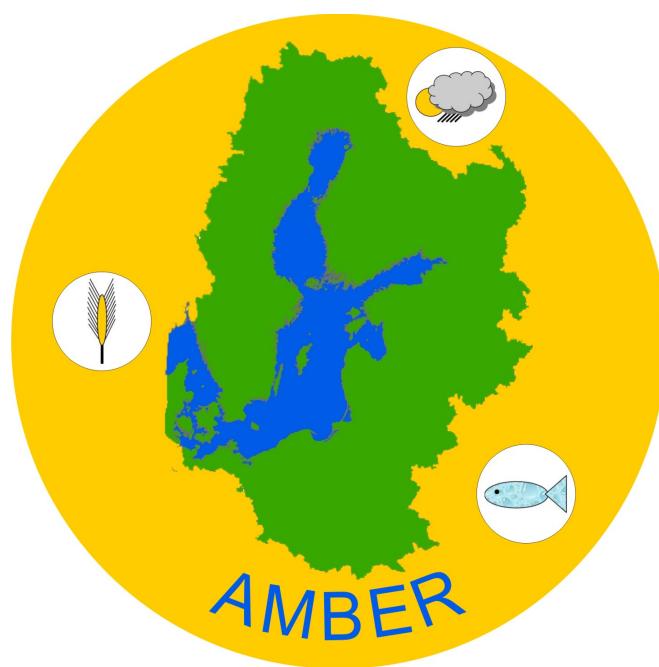


# **ERANET BONUS: Verbundprojekt BONUS-8: AMBER – Bewertung und Modellierung des Responseverhaltens des marinen Ökosystems der Ostsee auf Klimaänderung und Änderung der Landnutzung**

AMBER (Asessment and Modelling Baltic Ecological Response)



## **Abschlussbericht**

### **Teil I & II**

Fördernummer: 03F0485A

Zeitraum: 1.1.2009-31.12.2011

# **Teil I & II**

Teil I und II des Abschlußberichtes sind der englische Teil des Abschlußberichtes (siehe Anhang 1). Dieser Abschlußbericht wurde vom BONUS Sekretariat am 8.6.2012 als Deliverable 721 akzeptiert (siehe Anhang 2).

Der englische Abschlußbericht hat den Stand Januar 2012. Deshalb wird im Folgenden zusätzlich eine aktualisierte Version der begutachteten Publikationen und Diplom- und Doktorarbeiten aufgelistet.

## ***Erschienene Publikationen***

Almroth-Rosell, E., K. Eilola, R. Hordoir, H. E. M. Meier, and P. O. J. Hall (2011) Transport of fresh and resuspended particulate organic material in the Baltic Sea -- a model study. *Journal of Marine Systems*, 87, 1-12, doi: 10.1016/j.jmarsys.2011.02.005

Dailidienė I., Davulienė L., Kelpsaitė L. and Razinkovas A. (2010) Analysis of the Climate Change in Lithuanian Coastal Areas of the Baltic Sea. *Journal of Coastal Research*, DOI: 10.2112/JCOASTRES-D-10-00077

Dippner, J. W., K. Junker, and I. Kröncke (2010) Biological regime shifts and changes in predictability, *Geophys. Res. Lett.*, 37, L24701, doi:10.1029/2010GL045696

Gårdmark, A., Nielsen, A., Floeter, J., and Möllmann, C. (2010) Depleted marine fish stocks and ecosystem-based management: on the road to recovery, we need to be precautionary. *ICES J. Mar. Sci.*, doi:10.1093/icesjms/fsq158

Hänninen, J., I. Vuorinen (2011) Time-varying parameter analysis of the Baltic Sea freshwater runoffs. *Environmental Modeling and Assessment*, 16, 53-60 doi: 10.1007/s10666-010-9231-5.

Hietanen, S., H. Jäntti, C. Buiertz, K. Jürgens, M. Labrenz, M. Voss, J. Kuparinen (2012): Hypoxia and nitrogen processing in the Baltic Sea water column. *Limnology&Oceanography*, 57(1), 325-337, doi: 10.4319/lo.2012.57.1.0325

Hürdler J., M. Venohr, 2011: Auswirkungen des Klimawandels und der sozioökonomischen Entwicklung auf zukünftige Nährstoffeinträge in die Oder. Deutsche Gesellschaft für Limnologie (DGL). Erweiterte Zusammenfassungen der Jahrestagung 2010 (Bayreuth), Hardegsen 2011, 361-365.

