

NOAA
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Alaska ShoreZone Coastal Habitat Mapping Program

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Coastal Issues in Alaska

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



History of Human Impacts to Alaska's Coast

- *Exxon Valdez* oil spill 1989
- *Selendang Ayu* break up 2004
- Drill Rig *Kulluk* 2013
- Canadian barge Oct. 2014?



134 ft. barge adrift, Beaufort Sea



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: Aquiring Coastal Imagery

Planning, Logistics, etc.

- Consultations, awareness in coastal communities
- Land ownership and permitting
- Flight plan, fueling locations, lodging, food



I thought you ordered the fuel?

Phase I: Acquiring Coastal Imagery

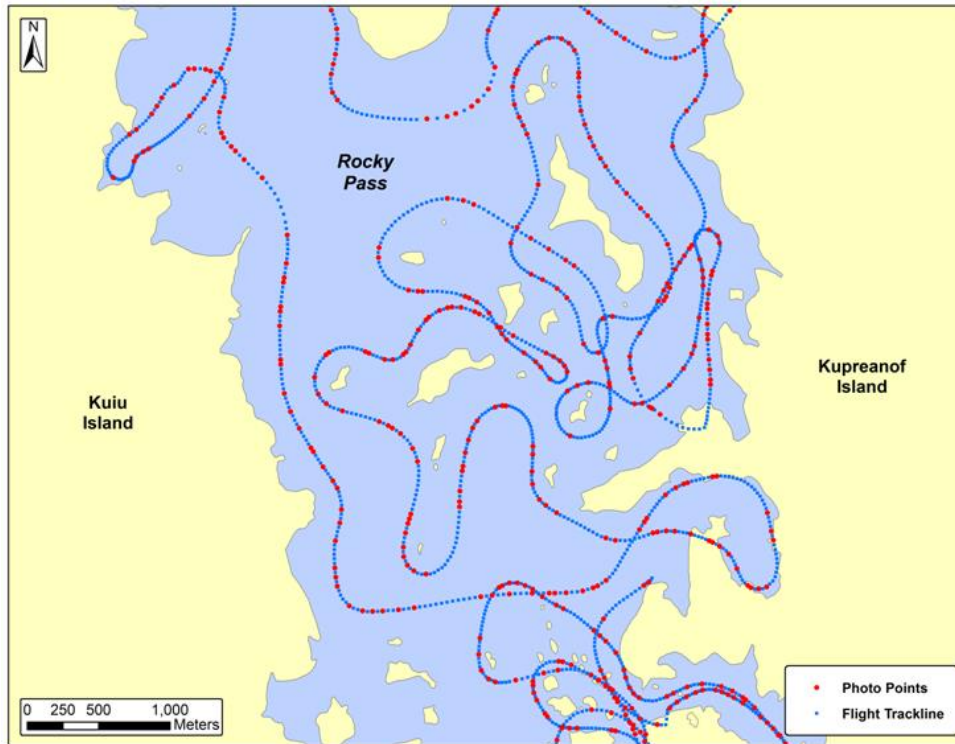
Mapping is based on video and still imagery:

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



Phase II: Habitat Mapping - Digital Shoreline

GPS flight trackline recorded at 1-second intervals:

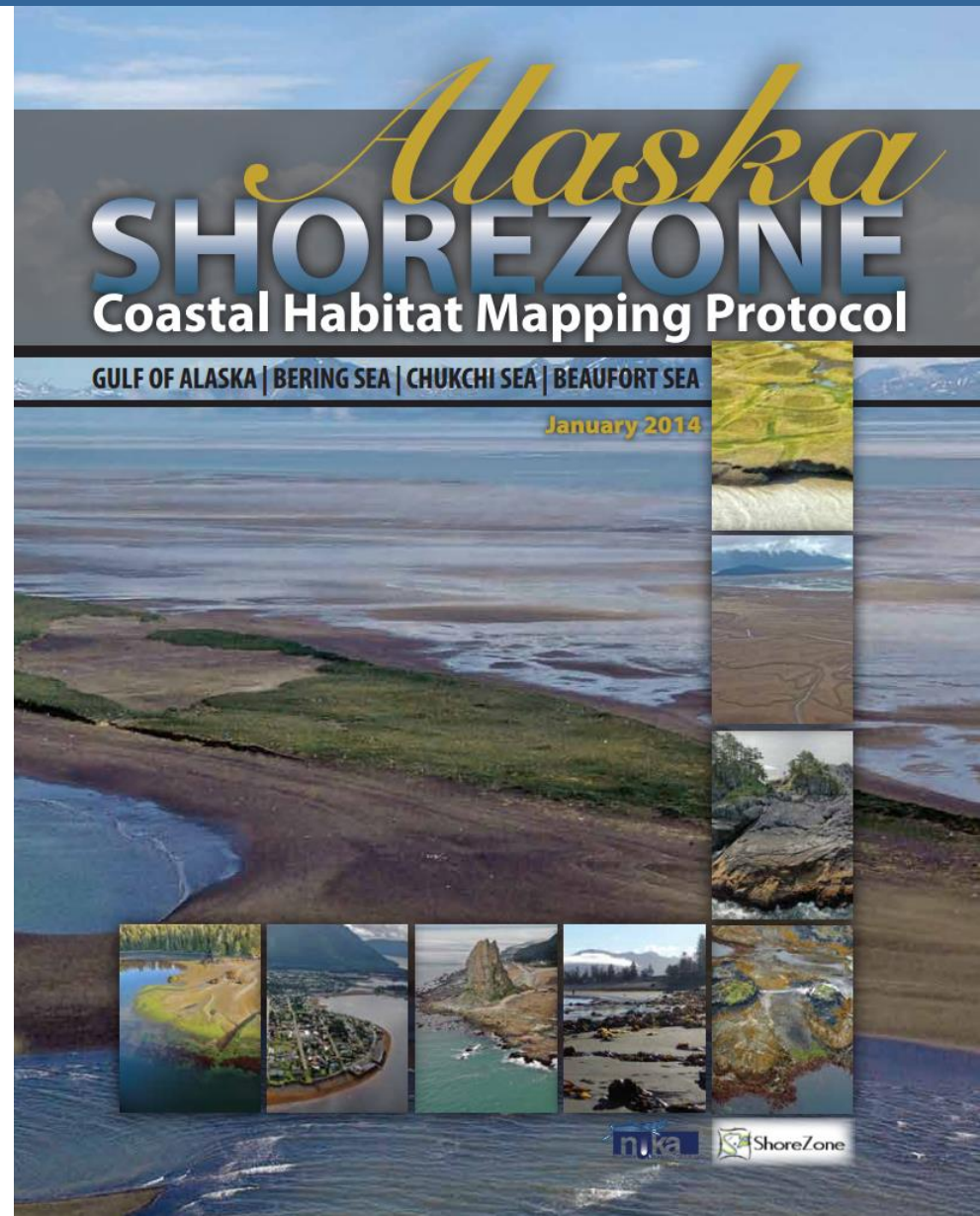


→ Navigation trackline and imagery are used to segment digital shoreline into along-shore units:



Phase II: ShoreZone Protocol

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



Phase II: ShoreZone Protocols - Shore Types

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
			STEEP (>20°)	n/a	
		NARROW (<30 m)	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	n/a	Estuaries	31
ANTHRO-POGENIC	Man-made	n/a	n/a	Man-made, permeable	32
		n/a	n/a	Man-made, impermeable	33
CHANNEL	Current	n/a	n/a	Channel	34
GLACIER	Ice	n/a	n/a	Glacier	35

Shore Type: Rock (BC Classes 1-5)

Southeast Alaska



Steep high cliff (Form "Cash"); fixed-wing aerial survey photo
Tayva Point, Lynn Canal (Unit 10/04/3200)



Low-tide, irregular rock platform with tidepools (Form "Pihp")
Yakobi Island (Unit 10/02/1632)

Shore Type: Rock and Sediment (BC Classes 6-20, continued)

Kodiak Archipelago



Wide (>30 m) platform (<5° slope) with gravel beach (BC Class 7).
Geese Channel (Unit 05/04/8011)



Steep cliff (>20°) with narrow (<30 m) gravel beach (BC Class 8).
Geese Channel (Unit 05/04/8030)

Shore Type: Glaciers (BC Class 35)

Southeast Alaska



Glaciers of Russel Fjord (Form "lg")

Northern Yakutat Bay (Unit 09/02/0145)
SE05_ML_4494.jpg



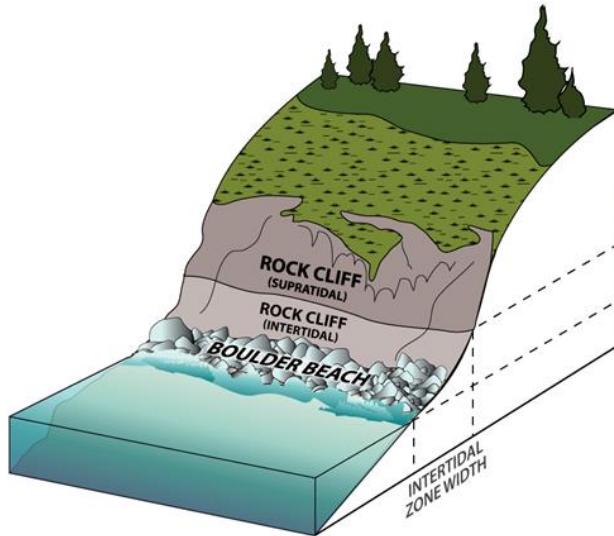
Glaciers of Tsaa Fjord, with high cliffs and waterfalls (Forms "lg," "Cash," and "Rm")

Ioy Bay (Units 09/01/0345-0349)
SE05_ML_3976.jpg

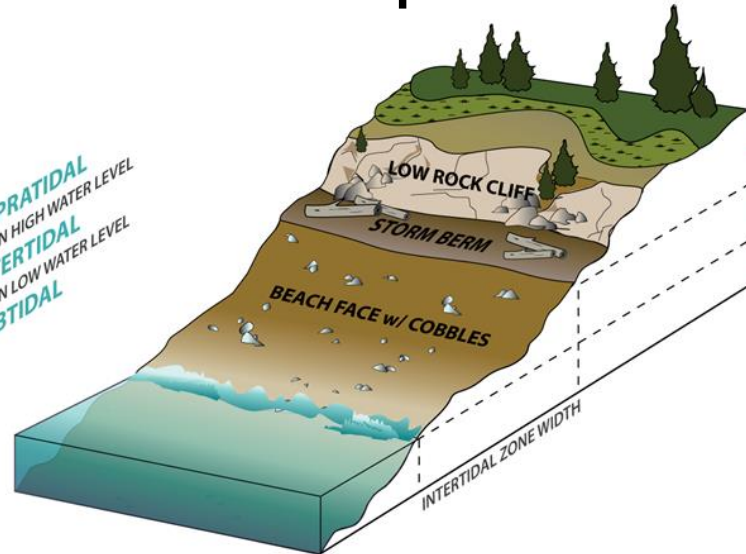
Phase II: biophysical mapping

Physical and biological features of across-shore zones are mapped with respect to relative tidal position

