

European Conference on Ecological Modelling

ECOLOGICAL MODELLING FOR TRANSFORMATION

September 4–8, 2023 | Leipzig, Germany

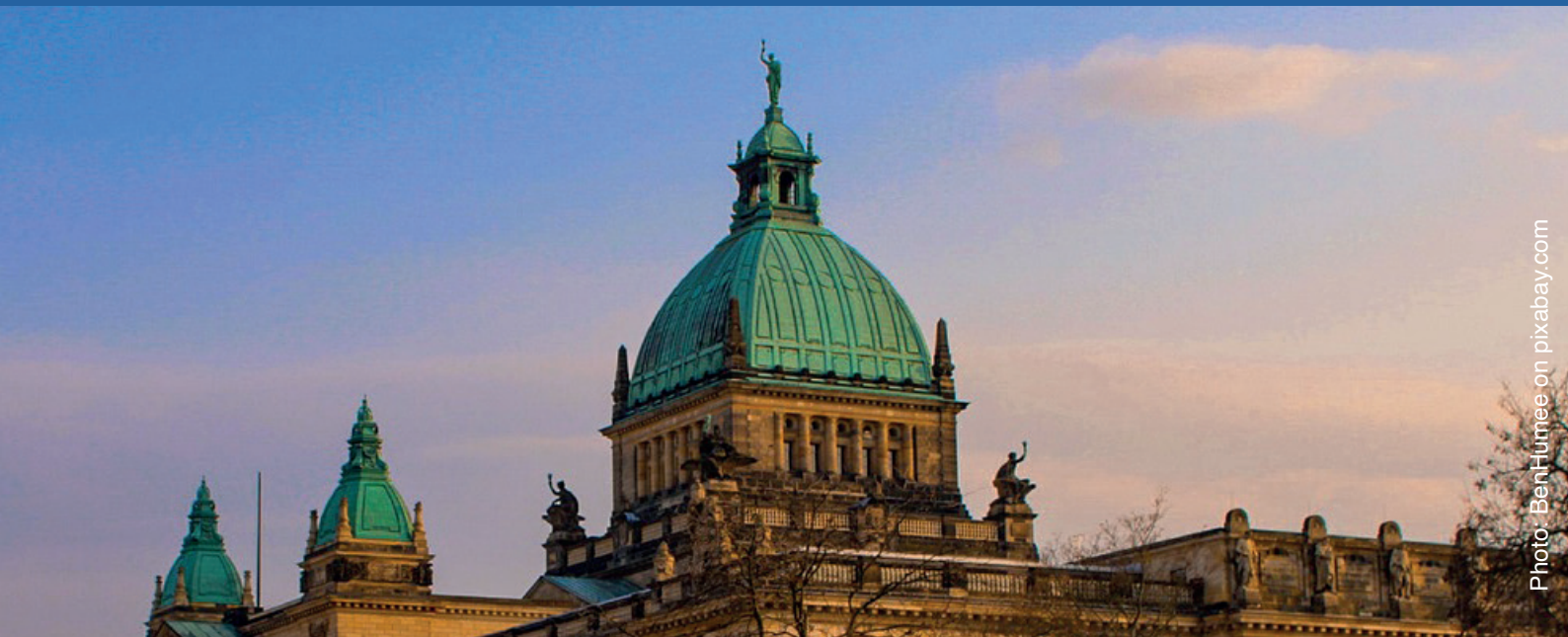


Photo: BenHurree on pixabay.com

ECEM 2023

Programm

LECTURE HALLS

Monday, 4 th September.....	4
Tuesday, 5 th September.....	4
Hall 1 A.....	4
Hall 1 B.....	6
Hall 1 CD	8
Hall 2 A.....	9
Hall 2 B.....	11
Room 101, Building 4.0	12
Wednesday, 6 th September	12
Hall 1 A.....	13
Hall 1 B.....	14
Hall 1 CD	16
Hall 2 A.....	18
Hall 2 B.....	19
Thursday, 7 th September	21
Hall 1 A.....	21
Hall 1 B.....	23
Hall 1 CD	24
Hall 2.....	26
Session: Open Topic	27
Friday, 8 th September	28
Hall 1 A.....	28
Hall 1 B.....	29
Hall 1 CD	29

SESSIONS

Movement

[1. Animal migrations under global changes – threats, implications, and mitigation](#)

[2. Modelling species migration and range shifts under global change](#)

[3. Movement modelling: underlying principles and processes](#)

Modelling methodology

[5. Reusable building blocks \(RBB\) for agent-, and individual-based models](#)

[6. Next-generation advances in individual-based modelling](#)

[7. New methods and applications in trait-based modelling in ecology](#)

[8. Integrative approaches to capture natural disturbance impacts in models](#)

Model-data integration

[9. Digital twins – a new modelling paradigm for ecology?](#)

[10. Combining process-based simulation models and remote sensing data – benefits and limits](#)

[11. Mathematical and data-driven models in ecohydrology](#)

[12. Advances in forest modelling by using new data sources and methods](#)

[13. Model-based data integration as a basis for FAIR ecological modelling, monitoring, and synthesis](#)

Response to change

[14. Leveraging animal ecophysiology to enhance model predictability in a changing world](#)

[15. Modelling variation and evolution of traits within individuals, populations and communities](#)

[16. Modelling climate-biosphere feedbacks](#)

[17. Sustaining insect pollination in a changing world using mechanistic simulation](#)

Policy support

[20. Environmental modelling for policy support – how to build bridges between two worlds](#)

[21. Ecological risk assessment and management – benefits and challenges of ecological modelling](#)

[31. From dynamic forest models to decision support for forest transformation – How can synergies be achieved? & 31a](#)

Theory development

[22. Functional responses: from theory to practice](#)

[23. Like a boomerang: How feedback loops affect ecosystem stability and species coexistence](#)

[24. Integrating analytical modeling and individual-based modeling for complexity reduction, upscaling, and to gain causal understanding](#)

AI and machine learning

[25. Integrating mechanistic modeling and machine learning for environmental problem-solving and supporting transformation](#)

[26. Beyond prediction: application of machine learning to gain new ecological insights](#)

[28. The use of artificial intelligence in ecological modelling](#)

Social-ecological systems

[29. Ecological Models for the Management of social-ecological Transformations](#)

[30. Modelling change in social-ecological systems – from conceptual reflections to promising case-based examples & 30a](#)

Monday, 4th September

14:00 – 17.00 Workshops

Hall 1 A: Workshop 9: Designing Dynamic Data-Driven Digital Twin Systems in Ecology

Hall 1 B: Workshop 2: Modeling/ Group Model Building

Hall 1 CD: Workshop 6: Effective digital note taking: How to organize your knowledge and streamline your workflow

Hall 2 A: Workshop 7: Computational notebooks for more openness, reproducibility, and productivity in research

Hall 2 B: Workshop 1: En-ROADS Simulator

18:00 Ice breaker in the foyer of the Leipziger KUBUS

Tuesday, 5th September

Hall 1

09:00 Welcome and Introduction

09:40 Keynote

Maja Schlüter: Modelling human-environment interactions for uncovering mechanisms of change in social-ecological systems

10:20 Coffee break

Hall 1 A

S 10 Combining process-based simulation models and remote sensing data – benefits and limits

Chair: Rico Fischer, Nikolai Knapp, Amanda H. Armstrong, Andreas Huth, Jürgen Groeneveld

10:50 Mapping Amazon Forest Productivity by Fusing GEDI Lidar Waveforms with an Individual-Based Forest Model

Luise Bauer; Nikolai Knapp; Andreas Huth; Rico Fischer
Helmholtz-Centre for Environmental Research - UFZ

