

Fabian Große - Curriculum Vitae

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Date of Birth	May 5, 1986	Email	fabian.grosse@dal.ca
Citizenship	German		

Personal profile

I am a physical oceanographer with specific interest in physico-biochemical interactions in the marine environment. In particular, I am interested in the analysis and quantification of anthropogenic vs. natural impacts in relation to marine ecosystem management. In order to investigate these complex interactions, I take advantage of numerical physical-biogeochemical models which provide detailed information on the physical and biochemical processes within the marine environment. With their help, I aim for the improved interpretation of observed features and the advancement of our understanding of marine ecosystem dynamics. My current research focuses on low oxygen conditions in coastal marine ecosystems.

Education

Oct 2013 - PhD in Earth System Science (Dr. rer. nat.)
May 2017 Universität Hamburg, Hamburg/Germany
completed : May 12, 2017
Thesis title : *The influence of nitrogen inputs on the oxygen dynamics of the North Sea*

Oct 2005 - Diploma in Physical Oceanography (equivalent to combined BSc & MSc)
May 2012 Institute of Oceanography, Universität Hamburg, Hamburg/Germany
completed : May 21, 2012
Thesis title : *Parameterising primary production and convection in a 3D model*

Employment History

Jun 2017 - *Post-doctoral fellow*
present Dalhousie University, Department of Oceanography, Marine Environmental Modelling Group
1355 Oxford Street, Halifax, NS, B3H 4R2, Canada

Aug 2012 - *Research assistant*
May 2017 Universität Hamburg, Bundesstraße 45a, D-20146, Hamburg/Germany

Project participation :

- 'Coastal Biomass Observatory Services (CoBiOS)', funded by EU-FP7
- 'Implementierung, Präzisierung und Weiterentwicklung des Deskriptors 5 Eutrophierung gemäß MSRL in Abstimmung mit WRRL, OSPAR & HELCOM (UFO12)', funded by German Federal Environmental Agency (UBA)
(engl. : 'Implementation, specification and advancement of descriptor 5 eutrophication according to MSFD in coordination with WFD, OSPAR & HELCOM')
- 'Implementierung, Präzisierung und Weiterentwicklung des Deskriptors 5 Eutrophierung für die MSRL mit Fokus auf Ableitung quantitativer Nährstoffreduktionsziele (UFO13)', funded by UBA
(engl. : 'Implementation, specification and advancement of descriptor 5 eutrophication with focus on the derivation of quantitative nutrient reduction targets')

Project contributions :

- Design and implementation of model output mapping software applicable for operational use
- Implementation and analysis of nutrient reduction scenarios for the North Sea using the biogeochemical model ECOHAM
- Design and implementation of a model-independent software for the calculation of 'trans-boundary nutrient transports' (TBNT)
- Design and implementation of analysis and validation software for ECOHAM and the hydrodynamic model HAMSOM

Additional Professional Experience

Jun 2014 - *Guest researcher*

Dec 2014 Deltares, P.O. Box 177, 2600 MH Delft/The Netherlands

- Model intercomparison and validation of the hydrodynamical models HAMSOM and Delft3D for the North Sea
- Design and implementation of active element tracing ('TBNT') for the biogeochemical model ECOHAM

Aug 2013 *Summer school*

Innovative Approaches in Marine Environment Modeling (AIMEN)

Institut Universitaire Européen de la Mer (IUEM), Brest/France

- 5-day workshop on marine ecosystem modelling
- Lectures and practical exercises

Nov 2007 - *Student assistant*

Jul 2012 Universität Hamburg, Bundesstraße 45a, D-20146, Hamburg/Germany

- Design and implementation of post-processing and validation software for ECOHAM
- Validation and analysis of ECOHAM results

Aug 2009 - *Scientific internship*

Sep 2009 Alfred Wegener Institute, Hafenstraße 43, D-25992, List/Germany

- Experimental studies on the oxygen dynamics of the Wadden Sea around Sylt Island/Germany

Oct 2008 - *Student assistant*

Nov 2008 Research cruise : R.V. Poseidon P375, Lisbon/Portugal - Las Palmas/Gran Canary

- Observations of the Mediterranean outflow along the Iberian Peninsula
- Investigating the role of synoptic-scale eddies ('meddies') for the propagation of the Mediterranean outflow water

Computational & Scientific Skills

■ Operating Systems

Linux/Unix

Windows

macOS

■ Programming Languages, Software etc.

