Gulf of Alaska Plan Team

SEPTEMBER EDITION

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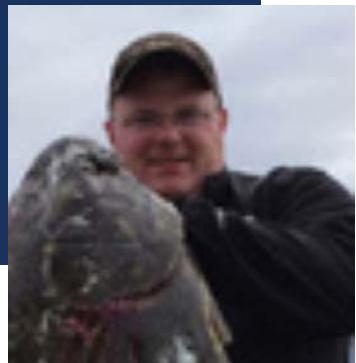
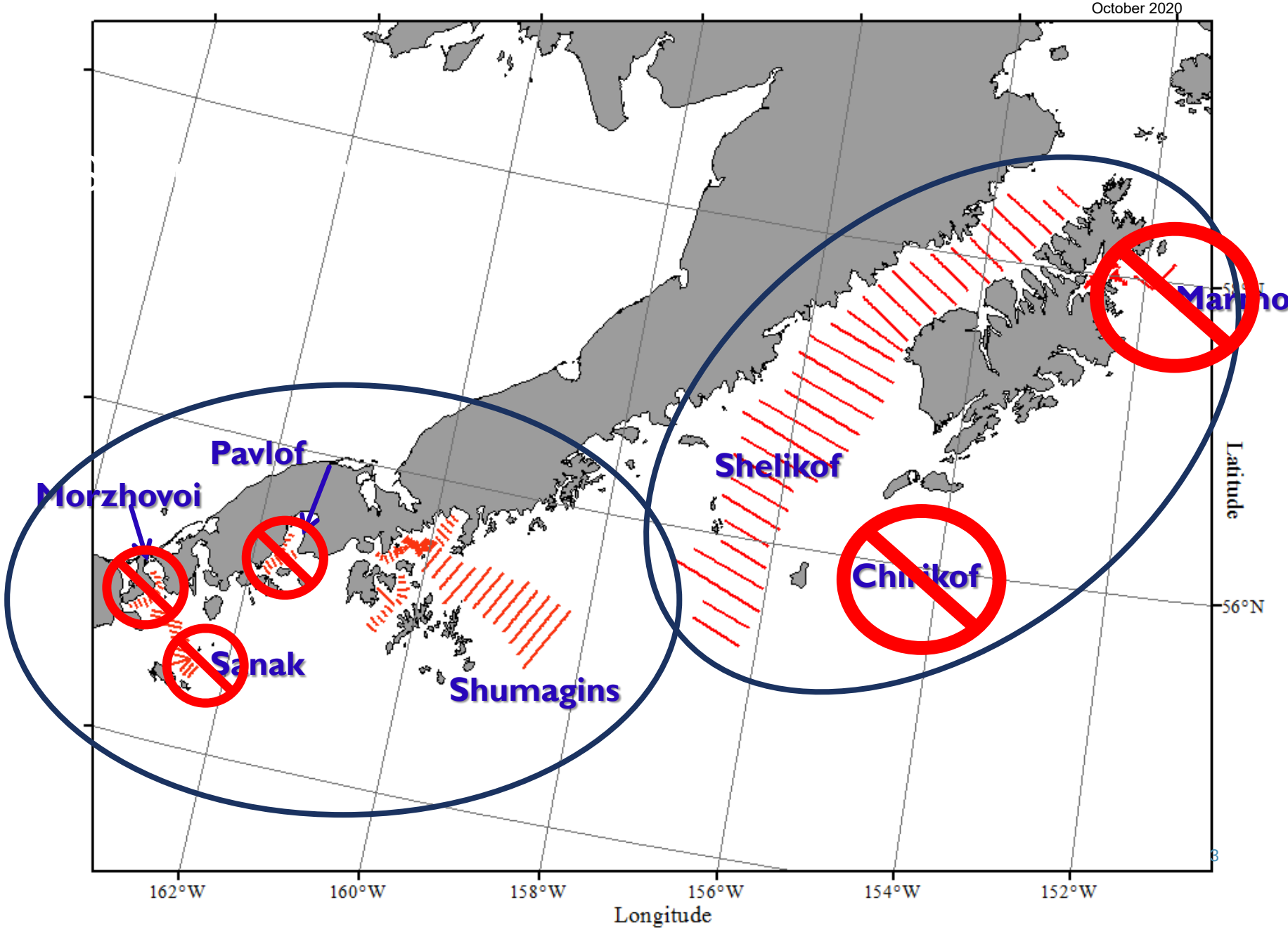
Marysia Szymkowiak	AFSC REFM
Kresimir Williams	AFSC RACE
vacant	ADF&G
vacant	USFWS



GOA pollock

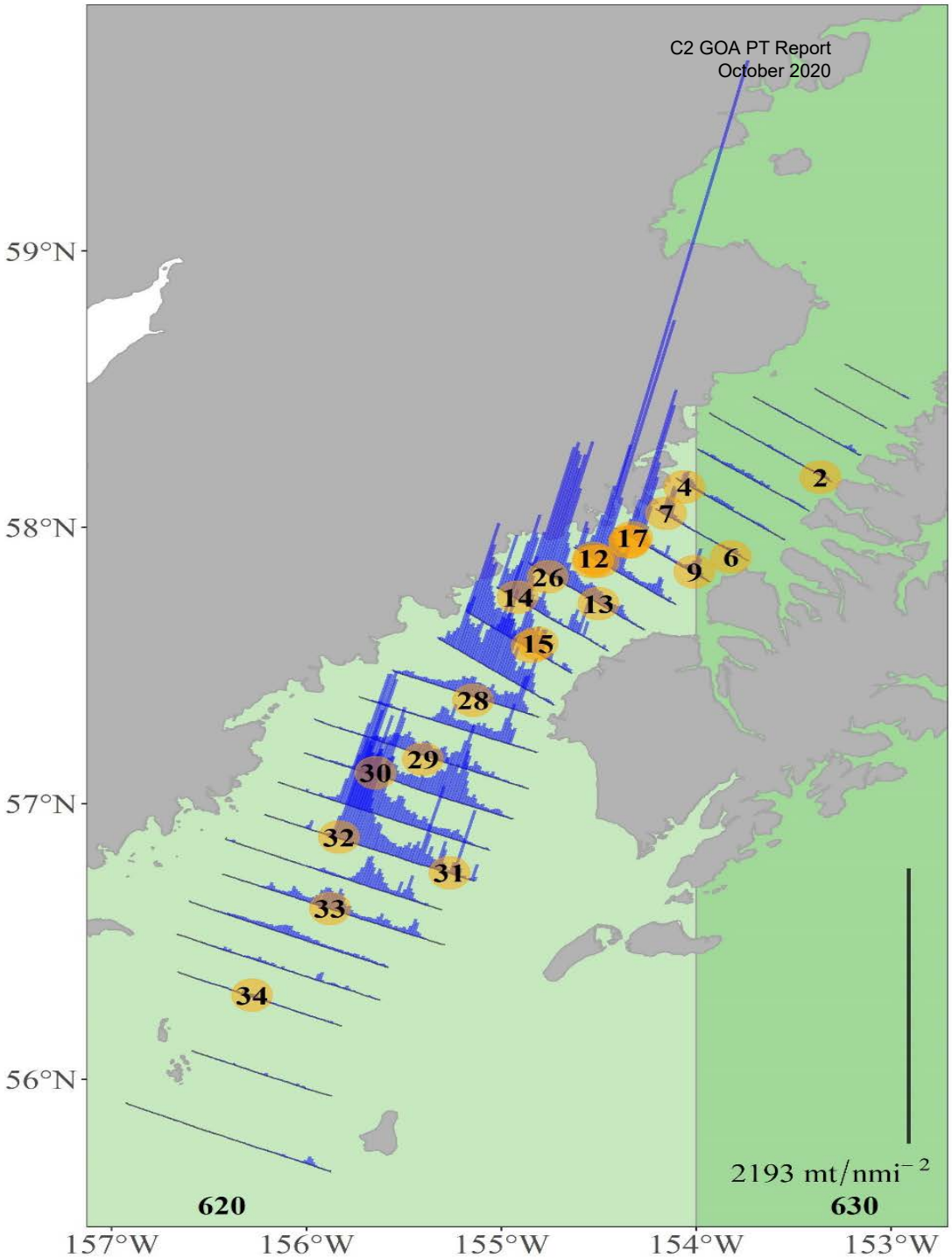
- Shelikof survey
- VAST application to SE Alaska


Pavlof
Morzhovoi
Sanak
Shumagins
Shelikof
Marmot
Chirikof
162°W
160°W
158°W
156°W
154°W
152°W
Longitude
56°N
Latitude

Shelikof St.

