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Clément BERTIN

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EDUCATION

PhD, Earth and Fluid Envelopes , <i>La Rochelle Université</i>	Mar 2023
Dipl. Ing., Hydrography and Oceanography , <i>École Nationale Supérieure des Techniques Avancées (ENSTA) Bretagne</i>	Sep 2019
MSc., Ocean and Climate Physics , <i>Université de Bretagne Occidentale (UBO)</i>	Sep 2019
MSc., Physical and Biogeochemical Oceanography , <i>Aix-Marseille Université</i>	Jun 2017
BSc., Physics , <i>Université de Bordeaux</i>	Jun 2016

WORK EXPERIENCE

Postdoctoral Fellow **Oct 2023 – Now**
NASA, Jet Propulsion Laboratory *Pasadena, USA*

- Evaluate the impact of Particulate Organic Carbon (POC) from the Mackenzie River and coastal erosion on the coastal air-sea CO₂ flux of the Southeastern Beaufort Sea (SBS)
- Evaluate the impact of subglacial discharge and plume-driven upwelling to air-sea CO₂ fluxes of the Lincoln Sea.

Postdoctoral Fellow **Apr 2023 – Jun 2023**
Littoral ENvironnement et Sociétés (LIENSs) Laboratory *La Rochelle, France*

- Simulated the contribution of Mackenzie River tDOC plume on the biophysical feedback of the coastal waters
- Evaluated the impact of riverine Colored Dissolved Organic Matter on the coastal air-sea CO₂ flux of the Southeastern Beaufort Sea (SBS)

PhD Candidate **Nov 2019 – Mar 2023**
Littoral ENvironnement et Sociétés (LIENSs) Laboratory *La Rochelle, France*

- Estimated the daily interannual flux of terrestrial dissolved organic carbon (tDOC) exported by the Mackenzie River into the Southeastern Beaufort Sea (SBS) by non-linear fitting of the chemodynamic relationship using merged *in situ* and remote-sensing data.
- Adapted the ECCO-Darwin global ocean-sea ice-biogeochemical model to the Mackenzie shelf region in the aim of better describing the Arctic land-ocean continuum
- Evaluated and quantified the impact of Mackenzie biogeochemical river runoff on the coastal air-sea CO₂ flux of the SBS

Master Thesis **Apr 2019 – Sep 2019**
Laboratoire d'Océanographie Physique et Spatiale (LOPS) *Brest, France*

- Evaluated the factors that drive the interannual variability of the phytoplankton biomass around Marquesas Island (French Polynesia) using ROMS-PISCES ocean-biogeochemical model

Master Internship **Jun 2018 – Aug 2018**
GEOMAR Helmholtz Centre for Ocean Research *Kiel, Germany*

- Evaluated the origin (fate) of surface waters that enter (exit) the Labrador Sea using ARGO float data
- Simulated the transport of drifters in the 1000m depth velocity field using Ocean Parcels Lagrangian transport model and evaluated the origin of deep waters in the Labrador Sea.

Bachelor Internship **Jun 2015**
Environnements et Paléoenvironnements Océaniques et Continentaux (EPOC) Laboratory *Bordeaux, France*

- Simulated the transport of swimmers caught in the rip current of the Biscarosse Beach (Landes, France) and evaluated the best method to escape such current.

OTHER EXPERIENCES

Advancing Knowledge of Methane in Arctic (AKMA) Expedition **May 2022**
RV Kronprins Haakon *Arctic Ocean*

Visiting Scientist

• NASA Jet Propulsion Laboratory, Pasadena, USA	3 weeks
• Massachusetts Institute of Technology, Cambridge, USA	1 week
• Takuvik International Research Laboratory, Québec, Canada	1 week
• Laboratoire d'Océanographie Microbienne, Banyuls-sur-Mer, France	1 week

DOCTORAL TRAININGS

Scientific integrity in research , <i>Bordeaux University, Online</i>	Dec 2021
Machine Learning and Deep Learning Using Python , <i>PR Statistics, Online</i>	May 2021
Introduction to Academic Pedagogy , <i>La Rochelle University</i>	Mar 2020
Numerical modelling for Ocean and Atmosphere , <i>Pierre Simon Laplace Institut, Sorbonne University</i>	Nov 2019

TEACHING EXPERIENCE

Graduate level classes

• Signal Processing (Courses and Python programming)	10 Hours
• Programming for Environmental Sciences (Python programming)	14 Hours
• Least Square Method (Courses and Python programming)	18 Hours
• Initiation to Physical Oceanography	3 Hours

Internship supervision

• Graduate level : Evaluation of the ECCO-Darwin Ocean/Biogeochemical/Sea Ice coupled model performance	6 Months
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OUTREACH

Ocean-Senses workshop <i>RV Kronprins Haakon</i>	May 2022 <i>Arctic Ocean</i>
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- Created educational content to make student feel the ocean floor through the 5 senses

Ma Thèse en 180 secondes (MT180) <i>La Rochelle Université</i>	Mar 2021 <i>La Rochelle</i>
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- Contest seeking to elect the best candidate able to explain his/her thesis to the broad audience in a maximum of three minutes ([Video](#))