COMPONENTS

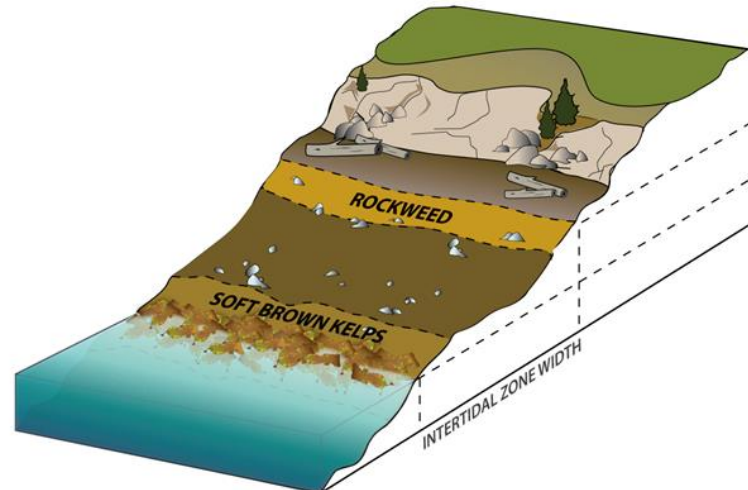
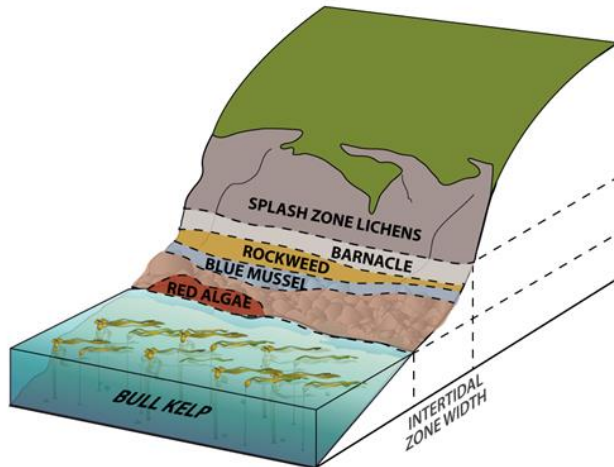


SUPRATIDAL
MEAN HIGH WATER LEVEL
INTERTIDAL
MEAN LOW WATER LEVEL
SUBTIDAL

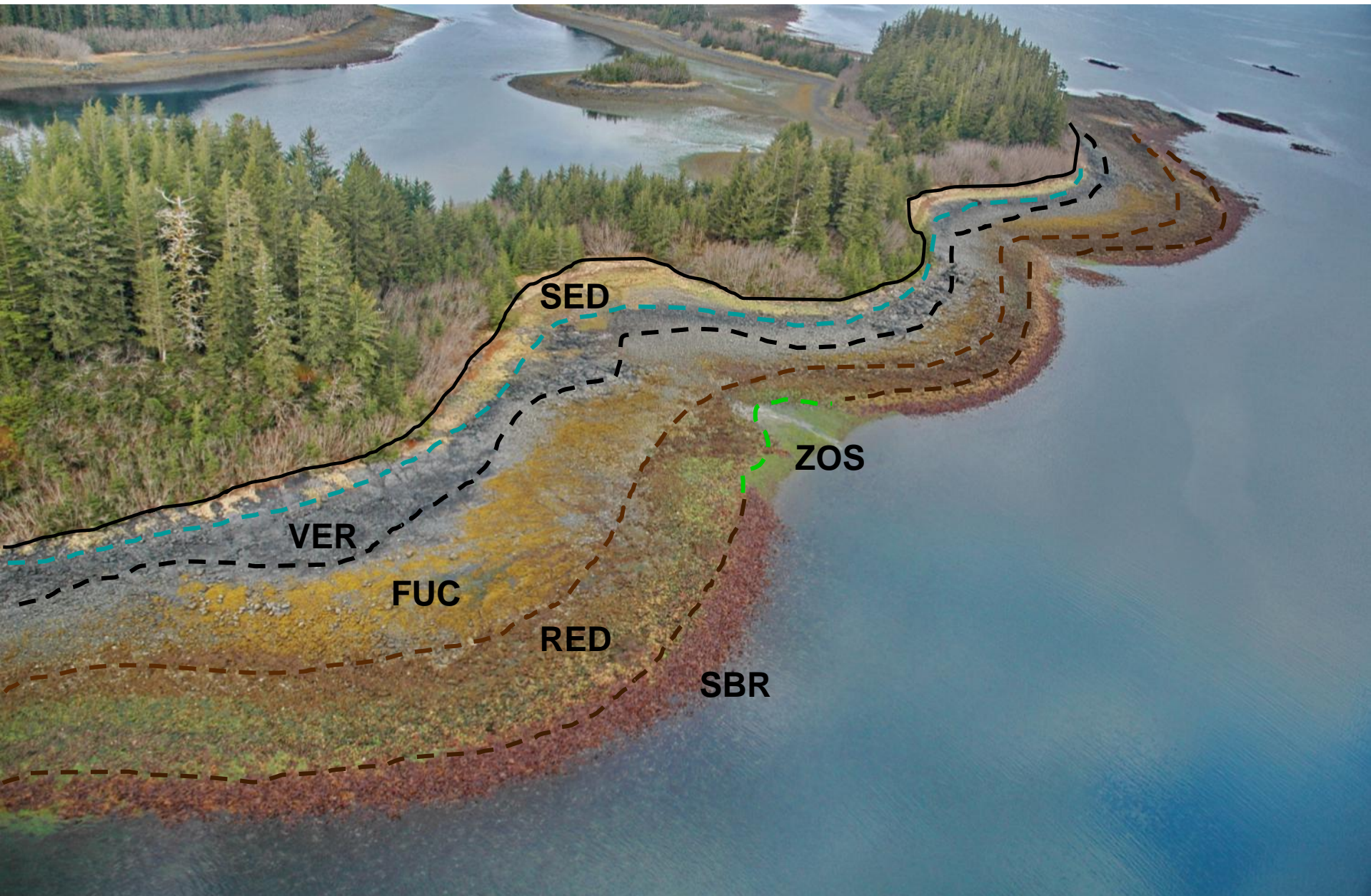


SUPRATIDAL
MEAN HIGH WATER LEVEL
INTERTIDAL
MEAN LOW WATER LEVEL
SUBTIDAL

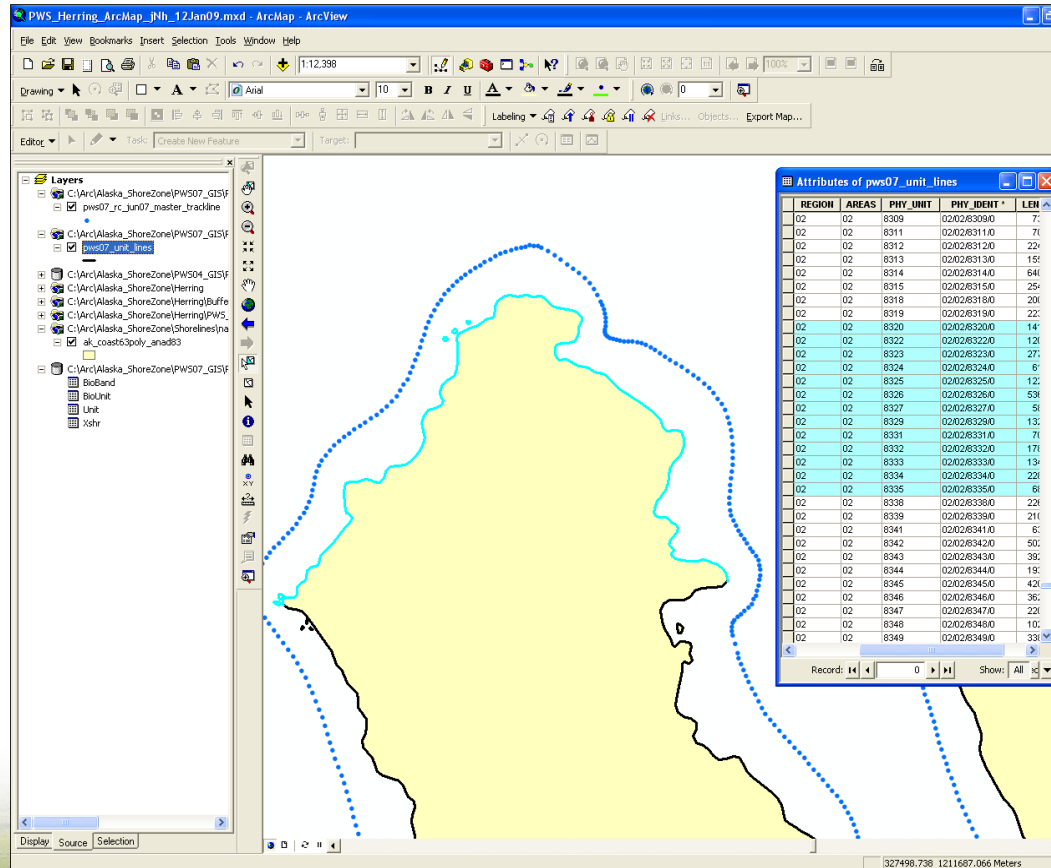
BIOBANDS



Phase II: habitat mapping - "Biobands"



