



C-5 CRAB PLAN TEAM REPORT
AND FINAL NORTON SOUND RED
KING CRAB ASSESSMENT



**BSAI
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CRAB PLAN TEAM REPORT: JANUARY 17-19, 2017

- NSRKC assessment: OFL and ABC
- AIGKC model recommendations
- Tanner crab model recommendations
- Update on BBRKC Gmacs
- Update on BSFRF survey
- BBRKC PSC (D-1)
- Stock Prioritization (D-2)



BSAI Crab Stocks Management Timing

Norton Sound red king crab

Assessed in
January/February

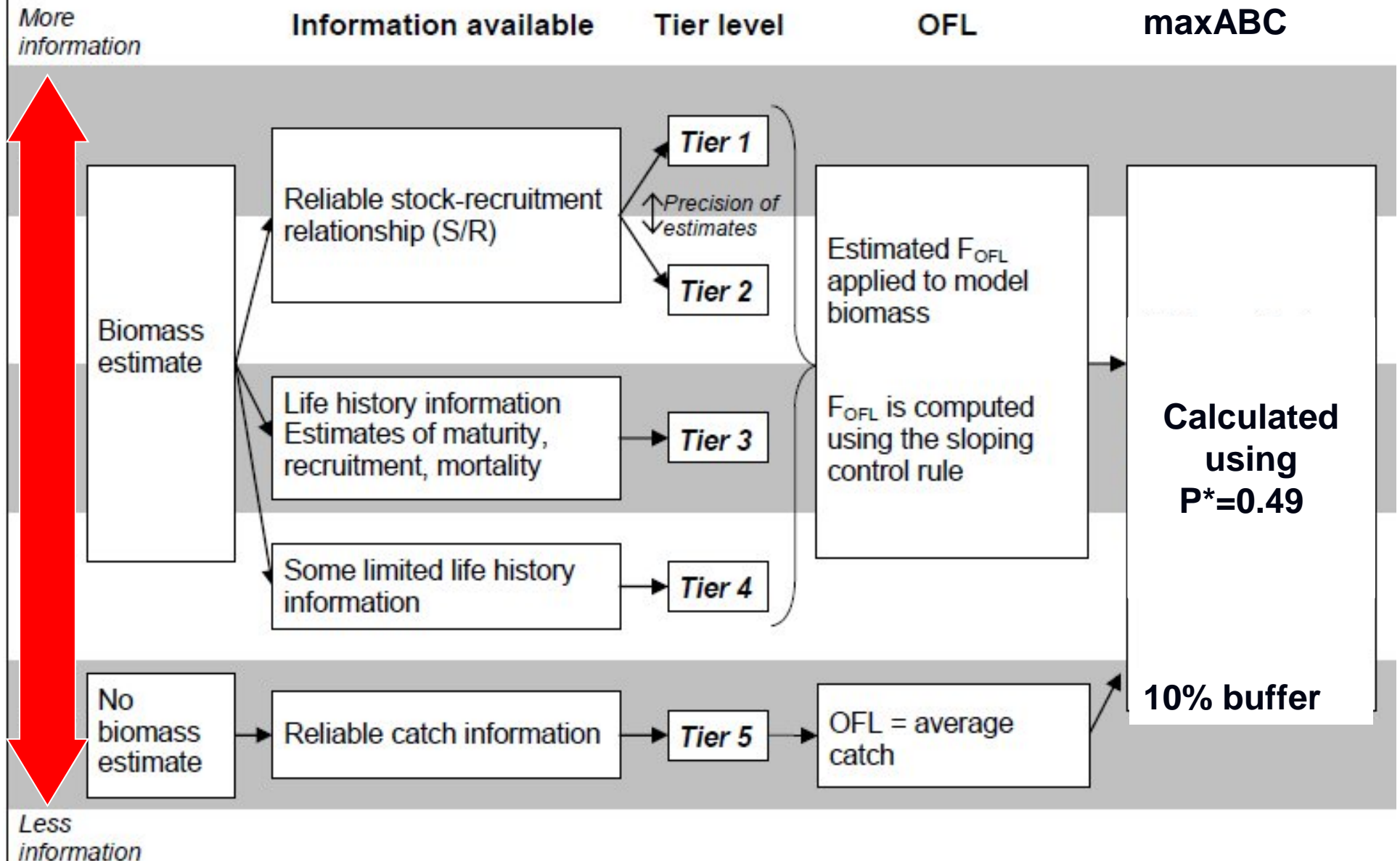
Aleutian Islands golden king crab
Pribilof Islands golden king crab
Western Aleutian Islands(Adak)
red king crab

