BALANCE

Submerged vegetation modelling in the Baltic Sea Region

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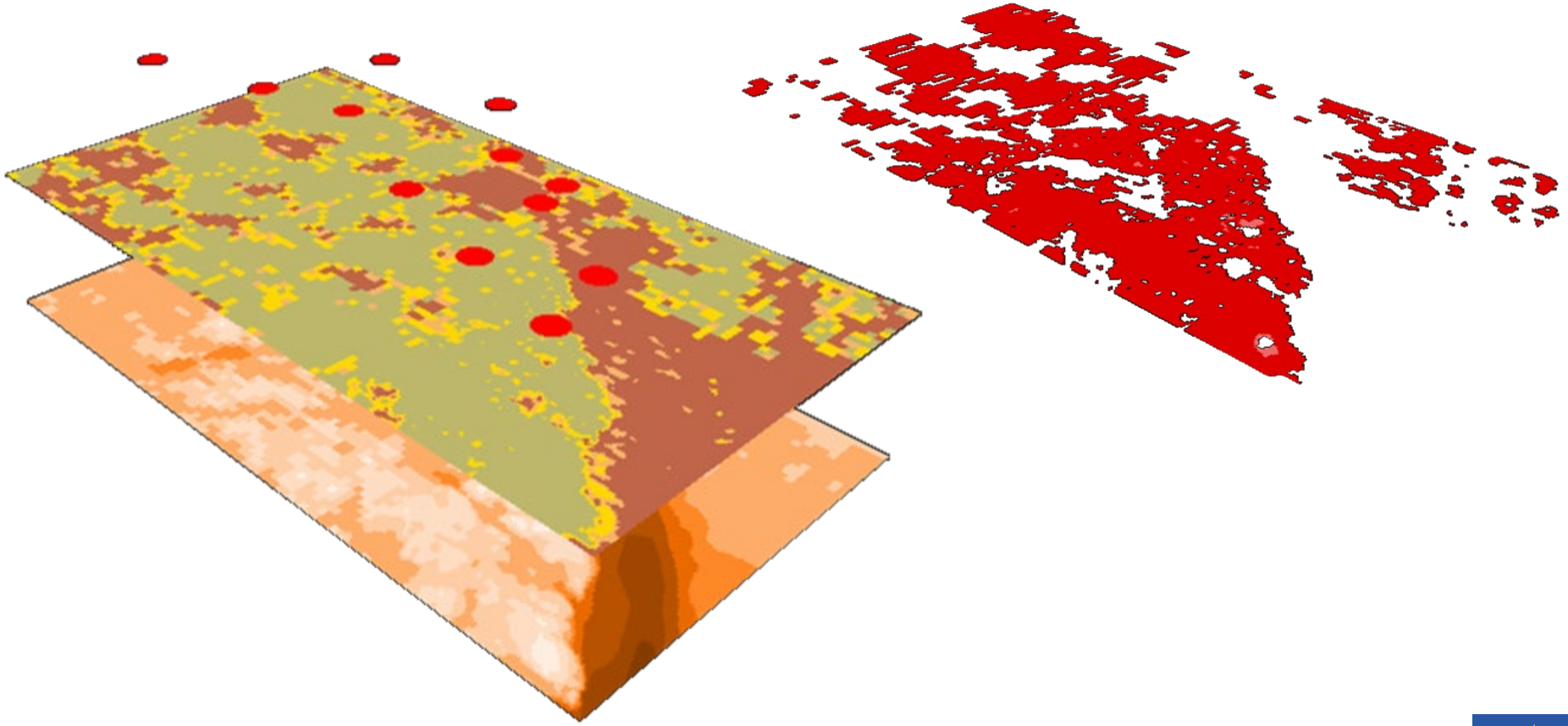
Why modelling?



Which modelling technique?

