global HFR Network

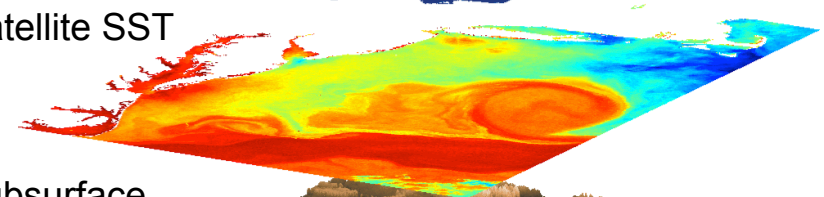
Rutgers Glider Network



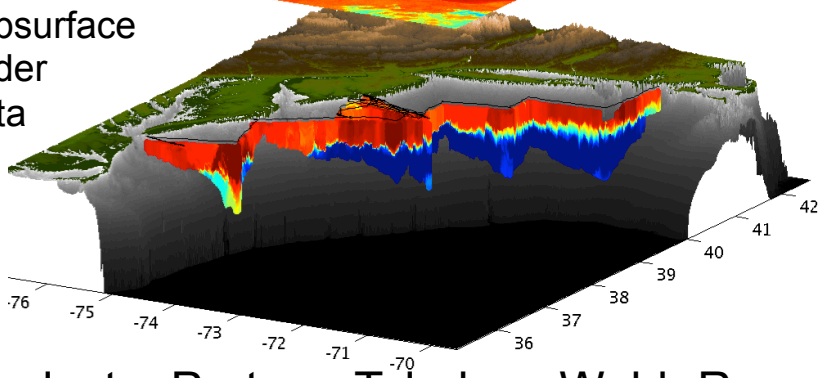
Satellite Ocean Color



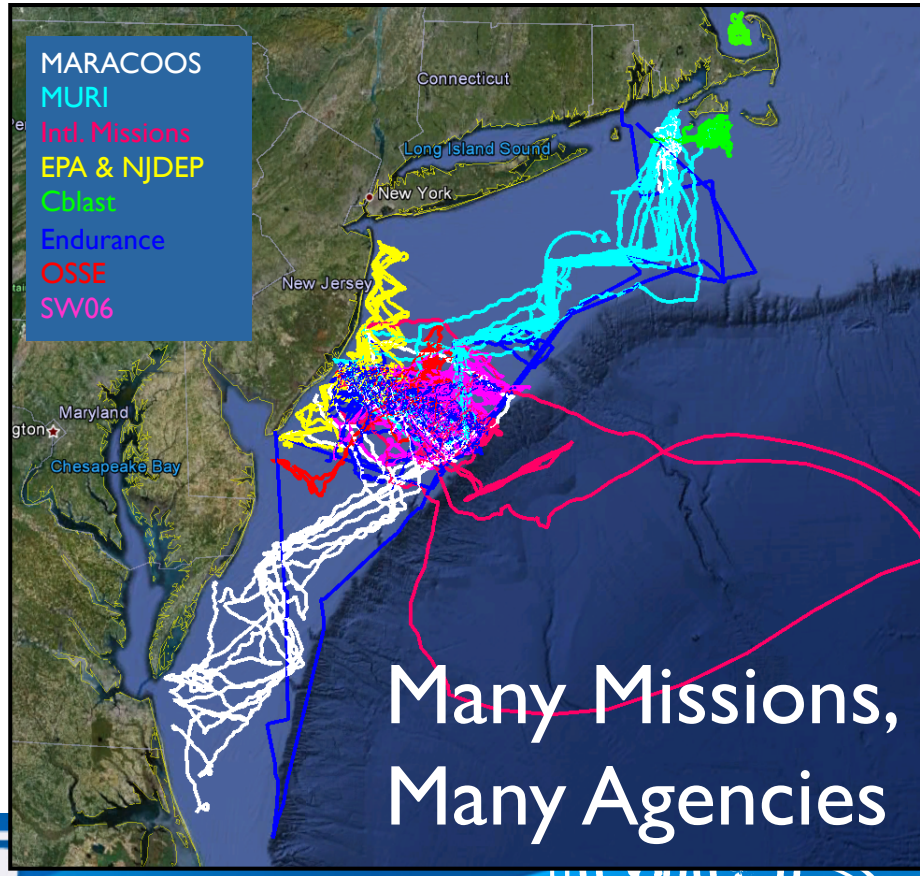
Satellite SST



Subsurface Glider Data



Industry Partner: Teledyne Webb Research



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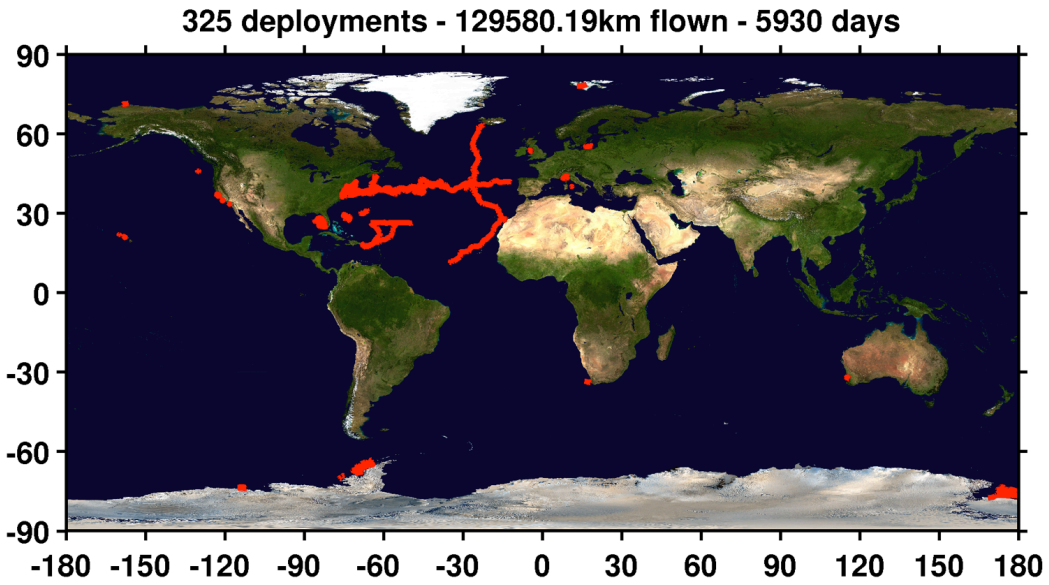
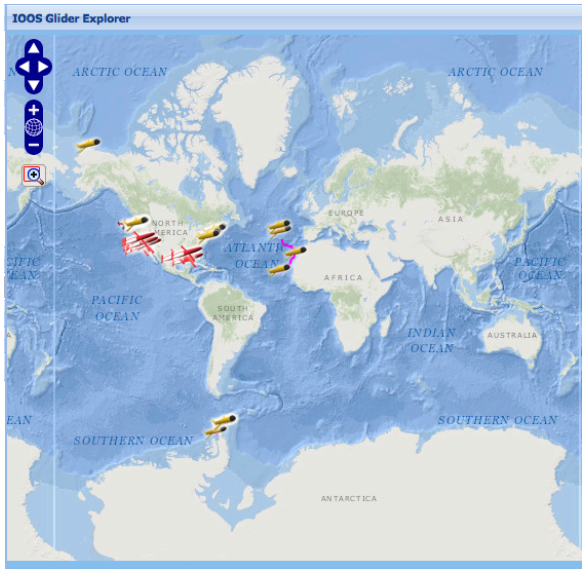


Rutgers Glider Deployments



U.S. National Glider Network

U.S. Navy Operational Fleet - 2011

Emerging Global Glider Network

U.S. Integrated Ocean Observing System

