Lot1 - Collaboration between the scientific community and the fishing sector to minimise discards in the Baltic cod fisheries

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Desk-top study

- Data sources
  - Baltic International Trawl Survey (BITS)
  - Sea sampling (SWE-DCF,NPZDR, DNK-MON, DEU-DCF)
  - Vessel Monitoring System (VMS) / Logbook / Landings
  - Gear selectivity
  - (Questionnaire)
- Temporal and spatial models
  - Season, Latitude, Longitude and depth
  - Persistence analysis
  - Overlay analysis (juvenile cod and effort)

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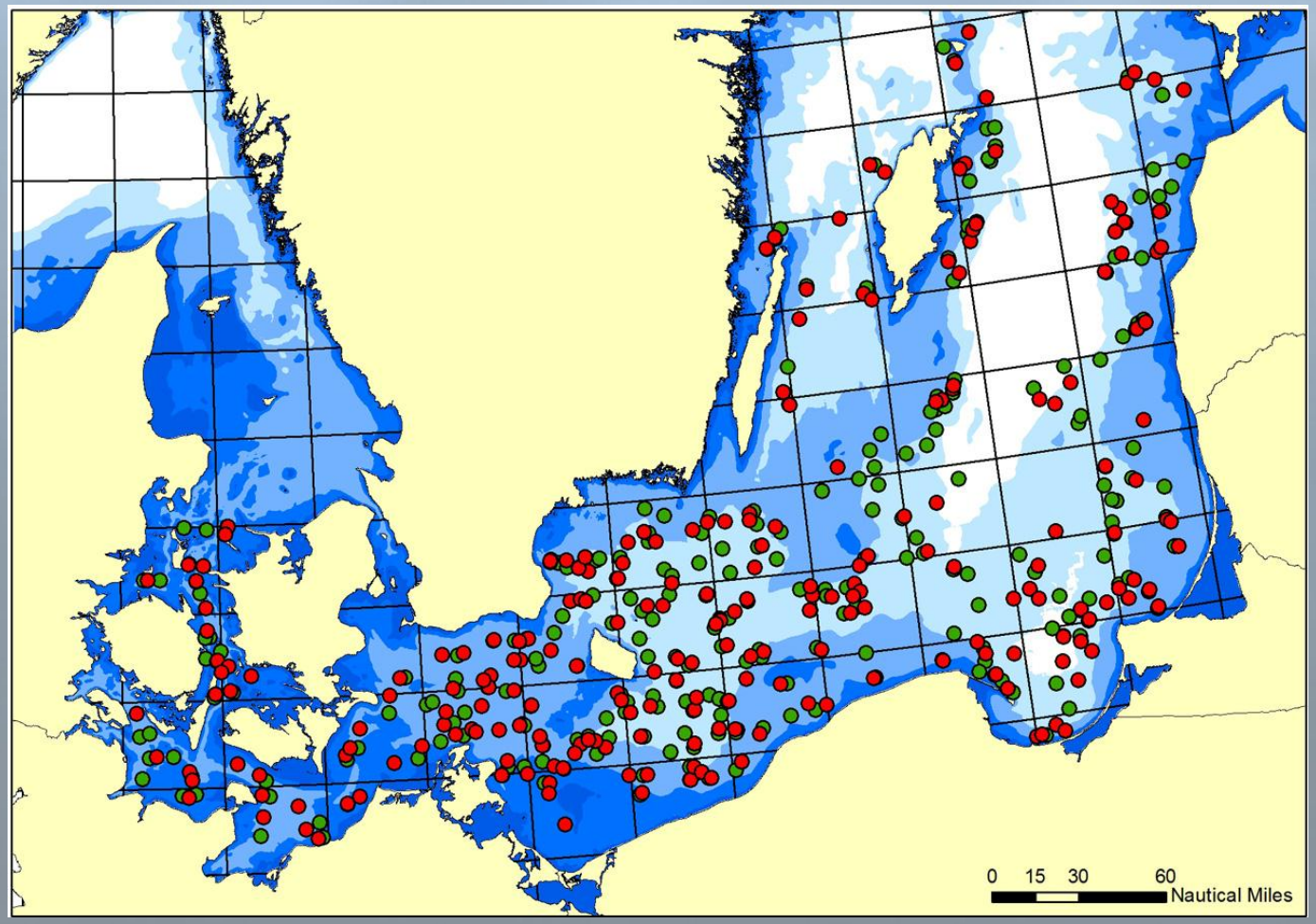
Baltic International Trawl survey (BITS)

about 550 hauls per year (feb-mar and oct-dec)
30 min, 3 knot, 20 mm diamond mesh



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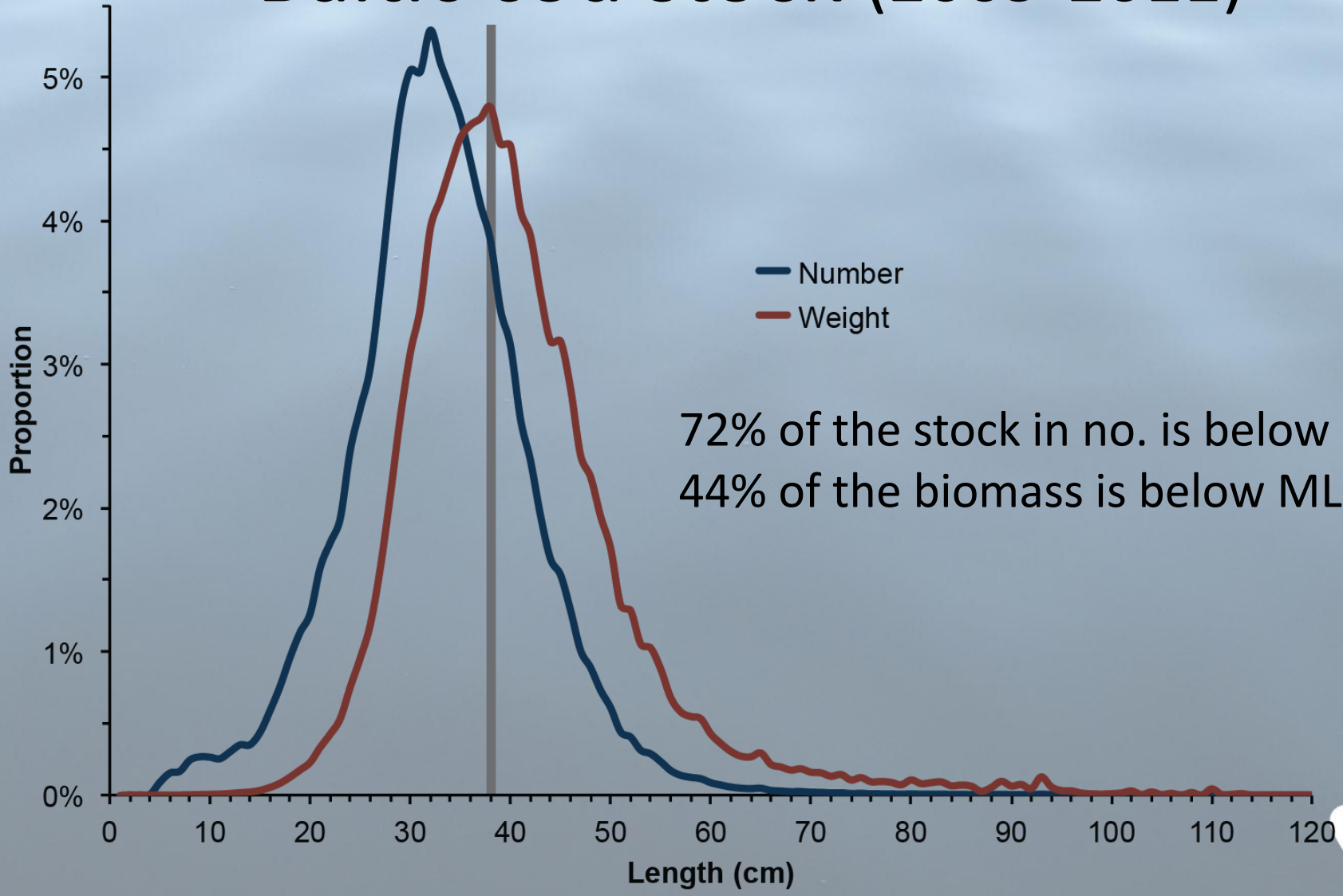
Baltic cod stock (2009-2011)



