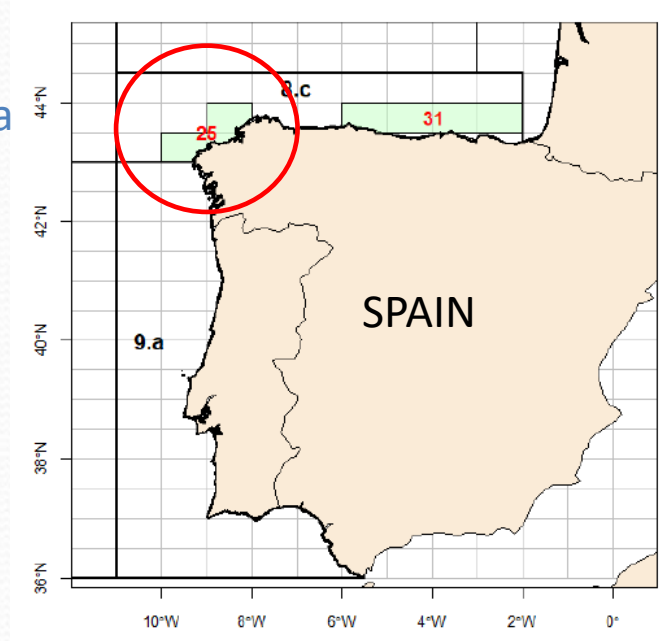


IMPRESS: Data-limited cases studies

# Use of SPICT in the stock of *Nephrops* of North Galicia (ICES Functional Unit no 25)

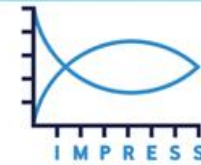
FU 25 North Galicia





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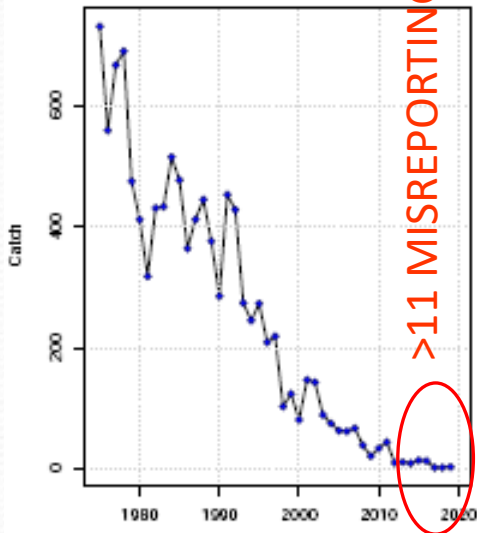
IMPROVING SCIENTIFIC ADVICE TO FISHERY MANAGEMENT FOR RESOURCES OF INTEREST FOR SPAIN IN ATLANTIC WATERS

