

# Marine RANDON

*Marine statistical ecologist*

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## Education

- 2016 - 2020 **PhD in marine ecology**, *Agrocampus Ouest (Rennes, France)*
- 2014 - 2016 **Master in Biodiversity, Ecology and Environment** - Specialization in Fisheries Science, *Agrocampus Ouest - Rennes 1 University (Rennes, France)*
- 2013 - 2014 **Bachelor in Sciences, Technology and Health** - Specialization in Biology, *Rennes 1 University (Rennes, France)*
- 2010 - 2013 **Classes Préparatoires aux Grandes Écoles Scientifiques** - Biology, Chemistry, Physics and Earth Sciences, *Lycée Lakanal (Sceaux, France)*

## Research experiences

- February 2020 - Present **Postdoctoral fellow**, *Simon Fraser University - Department of Statistics and Actuarial Sciences (Burnaby, Canada)*. Supervision: Dr. Ruth JOY, Pr. Michael DOWD

[A real-time data assimilative forecasting system for the endangered Southern Resident Killer Whales](#)

- Develop a data assimilation cycle to fuse real-time observations with model predictions
- Use a State Space Model framework with a Continuous-Time Correlated Random Walk to model the movement of SRKW
- Integrate multiple data sources (e.g., visual sightings, passive acoustic detections, preferred habitat, environmental conditions) and their respective spatiotemporal resolutions in the State Space Model
- Estimate behavioural parameters using a state augmentation procedure
- Compute a particle filter algorithm to estimate probabilities of whales' positions

- October 2016 - January 2020 **PhD in marine ecology**, *Agrocampus Ouest - Fisheries and Aquatic Ecology Research Group (Rennes, France)*. Supervision: Pr. Olivier LE PAPE, Dr. Élodie RÉVEILLAC

[Spatial structure and connectivity within the Eastern English Channel stock of common sole: What do we learn from a multi-tracer approach?](#)

- Design fish sampling protocols and participate to tagging experiments
- Measure and analyze otolith elemental concentrations by LA-ICPMS
- Analyze otolith shape using elliptical Fourier descriptors
- Develop Bayesian models to assign individuals based on their otolith compositions
- Prepare samples for ddRAD sequencing and perform basic population genetic analyzes
- Conduct population growth and abundance analyses using survey time series
- Combine the results from different tracers and compute an index of stock differentiation

March - **Master research project**, INRAE - *Research Unit of Aquatic Ecosystems and Global Change (Bordeaux, France)*. Supervision: Dr. Hilaire DROUINEAU, Dr. Françoise DAVERAT

Using otolith microchemistry within Bayesian reallocation models to explore the Allis shad (*Alosa alosa*) metapopulation functioning

- Investigate the metapopulation functioning of an anadromous fish species using a source-sink approach
- Develop an infinite mixture Bayesian model using otolith and water microchemistry to retrospectively estimate the natal river of fish

April - July 2015 **Master research project**, *Agrocampus Ouest - Fisheries and Aquatic Ecology Research Group (Rennes, France)*. Supervision: Émilie LE LUHERNE, Dr. Élodie RÉVEILLAC

Effects of green tides on the individual performances of a pelagic fish species, *Sprattus sprattus*

- Prepare otolith samples and estimate the age of juvenile fish by counting daily increments
- Estimate daily growth rates and calculate body condition index

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## Skills

Abilities Autonomy, Collaboration, Communication, Field/laboratory work  
Techniques Movement data, Natural tracers, Statistics, Modelling  
Computing Microsoft Office, L<sup>A</sup>T<sub>E</sub>X, Zotero, Qgis, PuTTY  
Code R (statistics, modeling, R Markdown, Shiny), Bash (basic), html and css  
Languages French (native), English (proficient)

