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Human Health and Ocean Sciences
University of Washington
Elaine Faustman
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&
Community Medicine
Ginger Armbrust
School of Oceanography

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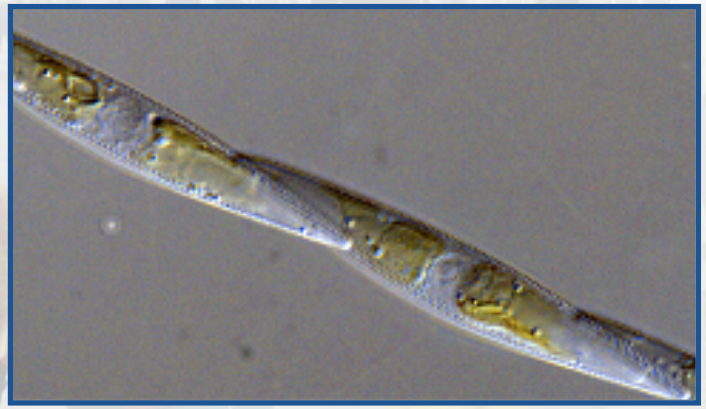
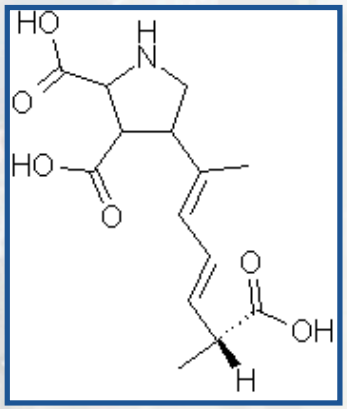
Initial focus is toxic diatoms



Pseudo-nitzschia



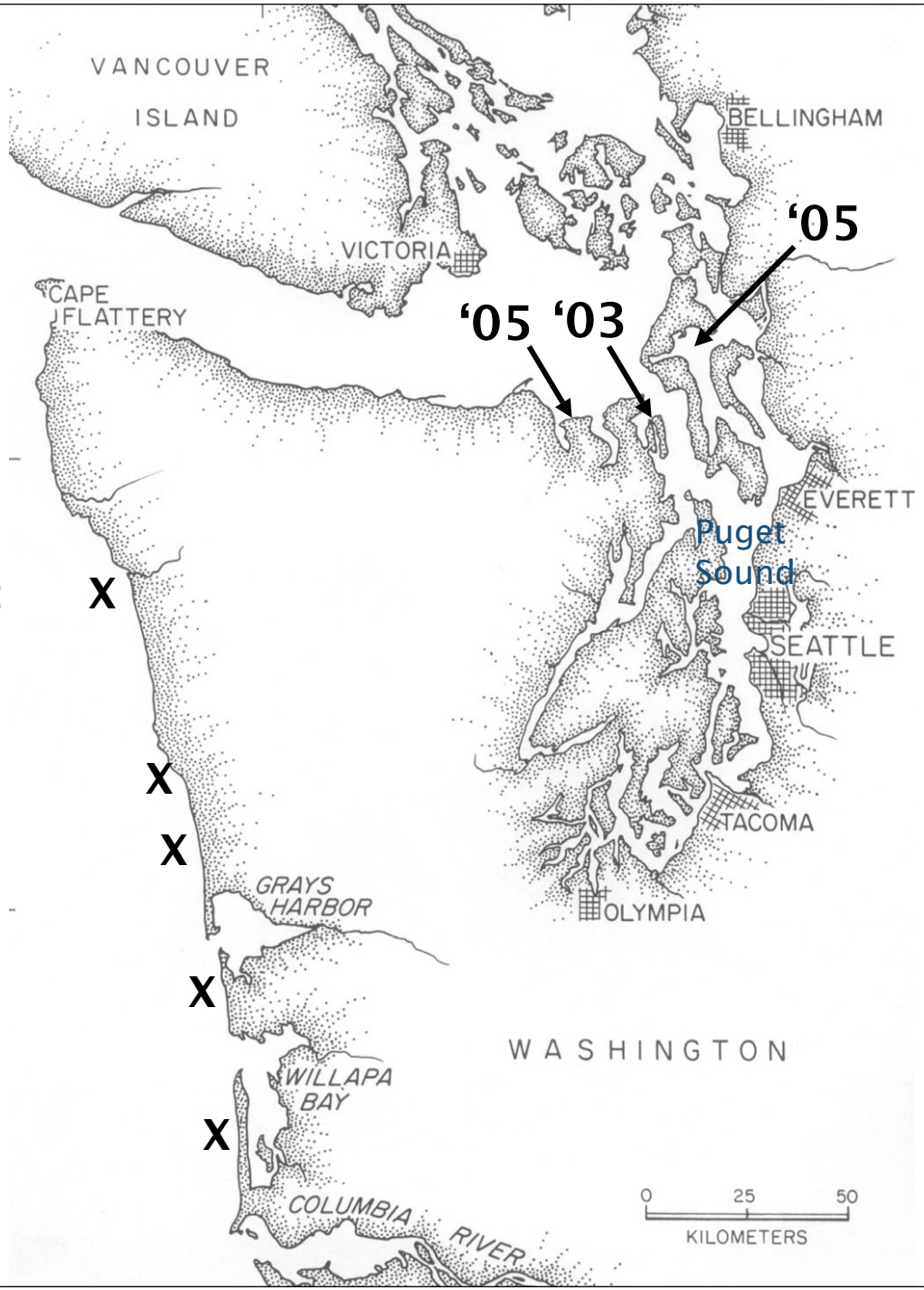
Domoic Acid

Consumption of shellfish contaminated with large amounts of domoic acid can result in amnesic shellfish poisoning

