

### Profile

- Research** Climate-energy interactions; refrigeration efficiency; effective cooling degree days; ENSO teleconnections; climate variability and change; AI/ML for extreme weather and high-dimensional climate diagnostics.
- Builder** Climate scientist and technical founder building production-grade weather and climate systems across forecast ingestion, risk algorithms, APIs, cloud infrastructure, and web/mobile products.
- Leadership** President-level and executive-board service, founder leadership, and management-consulting experience across graduate/postdoctoral representation, client-facing technical transformation, governance, finance, and large academic-career events.

### Education

- 2018 – 2022 **Ph.D. in Environmental System Science**, *ETH Zürich, Zürich, Switzerland*  
**Thesis:** The Role of the Tropical Atlantic for the El Niño Southern Oscillation Teleconnection to the North Atlantic/European Region  
**Supervisor:** Prof. Dr. Daniela Domeisen
- 2017 – 2018 **Master of Arts in Climate and Society**, *Columbia University, New York, NY, USA*  
GPA: 3.79/4.33  
*Master Internship:* Conducted a background study on global climatology and constructed composites using the Niño 3.4 index to determine global ENSO teleconnections.
- 2013 – 2017 **Honours Bachelor of Science in Earth Sciences**, *McGill University, Montreal, Canada*  
**Thesis:** Modelling Global, Regional, and Local Effects of Sea Level Change and Applications to the Nile Delta Region  
GPA: 3.57/4.00 (First Class Honours)
- Dec 2015 – Jun 2016 **Exchange Program**, *The University of Hong Kong, Hong Kong*  
Courses focused on Earth Sciences and Sustainability

### Professional Experience

- May 2022 – Present **Co-Founder & CEO**, *ClimaLinks AG, Zurich, Switzerland*
- Founded and built a weather-data decision platform spanning forecast ingestion, climate-risk algorithms, APIs, web/mobile interfaces, cloud deployment, and product strategy.
  - Engineered operational pipelines for NOAA GFS, ECMWF ENS Extended, SEAS5, ERA5, and other forecast/reanalysis products, translating heterogeneous weather data into decision-ready risk metrics.
  - Developed multi-variant, rules-based optimization algorithms and user-facing workflows for planning weather-sensitive operations using ensemble and seasonal forecast information.
  - Implemented the risk-modeling and analytics stack in Python with cloud-native deployment patterns for scalable product delivery.
- Sep 2024 – May 2025 **Transformation Fellow / Management Consultant**, *Core Transformations GmbH, Zurich, Switzerland*
- Led client-facing technical transformation work, translating business constraints into architecture decisions, delivery plans, and implementation priorities.
  - Managed multi-stakeholder coordination across technical and non-technical teams, maintaining alignment through consulting delivery cycles.
  - Advised client teams on technical operating models, stakeholder communication, and practical execution of organizational transformation work.

