

# Erik Kusch

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## Research Profile

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I am a macroecologist specialised in remote sensing applications and spatio-temporal analyses of biodiversity dynamics. I use quantitative tools to research ecosystem resilience, vegetation dynamics, and patterns of landscape-scale biodiversity to understand past, present, and future trajectories of natural ecosystems.

## Education

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### PhD in Biology; Specialisation on Ecoinformatics and Biodiversity

Aarhus, Denmark

AARHUS UNIVERSITY (AU)

01/2020 - PRESENT

Species association and interaction networks;  
Extinction debt consequences

### M.Sc. in Biology; Specialisation on Biodiversity, Ecology and Evolution

Bergen, Norway

UNIVERSITY OF BERGEN (UiB)

08/2017 - 08/2019

08/2019 Graduation from UiB (M.Sc., overall grade: A)  
08/2018 - 07/2019 Master's Thesis at UiB & Nansen Environmental and Remote Sensing Center:  
"Inferring Vegetation Memory from Remote Sensing Data and identifying Causal Links to Plant Function" (grade: First/A)

### Plant Functional Traits Course 3

Wayquecha Biological Station, Peru

UNIVERSITY OF BERGEN (UiB), UNIVERSITY OF ARIZONA (UOA)

08/03/2018 - 24/03/2018

Introduction to plant functional trait based ecology;  
Collecting plant functional trait data in the field;  
Developing data management skills;  
Assessing the impact of fire regimes on the Puna grasslands of the Peruvian Andes

### Bayesian Modelling Summer School

Lygra, Norway

NORWEGIAN UNIVERSITY OF LIFE SCIENCES (NMBU)

25/10/2017 - 29/10/2017

Introduction to the concepts of Bayesian statistics (priors, likelihoods, etc.);  
Sampling methods (Markov Chain Monte Carlo, rejection sampling, etc.);  
Bayesian modelling and hierarchical Bayesian models

### B.Sc. in Biology

Dresden, Germany / Bergen, Norway

TECHNICAL UNIVERSITY DRESDEN (TUD) / UNIVERSITY OF BERGEN (UiB)

10/2013 - 07/2017

07/2017 Graduation from TUD (Diploma/B.Sc., overall grade: 1.7)  
09/2016 - 02/2017 Bachelor's Thesis at UiB (via ERASMUS):  
"Remote Sensing And Predicting Shifts In Biome Distribution And Resilience Using NDVI Data" (grade: First/A)  
08/2015 - 12/2015 Studies at UiB (via ERASMUS)

## Experience

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### Research station co-manager

Scoraig, Scotland

SPATIAL AND POPULATION ECOLOGY, UNIVERSITY OF GLASGOW

06/2019 - PRESENT

- Scientific consultant/advisor for selected course activities on-site
- Visitor introduction and orientation
- Visitor management
- Outreach to local communities
- Research station maintenance
- Converting croft to research station

### Research fellow

Bergen, Norway

ECOLOGICAL AND ENVIRONMENTAL CHANGE RESEARCH GROUP, UNIVERSITY OF BERGEN

09/2019 - 12/2019

- Global dryland vegetation memory research
- Funded via Fast-Track-Initiative programme (see Honours & Awards)

## Research and teaching assistant

BEHAVIOURAL ECOLOGY RESEARCH GROUP, UNIVERSITY OF LEIPZIG

Leipzig, Germany

08/2017 - 08/2019; 03/2017 - 04/2017

- Analysing primate odour profiles
- Assessing a variety of statistical methods for analytical power in identifying odour effects
- Generating data with various implemented odour effects on which to test the methods

## Research and outreach assistant

PRIMATE RESEARCH CENTRE, UNIVERSITY OF KYOTO

Nagata/Inuyama, Japan

07/2018

- Collecting faecal & recording behaviour samples of Japanese macaques
- Analysing behavioural interactions via network analyses
- Creating a text-based adventure game about behavioural studies

## Research assistant

GERMAN CENTRE FOR MARINE BIODIVERSITY RESEARCH (DZMB), SENCKENBERG GROUP

Wilhelmshaven, Germany

05/2017 - 07/2017

- Sorting benthos samples and meiofauna taxa
- Researching trophic networks between Antarctic meio- and macrobenthos over time via stable isotope analyses

## Student Assistant

BOTANICAL INSTITUTE, TECHNICAL UNIVERSITY DRESDEN (TUD)

Dresden, Germany

05/2016 - 08/2016; 02/2015 - 08/2015

- Mapping distribution of moss species throughout the Elbsandsteingebirge

## Student Assistant

ZOOLOGICAL COLLECTION, TECHNICAL UNIVERSITY DRESDEN (TUD)

