

The Ocean Observatories Initiative: Advancing and Democratizing Marine Science

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NSF's Ocean Observatories Initiative

- Number of Arrays: 7 (4 Global, 2 Coastal, 1 Cabled)
- Types of platforms: Gliders, AUVs, profilers, surface moorings, fixed instrument chains, seafloor and subseafloor installations
- Number of simultaneously deployed instruments: 857
- Number of instrument types: 48
- Data Volume Produced: 3 Petabytes/year
- High power (10kV) and high speed data (10Gbs) fiber optic cable, satellite modems, acoustic modems, inductive modems
- Build: 5 years (deployments completed in 2015)
- Operations: ~20 years



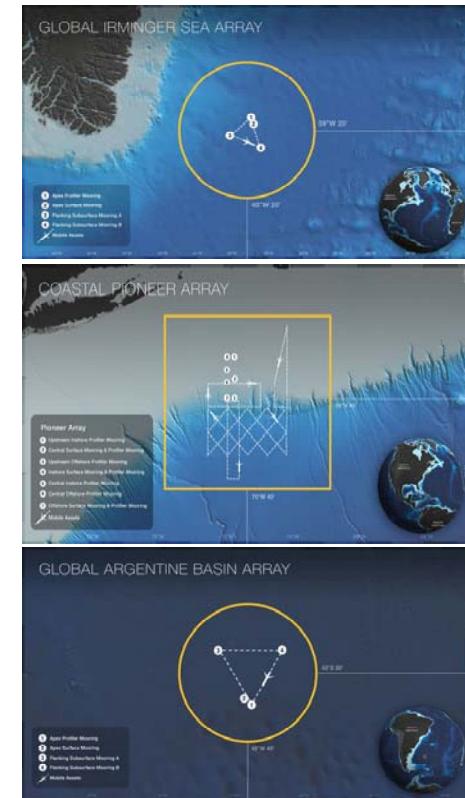
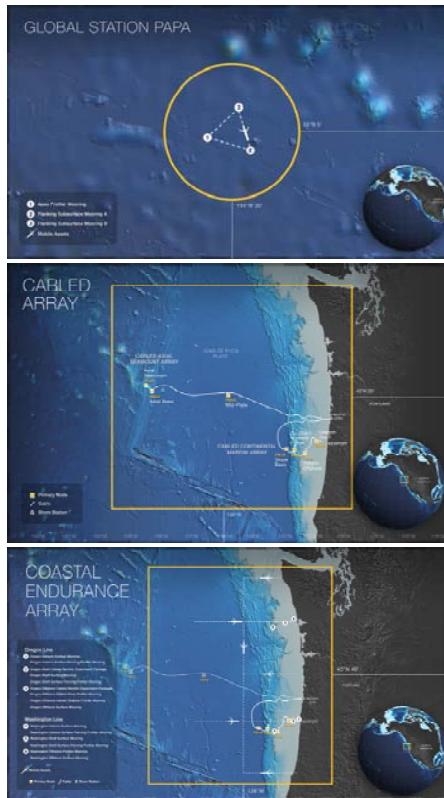


OOI Science Themes

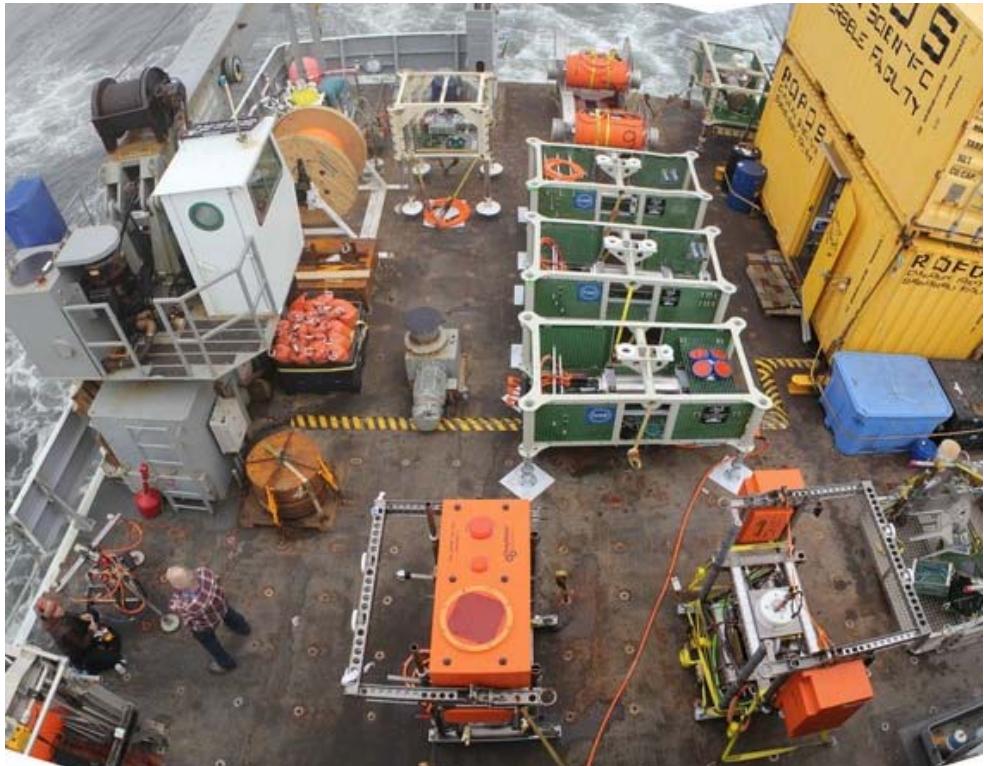
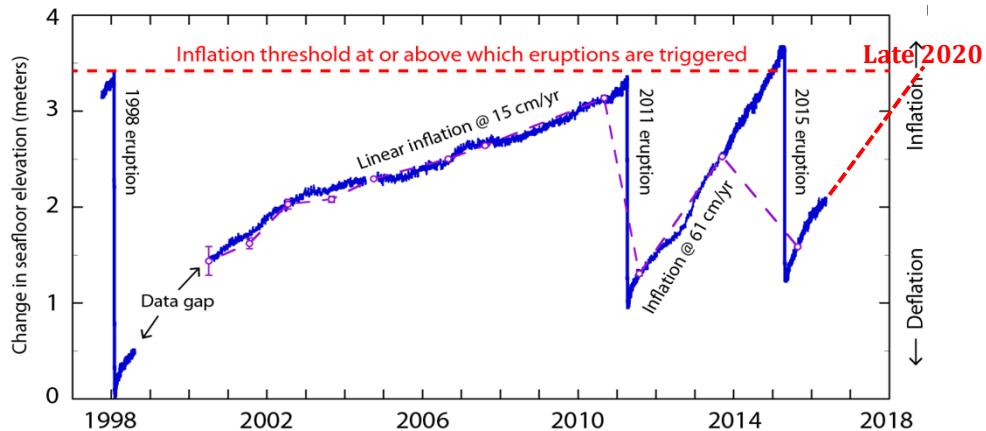
- Global Biogeochemistry and Carbon Cycling
- Ocean-Atmosphere Exchange
- Ocean Circulation, Mixing and Ecosystems
- Climate Variability and Ecosystems
- Coastal Ocean Dynamics and Ecosystems - Hypoxia on Continental Shelves
- Coastal Ocean Dynamics and Ecosystems - Shelf/Slope Exchange



