



NOAA
FISHERIES

Results from the Eastern (and Northern) Bering Sea Bottom Trawl Survey

May 26 to July 31, 2022

Duane.Stevenson@noaa.gov

RACE Division
Groundfish Assessment Program

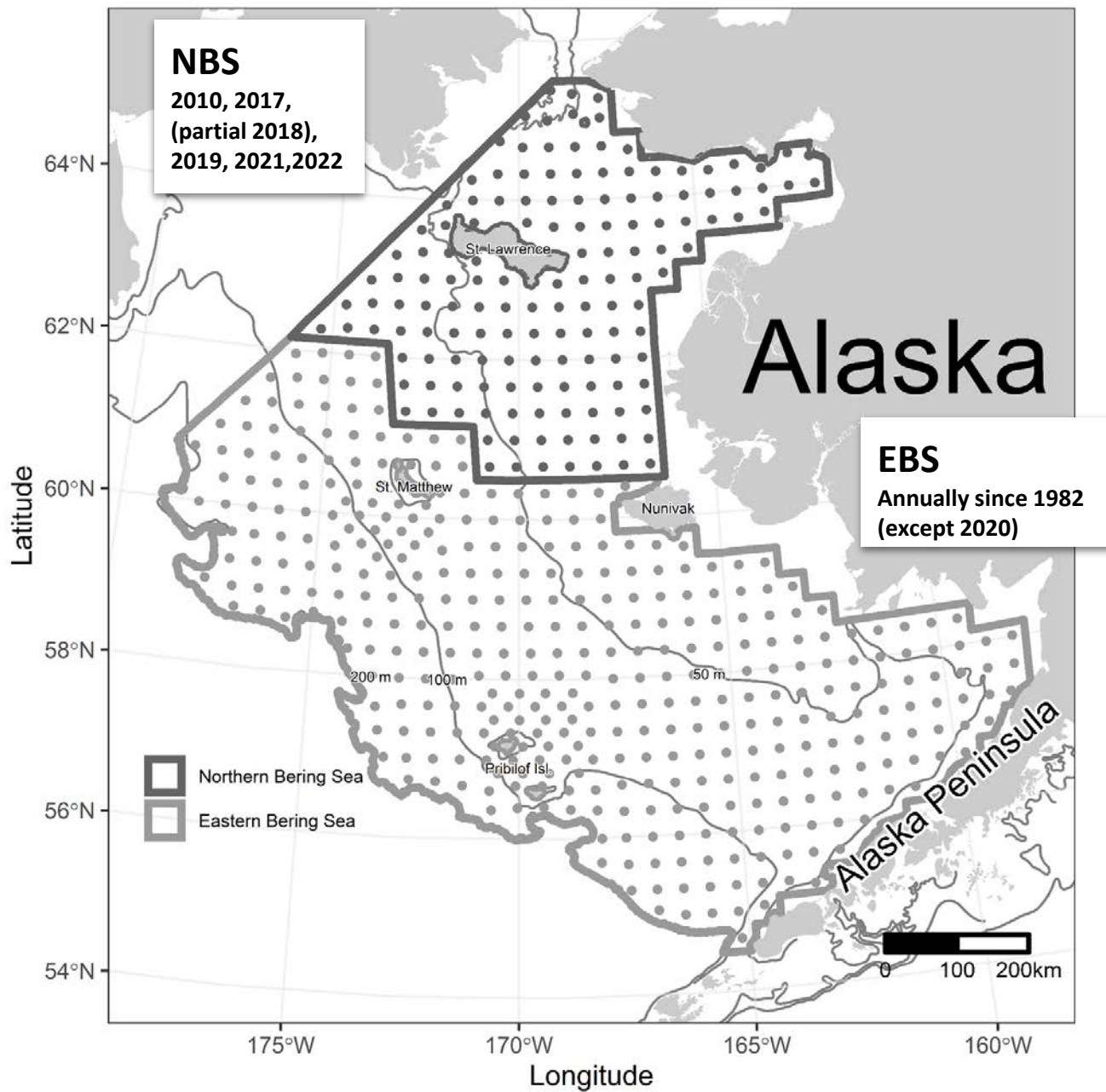
September 21, 2022



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Outline

- Environmental data
- Fish population data
- Additional research
- New public data interface
- State of the survey group



