SSC Report

Gulf of Mexico Fishery Management Council
January 25-28, 2016
Orange Beach, AL

January 2016 SSC Meeting

- **Standing and Special Reef Fish SSCs met Jan 5-6, 2016 in Tampa, FL**

SSC Members Present:

Standing SSC

Luiz Barbieri, Chair
Joe Powers, V. Chair
Harry Blanchet
Benjamin Blount
Mary Christman
Bob Gill
David Griffith
Jeff Isely
Walter Keithly
Kai Lorenzen
Paul Mickle
William Patterson
Sean Powers
Ken Roberts
James Tolan

Special Reef Fish SSC

Jason Adriance
Marcus Drymon
Robert Ellis
Jennifer Herbig
John Mareska

January 2016 SSC Meeting Agenda

rev. 12/31/2015

AGENDA[1]
GULF OF MEXICO FISHERY MANAGEMENT COUNCIL
STANDING AND SPECIAL REEF FISH
SCIENTIFIC AND STATISTICAL COMMITTEE
TAMPA, FLORIDA

Tuesday, January 5, 2016: 9:00 am – 5:00 pm
Wednesday, January 6, 2016: 8:30 am – 2:00 pm

I. Introductions and Adoption of Agenda – Chair

II. Approval of September 1-2, 2015 Standing and Special Reef Fish SSC minutes - Chair

III. Selection of SSC representative at January, 2016 Council meeting – Chair

IV. Assessment prioritization process – Methot

V. Discussion of Best Scientific Information Available – Mara Levy

-----15 minute break when appropriate-----

VI. SEDAR 43 Gray Triggerfish Projections (part 1) – SEFSC/SSC
   a. Selection of recruitment scenario
   b. Determination of P*

VII. Discussion on best approach for stability of management: constant catch or constant F – Atran/Barbieri

VIII. Constant catch OFL and ABC for wFL shelf stock of hogfish - FWRI
   a. Comparison of iterative vs. averaging methods

---- Lunch - 1 ½ hr -----

IX. SEDAR 42 red grouper benchmark assessment
   a. Review of assessment –SEFSC
   b. Determination of OFL and ABC for constant F – SSC/SEFSC
   c. Determination of OFL and ABC for constant catch – SSC/SEFSC

-----15 minute break when appropriate -----

X. Framework Action to Adjust Recreational Red Snapper ACT Buffer
   a. Review of methodology to set season length – SERO
   b. Methods to assign probability of exceeding ACL to ACT buffer – SERO/SSC
   c. Review of framework action options paper – Atran

-----End Day 1 ----- Begin Day 2 -----

XI. Management strategy evaluation using the individual-based multi-species model OSMOSE-WFS – Arnaud Gruss

XII. Draft Amendment 44 – MSST and MSY Proxies – Atran

-----15 minute break when appropriate-----

XIII. SEDAR 43 Gray Triggerfish Projections (part 2) – SEFSC/SSC
   a. Reanalysis of OFL, ABC, and rebuilding period

----- Lunch - 1 ½ hr -----

XIV. SEDAR Issues
   a. Proposed revisions to the SEDAR process – Rindone
   b. SEDAR 49 – Gulf of Mexico Data-limited Species – Neer
      i. Terms of Reference
      ii. Project schedule
      iii. Appointments for data, assessment, and review groups

XV. Review of SSC Meeting Schedule for 2016 – Atran

XVI. Other Business

Stock Assessment Prioritization

- Presentation by Dr. Rick Methot on new prioritization process developed by NMFS.
- Purpose: guide the type and frequency of assessments for managed stocks at region level
- Establishes a score for each of 12 factors within the categories of fishery, stock abundance and mortality, ecosystem considerations, assessment information, and targeted frequency of assessments.
- Each factor given a weight; summed weighted factor scores produce assessment-priority list
- Factor scores and weights will be developed by NMFS staff, SSC, and other Council advisors
- Process to provide guidance; not meant to be prescriptive
- Next step: seek an agreement at the spring SEDAR Steering Committee meeting to have the southeast Councils use information from this process
- NMFS is taking initial steps to assemble factor scores in coordination with SEDAR staff

Stock Assessment Prioritization

Prioritization History

2011
- Initiate development in response to budget inquiries

2013
- Needs discussed in proposed MSA reauthorization

Feb 2014
- Draft process presented to CCC and open for public comment

June 2014
- Public comments summarized for CCC

Sept 2014
- GAO report endorses draft plan

June 2015
- Process revised based on comments
- Presented to CCC

Aug 2015
- Prioritization document released to public
- Implementation initiated in cooperation with FMCs

Stock Assessment Prioritization

NMFS	Collates data from databases and past assessments
NMFS, Council Committees, Invited Experts	Provide scores for each stock for the other factors
NMFS, Councils	Assigns weights within ranges to each factor
NMFS Councils	Uses the proposed list, upcoming management cycle, data availability, and assessment capacity to determine set of assessments to do

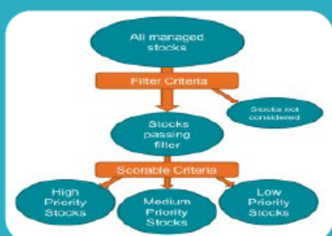
Stock Assessment Prioritization

Category	Factor	Source	Raw Scores
FISHERY	Commercial Fishery Importance - rescaled log(ex-vessel value)	SIS- ACL	0-5
	Recreational Fishery Importance - from regional input	Experts	0-5
	Importance to Subsistence	Experts	0-5
	Non-Catch Value	Experts	0-5
	Constituent Demand/Choke Stock	Experts	0-5
	Rebuilding Status	SIS	0-1
STOCK	Relative Stock Abundance	SIS	1-5
	Relative Fishing Mortality	SIS	1-5
ECO	Key Role in Ecosystem	Experts	1-5
ASMT	Unexpected Changes in Stock Indicators	Experts	0-5
	Relevant New Type of Information Available	Experts	0-5
	Years Assessment Overdue - relative to Target Frequency	SIS	0-10
TARGET FREQ	Mean Age in Catch	Experts	Value
	Stock Variability	Asmt	-1 to +1

Three Regional Science Activities

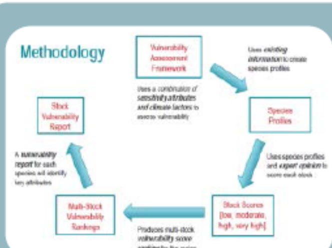
Stock Assessment Prioritization (http://goo.gl/8pQ898)