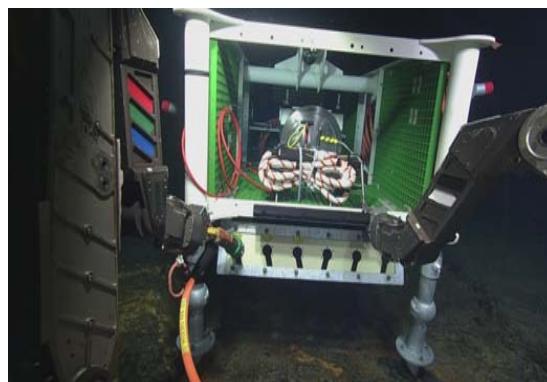
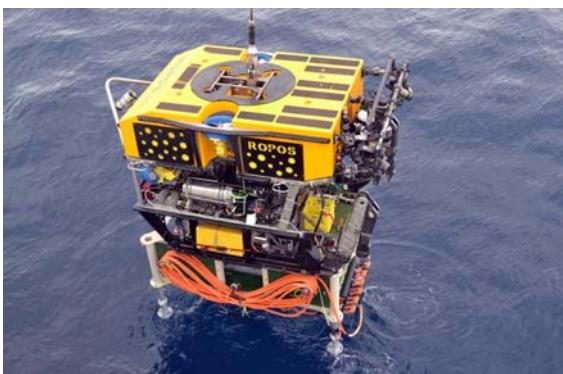
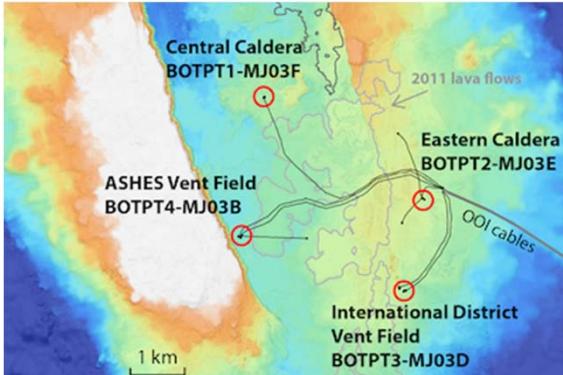
The Cabled, Coastal & Global Arrays



