

CV of Céline Heuzé, as of March 2025

PERSONAL INFORMATION

Email: celine.heuze@gu.se

Researcher unique identifier (ORCID): 0000-0002-8850-5868

URL for web site: <http://cheuze.com>

I am a Senior Lecturer and Docent in climatology at the University of Gothenburg, Sweden. My research focusses on current and future feedbacks between deep ocean currents and the rest of the climate system, especially so in polar regions, using global climate models, in-situ hydrographic data, deep learning, and satellite remote sensing. I have so far received ca 2 M€ in competitive grants as main applicant, and supervised 5 PhD students and 4 postdoctoral researchers. Notable achievements include receiving the 2022 EGU OS Division Outstanding Early Career Scientist Award and being physical oceanography PI for the [MOSAiC](#) and [SAS](#) international expeditions. I am a member of the CLIVAR [Ocean Model Development Panel](#) and the CMIP7 data author team.

CURRENT POSITION

2022 – Senior Lecturer (Universitetslektor) in climatology, Department of Earth Sciences, University of Gothenburg, Sweden.

ACADEMIC DEGREES

2020 Habilitation (Docentur) in climatology, Department of Earth Sciences, University of Gothenburg, Gothenburg, Sweden.

2015 PhD ‘Antarctic Bottom Water in CMIP5 models: characteristics, formation, evolution’ School of Environmental Sciences, University of East Anglia (UEA) and UK Met Office Hadley Centre. Supervisors: Profs Karen Heywood and David Stevens, and Dr. Jeff Ridley.

2011 Master/Engineering degree ‘Analysis of Southern Ocean mixed layer interannual variability’ Hydrodynamics and Ocean Engineering, Ecole Centrale de Nantes, France and Physical Oceanography, LOCEAN Université Pierre et Marie Curie, France.

PREVIOUS POSITIONS AND FELLOWSHIPS

2018 – 2022 Associate Senior Lecturer, Dpt Earth Sciences, U. Gothenburg, Sweden.

2015 – 2018 VINNMER Marie Curie Cofund, Incoming research fellow (postdoc), Dpt Marine Sciences, U. Gothenburg, Sweden and Dpt Earth Sciences, University of Oxford, UK.

2015 – 2017 Consultant in ocean remote sensing, Dpt Space, Earth and Environment, Chalmers University of Technology, Sweden.

2015 – 2015 Post-doctoral researcher; LOCEAN, Université Pierre et Marie Curie, France.

2011– 2015 NERC-CASE industrial PhD fellowship, School of Environmental Sciences, University of East Anglia, United Kingdom, and UK Met Office Hadley Centre, United Kingdom.

2011 – 2011 Research assistant; LOCEAN, Université Pierre et Marie Curie, France.

2010 – 2010 Research assistant; Centre Eau, Terre et Environnement, INRS, Canada.

FUNDED RESEARCH GRANTS – total 22.3 MSEK (ca 2.5 M€)

2023 – 2026 **Rymdstyrelsen** ‘Monitoring Arctic Polynyas from Space (MAPS)’, PI, 5.2 MSEK

2021 – 2025 **FORMAS** ‘Would the Northern European Enclosure Dam really protect Sweden from sea level rise? (NEEDS)’, PI, 4.0 MSEK

2019 – 2024 **Vetenskapsrådet** ‘Why is the deep Arctic Ocean Warming? (WAOW)’, PI, 3.6 MSEK

2019 – 2022 **Rymdstyrelsen** ‘Warm oceanic Inflows for Near-real time Detection Of Weddell polynya from Space (WINDOWS)’, PI, 4.5 MSEK

2019 – 2020 **Swedish Polar Research Secretariat**, PI, 1 MSEK for joining the MOSAiC expedition

2015 – 2018 **VINNOVA**, VINNMER Marie Curie Cofund Incoming research fellowship ‘Is Greenland meltwater going to stop the Atlantic overturning circulation?’, PI, 2.3 MSEK

2018 **UGOT climate fund**, CI (PI Sebastiaan Swart), 0.6 MSEK to purchase autonomous sensors

