

<http://www.oceansites.org/OceanSITES/>

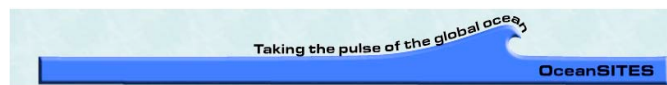
International Time Series Science Team

R. Weller

OOPC- 9

SOC

June 2004



Membership of the International Time Series Science Team

Bob Weller

WHOI, USA (Co-Chair)

Uwe Send

IfM Kiel, Germany (Co-Chair)

Ed Boyle

MIT, USA

Francisco Chavez

MBARI, USA

Tommy Dickey

UCSB, USA

Dave Karl

SOEST, USA

Tony Knap

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JAMSTEC, Japan

Richard Lampitt

SOC; UK

Joao Lorenzetti

INPE, Brazil

Roger Lukas

SOEST, USA

Mike McPhaden

PMEL, USA

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LODYC, France

V. S. N. Murty

NIO, India

Rodrigo Nunez

SHOA, Chile

John Orcutt

SIO, USA

Svein Osterhus

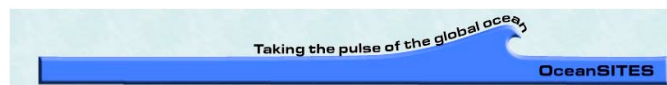
Bergen Univ., Norway

Bronte Tilbrook

CSIRO, Australia

Hendrik van Aken

NIOZ, Netherlands



January Science Team Meeting
Data management/sharing push
New website
White paper
Brochure
New Maps
Linkages
Status/Challenges

January meeting:

- After ORION (Ocean Research Interactive Observatory Networks) workshop
- Marked agreement and progress toward:

Data formats and data sharing project

New maps, “truth in advertising”

New countries

A way forward for severe environments

White paper draft

Brochure draft

Common data access:

- **develop a common data format for multidisciplinary timeseries data (2003)**
- **establish global data centers (1-2 US, 1 Europe, 1 Japan) (2004)**
- **start by merging data from TAO/TRITON/PIRATA, Bermuda, Hawaii, MBARI, ANIMATE, HiLats**

Data management:

Sylvie Pouliquen heads working group
developing data formats; agreement for pilot sharing
sites

Interaction with NSF, Ocean.US data folks

OceanSITES

OCEAN Sustained Interdisciplinary Timeseries Environment observation System

What are Time Series Stations and OceanSITES?

Fixed-point time series are an essential element of the global ocean observing system. These Eulerian Observatories are uniquely suited for fully sampling 2 of the 4 dimensions (depth and time), thus complementing other components of the observing system (satellites, floats, ships). They resolve a wide range of temporal variability and sample the water column from the surface to the bottom. Fixed-point stations will resolve multi-disciplinary variability and processes like CO₂ uptake, biological productivity, fluxes of heat, freshwater momentum and other properties between the ocean and atmosphere, and seismic and biological activity on the bottom.

Moorings are uniquely suited for sampling critical regions, in adverse conditions, and over extended periods. They can be used in passages and boundary currents, under the ice, in abyssal layers, during storm seasons, and to capture transient events events like blooms, convection, earthquakes.

Draft White Paper on the
Global Ocean Timeseries Observatory System

Draft Version: 17 Nov 2003

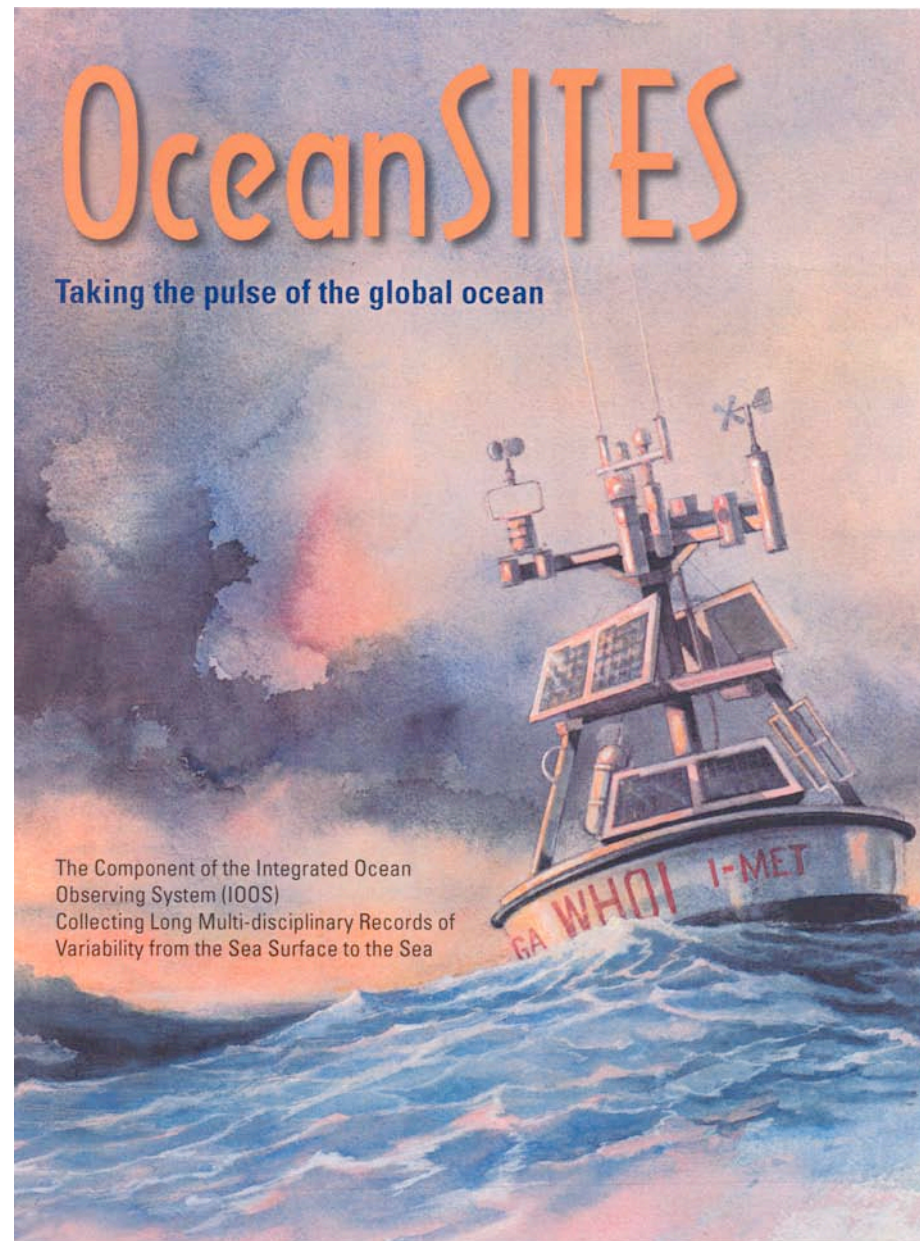
Uwe Send and Bob Weller
on behalf of the
International Ocean Timeseries Science Team



