BALANCE
3D Habitat mapping

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BALANCE Conference

25-26 October 2007

Copenhagen, Denmark

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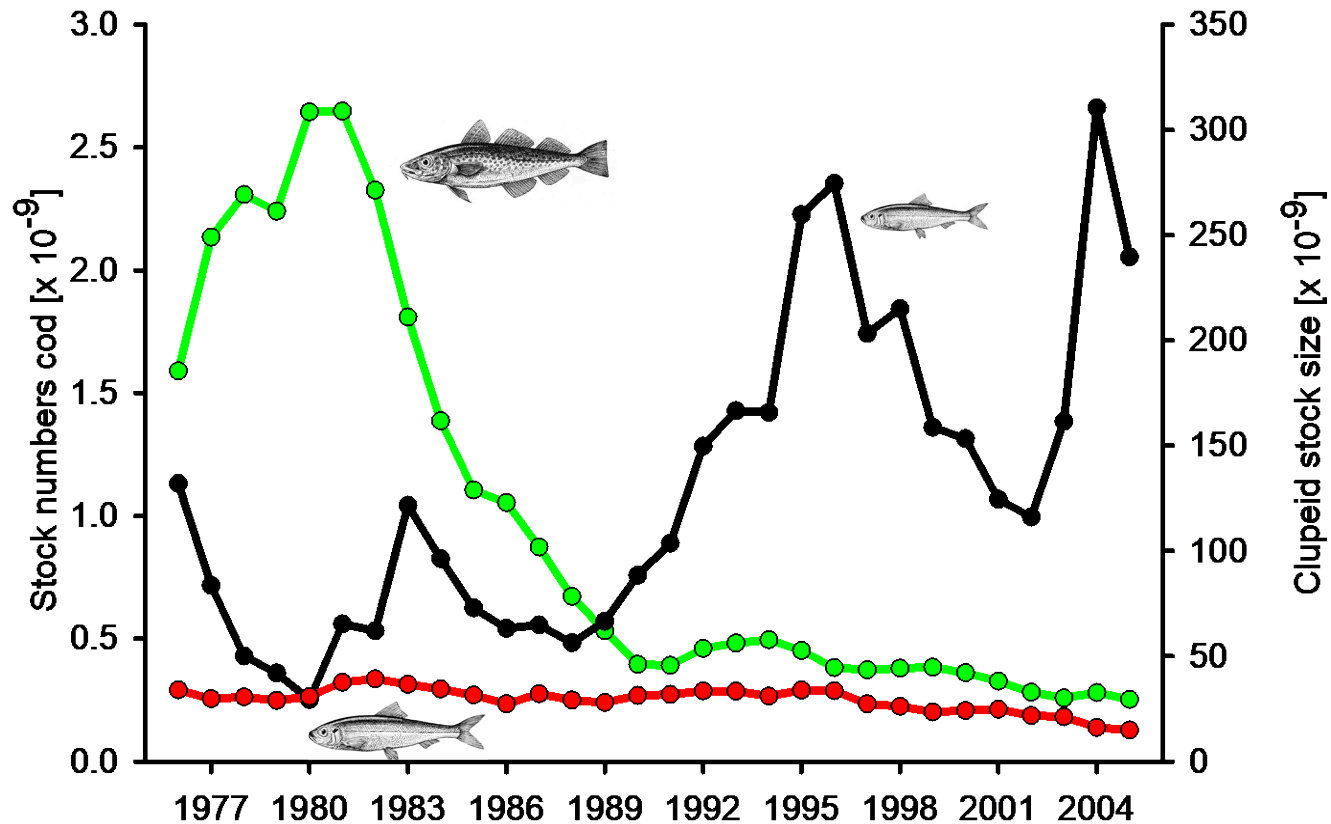
Why is this important?