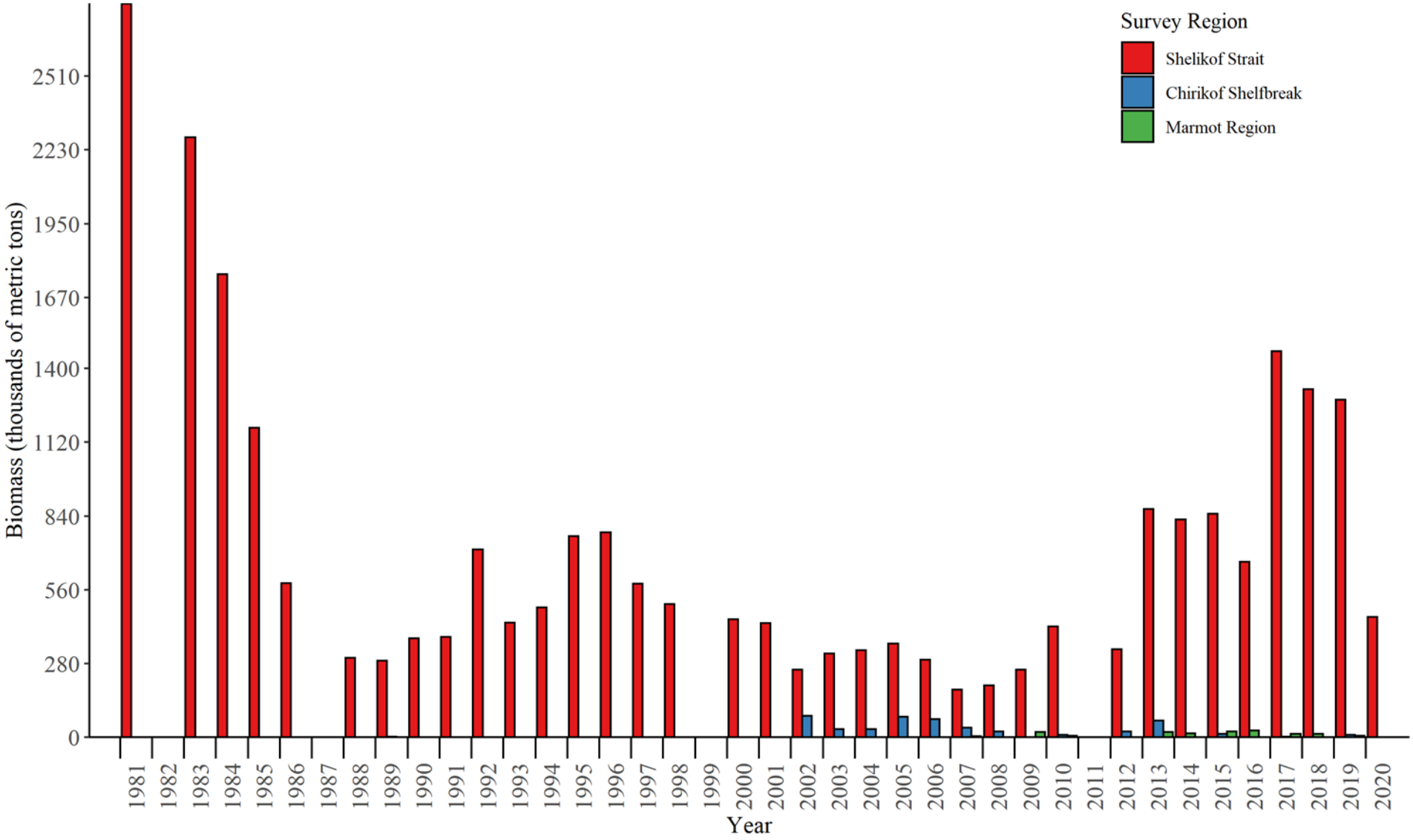
Pollock biomass

distribution



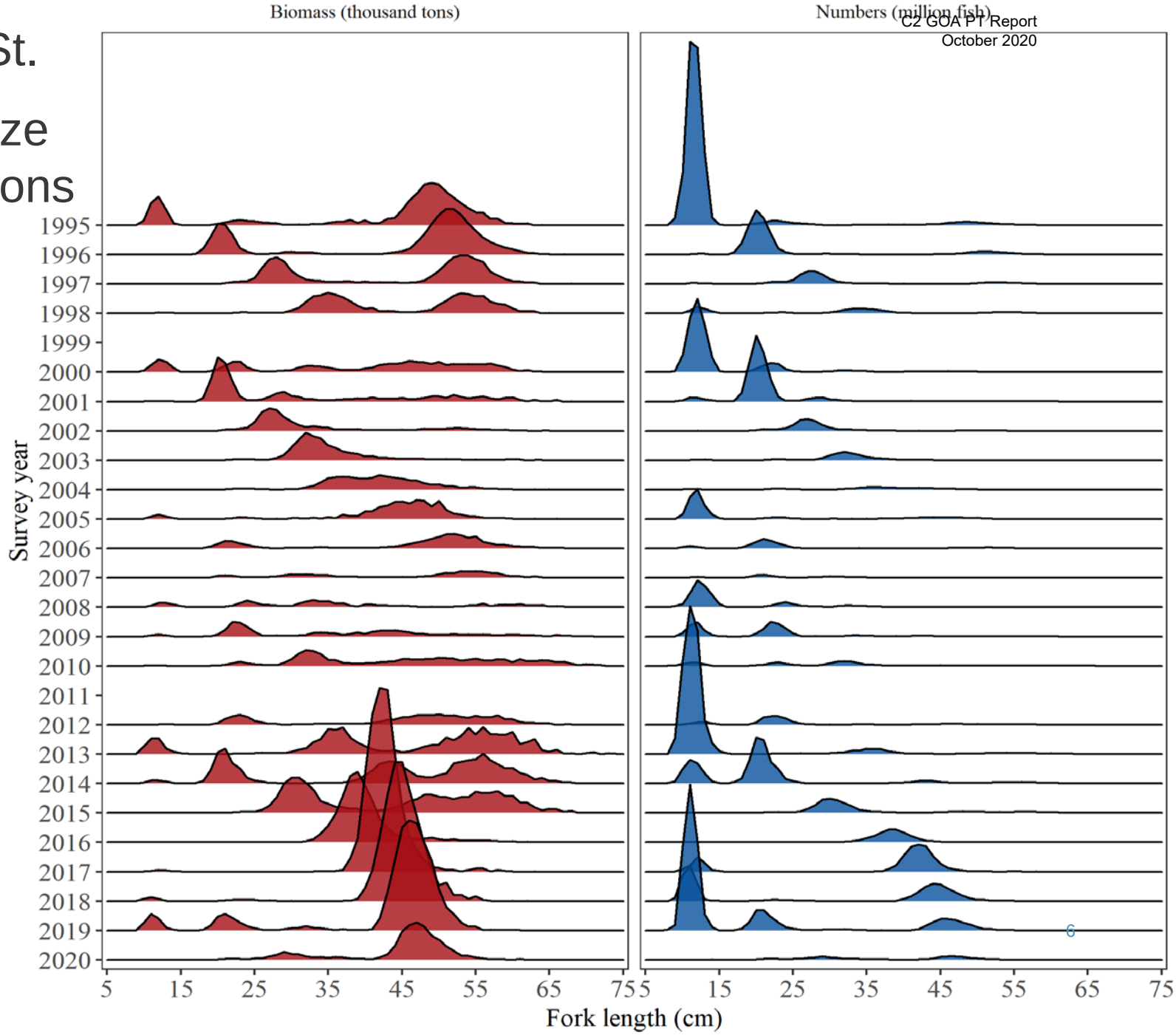
Acoustic survey

GOA pollock biomass estimates



Shelikof St.

Pollock size compositions



Shelikof Survey

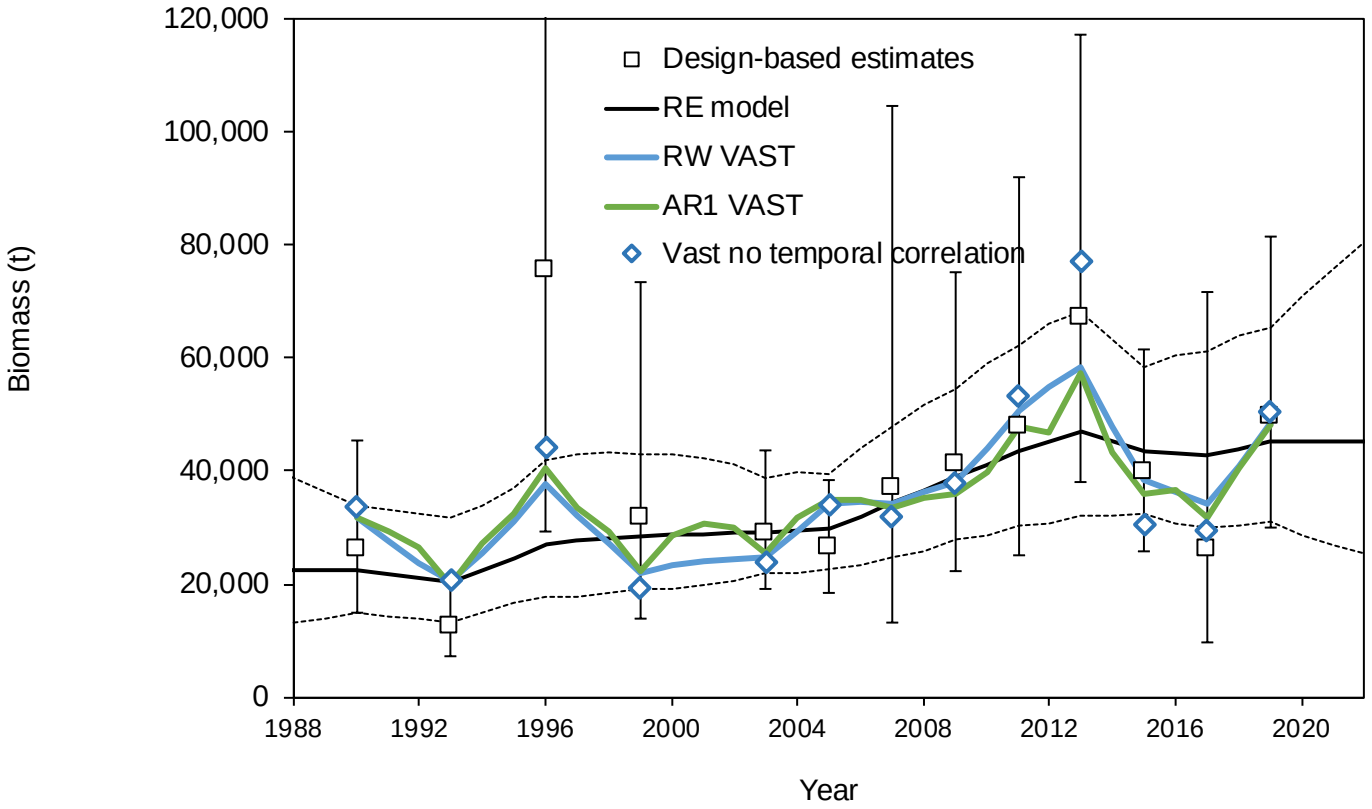
- Down from recent estimates
- Probably fit model better…