- Objective and transparent process to prioritize stocks for assessment
- Establishes target assessment level and frequency for each stock
- Cooperative process between NMFS, FMCs and other stakeholders



Habitat Assessment Prioritization (http://goo.gl/ZPNxbn)

- Process to develop regional habitat science priorities
- Uses criteria to score stocks appropriate to prioritizing habitat science
- Recently completed for West Coast stocks



Climate Vulnerability Assessment (http://goo.gl/0sARjR)

- Estimates relative vulnerability of fish stocks to potential climate change
- Based on existing information on species distributions and life history
- Results help managers identify ways to reduce risks/impacts to fisheries

Proposed Revisions to the SEDAR Process

- Council and SEDAR staff presented proposed changes to the SEDAR assessment process in September of 2015
- Council staff reviewed the current SEDAR assessment process for reference
- Proposed revision would result in the institution of a two-part species-specific assessment process, with research-track and operational-track components.
- Research-track assessment similar to a current benchmark assessment, but would not yield management advice upon its completion; 18 months to complete
- SEFSC staff developed and endorse proposed changes; perception = better standardized practices and increased throughput
- Mixed reaction by SSC: likely delays in the near term, but perhaps benefits of peer-review standard practices will create efficiencies

Best Scientific Information Available

- Discussion led by NOAA General Counsel Mara Levy
- Issue was SSC's handling of review of Gray Triggerfish update assessment
- When reviewing certain stock assessments, the SSC fulfills roles of 1) peer review, and then 2) advisor to the Council regarding ABC
- Levy: a motion stating that an assessment is BSIA but is not adequate for management is inconsistent given the requirements of the MSA; SSC confusing two roles
- Suggestion: Explicitly separate the two roles; clearly define which role is being conducted
- Discussion of what is meant by "best" in BSIA
- Levy: Congress made policy decision by virtue of the language in NS2, best = best available
- Staff pointed out NS2 guidelines revision and Dr. Methot indicated further guidance on assessment peer review forthcoming

Gray Triggerfish OFL/ABC

- **Results presented of yield streams requested by Council for a new gray triggerfish rebuilding plan**

1. Project $T_{REBUILD}$ (or T_{MIN}) in the absence of fishing mortality. This should be calculated under two projected recruitment scenarios:
   a. Assume low recruitment for the years 2014-2018 (5 years from 2013).
   b. Assume low recruitment for the years 2014-2021 (5 years from 2016, 8 years total).

2. Project the annual overfishing levels (OFLs) associated with the constant fishing mortality rate that allows stock to rebuild by 2026 ($F_{REBUILD}$), assuming the first year harvest levels can be set is 2017 and:
   a. Low recruitment from 2014-2018 and subsequent recruitment determined by stock-recruitment relationship in 2019-2026.
   b. Low recruitment from 2014-2021 and subsequent recruitment determined by the stock-recruitment relationship in 2022-2026

3. Project the annual overfishing levels (OFLs) associated with the constant fishing mortality rate that allows stock to rebuild by 2024 ($F_{REBUILD}$), assuming the first year harvest levels can be set is 2017 and:
   a. Low recruitment from 2014-2018 and subsequent recruitment determined by the stock-recruitment relationship 2019-2024.
   b. Low recruitment from 2014-2021 and subsequent recruitment determined by the stock-recruitment relationship 2022-2024.
   If T_{MIN} under this recruitment scenario is 8 years, then calculate rebuilding to occur in 2025.

4. The probability density function of each OFL (2a and b, 3a and b) will also be made available to facilitate the estimation of the acceptable biological catch (pending the Scientific and Statistical Committee's designation of P*).

Gray Triggerfish OFL/ABC

- **By a unanimous vote, the SSC accepts the low recruitment for 2014-2018 scenario as the basis for projections for gray triggerfish.**

- **By a vote of 18 to 2, the SSC recommends that the OFL for Gulf gray triggerfish for years 2017-2019 is 1.31, 1.29, and 1.22 mp ww, respectively. Annual ABC for these years will be computed as the 40th percentile of the $F_{REBUILD}$ PDF, which is contingent upon the Council specifying the duration of the rebuilding plan.**

Year	OFL	ABC_{2024} 8-year rebuild	ABC_{2025} 9-year rebuild	ABC_{2026} 10-year rebuild
2017	1,310,000	216,000	399,000	546,000
2018	1,290,000	227,000	412,000	554,000
2019	1,220,000	233,000	417,000	555,000

Yields are in pounds whole weight.

West FL Hogfish OFL/ABC

- Table 4. OFL & ABC Recommendations for wFL Shelf Stock of Hogfish from May 2015

