Heiner Dietze

Heiner Dietze
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EDUCATION
- ◇ **Christian-Albrechts-University**, Kiel, Germany.
  PhD, July 6, 2004. A quantitative analysis of the biological pump in the oligotrophic subtropical North Atlantic (http://oceanrep.geomar.de/4333/1/Diss_Dietze_2004.pdf).

- ◇ **Institut d'Etudes Scientifique de Cargèse**, France.
  SOLAS summer school 2003 (focussed on air-sea exchange)

- ◇ **University of Wales**, Gregynog, UK
  CARTUM summer school 2001 (focussed on turbulence)

- ◇ **Christian-Albrechts-University**, Kiel, Germany.
  Master of Science ("Diplom") in Physical Oceanography, January 25, 2001. A systematic intercomparison of three 1-D mixed layer models (http://oceanrep.geomar.de/5831/1/dietze_diplom.pdf).

WORK EXPERIENCE
- ◇ **Visiting Senior Lecturer, King's College London, (2022 – present)**
- ◇ **Data Science Staff / PostDoc, 50%, CAU, Kiel, Germany, (2021 – present)**
  - · Development of Big Data and Machine Learning tools at the interface between Earth System Modelling, GIS and Archeology.
  - · Proposal writing.
- ◇ **Lecturer**, CAU, Kiel, Germany, (2020 – 2021; 50% contract)
  - · Transition to online teaching, supervision and examination at CAU, Institut for Geosciences, Kiel.
  - · Lectures on Meteorology; Matlab and Unix courses
- ◇ **PostDoc**, CAU, Kiel, Germany, (2017 – 2020; 50% contract)
  - · Development of a forecasting system framework for the Eckernförde Bight (for the Landesamt für Landwirtschaft, Umwelt und ländliche Räume).
  - · Setup of a ultra-high resolution model (100 m resolution) of a bay in the Baltic Sea using MOM.
  - · Setup of a coupled ocean-circulation biogeochemical model off Africa featuring submesoscale 1.5 km resolution using MOM.

- ◇ **Senior Scientist, 50%, GEOMAR, Kiel, Germany (2010 – present)**

  - · (Co)Supervision of interns, PhD, master and bachelor students.
  - · Implementation of transient tracers into nested FOCI framework
  - · High-resolution nesting within the Flexible Ocean and Climate Infrastructure (FOCI).
  - · PI for DFG project.

- · Porting of ACCESS-CAFE from CSIRO onto german HPC site.
- · Setup of a "nest-in-nest" coupled ocean-circulation BGC model configuration off Peru using ROMS.
- · Purchase, setup and administration of distributed computing servers (infiniband interconnect).
- · Development of a near-global coupled biogeochemical-ocean circulation model which features eddy-resolving resolution in the Southern Ocean named MOMSO.
- · Development of a high-resolution (1 nautical mile) general ocean circulation model of the Baltic Sea named MOMBA.
- · Setup of numerical experiments (using UVic and GFDL's CM2.1) to explore the effect of the (unresolved) equatorial intermediate current system in earth system models.
- · Setup of a suite of coupled ecosystem-circulation models (down to eddy-permitting resoution) designed to explore oxygen dynamics in the eastern equatorial Pacific.
- · Setup of an eddy-resolving ocean circulation model to explore the fate of radiative materials released off Fukushima Dai-ichi, Japan. Contributing to the SCJ Report of model inter-comparison for environmental pollution from Fukushima Daiichi Nuclear Power Plant Accident https://oceanrep.geomar.de/26138.
- · Implementation of a biogeochemical module comprising iron (BLING) into the "University of Victoria earth system model".

◇ **Post-Doc**, SMHI, Norrköping, Sweden (2010)

- · Development of a 0-D model driven by output from RCO (which is yet another parallel-lized version of an ancient MOM version) to understand the dynamics of cyanobacteria in the Baltic Sea.
- · Start of development of a Baltic Sea model from scratch.

◇ **Post-Doc**, IFM-GEOMAR, Kiel, Germany (2007 – 2009)

- · Implemented a biogeochemistry model into the NEMO DRAKKAR V2.2 coupled ocean-atmosphere circulation model and ran test cases on a global $0.5°$ grid (ORCA05).
- · Setup of a suite of global coupled ecosystem-circulation models (using MOM4) to test the sensitivity of oxygen minimum zones on model resolution.

