

Johannes Ingrisch

ECOLOGY · DATA SCIENCE

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Education

Master in Data Science - Student

University of Innsbruck, Austria

FROM MATHEMATICAL FOUNDATIONS TO APPLICATIONS

2022 - present

- Completion in summer 2024
- Understanding the mathematical foundations of data science, state-of-the-art methods of unsupervised and supervised learning, software (R, Julia), and communication of results.

PhD Biology

University of Innsbruck, Austria

DEPARTMENT OF ECOLOGY

2012 - 2018

- Title: Effects of land-use change on the resilience of grassland carbon dynamics to extreme drought
- Supervisor Prof. Dr. Michael Bahn, Co-Supervisor Prof. Dr. Gerd Gleixner
- Grade: 1.0

Msc Geoecology

University of Bayreuth, Germany

PROGRAMME: ECOSYSTEM ANALYSIS

2009 - 2011

- Thesis: Assimilate partitioning in alpine *Kobresia pygmaea* grasslands on the Tibetan Plateau assessed by ^{13}C pulse labeling, supervised by Prof. Dr. Yakov Kuzyakov
- Grade 1.1

Bsc Geoecology

University of Bayreuth, Germany

2005 - 2009

- Thesis: Modellierung der ökologischen Nische quellspezifischer Arten und Prognosen zu ihrer zukünftigen Verbreitung, supervised by Prof. Dr. Carl Beierkuhnlein
- Erasmus exchange semester: Umeå, Sweden
- Grade 1.1

Skills

Data Analysis

- Analysis of extensive, multivariate, experimental datasets
- Data visualisation
- Statistical analysis: supervised learning, multivariate statistics

Software

- R (advanced)
- Julia, Python
- Git, Docker, R-Shiny, PostgreSQL, GIS
- MS Office, Latex

Experimental skills

- Planning, leading, and conducting multi-factorial climate manipulation experiments
- Field experiments in arctic and alpine environments
- Application of isotopes in environmental research
- Ecosystem flux measurements
- Isotope laser spectroscopy

Scientific Writing

Lead-author and Co-author of >15 scientific publications in international peer-reviewed journals

Project management

- Planning and managing large field campaigns
- Leading scientific data analysis and publications
- Acquisition of 3rd party funding

Languages

German (native), English (fluent), French (basics)

Experience

CAREER

Postdoctoral researcher

University of Innsbruck, Austria

WORKING GROUP *Functional Ecology* LEAD BY PROF. DR. MICHAEL BAHN

2018 - present

- Research focus: Thresholds and nonlinear responses of grassland ecosystems to gradients of drought intensity and warming.
- Development and implementation of a data processing pipeline and a PostgreSQL Database for data measured at the Long-term Ecosystem Research (LTER) field sites
- Teaching and co-supervising Bachelor, Master, and PhD Students
- Part-time (50%) during the employment in Freiburg

Postdoctoral researcher

University of Freiburg, Germany

WORKING GROUP *Ecosystem Physiology* LEAD BY PROF. DR. CHRISTIANE WERNER

2019 - 2021

- Research focus: Drought effects on carbon cycling in a tropical rainforest within the B2WALD project
- Planning and conducting experimental research campaign, focus on soil and stem carbon fluxes
- Data analysis, statistics of carbon flux data (soil, stem, leaf, and ecosystem scale), data visualization for presentations and publications
- Part-time (50%)

Research assistant

University of Vienna, Austria

CLIMGRASS EXPERIMENT - MULTI-FACTORIAL EXPERIMENT TO STUDY EFFECTS OF CHANGING CLIMATE ON GRASSLAND

2017

- A field experiment on the combined effects of drought, temperature and elevated CO₂ on carbon cycling in a managed mountain grassland
- Planning and conducting a large-scale experimental campaign to determine grassland carbon allocation, including isotopic pulse labeling and continuous measurements of soil isotopic carbon fluxes

Research assistant

University of Innsbruck, Austria

WORKING GROUP *Functional Ecology* LEAD BY PROF. DR. MICHAEL BAHN

2012 - 2017

- Research focus: Effects of land-use change and drought on carbon dynamics in a mountain grassland
- Management of a multiyear field experiment
- Development of a soil flux system to measure continuous isotopic fluxes *in situ* and a data processing pipeline
- Data analysis, statistics, visualisation, and publication of results in peer-reviewed journals
- co-supervision of undergraduate student

Voluntary service

Berchtesgaden National Park,

Germany

FREIWILLIGES ÖKOLOGISCHES JAHR

2004 - 2005

- Environmental education
- Assistance in various research projects

INTERNATIONAL EXPERIENCE

International Research Campaign

Agricultural University of Iceland

FORHOT Project: ECOLOGICAL EFFECTS OF LONGTERM WARMING IN THE ARCTIC

2018, 2022

I participated in two research campaigns aiming to understand the effects of long-term warming on the carbon cycle of arctic grasslands. During those campaigns we conducted isotope pulse labeling campaigns in arctic grasslands and operated state-of-the-art continuous isotopic soil flux systems under highly challenging climatic and topographic conditions.

