

# Comparative Retrospective Assessment of Biogeochemical Model Outputs for Fish and Foodweb Modelling in the Baltic Sea

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Workshop on Uncertainties of  
Scenario Simulations  
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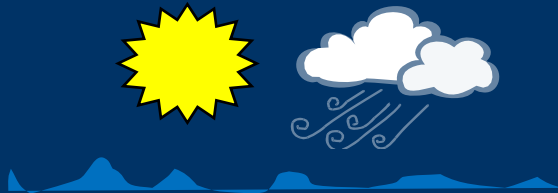


# Case Studies for Learning and Methodological Development

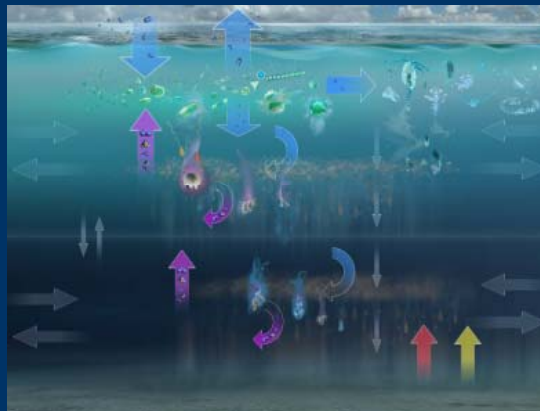
- temperature (e.g ., for sprat recruitment) – shown yesterday
- cod reproductive volume – a habitat indicator for cod spawning and reproduction (based on salinity and oxygen concentration)

# Model Outputs Linked Sequentially

Atmos.-Ocean



NPZD



Fish/foodweb

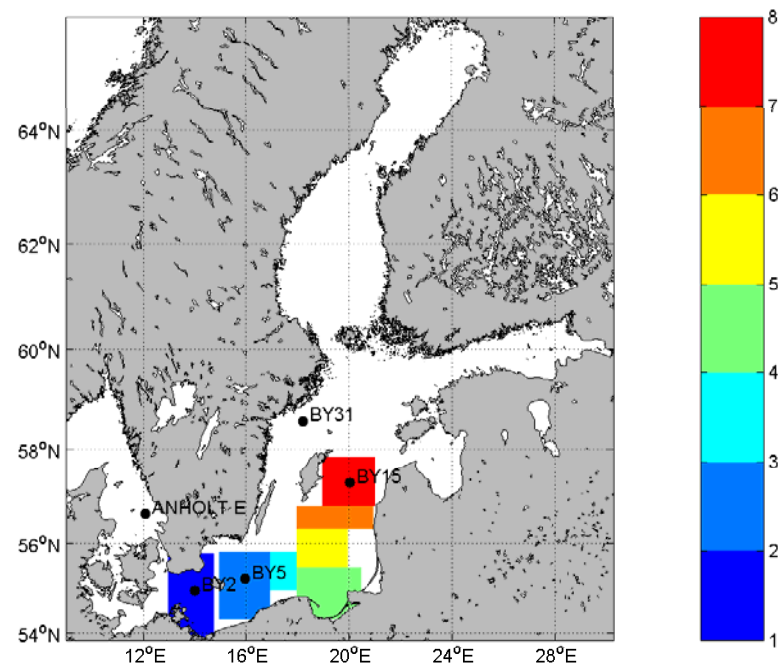


T, S, ...

Cod reproductive volume

# Modelled Data Available

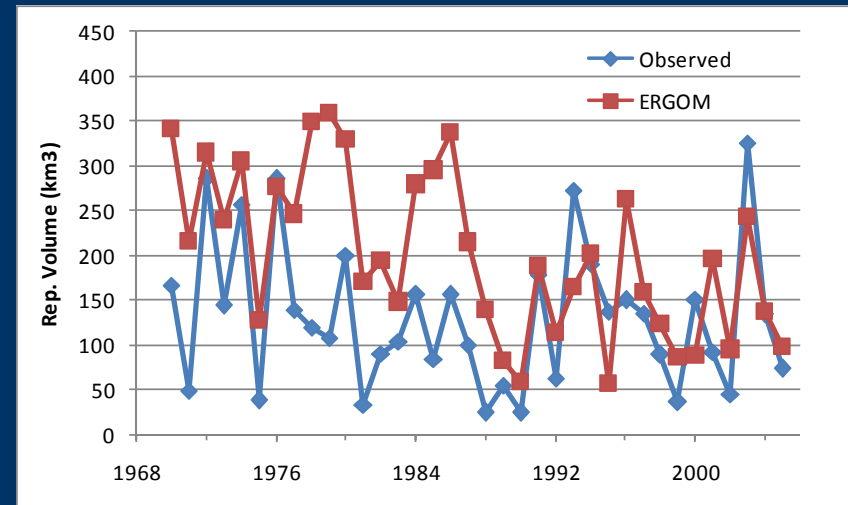
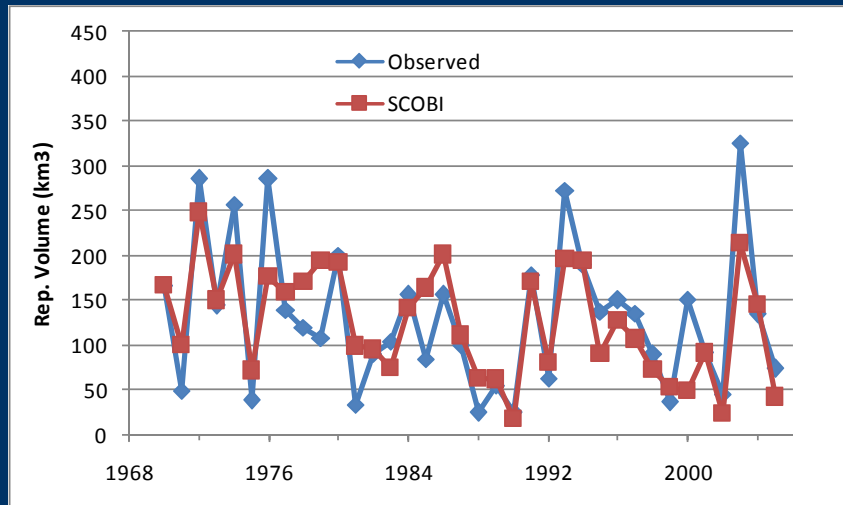
Cod reproductive volumes by basin and month, 1970-2005  
from RCO-SCOB1 and ERGOM



