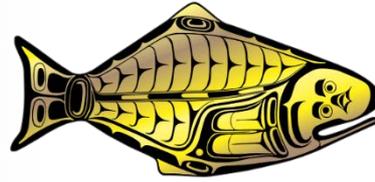


INTERNATIONAL PACIFIC



HALIBUT COMMISSION

# Report of the 13<sup>th</sup> Session of the IPHC Scientific Review Board (SRB013)

Agenda item 9

IPHC-2018-SRB013-R

# Scientific Review Board (SRB) – 4 Members



**Sean Cox**

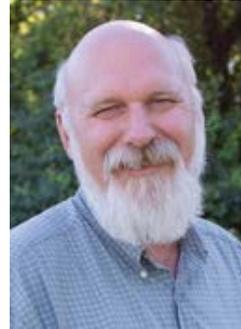
Simon Fraser  
University,  
Canada

(Chairperson)



**Jim Ianelli**

NMFS/NOAA,  
USA



**Kim Scribner**

Michigan State  
University, USA



**Marc Mangel**

University of  
California,  
Santa Cruz,  
USA

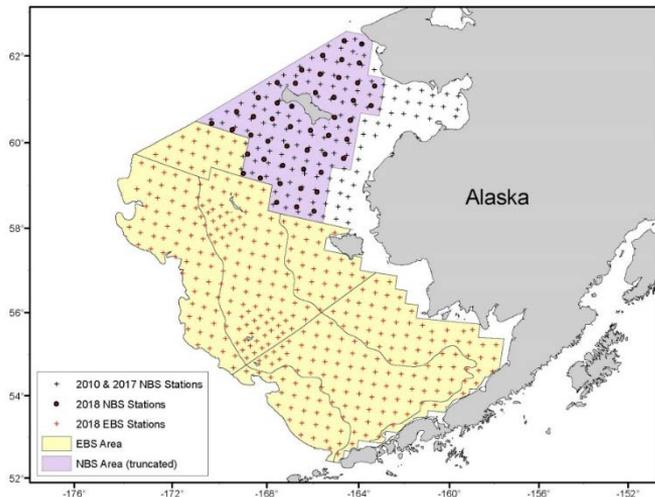
# SRB process



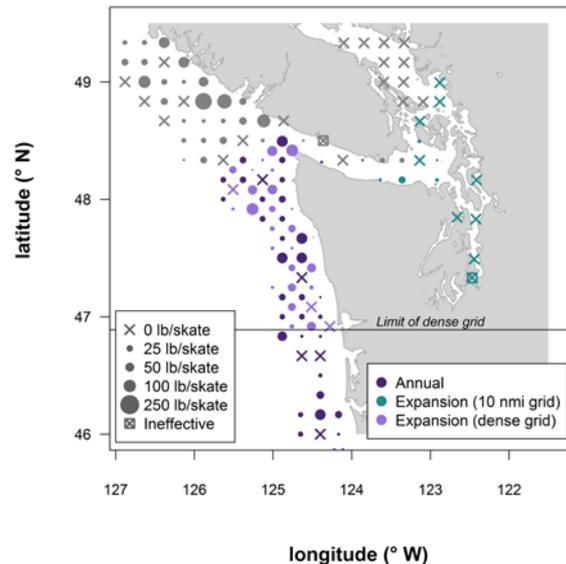
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# Fishery independent setline survey (FISS)

- SRB NOTED:
  - 6<sup>th</sup> review of space-time modeling (endorses)
  - Expanded stations helped reduce uncertainty
  - Cost-benefit on station density may be required
  - NBS data treated the same as EBS



95<sup>th</sup> IPHC Annual Meeting (AM095)