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## Scientific publications

- In prep* Ong, M., **Randon, M.**, Wilkin, R., Hsu, H., Cojocar, L., Anderson, J., McClelland, G., Craig, J., Chatwin, T., and Joy, R. Shift from natural to urban nest sites for the Double-Crested Cormorants in the Salish Sea: implications for management and conservation.
- In press* **Randon, M.**, Dowd, M., and Joy, R. A real-time data assimilative forecasting system for animal tracking. (accepted on February 16, 2022 for publication in *Ecology*).
- 2021 Mahé, K., MacKenzie, K., Ider, J., Massaro, A., Hamed, O., Jurado-Ruzafa, A., Gonçalves, P., Anastasopoulou, A., Jadaud, A., Mytilineou, C., **Randon, M.**, Elleboode, R., Morell, A., Ramdane, Z., Smith J., Bekaert, K., Amara, R., de Pontual, H., Ernande, B. Directional bilateral asymmetry in fish otolith: a potential tool to evaluate stock boundaries? *Symmetry*, 13, 987.
- 2021 **Randon, M.**, Réveillac, E. and Le Pape, O. A holistic investigation of tracers at population and individual scales reveals population structure for the common sole of the Eastern English Channel. *Estuarine, Coastal and Shelf Science*, 107096.
- 2020 **Randon, M.**, Le Pape, O. Ernande, B. Mahé, K. Volckaert, FAM. Petit, EJ. Lassalle, G. Le Berre, T. and Réveillac, E. Complementarity and discriminatory power of genotype and otolith shape in describing the fine-scale population structure of an exploited fish, the common sole of the Eastern English Channel. *PLoS ONE* 15(11): e0241429.

- 2018 **Randon, M.**, Réveillac, E., Rivot, E., Du Pontavice, H., and Le Pape, O. Could we consider a single stock when spatial sub-units present lasting patterns in growth and asynchrony in cohort densities? A flatfish case study. *Journal of sea research*, 142, 91-100.
- 2018 Du Pontavice, H., **Randon, M.**, Lehuta, S., Vermard, Y., and Savina-Rolland, M. Investigating spatial heterogeneity of von Bertalanffy growth parameters to inform the stock structuration of common sole, *Solea solea*, in the Eastern English Channel. *Fisheries research*, 207, 28-36.
- 2017 **Randon, M.**, Daverat, F., Bareille, G., Jatteau, P., Martin, J., Pecheyran, C., and Drouineau, H. Quantifying exchanges of Allis shads between river catchments by combining otolith microchemistry and abundance indices in a Bayesian model. *ICES Journal of Marine Science*, 75(1), 9-21.
- 2017 Le Luherne, E., Le Pape, O., Murillo, L., **Randon, M.**, Lebot, C., and Réveillac, E. Influence of green tides in coastal nursery grounds on the habitat selection and individual performance of juvenile fish. *PloS one*, 12(1), e0170110.

### Theses and reports

- 2020 **Randon, M.** Spatial structure and connectivity within the Eastern English Channel stock of common sole: What do we learn from a multi-tracer approach?. Doctoral Thesis.
- 2016 **Randon, M.** Using otolith microchemistry within Bayesian reallocation models to explore the Allis shad (*Alosa alosa*) metapopulation functioning. Master Thesis.
- 2015 **Randon, M.** Effects of green tides on the individual performances of a juvenile pelagic species, the sprat, *Sprattus sprattus* (L.). Master Thesis.

