



**NOAA
FISHERIES**

Results from the Eastern & Northern Bering Sea Bottom Trawl Survey

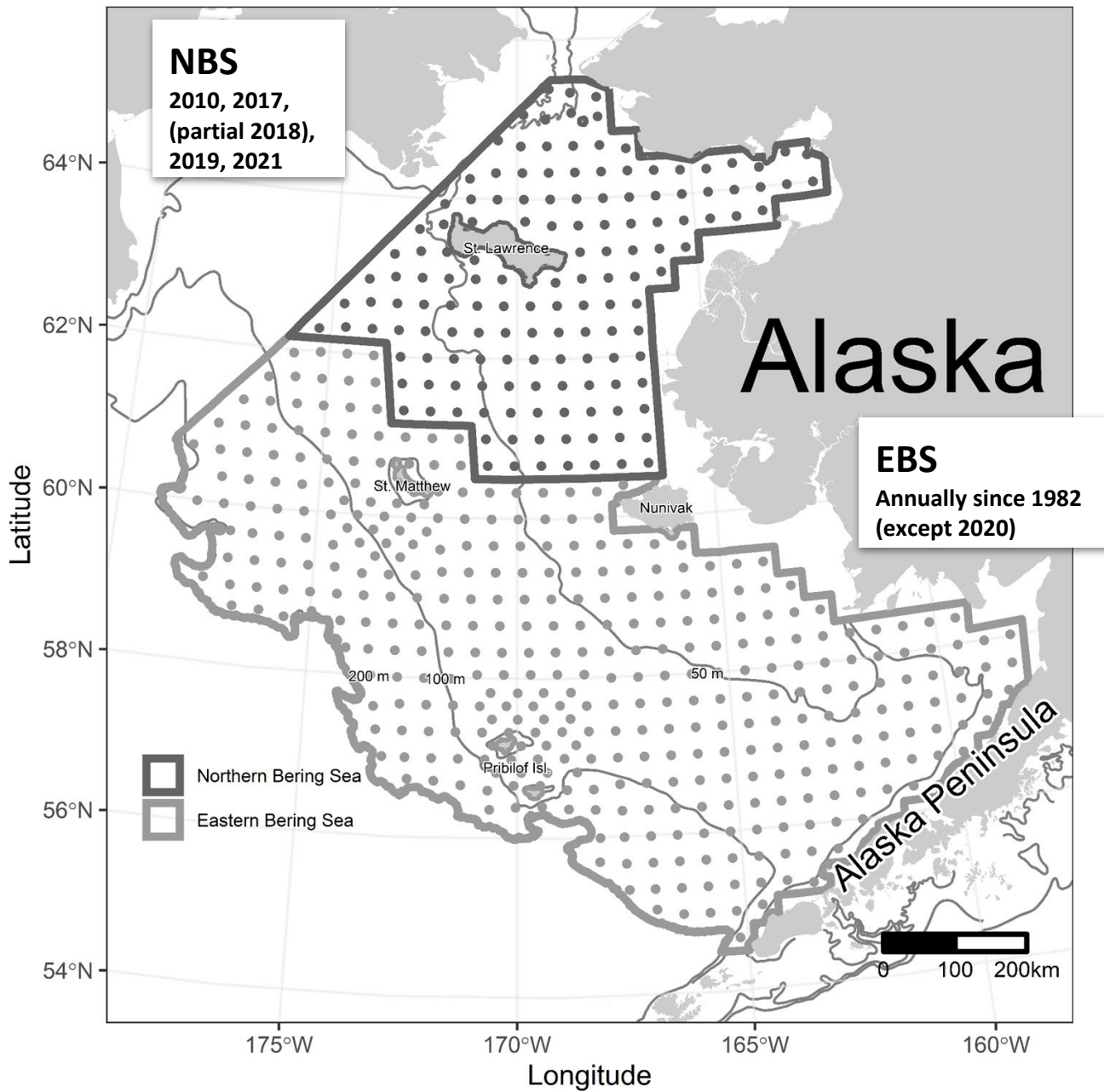
May 31 to August 16, 2021

Resource Assessment &
Conservation Engineering Division
Groundfish Assessment Program

November 15, 2021



NOAA FISHERIES



Survey Charter Vessels



FV Vesteraalen
2014-present
7th year



FV Alaska Knight
2010-present
10th year



Length measurements from EBS & NBS

Common name	EBS	NBS
walleye pollock	14,870	3,021
Pacific cod	8,372	2,062
Pacific halibut	2,086	405
yellowfin sole	5,731	3,953
flathead sole	8,617	7
northern rock sole	7,473	1,816
arrowtooth flounder	6,669	37
Alaska plaice	4,091	2,982
Alaska skate	3,440	534
Kamchatka flounder	1,331	1
rex sole	1,137	-
plain sculpin	919	726
starry flounder	553	897
Bering flounder	562	854
saffron cod	3	633
yellow Irish lord	573	-
great sculpin	549	69
longhead dab	491	272
Sakhalin sole	3	450
butter sole	212	-
other taxa (26)	956	300
Total	68,638	19,019

Age structures from EBS & NBS

Common name	EBS	NBS
Random/Haul		
walleye pollock	1,535	526
Pacific cod	1,366	395
flathead sole	832	-
Bering flounder	71	136
Greenland turbot	96	-
Kamchatka flounder	462	-
Alaska plaice	522	267
arrowtooth flounder	601	6
yellowfin sole	991	410
saffron cod	-	12
Pacific halibut	784	334
Stratified cm/sex/area		
northern rock sole	655	339
TOTAL	7,915	2,425