Fortran

MATLAB

Latex

Shell Scripting

High-Performance Computing (HPC)

■ Scientific Skills

Oceanography and biogeochemistry of coastal seas (e.g., North Sea, Baltic Sea, northern Gulf of Mexico)

Numerical modeling

Scholarships & Awards

- Feb 2014** Short-term doctoral scholarship
- Granted for a 7-month research stay at Deltares, Delft/The Netherlands
 - Funded by German Academic Exchange Service (DAAD)
- Feb 2013** 'Partnerstädtepreis' ('Twin Cities Award') 2012, 2nd prize
- Received for Diploma thesis
 - Funded by 'Förderverein des Centrum für Erdsystemforschung und Nachhaltigkeit' and 'Gesellschaft Harmonie von 1789'

Publications

■ In peer-reviewed journals

- Kerimoglu, O., **Große, F.**, Kreuz, M., Lenhart, H.-J., and van Beusekom, J.E.E. : *A model-based projection of historical state of a coastal ecosystem : Relevance of phytoplankton stoichiometry*, Science of The Total Environment, 639, 1311-1323, doi :10.1016/j.scitotenv.2018.05.215, 2018.
- **Große, F.**, Kreuz, M., Lenhart, H.-J., Pätsch, J., and Pohlmann, T. : *A Novel Modeling Approach to Quantify the Influence of Nitrogen Inputs on the Oxygen Dynamics of the North Sea*, Frontiers in Marine Science, 4 :383, 1-21, doi :10.3389/fmars.2017.00383, 2017.
- **Große, F.**, Greenwood, N., Kreuz, M., Lenhart, H.-J., Machoczek, D., Pätsch, J., Salt, L., and Thomas, H. : *Looking beyond stratification : a model-based analysis of the biological drivers of oxygen deficiency in the North Sea*, Biogeosciences, 13, 2511-2535, doi :10.5194/bg-13-2511-2016, 2016.
- **Große, F.**, Lindemann, C., Pätsch, J., Backhaus, J.O. : *The influence of winter convection on primary production : A parameterisation using a hydrostatic three-dimensional biogeochemical model*. Journal of Marine Systems, 147, 138-152, doi :10.1016/j.jmarsys.2014.07.002, 2015.

■ Non-refereed reports

- Lenhart, H.-J., Desmit, X., **Große, F.**, Mills, D., Lacroix, G., Los, H., Ménesguen, A., Pätsch, J., Troost, T., van der Molen, J., van Leeuwen, S., Wakelin, S. : *'Distance to target' modeling assessment*, OSPAR Report in Eutrophication Series, OSPAR Commission, 80 pp., url : <http://www.ospar.org/documents?v=7319>, 2013.

Conference & Workshop Contributions

■ Oral Presentations

- **Große, F.**, Zhang, H., Laurent, A., Fennel, K. : *Quantifying the relative contributions of riverine versus oceanic nutrient sources on coastal hypoxia* . Ocean Deoxygenation Conference, Kiel/Germany, September 2018.
- Lenhart, H.-J., **Große, F.** : *Assessing trans-boundary nutrient modelling results including WFD reduction scenario within an OSPAR frame*. 4th International Symposium on Research and Management of Eutrophication in Coastal Ecosystems (EUTRO2018), Nyborg/Denmark, June 2018.
- **Große, F.**, Fennel, K., Laurent, A. : *Quantifying the relative importance of anthropogenic nutrients in coastal marine ecosystems through element tracing : A case study for the northern Gulf of Mexico*. 52nd Canadian Meteorological and Oceanographic Society Congress, Halifax (NS)/Canada, June 2018.
- Kerimoglu, O., **Große, F.**, Kreuz, M., Lenhart, H.-J., van Beusekom, J.E.E. : *A model-based projection of historical state of a coastal ecosystem : relevance of phytoplankton stoichiometry*. ICES Working Group on Integrated, Physical-biological and Ecosystem Modelling (ICES-WGIPEM) meeting, Copenhagen/Denmark, April 2018.
- **Große, F.**, Kreuz, M., Lenhart, H.-J., Pätsch, J. : *Riverine nitrogen and oxygen deficiency in the North Sea : Extending trans-boundary nutrient transports for the ecological management of low oxygen conditions*. Advances in Marine Ecosystem Modelling Research (AMEMR), Plymouth/UK, July 2017.
- **Große, F.**, Lenhart, H.-J. : *WFD-compliant nitrogen reductions within the OSPAR framework : A source-oriented approach for the North Sea*. Innovative modelling in support of MSFD implementation, Brussels/Belgium, March 2017.

