

OTHER APPLICATIONS OF MAPPING TO MANAGEMENT

*Chris Romsos, Chris Goldfinger, and Many Others!
 OSU Active Tectonics & Seafloor Mapping Lab
 Prioritizing Seafloor Mapping for Washington's Pacific Coast
 Workshop #1
 October 27th, 2014*

WHO AM I & WHY AM I HERE TODAY?

A bit of personal background... (short I promise).



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To help review how and why seafloor mapping is relevant to resource management

- EXAMPLES - > Focus on project context, management drivers, and mapping solutions



ITEMS FROM BACKGROUND MATERIALS AND AN EARLIER PRESENTATION

SOW FROM LONG ISLAND SOUND S.P.P. “MAPPING OBJECTIVES”

- Maximize Reuse of Data
- Acquire new data to fill gaps or to enhance
- Provide Products to aide planning, sampling design and interpretation
- Deliver raw data, geospatial data and map products

MANAGEMENT ISSUES:

1. Regulatory
2. Living Resource Management
3. Ecosystem Management
4. Safety of Nav.
5. Spill Response
6. Coastal Inundation
7. Sediment Management
8. Cultural Heritage and Historical Resource
9. Marine Debris
10. Defense & Security
11. Other..

5 “APPLICATIONS TO MANAGEMENT” EXAMPLES SELECTED

1. PFMC & NOAA - 2012 5-Year Review of EFH
2. ODFW – Derelict Gear Removal Program
3. OREGON – State Waters Mapping Program
4. PMEC – South Energy Test Site and Cable Route Survey
5. BOEM – Benthic Habitat Characterization Study

Mapping
Complexity



High

Mapping Objectives are more important or interesting than complexity

1) 5-YEAR REVIEW OF PACIFIC COAST GROUND FISH ESSENTIAL FISH HABITAT AND SYNTHESIS (PFMC & NOAA FISHERIES)

- Management DRIVER(s):
 - EFH Provisions of Magnuson Stevens Act specify that FMPs:
 - Identify and describe EFH
 - Minimize adverse effects of fishing on EFH
 - Identify other actions to conserve and enhance EFH
- Mapping OBJECTIVES:
 - **Summarize the state of knowledge in terms of habitat availability, preference, use, etc.**
 - **Synthesize the information so that management can determine if conservation or enhancement action is needed.**

Issue:

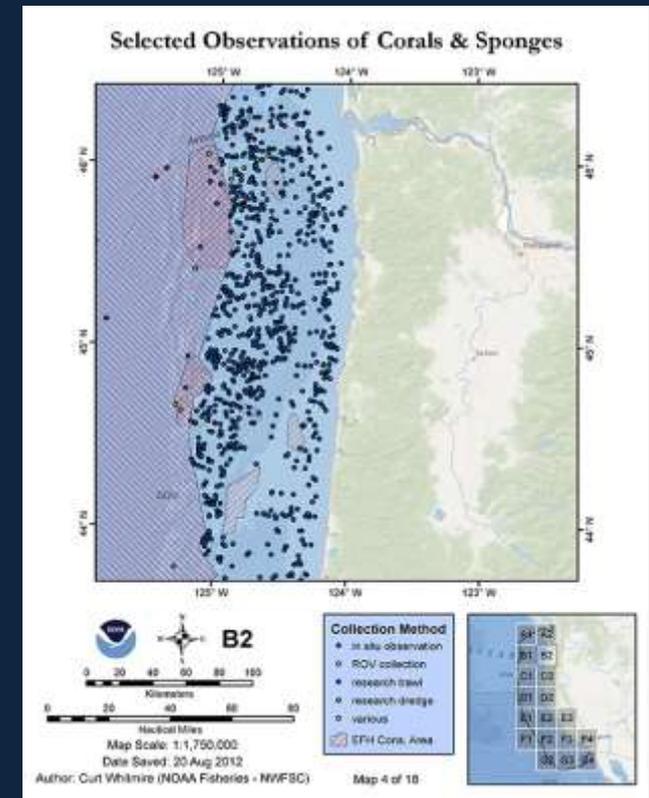
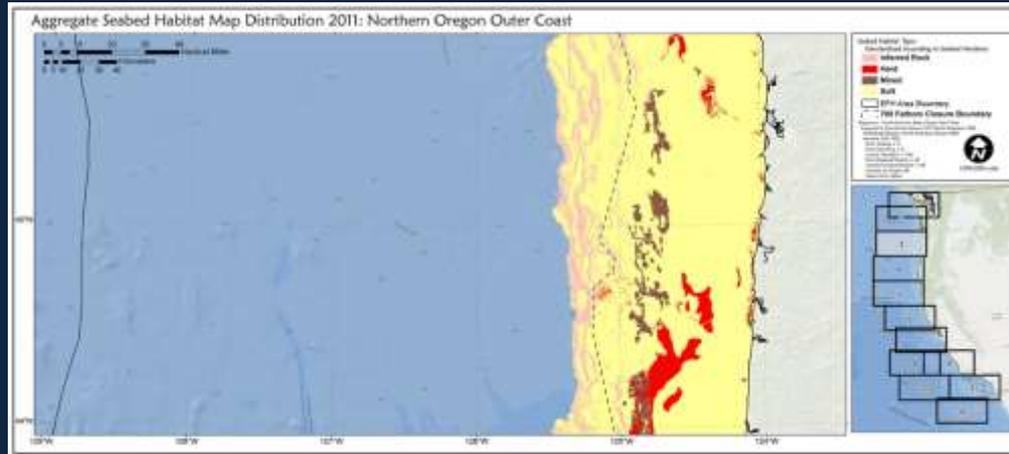
Regulatory, Living Resource & Ecosystem Management

