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FISHERIES**

Alaska Fisheries
Science Center

Report of the November 2017 Joint Groundfish Plan Team meeting

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December 4, 2017

Meeting overview

- Dates: November 13-14
- Place: AFSC Seattle lab
- Leaders: Dana Hanselman (BSAI co-chair), Grant Thompson (BSAI co-chair), Diana Stram (BSAI coordinator), Jon Heifetz (GOA co-chair), Jim Ianelli (GOA co-chair), Jim Armstrong (GOA coordinator)
- Participation: 24 Team members present, plus numerous AFSC and AKRO staff and members of the public

Thank you, Farron!

- For your many years of faithful service as SSC member and chair

Agenda (action items in red)

- Administrative
- Team procedures
- Assessment analysis planning
- Central tendency measures
- Sablefish (will be presented as part of GOA Team report)
- Economic SAFE report (will be presented in February)
- SSC “general recommendation” on indicators of decline and ecosystem status

Team procedures

- Team actions will be characterized simply by the combination of stand-alone paragraphs with bold font, and may use any verb that the rapporteur and editors feel is appropriate (i.e., use of “recommends” is no longer required)
- Statements in the minutes that do not conform to the above format *are not* Team actions, even if the text suggests that they are
- *Except that*, we noticed too late that two “policies” under the “General” heading in the BSAI Team minutes do not have bold font even though they should
 - Bold font will be added before minutes are posted to the Team page on the Council website (as opposed to Granicus)

Assessment analysis planning (1 of 5)

- In February, the SSC requested the following 3 analyses, to be completed prior to this year's assessment cycle:
 1. An evaluation of how projected OFL-to-ABC buffers should increase in the intervening years between full assessments
 2. Development of a framework for evaluating the costs and benefits of changing the target frequency for the affected stocks and complexes
 3. A more quantitative evaluation of the potential risks of changing the target frequency of the GOA flatfish stocks to a four-year cycle
- In February, Council concurred with #2 and #3 and assigned them to the Teams, to be completed prior to next year's assessment cycle

Assessment analysis planning (2 of 5)

- In September, the Teams respectfully requested the Council to reconsider, given that so much work had already gone into developing the new schedule and that the requested analyses might well exhaust whatever time had been freed by the change
- The Council repeated its desire to have analyses #2 and #3 completed, and added analysis #1 to its list
- The Teams recommend that a workshop be convened, involving members (to be named) of the Groundfish Plan Teams, the Social Science Planning Team, and the SSC, along with the GOA flatfish assessment authors, to examine existing work that pertains to the costs and benefits of different assessment frequencies or either of the other requested analyses
 - This is a starting point, not the end product

Assessment analysis planning (3 of 5)

- While a comprehensive analysis of the benefits and costs of all assessment frequencies would be ideal, a full-blown methodology appropriate for all species will be extremely time-consuming
- Regarding the recommendation to evaluate the OFL/ABC buffer impacts, it is unclear how much effort should be focused in this process and how this effort connects to ongoing activities, such as the SSC's and Council's February request for "more rapid progress on innovative decision tables or decision theoretic approaches to management."
- The Teams would like to receive clarification from the SSC regarding the scope of the three analyses that were requested in February in the context of assessment prioritization

Assessment analysis planning (4 of 5)

- History of changes in assessment frequency (continued on next slide)
 - In 2004, 14 GOA assessments moved to biennial schedule
 - Criteria: dependence on biennial surveys, long-lived species
 - Analysis: 2 pages of text in EA/RIR for Amendments 48/48
 - SSC: "The SSC supports Option C, utilizing a biennial specification process for certain GOA species, because it should promote efficiency in the TAC setting process and utilizes new survey information as it becomes available."
 - In 2005, 9 BSAI assessments moved to biennial schedule
 - Criteria: dependence on biennial surveys, long-lived species, species not key prey of Steller sea lions
 - Analysis: ?
 - SSC: ?

Assessment analysis planning (5 of 5)

- History of changes in assessment frequency (continued)
 - In 2012, 3 BSAI assessments moved to biennial schedule
 - Criteria: “lower profile,” little or no targeting, low catch/ABC ratio
 - Analysis: 2 page document
 - SSC: ?
 - In 2017, 13 assessments (5 BSAI, 7 GOA, 1 both) moved, conditionally, to either biennial or quadrennial schedules
 - Criteria: low catch/ABC ratio, low inter-annual biomass change, low fishery importance, other (special cases)
 - Analysis: national prioritization protocol underwent multiple rounds of review, all authors completed extensive questionnaire, 17 page discussion paper, 2 day Joint Team meeting with 14 pages of minutes

Central tendency measures (1 of 8)

