



**NOAA
FISHERIES**



***Alaska ShoreZone:* A Coastal Habitat Mapping Program**



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Why ShoreZone?

Accidents happen!



Why *ShoreZone* in Alaska?

A History of Human Impacts to Coastal Areas

- *Exxon Valdez* oil spill 1989
- *Selendang Ayu* break up 2004
- Drill Rig *Kulluk* 2013
- USCG: July – Sept. 2015 =
16 F/V groundings



Cape Puget, November 28, 2016



Why Now? Coastal Issues & Increased Risk

- Resource development
- Coastal development
- Climate change
- Loss of sea ice
- Coastal erosion
- Increased vessel traffic
- Subsistence needs

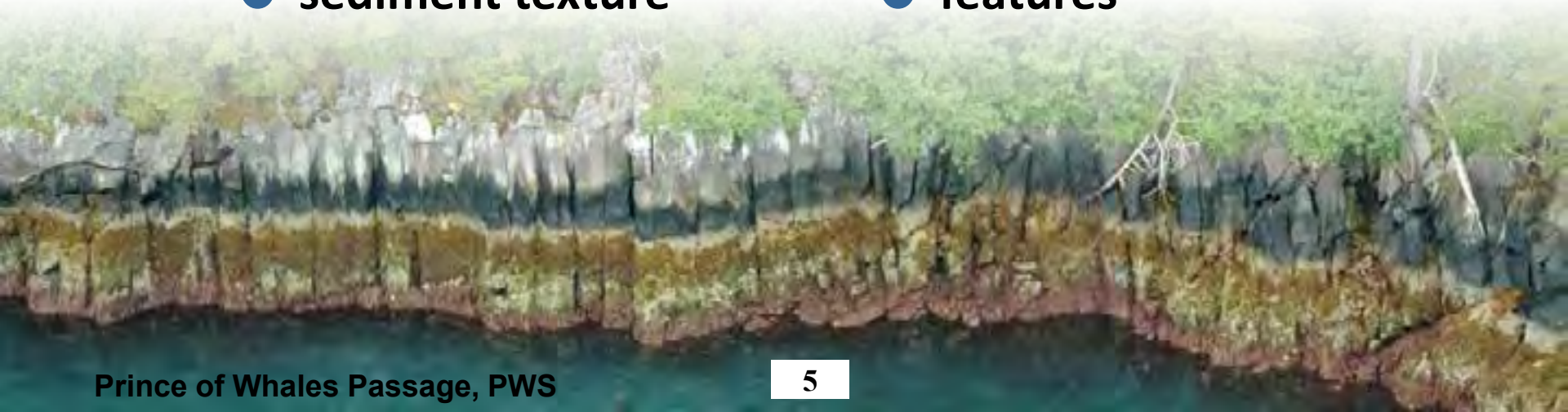


What is *ShoreZone*?

A standardized coastal habitat mapping product:

ShoreZone images and characterizes biophysical attributes of discrete shore units in both along-shore and across-shore components in a searchable, spatially explicit database.

- wave exposure
- geomorphology
- sediment texture
- biota
- man-made features
- features



Alaska *ShoreZone* Program:

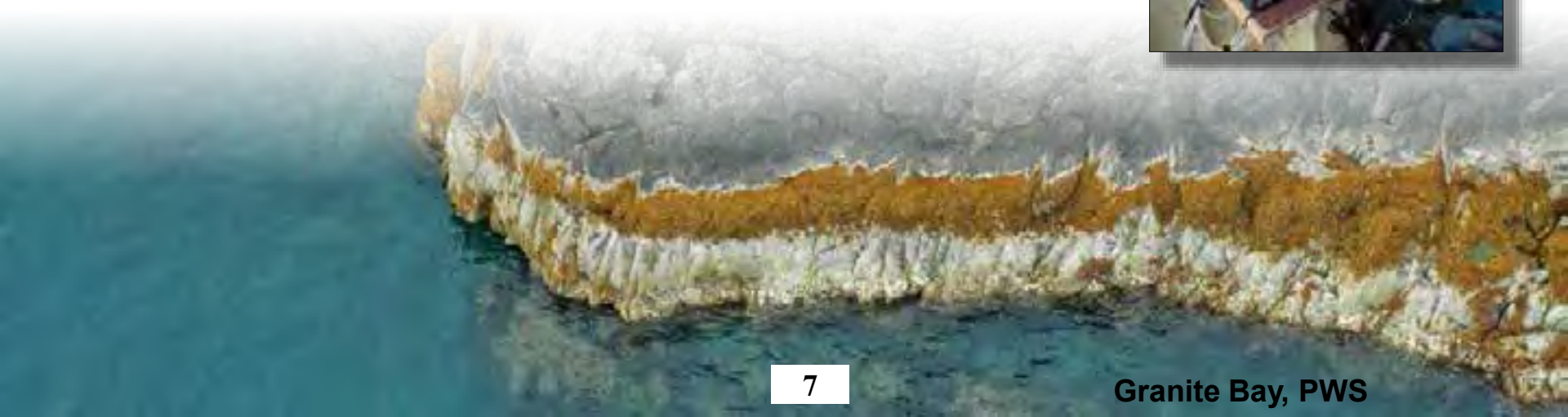
A partnership of many agencies and NGOs collaborating on various phases of ShoreZone:

- Phase I – Acquiring Coastal Imagery
- Phase II – Habitat Mapping
- Phase III – Online Products, outreach

Phase I: Acquiring Coastal Imagery

Mapping is based on video and still imagery:

- low altitude
- oblique
- geo-referenced
- low tide



Phase II: Coastal Habitat Mapping

Digitizing



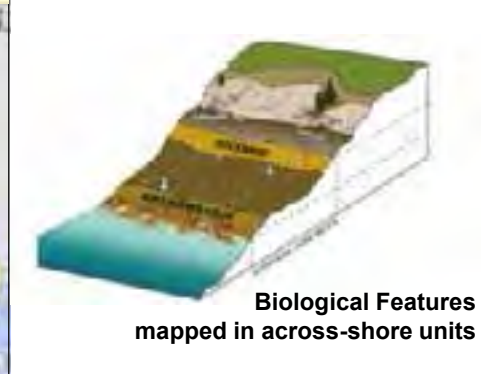
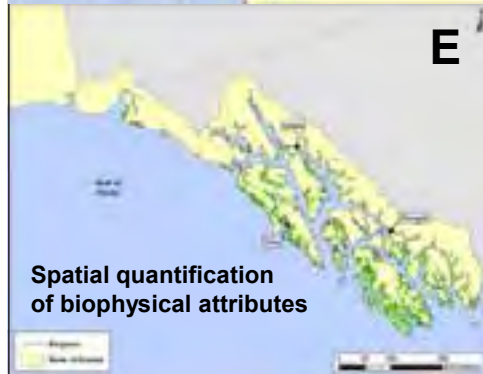
Imagery as Data

