

Can we save the Baltic Sea?

Henrik Österblom
Baltic Nest Institute
Warsaw, May 8, 2008

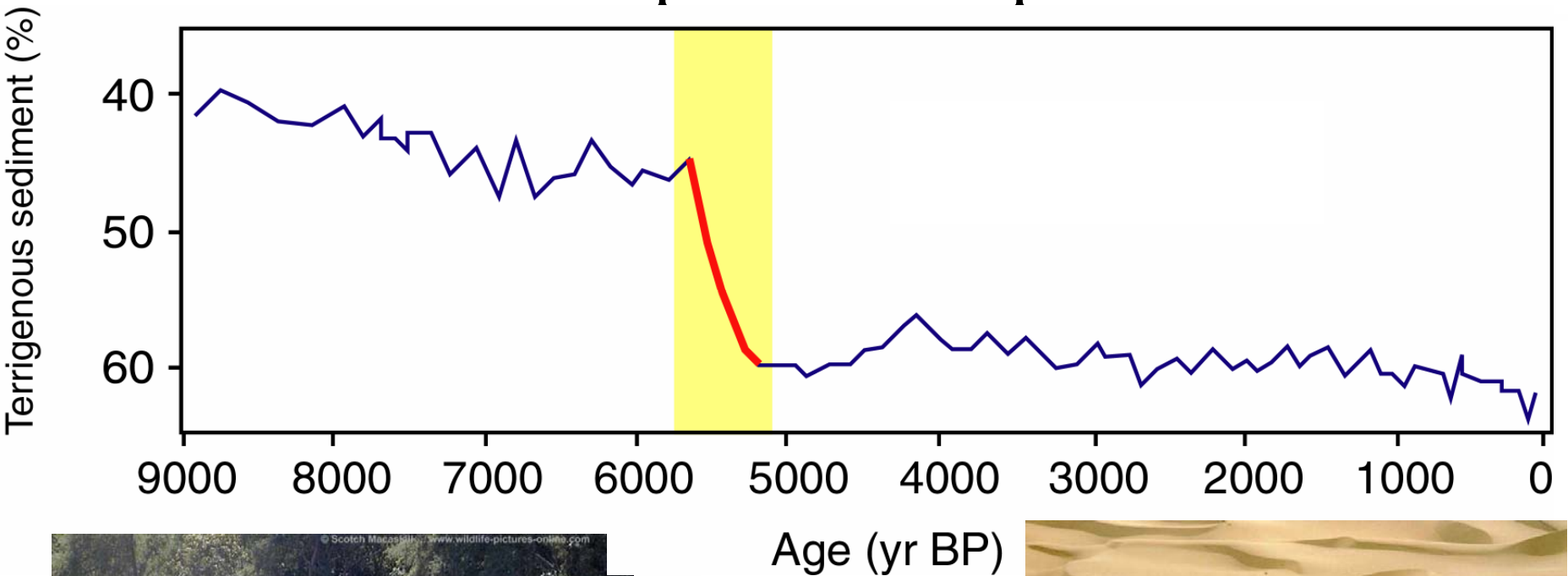
Outline

- General introduction to ecosystem dynamics
- What is the ecosystem approach?
- What does overfishing of cod mean for the ecosystem?
- What is our target for the ecosystem?
- Are we getting closer to the targets?

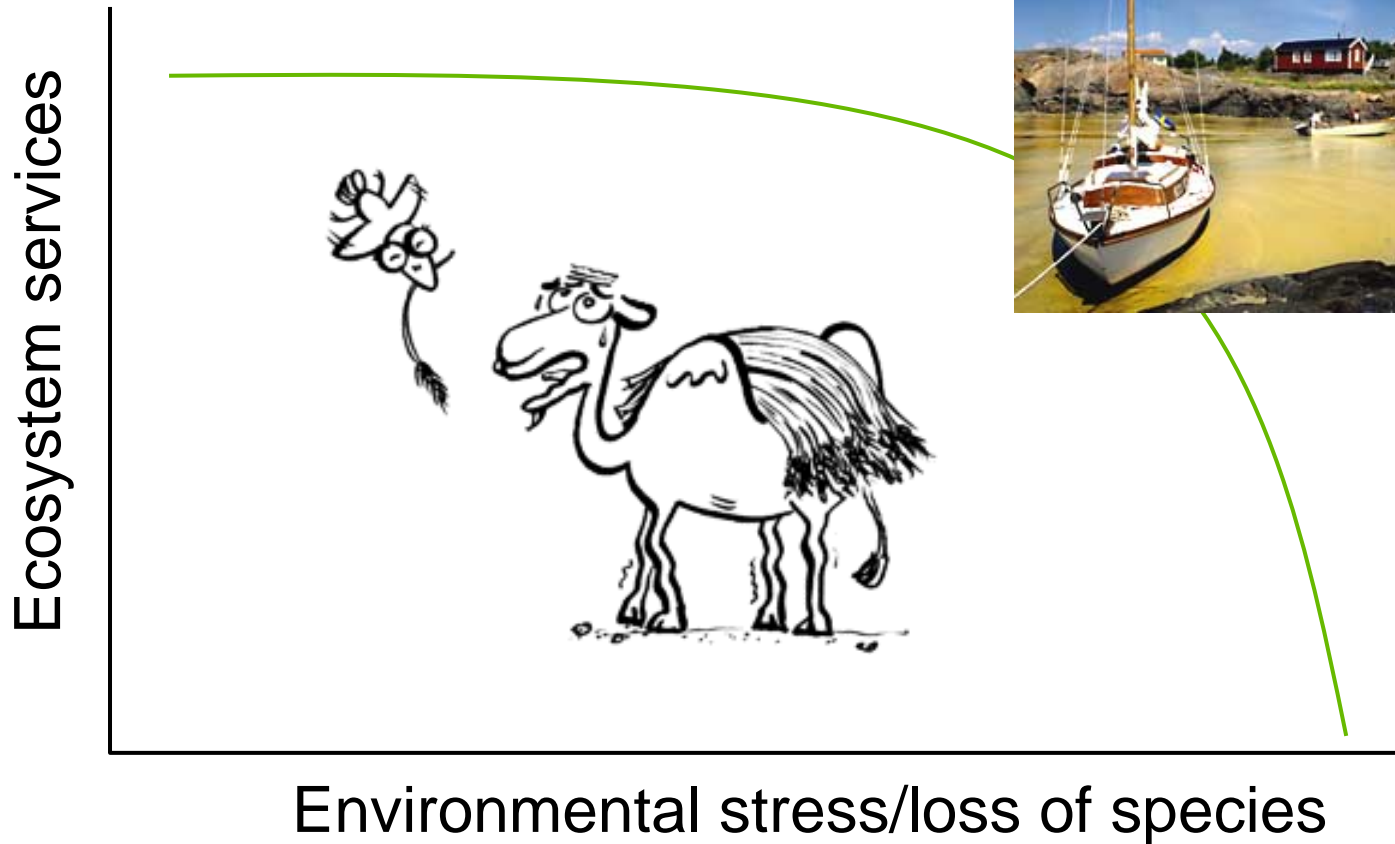
What is resilience?