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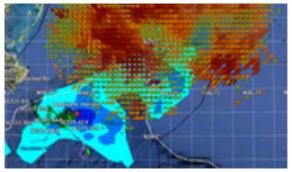
International Component

Glider Asset Map

Glider Fleet

Technologies and Applications

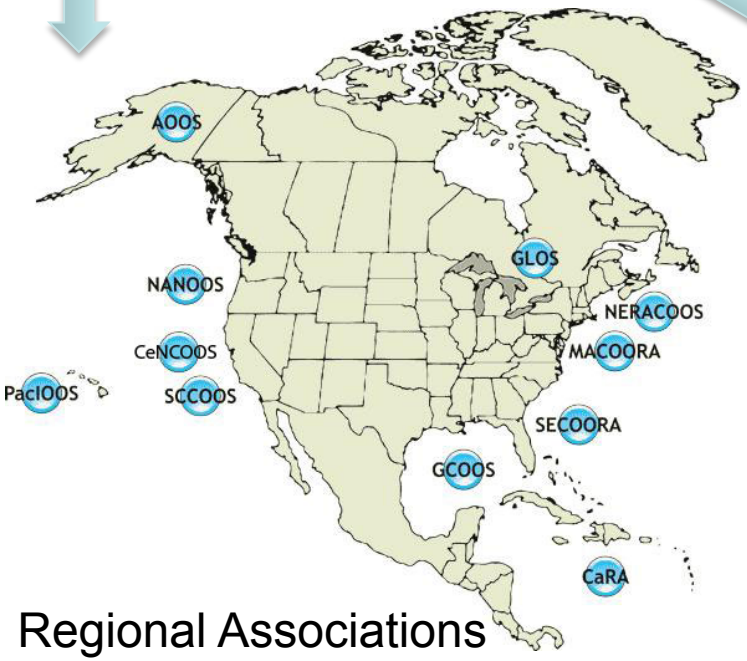


Global High Frequency (HF) Radar Network Component

High Frequency Radars

Regional Component

National Component



11 Regional Associations

Globally Coordinated Initiatives

17 U.S. Federal Agencies

U.S. Integrated Ocean Observing System

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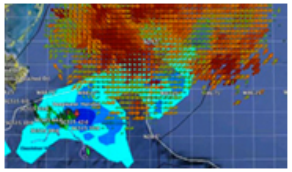
International Component

