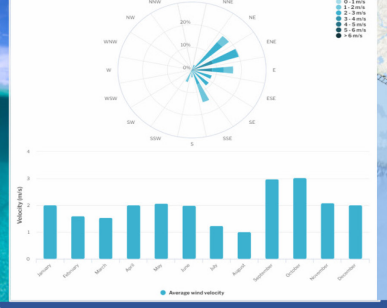








NOAA's Spatial Planning Approach For Alaska Aquaculture Opportunity Areas

NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

Anchorage and Juneau

February 26 and March 26, 2024

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

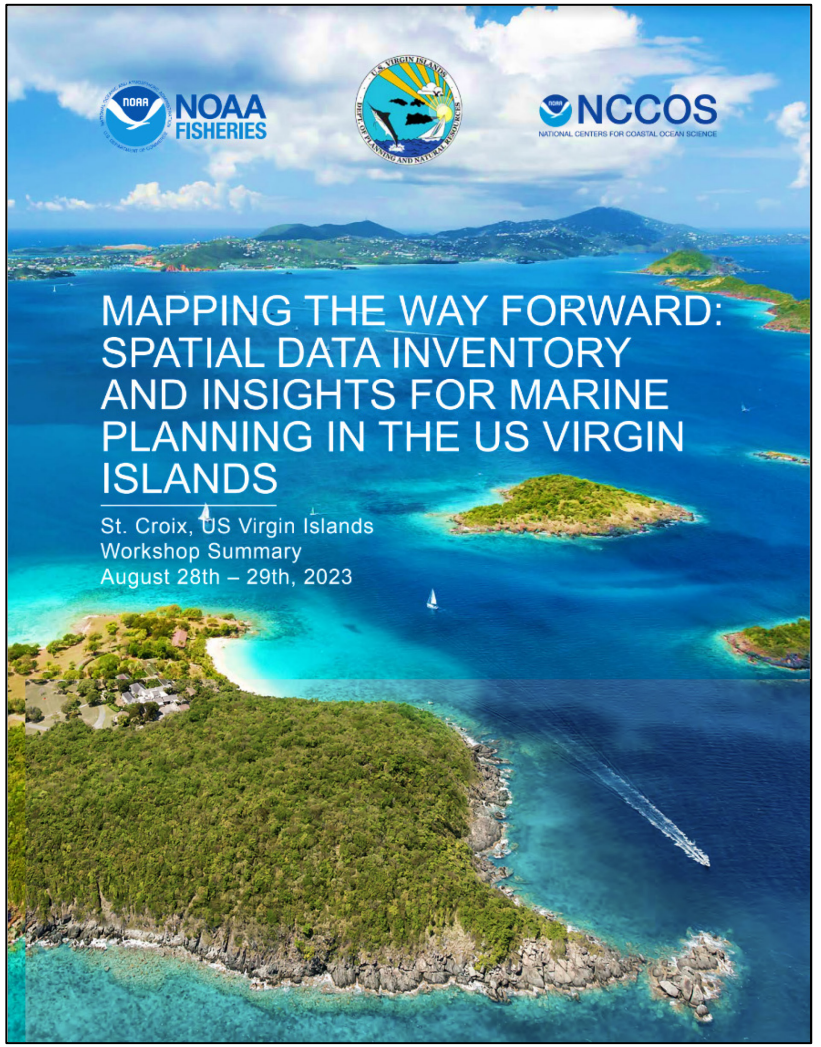
NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

We connect communities with coastal intelligence.

Our hope is that marine spatial planning "...*brings us closer to respectful, sustainable uses of our natural resources...*"

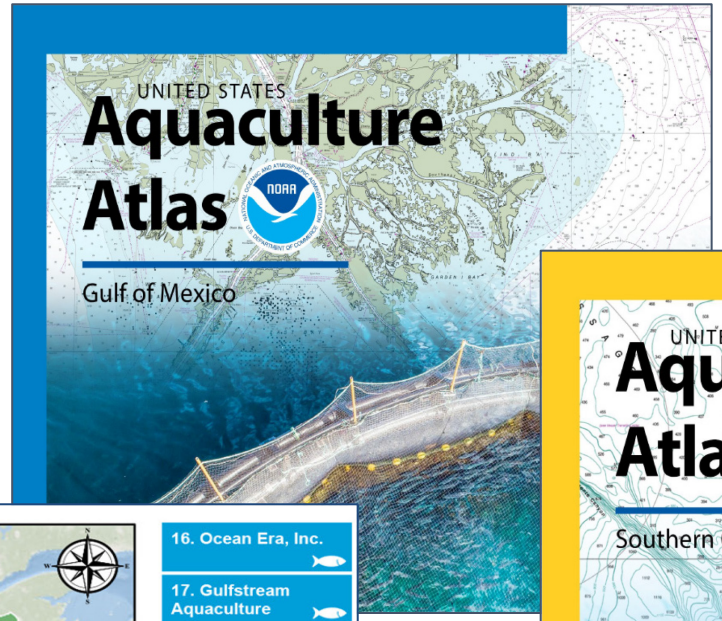
-Dr. Nicole Angeli, Director USVI DFW
USVI Marine Planning Workshop, 2023

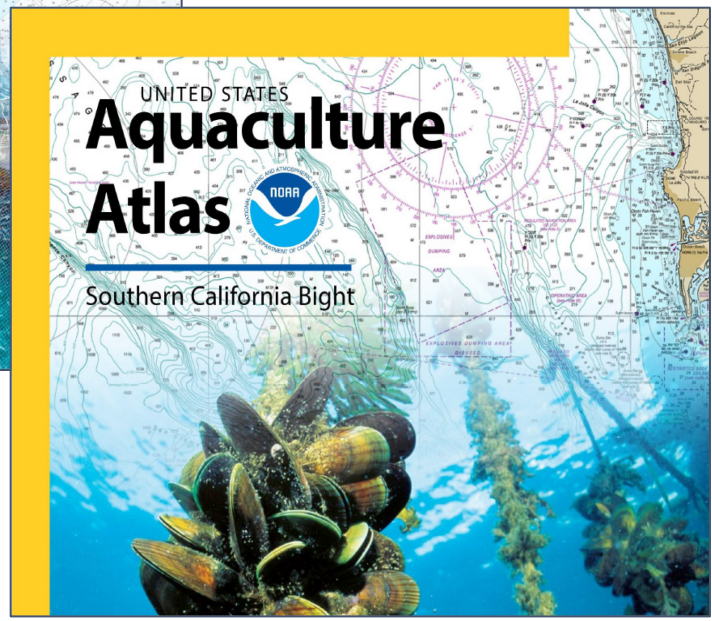


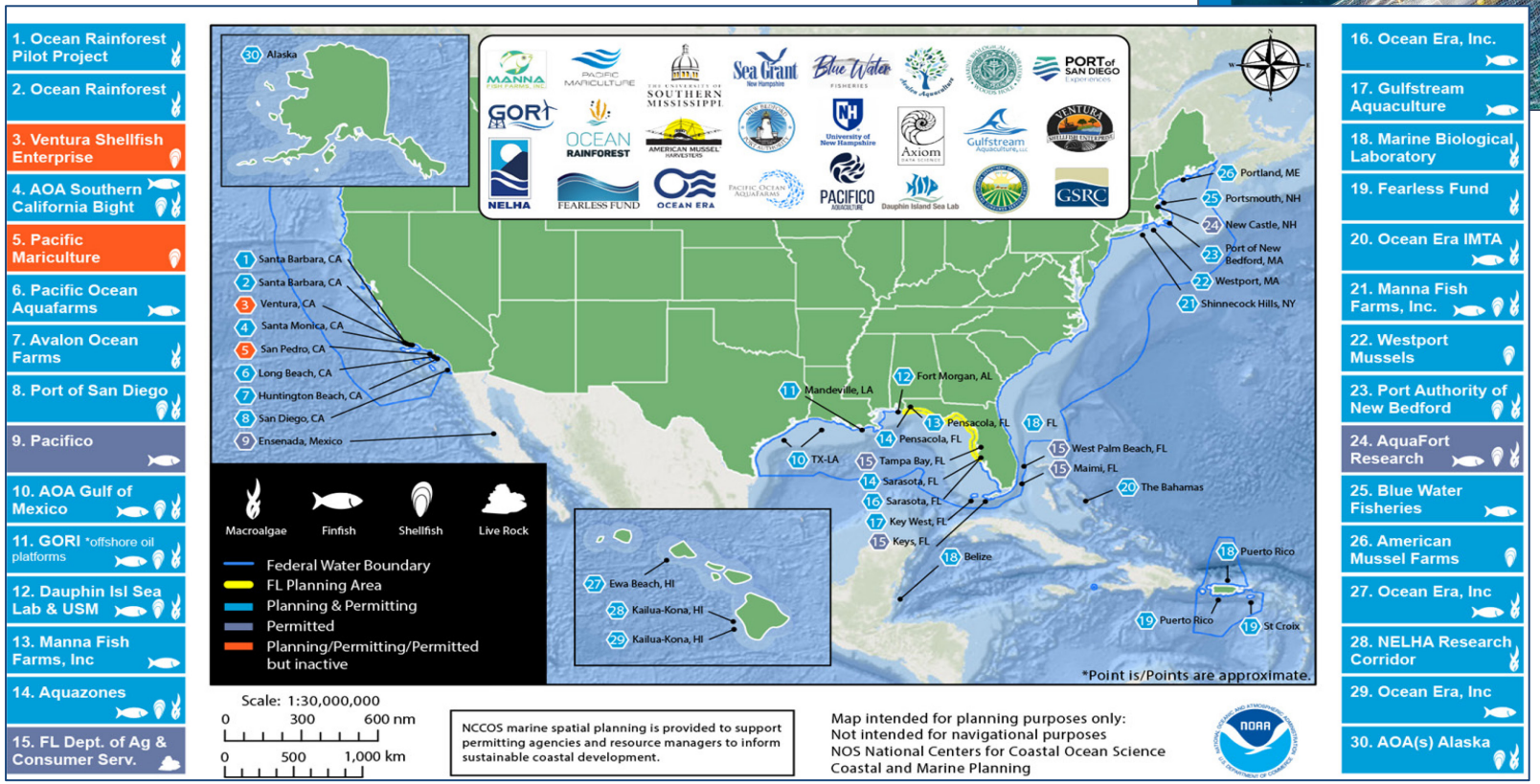


NCCOS Spatial Modeling

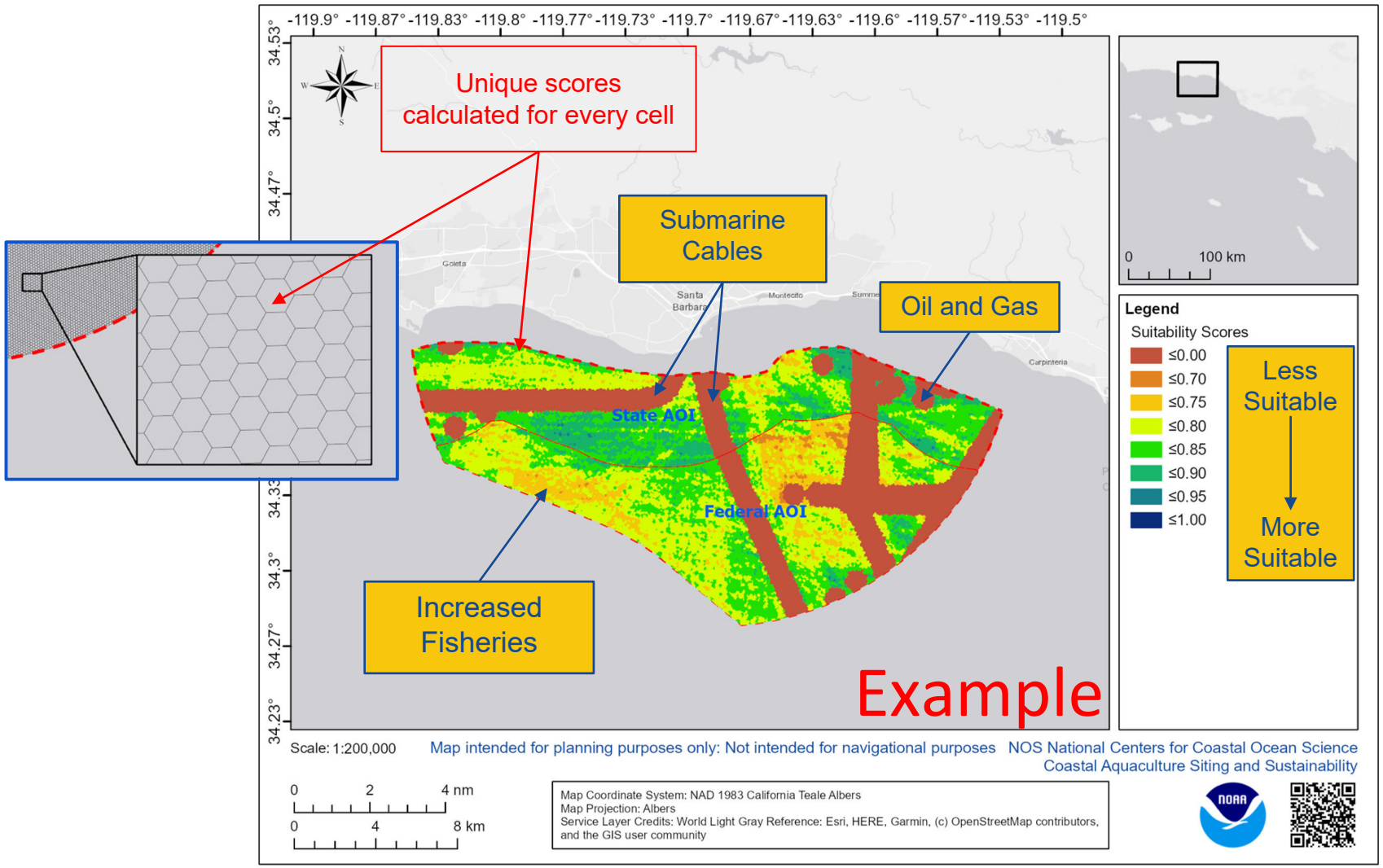
- Completed 60+ analyses in last 5 years
- Aquaculture Opportunity Areas
- State-designated aquaculture use areas
- Spatial planning for Ports/Harbors
- Tool/app development
- Community engagement







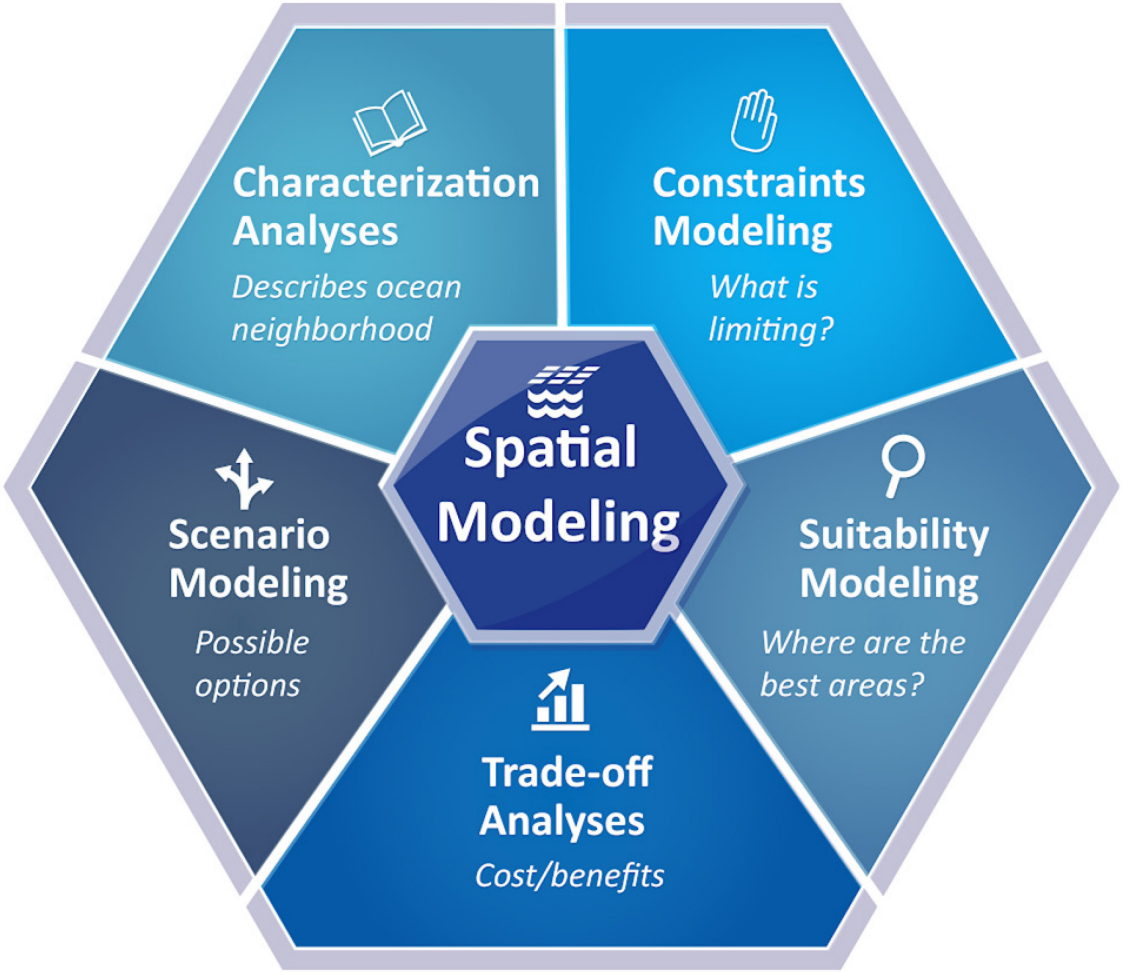
Our Goal: Identify Conflict, Find *Opportunity*



A **spatial suitability model** weights locations relative to each other based on given criteria.

Why Spatial Suitability Modeling?

- Analyzes the “whole ecosystem”
- Identifies hotspots of conflict and opportunity
- Requires set rules (weights) and methods
- Provides defensible and transparent methods
- Allows for scenario planning
- Supports comprehensive environmental review



Planning for AOAs in Alaska state waters

Step 1 - What are the project parameters?



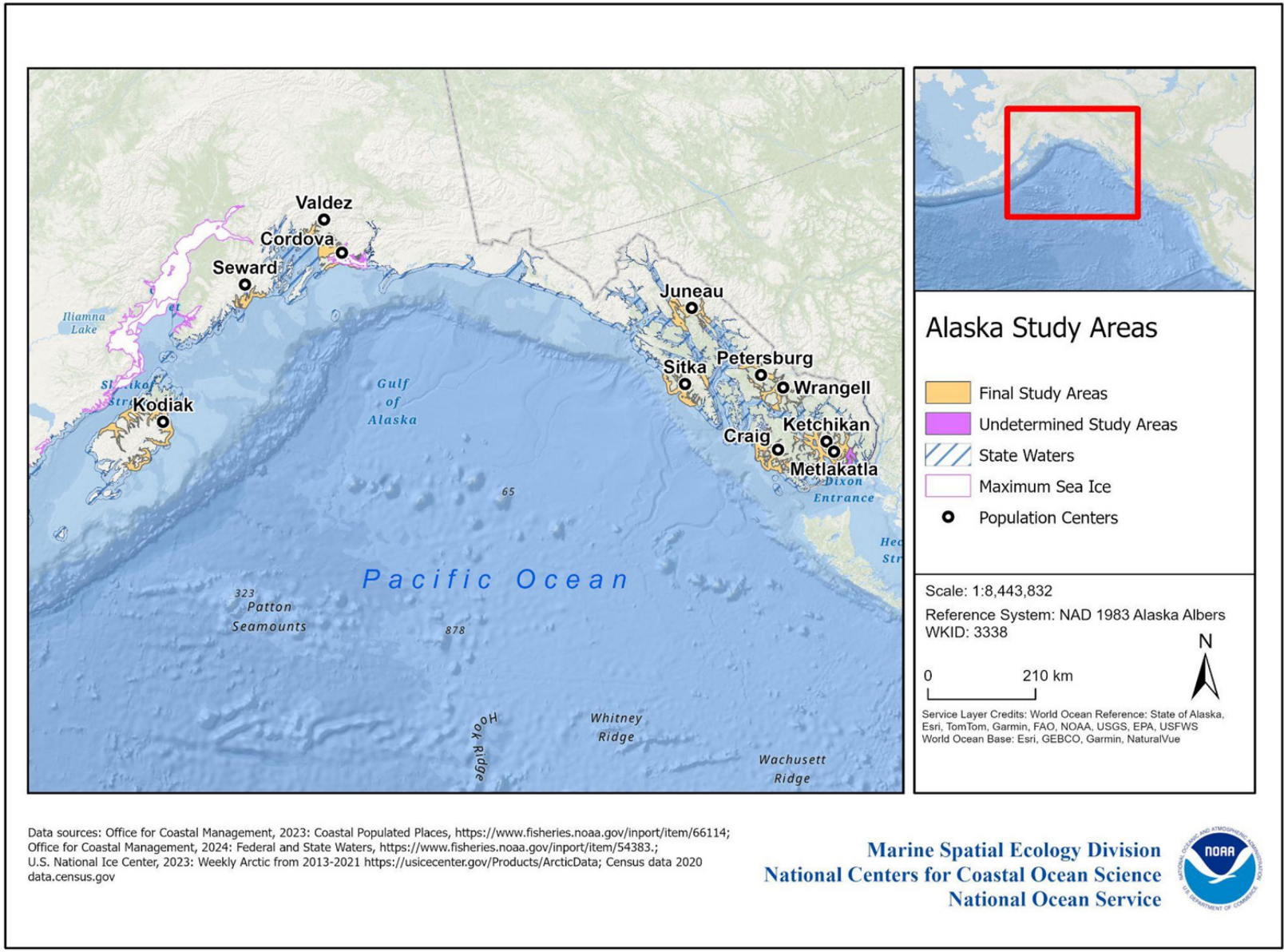




- Critical parameters for siting (e.g., distance from port, ice cover)?
- Final product for Atlases (e.g., consider species/gear, consider economic development, consider largest area for all aquaculture types)

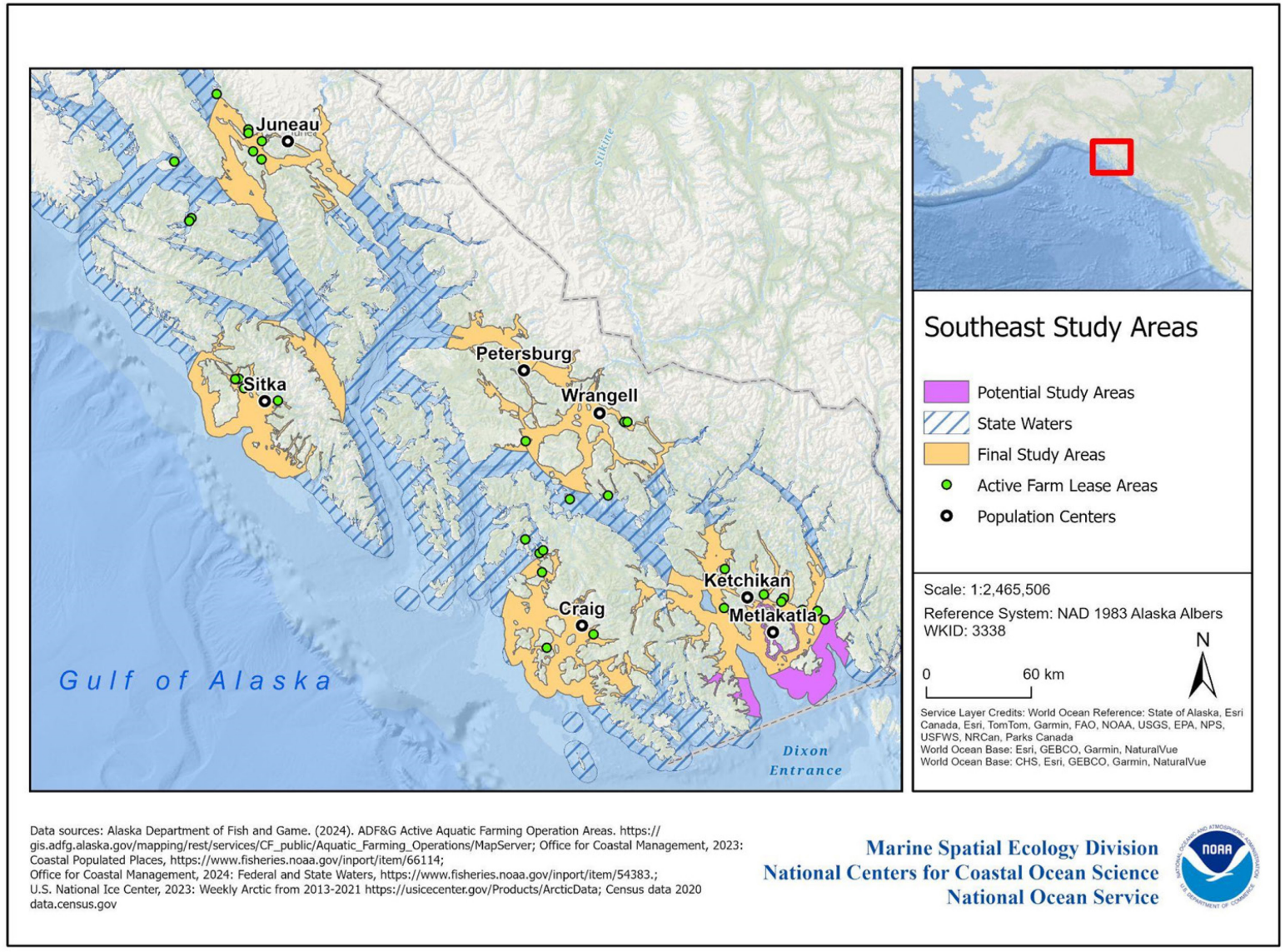
Step 1 - Study Area Parameters

- Alaska state waters
- Use distance from coastal population centers as proxy for infrastructure
    - 25 miles from top 25 coastal communities by population (2010 census data)
- Ice cover is considered a significant constraint for aquaculture (greatest sea ice extents between 2013-2021)
- Consideration of areas in proximity to existing aquaculture that are not captured by population center and ice analysis



Maps for demonstration only

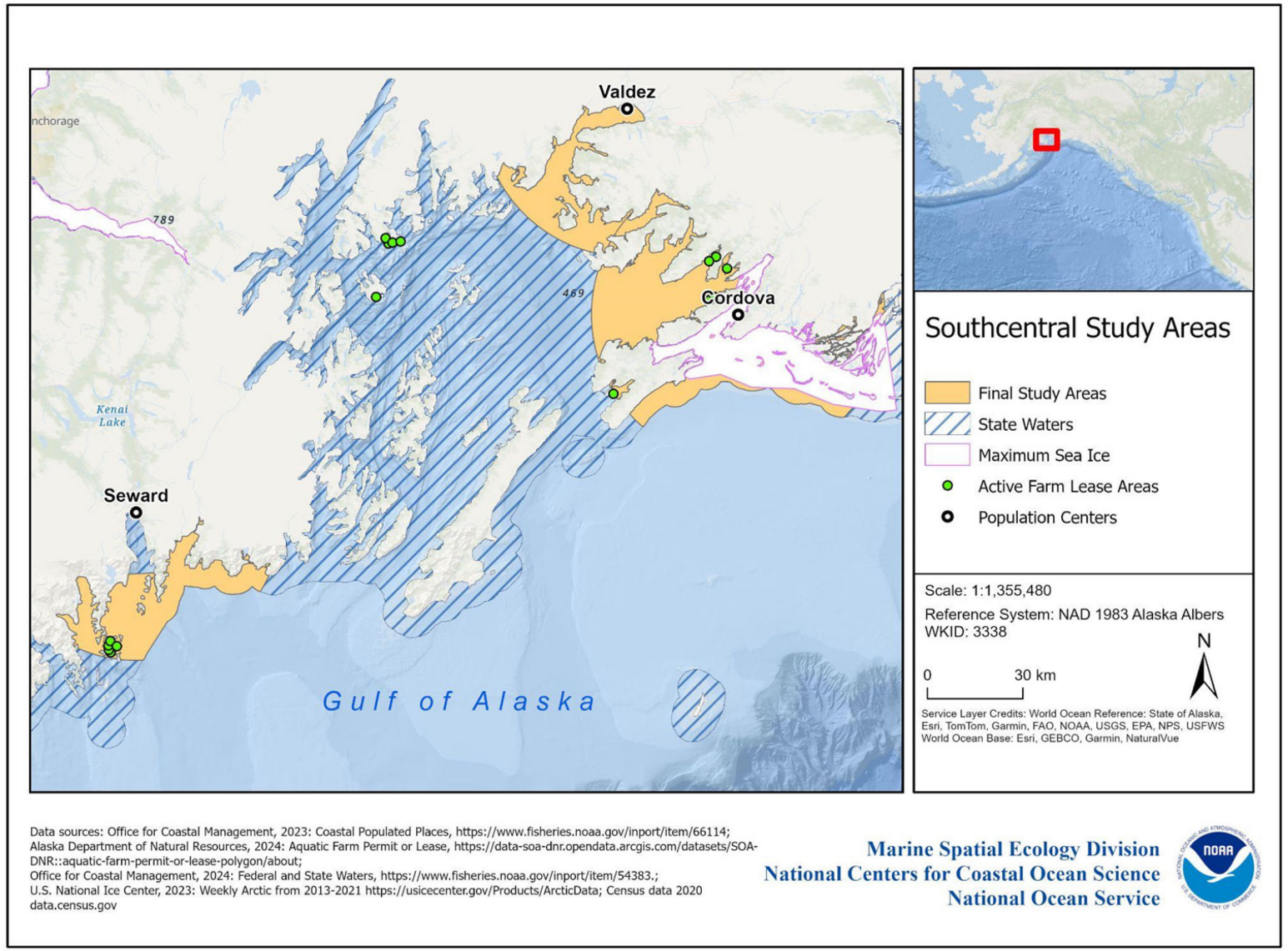
Step 2 - Identify Study Areas



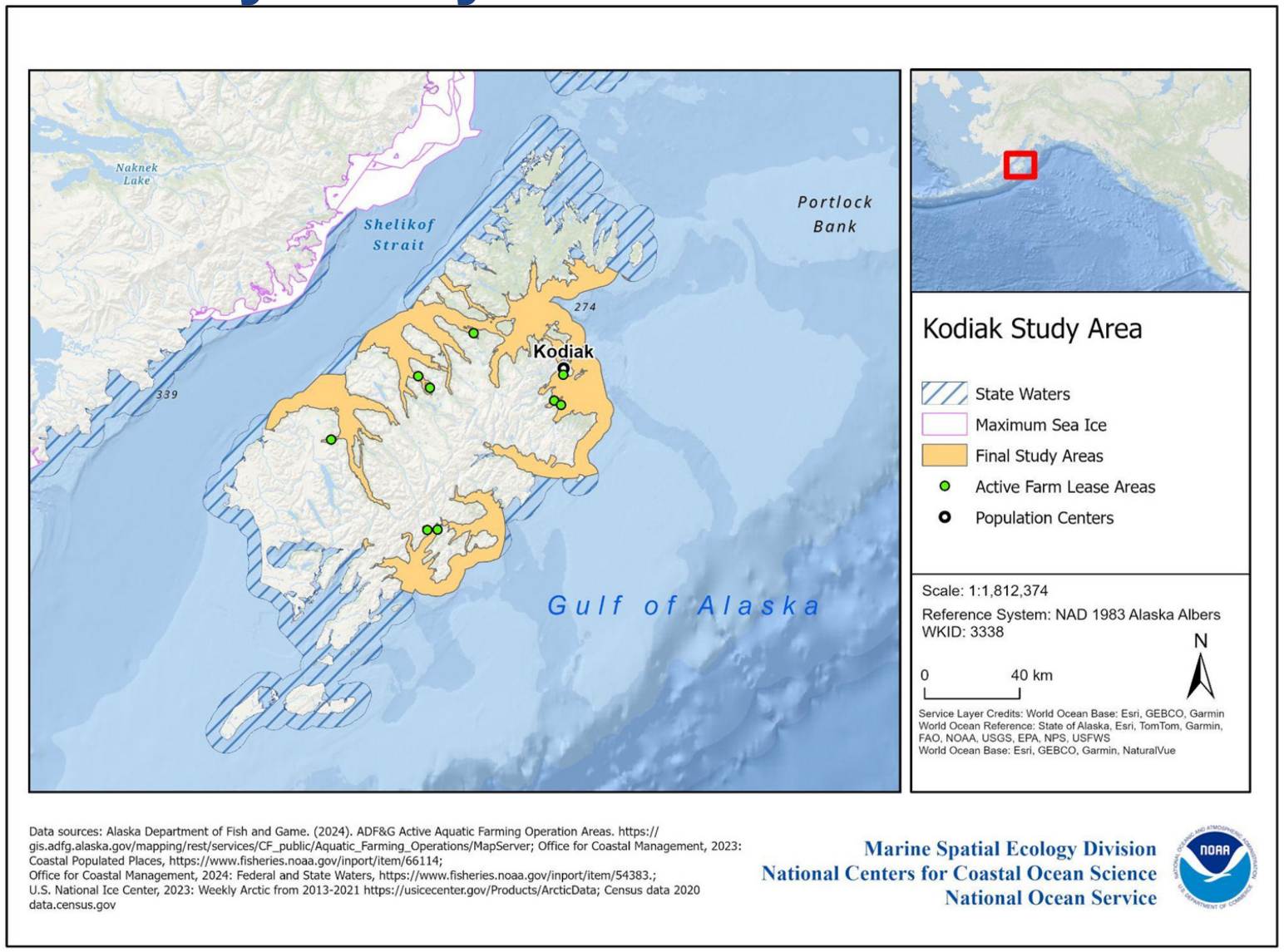
Data sources: Alaska Department of Fish and Game. (2024). ADF&G Active Aquatic Farming Operation Areas. https://gis.adfg.alaska.gov/mapping/rest/services/CF_public/Aquatic_Farming_Operations/MapServer; Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

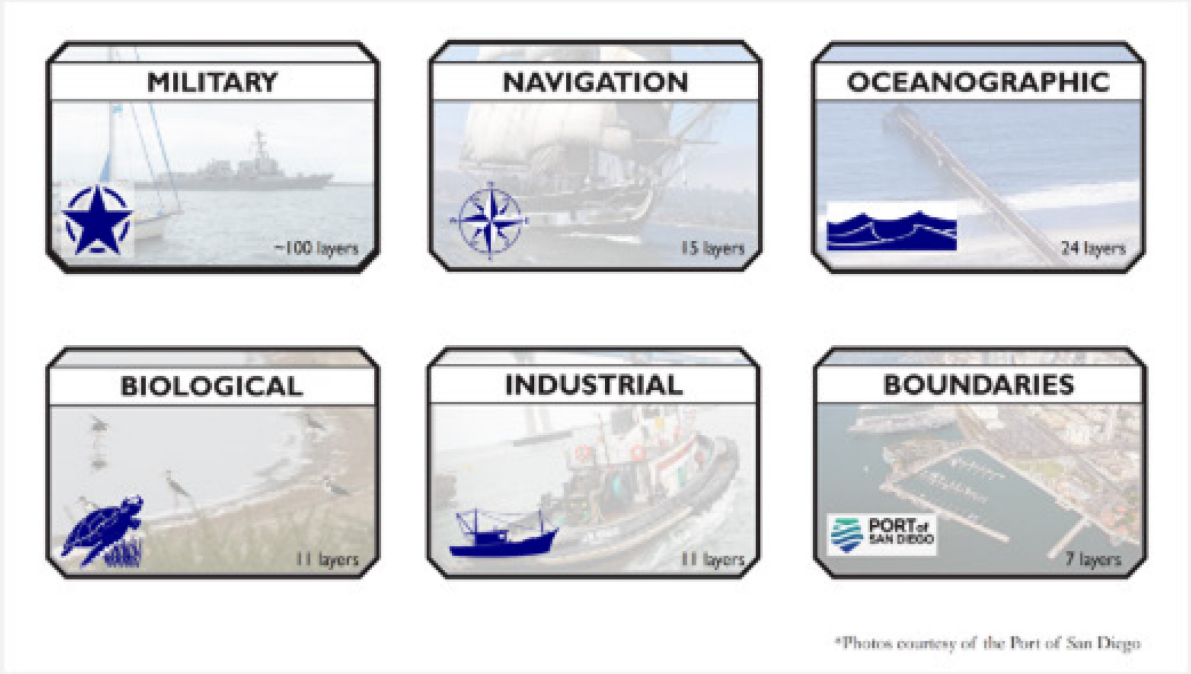
Step 2 - Identify Study Areas

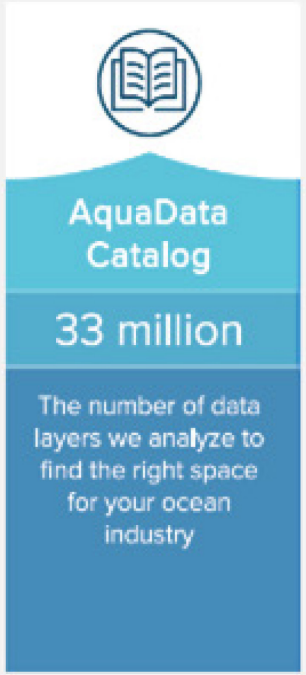


Step 2 - Identify Study Areas



Step 3 - Compile comprehensive geodatabase







Step 4 - Build the suitability model

MAPAK
ALASKA GEOSPATIAL OFFICE

MarineCadastre.gov
An Ocean of Information
A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.

NOAA
NOAA FISHERIES

State Agencies

BOEM
Bureau of Ocean Energy Management

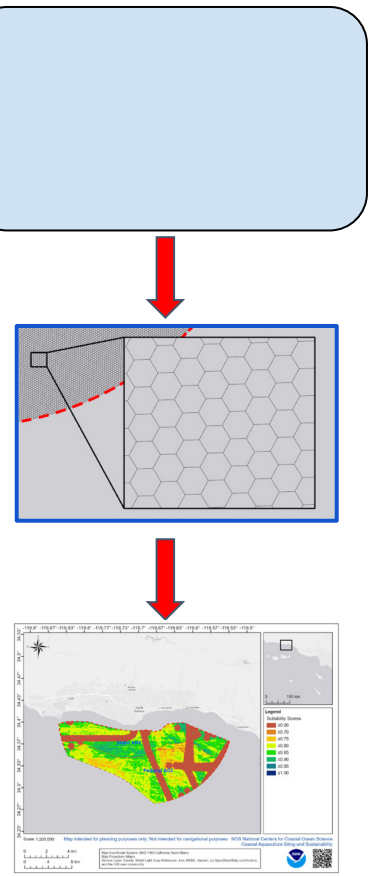
NCCOS

Submodels

- Constraints
- National Security
- Industry
- Fisheries
- Natural and Cultural Resources

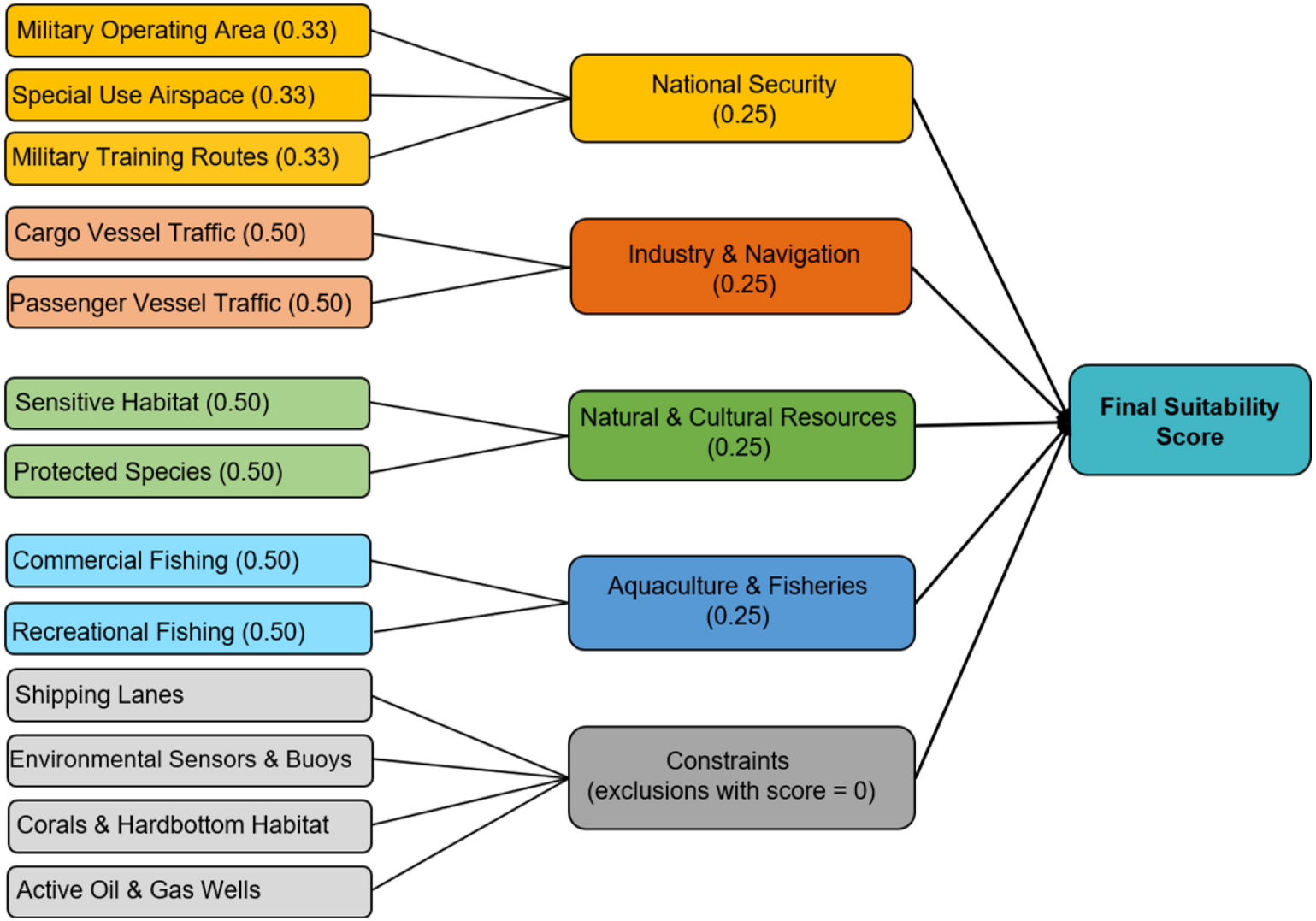
Areas Eliminated

Geometric Mean Calculated

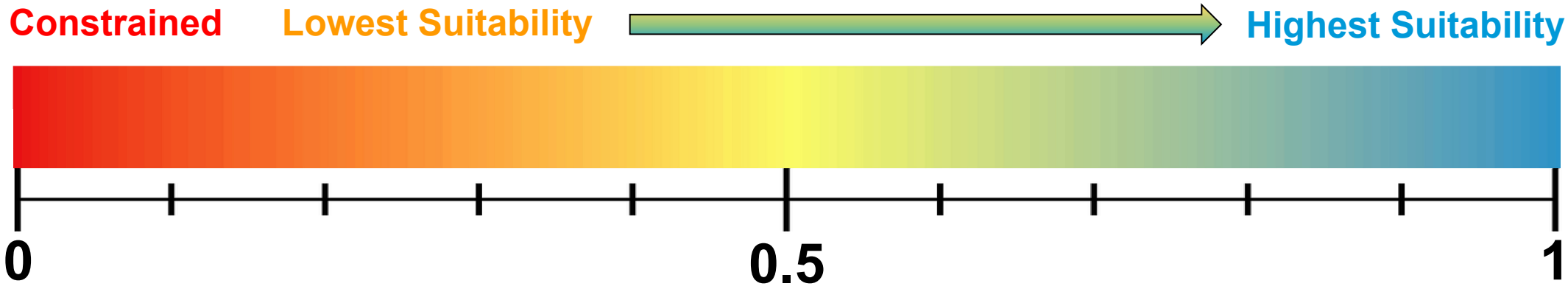


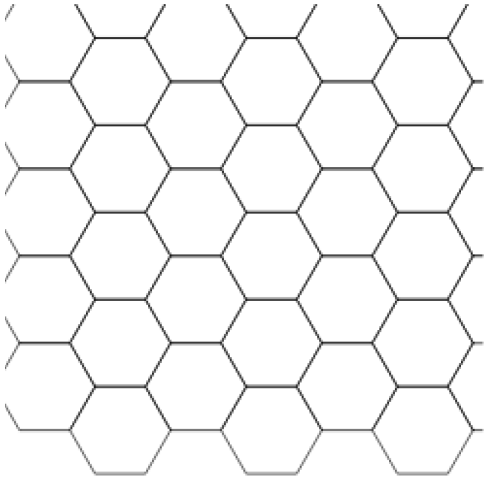
Step 4 - Build a suitability model for study areas

- Four submodels and constraints model
- Equal weights for all data and submodels
- Geometric mean used for calculating scores

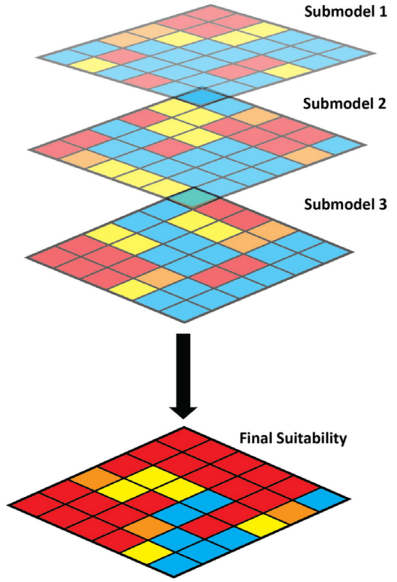


Step 4 - Build the suitability model





Scores are assigned to each grid cell for each separate data layer

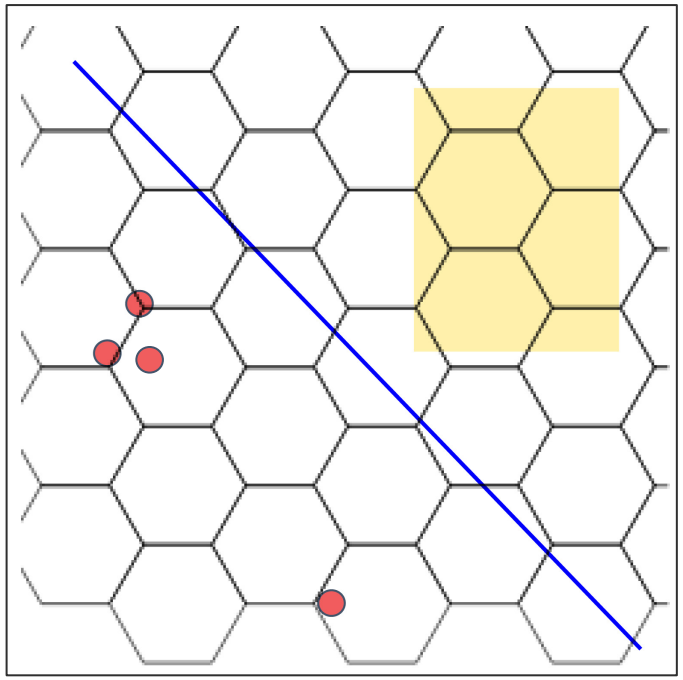


Cumulative scores for each submodel are calculated

The geometric mean of all submodels is calculated to determine final suitability

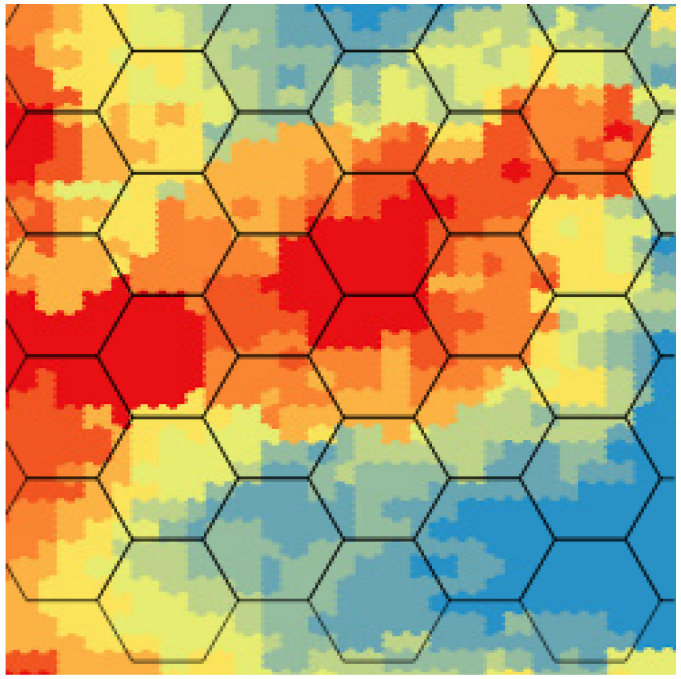
Step 4 - Build the suitability model

Categorical data



Presence/Absence Data
0 - 1 score is assigned to grid cell if that data layer is present inside of cell or overlaps the cell

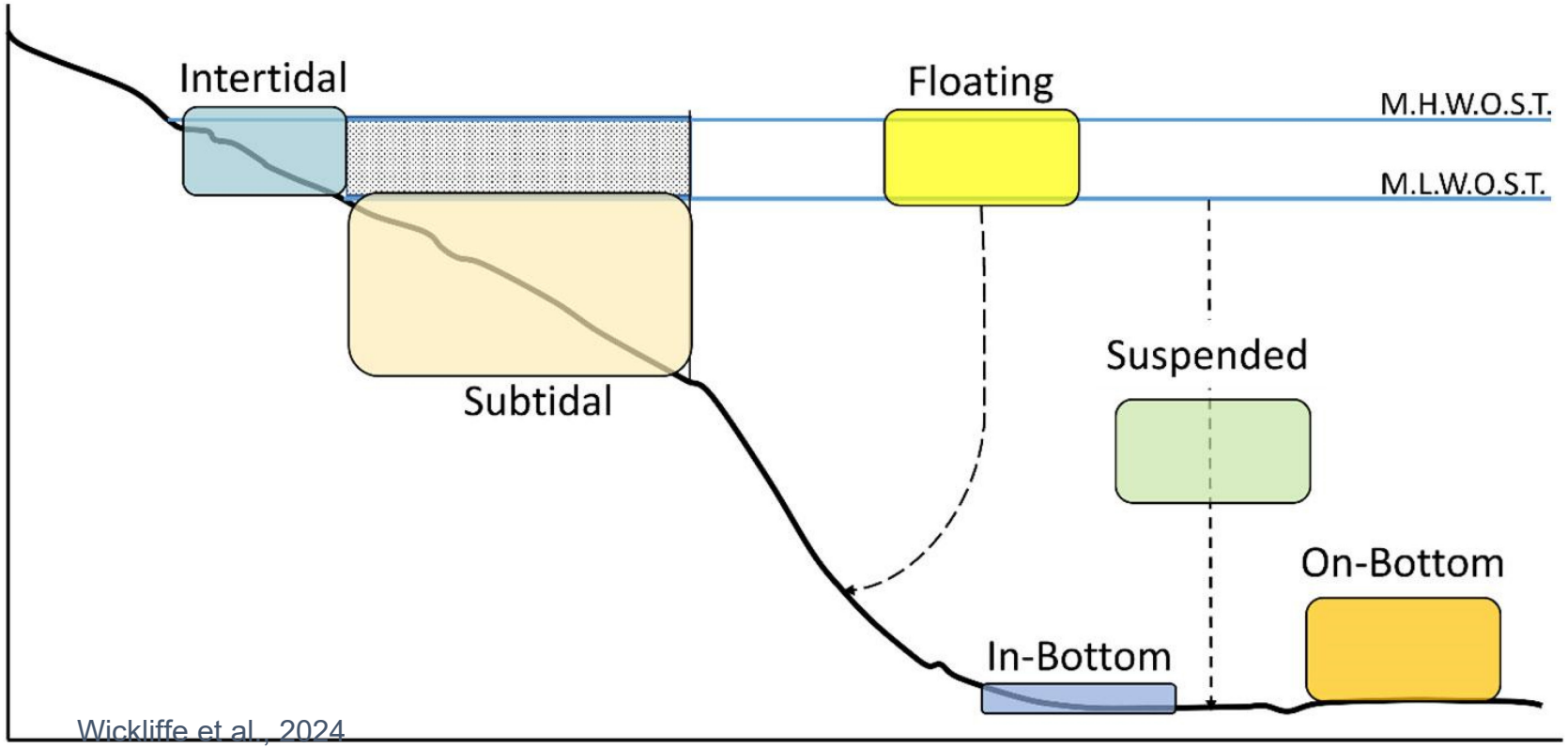
Continuous data



Raster Data - Changes over space and time
Data are rescaled 0 - 1 using a z-membership function (ZMF)

Building suitability models for species/gear combinations

- Develop list of candidate species
- Identify cultivation techniques
- Develop env. thresholds for each species/gear combination
- Clump species/gear types with similar thresholds

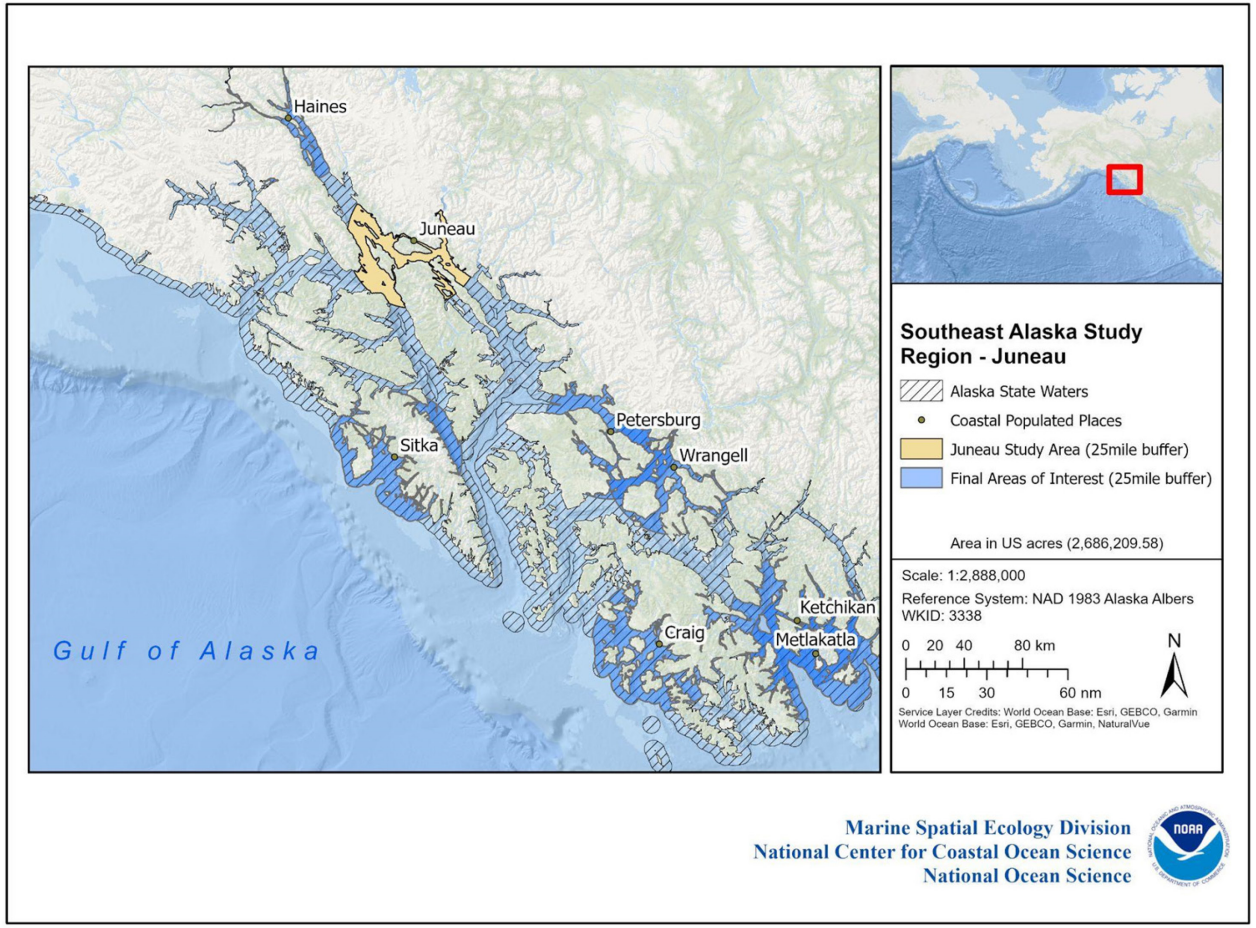


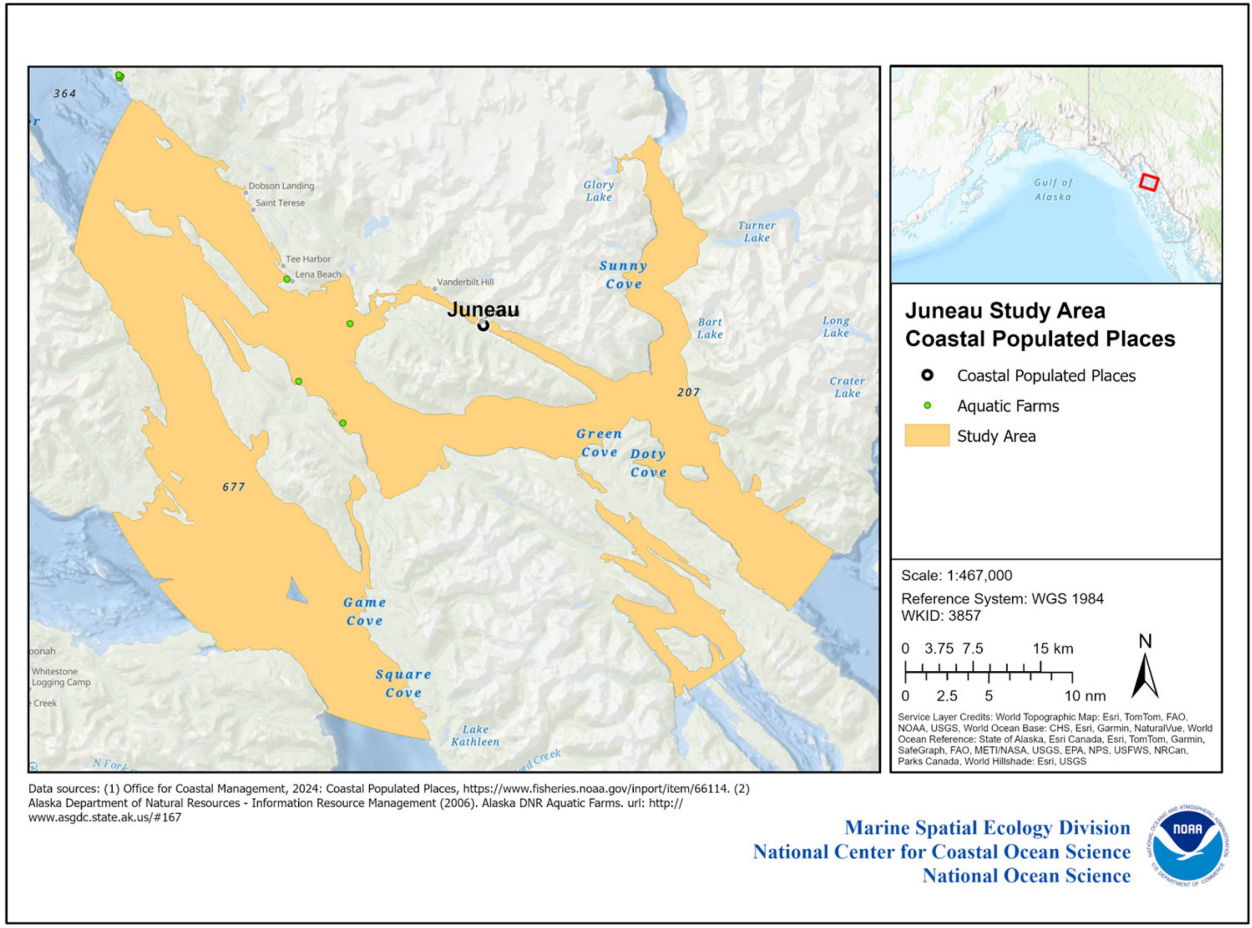
Wickliffe et al., 2024

Species Thresholds
Chlorophyll a
Current speed
Depth
pH
Salinity
Temperature
DO
Substrate type
Light transmissivity

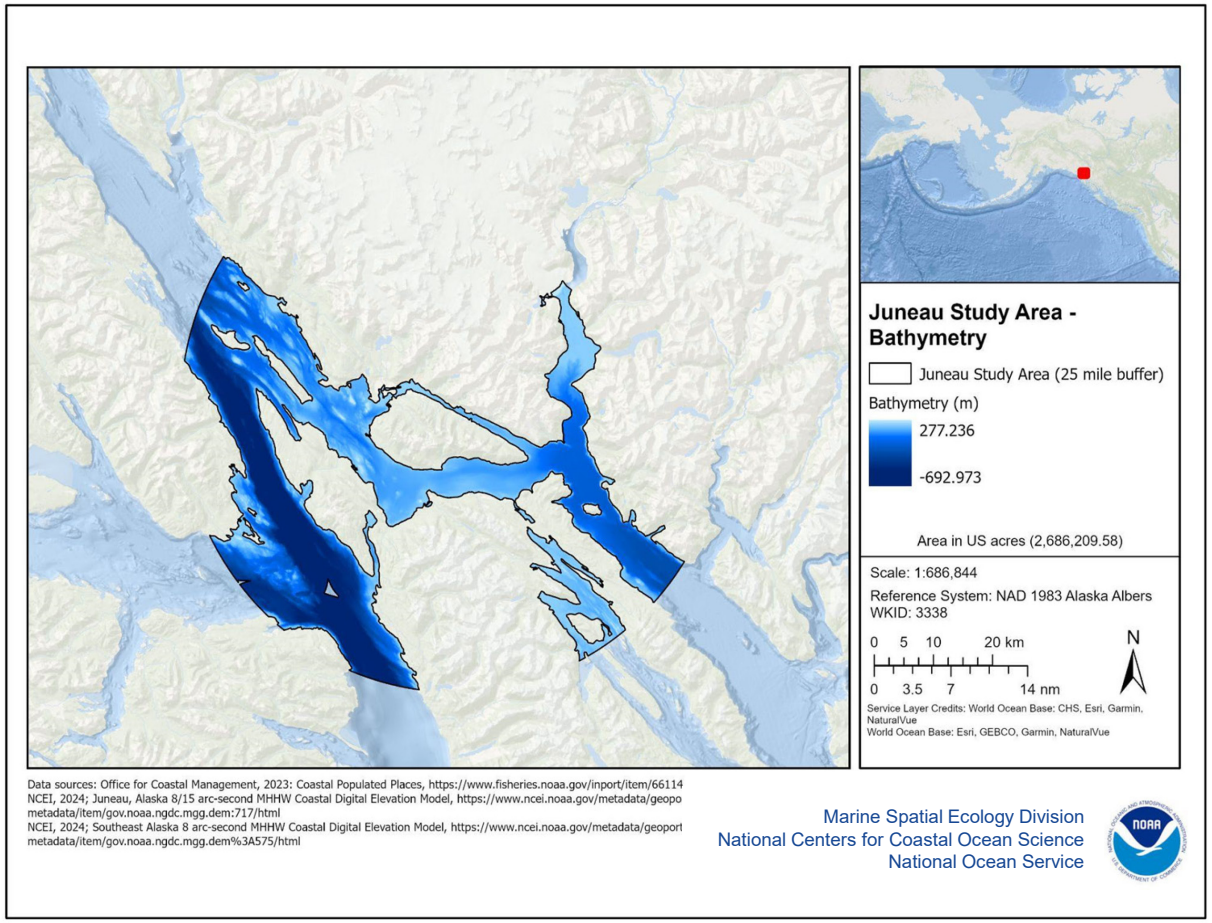
Gear Thresholds
Depth
Substrate type
Wave height
Current speed

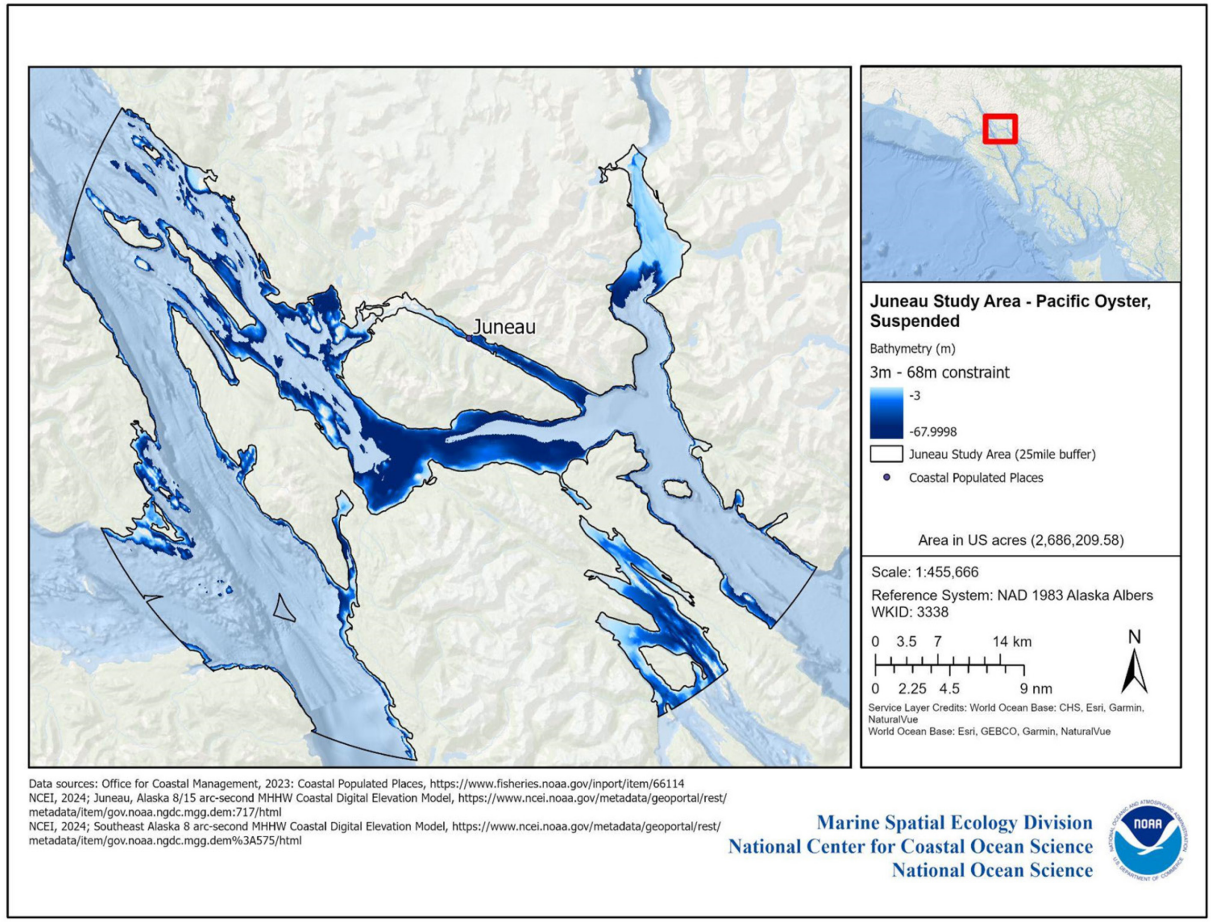
Step 4 - Build the suitability model



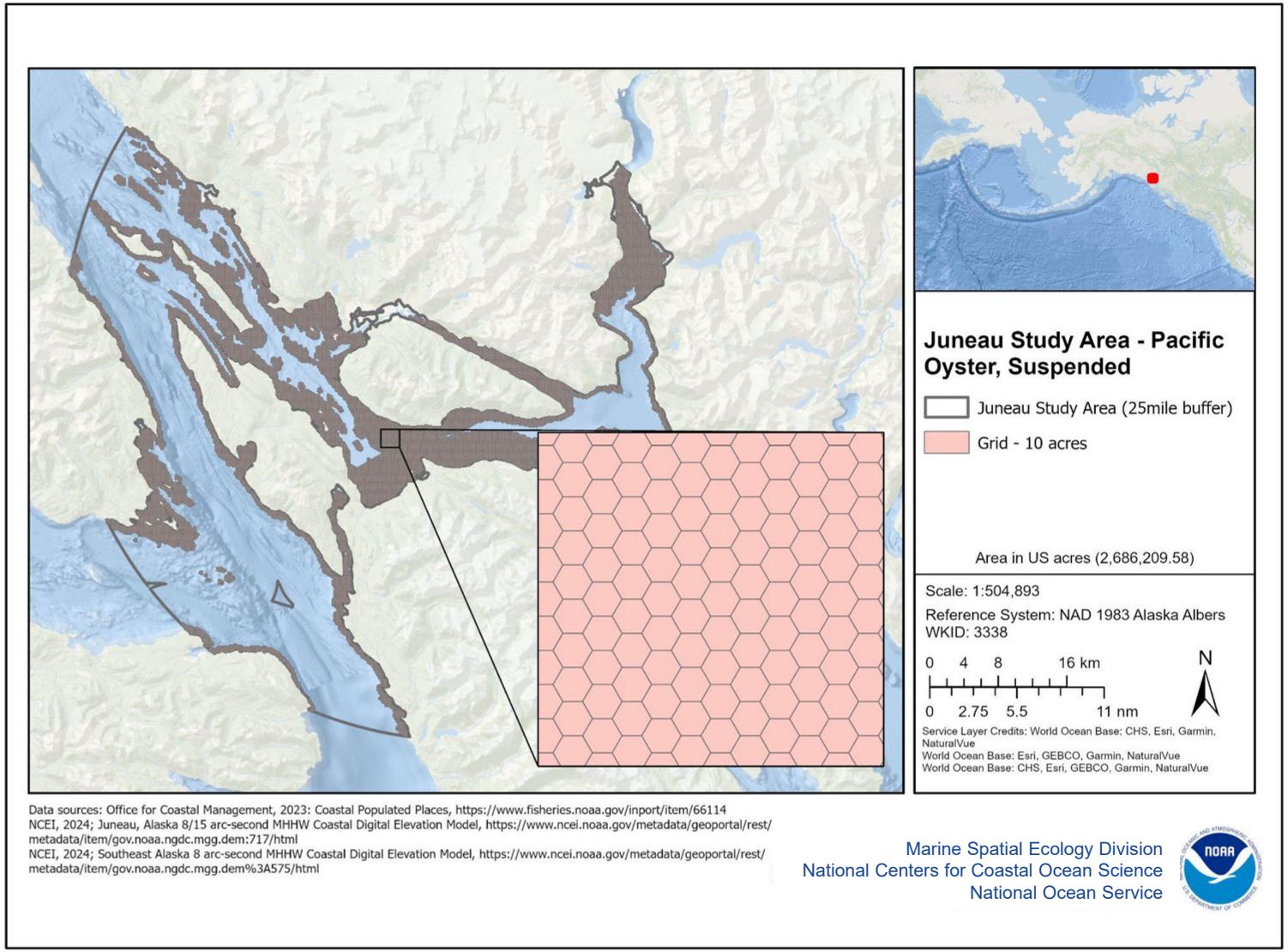


Step 4 - Build the suitability model





Step 4 - Build the suitability model



10 acre grid cell size

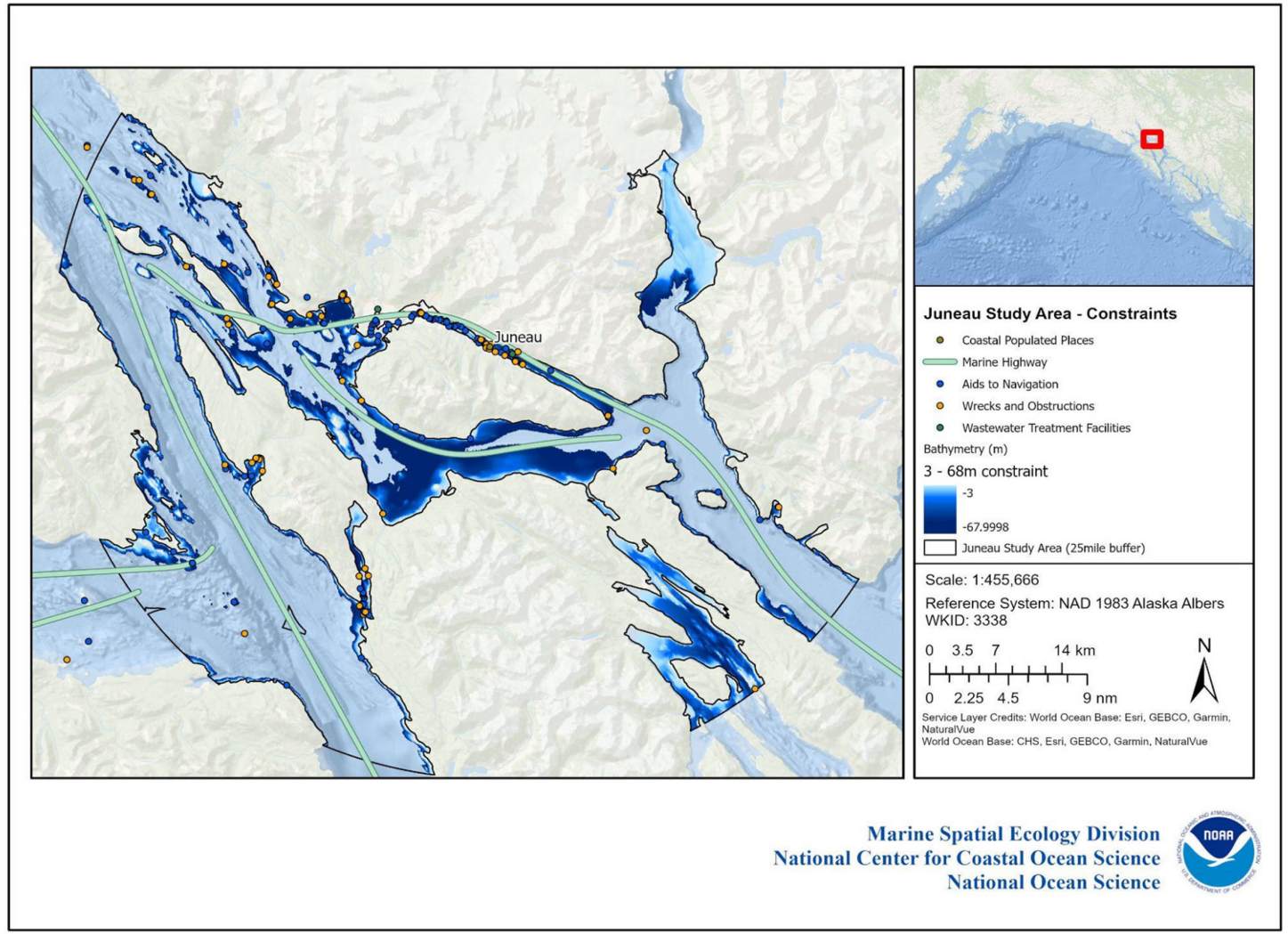
Within 25 miles of Coastal Populated Town

9-220’ depth

Step 4 - Build a suitability model

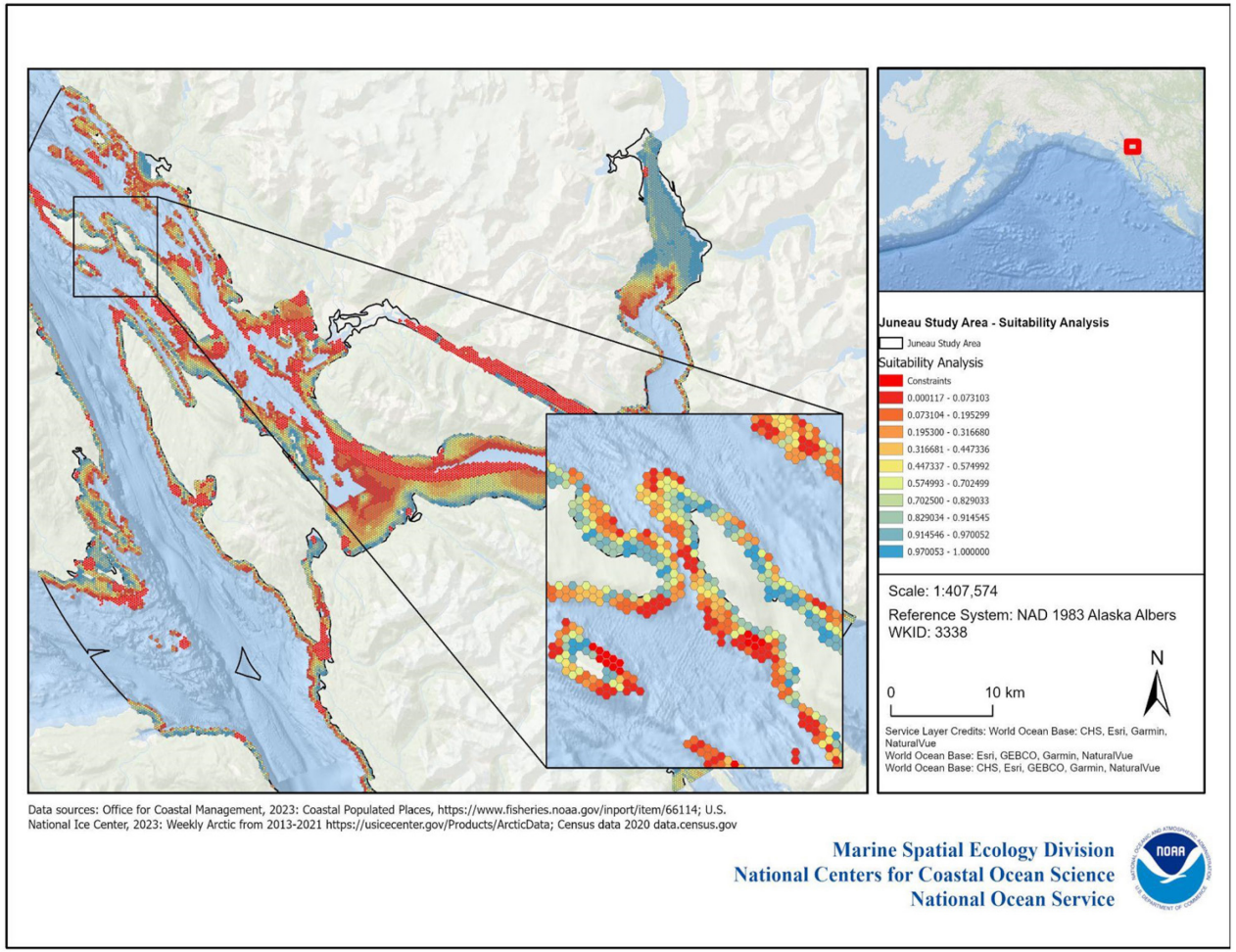
Datasets	
Wrecks and obstructions - 152.4 m setback	0
Aids to navigation - 500 m setback	0
Ocean disposal sites - 500 m setback	0
Marine Highways - 500 m setback	0
Bathymetry (3 m to 68 m)	linear
AIS Vessel Traffic 2021	continuous