11:10 Application of the 3D-CMCC-FEM model to assess gross primary productivity in Mediterranean forests at the regional level

Daniela Dalmonech¹; Angelo Nolè²; Gina Marano³; Elia Vangi¹; Gherardo Chirici⁴; Francesca Giannetti⁴; Alessio Collalti¹
¹ *Mediterranean, National Research Council of Italy*; ² *SAFE - University of Basilicata*; ³ *ETH Zurich, Switzerland*; ⁴ *geoLAB*

11:30 Masting of the Fagaceae family: improving simulations of the SEIB-DGVM with remote sensing

Lea Végh
Hokkaido University, Japan

- 11:50 Simulating biodiversity based on remote sensing data: Combining airborne LiDAR data with InVEST Habitat Quality Model**
Julia Henzler¹; Sebastian Fiedler¹; Michael Schlund²; Kerstin Wiegand¹
¹ University of Goettingen; ² University of Twente
- 12:10 Coupling GRASSMIND and PROSAIL models to simulate remote sensing signals of grassland communities with different management**
Maksim Iakunin¹; Daniel Doktor¹; Franziska Taubert¹; Reimund Goss²; Severin Sasso²; Hannes Feilhauer¹; Sylvia Haider³; Christiana Roscher¹
¹ Helmholtz-Centre for Environmental Research (UFZ); ² University of Leipzig; ³ Martin Luther University Halle-Wittenberg, Halle (Saale), Germany
- 12:30 Lunch break & Poster session**
- 14:00 Combining remote sensing and forest modelling to assess tropical forest fragmentation**
Rico Fischer; Franziska Taubert; Michael Müller; Jürgen Groeneveld; Thorsten Wiegand; Andreas Huth
Helmholtz - Centre for Environmental Research - UFZ
- 14:20 Towards disentangling geometric and demographic fragmentation effects in biodiversity data using a virtual ecology approach**
Felix May; Stav Gelber
Freie Universität Berlin
- 14:40 Fragmentation of tropical forests and percolation theory**
Andreas Huth; Rico Fischer; Franziska Taubert; Michael Mueller; Maximilian Lachmann; Juergen Groeneveld; Thorsten Wiegand
Helmholtz - Centre for Environmental Research UFZ
- 15:00 A new approach combining the multilayer radiative transfer model with a forest model: Application to boreal forests in Finland**
Hans Henniger¹; Friedrich Bohn¹; Andreas Huth²
¹ UFZ - Helmholtz Centre for Environmental Research GmbH; ² UFZ Helmholtz Centre for Environmental Research / German Centre for Integrative Biodiversity Research (iDiv)
- 15:20 Why matrix mosquito population models and remote sensing go hand in hand?**
Domagoj Hackenberger K.¹; Tamara Djerdj¹; Tin Klanjšček²; Sunčana Geček²; Branimir Hackenberger K.³
¹ BioQuant; ² Ruđer Bošković Institute; ³ SCIOM
- 15:40 Coffee break**

S 3 - Movement modelling: underlying principles and processes

Chairs: Pernille Thorbek, Thomas Preuss, Joachim Kleinmann

- 16:10 A piece-wise approach to developing a butterfly movement model**
Luke Evans¹; Richard Sibly; Ian Sims; Tom Oliver; Pernille Thorbek; Richard Walters
¹ University of Reading, UK
- 16:30 Linking movement and life history traits through dynamic energy budget modelling**
Andre Gergs¹; Kim Rake²; Vanessa Roeben¹
¹ Bayer AG, Division Crop Science; ² Research Institute gaiac
- 16:50 Movement modelling for small and medium sized mammals of the agricultural landscape for pesticide risk refinement**
Joachim Kleinmann¹; Magnus Wang²
¹ BASF SE; ² WSC Scientific GmbH

17:10 How virtual environments help to parameterize learning and decision making in a model for wild chimpanzee movement

Emiel van Loon¹; Evy van Berlo; Kavel Ozturk MSc; Karline Janmaat²

¹ *University of Amsterdam*; ² *University of Leiden*

17:30 Anticipating common buzzard population patterns in the afforesting UK landscape

Eduardo M. Arraut¹; Sean S. Walls²; David W. Macdonald³; Robert E. Kenward⁴

¹ *Aeronautics Institute of Technology, ITA*; ² *Lotek-UK*; ³ *Oxford University*; ⁴ *United Kingdom Centre for Ecology and Hydrology*

17:50 Refreshment for Workshop participants in Kubus foyer

18:15 – 20:15 Workshop 3: Participatory explorative stakeholder modeling

Tuesday, 5th September

Hall 1 B

S 26 - Beyond prediction: application of machine learning to gain new ecological insights

Chairs: Hanna Meyer, Masahiro Ryo

10:50 Species distribution models based on ML and DL - can we reliably infer ecological effects?

Maximilian Pichler; Florian Hartig

University of Regensburg

11:10 A comparison of machine learning and statistical species distribution models: quantifying overfitting supports model interpretation

Emma Chollet Ramampandra; Andreas Scheidegger; Jonas Wydler; Nele Schuwirth

Eawag, Switzerland

11:30 Exploring spatial autocorrelation and variable importance in machine learning models using patternograms

Jakub Nowosad

Adam Mickiewicz University in Poznan, Poland

11:50 Spatio-temporal model and machine learning method reveal patterns and processes of migration under climate change of North Pacific spiny dogfish

Yuki Kanamori¹; Toshikazu Yano; Hiroshi Okamura; Yuta Yagi

¹ *Japan Fisheries Research and Education Agency*

12:10 Tracking shifts of forest ecotones in aerial imagery with deep learning

Michael Maroschek¹; Rupert Seidl; Cornelius Senf; Werner Rammer

¹ *Berchtesgaden National Park*

12:30 Lunch break & Poster session

14:00 Model evaluation strategy impacts the interpretation and performance of machine learning models

Lily-belle Sweet¹; Christoph Müller²; Mohit Anand¹; Jakob Zscheischler³

¹ *Helmholtz Centre for Environmental Research - UFZ*; ² *Potsdam Institute for Climate Impact Research (PIK)*; ³ *Helmholtz Centre for Environmental Research – UFZ / Technische Universität Dresden*

14:20 Disentangling the role of weather drivers and forest structure on large-scale tree mortality with Transformer

Mohit Anand¹; Friedrich J. Bohn¹; Gustau Camps-Valls²; Rico Fischer¹; Andreas Huth¹; Lily-belle Sweet¹; Jakob Zscheischler¹
¹ Helmholtz Centre for Environmental Research - UFZ; ² Universitat de València

14:40 Mapping joint species distribution model predictions on the known species interactions space to increase causal understanding

Christophe Van Neste; Quentin Groom
Meise Botanic Garden

15:00 Dynamics of collective plant macrophenology from crowd-sourced data

Karin Mora; Jana Wäldchen; Michael Rzanny; Guido Kraemer; Ingolf Kühn; Patrick Mäder; Sophie Wolf; Teja Kattenborn; Miguel Mahecha

15:20 Discussion

15:40 Coffee break

S 8 - Integrative approaches to capture natural disturbance impacts in models

Chair: Olalla Díaz-Yáñez

16:10 Simulating biotic disturbance agents and their interactions in forest landscapes

Juha Honkaniemi¹; Katharina Albrich¹; Winslow D. Hansen²; Katherine Hayes²; Werner Rammer³; Rupert Seidl³

¹ Natural Resources Institute Finland (Luke); ² Cary Institute of Ecosystem Studies; ³ Technical University Munich

16:30 Predisposing and inciting stress factors leading to beech mortality in Switzerland

Gina Marano; Ulrike Hiltner; Harald Bugmann
ETH Zurich

16:50 A window into the future: Forest reorganization in landscapes with contrasting disturbance regimes

Christina Dollinger¹; Kristin Braziunas¹; Timon Keller²; Yuta Kobayashi³; Johannes Mohr¹; Akira Mori⁴; Werner Rammer¹; Kureha Suzuki⁴; Monica Turner²; Rupert Seidl¹

¹ TUM Technical University of Munich; ² University of Wisconsin-Madison; ³ Tokyo University of Agriculture and Technology; ⁴ The University of Tokyo

17:10 Vulnerability assessment to wind damage in a protective forest stand in the Alps.