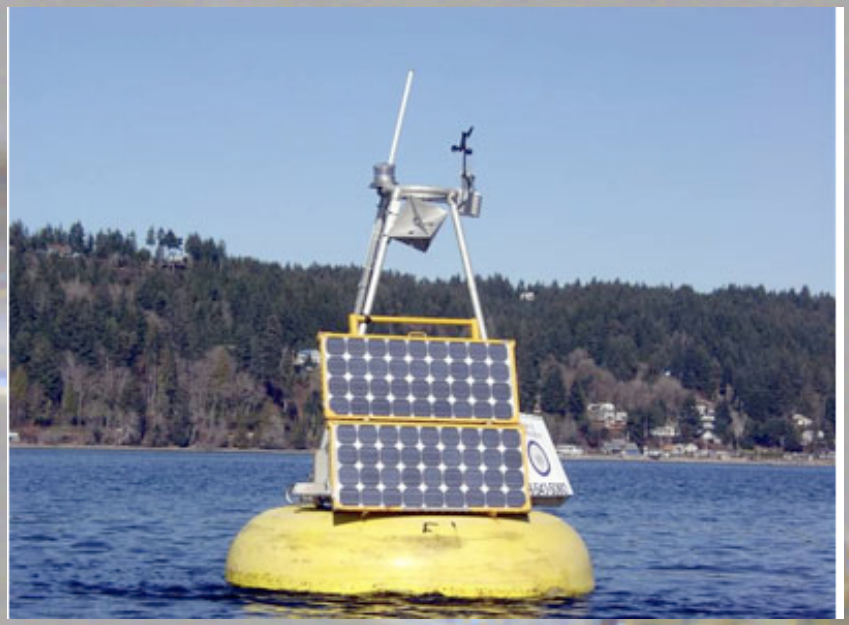
http://wdfw.wa.gov/fishcorn.htm

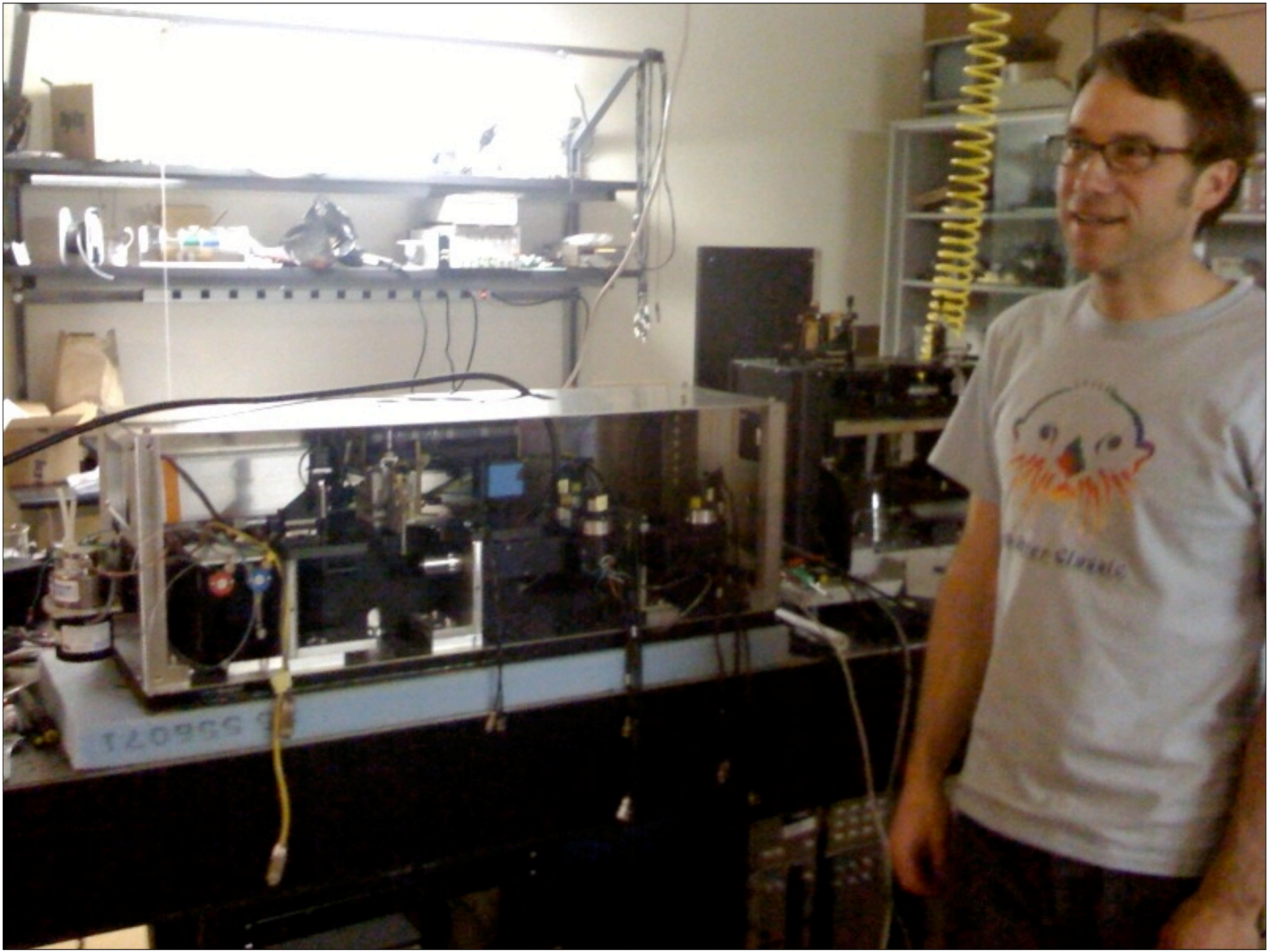
Pacific Ocean

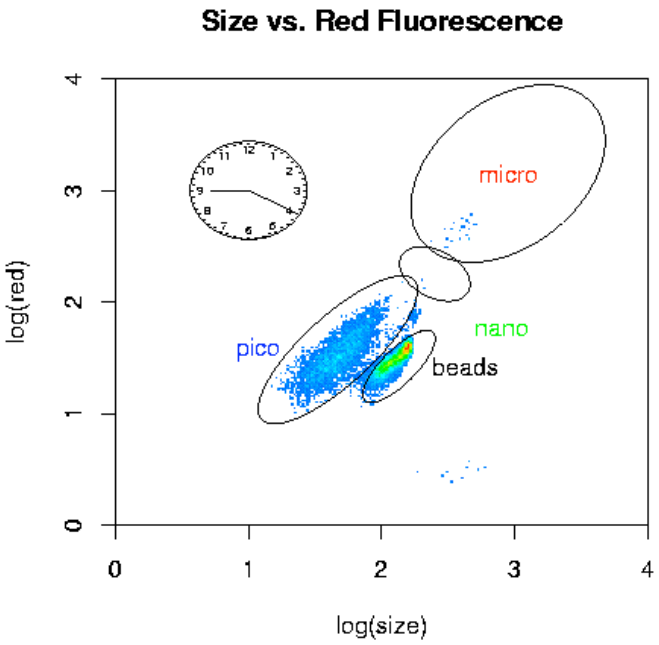
Shellfish closures:
1991-92