Survey Charter Vessels

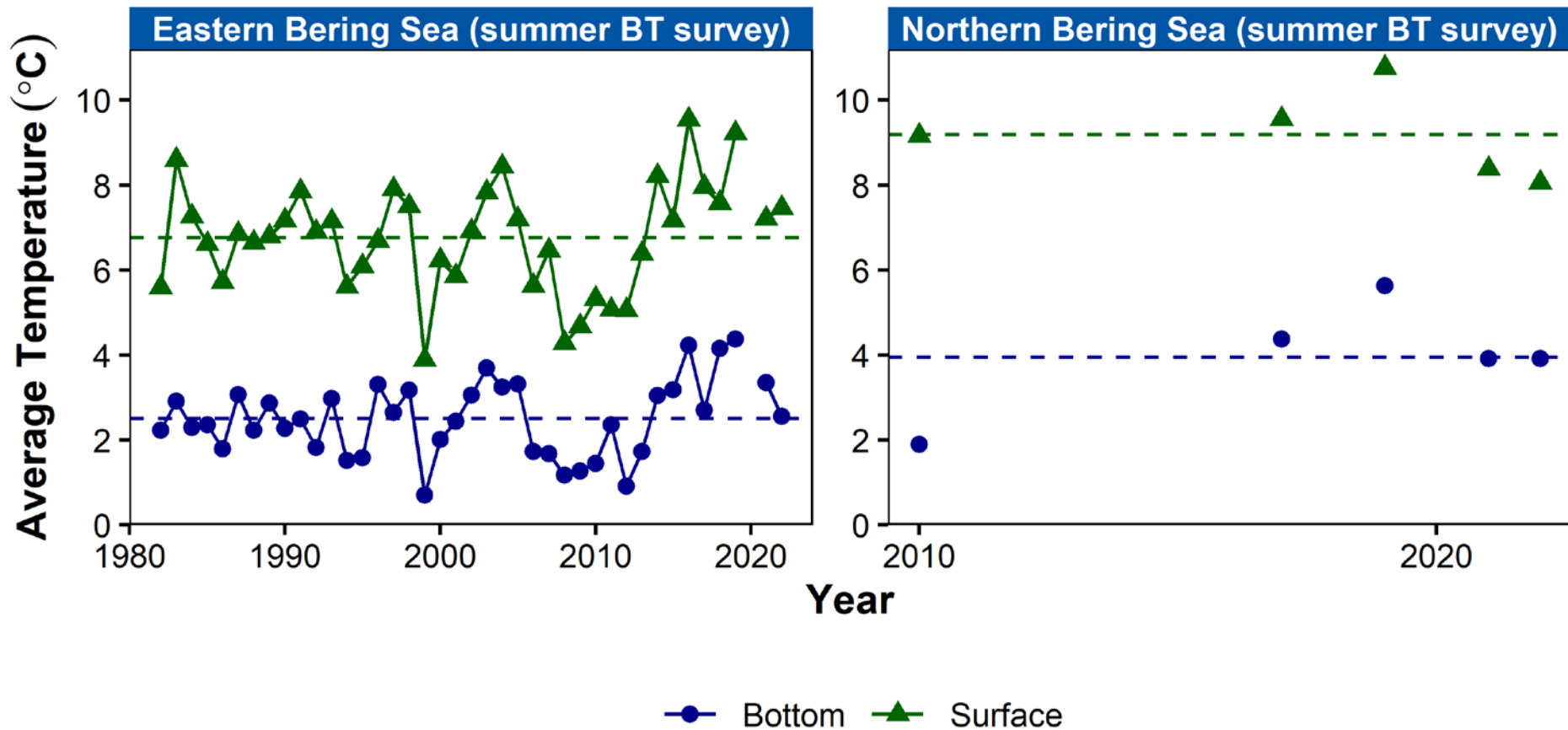


FV Vesteraalen
2014-present
8th year

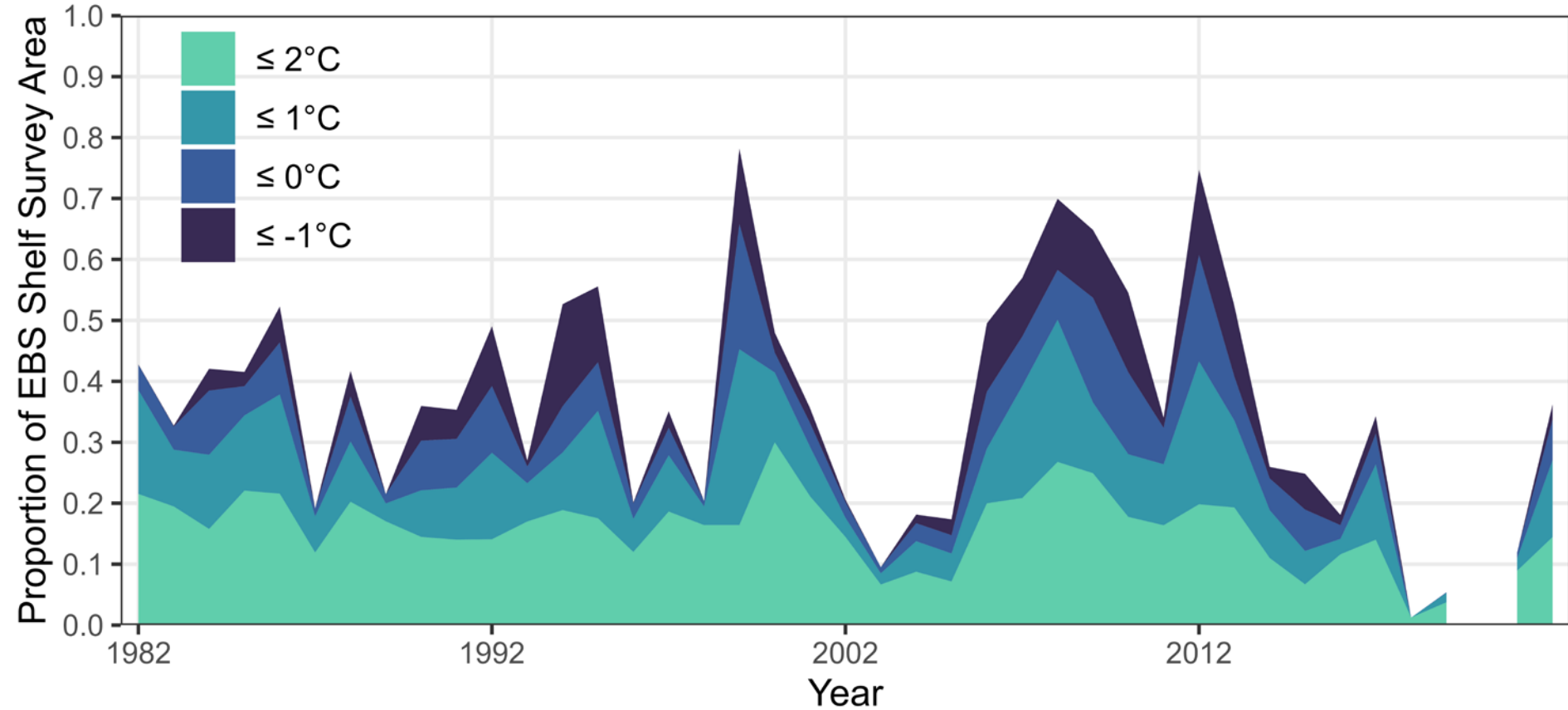


FV Alaska Knight
2010-present
11th year

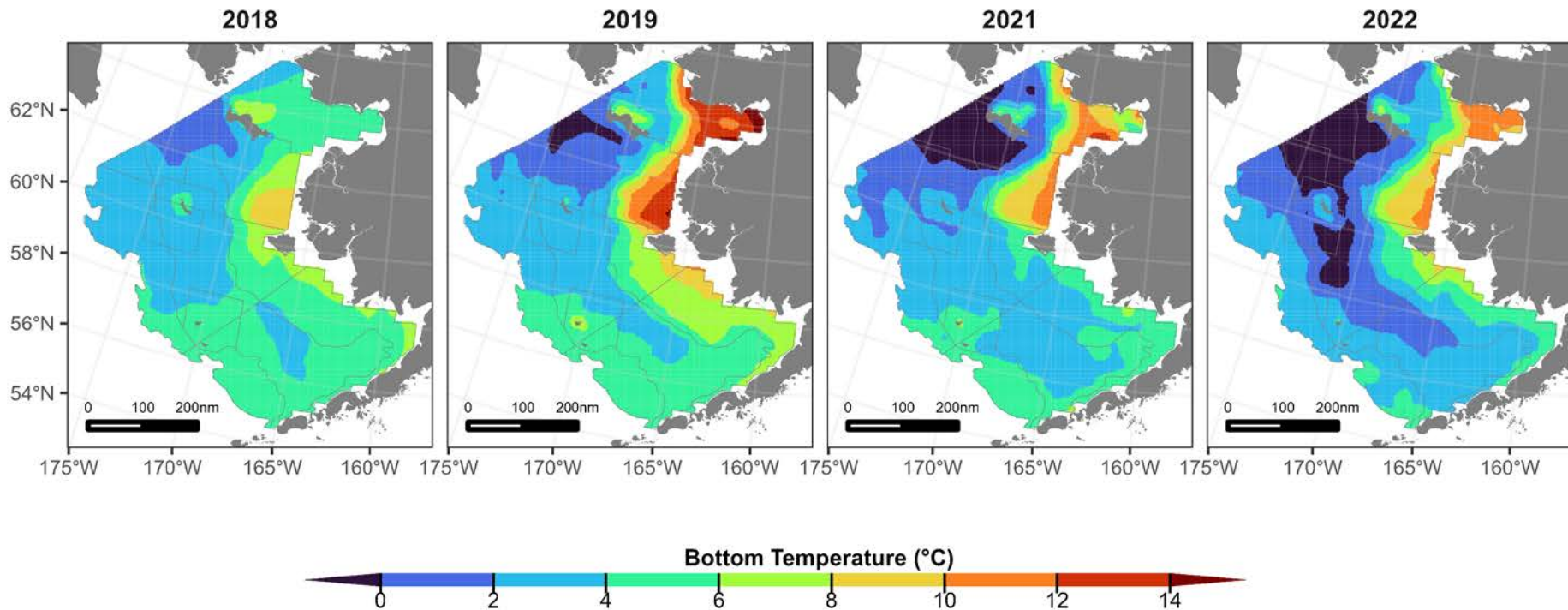
EBS/NBS Mean Surface and Bottom Temperatures



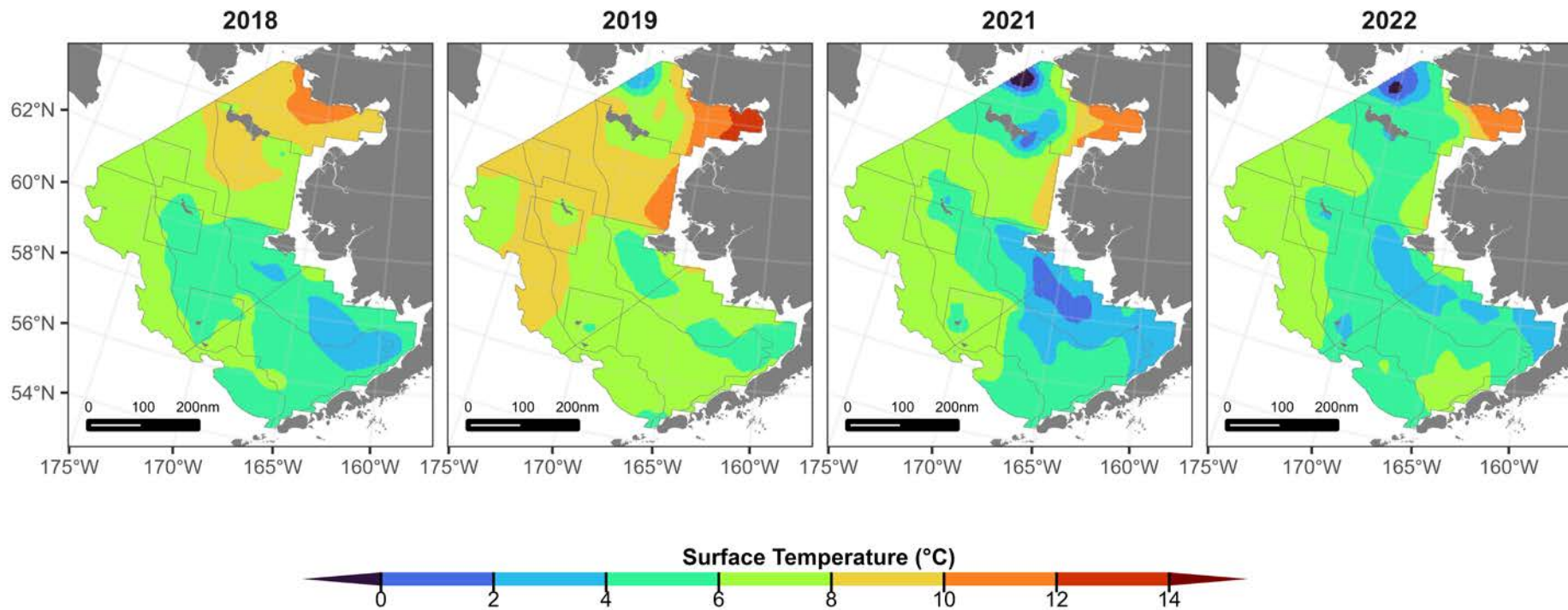
Cold Pool Area



Survey Bottom Temperatures



Survey Surface Temperatures



Length measurements from EBS

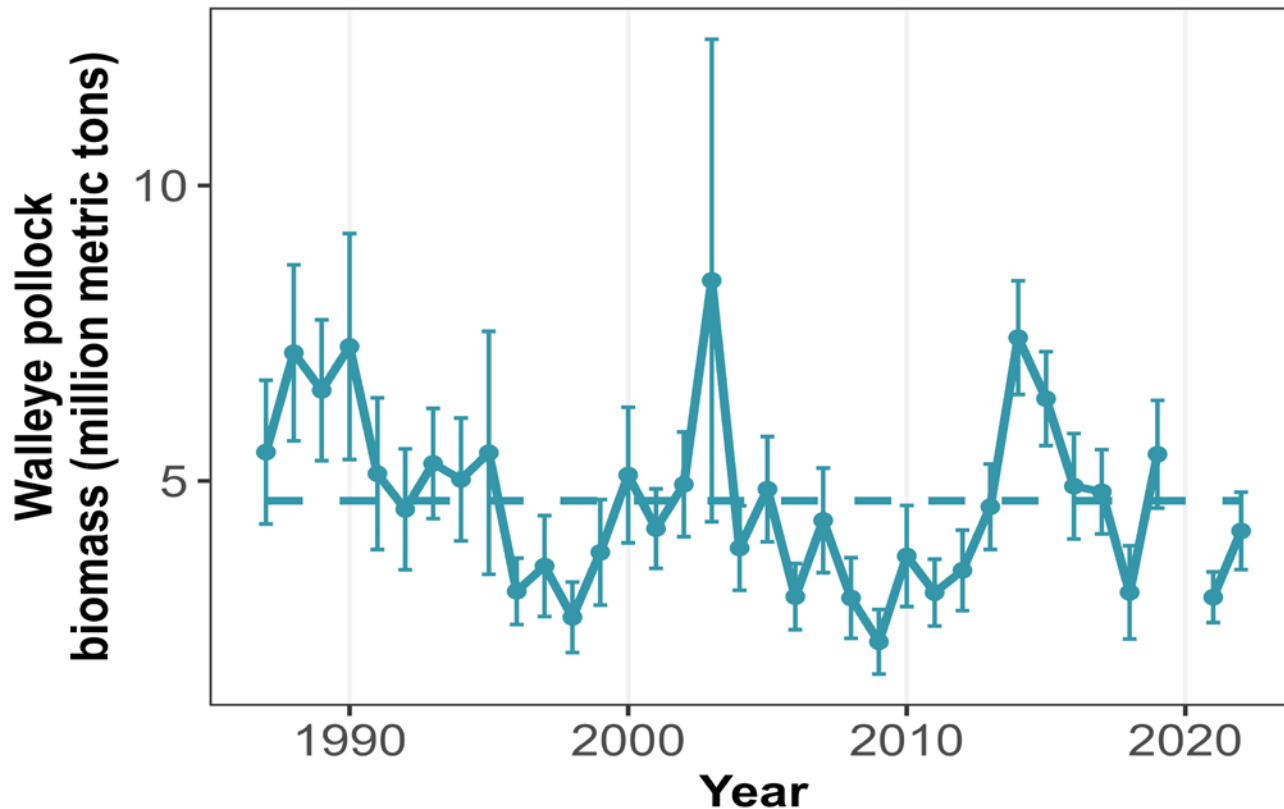
Common name	2021	2022
walleye pollock	53,739	36,687
northern rock sole	23,611	20,244
flathead sole	21,379	17,625
yellowfin sole	18,926	16,765
Pacific cod	14,058	12,375
arrowtooth flounder	13,958	10,165
Alaska plaice	8,541	8,116
Alaska skate	3,863	3,783
Pacific halibut	3,623	3,248
rex sole	2,104	1,787
Kamchatka flounder	1,678	1,159
longhead dab	1,619	2,127
plain sculpin	1,551	1,734
Bering flounder	1,192	1,107
yellow Irish lord	1,003	1,000
starry flounder	837	922
Bering skate	204	201
Greenland turbot	97	73
other taxa (26)	2,364	2,755
Total	174,347	141,873

Age structures from EBS

Common name	2021	2022
walleye pollock	1,535	1,614
Pacific cod	1,415	1,456
flathead sole	832	748
Bering flounder	71	84
Greenland turbot	96	70
Kamchatka flounder	462	358
Alaska plaice	522	459
arrowtooth flounder	601	482
yellowfin sole	1,030	619
northern rock sole	655	866
TOTAL	7,219	6,756



Walleye Pollock Biomass



EBS Biomass

2022: 4 Mmt

2021: 3 Mmt

(37.05%)

