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Alaska Fisheries  
Science Center

# Assessment of Pacific cod in the Aleutian Islands

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November 13, 2018

# Team and SSC comments

# Comments on assessments in general (1 of 3)

- *SSC1 (October 2017): "The SSC recommends that, for those sets of environmental and fisheries observations that support the inference of an impending severe decline in stock biomass, the issue of concern be brought to the SSC, with an integrated analysis of the indices in future stock assessment cycles. To be of greatest value, to the extent possible, this information should be presented at the October Council meeting so that there is sufficient time for the Plan Teams and industry to react to the possible reduction in fishing opportunity."*
  - The requested analysis was conducted during the summer
  - Because the results did not indicate that an impending severe decline is likely, and because a preliminary assessment was not conducted this year, the results are presented here, in the "Ecosystem considerations" section
  - See comment SSC3

# Comments on assessments in general (2 of 3)

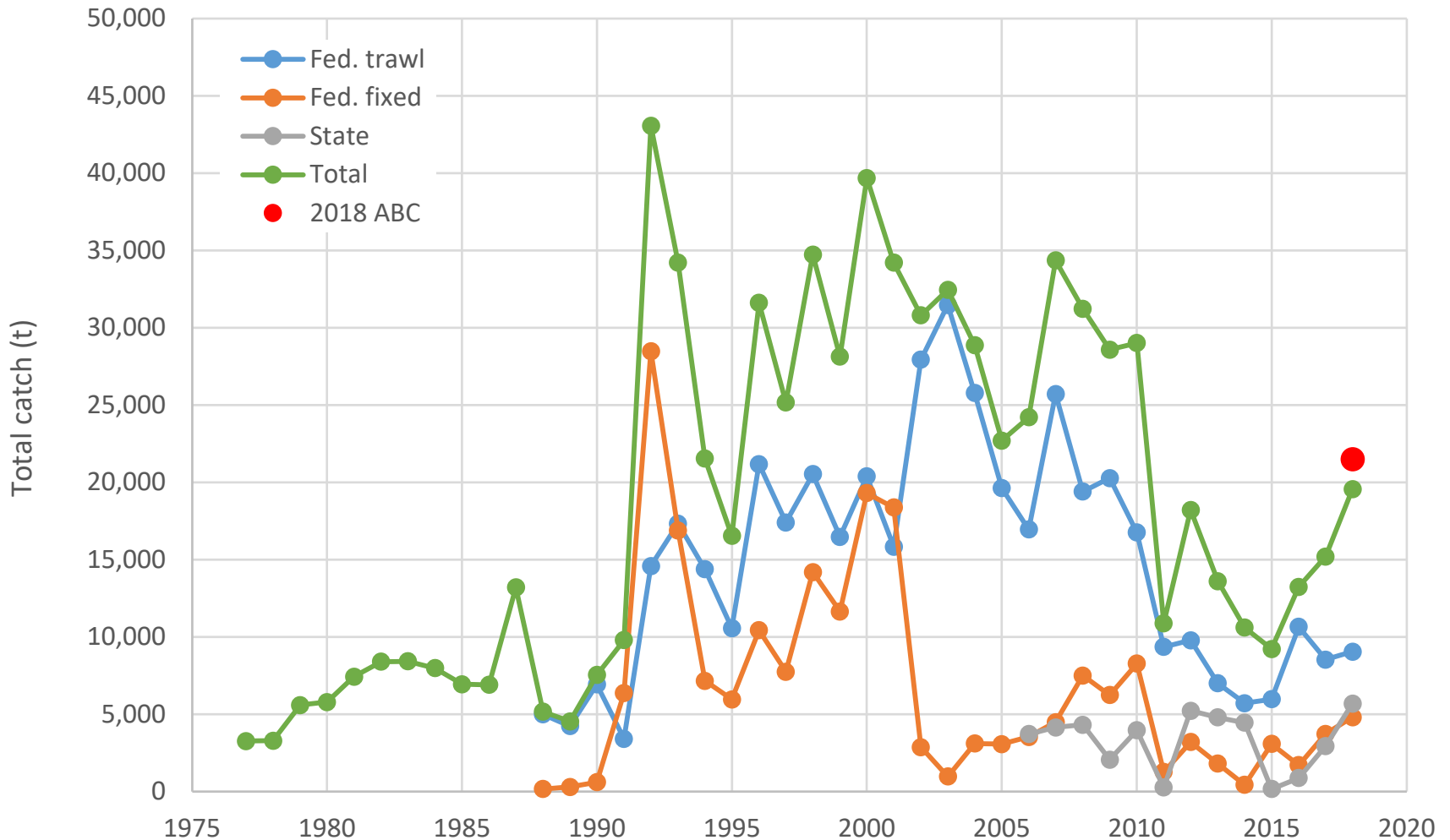
- *SSC2 (October 2017): "The SSC also recommends explicit consideration and documentation of ecosystem and stock assessment status for each stock ... during the December Council meeting to aid in identifying stocks of concern."* This recommendation was subsequently clarified in the minutes of the December 2017 SSC meeting and again in the minutes of the June 2018 SSC meeting (in the interest of efficiency these lengthy clarifications are not reproduced here), and then the following decision was reached at the October 2018 SSC meeting: *"The SSC recognized that because formal criteria for these categorizations have not been developed by the PT, they will not be presented in December 2018."*
  - In conformity with this decision, determinations regarding the current and future condition of the stock and ecosystem are not presented

