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Northeast Fisheries
Science Center



Golden Tilefish Research Track Assessment

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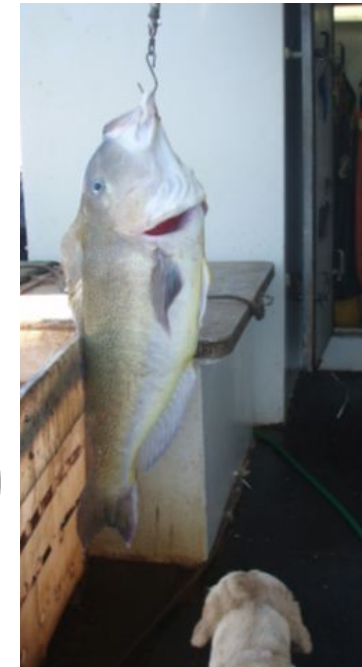
MAFMC Scientific and Statistical Committee

5/14/2024

Previous Assessment



- Last assessed in 2021 via Management Track
- ASAP model, terminal year 2019
 - Commercial landings and size/age data
 - Commercial CPUE index of abundance
- Reference points
 - $F_{40\%} = 0.261$ (proxy for F_{MSY})
 - $SSB_{40\%} = 10,995$ mt (proxy for SSB_{MSY}/SSB_{target})
- Stock status
 - Not overfished, F/F_{MSY} proxy = $0.160/0.261$
 - Overfishing not occurring, SSB/SSB_{MSY} proxy = $10,562/10,995$ mt



Intro

Modeling

SDC

Projections

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Conclusions



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Assessment Approach

- A primary goal was to advance from ASAP to WHAM assessment platform
- Bridge run gave similar results to ASAP model from 2021 MT
- RTWG struggled with modeling tradeoffs from the influences of random effects
- Recommended base configuration is ASAP-like model in WHAM, allows for continued model development in MT

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What's WHAM?

- The Woods Hole Assessment Model is an open-source state-space statistical catch-at-age assessment framework built in R and TMB
- Allows users to add in random effects at varying levels (including none), building to a full state-space model
- Allows for alternative covariance structures (AR1, iid, etc.)
- Allows for alternative age composition models (multinomial, Dirichlet, etc.)