Year	OFL	ABC
2016	257	240
2017	229	217
2018	211	200

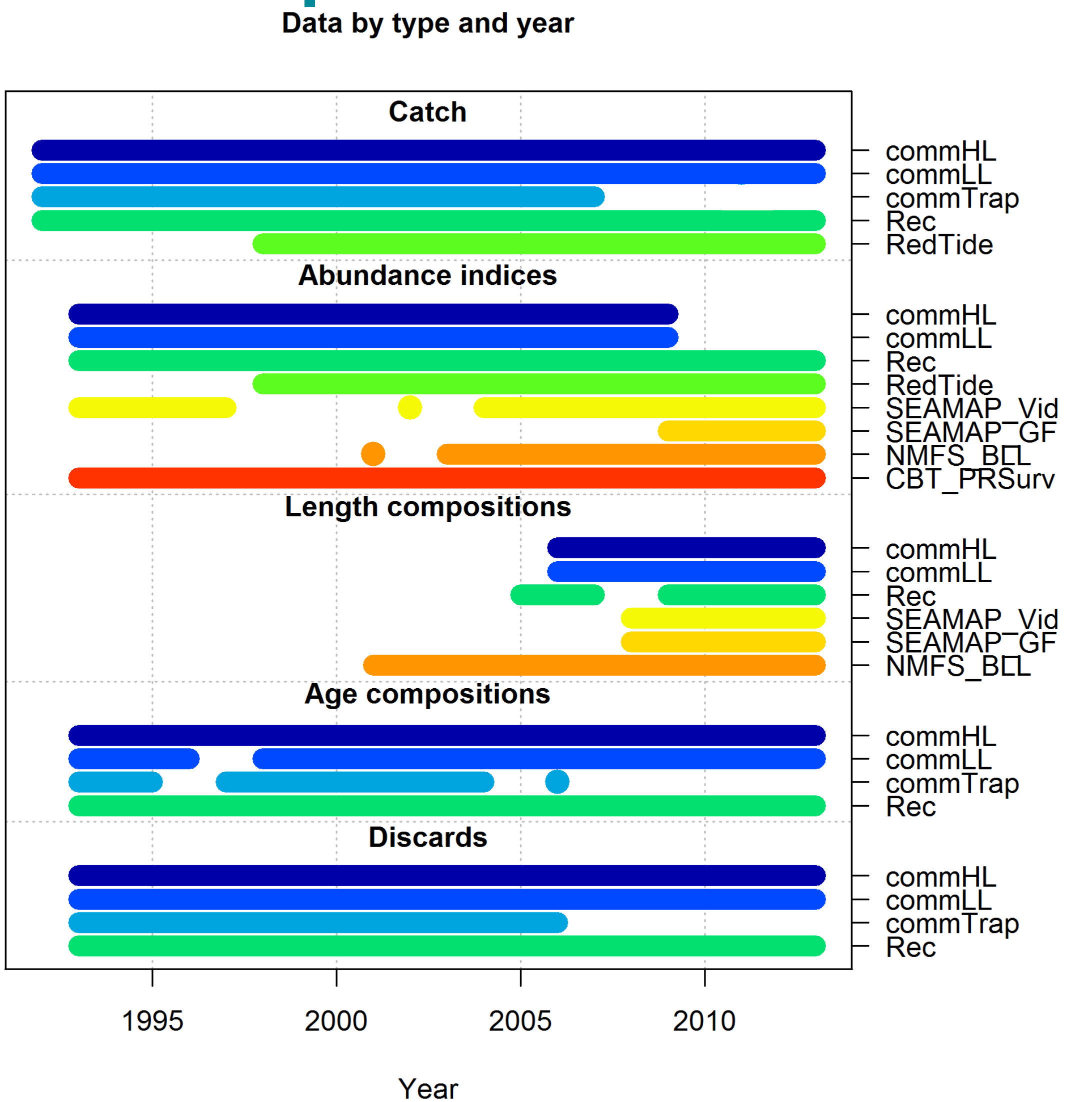
- Council requested constant catch scenario; FWRI unable to coordinate with SEFSC to perform iterative approach

- By a unanimous vote, under a constant catch scenario for 2016-2018, the SSC recommended the wFL Shelf hogfish constant catch consideration use the mean of the OFL and ABC for the constant F yield streams.

  OFL mean=232,000 lbs ww
  ABC mean=219,000 lbs ww

SEDAR 42 Gulf Red Grouper Assessment

Data inputs



- Catch (Retained catch or landings)
  - Trap fishery closed in 2006
- Abundance indices
  - Red tide index - Index of effort
- Length composition
  - Fishery-dependent data
    - Discards
- Age composition
  - Gaps are due to low sample size (<10)
- Discards
  - Trap fishery closed in 2006

Assessment model

- Stock Synthesis (Methot and Wetzel 2013) used as the assessment modeling platform
  - Integrated stock assesment model
  - Forward projecting statistical catch at age model
- Advantages
  - Do not have to split time series
    - Time varying selectivity and retention functions, time blocks
  - Can use both length and age composition data
  - Can link parameters to environmental series
  - Explicitly incorporates imprecision of observation processes (e.g., aging imprecision)

SEDAR 42 Gulf Red Grouper Assessment

Proposed base model

- **1986 - 2013**
- 1 area, 1 season model
- Combined gender model
- Maturity, protogyny, and fecundity a function of age using life history data inputs (fixed)
- von Bertalanffy growth (fixed)
- Lorenzen natural mortality (fixed)
- **Beverton-Holt spawner-recruitment relationship**
  - **Steepness estimated**
- **6 fishing fleets – landings and discards**
  - **Two recreational fleets (MRIP and Headboat**
- 4 fishery-dependent indices of abundance
- 3 fishery-independent indices of abundance
- Red tide mortality in 2005
- Age-based selectivity (Fleets)
- **Length-based selectivity**
  - **Fishery-independent surveys**
  - **NMFS BLL estimated**
- **Time-varying retention to account for changes in regulations (fixed)**

Recommended model

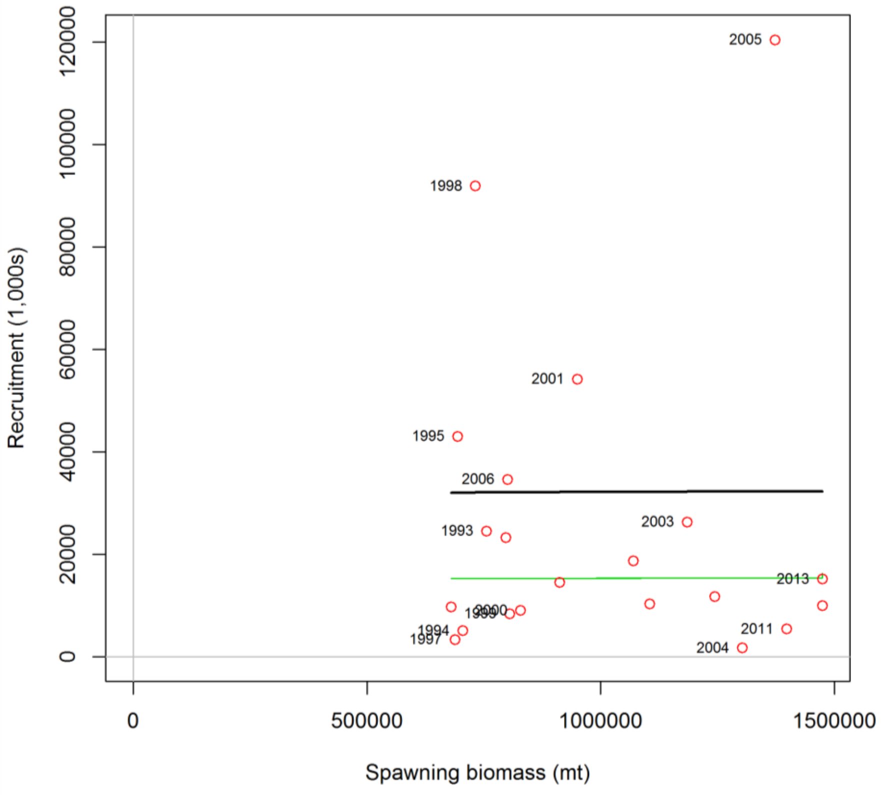
- **1993 - 2013**
- 1 area, 1 season model
- Combined gender model
- Maturity, protogyny, and fecundity a function of age using life history data inputs (fixed)
- von Bertalanffy growth (fixed)
- Lorenzen natural mortality (fixed)
- **Beverton-Holt spawner-recruitment relationship**
  - **Steepness fixed (h = 0.99)**
- **5 fishing fleets – landings and discards**
  - **Single recreational fleet**
- 4 fishery-dependent indices of abundance
- 3 fishery-independent indices of abundance
- Red tide mortality in 2005
- Age-based selectivity (Fleets)
- **Length-based selectivity**
  - **Fishery-independent surveys**
  - **NMFS BLL assumed asymptotic**
- **Time-varying retention to account for changes in regulations (estimated)**