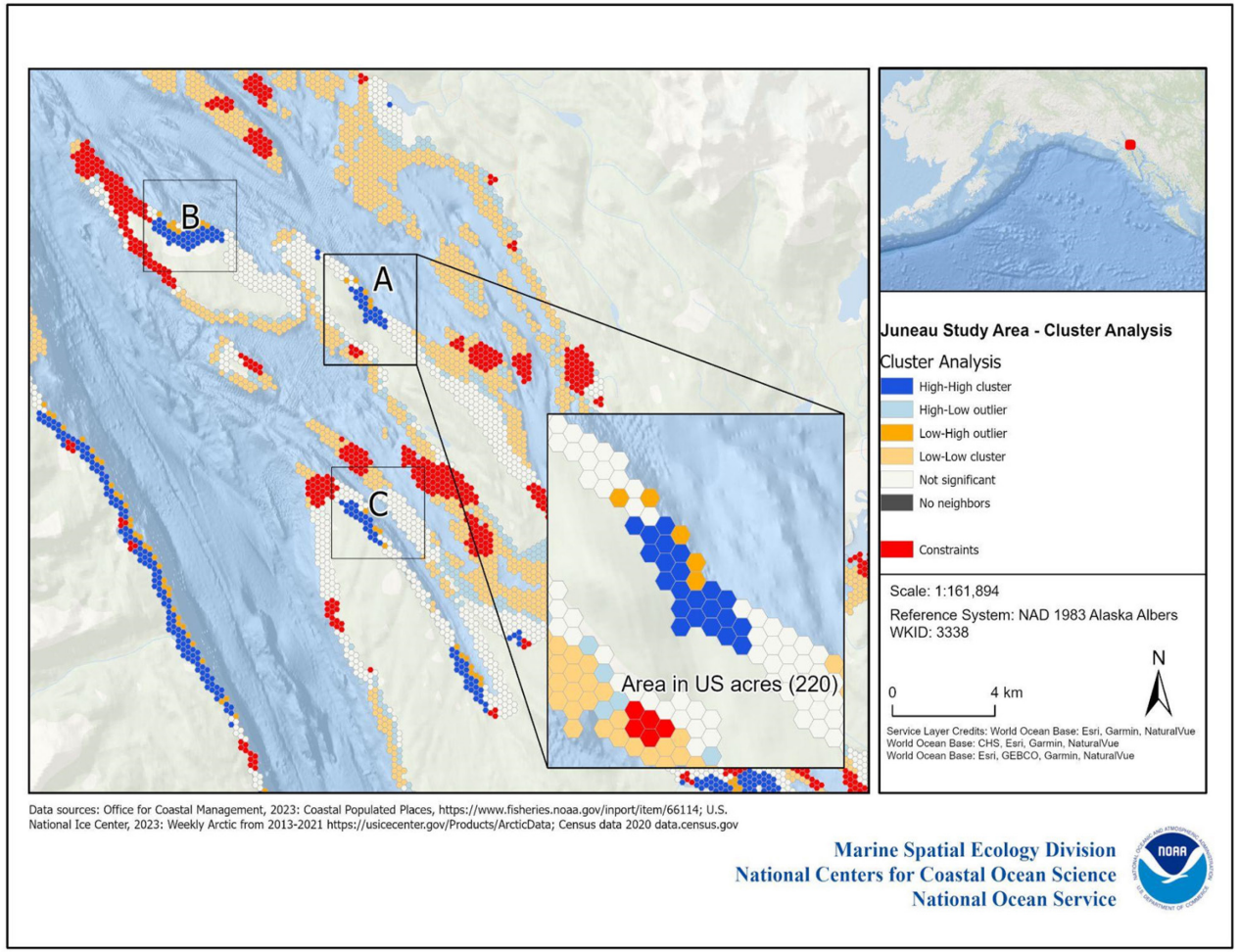
EXAMPLE



Maps for demonstration only

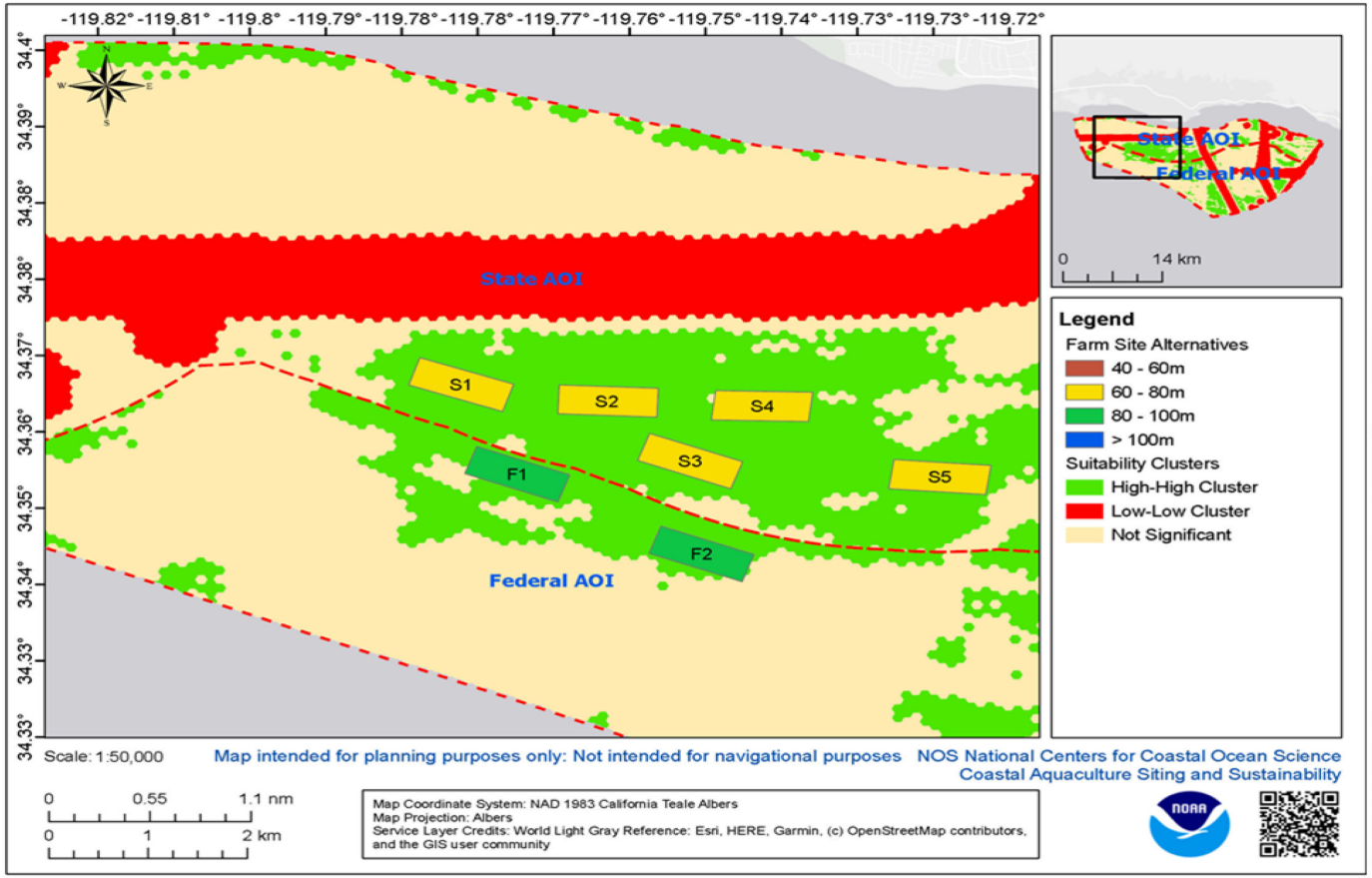
Step 5 - Cluster groups of highest scoring cells within study areas

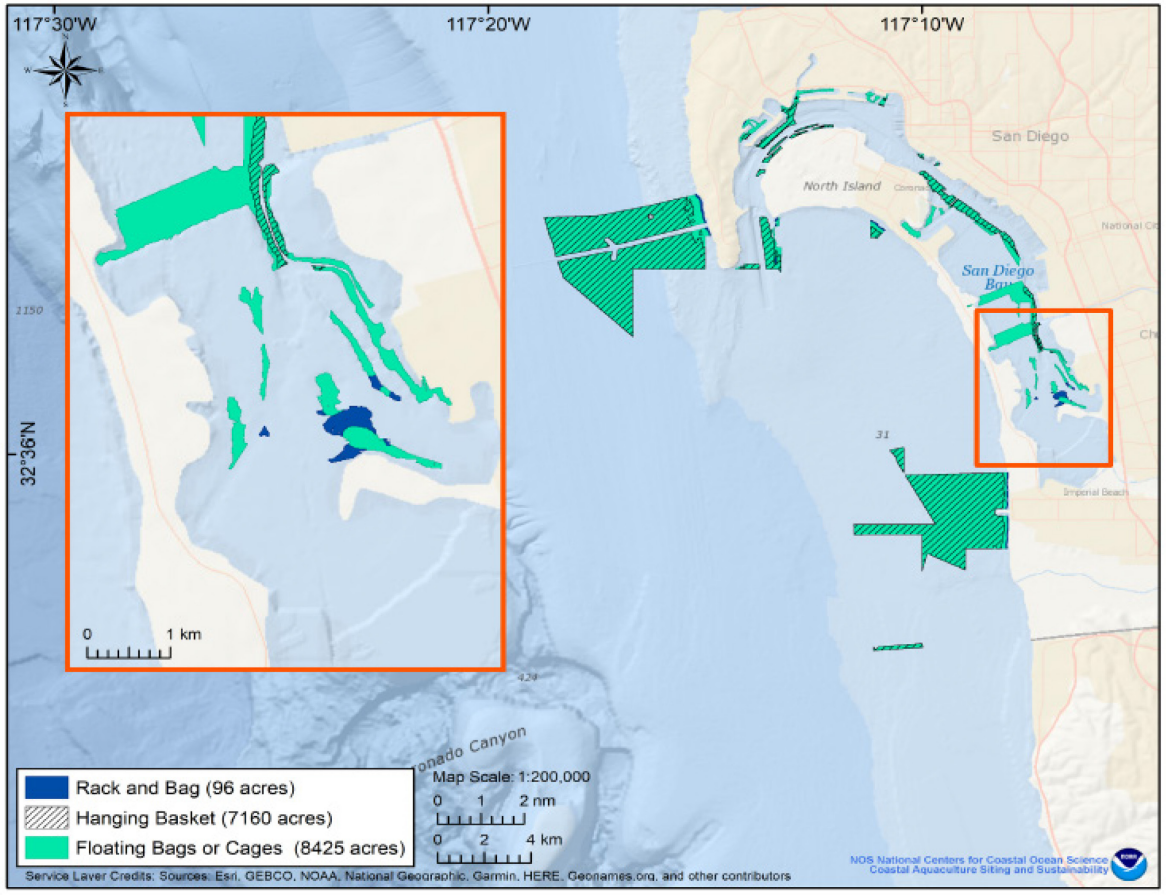




Maps for demonstration only

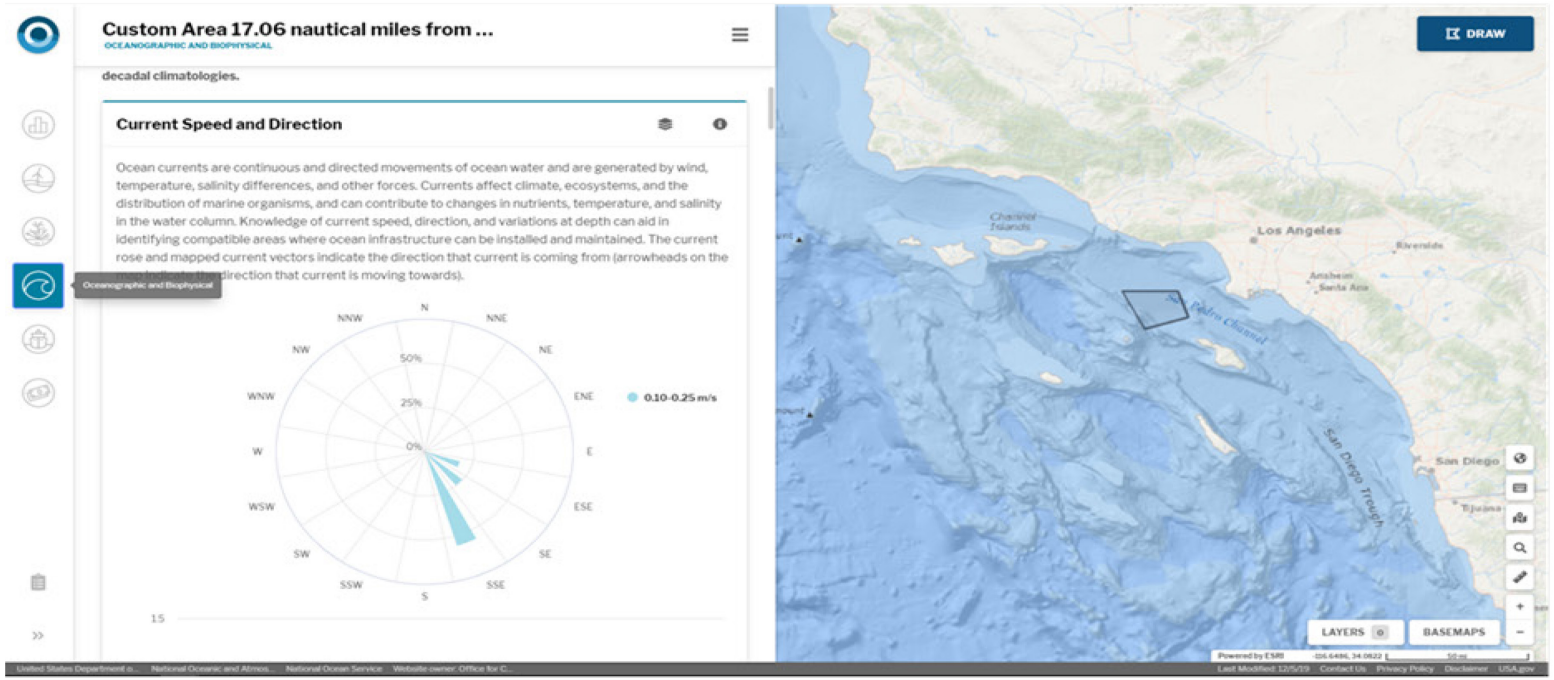
Step 6 - Identify best options within study areas





Maps for demonstration only

Step 7 - Characterize options



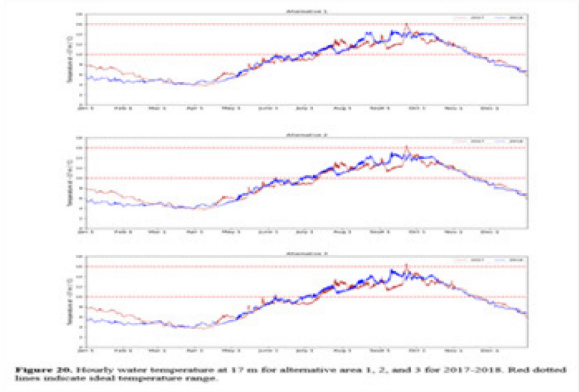
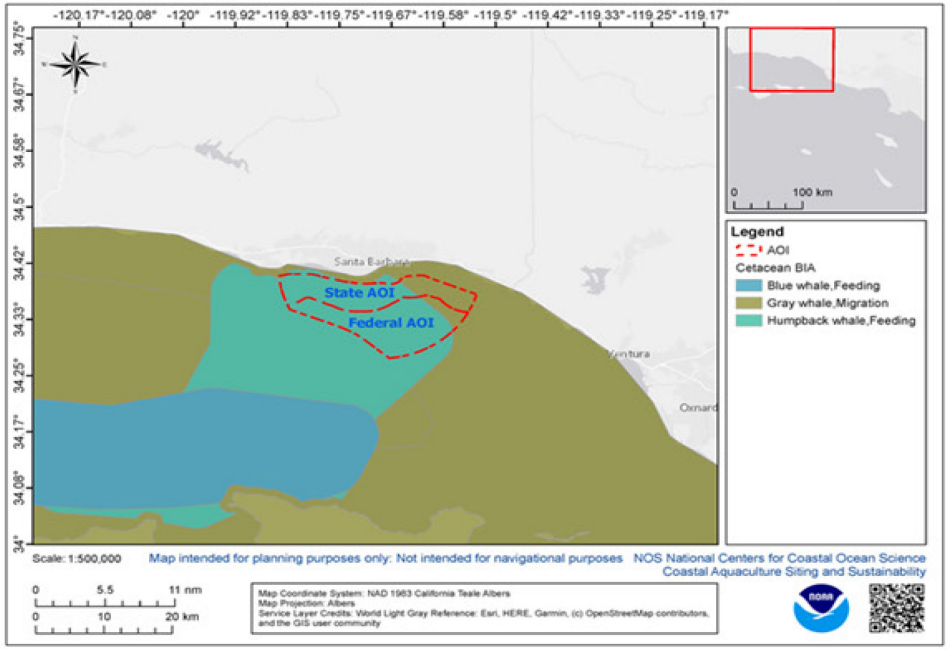


Figure 20. Hourly water temperature at 17 m for alternative area 1, 2, and 3 for 2017-2018. Red dotted lines indicate ideal temperature range.

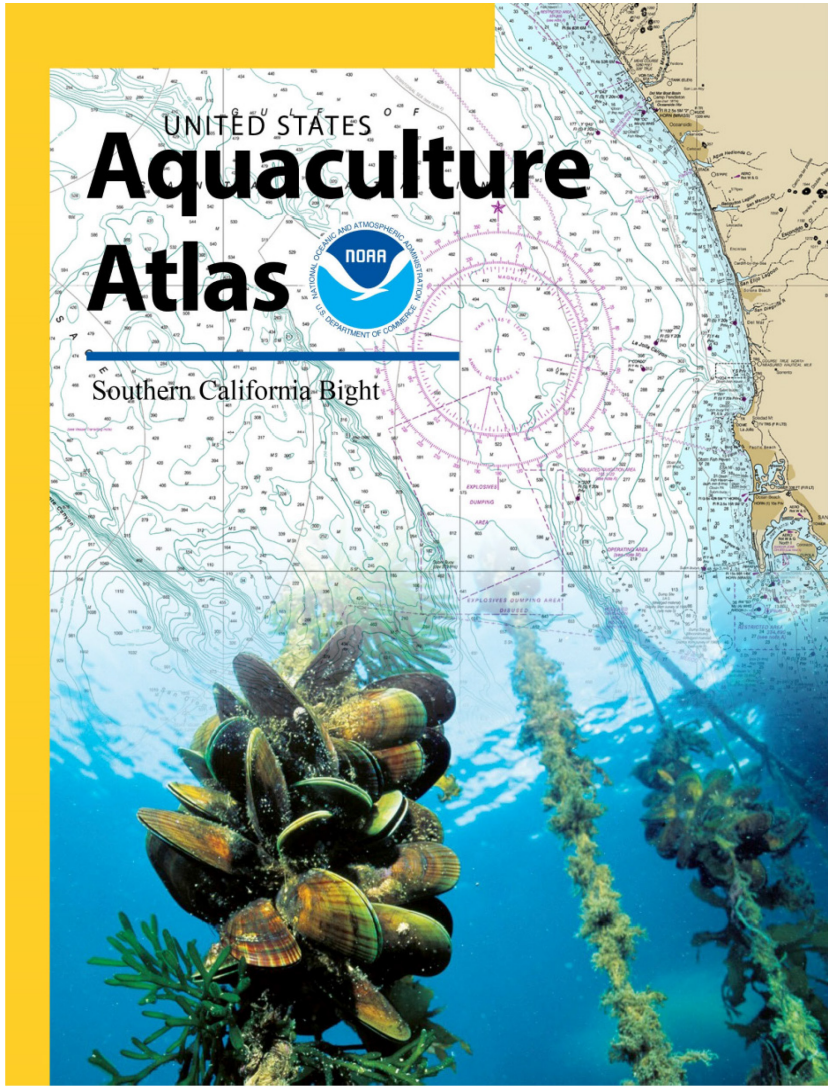
Parameter	Location A	Location B	Location C	Location D
Area (Acres)	390	1630	2640	840
Mean Suitability Score	0.86	0.86	0.84	0.86
Mean Bathymetry	44	39	37	33
Mean Slope	0.30	0.43	0.71	0.47
Mean Sediment grain size	0.29	0.68	0.43	0.32
Wave Height hours	50	54	68	58
Temperature hours	3933	3924	3908	3904
Mean VMS Traffic (2009-2019)	23	24	17	12
AIS 2017 Other vessel transits per 1 ha	1.66	2.34	1.90	2.84
AIS 2017 Tug/Tow vessel transits per 1 ha	0.24	0.13	0.33	0.45
AIS 2017 Tanker vessel transits per 1 ha	0	0	0	0
AIS 2017 Pleasure vessel transits per 1 ha	3.66	1.37	1.43	4.04
AIS 2017 Passenger vessel transits per 1 ha	1.03	5.50	3.66	0.57
AIS 2017 Cargo vessel transits per 1 ha	0	0	0	0
AIS 2017 Fishing vessel transits per 1 ha	0.43	1.21	2.38	0.50
Closest Port	Rye Harbor	Hampton Harbor	Newburyport	Newburyport
EPA Region	1	1	1	1
Coast Guard District	1	1	1	1
US Army Corps of Engineers District	New England	New England	New England	New England
Unexploded Ordnance	Yes	No	No	No

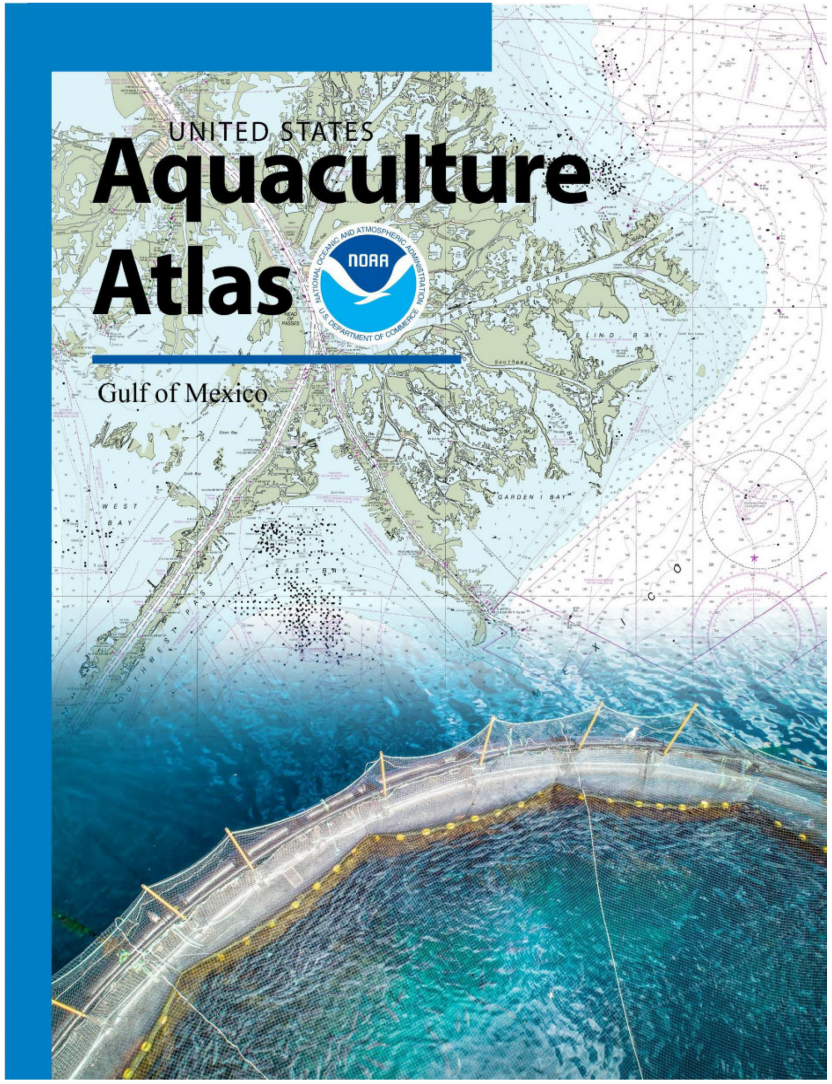


Maps for demonstration only

Step 8 - Develop report/atlas

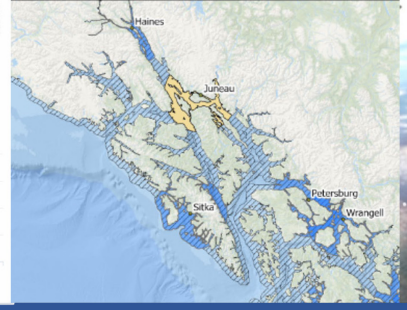
NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE











Building Species/Gear Specific Suitability Models For Alaska Aquaculture Opportunity Areas

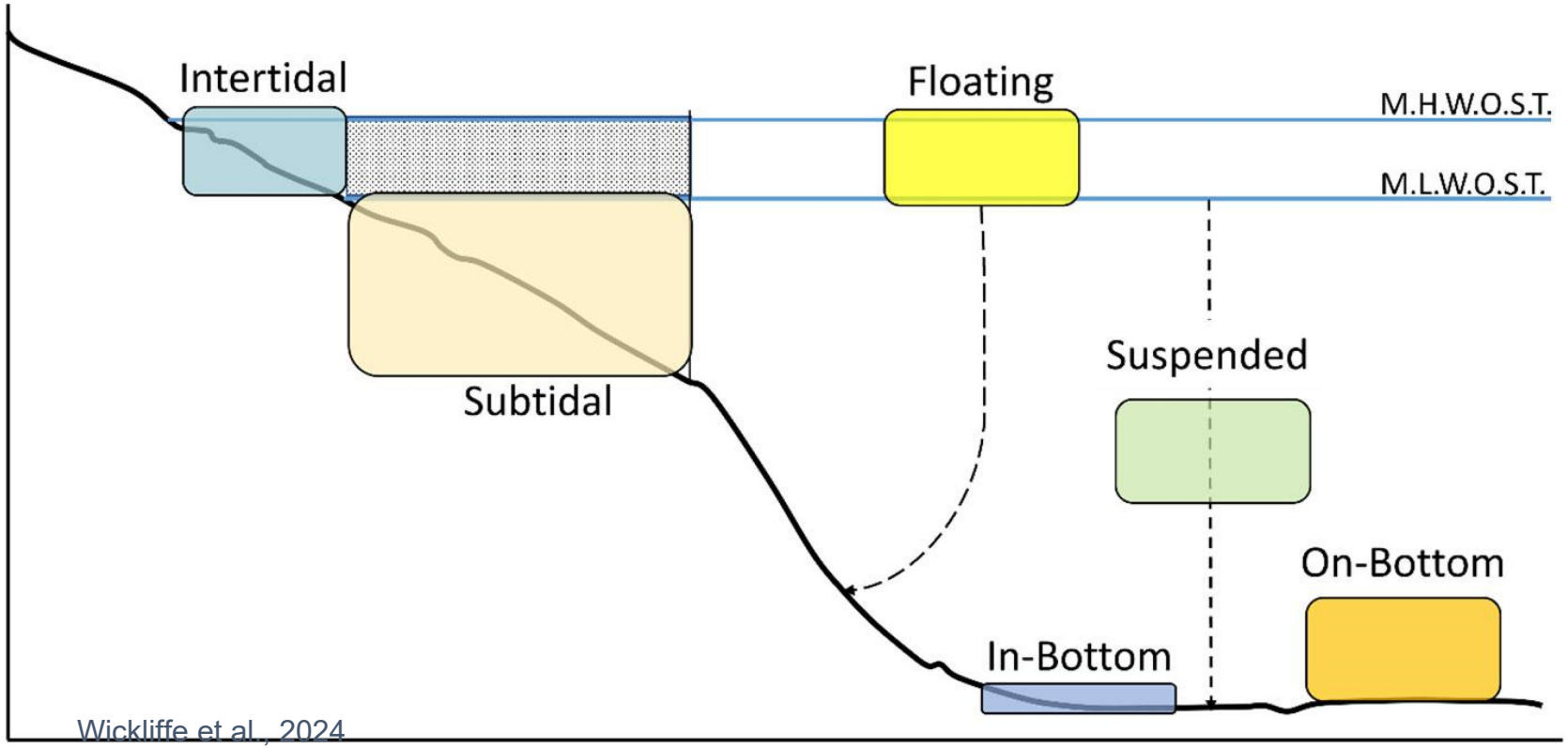
NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

Anchorage and Juneau

February 26 and March 26, 2024

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

Building suitability models for species/gear combinations

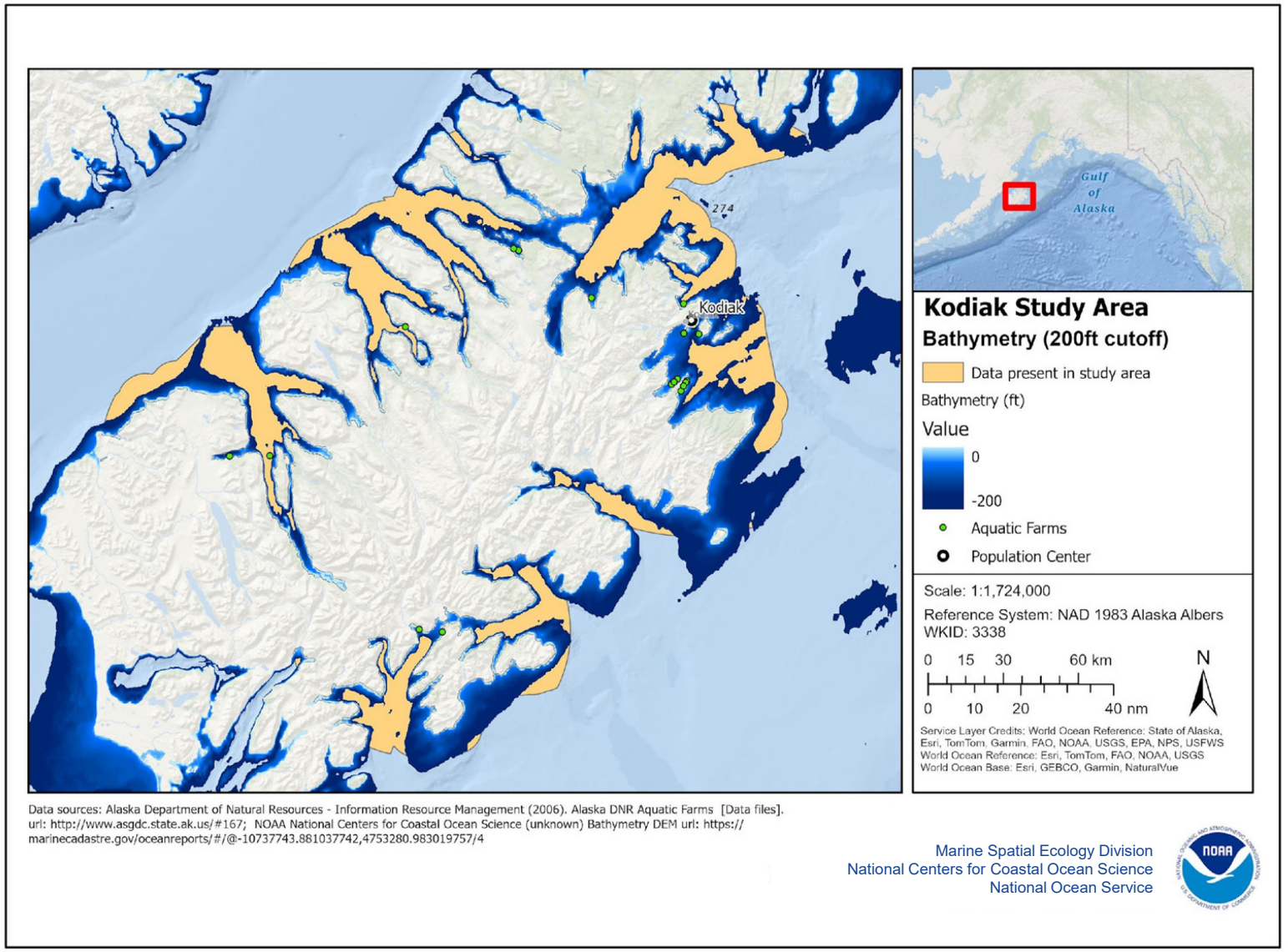


Wickliffe et al., 2024

Species Thresholds
Chlorophyll a
Current speed
Depth
pH
Salinity
Temperature
DO
Substrate type
Light transmissivity

Gear Thresholds
Depth
Substrate type
Wave height
Current speed

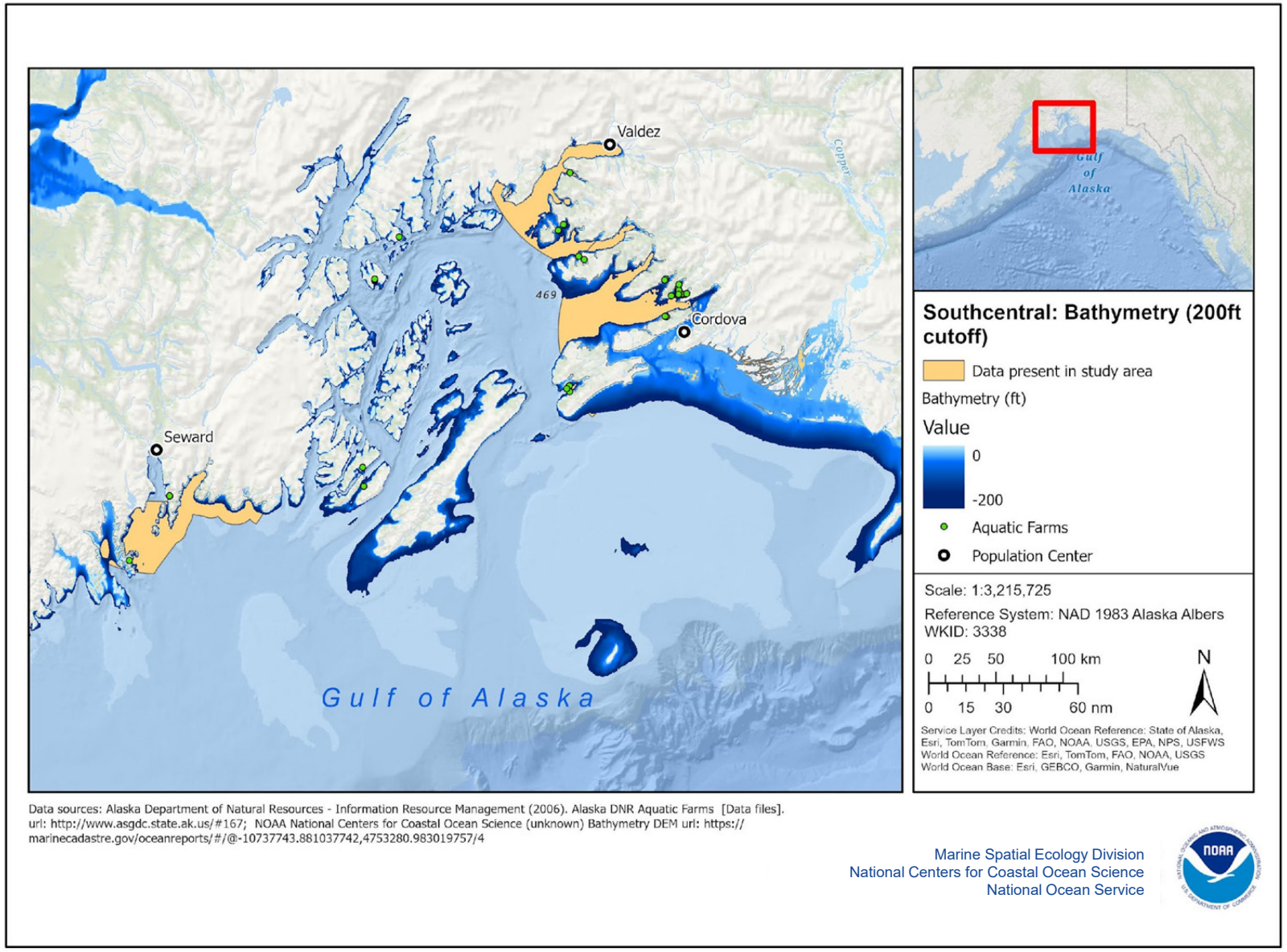
Focusing analysis to areas within the env. thresholds



Data sources: Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167; NOAA National Centers for Coastal Ocean Science (unknown) Bathymetry DEM url: https://marinecadastre.gov/oceanreports/#/@-10737743.881037742,4753280.983019757/4

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

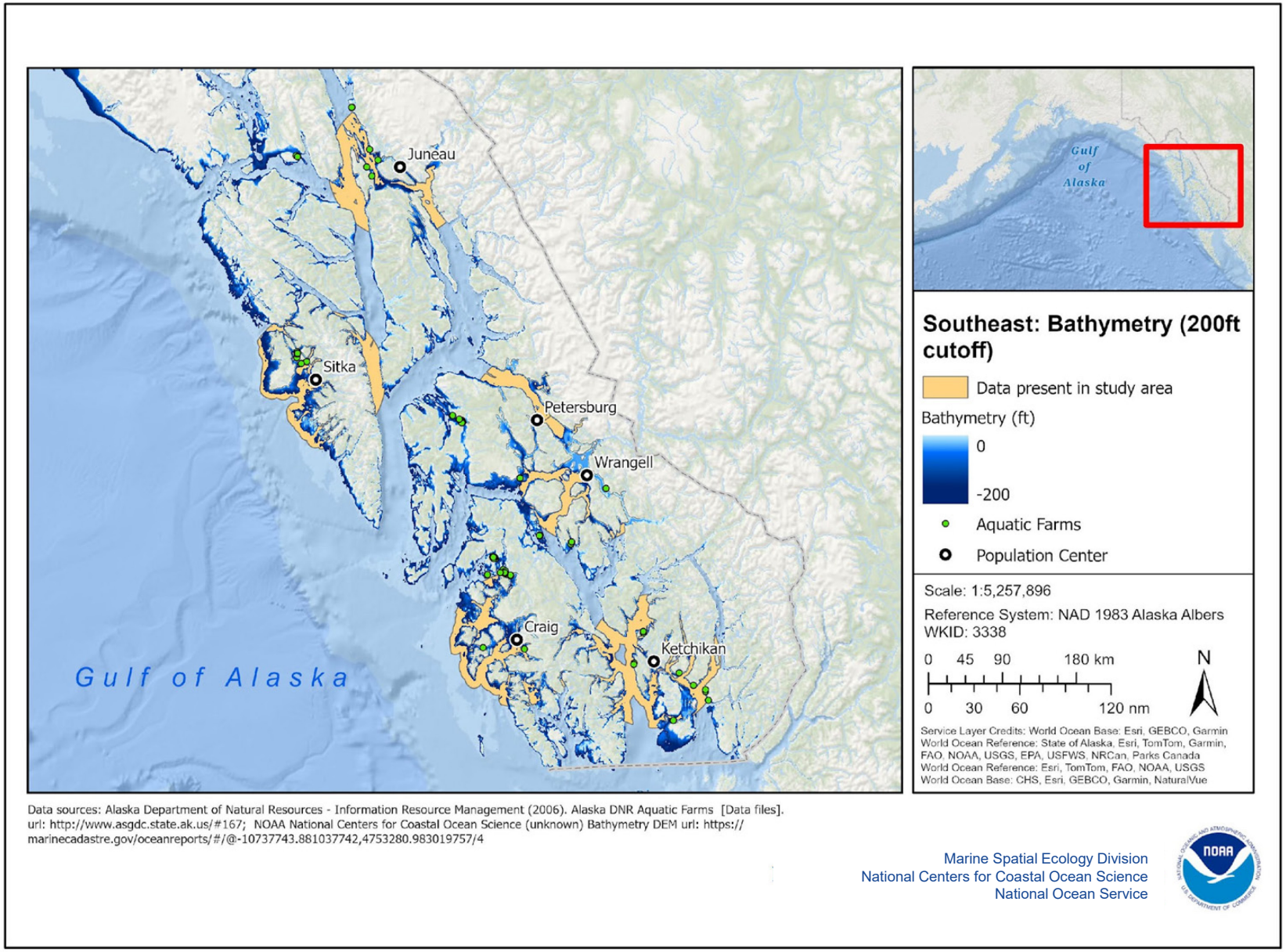
Focusing analysis to areas within the env. thresholds



Data sources: Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167; NOAA National Centers for Coastal Ocean Science (unknown) Bathymetry DEM url: https://marinecadastre.gov/oceanreports/#/@-10737743.881037742,4753280.983019757/4

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Focusing analysis to areas within the env. thresholds



Data sources: Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167; NOAA National Centers for Coastal Ocean Science (unknown) Bathymetry DEM url: https://marinecadastre.gov/oceanreports/#/@-10737743.881037742,4753280.983019757/4

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Gear type thresholds

Gear types with similar thresholds can be lumped together (e.g., hanging baskets & line cultivation)

Models are developed to exclude areas outside critical thresholds

Challenges:

- Resolution of information for species thresholds
- Resolution of environmental data for study areas
- Area may be possible but not practical

Appendix C – Thresholds by Cultivation Method and Species

Gear Type	Tide Min (m)	Tide Max (m)	Current Min (m/s)	Current Max (m/s)	Depth Min (m)	Depth Max (m)
Covered In Bottom manual	0.13	-1.63	0.01	0.25	-0.03	-1.25
Covered In Bottom mechanical	0.13	-1.63	0.01	0.25	-0.03	-1.25
Floating Bags*	0.13	+	0.01	2.20	-0.75	+
Floating Cages*	0.13	+	0.01	2.20	-0.75	+
Hanging Basket*	-1.63	+	0.01	2.20	-5.00	+
Horizontal Longlines	-1.63	+	0.01	1.50	-5.00	+
In Bottom	0.13	-1.63	0.01	0.70	-0.25	-1.00
Lantern Nets Cages*	-1.63	+	0.01	1.00	-5.00	+
Line Cultivation	-1.63	+	0.01	1.20	-0.75	+
Planting Seeded Cultch manual	0.13	-1.63	0.01	1.00	-0.25	-1.25
Planting Seeded Cultch	-1.63	+	0.01	1.00	-0.25	+
Rack and Bag	0.13	-1.63	0.01	0.60	-0.75	-1.50
Raft Culture*	-1.63	+	0.01	0.25	-5.00	+
Seabed Cultivation	-1.63	+	0.01	1.52	-5.00	+
Stake	0.13	-1.63	0.01	0.25	-0.30	-1.50
Substrate Nets	-1.63	+	0.01	0.60	-2.00	+
Supported Cages	-1.63	+	0.01	0.60	-3.00	+

* Cultivation method has promise for use in Alaska.

Species thresholds

Species with similar thresholds can be lumped together (e.g., oysters and scallops, clam species and cockles, mussel species)

Models are developed to exclude areas outside identified thresholds

Challenges:

- Resolution of information for species thresholds
- Resolution of environmental data for study areas
- Min and max thresholds may provide for subpar growth/production

Appendix C – Thresholds by Cultivation Method and Species

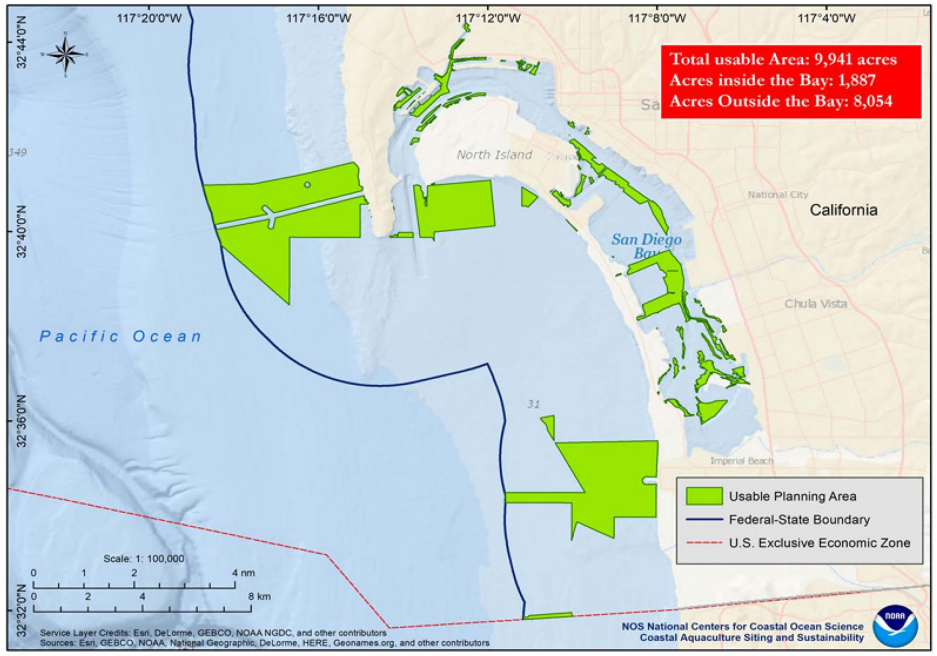
Species	Scientific Name	Temp. (°C)	Salinity (ppt)	Current (m/s)	Turbidity (mg/L)	Dissolved Oxygen	pH
Pacific Oyster*	*Crassostrea gigas*	10 - 30	20 - 37	Moderate	< 250	Low (1 mg/L) for short periods	8-9
Olympia Oyster	*Ostrea lurida*	13 - 18	25 - 40	Moderate	-	Low (1 mg/L) for short periods	8-9
Manila Clam	*Venerupis philippinarium*	5 - 28	15 - 35	Moderate	< 23	Low (1 mg/L) for short periods	6.8-8.5
Geoduck Clam*	*Panopea Generosa*	8 - 19	26 - 34	Moderate	-	Low (1 mg/L) for short periods	6.8-8.5
Butter Clam	*Saxidomus gigantea*	3 - 23	20 - 35	Moderate	-	Low (1 mg/L) for short periods	6.8-8.5
Softshell Clam	*Mya arenaria*	3 - 23	5 - 30	Moderate	-	Low (1 mg/L) for short periods	6.8-8.5
Native Littleneck Clam*	*Leukoma staminea*	3 - 23	20 - 35	Moderate	-	Low (1 mg/L) for short periods	6.8-8.5
Horse Clam	*Tresus capax*	3 - 23	20 - 35	Moderate	-	Low (1 mg/L) for short periods	6.8-8.5
Cockles*	*Cardiidae spp.*	3 - 23	20 - 35	Moderate	-	Low (1 mg/L) for short periods	6.8-8.5
Blue Mussel*	*Mytilus edulis*	2 - 27	20 - 35	Slow-Moderate	< 20	Low (1 mg/L) for short periods	8-9
Mediterranean Mussel	*Mytilus galloprovincialis*	10 - 21	20 - 35	-	-	Low (1 mg/L) for short periods	8-9
Purple Hinged Rock Scallop*	*Crassadoma gigantea*	10 - 27	23 - 40	Moderate-Strong	-	Intolerant at low conditions	-
Pacific Weathervane Scallop*	*Patinopecten caurinus*	10 - 27	23 - 40	Moderate-Strong	-	Intolerant at low conditions	-
Abalone	*Haliotis spp.*	7 - 27	27 - 35	Moderate-Strong	-	Low (1 mg/L) for short periods	-

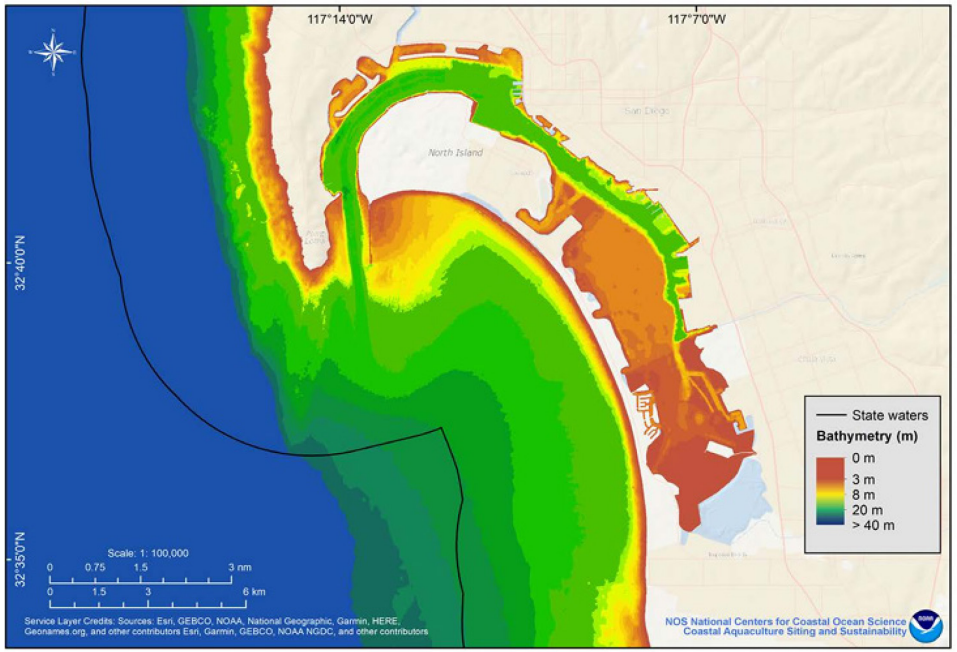
* Species has promise for mariculture cultivation in Alaska. Note only species native to Alaska, with the exception of Pacific oysters, can be cultured in Alaska.

Sources: Cheney, D.P. and T.F. Mumford, Jr. 1986. Shellfish and seaweed harvest of Puget Sound. Puget Sound Books, Washington Seagrant Program.

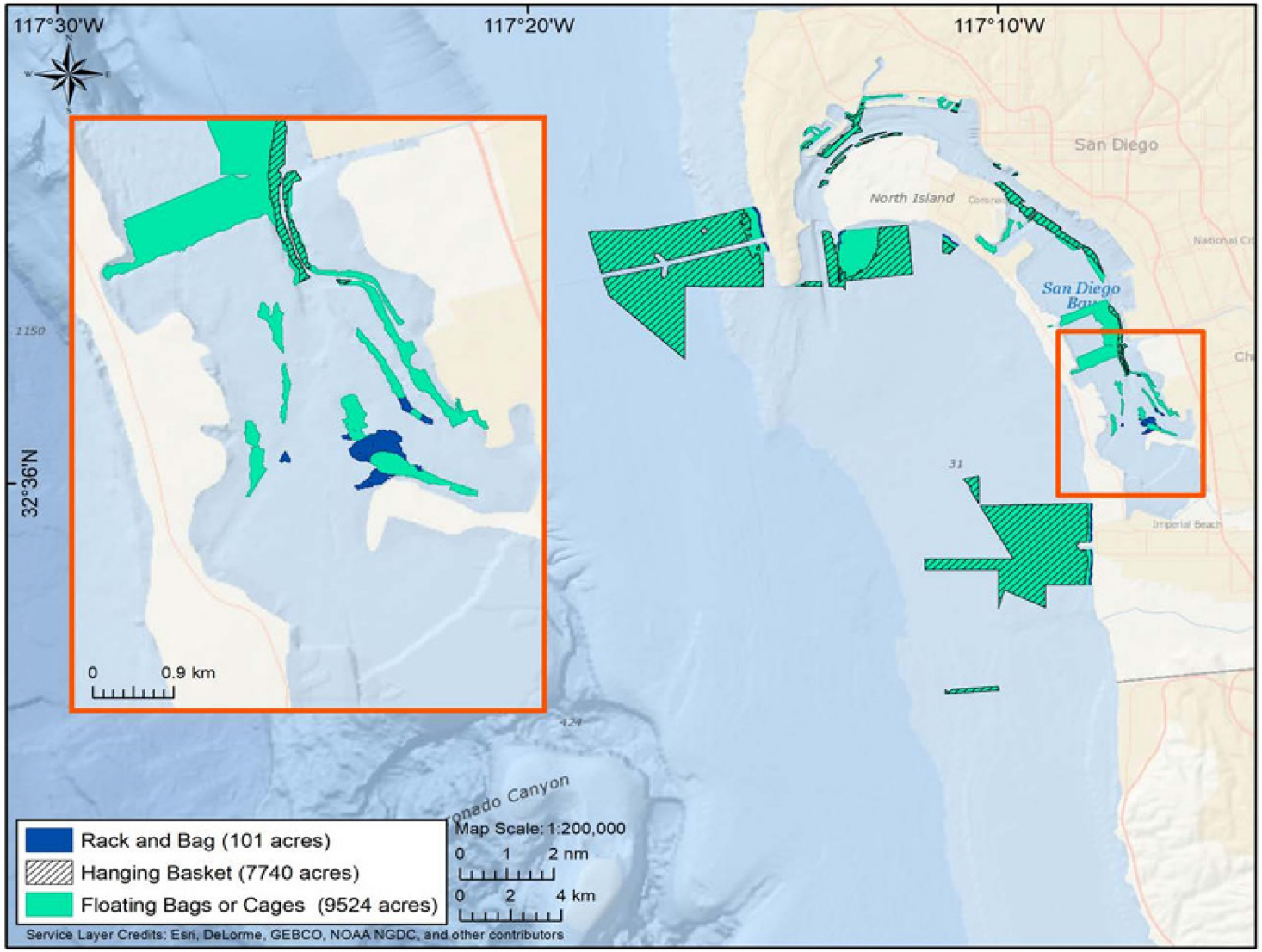
Suhrbier, A., Houle, K. and Cheney, D. 2016. Lower Big Quilcene River Modeling: Shellfish Salinity and Sedimentation/Turbidity Tolerances. Prepared for the Hood Canal Salmon Enhancement Group Report. Pacific Shellfish Institute, Olympia, WA.

Opportunities



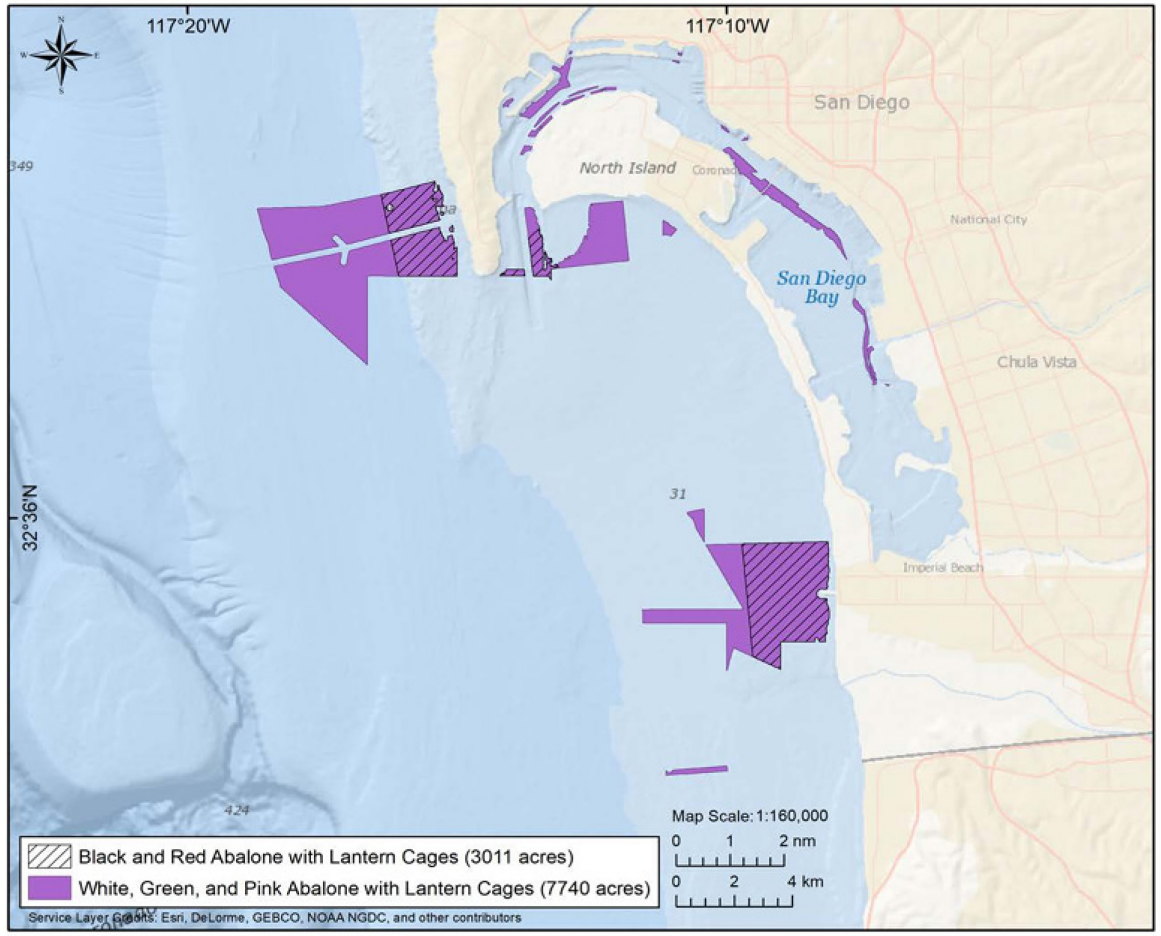


Oyster Opportunities

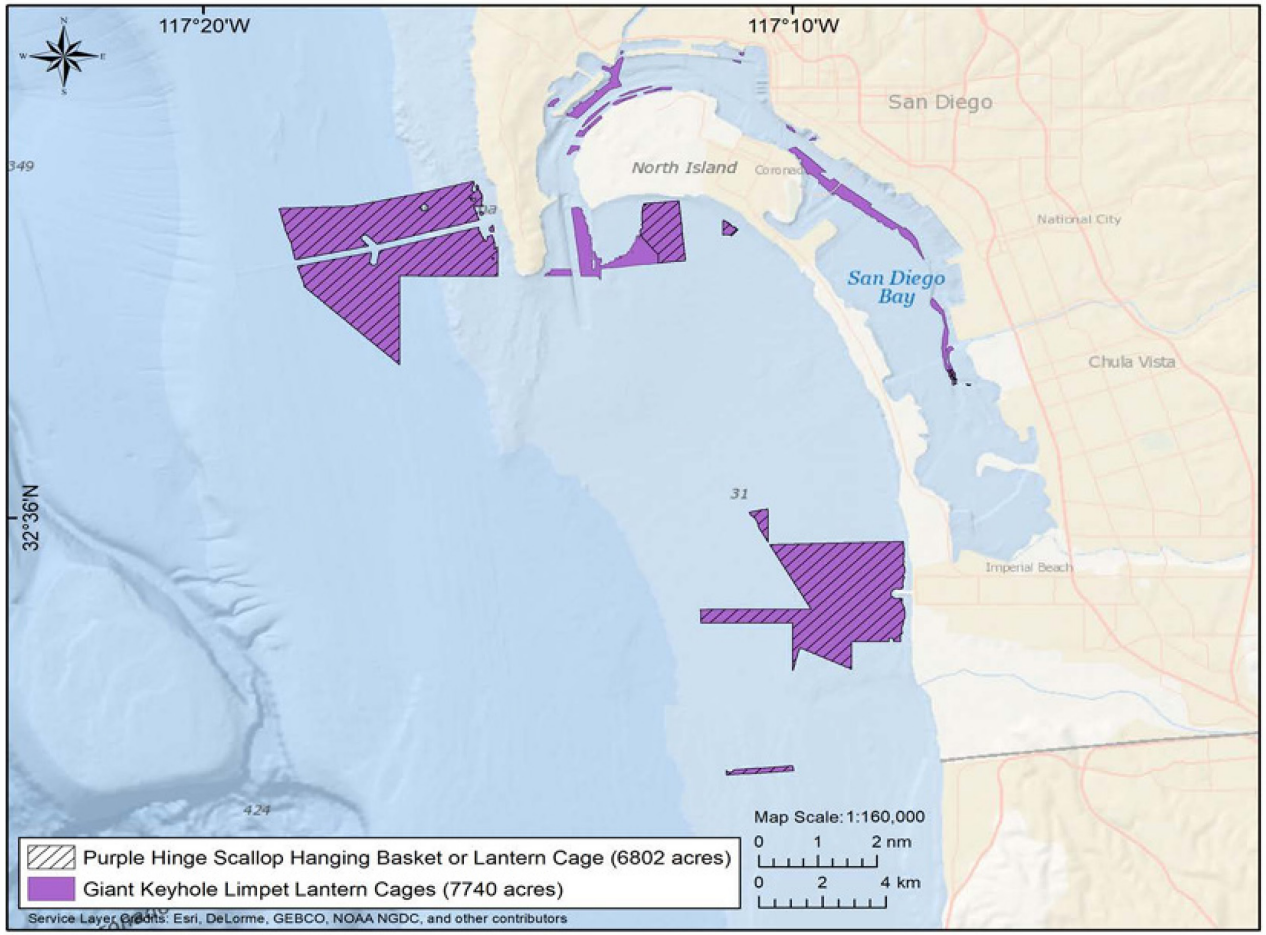


Opportunities

Abalone Opportunities

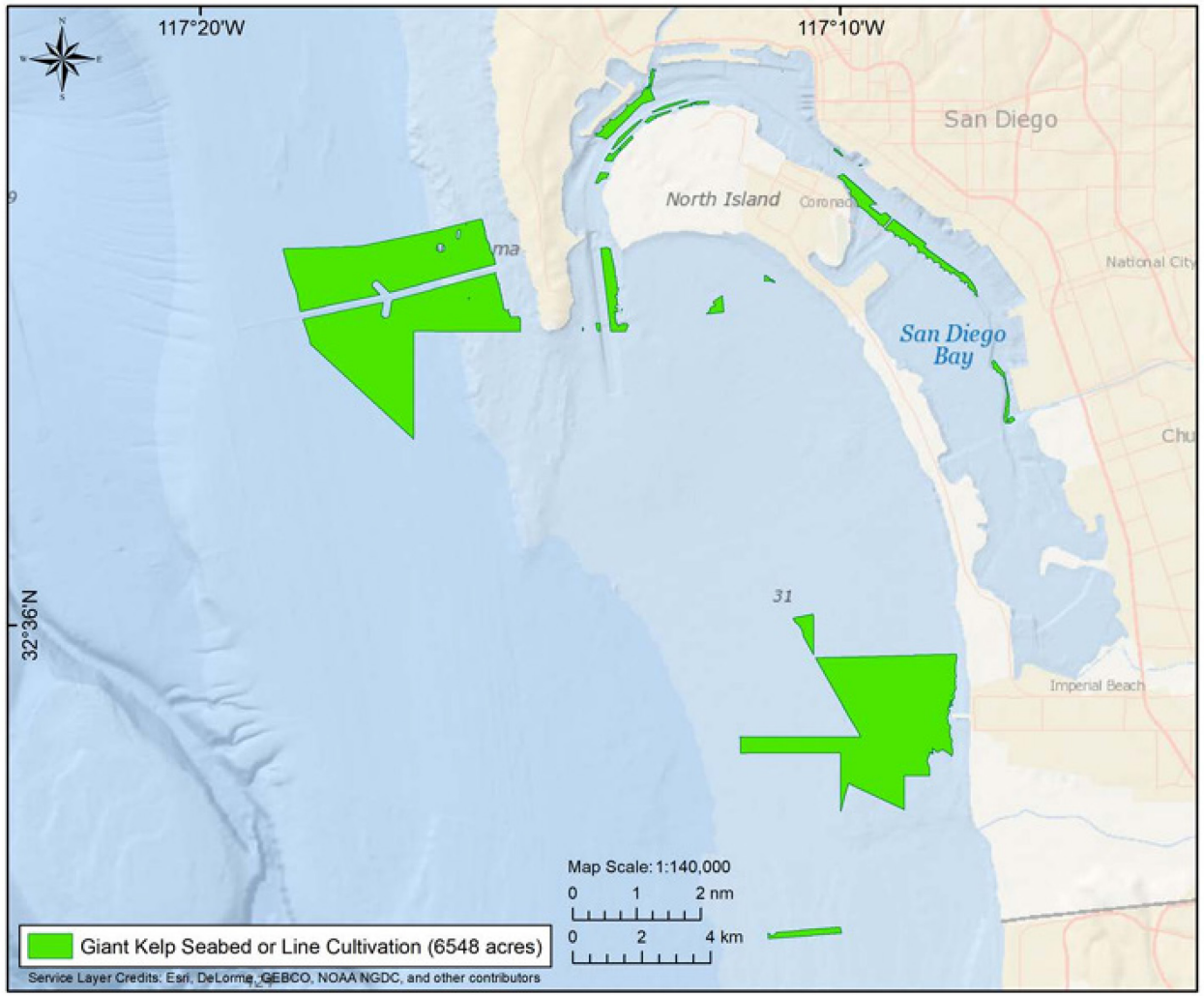


Purple Hinge Rock Scallop Opportunities

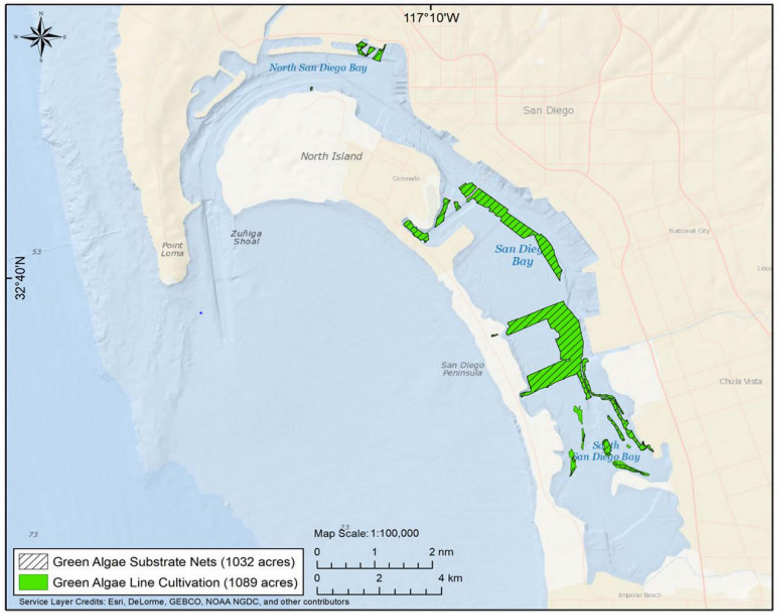


Opportunities

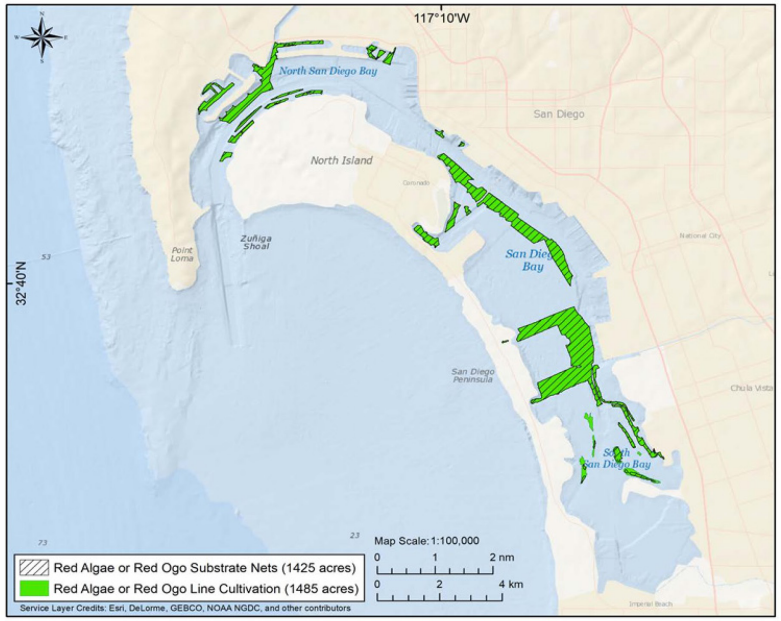
Giant Kelp Opportunities



Green Algae Opportunities



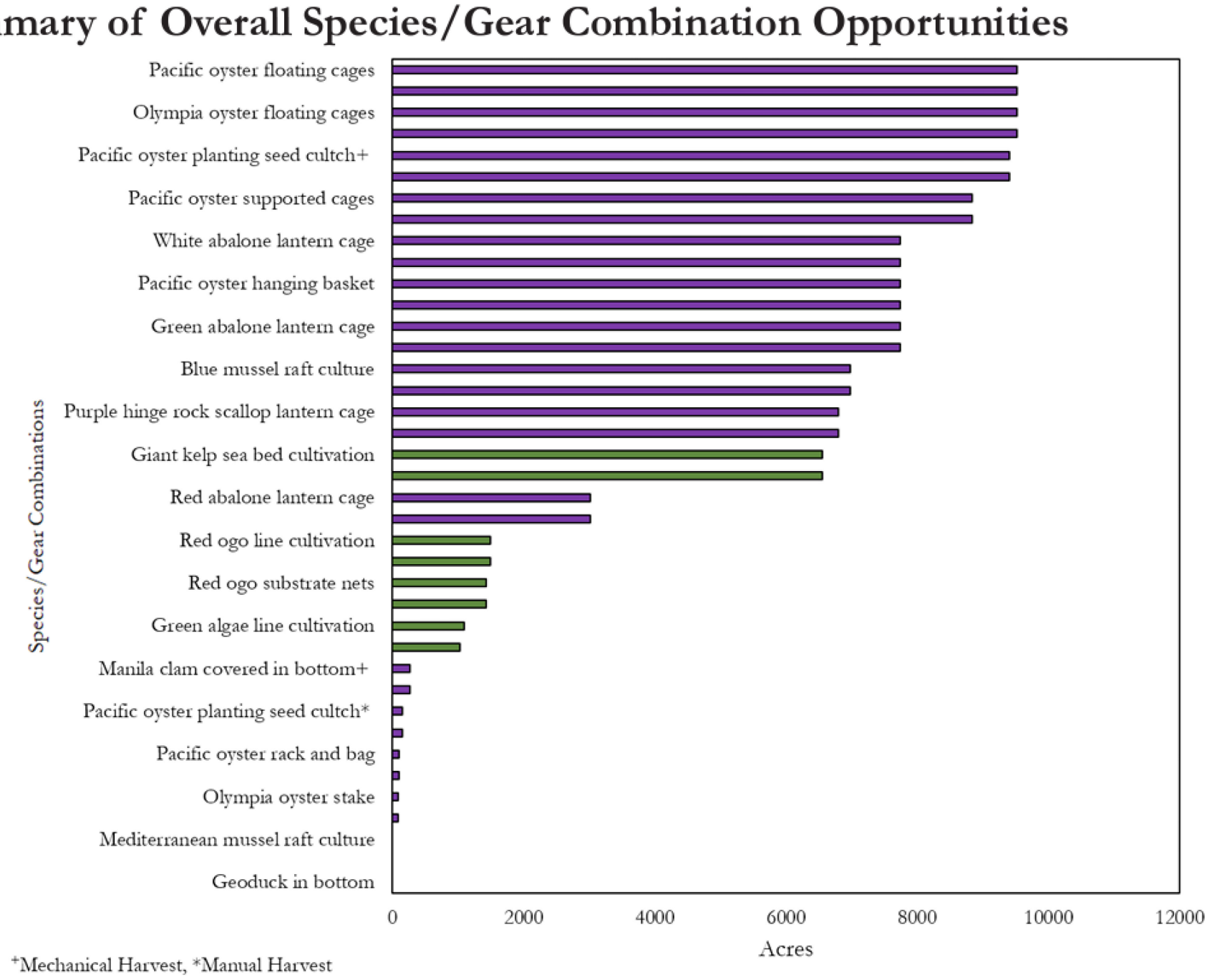
Red Algae Opportunities



Analysis

Analysis provides information of available acreage for each species gear combinations within each study area.

Significant overlap expected for species that utilize gear type with similar environmental thresholds.



Data Categories

1. ***Boundaries:*** state and federal boundaries, locations for existing military activities, area management plans, and designated parks and refuges, etc.
2. ***Oceanographic Data:*** meteorological and oceanographic conditions, water depth and slope (bathymetry), buoys and weather forecasting stations, etc.
3. ***Natural Resources:*** information about protected species and sensitive habitats
4. ***Cultural and Social Resources:*** cultural, subsistence, personal and traditional/historical uses of the environment, demographic data, shipwrecks, etc.
5. ***Fisheries:*** areas where both commercial and sport fisheries are active
6. ***Industries and Navigation:*** locations of vessel traffic, key industrial considerations (shipping lanes, pipelines, submarine cables), and outfalls, etc..

Boundaries

State/Federal Waters
Study Areas
National Security Areas
Ports and Harbors
Parks and Refuges
Civil Works Project Areas
Area Plans

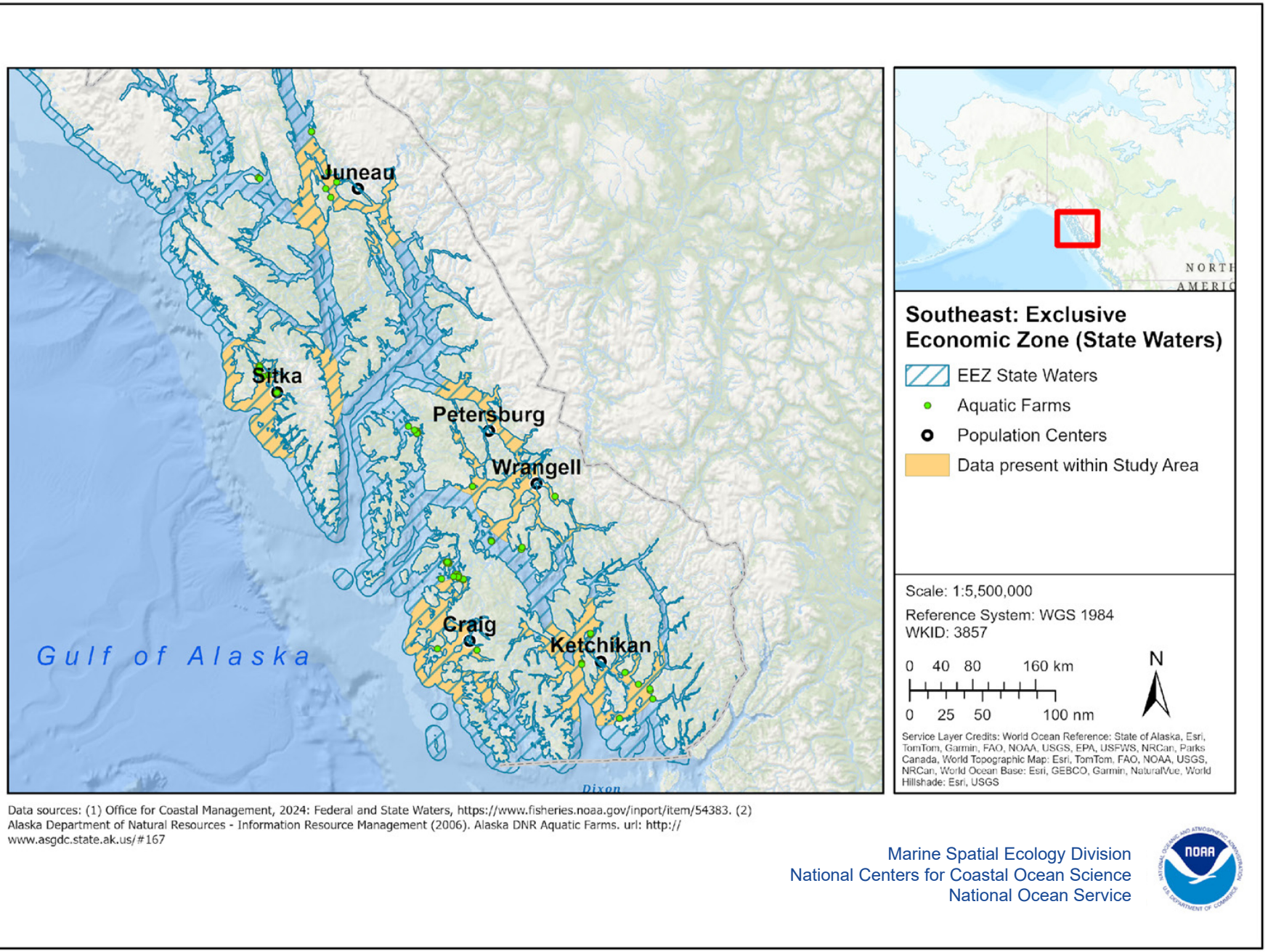


Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

State/Federal Waters

Summary: These data show the geographic representation of Federal and State Waters. The boundary between state and federal waters was determined by consulting The Submerged Lands Act (43 U.S.C. §§ 1301 et seq.), 48 U.S.C. §§ 1705 and The Abandoned Shipwreck Act (43 U.S.C. §§ 2101).

Data Link / Metadata Link
Type: Polygon
Original Source: NOAA OCM



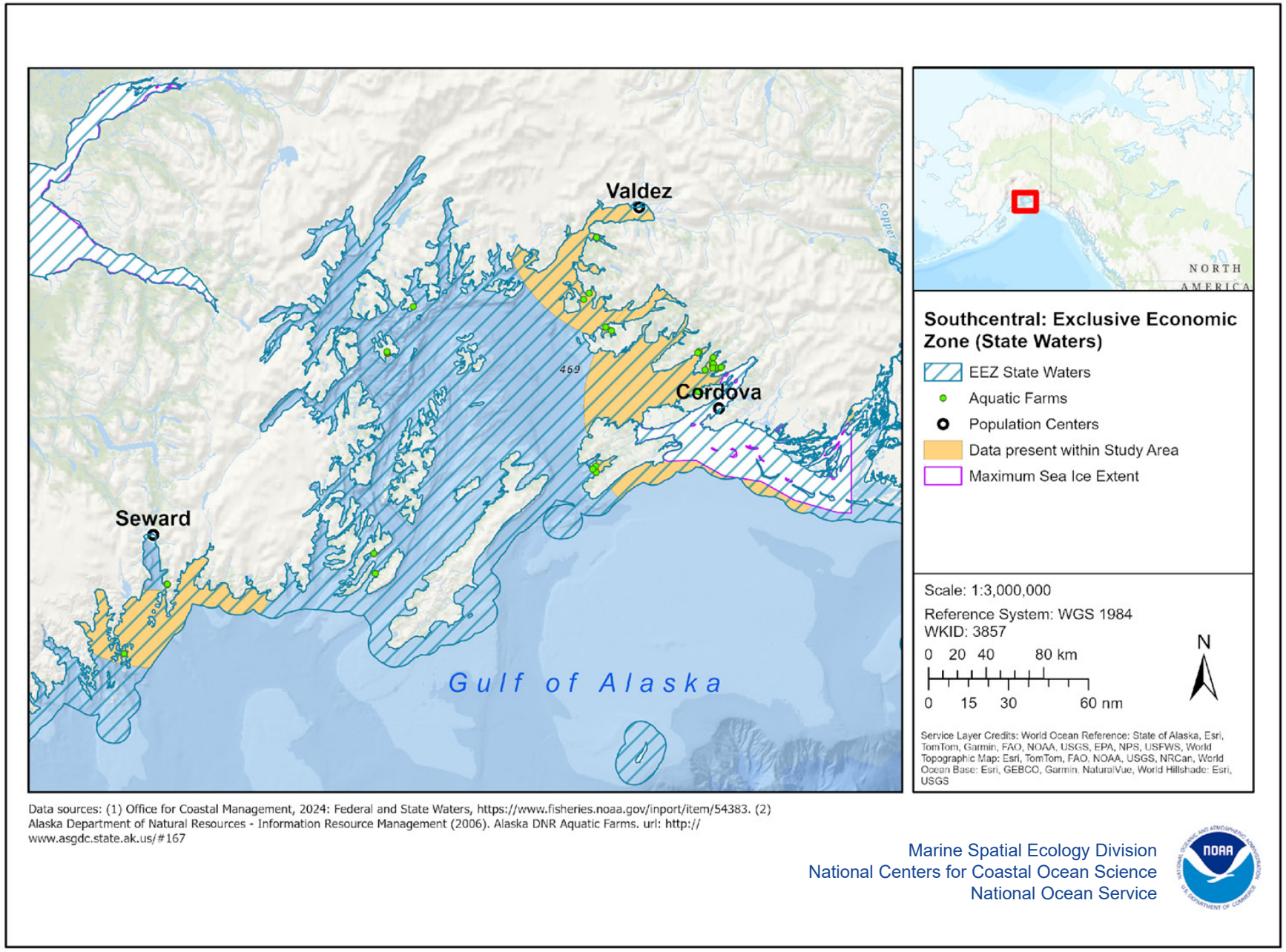
Data sources: (1) Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms. url: http://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

State/Federal Waters

Summary: These data show the geographic representation of Federal and State Waters. The boundary between state and federal waters was determined by consulting The Submerged Lands Act (43 U.S.C. §§ 1301 et seq.), 48 U.S.C. §§ 1705 and The Abandoned Shipwreck Act (43 U.S.C. §§ 2101).