Mapping Objective:

Maximize Reuse, Planning Products & Delivery

1) MAPPING ACTIVITIES UNDER THE 5-YEAR REVIEW OF EFH:

- Data Distributions



1) MAPPING ACTIVITIES UNDER THE 5-YEAR REVIEW OF EFH:

- Habitat Distributions

Spatial Regulations

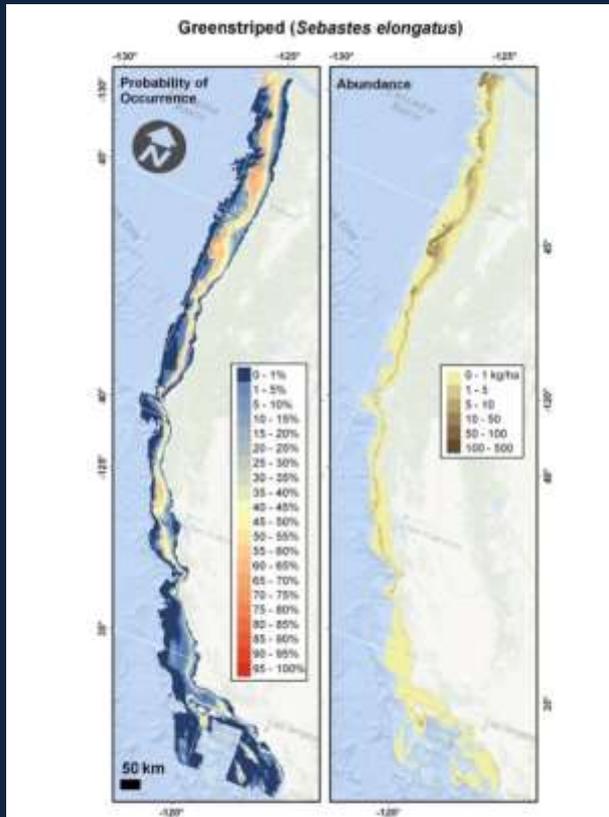


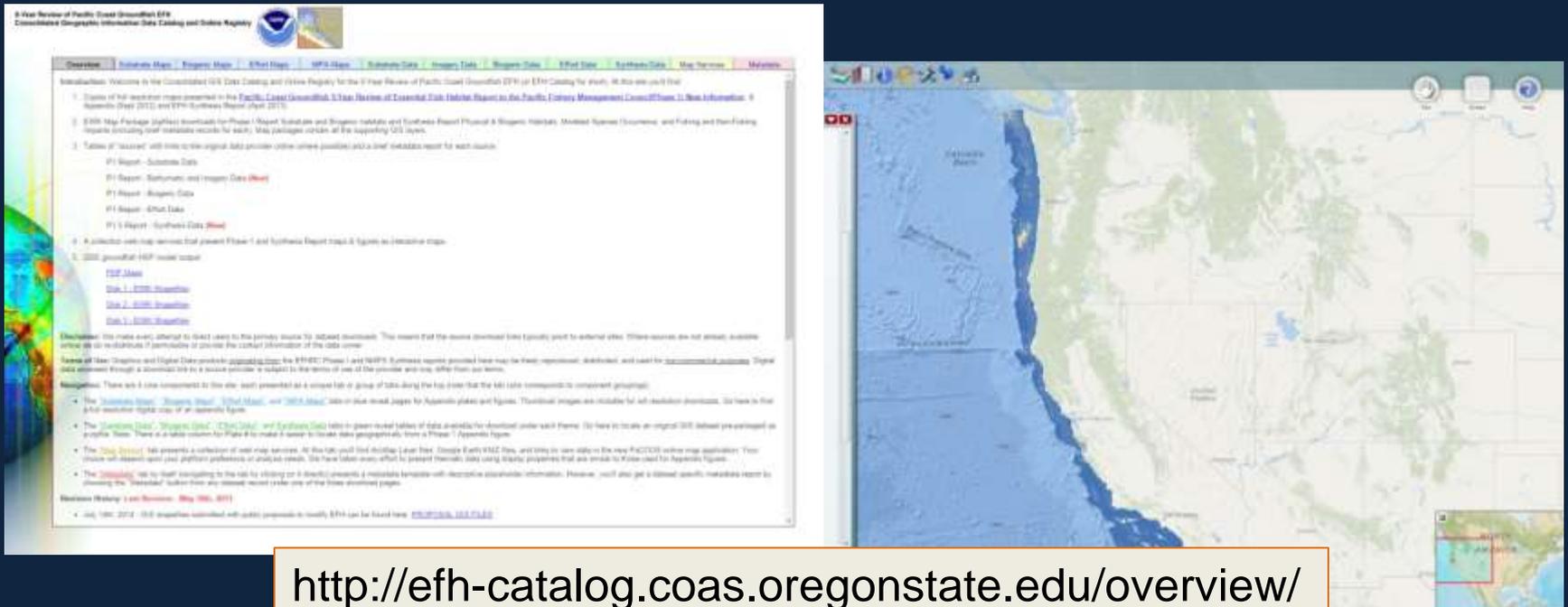
Figure 3.13. Greenstriped mean predicted probability of occurrence and predicted mean abundance. NWFSC model projections.