Glider Asset Map

Glider Fleet

Technologies and Applications

Technology



Global High Frequency (HF) Radar Network Component

High Frequency Radars

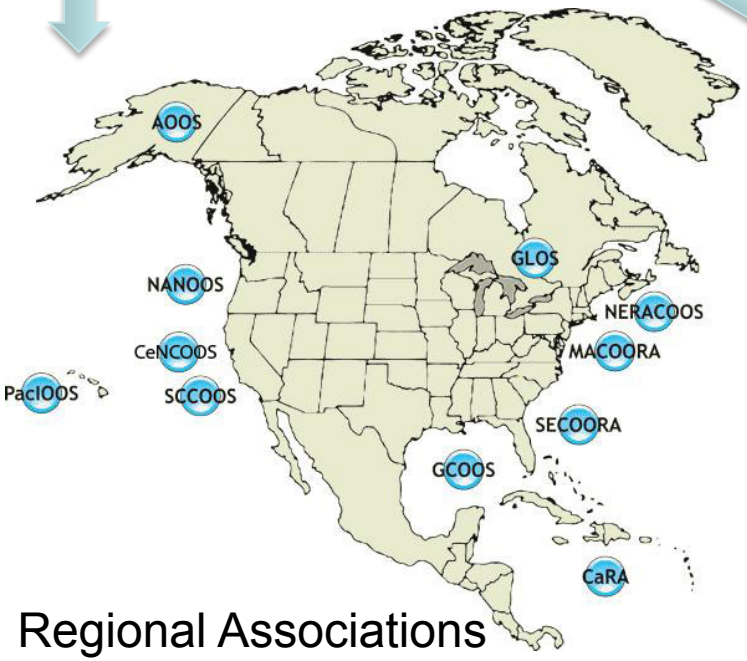
Technology

Challenger Glider Mission

Education

Regional Component

National Component



11 Regional Associations

Globally Coordinated Initiatives

17 U.S. Federal Agencies

National Science Foundation
Ocean Observatories Initiative

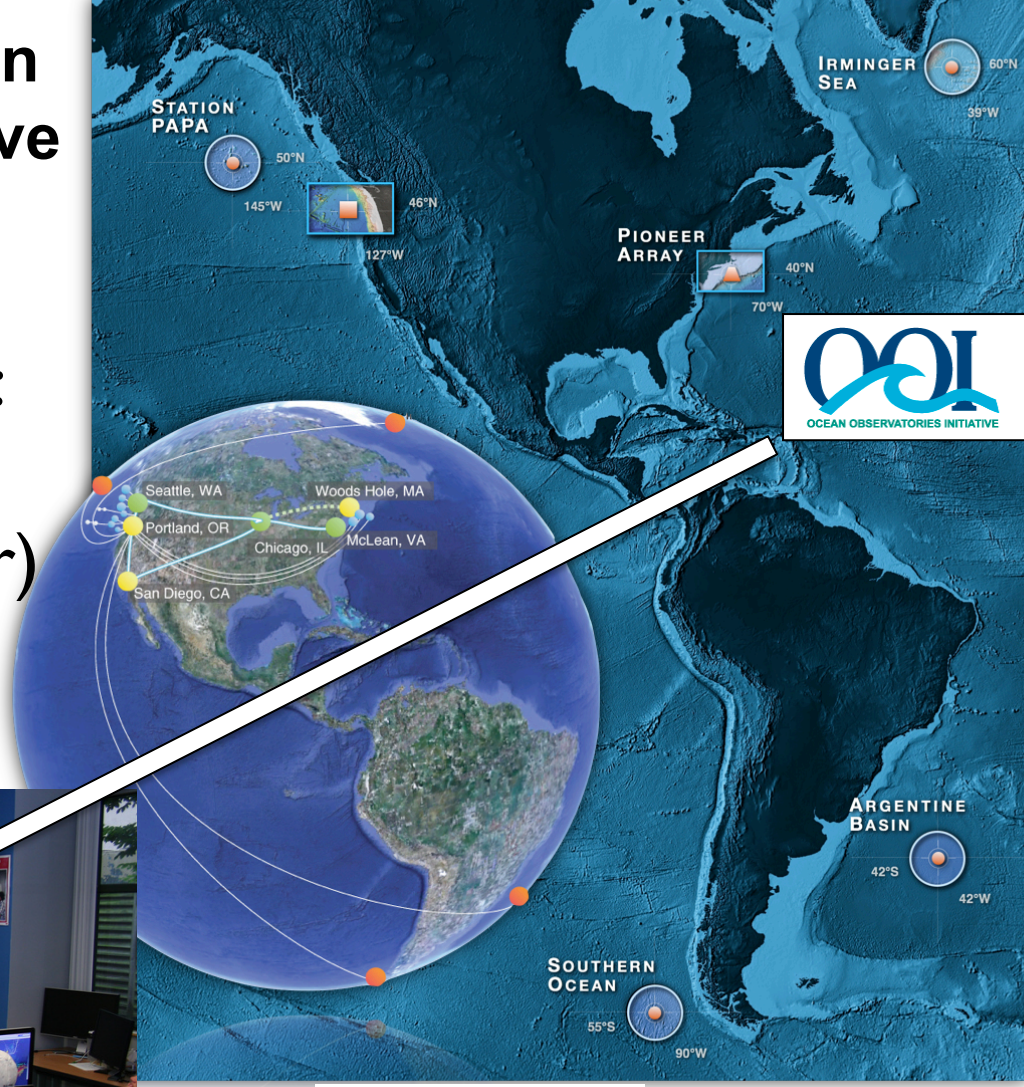
Construction Phase: $386 M

Implementing Organizations:

-Marine (Global, Regional, Endurance, Pioneer)

-Cyber Infrastructure

-Education



NSF · Consortium for Ocean Leadership · OOI Ocean Observatories Initiative · OSU Oregon State University · Rutgers University · UCSD · University of Washington

