

Gulf of Alaska Plan Team

SEPTEMBER EDITION

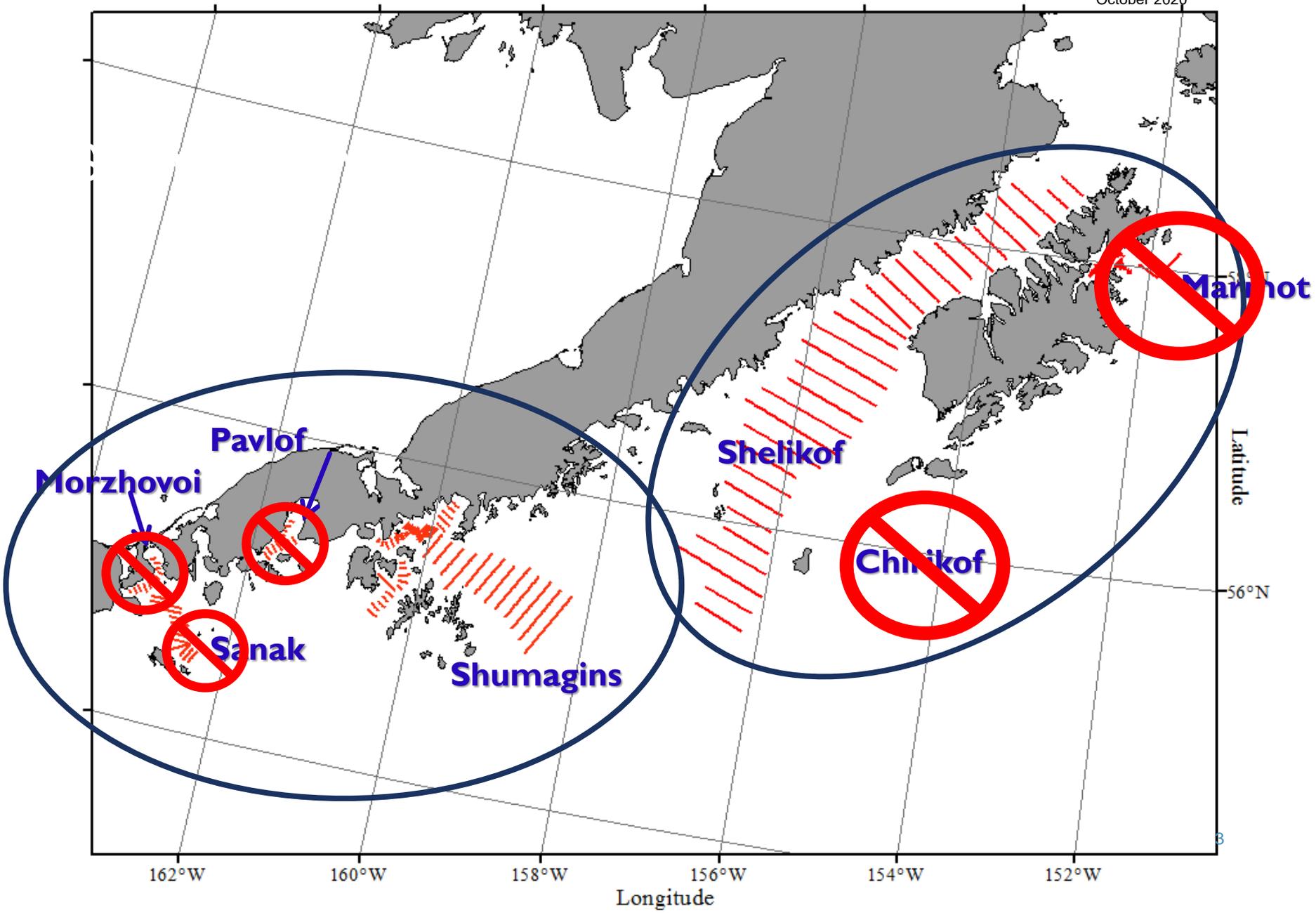
Jim Ianelli
Chris Lunsford
Sara Cleaver (Council)

Obren Davis	NMFS AKRO
Craig Faunce	AFSC FMA
Lisa Hillier	WDFW
Pete Hulson	AFSC ABL
Sandra Lowe	AFSC REFM
Nat Nichols	ADF&G
Jan Rumble	ADF&G
Paul Spencer	AFSC REFM
Marysia Szymkowiak	AFSC REFM
Kresimir Williams	AFSC RACE
vacant	ADF&G
vacant	USFWS