GOA Pollock assessment

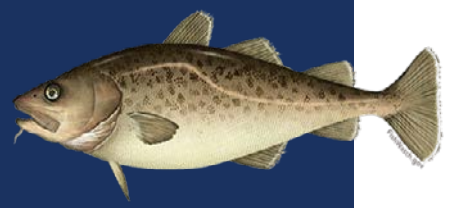
- Team discussed last year's risk factors …
  - Aspects on prey availability, smaller zooplanktons appeared to be ok for young pollock
  - The recent survey suggests that the survival may have changed. I
- ADFG survey was completed this year in area 620
  - Pollock ages should be available soon
  - Early indications that About the same as in 2019

VAST application to SE Alaska pollock

The Team requested that a comparison of approaches be done for management purposes



GOA Pacific Cod

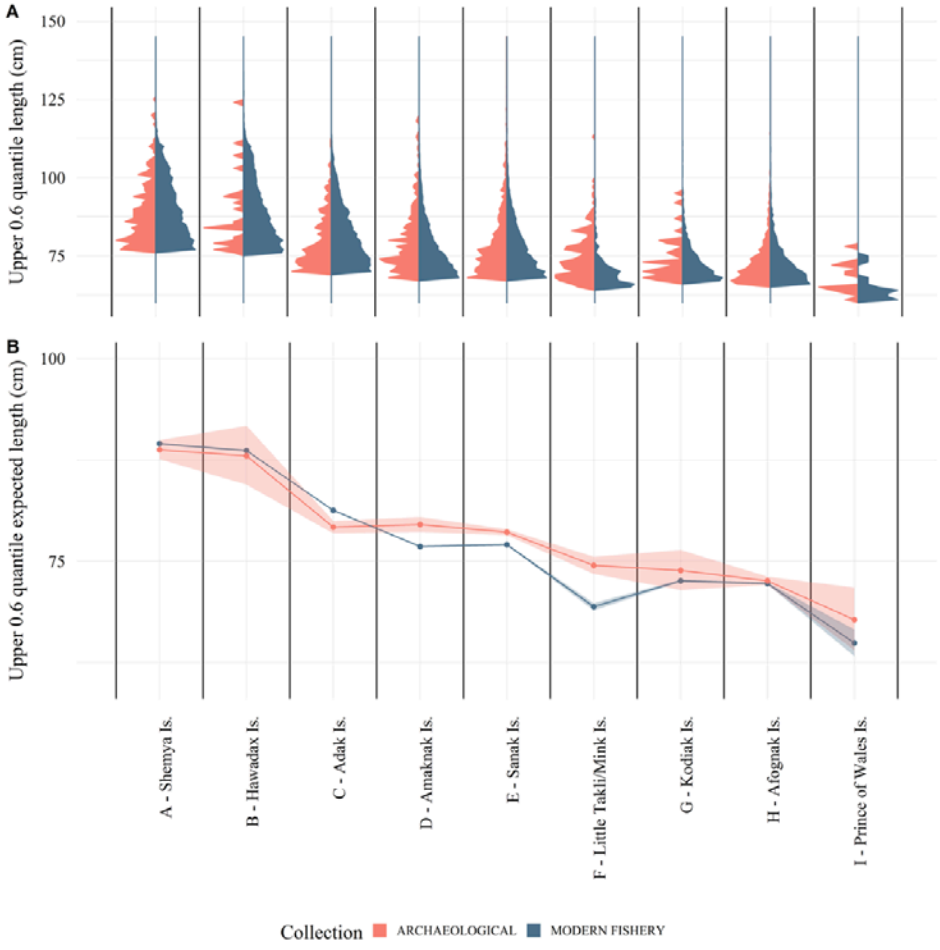


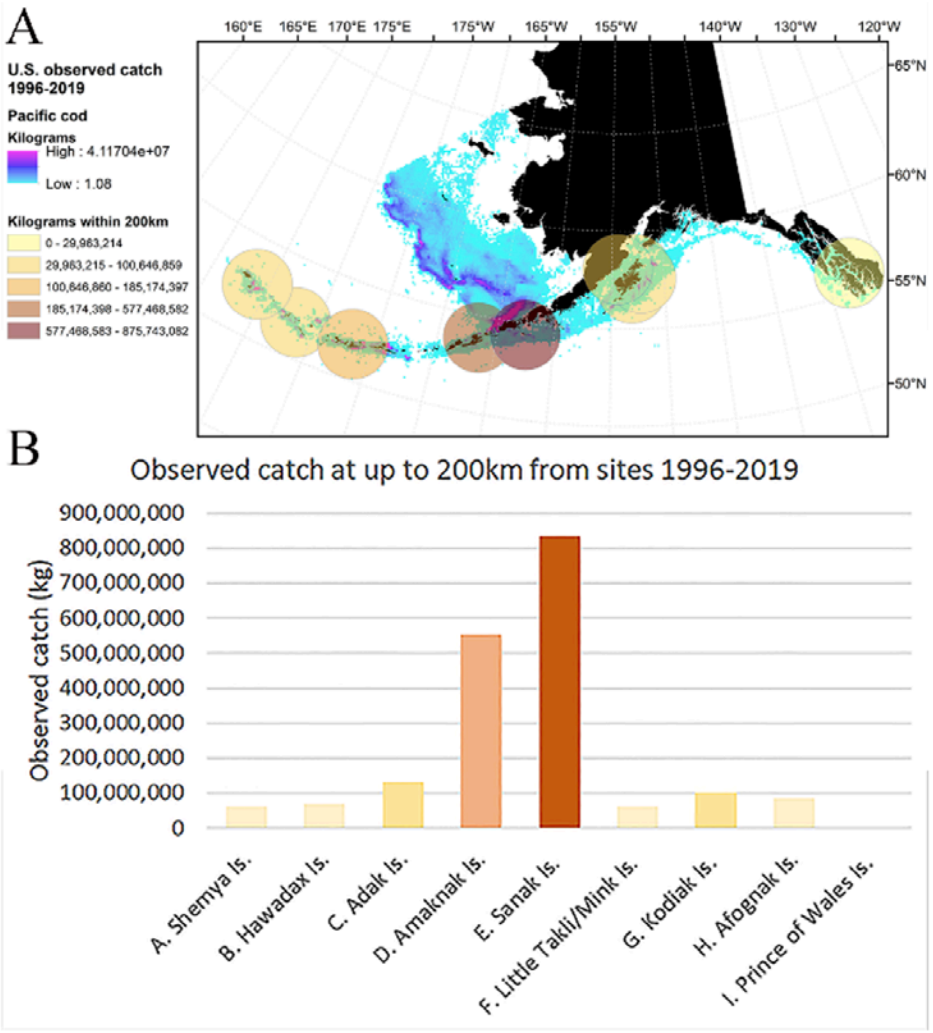
Climate-enhanced stock assessment model

- Marine heatwave cumulative index
  - Natural mortality at age
  - Recruitment

- Sea surface temperature
  - Growth
