

Curriculum Vitae Prof. Dr. Markus Meier

2014-03-21

Name: Hans Eberhard Markus Meier

Date of birth: 02.03.1963

Place of birth: Hamburg, Germany

Citizenship: German

Family: wife, two children (Ann-Kristin Johanna: 1999, Eva-Lena Maria: 2001)

Languages: German, English, Swedish

Current employment: Head of Oceanographic Research, Research Department

Swedish Meteorological and Hydrological Institute (SMHI)

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Main fields of current research:

- numerical modeling of the Baltic Sea and Arctic Ocean
- sea ice modeling
- ice-ocean model inter-comparison
- sub-grid scale parameterizations (e.g. turbulence, gravity driven dense bottom currents) in ocean circulation models
- variational data assimilation using the adjoint method
- water exchange through straits
- reconstruction of Baltic Sea climate of the 20th century, paleoclimate studies
- climate variability and climate sensitivity of the Baltic Sea and Arctic Ocean
- detection and attribution of climate change
- dynamical downscaling using regional climate models
- scenario simulations for the Baltic Sea and impact studies (e.g. Baltic ringed seal populations, flooding, coastal erosion, and spatial development)
- ensemble technique for climate change scenario simulations
- atmosphere-ice-ocean interaction
- heat and water cycles in uncoupled and coupled atmosphere-ice-ocean models
- performance of massively parallel ocean codes
- coupled physical-biogeochemical modeling to study the marine ecosystem in past and future climates
- measures against eutrophication

Degrees:

- High School Certificate, Neumünster, Germany, November 1981
- Diploma in Physics (Experimental, Theoretical and Applied Physics, Astronomy, thesis at the Institute of Fundamental and Applied Nuclear Physics), University of Kiel, Germany, September 1989
- Doctor of natural science (Physical Oceanography, Physics and Theoretical Physics, thesis at the Department of Theoretical Oceanography, Institute of Marine Research), University of Kiel, July 1996
- Docent (associate professor) in physical oceanography, University of Göteborg, January 2005 (Docent lecture on “Användning av tredimensionella oceanmodeller för att simulera cirkulationen på olika tids- och rumsskalor - vad fungerar bra respektive mindre bra”)
- Professor at the Faculty of Science, Stockholm University, Stockholm University, April 2012

Scientific employments:

- 1986-1989: Teaching contracts at the Institute of Fundamental and Applied Nuclear Physics, University of Kiel
- 1989: Scientific employee at the Institute of Fundamental and Applied Nuclear Physics, University of Kiel
- 1991-1996: Ph.D. student at the Department of Theoretical Oceanography, Institute of Marine Research, Kiel
- 1996-1997: Scientific employee at the Department of Theoretical Oceanography, Institute of Marine Research, Kiel
- 1997: Teaching contract, University of Kiel
- 1997-2006: Scientific employee at the Rossby Centre, SMHI, responsible for the development of a 3D coupled ice-ocean model for the Baltic Sea and for the Arctic Ocean, Nordic Seas, and North Atlantic Ocean
- since July 2006: Head of the Oceanographic Research Unit at the Research Department at SMHI (scientifically and economically responsible for 15 scientists)
- August 2006 - July 2012: 20 % teaching and supervising as adjoint lecturer (“adjungerad lektor i meteorologi och oceanografi”) with affiliation at the Department of Meteorology at Stockholm University (MISU)
- since August 2012: 20 % teaching and supervising as adjunct professor in oceanography with affiliation at the Department of Meteorology at Stockholm University (MISU)

Teaching:

- 1986-1989: Exercises for undergraduate students at Kiel University (Theoretical Physics, 1170 working hours)
- 1997: Exercises for undergraduate students at Kiel University (Theoretical Oceanography, 48 lecture hours)
- Jan 2005: Lectures for graduate students at Stockholm University (Physical oceanography of the Baltic Sea and seas around Sweden, 4 lecture hours)

Nov 2005: Invited guest lecture for graduate students at Gdansk University (Physical Oceanography of the Baltic Sea, 2 lecture hours)

Nov/Dec 2006: Lectures for undergraduate students at Stockholm University (Dynamical Meteorology I, 28 lecture hours corresponding to 120 working hours)

Dec 2008/Jan 2009: Lectures for graduate students at Stockholm University (Large scale oceanic circulation and physical oceanography of the Baltic Sea, 10 lecture hours corresponding to 40 working hours)

Nov/Dec 2008: Lectures for undergraduate students at Stockholm University (Dynamical Meteorology I, 30 lecture hours corresponding to 120 working hours)