Ecosystem resilience describes the capacity of an ecosystem to cope with disturbances, such as storms, fire and pollution, without shifting into a qualitatively different state.

Gradual loss of resilience can lead to unexpected collapse

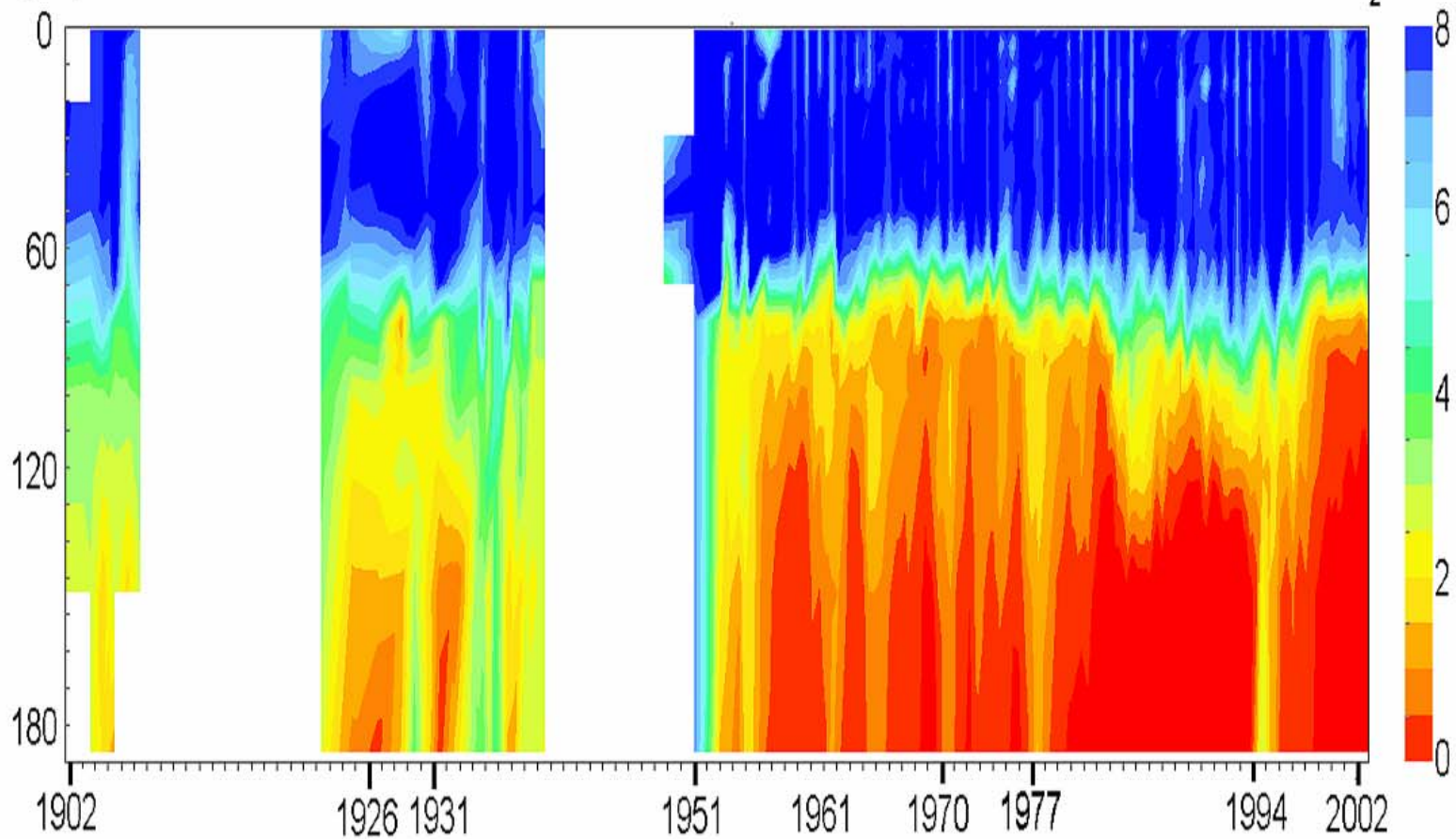


Threshold effects



Depth, meters

O₂ ml/l





Coral reefs



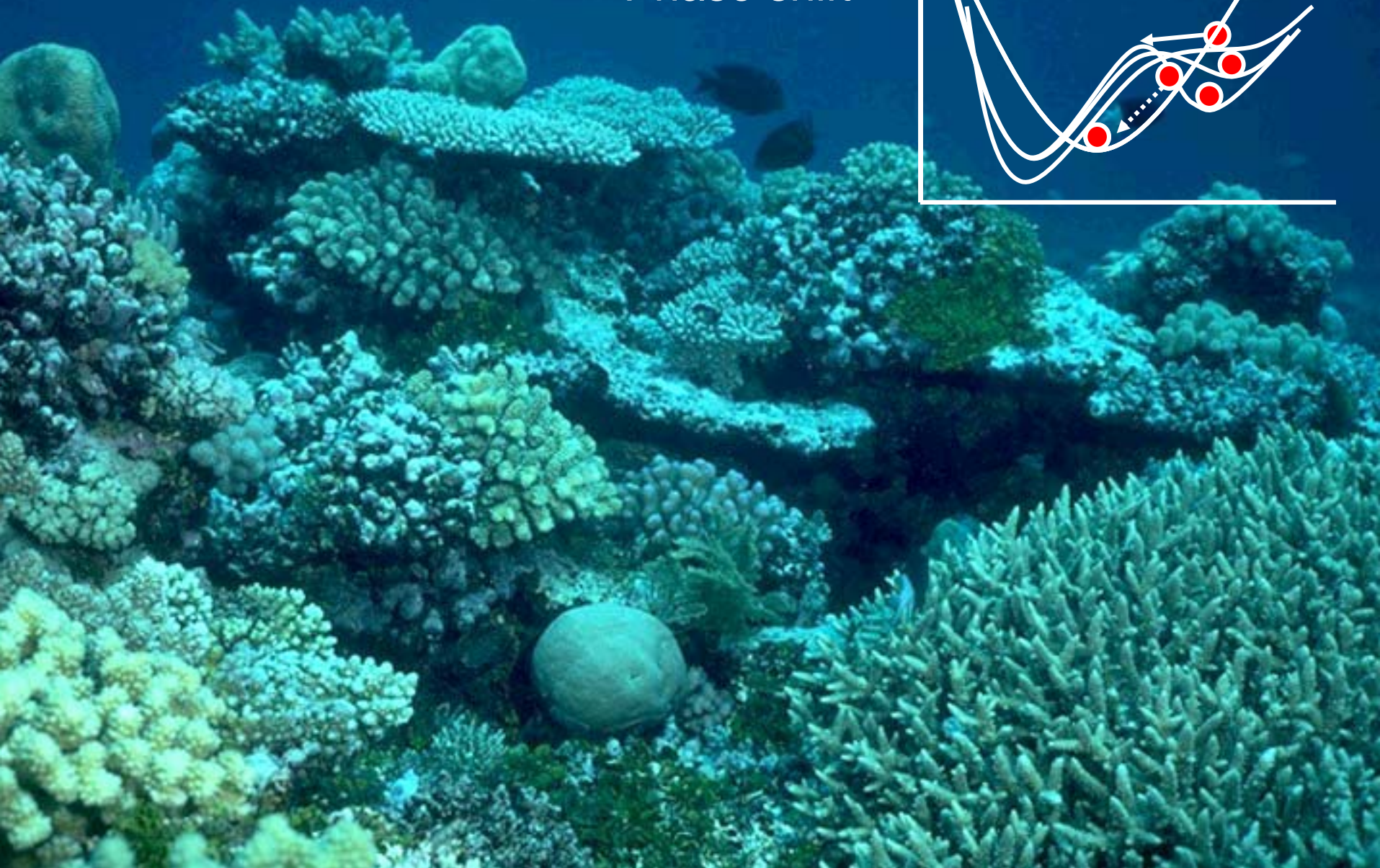
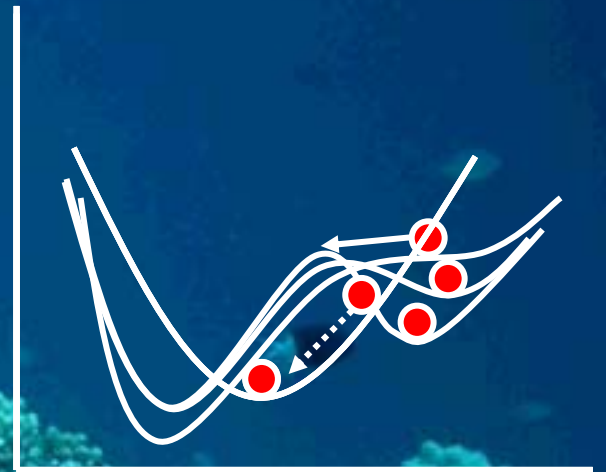
Grasslands



