MARINE & FRESHWATER RESEARCH INSTITUTE

Cucumaria frondosa

Fisheris and advice in Iceland

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Holosustain workshop

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Cucumaria frondosa

Orange-footed sea cucumber - Brimbútur

*C. frondosa t*he target species in Iceland is usually caught between 10-100 m

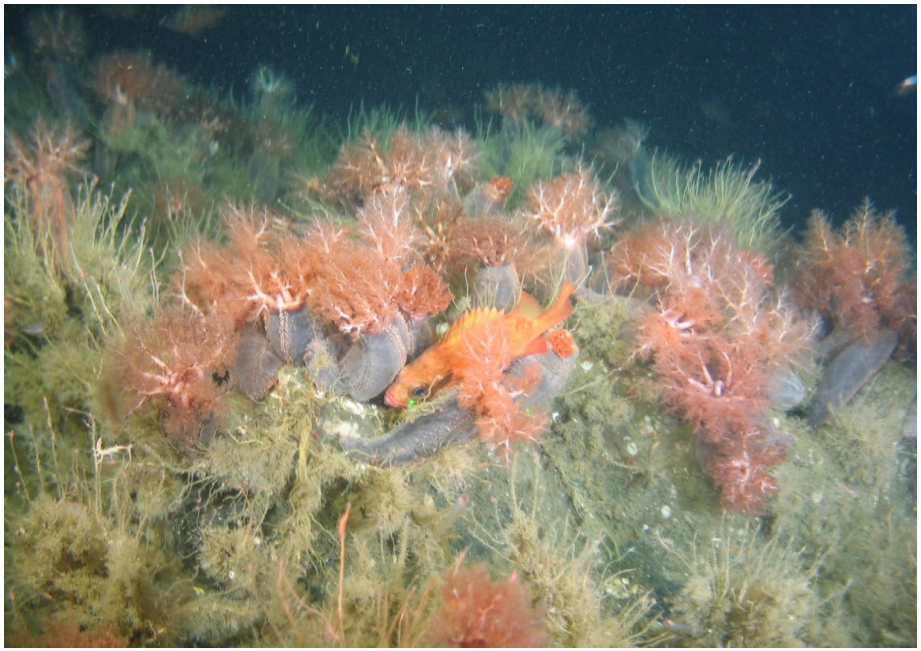
They can possible reach 25 years of age[1]

Takes about ten 10 years to reach 25 – 30 cm in Canada[2]

Spawning in Iceland May – July

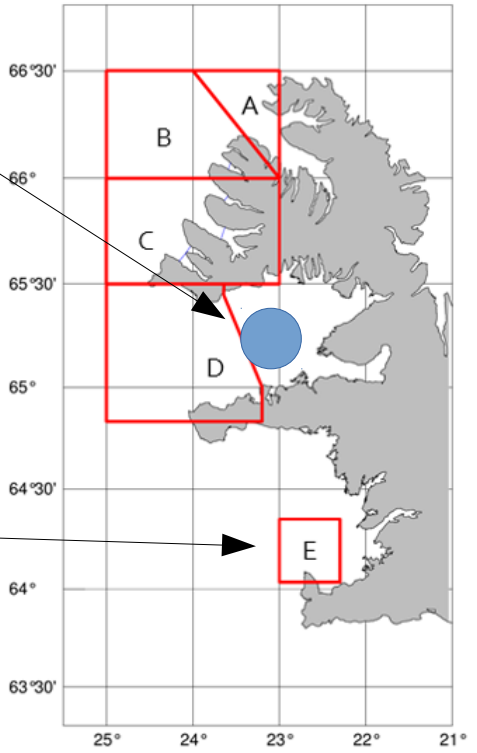
1. So et al. (2010).
2. Hamel & Mercier (1996).

C. frondosa



An experimental fishery started in Breiðafjörður in 2003.

Little was landed until 2008 when fishing was initiated in Faxaflói (Area E), with catches around 800 t in that area out of 1000 t for all areas combined



Assessment Reports & advice sheets

https://www.hafogvatn.is/en/harvesting-advice

SEA CUCUMBER – SÆBJÚGA

Cucumaria frondosa

COMMERCIAL FISHING

An experimental fishery for sea cucumber started in Breiðafjörður in 2003, but little until 2008 when fisheries started in Faxaflói with catch of around 800 t. Since then, la increased and in 2009 three fishing zones were demarcated by the Ministry: 1) W Reykjanes to Skagatá, 2) Northern area: Skagatá to Glettinganes and 3) Southern and e Glettinganes to Reykjanes. For each of these zones three fishing licenses were issue not allowed to move from one zone to another. However, no fishing was condu Northern area as limited fishing trials did not give positive results. In 2013, the Minist the area restriction.