FU 25 Noroeste Galicia

# Series

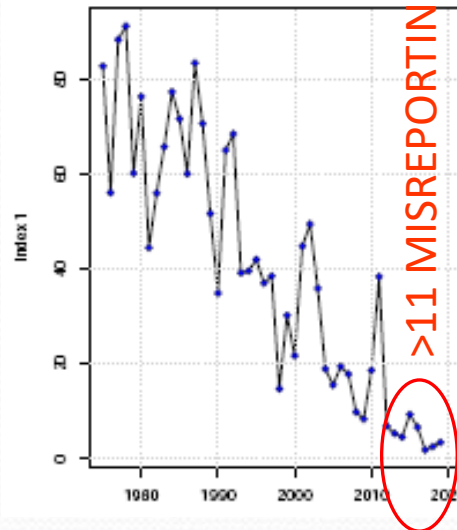
TOO SHORT

Nobs C: 45



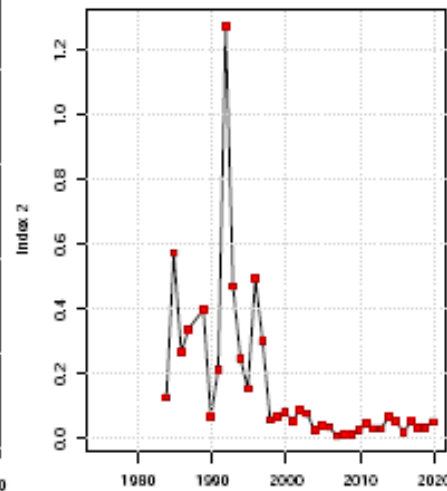
**CATCH**  
1975-2019

Nobs I: 45



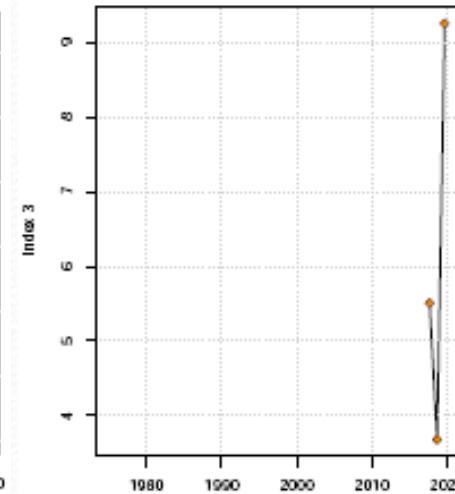
**CPUE**  
1975-2019

Nobs I: 36



**DEMERSALES**  
1983-2019

Nobs I: 3



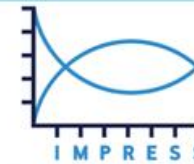
**SENTINEL**  
2017-2019

# INDICES



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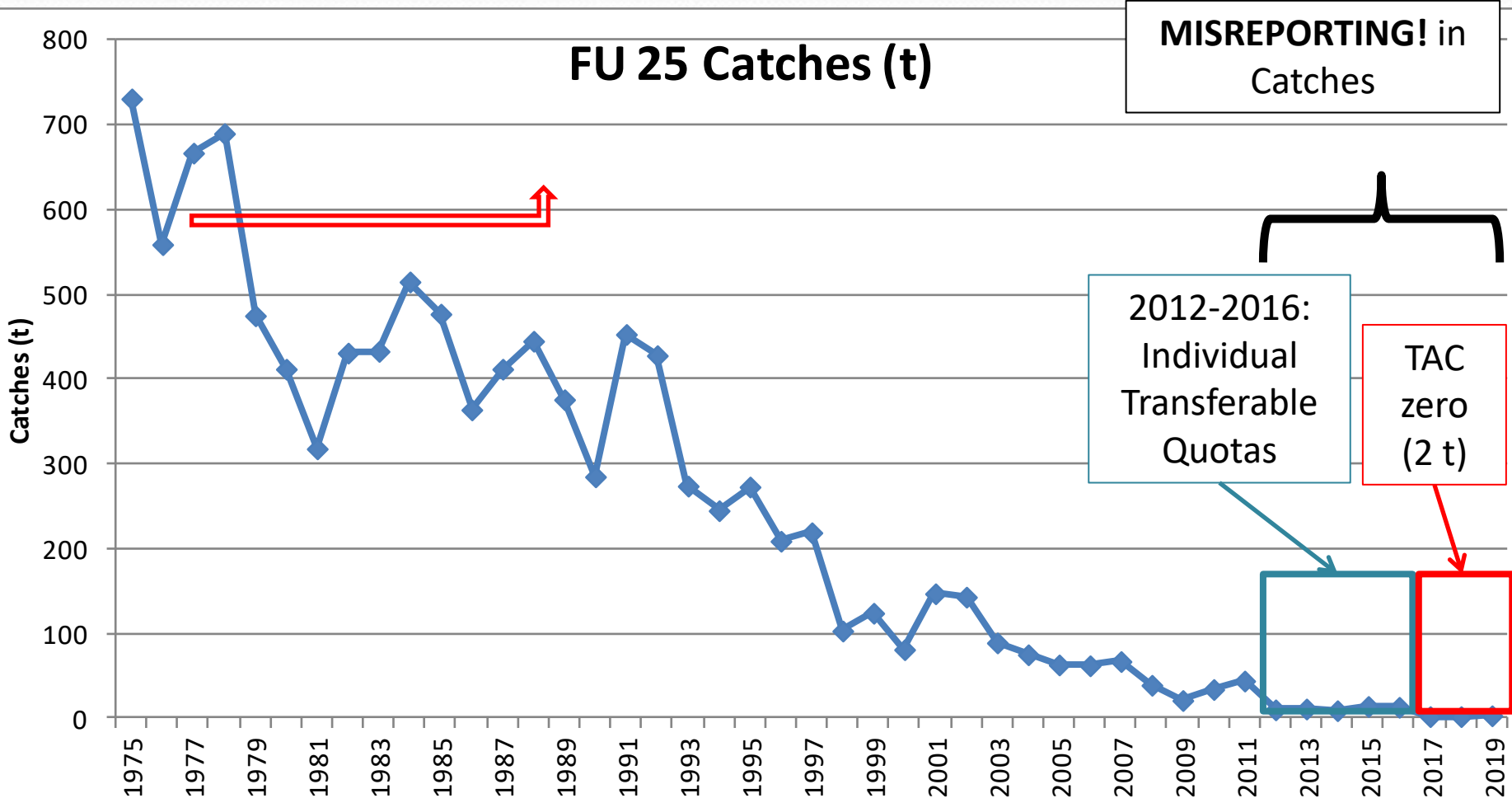
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IMPROVING SCIENTIFIC ADVICE TO FISHERY MANAGEMENT FOR RESOURCES OF INTEREST FOR SPAIN IN ATLANTIC WATERS