Assessed in
May/June

EBS snow crab
Bristol Bay red king crab
Tanner crab
Pribilof Islands red king crab
Pribilof Islands blue king crab
St. Matthew blue king crab

Assessed in
September/
October

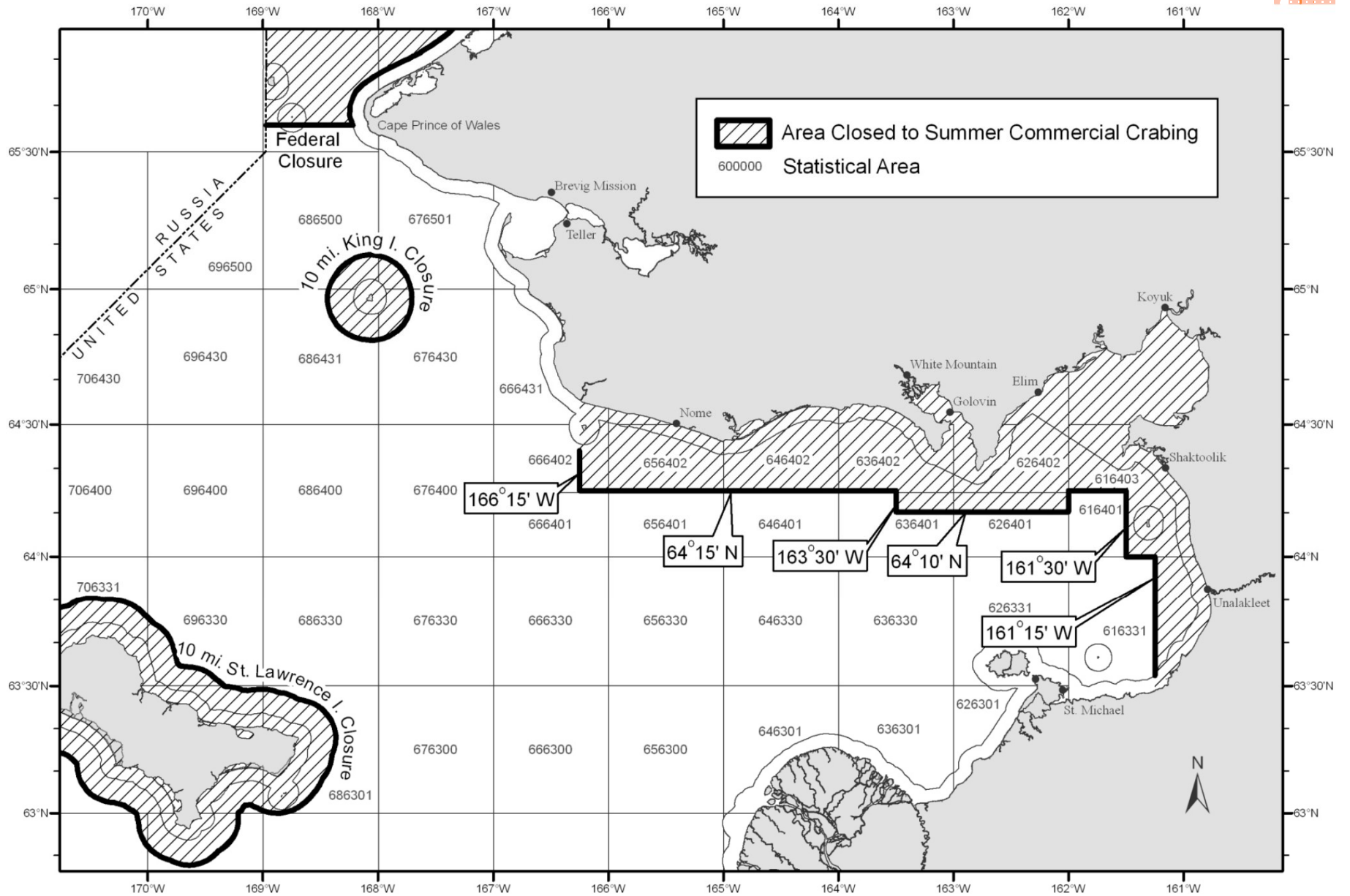
Current Crab Tier system



The left side of the page features a decorative vertical bar composed of several segments: a thin dotted line, a wider textured orange band, a thin solid orange line, and another thin dotted line. To the right of this bar are five solid orange circles of varying sizes, arranged in a cluster. A thin solid orange vertical line runs down the right edge of the page.