Red tide in SS3 model

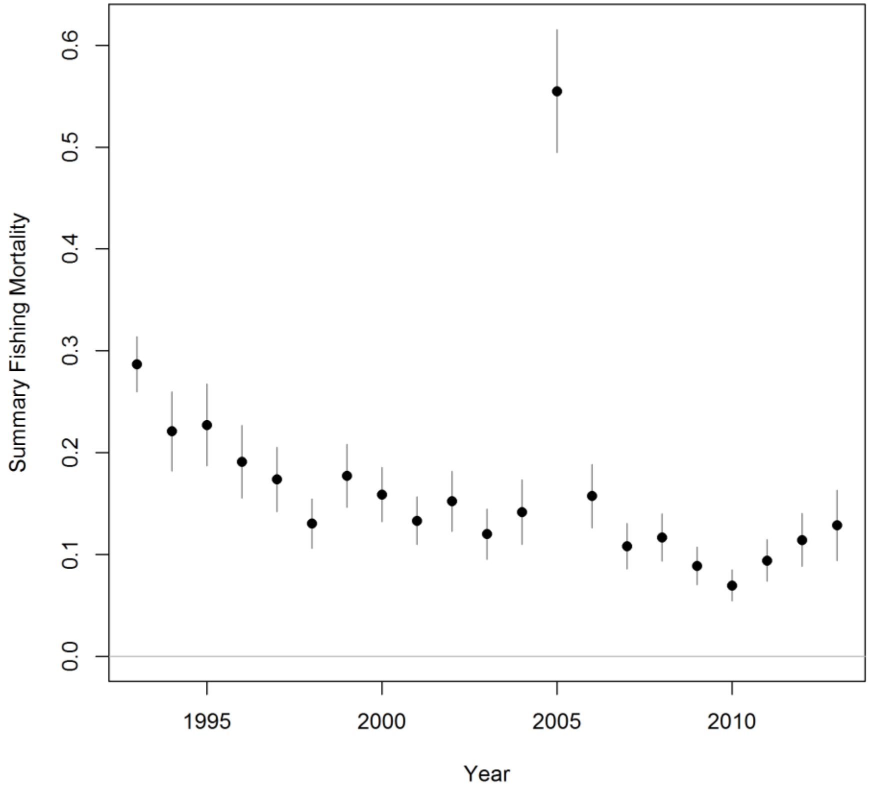
- Pseudo-fishery, discard only with 100% mortality
- Indices of abundance from the red tide fishery were derived from each index of red tide
- Selectivity of the red tide fishing fleet assumed constant at age
- Compare model fits by looking at residual fits to survey indices

