INTERNATIONAL PACIFIC HALIBUT COMMISSION 100 years

www.iphc.int

MANAGEMENT STRATEGY EVALUATION

Environment vs fishing

MSE is a process to evaluate harvest strategies and develop a management procedure that is robust to uncertainty and meets defined objectives. It can also be used to examine the effects of scenarios on the stock and fishery yield.

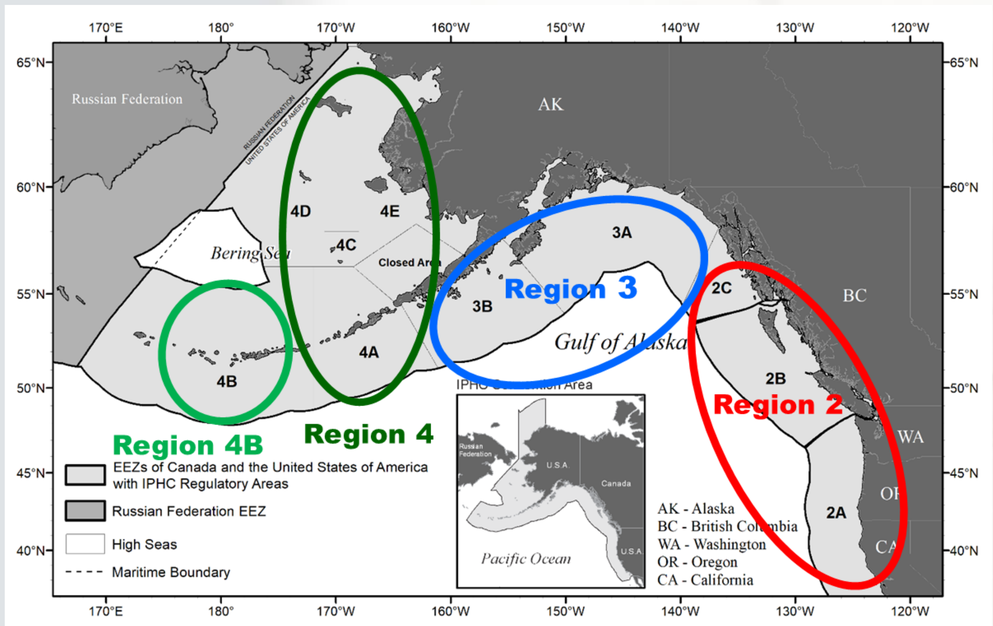
MSE simulations were performed linking recruitment & movement to environmental conditions.

- PDO: has 10- to 20-year cycles of low and high.
- Scenarios: a persistent low PDO and a persistent high PDO.