1994-95
1989-99
2001
2002-0
3
2004
2005
2006

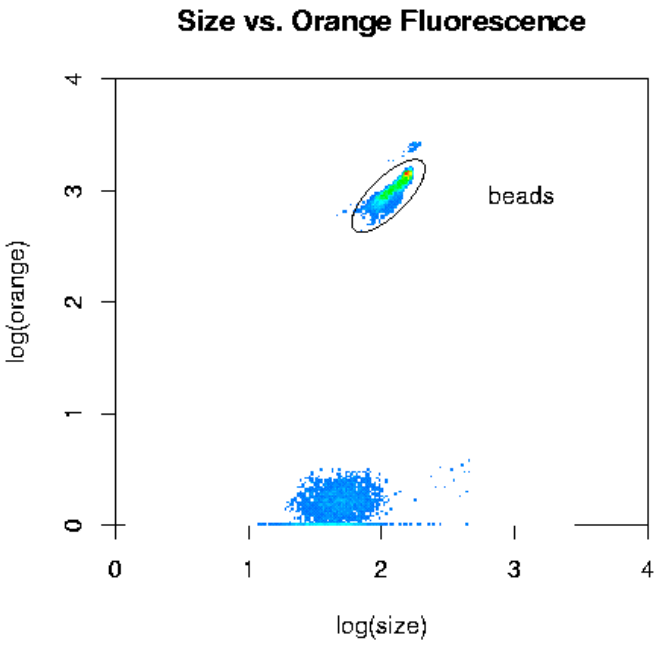


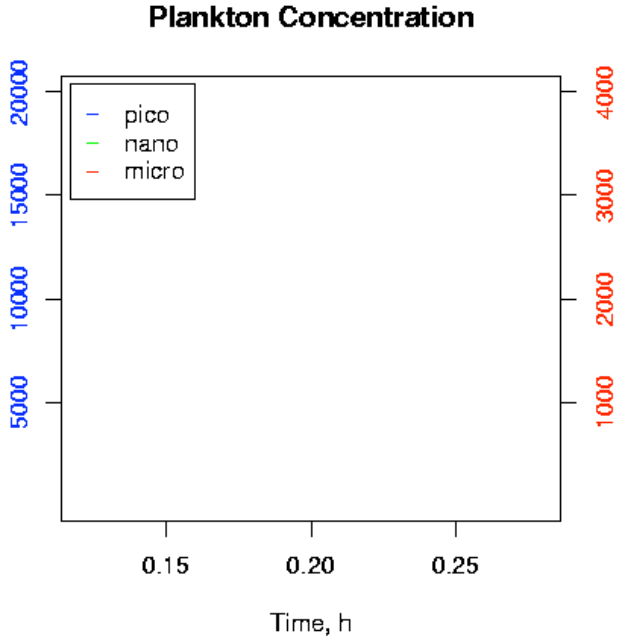
Developing sensitive methods to measure domoic acid in real time...