Other projects & samples from EBS & NBS

Special Projects

Acoustics

AVO Index

Environmental Monitoring

Ambient light monitoring

CTD data collection

HAB toxins

Fish/Crab Condition

EBS Pacific cod blood collection for stress physiology

EBS Snow crab reproduction

EBS Walleye pollock and Pacific cod body condition

Juvenile flatfish condition factors

Snow crab body condition

Population Genetics

Deepwater corals

Pacific cod and yellowfin sole

Pacific lamprey

Sand lances

Sleeper and salmon sharks

Miscellaneous

Arctic and saffron cod age and growth

crab collection for ocean acidification experiment

EBS 15/30 Tow Duration Study

EBS Bristol Bay red king crab tagging

EBS snow crab radiometrics

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

MML Food Habits Reference Collection

Observer Collections

P. cod tagging

Salmon shark feeding ecology

Shell condition classification study

Tanner and snow crab for thermal response curve research

Pacific lamprey

Stomachs

ATF & KAM

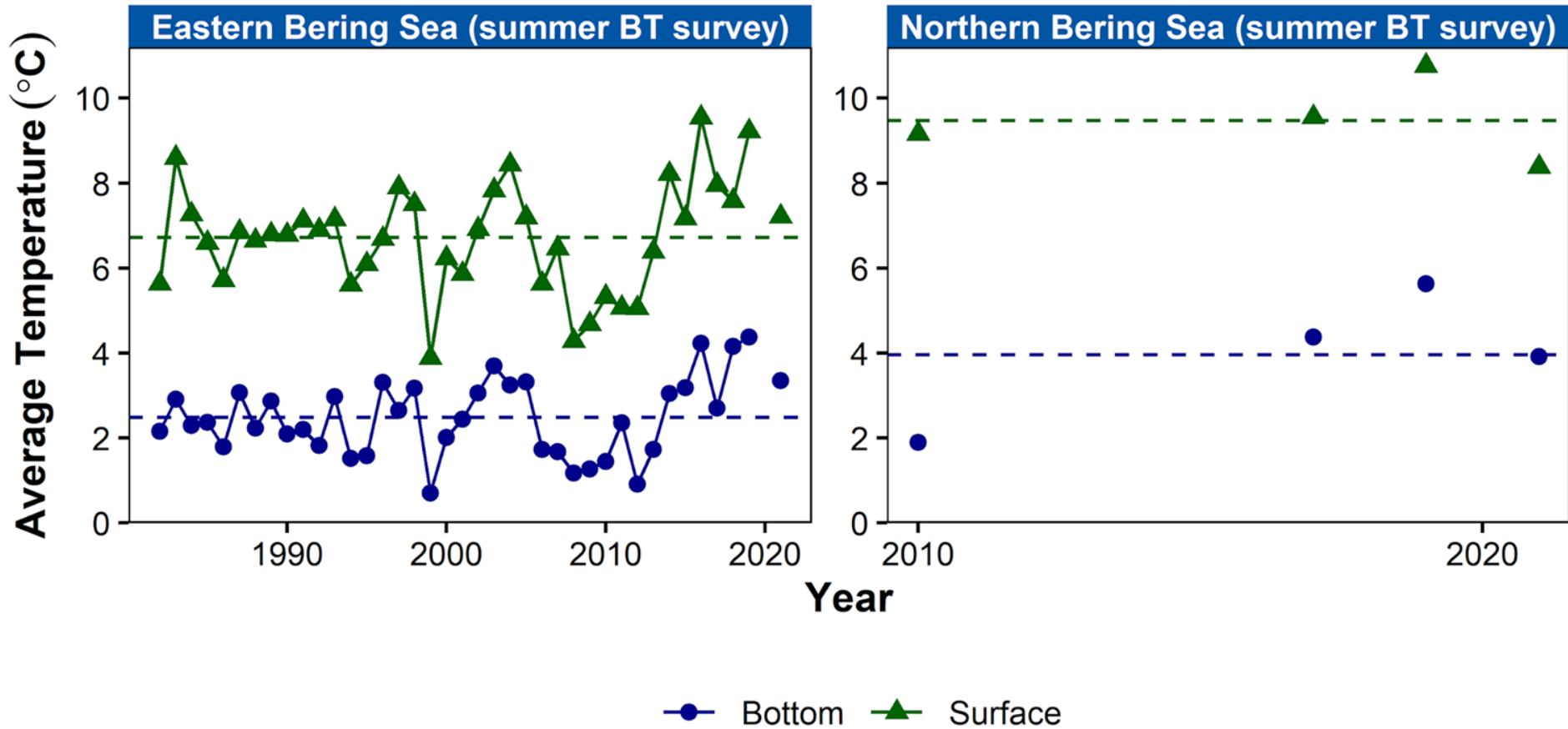
Halibut

Pacific cod

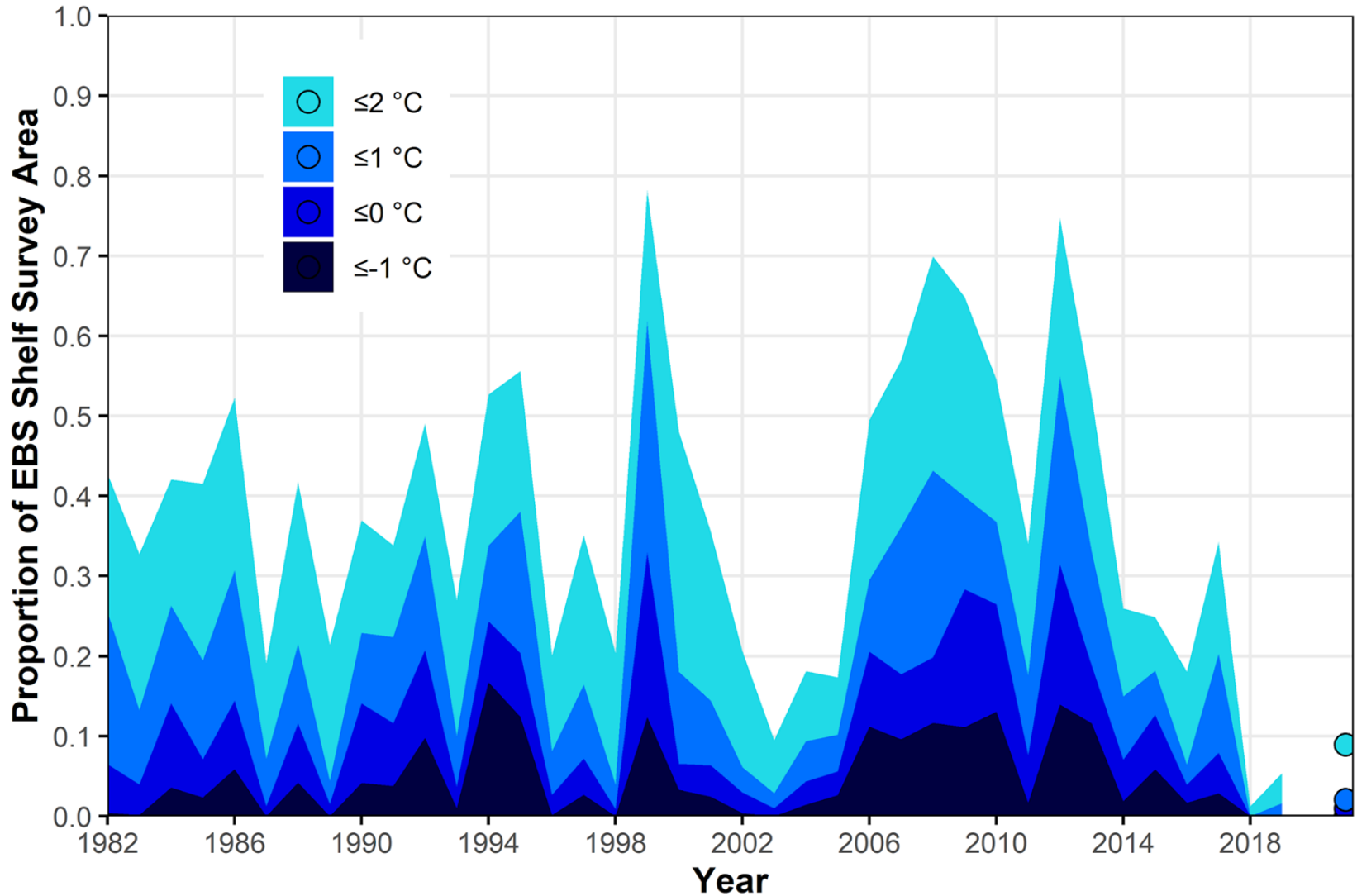
Pollock



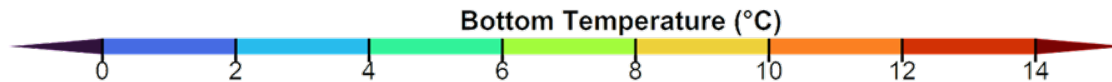
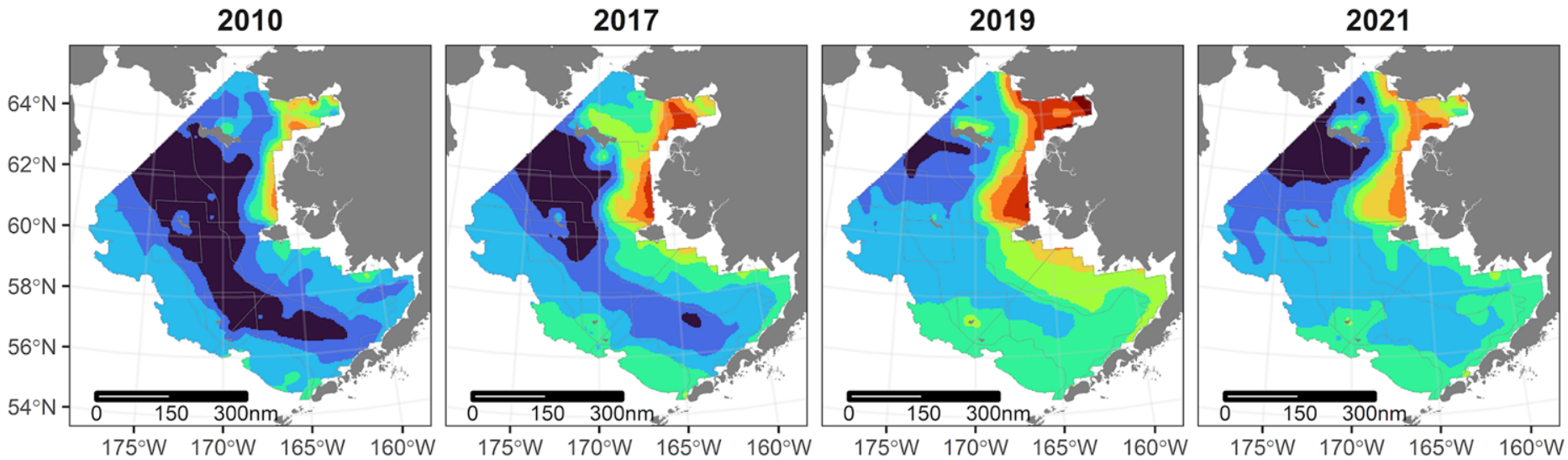
Mean Temperature



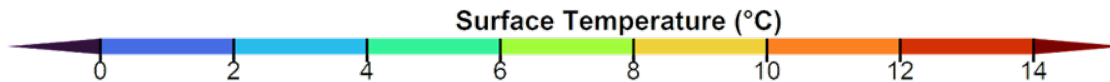
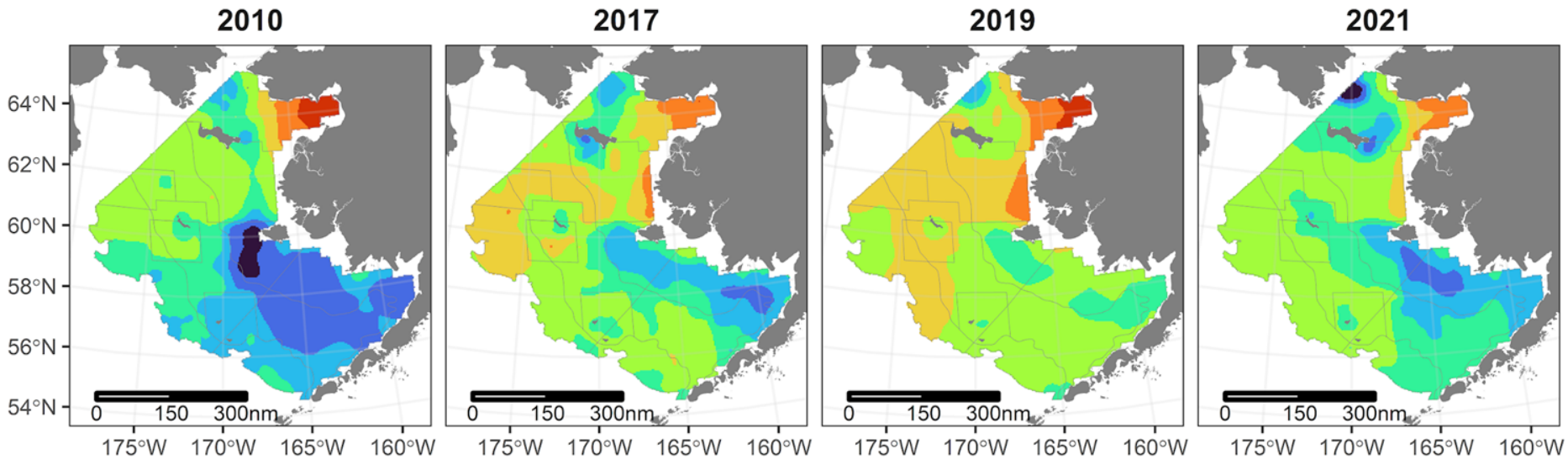
Cold Pool Area



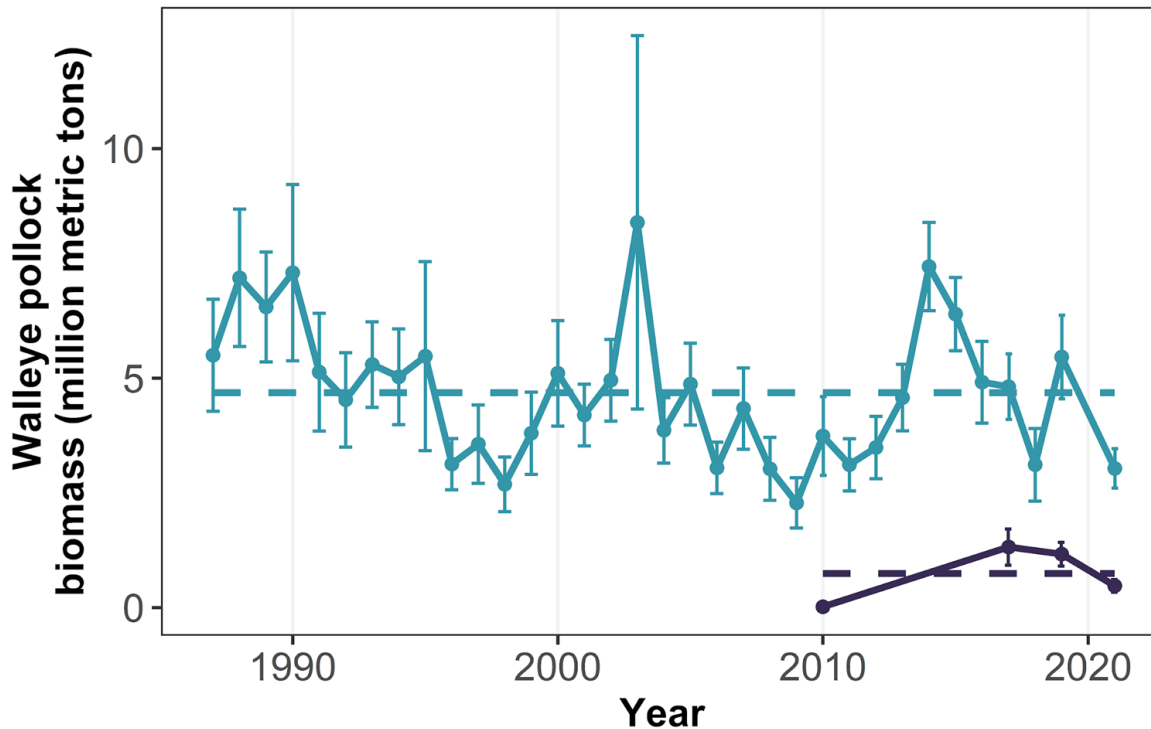
Survey Bottom Temperatures



Survey Surface Temperatures



Walleye Pollock Biomass



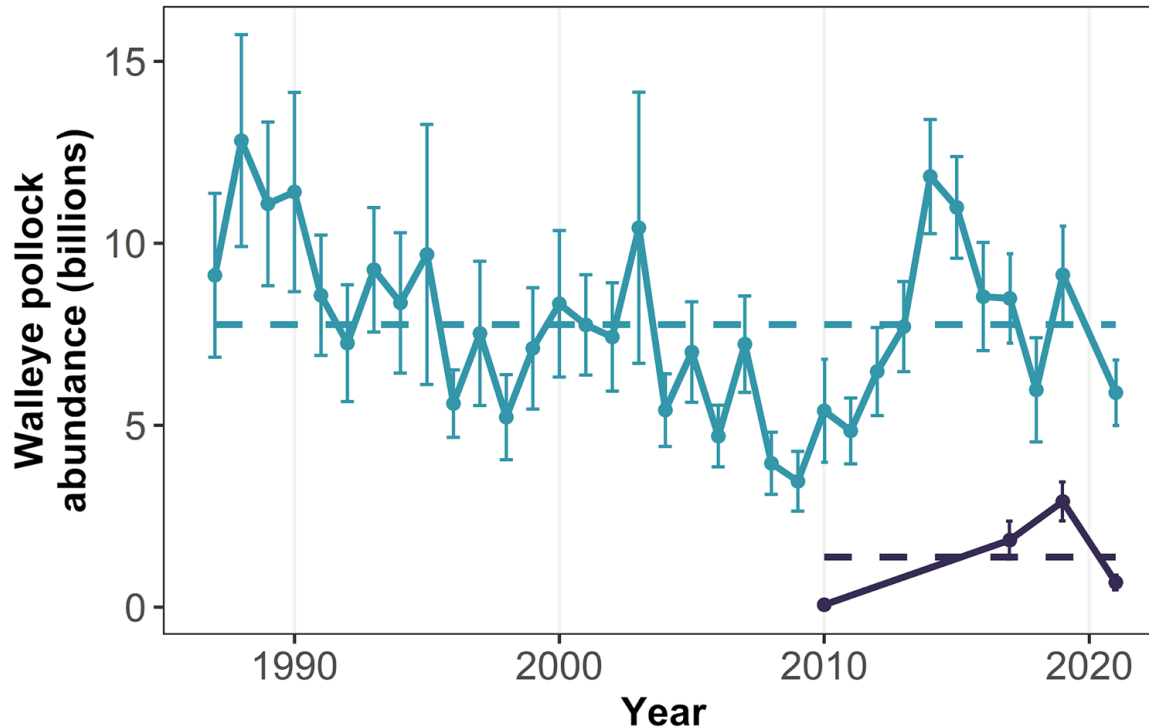
- Southeastern Bering Sea (mean = 4.7Mmt)
- Northern Bering Sea (mean = 0.7Mmt)

EBS Biomass
3.0M mt **-44.4%**
from 2019
(5.5M mt)

NBS Biomass
0.5M mt **-59.3%**
from 2019
(1.2M mt)



