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

Bering Sea Group

Outline

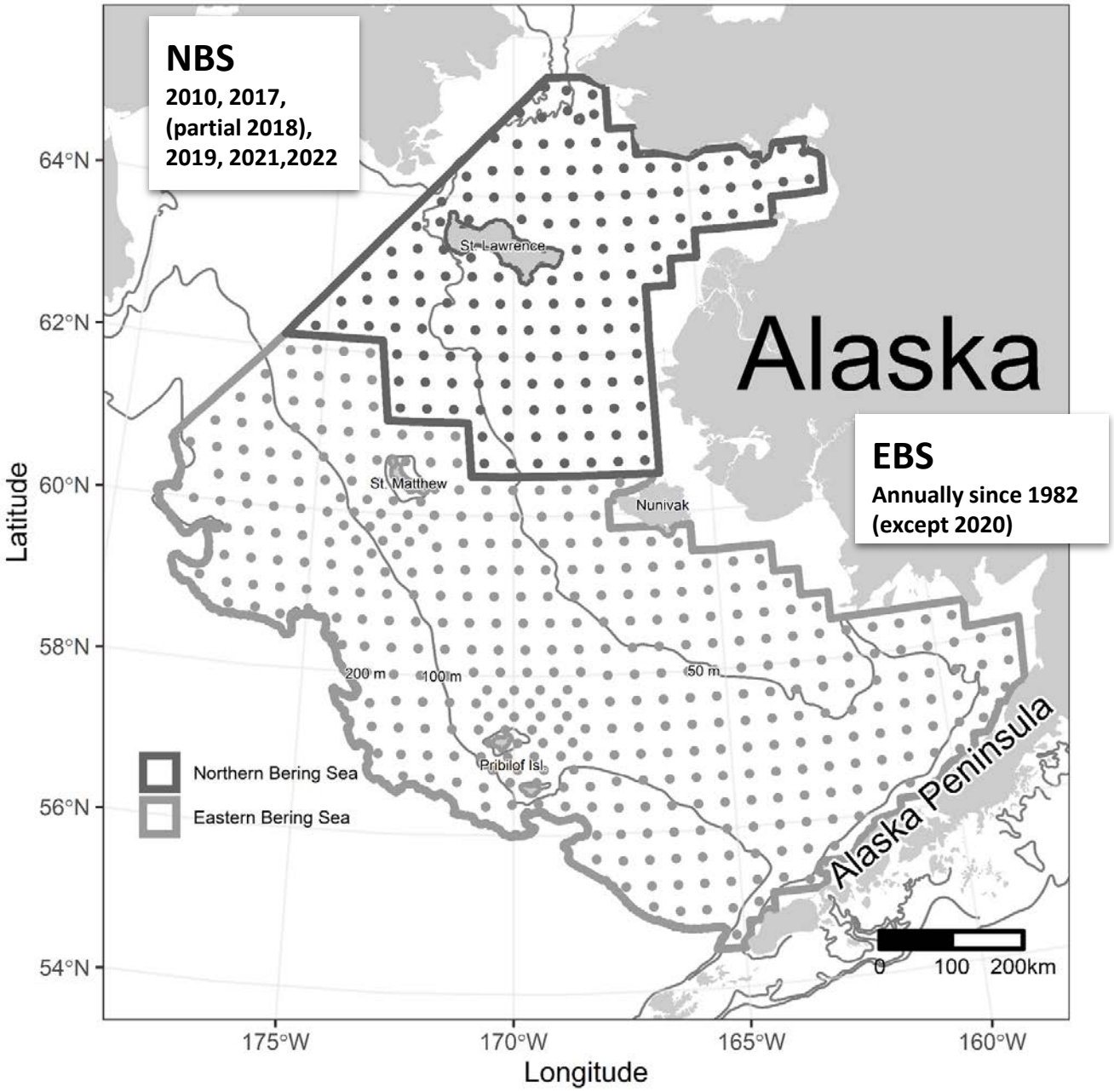
-Environmental data

-Fish population data

-Additional research

-New public data interface

-State of the survey group

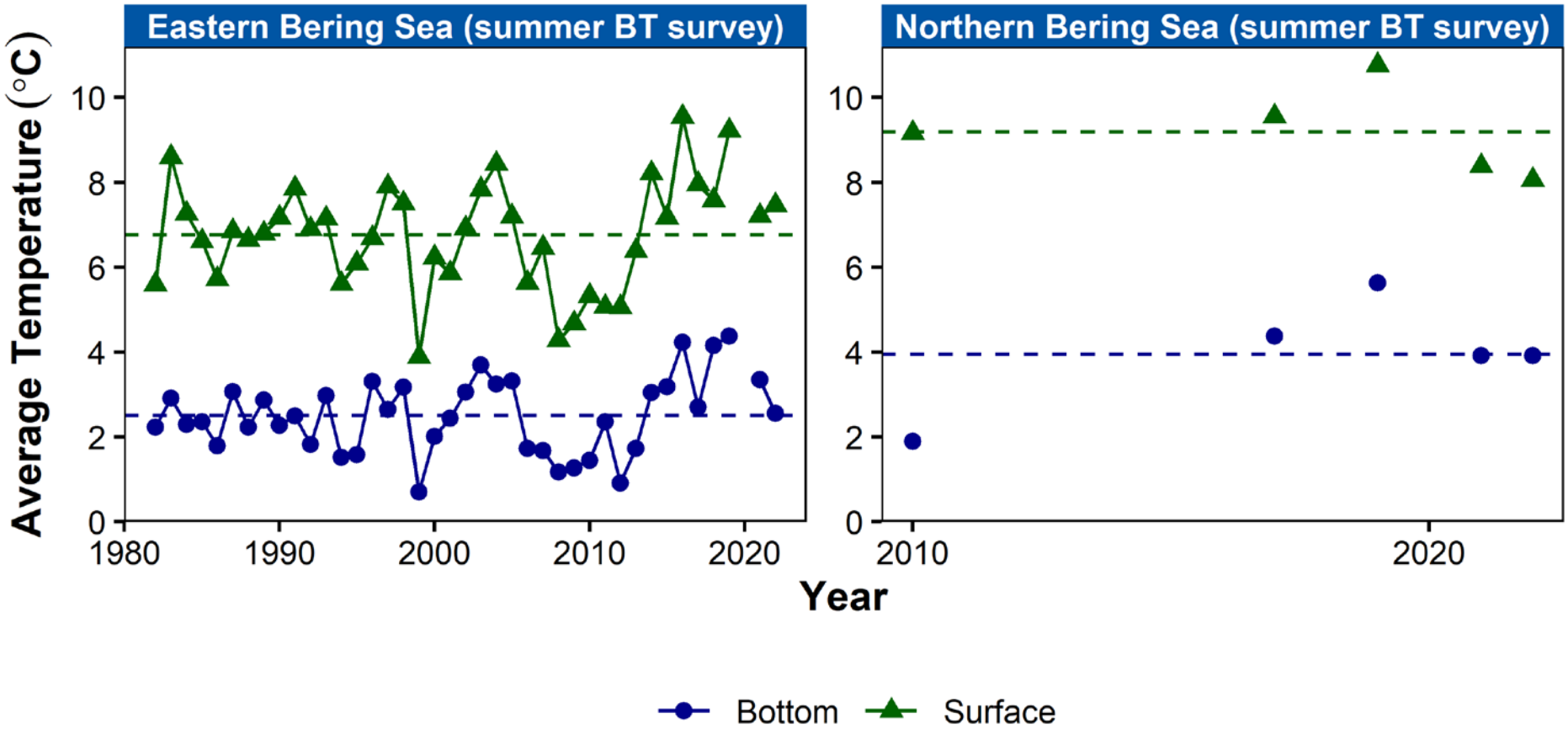

NBS
2010, 2017,
(partial 2018),
2019, 2021,2022
EBS
Annually since 1982
(except 2020)
Alaska
St. Lawrence
St. Matthew
Nunivak
Pribilof Isl.
200 m
100 m
50 m
Northern Bering Sea
Eastern Bering Sea
Alaska Peninsula
0
100
200km
64°N
62°N
60°N
58°N
56°N
54°N
175°W
170°W
165°W
160°W
Latitude
Longitude