2006 EFH Closures

1) MAPPING RESULTS UNDER THE 5-YEAR REVIEW OF EFH:

- Focusing just on “mapping data”
 - Identified over 300 sources of new seafloor mapping data
 - Developed summary map products for the PFMC and for a Public RFP
 - Delivered map data via hardcopy reports, online catalog, and live maps



The image shows a screenshot of the EFH Catalog website. On the left, there is a navigation menu with options like Overview, Substrate Maps, ERM Maps, etc. The main content area displays a list of reports and data sources, including 'E-File Map Package (eFiles) downloads for Phase 1 Report' and 'Tables of "Access" with links to the original data provider'. On the right, there is a map of the Pacific Northwest coast of the United States, showing the coastline and surrounding waters. The map is overlaid with a grid and various data points.

<http://efh-catalog.coas.oregonstate.edu/overview/>

2) MARINE DEBRIS: DERELICT FISHING GEAR

- ODFW: 2009 & 2011 sidescan sonar surveys near mouth of Columbia River to locate lost crab pots.
- Fishers hired to recover/remove located debris
- Aerial and other survey techniques also used
- ROV used to assess impact of recovery.



- Issue:
Marine Debris, Living & Ecosys. Mgmt.
- Mapping Objective:
Provide Products to aide planning,
sampling design and interpretation

2) MARINE DEBRIS: DERELICT FISHING GEAR

WEST COAST GOVERNORS ALLIANCE on OCEAN HEALTH
ORGANIZATIONAL CHARTER DOCUMENT 2014

Marine Debris Database

Home Data Organizations Projects Data Sheets Sign In

Location Type of debris Organization/Project Date

Filter by State: Filter by County:

First Previous 1 2 3 4 5 Next Last

Event Type	Site	County	State	Date	Action
Derelict Gear Removal	-124.092, 45.19	Tillamook	OR	10/15/2010	
Derelict Gear Removal	-124.092, 45.19	Tillamook	OR	10/15/2010	
Derelict Gear Removal	-124.092, 45.19	Tillamook	OR	10/15/2010	
Derelict Gear Removal	-124.092, 45.19	Tillamook	OR	10/15/2010	
Derelict Gear Removal	-124.092, 45.19	Tillamook	OR	10/15/2010	

Showing 1 to 5 of 16,788 entries

[View Report](#) [Download Data](#)

Map Event Details Report Tour

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3) OREGON STATE WATERS MAPPING PROGRAM

- Management DRIVERS (many):
 - Marine Reserves
 - Coastal Inundation (earthquakes and tsunami)
 - Habitat Research, Monitoring and Management
 - Oregon's Statewide Planning Goal 19 (stewardship and conservation of ocean resources)
- Mapping APPROACH:
 - Develop Partnership – NOAA NOS, & OCS provided considerable support
 - Multibeam bathymetry, backscatter, sediment samples
 - > Products: Bathymetry, Imagery, and Habitat Maps

