

Marco van Hulten

Curriculum Vitae

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Computer skills

System coding

C, Perl, Unix shells (Bash, Korn shell)

Scientific coding

Julia, Fortran

Data analysis & viz.

Productivity

Vim, LibreOffice, tmux, [regex](#), semi-automated pipelines

Publishing

[pandoc](#), [LATEX](#), Markdown, HTML, [webgen](#)

Finance

Bitcoin Core (CLI), [Ledger](#), Gnumeric, double-entry accounting

Version control

Mercurial, Git, CVS

Collaboration

Jitsi, XMPP (Jabber), [sourcehut](#), GitLab, [Savannah](#)

Operating systems

[Devuan](#) GNU/Linux, [GNU Guix](#), Rocky Linux, [OpenBSD](#)

Virtualisation

[vmm\(4\)/vmd\(8\)](#), [Sarus](#) (HPC containers)

Provisioning

Puppet, Ansible, [xCAT](#)

Monitoring

[Rsyslog](#), S.M.A.R.T., Prometheus

Hard- & firmware

RISC, [POWER9](#), single-board computers, Libreboot, flashing

Networking

Internet architecture, TLS, OpenPGP, PF firewall, WireGuard VPN, OpenSSH, Apache, Postfix

Filesystems

OpenZFS, Lustre, NFS, [softraid\(4\)](#) CRYPTO discipline

Security

public-key cryptography, [zero trust](#), blockchain, quantum computing

Work experience

Jun 2023–

Postdoctoral researcher, University of Bonn, Bonn.

I am working on climate modelling, algorithm engineering and High-Performance Computing (HPC)

Dec 2022–May 2023

IT systems and computing engineer, Deutsche Zentrum für Neurodegenerative Erkrankungen (DZNE), Bonn.

I have worked on HPC and other scientific computation at DZNE, playing roles in the administration of powerful computers, and supporting researchers such that they can run their software (analysis, models, pipelines) efficiently.

Jan 2021–Nov 2022

Senior software engineer, University of Bergen, Bergen (Norway).

I have executed complex data migrations involving different end-user and system administrator groups, and collaborated in the design and acquisition of a 32 PiB+ data storage system; I invested time in diverse courses ranging from IBM Spectrum Scale (GPFS) to quantum computing, and worked on my programming skills; I helped scientific users with problems and participated in the organisation of workshops for using our clusters; I fixed, improved, automated and documented the HPC infrastructure, both at the [national](#) level and at [UiB](#) (my [GitLab](#) projects).

Mar 2017–Dec 2020	Researcher , <i>University of Bergen</i> , Bergen. I have worked on the ocean component of the Norwegian Earth System Model (NorESM); the code structure has been changed such that both the seawater and the sediment are brought to a steady state more quickly; during this I improved my Fortran skills and learnt the much newer language Julia.
Sep 2014–Dec 2016	Postdoctoral researcher , <i>Laboratoire des Sciences du Climat et de l'Environnement, IPSL, CEA</i> , Paris. I developed ocean models, especially the biological carbon cycle, manganese and radioisotopes, then executed them, analysed the results and visually and statistically compared them to observational data.
2009–2014	PhD candidate , <i>Royal Netherlands Meteorological Institute (KNMI)</i> , De Bilt. Developing, executing and analysing climate models.
2007–2009	Workstation operator , <i>KNMI, Ministry of Infrastructure and Water Management</i> , De Bilt. Administration and users' support for Fedora and Debian GNU/Linux; I also wrote a comparison report on configuration management and the implementation of Puppet at KNMI.
2002–2009	CERT advisor and anti-abuse coordinator , <i>SSH Utrecht</i> , Utrecht.
2005	Operator and developer , <i>Log Lines B.V.</i> , Woerden. Development and operation of iSCSI systems.
2002	Student assistant for a C programming course , <i>University of Utrecht</i> , Utrecht.

Education

2009–2014	PhD in oceanography , <i>University of Groningen</i> , at <i>Royal Netherlands Meteorological Institute</i> , Utrecht. I ran Eulerian models (NEMO) simulating trace metals like manganese and aluminium; I gained insight in the cycling of these trace elements and their relevance to the global carbon cycle; I ran a Lagrangian model (Ariane) to study the variability of the deep western boundary current in the Atlantic Ocean.
2006–2009	MSc in physics , <i>Utrecht University</i> , Utrecht. My thesis was on the subject of space-time theories, specifically to investigate if the general theory of relativity can be considered a relational theory; for this I studied papers from Mach and Einstein, both in English and German.
1999–2006	BSc in physics , <i>Utrecht University</i> , Utrecht. My thesis was about the parallelisation of a sparse matrix–vector multiplication algorithm, comparing an implementation with and one without MPI–IO (part of the Message Passing Interface 2 standard).
1992–1999	Secondary education , <i>Willem van Oranje College</i> , Waalwijk.