72% of the stock in no. is below MLS
44% of the biomass is below MLS

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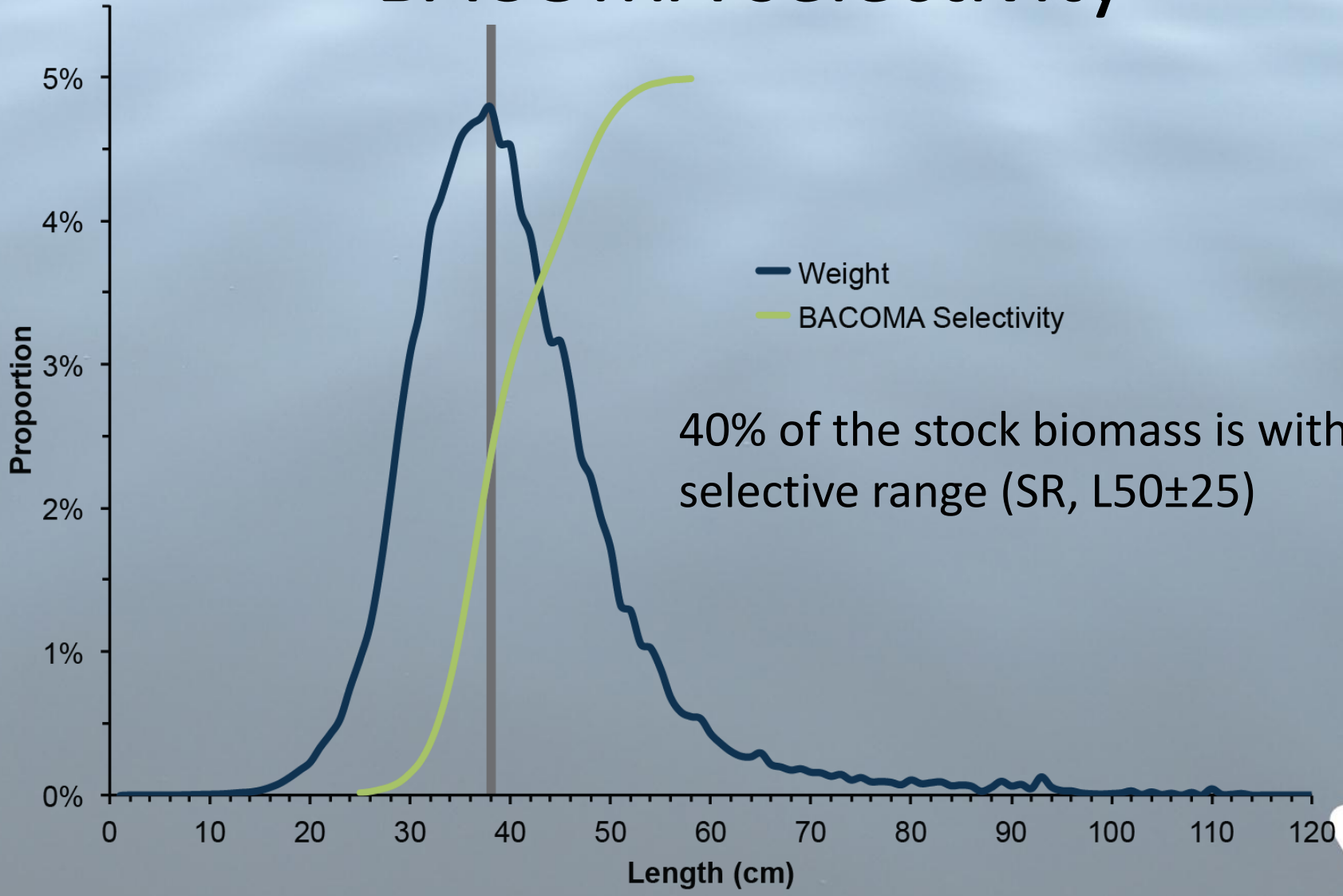
BACOMA selectivity



40% of the stock biomass is within selective range (SR, L50±25)