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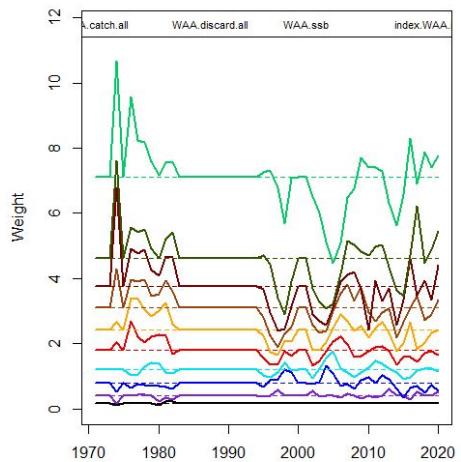
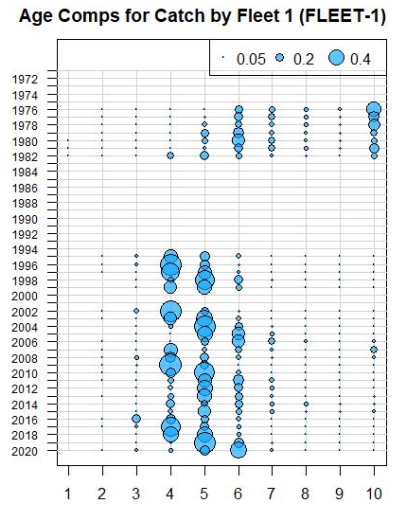
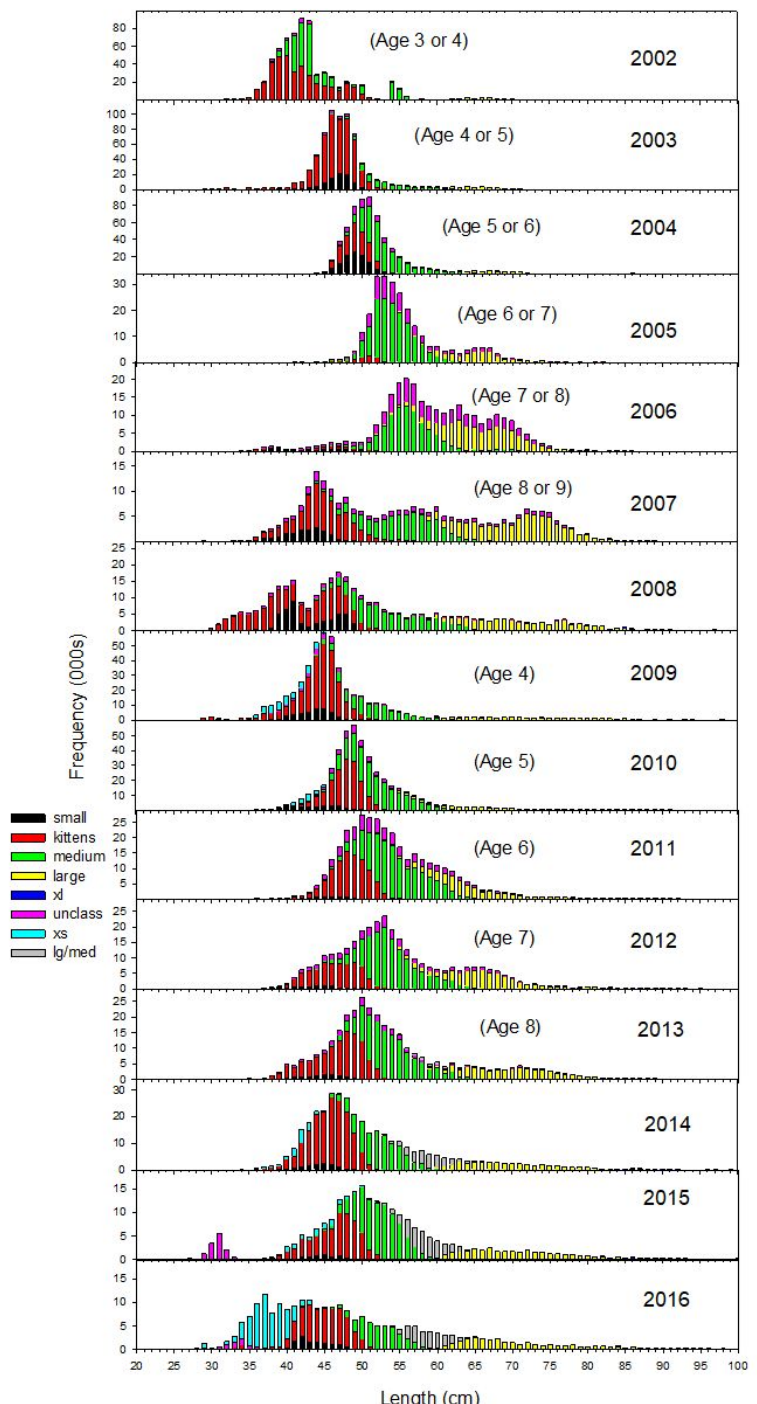
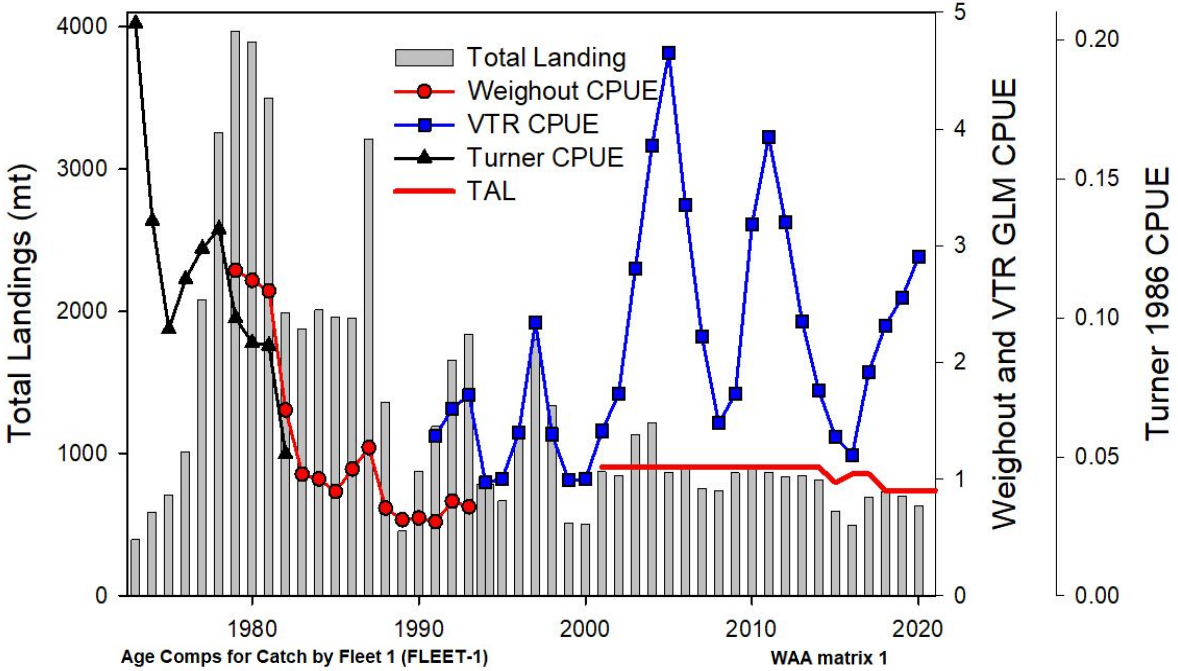