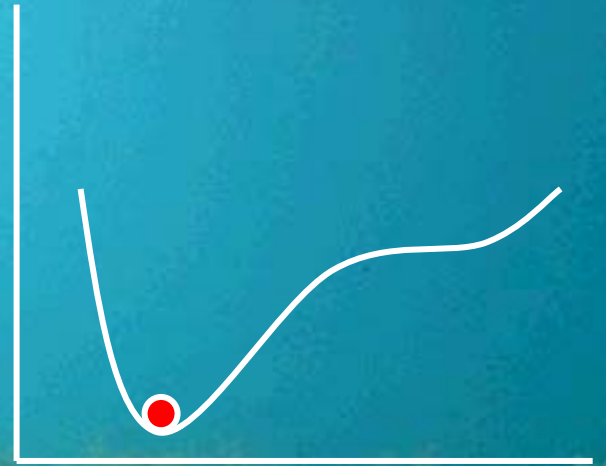
Tropical forests

Coral dominance

Phase shift



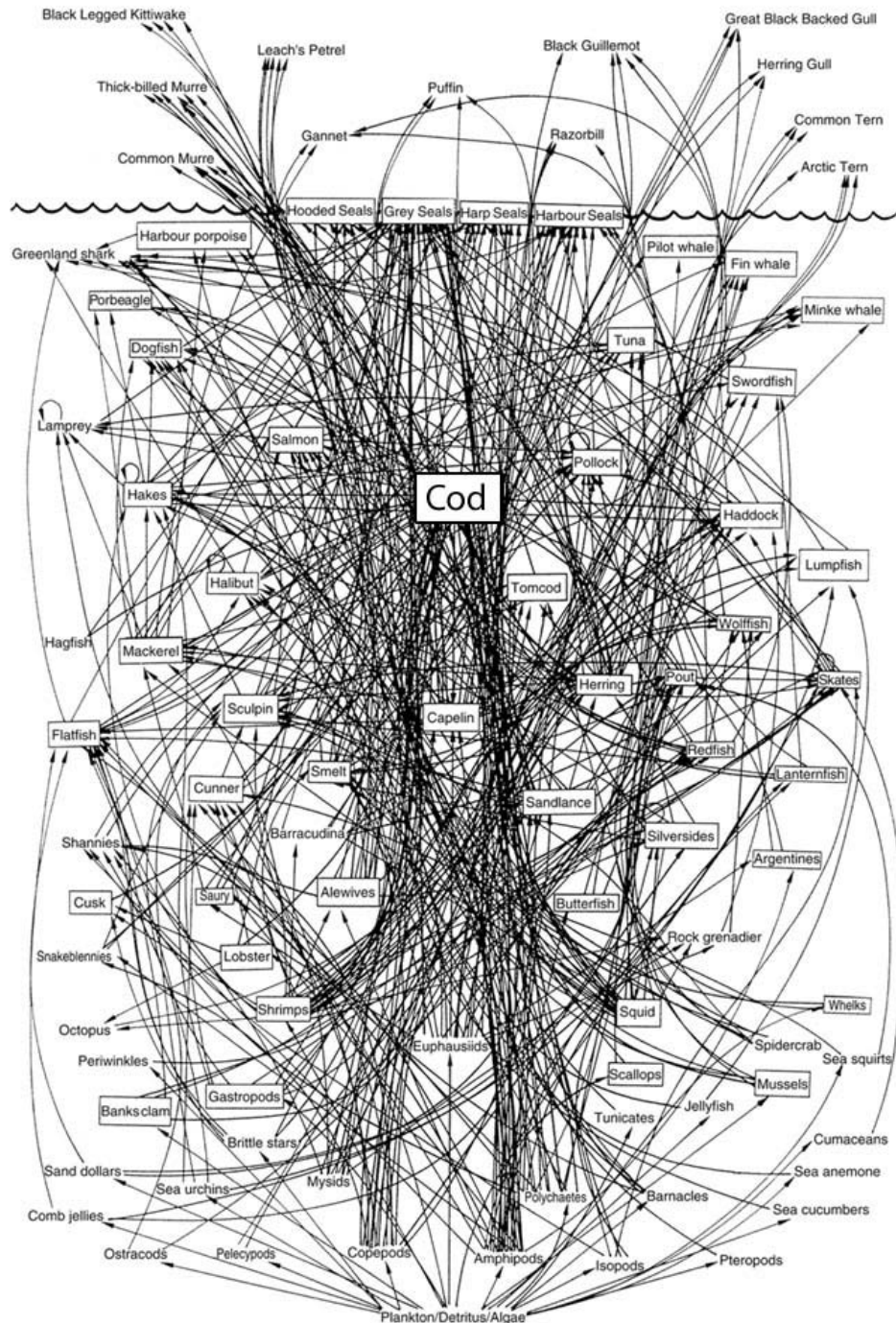
Algal dominance



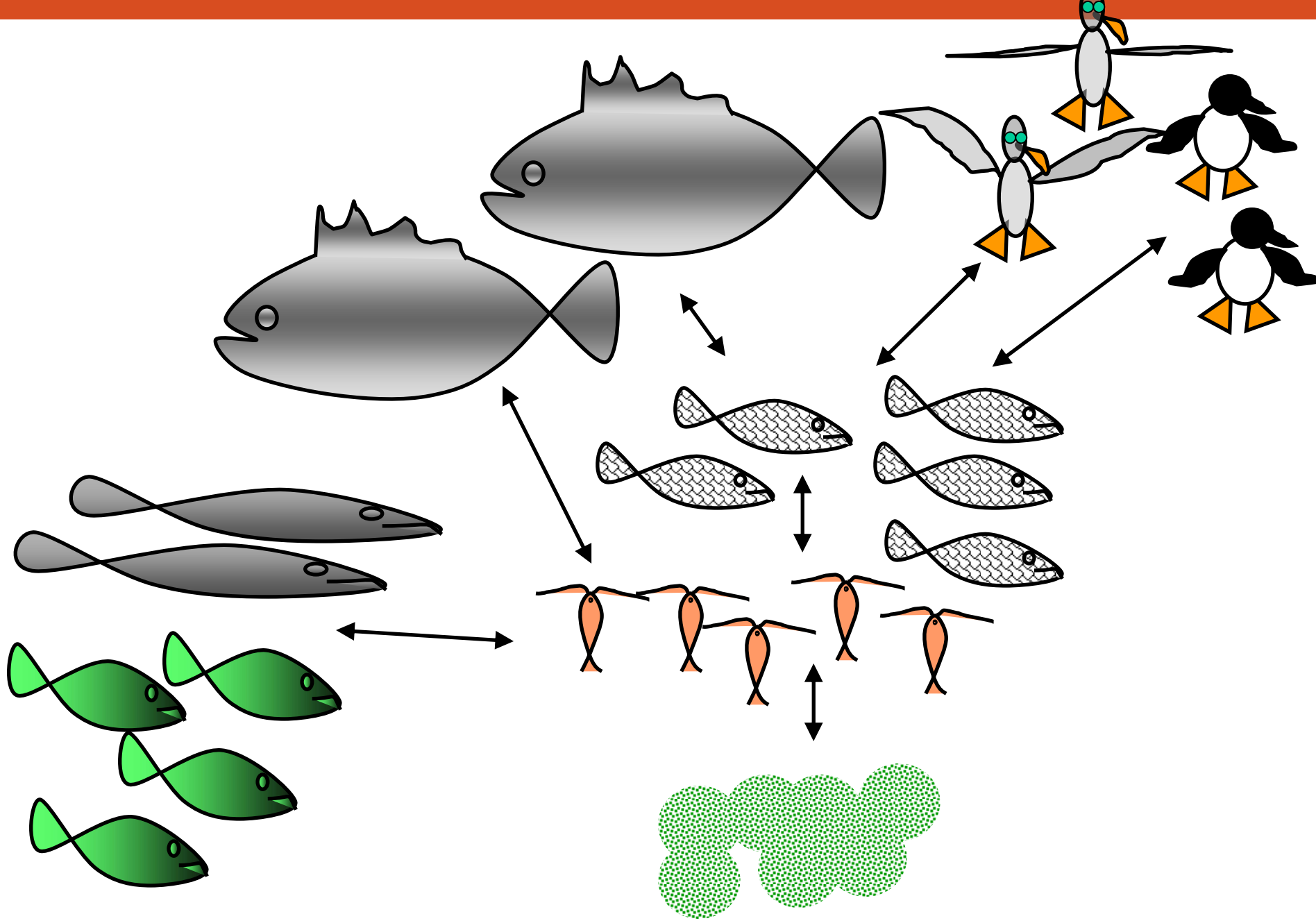
What is the ecosystem approach?

- Management is performed on the correct geographical scale
- Stakeholders are included
- Management that sustains ecosystem structure and function






