EMANUELE SILVIO GENTILE

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PROFILE

I am an atmospheric physicist and climate modeler with a foundation in theoretical physics, specialising in storm-resolving climate modelling, turbulence physics, and climate-risk science. My research integrates km-scale climate models, large-ensemble simulations, and higher-order boundary-layer turbulence schemes to quantify the physical controls on near-surface extremes. I focus on how moist convection and sub-grid turbulence shape extreme winds and precipitation and scale up to influence large-scale circulation and storm tracks under climate change. My work combines physically interpretable diagnostics with targeted AI and machine-learning approaches, including AI-based precipitation analysis and evaluation of data-driven weather models. I also have strong expertise in GPU-accelerated environments, gained through the implementation of regional AI weather models using the Anemoi (ECMWF) framework and through large-eddy simulations to study turbulent processes and enable scalable uncertainty quantification at very high resolution. I treat Earth's climate as a coupled dynamical system, linking atmospheric circulation, land-atmosphere coupling, and ocean-wave interactions to hazard-relevant extremes. Recently, I have expanded my focus to climate-risk and uncertainty quantification, bridging weather and climate science with insurance and financial applications using probabilistic, tail-based, and distribution-focused metrics. I am currently a Research Scientist at NCAS and the University of Reading, contributing to the CANARI project on climate-driven changes in extreme winds, precipitation, and flooding. Previously, I worked at NOAA/GFDL and Princeton University on unified representations of turbulence, convection, and clouds in global climate models.

RESEARCH EXPERIENCE AND EDUCATION

Research Scientist, University of Reading & NCAS, Reading, UK **(2025 – present)**

Lead high-resolution modelling and applied climate-risk analysis for the CANARI project.

- Lead high-resolution modelling of extreme wind and precipitation hazards using large ensembles to quantify uncertainty and assess impacts for infrastructure, energy, and financial risk.
- Develop probabilistic future-climate simulations to evaluate storm behaviour under different warming pathways for scenario-analysis applications.
- Lead AI/ML weather-modelling demonstrator (WCSSP India) including workflow design, deployment, and automated predictive analytics.
- Contributed to the Met Office km-scale global modelling initiative, supporting cross-institutional analysis of high-impact events, synoptic-scale circulation, and process-level performance (clouds, convection, extreme winds) through diagnostics, comparisons, and support to workshop coordination.
- Translate climate-model outputs into decision-relevant insights through work with the Hub for Applied Weather and Climate Science, supporting operational and climate-risk users
- Build an open-source wind loss model in collaboration with Azim Premji University, in India

Postdoctoral Research Associate, Princeton University & GFDL NOAA, Program in Atmospheric & Oceanic Science, Princeton, NJ, US **(2022-present)**

Leading climate research projects in two distinct areas: (1) improving boundary-layer turbulence and cloud representation in the GFDL's Atmospheric Model (AM4) by integrating the higher-order Cloud Layers Unified by Binormals (CLUBB) parametrization framework and (2) analysing projections of extreme wind and precipitation in future scenarios using high-resolution AM4 and global storm resolving eXperimental System for High-resolution prediction on Earth-to-Local Domains (X-SHiELD) models. Collaborating with senior GFDL scientists Dr Ming Zhao and Dr Leo Donner.

- Investigated the integration of the CLUBB framework into GFDL's AM4 climate model as part of the Climate Processes Team, collaborating with GFDL, NCAR, Penn State University, the University of Wisconsin Milwaukee, and the University of Stockholm. This work focused on enhancing boundary-layer turbulence and cloud representation, improving consistency with the Navier-Stokes equations and assessing its impact on extreme wind events.
- Integrated the CLUBB scheme into the GFDL's AM4 climate model (Fortran 95-based) modifying the model's source code enhancing the simulation of extreme wind speed and leading a comparative study with NCAR's Community Atmosphere Model (CAM) model to evaluate the advantages of higher order CLUBB scheme over traditional first-order approaches.
- Developed Python and Fortran 95 analytical tools to assess extreme wind speeds and momentum transport in GFDL-AM4 simulations improving model diagnostics for surface drag effects on global circulation.
- Assessed high-resolution AM4 and X-SHiELD climate simulations, analyzing future extreme wind and precipitation projections and identifying key drivers, such as midlatitude cyclones. The findings support stakeholders from businesses to policymakers in decision-making.