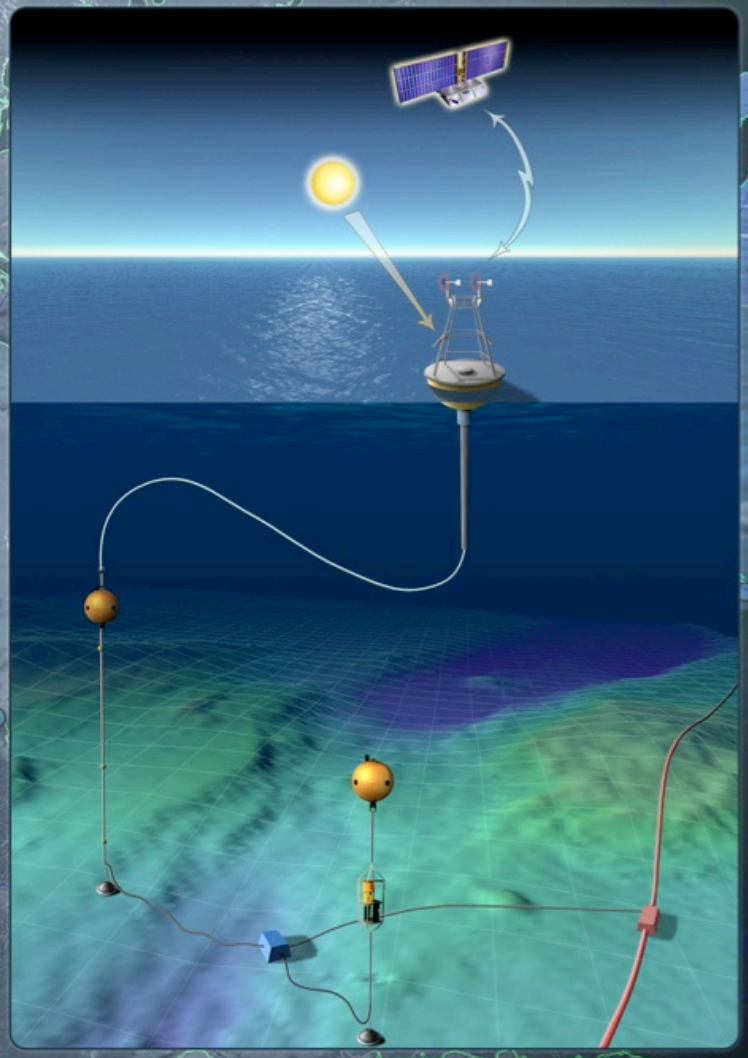





Size vs. Red Fluorescence
log(red)
log(size)
micro
nano
pico
beads
0
1
2
3
4

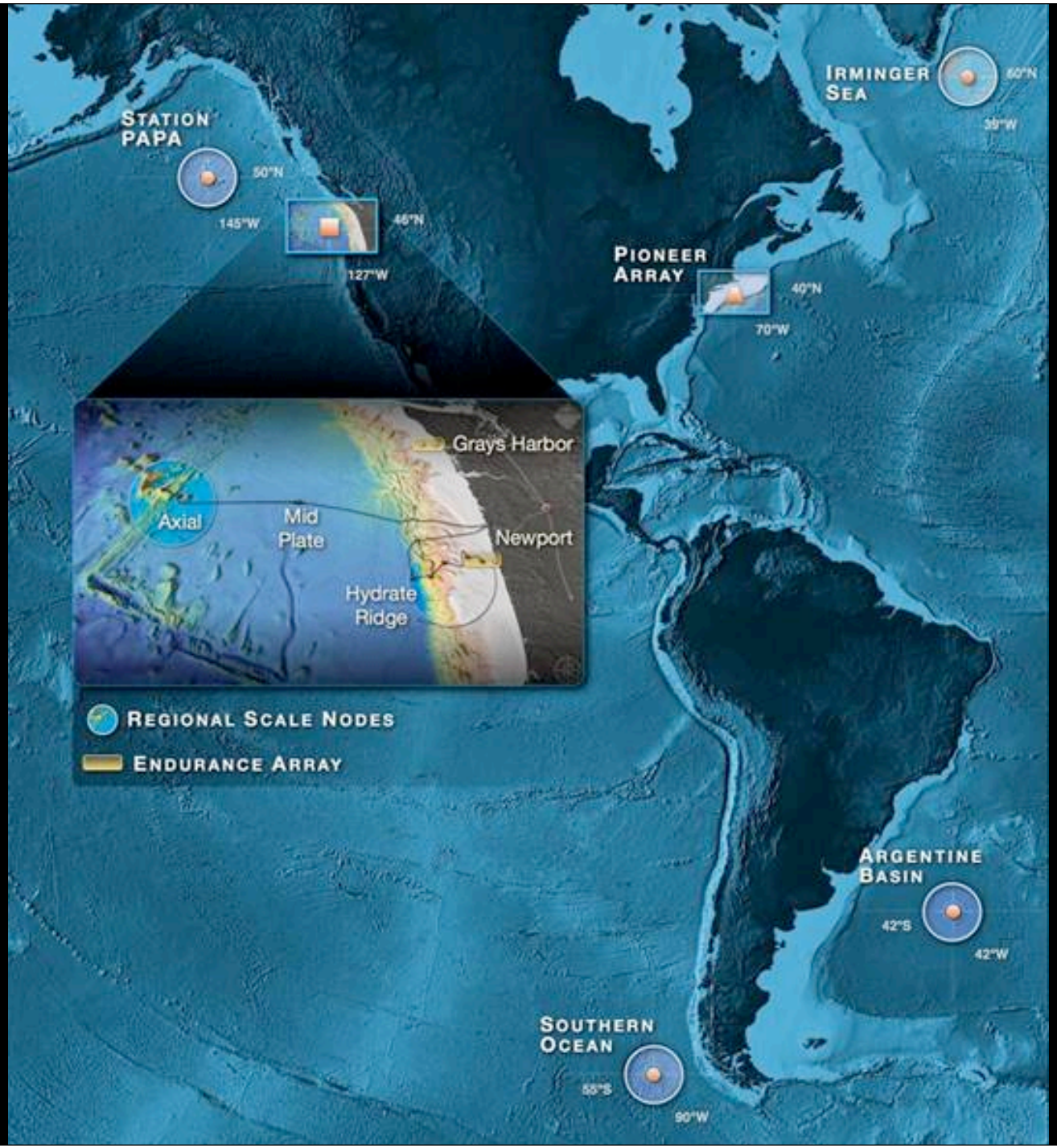

Size vs. Orange Fluorescence