A simplified food web for the Northwest Atlantic. © IMMA

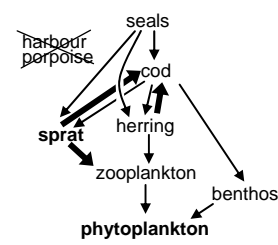
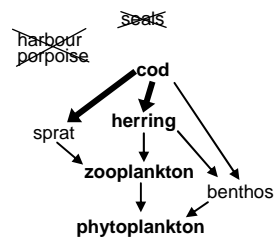
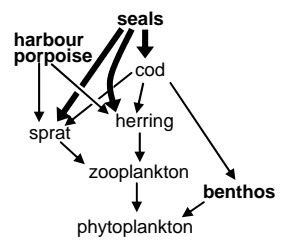
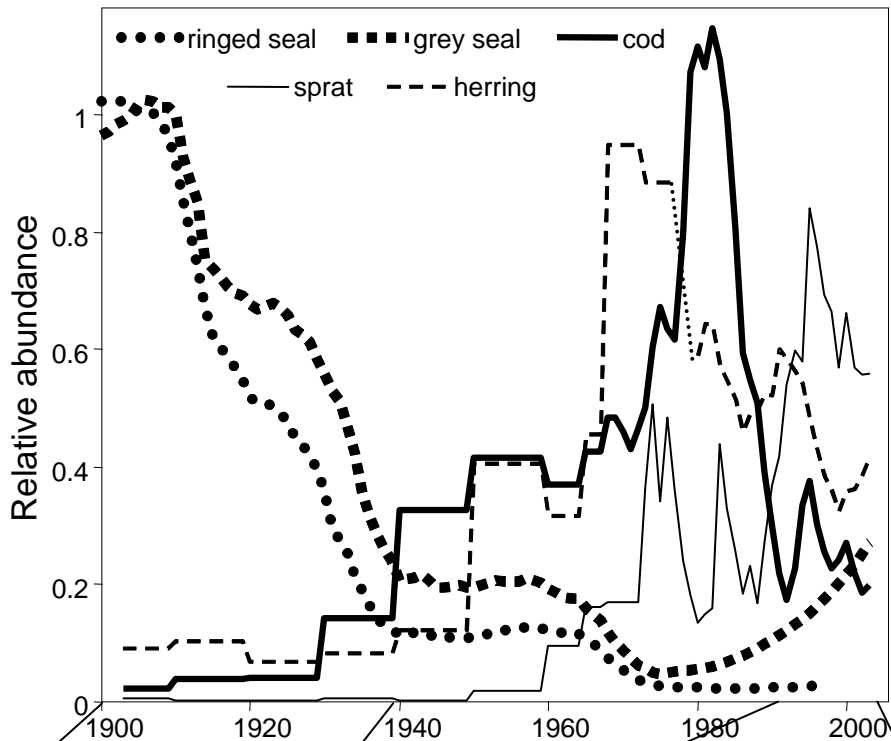