FU 25 North Galicia

# Annual Catch Series



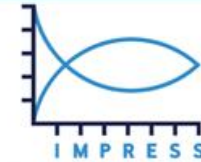


# Data

- Annual Commercial catches

- Abundance index: Demersales (1983-2019)

Stock	Year	C_t	DEM_kg/lanc
FU25	1983	433	0.127
FU25	1984	515	0.574
FU25	1985	477	0.266
FU25	1986	364	0.339
FU25	1987	412	0.369
FU25	1988	445	0.399
FU25	1989	376	0.066
FU25	1990	285	0.215
FU25	1991	453	1.275
FU25	1992	428	0.471
FU25	1993	274	0.247
FU25	1994	245	0.154
FU25	1995	273	0.496
FU25	1996	209	0.3
FU25	1997	219	0.058
FU25	1998	103	0.069
FU25	1999	124	0.082
FU25	2000	81	0.055
FU25	2001	147	0.087
FU25	2002	143	0.078
FU25	2003	89	0.025
FU25	2004	75	0.041
FU25	2005	63	0.036
FU25	2006	62	0.009
FU25	2007	67	0.011
FU25	2008	39	0.012
FU25	2009	21	0.025
FU25	2010	34	0.047
FU25	2011	44	0.03
FU25	2012	10	0.03
FU25	2013	11	0.067
FU25	2014	9	0.055
FU25	2015	14	0.02
FU25	2016	13	0.052
FU25	2017	2	0.032
FU25	2018	2	0.035
FU25	2019	3	0.051



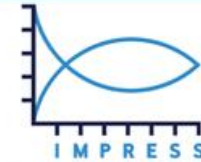
# Options

Projections?:

Catch	Indices	B	BMSY	B/B	F
1975-2011	CPUE $\leq$ 11+DEM $\leq$ 19+SEN $\leq$ 19	$\approx$ 14 500 t (19)	$\approx$ 20 300 t	0.7 (19)	0.003 (19)