EBS + NBS

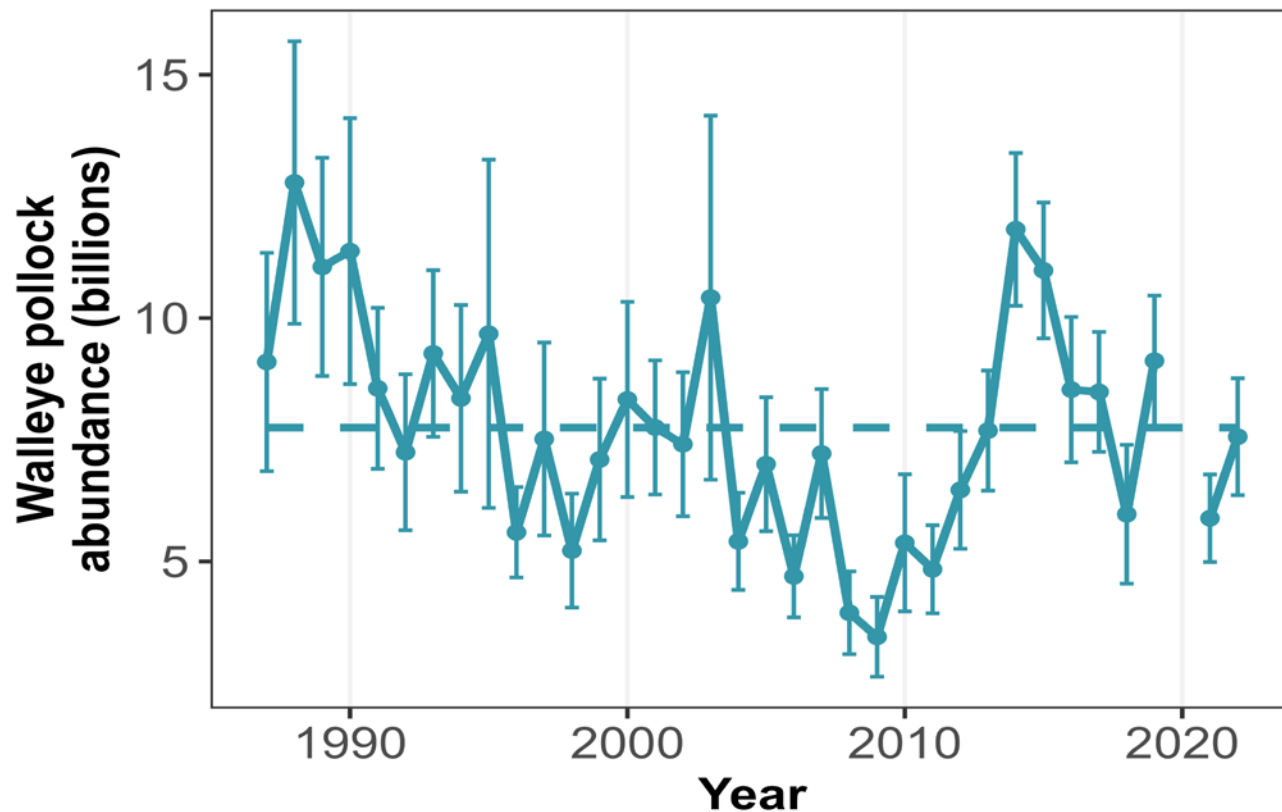
2022: 4.5 Mmt

2021: 3.5 Mmt

(29.8%)



Walleye Pollock Abundance



EBS Abundance

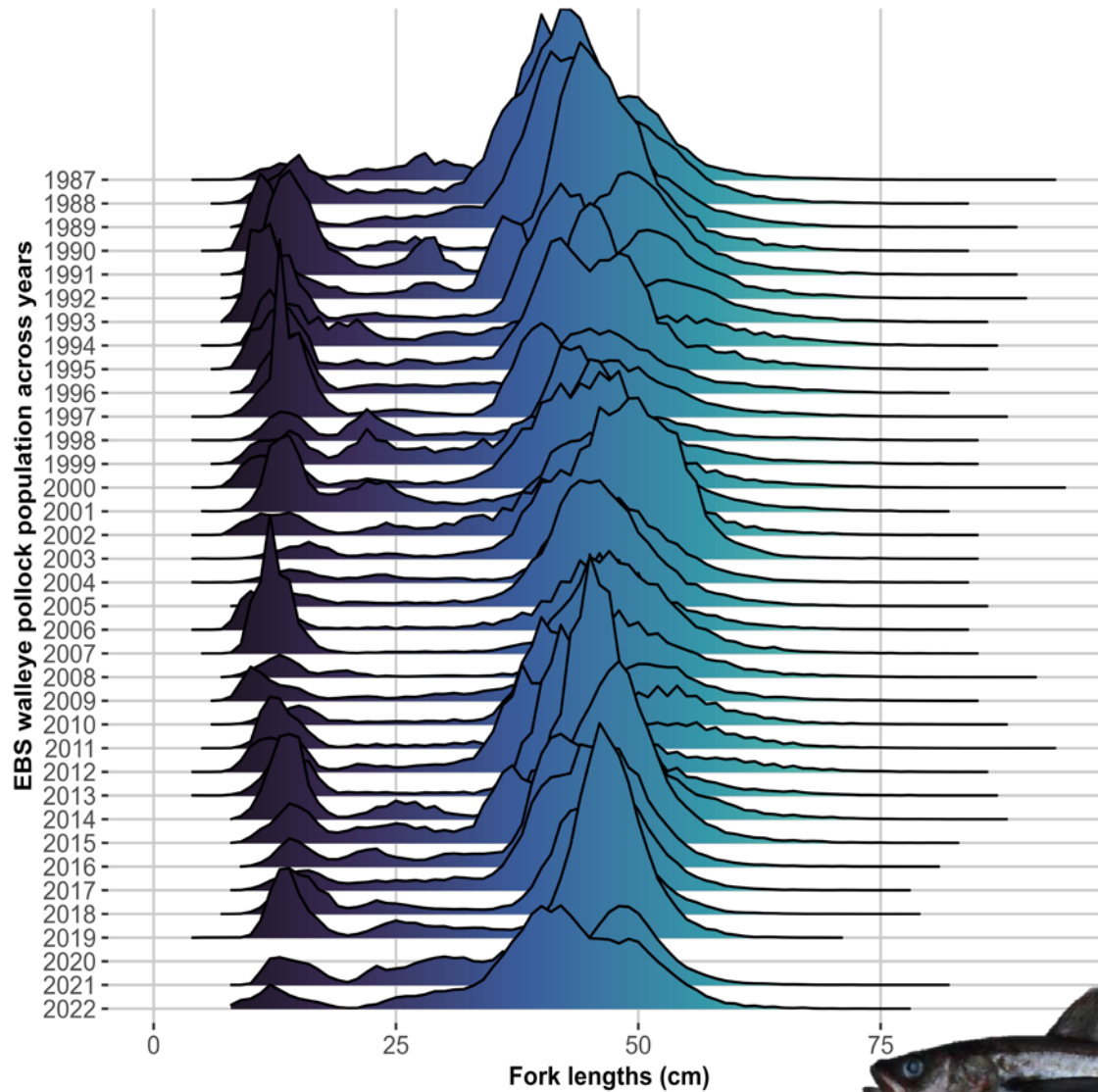
2022: 8 B

2021: 6 B

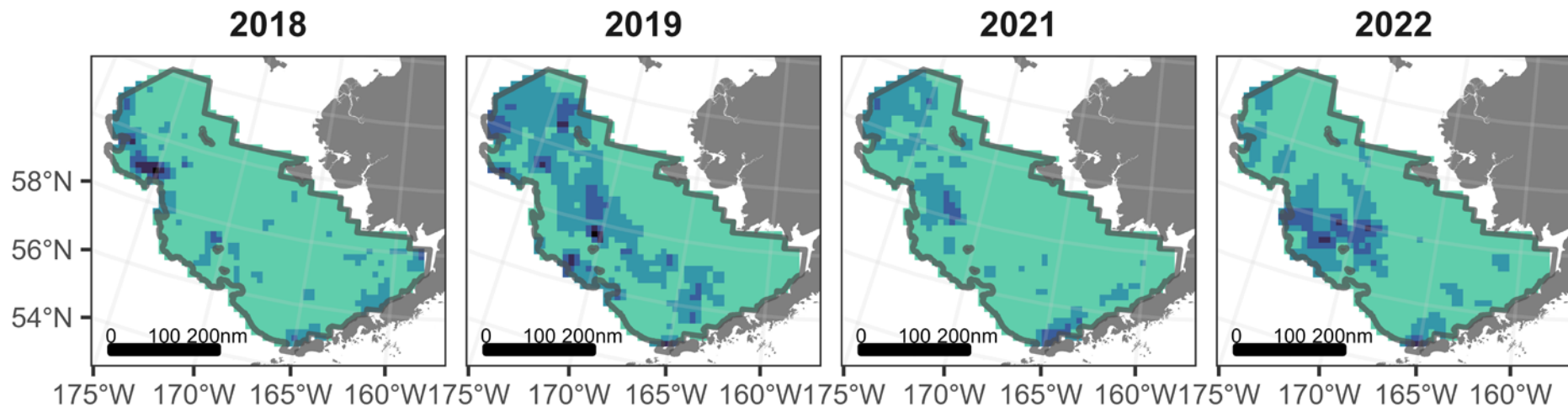
(28%)



Walleye Pollock Lengths



Walleye Pollock Distribution

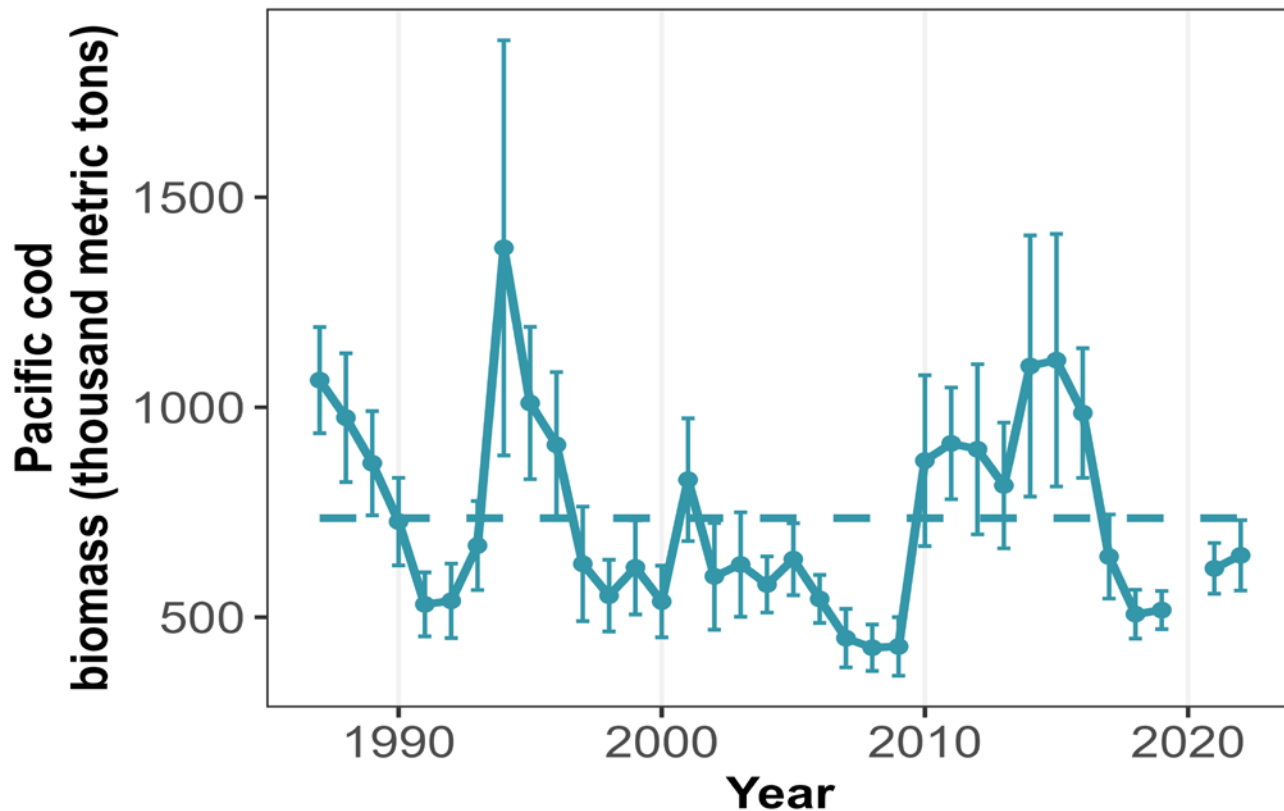


Walleye pollock
relative biomass (kg/ha)