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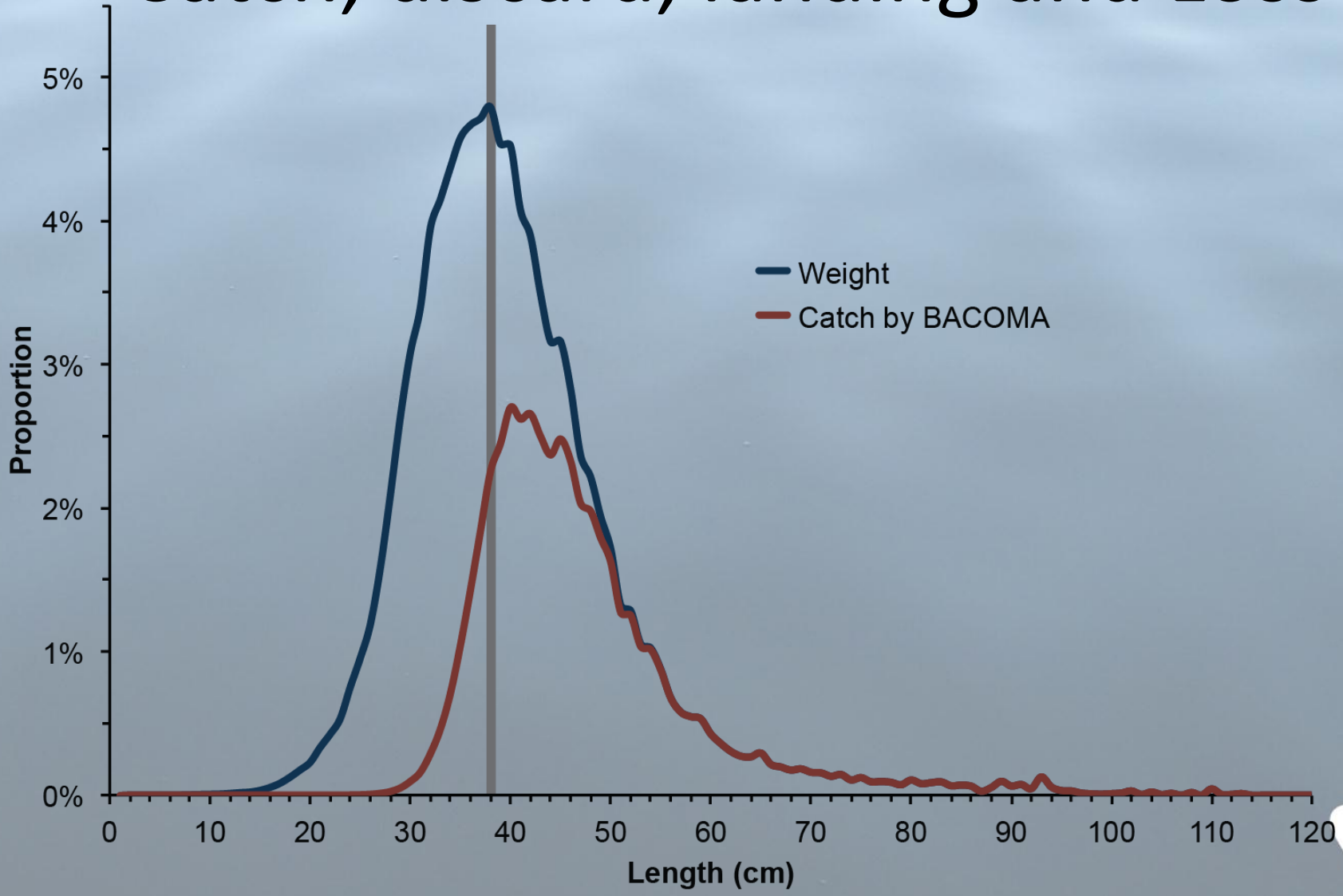
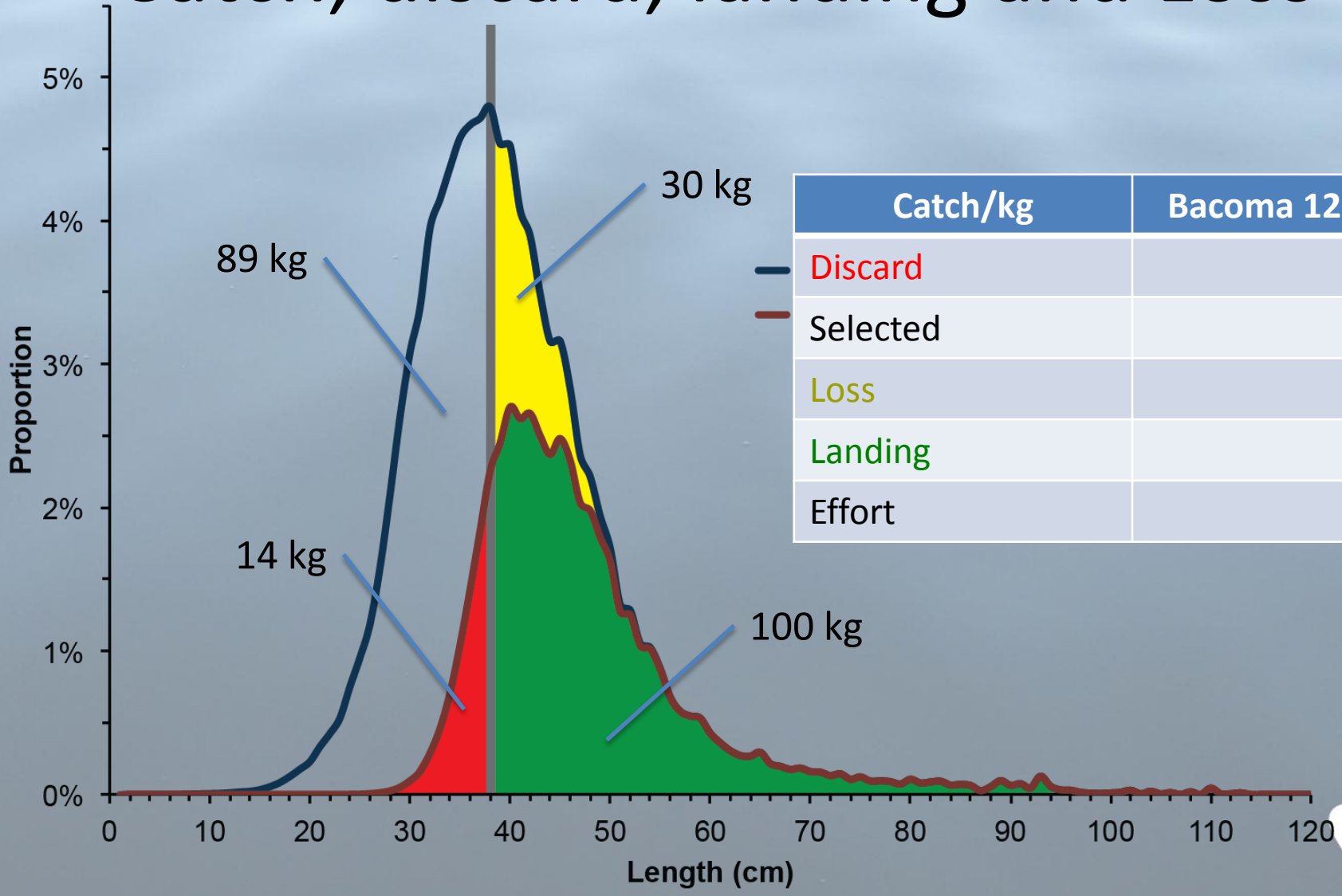
Catch, discard, landing and Loss I

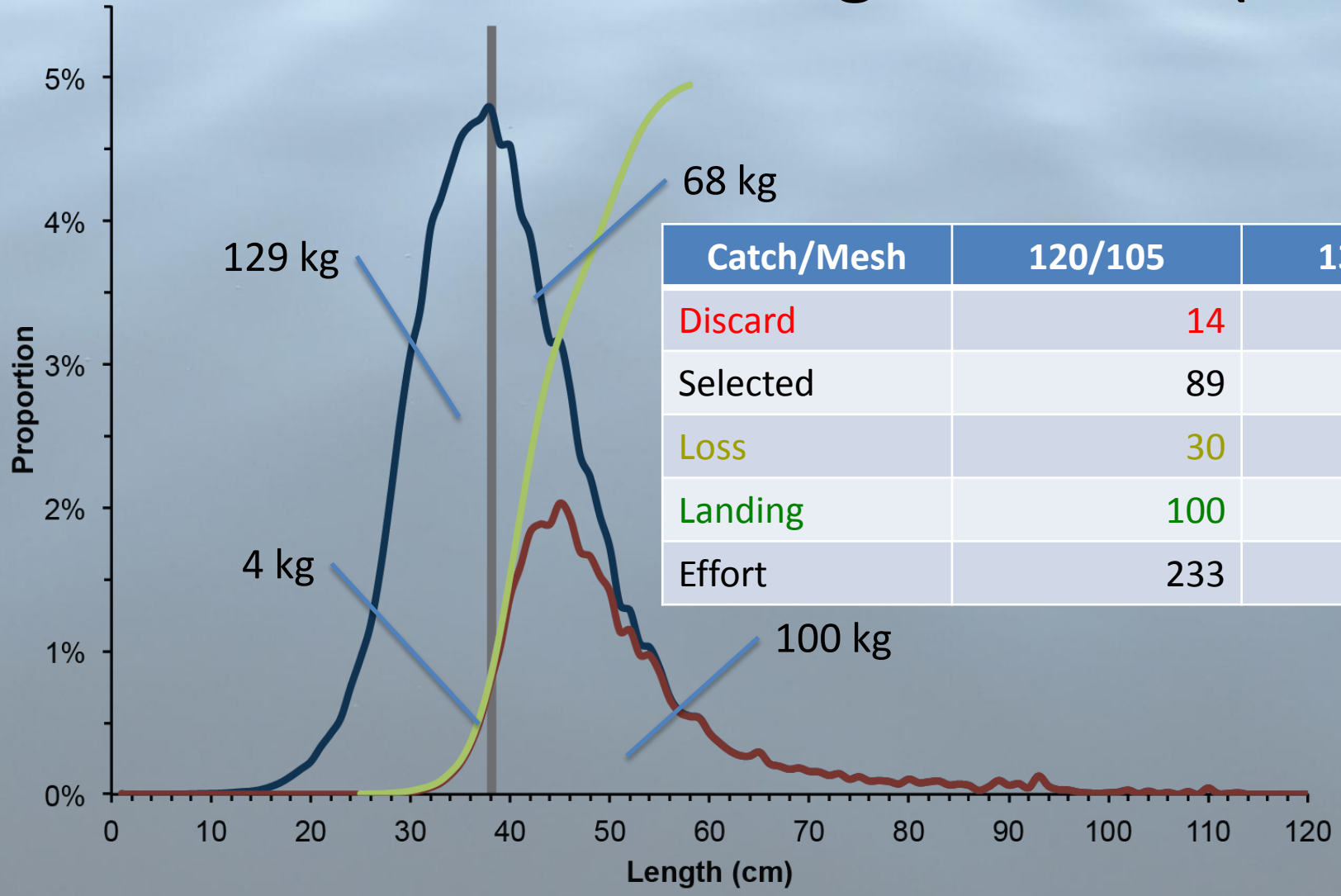


Catch, discard, landing and Loss II



Catch/kg	Bacoma 120/105
Discard	14
Selected	89
Loss	30
Landing	100
Effort	233

Catch, discard, landing and Loss (Mesh)