GRASP (Lehman et al. 2004)

Generalized Additive Models, GAM

Akaike information criterion (AIC)

Freeware, using R or S-plus

Transparent, flexible, GUI

Predictions in GIS (ArcView)

Cross validation

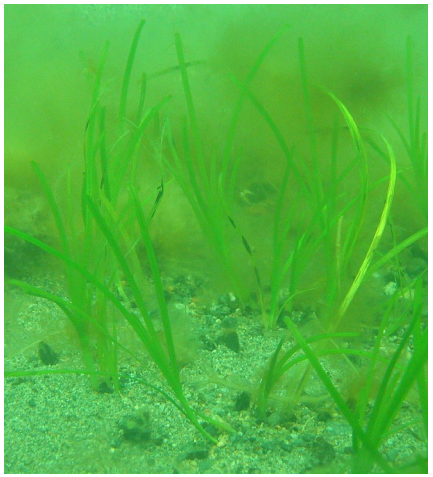
Several published studies with good results

Habitat forming species

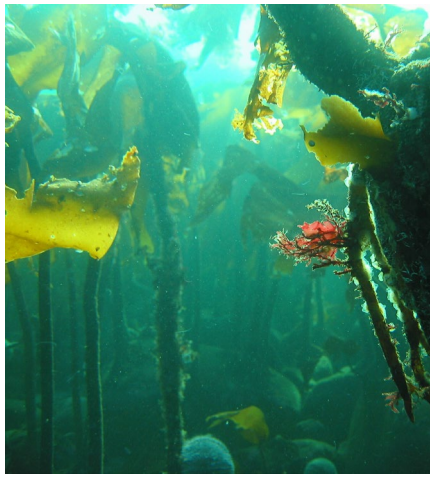
Charophytes

Bladderwrack

Eelgrass



Kelp



Photos Martin Isæus AquaBiota

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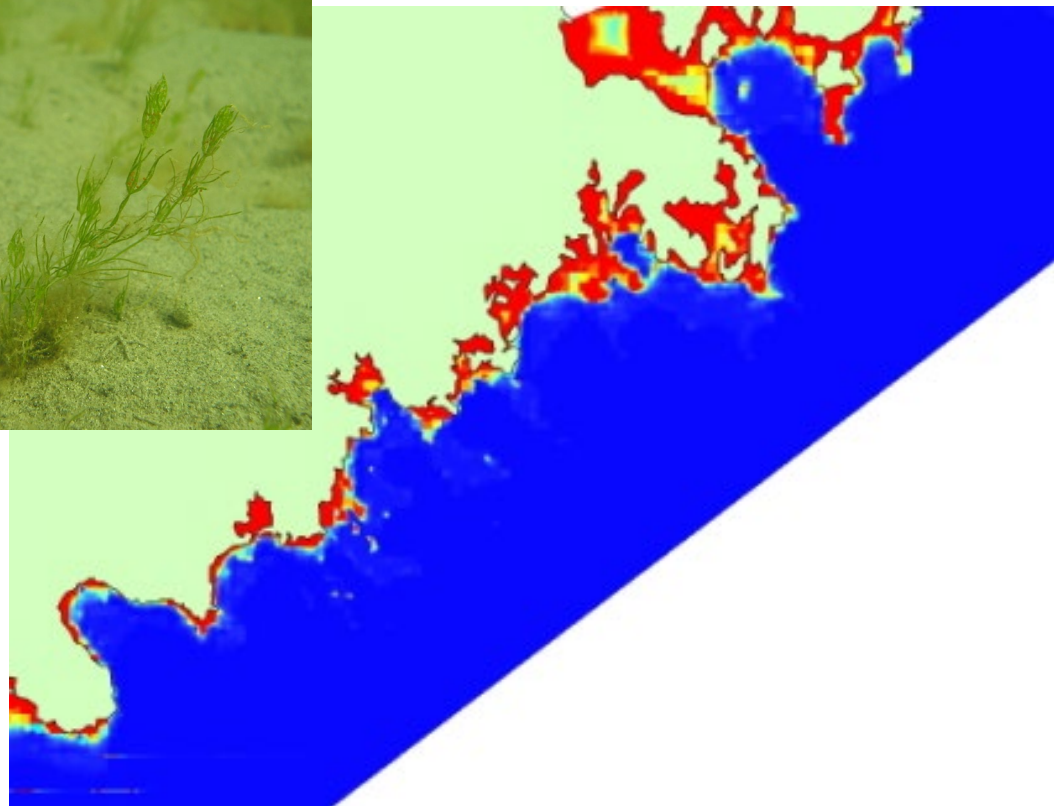
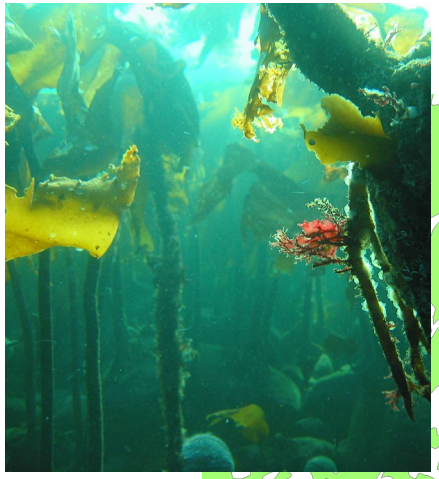
Comparison - species and areas

