



MARTA ANTONELLI

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PROFILE: Catchment hydrologist with several years of experience in conducting multidisciplinary research on both marine and freshwater ecosystems. Major research areas include: 1) assessment of the impact of disturbance on ecological communities and landscapes 2) understanding of the processes behind the generation of hydrological connectivity between aquatic and terrestrial environments.

PROFESSIONAL EXPERIENCE and EDUCATION

eawag Postdoctoral Researcher Kastanienbaum, Switzerland
2020 – present
Eawag, Swiss Federal Institute of Aquatic Science and Technology

- Multidisciplinary research in the field of **catchment and landscape hydrology**
- Developing a conceptual framework for the characterisation of the long-lasting influence of **historic human disturbance** on ecosystem structures and functions (“Anthropogenic legacy on ecosystems”, manuscript in preparation)
- Understanding of how **historical riverscape change** impacts on present-day ecology (i.e. multi-scale analysis of the factors driving historical change of hydrological connectivity within the riverscape)
- Coordinating the activities of the Project partners (internal meetings, advisory board meetings)



Ph.D in Eco-hydrology Belvaux, Luxembourg
Wageningen, The Netherlands
2014 – 2020
Luxembourg Institute of Science and Technology & Wageningen University & Research

- Degree Thesis: “**Tracing hydrological connectivity**”
Investigation of the dynamics of hydrological connectivity between the hillslopes and the stream by means of two innovative multidisciplinary approaches, namely **terrestrial diatoms** (unicellular algae) and **ground-based Thermal Infrared (TIR) imagery**
- Co-responsible for the planning and carrying-out of **field campaigns** (TIR images acquisition, surface water and groundwater sampling, terrestrial diatoms sampling)
- Responsible for the **statistical analysis** of the collected data (regression models, time series analysis, clustering, ordination methods and prediction models, e.g. random forest of regression trees)
- Co-developer of a procedure for the acquisition and post-processing of ground-based TIR images for **surface saturation mapping**
- Collaborated with Project partners for the development of side-projects (e.g. quantification of bacteriophages in stream water samples to investigate hydrological processes)



M.Sc. in Applied Ecology Rome, Italy
2010 – 2013
La Sapienza University of Rome

- Degree Thesis: “**Interaction force for the use of resources among marine invertebrates: vulnerability in the Gulf of Gaeta**”
Employment of **stable isotopes analysis** to determine the trophic niche of benthic macroinvertebrate communities of the Gulf of Gaeta (Italy). Quantification of the niche overlap and determination of the niche variation due to different environmental conditions and availability of resources (Passing grade: 110/110 cum Laude)
- Co-responsible for the maintenance of aquariums, field and laboratory instruments
- Co-responsible for stable isotope analysis of solid samples (algae and animals) using **elemental analysis and mass spectrometry**

SCHOLARSHIPS



MARIE CURIE Fellowship – European Union’s Seventh Framework Program for research, technological development and demonstration under grant agreement no. 607150 (FP7-PEOPLE-2013-ITN – INTERFACES – Ecohydrological interfaces as critical hotspots for transformations of ecosystem exchange fluxes and bio-geochemical cycling)

PROFESSIONAL TRAINING COURSES

- Environmental Systems Analysis - Eawag, Jun 2023, Switzerland
- Web Video Hackathon: production of web videos for scientific communication - FNR, 2019, Luxembourg; Participation to the Fast Forward Science online competition (<https://fastforwardscience.de/>) with the video “Tracing hydrological connectivity in the riparian zone via Thermal Infrared Imagery” https://www.youtube.com/watch?v=pe0ecMY7hg8&ab_channel=SteveMeyers
- INTERFACES Joint field experiment: analysis of interface hydrological processes at a basin scale - CNRS, Apr 2016, France
- Qualitative and Quantitative Molecular Techniques: collection of aquatic microbial organisms and their quantification through Polymerase Chain Reaction (qPCR) - NIB & Biosistemika, Sep 2015, Slovenia
- 6th Annual Catchment Science Summer School - University of Aberdeen, Aug 2015, Scotland

- High-Resolution Fluorescence Absorption Spectrophotometry and principles of Bioengineering: characterisation of dissolved organic matter and river restoration techniques - *University of Barcelona, CEAB-CSIC, Jun 2015, Spain*
- Advanced Distributed Sensing: ground-based TIR imagery and Distributed Temperature Sensing (DTS) - *LIST, Nov 2014, Luxembourg*

SKILLS and PERSONAL

Languages: Italian (native), English (full proficiency), French (intermediate)

IT: R, ArcGIS, QGIS, Minitab, MS Office, Jupiter Notebook

Lab and field work: Ground-based thermal infrared imagery, Water, soil and sediment sampling, Discharge measurement, Microscopy, Elemental analysis and mass spectrometry, qPCR (basics)

Social and organisational skills: critical reasoning, creativity and ability to work independently on unfamiliar projects, excellent ability to work in a team, prioritising and time management

Research interests: Streamflow generation and hydrological connectivity, Natural and anthropogenic disturbance, Statistical analysis of environmental data, Ground-based remote sensing, Geographic Information Systems

Driving License: Category B

LIST OF PUBLICATIONS

First-authored publications in Peer-reviewed journals:

- Antonelli, M, Laube, P, Doering, M, Scherelis, V, Wu, S, Hurni, L, Heitzler, M, and Weber, C. *Identifying anthropogenic legacy in freshwater ecosystems*. *WIREs Water* 2024, 11(4), e1729. <https://doi.org/10.1002/wat2.1729>
- Antonelli M, Glaser B, Teuling AJ, Klaus J, and Pfister L. *Saturated areas through the lens: 1. Spatio-temporal variability of surface saturation documented through Thermal Infrared imagery*. *Hydrological Processes* 2020, 34: 1310–1332. <https://doi.org/10.1002/hyp.13698>.
- Antonelli M, Glaser B, Teuling AJ, Klaus J, and Pfister L. *Saturated areas through the lens: 2. Spatio-temporal variability of streamflow generation and its relationship with surface saturation*. *Hydrological Processes* 2020, 34, 1333– 1349. <https://doi.org/10.1002/hyp.13607>.
- Antonelli M, Klaus J, Smettem KRJ, Teuling AJ, Pfister L. *Inferring Streamwater Mixing Dynamics from Thermal Infrared Imagery*. *Water* 2017, 9 – 358. <https://doi.org/10.3390/w9050358>.
- Antonelli M, Wetzel CE, Ector L, Teuling AJ, Pfister L. *On the potential for terrestrial diatom communities and diatom indices to identify anthropogenic disturbance in soils*. *Ecological Indicators* 2017, 75:73 – 81. <https://doi.org/10.1016/j.ecolind.2016.12.003>.

Co-authored publications in Peer-reviewed journals:

- Pfister, L, Klaus, J, Wetzel, CE, Antonelli, M. and Martinez-Carreras, N. *Tracing Hydrological Connectivity with Aerial Diatoms*. In *Ecohydrological Interfaces 2024* (eds S. Krause, D. Hannah and N. Grimm). <https://doi.org/10.1002/9781119489702.ch11>
- Scherelis, V, Doering, M, Antonelli, M, and Laube, P. *Hydromorphological Information in Historical Maps of Switzerland: From Map Feature Definition to Ecological Metric Derivation*. *Annals of the American Association of Geographers* 2023, 113(4), 799–816. <https://doi.org/10.1080/24694452.2022.2160693>
- Glaser B, Antonelli M, Hopp L, Klaus J. *Intra-catchment variability of surface saturation – insights from physically based simulations in comparison with biweekly thermal infrared image observations*. *Hydrology and Earth System Sciences* 2020, 24, 1393-1413. <https://doi.org/10.5194/hess-24-1393-2020>.
- Glaser B, Antonelli M, Chini M, Pfister L, Klaus J. *Technical note: Mapping surface-saturation dynamics with thermal infrared imagery*. *Hydrology and Earth System Sciences* 2018, 22, 5987-6003. <https://doi.org/10.5194/hess-22-5987-2018>.
- Pfister L, Wetzel CE, Klaus J, Martinez-Carreras N, Antonelli M, Teuling AJ, McDonnell JJ. *Terrestrial diatoms as tracers in catchment hydrology: a review*. *WIREs Water* 2017, 4: e1241. <https://doi.org/10.1002/wat2.1241>.
- Abbott BW, Baranov V, Mendoza-Lera C, et al. *Using multi-tracer inference to move beyond single-catchment ecohydrology*, *Earth-Science Reviews* 2016, 160, 19 – 42, <http://dx.doi.org/10.1016/j.earscirev.2016.06.014>.

Oral presentations at conferences:

- Antonelli M, Glaser B, Klaus J, Teuling AJ, Pfister L. *Runoff generation processes inferred from surface water network dynamics*. *HydroEco 2017 - 6th International Multidisciplinary Conference on Hydrology and Ecology*. Birmingham, UK, June 2017.
- Antonelli M, Martínez-Carreras N, Frentress J, Pfister L. *Diatoms as a tracer of hydrological connectivity: the Oak Creek case study (Oregon, USA)*. *European Geosciences Union (EGU) General Assembly Conference*, Vienna, Austria, April 2015.

Poster presentations at conferences:

- Antonelli M, Glaser B, Klaus J, Teuling AJ, Pfister L. *Do all riparian areas behave the same? On the mechanistic role of saturated area dynamics in hydrological responses*. *European Geosciences Union (EGU) General Assembly Conference*, Vienna, Austria, April 2018.

- Antonelli M, Wetzel CE, Juilleret J, Iffly JF, Ector L, Teuling AJ, Pfister L. *Land use control on terrestrial diatom communities: can indices based on aquatic diatoms be applied to soils?* 10th Central European Diatom Meeting (CEDM), Budapest, Hungary, April 2016.
- Antonelli M, Balasubramanian MN, Ogorzaly L, Pfister L. *qPCR (quantitative polymerase chain reaction) for the quantification of bacteriophages in stream water samples to investigate hydrological processes: a proof-of-concept study in the Huewelerbach experimental catchment (Luxembourg)*. European Geosciences Union (EGU) General Assembly Conference, Vienna, Austria, April 2016.
- Antonelli M, Smettem KR, Klaus J, Teuling AJ, Pfister L. *Water Mixing Dynamics inferred via Thermal Infrared Imagery: Laboratory and Field Observations*. American Geophysical Union (AGU) Fall Meeting, San Francisco, USA, December 2016.

PROFESSIONAL REFERENCES

Laurent Pfister (laurent.pfister@list.lu)

Luxembourg Institute of Science and Technology, Environmental Sensing and Modelling Unit, Belvaux, Luxembourg

Adriaan J. Teuling (ryan.teuling@wur.nl)

Wageningen University & Research, Hydrology and Quantitative Water Management, Wageningen, The Netherlands

Christine Weber (christine.weber@eawag.ch)

Swiss Federal Institute of Aquatic Science and Technology (Eawag), Department of Surface Waters Research and Management, Kastanienbaum, Switzerland