  - Maturity

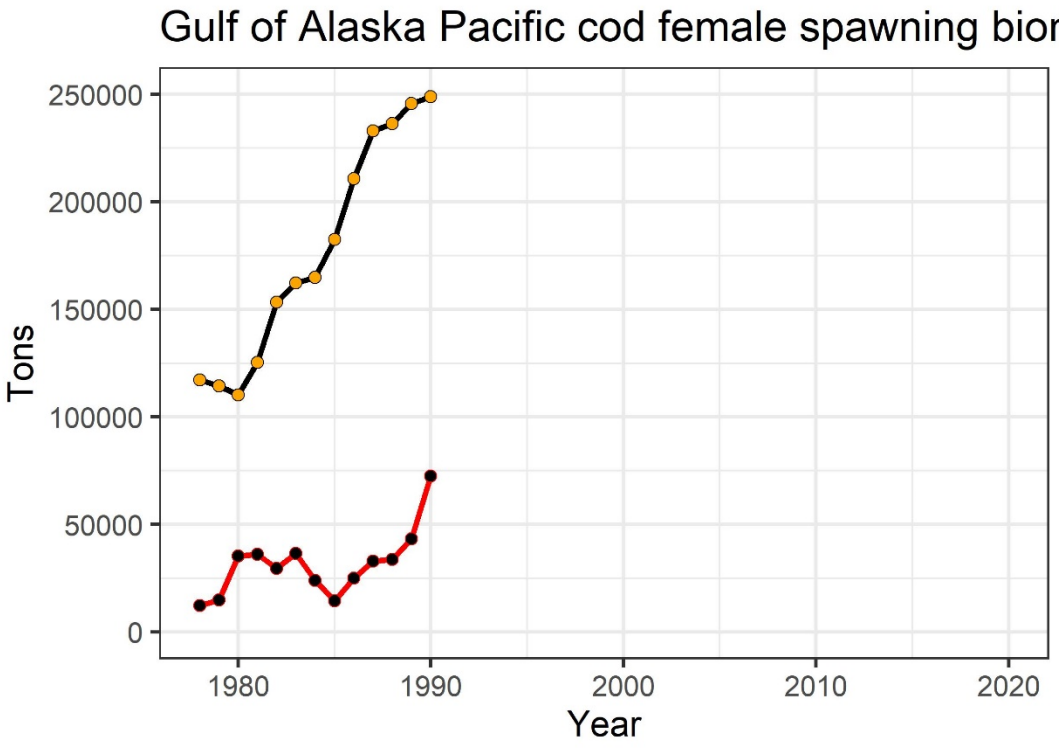
West et al. (In press)
‘Size distribution of Pacific cod in the North Pacific Ocean over 6 millennia’

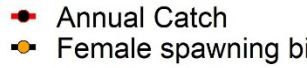


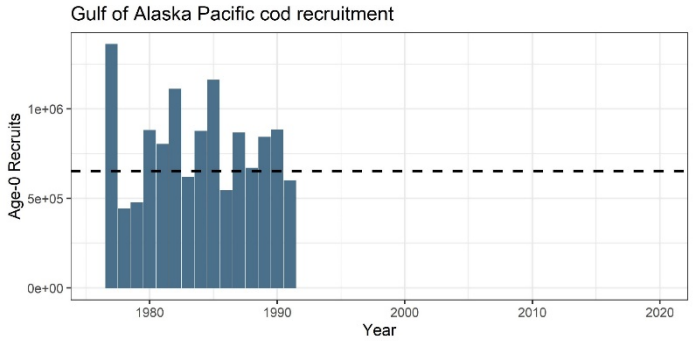


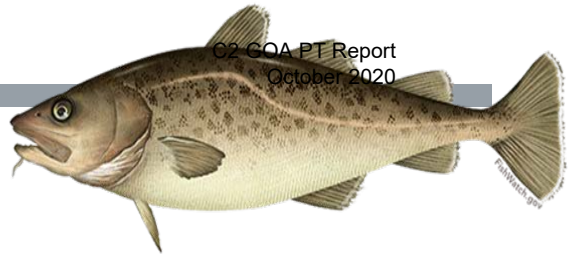
GADID BLOOM AND THE DEVELOPMENT OF THE MODERN DOMESTIC COD FISHERY – 1980'S

- Early 1980's saw a sharp increase in the Gulf of Alaska Pacific cod stock peaking in 1990 with a female spawning stock biomass of 250Kt



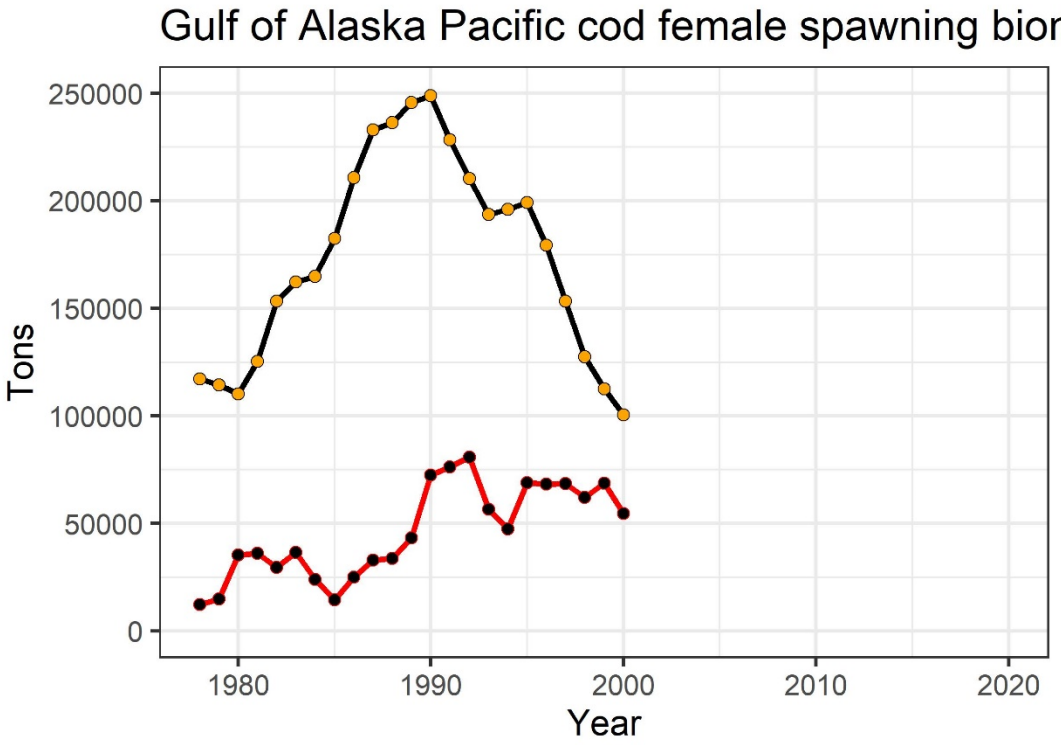


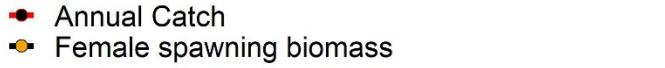


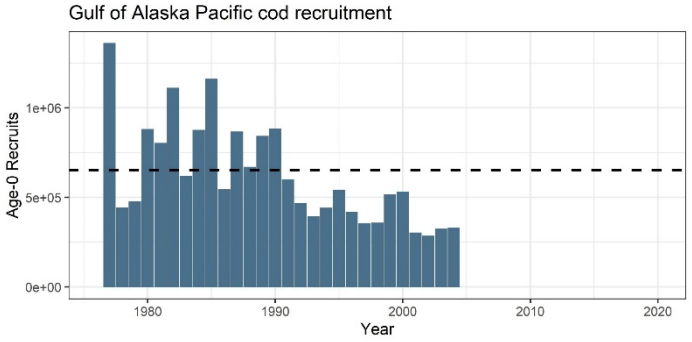


1990-2000'S

- Continuous decline despite relatively low fishing pressure
- Poor recruitment 1991-2004
- 61Kt female spawning biomass in 2008, lowest to date