SÆBJÚGA – SEA CUCUMBER (AÐALVÍK)

Cucumaria frondosa

RÁÐGJÖF – *ADVICE*

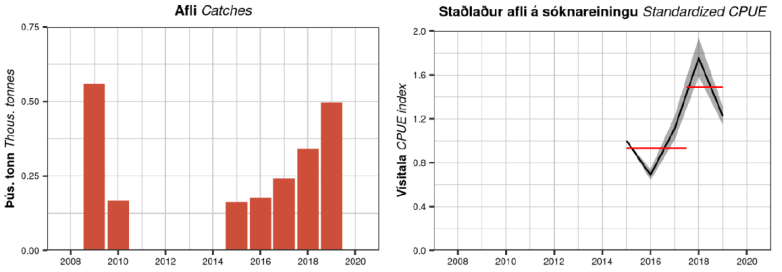
Hafrannsóknastofnun ráðleggur í samræmi við varúðarsjónarmið að afli fiskveiðiárið 2020/2021 verði ekki meiri en 122 tonn á svæði A, Vestfirðir norðursvæði - Aðalvík.

MFRI advises that when the precautionary approach is applied, catches in the fishing year 2020/2021 should not exceed 122 tonnes in fishing area A, Westfjords northern area - Aðalvík.

STOFNÞRÓUN – *STOCK DEVELOPMENT*

Staðlaður afli á sóknareiningu hækkaði milli áranna 2016 og 2018 en lækkaði árið 2019.

Standardized CPUE increased between 2016 and 2018 but declined again in 2019.