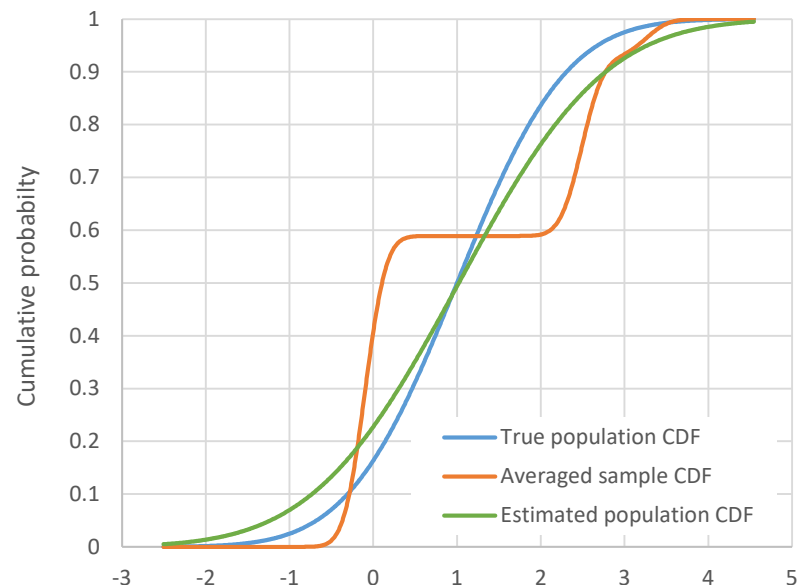
- From the SSC 10/17 minutes, directed to the EBS Pcod author:
“Clarify, with the Joint Plan Teams, the preferred measure of central tendency (e.g., median or mean) for assessments reporting probabilistic results either via Bayesian posteriors or model-averaged distributions.”
- Note: In the interest of efficiency, “average” as used in this presentation can mean either “weighted average” or “unweighted average” (same as “equally weighted average”)
 - This is not a presentation on model weighting

Central tendency measures (2 of 8)

- Approaches to alternative models (dichotomous):
 - A. From the population of all possible models, examine only 1
 - B. From the population of all possible models, examine a sample of size > 1
 1. Use only 1 model in the sample
 2. Use all models in the sample by assigning non-zero weights to each
 - a. Assign a weight of 0 to all models *not* in the sample
 - b. Use the averaged sample distribution to estimate the population distribution
 - Method is just exploratory at this point
 - EBS Pcod assessment provided it as an option

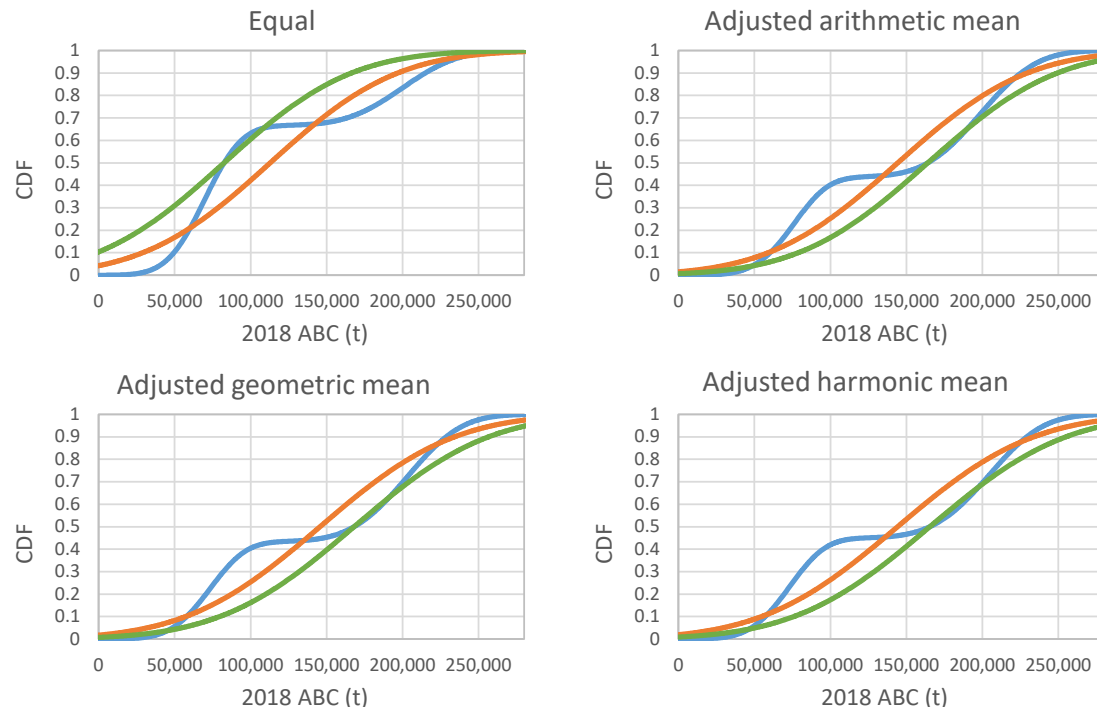
Central tendency measures (3 of 8)

- Hypothetical example:
 - Distributions of μ and σ (for normal distribution) given
 - “True” population distribution integrated over μ and σ
 - Three models with μ and σ drawn at random, weighted “correctly”
 - “Estimated” population distribution based on moments from sample



Central tendency measures (4 of 8)