Spatially Explicit



Geomorphology

Regional Quantification

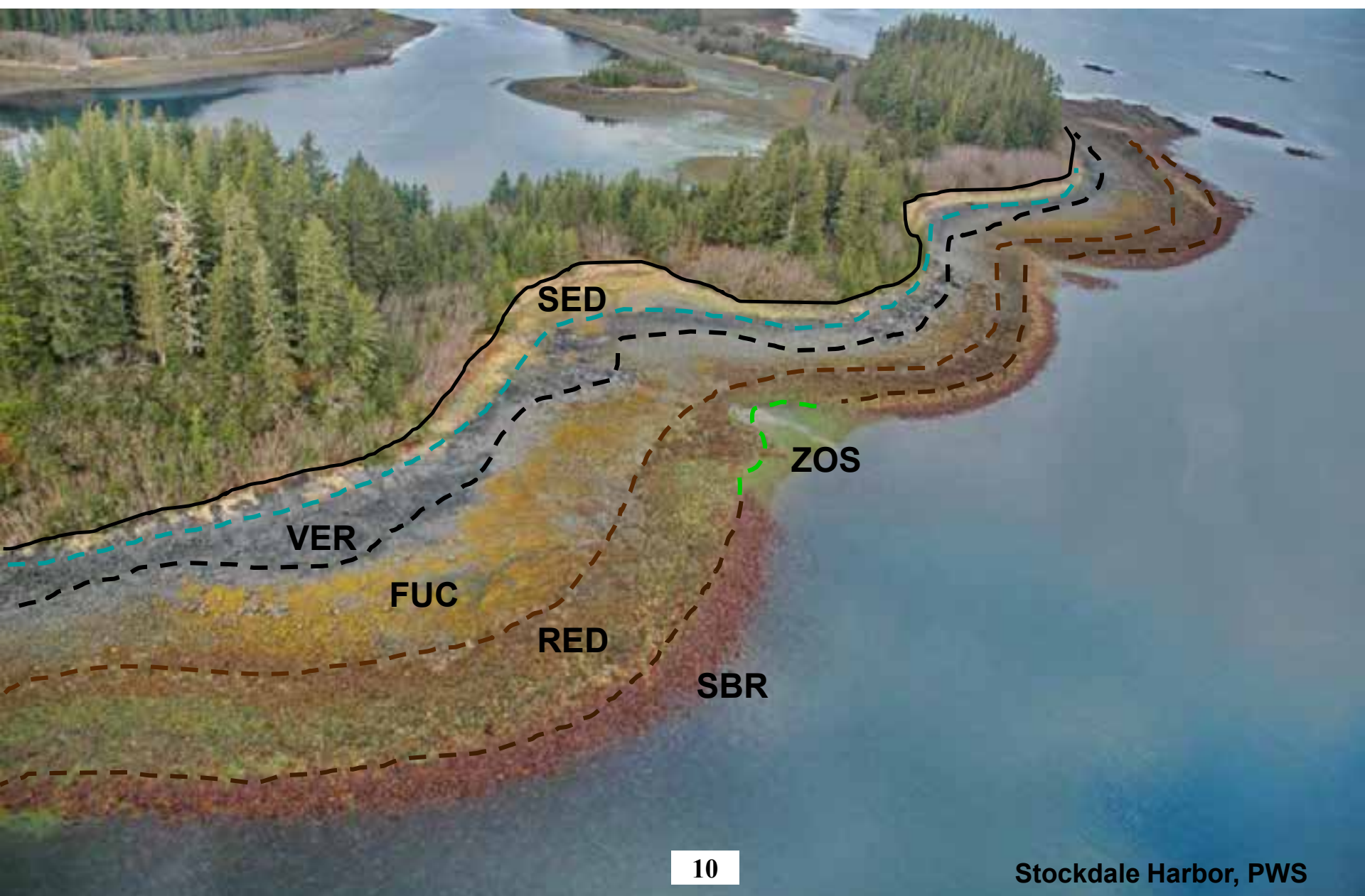


Biobands

Phase II: Coastal Habitat Mapping- biobands



Phase II: Coastal Habitat Mapping- biobands



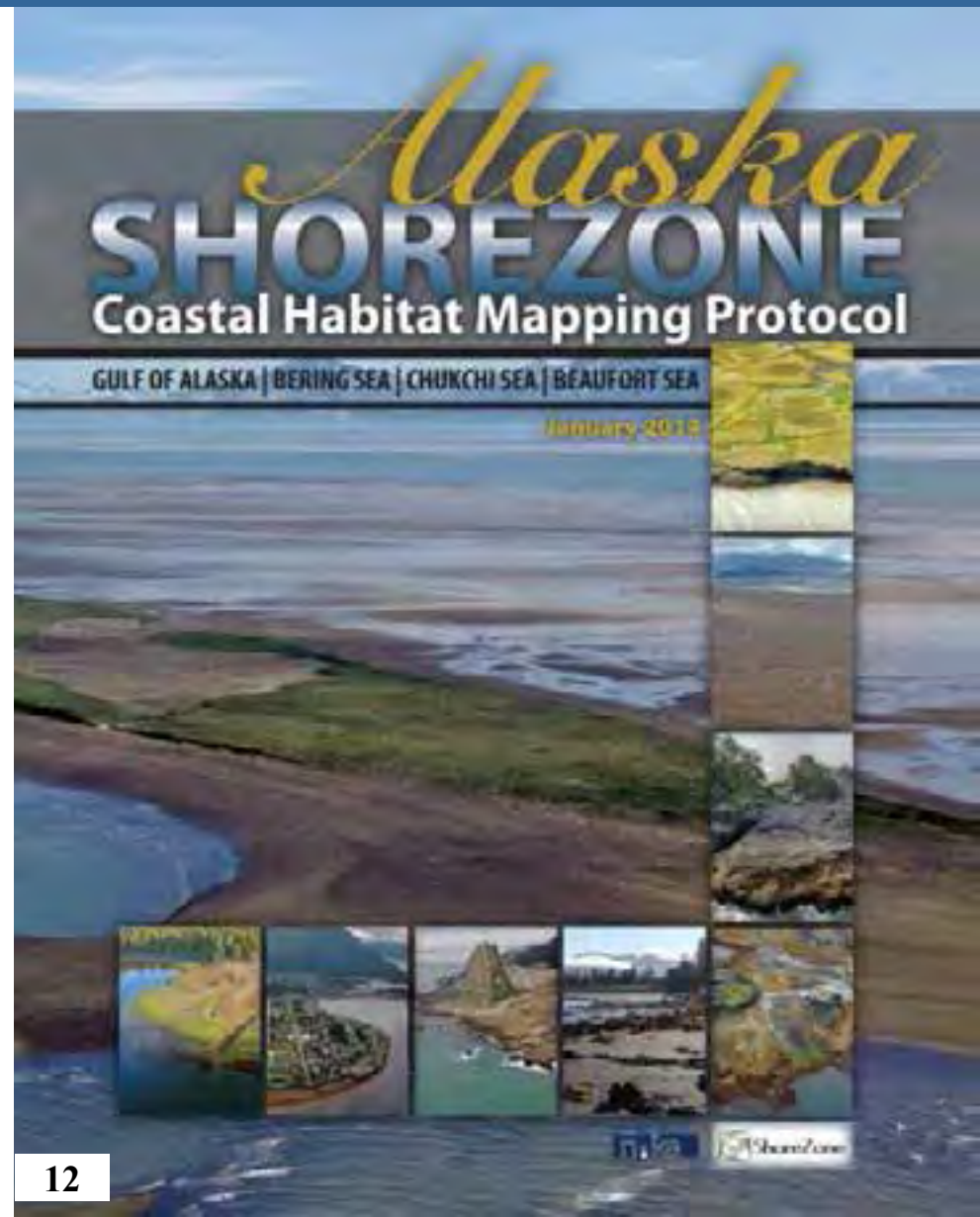
Phase II: Coastal Habitat Mapping- biobands



Phase II: Coastal Habitat Mapping

