NOAA FISHERIES

Management Track Assessment (Level 2)
Golden Tilefish

Lead Scientist: Paul Nitschke
Last Assessed: 2017 Operational Assessment
ASAP
June 28, 2021

Golden Tilefish

- Long-lived (40+ years) deep water.
- Small directed longline fishery

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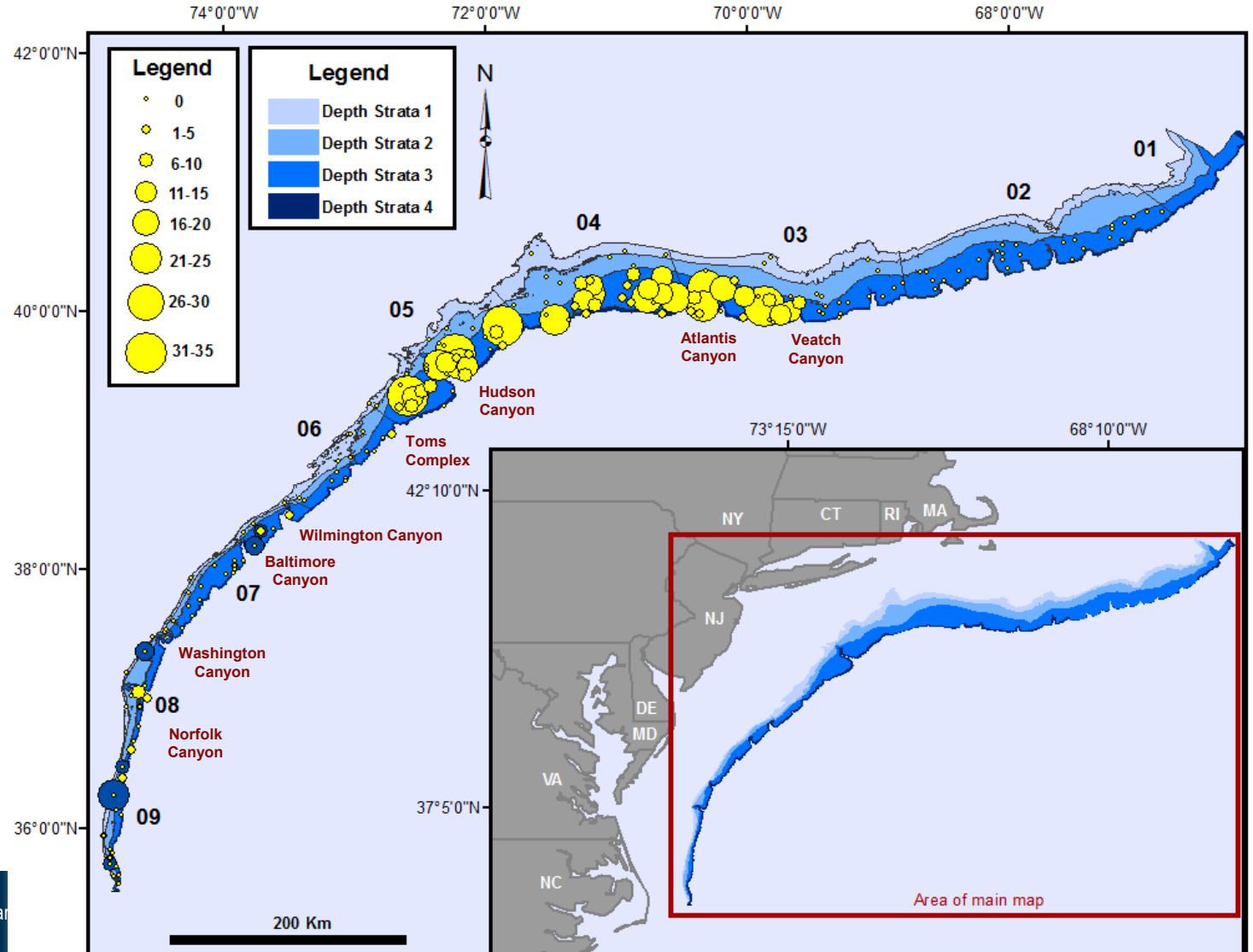
2017 Distribution of Golden and Blueline Tilefish



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Golden Tilefish

Assessment Model - ASAP

- The first tilefish assessments (1999, 2005, 2008) were based on ASPIC.
- ASAP model was developed in SARC 58 (2014) using a pooled age-length-key.
- Last assessed in the 2017 Operational Assessment with the same pooled age-length-key.
- Update the pooled-age-length-key in this 2021 assessment and to move to year specific keys as production ageing continues.

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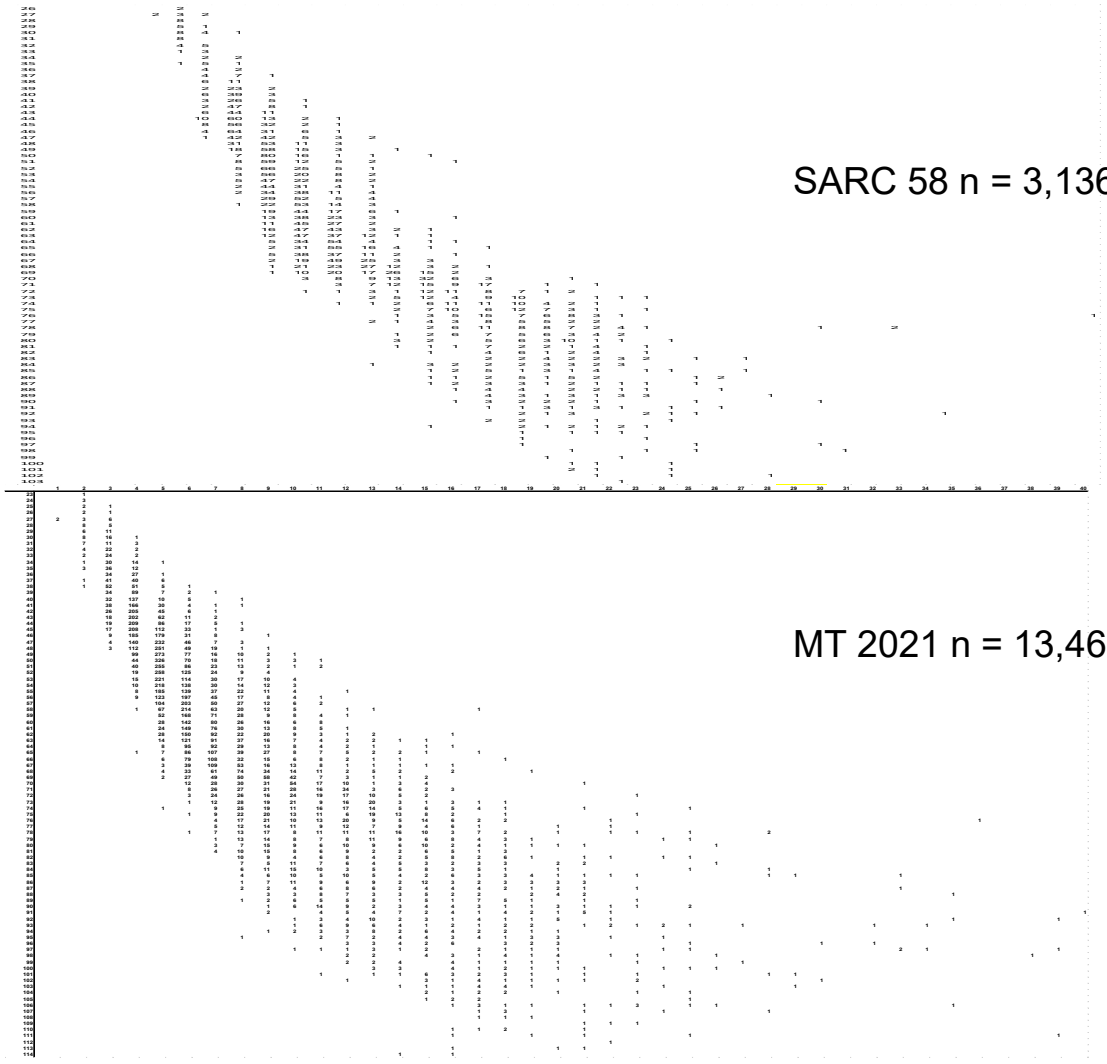
A Lot
More Tilefish
AGE Data



SARC 58 n = 3,136

MT 2021 n = 13,467

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Golden Tilefish

Data Poor - ASAP

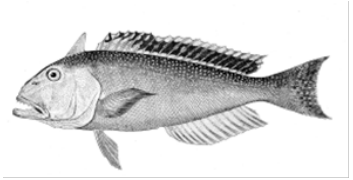
- Landings, commercial cpue, landings at length and age.
- Steve Turner's dissertation during the development of the directed fishery.
- No survey index, No recreational data used, No discard data used.
- Terminal year 2020
- Research Track in 2024

Golden Tilefish

Data Poor - ASAP

year	lengths
2001	320
2002	1,332
2003	3,565
2004	3,386
2005	3,424
2006	5,767
2007	7,419
2008	5,800
2009	5,269
2010	11,350
2011	10,476
2012	7,443
2013	8,707
2014	8,738
2015	6,527
2016	8,667
2017	6,188
2018	5,678
2019	6,697
2020	3,967

Golden Tilefish



Stock Status

- Not Overfishing and Not Overfished
  F_{2020} = 0.160 (61% of F_{MSY})
  F_{MSY} = 0.261
- SSB_{2020} = 10,562 mt (96% of SSB_{MSY})
  SSB_{MSY} = 10,995 mt (90% CI 6,238 mt - 16,438 mt)

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Golden Tilefish

BRPs *(average fishing mortality 2002-2012, a period when the stock was rebuilding under constant quota = 905 mt)*

2014 SARC 58 $F_{MSY} = F_{25\%} = 0.37$
2017 Operational Assessment $F_{MSY} = F_{38\%} = 0.31$
2021 Management Track $F_{MSY} = F_{40\%} = 0.261$

2014 SARC 58 $SSB_{MSY} = SSB_{25\%} = 5{,}153$ mt (Rebuilt in 2012)
2017 Operational Assessment $SSB_{MSY} = SSB_{38\%} = 9{,}420$ mt
2021 Management Track $SSB_{MSY} = SSB_{40\%} = 10{,}995$ mt
(5 year mean weights)

$MSY_{25\%} = 1{,}029$ mt
$MSY_{38\%} = 957$ mt
$MSY_{40\%} = 935$ mt

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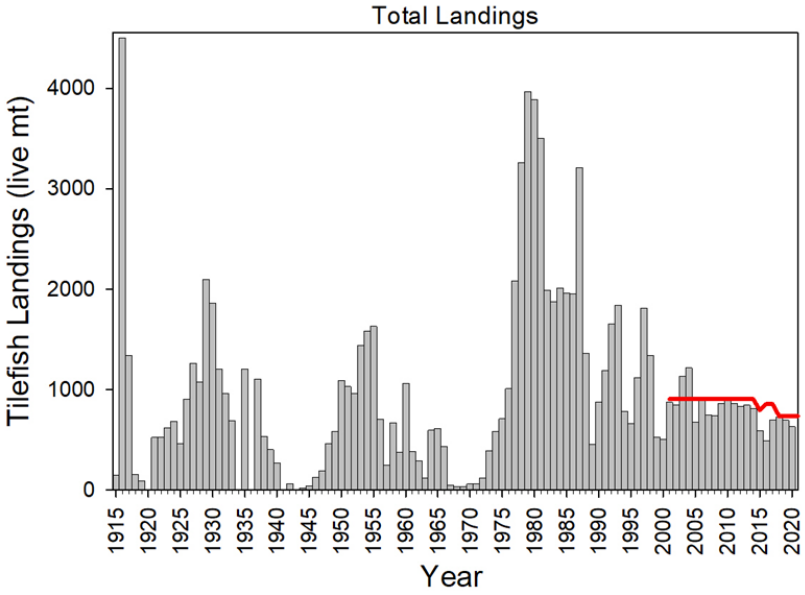
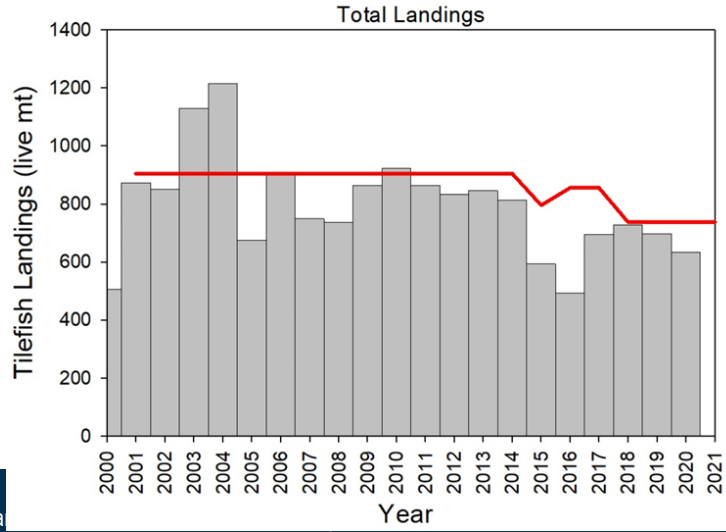
Golden Tilefish