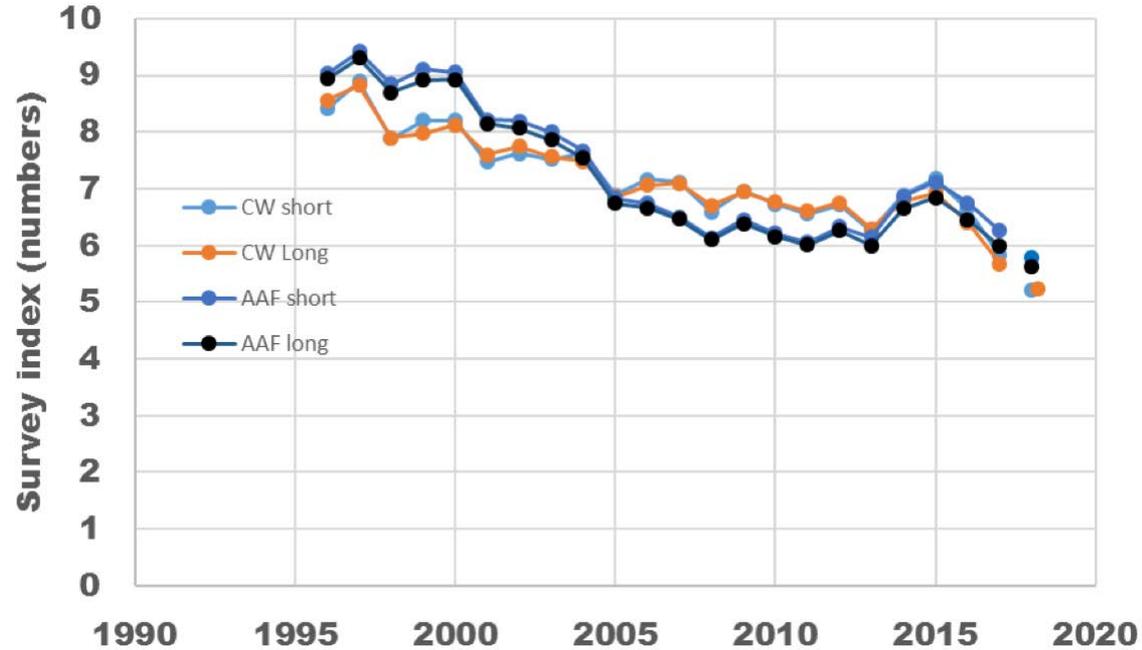
# SRB process

Stock assessment

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# Pacific halibut stock assessment: 2018

- Routine assessment update



# SRB RECOMMENDED Assessment Cycle

21. **NOTING** that the Commission has asked the IPHC Secretariat to develop a paper for consideration at the 94<sup>th</sup> Session of the IPHC Interim Meeting, that outlines both the current IPHC peer review process and areas for potential improvement, the SRB **RECOMMENDED** the following:

**Table 1.** IPHC stock assessment peer review timeline 2018-26.

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026
Stock assessment	Update	Full assessment	Update	Update	Full assessment	Update	Update	Full assessment	Update
Peer review	SRB	External & SRB	SRB	SRB	External & SRB	SRB	SRB	External & SRB	SRB

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MSE

# Management Strategy Evaluation (MSE)

Systematic process for testing the expected performance of management procedures against fishery objectives

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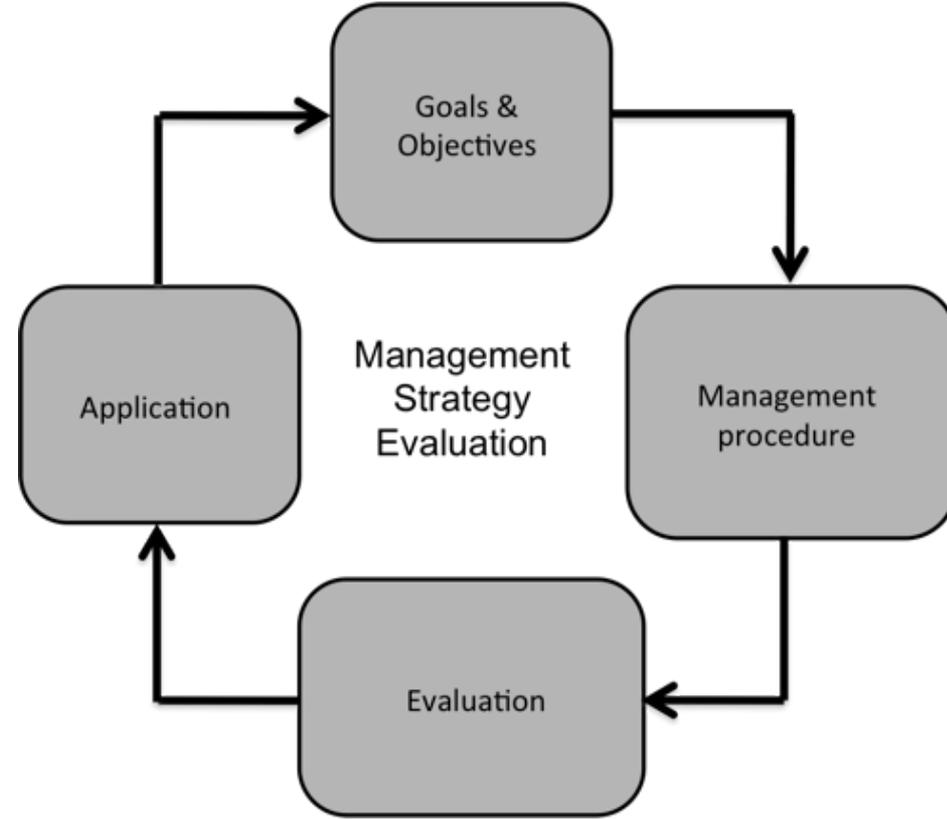
- **Objectives** developed via stakeholder engagement (MSAB)
- **Operating models** represent plausible scenarios/uncertainties for stock dynamics, movement, and future data (SRB,MSAB)
- Testing via **computer simulation** (IPHC Secretariat, SRB-review, MSAB)