Survey Charter Vessels

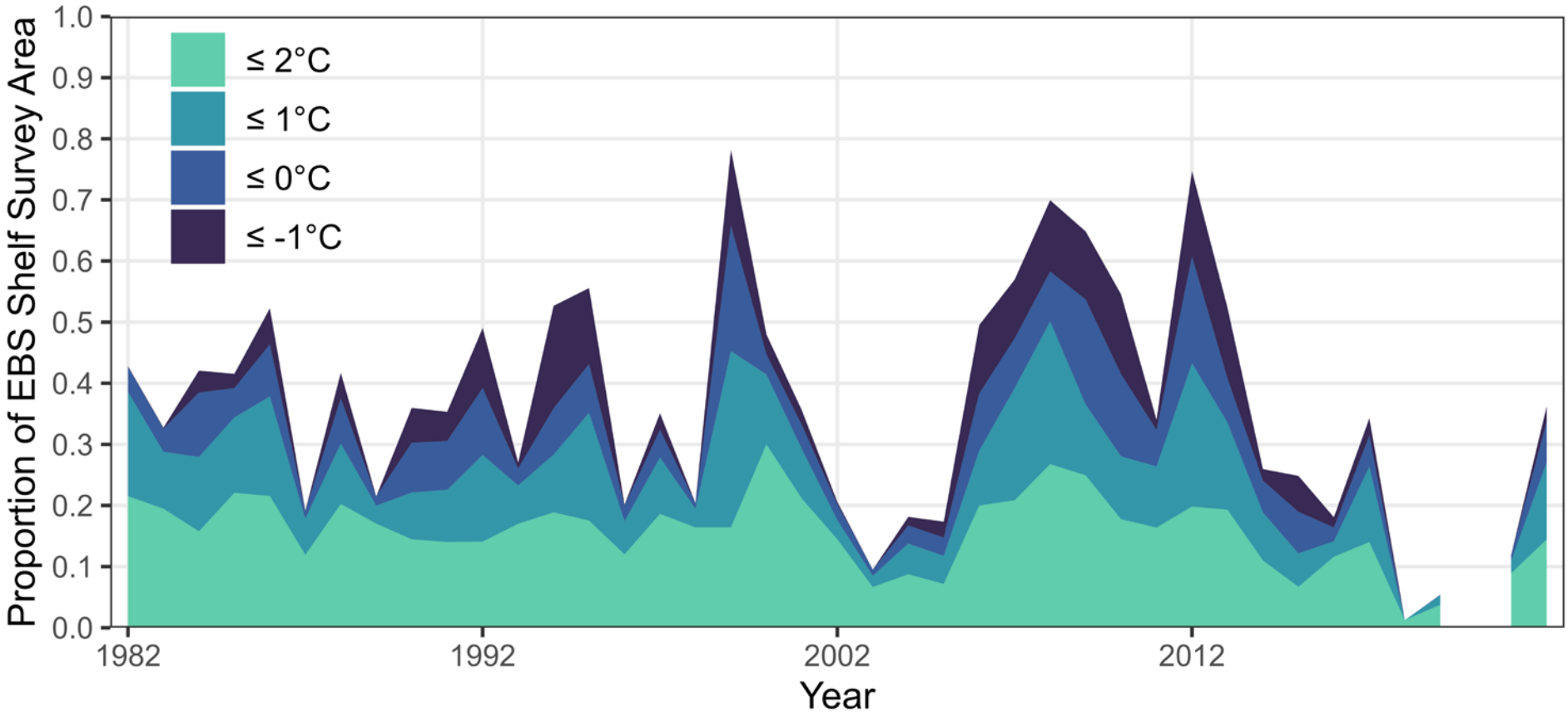
FV *Vesteraalen*
2014-present
8th year

FV *Alaska Knight*
2010-present
11th year

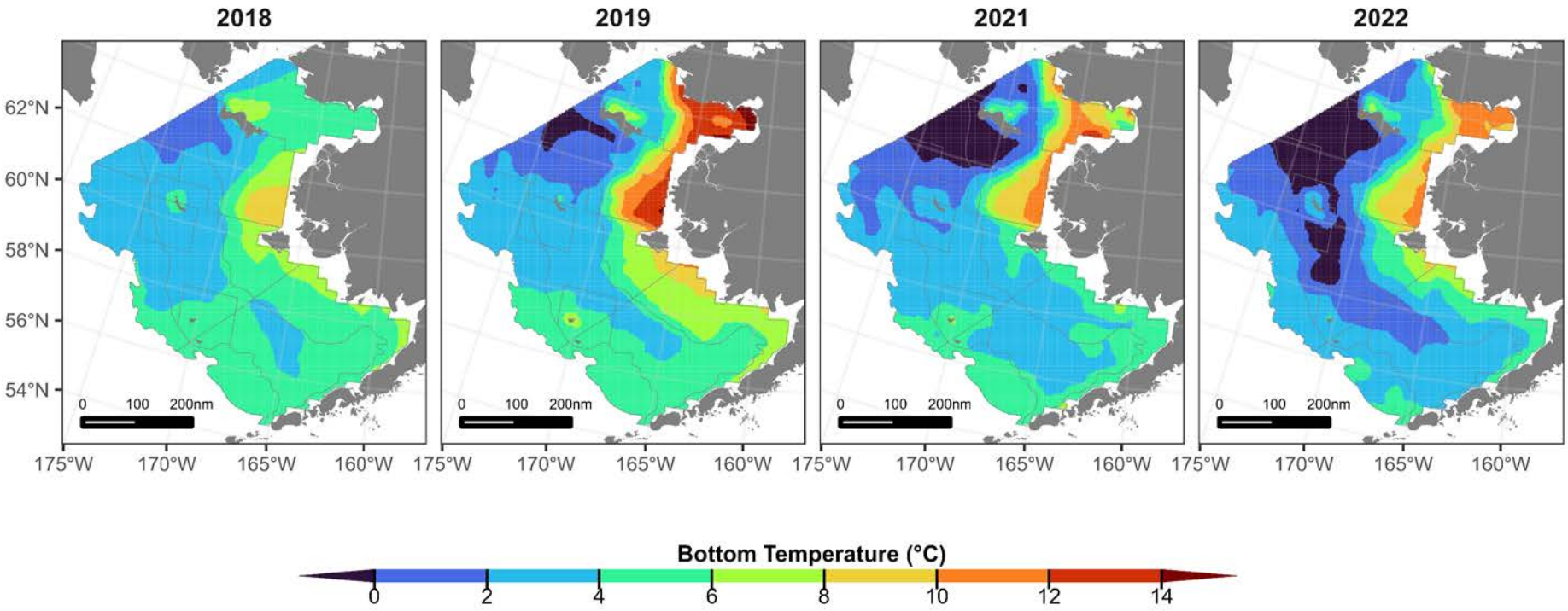
EBS/NBS Mean Surface and Bottom Temperatures