Walleye Pollock Abundance



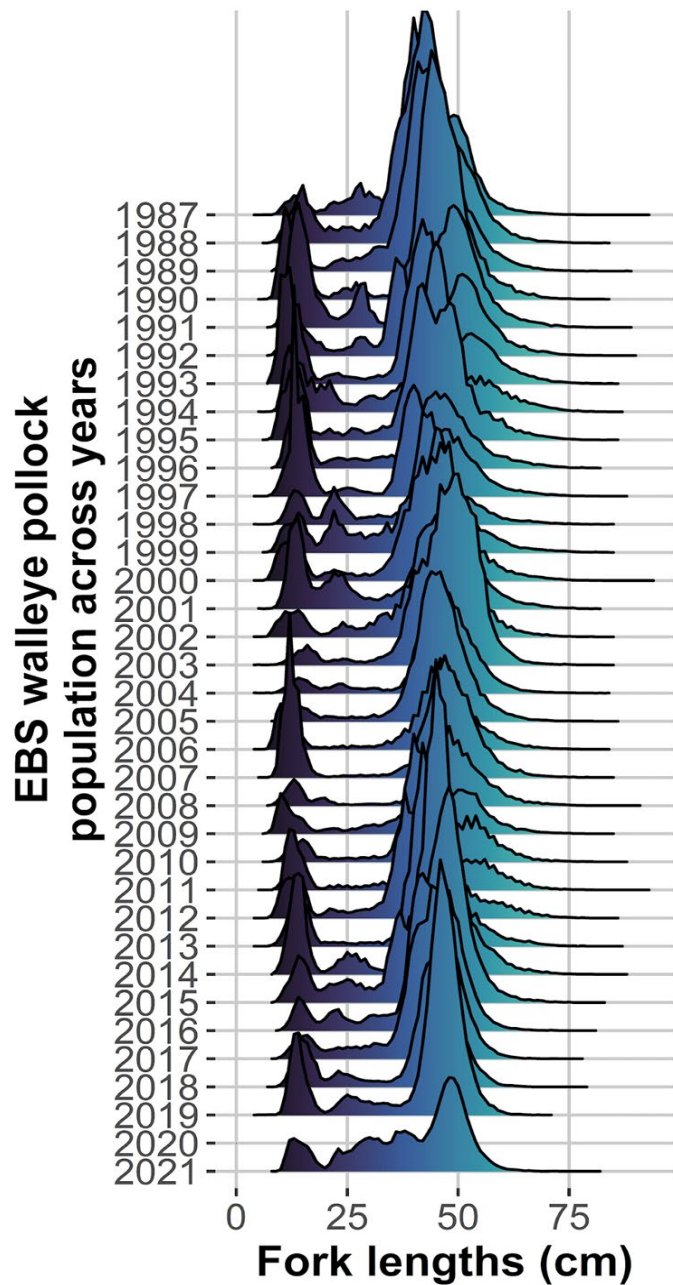
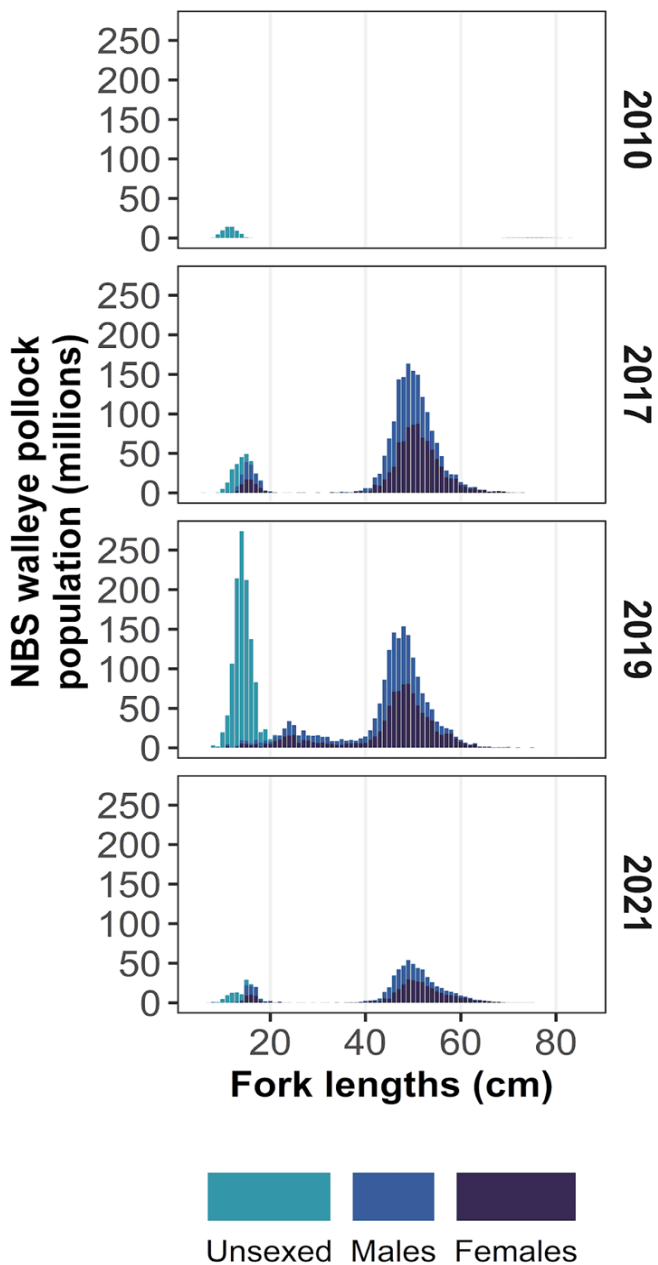
EBS Abundance
5.9B **-35.5%** from
2019 (9.1B)

NBS Abundance
0.7B **-76.6%** from
2019 (2.9B)

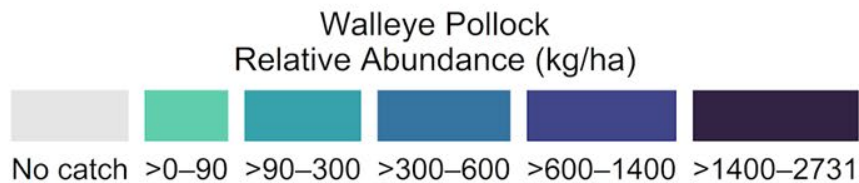
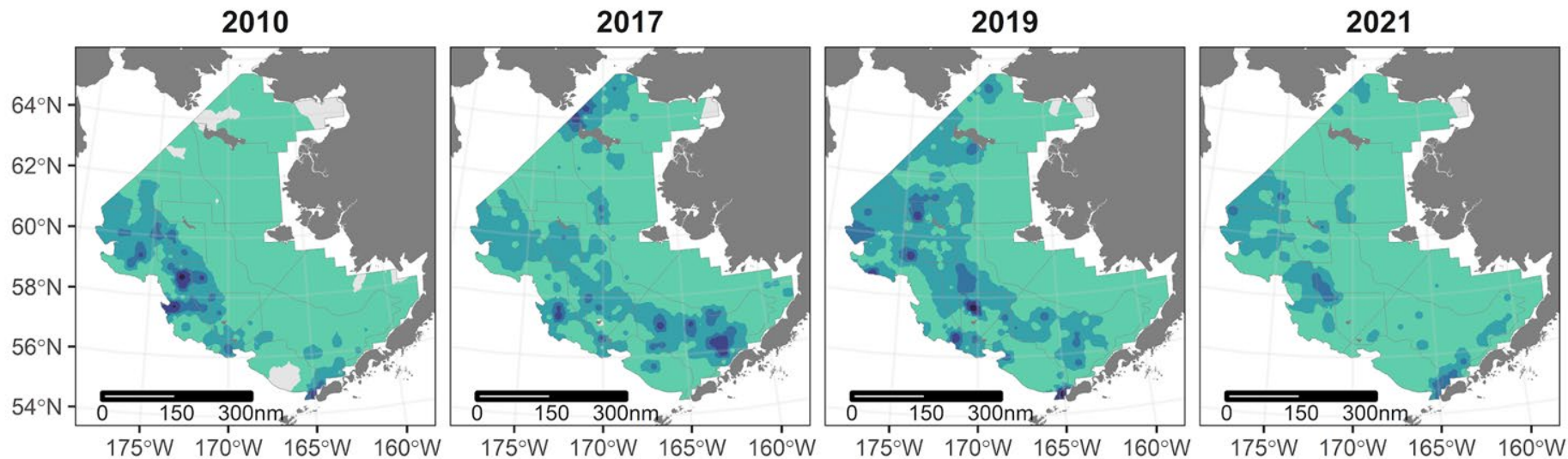
- Southeastern Bering Sea (mean = 7.8B)
- Northern Bering Sea (mean = 1.4B)



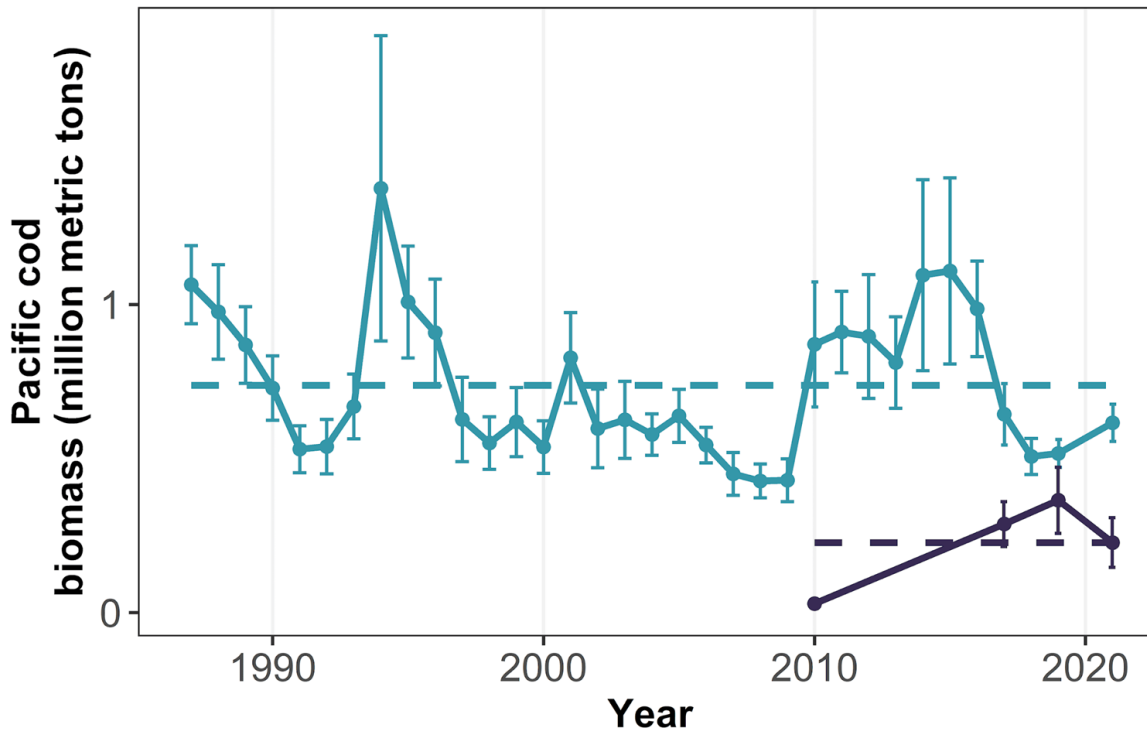
Walleye Pollock Lengths



Walleye Pollock Distribution



Pacific Cod Biomass



EBS Biomass

0.6M mt **19.2%**
from 2019
(0.5M mt)

