MEDAC 10 December 2018

STECF stock assessments

WEST MED DEMERSAL STOCKS (EWG 18-12)

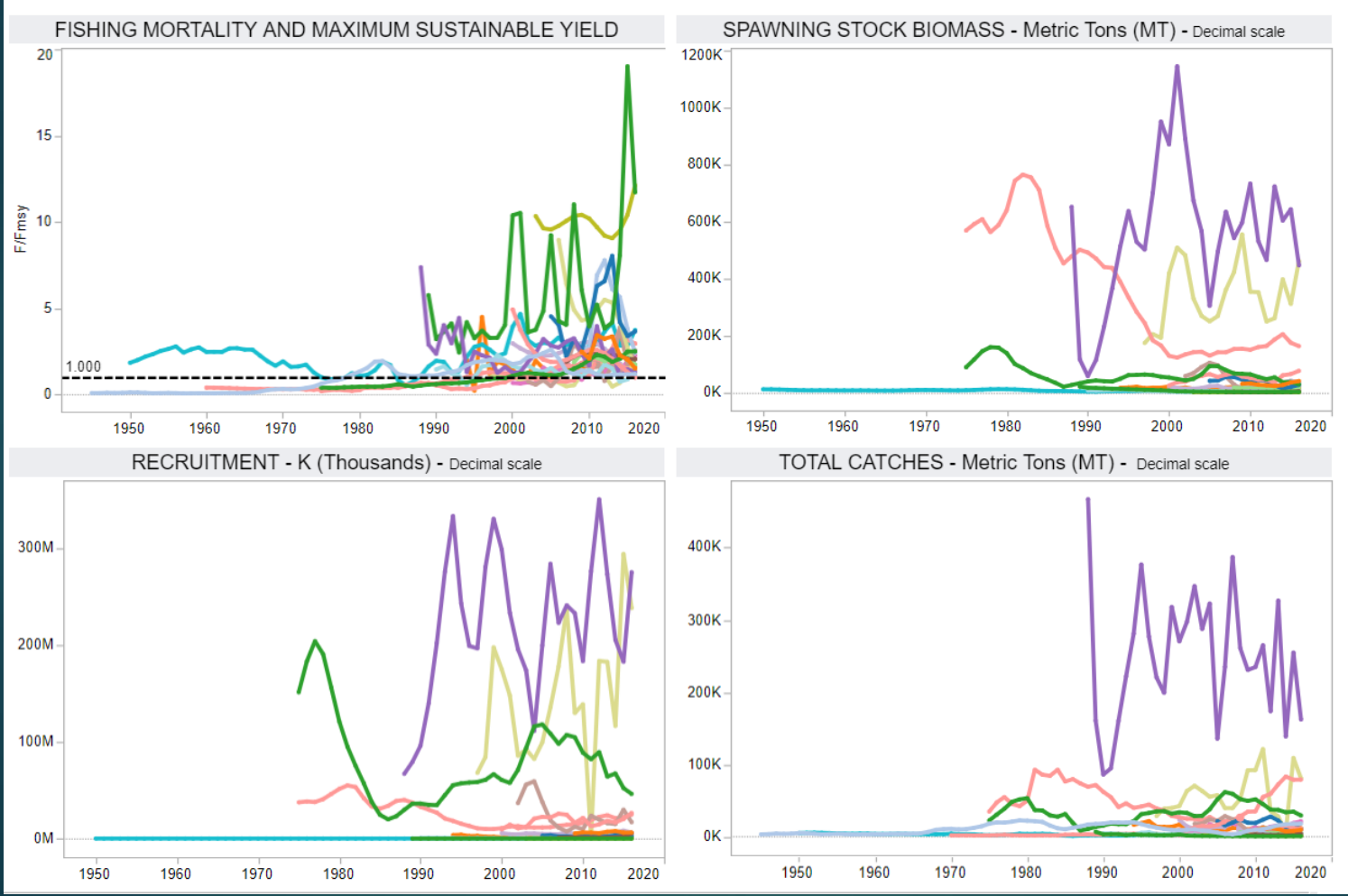
ADRIATIC DEMERSAL STOCKS (EWG 18-16)

REPORTS PUBLISHED

RESULTS PRESENTED TO GFCM WGSAD *(IN GREY: ACCEPTED)*

Exploring the dashboard

https://stecf.jrc.ec.europa.eu/dd/medbs/ram



Update with stock assessments 2017

Overall Approach

- age based assessment attempted if data available
  - Preferably a4a, or SS3 with XSA to compare. STF based on status quo F and target F0.1
- Surplus Production attempted if long time series of catch available. STF based on HR at MSY based on SSB in terminal year.
- If neither method was acceptable biomass indicators (with length indicator)
- For each 'stock' multiple assessments tested, and best models selected where possible.
- At the end of the meeting the group reviewed all assessments and agreed the basis of advice for all stocks except two and agreed the draft STECF comments.