Courses and certifications

Jun 2022	Workshop quantum computing, NordIQuEst/ENCCS, Sweden
Apr 2022	Quantum Computing, Saint Petersburg State University (Coursera certificate)
Mar 2022	IBM Spectrum Scale Advanced Administration for Linux and AIX
Mar 2022	IBM Spectrum Scale Remote Data Access
Apr 2021	FitSM Foundation training (“light-weight ITIL”)
Jan 2019	Course in writing popular science, organised by Media City Bergen
Dec 2014	IPython notebook workshop (now part of Jupyter)
2014	Advanced Fortran 2003 training

2013	<i>System Design</i> , PhD course on program design for an Earth system model
2011	<i>Programming and correctness</i> , advanced course on theory and methods of mathematically proving that an algorithm completes correctly
2009	Linux Professional Institute Certification 2
2008	Linux Professional Institute Certification 1

Languages

Dutch	native	Esperanto	intermediate (B2)
English	proficient (C2)	French	intermediate (B2)
Norwegian	advanced (C1)	German	intermediate (B1)

Community service and political experience

Jan 2021–Mar 2022	Board member of the Norwegian Pirate Party
Aug 2019–Jul 2022	Treasurer of a homeowner association
Nov 2018–Jan 2020	Chairman of the committee for sustainability of the Bjerknes Centre for Climate Research
Feb 2014	Presenter at the <i>Think Twice</i> conference of the PPI in Frankfurt, Germany
Jul 2012	Representative of the Dutch delegation (WFBN) to the XXVI World Federalist Movement congress in Winnipeg, Canada (paper)
2008–2009	Editor-in-chief of the trimester magazine for tenants
2008–	Member of the Free Software Foundation
2007–2009	Chairman of the residential board of a tenant foundation
2000–2008	Connecting tenants at a university campus to high-speed Internet and helping them with computer issues

Presentations

Jun 2022	Invited presentation about cryptocurrency and sustainability for the Deutscher Esperanto-Kongress at Oldenburg, Germany
Apr 2022	Presentation on quantum computing and its application in HPC
Mar 2022	Presentation on complexity and security in IT
Feb 2022	Presentation on blockchain for the IT department at UiB
Mar 2021	Training for researchers using the HPC facilities in Norway / presentation on using public-key cryptography
Mar 2020	Presentation about licensing scientific software.
Feb 2015	Invited presentation about aluminium in the sea for The 11th Keele Meeting on Aluminium in Lille
Mar 2016	Organised with colleagues a workshop for junior researchers at IPSL–LSCE, teaching to use a scientific software environment, including Unix, Vim and Ferret.
Aug 2012	Presentation about anthropogenic climate change and ocean acidification (in Esperanto) for Alternative grüne Woche 2012 at Schloss Grésillon , Baugé, France.