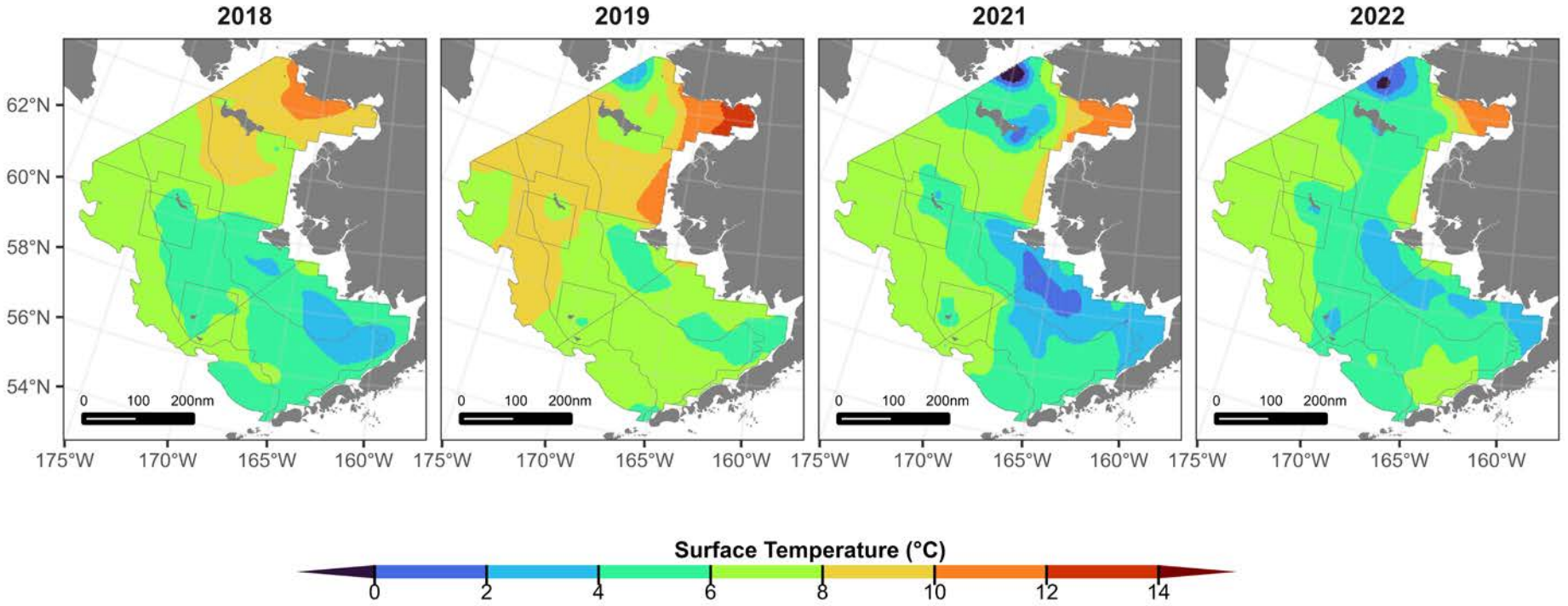
Cold Pool Area



Survey Bottom Temperatures



Survey Surface Temperatures



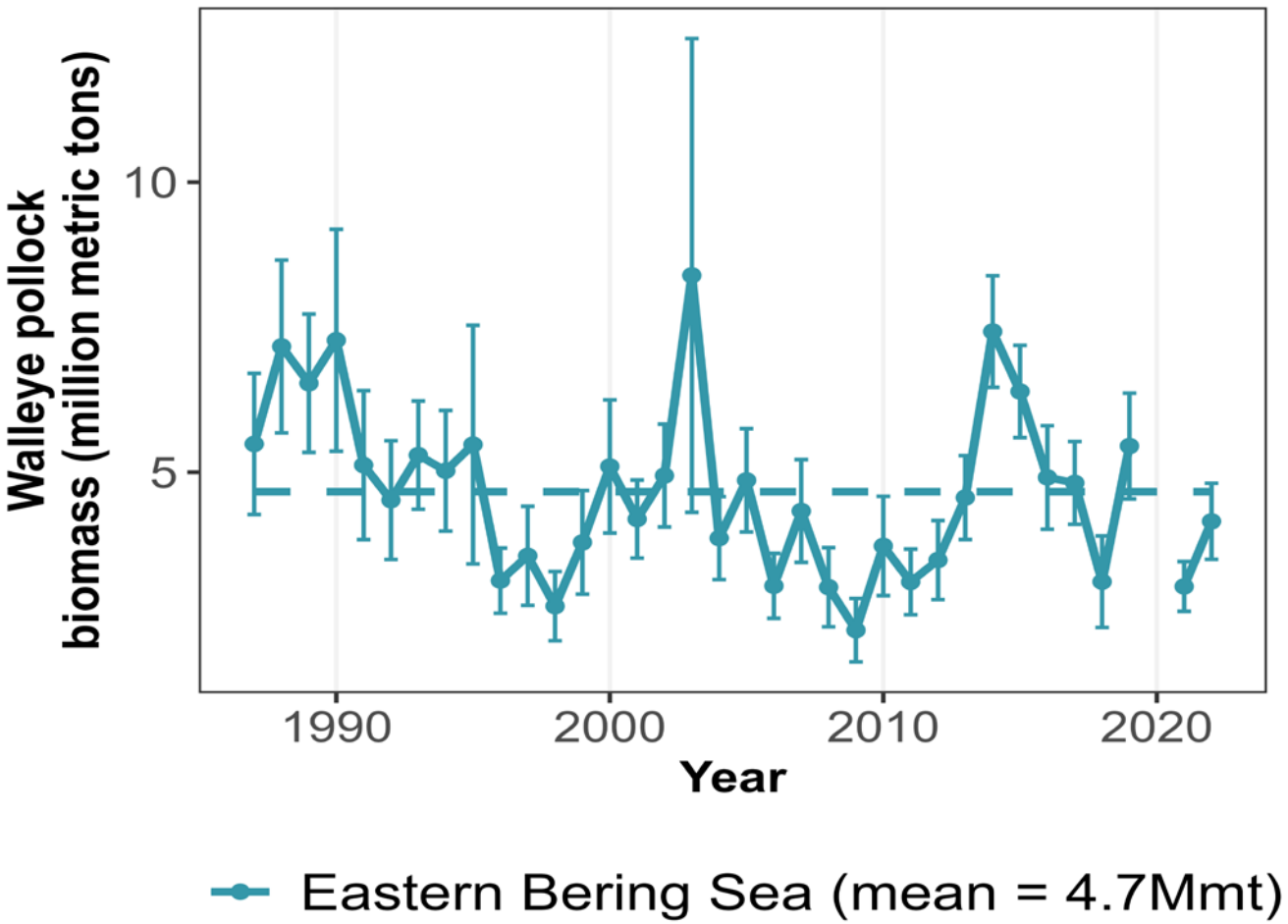
Length measurements from EBS

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**

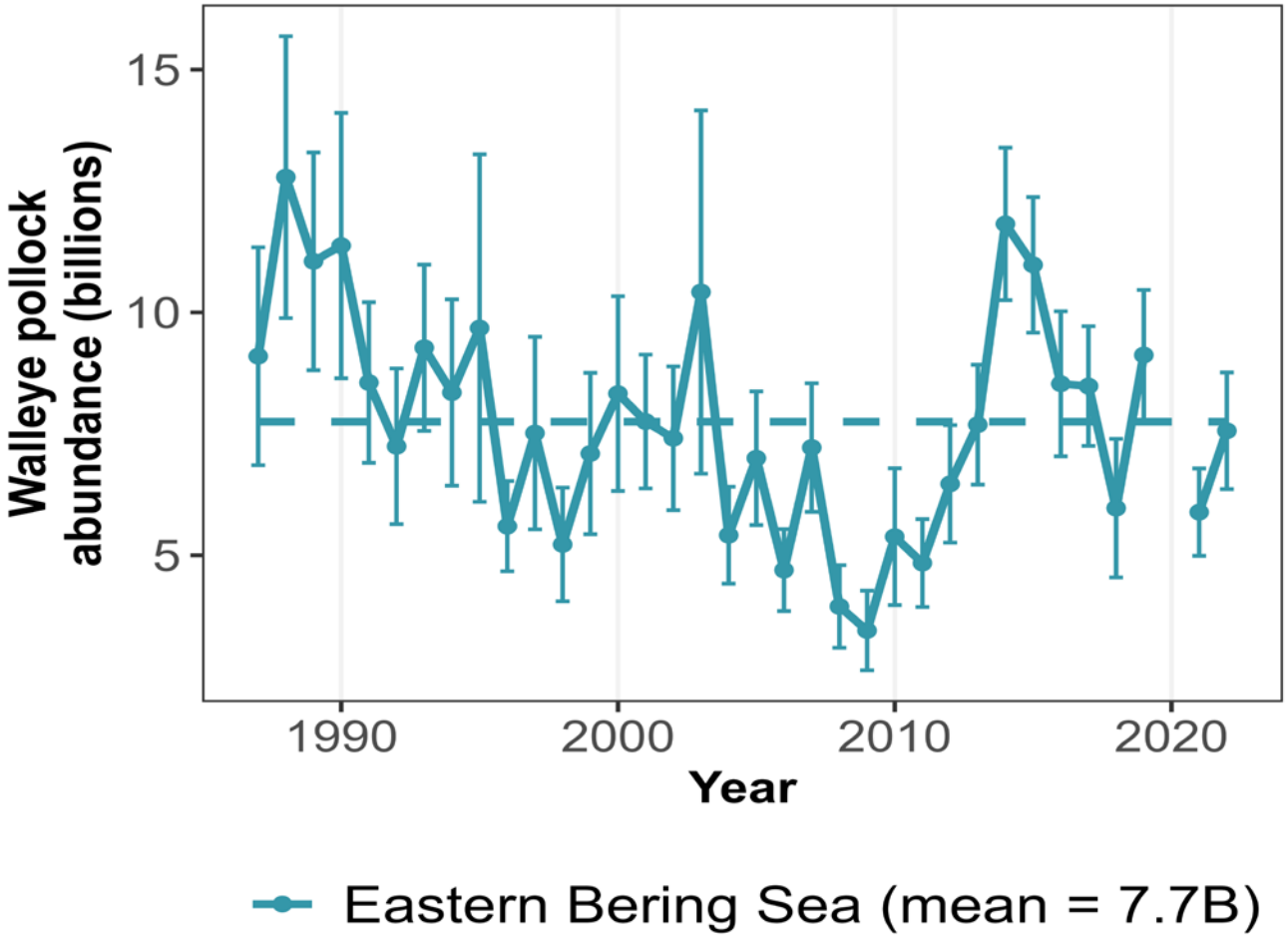
Walleye Pollock Biomass



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



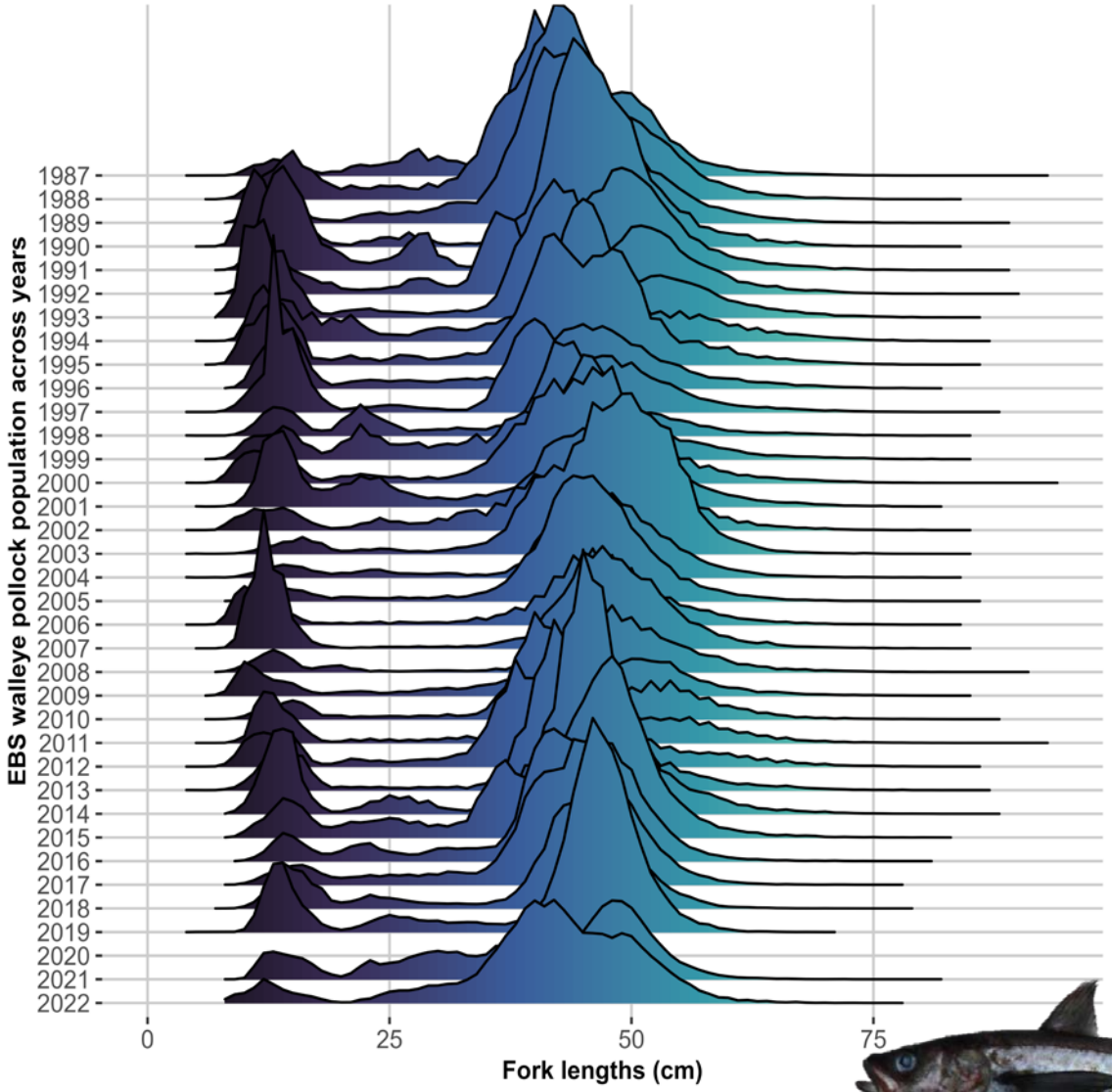
EBS Abundance

2022: 8 B

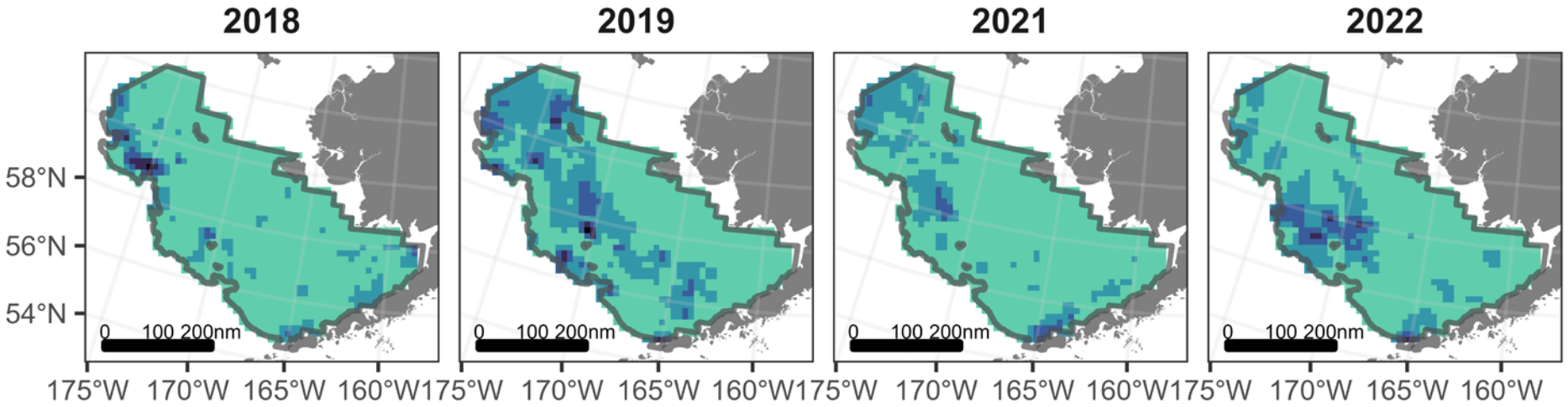
2021: 6 B

(28%)

Walleye Pollock Lengths



Walleye Pollock Distribution

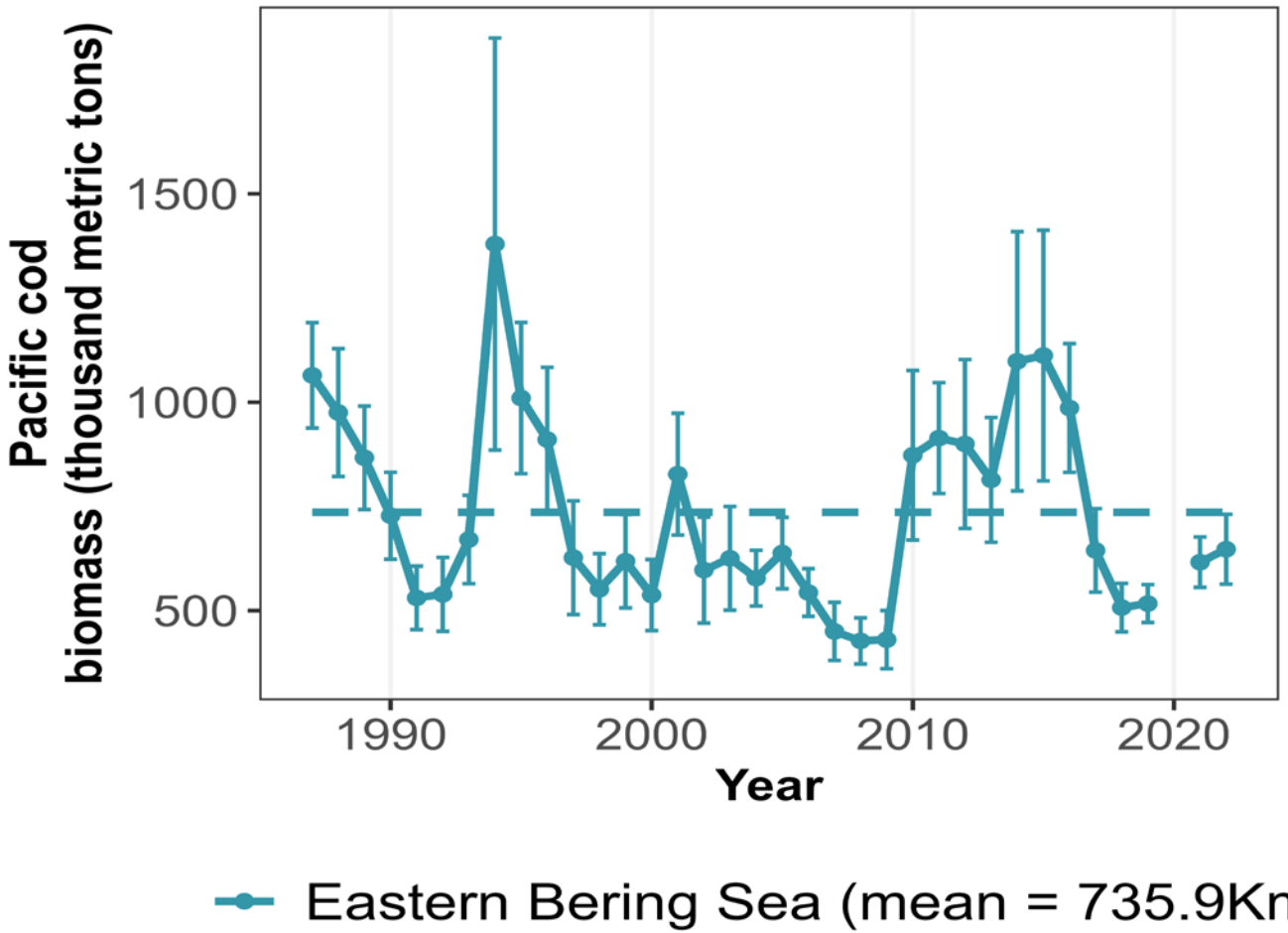


Walleye pollock
relative biomass (kg/ha)