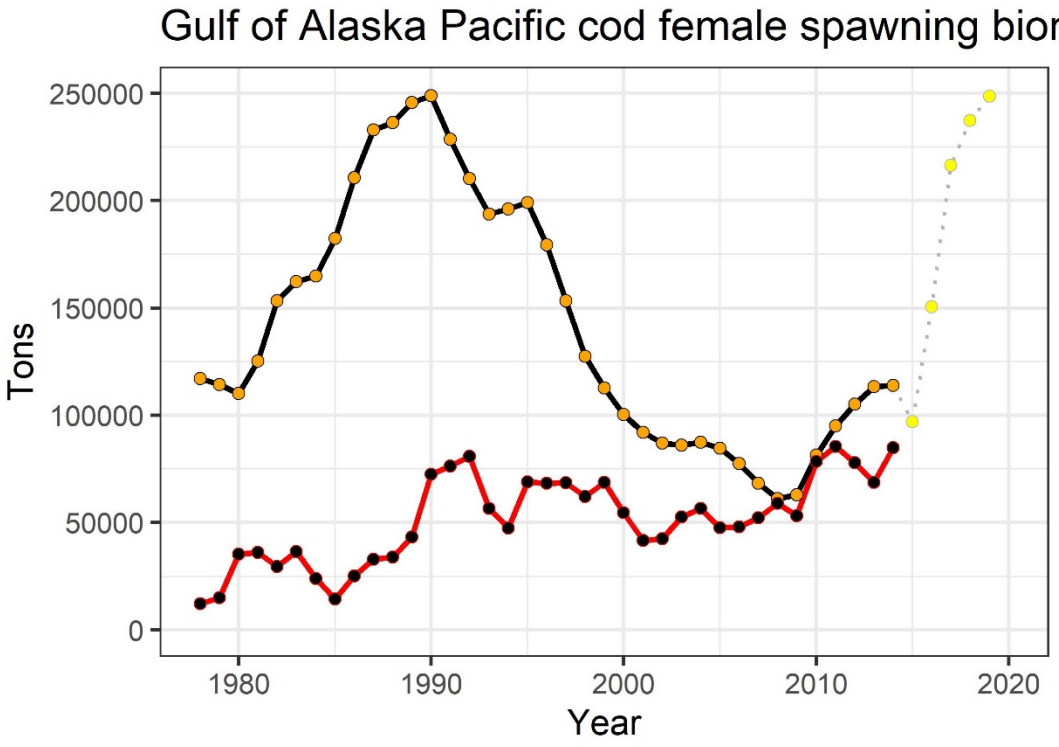




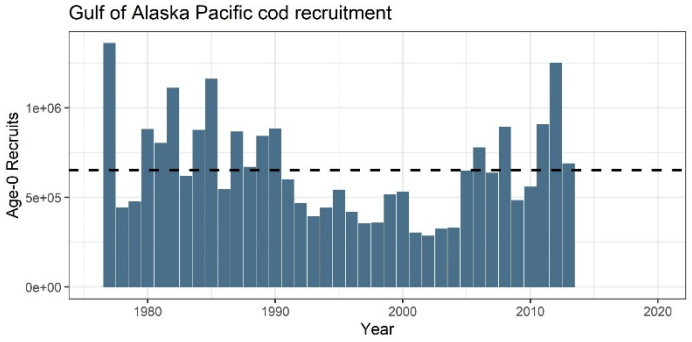


2008-2014

- High recruitment in 2006 through 2012 resulted in a sharp increase in spawning biomass in 2008-2014
- $103 million US in first wholesale value annually

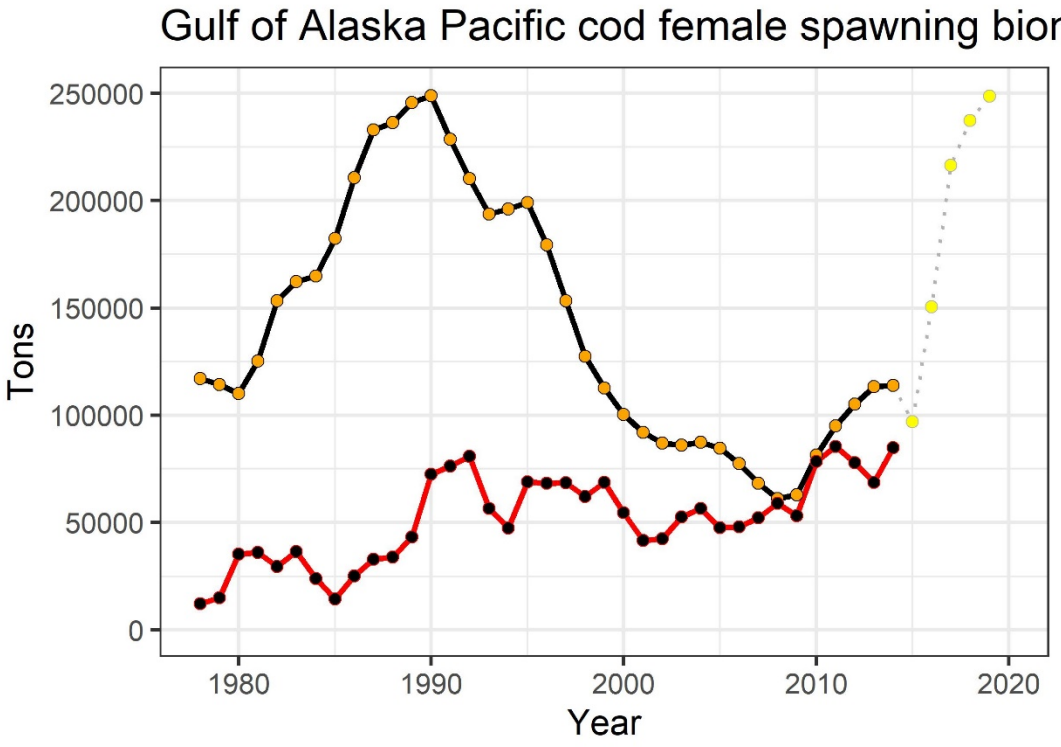


Annual Catch
Female spawning biomass

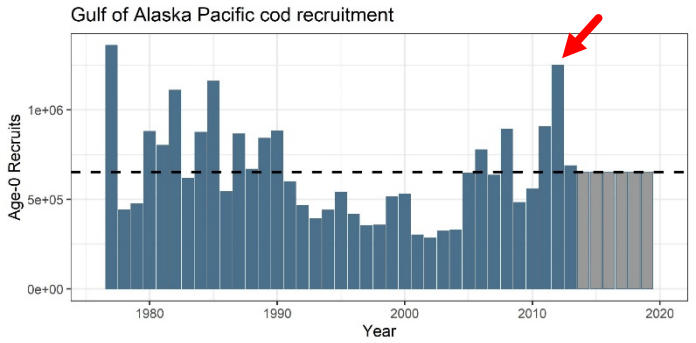


2015-2019 PROJECTIONS

- 2012 year class estimated to be largest since 1977
- Under average conditions spawning stock projected to rise steeply

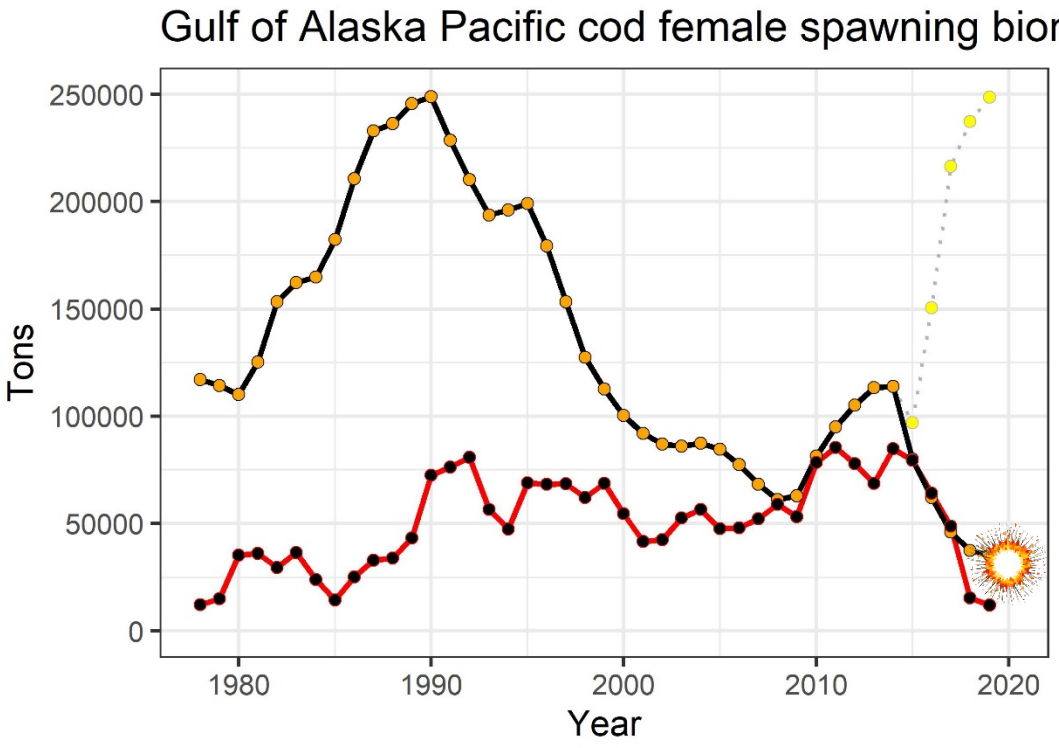


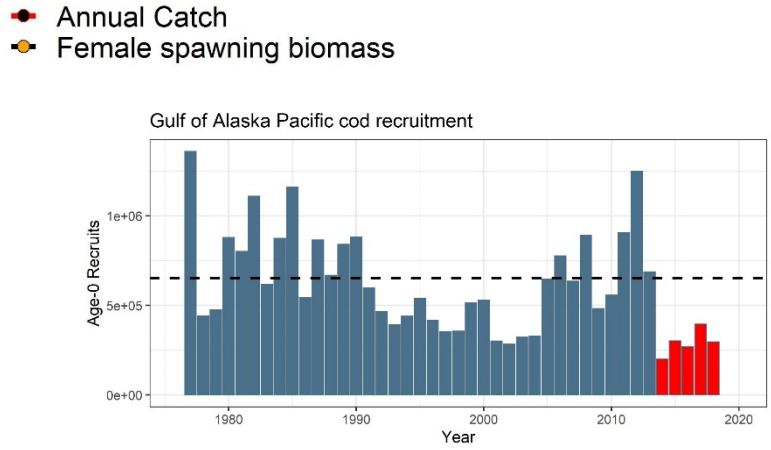
Annual Catch
Female spawning biomass



2015-2019 REALITY

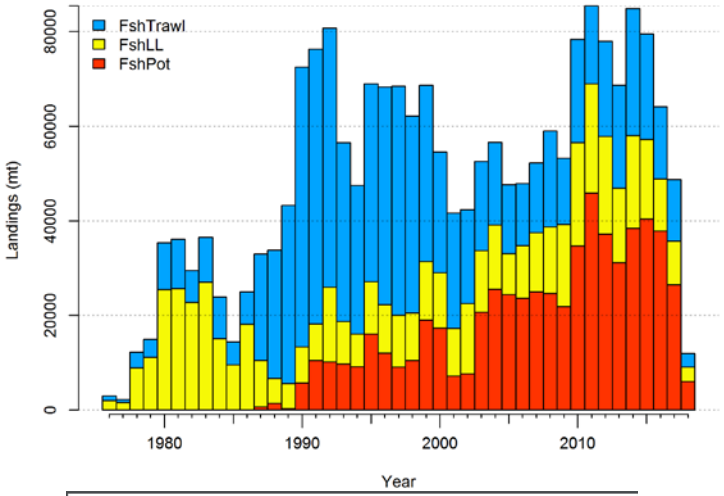
- Poor recruitment 2014-2018
- Sudden collapse of the stock
- 2019 lowest female spawning biomass in timeline (33Kt)