The basis advice (Section 5) is dependent on the type and quality of information available and is as follows:

- **Full assessment and MSY reference points** : Catch / Effort advice at MSY based on short term forecast at F=F_{MSY} (Nephrops based on HR)
- **Full assessment without full reference points**: Catch / Effort advice under MSY considerations : (MSY proxy F=F0.1) with STF
- **Assessment providing SSB tend information historic F evaluation, not suitable for STF:** Stock status but no catch advice
- **Trend based indictor with exploitation and stock status considered OK**: Catch / Effort advice under precautionary considerations based on ICES smoothed index of trend without precautionary buffer (20% reduction).
- **Trend based indictor with exploitation and stock status unknown or considered not acceptable :** Catch / Effort advice under precautionary considerations based on ICES smoothed index of trend with precautionary buffer (20% reduction).
- **Equilibrium (VIT) analysis:** If consistent among years and coherent with length analysis advice based of change on F from F status quo to F0.1
- **Valid length analysis/not fully in line with VIT analysis:** statement of stock status, indication of direction but not magnitude of change required.
- **No coherent analysis** no advice

Western Mediterranean stocks

ALL STOCKS BUT ONE ARE SIGNIFICANTLY BEING OVERFISHED,

BIOMASS IS STABLE AT LOW LEVEL OR DECREASING FOR THE MAJORITY OF THE STOCKS

ANNEX I List of stocks to assess

Area	Common name	Scientific name
GSA 1-5-6-7	Hake	*Merluccius merluccius*
GSA 1-5-6-7	Deep-water rose shrimp	*Parapenaeus longirostris*
GSA 1	Red mullet	*Mullus barbatus*
GSA 5	Red mullet	*Mullus barbatus*
GSA 6	Red mullet	*Mullus barbatus*
GSA 7	Red mullet	*Mullus barbatus*
GSA 5	Norway lobster	*Nephrops norvegicus*
GSA 6	Norway lobster	*Nephrops norvegicus*
GSA 9-10-11	Hake	*Merluccius merluccius*
GSA 9-10-11	Deep-water rose shrimp	*Parapenaeus longirostris*
GSA 9	Red mullet	*Mullus barbatus*
GSA 10	Red mullet	*Mullus barbatus*
GSA 9	Norway lobster	*Nephrops norvegicus*
GSA 11	Norway lobster	*Nephrops norvegicus*
GSA 1	Blue and red shrimp	*Aristeus antennatus*
GSA 5	Blue and red shrimp	*Aristeus antennatus*
GSA 6	Blue and red shrimp	*Aristeus antennatus*
GSA 9-10-11	Giant red shrimp	*Aristaeomorpha foliacea*