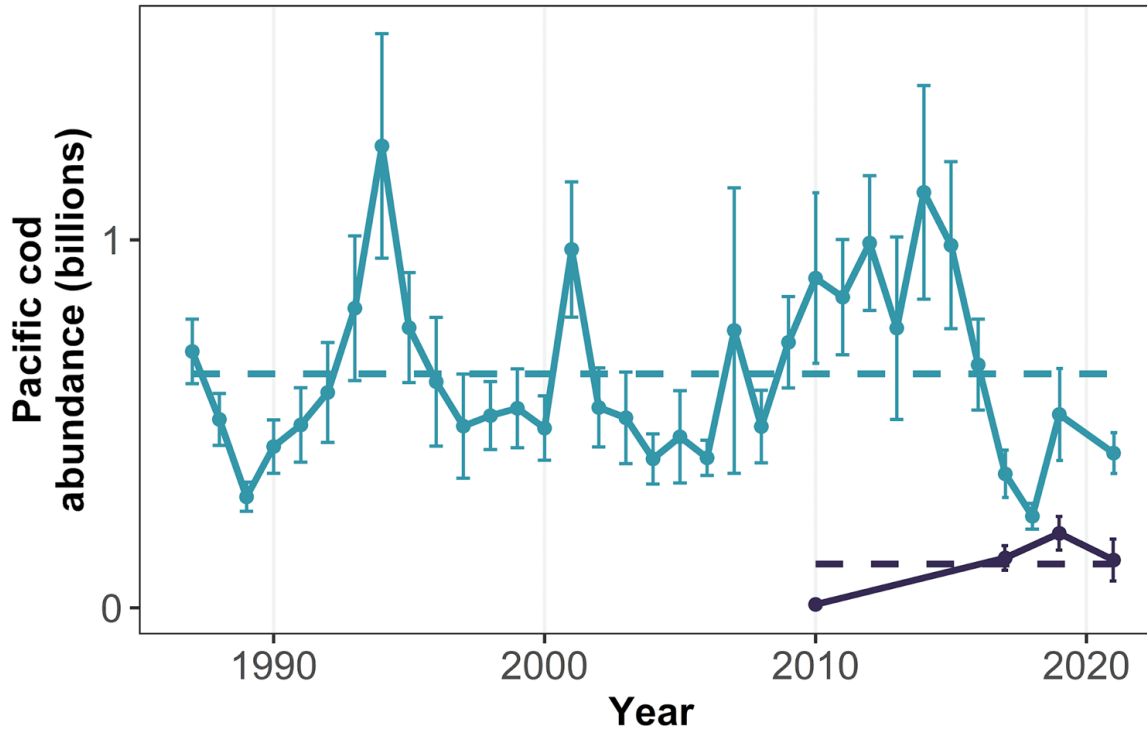
NBS Biomass

0.2M mt **-37.6%**
from 2019
(0.4M mt)

- Southeastern Bering Sea (mean = 0.7Mmt)
- Northern Bering Sea (mean = 0.2Mmt)



Pacific Cod Abundance



EBS Abundance

0.4B **-20.0%**
from 2019
(0.5B)

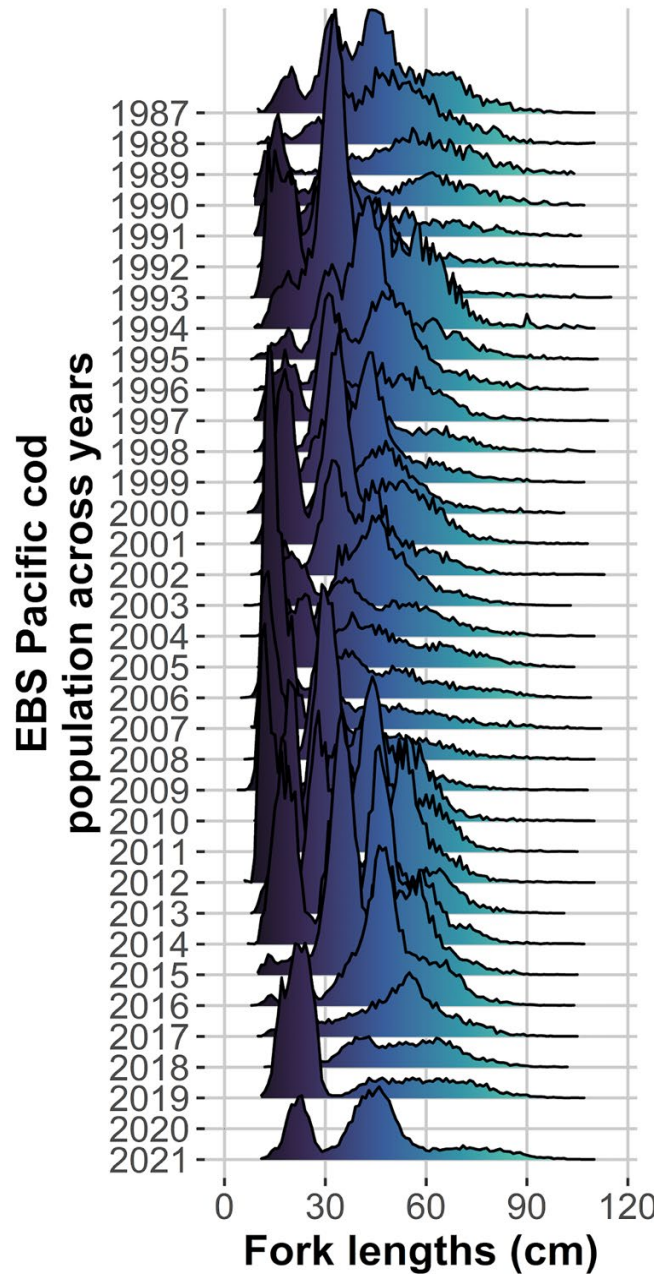
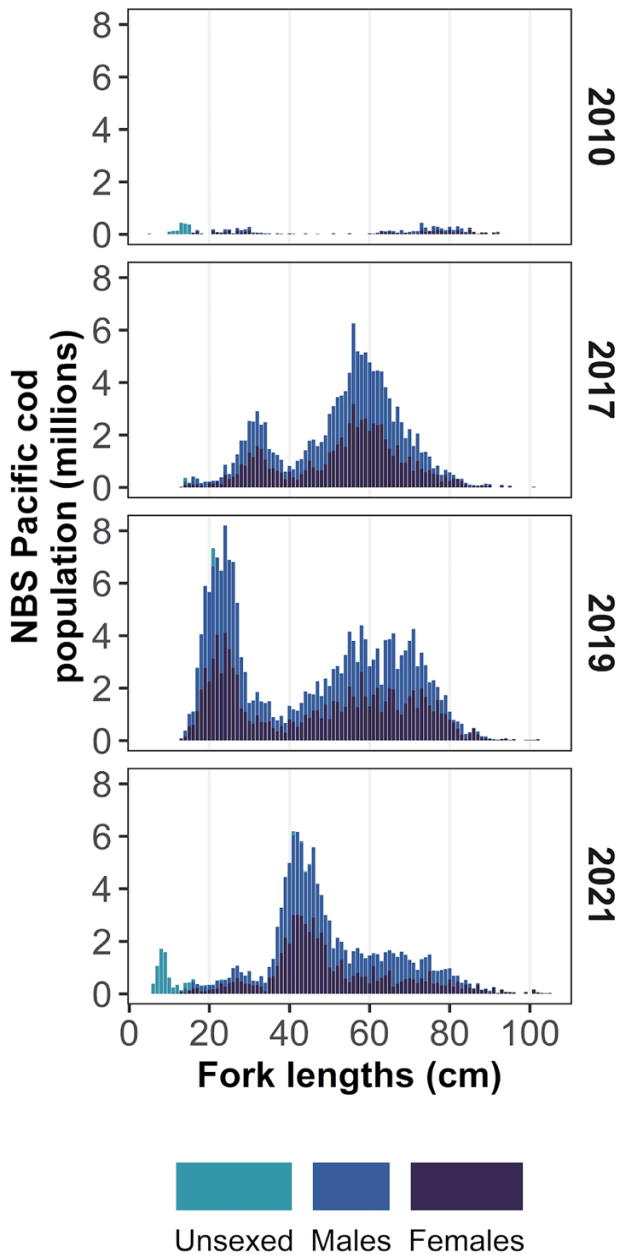
NBS Abundance

0.1B **-35.8%**
from 2019
(0.2B)

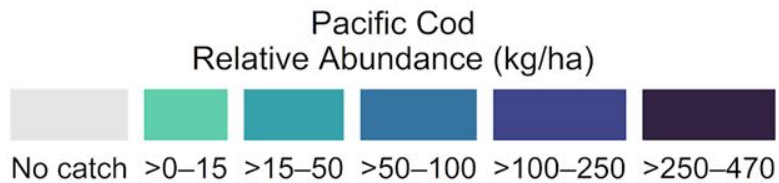
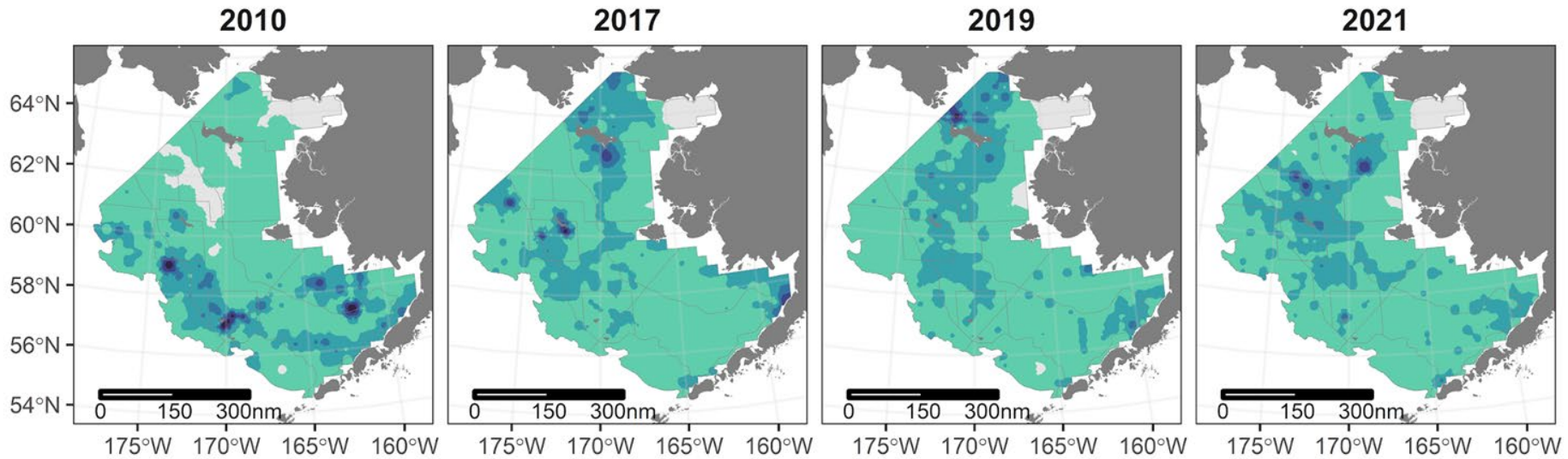
- Southeastern Bering Sea (mean = 0.6B)
- Northern Bering Sea (mean = 0.1B)