Ph.D. in Atmosphere, Oceans and Climate, University of Reading, UK (2018-2022)

- **Thesis by articles:** *The Impact of Atmosphere-Ocean-Wave Coupling on Extreme Surface Wind Forecasts,* supervised by Prof. Suzanne Gray, Prof. Janet Barlow, Dr. Huw Lewis (Met Office)
- Funded through a NERC Industrial CASE PhD studentship in collaboration with the Met Office.
- Investigated the impact of atmosphere-ocean-wave coupling on extreme winds in mesoscale systems using the Met Office's UKEP multi-model system, comparing the benefits of fully coupled simulations with an atmosphere-only parameterization based on surface drag.
- Developed a framework enabling the first coupled ensemble convective-scale prediction system for the UK, supporting 30 perturbed members. Conducted during a 2-month remote Met Office internship, enhanced the representation of initial condition perturbations and improved forecast sensitivity.
- Built a climatology of extreme winds and gusts in UK's seas by processing MIDAS and Marine Met Office data (2011–2020).
- Analyzed Mediterranean hurricane predictability in convection-permitting ensemble simulations, contributing to European project CA1909 on hurricane predictability.
- Teaching Assistant (2019–2022) in Atmospheric Physics, Boundary Layer Meteorology, and Fluid Dynamics, providing tutorial sessions and coursework support to master students.
- Laboratory Demonstrator (2019–2021) in Boundary Layer Meteorology and Fluid Dynamics, supervising experiments and guiding students in practical applications.

Undergraduate Research Opportunities Programme (UROP), Condensed Matter Theory Group, Imperial College London (2016-2018)

- Extended Fortran95 FDTD simulations for light interactions in nano-plasmonic structures and semiconductors to improve robustness, with application in laser and photonic devices.
- Optzimed and extended a C parallel FDTD model, based on MPI paradigm, for semiconductor diffusion and pumping, improving performance on WS clusters
- Developed a Python algorithm for simulating 2D surface states at photonic crystal interfaces, applied to the study of topological properties in condensed matter physics

BSc ARCS in Physics with Theoretical Physics, Imperial College London, UK **(2015-2018)**

- Graduated with First-Class Honours.
- Final Year Project: *Calculating evanescent Floquet modes in photonic crystals: bringing topological surface states to light*, supervised by Prof. Ortwin Hess.
- Awarded the Department Tessella Prize for Software the most outstanding BSc final year computational project.

RESEARCH SKILLS

AI and ML-based Regional Weather Modelling and Validation:

- Currently implementing a regional high-resolution ML weather for the UK based on the Bris weather model and the ECMWF Anemoi ML framework.
- Developed and tested an ad-hoc validation framework based on Fourier Analysis for seasonal summer precipitation predicted by the AI weather model GraphCast, developed by Google.

Climate Modeling and Simulation:

- Implemented and fine-tuned the prognostic momentum CLUBB higher-order parameterization scheme in GFDL's AM4 model (Fortran 95), improving surface coupling and enhancing model accuracy for extreme weather event simulations.
- Expert in designing high-resolution global atmospheric climate simulations and in the impact assessment of global warming on extreme wind speeds, developing custom-developed diagnostic.

Collaborative Technical Development:

- Developed the first ensemble convective-scale prediction system for the UK, in collaboration with the Met Office, by integrating atmosphere, ocean, and wave UKEP models, with MOGREPS-UK ensemble functionalities, using Jinja2, Django, and Python for scripting.
- Data Analysis, Visualization & Tool Development: Specialized in mesoscale weather system diagnostics and model evaluation. Designed custom Python tools for analyzing and visualizing meteorological data, interfacing with Iris, CF-Python, Pandas and Matplotlib.

Programming & Software Development: Skilled in Python and Fortran 95, with experience in Unix Shell scripting, C, and Object-Oriented Programming. Developed and adapted data analysis tools for meteorological applications to assess the impact of improved boundary-layer turbulence representation on global circulation and extreme wind predictability, both online (Fortran 95) and offline (post-proc with Python-Iris, CF-Python, Pandas, and Matplotlib). Proficient in Jupyter Notebook, Spyder, and PyCharm.