No catch >0–100 >100–300 >300–700 >700–1400 >1400–2731

Eastern Bering Sea

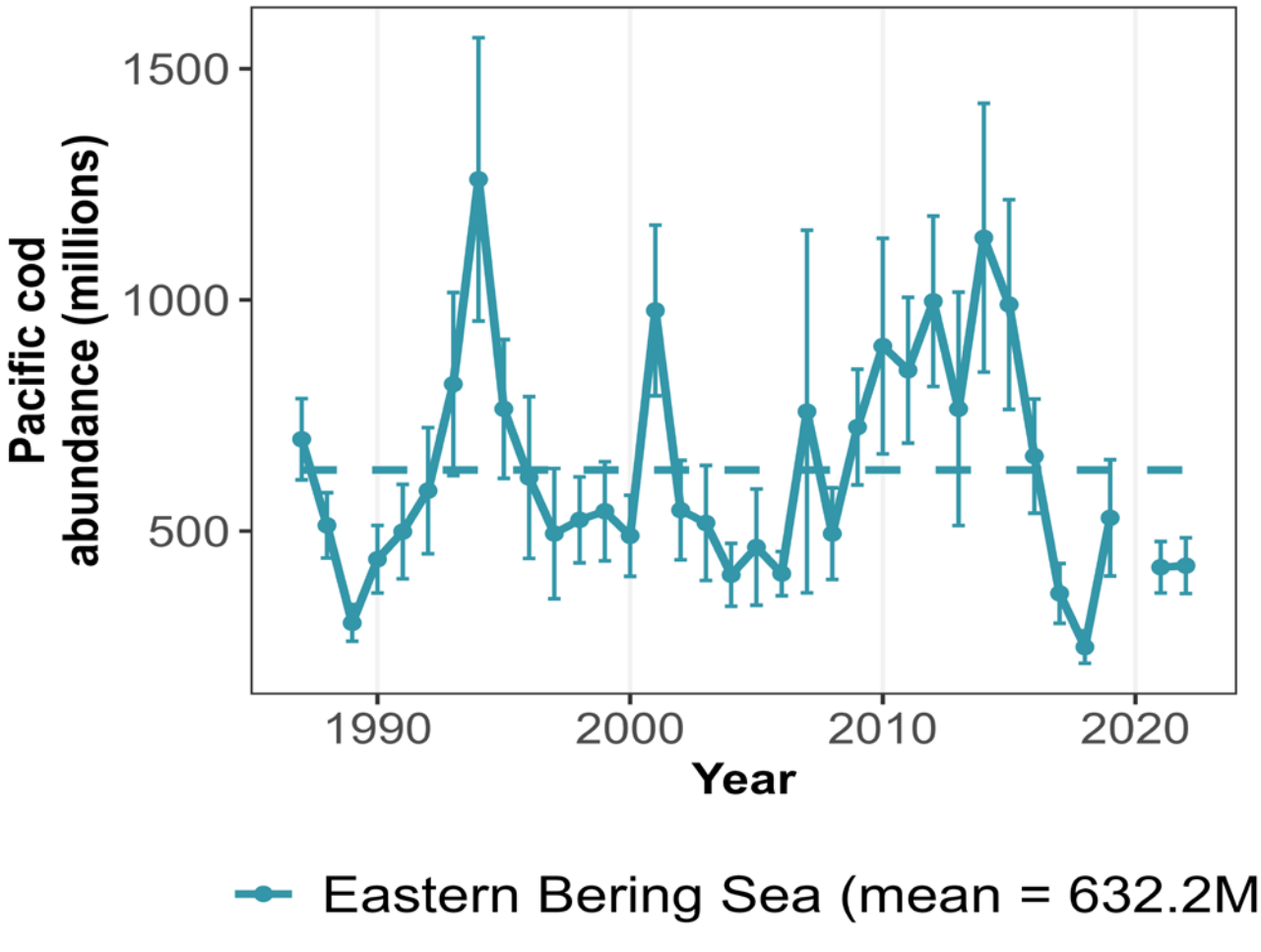
Pacific Cod Biomass



EBS Biomass
2022: 647 Kmt
2021: 616 Kmt
(5.03%)

EBS + NBS
2022: 801 Kmt
2021: 844 Kmt
(-5.1%)

Pacific Cod Abundance



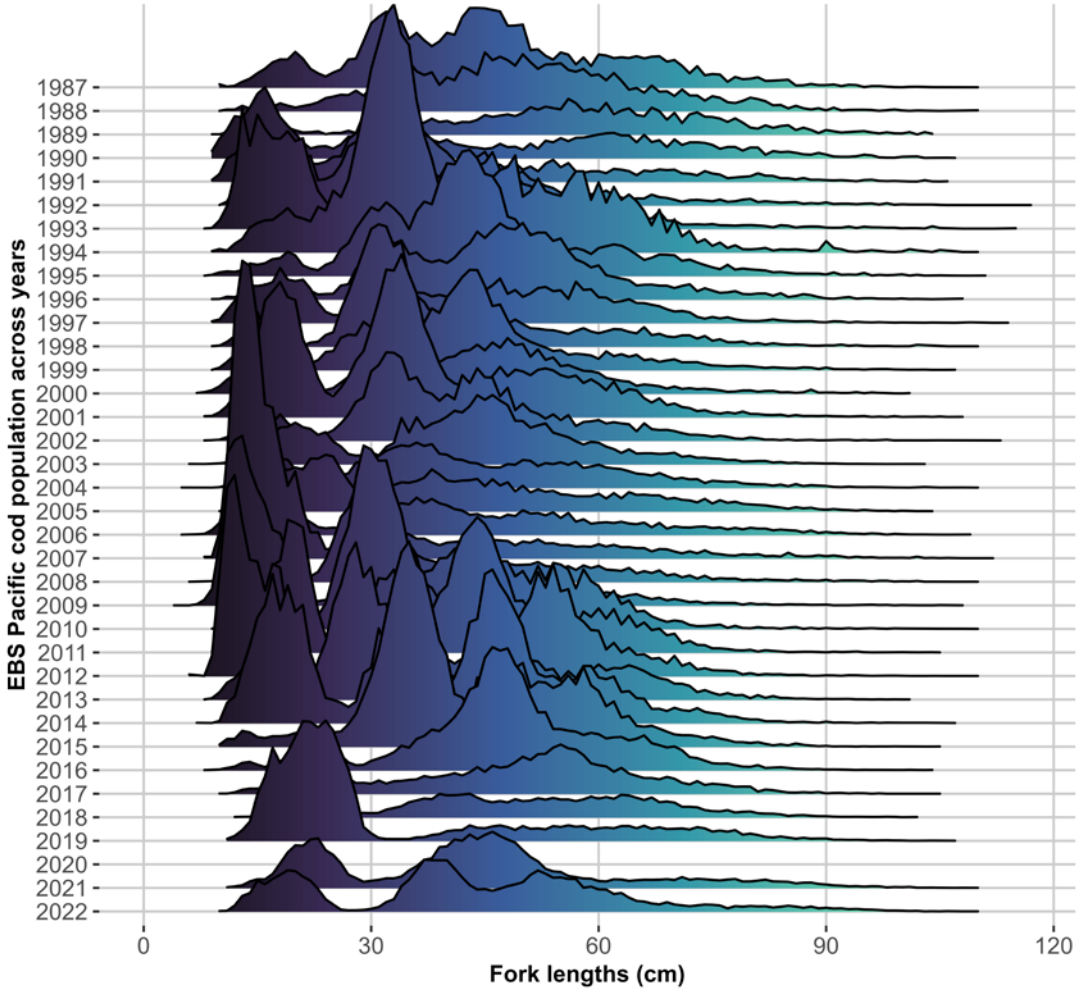
EBS Abundance

2022: 425 M

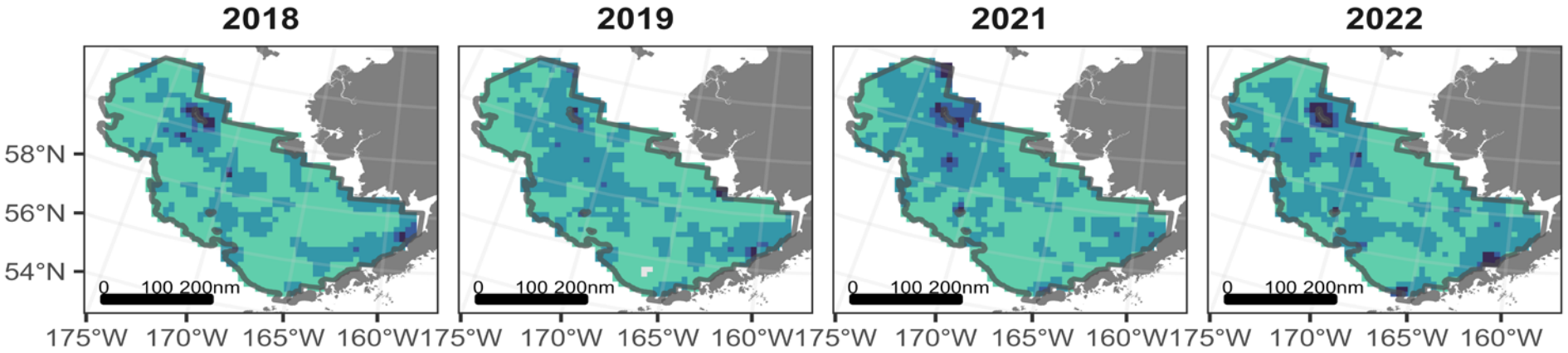
2021: 422 M

(1%)