- **Große, F.**, Kreuz, M., Lenhart, H.-J., Pätsch, J. : *The influence of riverine nitrogen on the dynamics of the North Sea oxygen minimum zone*. European Geophysical Union (EGU) General Assembly, Vienna/Austria, April 2016.
- **Große, F.**, Kreuz, M., Pätsch, J. : *A new post-processing tool for the source-related element tracing in biogeochemical models*. EGU General Assembly, Vienna/Austria, April 2015.
- Pätsch, J., Thomas, H., **Große, F.**, Kreuz, M. : *The influence of the NAO on oxygen dynamics in the North Sea*. EGU General Assembly, Vienna/Austria, April 2015.
- **Große, F.**, Lenhart, H.-J., Brockmann, U. : *Looking beyond stratification : A model-based analysis of the biological drivers of oxygen depletion in the North Sea*. 46th International Liège Colloquium on 'Low oxygen environments in marine, estuarine and fresh waters', Liège/Belgium, May 2014.
- **Große, F.**, Pätsch, J., Backhaus, J.O. : *Parameterising primary production and convection in a 3D model*. 45th International Liège Colloquium on 'Primary production in the Ocean : from the synaptic to the global scale', Liège/Belgium, May 2013.
- **Große, F.**, Pätsch, J., Backhaus, J.O. : *Parameterising primary production and convection in a 3D model*. YOUMARES, Lübeck/Germany, September 2012.

■ Poster Presentations

- **Große, F.**, Fennel, K., Laurent, A. : *Quantifying the relative importance of different nitrogen sources on hypoxia development in the northern Gulf of Mexico : A biogeochemical model analysis*. Ocean Sciences Meeting, Portland (OR)/USA, February 2018.
- **Große, F.**, Kreuz, M., Pätsch, J. : *A new post-processing tool for the source-related element tracing in biogeochemical models*. EGU General Assembly, Vienna/Austria, 2015.
- **Große, F.**, Körner, U., Kreuz, M., Lebretton, C., Lenhart, H., Pätsch, J. : *Modelling phytoplankton dynamics in the North Sea : The influence of satellite-derived TSM*. AMEMR, Plymouth/UK, July 2014.

Supervision of Theses

- Sep 2016** Bachelor's thesis of Joel Graef
Department of Informatics, Universität Hamburg, Universität Hamburg, Hamburg/Germany
Thesis title : *Leistungs- und Genauigkeitsanalyse numerischer Löser für Differentialgleichungen*
(engl. : *Performance and precision analysis of numerical solvers for differential equations*)
- Aug 2016** Master's thesis of Simon Kostede
Department of Informatics, Universität Hamburg, Universität Hamburg, Hamburg/Germany
Thesis title : *Performanceanalyse der Ein-/Ausgabe des Ökologiemodells ECOHAM5*
(engl. : *Performance analysis of input/output of the ecological model ECOHAM5*)

Professional Services

Reviewer for Biogeosciences, Hydrobiologia, Journal of Marine Systems

University Services

- Aug 2017 - present** Dalhousie Postdoctoral Society
Dalhousie University
- Co-President (since January 2018)
 - Member of Executive Committee
 - Webmaster
 - Postdoctoral Representative at Faculty of Graduate Studies Council
 - Organization of Post-doctoral Research Day (one-day conference)
- Apr 2008 - Sep 2011** Student council
Institute of Oceanography, Universität Hamburg

- Organization of introductory week for new students
- Contact person for students and academic staff
- Student support for administrative issues
- Member of appointment committee

Volunteer Work

- Sep 2012 -** KlimaTeller
May 2014 GreenFlux e.V., Hamburg/Germany
- Project goals
 - informing about the impact of meat and dairy production (and consumption) on green house gas (GHG) emissions
 - active reduction of GHG emissions by introducing one day per week with low-emission meals in university and company cafeterias
 - Organization of and participation in information events
 - Communication with project partners (universities and private companies)

Community Service

- Aug 2004 -** Kinderhaus Dresden-Plauen, Windbergstraße 22, D-01189 Dresden/Germany
May 2005 Caretaker and child care worker

Personal Interests

Squash, Fishing, Cycling, Hiking, Making Music

Referees

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