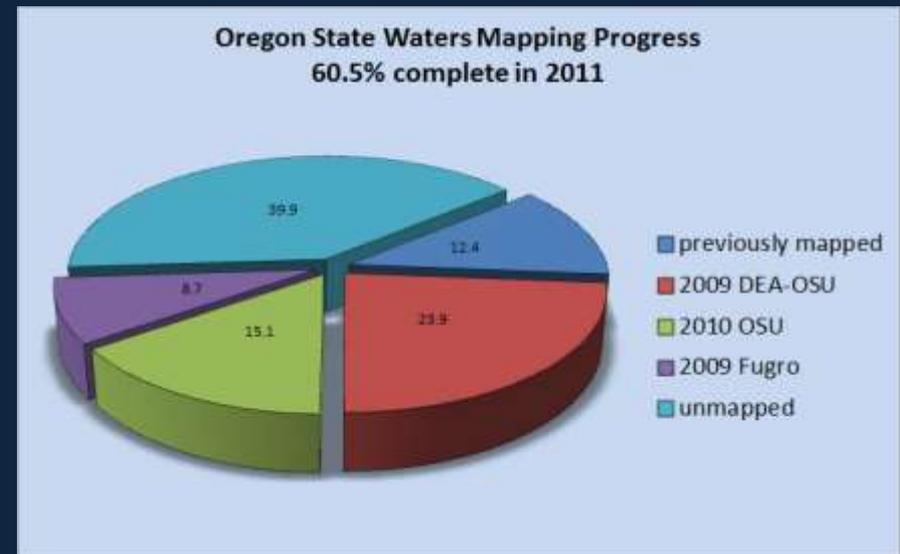
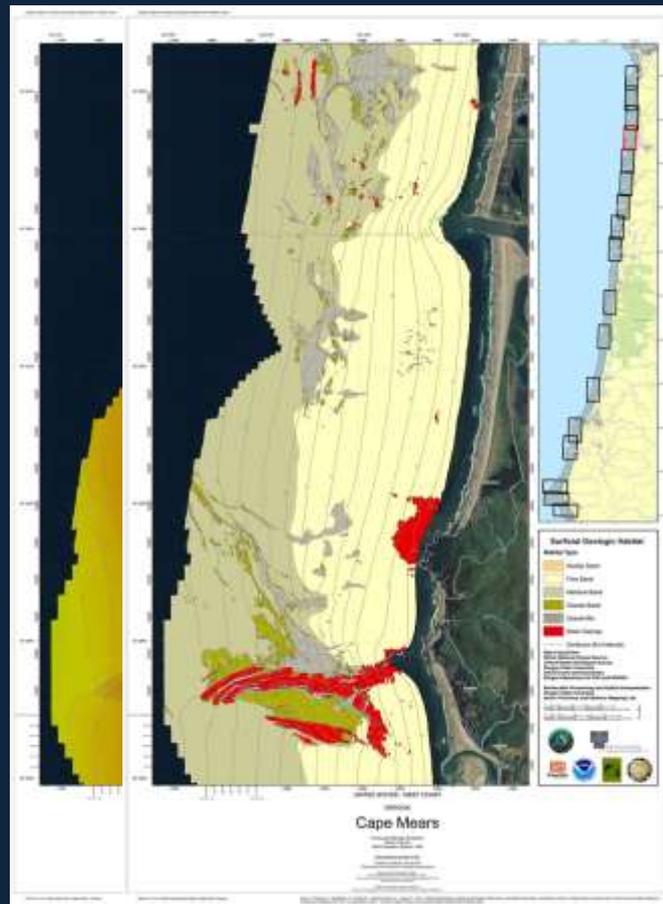
Issue:

Conceived to address MSP “in general”

Mapping Objective:

Acquire new data, Provide Products, Deliver Data

3) RESULTS: OREGON STATE WATERS MAPPING PROGRAM



<http://activetectonics.coas.oregonstate.edu>

4) P MEC SOUTH ENERGY TEST SITE SURVEY (OSU & NNMREC)

- Management DRIVER(s):
 - Federal permitting of transmission cable and “test berth” site
- Technical DRIVER(s):
 - Site Suitability & Design Criteria
- Mapping CONTEXT:
 - New mapping to fill gaps and enhance
 - New mapping to satisfy permitting spec.
 - Products for route planning
 - Products for permit applications, etc.

Issue:

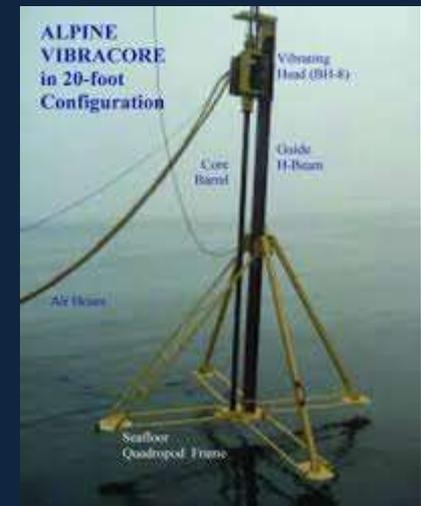
Regulatory

Mapping Objective:

Acquire New, Planning Products & Delivery

4) MAPPING ACTIVITIES

- Types of mapping data sought:
 - Full coverage multibeam bathymetry and backscatter
 - Characterize the seabed depth shape and composition
 - Identify obstacles to cable burial or energy device installation
 - Hard Seabed / Rocky Outcrop
 - Subbottom profiles
 - Identify obstacles to cable burial or energy device installation
 - Subsurface rock
 - Magnetics
 - Identify obstacles to cable burial or energy device installation
 - Cars, shipwrecks, or other ferrous obstacles
 - Sediment Cores
 - Groundtruth the seabed and sub bottom characterizations