SEDAR 42 Gulf Red Grouper Assessment

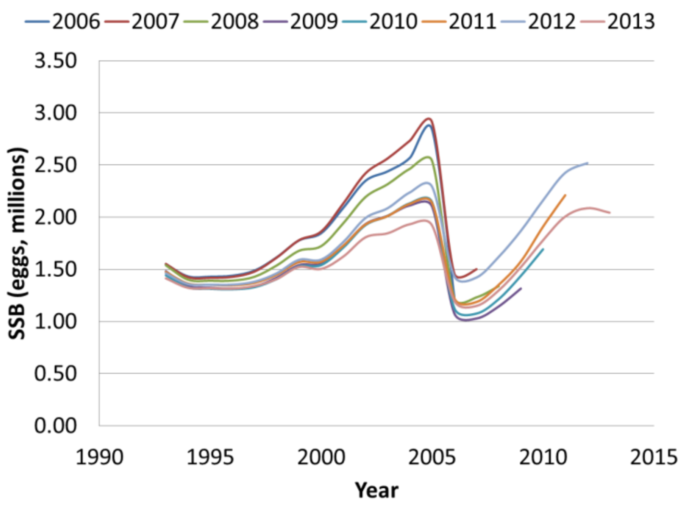
Stock-recruit relationship

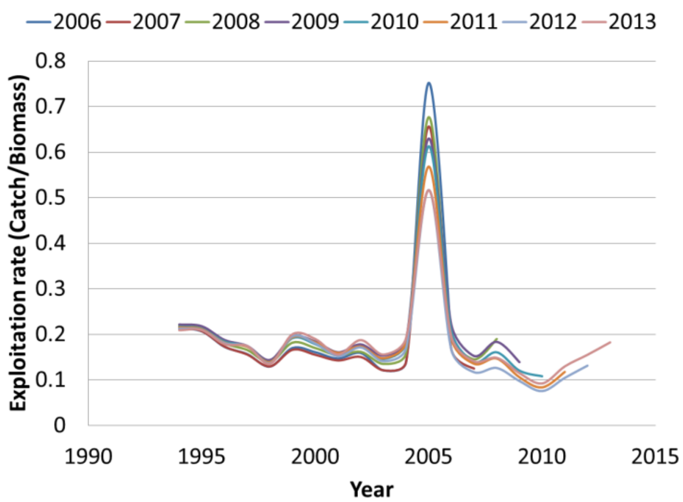


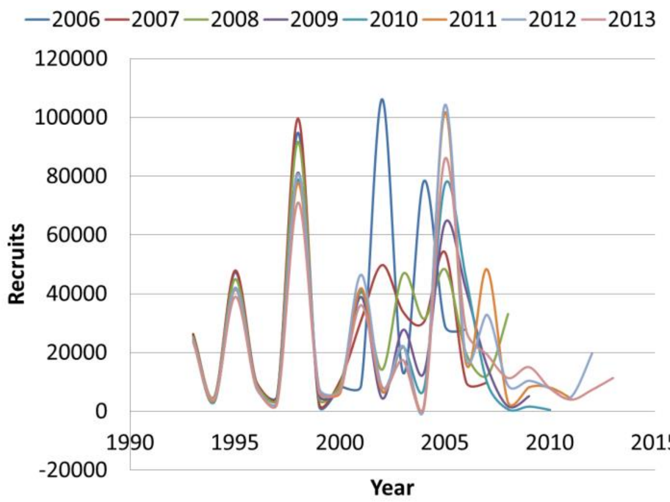
Exploitation Rate



Retrospective analysis results



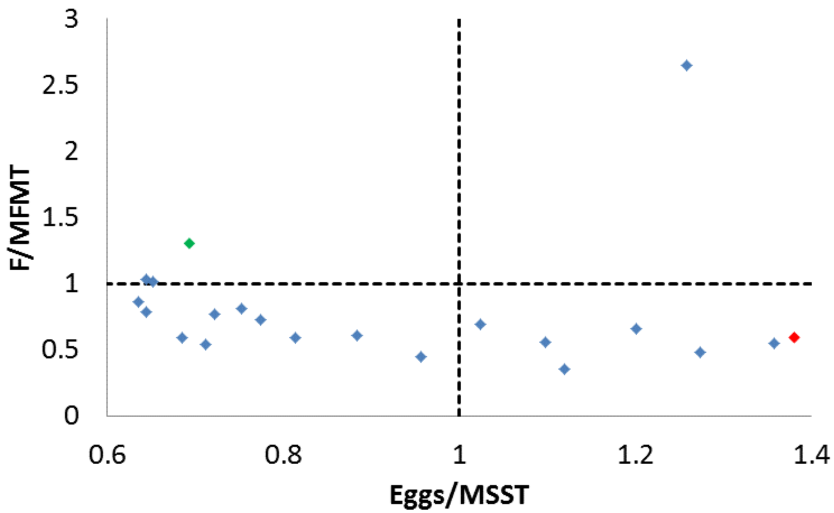


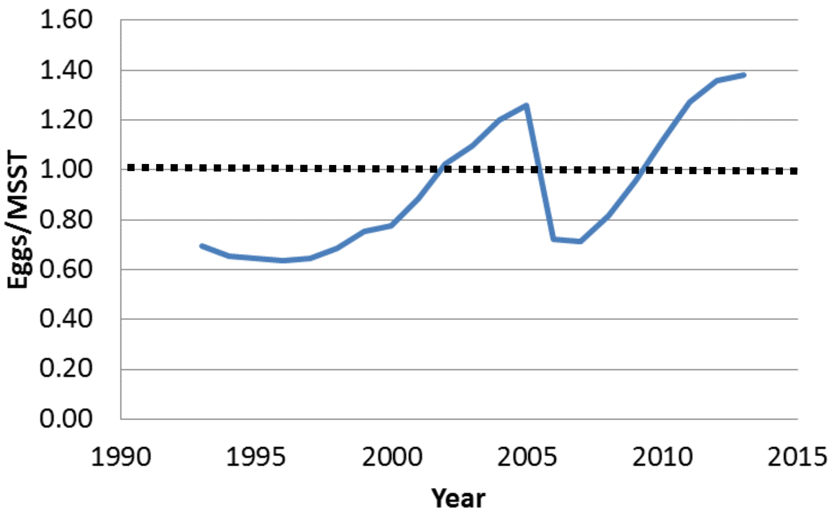


- Lack of systematic retrospective pattern in spawning potential (SSB in eggs) and exploitation rate
- Pattern in recruitment indicative of random fluctuations prior to having a recruitment index

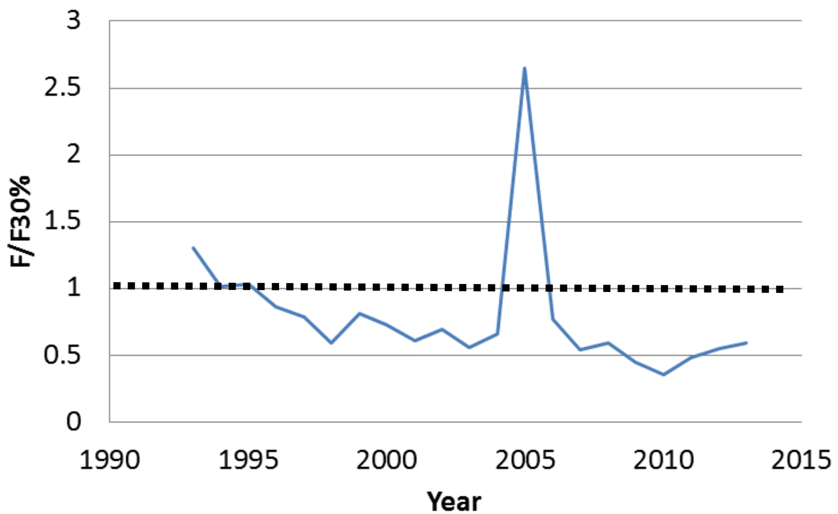
SEDAR 42 Gulf Red Grouper Assessment

Stock status





- 1993: Overfishing and overfished
- 2013: Not overfishing and not overfished



SEDAR 42 Gulf Red Grouper Assessment

Table 6. SEDAR 42 Red Grouper Assessment Results

Criteria	Definition	Value
Base M		$0.144\ y^{-1}$
	Mortality rate criteria	
F_{MSY} or proxy	$F_{30\%SPR}$	$0.212\ y^{-1}$
MFMT	$F_{30\%SRP}$	$0.212\ y^{-1}$
F_{OY}	75% of $F_{30\%SPR}$	$0.164\ y^{-1}$
$F_{current}$	F_{2013}	$0.126\ y^{-1}$
$F_{current}$/MFMT		0.59
$F_{current}/F_{OY}$		0.77
	Biomass criteria	
SSB_{MSY} (Eggs)	SSB at $F_{30\%SPR}$	2,447,900
MSST	$(1-M)*SSB_{30\%SPR}$	2,095,402
SSB_{OY}		3,081,890
$SSB_{current}$ (Eggs)	Eggs	2,905,630
$SSB_{current}/SSB_{30\%SPR}$		1.19
$SSB_{current}$/MSST		1.39
$SSB_{current}/SSB_{OY}$		0.94