Apr 2009: Invited guest lecture for graduate students at Lund University within the course “The Baltic Sea: Yesterday, Today and Tomorrow” (Physical processes and predicted changes with climate, 2 lecture hours)

Jul 2009: Invited lectures for graduate students at the International BALTEX summer school on “Threats and challenges for the Baltic Sea environment under climate change”, Nexø, Bornholm, Denmark, 27 July - 5 August, 2009 (Regional climate simulations and uncertainties of scenario simulation, 8 lecture hours)

Sep 2009: Invited guest lecture for undergraduate students at Södertörn University, Huddinge, Sweden, within the course “The Baltic Sea’s Ecosystem and Natural Resources” (in total 15 ECTS credits) (2 lecture hours)

Nov/Dec 2009: Lectures for undergraduate students at Stockholm University (Dynamical Meteorology I, 36 lecture hours corresponding to 144 working hours, 12 ECTS credits)

Oct 2010: Invited guest lecture for undergraduate students at Södertörn University, Huddinge, Sweden, “Impact of changing climate on the Baltic Sea” (2 lecture hours)

Oct 2010: Lecture for graduate students within the “Climate Modelling School” organized by the BONUS+ project AMBER, Norrköping, Sweden, “Baltic Sea Climate Modelling” (1 lecture hour)

Nov/Dec 2010: Lectures for undergraduate students at Stockholm University (Dynamical Meteorology I, 36 lecture hours corresponding to 144 working hours, 12 ECTS credits)

Mar 2013: Invited lecture for graduate students at the Baltic Ecosystem Adaptive Management (BEAM) modeling course “Modeling as a tool to study the Baltic Sea ecosystem - Possibilities and challenges”, Askö Laboratory, Sweden, 18-24 March 2013, “Biogeochemical modeling in the Baltic Sea (RCO-SCOBI, future climate projections)”

May 2013: Keynote lecture at the Baltic Ecosystem Adaptive Management (BEAM) modeling seminar Stockholm University, Sweden, 18-24 March 2013, “Oceanography”

June 2013: Lectures for undergraduate (master) students at Stockholm University (Physical Oceanography, my part comprises 4 lecture hours corresponding to 16 working hours, 7.5 ECTS credits in total)

Supervising:

Guest scientists at SMHI supervised:

- Dr. Frank Kauker (AWI, Bremerhaven, 2001, 2002)
- Dr. Jari Haapala (FIMR, Helsinki, 2003)
- PhD student Robert Osinski (IOPAS, Sopot, 2005)
- Dr. Jan Jedrasik (Gdansk University, Gdynia, 2005)

- PhD student Germo Väli (Marine Systems Institute at Tallinn University of Technology, Tallinn, 2011)

Honours/master thesis students supervised:

- Ulf Ekström (Linköping University, 2002): Setup of the Rossby Centre Ocean model applied to the Arctic Ocean. (practical course as part of the master degree, 4 months)
- Tobias Strömngren (Royal Institute of Technology (KTH), Stockholm, 2005): Implementation of a flux corrected transport scheme in the Rossby Centre Ocean model. (20 point honours research project, master degree)
- Mattias Franzén (Göteborg University, 2007): Analysis of sea level trends in the North Sea and Kattegat area simulated with the CCSM3 global climate model during 1870-2100. (10 point honours research project, bachelor degree)
- David Olofsson (Department of Meteorology, Stockholm University, 2007): Developing analysis tools to investigate results of the Rossby Centre Ocean model. (student summer employment, 2 months)
- Johannes Behling (upper-secondary school pupil from Kiel, Germany, 2008): Introduction into ocean modelling. (practical course, 2 weeks)
- Malin Anteros (Department of Meteorology, Stockholm University, 2008): Analysing the Baltic Sea conveyor belt using results of a three-dimensional ocean circulation model. (20 point honours research project, master degree)
- David Lindstedt (Department of Meteorology, Stockholm University, 2008): Impact of mixing on the Baltic Sea deep water renewal - a model study. (20 point honours research project, master degree)
- Elin Jansson (Department of Meteorology, Stockholm University, 2009): Impact of river regulation on the Baltic Sea salinity. (30 point honours research project, master degree)

PhD thesis students supervised:

- Lisa Bengtsson (Department of Meteorology, Stockholm University, 2006-2012): Cloud parameterizations in general circulation models. (PhD committee member, main supervisor: Prof. Erland Källén)
- Sebastian Mårtensson (Department of Meteorology, Stockholm University, 2007-2013): Modeling climate variability of the Arctic Ocean in past and future climates with special focus on changing sea-ice. (Primary supervisor)
- Christian Porsche (Baltic Sea Research Institute Warnemünde at the University of Rostock, since 2009): Einfluss von Klimaveränderung auf das Ökosystem der Ostsee - Vergleich von Variationen in den letzten 2000 Jahren mit erwarteten Veränderungen in den nächsten 100 Jahren (Co-supervisor, main supervisor: Dr. Thomas Neumann)
- Léon Chafik (Department of Meteorology, Stockholm University, 2009-2014): (PhD committee member, main supervisor: Prof. Peter Lundberg)
- Per Pemberton (Department of Meteorology, Stockholm University, since 2010): Ocean-ice process studies on Arctic modulation of the global warming signal. (Primary supervisor)
- Ulrika Willen (Department of Meteorology, Stockholm University, since 2010): (PhD committee member, main supervisor: Prof. Mikael Tjernström)
- Filippa Fransner (Department of Meteorology, Stockholm University, since September 2012): TBD. PhD within Baltic Ecosystem Adaptive Management (BEAM) program. (Primary supervisor)

University / Research Institute committees:

- Opponent at licentiat thesis presentation at Uppsala University (Björn Carlsson, 2007).
- Committee member of licentiat thesis defense at Stockholm University (Linus Magnusson, 2007).
- Committee member of PhD thesis defense at Göteborg University (Christian Nohr, May 2009).
- Member of the evaluation committee of 6 master thesis defenses at Stockholm University (Emma Grönkvist, Per Axelsson, Marcus Johansson, Anders Söderberg, Alexander Håkansson, Charlotte Boström, June 2009).
- Member of the Steering Group Committee of the 'ECOCHANGE' programme, the joint Strategic Marine Environmental Research Programme on the Baltic Sea of Umeå and Linnaeus universities.
- Member of the Scientific Advisory Board of the Leibniz Institute for Baltic Research Warnemünde, Rostock, Germany. (2012-2015)

Training courses:

- Jun 2001: PRISM/COACH summer school on “Climate modelling in Europe” (Les Diablerets, Switzerland, one week)
- May 2004: university teaching (“Högskolepedagogisk introduktionskurs”, Göteborg University, one week)
- Nov 2006: project management and leadership course for members of steering groups (“Praktisk projektstyrning (PPS) Styrgrupp”, Tieto Enator, 1 day)
- Jan/Feb 2007: leadership course (“Forma Ledarutveckling”, 4 days)
- Feb 2010: media training course (“medie/budskapsträning”, 1 day)
- Feb/May 2010: leadership course (“ledarutveckling, Ekebacka Konsult AB”, 4 days)

Invited visiting scientist:

- Aug 1997: Department of Meteorology, Stockholm University, Stockholm, Sweden
- Feb 2003: International Arctic Research Center, University of Alaska, Fairbanks, U.S.A.
- Nov 2005: Institute of Oceanology, University of Gdansk, Gdynia, Poland

Coordination of International Workshops or Sessions at International Meetings, scientific organizing committees:

- Feb 1998: Coordinator of the SWECLIM workshop on atmosphere and ocean circulation climate modeling, Norrköping, Sweden
- Nov 1998: Coordinator of the SWECLIM workshop on modeling sea ice coupled to a 3D Baltic Sea model, Norrköping, Sweden
- Oct 1999: Co-coordinator of the SWECLIM workshop on coupling of ocean, ice, and atmosphere, Norrköping, Sweden
- Aug 2003: Co-convener of the Baltic Sea Ice Research workshop at the Baltic Sea Science Conference (BSSC), Helsinki, Finland
- Oct 2003: Member of the scientific organizing committee of the Second Workshop on Climate Variations in Sweden during the past 2000 years: Climate variability, environmental change, and cultural response, Uppsala, Sweden