Planning of closures in space and time

Understanding how climatic changes force fish dispersal

Introduction

1) The Baltic – cod decline, topography, stratification and inflows

2) Fish dispersion in relation to salinity, temperature and oxygen

3) 2D mapping

4) From 2D to 3D
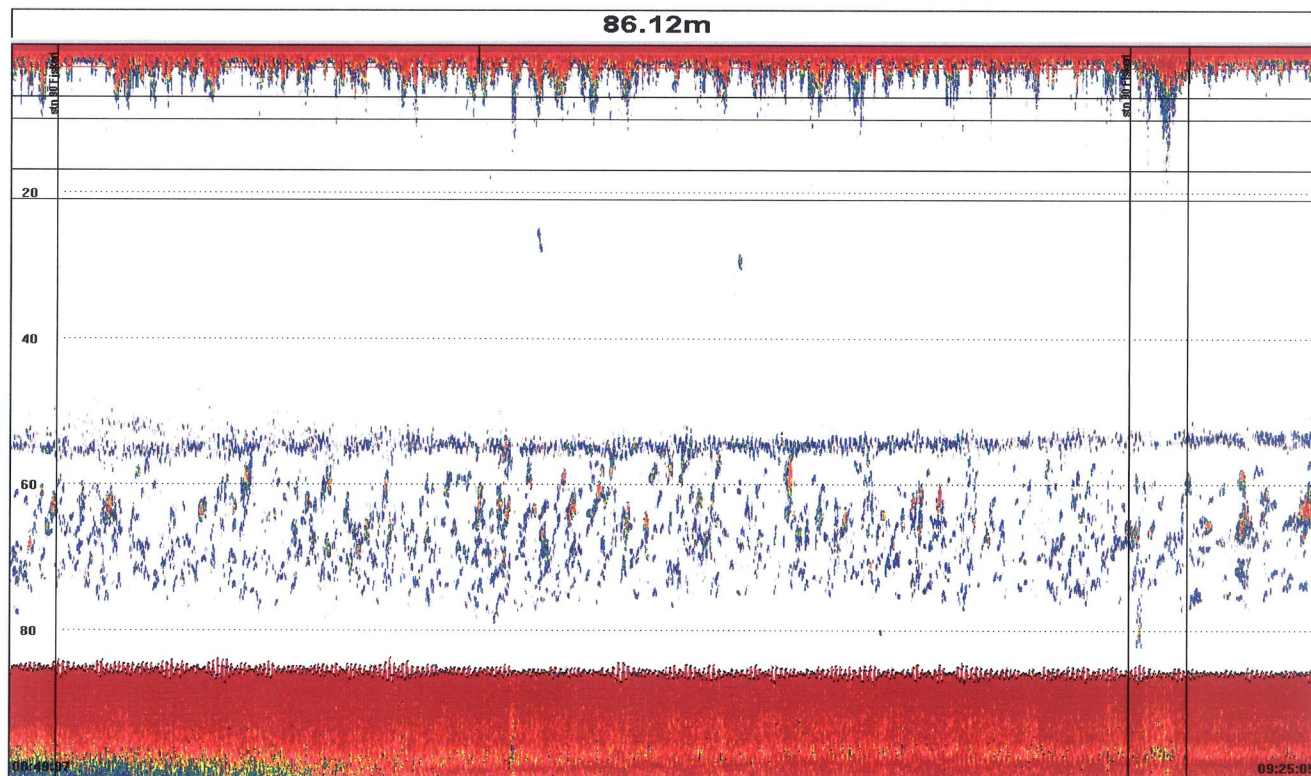
5) 3D time series

6) Conclusions

Baltic cod in decline

The Baltic – Topography, vertical stratification and inflows
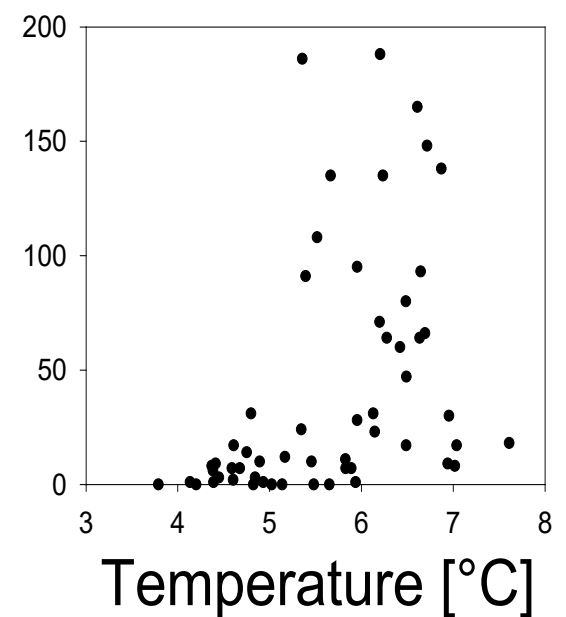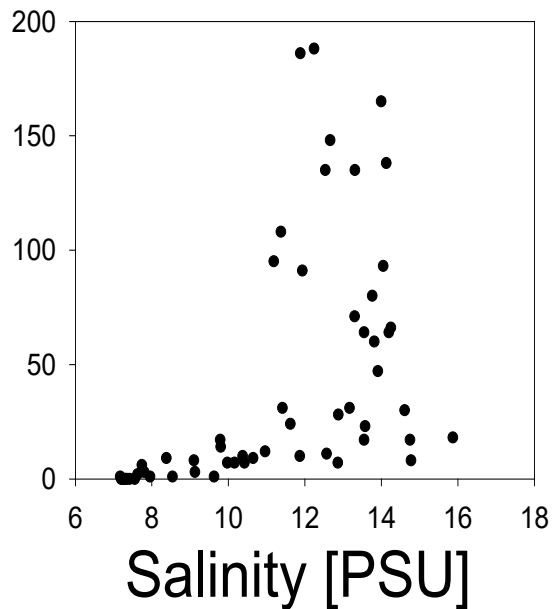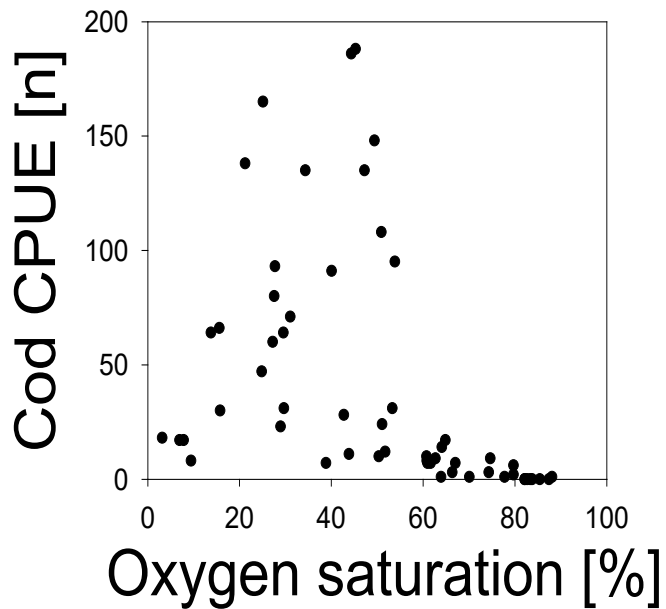

Oxygen saturation [%]

