# Selected highlights from the ECOSUPPORT project


## The ECOSUPPORT consortium

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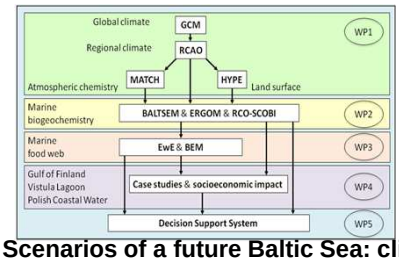
ECO SUPPORT

BONUS
SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION



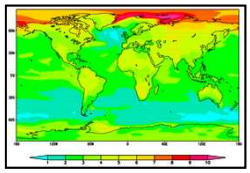

IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
WMO UNEP


## 1. Scenarios of a future Baltic Sea: climate change & nutrient loads

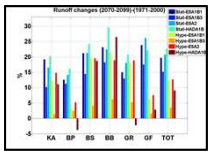
The project uses a hierarchy of models to assess the impact of ecosystem drivers. These include two Global Climate Models, one Regional Climate model, one hydrological model, three marine models (coupled physical-biogeochemical models), several statistical and one dynamical food-web model and two regional ocean models.

38 transient simulations for the period 1961-2100 were performed with the marine models in order to produce an ensemble of projections for the future state of the Baltic Sea. Four climate runs of two IPPC scenarios (ECHAM5 MPI/OM A1B_1, ECHAM5 MPI/OM A1B_3, ECHAM5 MPI/OM A2 and HadCM3 A1B) were combined with four nutrient load scenarios (reference, current legislation, Baltic Sea Action Plan and "business as usual" (increasing loads)).

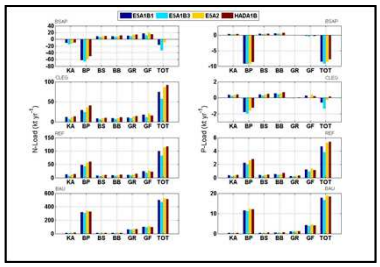
## 2. Projections of climate change give changes in temperature, runoff & nutrient loads



All climate scenarios give warmer air temperatures in future, with an annual regional increase in the range 2.7 – 3.8 K. Precipitation increases in the range 12-18 %.



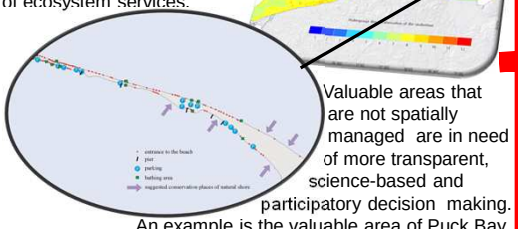

Future river runoff to the Baltic basin was derived from the climate scenarios with one hydrological model (HYPE) and one statistical approach. All simulations give a future increase of freshwater flow in the range 15%-22%.




Load scenarios show the importance of applying reduction measures. The reference case – same river concentrations of N and P in future as today – show a future load increase due to climate effects.

## 6. Biological valorization at the Polish coast

A marine biodiversity hot spot can also be the most degraded. Strong conflicts arise between nature conservation, recreation and fishery. Both conflicts and the climate change influences the provision of ecosystem services.



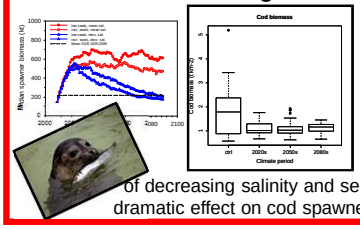
Valuable areas that are not spatially managed are in need of more transparent, science-based and participatory decision making. An example is the valuable area of Puck Bay.

## 7. Stakeholder involvement

A survey was conducted with representatives from stakeholders in Russia and Poland. The answers showed awareness of climate related issues, but that at the present time they were not of high importance in regions were socio-economic problems prevail. Municipality management is often performed without taking climate change into account.

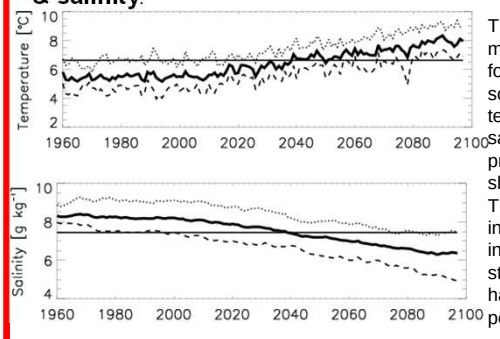
Interactive scientific presentations have been performed at a number of occasions using visualizations in a GeoDome. The format has shown to encourage discussion and understanding of complex processes, data and scenarios and is therefore useful as a tool for decision support.

## 5. Food-web modeling



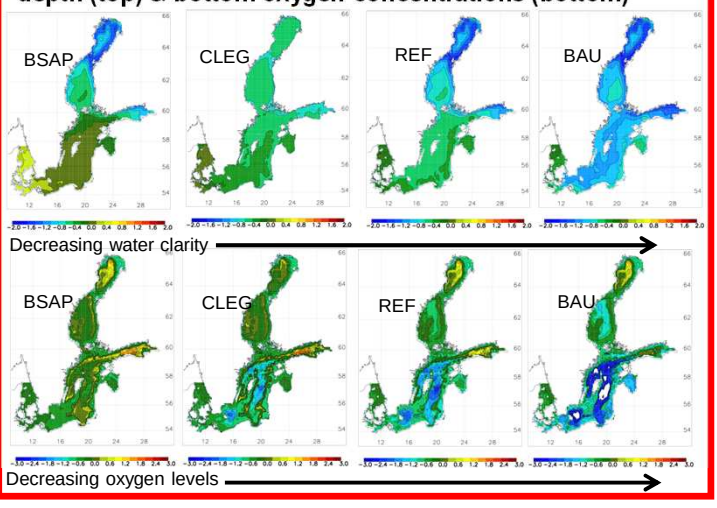

Modeling of cod biomass in Central Baltic Sea shows a future decrease in biomass due to a reduction in cod reproduction volume. The combined effect of decreasing salinity and seal predation has a dramatic effect on cod spawner biomass.

## 3. Projections of the future marine environment: temperature & salinity




The simulation of the ensemble mean of the ocean models forced by the different climate scenarios display an increase in temperature and a decrease in salinity by the end of the projection period. The figures show volume averaged results. The effects of climate change – increased air temperatures and increased runoff – are statistically significant about halfway through the simulation period.

## 4. Projections of the future marine environment: Secchi depth (top) & bottom oxygen concentrations (bottom)

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