Phase II: A Rigorous Geospatial Database

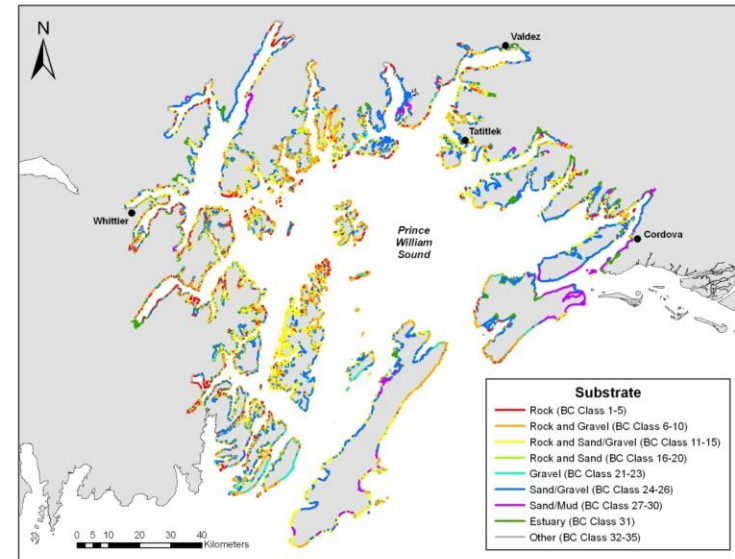
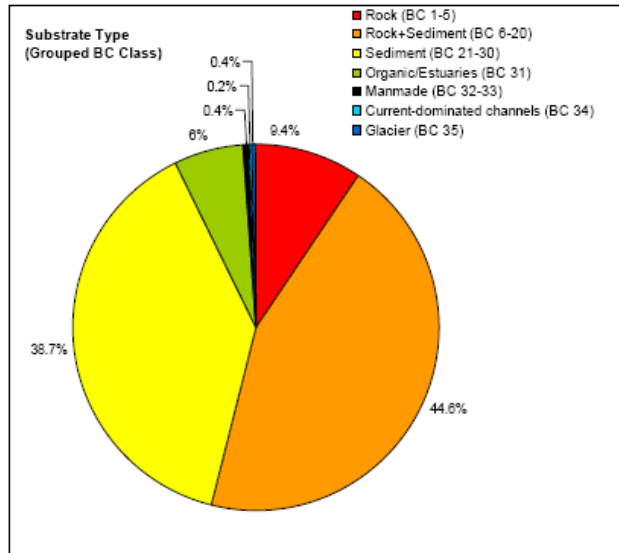


ShoreZone Summary Reports

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)	Sum of Unit Length (km)	# of Units	% Occurrence (by length)	Cumulative Occurrence (% km)
Rock	1	Rock Ramp, wide	4.8	25	0.1%	9.4%
	2	Rock Platform, wide	8.1	30	0.1%	627.8 km
	3	Rock Cliff	462.1	2204	8.3%	
	4	Rock Ramp, narrow	51.6	386	0.9%	
	5	Rock Platform, narrow	1.2	15	0.0%	
Rock & Sediment	6	Ramp with gravel beach, wide	128.2	454	2.3%	44.6%
	7	Platform with gravel beach, wide	128.0	298	2.3%	2,488.0 km
	8	Cliff with gravel beach	443.9	1852	7.9%	
	9	Ramp with gravel beach	273.4	1317	4.9%	
	10	Platform with gravel beach	6.4	44	0.1%	
	11	Ramp to gravel & sand beach, wide	253.3	1085	4.5%	
	12	Platform with G&S beach, wide	232.7	777	4.2%	
	13	Cliff with gravel&sand beach	518.1	2561	9.3%	
	14	Ramp with gravel&sand beach	486.8	2378	8.7%	
	15	Platform with gravel&sand beach	14.5	112	0.3%	
	16	Ramp with sand beach, wide	0.0	0	0.0%	
	17	Platform with sand beach, wide	2.2	11	0.0%	
	18	Cliff with sand beach	0.7	5	0.0%	
	19	Ramp with sand beach, narrow	0.8	5	0.0%	
20	Platform with sand beach, narrow	0.2	2	0.0%		
Sediment	21	Gravel flat, wide	79.0	321	1.4%	38.7%
	22	Gravel beach, narrow	50.1	220	0.9%	2,163.5 km
	23	Gravel flat or fan	0.2	1	0.0%	
	24	Sand & gravel flat or fan, wide	1174.9	5216	21.0%	
	25	Sand & gravel beach, narrow	595.4	3019	10.7%	
	26	Sand & gravel flat or fan, narrow	32.1	212	0.6%	
	27	Sand beach	5.0	22	0.1%	
28	Sand flat	98.4	179	1.8%		
29	Mudflat	127.3	221	2.3%		
30	Sand beach	1.2	4	0.0%		
Organics	31	Organic shorelines, narrow	348.1	1172	6.2%	6.2% 348.1 km
Man-made	32	Man-made, permeable	22.6	36	0.4%	0.4% (23 km)
	33	Man-made, impermeable	0.5	3	0.0%	
Channel	34	Channel	11.0	31	0.2%	0.2% (11 km)
Glaciers	35	Glacier	23.1	18	0.4%	0.4% (23 km)



Phase III: ShoreZone online

- **ShoreZone.org – partner website**
- **Main portal - NOAA Fisheries web enabled GIS, “flex site”**
- **Other portals**



[Web](#)[Maps](#)[Shopping](#)[Videos](#)[News](#)[More ▾](#)[Search tools](#)

About 283,000 results (0.45 seconds)

Alaska ShoreZone Coastal Mapping and Imagery

<https://alaskafisheries.n...> ▾ 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.go...> ▾ 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 Resources ▾



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

Web Enabled GIS - Flex Desktop

www.alaskafisheries.noaa.gov/mapping/szflex/



[Disclaimer](#) [Privacy Policy](#) [ShoreZone Page](#) [Metadata](#) [Contact](#) [Data Dictionary](#) [Admin Links](#)

Alaska ShoreZone Flex Mapping Website

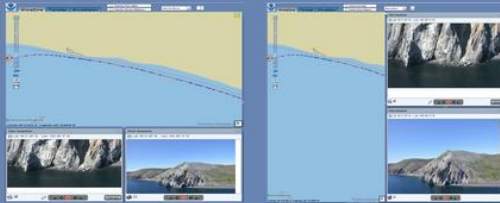
Choose a database

- ShoreZone
- Nearshore Fish Atlas
- Shore Stations

Choose a desktop configuration

- Images on bottom
- Images to right

Start



Alaska ShoreZone - Flex Desktop

The screenshot displays the Alaska ShoreZone Flex Desktop application interface. At the top, there are navigation tabs for "ShoreZone", "FishAtlas", and "ShoreStation". A search bar contains "Alaska Base". On the right, there are links for "Disclaimer", "Privacy Policy", "ShoreZone Page", "Metadata", "Contact", "Data Dictionary", and "Admin Links". Below the navigation is a map of Alaska with a yellow shaded area representing the ShoreZone. A vertical scale bar on the left indicates 500 km and 400 mi. The map's coordinates are Latitude: 49° 32.03035' N and Longitude: 154° 8.49609' W. A "Layer Legend" panel is open on the right, showing a list of layers with checkboxes. The "Shore Zone Layers" section is expanded, showing "Still Photos" and "Video Flightline" as checked, and "Photo Mark" as a sub-item. Other sections include "Derived ShoreZone Attributes" (Habitat Class, BC Class, Biological Wave Exposure), "Response Attributes" (Environmental Sensitivity Index (ESI), Oil Residency Index (OR)), and "Biological Attributes" (SplashZone; Black Seaside Lichen bioband, Dune Grass, Sedges, and Salt Marsh Vegetation, Dune Grass, Sedges, Salt Marsh Vegetation). At the bottom, there are two "Video Snapshots" and "Photo Snapshots" panels, both displaying the message "Current extent is too large. Reduce extent size to see video/photos." and a "Unit Description Table" panel with the message "Scale is too large. Zoom in further to see Units." The interface also includes a "Task Management" and "Locations" panel at the top right and a "Video" control bar at the bottom.

ShoreZone | FishAtlas | ShoreStation

Overlay Fish Atlas
Overlay Shore Stations

Alaska Base

Disclaimer | Privacy Policy | ShoreZone Page | Metadata | Contact | Data Dictionary | Admin Links

Layer Legend | Layer Query | Task Management | Locations

Show all layers in service

- Shore Zone Layers
 - Still Photos
 - Photo Mark
 - Video Flightline
- Derived ShoreZone Attributes
 - Habitat Class
 - BC Class
 - Biological Wave Exposure
- Response Attributes
 - Environmental Sensitivity Index (ESI)
 - Oil Residency Index (OR)
- Biological Attributes
 - SplashZone; Black Seaside Lichen bioband
 - Dune Grass, Sedges, and Salt Marsh Vegetation
 - Dune Grass
 - Sedges
 - Salt Marsh Vegetation

Video Snapshots

Photo Snapshots

Unit Description Table

Scale is too large. Zoom in further to see Units.

Video

Alaska ShoreZone - Flex Desktop

ShoreZone FishAtlas ShoreStation

Overlay Fish Atlas Overlay Shore Stations

Alaska Base

[Disclaimer](#) [Privacy Policy](#) [ShoreZone Page](#) [Metadata](#) [Contact](#) [Data Dictionary](#) [Admin Links](#)

Layer Le... Layer Qu... Task Ma... Locations

Show all layers in service

Derived ShoreZone Attributes

Habitat Class

- 10, Very Exposed/Immobile/Rock
- 11, Very Exposed/Partially Mobile/Sedime
- 12, Very Exposed/Mobile/Sediment
- 20, Exposed/Immobile/Rock
- 21, Exposed/Partially Mobile/Sediment or
- 22, Exposed/Mobile/Sediment
- 23, Exposed/Estuary
- 30, Semi-Exposed/Immobile/Rock
- 31, Semi-Exposed/Partially Mobile/Sedim
- 32, Semi-Exposed/Mobile/Sediment
- 33, Semi-Exposed/Estuary
- 34, Semi-Exposed/Current Channel
- 35, Semi-Exposed/Glacier
- 37, Semi-Exposed/Anthropogenic Perme

Unit Description Table

Units for viewable region. Total Unit Count: 5

Unit ID	Habitat Class	Biological Wave Expos
18/02/1025/0	32	SE
18/02/1149/0	32	SE
18/02/1150/0	32	SE
18/02/1151/0	32	SE
18/02/1152/0	32	SE

Video Snapshots

Lat: 71 18' 29" N Lon: 156 45' 1" W

360 neak09 03 YouTube

Photo Snapshots

Lat: 71 18' 25" N Lon: 156 45' 17" W

500 m
2000 ft

Latitude: 71° 16' 55.561" N Longitude: 156° 43' 00.420" W ShoreStation | FishAtlas | ShoreZone

