

Ecosystem
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Why mackerel must be taken very

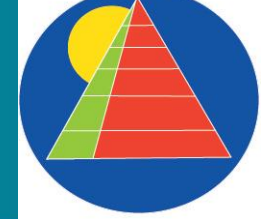
SERIOUS!

Jens Christian Holst

Scientific advisor

Ecosystembased

jens@ecosystembased.com



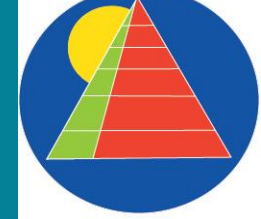
The hypothesis on overgrazing and predation

A photograph of a large pile of fish, likely salmon, resting on a wooden surface. The fish are arranged in a somewhat chaotic manner, with some overlapping. The text "Living together = competition and predation" is overlaid in a bold, orange font across the center of the image. The background is a light-colored wooden surface with some visible grain and texture.

Living together

=

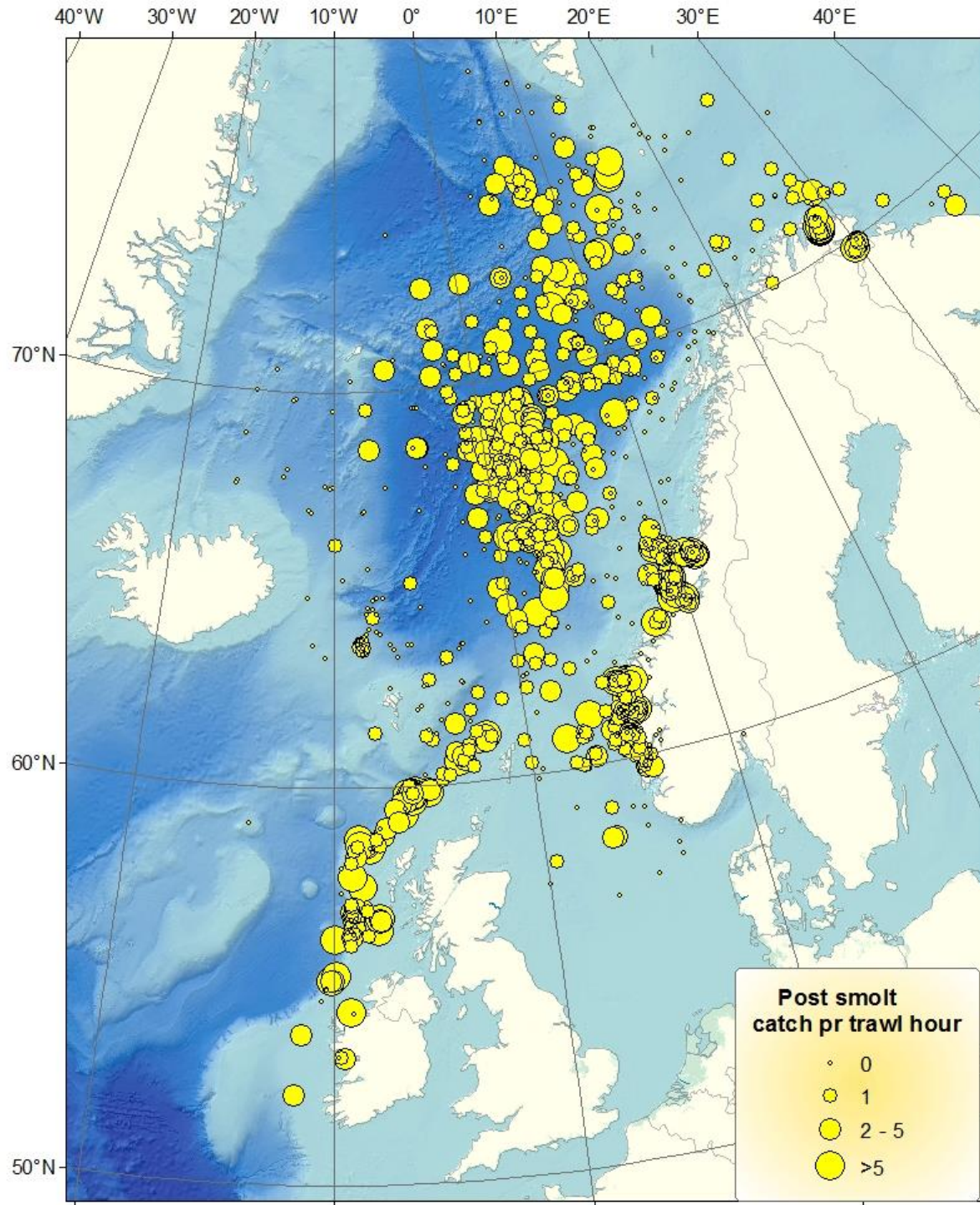
competition and predation



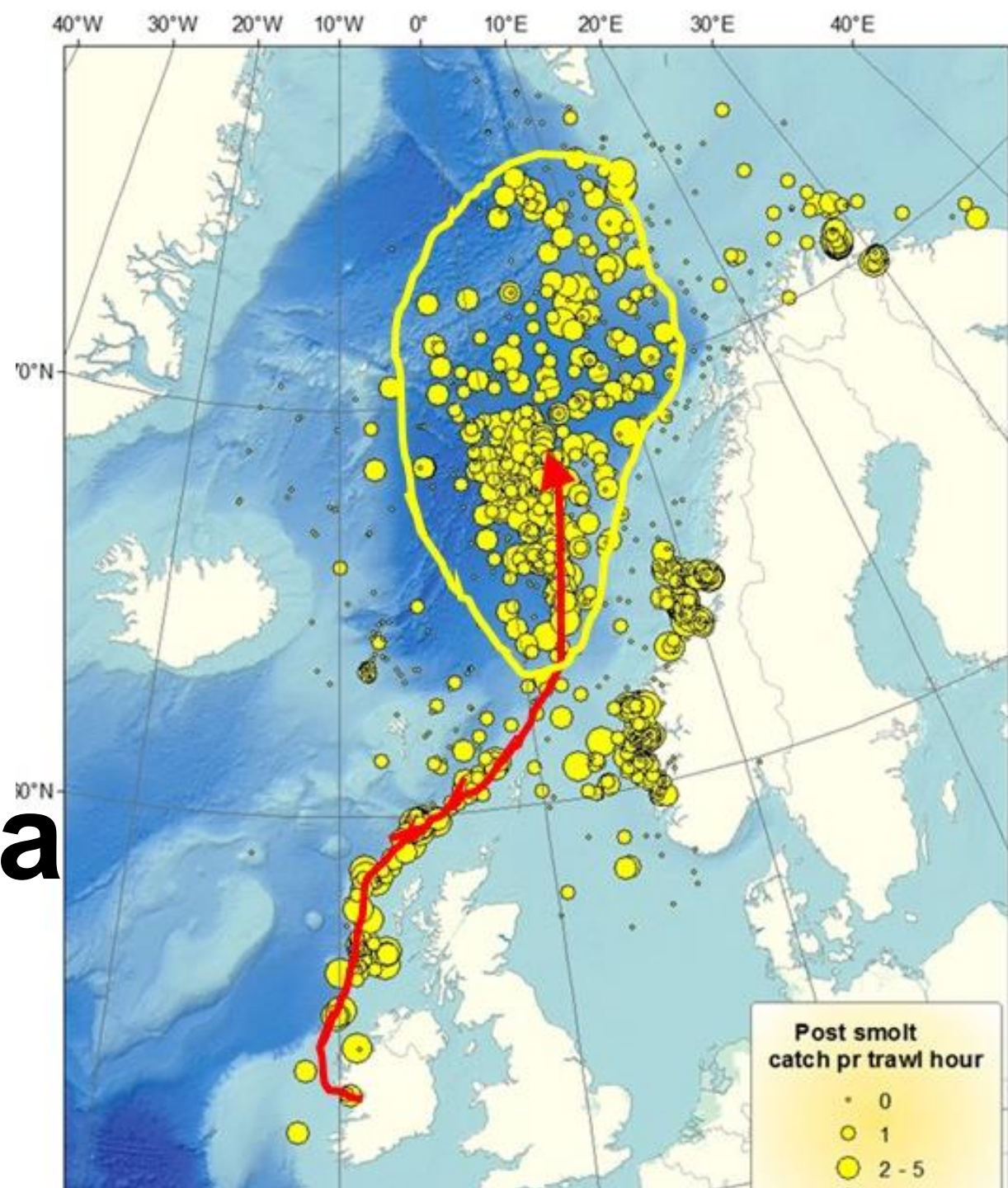
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Salmon postsmolt migrations first three months at sea

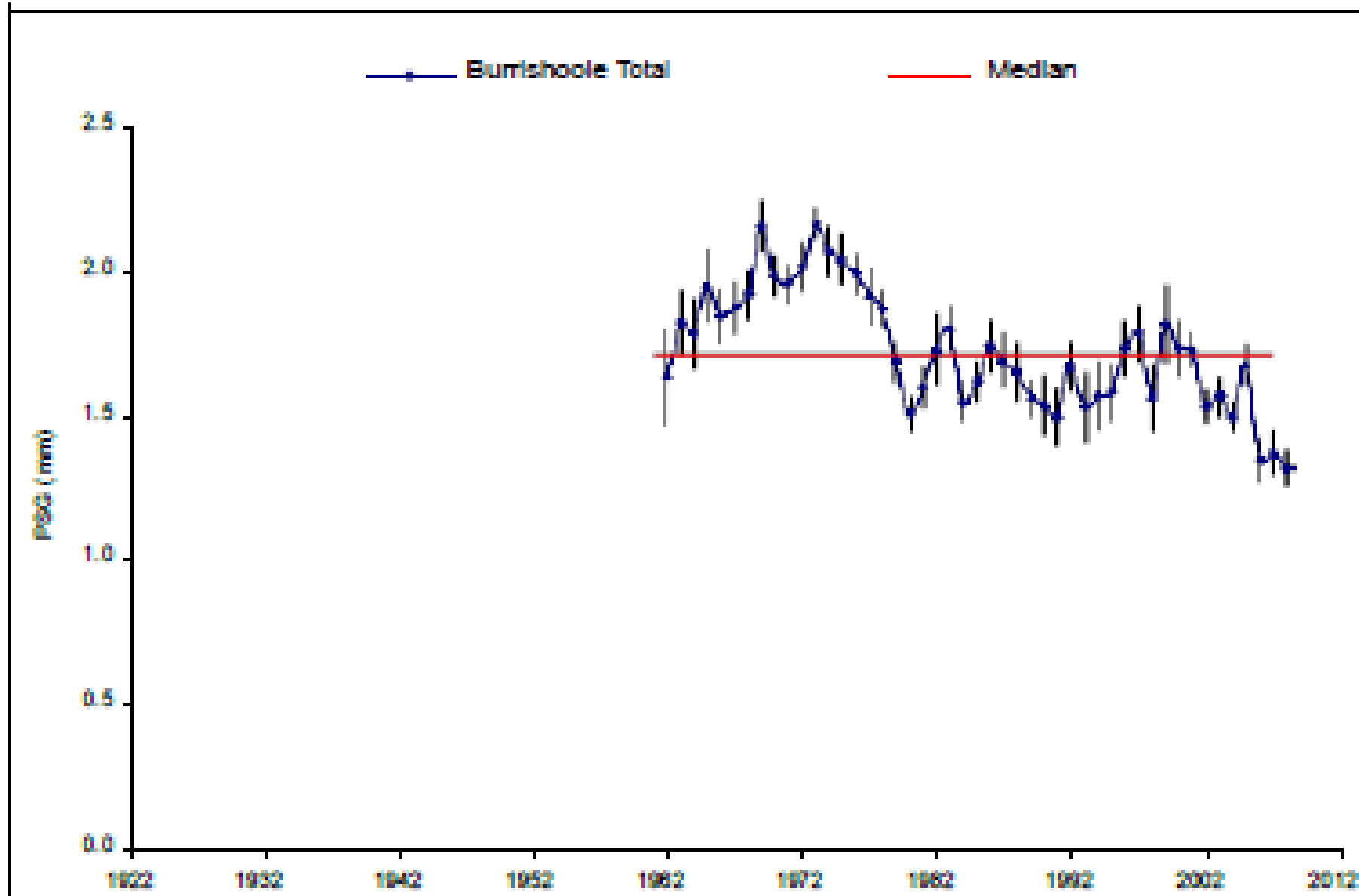
6000+
scientific catches
of postsmolt
starting 1991