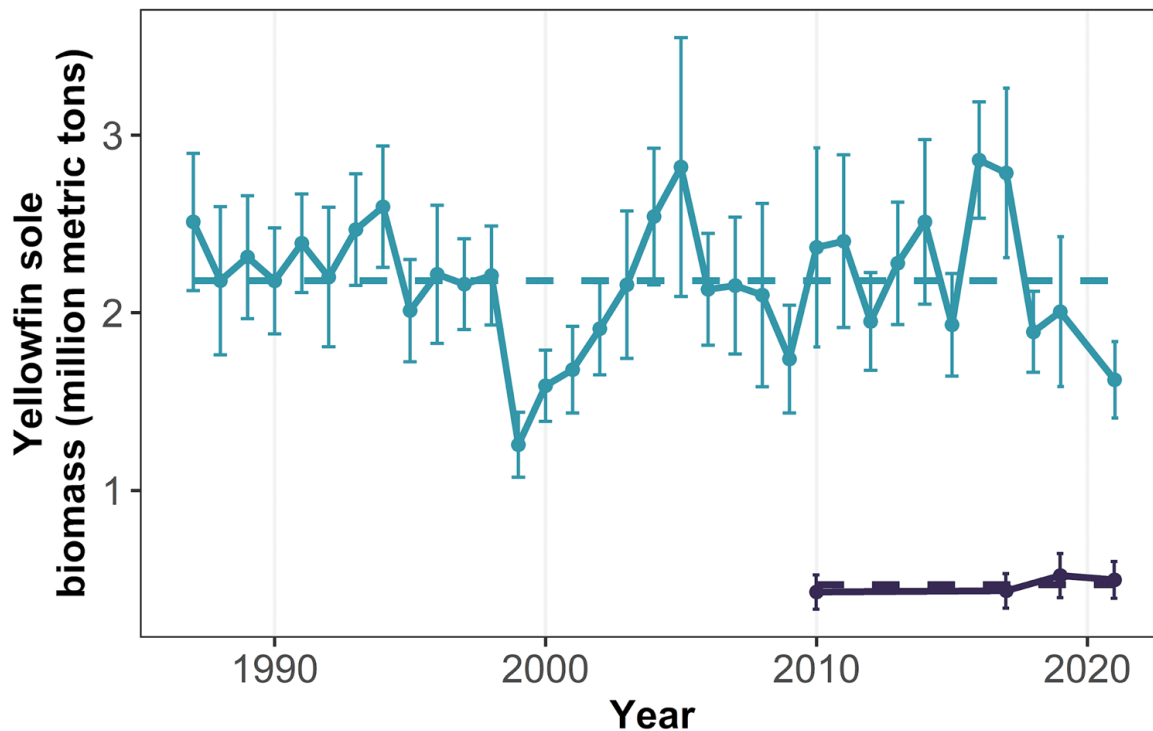
Pacific Cod Lengths



Pacific Cod Distribution



Yellowfin Sole Biomass



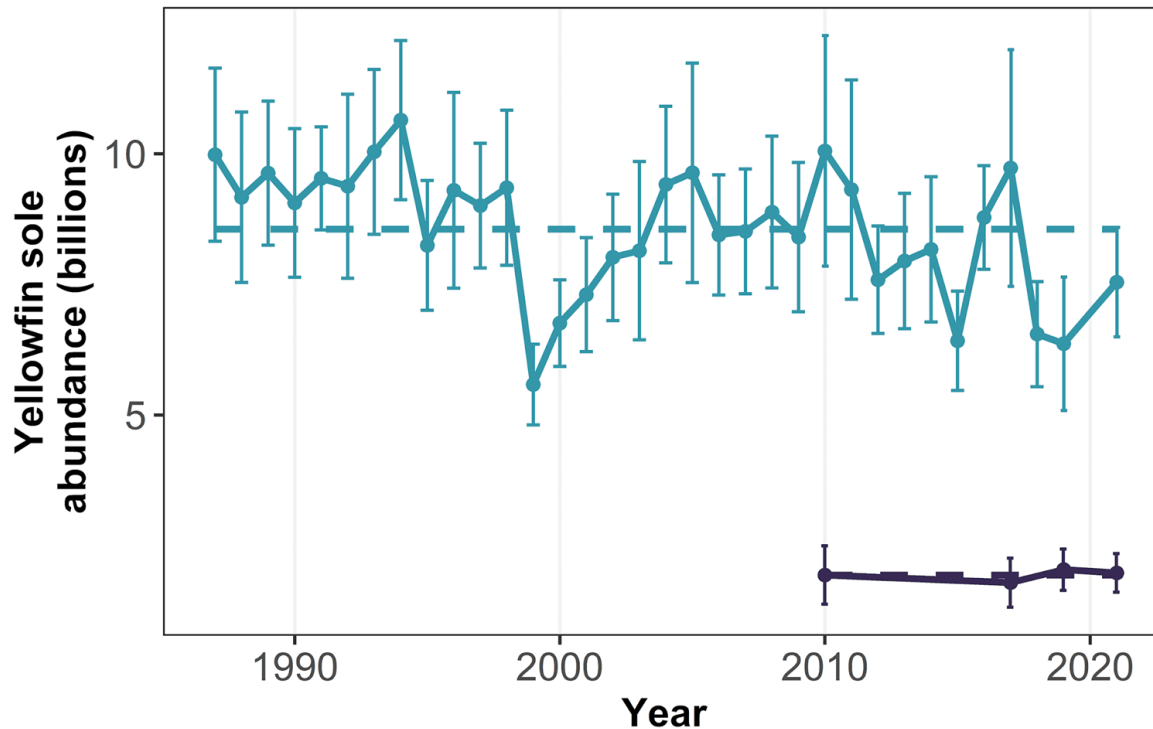
- Southeastern Bering Sea (mean = 2.2Mmt)
- Northern Bering Sea (mean = 0.5Mmt)

EBS Biomass
1.6M mt **-19.1%**
from 2019
(2.0M mt)

NBS Biomass
0.5M mt **-4.6%**
from 2019
(0.5M mt)



Yellowfin Sole Abundance



- Southeastern Bering Sea (mean = 8.6B)
- Northern Bering Sea (mean = 1.9B)

EBS Abundance

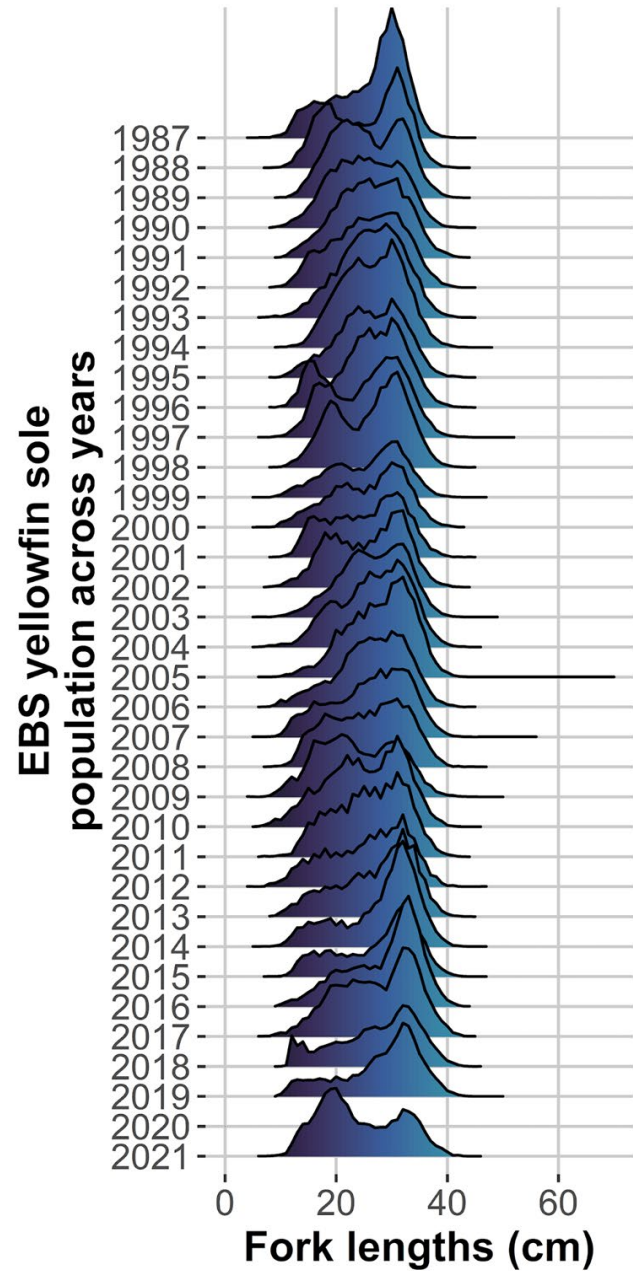
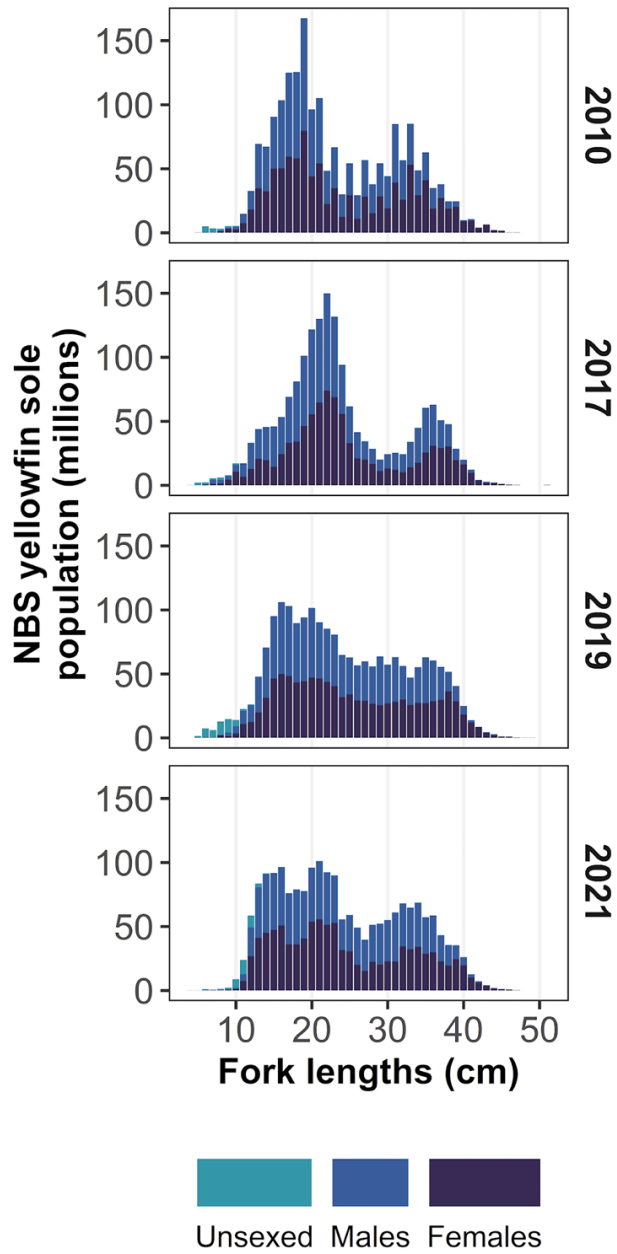
7.5B **18.5%**
from 2019
(6.4B)

NBS Abundance

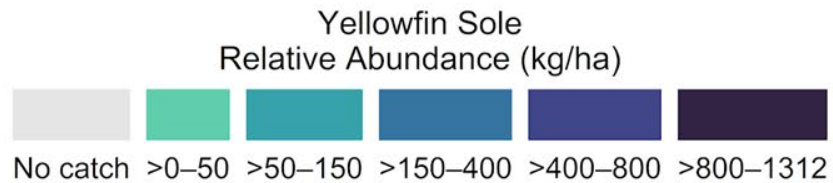
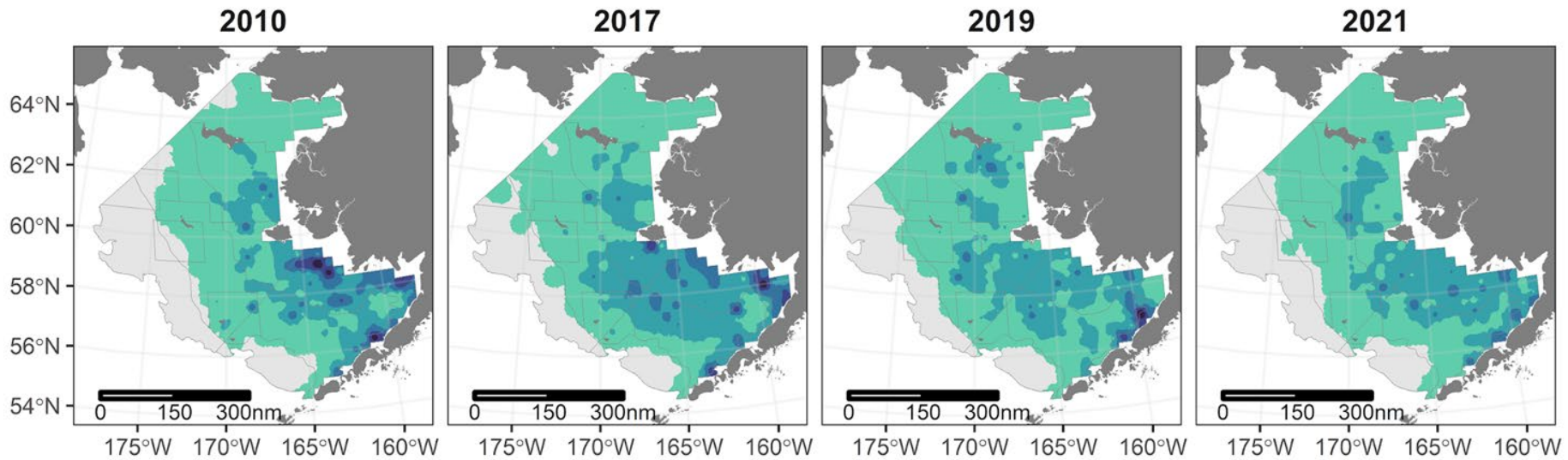
2.0B **-3.0%**
from 2019
(2.0 B)