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Trans-Atlantic Glider Challenge – May 24, 2006 –
UNESCO E.U./U.S. Baltic Sea Conference in Lithuania

Innovate, Incubate, Integrate
noaa research
NOAA's OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

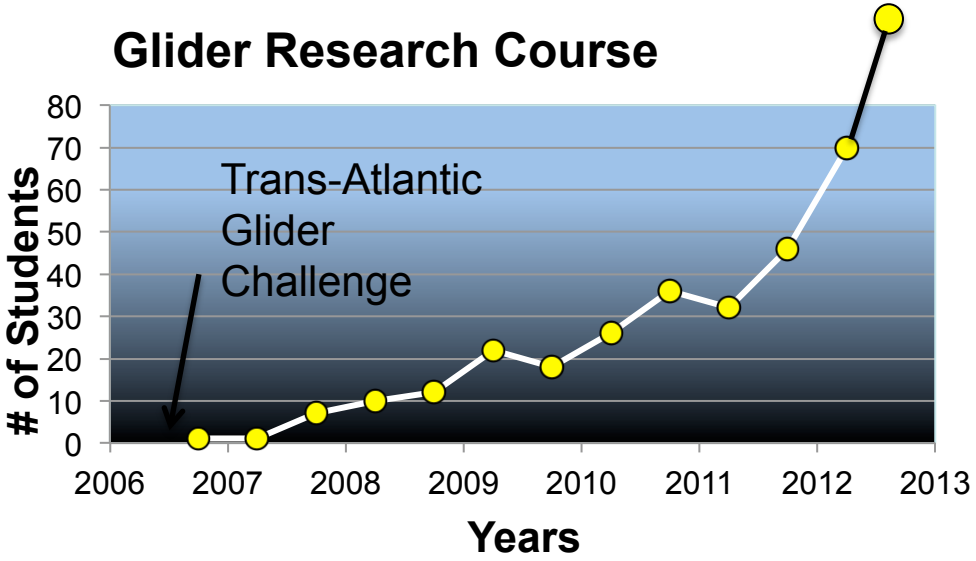
Dr. Rick Spinrad

Assistant Administrator

NOAA
Office of Oceanic and Atmospheric Research

"I have something you need to do for the good of your country."

"Take one of your gliders, modify it, and fly it across the Atlantic, inspiring students along the way."



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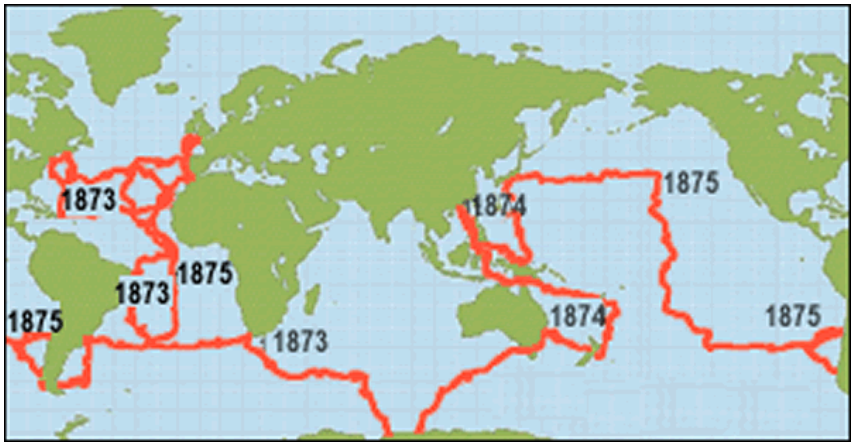
A Global Challenge – The Challenger Glider Mission

December 9, 2009 – Baiona, Spain



Ralph Rayner & Rick Spinrad's Global Challenge:

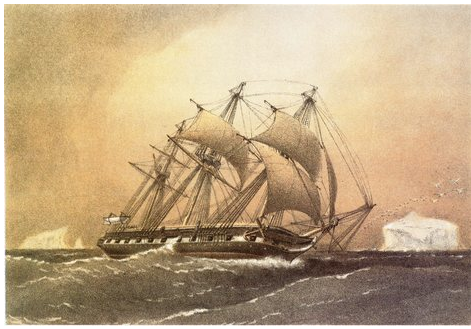
Build a Global Glider Fleet and Coordinate the First Robotic Circumnavigation.

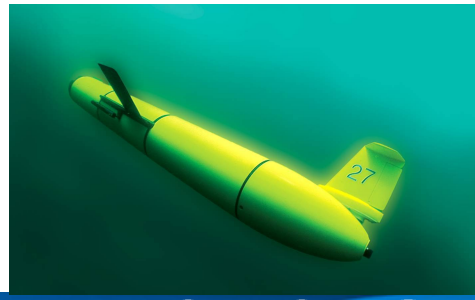
Revisit the Historic Track of the HMS Challenger –
And inspire a global network of students along the way.

