

curriculum vitæ

Prof. Dr. Hans Burchard

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Personal Data

Date of Birth August 17, 1959
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Qualification

2001 Habilitation in Physical Oceanography at the University of Hamburg on *Applied Turbulence Modelling in Marine Waters*
1992-1995 PhD student at the Institute for Oceanography at the University of Hamburg, PhD thesis on *Turbulenzmodellierung mit Anwendungen auf thermische Deckschichten im Meer und Strömungen in Wattengebieten* (passed with distinction “summa cum laude”, awarded as best dissertation in 1995 at the Geophysical Faculty of the University of Hamburg).
1989-1992 University study (Master) of Applied Mathematics at the University of Hamburg
1985-1987 Training as high school teacher at the Seminar Elmshorn
1978-1984 University Study (Staatsexamen) of Mathematics and Sport for high school teachers at the University of Kiel

Employment

2002-present University Professor for Physical Oceanography and Instrumentation at the Leibniz Institute for Baltic Sea Research Institute Warnemünde at the University of Rostock, Deputy Head of the department of Physical

	Oceanography and Instrumentation (2013-2015 acting department head)
2000-2001	Researcher at the Institute for Oceanography, Hamburg
1999-2000	Visiting Scientist, grant holder of the German Research Foundation, Institute for Oceanography, University of Hamburg
1996-1998	Researcher at the Space Applications Institute, Joint Research Centre of the European Communities, Ispra, Italy.
1995-1996	Research Assistant at the International Centre for Computational Hydrodynamics, Danish Hydraulic Institute, Hørsholm, Denmark.
1992-1995	PhD student, Institute for Oceanography, University of Hamburg
1987-1989	Teacher for Mathematics and Sports at the Gymnasium Büsum

Professional Experience

2021	Visiting professor at the Scottish Association of Marine Science (SAMS) in Oban, Scotland
2020-2024	Member of the <i>Zukunftsforum Ozean (Forum Future Ocean)</i> of the German Marine Research Consortium (KDM)
2020-2024	Member of the Advisory Board for the research vessels Maria M. Merian and Meteor
2017	Visiting professor at the University of Victoria, B.C., Canada (3 months)
2015-2019	Member of the board of the Department of Maritime Systems of the Interdisciplinary Faculty of the University of Rostock
2012-2016	Associate Editor of Continental Shelf Research (Elsevier)
2012-2020	Elected member of the Fachkollegium 313 (Physics, Biology and Chemistry of the Ocean) of the German Research Foundation, quality control of proposal evaluation
2012-2016	Representative of DFG Fachkollegium 313 at the Senatskommission Ozeanographie (coordination of research activities on large German research vessels)
2012-2016	Member of the Scientific Board of the North-German Supercomputing Alliance (HLRN)
2011	Visiting professor at the Woods Hole Oceanographic Institution in Woods Hole, MA, USA (3 months)
2008	Visiting professor at the School of Ocean Sciences of the University of Bangor, Wales (4 months)
2008-present	Member of the Interdisciplinary Faculty and the Department of Maritime Systems at the University of Rostock
2005-2007	Chairman of the Conference of Baltic Oceanographers (CBO)
2004-2007	Full Member of SCOR Working Group 121 on „Ocean Mixing“
2003-present	Organiser of the biannual Warnemünde Turbulence Days (WTD), see http://www.io-warnemuende.de/wtd.html
2000-present	Member of PECS Steering Committee (Biennial Conference of Physics of Estuaries and Coastal Seas)
2000-2006	Editor of Ocean Dynamics (Springer)

1999-2014	Partner in Bolding & Burchard ApS, Denmark (development and service in numerical ocean modelling), together with Dr. Karsten Bolding
1999-present	Major developer of the General Ocean Turbulence Model (GOTM, www.gotm.net) and the General Estuarine Transport Model (GETM, www.getm.eu)

Awards

2019	Georg Wüst Prize awarded by the German Society for Marine Research (DGM, Deutsche Gesellschaft für Meeresforschung) to honour outstanding ocean researchers
2013-2018	Honorary Professor of Physical Oceanography at the University of Aarhus, Denmark
2001-2002	Alexander-von-Humboldt-Prize of the National Belgian Research Foundation (Fonds National de la Recherche Scientifique)
1995	Best Dissertation of the Geophysical Faculty of the University of Hamburg