2017 **UGOT climate fund**, CI (PI Anna Wählin), 0.8 MSEK to purchase autonomous sensors

2016 – 2017 **Stiftelse Olle Engkvist Byggmästare**, PI, 0.3 MSEK to purchase sensors

SUPERVISION OF POSTDOCTORAL RESEARCHERS AND STUDENTS

- 2024 – **Postdoctoral researcher** Z. Li, Dpt Earth Sciences, U Gothenburg.
- 2024 – **PhD student** J. Gunnarsson, Dpt Marine Sciences, U. Gothenburg; assistant supervisor.
- 2023 – **PhD student** H.-M. Wong, Dpt Earth Sciences, U. Gothenburg; main supervisor.
- 2021 – 2023 **Postdoctoral researcher** L. Poropat, Dpt Earth Sciences, U. Gothenburg.
- 2021 – 2023 **Postdoctoral researcher** L. Zhou, Dpt Earth Sciences, U. Gothenburg.
- 2020 – 2020 **Postdoctoral researcher** A. Lemos, Dpt Earth Sciences, U. Gothenburg.
- 2019 – 2024 **PhD student** S. Karam, Dpt Earth Sciences, U. Gothenburg; main supervisor.
- 2018 – 2022 **PhD student** M. Mohrmann, Dpt Marine Sciences, U. Gothenburg; assistant supervisor.
- 2016 – 2020 **PhD student** W. Aldenhoff, Chalmers University of Technology; assistant supervisor.
- 2015 – Supervisor or examiner for Master's and bachelor's student projects

TEACHING ACTIVITIES (ca 30% of my time)

- 2021 – “AI for Earth and Environmental Sciences” (PhD course) + **Course responsible**
- 2021 – “Advanced climate data analysis” (First cycle) + **Course responsible**
- 2018 – “Climate Modelling” (Second cycle) + **Course responsible**
- 2018 – “Arctic in a changing climate” (PhD course) + **Course responsible**

REVIEWING ACTIVITIES

- External opponent or committee member at PhD defences: University of Bergen, Norway (2019, 2021); LOCEAN-IPSL, France (2021,2024); University of Gothenburg, Sweden (2023); Stockholm University, Sweden (2024).
- Reviewer: Deutsche Forschungsgemeinschaft (DFG), Germany; Natural Environment Research Council (NERC), UK; National Science Centre, Poland; Natural Sciences and Engineering Research Council (NSERC), Canada; Agence Nationale de la Recherche (ANR), France.
- Editor: Guest, [‘The Arctic Ocean’s changing Beaufort Gyre’ special issue](#), JGR and [MOSAiC special issue](#), Elem Sci Ant. Associate Editor, J. Phys. Ocean. (2018-2020).

ACADEMIC LEADERSHIP

- 2024 Member CMIP7 data author team for ocean and sea ice
- 2024 Member CLIVAR [Ocean Model Development Panel](#).
- 2024 Member of the science faculty Academic appointment board (lärarförslagsnämnd).
- 2021 – 2023 Advisory board member of the Greenland-Ice sheet-Ocean science network ([GRISO](#)).
- 2020 – 2024 Convenor of session “Changes in the Arctic Ocean, sea ice and subarctic seas systems: Observations, Models and Perspectives”, EGU general assembly.
- 2018 – 2023 Swedish PI of the physical oceanography programme, [Synoptic Arctic Survey](#).
- 2017 – 2023 Physical Oceanography PI and overall expedition board member for the one-year long [MOSAiC expedition](#).
- 2017 – 2018 Executive secretary of Sweden’s national committee of the international Association of Polar Early Career Scientists ([APECS](#)), then National committee representative for APECS Sweden within APECS international.
- 2017 – 2022 Member CliC/CLIVAR [Northern Oceans Regional Panel](#).
- 2016 – 2019 Regular author, Cryosphere Division, European Geophysical Union [blog](#).
- 2012 – Physical oceanography PI onboard or onshore for international ship-based polar expeditions

AWARDS AND PRIZES (since end of PhD)

