ISC/05/Plenary/7

Preliminary Research Concerning Biological Reference Points Associated With
North Pacific Albacore Population Dynamics and Fisheries

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Question Posed to ISC5
by the Japan & USA Delegations

"What is the level (or dynamic range) of fishing mortality (F) that will maintain the stock within the range of spawning stock biomass (SSB) that we have experienced over the assessment period (1975-2003)?"

Historical Catch (1952-2003) of North Pacific Albacore with Median. Lower 25th Percentile, and Lower 10th Percentile
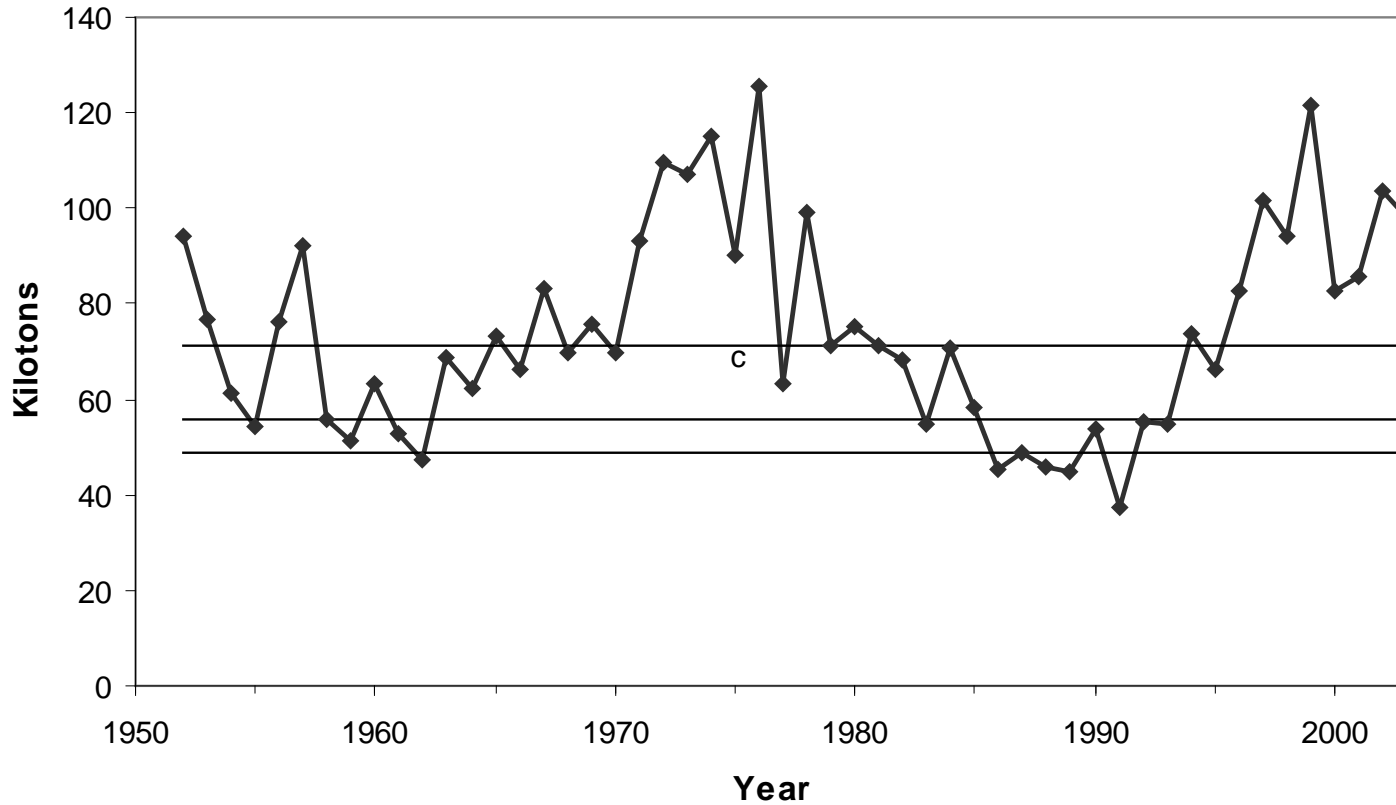
19ᵗʰ North Pacific Albacore Workshop
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**Biological Parameters**