### Oral communications

- March 2022 **Randon, M.** Where are they going? Towards an operation real-time forecasting system for the endangered Southern Resident Killer Whales. Invited lecturer. Stats Seminar Series - Department of Statistics and Actuarial Sciences (Simon Fraser University). Burnaby, Canada.
- December 2021 **Randon, M.**, Joy, R., Bergner, S., Campbell, D., Dowd, M., Frazao, F., Kirsebom, O., Nguyen Hong Duc, P., Riera, A., Veirs, S., Veirs, V., Wladichuk, J., and Yurk, H. Integrating visual and acoustic observations to build an 'intelligent' killer whale movement forecast system. Invited speaker. Acoustical Society of America - Special Session on 'Applications of Bioacoustics in Killer Whale Conservation'. Seattle, USA.
- November 2021 **Randon, M.** Where are they going? A real-time forecasting system for the endangered Southern Resident Killer Whales. Invited lecturer. Seminar Series Fall 2021 - School of Environmental Science (Simon Fraser University). Burnaby, Canada.
- June 2021 **Randon, M.**, Dowd, M., and Joy, R. A real-time data assimilative forecasting movement model for mitigating whale collisions and acoustic disturbance from marine traffic. Statistical Society of Canada. Virtual conference.
- February 2021 Ong, M., Joy, R., **Randon, M.**, McClelland, G., Cragg, J., Chatwin, T. Photogrammetric Monitoring Of Double Crested Cormorants Nesting Sites On Ironworkers Memorial Bridge In Vancouver. Annual Meeting of the Pacific Seabird Group. Virtual conference.
- February 2021 Yurk, H., Berger, S., **Randon, M.**, and Joy R. Using big (acoustic) data, neural networks and artificial intelligence in the conservation of Southern Resident killer whales. Invited by the Port of Vancouver ECHO Program. Burnaby, Canada.

- December 2020 **Randon, M.**, Kirsebom, O., and Joy, R. Dept of Fisheries and Oceans 'Science Talk' Series. Burnaby, Canada.
- September 2019 **Randon, M.** Réveillac, E., Lecomte, J.B., Rivot, E., Ernande, B., Mahé, K., Petit, E., Lassalle, G., Volckaert, F., and Le Pape, O. A multi-tracer approach reveals low connectivity in a flatfish metapopulation. International Marine Connectivity Conference (iMarCo). Aveiro, Portugal.
- September 2019 Le Pape, O., **Randon, M.**, Lecomte, J.B., Rivot, E., Réveillac, E. Estimating life-cycle connectivity of an exploited marine fish: implications for management impacts. Swimway conference. Hamburg, Germany.
- June 2019 **Randon, M.**, Le Pape, O., Ernande, B., Mahé, K., Volckaert, F., Petit, E., Lassalle, G., Le Berre, T., Martin, N., and Réveillac, E. Coupling natural tracers to assess the connectivity within a flatfish metapopulation. International Sclerochronology Conference (ISC). Split, Croatia.
- June 2017 **Randon, M.**, Daverat, F., Bareille, G., Jatteau, P., Martin, J., Pecheyran, C., and Drouineau, H. Quantifying exchanges of Allis shads between river catchments by combining otolith microchemistry and abundance indices in a Bayesian model. Association Française Halieutique (AFH). Nantes, France.

## Posters

- March 2021 **Randon, M.**, Dowd, M., and Joy, R. Where are they going? A real-time forecasting system for animal tracking. 7th Annual SFU Postdoc Research Day. Burnaby, BC, Canada.
- November 2017 **Randon, M.**, Réveillac, E., Rivot, E., Du Pontavice, H., and Le Pape, O. Spatio-temporal patterns in growth and density reveals structuration in a flatfish stock: The common Sole of the Eastern English Channel. International Flatfish Symposium. Saint-Malo, France.
- November 2017 Véron, M., Archambault, B., Rochette, S., Hunter, E., Lehuta, S., **Randon, M.**, Savina-Rolland, M., Vermard, Y., Réveillac, E., Rivot, E., Le Pape, O. Integrating mark-recapture data within a Bayesian life-cycle model to evaluate spatial structure and population dynamics of sole. A coastal and nursery dependent flatfish: Eastern Channel Sole. International Flatfish Symposium. Saint-Malo, France.

## Paper reviewing

- 2022,2021 Fisheries Research, Thalassas: An International Journal for Marine Sciences, Ecology and Evolution, Estuarine Coastal and Shelf Science ([See on Publons](#)).

