PERSONAL INFORMATION

Arno Behrens

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Sex Male | Date of birth 21/07/1955 | Nationality German

WORK EXPERIENCE

November 1985 - ongoing

Research scientist
(retired in May 2021 – since then part time only – support for the Black Sea wave routines - BLK-MFC)

Department Data Analysis and Data Assimilation

Helmholtz-Zentrum hereon, Institute of Coastal Research, Max-Planck-Str. 1, 21502 Geesthacht, Germany

- responsible for development, implementation and maintenance of wave forecast systems
- responsible for the pre-operational wave forecast system in the frame of COSYNA
- responsible for many commercial contracts with the German Met Service (DWD: Deutscher Wetterdienst), German Navy, Omani Met Service, German ministry of traffic
- Scientific and technical support for Eu-projects MyWave, Field-AC, Safedor and Adopt
- responsible for the Hereon contribution to the national project Demarine-2
- responsible for the maintenance of the web based source code library of the wave model WAM on the Github server
- research on waves as natural hazards
- development of an ensemble forecast system for ocean waves
- data assimilation of satellite data obtained by radar altimeters into computed wave fields
- many applications of the community wave model WAM to various areas on different scales (global, regional, local) worldwide
- responsible for the operational wave forecast system for the Black Sea in the frame of the Copernicus Marine Environment Monitoring Service (CMEMS)

Business or sector wave modeling

Research interim

September 2003 – March 2004

Canadien Meterological Centre (CMC), Dorval, Quebec, Canada

- development of a new parallalised source code (MPI) of the third generation wave model WAM

Business or sector wave modelling

Postgraduate – Phd student

September 1983 – October 1986

Alfred-Wegener-Institute for Polar Research, Bremerhaven, Germany

- development and application of a numerical hydrodynamic model to investigate the open polynyas in front of the Antarctic coasts in the Weddell Sea

EDUCATION AND TRAINING

October 1986 — **PhD in physical oceanography** — 8

University of Hamburg, Alfred-Wegener-Institute for Polar Research, Bremerhaven

Thesis: **Development and maintenance of coastal polynyas in the Weddell Sea**

July 1983 — **Diploma in physical oceanography** — 7

University of Hamburg, Germany

- Thesis: **Upwelling phenomena in the Gulf of California**

PERSONAL SKILLS

Mother tongue(s): German

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1	B2	C1	B2

Replace with name of language certificate. Enter level if known.

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills: good communication skills gained through experience in national and international projects and a seven month visit at the Meteorological Service Canada (MSC) in Montreal, Canada

Organisational / managerial skills: Responsible for many commercial contracts

Job-related skills

▪ Involvement in the following research projects:

COSYNA
HZG project : Coastal Observing System for Northern and Arctic Seas. The COSYNA Mission is to develop an integrated observing and modelling system suitable for the operational and synoptic description of the environmental status of the North Sea and Arctic coastal waters (2009 – ongoing)

DEMARINE-2
Improvement of the operational forecasts for waves, currents and water level for the German coastal waters (national project of the ministry of traffic (2012-2015)

MyWave
A pan-European concerted and integrated approach to operational wave modelling and forecasting – a complement to GMES MyOcean services (EU-FP7, 2012-2014)

Field-AC
Fluxes, Interactions and Environment at the Land-Ocean Boundary. Downscaling, Assimilation and Coupling (EU FP7, 2010-2012)

ADOPT
Advanced decision support system for ship design, operation and training (EU FP6, 2005-2008)

SAFEDOR
Design, operation and regulation for safety (EU FP6, 2005-2009)

SEAROUTES
Advanced decision support for shiprouting based on full-scale ship specific responses as well as improved sea and weather forecasts including synoptic, high precision and real time satellite data (EU FP5, 2001-2003)

Computer skills

Working on HPC Linux cluster, IBM-, NEC-, CRAY-supercomputer, Windows-PC
Very good knowledge of numerical modeling
Programming Languages: Fortran 77/90/95, MPI, PVWAVE, CDO
File Transfer: SSH, FTP, SCP, Putty, Filezilla, wget
Script Languages: bash shell, korn shell
Knowledge in software development environments: Git
Operating Systems: Unix, Linux, MSWindows

Driving licence

A1, BE, C1E, MLT

ADDITIONAL INFORMATION

Publications

Øyvind Breivik, Ana Carrasco, Hilde Haakenstad, Ole Johan Aarnes, Arno Behrens, Jean-Raymond Bidlot, Jan-Victor Björkqvist, Patrik Bohlinger, Birgitte R. Furevik, Joanna Staneva, Magnar Reistad, 2022 : The Impact of a Reduced High-Wind Charnock Parameter on Wave Growth With Application to the North Sea, the Norwegian Sea, and the Arctic Ocean. Journal of Geophysical Research: Oceans, Volume 127, Issue 3, e2021JC018196, http://doi.org/10.1029/2021JC018196