◇ **Post-Doc**, CSIRO, Hobart, Australia (2005 – 2007)

- · Implemented a biogeochemistry model and a suite of passive tracers into the MOM4 ocean circulation model. These tools were used to explore the nutrient budget of anti-cyclonic eddies off Western Australia.

◇ **Post-Doc**, IFM-GEOMAR, Kiel (2004 – 2005)

- · Modeled the export of dissolved organic carbon in the North Atlantic. Setup of a regional, eddy-resolving, coupled ecosystem-circulation model of the equatorial Pacific using SPFLAME.

◇ **PhD Student**, IFM-GEOMAR, Kiel (2001 – 2004)

- · Quantitative assessment of the biological pump in the oligotrophic subtropical North Atlantic based on a combination of cruise data and integrations of an eddy-permitting coupled ecosystem-circulation model. PI for physical measurements (VMADCP, CTD) on two cruises in the NA.

TEACHING   Transition to online teaching

Lectures on Oceanography, Meteorology, Turbulence

Unix and Matlab courses for Batchelor Students

Development and execution of a lecture-tutorial combination on global ocean-circulation modelling. Employs cutting-edge numerically-efficient offline algorithms and even runs on a Raspberry Pi!

Lecture (both development and execution) on ocean circulation and air-sea gas exchange

Tutorial on modeling of marine biogeochemistry within the framework of "UTAS-CSIRO Joint PhD Program in Quantitative Marine Science".

Lecture on inverse techniques for master students.

(Co-) Supervision of various Batchelor, Master and Ph.D. students

REVIEW
ACTIVITIES

Anthropocene

Biogeosciences

Canadian Foundation for Climate and Atmospheric Sciences (CFCAS)

Comisión Nacional de Investigación Científica y Tecnológica (CONICYT, Chile)

Deep-Sea Research I

Deep-Sea Research II

DFG German Science Foundation

Environmental Science: Processes & Impacts

Frontiers, associated editor

Geophysical Research Letters

Global Biogeochemical Cycles

Journal of Advances in Modeling Earth Systems

Journal of Geophysical & Astrophysical Fluid Dynamics

Journal of Geophysical Research - Oceans

Journal of Marine Systems

Journal of Plankton Research

Limnology and Oceanography

Nature Geoscience

Ocean Dynamics

Ocean Modelling

Oceanologia

Progress in Oceanography

Reviewer for the ship-time proposals (GPF, German Research Vessels)

Reviewer for compute-time proposals to the Juelich Supercomputing Centre

Tellus Series B: Chemical and Physical Meteorology

Water

FUNDING

Lead author of HLRN computing time grant (50k Euros) titled: *Assessment of ocean ventilation in a nested earth system model*

DFG Travel grant to CSIRO in Hobart, Tasmania (Di 1665/6-1): *Reducing uncertainties in projected Southern Ocean Carbon fluxes*

Lead author of HLRN computing time grant (39k Euros) titled: *Winds in the Southern Ocean, basal melting in Antarctica and air-sea carbon fluxes.*

Heiner Dietze

Lead author of DFG New Research Grant Application (2-year Post-Doc, 117k Euros) titled: *Sensitivity of the simulated relation of Southern Ocean winds and air-sea CO_2 fluxes to the parameterisation of sub-grid scale eddies in IPCC-type ocean models.*

Coauthor of *Nutrients Originating in Volcanoes and their effect on the Euphotic zone of the Marine ecosystem* (internal, i.e. IFM-GEOMAR, the call was for an interdisciplinary young researchers' group, funding comprised a PhD position and a bit of travel money).

Coauthor of "Excellence Cluster" proposal for a PhD position titled *Parameterization of near surface vertical mixing processes by multiscale methods.*

<div style="float:left">PEER-
REVIEWED
PUBLICA-
TIONS</div>

LÖPTIEN, U. and H. **Dietze**, 2022. Ambiguous controls on simulated diazotrophs in the world oceans. *Nature Scientific Reports*, doi:10.1038/s41598-022-22382-y, 10 pages.

LÖPTIEN, U. and H. **Dietze**, 2022. Retracing cyanobacteria blooms in the Baltic Sea. *Nature Scientific Reports*, doi:10.1038/s41598-022-14880-w, 8 pages.