# Model Fitting – Bornholm Basin

RCO-SCOBI

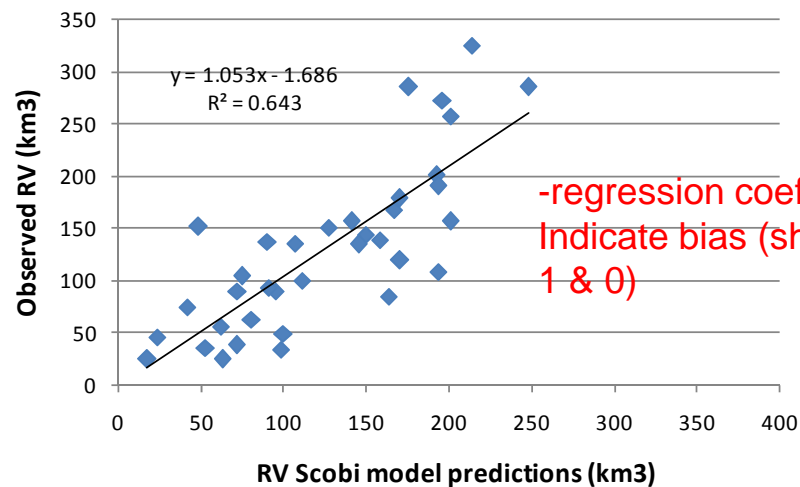
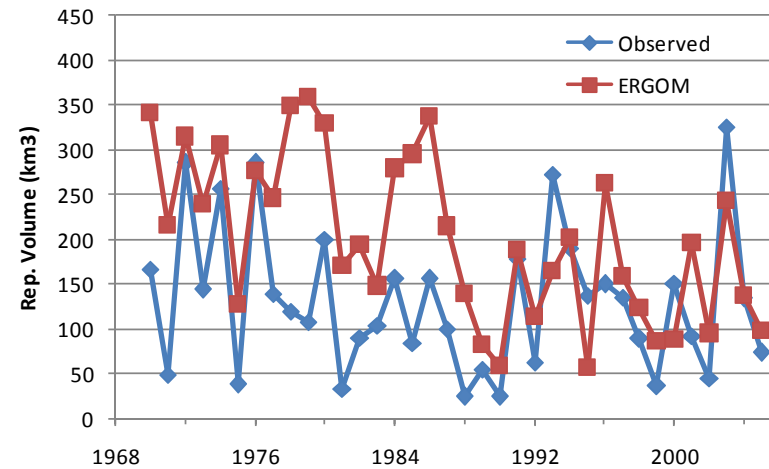
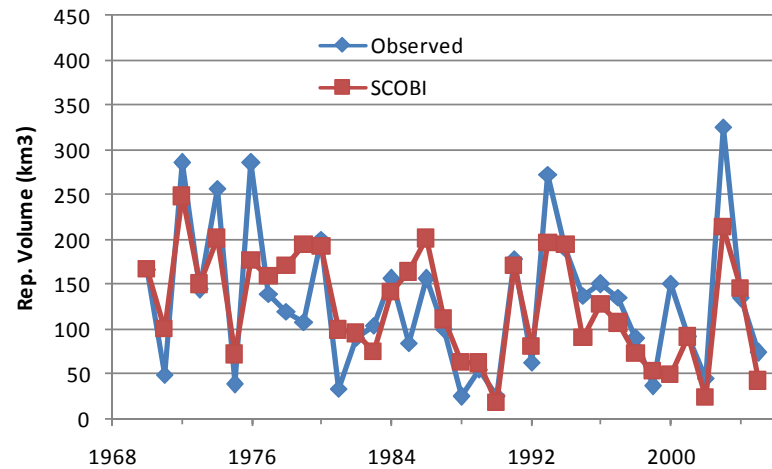
ERGOM