Scientific Interest

- Transport and mixing processes in stratified coastal seas
- Tidal and non-tidal estuarine circulation regimes
- Sediment transport
- Impacts of offshore structures and anthropogenic discharges on coastal dynamics
- Long-term change and variability in the coastal ocean
- Physical-biological interaction in the marine environment
- Turbulence closure modelling
- Development of numerical ocean models
- Numerical methods for conservation equations

Teaching experience

- Regular lectures (one per semester) at the University of Rostock (since 2002) in the framework of the Master in Physics: Hydrodynamics, Marine Turbulence, Coastal Ocean Processes, Numerical Methods of Conservation Equations
- Various summer school presentations, e.g. at the AWI-GKSS-IOW summer schools, the Physics Summer School of the Deutsche Physikalische Gesellschaft on “Physics of the Ocean” (2011, 2014), the POMOR winter school in St. Petersburg (2013, 2015, 2017, 2019), the winter school on lakes and estuaries (Trieste, 2014, 2016), the POGO courses in 2014 (List/Sylt), organised by AWI, and the BioCat summer school in the framework of the SOPRAN projects (2008).

Supervision of students

PhD students

- Richard Hofmeister, Numerical and diagnostic techniques for modelling stratified coastal seas,

University of Rostock, 2007-2010, defended in February 2011 (supervisor).

- Hannes Rennau, Natural, numerical and structure-induced mixing in dense gravity currents: idealised and realistic model studies, University of Rostock, 2006-2010, defended in May 2011 (supervisor).
- Peter Holtermann, The Baltic Sea Tracer Release Experiment: Mixing processes in the Gotland Basin, University of Rostock, 2007-2012, defended in March 2012 (co-supervisor)
- Eefke van der Lee, Observation of internal waves in the Baltic Sea: Motions near the inertial and buoyancy frequencies, University of Rostock, 2008-2012, defended in May 2012 (co-supervisor)
- Bianca Schippmann, Particle tracking as modelling tool for coastal management in the Baltic Sea, University of Rostock, 2009-2013, defended in December 2013 (co-supervisor)
- Knut Klingbeil, Approaches for the improvement of physical transport processes in numerical models of the coastal ocean, University of Rostock, defended in February 2014 (supervisor).
- Johannes Becherer, Estuarine circulation in well-mixed tidal inlets, University of Rostock, defended in July 2014 (supervisor).
- Elisabeth Schulz, Impact of the depth-to-width ratio of a tidally energetic estuary on the residual along-channel circulation, University of Rostock, 2009-2014, defended in December 2014 (supervisor)
- Mahdi Mohamadi-Aragh, The impact of advection schemes on lateral shear and baroclinic instability, University of Hamburg, 2010-2014, defended in December 2014 (supervisor)
- Kaveh Purkiani, Numerical modelling of Wadden Sea dynamics, University of Rostock, 2010-2014, defended in April 2015 (supervisor)
- Xaver Lange, Baroclinic effects in the coastal zone, University of Rostock, 2016-2018, defended in April 2019 (supervisor)
- Evridiki Chrysagi, Energy conversions in the upper ocean mixed layer, University of Rostock, 2016-2020, defended in January 2021 (supervisor)
- Marvin Lorenz, Quantifying exchange flow in the Persian Gulf, University of Rostock, 2017-2020, defended in March 2021 (supervisor)
- Markus Reinert, Estimating melt rates in cavities under glacial ice in Greenland fjords, University of Rostock, 2020- (supervisor)
- Erika Henell, Effective diapycnal mixing in the Baltic Sea, University of Rostock, 2021- (co-supervisor)

Master students

- Alger Werft, Surface wave modelling in the Wadden Sea, Carl von Ossietzki Universität Oldenburg, submitted in Feb. 2003.
- Frank Wolk, Three-dimensional Lagrangian Tracer modelling in Wadden Sea areas, Carl von Ossietzki Universität Oldenburg, submitted in Feb. 2003.
- Hannes Rennau, A two-layer model for simulating Baltic Sea inflows, University of Rostock, submitted in March 2006.
- Richard Hofmeister, Model studies on stratification in the Limfjord, University of Rostock, submitted in June 2006.
- Peter Holtermann, Reconstruction of the hydrodynamics in a tropical estuary, University of Rostock, submitted August 2007.
- Mathias Ahrenberg, Skalenabschätzung von Transporten in der Westlichen Ostsee, University of Rostock, submitted November 2007.