Standardized Protocols

- Guidelines for users
- Codes and definitions
- Diagrams
- photographic examples



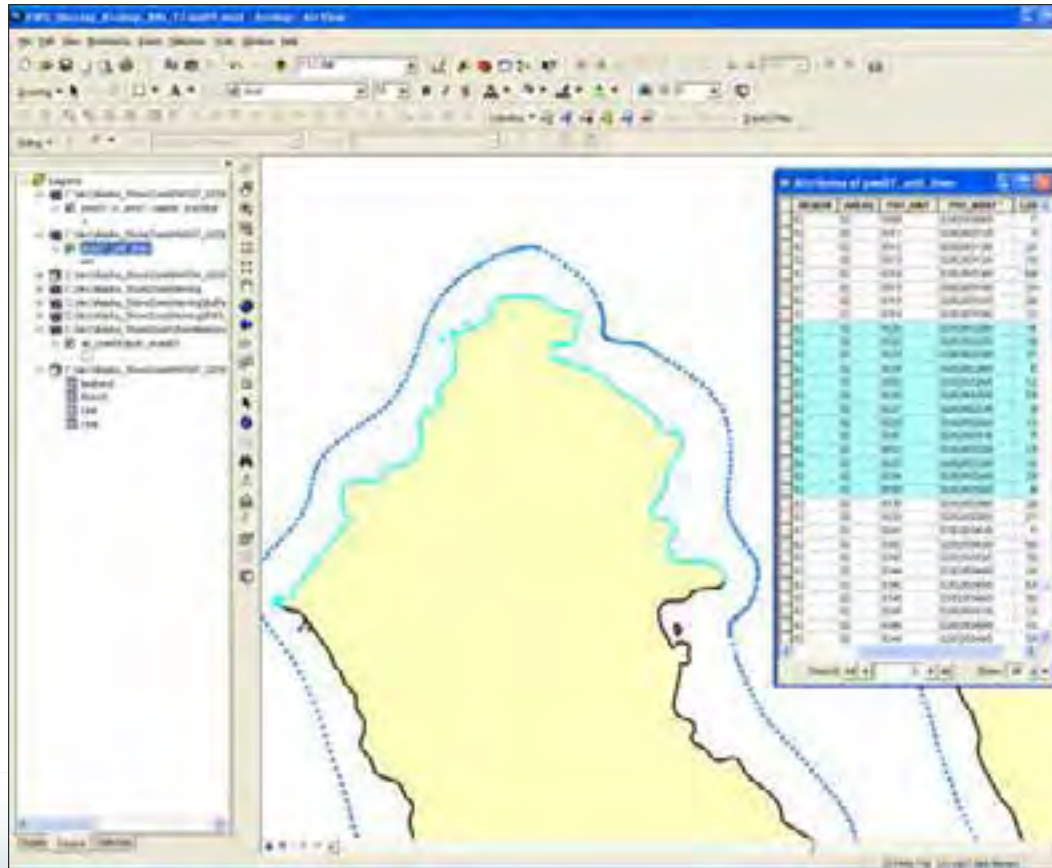
Phase II: Coastal Habitat Mapping

Table A-2. Classification of shore types employed in ShoreZone mapping
(derived from the Howes et al. [1994] "BC Class" system in British Columbia)