HMS Challenger Voyage
First Scientific Circumnavigation
1872-1876

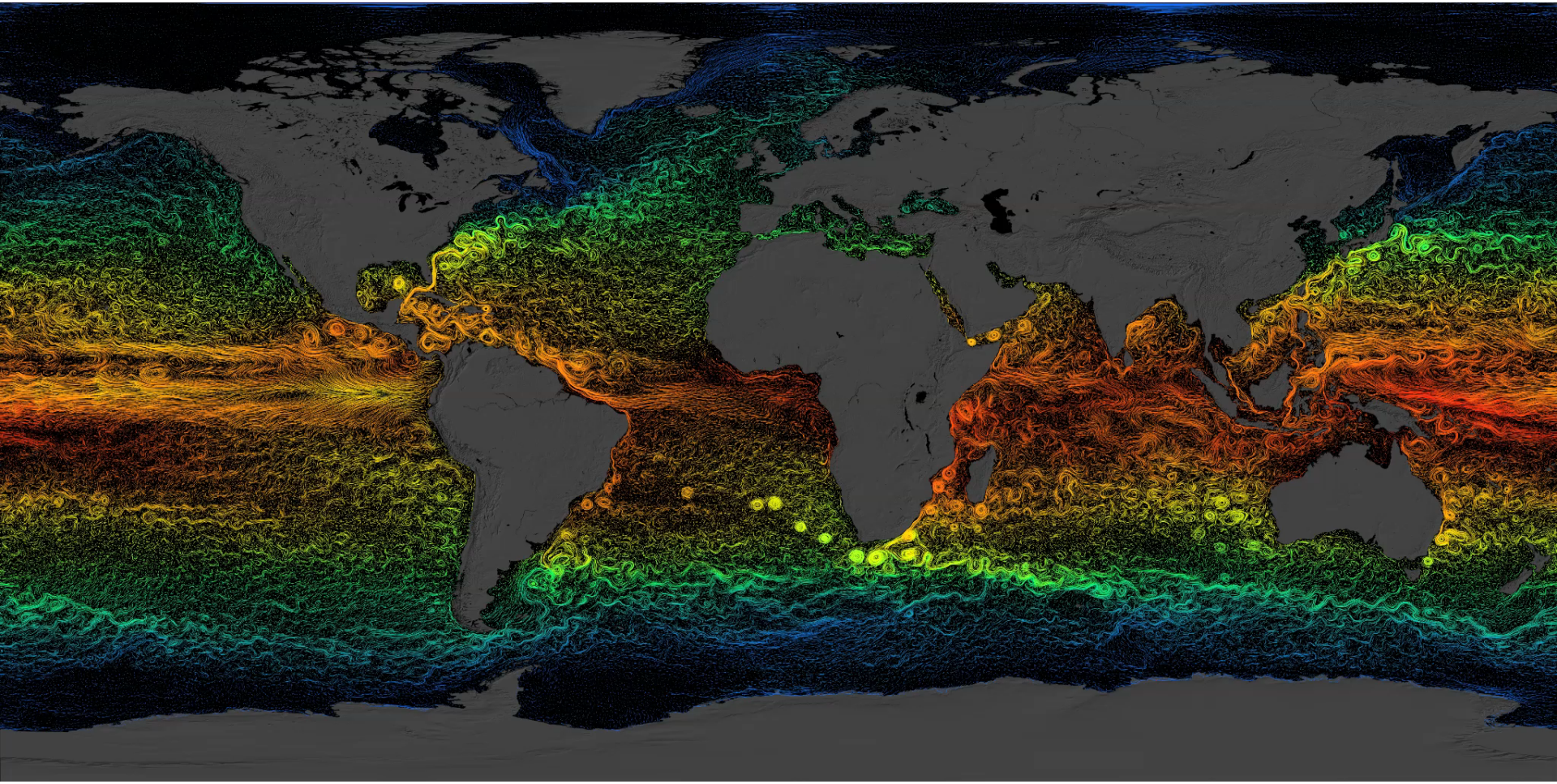
128,000 km =

= 16 gliders
x 8,000 km/glider





Models for Global Circulation and Heat Transport

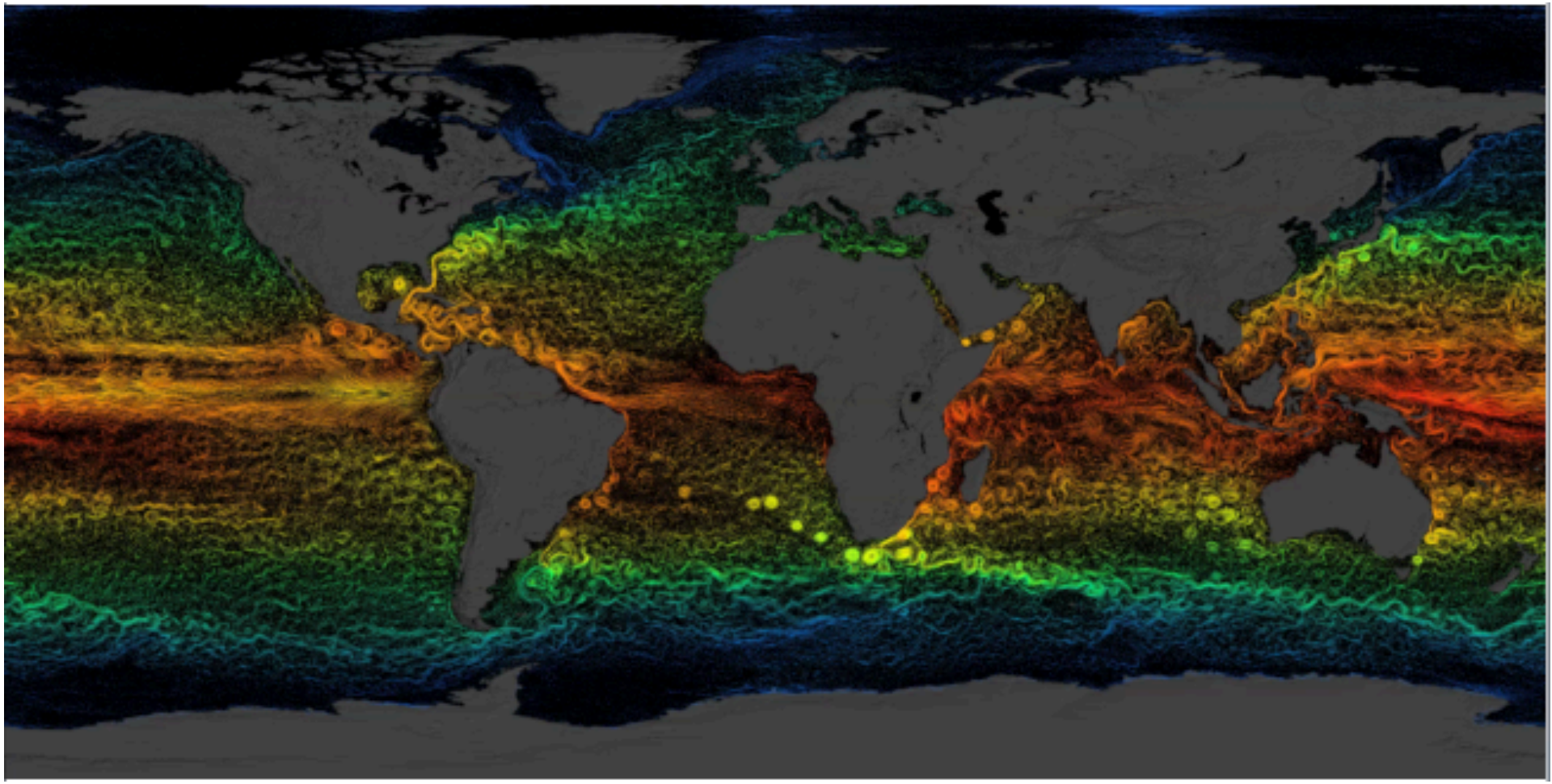


Science & Education Drivers

How accurate are these global models?
Do I need to embed a regional model?
How much data do I need to assimilate?

Broaden the workforce
Improve ocean literacy
Develop a global perspective

Models for Global Circulation and Heat Transport