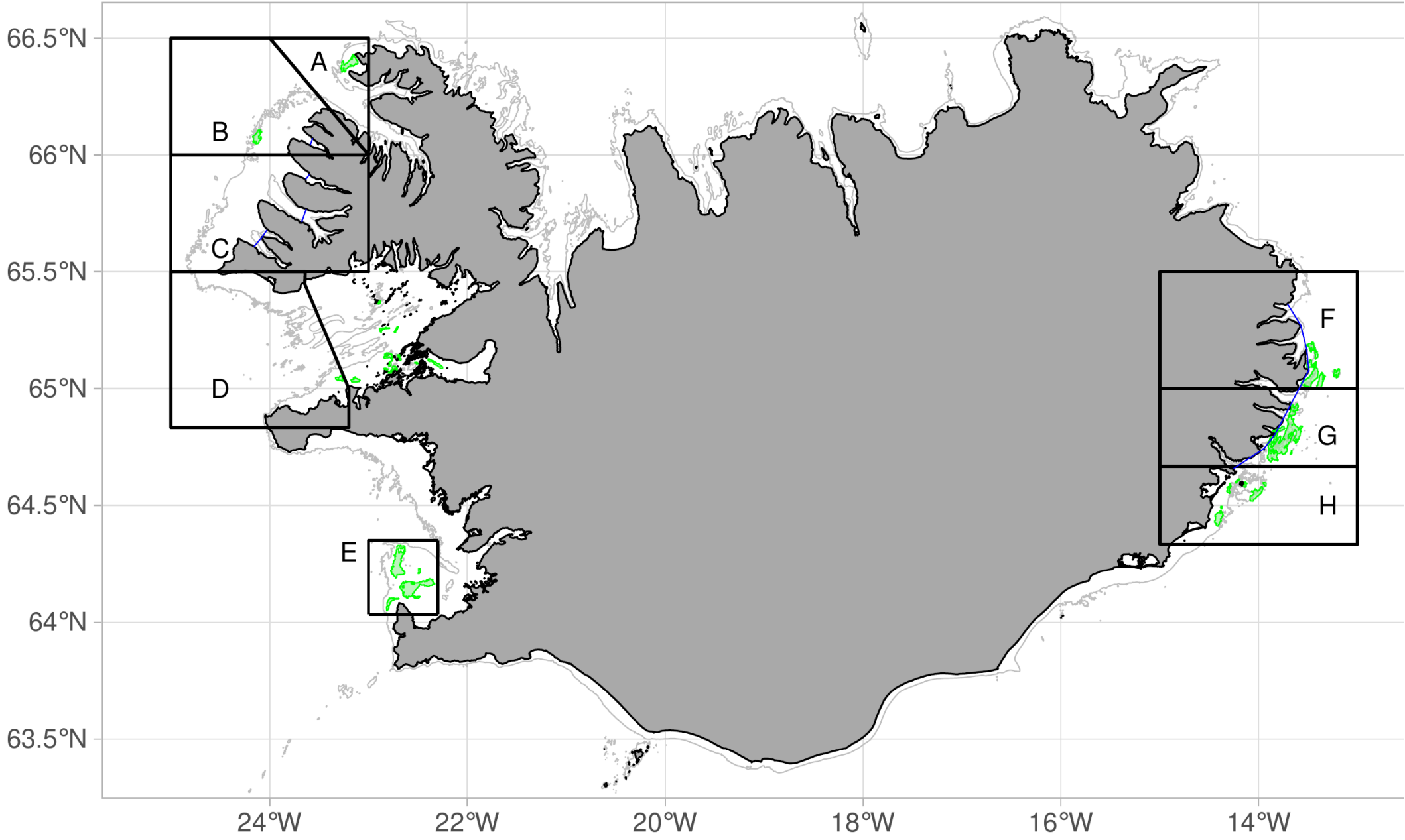


Sæbjúga. Afli og staðlaður afli á sóknareiningu á svæði A, Vestfirðir norðursvæði - Aðalvík. Rauðar láréttar línur sýna meðalafla á sóknareiningu fyrir árin 2015–2017 og 2018–2019 sem nýtast við útreikninga ráðgjafar.

