

National Marine Sanctuaries
National Oceanic and Atmospheric Administration



NATIONAL MARINE
SANCTUARIES

OLYMPIC COAST

OCNMS Summer 2016 Research Activity Highlights

Liam Antrim
Acting Research Coordinator

Conduct Collaborative Research, Assessments and Monitoring

- Quinault Canyon
- Oceanographic moorings
- Ocean acidification
- Populations, Communities and Ecosystems

Quinault Canyon

Mapping and Exploration

Multibeam sonar mapping

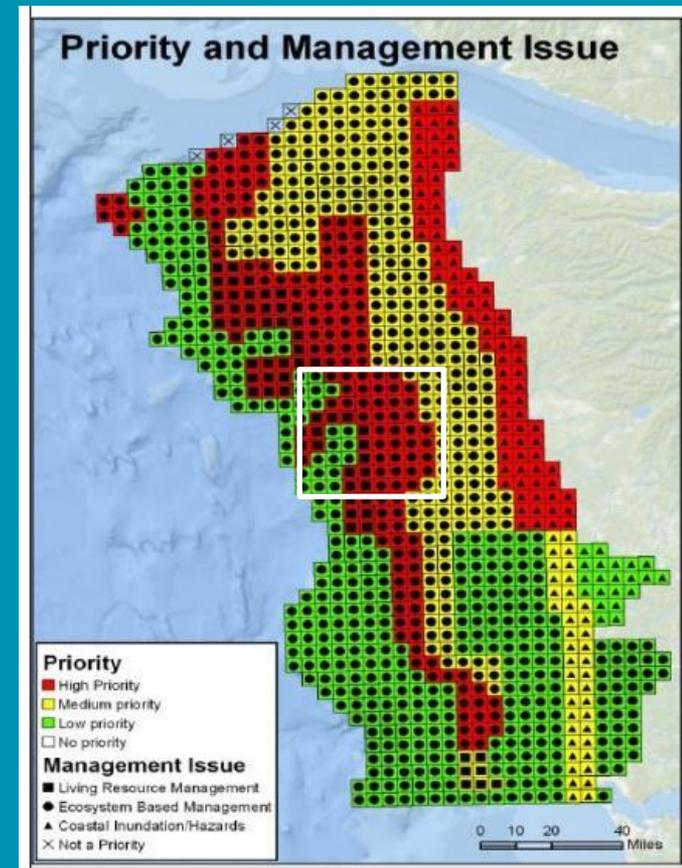
- NOAA OCS *Rainier* (April-May 2016)

Subbottom profiler and ROV

- Ocean Exploration Trust *EV Nautilus*,
Cascadia Margin Survey (June 2016)

NOAA Office of Exploration and
Research funding (July 2017)