SEDAR 42 Gulf Red Grouper Assessment

- **SSC separated functions of peer review and providing management advise**

- **By a unanimous vote, the SSC accepted the SEDAR 42 Gulf Red Grouper Assessment, including responses to review workshop comments, as the best available science which is sufficient for estimating stock status.**

- **By a unanimous vote, the SSC accepted the stock status determination for Gulf red grouper as not overfished and not experiencing overfishing, as of the terminal year of the assessment (2013).**

Projections

- Two fishing mortality targets
  - $F_{30\%SPR}$ and F_{OY}
    - $F_{OY} = 0.75*F_{30\%SPR}$
- Selectivity: 2010 - 2013
- Fishing mortality: 2011 - 2013
- Landings allocation: 76% commercial, 24% recreational
- 2014 red tide event assumed to be negligible

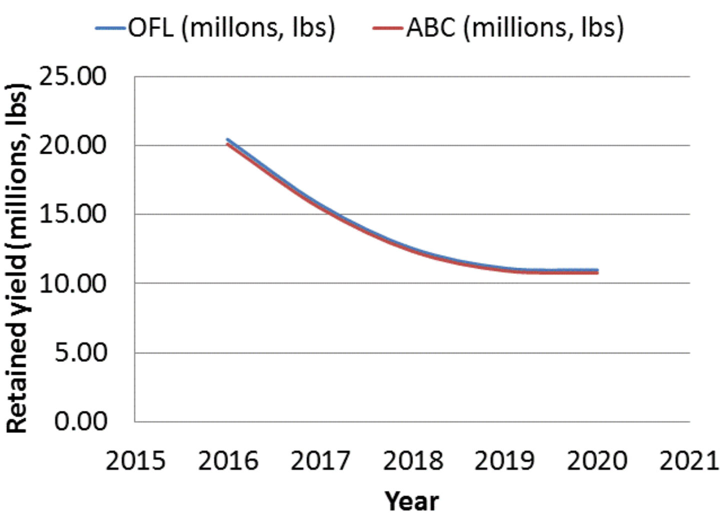
SEDAR 42 Gulf Red Grouper Assessment

- **By a unanimous vote, the SSC recommended that the annual OFL for Gulf red grouper for years 2016-2020 be set at the 50th percentile of the OFL PDF, assuming estimated landings for 2014 and 2015 fishing years. The annual ABC for years 2016-2020 will be computed as the 43rd percentile of the OFL PDF. Under a constant catch scenario, the mean of these time series for OFL or ABC would be utilized.**

OFL and ABC from retained yield stream

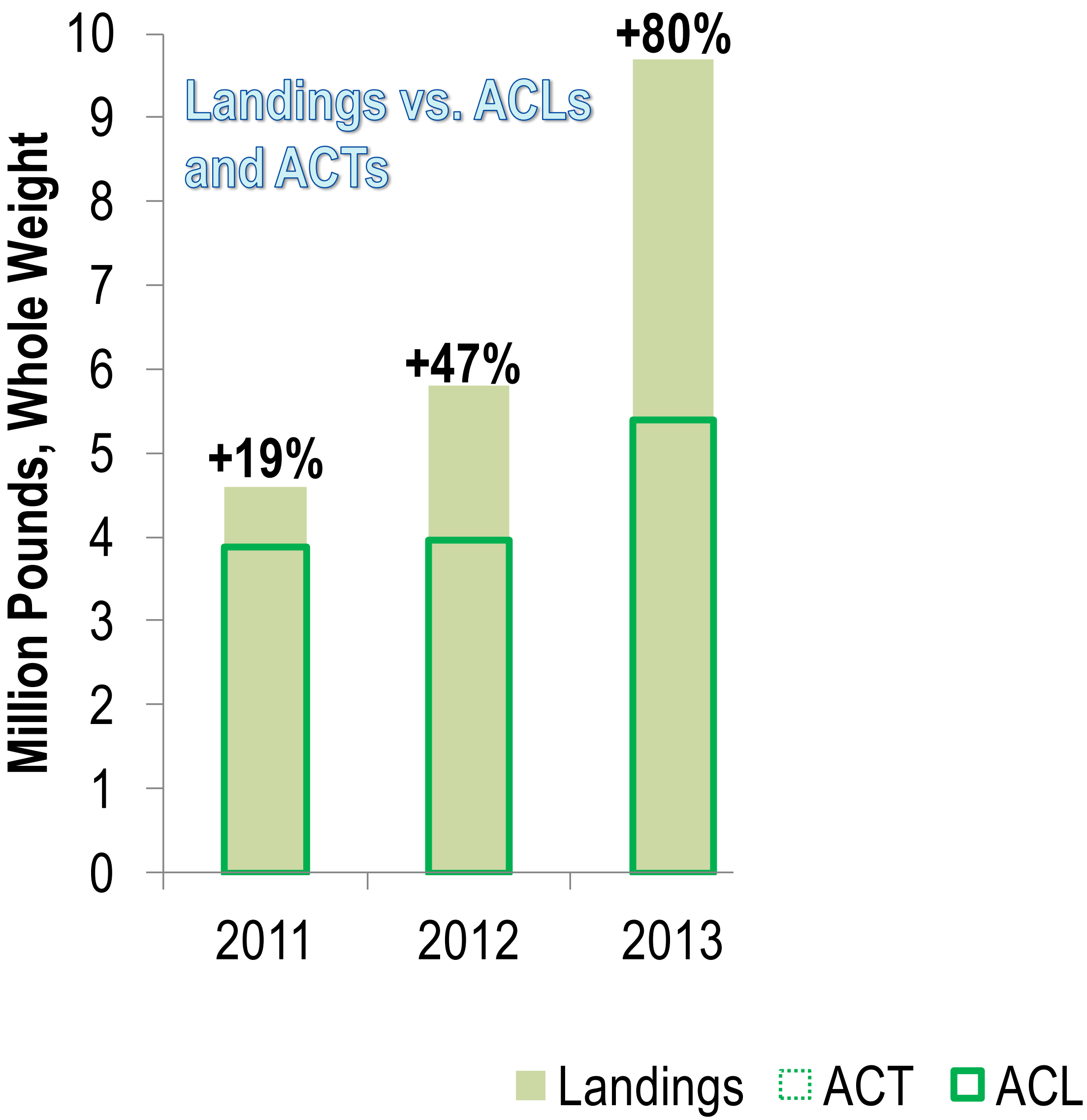
- ABC derived using a Pstar = 0.427

Year	OFL (millions lbs)	ABC (millions lbs)
2016	20.44	20.10
2017	15.73	15.48
2018	12.55	12.34
2019	11.12	10.93
2020	10.98	10.77