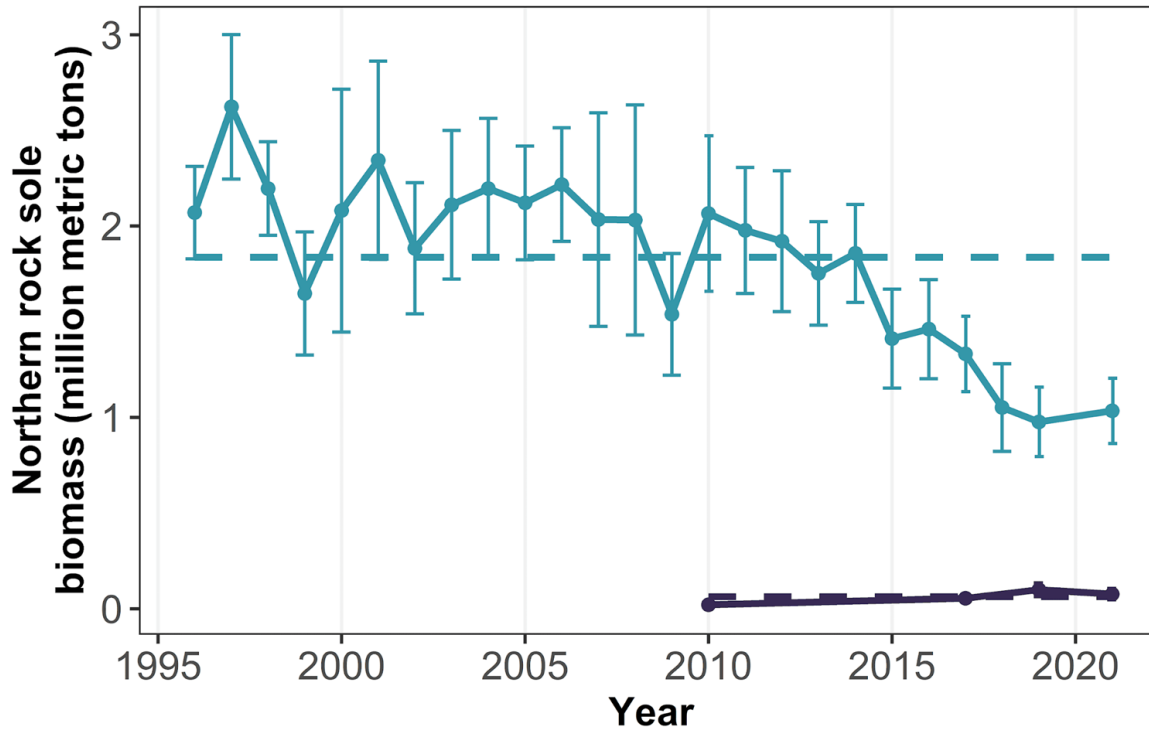
Yellowfin Sole Lengths



Yellowfin Sole Distribution



Northern Rock Sole Biomass



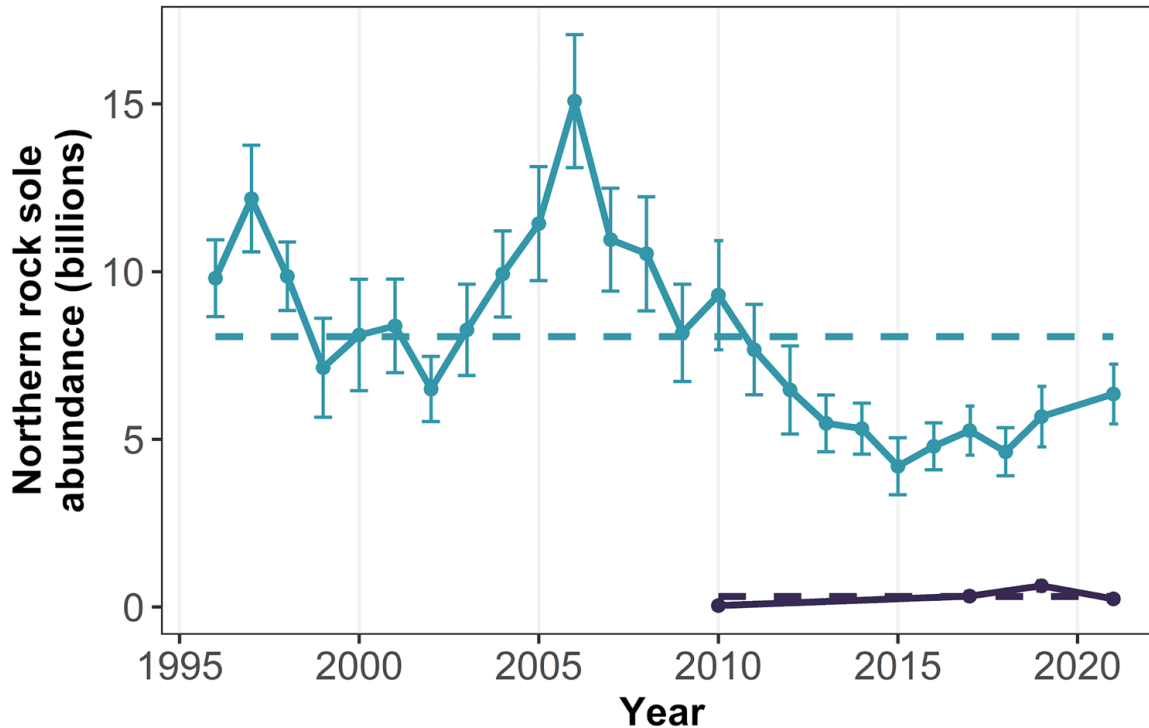
- Southeastern Bering Sea (mean = 1.8Mmt)
- Northern Bering Sea (mean = 0.1Mmt)

EBS Biomass
1.0M mt **5.9%**
from 2019
(1.0M mt)

NBS Biomass
0.1M mt **-22.6%**
from 2019
(0.1M mt)



Northern Rock Sole Abundance



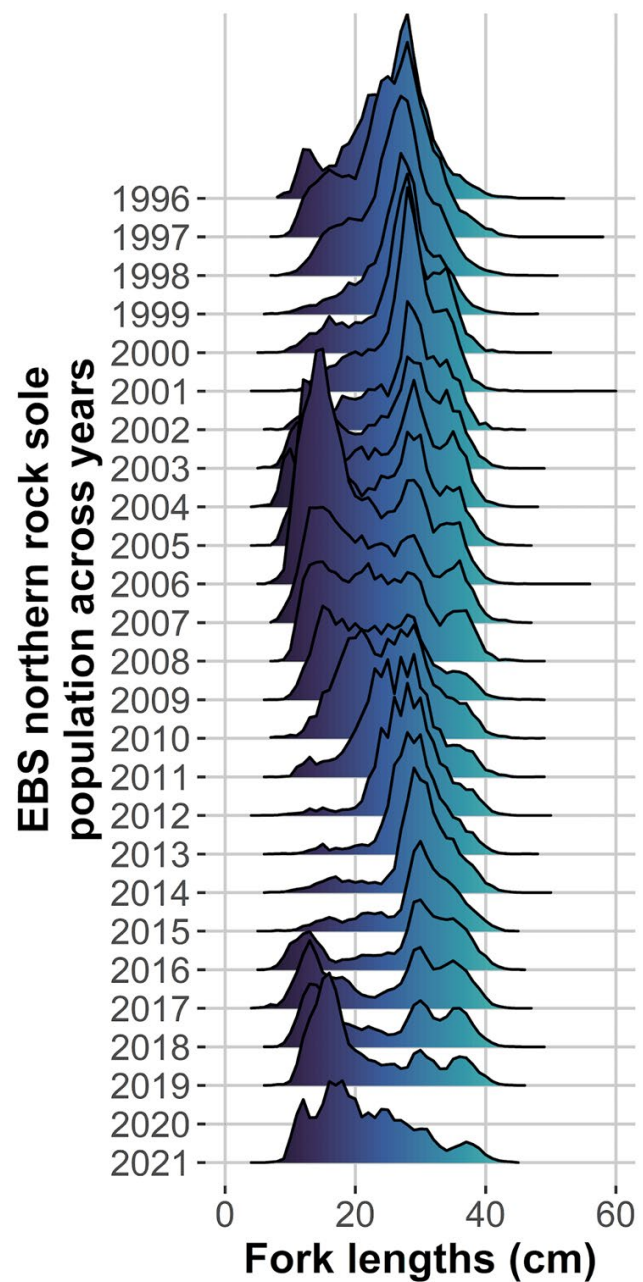
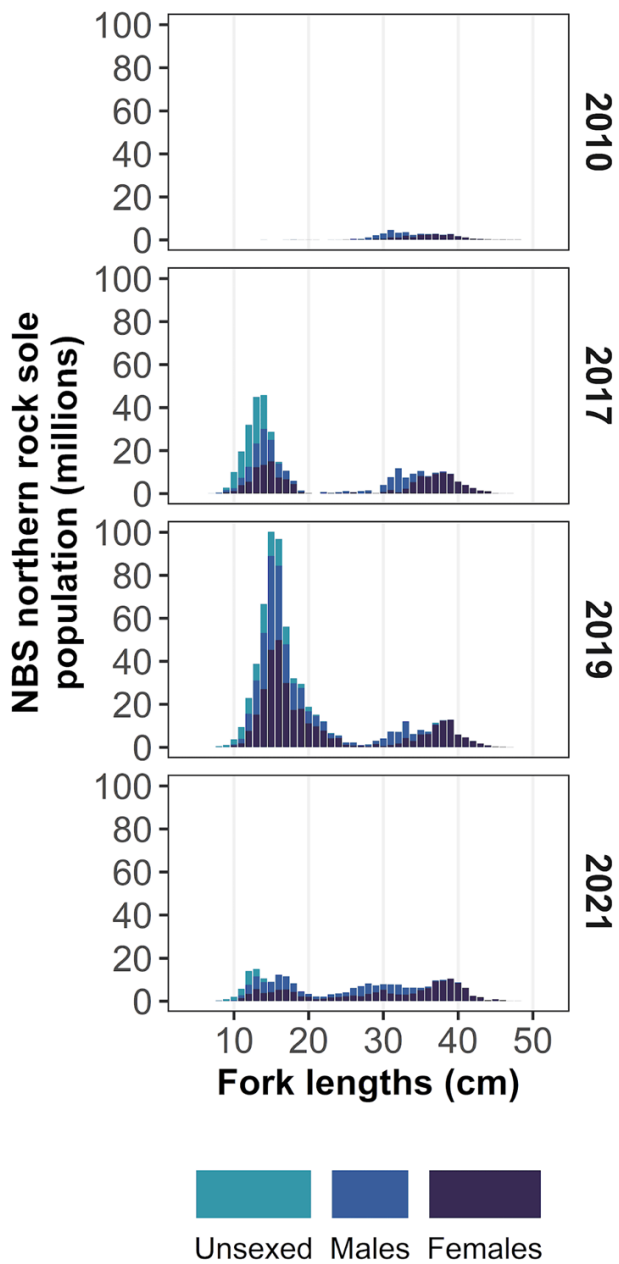
- Southeastern Bering Sea (mean = 8.1B)
- Northern Bering Sea (mean = 0.3B)

EBS Abundance
6.4B **11.9%**
from 2019
(5.7B)

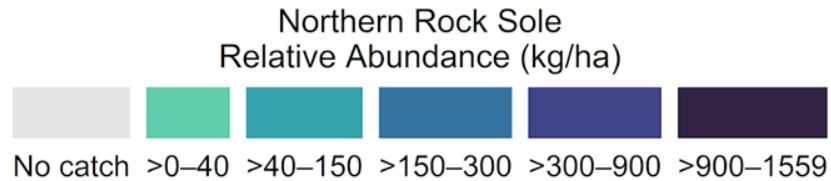
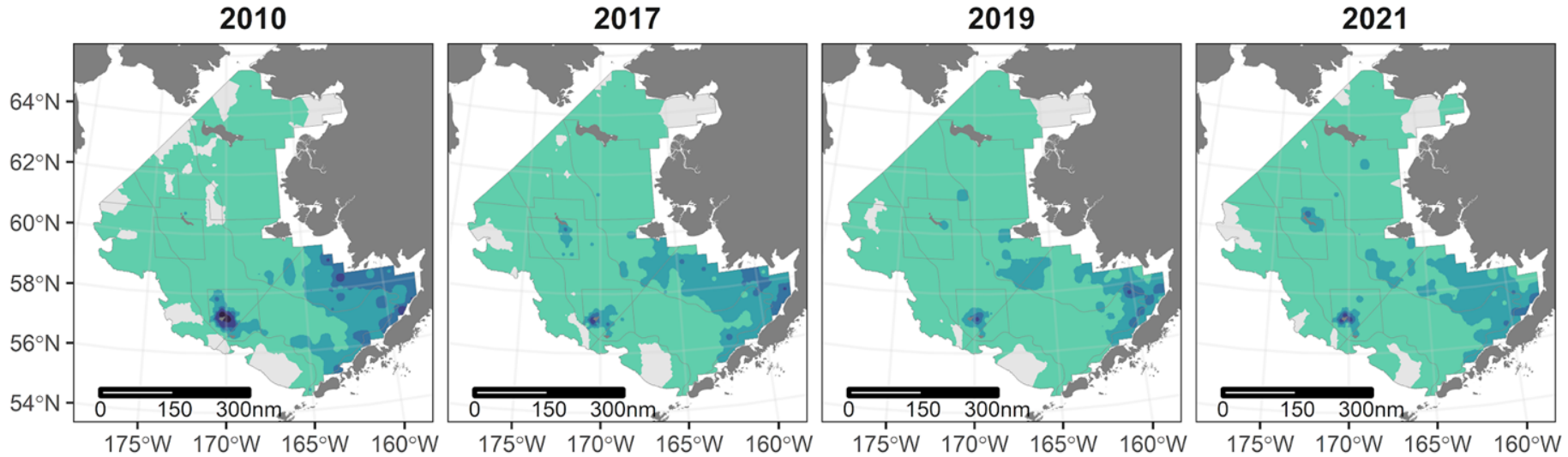
NBS Abundance
0.2B **-62.0%**
from 2019
(0.6B)



