

DR ALEXANDER HAYWARD

Polar Climate & Earth System Scientist

Copenhagen, Denmark | alexhayward1995@gmail.com | +45 20 21 87 77

[Google Scholar](#) | [LinkedIn](#)

PROFILE

Polar climate and cryosphere scientist with over eight years of experience in international research, programme coordination, and science communication. My research spans climate–cryosphere interactions, satellite Earth observation, marine heatwaves, and long-term climate data records. I have a strong track record of leading multi-partner projects (>€500k as PI), coordinating multinational author teams for policy-relevant assessments (AMAP, Copernicus ESOTC), and communicating climate science to policy, public, and scientific audiences — including ministerial briefings and a first-author publication in *Nature Climate Change*. I combine deep polar research expertise with practical experience translating science into climate services and decision-relevant information.

PROFESSIONAL EXPERIENCE

Earth System Scientist

February 2024 – Present

Danish Meteorological Institute (DMI) — Copenhagen, Denmark

- Provide scientific leadership across polar climate research, cryosphere monitoring, and international programme coordination at Denmark's National Meteorological and Hydrological Service.
- Work Package Lead for ESA PHYTO-CCI (phytoplankton Essential Climate Variables), FOCCUS (coastal oceans), and ObsSea4Clim (polar ocean climate extremes). Manage budgets, milestones, partner coordination, and technical reporting across international consortia.
- Principal Investigator for the RetroKlim project, applying machine learning to downscale and backdate Danish regional climate data services. Manage full project lifecycle: planning, budget, recruitment, and multi-partner reporting.
- Lead Author and chapter coordinator for the AMAP 2026 assessment on Arctic and Subarctic marine heatwaves, managing a multinational, multidisciplinary author team and synthesising science on high-impact climate events into policy-relevant narrative.
- Co-author, Copernicus European State of the Climate Report 2026, contributing scientific analysis and narrative on polar climate indicators.
- Lead science communication and international engagement: brief Greenlandic ministers on cryosphere priorities; convene international conference sessions on marine heatwaves; engage with media on polar climate change.
- Contribute to Copernicus Climate Change Service (C3S) product development for ice surface temperature.
- Lead Arctic field expeditions in Greenland (Qaanaaq), deploying and maintaining IST sensors and automated weather station networks.
- Develop user-oriented tools (PhytoClass GUI) enhancing accessibility of scientific outputs for non-specialist users.
- Mentor and provide line management for staff and students (including Google Summer of Code), ensuring capacity building across projects.

Key achievements:

- First-author *Nature Climate Change* (2025) on Antarctic phytoplankton restructuring under shifting sea-ice regimes.
- Secured over €400,000 in competitive research funding across international programmes.
- Co-authored Copernicus ESOTC 2026; delivered GCOS-compliant ESA and C3S outputs aligned with WMO priorities.
- Strengthened science–policy interface through ministerial briefings, AMAP lead authorship, and stakeholder engagement.

Postdoctoral Researcher

June 2023 – January 2024

National Institute of Water and Atmospheric Research (NIWA) — Wellington, New Zealand

- Authored and co-authored peer-reviewed publications translating Southern Ocean climate research into high-impact scientific communications.

- Mentored postgraduate and undergraduate students in scientific writing, data analysis, and project design.
- Contributed to grant writing, strategic research planning, and team coordination.

PhD Researcher

December 2019 – June 2023

University of Otago / NIWA — Dunedin & Wellington, New Zealand

- Doctoral research developing novel methods to monitor Essential Climate Variables in the Southern Ocean, integrating in-situ measurements, satellite remote sensing, and machine learning.
- Developed PhytoClass, an open-source chemotaxonomic tool now adopted internationally for ocean ecosystem monitoring.
- Consulted for CCAMLR on biological sampling policy, bridging research and international governance.
- Convened a SCAR conference session on polar phytoplankton and ecosystem change.
- Published in *Frontiers for Young Minds*, communicating Arctic food web science to young audiences.
- Planned and participated in Antarctic and Southern Ocean expeditions; collaborated internationally with USF, AAD, and UCSB.

Volunteer Secretary, Wellington Branch

June 2021 – January 2023

New Zealand Antarctic Society — Wellington, New Zealand

- Coordinated diplomatic and public engagement events, including embassy liaison and a mid-winter dinner bringing together diplomats from multiple countries.
- Sustained Antarctic science and policy community through COVID-19, including ‘Fresh off the Ice’ seminar series.

Researcher, Changing Arctic Ocean Programme

May 2018 – March 2020

EcoLight / University College London — London, UK & Central Arctic Ocean

- Six-week central Arctic expedition aboard Korean icebreaker R.V. Araon, collaborating with KOPRI, AWI, and UCL in a multinational research environment.
- Deployed autonomous sea-ice observing systems; contributed to strategic planning for subsequent Arctic voyages.
- Co-authored peer-reviewed publications on Arctic under-ice light regimes and ecosystem dynamics.

EDUCATION

PhD in Marine Sciences

2019 – 2023

University of Otago — Dunedin, New Zealand

Remote sensing of phytoplankton in the Southern Ocean and Antarctica. Machine learning. Antarctic fieldwork.

MSci in Earth Sciences (Oceanography)

2015 – 2019

University College London — London, UK

Year abroad at University of British Columbia, Vancouver. Masters thesis on light transmittance through Arctic sea ice.

PUBLICATIONS

18 peer-reviewed publications | 300+ citations | h-index 8. Selected below; full list on [Google Scholar](#).