- Bianca Schippmann, Comparison of Rosenbrock methods with Modified Patankar schemes used in biogeochemical modelling, University of Rostock, submitted December 2008.
- Elisabeth Fischer, Turbulent kinetic energy dissipation rate in the Rhine Region of Freshwater Influence, University of Rostock, submitted December 2008.
- Knut Klingbeil, Testing the feasibility of an alternative approach for the inclusion of non-hydrostatic dynamics into the General Estuarine Transport Model, University of Rostock, submitted May 2009.
- Artur Szewczyk, Observations of the medium-intensity inflow into the Baltic Proper in November 2005 and comparison with the model data, University of Rostock, submitted November 2009.
- Anja Bachmann, Auswertungen von Feldmessungen und Computersimulationen zur Bestimmung des Strömungswiderstandes im Fehmarnbelt, University of Rostock, submitted August 2010.
- Johannes Fiedler, Second-moment turbulence closure modelling, University of Rostock, submitted March 2012.
- Lennart Schüler, One-dimensional basin-wide modelling, University of Rostock, submitted May 2012.
- Xaver Lange, Particle transport in the lower Warnow estuary, University of Rostock, submitted in October 2015.
- Clemens Krautschik, Baltic Sea sea surface elevation observations from satellite, University of Rostock, submitted in October 2017.
- Marvin Lorenz, Exchange flow in the Persian Gulf, University of Rostock, submitted September 2017.
- Nicky Koganti, Dihaline mixing in tidal estuaries, University of Rostock, submitted June 2020.
- Nina Reese, Mixing and exchange flow in the Elbe Estuary, University of Rostock, to be submitted November 2021.

Evaluation activities

- Member of review panel for the Royal Netherlands Institute for Sea Research (NIOZ), September 2012, and GEOMAR, October 2017.
- Member of PhD committees at various universities such as University of Hamburg, University of Siegen, University of Southampton (UK), TU Delft (Netherlands), University Santiago de Compostela (Spain), University of Bergen (Norway), University of Trondheim (Norway), University of Louvain-la-Neuve (Belgium).
- Research proposal peer-reviews for various funding agencies such as German Research Foundation, German Academic Exchange Service, Humboldt Foundation (Germany), National Science Foundation (USA), National Environment Research Council (UK), Estonian Science Foundation, Agence Nationale de la Recherche (France), and the Netherlands Organisation for Scientific Research (NWO).
- Peer-reviews for international scientific journals such as Journal of Physical Oceanography, Journal of Geophysical Research (Oceans), Geophysical Research Letters, Ocean Modelling, Coastal Engineering, Continental Shelf Research, Journal of Marine Systems, Ocean Dynamics, JAMES.
- Reviews of applications for professorships at various institutes such as Alfred-Wegener Institute (Germany), University of Hamburg (Germany), Oregon State University (USA), Woods Hole Oceanographic Institution (USA), Rutgers University (USA), Florida State University (USA), University of Aarhus (Denmark), South Africa's National Research Foundation (NRF).
- Environmental Impact Assessment of the fixed link across the Fehmarn Belt (modelling of local impacts on hydrography).

- Environmental Impact Assessment of cooling water discharge in Greifswald Bay from a planned coal power station in Lubmin.

Public Outreach

- Member of the Scientists for Future network with several public presentations on regional climate change impacts (since 2019)
- Various presentations in the framework of “Kinder-Universität” activities about “How does the Baltic Sea function” at the University of Rostock and at the Hochschule Wismar, with up to 400 elementary school children (2007-2009), as well as in schools in Rostock. An idealised Plexiglas model of the Baltic Sea which I developed was copied more than ten times and became a common teaching tool.
- Presentation in the framework of the “Senioren-Akademie” about possible obstruction of the water exchange between Baltic Sea and North Sea due to offshore constructions (about 300 participants).
- Various public presentations about the 2004 tsunami in the Indian Ocean (e.g. “Samstags-Universität” at the University of Rostock).
- Various TV, radio and newspaper interviews about the impacts of offshore wind farms on the exchange between Baltic Sea and North Sea.
- Three public presentations in the framework of the “Warnemünder Abende” of IOW about tides in the ocean, impacts of offshore wind farms and sediment transport in the Wadden Sea.