Jäntti H, Stange F, Leskinen E, Hietanen S (2011) Seasonal variation in nitrification and nitrate-reduction pathways in coastal sediments in the Gulf of Finland, Baltic Sea. *Aquatic Microbial Ecology* 63:171-181, doi:10.3354/ame01492

Jäntti,H., Leskinen, E., Stange, C.F., Hietanen, S. (2012) Measuring nitrification in sediments - comparison of two methods and three  $^{15}\text{NO}_3^-$ - measurement techniques, isotopes and Environmental Health Studies,48: 313-326. doi: 10.1080/10256016.2012.641543

Jäntti, H., Hietanen, S. (2012) The effects of hypoxia on sediment nitrogen cycling in the Baltic Sea. AMBIO, 41:161-169. doi: 10.1007/s13280-011-0233-6

Junker, K., D. Sovilj, I. Kröncke, J.W. Dippner (2012) Climate induced changes in benthic macrofauna - a non-linear model approach. Journal of Marine Systems, 96-97, 90-94.

Korth, F., Deutsch, B., Liskow I. and Voss M. (2011) Uptake of dissolved organic nitrogen by size-fractionated plankton along a salinity gradient from the North Sea to the Baltic Sea, Biogeochemistry, DOI: 10.1007/s10533-011-9656-1

Krämer, I., Hürdler, J., Hirschfeld, J., Venohr, M. and Schernewski, G. (2011), Nutrient Fluxes from Land to Sea: Consequences of Future Scenarios on the Oder River Basin – Lagoon – Coastal Sea System. International Review of Hydrobiology, 96: 520–540. doi: 10.1002/iroh.201111293

Meier, H. E. M., and K. Eilola, 2011: Future projections of ecological patterns in the Baltic Sea. SMHI Reports Oceanography No.107.

Meier, H.E.M., K. Eilola, and E. Almroth, 2011: Climate-related changes in marine ecosystems simulated with a three-dimensional coupled biogeochemical-physical model of the Baltic Sea. Climate Research, 48, 31-55.

Pempkowiak, Janusz; Szymczycha, Beata; Kotwicki, Lech (2010): Submarine groundwater discharge (SGD) to the Baltic Sea. ROCZNIK OCHRONA SRODOWISKA, 12, 17-32.

Philippart, C. J. M., R. Anadón, R. Danovaro, J. W. Dippner, K. F. Drinkwater, S. J. Hawkins, T. Oguz, G. O'Sullivan, and P. C. Reid (2011) Impacts of climate change on European marine ecosystems: Observations, expectations and indicators. Journal of Experimental Marine Biology and Ecology, 400, 52-69, doi:10.1016/j.jembe.2011.02.023

Pouzols, F.M., Lendasse, A. (2012) Adaptive Kernel Smoothing Regression for Spatio-Temporal Environmental Datasets. Neurocomputing, 90: 59-65. doi: 10.1016/j.neucom.2012.02.023

Rönkä, M., Saari, L., Hario, M. Hänninen, J. & Lehikoinen, E. (2011). Breeding success and population trends of waterfowl - implications for monitoring. Wildlife Biology 17: 225-239.

Schafmeister, M.-T. and A. Darsow, 2011: Potential Change in Groundwater Discharge as Response to Varying Climatic Conditions – An Experimental Model Study at Catchment Scale. The Baltic Sea Basin, J. Harff, S. Björck, and P. Hoth, Eds., Springer Berlin Heidelberg, 391-404.

Schernewski, G., T. Neumann, and H. Behrendt (2011) Sources, Dynamics and Management of Phosphorus in a Southern Baltic Estuary. The Baltic Sea Basin as a natural Laboratory, J. Harff, S. Björck, and P. Hoth, Eds., Springer Berlin Heidelberg, 373-388

Schernewski, G., Neumann, T., Maack, S., Venohr, M. (2011) Gewässereutrophierung – vom globalen Problem zum regionalen Lösungsansatz. In: Fränzle, Müller & Schröder (Eds) Handbuch der Umweltwissenschaften, Grundlagen und Anwendung der Ökosystemforschung, Wiley –VCH Verlag, Erg. Lfg. 3/11, 1-20.

Schernewski, G., N. Stybel & T. Neumann (2012): Zebra Mussel Farming in the Szczecin (Oder) Lagoon: Water-Quality Objectives and Cost-Effectiveness Ecology and Society. <http://dx.doi.org/10.5751/ES-04644-170204>

Stybel, N., Fenske, C., Schernewski, G. (2009) Mussel cultivation to improve water quality in the Szczecin Lagoon. *J. Coastal Res.*, SI56, 1459-1463

Venohr, M., Hirt, U., Hofmann, J., Opitz, D., Gericke, A., Wetzig, A., Natho, S., Neumann, F., Hürdler, J., Matranga, M., Mahnkopf, J., Gadegast, M. and Behrendt, H. (2011), Modelling of Nutrient Emissions in River Systems – MONERIS – Methods and Background. *International Review of Hydrobiology*, 96: 435–483. doi: 10.1002/iroh.201111331