The Cabled Array

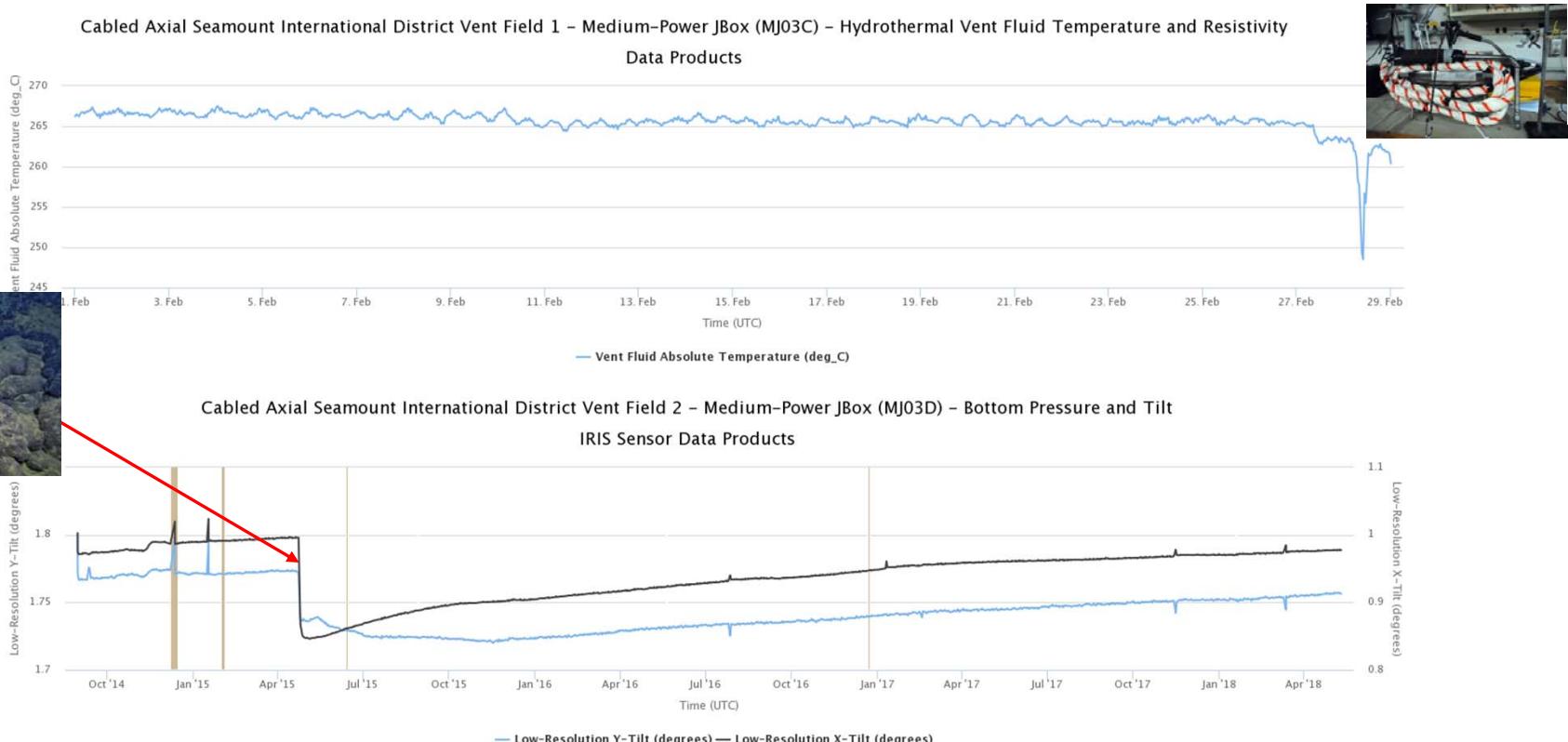


Cabled International District 1 Site

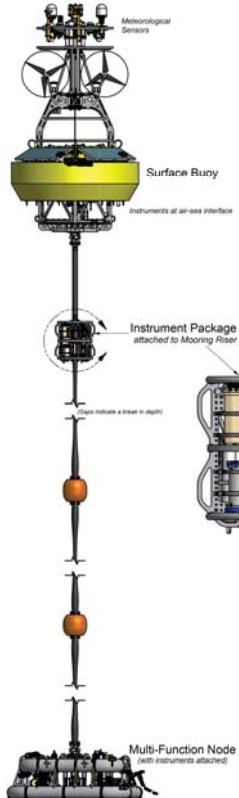


Cabled Array Example Data

April 24, 2015 Eruption
of Axial Seamount



Fixed and Mobile Platform Examples



Buoys

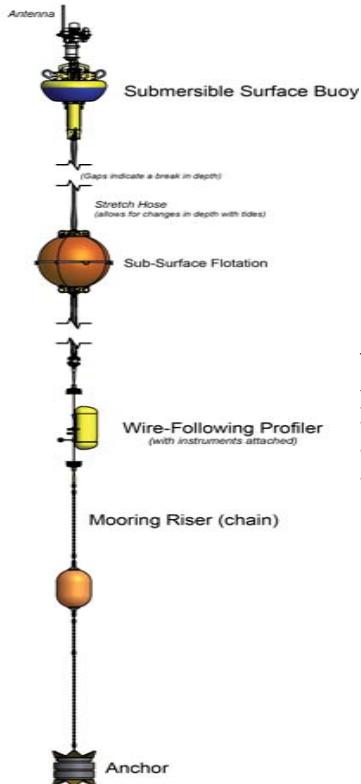
- Wind, rain, humidity
- Air pressure & temperature,
- Long & short wave radiation
- Wave spectra, air-sea pCO₂
- Surface CT & velocity

7m on moorings

- CTD, O₂,
- Chl-a, OBS, CDOM
- Point velocity
- Spec. Irrad., NO₃,
- Opt. Atten. & Absorp.
- pH, pCO₂, ADCP

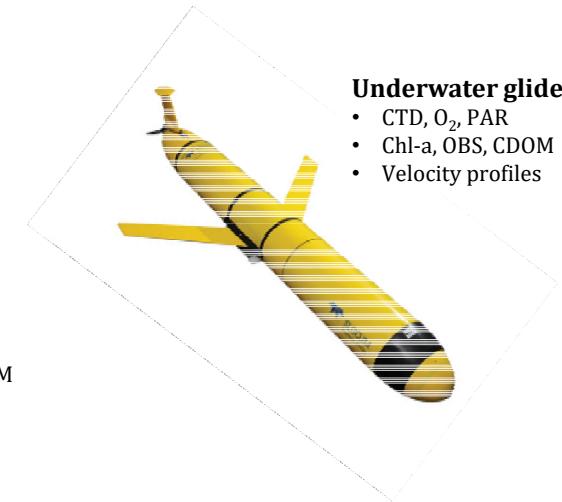
Mooring Anchors

- CTD, O₂,
- Chl-a, OBS, CDOM
- Fast point velocity
- Opt. Atten. & Absorp.
- pH, pCO₂, ADCP
- Bioacoustic sonar, camera,
- Integrated pressure