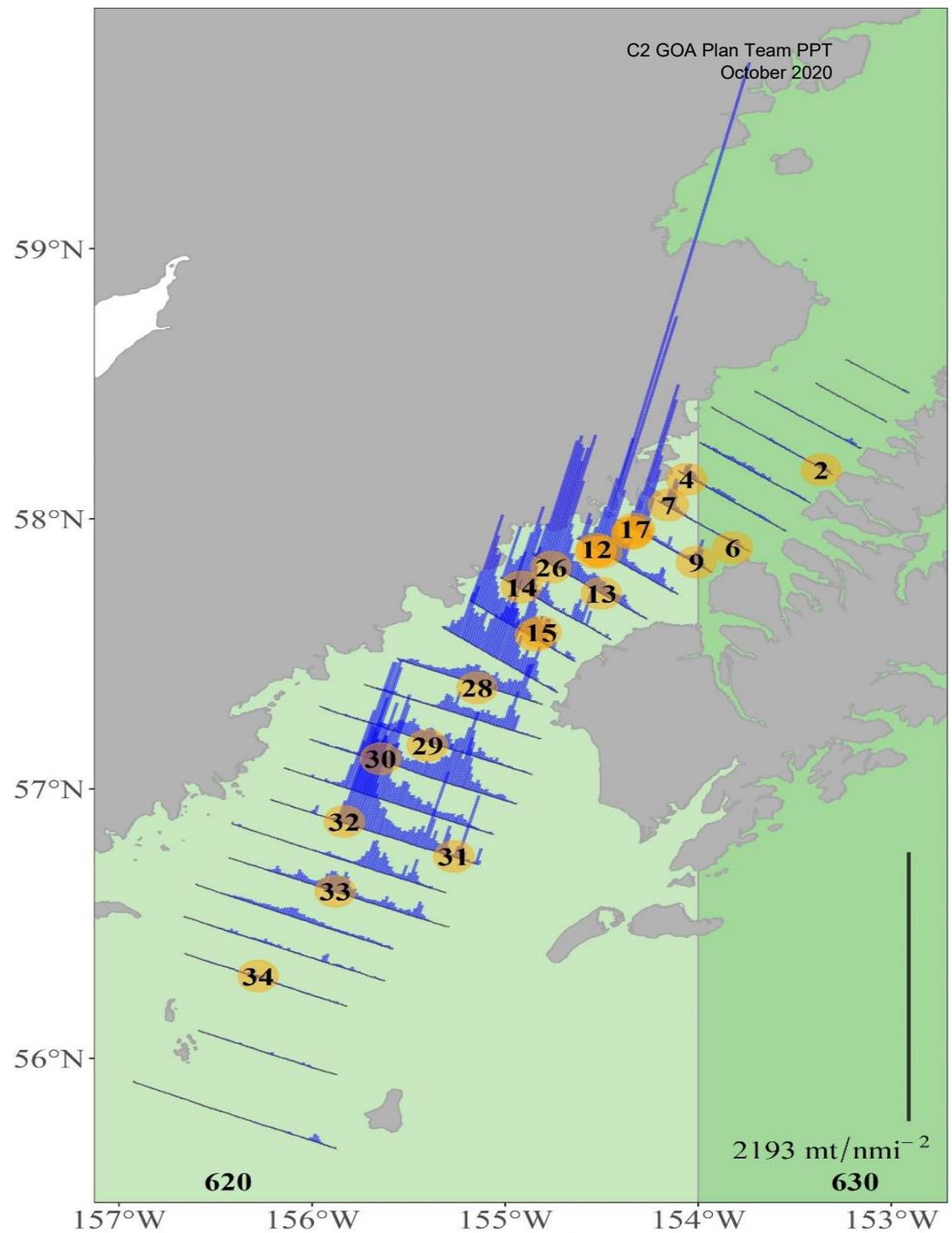


GOA pollock

- Shelikof survey
- VAST application to SE Alaska

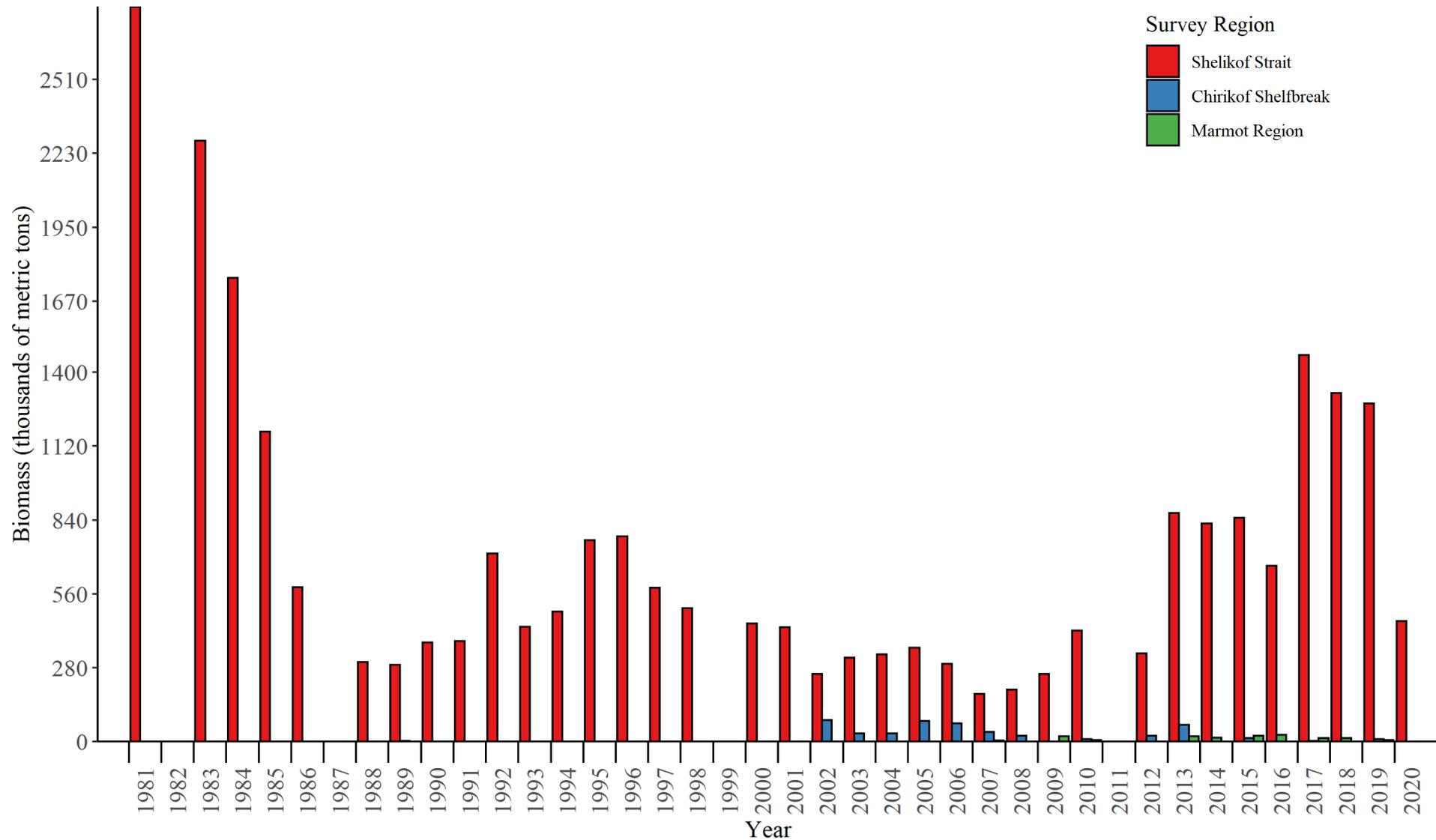


Shelikof St. Pollock biomass distribution

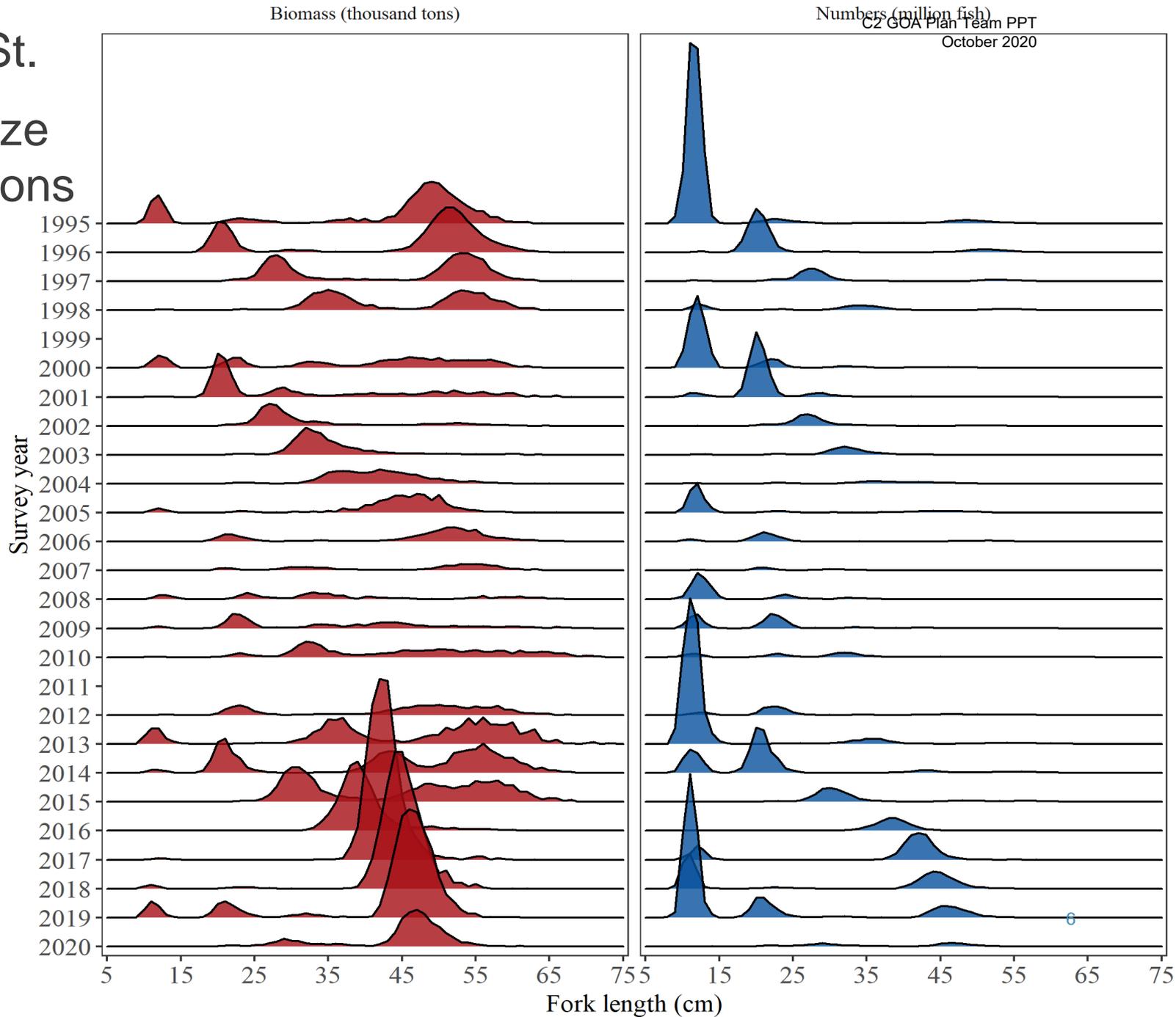


Acoustic survey

GOA pollock biomass estimates