Salinity and Temperature [°C]
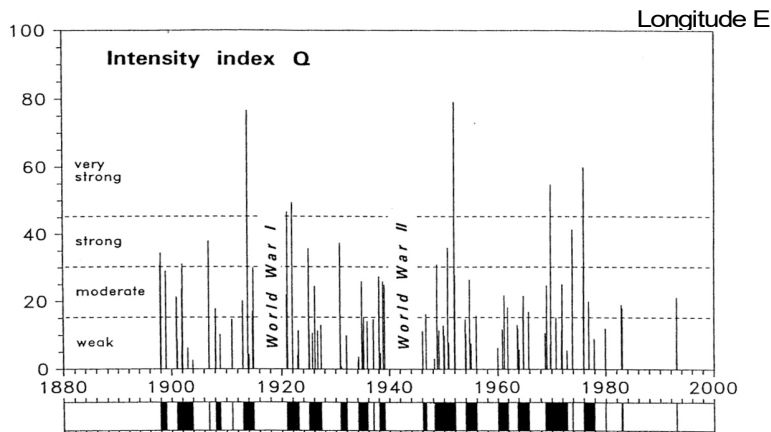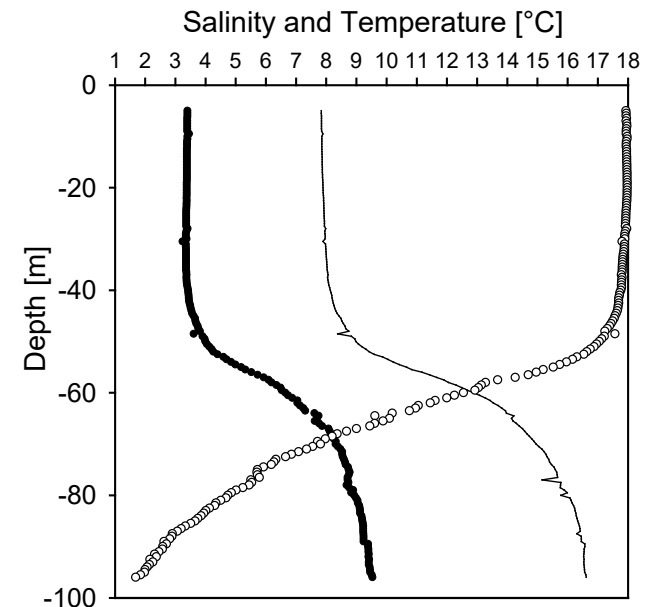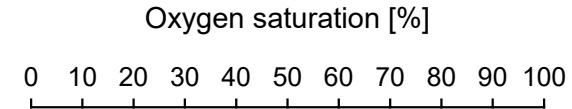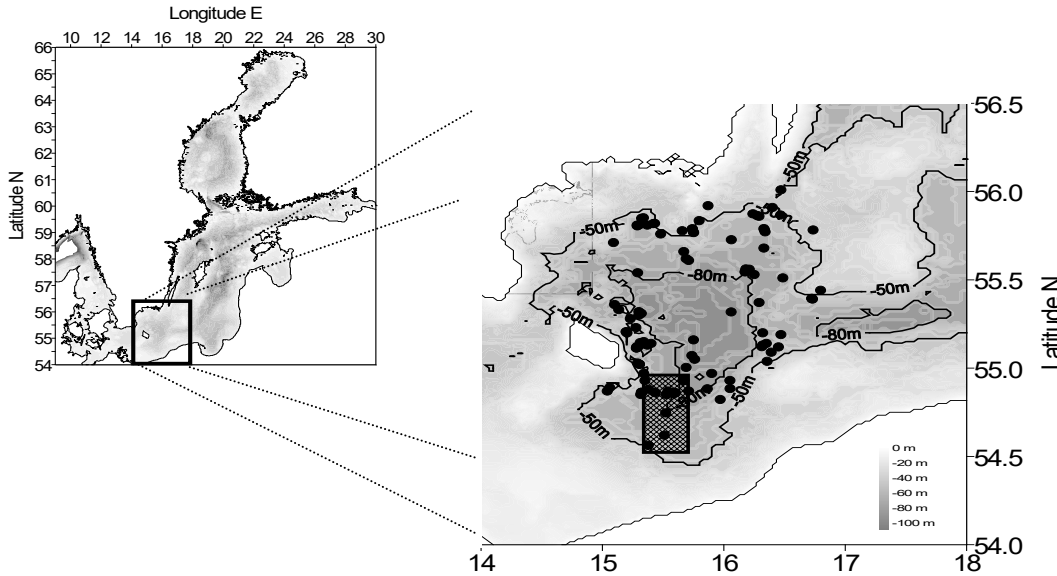
Q is a relative measure that ranges between 0 (k=5 days, S=17 PSU) and 100 (k=30 days, S=24 PSU). The graph is from Matthäus (1993). Additional inflows in 1994 and 2003.
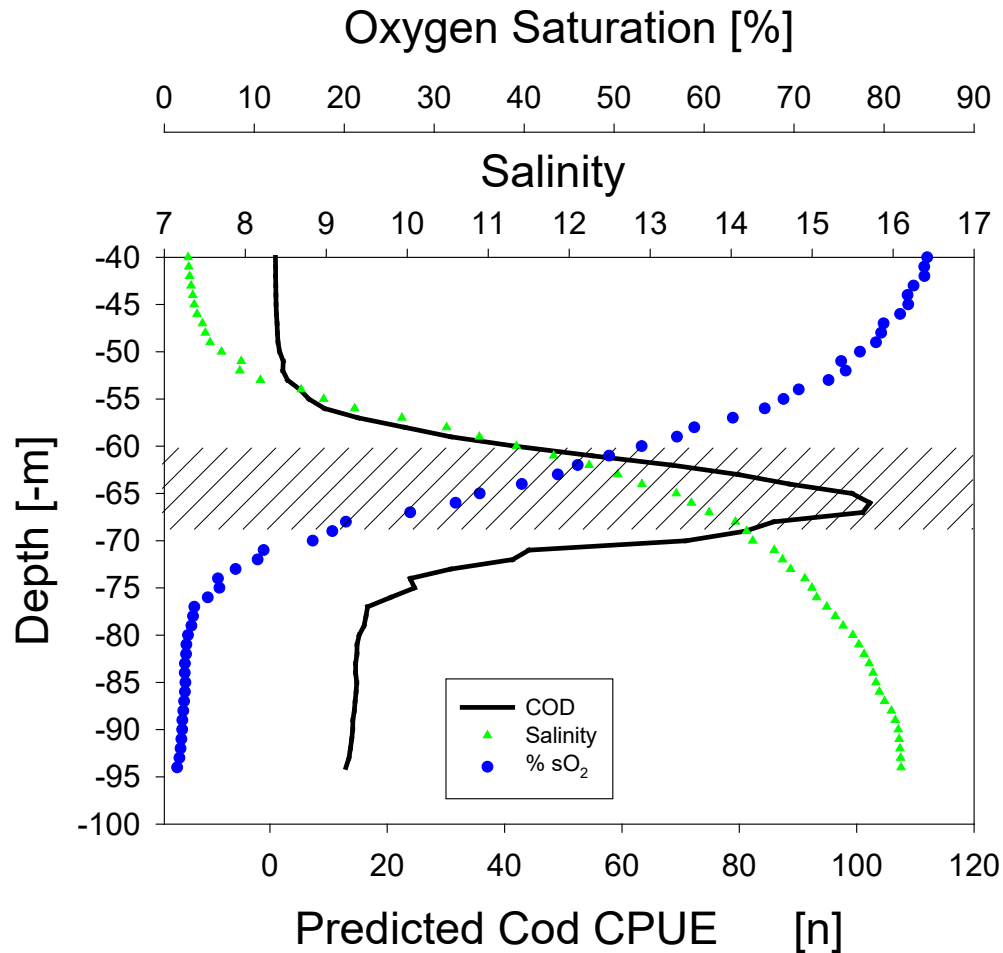
Fish dispersion - acoustics

