INTERNATIONAL PACIFIC HALIBUT COMMISSION

Assessment update: September 2019

Agenda items 6.1 & 6.2

IPHC-2019-SRB015-07

Outline

- Recap of review schedule
- SRB requests from June
- External review discussion
- Research priorities (Part 1)
- Data updates
- Status reporting

Review process - SRB meetings

- June: research and development of assessment related products, major changes to assessment

  September: work meeting, informal updates for Commissioners

- September: follow up to June, minor changes as needed

  November: final data and assessment (no methods changes), Interim Meeting

- December: Optional conference call to address any unexpected issues

  January/February: Final documents and projections, Annual Meeting - mortality limits set

June requests

SRB014–Req.01 (para. 27): *"The SRB REQUESTED the following additional analyses for evaluation in September:*

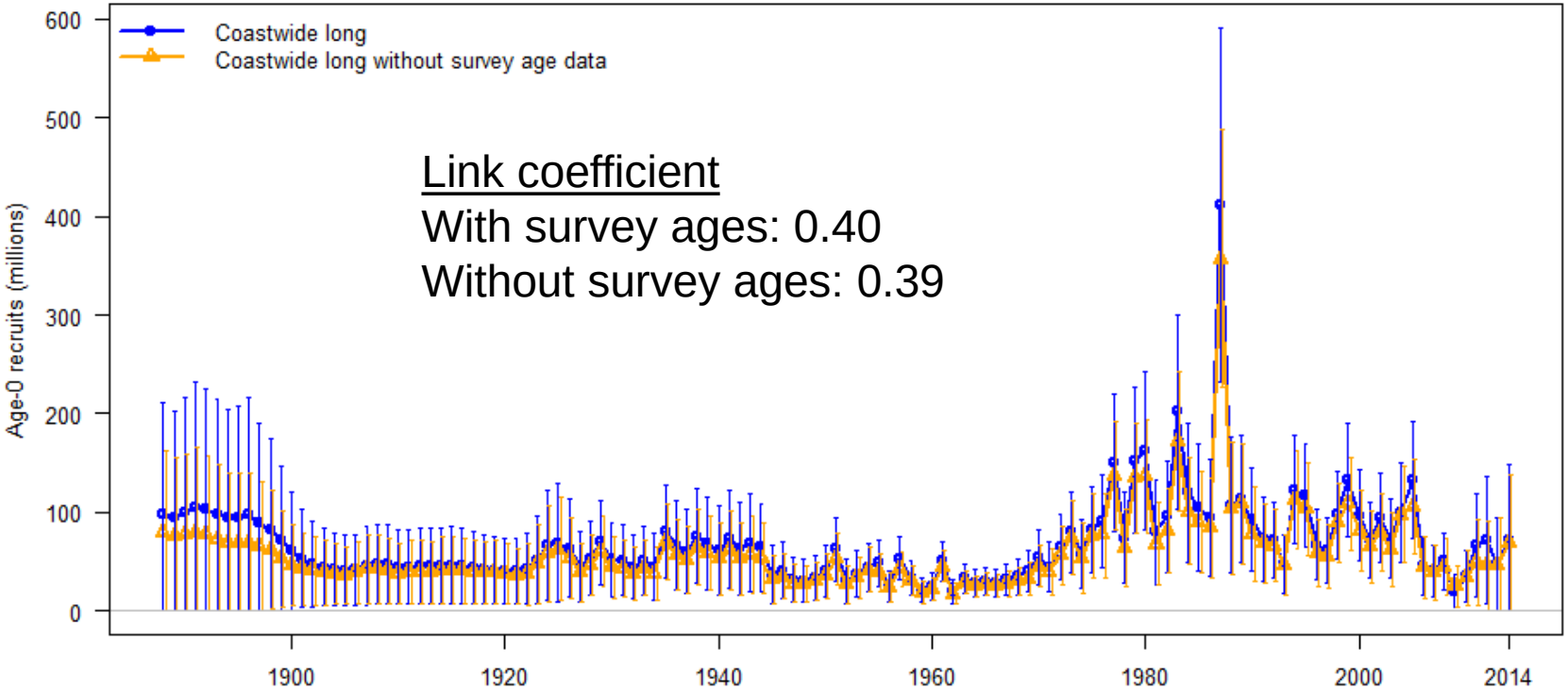
a) The Pacific Decadal Oscillation (PDO) index affects results that correspond with the presence and absence of FISS age data. As a check, perhaps evaluate models with the selectivity for the FISS fixed at the current estimates but then do a run which completely down-weights the FISS age data. This is intended as a check for the PDO coefficient.

b) Evaluate a profile (coarse) over steepness, e.g. 0.65 and 0.85, and check the impact on recruitment estimates and RSB values."

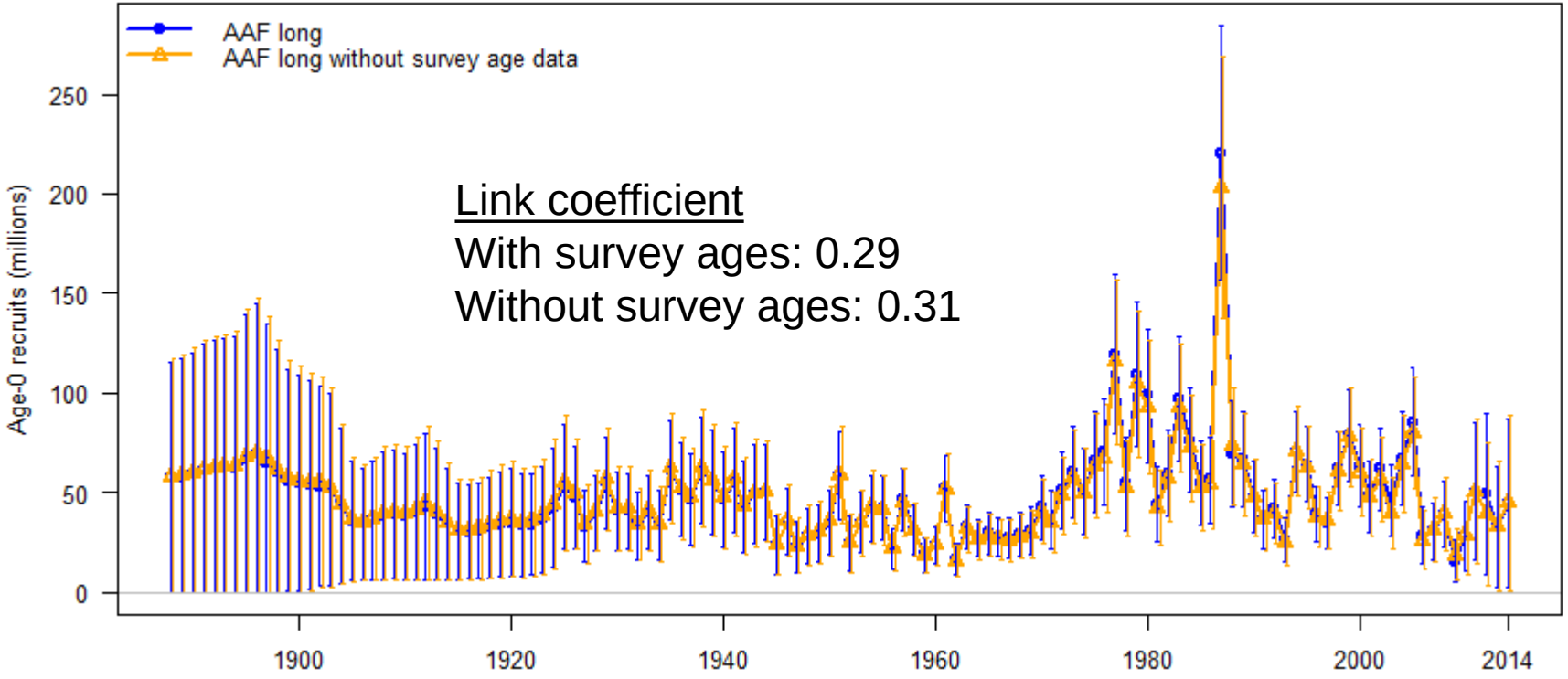
FISS data and PDO effects

- Estimate all model parameters
- Re-estimate with FISS selectivity parameters fixed at MLEs and likelihood component for FISS age data set to 0.0
- Compare time-series and PDO coefficients

FISS data and PDO effects: CW long



FISS data and PDO effects: AAF long



Note: Figure corrected from IPHC-2019-SRB-015-07

FISS data and PDO effects

- Conclusion:
  - PDO effects appear consistent with fishery age data, even when FISS age data are removed from the objective function