Shelikof St. Pollock size compositions



Shelikof Survey

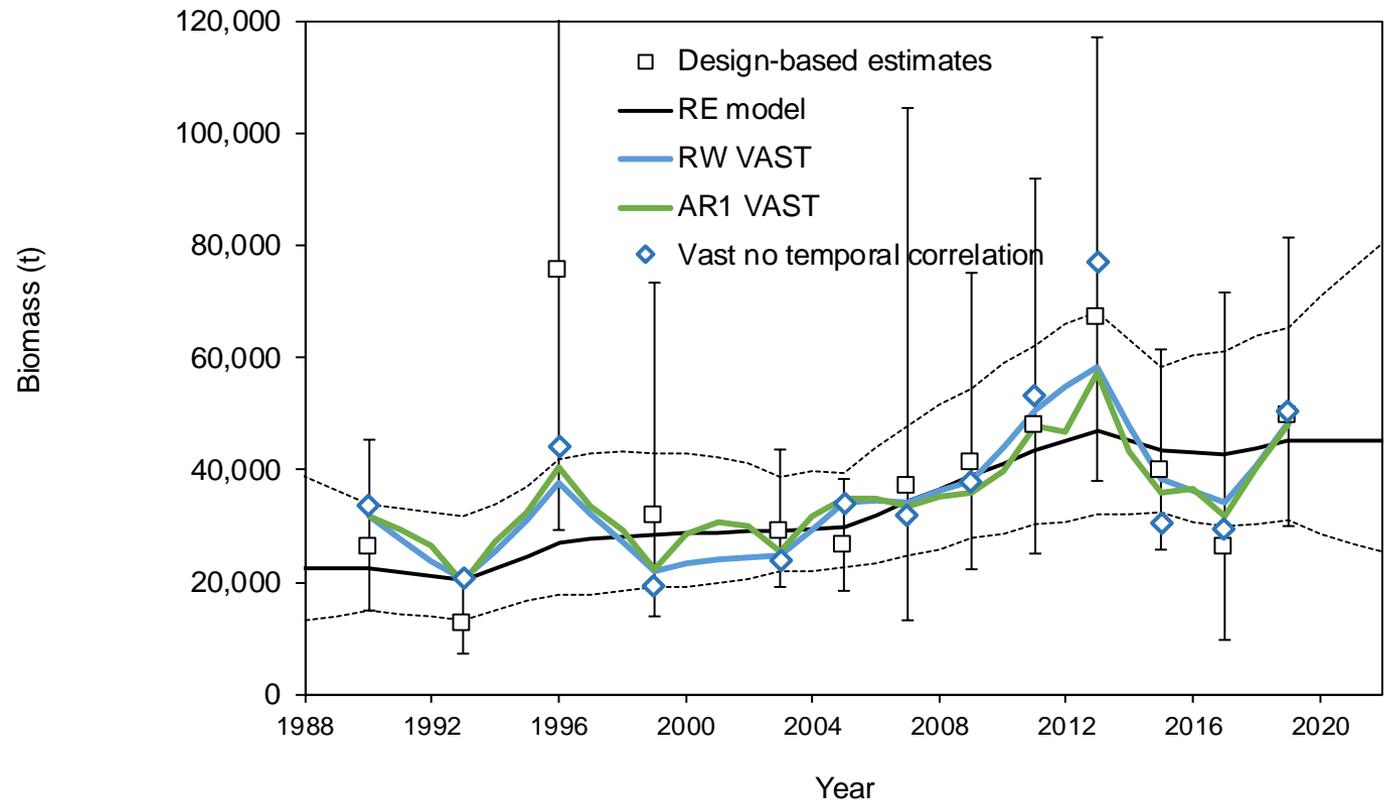
- Down from recent estimates
- Probably fit model better...

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

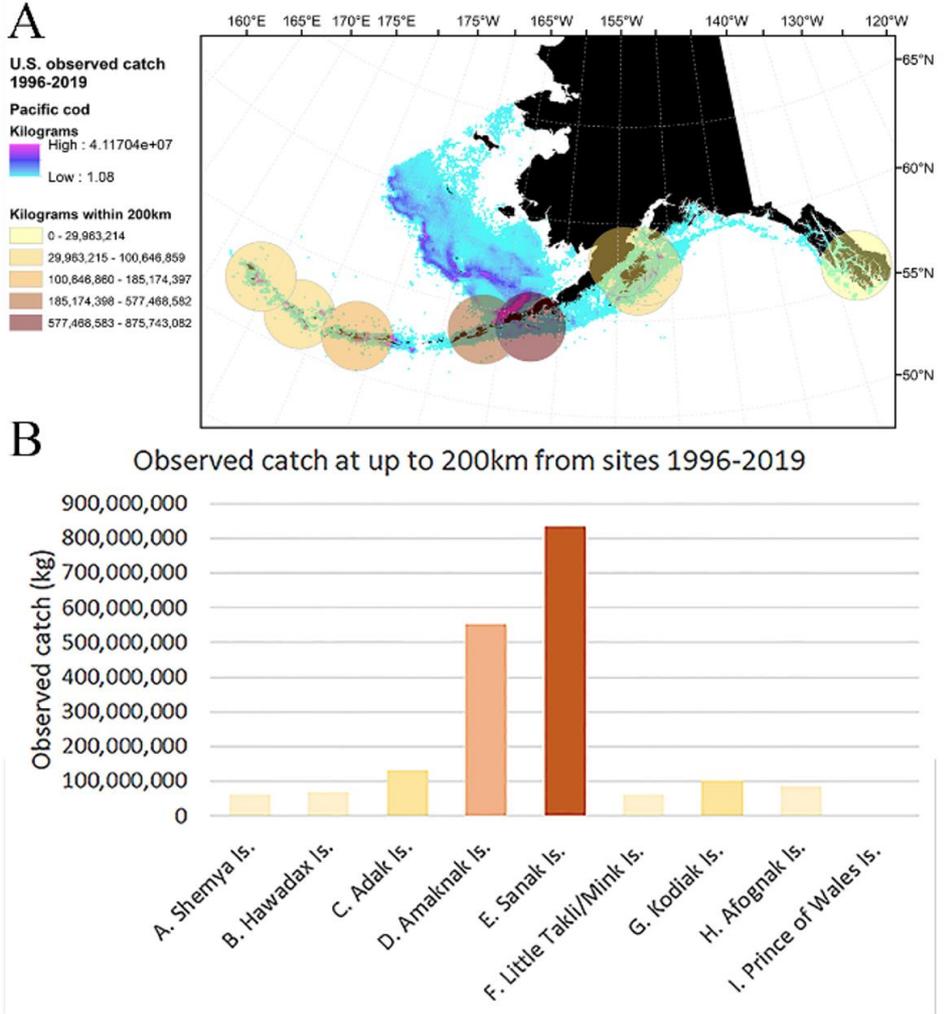
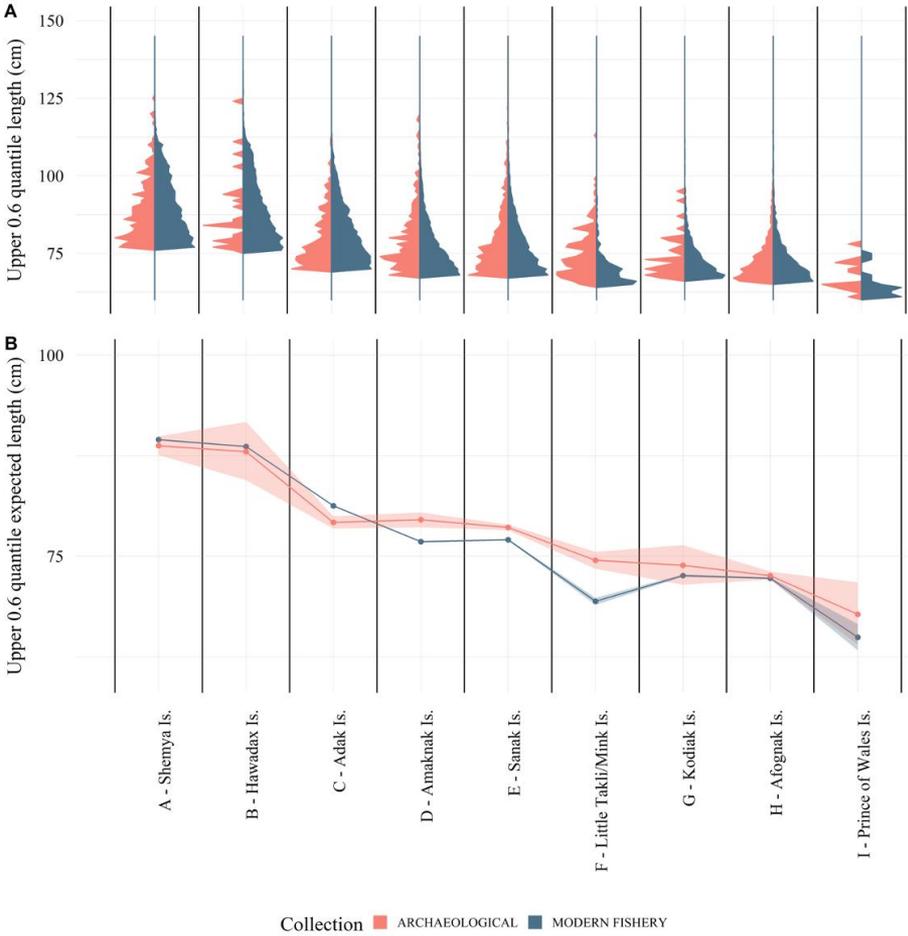