Fish dispersion - Trawl survey catches

Fish dispersion – vertical modelling

2D mapping - ICES CTD stations 1994 to 2005
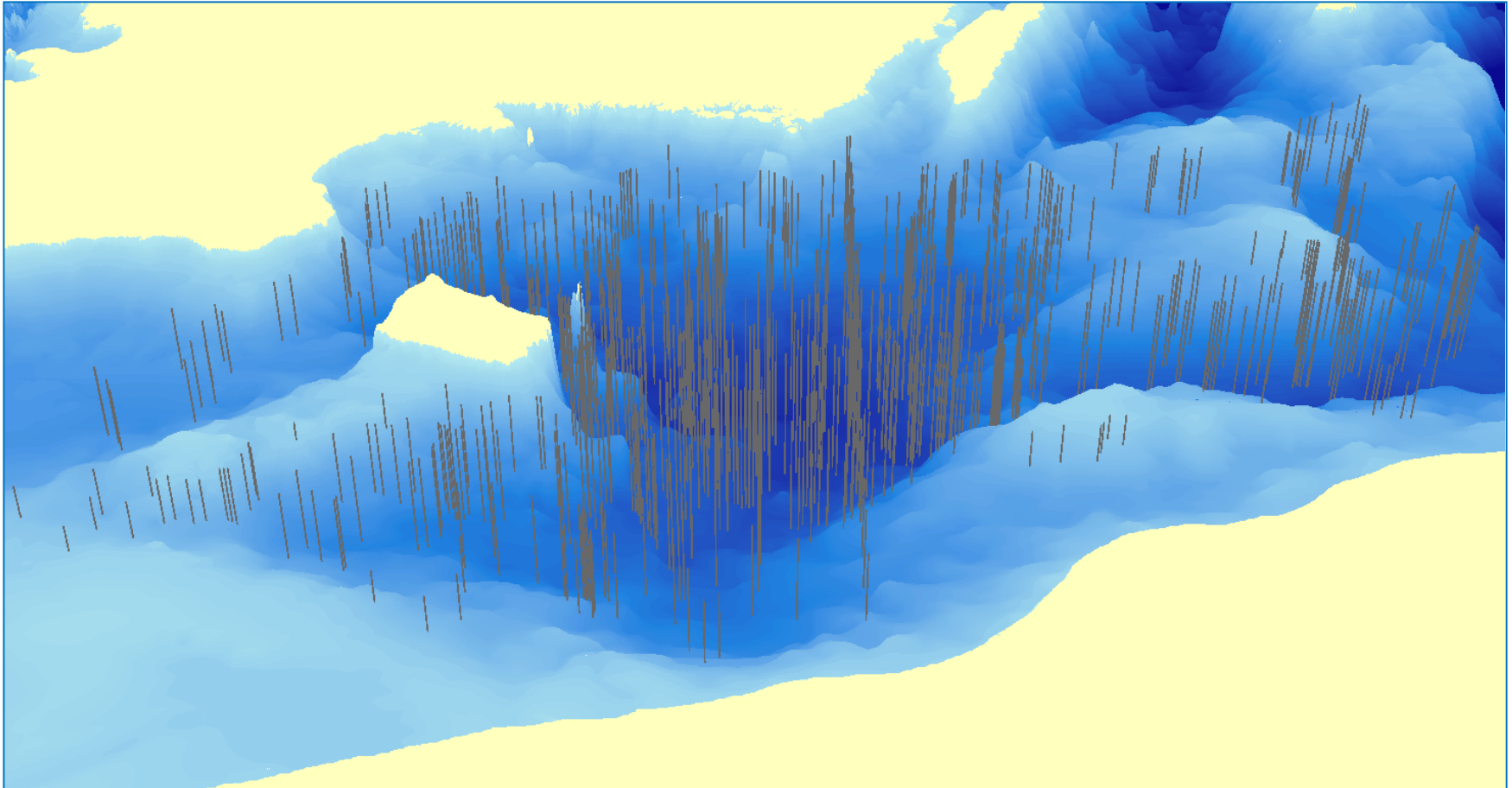
Stations suitable
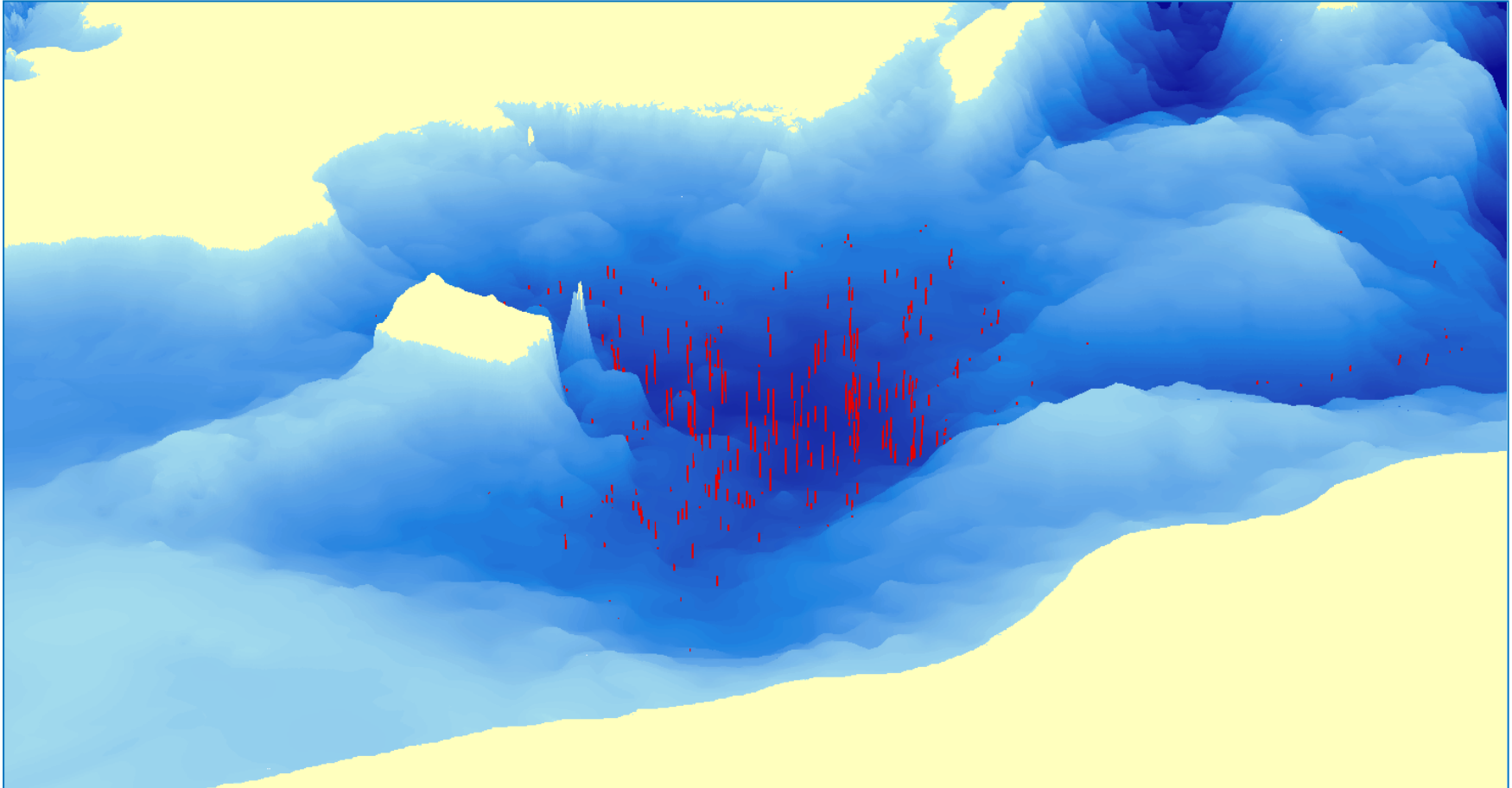for
cod egg survival