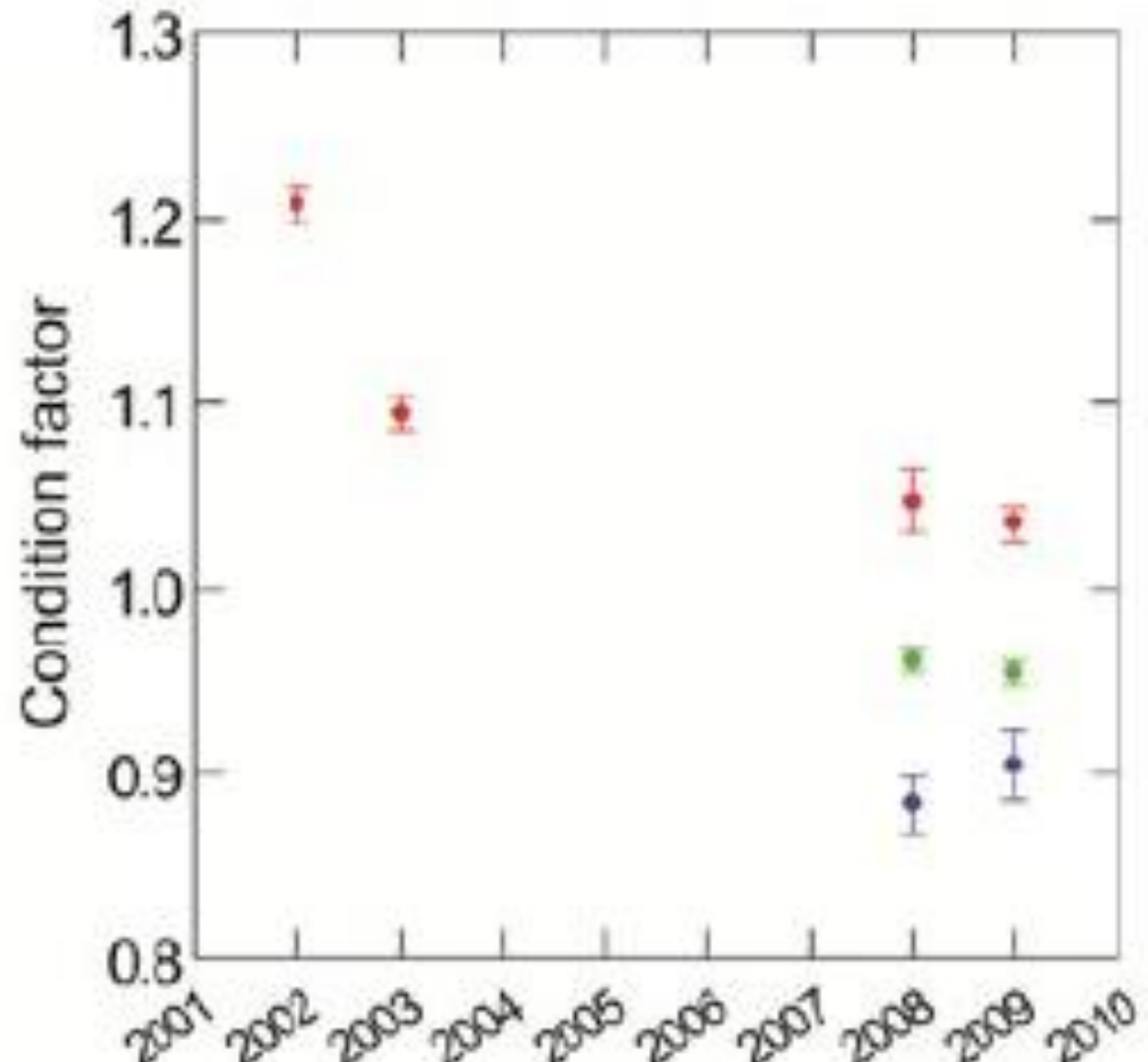
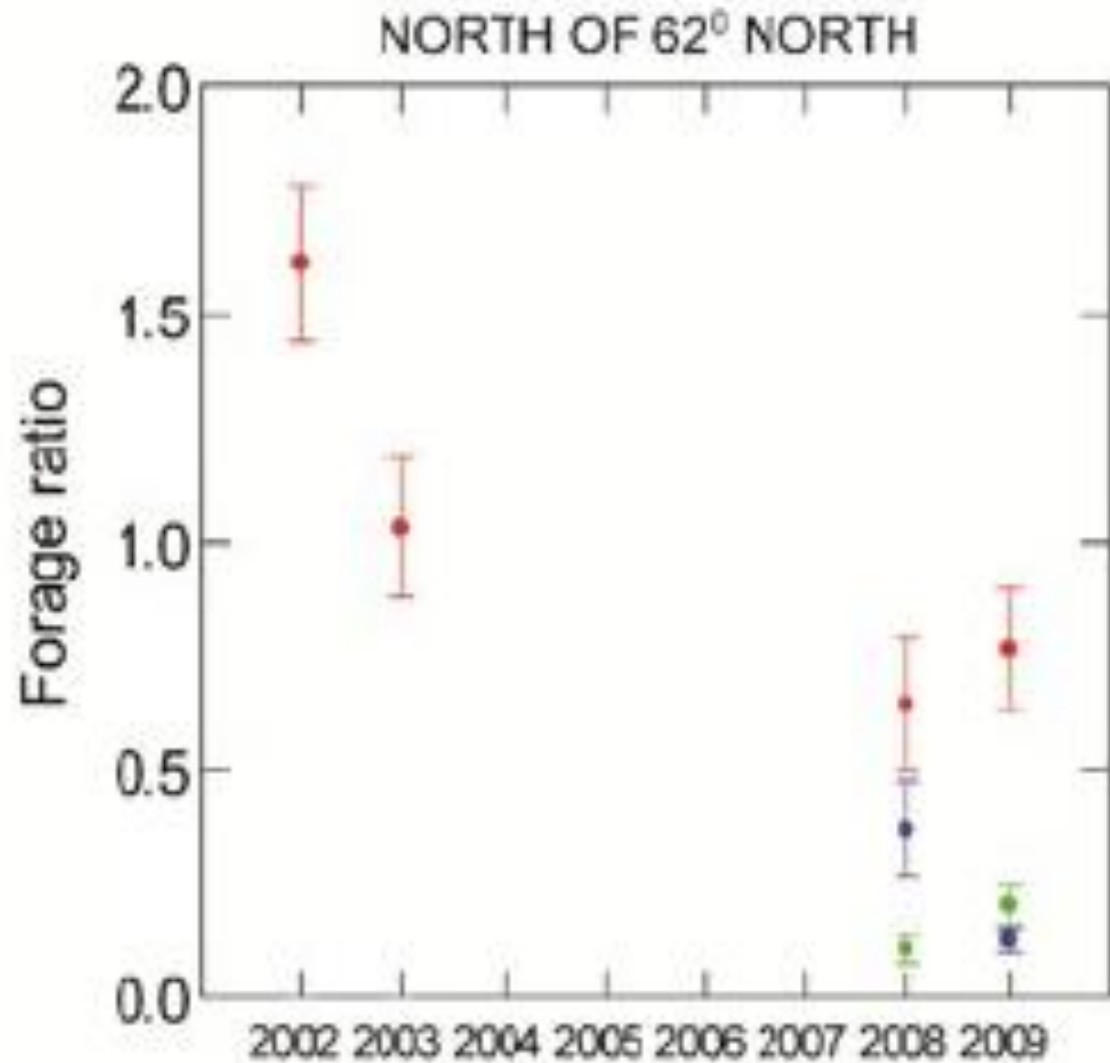
**Postsmolt salmon
migration first
three months at sea**