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## Research Experience

- Jun 2025 – Present **Postdoctoral Researcher**, *Department of Atmospheric Sciences, University of Hawai'i at Mānoa, Honolulu, HI, USA*
- Researching refrigeration energy efficiency and climate variability, quantifying biases in cooling-demand projections and developing improved climate-energy metrics including effective Cooling Degree Days.
  - Producing global diagnostics linking refrigeration COP climatologies, extreme heat, humidity, ENSO-driven variability, and hidden energy burdens in cooling systems.
  - Applying AI/ML climate prediction workflows, high-dimensional climate diagnostics, and KOA high-performance computing to climate-energy questions.
  - Building reproducible climate-data workflows for large gridded datasets using Python, xarray, dask, Zarr/NetCDF, and HPC/cloud storage patterns.
- May 2022 – Mar 2023 **Postdoctoral Researcher (part-time)**, *Institute for Atmospheric and Climate Science, ETH Zürich, Zürich, Switzerland*
- Researched ENSO teleconnections to the tropical North Atlantic using CESM-WACCM and FOCI models, demonstrating linear and nonlinear SST responses to El Niño and La Niña events.
- Sep 2018 – May 2022 **PhD in Atmospheric Physics**, *Institute for Atmospheric and Climate Science, ETH Zürich, Zürich, Switzerland*
- Investigated the modulation of El Niño–Southern Oscillation (ENSO) teleconnections to the North Atlantic European (NAE) region, focusing on the role of the tropical North Atlantic (TNA).
  - Developed diagnostics for linear and nonlinear tropical Atlantic SST responses to extreme El Niño and La Niña events using reanalysis data and coupled climate models (CESM, FOCI, CMIP5).
  - Examined how TNA SST anomalies influence the Walker circulation and modulate Rossby wave sources, assessing their impact on regional climate patterns in the NAE.
- Jun 2018 – Aug 2018 **Research Assistant**, *Institute for Atmospheric and Climate Science, ETH Zürich, Zürich, Switzerland*
- Conducted a background study of global climatology of atmospheric variables.
  - Investigated influence of ENSO teleconnections using composite Niño 3.4 index.
- Oct 2017 – Aug 2018 **Research Assistant**, *International Research Institute for Climate and Society, Columbia University, New York, NY, USA*
- Performed quality control for the Columbia World Project data library.
  - Mapped global datasets used in the textbook “Climate Information for Public Health Action”.
  - Contributed to an official USAID report titled “Evaluation of Ignitia Daily Rainfall Forecasts for Subscribers in West Africa”, influencing budget discussions.
- Oct 2017 – Aug 2018 **Data Visualizer**, *Earth Institute, Columbia University, New York, NY, USA*
- Created detailed climate maps using MATLAB for the textbook “Climate Information for Public Health Action”.
- May 2017 – Sep 2017 **Research Assistant**, *Economic Geology Department, McGill University, Montreal, Canada*
- Performed literature review on the potential of lithium pegmatite.
  - Operated scanning electron microscope to analyze unknown lithium minerals.
  - Prepared a professional report for Avalon Advanced Materials Inc.
- Sep 2016 – May 2017 **Undergraduate Honours Thesis**, *McGill University, Montreal, Canada*
- Studied key factors influencing sea level rise locally and globally.
  - Utilized a global sea level change model to interpret local sea level change.
  - Assessed mitigation and adaptation techniques for Alexandria, Egypt.
  - Highlighted issues of representing subsidence in global models.
- May 2016 – Sep 2016 **Research Assistant**, *Precambrian Research Office, McGill University, Montreal, Canada*
- Engineered and programmed a turbidostat for culturing bacteria including *Vibrio natriegens*.
  - Presented project findings to scholars at the University of Colorado-Boulder Benson Labs.
- May 2015 – Nov 2015 **Research Assistant**, *Geochemistry Department, McGill University, Montreal, Canada*
- Synthesized andesitic glass with pyroxene and plagioclase phenocrysts.
  - Operated CT scanner at the Paul Scherrer Institute synchrotron to study vesicle formation.

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## Publications

2026

**Casselmann, J. W.** & Karamperidou, C. (2026). Efficiency-weighted cooling degree days reveal opposing temperature and humidity effects on energy demand. *Research Square*. <https://doi.org/10.21203/rs.3.rs-8683958/v1> [Preprint].

De Vries, A.-J., Feldstein, S. B., **Casselmann, J. W.**, Fragkoulidis, G., Lelieveld, J., & Domeisen, D. I. V. (2026). The influence of El Niño–Southern Oscillation on cool-season precipitation variability in the arid Middle East. *EGUsphere*. <https://doi.org/10.5194/egusphere-2026-1569> [Preprint under review for *Weather and Climate Dynamics*].

2025

De Vries, A. J., Wicker, W., Fragkoulidis, G., Rudeva, I., Rivoire, P., Russo, E., **Casselmann, J. W.**, Yadav, P., Pilon, R., Afargan-Gerstman, H., Nangombe, S., Hart, N. C. G., & Domeisen, D. I. V. (2025). Extreme weather in the Southern Hemisphere in early 2022. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/BAMS-D-23-0141.1>

2023

**Casselmann, J. W.**, Lübbecke, J. F., Bayr, T., Huo, W., Wahl, S., & Domeisen, D. I. V. (2023). The teleconnection of extreme El Niño–Southern Oscillation (ENSO) events to the tropical North Atlantic in coupled climate models. *Weather and Climate Dynamics*, 4, 471–487. <https://doi.org/10.5194/wcd-4-471-2023>

2022

**Casselmann, J. W.**, Jiménez-Esteve, B., & Domeisen, D. I. V. (2022). Modulation of the ENSO teleconnection to the North Atlantic by the tropical North Atlantic and Caribbean. *Weather and Climate Dynamics*, 3, 1077–1096. <https://doi.org/10.5194/wcd-2021-82>

2021

**Casselmann, J. W.**, Taschetto, A. S., & Domeisen, D. I. V. (2021). Nonlinearity in the pathway of El Niño–Southern Oscillation to the tropical North Atlantic. *Journal of Climate*, 34(17), 7277–7296. <https://doi.org/10.1175/JCLI-D-20-0952.1>

2018

Pleše, P., Higgins, M. D., Mancini, L., Lanzafame, G., Brun, F., Fife, J. L., **Casselmann, J. W.**, & Baker, D. R. (2018). Dynamic observations of vesiculation reveal the role of silicate crystals in bubble nucleation and growth in andesitic magmas. *Lithos*, 296, 532–546. <https://doi.org/10.1016/j.lithos.2017.11.024>

Books

**Casselmann, J. W.** (2022). An international review on climate change and social impacts. In Poe-Llamanzares, B. (Ed.), *A Sustainable Future* (pp. 95–114). Manila Bulletin Publishing Corporation.

