

Curriculum Vitæ

Personal data

Name Matthias Gröger

Employment

- since 09/2016 **Research lead for the departments Ocean Climate group.**
- 01/2015 – 08/2015 **Guest researcher at the Department of Meteorology at Stockholms University.**
- since 08/2013 **Swedish Meteorological and Hydrological Institute, as a researcher at the Research and Development Department.**
- 10/2012 – 08/2013 **Max-Planck-Institute for Meteorology Hamburg.**
Project **Climate induced changes in circulation and water mass properties on the NW European shelf.**
- 08/2009 – 09/2012 **Max-Planck-Institute for Meteorology Hamburg.**
Project **Physical and biogeochemical changes in the North Atlantic and their impact on the North Sea.**
- 05/2007 – 08/2009 **IFM Geomar Leibniz Institute for Marine Sciences Kiel.**
Project **Isotopic signatures on the Laptev Shelf – water mass and sea ice formation in the Arctic Ocean.**
- 07/2002 – 08/2006 **Max-Planck-Institute for Meteorology Hamburg.**
Project **Simulation of the last glacial cycle with a complex earth system model.**
- 02/1999 – 06/2002 **University of Bremen, FB 5 – Geosciences (Ph-D position).**
Project **Pliocene to Pleistocene Deepwater circulation in the western Atlantic.**

Publications

- Meier, H.E.M., Edman, M., Eilola, K., Placke, M., Neumann, T., Andersson, H., Brunnabend, S., Dieterich, C., Frauen, C., Friedland, R., **Gröger, M.**, Gustafsson, B., Gustafsson, E., Isaev, A., Kniebusch, M., Kuznetsov, I., Müller-Karulis, B., Naumann, M., Omstedt, A., Ryabchenko, V., Saraiva, S., and Savchuk, O. (2019), Assessment of uncertainties in scenario simulations of biogeochemical cycles in the Baltic Sea Front. *Mar. Sci.*, 6:46 DOI:10.3389/fmars.2019.00046.
- Saraiva, S., Meier, H.E.M., Andersson, H., Höglund, A., Dieterich, C., **Gröger, M.**, Hordoir, R., Eilola, K. (2018), Uncertainties in projections of the Baltic Sea ecosystem driven by an ensemble of global climate models, *Front. Earth Sci. - Interdisciplinary Climate Studies*, doi: 10.3389/feart.2018.00244
- Hordoir, R., Axell, L., Höglund, A., Dieterich, C., Fransner, F., **Gröger, M.**, Liu, Y., Pemberton, P., Schimanke, S., Andersson, H., Ljungemyr, P., Nygren, P., Falahat, S., Nord, A., Jönsson, A., Lake, I., Döös, K., Hieronymus, M., Dietze, H., Löptien, U., Kuznetsov, I., Westerlund, A., Tuomi, L., and Haapala, J.: Nemo-Nordic 1.0: A NEMO based ocean model for Baltic and North Seas, research and operational applications, *Geosci. Model Dev.*, 12 (1), 363–386, DOI: 10.5194/gmd-12-363-2019
- Meier, H.E.M., Edman, M., Eilola, K., Placke, M., Neumann, T., Andersson, H., Brunnabend, S.-E., Dieterich, C., Frauen, C., Friedland, R., **Gröger, M.**, Gustafsson, B., Gustafsson, E., Isaev, A., Kniebusch, M., Kuznetsov, I., Müller-Karulis, B., Omstedt, A., Ryabchenko, V., Saraiva, S., Savchuk, O.P., (2018) Assessment of eutrophication abatement scenarios for the Baltic Sea by multi-model ensemble simulations, *Front. Mar. Sci. - Coastal Ocean Processes*, 5, 440, DOI:10.3389/fmars.2018.00440
- Saraiva, S. Meier, H.E.M., Andersson, H., Höglund, A., Dieterich, C., **Gröger, M.** Hordoir, H., Eilola, K., (2018), Baltic Sea ecosystem response to various nutrient load scenarios in present and future climates, *Climate Dynamics*, doi:10.1007/s00382-018-4330-0.
- Pätsch, J., Burchard, H., Dieterich, C., Gräwe, U., **Gröger, M.**, Mathis, M., Kapitza, H., Bersch, M., Moll, A., Pohlmann, T., Su, J., Ho-Hagemann, H. T.M., Schulz, A., and Eden, C. (2017), An evaluation of the North Sea circulation in global and regional models relevant for ecosystem simulations, *Ocean Modelling*, DOI:10.1016/j.ocemod.2017.06.005.
- Ho-Hagemann, H.T.M., **Gröger, M.**, Rockel, B., Zahn, M., Geyer, B., Meier, H.E.M., (2017), Effects of air-sea coupling over the North Sea and the Baltic Sea on simulated summer precipitation over Central Europe, *Climate Dynamics*, DOI: 10.1007/s00382-017-3546-8.
- Gröger, M.**, Dieterich, C., Meier, Markus HEM, Schimanke, S. (2015) Thermal air-sea coupling in hindcast simulations for the North Sea and Baltic Sea on the NW European shelf, *Tellus A*, 67, 26911, doi: 10.3402/tellusa.v67.26911.
- Sein DV, Mikolajewicz U, **Gröger M.**, Fast I, Cabos W, Pinto JG, Hagemann S, Semmler T, Izquierdo A, Jacob D (2015) Regionally coupled atmosphere - ocean – sea ice – marine biogeochemistry model ROM. Part I: Description and validation. *J Adv Model Earth Syst.* doi:10.1002/2014MS000357