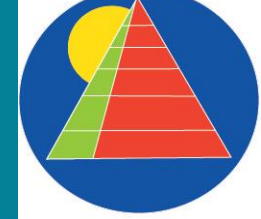


Collapse in postsmolt growth



Reduced postsmolt feeding

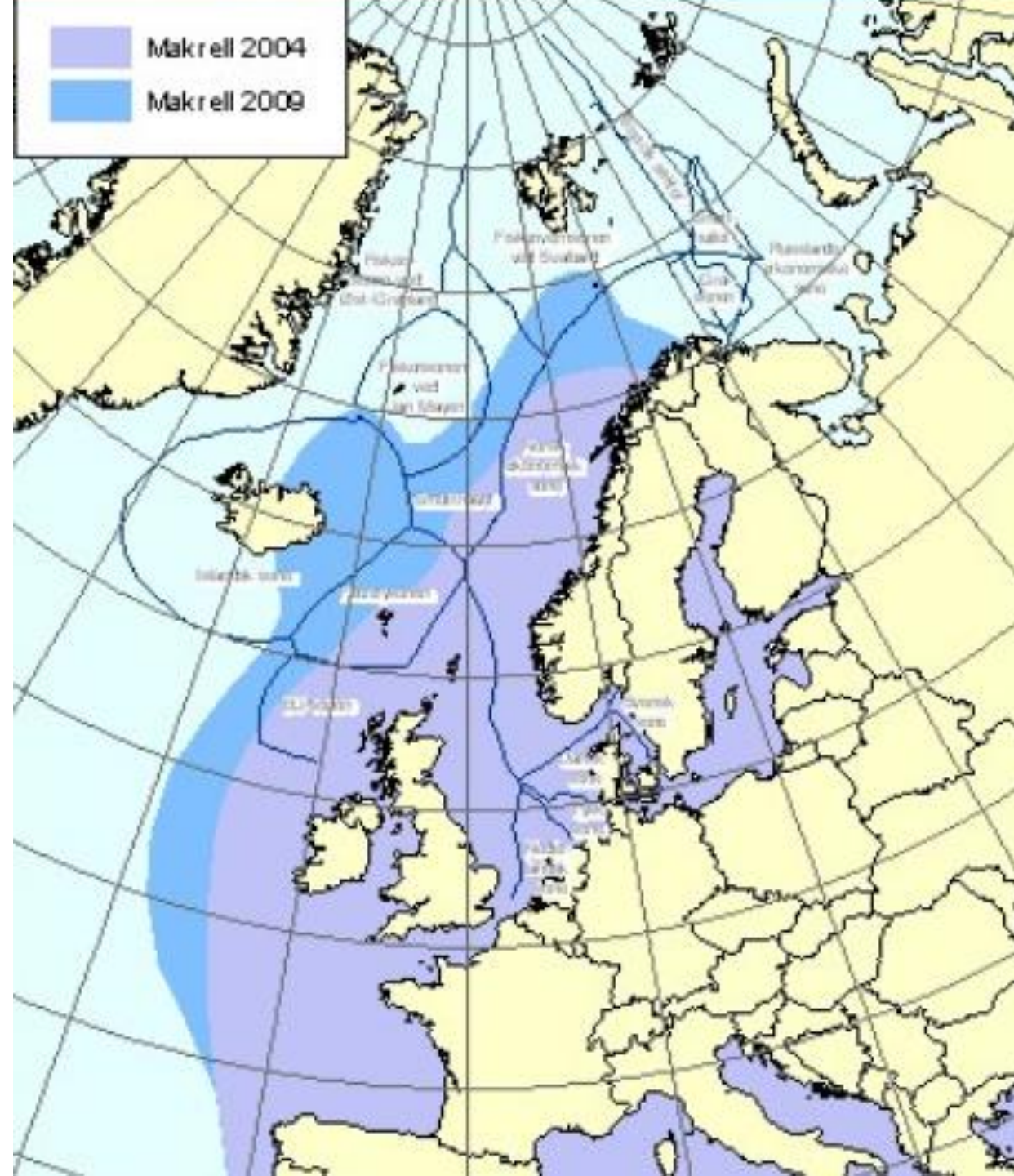




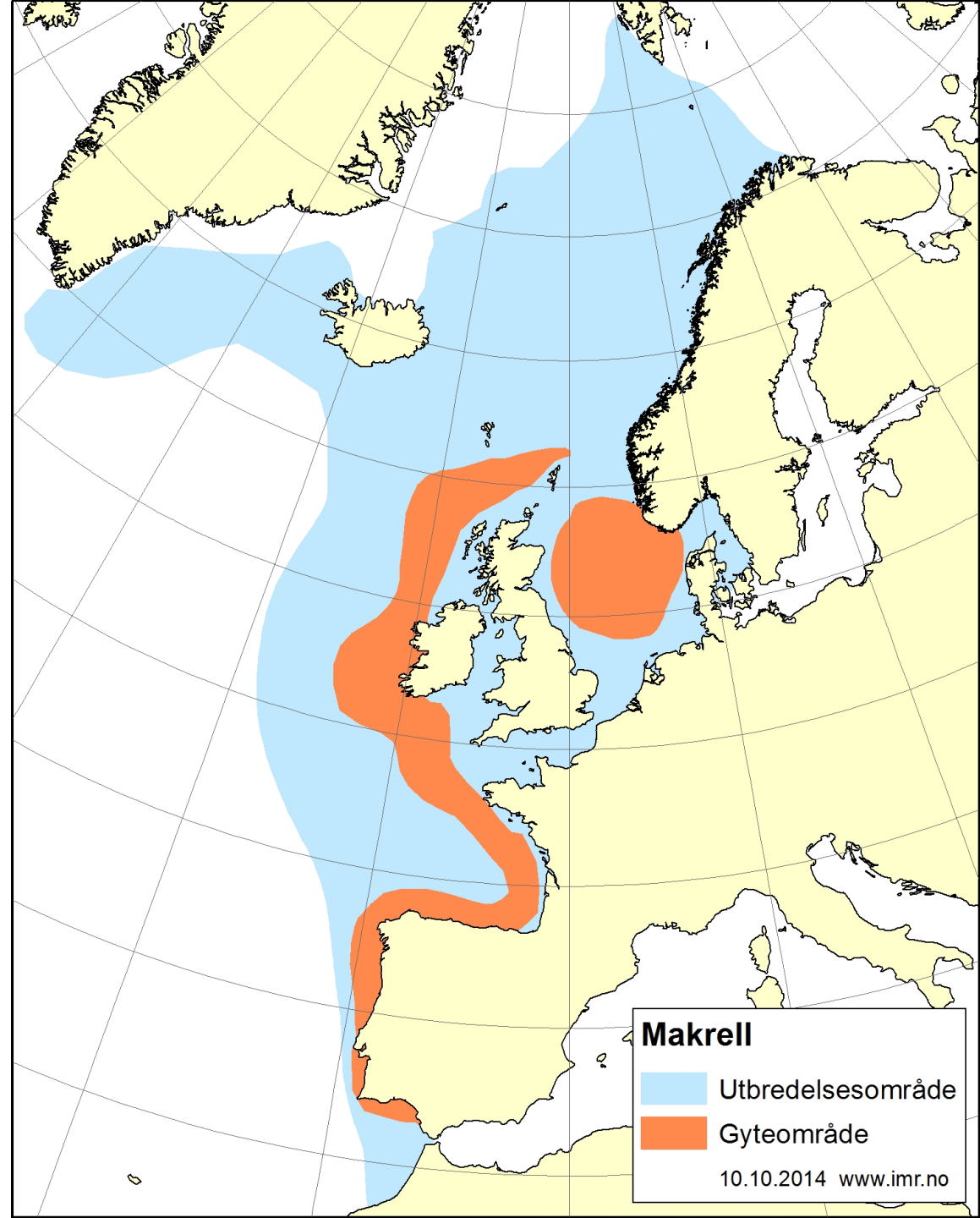
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Extreme increase in mackerel stock distribution and stock size

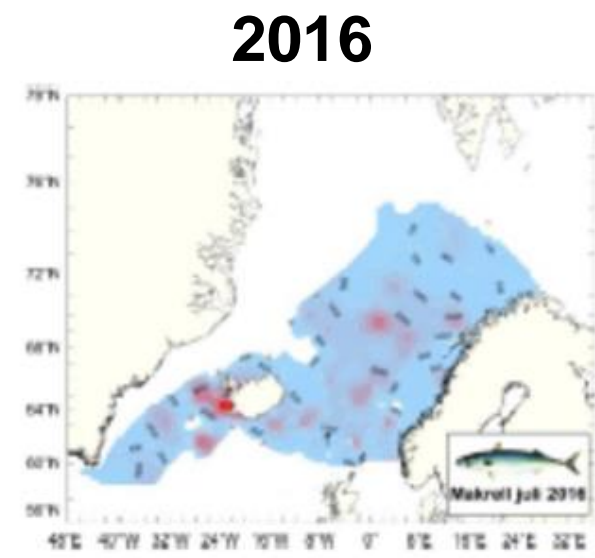
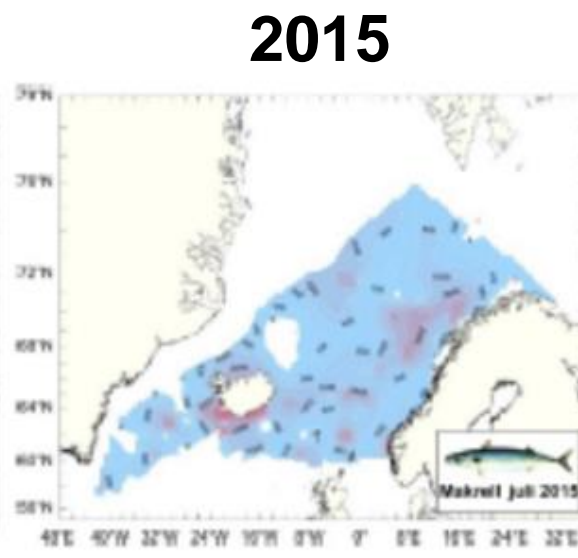
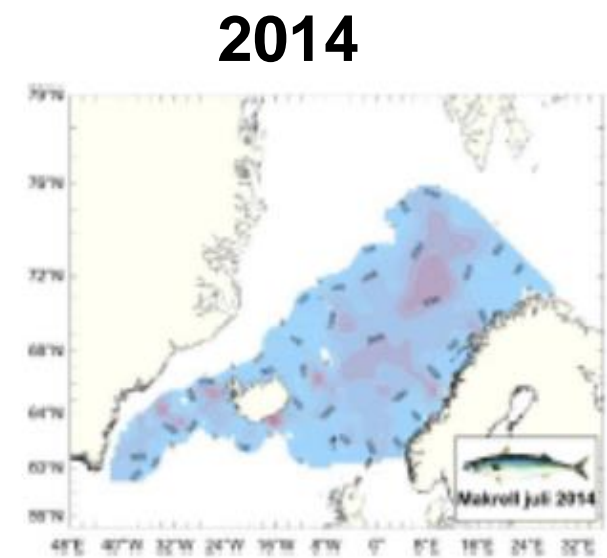
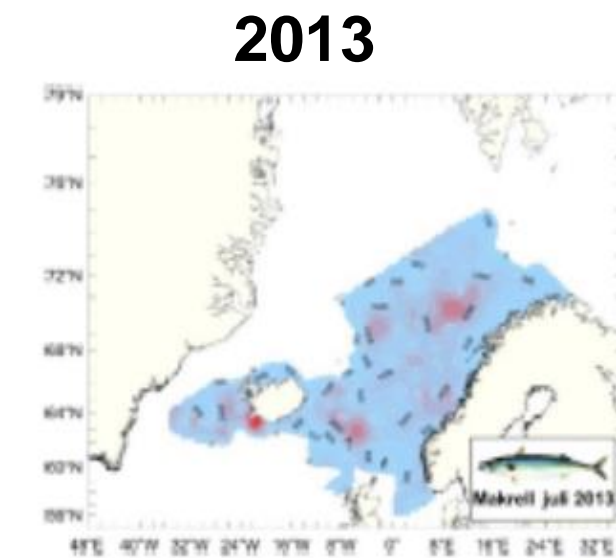
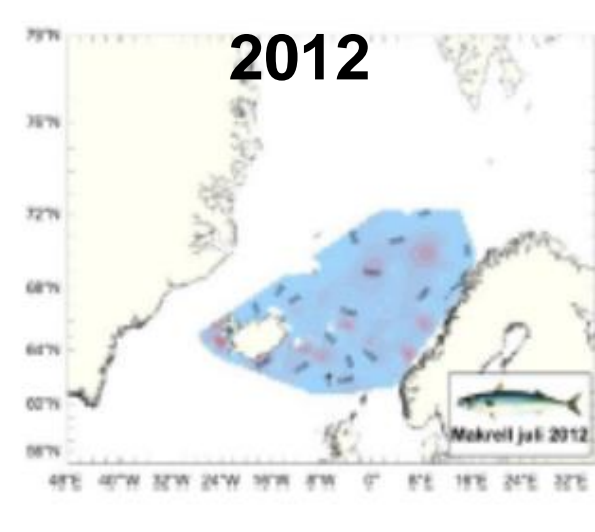
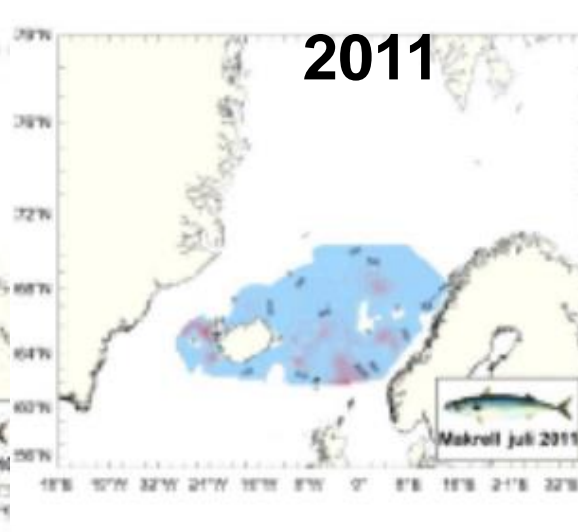
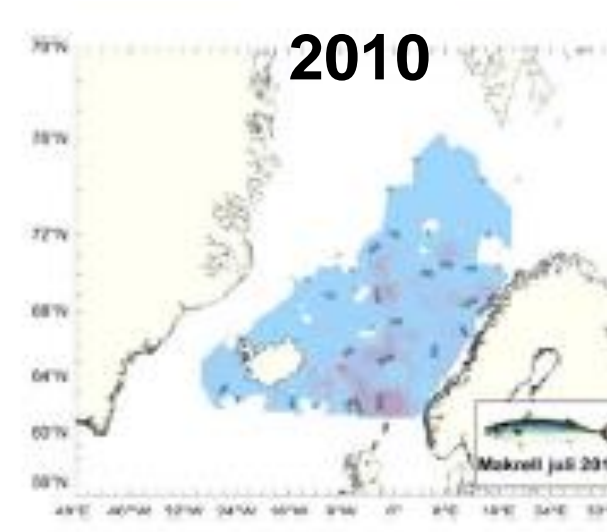
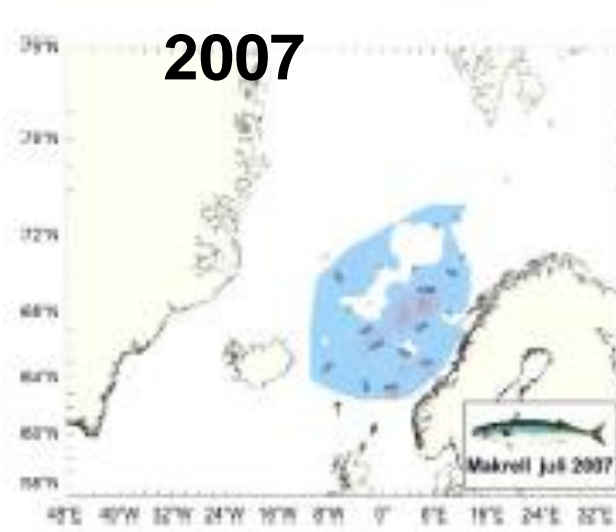
Mackerel distribution 2004 and 2009