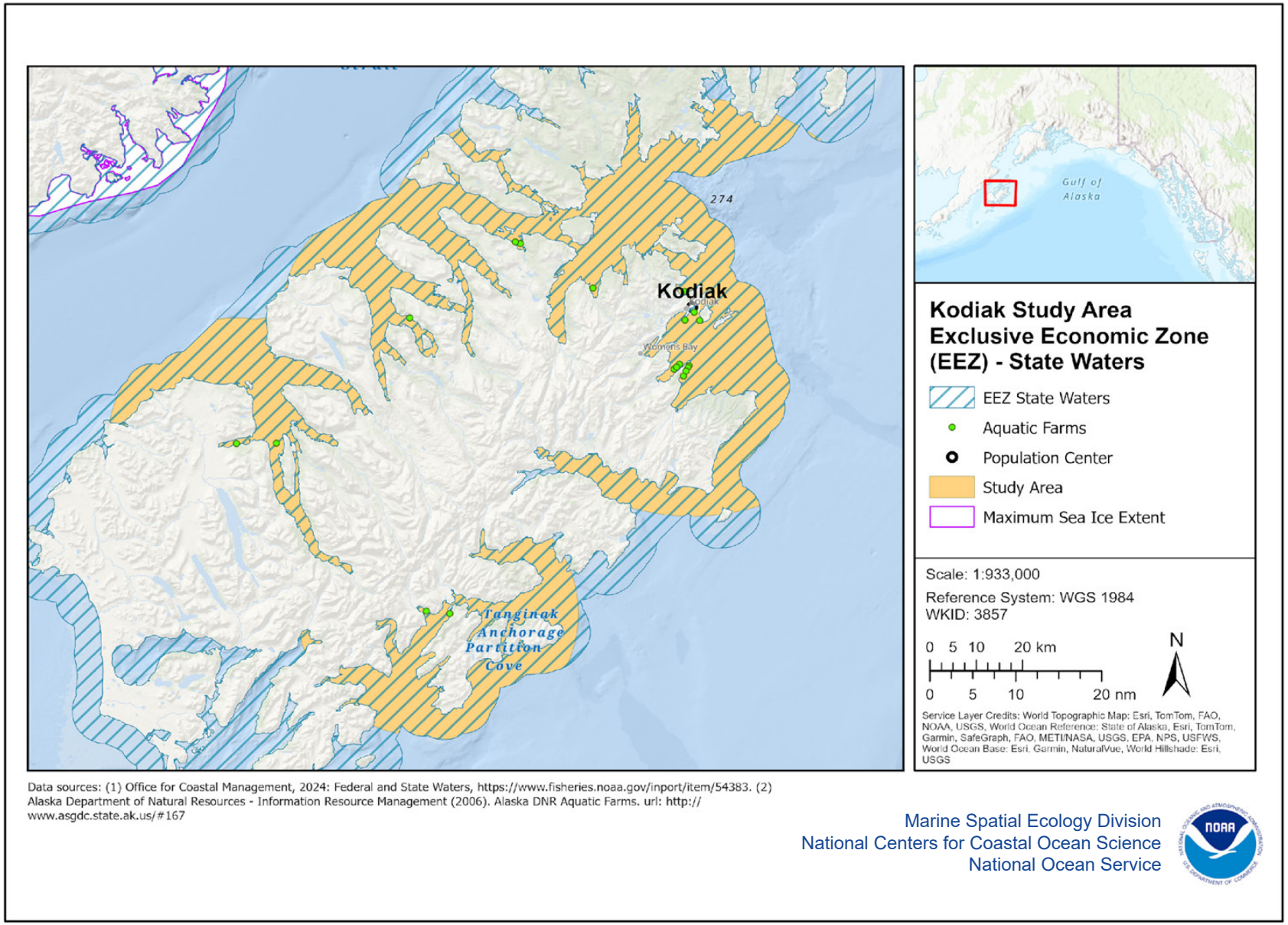
Data Link / Metadata Link
Type: Polygon
Original Source: NOAA OCM



State/Federal Waters

Summary: These data show the geographic representation of Federal and State Waters. The boundary between state and federal waters was determined by consulting The Submerged Lands Act (43 U.S.C. §§ 1301 et seq.), 48 U.S.C. §§ 1705 and The Abandoned Shipwreck Act (43 U.S.C. §§ 2101).

Data Link / Metadata Link
Type: Polygon
Original Source: NOAA OCM



Data sources: (1) Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms. url: http://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Study Areas

Southeast Alaska Study Areas: 25 miles radius from a coastal populated location with >1,000 people.

Juneau- 1,549,748 acres

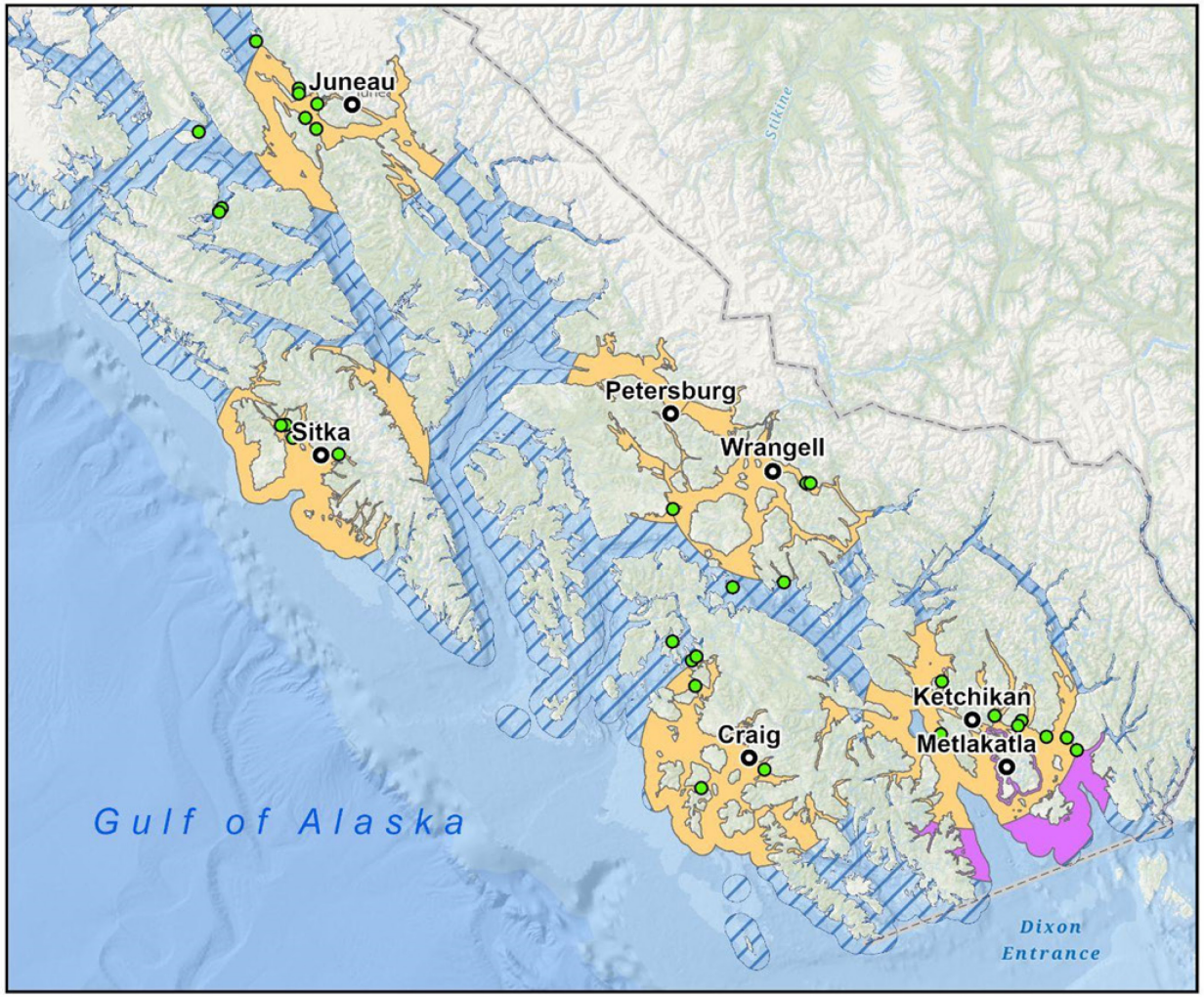
Craig- 1,930,616 acres

Sitka- 1,829,251 acres

Petersburg- 1,352,032 acres

Wrangell- 1,313,568 acres

Ketchikan- 2,044,998 acres





Southeast Study Areas

- Final Study Areas
- Undetermined Study Areas
- State Waters
- Active Farm Lease Areas
- Population Centers

Scale: 1:2,494,597

Reference System: NAD 1983 Alaska Albers
WKID: 3338

N

0 60 km

Service Layer Credits: World Ocean Reference: State of Alaska, Esri Canada, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS, NRCan, Parks Canada
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue
World Ocean Base: CHS, Esri, GEBCO, Garmin, NaturalVue

Data sources: Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114; Alaska Department of Natural Resources, 2024: Aquatic Farm Permit or Lease, https://data-soa-dnr.opendata.arcgis.com/datasets/SOA-DNR::aquatic-farm-permit-or-lease-polygon/about;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

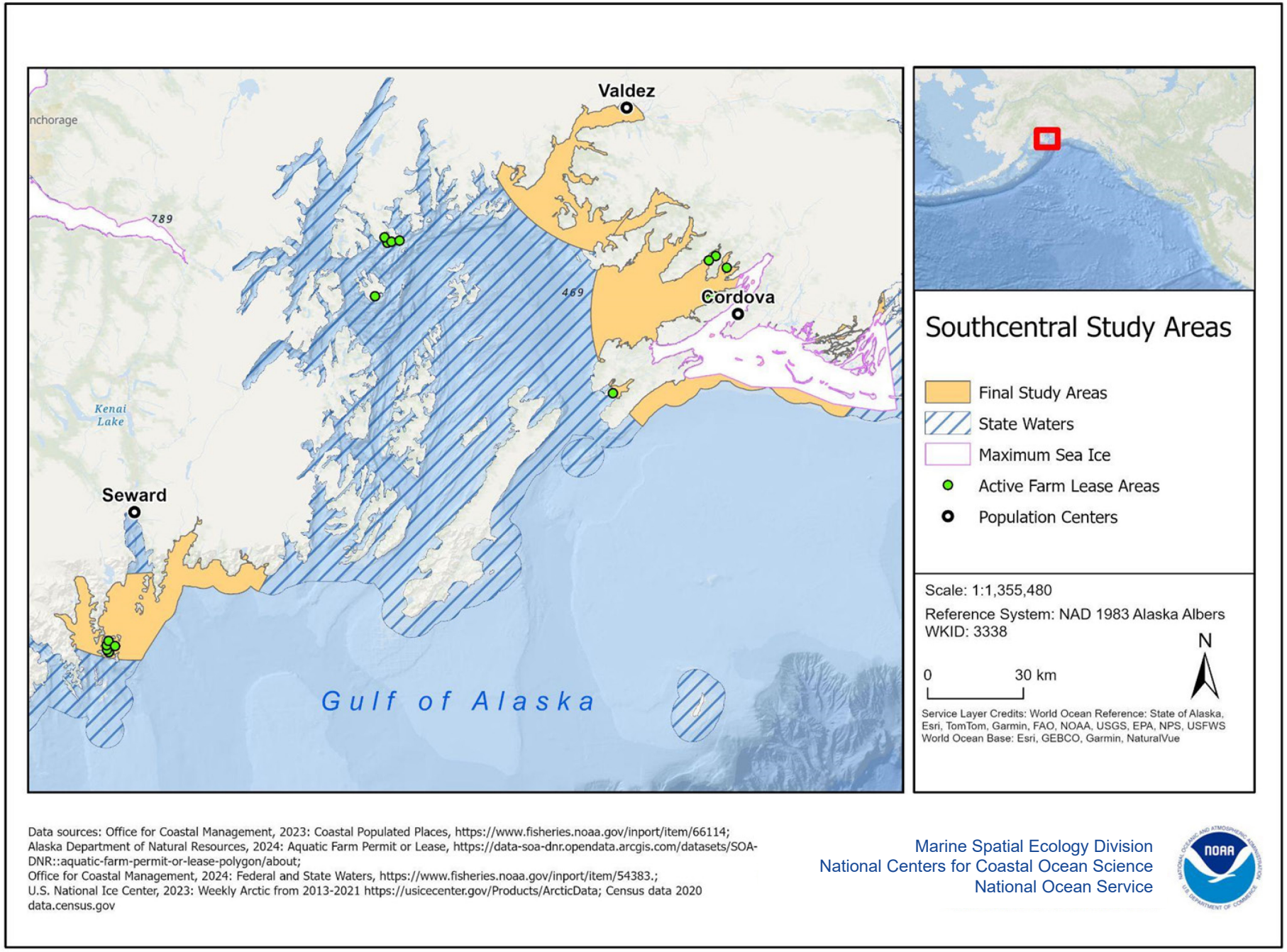
Study Areas

Southcentral Alaska Study Areas: 25 miles radius from a coastal populated location with >1,000 people and no observed ice cover between 2010-2020.

Valdez- 818,552 acres

Cordova- 1,278,966 acres

Seward- 851,024 acres



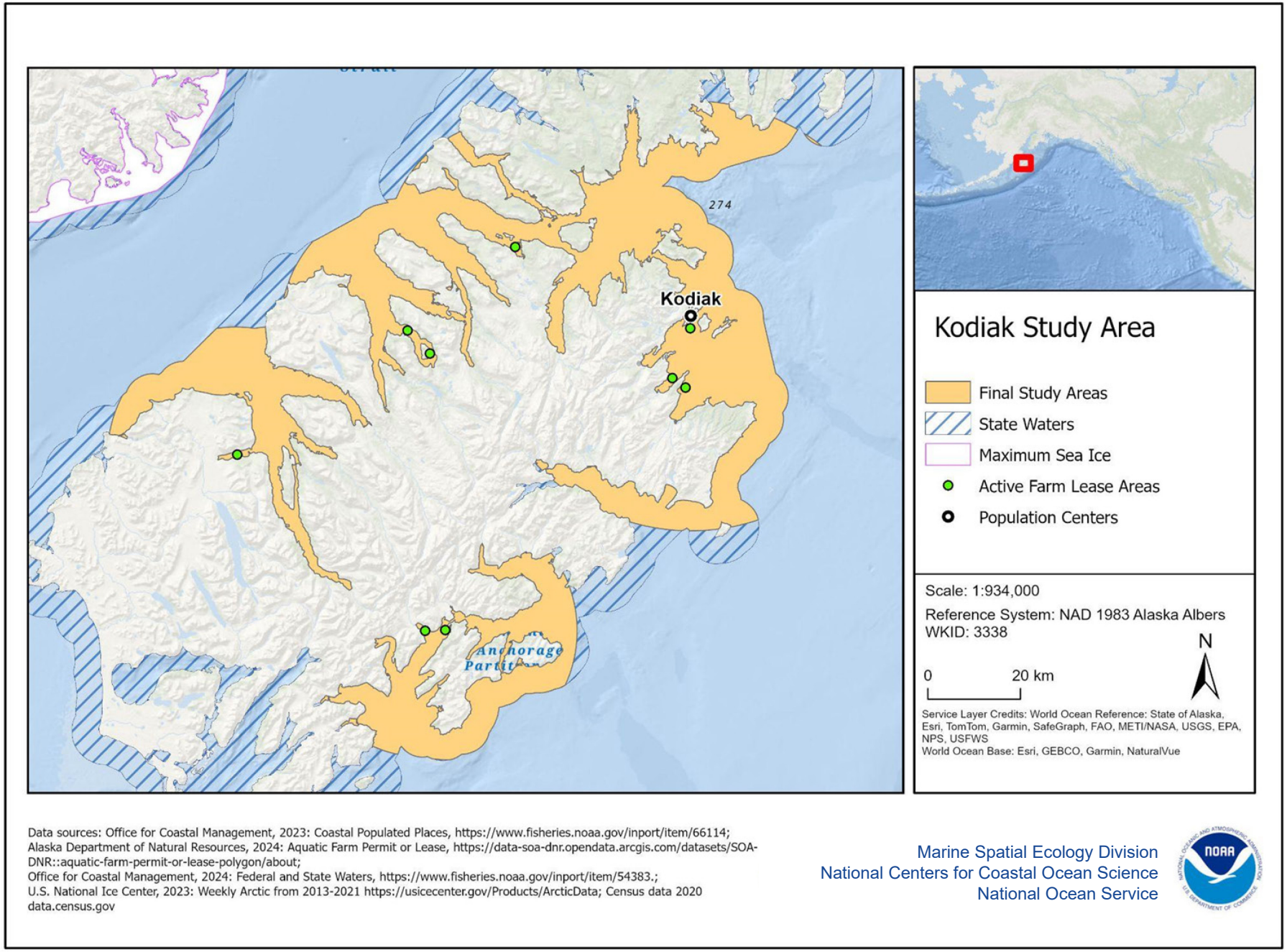
Data sources: Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114; Alaska Department of Natural Resources, 2024: Aquatic Farm Permit or Lease, https://data-soa-dnr.opendata.arcgis.com/datasets/SOA-DNR::aquatic-farm-permit-or-lease-polygon/about; Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.; U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Study Areas

Kodiak Study Area: 25 miles radius from a coastal populated location with >1,000 people, 15 miles radius from existing aquatic lease sites.

Total- 3,648,890 acres



Data sources: Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114; Alaska Department of Natural Resources, 2024: Aquatic Farm Permit or Lease, https://data-soa-dnr.opendata.arcgis.com/datasets/SOA-DNR::aquatic-farm-permit-or-lease-polygon/about; Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.; U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

National Security

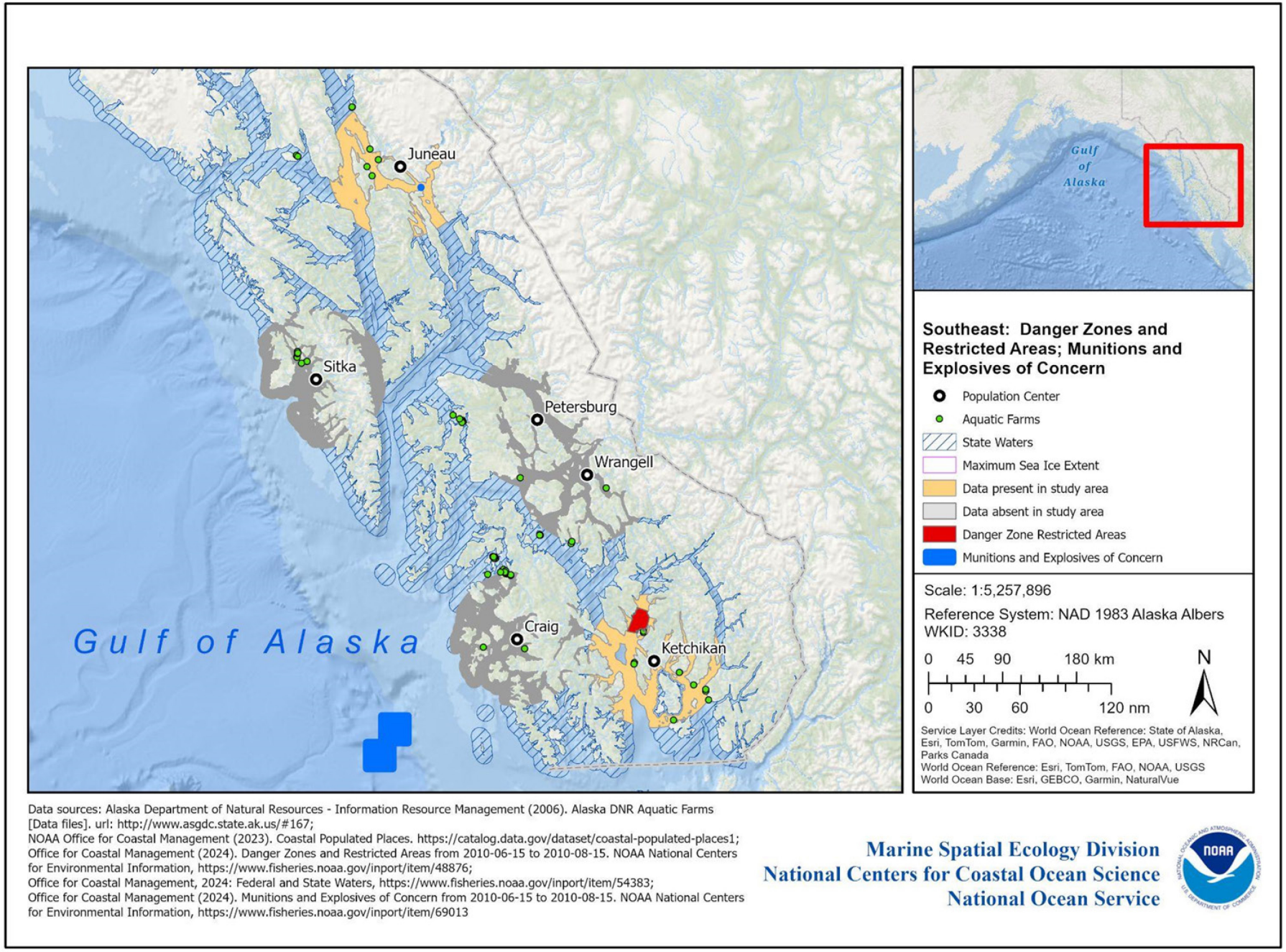
Danger Zones and Restricted Areas: areas used for especially hazardous operations or otherwise restricted access

Data Link / Metadata Link

Munitions and explosives of concerns: explosive weapons (bombs, bullets, shells, grenades, mines, etc.) that did not explode when they were employed and still pose a risk of detonation

Data Link / Metadata Link

Type: Polygon
Original Source: DOD USACE



National Security

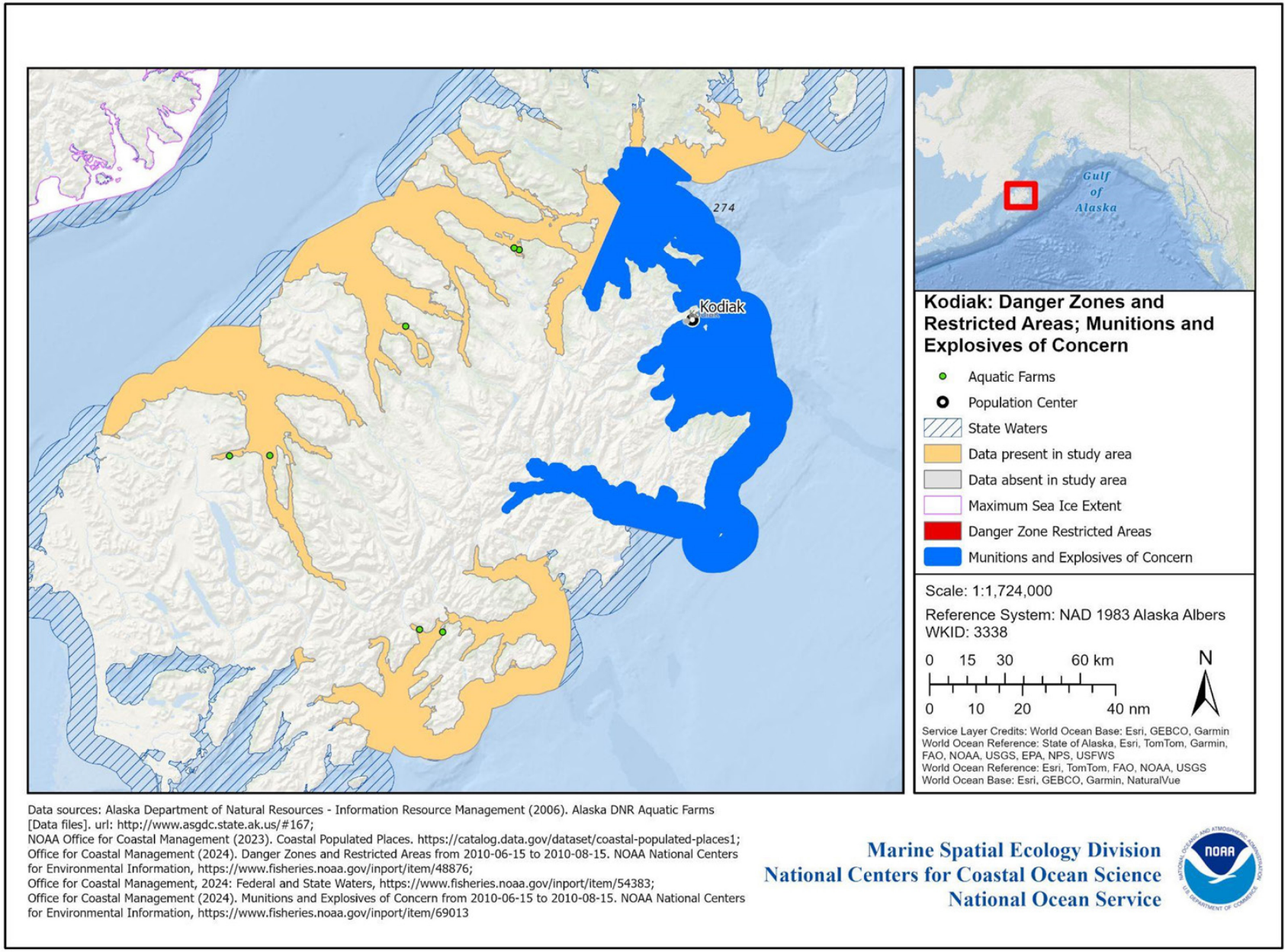
Danger Zones and Restricted Areas: areas used for especially hazardous operations or otherwise restricted access

Data Link / Metadata Link

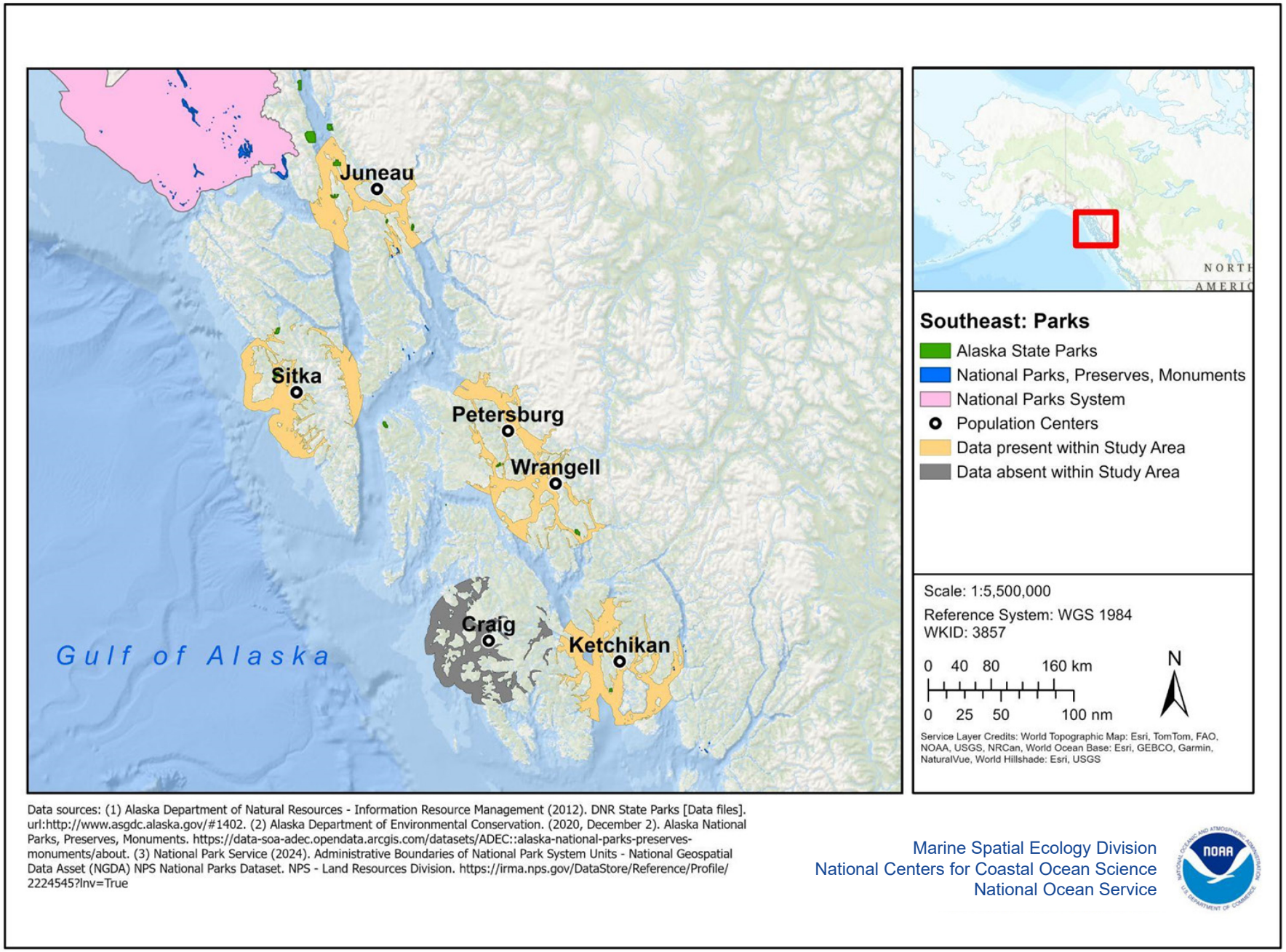
Munitions and explosives of concerns: explosive weapons (bombs, bullets, shells, grenades, mines, etc.) that did not explode when they were employed and still pose a risk of detonation

Data Link / Metadata Link

Type: Polygon
Original Source: DOD USACE



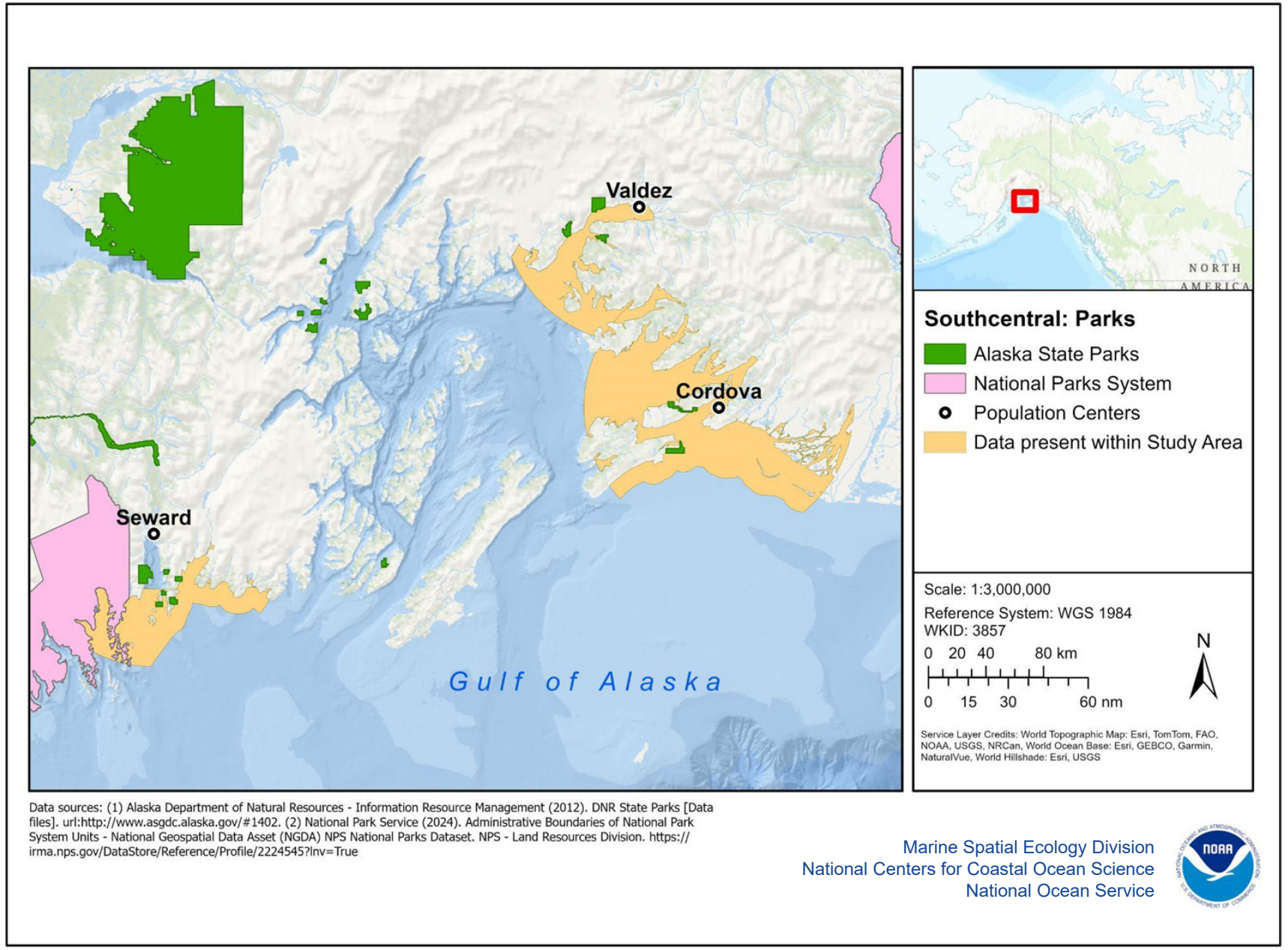
Parks and Refuges



Data sources: (1) Alaska Department of Natural Resources - Information Resource Management (2012). DNR State Parks [Data files]. url:http://www.asgdc.alaska.gov/#1402. (2) Alaska Department of Environmental Conservation. (2020, December 2). Alaska National Parks, Preserves, Monuments. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-national-parks-preserves-monuments/about. (3) National Park Service (2024). Administrative Boundaries of National Park System Units - National Geospatial Data Asset (NGDA) NPS National Parks Dataset. NPS - Land Resources Division. https://irma.nps.gov/DataStore/Reference/Profile/2224545?lnv=True

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

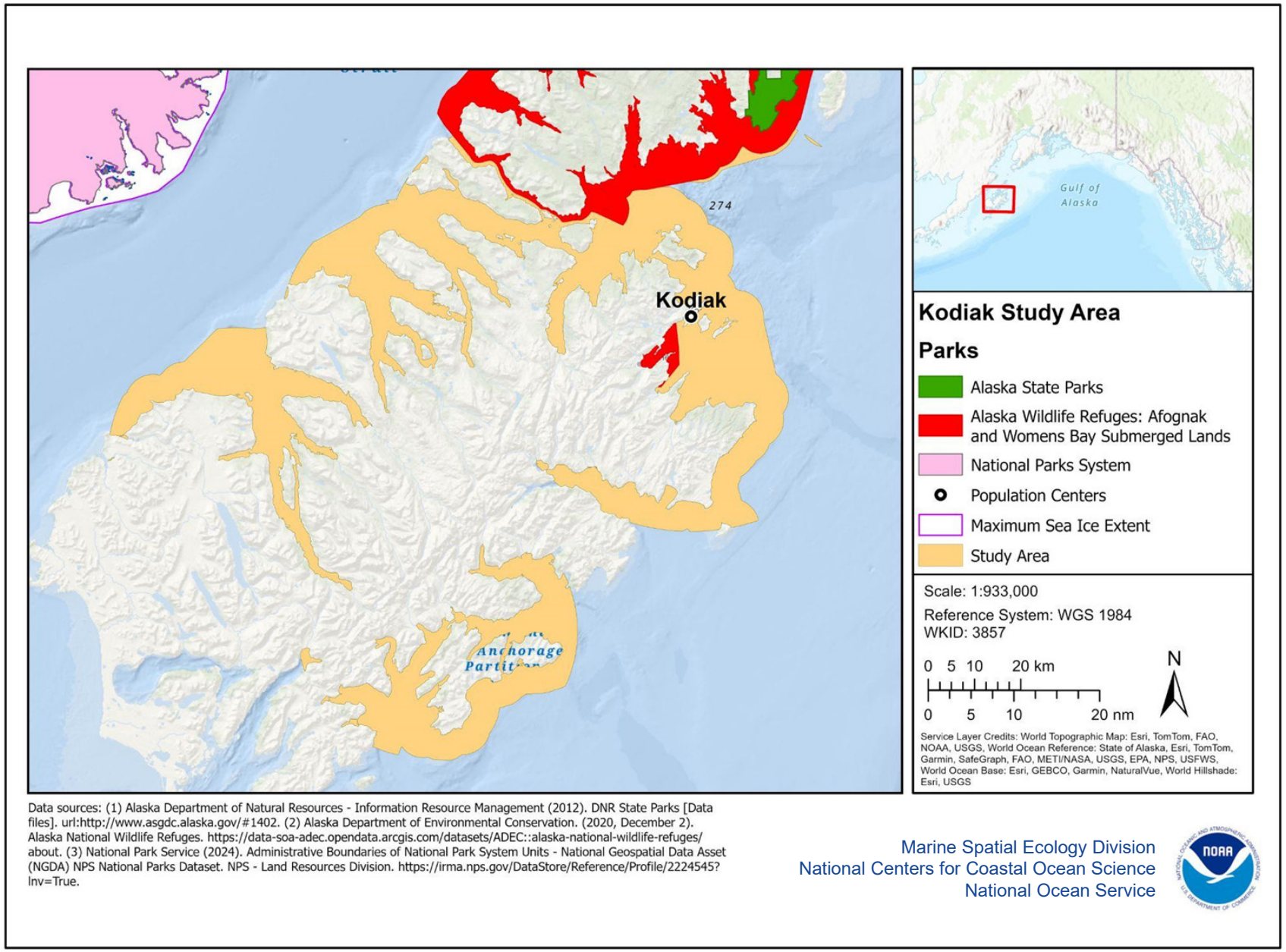
Parks and Refuges



Data sources: (1) Alaska Department of Natural Resources - Information Resource Management (2012). DNR State Parks [Data files]. url:http://www.asgdc.alaska.gov/#1402. (2) National Park Service (2024). Administrative Boundaries of National Park System Units - National Geospatial Data Asset (NGDA) NPS National Parks Dataset. NPS - Land Resources Division. https://irma.nps.gov/DataStore/Reference/Profile/2224545?lnv=True

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Parks and Refuges



Data sources: (1) Alaska Department of Natural Resources - Information Resource Management (2012). DNR State Parks [Data files]. url:http://www.asgdc.alaska.gov/#1402. (2) Alaska Department of Environmental Conservation. (2020, December 2). Alaska National Wildlife Refuges. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-national-wildlife-refuges/about. (3) National Park Service (2024). Administrative Boundaries of National Park System Units - National Geospatial Data Asset (NGDA) NPS National Parks Dataset. NPS - Land Resources Division. https://irma.nps.gov/DataStore/Reference/Profile/2224545?lnv=True.

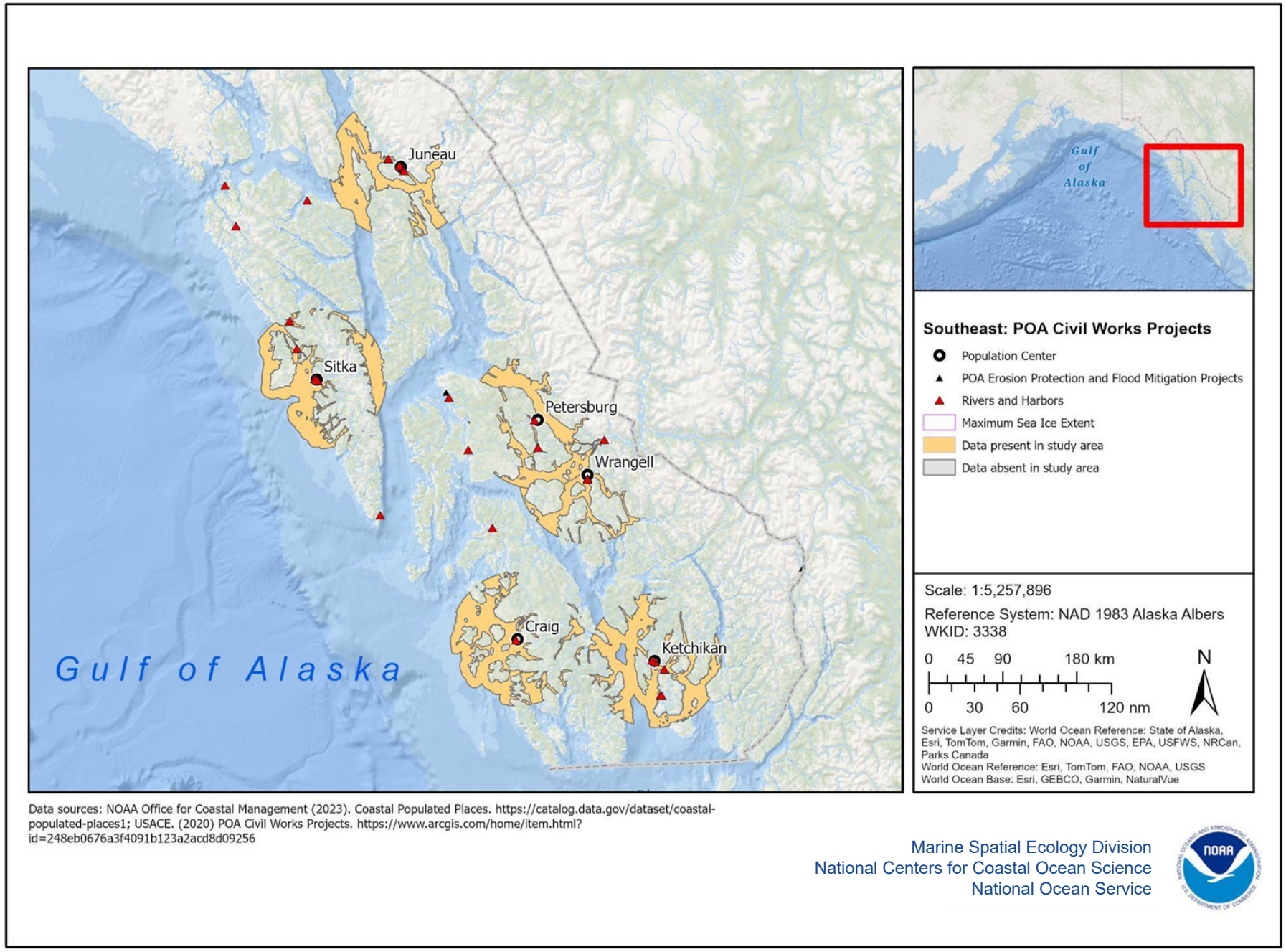
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Army Corps Civil Works Projects

POA Civil Works Projects: Harbors, Rivers, Erosion Protection and Flood Mitigation

[Data Link]

Type: point
Original Source: USACE



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; USACE. (2020) POA Civil Works Projects. https://www.arcgis.com/home/item.html?id=248eb0676a3f4091b123a2acd8d09256

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

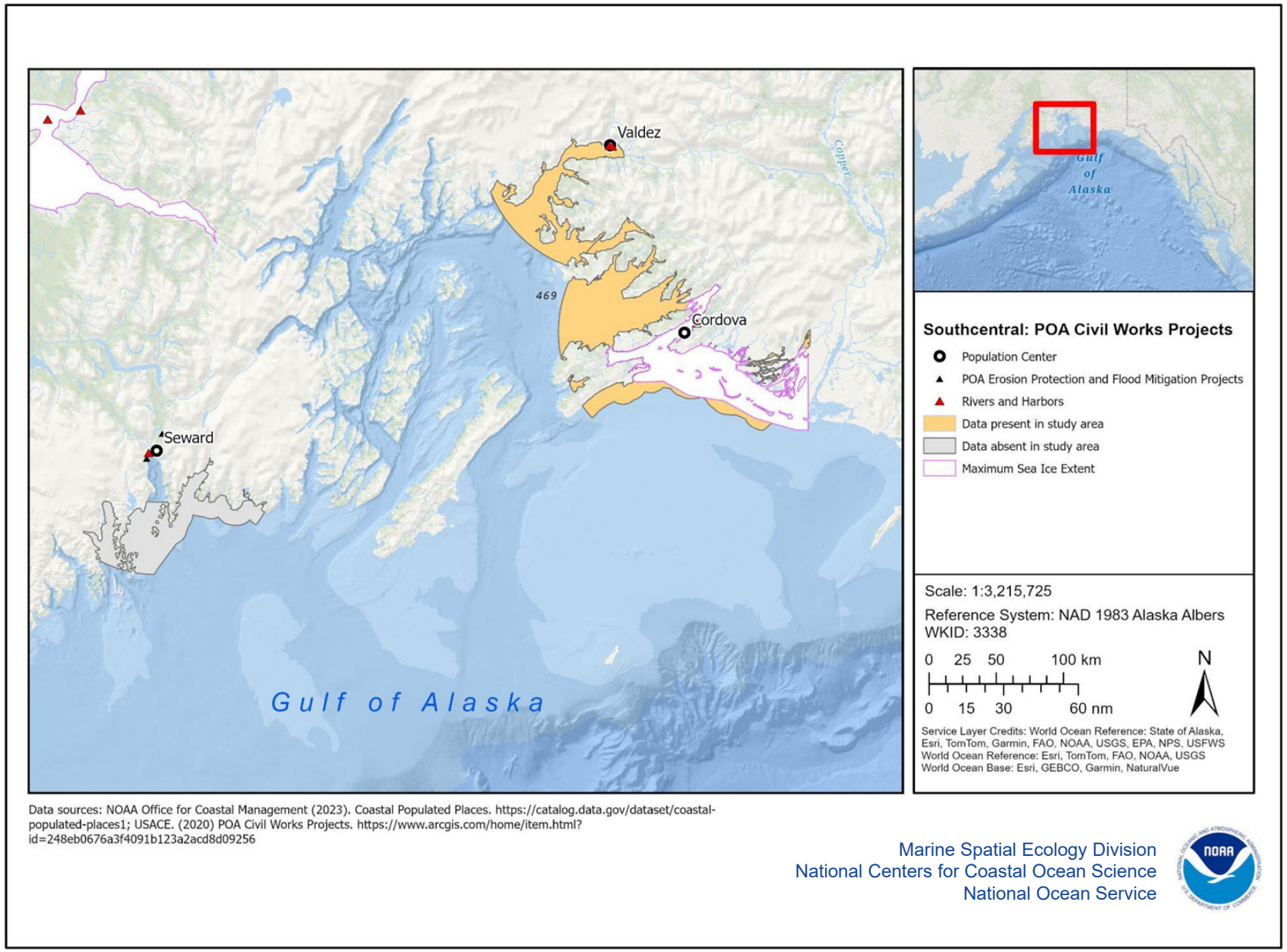
Army Corps Civil Works Projects

POA Civil Works Projects: Harbors, Rivers, Erosion Protection and Flood Mitigation

[Data Link]

Type: point

Original Source: USACE



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; USACE. (2020) POA Civil Works Projects. https://www.arcgis.com/home/item.html?id=248eb0676a3f4091b123a2acd8d09256

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

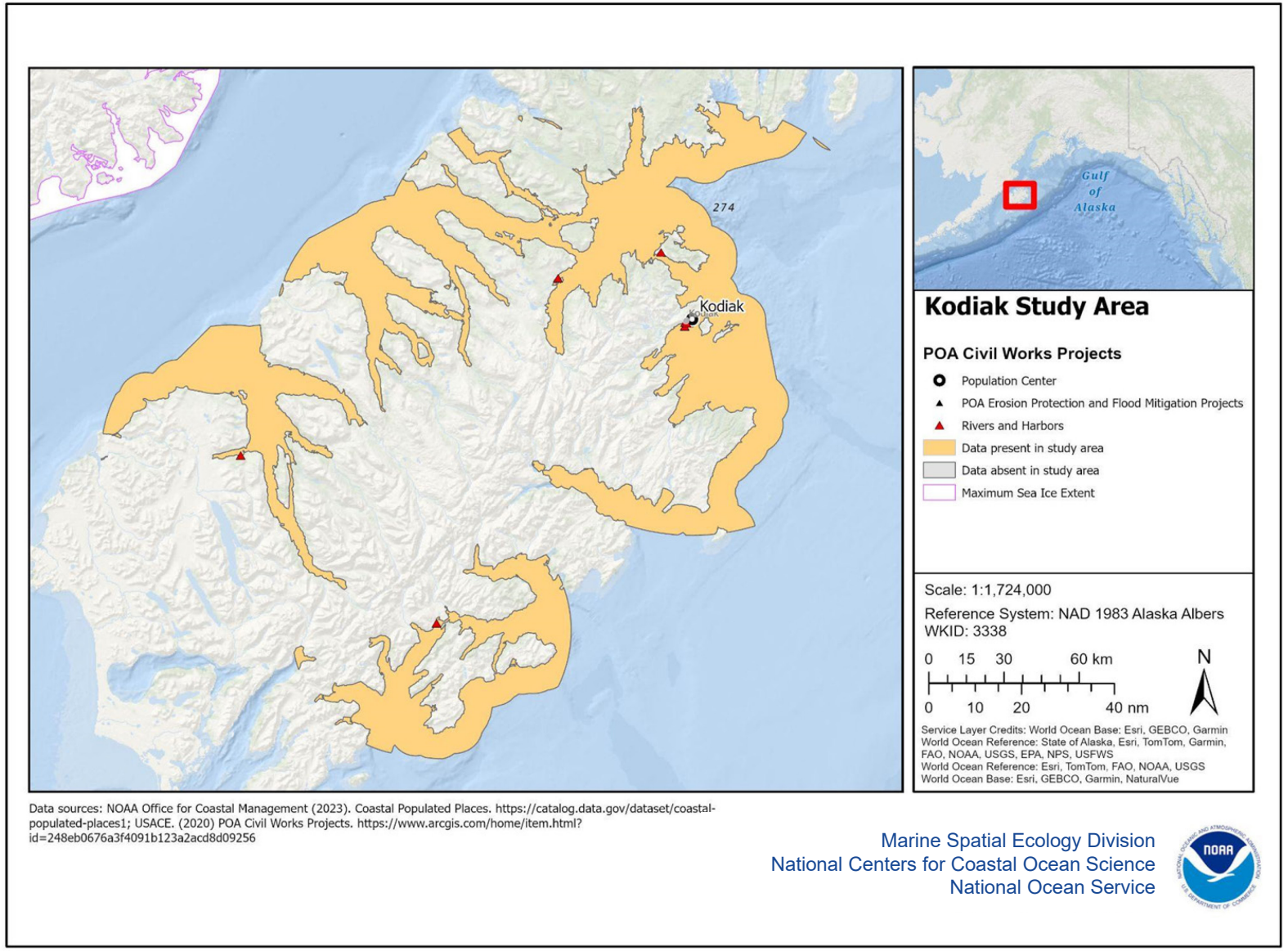
Army Corps Civil Works Projects

POA Civil Works Projects: Harbors, Rivers, Erosion Protection and Flood Mitigation

[Data Link]

Type: point

Original Source: USACE

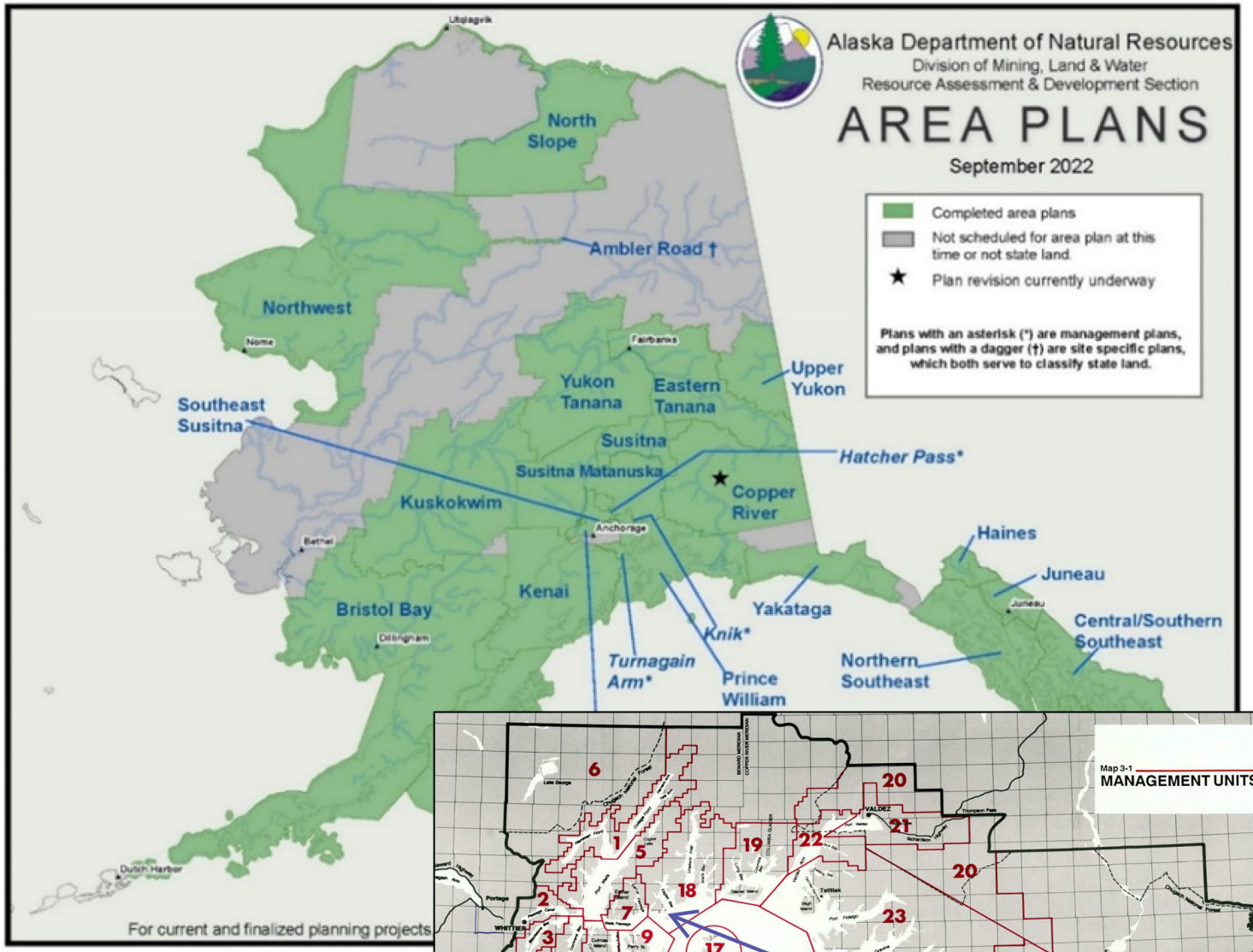


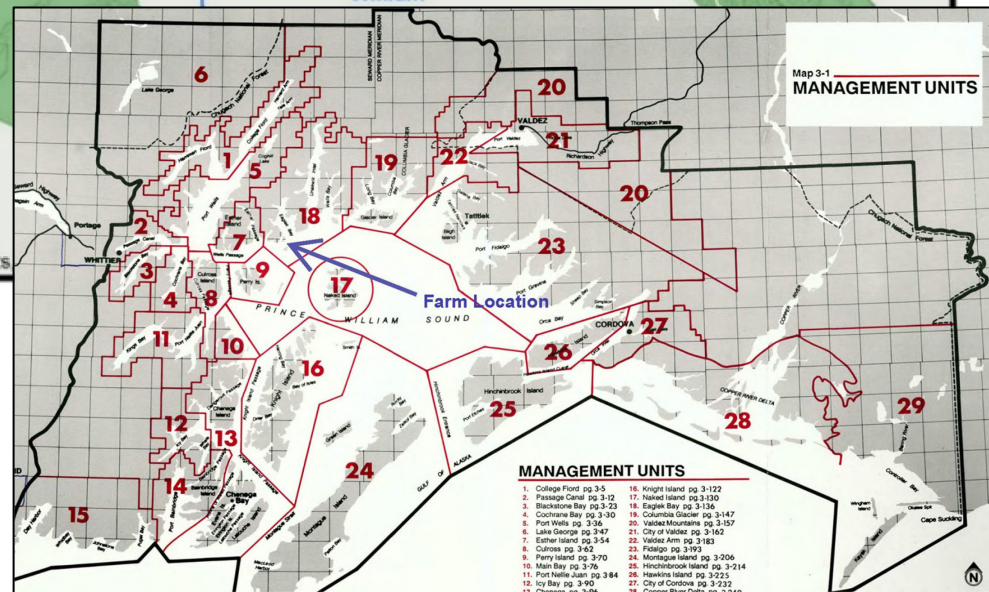
Area Plan- Management Units

An area plan is a regional land use plan that provides for the use and management of state-owned lands. They establish goals, policies, management intent, and guidelines for the use of state land.

The plans can include restrictions on location, anchorages, existing uses, and management guidelines, that may limit aquatic leasing.

May include data relevant to biological, commercial, and traditional/historic uses of areas.





Boundaries

Boundaries	Overlap	Type
State/Federal Line	N/A	Constraint
Southeast Alaska Study Areas	Juneau, Craig, Sitka, Petersburg, Wrangell, Ketchikan	Constraint
Southcentral Alaska Study Areas	Valdez, Cordova, Seward	Constraint
Kodiak Study Areas	Kodiak	Constraint
Munitions and Explosives of Concern	Juneau, Kodiak	Consideration
Danger Zones and Restricted Areas	Ketchikan	Consideration
State Parks (With Submerged Lands)	Southeast, Southcentral, Kodiak	Constraint
National Wildlife Refuges (With Submerged Lands)	Kodiak	Consideration
National Park System (With Submerged Lands)	Seward	Consideration
US Army Corps of Engineers Civil Works Projects	SE, SC, Kodiak	Constraint
Area Plan Management Units	Southeast, Southcentral, Kodiak	Consideration

Oceanographic /Hydrographic Data

Bathymetry, temp, salinity, chlorophyll, water quality, HABs

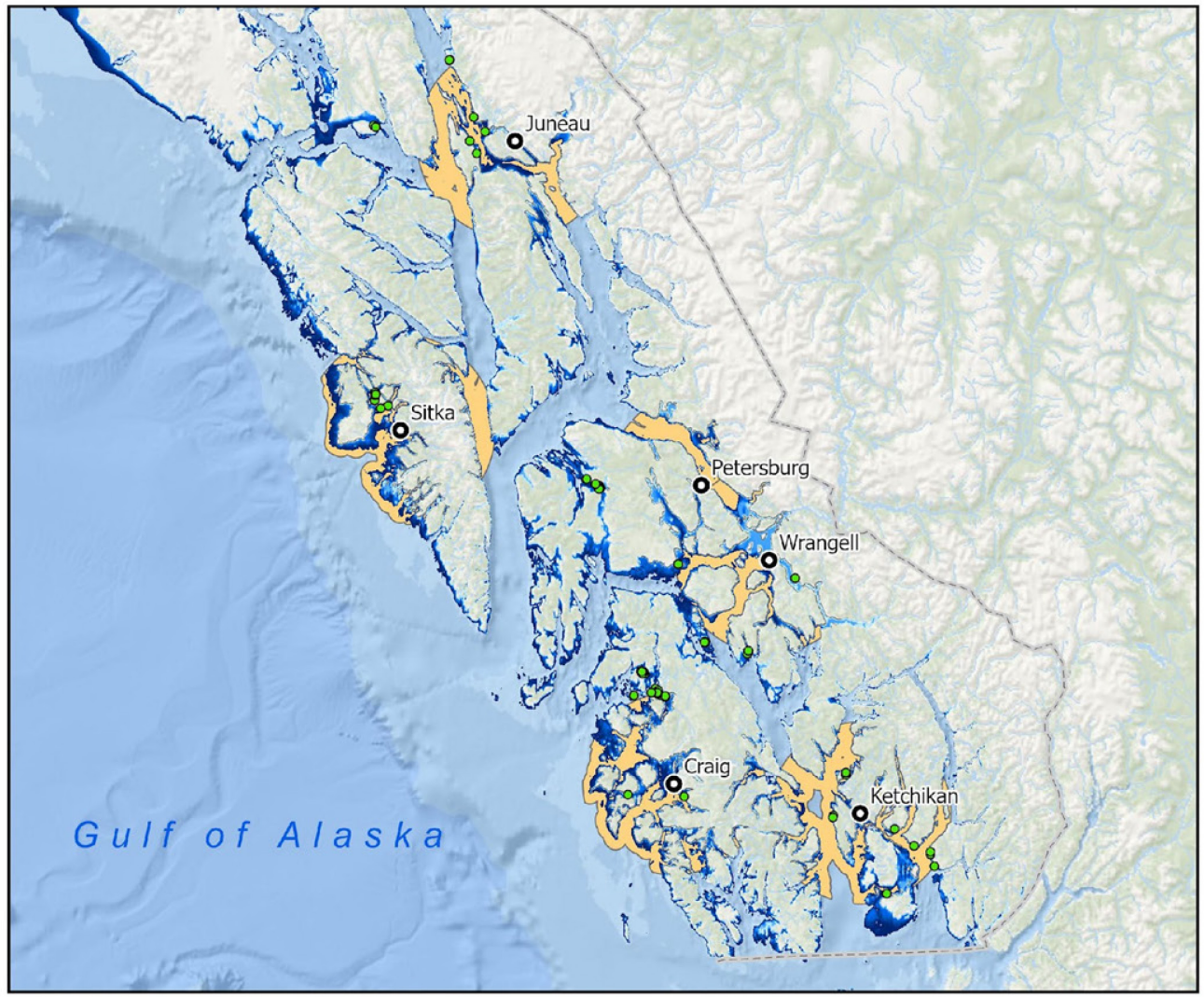


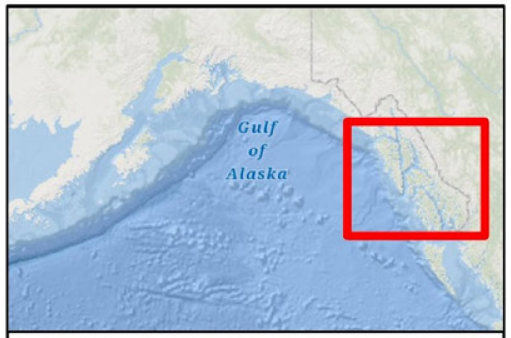
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

Southeast Bathymetry <200’

8/15 arc-second MHHW Coastal Digital Elevation Model

Source: NOAA





Southeast: Bathymetry (200ft cutoff)

Data present in study area

Bathymetry (ft)

0

-200

Aquatic Farms

Population Center

Scale: 1:5,257,896

Reference System: NAD 1983 Alaska Albers
WKID: 3338

0 45 90 180 km

0 30 60 120 nm

N

Service Layer Credits: World Ocean Base: Esri, GEBCO, Garmin
World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS, NRCan, Parks Canada
World Ocean Reference: Esri, TomTom, FAO, NOAA, USGS
World Ocean Base: CHS, Esri, GEBCO, Garmin, NaturalVue

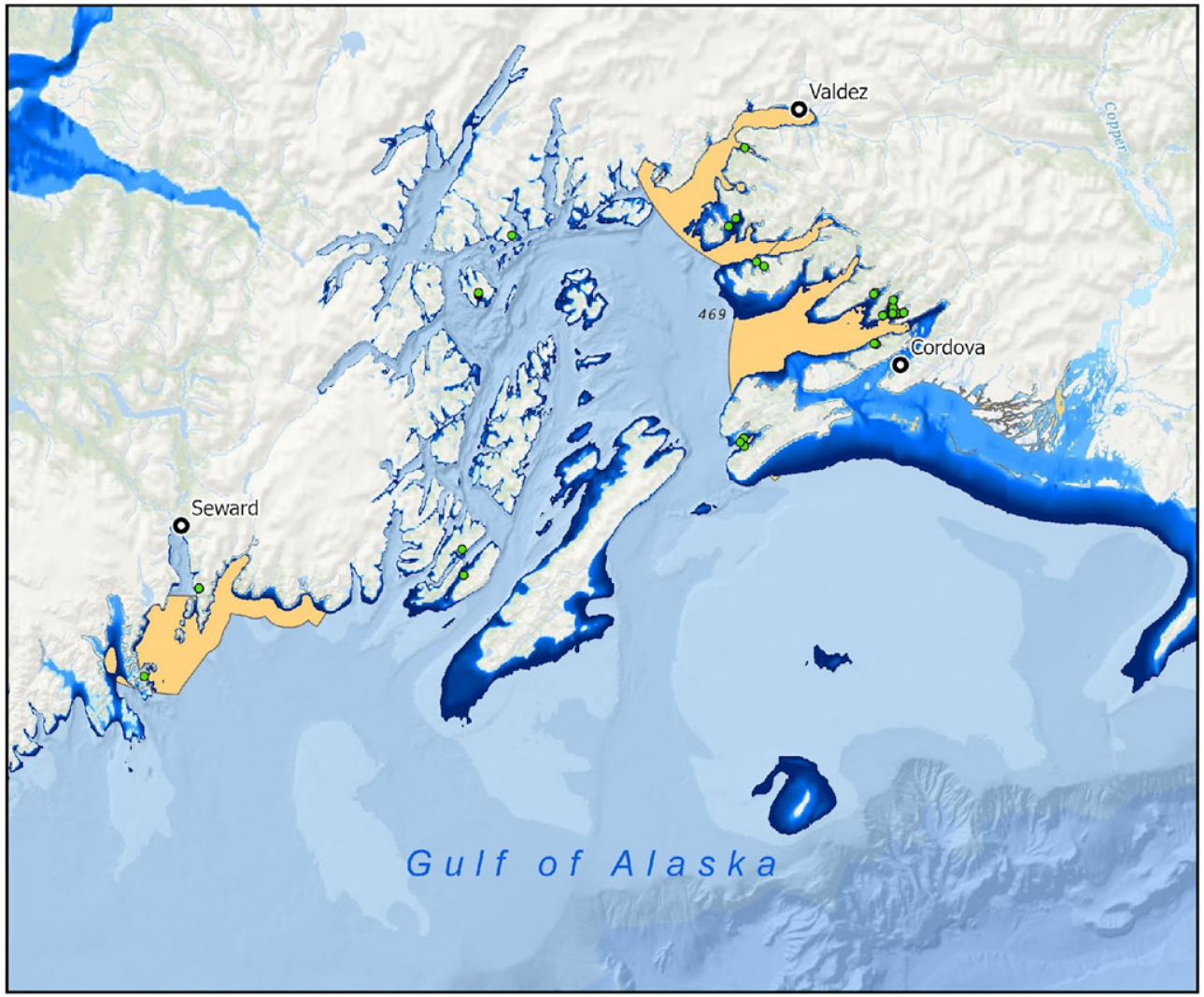
Data sources: Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167; NOAA National Centers for Coastal Ocean Science (unknown) Bathymetry DEM url: https://marinecadastre.gov/oceanreports/#/@-10737743.881037742,4753280.983019757/4

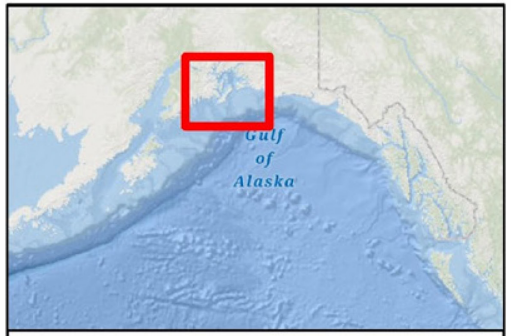
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Southcentral Bathymetry <200’

8/15 arc-second MHHW Coastal Digital Elevation Model

Source: NOAA





Southcentral: Bathymetry (200ft cutoff)

Data present in study area

Bathymetry (ft)

Value

0

-200

Aquatic Farms

Population Center

Scale: 1:3,215,725

Reference System: NAD 1983 Alaska Albers
WKID: 3338

0 25 50 100 km

0 15 30 60 nm

N

Service Layer Credits: World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS
World Ocean Reference: Esri, TomTom, FAO, NOAA, USGS
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue

Data sources: Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167; NOAA National Centers for Coastal Ocean Science (unknown) Bathymetry DEM url: https://marinecadastre.gov/oceanreports/#/@-10737743.881037742,4753280.983019757/4

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Kodiak Bathymetry <200’

8/15 arc-second MHHW Coastal Digital Elevation Model

Source: NOAA





Kodiak Study Area

Bathymetry (200ft cutoff)

Data present in study area

Bathymetry (ft)

Value

0

-200

Aquatic Farms

Population Center

Scale: 1:1,724,000

Reference System: NAD 1983 Alaska Albers
WKID: 3338

0 15 30 60 km

0 10 20 40 nm

N

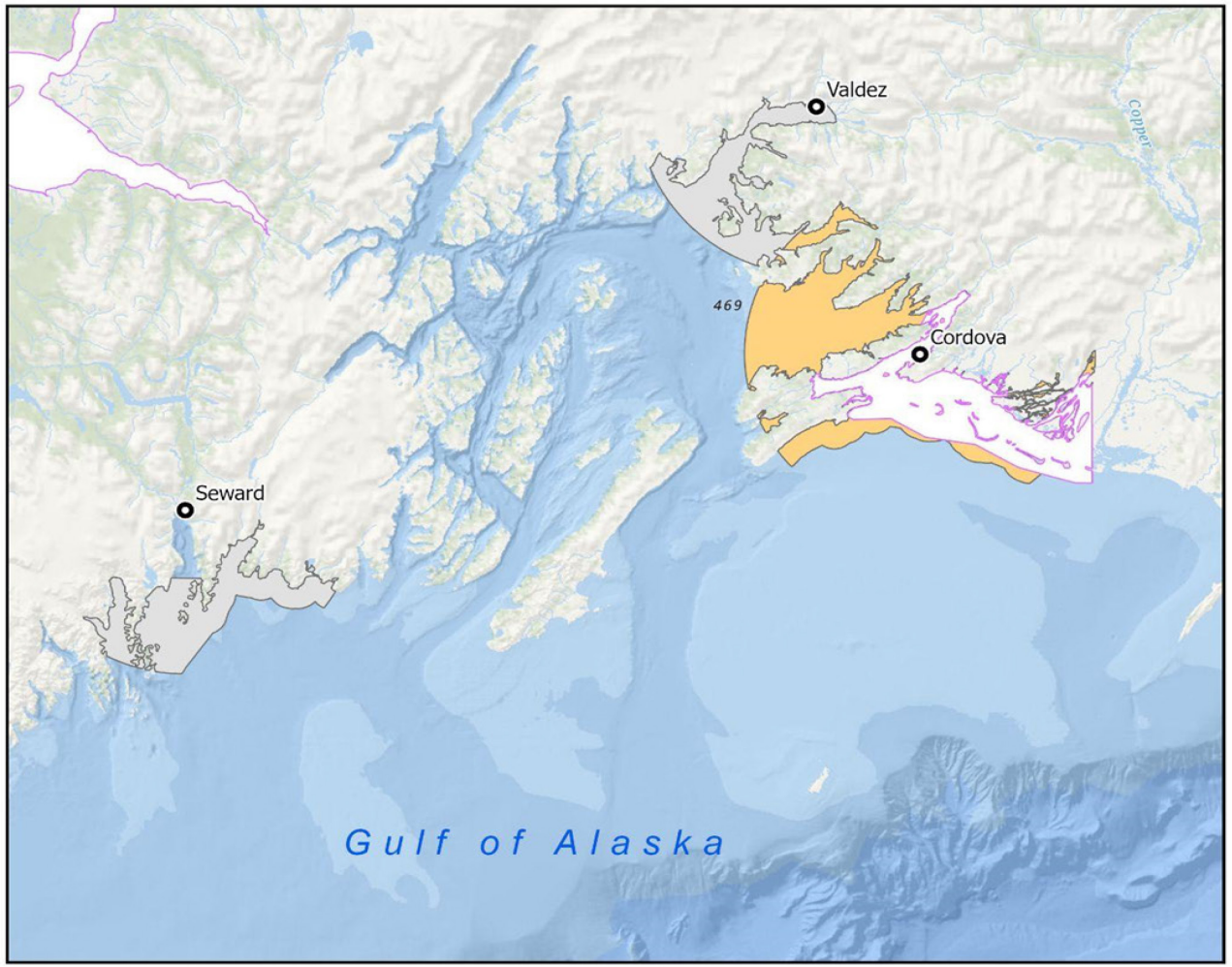
Service Layer Credits: World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS
World Ocean Reference: Esri, TomTom, FAO, NOAA, USGS
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue

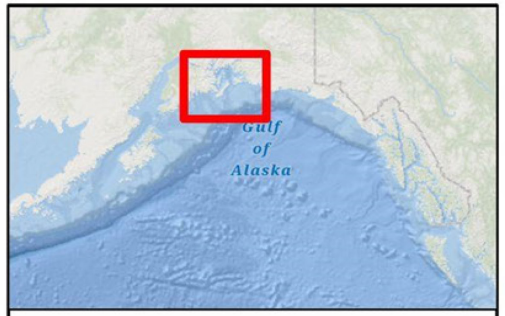
Data sources: Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167; NOAA National Centers for Coastal Ocean Science (unknown) Bathymetry DEM url: https://marinecadastre.gov/oceanreports/#/@-10737743.881037742,4753280.983019757/4

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Maximum Aggregate Sea Ice 2010-2020

10-year aggregate maximum sea ice cover reported by the U.S. National Ice Center





Southcentral: Maximum Sea Ice Extent

- Population Center
- Data present in study area
- Data absent in study area
- Maximum Sea Ice Extent

Scale: 1:3,215,725

Reference System: NAD 1983 Alaska Albers
WKID: 3338

0 25 50 100 km

0 15 30 60 nm

N

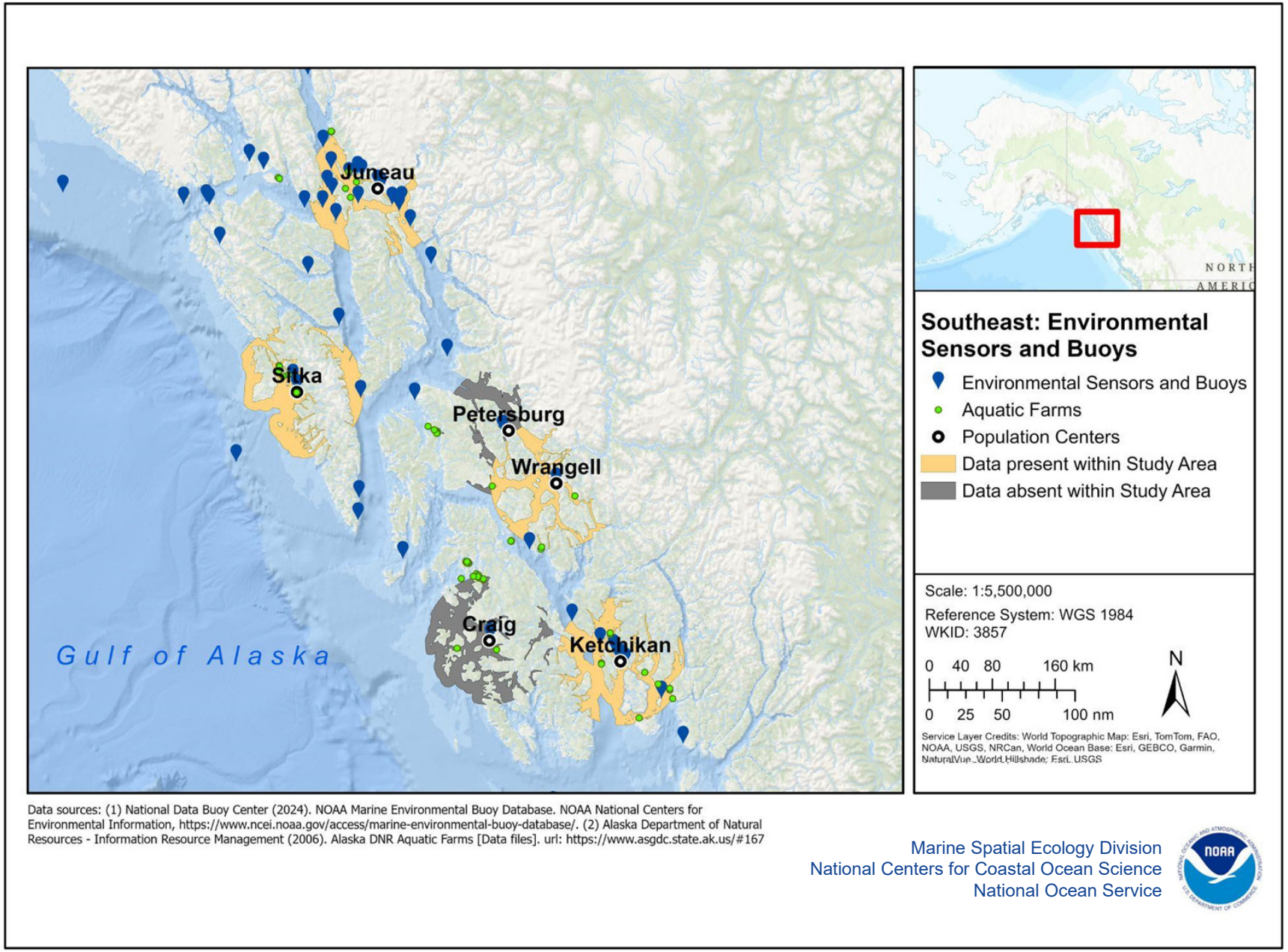
Service Layer Credits: World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS
World Ocean Reference: Esri, TomTom, FAO, NOAA, USGS
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue

Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; USNIC (2023). Daily Arctic Shapefile. https://usicecenter.gov/Products/ArcticData

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Environmental Sensors and Buoys