INDEX : DEMERSALES 1983-2019

Catch	B <sub>MSY</sub>	F <sub>MSY</sub>	MSY	B 2019.81	F 2019.81	B/B <sub>MSY</sub>	F/F <sub>MSY</sub>	Catch	E (B <sub>inf</sub> )
83-19	806 t	0.07	62 t	460 t	0.007	0.57	0.09		
83-16	2529 t	0.02	67 t	411 t	0.04	0.16	1.6	17 t	1755
83-11	10425 t	0.06	672 t	141 t	0.5	0.01	7.6	67 t	199



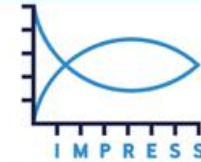
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INDEX : DEMERSALES 1983-2019

Catch	B <sub>MSY</sub>	F <sub>MSY</sub>	MSY	B 2019.81	F 2019.81	B/B <sub>MSY</sub>	F/F <sub>MSY</sub>	Catch	E (B <sub>inf</sub> )
83-19	806 t	0.07	62 t	460 t	0.007	0.57	0.09		
83-16	2529 t	0.02	67 t	411 t	0.04	0.16	1.6	17 t	1755
83-11	10425 t	0.06	672 t	141 t	0.5	0.01	7.6	67 t	199



# Options

Projections?:

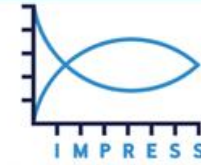
Catch	Indices	B	BMSY	B/B	F
1975-2011	CPUE $\leq$ 11+DEM $\leq$ 19+SEN $\leq$ 19	$\approx$ 14 500 t (19)	$\approx$ 20 300 t	0.7 (19)	0.003 (19)

Catch	Indices	B	BMSY	B/B	F
1975-2019	CPUE $\leq$ 16	$\approx$ 2 000 t (19)	$\approx$ 18 000 t	0.11 (19)	0.001 (19)
	CPUE $\leq$ 16+DEM $\leq$ 19	$\approx$ 5 300 t (19)	$\approx$ 20 200 t	0.26 (19)	0.001 (19)
1975-2016	CPUE $\leq$ 16	$\approx$ 8 000 t (16)	$\approx$ 22 000 t	0.36 (16)	0.002 (16)
	CPUE $\leq$ 16+DEM $\leq$ 16	$\approx$ 8 500 t (16)	$\approx$ 21 500 t	0.39 (16)	0.002 (16)
1975-2011	CPUE $\leq$ 11	$\approx$ 12 461 t (11)	$\approx$ 12 314 t	1.0 (11)	0.004 (11)
	CPUE $\leq$ 11+DEM $\leq$ 11	$\approx$ 12 000 t (11)	$\approx$ 14 600 t	0.82 (11)	0.004 (11)