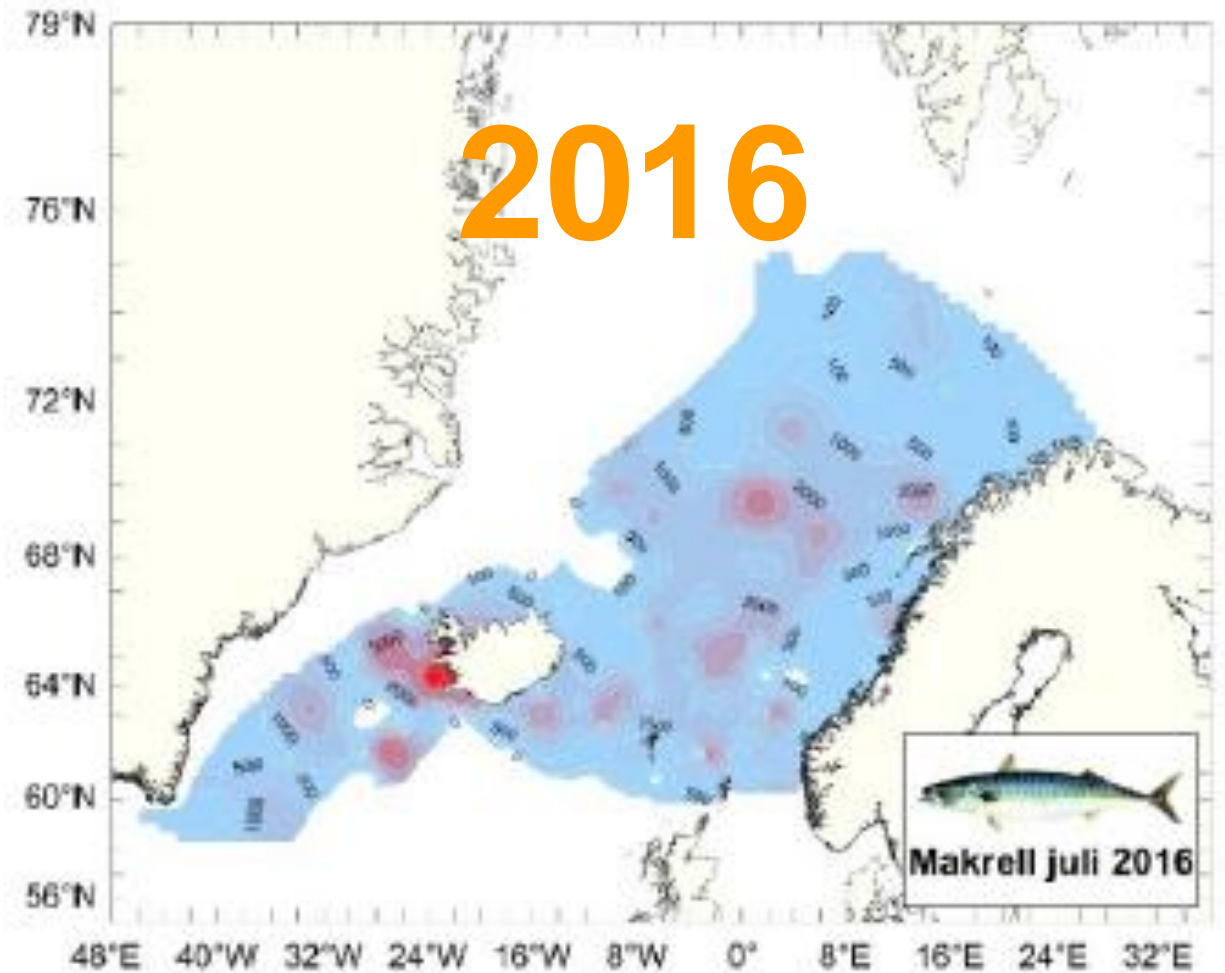
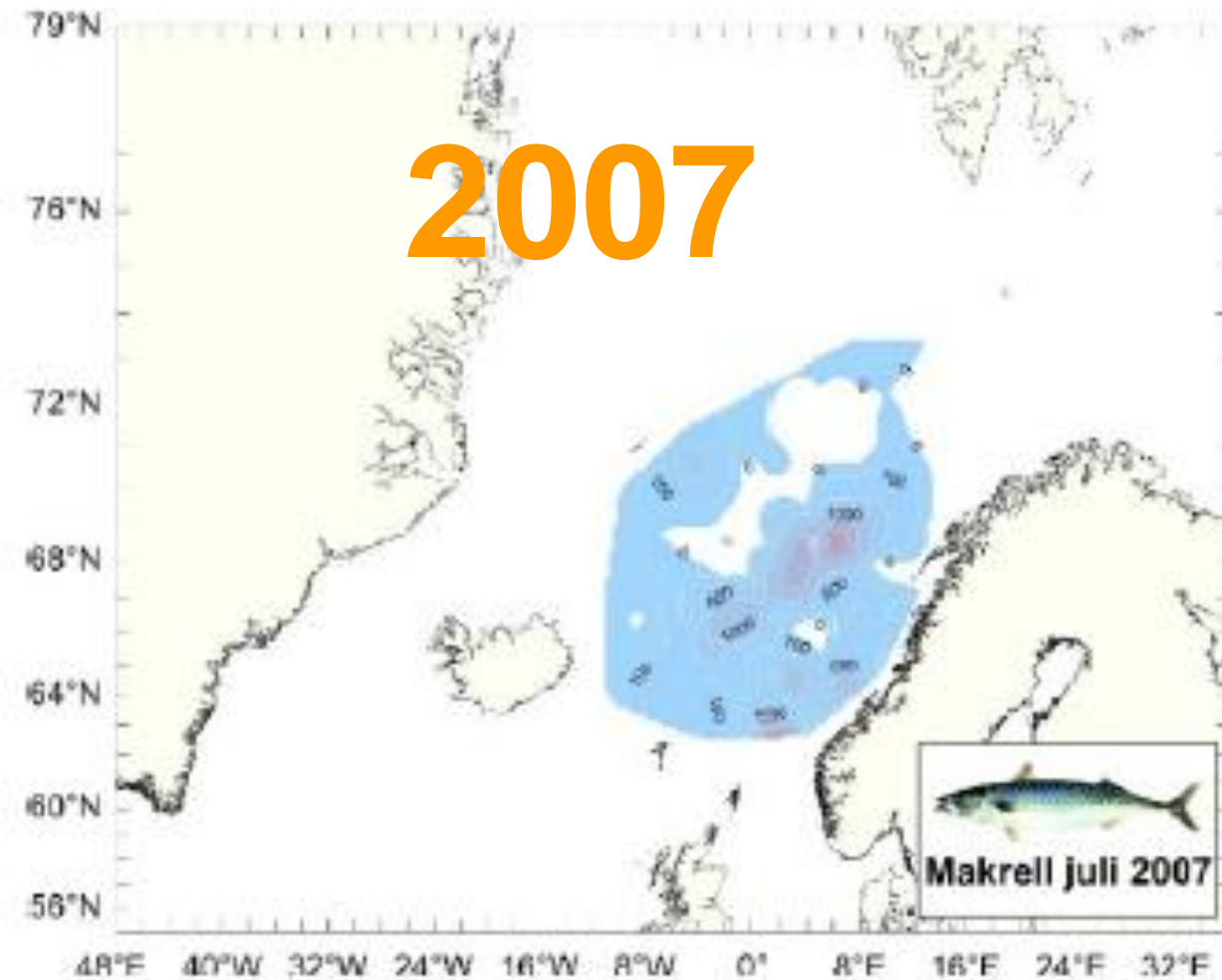
Mackerel distribution 2019