- Jun 2005: Convener of the workshop on “Ventilation of the Baltic Sea deep water: observations and model results” at the Baltic Sea Science Conference (BSSC), Sopot, Poland
- Nov 2005: Coordinator of the Fourth Workshop on Climate Variations in Sweden during the past 2000 years: Observations and model results, Norrköping, Sweden
- Mar 2007: Convener of the session “Dynamics of the Baltic Sea deep water - observations and model results” at the Baltic Sea Science Conference (BSSC), Rostock, Germany
- Jan 2008: Organizer of the BALTEX workshop on the “Utility of Regional Climate Models”, Norrköping, Sweden, 23 January 2008
- Oct 2008: Organizer of the Marine Environmental Day “Can we save the Baltic Sea? - Eutrophication in future climate”, Norrköping, Sweden, 21 October 2008
- May 2009: Member of the scientific committee of the second Lund Regional-scale Climate Modelling Workshop: “21st Century Challenges in Regional Climate Modelling”, Lund, Sweden, May 4-8, 2009
- May 2009: Member of the scientific committee of the conference “Climate change - The environmental and socioeconomic response in the southern Baltic region”, and convener of Session B: “Modeling of the past climate change and future projections”, Szczecin, Poland, 25-29 May, 2009
- Jul 2009: Co-Convener (IAPSO) and session chair of the session J 21 “Regional Climate Modelling” at the Joint Assembly of IAMAS (International Association of Meteorology and Atmospheric Science), IAPSO (International Association for the Physical Sciences of the Oceans) and IACS (International Association of the Cryospheric Sciences), MOCA-09, in Montreal, Canada, July 20-24, 2009.
- Aug 2009: Member of the scientific committee of the 7th Baltic Sea Science Congress (BSSC) 2009 “Towards better understanding and improved technology for serving the society” Tallinn, Estonia, 17-21 August, 2009
- Oct 2009: Organizer of the international Workshop “The marine ecosystem in changing climate - on the added value of coupled climate-environmental modeling for the Baltic Sea”, Norrköping, Sweden, 16 October 2009.
- Oct 2010: Organizer of the “Climate Modelling School for PhD students, Norrköping, Sweden, 13 October 2010.
- Oct 2010: Organizer of the international BONUS+ program workshop “Uncertainties of scenario simulations”, Norrköping, Sweden, 14 October 2010.
- Aug 2011: Member of the scientific committee of the 8th Baltic Sea Science Congress (BSSC) 2011 “Joint research efforts for sustainable ecosystem management” St.Petersburg, Russia, 22-26 August, 2011
- Aug 2011: Convener of the theme session “Impact of changing climate and human-induced pressures on the Baltic Sea Ecosystem” proposed by the BONUS+ program by Markus Meier (Sweden), Joachim Dippner (Germany), Aarno Kotilainen (Finland) at the Baltic Sea Science Congress (BSSC), St.Petersburg, Russia, 22-26 August 2011
- Sep 2011: Co-Convener of the theme session “Integration of multidisciplinary knowledge in the Baltic Sea to support science-based management” proposed by the BONUS+ program by Sakari Kuikka (Finland), Michael Gilek (Sweden), Markus Meier (Sweden), Kari Lehtonen (Finland) at the 2011 Annual Science Conference of International Council for the Exploration of the Sea (ICES), Gdansk, Poland, 19-23 September 2011

Dec 2011: Organizer of the international ECOSUPPORT and RECOCA stakeholder conference on “An outlook to the future Baltic Sea: how can we reach the targets of the Baltic Sea Action Plan?”, Stockholm University, Stockholm, Sweden, 7 December 2011.

Jul 2013: Lead convener for the symposium on “Baltic and other regional seas” (P02) at the Joint Assembly of IAHS (International Association of Hydrological Science), IAPSO (International Association for the Physical Sciences of the Oceans) and IASPEI (International Association of Seismology and Physics of the Earth’s Interior), in Gothenburg, Sweden, July 22-26, 2013.

Aug 2013: Member of the international scientific committee of the 9th Baltic Sea Science Congress (BSSC) 2013 “New horizons for Baltic Sea Science”, and convener of the Session (no. 9): “Climate of Baltic Sea in 21st century, effects from microscales to regional patterns”, Klaipeda, Lithuania, 26-30 August, 2013

May 2014: Member of the scientific committee of the international conference on “Climate Change - The environmental and socio-economic response in the southern Baltic region”, Szczecin, Poland, 25-28 May, 2014

May 2014: Member of the scientific committee of the 6th IEEE/OES Baltic Symposium 2014 on “Measuring and modeling of multi-scale interactions in the marine environment”, Tallinn, Estonia, 26-29 May, 2014

Editorial tasks:

- since 2009: Topic Editor of the EGU journal Ocean Science (<http://www.ocean-science.net/index.html>)
- winter/spring 2012: Member of the Guest Editorial Board of the AMBIO special issue “ECOSUPPORT - Different Ecosystem Drivers Under Future Climate Scenarios in the Baltic Sea” (Volume 41, Number 6, September 2012)

Referee for research councils:

- Natural Sciences and Engineering Research Council of Canada (NSERC)
- Helmholtz Association of National Research Centres, Germany
- The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS)
- The Swedish Research Council (VR)
- Swedish Environmental Protection Agency (SEPA)
- The Netherlands Organisation for Scientific Research (NWO, the Dutch Research Council)
- Estonian Science Foundation
- Intergovernmental Panel on Climate Change (IPCC), forth and fifth assessment reports (AR4, AR5)
- Canadian Foundation for Climate and Atmospheric Sciences (CFCAS)
- University of Alaska Coastal Marine Institute (CMI)
- Climate report for the Hamburg region, Germany

Referee for international scientific journals:

- Science
- Geophysical Research Letters
- Journal of Geophysical Research - Oceans
- Tellus
- Climate Dynamics
- Continental Shelf Research
- Monthly Weather Review
- International Journal of Climatology
- Ocean Sciences
- Journal of Marine Research
- Journal of Marine Systems
- Boreal Environmental Research
- Ocean Dynamics
- Climate Research
- Journal of Sea Research
- AMBIO
- Nordic Hydrology
- Estuarine, coastal and shelf science
- Oceanologia
- Geophysica
- Marine Ecology Progress Series
- Global and Planetary Change
- International Review of Hydrobiology
- International Journal of Earth Sciences
- Environmental Modeling and Assessment
- Climate of the Past
- Ocean Engineering
- History of Oceanography Yearbook
- Great Lakes Research
- Climatic Change
- Eos (newsletter of the American Geophysical Union, AGU)
- Geoscientific Model Development
- Ocean Modelling
- Limnology and Oceanography
- Ecological Engineering
- Ecological Applications

Awards:

Oct 2011: the project ECOSUPPORT received the Bonus+ Award 2011 for the best public engagement activity or product for the GEODOME stakeholder decision support by scientific communication (2000 Euro)

Additional assignments:

- 2000-2001: Member of the evaluation group for ocean modeling at SMHI (Bengtsson et al., 2001)
- 2001: Member of the second evaluation group for ocean modeling at SMHI
- 2002-2005: External expert and advisor of the EU funded Centre of Excellence for Baltic Development, Education and Research (BALTDER), Institute of Oceanology, University of Gdansk, Gdynia, Poland
- 2005: Member of the writing team of chapter 2 (Past and current climate change, detection and attribution) and chapter 3 (Projections of future climate change) of the BALTEX Assessment of Climate Change for the Baltic Sea Basin (BACC)
- since 2006: Member of the steering group of the Research Department at the Swedish Meteorological and Hydrological Institute
- since 2007: Chair of the BALTEX/Baltic Earth Working Group on the “Added Value of Regional Coupled Atmosphere-Ocean Models” (http://www.baltex-research.eu/organisation/bwg_rcm.html). The working group will conduct working group meetings, organizing workshops open for all interested scientist on the topic, and setting up international collaborations and projects financed by the EU, BONUS or national funding agencies.
- 2009-2011: Coordinator of the international BONUS+ project “ECOSUPPORT” with 11 involved partners, about 1.6 mio Euro, 2009-2011,
- 2011-2014: Lead author for the North Sea Region Climate Change Assessment (NOSCCA), chapter 3.b: Projected changes in the Norths Sea (and interface regions)
- 2011-2013: Contributing author for the BALTEX Assessment of Climate Change II (BACC II), chapter 4.3.4. Marine physical changes (incl. sea ice, storm surges and waves)
- 2011-2012: Member of the Working Group on Drafting a Science Plan for a scientific research network following BALTEX Phase II (PostBALTEX).
- since October 2012: Member of the OSPAR Intersessional Correspondence Group on Eutrophication Modelling
- 2013: Member of the Swedish Research Council Review Panel (NT-8)
- 2013-2014: Chair of the Baltic Earth Working Group on Baltic Sea scenario simulations
- 2013-2014: Chair of the Interim Science Steering Group of the BALTEX successor program “Baltic Earth” (<http://www.baltex-research.eu/>)

Research Highlights

- Our paper on “Hypoxia in future climates: A model ensemble study for the Baltic Sea.”, *Geophys. Res. Lett.*, 38, L24608, 2011, was highlighted by *Nature Climate Change*, see A. Brown, 2012: Low oxygen outlook. *Nature Climate Change*, 2, 75 (doi:10.1038/nclimate1406, published online 27 January 2012)
- Our paper on “Modeling the combined impact of changing climate and changing nutrient loads on the Baltic Sea environment in an ensemble of transient simulations for 1961-2099.”, *Climate Dynamics*, 2012, doi: 10.1007/s00382-012-1339-y. (published online 25 April 2012) was highlighted by *Nature Climate Change*, see B. Wake, 2012: Climate and Baltic Sea nutrients, Vol. 2, p. 394 (doi:10.1038/nclimate1567, published online 25 May 2012)