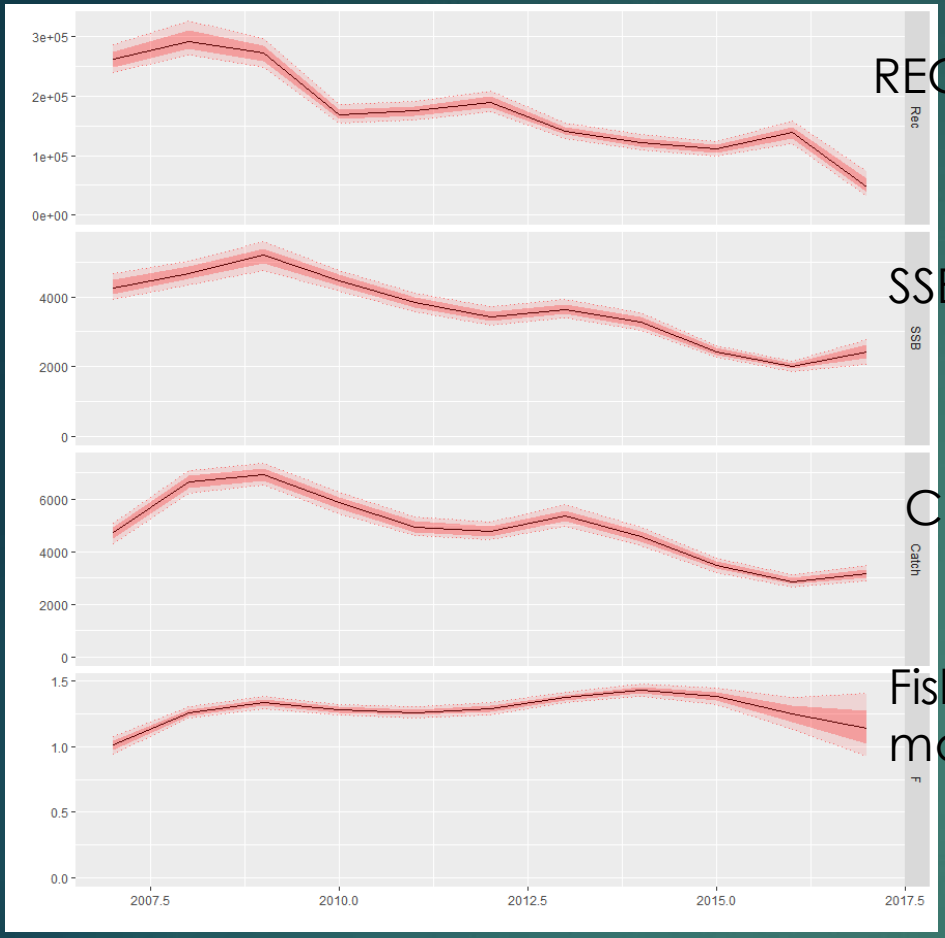
Area	Species	Previous Analysis /	Attempted analyses and **basis of advice**
1_5_6_7	Hake	XSA, 2015	**a4a STF**
9_10_11	Hake	XSA, 2015	**a4a STF**
1	Red Mullet	XSA, 2014	**a4a STF**
5	Red Mullet	XSA, 2013	a4a **No Advice**
6	Red Mullet	XSA, 2014	XSA **a4a STF**
7	Red Mullet	XSA, 2014	XSA **a4a STF**
9	Red Mullet	XSA, 2014	**a4a STF**
10	Red Mullet	VIT, 2012	**a4a STF**
5	Norway lobster	XSA, 2017	**a4a STF**
6	Norway lobster	SepVPA, 2017	**a4a STF**
9	Norway lobster	XSA, 2017	XSA a4a **Index Advice**
11	Norway lobster	XSA, 2017	XSA a4a **Index Advice**
1_5_6_7	Deep-water rose shrimp	Not assessed before	XSA, a4a **Index advice**
9_10_11	Deep-water rose shrimp	XSA, 2016	XSA **a4a STF**
1	Blue and red shrimp	XSA, 2015	**a4a STF**
5	Blue and red shrimp	Not assessed before	**Index advice**
6	Blue and red shrimp	XSA, 2015	**a4a STF**
9_10_11	Giant red shrimp	Not assessed before	**a4a STF**

Conclusions : ‘Advice’ a
:

Area	Species	Method/ basis	F_{2017}	F_{2019}	Change in F	Catch 2017	Catch 2019	Change in catch	Biomass (status)
1_5_6_7	Hake	a4a	1.14	0.23	-80%	3172	819	-74%	Stable
9_10_11	Hake	a4a	0.55	0.14	-75%	1782	494	-72%	Decr.
1	Red Mullet	a4a	1.47	0.26	-82%	231	35	-85%	Stable
5	Red Mullet	No advice							
6	Red Mullet	a4a	1.2	0.22	-82%	1607	482	-70%	Stable
7	Red Mullet	a4a	1.3	0.64	-51%	354	130	-63%	Stable
9	Red Mullet	a4a	1.57	0.54	-66%	1601	812	-49%	Incr.
10	Red Mullet	a4a	0.25	0.54	84%	596*	1056		Incr.