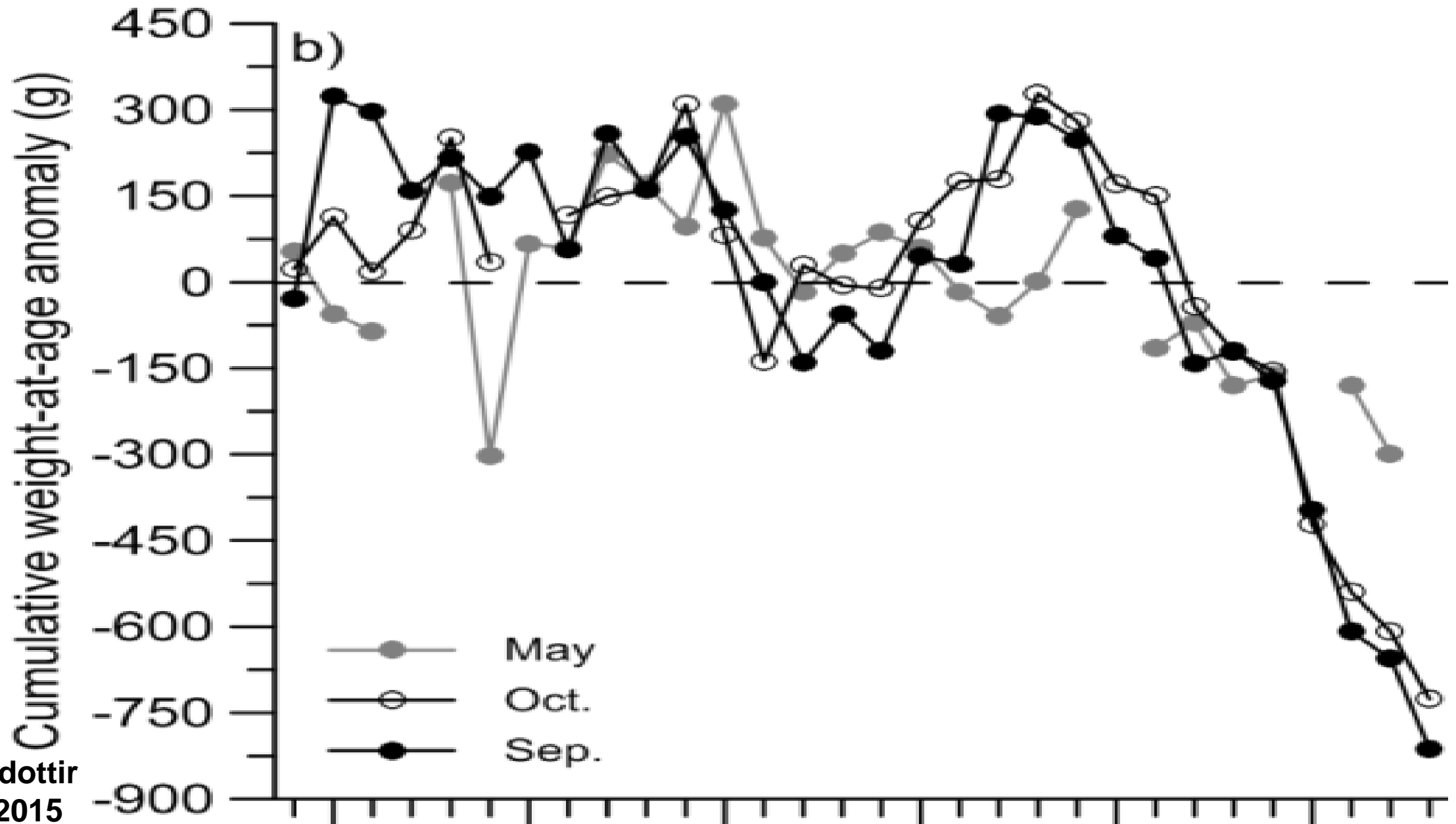
July-august trawl survey

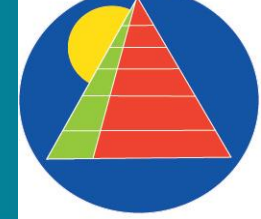


Three times larger geographic distribution, double density: sixfold increase

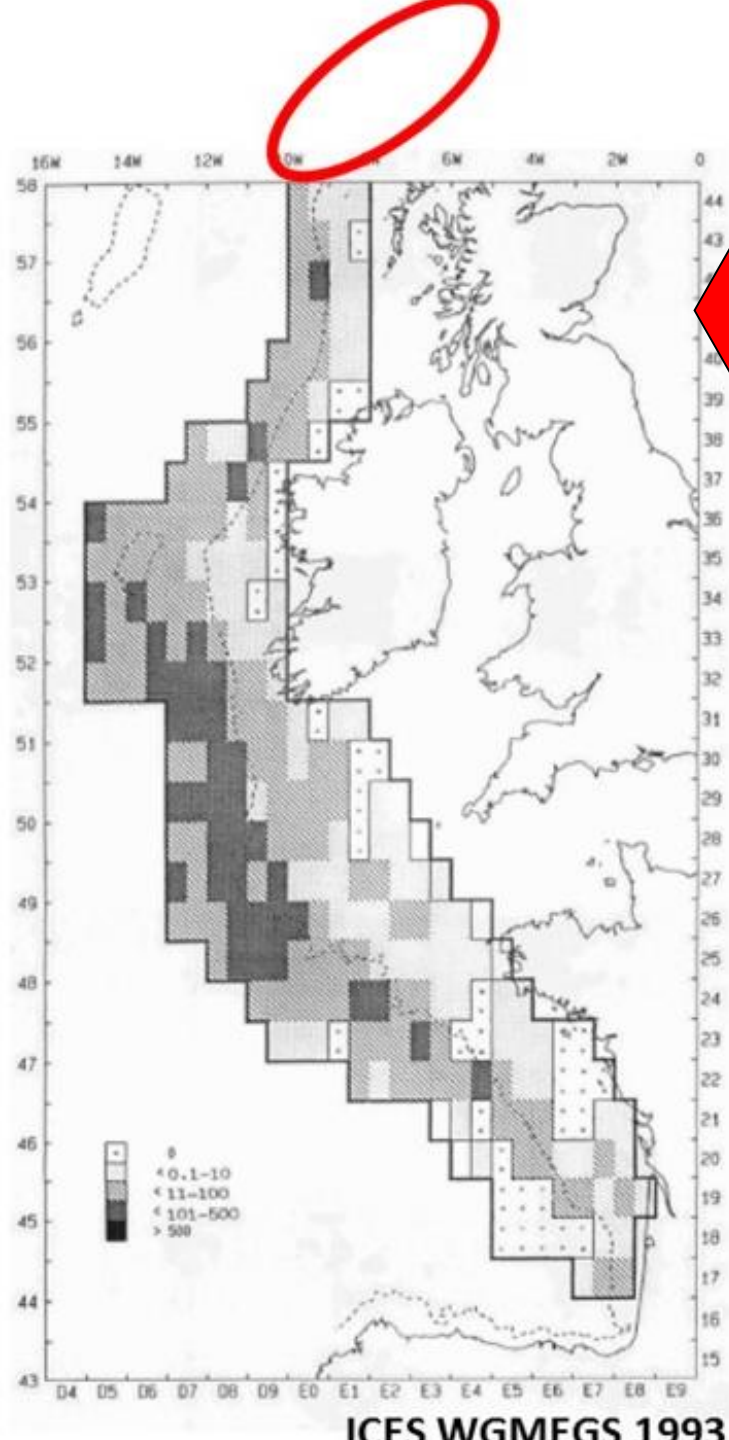


Mackerel growth: Total collapse



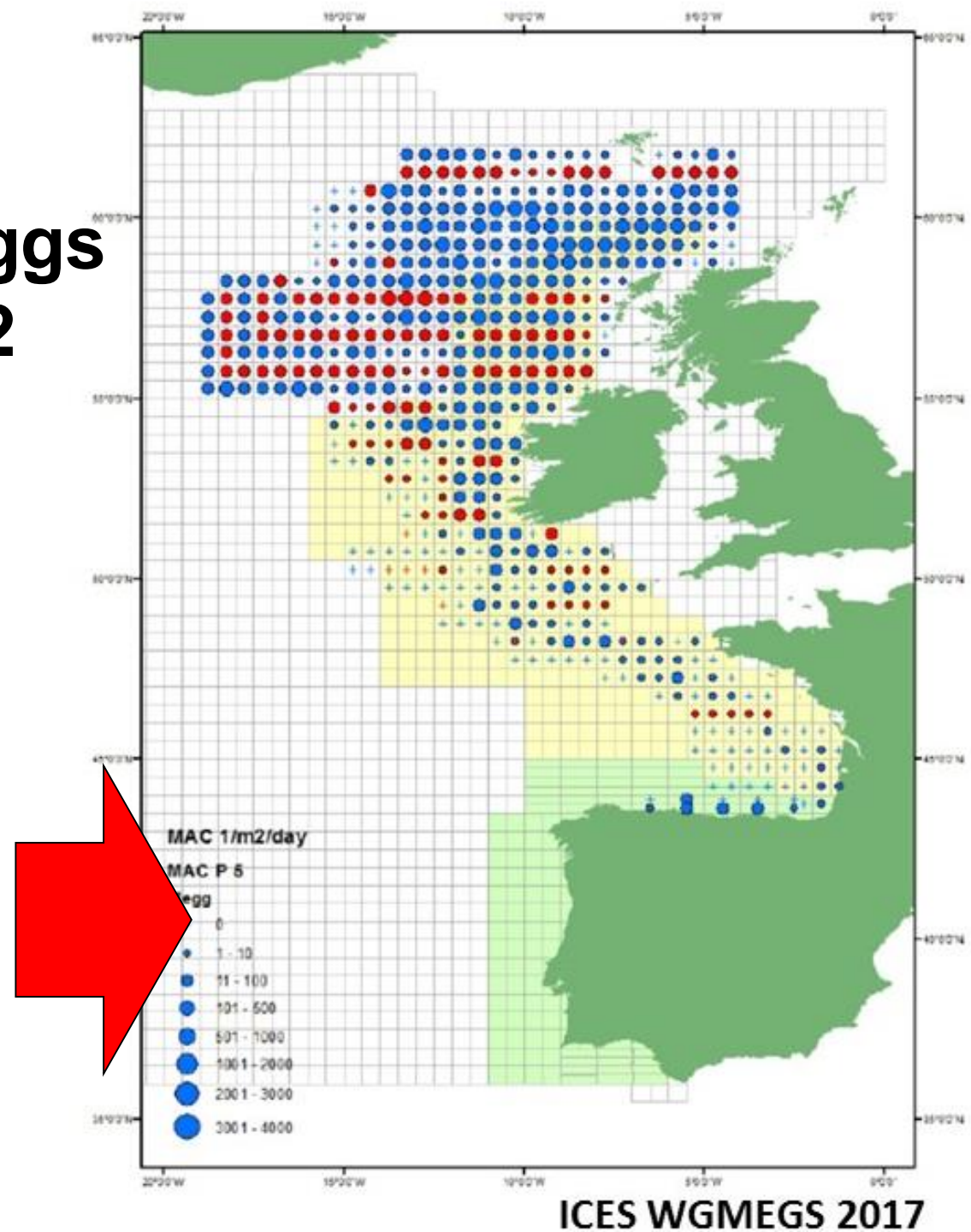


**Extreme increase in overlap
between
mackerel and salmon smolts**

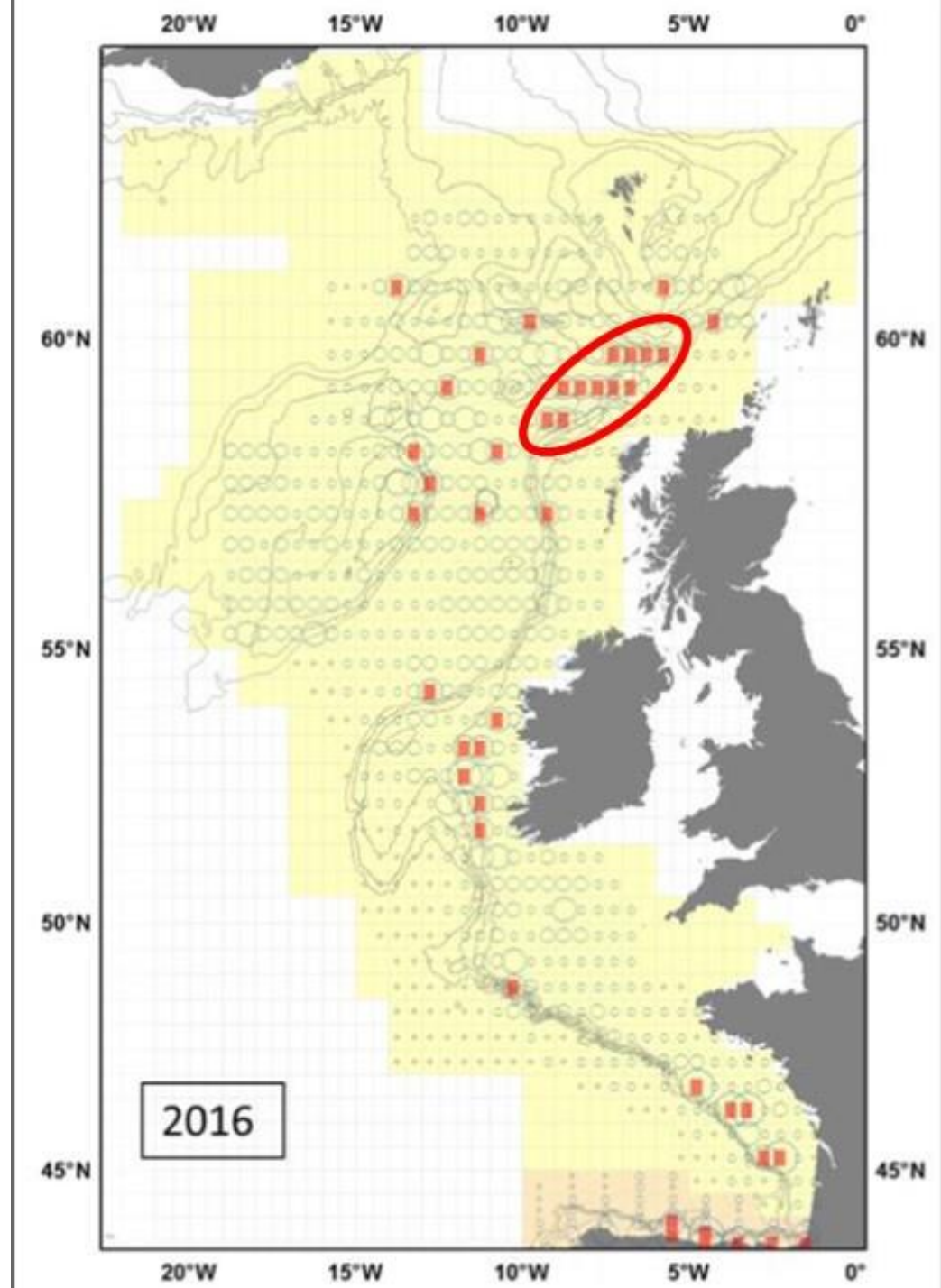


**Mackerel eggs
May 1992**