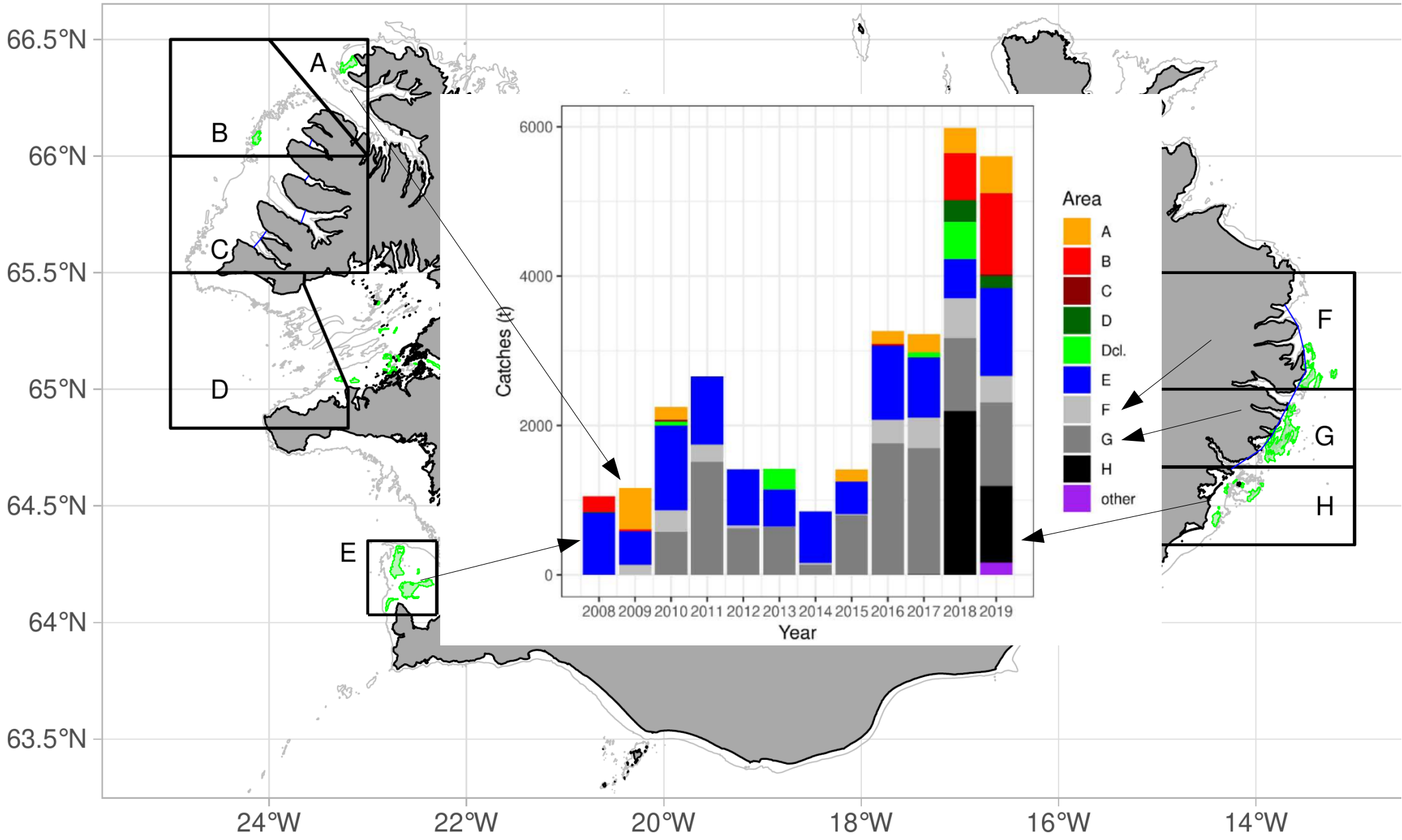
Sea cucumber. *Catches and standardized CPUE in fishing area A, Westfjords northern area - Aðalvík. Red horizontal lines indicate average CPUE for 2015–2017 and for 2018–2019 used in the advice calculations.*