NORTON SOUND RED KING CRAB

FISHERY DISTRICT



CHARACTERISTICS OF NORTON SOUND RED KING CRAB

- Northernmost red king crab population that can support commercial fishery
- Live entire life-history in < 40m depth
- Many of life-history / stock separation unknown
- Commercial fishery started in 1977



NORTON SOUND FISHERIES

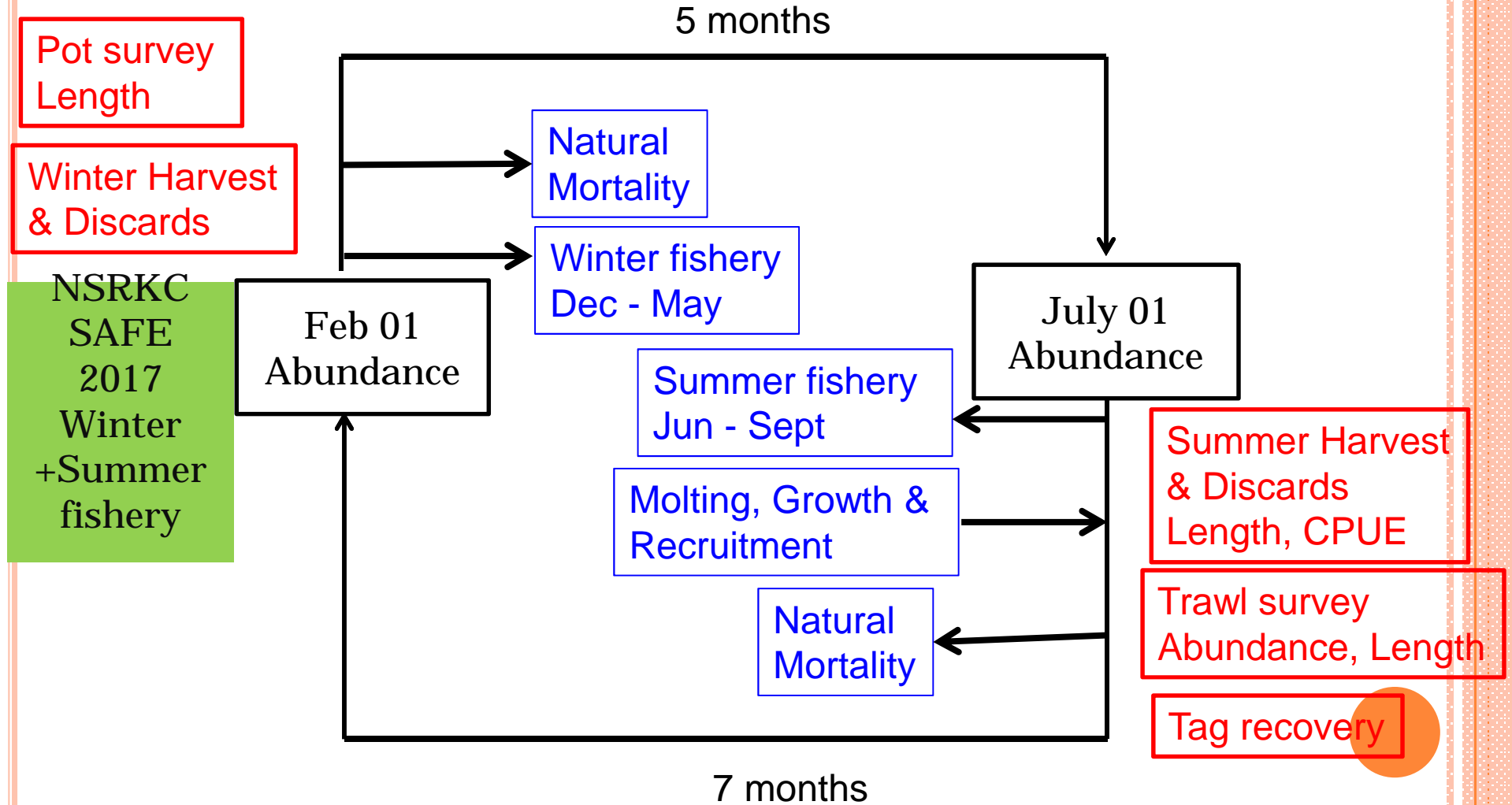
- Fisheries Periods:
 - Summer: July-August
 - Winter: December-April
- Summer Fisheries (majority of catch)
 - Commercial, CDQ, Subsistence
 - Small boat pots fishery
- Winter Fisheries:
 - Commercial, Subsistence
 - Pots through Ice
- Majority of harvest occurs in Summer Commercial Fisheries