HORDOIR, R., SKAGSETHM, Ø., INGVALDSEN, R. B., SANDØ, A. B., LÖPTIEN, U., **Dietze**, H., GIERISCH, A. M. U., ASSMANN, K. M., LUNDESGAARD, Ø., and S. LIND, 2022. Changes in Arctic Stratification and Mixed Layer Depth Cycle: A Modeling Analysis. *Journal of Geophysical Reserach: Oceans*, doi:10.1175/JPO-D-21-0092.1, 18 pages.

DILMAHAMOD, A. F., KARSTENSEN, J., **Dietze**, H., LÖPTIEN, U., and K. FENNEL, 2022. Generation mechanisms of mesoscale eddies in the Mauretanian Upwelling Region. *Journal of Physical Oceanography*, doi:10.1175/JPO-D-21-0092.1, 22 pages.

LÖPTIEN, U., **Dietze**, H., PREUSS, R., and U. V. TOUSSAINT, 2021. Mapping manifestations of parametric uncertainty in projected pelagic oxygen concentrations back to contemporary local model fidelity. *Nature Scientific Reports*, doi:10.1038/s41598-021-00334-2, 7 pages.

Dietze, H. and U. LÖPTIEN, 2021. Retracing hypoxia in Eckernförde Bight (Baltic Sea). *Biogeosciences* **Highlight paper**, doi:10.5194/bg-18-4243-2021, 22 pages.

MUNKES, B., LÖPTIEN, U., and H. **Dietze**, 2021. Cyanobacteria blooms in the Baltic Sea: a review of models and facts. *Biogeosciences*, doi:10.5194/bg-18-2347-2021, 32 pages.

Dietze, H., LÖPTIEN, U., HORDOIR, R., HEINEMANN, M., HUISKAMP, W., and B. SCHNEIDER, 2020. Silicon isotopes in an EMIC's ocean: sensitivity to runoff, iron supply and climate. *Paleoceanography and Paleoclimatology*, doi:10.1029/2020PA003960, 29 pages.

MATHESIUS, S., GETZLAFF, J., **Dietze**, H., OSCHLIES, A., and M. SCHARTAU, 2020. Reanalysis of vertical mixing in mesocosm experiments: PeECE III and KOSMOS 2013. *Earth System Science Data*, doi:10.5194/essd-12-1775-2020, 21 pages.

Dietze, H., LÖPTIEN, U. and J. GETZLAFF, 2020: MOMSO - a near-global, coupled biogeochemical ocean-circulation model configuration with realistic eddy kinetic energy in the Southern Ocean. *Geoscientific Model Development Discussion*, doi:10.5194/gmd-13-71-2020, 27 pages.

LÖPTIEN, U. and H. **Dietze**, 2019: Reciprocal bias compensation and ensuing uncertainties in model-based climate projections: pelagic biogeochemistry versus ocean mixing. *Biogeosciences* **Highlight paper**, doi:10.5194/bg-16-1865-2019, 17 pages.

HORDOIR, R., AXELL, L., HÖGLUND, A., DIETERICH, C., FRANSNER, F., GRÖGER, M., LIU, Y., PEMPERTON, P., SCHIMANKE, S., ANDERSSON, H., LJUNGMYR, 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 J. HAAPALA, 2019: Nemo-Nordic 1.0: a NEMO-based ocean model for the Baltic and North seas -

research and operational applications. *Geoscientific Model Development*, doi:10.5194/gmd-12-363-2019, 24 pages.

LÖPTIEN, U. and H. **Dietze**, 2017: Effects of parameter indeterminacy in pelagic biogeochemical modules of Earth System Models on projections into a warming future: The scale of the problem. *Global Biogeochemical Cycles*, doi:10.1002/2017GB005690, 18 pages.

KVALE, K. F., KHATIWALA, S., **Dietze**, H., KRIEST, I., and A. OSCHLIES, 2017: Evaluation of the Transport Matrix Method for simulation of ocean biogeochemical tracers. *Geoscientific Model Development*, doi:10.5194/gmd-10-2425-2017, 21 pages.

Dietze, H., GETZLAFF, J., and U. LÖPTIEN, 2017: Simulating natural carbon sequestration in the Southern Ocean: on uncertainties associated with eddy parameterizations and iron deposition. *Biogeosciences*, doi:10.5194/bg-14-1561-2017, 16 pages.