2D mapping – Cod eggs and larvae

Geitner et al.,
this conference

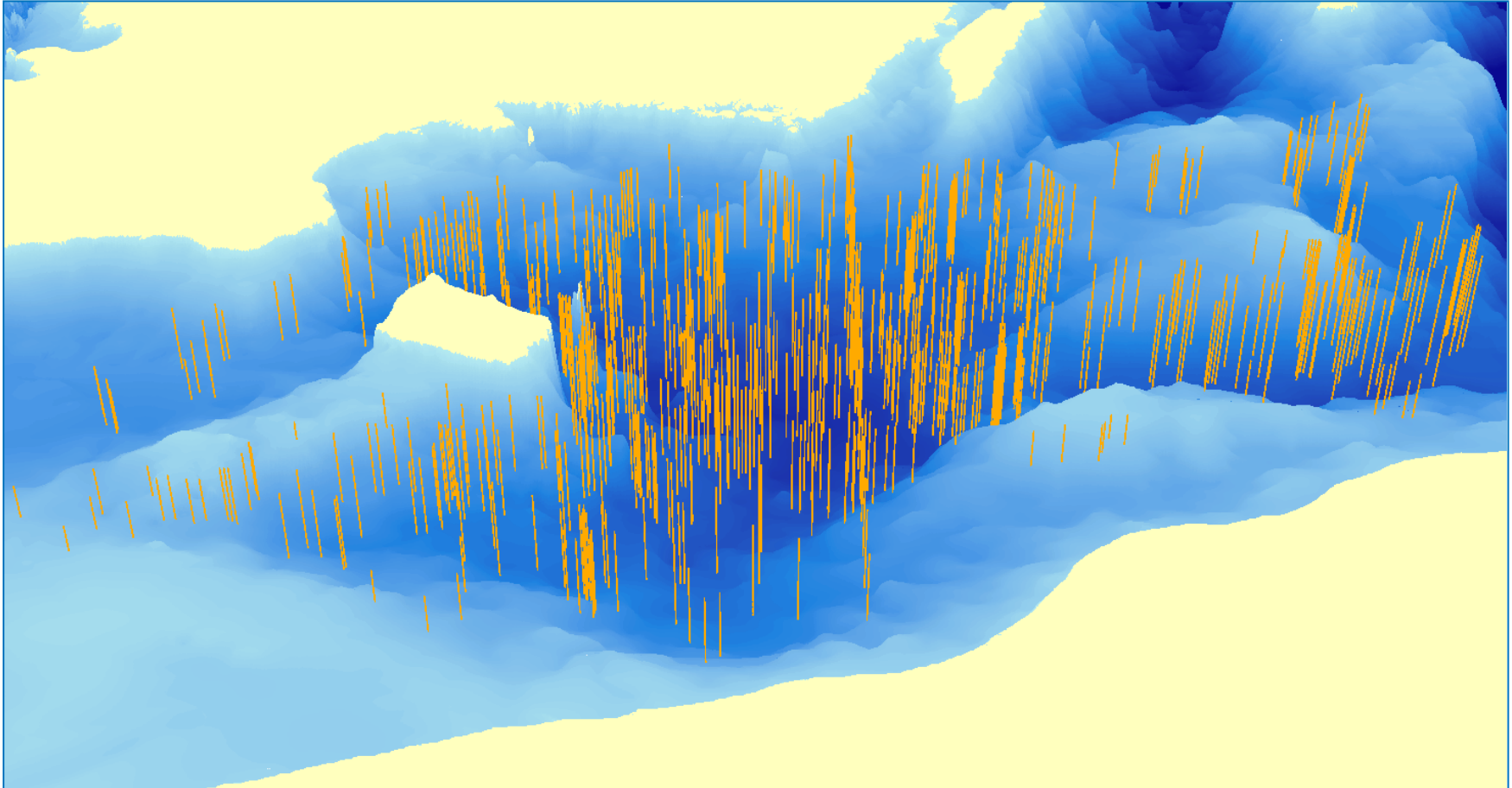# From 2D to 3D - ICES CTD stations 1994 to 2005