SUBSTRATE	SEDIMENT	WIDTH	SLOPE	COASTAL CLASS	NO.
ROCK	N/A	WIDE (>30 m)	STEEP (>20°)	n/a	
			INCLINED (5-20°)	Rock Ramp, wide	1
			FLAT (<5°)	Rock Platform, wide	2
		NARROW (<30 m)	STEEP (>20°)	Rock Cliff	3
			INCLINED (5-20°)	Rock Ramp, narrow	4
		FLAT (<5°)	Rock Platform, narrow	5	
ROCK & SEDIMENT	GRAVEL	WIDE (>30 m)	STEEP (>20°)	n/a	
			INCLINED (5-20°)	Ramp with gravel beach, wide	6
			FLAT (<5°)	Platform with gravel beach, wide	7
		NARROW (<30 m)	STEEP (>20°)	Cliff with gravel beach	8
			INCLINED (5-20°)	Ramp with gravel beach	9
			FLAT (<5°)	Platform with gravel beach	10
	SAND & GRAVEL	WIDE (>30 m)	STEEP (>20°)	n/a	
			INCLINED (5-20°)	Ramp w gravel & sand beach, wide	11
			FLAT (<5°)	Platform with G&S beach, wide	12
		NARROW (<30 m)	STEEP (>20°)	Cliff with gravel/sand beach	13
			INCLINED (5-20°)	Ramp with gravel/sand beach	14
			FLAT (<5°)	Platform with gravel/sand beach	15
	SAND	WIDE (>30 m)	STEEP (>20°)	n/a	
			INCLINED (5-20°)	Ramp with sand beach, wide	16
			FLAT (<5°)	Platform with sand beach, wide	17
NARROW (<30 m)		STEEP (>20°)	Cliff with sand beach	18	
		INCLINED (5-20°)	Ramp with sand beach, narrow	19	
		FLAT (<5°)	Platform with sand beach, narrow	20	
SEDIMENT	GRAVEL	WIDE (>30 m)	FLAT (<5°)	Gravel flat, wide	21
		NARROW (<30 m)	STEEP (>20°)	n/a	
			INCLINED (5-20°)	Gravel beach, narrow	22
			FLAT (<5°)	Gravel flat or fan	23
	SAND & GRAVEL	WIDE (>30 m)	STEEP (>20°)	n/a	
			INCLINED (5-20°)	n/a	
			FLAT (<5°)	Sand & gravel flat or fan	24
	NARROW (<30 m)	STEEP (>20°)	n/a		
		INCLINED (5-20°)	Sand & gravel beach, narrow	25	
		FLAT (<5°)	Sand & gravel flat or fan	26	
	SAND / MUD	WIDE (>30m)	STEEP (>20°)	n/a	
INCLINED (5-20°)			Sand beach	27	
FLAT (<5°)			Sand flat	28	
NARROW (<30m)		FLAT (<5°)	Mudflat	29	
		STEEP (>20°)	n/a		
		INCLINED (5-20°)	Sand beach	30	
		FLAT (<5°)	n/a	n/a	
	ORGANICS	n/a	n/a	Estuaries	31
ANTHRO-POGENIC	Man-made	n/a	n/a	Man-made, permeable	32
			n/a	Man-made, impermeable	33
CHANNEL	Current	n/a	n/a	Channel	34
GLACIER	Ice	n/a	n/a	Glacier	35



Phase II: Coastal Habitat Mapping

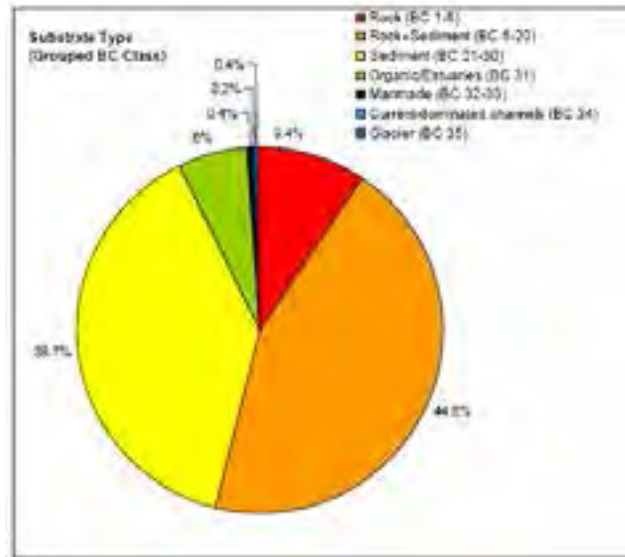


Phase II: Coastal Habitat Mapping

Summary Report: Shore Type

Table 2.1. Shore types by BC Class observed in Prince William Sound.

Substrate Type	Shore Type (BC Class)	Shore Type (BC Class)	Size of Unit Length (m)	# of Units	% Occurrence (by length)	Cumulative Occurrence (% km)
Rock	1	Rock (BC Class 1-8)	4.9	25	0.1%	0.4%
	2	Rock (BC Class 9-10)	8.1	30	0.1%	0.7%
	3	Rock (BC Class 11-12)	402.1	2334	9.3%	10.0%
	4	Rock (BC Class 13-14)	31.0	286	0.9%	11.2%
	5	Rock (BC Class 15-16)	1.2	35	0.0%	11.6%
Rock & Sediment	6	Rock & Sediment (BC Class 17-18)	128.2	858	2.7%	14.6%
	7	Rock & Sediment (BC Class 19-20)	125.0	208	2.3%	17.2%
	8	Rock & Sediment (BC Class 21-22)	443.9	1952	7.0%	24.5%
	9	Rock & Sediment (BC Class 23-24)	223.4	1317	4.9%	29.7%
	10	Rock & Sediment (BC Class 25-26)	6.6	44	0.1%	30.1%
	11	Rock & Sediment (BC Class 27-28)	203.3	1088	4.3%	34.8%
	12	Rock & Sediment (BC Class 29-30)	202.7	717	4.2%	39.3%
	13	Rock & Sediment (BC Class 31-32)	518.1	2001	7.3%	46.6%
	14	Rock & Sediment (BC Class 33-34)	266.8	1378	5.7%	52.6%
	15	Rock & Sediment (BC Class 35-36)	14.3	112	0.3%	53.3%
	16	Rock & Sediment (BC Class 37-38)	0.0	0	0.0%	53.3%
	17	Rock & Sediment (BC Class 39-40)	2.2	11	0.0%	53.5%
	18	Rock & Sediment (BC Class 41-42)	0.7	9	0.0%	53.7%
19	Rock & Sediment (BC Class 43-44)	0.6	5	0.0%	54.0%	
20	Rock & Sediment (BC Class 45-46)	0.2	2	0.0%	54.2%	
Sediment	21	Sediment (BC Class 47-48)	76.0	321	1.0%	55.5%
	22	Sediment (BC Class 49-50)	00.1	288	0.9%	56.7%
	23	Sediment (BC Class 51-52)	0.2	1	0.0%	56.9%
	24	Sediment (BC Class 53-54)	1134.0	9216	27.2%	84.1%
	25	Sediment (BC Class 55-56)	395.4	2019	6.3%	90.4%
	26	Sediment (BC Class 57-58)	32.1	213	0.6%	91.0%
	27	Sediment (BC Class 59-60)	9.0	22	0.1%	91.1%
	28	Sediment (BC Class 61-62)	86.4	170	1.0%	92.1%
Organic	29	Organic (BC Class 63-64)	127.3	231	2.3%	94.4%
	30	Organic (BC Class 65-66)	1.2	4	0.0%	94.6%
Marine Life	31	Marine Life (BC Class 67-68)	348.1	1172	4.0%	98.6%
	32	Marine Life (BC Class 69-70)	0.0	0	0.0%	98.6%
Channel	33	Channel (BC Class 71-72)	11.2	31	0.2%	99.1%
	34	Channel (BC Class 73-74)	25.1	16	0.4%	99.5%



What are *ShoreZone* Shore Stations?