 Eastern Bering Sea



Pacific Cod Biomass



EBS Biomass

2022: 647 Kmt

2021: 616 Kmt

(5.03%)

EBS + NBS

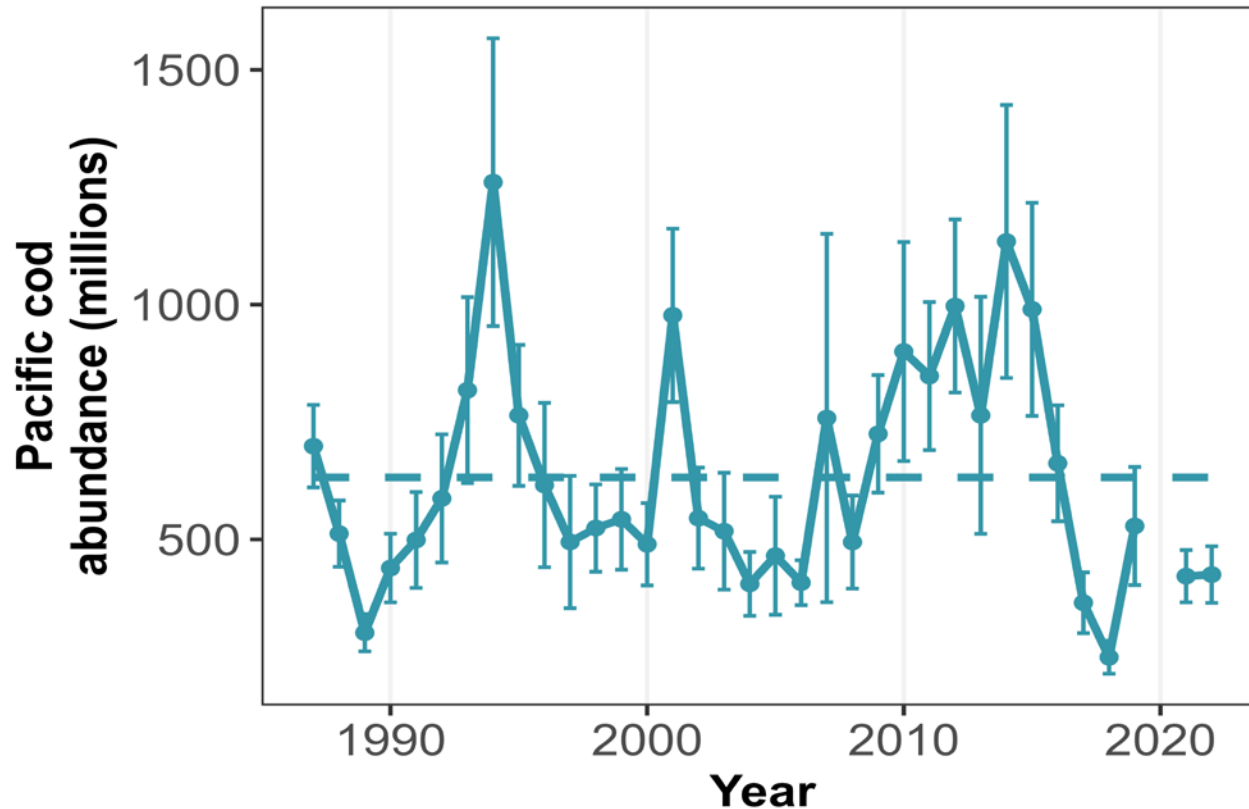
2022: 801 Kmt

2021: 844 Kmt

(-5.1%)



Pacific Cod Abundance



EBS Abundance

2022: 425 M

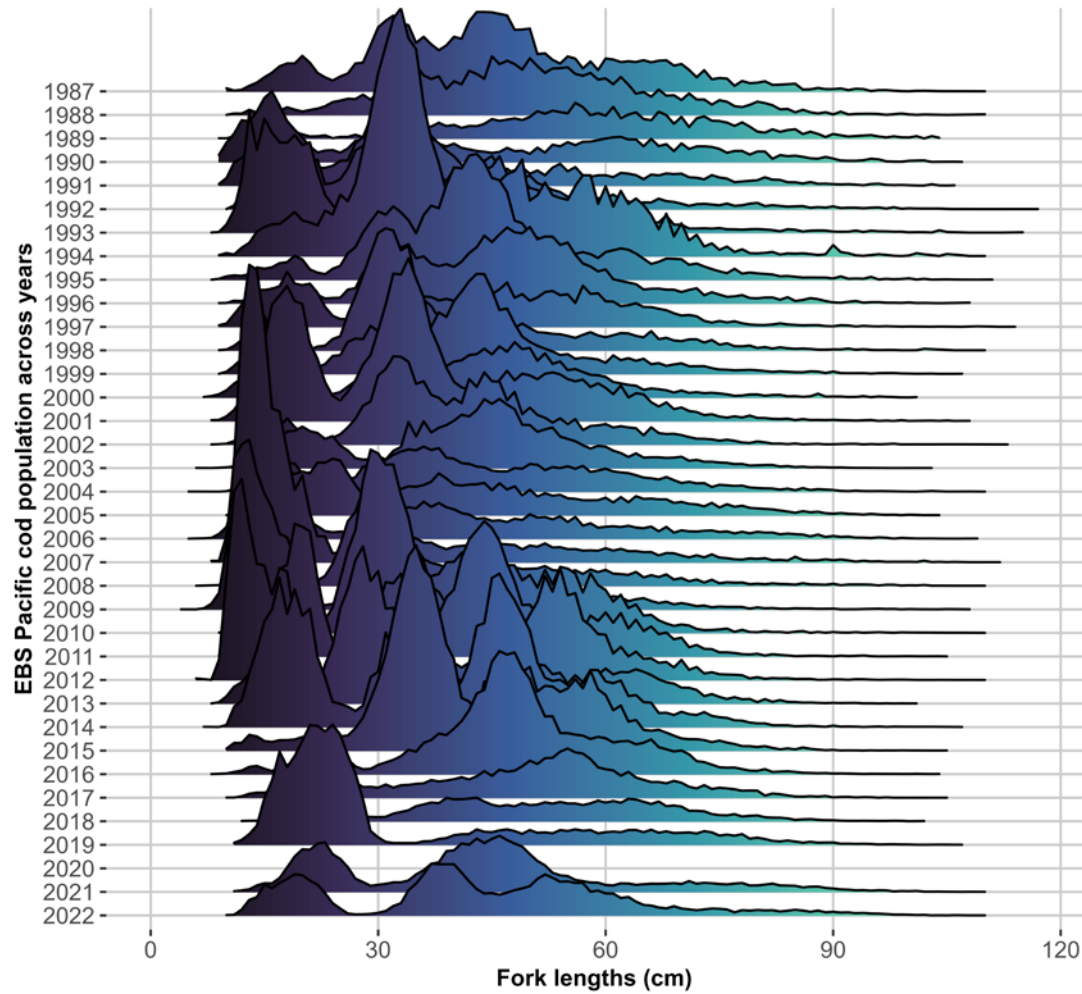
2021: 422 M

(1%)

— Eastern Bering Sea (mean = 632.2M)