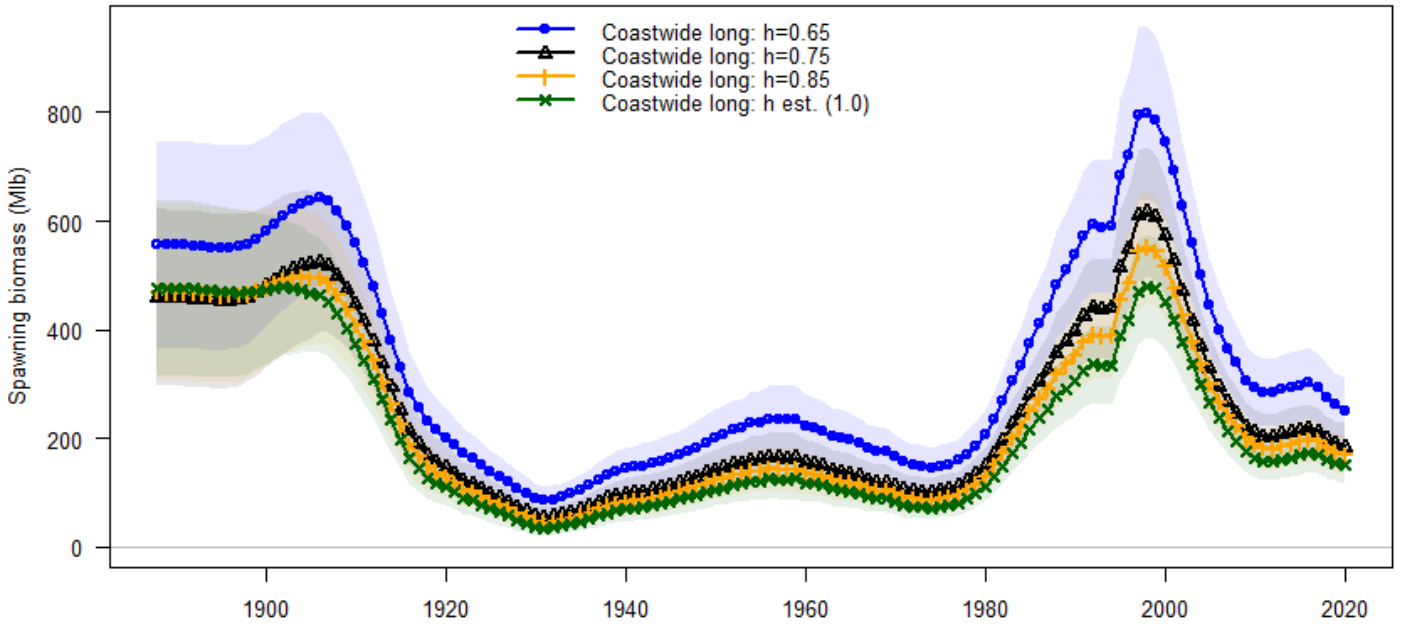
Steepness: profile

- Re-run all models with steepness values:
  - 0.65, 0.75, 0.85, estimated freely
- Compare SB, Recruitment and likelihood values

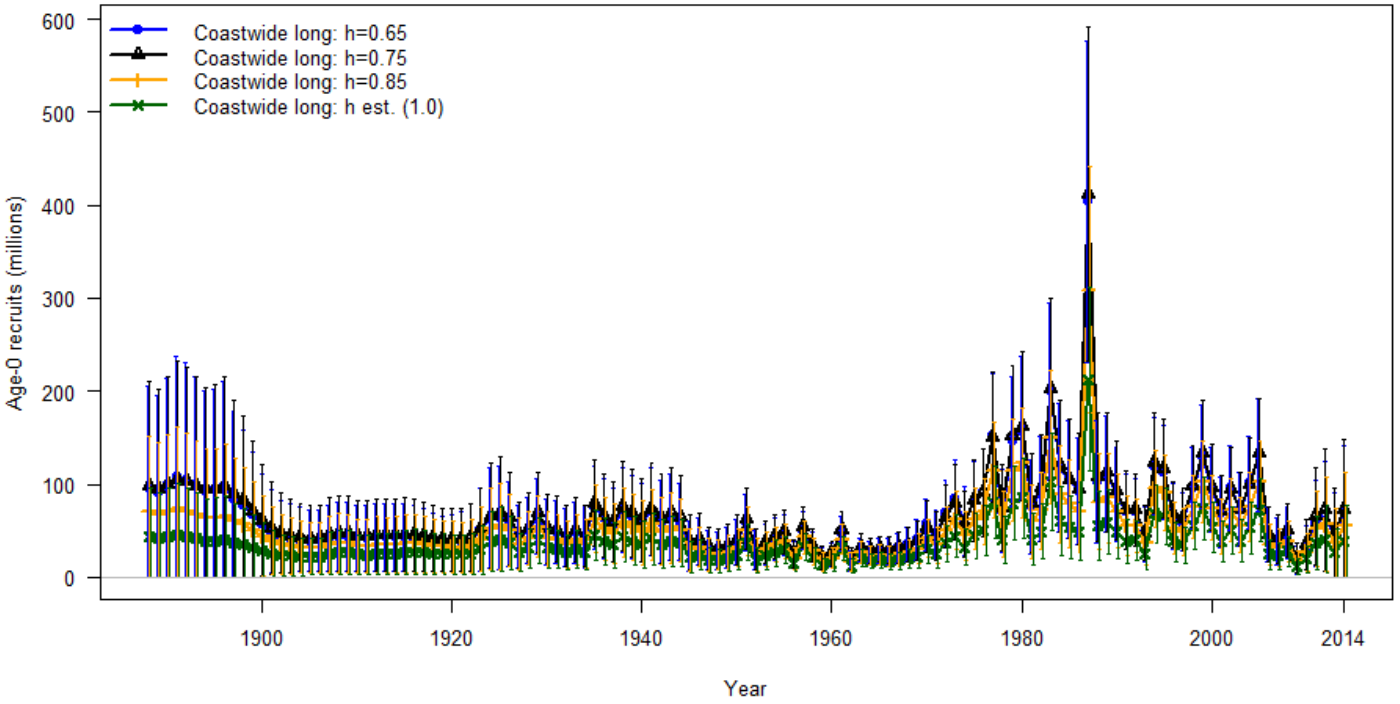
Steepness: profile

- Little difference in resulting estimates
  - CW short, AAF short, AAF long

Steepness profile: CW long

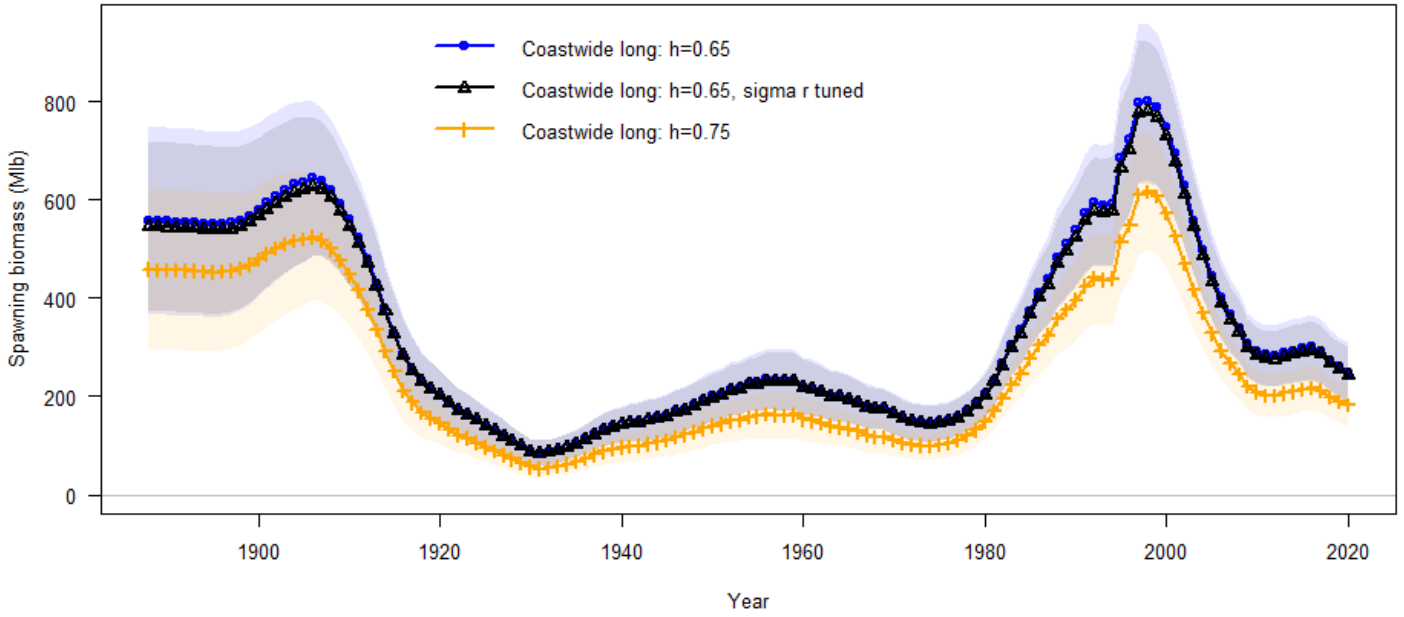


Steepness profile: CW long



Steepness profile: CW long

Differences due to constraining σ_r? No.



