

Rosalie Bruel (Ph.D.)

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Education

- 2014-2018** **University Savoie-Mont Blanc, Chambéry, France**
Ph.D., Ecology.
- 2012-2014** **University of Pau et Pays de l'Adour, Anglet, France**
M.A., Aquatic Ecology and Hydrobiology.
- 2011-2012** **Napier University, Edinburgh, Scotland (UK)**
B.A. of Science with Distinction, Environmental Biology.
- 2009-2011** **University Aix-Marseille, Digne-les-bains, France**
BTEC Higher National Diploma, Environmental Biology.

Research

- 07.2018-present** **Rubenstein School of Environment and Natural Resources (University of Vermont), Burlington, VT, U.S.A.**
Postdoctoral associate. Advisors: E. Marsden, J. Stockwell.
Lake Champlain food-web modelling.
- 04.2018** **CARTEL (University Savoie Mont-Blanc), Thonon-les-bains, France**
Study collaborator. Advisor: V. Frossard.
Project: SIGNALE.
I sub-sampled a 70 cm core from Lake Tignes (FR) for ancient DNA and biological remains.
I analysed the samples for Cladocera sub-fossils.
- 10.2014-09.2017** **CARTEL (INRA/University Savoie Mont-Blanc), Thonon-les-bains, France**
+ **CNR-ISE, Verbania-Pallanza, Italy (7 months international stay)**
Ph.D. student. Supervisor: M.-E. Perga.
Project: "Eutrophication legacy on peri-alpine lakes ecological vulnerability to climate change".
I reconstruct the long-term (80 to 1500 years) succession of zooplankton communities in heavily anthropised peri-alpine lakes. My objective is to distangle the impacts of climate change and local human forcings, testing for theoretical non-linear properties of systems and loss of resilience.
Collaboration with researchers from various backgrounds (Ecology, Paleolimnology, Sedimentology): EDYTEM, ISTERRE (FR), University of Geneva, University of Lausanne, EAWAG, ETH Zurich (CH), CNR-ISE (IT)
- 2014** **Edytem & Asters, Le Bourget-du-lac, France**
Master thesis. Supervisors: F. Arnaud, E. Malet (Edytem), C. Birck (Asters).
Project: "Constraints and contributions of high-frequency sensors in the monitoring of ecosystems: the example of Lake Anterne watershed"
During the first part of the project, I cleaned (QA/QC) and compiled the data from Lake Anterne monitoring program (weather, in-lake sensors, river station, soil sensors). Then, I used the data to give the first picture on the seasonal dynamics of this high-altitude lake (e.g. mixing periods). Finally, I coded on R a routine to detect summer extreme events (extreme wind, rain, or combination of both) from high-frequency data, and investigated the impact on the physico-chemistry of the lake.

2013 **Halieutic Ressources Laboratory, Ifremer, Anglet, France**
 Master thesis. Supervisor: N. Caill-Milly.
 Project: "Impact of environmental factors on manila clam (*Venerupis philippinarum*) morphology in Arcachon Bay (France)"
 I looked at the relationships between manila clam morphology and environmental conditions (extracted from MARS-3D model) to find the potential best protected area in Arcachon Bay.

Teaching

Fisheries Biology & Techniques

WFB 161 - University of Vermont (VT, US) - Fall 2018 - SO/JR/SR students

GLEON Graduate Students Association workshop

Intro to GitHub - GLEON 20 All hand's meeting - Rottneest Island (WA, AU) - 02/12/18 - Graduate students

Courses

- 2015** **International Summer School in limnology, Bolshie Koty (RU)**
 "Lake Ecosystems under Pressure, Processes and Impacts".
- 2014** **International Summer School in limnology, Evian-les-Bains (FR)**
 "Lake Ecology and Temporal Dynamics".
- 2014** **NETLAKE Workshop, Action COST ES1201, Uppsala (SE)**
 "Automated Monitoring and High-Frequency Data Analysis".

Awards and Fellowships

Sea Grant

Stockwell, Marsden, and Bruel "Food web models to evaluate impacts of environmental change and management actions on Lake Champlain fish populations" (\$150,000)

GLEON

Grant to attend 20th GLEON All Hands' meeting, Rottneest Island, AU (2018) (\$3000)

PAGES

Grant to attend 2nd EcoRe3 workshop in Salt Lake City, US (2018) (\$850)

Grant to attend 5th PAGES Open Science Meeting in Zaragoza, Spain (2017) (200€)

Explo'RA Doc, Grant awarded by Region Auvergne Rhone-Alpes

Funding for international stay at the Institute for Ecosystem Studies (CNR-ISE, Verbania-Pallanza, IT), 2016 (6 months) (4260€)

Doctoral School SISEO

Funding to support the participation to an International Summer School (in Russia), 2015 (800€)