Curtain that
split the lake in
two sections

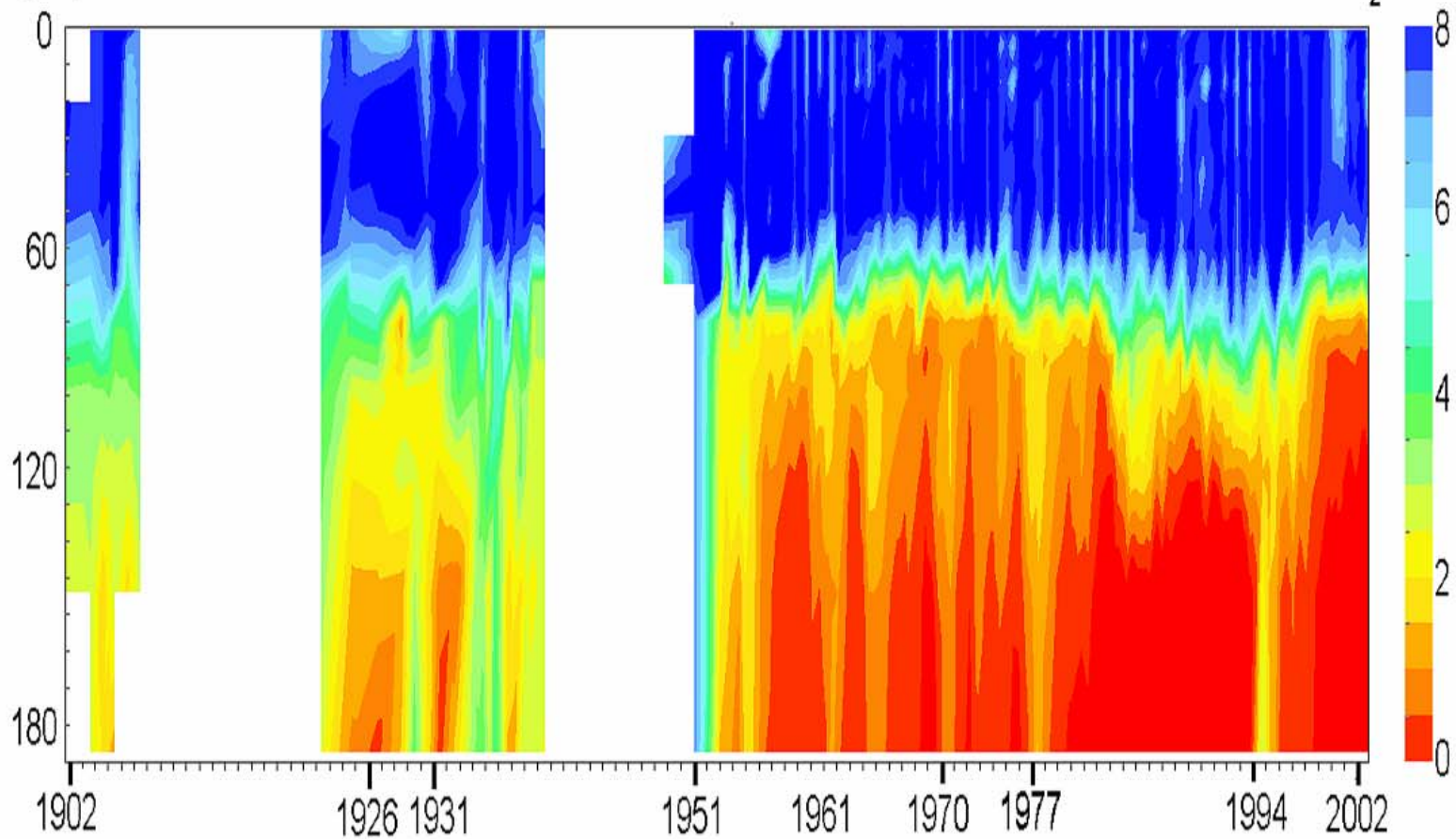


**Changes in fish stocks affects
the ecosystem...but what
factors drive changes in the
fish stock community?**

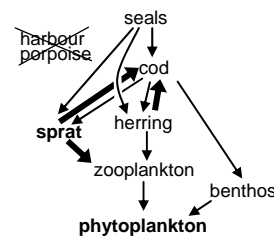