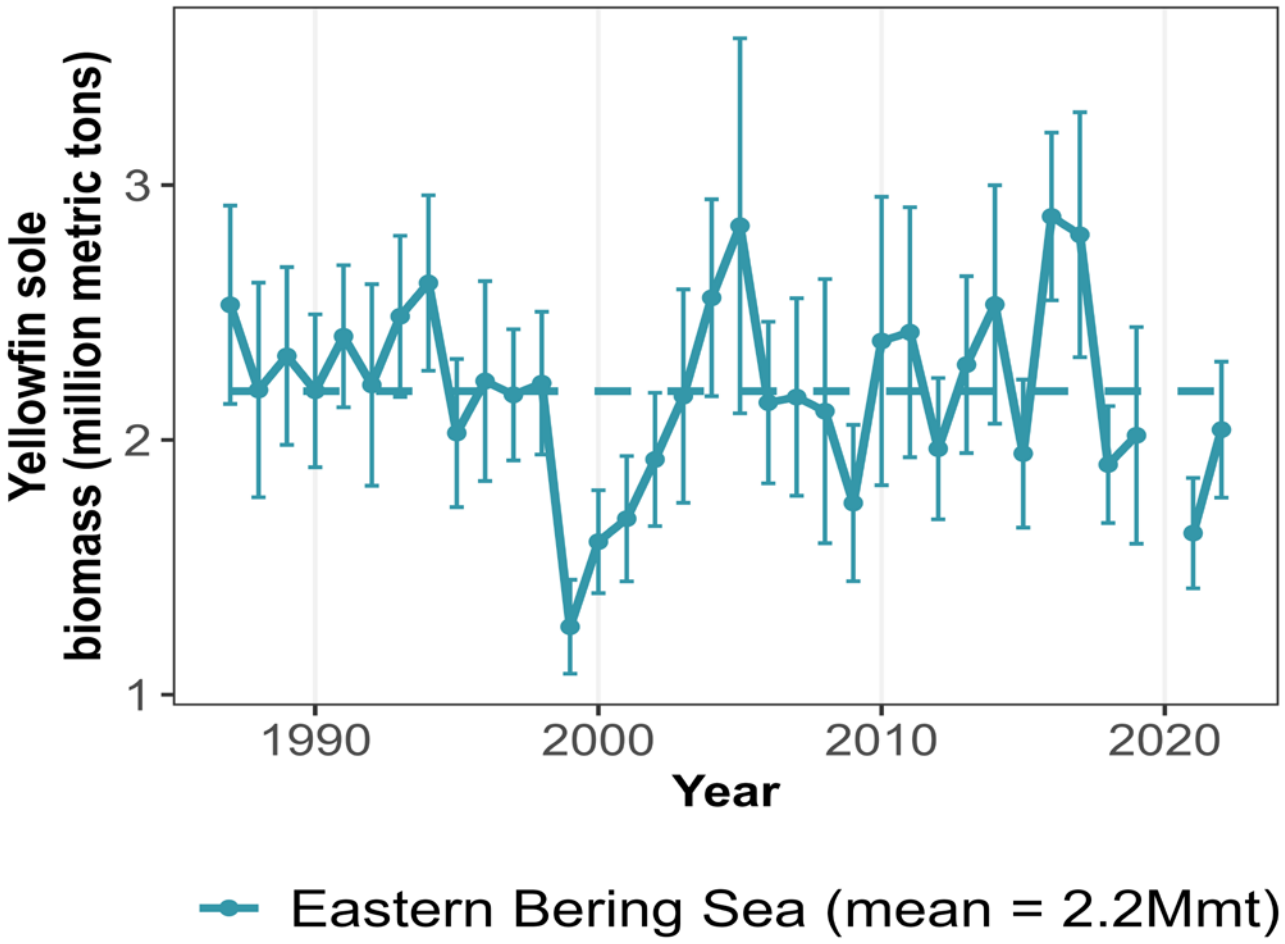
Pacific Cod Lengths



Pacific Cod Distribution



Yellowfin Sole Biomass

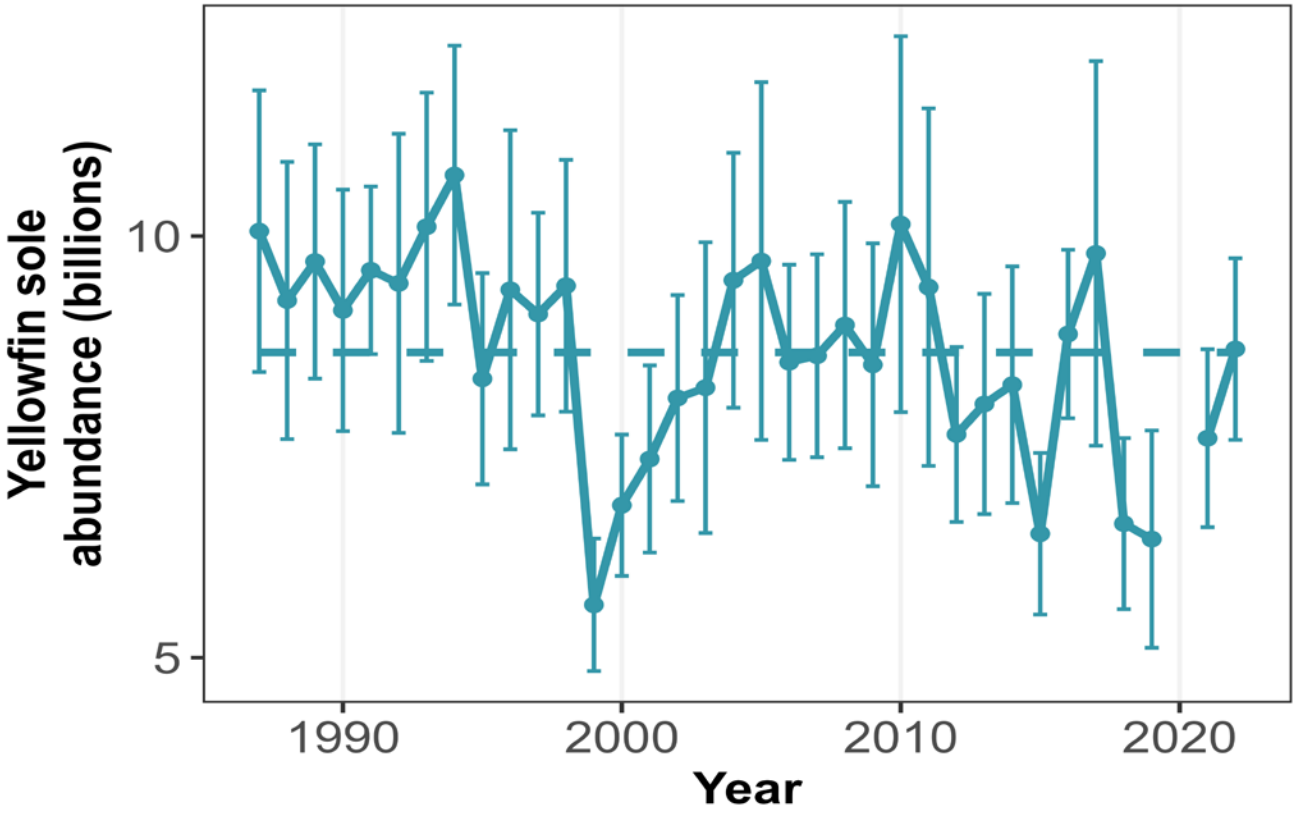


EBS Biomass
2022: 2 Mmt
2021: 2 Mmt
(24.85%)

EBS + NBS
2022: 2.6 Mmt
2021: 2.1 Mmt
(21.5%)

NOAA FISHERIES

Yellowfin Sole Abundance



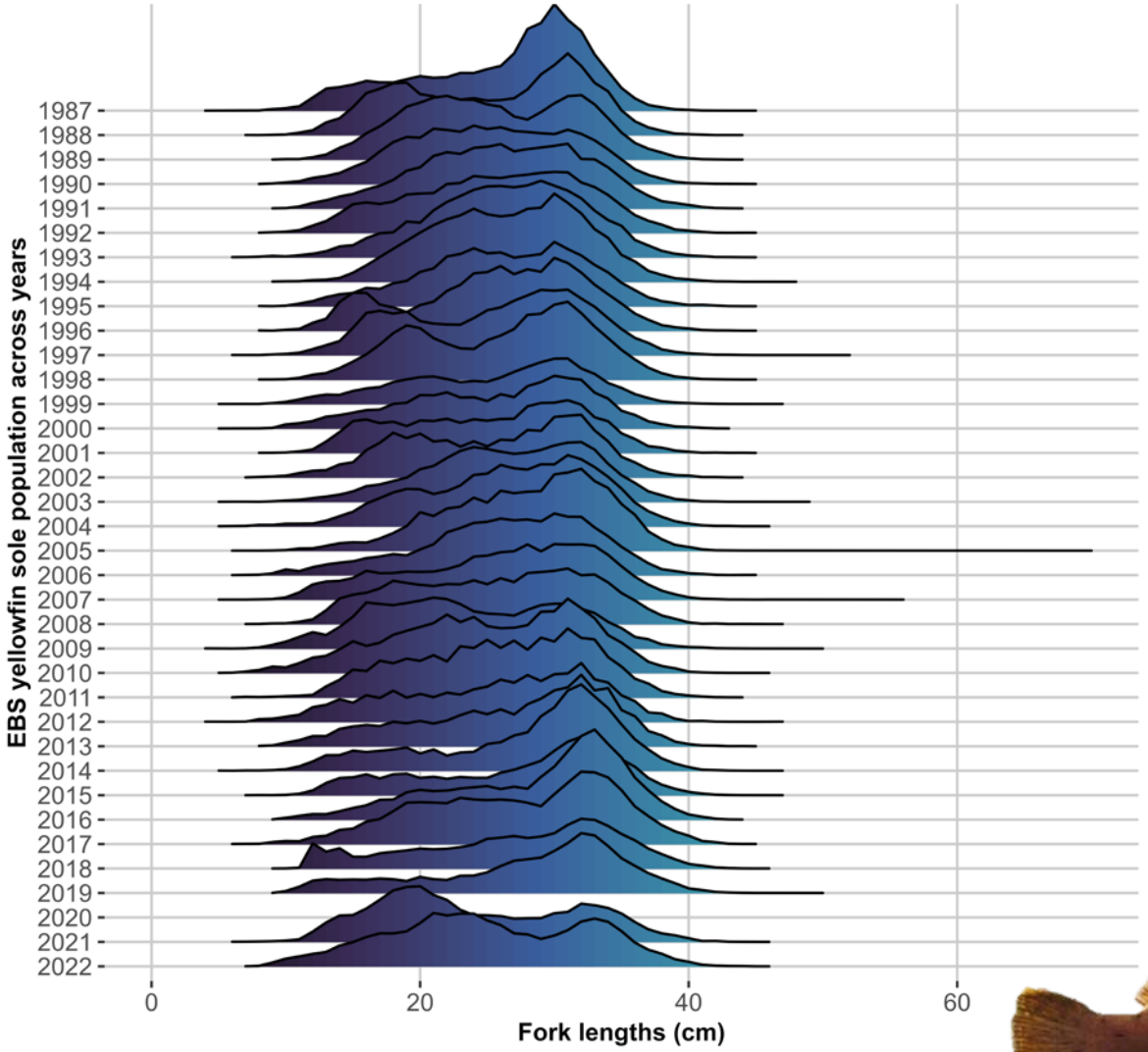
EBS Abundance

2022: 9 B

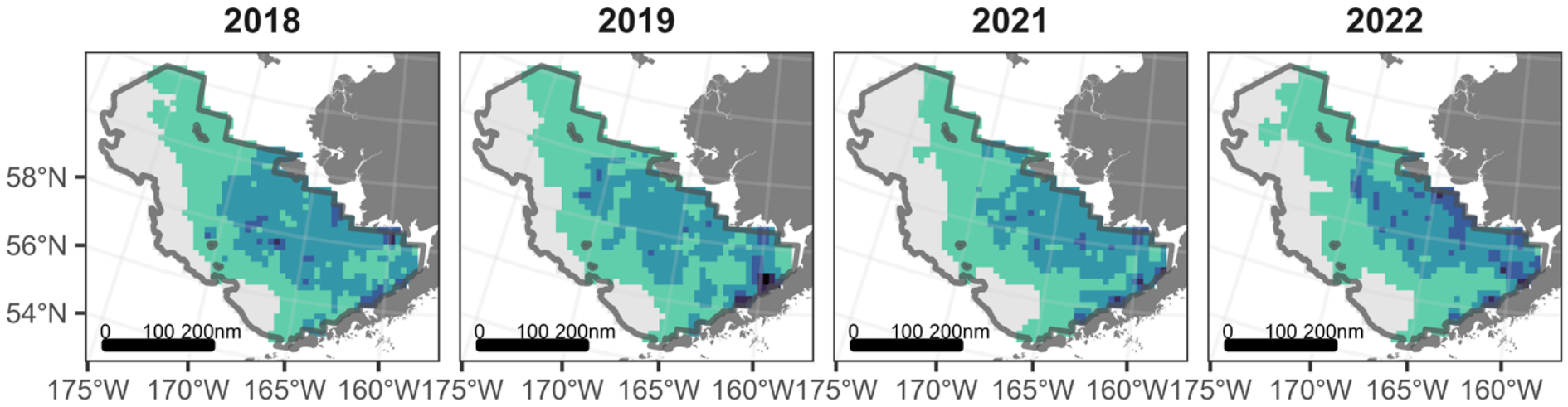
2021: 8 B

(14%)