- 2024 Royal Society of Arts and Science in Gothenburg (KVVS), Birger Karlsson **science prize**
- 2022 European Geosciences Union, OS Division **Outstanding Early Career Scientist Award**
- 2017 European Geophysical Union best blog award
- 2016 Wallenberg Foundation travel award for young researchers
- 2015 Forum for Arctic Modelling and Observation Systems travel award

BIBLIOMETRIC DATA

Publications 49 + 2 monographs, **citations 2500, H-index 23**, i10-index 32 (Google Scholar)
Also >50 invited lectures and presentations at international scientific meetings, and interviewed regularly for newspaper article and TV or radio programmes.

FULL LIST OF PUBLICATIONS

Publications with an asterisk * were led by a PhD student or postdoc under my supervision.

Peer reviewed articles

- [49] F. Vermassen, C. Bird, T.M. Weitkamp, K.F. Darling, H. Farnelid, **C. Heuzé**, A.Y. Hsiang, S. Karam, C. Stranne, M. Sundbom, and H.K. Coxall (2025) The distribution and abundance of planktonic foraminifera under summer sea-ice in the Arctic Ocean, *Biogeosciences*, accepted
- [48] M. Athanase, R.H. Köhler, **C. Heuzé**, X.J. Levine, R.S. Williams (2025). The Arctic Beaufort Gyre in CMIP6 Models: Present and Future, *Journal of Geophysical Research: Oceans*, accepted
- [47] **C. Heuzé** and A. Jahn (2024) The first ice-free day in the Arctic Ocean could occur before 2030, *Nature Communications* **15**, 10101
- [46] A. Fong, C. Hoppe, [...], **C. Heuzé**, et al. (2024) Overview of the MOSAiC expedition: Ecosystem. *Elementa Science of the Anthropocene* **12**
- [45*] S. Karam, **C. Heuzé**, M. Hoppmann, and L. de Steur, L. (2024) Continued warming of deep waters in Fram Strait, *Ocean Science* **20**, 917-930
- [44] K. Schulz, Z. Koenig, M. Muilwijk, [...], **C. Heuzé**, et al. (2024) The Eurasian Arctic Ocean along the MOSAiC drift (2019-2020): An interdisciplinary perspective on properties and processes. *Elementa Science of the Anthropocene* **12**
- [43] B. Rabe, [...], **C. Heuzé**, et al. (2024) The MOSAiC Distributed Network: observing the coupled Arctic system with multidisciplinary, coordinated, platforms. *Elementa Science of the Anthropocene* **12**
- [42] **C. Heuzé** and H. Liu (2024) No emergence of deep convection in the Arctic Ocean across CMIP6 models. *Geophysical Research Letters* **51**, e2023GL106499
- [41*] L. Poropat, D. Jones, S.D.A. Thomas, and **C. Heuzé** (2024) Unsupervised classification of the Northwestern European seas based on satellite altimetry data. *Ocean Science*, Special Issue for the 54th International Liège Colloquium on Machine Learning and Data Analysis in Oceanography. *Ocean Science* **20**, 201–215
- [40] **C. Heuzé**, O. Huhn, M. Walter, N. Sukhikh, S. Karam, W. Körtke, M. Vredenburg, K. Bulsiewicz, J. Sültenfuß, Y.-C. Fang, C. Mertens, B. Rabe, S. Tippenhauer, J. Allerholt, H. He, D. Kuhlmei, I. Kuznetsov, and M. Mallet (2023) A year of transient tracers chlorofluorocarbon 12 and sulfur hexafluoride, noble gases helium and neon, and tritium in the Arctic Ocean from the MOSAiC expedition (2019-2020). *Earth System Science Data* **15**, 5517–5534
- [39*] S. Karam, **C. Heuzé**, V. Müller, and Y. Zheng (2023), Recirculation of Canada Basin Deep Water in the Amundsen Basin, Arctic. *Journal of Physical Oceanography* **53**, 2559–2574
- [38] **C. Heuzé**, H. Zanowski, S. Karam, and M. Muilwijk (2023), The deep Arctic Ocean and Fram Strait in CMIP6 models. *Journal of Climate* **36**, 2551–2584
- [37] M. Muilwijk, A. Nummelin, **C. Heuzé**, I.V. Polyakov, H. Zanowski, and L.H. Smedsrud (2023), Divergence in Climate Model Projections of Future Arctic Atlantification. *Journal of Climate* **36**, 1727–1748
- [36*] L. Zhou, **C. Heuzé**, and M. Mohrmann (2023), Sea Ice Production in the 2016 and 2017 Maud Rise Polynyas. *Journal of Geophysical Research Oceans* **128**, e2022JC019148
- [35] M. Konrad-Schmolke, R. Halama, D. Chew, **C. Heuzé**, J. de Hoog, and H. Ditterova (2022) Discrimination of thermodynamic and kinetic contributions to the heavy rare earth element patterns in metamorphic garnet. *Journal of Metamorphic Geology* **41**, 465–490
- [34] **C. Heuzé**, S. Purkey, and G.C. Johnson (2022) It is high time we monitor the deep ocean. *Environmental Research Letters* **17**, 121002.
- [33] X. Gong, H. Liu, F. Wang, and **C. Heuzé** (2022) Of Atlantic Meridional Overturning Circulation in the CMIP6 Project. *Deep Sea Research Part II: Topical Studies in Oceanography*, 105193
- [32] A.M. de Boer, D.K. Hutchinson, F. Roquet, L.C. Sime, N.J. Burls, and **C. Heuzé** (2022) The impact of Southern Ocean topographic barriers on the ocean circulation and the overlying atmosphere, *Journal of Climate* **35**, 5805–5821
- [31*] M. Mohrmann, S. Swart, and **C. Heuzé** (2022) Observed Mixing at the Flanks of Maud Rise in the Weddell Sea, *Geophysical Research Letters* **49**, e2022GL098036
- [30] P. Snoeijis-Leijonmalm, H. Flores, S. Sakinan, N. Hildebrandt, A. Svenson, G. Castellani, K. Vane, F.C. Mark, **C. Heuzé**, S. Tippenhauer, B. Niehoff, J. Hjelm, J. Hentati Sundberg, F.L. Schaafsma, R. Engemann