ShoreZone on ERMA – Environmental Response Mgmt Application

The screenshot displays the ERMA Arctic web application interface. The main map area shows a coastal region with a yellow landmass and blue water. A red dashed line and a blue solid line represent the ShoreZone boundary. The map includes a scale bar (0 to 2 km), zoom controls, and a location indicator showing coordinates: 71.29188°, -156.57971°. The interface includes a navigation menu with options like 'Information', 'Help', and 'Recent Data'. A search bar is located at the top center. The right sidebar contains a 'Layers' panel with the following categories and items:

- Background
- Arctic Shield 2014
- UAF ARCTREX Study (Sept 2014)
- Admin Boundaries & Reference Features
- Bathymetry & Hydrology
- Environmental Quality & Monitoring
- Marine Debris
- Imagery & Remote Sensing
- Natural Resources, Habitats, & Managed Areas
 - Critical Habitat
 - Coastal Resources & Habitats
 - ShoreZone
 - Alaska ShoreZone North Slope Imagery
 - Alaska ShoreZone Photos
 - BC Shoreline Classification
 - Biological Wave Exposure (Zoom Dependent)
 - Biological Wave Exposure - Cook Inlet and Outer Kenai
 - Habitat Classification (Zoom Dependent)
 - Oil Residency Index (Zoom Dependent)
 - Biological Attributes
 - Alaria (Zoom Dependent)
 - Barnacles (Zoom Dependent)
 - Biofilm (Zoom Dependent)
 - Bleached Red Algae (Zoom Dependent)
 - Blue Mussels (Zoom Dependent)
 - Canopy Kelp Biobands (Zoom Dependent)
 - Red Algae (Zoom Dependent)
 - Rockweed (Zoom Dependent)
 - Seagrass Biobands (Zoom Dependent)
 - SplashZone; Black Seaside Lichen Bioband (Zoom Dependent)
 - Tundra (Zoom Dependent)
 - Cultural Resources & Human Use
 - Environmental Sensitivity Index (NOAA ESI)
 - Land Use & Land Cover
 - Managed Areas
 - Oil and Gas
 - Alaska Oil and Gas Planning Areas (BOEM, 2008)
 - National Petroleum Reserve in Alaska - NPRA (USGS, 2010)
 - CCS Blended Oil and Gas Leases (BOEM, 2010)

ShoreZone on ERMA – Imagery on Flickr

flickr

Sign Up

Explore

Upload



Sign In



USGS Lat: 71.307500 Lon: -156.752667 UTC: 03:47:42 17 Jul 2009 DSC_3564.JPG

Back to photostream



ShoreZone on ERMA – video on vimeo

vimeo

Join

Log In

Create

Watch

Upload

Search



North Slope Chukchi Sea 2009 - Tape 3

Uploaded 9 months ago **107 Plays** / **0 Likes** / **0 Comments**

#vimeo.com/84268160

✓ Follow

BSEE North Slope Imagery



Created by **Coastal&Oceans** PRO
10 months ago

Coastal imagery of the North Slope of Alaska from Point Hope in the Chukchi Sea to the Canadian Border in the Beaufort Sea.

BSEE North Slope Imagery

BROWSE THIS CHANNEL

56 Videos

1 Follower

1 Moderator

SHOUT BOX

NEED HELP?

If you have questions about what's on this page, look here first: [Help](#) / [FAQ](#)

BSEE North Slope Imagery



NEAK09 03

from Coastal&Oceans



NEAK09 04

from Coastal&Oceans



ShoreZone on BSEE (Bureau of Safety and Environmental Enforcement)

ArcGIS Alaska North Slope Coastal Imagery

MODIFY MAP Sign In

Share Print Measure Find address or place

Home Features Plans Gallery Help

Legend

- 2006 Beaufort Photo Video
 - Video
 - Photo
- 2009 Beaufort Photo Video
 - Photo
 - Video
- 2012 Beaufort Photo Video
 - Video
 - Photo
- 2001 Chukchi Video
- 2009 Chukchi Photo Video
 - Video
 - Photo
- 2012 Chukchi Photo Video
 - Video
 - Photo

2009 Chukchi Photo Video

Click to Play Video	More info
Click to View Photo	More info
Photoname	A509AK_DSC_3564.jpg
LON	-156.75
LAT	71.31
DATE.UTC	20090717
TIME.UTC	034742

Zoom to

Browerville

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, ...

POWERED BY esri

ShoreZone on AOOS – CIRCAC response tool

AOOS Cook Inlet Response Tool

Search for data

Catalog Portal 2 layers Settings

Legend

- Cook Inlet Geographic Response Strategies
- Geographic Response Strategies
- Cook Inlet ShoreZone Imagery
- Cook Inlet ShoreZone Imagery**
- Video
- Photograph

59.3936,-153.9319

Cook Inlet ShoreZone Imagery

Sync map with media

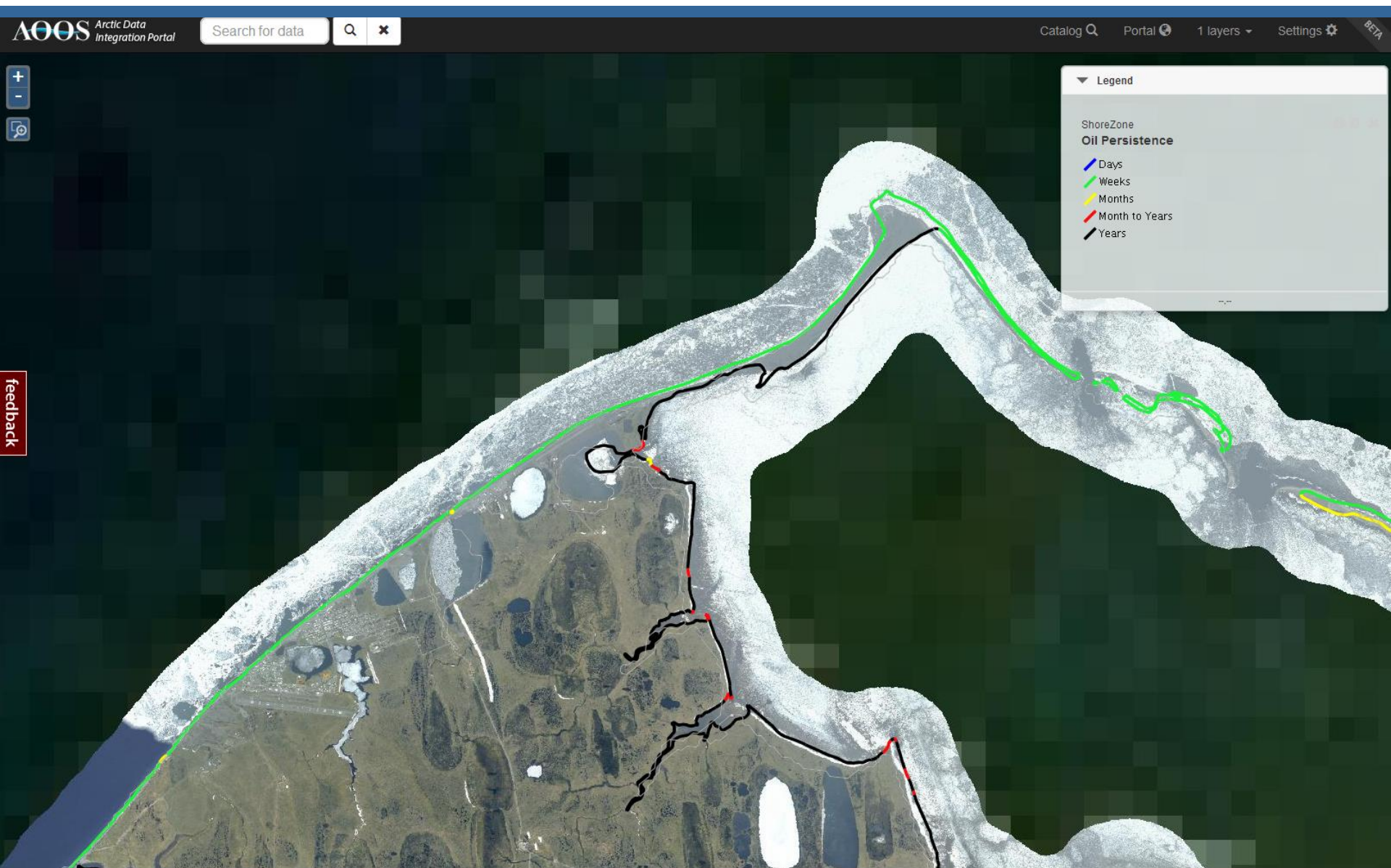
View original and metadata

ci09_hm_15.flv

Watch on youtube and view metadata

+Data

ShoreZone on AOOS – Arctic Portal



Recent ShoreZone Online Services

NOAA website:

- YouTube streaming video
- Download video clips
- Download shapefiles, xshore
- Fish Atlas and Shore Station overlay
- Linking video and photo play
- WMS basemap layers

NOAA mobile: *internet and stand alone*

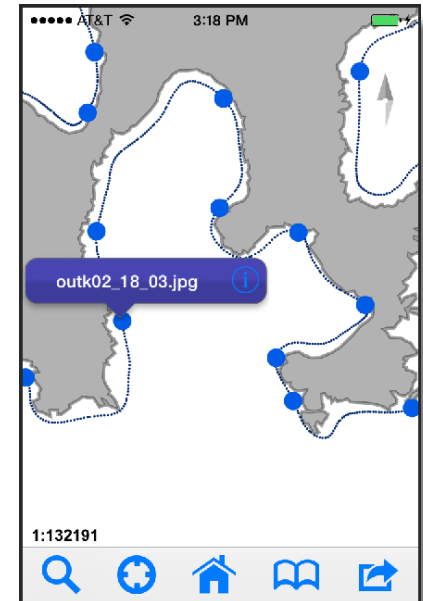
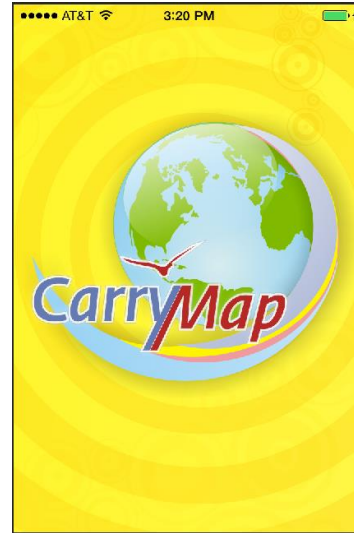
- Local photos and units
- Internet photos\YouTube & units
- Low resolution imagery
- Medium resolution imagery
- Full resolution imagery



There's an App for That!