C. frondosa – Management areas

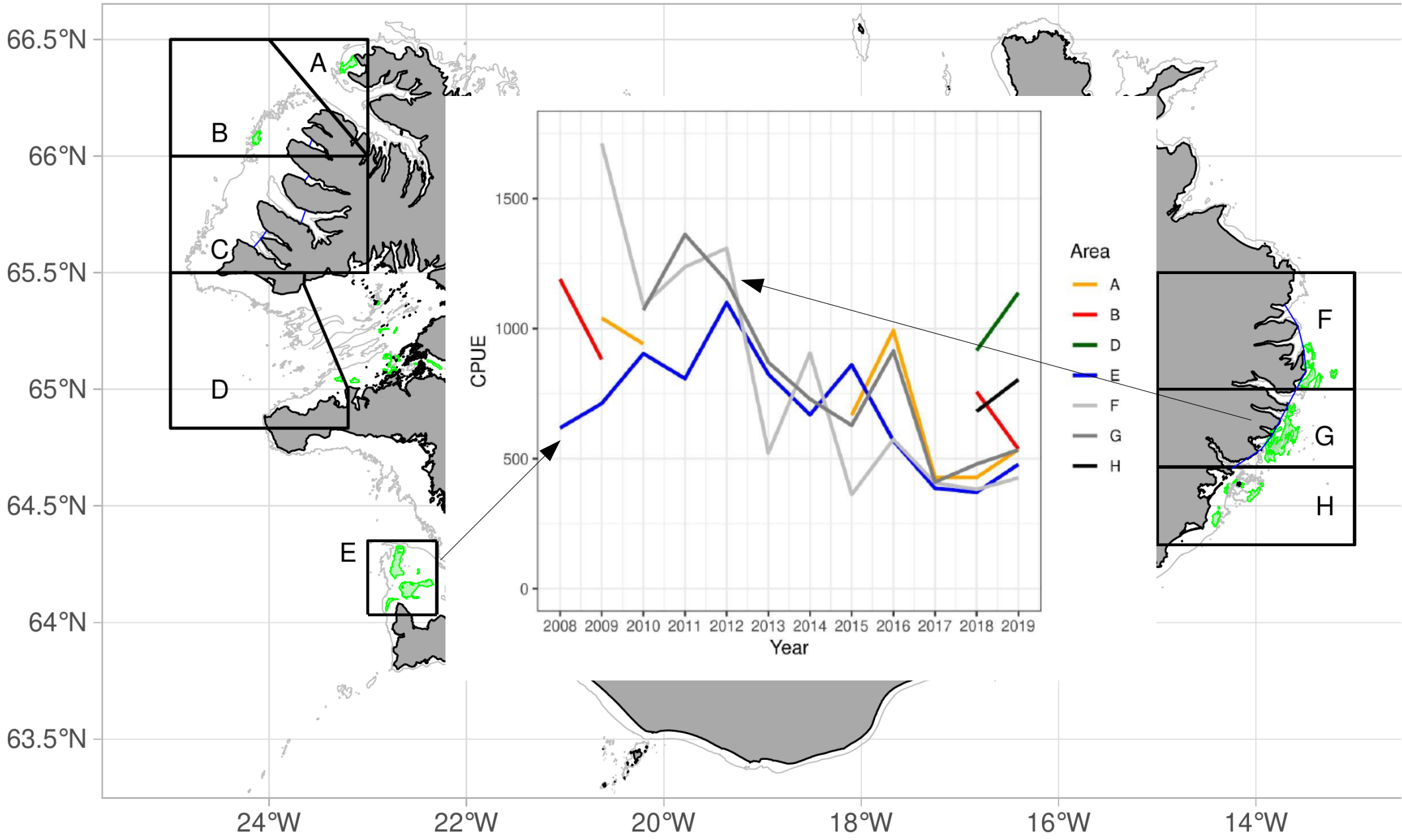
VMS records in green



C. frondosa – Catch by areas



C. frondosa – CPUE by areas



C. frondosa - Fishery

The catches have fluctuated, somewhat due to marketing reasons, but during the past three years they have increased steadily. Landings reached 6000 t in 2018 (5600 t in 2019), an almost two-fold increase from the previous year.

There has been a downward trend in the CPUE. The vessels have become larger and most operate with two beam dredges.

C. frondosa - Fishery

Intense fishing in recent years on virgin grounds (unregulated) and late closures have resulted in increased effort. Advised area enlargements have lagged and been put forward later along with other changes in regulations.
New areas are now continuous to circumvent fishing around their edges.

C. frondosa - Advice (TAC)
Brief History of the advice

2009 Based on limited dredge surveys (10% HR)

2012 Based on CPUE and coarse area estimate (10% HR)

2016 Average catch of last 6 years with 20% precautionary buffer

2017 TAC per km^2 scaled to area E (9.1t/km^2, based on VMS data)

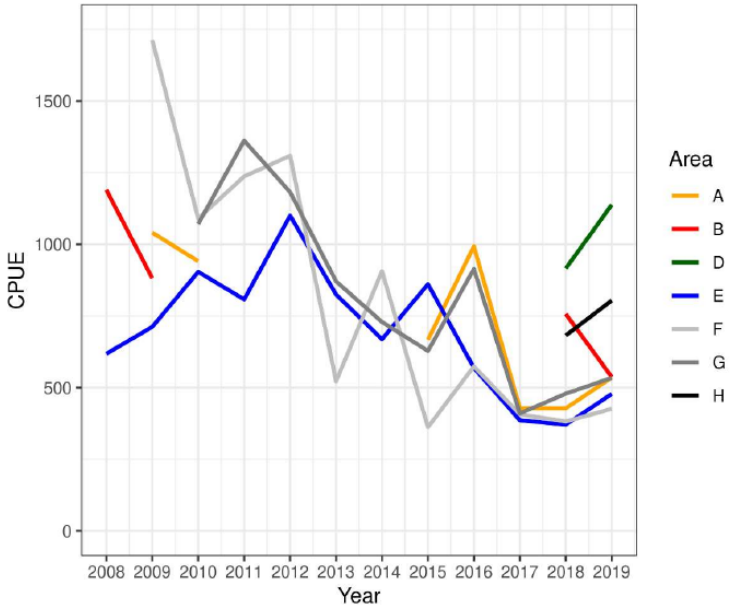
2019 TAC for area B, D & H based on 9.1t/km^2 (size from VMS) TAC in Area E lowered with 20% precautionary buffer

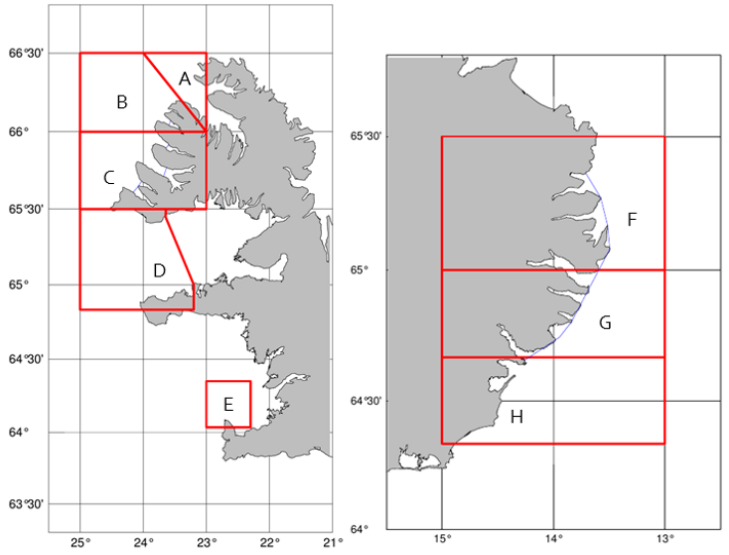
2020 ICES cat 3.2, rule used, for datalimited stocks for areas A, E, F og G. Index A / Index B * $Advice_{-1}$