Maximiliano Costa¹; Tommaso Baggio²; Barry Gardiner³; Emanuele Lingua²

¹ ETH (Zurich); ² University of Padova; ³ Institut Européen de la Forêt Cultivée

17:30 Simulating biotic disturbances with forest landscape models: comparing different approaches in different forest ecosystems

Marco Mina
Eurac Research

17:50 Refreshment for Workshop participants in Kubus foyer

18:15 – 20:15 Workshop 4: Towards unified principles for movement modelling

Tuesday, 5th September

Hall 1 CD

S21 - Ecological risk assessment and management – benefits and challenges of ecological modelling

Chairs: Oliver Jakoby, Andreas Focks

10:50 Mechanistic effect models in the environmental risk assessment of chemicals - Possibilities and requirements

Andreas Focks
Osnabrück University

11:10 How to Include Temperature in Ecological Risk Assessment

Annika Mangold-Döring¹; Jan Baas¹; Andreas Focks²; Paul van den Brink¹; Egbert van Nes³
¹ *Wageningen Environmental Research*; ² *Osnabrück University*; ³ *Wageningen University & Research*

11:30 A workflow for assessing the quality of model input data - an example from toxicokinetic-toxicodynamic modelling

Barbara Bauer¹; Alexander Singer¹; Zhenglei Gao²; Oliver Jakoby¹; Johannes Witt²; Thomas Preuss²; André Gergs²
¹ *RIFCON GmbH*; ² *Bayer AG, Division Crop Science*

11:50 Individual-based modelling for risk assessment

Liubov Zakharova; Benoit Goussen
IBACON GmbH

12:10 Using mechanistic effect modelling to evaluate field effect study design for environmental risk assessment

Oliver Jakoby¹; Pernille Thorbek²; Torben Wittwer¹; Katharina Ott²; Tina Grimm¹; Kai Ristau²; Lara Ibrahim¹
¹ *RIFCON GmbH*; ² *BASF SE*

12:30 Lunch break & Poster session

14:00 Modelling the Fate of Pesticides in ALMaSS: A Multi-Compartment Approach for Risk Assessment

Trine Poulsen¹; Christopher John Topping; Xiaodong Duan
¹ *Aarhus University*

14:20 Assessing the abundance variability of beneficial terrestrial arthropod species

Leonhard Urs Bürger¹; Andreas Focks
¹ *Osnabrück University*

14:40 Uncertainty quantification for model-based decision support for ecological risk assessment

Nele Schuwirth; Helen Moor
Eawag, Swiss Federal Institute of Aquatic Science and Technology

15:00 Modelling the establishment potential and economic impact of plant pests in Germany

Bastian Hess; Jenny Jacobs; Anne Wilstermann; Gritta Schrader
Julius Kühn-Institute - Institute for National and International Plant Health

15:20 Multi-agent modelling to simulate the boosted sterile insect technique for fruit fly management

Esther Diouf¹; Thierry Brévault¹; Saliou Ndiaye²; Emile Faye¹; Anais Chailleux¹; Paterne Diatta³; Cyril Piou¹
¹ *CIRAD*; ² *ENSA*; ³ *ISRA*

15:40 Coffee break

- 16:10 Exploring the success of the Boosted Sterile Insect Technique with a theoretical agent-based model**
Fanny Herbillon¹; Esther Gnilane Diouf¹; Thierry Brévault²; Marion Haramboure³; Simmon Fellous⁴; Cyril Piou¹
¹ CIRAD, France; ² CIRAD, UPR AIDA, BIOPASS, Dakar, Sénégal; ³ CIRAD, France; ⁴ INRAE, France
- 16:30 Evaluating the risk of biological invasion by alien plants in India: Ensemble machine learning models revealed management insights**
Amiya Ranjan Bhowmick¹; Jyoti Prajapati¹; Achyut Kumar Banerjee²; Abhishek Mukherjee³
¹ Institute of Chemical Technology, Mumbai; ² Sun Yat-sen University, China; ³ Indian Statistical Institute
- 16:50 An individual-based model to support conservation decisions of a critically endangered grassland bird**
Tiago Crispim-Mendes¹; Francesco Valerio²; Ana Teresa Marques²; Ricardo Pita¹; Sérgio Godinho³; João Paulo Silva²
¹ MED – Mediterranean Institute for Agriculture, Environment, and Development & CHANGE – Global Change and Sustainability Institute, Portugal; ² CIBIO, Universidade do Porto, EaRSLab—Earth Remote Sensing Laboratory, University of Évora, Portugal
- 17:10 Habitat modelling of vascular plants of the hardwood floodplain forest of the Leipzig Northwest Floodplain in the "Lebendige Luppe" project**
Frank Masurowski
Helmholtz Centre for Environmental Research – UFZ
- 17:50 Refreshment for Workshop participants in Kubus foyer**

18:15 – 20:15 Workshop 5: Social-ecological and Ecological-economic - Models for Land-based Biodiversity Conservation

Tuesday, 5th September

Hall 2 A

S1 - Animal migrations under global changes – threats, implications, and mitigation

Chair: Simeon Lisovski

- 10:50 Animal migrations under global changes – threats, implications, and mitigation**
Silke Bauer¹; Yali Si²; Simeon Lisovski³
¹ Swiss Ornithological Institute; ² Leiden University; ³ Alfred Wegener Institute Helmholtz Center for Polar and Marine Research
- 11:10 Predicting geese migration under climate change and habitat alterations**
Ulysse Reverre-Lamotte¹; Silke Bauer²; Simeon Lisovski¹
¹ AWI; ² Vogelwarte, CH
- 11:30 Integrating individual-based models and machine learning for bird migration forecasts and inference about underlying decision rules**
Bart Hoekstra¹; Emiel van Loon¹; Adriaan Dokter²; Judy Shamoun-Baranes¹
¹ University of Amsterdam; ² Cornell Lab of Ornithology
- 12:30 Lunch break & Poster session**

S 20 - Environmental modelling for policy support – how to build bridges between two worlds

