Cooperative research in the Atlantic mackerel assessment

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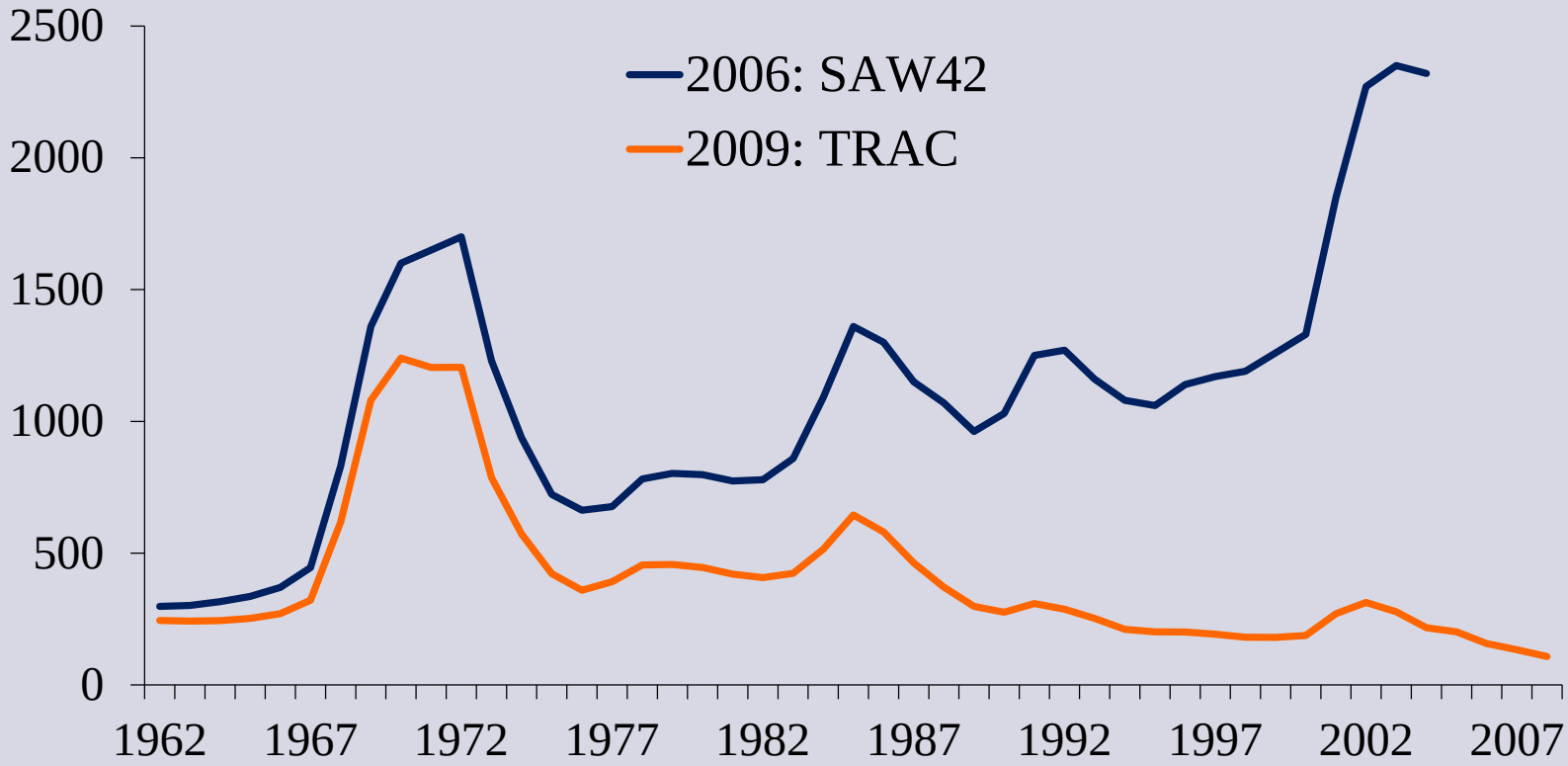
READ / Population dynamics

Previous assessments:

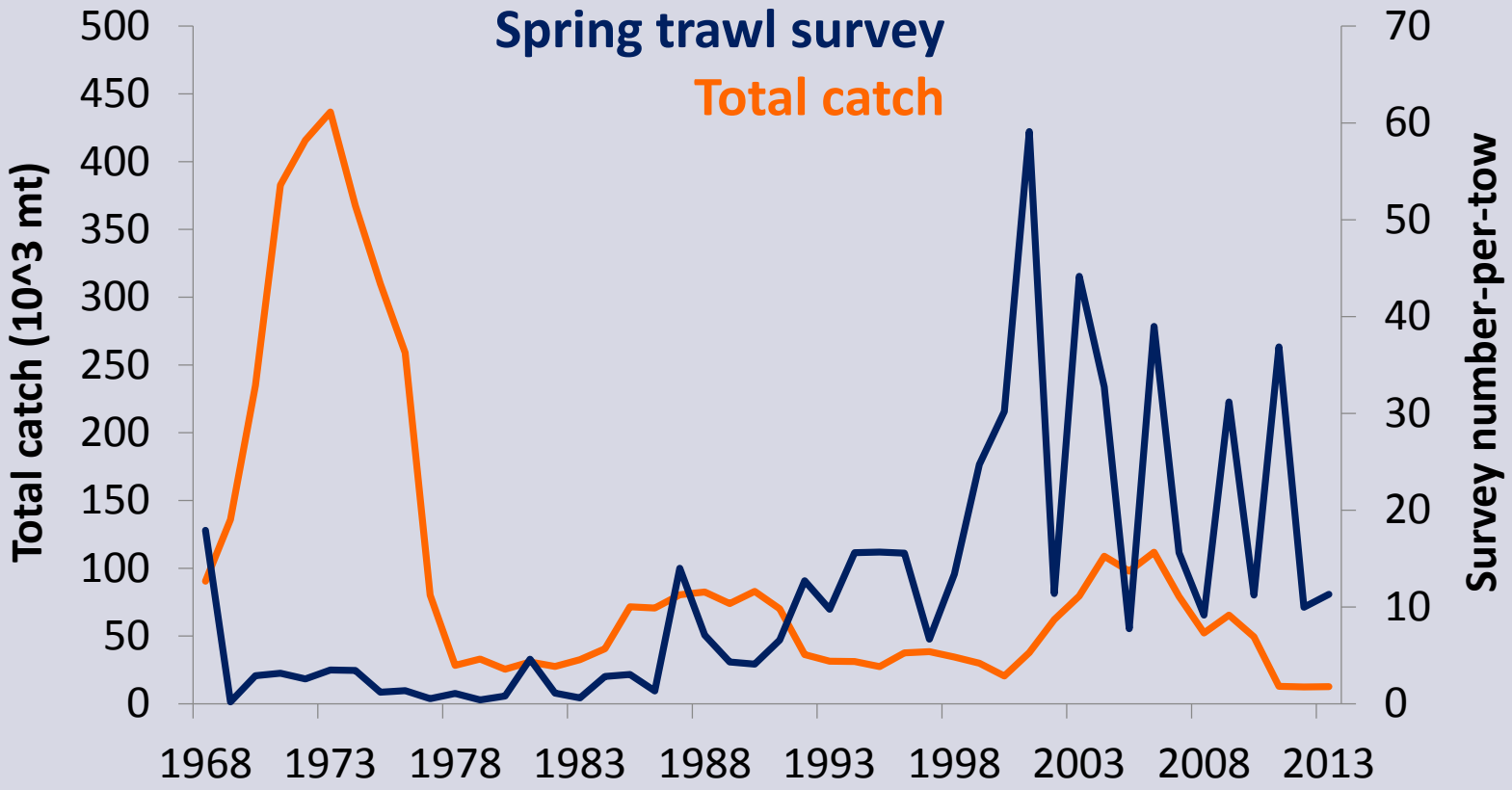
Spawning stock biomass estimates (000s mt)



*** **Diagnostic issues with both assessments**

- 2009 TRAC did not pass peer review
- 2009: '06 model should not be used for management

Conflicting input data



- Difficult for model to resolve disparate trends between removals (total catch) & spring survey index
- Potential issues with spring survey index

Population ecology workshops hosted by cooperative research

- Two workshops: December 2015 and 2016
- Participants: Industry, Academics, NEFSC, NGO
- Collaborative, insightful
- Discussed population ecology, distribution, migration patterns, catchability

- Follow-up interviews, assessment working documents and qualitatively informed multiple aspects of the assessment
- Also resulted in multiple hypothesis about mackerel trends in population ecology

Helpful insights:

- Some working group members concerned that trawl survey not useful because mackerel thought of as a pelagic species
  - MWT primary gear since 2000 – described as bottom-tending MWT
  - Captains indicated that when fish mackerel, fish near the bottom
- Tow speed: due to tow speed and length, trawl survey able to catch smaller fish better than larger fish
  - Gear selectivity one of critical parameters in stock assessment models

Helpful insights:

- Changes in fishery selectivity: historically had the ability to leave small fish and go for big fish; mid 2000's targeting small fish
  - Provide rationale/timeframes for selectivity changes in model
- Mackerel do not have swimbladders, but fishermen still use acoustics to find mackerel;
  - Potential future analysis of survey catchability using acoustics data from Bigelow
- Pronounced shift in size structure and migration patterns in late 1990's
  - Last big schools of large fish caught in 1998; last big schools of small fish caught in 2006 → possible size/age truncation
  - Used to see two waves of fish migrating south but lost inshore component and fish not coming as far south (south of Hudson Valley) → change in availability?

Overall…

- Qualitatively informed assessment
- Added interpretation to observed trends – ex: truncation in age structure
- Provided prior information of key parameters such as selectivity, catchability
- Beneficial to bring industry into the process and garner their insight from years on the water