4) MAPPING ACTIVITIES: P MEC SETS SURVEY

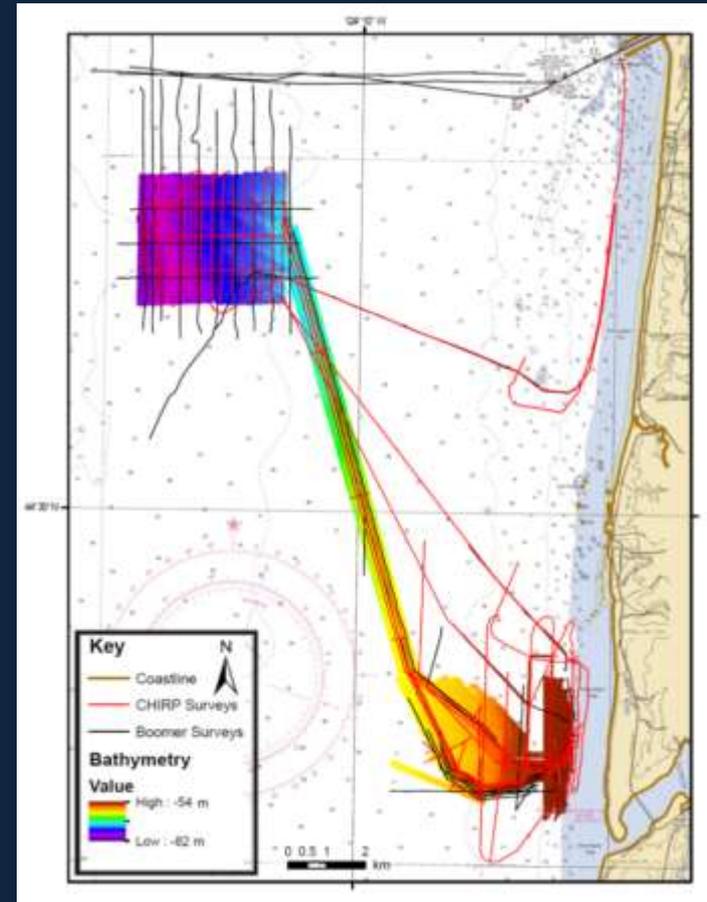
- Focused and intensive
 - Multiple technologies deployed over a relatively small area

CONS:

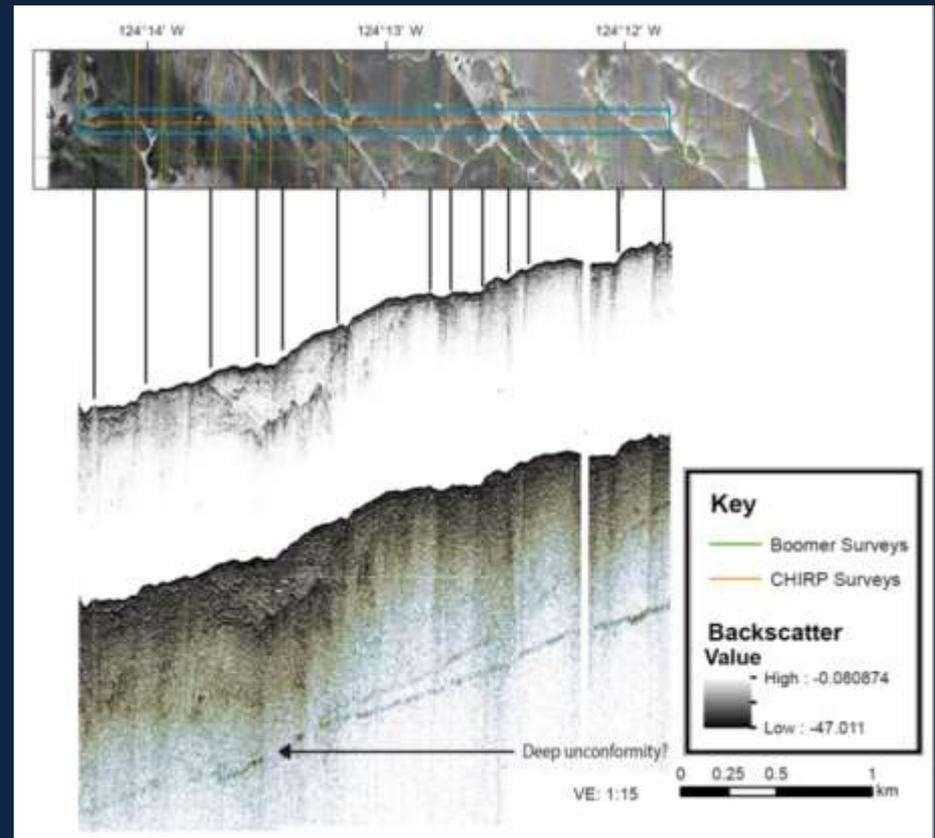
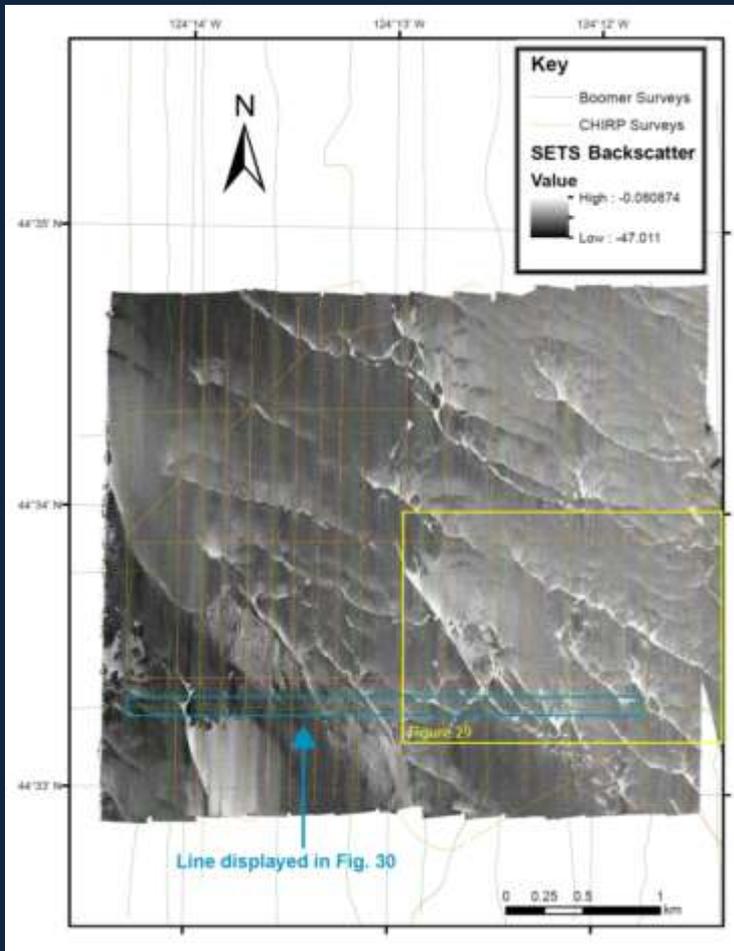
- Costs are high
- Time and Effort intensive
- Small area covered