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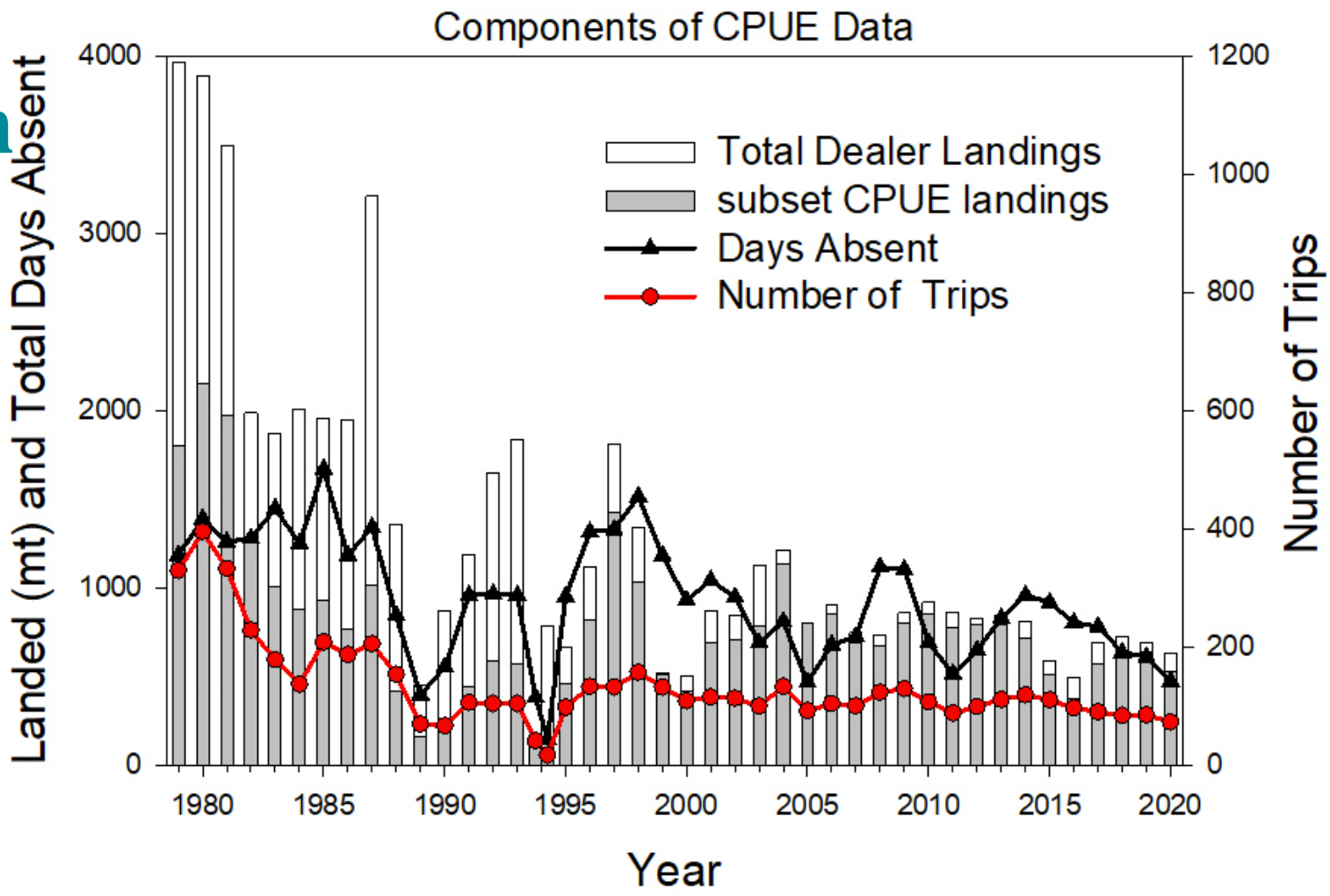
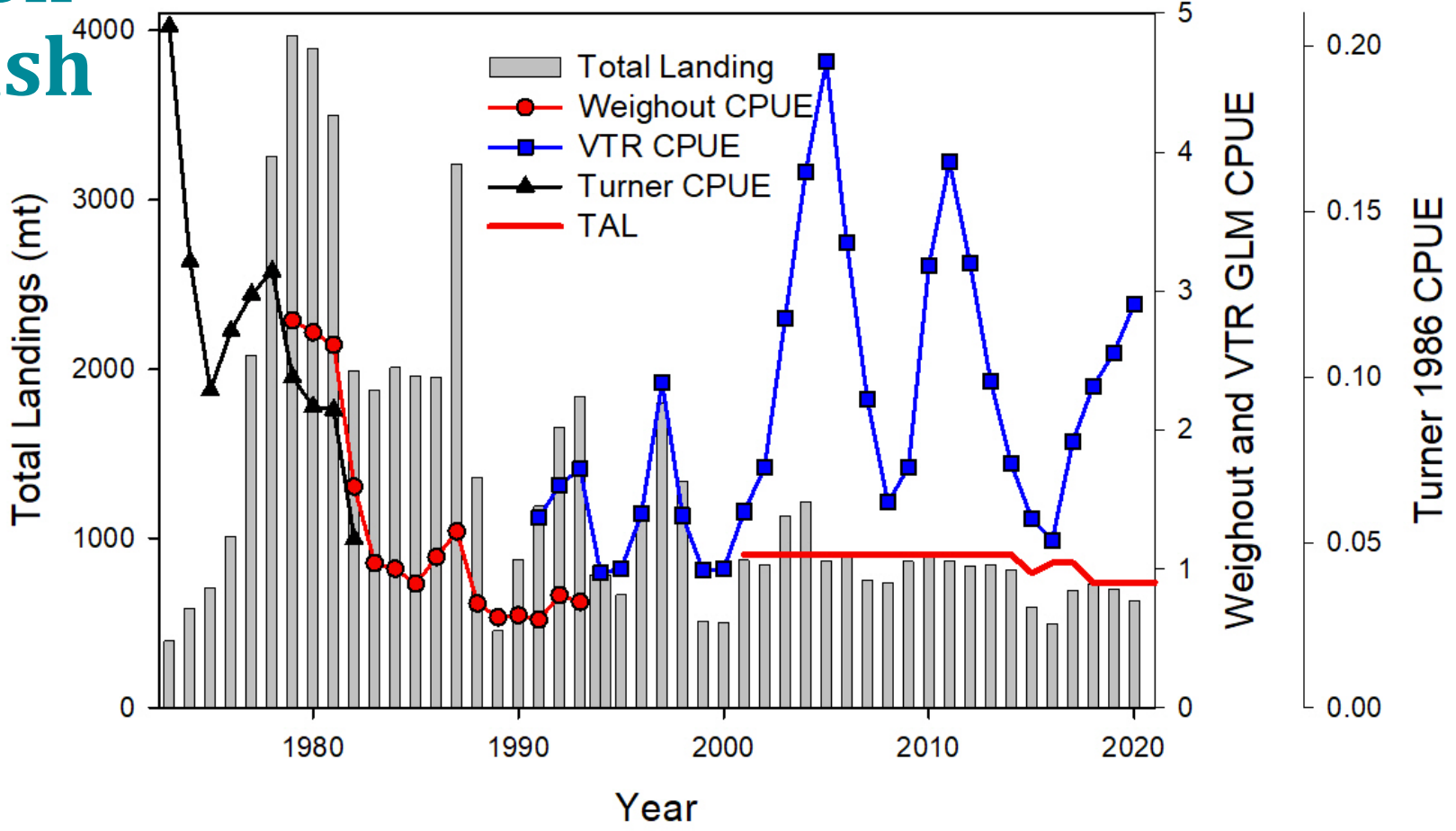
Golden Tilefish



Golden Tilefish



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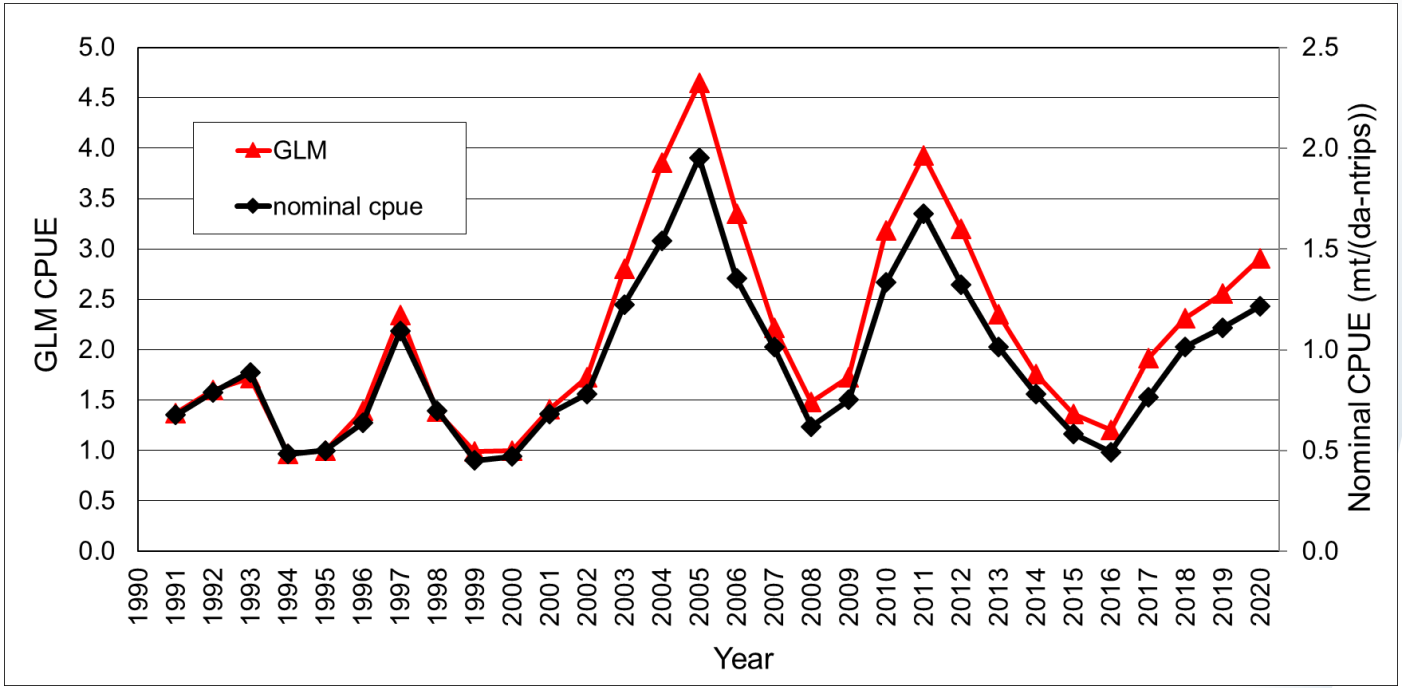
Golden Tilefish

C P U E



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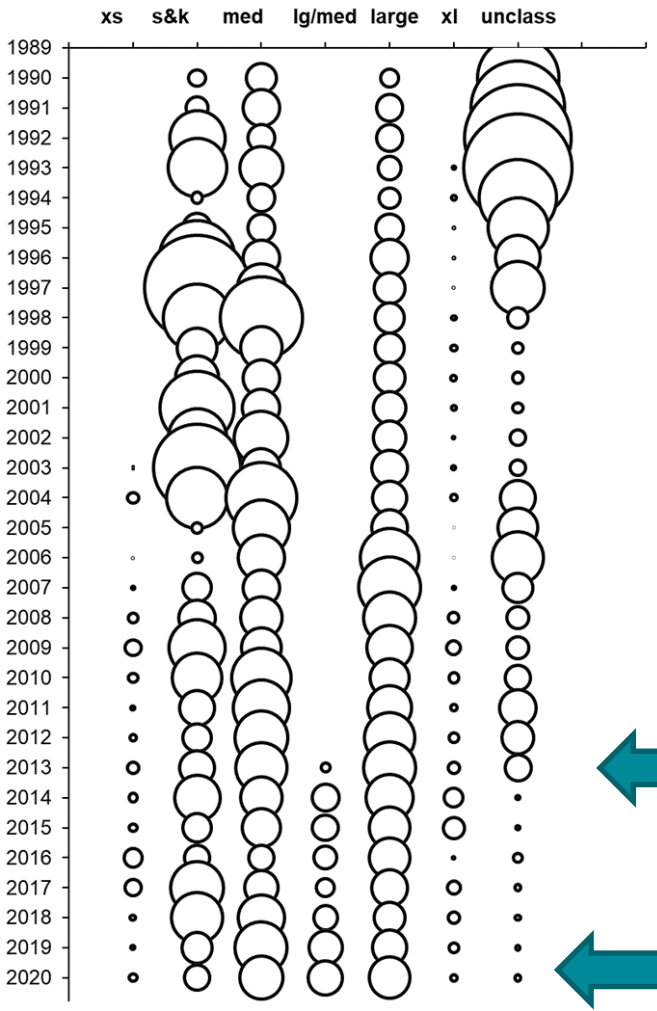
Golden Tilefish



Lg/med code

Unclass are small

year	lengths
2001	320
2002	1,332
2003	3,565
2004	3,386
2005	3,424
2006	5,767
2007	7,419
2008	5,800
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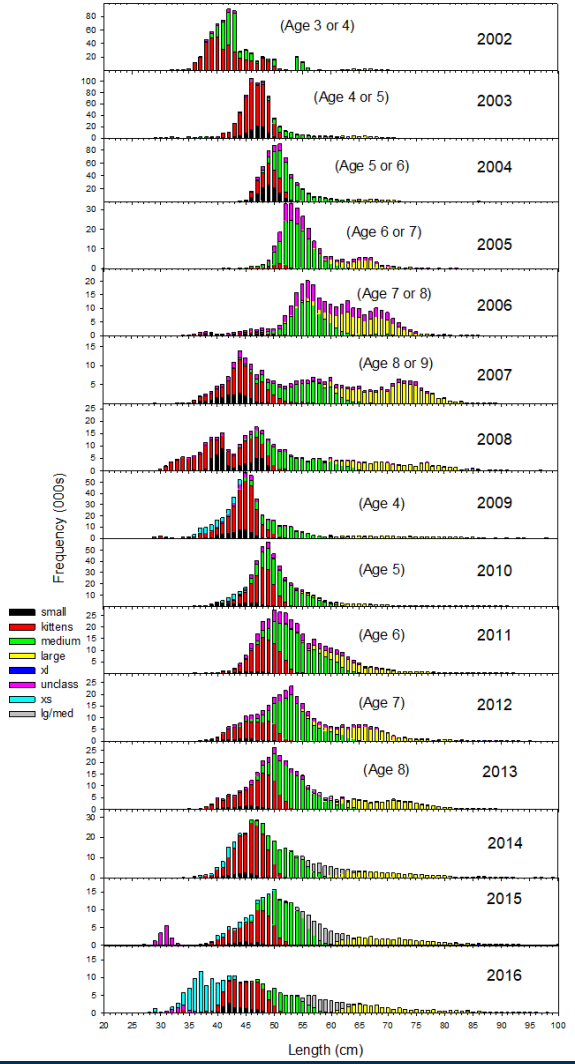
Golden Tilefish



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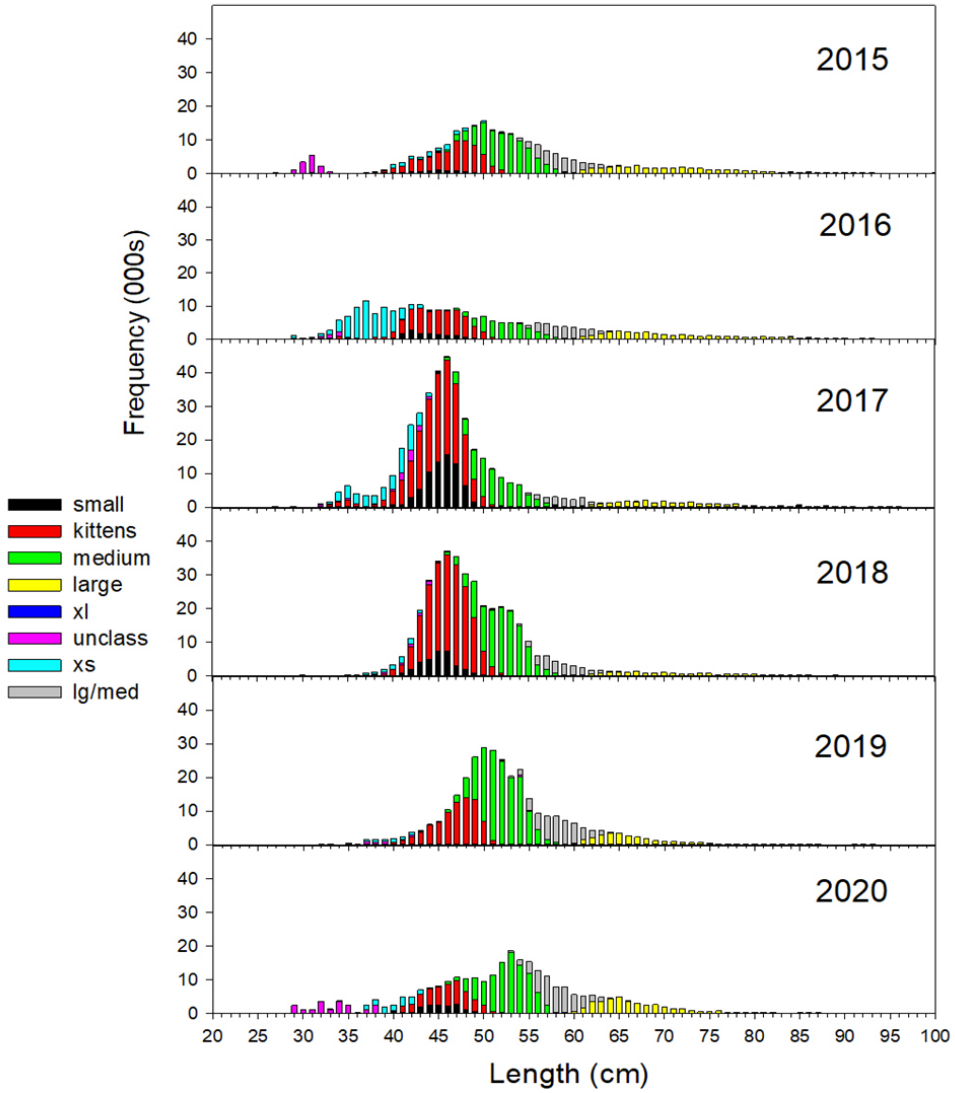
Golden Tilefish