- Ocean Exploration Trust *EV Nautilus*



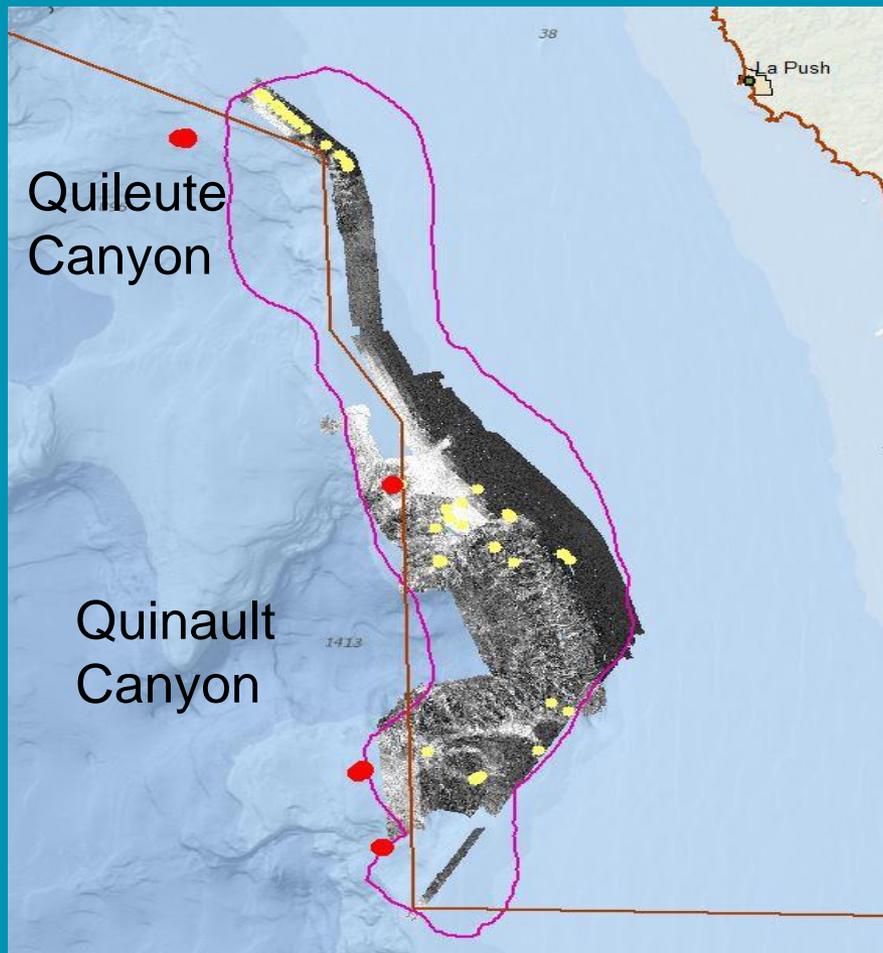
NOAA Ship *Rainier*

April-May 2016

- Partnership
- OCNMS role
- Accomplishments
- Future plans



NOAA Ship *Rainier*



Completed:

205 sq nautical miles
Primarily deep canyon

- Bathymetry
- Backscatter
- Water column

FY17 Pending:

173 sq nautical miles
Primarily shelf

- Methane plumes discovered
- Methane plumes known

Ocean Exploration Trusts

E/V Nautilus



- 2 ROVs
- Multibeam sonar
- Subbottom profiler
- Telepresence



E/V Nautilus

Cascadia Margin June 1-20, 2016

- <http://www.nautiluslive.org/expedition/2016>
“Seeps and Ecosystems of the Cascadia Margin”
- Gas hydrate and methane seeps focus
- Wreck of the World War II freighter
SS Coast Trader
- Quinault Canyon rim habitat characterization
 - 12 h ROV dive