Yellowfin Sole Lengths



Yellowfin Sole Distribution

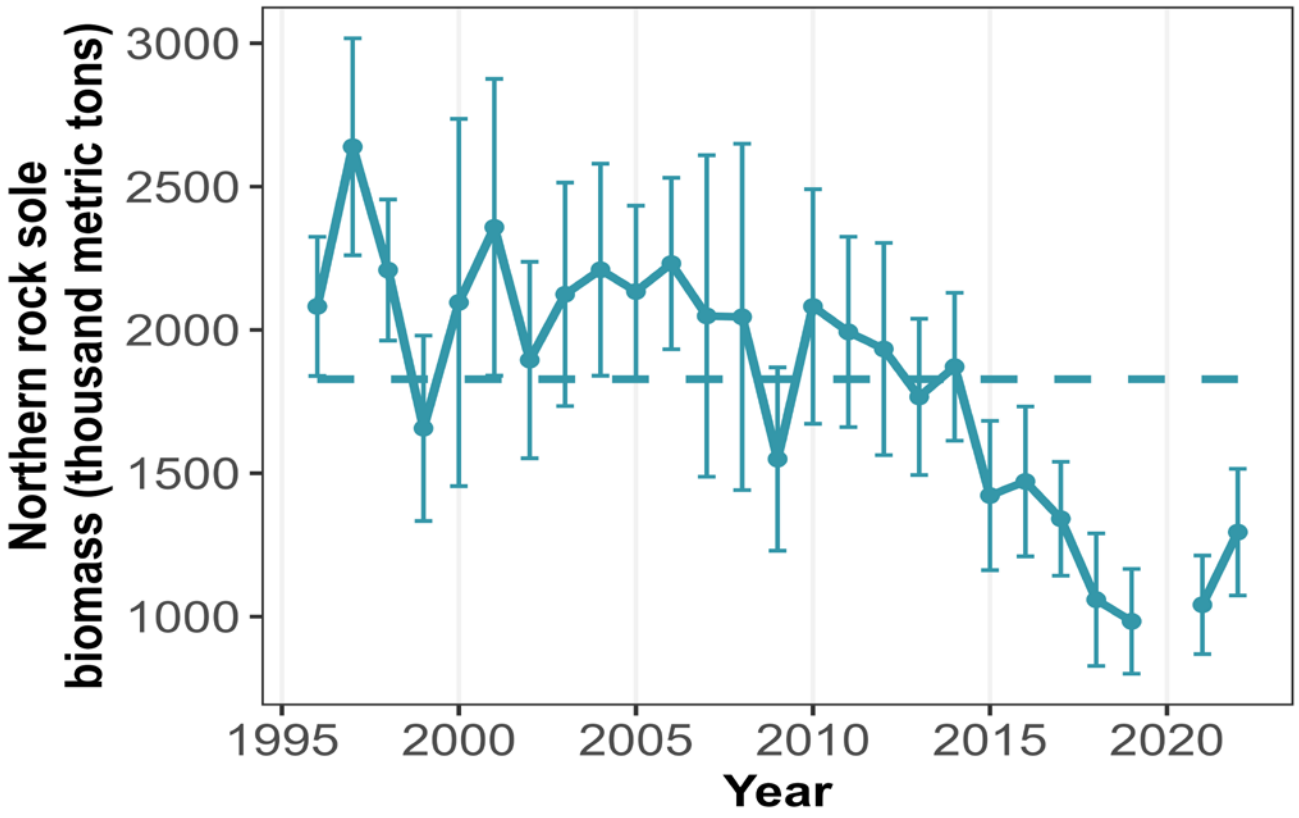


Yellowfin sole
relative biomass (kg/ha)