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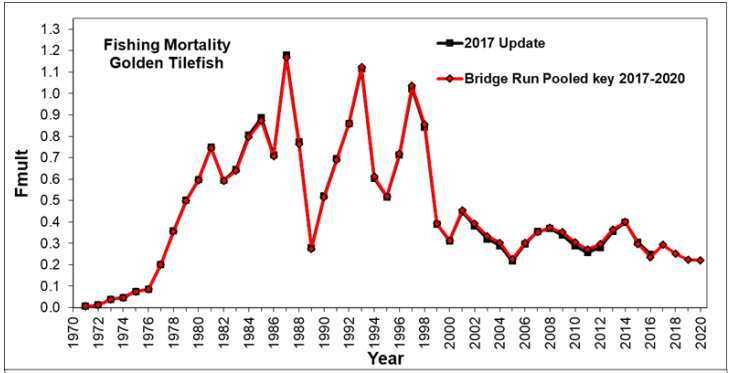
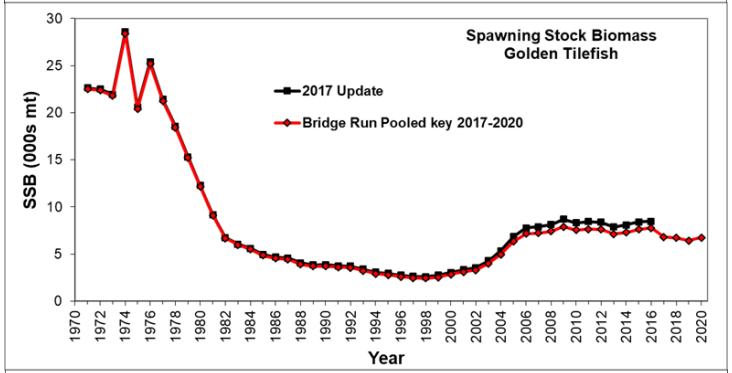
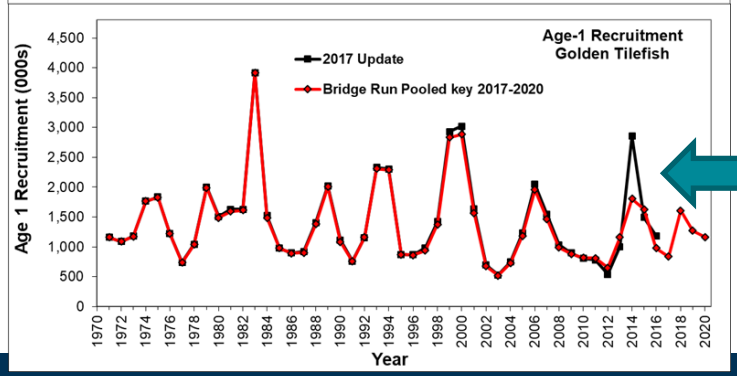
Bridge Run

updated pooled 2017-2020







High uncertainty

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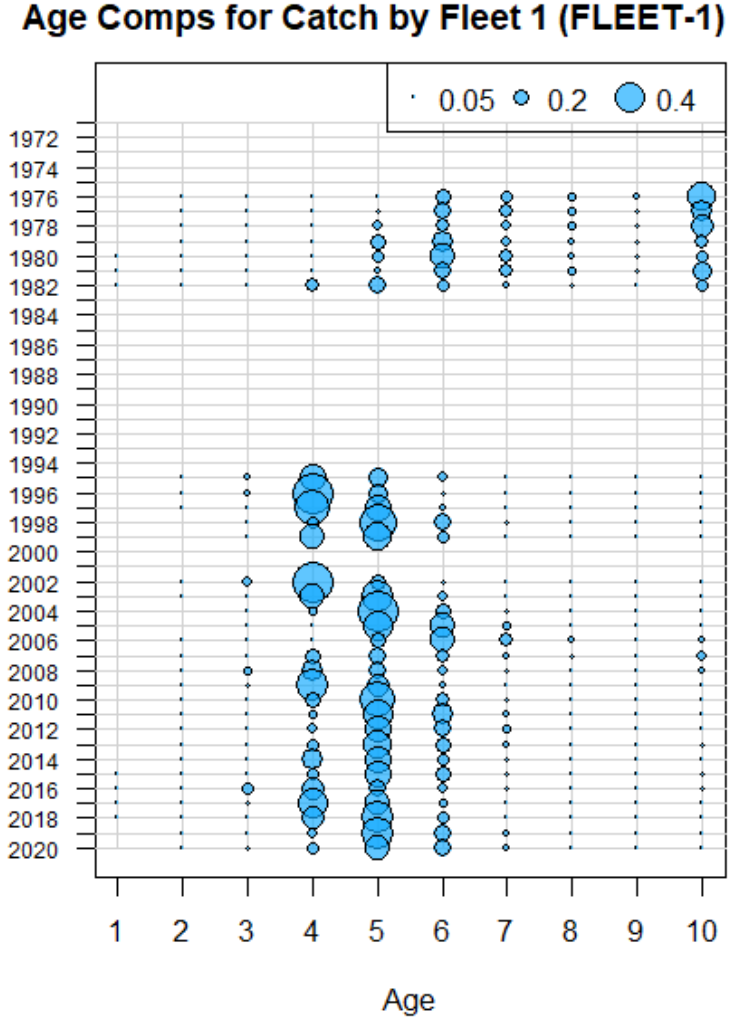
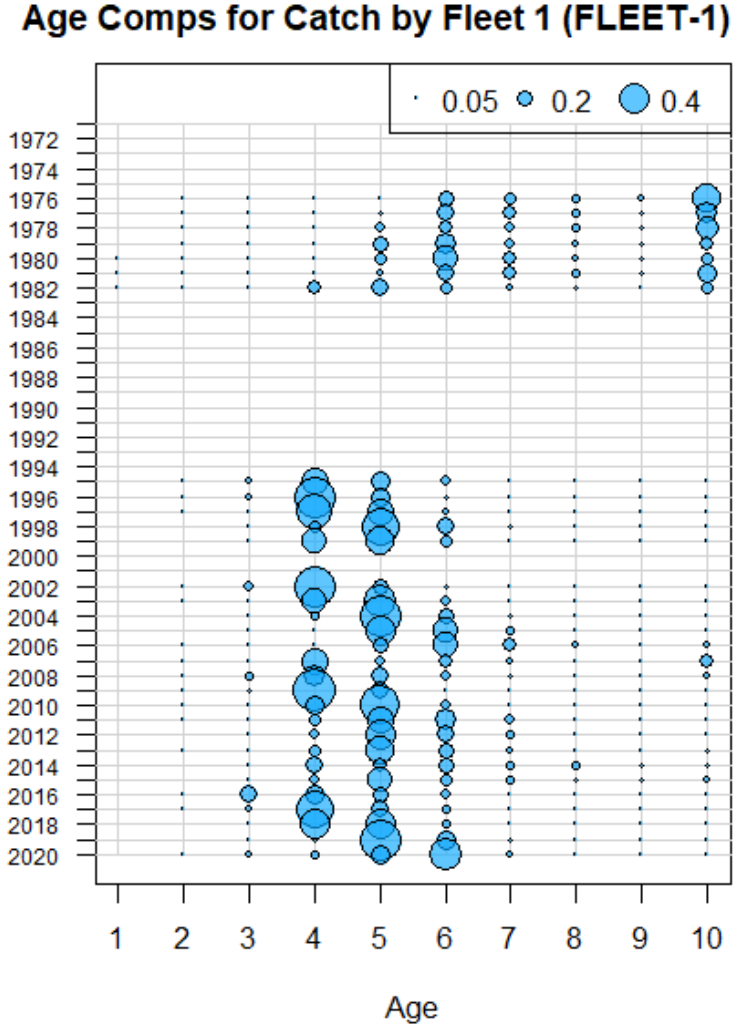
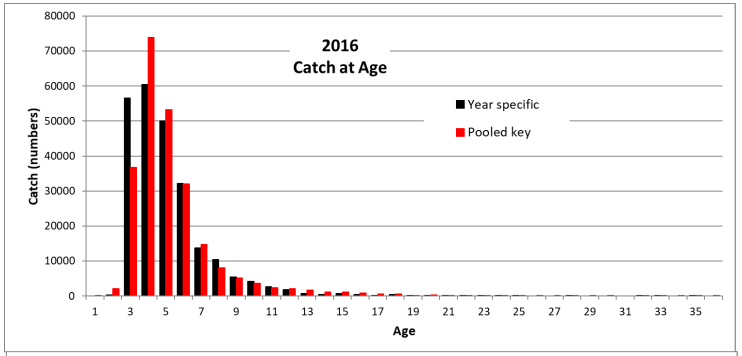
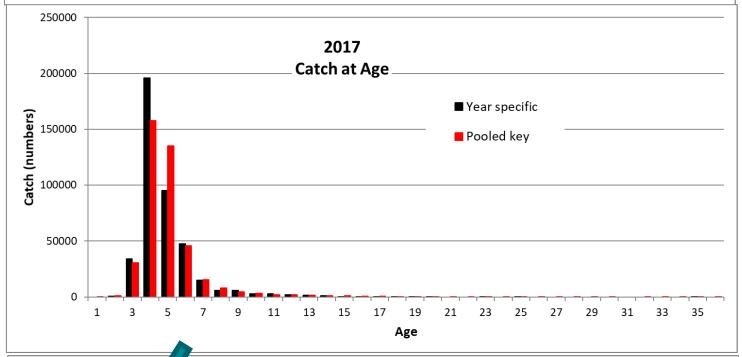
Pooled-key run 1