Li Delei, Feng Jianlong, Zhu Yuchao, Staneva Joanna, Qi Jifeng, Behrens Arno, Lee Donghyun, Min Seung-Ki, Yin Baoshu, 2022 : Dynamical Projections of the Mean and Extreme Wave Climate in the Bohai Sea, Yellow Sea and East China Sea. Frontiers in Marine Science, VOLUME=9, URL=https://www.frontiersin.org/article/10.3389/fmars.2022.844113. DOI=10.3389/fmars.2022.844113, ISSN=2296-7745.

Alvise Benetazzo, Francesco Barbariol, Paolo Pezzutto, Joanna Staneva, Arno Behrens, Silvio Davison, Filippo Bergamasco, Mauro Sclavo, Luigi Cavaleri, 2021 : Towards a unified framework for extreme sea waves from spectral models: rationale and applications, Ocean Engineering, Volume 219, 2021, 108263, ISSN 0029-8018, https://doi.org/10.1016/j.oceaneng.2020.108263.

Ciliberti, S.A.; Grégoire, M.; Staneva, J.; Palazov, A.; Coppini, G.; Lecci, R.; Peneva, E.; Matreata, M.; Marinova, V.; Masina, S.; Pinardi, N.; Jansen, E.; Lima, L.; Aydoğdu, A.; Creti', S.; Stefanizzi, L.; Azevedo, D.; Causio, S.; Vandenbulcke, L.; Capet, A.; Meulders, C.; Ivanov, E.; Behrens, A.; Ricker, M.; Gayer, G.; Palermo, F.; Ilicak, M.; Gunduz, M.; Valcheva, N.; Agostini, P., 2021 : Monitoring and Forecasting the Ocean State and Biogeochemical Processes in the Black Sea: Recent Developments in the Copernicus Marine Service. *J. Mar. Sci. Eng.* **2021**, *9*, 1146. https://doi.org/10.3390/jmse9101146.

Pleskachevsky, A., Gebhardt, C., Rosenthal, W., Lehner, S., Hoffmann, P., Kiesre, J., Bruns, T., Lindenthal, A., Janssen, F. and Behrens, A., 2015 : Satellite-Based Radar Measurements for Validation of High Resolution Sea State Forecast Models in the German Bight, ISRE-36, The 36th International Symposium on Remote Sensing of Environment, 11-15 May 2015, Berlin, Germany.

Behrens, A., 2015 : Development of an ensemble prediction system for ocean surface waves in a coastal area. Ocean Dynamics, Volume 63, Issue 4 (2015), pp 469-486, DOI: 10.1007/s10236-015-0825-y.

Staneva, J., Behrens, A. and Groll, N., 2014 : Recent Advances in Wave Modelling for the North Sea and German Bight, Die Küste 81/2014, 233 – 254.

Kieser, J., Bruns, T., Lindenthal, A., Brüning, T., Janssen, F., Behrens, A., Li, X.-M. Lehner, S. and Pleskachevsky, A., 2013 : First studies with the high resolution coupled wave current model CWAM and other aspects of the project sea state monitor, 13th international workshop on wave hindcasting and forecasting – and 4th coastal hazard symposium, Banff, Canada.

Samedo, A., Weisse, R., Behrens, A., Sterl, A., Bengtsson, L. and Günther, H. , 2013 : Projection of global wave climate change towards the end of the 21st century, Journal of Climate (AMS – American Meterological Society), Vol 26, pp 8269-8288.

Soomere, T., Weisse, R. and Behrens, A., 2012 : Wave climate in the Arkona Basin, the Baltic Sea. Ocean Sci., 8, 287-300, 2012, doi:10.5194/os-8-287-2012.

Wahle, K., Behrens, A. and Günther, H., 2011 : Near coastal wave modelling in the German Bight and Wadden Sea . In: 12th International Workshop on Wave Hindcasting and Forecasting & 3rd Coastal Hazard Symposium. Hawaii, October 30 – November 4, 2011.

Samedo, A., Behrens, A., Bengtsson, L., Günther, H., Sterl, A. and Weisse, R., 2011 : Impact of a Warmer Climate on the Global Wave Field. In: 12th International Workshop on Wave Hindcasting and Forecasting & 3rd Coastal Hazard Symposium. Hawaii, October 30 – November 4, 2011.