No catch >0–50 >50–150 >150–300 >300–700 >700–1277

Eastern Bering Sea

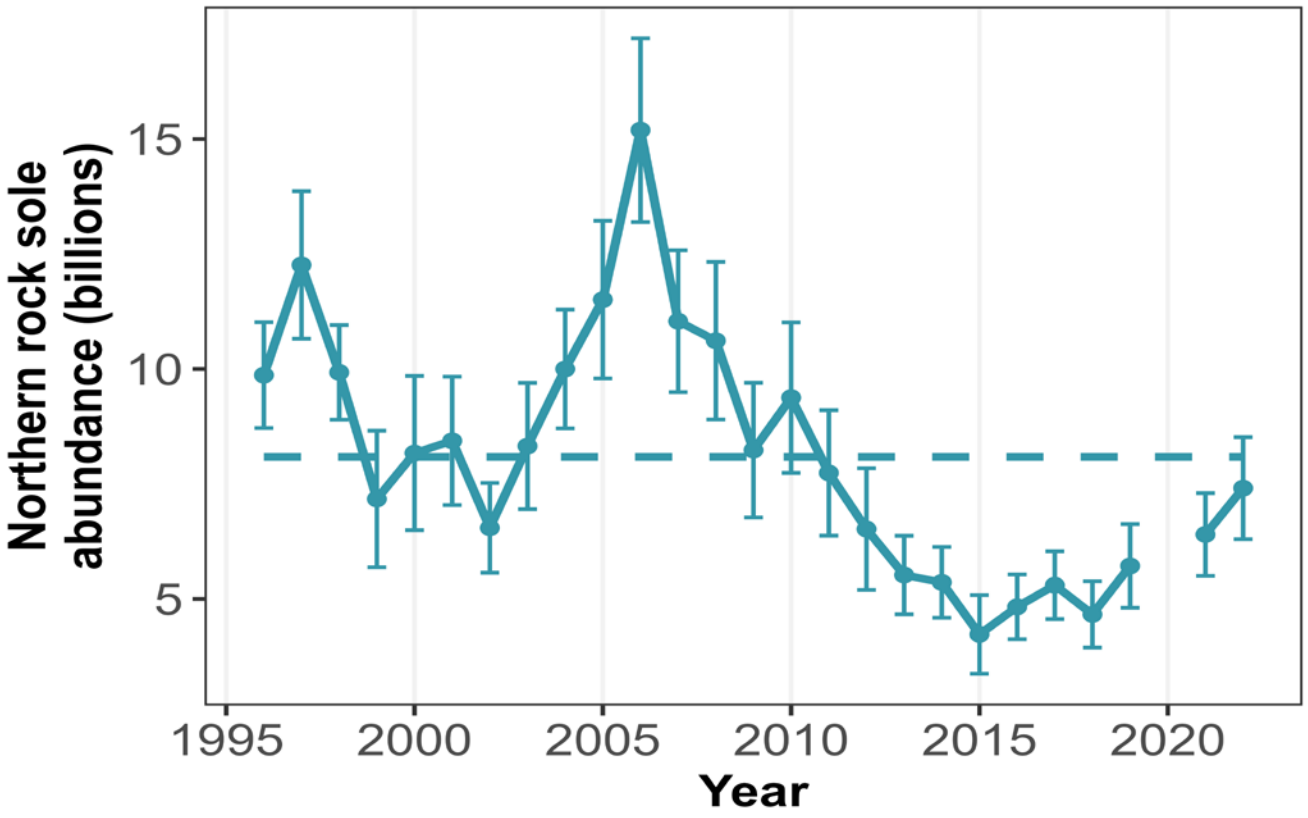
Northern Rock Sole Biomass



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

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

Northern Rock Sole Abundance



EBS Abundance

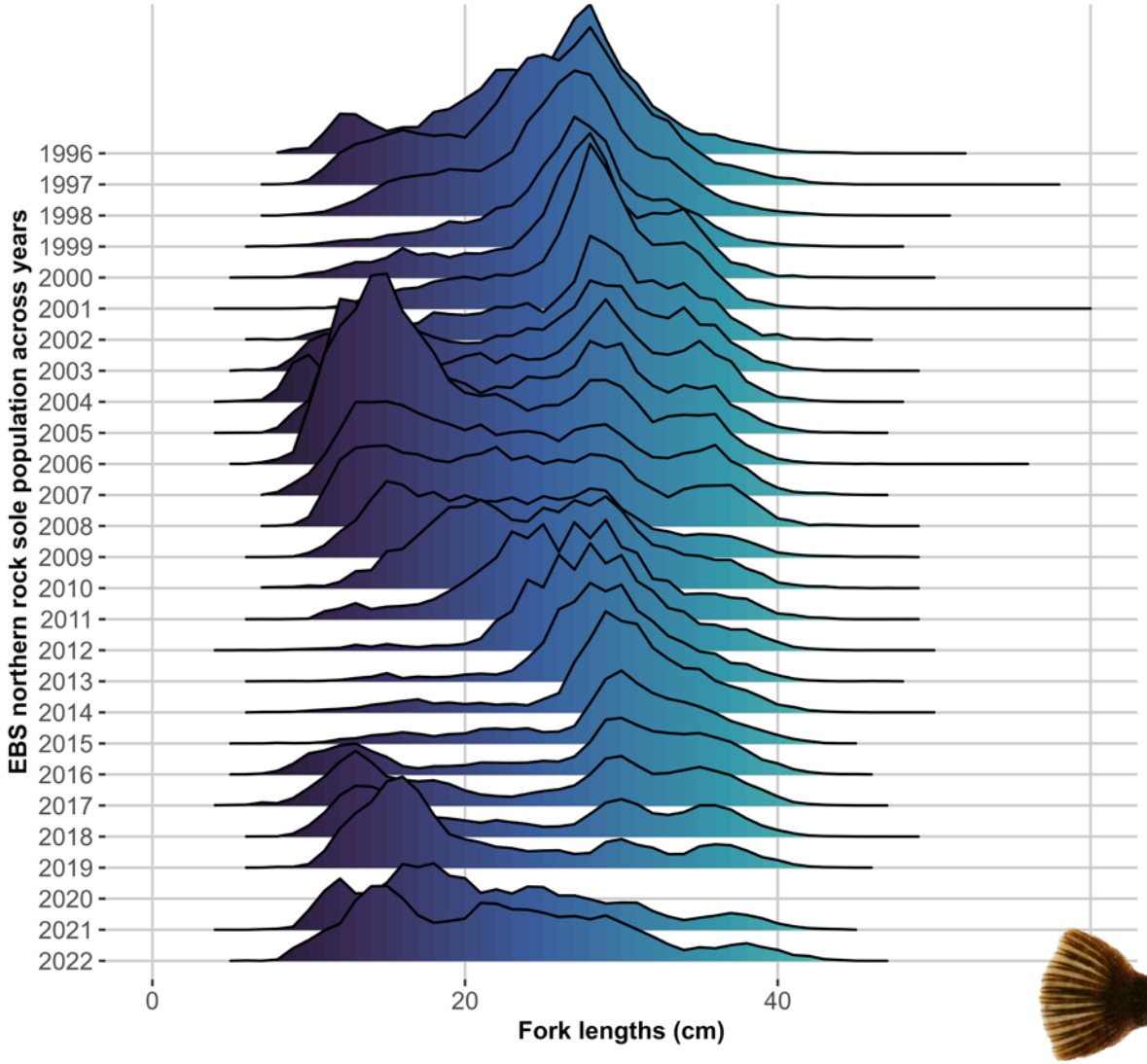
2022: 7 B

2021: 6 B

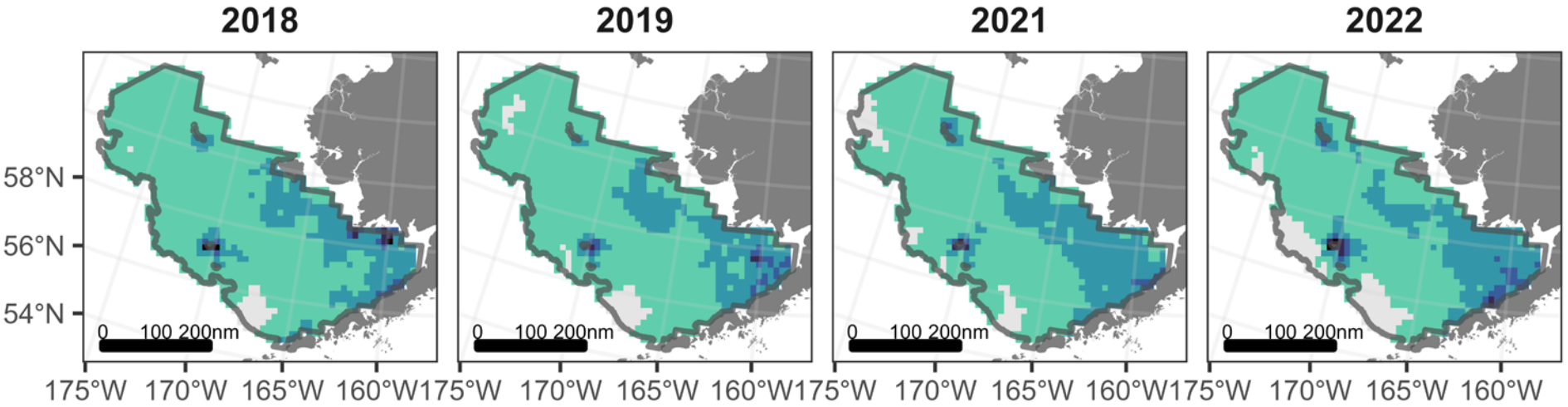
(16%)

NOAA FISHERIES

Northern Rock Sole Lengths



Northern Rock Sole Distribution



Northern rock sole
relative biomass (kg/ha)

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

Eastern Bering Sea

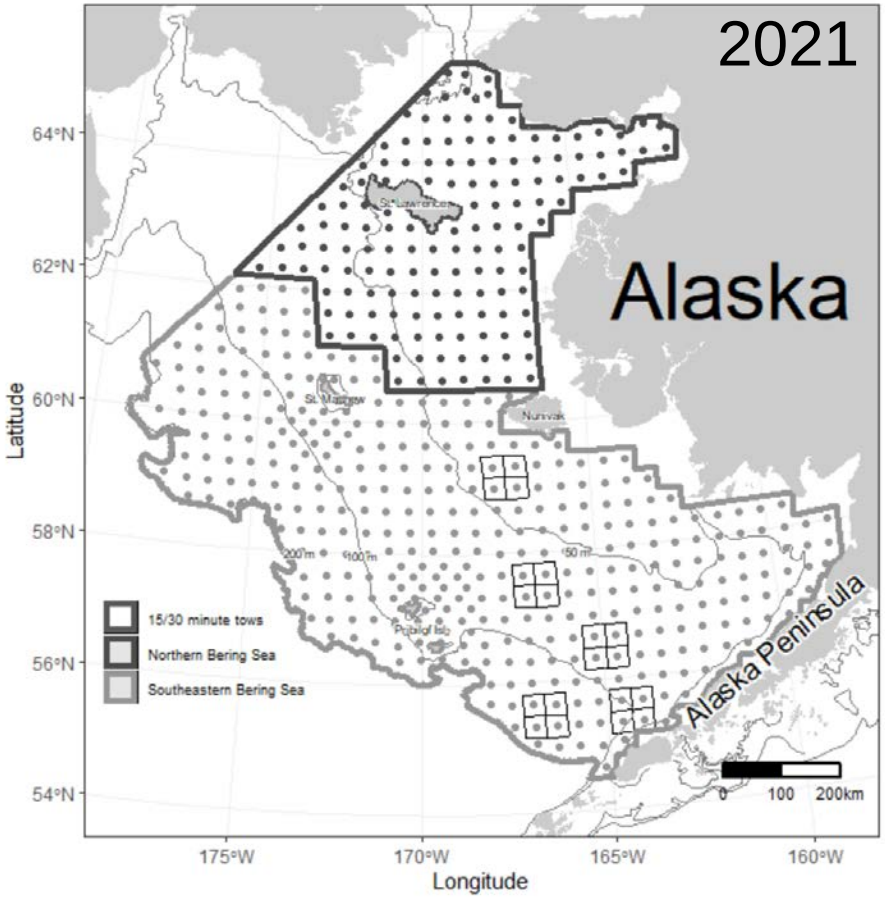
		EBS		NBS	
Common name	Year	Biomass (mt)	Abundance (x1000)	Biomass (mt)	Abundance (x1000)
walleye pollock	2021	3,034,317	5,893,682	474,448	679,315
	2022	4,153,971(37%)	7,563,348 (28%)	394,585 (-17%)	694,456 (2%)
Pacific cod	2021	616,380	421,752	227,577	129,700
	2022	647,400 (5%)	425,156 (1%)	153,735 (-32%)	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%)

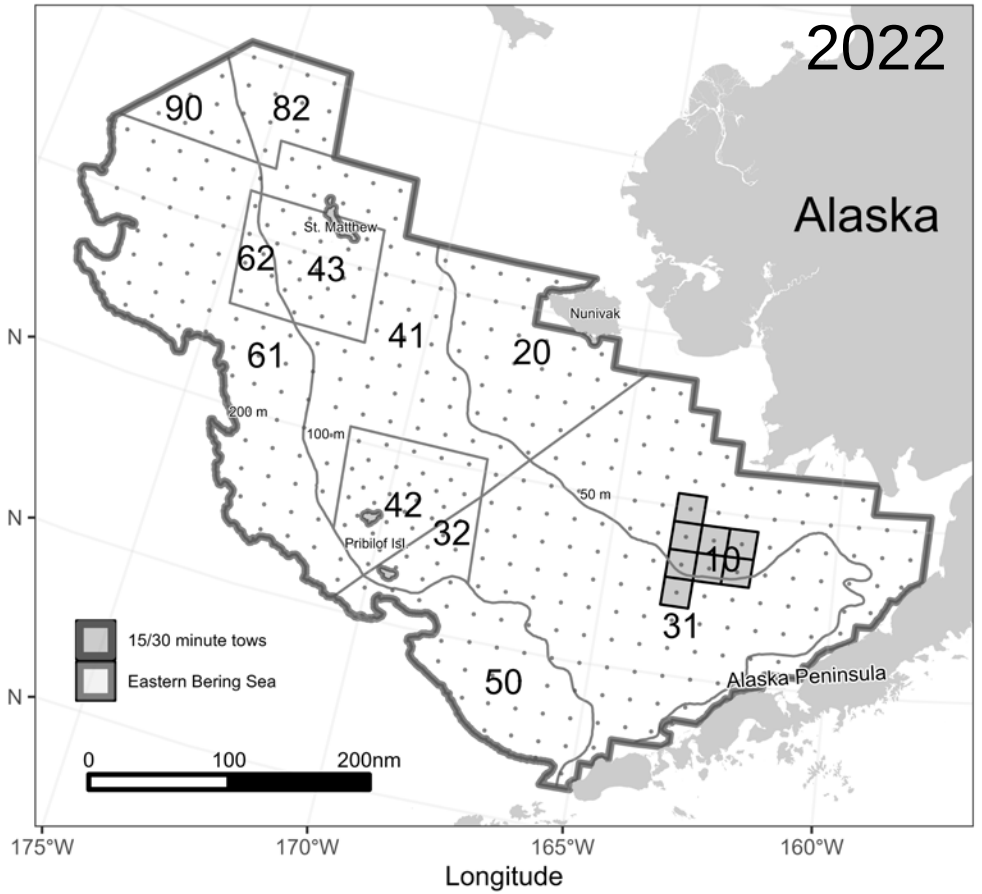
EBS Survey Special Projects

Special Projects	
Acoustics	**Misc**
EBS & NBS AVO index	EBS & NBS Arctic and saffron cod age and growth
Crab Disease	EBS & NBS L/W collection for A. cod, s. cod, rex sole, and starry flounder
EBS & NBS Bitter Crab Syndrome Monitoring	EBS & NBS MML food dabits reference collection
EBS & NBS Black eye syndrome: eyestalk collection	EBS & NBS NWFSC collection
EBS & NBS Black eye syndrome: live collection	EBS & NBS Outreach collection
EBS Bitter crab live collections	EBS & NBS P. cod tagging
Environmental Monitoring	EBS & NBS Pacific halibut
EBS & NBS Ambient light monitoring	EBS & NBS Pacific lamprey
EBS & NBS CTD data collection	EBS & NBS Shellfish Photo Documentation Refresh
EBS & NBS HAB toxins	EBS 15/30 tow duration study
Fish/Crab Condition	EBS Bristol Bay red king crab tagging
EBS & NBS Snow crab body condition	EBS crab collection for ocean acidification experiment
EBS & NBS Walleye pollock and Pacific cod body condition	EBS Observer collections
EBS Pacific cod blood collection for stress physiology	NBS Mollusk collection
Population Genetics	NBS Pacific herring, Arctic flounder, and Pacific cod collection
EBS & NBS Flatfish genomics	
EBS & NBS Pacific herring genetics	
EBS & NBS Sand lances	
EBS & NBS Sleeper and salmon sharks	