log(orange)
log(size)
beads
0
1
2
3
4

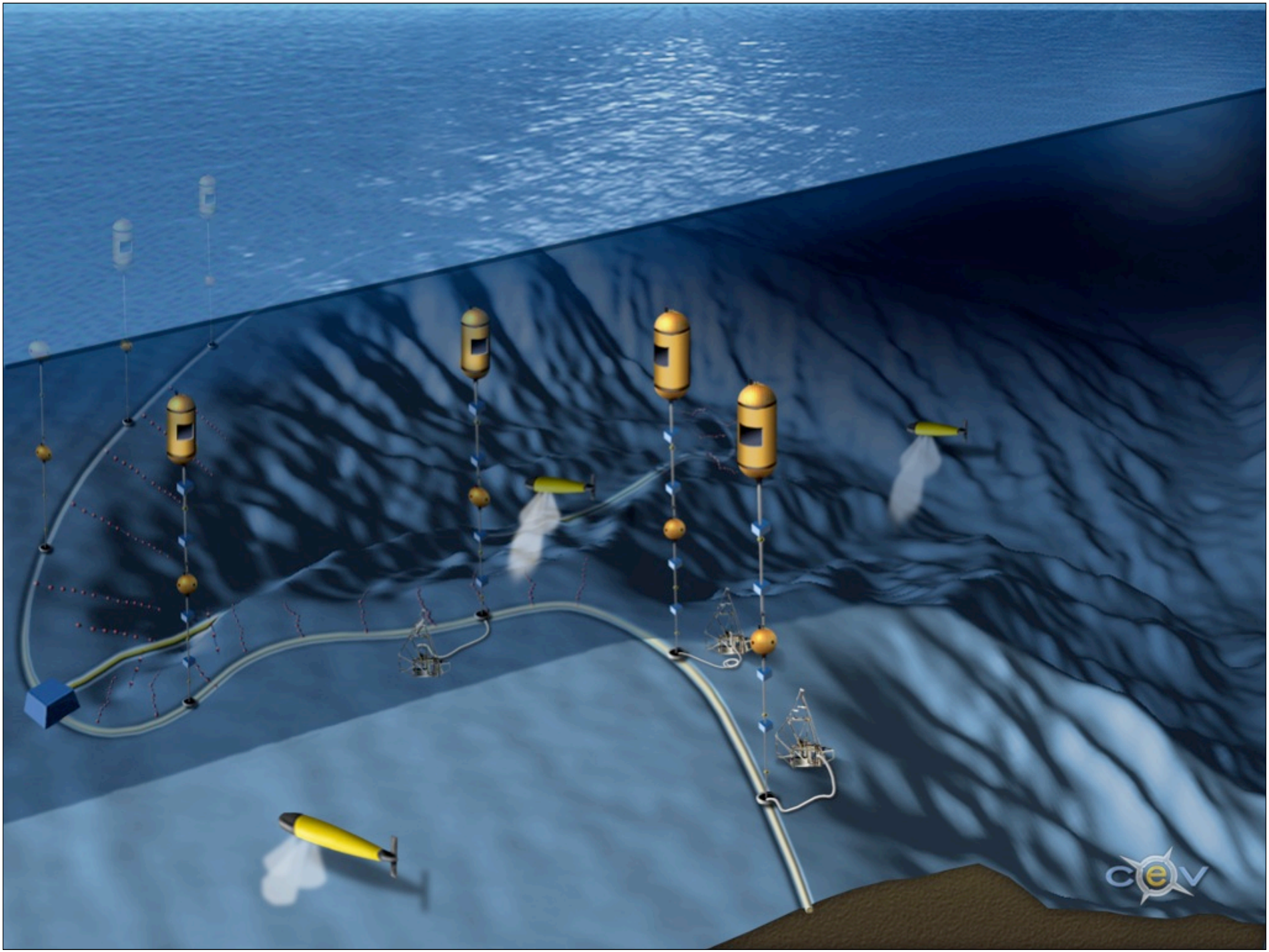

Plankton Concentration
pico
nano
micro
5000
10000
15000
20000
1000
2000
3000
4000
0.15
0.20
0.25
Time, h