Science & Education Drivers	How accurate are these global models? Do I need to embed a regional model? How much data do I need to assimilate?	Broaden the workforce Improve ocean literacy Develop a global perspective

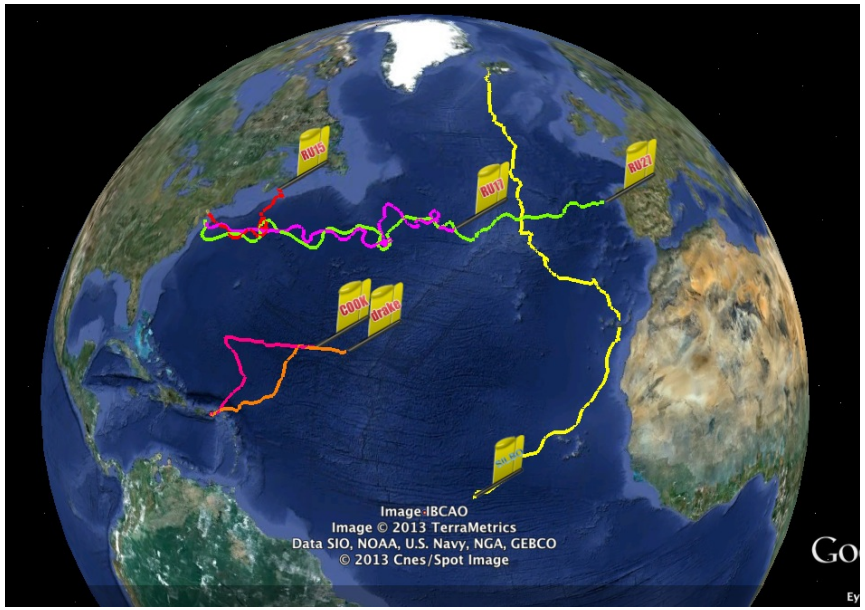
Global Challenger Glider Mission

PLOCAN consorcio

PLATAFORMA OCEÁNICA DE CANARIAS

Companion Course at
Plataforma Oceanica de Canarias

- Shared Glider Missions – Iceland to Azores; Azores to Canaries; Canaries to Brazil?
- Skype Sessions between classes
- Two-way International Exchange programs
- Students Learn Science from their teachers
- Students Learn Culture from their peers