Pacific Cod Lengths



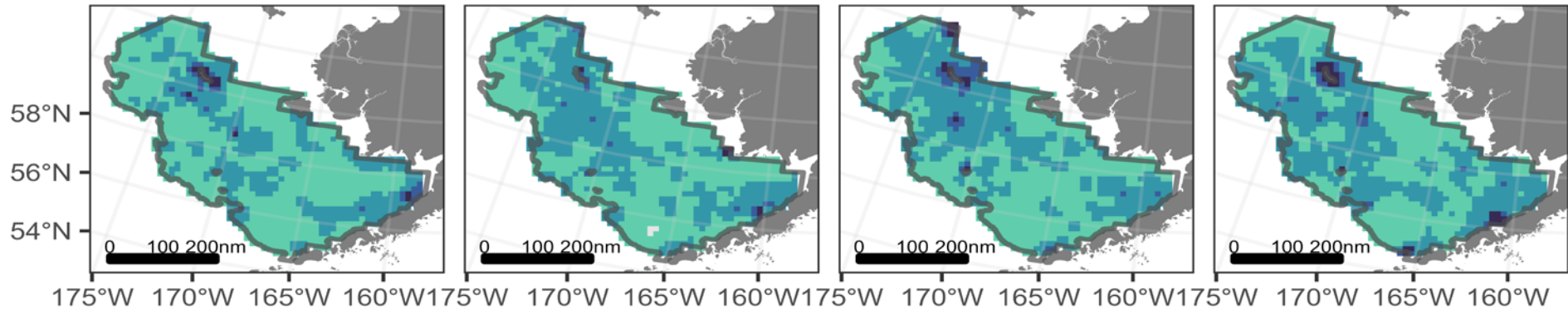
Pacific Cod Distribution

2018

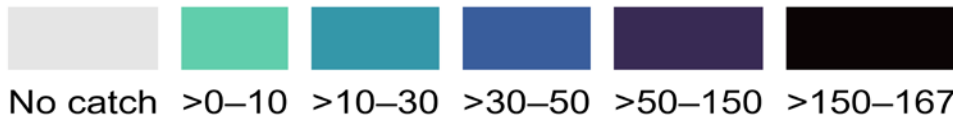
2019


2021

2022



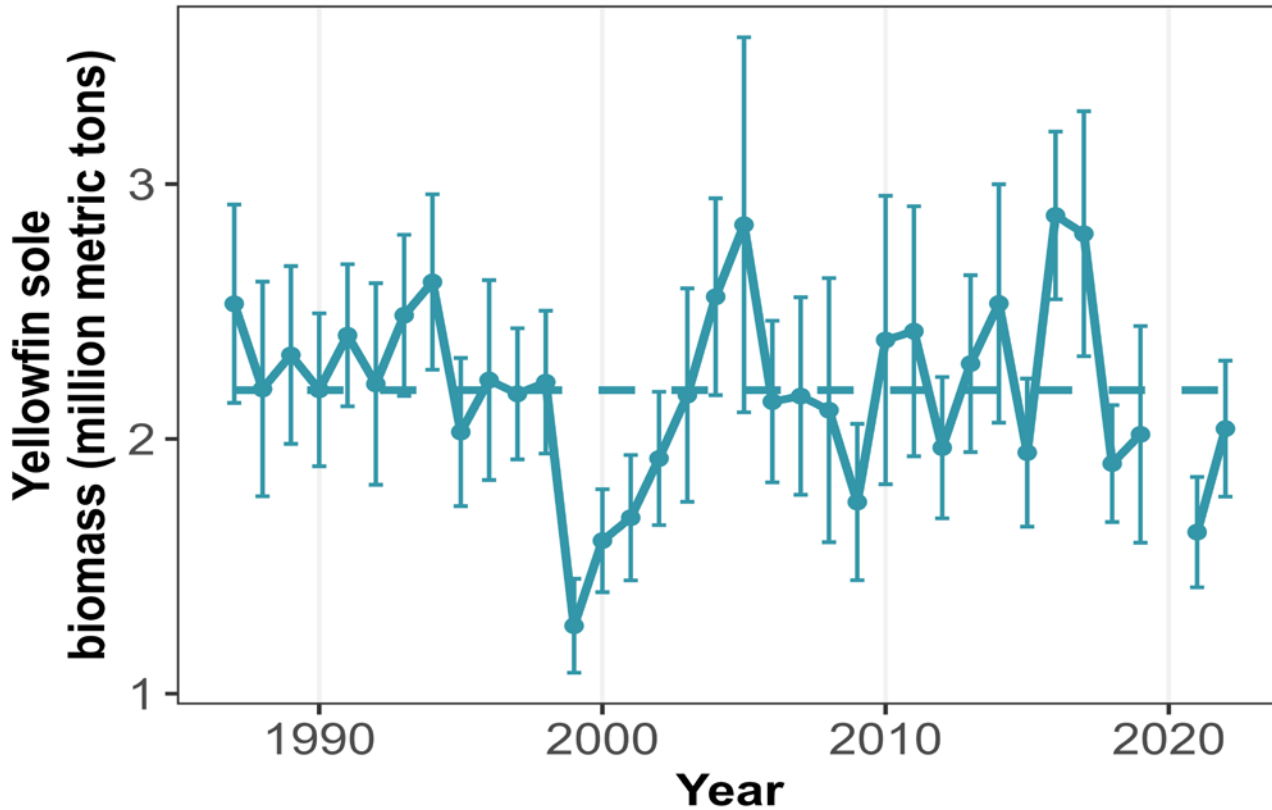
Pacific cod
relative biomass (kg/ha)



 Eastern Bering Sea



Yellowfin Sole Biomass



EBS Biomass

2022: 2 Mmt

2021: 2 Mmt

(24.85%)

EBS + NBS

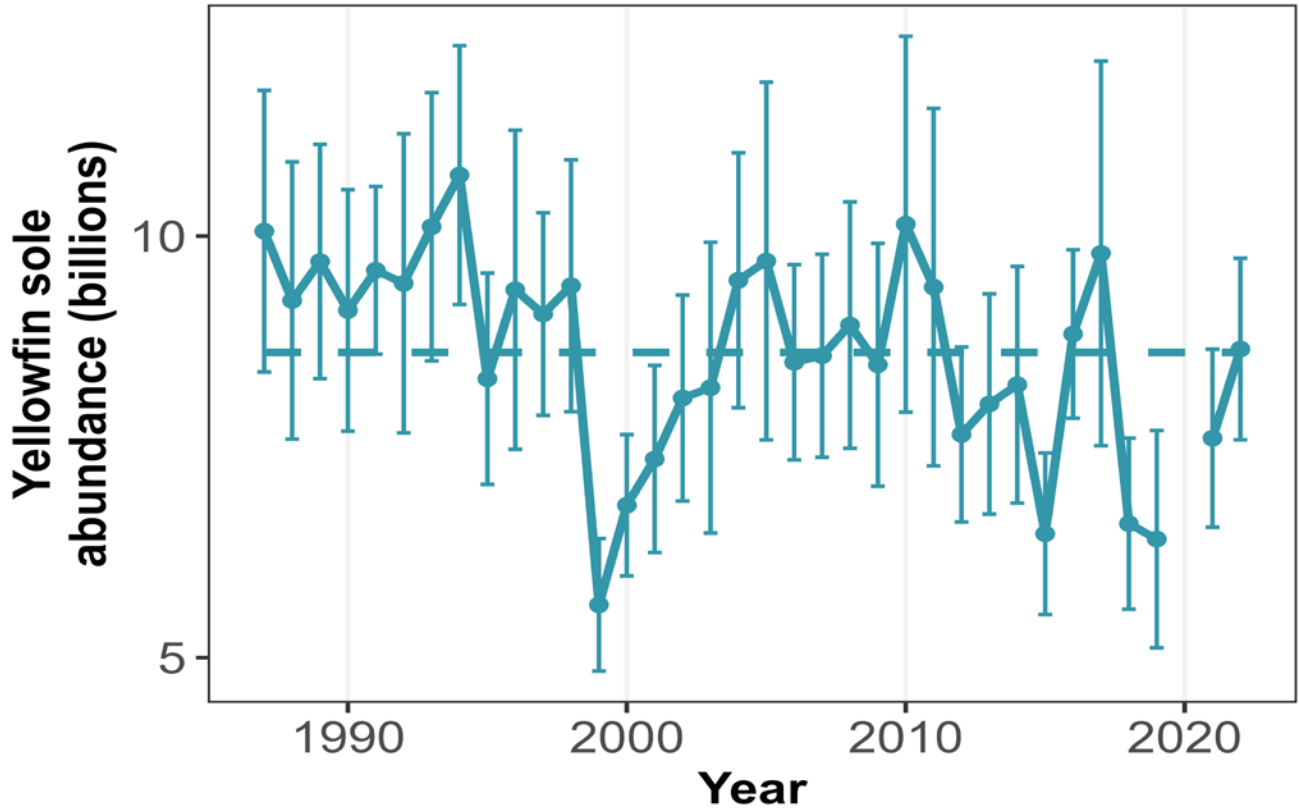
2022: 2.6 Mmt

2021: 2.1 Mmt

(21.5%)



Yellowfin Sole Abundance



EBS Abundance

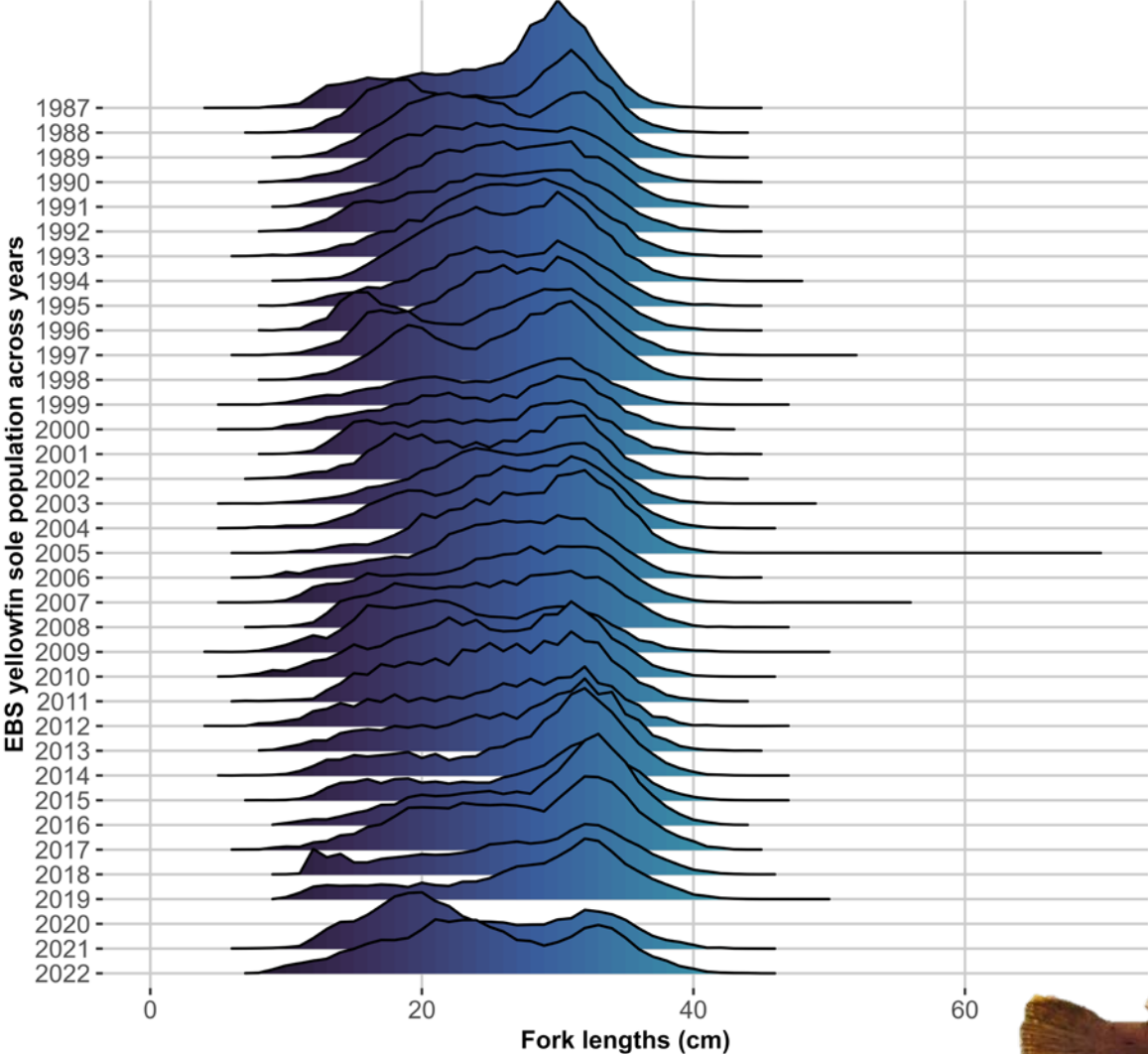
2022: 9 B

2021: 8 B

(14%)



Yellowfin Sole Lengths



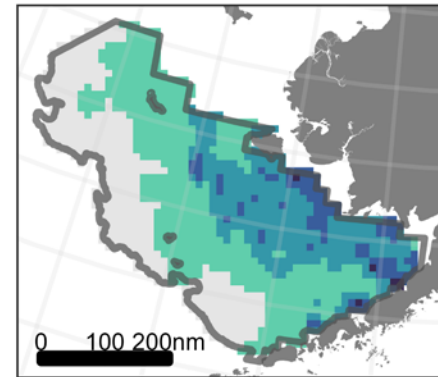
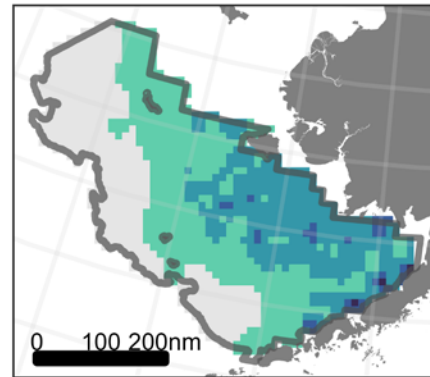
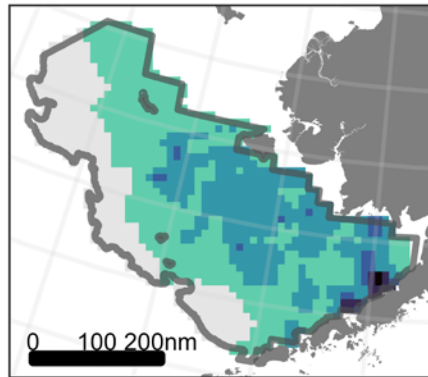
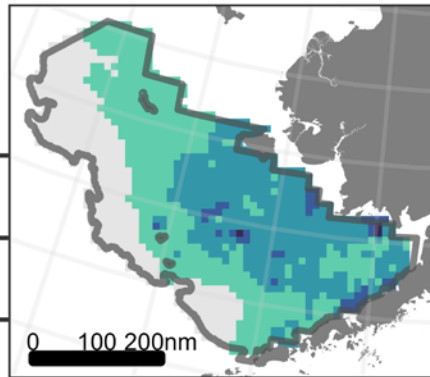
Yellowfin Sole Distribution