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Model Inputs



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ASAP to WHAP Transition



ASAP	WHAM
<i>Recruitment</i>	
Penalty on recruitment deviations from a mean	Recruitment as a random effect
<i>Start up</i>	
Penalty on deviations from an equilibrium population	Two parameter equilibrium population (recruitment & F) <u>or</u> Estimates starting numbers at age

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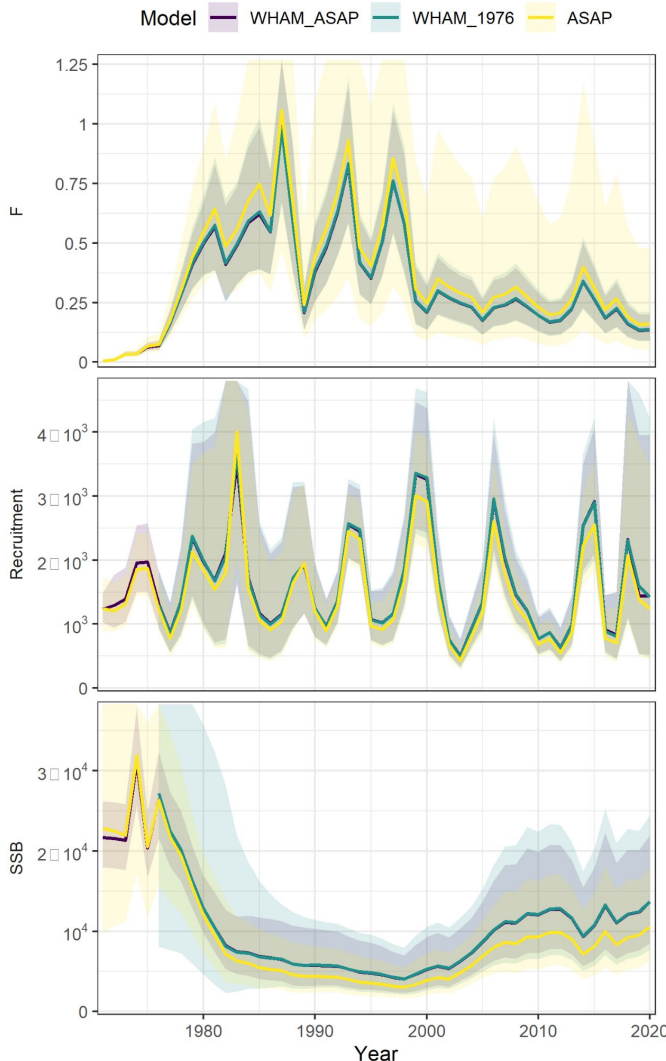
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Modeling Challenges



- Use of WHAM for data-limited stocks largely untested
 - Model results were sensitive to the inclusion of random effects
- NRCC AWG recommended RTWG move forward using the 2021 MT data to focus on model development
 - Work under ToRs 1-3 was reviewed on its own merit