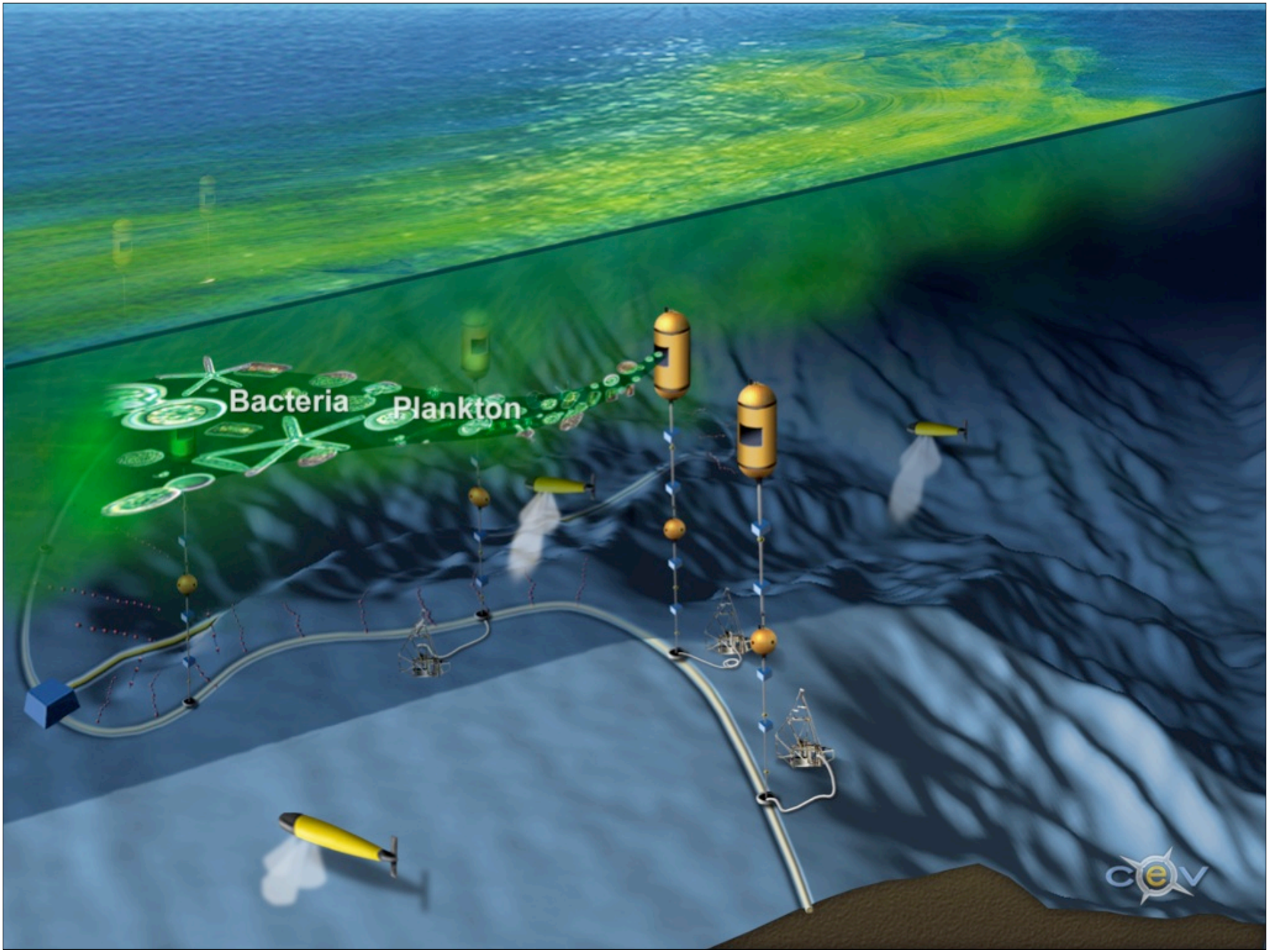


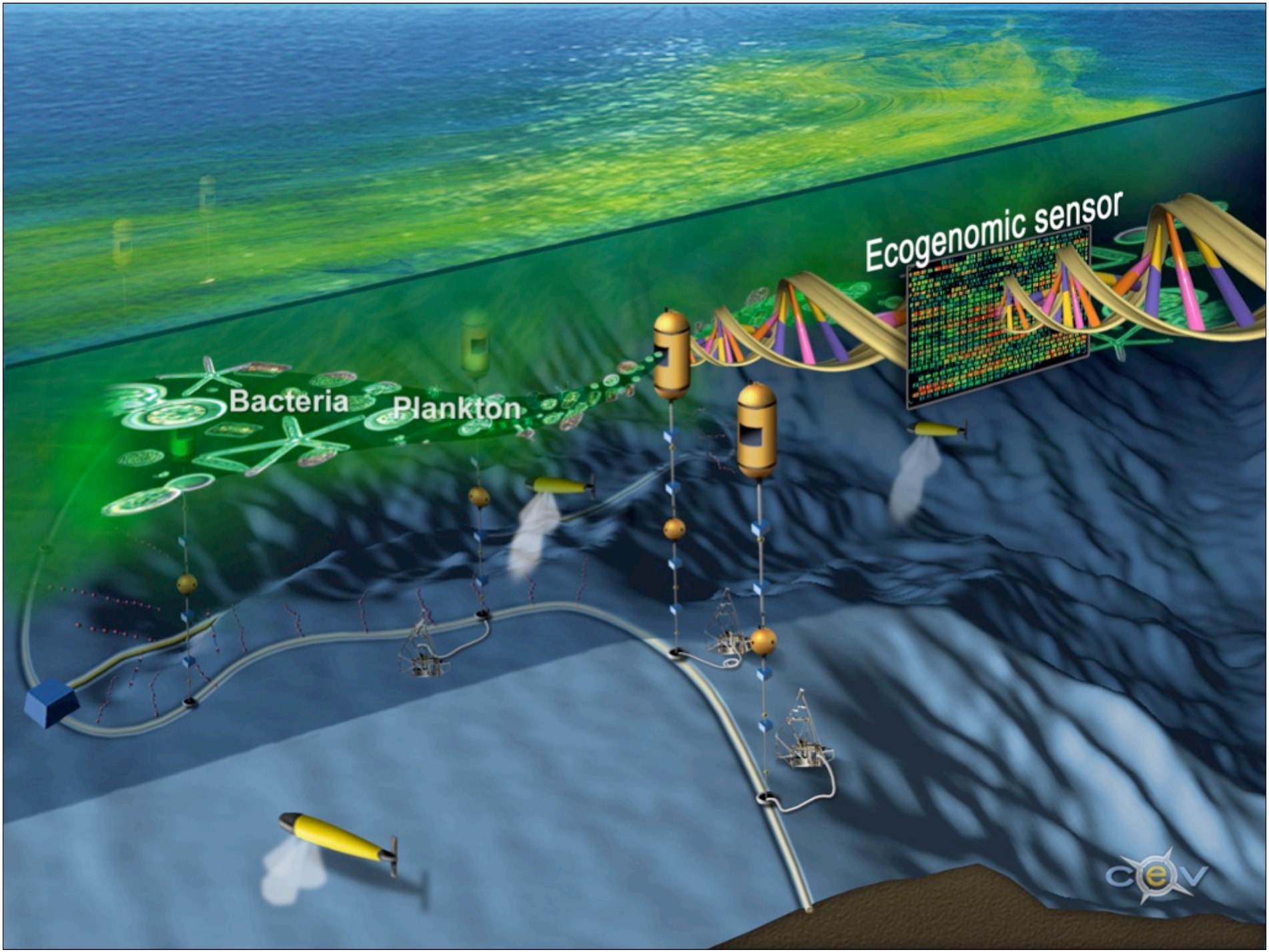
A Few Steps Into the Future...

Capturing Space and Time Underwater


STATION PAPA
50°N
145°W
46°N
127°W
IRMINGER SEA
60°N
39°W
PIONEER ARRAY
40°N
70°W
Grays Harbor
Axial
Mid Plate
Newport
Hydrate Ridge
REGIONAL SCALE NODES
ENDURANCE ARRAY
ARGENTINE BASIN
42°S
42°W
SOUTHERN OCEAN
55°S
90°W

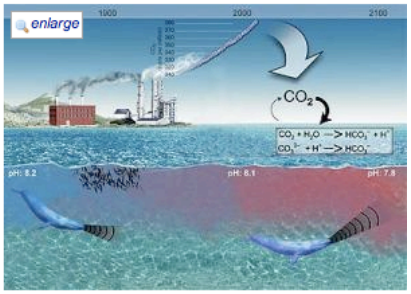



Bacteria
Plankton


Ecogenomic sensor
Bacteria
Plankton

Sounds Travel Farther Underwater As World's Oceans Become More Acidic

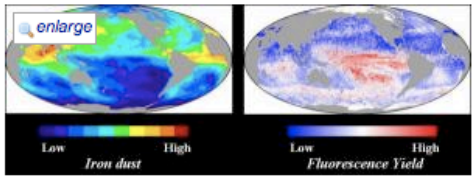
ScienceDaily (Sep. 30, 2008) — It is common knowledge that the world's oceans and atmosphere are warming as humans release more and more carbon dioxide into the Earth's atmosphere. However, fewer people realize that the chemistry of the oceans is also changing—seawater is becoming more acidic as carbon dioxide from the atmosphere dissolves in the oceans.



This illustration shows how increasing carbon dioxide in the atmosphere leads to an increase in the acidity of seawater, which in turn allows sounds (such as whale calls) to travel farther underwater. Image: (Credit: Copyright 2008 MBARI; Base image courtesy of David Fierstein)

Satellite Detects Red Glow To Map Global Ocean Plant Health

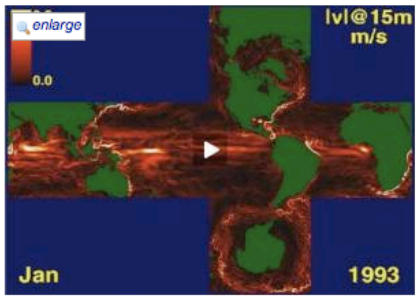
ScienceDaily (June 1, 2009) — Researchers from Oregon State University, NASA and other organizations said today that they have succeeded for the first time in measuring the physiology of marine phytoplankton through satellite measurements of its fluorescence – an accomplishment that had been elusive for years.