2018

2019

2021

2022

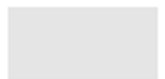


175°W 170°W 165°W 160°W 175°W 170°W 165°W 160°W 175°W 170°W 165°W 160°W 175°W 170°W 165°W 160°W

Yellowfin sole
relative biomass (kg/ha)



Eastern Bering Sea



No catch

>0-50

>50-150

>150-300

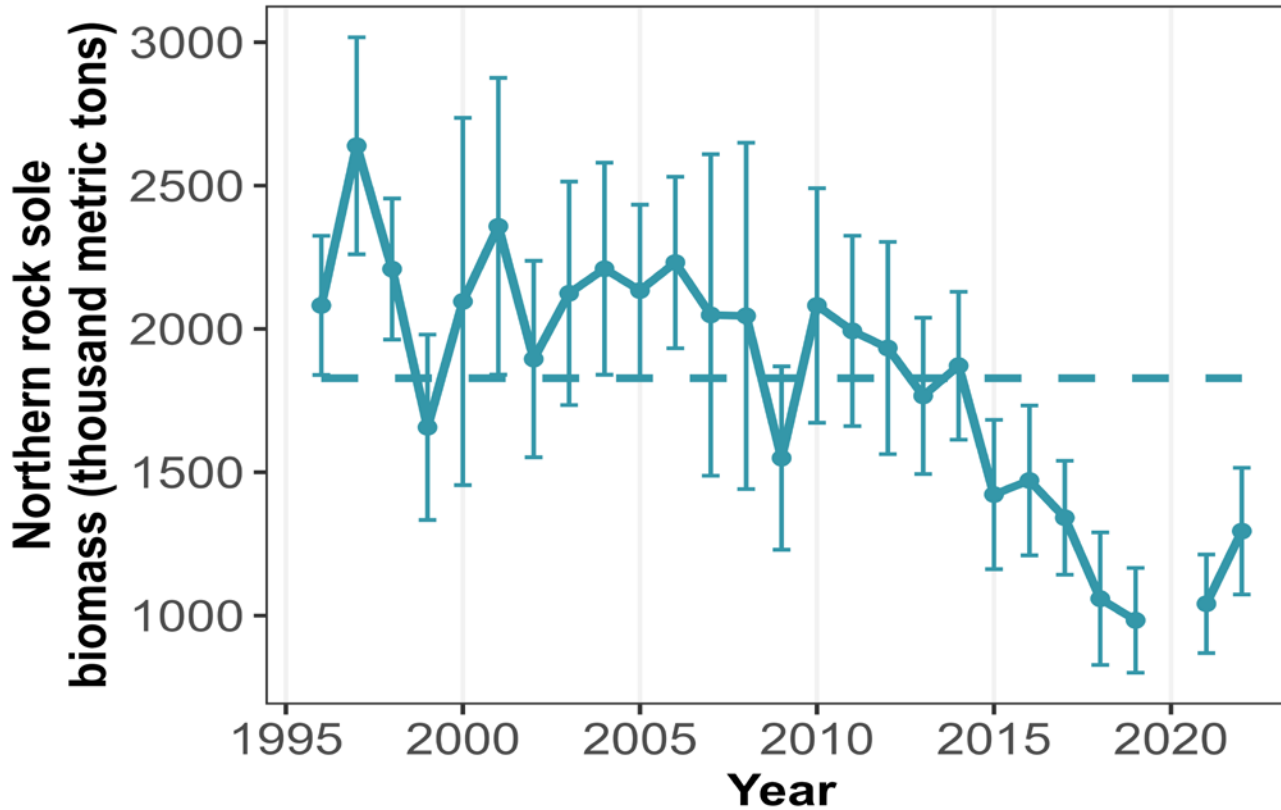
>300-700

>700-1277



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Northern Rock Sole Biomass



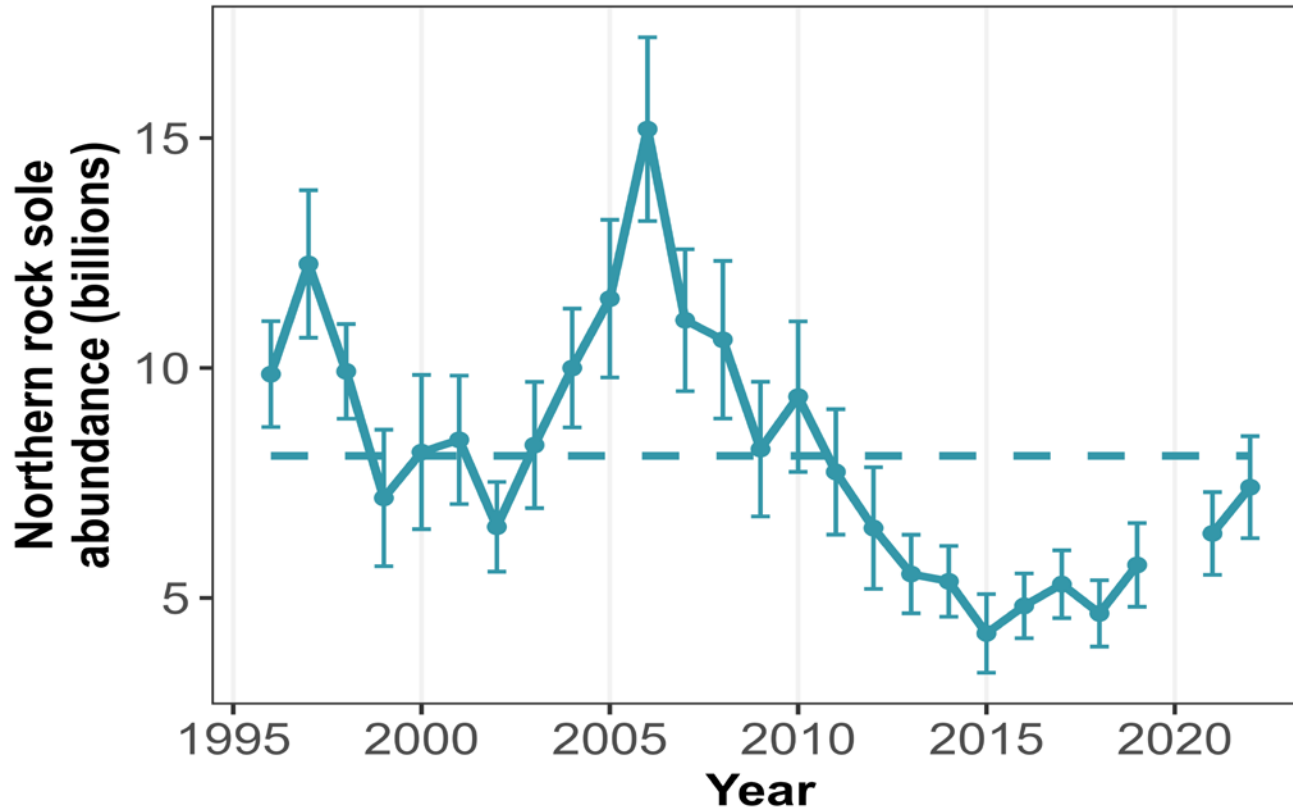
EBS Biomass
2022: 1.3K Kmt
2021: 1K Kmt
(24.34%)

EBS + NBS
2022: 1.3 Mmt
2021: 1.1 Mmt
(20.0%)

—●— Eastern Bering Sea (mean = 1,828.4Kmt)



Northern Rock Sole Abundance



EBS Abundance

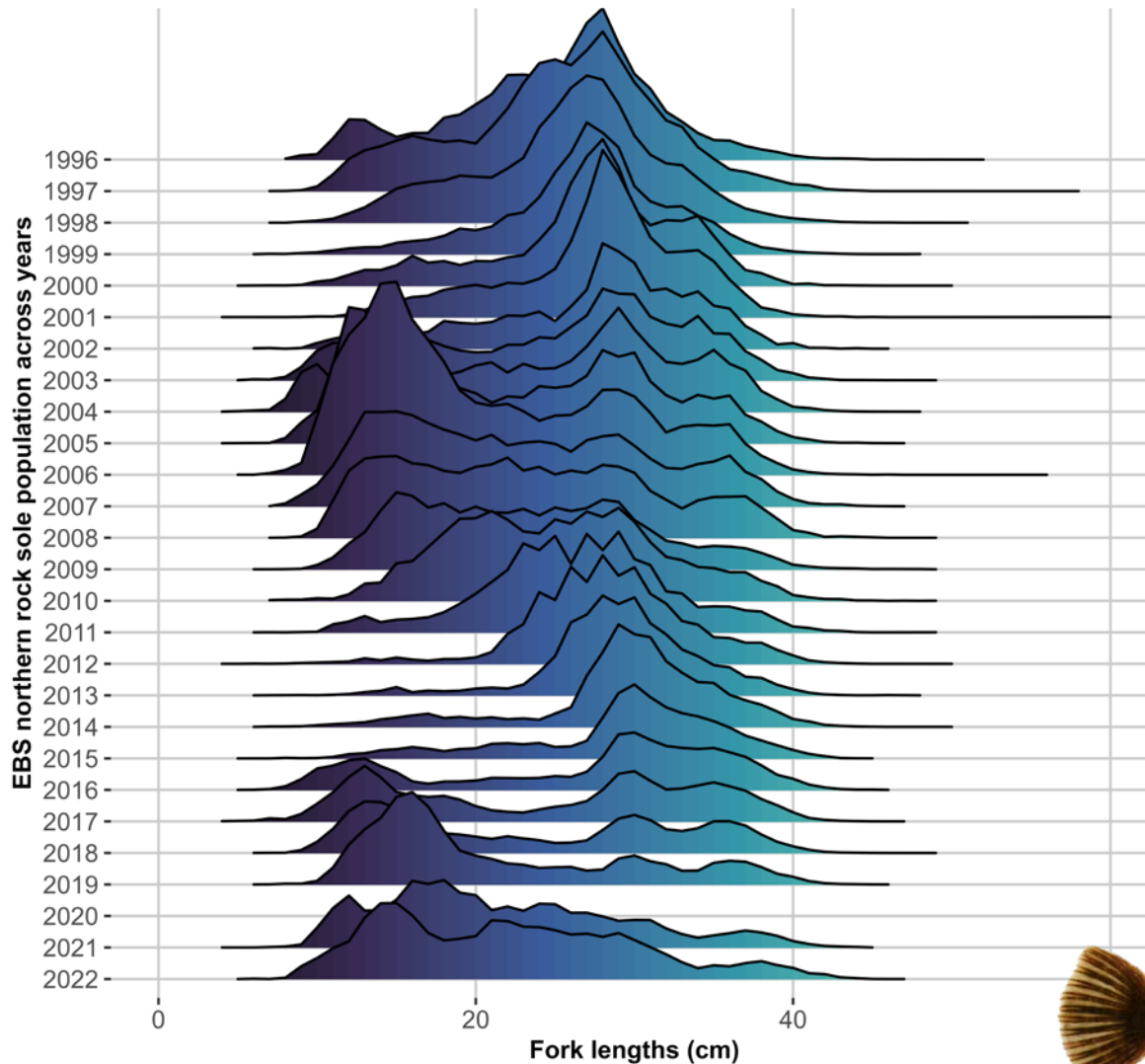
2022: 7 B

2021: 6 B

(16%)