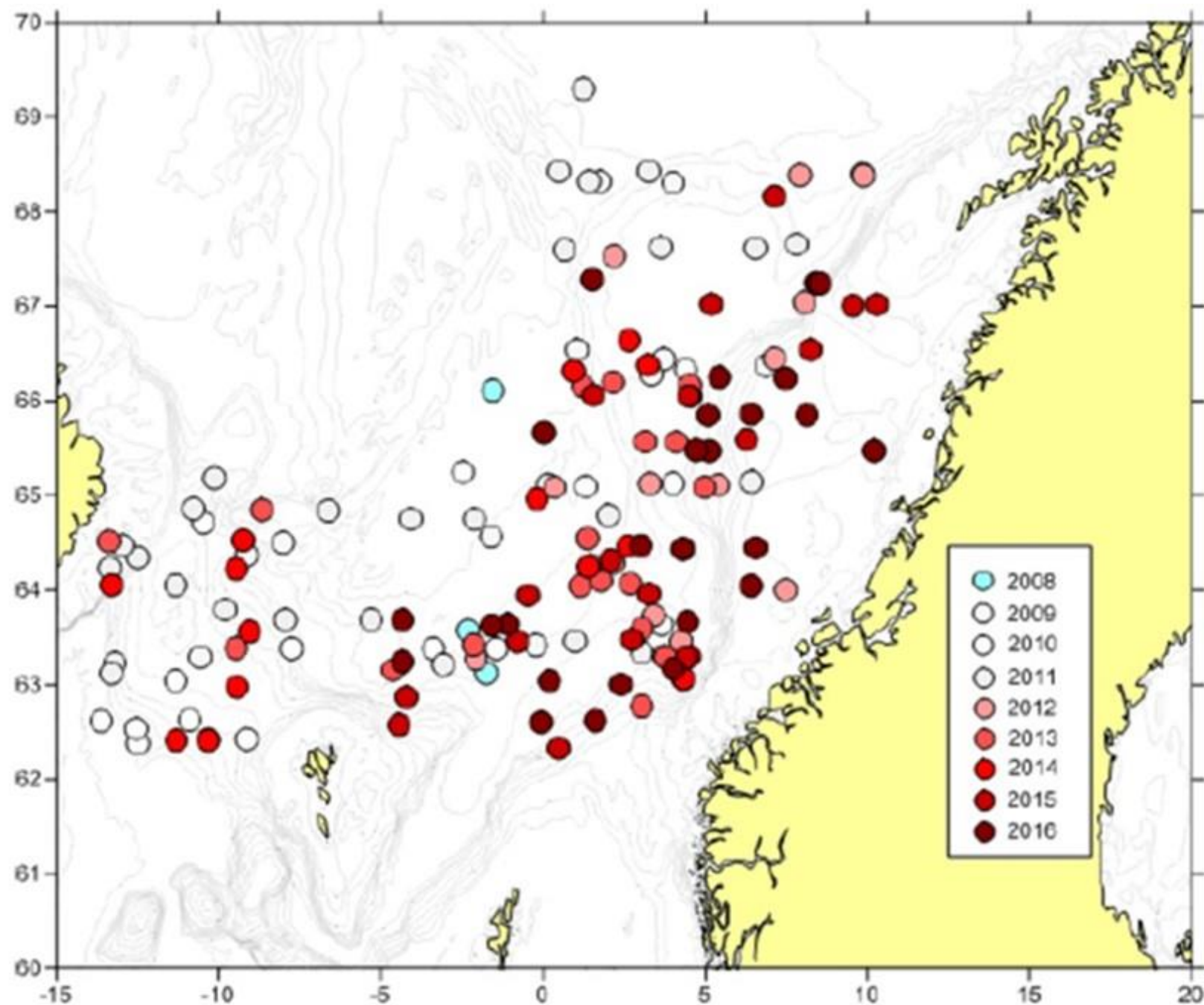
**Mackerel eggs
May 2016**



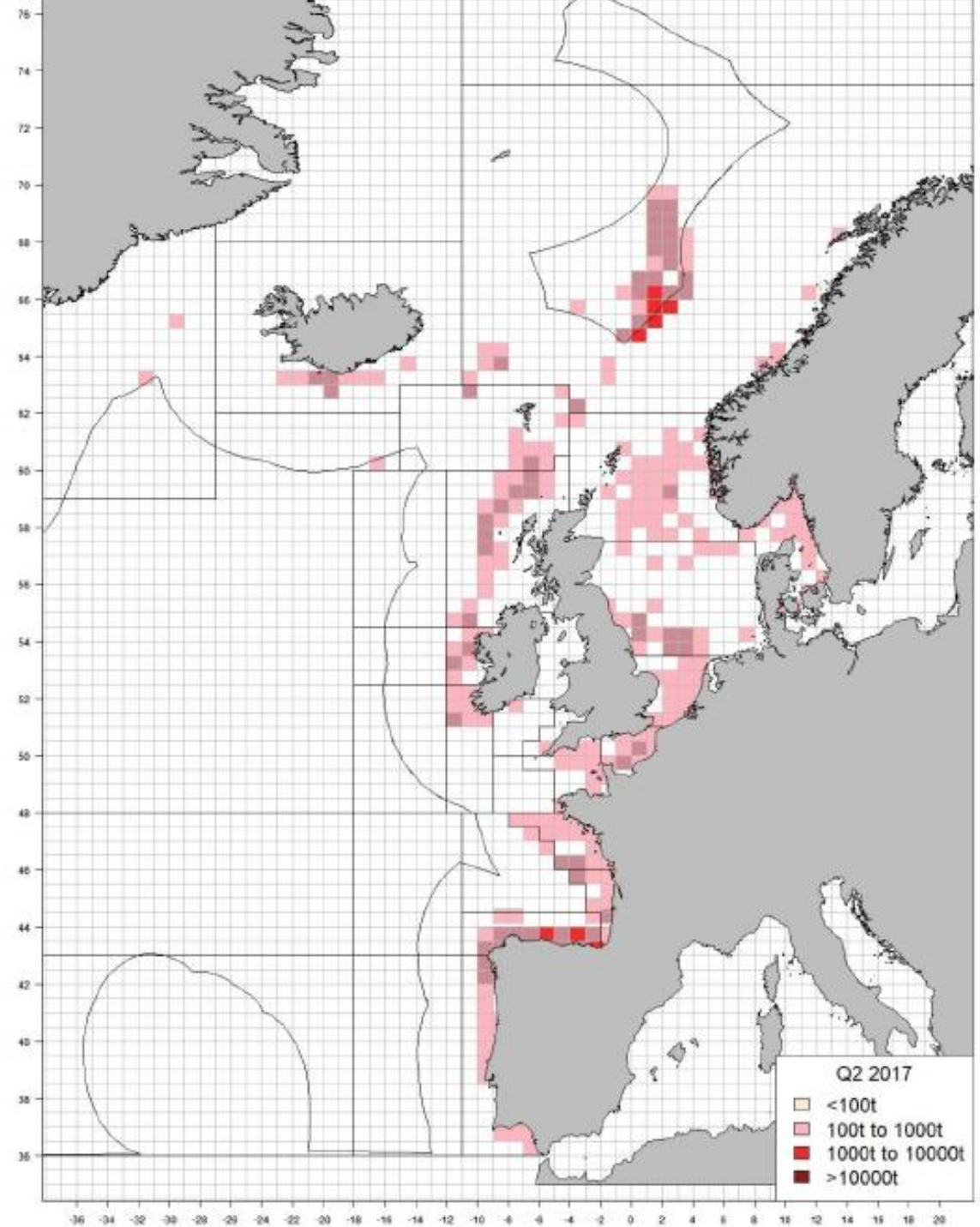
Highest mackerel egg densities in 2016



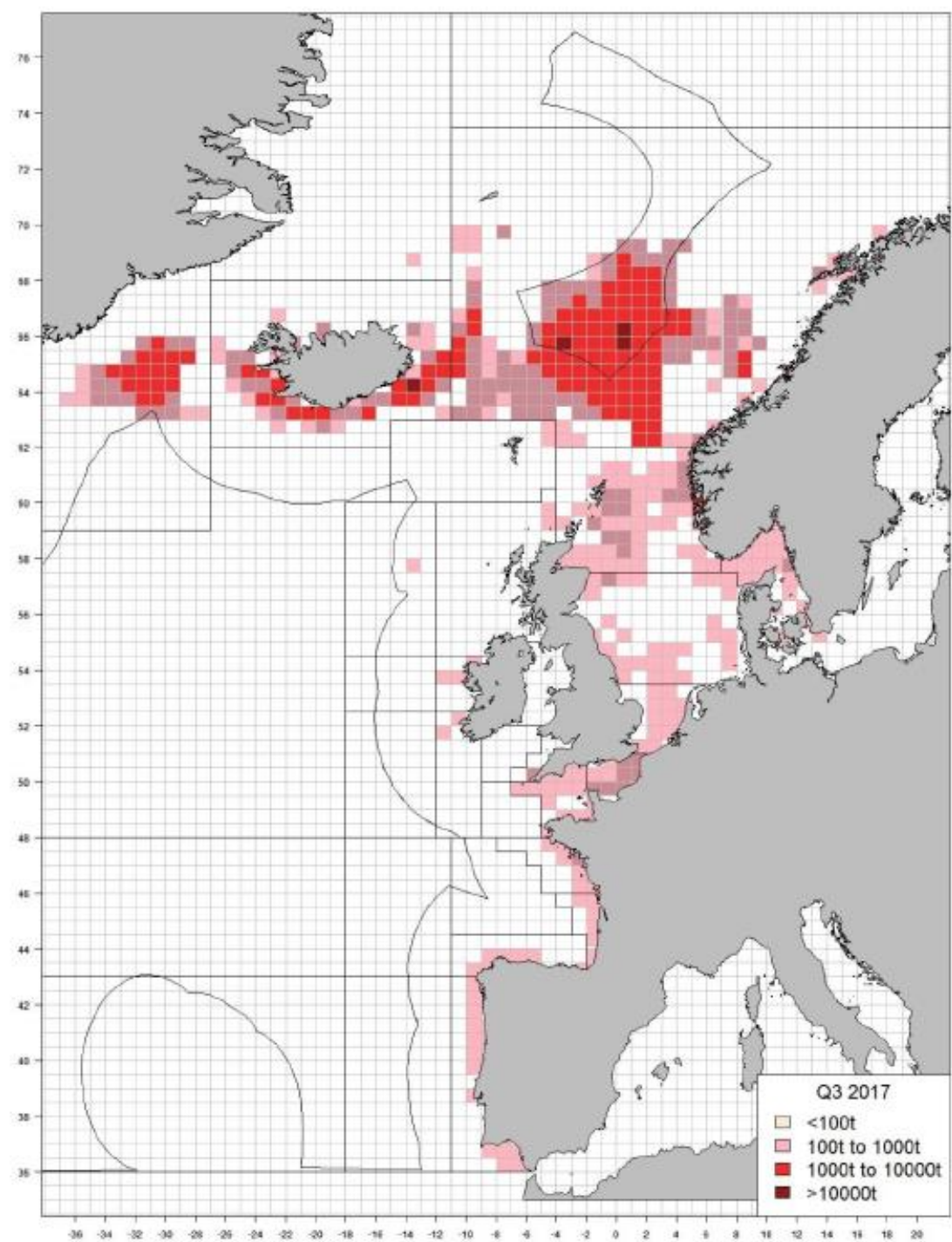
**Mackerel also
spawning
all way up to
Northern Norway
after 2008**



Mackerel fisheries April-June



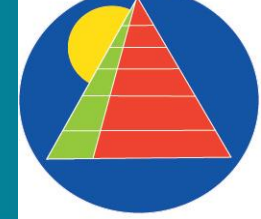
Mackerel fisheries July -August





Postsmolt life catching aquarium!