Chair: Klaus Hennenberg, Mirjam Pfeiffer

- 14:00 Where can ecosystem services be improved in agricultural landscapes? – An opportunity-map approach for Northwest-Saxony, Germany**
Irina Hei¹; Matteo Wolf²; Andrea Kaim¹
¹ Helmholtz-Zentrum fr Umweltforschung GmbH – UFZ; ² University of Bayreuth, Germany
- 14:20 A comparison of agri-environment measures' contributions to habitat suitability for farmland birds across regions, species, and model algorithms**
Stephanie Roilo; Anna Cord
Technische Universitt Dresden
- 14:40 Opportunities and limitations of modelling approaches to evaluate the efficacy of policy instruments within the policy advise process**
Christoph Schnemann, Anastasiia Sidorova, Hendrik Herold
Leibniz Institute of Ecological Urban and Regional Development
- 15:00 Persefone.jl: an adaptable open-source model of agriculture and ecosystems**
Daniel Vedder; Guy Pe'er
Helmholtz Centre for Environmental Research - UFZ / German Centre for Integrative Biodiversity Research (iDiv) / Friedrich Schiller University Jena
- 15:20 Fisheries Management in a Changing Environment, or, How to Improve a Running System?**
Maria Elena Pierce
Thnen Institute for Baltic Sea Fisheries
- 15:40 Coffee break**
- 16:10 When models become bold - lessons learned from five LULUCF models out of three projects**
Kai Neumann
Consideo GmbH
- 16:30 Scenarios and monitoring systems: Instruments for exploring and evaluating strategies for the transition towards a sustainable bio-economy**
Jan Schngel; Rdiger Schaldach
University of Kassel
- 16:50 Application of the Carbon Budget Model to assess the contribution of climate-smart forestry for climate change mitigation in forests of the European Alps.**
Sebastian Brocco¹; Roberta Berretti²; Renzo Motta²; Giorgio Vacchiano¹
¹ University of Milan; ² University of Turin
- 17:10 A scenario-based analysis for political decision making in Bavaria to enhance biodiversity and climate mitigation**
Anne Lewerentz¹; Juliano S. Cabral²; Jana Blechschmidt³; Stefan Fallert³; Elizabeth Gosling⁴; Konstantin Gregor⁴; Isabelle Jarisch⁴; Andreas Krause⁴; Sven Rubanschki⁴; Christian Stetter⁵; Maximilian Brnner⁶; Florian Hartig⁷; Markus Hoffmann⁴; Julia Kiesli
¹ Karlsruhe Institut fr Technologie; ² University of Birmingham; ³ University of Wrzburg; ⁴ Technical University of Munich ; ⁵ ETH Zurich; ⁶ University Erlangen-Nrnberg; ⁷ University of Regensburg
- 17:30 Integrating multiple modeling approaches to bridge the gap between modeling and decision-making in management of a marine ecosystem**
Gideon Gal; Yoav Peled; Eyal Ofir
Israel Oceanographic and Limnological Research
- 17:50 Refreshment for Workshop participants in Kubus foyer**
- 18:15 – 20:15 Workshop 8: Ecological modelling for environmental risk assessment**

Tuesday, 5th September

Hall 2 B

S5 - Reusable building blocks (RBB) for agent-, and individual-based models

Chairs: Uta Berger, Volker Grimm

- 10:50 Reusable building blocks for agent-based modelling: benefits, challenges, and a strategy for their release**
Uta Berger¹; Volker Grimm²
¹ Technische Universität Dresden; ² Helmholtz Centre for Environmental Research-UFZ
- 11:10 Developing a Benchmarking Framework for a Ready-to-Use RBB Library for Forest Ecology: pyMANGA**
Marie-Christin Wimmeler¹; Jasper Bathmann¹; Jonas Vollhüter²; Uta Berger¹
¹ Technische Universität Dresden; ² Freie Universität Berlin, Institute of Biology, Berlin, Germany
- 11:30 ~~Online Model Library of larval fish: a tool to better understand fish recruitment in changing marine~~**
~~Anna Akimova¹; Tahereh Nakisa¹; Ute Daewel²; Ismael Nunez-Riboni¹~~
~~*¹ Thünen Institute for Sea Fisheries; ² HEREON*~~ **Cancelled**
- 11:50 Review on process-based predictive models for studying impact of disturbance on marine mammals**
Magda Chudzinska¹; Cara Gallagher²
¹ University of St Andrews; ² University of Potsdam
- 12:10 Entity Component System (ECS) – a design for flexible and performant individual-based models (IBMs)**
Martin Lange
Helmholtz Centre for Environmental Research - UFZ
- 12:30 Lunch break & Poster session**

S6 - Next-generation advances in individual-based modelling

Chair: Aisling Daly

- 14:00 How are local communities defined? A mismatch between metacommunity theory and empirical studies**
Lluís Serra; Nerea Abrego; Otso Ovaskainen
University of Jyväskylä
- 14:20 Individual-Based Models to inform elasmobranch conservation in a Mediterranean sub-basin**
Carlo Zampieri; Alberto Barausse
University of Padova
- 14:40 Fish condition as an indicator of stock status: a DEB-IBM approach to support fisheries management**
Ines Haberle¹; Lav Bavčević²; Tin Klanjšček¹
¹ Ruđer Bošković Institute; ² University of Zadar
- 15:00 Dynamic energy budget individual-based models revisited: integrating individual-scale behaviours**
Wissam Barhdadi; Aisling Daly; Jan Baetens; Bernard De Baets
- 15:20 New approaches in model calibration for studying epigenetic mechanisms of homeostasis in response to environmental stressors**

Kristin Crouse¹; Diane Genereux²; Allyson Hindle³; Elinor Karlsson⁴; Carla Madelaire⁵; Lucas Moreira²; Valery Forbes⁶

¹ University of Minnesota; ² Broad Institute; ³ University of Nevada, Las Vegas; ⁴ University of Massachusetts; ⁵ San Diego Zoo; ⁶ Florida Atlantic University

15:40 Coffee break

S 11 - Mathematical and data-driven models in ecohydrology

Chairs: Ricardo Martinez-Garcia, Justin M. Calabrese

16:10 A global analysis platform for understanding how changing hydrology influences riverine fish biodiversity

Justin M. Calabrese¹; Richard Tripathi²; Falk Hesse³; Adam Mertel³; Jeffrey Kelling⁴

¹ HZDR / UFZ / University of Maryland; ² HZDR / Washington University; ³ HZDR; ⁴ HZDR / Chemnitz University of Technology

16:30 Modeling the functioning of multiple stressed riverine ecosystems: Challenges and solutions

Laura Meier¹; Mario Brauns¹; Mechthild Schmitt¹; Volker Grimm¹; Karin Frank²; Markus Weitere¹

¹ Helmholtz-Centre for Environmental Research – UFZ; ² Helmholtz Centre for Environmental Research - UFZ / German Centre for Integrative Biodiversity Research (iDiv)

16:50 Mechanistically delineating the effects of temperature and salinity on stream dissolved oxygen

Luan Farias¹; Michael Rode²; T.T. (Thi Thu) Yen Le¹

¹ Universität Duisburg-Essen; ² Helmholtz-Zentrum für Umweltforschung UFZ

17:10 Modelling tropical saltmarshes as signature ecosystems for vegetation reliance on spatial and temporal patterns of both water quantity and quality.

Ronny Peters¹; Jonas Vollhüter²; Marie-Christin Wimmeler¹; Ulf Mehlig³; Uta Berger¹

¹ TU Dresden; ² FU Berlin; ³ Universidade Federal do Pará

17:50 Refreshment for Workshop participants in Kubus foyer

18:15 – 20:15 Workshop 10: Talking about models

Tuesday, 5th September

Room 101, Building 4.0

18:15 – 20:15 Workshop 11: Reducing ambiguities and increasing efficiency

Wednesday, 6th September

Hall 1

09:00 Keynote

David Storch: Towards a general framework for understanding biodiversity patterns in space and time

09:40 Keynote

Stephanie Kramer-Schadt: The host, the environment and the pathogen – understanding wildlife disease dynamics when data are rare

10:20 Coffee break

Hall 1 A

S 3 – Movement modelling: underlying principles and processes

Chairs: Pernille Thorbek, Thomas Preuss, Joachim Kleinmann

10:50 To go or not to go? Modeling the decision-making process behind ungulate partial migration

Ricardo Martinez-Garcia

Center for Advanced Systems Understanding (CASUS) - Helmholtz Zentrum Dresden-Rossendorf (HZDR)

11:10 Trait-based patterns in step-selection responses across species.