Visiting scientist

University of Arizona, USA

THE B2WALD EXPERIMENT: DROUGHT IN AN ENCLOSED TROPICAL RAINFOREST

2019

I participated in a large-scale, multinational experiment at the Biosphere-2 research facility. Aim of the experiment was to study the effects of drought on the water and carbon cycle of an enclosed tropical rainforest. During this experiment, I was in charge of two work packages measuring isotopic CO₂ fluxes and VOC fluxes with an isotopic carbon analyzer and a PTR-TOF spectrometer. The two month stay was hosted by Dr. Laura Meredith.

International Research Campaign

Tibet, China

TIP ATMOSPHERE-ECOLOGY-GLACIOLOGY CLUSTER

2010

Participant in an international research campaign to study the effects of land-use change on the carbon cycle of Tibetan grasslands, during which we conducted a isotopic pulse-labeling experiment.

Erasmus exchange student

University of Umeå, Sweden

ARCTIC AND ALPINE ECOLOGY, PALEOECOLOGY

2009

Lectures, seminars, and field courses on the topics of paleolimnology and arctic and alpine ecology, including a two-month stay at the Abisko field station in Lapland.

OTHER ACADEMIC ACTIVITIES

Teaching

University of Innsbruck

UNDERGRADUATE AND GRADUATE CLASSES

- Data management and analysis for environmental sciences (PhD level).
- Seminar: Presenting (Master level)
- Seminar: Functional ecology (Master level)
- Application of isotopes in ecological research (Master level)
- Ecological project study (Bachelor level, Master level)
- Exercise: Data management and statistics (Bachelor level)

Reviewing Activities

INTERNATIONAL SCIENTIFIC JOURNALS

Voluntary reviewer for various peer-reviewed journals, including Trends in Ecology and Evolution, Global Change Biology, Journal of Ecology, Functional Ecology.

Grants, Scholarships, & Awards

GRANTS

- 2019 **Research Grant**, Tiroler Wissenschaftsförderung
- 2016 **Research Grant**, Mountain Agriculture Research Unit

SCHOLARSHIPS

- 2016 **Scholarship**, Doctoral Scholarship by University of Innsbruck
- 2012 **Scholarship**, Doctoral Scholarship by University of Innsbruck
- 2012 **Scholarship**, Short-term scientific mission, COST Action SIBAE
- 2007 **Scholarship**, The German Academic Scholarship Foundation

AWARDS

- 2019 **Jury Recognition Award**, Best Paper Award by the University of Innsbruck

Publications, peer-reviewed (selected)

Ingrisch, J., Umlauf, N., Bahn, M. (2023) Functional thresholds alter the relationship of plant resistance and recovery to drought. Ecology, 104(2). <https://doi.org/10.1002/ecy.3907>

Werner, C., Meredith, L. K., Ladd, S. N., Ingrisch, J., Kuebert, A., van Haren, J., Bahn, M., Bailey, K., Bamberger, I., Beyer, M., Blomdahl, D., Byron, J., Daber, E., Deleeuw, J., Dippold, M. A., Fudyma, J., Gil-Loaiza, J., Honeker, L. K., Hu, J., ... Williams, J. (2021). Ecosystem fluxes during drought and recovery in an experimental forest. Science, 374(6574), 1514–1518. <https://doi.org/10.1126/science.abj6789>

Meeran, K., Ingrisch, J., Reinthaler, D., Canarini, A., Müller, L., Pötsch, E. M., Richter, A., Wanek, W., Bahn, M. (2021). Warming and elevated CO₂ intensify drought and recovery responses of grassland carbon allocation to soil respiration. Global Change Biology, 27(14), 3230–3243. <https://doi.org/10.1111/gcb.15628>

Harris, E., Diaz-Pines, E., Stoll, E., Schlöter, M., Schulz, S., Duffner, C., Li, K., Moore, K. L., Ingrisch, J., Reinthaler, D., Zechmeister-Boltenstern, S., Glatzel, S., Brueggemann, N., Bahn, M. (2021). Denitrifying pathways dominate nitrous oxide emissions from managed grassland during drought and rewetting. Science Advances, 7(6), eabb7118. <https://doi.org/10.1126/sciadv.abb7118>

Ingrisch, J., Karlowisky, S., Hasibeder, R., Gleixner, G., Bahn, M. (2020). Drought and recovery effects on belowground respiration dynamics and the partitioning of recent carbon in managed and abandoned grassland. Global Change Biology, 26(8), 4366–4378. <https://doi.org/10.1111/gcb.15131>