Technical Reports

Goddard, L., Mason, S., Lenssen, N., Dinku, T., Kruczkiewicz, A., & **Casselmann, J. W.** (2018). Evaluation of Ignitia daily rainfall forecasts for subscribers in West Africa. Report to Securing Water for Food (SWFF) and USAID. International Research Institute for Climate and Society (IRI), The Earth Institute, Columbia University.

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## Awards and Scholarships

2019 **FDSE Summer School Scholarship, ETH Zürich**

Awarded scholarship to attend the Fluid Dynamics of Sustainability and the Environment Summer School in Paris, France.

- 2019 **EGU Early Career Scientist Travel Award**, *European Geosciences Union*  
Provided travel funding to attend the EGU General Assembly in Vienna, Austria.
- 2017 **Major Entrance Scholarship**, *Columbia University*  
Awarded for entry into the Master of Arts in Climate and Society program.
- 2017 **NSERC-USRA Research Award**, *McGill University*  
Natural Sciences and Engineering Research Council of Canada Undergraduate Student Research Award.
- 2016 **Trevor Ross Science Bursary**, *McGill University*
- 2016 **Robert H. Mills Undergraduate Research Award**, *McGill University*
- 2015 **Osisko Scholarship**, *McGill University*
- 2015 **Chevron-Gulf Research Forward Scholarship**, *McGill University*
- 2013 **R.E. Powell Major Entrance Scholarship**, *McGill University*
- 2013 **Governor General's Bronze Academic Medal**, *Rothwell-Osnabruck High School*  
Awarded for achieving the highest average upon graduation from high school.

## Conference Presentations

### Previous

- 2026 **Casselman, J. W.** & Karamperidou, C. *Hidden Energy Burdens: How Neglecting Refrigeration Efficiency Distorts Cooling Degree Day Estimates*. Presentation at the 2026 ERC EARTH Spring Summit, University of Notre Dame, Notre Dame, IN, 13 March 2026.
- 2026 **Casselman, J. W.** & Karamperidou, C. *Hidden Energy Burdens: How Neglecting Refrigeration Efficiency Distorts Cooling Degree Day Estimates*. Poster presented at the 2026 ERC EARTH Spring Summit, University of Notre Dame, Notre Dame, IN, 12 March 2026.
- 2025 **Casselman, J. W.** & Karamperidou, C. *Seasonal Asymmetries in the Sensitivity of Cooling Efficiency to Extreme Heat and Climate Variability*. Poster presented at AGU25, Session A31F: *Extreme Weather and Climate in Urban Areas: Physical Modeling, AI/ML Approaches, and Digital Twins for Social Impacts and Mitigation I Poster*, New Orleans, LA, 17 December 2025, 08:30–12:00 CST.
- 2025 **Casselman, J. W.** & Karamperidou, C. *Linking Refrigeration Efficiency to Large-Scale Climate Variability*. Poster presented at the NSF ERC EARTH Site Visit, University of Kansas, Lawrence, KS, 20–22 October 2025.
- 2022 **Casselman, J. W.**, et al. *Representing the ENSO Teleconnection to the Tropical North Atlantic in Coupled Models*. Poster presented at the AMS Conference on Atmospheric and Oceanic Fluid Dynamics, June 2022.
- 2022 **Casselman, J. W.**, Jiménez-Esteve, B., & Domeisen, D. I. V. *Tropical Atlantic modulation of the ENSO teleconnection to the North Atlantic*. Presentation at the EGU General Assembly, May 2022.
- 2022 **Casselman, J. W.**, Jiménez-Esteve, B., & Domeisen, D. I. V. *Modulation of the ENSO teleconnection to the North Atlantic by the tropical North Atlantic and Caribbean*. Virtual presentation at the AMS Annual Meeting, January 2022.
- 2021 **Casselman, J. W.**, Taschetto, A. S., & Domeisen, D. I. V. *Non-Linearity in the Pathway of El Niño–Southern Oscillation to the Tropical North Atlantic*. Virtual presentation at the AOGS Annual Meeting, August 2021.
- 2021 **Casselman, J. W.**, Taschetto, A. S., & Domeisen, D. I. V. *Non-Linearity in the Pathway of El Niño–Southern Oscillation to the Tropical North Atlantic*. Virtual presentation at the EGU General Assembly, April 2021.
- 2021 **Casselman, J. W.** & Domeisen, D. I. V. *Identification of the Nonlinear Aspects of the ENSO Teleconnection Towards the Tropical Atlantic*. Virtual presentation at the AMS Annual Meeting, January 2021.