Climate-enhanced stock assessment model

- Marine heatwave cumulative index
 - Natural mortality at age
 - Recruitment
- Sea surface temperature
 - Growth
 - Maturity

West et al. (In press)

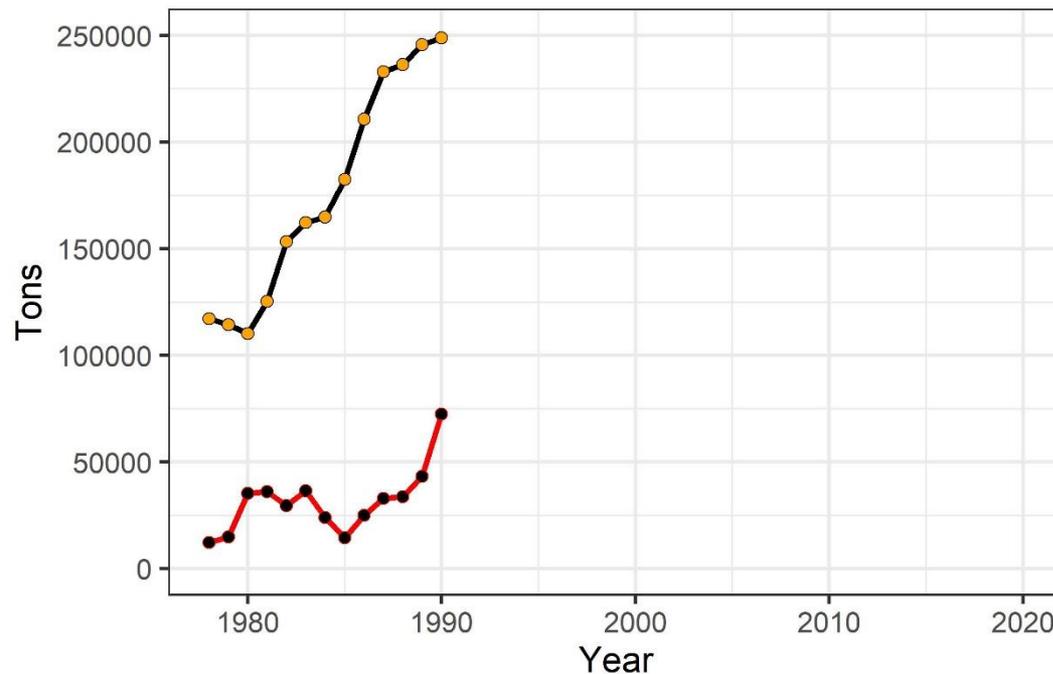
'Size distribution of Pacific cod in the North Pacific Ocean over 6 millennia'



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

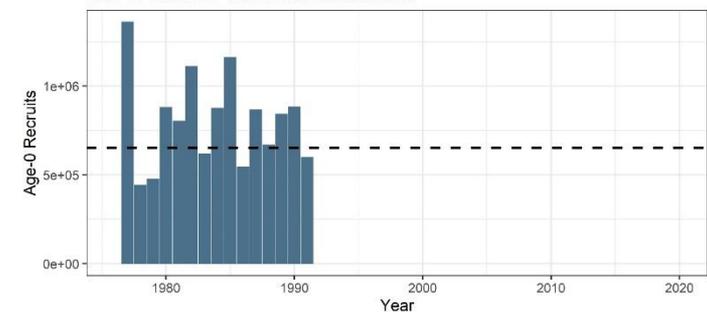
- Early 1980's saw a sharp increase in the Gulf of Alaska Pacific cod stock peaking in 1990 with a female spawning stock biomass of 250Kt

Gulf of Alaska Pacific cod female spawning biomass and catch



- Annual Catch
- Female spawning biomass

Gulf of Alaska Pacific cod recruitment

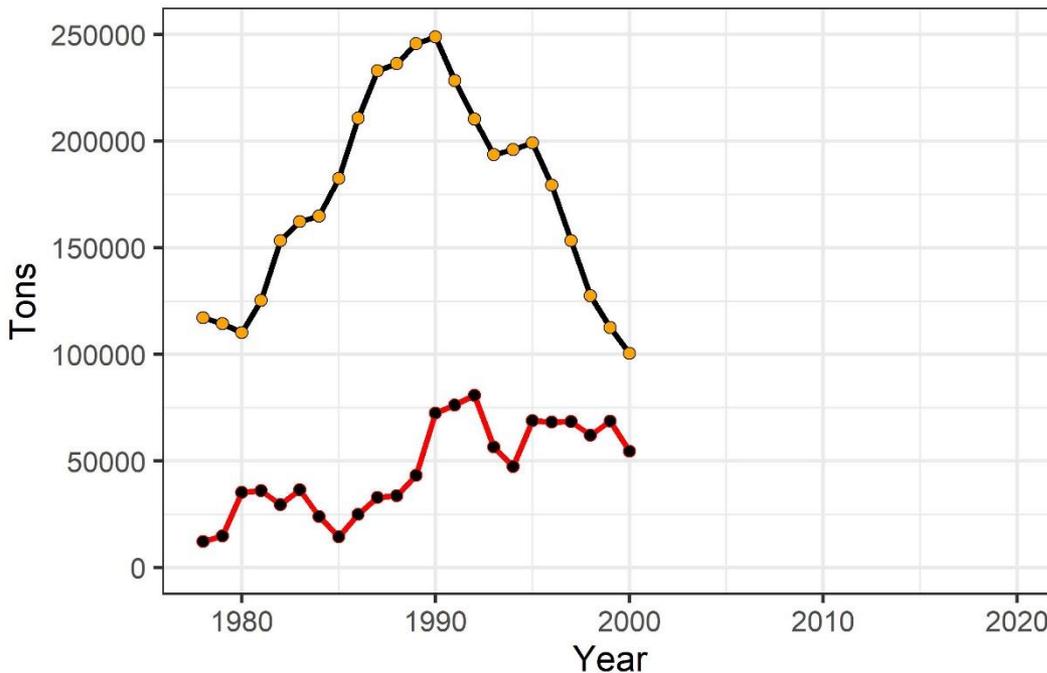




1990-2000'S

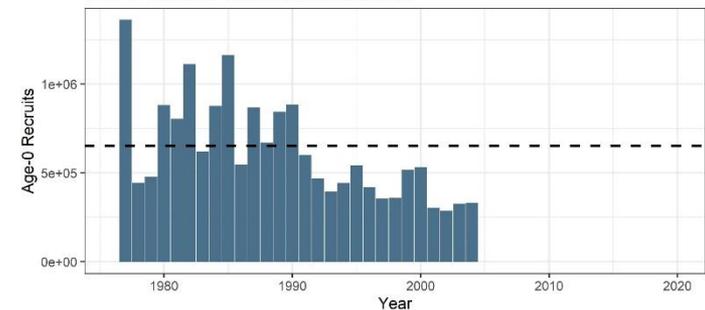
- Continuous decline despite relatively low fishing pressure
- Poor recruitment 1991-2004
- 61Kt female spawning biomass in 2008, lowest to date