and The EFICA-MOSAiC Team (2022) Unexpected fish and squid in the central Arctic deep scattering layer, *Science Advances* **8**

[29] B. Rabe, **C. Heuzé**, J. Regnery, *et al.* (2022) Overview of the MOSAiC expedition: Physical Oceanography, *Elementa Science of the Anthropocene* **10**

[28] M. Shupe, M. Rex, *et al.* (2022) Overview of the MOSAiC expedition – Atmosphere, *Elementa Science of the Anthropocene* **10**

[27] M. Nicolaus, D. Perovich, *et al.* (2022) Overview of the MOSAiC expedition: Snow and Sea Ice, *Elementa Science of the Anthropocene* **10**

[26*] L. Zhou, **C. Heuzé**, and M. Mohrmann (2022) Early winter triggering of the Maud Rise Polynya, *Geophysical Research Letters* **49**, e2021GL096246

[25*] M. Mohrmann, **C. Heuzé**, and S. Swart (2021) Southern Ocean polynyas in CMIP6 models, *The Cryosphere* **15**, 4281–4313.

[24] A. Solomon, **C. Heuzé**, B. Rabe, S. Bacon, L. Bertino, P. Heimbach, J. Inoue, D. Iovino, R. Mottram, X. Zhang, Y. Aksenov, R. McAdam, A. Nguyen, R. Raj, and H. Tang (2021) Freshwater in the Arctic Ocean 2010-2019, *Ocean Science* **17**, 1081–1102

[23] **C. Heuzé**, L. Zhou, M. Mohrmann, and A. Lemos (2021) Spaceborne infrared imagery for early detection of Weddell Polynya openings, *The Cryosphere* **15**, 3401–3421

[22] **C. Heuzé** (2021) Antarctic Bottom Water and North Atlantic Deep Water in CMIP6 models, *Ocean Science* **17**, 59-90.