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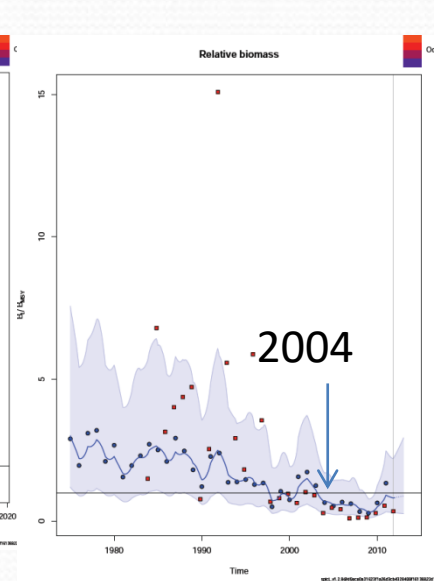
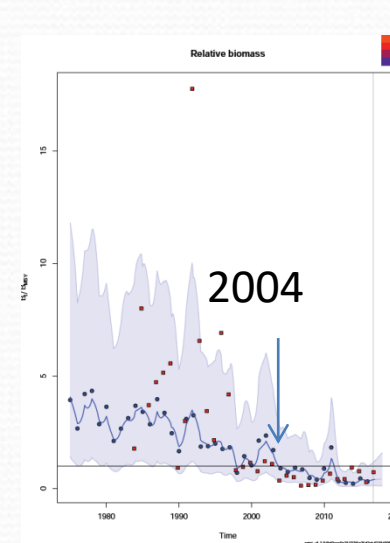
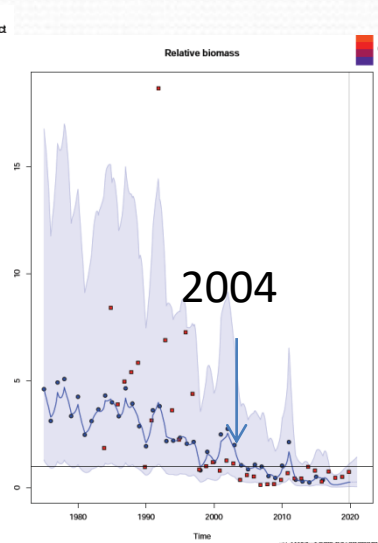
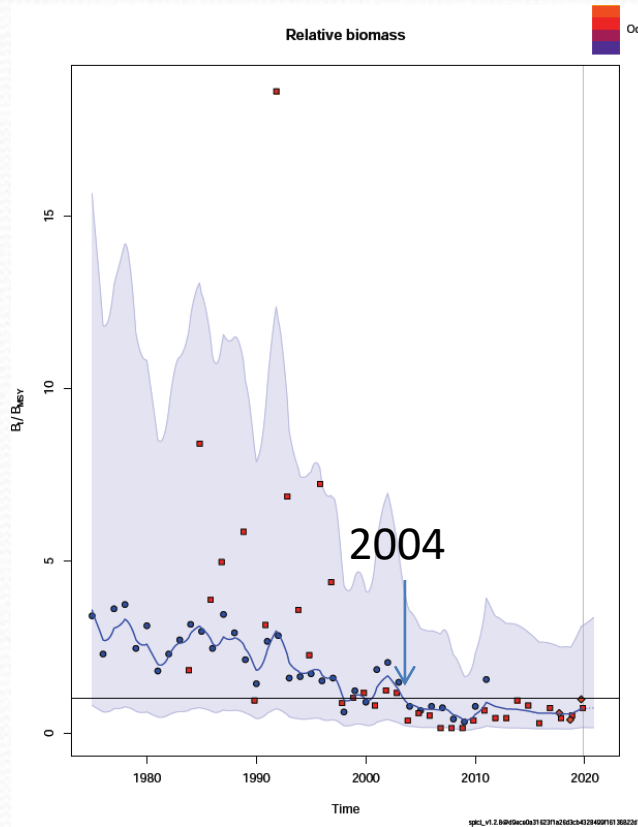
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C 1975-2011  
CPUE 11  
DEM 19  
SEN 19  
B19/BMSY=0.7