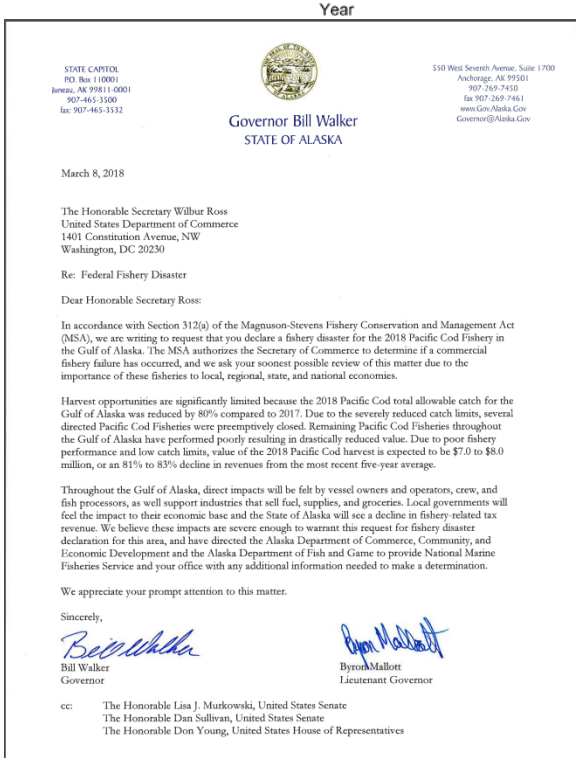
2018

- 80% reduction in ABC
  - 88 Kt in 2017 to 18 Kt in 2018
  - Realized catch in 2018 was 15Kt
    - 69% reduction from 2017
  - Reduction from $75 to $32 million in first wholesale value



2019

- ABC further reduced to 17 Kt
  - Realized catch of 15Kt
- Fishery disaster declared 25 September 2019



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March 8, 2018

The Honorable Secretary Wilbur Ross
United States Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Re: Federal Fishery Disaster

Dear Honorable Secretary Ross:

In accordance with Section 312(a) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), we are writing to request that you declare a fishery disaster for the 2018 Pacific Cod Fishery in the Gulf of Alaska. The MSA authorizes the Secretary of Commerce to determine if a commercial fishery failure has occurred, and we ask your soonest possible review of this matter due to the importance of these fisheries to local, regional, state, and national economies.

Harvest opportunities are significantly limited because the 2018 Pacific Cod total allowable catch for the Gulf of Alaska was reduced by 80% compared to 2017. Due to the severely reduced catch limits, several directed Pacific Cod Fisheries were preemptively closed. Remaining Pacific Cod Fisheries throughout the Gulf of Alaska have performed poorly resulting in drastically reduced value. Due to poor fishery performance and low catch limits, value of the 2018 Pacific Cod harvest is expected to be $7.0 to $8.0 million, or an 81% to 83% decline in revenues from the most recent five-year average.

Throughout the Gulf of Alaska, direct impacts will be felt by vessel owners and operators, crew, and fish processors, as well support industries that sell fuel, supplies, and groceries. Local governments will feel the impact to their economic base and the State of Alaska will see a decline in fishery-related tax revenue. We believe these impacts are severe enough to warrant this request for fishery disaster declaration for this area, and have directed the Alaska Department of Commerce, Community, and Economic Development and the Alaska Department of Fish and Game to provide National Marine Fisheries Service and your office with any additional information needed to make a determination.

We appreciate your prompt attention to this matter.

Sincerely,

Bill Walker
Governor

Byron Mallott
Lieutenant Governor

cc: The Honorable Lisa J. Murkowski, United States Senate
The Honorable Dan Sullivan, United States Senate
The Honorable Don Young, United States House of Representatives

2020

- Closure of the directed federal fishery as stock status descended below 20% of unfished spawning biomass

GOA Pacific Cod

- Heatwave indicators continue to play a role in the stock
- Team discussed data from fishery (observers) and EM and fishery details (e.g., avoiding cod to keep away from rockfish hardcap on cod bycatch)
- Look forward to research and basic models

GOA Pacific Ocean Perch Model Update

1. Post November 2019 Plan Team events
2. GOA POP Internal Review Team
3. Preliminary Results
4. Recommendations for Fall 2020 Assessment

GOA Pacific Ocean Perch Model Update

December 2019 Council meeting:

- Industry requested an internal review of the GOA POP assessment
  - TOR for CIE review emphasize model fit, including
    - Time varying selectivity (or time blocks)
    - Design-based biomass estimators
    - Acoustic-trawl (AT) data as an index of secondary priority
- SSC minutes: “The SSC agrees that the formation of an internal assessment review team prior to the CIE review would be beneficial.” SSC recommendations include:
  - Supports continued efforts to provide AT biomass estimates
  - Supports GOA GPT recommendation to explore incorporating AT into the assessment, examining catchability and selectivity, and examining VAST model for POP abundance and apportionment

GOA Pacific Ocean Perch Model Update

Dec 2019:

- AP Motion 6: The AP recommends the CIE review Gulf Pacific Ocean Perch in April of 2020, and the terms of reference for the CIE need to prioritize fixing the models' performance and exploring the VAST model. The model should be revised before the September Plan Team meeting to move forward with the new ABC for the November Plan Team and 2021 Specs.
  - Rationale: The POP survey showed twice the POP biomass than the model; a CIE review of POP was recommended by the SSC and is important to model performance in time for use in next year's specification process
- Carried through to Council motion and included VAST model explorations

GOA Pacific Ocean Perch Model Update

Internal review tasks

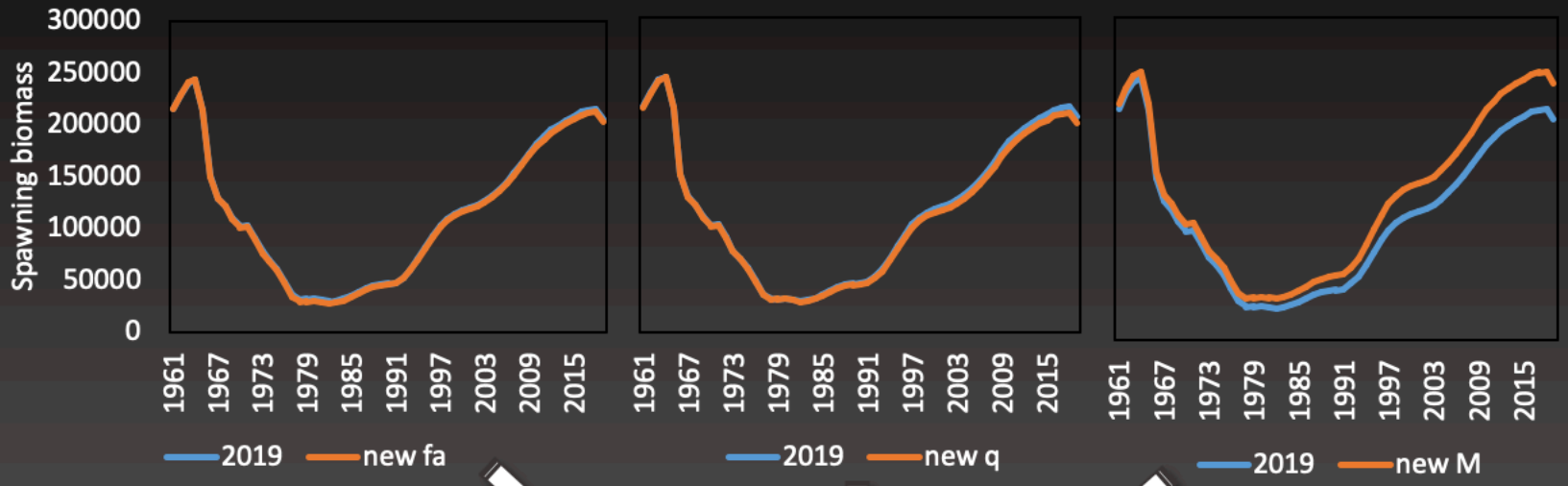
- Updating priors/data
- Initial abundance
- Fishery selectivity
- Time-dependent mean recruitment & recruitment variability
- Implementing VAST biomass index (with variance inflation parameter)