Gulf of Alaska Pacific cod female spawning biomass and catch



- Annual Catch
- Female spawning biomass

Gulf of Alaska Pacific cod recruitment

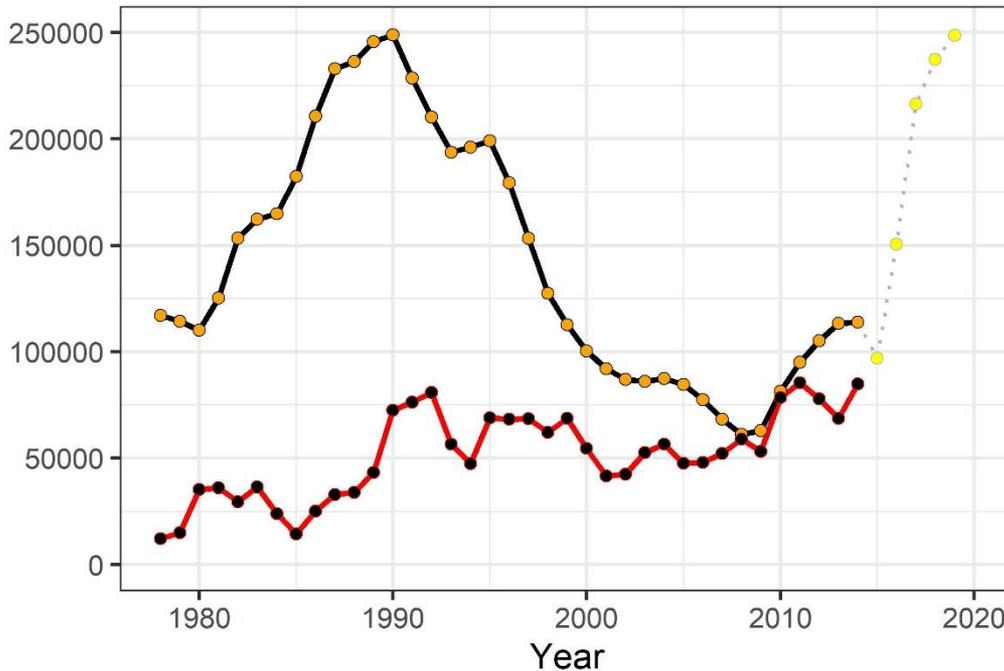




2008-2014

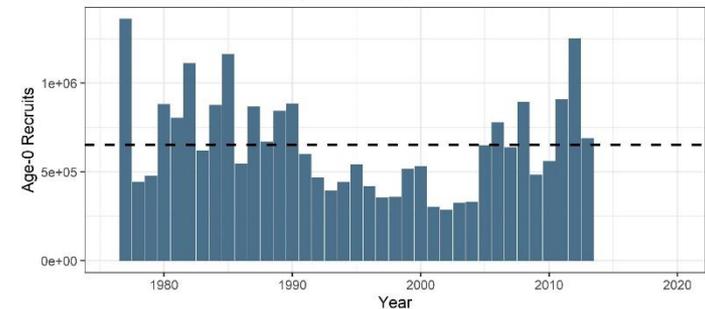
- High recruitment in 2006 through 2012 resulted in a sharp increase in spawning biomass in 2008-2014
- \$103 million US in first wholesale value annually

Gulf of Alaska Pacific cod female spawning biomass and catch



- Annual Catch
- Female spawning biomass

Gulf of Alaska Pacific cod recruitment

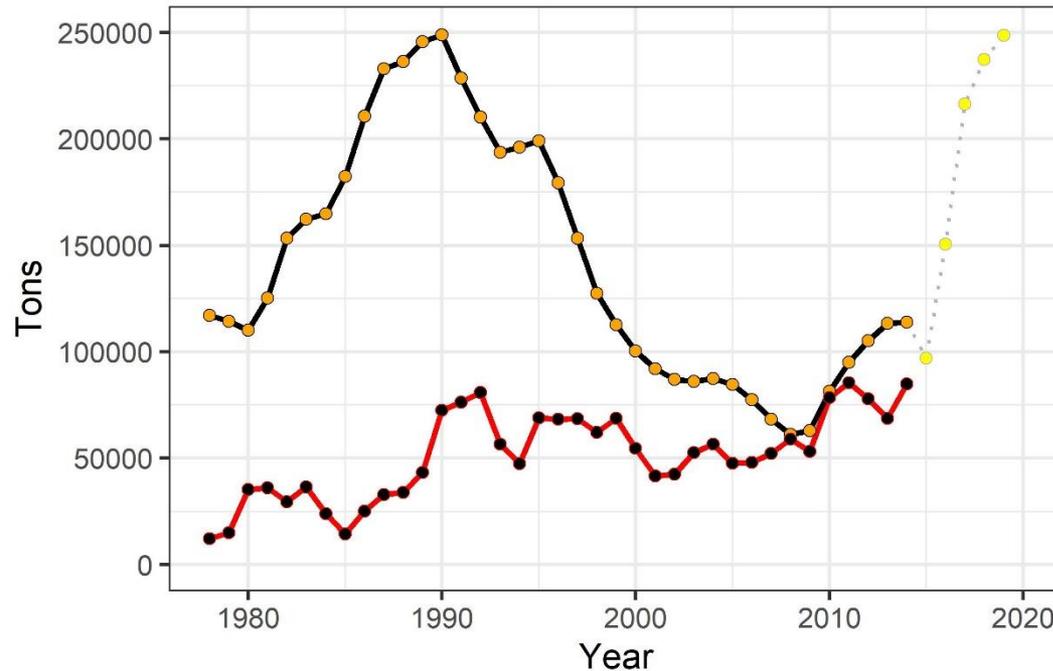




2015-2019 PROJECTIONS

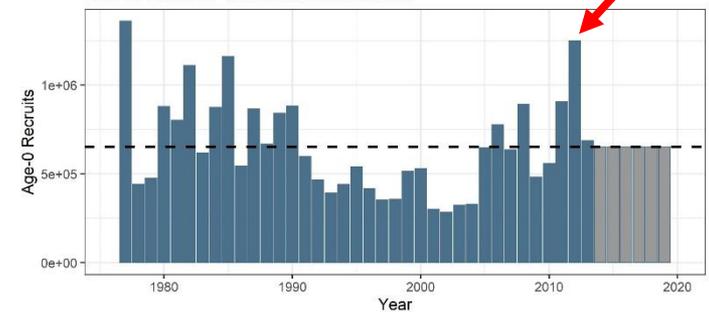
- 2012 year class estimated to be largest since 1977
- Under average conditions spawning stock projected to rise steeply

Gulf of Alaska Pacific cod female spawning biomass and catch



- Annual Catch
- Female spawning biomass

Gulf of Alaska Pacific cod recruitment

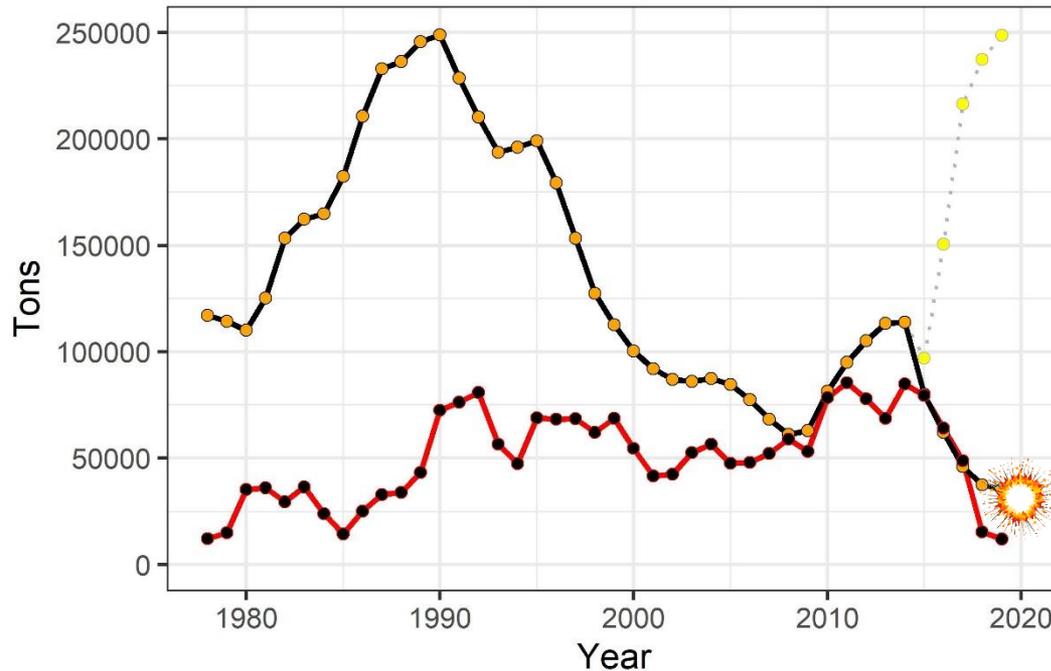




2015-2019 REALITY

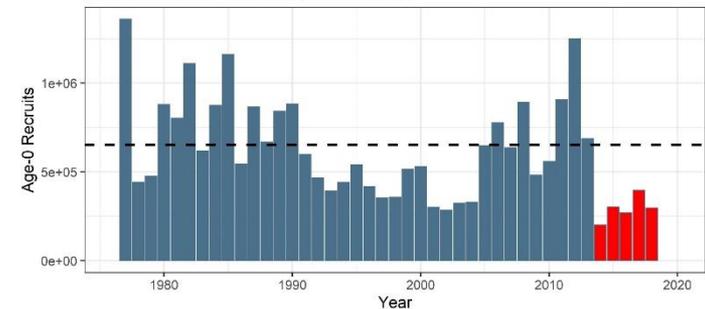
- Poor recruitment 2014-2018
- Sudden collapse of the stock
- 2019 lowest female spawning biomass in timeline (33Kt)