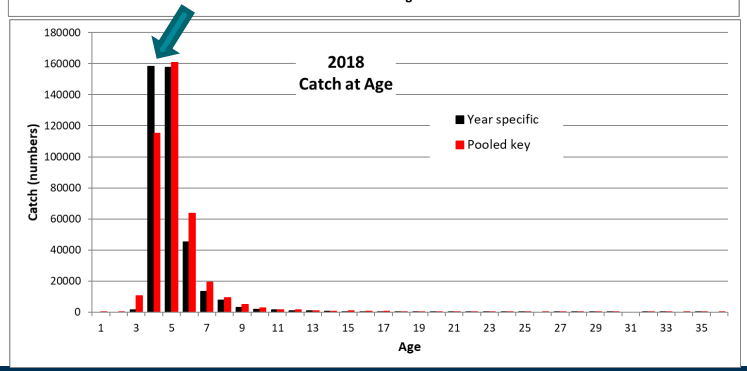


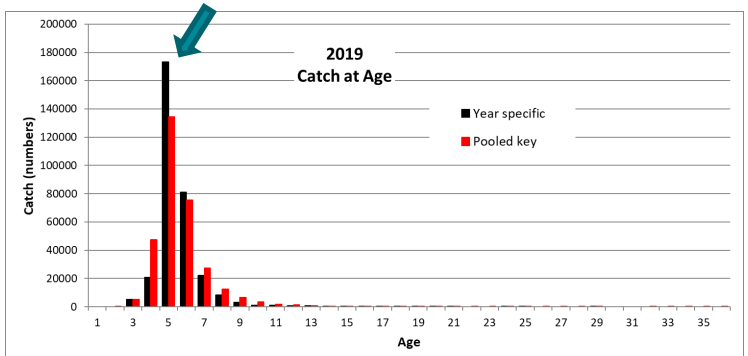
Year specific Key run 2

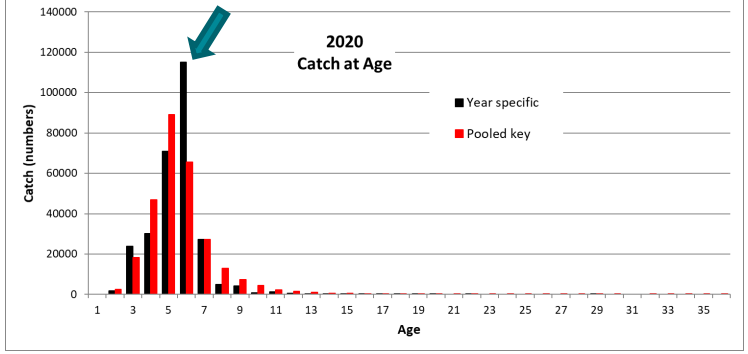












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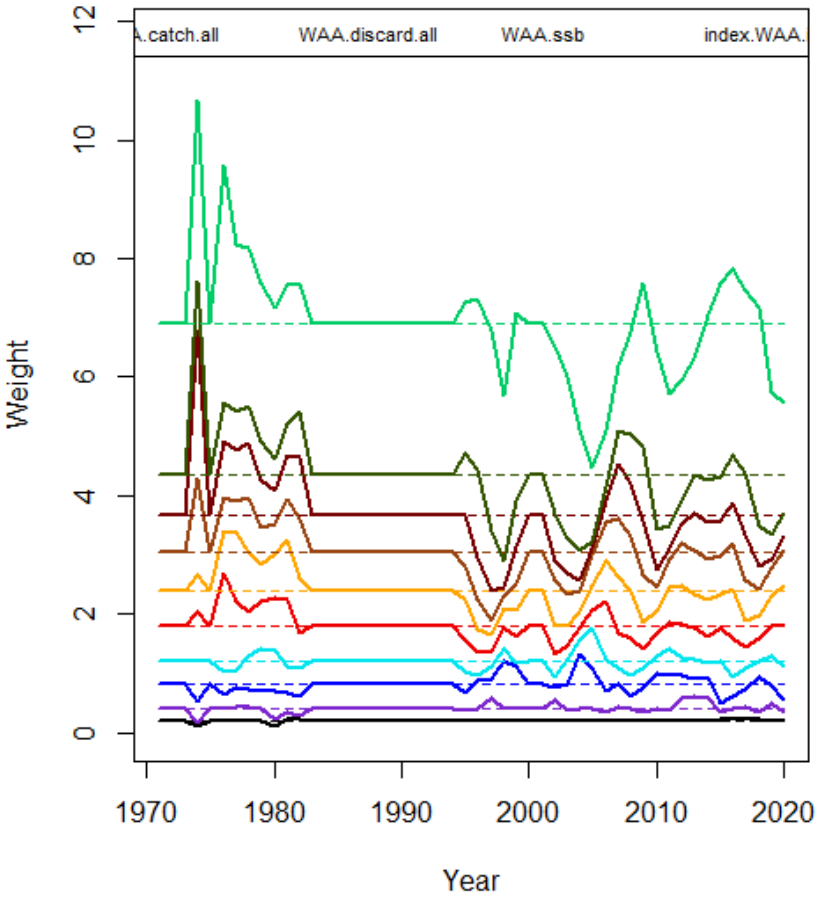
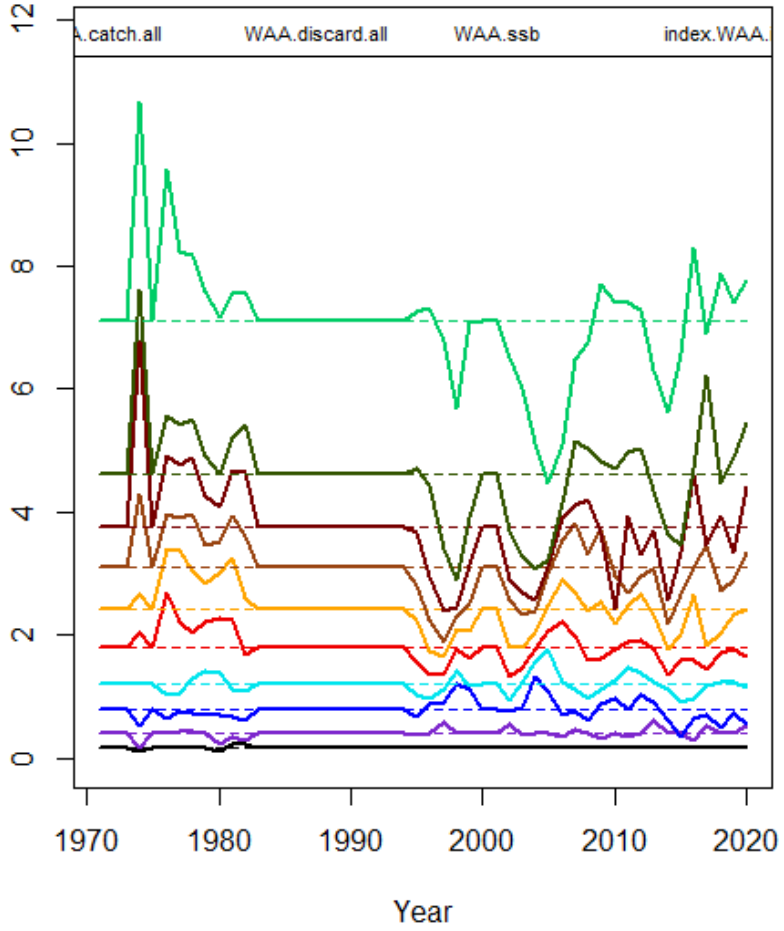
Pooled-key run 1

WAA matrix 1



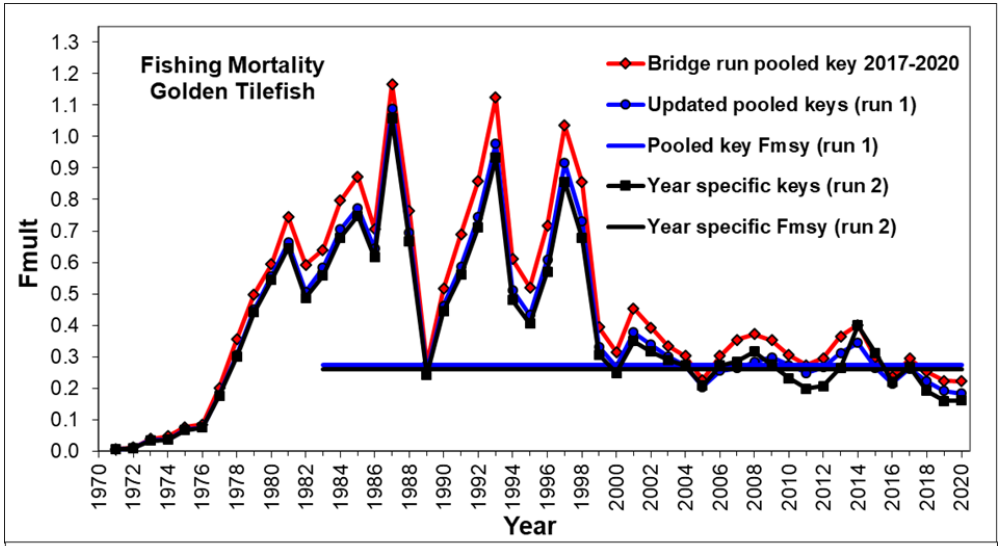
Year specific Key run 2

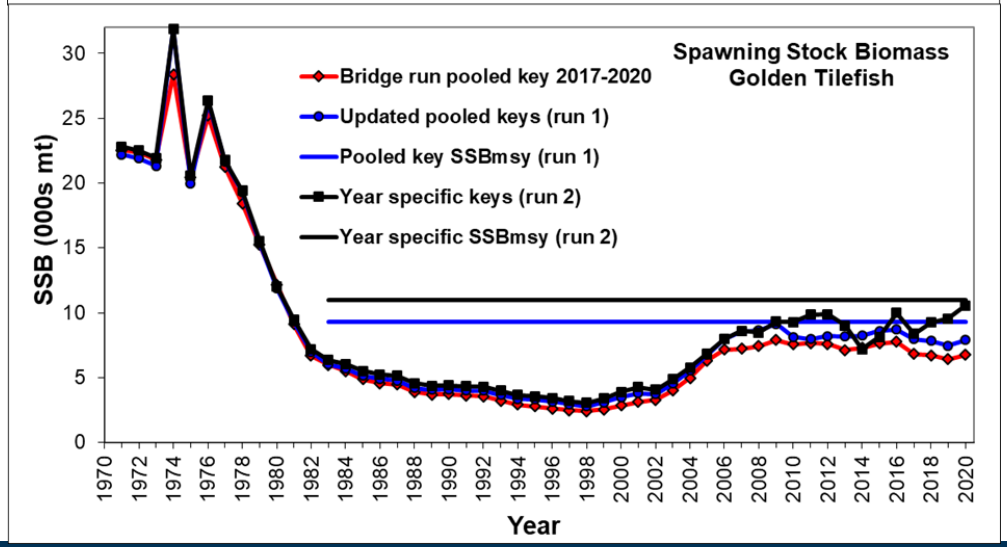
WAA matrix 1



Golden Tilefish

Age Data Years
2007,
2009 - 2012,
and
2014 - 2020





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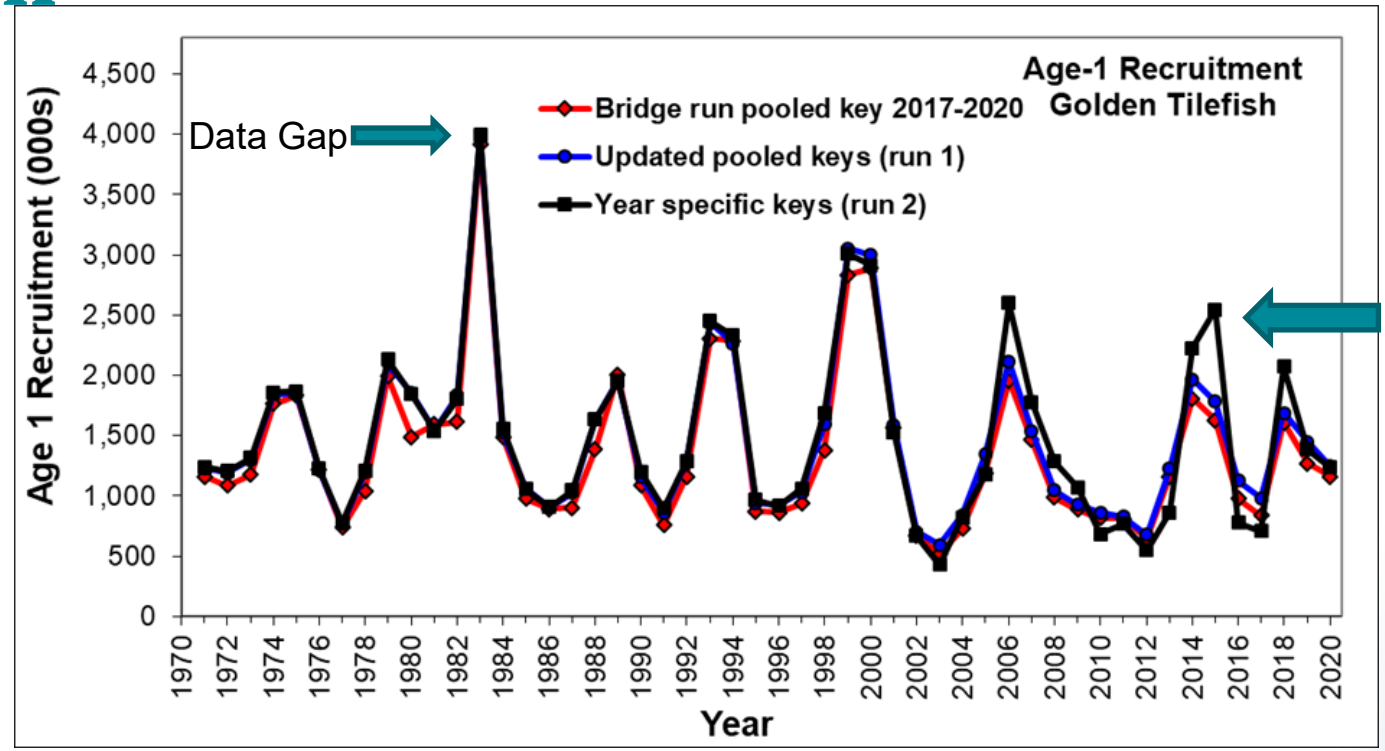

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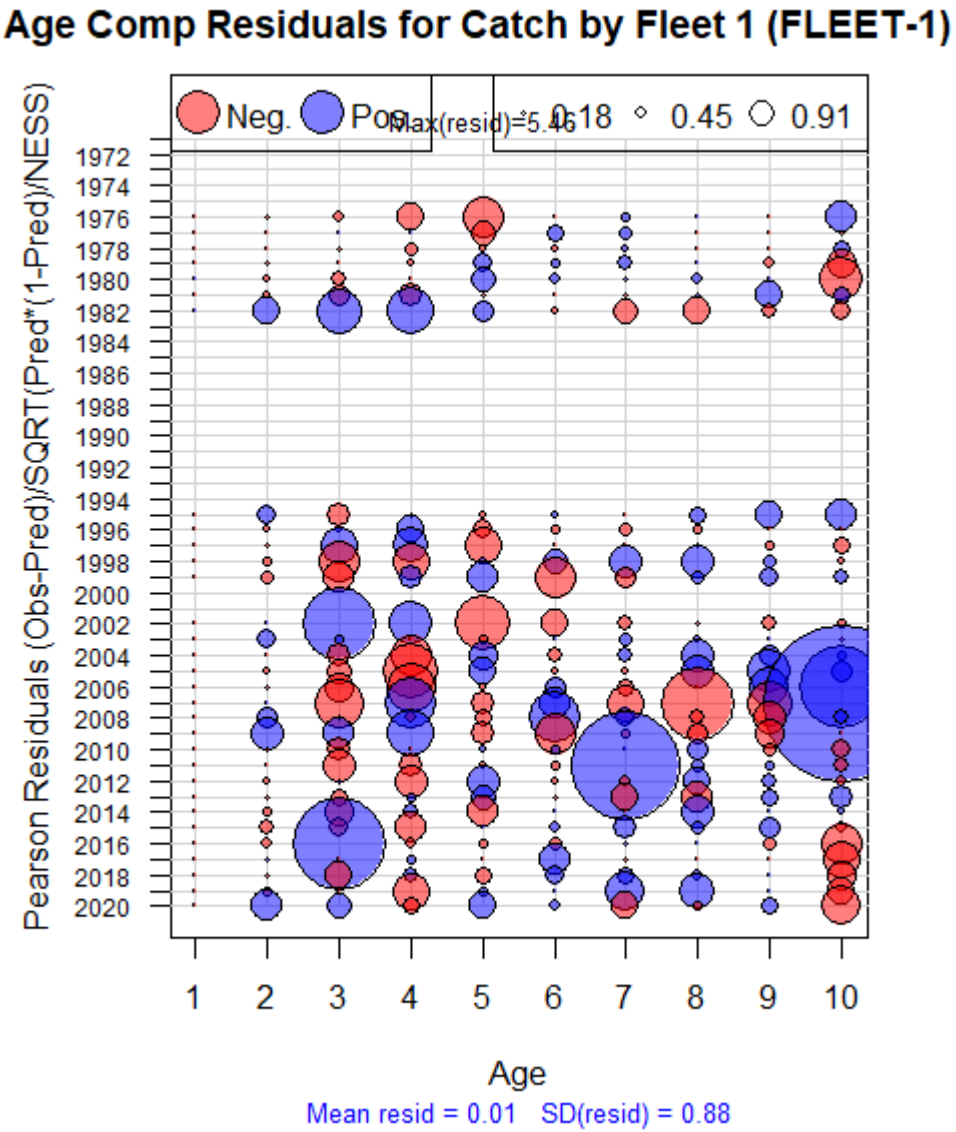
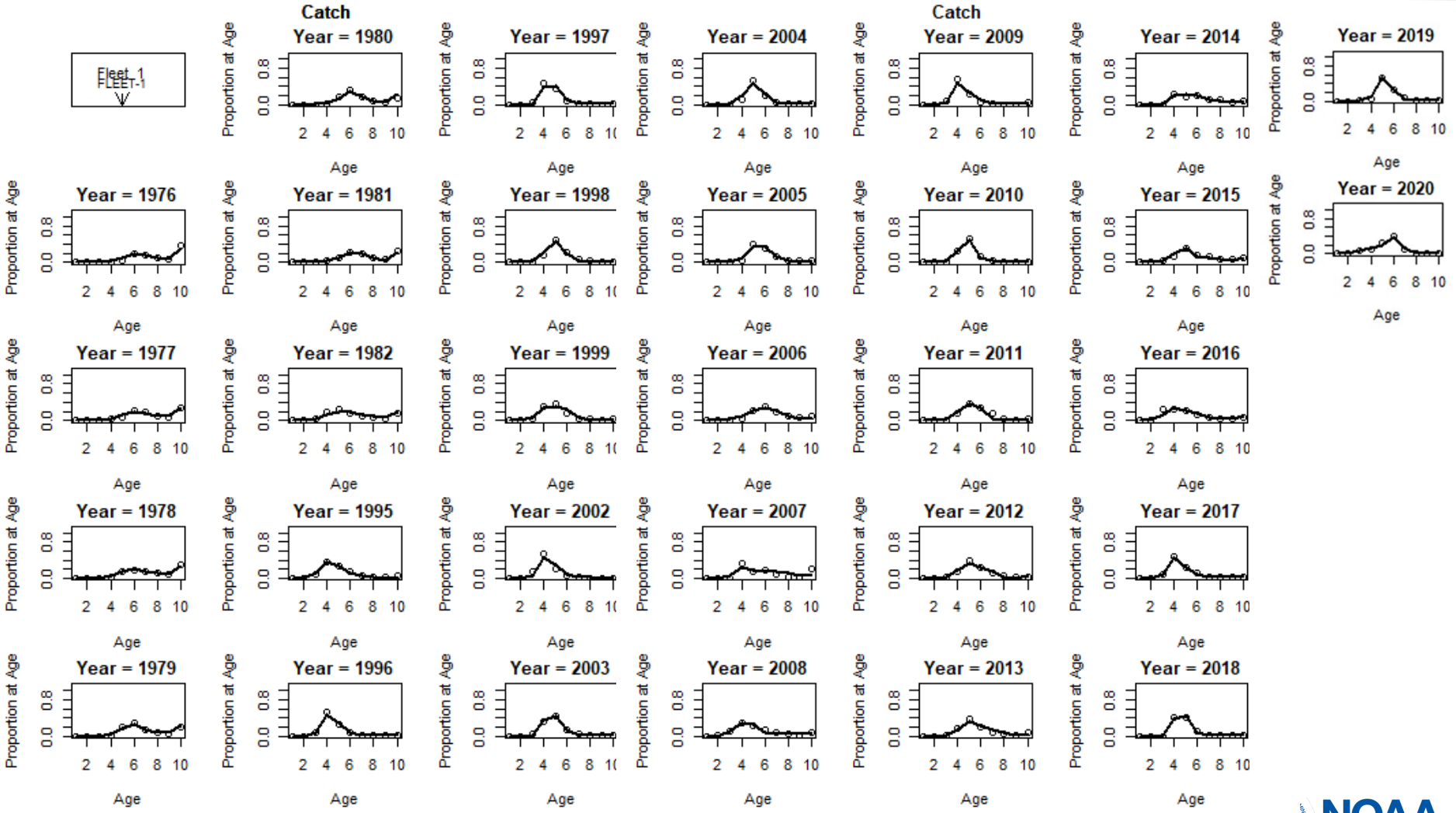