- Site-specific on-the-ground; nests within Alaska ShoreZone Program.
- Detailed biophysical documentation for each bioband.
- Species data reported on a categorical, semi-quantitative scale.
- The ShoreZone and Shore Station data are not meant to be compared; simply provides detail about regional differences.
- Sites selected opportunistically chosen to encompass the range of observed coastal habitats and wave exposures.



Shore Stations – beach width, slope, substrate



Shore Stations: Species Assemblages



Shore Stations: Individual species



Nearshore Fish Atlas: Beach seine catch data



- A NOAA database of beach seine hauls throughout Alaska (1998-present).
- Database contains:
 - 1,008 beach seine hauls
 - over 700,000 fish
 - 122 fish species
 - SEAK, PWS, Cook Inlet, Aleutians, Arctic
- Provides spatially-explicit distribution and habitat use by forage fish
- Integrated with ShoreZone



Phase III: *ShoreZone* online

NOAA website:

- Online Desktop with tools
- Streaming video
- Download video clips
- Download data, shapefiles
- Fish Atlas and Shore Station overlay

ShoreZone.org

- All things ShoreZone
- West Coast ShoreZone
- Online desktop for AK, WA, OR, ... BC, CA?





Web

Maps

Shopping

Videos

News

More ▾

Search tools

About 283,000 results (0.45 seconds)

Alaska ShoreZone Coastal Mapping and Imagery

<https://alaskafisheries.noaa.gov/> ▾ National Oceanic and Atmospheric Administration ▾
Alaska **ShoreZone** Coastal Mapping and Imagery - You can fly the Alaska coastline (via video), view still photos, and access biophysical data using our

ShoreZone Flex Site - NOAA Fisheries Alaska

alaskafisheries.noaa.gov ▾ National Oceanic and Atmospheric Administration ▾
Disclaimer Privacy Policy **ShoreZone** Page Metadata Contact Data Dictionary Admin Link
Alaska **ShoreZone** Flex Mapping Website. Initial mode: **ShoreZone**

ShoreZone | Facebook

<https://www.facebook.com/ShoreZone> ▾
ShoreZone 175 likes · 3 talking about this. **ShoreZone** is a coastal habitat mapping program using georeferenced imagery taken by helicopter. Geology and

ShoreZone Habitat Mapping - Coastal and Ocean ...

www.coastalandoceans.com/ /**ShoreZo** ▾ Coastal and Ocean Resources Inc. ▾
The **ShoreZone** mapping system assesses coastal habitats with coastal zone aerial video digital still imagery during the lowest daylight tides of the year.

Shorezone - Geographic Information Network of Alaska

www.gina.alaska.edu/projects/shorezone ▾ University of Alaska system ▾
The Alaska **ShoreZone** Project is taking an inventory of the biology and geology of Alaska's immense coastline by making millions of photographs, video, and

Nearshore Habitat Inventory Projects

www.dnr.wa.gov/ /a ▾ Washington State Department of Natural Resource



***Integrated Datasets
and
Web Enabled GIS***

ShoreZone Online Desktop:



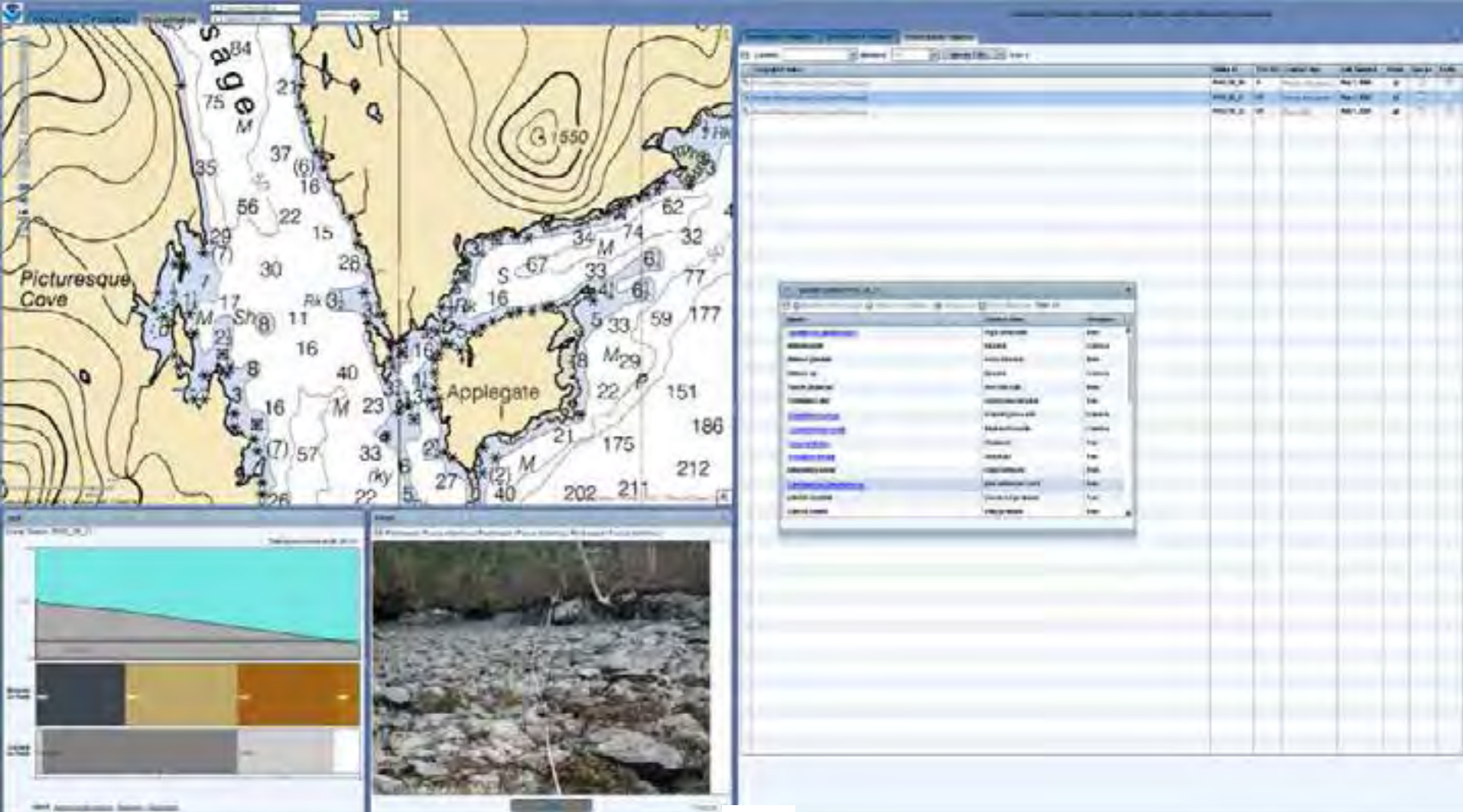
The screenshot displays the ShoreZone Online Desktop interface, which is divided into several functional panels:

- Map Panel:** A central map showing a coastline with various colored overlays representing different shore units. A red square highlights a specific unit.
- Expandable Layer Legend Panel:** A panel on the right side of the map that lists 160+ attribute layers. A callout points to a specific layer's details, showing a 'Single Unit Panel' with a quick summary of attributes such as Length, Habitat Class, and Coastal Class.
- Full Motion Video Panel:** A panel at the bottom left showing a video feed of a coastal landscape.
- High resolution still images:** A panel at the bottom center showing a high-resolution still image of the same coastal landscape.
- Unit Attributes Panel:** A table at the bottom right listing the complete attributes for various shore units. The table has columns for Unit ID, Length, Habitat Class, Coastal Class, and Environmental Status.

Unit ID	Length	Habitat Class	Coastal Class	Environmental Status
SAET10076	286	E	2	13
SAET10080	219	E	2	13
SAET10086	223	E	2	13
SAET10140	279	E	2	13
SAET10141	209	E	2	30
SAET10132	228	E	2	28
SAET10138	229	E	2	28
SAET10144	198	E	2	28
SAET10145	179	E	2	28
SAET10160	348	E	2	30
SAET10176	1,681	E	2	28
SAET10180	282	E	2	28

ShoreZone Online Desktop:

Shore Stations:





ShoreZone Online Desktop:

Fish Atlas:


The screenshot displays the 'ShoreZone Online Desktop' interface, specifically the 'Fish Atlas' section. The main map area shows a topographic map of the Culross Islands, with bathymetry and labels such as 'Culross Passage', 'Culross Scars', 'Culross Island', 'Culross Bay', 'Mines', and 'BM 10 (Tide)'. The interface includes a search and filter panel on the right, a data table with columns for 'Date', 'Time', 'Depth', 'Species', 'Count', 'Length', 'Weight', 'Sex', 'Age', 'Status', and 'Notes', and a smaller window displaying a list of species with their counts. The bottom-left panel is titled 'NOAA FISHES' and shows a grid of fish species. The bottom-right panel displays two photographs of fish, one yellow and one brown.

ShoreZone on AOOS – CIRCAC response tool

The screenshot displays the AOOS Cook Inlet Response Tool interface. At the top left, the logo "AOOS Cook Inlet Response Tool" is visible next to a search bar containing "Search for data". On the top right, there are navigation options: "Catalog", "Portal", "2 layers", and "Settings". The main map area shows a satellite view of the Cook Inlet region with a red line representing the ShoreZone boundary. A legend on the right side of the map lists the following layers:

- ▼ Legend
- Cook Inlet Geographic Response Strategies
- Geographic Response Strategies
- Cook Inlet ShoreZone Imagery
- Video
- ▼ Photograph

In the bottom left corner, there is a video player window. The video title is "06.29.08.153.0318" and it is described as "Cook Inlet ShoreZone Imagery". The video player shows a landscape view of a coastline with a red line overlaid on the water's edge. The video player controls at the bottom indicate a duration of 00:51 and a progress bar.



Seaweed Resources Online



www.seaweedsokalaska.com

Seaweeds of Alaska



- Chlorophyta
- Ochrophyta
- Rhodophyta

Taxonomic Tree

Resources & Misc. Charts

habitat Classification

Coastal Regions & Maps

Search Species Name

Advanced Search

RCAC logo

Nereocystis luetkeana

Bull Kelp



Authority: (L. Matens) Probst et Flueckiger
North Pacific Distribution: Eastern Aleutian Is. (Unalaska Is.) AK, to the Luis Chopra County, California

Phylum: Ochrophyta
Class: Phaeophyceae
Order: Laminariales
Family: Laminariaceae

Former Scientific Name:
Fucus luetkeanus

Description: Thallus of this common canopy-forming kelp has a tuftly branched blade (fronds) and a cylindrical stipe 10–30 m (33–115 ft) long, terminating in a single, gas-filled pneumatocyst from which the many blades, up to 10 m (33 ft) long, radiate. Blade growth can reach 10 cm (4 in) per day. Reproductive patches (spor) develop on the blades and drip to the surface at maturity. **Habitat:** This annual kelp grows on rock from the low intertidal to subtidal, in partly semi-exposed habitats at high current areas. Offshore beds can persist for one to twenty years, usually in deeper water than *Ecklonia* or *Macrocystis*, where they co-occur.

Advanced Search



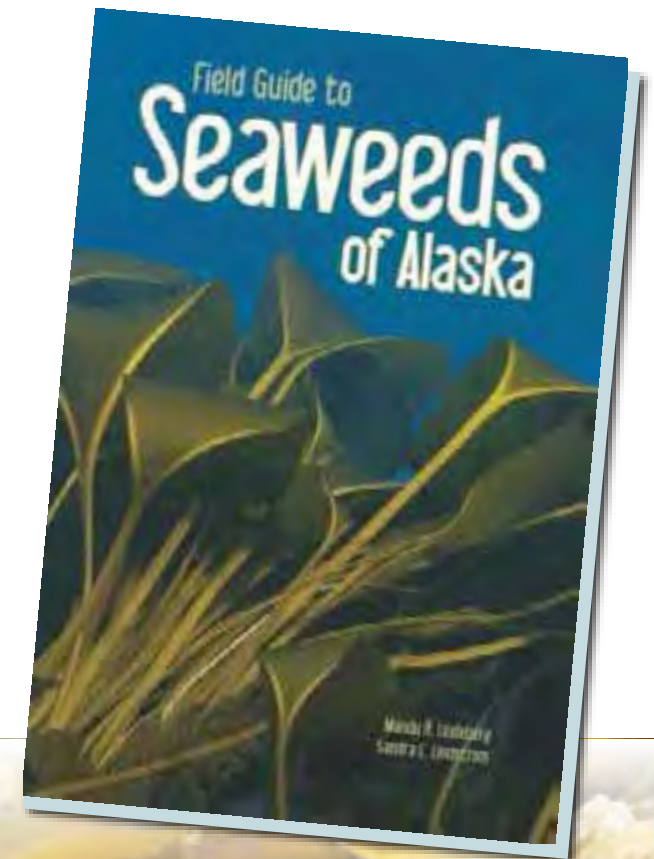
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Field Guide:



Have No Fear!