Gulf of Alaska Pacific cod female spawning biomass and catch



- Annual Catch
- Female spawning biomass

Gulf of Alaska Pacific cod recruitment





2018

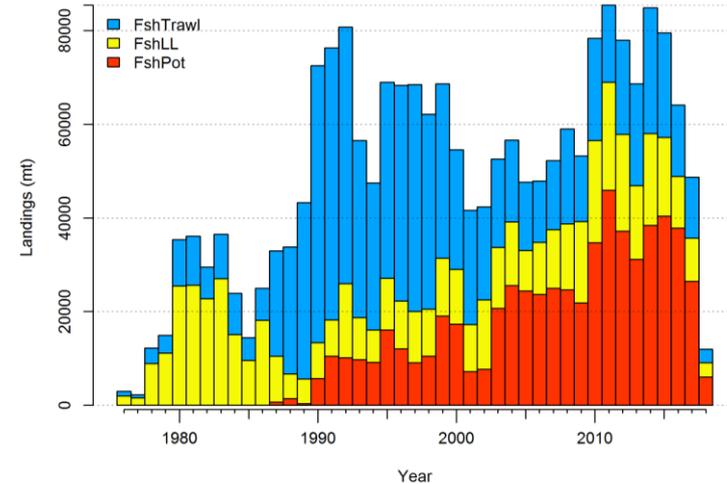
- 80% reduction in ABC
 - 88 Kt in 2017 to 18 Kt in 2018
 - Realized catch in 2018 was 15Kt
 - 69% reduction from 2017
- Reduction from \$75 to \$32 million in first wholesale value

2019

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

2020

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



STATE CAPITOL
PO Box 110001
Juneau, AK 99811-0001
907-463-3300
fax: 907-463-3332

550 West Seventh Avenue, Suite 1700
Anchorage, AK 99501
907-269-7410
fax 907-269-7461
www.Gov/Alaska.Gov
Governor@Alaska.Gov

Governor Bill Walker
STATE OF ALASKA

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
Bill Walker
Governor

Byron Mallott
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

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)

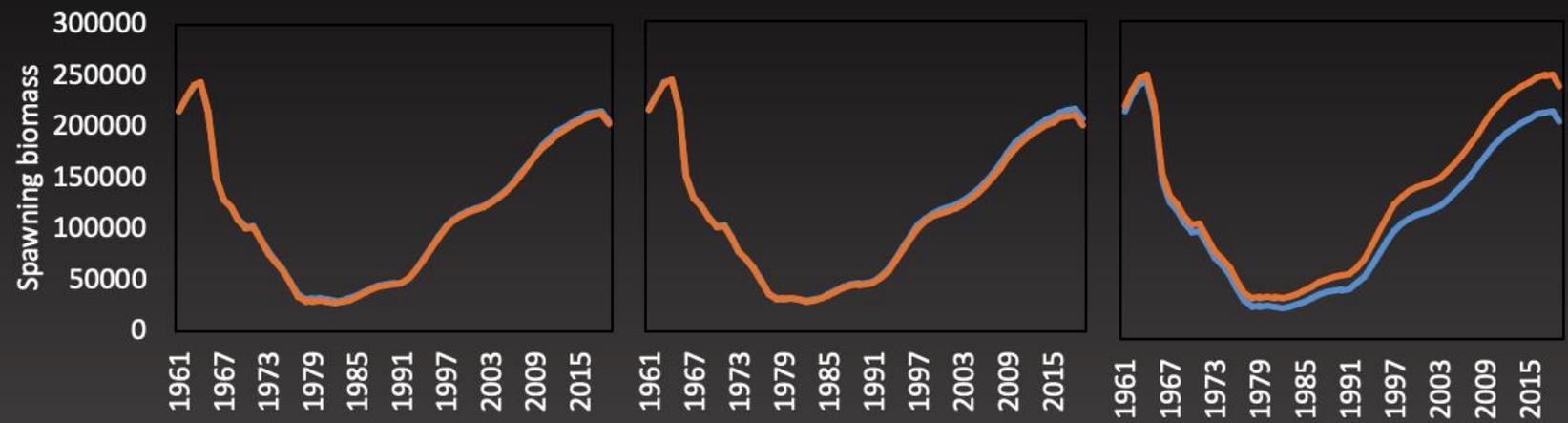
GOA Pacific Ocean Perch Model Update

Recommendations for Fall 2020 assessment

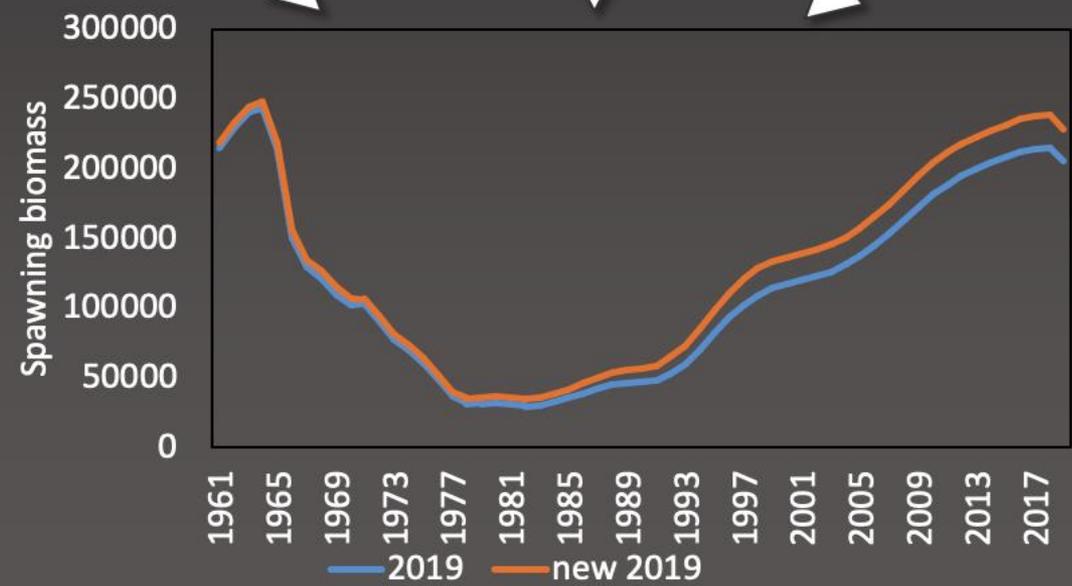
- While model sensitivity still an issue, an intermediate step to a full assessment in 2021 would be to update priors and data
- Specifically:
 - Update fishery age comps and ageing error matrix
 - Define prior on M based on Hamel (2015)
 - Define prior on q based on Jones et al. (in review)

Recommendations for Nov assessment

27 GAA Jan Term 17
26 GAA Jan Term 17
25 GAA Jan Term 17
24 GAA Jan Term 17
23 GAA Jan Term 17
22 GAA Jan Term 17
21 GAA Jan Term 17
20 GAA Jan Term 17
19 GAA Jan Term 17
18 GAA Jan Term 17
17 GAA Jan Term 17
16 GAA Jan Term 17
15 GAA Jan Term 17
14 GAA Jan Term 17
13 GAA Jan Term 17
12 GAA Jan Term 17
11 GAA Jan Term 17
10 GAA Jan Term 17
9 GAA Jan Term 17
8 GAA Jan Term 17
7 GAA Jan Term 17
6 GAA Jan Term 17
5 GAA Jan Term 17
4 GAA Jan Term 17
3 GAA Jan Term 17
2 GAA Jan Term 17
1 GAA Jan Term 17