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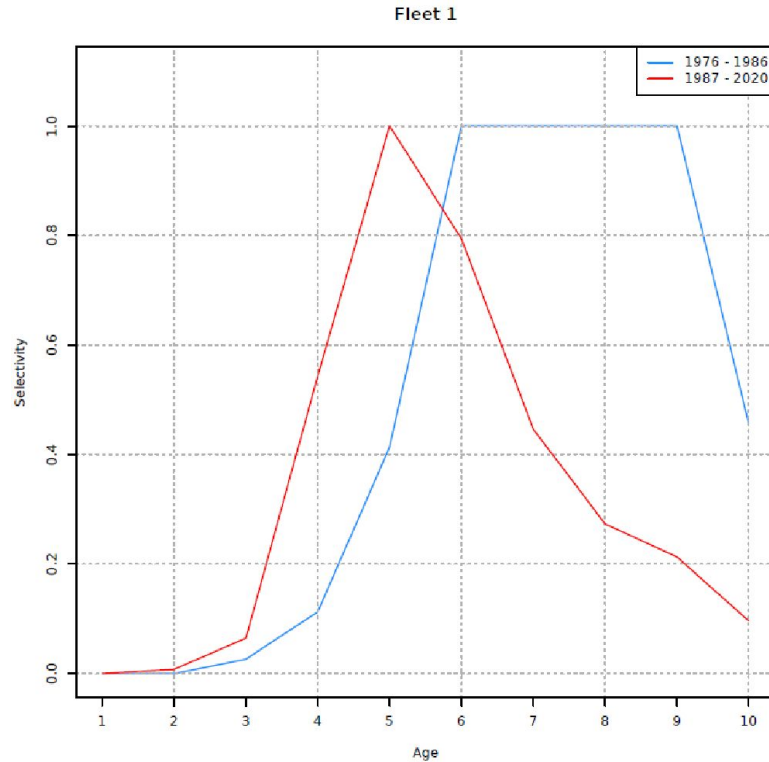
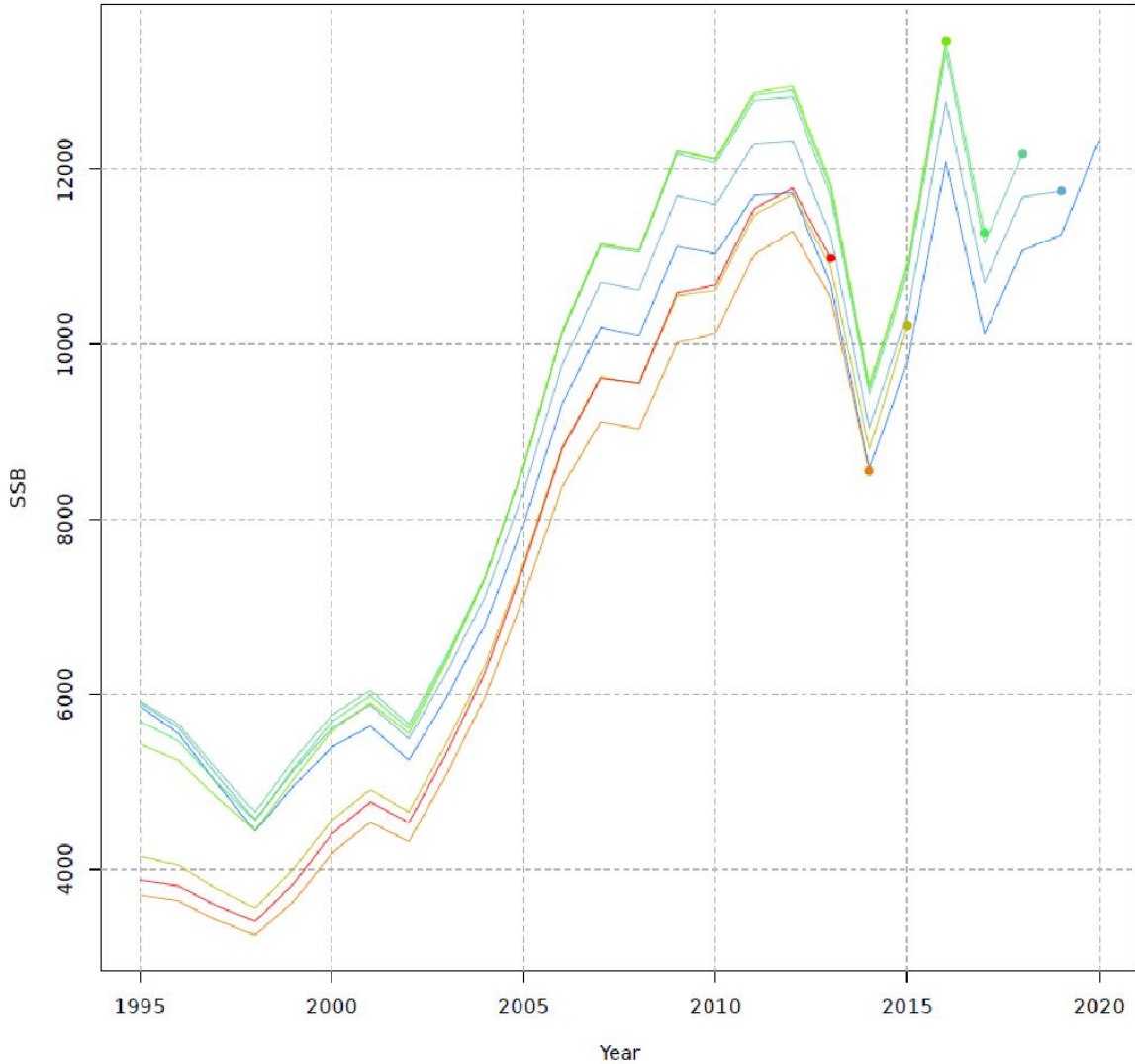
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WHAM Development