Machine Learning Applications: Familiar with Keras and TensorFlow for building and optimizing neural network models (NNs, CNNs, RNNs) in climate science applications.

High-Performance Computing: Experience running large-scale climate simulations on the HPC Gaea HPE-Cray EX 3000 systems (containing a peak calculating capability greater than 25 petaflops).

Technical & Writing Tools: Proficient in LaTeX for academic writing and MS Office for documentation.

Professional Engagement & Remote Collaboration:

- Currently establishing collaboration with leading insurers and energy actors as member of the Climate Finance Hub at the University of Reading.
- Established research collaboration across US, UK, and Europe institutions, contributing to advancements in km-scale global climate modelling and participating in a European COST action.
- Organized and moderated the Mesoscale Group seminars at the University of Reading, expanding the network and promoting the exchange of scientific knowledge.

RESEARCH VISITS

- **LAERO (Planned, first half 2026)**: Research visit with **Florian Pantillon** focusing on the NAWDIC field campaign, extreme wind events, and their dynamical drivers in midlatitude cyclones. Scientific exchange on km-scale modelling, observational constraints from field data, and implications for the representation of extreme winds in weather and climate models.
- **ETH, Zurich (2025)**: Scientific visit to Prof Heini Wernli focused on extratropical cyclone dynamics, storm-track diagnostics, and dynamical-thermodynamical coupling in extreme events. Technical discussions on Lagrangian analysis, cyclone tracking methodologies, and implications for high-resolution climate modelling.
- **TU Delft, Delft, Netherlands (2025):** investigated higher-order closure and large-eddy simulation techniques aimed at improving the representation of momentum transfer in atmospheric models, with Prof Stephan de Roode.
- **California Institute of Technology, Pasadena, CA, US (2025):** explored how the CLUBB higher-order scheme could be used as a mathematical framework to develop a ML-based turbulence parametrization scheme to implement in climate models, with Prof Tapio Schneider.
- **Stockholm University, Meteorology Department, Sweden (2024)**: Developed metrics for boundary-layer parametrization impact assessment in collaboration with Prof. Gunilla Svensson.
- **NCAR, Mesa Laboratory, Boulder, CO, US (2023)**: Comparative assessment of the higher-order turbulence scheme CLUBB between its implementation in the leading NCAR climate models CAM and the GFDL-developed AM4, in collaboration with Dr. Julio Bacmeister and Dr. Richard Rotunno.
- **Met Office, Weather Science Department, Exeter, UK (2020-2025, twice a year visits, recurrent)**: Worked on physics parametrizations and intercomparisons of km-scale climate models in collaboration with Dr. Adrian Lock, Dr. Huw Lewis, Dr. John Edwards and Dr Lorenzo Tommassini.
- **University of Reading, Department of Meteorology, UK (2022-2025, twice a year visits)**: Analyzed midlatitude cyclone dynamics in changing climates, in collaboration with Prof. Pier Luigi Vidale, Dr. Kevin Hodges, Prof. Suzanne Gray and Prof. Miguel Texeira.

TEACHING

Teaching Assistant, University of Reading, UK (2025-present)

- Conducted teaching & tutorial sessions in Numerical Modelling for Weather and Climate Science as well as the Atmosphere and Ocean Dynamics course, engaging undergraduate students from the 2nd and 3rd year of the Meteorology undergraduate programme.

Guest Lectures & Climate Change Outreach, Princeton University (2022-2024)

- Delivered lectures on midlatitude cyclones and Mediterranean hurricanes to graduate and undergraduate students, reaching up to 30 attendees**.**
- Engaged in public outreach initiatives, presenting to graduate students at the City University of New York from underrepresented backgrounds on climate change facts, the state of climate models, and future directions in climate modeling**.**

Teaching Assistant, University of Reading, UK (2019-2022)

- Led tutorial sessions in Atmospheric Physics, Boundary Layer Meteorology, and Fluid Dynamics, engaging up to 40 master's students.
- Developed teaching materials, managed coursework evaluations, provided detailed feedback, and supported students with assignments.
- Received positive feedback for clarity of explanations and ability to inspire student interest in complex topics.