Conclusions : 'Advice' b

Area	Species	Method/ basis	F_{2017}	F_{2019}	Change in F	Catch 2017	Catch 2019	Change in catch	B(status)
5	Nephrops	a4a	0.73	0.13	-82%	34	3.3	-90%	Decr.
6	Nephrops	a4a	0.44	0.12	-73%	290	125	-57%	Incr.
9	Nephrops	Index				Unknown	90		Decr.
11	Nephrops	Index				28.3	17.1	-40%	Decr.
1_5_6_7	Deep-water rose shrimp	Index				998	638.4	-36%	Incr.
9_10_11	Deep-water rose shrimp	a4a	1.68	0.74	-56%	1507	644	-57%	Decr.
1	Blue and red shrimp	a4a	0.73	0.42	-42%	99	97	-2%	Stable
5	Blue and red shrimp	Index				171	150	-12%	Incr.
6	Blue and red shrimp	a4a	0.96	0.32	-67%	527	223	-58%	Decr.
9_10_11	Giant red shrimp	a4a	1.12	0.57	-49%	399	171	-57%	Decr.

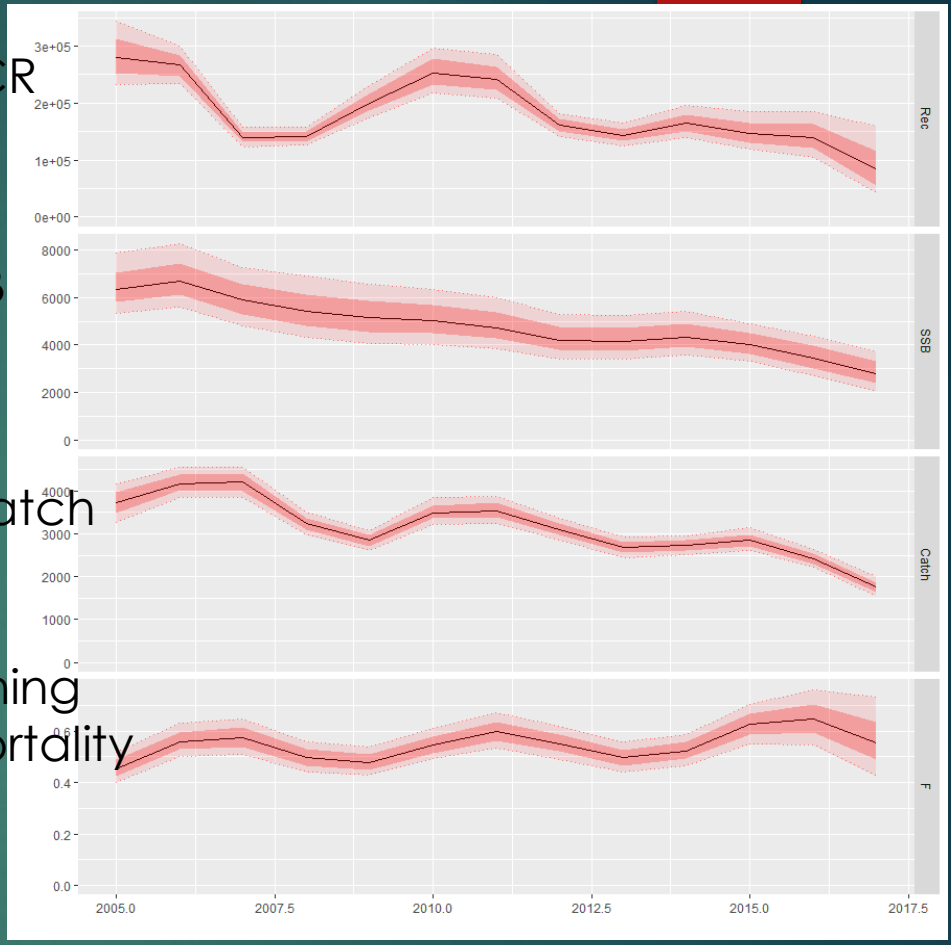


RECR

SSB

Catch

Fishing mortality



Hake GSA 1-5-6-7

Hake GSA 9-10-11

Assessment issues

- Aligning age, mid year spawning and calendar year assessment and t0 for growth equations.
  - Mid year spawning (recruitment) requires growth to start at some point within the year.
  - Calendar year assignment of catch and survey requires annual birthday 1st of January
  - Aging of individuals may be by calendar year or month from spawning.
  - Slicing of mid year spawners requires t0 to be amended to ensure length 1st of January give correct transition from age 0 to age 1. Or calendar year aging needs to be assigned to correct point in the year. The Influence on youngest ages are the greatest
  - Mostly affects red mullet and DWRS.
- Plus group fitting with survey data.
  - Needs correctly constructed plus group, if its to be fitted.