Steepness: profile

- Little difference in resulting estimates
  - CW short, AAF short, AAF long
- Coastwide long:

Steepness	Delta NLL
0.65	+32
0.75	+4
0.85	+2
Estimated (1.0)	0

Steepness profile: CW long

- Summary:
  - Data support values from ~0.75-1.0
    - (noting that likelihood deltas/AICs are highly sensitive to data weighting)
  - Higher values of steepness correspond to lower current (and historical) SB
  - Higher values of steepness will also correspond to increased relative spawning biomass

Steepness: CW long

- Decision point:
  - Include an additional model/models (nested) to the ensemble to account for uncertainty in steepness in the long coastwide model?

Independent peer review

- Document contains a select list of recommendations that may be worthy of further discussion or highlighting in the SRB015 report
- Some of this may have already occurred in Agenda item 4.0

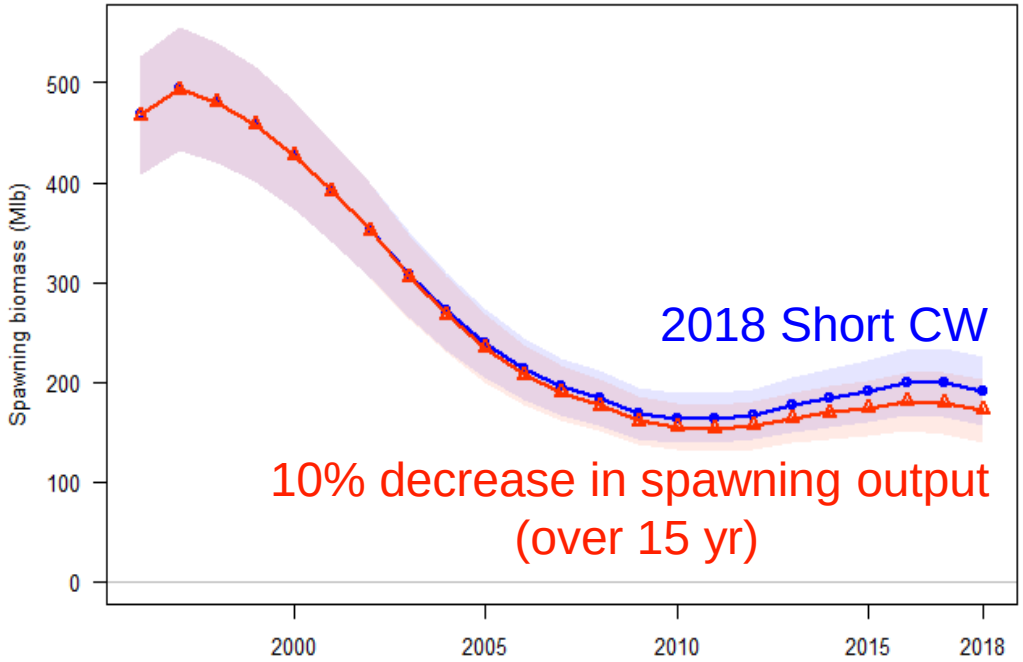
Independent peer review

- Decision points for SRB015:
  - Connectivity with Russian waters (p.12, 20) – is there analysis to be done ahead of the stock structure research?
  - Data weighting (p.11, 16) – should weights be adjusted during updates?
  - Stand-alone vs. generalized software (p.13) – should IPHC be planning to go back to independent code or following the next generation of generalized assessment code?
  - Leave-one-out ensemble robustness testing (p. 17-18) – should this be routinely included for the SRB or in the general document?
  - Presentation of research priorities (p. 19) – now included in all three presentations (Assessment, MSE, Research Program Updates). Are we getting closer?

Research priorities

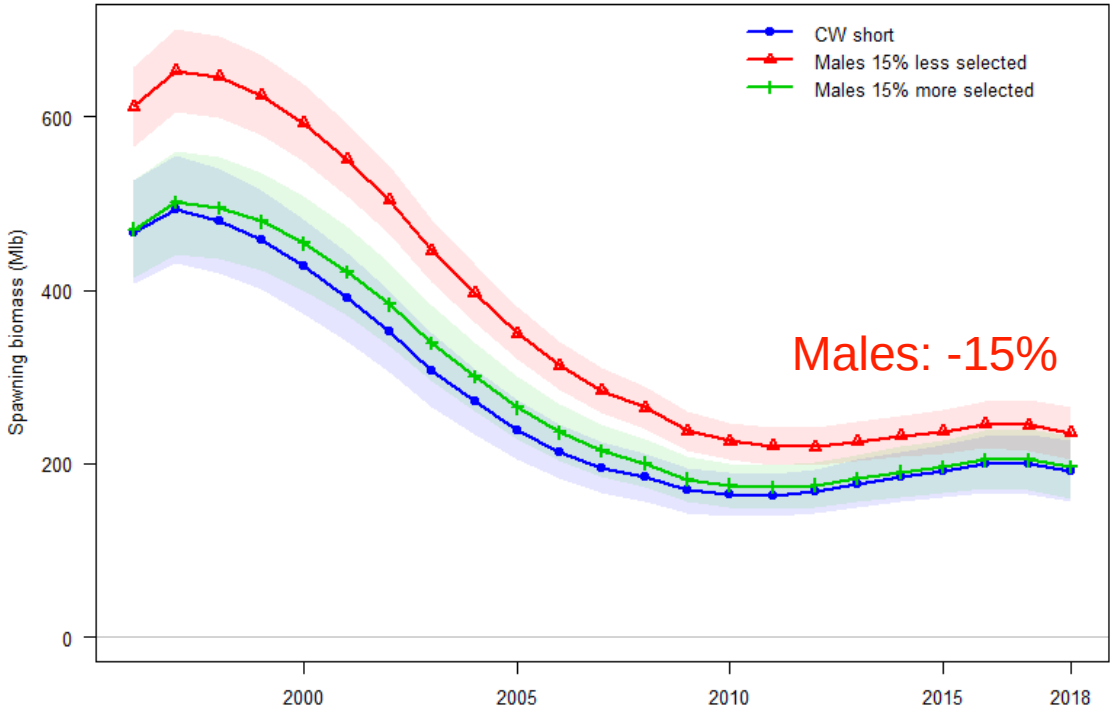
- Assessment: clearly documenting effects of new data
  - 2019 bridging analysis:
    - Whale depredation unimportant to assessment, but critical to stakeholders
    - Sex-ratio data very important to assessment
- Assessment: sensitivity analyses for planning purposes
  - Setting up the research needs
  - Conditioning expectations regarding effects