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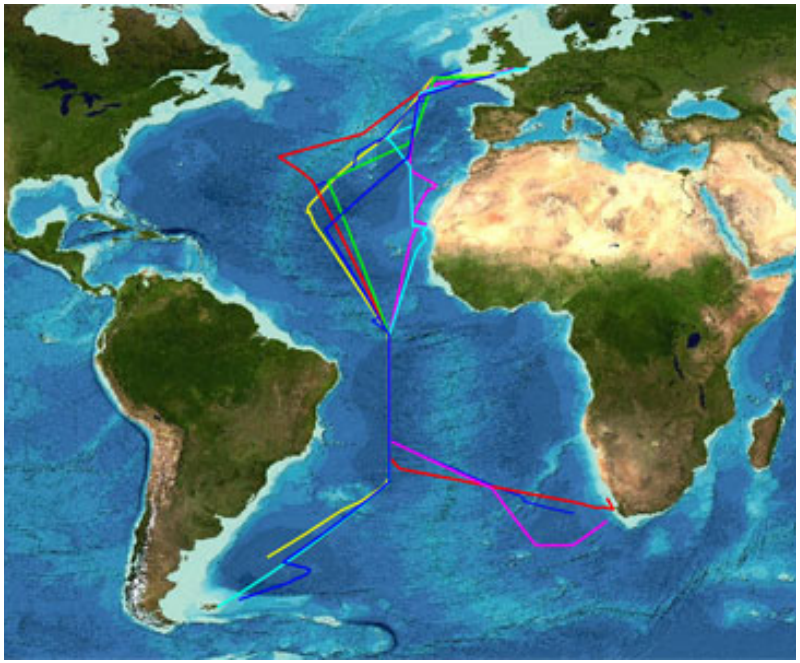
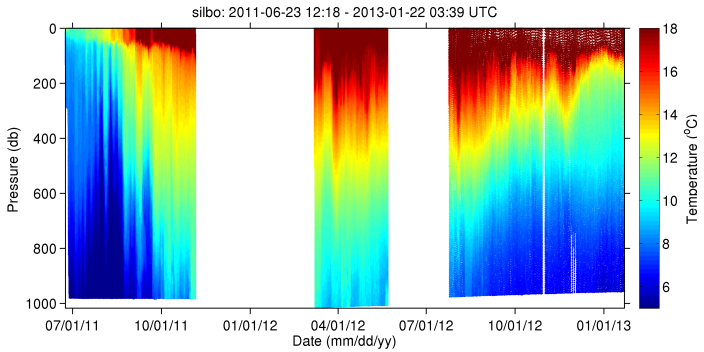
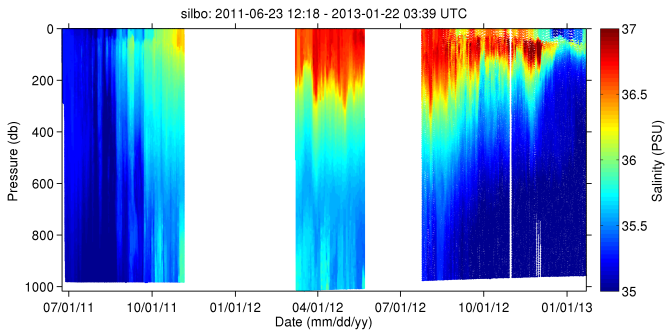
Challenger Glider Mission: Initial Atlantic Missions



PML Atlantic Meridional Transect

Gliders *Silbo* and *Challenger*

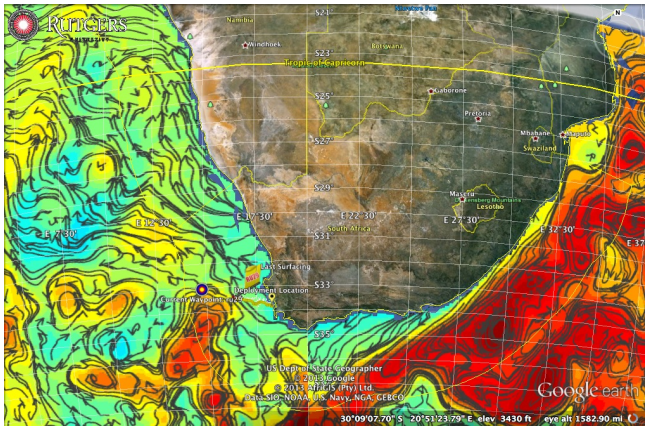




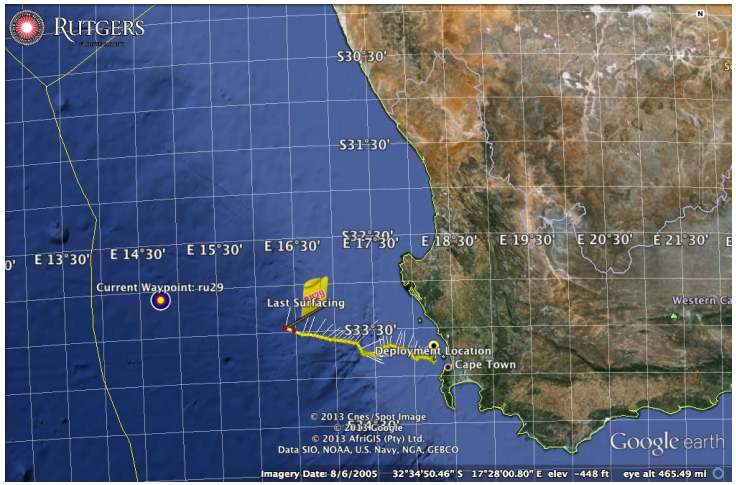
Glider *Silbo* Temperature & Salinity Sections: >8,898 km since June 23, 2011