# Comments on assessments in general (3 of 3)

- *SSC3 (October 2018, follow-up to comment SSC1): “Stock assessment authors are encouraged to work with ESR analysts to identify a small subset of indicators prior to analysis, and preferably based on mechanistic hypotheses.”*
  - This will be done prior to next year’s analysis.
- *SSC4 (October 2018): “It would be helpful for the Plan Teams and other authors of Tiers 5 and 6 stocks to explore the increasing number of methods available for data-limited situations.”*
  - Alternative methods for data-limited assessments will be explored when time permits.

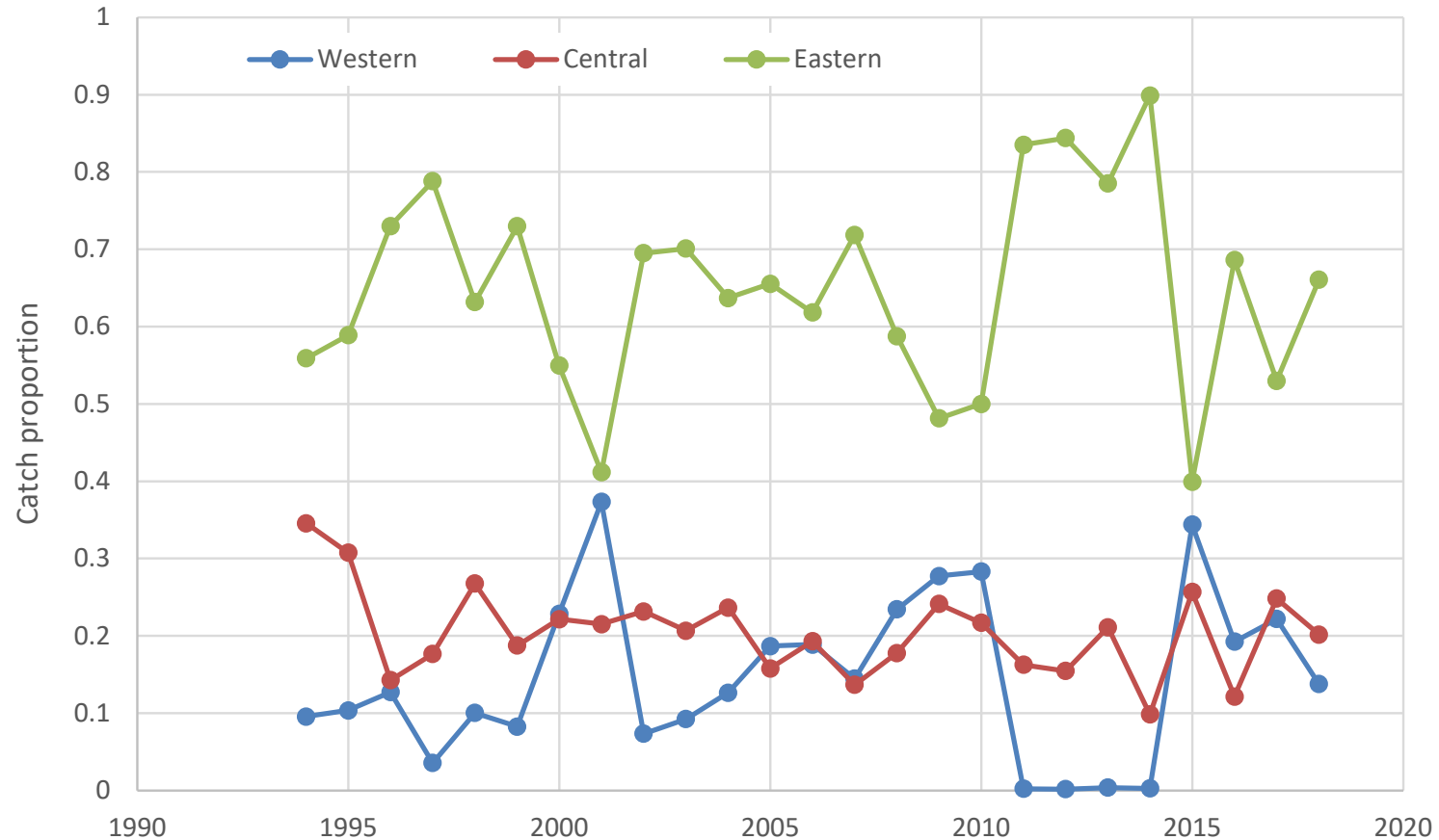
# Data highlights

# Catch history (2018 data are incomplete)



# Catch proportions by subarea

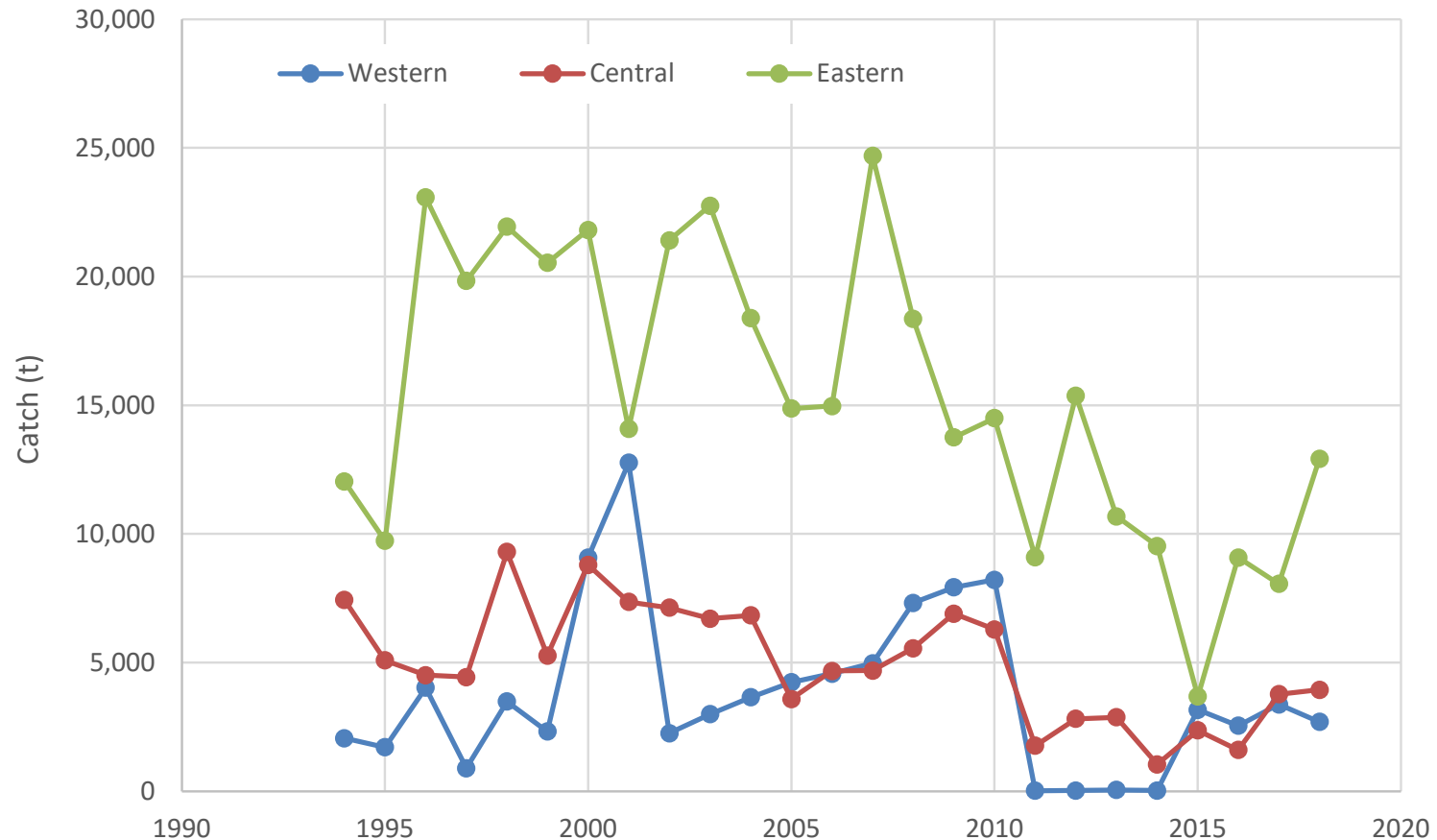
- Western area was closed from 2011-2014; 2018 data are incomplete