AOOS Alaska Ocean Observing System

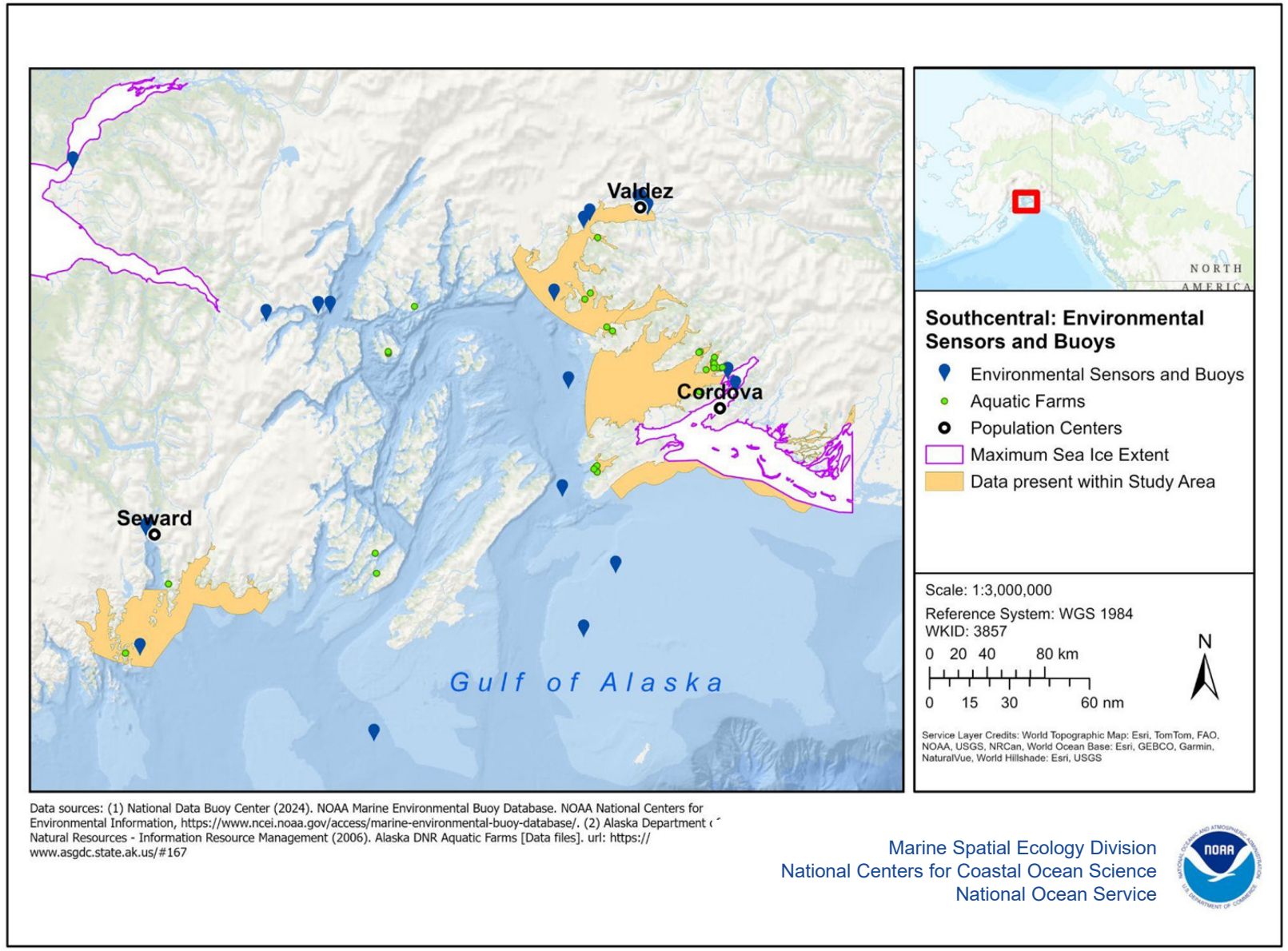


Data sources: (1) National Data Buoy Center (2024). NOAA Marine Environmental Buoy Database. NOAA National Centers for Environmental Information, https://www.ncei.noaa.gov/access/marine-environmental-buoy-database/. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: https://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Environmental Sensors and Buoys

AOOS Alaska Ocean Observing System

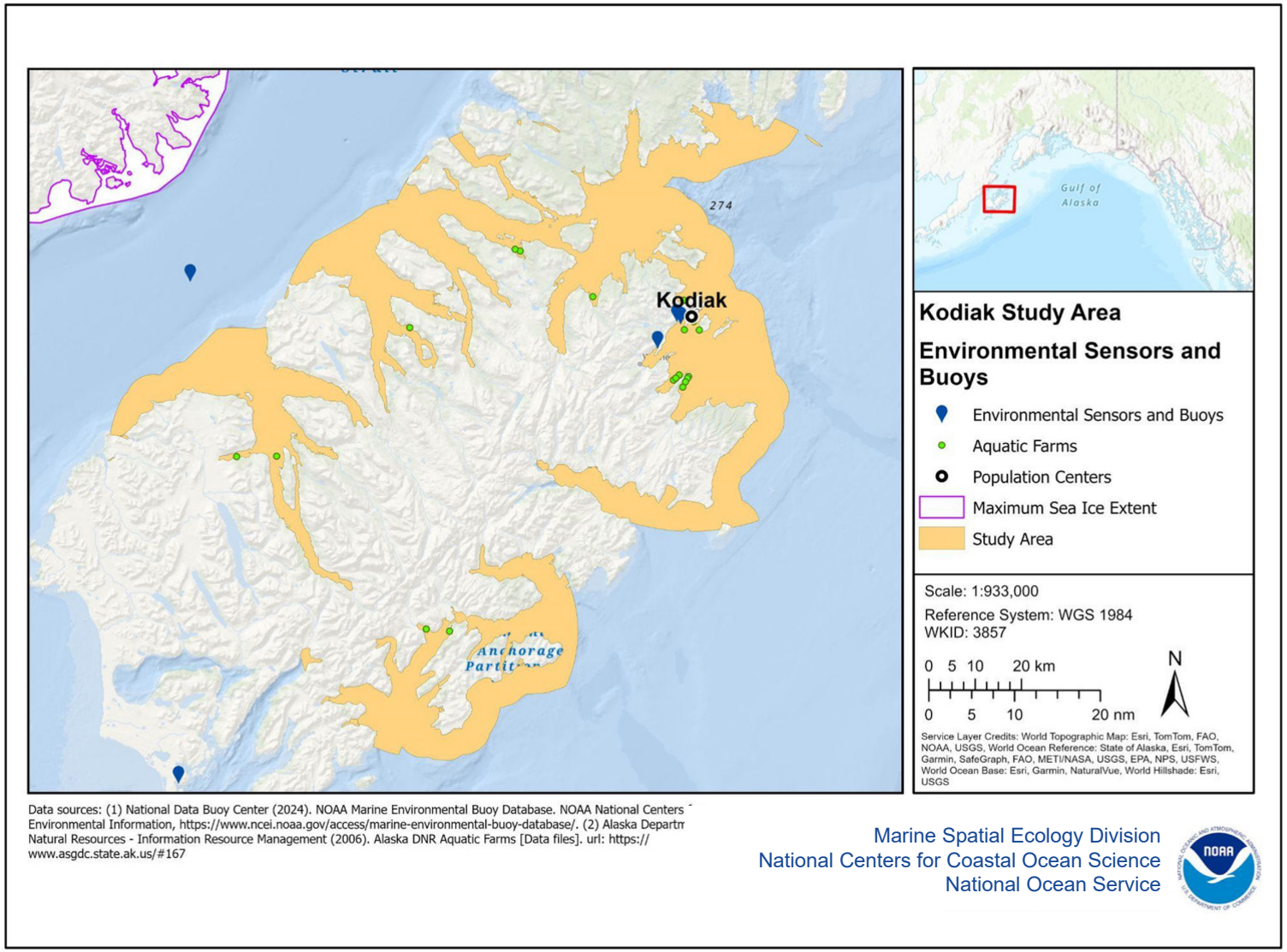


Data sources: (1) National Data Buoy Center (2024). NOAA Marine Environmental Buoy Database. NOAA National Centers for Environmental Information, https://www.ncei.noaa.gov/access/marine-environmental-buoy-database/. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: https://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Environmental Sensors and Buoys

AOOS Alaska Ocean Observing System

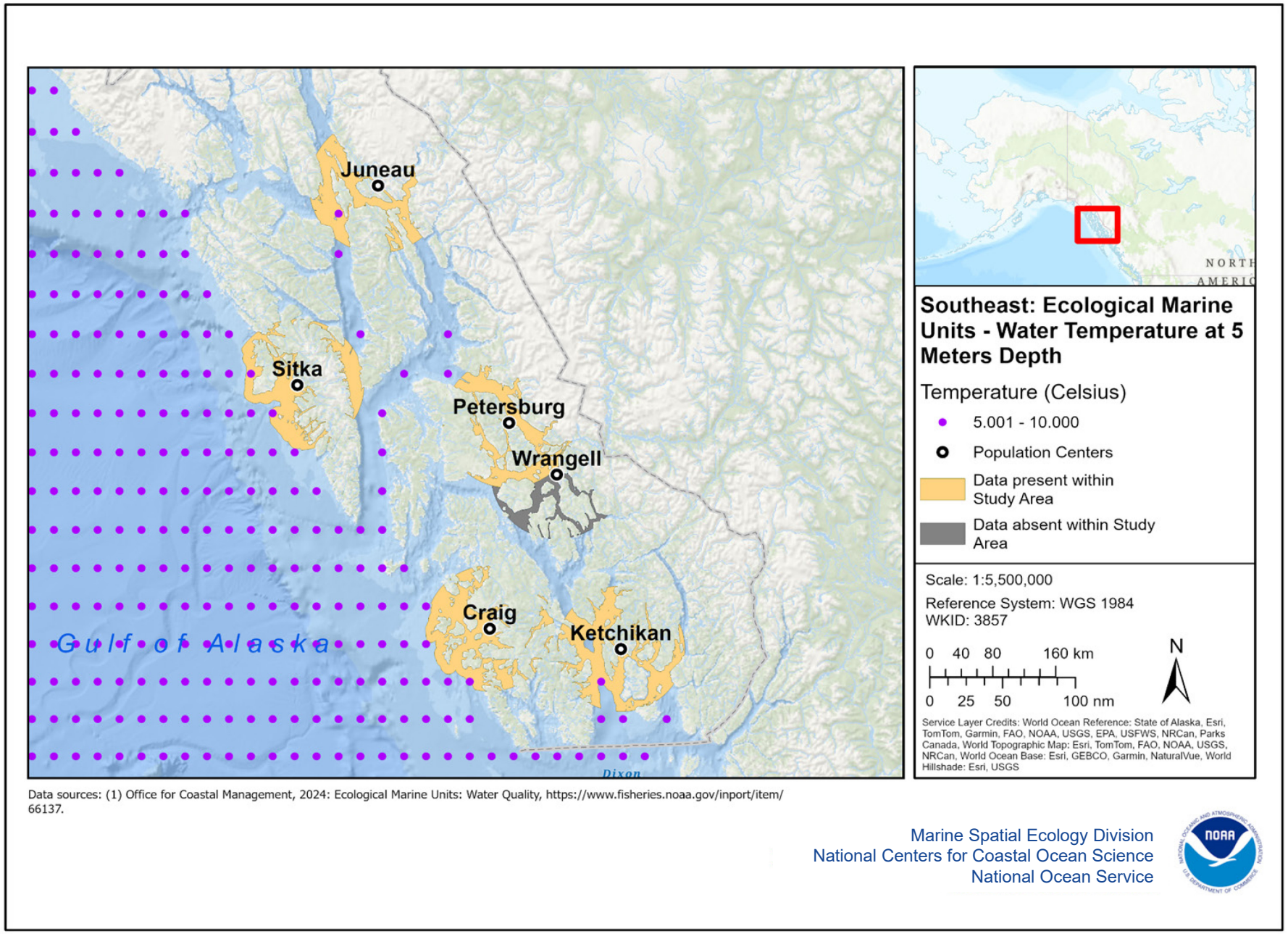


Data sources: (1) National Data Buoy Center (2024). NOAA Marine Environmental Buoy Database. NOAA National Centers Environmental Information, https://www.ncei.noaa.gov/access/marine-environmental-buoy-database/. (2) Alaska Departm Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: https://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Ecological Marine Units Data

Ecological Marine Units: Monitoring within select ports and waterways for a suite of parameters including dissolved oxygen, pH, temperature, salinity, bacteria (fecal coliform and enterococci), ammonia as nitrogen, copper (total and dissolved), nickel (total and dissolved), and zinc (total and dissolved).

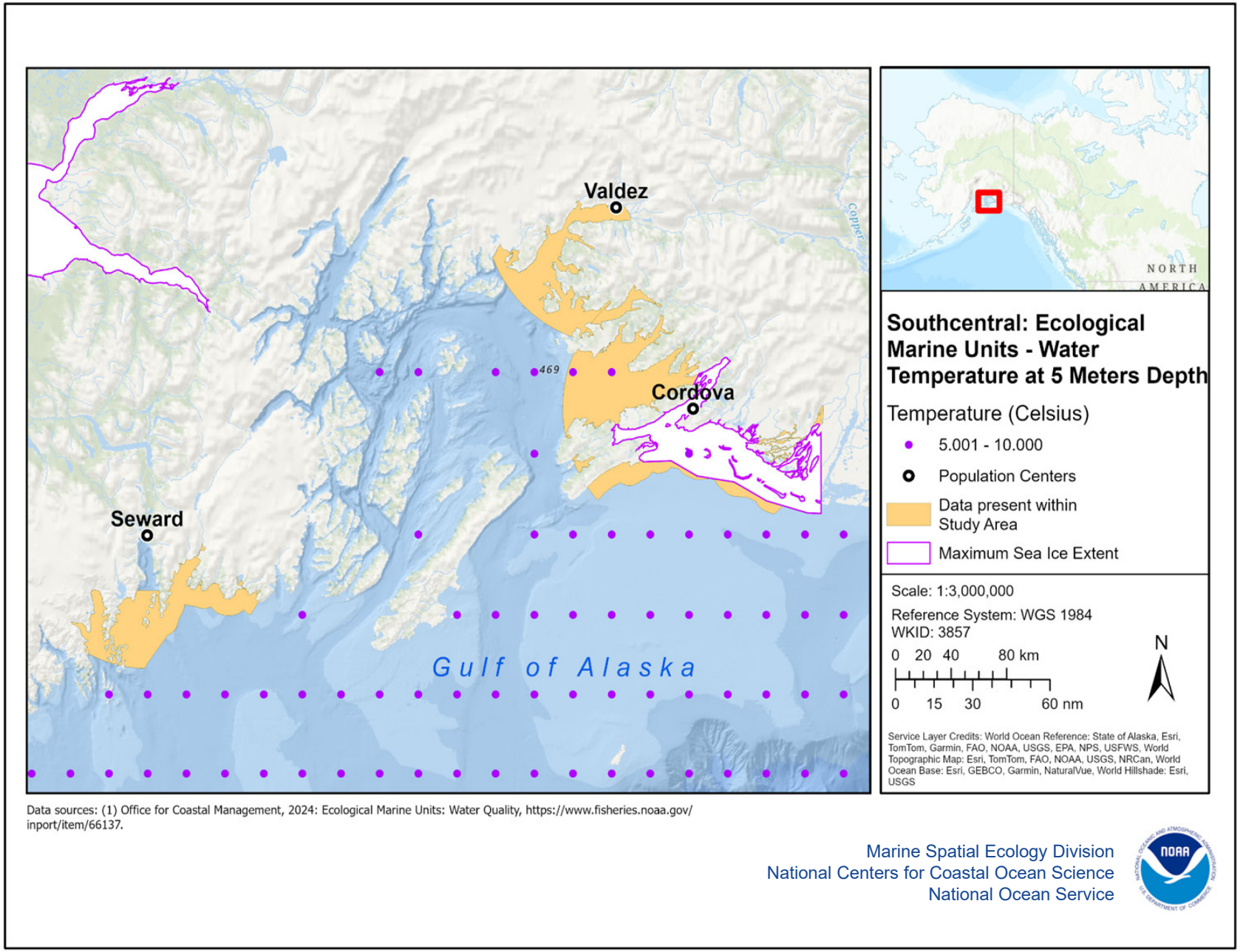


Data sources: (1) Office for Coastal Management, 2024: Ecological Marine Units: Water Quality, https://www.fisheries.noaa.gov/inport/item/66137.

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Ecological Marine Units Data

Ecological Marine Units: Monitoring within select ports and waterways for a suite of parameters including dissolved oxygen, pH, temperature, salinity, bacteria (fecal coliform and enterococci), ammonia as nitrogen, copper (total and dissolved), nickel (total and dissolved), and zinc (total and dissolved).

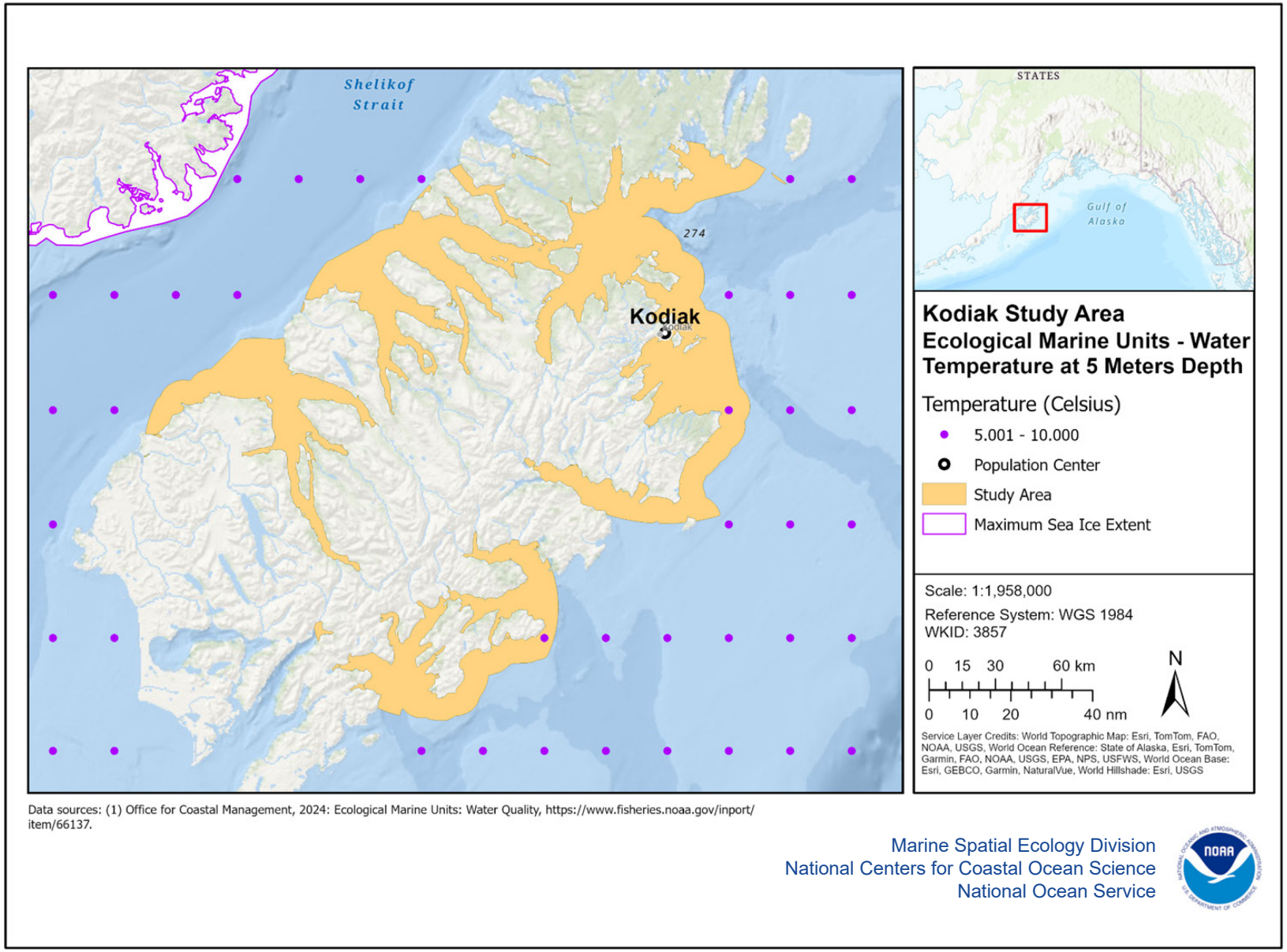


Data sources: (1) Office for Coastal Management, 2024: Ecological Marine Units: Water Quality, https://www.fisheries.noaa.gov/inport/item/66137.

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Ecological Marine Units Data

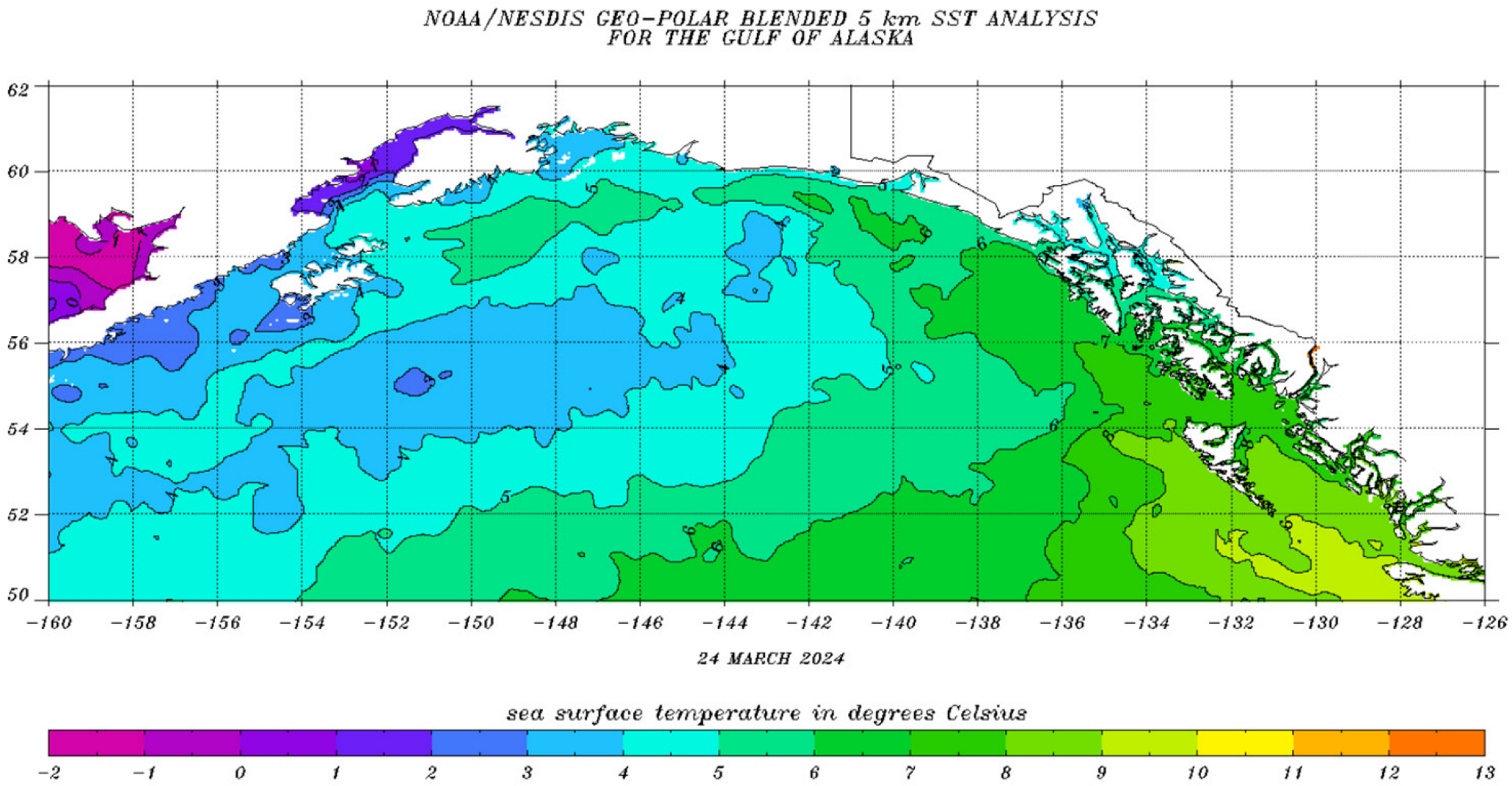
Ecological Marine Units: Monitoring within select ports and waterways for a suite of parameters including dissolved oxygen, pH, temperature, salinity, bacteria (fecal coliform and enterococci), ammonia as nitrogen, copper (total and dissolved), nickel (total and dissolved), and zinc (total and dissolved).



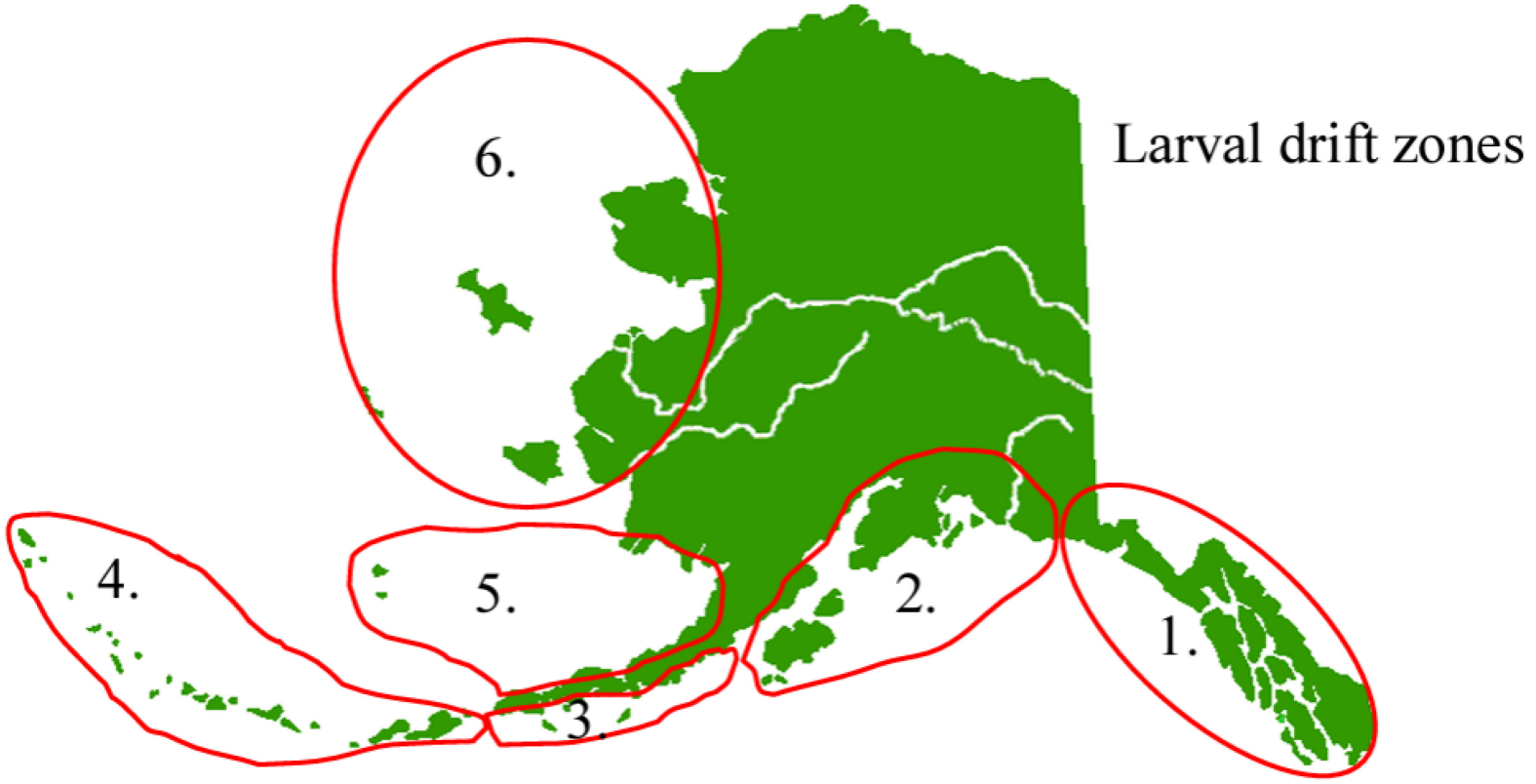
Data sources: (1) Office for Coastal Management, 2024: Ecological Marine Units: Water Quality, https://www.fisheries.noaa.gov/inport/item/66137.

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Satellite Data Products



Larval Drift Zones



(1) Southeastern Alaska, from the Canadian border north to Cape St. Elias.

(2) Prince William Sound and Cook Inlet, from Cape St. Elias west and south to Cape Igvak, including Kodiak Island.

(3) Chignik and the Alaska Peninsula-Aleutian Islands, from Cape Igvak west to the tip of Unimak Island.

(4) The Aleutian Islands, including all islands west of Unimak Pass.

(5) The southeast Bering Sea and north Alaska Peninsula, from the westernmost tip of Unimak Island north to the Kuskokwim River, including the Pribilof Islands.

(6) The northeast Bering Sea, including all coastal islands north of the Kuskokwim River.

Oceanographic and Other

Oceanographic Data	Overlap	Type
Bathymetry	Southeast, Southcentral, Kodiak	Constraint
Maximum Aggregate Sea Ice	Cordova, Seward	Constraint
Environmental Sensors and Buoys	Southeast, Southcentral, Kodiak	Constraint
Ecological Marine Units	Southeast, Southcentral, Kodiak	Consideration
Larval Drift Zones	Southeast, Southcentral, Kodiak	Constraint

Other sources of oceanographic related data:

- Navy Coastal Ocean Model- Current Speed and Direction
- NWS- Coastal Waters Forecast (CWF)
- Alaska Harmful Algal Bloom Network
- Satellite
- Sediment texture

Core Data Questions

1. Are you aware of any data that are missing from the list but available? If yes, can you identify which types of data and provide a point of contact from whom we could acquire the data?

1. What data gaps exist?

Data Gaps

slido



Are you aware of any data that are missing from the list but available? If yes, what type of data and can you provide a point of contact from whom we could acquire that data?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

Data Gaps

slido



What data gaps exist for boundaries and hydrographic data?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

Natural Resources

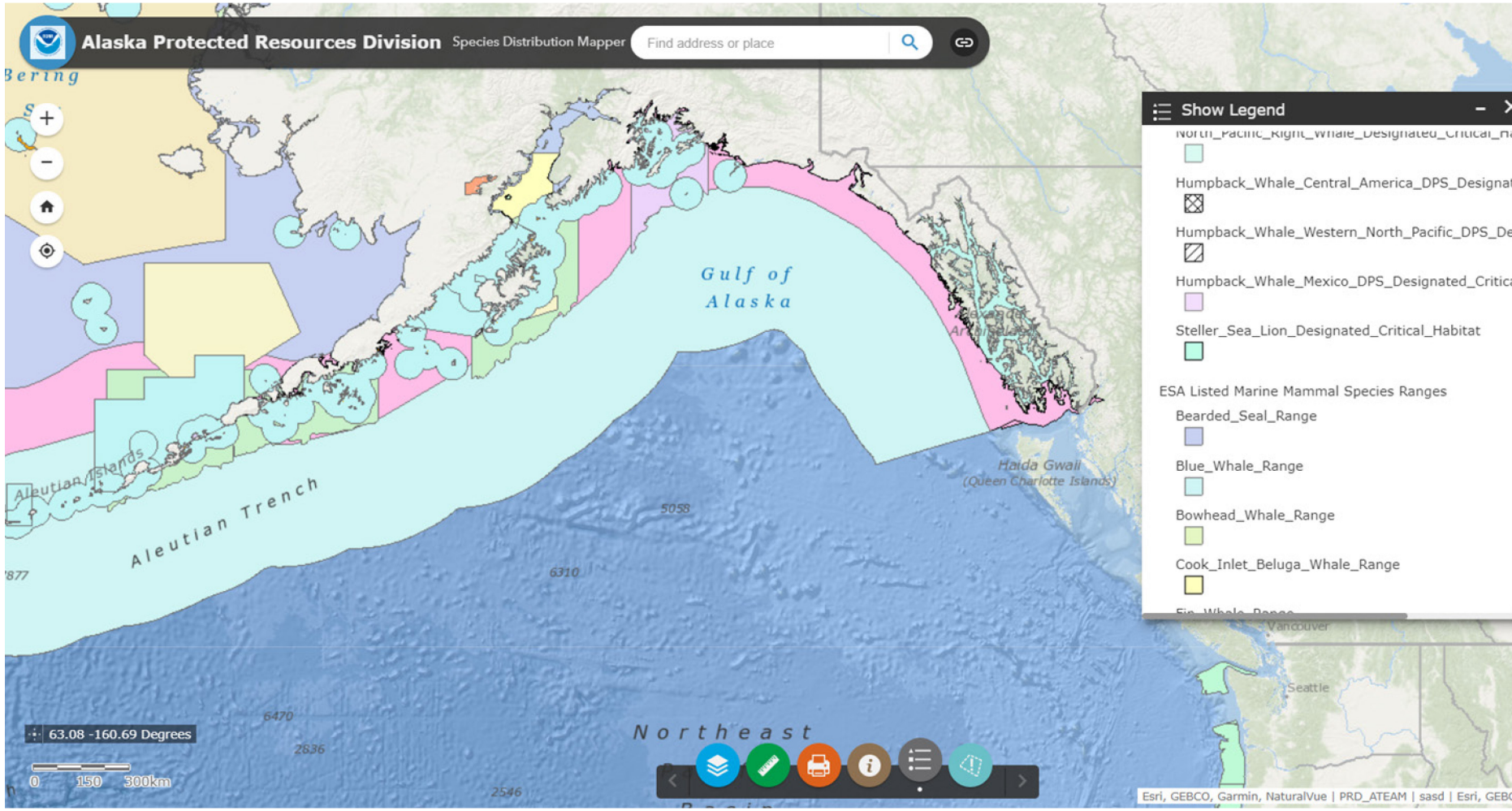
Information about protected species and sensitive habitats



Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

NMFS ESA Critical Habitat & Range

Critical habitats: (1) Specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation, which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation.

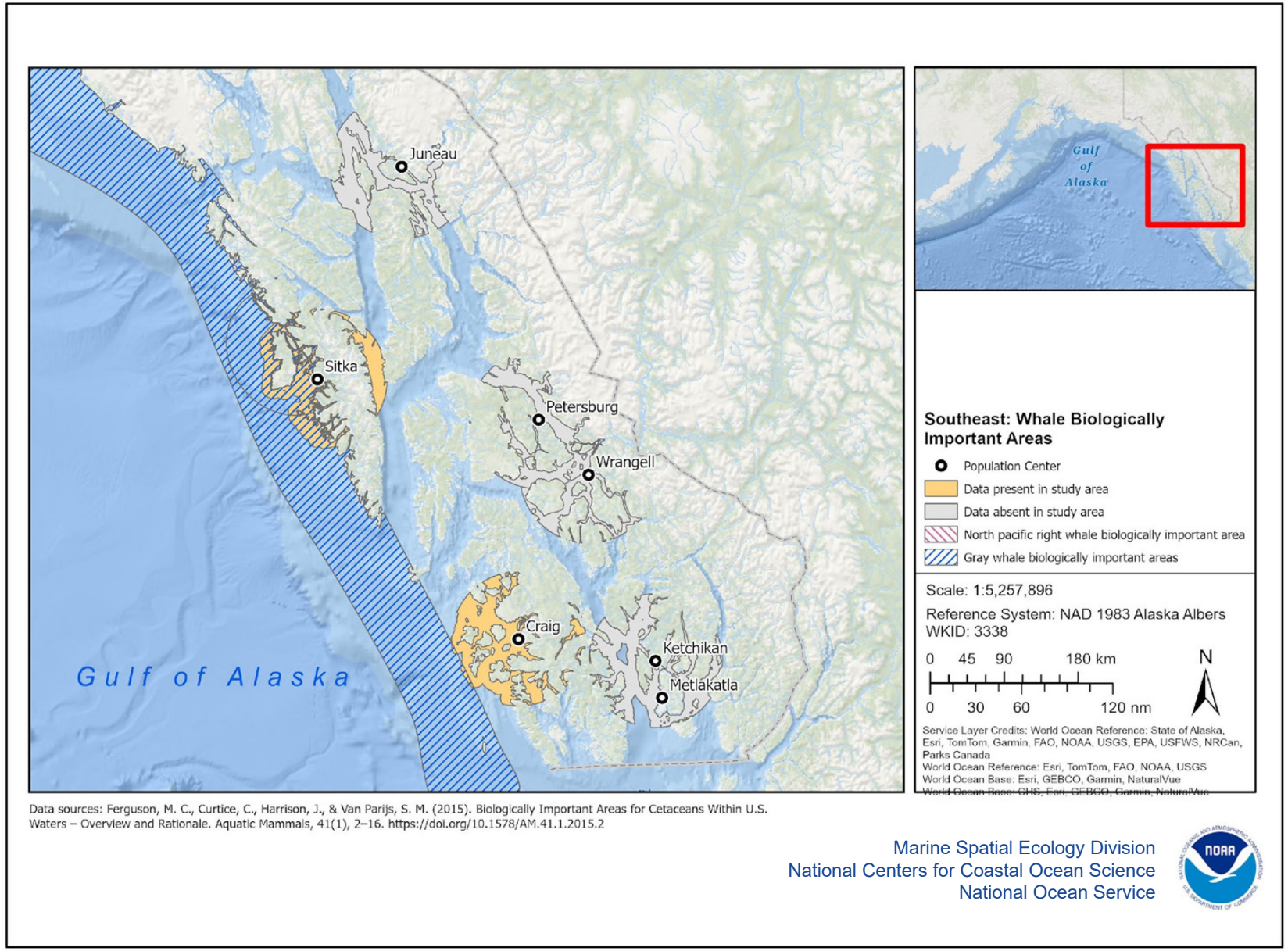


Whale Biologically Important Areas

North Pacific Right Whales in red and Gray Whales in blue

BIAs are reproductive areas, feeding areas, migratory corridors, and areas in which small and resident populations are concentrated. BIAs are region-, species-, and time-specific.
does not have direct or immediate regulatory consequences

Source: CetMap



Data sources: Ferguson, M. C., Curtice, C., Harrison, J., & Van Parijs, S. M. (2015). Biologically Important Areas for Cetaceans Within U.S. Waters – Overview and Rationale. Aquatic Mammals, 41(1), 2–16. https://doi.org/10.1578/AM.41.1.2015.2

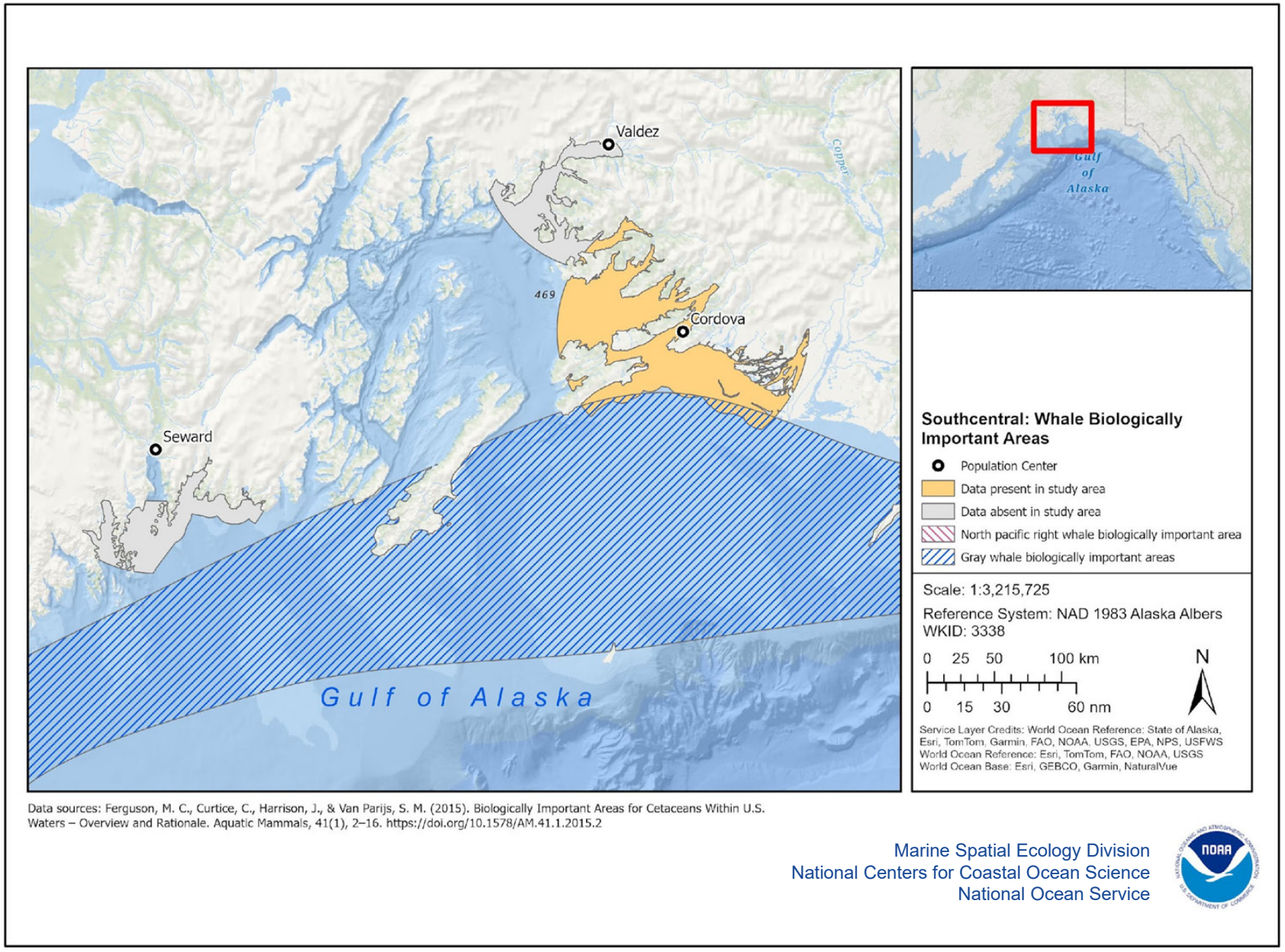
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Whale Biologically Important Areas

North Pacific Right Whales in red and Gray Whales in blue

BIAs are reproductive areas, feeding areas, migratory corridors, and areas in which small and resident populations are concentrated. BIAs are region-, species-, and time-specific.
does not have direct or immediate regulatory consequences

Source: CetMap



Data sources: Ferguson, M. C., Curtice, C., Harrison, J., & Van Parijs, S. M. (2015). Biologically Important Areas for Cetaceans Within U.S. Waters – Overview and Rationale. Aquatic Mammals, 41(1), 2–16. https://doi.org/10.1578/AM.41.1.2015.2

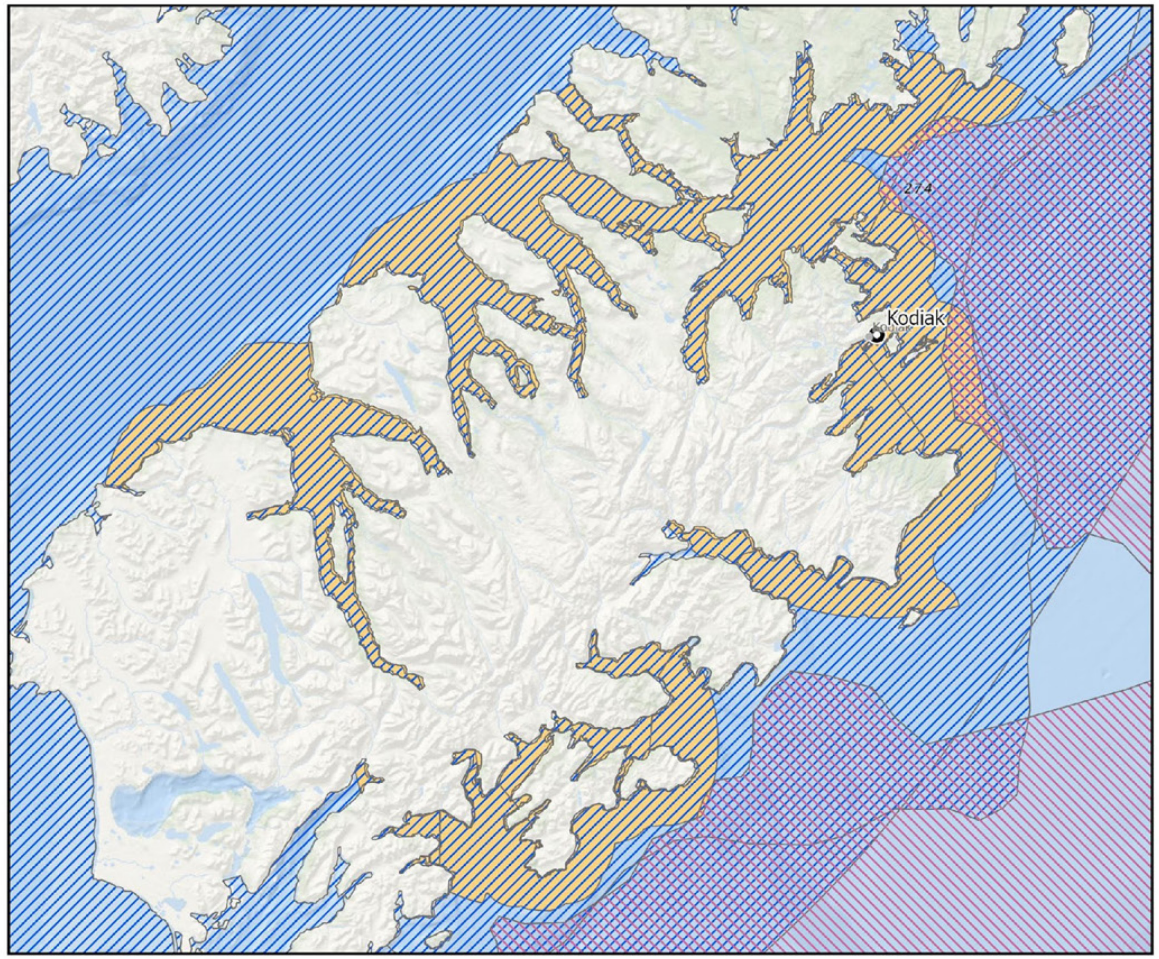
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Whale Biologically Important Areas

North Pacific Right Whales in red and Gray Whales in blue

BIAs are reproductive areas, feeding areas, migratory corridors, and areas in which small and resident populations are concentrated. BIAs are region-, species-, and time-specific.
does not have direct or immediate regulatory consequences

Source: CetMap



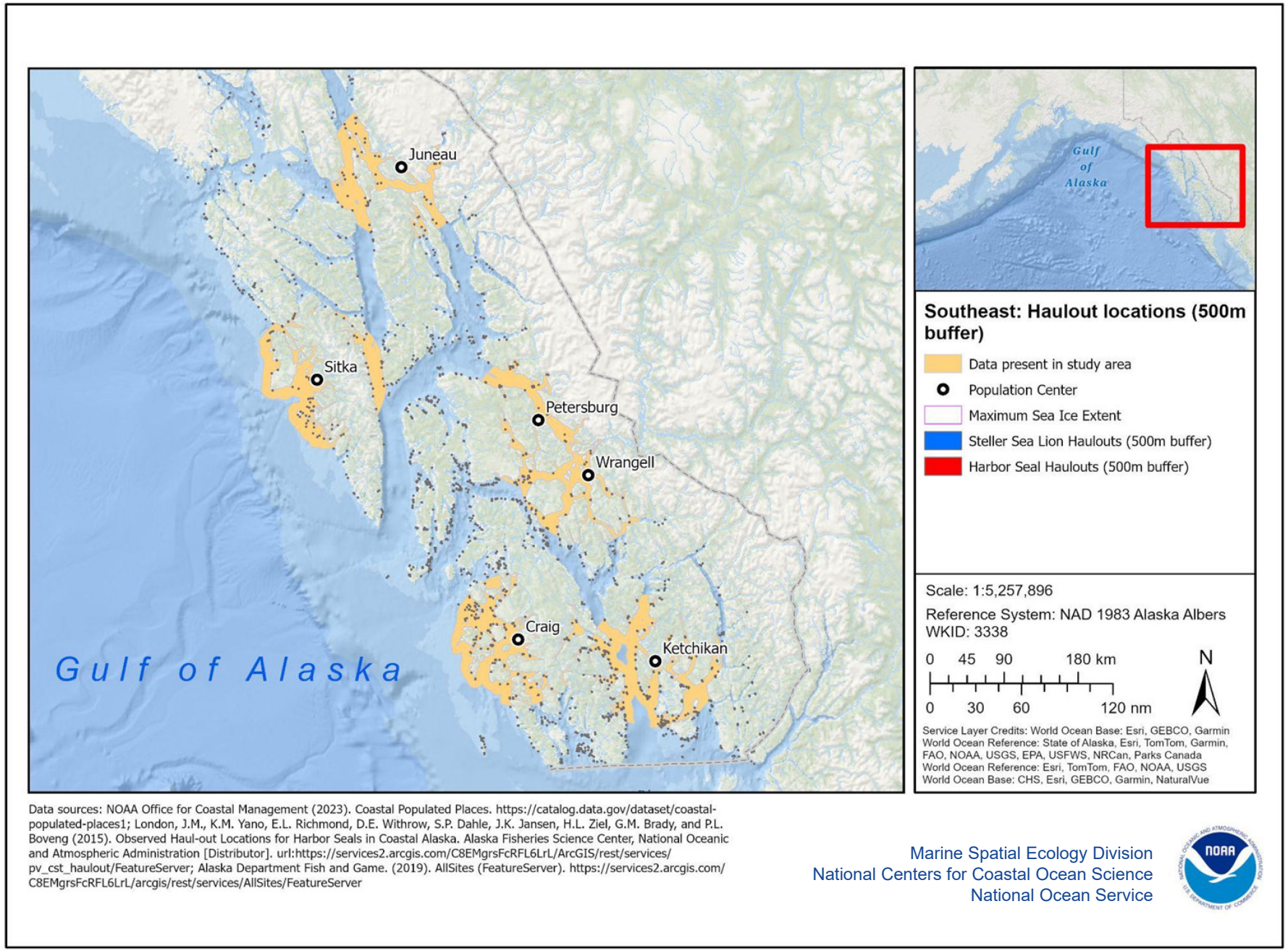
Data sources: Ferguson, M. C., Curtice, C., Harrison, J., & Van Parijs, S. M. (2015). Biologically Important Areas for Cetaceans Within U.S. Waters – Overview and Rationale. Aquatic Mammals, 41(1), 2–16. https://doi.org/10.1578/AM.41.1.2015.2

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Pinniped Haul Out Locations

500m buffer around Haul Out locations for Steller Sea Lion and Harbor Seal

ADF&G, NOAA AFSC



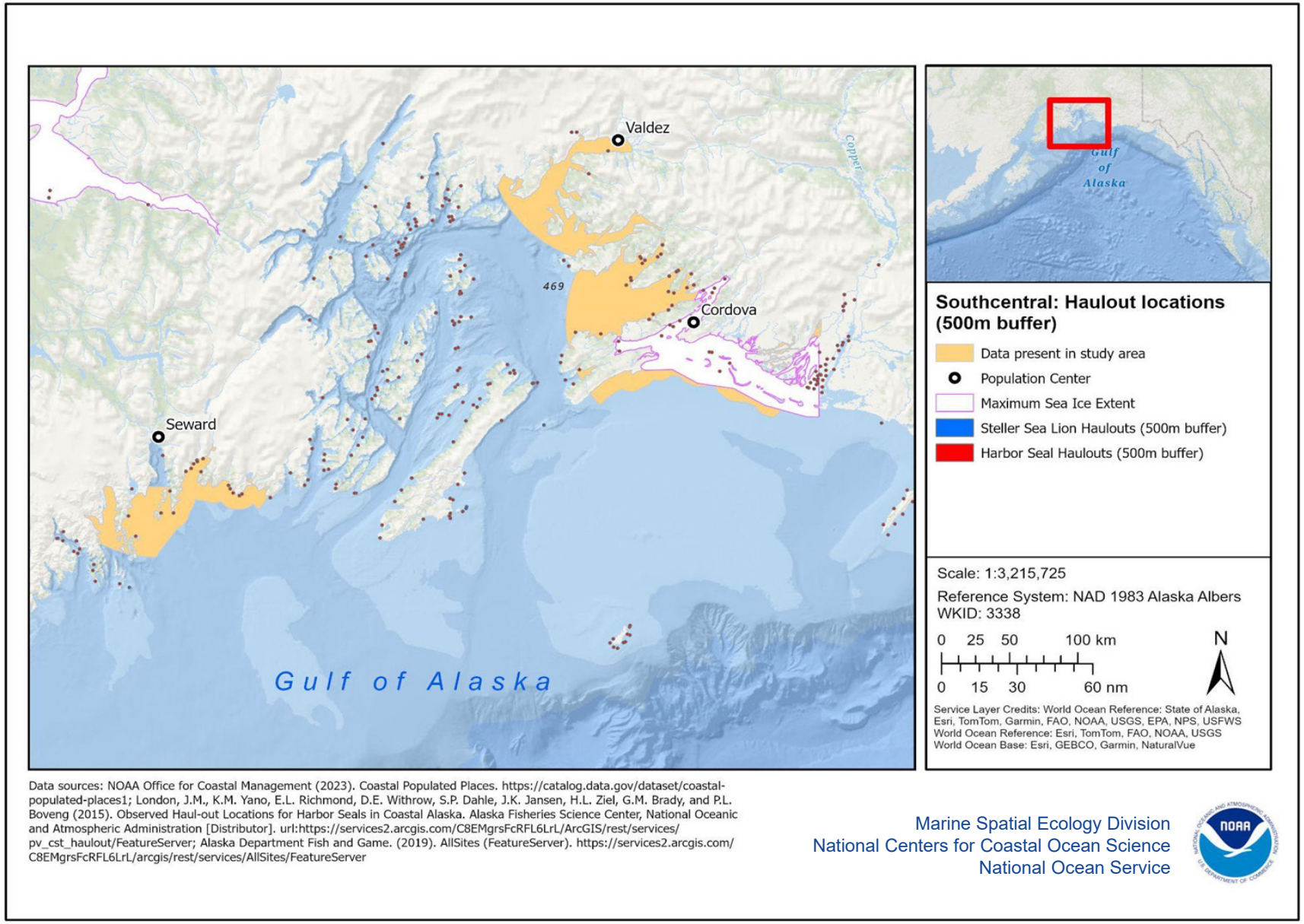
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; London, J.M., K.M. Yano, E.L. Richmond, D.E. Withrow, S.P. Dahle, J.K. Jansen, H.L. Ziel, G.M. Brady, and P.L. Boveng (2015). Observed Haul-out Locations for Harbor Seals in Coastal Alaska. Alaska Fisheries Science Center, National Oceanic and Atmospheric Administration [Distributor]. url:https://services2.arcgis.com/C8EMgrsFcRFL6LrL/ArcGIS/rest/services/pv_cst_haulout/FeatureServer; Alaska Department Fish and Game. (2019). AllSites (FeatureServer). https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/AllSites/FeatureServer

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Pinniped Haul Out Locations

500m buffer around Haul Out locations for Steller Sea Lion and Harbor Seal

ADF&G, NOAA AFSC



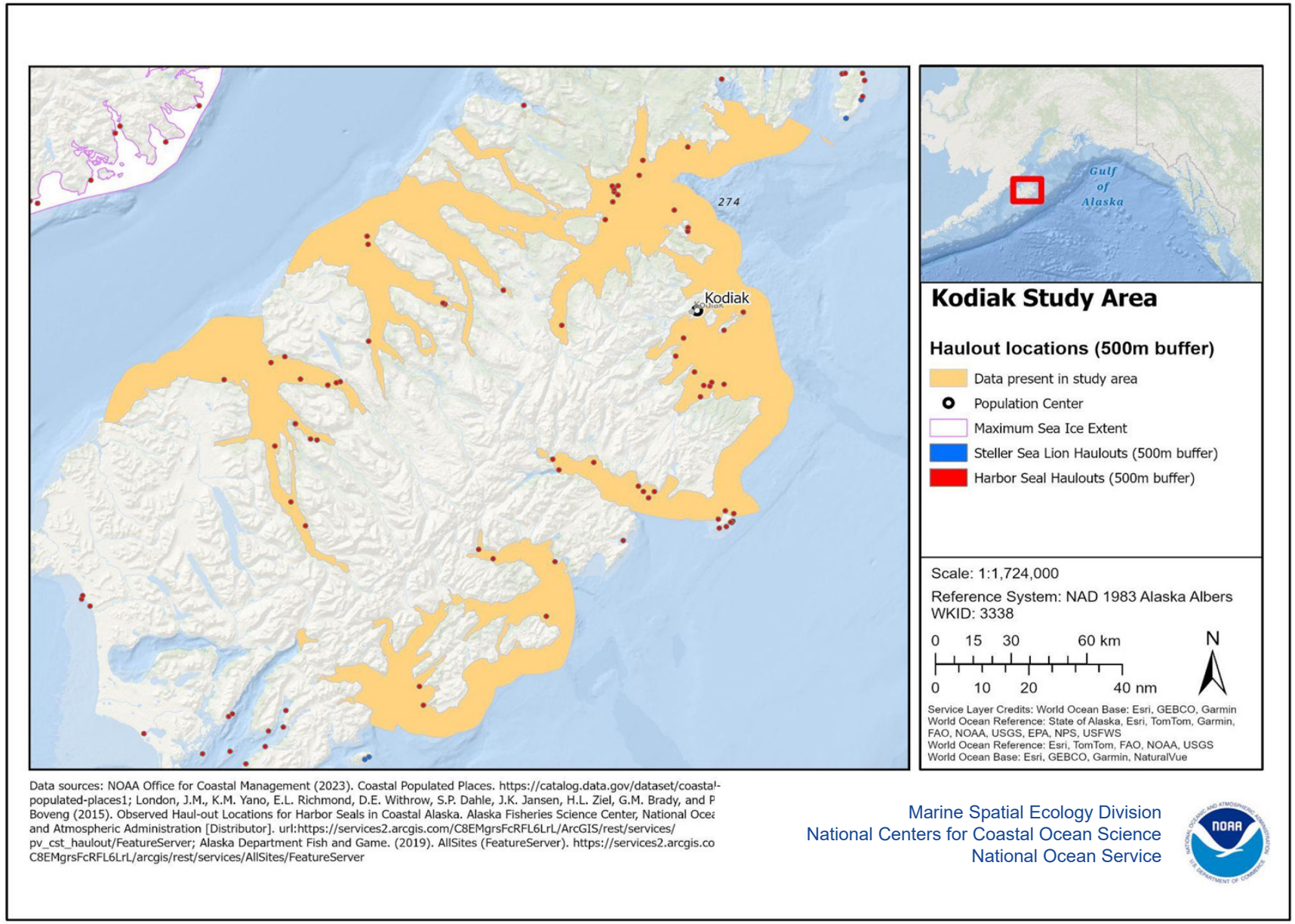
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; London, J.M., K.M. Yano, E.L. Richmond, D.E. Withrow, S.P. Dahle, J.K. Jansen, H.L. Ziel, G.M. Brady, and P.L. Boveng (2015). Observed Haul-out Locations for Harbor Seals in Coastal Alaska. Alaska Fisheries Science Center, National Oceanic and Atmospheric Administration [Distributor]. url:https://services2.arcgis.com/C8EMgrsFcRFL6LrL/ArcGIS/rest/services/pv_cst_haulout/FeatureServer; Alaska Department Fish and Game. (2019). AllSites (FeatureServer). https://services2.arcgis.com/C8EMgrsFcRFL6LrL/arcgis/rest/services/AllSites/FeatureServer

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Pinniped Haul Out Locations

500m buffer around Haul Out locations for Steller Sea Lion and Harbor Seal

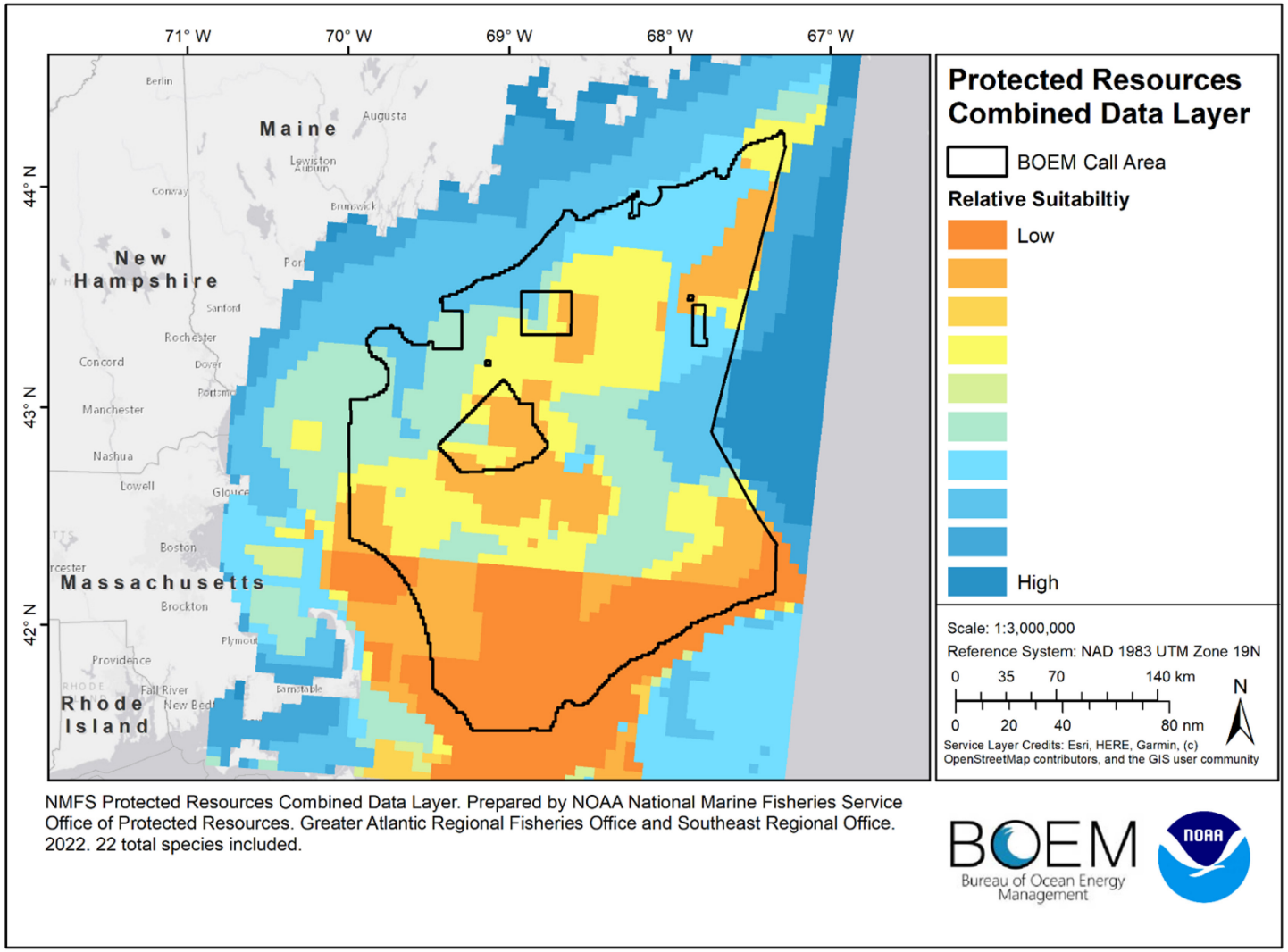
ADF&G, NOAA AFSC



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; London, J.M., K.M. Yano, E.L. Richmond, D.E. Withrow, S.P. Dahle, J.K. Jansen, H.L. Ziel, G.M. Brady, and P Boveng (2015). Observed Haul-out Locations for Harbor Seals in Coastal Alaska. Alaska Fisheries Science Center, National Ocea and Atmospheric Administration [Distributor]. url:https://services2.arcgis.com/C8EMgrsFcRFL6LrL/ArcGIS/rest/services/pv_cst_haulout/FeatureServer; Alaska Department Fish and Game. (2019). AllSites (FeatureServer). https://services2.arcgis.co C8EMgrsFcRFL6LrL/arcgis/rest/services/AllSites/FeatureServer

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

NMFS Protected Species Combined Data Layer



NMFS Protected Resources Combined Data Layer. Prepared by NOAA National Marine Fisheries Service Office of Protected Resources. Greater Atlantic Regional Fisheries Office and Southeast Regional Office. 2022. 22 total species included.

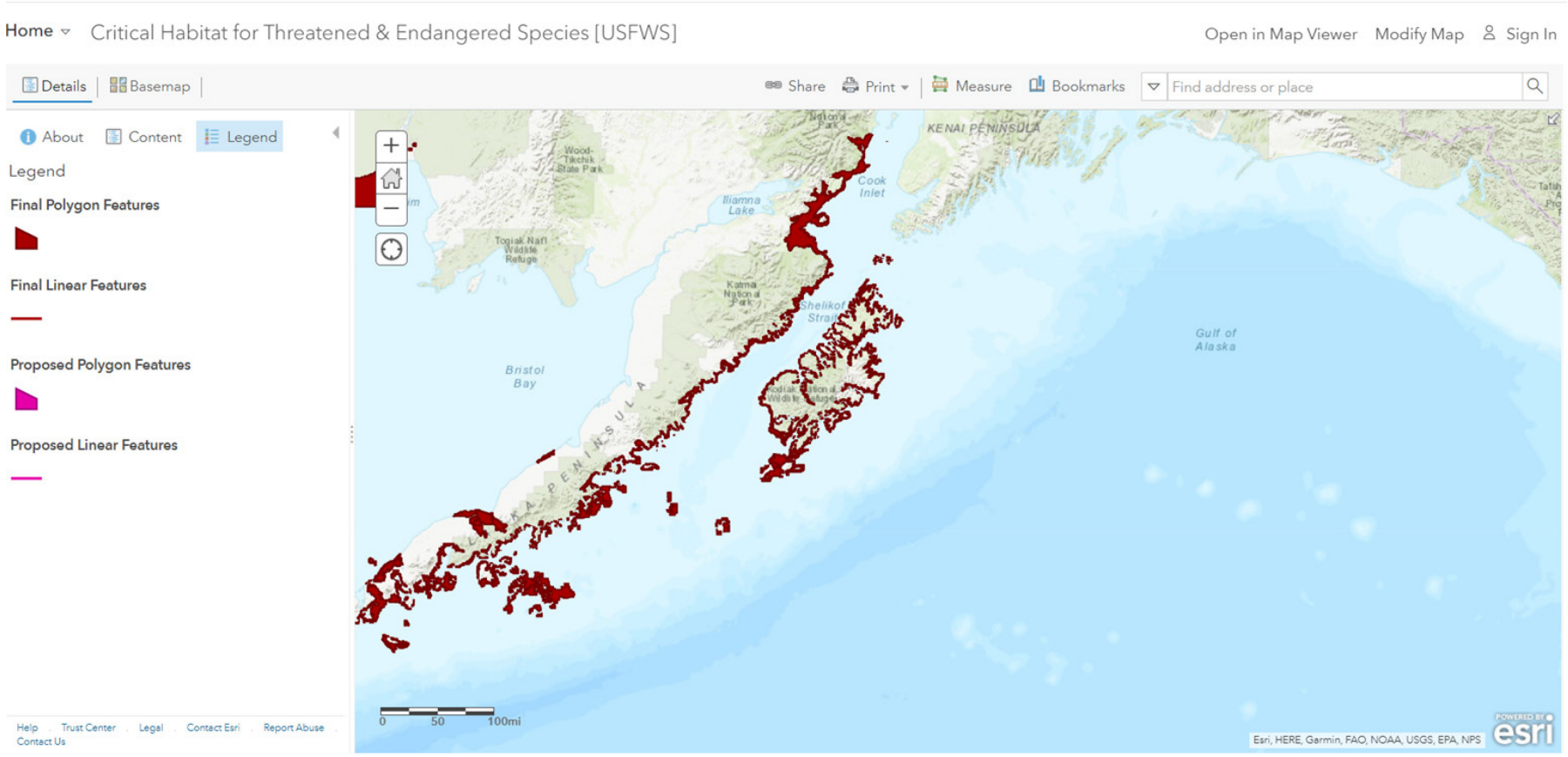
BOEM Bureau of Ocean Energy Management

NOAA

Species Common Name	Status and Trend	Score (0-1)
Atlantic white-sided dolphin	Protected; low use area	0.9
Bottlenose dolphin	Protected; unknown/declining	0.6
Harbor porpoise	Protected; unknown/declining	0.7
Pilot whale	Protected; unknown/declining	0.7
Risso's dolphin	Protected; unknown/declining	0.7
Short-beaked common dolphin	Protected; unknown/declining	0.7
Seals	Protected; increasing/stable	0.8
Blue whale	Endangered; unknown/stable	0.2
Fin whale	Endangered; unknown/stable	0.2
Humpback whale	Protected; increasing/stable	0.8
Minke whale	Protected; unknown/declining	0.7
North Atlantic right whale	Endangered; declining	0.1
Sei whale	Endangered; unknown/stable	0.2
Sperm whale	Endangered; unknown/stable	0.2
Atlantic Salmon (Gulf of Maine DPS)	Endangered; low use area	0.5
Atlantic sturgeon (All DPSs)	Endangered; unknown/stable	0.2
Giant manta ray	Threatened; unknown/declining	0.4
Shortnose sturgeon	Endangered; low use area	0.5
Green sea turtle	Threatened; increasing/stable	0.5
Kemp's ridley sea turtle	Endangered; unknown/stable	0.5
Leatherback sea turtle	Endangered; declining	0.1
Loggerhead sea turtle (NW Atlantic, NW Atlantic Ocean DPSs)	Threatened; increasing/stable	0.5

FWS Critical Habitat Designations

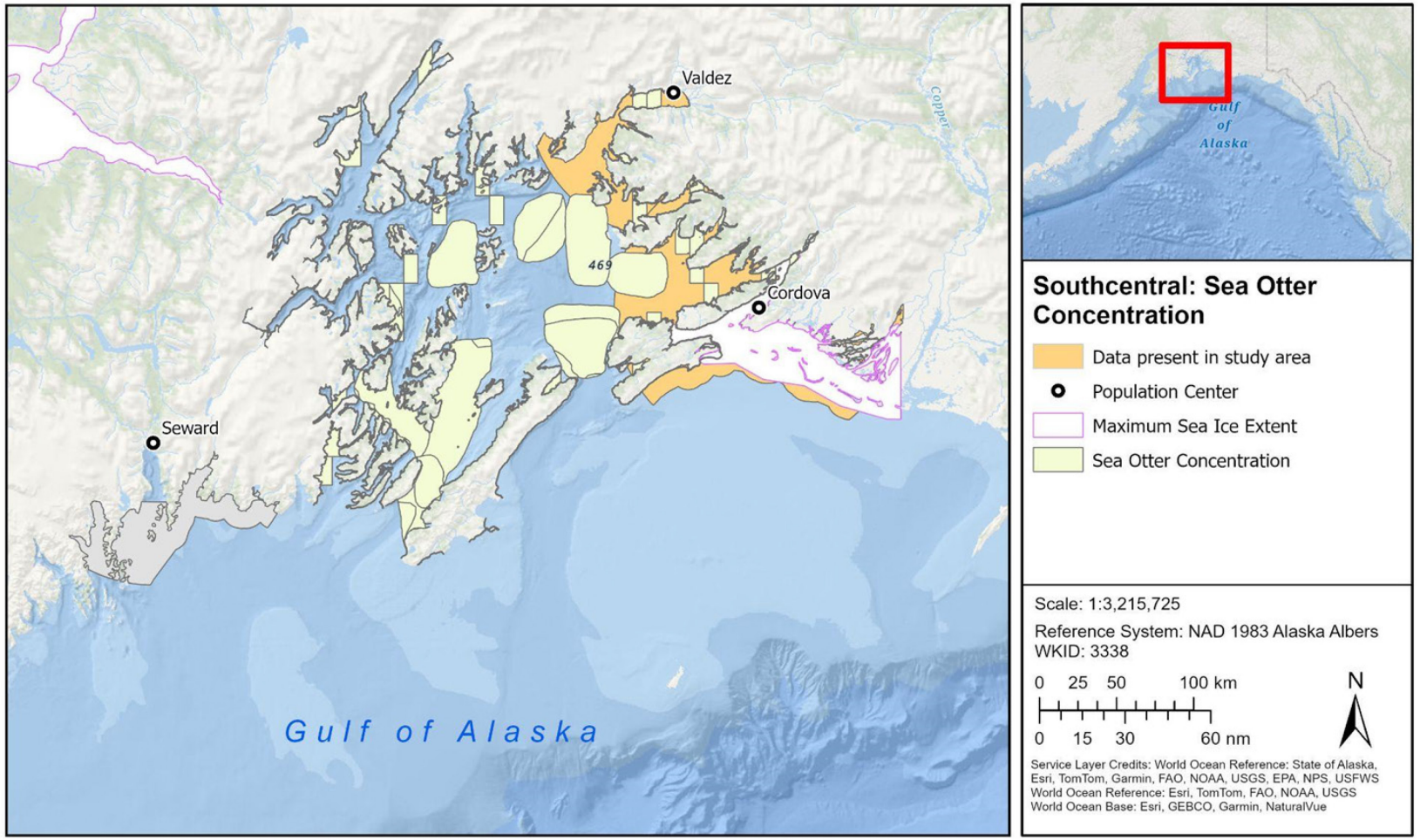
Critical habitats: (1) Specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation, which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation.



Sea Otter Concentration Areas

Sea otter concentration from the Bristol Bay, Cook Inlet, Kodiak, Prince William Sound, and Southeast Alaska regions.

Information for the regions was collected at various times between 1997 and 2004. This data set was collected by the U.S. National Ocean and Atmospheric Administration's Office of Response and Restoration Environmental Sensitivity Index. ESI data characterize estuarine environments and wildlife by their sensitivity to spilled oil.



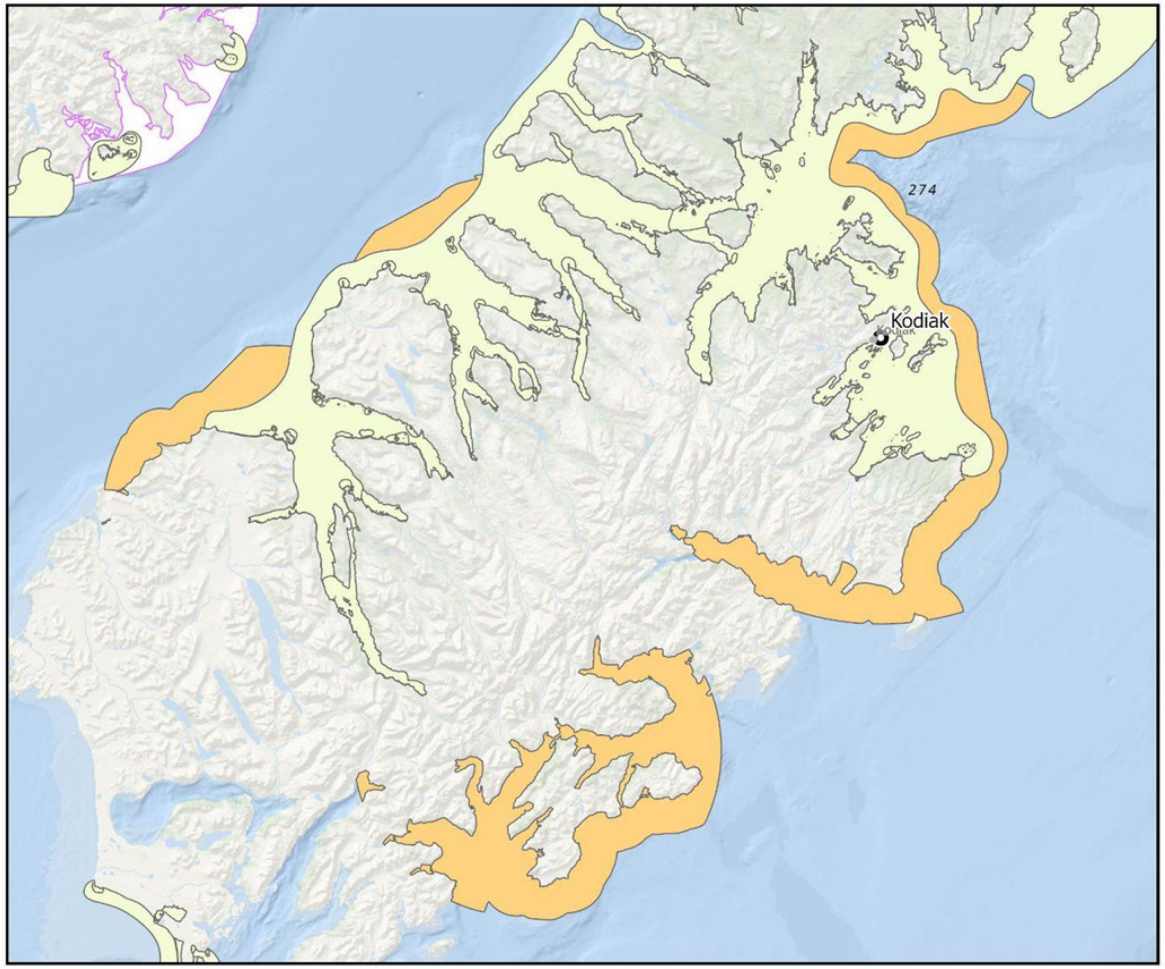
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; NOAA Office of Response and Restoration (2004). State, Territory, International Coastal Atlases Alaska. url: https://response.restoration.noaa.gov/esi_download#Alaska

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Sea Otter Concentration Areas

Sea otter concentration from the Bristol Bay, Cook Inlet, Kodiak, Prince William Sound, and Southeast Alaska regions.

Information for the regions was collected at various times between 1997 and 2004. This data set was collected by the U.S. National Ocean and Atmospheric Administration's Office of Response and Restoration Environmental Sensitivity Index. ESI data characterize estuarine environments and wildlife by their sensitivity to spilled oil.