Northern Rock Sole Lengths



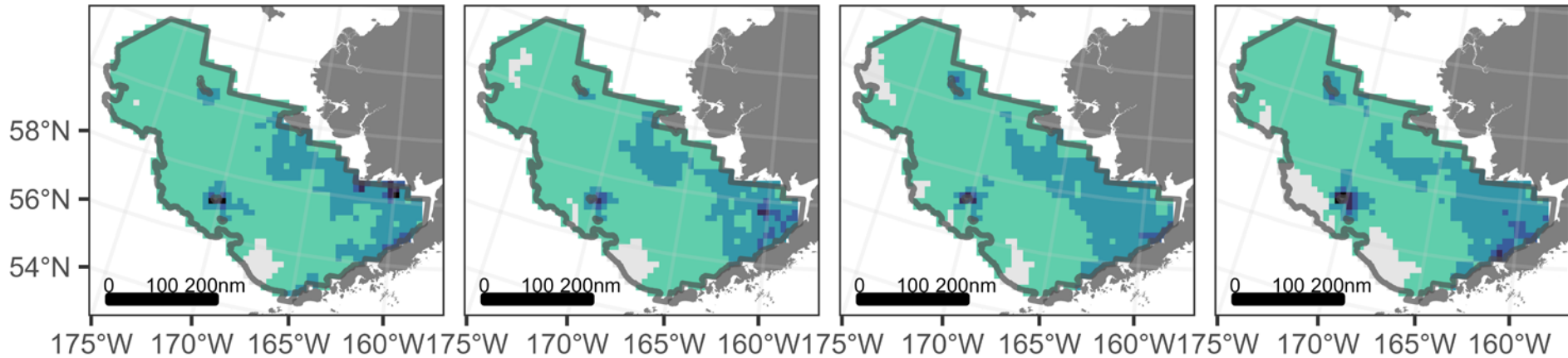
Northern Rock Sole Distribution

2018

2019

2021


2022



Northern rock sole
relative biomass (kg/ha)



No catch >0-30 >30-150 >150-250 >250-400 >400-672

 Eastern Bering Sea



Common name	Year	EBS		NBS	
		Biomass (mt)	Abundance (x1000)	Biomass (mt)	Abundance (x1000)
walleye pollock	2021	3,034,317	5,893,682	474,448	679,315
	2022	4,153,971 (37%)	7,563,348 (28%)	394,585 (-17%)	694,456 (2%)
Pacific cod	2021	616,380	421,752	227,577	129,700
	2022	647,400 (5%)	425,156 (1%)	153,735 (-32%)	86,038 (-34%)
yellowfin sole	2021	1,633,968	7,603,199	496,038	1,979,003
	2022	2,039,968 (25%)	8,660,407 (14%)	548,026 (10%)	2,635,201 (33%)
northern rock sole	2021	1,041,169	6,401,139	76,630	240,688
	2022	1,294,581 (24%)	67,408,458 (16%)	46,442 (-39%)	159,158 (-34%)
flathead sole	2021	674,745	2,571,918	138	
	2022	703,375 (4%)	2,442,797 (-5%)	128 (-7%)	
Bering flounder	2021	9,511	42,197	8,384	61,872
	2022	6,237 (-34%)	36,007 (-15%)	5,910 (-30%)	60,889 (-2%)
Alaska plaice	2021	335,034	582,046	344,578	570,759
	2022	385,294 (15%)	660,307 (13%)	299,028 (-13%)	538,884 (-6%)
Pacific halibut	2021	131,864	101,442	25,995	14,118
	2022	149,064 (13%)	91,474 (-10%)	25,940 (-1%)	10,317 (-27%)
Greenland turbot	2021	10,690	2,748	0	0
	2022	7,869 (-26%)	1,988 (-28%)	0	0
arrowtooth flounder	2021	457,569	937,014	1,740	2,251
	2022	521,615 (14%)	1,001,554 (7%)	409 (-76%)	520 (-77%)
kamchatka flounder	2021	32,856	60,002	33	26
	2022	29,699 (-10%)	45,293 (-25%)	0 (-100%)	0 (-100%)
Bering skate	2021	12,168	6,001	0	0
	2022	12,803 (5%)	5,890 (-2%)	0	0
Alaska skate	2021	468,113	106,919	80,207	18,681
	2022	463,017 (-1%)	102,817 (-4%)	48,919 (-39%)	11,590 (-38%)

EBS Survey Special Projects

Special Projects

Acoustics

EBS & NBS AVO index

Crab Disease

EBS & NBS Bitter Crab Syndrome Monitoring

EBS & NBS Black eye syndrome: eyestalk collection

EBS & NBS Black eye syndrome: live collection

EBS Bitter crab live collections

Environmental Monitoring

EBS & NBS Ambient light monitoring

EBS & NBS CTD data collection

EBS & NBS HAB toxins

Fish/Crab Condition

EBS & NBS Snow crab body condition

EBS & NBS Walleye pollock and Pacific cod body condition

EBS Pacific cod blood collection for stress physiology

Population Genetics

EBS & NBS Flatfish genomics

EBS & NBS Pacific herring genetics

EBS & NBS Sand lances

EBS & NBS Sleeper and salmon sharks

Misc

EBS & NBS Arctic and saffron cod age and growth

EBS & NBS L/W collection for A. cod, s. cod, rex sole, and starry flounder

EBS & NBS MML food habits reference collection

EBS & NBS NWFSC collection

EBS & NBS Outreach collection

EBS & NBS P. cod tagging

EBS & NBS Pacific halibut

EBS & NBS Pacific lamprey

EBS & NBS Shellfish Photo Documentation Refresh

EBS 15/30 tow duration study

EBS Bristol Bay red king crab tagging

EBS crab collection for ocean acidification experiment

EBS Observer collections

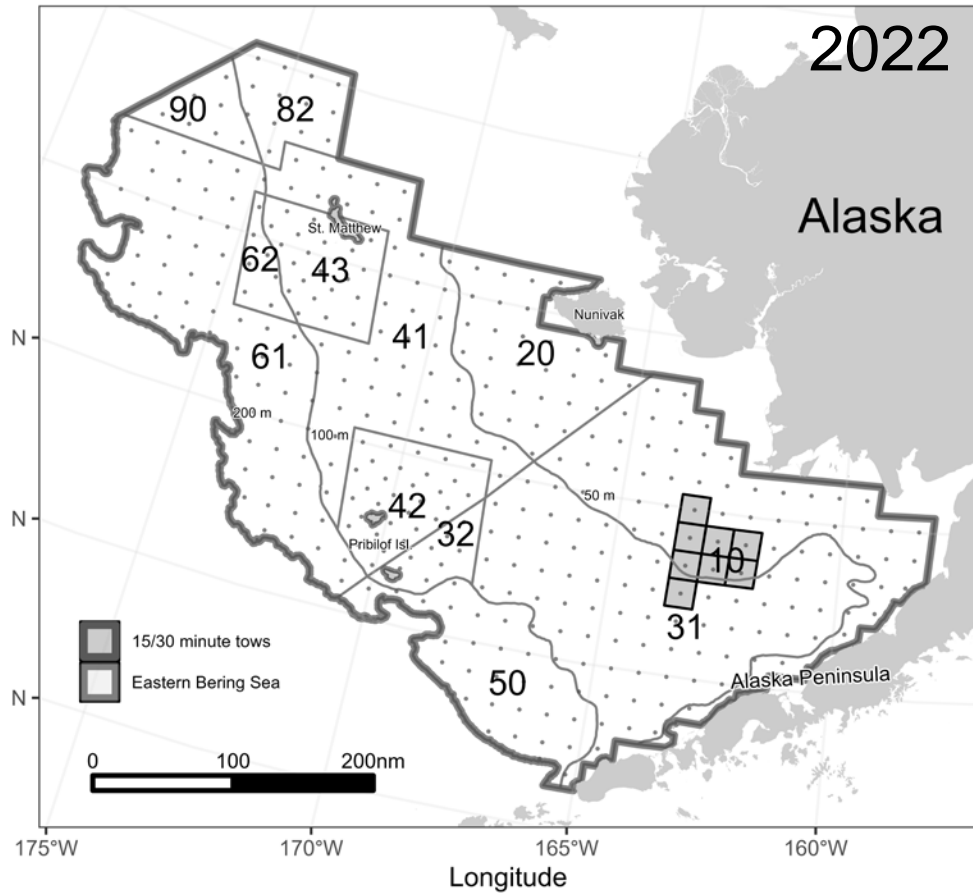
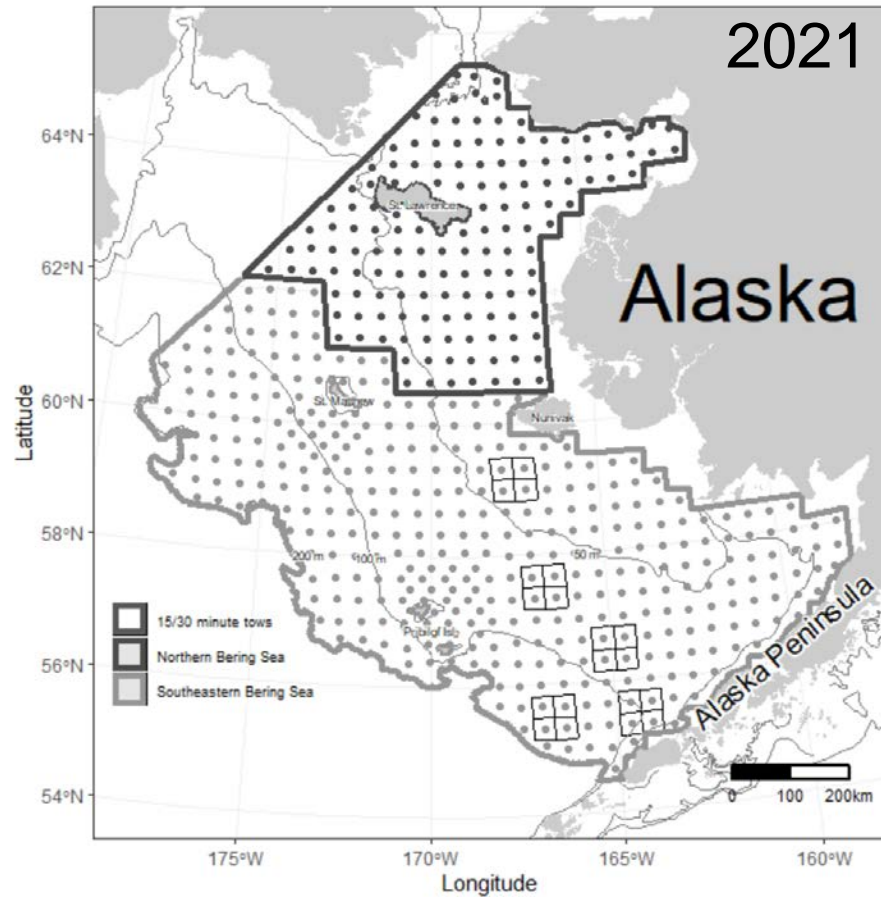
NBS Mollusk collection