Sensitivity to maturity (2018): skip spawning or schedule changes



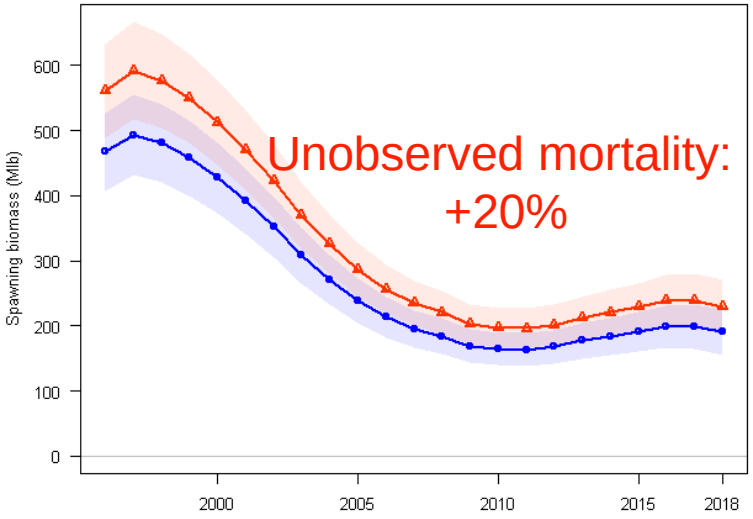
From: IPHC-2018-AM094-10

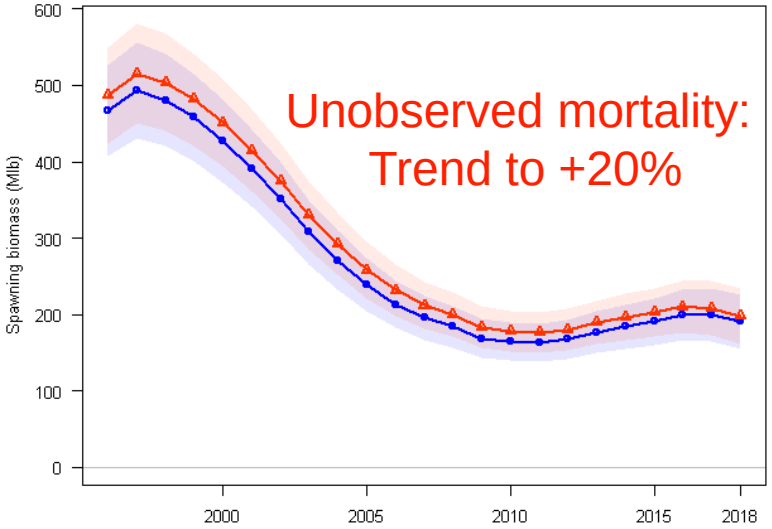
Sensitivity to male selectivity (2018):



From: IPHC-2018-AM094-10

Sensitivity to unobserved mortality, e.g., whale depredation, discards, etc. (2018):





From: IPHC-2018-AM094-10

Research priorities

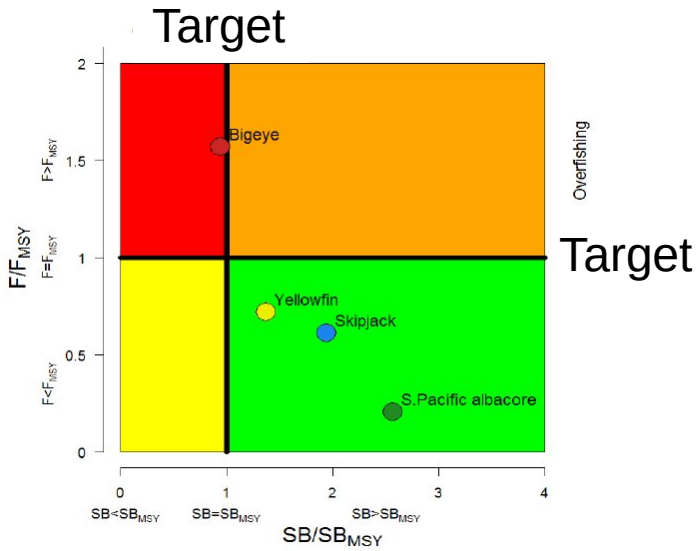
- Independent review gave a comprehensive evaluation of individual topics
- More discussion under Agenda items 7 & 8

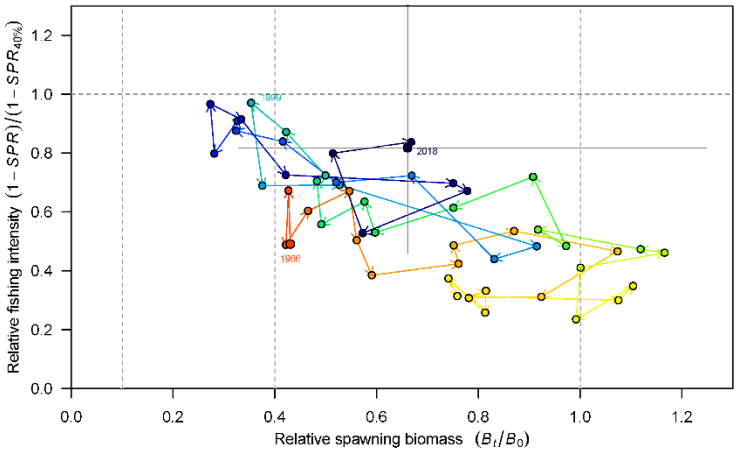
Data sources

- No new preliminary data available from 2019
- Expected sources:
  - Sex-ratio of the 2018 commercial landings
  - Standard data updates:
    - 2018 additions
    - 2019 observations
      - Mortality estimates
      - Fishery and modeled survey CPUE
      - Survey and fishery age data
      - Weight at age

Phase plots

- Also: Kobe plots, status plots, ‘stoplight’ plots
- Reporting status relative to fishing intensity and biomass reference points (e.g., targets and limits)





Previous discussions of phase plots

- SRB002 (2013)
- SRB007 (2015)
- SRB012 (2018)
- SRB013 (2018)

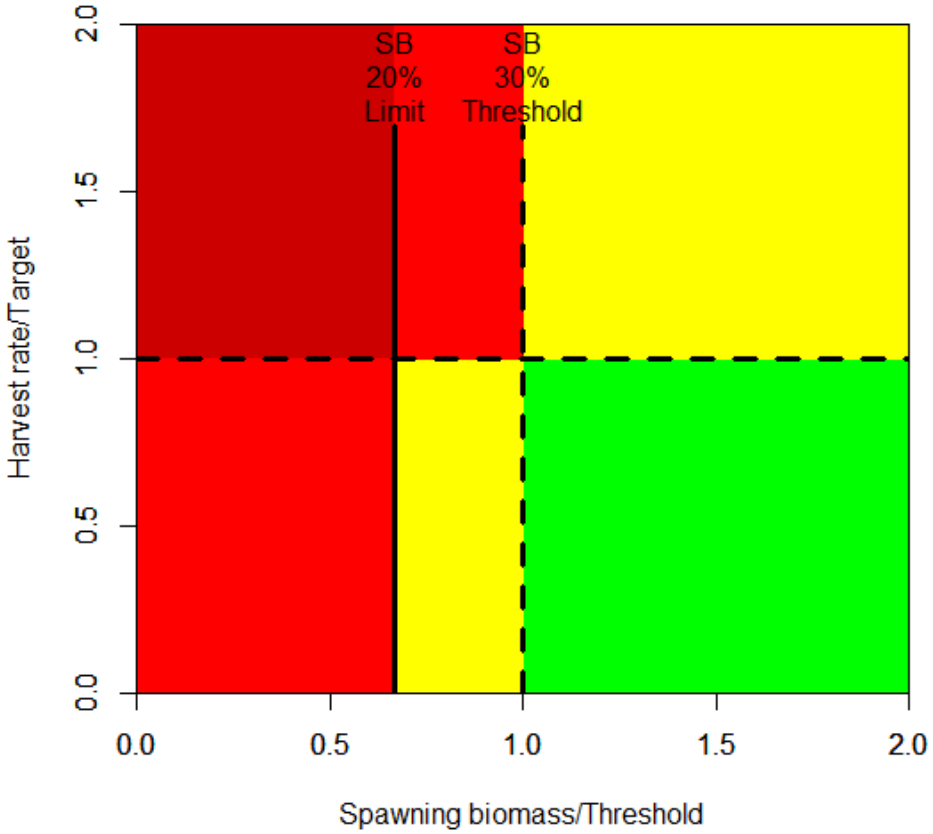
Phase plots

Standard
Fishing intensity target
Fishing intensity limit (optional)
Spawning biomass target
Spawning biomass limit (optional)