Catch/Mesh	120/105	135/120
Discard	14	4
Selected	89	129
Loss	30	68
Landing	100	100
Effort	233	301

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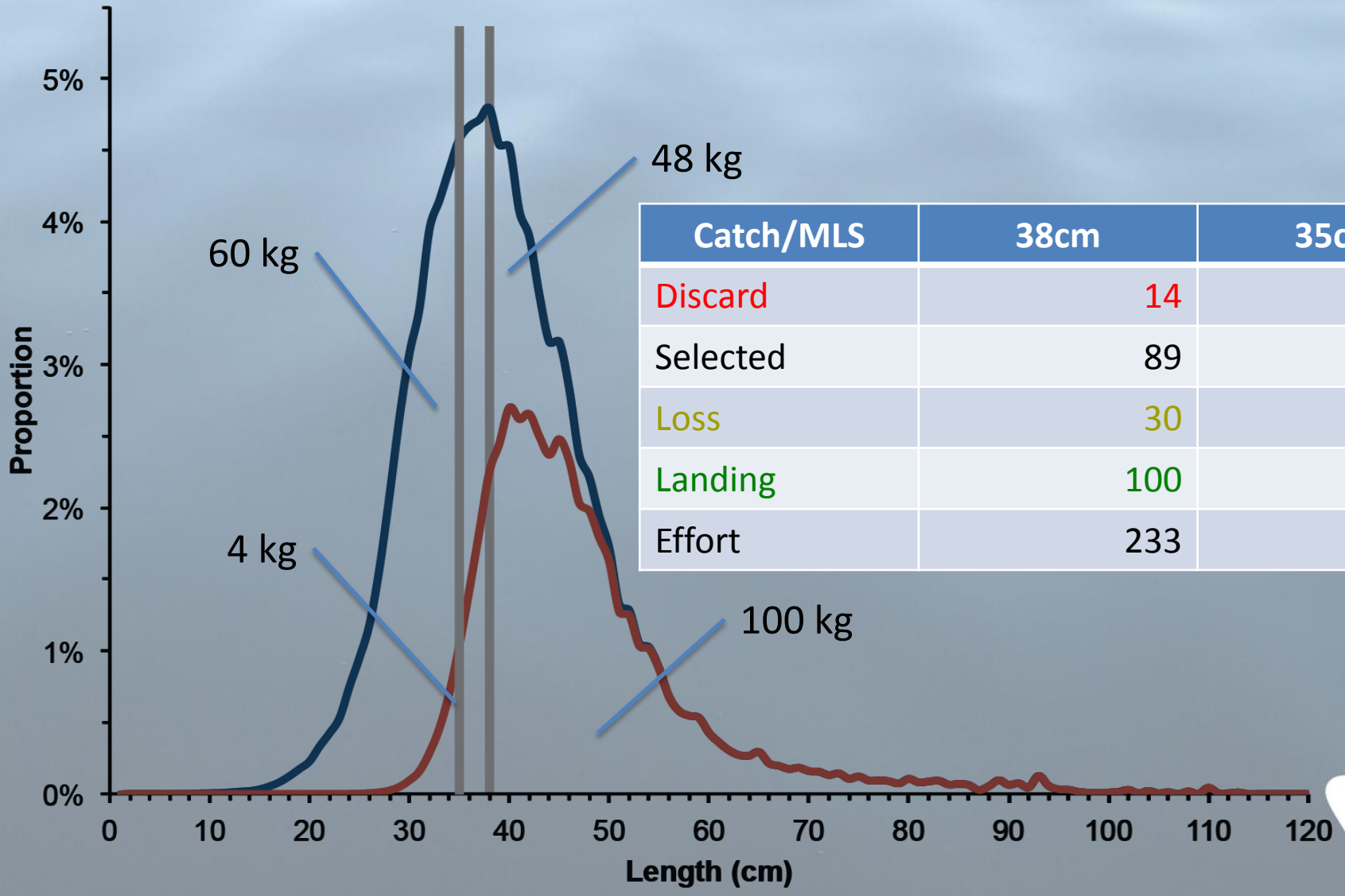
Catch, discard, landing and Loss (MLS)



Catch/MLS	38cm	35cm
Discard	14	4
Selected	89	60
Loss	30	48
Landing	100	100
Effort	233	212