- 2020 **Casselman, J. W.** & Domeisen, D. I. V. *The Importance of the NAO for the ENSO-Tropical Atlantic Teleconnection*. Live-chat presentation at the EGU General Assembly, May 2020.
- 2019 **Casselman, J. W.** & Domeisen, D. I. V. *The Influence of the Tropical Atlantic on the ENSO-North Atlantic Teleconnection*. Poster presented at the AGU Fall Meeting, San Francisco, December 2019.
- 2019 **Casselman, J. W.** & Domeisen, D. I. V. *Influence of the Tropical Atlantic on the North Atlantic-ENSO Teleconnection*. Poster presented at the EGU General Assembly, Vienna, April 2019.

## Teaching Experience

- Spring 2019 – **Teaching Assistant**, *ETH Zürich, Zürich, Switzerland*  
 2021 **Course: Global Atmospheric Circulation**
- Graded student reports, exercises, and examinations.
  - Developed exercise problems and solutions.
- Spring 2019 – **Lab Supervisor**, *ETH Zürich, Zürich, Switzerland*  
 2021 **Rotating Tank Atmospheric Physics Lab**
- Supervised and guided undergraduate students in laboratory experiments.
- Fall 2018 – **Seminar Supervisor**, *ETH Zürich, Zürich, Switzerland*  
 2020 **Seminar for Bachelor Students**
- Supervised three bachelor students in presenting academic papers and preparing a combined poster.
- Feb 2020 – **Thesis Supervisor**, *ETH Zürich, Zürich, Switzerland*  
 Feb 2021 **Bachelor Thesis Supervision**
- Supervised a bachelor student's thesis project.
  - Assisted with programming and provided feedback on the student's work.
- Fall 2019 **Teaching Assistant**, *ETH Zürich, Zürich, Switzerland*  
**Course: European Climate Change**
- Assisted in grading student reports and examinations.
- Fall 2019 **Teaching Assistant**, *ETH Zürich, Zürich, Switzerland*  
**Course: Numerical Modelling of Weather and Climate**
- Graded student reports and examinations.
  - Taught students programming skills to develop a simple atmospheric model.

## Academic Experience

### Summer Schools and Workshops

- June 2018 **FDSE Summer School Participant**, *École Polytechnique, Paris, France*
- Attended the Fluid Dynamics of Sustainability and the Environment Summer School.
  - Investigated the influence of the Coriolis force on fluids.

### Geological Field Studies

- Spring 2016 **Indonesia Geological Field Studies**, *McGill University, Indonesia*
- Led an undergraduate group in planning and fundraising for a 2.5-week geological excursion.
  - Coordinated on-the-ground activities alongside Dr. Anthony Williams-Jones.
  - Investigated island arc volcanic formations within Java and Bali.
- Spring 2016 **Hong Kong Geological Field Studies**, *The University of Hong Kong, Hong Kong*
- Created a detailed stratigraphic history of Hong Kong during the Devonian age.
  - Investigated past volcanic events through analysis of sedimentary deposits.
- Fall 2015 **Washington-Oregon Field School**, *McGill University, USA*
- Examined the volcanic history of the Cascade mountain range.
  - Studied hazard prevention measures implemented in areas surrounding Mount St. Helens.

- Summer 2015 **Nevada-California Field School**, *McGill University, USA*
- Studied rock formations to develop mapping techniques.
  - Interpreted local structural geology and petrology.
- Summer 2015 **Peru Geological Field Studies**, *McGill University, Peru*
- Studied the geological history of the Andes through geomorphological analysis.
  - Explored ore-forming deposits and their relationship to different mining strategies.
- Summer 2015 **Bancroft Mineralogy Field Excursion**, *McGill University, Canada*
- Examined high-grade metamorphic rocks and pegmatites within the Canadian Shield.
  - Analyzed crystal formation and identification of pegmatite minerals.

