

César SAUVAGE

Research Associate III

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Positions Held

- 2023 – now **Research Associate III**,
WHOI (Woods Hole Oceanographic Institution),
Supervisor : Hyodae Seo.
- 2020 – 2023 **Postdoctoral Investigator**,
WHOI (Woods Hole Oceanographic Institution),
Supervisors : Hyodae Seo and Carol Anne Clayson.
- 2016 – 2019 **Ph.D. Student**,
CNRM (National Centre for Meteorological Research),
Supervisors : Cindy Lebeaupin Brossier, Marie-Noëlle Bouin, Véronique Ducrocq.
- 2015 **Guest Student**,
Apr. to Sep. *Mediterranean Institute of Oceanography, Toulon (MIO), France,*
Supervisors : Anne Molcard and Yann Ourmières.

Education

- 2016 – 2019 **Ph.D. at CNRM (National Centre for Meteorological Research)**,
Paul Sabatier University, Toulouse, France,
Dissertation : Ocean-atmosphere coupling for prediction of Mediterranean heavy precipitation events : better modeling and impacts of river runoff and sea state.
- 2012 – 2015 **Engineering University**, 3 year master program,
Polytech'Nice-Sophia Antipolis, France.
Hydrology, Water treatment, Fluid mechanics, Modelling, Physical oceanography.
- 2014 **Semester in South Korea**, *Incheon National University.*

Publications

- 2024 **Sauvage, C.**, Seo, H., Barr, B., Edson, J.B. and Clayson, C.A., *Misaligned Wind-Waves Behind Atmospheric Cold Fronts*. *Journal of Geophysical Research : Oceans*, 129, e2024JC021162, 2024.
- Bouin M-N, C. Lebeaupin Brossier, S. Malardel, A. Voldoire, **Sauvage, C.**, *The wave-age-dependent stress parameterisation (WASP) for momentum and heat turbulent fluxes at sea in SURFEX v8.1*, *Geosci. Model Dev.*, 17, 117–141, gmd-17-117-2024 , 2024.
- 2023 **Sauvage, C.**, Seo, H., Clayson, C.A. and Edson, J.B., *Improving wave-based air-sea momentum flux parameterization in mixed seas*. *Journal of Geophysical Research : Oceans*, 128, e2022JC019277, DOI : 10.1029/2022JC019277, 2023.
- 2021 **Sauvage, C.**, Lebeaupin Brossier, C., Bouin, M-N., *Towards kilometer-scale ocean-atmosphere-wave coupled forecast on a Mediterranean heavy precipitation event*. *Atmos. Chem. Phys.*, 21, 11857–11887, DOI : 10.5194/acp-21-11857-2021, 2021.
- 2020 **Sauvage, C.**, Lebeaupin Brossier, C., Bouin, M-N., and Ducrocq, V., *Characterization of the air-sea exchanges during a Mediterranean heavy precipitation event using realistic sea state modelling*. *Atmos. Chem. Phys.*, 20, 1675–1699, DOI : 10.5194/acp-20-1675-2020, 2020.
- 2018 **Sauvage, C.**, Lebeaupin Brossier, C., Ducrocq, V., Bouin, M-N., Vincendon, B., Verdecchia, M., Taupier-Letage, I. and Orain, F., *Impact of the representation of the freshwater river input in the Western Mediterranean Sea*. *Ocean Modelling*, 131, 115–131, DOI : 10.1016/j.ocemod.2018.09.005, 2018.

- 2018 **Sauvage, C.**, Lebeauupin Brossier, C., Bouin, M-N., and Ducrocq, V., *Role of the sea state on the air-sea exchanges during a Mediterranean heavy precipitation event in a kilometer-scale forecast system*. AMS 21st Conference on Air-Sea Interaction, Conference paper - Extended abstract.

Projects

- Current **NSF PO (2022-2026)**, *Improving understanding of coupled impacts of oceans and waves on air-sea fluxes in the US Northeast Coast*. PIs : Seo H., Sauvage C., and Clayson C.A.
- NASA MAP (2021-2024)**, *Improving coupled atmosphere-ocean processes in NU-WRF for the simulation of coast-threatening extratropical cyclones in the northeastern US*. PIs : Seo H., Clayson C.A. (WHOI), Braun S.A. and Shi R. (NASA GSFC).
- DOE WFIP3 (2021-2026)**, *Improving High Resolution Offshore Wind Resource Assessments and Forecasts using Observations in the MA/RI Lease Areas*. Kirincich et al.
- NOAA CVP (2019-2022)**, *Coupled Ocean-atmosphere interaction mediated by ocean mesoscale eddies in the Northwestern Tropical Atlantic Ocean*. PIs : Seo H. and Clayson C.A.
- Past **MISTRALS - HYMEX (2010-2020)**, *Hydrological Cycle in Mediterranean Experiments*. Drobinski et al., 2014.