Björn Franke; Aafke Schipper; Mark A. J. Huijbregts; Marlee Tucker

Radboud University Nijmegen

11:30 Continuous capture process based on advection-diffusion-reaction models within Joint species movement modelling

Luisa Fernanda Rodriguez Carrillo¹; Otso Ovaskainen²

¹ *University of Helsinki*; ² *University of Jyväskylä*

12:10 A method to evaluate the barrier effect of urban elements: a case study with blackbirds in Munich

Anne Mimet¹; Lisa Merckens¹; Soyeon Bae²; Thomas E. Hauck³; Wolfgang W. Weisser¹

¹ *Technical University Munich*; ² *Universität Göttingen*; ³ *Technische Universität Wien*

12:30 A multi-sensor GEE framework to match high-quality remote sensing data with wildlife movement when spatiotemporally scaling behaviour-driven resource selection

Francesco Valerio¹; Sérgio Godinho²; Ana Teresa Marques³; Tiago Crispim-Mendes⁴; Ricardo Pita⁴; João Paulo Silva³

¹ *BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO/University of Porto*; ² *EaRSLab-Earth Remote Sensing Laboratory/University of Évora*; ³ *CIBIO-Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado/Un*

12:30 Lunch break & Poster session

S 14 - Leveraging animal ecophysiology to enhance model predictability in a changing world

Chair: Cara A. Gallagher, Marianna Chimienti

14:00 Explicit Consideration of Temperature Improves Predictions of Toxicokinetic–Toxicodynamic Models

Annika Mangold-Döring¹; Anna Huang¹; Egbert van Nes²; Andreas Focks³; Paul van den Brink¹

¹ *Wageningen Environmental Research*; ² *Wageningen University & Research*; ³ *Osnabrück University*

14:20 Diving deep into temperature-dependent sex determination of loggerhead sea turtles, *Caretta caretta*: are mothers contributing more than we think?

Rebekka Allgayer¹; James Gilbert²; Justin Travis¹; Eugenie Yen²; Christophe Eizaguirre²

¹ *University of Aberdeen*; ² *Queen Mary University of London*

14:40 Using Integrative Biophysical and Agent-Based Models to Predict Plethodontid Salamander Behavior

Kira McEntire

Queens University of Charlotte - Charlotte, NC

15:00 Predicting effects of climate change on aquatic ectotherms using Dynamic Energy Budgets: a (cray)fish case study (or two)

Nina Marn¹; Ines Haberle¹; Sandra Hudina²; Adriana E. Sardi³; Jose M. Moreira⁴; Tin Klanjscek¹
¹ *Rudjer Boskovic Institute*; ² *University of Zagreb*; ³ *EPOC-LPTC, University of Bordeaux*; ⁴ *MARETEC—Marine, Environment and Technology Center, LARSyS, Instituto Superior Técnico, University of Lisbon*

- 15:20 Energetic consequences of resource fragmentation in a simulated mammal community: Linking movement, metabolism and coexistence**
 Leonna Szangolies; Cara Gallagher; Florian Jeltsch
University of Potsdam
- 15:40 Coffee break**
- 16:10 Species distribution models are improved by incorporating thermal physiology under current and future climate change**
 Jussi Mäkinen¹; Julia Laterza Barbosa²; Brooke Lee Bodensteiner²; Jeremy Cohen²; Diego Ellis Soto²; Shubhi Sharma²
¹ *University of Helsinki*; ² *Yale University*
- 16:30 Large herbivores in a dynamic global vegetation model: from physiology to carrying capacity**
 Wolfgang Traylor¹; Matthew Forrest¹; Thomas Hickler²
¹ *Senckenberg - Biodiversität und Klimaforschungszentrum (BiK-F)*; ² *Senckenberg - Biodiversität und Klimaforschungszentrum (BiK-F) / Goethe University*
- 16:50 Combining bioenergetics and movement models to improve understanding of the population consequences of disturbance**
 Magda Chudzinska; Katarina Klementisova; Cormac Booth
SMRU Consulting
- 17:10 Bioenergetic modelling of a marine top predator's responses to changes in prey structure**
 Mariana Silva¹; Cláudia Oliveira¹; Rui Prieto¹; Mónica Silva¹; Leslie New²; Sergi Pérez-Jorge¹
¹ *OKEANOS, University of the Azores*; ² *Ursinus College*
- 17:30 Estimating Energy Balance of Adélie Penguins Using Depth Data and Machine Learning**
 Benjamin Dupuis; Marianna Chimienti; Coline Marciau; Olivia Hicks; Yan Ropert-Coudert; Frédéric Angelier; Akiko Kato
La Rochelle Université, France

19:00 Conference Dinner at Moritzbastei

Wednesday, 6th September

Hall 1 B

S 7 – New methods and applications in trait-based modelling in ecology

Chairs: Mateus Dantas de Paula, Liam Langan, Simon Scheiter, Thomas Hickler, Katrin Meyer

- 10:50 How traits control species' biomass in monoculture and mixture and drive biodiversity-ecosystem functioning relationships**
 Verónica Ceballos Núñez¹; Christian Wirth; Adam Thomas Clark; Michael S. Crawford; Caroline E. Farrior; Jes Hines; Jens Kattge; Emma Ladouceur; Jeremy Lichstein; Isabelle Maréchaux; Felix May; Akira Mori; Björn Reineking; Lindsay Turnbull
¹ *Leipzig University / German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig*
- 11:10 Trait patterns simulated by aDGVM2 can be used for biome classification**
 Simon Scheiter¹; Dushyant Kumar; Mirjam Pfeiffer; Liam Langan
¹ *Senckenberg Biodiversity and Climate Research Centre (SBiK-F)*

- 11:30 Using a trait-based model to identify land use schemes that increase plant diversity while maintaining high yields in grasslands in Germany**
Felix Nößler; Oksana Buzhdygan; Thibault Moulin; Felix May
Freie Universität Berlin
- 11:50 Simulating trait shifts of German forests under droughts and climate change - First results of ForestSpectrum**
Boris Sakschewski¹; Martin Gutsch¹; Werner von Bloh¹; Christopher Reyer¹; Kirsten Thonicke¹; Maik Billing¹; Sarah Bereswill¹; Markus Druke¹; Max Tölle¹; Mats Mahnken¹; Jamir Priesner¹; Tobias Schad²; Marco Natkhin²; Ta
¹ Potsdam Institute for Climate Impact Research (PIK); ² Thünen Institute of Forest Ecosystems
- 12:10 Exploring variations in species traits and indicator values correlating with the invasiveness of plant species**
Kristina Blennow¹; Cecilia Palmér²
¹ Swedish University of Agricultural Sciences (SLU) AND Lund University; ² Swedish University of Agricultural Sciences (SLU)
- 12:30 Lunch break & Poster session**
- 14:00 Quantifying the effect of competition on functional assembly of moss and lichen communities: A process-based model analysis**
Yunyao Ma¹; Imke Petersen¹; Maaiké Y. Bader²; Philipp Porada¹
¹ University of Hamburg; ² University of Marburg
- 14:20 Network-informed selection of traits for ecosystem research**
Quan Pan; Marijn Bauters; Marc Peaucelle; Hans Verbeeck
Ghent University
- 14:40 EcoMoveR: A species-based ecosystem model at the landscape scale**
Selwyn Hoeks
Radboud University Nijmegen
- 15:00 Hierarchical ordination, a unifying framework for drivers of community processes**
Robert Brian O'Hara; Bert van der Veen
NTNU Norwegian University of Science and Technology
- 15:20 Amazon southeastern presents higher functional richness but lower ability to store carbon with reduced precipitation**
Bianca Fazio Rius¹; Carolina Casagrande Blanco¹; João Paulo Darela Filho²; Guilherme Gutierrez Pereira³; Caio Reis Costa Mattos⁴; Deliane Penha⁵; David Montenegro Lapola¹; Marina Hirota⁶
¹ State University of Campinas; ² Technical University Munich; ³ University of Campinas; ⁴ Princeton University; ⁵ Instituto Nacional de Pesquisas da Amazônia; ⁶ Federal University of Santa Catarina
- 15:40 Coffee break**
- 16:10 Assessing the tree regeneration niche from inventory data using a dynamic forest model**
Yannek Käber¹; Florian Hartig²; Harald Bugmann³
¹ University of Freiburg; ² University of Regensburg; ³ ETH Zurich
- 16:30 Including the collaboration gradient of root traits and mycorrhiza in a Dynamic Vegetation Model**
Mateus Dantas de Paula¹; Liam Langan¹; Kerstin Pierick²; Laynara Lugli³; Tatiana Reichert; Joao Paulo Darela Filho⁴; Anja Rammig⁴; Jürgen Homeier²; Thomas Hickler⁵