NBS Pacific herring, Arctic flounder, and Pacific cod collection



15/30 Minute tows

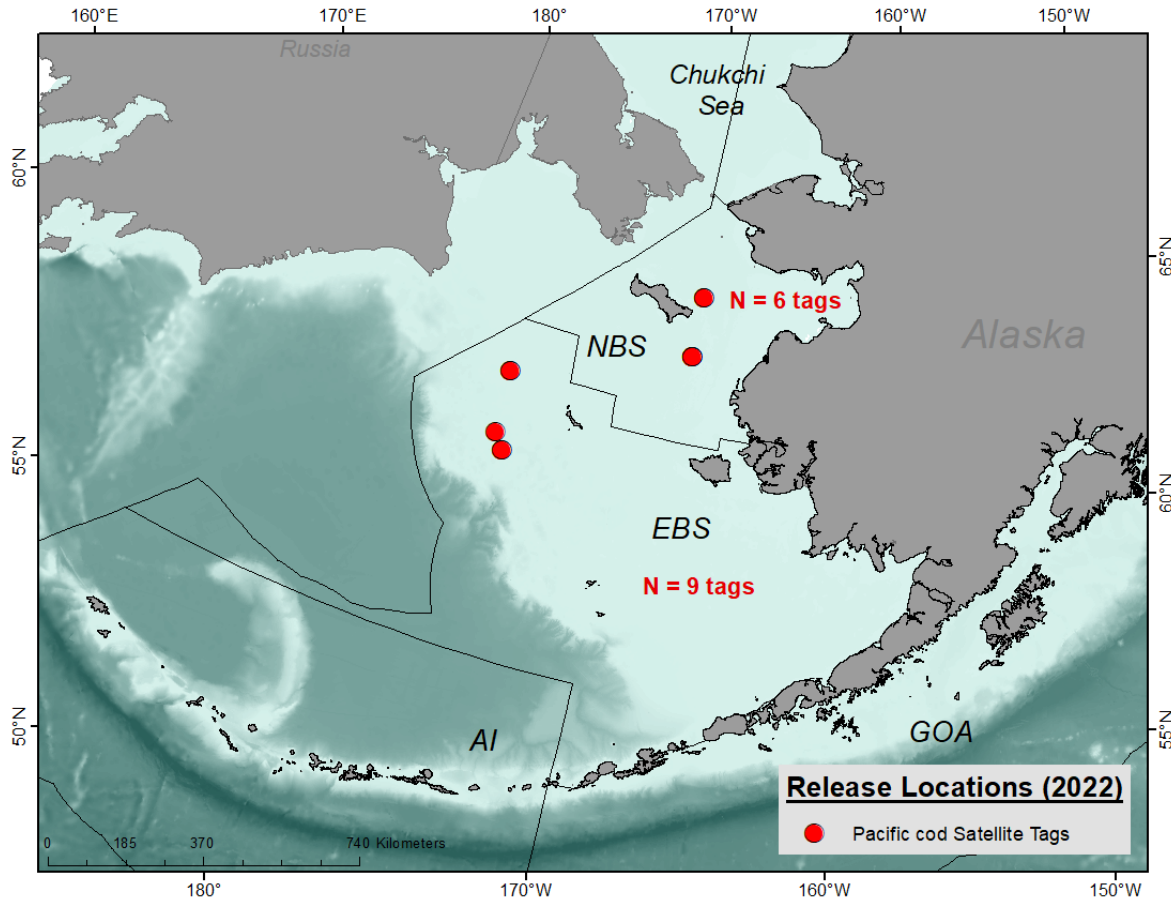
8 additional paired tows added to the data set in 2022



Questions? Contact Lukas.defilippo@noaa.gov

Pacific Cod PSAT Tagging

Cooperative study with Pacific cod harvesters
(Industry funded the purchase of 15 satellite tags)



Acknowledgements:

Funding:

Pacific cod harvesters
NCRP Grant

Scientific Field Personnel:

Rebecca Haehn
Nicole Charriere
Jennifer Gardner
Reyn Yoshioka
Adriana Myers
Cynthia Yeung
Lukas DeFilippo
Emily Ryznar
Chris Anderson

Questions? Contact Susanne.mcdermott@noaa.gov



Fish Condition Research

- Fat meter Pacific cod and walleye pollock condition
 - **156** cod and **205** walleye pollock sampled
- Pacific halibut stress (trawl $n=60$, RR $n=1$)
 - Lactate, pH, glucose, hematocrit (at sea)
 - Stored plasma & mucus - cortisol
- Pacific cod antifreeze protein ($n=85$)
 - Station temperatures ranging from -0.55 to 7.58 °C
- Questions?: Bianca.Prohaska@noaa.gov



Public-facing Data Products

Historical survey catch data (FOSS):

<https://www.fisheries.noaa.gov/foss/f?p=215:28>

Mapping of survey catch data (DisMAP):

<https://apps-st.fisheries.noaa.gov/dismap/>

Hosted by NOAA Fisheries Office of Science and Technology

For more info: Emily.Markowitz@noaa.gov

FOSS – The Fisheries One-Stop Shop

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Processed Products
Per Capita Consumption
Supply
USCG Vessels
AFSC GAP Survey
AFSC GAP Metadata
Partners
Metadata and Caveats
Frequently Asked Questions
Quick Start Guide

AFSC Groundfish and Crab Assessment Program Bottom Trawl Surveys

Survey data also available through API

Data Caveats

The Resource Assessment and Conservation Engineering (RACE) Division Groundfish Assessment Program (GAP) of the Alaska Fisheries Science Center (AFSC) conducts fisheries-independent bottom trawl surveys to assess the populations of demersal fish and crab stocks of Alaska. Data presented here are presence-only (non-zero) observations from those surveys and therefore CANNOT be aggregated. Please reach out to survey team leads listed in the metadata if clarification is needed.

Selecting all surveys for all years and all species will result in a dataset of approximately 1 million rows and might crash the page. If the entire dataset is required, please use the API or let us know using the Comments page and we'll send the data to you directly.

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Catch Date: Square Thousand km
 Catch Data: Square km
 Haul Data

Go Actions

Year	Srvy	Survey	Latitude Dd	Longitude Dd	Species Code	Common Name	Scientific Name	Taxon Confidence	Cpue Kglm2	Cpue Nokm2	Weight Kg	Count
2021	NBS	Northern Bering Sea Crab/Groundfish Survey - Eastern Bering Sea Shelf Survey Extension	63.67344	-169.66309	21735	Saffron Cod	Eleginus gracilis	High	1.696394	24.234193	0.07	1
2021	NBS	Northern Bering Sea Crab/Groundfish Survey - Eastern Bering Sea Shelf Survey Extension	62.8552	-168.84195	21735	Saffron Cod	Eleginus gracilis	High	3.310923	22.371103	0.148	1

AFSC GAP Metadata
<https://www.fisheries.noaa.gov>

DisMAP – Distribution Mapping and Analysis Portal

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | U.S. DEPARTMENT OF COMMERCE

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Search NOAA Fisheries

Distribution Mapping and Analysis Portal

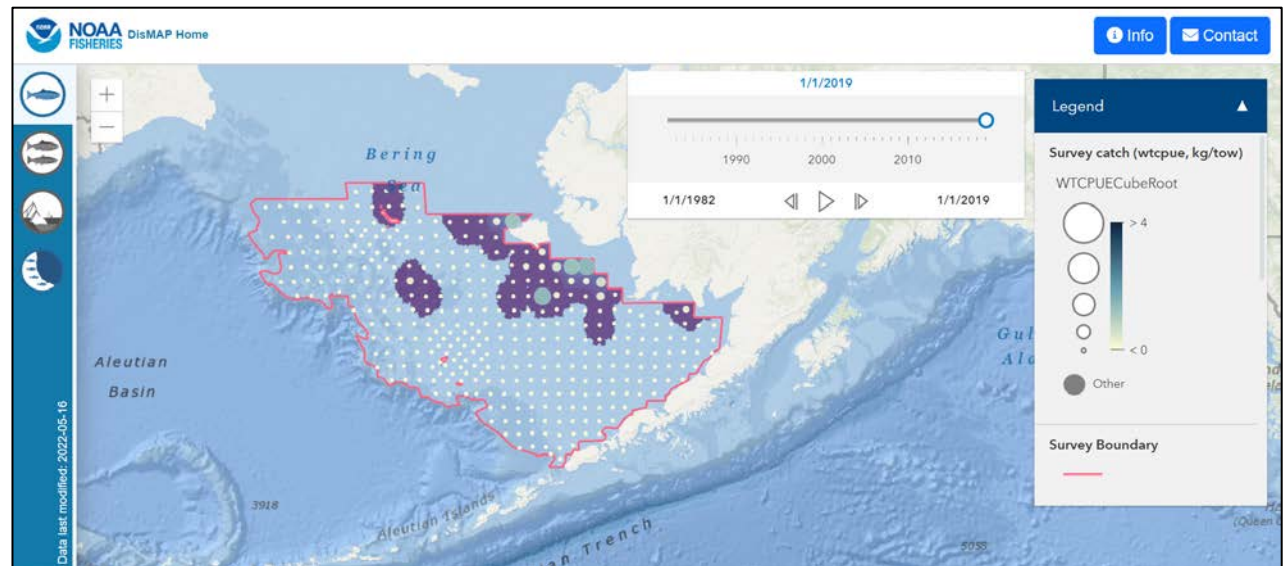
The NOAA Fisheries Distribution Mapping and Analysis Portal (DisMAP) provides easy access to information to track and understand distributions of marine species in the U.S. Marine Ecosystems. Launch the portal to explore, visualize and interact with information on marine species distributions.

[Launch Portal](#)

The geographic, or spatial extent, over which a species is found to occur, is its distribution. Understanding how species are distributed in space and time and the factors that drive spatial patterns in distribution and abundance are central questions in ecology and important for species conservation and management.

More Information

> Fisheries Science and Management in



State of the Survey Group

- Lots of recent turnover
(50% of staff in position for < 3 years)

- Influx of amazing talent, exodus of institutional knowledge

- This year we attempted to slow the pace of the survey, and optimize our collections

- We are also trying to increase the efficiency and transparency of data analysis and products



Summary

- EBS survey temps indicate larger cold pool than recent years
- Fish biomass in EBS is up except for a few species, and generally down in the NBS
- EBS and NBS results available now (not on FOSS yet)
- Help us to streamline our process by streamlining yours

New portal for data requests:

<https://github.com/afsc-gap-products/data-requests>

Nancy.Roberson@noaa.gov

Thank you!

Questions to duane.stevenson@noaa.gov

Bering Sea Survey team:

Caitlin Allen-Akselrud

Chris Anderson

Thaddaeus Buser

Nicole Charriere*

Jason Conner

Liz Dawson

Lukas DeFilippo

Rebecca Haehn

Elaina Jorgensen

Emily Markowitz*

Bianca Prohaska*

Sean Rohan

Adriana Myers (on loan from FMA)