[21*] W. Aldenhoff, L.E.B. Eriksson, Y. Ye and **C. Heuzé** (2020), First-year and Multiyear Sea Ice Incidence Angle Normalization of Dual-polarized Sentinel-1 SAR Images in the Beaufort Sea, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* **13**, 1540-1550

[20] A. Wåhlin, N. Steiger, E. Darelius, K.M. Assmann, M.S. Glessmer, H.K. Ha, L. Herraiz-Borreguero, **C. Heuzé**, A. Jenkins, T.W. Kim, A.K. Mazur, J. Sommeria, and S. Viboud (2020) Ice front blocking of ocean heat transport to an Antarctic ice shelf. *Nature* **578**, 568–571

[19*] W. Aldenhoff, **C. Heuzé**, and L.E.B. Eriksson (2019) Sensitivity of Radar Altimeter Waveform to Changes in Sea Ice Type at Resolution of Synthetic Aperture Radar, *Remote Sensing special issue Combining Different Data Sources for Environmental and Operational Satellite Monitoring of Sea Ice Conditions*, **11**, 2602

[18*] W. Aldenhoff, L.E.B. Eriksson, and **C. Heuzé** (2019) Comparison of Sentinel-1 SAR And Sentinel-3 Altimetry Data For Ice Type Discrimination, *Geoscience and Remote Sensing Symposium (IGARSS), 2019 IEEE International*

[17] **C. Heuzé** and M. Årthun (2019) The Atlantic inflow across the Greenland-Scotland ridge in CMIP5 models, *Elementa Science of the Anthropocene* **7**

[16] **C. Heuzé**, G. Garric, and T. Lavergne (2019) The Weddell Polynya [in Copernicus Marine Environment Monitoring Service Ocean State Report issue 3], *Journal of Operation Oceanography*

[15] B.T. Hassett, T.V. Vonnahme, X. Wang, G.B. Jones, and **C. Heuzé** (2019) Review of pelagic marine fungi - global analysis of cultured and high-throughput sequencing diversity, *Botanica Marina* **63**, 121-139

-- 2015 to 2018: Marie Curie Fellowship (independent postdoc) publications --

[14] S. Swart, E.C. Campbell, **C. Heuzé**, K. Johnson, J.L. Lieser, R. Massom, M. Mazloff, M. Meredith, P. Reid, J.-B. Sallée and S. Stammerjohn (2018), Return of the Maud Rise polynya: climate litmus or sea ice anomaly? [in State of the Climate in 2017 chapter 6], *Bulletin of the American Meteorological Society* **99** S188-S189

[13] **C. Heuzé** and W. Aldenhoff (2018), Near-Real Time Detection of the Re-Opening of the Weddell Polynya, Antarctica, from Spaceborne Infrared Imagery, *Geoscience and Remote Sensing Symposium (IGARSS), 2018 IEEE International*

[12*] W. Aldenhoff, **C. Heuzé** and L.E.B. Eriksson (2018), Comparison of ice/water classification in Fram Strait from C- and L-band SAR imagery, *Annals of Glaciology* **59**, 112–123

[11] **C. Heuzé**, G.K. Carvajal and L.E.B. Eriksson (2017), Optimisation of sea surface current retrieval using a maximum cross correlation technique on modelled sea surface temperature, *Journal of Atmospheric and Oceanic Technology* **34**, 2245–2255

[10] **C. Heuzé** (2017), North Atlantic deep water formation and AMOC in CMIP5 models, *Ocean Science* **13**, 609-622.