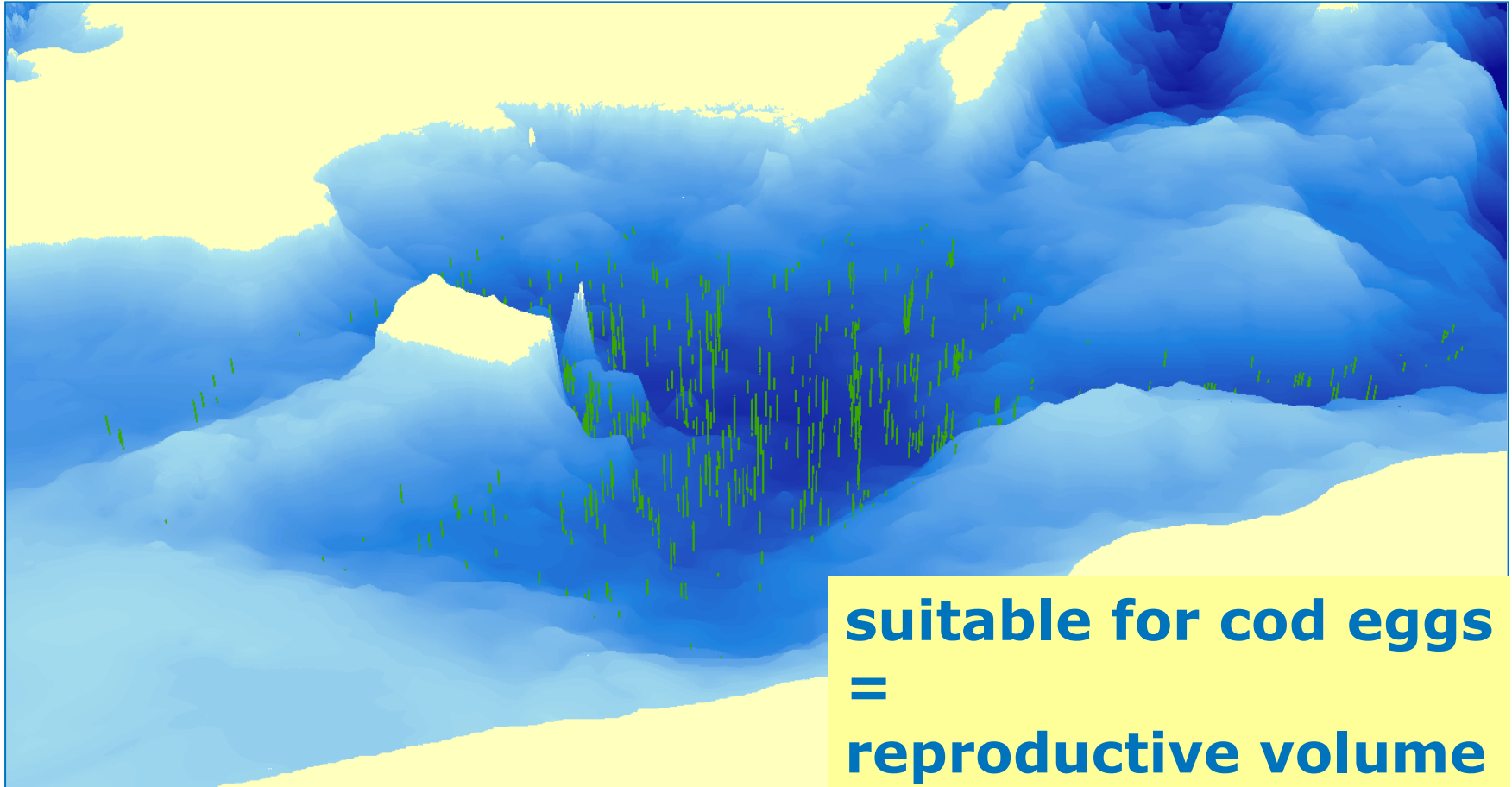# From 2D to 3D - ICES CTD stations Oxygen<2ml/l