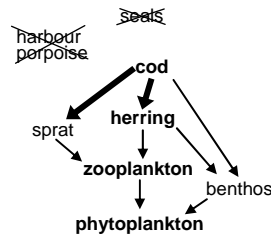
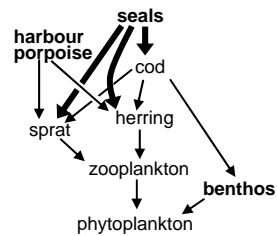
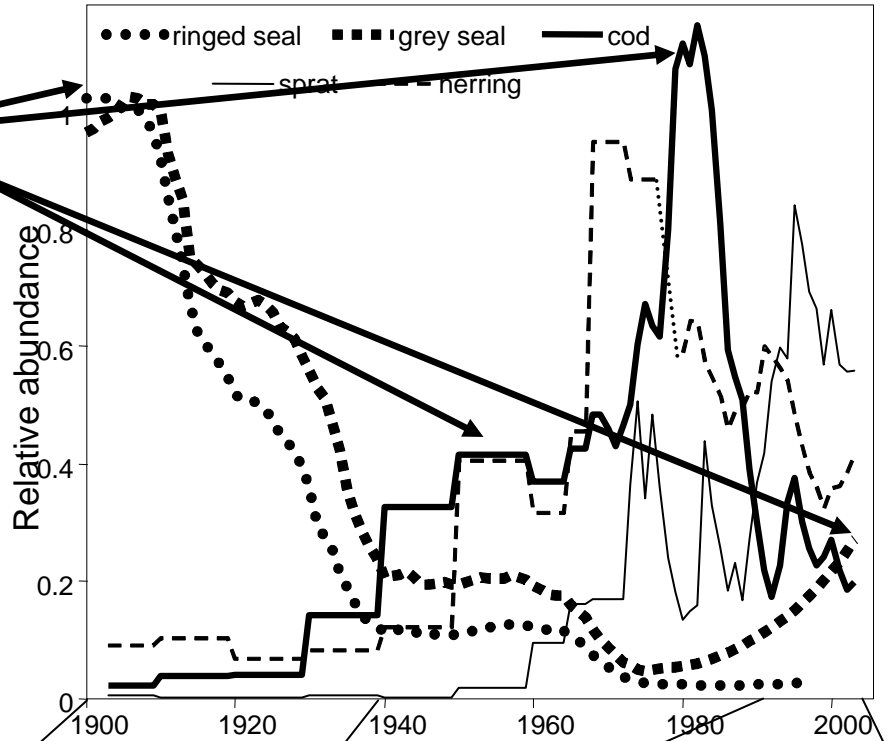


Depth, meters

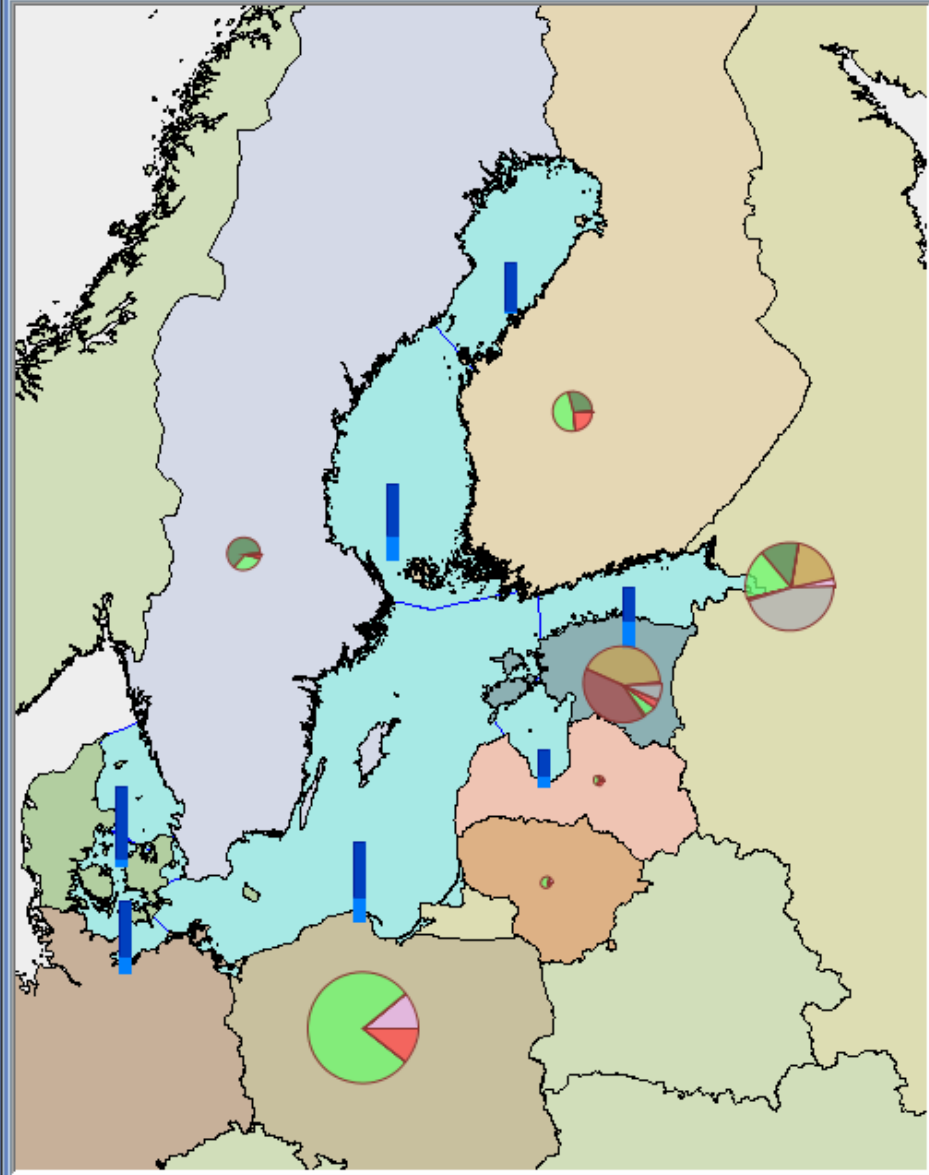
O₂ ml/l



Our target?