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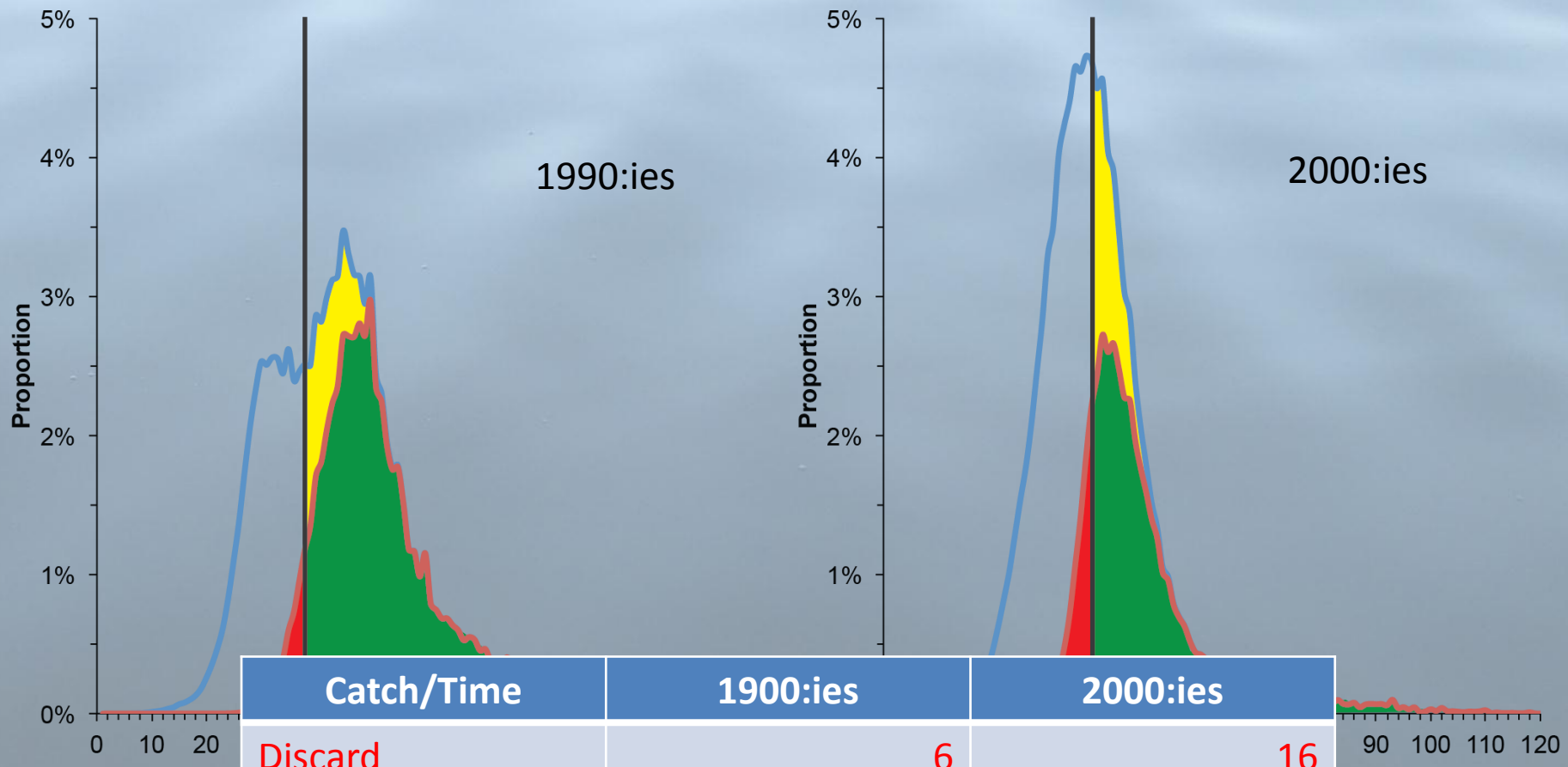
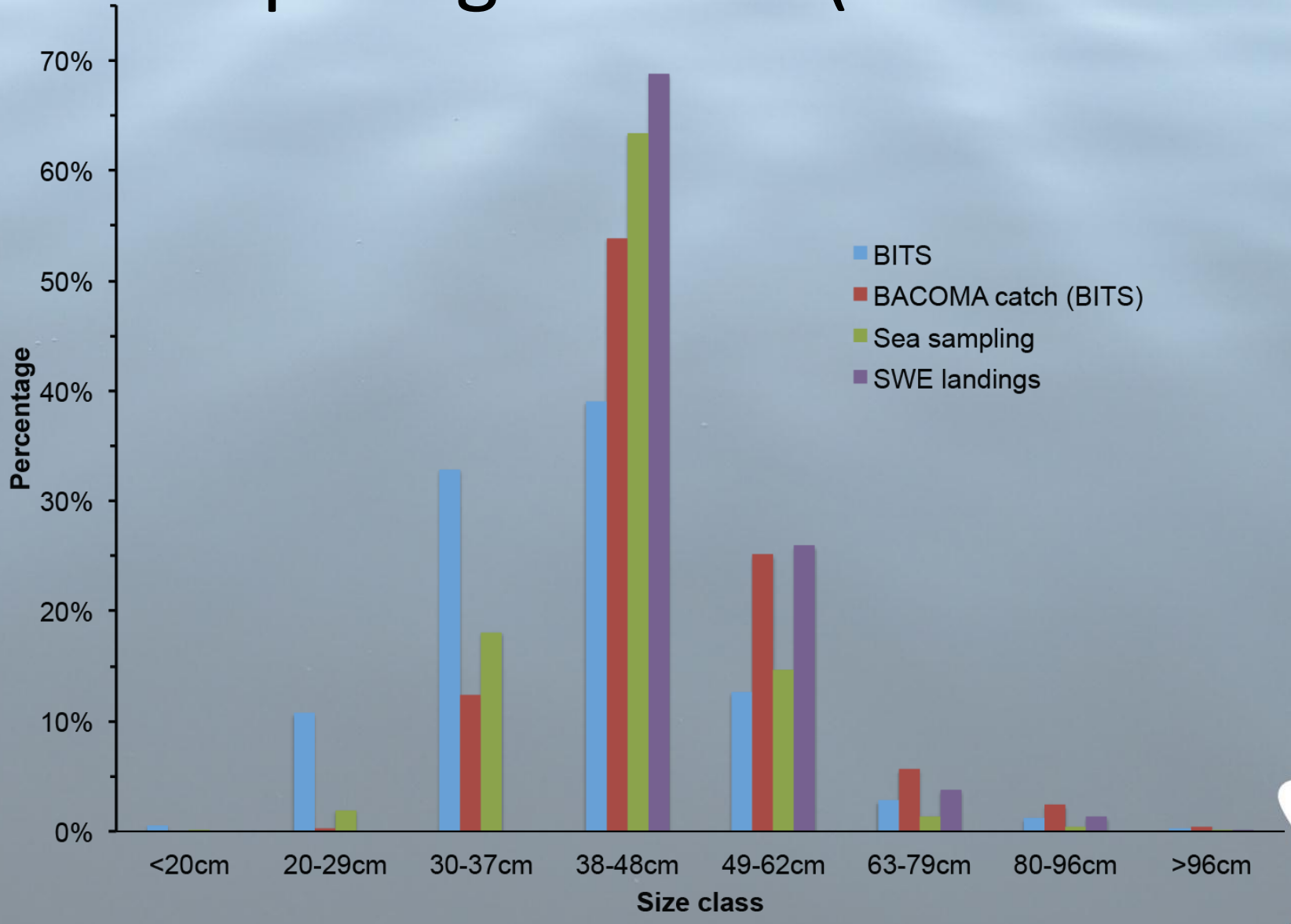
Catch, discard, landing and Loss (Population structure)



Catch/Time	1900:ies	2000:ies
Discard	6	16
Selected	49	113
Loss	17	33
Landing	100	100
Effort	172	262

Comparing catches (2009-2011*)



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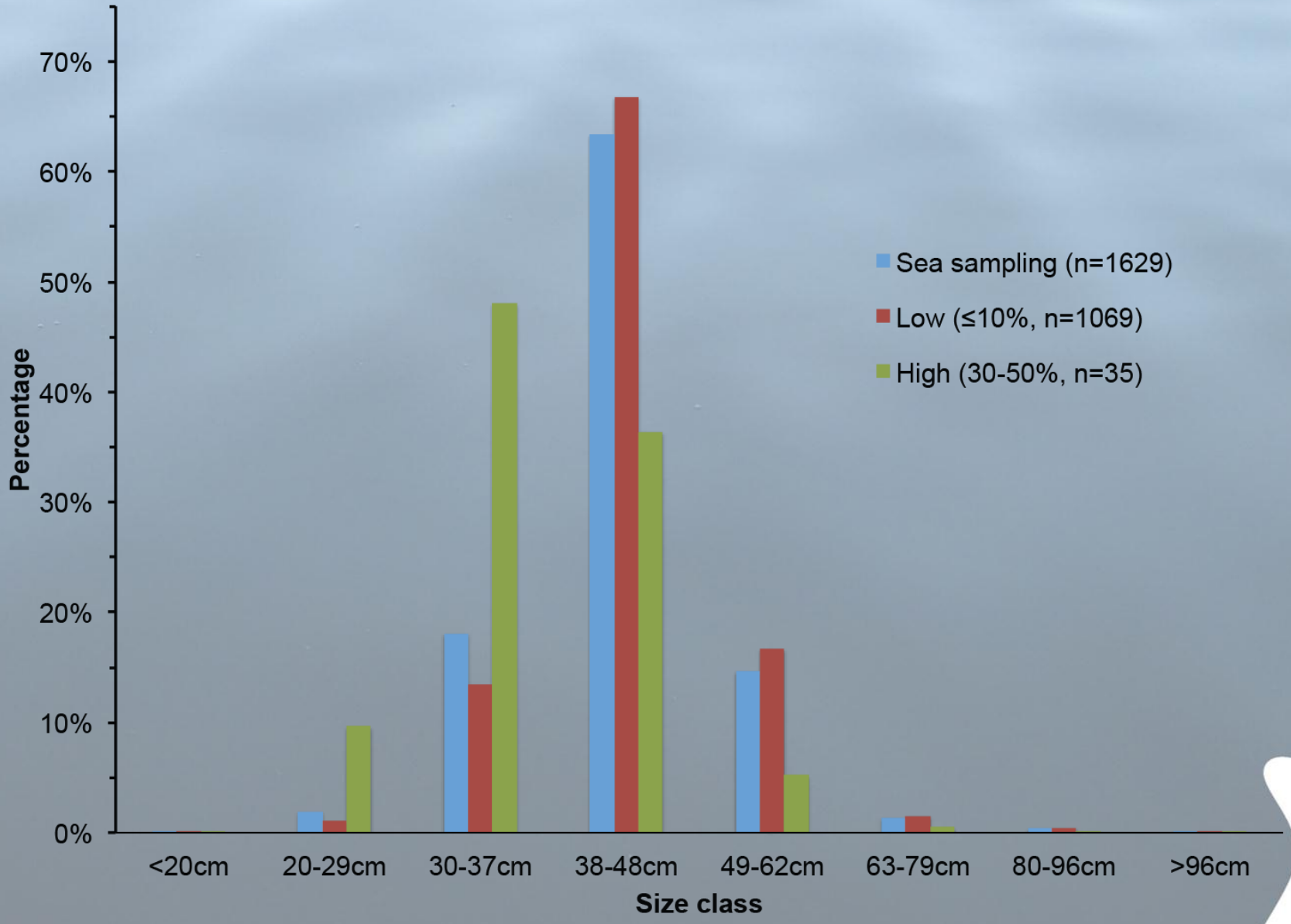
Sea sampling (catches >300kg cod)