Ph.D. Grant awarded by the University Savoie Mont-Blanc

Awarded for 3 years (2014-2017) (60500 €)

NETLAKE

Grant to attend 1st NETLAKE workshop on Automated Buoys Deployment, Erken, SE (2014) (300€)

International student grant awarded by the Student Award Agency for Scotland

Grant awarded to cover Napier University tuitions fees (2011-2012) (£1820)

Student Awards

- Best Poster, Ph.D. students Day, Doctoral School SISEO, 13 November 2015
- Best Presentation, International Summer School in Limnology, August 2014

Outreach

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- 2018-04-02 **Host for 'La Bio au labo' (Science popularization)** - Daily communication on Twitter & Facebook during a week.
- 2017-05-22 **March for Sciences, Thonon-les-bains (FR)** - Organisation team co-leader of Thonon-les-bains Satellite March. Contact with authorities for autorisation request. Public relation via local newspapers, Twitter, Facebook. Organisation and animation of meetings.
- 2016-09-30 **European Researchers Night, Verbania-Pallanza (IT)** - Introduction to paleolimnology with the paleo-team of the CNR-ISE.
- 2015-10-11 **"Fête de la science", Thonon-les-bains (FR)** - Member of the organization committee. Creation of a children play-book.
- 2015-07 **9th Symposium for European Freshwater Sciences, Geneva (CH)** - Student volunteer.
- 2015-06 **NETLAKE Workshop, Evian-les-bains (FR)** - Support in the organization.

Skills

Languages: English (advanced), French (native)

Main interest / theoretic knowledge: limnology, freshwater ecology, transitions in ecosystems (drivers, dynamics, linearity vs. non-linearity), climate change, multi-lake analysis

Paleolimnology: core sampling and sub-sampling (regular+DNA protocol), sediment dating (radioelements, paleomagnetism), age-depth models (clam, *serac* (author of the R package)), XRF analysis

High-frequency: QA/QC (GLEON programs: Data Standardizer, B3, rB3), buoy deployment

Evaluation of community diversity: sampling strategy, taxonomy (cladoceran sub-fossils, river macro-invertebrates), pigments analysis (HPLC)

Statistics: R, uni- and multivariate analysis of ecological data, linear and non-linear models, temporal series

Scientific Communication: R, Python (Graphics), QGIS, L^AT_EX, Microsoft Office Suite, Zotero

Publications

Publications in peer reviewed international scientific journals

- 2018 **Bruel, R.**, Marchetto, A., Bernard, A., Lami, A., Frossard, V., Sabatier, P., Perga, M.-E. (Freshwater Biology) Seeking alternative stable states in a deep lake. DOI: 10.1111/fwb.13093
- Perga, M.-E., **Bruel, R.**, Rodriguez, L., Guénand, Y., Bouffard, D. (Global Change Biology) Storm impacts on alpine lakes: antecedent weather conditions matter more than the event intensity. DOI: 10.1111/gcb.14384
- Subm. **Bruel, R.**, Sabatier, P. (Submitted to Quaternary Geochronology) *serac*: a R package for Short-lived Radionuclides Chronology of recent sediment cores.
- Bruel, R.**, Girardclos, S., Marchetto, A., Kremer, K., Lami, A., Crouzet, C., Reyss, J.-L., Sabatier, P., Perga, M.-E. (Submitted) Eutrophication legacy: when Lake Geneva became vulnerable to climate variability.
- In prep. **Bruel, R.**, Marchetto, A., Milan, M., Tolotti, M., Lami, A., Nevalainen, L., Manca, M., Dubois, N., Sabatier, P., Perga, M.-E. (In prep.) Quantitative approach to lakes ecological vulnerability to climate change.
- Monchamp, M.E., **Bruel, R.**, Frossard, V., McGowan, S., Lavrieux, M., Muschick, M., Perga, M.-E., Dubois, N. (In prep.) Human impact on planktonic and benthic communities at multiple trophic levels: The sedimentary record of Lake Joux, Switzerland.
- Goulon, C., Lasne, E., Anneville, O., **Bruel, R.**, Domaizon, I., Cachera S., Champigneulle A., Guillard, J. (In prep.) Restoration of whitefish population in Lake Bourget: an historical analysis.