Fishing Intensity: SPR=43%

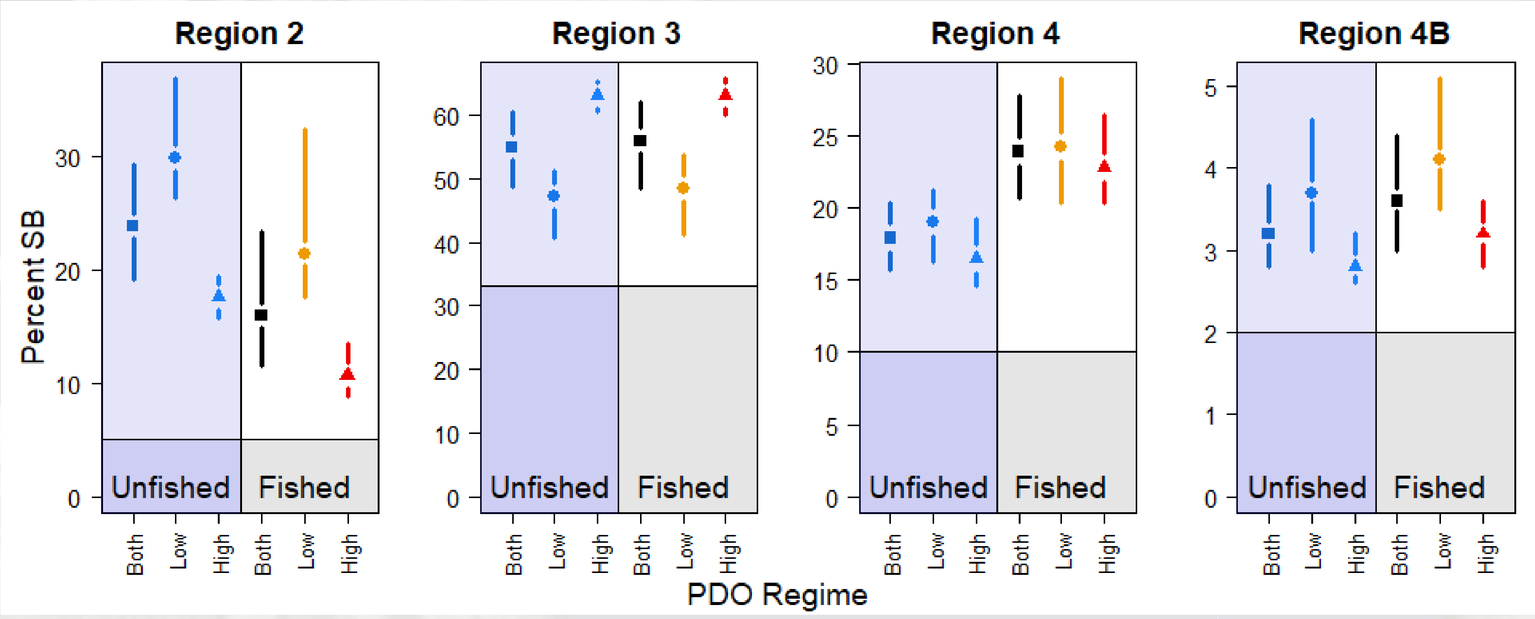
No observation error, No estimation error, No decision-making variability

Low PDO	High PDO
Low average recruitment	High average recruitment
Typically, less recruitment in Region 4	Typically, more recruitment in Region 4
Less movement from Region 4 to 3	More movement from Region 4 to 3
More movement from Region 3 to 2	Less movement from Region 3 to 2



- The median relative coastwide spawning biomass (RSB) was similar for high and low PDO scenarios.
- There was a higher probability that the RSB was less than 36% for the low PDO scenario.
- The long-term median TCEY was 22% less for the low PDO scenario and 26% more for the high PDO scenario when compared to a cyclical PDO.
- The median average TCEY for a high PDO was 1.6 times greater than the TCEY for the low PDO.

Long-Term Performance Metrics			
PDO	Both	Low	High
Median RSB	38.8%	37.6%	39.2%
P(RSB<20%)	<0.001	<0.001	<0.001
P(RSB<36%)	0.238	0.329	0.157
Median TCEY (Mlbs)	65.6	51.4	83.0
Median AAV of TCEY	5.2%	4.5%	4.5%
Median TCEY Region 2 (Mlbs)	20.5	19.1	21.2
Median TCEY Region 3 (Mlbs)	33.7	23.0	48.7
Median TCEY Region 4 (Mlbs)	8.1	6.6	9.4
Median TCEY Region 4B (Mlbs)	2.4	2.2	2.6



Percentage of spawning biomass in each Biological Region when not fished and when fished. The PDO is modelled with cyclical low and high periods in "Both". Darker shaded area shows below the threshold for the spatial conservation objective.

MSE simulations assuming a persistent low or high PDO show that fishing and the environment affect the percentage of spawning biomass in each Biological Region in different ways.

- Region 2: affected by PDO and fishing
- Region 3: affected by PDO.
- Region 4: affected by fishing.
- Region 4B: affected by PDO and fishing

- Even though we cannot "manage" the PDO regime, it is useful to understand the effects of the PDO on the spawning biomass and TCEYs, separating the effects of fishing from the effects of the environment.
- The environment may have a larger effect on the distribution of spawning biomass than fishing does.
- Different distribution procedures would likely produce different outcomes of percent spawning biomass in each area

International Pacific Halibut Commission. 2320 W. Commodore Way Suite 300, Seattle, WA 98199-1287, USA. www.iphc.int. Phone: +1-206-634-1838