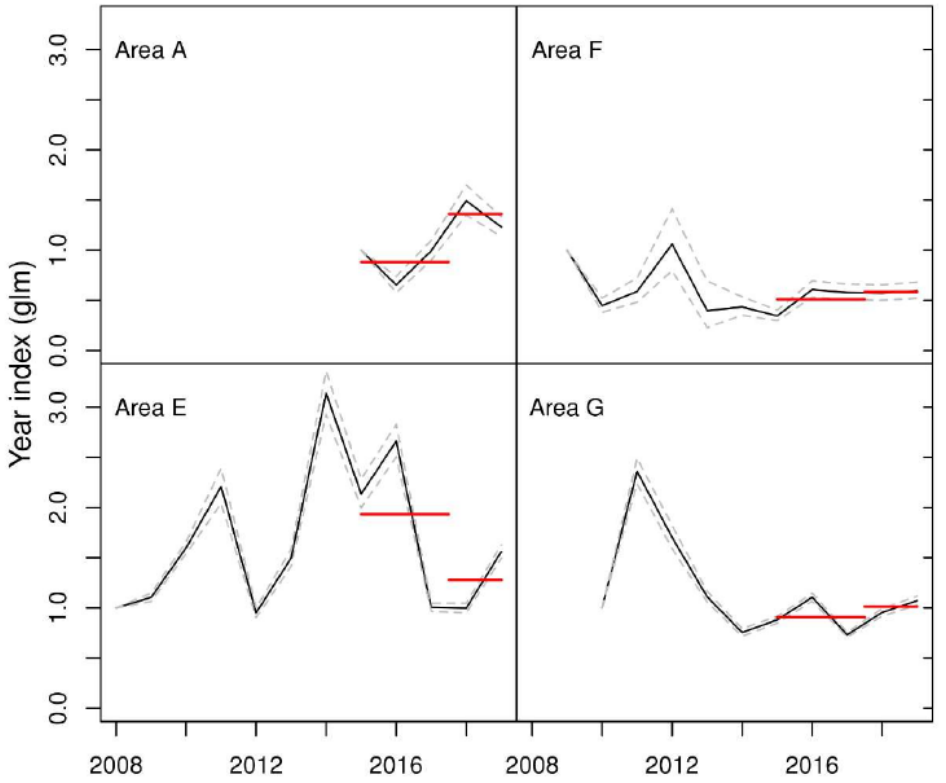
Index A = standardized CPUE of the last two years
Index B = standardized CPUE of the 3 previous years prior A