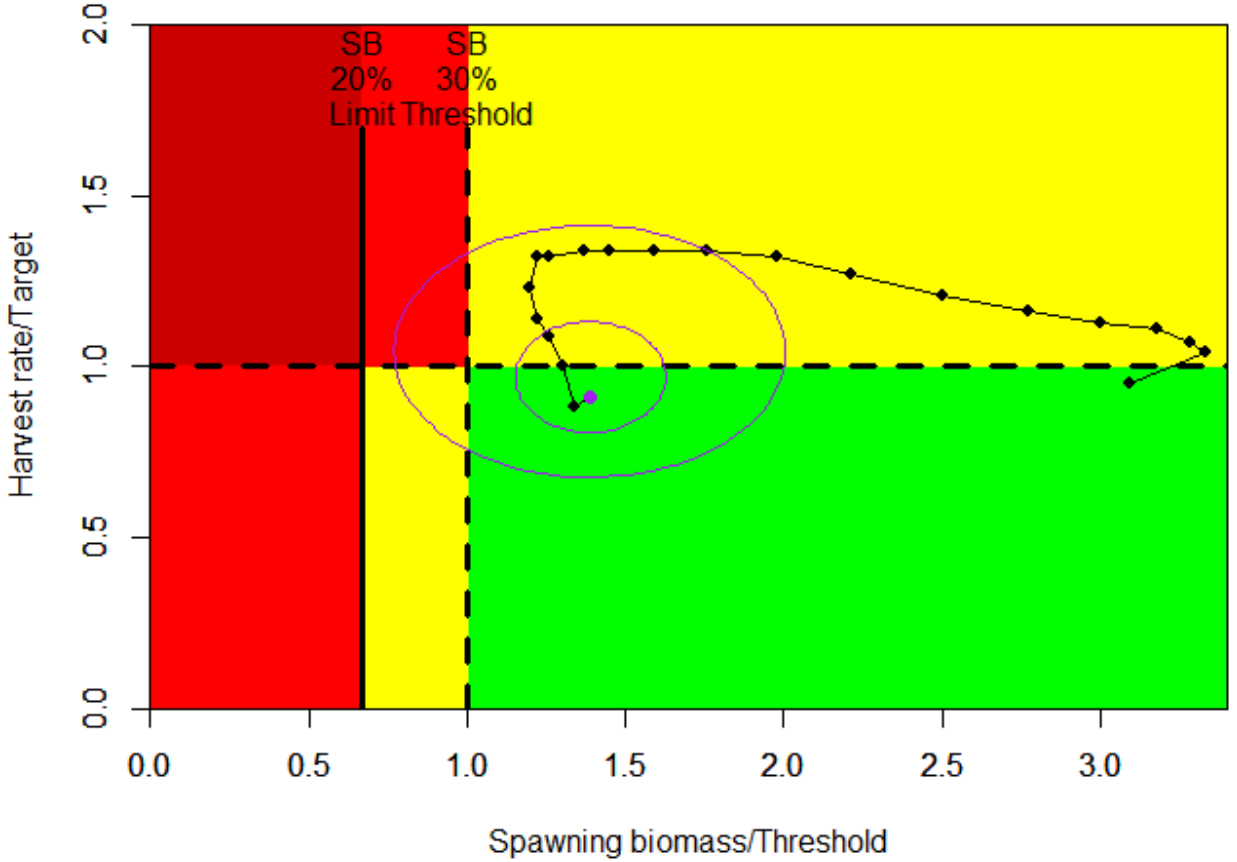
Phase plots

Standard	IPHC – Interim management strategy
Fishing intensity target	Is $F_{SPR=46\%}$ functioning as a target for the purpose of status determination?
Fishing intensity limit (optional)	None
Spawning biomass target	Is $SB_{30\%}$ functioning as a target for the purpose of status determination?
Spawning biomass limit (optional)	$SB_{20\%}$

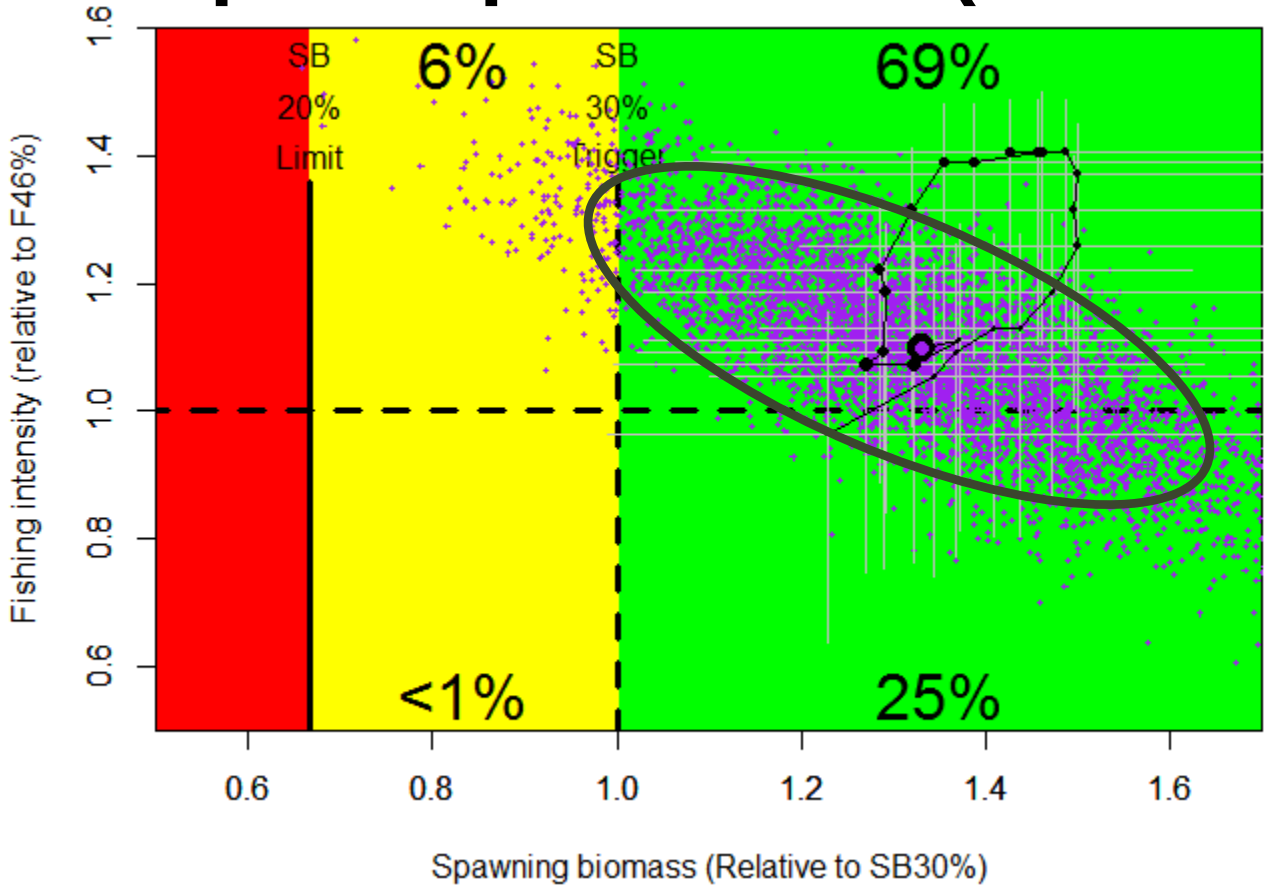
Phase plots (2013)