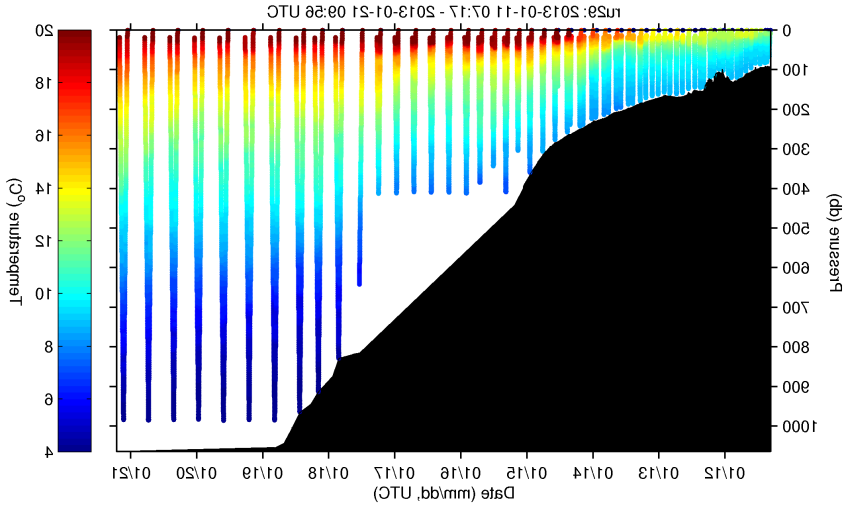
Challenger Glider Mission: South African Launch of RU29

Students Sinekhaya, Ashley, JP Launch *Challenger*



Challenger rides an eddy

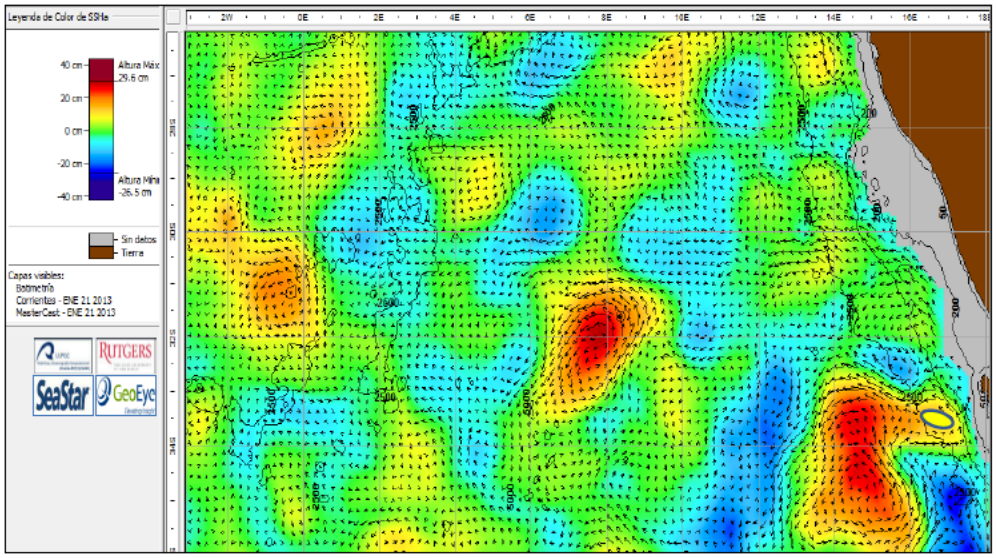


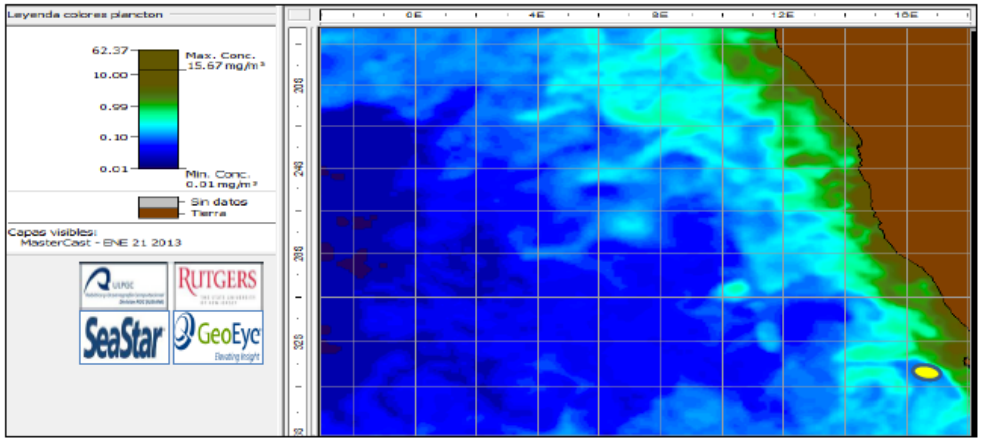


Glider *Challenger (RU29):* >228 km since January 11, 2013

Today's Activities for *Challenger (RU29)*

Path planning guidance from the Universidad de Las Palmas de Gran Canaria





Rutgers University Spring Semester Course begins

Chart a course for what we do together in South Africa

Conclusions:

- MARACOOS has developed and sustained a Regional Scale Observation & Forecasting System.
- Demonstrated value for Science, Society & Security.
- Global HF Radar & Glider Networks are emerging.

Challenger Glider Mission:

- Starting now with 4 Gliders
- Leverage existing programs
- Build a global community

I-COOL

http://www.i-cool.org

International Coalition of Ocean Observing Laboratories