Stock Assessment Results

Uncertainty Analysis Scenarios

- Low Productivity and Low Current F
- Low Productivity and High Current F
- High Productivity and Low Current F
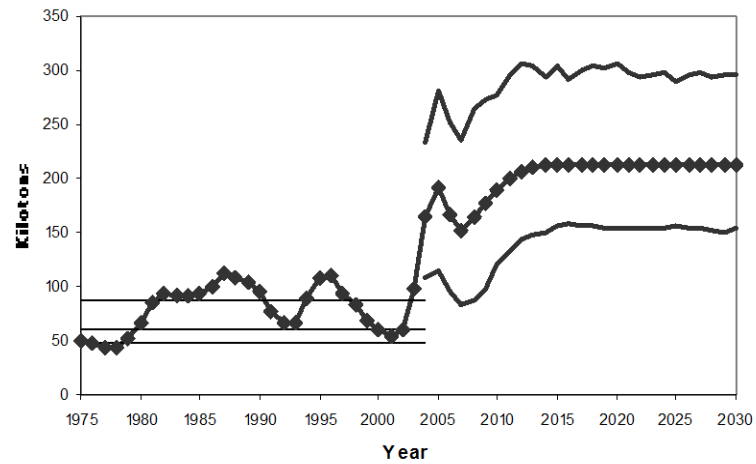- High Productivity and High Current F

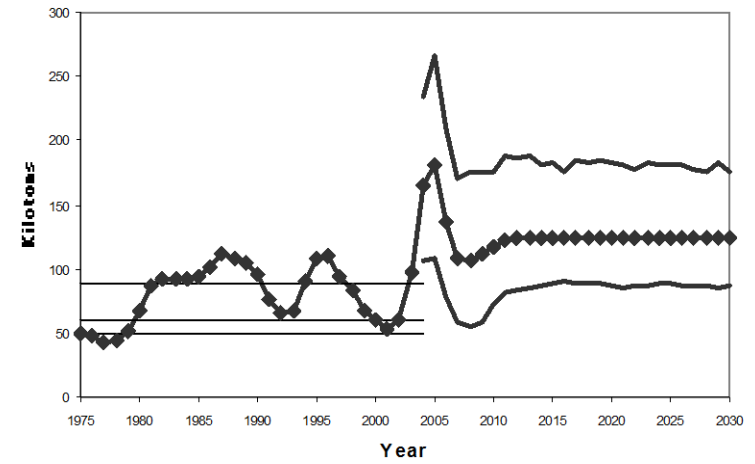Spawning Stock Biomass with Low Productivity and F=0.43 and 90% CI's for Projection Years
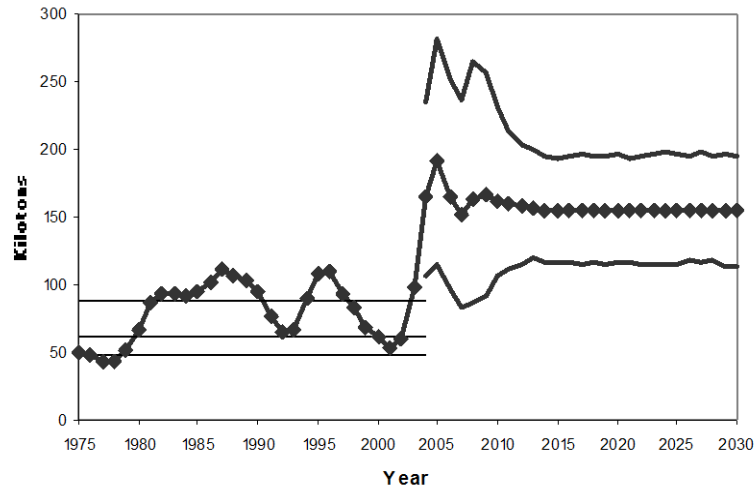
Spawning Stock Biomass with Low Productivity and F=0.68 and 90% CI's for Projection Years
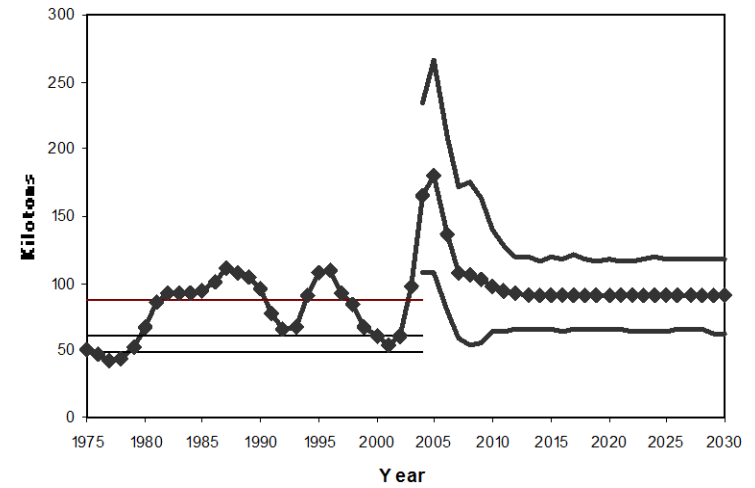
Spawning Stock Biomass with High Productivity and F=0.43 and 90% CI's for Projection Years