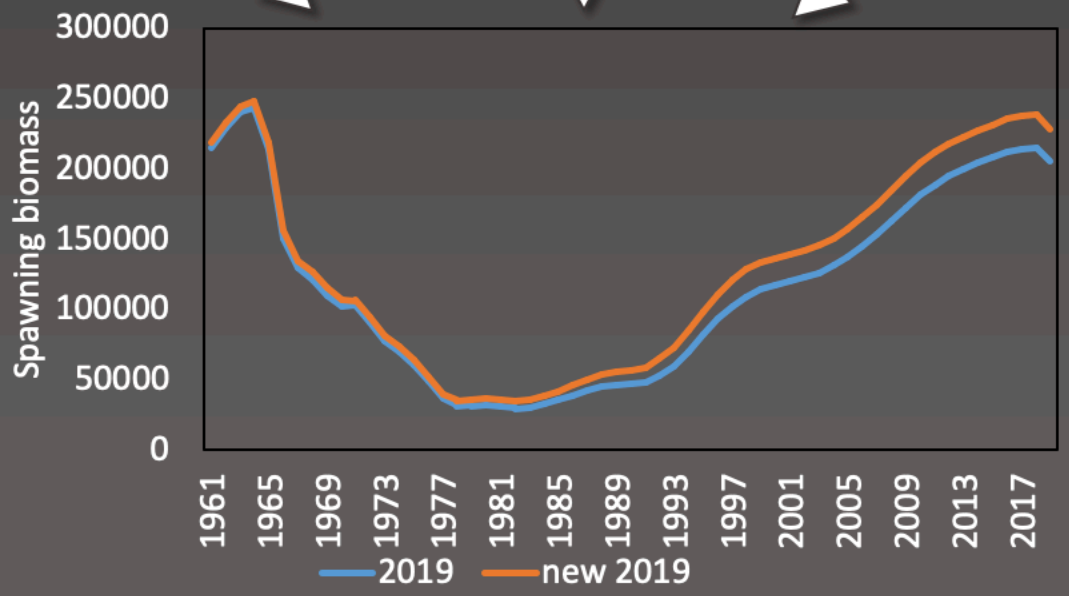
GOA Pacific Ocean Perch Model Update

Recommendations for Fall 2020 assessment

- While model sensitivity still an issue, an intermediate step to a full assessment in 2021 would be to update priors and data
- Specifically:
  - Update fishery age comps and ageing error matrix
  - Define prior on M based on Hamel (2015)
  - Define prior on q based on Jones et al. (in review)

Recommendations for Nov assessment





GOA POP

The Team agreed with the author to bring forth a full GOA POP assessment in 2020

- **Use proposed prior and data updates incremental progression towards further model development**
- **Will be evaluated during the 2021 CIE review and assessment cycle.**
- **The Team also recommends the review team continue to investigate similarities and linkages between the GOA and AI POP stocks.**

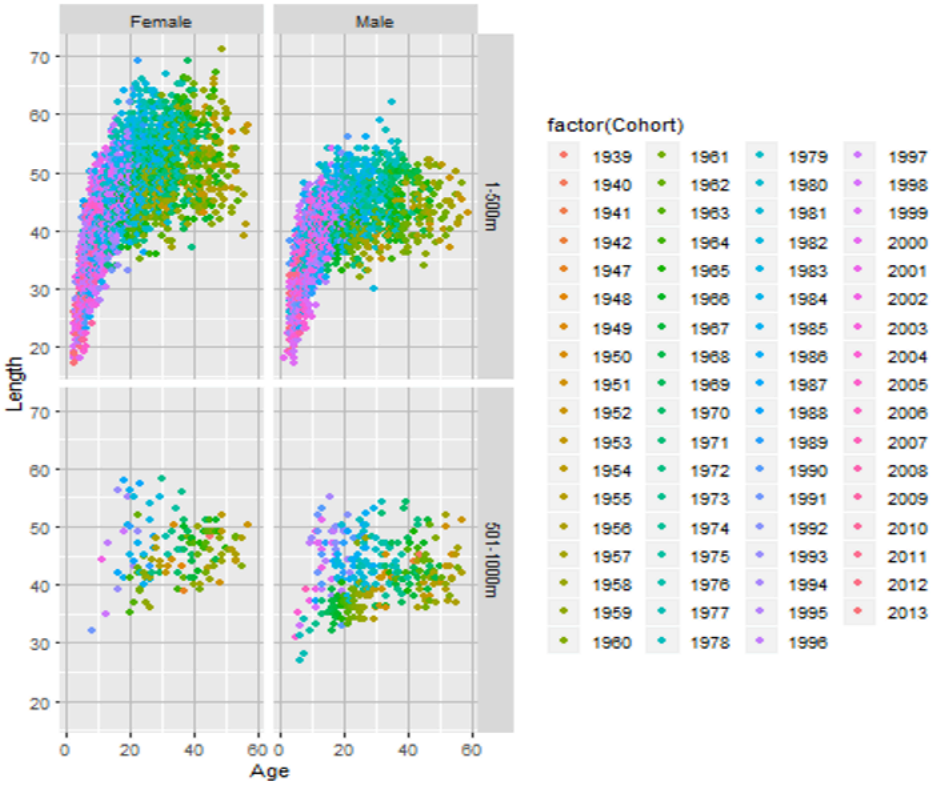
Dover sole

Two presentations:

- Movement related growth
- Survey estimationg w/ VAST

Movement models for Dover sole

- Ontogenetic movement to depth
- Fish at depth are older
- Older cohorts at depth are smaller



GOA Dover sole
Estimates of abundance using a VAST

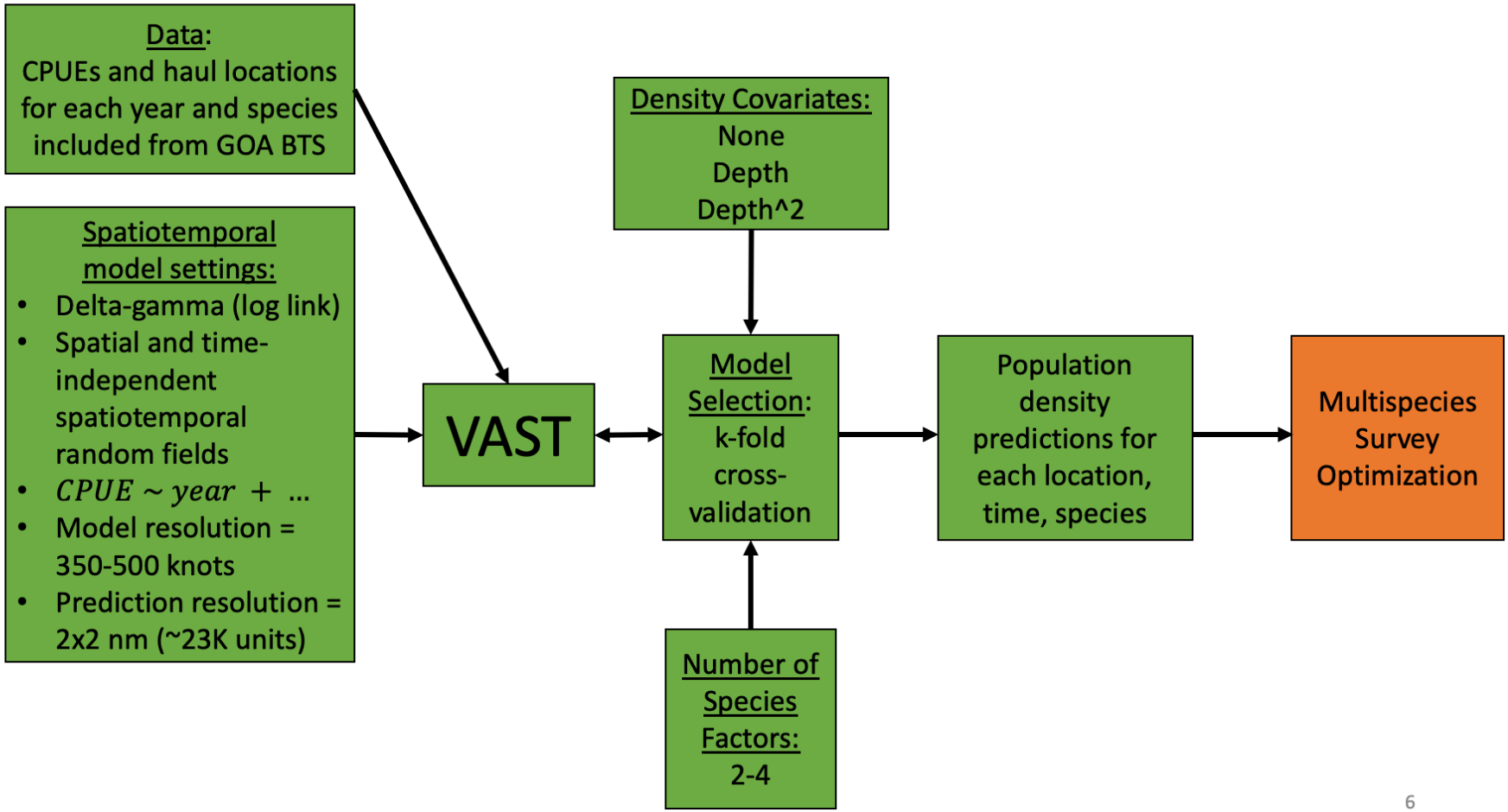
Presentation / overview by Andrea Havron