— 2019 — new fa — 2019 — new q — 2019 — new M



— 2019 — new 2019

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.**

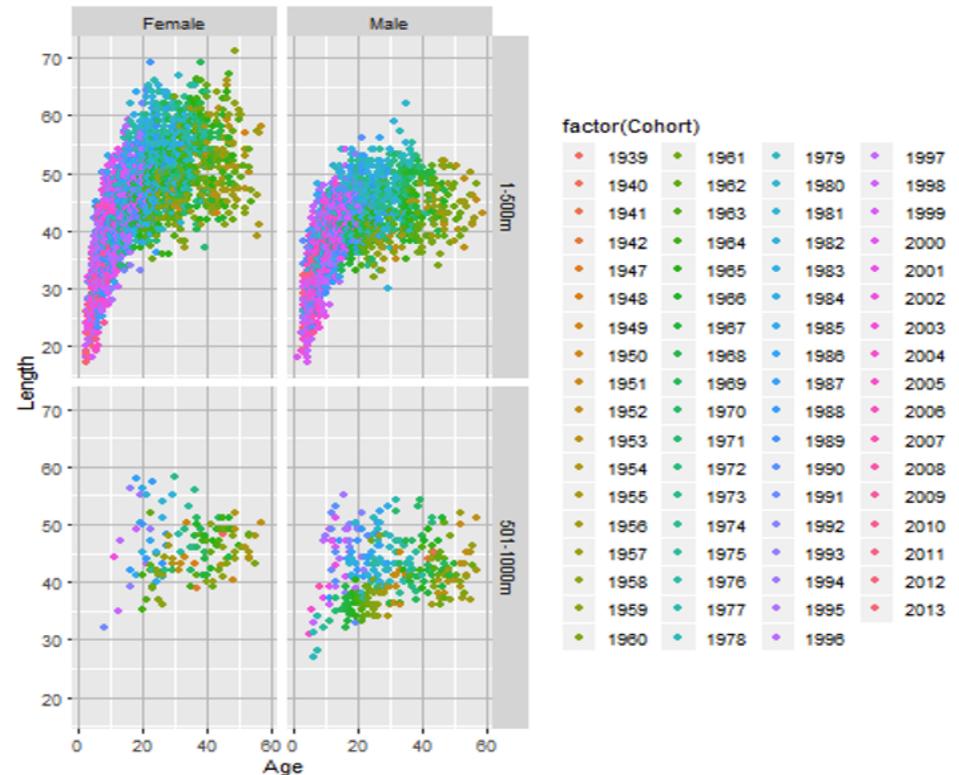
Dover sole

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

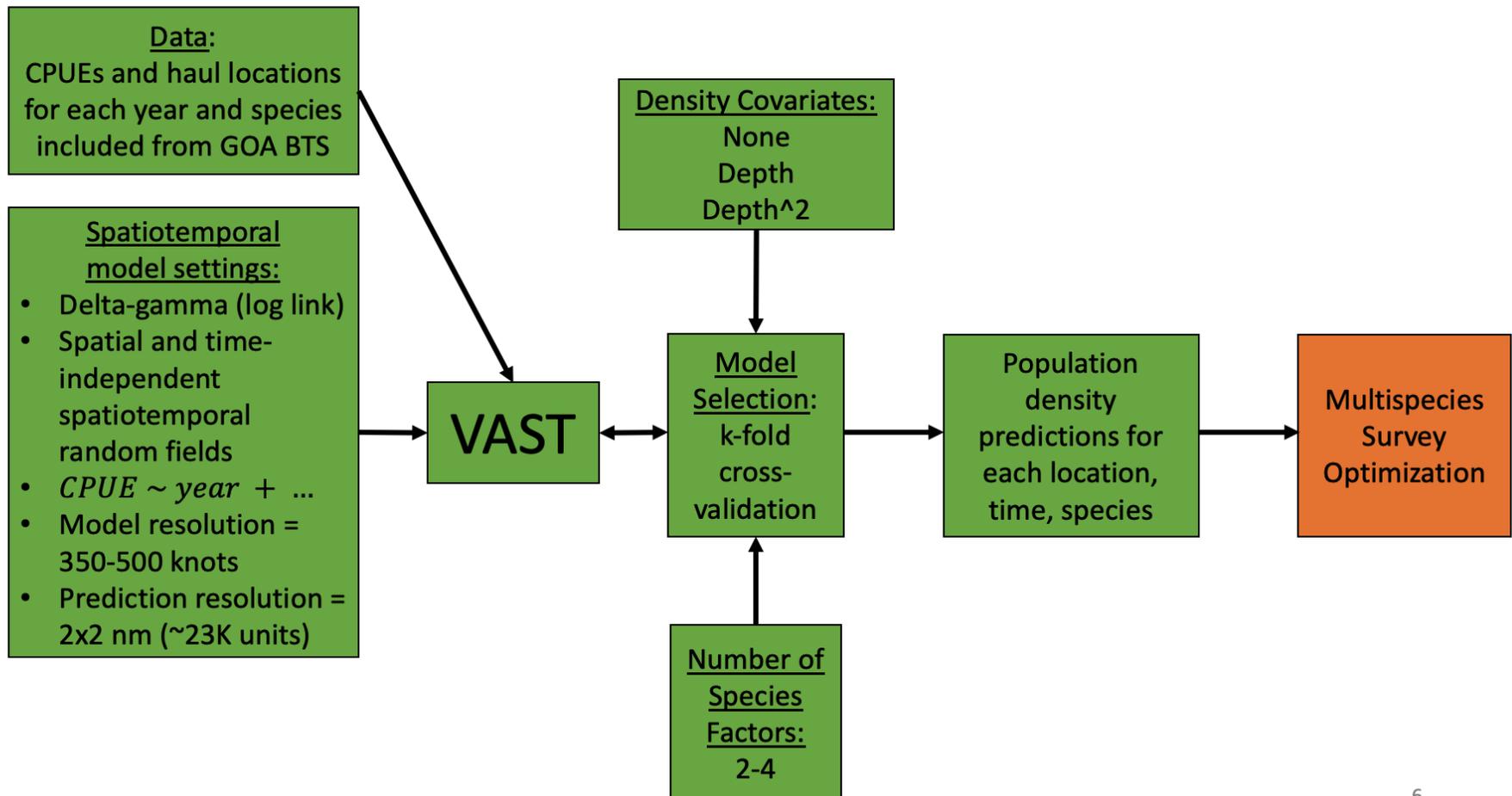
Presentation / overview by Andrea Havron