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Developing the Tilefish WHAM Further

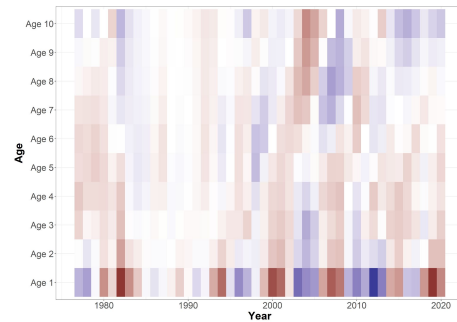
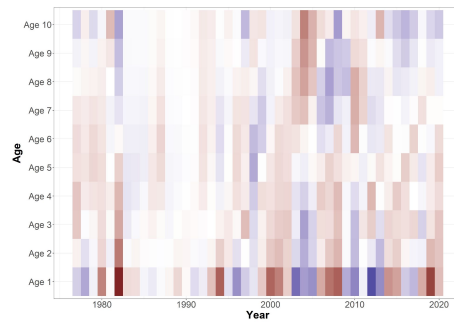
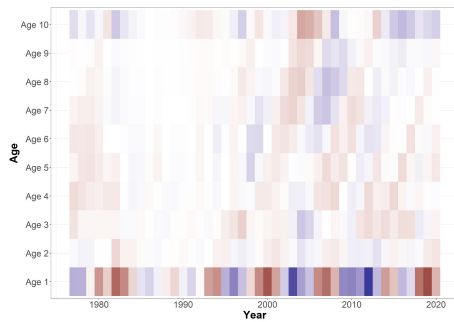
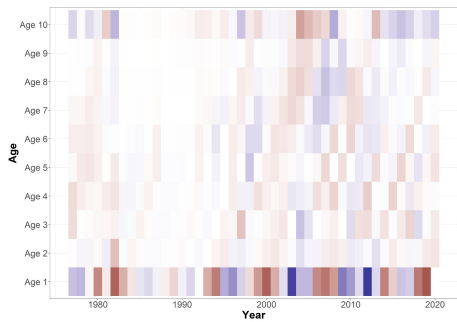


iid

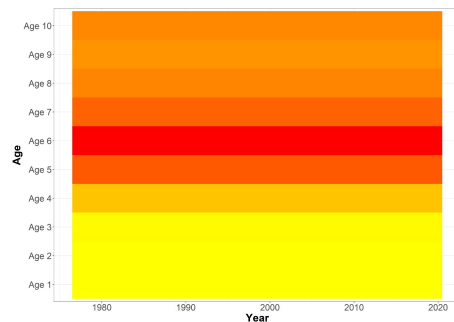
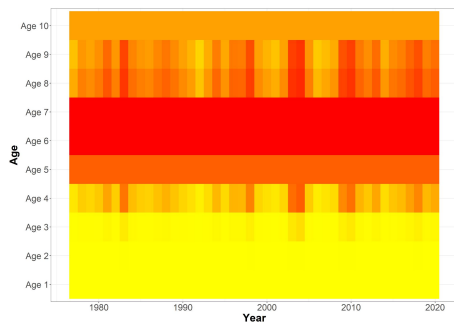
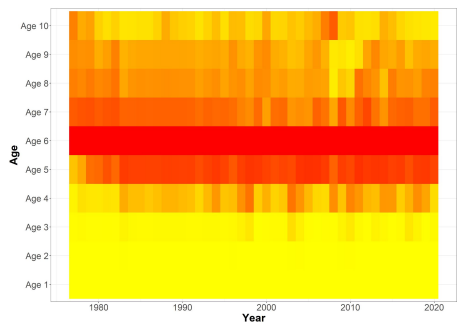
AR1year