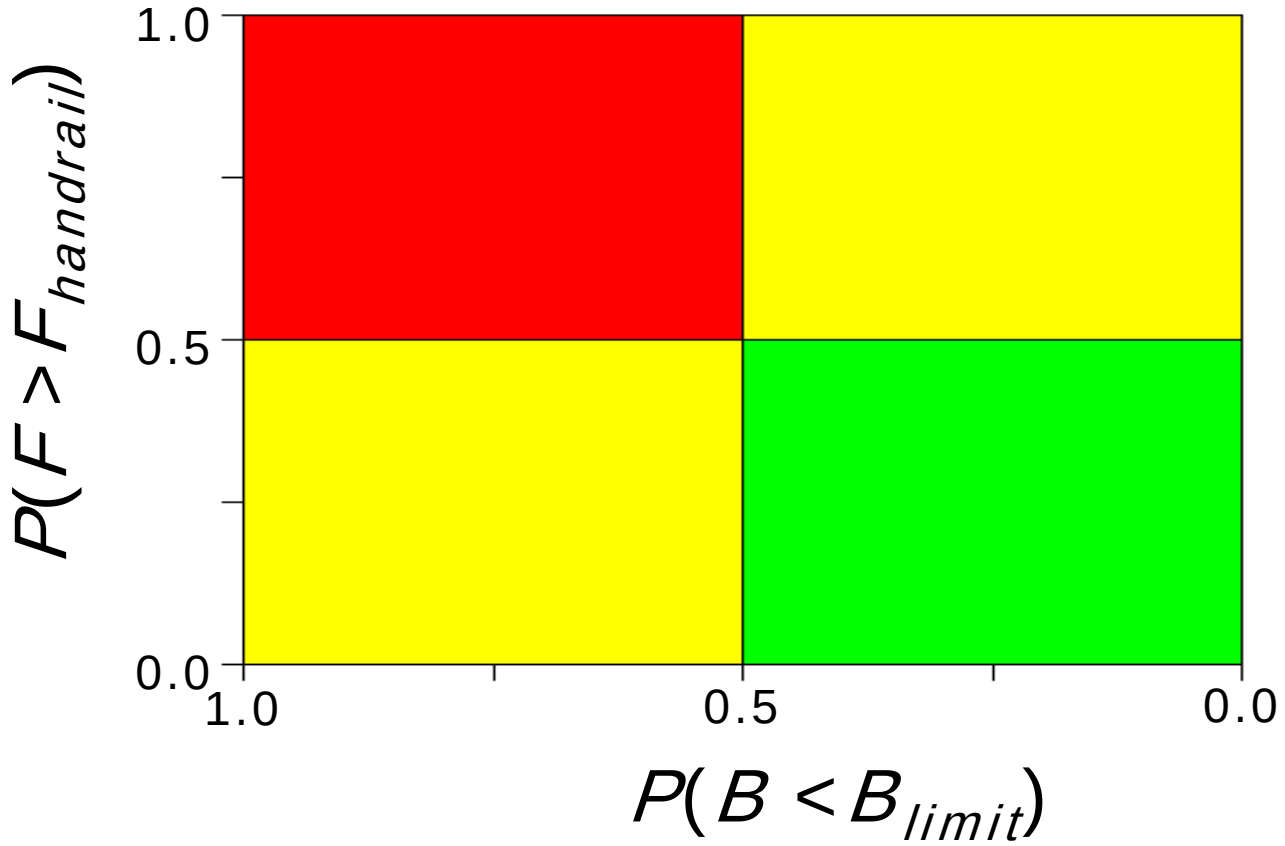
Previous phase plots: 2015 (SRB007)



Previous phase plots: 2018 (SRB012)



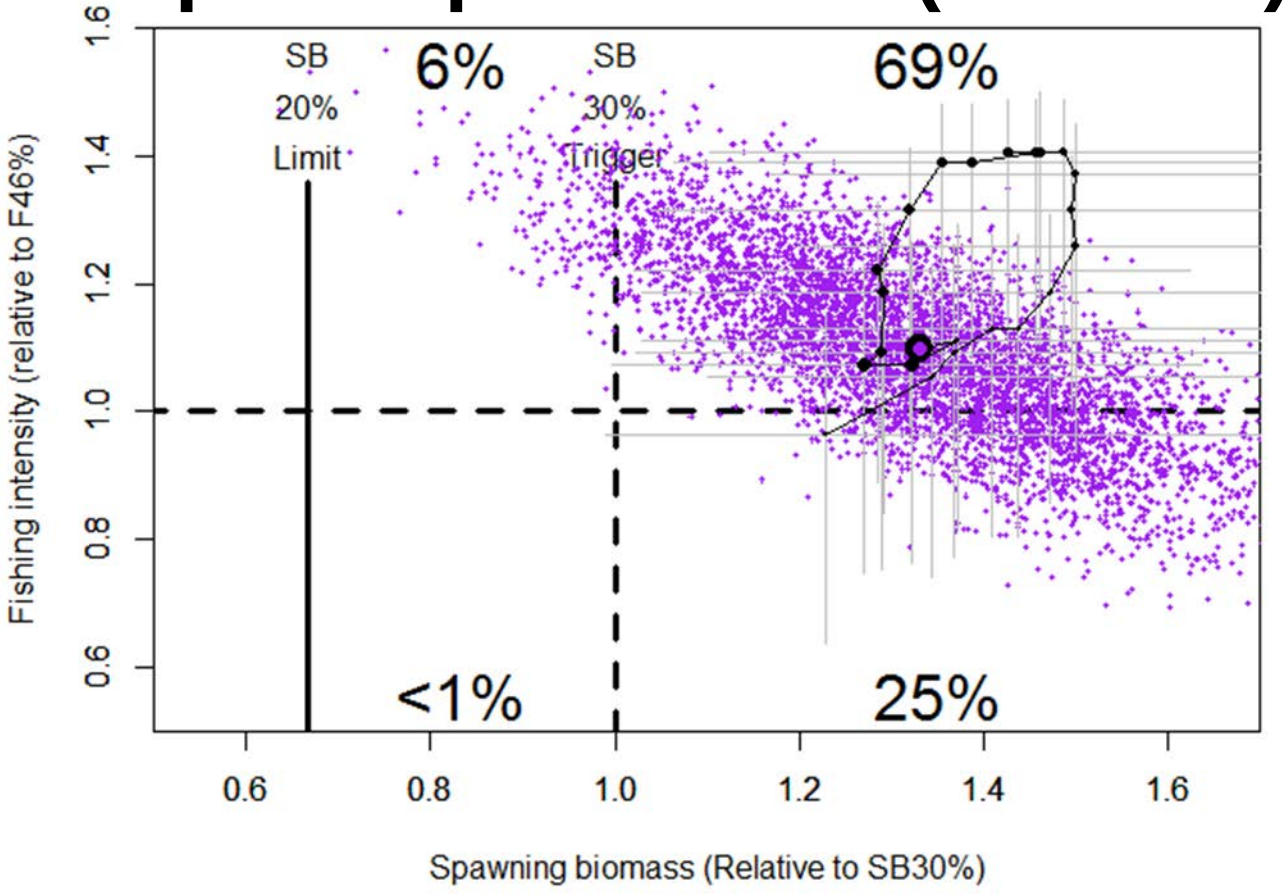
Previous phase plots: 2018 (SRB012)