First-author and lead contributions

- **Hayward, A.**, Wright, S.W., Carroll, D., et al. (2025). Antarctic phytoplankton communities restructure under shifting sea-ice regimes. *Nature Climate Change*, 15, 889–896.
- **Hayward, A.**, Pinkerton, M.H., Wright, S.W., et al. (2024). Twenty-six years of phytoplankton pigments reveal a circumpolar Class Divide. *Comms. Earth & Environ.*, 5(1), 92.
- **Hayward, A.**, Pinkerton, M.H., & Gutiérrez-Rodríguez, A. (2023). PhytoClass: A pigment-based chemotaxonomic method. *Limnol. Oceanogr.: Methods*, 21(4), 220–241.
- **Hayward, A.**, Dasgupta, N., McAdam, R., et al. (2025). MHW-MAD: A multi-definition global marine heatwave dataset. *Earth Syst. Sci. Data Discuss.*, 2025, 1–21.
- **Hayward, A.**, Murray, T., Di Geronimo, S., et al. (2026). PhytoClass, now with a GUI: Point-and-click pigment chemotaxonomy. *Limnol. Oceanogr. Bulletin*.

- **Hayward, A., & Grigor, J.** (2020). The bottom of the Arctic's food web is of top importance. *Frontiers for Young Minds*, 8, 122.

Selected co-authored contributions

- **Heidemann, A.C., Hayward, A., Assmy, P., et al.** (2026). A Pan-Arctic Pigment Database for Phytoplankton and Sea-Ice Algae. *Earth Syst. Sci. Data Discuss.*, 2026, 1–33.
- **Pécuchet, L., Mohamed, B., Hayward, A., et al.** (2025). Arctic and Subarctic marine heatwaves and their ecological impacts. *Front. Environ. Sci.*, 13, 1473890.
- **Pinkerton, M.H., Boyd, P.W., et al. incl. Hayward, A.** (2021). Evidence for the impact of climate change on primary producers in the Southern Ocean. *Front. Ecol. Evol.*, 9, 592027.
- **Pinkerton, M.H., & Hayward, A.** (2021). Estimating variability and long-term change in sea ice primary productivity. *J. Mar. Syst.*, 221, 103576.
- **Veysi ere, G., Castellani, G., et al. incl. Hayward, A.** (2022). Under-ice light field in the Western Arctic Ocean. *Front. Earth Sci.*, 9, 643737.
- **Xu, W., Wang, G., et al. incl. Hayward, A.** (2025). Mesoscale eddies drive phytoplankton-mediated biogeochemistry in the South China Sea. *JGR: Biogeosciences*, 130(6).
- **Viljoen, J.J., Cloete, R., et al. incl. Hayward, A.** (2025). Winter dynamics of phytoplankton and micronutrients in the Southern Ocean. *JGR: Oceans*, 130(10).

SCIENCE COMMUNICATION & OUTREACH

- Ministerial briefings to Greenlandic government on cryosphere monitoring priorities, translating climate science into actionable information for regional decision-makers.
- Co-author, Copernicus European State of the Climate Report 2026, contributing scientific narrative on polar climate indicators for a flagship public communication product.
- Lead Author, AMAP 2026 chapter on Arctic and Subarctic marine heatwaves, synthesising multidisciplinary science into policy-relevant assessment for Arctic Council audiences.
- First-author *Nature Climate Change* (2025) on cryosphere–ecosystem regime shifts, communicating high-impact research to broad audiences.
- Lead developer, KlimaAtlas, translating scientific outputs into locally relevant climate services for policymakers, businesses, and the public.
- *Frontiers for Young Minds* publication on Arctic food webs — science communication for young audiences.
- Convener, SCAR conference session on polar phytoplankton and ecosystem change.
- Developer, PhytoClass GUI — open-source tool making scientific methods accessible to non-specialist users.
- Organised diplomatic engagement events through the New Zealand Antarctic Society, connecting science with international policy stakeholders.

RESEARCH FUNDING

- Over €400,000 secured in competitive research funding as PI or Work Package Lead.
- Contributed to international consortia worth over €2.5 million (ESA CCI, Copernicus, Horizon Europe).
- Experience preparing concept notes, proposals, work plans, and budget frameworks for international funders.

POLAR FIELDWORK

- Greenland (Qaanaaq) — Arctic field expeditions deploying IST sensors and AWS networks (2024–present).
- Central Arctic Ocean — Six-week expedition aboard R.V. Araon with KOPRI (2018).
- Antarctica and Southern Ocean — Multiple expeditions for sampling and ecosystem research (2019–2023).

TECHNICAL SKILLS

Programming	Python, R, bash, SQL. HPC environments. xarray, dask, scikit-learn.
Earth Observation	Satellite remote sensing (ocean colour, SST, IST), CDO, NetCDF, HDF, Zarr.
Data Frameworks	GCOS/ECV standards, Copernicus C3S, ESA CCI.
Communication	Scientific writing, policy briefing, media engagement, web content.
Other	Microsoft Office 365, Adobe, SharePoint, Linux, Git.

LANGUAGES

English (native) | Danish (A1) | Italian (B1)

ADDITIONAL QUALIFICATIONS

- Rifle License for Arctic fieldwork (Kopenhamns Skyttecenter, 2025).
- STCW Certification and Watchkeeping for Seafarers (2018).
- Motorboat License, Royal Yachting Society (2018).
- Advanced Open Water Diver, PADI (2017).
- Peer reviewer for 10+ international journal articles.

REFERENCES

Available upon request.