JOSE, Y. S., **Dietze**, H., and A. OSCHLIES, 2017: Linking diverse nutrient patterns to different water masses within anticyclonic eddies in the upwelling system off Peru. *Biogeosciences*, doi:10.5194/bg-14-1349-2017, 16 pages.

Dietze, H. and U. LÖPTIEN, 2016: Effects of surface current-wind interaction in an eddy-rich general circulation simulation of the Baltic Sea. *Ocean Science*, doi:10.5194/os-12-977-2016, 10 pages.

LANDOLFI, A., **Dietze**, H., and G. VOLPE, 2016: Longitudional variability of organic nutrients in the North Atlantic subtropical gyre. *Deep-Sea Research Part I*, doi:10.1016/j.dsr.2015.11.009, 11 pages.

GETZLAFF, J., **Dietze**, H., and A. OSCHLIES, 2016: Simulated effects of southern hemispheric wind changes on the Pacific oxygen minimum zone. *Geophysical Research Letters*, doi:10.1002/2015GL066841, 7 pages.

HORDOIR, R., AXELL, L., LÖPTIEN, U., **Dietze**, H., and I. KUTZENOV, 2015: Influence of sea level rise on the dynamics of salt inflows in the Baltic Sea. *Journal of Geophysical Research Oceans*, doi:10.1002/2014JC010642, 16 pages.

LÖPTIEN, U., and H. **Dietze**, 2015: Constraining parameters in marine pelagic ecosystem models - is it actually feasible with typical observations of standing stocks? *Ocean Science*, doi:10.5194/os-11-573-2015, 18 pages.

LANDOLFI, A., KOEVE, W., **Dietze**, H., KÄHLER, P., and A. OSCHLIES, 2015: A new perspective on environmental controls of marine nitrogen fixation. *Geophysical Research Letters*, doi:10.1002/2015GL063756, 8 pages.

FIETZKE, J., RAGAZZOLA, F., HALFAR, J., **Dietze**, H., FOSTER, L. C., HANSTEEN, T. H., EISENHAUER, A., and R. S. STENECK, 2015: Century-scale trends and seasonality in pH and temperature for shallow zones of the Bering Sea. *Proceedings of the National Academy of Sciences of the United States of America*, doi:10.1073/pnas.1419216112, 6 pages.

LÖPTIEN, U., and H. **Dietze**, 2014: Sea ice in the Baltic Sea - revisiting BASIS ice, a historical data set covering the period 1960/1961-1978/1979. *Earth System Science Data*,

doi:10.5194/essd-6-367-2014, 8 pages.

Dietze, H., Löptien, U., and K. Getzlaff, 2014: MOMBA 1.1 – a high-resolution Baltic Sea configuration of GFDL's Modular Ocean Model. *Geoscientific Model Development* **Highlight paper**, doi:10.5194/gmd-7-1713-2014, 19 pages.

Pahlow, M., **Dietze**, H., and A. Oschlies, 2013: Optimality-based model of phytoplankton growth and diazotrophy. *Marine Ecology Progress Series* **Feature article**, doi:10.3354/meps10449, 17 pages.

Hordoir, R., Dieterich, C., Basu, C., **Dietze**, H., and H. E. M. Meier, 2013: Freshwater outflow of the Baltic Sea & transport in the Norwegian Current: a statistical correlation analysis based on a numerical experiment. *Continental Shelf Research*, doi:10.1016/j.csr.2013.05.006, 10 pages.

Getzlaff, J., and H. **Dietze**, 2013: Effects of increased isopycnal diffusivity mimicking the unresolved equatorial intermediate current system in an earth system climate model. *Geophysical Research Letters*, doi:10.1002/grl.50419, 5 pages.

Dietze, H., and U. Löptien, 2013: Revisiting "nutrient trapping" in global coupled biogeochemical ocean circulation models. *Global Biogeochemical Cycles*, doi:10.1002/gbc.20029, 20 pages.

Landolfi, A., **Dietze**, H., Koeve, W. and A. Oschlies, 2013: Overlooked runaway feedback in the marine nitrogen cycle: the vicious cycle. *Biogeosciences*, doi:10.5194/bg-10-1351-2013, 13 pages.

Dietze, H. and I. Kriest, 2012: ^{137}Cs off Fukushima Dai-ichi, Japan – model based estimates of dilution and fate. *Ocean Science*, doi:10.5194/os-8-319-2012, 14 pages.