# Management Strategy Evaluation (MSE)

MSE aims to choose a **repeatable management procedure**

**Scientifically-defensible** harvest strategy

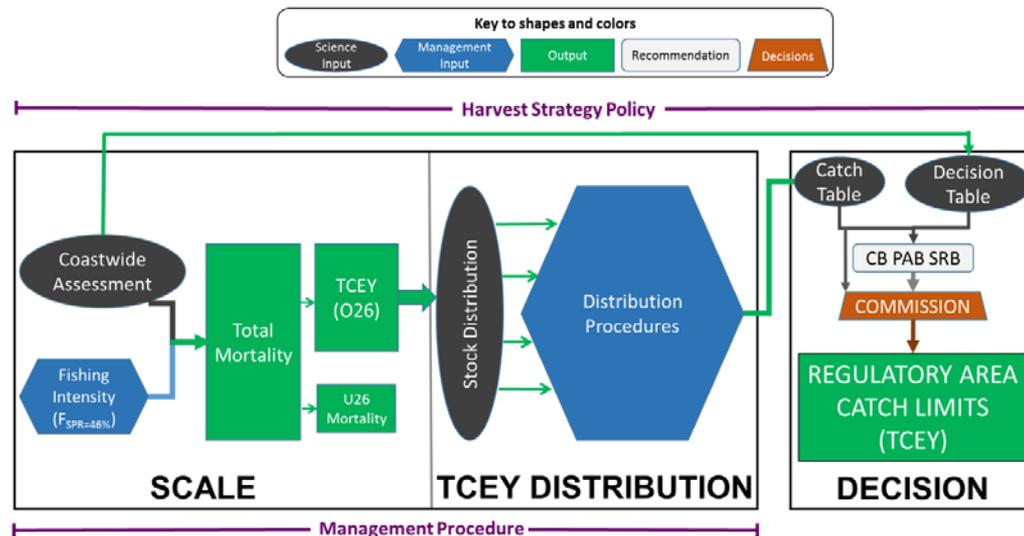
**Adapted over time** in response to new information



# Management Strategy Evaluation (MSE)

## Program of Work

- January 2019: Recommendations on Scale
  - Coastwide fishing intensity (HCR)
- January 2021: Recommendations on Distribution (and Scale)



# SRB013-Req.01 (para 26) – MSAB prioritize objectives

## Current Goals and Objectives (primary)

GENERAL OBJECTIVE	MEASURABLE OBJECTIVE	MEASURABLE OUTCOME	TIME-FRAME	TOLERANCE	PERFORMANCE METRIC
1.1. KEEP BIOMASS ABOVE A LIMIT TO AVOID CRITICAL STOCK SIZES  Biomass Limit	Maintain a minimum female spawning stock biomass above a biomass limit reference point at least 90% of the time	SB < Spawning Biomass Limit ( $SB_{Lim}$ )  $SB_{Lim}$ =20% spawning biomass	Long-term	0.10	$P(SB < SB_{Lim})$
2.1 LIMIT CATCH VARIABILITY	Limit annual changes in the coastwide TCEY	Average Annual Variability (AAV) > 15%	Long-term	0.25	$P(AAV > 15\%)$
2.2 MAXIMIZE DIRECTED FISHING YIELD	Maintain TCEY above a minimum level coastwide	Coastwide TCEY < $TCEY_{min}$	Long-term Short-term	?? ??	$P(TCEY < TCEY_{min})$