NOAA FISHERIES



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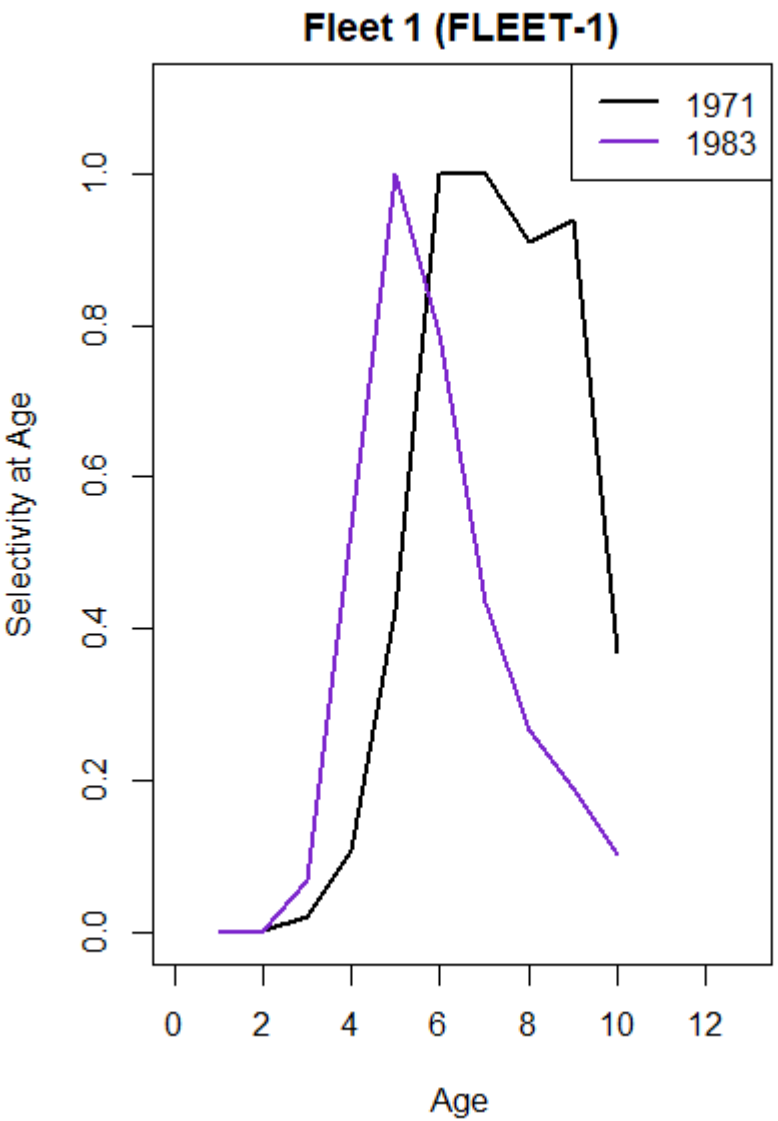
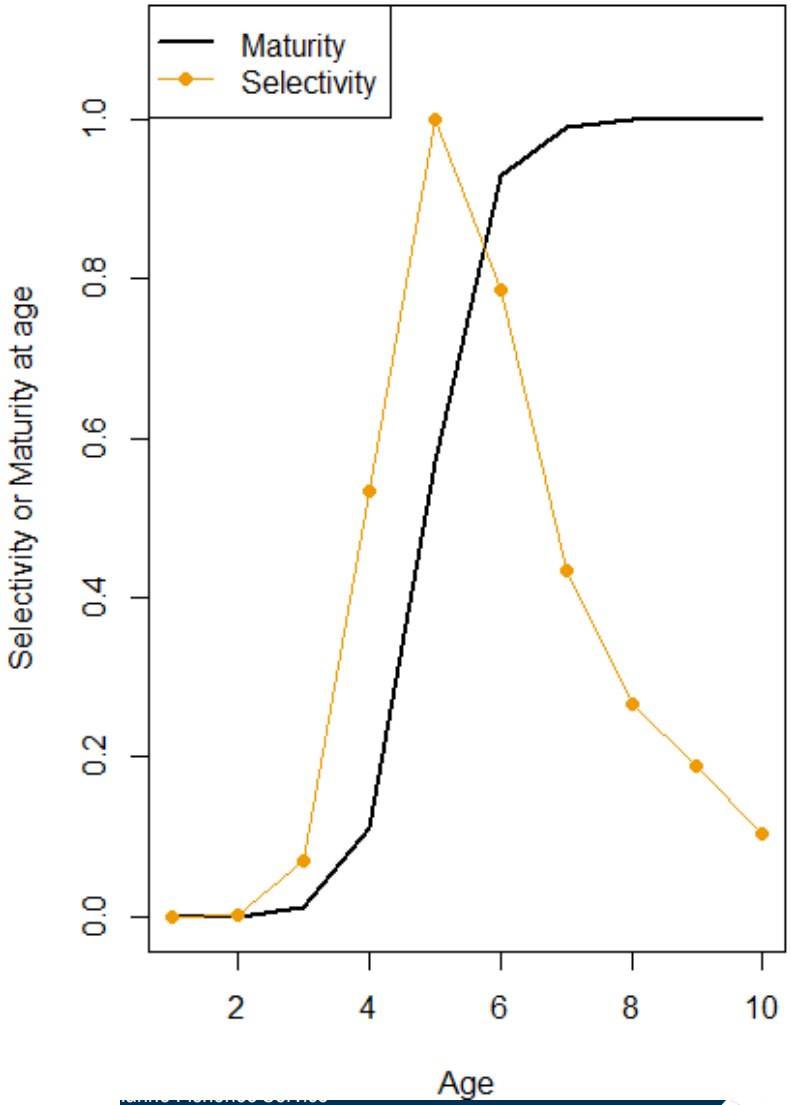
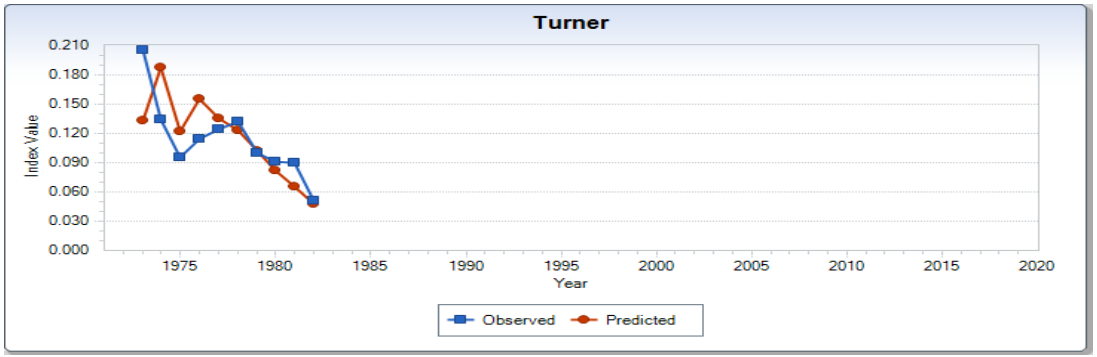
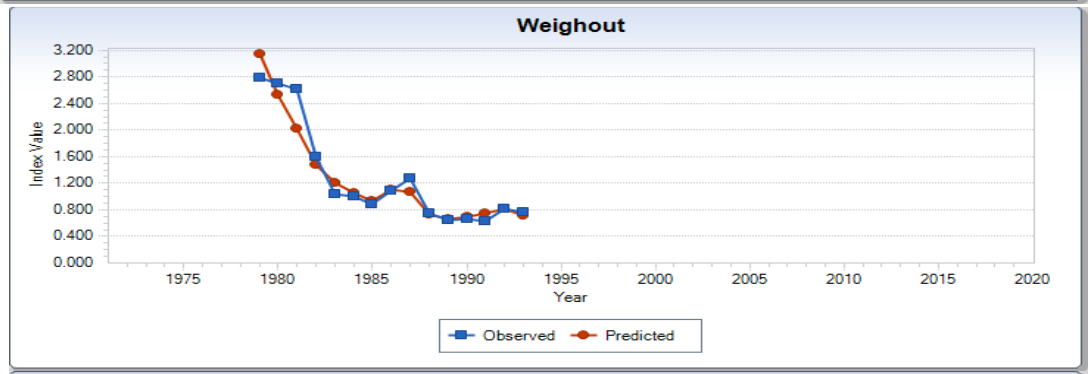

Fleet 1 (FLEET-1)
1971
1983
Selectivity at Age
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
12
Age

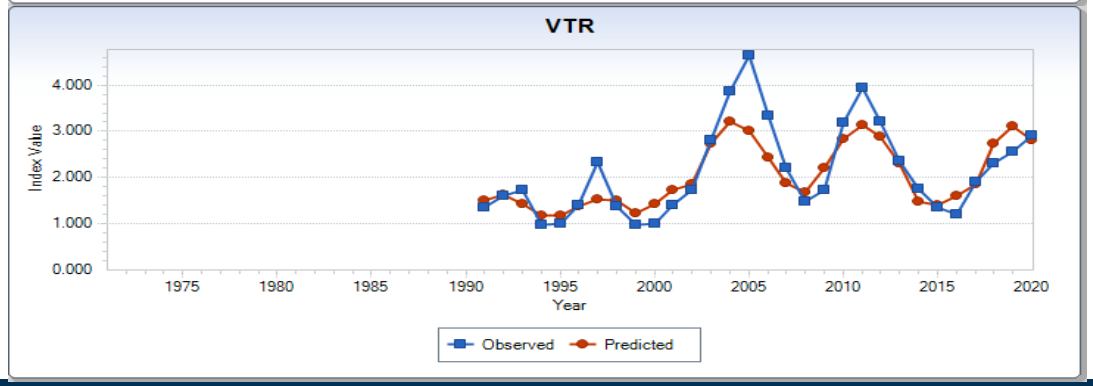

Maturity
Selectivity
Selectivity or Maturity at age
0.0
0.2
0.4
0.6
0.8
1.0
2
4
6
8
10
Age

Golden Tilefish

C
P
U
E







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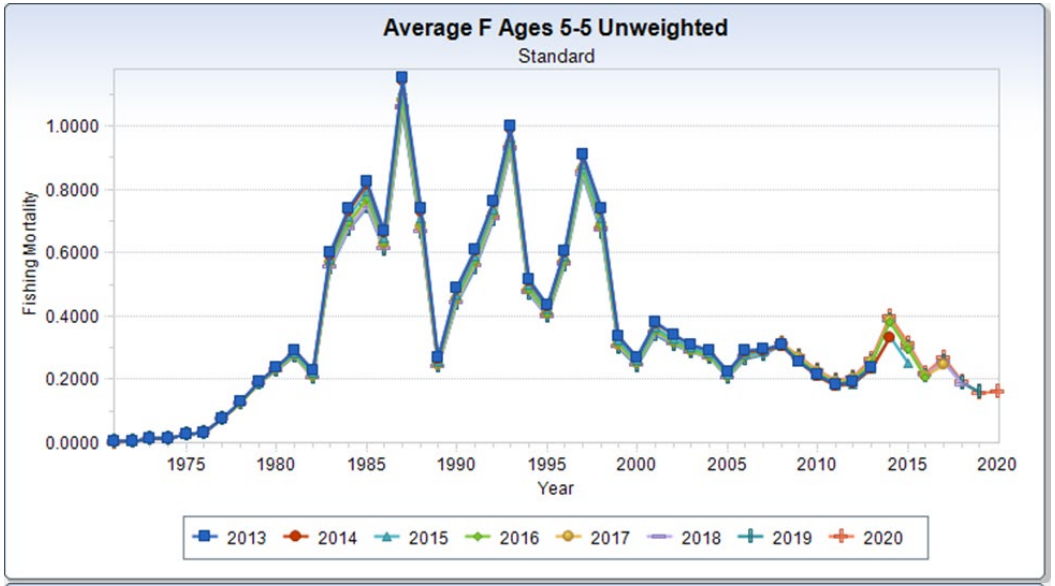
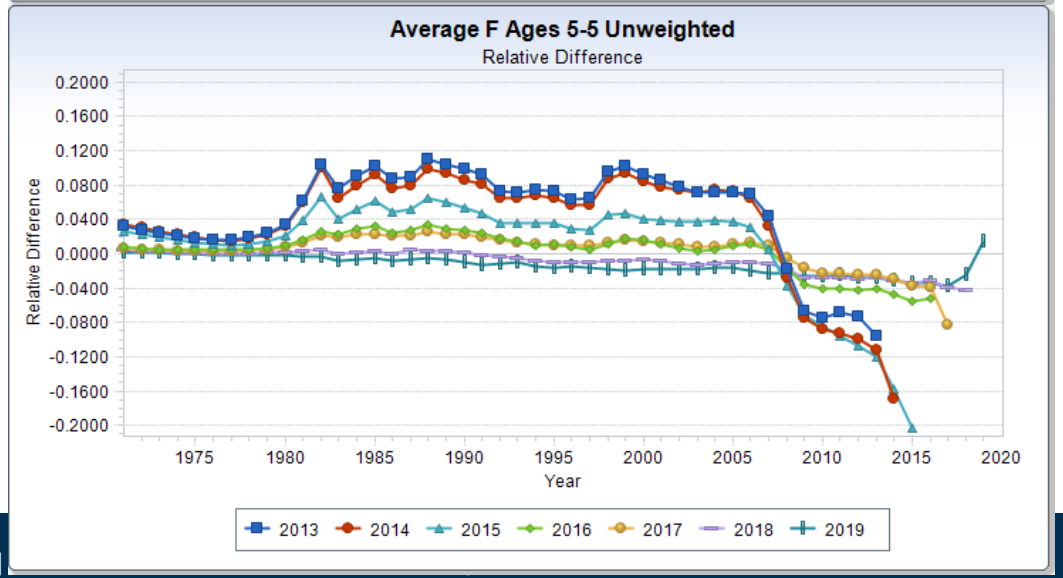
Golden Tilefish