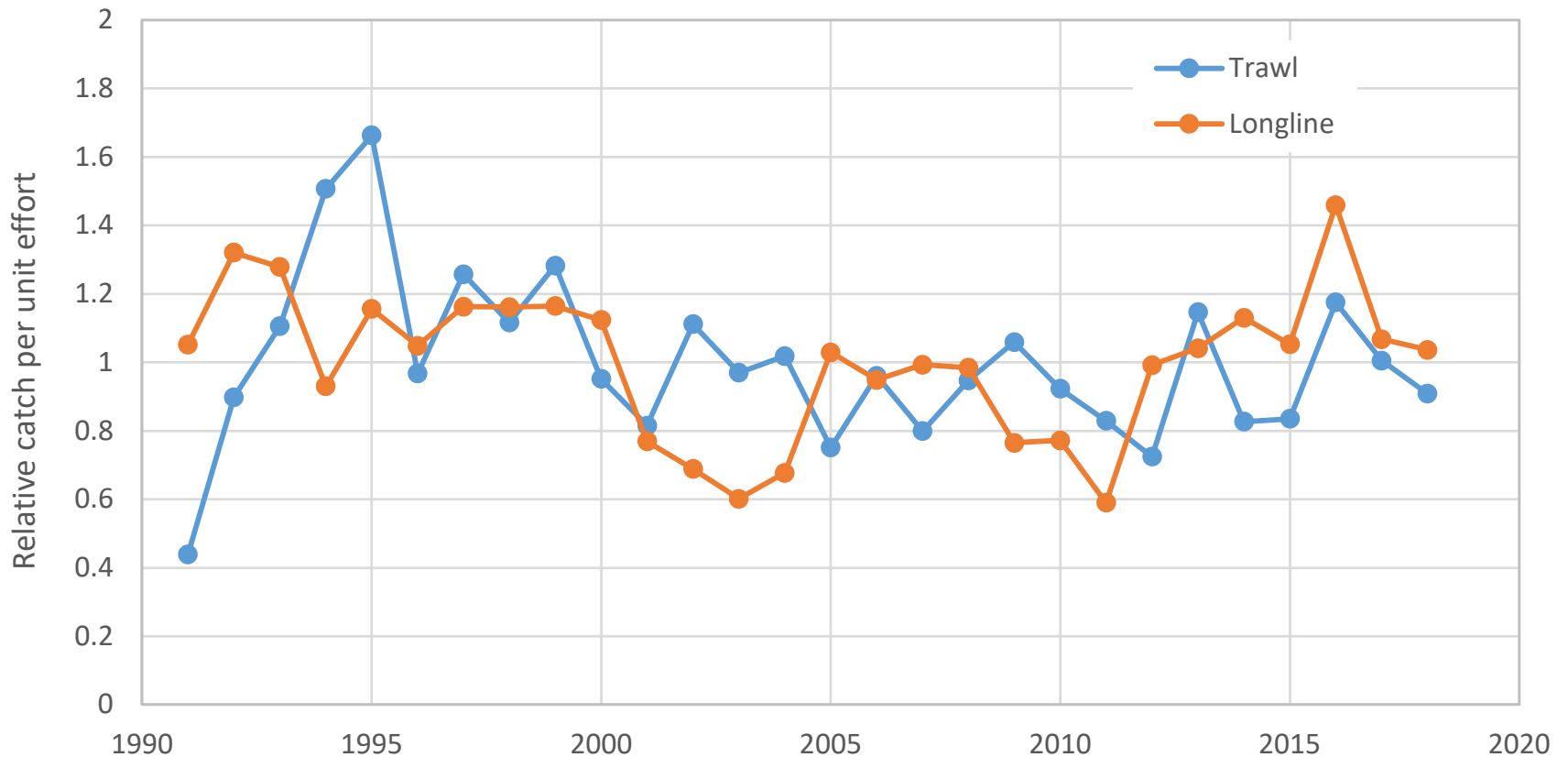


# Catch amounts by subarea

- Western area was closed from 2011-2014; 2018 data are incomplete

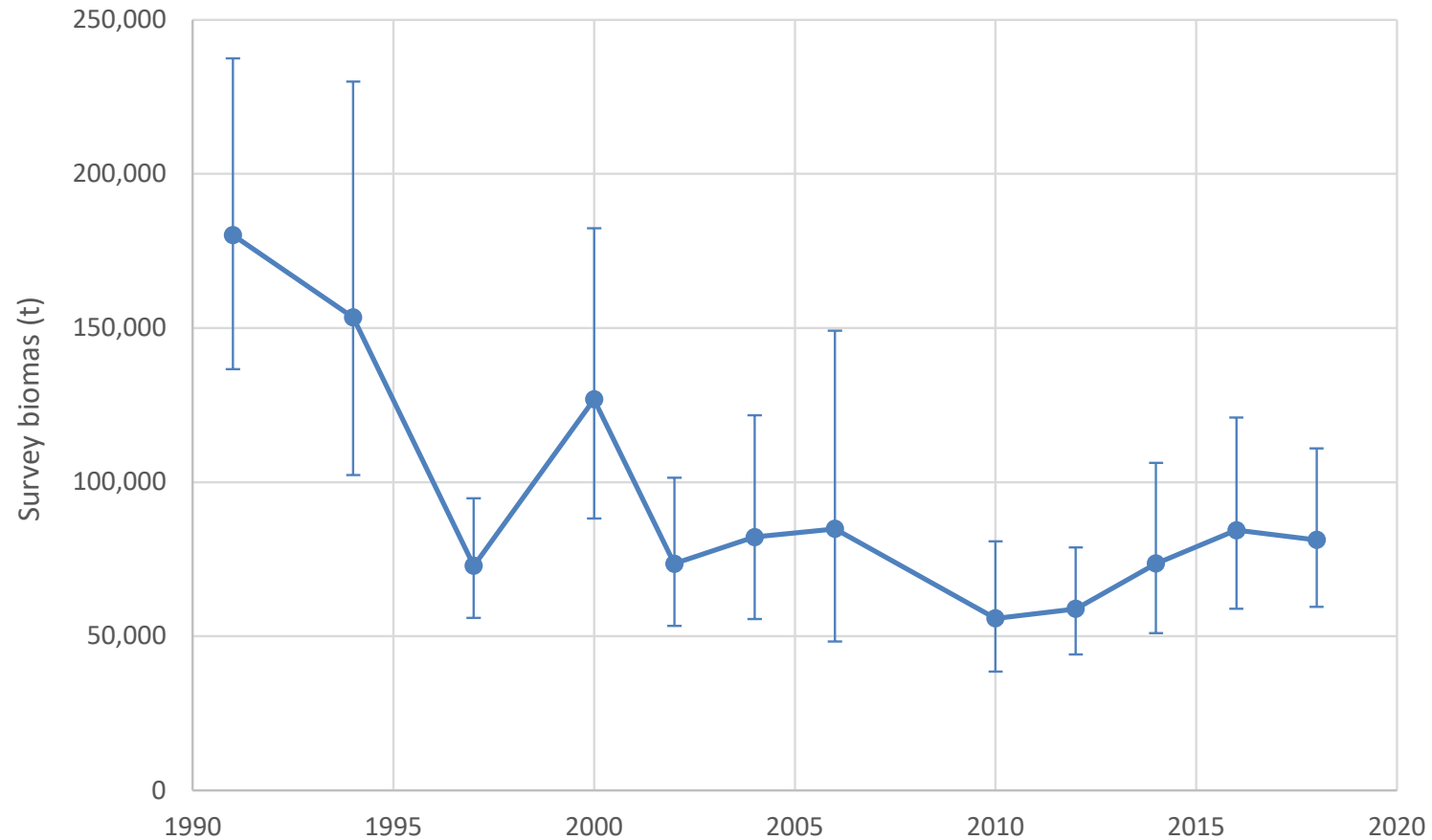


# Fishery CPUE (2018 data are incomplete)



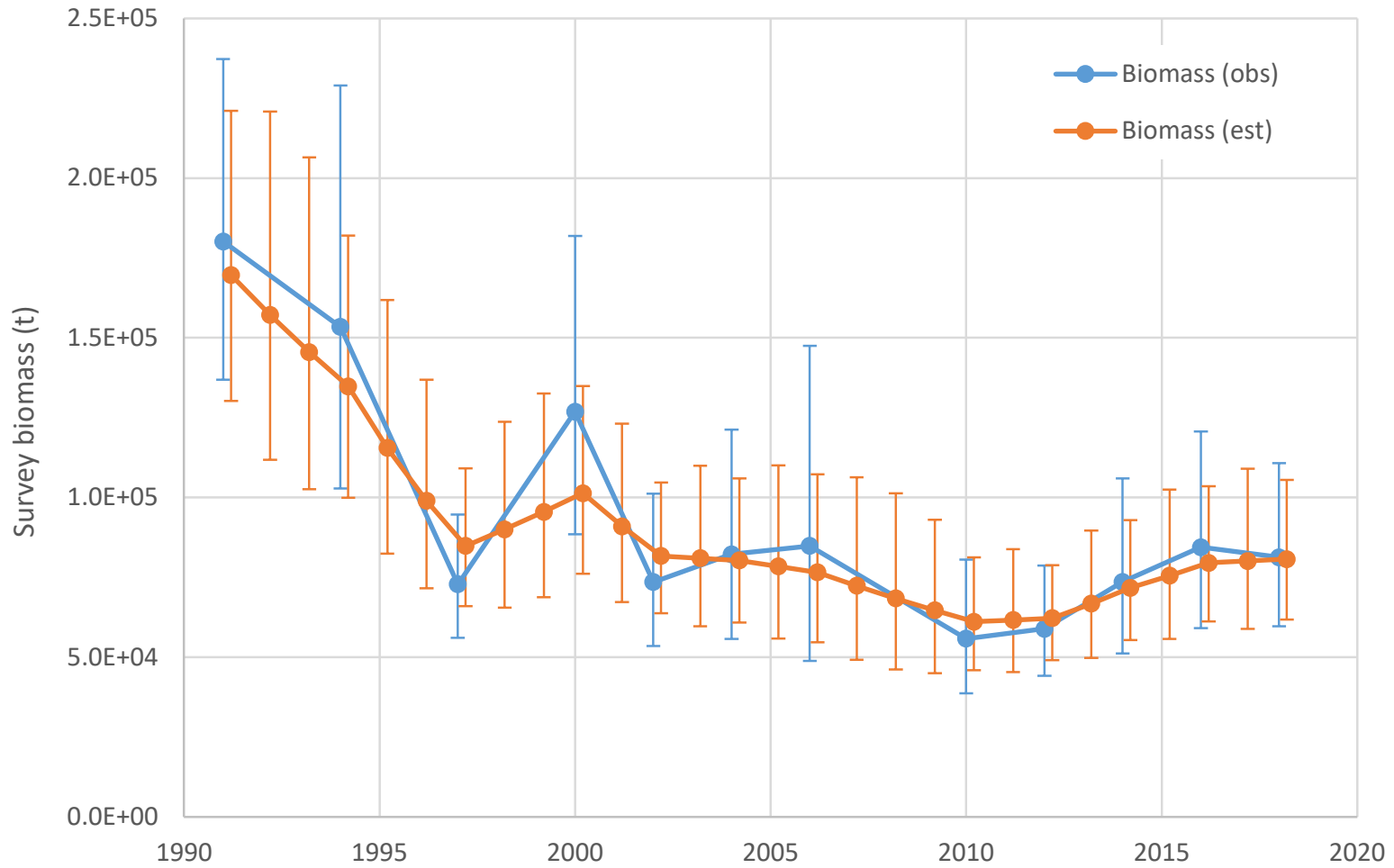
# Trawl survey biomass

- 2018 is down 4% from 2016, up 46% from 2010, down 14% from mean



# Results

# Fit to survey biomass: figure



# Fit to survey biomass: statistics (with previous)

- Log-scale process error standard deviation: 0.16 (0.17)