Taking the pulse of the global ocean

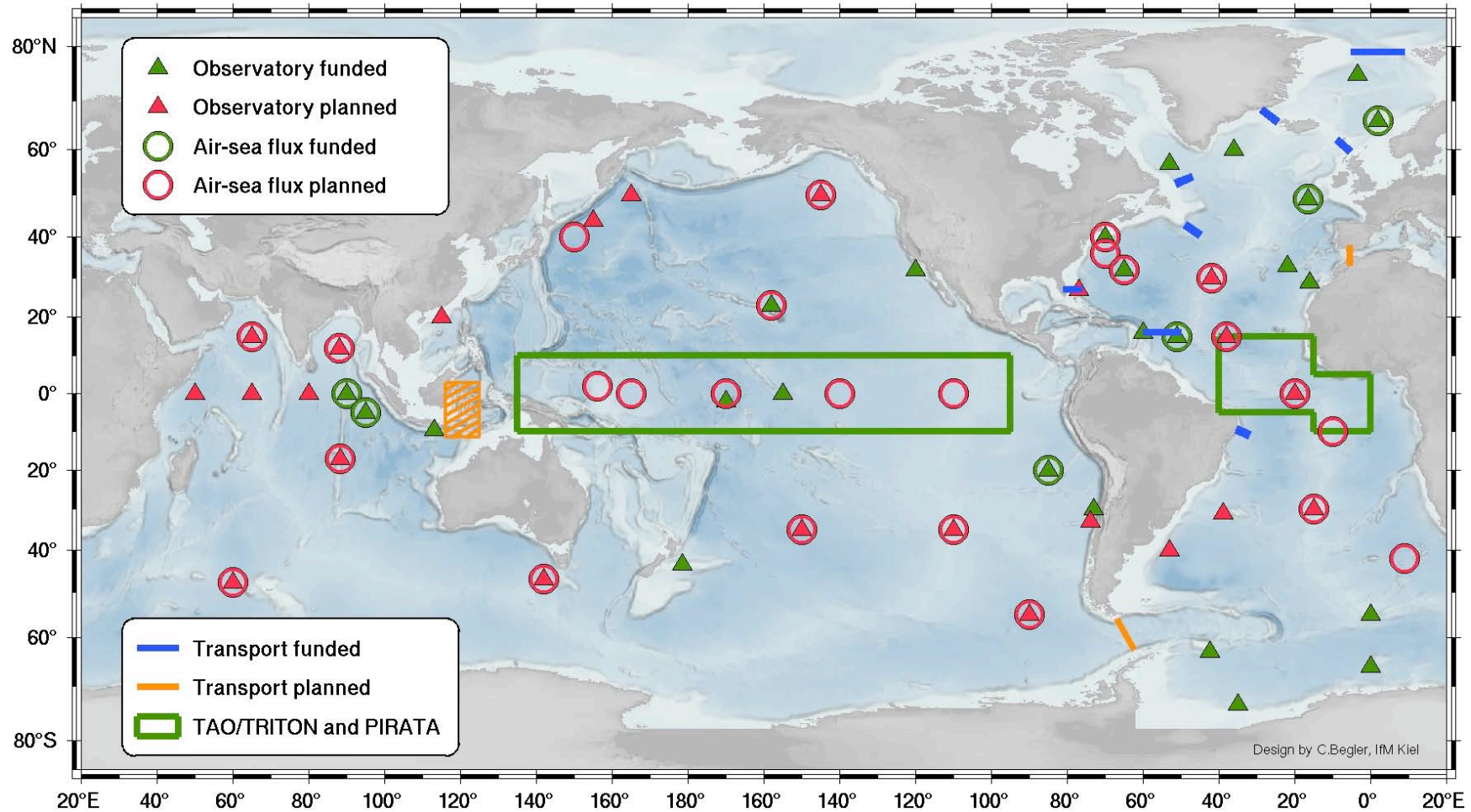
OceanSITES

Draft
brochure:

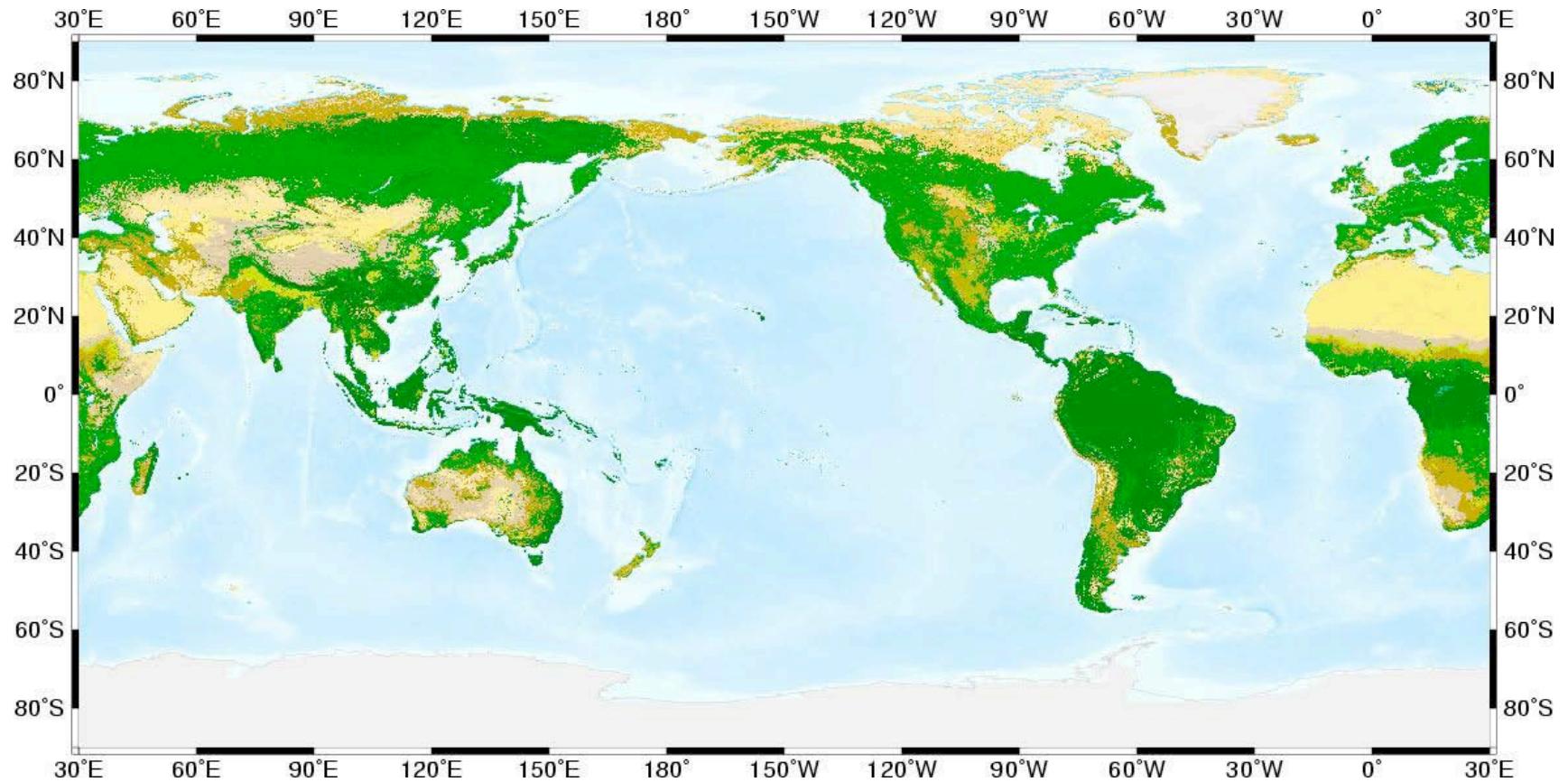


Old Map

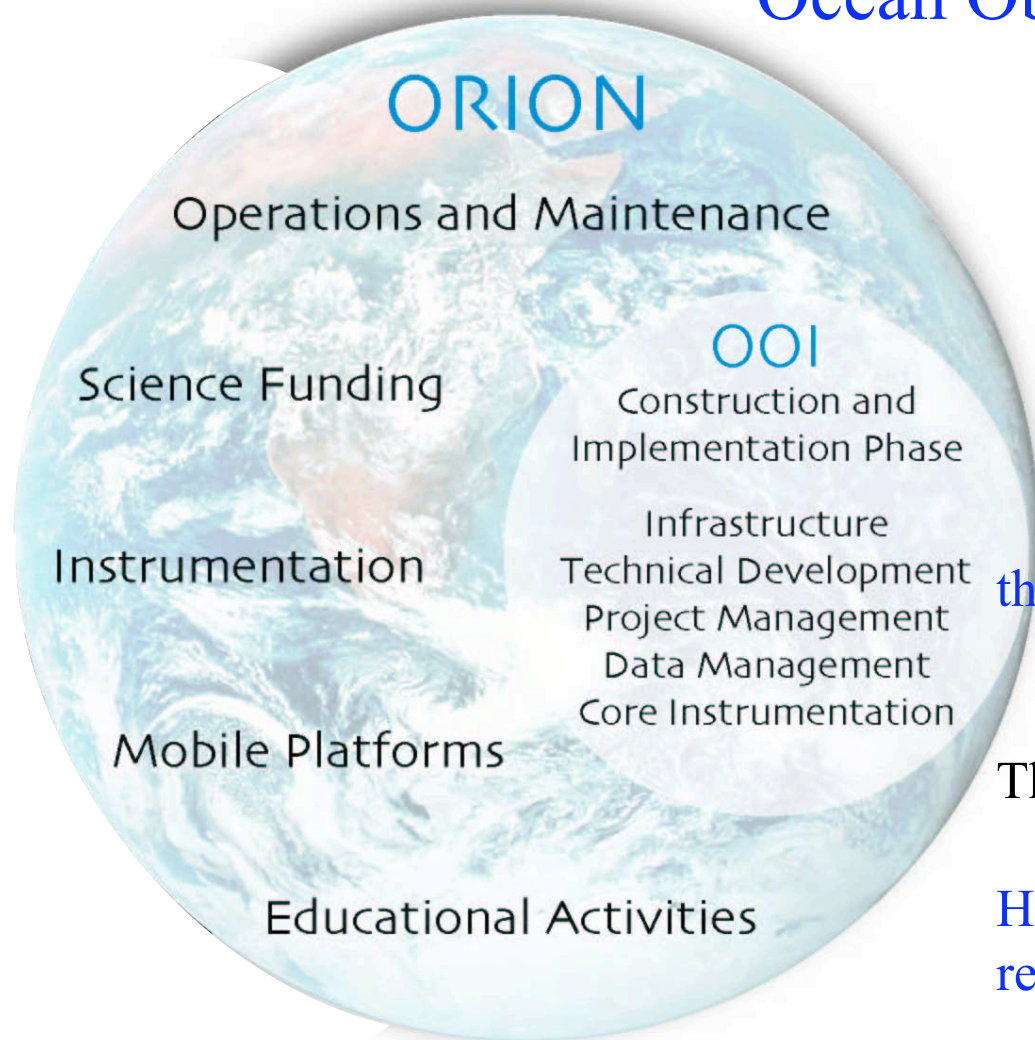
Global Observatory Buoy Sites, Funded and Planned



New, JCOMM-Compliant Base Map



Ocean Observatories Initiative (OOI)



Integral component of ORION –
Ocean Research Interactive
Observatory Networks

The OOI is based on \$247M in
the NSF budget for 2007-2010
(as an MREFC project).

This is a one time shot of “new” money.

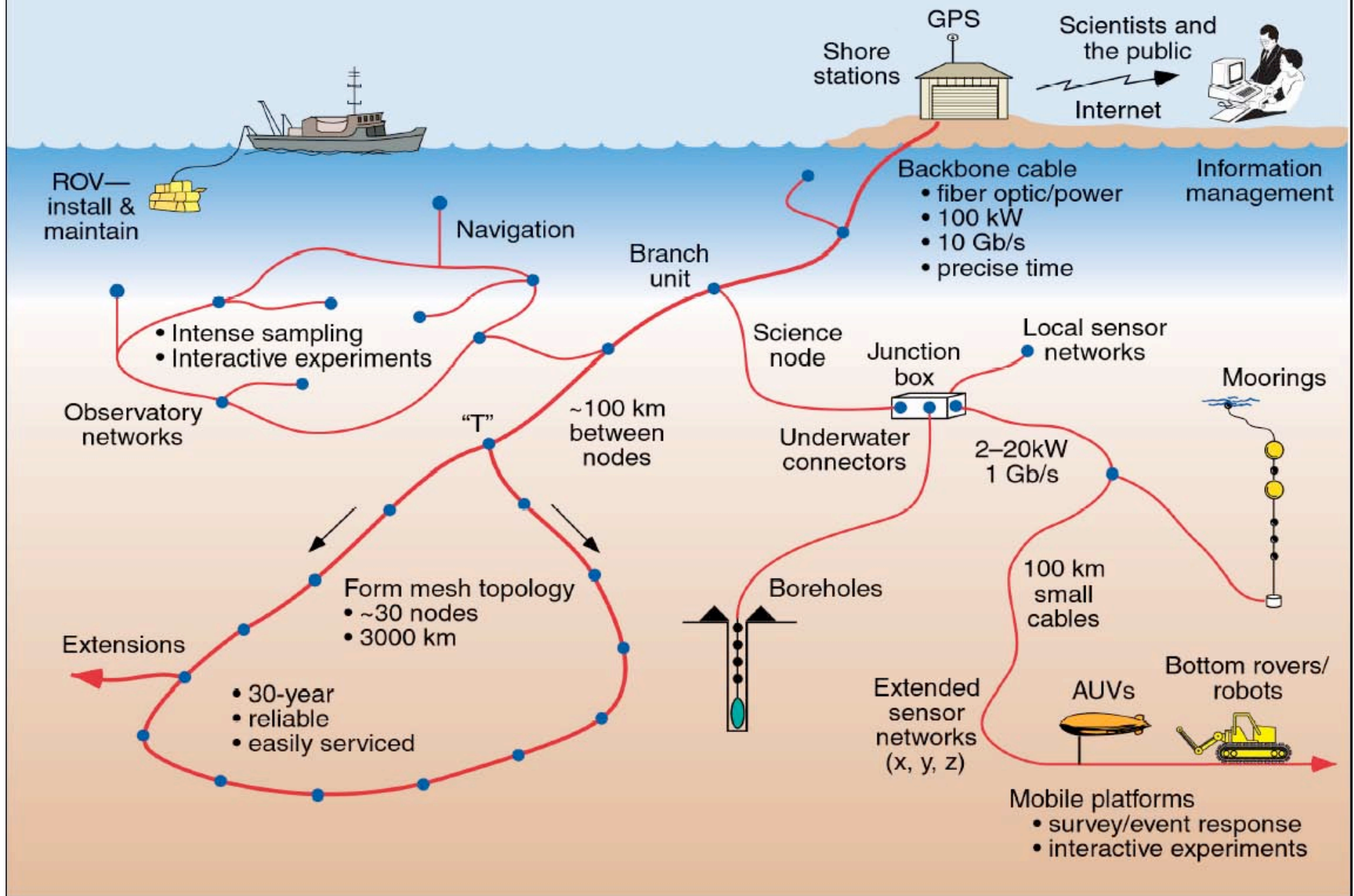
How the rest of ORION is funded
remains to be determined.