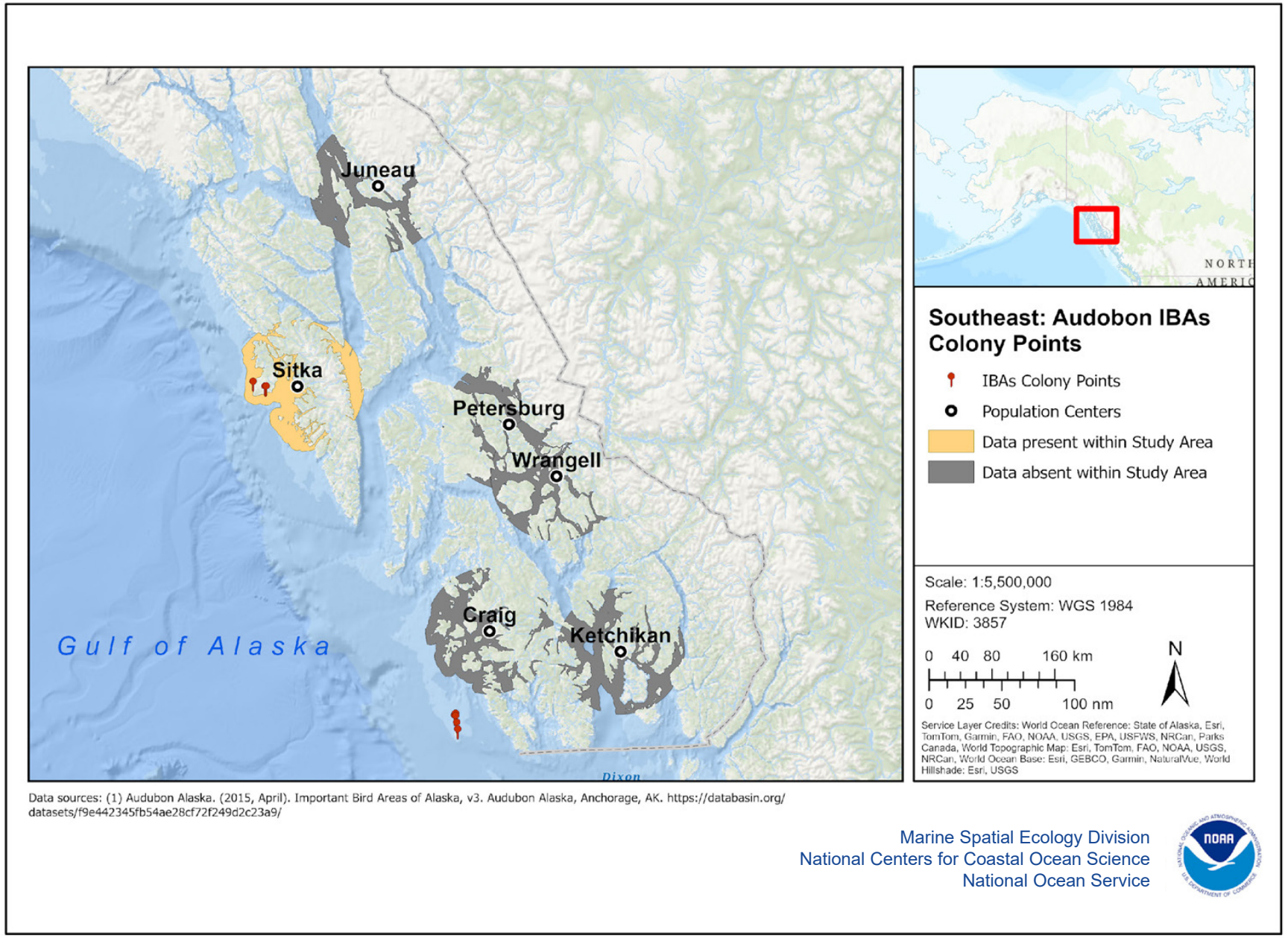
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; NOAA Office of Response and Restoration (2004). State, Territory, International Coastal Atlases: Alaska. u https://response.restoration.noaa.gov/esi_download#Alaska

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Audubon Bird Important Biological Areas (colonies)

These IBA colony points are relied on for breeding, nesting, foraging, resting, staging, and/or migration.

Source: Audubon Alaska



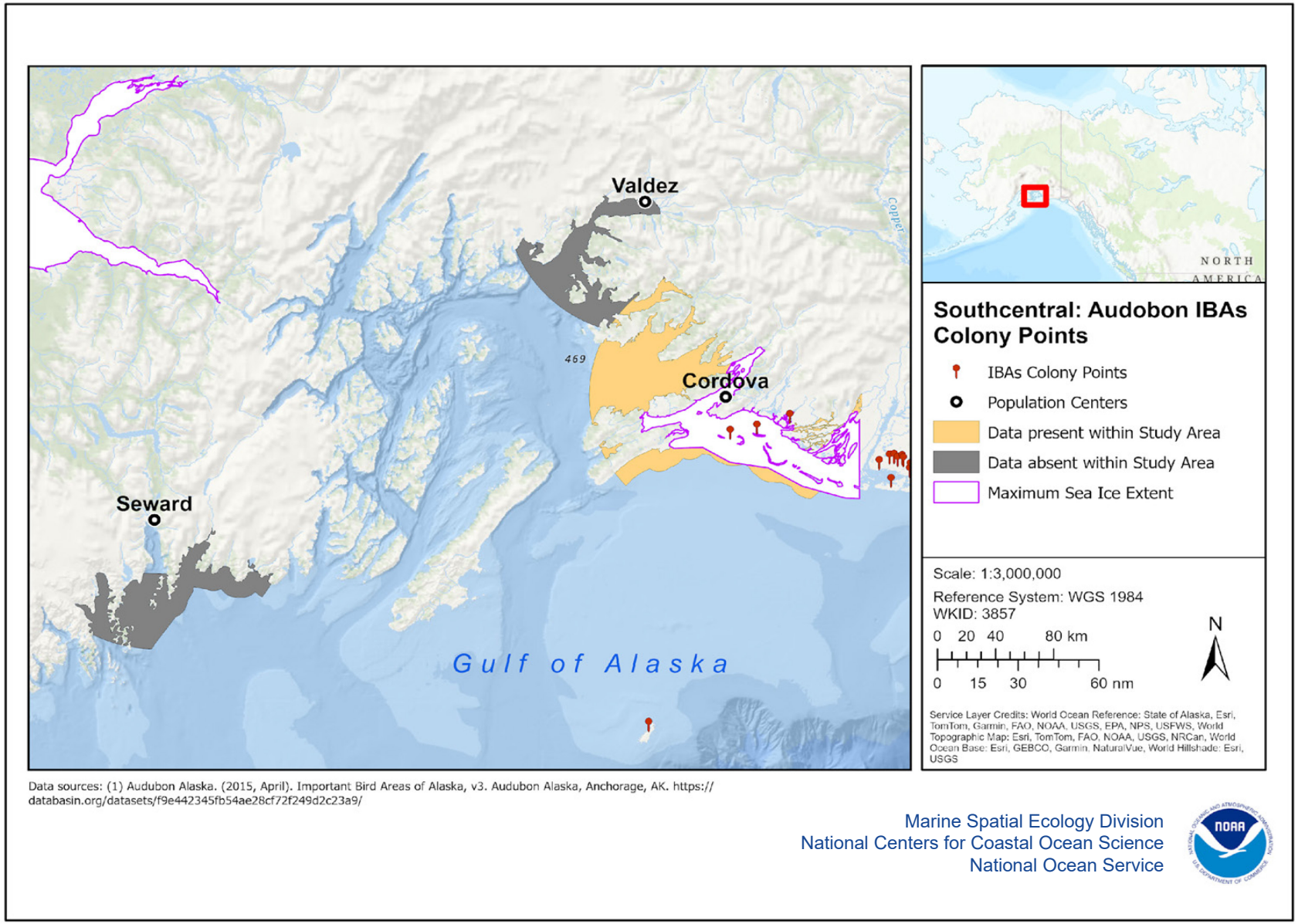
Data sources: (1) Audubon Alaska. (2015, April). Important Bird Areas of Alaska, v3. Audubon Alaska, Anchorage, AK. https://databasin.org/datasets/f9e442345fb54ae28cf72f249d2c23a9/

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Audubon Bird Important Biological Areas (colonies)

These IBA colony points are relied on for breeding, nesting, foraging, resting, staging, and/or migration.

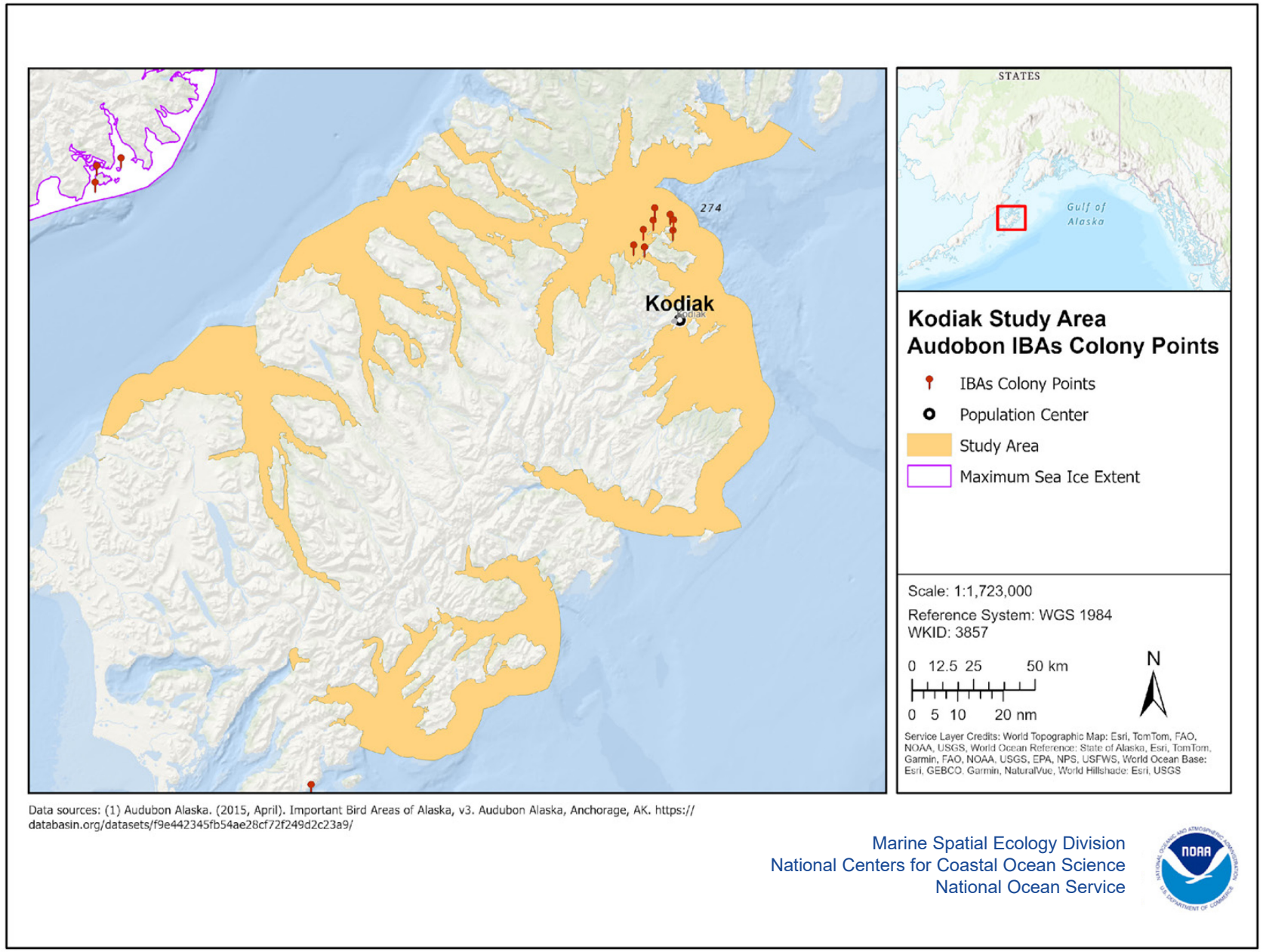
Source: Audubon Alaska



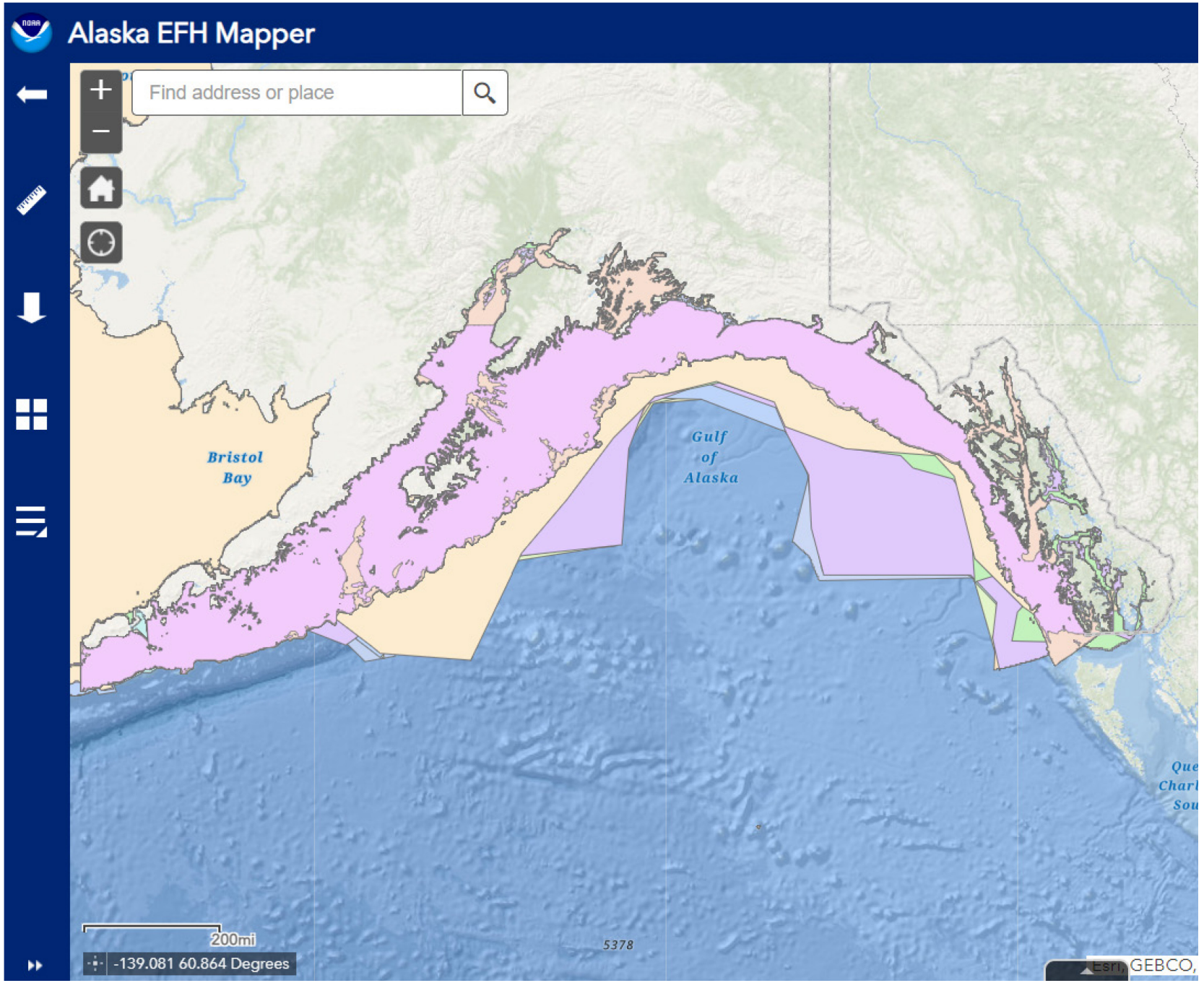
Audubon Bird Important Biological Areas (colonies)

These IBA colony points are relied on for breeding, nesting, foraging, resting, staging, and/or migration.

Source: Audubon Alaska



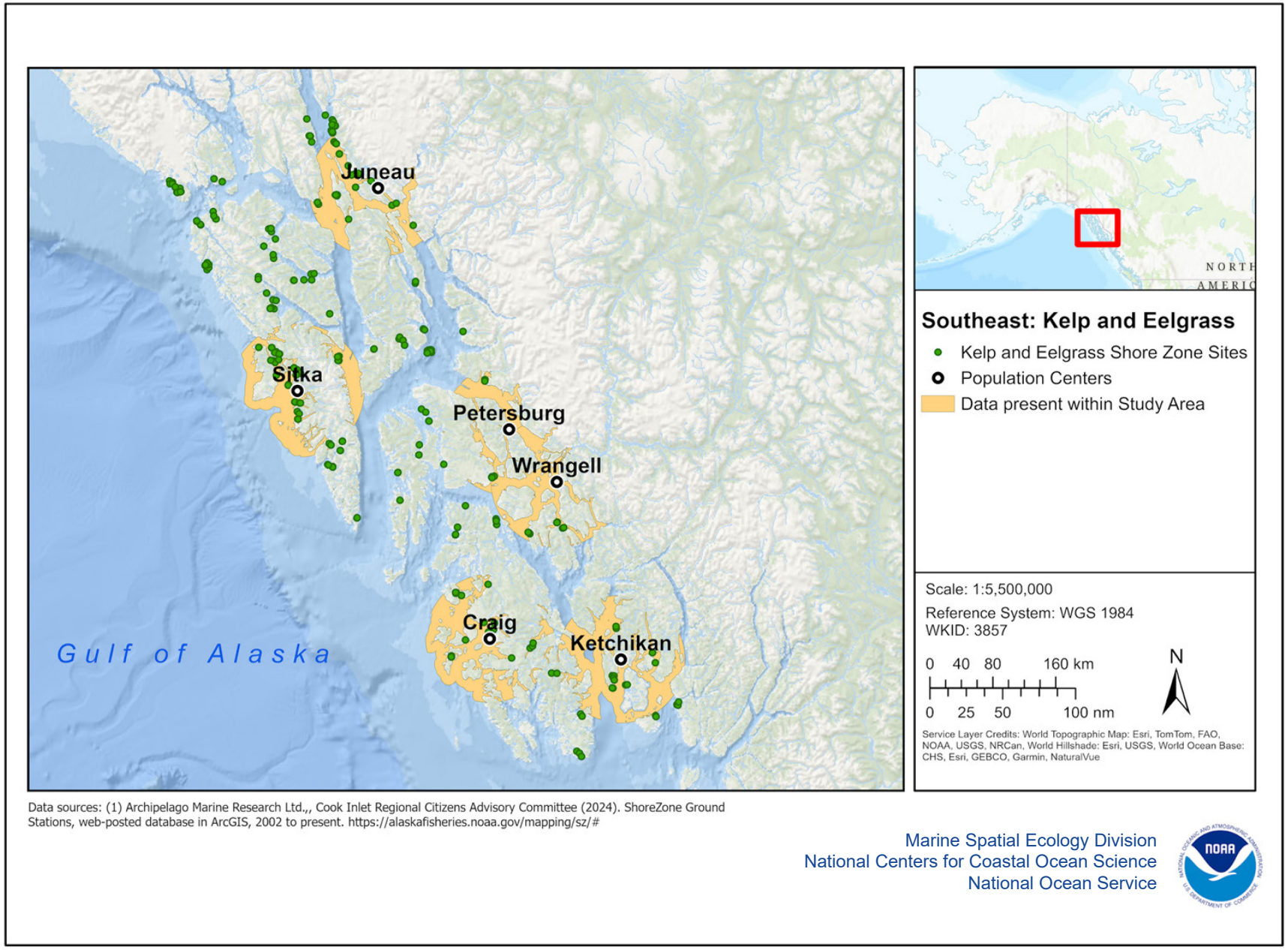
NMFS Essential Fish Habitat & Combined Habitat Data Layer



Kelp and Eelgrass

ShoreZone is a coastal habitat mapping and classification system in which georeferenced aerial imagery is collected specifically for the interpretation and integration of geological and biological features of the intertidal zone and nearshore environment.

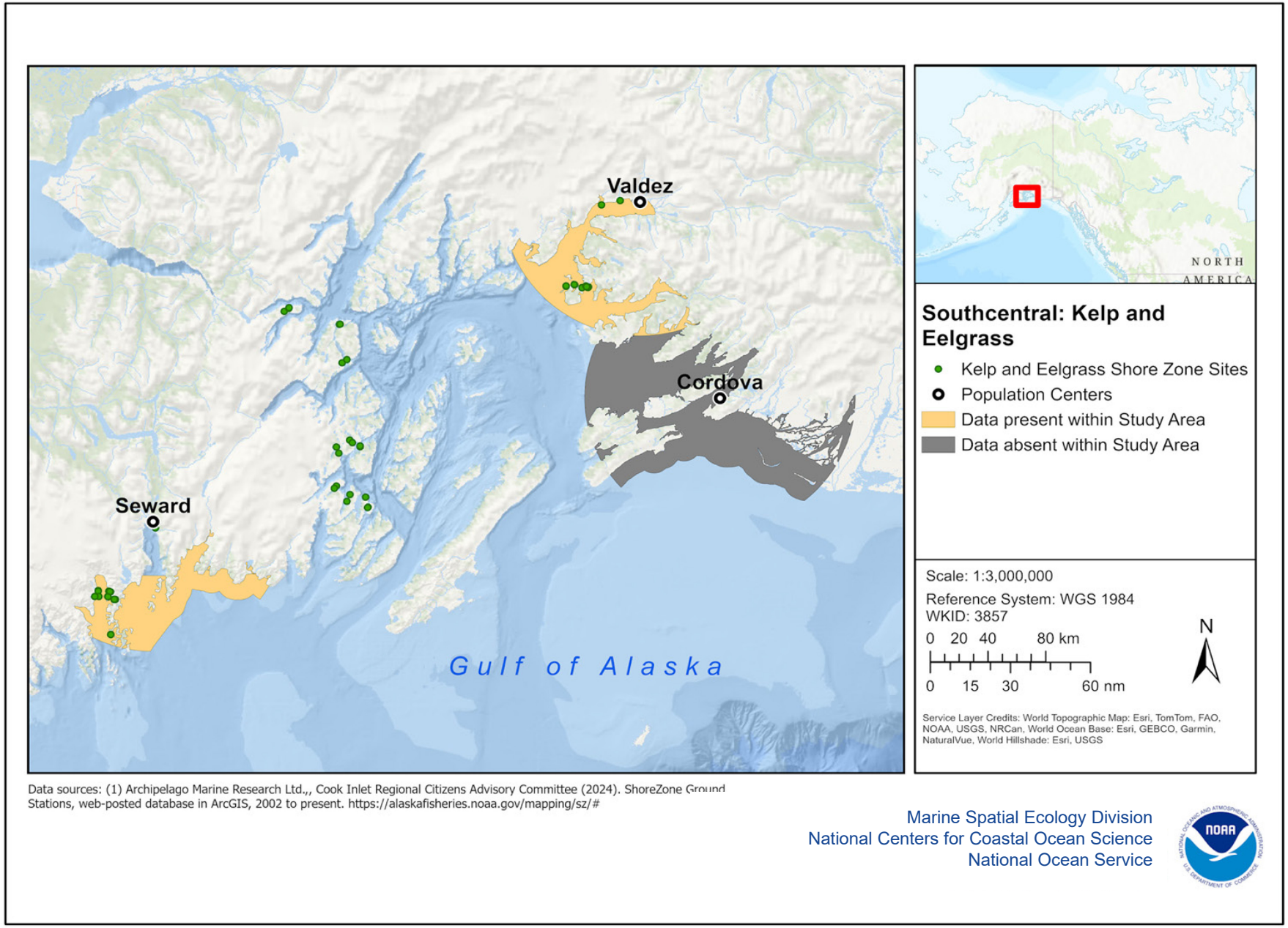
Source: NOAA



Kelp and Eelgrass

ShoreZone is a coastal habitat mapping and classification system in which georeferenced aerial imagery is collected specifically for the interpretation and integration of geological and biological features of the intertidal zone and nearshore environment.

Source: NOAA



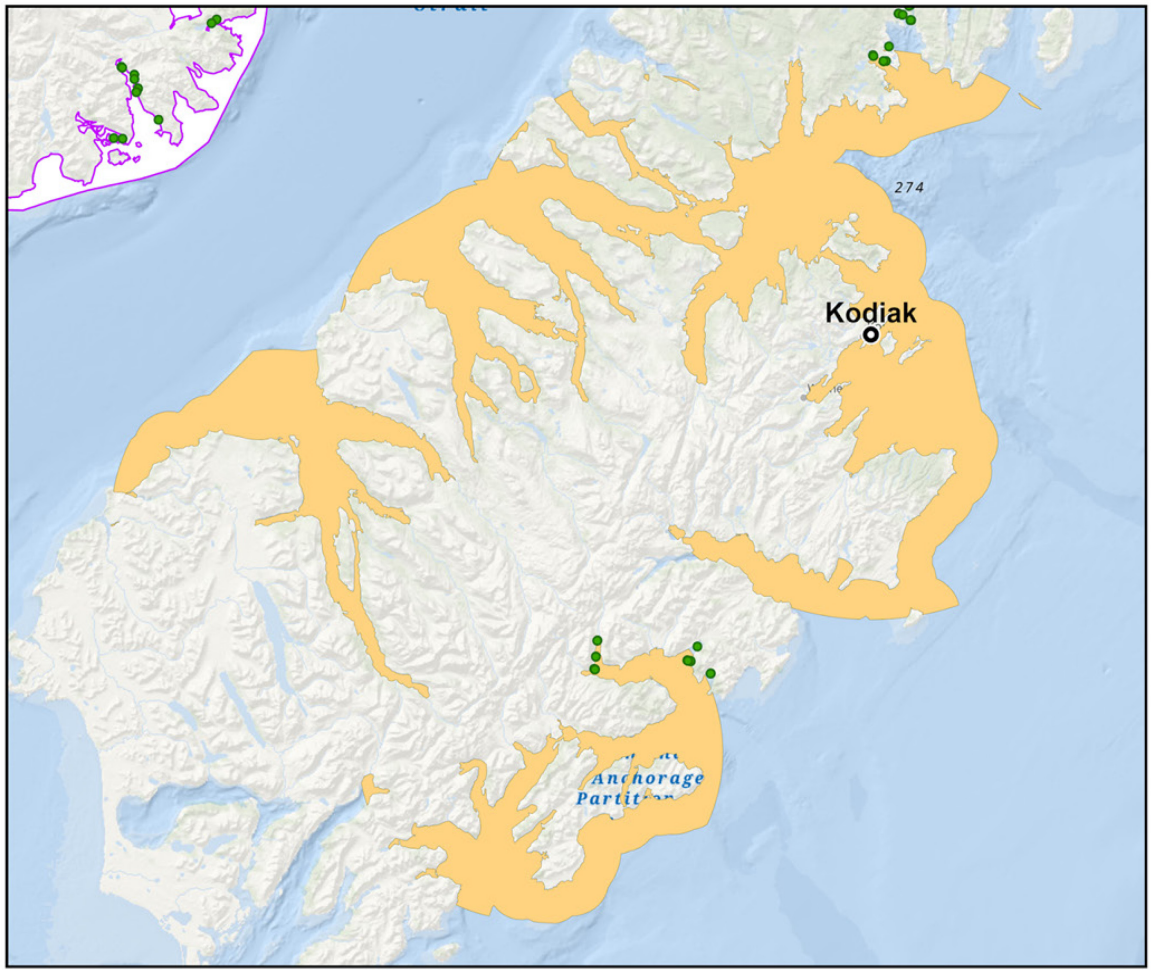
Data sources: (1) Archipelago Marine Research Ltd.,, Cook Inlet Regional Citizens Advisory Committee (2024). ShoreZone Ground Stations, web-posted database in ArcGIS, 2002 to present. https://alaskafisheries.noaa.gov/mapping/sz/#

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Kelp and Eelgrass

ShoreZone is a coastal habitat mapping and classification system in which georeferenced aerial imagery is collected specifically for the interpretation and integration of geological and biological features of the intertidal zone and nearshore environment.

Source: NOAA



Data sources: (1) Archipelago Marine Research Ltd.,, Cook Inlet Regional Citizens Advisory Committee (2024). ShoreZone Ground Stations, web-posted database in ArcGIS, 2002 to present. https://alaskafisheries.noaa.gov/mapping/sz/#

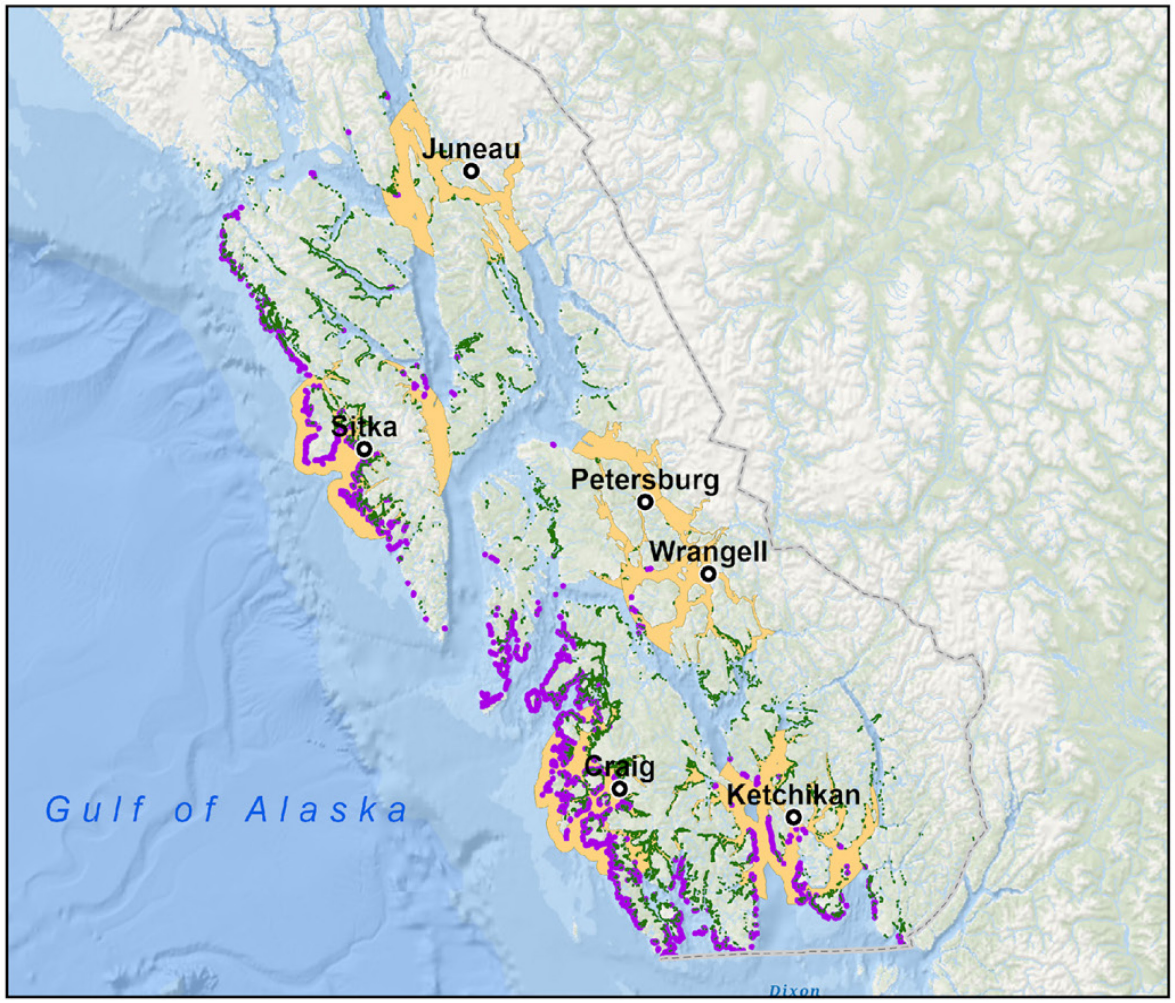
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Seagrass BioBands

A Bioband is an observed assemblage of coastal biota which are spatially distinct, with alongshore and across-shore patterns of color and texture that are visible in aerial imagery.

Eelgrass in green
Surfgrass in purple

Source: ShoreZone, NOAA





Southeast: Alaska ShoreZone Seagrass Biobands

Eelgrass
Surfgrass
Population Centers
Study Areas

Scale: 1:5,500,000
Reference System: WGS 1984
WKID: 3857

0 40 80 160 km
0 25 50 100 nm

N

Service Layer Credits: World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS, NRCan, Parks Canada, World Topographic Map: Esri, TomTom, FAO, NOAA, USGS, NRCan, World Ocean Base: Esri, GEBCO, Garmin, NaturalVue, World Hillshade: Esri, USGS

Data sources: (1) NOAA Fisheries. (2017). Alaska ShoreZone | NOAA Fisheries (Alaska). NOAA. https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-shorezone

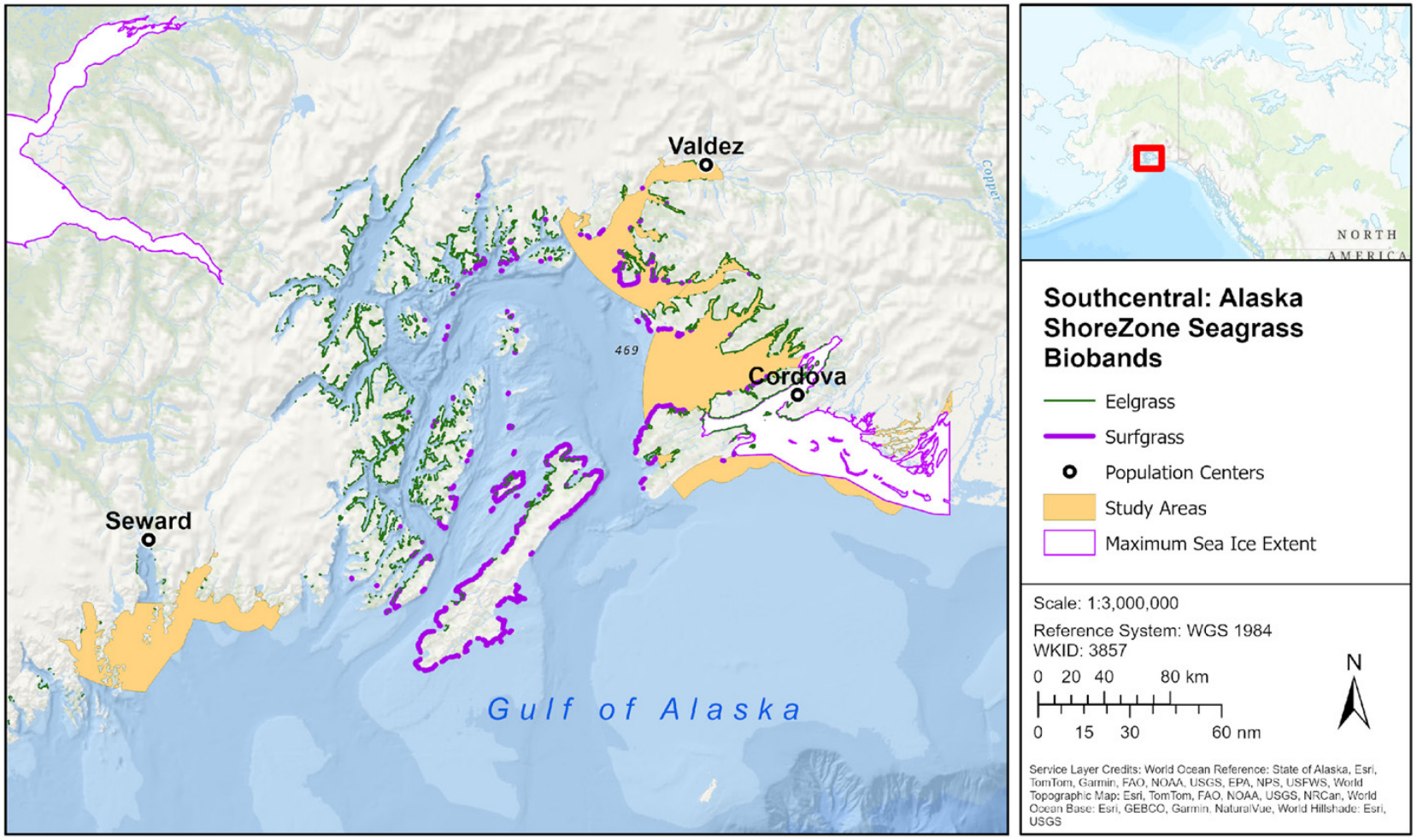
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Seagrass BioBands

A Bioband is an observed assemblage of coastal biota which are spatially distinct, with alongshore and across-shore patterns of color and texture that are visible in aerial imagery.

Eelgrass in green
Surfgrass in purple

Source: ShoreZone, NOAA



Data sources: (1) NOAA Fisheries. (2017). Alaska ShoreZone | NOAA Fisheries (Alaska). NOAA. https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-shorezone

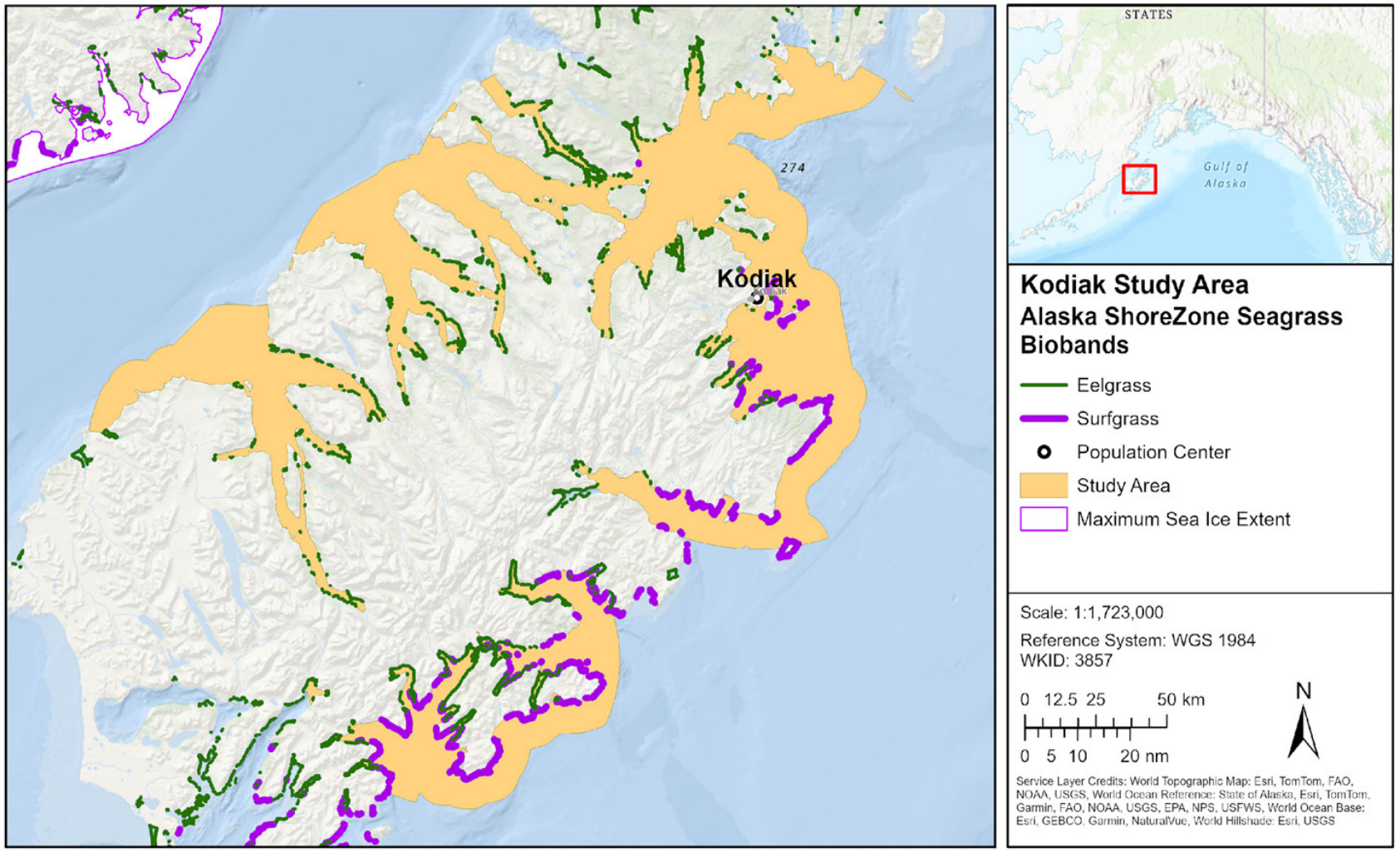
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Seagrass BioBands

A Bioband is an observed assemblage of coastal biota which are spatially distinct, with alongshore and across-shore patterns of color and texture that are visible in aerial imagery.

Eelgrass in green
Surfgrass in purple

Source: ShoreZone, NOAA



Data sources: (1) NOAA Fisheries. (2017). Alaska ShoreZone | NOAA Fisheries (Alaska). NOAA. https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-shorezone

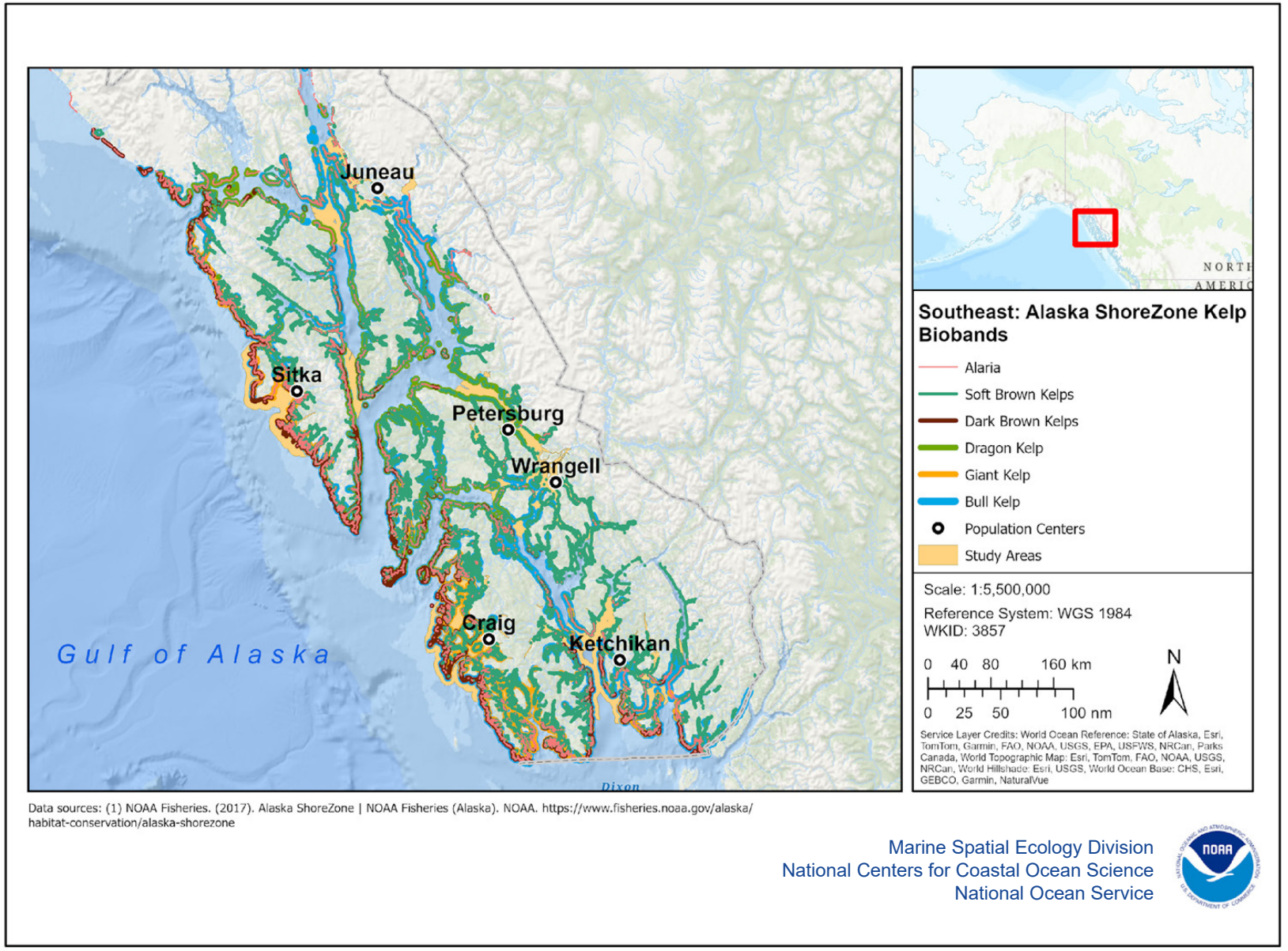
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Kelp BioBands

A Bioband is an observed assemblage of coastal biota which are spatially distinct, with alongshore and across-shore patterns of color and texture that are visible in aerial imagery.

Alaria - pink
Soft brown kelps - green
Dark brown kelps - brown
Dragon kelp - dk green
Giant kelp - orange
Bull kelp - blue

Source: ShoreZone, NOAA



Data sources: (1) NOAA Fisheries. (2017). Alaska ShoreZone | NOAA Fisheries (Alaska). NOAA. https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-shorezone

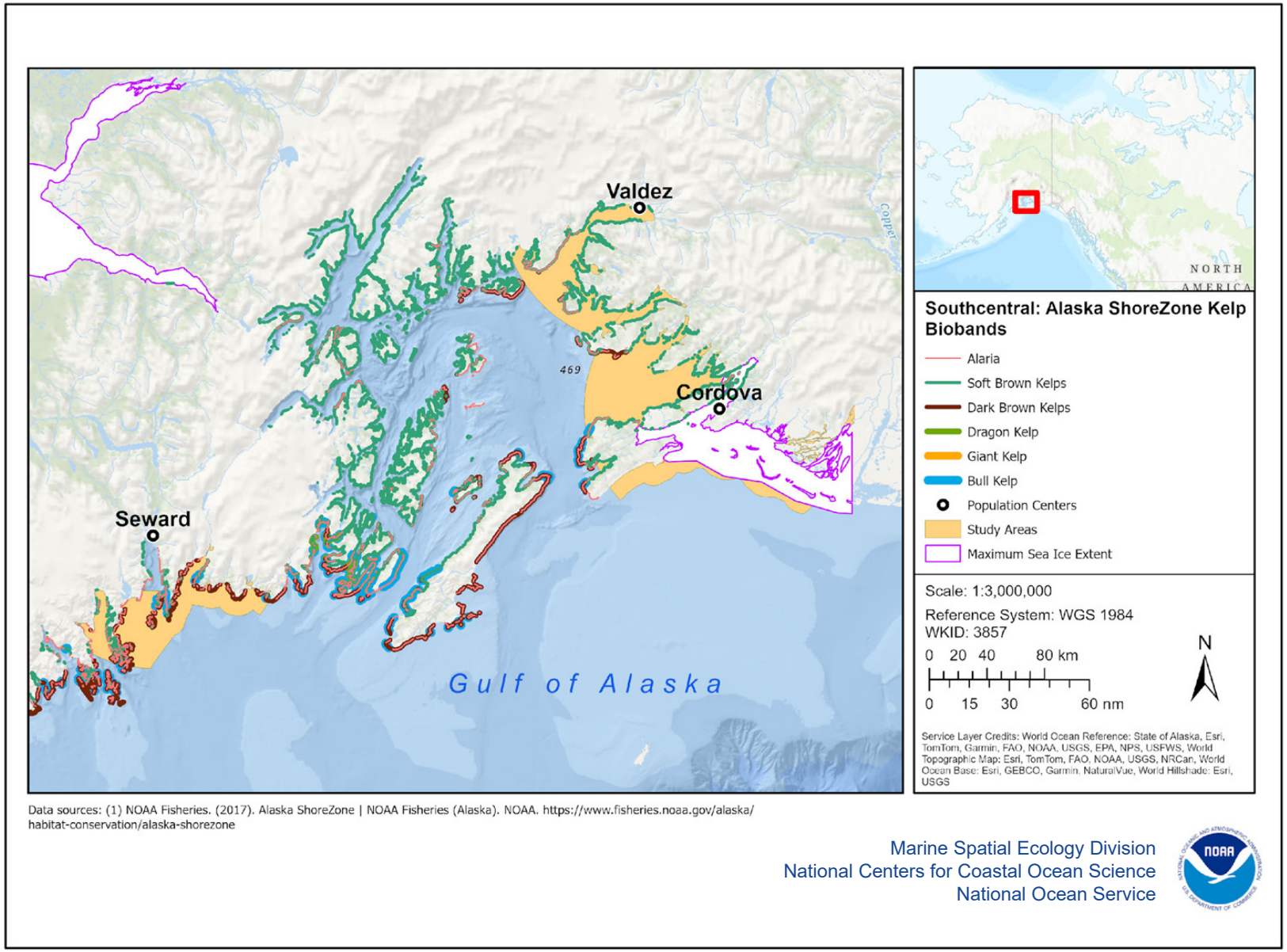
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Kelp BioBands

A Bioband is an observed assemblage of coastal biota which are spatially distinct, with alongshore and across-shore patterns of color and texture that are visible in aerial imagery.

Alaria - pink
Soft brown kelps - green
Dark brown kelps - brown
Dragon kelp - dk green
Giant kelp - orange
Bull kelp - blue

Source: ShoreZone, NOAA

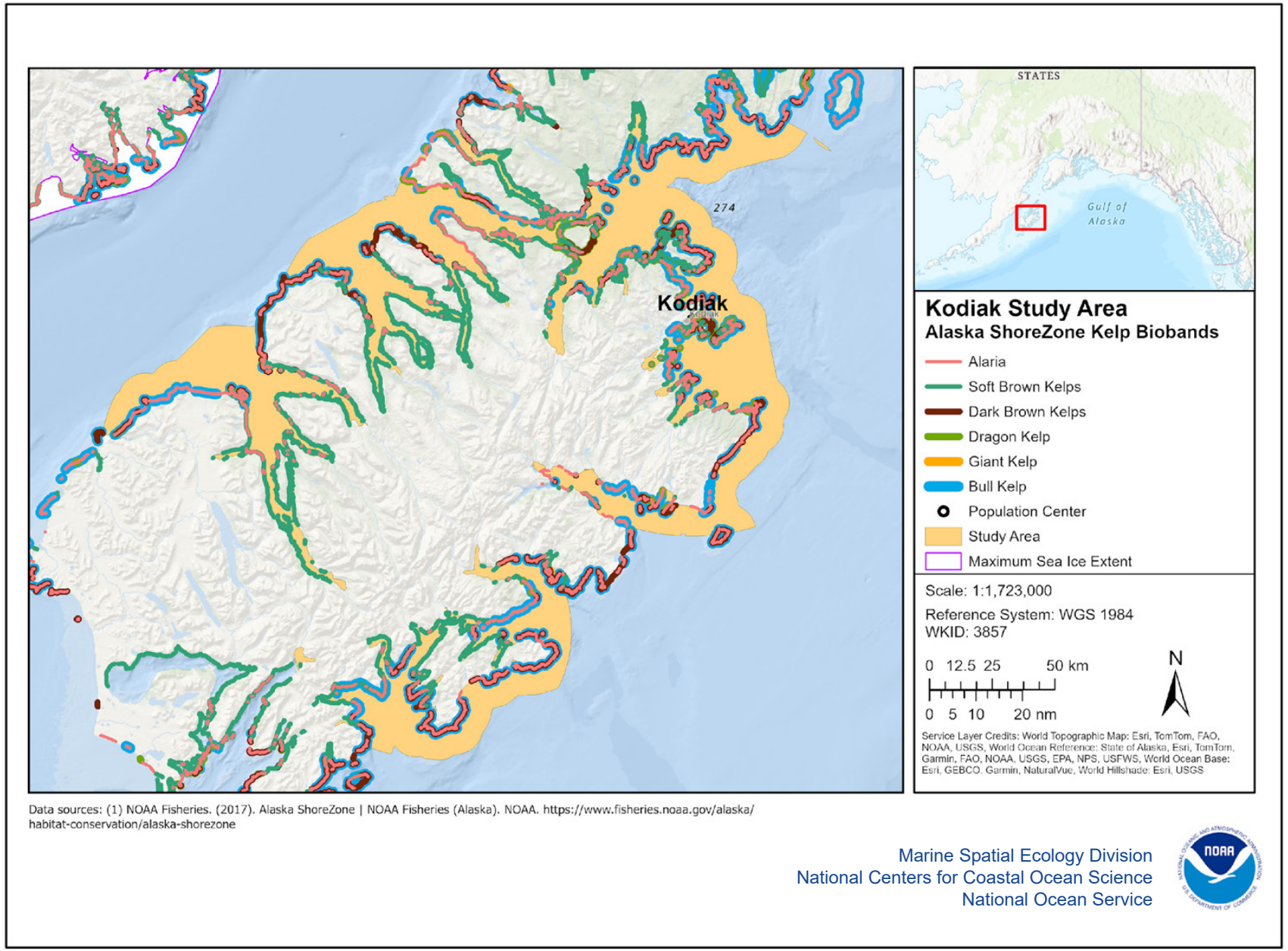


Kelp BioBands

A Bioband is an observed assemblage of coastal biota which are spatially distinct, with alongshore and across-shore patterns of color and texture that are visible in aerial imagery.

Alaria - pink
Soft brown kelps - green
Dark brown kelps - brown
Dragon kelp - dk green
Giant kelp - orange
Bull kelp - blue

Source: ShoreZone, NOAA



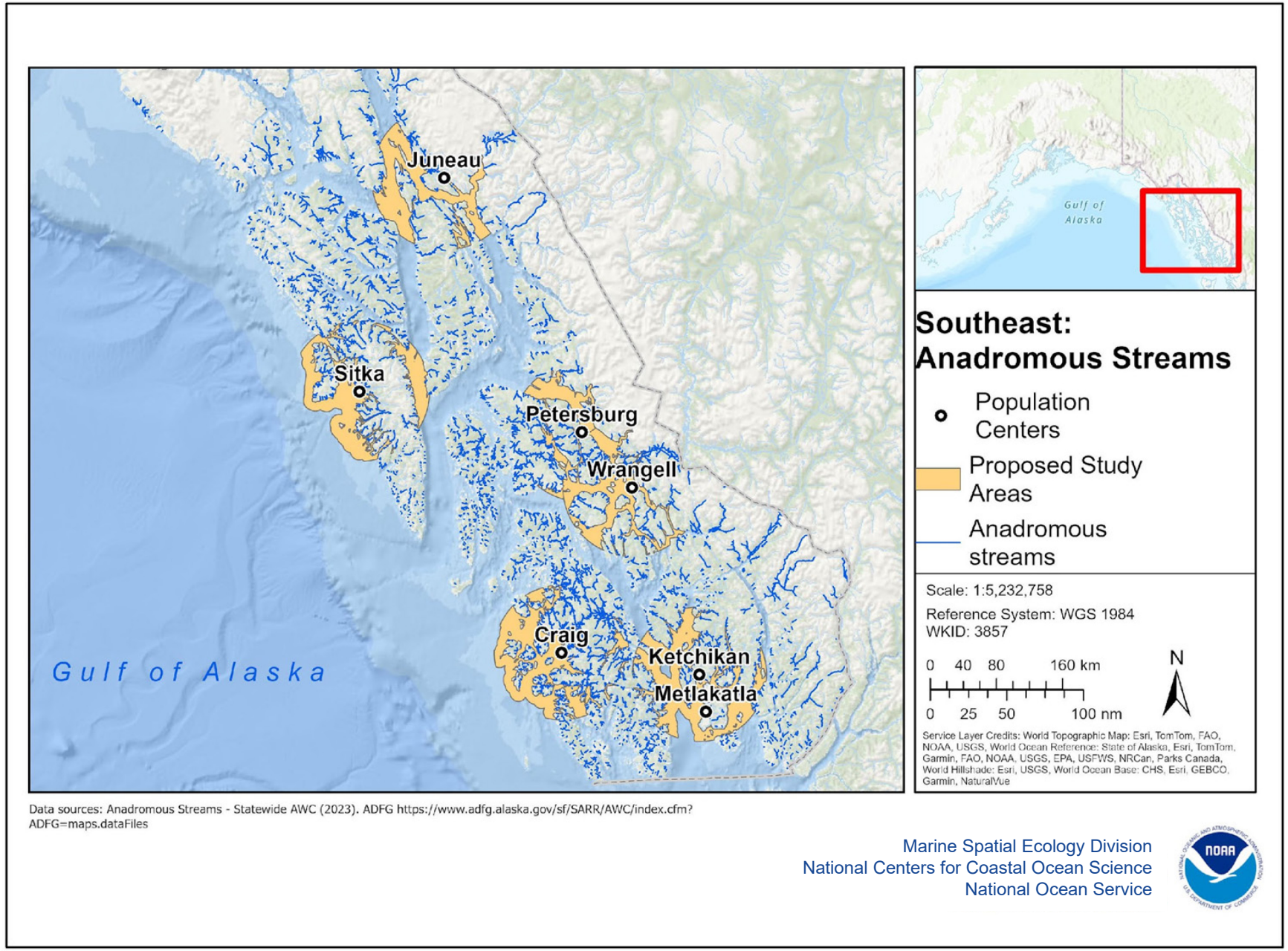
Data sources: (1) NOAA Fisheries. (2017). Alaska ShoreZone | NOAA Fisheries (Alaska). NOAA. https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-shorezone

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Anadromous Streams

The Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes and its associated Atlas currently lists almost 20,000 streams, rivers or lakes around the state which have been specified as being important for the spawning, rearing or migration of anadromous fish. However, based upon thorough surveys of a few drainages it is believed that this number represents a fraction of the streams, rivers, and lakes actually used by anadromous species.

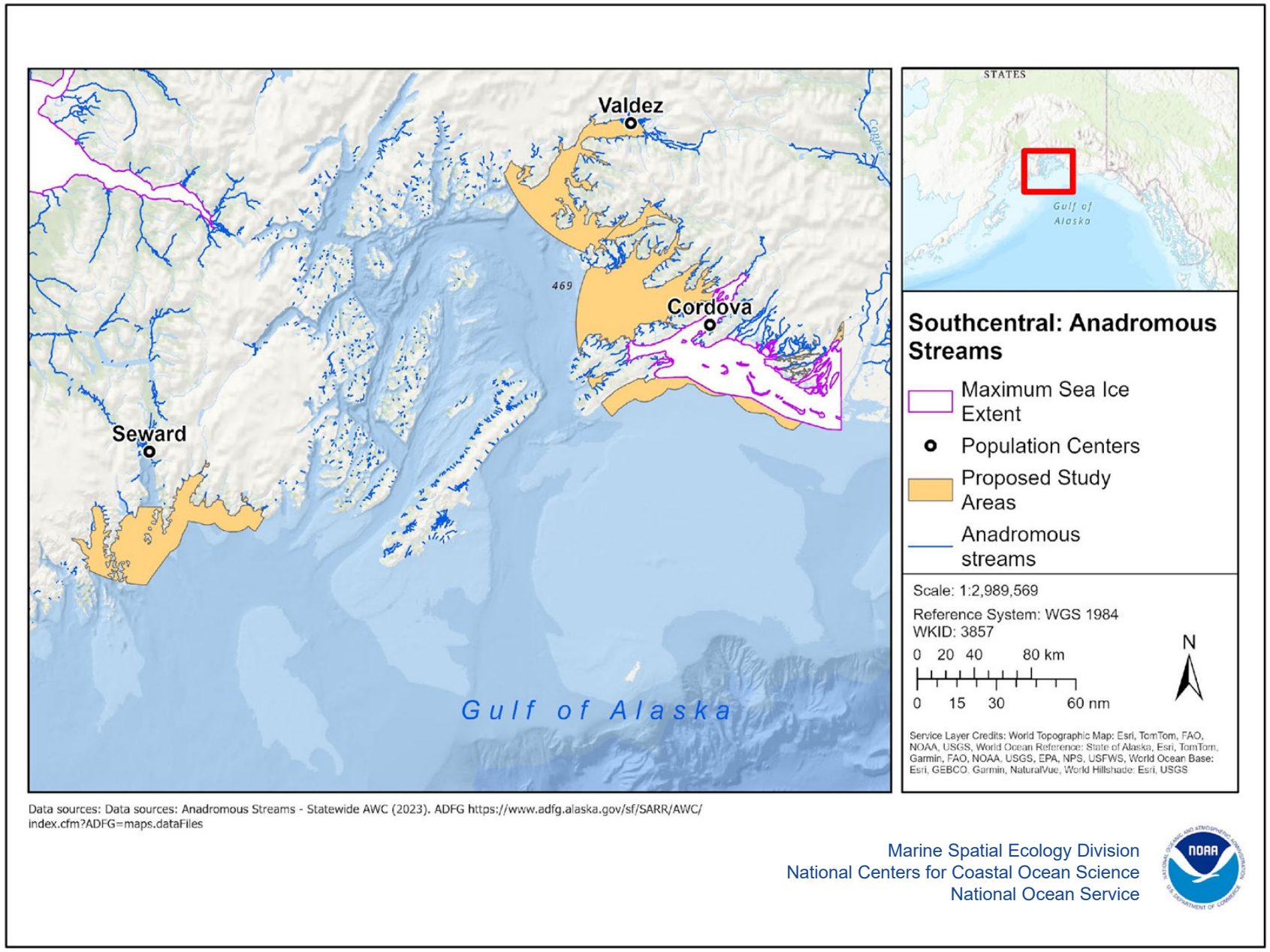
Source: ADF&G



Anadromous Streams

The Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes and its associated Atlas currently lists almost 20,000 streams, rivers or lakes around the state which have been specified as being important for the spawning, rearing or migration of anadromous fish. However, based upon thorough surveys of a few drainages it is believed that this number represents a fraction of the streams, rivers, and lakes actually used by anadromous species.

Source: ADF&G



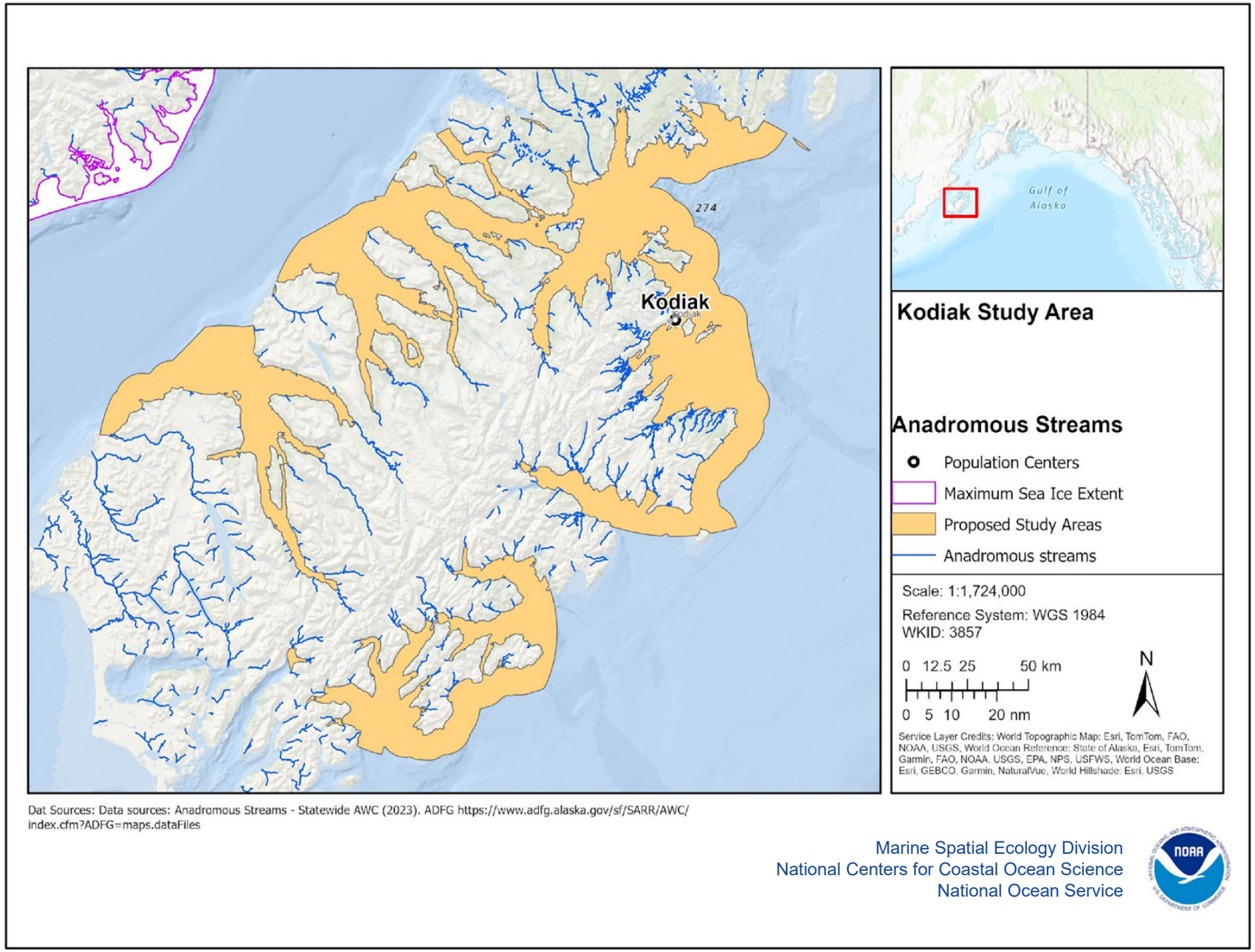
Data sources: Data sources: Anadromous Streams - Statewide AWC (2023). ADFG https://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=maps.dataFiles

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Anadromous Streams

The Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes and its associated Atlas currently lists almost 20,000 streams, rivers or lakes around the state which have been specified as being important for the spawning, rearing or migration of anadromous fish. However, based upon thorough surveys of a few drainages it is believed that this number represents a fraction of the streams, rivers, and lakes actually used by anadromous species.

Source: ADF&G

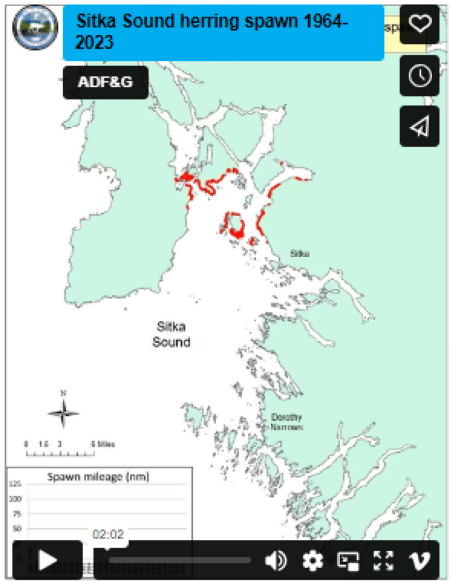


Herring Spawning

Pink areas represent Pacific herring spawning areas from the Bristol Bay, Cook Inlet, Kodiak, Prince William Sound, and Southeast Alaska regions.

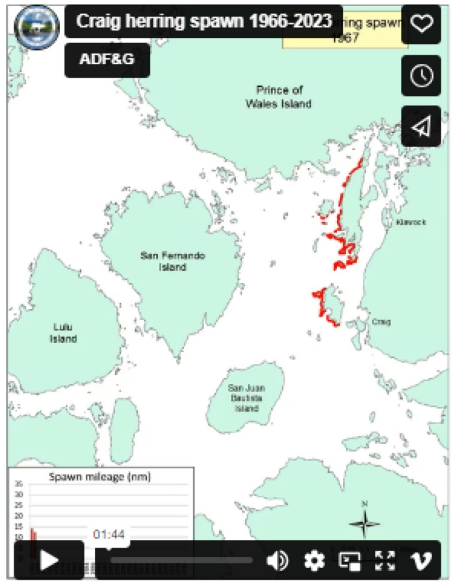
Source: NOAA, Office of Response and Restoration

Sitka Sound, 1964–2023



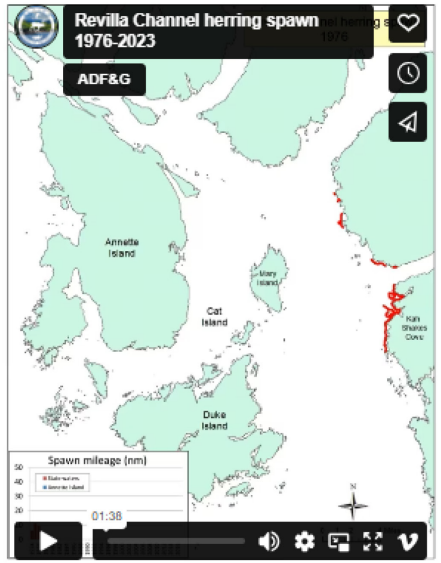
Sitka Sound Spawn Locations (*PDF 44,235 kB*)

Craig, 1966–2023



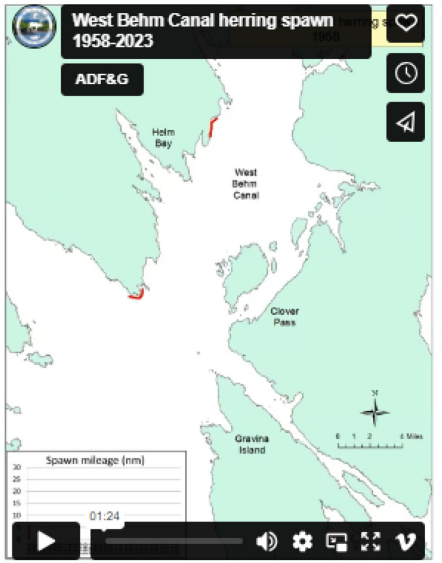
Craig Spawn Locations (*PDF 36,923 kB*)

Revilla Channel, 1976–2023



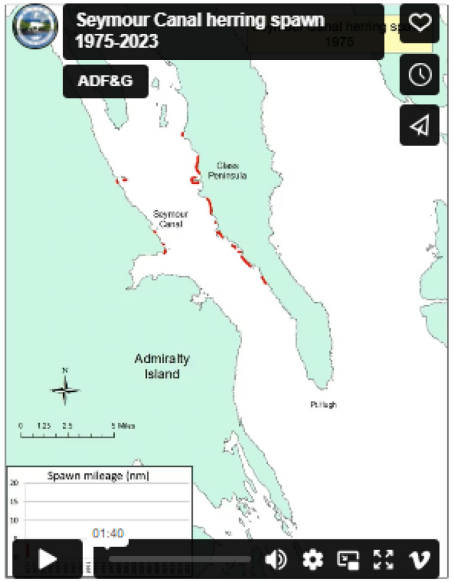
Revilla Channel Spawn Locations (*PDF 34,479 kB*)

West Behm Canal, 1958–2023

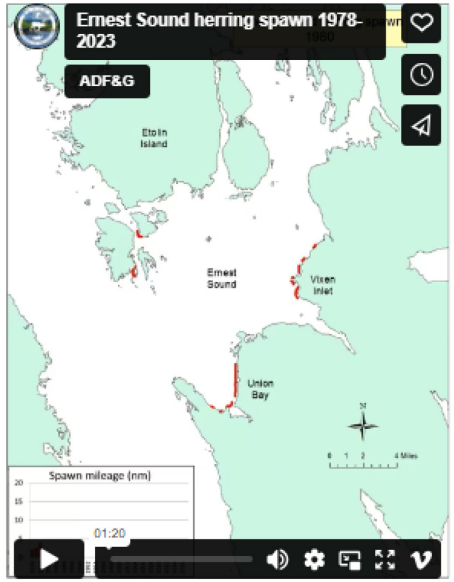


West Behm Canal Spawn Locations (*PDF 24,630 kB*)

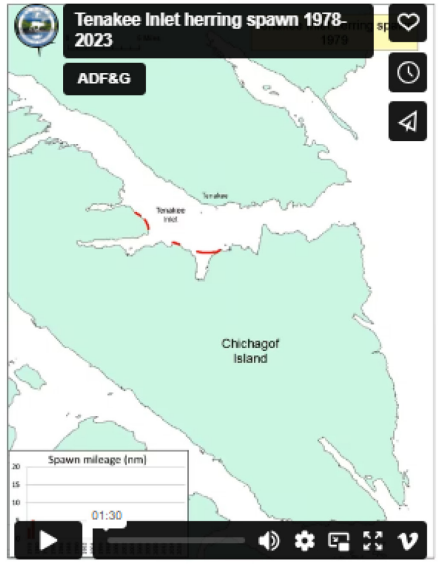
Seymour Canal, 1975–2023



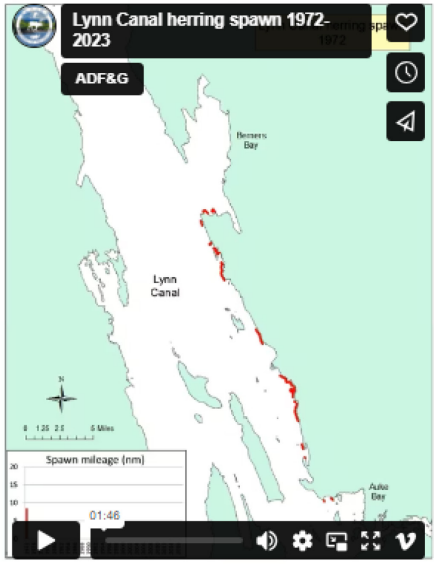
Ernest Sound, 1975–2023



Tenakee Inlet, 1978–2023



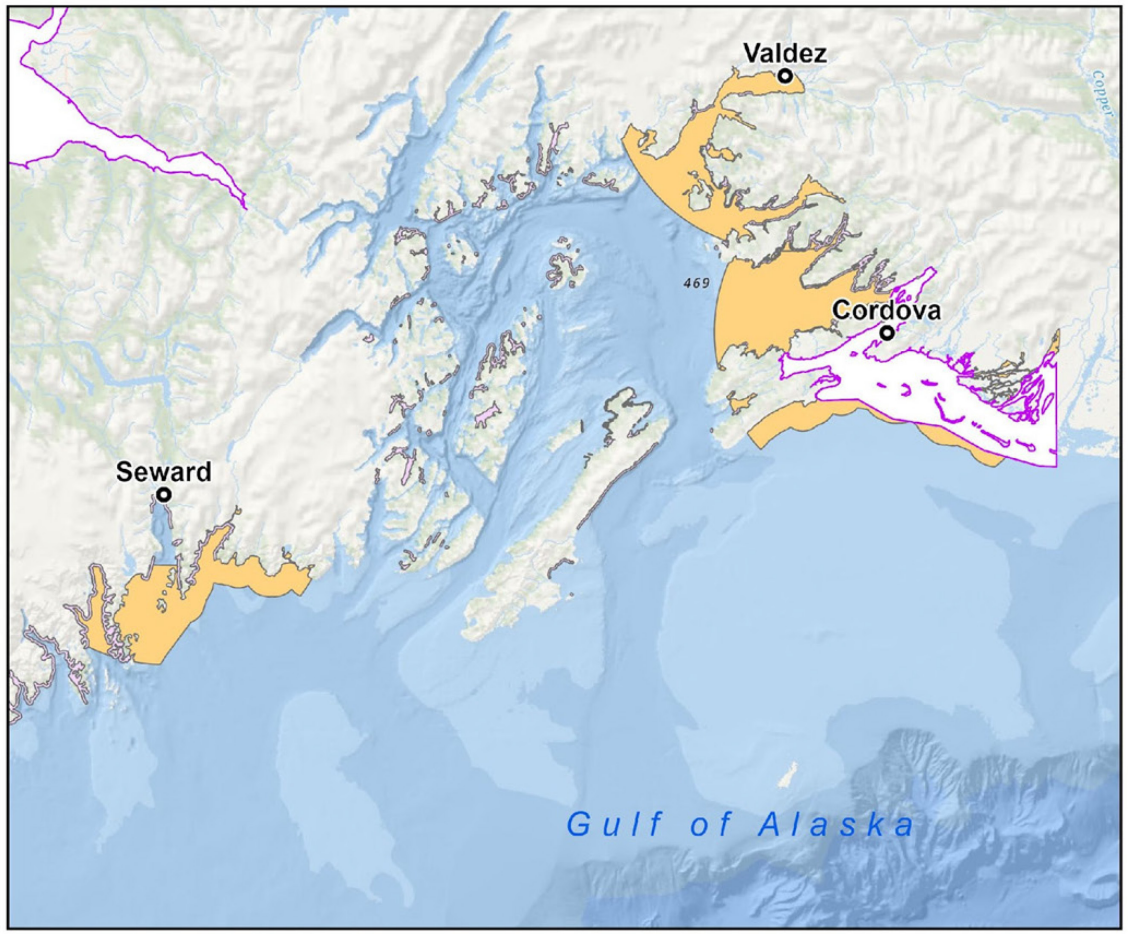
Lynn Canal, 1972–2023



Herring Spawning

Pink areas represent Pacific herring spawning areas from the Bristol Bay, Cook Inlet, Kodiak, Prince William Sound, and Southeast Alaska regions.

Source: NOAA, Office of Response and Restoration



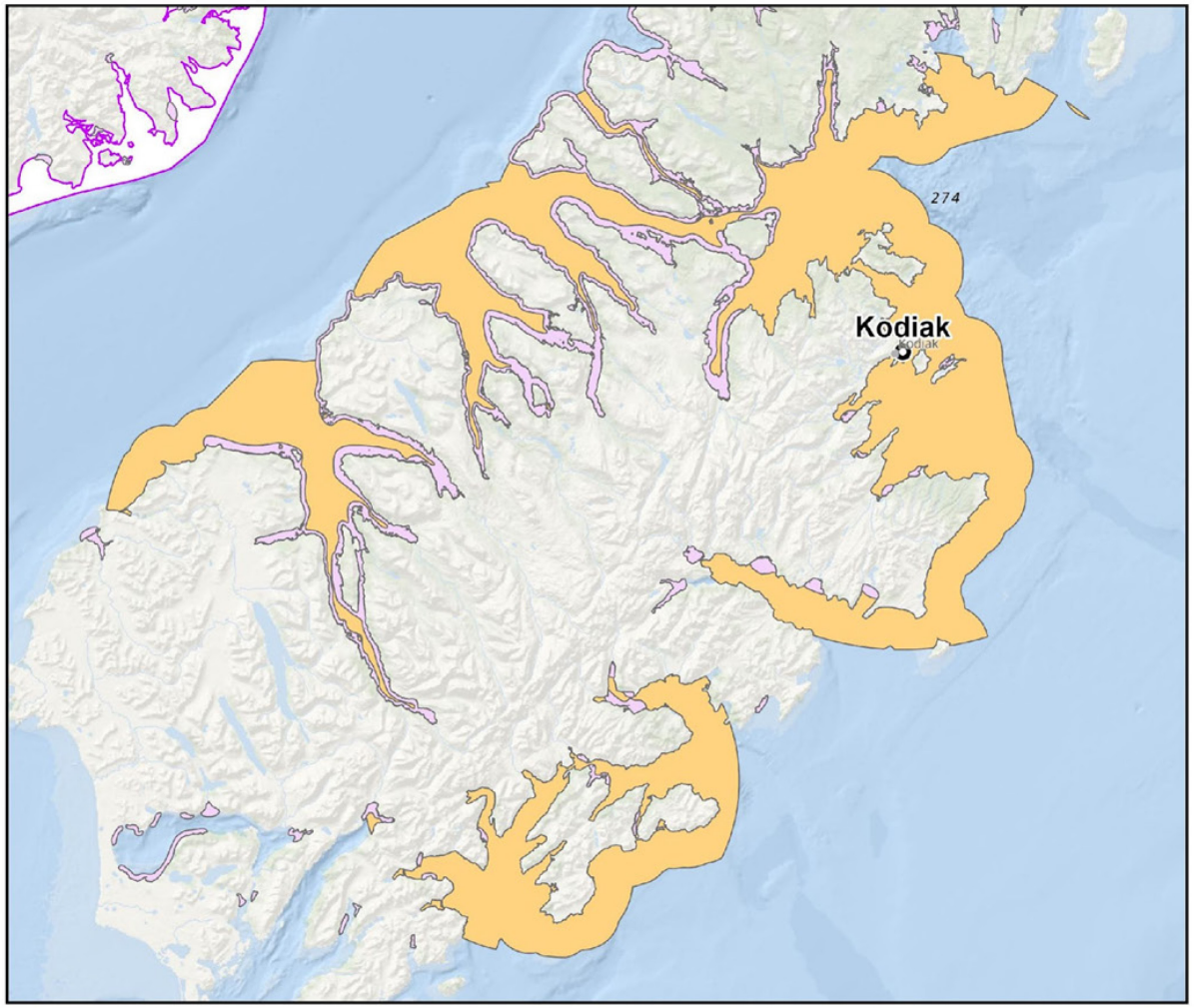
Data sources: NOAA Office of Response and Restoration. Download ESI Maps and GIS Data [Data files]. url: https://response.restoration.noaa.gov/esi_download

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Herring Spawning

Pink areas represent Pacific herring spawning areas from the Bristol Bay, Cook Inlet, Kodiak, Prince William Sound, and Southeast Alaska regions.