P. Bakker, Masson-Delmotte, V., Martrat, B., Charbit, S., Renssen, H., **Gröger, M.**, Krebs-Kanzow, U., Lohman, G., Lunt, D.J., Pfeiffer, M., Phipps, S.J., Prange, M., S. P. Ritz, S.P., Schulz, M., Stenni, B., Stone, E.J., and Varma, V. (2014), Temperature trends during the Present and Last interglacial periods - A multi-model-data comparison, *Quaternary Science Reviews*, DOI: 10.1016/j.quascirev.2014.06.031.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, D. Sein, and A. Moll, (2013). NW European shelf under climate warming: Implications for open ocean – shelf exchange, primary production, and carbon absorption. *Biogeosciences*, 10, 3767-3792, doi:10.5194/bg-10-3767-2013

Bakker, P., Stone, E. J., Charbit, S., **Gröger, M.**, Krebs-Kanzow, U., Ritz, S. P., Varma, V. Khon, S., Lunt, D. J., Mikolajewicz, U., Prange, M., Renssen, H., Schneider, B., Schulz, M., (2013) Last interglacial temperature evolution – a model inter-comparison, *Clim. Past*, 9, 605-619, doi:10.5194/cp-9-605-2013,8,4663-4699,doi: 10.5194/cpd-8-4663-2012

M. Gröger, and U. Mikolajewicz, (2011). Note on the CO₂ air-sea gas exchange at high temperatures, *Ocean Modelling*, 39, 284 - 290, doi: 10.1016/j.ocemod.2011.05.003

D. Bauch, **M. Gröger**, I. Dmitrenko, J. Hölemann, S. Kirillov, A. Mackensen, E. Taldenkova, N. Andersen, (2011). Atmospheric controlled freshwater release at the Laptev Sea Continental margin. *Polar research*, 30:5858 - DOI: 10.3402/polar.v30i.5858.

D. Bauch, J. Hölemann, S. Willmes, **M. Gröger**, A. Novikhin, A. Nikulina, H. Kassens, L. Timokhov, (2010). Changes in distribution of brine waters on the Laptev Sea shelf in 2007. *Journal of Geophysical Research*, 115, C11008, doi:10.1029/2010JC006249

M. Vizcaíno, U. Mikolajewicz, **M. Gröger**, E. Maier-Reimer, G. Schurgers, and A. M. E. Winguth (2008). Long-term ice sheet–climate interactions under anthropogenic greenhouse forcing simulated with a complex earth system model. *Climate Dynamics*, doi: 10.1007/s00382-008-0369-7.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, G. Schurgers, M. Vizcaino and A. Winguth (2007). Vegetation - climate feedbacks in transient simulations over the last interglacial (128,000-113,000 yrBP). in F. Sirocko, T. Litt, M. Claussen and Sanchez Goni (eds.), *The climate of past interglacials*, pp 563-572.