Venohr, M., Hürdler, J., Opitz, D. (2010) Potential von Maßnahmen zur Reduktion der Nährstoffflüsse im Einzugsgebiet der Oder. In: Kannen, A., Schernewski, G., Krämer, I., Lange, M., Janssen, H., Stybel, N. (Eds) Forschung für ein Integriertes Küstenzenzenmanagement: Fallbeispiele Odermündungsregion und Offshore-Windkraft in der Nordsee, *Coastline Report* 15, 151-166

Voss, M., J. W. Dippner, C. Humborg, J. Hürdler, F. Korth, T. Neumann, G. Schernewski, and M. Venohr (2011) History and scenarios of future development of Baltic Sea eutrophication. *Estuarine, Coastal and Shelf Science*, 92, 307-322 doi:10.1016/j.ecss.2010.12.037

Vuorinen, I. (2011) Climate Change in the Baltic Sea marine environment. *Baltic Rim Economic Quarterly Review* 2, 31 May 2011. p 27

## Akzeptierte Publikationen

Dippner, J.W., G. Kornilovs, K. Junker (2012) A Multivariate Baltic Sea Environmental Index. *Ambio*, accepted

Hänninen, J., I. Vuorinen (2012) Comparison of several climate indices as input in modelling of the Baltic Sea runoff. *Boreal Environment Research*, accepted.

Meier, H.E.M., A. Höglund, R. Döscher, H. Andersson, U. Löptien and E. Kjellström: Quality assessment of atmospheric surface fields over the Baltic Sea from an ensemble of regional climate model simulations with respect to ocean dynamics. *Oceanologia*, accepted

Morkūnė R. (2012) Trophic peculiarities of the Great Cormorant, Grey Heron and Long-tailed Duck on the Baltic Sea Lithuanian coast: a stable isotope approach. *Ekologija*. Accepted.

B. Szymczycha, L. Kotwicki, J. Pempkowiak. (2010): Submarine Groundwater Discharge (SGD) to the Baltic Sea, *Ann. Set Envir. Prot.*, accepted

Zilius, M., M. Bartoli, D. Daunys, R. Pilkaityte and A. Razinkovas: Benthic oxygen uptake in the shallow eutrophic Curonian lagoon (Baltic Sea), *Hydrobologia*, accepted.

### Eingereichte Publikationen

Dippner, J.W., Möller, C., Hänninen, J. (2011) Regime Shifts in North Sea and Baltic Sea: a comparison. *Journal of Marine Systems*, submitted

Eilola, K., E. Almroth-Rosell, C. Dieterich, F. Fransner, A. Höglund, and H. E. M. Meier (2012) Nutrient transports and interactions between coastal regions and the open Baltic Sea: A model study in present and future climate. *AMBIO*, under review.

Frey, C., Dippner, J.W., Voss M., (2012) Isotopic evidence for close coupling of N-cycling processes in the redoxcline of the Baltic Sea. *Global Biogeochemical Cycles*, submitted.

Hänninen, J., I. Vuorinen (2010) Transfer-function modelling from climate indices and runoff to nutrient loading and concentrations in the Baltic Sea. *Global Change Biology*, submitted

Korth, F., Liskow, I., Fry, B., and Voss, M. (2011) Nitrogen turnover during spring outflow from the nitrate-rich Curonian and Szczecin lagoon using dual isotopes in nitrate. *Marine Chemistry*, submitted

Lech Kotwicki, Katarzyna Grzelak, Michał Czub, Olaf Dellwig, Torben Gentz, Beata Szymczycha, Michael Böttcher: Submarine Groundwater Discharge to the Baltic coastal zone - impact on meiofaunal community. *Journal of Marine System*, submitted

Maiju Lehtiniemi, Elena Gorokhova, Sören Bolte, Holger Haslob, Bastian Huwer, Tarja Katajisto, Lennart Lennuk, Arno Pöllumäe, Matthias Schaber, Outi Setälä, Thorsten B.H. Reusch, Satu Viitasalo-Frösén, Ilppo Vuorinen, Pentti Välimäki (2011) Distribution and reproduction of the Arctic comb jelly *Mertensia ovum* in the Baltic Sea – genetic analyses suggest a long history for a recently identified species. *Marine Ecology Progress Series*, submitted

C Möllmann, T. Blenckner, M. Tomczak: Effect of coastal eutrophication on open Baltic Sea fish community - a modeling study. *PlosONE*, submitted.

Razinkovas-Baziukas, A., G. Schernewski, D. Baziuke (2011): Long term trends in temperature and river forcing of the Curonian and Oder lagoons: a comparison. *Transitional Water Bulletin*, submitted