Source: NOAA, Office of Response and Restoration





Kodiak Study Area

Pacific Herring Spawning Areas

- Population Centers
- Maximum Sea Ice Extent
- Data present within study area
- Data absent within study area
- Pacific Herring Spawning Areas

Scale: 1:1,724,000

Reference System: WGS 1984
WKID: 3857

0 12.5 25 50 km

0 5 10 20 nm

N

Service Layer Credits: World Topographic Map: Esri, TomTom, FAO, NOAA, USGS, World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS, World Ocean Base: Esri, GEBCO, Garmin, NaturalVue, World Hillshade: Esri, USGS

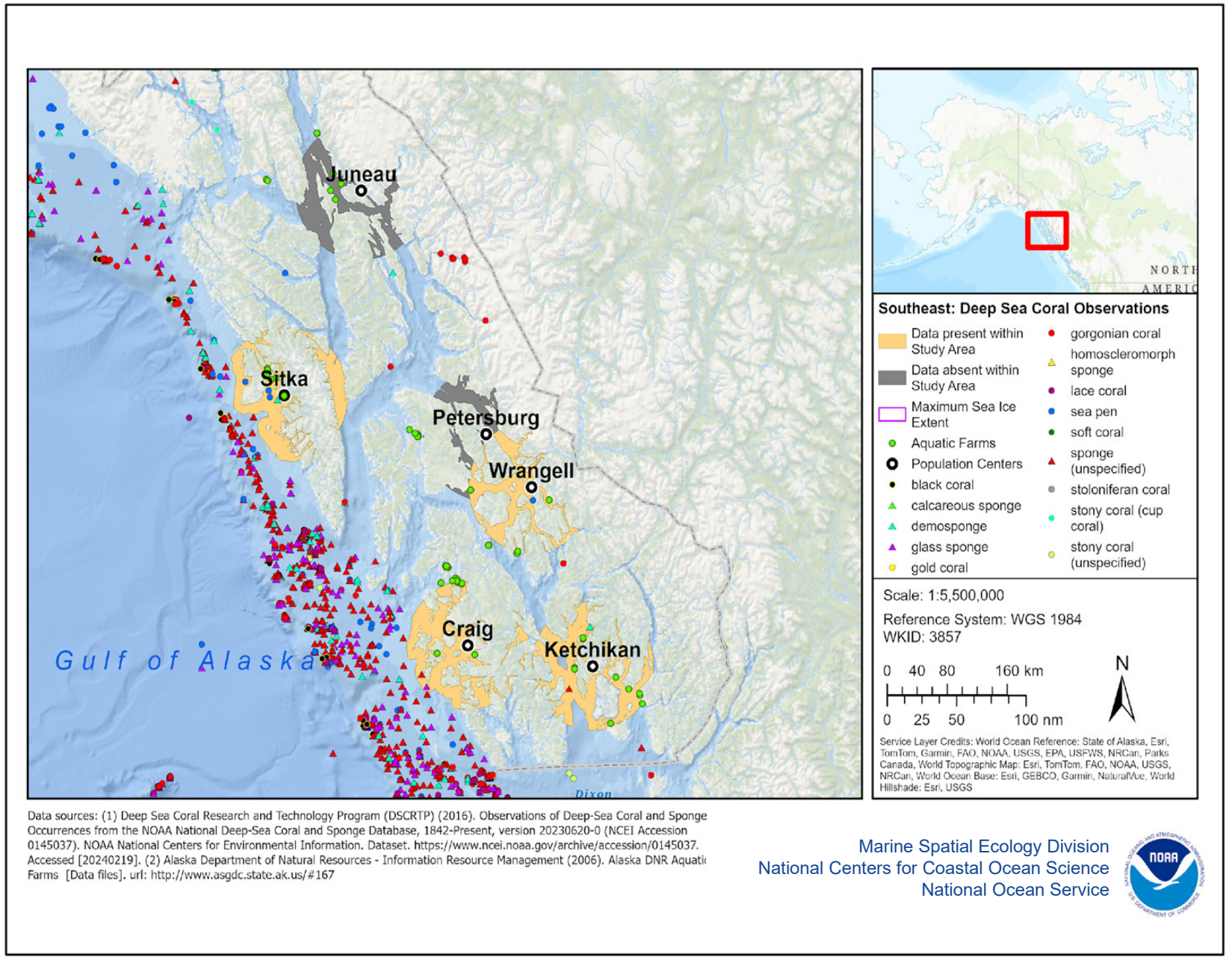
Dat Sources: NOAA Office of Response and Restoration. Download ESI Maps and GIS Data [Data files]. url: https://response.restoration.noaa.gov/esi_download

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Deep Sea Corals

NOAA's Deep Sea Coral Research and Technology Program National Deep Sea Corals and Sponges Database

Source: NOAA Deep Sea Coral Data Portal



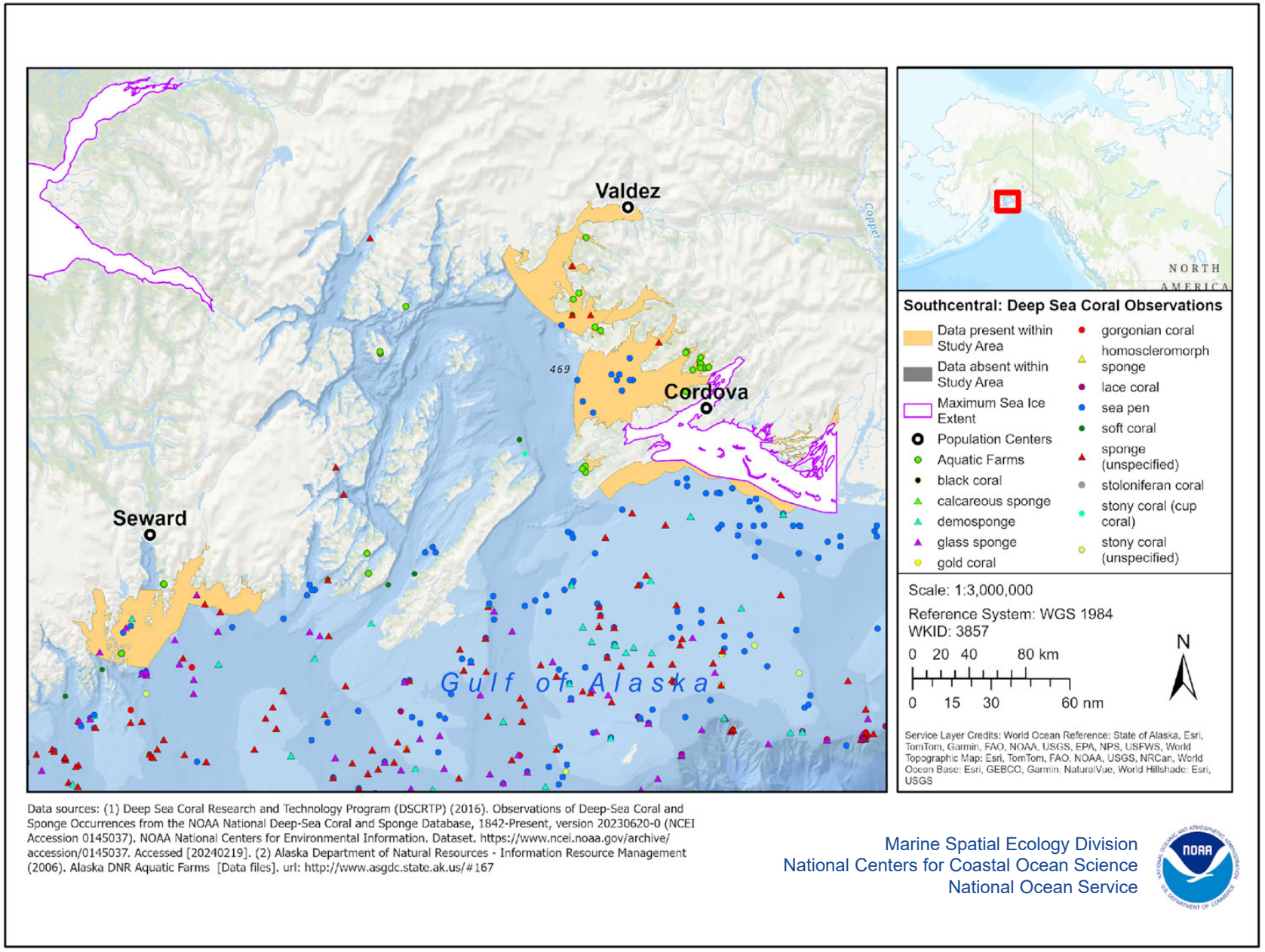
Data sources: (1) Deep Sea Coral Research and Technology Program (DSCRTP) (2016). Observations of Deep-Sea Coral and Sponge Occurrences from the NOAA National Deep-Sea Coral and Sponge Database, 1842-Present, version 20230620-0 (NCEI Accession 0145037). NOAA National Centers for Environmental Information. Dataset. https://www.ncei.noaa.gov/archive/accession/0145037. Accessed [20240219]. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Deep Sea Corals

NOAA's Deep Sea Coral Research and Technology Program National Deep Sea Corals and Sponges Database

Source: NOAA Deep Sea Coral Data Portal



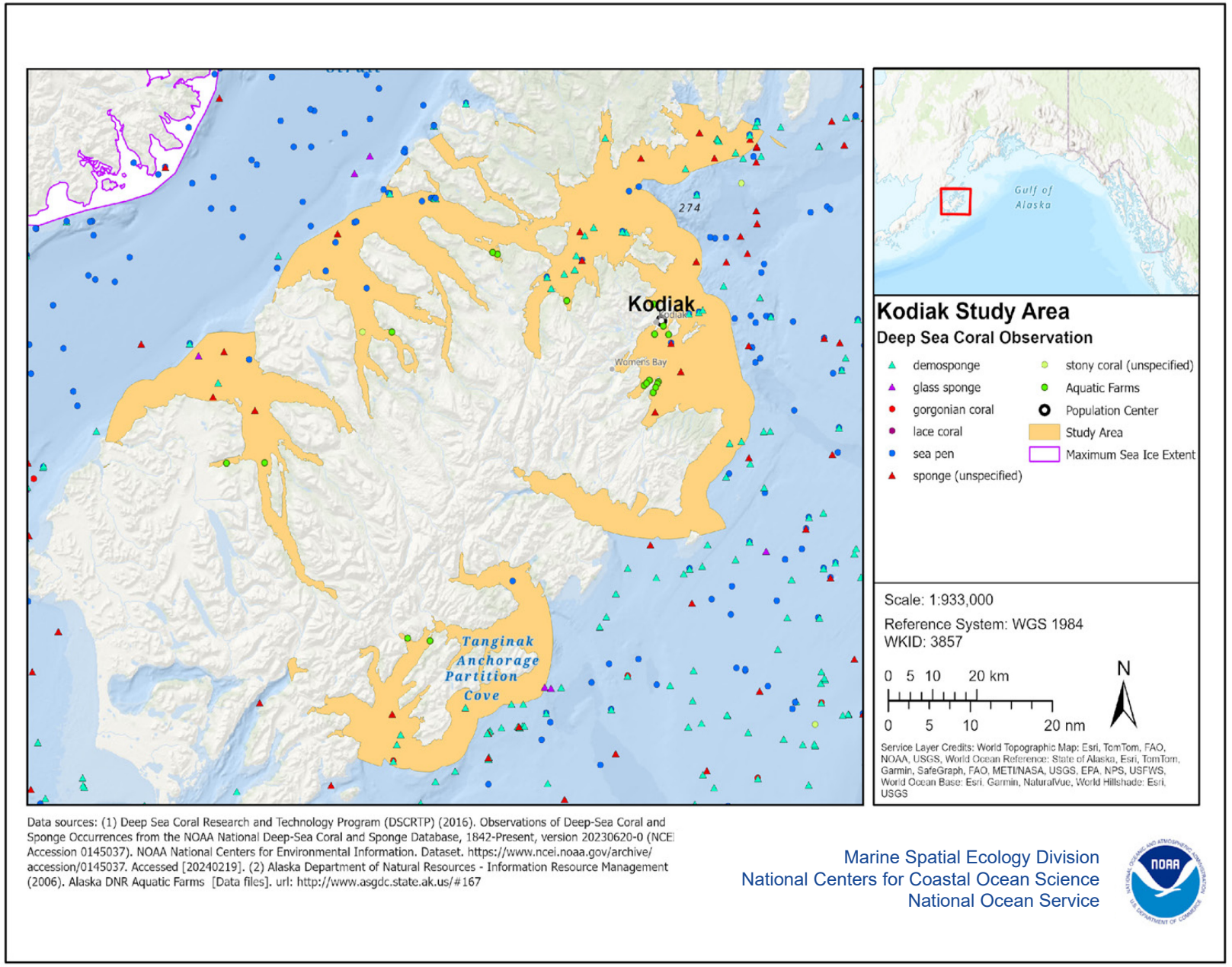
Data sources: (1) Deep Sea Coral Research and Technology Program (DSCRTP) (2016). Observations of Deep-Sea Coral and Sponge Occurrences from the NOAA National Deep-Sea Coral and Sponge Database, 1842-Present, version 20230620-0 (NCEI Accession 0145037). NOAA National Centers for Environmental Information. Dataset. https://www.ncei.noaa.gov/archive/accession/0145037. Accessed [20240219]. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Deep Sea Corals

NOAA's Deep Sea Coral Research and Technology Program National Deep Sea Corals and Sponges Database

Source: NOAA Deep Sea Coral Data Portal



Core Data Questions

1. What are your concerns or questions about the data layers just presented?

1. Are you aware of any data that are missing from the list but available? If so, can you provide a point of contact from whom we could acquire the data?

1. What data gaps exist? In considering the list of identified data gaps in group discussion, what stands out as a high priority?

Natural Resources

Natural Resources	Overlap	Type
NMFS ESA Critical Habitat	Southeast, Southcentral, Kodiak	Consideration
Whale Biologically Important Areas	Southeast, Southcentral, Kodiak	Consideration
Pinniped Haul Out Locations	Southeast, Southcentral, Kodiak	Consideration
Sea Otter Concentration Areas	Southeast, Southcentral, Kodiak	Consideration
FWS ESA Critical Habitat	Kodiak	Consideration
NMFS Essential Fish Habitat	Southeast, Southcentral, Kodiak	Consideration
Kelp and Eelgrass Shore	Southeast, Southcentral, Kodiak	Consideration
Seagrass BioBand	Southeast, Southcentral, Kodiak	Consideration
Kelp BioBand Shore Zone	Southeast, Southcentral, Kodiak	Consideration
Anadromous Stream	Southeast, Southcentral, Kodiak	Constraint
Audubon Bird IBA	Southeast, Southcentral, Kodiak	Consideration
Herring Spawning	Southeast, Southcentral, Kodiak	Consideration
Deep Sea Corals	Southeast, Southcentral, Kodiak	Consideration

Cultural and Social Resources



Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

Cultural and Social Resources

- Coastal infrastructure/working waterfronts
- *Personal use and Subsistence fisheries
- *Traditional/ceremonial or important recreational uses of marine or coastal areas (dive sites, sandbars, transit routes to those areas, etc)
- *Underwater and/or coastal actual or possible archeological sites

***Limited current spatially explicit public information**

Community Subsistence Information System Data

ADF&G Home » Subsistence Hunting & Fishing » Harvest Data & Reports » CSIS

myADF&G

Welcome to the Community Subsistence Information System: CSIS

The CSIS is the repository of Alaska community harvest information gathered by the Alaska Department of Fish and Game, Division of Subsistence.

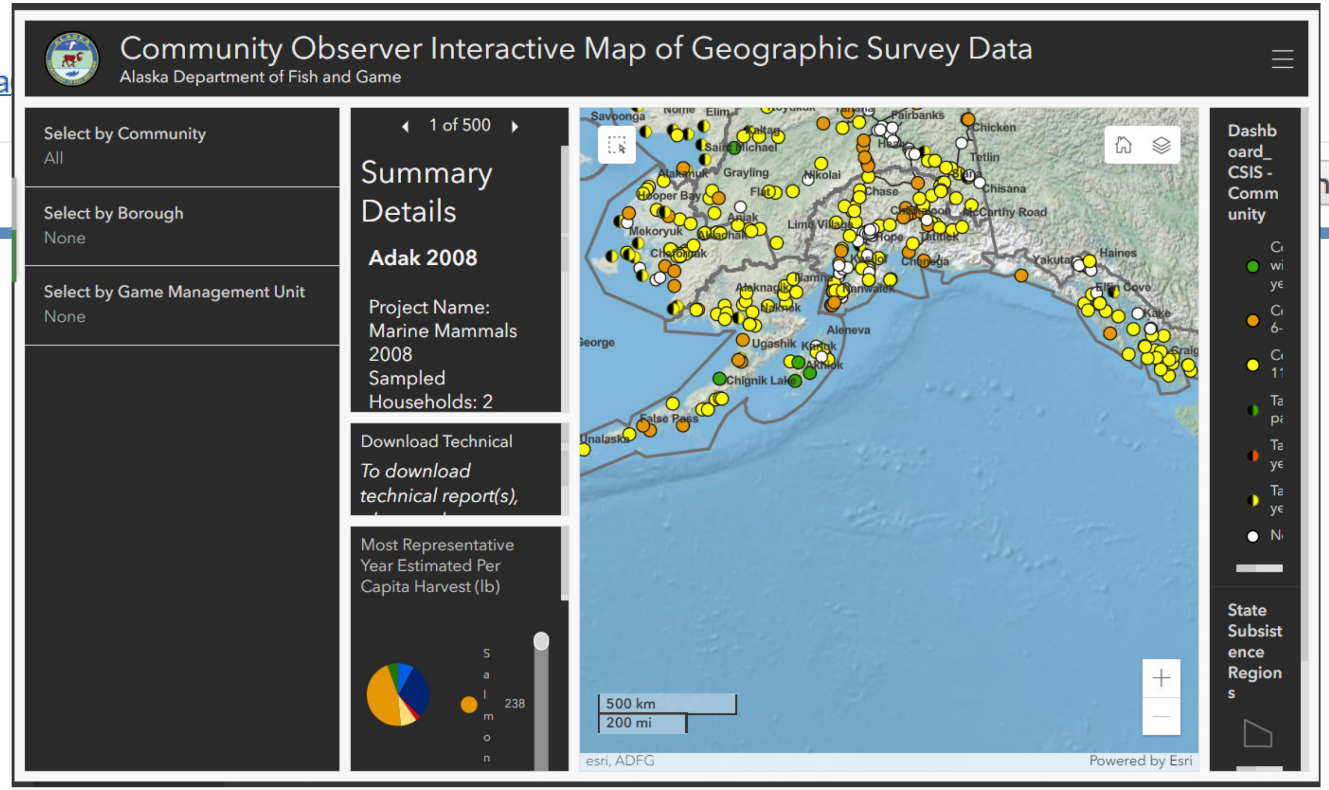
Harvest Information (What's this?)
- Harvest by Community
- Resource Categories
- Resource by Region
- State Subsistence Region
- Federal Subsistence Region

Community Information (What's this?)
- Summary Information
- Economics
- Demographics
- References
- Methods

Special Topic Reports
- Conversion Factor Summary
- Downloadable Special Reports

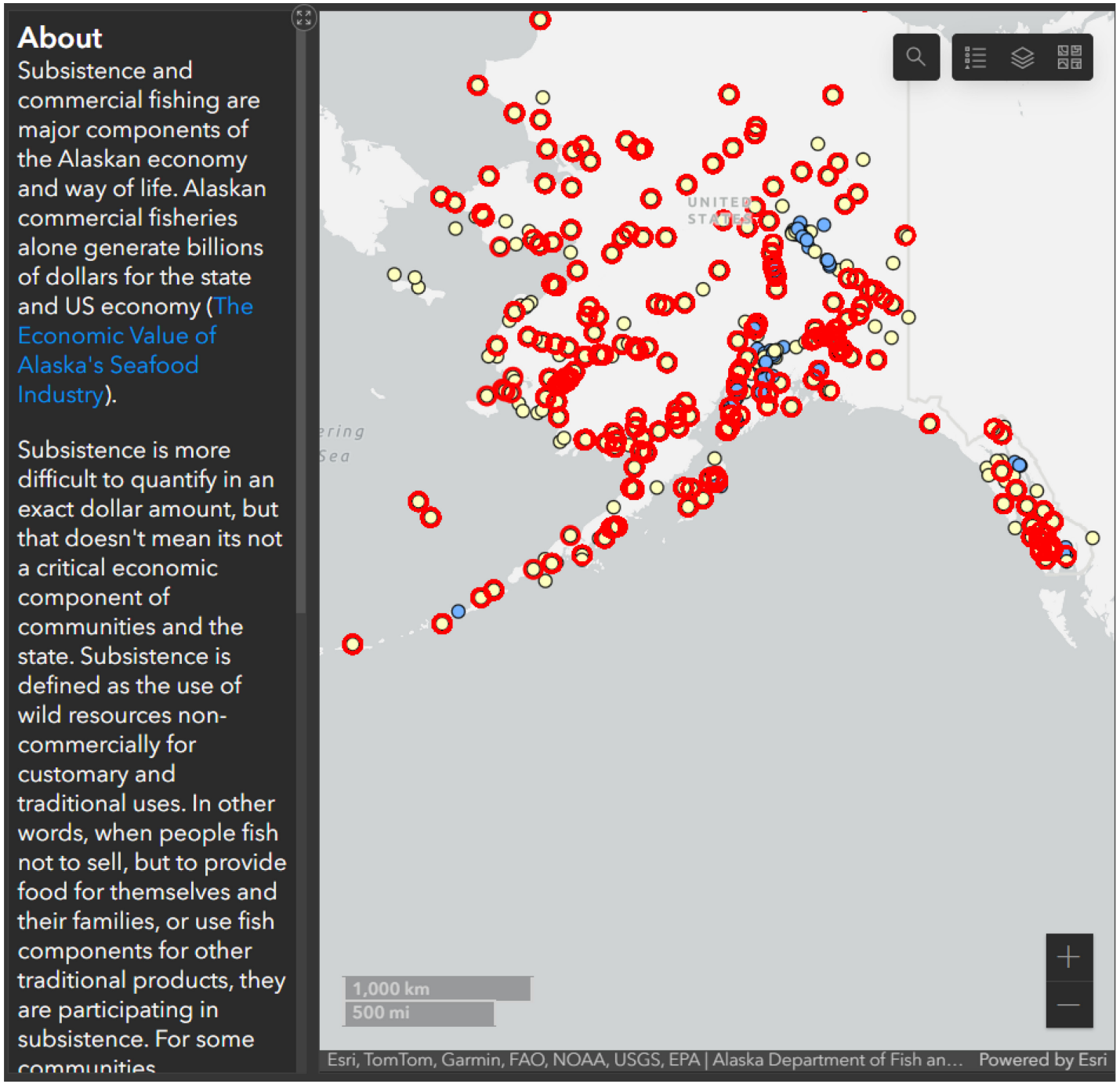
Community Observer
- Interactive Map of Geographic Survey Data

Game Management Unit
- Specific Game Management Units
- GMU (plus communities within a 25 mile ra



Subsistence Fisheries Revenues

Source: ADF&G

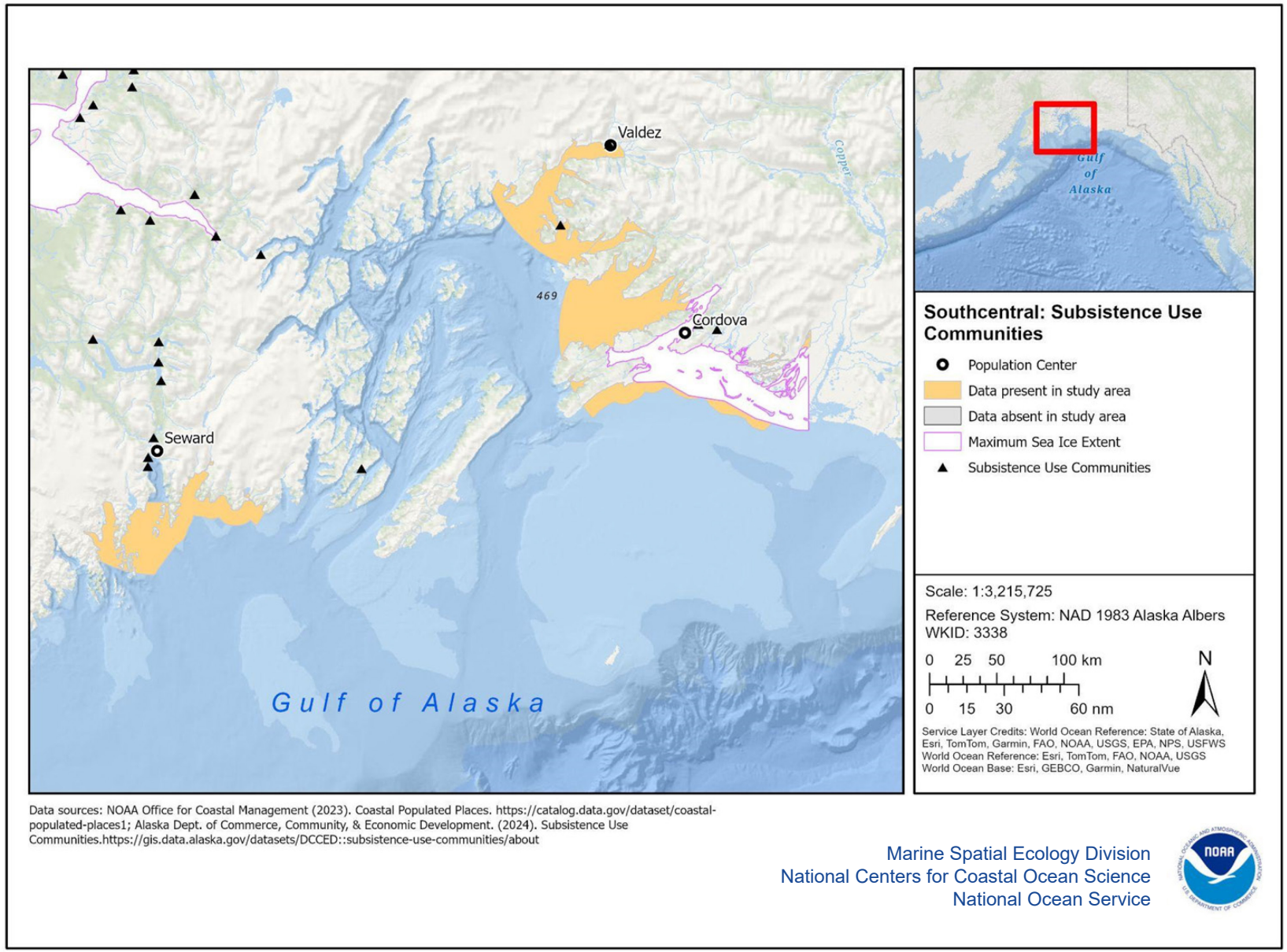


Subsistence Use Communities

Communities are designated based on socioeconomic characteristics:

- Social and economic structure
- Economic stability
- Employment information
- Cash income information
- Costs of goods and services
- Variety of species used
- Seasonality of the economy
- Resident participation
- Harvest levels
- Values associated with harvest
- Areas of harvest
- Extent of sharing harvest

Source: Alaska Dept. of Commerce, Community, & Economic Development

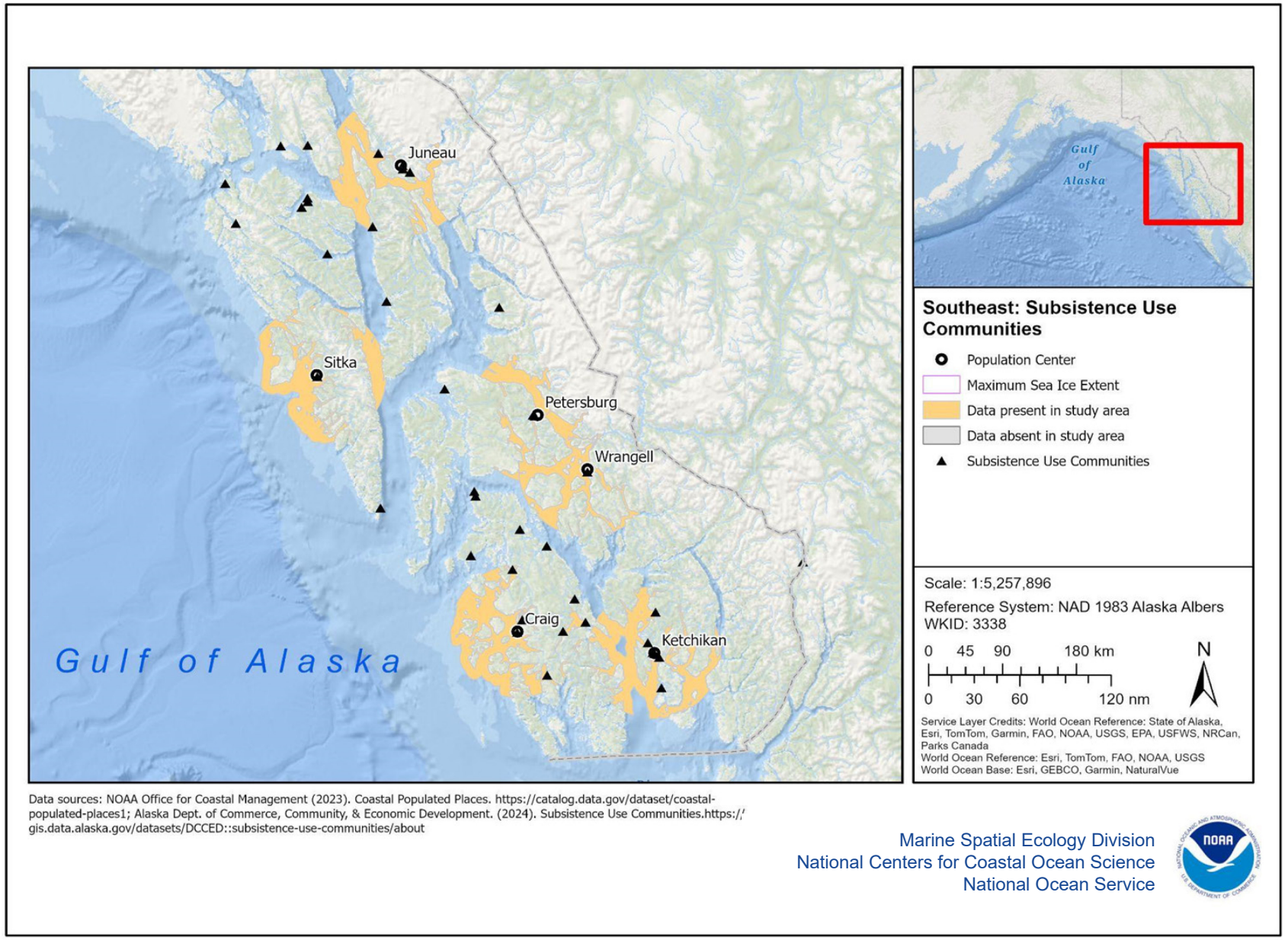


Subsistence Use Communities

Communities are designated based on socioeconomic characteristics:

- Social and economic structure
- Economic stability
- Employment information
- Cash income information
- Costs of goods and services
- Variety of species used
- Seasonality of the economy
- Resident participation
- Harvest levels
- Values associated with harvest
- Areas of harvest
- Extent of sharing harvest

Source: Alaska Dept. of Commerce, Community, & Economic Development

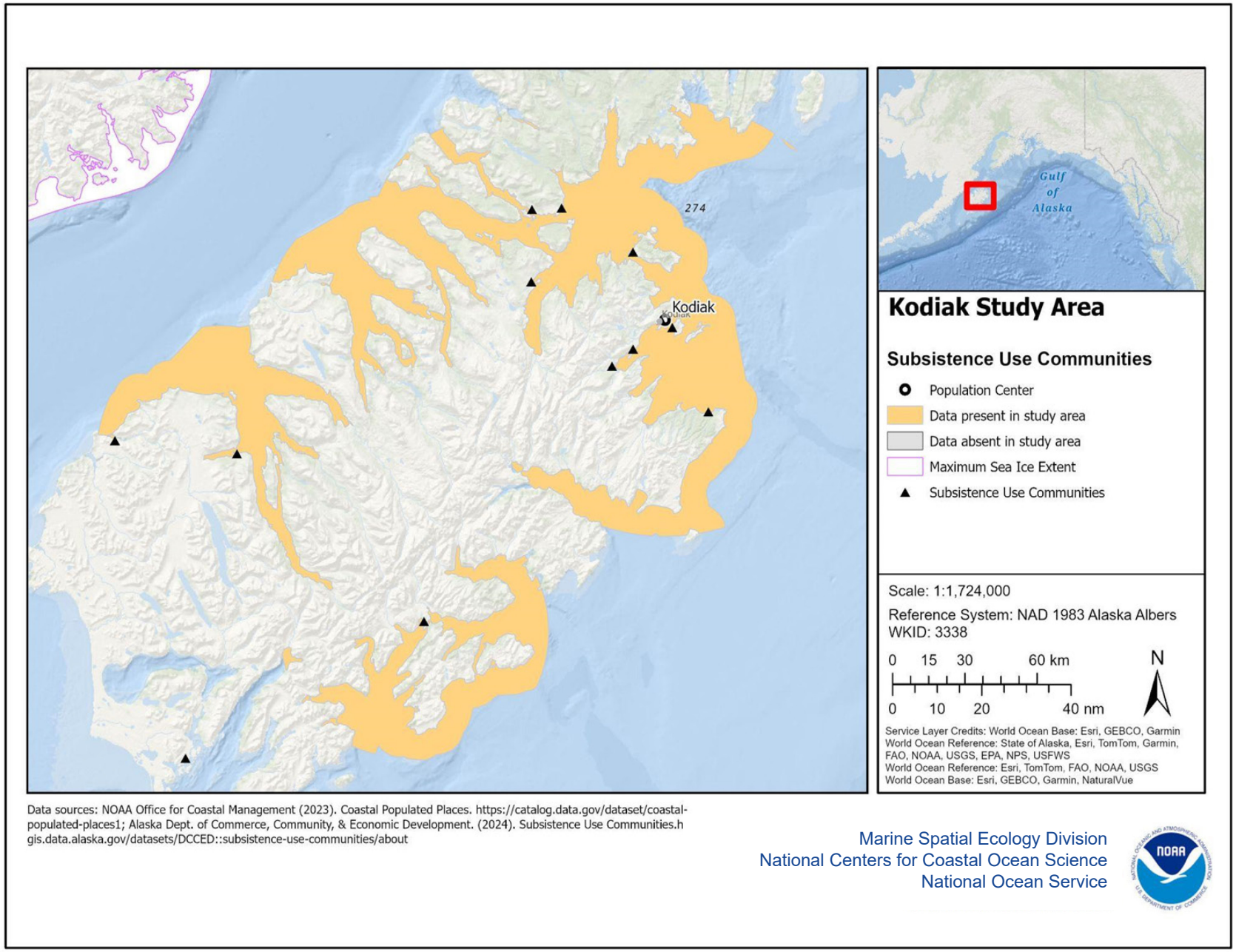


Subsistence Use Communities

Communities are designated based on socioeconomic characteristics:

- Social and economic structure
- Economic stability
- Employment information
- Cash income information
- Costs of goods and services
- Variety of species used
- Seasonality of the economy
- Resident participation
- Harvest levels
- Values associated with harvest
- Areas of harvest
- Extent of sharing harvest

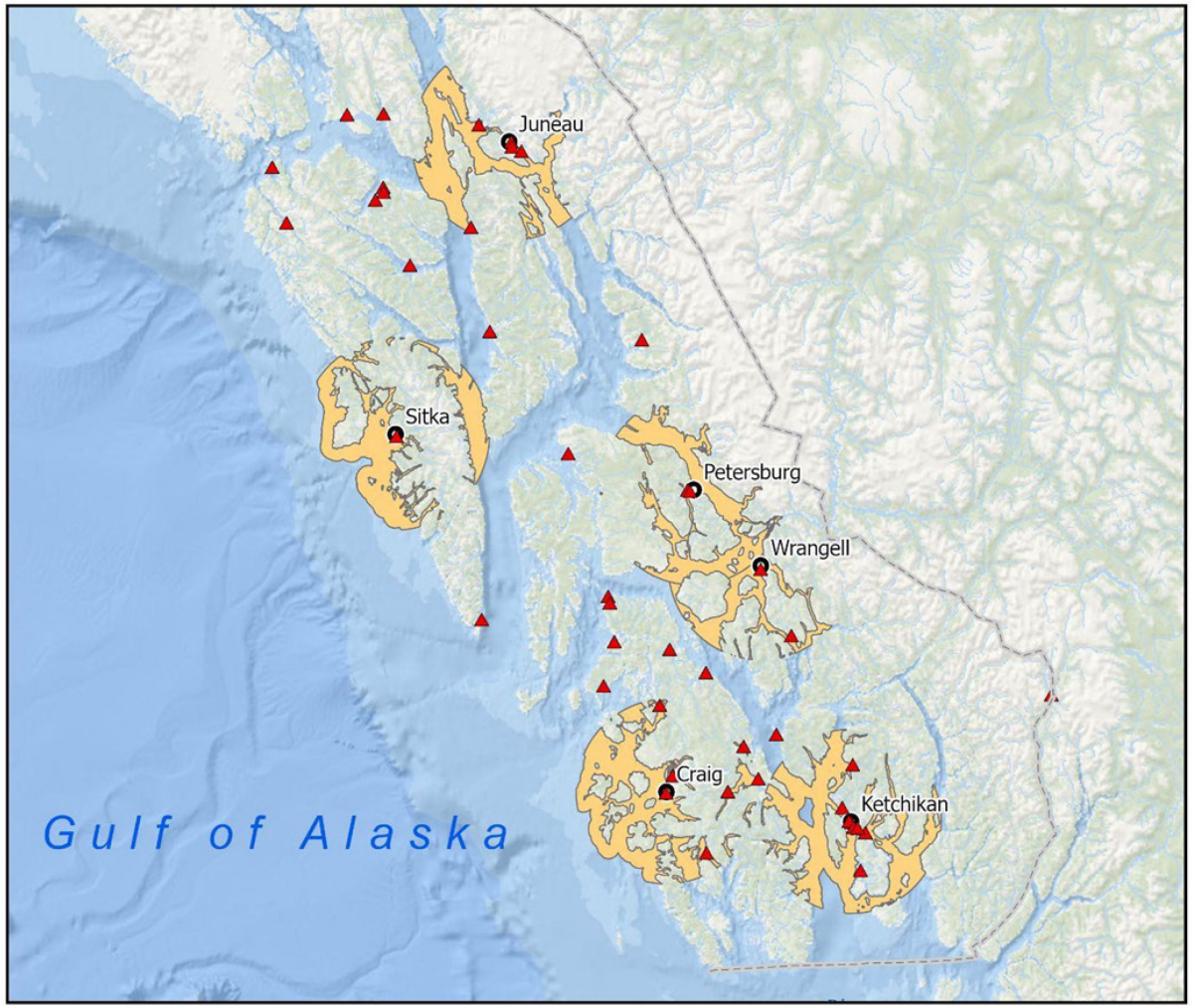
Source: Alaska Dept. of Commerce, Community, & Economic Development

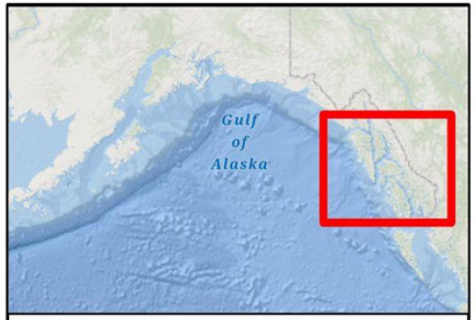


Community Culture and History

Culture and history narratives for each these communities in Alaska as indicated by red triangles.

Source: Alaska Department of Commerce, Community, & Economic Development





Southeast: Community Culture and History

- Population Center
- Maximum Sea Ice Extent
- Data present in study area
- Data absent in study area
- Community Culture and History

Scale: 1:5,257,896

Reference System: NAD 1983 Alaska Albers
WKID: 3338

0 45 90 180 km

0 30 60 120 nm

N

Service Layer Credits: World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS, NRCan, Parks Canada
World Ocean Reference: Esri, TomTom, FAO, NOAA, USGS
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue

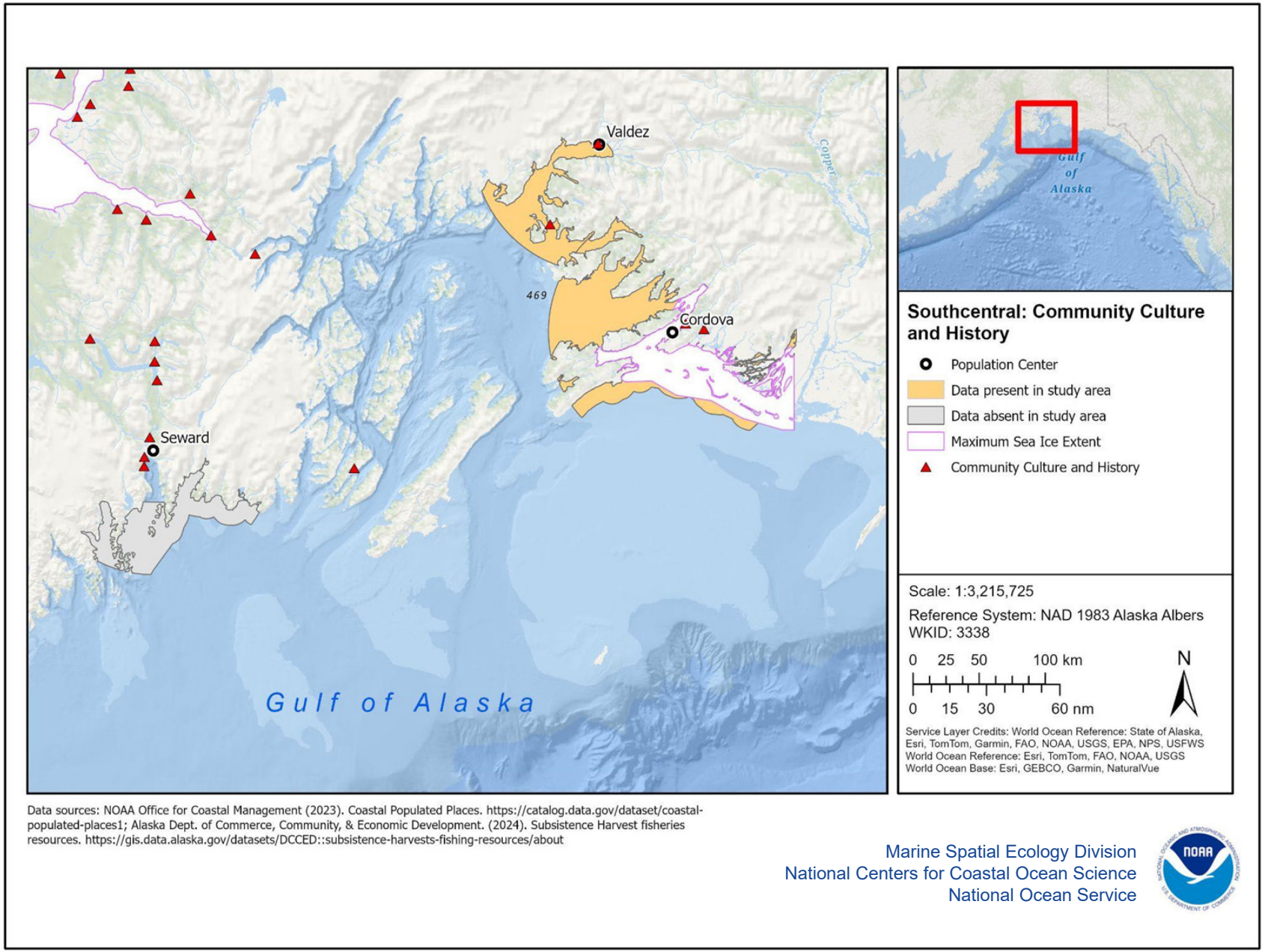
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024). Subsistence Harvest fisheries resources. https://gis.data.alaska.gov/datasets/DCCED::subsistence-harvests-fishing-resources/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Community Culture and History

Culture and history narratives for each these communities in Alaska as indicated by red triangles.

Source: Alaska Department of Commerce, Community, & Economic Development



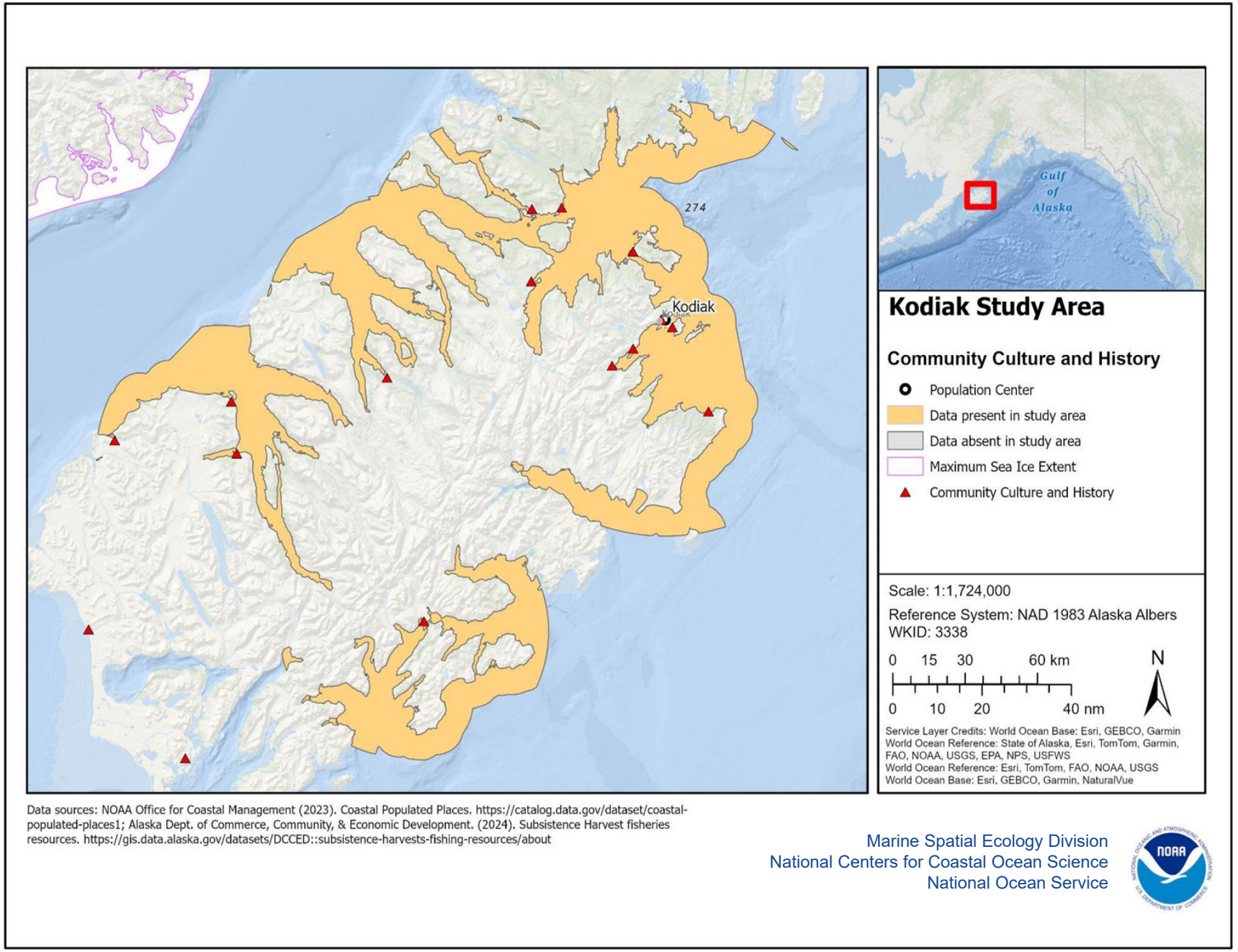
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024). Subsistence Harvest fisheries resources. https://gis.data.alaska.gov/datasets/DCCED::subsistence-harvests-fishing-resources/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Community Culture and History

Culture and history narratives for each these communities in Alaska as indicated by red triangles.

Source: Alaska Department of Commerce, Community, & Economic Development

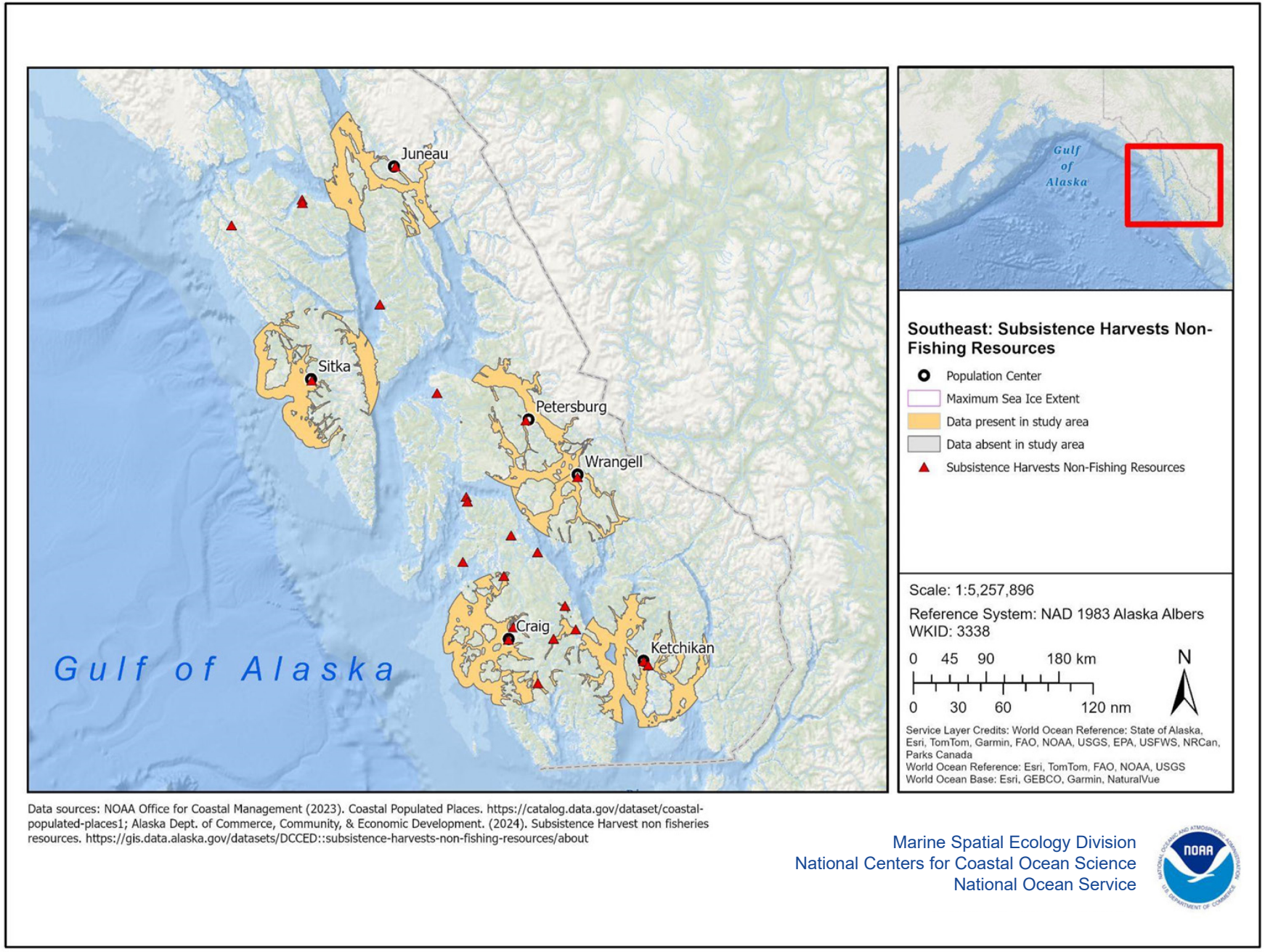


Subsistence Harvest Non-Fisheries Resources

Non Fishing Subsistence use designations for all locations in Alaska.

Subsistence use designations for all locations in Alaska, determined by the Joint Board of Fisheries and Game.

Source: ADF&G



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024). Subsistence Harvest non fisheries resources. https://gis.data.alaska.gov/datasets/DCCED::subsistence-harvests-non-fishing-resources/about

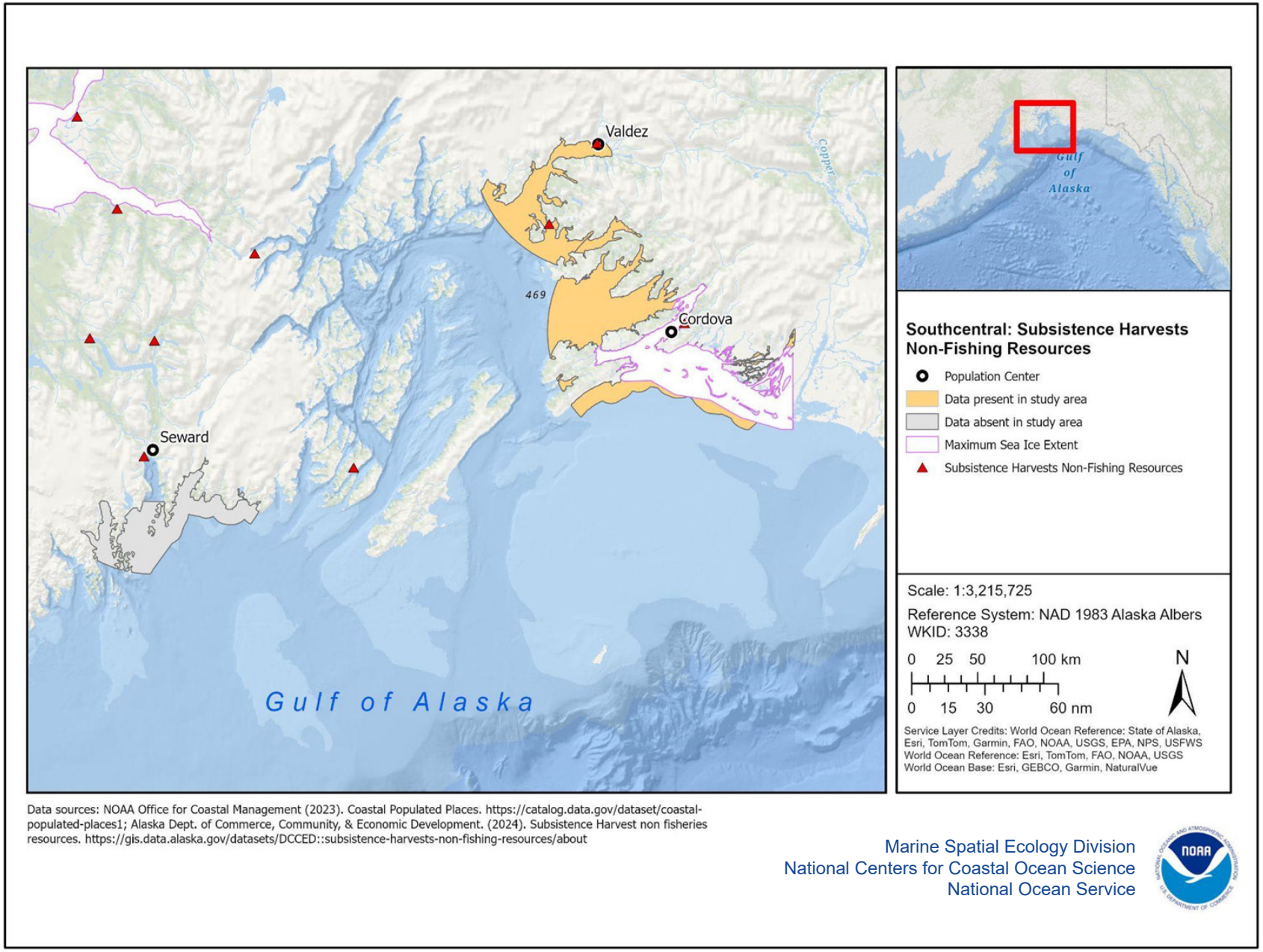
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Subsistence Harvest Non-Fisheries Resources

Non Fishing Subsistence use designations for all locations in Alaska.

Subsistence use designations for all locations in Alaska, determined by the Joint Board of Fisheries and Game.

Source: ADF&G



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024). Subsistence Harvest non fisheries resources. https://gis.data.alaska.gov/datasets/DCCED::subsistence-harvests-non-fishing-resources/about

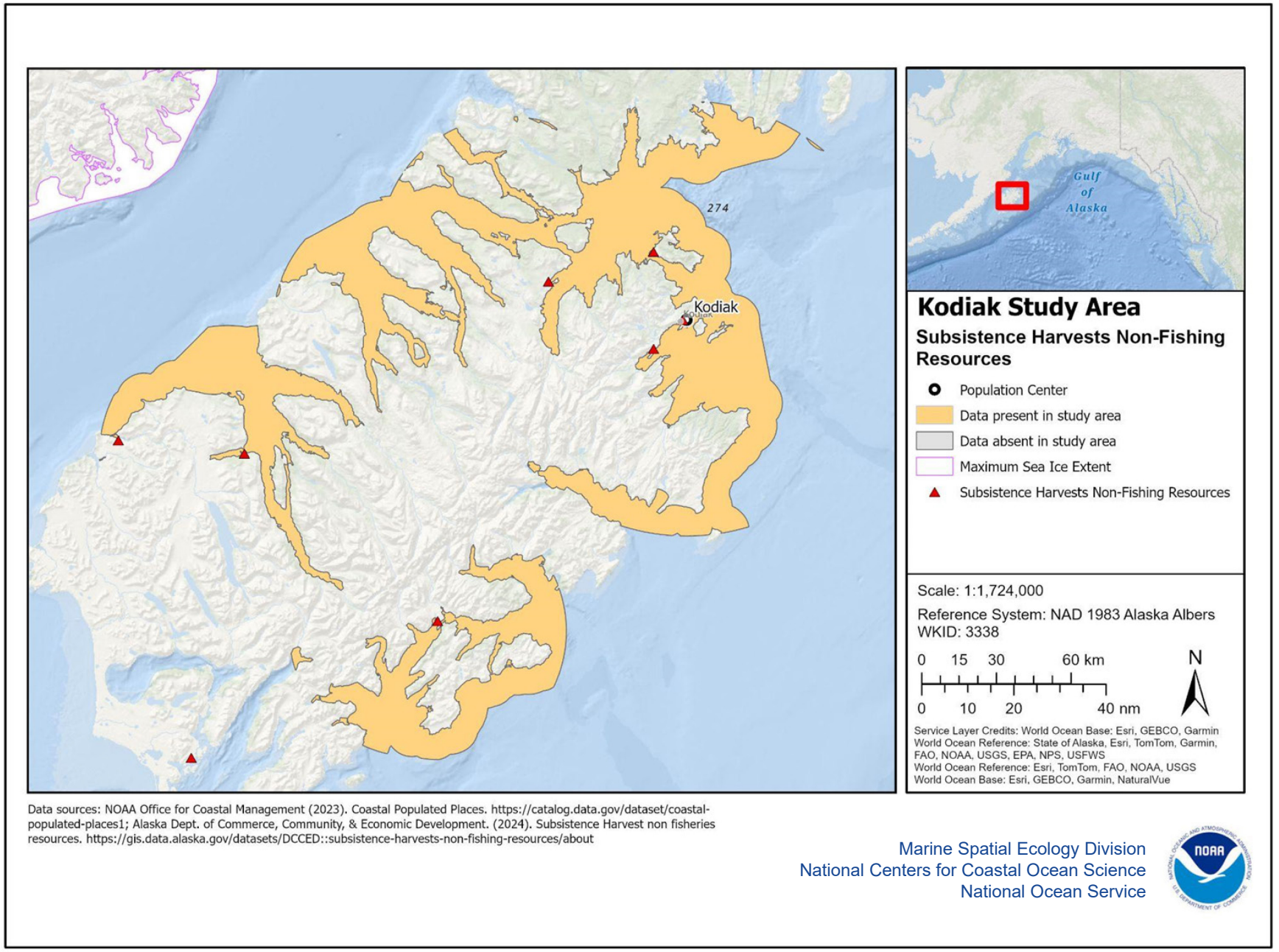
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Subsistence Harvest Non-Fisheries Resources

Non Fishing Subsistence use designations for all locations in Alaska.

Subsistence use designations for all locations in Alaska, determined by the Joint Board of Fisheries and Game.

Source: ADF&G



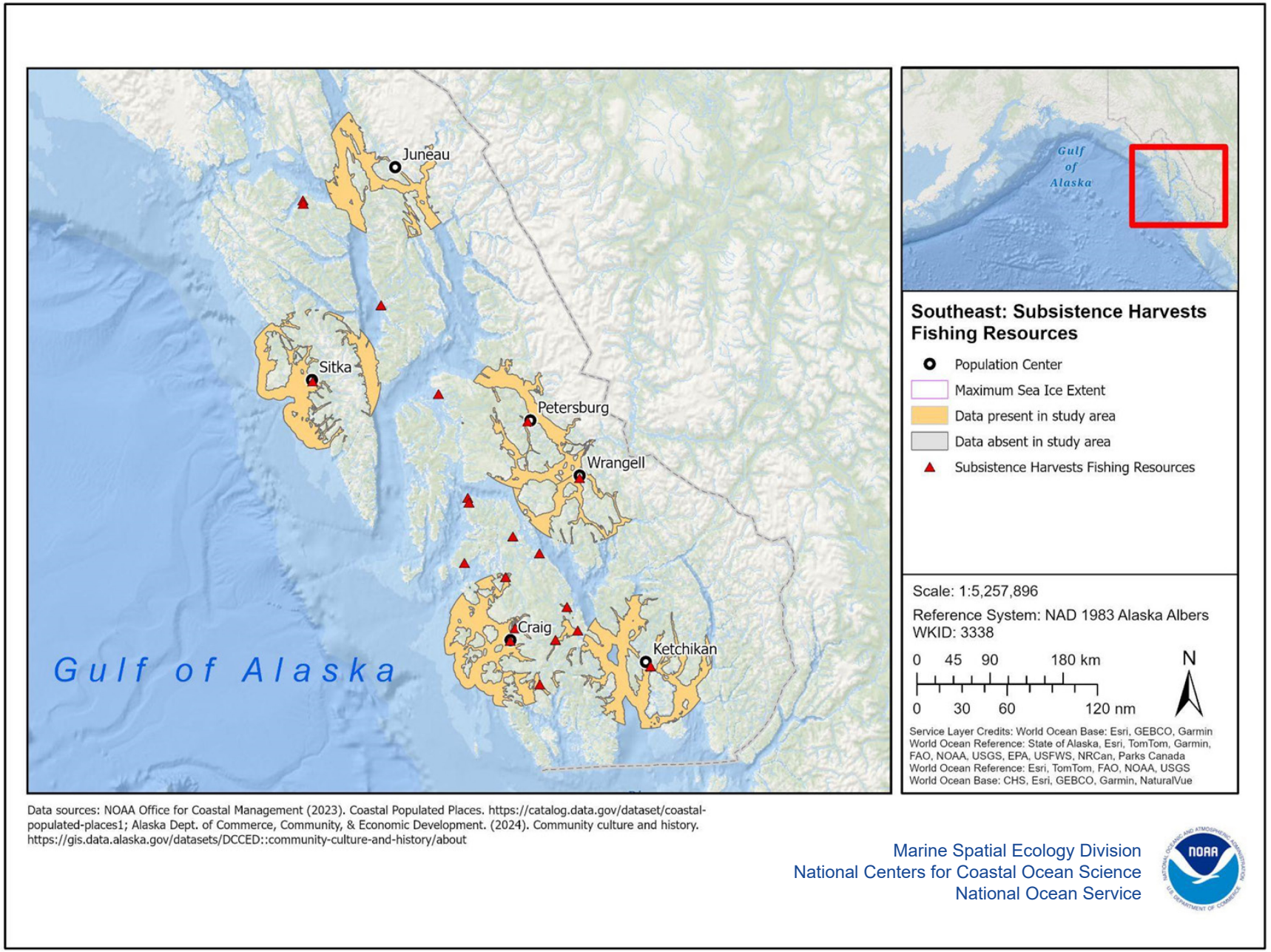
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024). Subsistence Harvest non fisheries resources. https://gis.data.alaska.gov/datasets/DCCED::subsistence-harvests-non-fishing-resources/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Subsistence Harvest Fisheries Resources

Subsistence Fisheries Harvest use designations for all locations in Alaska, determined by the Joint Board of Fisheries and Game.

Source: ADF&G



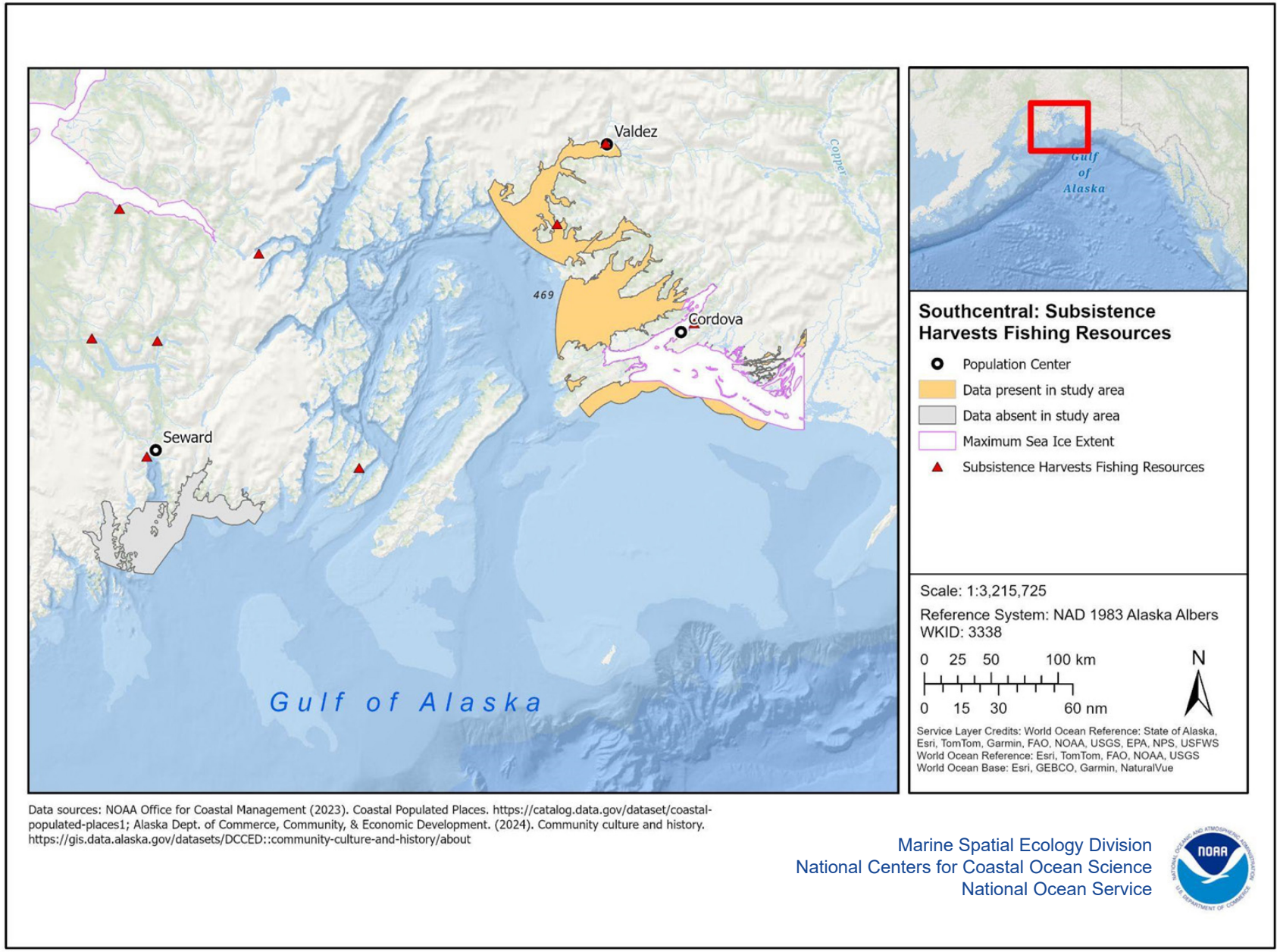
Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024). Community culture and history. https://gis.data.alaska.gov/datasets/DCCED::community-culture-and-history/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Subsistence Harvest Fisheries Resources

Subsistence Fisheries Harvest use designations for all locations in Alaska, determined by the Joint Board of Fisheries and Game.

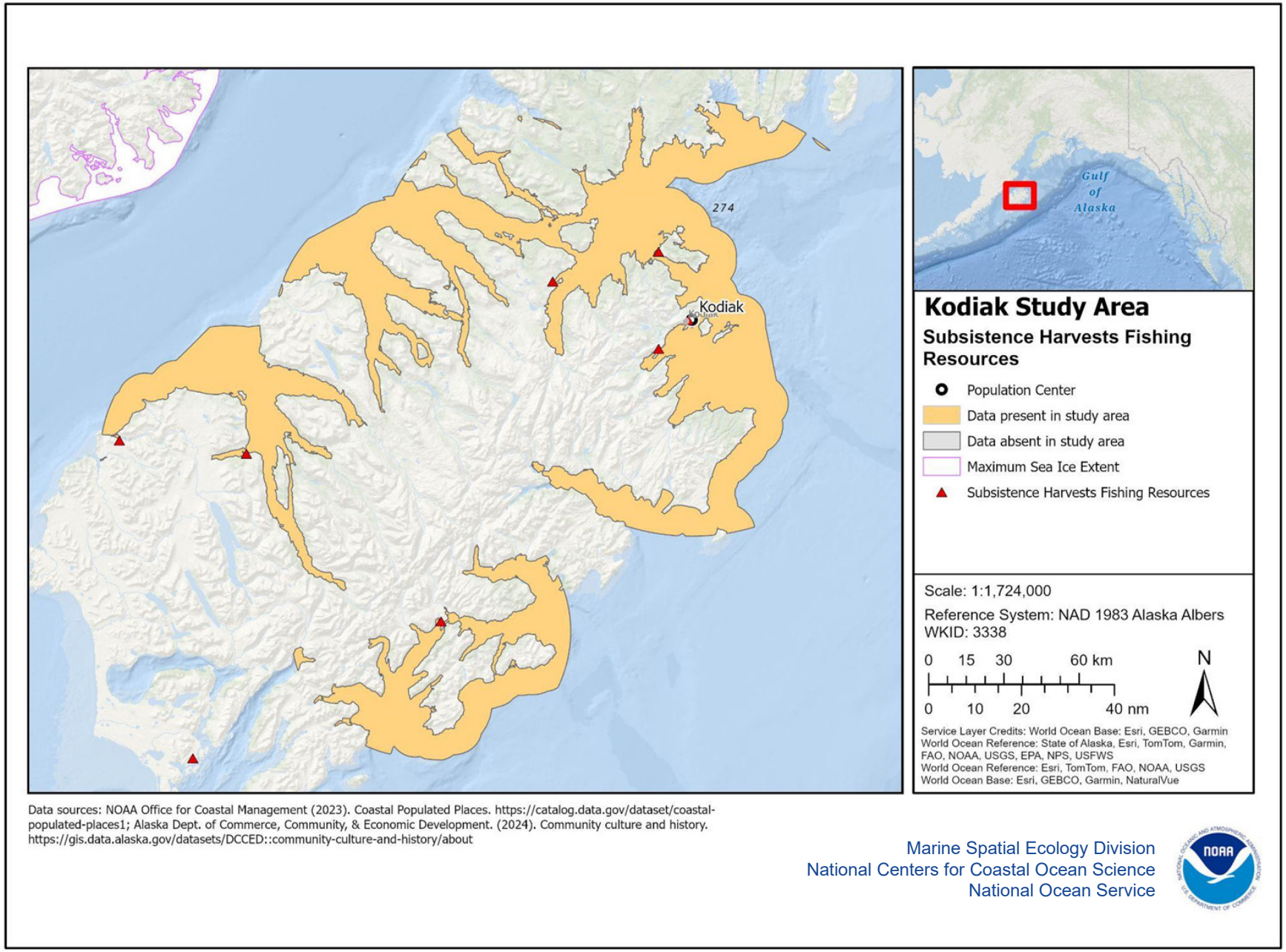
Source: ADF&G



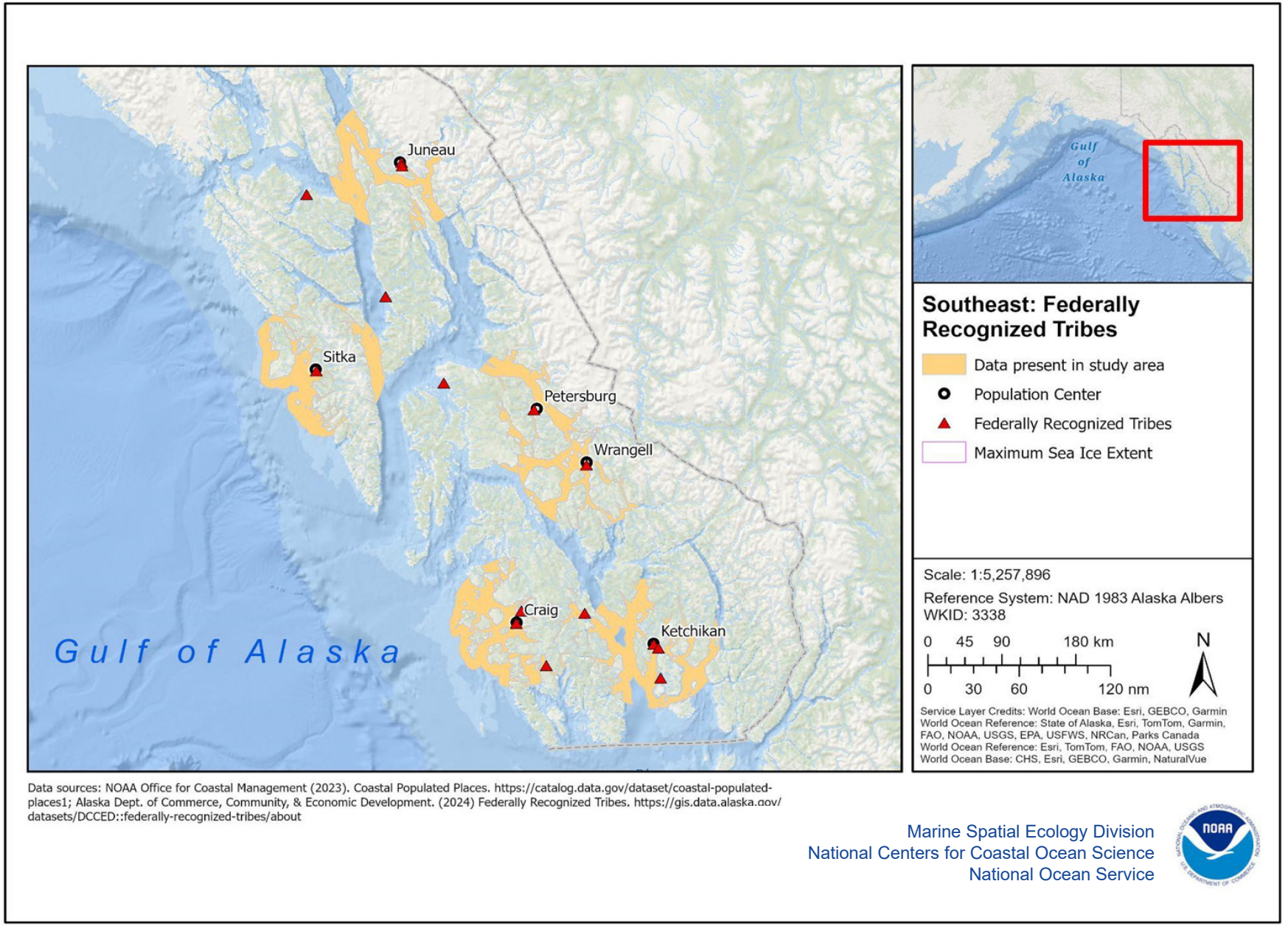
Subsistence Harvest Fisheries Resources

Subsistence Fisheries Harvest use designations for all locations in Alaska, determined by the Joint Board of Fisheries and Game.