Podcast on permafrost thaw <i>Radio Chrétienne Francophone (RCF)</i>	Dec 2020 <i>La Rochelle</i>
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- Guest on a podcast on the consequences of permafrost thaw in Arctic for the program "*Littoral, ENvironnement & Sociétés*", presented by Gaëlle de Christen ([Podcast](#))

Conference on the risks of permafrost thaw <i>Fête de la Science festival</i>	Feb 2020 <i>La Rochelle</i>
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Les Docs de l'environnement	2020–2023
• Content creation on an Instagram and a Facebook account aimed at sharing the daily life of PhD students to the broad audience	

PUBLICATIONS

Bertin, C., Carroll, D., Menemenlis, D., Dutkiewicz, S., Zang, H., Matsuoka, A., Manizza, M., Babin, M., Miller, C.E., Mangin, A., & Le Fouest, V. (In Prep). Paving the way to an improved representation of tDOC and physical plume: a sensitivity analysis.

Bertin, C., Carroll, D., Menemenlis, D., Dutkiewicz, S., Zang, H., Matsuoka, A., Tank S., Manizza, M., Babin, M., Miller, C.E., Mangin, A., & Le Fouest, V. (2023). Biogeochemical river runoff drives intense Arctic Ocean outgassing. *Geophysical Research Letters*, 50, e2022GL102377. doi: [10.1029/2022GL102377](https://doi.org/10.1029/2022GL102377)

Bertin, C., Matsuoka, A., Mangin, A., Babin, M. & Le Fouest, V. (2022) Merging satellite and in situ data to assess the flux of terrestrial dissolved organic carbon from the Mackenzie River to the coastal Beaufort Sea. *Frontiers in Earth Science*, 10. doi: [10.3389/feart.2022.694062](https://doi.org/10.3389/feart.2022.694062)

Cusset, F., Bustamante, P., Carravieri, A., **Bertin, C.**, Brasso, R., Costi, I., Dunn, M., Emmerson, L., Guillou, G., Hart, T., ..., Chérel, Y. (Submitted). Circumpolar assessment of mercury contamination: the Adélie penguin as a bioindicator of Antarctic marine ecosystems. *Ecotoxicology*.

Panieri, G., Bünz, S., Savini, A., Jensen, A., Løfquist, B., Runar, Olsen B.R., Willis, C., Argentino, C., **Bertin, C.**, Oddone, D., ..., Dyrved, Holm V. (2022). CAGE22-2 Scientific Cruise Report: AKMA 2/Ocean Senses. *CAGE22-2 Scientific Cruise Report: AKMA 2/Ocean Senses*. doi:[10.7557/cage.6755](https://doi.org/10.7557/cage.6755)

CONFERENCES

Bertin, C., Carroll, D., Menemenlis, D., Dutkiewicz, S., Zang, H., Miller, C.E., Matsuoka, M., Babin, M., Mangin, A., & Le Fouest, V. (2022). Quantifying the impact of terrestrial dissolved organic carbon runoff on Beaufort Sea coastal air-sea CO₂ fluxes over seasonal to interannual timescales [Oral presentation-Poster]. *Arctic Frontiers*, May 8- 11, 2022, Tromsø, Norway.

Gaffet, A., **Bertin, C.,** Carroll, D., Menemenlis, D., Dutkiewicz, S., Zhang, H., Matsuoka, A., Babin, M., Mangin, A. & Le Fouest, V. (2021). Comparison of a regional ocean biogeochemistry model to observations in the highly-dynamic Mackenzie shelf region (Beaufort Sea) [Poster]. *Aquatic Science Meeting*, June 22-27, 2021, Online.

Bertin, C., Carroll, D., Menemenlis, D., Dutkiewicz, S., Zhang, H., Matsuoka, A., Babin, M., Mangin, A. & Le Fouest, V. (2021). Terrestrial DOC removal by marine heterotrophic bacteria in the oligotrophic Beaufort Sea, western Arctic Ocean: a model study [Oral presentation]. *Aquatic Science Meeting*, June 22-27, 2021, Online.

Bertin, C., Menemenlis, D., Carroll, D., Zhang, H., Decharme, B., & Le Fouest, V. (2021). Impact of River Forcing on Simulated Ocean-Sea Ice Coupling in the Arctic Mackenzie Shelf (South-Eastern Beaufort Sea) [Oral presentation]. *Arctic Science Summit Week*, Online, March 19-26, 2021, Lisbon, Portugal.

Bertin, C., Matsuoka, A., Mangin, A., Babin, M. & Le Fouest, V. (2020). Merging remotely-sensed and *in situ* data to assess the riverine flux of dissolved organic carbon from the Mackenzie river to the Beaufort Sea [Poster]. *Arctic Change*, December 7-10, 2020, Online.

Bertin, C., Matsuoka, A., Mangin, A., Babin, M. & Le Fouest, V. (2020). Plus-value de l'apport de mesures satellites pour l'estimation du flux de DOC du fleuve Mackenzie vers l'océan Arctique [Oral presentation]. *16ième journées scientifiques du Comité National Français des Recherches Arctiques et Antarctiques*, September 22-23, 2020, La Rochelle, France.

AWARDS

Arctic Frontier 2022 outstanding poster award (APECS)