AR1age

2DAR1



NAA Random Effects



Selectivity Random Effects

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Did not converge

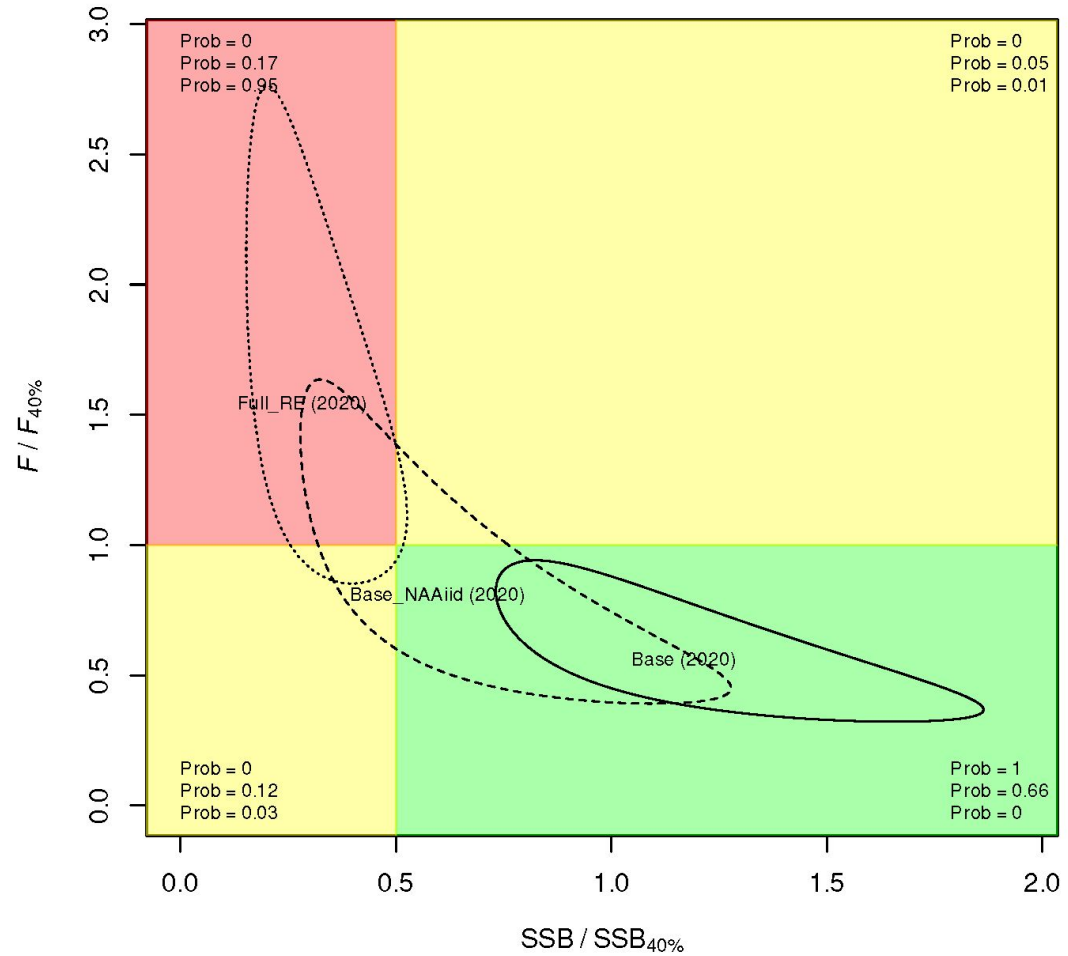
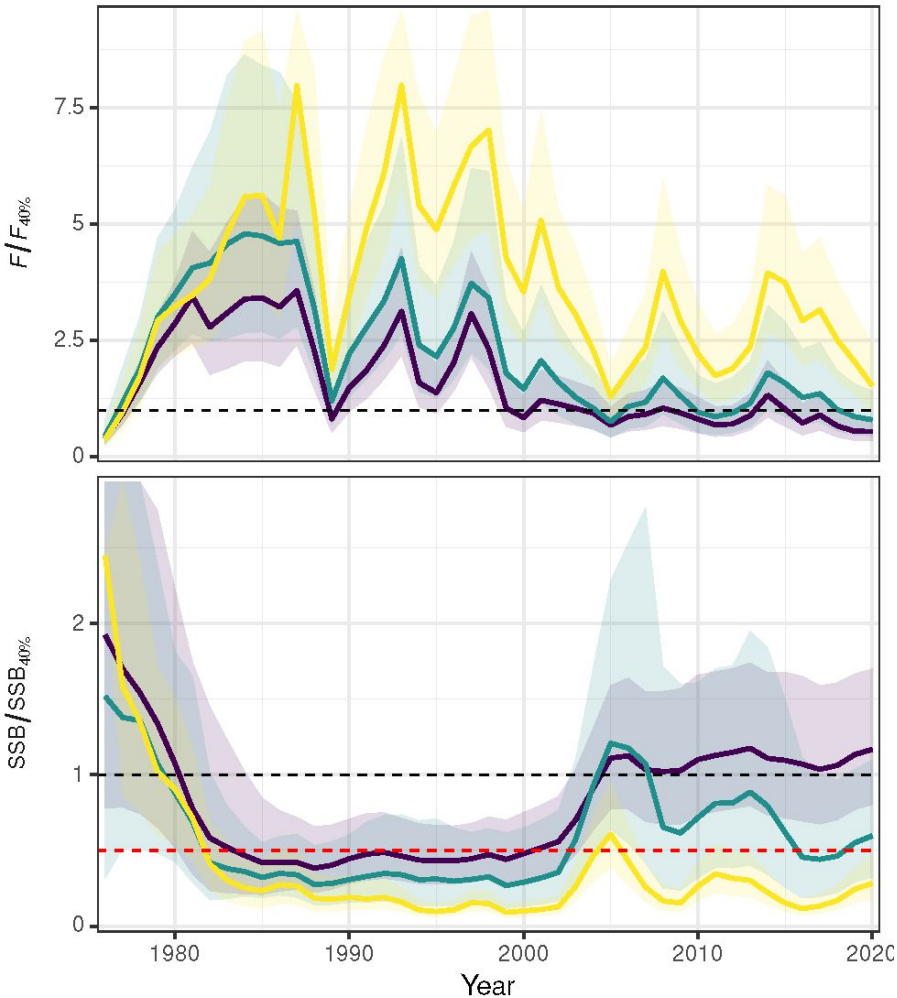