- Actual example: EBS Pcod assessment
 - Blue = sample distribution, orange = population distribution fit to mean, green = population distribution fit to median
 - No way of knowing the true population distribution, of course



Central tendency measures (5 of 8)

- Approaches to uncertainty:
 1. Frequentist approach
 - Example: P^* approach to setting ABC
 - Given the distribution of the true-but-unknown OFL, set ABC such that the CDF evaluated at ABC equals P^*
 - Percentiles (e.g., the median if $P^*=1$) are key
 2. Bayesian ("decision-theoretic") approach
 - Example: constant relative risk aversion (RRA)
 - Given the distribution of long-term yield conditional on FABC, set FABC so as to maximize the mean of order 1-RRA
 - Expected values (e.g., the mean if $RRA=0$) are key

Central tendency measures (6 of 8)

- Fun facts about means and medians:
 - The sample mean is an unbiased estimator of the population mean, and the sample median is an unbiased estimator of the population median
 - In general, the sample median has a larger variance than the sample mean
 - E.g., if the population distribution is normal, the variance of the sample median will be greater than the variance of the sample mean (asymptotically) by a factor of $\pi/2$
 - If the population distribution is symmetric, the population mean and median are equal, in which case the sample mean is a better estimator (than the sample median) of either the population mean or median

Central tendency measures (7 of 8)

- Frequentist approaches naturally lend themselves to use of percentiles, such as the median
 - If the “final” distribution is just the averaged sample distribution, then the median is a more useful choice than the mean
 - If the “final” distribution is the population distribution as inferred from the statistics of the averaged sample distribution, the sample mean will provide a better estimate of the population distribution and its various percentiles, such as the median
- Bayesian approaches naturally lend themselves to use of moments, such as the mean
 - Regardless of sample distribution vs. population distribution
- Of course, if it is just a matter of *reporting*, easy enough to do both

Central tendency measures (8 of 8)





- The Teams concluded that the choice of central tendency measure depends on the task at hand and the approach taken and that, in the context of model averaging, the choices involved in assembling the suite of models are likely more important than the choice of central tendency measure

SSC “general recommendation” (1 of 6)

- Text of the recommendation (from the SSC 10/17 minutes):
 1. “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 involved.”
 - “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.”
 2. “The SSC also recommends explicit consideration and documentation of ecosystem and stock assessment status for each stock, perhaps following the framework suggested below, during the December Council meeting to aid in identifying areas of concern.”

SSC “general recommendation” (2 of 6)

- Sample table

Stock Assessment status			
			
Ecosystem Assessment status		2006 EBS Pollock	2016 EBS Pollock
		“No red flags were indicated.”	EBS Yellowfin sole

Zador and Harvey, In prep.

SSC “general recommendation” (3 of 6)

- Some questions regarding task #1:
 - Who will make the determination that some set(s) of environmental and fisheries observations “support the inference of an impending severe decline in stock biomass?”
 - What form should the “integrated analysis” take?
 - Who should conduct the integrated analysis?

SSC “general recommendation” (4 of 6)

- Some of my own thoughts on defining “severe” decline:
 - If the definition is too broad, severe declines may be hard to predict, as random chance becomes more likely to be a determining factor
 - If the definition is too narrow, predictors may be hard to test, as the sample size becomes very small
- Frequency of “severe” declines in the EBS and GOA trawl surveys, based on species present in at least 20% of hauls in all years:

"Severe" decline	EBS		GOA		Combined	
	No.	Prop.	No.	Prop.	No.	Prop.
-30%	12	0.050	16	0.143	28	0.080
-40%	5	0.021	6	0.054	11	0.031
-50%	1	0.004	3	0.027	4	0.011
-60%	0	0.000	1	0.009	1	0.003
-70%	0	0.000	0	0.000	0	0.000

SSC “general recommendation” (5 of 6)

- Some questions regarding task #2:
 - Should the “thumbs” table be used to accomplish task #2?
 - If “yes,” then:
 - Who will make the “thumb” determinations with respect to stock assessment status and ecosystem assessment status?
 - What criteria will be used to make the “thumb” determinations?
 - Is “stock assessment status” supposed to correspond to either of the status determinations that we are required to make under the MSFCMA?
 - If “no,” then how should task #2 be accomplished?
 - Would the anticipated “Ecosystem-Socioeconomic Profiles” suffice and, if so, will they be ready in time?

SSC “general recommendation” (6 of 6)

- Discussion on this topic included the feasibility/need to connect individual assessments to the ecosystem information in the ESRs
- Various people speculated that the information needed for the two tasks exists already, in which case the question would be how to connect ecosystem information to individual assessments and how to elevate those issues that are most pressing
- The Teams recommended that the coordinators and co-chairs work with the FEP Team through chairs Kerim Aydin and Diana Evans to appoint a workgroup that will develop a process for responding to the SSC recommendation (both task #1 and task #2), which should include addressing the questions and issues identified in these minutes, with the understanding that the workgroup will need to obtain Joint Team approval of the process in sufficient time to meet the deadlines identified in the SSC recommendation