¹ Senckenberg - Biodiversität und Klimaforschungszentrum (BiK-F); ² Göttingen University; ³ Technical University of Munich; ⁴ TUM Technical University of Munich; ⁵ Senckenberg - Biodiversität und Klimaforschungszentrum (BiK-F) / Goethe University

16:50 Small-scale coexistence of three congeneric tree species is driven by trait differentiation and plasticity in a Brazilian flooded white-sand forest

Valéria Forni Martins¹; Kelly Fernandes de Oliveira Ribeiro²; Flavio Antonio Maës dos Santos²

¹ UFSCar; ² UNICAMP

17:10 Model-based Impact Analysis of Climate Change and Land-use Intensification on Trophic Networks

Christian Neumann¹; Tuanjit Sritongchuay¹; Ralf Seppelt^{1,2,3}

¹ Department Computational Landscape Ecology, UFZ – Helmholtz Centre for Environmental Research, Leipzig, Germany; ² Institute of Geoscience & Geography, Martin-Luther-University Halle-Wittenberg, Halle (Saale), Germany; ³ iDiv – German Centre for Integrative Biodiversity Research, 04103 Leipzig, Germany

19:00 Conference Dinner at Moritzbastei

Wednesday, 6th September

Hall 1 CD

S 25 – Integrating mechanistic modeling and machine learning for environmental problem-solving and supporting transformation

Chair: Markus Reichstein

10:50 Deep learning for likelihood-free inference in complex computer simulations

Florian Hartig

University of Regensburg

11:10 Linking non-parametric upscaling of agent-based models to machine learning

Thorsten Wiegand Dr.¹; Pablo A. Cipriotti.²

¹ Helmholtz Centre for Environmental Research GmbH - UFZ; ² Universidad de Buenos Aires

11:30 A hybrid modeling approach for spatiotemporal bird migration forecasts based on weather radar data

Fiona Lippert; Bart Kranstauber; Patrick Forré; E. Emiel van Loon

University of Amsterdam

11:50 Double machine learning for causal hybrid modeling in Earth sciences

Kai-Hendrik Cohrs¹; Gherardo Varando¹; Markus Reichstein²; Gustau Camps-Valls¹

¹ Universitat de València; ² Max Planck Institut for Biogeochemistry Jena

12:10 General discussion

12:30 Lunch break & Poster session

S 30 – Modelling change in social-ecological systems – from conceptual reflections to promising case-based examples

Chair: Birgit Müller, Maja Schlüter, Calum Brown

- 14:00** ~~Evaluating policy outcomes in complex land-use systems~~
 Nils Droste¹; Dalia D'Amato²; Hanna Ekström¹; Alexia Fridén¹; Bogomil Emilov Iliev³; Akonwi Nebasifu Ayonghe⁴; Wilhelm May¹; Marianne Thomsen³
¹Lund University; ²Finnish Environment Institute (SYKE); ³Copenhagen University; ⁴University of Helsinki **Cancelled**
- ^
- 14:20** **Emerging societal tipping points in social-ecological system models**
 Jun.-Wolfram Barfuss
 University of Bonn
- 14:40** **A game-theoretic systematic of interactions and dynamics in the conservation and management of spatial ecosystem services**
 Martin Drechsler
 Helmholtz - Centre for Environmental Research - UFZ
- 15:00** **Balancing Cost and Benefit: A Theoretical Study of Fungicide Treatment in Multiple Fields**
 Prateek Verma¹; Alexey Mikaberidze²; Chaitanya Gokhale³; Maria Bargués-Ribera⁴
¹Institute for Chemistry and Biology of the Marine Environment (ICBM); ²University of Reading; ³Max Planck Institute for Evolutionary Biology; ⁴University of Cambridge
- 15:20** **Social-Ecological Modelling of Bivalve harvesting in the North Adriatic Sea: Insights for Sustainability**
 Serena Zunino¹; D. Borme¹; S. Ciriaco²; C. Solidoro¹; D. Melaku Canu¹
¹National Institute of Oceanography and Applied Geophysics - OGS; ²Shoreline Soc. Coop., AREA Science Park, Padriciano
- 15:40** **Coffee break**
- 16:10** **Large-scale land-based quality of life estimations under climate and socio-economic scenarios**
 Elizabeth Díaz General; Calum Brown; Mark Rounsevell
 Karlsruhe Institut für Technologie (IMK-IFU)
- 16:30** **Exploring the transformation to more regenerative agricultural systems using empirical case studies and a coupled social-ecological model**
 Luana Schwarz; Jonathan Donges
 PIK - Potsdam Institute for Climate Impact Research
- 16:50** **Semi-empirical modelling meets sensitivity analysis: do droughts impact management decisions in Central European grasslands?**
 Julia Kunkel; Jürgen Groeneveld; Birgit Müller
 Helmholtz Centre for Environmental Research - UFZ
- 17:10** **Modeling rangelands as complex adaptive socio-ecological systems: An agent-based model of pyric herbivory**
 Hsiao-Hsuan Wang; William Grant
 Texas A&M University

19:00 Conference Dinner at Moritzbastei

Wednesday, 6th September

Hall 2 A

S 2 - Modelling species migration and range shifts under global change

Chair: Heike Lischke

10:50 Modelling the role of multiple global change drivers on future range shifts in a tropical Biodiversity HotspotEmma L Underwood¹; Kerry A Brown¹; Nigel Walford¹; Mark Mulligan²¹ Kingston University London; ² King's College London**11.10 CATS: Modelling plant migration in a changing environment**

Andreas Gattringer; Johannes Wessely; Karl Hülber; Dietmar Moser; Stefan Dullinger

University of Vienna, Austria

11:30

11:50 Details matter! – importance of small-scale processes to model high-latitude ecosystem responses

Stefan Kruse; Josias Gloy; Ramesh Glückler; Veronika Döpfer; Ulrike Herzsuh

Alfred Wegener Institute Helmholtz Center for Polar and Marine Research

12:10 Tree migration in complex landscapes

Olalla Díaz-Yáñez; Paloma Julia Martinez; Harald Bugmann

ETH Zurich

12:30 Lunch break & Poster session**14:00 Simulating landscape-scale treeline dynamics under climate and land-use change to support forest management strategies**Sebastian Marzini¹; Marco Mina¹; Camilla Wellstein²; Erich Tasser¹¹ Eurac Research; ² Free University of Bolzano-Bozen**14:20 Competition and demography rather than dispersal limitation slow down upward shifts of trees' upper elevation limits in the Alps**Daniel Scherrer¹; Yann Vitasse¹; Antoine Guisan²; Thomas Wohlgemuth¹; Heike Lischke¹¹ Swiss Federal Institute for Forest, Snow and Landscape Research WSL; ² University of Lausanne**14:40 Postglacial range formation of temperate forest understorey herbs – insights from a spatiotemporally explicit modelling approach**