PROS:

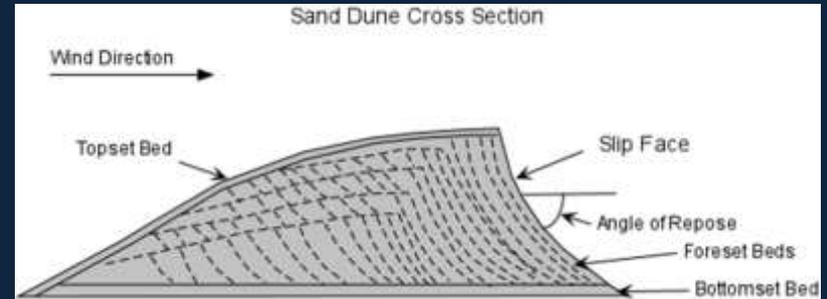
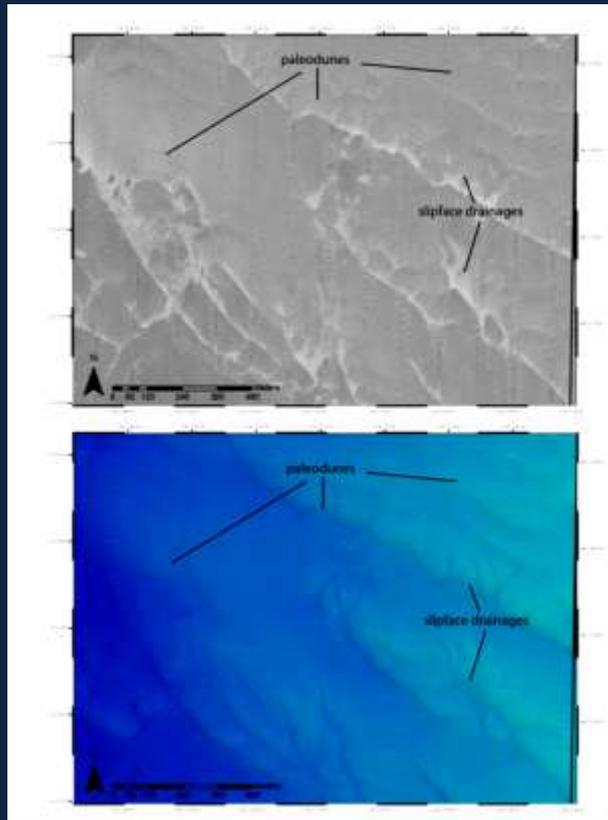
- Better or more complete understanding. Not just the surface.
- Discovery!



4) DISCOVERY: PALEO-DUNES



4) PALEO-DUNES CONT.



5) BENTHIC HABITAT CHARACTERIZATION STUDY (OSU & BOEM)

- Management DRIVER(s):
 - Outer Continental Shelf Lands Act, 1953 (OCSLA):
 - Interior administers mineral exploration and development
 - Leasing & Regulatory authority granted to Interior
 - National Environmental Policy Act, 1970 (NEPA)
 - Costal Zone Management Act, 1972 (CZMA)
- Mapping OBJECTIVES:
 - New mapping to fill gaps and enhance
 - Update and enhance summary products
 - Modeling benthic species habitat preferences

Issue:

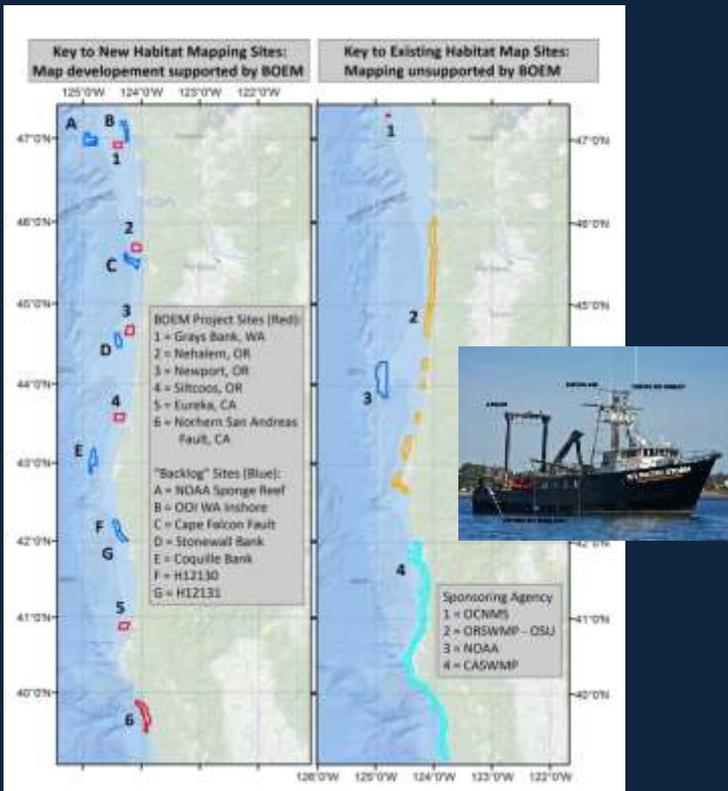
Regulatory, Living Resource & Ecosystem Management

Mapping Objective:

Maximize Reuse, Acquire New, Planning Products & Delivery

5) MAPPING ACTIVITIES UNDER THE BENTHIC HABITAT CHARACTERIZATION PROJECT:

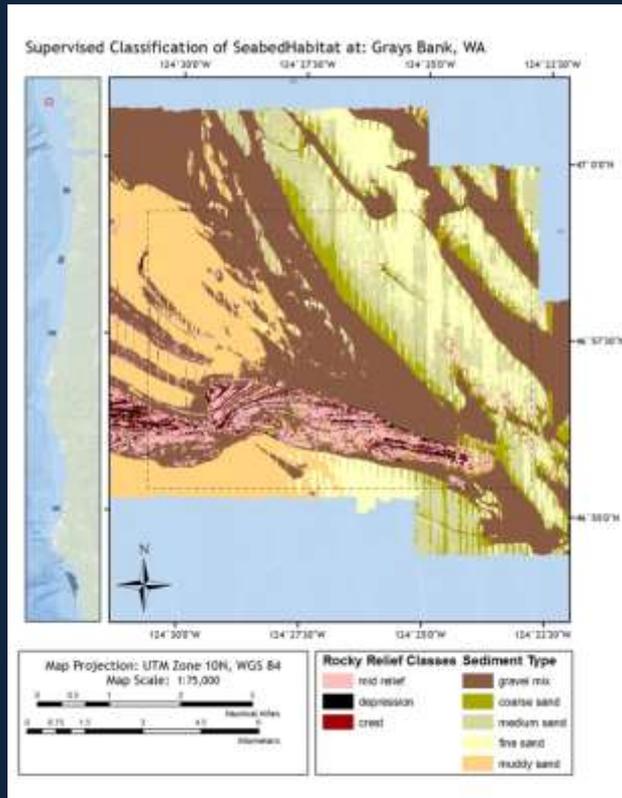
- New Mapping in Fed. Waters on the continental shelf
- Sampling and Groundtruthing



5) MAPPING RESULTS UNDER THE BENTHIC HABITAT CHARACTERIZATION PROJECT:

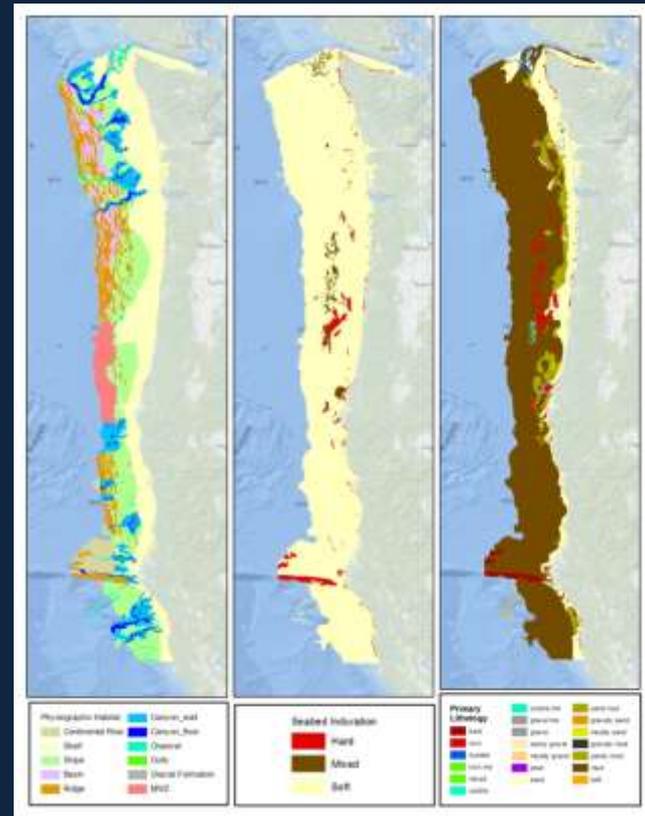
- Local Habitat Maps
- Grays Bank, WA

GAP FILL



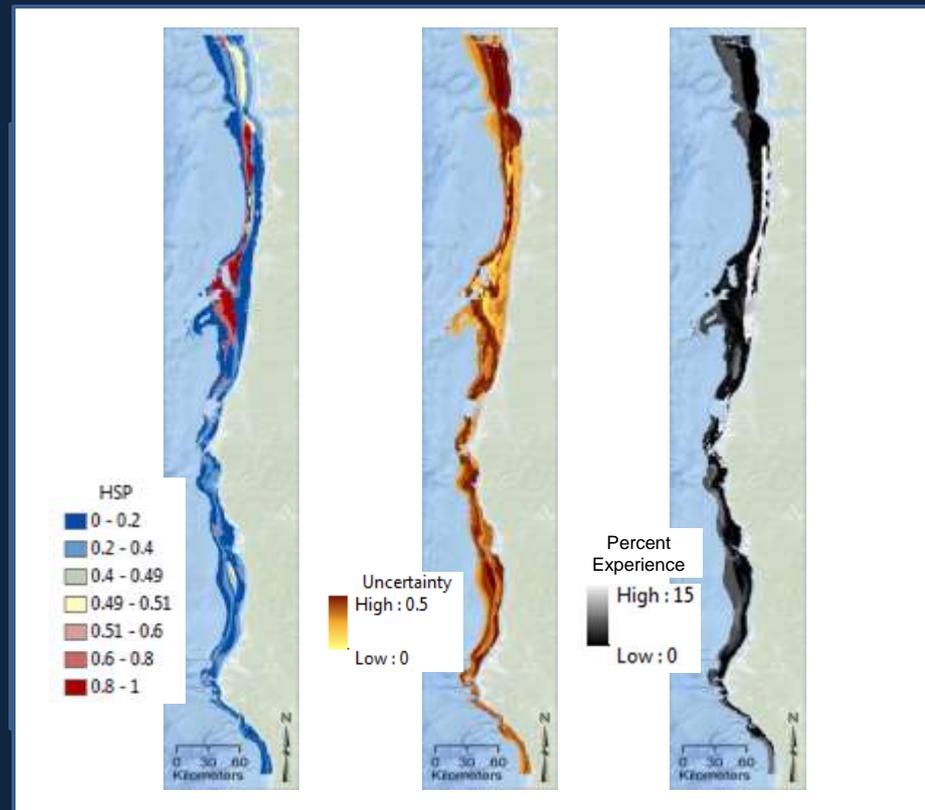
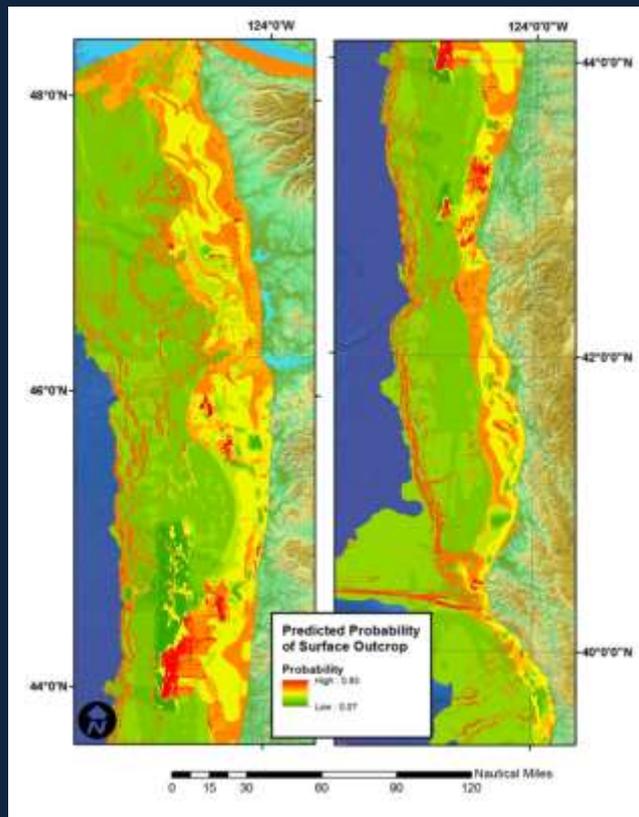
UPDATE & ENHANCE

- Updated Regional Habitat Maps
- Version 4.0 SGH for WA, OR, NCA



5) MODELING RESULTS UNDER THE BENTHIC HABITAT CHARACTERIZATION PROJECT:

- Predicted Habitat Types
- BENTHIC INFAUNA:
- Habitat Suitability Models



SO, WHAT ARE THE APPLICATIONS OF MAPPING TO MANAGEMENT?

1. Regulatory
 2. Living Resource Management
 3. Ecosystem Management
 4. Safety of Nav.
 5. Spill Response
 6. Coastal Inundation
 7. Sediment Management
 8. Cultural Heritage and Historical Resource
 9. Marine Debris
 10. Defense & Security
 11. Other..
- This list from our “Field Definitions” worksheet is fairly comprehensive.
 - Prioritization is an important step.
 - We often ask other researchers to collect a bit of data for us along a transit when they can.
 - Having or publishing your official priorities will make easier for other groups to assist.
 - **INVIGORATE THE INVESTMENT!!**