Research Cruises

1. North Atlantic, *R/V Valdivia*: Mooring work and CTD profiles for SEFOS project, (23.06.-14.07. 1995)
2. Knebel Vig (Denmark), *R/V Tyra*: Microstructure and CTD within PhASE project (14.09.-20.09. 1997)
3. Lloret de Mar (Spain), *R/V Odon de Buen*: Microstructure and CTD within PhASE project (01.06.-07.06. 1998)
4. Baltic Sea, *R/V Gauss*: HELCOM monitoring cruise (March 2003)
5. Arkona Sea, *R/V Helmsand*: CTD, microstructure, ADCP and mooring work within QuantAS projects (26.01.-13.02. 2004)
6. Arkona Sea, *R/V Professor Albrecht Penck*: CTD, microstructure, ADCP and mooring work within QuantAS projects (16.11.-29.11. 2005, chief scientist: Hans Burchard)
7. Wadden Sea in Lower Saxony, *R/V Ludwig Prandtl*: CTD, microstructure, ADCP and mooring work within ECOWS project (11.04.-14.04. 2010)
8. Wadden Sea in Lower Saxony, *R/V Ludwig Prandtl*: CTD, microstructure, ADCP and mooring work within ECOWS project (09.05.-19.05. 2011)
9. Central Baltic Sea, *R/V Elisabeth Mann Borgese*: synoptic observations of sub-meso-scale features of upper ocean layers, using various towed instruments (06.07.-19.07. 2012, chief scientist: Hans Burchard)

Research Projects (last 5 years)

1. German Federal Ministry for Research and Education: “Greenland Ice sheet/Ocean interaction”, 2017-2020 (Phase I); 2020-2023 (Phase II), 250.000 Euro / 169.000 Euro. Efforts: Estimating melt rates at the water-ice interface below the 79°N glacier by means of idealised and spatially highly resolved model simulations (coordinated by Alfred Wegener Institute for Marine and Polar Research).
2. German Research Foundation: “TRR181 - Energy Transfers in Atmosphere and Ocean, subprojects M5 (Reducing spurious diapycnal mixing in ocean models) and T2 (Energy budget of the ocean surface mixed layer)”. 2016-2020, 350.000 Euro. Efforts: Improving accuracy and energy-consistency of numerical ocean models; understanding energy fluxes in the upper ocean. The TRR is coordinated by the University of Hamburg.
3. German Research Foundation: “Baltic TRANSCOAST, subproject H3: Downscaling (process oriented localization) of larger scale simulations of sea water currents to assess interactions between sea and groundwater bodies”, 2016-2020, 180.000 Euro. Efforts: Ocean modelling to investigate the interaction between a coastal swamp and the adjacent coastal ocean. This project is part of the Baltic TRANSCOAST graduate school, coordinated by the University of Rostock.
4. German Research Foundation: “Morphodynamic response of the Wadden Sea to climate change”, 2016-2019, 230.000 Euro. Efforts: Development of a baroclinic model for the morphodynamics of the Wadden Sea. This project is part of the Priority Programme SPP 1889 on Regional Sea Level Change and Society, coordinated by the University of Hamburg.
5. German Federal Ministry for Research and Education: “Modular System for Shelves and Coasts - Synthesis”, 2016-2019, 250.000 Euro. Efforts: Development of a modular model system for shelf seas and coastal seas, including water column, benthos, waves, atmosphere, biogeochemistry (joint project with the coordinating Helmholtz-Zentrum Geesthacht and Bundesanstalt für Wasserbau).
6. Leibniz Society (SAW), “Greenland glacial system and future sea-level rise”, 2014-2016, 160.000 Euro. Efforts: Development of an accurate and efficient model for Greenland’s fjords, including interaction with outlet glaciers (joint project with the coordinating Potsdam Institute for Climate Impact Research and the Alfred-Wegener Institute for Marine and Polar Research).

Publications

Statistics:	web of knowledge:	139 publications	5240 citations	h-index 39
	google scholar:		9052 citations	h-index 49

Books

1. Burchard, H., *Applied turbulence modelling in marine waters*, vol. 100 of *Lecture Notes in Earth Sciences*, Springer, Berlin, Heidelberg, New York, 229 pp., **2002**.