Wire following profiler

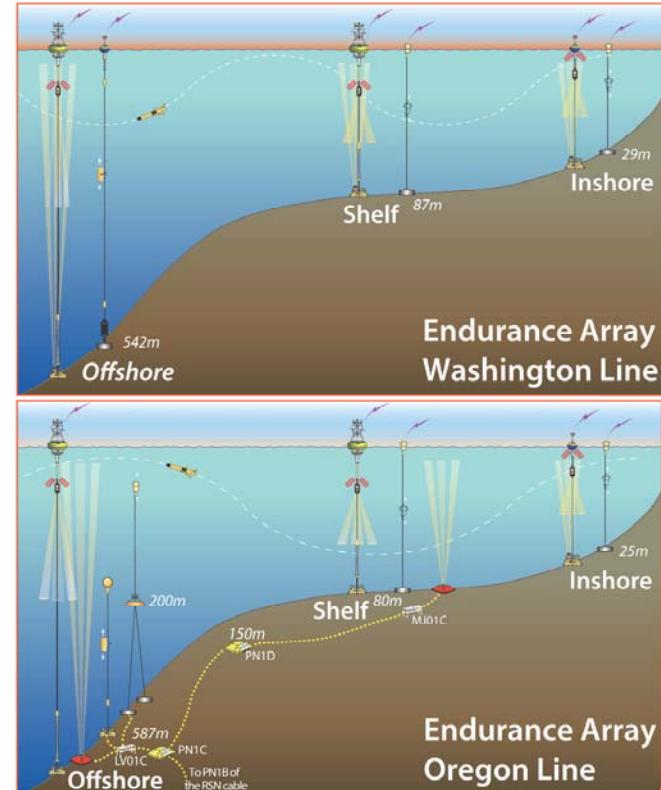
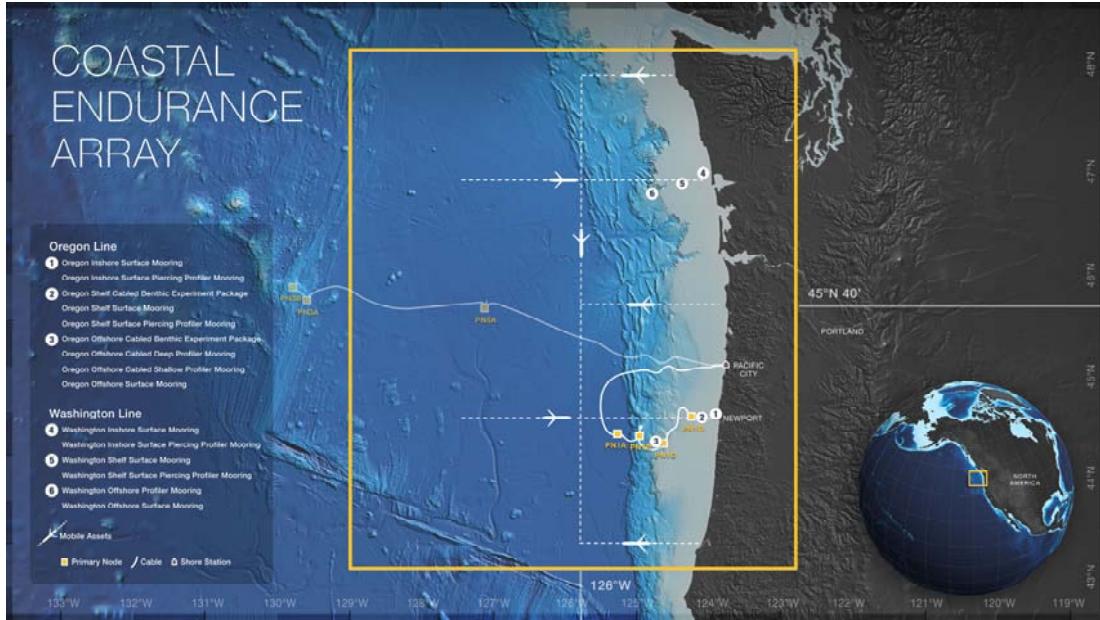
- CTD, O₂, PAR
- Chl-a, OBS, CDOM
- Point velocity