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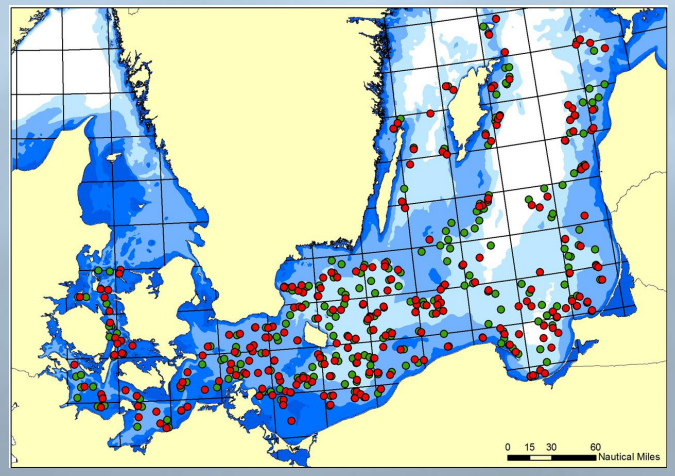
Spatial and temporal model



Modeled area (black)

⇩

density of cod (30-37 cm)

⇩

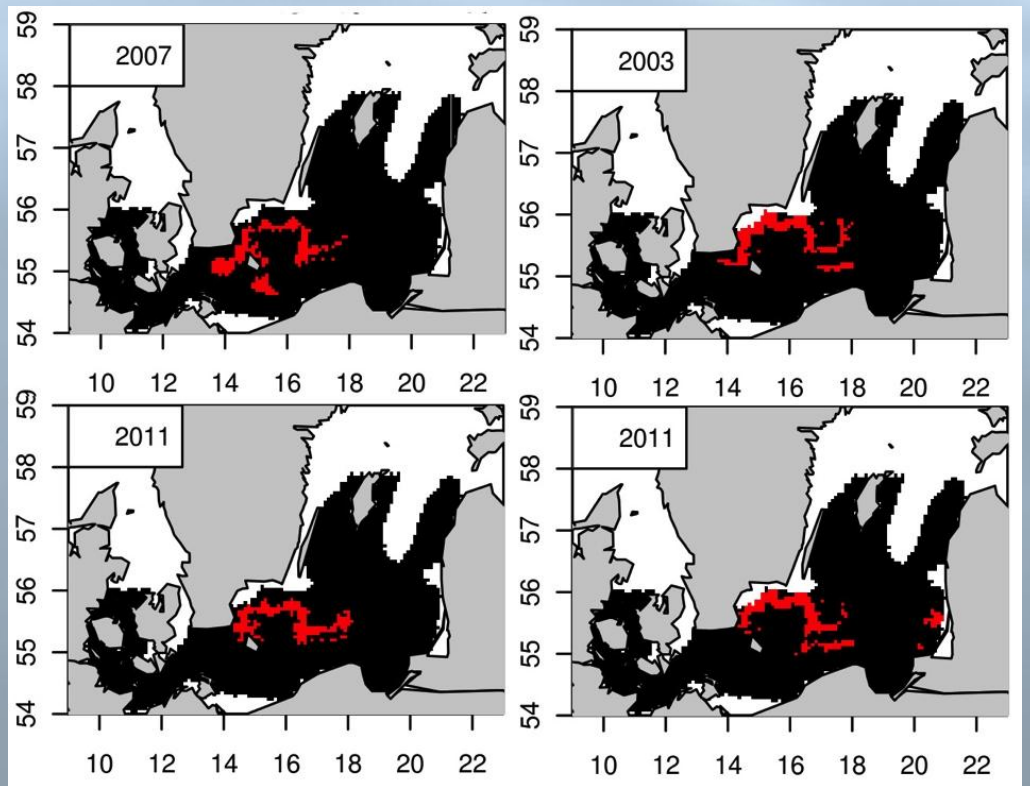
Hotspot (red) saving 30% of juveniles

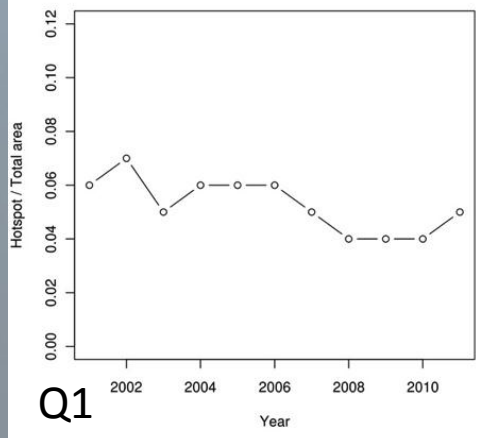
⇩

Covering ≈5% of the modeled area

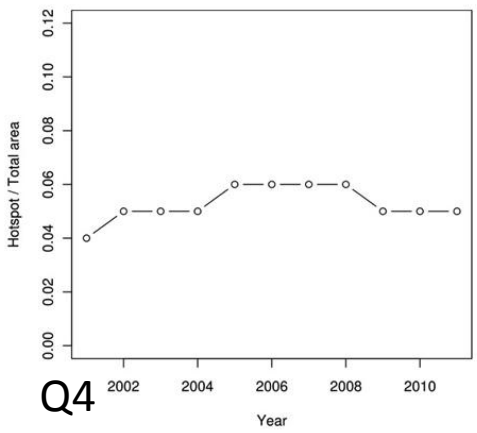