Sirocko, Frank Claussen, Martin Litt, Thomas Fernanda Sánchez Goñi, Maria Berger, Andre Boettger, Tatjana Diehl, Markus Desprat, Stéphanie Delmonte, Barbara Degering, Detlev Frechen, Manfred A. Geyh, Mebus **Groeger, M.** Kageyama, M., Kaspar, F., Kühl, N., Kubatzki, C., Lohmann, G., Loutre, M. F., Müller, U., Rein, B., Rosendahl, W., Roucoux, K., Rousseau, D., Seelos, K., Siddall, M., Scholz, D., Spötl, C., Urban, B., Vautravers, M., Velichko, A., Wenzel, S., Widmann, M., Wünnemann, B., (2007) Chronology and climate forcing of the last four interglacials, *Developments in Quaternary Science*, 7, DOI:10.1016/S1571-0866(07)80065-0

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, G. Schurgers, M. Vizcaino and A. Winguth (2007). Changes in the hydrological cycle, ocean circulation, and carbon cycling during the last interglacial and glacial transition. *Paleoceanography*, 22, PA4205, doi:10.1029/2006PA001375.

U. Mikolajewicz, **M. Gröger**, E. Maier-Reimer, G. Schurgers, M. Vizcaino and A. Winguth (2007) Long-term effects of anthropogenic CO₂ emissions simulated with a complex earth system model. *Climate Dynamics*, 28, 599-633, doi: 10.1007/s00382-006-0204-y.

G. Schurgers, U. Mikolajewicz, **M. Gröger**, E. Maier-Reimer, M. Vizcaino and A. Winguth (2007). Long-term effects of biogeophysical and biogeochemical interactions between terrestrial biosphere and climate under anthropogenic climate change. *Global and Planetary Change*, 64(1-2), 26-37.

G. Schurgers, U. Mikolajewicz, **M. Gröger**, E. Maier-Reimer, M. Vizcaino and A. Winguth (2007). Dynamics of the terrestrial biosphere, climate and atmospheric CO₂ concentration during interglacials: a comparison between Eemian and Holocene and Holocene, *Climate of the Past*, 3, 1–14.

A. Winguth, U. Mikolajewicz, **M. Gröger**, E. Maier-Reimer, G. Schurgers, and M. Vizcaíno (2005), Centennial-scale interactions between the carbon cycle and anthropogenic climate change using a dynamic earth system model. *Geophysical Research Letters* 32(23), doi:10.1029/2005GL023681.

G. Schurgers, U. Mikolajewicz, **M. Gröger**, E. Maier-Reimer, M. Vizcaino and A. Winguth (2007). The effect of land surface changes on Eemian climate., *Climate Dynamics*, 29 (4), 357-373, doi: 10.1007/s00382-007-0237-x.

Gröger, M., Henrich, R., and Bickert, T. (2003). Glacial-Interglacial variability in lower North Atlantic deep water: inference from silt grain-size analysis and carbonate preservation in the western equatorial Atlantic. *Marine Geology* 201(4), 321-332.

Gröger, M., Henrich, R., and Bickert, T. (2003): Variability of silt grain-size and planktonic foraminiferal preservation in Plio-/Pleistocene sediments from the western equatorial Atlantic and Caribbean: *Marine Geology* 201(4), 307-320.

Henrich, R., Baumann, K.H., Gerhardt, S., **Gröger, M.**, and A. Volbers (2003). Carbonate preservation in deep and intermediate water masses in the South Atlantic: evaluation and geological record (a review). In: Wefer, G., Mulitza, S., Ratmeyer, V. (Eds.), *The South Atlantic in the Late Quaternary: reconstruction of material budget and current systems*. Springer Verlag, Berlin, Heidelberg.

Gröger, M., Ortner, H. & Haas, Ch., (1997). Flysch-Spurenfossilassoziationen in der Höheren Muttekopfgosau (Oberkreide) nordwestlich von Imst. - *Geol. Paläont. Mitt. Innsbruck*, 22, 153-158.