Underwater gliders

- CTD, O₂, PAR
- Chl-a, OBS, CDOM
- Velocity profiles

Coastal Endurance Array



Mooring Assembly and Integration



Ocean Observing Center
Corvallis, OR



Shipping Equipment to the Coast



Cruise Mobilization

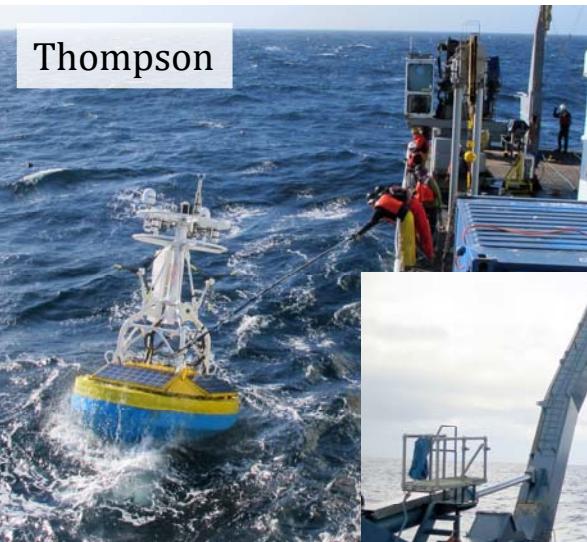




A APPLETON

Operational Challenges