⇩

Hotspot ≈ 6 times higher density of small cod





Q1



Q4

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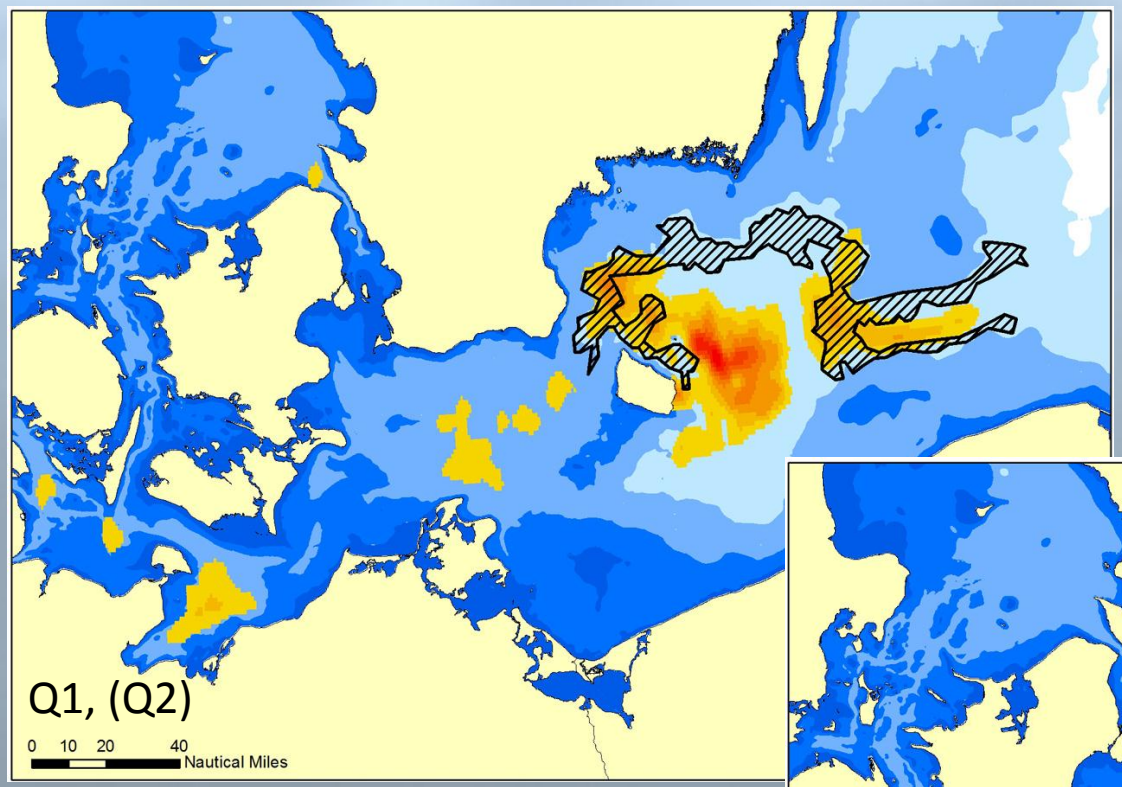
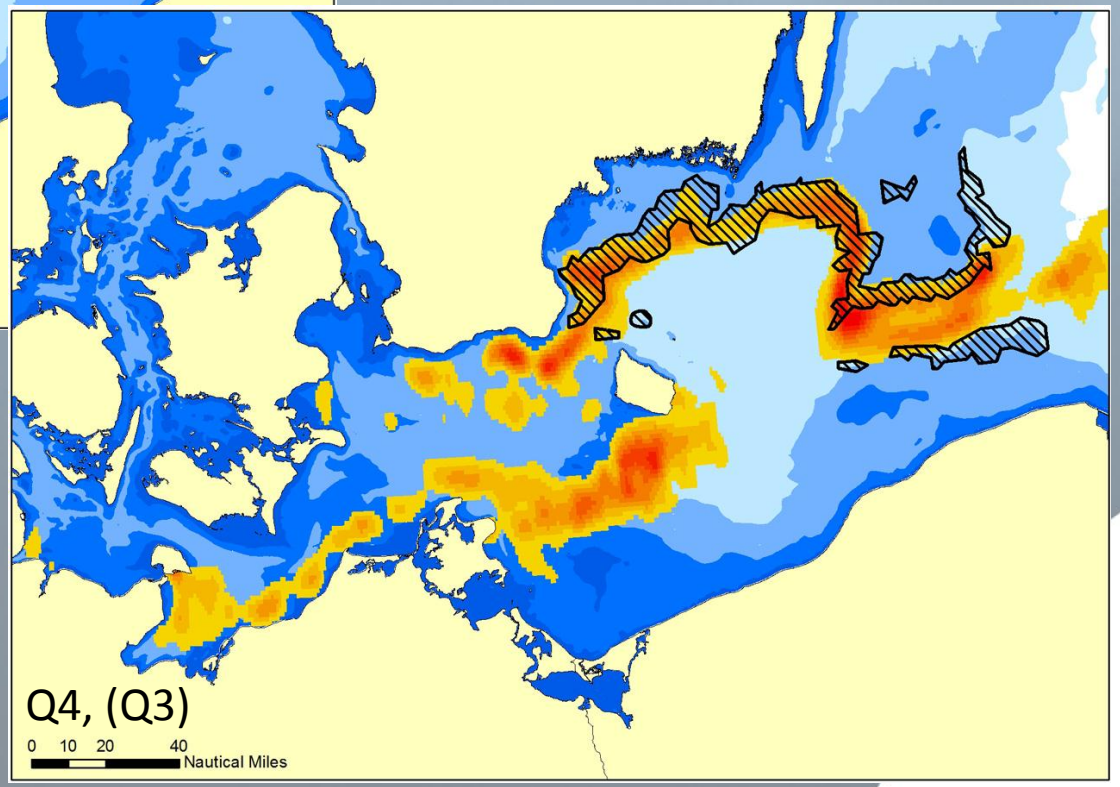
Persistence and Overlay analysis



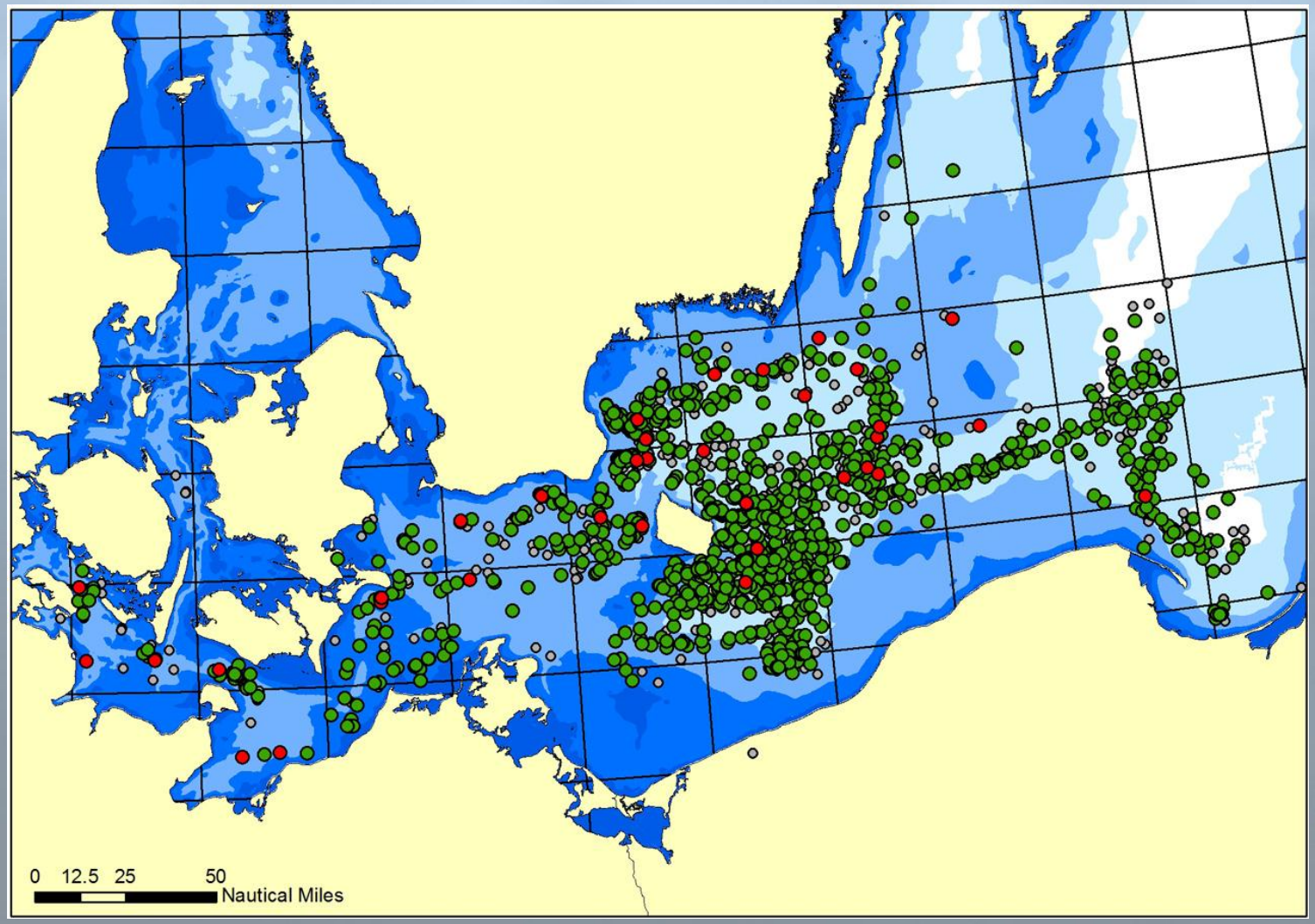
VMS / Logbook
(kg/mouth/sea square)
⏎
Persistence
Areas ≥50% of the time
as “hotspot”