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Cannibalism in mackerel and the potential for postsmolt predation

30 cm mackerel



30 cm mackerel



12.5 cm mackerel



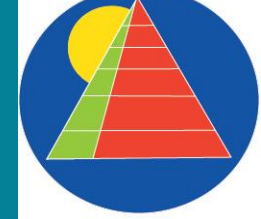
30 cm mackerel



12.5 cm smolt

**Cannibalism
is today
common
in the
starving
mackerel**

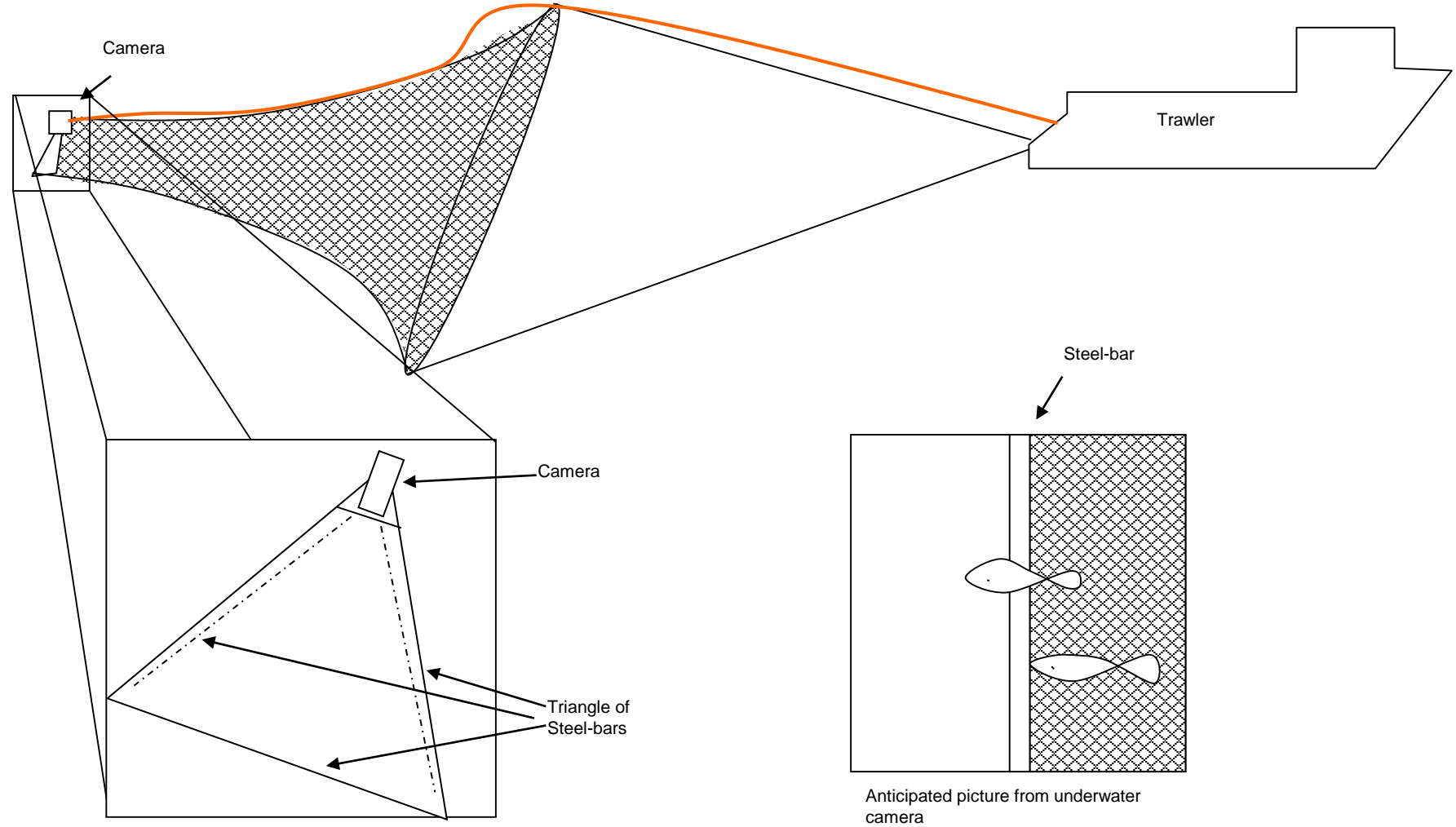




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**We know exactly where the
postsmolts
and the mackerel overlap**