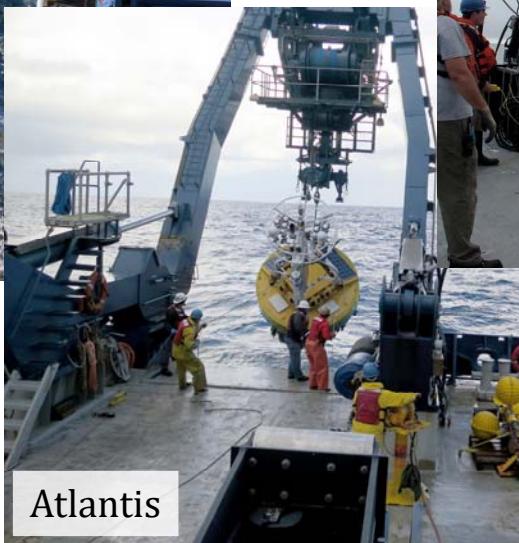
Thompson



Oceanus



Sikuliaq



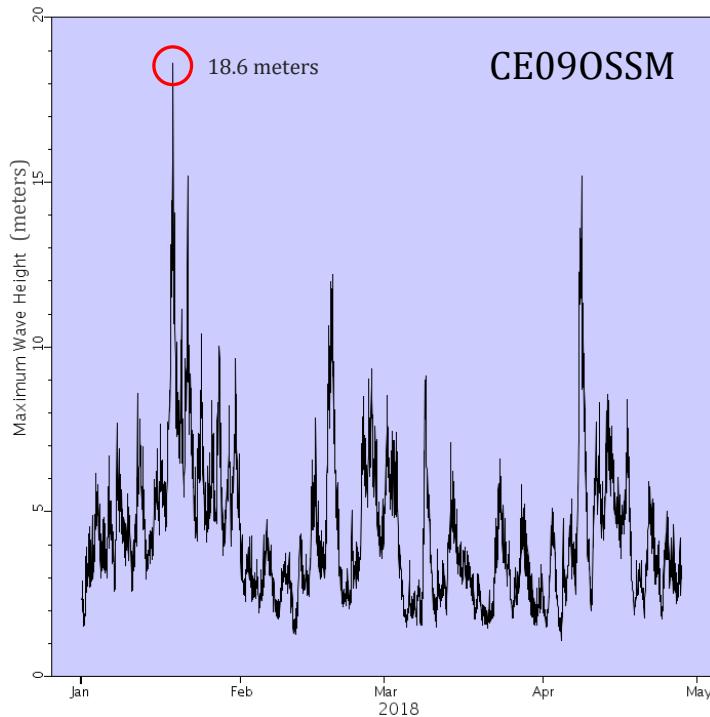
Atlantis



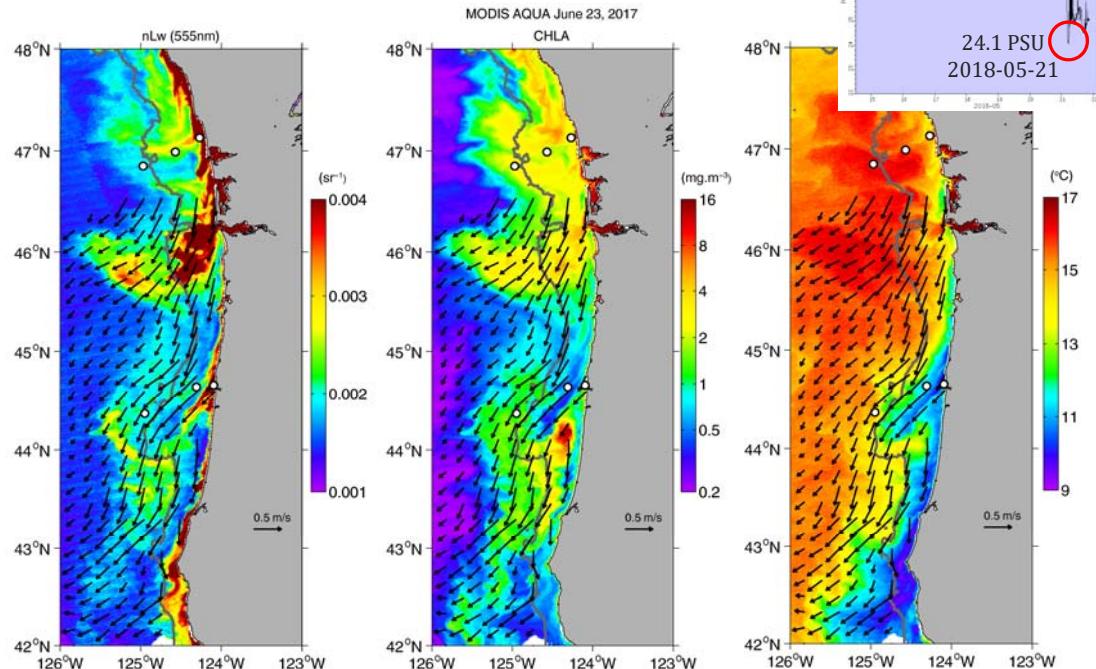
Sally Ride

Operational Challenges Cont.

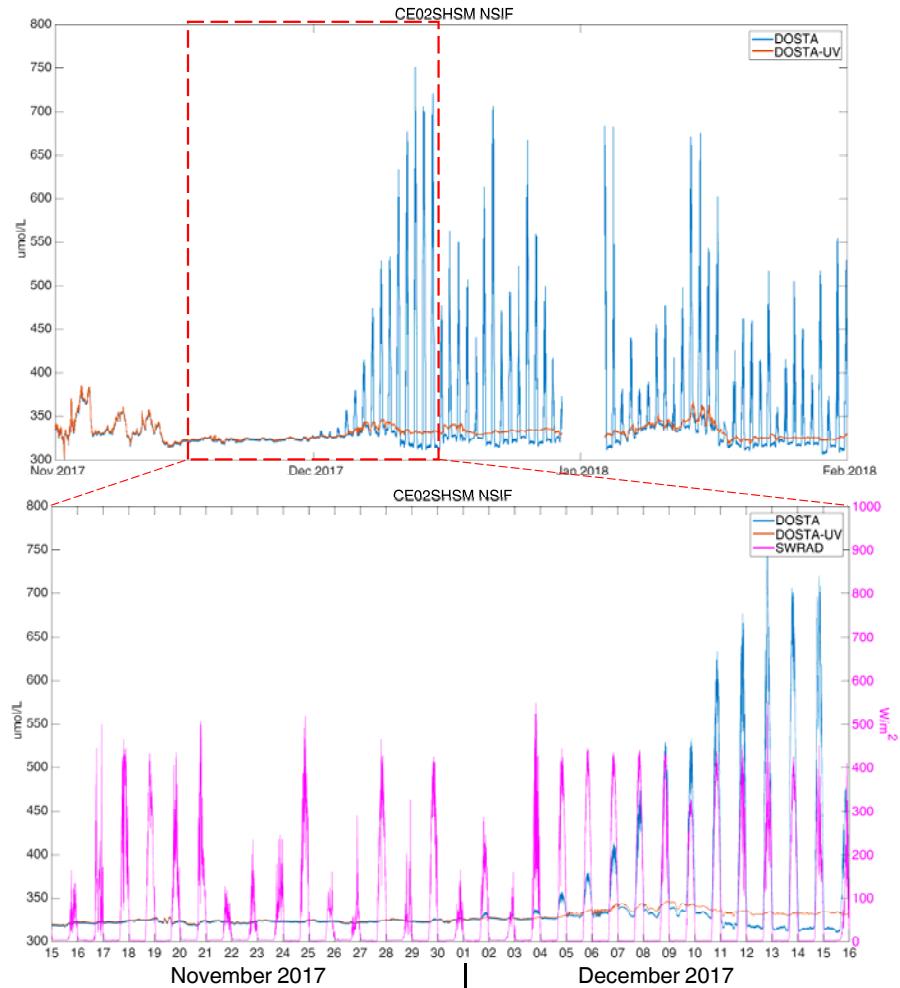
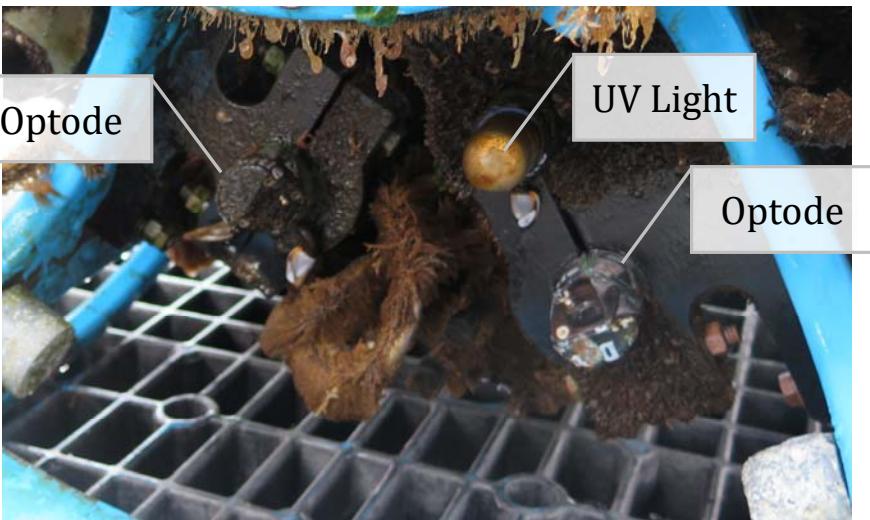
Winter storms