Mohn's Rho = -0.09

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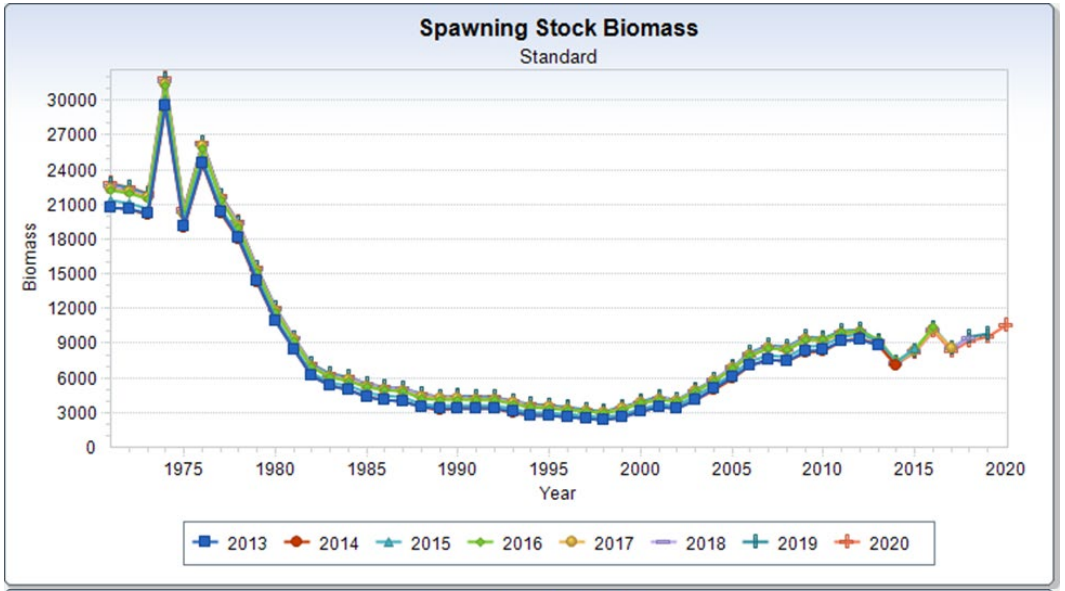
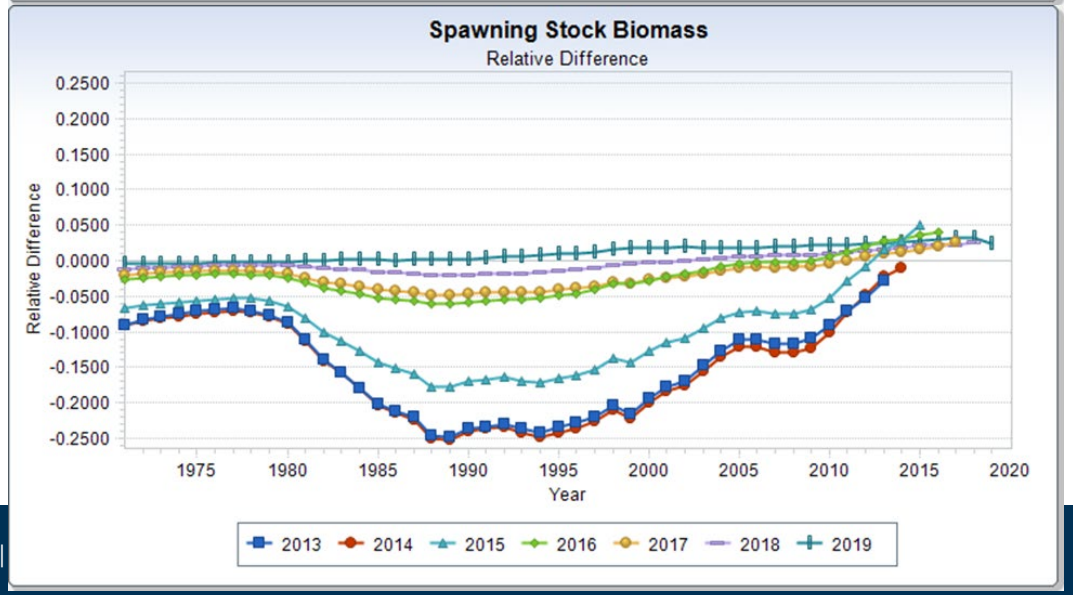
Golden Tilefish





Mohn's Rho = +0.02

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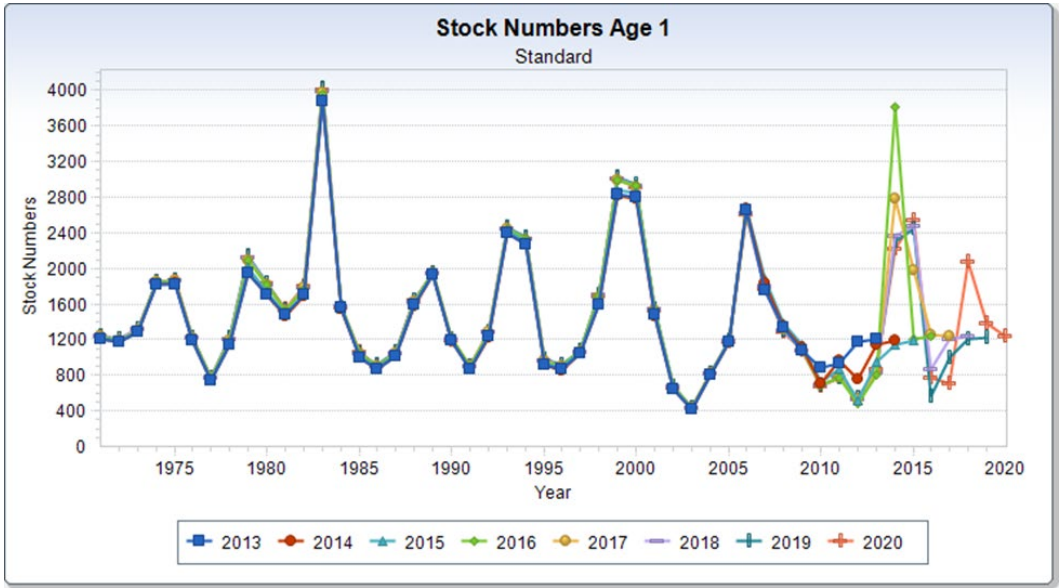
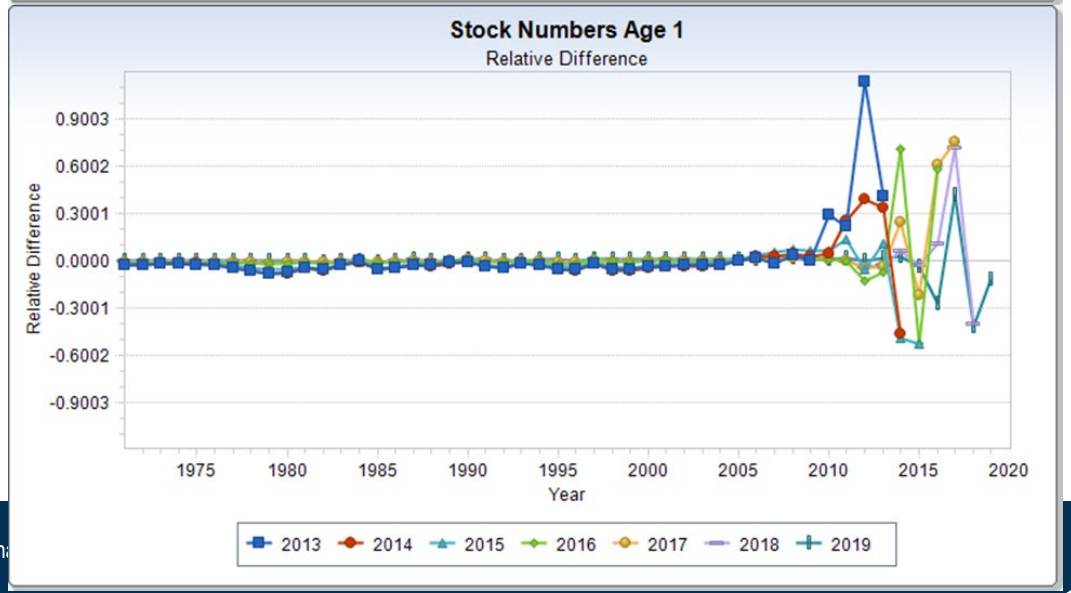
Golden Tilefish





Mohn's Rho = +0.03

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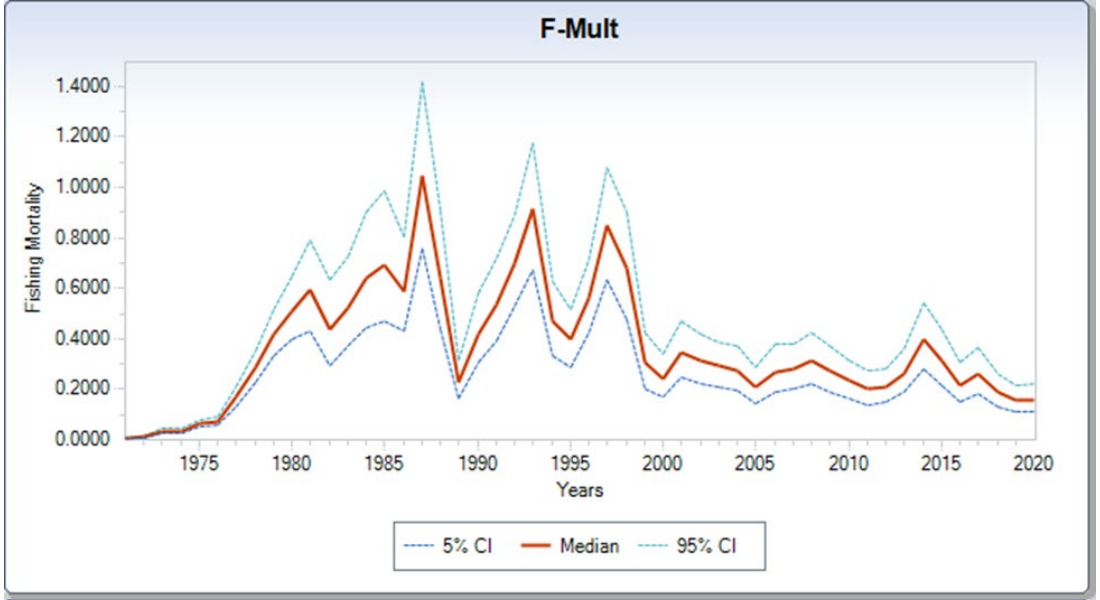
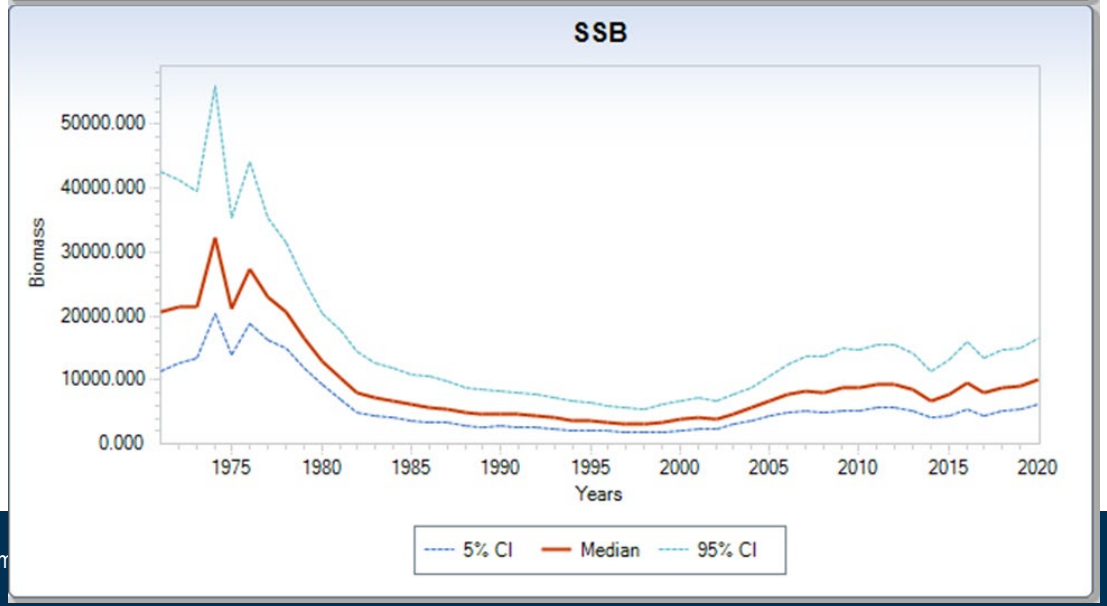
Golden Tilefish