Laboratory Demonstrator, University of Reading, UK (2019-2021)

- Supervised practical sessions in Boundary Layer Meteorology and Fluid Dynamics, mentoring up to 10 master's students.
- Provided hands-on guidance to enhance experimental skills and deepen students' understanding of atmospheric processes.

MSc Thesis Co-Supervision, University of Reading, UK (2020)

- Co-supervised an MSc Thesis on atmospheric sciences, guiding the student from research design to final submission.

Science Specialist (Private Tutoring & Admissions Prep), Marie-Louise Banning Education Consultant, UK (2018-2021)

- Prepared students for Physics and Mathematics sections of university admission exams, delivering personalized online lessons to enhance academic readiness.

Mathematics Tutor, Tutorfair, UK (2018)

- Provided one-on-one mathematics tutoring to undergraduate students, tailoring lessons to individual learning needs and academic goals**.**

Peer-Assisted Learning (PAL) Mentor, Imperial College London, UK (2017-2018)

- Volunteered as a mentor for 1st and 2nd-year Physics students, facilitating discussions, offering academic advice, and supporting their learning process.

COMMUNITY SERVICE

- **Peer Reviewer** for journals including *Geophysical Research Letters, Journal of Climate, Weather and Climate Dynamics, International Journal of Climatology, Journal of Climate, Journal of Geophysical Research: Atmospheres, Atmospheric Research,* and *Earth and Space Science.* Also a reviewer for ERC grants.

- **Conference Session Chair:** Chairing EGU26 session on "Transport and dynamics across scales: from sub-grid physical processes to large-scale circulation". Co-chaired the AGU23 session "*"Extreme Events: Observations and Modelling"* (San Francisco, US), and the 2022 MedCylones meeting Working Group 1 session *"Process-based Understanding of Mediterranean Cyclones at Weather Time Scales"* (Athens, Greece)
- **Advisory Contributor, Academy of Medical Sciences, London, UK (2020):** Contributed expertise to the report *'Preparing for a Challenging Winter 2020/21,'* assessing the impact of winter weather conditions on the UK's response to the second wave of COVID-19.
- **Professional Memberships:** AGU, AMS, EGU, European Meteorological Society, NOAA Affiliation, COST Action CA1909.

LEADERSHIP AND ORGANIZATIONAL SKILLS

- **Climate Outreach Coordination:** Designed and led climate outreach initiatives with GFDL staff, and Princeton University's PhD students, engaging local communities, high schools and CUNY Graduate Center students (2023-2024).
- **Seminar Organization:** Currently co-lead the University of Reading departmental seminars. Led the *Mesoscale Group* seminars at the University of Reading (2020-2022), fostering collaboration and knowledge exchange within the meteorology community.
- **Club Leadership:** Served as President of the Reading University Volleyball Club (2019-20) and Chair of the Imperial College Italian Society (2017-18), overseeing event planning and community engagement.
- **Peer support:** Contributed to the Research Away day organisation. While at GFDL, active member of the *GFDL Employee Association*, facilitating professional networking and organizing lab-wide social events to enhance scientific collaboration.

LANGUAGES

- **English:** Fluent (Near-native) – Over a decade of study and research in English-speaking academic environments (Imperial College London, University of Reading, GFDL, Princeton University). Strong academic writing, presentations, and scientific communication.
- **Italian:** Native.
- **French:** Intermediate (Conversational proficiency) – Active and regularly participant in Princeton University's French Society and informal conversations in French speaking academic and social setting. Completed language courses in France and Quebec up to level B1/B2.

ADDITIONAL TRAINING & PROFESSIONAL DEVELOPMENT

1. **Grant Proposal Development:**
   a. Won in December 2025 a WCSSP India research grant to develop in collaboration with Met Office a regional ML/AI model based on the Anemoi framework and the MET Norway Bris model
   b. Won in September 2025 a 10000 GPU hours grant for Isambard-AI and Dawn supercomputers
   c. Finalist in *Future Leaders Fellowship* (£1.5M funding) progressed through all steps up to the national interview stage
   d. Finalist in the *Leverhulme Early Career Fellowship* selection at the University of Reading (2025).
   e. Finalist in the *Advancing the Frontiers for Earth System Prediction* fellowship at the University of Reading (2025), developing a grant in close collaboration with Met Office and ECMWF.

f. Selected to develop a proposal for the Schmidt Foundation at UC San Diego on Machine Learning and Climate Modelling (2024).