- **The NSF OOI**

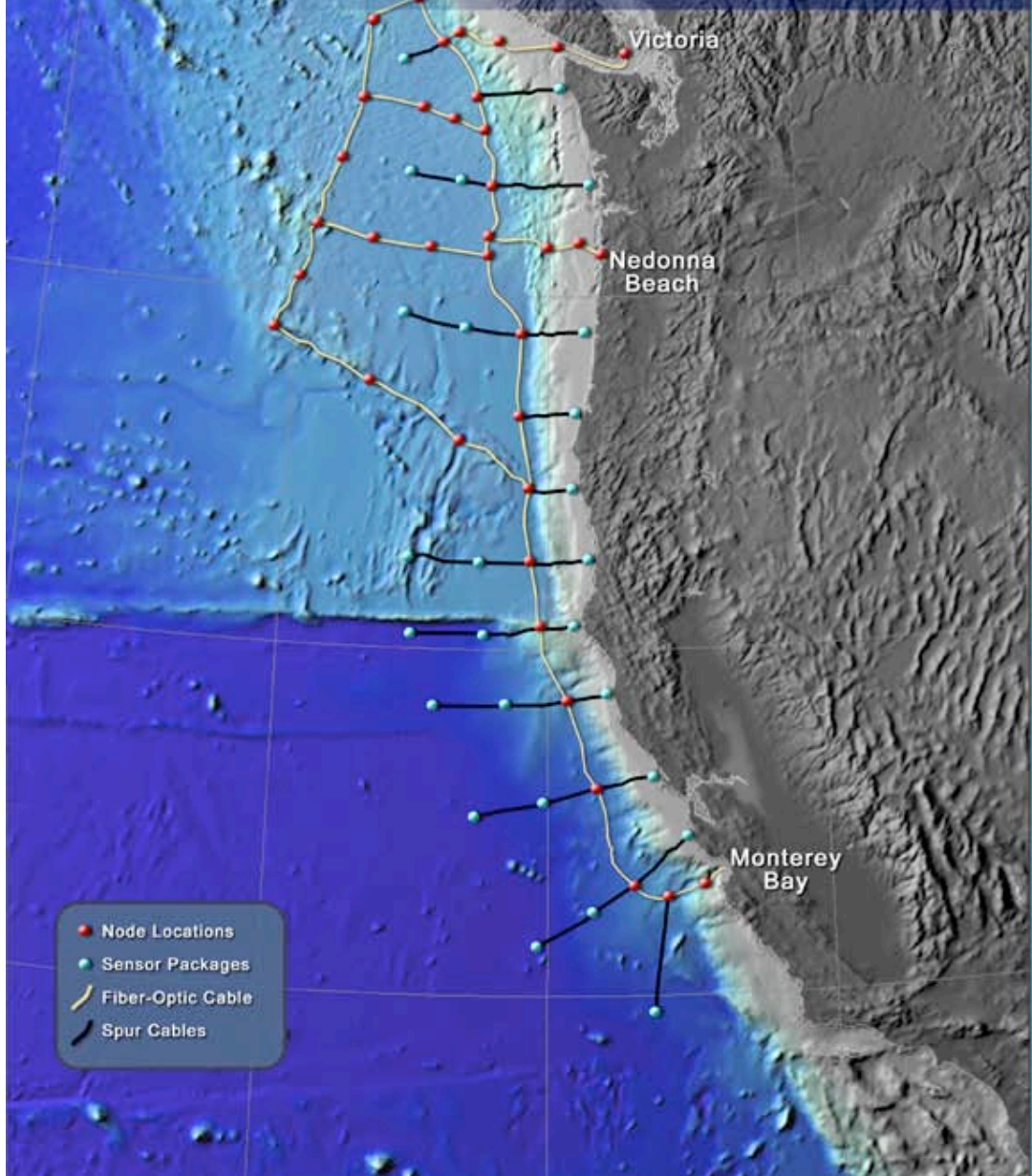
A 5-year project to develop, build, and operate for the community:

- **Coastal observatories**
- **Blue water moorings with severe environment, power, stability, and telemetry capability**
- **A regional observatory**