File **Warning: Some data behind this model are outdated!**



Input data

Targets Measures

Region	Transparency	Improvement
Bothnian Bay	5.6	0.0
Bothnian Sea	5.9	0.0
Baltic Proper	6.3	0.0
Gulf of Finland	3.9	3.0
Gulf of Riga	3.0	0.0
Danish Straits	6.3	0.0
Kattegat	8.2	0.0

Calculate

Result

Countries Sea regions

Region	Nitrogen	Phosphorus	Transparency	Improvement
Bothnian Bay	16.7	0.22	5.7	0.1
Bothnian Sea	15.0	0.44	8.6	2.7
Baltic Proper	16.8	1.02	9.2	2.9
Gulf of Finland	17.4	0.71	6.9	3.0
Gulf of Riga	28.0	0.96	4.3	1.2
Danish Straits	18.1	0.88	8.2	1.9
Kattegat	16.9	0.71	9.1	0.9

Managing eutrophication and fisheries

- HELCOM BSAP a good start to define targets, not it is time to estimate costs, secure funds and get to work
- ICES recommendations still not followed – need for increased public awareness and political pressure – the time is right for this!
- European policy changes on the way, need to speed up and put substance to ambitions!

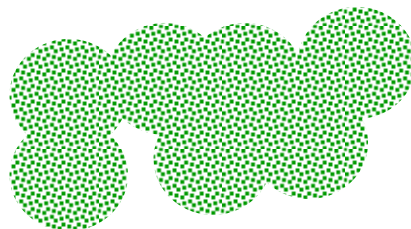
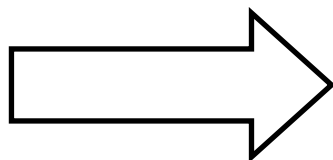
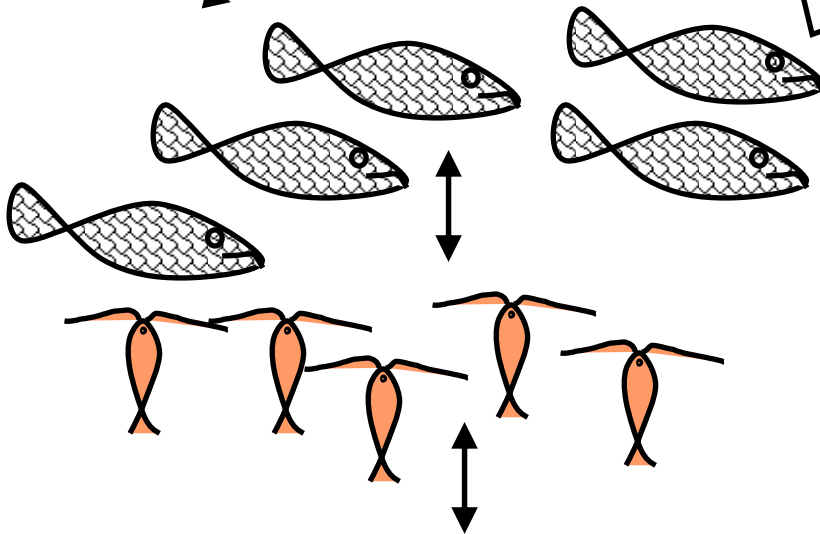
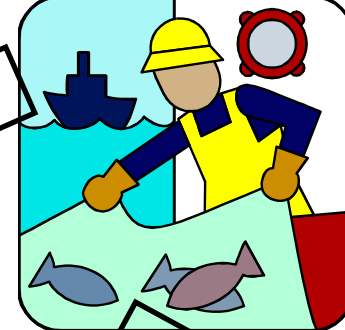
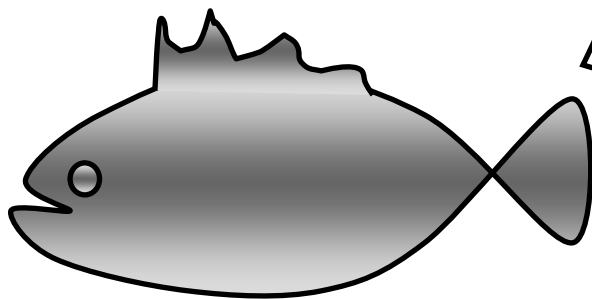
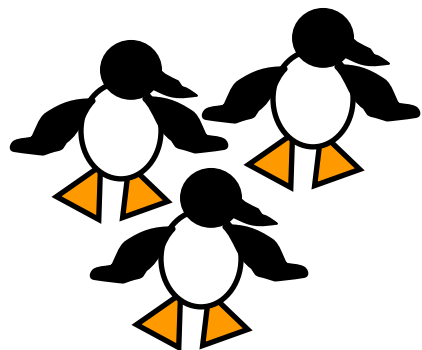
Conclusions

- Overfishing of cod has resulted in a number of consequences on the ecosystem – which we are only beginning to understand
- Enormous catches of cod during 1980s possible due to seal culling, eutrophication and favourable climate
- Big challenge, but yes, we can save the Baltic!

Thank you!