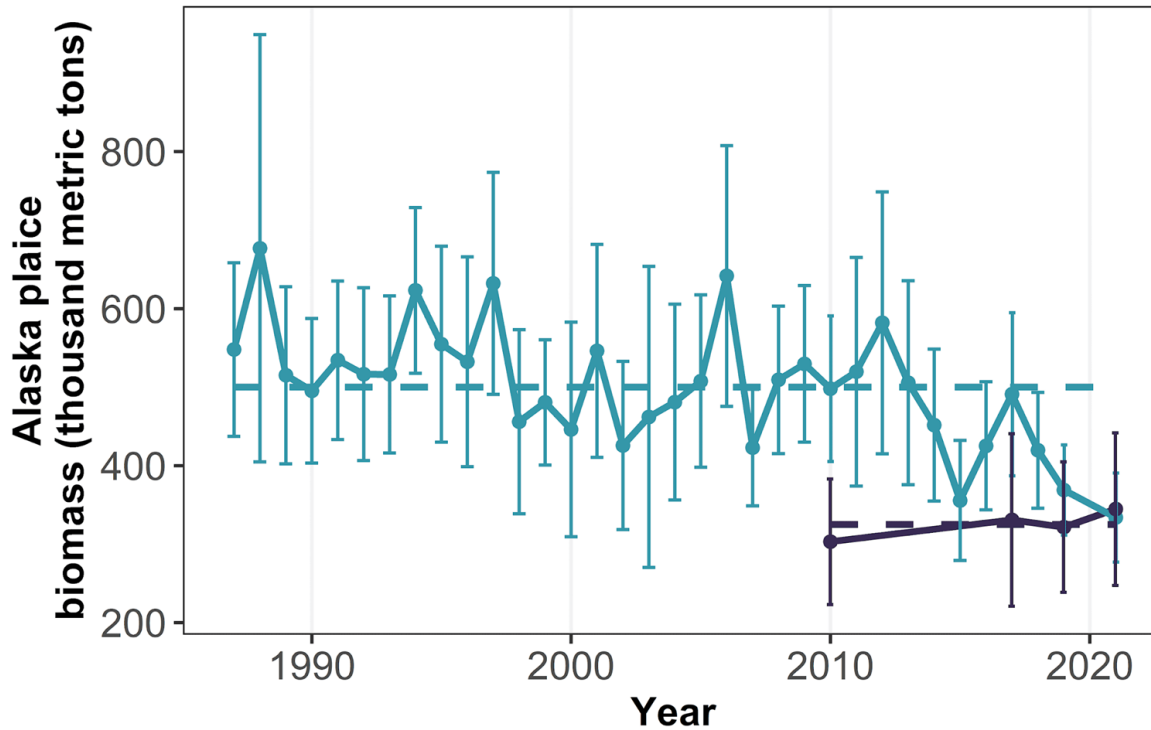
Northern Rock Sole Lengths



Northern Rock Sole Distribution



Alaska Plaice Biomass

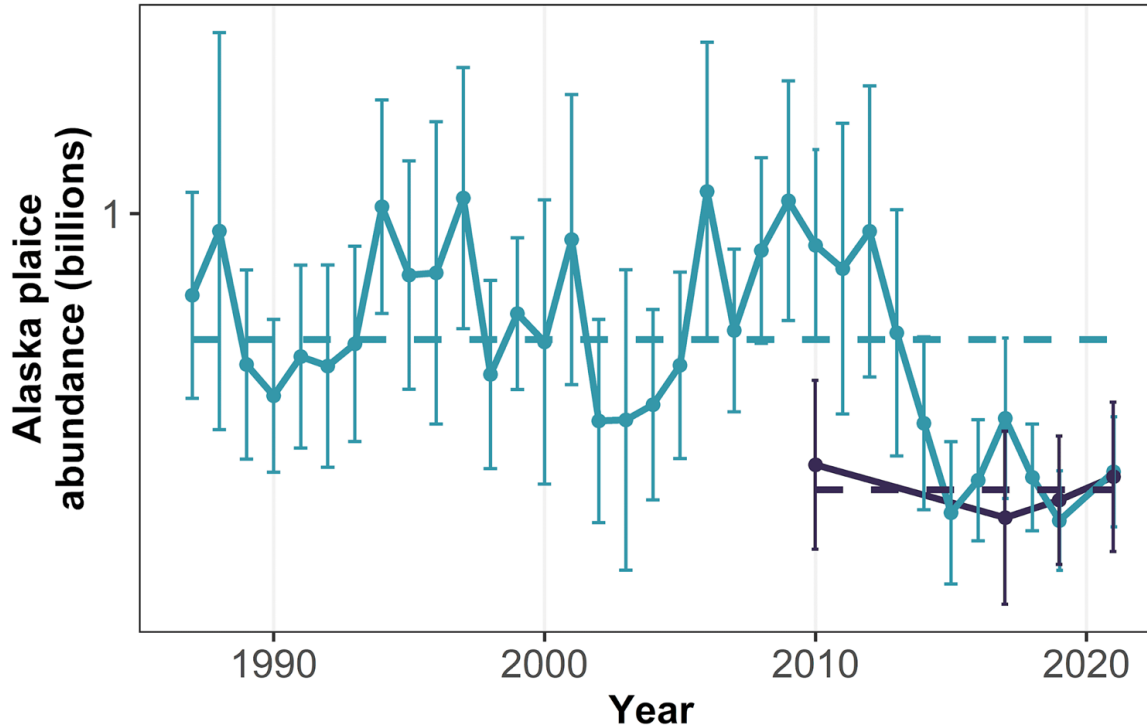


EBS Biomass
333.8K mt **-9.5%**
from 2019
(368.8K mt)

NBS Biomass
344.6K mt **7.2%**
from 2019
(321.6K mt)



Alaska Plaice Abundance



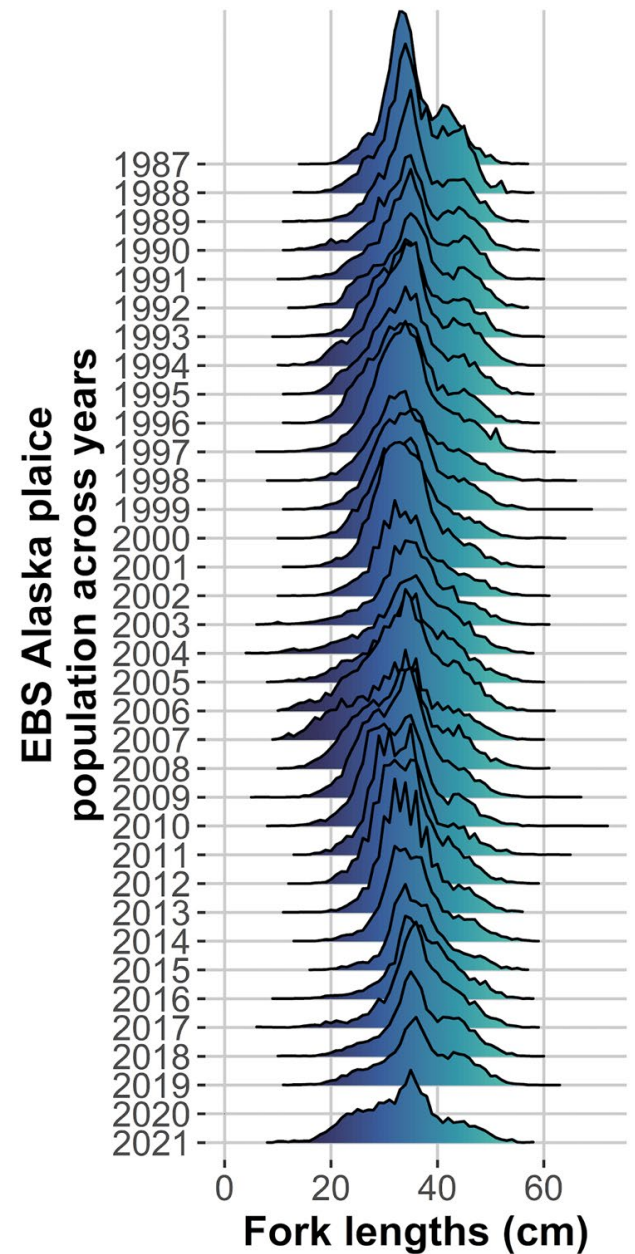
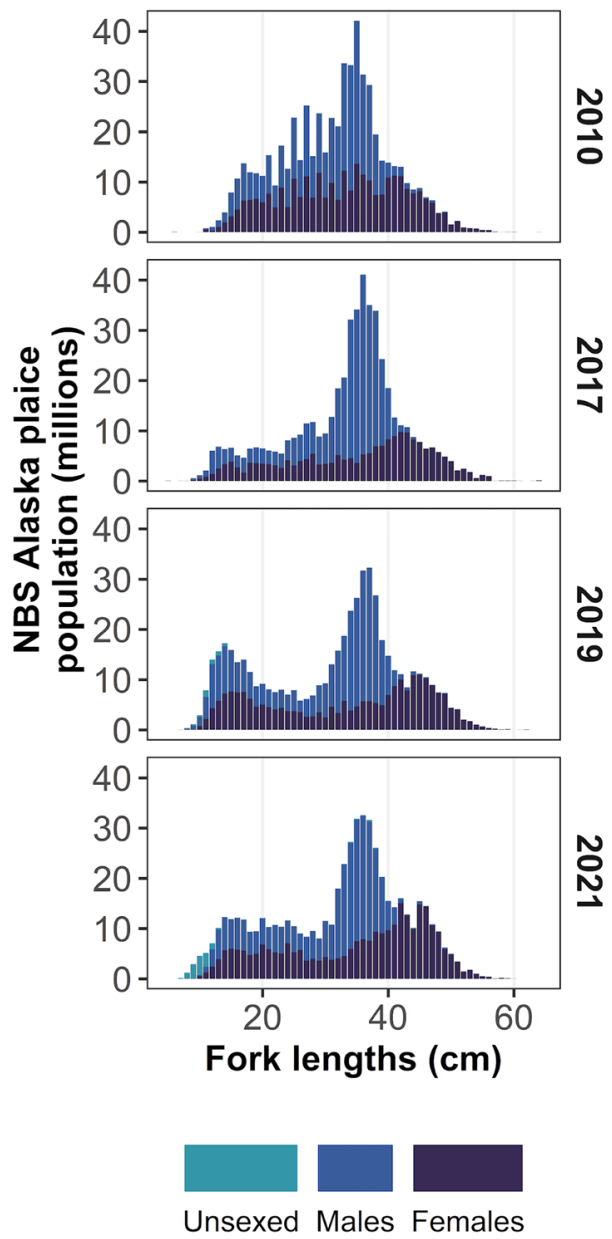
- Southeastern Bering Sea (mean = 0.8B)
- Northern Bering Sea (mean = 0.5B)

EBS Abundance
0.6B **16.0%**
from 2019
(0.5B)