Publications in peer-reviewed journals

1. Basdurak, N. B., H. Burchard, H. M. Schuttelaars, A local eddy viscosity parameterization for wind-driven estuarine exchange flow. Part I: Stratification dependence, *Progr. Oceanogr.*, 193, 102548, 2021.
2. Burchard, H., U. Gräwe, K. Klingbeil, N. Koganti, X. Lange, M. Lorenz, Effective diahaline diffusivities in estuaries, *J. Adv. Model. Earth Syst.*, 13, <https://doi.org/10.1029/2020MS002307>, **2021**.
3. Chrysagi, E., P. L. Holtermann, L. Umlauf, K. Klingbeil, H. Burchard, High-resolution simulations of submesoscale processes in the Baltic Sea: The role of storm events, *J. Geophys. Res.*, 126, <https://doi.org/10.1029/2020JC016411>, **2021**.
4. Li, Q., J. Bruggeman, H. Burchard, K. Klingbeil, L. Umlauf, K. Bolding, Integrating CVMix into

- GOTM (v6.0): A consistent framework for testing, comparing, and applying ocean mixing schemes, *Geosci. Model Dev.*, 14, 4261–4282, **2021**.
5. Lorenz, M., K. Klingbeil, H. Burchard, Impact of evaporation and precipitation on estuarine mixing relations, *J. Phys. Oceanogr.*, 51, 1319–1333, <https://doi.org/10.1175/JPO-D-20-0158.1>, **2021**.
 6. Burchard, H., A universal law of estuarine mixing. *J. Phys. Oceanogr.*, 50, 81-93, **2020**.
 7. Chegini, F., P. L. Holtermann, O. Kerimoglu, M. Becker, M. Kreuz, K. Klingbeil, U. Gräwe, C. Winter, H. Burchard, Processes of stratification and de-stratification during an extreme river discharge event in the German Bight ROFI, *J. Geophys. Res.*, 125, 10.1029/2019JC015987, **2020**.
 8. Lange, X., H. Burchard, K. Klingbeil, Inversions of estuarine circulation are frequent in a weakly tidal estuary with variable wind forcing and seaward salinity fluctuations, *J. Geophys. Res.*, 125, 10.1029/2019JC015789, **2020**.
 9. Lorenz, M., K. Klingbeil, H. Burchard, Numerical study of the exchange flow of the Persian Gulf using an extended Total Exchange Flow analysis framework. *J. Geophys. Res.*, 125, e2019JC015527. <https://doi.org/10.1029/2019JC015527>, **2020**.
 10. Schulz, K., H. Burchard, V. Mohrholz, P. Holtermann, H. Schuttelaars, M. Becker, C. Maushake, T. Gerkema, Intratidal and spatial variability over a slope in the Ems estuary: robust along-channel SPM transport versus episodic events, *Estuarine Coastal Shelf Sci.*, 243, 10.1016/j.ecss.2020.106902, **2020**.
 11. van Berkel, J., H. Burchard, A. Christensen, L. O. Mortensen, O. S. Petersen, F. Thomsen, The effects of offshore wind farms on hydrodynamics and implications for fishes. *Oceanogr.*, 33, 108-117, **2020**.
 12. Burchard, H., X. Lange, K. Klingbeil, and P. MacCready, Mixing estimates for estuaries, *J. Phys. Oceanogr.*, 49, 631-648, **2019**.
 13. Klingbeil, K., J. Becherer, E. Schulz, H. E. de Swart, H. M. Schuttelaars, A. Valle-Levinson, and H. Burchard, Thickness-weighted averaging in tidal estuaries and the vertical distribution of the Eulerian residual transport, *J. Phys. Oceanogr.*, 49, 1809-1826, **2019**.
 14. Lange, X., and H. Burchard, The relative importance of wind straining and gravitational forcing in driving exchange flows in tidally energetic estuaries, *J. Phys. Oceanogr.*, 49, 723-736, **2019**.
 15. Lemarié, F., H. Burchard, L. Debreu, K. Klingbeil, and J. Sainte-Marie, Advancing dynamical cores of ocean models at all scales, *Bull. Am. Met. Soc.*, doi:10.1175/BAMS-D-18-0303.1, **2019**.
 16. Lorenz, M., K. Klingbeil, P. MacCready, and H. Burchard, Numerical issues of the Total Exchange Flow (TEF) analysis framework for quantifying estuarine circulation, *Ocean Sci.*, 15, 601-614, **2019**.
 17. Becherer, J., J. Hofstede, U. Gräwe, K. Purkiani, E. Schulz, and H. Burchard, The Wadden Sea in transition - consequences of sea level rise, *Ocean Dyn.*, 68, 131-151, **2018**.
 18. Burchard, H., K. Bolding, R. Feistel, U. Gräwe, P. MacCready, K. Klingbeil, V. Mohrholz, L. Umlauf, and E. M. van der Lee, The Knudsen theorem and the Total Exchange Flow analysis framework applied to the Baltic Sea, *Progr. Oceanogr.*, 165, 268-286, **2018**.
 19. Burchard, H., H.M. Schuttelaars, and D.K. Ralston, Sediment trapping in estuaries. *Annu. Rev. Mar. Sci.*, 10, 371-395, **2018**.
 20. Hofstede, J.L.A., J. Becherer, and H. Burchard, Are Wadden Sea tidal systems with a higher tidal range more resilient against sea level rise?, *J. Coast. Conserv.*, doi: 10.1007/s11852-016-0469-1, **2018**.
 21. Jurasinski, G., M. Janssen, M. Voss, M. E. Böttcher, M. Brede, H. Burchard, S. Forster, L. Gosch, U. Gräwe, S. Gründling-Pfaff, F. Haider, M. Ibenthal, N. Karow, U. Karsten, M. Kreuzburg, X. Lange, P. Leinweber, G. Massmann, T. Ptak, F. Rezanezhad, G. Rehder, K. Romoth, H. Schade, H. Schubert, H. N. Schulz-Vogt, I. Sokolova, R. Strehse, V. Unger, J. Westphal, B. Lennartz, Understanding the coastal ecocline: Assessing sea-land-interactions at non-tidal, low-lying coasts through