NSRKC STOCK ASSESSMENT MODEL

MODELING PROCESS

AVAILABLE DATA & MODEL FIT



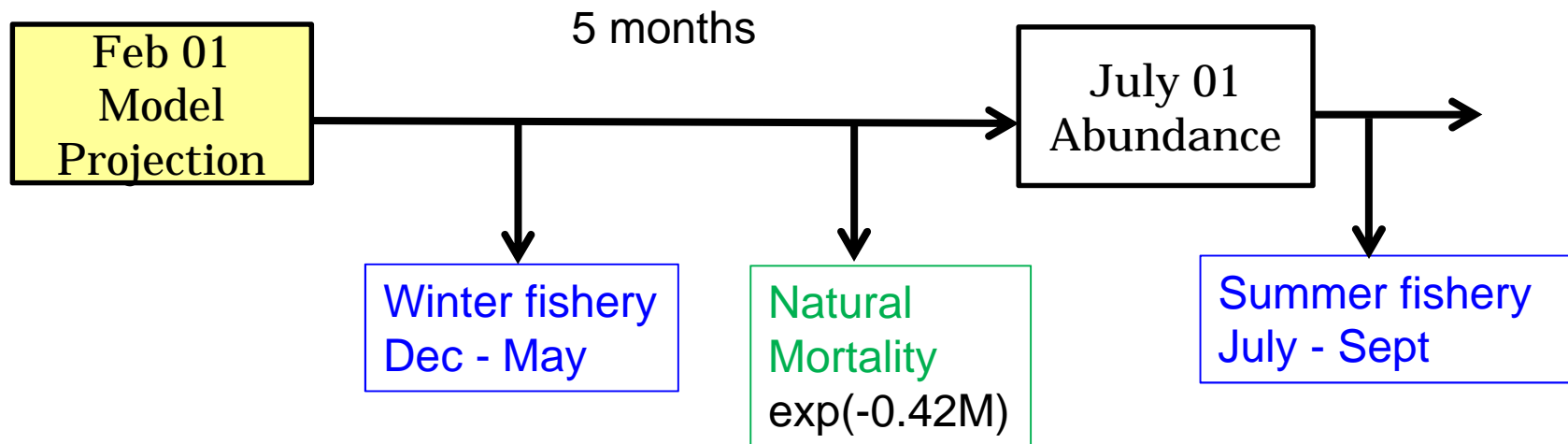
CHANGES FISHERY & DATA

- Winter fishery 2016
 - Commercial: 29,792 (79,980 lb.) highest ever.
 - Subsistence: 5,340 (13,350 lb.). average.
- Summer commercial fishery 2015
 - 6/27-7/21: 138,997 (420,159 lb.)
- Total retained harvest: 168,789 (0.50 mill. lb.) < ABC (0.57 mill. lb.)
- All harvest data finalized.
- Changes in fishery regulation: None