Johannes Wessely

University of Vienna, Austria

15:00 Estimating species ability to follow climate change – dispersal matters and current environmental envelopes might not be sufficientVeiko Lehsten¹; Deborah Zani²; Heike Lischke³¹ Mid Sweden University; ² University of Lund; ³ Swiss Federal Institute for Forest, Snow and Landscape Research WSL**15:20 Modelling Northern Hemisphere tree migration in the last 50,000 years**Deborah Zani¹; Heike Lischke¹; Veiko Lehsten²¹ Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Birmensdorf, Switzerland; ² Lund University**15:40 Coffee break****S 9 - Digital twins – a new modelling paradigm for ecology?**

Chair: Koen de Koning

- 16:10 A digital twin of the crane migration**
Koen de Koning¹; Melanie Arp²; Hugo Koopmans²; Johan Mansson³; Lovisa Nilsson³
¹ Wageningen University; ² Sensing Clues Foundation; ³ Swedisch University of Agricultural Sciences
- 16:30 From Model to Digital Twin: Use Case Blueprints and Challenges in building Digital Twins for Environmental Research and Policy**
Merijn de Bakker, Elena Lazovik, Franziska Taubert, Thanasis Trantas, Volker Grimm, Jeroen Broekhuijsen, Otso Ovaskainen
TNO, Netherlands
- 16:50 Individual-based remote sensing of trees: towards digital twins of forests**
Nikolai Knapp
Thünen Institute of Forest Ecosystems
- 17:10 Monitoring and protecting biodiversity with Digital Twins**
Franziska Taubert¹; Merijn P. de Bakker²; Thomas Banitz¹; Volker Grimm¹; Jürgen Groeneveld¹; Otso Ovaskainen³
¹ Helmholtz Centre for Environmental Research - UFZ; ² The Netherlands Organisation for Applied Scientific Research (TNO); ³ University of Jyväskylä (JYU)
- 17:30 Development of three prototype digital twins for (near) real-time biodiversity monitoring and conservation**
Anna Davison; Koen de Koning
Wageningen University & Research

19:00 Conference Dinner at Moritzbastei

Wednesday, 6th September

Hall 2 B

S 13 - Model-based data integration as a basis for FAIR ecological modelling, monitoring, and synthesis

Chair: Steffen Ehrmann

- 10:50 Integration of forest inventory data, forest growth modeling and 3D visualization: a case study from the Elster-Luppe floodplain forests in Leipzig.**
Hans Dieter Kasperidus¹; Timo Hartmann¹; Christian Hecht¹; Georg Rieland¹; Rolf Engelmann²; Caroline Seele-Dilbat³; Michael Vieweg¹; Peter Biber⁴; Mathias Scholz¹
¹ Helmholtz Centre for Environmental Research - UFZ; ² Leipzig University; ³ City of Leipzig; ⁴ Technical University Munich
- 11:10 Respect your Data! Efficient integrated modelling of species distributions**
Bob O'Hara
NTNU Norwegian University of Science and Technology
- 11:30 A reproducible workflow for the field of data integration**
Philip Mostert; Wouter Koch; Anne Bruls Msc; Ellen Martin Msc; Ragnhild Bjørkås Msc; Robert O'Hara
Norwegian University of Science and Technology
- 11:50 A novel pipeline for assessing ecological economics models using an artificial landcover generator**
Eyal Goldstein¹; Kerstin Wiegand; Volker Von Gross; Carola Paul
¹ Goettingen University
- 12:10 Extended discussion on trends and perceived needs to foster modern workflows**

Moderation: Steffen Ehrmann

12:30 Lunch break & Poster session

S 29 - Ecological Models for the Management of social-ecological Transformations

Chairs: Broder Breckling, Hauke Reuter

14:00 Aligning agent-based modelling with multi-objective optimization to minimize trade-offs of an agricultural transformation

Andrea Kaim; Bartosz Bartkowski; Malin Gütschow; Irina Heiß; Johannes Linde
Helmholtz - Centre for Environmental Research - UFZ

14:20 Applying the new developed rubber plant functional type in the Community Land Model (CLM5) to an environmental-friendly ecosystem

Ashehad A. Ali¹; Yuanchao Fan²; Martyna M. Kotowska¹; Christian Stiegler¹; Fabian Brambach¹; Dirk Holscher¹; Holger Kreft¹; Marife D. Corre¹; Edzo Veldkamp¹; Alexander Knohl
¹ *University of Goettingen*; ² *Tsinghua University*

14:40 A modelling tool to explore landscape management strategies to promote pest control and limit beet yellows disease spread

Gaëlle van Frank¹; Olivier Therond²; Aude Vialatte¹
¹ *UMR DYNAFOR, INP de Toulouse, INRAE, France*; ² *Université de Lorraine, INRAE, France*

15:00 Using models and multi-objective optimization tools to guide the transformation toward more sustainable agricultural systems

Marta Bonato¹; Anna F. Cord²; Bartosz Bartkowski¹; Michael Strauch¹
¹ *UFZ - Helmholtz Centre for Environmental Research*; ² *Technische Universität Dresden*

15:20 A GIS modelling approach to analyse landscape structure related capacities for field margin photovoltaics in Lower Saxony (Germany)

Hannes Foth¹; Roland Pesch¹; Karen Baumann²; Broder Breckling²
¹ *Jade University of Applied Science*; ² *University of Vechta*

15:40 Coffee break

S 24 Integrating analytical modeling and individual-based modeling for complexity reduction, upscaling, and to gain causal understanding

Chair: Thorsten Wiegand, Andreas Huth, Jürgen Groeneveld

16:10 Software-assisted predictability assessment for stochastic hybrid models

Leonardo Aguirre
Eawag, Swiss Federal Institute of Aquatic Science and Technology

16:30 Intrinsic growth rates influence stability in the Lotka-Volterra competition

Heike Lischke; Thomas Löffler
Swiss Federal Institute for Forest, Snow and Landscape Research (WSL)

16:50 Linking Lotka-Volterra models to the microscale of individuals

Thorsten Wiegand; Samuel Fischer; Andreas Huth
Helmholtz Centre for Environmental Research GmbH - UFZ

17:10 SMART Modeling for an Individual-based Ecology in a Changing World

Karin Frank¹; Sabine Attinger²; Volker Grimm²
¹ *Helmholtz Centre for Environmental Research—UFZ / German Centre for Integrative Biodiversity Research (iDiv)*; ² *Helmholtz Centre for Environmental Research—UFZ*

19:00 Conference Dinner at Moritzbastei

Thursday, 7th September

Hall 1

09:00 **Keynote**

Valery E. Forbes: Improving transparency and reproducibility in ecological modeling for decision support: Lessons from ecological risk assessment

09:40 **Keynote**

Otso Ovaskainen: New high-throughput methods for collecting ecological data pose new challenges for ecological modelling

10:20 **Coffee break**

Hall 1 A

S 12 – Advances in forest modelling by using new data sources and methods

Chairs: Friedrich J. Bohn, Andreas Huth, Rico Fischer, Amanda Armstrong, Uta Berger

10:50 **Carbon sequestration of German forests: An individual based forest model experiment**

Anne Holtmann; Rico Fischer; Andreas Huth; Friedrich Bohn; Corinna Rebmann; Samuel Fischer
UFZ - Helmholtz Centre for Environmental Research

11:10 **Carbon change affects Carbon cycle of forest cohorts but not homogeneously**

Elia Vangi¹; Elisa Cioccolo²; Daniela Dalmonech¹; Leonardo Bianchini²; Alessio Collalti¹
¹ *CNR - National Research Council of Italy*; ² *UNITUS*

11:30 **Bayesian calibration of silver fir (*Abies alba*, Miller) parameters in 4C**

Martin Gutsch¹; Mats Mahnken¹; Kirsten Krüger²; Christopher P.O. Reyer¹
¹ *Potsdam Institute for Climate Impact Research*; ² *Technical University Munich*