## Awards

- March 2021 Award of the best poster – SFU Postdoc Research Day – **Randon, M.**, Dowd, M., and Joy, R. Where are they going? A real-time forecasting system for animal tracking. 1000 \$CA
- March 2021 Award of the second best writing contest – SFU Postdoc Research Day – **Randon, M.** A real-time forecasting system of whale trajectories to limit the risk of collision with commercial vessels: application to the endangered Southern Resident Killer Whales. 250 \$CA

## Grant applications

- January 2022 Ifremer Postdoctoral Fellowship 2022. Informing the ecology, conservation, and management of the European sea bass by coupling movement data and natural tracers. **Randon, M.**. 102 600 €. PENDING.
- November 2021 France Canada Research Funding - 2022 New Research Collaboration Program. Understanding and forecasting impacts of climate-induced changes on Arctic ice seals. Jeanniard du Dot, T., Joy, R., **Randon, M.**, and Rowenna Gryba. 15 000 \$CA. PENDING.

## Student supervision

- Ongoing **Supervision**, M. Sc. in Ecological Restoration (SFU/BCIT, Canada), Bailey Feddersen - Understanding the relationship between Southern Resident Killer Whales movement and environmental conditions in the Salish Sea.
- 2020-2021 **Co-supervision**, M. Sc. in Ecological Restoration (SFU/BCIT, Canada), Macus Ong - Comparing pelagic and double-crested cormorants nesting on traditional rookeries and Vancouver urban bridges.
- 2018 **Co-supervision**, Master (second year) in Ecological Modeling (Agrocampus Ouest, France), Alaia Morell - Spatial structure of life history traits of the common sole in the Eastern English Channel.
- 2018 **Supervision**, Laboratory work (Agrocampus Ouest, France), Nathan Martin – Otolith preparation and LA-ICPMS analyses.

## Teaching experience

- 2019 **Teaching assistant** Master in fisheries science and aquaculture (Agrocampus Ouest, France), Fish dissection and otolith extraction – Teaching unit of fish biology.
- 2019 **Teaching assistant** Master in fisheries science and aquaculture (Agrocampus Ouest, France), Exploration of the FAO database – Teaching unit in aquaculture.
- 2019 **Teaching assistant** Master in fisheries science and aquaculture (Agrocampus Ouest, France), Bayesian modeling project – Reconstruct the past habitat utilization of fish using otolith microchemistry – Teaching unit in statistics.

## References

- Dr. Ruth JOY School of Environmental Science, Faculty of Environment - Simon Fraser University (Burnaby, BC, Canada), Email: [rjoy@sfu.ca](mailto:rjoy@sfu.ca)
- Pr. Michael DOWD Department of Mathematics & Statistics - Dalhousie University (Halifax, NS, Canada), Email: [michael.dowd@dal.ca](mailto:michael.dowd@dal.ca)
- Pr. Olivier LE PAPE Research Unit of Ecology and Ecosystem Health - Fisheries and Aquatic Ecology Research Group - Agrocampus Ouest (Rennes, France), Email: [olivier.le.pape@agrocampus-ouest.fr](mailto:olivier.le.pape@agrocampus-ouest.fr)
- Dr. Elodie RÉVEILLAC Research Unit of Littoral - Environment and Society (LIENSs) - La Rochelle University (La Rochelle, France), Email: [elodie.reveillac@univ-lr.fr](mailto:elodie.reveillac@univ-lr.fr)
- Dr. Hilaire DROUINEAU Research Unit of Aquatic Ecosystems and Global Change - INRAE (Bordeaux, France), Email: [hilaire.drouineau@inrae.fr](mailto:hilaire.drouineau@inrae.fr)

## Personal interests

- General Association Scuba diving (Level 2), Running, Hiking, Reading, Crochet
- Association The Society For Marine Mammalogy