2. **Teaching & Mentoring:** Completed *Introduction to Teaching & Lecturing Methods* and *Supervising MSc Students* workshops (University of Reading, 2019), strengthening student guidance and mentoring skills. Delivered guest lectures on midlatitude cyclones and Mediterranean hurricanes to graduate and undergraduate students, reaching up to 30 attendees (2022-2024).
3. **Scientific Writing & Presentation:** Trained in *Presentation Skills* and *Critical Academic Writing* courses (University of Reading). Attended a *Public Engagement Workshop* (2018) on effective climate science communication for diverse audiences.
4. **Programming & Machine Learning:** Completed *OOP and Python* course (University of Reading, 2018-2019) and advanced ML/AI courses in the *Department of Computer Science*. Completed the ECMWF *Machine Learning in Weather & Climate* online course. Completed training in ECMWF machine learning framework Anemoi.
5. **Atmospheric Science & Data Assimilation:** Attended the *Diabatic Winter School* on diabatic processes in the atmosphere (Kvalheim, Norway, 2020). Completed two *Data Assimilation* courses on ECMWF operational forecasting (University of Reading & ECMWF, 2020).
6. **Entrepreneurship & Sustainability:** Participated in the *YES Competition* (University of Reading & Syngenta, 2019) on commercializing scientific innovations. Completed *Innovating for Sustainable Development* (Kintbury, 2019), integrating research with the UN Sustainable Development Goals.

AWARDS AND PRIZES

- **NERC Industrial CASE PhD Studentship and Travel Grant**, (NE/R007640/1), sponsored by the Met Office, UK (2018-2022)
- **Tessella Prize for Software,** Imperial College London, UK (2018): Received for the most outstanding BSc final year computational project.
- **EPSRC Bursary for UROP Summer Placement**, Department of Condensed Matter Theory, Imperial College London, UK (2016)
- **Italian State Honours Scholarship and Admission to the National Register of Excellence**, Italy (2015) – Awarded for achieving a perfect score of 100 with honours in the final exam

PEER-REVIEWED PUBLICATIONS

- **Gentile, E.S.,** Zhao, M., Harris, L., Hodges, K., *Response of Extreme North Atlantic Midlatitude Cyclones to a Warmer Climate in the GFDL X-SHiELD Kilometer-Scale Global Storm-Resolving Model* (2024). DOI: 10.1029/2024GL112570
- Pantillon, F., Davolio,S., Avolio,E., Calvo-Sancho,C., Carrió, D.S., Dafis,S., Flaounas,E., **Gentile, E.S.**, Gonzalez-Aleman,J.J., Gray,S.L., Miglietta,M.M., Patlakas,P., Pytharoulis,I., Ricard,D., Ricchi,A. and Sanchez, C., *The crucial representation of deep convection to predict the cyclogenesis of medicane Ianos.* Weather and Climate Dynamics (2024) DOI: 10.5194/egusphere-2024-1105
- **Gentile, E.S.**, Zhao, M., Tan, Z., Larson, V., Zarzycki, C., *The Effect of Coupling Between CLUBB Turbulence Scheme and Surface Momentum Flux on Global Wind Simulations.* Journal of Advances in Modeling Earth Systems (2024) DOI: 10.1029/2024MS004295
- **Gentile, E.S.**, Zhao, M. and Hodges, K., *Poleward intensification of midlatitude extreme winds under warmer climate.* npj Climate and Atmospheric Science Journal. DOI: 10.1038/s41612-023-00540-x.