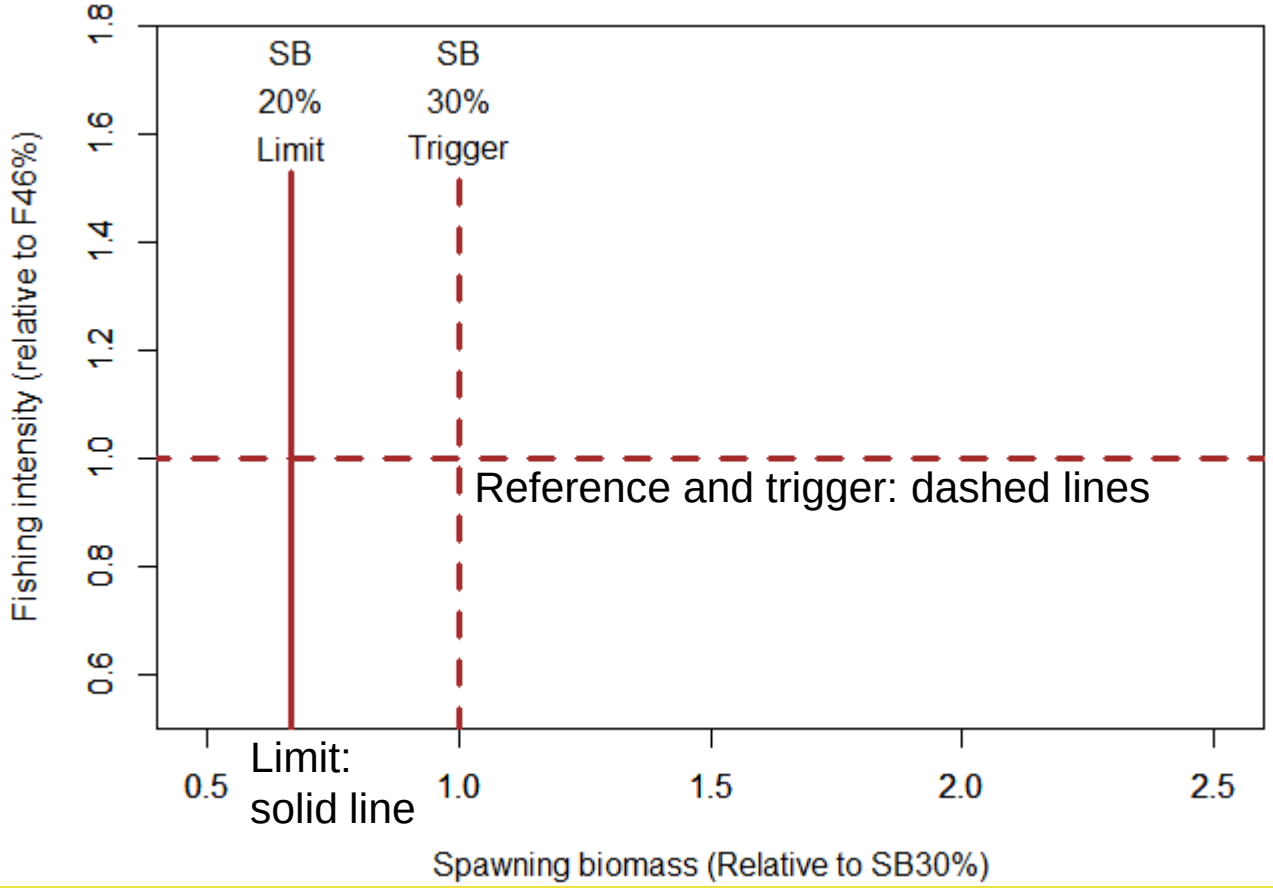
Previous discussions of phase plots

- SRB002 (2013)
- SRB007 (2015)
- SRB012 (2018)
  - 24. The SRB NOTED that the phase plot presentation showing historical stock status and fishing intensity is a common and informative way to present fishery status. However, the perception of fishery status depends on the choices for reference points (i.e. vertical and horizontal lines in the spawning biomass and fishing intensity dimensions, respectively) and corresponding zones. Therefore, the SRB REQUESTED that the plot not be coloured with discrete "stoplight" colours. It is important that the IPHC Secretariat make it clear to viewers that (1) that F46% is the implied fishing intensity given relatively recent catch history, and (2) that the implied biomass target associated with F46% is not at the crosshairs given in the plot.
- SRB013 (2018)

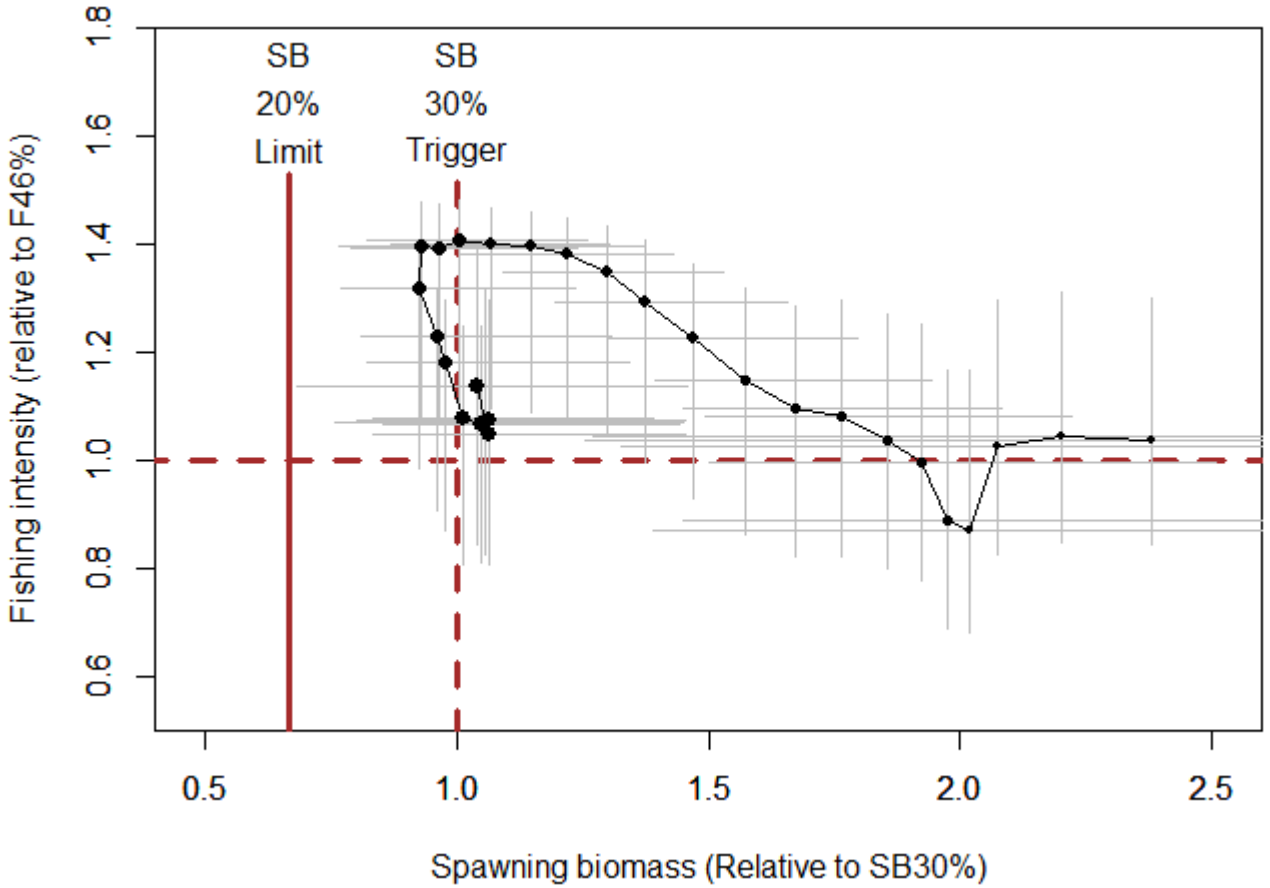
Previous phase plots: 2018 (SRB013)