SS *Coast Trader*

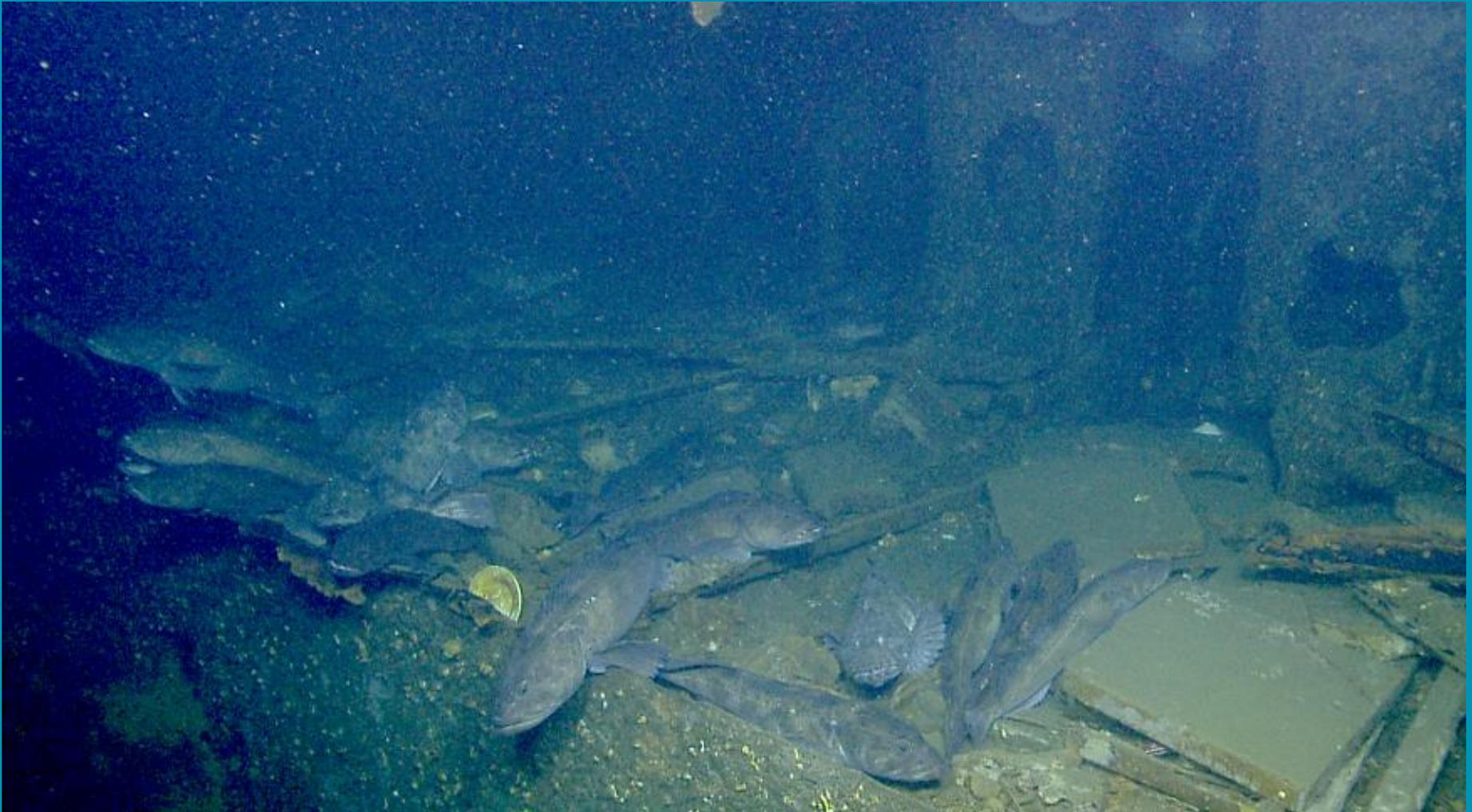


SS *Coast Trader*