- **Gentile, E.S.**, Gray, S.L. *Attribution of observed extreme marine wind speeds and associated hazards to midlatitude cyclone conveyor belt jets near the British Isles.* International Journal of Climatology 43, 2735-2753 (2023) DOI: 10.1002/joc.7999
- **Gentile, E.S.**, Gray, S.L., Lewis, H.W., *The sensitivity of probabilistic convective-scale forecasts of an extratropical cyclone to atmosphere-ocean-wave coupling.* Quarterly Journal of the Royal Meteorological Society 148, 685-710 (2022) DOI: 10.1002/qj.4225
- **Gentile, E.S.**, Gray, S.L., Barlow, J.F, Lewis, H.W., Edwards, J.M., *The impact of atmosphere-ocean-wave coupling on the near-surface wind speed in forecasts of extratropical cyclones.* Boundary-Layer Meteorology 180, 105–129 (2021) DOI: 10.1007/s10546-021-00614-4

Under Review

- **Gentile, E.S.**, Zhao, M., Larson, V., Zarzycki, C., Svensson, G, Donner L. *Enhancing nocturnal convection and Low-Level-Jet representation over the Great Plains via prognostic momentum fluxes and generalized turbulent lengthscale in CLUBB turbulence scheme.* Under Review in the Journal of Advances in Modeling Earth Systems (2025).
- **Gentile, E. S.**, Hunt, K. M. R., Tomassini, L., Harvey, B., & Martinez-Alvarado, O. *Global diurnal precipitation cycle in the AI model GraphCast and a 5-km Unified Model: Challenges and opportunities.* Under Review in Geophysical Research Letters (2025).

In preparation

- Schiemann, R. K. H., Lister, G., Hatcher, R., Hodson, D., Lawrence, B., Shaffrey, L., Dittus, A., Robson, J., Harvey, B., Hodges, K., Martínez-Alvarado, O., Woolnough, S., Turner, A. G., **Gentile, E. S.**, et al. *The CANARI HadGEM3 Large Ensemble: Design and evaluation of historical simulations.* Submitted to Geoscientific Model Development (2025).
- **Gentile, E. S.**, Harvey, B., Hodges, K., & Martinez-Alvarado, O. *Future Northern Hemisphere extreme winds and associated insurance risk under SSP3-7.0 from a large-ensemble climate model.* In preparation for submission to Nature Climate Change (2025).

CONFERENCE PRESENTATIONS AND SEMINARS

Invited Seminar Talks

CNR-ISAC, Istituto di scienze dell'atmosfera e del clima, Bologna, Italy (November 2025, In Person) *Bridging Scales to Predict Wind Extremes in a Warming Climate: From General Circulation to Storm-Resolving Models*

Cambridge University, Quantitative Climate and Environmental Science (QCES) program, Cambridge, UK, (October 2025, in person) Predicting wind extremes in a warming climate: from general circulation to storm-resolving models via improved turbulence representation.

CANARI Annual Workshop, Cambridge University, British Antarctic Survey, Cambridge, UK (September 2025, In person) *Response of North Atlantic Midlatitude Cyclones to a warmer climate*

ETH Zurich, Department of Environmental Systems Science, Zurich, Switzerland (July 2025, In Person) *Predicting wind extremes in a warming climate: from general circulation to storm-resolving models via improved turbulence representation*

University of Exeter, Navigating the turbulence grey-zone in Numerical Weather Prediction, Exeter, (UK), (June 2025, In Person): *Enhanced simulations of low-level jets and moisture transport over the US great plains by directly prognosing momentum flux and using a generalised turbulence length-scale.*

TU Delft, Momentum Budget symposium, Delft, (NL), (June 2025, In Person): *Enhanced simulations of nocturnal precipitation and Low-Level Jet structure over the Great Plains by directly prognosing momentum flux and using a generalized turbulent length scale*

Columbia University, LEAP Centre, informal seminar, New York, NY (US), (March 2025, In Person): *Sharper low-level jet and enhanced precipitation cycle over the US Great plains by directly prognosing momentum flux.*

Caltech, CliMA seminar series, Pasadena, CA, US (January 2025, In Person): *Can we advance the predictive capabilities of global circulation and extreme winds under a future non-stationary warmer climate scenario?*

Stockholm University Formal Seminar, Stockholm, Sweden (Aug 2024, In Person): *Predictions and projections of extreme winds and associated synoptic and mesoscale drivers with state-of-the-art global climate models.*

M2LInES Seminar Series New York, US (Feb 2024, online): *Modelling momentum transport in climate simulations of boundary-layer winds with a higher-order parameterization scheme*