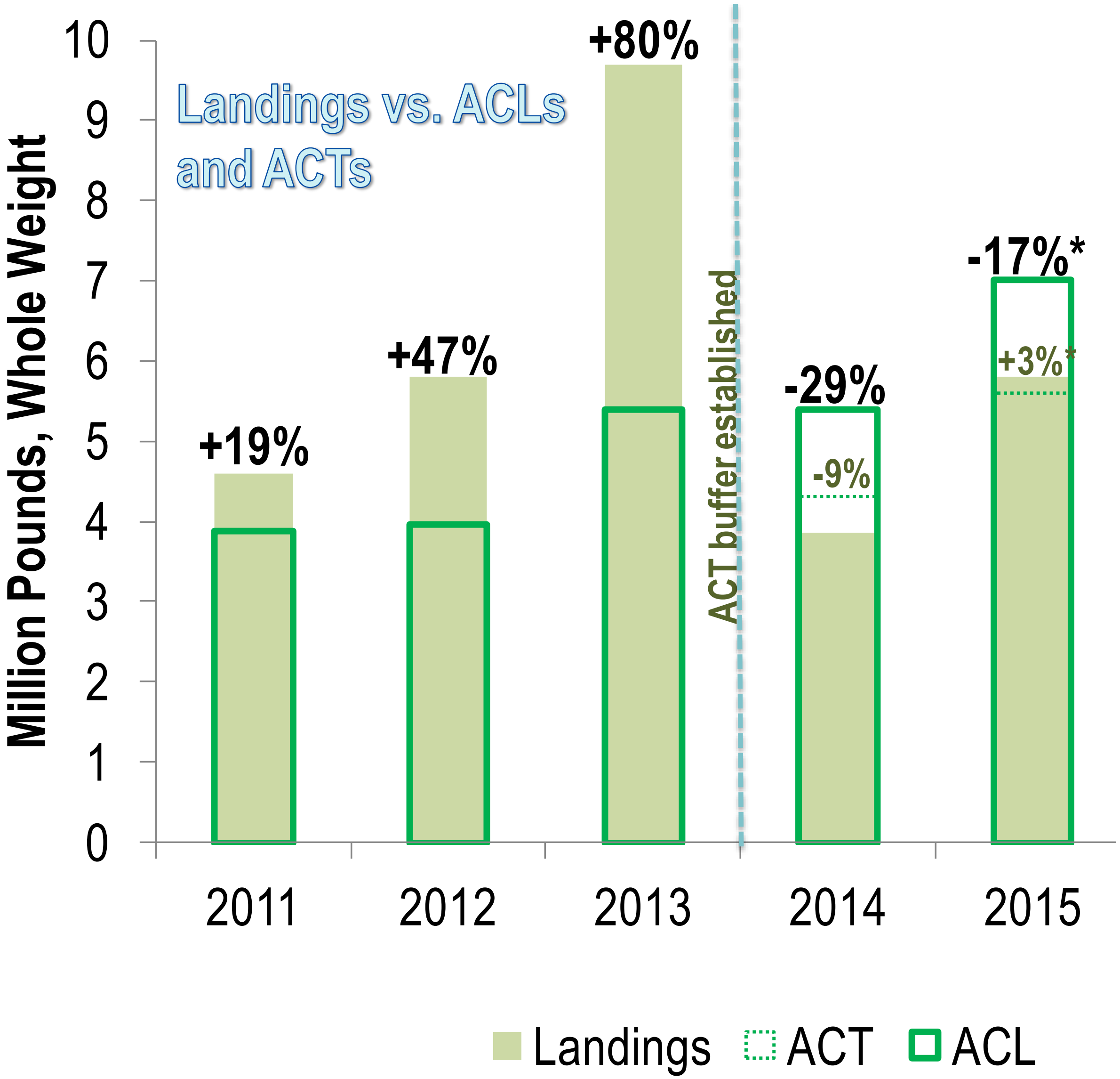


Mean ABC = 13.92 million pounds

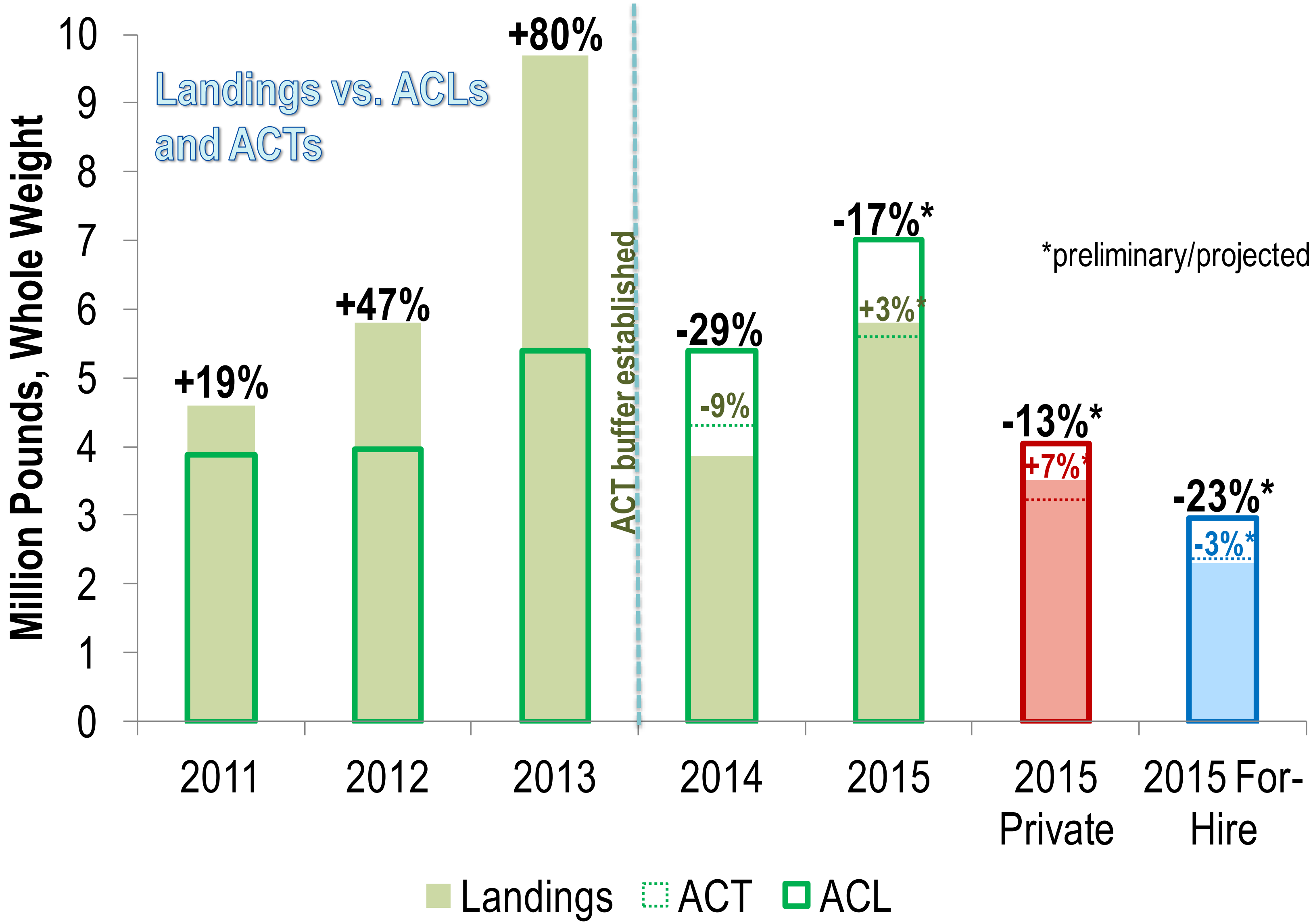
Recreational Red Snapper ACT Buffer



Recreational Red Snapper ACT Buffer



Recreational Red Snapper ACT Buffer



Recreational Red Snapper ACT Buffer

- A 20% buffer was projected to have a 15% probability of exceeding the ACL in 2014; underage due in part to overestimating some state catch rates.

- For 2015, four catch rate and average weight scenarios were evaluated using regression-based approaches on different input time series and predictor variables.

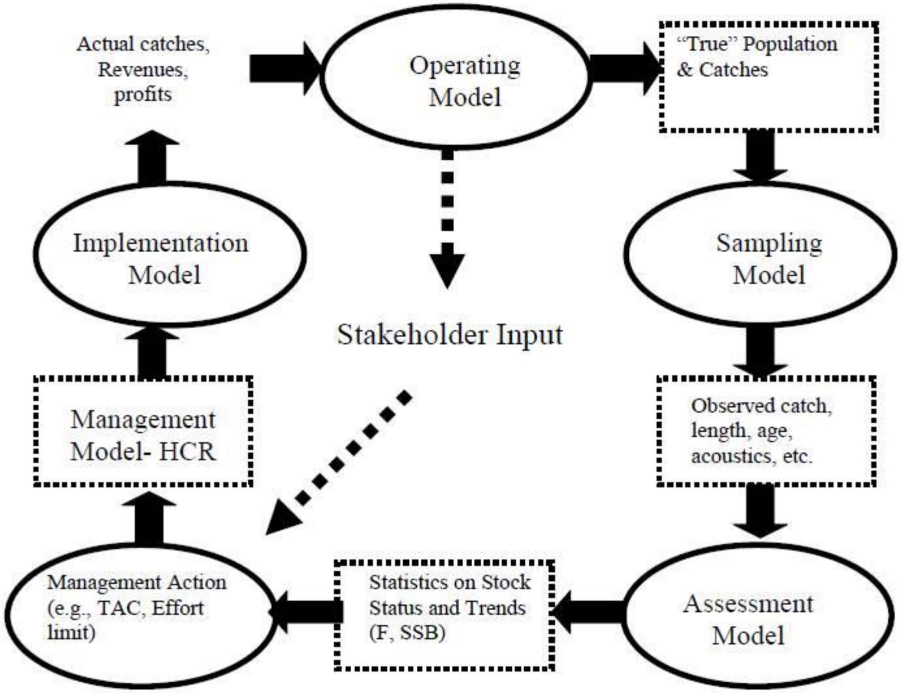
- SSC members felt that, due to the numerous sources of uncertainty, there were too many moving parts to be able to establish a scientific justification for either changing or retaining the 20% buffer. In addition, with only one year of sector separation, there is little data on which to base any analysis. SSC members suggested that the buffer be re-evaluated in 3 or 4 years when there will be more landings data under sector separation.

Management Strategy Evaluation with OSMOSE Model

- Dr. Arnaud Grüss demonstrated management strategy evaluation (MSE) red tide implications on red grouper with OSMOSE-WFS ecosystem model .

- MSE is a framework that can be used to simulate alternative management strategies, including ones to uncertainty and natural variation, and that balance conservation and socio-economic objectives.