- **Everyone can use it.**
 - picture key
- **Take it to the beach.**
 - water resistant.





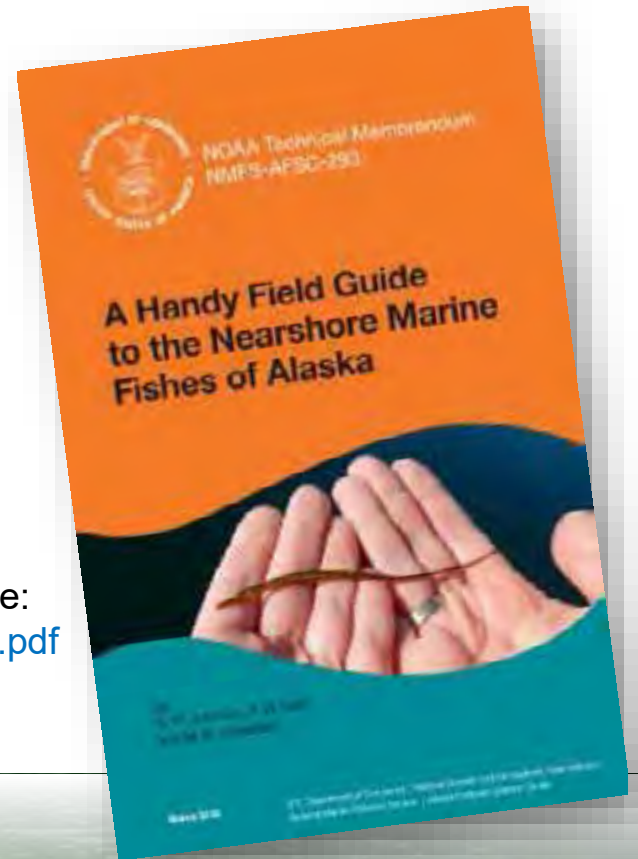
Easily find what your looking for:

- **113 fish species, 23 families**
- **Distribution and habitat use**
- **Key photos of life history stages**
- **Identification tips**

Download Free PDF!

Google the field guide or go to Alaska Fisheries Science Center website:

<http://www.afsc.noaa.gov/Publications/AfSC-TM/NOAA-TM-AFSC-293.pdf>



ShoreZone Progress – Sept. 2016



Applications of *ShoreZone*

- Originally developed for oil spill planning and response
- First responders – USCG, federal and state agencies
- Resource Managers – sensitive habitats, invasive species
- Scientists – site selection, monitoring, species distribution
- Educators and students – coastal environment



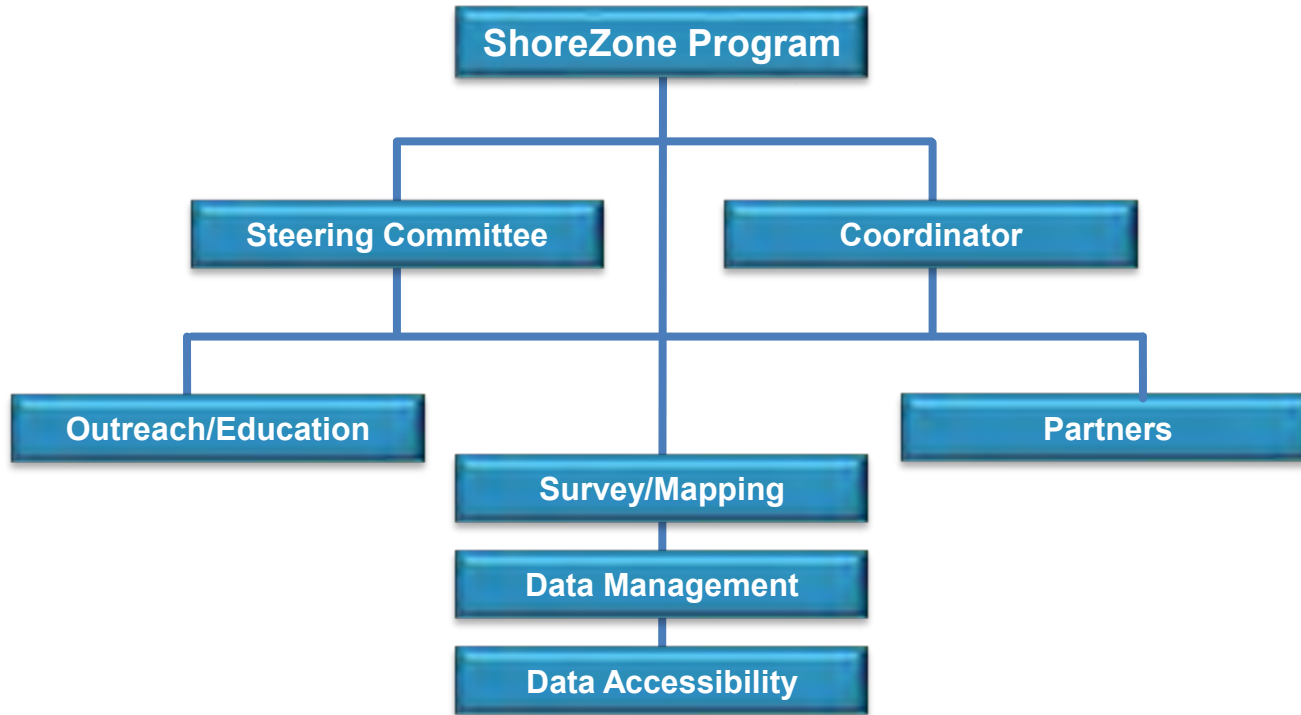
***ShoreZone* Users – many we didn't anticipate!**

Random List that came across my desk in the last year:

- Rome Italy – Iberpress photo news agency
- Univ. Algarve Portugal – Global distribution of Giant Kelp
- Geoduck documentary – Story House Productions, Wash. D.C.
- Rpt to EVOSTC – lingering oil and Restoration Assessment
- NMFS highlight article – Art Meets Science on the AK Coastline
- NOAA Under Secretary – Request for coastal erosion slides
- NOAA Climate Tool Kit – ShoreZone added, press release POTUS



Alaska *ShoreZone* Program Org Chart



ShoreZone Partners

- NMFS AK Region
- NMFS Auke Bay Labs
- NOAA NOS
- NOAA AK Region Collaboration Team
- US DOI FWS Yukon Delta
- US DOI FWS NWR
- US FWS ALCC
- US FWS WALCC
- US DOI NPS
- US DOI BOEM
- US DOI BSEE
- PWS RCAC
- CI RCAC
- TNC
- UAF GINA

.... and many more!