Seriously?

- Smart phones/ tablets
- Carry Map
- Load and go



Additional Resources online



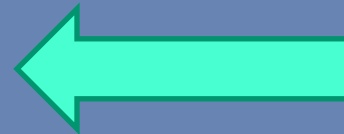
[Disclaimer](#) [Privacy Policy](#) [ShoreZone Page](#) [Metadata](#) [Contact](#) [Data Dictionary](#) [Admin Links](#)

ShoreZone demo maps for the CarryMap app

Map	Approx. Size	Apple iOS / Android	Windows
Kachemak Bay - with photos	20 MB	Download	Download
Cook Inlet - with some photos	400 MB	Download	Download
Cook Inlet - photos online	115 MB	Download	Download

Download the full ShoreZone
geodatabase (620 MB)

[Download](#)



<http://alaskafisheries.noaa.gov/mapping/szflex/szapps.htm>

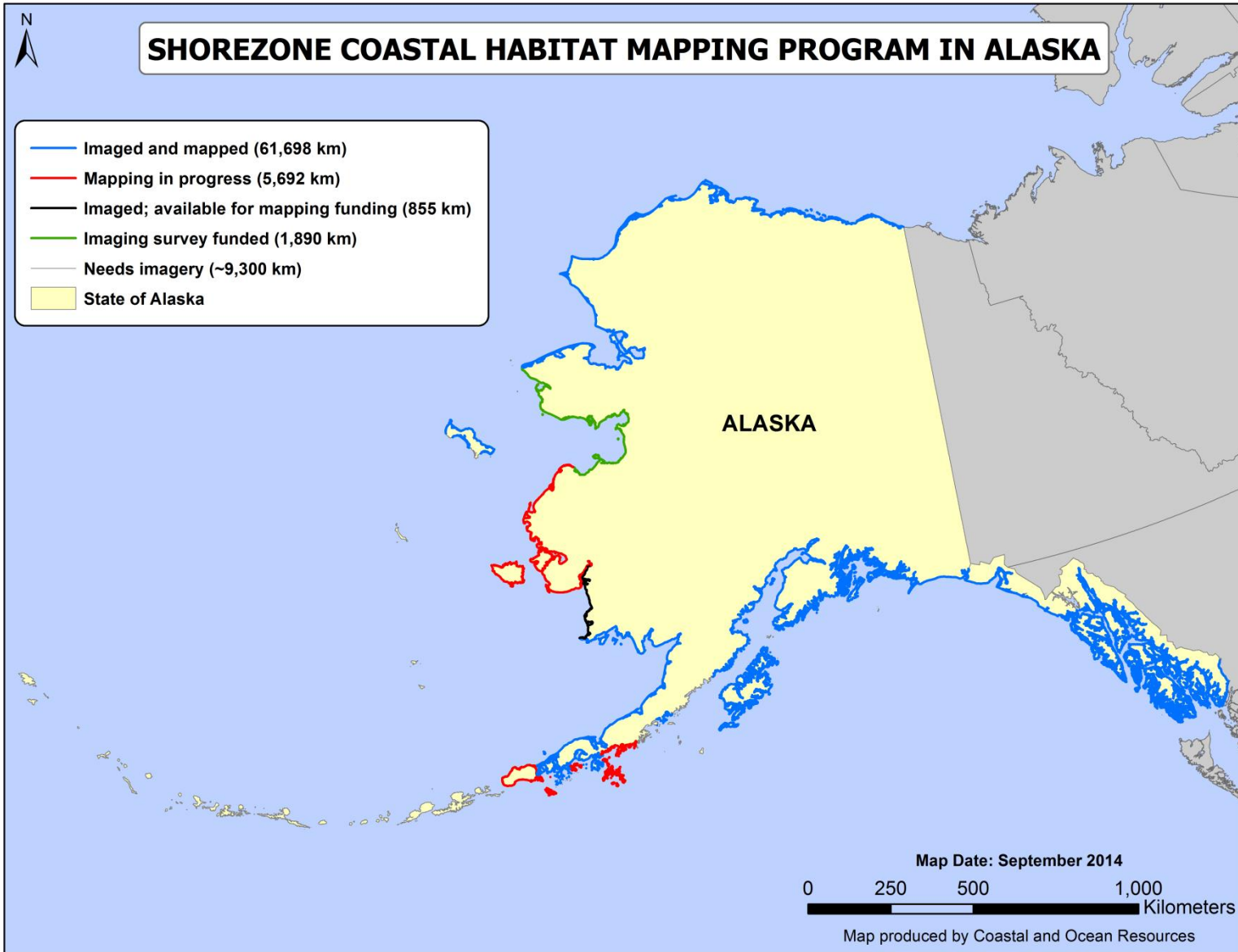
Applications of ShoreZone

- 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




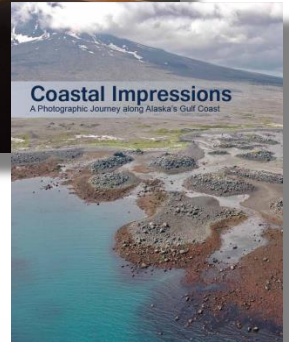
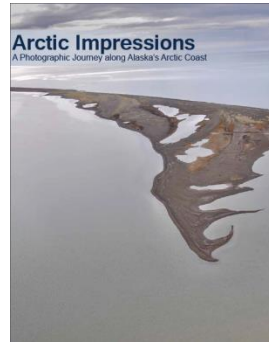
ShoreZone Progress – Sept. 2014

Are we done yet?



ShoreZone Outreach

- Friend us 
- Webinars
- Custom training



Alaska ShoreZone Contact:



Alaska Field Office
715 L Street
Suite 100
Anchorage, AK 99501

- **Amalie Couvillion**
ShoreZone Partnership Coordinator
(907) 865-5703
(907) 351-8346
acouvillion@tnc.org

I can help!



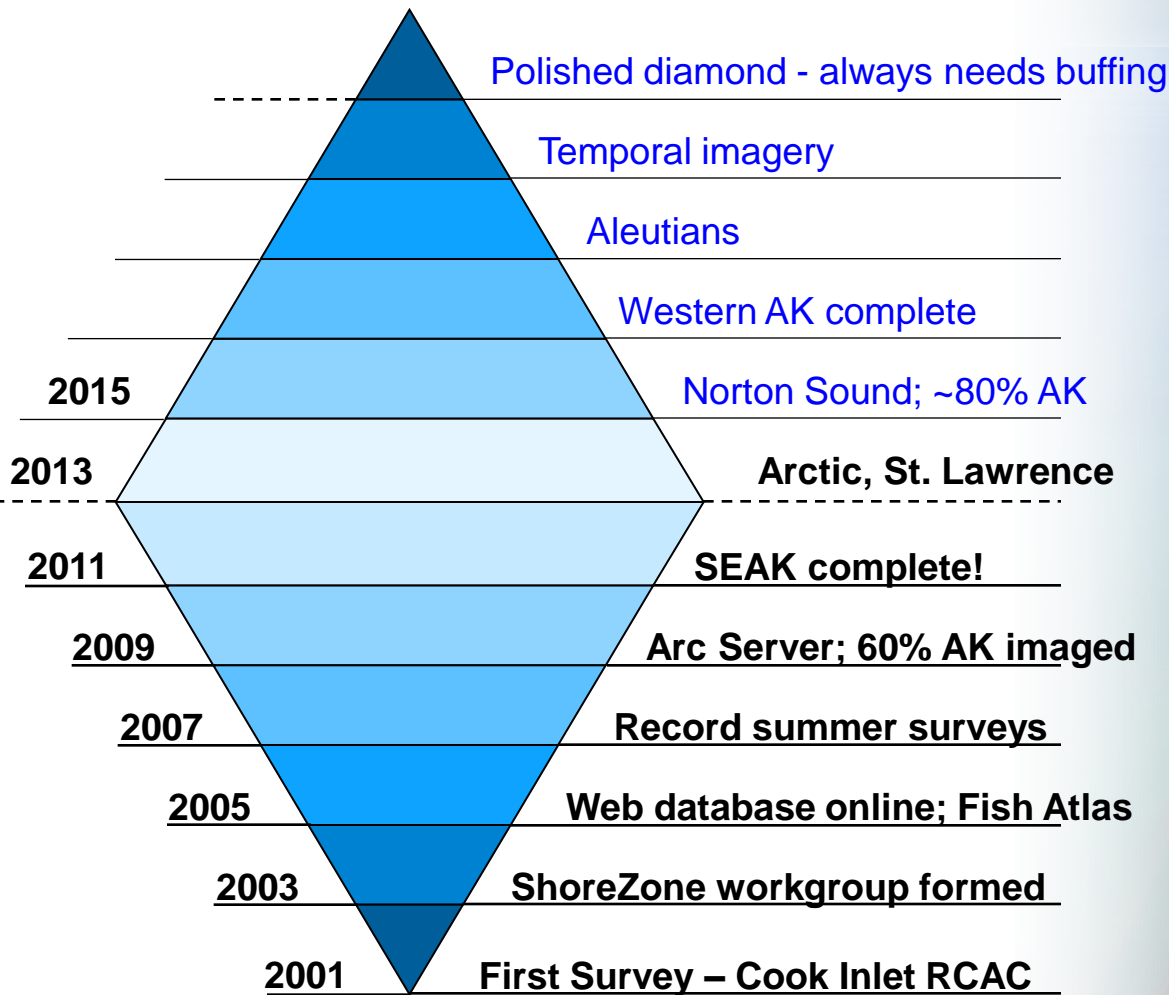
FY 2014 ShoreZone Funding Partners

- 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



Diamond in the Rough – starting to shine...