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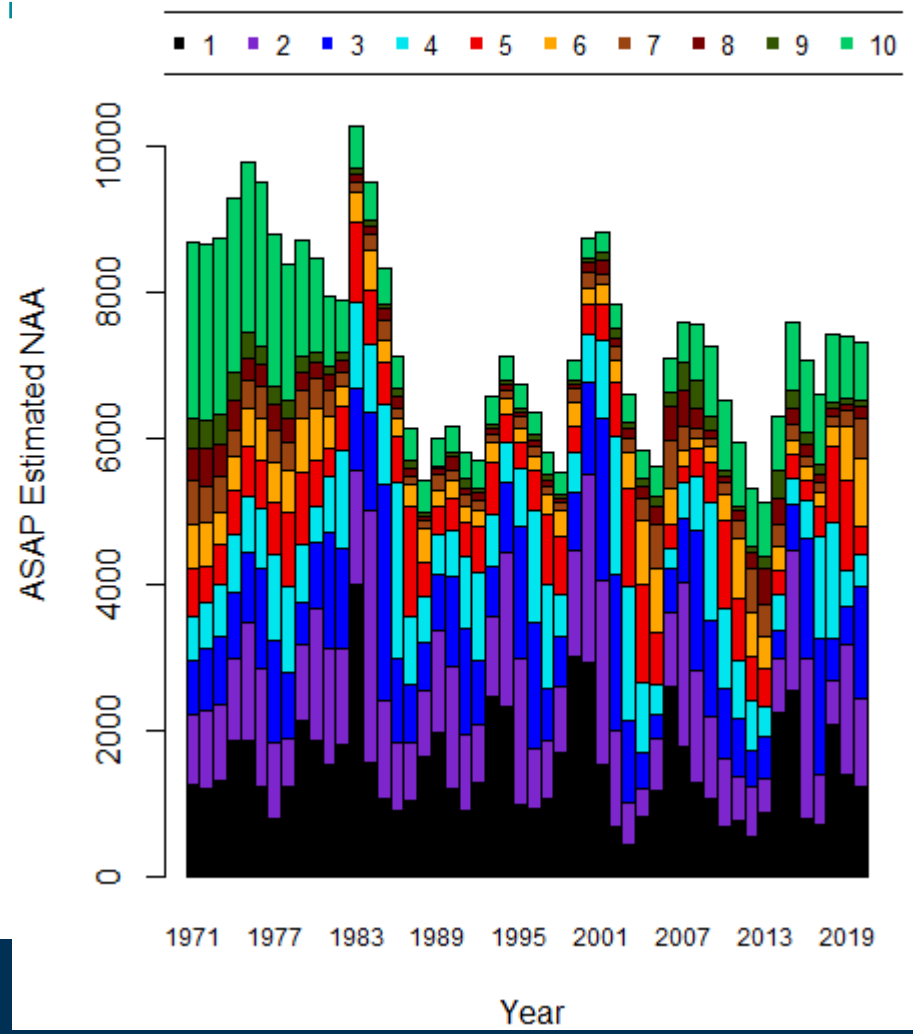
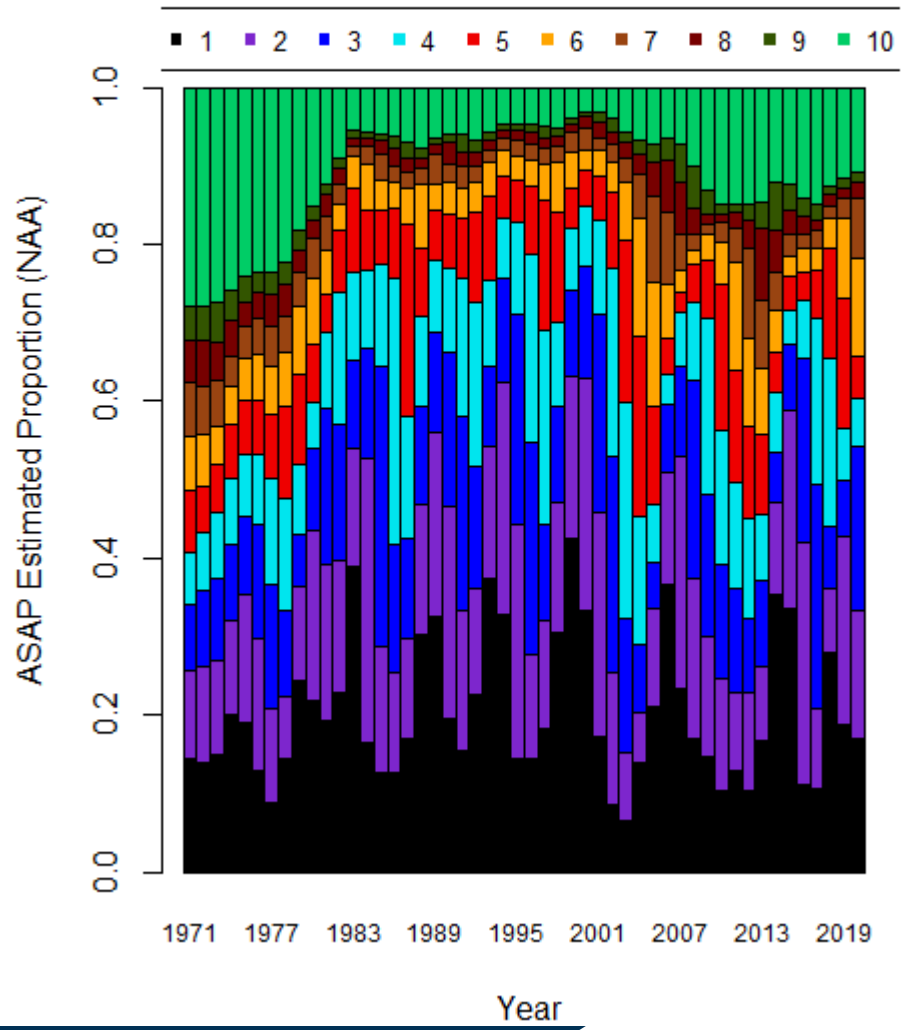
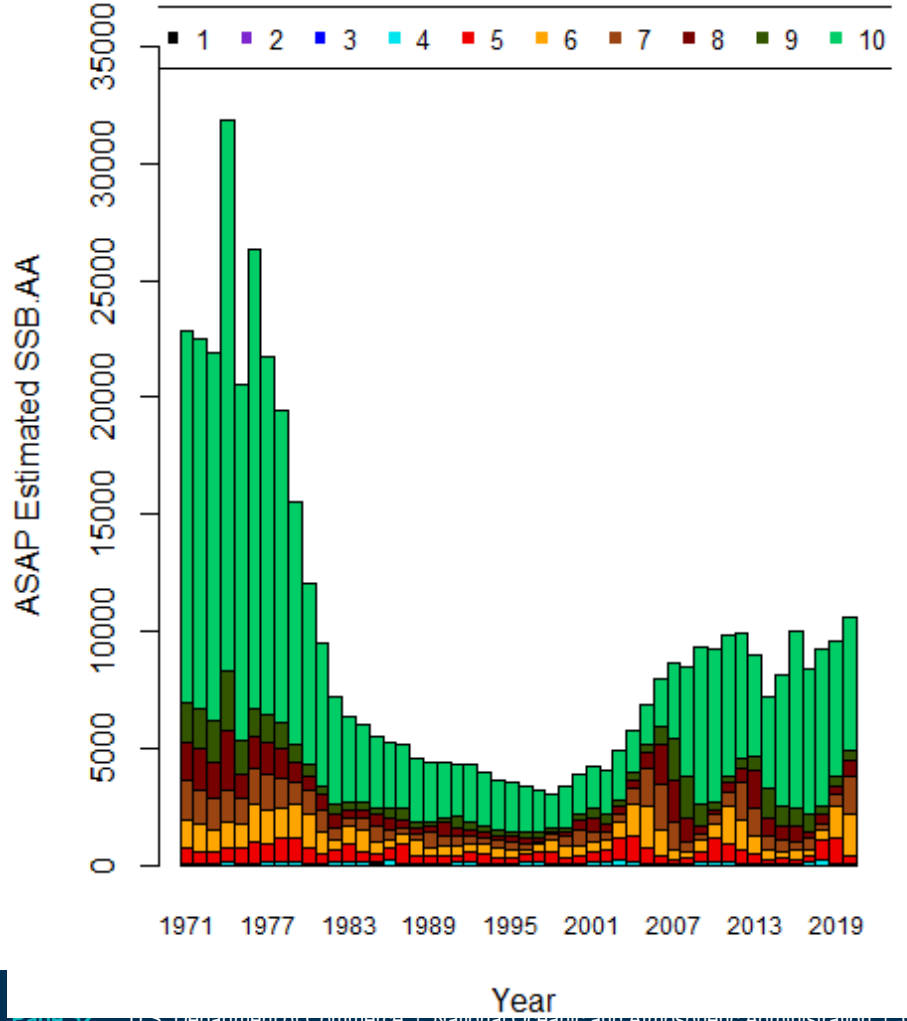
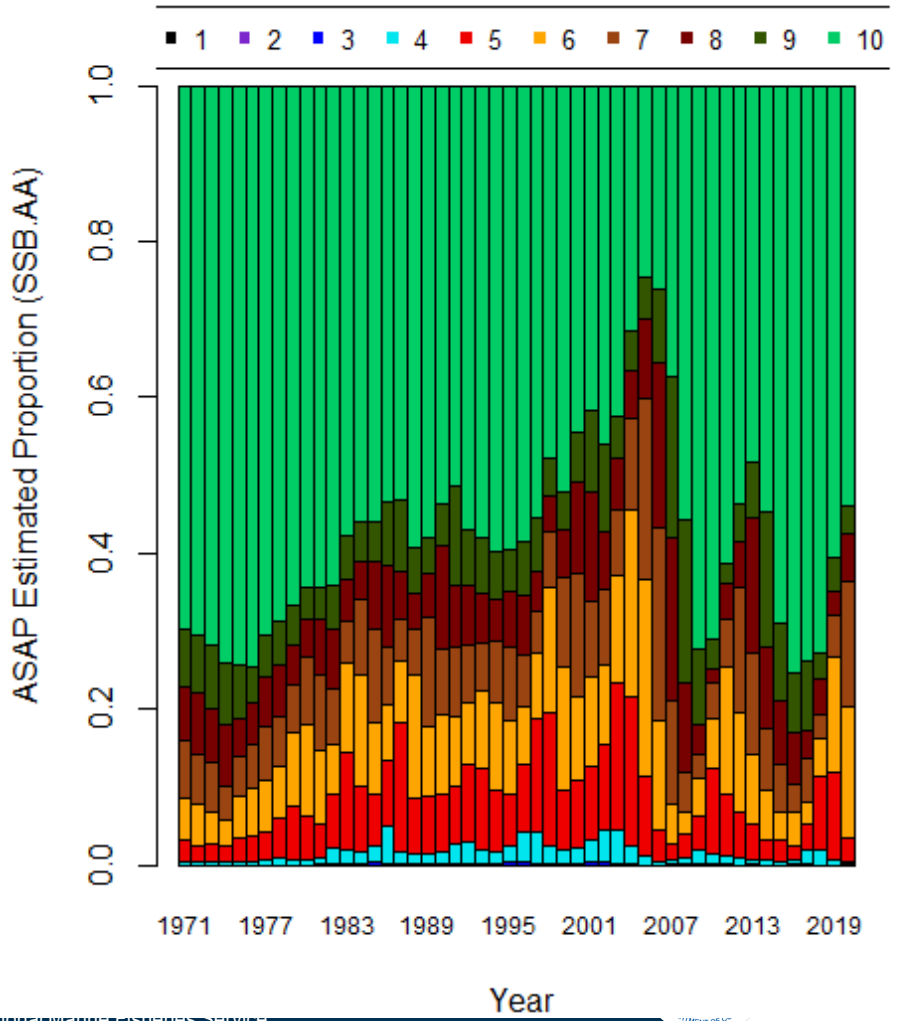
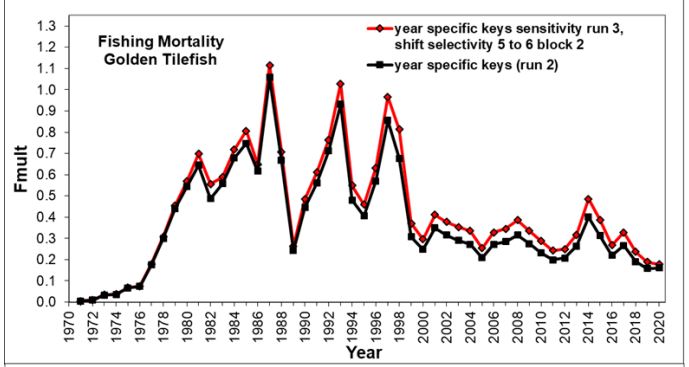

1 2 3 4 5 6 7 8 9 10
ASAP Estimated NAA
0
2000
4000
6000
8000
10000
1971 1977 1983 1989 1995 2001 2007 2013 2019
Year

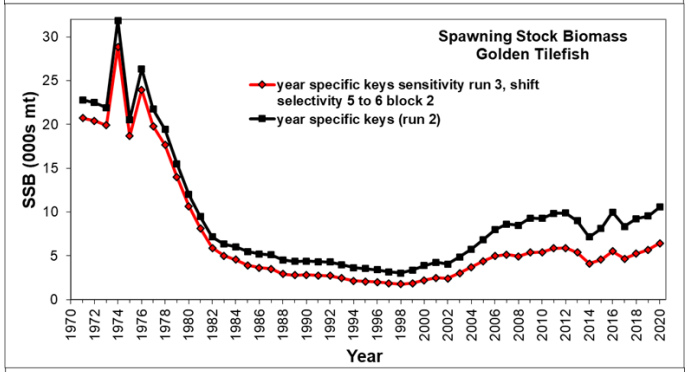

1 2 3 4 5 6 7 8 9 10
ASAP Estimated Proportion (NAA)
0.0
0.2
0.4
0.6
0.8
1.0
1971 1977 1983 1989 1995 2001 2007 2013 2019
Year

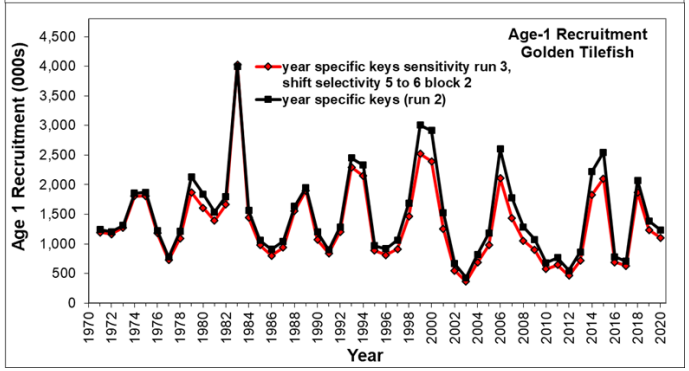

1 2 3 4 5 6 7 8 9 10
ASAP Estimated SSB.AA
0 5000 10000 15000 20000 25000 30000 35000
1971 1977 1983 1989 1995 2001 2007 2013 2019
Year


1 2 3 4 5 6 7 8 9 10
ASAP Estimated Proportion (SSB.AA)
0.0 0.2 0.4 0.6 0.8 1.0
1971 1977 1983 1989 1995 2001 2007 2013 2019
Year