ShoreZone Outreach

- Social Media



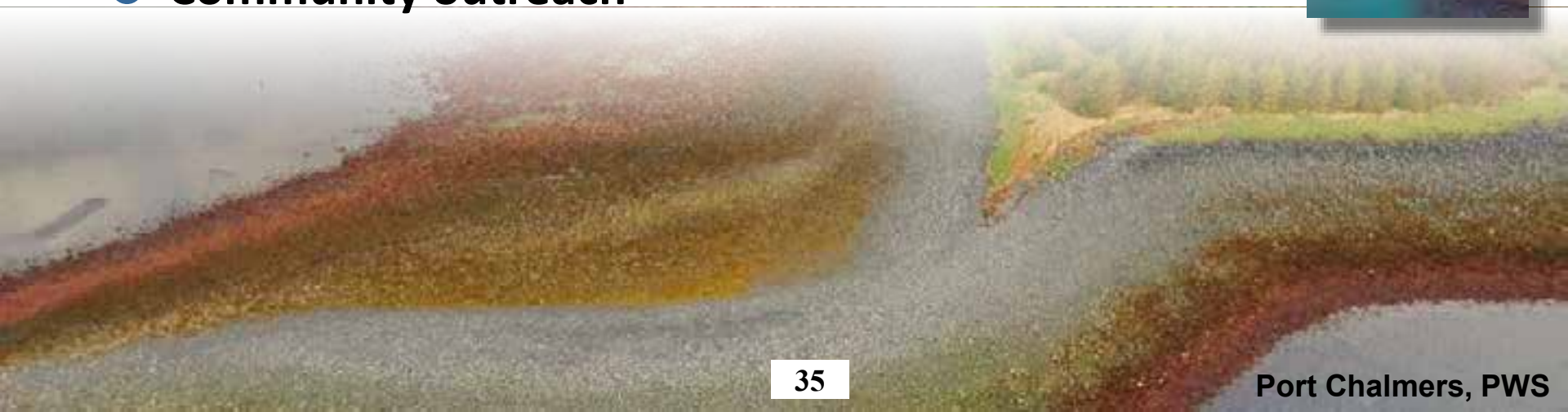
facebook

- ShoreZone.org

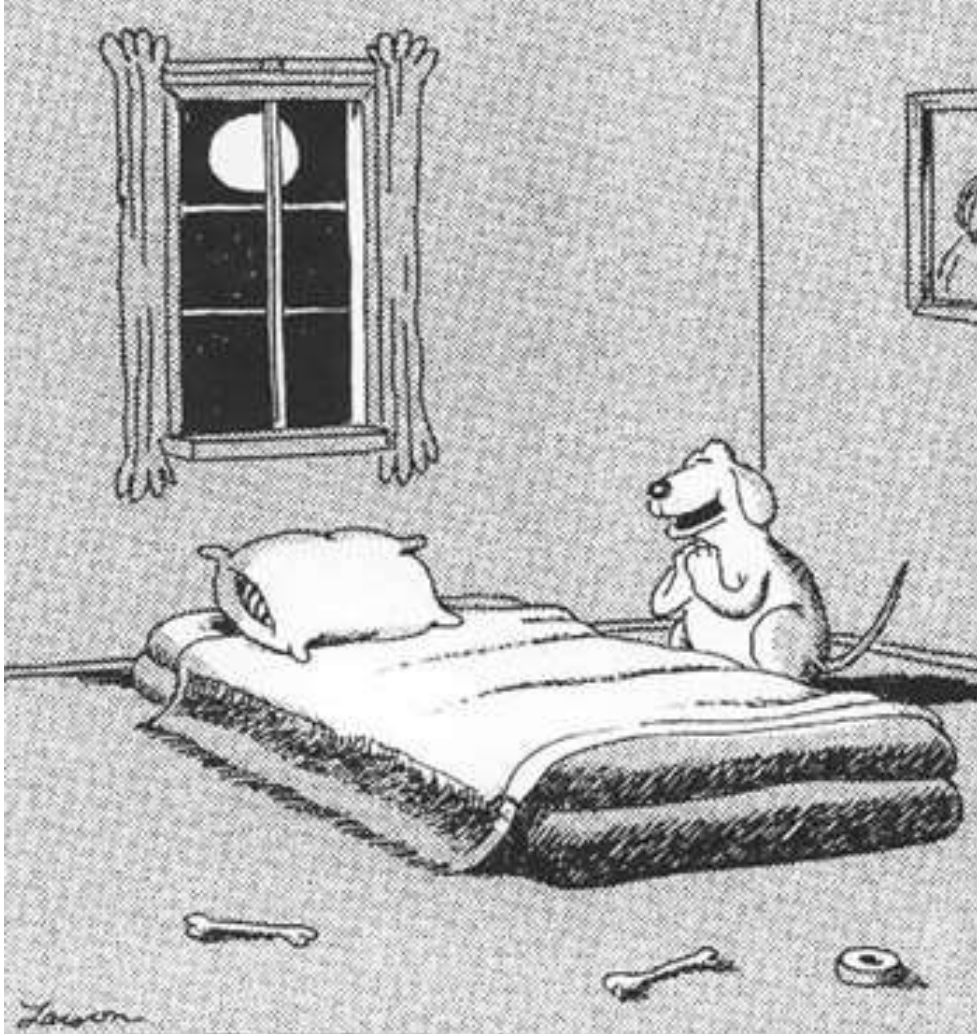
- Webinars

- Coastal Impressions

- Community outreach



ShoreZone: Future Needs



- Aleutians, omg!
- More tools –
Coastal vulnerability
- High definition mapping
- Re-imaging
- More Impressions

More of
Everything !



Thank You – Questions?