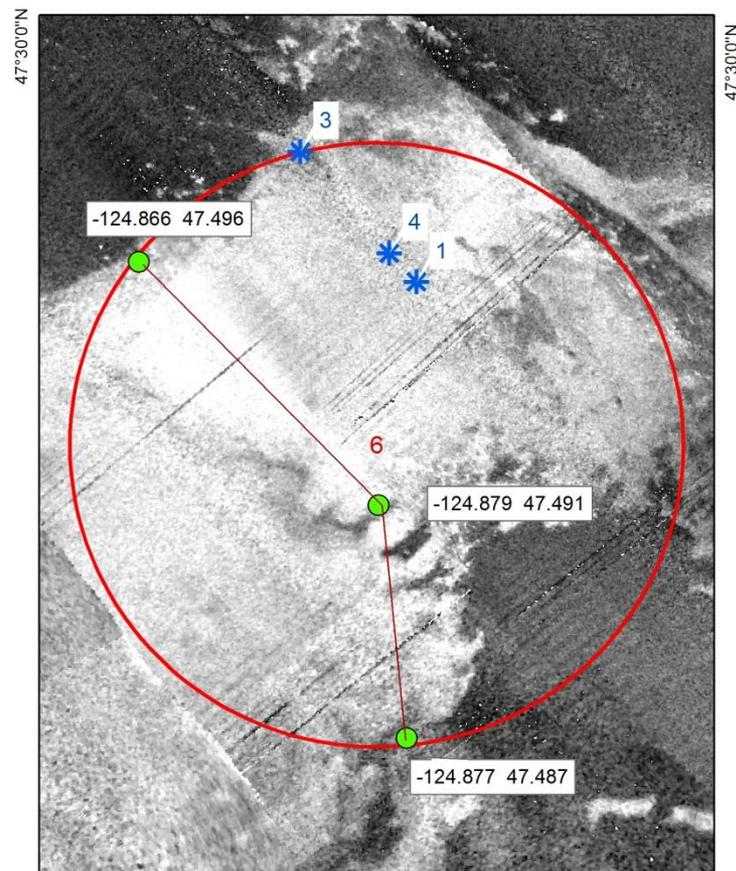
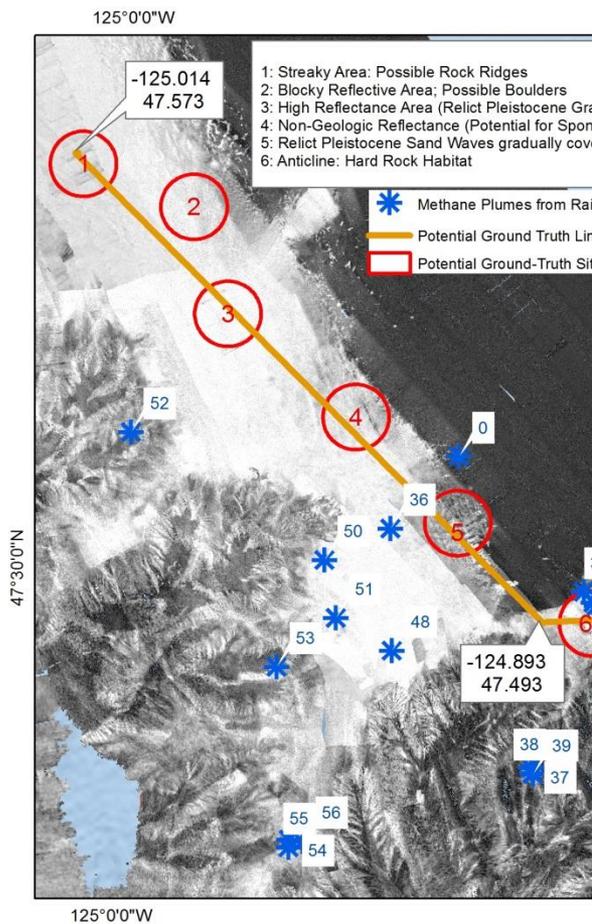