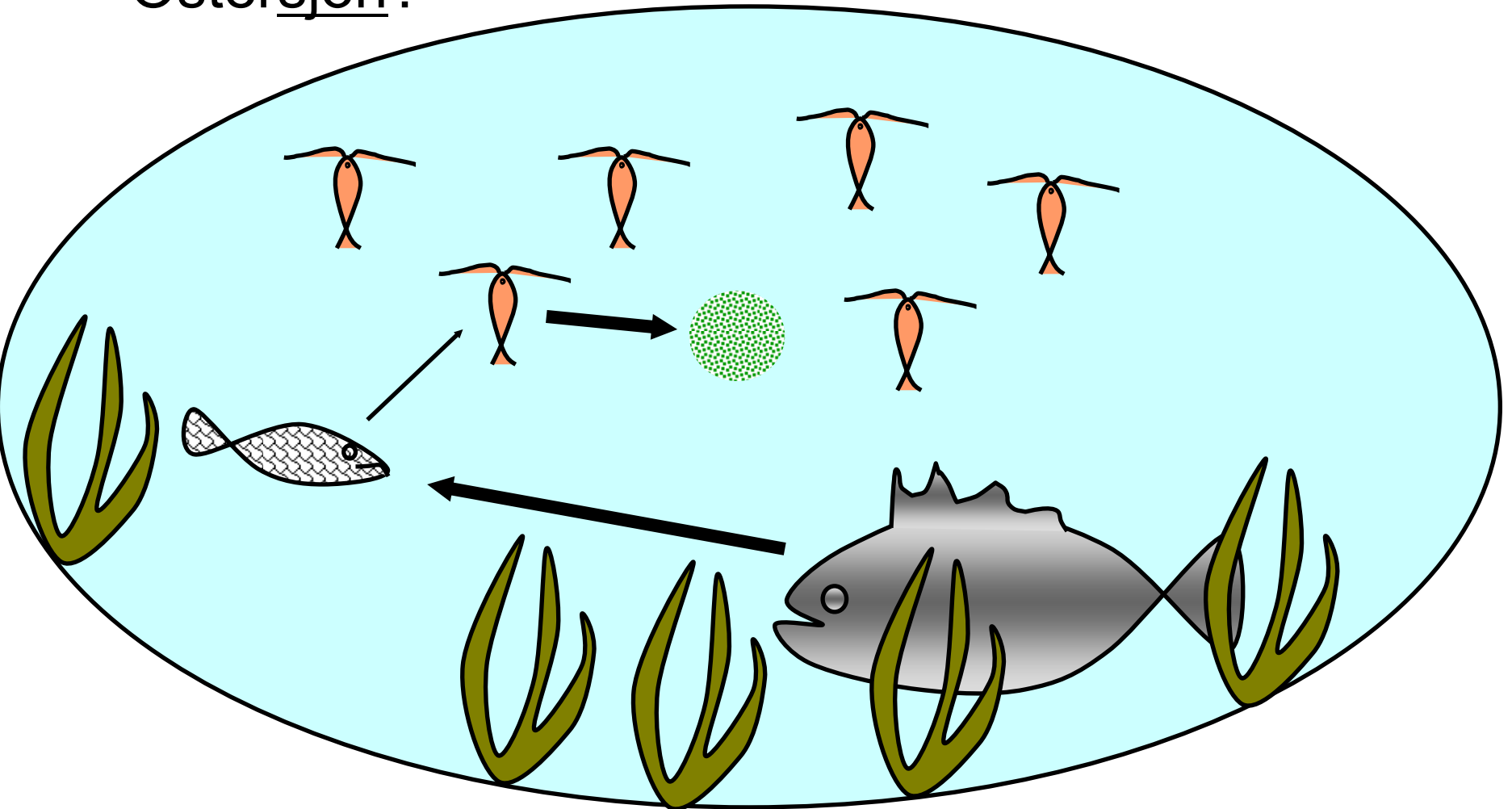
henrik.osterblom@stockholmresilience.su.se
hst@mbox.su.se

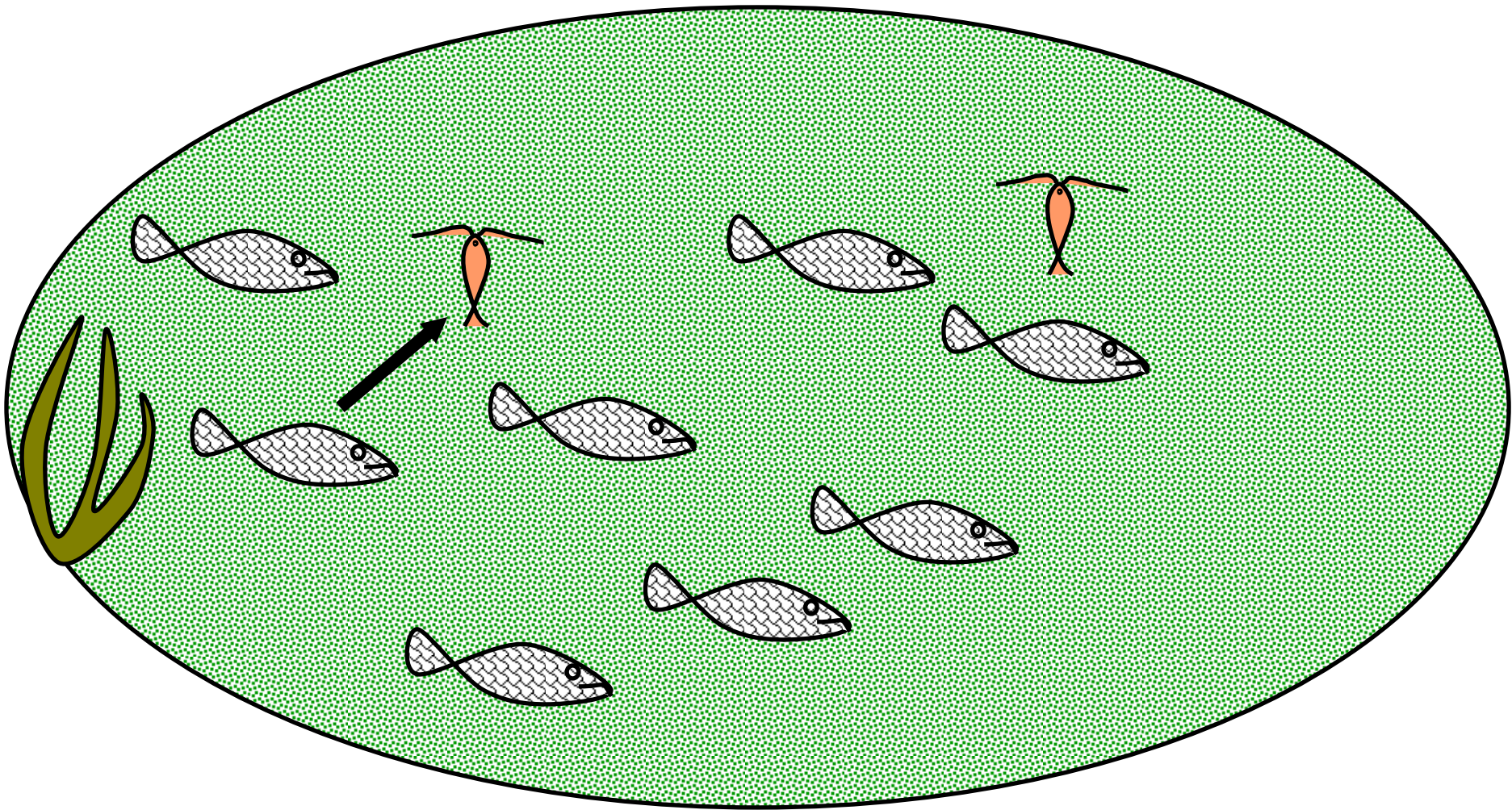
www.balticnest.org
www.stockholmresilience.su.se



Vi vet hur sjöar fungerar!

Finns relevanta likheter mellan sjöar och Östersjön?







★ Oslo

Stockho

★ Helsinki

★ Tallinn

Göteborg (

K

en)



★ Oslo

★ Stockholm

★ Helsinki

★ Tallinn

★ Göteborg (Gothenburg)

★ København (Copenhagen)

★ Vilnius



Image © 2007 TerraMetrics
Image NASA

©2007 Google™