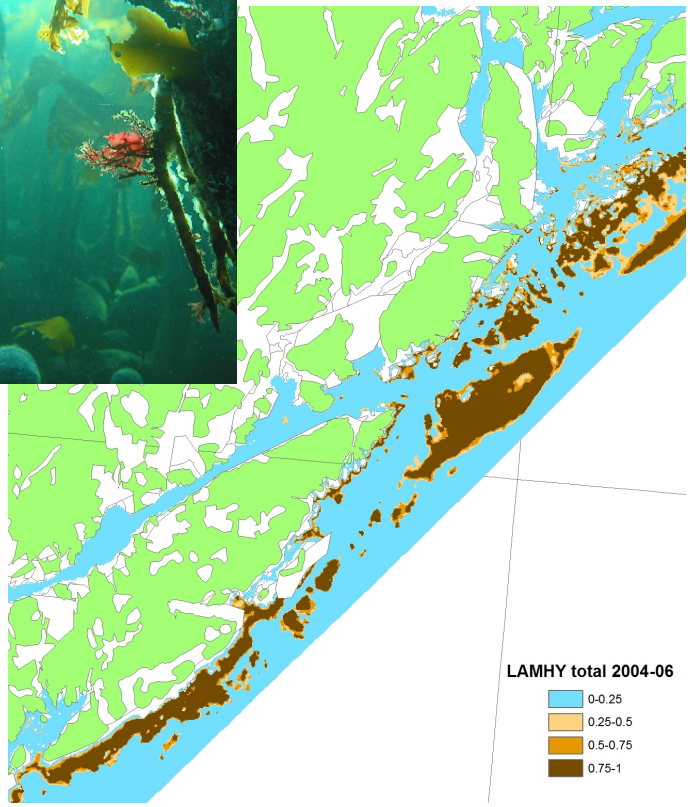
Est	Charophytes presence	**Depth**	**Slope(50, 100, 500,** 1000**)**	Geo (50)	IDW geo				
Swe	Charophytes biomass Forsmark	Depth	**Slope**			**Temp**	**SWM**	**Shadow**	Aspect
Swe	Charophytes biomass Oskarshamn	**Depth**	**Slope**			**Temp**	**SWM**	**Shadow**	**Aspect**
Est	Fucus vesiculosus presence	**Depth**	**Slope(50, 100, 500, 1000)**	Geo (50)	**IDW geo**				
Swe	Fucus vesiculosus presence	**Depth**	**Slope**		**Geo (m)**		**SWM**	**Shadow**	
Est	Zostera marina presence	**Depth**	**Slope(**50, 100, **500, 1000)**	Geo (50)	IDW geo				
Swe	Zostera marina presence	**Depth**	Slope		**Geo (m)**		**SWM(d)**		
Nor	Zostera marina presence	**Depth**	**Slope**				**SWM**		
Nor	Laminaria hyperborea presence	**Depth**	Slope		**Curvature**		**SWM**	Shadow	
Fin	Algae presence	**Depth**	Slope	Distance to rock	**Distance to sand**		**Density shoreline**	Turbidity	**Aspect**
Fin	Vascular plants presence	**Depth**	Slope	Distance to rock	**Distance to sand**		**SWM**	Turbidity	Aspect

Charophytes in Estonia & Sweden



Laminaria





Monitoring data 1990-2006

Best model 2004-06

Monitoring data design not appropriate for spatial modelling

Conclusions & perspectives

Key messages

Depth and Wave exposure important predictors

Geology probably important, poorly mapped, proxy parameters useful

Appropriate sampling design needed

Fine local models

Next steps

Regional models, add input layers

Perspectives

Modelling will provide great important basic layers useful for managing the Baltic Sea

Input to planning tools e.g. MARXAN

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- All authors

Thank you for your attention