From 2D to 3D - ICES CTD stations salinity<11 ppt

From 2D to 3D - ICES CTD stations
Oxygen>2 ml/l, salinity<11 ppt
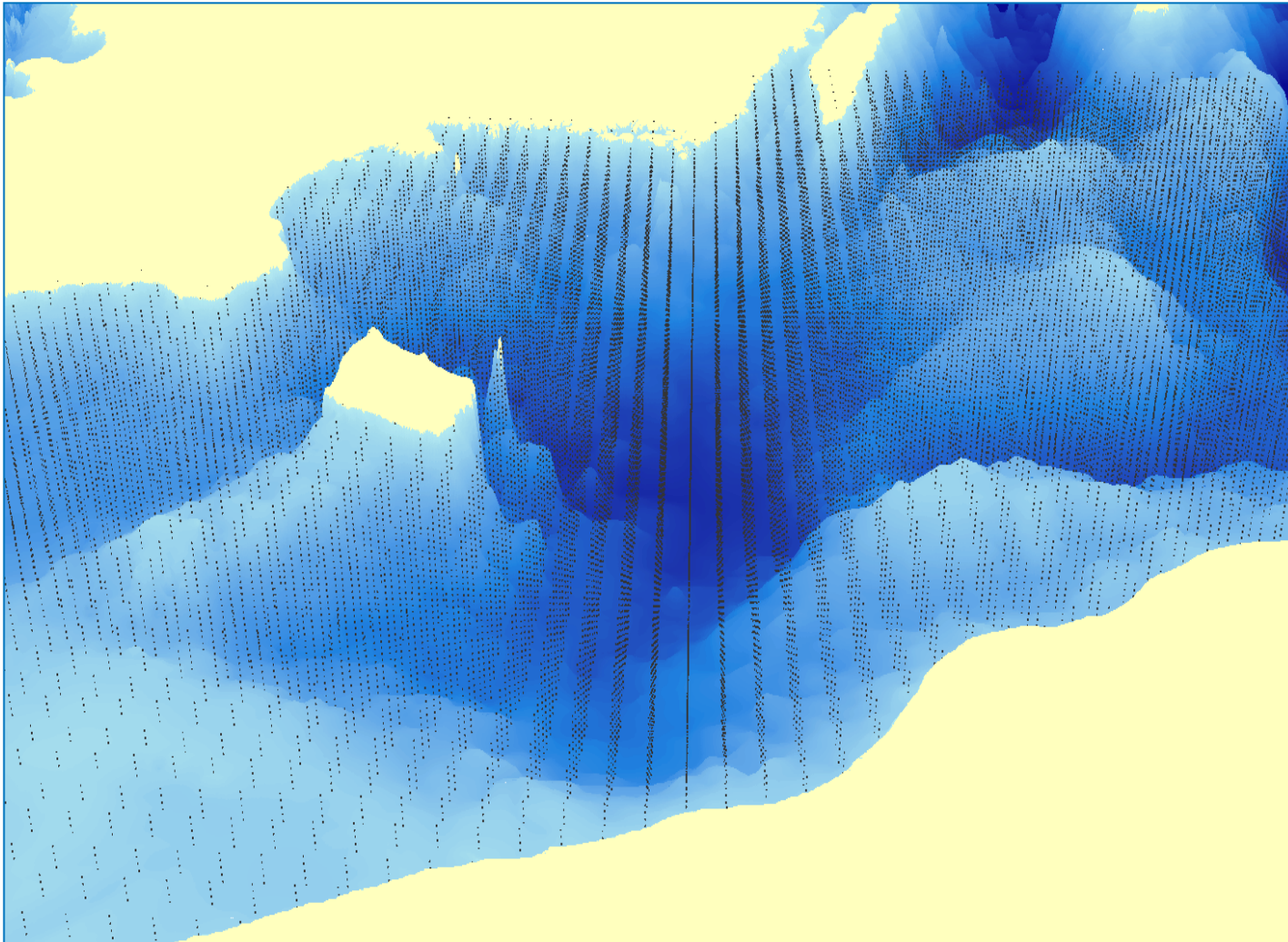

suitable for cod eggs
=
reproductive volume

From 2D to 3D – reproductive volume

Bornholm Basin of the Baltic Sea
ICES CTD stations - Cod Egg Habitat
Temperature > 1.5 °C, Salinity > 11 PSU, Oxygen > 2 ml/l
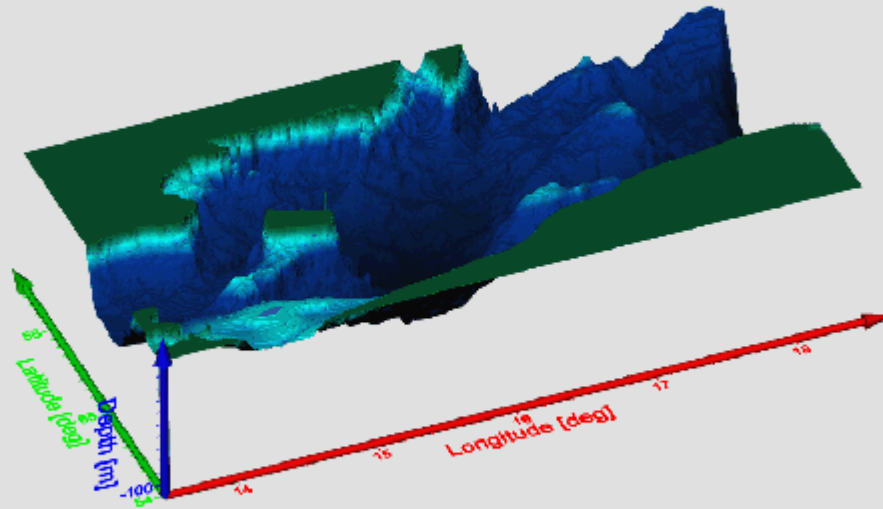1994 - 2005
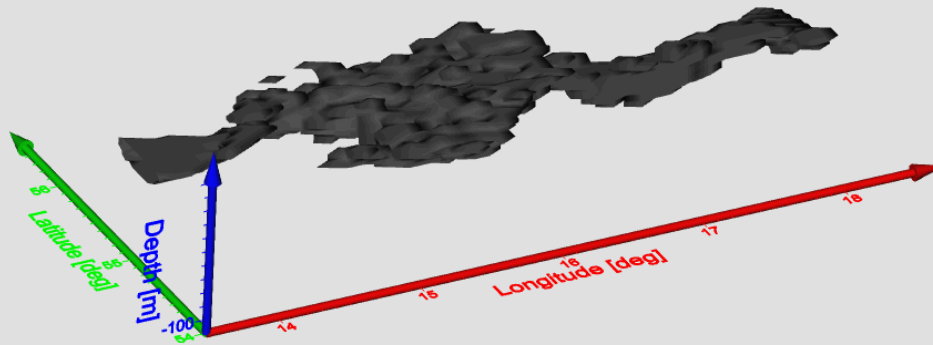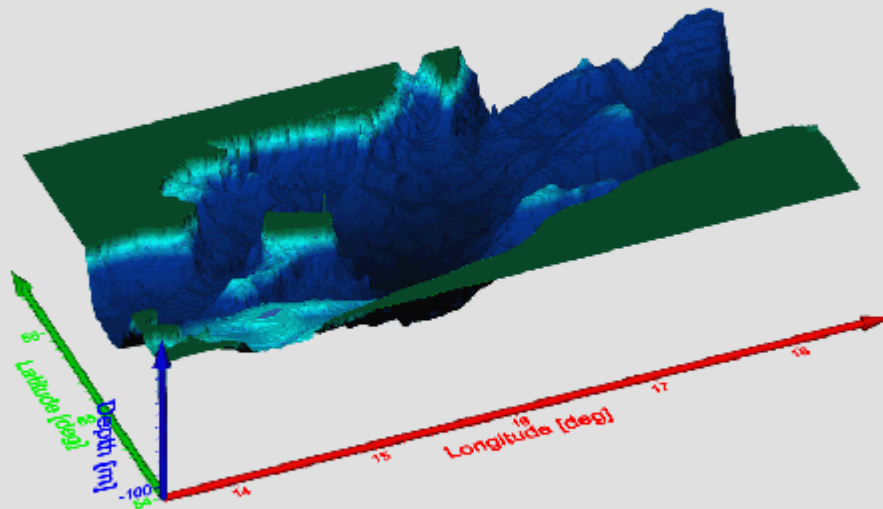
3D time series - Hydrodynamic model output