Honor & Award

- Sep. 2023 Travel grant received to attend the **Workshop on Atmosphere-ocean coupling at (sub)mesoscales**, Leiden, the Netherlands.
- Mar. 2023 Travel grant received as early career scientist to attend the **US CLIVAR Mesoscale and Frontal-Scale Air-Sea Interactions Workshop**, Boulder, CO, USA.
- Oct. 2021 **Physical Oceanography Dissertation Symposium XI (PODS)**, Kaua'i, Hawai'i, USA, Invited speaker.

Teaching and Outreach

- Apr. 2023 **"Ocean-Atmosphere Interactions Impact on Global Climate"**, Guest lecture in *Earth and Science class at Glenville State University, Glenville, WV (virtual)*.
- Nov. 2021 **"Introduction to ocean surface waves"**, Guest lecture for the *MIT/WHOI Joint Program, Woods Hole, MA*.

Student Mentoring

- Winter 2024 Co-advised Yoo-Jun Kim (Tokyo University) during November 2023-March 2024 ; Yoo-Jun is working on coastal and estuary circulation around Japan, looking into LES-scale winds and circulation..
- Summer 2023 Co-advised Peisen Tan (University of Miami) during Summer 2023 ; Peisen is working on laboratory and numerical modeling of short wind waves and swell interactions..

Community Activities

- Session chair : "Waves in the large-scale air-sea system" at The 4th workshop on Waves and Wave-Coupled Processes, Uppsala, Sweden, February 2023.
- Session chair : "Regional / Shelf Scale" at the Physical Oceanography Dissertation Symposium XI, Kaua'i, Hawai'i, USA, Oct. 2021.
- Ad hoc reviewer for the National Science Foundation (NSF).
- Reviewer for Journal of Geophysical Research (JGR) : Oceans, JGR Atmospheres ; Atmospheric Chemistry and Physics (ACP) ; Geoscientific Model Development (GMD) ; Scientific Reports ; Limnology.

- Co-organizer of the Physical Oceanography Department Seminar at WHOI (2021- 2022).
- Member of the Physical Oceanography Website Committee at WHOI (2022 – now).

Internationals Conferences and Seminars

** : Invited talks.

- Apr. 2024 **5th Workshop on Waves and Wave-Coupled Processes**, *Reading, UK*,
Sauvage C., H. Seo, B. Barr, J. B. Edson and C-A. Clayson : Misaligned Wind-Waves Behind Atmospheric Cold Fronts. Talk.
- Feb. 2024 **Ocean Science Meeting 2024**, *New Orleans, LA, USA*,
Sauvage C., H. Seo, J. B. Edson and C-A. Clayson : Air-Sea Flux Impacts Over Misaligned Waves During Atmospheric Cold Fronts. Talk.
- Nov. 2023 **The North American Wind Energy Academy (NAWEA)/WindTech 2023 Conference**, *Denver, CO, USA*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : On the misaligned wind waves behind the atmospheric cold fronts. Poster.
- Sep. 2023 **Workshop on Atmosphere-ocean coupling at (sub)mesoscales**, *Leiden, the Netherlands*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Improving wave-based air-sea momentum flux parameterization in mixed seas. Poster.
- May 2023 ****ODYSEA : winds and currents seminar series**, *Virtual*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Improving wave-based air-sea momentum flux parameterization in mixed seas..
- May 2023 **The 29th WISE meeting**, *New Jersey, NY, USA*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Improving wave-based air-sea momentum flux parameterization in mixed seas..
- Apr. 2023 **WHOI Physical Oceanography Seminar, Physical Oceanography Seminar**, *Woods Hole, MA, USA*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Improving wave-based air-sea momentum flux parameterization in mixed seas..
- Apr. 2023 ****Graduate School of Oceanography, Physical Oceanography Seminar**, *Rhode Island, RI, USA*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Improving wave-based air-sea momentum flux parameterization in mixed seas..
- Mar. 2023 **US CLIVAR Mesoscale and Frontal-Scale Air-Sea Interactions Workshop**, *Boulder, CO, USA*,
- **Sauvage C.**, H. Seo, C-A. Clayson and J. B. Edson : Improving wave-based air-sea momentum flux parameterization in mixed seas. Poster.
- Seo H., **C. Sauvage** , C. Renkl, C-A. Clayson and J. B. Edson : On the misaligned wind waves behind the atmospheric cold fronts. Poster.
- Feb. 2023 **The 4th Workshop on Waves and Wave-Coupled Processes**, *Uppsala, Sweden*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Improvements of parametrized air-sea momentum flux using coupled wave modeling in the Northwest Tropical Atlantic Ocean.
- Jan. 2023 **AMS 2023 : 14th Conference on Weather, Climate, and the New Energy Economy**, *Denver, CO, USA*,
- **Sauvage C.**, H. Seo, C-A. Clayson and J. B. Edson : Impacts of Surface Waves on Air-Sea Flux and Marine Boundary Layer Processes in the North Atlantic Oceans.
- Edson J.B., D. Vandemark, M. Emond, C-A. Clayson, H. Seo, and **C. Sauvage** : Oceanic Data for Atmospheric Research : Improvements to the COARE Bulk Flux Algorithm using OOI Surface Flux Data. (23rd Conference on Air-Sea Interaction, co-author).