C 1975-2019  
CPUE 16  
DEM 19  
B19/Bmsy=0.3

C 1975-2016  
CPUE 16  
DEM 16  
B16/BMSY=0.4

C 1975-2011  
CPUE 11  
DEM 11  
B11/BMSY=0.8

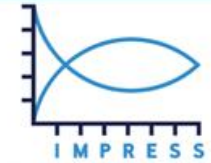






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# Doubts

## 2.- Technical aspects

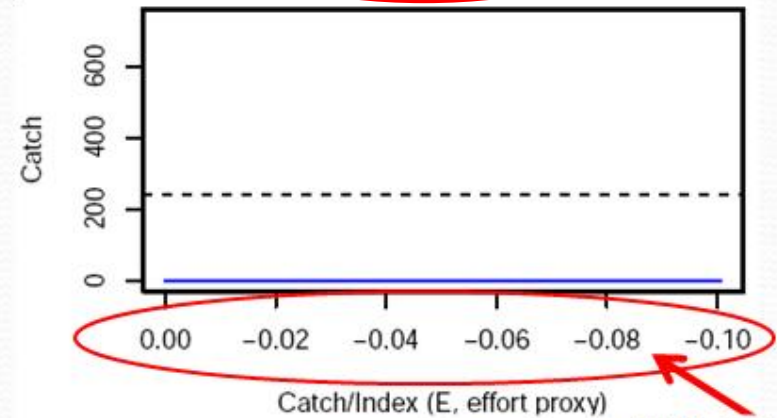
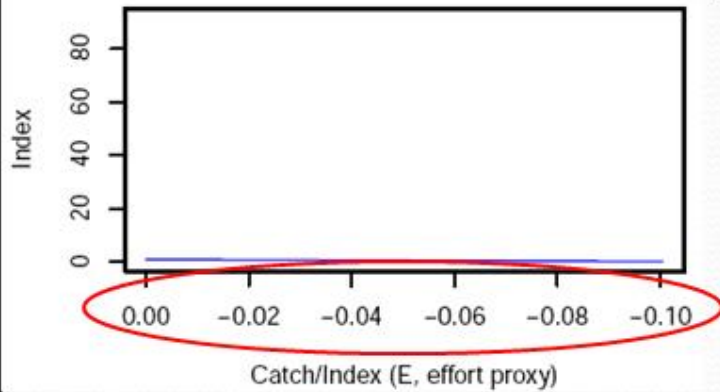


# No $F_{MSY}$ and MSY

R-squared: 0.537

(Converge all but...:)

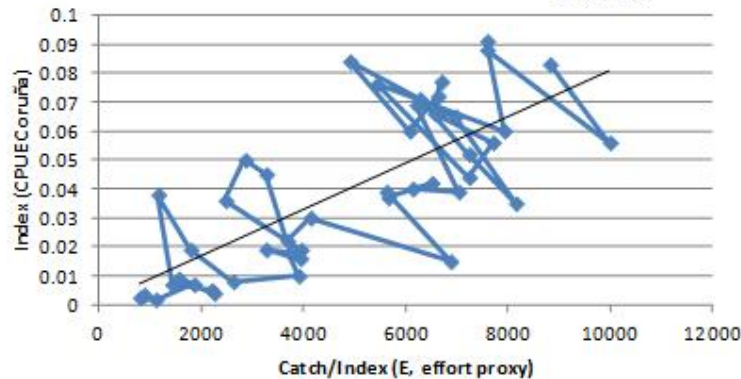
Emsy guess: -0.05



75-2019

$$y = 8E-06x + 0.0007$$

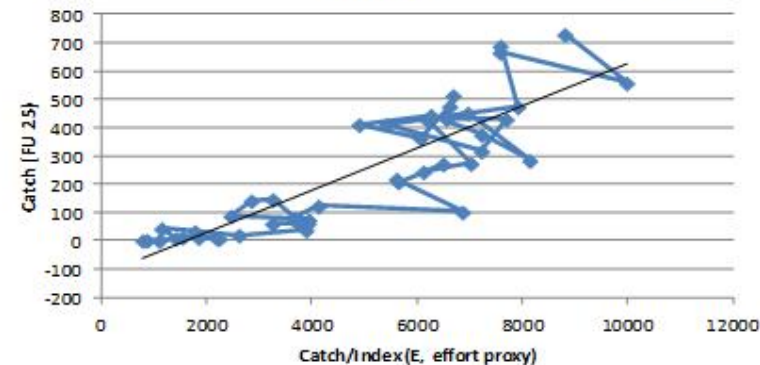
$$R^2 = 0.5394$$



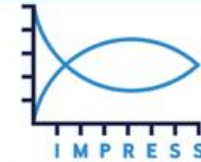
75-2019

$$y = 0.0748x - 122.34$$

$$R^2 = 0.7441$$



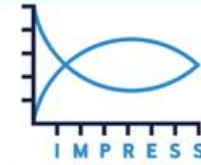
- The effort in the projections is higher the present effort
- In the last years catch, effort and CPUE have decreased
- Nephrops has disappeared from some areas of the stock