3D time series - Cod egg habitat 2003

Bornholm Basin of the Baltic Sea
Hydrographical Model Data - Cod Egg Habitat

3D time series - Cod egg habitat 2004

Bornholm Basin of the Baltic Sea
Hydrographical Model Data - Cod Egg Habitat

3D time series - Cod spawning habitat volume
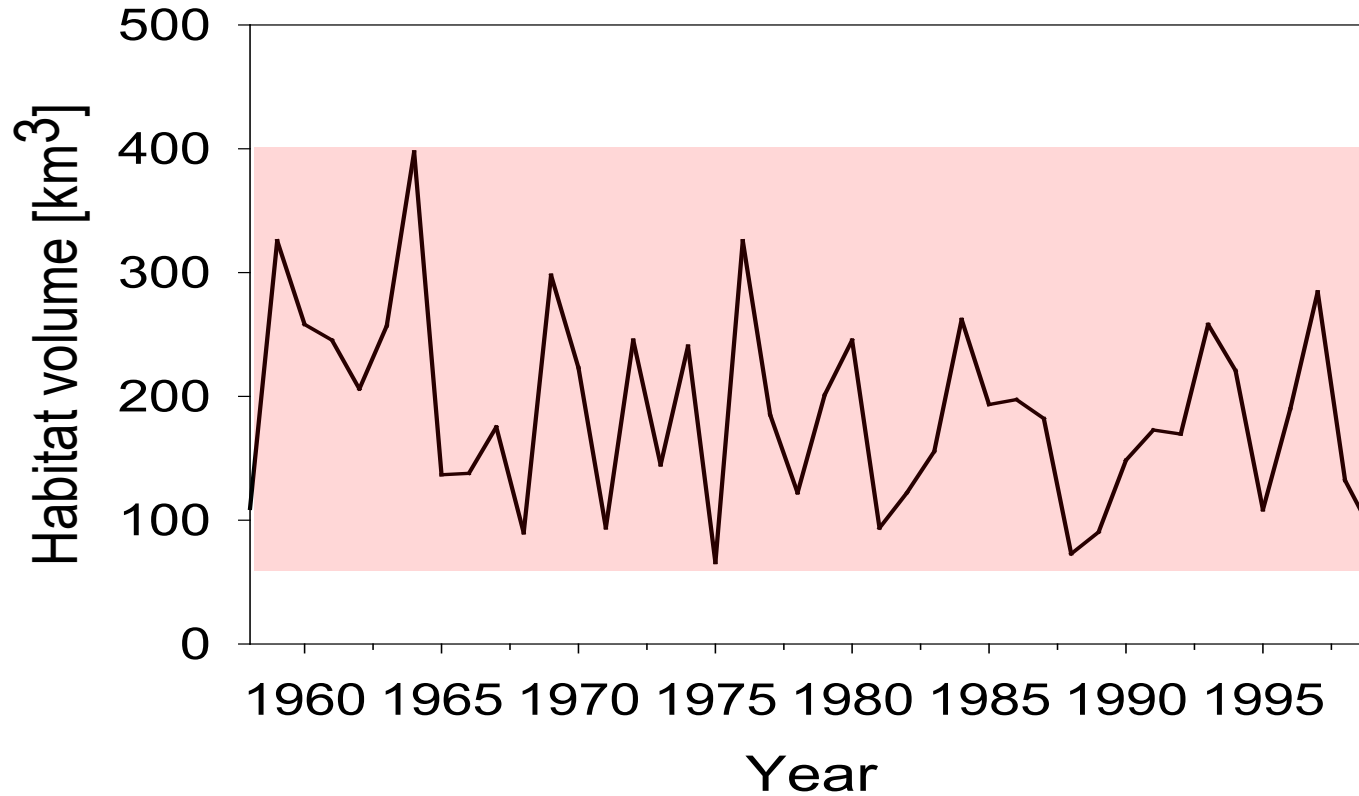
Conclusions & perspectives

Key messages

Cod spawning habitat and reproductive volume are very dynamic

Cod spawning habitat and reproductive volume respond to environmental changes

Perspectives

The hydrographic situation in spring may be used to predict Baltic cod reproductive volume in summer.

Acknowledgements

The results presented were funded by BALANCE

BALANCE is part-financed by
the European Union (European Regional Development Fund)
within the BSR INTERREG IIIB Programme

The following persons and institutions have contributed:

► Gerd Kraus (DIFRES)

► Thomas Kirk Sørensen (DIFRES)

► Ole Vestergaard (DIFRES)

► Jonna Tomkiewicz (DIFRES)

► Rasmus Borgstrøm (DIFRES)

► Andreas Espersen (DIFRES)

► Hjalte Parner (DIFRES)

► Hans-Harald Hinrichsen (IFM-Geomar)

► Wlodek Grygiel (SFI)

► Rainer Oberst – Federal Research Centre for Fisheries (Germany)

Thank you for your attention