<http://www.nautiluslive.org/video/2016/06/05/ss-coast-trader-wreck-survey>

SS *Coast Trader*



E/V Nautilus Habitat Groundtruthing



E/V Nautilus

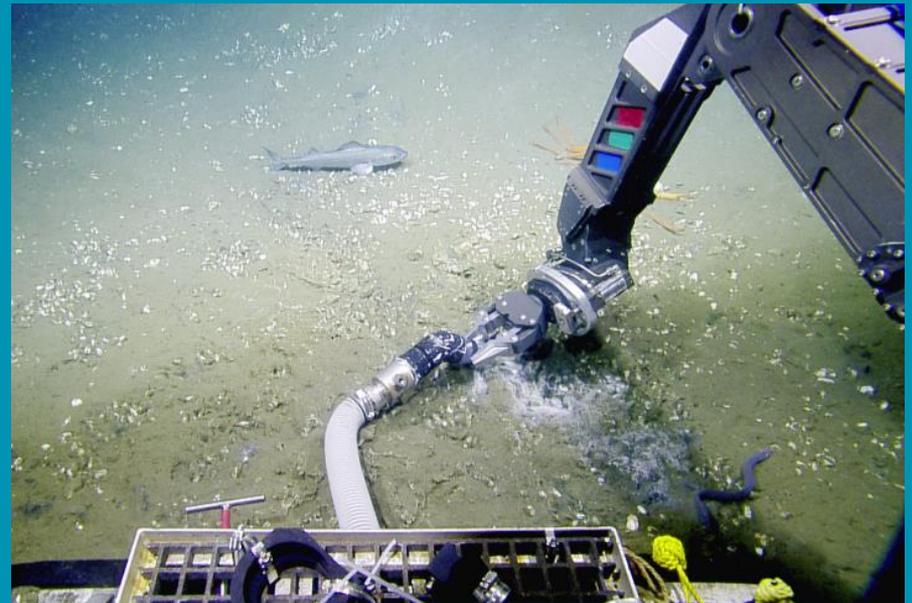
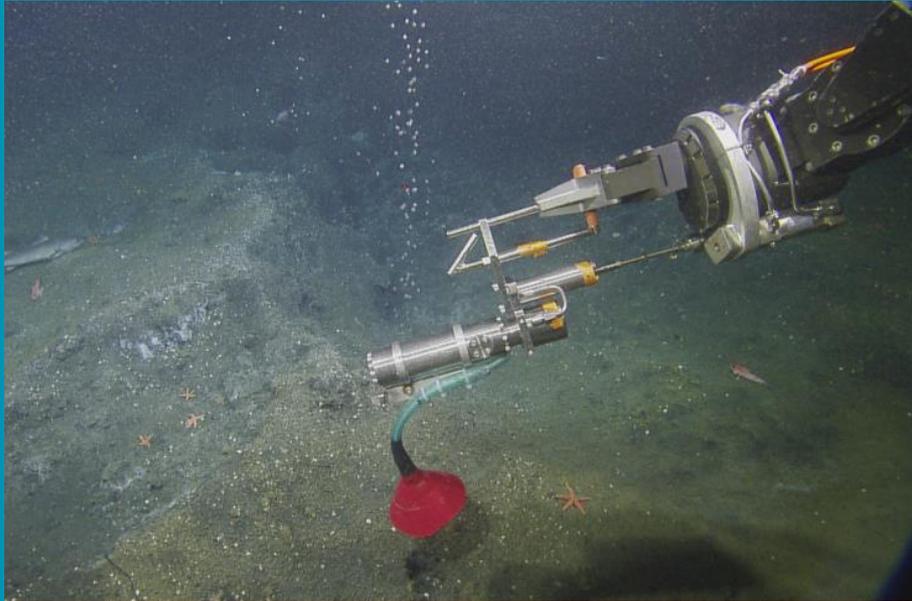
Ship to Shore at Taholah



Taholah
High school
Ship to Shore
with EV Nautilus
June 8th, 2016.