Source: ADF&G



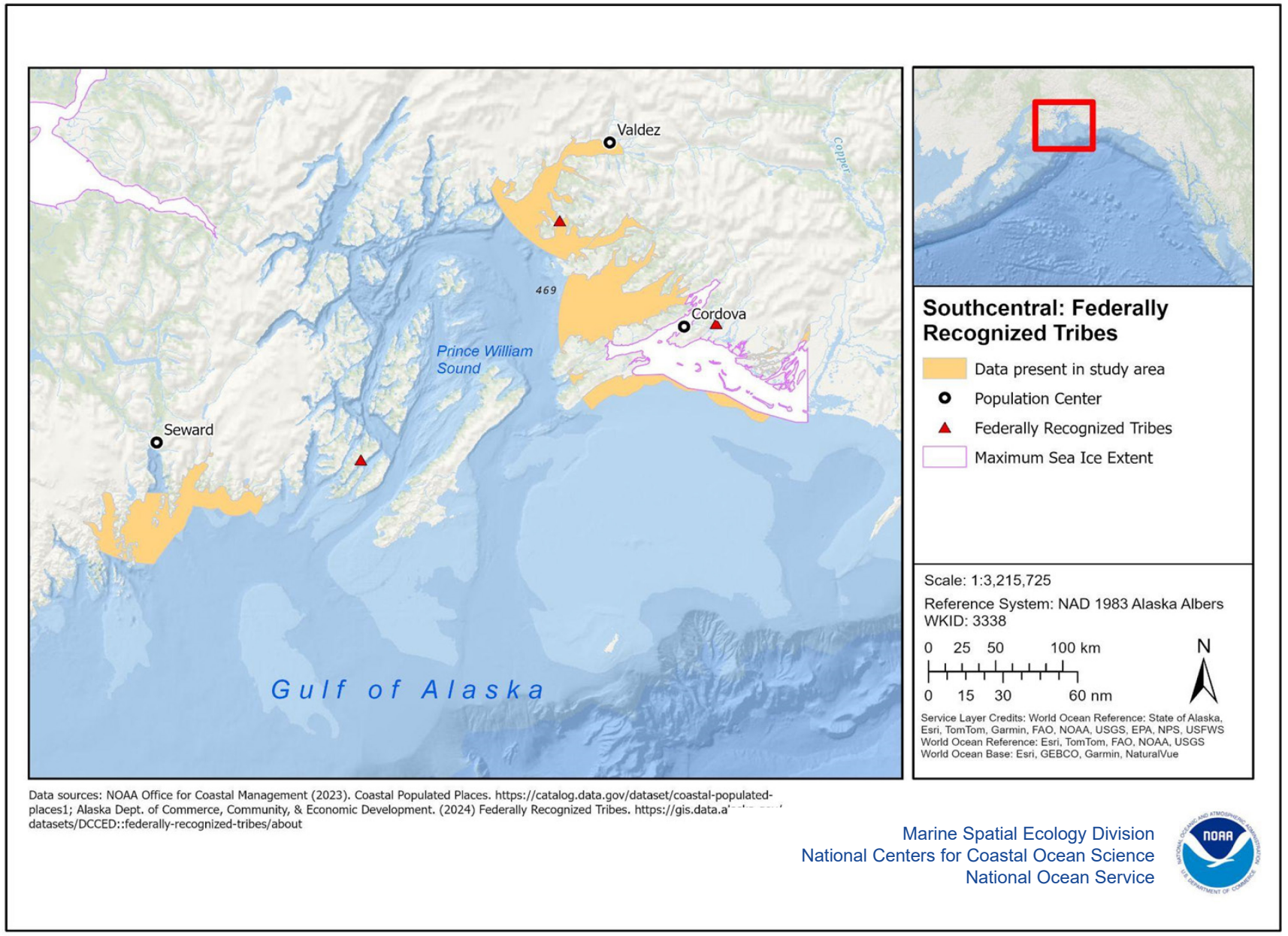
Federally Recognized Tribes



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024) Federally Recognized Tribes. https://gis.data.alaska.gov/datasets/DCCED::federally-recognized-tribes/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

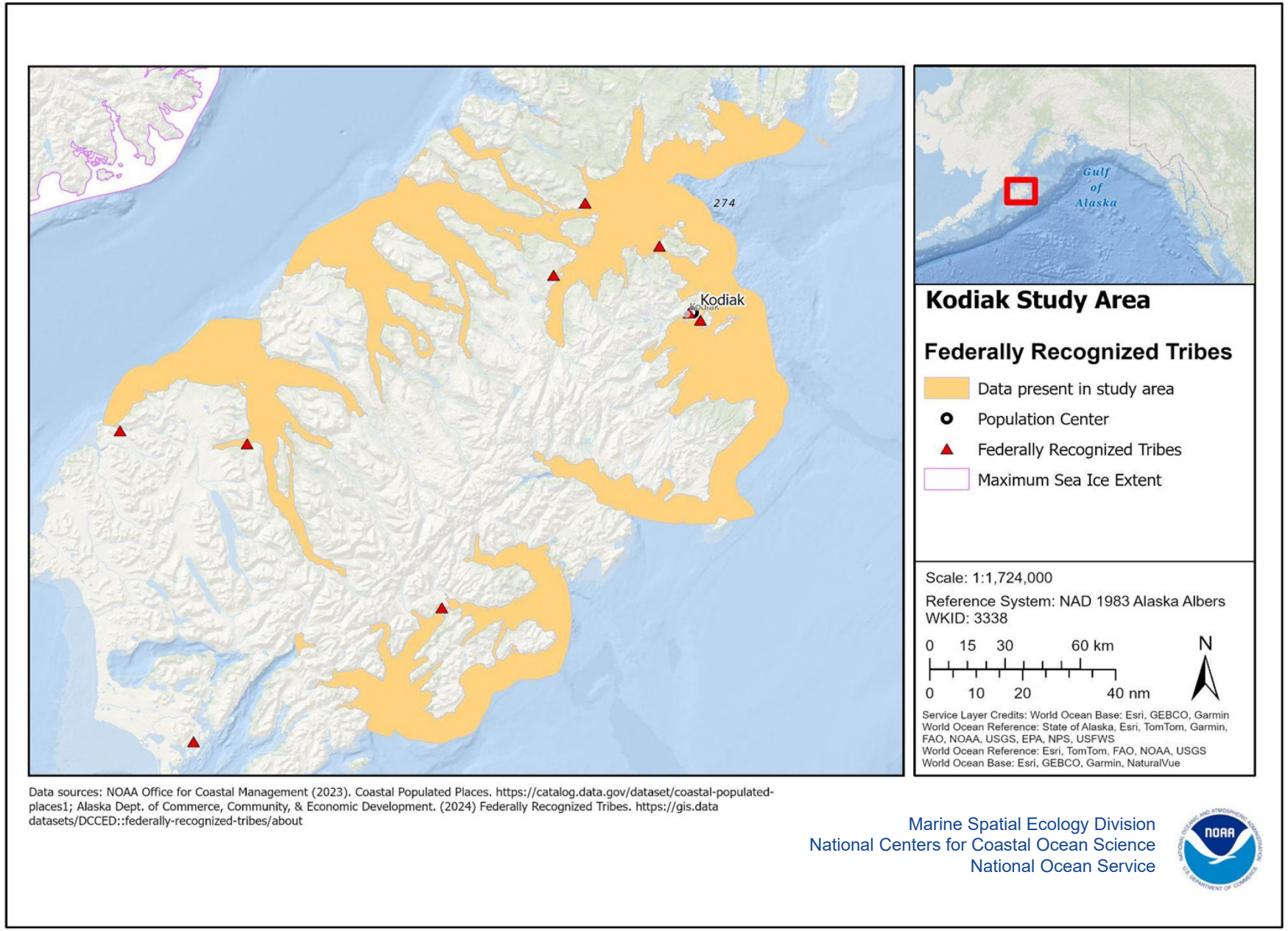
Federally Recognized Tribes



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024) Federally Recognized Tribes. https://gis.data.a[illegible] datasets/DCCED::federally-recognized-tribes/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Federally Recognized Tribes



Data sources: NOAA Office for Coastal Management (2023). Coastal Populated Places. https://catalog.data.gov/dataset/coastal-populated-places1; Alaska Dept. of Commerce, Community, & Economic Development. (2024) Federally Recognized Tribes. https://gis.data datasets/DCCED::federally-recognized-tribes/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Partnerships for participatory mapping and engagement

Bring on project partners to:

- Help NOAA address subsistence and tribal data scarcity
- Identify methods to support integration of indigenous and traditional knowledge into analysis
- Identify data sharing protocols that do not compromise data sensitivity and sovereignty

Use participatory mapping opportunities to:

- Identify existing spatial data sets
- Develop new datasets to support spatial analysis

Stakeholder Engagement Strategies for Participatory Mapping



NOAA Guidance
and Best Practices for
Engaging and Incorporating Indigenous Knowledge in Decision-Making

Introduction

Indigenous Peoples across the United States have been stewards and part of their environments for thousands of years. Throughout this time they have amassed an immense amount of knowledge informed by unique ways of knowing and being. This knowledge continues to grow today, built upon a living process over a millennia[1]. To truly understand the environment and to have adaptive and holistic decision-making, we need to bring together Indigenous Knowledge and science. Bringing forward equitable engagement practices for the involvement of Indigenous Knowledge will inform and enrich many aspects of NOAA's work, allowing us to better understand Earth and ocean systems and fulfill our management responsibilities. As a continuation of our commitment to engage meaningfully with federally recognized Tribes, non-recognized Tribes and other Indigenous Peoples, NOAA is building upon the "NOAA Procedures for Government-to-Government Consultation with Federally Recognized Indian Tribes and Alaska Native Corporations" (Consultation Handbook) to provide guidance on including IK in

Core Data Questions

1. What additional cultural and social uses not discussed may present conflicts with aquaculture?

1. Are you aware of any data not discussed that may be available? If so, can you provide a point of contact for follow up?

Cultural and Social Resources

Cultural and Social Resources	Overlap	Type
Community Subsistence Information System Data	Southeast, Southcentral, Kodiak	Consideration
Subsistence Fisheries Revenues	Southeast, Southcentral, Kodiak	Consideration
Subsistence Use Communities	Southeast, Southcentral, Kodiak	Consideration
Subsistence Harvest Non-Fisheries Resources	Southeast, Southcentral, Kodiak	Consideration
Subsistence Harvest Fisheries Resources	Southeast, Southcentral, Kodiak	Consideration
Community Culture and History	Southeast, Southcentral, Kodiak	Consideration
Federally Recognized Tribes	Southeast, Southcentral, Kodiak	Consideration

Fisheries

Commercial
Sport



Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

Sport Fisheries

Limited spatially explicit public information

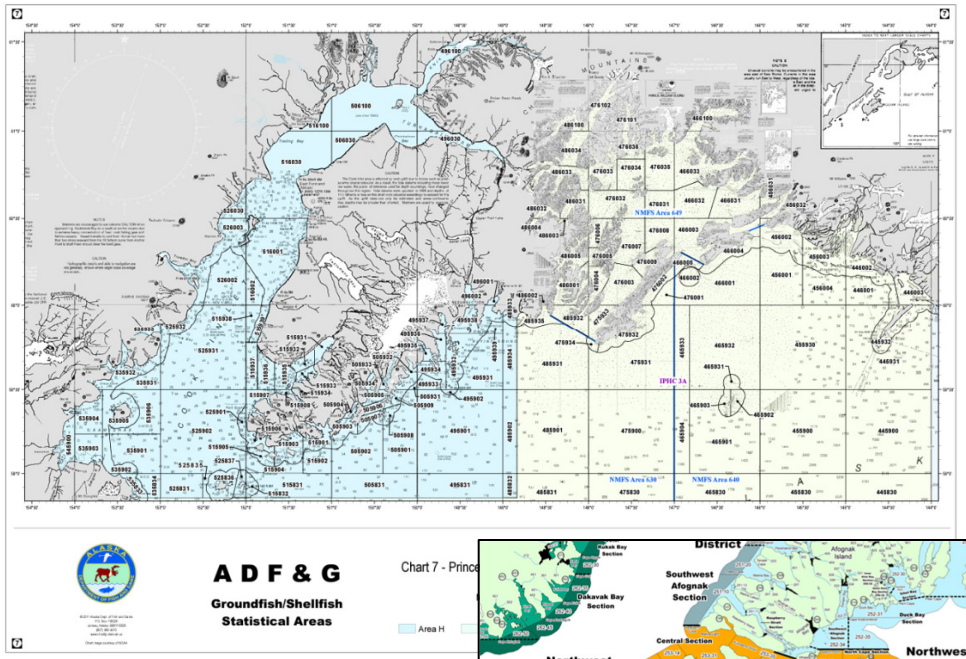
- Charter logbook information- access to data challenging/restricted
- Recreational tournaments might have some spatial data
- Public comments and input on past proposed leases can provide some insight into spatial distribution and trends



Commercial Fisheries

Commercial Fish ticket data for:

- Salmon
- Herring
- Shellfish
- Groundfish
- Dive Fisheries

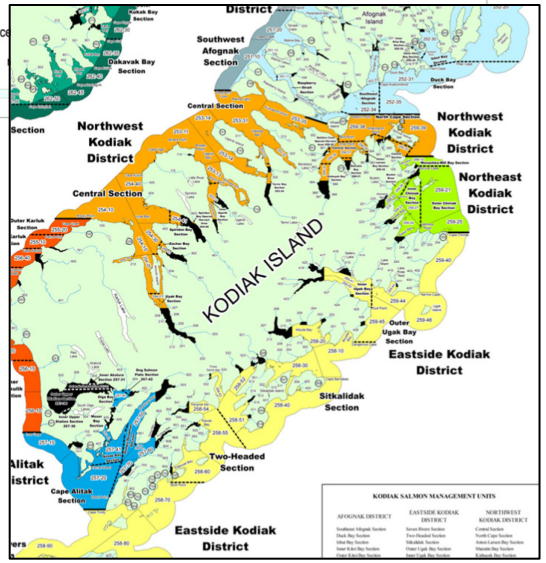


Limitations

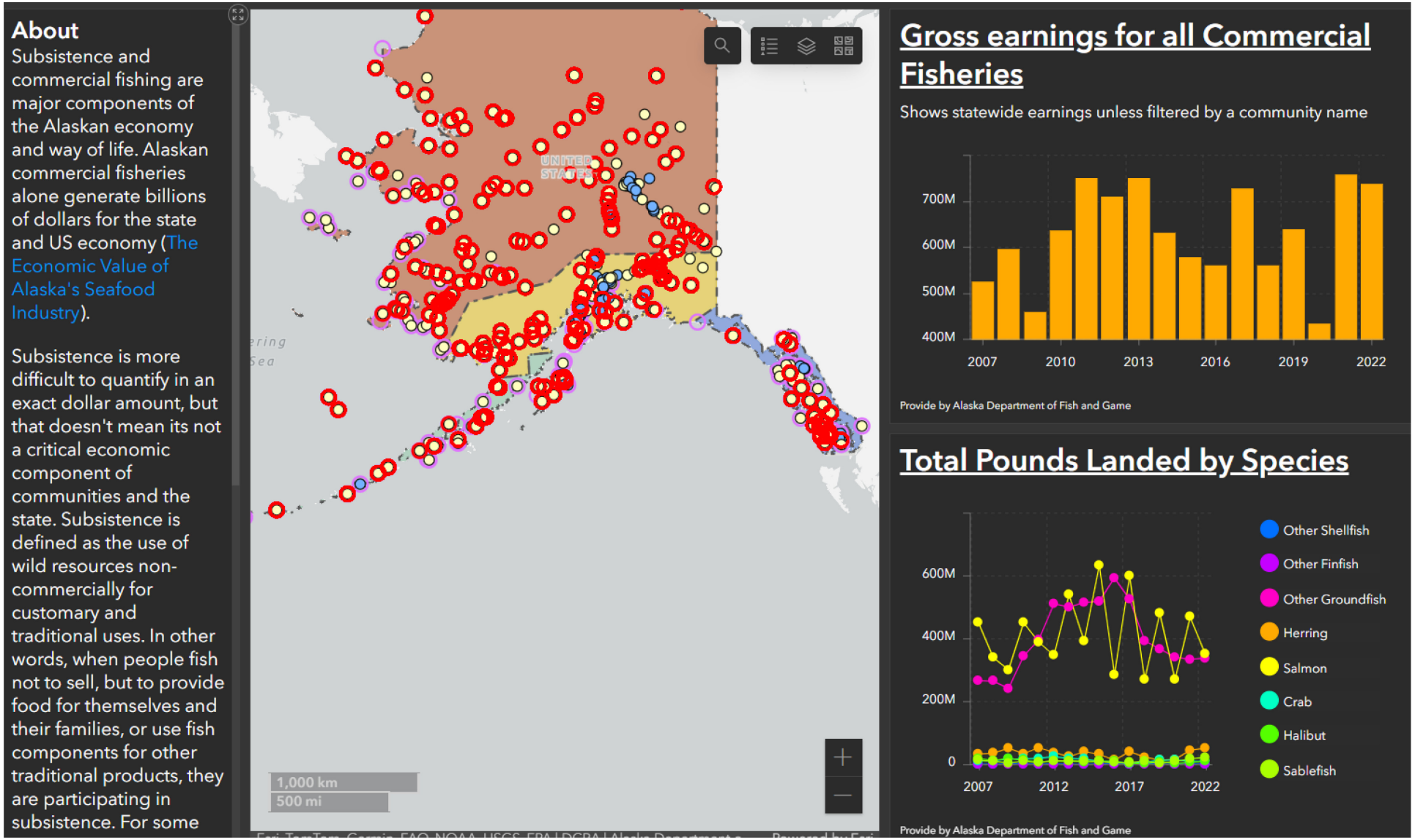
- Some statistical areas are large
- Data processing labor intensive

Opportunities

- Refine area fished based on trends (example- max depth for dive fisheries could be applied to narrow down where within the reporting area fishing is occurring)
- Seasonal trends may provide opportunities for seasonal operations (seaweed)
- Public comments and input on past proposed leases can provide some insight into spatial distribution and trends



Commercial Fisheries Revenues



Industries

locations of vessel traffic, key industrial considerations, outfalls, etc.

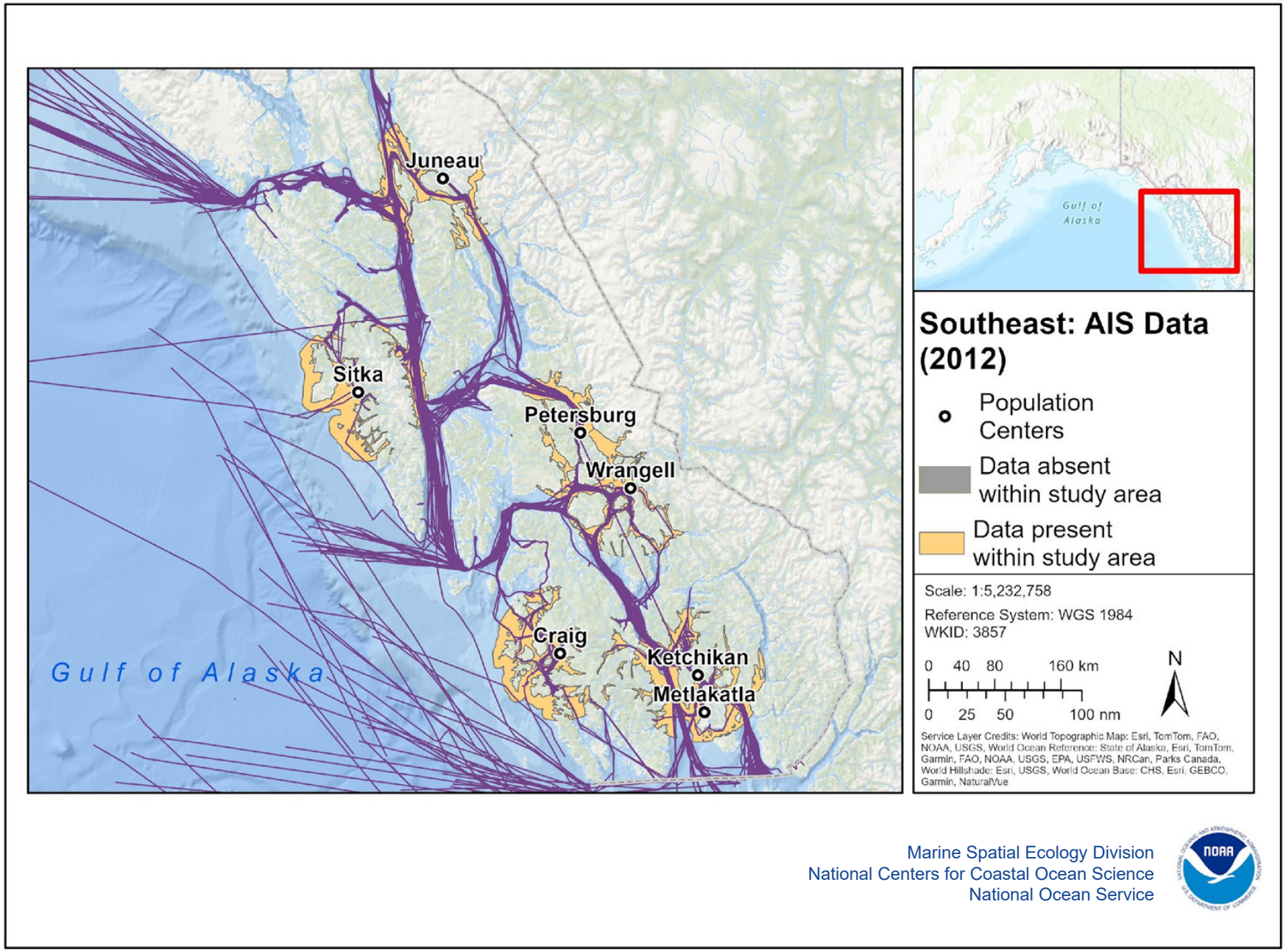


Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov

AIS Vessel Tracks

Summary: the location and characteristics of commercial and recreational boats as a sequence of positions transmitted by an Automatic Identification System (AIS). The distribution, type, and frequency of vessel tracks are a useful aid to understanding the risk of conflicting uses within a certain geographic area. Types = Cargo, Fishing, Other, Passenger, Pleasure and Sailing, Tanker, Tug and Tow

Source: US Coast Guard

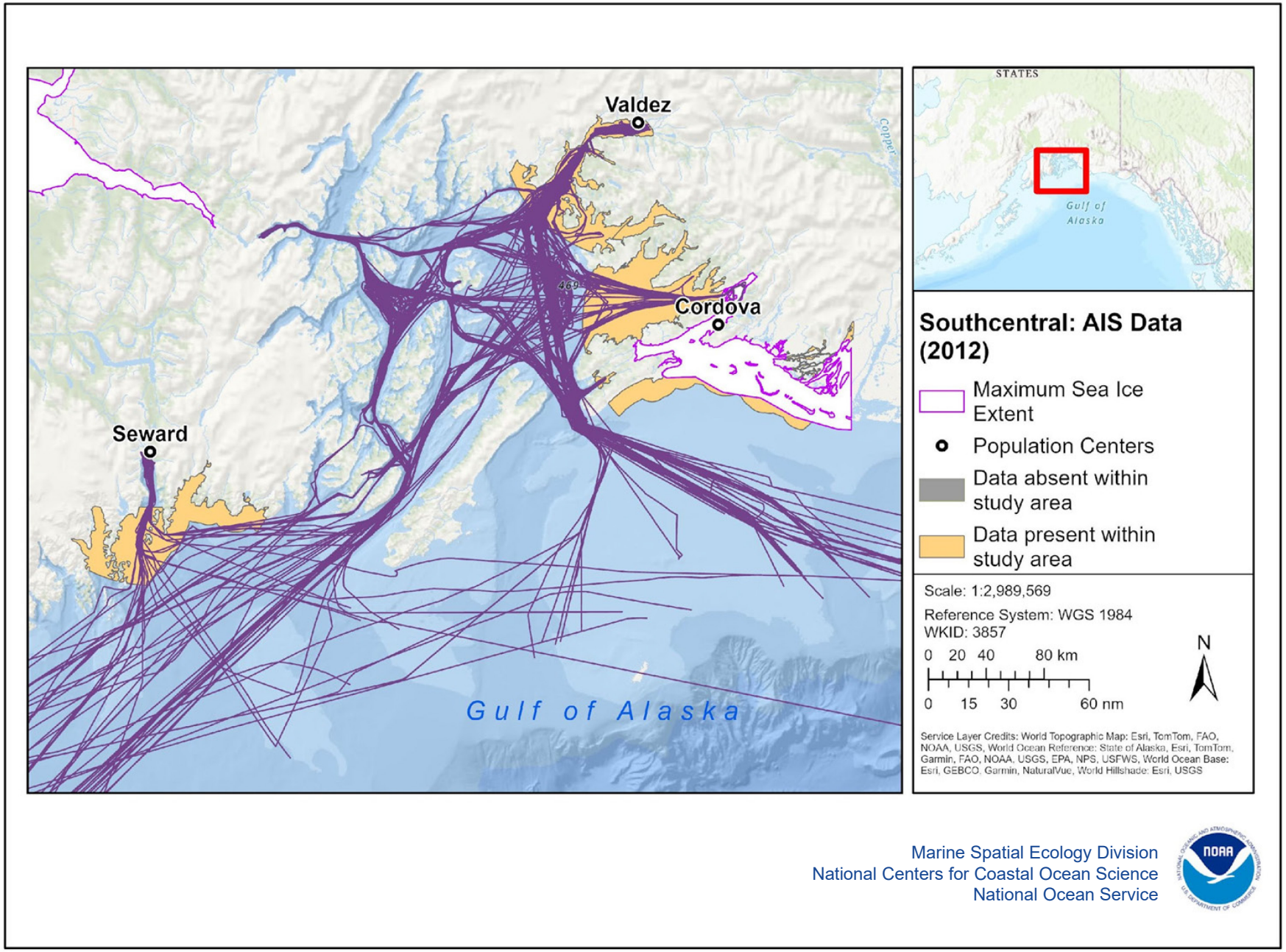


Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

AIS Vessel Tracks

Summary: the location and characteristics of commercial and recreational boats as a sequence of positions transmitted by an Automatic Identification System (AIS). The distribution, type, and frequency of vessel tracks are a useful aid to understanding the risk of conflicting uses within a certain geographic area. Types = Cargo, Fishing, Other, Passenger, Pleasure and Sailing, Tanker, Tug and Tow

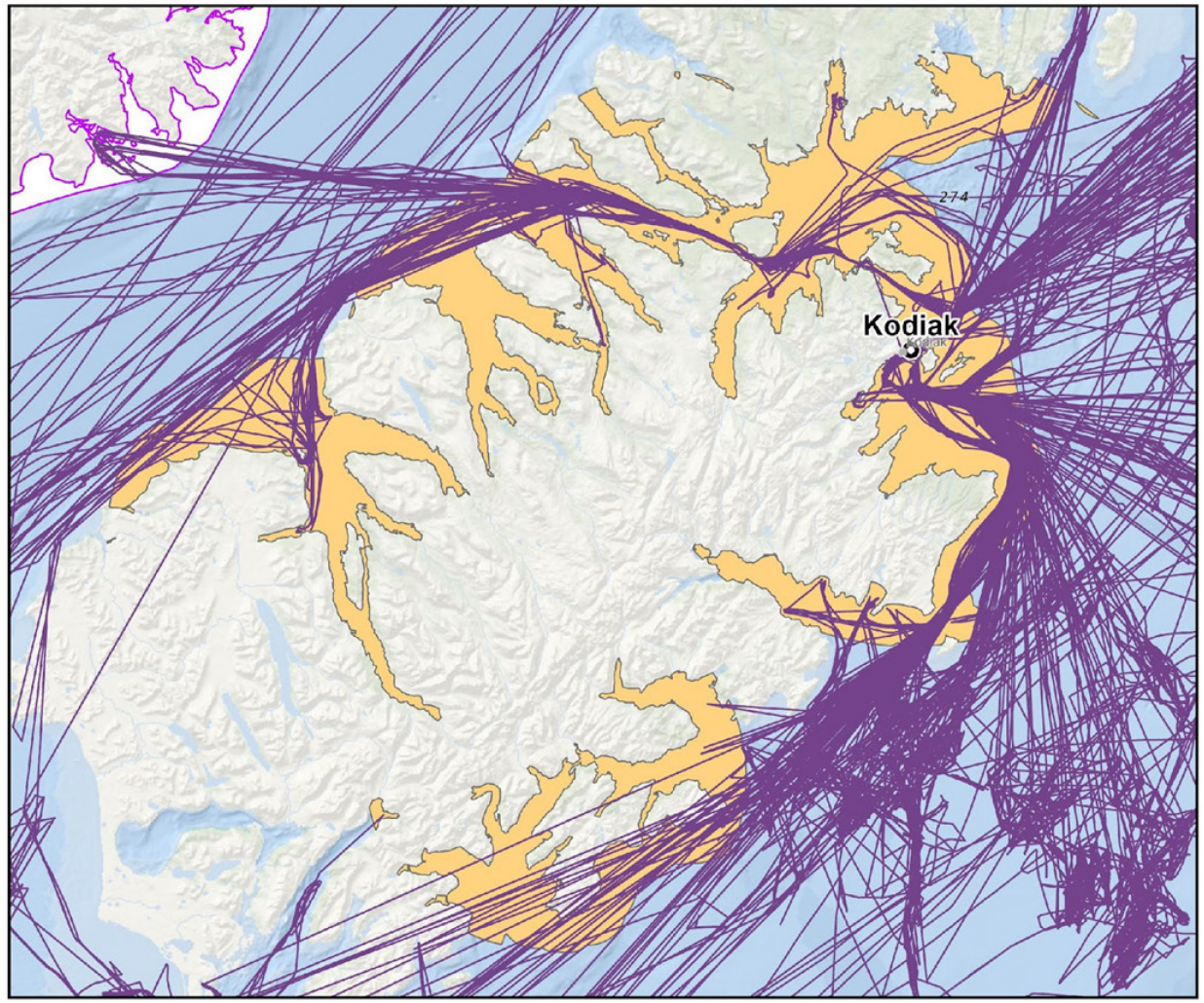
Source: US Coast Guard



AIS Vessel Tracks

Summary: the location and characteristics of commercial and recreational boats as a sequence of positions transmitted by an Automatic Identification System (AIS). The distribution, type, and frequency of vessel tracks are a useful aid to understanding the risk of conflicting uses within a certain geographic area. Types = Cargo, Fishing, Other, Passenger, Pleasure and Sailing, Tanker, Tug and Tow

Source: US Coast Guard





Kodiak Study Area

AIS Data (2012)

- Population Centers
- AIS Data (2012)
- Maximum Sea Ice Extent
- Data present within study area
- Data absent within study area

Scale: 1:1,724,000

Reference System: WGS 1984
WKID: 3857

0 12.5 25 50 km

0 5 10 20 nm

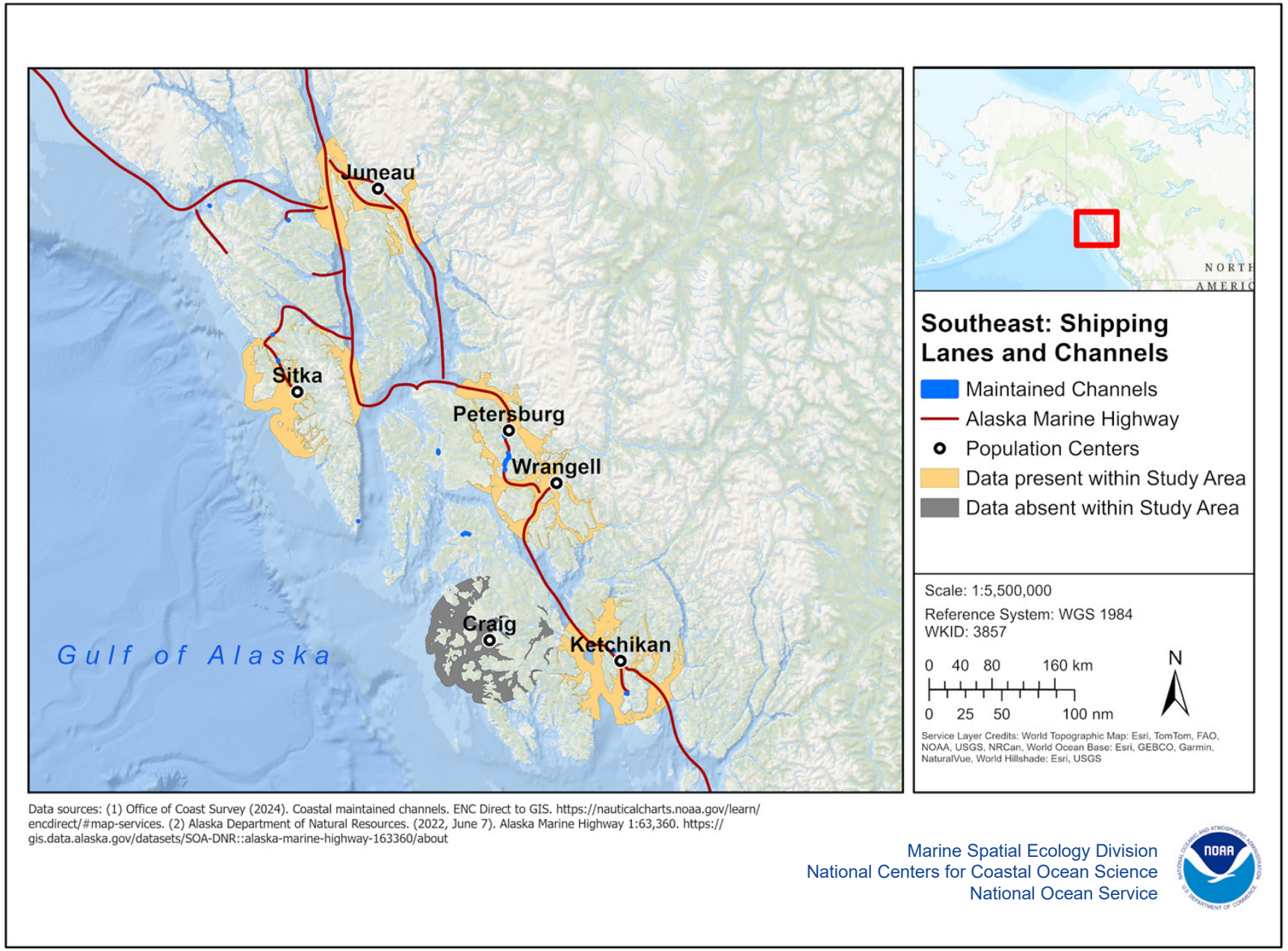
N

Service Layer Credits: World Topographic Map: Esri, TomTom, FAO, NOAA, USGS, World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS, World Ocean Base: Esri, GEBCO, Garmin, NaturalVue, World Hillshade: Esri, USGS

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Shipping Lanes & Channels

Alaska Marine Highway

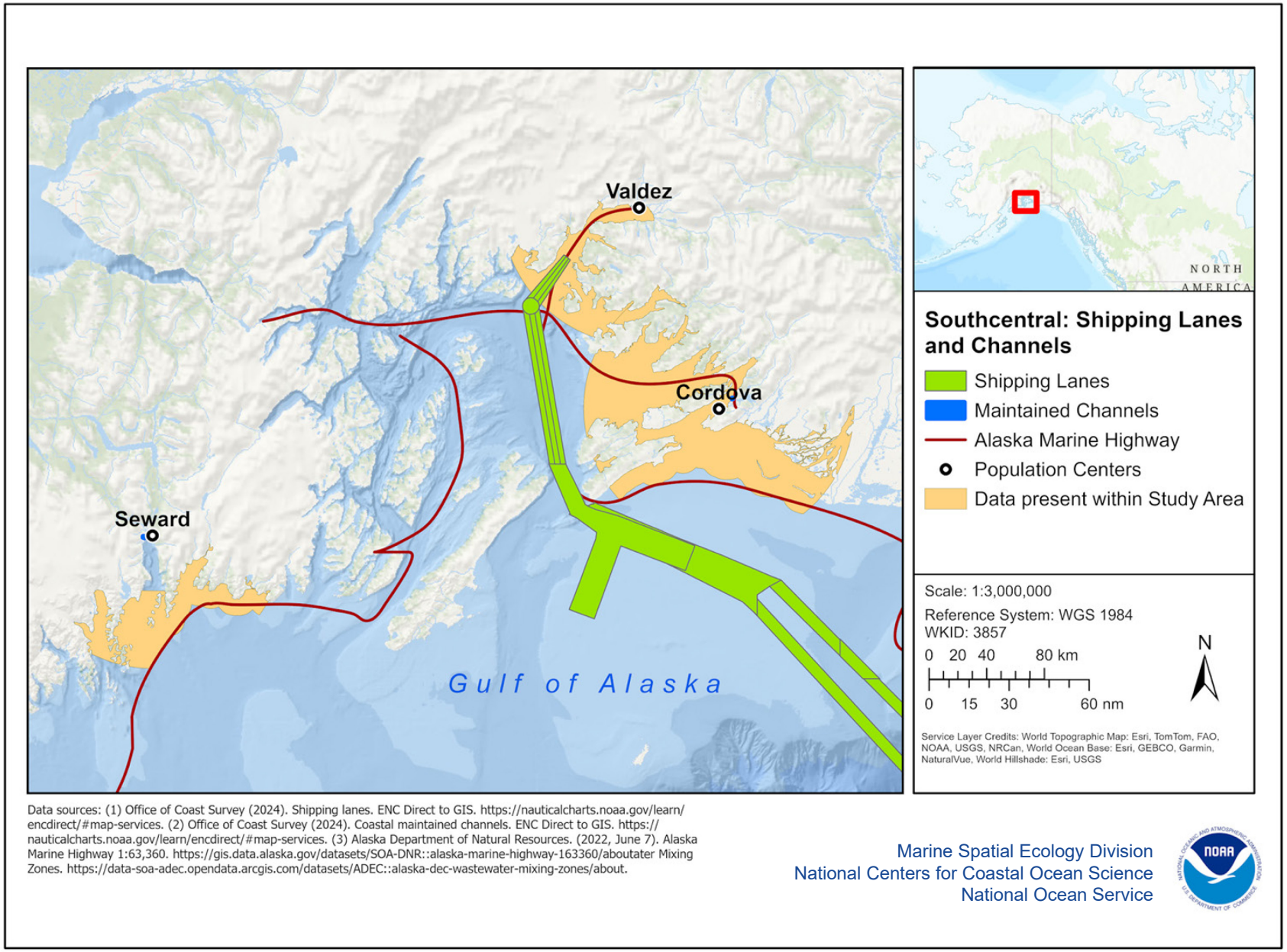


Data sources: (1) Office of Coast Survey (2024). Coastal maintained channels. ENC Direct to GIS. https://nauticalcharts.noaa.gov/learn/encdirect/#map-services. (2) Alaska Department of Natural Resources. (2022, June 7). Alaska Marine Highway 1:63,360. https://gis.data.alaska.gov/datasets/SOA-DNR::alaska-marine-highway-163360/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Shipping Lanes & Channels

Alaska Marine Highway

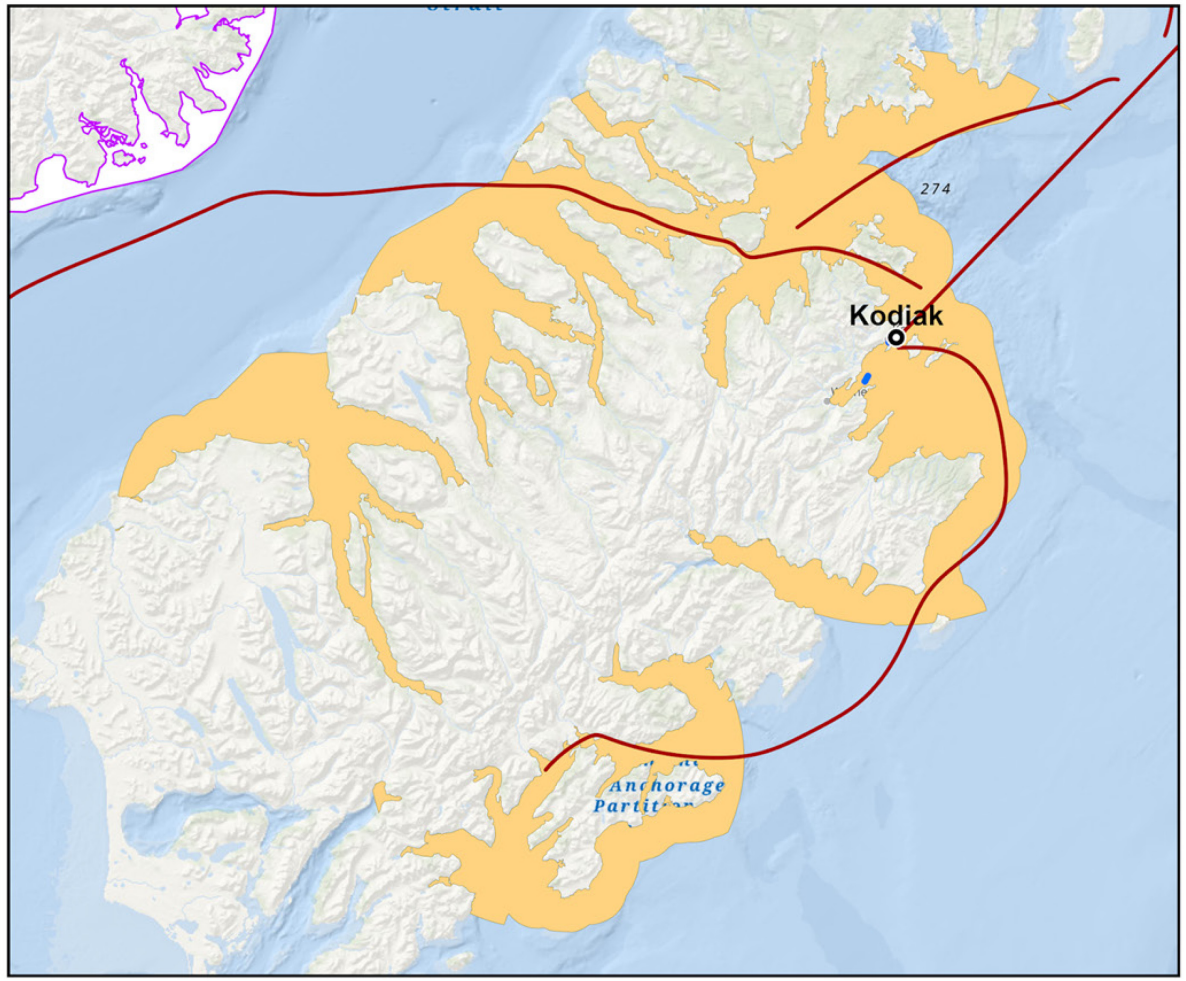


Data sources: (1) Office of Coast Survey (2024). Shipping lanes. ENC Direct to GIS. https://nauticalcharts.noaa.gov/learn/encdirect/#map-services. (2) Office of Coast Survey (2024). Coastal maintained channels. ENC Direct to GIS. https://nauticalcharts.noaa.gov/learn/encdirect/#map-services. (3) Alaska Department of Natural Resources. (2022, June 7). Alaska Marine Highway 1:63,360. https://gis.data.alaska.gov/datasets/SOA-DNR::alaska-marine-highway-163360/aboutater Mixing Zones. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wastewater-mixing-zones/about.

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Shipping Lanes & Channels

Alaska Marine Highway





Kodiak Study Area

Shipping Lanes and Channels

- Maintained Channels
- Alaska Marine Highway
- Population Centers
- Maximum Sea Ice Extent
- Study Area

Scale: 1:933,000

Reference System: WGS 1984
WKID: 3857

0 5 10 20 km

0 5 10 20 nm

N

Service Layer Credits: World Topographic Map: Esri, TomTom, FAO, NOAA, USGS, World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS, World Ocean Base: Esri, GEBCO, Garmin, NaturalVue, World Hillshade: Esri, USGS

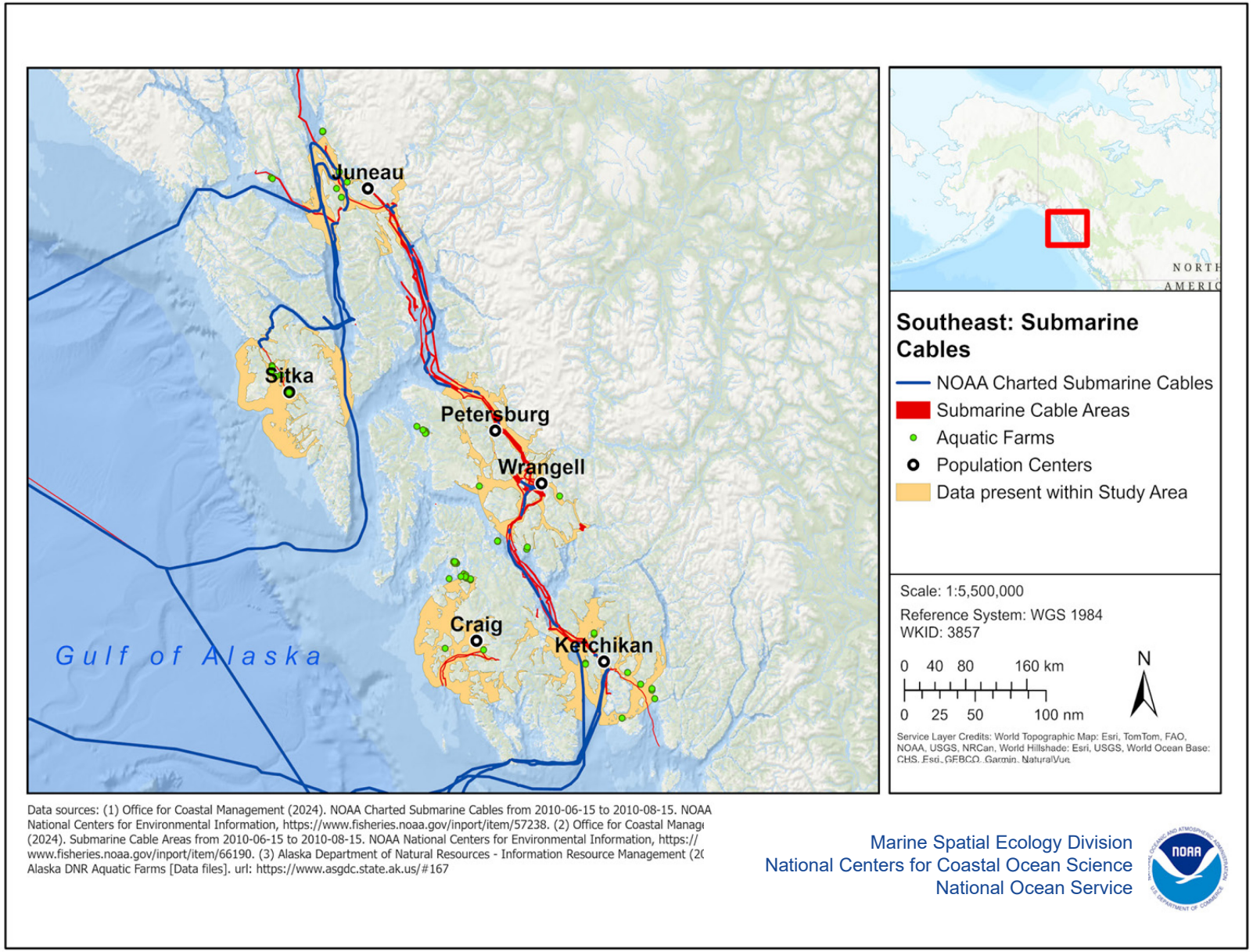
Data sources: (1) Office of Coast Survey (2024). Coastal maintained channels. ENC Direct to GIS. https://nauticalcharts.noaa.gov/learn/encdirect/#map-services. (2) Alaska Department of Natural Resources. (2022, June 7). Alaska Marine Highway 1:63,360. https://gis.data.alaska.gov/datasets/SOA-DNR::alaska-marine-highway-163360/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Submarine Cables Cook Inlet Fiber Optic Network

Summary: general location of commercial and research submarine cables in and around U.S. navigable waters. The majority of these cables are for telecommunications, and the remaining are for power transmission. In the nearshore, cables are routinely buried below the seabed. In the offshore, they are placed directly on the seabed.

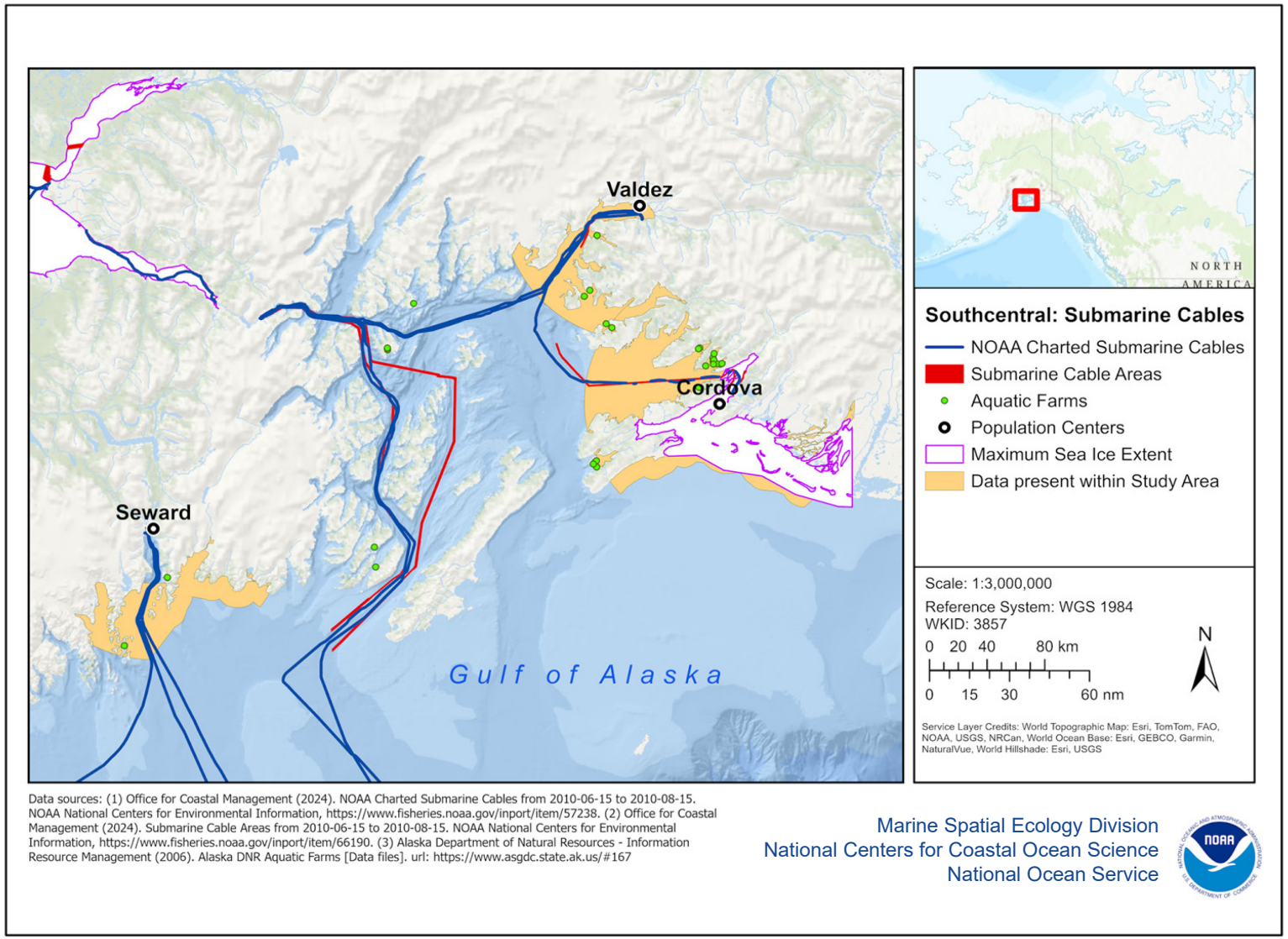
Original Source: NOAA Office of Coastal Survey, NASCA, USACE



Submarine Cables Cook Inlet Fiber Optic Network

Summary: general location of commercial and research submarine cables in and around U.S. navigable waters. The majority of these cables are for telecommunications, and the remaining are for power transmission. In the nearshore, cables are routinely buried below the seabed. In the offshore, they are placed directly on the seabed.

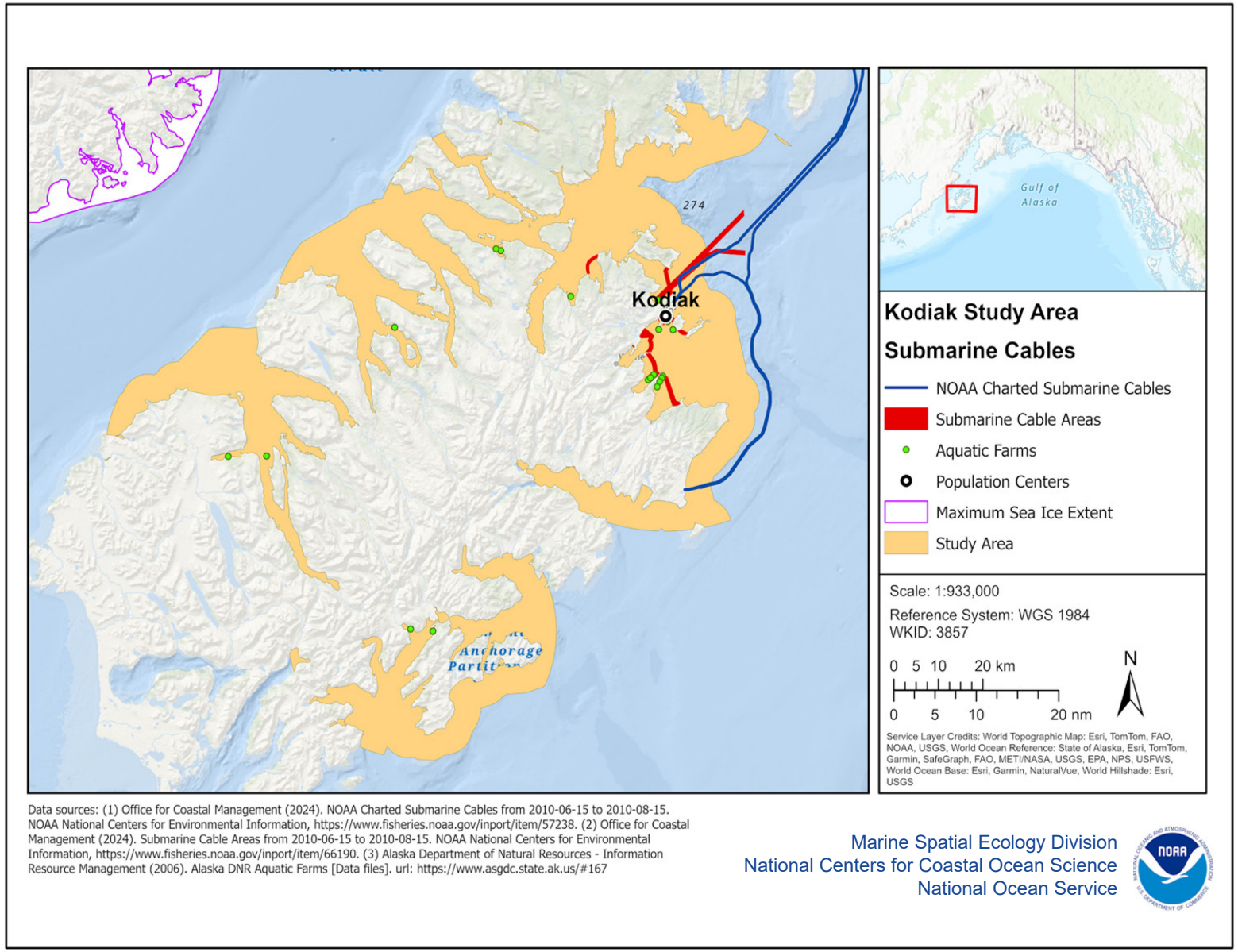
Original Source: NOAA Office of Coastal Survey, NASCA, USACE



Submarine Cables Cook Inlet Fiber Optic Network

Summary: general location of commercial and research submarine cables in and around U.S. navigable waters. The majority of these cables are for telecommunications, and the remaining are for power transmission. In the nearshore, cables are routinely buried below the seabed. In the offshore, they are placed directly on the seabed.

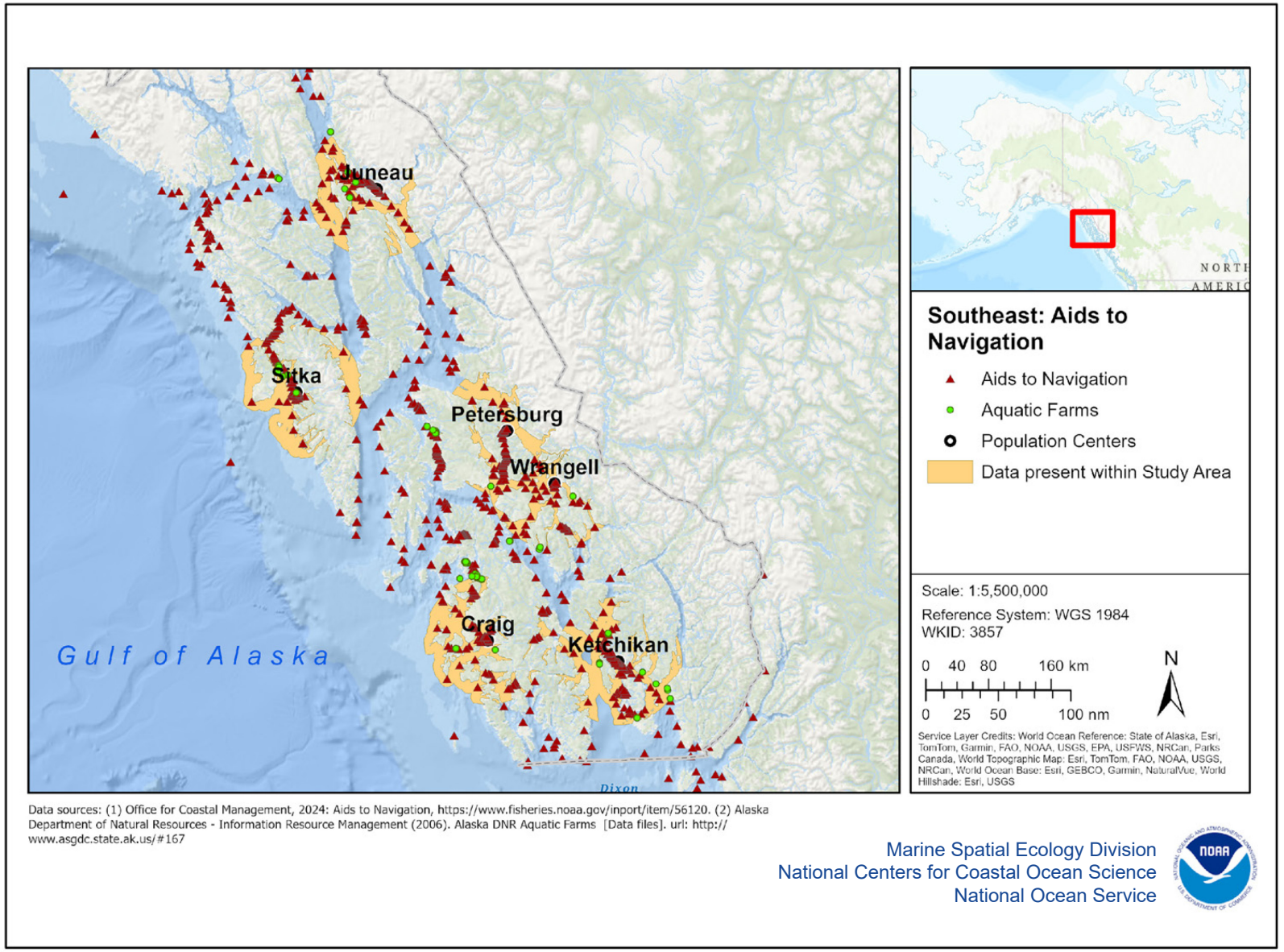
Original Source: NOAA Office of Coastal Survey, NASCA, USACE



Aides to Navigation

Summary: aids to navigation (e.g., lights, signals, buoys, and day beacons), that are intended to assist a navigator to determine position or safe course, or to warn of dangers or obstructions to navigation. The U.S. Coast Guard is responsible for ensuring that this network is up to date and functioning properly so recreational and commercial boaters can safely navigate the maritime environment.

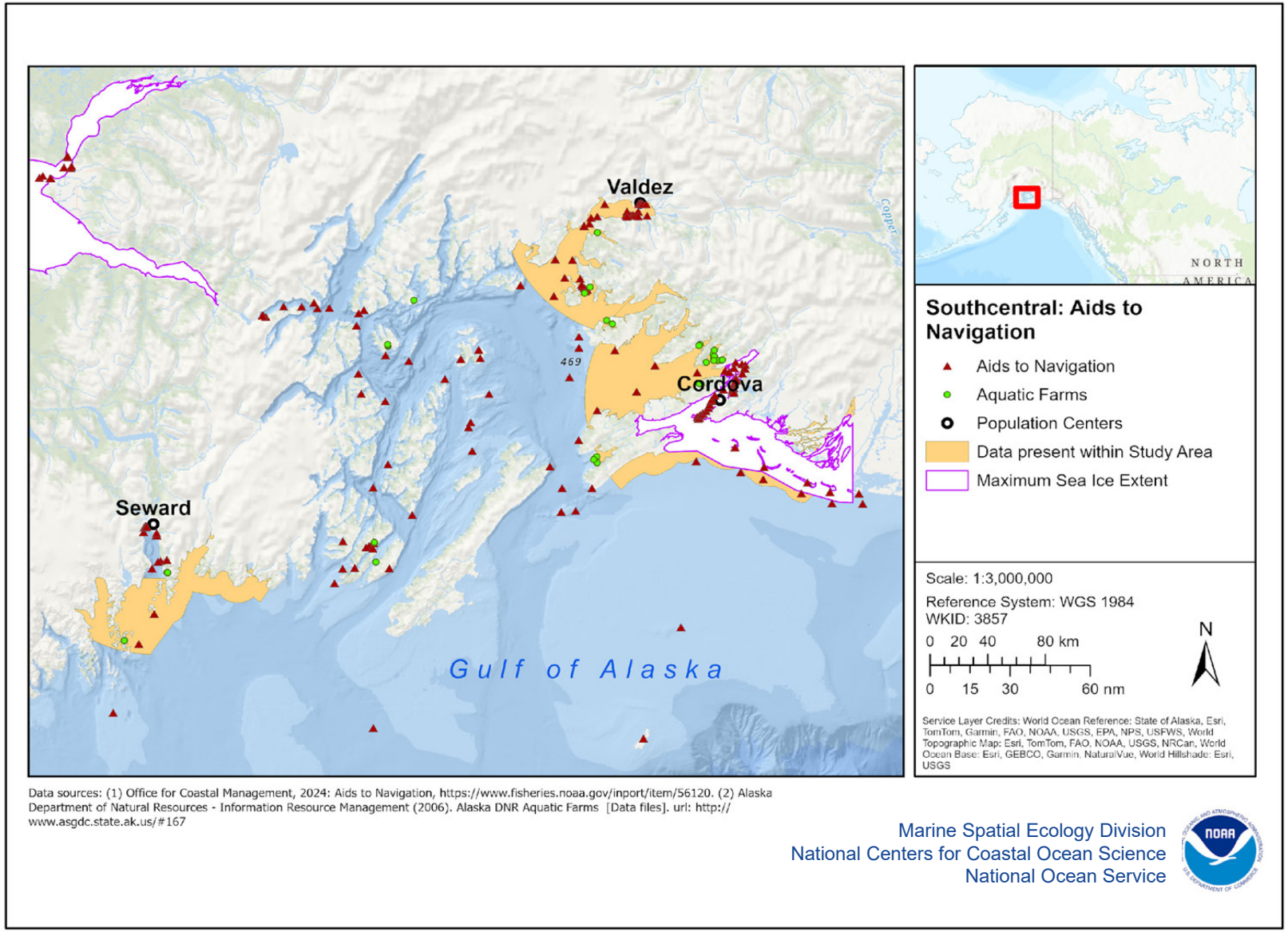
Source: US Coast Guard



Aides to Navigation

Summary: aids to navigation (e.g., lights, signals, buoys, and day beacons), that are intended to assist a navigator to determine position or safe course, or to warn of dangers or obstructions to navigation. The U.S. Coast Guard is responsible for ensuring that this network is up to date and functioning properly so recreational and commercial boaters can safely navigate the maritime environment.

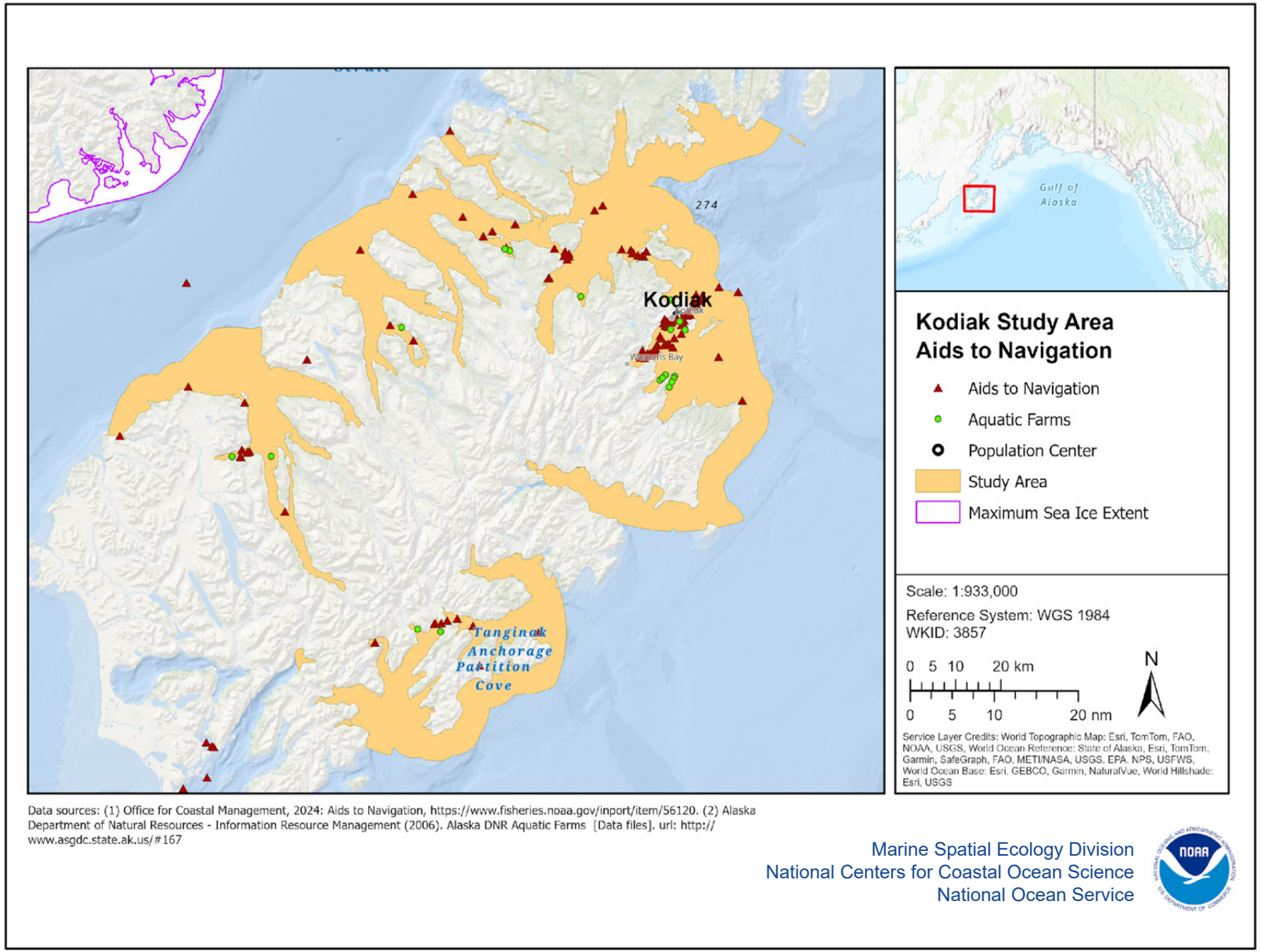
Source: US Coast Guard



Aides to Navigation

Summary: aids to navigation (e.g., lights, signals, buoys, and day beacons), that are intended to assist a navigator to determine position or safe course, or to warn of dangers or obstructions to navigation. The U.S. Coast Guard is responsible for ensuring that this network is up to date and functioning properly so recreational and commercial boaters can safely navigate the maritime environment.

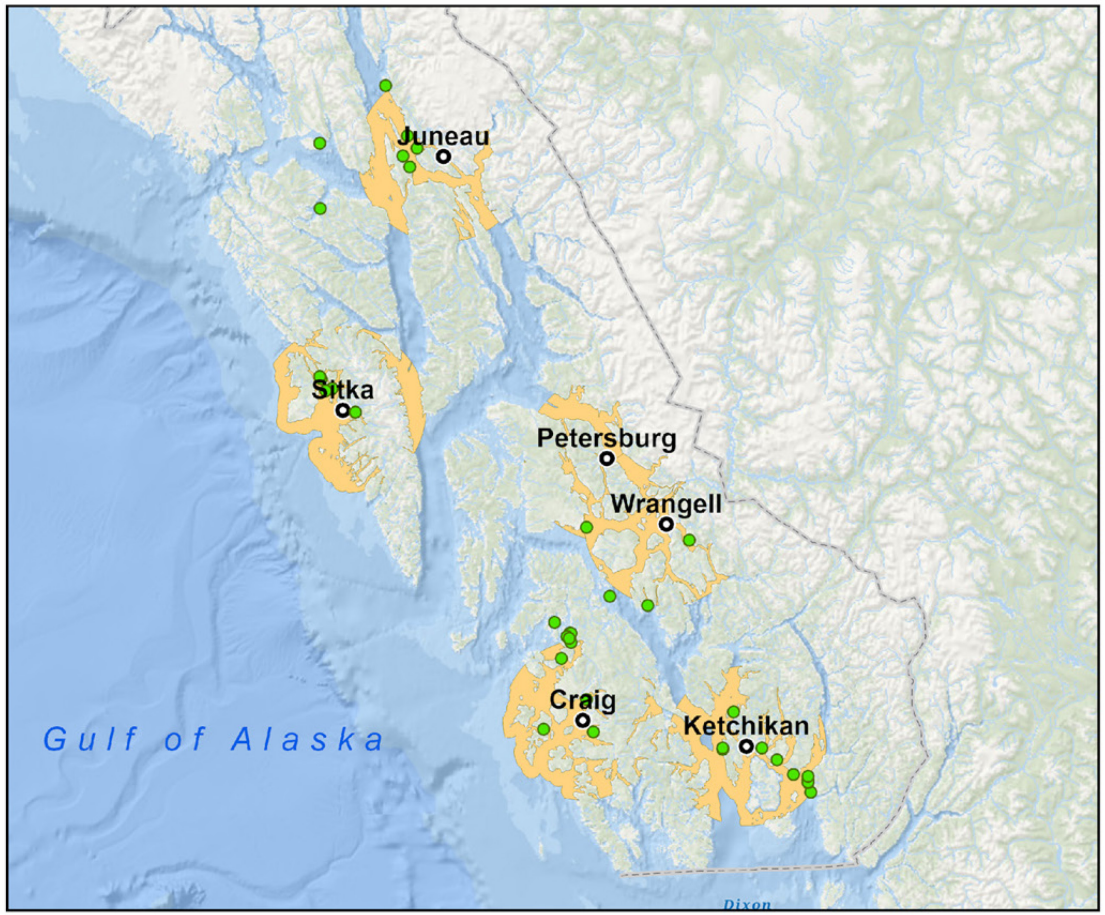
Source: US Coast Guard



Data sources: (1) Office for Coastal Management, 2024: Aids to Navigation, https://www.fisheries.noaa.gov/inport/item/56120. (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms [Data files]. url: http://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Active Aquatic Farm Leases





Southeast: Active Aquatic Farm

- Active Aquatic Farm
- Population Centers
- Data present within Study Area

Scale: 1:5,500,000

Reference System: WGS 1984
WKID: 3857

0 40 80 160 km

0 25 50 100 nm

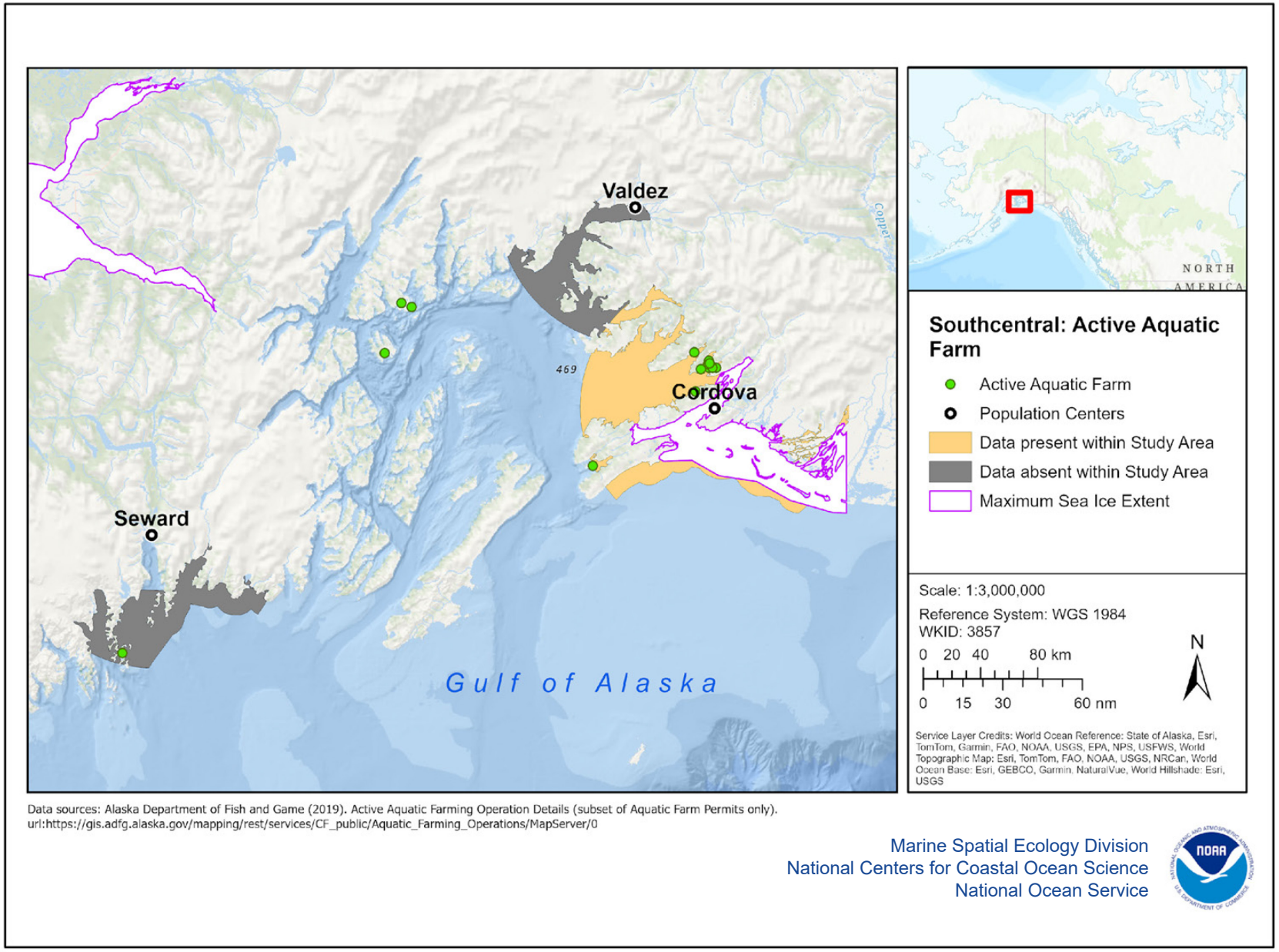
N

Service Layer Credits: World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS, NRCan, Parks Canada, World Topographic Map: Esri, TomTom, FAO, NOAA, USGS, NRCan, World Hillshade: Esri, USGS, World Ocean Base: CHS, Esri, GEBCO, Garmin, NaturalVue

Data sources: Alaska Department of Fish and Game (2019). Active Aquatic Farming Operation Details (subset of Aquatic Farm Permits only).
url:https://gis.adfg.alaska.gov/mapping/rest/services/CF_public/Aquatic_Farming_Operations/MapServer/0

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

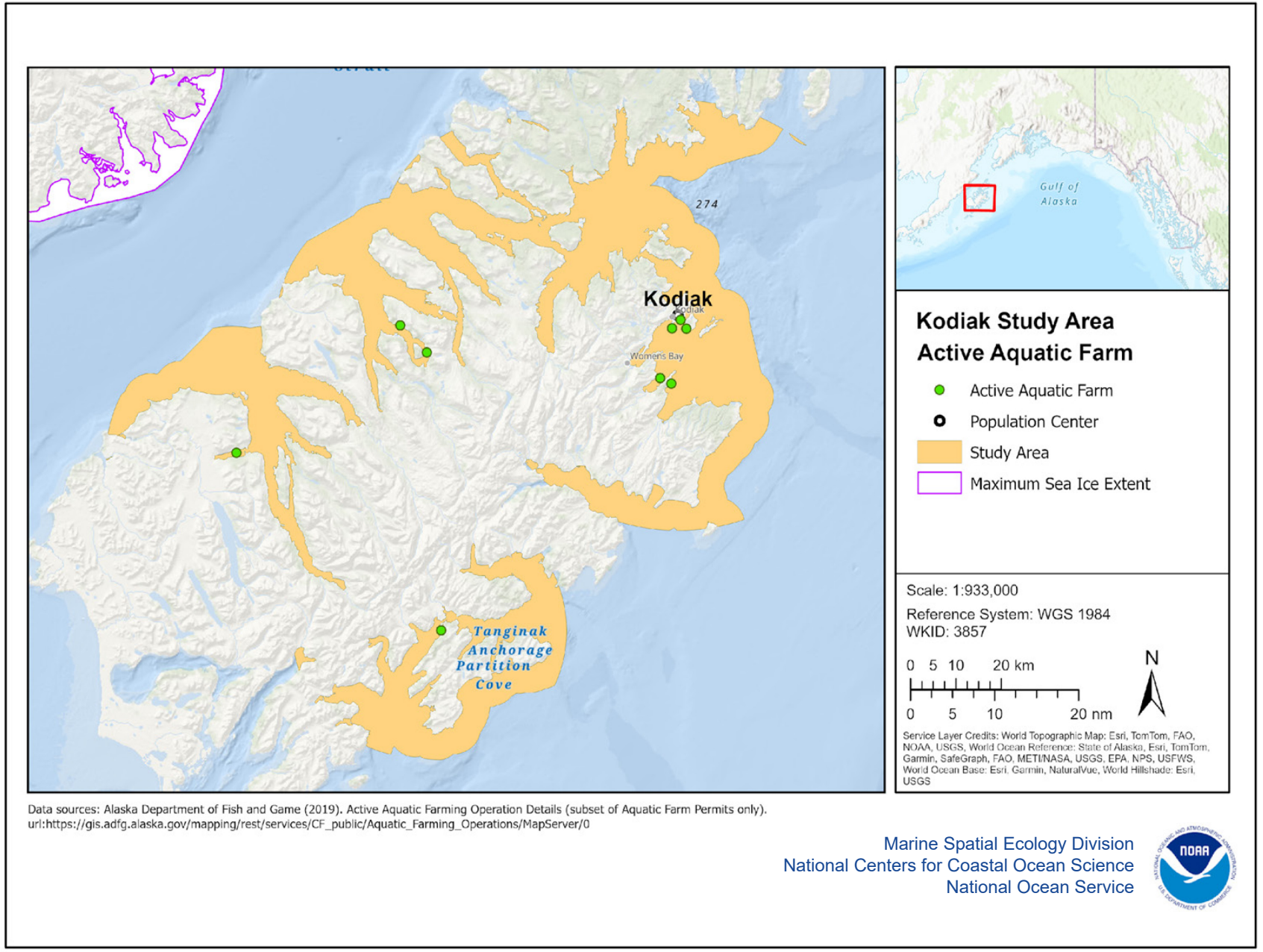
Active Aquatic Farm Leases



Data sources: Alaska Department of Fish and Game (2019). Active Aquatic Farming Operation Details (subset of Aquatic Farm Permits only). url:https://gis.adfg.alaska.gov/mapping/rest/services/CF_public/Aquatic_Farming_Operations/MapServer/0