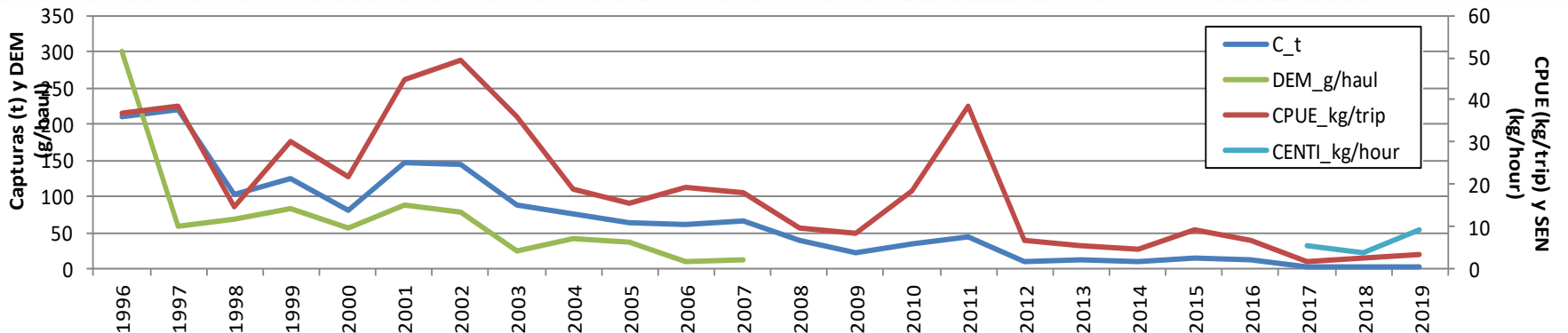
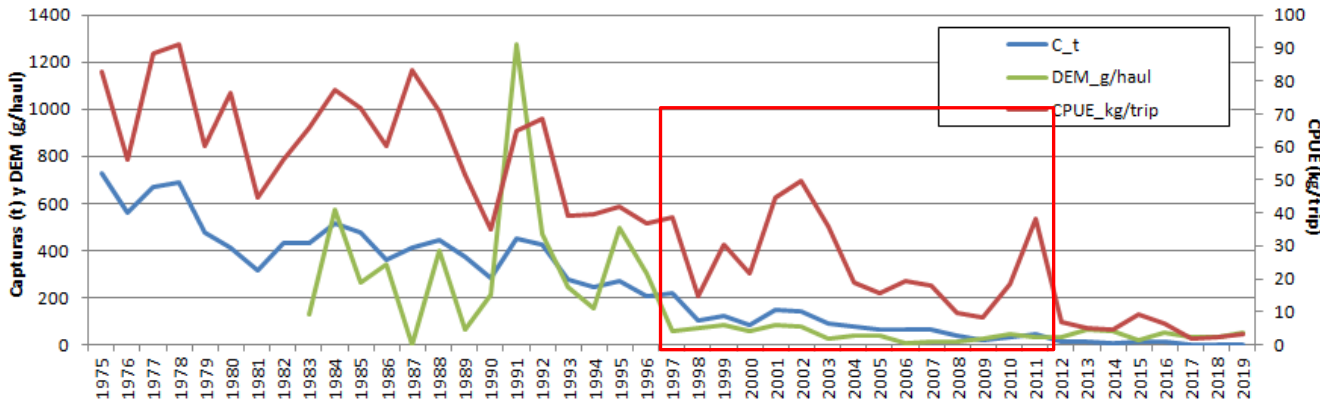
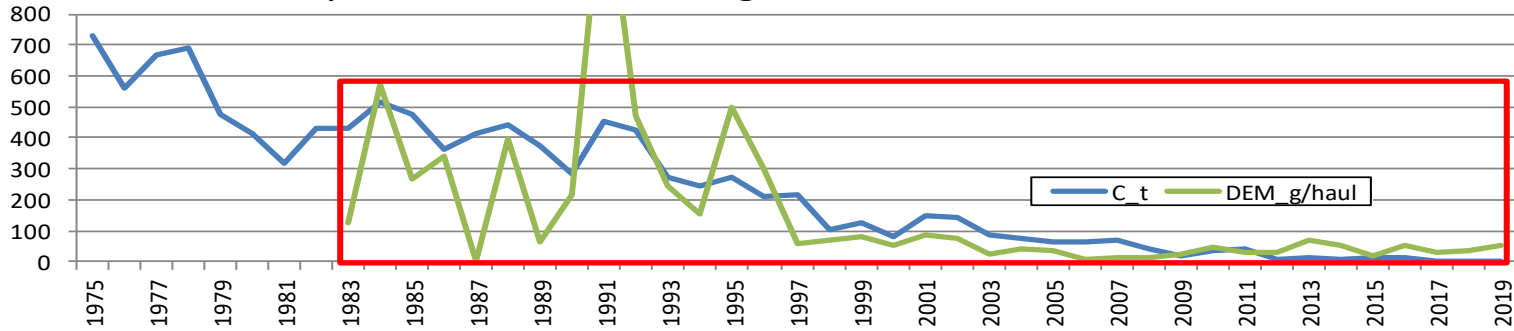
# Cases with $F_{MSY}$ and MSY