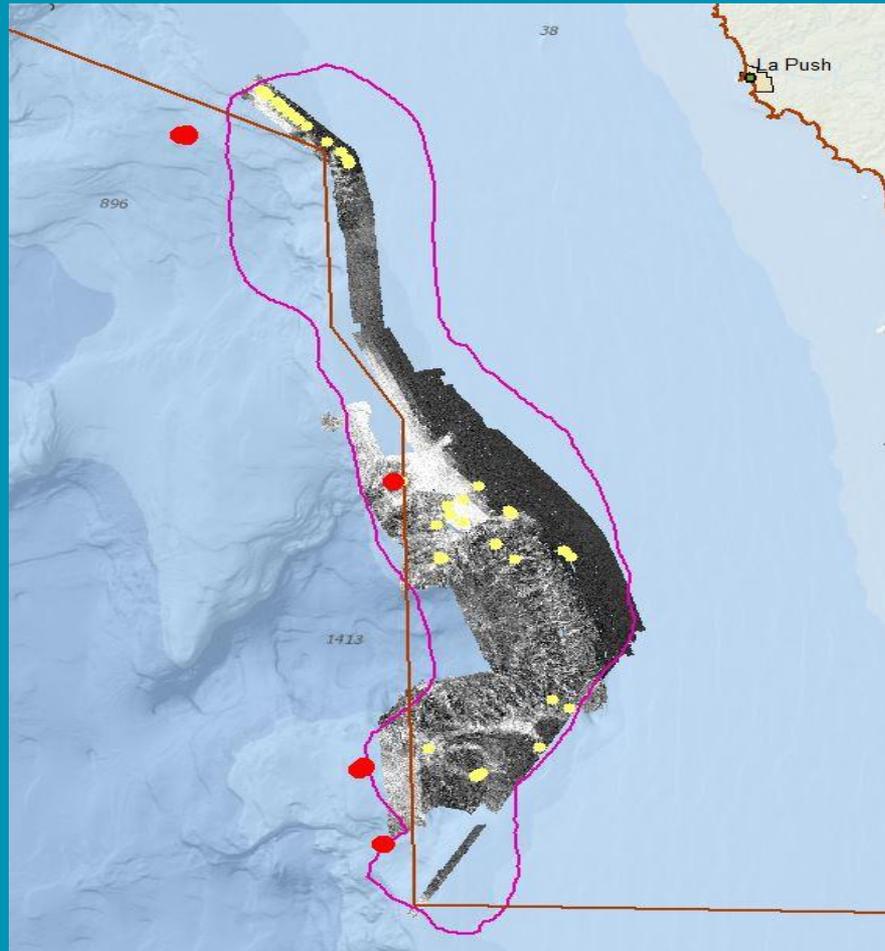


E/V Nautilus Methane Seeps



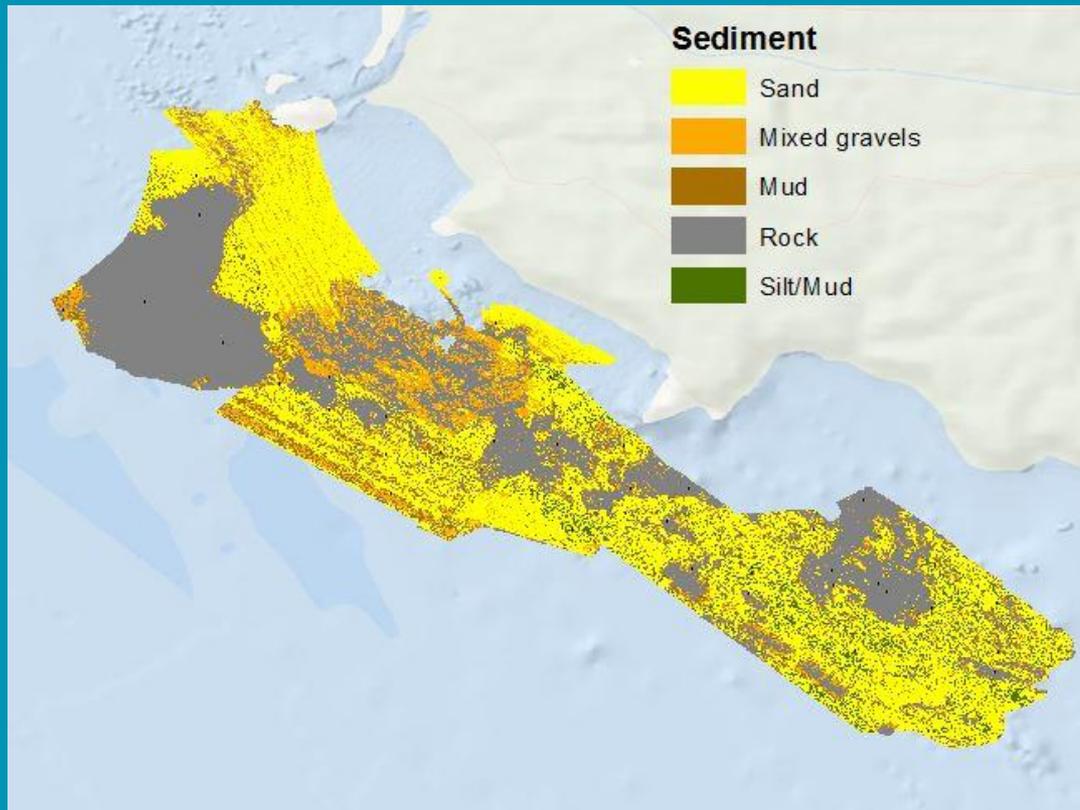
E/V Nautilus

Methane Seeps



Habitat Mapping

R/V *Tatoosh* 2015 / 2016



Preliminary Classification Giants Graveyard & Quilleute Needles

6.2 sq nautical miles

SEAFLOOR INDURATION

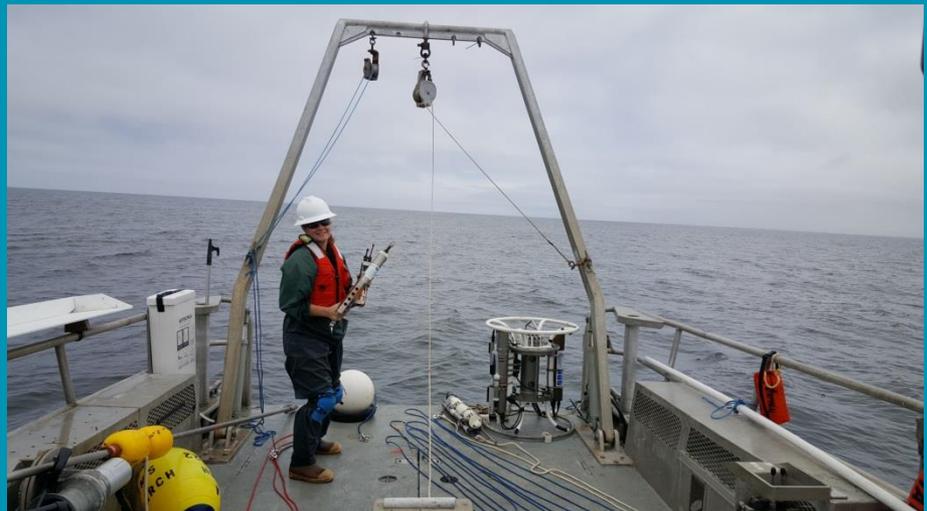
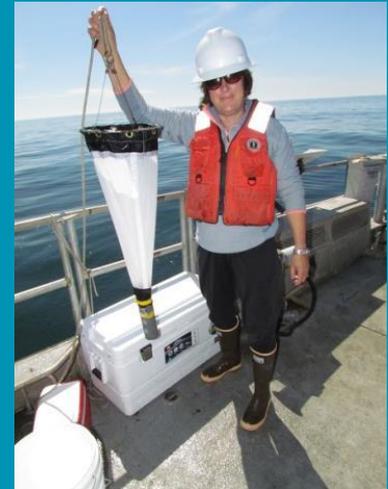
- 54% Soft (sand/mud)
- 35% Mixed hard/soft
- 11% Hard (rocky)

Physical and Chemical Oceanography

- Coastal Mooring Program
- Ocean Acidification and Hypoxia
- Other field work

OCNMS Coastal Mooring Program

- 16th year – May 23-31 deployment
- Overwinter temperature data – 4th year
- Harmful algal bloom sampling – Quileute Natural Resources
- Legacy installations
 - 2015 Cape Elizabeth moorings
 - 2011 Makah Bay 15m
 - 2010 Teahwhit Head 15m
- New instrumentation needed