Dresden, Germany

04/2016 - 05/2016; 11/2013 - 08/2015

- Restructuring the collection & carrying out a regular stocktaking

## Ranger & Tour Guide

NATIONAL PARK SAXON-BOHEMIAN SWISS

Saxony, Germany

04/2016 - 06/2016

- Conducting programmes concerning environmental and biodiversity education

# Teaching & Supervision Activity

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## Author & Lecturer: Excursions into Biostatistics

 [GitHub Repository](#)

SEMINAR SERIES

A diverse range of talks concerning biostatistics including (but not limited to) overviews of classification and regression methods as well as their application in R, statistical significance and the p-value conundrum, model selection and validation, coding practices, and basic statistical terminology.

## Author & Lecturer: An Introduction to Biostatistics Using R

 [GitHub Repository](#)

TALK SERIES

An introductory biostatistics course for undergraduate and graduate students consisting of 13 lectures which provide an overview of the fundamentals of basic biostatistical methods and their application in R. The theoretical aspects of the course series are supplemented with hands-on exercises on a simulated data set of house sparrow morphology across the globe to simulate a coherent research project throughout the duration of the course.

## Author

Aarhus University

BIOLOGICAL RESEARCH IN THEORY AND PRAXIS (BFTP)

- Project resources for biome classification analyses from NDVI data
- RMarkdown introductions to spatial ecology & k-cluster analyses

## Instructor & Advisor

Aarhus University

ECOINFORMATICS & BIODIVERSITY MASTERS SEMINARS (EBMS)

- Feedback to student presentations
- Resources, presentations, and advisorship concerning biostatistics
- Arrangements for invited speaker presentations

## Extracurricular Activity

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### Member: Bayes Study Group

UNIVERSITY OF BERGEN

- Understanding Bayesian statistics in theory and practice
- Using published literature as tutorials

Bergen, Norway

09/2018 - 12/2019

### Member: EECRG Reading Group

UNIVERSITY OF BERGEN

- Proof-reading other students'/researchers' writing
- Providing own writing to be proof-read

Bergen, Norway

10/2017 - 12/2019

### Tutor: BiOrakel Team

CENTRE OF EXCELLENCE IN BIODIVERSITY EDUCATION (BIOCEED), UNIVERSITY OF BERGEN

- Answering study-topic related questions from students
- Tutoring students on how to use statistical programmes
- Explaining how to do proper referencing

Bergen, Norway

08/2017 - 07/2018

### Core Member: Students Council of Biology Studies at the TUD

TECHNICAL UNIVERSITY OF DRESDEN

- Student coordinator of exchange programs

Dresden, Germany

10/2013 - 10/2015

## Honours & Grants & Awards

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### SCHOLARSHIPS & GRANTS

02/2020 **Scholarship for Academically Excellent Students**, Frands Christian Frantsen's Scholarship

Aarhus, Denmark

03/2019 **Funding for Particularly Talented Students**, Lina Asbjørnsens Stipendiefond

Bergen, Norway

02/2019 **Fast-Track-Initiative Funding**, FTI, Bjerknessenteret

Bergen, Norway

03/2018 -  
08/2019 **Project Grant**, L. Meltzers Høyskolefond

Bergen, Norway

03/2018 -  
08/2019 **Scholarship**, German Academic Scholarship Foundation (Studienstiftung des deutschen Volkes)

Bonn, Germany

### AWARDS

10/2019 **Best Poster: Student and Early Career Researcher**, International Society for Ecological Modelling

Salzburg, Austria

10/2019 **Modeller's Choice Poster Award**, International Society for Ecological Modelling

Salzburg, Austria

## Talks

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### KrigR - Climate Data For Your Spatial Study

Oxford, United Kingdom

Sydney, Australia

INVITED SPEAKER, SALGO TEAM, UNIVERSITY OF OXFORD

18/06/2020

SPEAKER, INTERNATIONAL STATISTICAL ECOLOGY CONFERENCE 2020

25/06/2020

- Introducing the KrigR R Package
- Climate data products
- Era5(-Land) download functionality
- Geostatistical downscaling (kriging) of spatial products
- Kriging pitfalls and recommendations

## Remote Sensing Vegetation Memory as a Proxy of Resilience and Demographies

Oxford, United Kingdom

INVITED SPEAKER, SALGO TEAM, UNIVERSITY OF OXFORD

16/10/2019

- Linking resilience components and vegetation memory
- Using state-of-the-art climate reanalysis data sets
- Global generalisations of vegetation memory across dryland regions
- Linking remote sensed resilience proxies of vegetation communities with vegetation demography