Same advice for „new“ areas B, C, D og H

C. frondosa - CPUE and standardized index







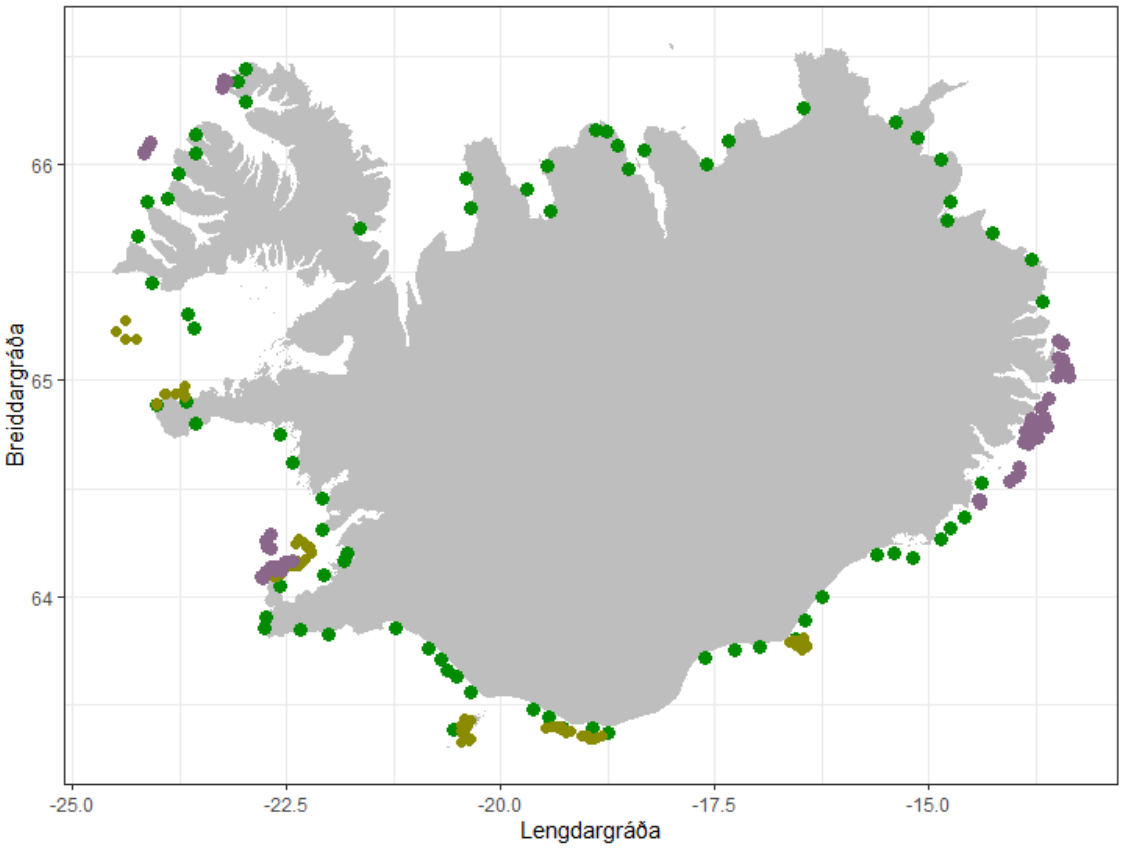
Sea cucumber. Year index in glm model in areas A, F, E and G. The horizontal red lines are the average of the latest 1:2 and 3:5 years used as an index.