NEPTUNE Essential Elements



NEPTUNE Cable Coastal Dynamics



Sea Surface Temperature

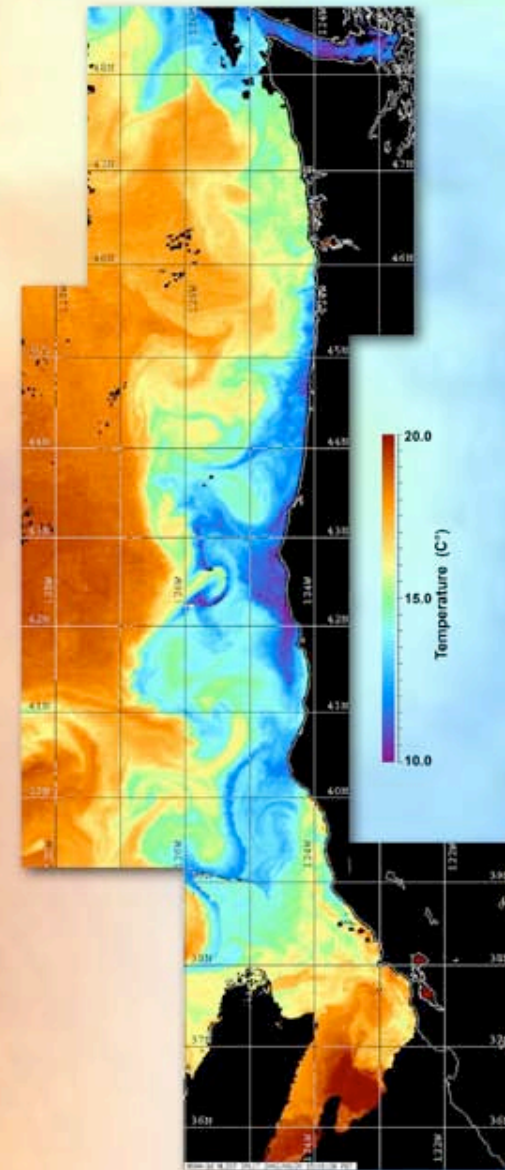
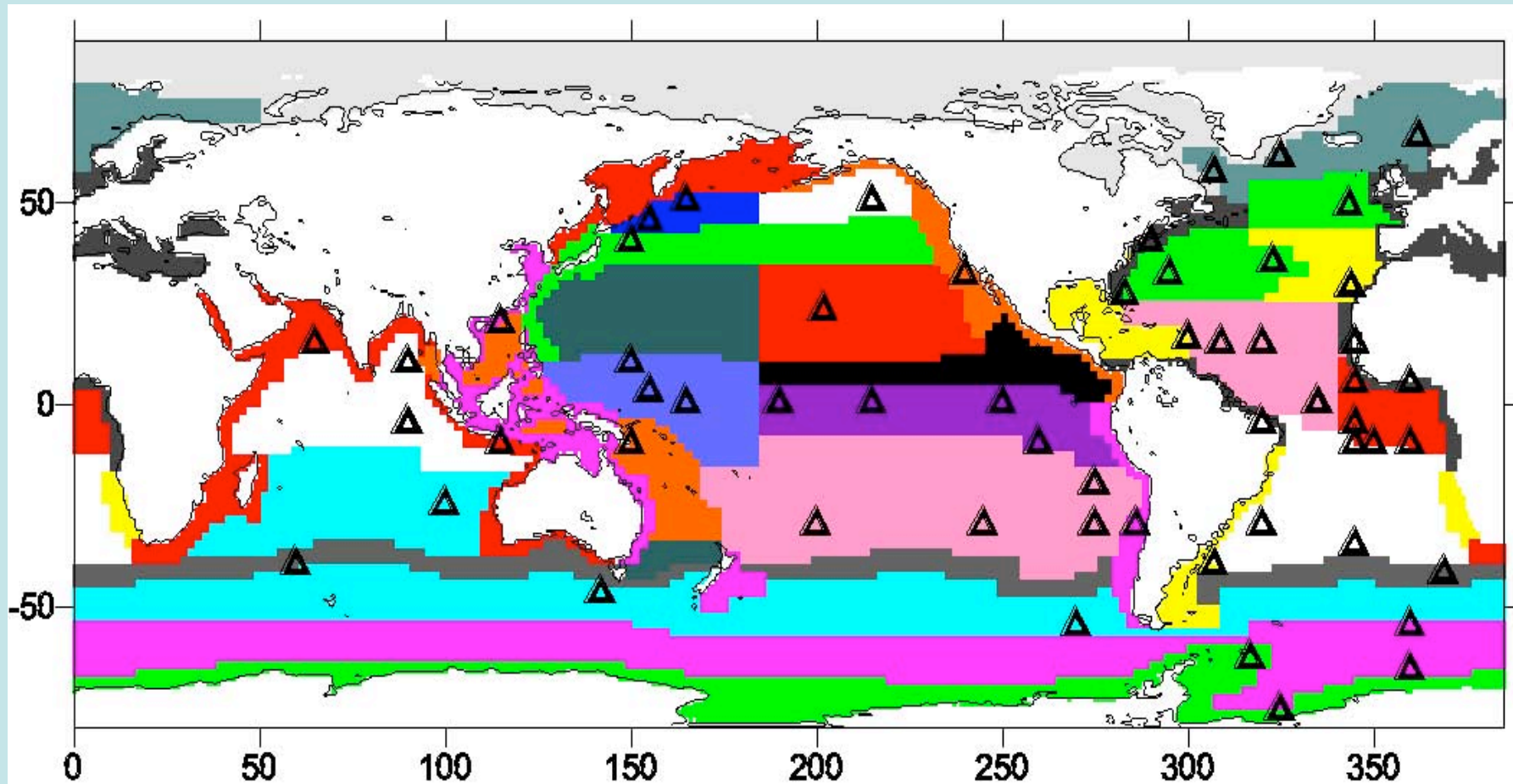


Image Source: NOAA Coast Watch <http://coastwatch.noaa.gov>

- Tectonic plate scale
- 2000 miles of fiber optic cable
- Network of submarine laboratories
- The Internet on the seafloor, 100kw of power and high bandwidth
- Real-time data return and control, fleets of ROVs and AUVs
- >30 year lifetime, adaptable and expandable