Ocean Acidification

2016 West Coast Ocean Acidification Cruise

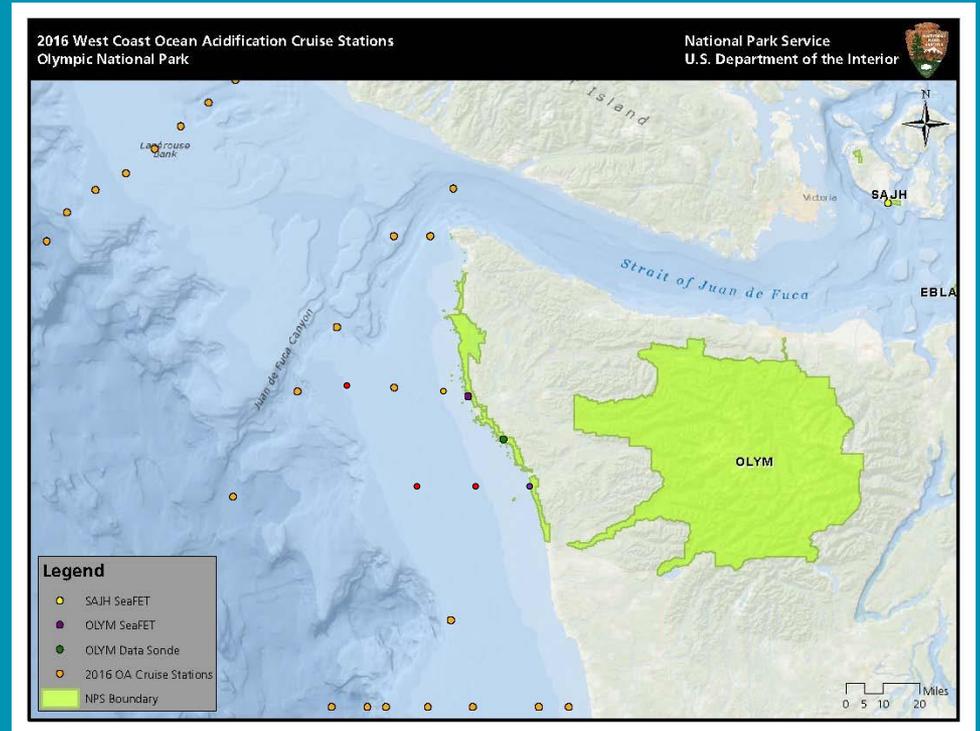
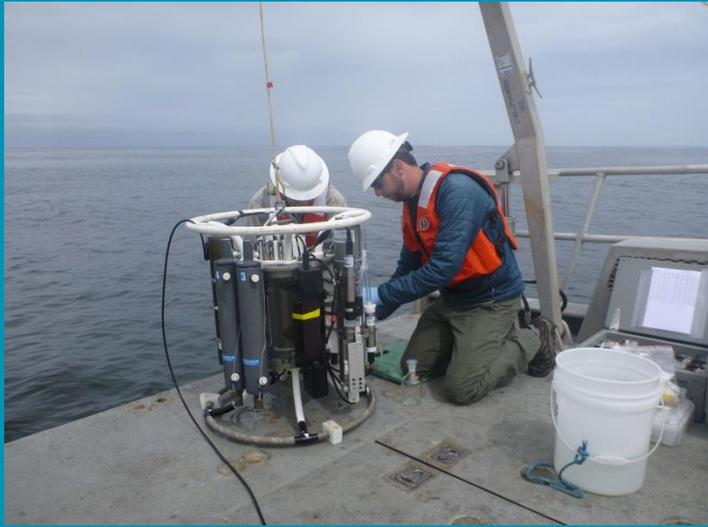


- 5th West Coast OA Cruise
- First cruise since 2007 to cover Baja to BC
- Integrated sampling
 - OA, temperature, oxygen
 - HABs
 - Zooplankton

<http://www.pmel.noaa.gov/co2/story/WCOA2016+Blog>

Ocean Acidification

2016 West Cost Ocean Acidification Cruise



NPS Collaboration

Ocean Acidification

Kelp Forest Study

Funding: NOAA Climate Program Office, Coastal and Ocean Climate Applications

PIs: Cathy Pfister, Albert Coleman, Mark Altabet
Partners: OCNMS, WDNR

Title: *Kelp forests: their dynamics, services, and fate in a changing climate*

Goal: test the extent to which kelp serves as an ocean acidification refuge for calcifying species.

Ocean Acidification Kelp Forest Study

Parameters: pH, DO, temperature, salinity, TA,
pH, DIC, chl *a*, DOC, POM, nutrients



Populations, Communities & Ecosystems



Intertidal monitoring



Pelagic seabirds



Subtidal surveys



Sea otter census