Lalbeharry, R., Behrens, A., Guenther, H. and Wilson, L., 2009 : Matching of Coastal and Open Ocean Wave Models in a Mesoscale Application over Lake Erie, Atmosphere-Ocean, Vol 47 (3) 2009, pp 184-203 (doi: 10.3137/OCE305.2009).

Behrens, A., Günther, H., 2009 : Operational wave prediction of extreme storms in Northern Europe, **N**atural Hazards, Volume 49, Issue2 (2009), Page 387 – 399 (DOI 10.1007/s11069-008-9298-3)

Soomere, T., Behrens, A., Tuomi, L., and Nielsen, J. W., 2008 : Wave conditions in the Baltic Proper and in the Gulf of Finland during windstorm Gudrun, Nat. Hazards Earth Syst. Sci., 8, 37-46, 2008

Lalbeharry, R.; Behrens, A.; Guenther, H.; Wilson, L., 2004 : An evaluation of wave model performances with linear and nonlinear dissipation source terms in Lake Erie. In: 8thInternational Workshop on Wave Hindcasting and Forecasting. Oahu, HI (USA), 19.11.2004.

Behrens, A, 2002 : Seegangsvorhersage. In: Promet. Vol. 28, Heft 1/2, 17-23.

Riethmueller, R. ; Behrens, A. ; Gassenmaier, G. ; Gayer, G. ; Guenther, H.; Puls, W.; Rosenthal, W.; Rybaczok, P. ; Witte, G.; Ziemer, F.; Herbers, D.; Baumert, H., 1999 : The PROMISE / Sylt-Roemoe data set - a comprehensive bench-mark data set to test and evaluate numerical models for suspended sediment transport in shallow tidal lagoons.

Behrens, A., 1998 : Wave spectral data from numerical wave models: A comparison of wave model results for the Baltic Sea, obtained by a second- and a third-generation wave model. In: Cost Conference on Provision and Engineering/Operational Application of Ocean Wave Spectra. Paris (F), September 21-25, 1998.

Behrens, A.; Schrader, D., 1994 : The wave forecast system at the Deutscher Wetterdienst and the Bundesamt fuer Seeschiffahrt und Hydrographie: A verification using ERS-1 altimeter and scatterometer data. Ocean Dynamics. Vol. 46 (1994) 2, 131-149.

Behrens, A., 1994 : A long term comparison between ERS-1 satellite data and numerical wind and wave model forecast results. In: Oceanic Engineering Society (OES) of the Institute of Electrical and Electronics Engineers (IEEE) (Ed.): Oceans 94 Osates. Brest (F), September 13-16, 1994. 1, 70-75.

Behrens, A.; Koch, W., 1993 : GEOSAT satellite data in comparison with wave model results and ocean winds. GKSS 93/E/22.

Behrens, A.; Schrader, D., 1993 : ERS-1 satellite data in comparison with wind and wave model forecast results. In: Proceedings of the 2nd ERS-1 Symposium: Space at the service of our environment. Hamburg (D), October 11-14, 1993. 2, 1155-1160.

Stockdreher, E.; Behrens, A.; Koch, W.; Ziemer, F., 1989 : A study on ship route optimization: measurement and simulations. In: Blake, M. (Ed.): CAMS '89: IFAC Workshop on Expert Systems and Signal Processing in Marine Automation. Lyngby (DK), August 28-30, 1989. 247-258. (ISBN: 8777480007).

Behrens, A.; Koch, W., 1989 : GEOSAT satellite data in comparison with wave model results and ocean winds. In: 2nd International Workshop on Wave Hindcasting and Forecasting. Vancouver (CDN), April 25-28, 1989.

Seminars

Futoore : Modeling and Forecasting for Operational Oceanography, BSH, Hamburg, October 2013
Workshop on ocean waves, ECMWF, Reading,June 2012
EGU – General Assembly 2008, Vienna
EGU – General Assembly 2006, Vienna
10th polish/german Seminar : Global Changes and Extreme Phenomena in the Baltic Sea, 2007, Gdansk, Poland
Dach : The wave forecast system of the German Met Service, 2004, Karlsruhe, Germany
2nd International Workshop on Wave Hindcasting and Forecasting, Vancouver (CDN), April 25-28, 1989
6th WAM-Meeting of the Wave Modelling Group. Paris (F), March 1988.

Oceanographic cruises

German Research vessel Meteor (North Sea, 1978), Polarstern (Antarctic Seas, 1983) : salinity and temperature measurements (CTD sonde)