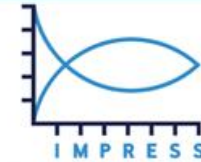
The only 3 cases with convergence,  $F_{MSY}$  and MSY:

Series	Biomass (t)	$B_{MSY}$	Biomass / $B_{MSY}$	F	$F_{MSY}$	MSY
Catch + DEM (1983-2019)	458 (2019)	906	0.51 (2019)	0.005 (2019)	0.063	59
Catch + CPUE+DEM (97-11)	146 (2011)	148	0.99 (2011)	0.29 (2011)	0.6	89
Catch + CPUE (96-11) +DEM(96-19)+SEN(17-19)	373 (2019)	193	1.93 (2019)	0.152 (2019)	0.45	87



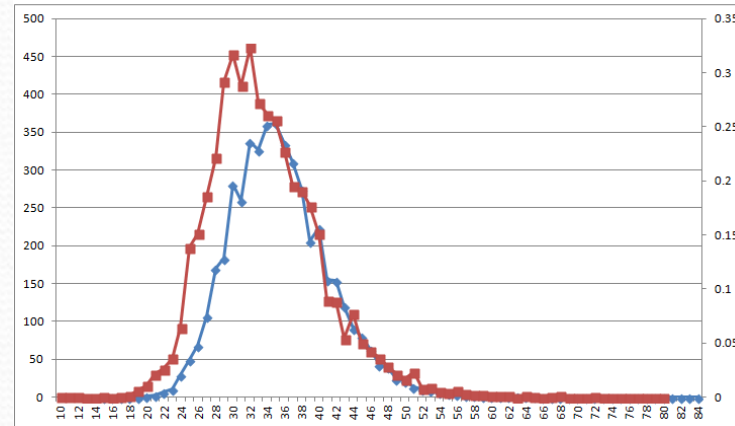
### The only 3 cases with convergence, FMSY and MSY:





# Doubts

- How can we give less weight to the catch series since 2011?
- Is necessary to remove the Small individuals from the Survey index (red) (blue: fleet)?



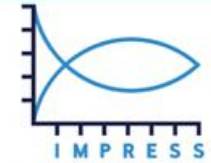
# Posibilities

- It is possible to have the Catch and CPUE series by quarter or month.



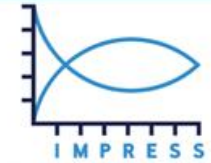
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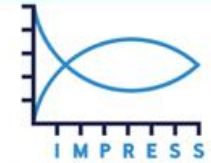
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# Thank you



# Doubts

- 1.- Time window
- 2.- Technical aspects



# Doubts

## 1.- Time window