Future Goals



A True Measure of Success is:

“We used ShoreZone to”

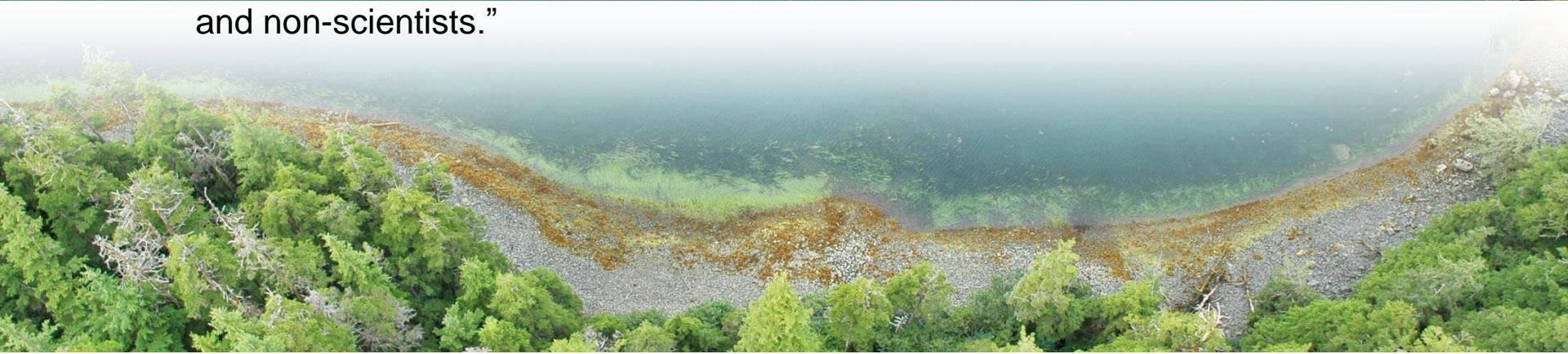


Recent Testimonial – graduate student

Nicole Bitler - Committee on Evolutionary Biology, The University of Chicago

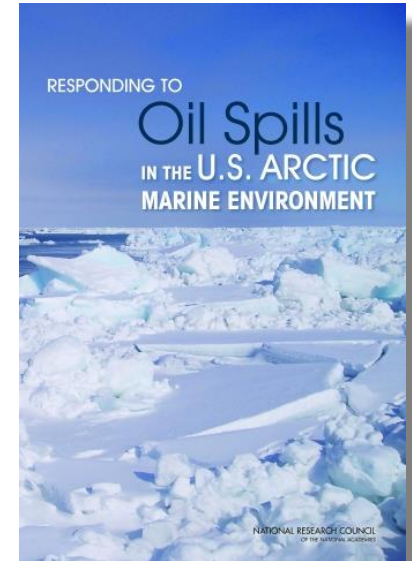
- “The ShoreZone habitat mapping resource has been incredibly helpful for my research on the phenotypic consequences of range expansion in two marine intertidal whelks, *Nucella lamellosa* and *Nucella ostrina*. As a graduate student at the University of Chicago, the ShoreZone maps helped me pinpoint ideal sites for collection and have also allowed me to retrospectively assess the biological and environmental characteristics of sites that I visited during my field work in Alaska.

The categorization of wave exposure across coastal sites is one of the features of the maps that has been most useful for my work, since wave exposure has been shown to strongly influence morphology in the whelks I am studying. The photographs and videos associated with the sites are also a fantastic resource, and I have used them in communicating my research to scientific colleagues and non-scientists.”



ShoreZone Referenced in 2014 Publication

- Committee on Responding to Oil Spills in the U.S. Arctic Marine Environment
- Ocean Studies Board
- Division of Life and Earth Studies
- Marine Board
- Transportation Research Board
- National Research Council





Thank You – Questions?



Web Enabled GIS: desktop orientation



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FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area	Fish	Habitat	Habitat key
<input checked="" type="radio"/> Statewide	<input checked="" type="radio"/> All Species	<input checked="" type="radio"/> All Habitats	● Bedrock
<input type="radio"/> Group By Region	<input type="radio"/> Select a Species	<input type="radio"/> Group by Habitats	● Eelgrass
<input type="radio"/> Group By Locale		<input type="radio"/> Select a Habitat	● Kelp
<input type="radio"/> Group By Site			● Sand-Gravel

FishAtlas Regions

Region	Hauls	Species	Total Catch	Fish Catch	Locales
Aleutian Islands	70	27	84,118		
Arctic	81	23	20,803		
Bristol Bay	8	17	6,775		
Prince William Sound	133	55	61,423		
southcentral Alaska	23	40	2,858		
southeastern Alaska	694	92	542,368		
Totals	1,009	121	718,345		

FishAtlas Locales

FishAtlas Sites

Temperature Data

Eelgrass Data

Data

Photos

No Image Loaded

Pictures: 0

Query = all sites with Saffron cod



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FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area: Statewide Group By Region Group By Locale Group By Site

Fish: All Species Select a Species Browse Select

Habitat: All Habitats Group by Habitats Select a Habitat

Habitat key:
 Bedrock
 Eelgrass
 Kelp
 Sand-Gravel

FishAtlas Regions FishAtlas Locales FishAtlas Sites Temperature Data Eelgrass Data

All Regions Total Fish Catch Habitat: All

Region	Hauls	Species	Total Catch	Fish Catch	Locales
Aleutian Islands	70	27	84,118		
Arctic	81	23	20,803		
Bristol Bay	8	17	6,775		
Prince William Sound	133	55	61,423		
southcentral Alaska	23	40	2,858		
southeastern Alaska	694	92	542,368		

Query Results: Grouped By Site, Saffron cod (*Eleginus gracilis*), All Habitats

Total: 51

Region	Map	Locale	Site	Latitude	Longitude	Hauls	Catch	CPUE	FO
Arctic	1	Chukchi Sea	B15	71.3510	-156.5706	4	136	34	25
Arctic	1	Chukchi Sea	B16	71.3056	-156.7550	4	238	60	25
Arctic	1	Chukchi Sea	B17	71.2375	-156.9101	4	4	1	25
Arctic	1	Chukchi Sea	B19	71.0897	-157.1791	4	84	21	25
Prince William Sound	21	Chenega Island	B17	60.3600	-148.0893	5	657	131	100
Prince William Sound	21	Chenega Island	B18	60.3628	-148.0901	5	15	3	20
Prince William Sound	17	Culross Island	B23	60.7447	-148.2188	4	565	141	75
Prince William Sound	17	Culross Island	B24	60.7454	-148.2142	4	53	13	100
Prince William Sound	18	Culross Passage	B20	60.6243	-148.2018	4	351	88	75

Totals: 1,009 121 718,345

Pictures: 0

Entire Database: Saffron cod



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FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area: Statewide Group By Region Group By Locale Group By Site

Fish: All Species Select a Species

Habitat: All Habitats Group by Habitats Select a Habitat

Habitat key:
 Bedrock
 Eelgrass
 Kelp
 Sand-Gravel

FishAtlas Regions FishAtlas Locales FishAtlas Sites Temperature Data Eelgrass Data

All Regions Total Fish Catch Habitat: All

Region	Hauls	Species	Total Catch	Fish Catch	Locales
Aleutian Islands	70	27	84,118		

Fish Catch for All Regions

FMP Species Forage Fish All Fish Total: 140

Species	Catch	Average Length	# Measured
Walleye pollock	124,524	58.9	2,517
Pacific sand lance	121,089	90.9	3,324
Pacific herring	106,451	56.8	3,126
Pink salmon	89,556	52.2	4,472
Chum salmon	76,385	64.5	3,856
Shiner perch	29,000	90.6	2,662
Juvenile cod	22,438	26.9	962
Pacific sandfish	21,943	56.2	815
Capelin	21,770	57.6	1,305
Saffron cod	17,492	118.3	2,316
Crescent gunnel	12,222	124.3	275
Pacific cod	8,522	71.3	2,089
Threespine stickleback	8,179	42.5	478
Bay pipefish	8,054	171.4	592
Totals	718,345		41,594

Latitude: 56° 16.50867' N Longitude: 108° 2.57812' W

Data

NOAA FISHERIES

Saffron cod *Eleginus gracilis*

Common name: Saffron cod
 Scientific name: *Eleginus gracilis*
 Family: cods - Gadidae

adult (365 mm)

juvenile (265 mm)

Photos

from Atlas of nearshore fishes of Alaska: A synthesis of marine surveys from 1988 to 2011. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-FSPC-239, 261 p. The complete document is available at <http://www.afsc.noaa.gov/techmemo/tm-fs-fic-239.htm>

Filter: all sites in Chukchi Sea with Saffron cod



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FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area: Statewide Group By Region Group By Locale Group By Site

Fish: All Species Select a Species

Habitat: All Habitats Group by Habitats Select a Habitat

Habitat key:
 Bedrock
 Eelgrass
 Kelp
 Sand-Gravel

FishAtlas Regions FishAtlas Locales FishAtlas Sites Temperature Data Eelgrass Data

Locales: Chukchi Sea Habitat: All Saffron cod Total: 6

Region	Locale	Location	Site	Lat	Long	Habitat	Hauls	Species	Total Cat	Fish Catch	Photos
Arctic	Chukchi Sea	Skull Cliff	B12	70.8399	-157.9678	Sand-Gravel	1	1	1		
Arctic	Chukchi Sea	Point Barrow	B03	71.3816	-156.4802	Sand-Gravel	6	1	5		
Arctic	Chukchi Sea	Barrow	B15	71.351	-156.5706	Sand-Gravel	4	1	136		
Arctic	Chukchi Sea	Barrow	B16	71.3056	-156.755	Sand-Gravel	4	1	238		
Arctic	Chukchi Sea	Barrow	B17	71.2375	-156.9101	Sand-Gravel	4	1	4		
Arctic	Chukchi Sea	Barrow	B19	71.0897	-157.1791	Sand-Gravel	4	1	84		

Latitude: 71° 20.03424' N Longitude: 159° 23.83466' W

Data Photos

No Image Loaded

Pictures: 0

All Saffron cod caught at station B16



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FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area: Statewide Group By Region Group By Locale Group By Site

Fish: All Species Select a Species

Habitat: All Habitats Group by Habitats Select a Habitat

Habitat key:
 Bedrock
 Eelgrass
 Kelp
 Sand-Gravel

FishAtlas Regions FishAtlas Locales FishAtlas Sites Temperature Data Eelgrass Data

Locales: Chukchi Sea Habitat: All Saffron cod Total: 6

Region	Locale	Location	Site	Lat	Long	Habitat	Hauls	Species	Total Cat	Fish Catch	Photos
Arctic	Chukchi Sea	Skull Cliff	B12	70.8399	-157.9678	Sand-Gravel	1	1	1		
Arctic	Chukchi Sea	Point Barrow	B03	71.3816	-156.4802	Sand-Gravel	6	1	5		
Arctic	Chukchi Sea	Barrow	B15	71.351	-156.5706	Sand-Gravel	4	1	136		
Arctic	Chukchi Sea	Barrow	B16	71.3056	-156.755	Sand-Gravel	4	1	238		<input checked="" type="checkbox"/>