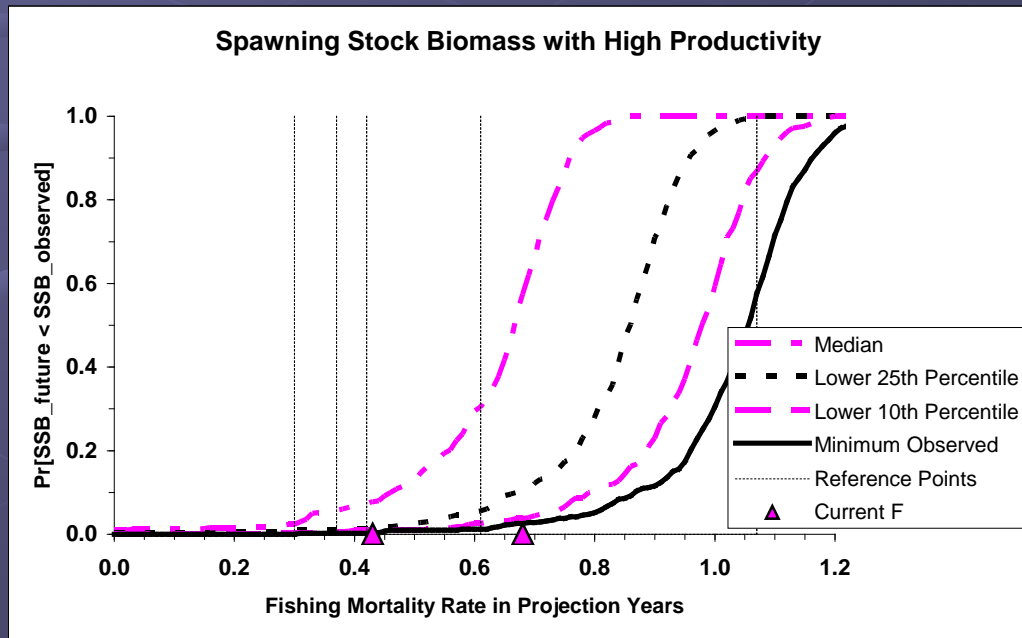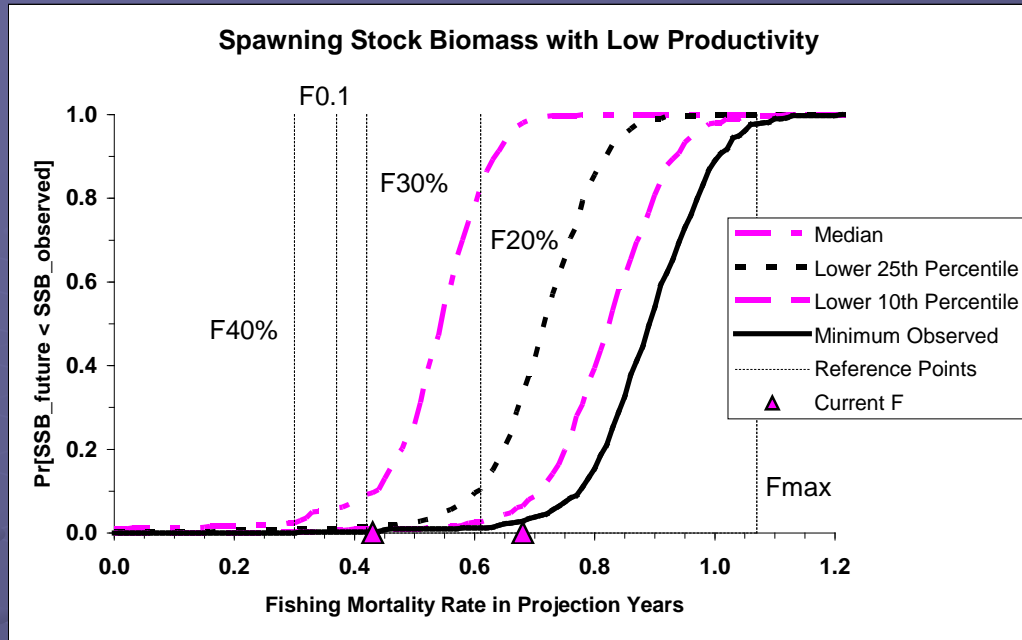Spawning Stock Biomass with High Productivity and F=0.68 and 90% CI's for Projection Years