A digital image showing how the input of iron into marine ecosystems can affect phytoplankton growth in the oceans. (Credit: Image courtesy of Oregon State University)

NASA Supercomputing Goes Green: Modeling Earth's Ocean Climate

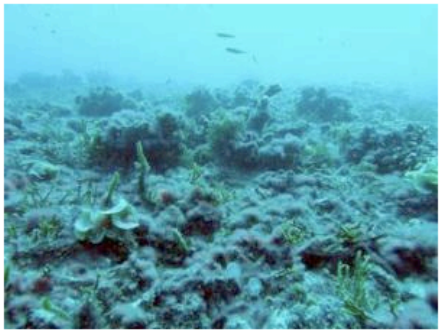
ScienceDaily (May 27, 2009) — Earth scientists are reaping huge benefits from research performed on NASA's advanced supercomputers. New cube-based simulations are helping to improve estimates of ocean circulation and climate.



Still image from an animation that shows ocean surface current speeds evolving in time (Jan. 1993 to Dec. 2002) and projected onto the cube grid. Red are faster surface currents (for example the Gulf Stream). (Credit: Image courtesy of NASA)

Mass Extinctions And 'Rise Of Slime' Predicted For Oceans

ScienceDaily (Aug. 13, 2008) — Human activities are cumulatively driving the health of the world's oceans down a rapid spiral, and only prompt and wholesale changes will slow or perhaps ultimately reverse the catastrophic problems they are facing.



During a recent research expedition to Kiritimati, or Christmas Island, Jeremy Jackson and other researchers documented a coral reef overtaken by algae, featuring murky waters and few fish. The researchers say pollution, overfishing, warming waters or some combination of the three are to blame. (Credit: Jennifer E. Smith)

In-depth Look At Northwestern Hawaiian Islands Marine Life, Ecosystems

ScienceDaily (May 27, 2009) — A new NOAA report on the Northwestern Hawaiian Islands (NWHI), protected by the Papahānaumokuākea Marine National Monument, provides the sharpest picture yet of the region's marine life and ecosystems.

Giant trevally along a shallow reef in the Northwestern Hawaiian Islands. (Credit: Claire Fackler, NOAA National Marine Sanctuaries)

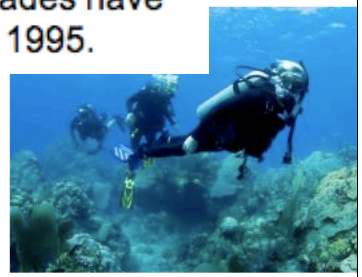
Lionfish Decimating Tropical Fish Populations, Threatening Coral Reefs

ScienceDaily (July 21, 2008) — The invasion of predatory lionfish in the Caribbean region poses yet another major threat there to coral reef ecosystems -- a new study has found that within a short period after the entry of lionfish into an area, the survival of other reef fishes is slashed by about 80 percent.

Lionfish. (Credit: Image courtesy of Oregon State University)

Major Losses For Caribbean Reef Fish In Last 15 Years

ScienceDaily (Mar. 20, 2009) — By combining data from 48 studies of coral reefs from around the Caribbean, researchers have found that fish densities that have been stable for decades have given way to significant declines since 1995.



By combining data from 48 studies of coral r from around the Caribbean, researchers have that fish densities that have been stable for

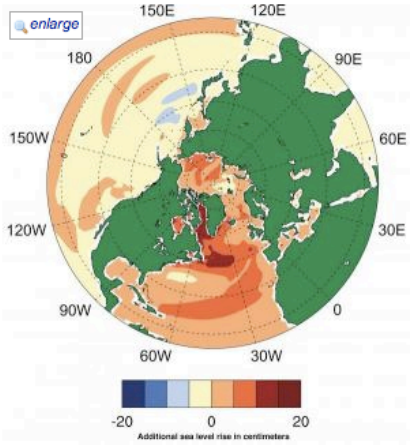
Melting Greenland Ice Sheets May Threaten Northeast United States, Canada

ScienceDaily (May 28, 2009) — Melting of the Greenland ice sheet this century may drive more water than previously thought toward the already threatened coastlines of New York, Boston, Halifax, and other cities in the northeastern United States and Canada, according to new research led by the National Center for Atmospheric Research (NCAR).

The study, which is being published

New Insight Into Decline Of Arctic Sea

ScienceDaily (May 15, 2009) — The mechanical behavior of the Arctic sea ice cover appears to favor its rapid decline. Scientists from INSU-CNRS, Université J. Fourier and Université de Savoie have analyzed the trajectories of drifting buoys anchored in the ice and found that the mean drift rate and deformation rate of Arctic sea ice has strongly increased over the last three decades. These effects, related to the mechanical properties of the cover, contribute to the faster-than-expected decline of Arctic sea ice.



This visualization, based on new computer modeling, shows that sea level rise may be an additional 10 centimeters (4 inches) higher by populated areas in northeastern North America than previously thought. Extreme northeastern North America and Greenland may experience even higher sea level rise. (Credit: Graphic courtesy Geophysical Research Letters, modified by UCAR)

1) Understand how ocean processes affect the health of our planet
2) Understand the interdisciplinary nature of oceanography
3) Understand the science behind topics discussed in news
4) Appreciate the excitement of conducting research at sea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