Adriatic demersal stocks

ALL STOCKS BUT ONE ARE SIGNIFICANTLY BEING OVERFISHED,

BIOMASS IS STABLE OR INCREASING FOR ALL STOCKS

ANNEX I List of stocks to assess

Area	Common name	Scientific name
GSA 17-18 (see TOR 7)	Hake	***Merluccius merluccius***
GSA 17-18	Red mullet	***Mullus barbatus***
GSA 17-18	Norway lobster	***Nephrops norvegicus***
GSA 17-18-19	Deep-water rose shrimp	***Parapenaeus longirostris***
GSA 17-18	Common cuttlefish	***Sepia officinalis***
GSA 17	Sole	***Solea vulgaris***
GSA 17-18	Spottail mantis shrimp	***Squilla mantis***

Area	Species	Previous Analysis /	Attempted analyses and **basis of advice**
17-18 TOR 7	Hake	A4a/SS3 2017 (not accepted)	SS3**, a4a, STF**
17-18	Red mullet	Index 2017	**a4a, STF**
17-18	Norway lobster	SPICT 2017	a4a, **SPiCT, STF**
17-18-19	Deep-water rose shrimp	A4a XSA 2017	**a4a, STF**
17-18	Common cuttlefish	CMSY 2017	SPiCT, **CMSY**
17	Sole	A4a/SS3 2017(not accepted)	a4a, **SS3, STF**
17-18	Spottail mantis shrimp	2017	XSA, **a4a, STF**

Conclusions : 'Advice'

Area	Species	Method/ basis	F_{2017}	F_{2019}	Change in F	Catch 2017	Catch 2019	Change in catch	Biomass (status)
17-18 (see TOR 7)	Hake	a4a	0.53	0.16	-70%	6035	2694	-55%	Increasing
17-18	Red mullet	a4a	0.48	0.41	-15%	5652	5083	-10%	Increasing
17-18	Norway lobster	SPiCT	0.66	0.35*	-47%	1430	745	-48%	$0.43B_{msy}$
17-18-19	DW rose shrimp	a4a	1.13	0.43	-62%	10408	2635	-75%	Increasing
17-18	Common cuttlefish	CMSY	$0.5\ F_{MSY}$	$F=F_{MSY}$	101%	3774	7600	101%	At B_{msy}
17	Sole	SS3	0.65	0.24	-63%	2257	659	-71%	Stable
17-18	Spottail mantis shrimp	a4a	1.04	0.41	-61%	4672	2742	-41%	Increasing