Theses

- 2018 **Bruel, R.** Eutrophication legacy on peri-alpine lakes ecological vulnerability to climate change. CAR-RTTEL, INRA/University Savoie-Mont Blanc. PhD program, University Grenoble Alpes.
- 2014 **Bruel, R.** Constraints and contributions of high-frequency sensors in the monitoring of ecosystems: the example of Lake Anzerne watershed. Asters/Edytem. Master DynEA, UPPA. 25p + Supplementary Materials.(French version available upon request)

- 2013** **Bruel, R.** Impact of environmental factors on manila clam (*Venerupis philippinarum*) morphology in Arcachon Bay (France). Ifemer. Master DynEA, UPPA. 50p + Supplementary Materials (French version available upon request)

Reports

- 2014** **Bruel, R.**, Malet E. Lake Anterne's monitoring (north-eastern French Alps). Documentation about the data and metadata. Edytem. 22p. (English version available upon request)
Bruel, R. Tinytag Explorer – Dispositifs de mesures Tinytag installés dans le cadre du suivi des lacs dans les Alpes françaises. Guide de l'utilisateur. 16p. (French version available upon request)
Bruel, R. Data Standardizer – Standardisation des données capteur. Guide de l'utilisateur. 11p. (French version available upon request)
Bruel, R. B3 – Compilation de données haute-fréquence et outil de contrôle des données. Guide de l'utilisateur. 24p. (French version available upon request)

Communications

Seminar, Conference, Workshop

- 2018** Kremer, K., **Bruel, R.**, Zenhäusern, G., Girardclos, S. Turbidites as proxy for past events (Lake Geneva, France/Switzerland). *ISC 2018*. Québec (CA), 13-17 August 2018 (**Poster**)
@RosalieBruel, **@SGirardclos**, **@MEPerga**. Eutrophication legacy on Lake Geneva vulnerability to climate change. *#QUAPAL18*. Twitter, 13 June 2018 (**Twitter conference**)
Bruel, R., Alric, A., Marchetto, A., Girardclos, S., Marchetto, A., Kremer, K., Frossard, V., Perga, M.-E. Size structure of zooplankton grazer community to infer lake ecological resistance towards climate variability. *EcoRe3 2nd Workshop*. Salt Lake City, UT (US), 8-10 May 2018 (**Presentation**)
- 2017** **Bruel, R.**, Marchetto, A., Bernard, A., Lami, A., Frossard, V., Sabatier, P., Perga, M.-E. Littoral habitats display evidence for alternative stable states even in a deep lake. *SEFS 10*. Olomouc (CZ), 2-7 July 2017 (**Presentation**)
Bruel, R., Marchetto, A., Bernard, A., Lami, A., Frossard, V., Sabatier, P., Perga, M.-E. Operational assessment of regime shifts: application to the long-term ecological trajectory of a hollow lake under multiple forcings. *OSM Pages 2017*. Zaragoza (ES), 9-13 May 2017 (**Presentation**)
Bruel, R., Girardclos, S., Marchetto, A., Kremer, K., Crouzet, C., Reyss, JL., Sabatier, P., Perga, ME. Another Side of the Anthropocene: humans increased ecosystem vulnerability to climate variability. *OSM Pages 2017*. Zaragoza (ES), 9-13 May 2017 (**Poster**)
- 2016** **Bruel, R.** Lakes vulnerability to climate change modulated by human local forcings: ongoing studies and future collaboration with ISE. Seminari Limnologici del Istituto per lo Studio del Ecosistema (CNR), Verbania Pallanza (IT), 13 May 2016 (**Seminar**)
Bruel, R., Bernard, A., Marchetto, A., Lami, A., Frossard, V., Sabatier, P., Perga, M.-E. Nutrient, not climate change, drives a new equilibrium in the cladoceran assemblage of a deeper lake (Italy). *XIV Subfossil Cladocera Workshop*. Levico Terme (IT), 5-8 April 2016 (**Presentation**)
- 2015** Bouffard, D., **Bruel, R.**, *et al.* Modelling as a tool to understand high-altitude lakes: Lake Anterne case study. Bourg d'Oisans, 9-10 November 2015 (**Presentation by DB**)
Bruel, R., Kremer, K., Girardclos, S., Perga, M.-E.. Comparison of Lake Geneva zooplankton responses to current and medieval atmospheric warming. *15^e Congrès Français de Sédimentologie*. Chambéry, 13-15 October 2015 (**Presentation**)
Bruel, R., Birck, C., Sentinel lakes: a network for the study and management of mountain lakes in the French Alps. *SEFS 9*. Geneva (CH), 5-10 July 2015 (**Presentation**)
Bruel, R., Girardclos, S., Kremer, K., Perga, ME. Comparison of current and medieval planktonic responses to atmospheric warming in Lake Geneva. *SEFS 9*. Genève (CH), 5-10 July 2015 (**Poster**)
- 2014** **Bruel, R.**, Arnaud, F., Malet, E., Birck, C. Treatment of high-frequency monitoring data: contributions on understanding lakes dynamics – The example of Lake Anterne. *5^e rencontres scientifiques et techniques, Réseau Lacs Sentinelles*. Aix-en-Provence, 27-28 November 2014 (**Presentation**)
Bruel, R., Arnaud, F., Malet, E., Birck, C., Perga, M.E. NETworking Lake observatories in Europe. Lake Anterne, Netlake site in France. *Netlake workshop*. Erken (SE), June 2014 (**Poster**)

References

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