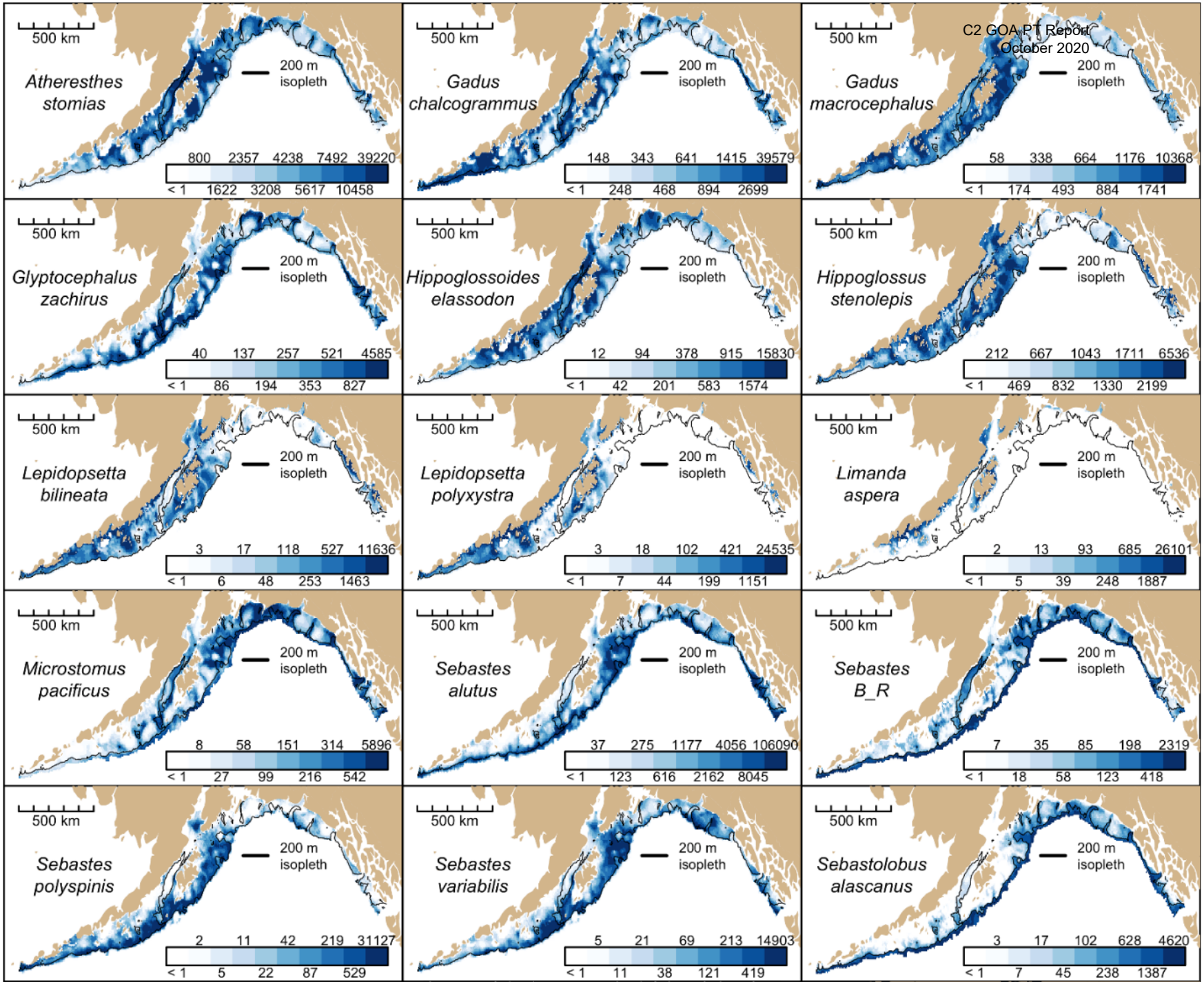
Relative to the movement and VAST approaches

- **The Team agrees with the suggested research directions for each of these projects**
  - **Results consistent with current assessment and survey estimation procedures**
  - **For the work on biomass estimation using VAST, the Team recommends that authors coordinate with other AFSC scientists that are applying the VAST estimation approaches,**
    - **specifically studies on survey optimization, application to GOA walleye pollock, and the production of VAST biomass estimates from the RACE program**

GOA Survey Optimization Scheme

Project overview: operating model -> survey optimization




500 km
200 m isopleth
Atheresthes stomias
< 1 1622 3208 5617 10458
800 2357 4238 7492 39220
Gadus chalcogrammus
< 1 248 468 894 2699
148 343 641 1415 39579
Gadus macrocephalus
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58 338 664 1176 10368
Glyptocephalus zachirus
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Hippoglossoides elassodon
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Lepidopsetta bilineata
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Lepidopsetta polyxystra
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3 18 102 421 24535
Limanda aspera
< 1 5 39 248 1887
2 13 93 685 26101
Microstomus pacificus
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8 58 151 314 5896
Sebastes alutus
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37 275 1177 4056 106090
Sebastes B_R
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7 35 85 198 2319
Sebastes polyspinis
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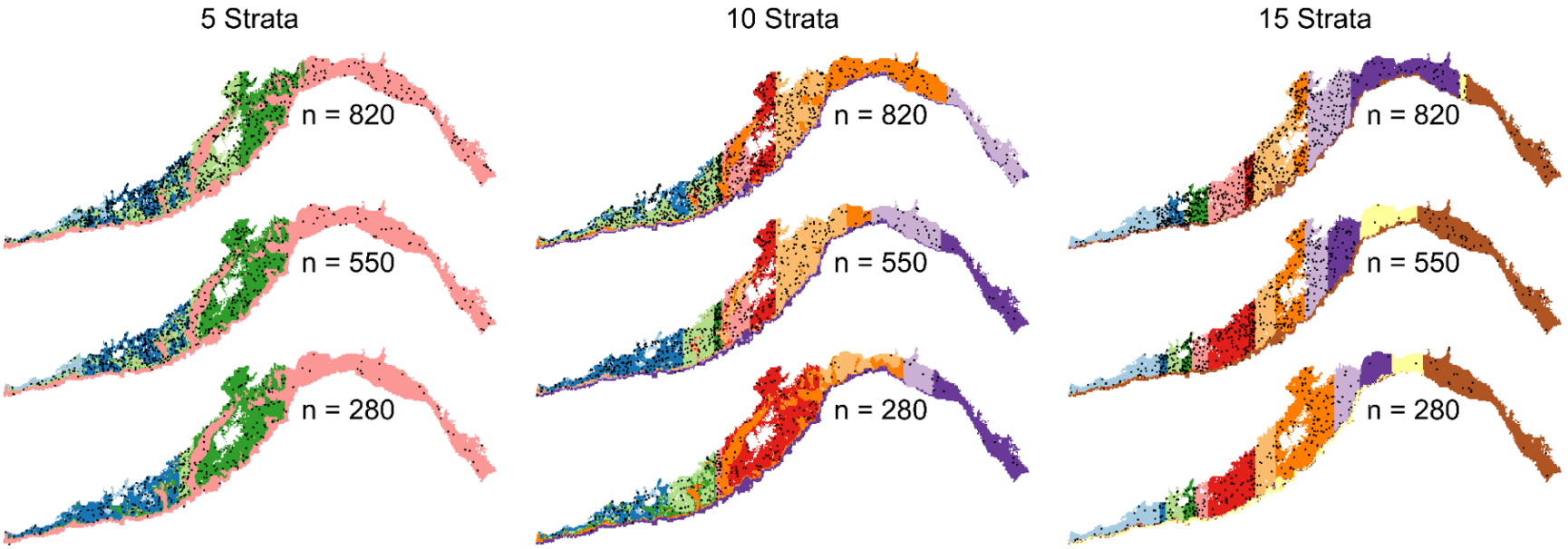
2 11 42 219 31127
Sebastes variabilis
< 1 11 38 121 419
5 21 69 213 14903
Sebastolobus alascanus
< 1 7 45 238 1387
3 17 102 628 4620

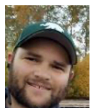
GOA Survey Optimization Scheme

- Can design a survey to meet user-specified precision constraints
- Improve abundance index estimation
  - Reduce bias (important for tier 5 stocks)
  - May increase accuracy of uncertainty estimate (important for data-weighting)
- Improved flexibility of surveys given modular approach
  - Can generate population density predictions with multiple methods
  - Enabling quick, data-driven decisions on where to cut samples when necessary
    - Can use to optimize allocation among existing strata (fast!)

GOA Survey Optimization Scheme

Optimal strata with examples of optimal sampling density





Optimal allocation indicates highest sampling density in western GOA where biomasses of many species are highest

21

The Team recommends research to incorporate management boundaries in stratification scheme for apportionment issues.

32

The Team continues to recommend a full survey of all depths be conducted in the GOA on a biennial basis.

2021 and 2022 Harvest Specification Recommendations

- Accepted w/ some edit (post meeting) that sculpins N/A now (as on e-agenda; moved to ecosystem component)