- In its simplest form, MSE provides feedback between an operating model that simulates dynamics in the real world and a management model that prescribes management actions based on decision rules.



Management Strategy Evaluation with OSMOSE Model

- MSE results: all ABC strategies resulted in significant initial decrease in red grouper catch, but exceeded its initial level in medium term (i.e., after 10 to 20 years of simulations).

- Higher P* values resulted in higher catch-related metrics, while smaller P* values resulted in higher biomass-related metrics.

- When episodic events of natural mortality occurred in the model, higher P* values eventually resulted in lower catches. The frequency of ABC updates did not have a significant impact on performance of ABC strategies.

- Some SSC members questioned the use of net present value of revenue vs. profits in the MSE exercise; others noted that MSY estimation in multi-species OSMOSE is not the same as MSY or proxy estimated in single-species assessment models

- The SSC noted the utility of MSE and Shannon Cass-Calay indicated will eventually have a staff scientist conducting MSEs.

- An SSC sub-committee on MSE will be lead by Dr. Kai Lorenzen with the goal of examining the SSC's potential role in conducting MSEs in the future.

Other Topics Discussed

- **Discussion on comparison of constant F versus constant catch management strategies**
- **SEDAR 49—Data Limited Stocks; panel membership by SSC members established**
- **Review of 2016 SSC meeting schedule**