NSRKC STOCK ASSESSMENT MODEL

OFL ISSUE

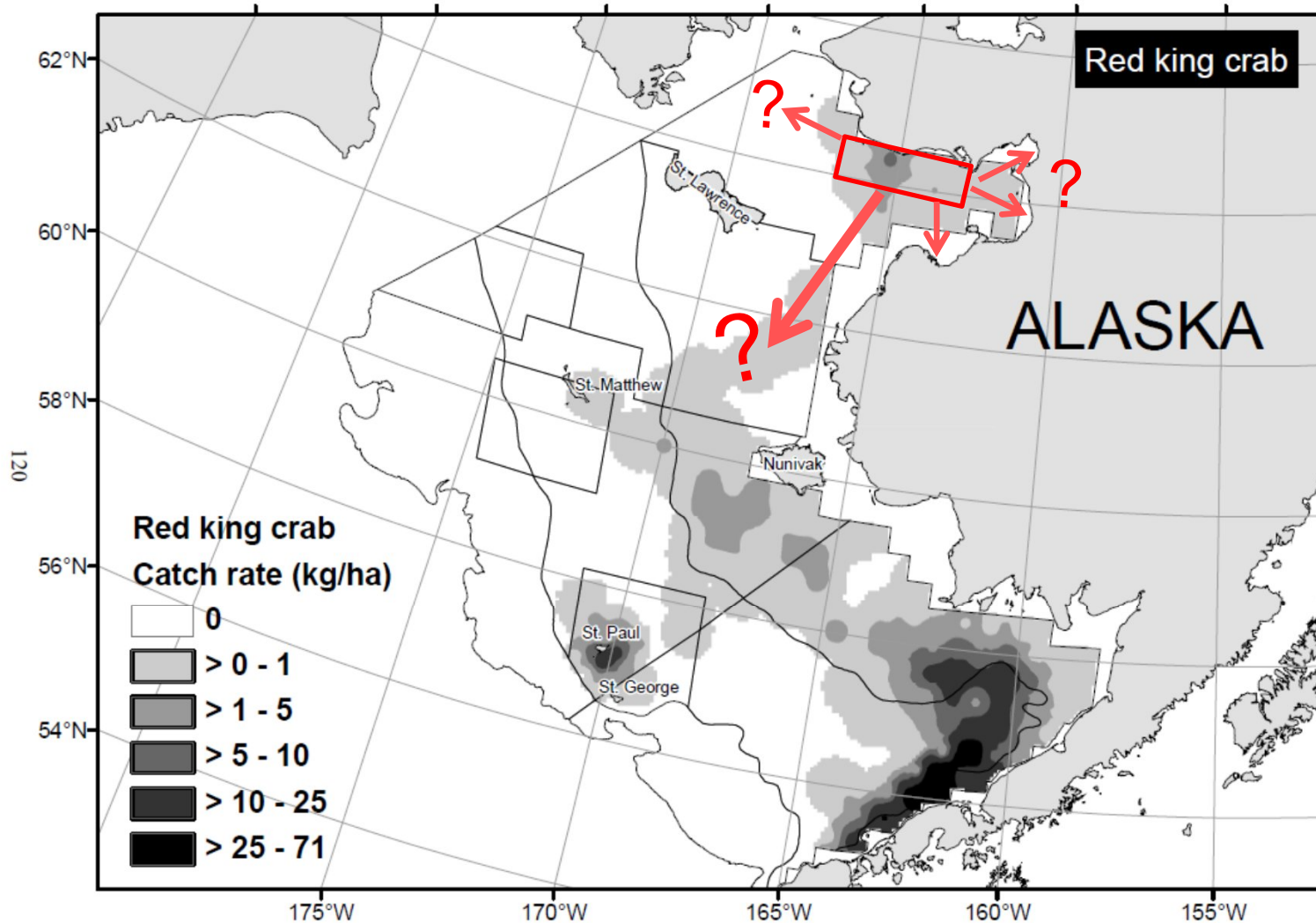


$$\text{OFL} = \text{Winter} + \text{Summer fishery}$$

How do we calculate B and OFL?
Split OFL calculation



ALTERNATIVE HYPOTHESES WITH RESPECT TO WHETHER OLDER CRABS DIE OR MIGRATE



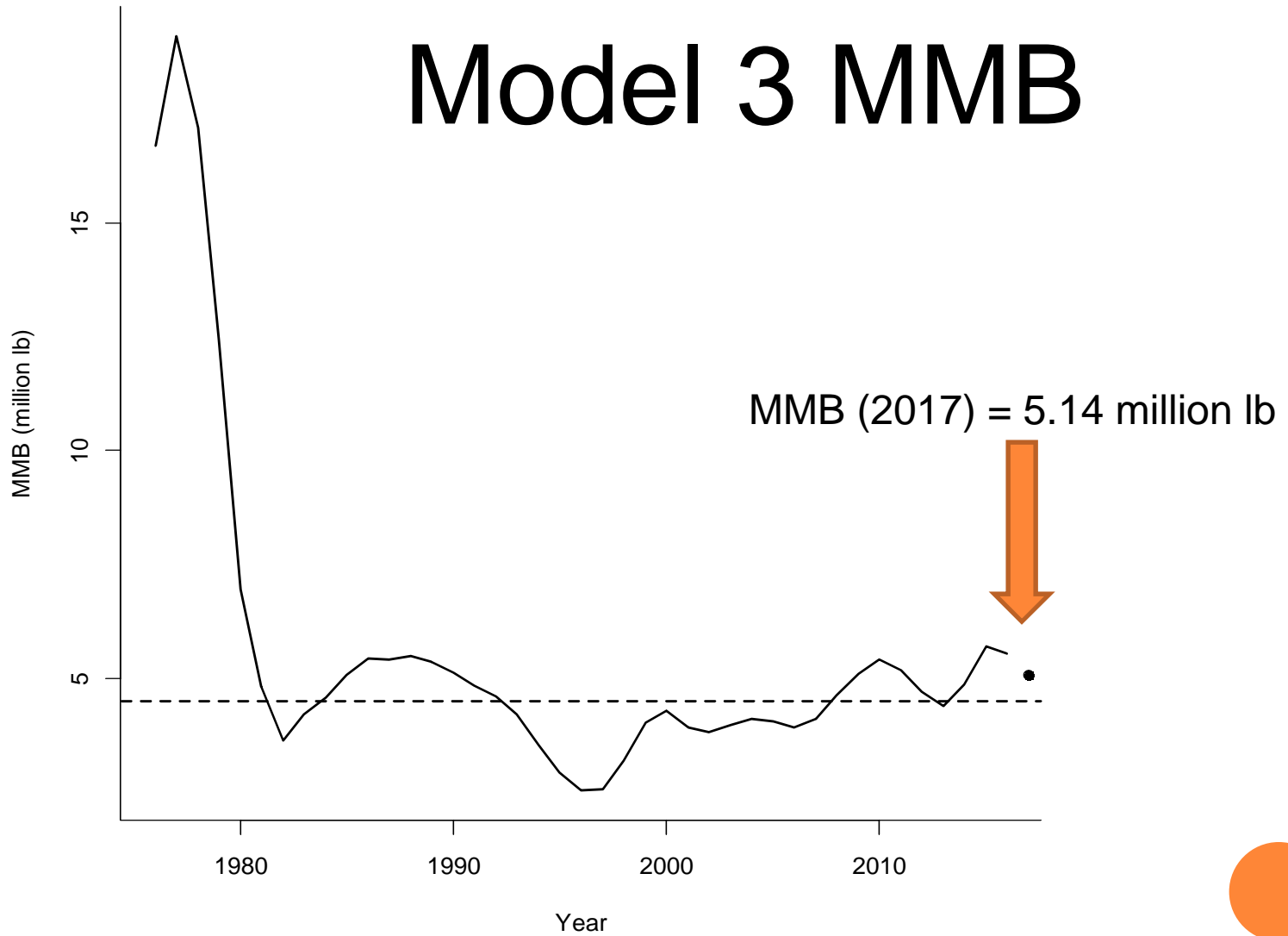
FINAL MODEL SELECTION

- 3 alternative realities of Norton Sound Red King Crab life-history that are equally likely in terms of model fit but biologically unusual.
- 1. 3-4.0 times higher natural mortality for large sized crab (Models 0, 1, 3).
- 2. Large crabs (consisting of 50% of MMB) move out of Norton Sound fishery and survey area (Model 5).
- 3. 2.5 times higher natural mortality ($M = 0.44$) for all crab lengths (Model 6).
- Author recommendation Model 3 (CPT concurred)
- Fewer parameters, better fit