### Sustainability Studies

- Spring 2016 **Hong Kong Sustainability Field Study**, *The University of Hong Kong, Hong Kong*
- Interpreted the relationship between local settlements and government regulation through interviews and literature review.
  - Proposed possible future adaptation practices for local communities.

## Academic Service and Leadership

- 2026 – Present **President, ATMO Graduate Coalition**, *Department of Atmospheric Sciences, University of Hawai'i at Mānoa, Honolulu, HI, USA*
- Represent graduate students and postdoctoral researchers in the Department of Atmospheric Sciences.
  - Coordinate advocacy and communication between the graduate/postdoctoral community and departmental leadership.
- Mar 2019 – May 2021 **President, VMUSYS**, *ETH Zürich Department of Environmental Systems Science, Zürich, Switzerland*
- Represented the interests of all PhD students, postdocs, and senior scientists within the department.
  - Served as a representative at the department resource commission.
  - Chaired consultations to review public statements and ETH by-law changes.
  - Assisted committees for events, welcome packages, and treasury.
- Fall 2019 **Vice-President Internal**, *McGill Earth and Planetary Sciences Society, McGill University*
- Organized student events throughout the year for EPSC undergraduate students.
- 2013 – 2017 **Member and Officer**, *Alpha Delta Phi Literary Society, McGill University, Montreal, Canada*
- Held positions of Vice-President Academics (2015–2016), Philanthropy Chair (2014–2015), and Secretary (2013–2014).
  - Created a database for class notes and supported members' educational needs.
  - Organized fundraising events, including local dodgeball tournaments and veterans' poppy drives.

## University Service

- Aug 2020 – Mar 2023 **Executive Board Member**, *AVETH, ETH Zürich, Zürich, Switzerland*
- Served as an executive board member representing all doctoral students, postdocs, and higher scientific staff of ETH.
  - Represented Telejob, a subsidiary organization of AVETH.
- Aug 2020 – Mar 2023 **Treasurer**, *Telejob, ETH Zürich, Zürich, Switzerland*
- Created and presented monthly financial statements to the ETH Career Center.
  - Accountable for yearly audits and responsible for the annual budget.
  - Managed quarterly review of an investment portfolio.
- Jul 2020 – Aug 2021 **Project Manager**, *poly-E-fair, ETH Zürich, Zürich, Switzerland*
- Managed project subgroups including company/student relations and technical teams.
  - Negotiated contracts with outsourcing partners.
  - Interviewed and hired students for project roles.

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## Peer Reviewer

Frontiers in Climate (2022)

Geophysical Research Letters (2021)

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## Skills

### Climate Data & HPC

xarray, dask, Zarr, NetCDF, GRIB, CDO, ERA5, SEAS5, NOAA GFS, DWD ICON, ECMWF products, CMIP3/5/6, Google Cloud Storage workflows, Euler and KOA high-performance computing clusters.

### Scientific Computing & AI/ML

Python, MATLAB, NumPy, SciPy, Pandas, Scikit-learn, Matplotlib, Seaborn, Jupyter, high-dimensional climate diagnostics, AI/ML climate prediction workflows.

### Weather, Climate Models & Earth Observation

Analyzed output from FOCI, CESM-WACCM, CMIP3/5/6; ran and configured Isca and DleSym; worked with Sentinel-1/2/3, TRMM, CHIRPS, GRACE, Google Earth Engine, QGIS, and Panoply.

### Cloud, Backend & Data Systems

FastAPI, Flask, Django, Hasura/PostgreSQL, SQL/GraphQL, OpenAPI/Swagger, Docker, Caddy, Nginx, Google Cloud Platform (BigQuery, Cloud Run, Compute Engine, Cloud KMS, Secret Manager, Cloud Storage, Cloud Scheduler), Firebase.

### Frontend & Product

TypeScript, JavaScript, React.js, React Native, Expo, HTML, CSS, Tailwind CSS, WordPress, Stripe, RevenueCat.

### Security, DevOps & Tooling

Git, Bash automation, JWT, OAuth, Firebase Auth, IAM least privilege, Linux system administration, file integrity verification, production service hardening, log shipping, SendGrid alerts, LaTeX, VS Code.

### Laboratory Equipment

High-temperature furnaces, CT scanners, scanning electron microscopes, analytical electron microprobes, energy-dispersive X-ray spectroscopy, seismometers, sun photometers, gravimeters

### Languages

English: Native proficiency (C2)

French: Intermediate (A2)

German: Beginner (A1)

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## References

Available upon request.