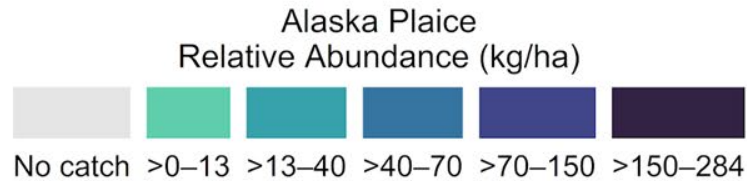
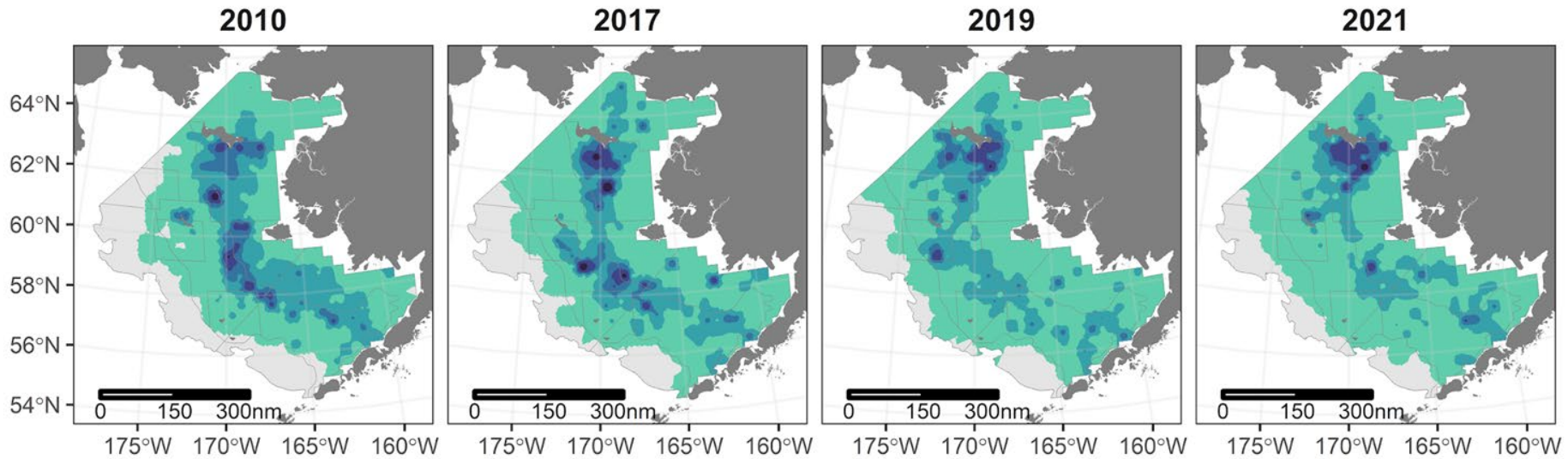
NBS Abundance
0.6B **7.2%**
from 2019
(0.5B)



Alaska Plaice Lengths



Alaska Plaice Distribution



EBS

NBS

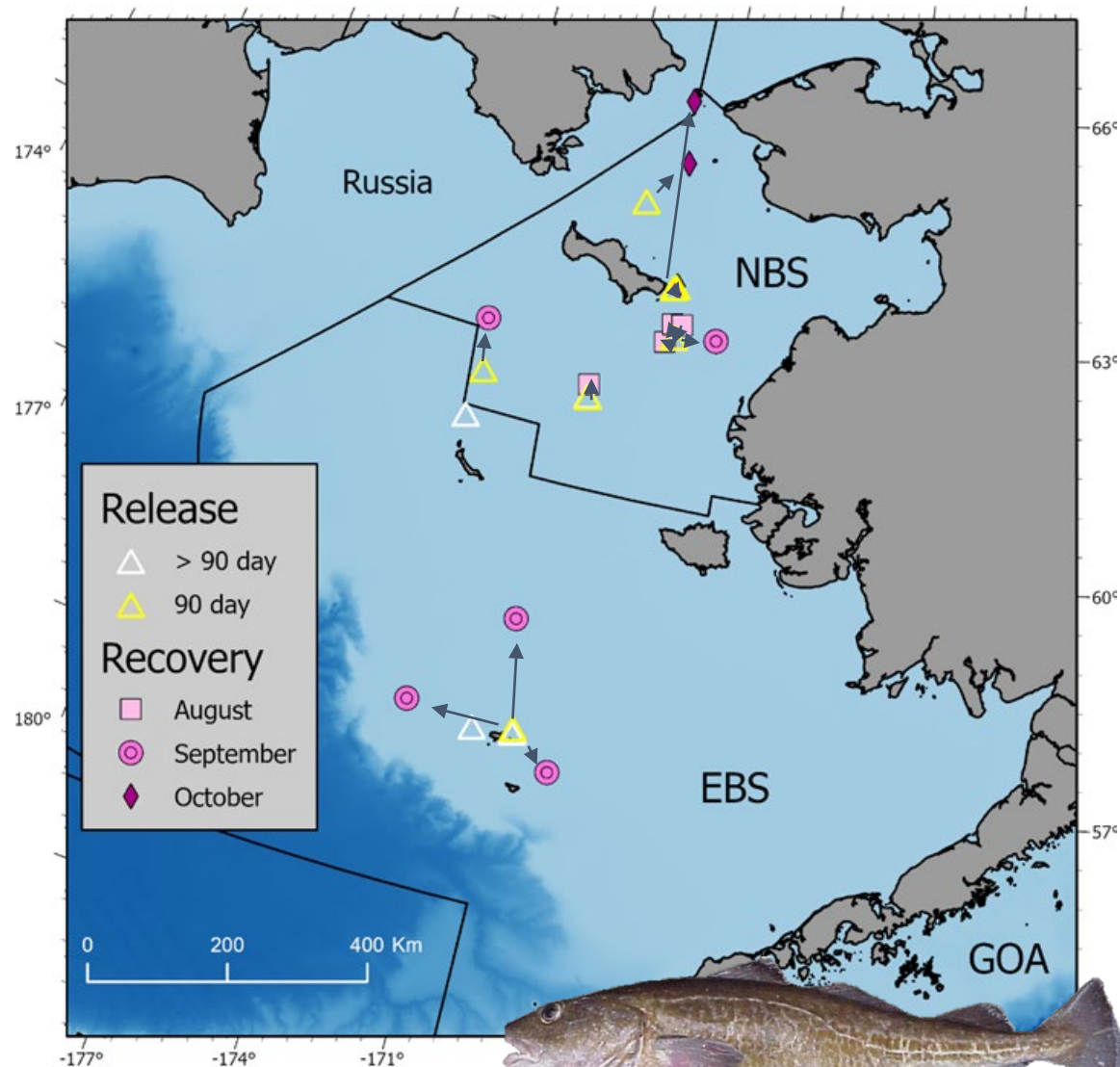
Common name	Year	EBS		NBS	
		Biomass (mt)	Abundance (x1000)	Biomass (mt)	Abundance (x1000)
walleye pollock	2019	5,458,366	9,130,705	1,167,099	2,905,734
	2021	3,034,317 (-44%)	5,893,682 (-35%)	474,448 (-59%)	679,315 (-77%)
Pacific cod	2019	516,910	525,688	364,982	202,148
	2021	616,267 (19%)	420,638 (-20%)	227,577 (-38%)	129,700 (-36%)
yellowfin sole	2019	2,006,505	6,365,105	520,029	2,040,570
	2021	1,622,913 (-19%)	7,544,295 (19%)	496,038 (-5%)	1,979,003 (-3%)
northern rock sole	2019	976,686	5,675,780	99,040	633,489
	2021	1,034,224 (6%)	6,350,791 (12%)	76,630 (-23%)	240,688 (-62%)
flathead sole	2019	611,483	2,217,216	463	2,407
	2021	676,077 (11%)	2,580,936 (16%)	138 (-70%)	371 (-85%)
Bering flounder	2019	8,269	35,805	18,526	121,825
	2021	9,524 (15%)	42,290 (18%)	8,384 (-55%)	61,872 (-49%)
Alaska plaice	2019	368,787	499,174	321,571	532,600
	2021	333,830 (-9%)	578,997 (16%)	344,578 (7%)	570,759 (7%)
Pacific halibut	2019	113,855	74,459	25,722	7,897
	2021	131,416 (15%)	100,853 (35%)	25,995 (1%)	14,118 (79%)
Greenland turbot	2019	16,053	5,101	424	220
	2021	10,714 (-33%)	2,754 (-46%)	0 (-100%)	0 (-100%)
arrowtooth flounder	2019	578,390	1,014,099	1,443	1,425
	2021	459,660 (-21%)	940,486 (-7%)	1,740 (21%)	2,251 (58%)
kamchatka flounder	2019	44,870	78,749	61	84
	2021	33,011 (-26%)	60,301 (-23%)	33 (-47%)	26 (-69%)
Bering skate	2019	10,091	5,089	-	-
	2021	12,226 (21%)	6,036 (19%)	-	-
Alaska skate	2019	491,109	102,980	95,102	22,484
	2021	467,910 (-5%)	106,813 (4%)	80,207 (-16%)	18,681 (-17%)



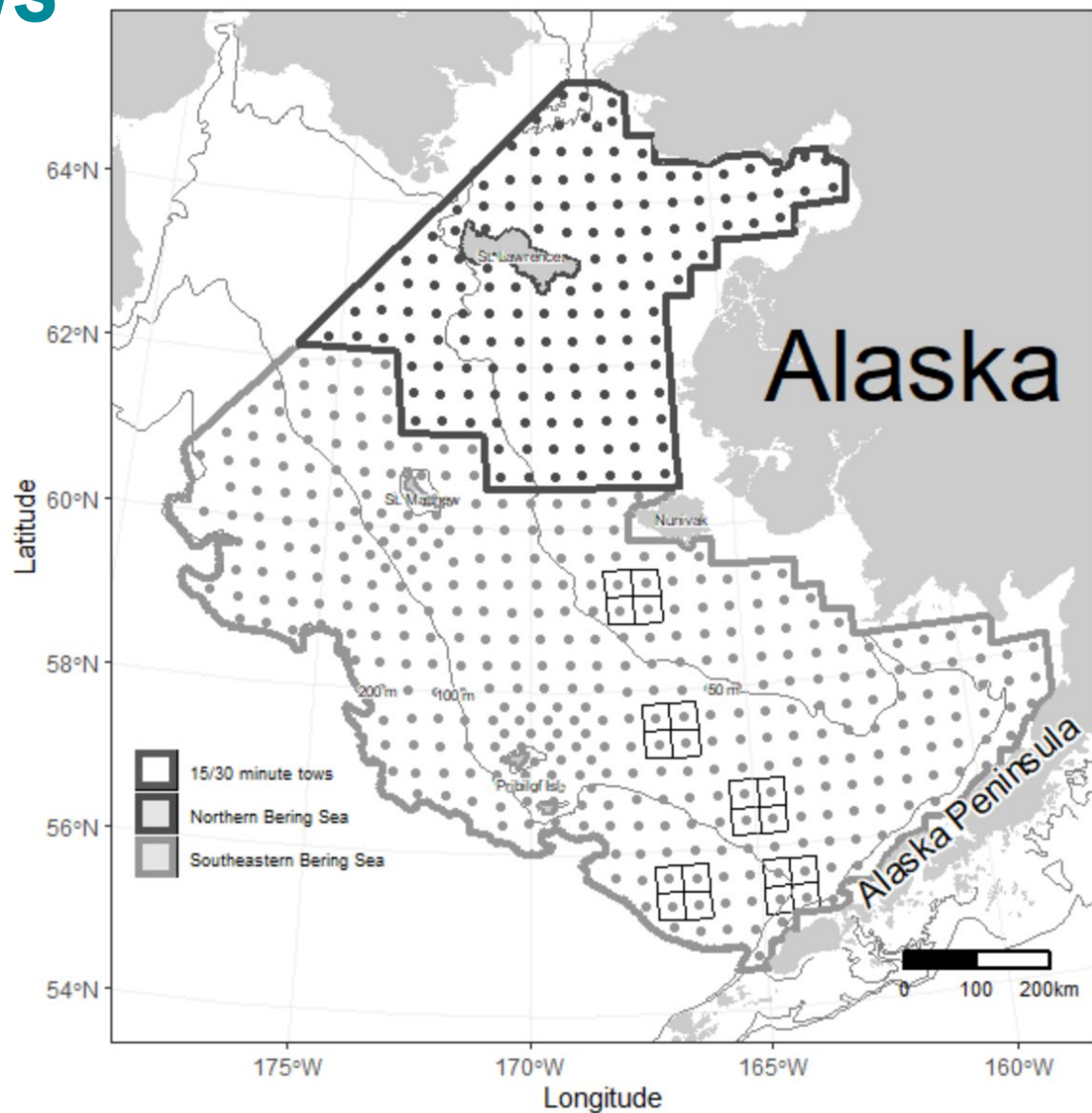
NBS Pacific Cod PSAT Tagging

Tagged 26 Pacific cod (8 EBS and 18 NBS) and released 2 stationary tags in the NBS

Collaborative project with NSEDC and Industry Cod Harvesters



15/30 Minute tows



Fish Condition Research

FatMeter:
developing a condition
index for pollock and cod

Physiological stress:
testing blood chemistry
and mucus to
characterize stress
response





Lyle Britt*
Caitlin Allen-Akselrud
Nicole Charriere
Jason Conner
Liz Dawson
Lukas DeFilippo
Rebecca Haehn
Elaina Jorgensen
Emily Markowitz
Bianca Prohaska
Sean Rohan
Duane Stevenson



BOLD = hired within the last 2 years
* = team supervisor (former)
GOLD = prepared this slide show

Thank you!



NOAA FISHERIES