- [9] **C. Heuzé**, G.K. Carvajal, L.E.B. Eriksson and M. Soja-Woźniak (2017), Sea Surface Currents Estimated from Spaceborne Infrared Images Validated against Reanalysis Data and Drifters in the Mediterranean Sea, *Remote Sensing* **9**, 422
- [8] **C. Heuzé**, A. Wåhlin, H.L. Johnson and A. Münchow (2017), Pathways of meltwater export from Petermann Glacier, Greenland, *Journal of Physical Oceanography* **47**, 405-418.
- [7] M. Reeve, **C. Heuzé**, W.T. Ball, R.H. White, G. Messori, K. van der Wiel, I. Medhaug, A.H. Eckes, A. O'Callaghan, M.J. Newland, S.R. Williams, M. Kasoar, H.E. Wittmeier and V. Kumer (2016), Improving together: better science writing through peer learning, *Hydrology and Earth System Sciences* **20**, 2965-2973.
- [6] G.K. Carvajal, M. Woźniak, **C. Heuzé**, L.E.B Eriksson, J. Kronsell and B. Rydberg (2016): Assessment of satellite and ground-based estimates of surface currents, *Geoscience and Remote Sensing Symposium (IGARSS), 2016 IEEE International*
- [5] **C. Heuzé**, F. Vivier, J. Le Sommer, J.-M. Molines and T. Penduff (2015), Can we map the interannual variability of the whole upper Southern Ocean with the current database of hydrographic data?, *Journal of Geophysical Research Oceans* **120**, 7960-7978.

-- 2012 to 2015: PhD publications --

- [4] **C. Heuzé**, K.J. Heywood, D.P. Stevens and J.K. Ridley (2015), Changes in global ocean bottom properties and volume transports in CMIP5 models under climate change scenarios, *Journal of Climate* **28**, 2917–2944. Part of my PhD thesis.
- [3] **C. Heuzé**, J. Ridley, D. Calvert, D. Stevens and K. Heywood (2015), Increasing vertical mixing to reduce Southern Ocean deep convection in NEMO3.4, *Geoscientific Model Development* **8**, 3119-3130. Part of my PhD thesis.
- [2] K.J. Heywood, S. Schmitdko, **C. Heuzé**, J. Kaiser, T.D. Jickells, B.Y. Queste, D.P. Stevens, M. Wadley, A.F. Thompson, S. Fielding and D. Guihen (2014), Ocean processes at the Antarctic continental slope, *Philosophical Transactions of the Royal Society A* **372**, 20130047.
- [1] **C. Heuzé**, K.J. Heywood, D.P. Stevens and J.K. Ridley (2013), Southern Ocean Bottom Water Characteristics in CMIP5 models, *Geophysical Research Letters* **40**, 1409-1414. Part of my PhD thesis.

Other

Preprint currently under review:

- [a] **C. Heuzé**, L. Carlstedt, L. Poropat, and H. Reese (2025) Drivers of high frequency extreme sea level around Northern Europe – Synergies between recurrent neural networks and Random Forest, *Ocean Science / EGUSphere*, doi:10.5194/egusphere-2025-700

Other articles with a DOI:

- [c] M. D. Shupe, M. Rex, K. Dethloff, E. Damm, A. A. Fong, R. Gradinger, **C. Heuzé**, B. Loose, A. Makarov, W. Maslowski, M. Nicolaus, D. Perovich, B. Rabe, A. Rinke, V. Sokolov, A. Sommerfeld, (2020) A year drifting with the Arctic sea ice. *Arctic Report Card 2020*, doi: 10.25923/9g3v-xh92.
- [b] **C. Heuzé**, M. Mohrmann, E. Andersson and E. Crafoord (2020). Global decline of deep water formation with increasing atmospheric CO₂. *EarthArXiv*, doi:10.31223/X56K6D
- [a] L. Waldrop Bergman and **C. Heuzé** (2018), Influence of initial stratification, wind and sea ice on the modelled oceanic circulation in Nares Strait, northwest Greenland, *Ocean Science Discussion*, doi:10.5194/os-2018-122

Monographs

- C. Heuzé** (2015) Antarctic Bottom Water in CMIP5 models: characteristics, formation, evolution, *PhD thesis, University of East Anglia*.
- C. Heuzé** (2011) Analyse de la variabilité interannuelle de la couche de mélange de l'Océan Austral / Analysis of Southern Ocean mixed layer interannual variability, *Master thesis, LOCEAN Université Pierre et Marie Curie and Ecole Centrale de Nantes*.