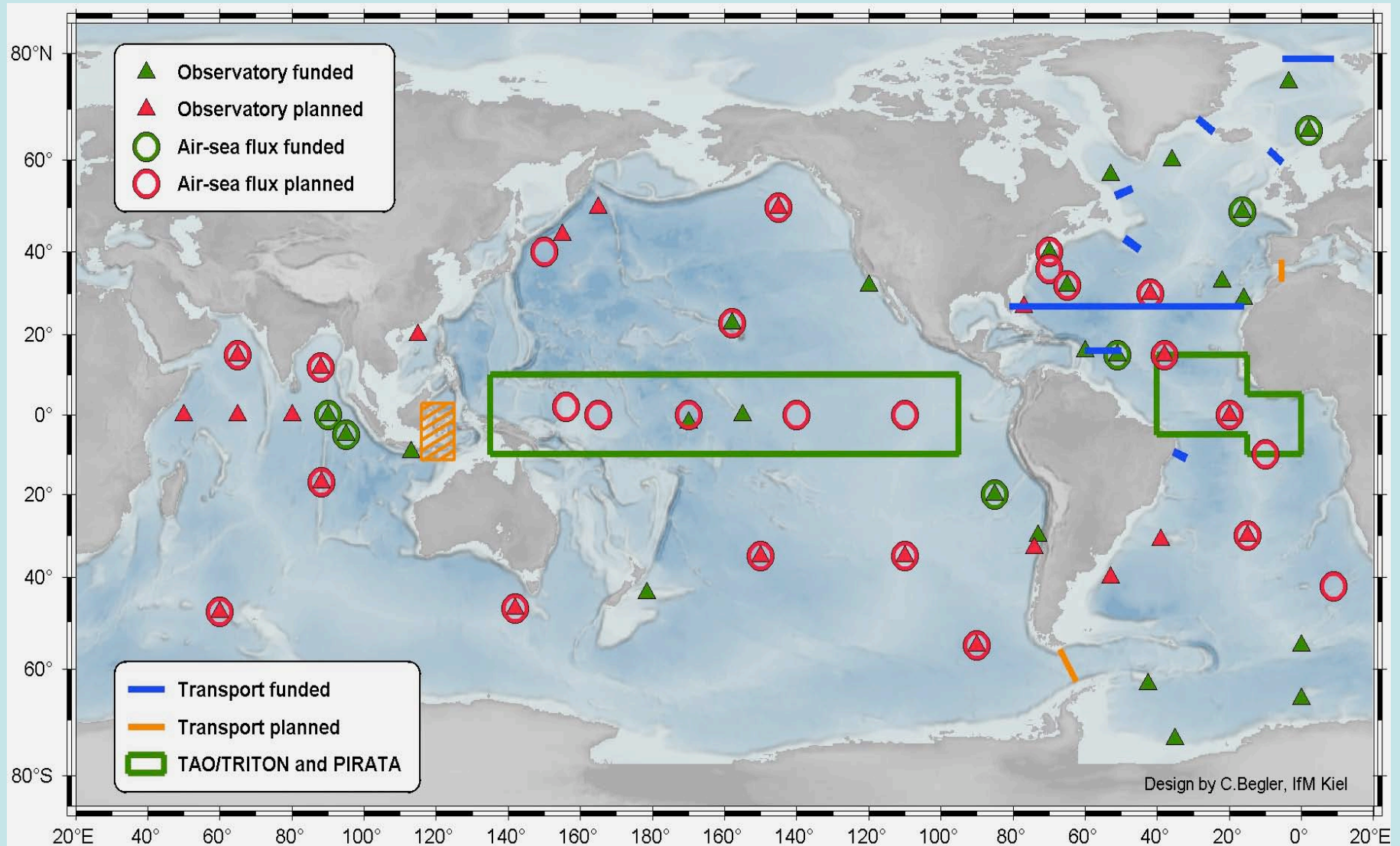


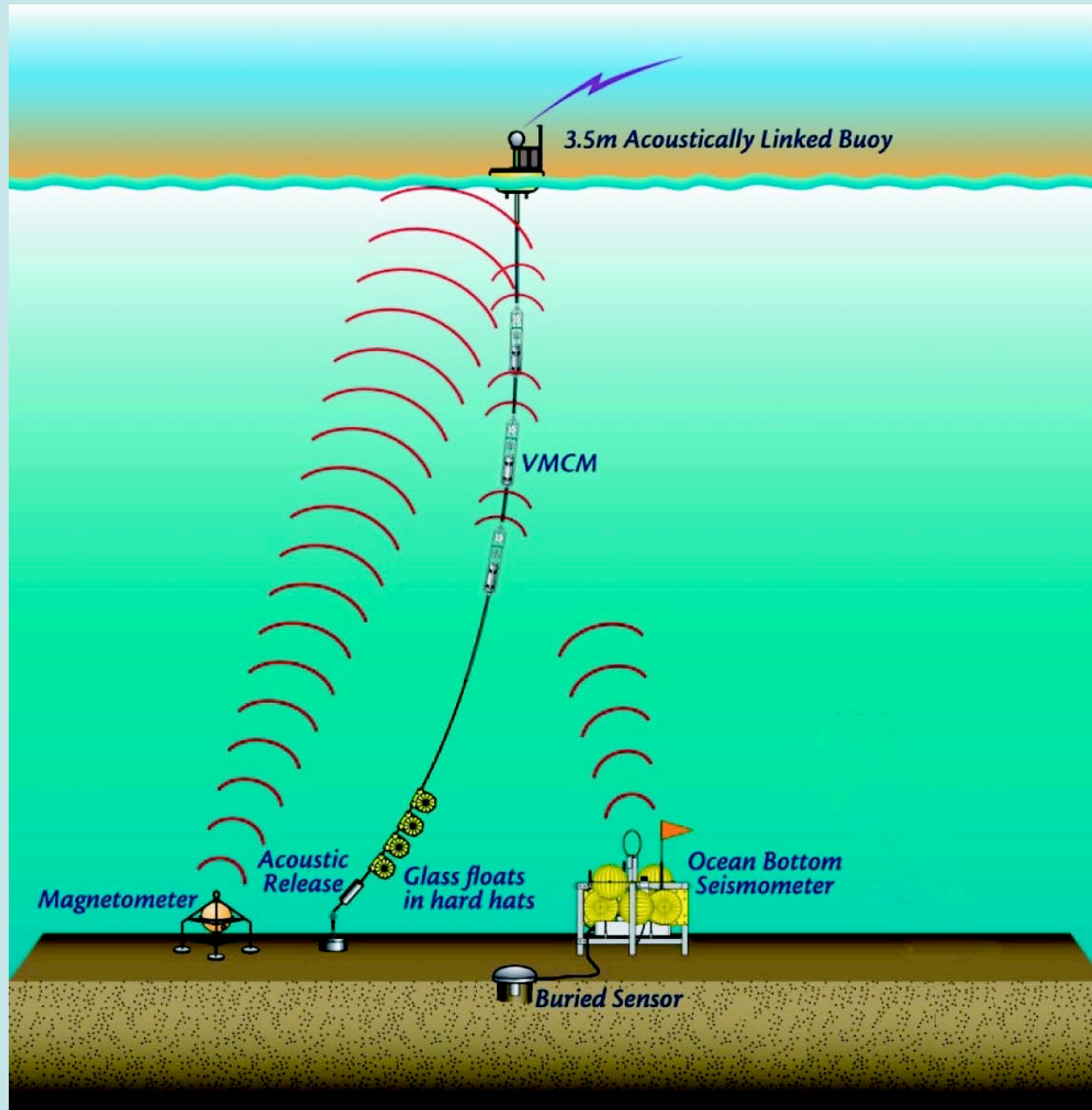


Principals for site selection: address “characteristic provinces or regions of as many disciplines as possible and/or very high value sites.