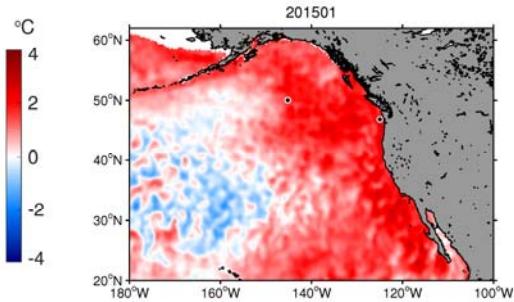
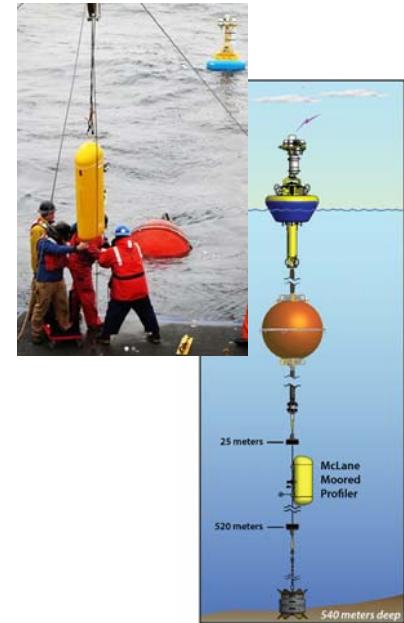
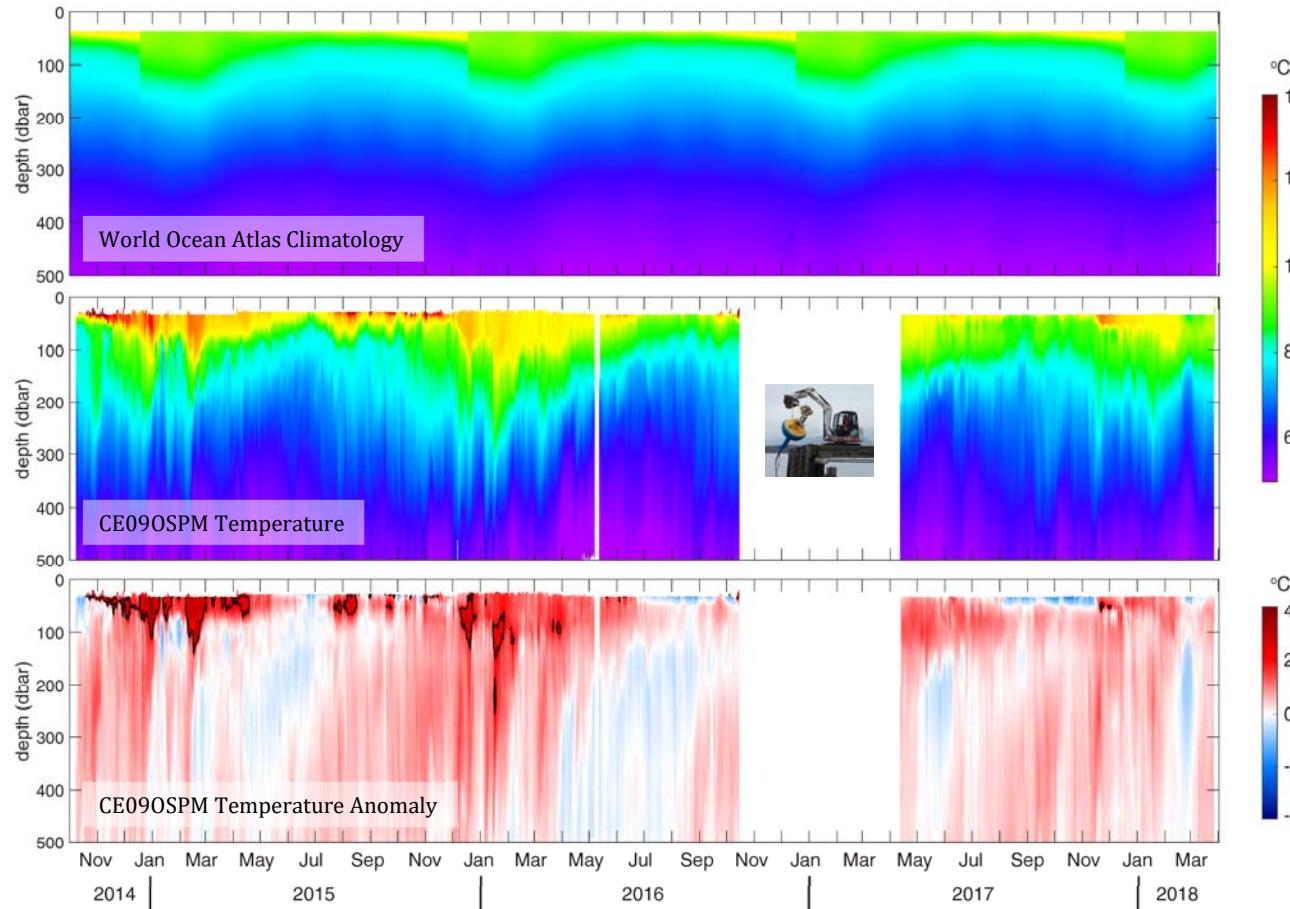
Columbia River plume water