- Dec. 2022 **AGU 2022**, *Chicago (virtual), IL, USA*,
- **Sauvage C.**, H. Seo, C-A. Clayson and J. B. Edson : Impacts of Waves and Sea States on Air-Sea Momentum Flux in the Northwest Tropical Atlantic Ocean : Parameterization and Wave Coupled Climate Modeling.
- Edson J.B., D. C. Vandemark, H. Seo, M. Emond, **C. Sauvage** and C-A. Clayson : Improvements to the COARE Bulk Flux Algorithm using OOI Surface Flux Data. (Poster, co-author).
- DeSilva A.M., K. L. Daly, G. Voulgaris, J. B. Edson, A. J. Plueddemann, **C. Sauvage**, A. Nath, K. G. Bemis, E. Biondi, A. S. Bower, M. Denolle, J. Fang and A. Z. Wang : Ocean Observatories Initiative Facility Board (OOIFB) Town Hall. (Lightening talk, co-author).
- Jun. 2022 **Whither the Gulf Stream Workshop : Present Understanding and Future Opportunities for Elucidating the Role of the Gulf Stream in Weather and Climate**, *Woods Hole, MA, USA*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Impacts of surface waves on air-sea flux and marine boundary layer processes in the North Atlantic Oceans. Poster.
- Mar. 2022 **US CLIVAR Air-Sea Interaction Working Group**, *Virtual*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Impacts of surface waves on air-sea flux and marine boundary layer processes in the extratropical and tropical North Atlantic Oceans.
- Feb. 2022 **Ocean Science Meeting**, *Virtual*,
Sauvage C., H. Seo, C-A. Clayson and J. B. Edson : Impacts of waves and sea states on air-sea flux in the Northwest Tropical Atlantic Ocean : parameterization and wave coupled climate modeling.
- Dec. 2021 **Coastal Ocean Fluid Dynamics Laboratory (COFDL) Seminar**, *Virtual*,
Sauvage C., H. Seo, C-A. Clayson and J.B. Edson : Impacts of sea states on momentum flux in the Northwest Tropical Atlantic Ocean.
- Jun. 2021 **The International Workshop for Mid-Latitude Air-Sea Interaction**, *Virtual*,
Sauvage C., H. Seo and C-A. Clayson : Effects of sea state and small-scale currents on air-sea fluxes in the Northwest Tropical Atlantic Ocean.
- Apr. 2021 **EGU Annual Meeting**, *Virtual*,
Sauvage C., H. Seo and C-A. Clayson : Effects of sea state and small-scale currents on air-sea fluxes in the Northwest Tropical Atlantic Ocean.
- Jan. 2021 **AMS 101st Annual Meeting**, *Virtual*,
Sauvage C., H. Seo and C-A. Clayson : Modeling of ocean mesoscale variability and coupled ocean-atmosphere interaction in the Northwest Tropical Atlantic Ocean.
- Dec. 2020 **AGU Fall Meeting** , *Virtual*,
Sauvage C., H. Seo and C-A. Clayson : Modeling of ocean mesoscale variability and coupled ocean-atmosphere interaction in the Northwest Tropical Atlantic Ocean.
- Sept. 2020 **WHOI Physical Oceanography Seminar**, *Woods Hole, MA, USA*,
Sauvage C., C. Lebeaupin Brossier, M-N. Bouin and V. Ducrocq : Ocean-atmosphere coupling for prediction of Mediterranean heavy precipitation events : better modeling and impacts of river runoff and sea state.
- May 2019 **12th HyMeX workshop**, *Split, Croatia*,
Sauvage C., C. Lebeaupin Brossier, V. Ducrocq and M-N. Bouin : Characterization of the air-sea exchange during a Mediterranean heavy precipitation event using realistic sea state modelling.
- June 2018 **AMS 21st Conference on Air-Sea Interaction**, *Oklahoma City, OK, USA*,
Sauvage C., C. Lebeaupin Brossier, V. Ducrocq and M-N. Bouin : Role of the sea state on the air-sea exchange during a Mediterranean heavy precipitation event in a kilometer-scale forecast system.

- June 2018 **11th HyMeX workshop**, *Lecce, Italy*,
Sauvage C., C. Lebeaupin Brossier, V. Ducrocq and M-N. Bouin : Role of the sea state on the air-sea exchanges during a Mediterranean heavy precipitation event in a kilometer-scale forecast system.
- July 2017 **10th HyMeX workshop**, *Barcelona, Spain*,
Sauvage C., C. Lebeaupin Brossier, V. Ducrocq and M-N. Bouin : Ocean-atmosphere coupling for Mediterranean heavy precipitation forecast : better river runoff and sea state modelling. Poster.