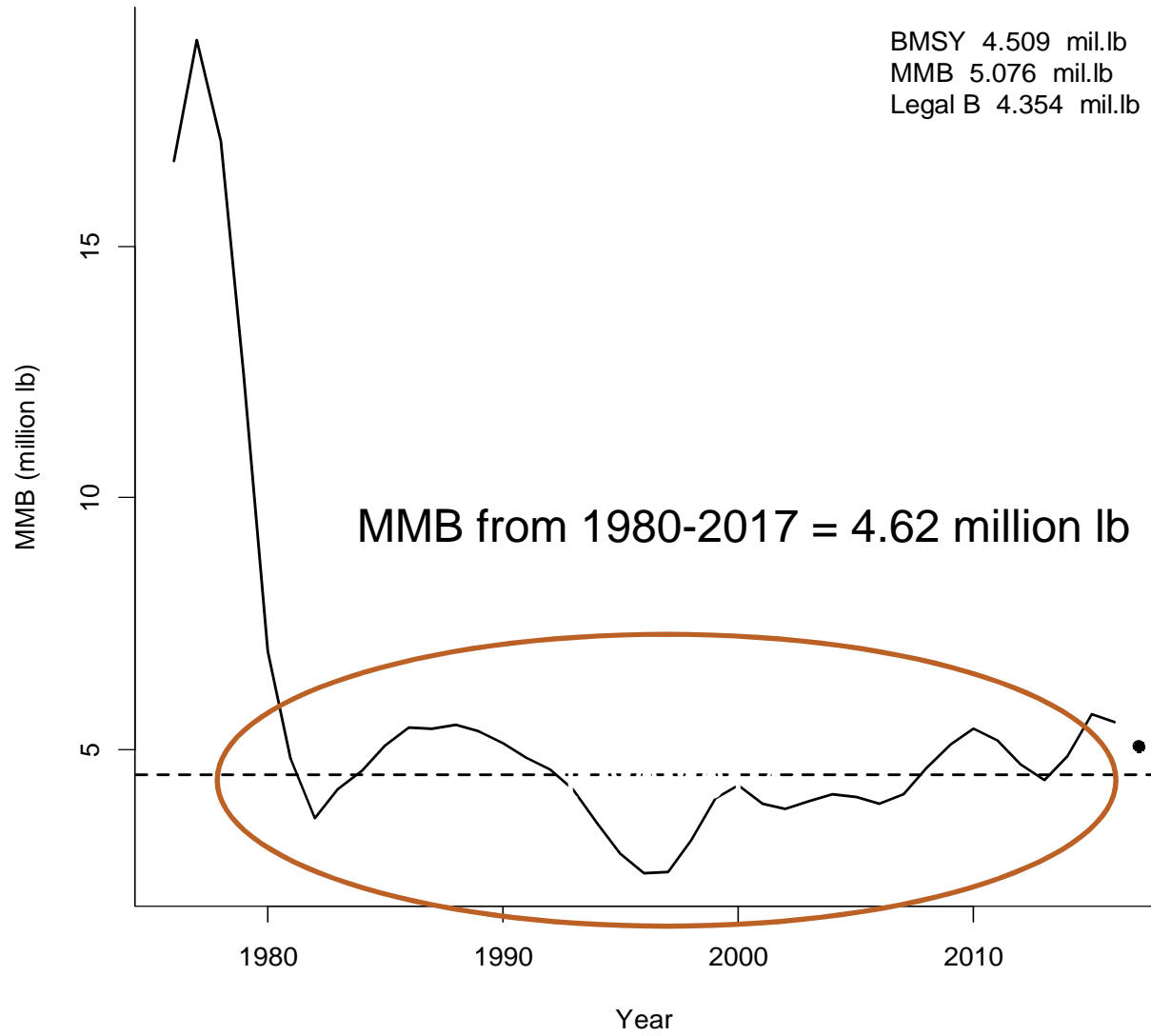


MMB Feb 01

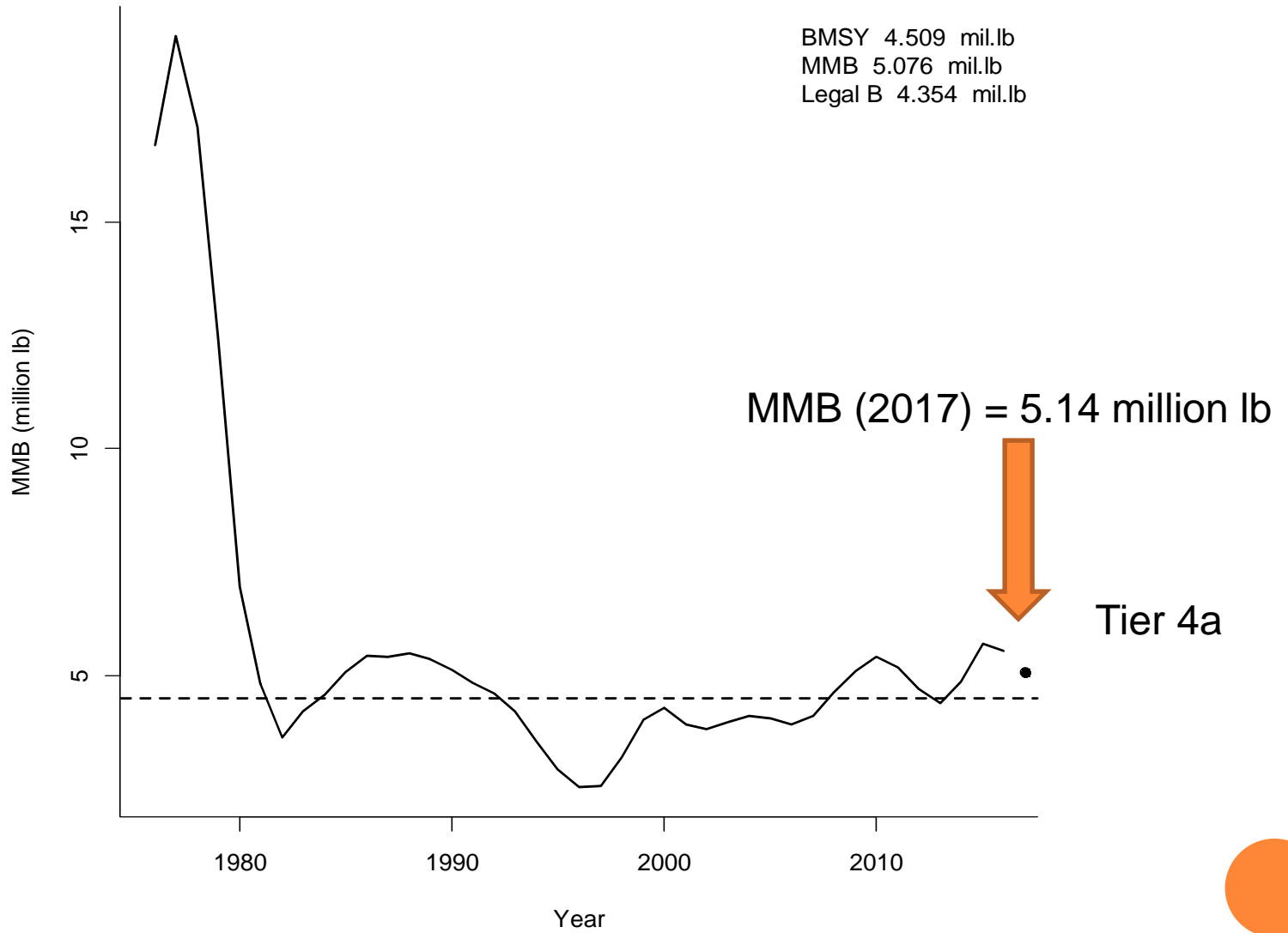
Model 3 MMB



MMB Feb 01

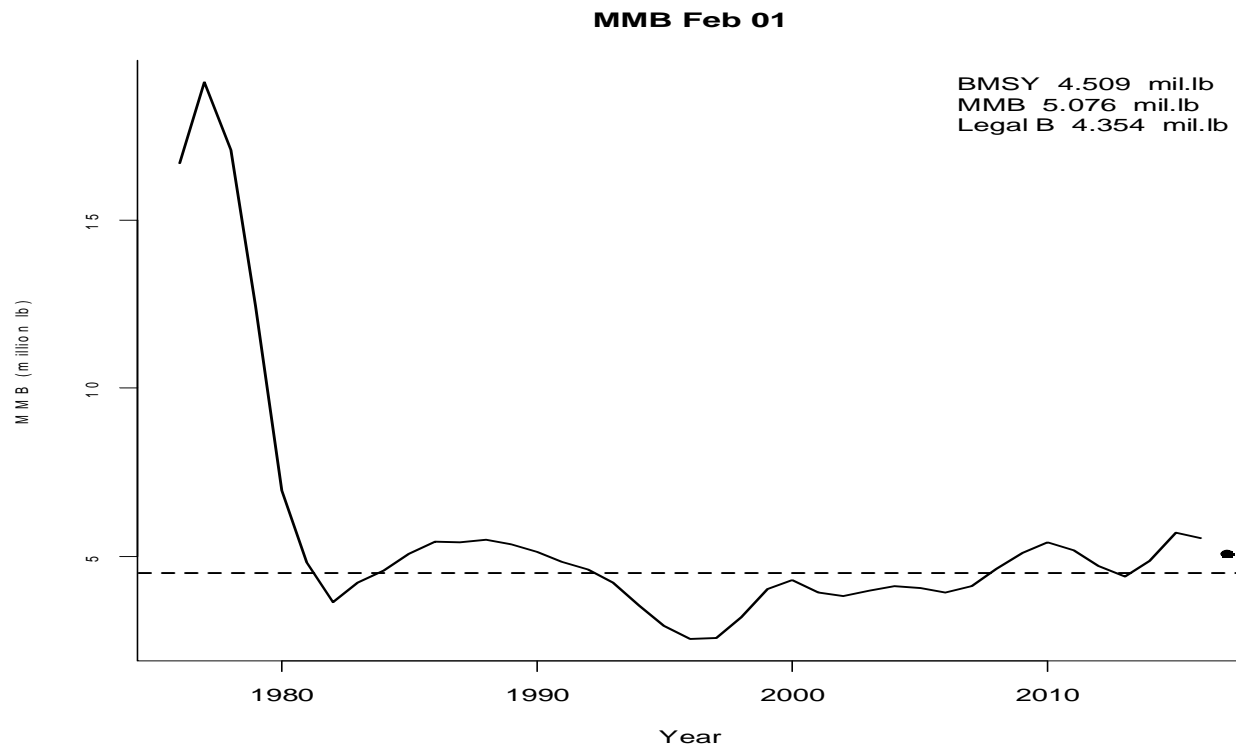


MMB Feb 01



OFL AND ABC

- OFLr= 0.67 million lb
- ABC = 20% buffer = 0.54 million lb= 0.24 (1000t)



ADDITIONAL CPT ISSUES

- AIGKC model recommendations
- Tanner crab model recommendations
- Update on BBRKC Gmacs
- Update on BSFRF survey
- BBRKC PSC (D-1)
- Stock Prioritization (D-2)



AIGKC MODEL RECOMMENDATIONS

- Model approved for use in 2017 specifications for June
- Discussion of model recommendations for May CPT and June SSC review
- CPT and SSC recommend that this stock qualifies for Tier 3 status for establishing OFL and ABC
 - $F_{35\%}$ can be estimated



TANNER CRAB MODEL RECOMMENDATIONS

- Continued progress on a new Tanner crab model for use in 2017/18
- minor differences in old vs new model that author is working to tweak
- New model would be a bridge towards plans to move to a GMACs formulation in 2 years



MAY MEETING AND FUTURE PLANS

- Final assessments for AIGKC, PIGKC, WAIRKC
- Modeling updates and proposed scenarios for
 - BBRKC (GMACs and 2016 model)
 - Snow crab
 - Tanner crab
 - SMBKC
 - PIRKC
- Research Priorities
- Revisit stock prioritization results and plans