# SRB013-Req.02 (para 29)

## *Updates to MSE framework and closed-loop simulations*

SRB013–Req.02 ([para. 29](#)) The SRB **REQUESTED** that in future iterations of the MSE, the IPHC Secretariat and MSAB consider:

- a) the use of estimation error in the proxy assessment method with coefficients of variation equal to 0.15, a correlation of 0.5, and autocorrelation equal to 0.2 represents one plausible scenario. A larger error and autocorrelation could be considered in robustness tests or as alternative scenarios;
- b) a management procedure include a constraint on the TMq change to be consistent with the maximum change that has happened historically;
- c) the current conditioned operating model be used to simulate a coast-wide survey index and that such data be used to consider an alternative survey-based management procedure (this may provide a more transparent TMq-setting algorithm than the current SPR based control-rule and help with MSAB deliberations).

# SRB013-Req.02 (para 29)

- a) Fine tune MSE simulations
- b) Constraint catch variability to historical
- c) Examine survey-based management procedures

# SRB013-Rec.02 (**para 30**)-RECOMMENDATIONS

## *MSE Simulation results*

SRB013–Rec.02 ([para. 30](#)) The SRB **RECOMMENDED** a clear separation between the current stock assessment process and MSE process, so that it is understood:

- a) these two processes, including statistics and performance metrics, are distinct and not comparable;
- b) the purpose of the current ensemble stock assessment approach is to develop a decision table to assist the Commission in setting an annual TCEY. This TCEY setting process lacks specificity and how decisions are made is unclear. Furthermore, repeated application of this process is difficult to evaluate relative to Commission objectives;
- c) the purpose of the MSE is to compare alternative management procedures against Commission objectives over a wide range of plausible uncertainties within the operating model and management procedures. Therefore, these procedures by definition must be specific and repeatable.

# SRB013-Rec.02 (para 30)-RECOMMENDATIONS

Stock assessment and MSE are separate:

- a) models and performance metrics are different
- b) Ensemble assessment informs annual TCEY
- c) MSE informs choice of repeatable MP

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Biological program

# Biological research program



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## Biological research

## Stock assessment

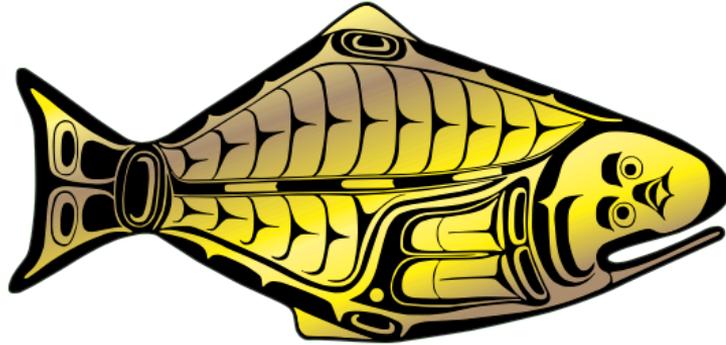
## Stock assessment MSE

Research areas	Research outcomes	Relevance for stock assessment	Inputs to stock assessment and MSE development
Reproduction	Sex ratio Spawning output Age at maturity	Spawning biomass scale and trend Stock productivity Recruitment variability	Sex ratio Maturity schedule Fecundity
Growth	Identification of growth patterns Environmental effects on growth Growth influence in size-at-age variation	Temporal and spatial variation in growth Yield calculations Effects of ecosystem conditions Effects of fishing	Predicted weight-at-age Mechanisms for changes in weight-at-age
Discard Survival	Bycatch survival estimates Discard mortality rate estimates	Scale and trend in mortality Scale and trend in productivity	Bycatch and discard mortality estimates Variability in bycatch and uncertainty in discard mortality estimates
Migration	Larval distribution Juvenile and adult migratory behavior and distribution	Geographical selectivity Stock distribution	Information for structural choices Recruitment indices Migration pathways and rates Timing of migration
Genetics and Genomics	Genetic structure of the population Sequencing of the Pacific halibut genome	Spatial dynamics Management units	Information for structural choices

# Biological research integration

**SRB REQUESTED:** Integration specifics, e.g. how does population genetics and migration help identify/clarify movement and population structure hypotheses for consideration in MSE and stock assessment?

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