Laboratoire d'Aerologie & Meteo France, Toulouse, France (Apr 2021, Online): *The importance of atmosphere-ocean-wave coupling in deterministic and ensemble regional km-scale forecasts of midlatitude cyclones.*

Atmosphere-Ocean Dynamics Group, Cambridge University, UK (Nov 2020, Online): *The impact of atmosphere-ocean-wave coupling on extreme surface wind speed*

Solicited Conference Presentation

EMS21, Bonn, Germany (Sept 2021, Online) : *The importance of atmosphere-ocean-wave coupling in ensemble regional convective-scale forecasts of midlatitude cyclones.*

Conference Oral Presentation

AMS Annual Meeting 2025, New Orleans, US (January 2025, In Person): *What are the benefits of km-scale global climate model simulations for predicting extratropical cyclones extreme winds?*

Met Office Seminar Series *Path to High Resolution*, Exeter, UK (Sept 2024, In Person): *Harnessing the benefits of global km-scale climate models.*

EMS Annual Meeting 2024, Barcelona, Spain (Sep 2024, In Person): *Enhancing global wind climate simulations in the GFDL-AM4 model by unifying planetary boundary layer and cloud turbulence parametrizations with the higher-order scheme CLUBB.*

EGU General Assembly, Vienna, Austria (Apr 2022, 2023, 2024, In Person)

- *Poleward intensification of midlatitude extreme winds under warmer climate (2024)*
- *Modelling momentum transport in climate simulations of boundary-layer winds with a higher order parameterization scheme (2023)*
- *Midlatitude cyclone features associated with extreme winds and gusts in the seas surrounding the UK (2022)*

AMS Annual Meeting 2024, Baltimore, US (Jan 2024, In Person): *Momentum transport in boundary-layer wind climate simulations and its parametrization by CLUBB: challenges and opportunities.*

AGU Annual Meeting 2023, San Francisco, US (Dec 2023, Online): *Poleward intensification of midlatitude extreme winds under warmer climate.*

Conference Poster Presentations

Oxford Model Uncertainty Workshop, Oxford, UK (Sep 2024): *What are the benefits of km-scale global climate model simulations for predicting extratropical cyclone extreme winds?*

European Windstorm Workshop, Birmingham University (Oct 2019), **DTP Scenario Conference**, London (Sept 2019), **RMetS Student Conference**, Birmingham University, **Diabatic Winter School**, Norway (March 2019) (July 2019): *The impact of atmosphere-ocean-wave coupling on extreme surface wind speed forecasts.*

Seminars & Workshops

GFDL Lunchtime Seminar Series, Princeton, US (March 2024, In Person): *Advancing predictive capabilities of global circulation and extreme winds in a warmer climate.*

CMCC Seminar, Bologna, Italy (May 2023, In Person): *Attribution of observed extreme marine wind speeds and associated hazards to midlatitude cyclone conveyor belt jets near the British Isles*

NCAR Informal Happy Hour Seminar, Colorado, US (March 2023, Online): *Attribution of observed extreme marine wind speeds and associated hazards to midlatitude cyclone conveyor belt jets near the British Isles.*

GFDL Seminars, Princeton (March 2022, Online): *The impact of atmosphere-ocean-wave coupling on extreme surface wind speed.*

Mesoscale Group Talk, University of Reading (Feb 2023 & Mar 2021 & Nov 2020, Online)

- *Attribution of observed extreme marine wind speeds and associated hazards to midlatitude cyclone conveyor belt jets near the British Isles.* (2023)
- *On the predictability of Ianos, a hurricane in the Mediterranean.* (2021)
- *The impact of atmosphere-ocean-wave coupling on extreme surface wind speed. .* (2020)

Meeting on Mediterranean Cyclones and Aerosol, Castro Marina, Italy (Sept 2021)*: Sensitivity of ensemble convective-scale coupled system: an atmosphere-ocean-wave coupling in a cyclone case study.*

University of Reading, Meteorology Department Seminar (Oct 2021, Online): *Forecasting midlatitude cyclone winds with a convective-permitting model coupled to ocean and wave models*.

Climate Conference COP24, Katowice, Poland (2018): *Short presentation of PhD research.*