Recruitment Estimate (Age 1) for Assessment Period (1975-2004)

Spawning Stock Biomass with Low Productivity

F0.1

F30%

F20%

F40%

Fmax

Median
Lower 25th Percentile
Lower 10th Percentile
Minimum Observed
Reference Points
Current F

Pr[SSB_future < SSB_observed]

Fishing Mortality Rate in Projection Years

Spawning Stock Biomass with High Productivity

Median
Lower 25th Percentile
Lower 10th Percentile
Minimum Observed
Reference Points
Current F

Pr[SSB_future < SSB_observed]

Fishing Mortality Rate in Projection Years

		Low Productivity		High Productivity	
		Probability Level Desired		**Probability Level Desired**	
SSB Threshold Desired		**50%**	**95%**	**50%**	**95%**
Minimum Observed SSB	$F_{SSB-Min}$	0.89	0.72	1.05	0.78
Lower 10th Percentile	$F_{SSB-10\%}$	0.82	0.66	0.98	0.71
Lower 25th Percentile	$F_{SSB-25\%}$	0.72	0.55	0.86	0.57
Median	$F_{SSB-50\%}$	0.54	0.33	0.67	0.33

High Current F = 0.68

Low Current F = 0.43
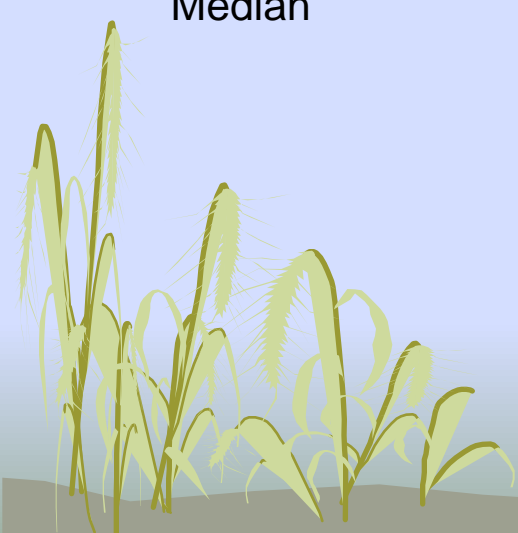
Question Posed to ISC5
by the Japan & USA Delegations

"What is the level (or dynamic range) of fishing mortality (F) that will maintain the stock within the range of spawning stock biomass (SSB) that we have experienced over the assessment period (1975-2003)?"

Answer to Question Posed to ISC5
by the Japan & USA Delegations
(Advice of the ISC)

1. Future SSB can be maintained at or above the minimum 'observed' SSB (43,000 t in 1977) with F's slightly higher than the current F range

2. However, the lowest 'observed' SSB estimates all occurred in late 1970's and may be the least reliable estimates of SSB

3. A more robust SSB threshold could be based on the lower 10th or 25th percentile of 'observed' SSB

4. If so done, current F should maintain SSB at or above the 10th percentile threshold

5. A modest reduction in current F may needed to maintain SSB at or above the 25th percentile threshold

The End