Scientific publications

- M.M.P. van Hulten, C. Heinze, J. Schwinger, and J. Tjiputra. Long-term climate simulation in NorESM: burst-coupling the sediment in the BLOM/iHAMOCC ocean module ([report](#)), 2022.
- M.M.P. van Hulten. Bitmono: Ĉu daŭripova mono? (report from the *Germana Esperanto-Kongreso 2022*). Deutsche Esperanto-Bund e. V. (D.E.B.), 2022.
- C.T. Hayes, K.M. Costa, E.M. Calvo, Z. Chase, L.L. Demina, J.-C. Dutay, C.R. German, L.-E. Heimbürger-Boavida, S.L. Jaccard, A. Jacobel, K.E. Kohfeld, M.D. Kravchishina, J. Lippold, F. Mekik, L. Missiaen, F. Pavia, A. Paytan, M.V. Petrova, R. Pedrosa-Pàmies, S. Rahman, L.F. Robinson, M. Roy-Barman, A. Sánchez-Vidal, A.M. Shiller, A. Tagliabue, A.C. Tessin, M.M.P. van Hulten, and J. Zhang. The composition and flux of seafloor sediments in the global ocean. *Global Biogeochem. Cycles*, 35(4):e2020GB006769, [10.1029/2020GB006769](#), 2021.
- J. Bock, M. Michou, P. Nabat, M. Abe, J.P. Mulcahy, D.J.L. Olivé, J. Schwinger, P. Suntharalingam, J. Tjiputra, M.M.P. van Hulten, M. Watanabe, A. Yool, and R. Séférian. Evaluation of ocean dimethylsulfide concentration and emission in CMIP6 models. *Biogeosci.*, 18(12):3823–3860, [10.5194/bg-18-3823-2021](#), 2021.
- M.M.P. van Hulten, J.-C. Dutay, and M. Roy-Barman. A global scavenging and circulation ocean model of thorium-230 and protactinium-231 with improved particle dynamics (NEMO-ProThorP 0.1). *Geosci. Model Dev.*, 11(9):3537–3556, [10.5194/gmd-11-3537-2018](#), 2018.
- M.M.P. van Hulten, R. Middag, J.-C. Dutay, H.J.W. de Baar, M. Roy-Barman, M. Gehlen, A. Tagliabue, and A. Sterl. Manganese in the west atlantic ocean in the context of the first global ocean circulation model of manganese. *Biogeosci.*, (14):1123–1152, [10.5194/bg-14-1123-2017](#), [arXiv:1410.7183](#), 2017.
- M.M.P. van Hulten. ComPlot: Comparison plotter to visually evaluate ocean model simulations ([project](#), [README](#)). *The Journal of Open Source Software*, 2(368), [10.21105/joss.00368](#), 2017.
- O. Aumont, M.M.P. van Hulten, M. Roy-Barman, J.-C. Dutay, C. Éthé, and M. Gehlen. Variable reactivity of particulate organic matter in a global ocean biogeochemical model. *Biogeosci.*, 14(9):2321–2341, [10.5194/bg-14-2321-2017](#), 2017.
- William B. Homoky, Thomas Weber, William M. Berelson, Tim M. Conway, Gideon M. Henderson, M.M.P. van Hulten, Catherine Jeandel, Silke Severmann, and Alessandro Tagliabue. Quantifying trace element and isotope fluxes at the ocean–sediment boundary: a review. *RSTA*, 374(2081), [10.1098/rsta.2016.0246](#), 2016.
- A.R. Baker, W.M. Landing, E. Bucciarelli, M. Cheize, S. Fietz, C.T. Hayes, D. Kadko, P.L. Morton, N. Rogan, G. Sarthou, R.U. Shelley, Z. Shi, A. Shiller, and M.M.P. van Hulten. Trace element and isotope deposition across the air–sea interface: progress and research needs. *Phil. Trans. R. Soc. A: Mathematical, Physical and Engineering Sciences*, 374(2081), [10.1098/rsta.2016.0190](#), 2016.
- R. Middag, M.M.P. van Hulten, H.M. van Aken, M. Rijkenberg, L.J.A. Gerringa, P. Laan, and H.J.W. de Baar. Dissolved aluminium in the ocean conveyor of the West Atlantic Ocean: Effects of the biological cycle, scavenging, sediment resuspension and hydrography. *Mar. Chem.*, 177, Part 1:69–86, [10.1016/j.marchem.2015.02.015](#), 2015.
- J.-C. Dutay, A. Tagliabue, I. Kriest, and M.M.P. van Hulten. Modelling the role of marine particle on large scale ^{231}Pa , ^{230}Th , Iron and Aluminium distributions. *Prog. Oceanogr.*, [10.1016/j.pocean.2015.01.010](#), 2015.
- M.M.P. van Hulten, A. Sterl, R. Middag, H.J.W. de Baar, M. Gehlen, J.-C. Dutay, and A. Tagliabue. On the effects of circulation, sediment resuspension and biological incorporation by diatoms in an ocean model of aluminium. *Biogeosci.*, 11(14):3757–3779, [10.5194/bg-11-3757-2014](#), [arXiv:1405.5752](#), 2014.
- M.M.P. van Hulten. *Aluminium and Manganese in the West Atlantic Ocean*. PhD thesis, University of Groningen, 2014.
- M.M.P. van Hulten, A. Sterl, J.-C. Dutay, A. Tagliabue, M. Gehlen, H.J.W. de Baar, and R. Middag. Aluminium in an ocean general circulation model compared with the West Atlantic GEO-TRACES cruises. *J. Mar. Syst.*, 126(0):3–23, [10.1016/j.jmarsys.2012.05.005](#), [arXiv:1202.4679](#), 2013.