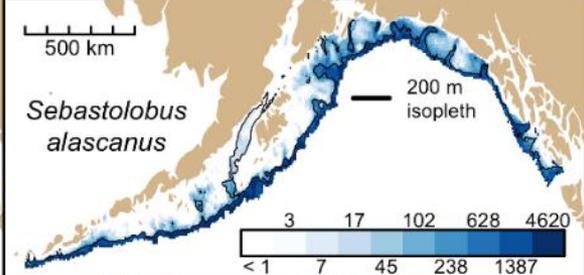
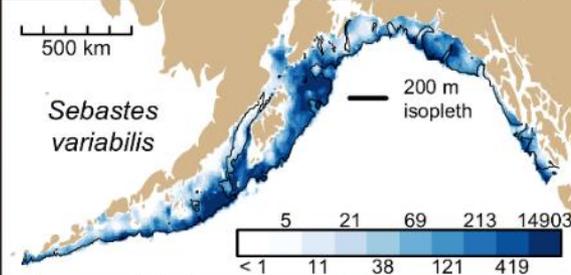
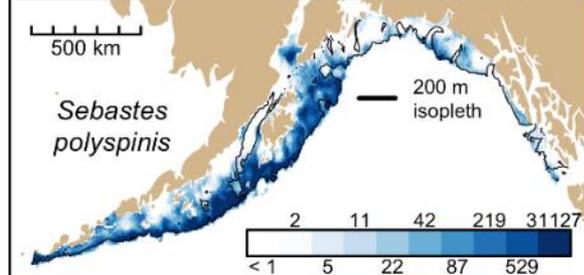
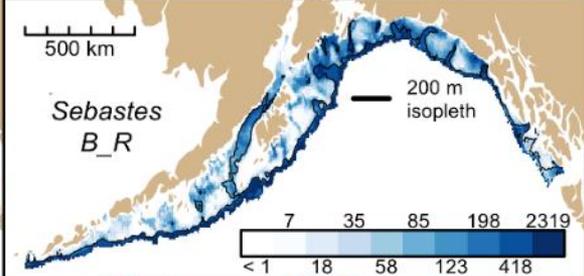
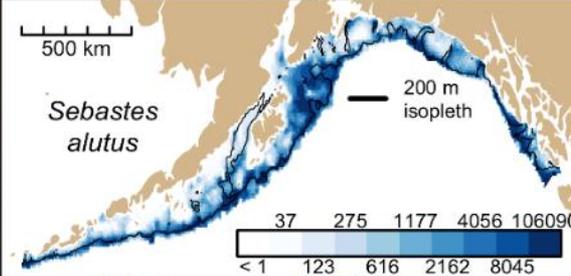
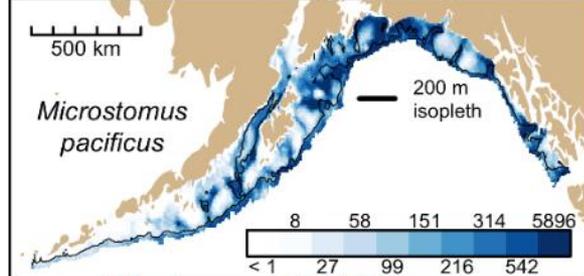
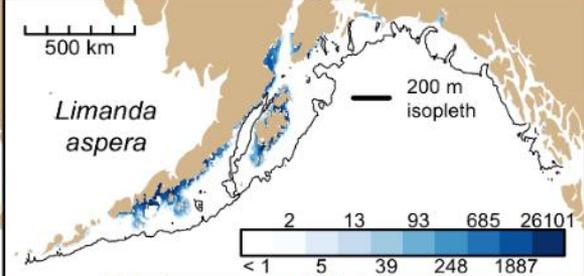
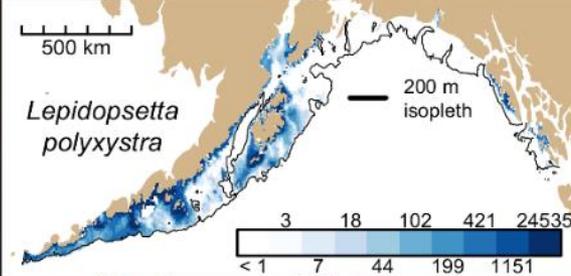
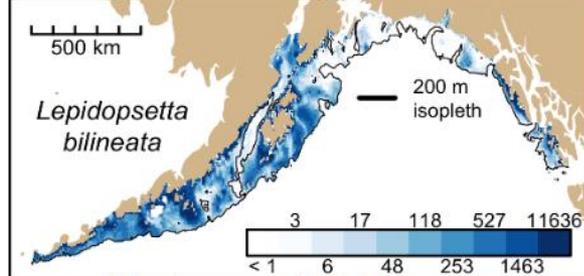
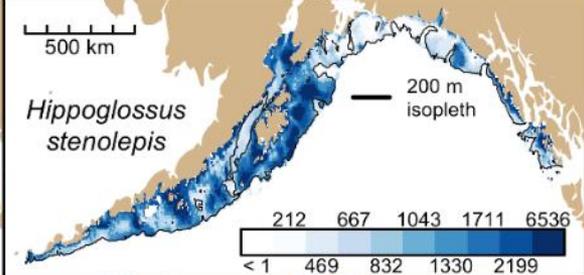
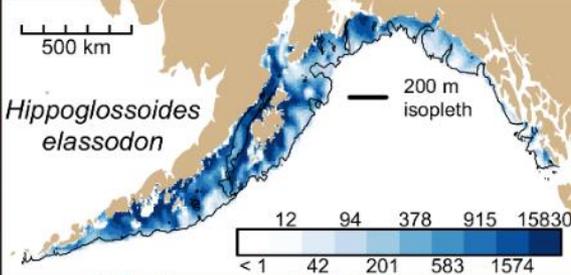
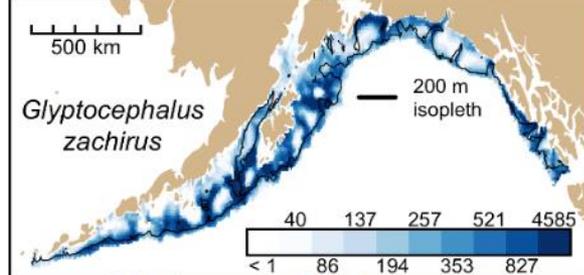
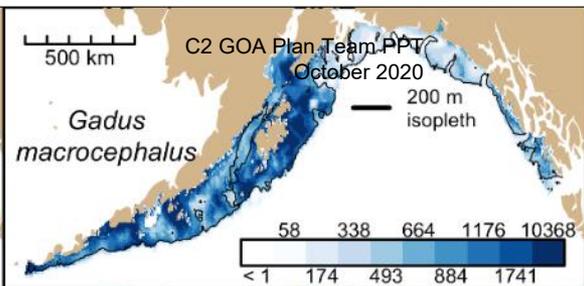
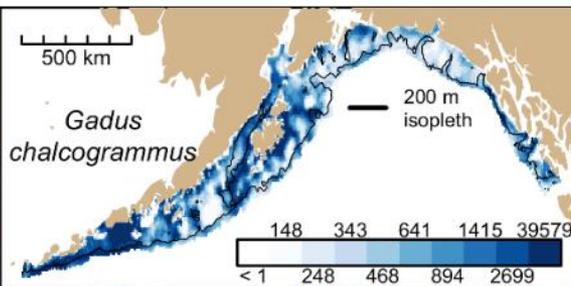
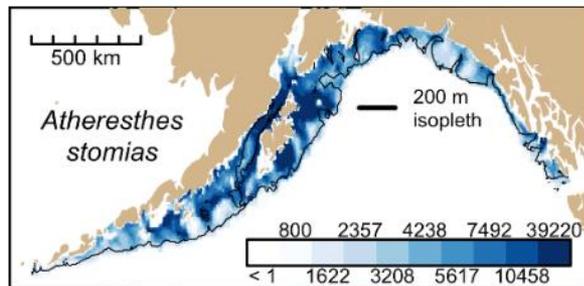
Relative to the movement and VAST approaches

- **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**



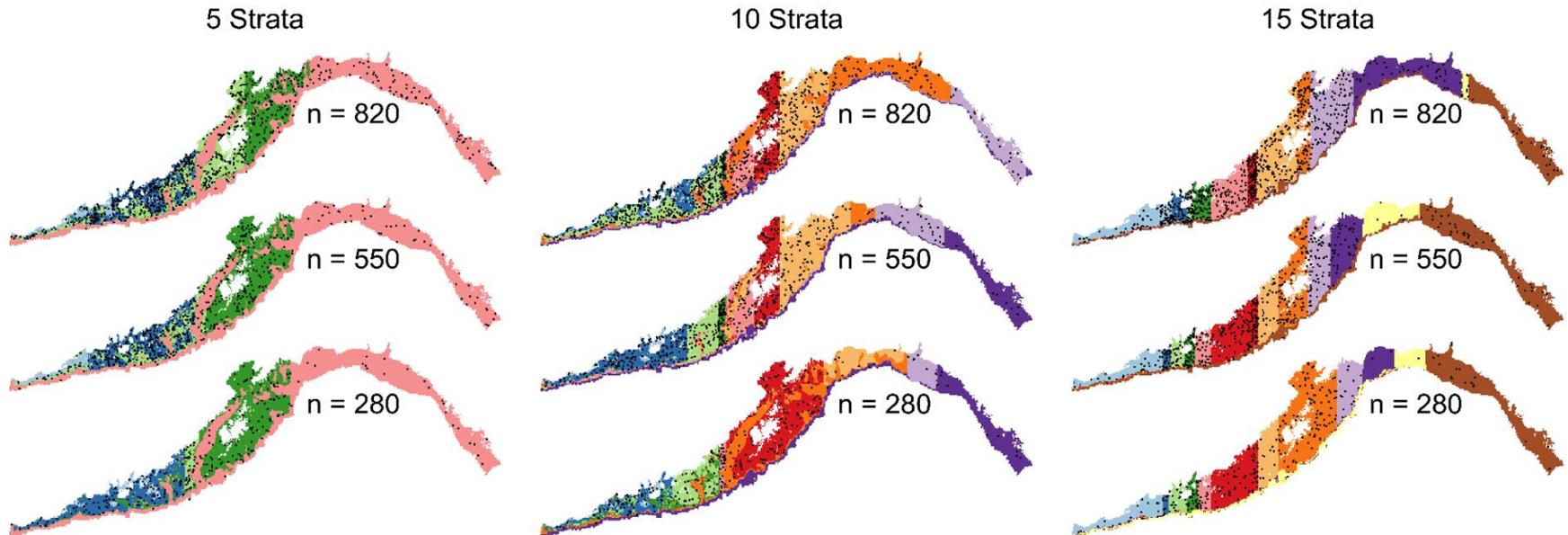


GOA Survey Optimization Scheme

- 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)

GOA Groundfish Specs- AP action

- Review Plan Team and SSC Proposed:
 - ABC & OFL
 - Halibut DMRs

- Provide AP Proposed:
 - TAC
 - PSC limits