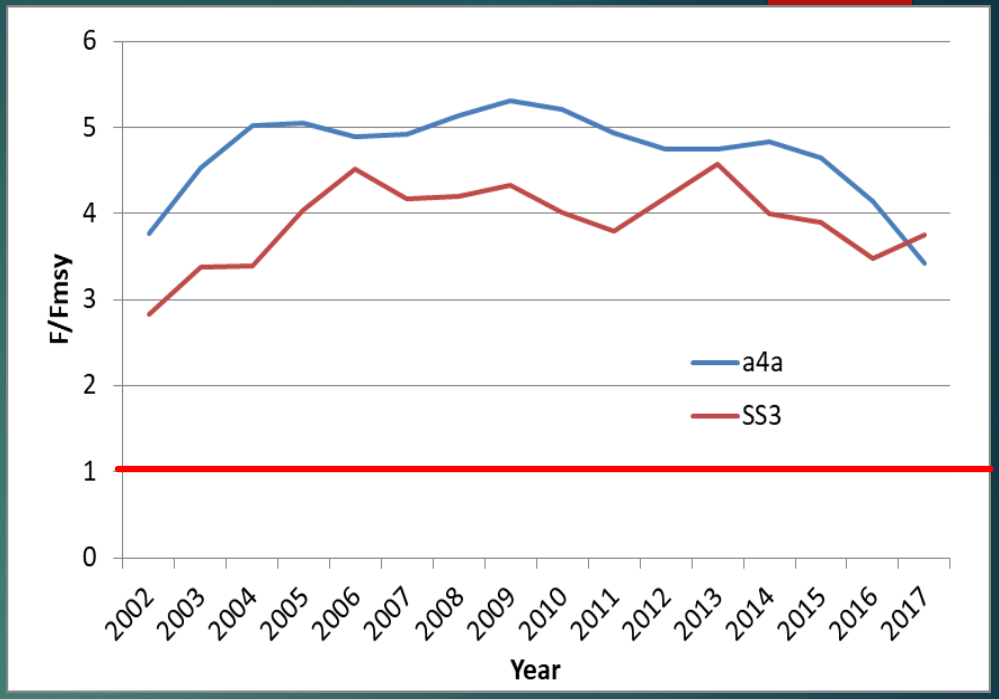
Tor 7 – hake in GSA 17-18

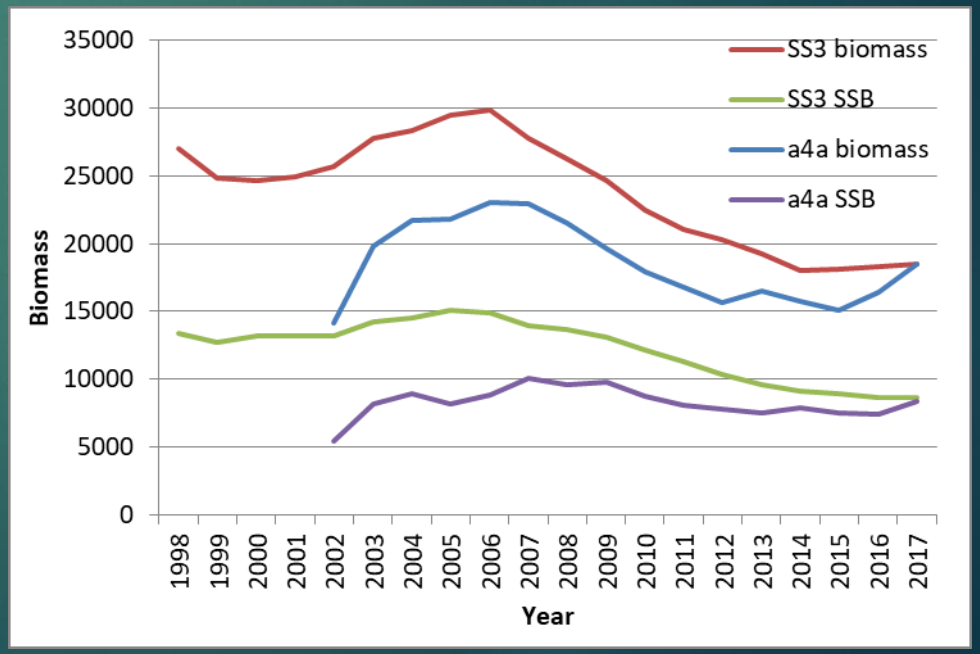
- SS3 model developed much further, a4a model fitted to similar data treatment:
  - 3 people worked before and through the meeting.
  - Two main SS3 configuration options were reached by the end of the assessment meeting: in one of them, the growth parameters were estimated and the selection patterns by length of the fleets were assumed to be the same for both sexes; in the other configuration, the growth parameters were treated as fixed inputs whereas the selection patterns of some of the fleets were allowed to differ by sex.
  - SS3 multifleet model with fixed selection fitted separately by sex
  - A4a single fleet (combined fishery) separated by sex
  - Both models fitted using DCR supplied growth data.

- Setting up the SS3 stock assessment in a satisfactory manner proved very challenging because:
  - the assessment time series is relatively short and there are no strong signals in the available fishery or survey data to drive assessment results in a clear way.
  - No reliable age composition data are available for the assessment and there are strong uncertainties about growth.
  - the Linfinity growth parameter considered to be more realistic from a biological perspective (111 cm for females and 73 cm for males) are substantially larger than suggested by the length composition data. If these Linfinity values are indeed realistic, possible conclusions (given that such lengths are not observed in the data)
    - are that the stock is heavily depleted, or
    - that the natural mortality pattern is substantially different from that currently assumed,
    - or that the fishery selectivity is even more dome-shaped than the domed doublé normal selectivities used in the above model,
    - or a combination of these possibilities.
    - If the growth parameters are estimated within the stock assessment, the estimated Linfinity values are considerably lower (72 cm for females and 43 cm for males).
- These issues open a wide range of possibilities for developing an appropriate assessment, with none of them being clearly satisfactory and with no obvious way to clearly discern between them.

Hake 17-18

The two models a4a and SS3 gave similar results in terms of stock status, F/Fmsy total biomass and SSB in 2017.
The a4a model gives slightly higher historic F with a sharper decline in F over the last 4 years. The historic differences from both models are minor; with SS3 currently showing a slightly greater decline in stock over the time series.
However, retrospective analysis shows that the SS3 model is less stable and for the moment is the preferred model for advice.





GFCM-STECF benchmark
January 2019