- interdisciplinary research, *Frontiers Mar. Sci.*, 5, doi: 10.3389/fmars.2018.00342, **2018**.
22. Klingbeil, K., F. Lemari e, L. Debreu, and H. Burchard, The numerics of hydrostatic structured-grid coastal ocean models: state of the art and future perspectives, *Ocean Modell.*, 125, 80-105, **2018**.
 23. Lemmen, C., R. Hofmeister, K. Klingbeil, M.H. Nasermoaddeli, O. Kerimoglu, H. Burchard, F. Kösters, and K.W. Wirtz, Modular System for Shelves and Coasts (MOSSCO v1.0) – a flexible and multi-component framework for coupled coastal ocean ecosystem modelling, *Geosci. Model Devel.*, 11, 915-935, <https://doi.org/10.5194/gmd-11-915-2018>, **2018**.
 24. MacCready, P., W.R. Geyer, and H. Burchard, Estuarine exchange flow is related to mixing through the salinity variance budget, *J. Phys. Oceanogr.*, 48, 1375-1384, **2018**.
 25. Nasermoaddeli, M.H., C. Lemmen, G. Stigge, O. Kerimoglu, H. Burchard, K. Klingbeil, R. Hofmeister, M. Kreis, K.W. Wirtz, F. Kösters, A model study on the large-scale effect of macrofauna on the suspended sediment concentration in a shallow shelf sea, *Estuarine Coastal Shelf Sci.*, 211, 62-76, **2018**.
 26. Pätsch, J., H. Burchard, C. Dieterich, U. Gräwe, M. Gröger, M. Mathis, H. Kapitza, M. Bersch, A. Moll, T. Pohlmann, J. Su, H.T.M. Ho-Hagemann, A. Schulz, A. Elizalde, & C. Eden, An evaluation of the North Sea circulation in global and regional models relevant for ecosystem simulations, *Ocean Modell.*, 116, 70-95, **2017**.
 27. Dijkstra, Y. M., H.M. Schuttelaars, H. Burchard, Generation of exchange flows in estuaries by tidal and gravitational eddy viscosity - shear covariance (ESCO), *J. Geophys. Res.*, 122, 4217–4237, **2017**.
 28. Burchard, H., N.B. Badurak, U. Gräwe, M. Knoll, V. Mohrholz, S. Müller, Salinity inversions in the thermocline under upwelling-favorable winds, *Geophys. Res. Lett.*, 44, doi:10.1002/2016GL072101, **2017**.
 29. Becherer, J., G. Flöser, L. Umlauf, and H. Burchard, Estuarine circulation vs tidal pumping: Sediment transport in a well-mixed tidal inlet, *J. Geophys. Res.*, 121, doi:10.1002/2016JC011640, **2016**.
 30. Gräwe, U., T. Gerkema, M. Duran-Matute, T.H. Badewien, E. Schulz, and H. Burchard, A numerical model for the entire Wadden Sea: skill assessment and analysis of hydrodynamics, *J. Geophys. Res.*, 121, 5231–5251, doi:10.1002/2016JC011655, **2016**.
 31. Mandal, S., H. Homma, A. Priyadarshi, H. Burchard, S.L. Smith, K.W. Wirtz, and H. Yamazaki, A one-dimensional physical-biological model of the impact of highly intermittent phytoplankton distributions, *J. Plankton Res.*, doi: 10.1093/plankt/fbw019, **2016**.
 32. Purkiani, K., J. Becherer, K. Klingbeil, and H. Burchard, Variability of estuarine circulation in a tidally energetic inlet with curvature, *J. Geophys. Res.*, 121, doi:10.1002/2015JC010945, **2016**.
 33. Becherer, J., M.T. Stacey, L. Umlauf, and H. Burchard, Lateral circulation generates flood-tide stratification and estuarine exchange flow in a curved channel, *J. Phys. Oceanogr.*, 44, 638-656, **2015**.
 34. Burchard, H., and T.H. Badewien, Thermohaline residual circulation of the Wadden Sea, *Ocean Dyn.*, 65, 1717-1730, **2015**.
 35. Gräwe, U., P. Holtermann, K. Klingbeil, and H. Burchard, Advantages of vertically adaptive coordinates in numerical models of stratified shelf seas. *Ocean Modelling*, 92, 56-68, **2015**.
 36. Gräwe, U., M. Naumann, V. Mohrholz, and H. Burchard, Anatomizing one of the largest saltwater inflows in the Baltic Sea in December 2014, *J. Geophys. Res.*, 120, 7676-7697, **2015**.
 37. Mohammadi-Aragh, M., K. Klingbeil, N. Brüggemann, C. Eden, and H. Burchard, The impact of advection schemes on lateral shear and baroclinic instabilities, *Ocean Modelling*, 94, 112-127, **2015**.
 38. Purkiani, K., J. Becherer, G. Flöser, U. Gräwe, V. Mohrholz, H.M. Schuttelaars, and H. Burchard, Numerical analysis of stratification and de-stratification processes in a tidally energetic inlet with an ebb tidal delta, *J. Geophys. Res.*, 120, 225-243, **2015**.