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Modeling Results



Model ■ Base ■ Base_NAAiid ■ Full_RE



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Status Determination Criteria

Model	$F_{40\%}$	$SSB_{40\%}$	MSY at $SSB_{40\%}$	Mean Recruitment	F_{2020}	SSB_{2020}	$F/F_{40\%}$ %	$SSB/SSB_{40\%}$
Base	0.265	9,314	855	1,139	0.146	11,980	0.55	1.29
Base_NAAiid	0.238	8,014	791	1,148	0.190	5,246	0.80	0.65
Full_RE	0.138	8,195	1,075	1,181	0.223	2,567	1.61	0.31

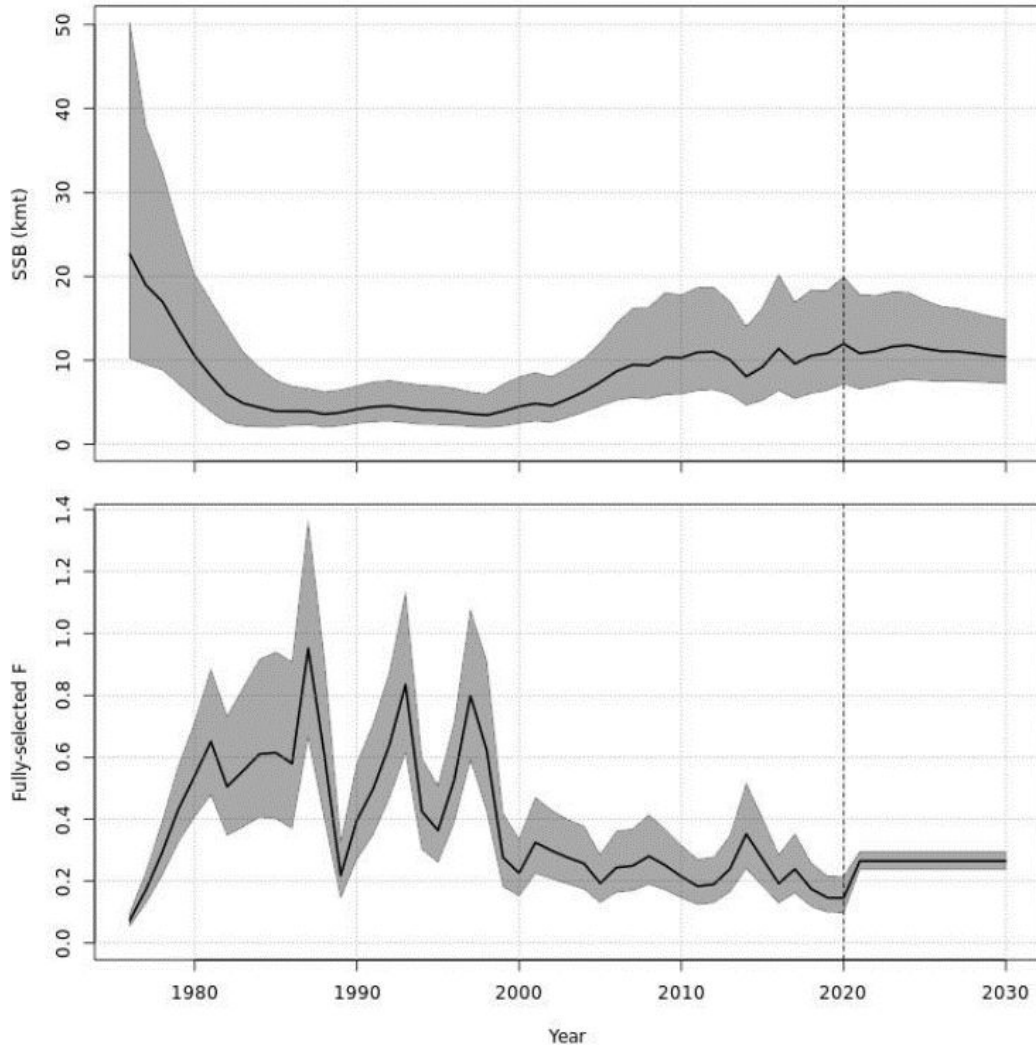
- Previous reference points based on $SPR_{40\%}$
- 10-year average 2011-2020
- Recruitment based on the entire time series minus the last two years

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Projection Methods



- Projections are integrated within WHAM model
- $F_{40\%}$ 10-year projections provided for informative purposes
- Terminal year is 2020
 - Next MT (June 2024) will add 3 years of data

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Backup Assessment Approaches



RTWG

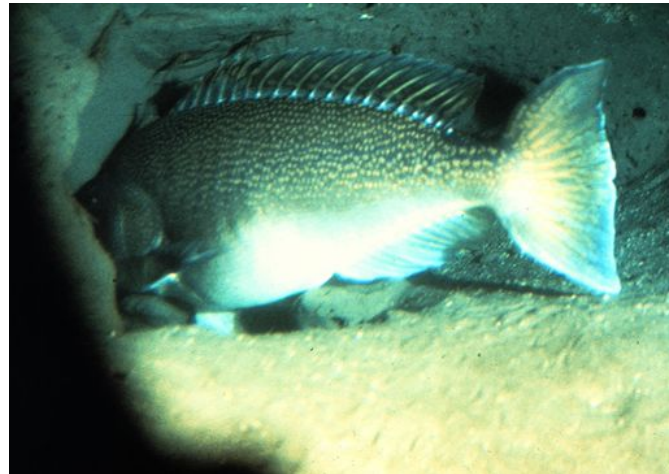
Plan B: Alternative WHAM configuration

Plan C: Historical fishery performance

Review Panel

Plan B: Revert to ASAP

Plan C: ???



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Next Steps for Tilefish



- ~~April 4: Assessment Oversight Panel~~
- April-June: Preparing MT assessment
- Week of June 24: Management Track Assessment Review Panel (Level 3 review)
- 2025 and beyond: Continue to address research recommendations via MT

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Questions?



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