Options for 2019 - standard format



Options for 2019 - standard format



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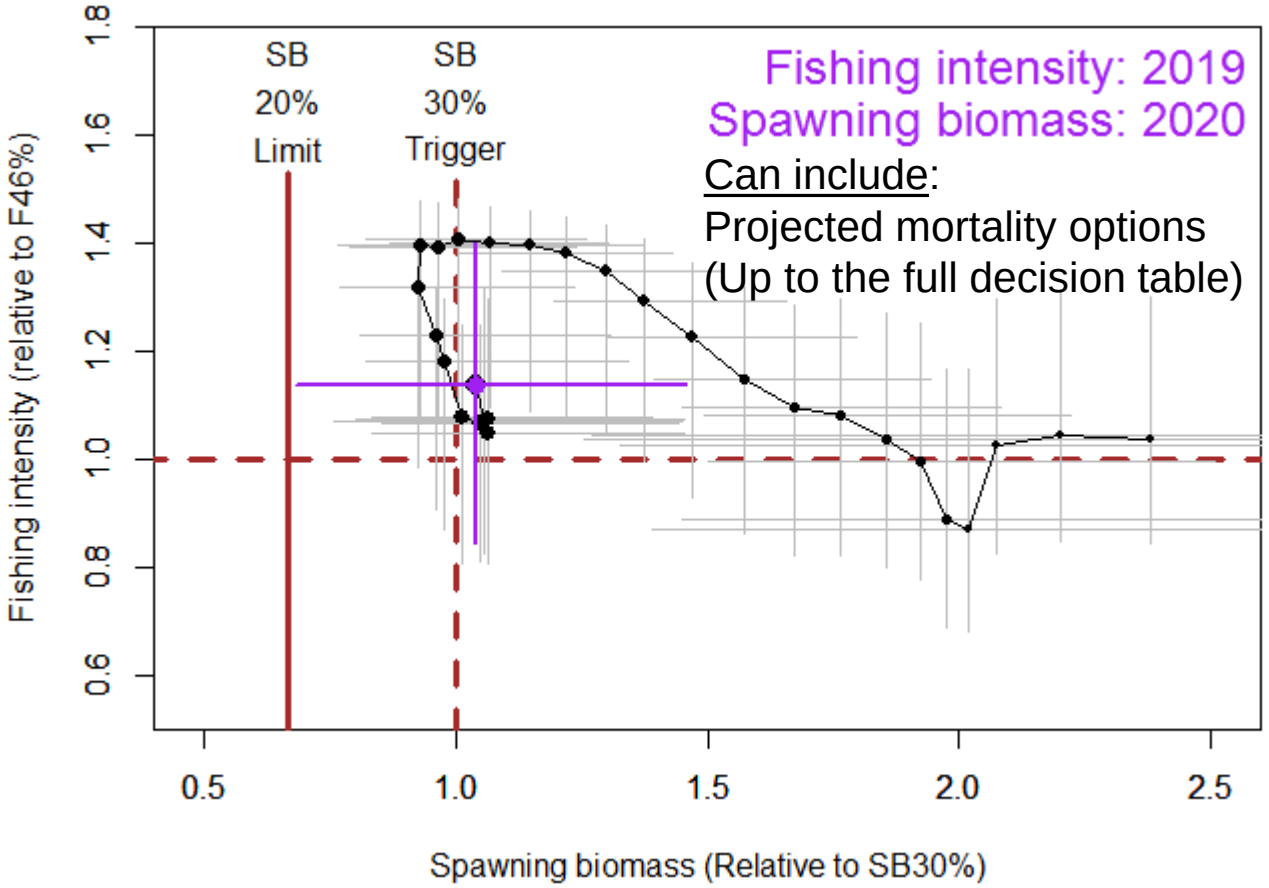
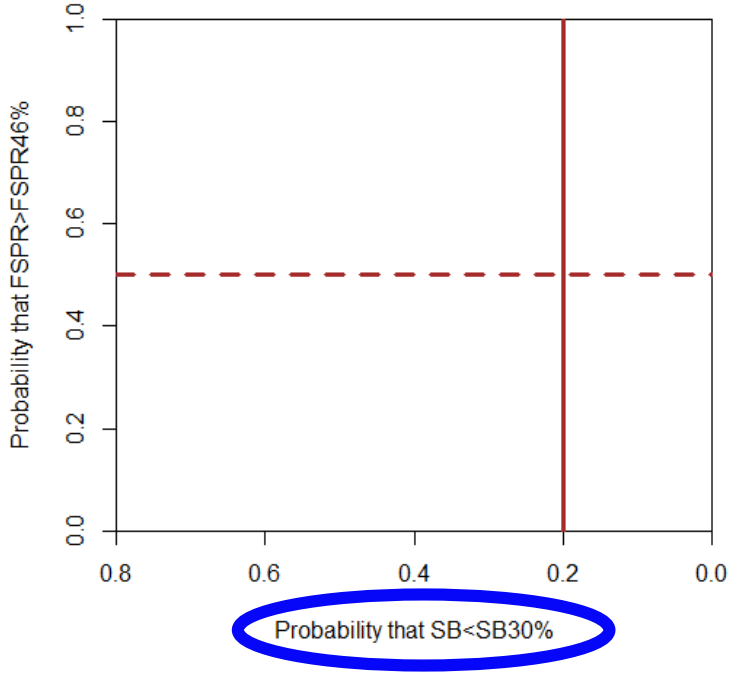
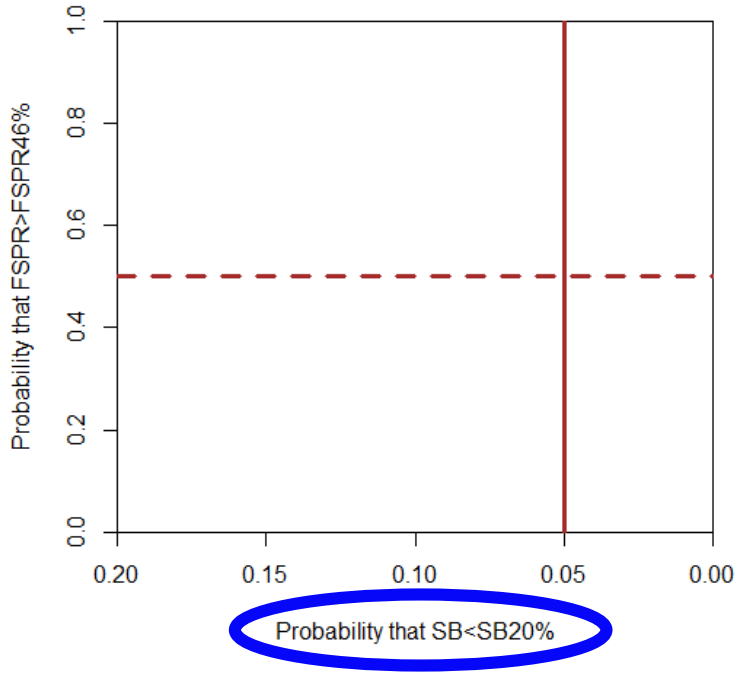


Options for 2019 - probability format

Uncertainty already included in the axes.
Solid lines indicate tolerances from MSE





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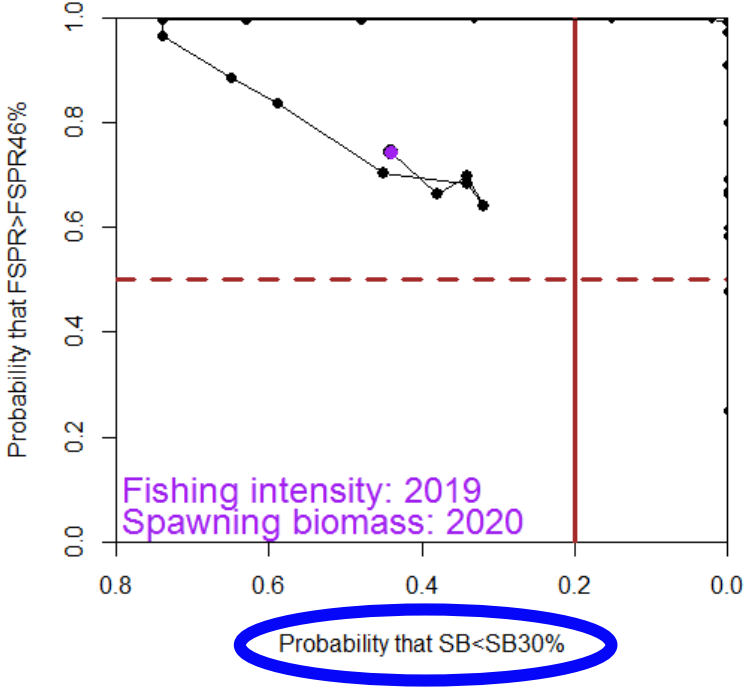

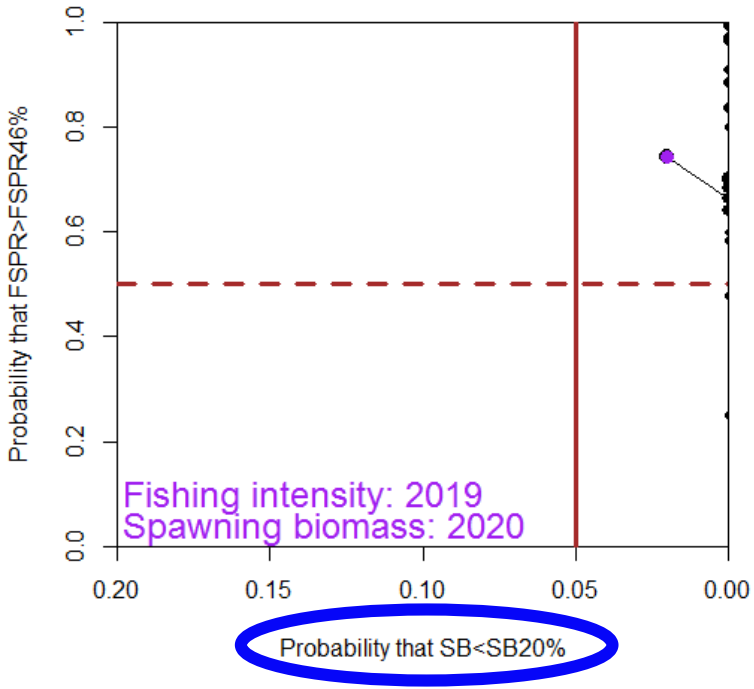

Recommendations for the Secretariat

That the SRB:

a) **NOTE** paper IPHC-2019-SRB015-07 which provides a response to requests from SRB014.

b) **RECOMMEND** any additional changes to the assessment model structure, ensemble methods or data sources for implementation in the final 2019 stock assessment.

c) **RECOMMEND** any additional changes to the assessment model structure, ensemble methods or data sources for exploration and presentation at SRB016, June 2020.

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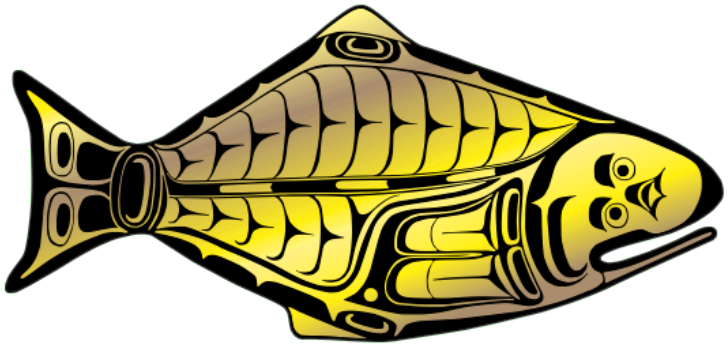

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