- CV of log-scale process error standard deviation: 0.36 (0.37)
- Root-mean-squared error: 0.105 (0.103)
- Average log-scale standard error (data): 0.180 (0.182)
- Mean normalized residual: 0.054 (0.054)
- Standard deviation of normalized residuals: 0.633 (0.625)
- Correlation (data:model): 0.972 (0.975)

# Summary table

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2018	2019	2019	2020
$M$ (natural mortality rate)	0.36	0.36	0.34	0.34
Tier	5	5	5	5
Biomass (t)	79,600	79,600	80,700	80,700
$F_{OFL}$	0.36	0.36	0.34	0.34
$maxF_{ABC}$	0.27	0.27	0.255	0.255
$F_{ABC}$	0.27	0.27	0.255	0.255
OFL (t)	28,700	28,700	27,400	27,400
maxABC (t)	21,500	21,500	20,600	20,600
ABC (t)	21,500	21,500	20,600	20,600
Status	As determined last year for:		As determined this year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a

- Natural mortality rate borrowed from Model 16.6i in EBS assessment
- See next 4 slides for the “harvest limit” in the Western subarea

# Western subarea “harvest limit”

- 50 CFR 679.20(a)(7)(vii), Pacific cod harvest limitations
  - During the annual harvest specifications process, the Regional Administrator will establish an Area 543 Pacific cod harvest limit based on Pacific cod abundance in Area 543 as determined by the annual stock assessment process.
  - NMFS will first subtract the State GHL Pacific cod amount from the AI Pacific cod ABC.
  - Then NMFS will determine the harvest limit in Area 543 by multiplying the percentage of Pacific cod estimated in Area 543 by the remaining ABC for AI Pacific cod.