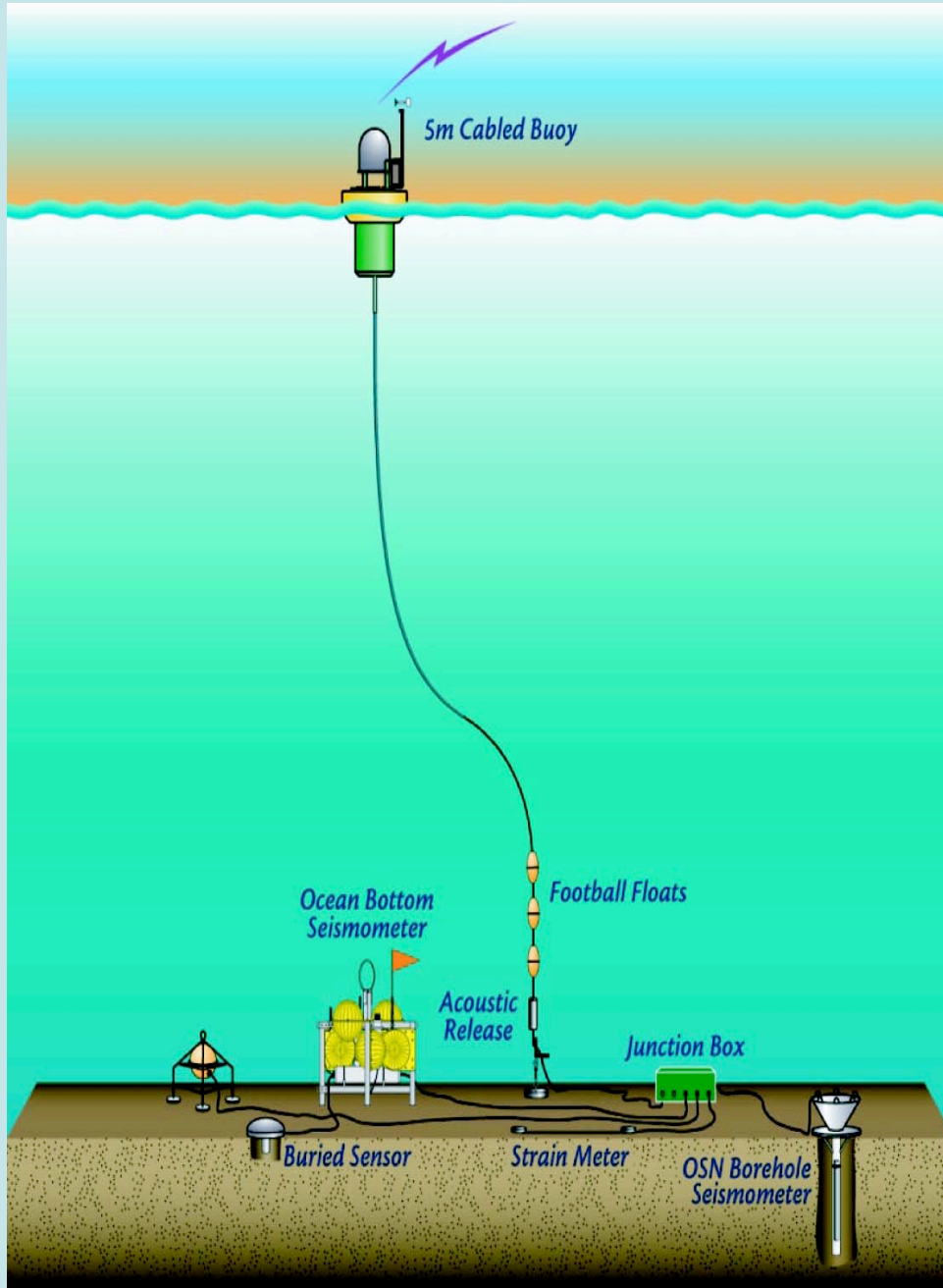
Shown: Longhurst’s (1995) 57 biological provinces, based on surface chlorophyll, vertical chlorophyll profile, mixed layer depth, surface nutrients, $N^2(z)$

Sites identified by Int'l Time Series Science Team

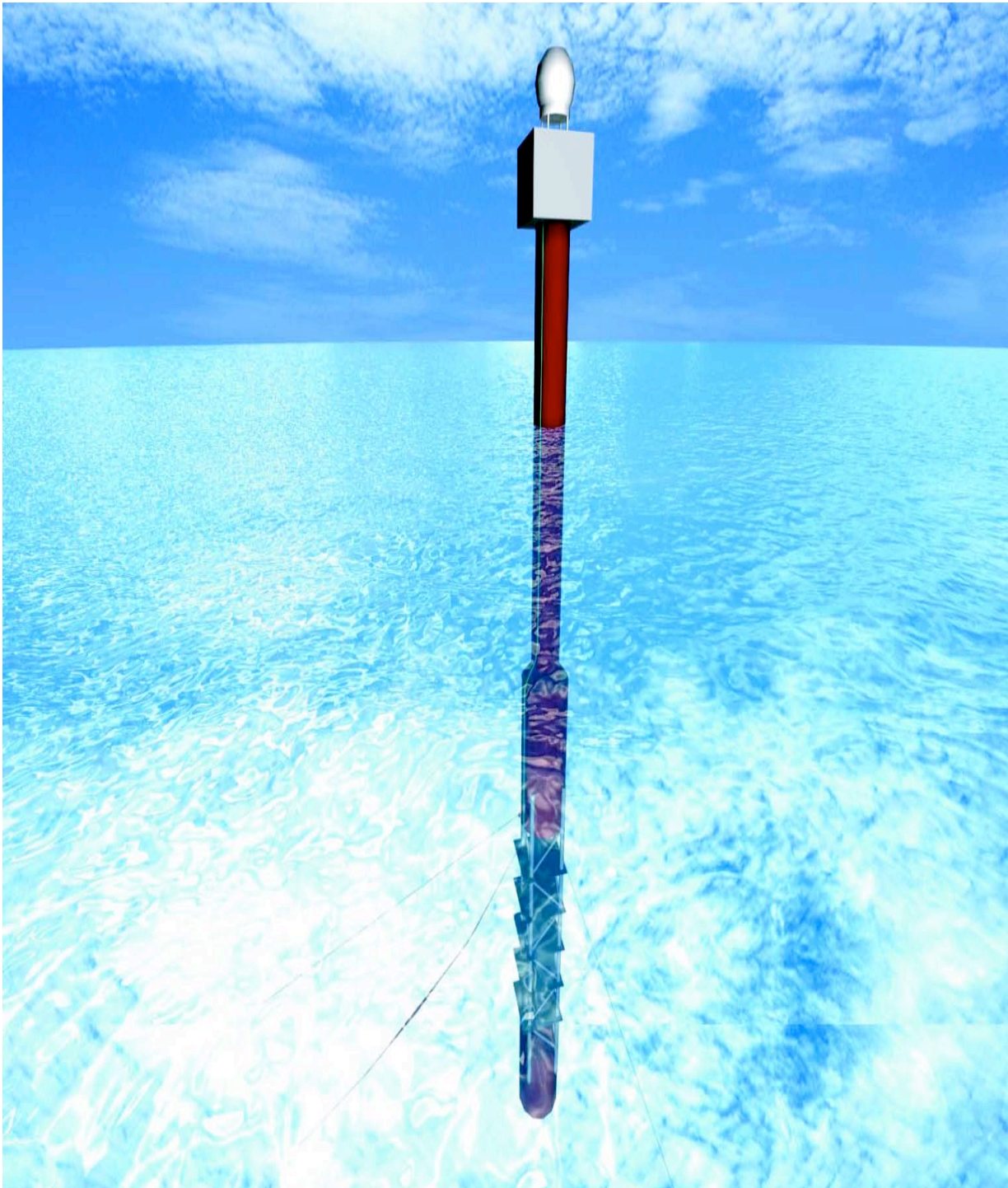




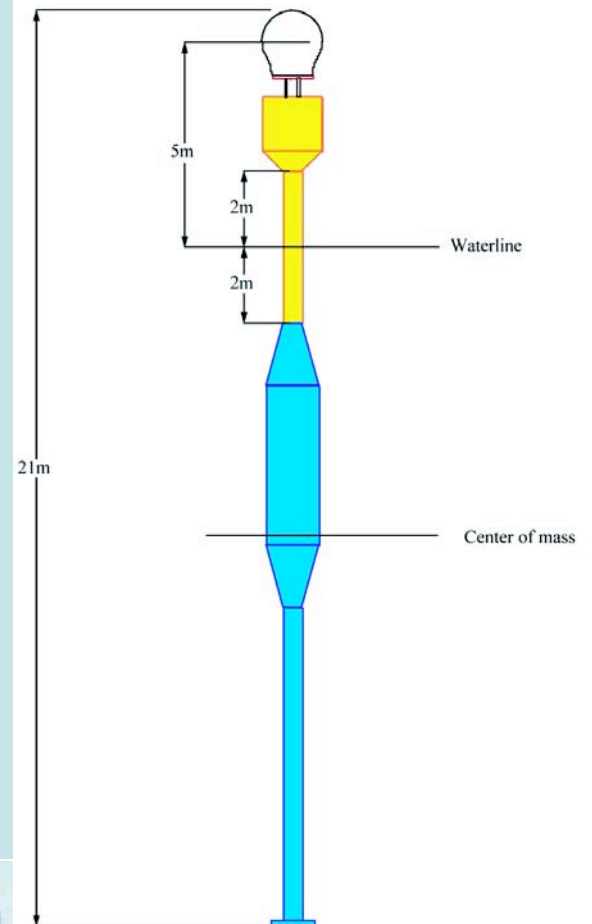
Building on existing capability - a low bandwidth, acoustically linked observatory