Gröger, M., (1998). Bericht über geologische Aufnahmen in den Nördlichen Kalkalpen, Blatt 115 Reutte. - *Jb. Geol. Bundes-A.*,1998, 311-312, Wien.

Presentations (Selection)

Gröger M, Andersson H, Dieterich C, Meier HEM, Wählström I, MacKenzie B., 2018, The individual role of temperature and salinity change for different trophic levels in global climate scenarios downscaled for the Baltic Sea and North Sea, oral presentation, MedCORDEX-Baltic Earth-COST Workshop on Regional Climate System Modelling for the European Sea Regions, Universitat de les Illes Balears, Palma de Mallorca, Spain, 14- 16 March 2018

Gröger, M., Interactive air-sea coupling in the Baltic Sea – A stepstone towards regional earth system modelling, Baltic Earth workshop on coupled atmosphere-ocean modeling for the the North Sea and Baltic Sea, 27-29 february 2017, oral presentation, Rostock-Warnemuende, Germany.

Gröger, M., PISCES and Ocean Biogeochemistry in EC-Earth, Modelling the global and regional Earth System autumn meeting, oral presentation, Båstad, 11-12 November 2015.

Gröger, M., Döscher, R., Meier, H.E.M., and Svensson, G., Closing the carbon cycle in the EC EARTH earth system model, poster presentation, Geophysical Research Abstracts, Vol. 17, EGU2015-15414-1, 2015.

Gröger M., Dieterich C., Schimanke S. and Meier H.E.M., Added value of interactive air-sea coupling, Joint regional climate system modelling for the European sea regions workshop, oral presentation, Rome, 2015.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, and D. Sein, and A. Elizalde Changes in open ocean - shelf exchange along the continental slope of NW Europe during the 21st Century, oral presentation, IAHS - IAPSO - IASPEI Joint Assembly in Gothenburg 22-26 July 2013.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, and D. Sein, and A. Elizalde The decline of the NW European shelf pump, productivity and CO₂ uptake caused by climate warming during 21. century, oral presentation, 6th International Conference on Water Resources and Environment Research (ICWRER), Koblenz, 2013

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, and D. Sein. NW European shelf productivity under climate warming: Implications for shelf carbon absorption, oral presentation, Geophysical Research Abstracts Vol. 15, EGU2013-6911, Wien, 2013.

Gröger, Maier-Reimer, Mikolajewicz & Sein., Mechanisms of carbon cycling and CO₂ absorption on shelves. A model case study for the NW European shelf, oral presentation, GV & Sediment Meeting, Hamburg, Germany September 23-28, 2012

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, and D. Sein. NW European shelf productivity under climate warming: Implications for shelf carbon absorption. Poster Presentation, Geophysical Research Abstracts Vol. 14, EGU2012-5950-2, Wien, 2012.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, and D. Sein. Mechanisms of carbon absorption on shelves - A model case study for the NW European shelf, oral presentation, Geophysical Research Abstracts Vol. 13, EGU2011-4675-1, Wien, 2011.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, J. Segsneider, and D. Sein Changes in water mass exchange between the NW european shelf areas and the North Atlantic and their impact on nutrient/carbon cycling, oral presentation, Geophysical Research Abstracts Vol. 12, EGU2010-9754, 2010.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, G. Schurgers, M. Vizcaino and A. Winguth. An earth

system model for longterm integrations and its application on paleoclimate and CO2 scenarios – Invited talk, Texas A&M University, College Station, Texas.

M. Gröger. Variations in meridional overturning circulation and its role in climate change during the Quaternary. Oral presentation, workshop on ocean and climate, University of Bremen, February 2007.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, G. Schurgers, M. Vizcaino and A. Winguth. Changes in the carbon cycle and ocean biogeochemistry during the last interglacial and in IPCC scenarios simulated with a complex earthsystem model – Invited talk, University of Bern Institute for environmental physics, December 2006.

M. Gröger, E. Maier-Reimer, U. Mikolajewicz, G. Schurgers, M. Vizcaino and A. Winguth. An earthsystem model for longterm integrations and its application on paleoclimate and CO2 scenarios – Invited talk, MPI for Biogeochemistry Jena, July 2006.

5