## Identifying ecological-memory patterns in drylands using remote sensing and state-of-the-art climate-reanalysis products

Oxford, United Kingdom

Salzburg, Austria

Aarhus, Denmark

INVITED SPEAKER, ECOSYSTEM RESEARCH GROUP, UNIVERSITY OF OXFORD

15/10/2019

SPEAKER, INTERNATIONAL SOCIETY FOR ECOLOGICAL MODELLING CONFERENCE 2019

04/10/2019

INVITED SPEAKER, ECOINFORMATICS AND BIODIVERSITY RESEARCH GROUP, UNIVERSITY OF AARHUS

06/09/2019

- Use of statistical downscaling approaches of state-of-the-art climate reanalysis products in macroecology
- Metric of cross-community vegetation resilience expressed through vegetation memory patterns

## Rmarkdown - Manuscript Workflow Revisited

Leipzig, Germany

INVITED SPEAKER, BEHAVIOURAL ECOLOGY GROUP, UNIVERSITÄT LEIPZIG

18/06/2019

- Introduction to Rmarkdown and its capabilities
- Latex-based compilation of manuscripts and R codes via Rmarkdown

## Statistical Significance in Biology - Conventions, Abstractions, and the Future

Leipzig, Germany

INVITED SPEAKER, BEHAVIOURAL ECOLOGY RESEARCH GROUP, UNIVERSITÄT LEIPZIG

18/06/2019

- Overview to the reproducibility crisis in contemporary research
- Guidelines to proper statistical conduct in biological sciences

## Spatial Patterns of Plant Performance

Bergen, Norway

INVITED SPEAKER, BIO DAY, UNIVERSITETET I BERGEN

15/03/2019

- Metrics of plant performance through time-series analyses
- Explaining plant response to climate events through ecosystem function

## Inferring Vegetation Memory from Remote Sensing Data

Glasgow, Scotland

INVITED SPEAKER, SPATIAL ECOLOGY GROUP, UNIVERSITY OF GLASGOW

09/01/2019

- Use of state-of-the-art climate reanalysis products in macroecology
- Spatio-temporal approaches to ecosystem resilience through vegetation memory on regional scales

## Aktivurlaub als Hämophilie-Patient

Leipzig, Sachsen, Germany

INVITED SPEAKER, CENTRAL GERMAN CONFERENCE OF THE GERMAN HAEMOPHILIA AGENCY (DHG)

03/03/2015

- Why to keep active as a haemophilia patient
- How to organise travels as a haemophiliac
- Recommendations of activities that are permissible for haemophiliacs

## Posters

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### Intrinsic vegetation memory as a proxy of engineering resilience may be an oversimplification

Bergen, Norway

Salzburg, Austria

Sydney, Australia

POSTER AUTHOR AND PRESENTER, BJERKNES CENTRE FOR CLIMATE RESEARCH ANNUAL MEETING 2019

16/09/2019

POSTER AUTHOR AND PRESENTER, INTERNATIONAL SOCIETY FOR ECOLOGICAL MODELLING CONFERENCE 2019

03/10/2019

POSTER AUTHOR AND PRESENTER, INTERNATIONAL STATISTICAL ECOLOGY CONFERENCE 2020

25/06/2020

- Understanding resilience components through vegetation memory characteristics
- Using state-of-the-art climate reanalysis data sets
- Making policy decisions based on vegetation memory

## The role of meiofauna in benthic functioning - a question of time

Corpus Christi, Texas, USA

Rostock, Germany

CO-AUTHOR OF DFG SPP 1158 ANTARCTIC RESEARCH REPORT COLLOQUIUM

03/2018

- Research considering trophic networks between Antarctic meio- and macrobenthos over time via stable isotope analyses

## Memberships and Affiliations

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- Research Collaborator with the SalGo Team at Oxford University
- Research Station Co-Manager with Spatial and Population Ecology, University of Glasgow
- Member of the International Society For Ecological Modelling (ISEM)
- Member of the International Biogeography Society (IBS)
- Alumni of the German Academic Scholarship Foundation (Studienstiftung des deutschen Volkes)
- Member of the British Ecological Society (BES)
- Member of the German Hemophilia Association (DHG)
- Member of the DNT Norge (Norwegian Trekking Association)
- Member of the International Youth Hostelling Organization (DJH)

## Activities and Interests

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- Hiking and mountaineering
- Rock climbing
- Sports (endurance and strength training)
- Photography
- Archery
- Choir singing

## References

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References are available on request.