Electro-optical link from surface buoy to bottom, along bottom. Allows power down, data up. Satellite link via surface buoy.



**High bandwidth
in rough seas to
be addressed by
new buoy
designs.**

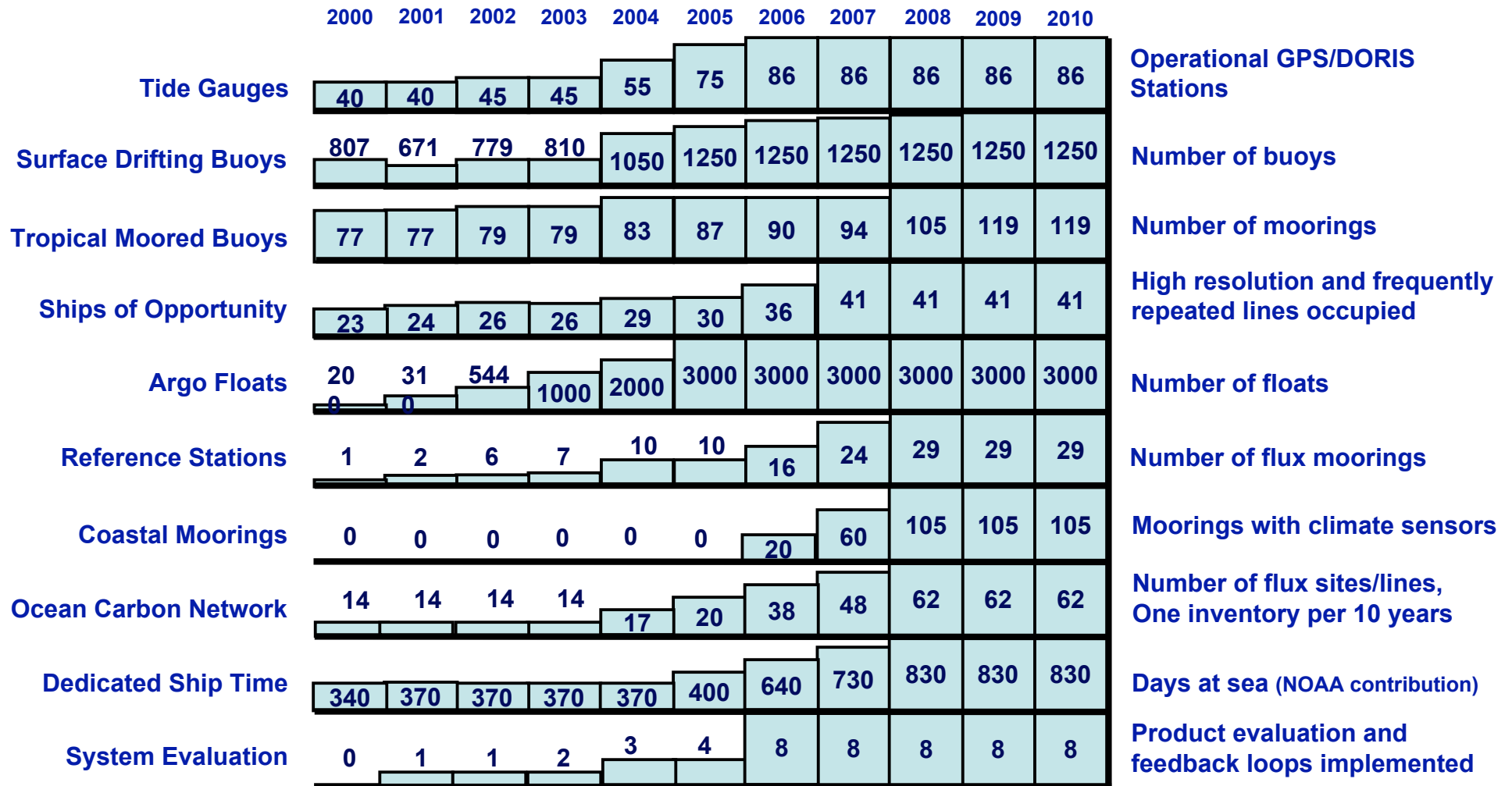




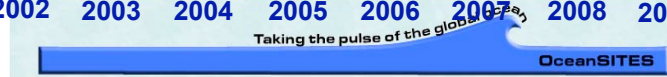
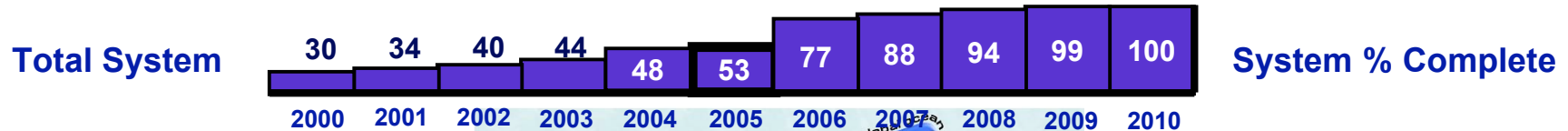
At the top of the spar,
a stabilized C-band
communications
system.

In the spar, power
generation.

NOAA Climate Obs Program Milestones



Initial Ocean Observing System Milestones including international contributions



The OOI will:

- **solicit proposals to build and operate each of the three elements, be responsible for maintenance, core instrumentation**
- **PI's will propose to use observatories as they would a UNOLS vessel**
- **Expand blue water capability and capacity**

Efforts underway to develop a coordinated global system:

- **multidisciplinary**
- **linking up changes at different locations**
- **detecting patterns**
- **understanding differences between regimes**
- **spreading/propagation of signals/changes**
- **harmonize/share technologies**
- **cross-community synergy, linked variables**
- **common data management and access**
- **common advocacy**

Adoption

Choosing sites:

- Key locations for a specific discipline
- Sites that are characteristic and representative of several disciplines
- Sites that will be foci for process studies and coordinated sampling in the region around them
- Sites that will be maintained, continuously, for long periods
- Data will be freely available



Servicing the WHOI mooring off northern Chile:
Every 12 months, a dedicated cruise is required with supporting in-situ calibration.
Operationalization of time series stations - implications? Coordination?
Support for Time Series Science Team?