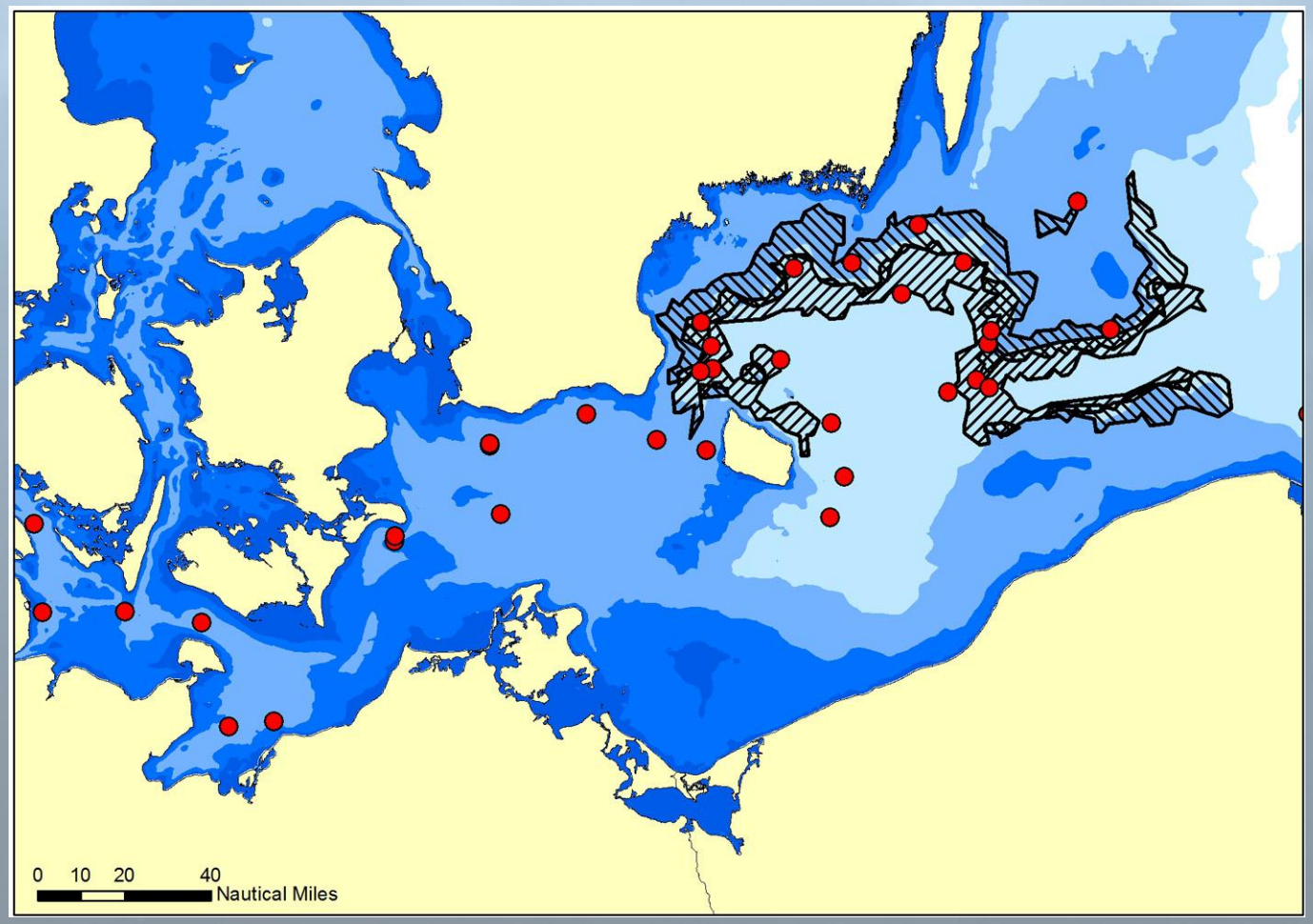
Overlay
⏎
VMS / Logbook
Persistence
⏎
25% of all cod catch
is in “hotspot” areas

Spatial distribution

“High” (30-49%, n=35) and “Low” (<10%, n=1069)



Spatial distribution - “high discard haul”



18 of 20 “high discard hauls” were observed nearby the modeled “high risk area” in the eastern Baltic

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Technical review of gear selectivity

1) Test and demonstration (ROV) on Research vessel
2) Flume tank observation
3) Catch comparison on a Commercial vessel
4) Sorting grid
5) Literature review

Technical design	Proposed by	Research	Flume	Commercial	Literature
Escape-device Belly-section	Vilnis Ulups,	X		(X)	
New envelope-codend design	Krzysztof Stanuch	X		(X)	
Plastic panels	Knud Carlsen	?	?	?	
Different trawl designs	workshop				X
Ageing of T90 and Bacoma	discussed RAC 2010	X		(X)	
Change of fishing behavior	workshop	X	X	(X)	
Optimizing legal codends	workshop	X	X	(X)	X

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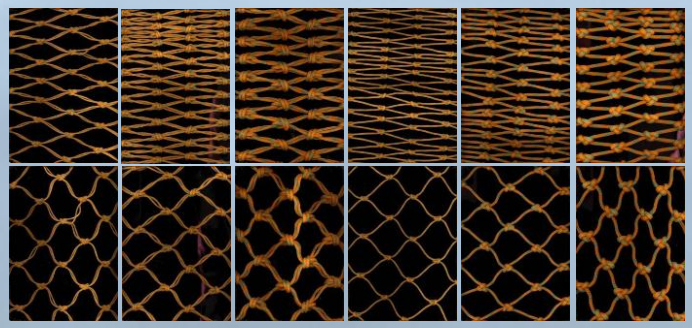
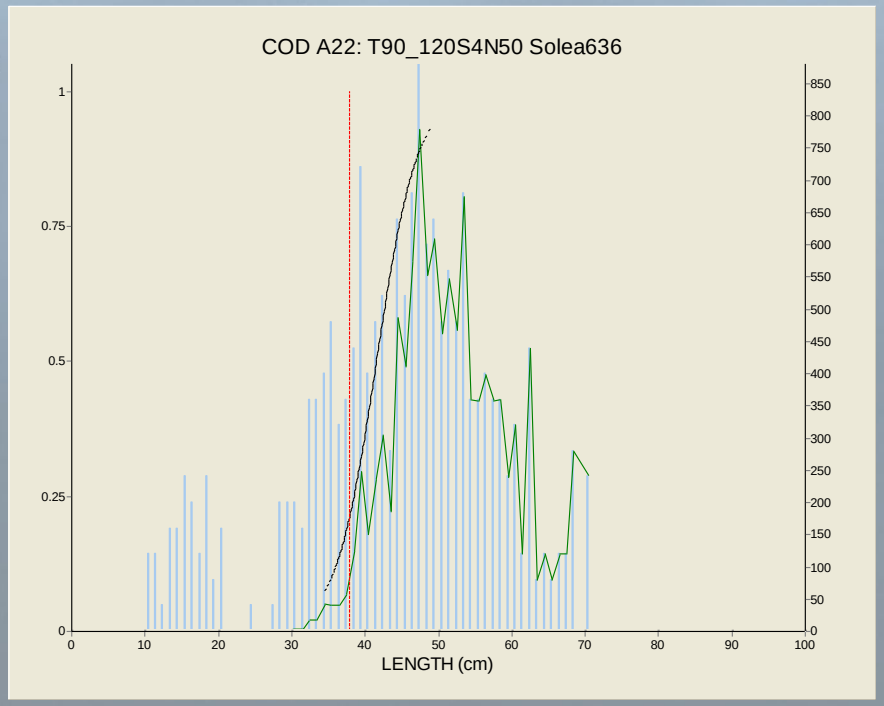
Overview optimizing legal codends





BACOMA120D105	solea619
BACOMA120D105	solea654
BACOMA120D105	solea 630
BACOMA 120D105	solea645
BACOMA140D105	solea645
BACOMA120S130	solea645
S120	solea645
T90_124S3.9n50	solea645
T90_120s4n50	predict solea 636
T90_120s6n50	predict solea 637
T90_120s8n50	predict solea 638
T90_120D3n50	predict solea 639
T90_120D4n50	predict solea 640
T90_120D6n50	predict solea 641
T90_114,5S5n46	solea610
T90_114,5S5n91	solea610
T0_114,5S5n44	solea610
T0_114,5S5n92	solea610
T0_120s4n50	predict solea 636
T0_120s6n50	predict solea 637
T0_120s8n50	predict solea 638
T0_120D4n50	predict solea 639
T0_120D6n50	predict solea 640
dyneema	
T0S2.5n88	solea 619
T0s2.5n44	
T90s2.5n44	

Some ideas in progress..