C. frondosa - Recommendation and landings by area

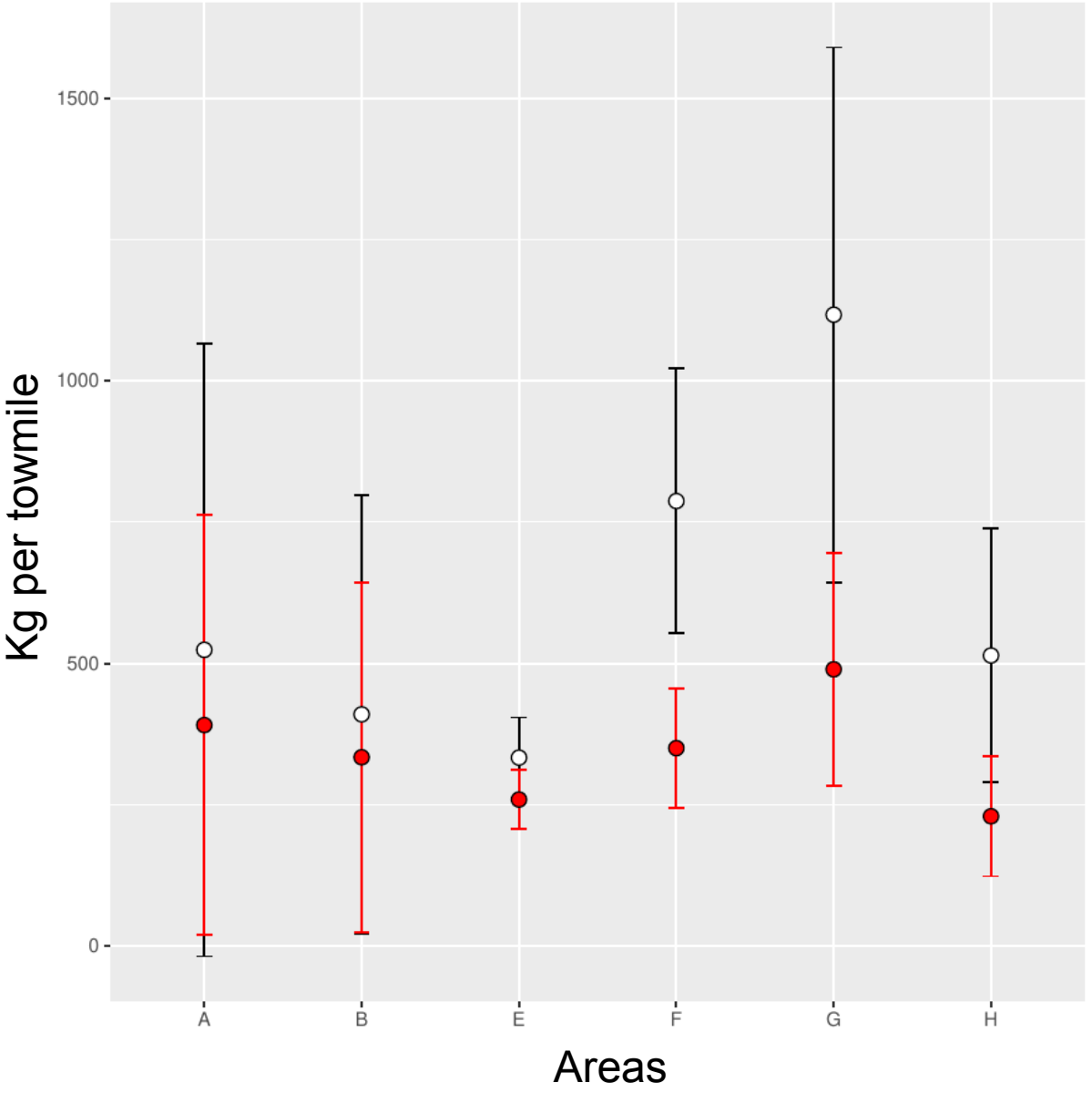
	Area A (Aðalvík)			Area B (Westfjord; middle)			Area C (Westfjord; south)			Area D (Breiðafjörður; outer)			Area E (Faxaflói)		
Quota year	R.TAC	TAC	Landings	R.TAC	TAC	Landings	R.TAC	TAC	Landings	R.TAC	TAC	Landings	R.TAC	TAC	Landings
2007/2008			2			107						8			478
2008/2009	350		469			124						0	950	*	477
2009/2010	350		173			3						0	950	*	1066
2010/2011	310	*	85			0,5			27			0	1500	*	900
2011/2012	310	*	0			0			0			0	1500	*	1015
2012/2013	310	*	0			0			0			0	1500	*	349
2013/2014	170	*	0			0			0			0	1030	*	814
2014/2015	170	*	160			0			0			0	1000	*	446
2015/2016	170	*	169			9			15			0	1000	*	981
2016/2017	190	*	244			0			0			0	644	*	684
2017/2018	102	*	248			523			1			198	644	*	700
2018/2019	102	*	321			860			23			207	644	*	833
2019/2020	102	*	276[c]	131	*	324[c]	50		26	56		52[c]	515	*	539[c]
2020/2021	122			131			50			56			330		

	Area F+G (East)			Area F (East; north)			Area G (East; middle)			Area H (East; south)		
2007/2008			0									
2008/2009			0									
2009/2010			572			414			159			
2010/2011			1880			229			1651			
2011/2012			791			39			752			
2012/2013			807			19			787			
2013/2014	1400	*	72		*	7		*	65			
2014/2015	1400	*	600		*	4		*	596			
2015/2016	1400	*	1740		*	115		*	1625			
2016/2017	623	*	1738		*	415		*	1323			0,2
2017/2018			1482	245	*	481	740	*	1001			1710
2018/2019				245	*	345	740	*	781			1089
2019/2020				245	*	240[c]	740	*	1091[c]	406	*	392[c]
2020/2021				280			828			406		

C. frondosa - Enlargened beam trawl survey, in September 2020 (Pink dots – *C. frondosa*)



C. frondosa - Survey indices Whole and „quick-drained“ index



C. frondosa - Summary

The world history of Sea cucumber fisheres is of a sharp increase and fall in most regions

CPUE in Iceland has decreased on all areas that have been fished for some time. New areas show rather quickly sign of utilization

Uncertainty is about biological parameters in Icelandic waters and the environmental impact of the fisheries

Its a common goal of the all bodies, government and industry to control the fisheries in a sustainable manner and further without to much pressure on the ecosystem