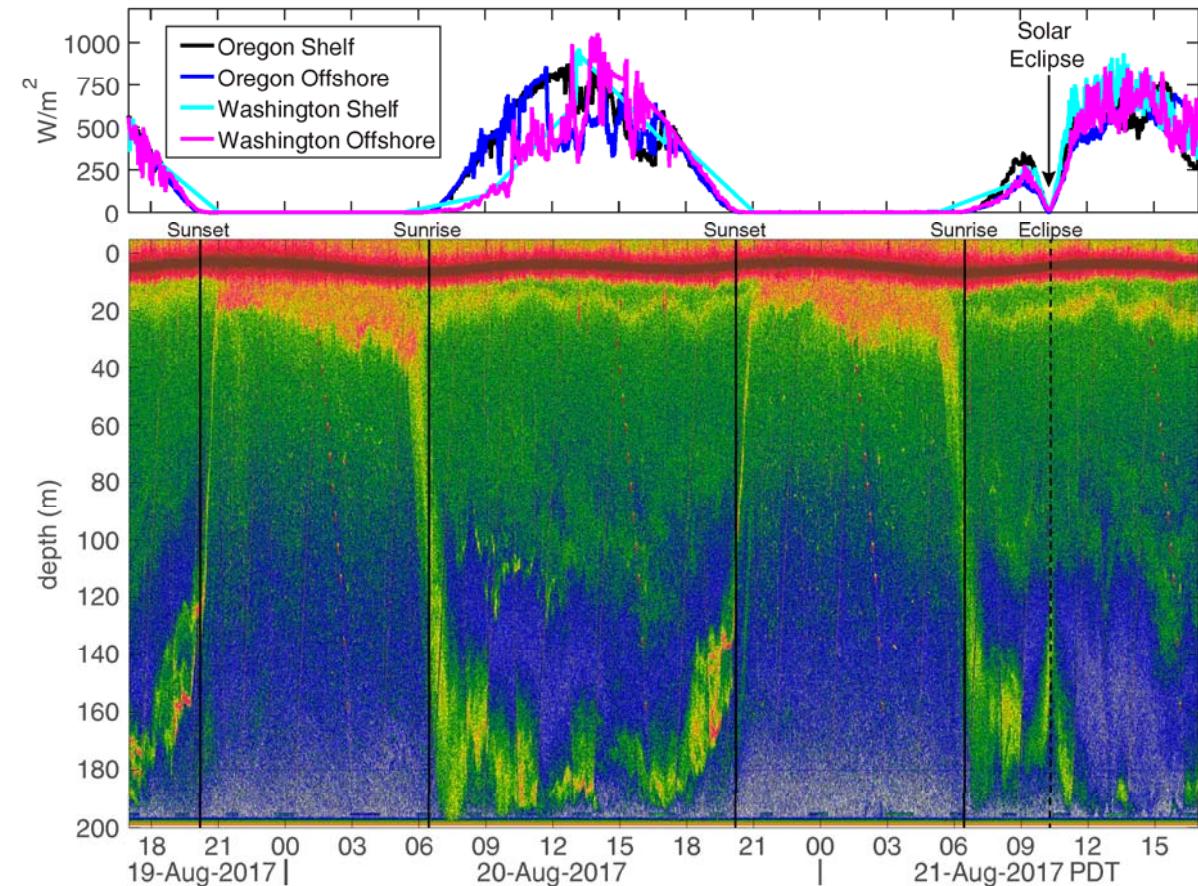
Biofouling Challenges



Marine Heatwaves



2017 Solar Eclipse

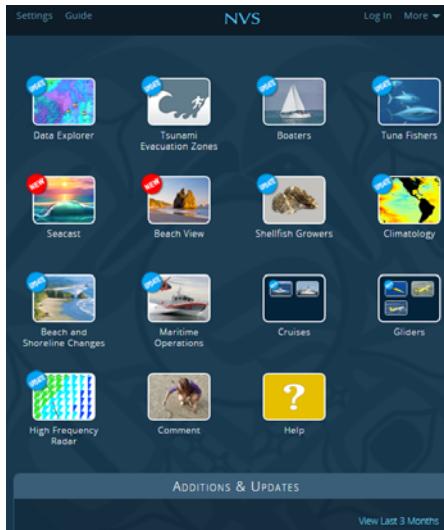


OOI Data Access

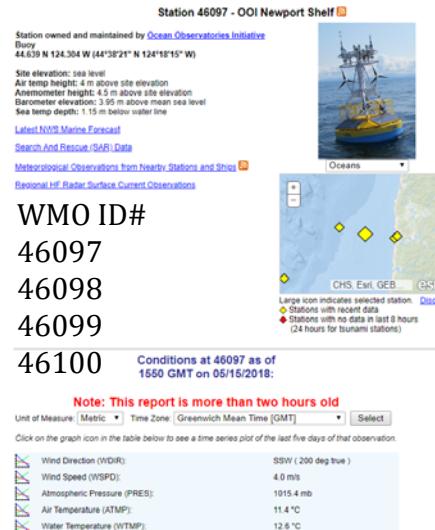
oceanobservatories.org



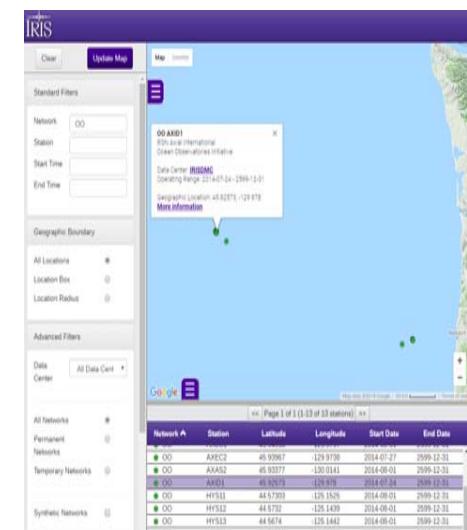
nvs.nanoos.org



ndbc.noaa.gov



ds.iris.edu



Apps Settings Guide

NVS DATA EXPLORER

Log In More



Map

Asset List

Terrain Map



WVNOOS

Layers

OSU NARR Climate

- Winds (Climate)
- Winds (Anomaly)
- Winds (Mean)

OSU ROMS

- Bottom Salinity
- Bottom Temperature
- Pycnocline *(i)*

- Salinity & Currents
- Sea Surface Height (Anomaly)
- Thermocline *(i)*

- Water Temp. & Currents
- Water Temp. & Currents

UBC SalishSeaCast

- Salinity
- Water Temperature



Apr 2018

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Salinity & Currents

Salinity

May 2018

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

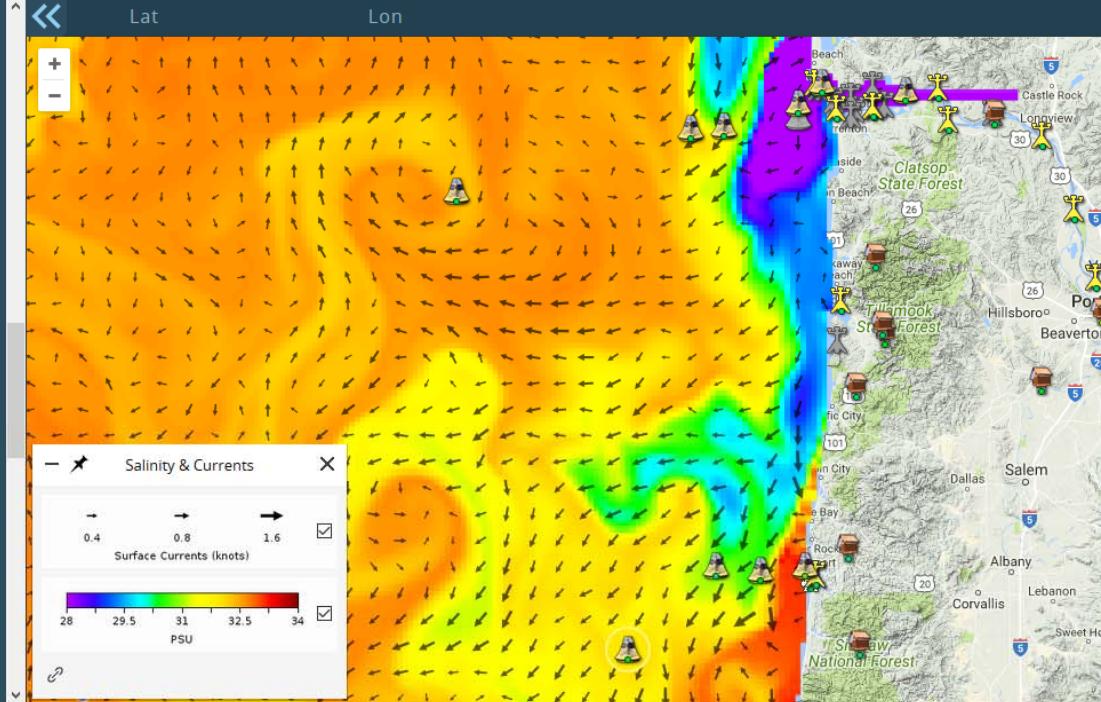
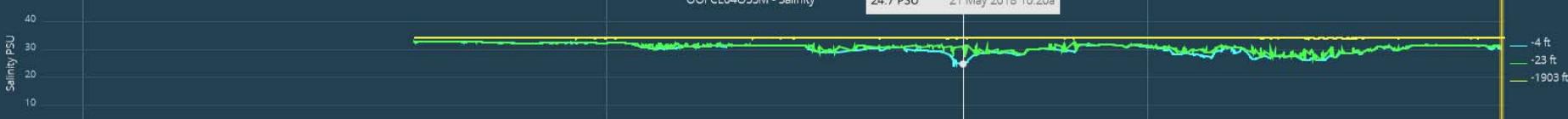
21 June 2018 6:00 am PDT

May 2018

Jun 2018

Jun 2018

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



OR Offshore Surface Mooring

Observations Forecasts Comparator Details History

Wind Speed (15 ft)

0.8 knots

Avg. Wave Period (0 ft)

7 sec

Dom. Wave Period (0 ft)

9.5 sec

Pressure

(-23 ft) 7.3 dbar

(-1,903 ft) 584.9 dbar

HYDROGRAPHIC

Salinity

30 PSU

(-4 ft) 30.2 PSU

(-23 ft) 33.9 PSU

Water Temperature

60.5 °F

(-4 ft) 60.1 °F

(-23 ft) 40.9 °F

Wave Height (0 ft)

3.4 ft

Wave Mean Dir. (0 ft)

252.9 deg (from)

Link

Questions?

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Oregon State University

For more information:

<http://www.oceanobservatories.org/>

<https://www.instagram.com/osuooi/>

<https://www.youtube.com/user/ooicgsn/playlists>