Fish Catch for Chukchi Sea, Arctic, B16

FMP Species Forage Fish All Fish Filter Date: Species Sum Total: 11

Species	Catch	Average Length	# Measured
Capelin	871	56.0	133
Saffron cod	238	38.5	30
Juvenile sculpin	61	22.1	11
Arctic cod	26	42.3	26
Slender eelblenny	21	47.0	19
Pacific sand lance	19	71.2	19
Arctic sculpin	4	82.5	4
Juvenile poacher	2	21.5	2
Juvenile prickleback	2	33.5	2
Fourhorn sculpin	1	80.0	1
Shorthorn sculpin	1	87.0	1
Totals	1,246		248

Data: Gadidae Saffron cod

Geographic Distribution:
 Sample locations
 Capture locations

Abundance Indices by Region and Habitat:
 n = 17,492

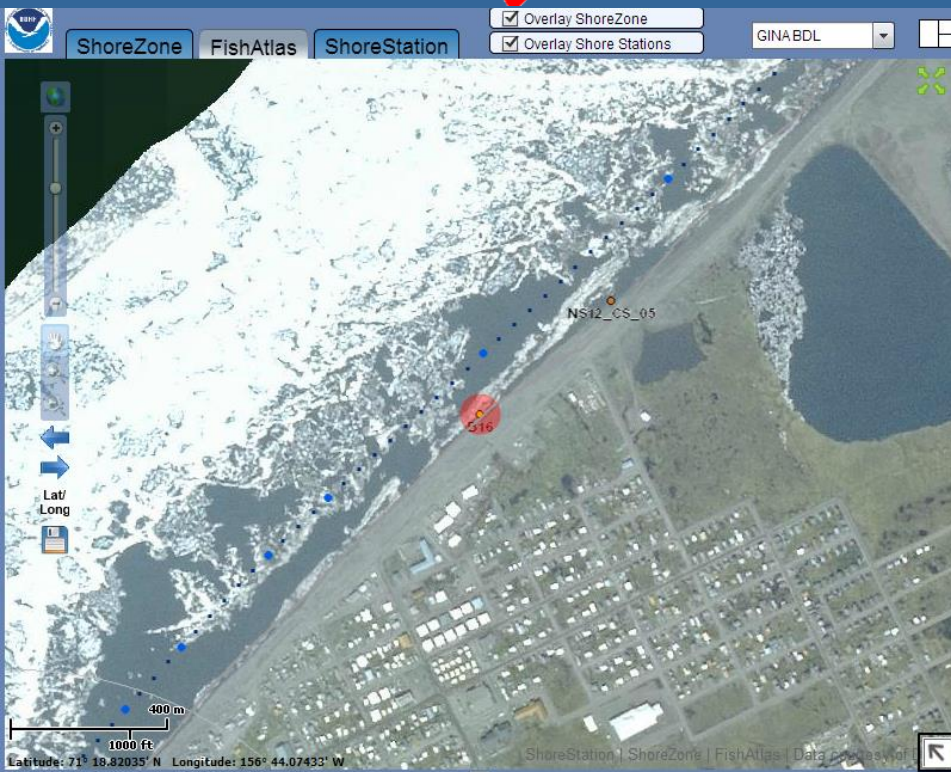
Photos: Chukchi Sea, Chukchi Sea, Barrow, Boat ramp, B16, S...

Latitude: 71° 18.63895' N Longitude: 156° 43.22976' W

ShoreZone | ShoreStation | FishAtlas | Data courtesy of

Pictures: 2

All Saffron cod caught at station, on 9/14/2009



FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area: Statewide Group By Region Group By Locale Group By Site

Fish: All Species Select a Species

Habitat: All Habitats Group by Habitats Select a Habitat

Habitat key:
 Bedrock
 Eelgrass
 Kelp
 Sand-Gravel

FishAtlas Regions FishAtlas Locales FishAtlas Sites Temperature Data Eelgrass Data

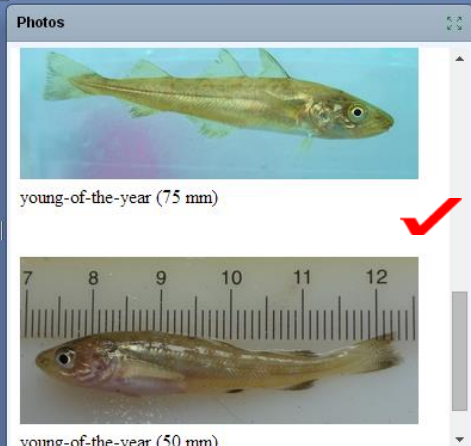
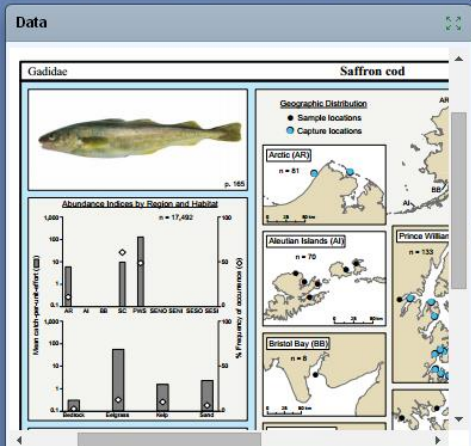
Locales: Chukchi Sea Habitat: All Filter: Saffron cod Total: 6

Region	Locale	Location	Site	Lat	Long	Habitat	Hauls	Species	Total Catch	Fish Catch	Photos
Arctic	Chukchi Sea	Skull Cliff	B12	70.8399	-157.9678	Sand-Gravel	1	1	1		
Arctic	Chukchi Sea	Point Barrow	B03	71.3816	-156.4802	Sand-Gravel	6	1	5		
Arctic	Chukchi Sea	Barrow	B15	71.351	-156.5706	Sand-Gravel	4	1	136		
Arctic	Chukchi Sea	Barrow	B16	71.3056	-156.755	Sand-Gravel	4	1	238		

Fish Catch for Chukchi Sea, Arctic, B16

FMP Species Forage Fish All Fish Filter Date: 9/14/2009 Total: 6

Species	Date	Catch	Average Length	# Measured
Capelin	9/14/2009	409	53.2	32
Saffron cod	9/14/2009	238	38.5	30
Arctic cod	9/14/2009	25	42.9	25
Slender eelblenny	9/14/2009	12	49.9	11
Fourhorn sculpin	9/14/2009	1	80.0	1
Pacific sand lance	9/14/2009	1	72.0	1
Totals		686		100



Shore Station dataset



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Locales: All BioBand: All Species Filter Total: 457

Geographic Name	Station Id	EXP BIO	BC Class	Date Sampled	Photos	Species	Profile
Upper Cook Inlet, Fire Island	UCL_12_02	SE	Sand & gravel flat...	September 10,			
Eastern Beaufort Sea	NS12_BS_04	E	Ground Ice Slum...	August 2, 2012			
Eastern Beaufort Sea	NS12_BS_05	P	Inundated Tundra	August 3, 2012			
Eastern Beaufort Sea	NS12_BS_06	E	Sand beach	August 3, 2012			
Eastern Beaufort Sea	NS12_BS_07	E	Sand beach	August 3, 2012			

Species Data for NS12_CS_05

Benthic marine algae Marine invertebrates All Species Show Biobands Total: 2

Species	Common Name	Abundance
<i>Honckenya</i> sp.	beach greens	Few
<i>Poaceae</i>	unknown fine Poa grass	Few

Shore Station: NS12_CS_05 Total across-shore width: 66.37m

Biobands on Profile: BRE

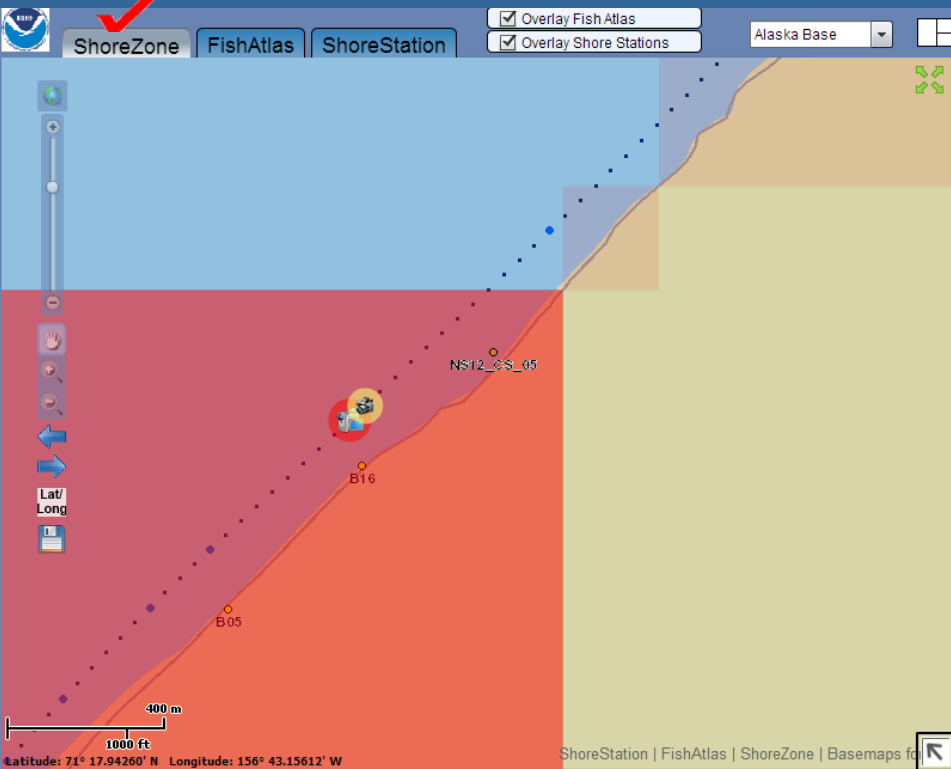
Substrate on Profile: S P

Photos: alongshore

About: [Cross-shore profiles](#) [Biobands](#) [Substrates](#) Pictures: 9

Northern Chukchi Sea	NS12_CS_01	P	Ground Ice Slum...	August 8, 2012			
Northern Chukchi Sea	NS12_CS_02	SE	Ground Ice Slum...	August 8, 2012			
Northern Chukchi Sea	NS12_CS_03	SP	Sand & gravel be...	August 8, 2012			
Northern Chukchi Sea	NS12_CS_04	E	Ground Ice Slum...	August 8, 2012			
Northern Chukchi Sea	NS12_CS_05	E	Sand & gravel be...	August 9, 2012			
Northern Chukchi Sea	NS12_CS_06	E	Sand & gravel flat...	August 11, 201			