39. Radtke, H., and H. Burchard, A positive and multi-element conserving time stepping scheme for biogeochemical processes in marine ecosystem models, *Ocean Modelling*, 85, 32-41, **2015**.
40. Schulz, E., H.M. Schuttelaars, U. Gräwe, and H. Burchard, Impact of the depth-to-width ratio of a tidally energetic estuary on the residual along-channel circulation, *J. Phys. Oceanogr.*, 45, 2048-2069, **2015**.
41. Berdalet, E., M.A. McManus, O.N. Ross, H. Burchard, F.P. Chaves, J.S. Jaffe, I.R. Jenkinson, R. Kudela, I. Lips, U. Lips, A. Lucas, D. Rivas, M.C. Ruiz-de la Torre, J. Ryan, J.M. Sullivan, and H. Yamazaki, Understanding harmful algae in stratified systems: Review of progress and identification of gaps in knowledge. *Deep Sea Res. II*, 101, 4-20, **2014**.
42. Burchard, H., U. Gräwe, P. Holtermann, K. Klingbeil, and L. Umlauf, Turbulence closure modelling in coastal waters, *Die Küste*, 81, 69-87, **2014**.
43. Burchard, H., E. Schulz, and H.M. Schuttelaars, Impact of estuarine convergence on residual circulation in tidally energetic estuaries and inlets, *Geophys. Res. Lett.*, 41, 913-919, **2014**.
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