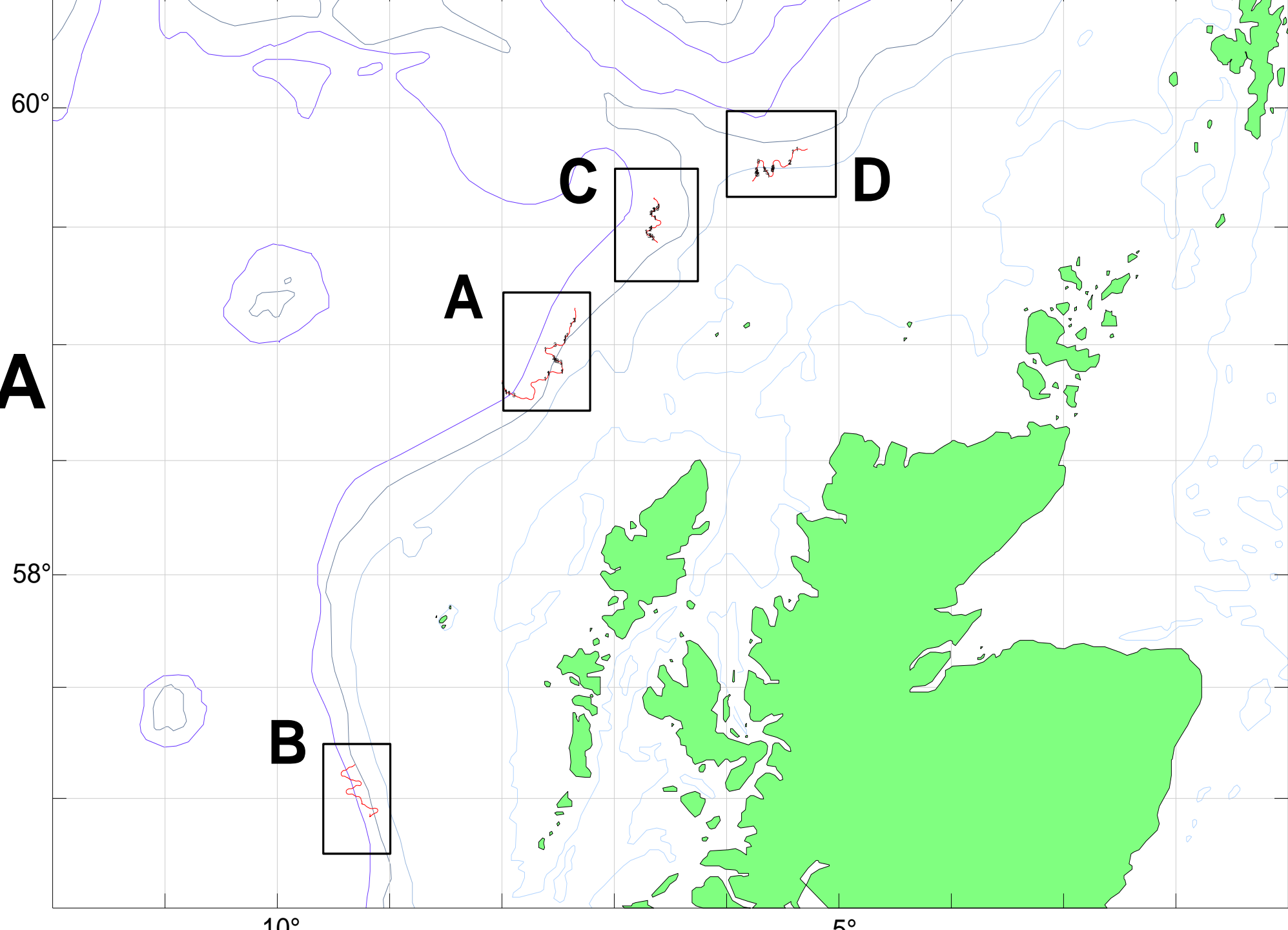
Video trawling

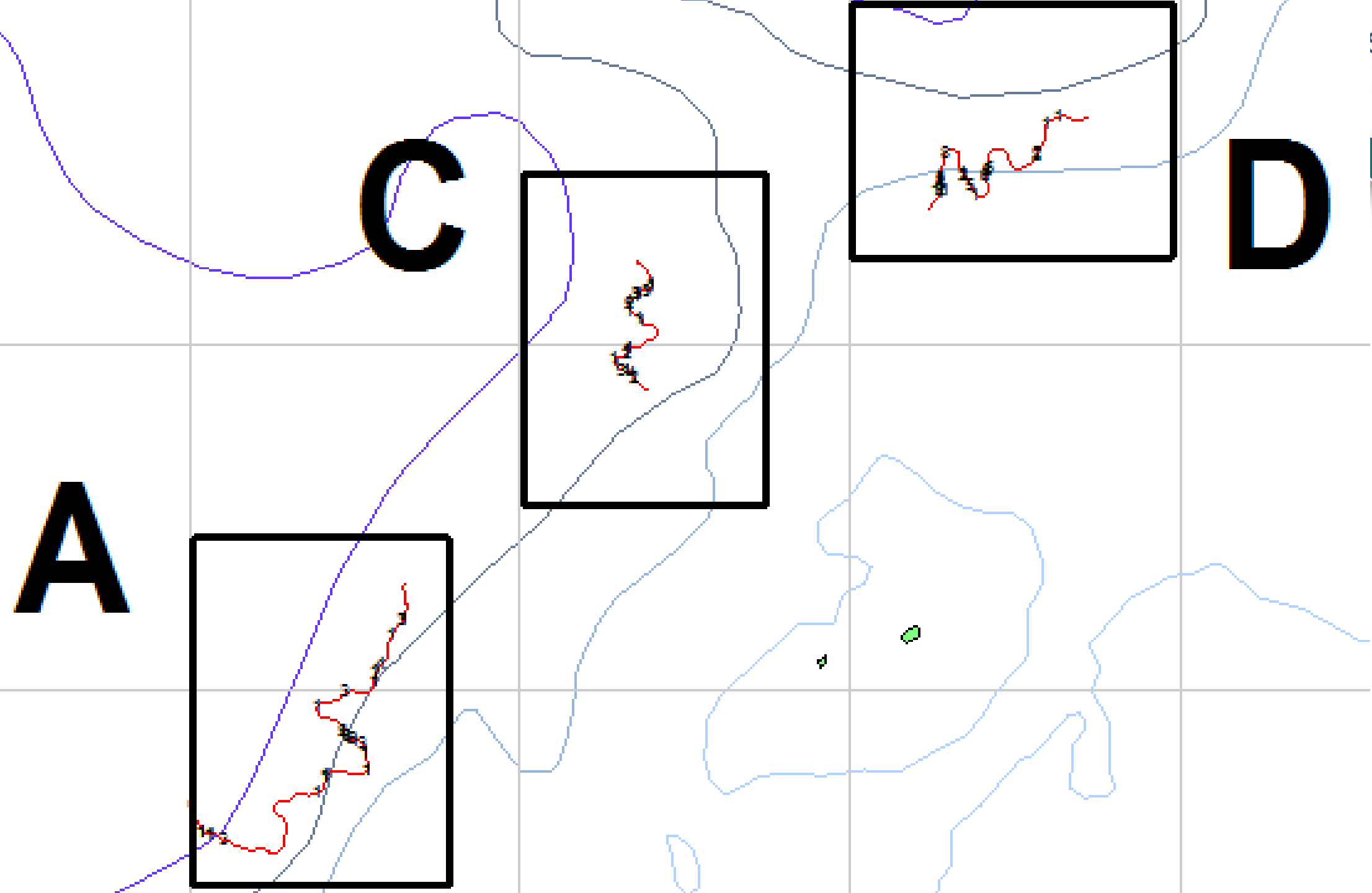


VIDEO FRAME



RV SCOTIA MAY 2005



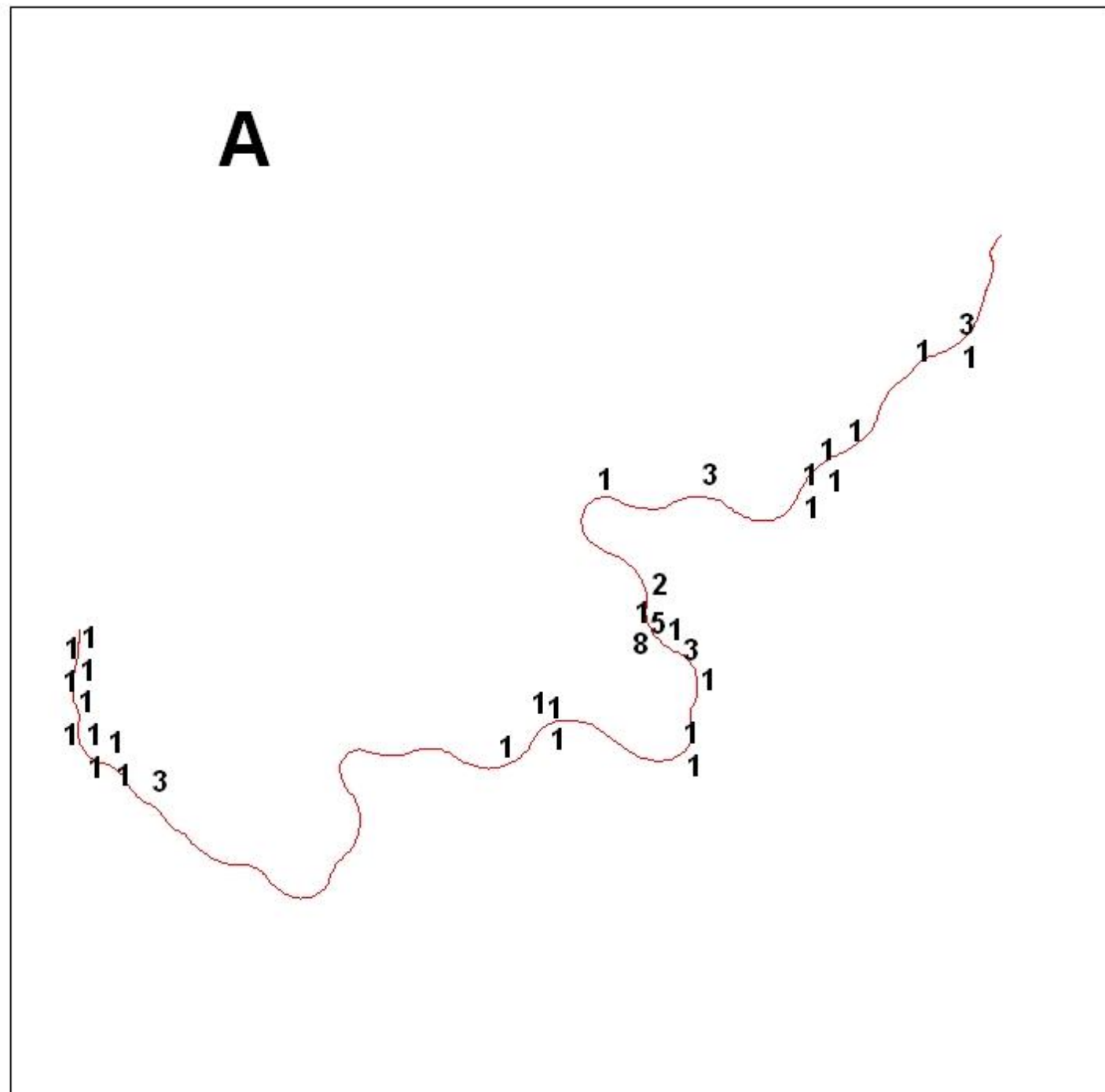


A

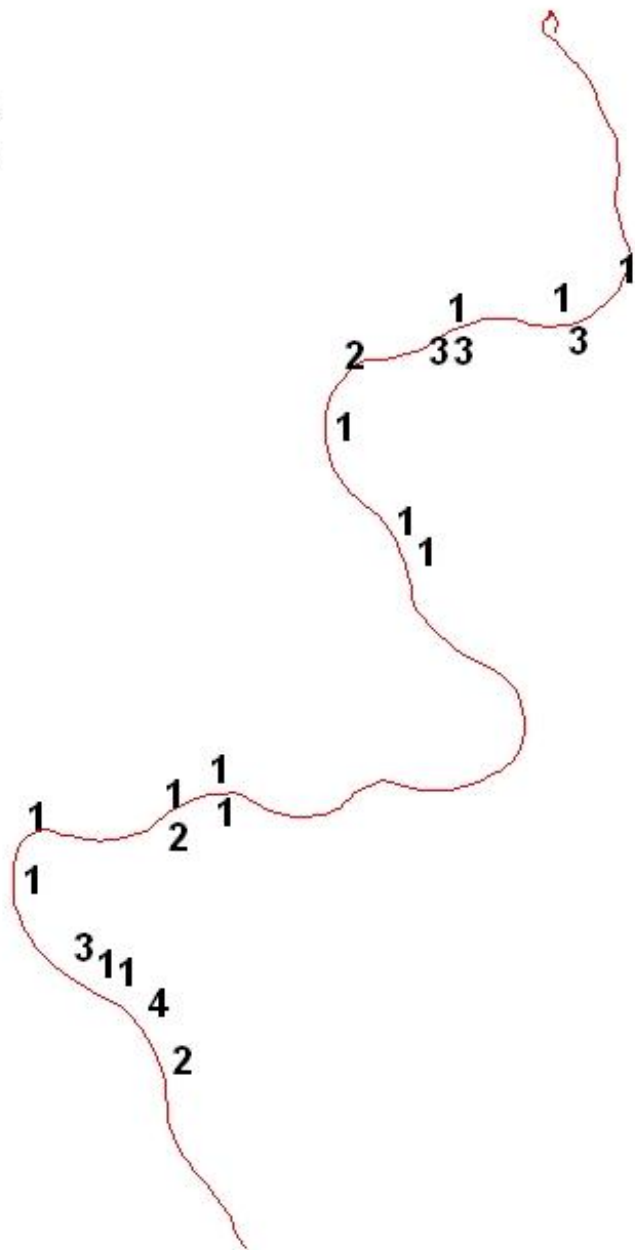
C

D

Continuous smolt distribution along trawling track



C



My experience:

**Strong resistance against
the hypothesis on overgrazing and predation
in particular from scientists who are not
marine ecologists but river scientists**