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

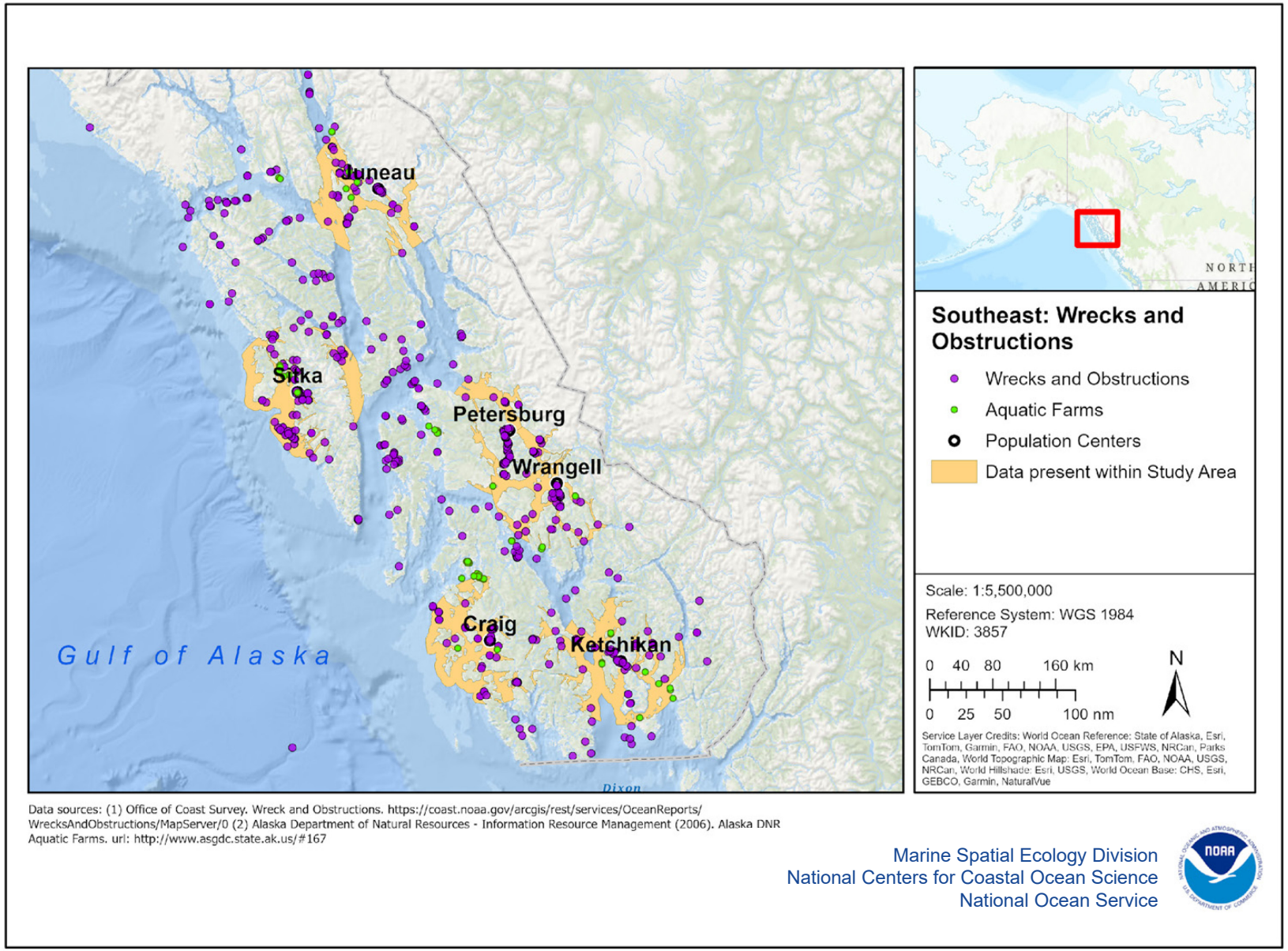
Active Aquatic Farm Leases



Data sources: Alaska Department of Fish and Game (2019). Active Aquatic Farming Operation Details (subset of Aquatic Farm Permits only). url:https://gis.adfg.alaska.gov/mapping/rest/services/CF_public/Aquatic_Farming_Operations/MapServer/0

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

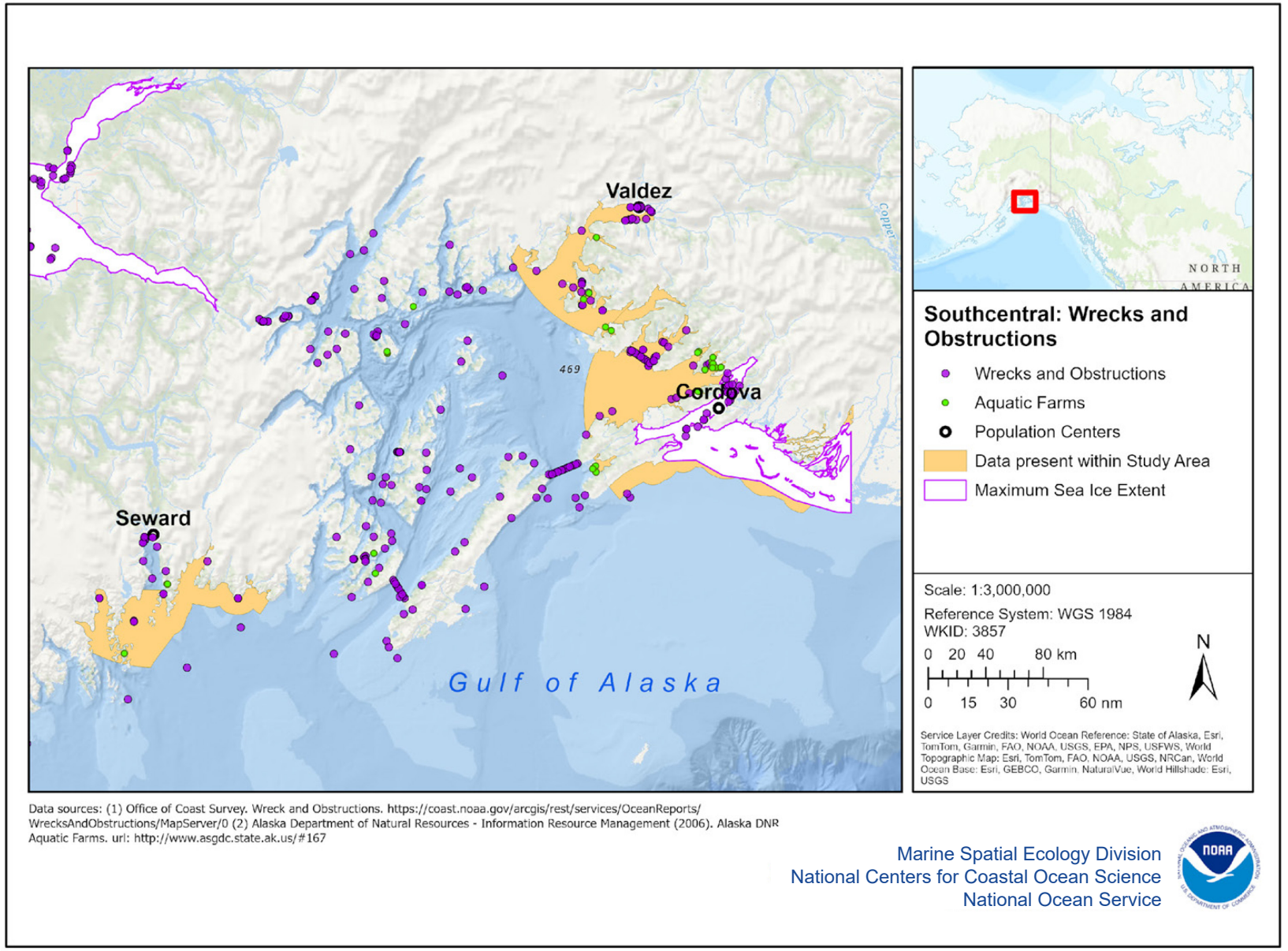
Ship Wrecks & Obstructions



Data sources: (1) Office of Coast Survey. Wreck and Obstructions. https://coast.noaa.gov/arcgis/rest/services/OceanReports/WrecksAndObstructions/MapServer/0 (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska DNR Aquatic Farms. url: http://www.asgdc.state.ak.us/#167

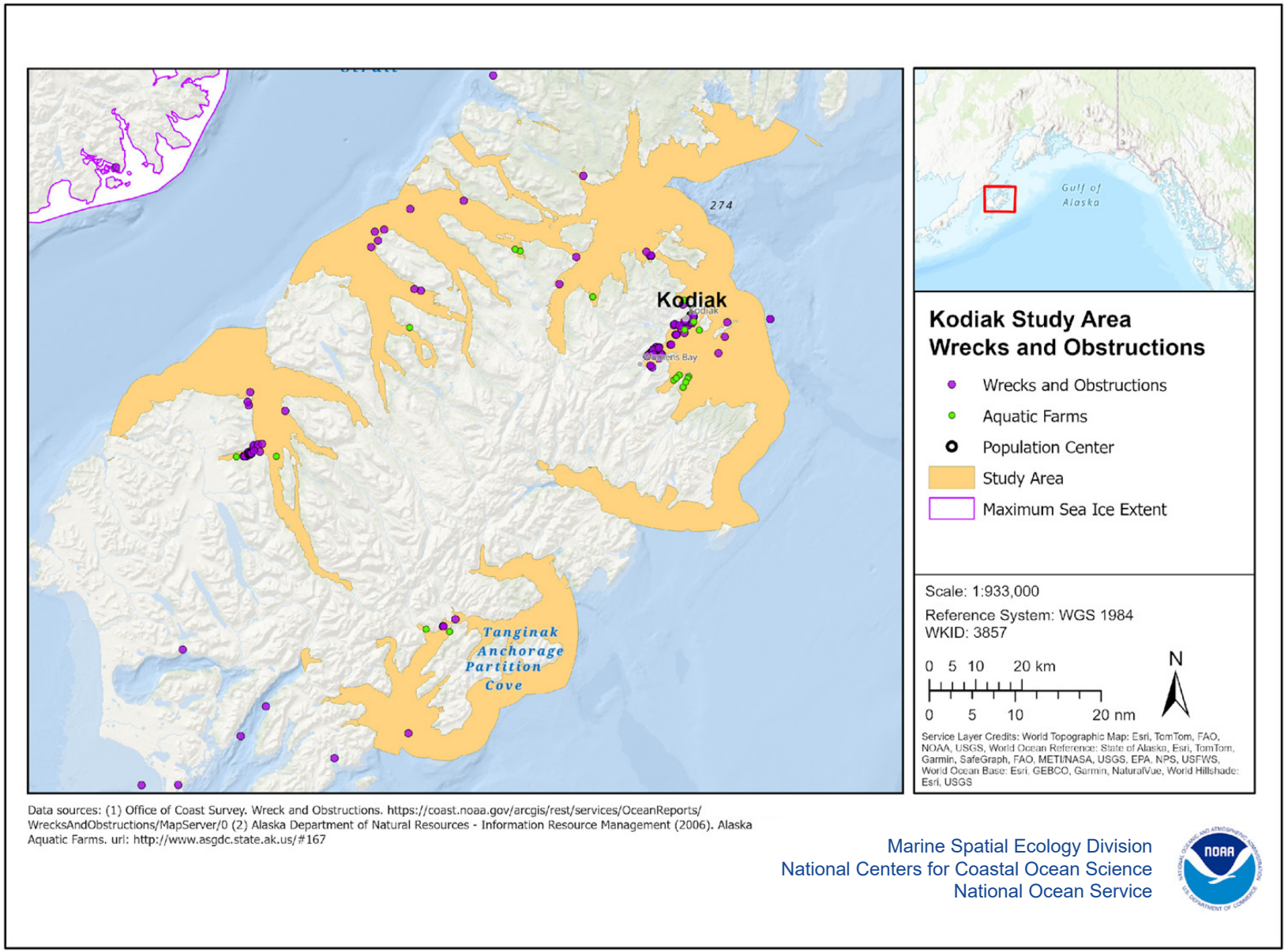
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Ship Wrecks & Obstructions



Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

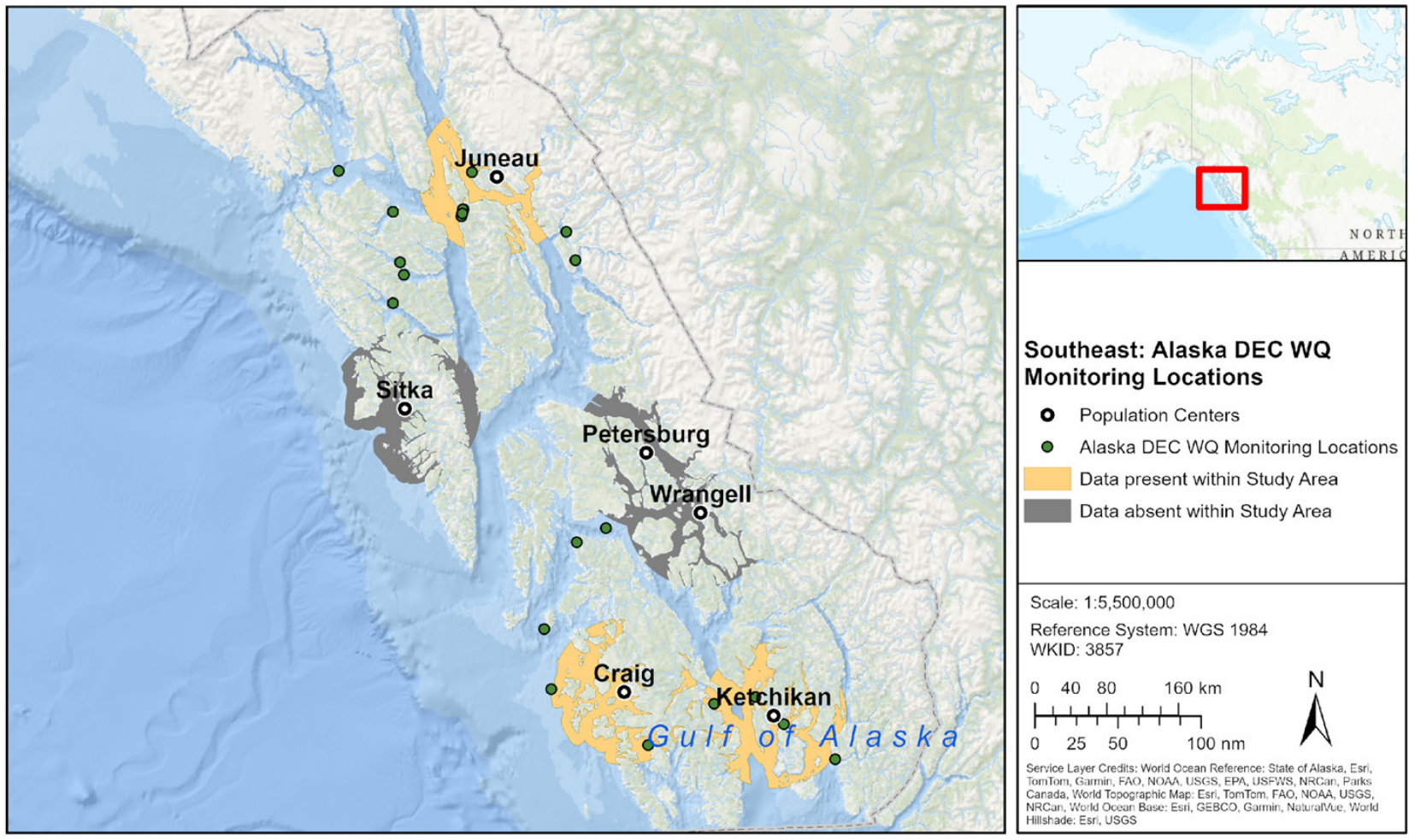
Ship Wrecks & Obstructions



Data sources: (1) Office of Coast Survey. Wreck and Obstructions. https://coast.noaa.gov/arcgis/rest/services/OceanReports/WrecksAndObstructions/MapServer/0 (2) Alaska Department of Natural Resources - Information Resource Management (2006). Alaska Aquatic Farms. url: http://www.asgdc.state.ak.us/#167

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

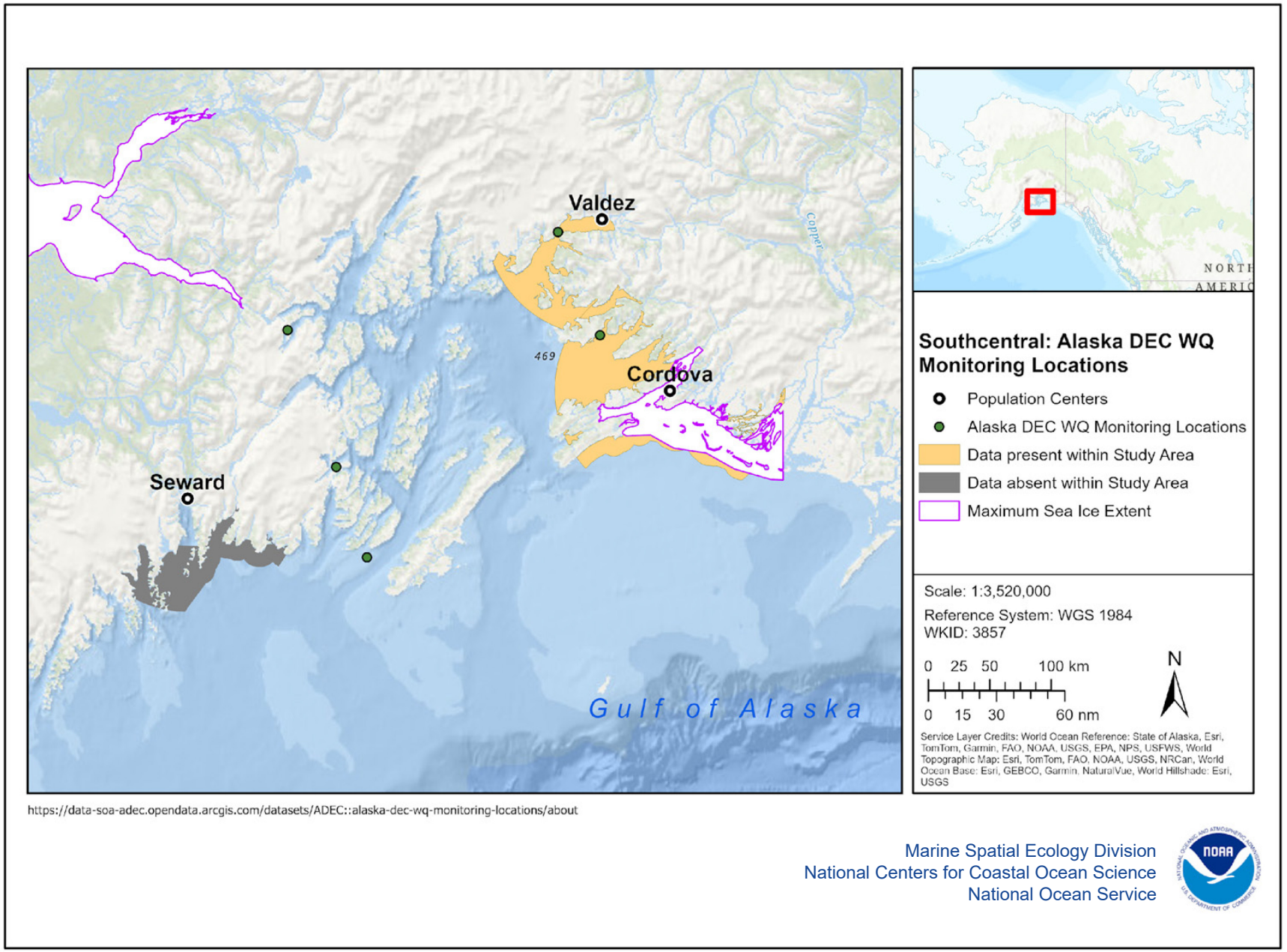
DEC Water Quality Monitoring Stations



https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wq-monitoring-locations/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

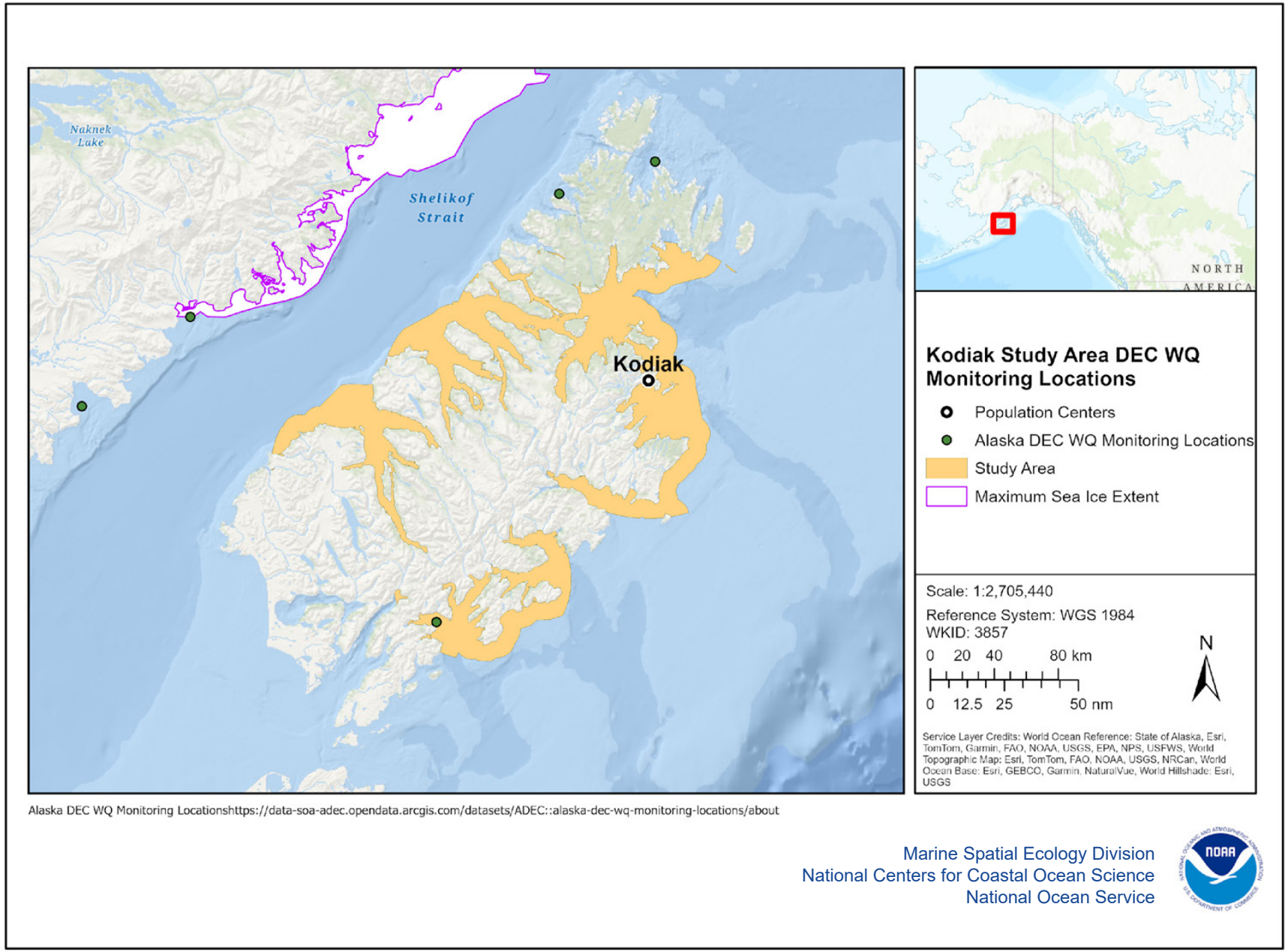
DEC Water Quality Monitoring Stations



https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wq-monitoring-locations/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

DEC Water Quality Monitoring Stations

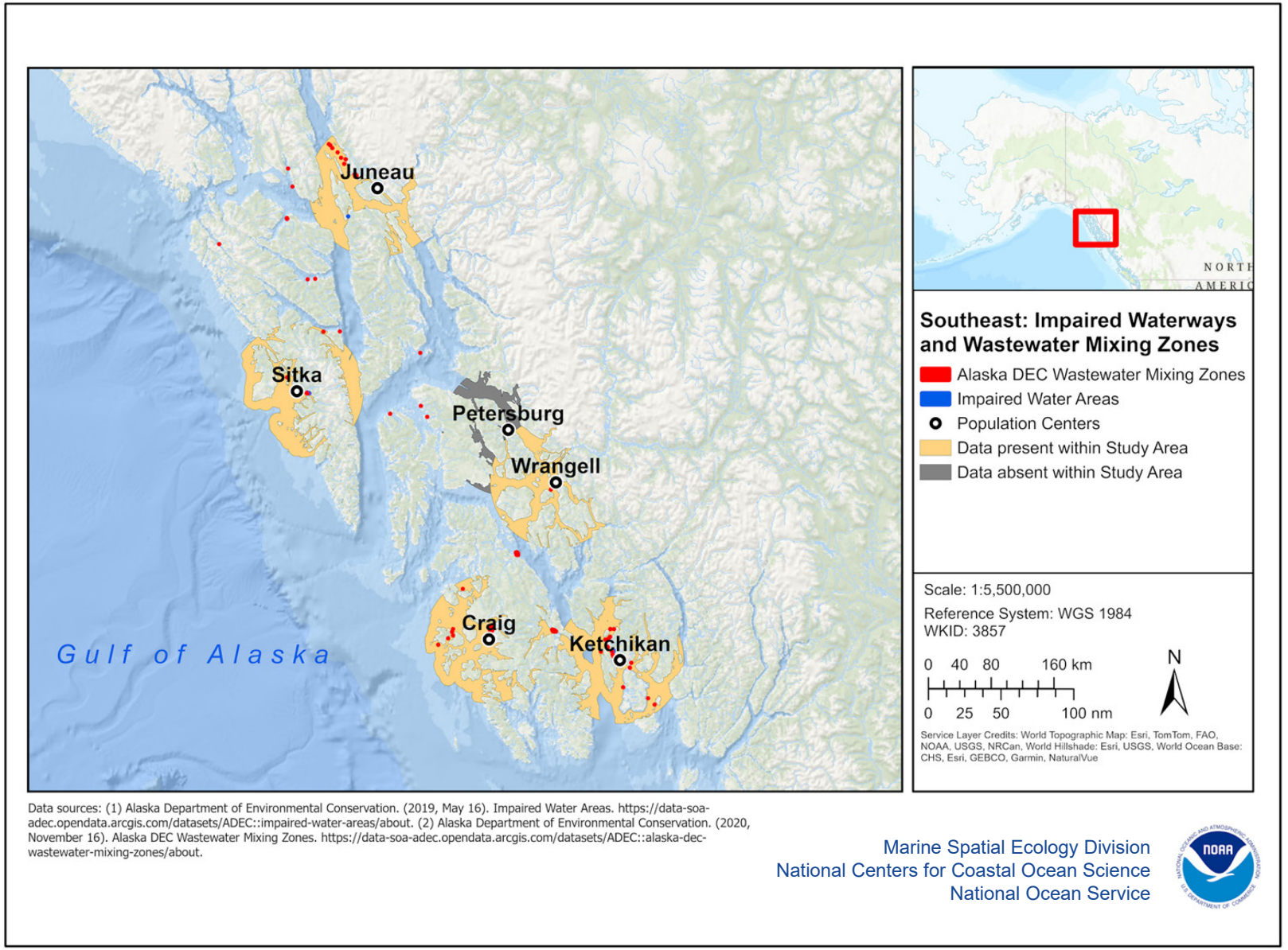


Alaska DEC WQ Monitoring Locationshttps://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wq-monitoring-locations/about

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

DEC Impaired Waters and Wastewater Mixing Zones

Alaska Priority and 303(d) Impaired Waters
This layer represents lakes, harbors and similar polygon features that have been defined by the ADEC via qualitative and quantitative data. These features are noted in the 2014/2016 Integrated Report and currently being actively monitored or have institutional controls (TMDLs) in place, and are classified as Category 2, 3, 4a, 4b, 4c or Category 5 under Section 303(d) of the Clean Water Act (1987). These 2014/2016 Impaired Waters should be used for regulatory purposes.
Data Link
Type: polygon
Original Source: ADEC

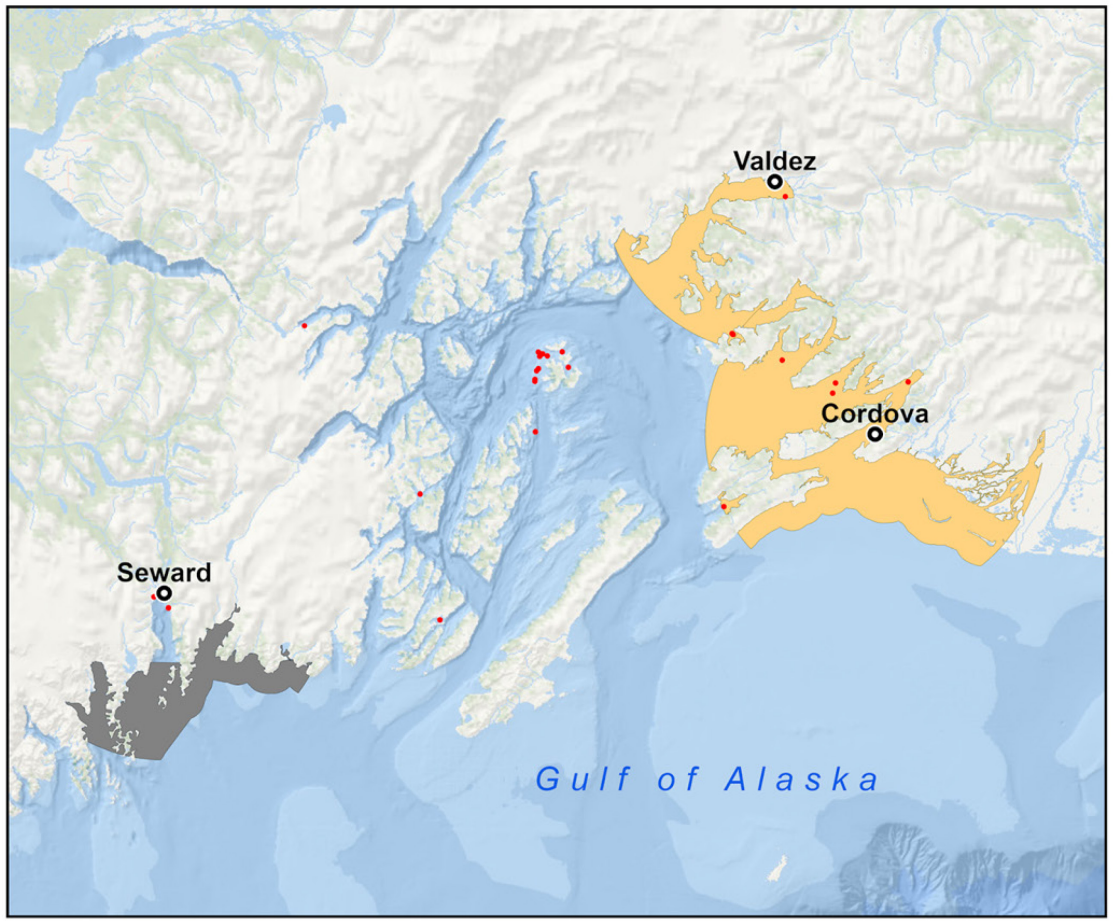


Data sources: (1) Alaska Department of Environmental Conservation. (2019, May 16). Impaired Water Areas. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::impaired-water-areas/about. (2) Alaska Department of Environmental Conservation. (2020, November 16). Alaska DEC Wastewater Mixing Zones. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wastewater-mixing-zones/about.

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

DEC Impaired Waters and Wastewater Mixing Zones

Alaska Priority and 303(d) Impaired Waters
This layer represents lakes, harbors and similar polygon features that have been defined by the ADEC via qualitative and quantitative data. These features are noted in the 2014/2016 Integrated Report and currently being actively monitored or have institutional controls (TMDLs) in place, and are classified as Category 2, 3, 4a, 4b, 4c or Category 5 under Section 303(d) of the Clean Water Act (1987). These 2014/2016 Impaired Waters should be used for regulatory purposes.
Data Link
Type: polygon
Original Source: ADEC





Southcentral: Impaired Waterways and Wastewater Mixing Zones

- Alaska DEC Wastewater Mixing Zones
- Impaired Water Areas
- Population Centers
- Data present within Study Area
- Data absent within Study Area

Scale: 1:3,000,000
Reference System: WGS 1984
WKID: 3857
0 20 40 80 km
0 15 30 60 nm
N

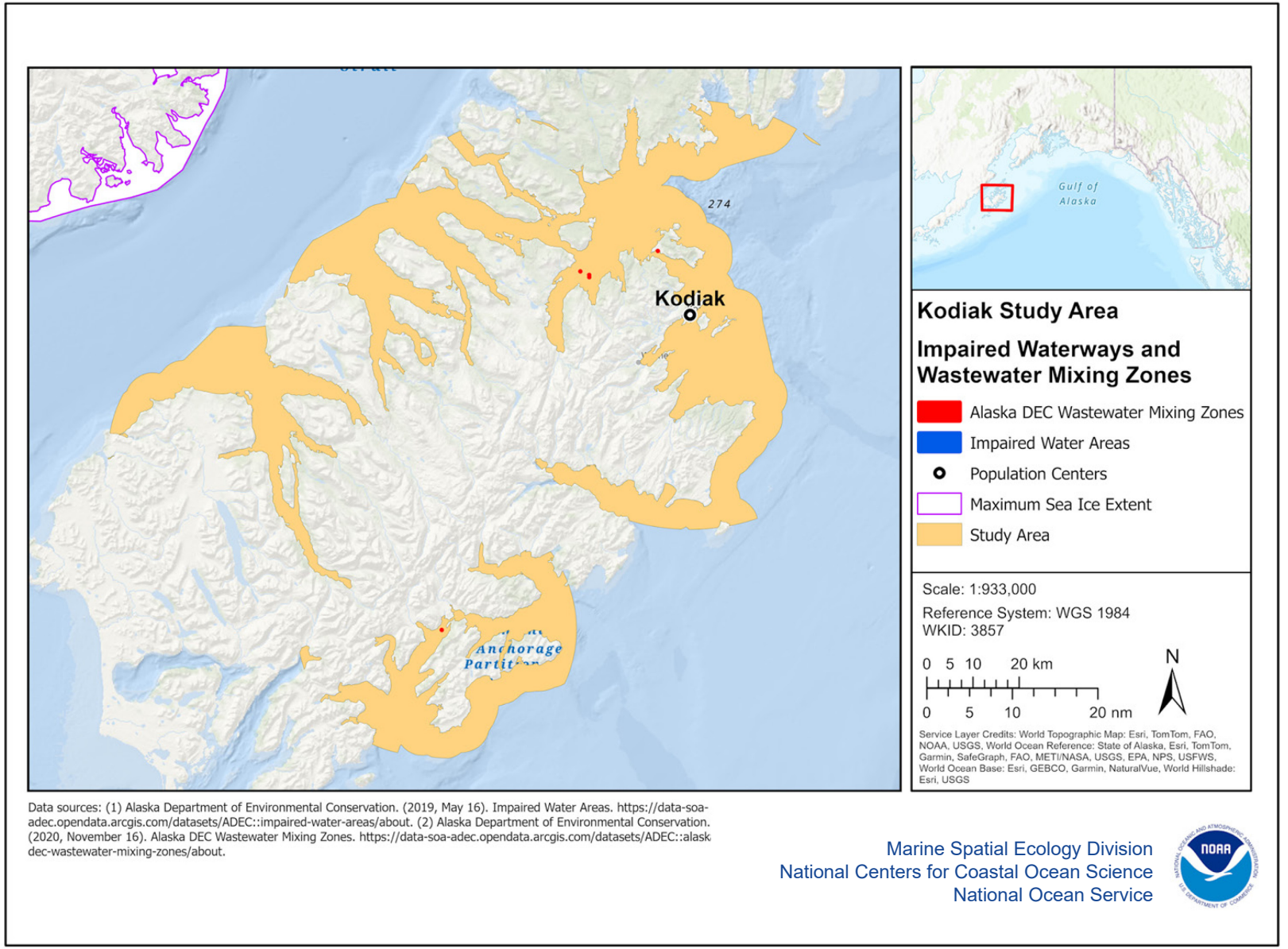
Service Layer Credits: World Topographic Map: Esri, TomTom, FAO, NOAA, USGS, NRCan, World Ocean Base: Esri, GEBCO, Garmin, NaturalVue, World Hillshade: Esri, USGS

Data sources: (1) Alaska Department of Environmental Conservation. (2019, May 16). Impaired Water Areas. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::impaired-water-areas/about. (2) Alaska Department of Environmental Conservation. (2020, November 16). Alaska DEC Wastewater Mixing Zones. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wastewater-mixing-zones/about.

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

DEC Impaired Waters and Wastewater Mixing Zones

Alaska Priority and 303(d) Impaired Waters
This layer represents lakes, harbors and similar polygon features that have been defined by the ADEC via qualitative and quantitative data. These features are noted in the 2014/2016 Integrated Report and currently being actively monitored or have institutional controls (TMDLs) in place, and are classified as Category 2, 3, 4a, 4b, 4c or Category 5 under Section 303(d) of the Clean Water Act (1987). These 2014/2016 Impaired Waters should be used for regulatory purposes.
Data Link
Type: polygon
Original Source: ADEC

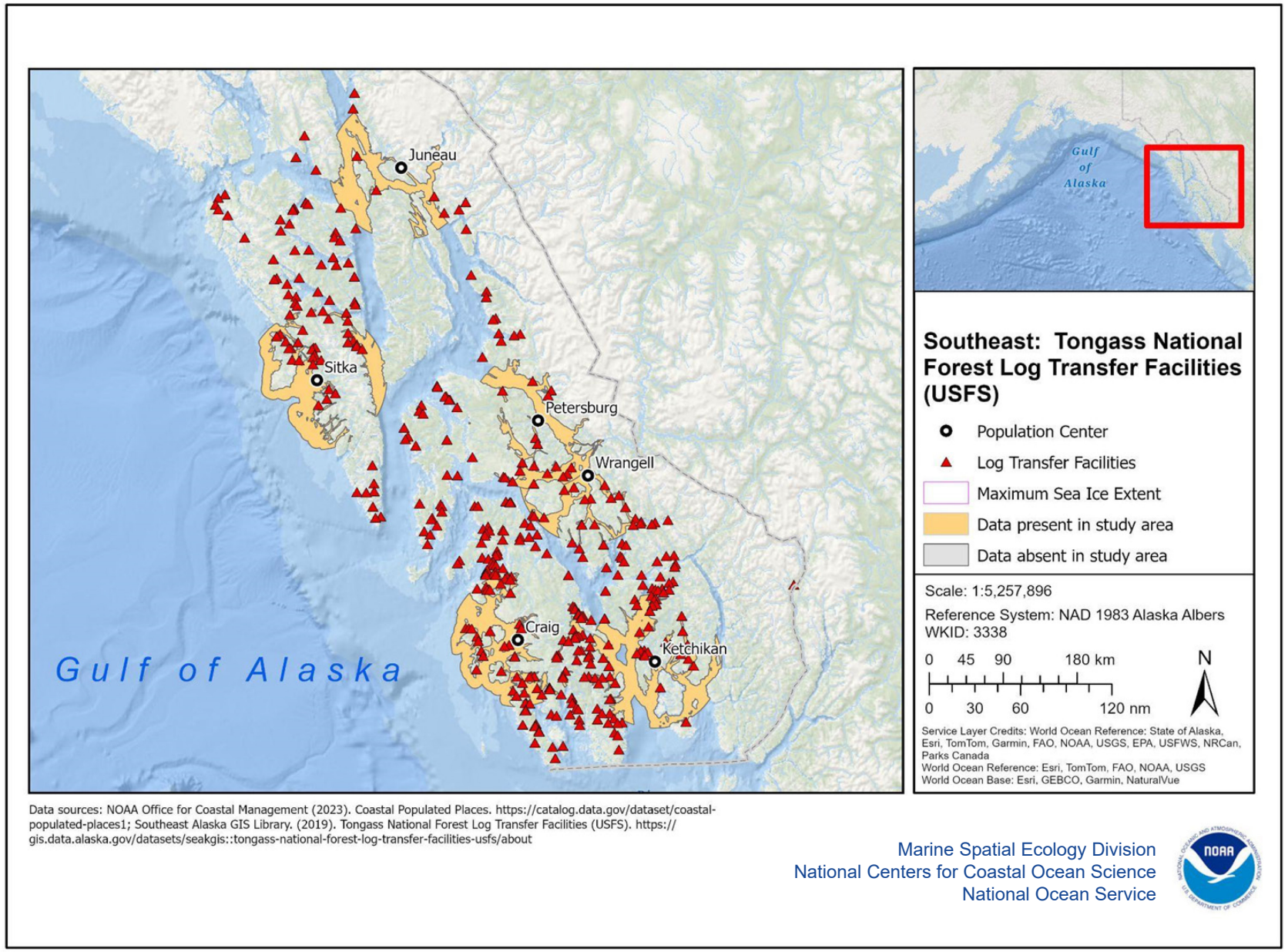


Data sources: (1) Alaska Department of Environmental Conservation. (2019, May 16). Impaired Water Areas. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::impaired-water-areas/about. (2) Alaska Department of Environmental Conservation. (2020, November 16). Alaska DEC Wastewater Mixing Zones. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::alaska-dec-wastewater-mixing-zones/about.

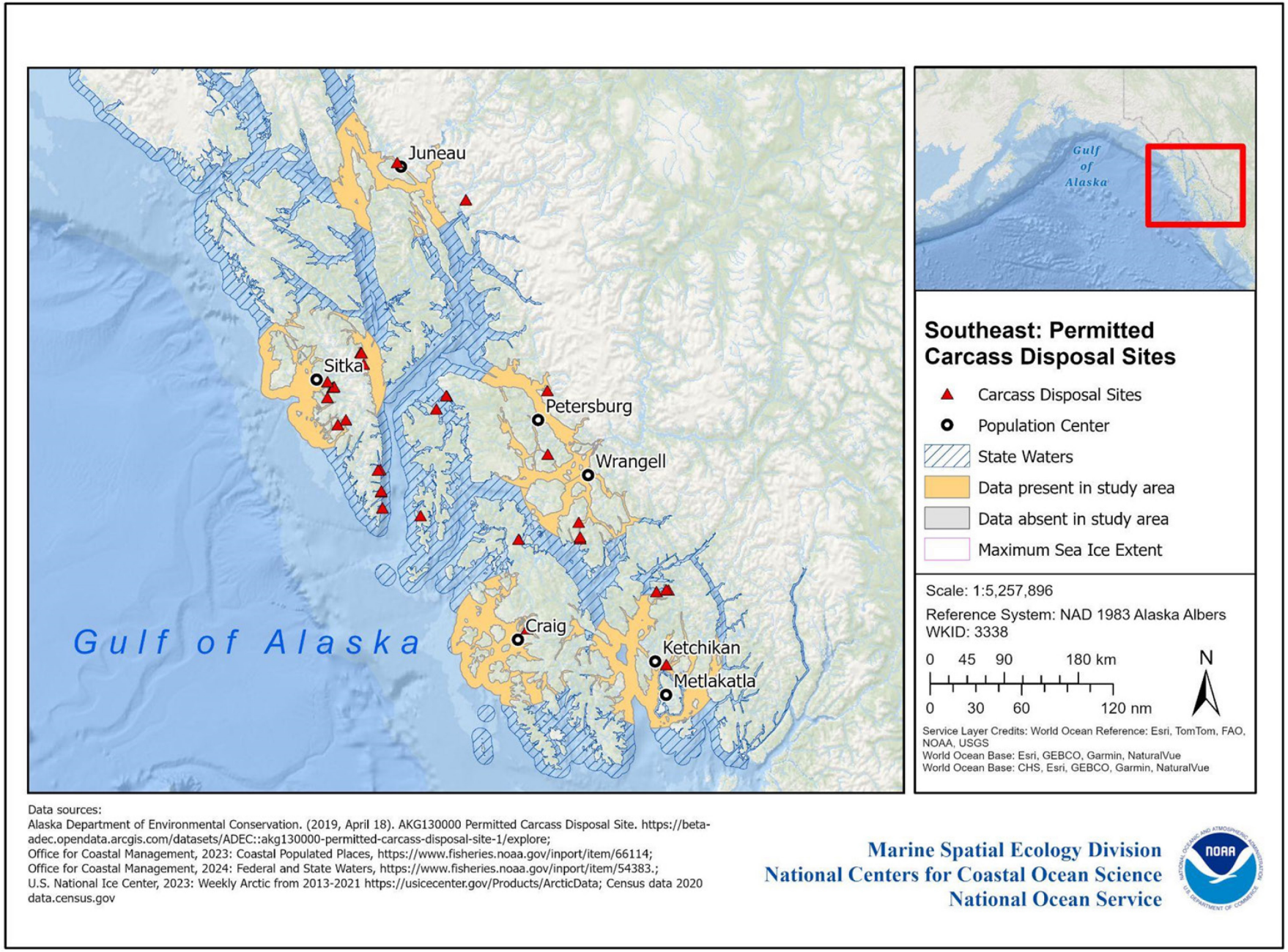
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Log Transfer Facilities

Summary:
Southeast Alaska GIS Library. (2019). Tongass National Forest Log Transfer Facilities (USFS). https://gis.data.alaska.gov/datasets/seakgis::tongass-national-forest-log-transfer-facilities-usfs/about



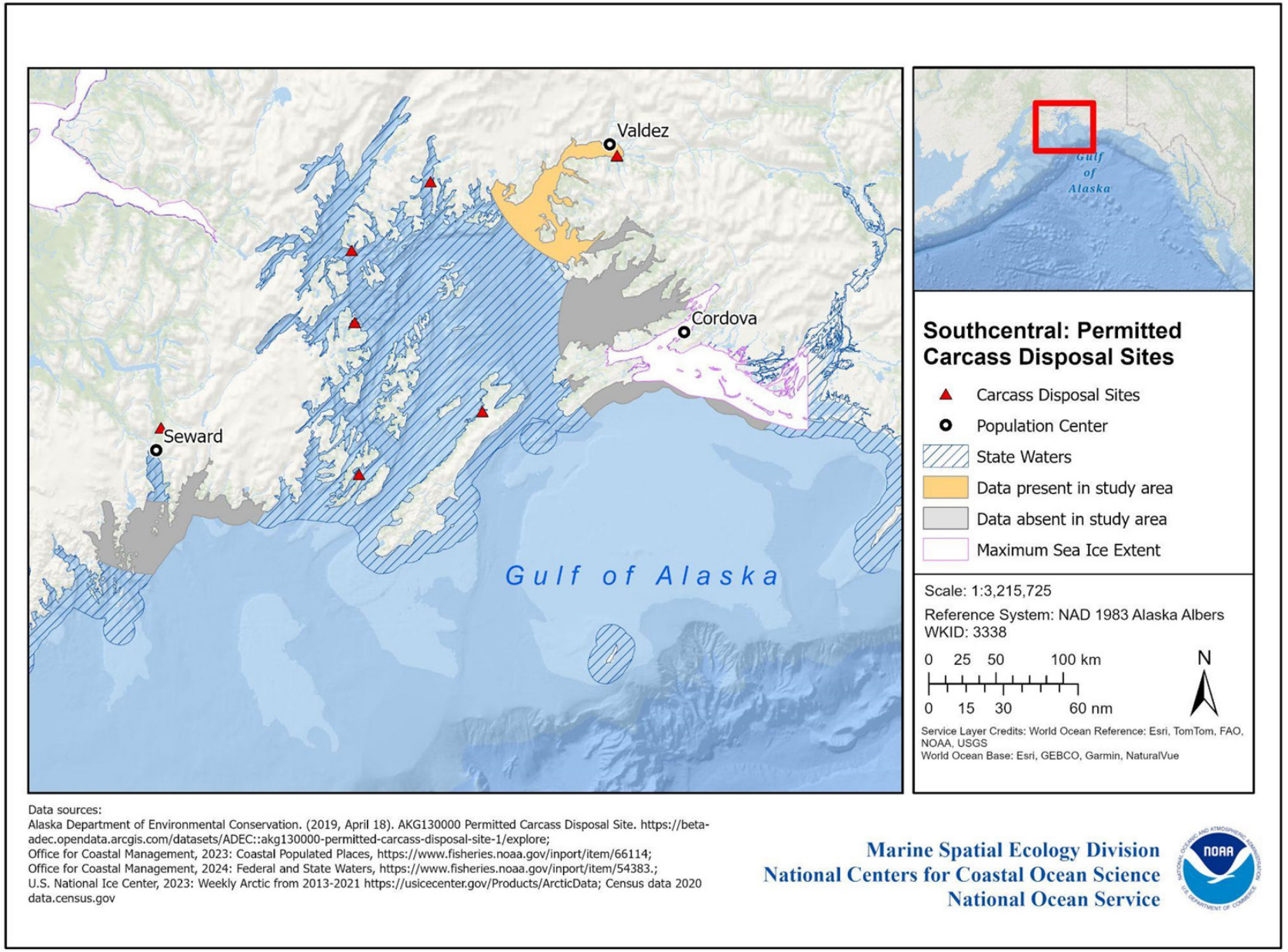
Carcass Disposal Sites



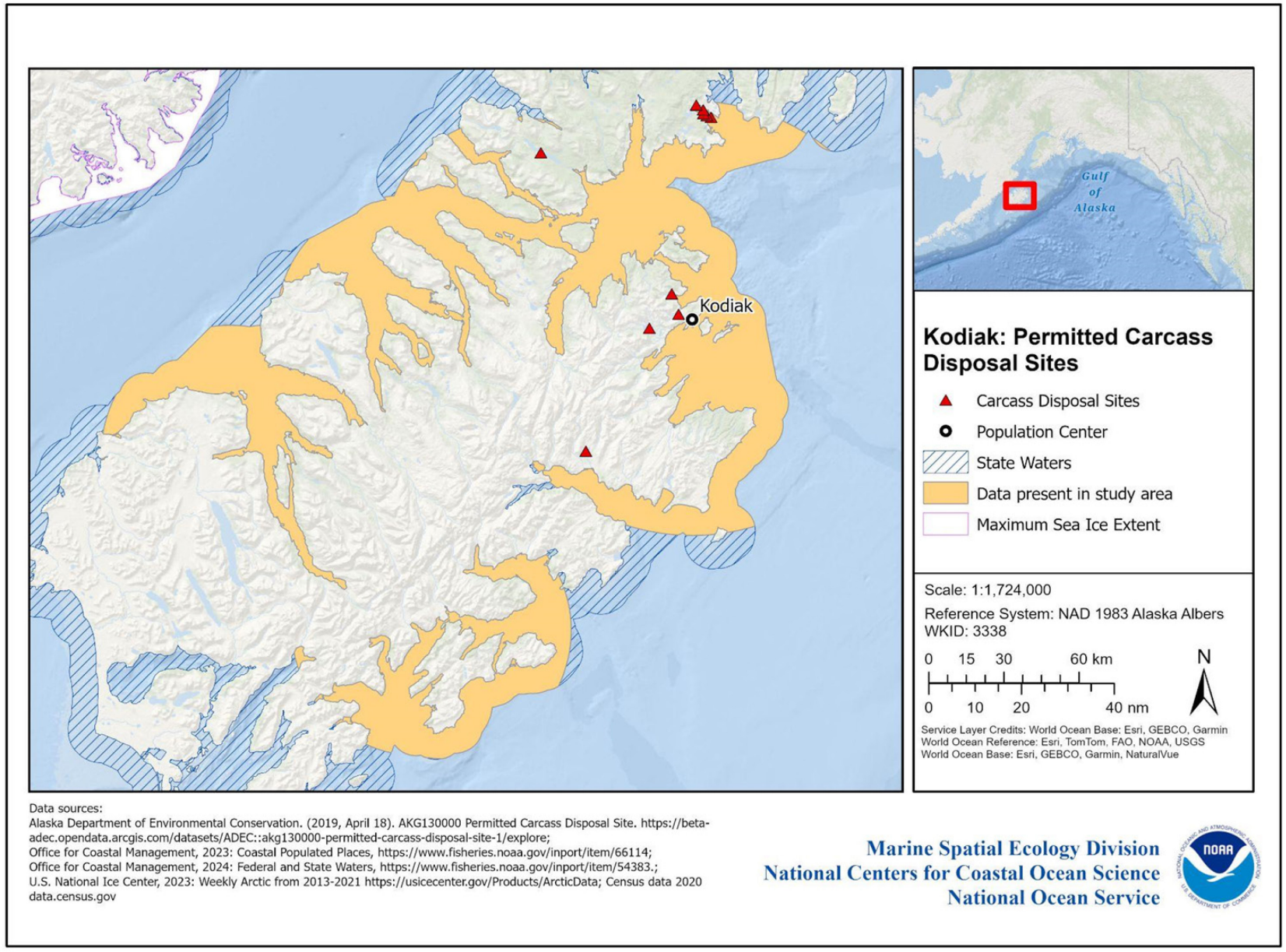
Data sources:
Alaska Department of Environmental Conservation. (2019, April 18). AKG130000 Permitted Carcass Disposal Site. https://beta-adec.opendata.arcgis.com/datasets/ADEC::akg130000-permitted-carcass-disposal-site-1/explore;
Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

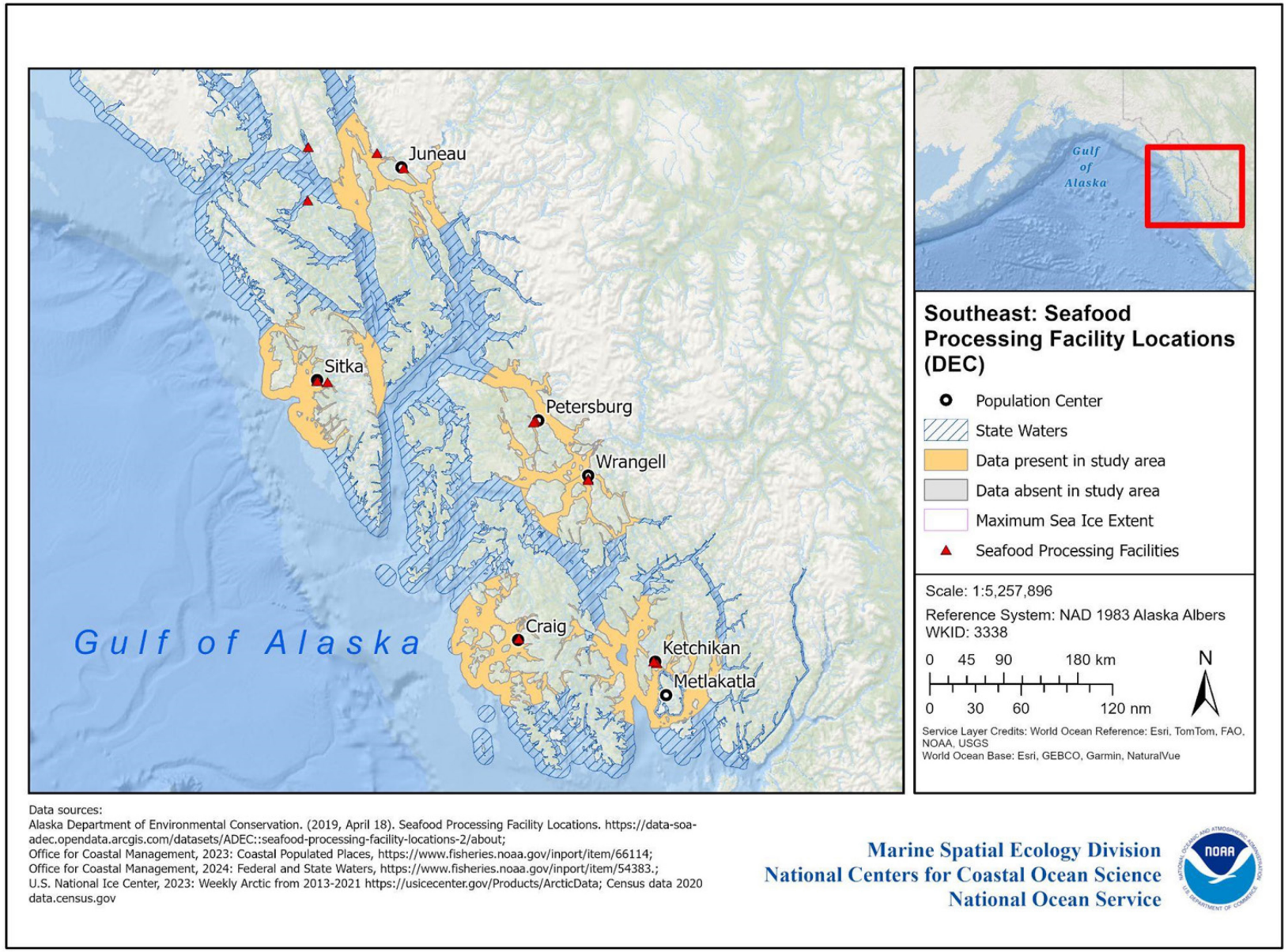
Carcass Disposal Sites



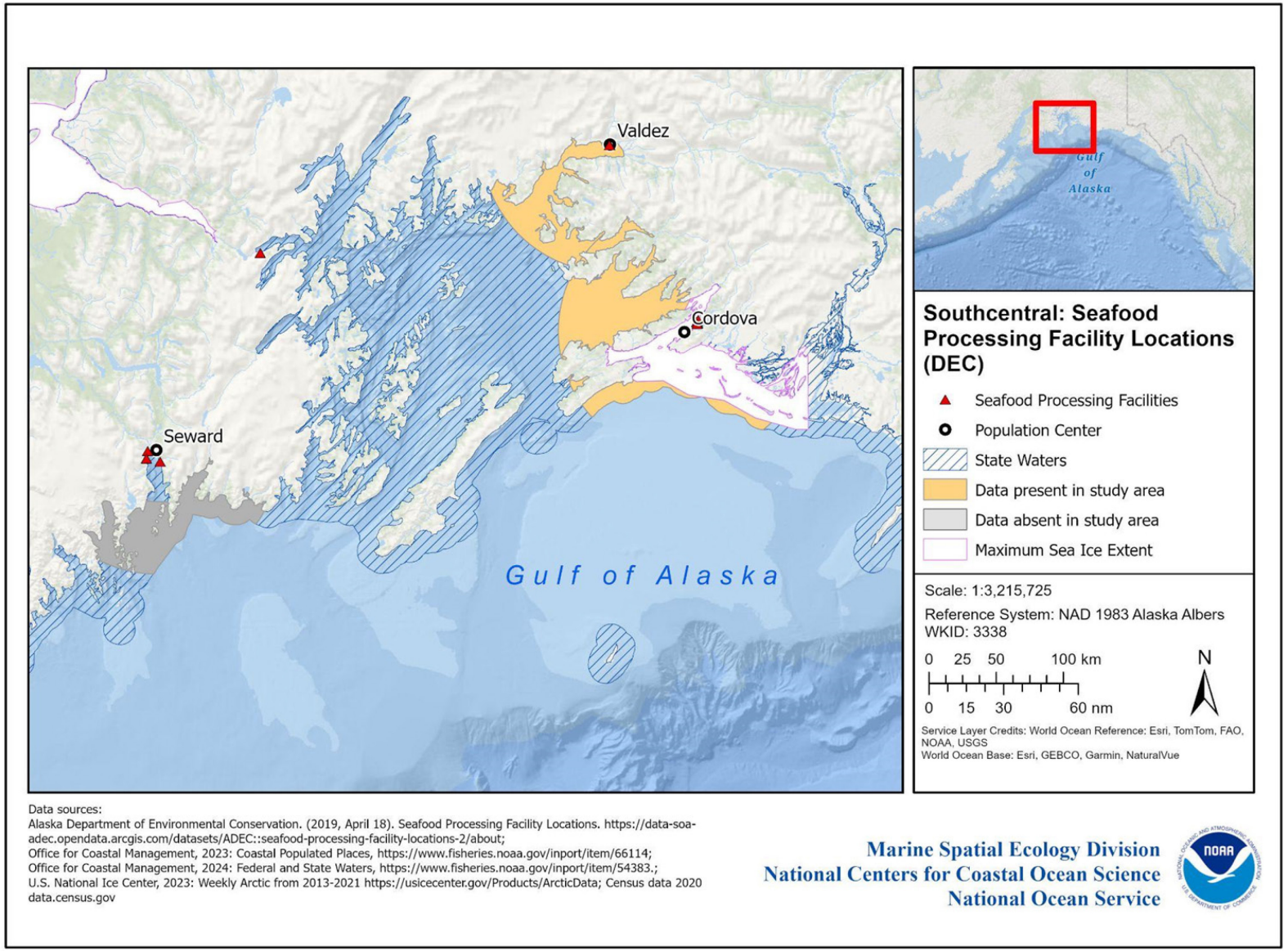
Carcass Disposal Sites



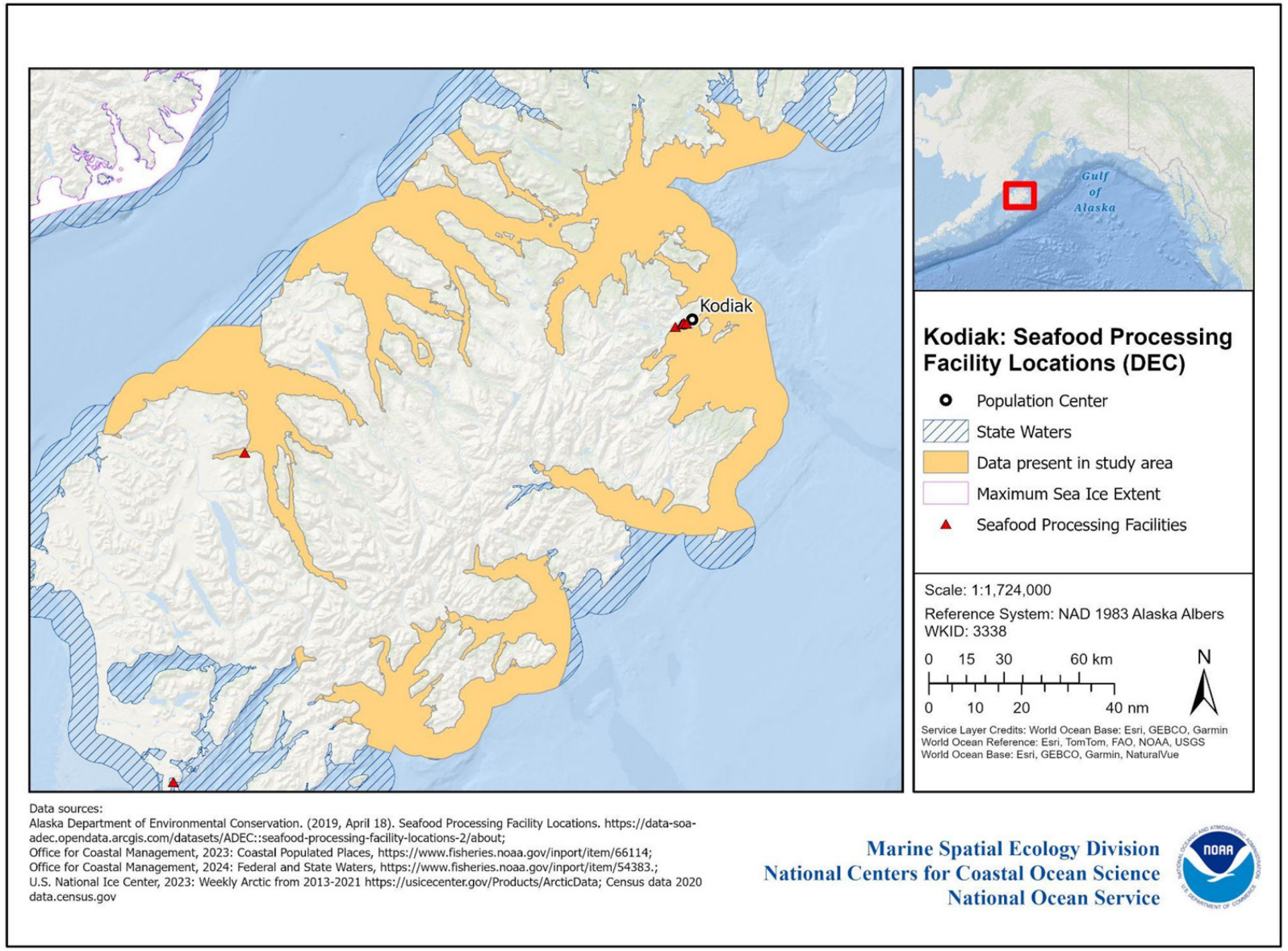
Seafood Processing Facilities



Seafood Processing Facilities



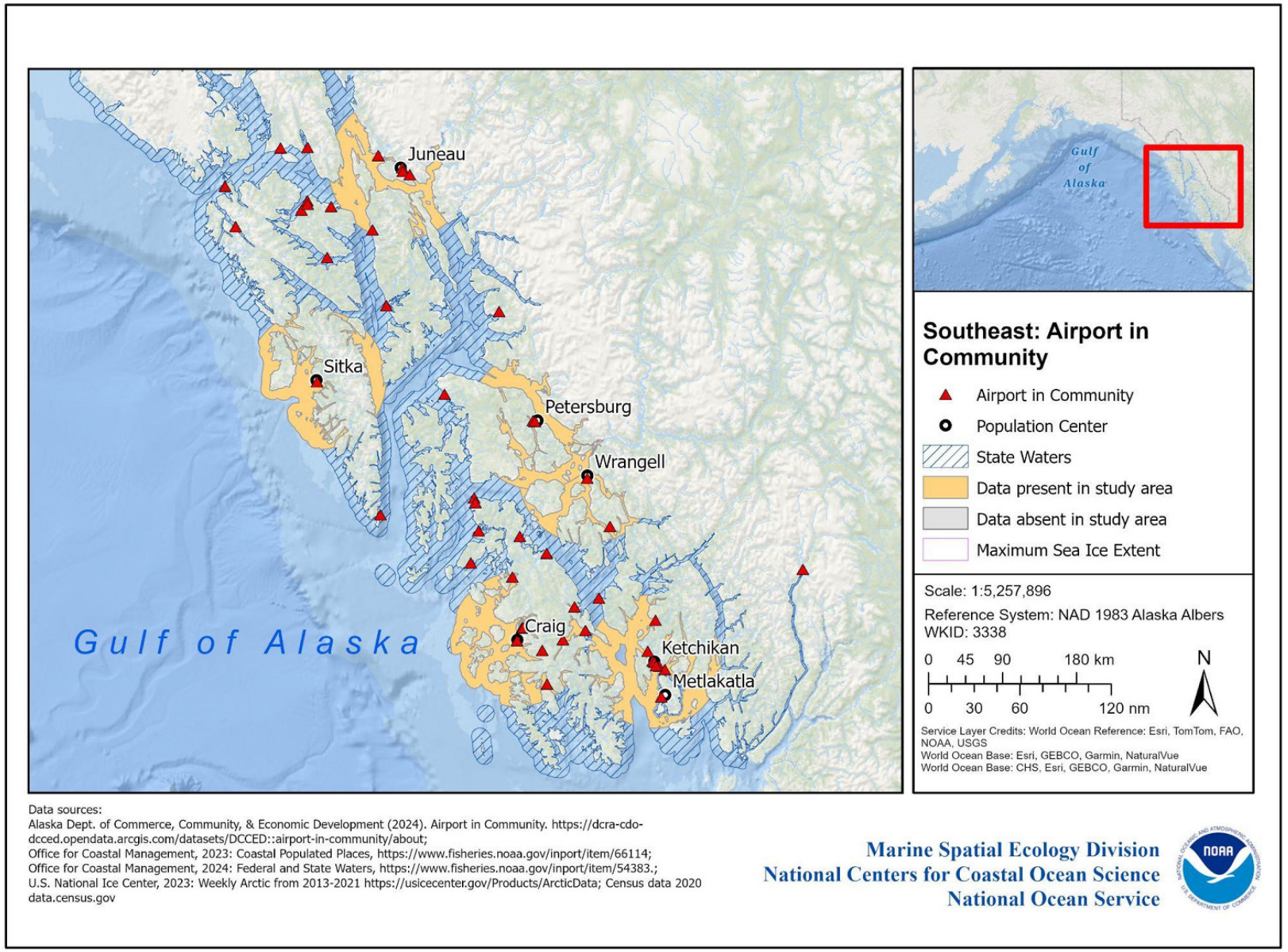
Seafood Processing Facilities



Data sources:
Alaska Department of Environmental Conservation. (2019, April 18). Seafood Processing Facility Locations. https://data-soa-adec.opendata.arcgis.com/datasets/ADEC::seafood-processing-facility-locations-2/about;
Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

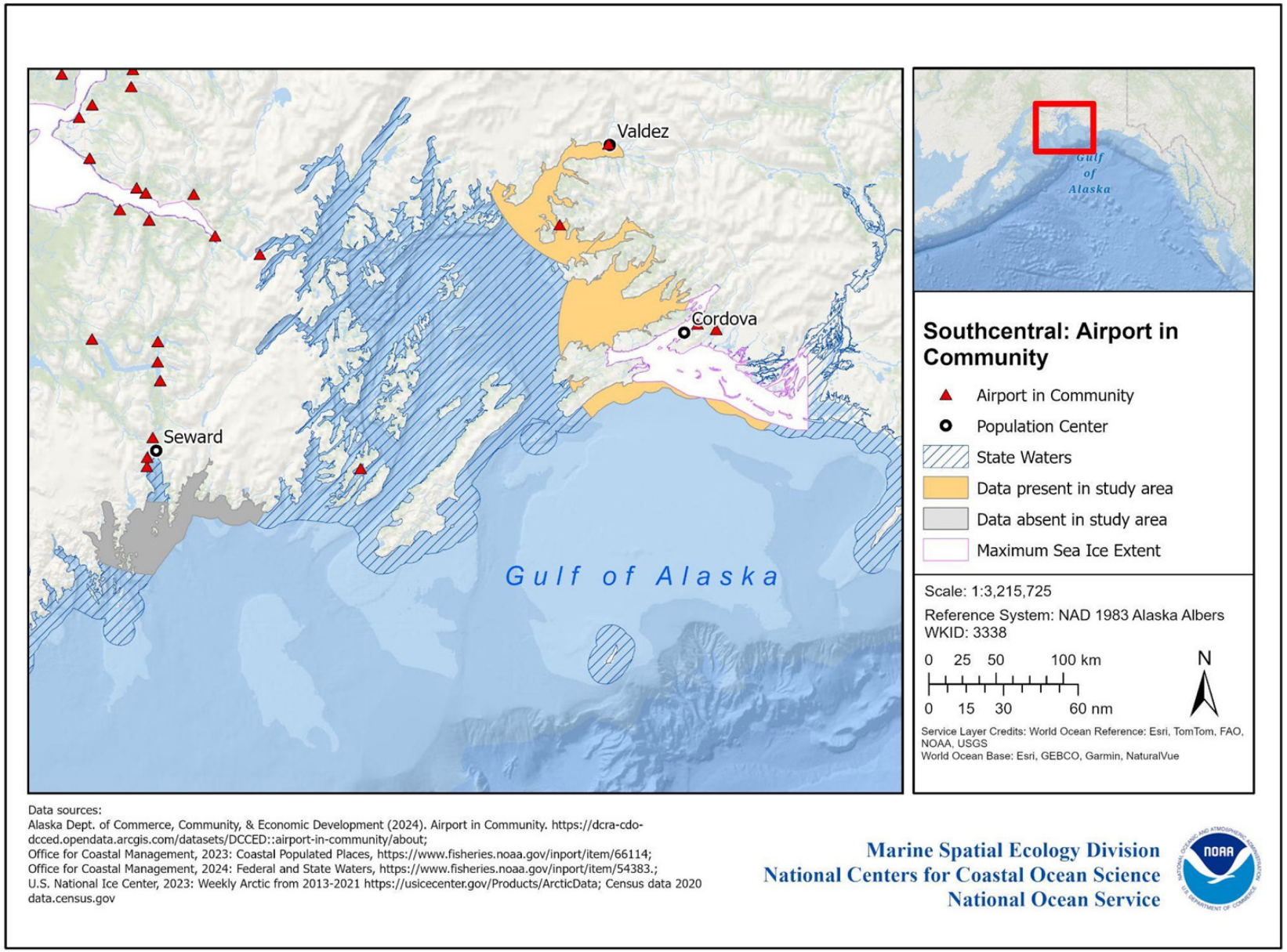
Airports



Data sources:
Alaska Dept. of Commerce, Community, & Economic Development (2024). Airport in Community. https://dcra-cdo-dcced.opendata.arcgis.com/datasets/DCCED::airport-in-community/about;
Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

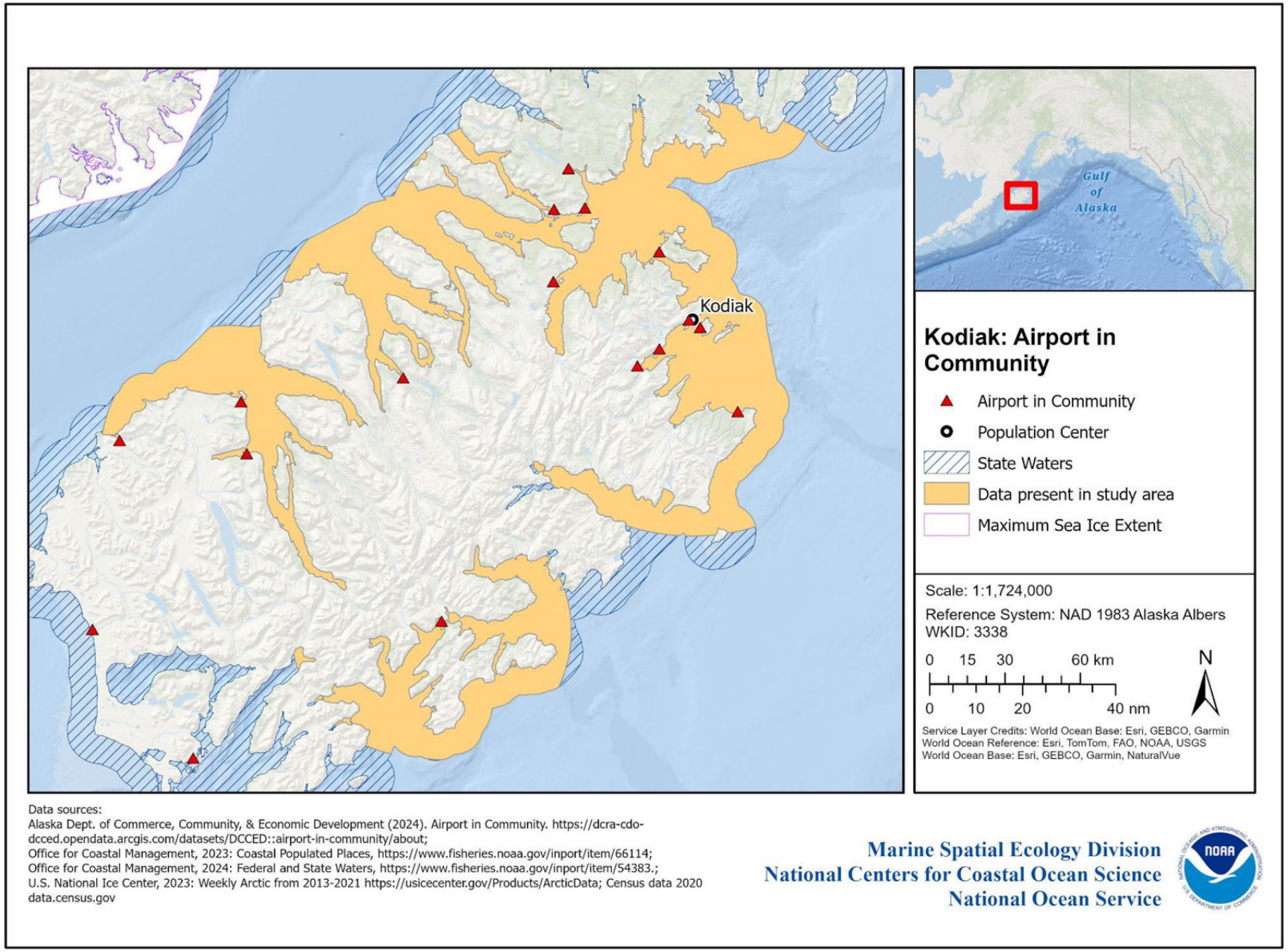
Airports



Data sources:
Alaska Dept. of Commerce, Community, & Economic Development (2024). Airport in Community. https://dcra-cdo-dcced.opendata.arcgis.com/datasets/DCCED::airport-in-community/about;
Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service

Airports


Kodiak
Gulf of Alaska
Kodiak: Airport in Community
Airport in Community
Population Center
State Waters
Data present in study area
Maximum Sea Ice Extent
Scale: 1:1,724,000
Reference System: NAD 1983 Alaska Albers
WKID: 3338
0 15 30 60 km
0 10 20 40 nm
N
Service Layer Credits: World Ocean Base: Esri, GEBCO, Garmin
World Ocean Reference: Esri, TomTom, FAO, NOAA, USGS
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue
Data sources:
Alaska Dept. of Commerce, Community, & Economic Development (2024). Airport in Community. https://dcra-cdo-dcced.opendata.arcgis.com/datasets/DCCED::airport-in-community/about;
Office for Coastal Management, 2023: Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114;
Office for Coastal Management, 2024: Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383.;
U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov
Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
NOAA

Industries

Industry	Overlap	Type
AIS Vessel Traffic	Southeast, Southcentral, Kodiak	Consideration
Active Aquatic Farming Operations (Aquatic Farm Permits only)	Cordova, Kodiak, Ketchikan, Craig, Sitka, Petersburg, Wrangell	Constraint
Cook Inlet Fiber Optic Network	Kodiak	Constraint
Alaska Harbors	Valdez, Cordova, Kodiak, Ketchikan, Juneau, Craig, Sitka, Petersburg, Wrangell	Constraint
NOAA Charted Submarine Cables	Valdez, Cordova, Kodiak, Ketchikan, Juneau, Sitka, Petersburg, Wrangell	Constraint
Permitted Carcass Disposal Site	Valdez, Kodiak, Sitka, Wrangell	Consideration
Alaska Marine Highway	Kodiak, Ketchikan, Juneau, Sitka	Constraint
Shipwrecks and Obstructions	Southeast, Southcentral, Kodiak	Constraint
DEC Water Quality Monitoring Stations	Southeast, Southcentral, Kodiak	Consideration
DEC Impaired Waters	Southeast, Southcentral, Kodiak	Consideration
DEC Wastewater Mixing Zones	Southeast, Southcentral, Kodiak	Constraint
Log transfer facilities	Southeast	Constraint
Carcass Disposal Site	Southeast, Southcentral, Kodiak	Constraint
Seafood Processing Facilities	Southeast, Southcentral, Kodiak	Constraint
Airports	Southeast, Southcentral, Kodiak	Constraint

Additional data in development- USFS Special Use Permits, seaplanes, ect.

Core Data Questions

1. What are your concerns or questions about the data layers just presented?

1. Are you aware of any data that are missing from the list but available? If so, can you provide a point of contact from whom we could acquire the data?

1. What data gaps exist? In considering the list of identified data gaps in group discussion, what stands out as a high priority?



Thank You!

Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
National Ocean Service
christopher.schillaci@noaa.gov