Miehe, G., Schleuss, P.-M., Seeber, E., Babel, W., Biermann, T., Braendle, M., Chen, F., Coners, H., Foken, T., Gerken, T., Graf, H.-F., Guggenberger, G., Hafner, S., Holzapfel, M., Ingrisch, J., Kuzyakov, Y., Lai, Z., Lehnert, L., Leuschner, C., ... Wesche, K. (2019). The Kobresia pygmaea ecosystem of the Tibetan highlands – Origin, functioning and degradation of the world's largest pastoral alpine ecosystem: Kobresia pastures of Tibet. Science of The Total Environment, 648, 754–771. <https://doi.org/10.1016/j.scitotenv.2018.08.164>

Bahn, M., Ingrisch, J. (2018). Accounting for Complexity in Resilience Comparisons: A Reply to Yeung and Richardson, and Further Considerations. Trends in Ecology Evolution, 33(9), 649–651. <https://doi.org/10.1016/j.tree.2018.06.006>

Ingrisch, J., Bahn, M. (2018). Towards a Comparable Quantification of Resilience. Trends in Ecology Evolution, 33(4), 251–259. <https://doi.org/10.1016/j.tree.2018.01.013>

Ingrisch, J., Karlowisky, S., Anadon-Rosell, A., Hasibeder, R., Koenig, A., Augusti, A., Gleixner, G., Bahn, M. (2018). Land Use Alters the Drought Responses of Productivity and CO₂ Fluxes in Mountain Grassland. Ecosystems, 21(4), 689–703. <https://doi.org/10.1007/s10021-017-0178-0>

- Karlowsky, S., Augusti, A., **Ingrisch, J.**, Akanda, M. K. U., Bahn, M., Gleixner, G. (2018). Drought-Induced Accumulation of Root Exudates Supports Post-drought Recovery of Microbes in Mountain Grassland. *Frontiers in Plant Science*, 9. <https://www.frontiersin.org/articles/10.3389/fpls.2018.01593>
- Karlowsky, S., Augusti, A., **Ingrisch, J.**, Hasibeder, R., Lange, M., Lavorel, S., Bahn, M., Gleixner, G. (2018). Land use in mountain grasslands alters drought response and recovery of carbon allocation and plant-microbial interactions. *Journal of Ecology*, 106(3), 1230–1243. <https://doi.org/10.1111/1365-2745.12910>
- Anadon-Rosell, A., Hasibeder, R., Palacio, S., Mayr, S., **Ingrisch, J.**, Ninot, J. M., Nogues, S., Bahn, M. (2017). Short-term carbon allocation dynamics in subalpine dwarf shrubs and their responses to experimental summer drought. *Environmental and Experimental Botany*, 141, 92–102. <https://doi.org/10.1016/j.envexpbot.2017.07.006>
- Gavazov, K., **Ingrisch, J.**, Hasibeder, R., Mills, R. T. E., Buttler, A., Gleixner, G., Pumpanen, J., Bahn, M. (2017). Winter ecology of a subalpine grassland: Effects of snow removal on soil respiration, microbial structure and function. *Science of The Total Environment*, 590–591, 316–324. <https://doi.org/10.1016/j.scitotenv.2017.03.010>
- Ingrisch, J.**, Biermann, T., Seeber, E., Leipold, T., Li, M., Ma, Y., Xu, X., Miehe, G., Guggenberger, G., Foken, T., Kuzyakov Y. (2015). Carbon pools and fluxes in a Tibetan alpine *Kobresia pygmaea* pasture partitioned by coupled eddy-covariance measurements and ¹³CO₂ pulse labeling. *Science of the Total Environment*, 505, 1213–1224. <https://doi.org/10.1016/j.scitotenv.2014.10.082>

Presentations (selected)

2022	Drought effects on whole-tree C dynamics in an enclosed tropical rainforest , EGU General Assembly	Vienna
2021	Functional thresholds of plant resistance and recovery to drought , EGU General Assembly	online
2019	Resistance and recovery: A bivariate framework for resilient responses to disturbance , BES Annual Meeting, invited	Belfast
2019	Land use alters drought effects on belowground partitioning of recent carbon in mountain grassland , SINA Annual Meeting	Innsbruck
2018	Effects of land-use change on the resilience of grassland carbon dynamics to extreme drought , SusAlps Conference	Garmisch-Partenkirchen
2018	Land use alters drought effects on belowground partitioning of recent carbon in mountain grassland , GFÖ Annual Meeting	Vienna
2016	Land use alters the resilience of grassland carbon dynamics to extreme drought , Ecosummit	Montpellier
2015	Land use affects the resistance and resilience of carbon dynamics of mountain grasslands to extreme drought , EGU general assembly 2015, EGU General Assembly	Vienna