15/30 Minute tows

8 additional paired tows added to the data set in 2022

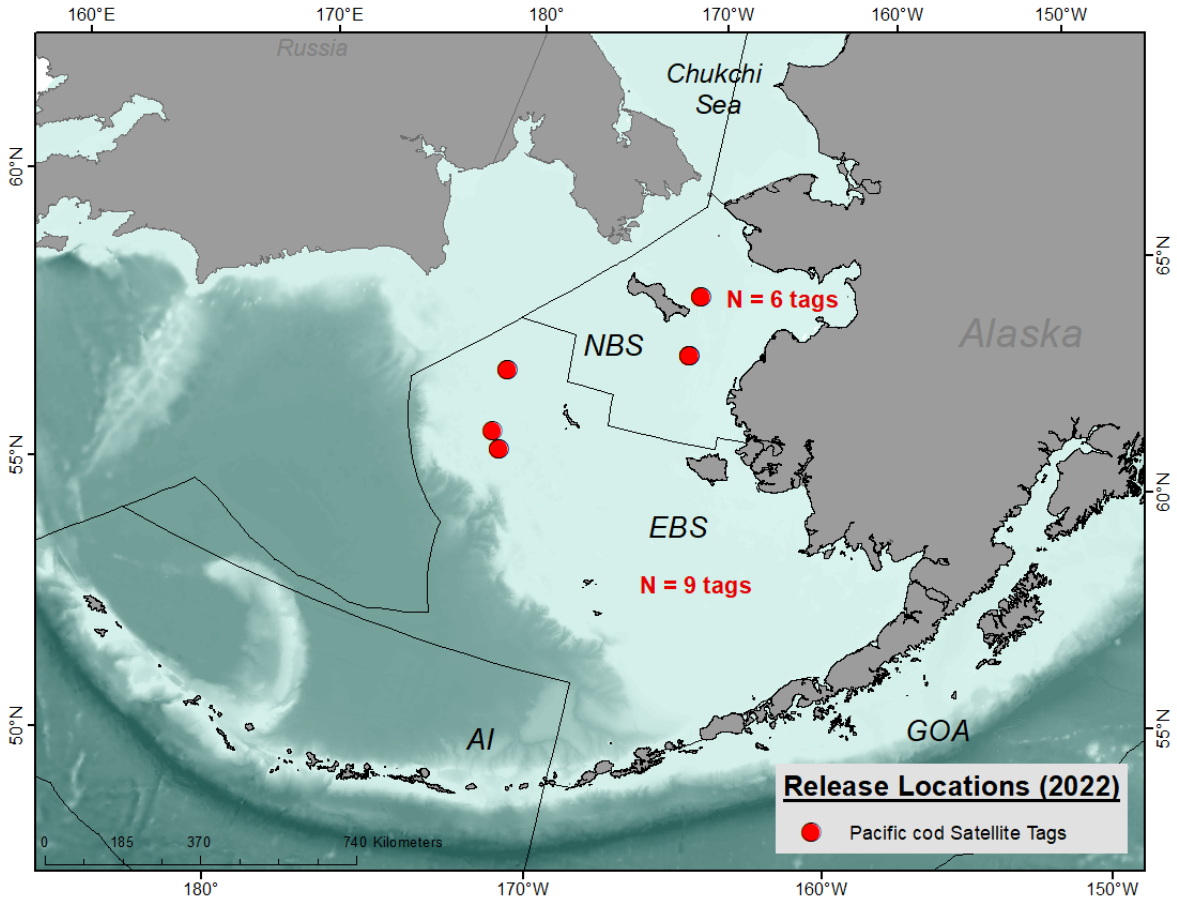




Questions? Contact Lukas.defilippo@noaa.gov

Pacific Cod PSAT Tagging

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



Acknowledgements:

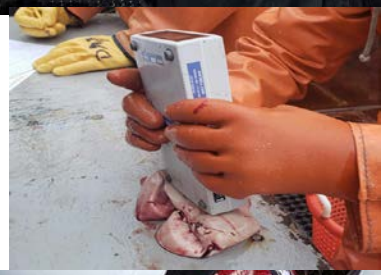
Funding:
Pacific cod harvesters
NCRP Grant

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

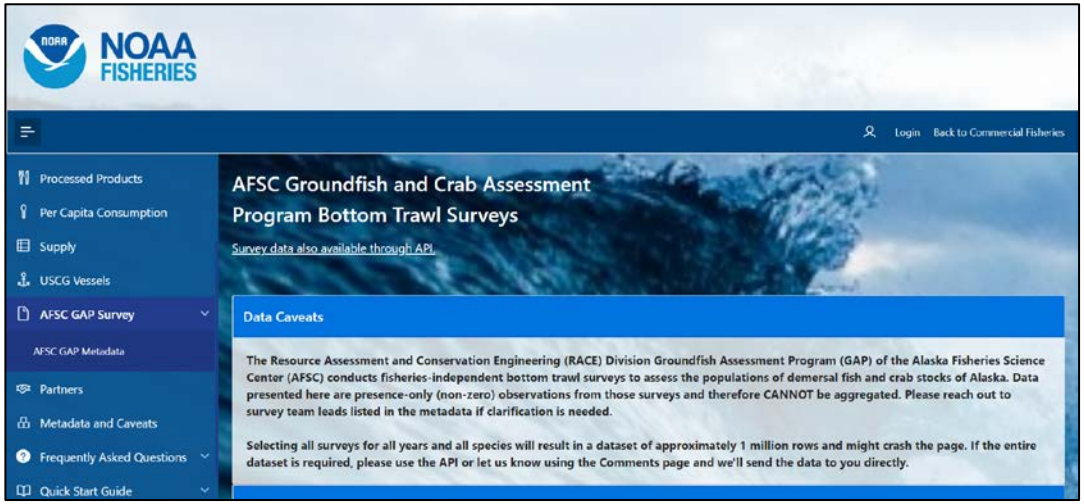
Historical survey catch data (FOSS):
https://www.fisheries.noaa.gov/foss/f?p=215:28

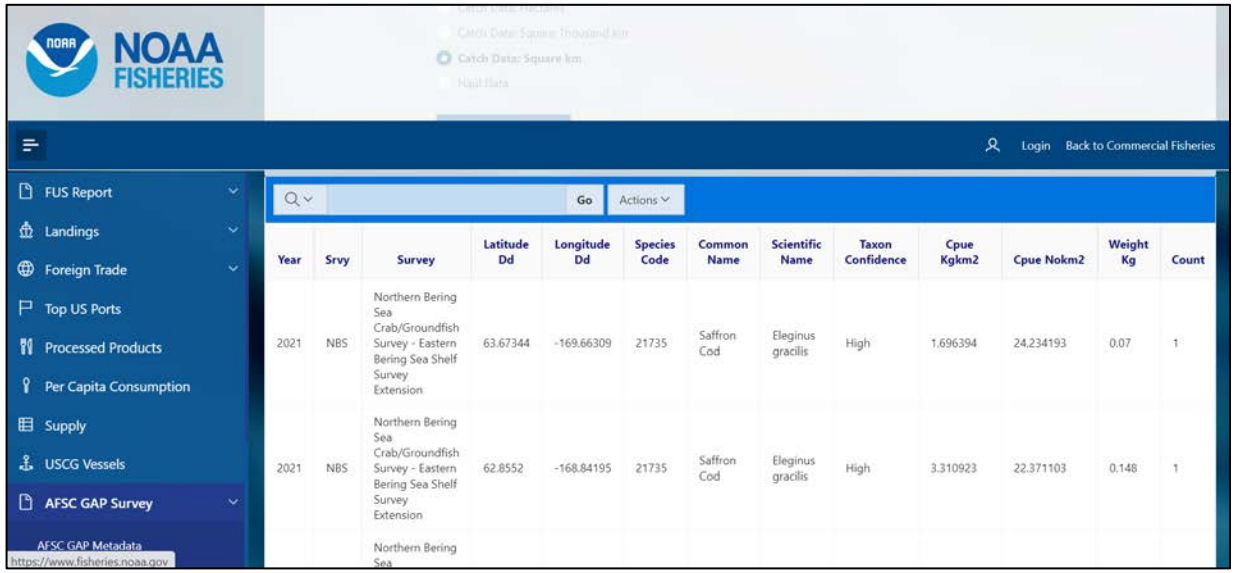
Mapping of survey catch data (DisMAP):
https://apps-st.fisheries.noaa.gov/dismap/

Hosted by NOAA Fisheries Office of Science and Technology

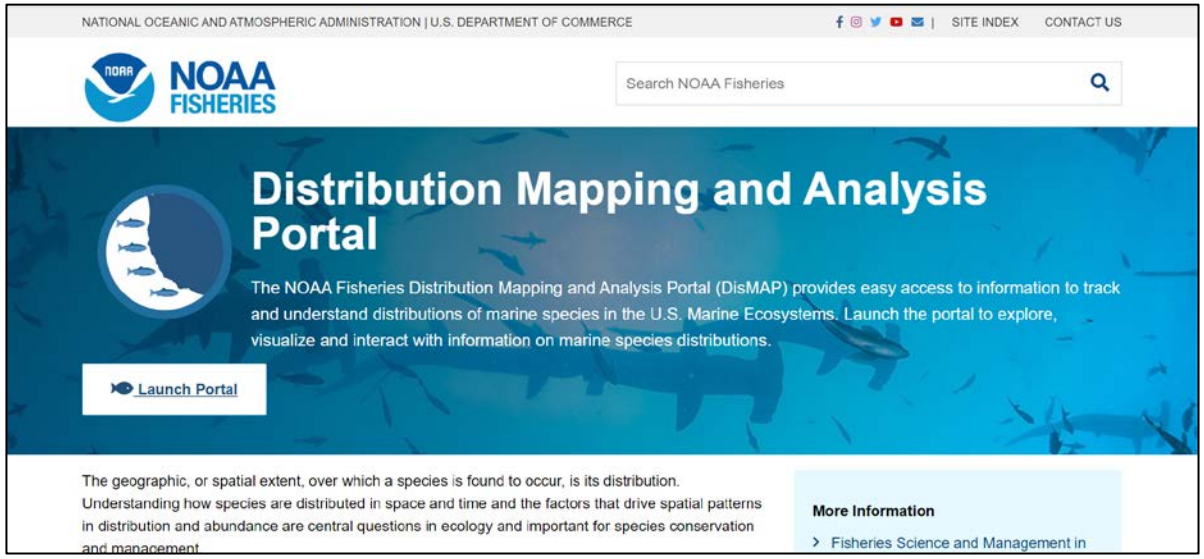
For more info: Emily.Markowitz@noaa.gov

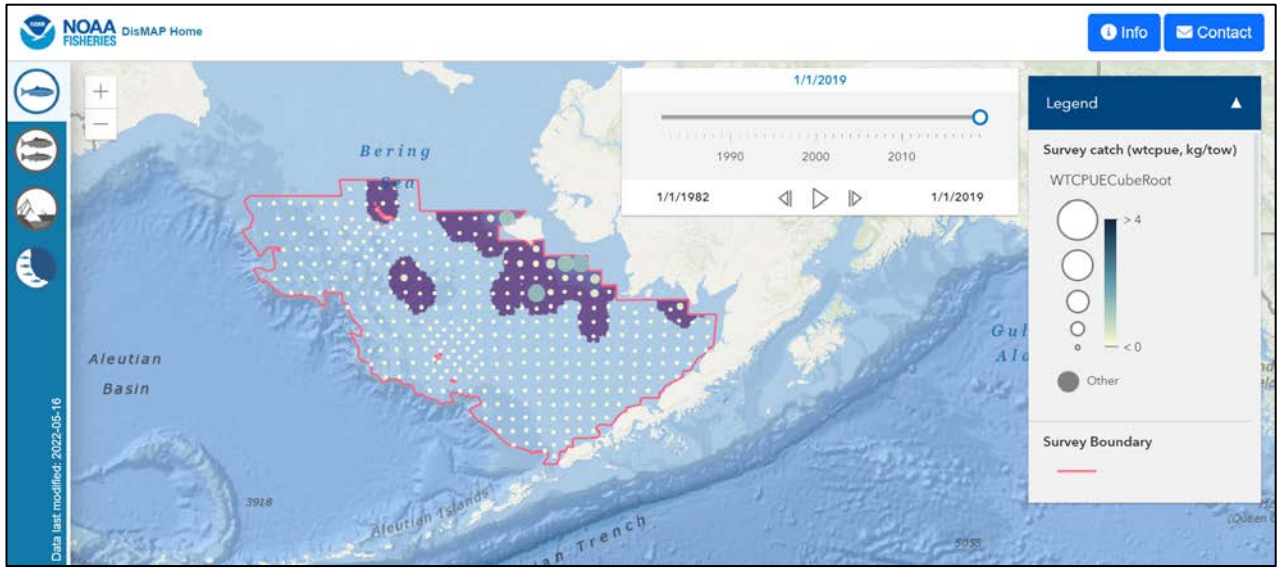
FOSS – The Fisheries One-Stop Shop





DisMAP – Distribution Mapping and Analysis Portal





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

Bering Sea Group

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)

NOAA FISHERIES

*Special thanks for preparing slides!