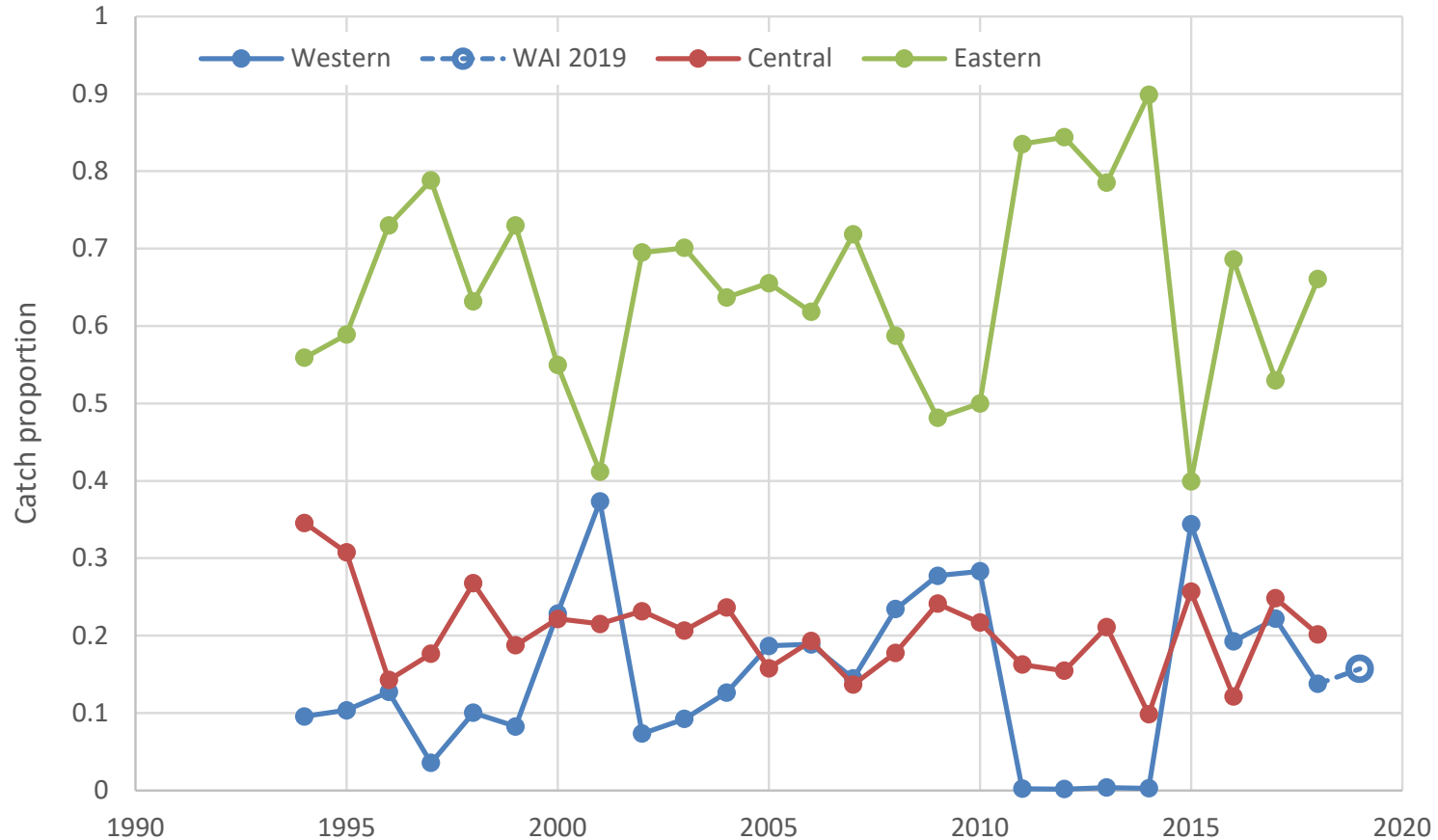


# Western subarea biomass proportion

- Survey data:
  - Time series average: 25.1%
  - Most recent point: 14.1%
- Model output:
  - Time series average: 24.5%
  - Most recent point: 15.7%
- Past recommendations have been to use the most recent model point

# Catch proportions by subarea

- 2019 value based on most recent model biomass proportion



# Catch amounts by subarea

- 2019 value based on most recent model biomass proportion