ShoreZone



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Layer Legend | Layer Query | Task Management | Locations

Show all layers in service

- Shore Zone Layers
 - Still Photos
 - Photo Mark
 - Video Flightline
- Derived ShoreZone Attributes
 - Habitat Class
 - BC Class
 - Biological Wave Exposure
- Response Attributes
 - Environmental Sensitivity Index (ESI)
 - Oil Residency Index (ORI)
- Biological Attributes
 - SplashZone; Black Seaside Lichen bioband
 - Dune Grass, Sedges, and Salt Marsh Vegetation
 - Dune Grass
 - Sedges
 - Salt Marsh Vegetation

Unit ID: 18/02/1151/0

Length: 2,176

Habitat Class: 32: Semi-Exposed/Mobile/Sediment

Biological Wave Exposure: Semi-Exposed

Oil Residency Index (ORI): 3 Moderate persistence; weeks to months

BC Class: sand and gravel flat fan (26)

ES: Mixed sand and gravel beaches (5)

Video Snapshots

Lat: 71 18' 23" N Lon: 156 45' 21" W

360 neak09 03 YouTube

Photo Snapshots

Lat: 71 18' 25" N Lon: 156 45' 17" W

USGS Lat: 71.307500 Lon: -156.752867 UTC: 03:47:42 17 Jul 2009 DSC_3564.JPG

Unit Description Table

Units for viewable region. Total Unit Count: 3

Unit ID	Length	Habitat Class	Biological Wave Exposure	Oil Residency Index (ORI)	BC Class	Environmental
18/02/1025/0	365	32	SE	3	26	5
18/02/1151/0	2,176	32	SE	3	26	5
18/02/1152/0	5,117	32	SE	3	26	5

ShoreZone



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Layer Le... Layer Qu... Task Ma... Locations

Show all layers in service

Derived ShoreZone Attributes

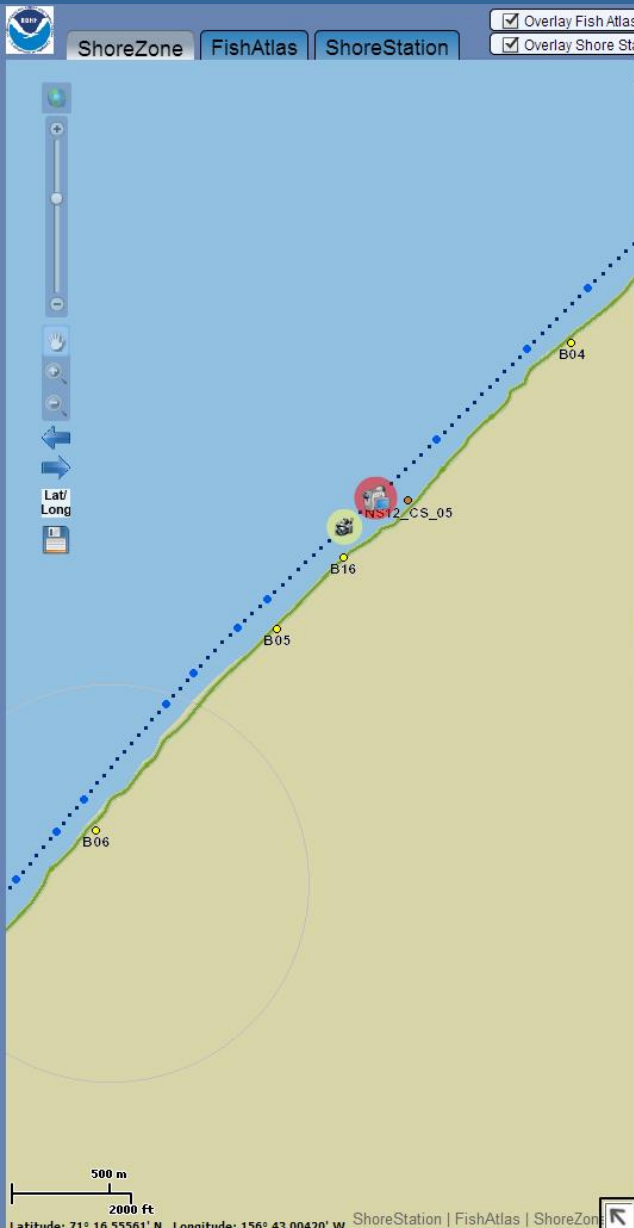
Habitat Class

- 10, Very Exposed/Immobile/Rock
- 11, Very Exposed/Partially Mobile/Sedime
- 12, Very Exposed/Mobile/Sediment
- 20, Exposed/Immobile/Rock
- 21, Exposed/Partially Mobile/Sediment or
- 22, Exposed/Mobile/Sediment
- 23, Exposed/Estuary
- 30, Semi-Exposed/Immobile/Rock
- 31, Semi-Exposed/Partially Mobile/Sedim
- 32, Semi-Exposed/Mobile/Sediment
- 33, Semi-Exposed/Estuary
- 34, Semi-Exposed/Current Channel
- 35, Semi-Exposed/Glacier
- 37, Semi-Exposed/Anthropogenic Perme

Unit Description Table

Units for viewable region. Total Unit Count: 5

Unit ID	Habitat Class	Biological Wave Expos
18/02/1025/0	32	SE
18/02/1149/0	32	SE
18/02/1150/0	32	SE
18/02/1151/0	32	SE
18/02/1152/0	32	SE



Video Snapshots

Lat: 71 18' 29" N Lon: 156 45' 1" W

360 neak09 03

Video

Photo Snapshots

Lat: 71 18' 25" N Lon: 156 45' 17" W

Fish Atlas: Temperature loggers



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FishAtlas Statewide Queries

Submit Clear FishAtlas Home FishAtlas Help

Area: Statewide Group By Region Group By Locale Group By Site

Fish: All Species Select a Species

Habitat: All Habitats Group by Habitat Select a Habitat

Habitat key: Bedrock Eelgrass Kelp Sand-Gravel

FishAtlas Reg... FishAtlas Loc... FishAtlas Sites Temperature ... Eelgrass Data

Display Thermograph Layer Locales: All Total: 16

Site	Region	Locale	Lat	Long	Habitat	Graph
THERM01	southeast	Tenakee Springs	57.7364	-135.3785	Eelgrass	
THERM01	Prince Wil	Culross Passage	60.6655	-148.1866	Kelp	
THERM02	Prince Wil	Jackpot Bay	60.3443	-148.232	Eelgrass	
THERM02	southeast	Chaik Bay	57.3142	-134.4773	Eelgrass	
THERM03	Prince Wil	Flemming Island	60.1643	-148.042	Kelp	
THERM03	southeast	Nakwasina Sound	57.2055	-135.3774	Kelp	
THERM04	southeast	Pirate Cove	56.9863	-135.3742	Kelp	
THERM05	southeast	Sandy Cove	56.9788	-135.3115	Kelp	
THERM06	southeast	Brothers Islands	57.2901	-133.8217	Kelp	
THERM07	southeast	Benjamin Island	58.566	-134.9088	Kelp	
THERM08	southeast	Funter Bay	58.2517	-134.9086	Kelp	
THERM09	southeast	Berners Bay	58.7089	-134.9458	Kelp	
THERM10	southeast	Berners Bay	58.668	-134.92	Eelgrass	
THERM11	southeast	Bridget Cove	58.6405	-134.9553	Kelp	
THERM12	southeast	Auke Bay	58.3792	-134.6898	Kelp	
THERM13	southeast	Peterson Creek	58.3035	-134.684	Kelp	

About Temperature Data

Lat/Long

100 m 400 ft

Picture: 0

Data

Nearshore Fish Atlas of Alaska

Mean monthly water temperature
Data logger depth - 2 m at zero tide
Auke Nu Cove, Auke Bay, southeastern Alaska, THERM12
58.3792 N 134.6898 W

Auke Nu Cove, Auke Bay

Mean water temperature (°C)

Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar

Photos

No Image Loaded

Fish Atlas: Eelgrass monitoring



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Data

Nearshore Fish Atlas of Alaska

Auke Nu Cove, Auke Bay, southeastern Alaska
 Eelgrass (*Zostera marina*) meadow mapped with GPS
 Meadow area: 1.87 hectares
 Years mapped: 2004-2007

FishAtlas Statewide Queries

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Area	Fish	Habitat	Habitat key
<input checked="" type="radio"/> Statewide	<input checked="" type="radio"/> All Species	<input checked="" type="radio"/> All Habitats	<input checked="" type="radio"/> Bedrock
<input type="radio"/> Group By Region	<input type="radio"/> Select a Species	<input type="radio"/> Group by Habitat	<input checked="" type="radio"/> Eelgrass
<input type="radio"/> Group By Locale		<input type="radio"/> Select a Habitat	<input checked="" type="radio"/> Kelp
<input type="radio"/> Group By Site			<input checked="" type="radio"/> Sand-Gravel

[FishAtlas Reg...](#) [FishAtlas Loc...](#) [FishAtlas Sites](#) [Temperature ...](#) [Eelgrass Data](#)

Display Eelgrass Layer **Total: 13**

Site	Description	Hectares	Acres	Map
Auke Nu Cove	Auke Nu Cove, Auke Bay	1.86	4.62	
Auke Village	Auke Village, Auke Bay	0.33	0.82	
Bay Creek	Bay Creek, Auke Bay	0.97	2.39	
Bridget Cove Central	Bridget Cove, central	0.89	2.22	
Bridget Cove North	Bridget Cove, north	0.95	2.34	
Bridget Cove South	Bridget Cove, south	5.80	14.34	
Crab Bay	Crab Bay, Tenakee Sprin	1.84	4.55	
Echo Cove	Echo Cove, Berners Bay	2.90	7.17	
Funter Bay	Funter Bay	7.73	19.10	
Nakwasina	Nakwasina Sound	0.71	1.77	
Peterson Creek	Peterson Creek	2.79	6.91	
Sandy Cove	Sandy Cove	0.73	1.81	
Waydelich Creek	Waydelich Creek, Auke E	0.36	0.89	

[About Eelgrass Maps](#)

Photos

No Image Loaded

Pictures: 0