Olgun, N., S. Duggen, P. Croot, P. Delmelle, H. **Dietze**, U. Schacht, N. Oskarsson, C. Siebe, A. Auer, and D. Garbe-Schönberg, 2011: Surface ocean iron fertilization: The role of airborne volcanic ash from subduction zone and hotspot volcanoes and related iron-fluxes into the Pacific Ocean. *Global Biogeochemical Cycles*, doi:10.1029/2009GB003761, 15 pages.

Liu, N., Eden, C., **Dietze**, H., Wu, D. and X. Lin, 2010: Model-based estimate of the heat budget in the East China Sea. *Journal of Geophysical Research*, doi:10.1029/2009JC005869, 11 pages.

Kähler, P., Oschlies, A., **Dietze**, H. and W. Koeve, 2010: Oxygen, carbon, and nutrients in the oligotrophic eastern subtropical North Atlantic. *Biogeosciences*, doi:10.5194/bg-7-1143-2010, 14 pages.

Zamora, L., Landolfi, A., Oschlies, A., Hansell, D., **Dietze**, H. and F. Dentener, 2010: Atmospheric deposition of nutrients and excess N formation in the North Atlantic. *Biogeosciences*, doi:10.5194/bg-7-777-2010, 17 pages.

DUGGEN, S., OLGUN, N., CROOT, P., HOFFMANN, L., **Dietze**, H., DELMELLE, P., and C. TESCHNER, 2010: The role of airborne volcanic ash for the surface ocean biogeochemical iron-cycle: a review. *Biogeosciences*, doi:10.5194/bg-7-827-2010, 18 pages.

Dietze, H., MATEAR, R. and T. MOORE, 2009: Nutrient supply to anticyclonic meso-scale eddies off western Australia estimated with artificial tracers released in a circulation model. *Deep Sea Research Part I*, doi:10.1016/j.dsr.2009.04.012, 9 pages.

EDEN, C. and H. **Dietze**, 2009: Effects of mesoscale eddy/wind interactions on biological new production and eddy kinetic energy. *Journal of Geophysical Research Ocean*, doi:10.1029/2008JC005129, 14 pages.

LÖPTIEN, U., EDEN, C., TIMMERMANN, A. and H. **Dietze**, 2009: Effects of biologically induced differential heating in an eddy-permitting coupled ocean-ecosystem model. *Journal of Geophysical Research*, doi:10.1029/2008JC004936, 17 pages.

Dietze, H. and A. OSCHLIES, 2005: On the correlation between air-sea heat flux and abiotically induced oxygen exchange in a circulation model of the North Atlantic. *Journal of Geophysical Research*, doi:10.1029/2004JC002453, 10 pages.

Dietze, H. and A. OSCHLIES, 2005: Modeling abiotic production of apparent oxygen utilisation in the oligotrophic subtropical North Atlantic. *Ocean Dynamics*, doi:10.1007/s10236-005-0109-z, 6 pages.

Dietze, H., A. OSCHLIES and P. KÄHLER, 2004: Internal-wave-induced and double-diffusive nutrient fluxes to the nutrient-consuming surface layer in the oligotrophic subtropical North Atlantic. *Ocean Dynamics*, doi:10.1007/s10236-003-0060-9, 7 pages.

OSCHLIES, A., H. **Dietze** and P. KÄHLER, 2003: Salt-finger driven enhancement of upper ocean nutrient supply. *Geophysical Research Letters*, doi:10.1029/2003GL018552, 4 pages.

OTHER REPORTS

BAILLY DU BOI, P., BOCQUET, M., BOUST, D., BROVCHENKO, I., CHOE, A., CHRISTOUDIAS, T., DIDIER, D., **Dietze**, H., GARREAU, P., HIGASHI, H., JUNG, K. T., KIDA, S., LE SAGER, P., LELIEVELD, J., MADERICH, V. S., MIYAZAWA, Y., PARK, S. U., QUELO, D., SAITO, K., SHIMBORI, T., UCHIYAMA, Y., VAN VELTHOVEN, P., WINIAREK, V. and YOSHIDA, S., 2004: A review of the model comparison of transportation and deposition of radioactive materials released to the environment as a result of the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Plant accident. *Report of the Science Council of Japan, Sectional Committee on Nuclear Accident*, 103 pages.

REFEREES

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