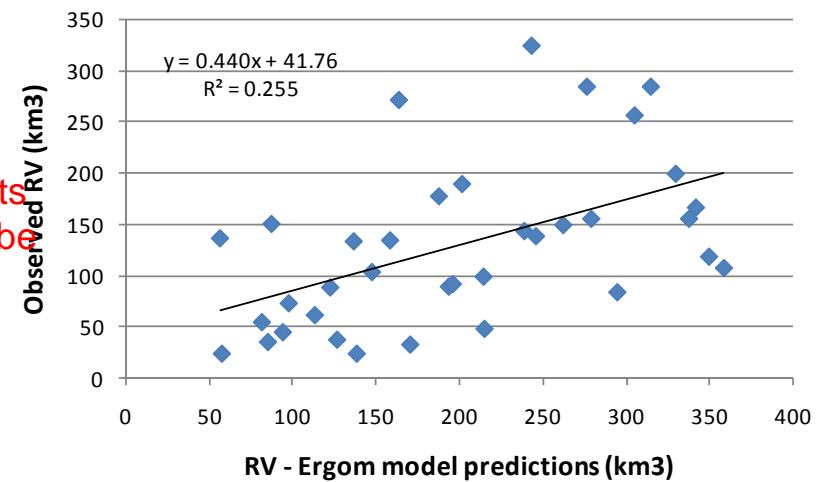
# Model Fitting 1970-2005

## RCO-SCOB1

## ERGOM



-regression coefficients  
Indicate bias (should be  
1 & 0)



# Model Comparisons of Forecasts

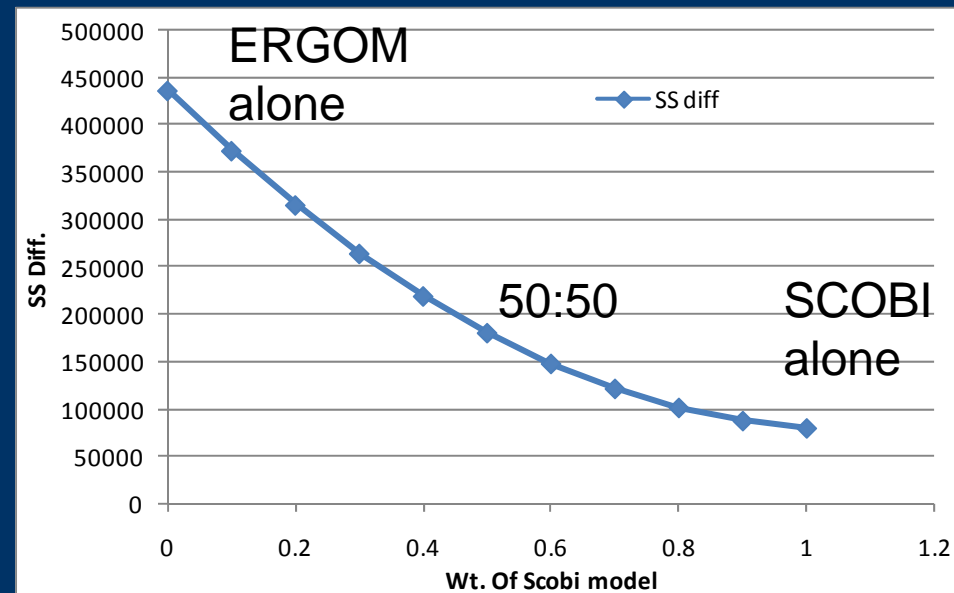
- both models track the past and “forecasted” data quite well
- one model explains more variation and has less biased results

# Sensitivity to Weighting in Ensemble Averages

	August	Model 1 SCOBI	Model 2 ERGOM	wt-sco bi	wt-ergom	wt. Pred.	Observed Plikshs	(o-p) <sup>2</sup>
Bornholm_	1970	167	342	1	0	167	167	0.1
Bornholm_	1971	100	215	1	0	100	48.6	2614.4
Bornholm_	1972	248	315	1	0	248	285	1380.9
Bornholm_	1973	150	239	1	0	150	144	34.7

-calc. sum of squared differences (= SSE, SSRes)

-compare SS Diff. for different weightings of the two models.





# Next Work Activities

- expand time series – include recent years and older years farther back.
- include outputs from 3<sup>rd</sup> model, BALTSEM
- repeat all analyses for other basins – Gdansk, Gotland, and compare  
Among basins
- repeat entire exercise for another set of field data for Bornholm Basin  
(H.-H. Hinrichsen, Geomar-Kiel)

# Conclusions

- AO and NPZD models give good representation of some key hydrographic and biological variables that affect sprat and cod recruitment
- some of those variables themselves explain similar levels of variability in recruitment as observed data
- need to continue and expand analyses (Baltsem model to be included)
- some ways to proceed with ensemble averaging are possible
- very promising possibilities to use AO and NPZD models for projections of sprat and cod recruitment

-thank you