Golden Tilefish







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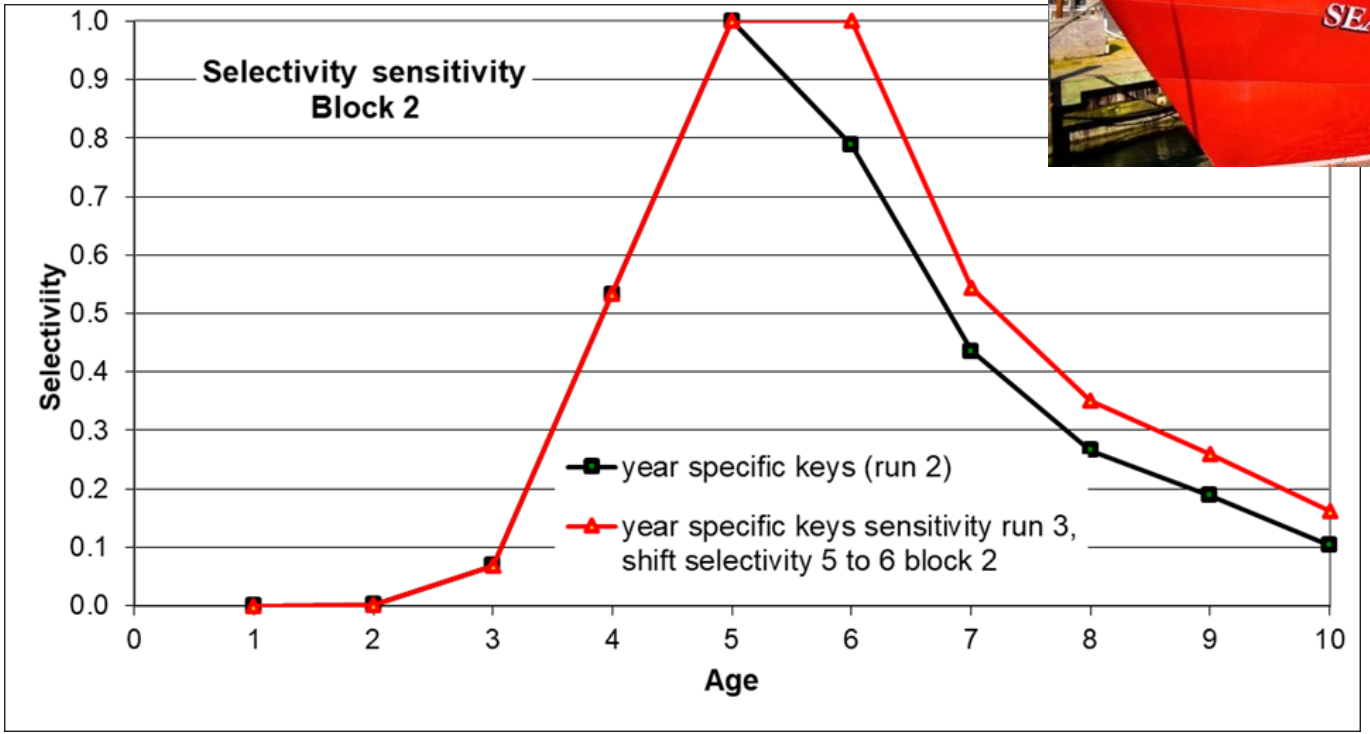

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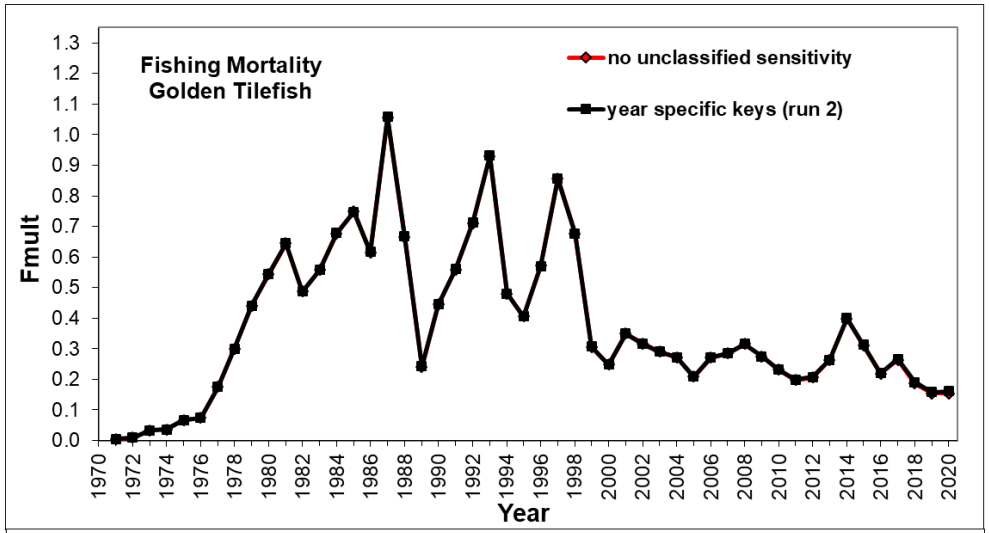
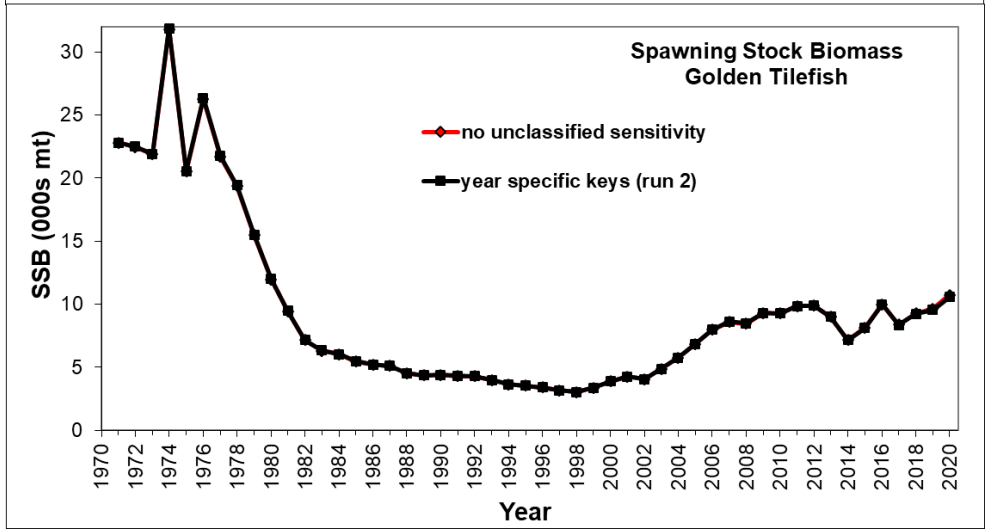
Extra Credit Sensitivity Run
(not in the report)





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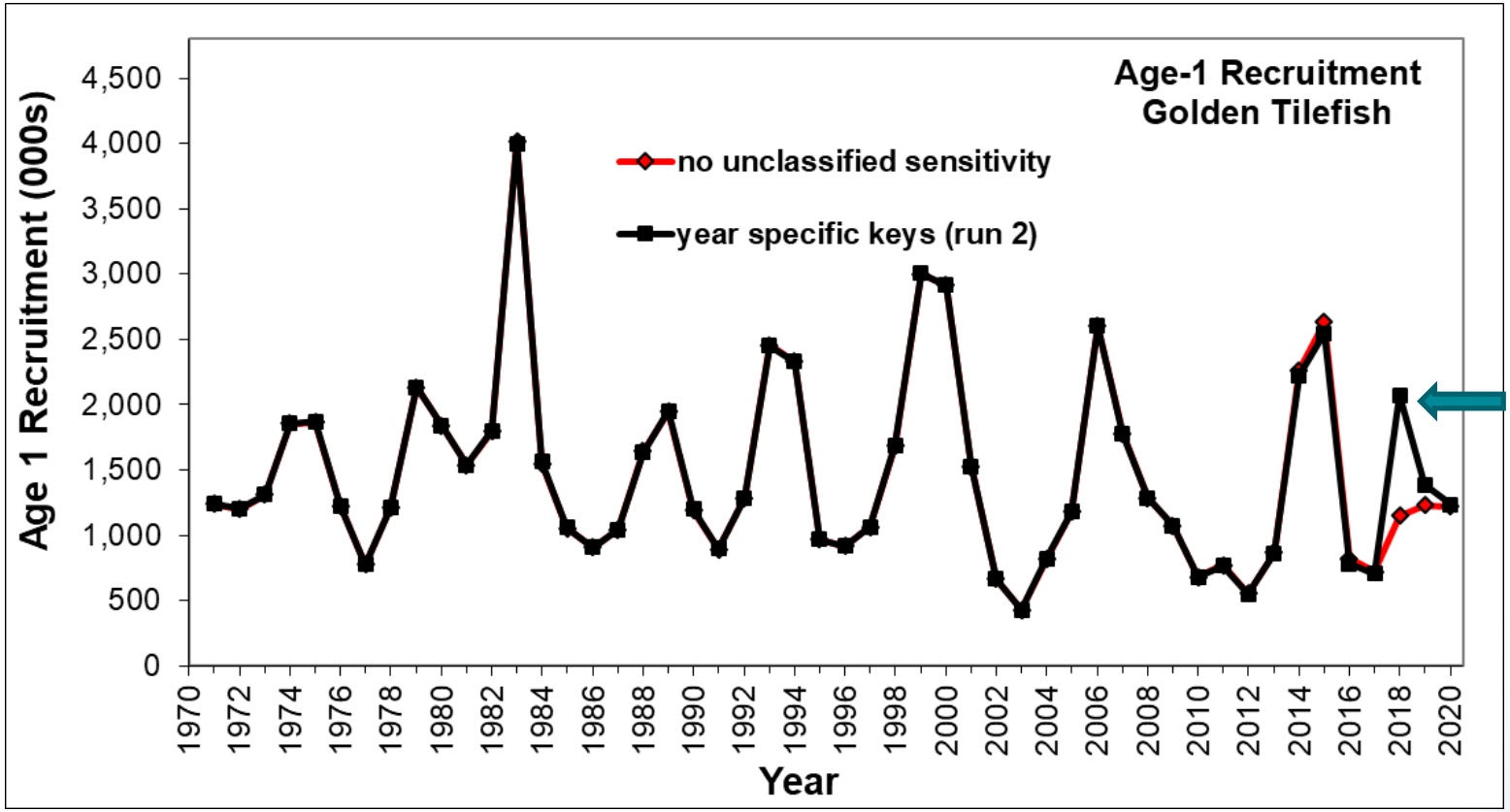

Bye-Bye
2017 yc

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Golden Tilefish

Final Run 2 Projection

Catch, Fishing Mortality (F), Spawning Stock Biomass (SSB),
Probability of $F>F_{MSY}$ and $SSB<SSB_{MSY}/2$
Catch and SSB in metric tons

Year	Total Catch	F	SSB	$P(F>F_{MSY})$	$P(SSB<SSB_{MSY}/2)$
2021	742	0.207	10,061	0.172	0.026
2022	1,011	0.261	10,491	-	0.015
2023	991	0.261	11,165	-	0.004
2024	949	0.261	11,586	-	0.001

$MSY_{40\%}$ = 935 mt

Year	Final Run 2	Extra Credit Sensitivity Run Unlassifieds not used	Difference
2021	742	742	0
2022	1,011	846	165
2023	991	862	129
2024	950	860	90
2025	930	875	55
2026	937	898	39
			478

2 unclassified samples = 16 fish sampled = 478 mt over 5 years

Projections based on the final run 2 appear to be highly uncertain given this sensitivity run.

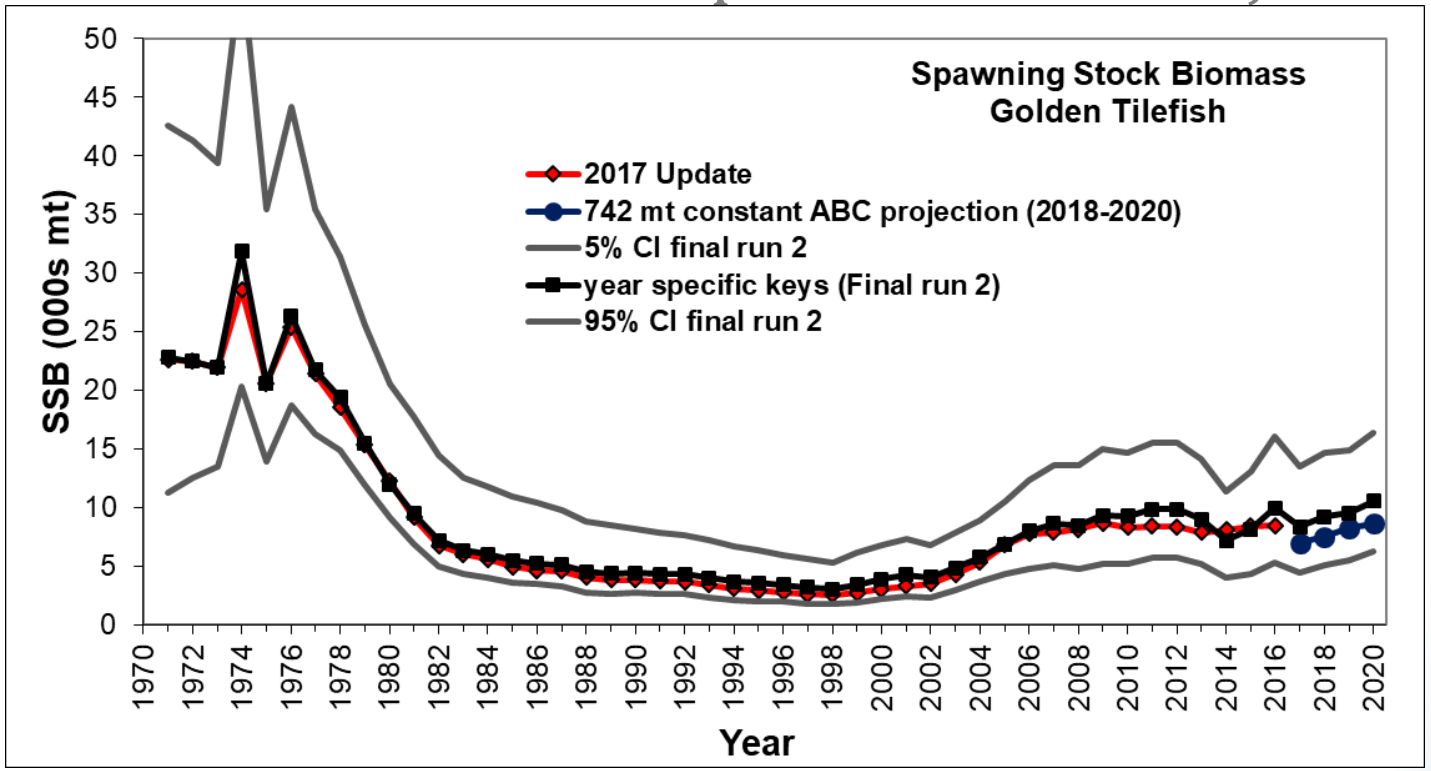
Golden Tilefish

Reviewer Comments

- Given the results of the assessment update, it seems to be reasonable to change overfishing definition to F40%.
- Continuation of adequate age sampling is critical to the switch from the use of pooled age-length-key to year specific age-length-keys for more appropriate characterization of age structure and better tracking of year classes.
- There is a significant concern with reductions in the biological port sampling that may negatively affect future assessments, including the next RT assessment model in 2024.
- Due to the lack of information on incoming recruitment at the end of the time series (no fishery independent surveys that capture young fish), alternatives to the TAL calculations based on projections that rely on uncertain indications of year class strength should be considered. Conservative approach to changes in the TAL over time appear to have resulted in overall benefits for both the tilefish stock and for the fishery.

Golden Tilefish

Final model estimates compared to 2017 Projections



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Golden Tilefish

Final model estimates compared to 2017 Projections

Year	*Basis for Projection*	*Compare to*	*Projection*	*Estimate*	*Delta*	*Delta^2*
2017	2017_PROJ	2021_MT	6,983	8,360	-1,377	1,895,881
2018	2017_PROJ	2021_MT	7,539	9,228	-1,689	2,852,991
2019	2017_PROJ	2021_MT	8,264	9,538	-1,274	1,624,019
2020	2017_PROJ	2021_MT	8,648	10,562	-1,914	3,663,779
		Average	7,859	9,422		

Total sum of squares	10,036,670
Number of years	4
Variance	2,509,168
Mean square Error	1,584
Ave Projected SSB	7,859
CV of Projected SSB	20%

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