11:50 **KDE-likelihood: a tool for fitting individual-based models to equilibrium data**

Samuel Fischer¹; Franziska Taubert; Andreas Huth
¹ *Helmholtz Centre for Environmental Research - UFZ*

12:30 **Lunch break & Poster session**

14:00 **Xylem formation as the basis of adaptive physiological processes in individual-tree-based models - a new perspective for modelling life-history-related drought sensitivity**

Martin Zwanzig
Technische Universität Dresden

- 14:20 High resolution simulations of forest structure project heterogeneous change across the North American Taiga-Tundra Ecotone**
Dr Amanda Armstrong¹; Paul Montesano²; Batuhan Osmanoglu²; Elise Heffernan³; Bradley Gay⁴; Kenneth J Ranson²; Henry H Shugart³; Howard Epstein³
¹ University of Maryland Baltimore County; ² NASA Goddard Space Flight Center; ³ University of Virginia; ⁴ George Mason University
- 14:40 A mechanistic permafrost and soil organic layer module to improving long-term projections of boreal forest dynamics**
Werner Rammer¹; Adrianna Foster²; Benjamin Gaglioti³; Rupert Seidl⁴; Winslow Hansen⁵
¹ TU München (TUM); ² National Center for Atmospheric Research; ³ University of Alaska Fairbanks; ⁴ Technical University Munich; ⁵ Cary Institute of Ecosystem Studies
- 15:00 The dynamics of the Amazon forests - linking vegetation modelling and remote sensing**
Andreas Huth¹; Rico Fischer²; Nikolai Knapp²; Luise Bauer²; Friedrich Bohn²; Kostas Papathanassiou³; Edna Roedig²
¹ Helmholtz - Centre for Environmental Research UFZ, Univ. of Osnabrueck; ² Helmholtz - Centre for Environmental Research UFZ; ³ German Aerospace Center (DLR)
- 15:20 Creating virtual forest around the globe: Forest Factory 2.0 and analysing the state space of forests**
Hans Henniger, Andreas Huth, Karin Frank, Friedrich J. Bohn
- 15:40 Coffee break**

S 31 - From dynamic forest models to decision support for forest transformation – How can synergies be achieved?

Chair: Ulrike Hiltner

- 16:10 Strengthening the connection between dynamic model simulations and managing forest risks under climate change**
Tomáš Hlásny¹; Marcus Lindner²; Julia Haas³
¹ Czech University of Life Sciences in Prague; ² European Forest Institute; ³ Forest Europe Secretariat Liaison Unit Bonn
- 16:30 Feasibility of enhancing carbon sequestration and stock capacity in temperate and boreal European forests via changes to management regimes**
Daniela Dalmonech¹; Gina Marano²; Carlo Trotta³; Alessio Collalti¹
¹ National Research Council of Italy (CNR-ISAFOM); ² ETH Zurich, Switzerland
- 16:50 Simulation-based analysis of trade-offs in ecosystem services in beech forests**
Thomas Kainz; [Christian Hochauer](#); Manfred J. Lexer
University of Natural Resources and Life Sciences (BOKU) Vienna
- 17:10 Sustainable stem number profiles in Swiss protection forests: What is the role of climate change?**
Ulrike Hiltner; Harald Bugmann
ETH Zurich, Switzerland
- 17:30 Climate risks of temperate forests of southern South America in the next decades**
Alvaro G. Gutiérrez
Universidad de Chile & Instituto de Ecología y Biodiversidad

Thursday, 7th September

Hall 1 B

S 23 – Like a boomerang: How feedback loops affect ecosystem stability and species coexistence

Chair: Korinna T. Allhoff

10:50 Competition across scales: Insights into the feedback structure of competition networks from an individual-based model

Franziska Koch¹; Sebastian Lorenz Krüger¹; David K.A. Barnes²; Anje-Margriet Neutel²; Korinna T. Allhoff¹

¹ University of Hohenheim; ² British Antarctic Survey, Cambridge

11:10 Paradoxical effects of nutrient enrichment on the pelagic ecosystem of the northern Adriatic Sea

Alberto Barausse¹; Giovanni Galli²; Carlotta Mazzoldi¹; Luca Palmeri¹

¹ University of Padova; ² Plymouth Marine Laboratory

11:30 Time-dependent higher-order interactions

Thomas Van Giel; Jan Baetens; Aisling Daly; Bernard De Baets
Ghent University

11:50 Feedback between different dispersal strategies and self-organised pattern formation supports consumer coexistence in metacommunities

Christian Guill¹; Felix Nößler²; Toni Klauschies¹

¹ University of Potsdam; ² Freie Universität Berlin

12:10 Metacommunity size and connectance affect local diversity enhancement from self-organized pattern formation

Louica Philipp; Toni Klauschies; habil. Christian Guill

University of Potsdam/Institute of Biochemistry and Biology/Ecology & Ecosystem Modelling

12:30 Lunch break & Poster session

Chair: Korinna T. Allhoff

14:00 Eco-evolutionary feedbacks within communities

Lynn Govaert
IGB Berlin

14:20 Evolutionary community assembly with varying niche width: exploring the conditions for coexistence and emergence of generalists and specialists

Vasco Lepori¹; Nicolas Loeuille²; Rudolf P. Rohr¹

¹ University of Fribourg; ² Sorbonne Université

14:40 Eco-evolutionary dynamics and tipping points: when evolution creates or modulates feedbacks

Nicolas Loeuille
Sorbonne Université, france

15:00 Eco-evolutionary dynamics in 2-species mutualistic systems: One-sided population decline triggers joint interaction disinvestment

Franz Weyerer¹; Avril Weinbach²; Christiane Zarfl¹; Korinna Theresa Allhoff²

¹ University of Tübingen; ² University of Hohenheim

15:20 Spatial dynamics affect eco-evolutionary feedback within a mutualistic metacommunity - and vice versa!

Malina Palmer¹; Avril Weinbach; Marina Alberti; Korinna Theresa Allhoff

¹ *University of Hohenheim*

15:40 Coffee break

Chair: Avril Weinbach

16:10 Plant-soil feedbacks generated by nitrification modulation by plants impact ecosystem structure, functioning, and resilience

Alice Nadia Ardichvili¹; Sébastien Barot²; Jean-Christophe Lata¹; Nicolas Loeuille Pr.¹

¹ *Sorbonne Université*; ² *Institut de Recherche pour le Développement*

16:30 Multi-species grassland dynamics – how resources allocation affect interspecific competition outcomes

Thibault Moulin¹; Frank Jabot²; Julien Pottier²; Britta Tietjen¹

¹ *Freie Universität Berlin*; ² *INRAE, Université Clermont Auvergne, France*

16:50 The significance of herbivory in forming the ecosystem of dryland vegetation: tying spiral vegetation patterns and nonlinear nonlocal grazing

Mrinal Kanti Pal¹; Swarup Poria²

¹ *The Institute of Mathematical Sciences*; ² *University of Calcutta*

17:10 Livestock management promotes bush encroachment in savanna systems by altering plant–herbivore feedback

Franziska Koch¹; Britta Tietjen²; Katja Tielbörger³; Korinna Theresa Allhoff¹

¹ *University of Hohenheim*; ² *Freie Universität Berlin*; ³ *University of Tübingen*

17:30 Discussion

Thursday, 7th September

Hall 1 CD

S 30a – Modelling change in social-ecological systems – from conceptual reflections to promising case-based examples

Chairs: Birgit Müller, Maja Schlüter, Calum Brown

10:50 A data driven approach to model responses of German North Sea fishing fleets to future scenarios

Jonas Letschert¹; Vanessa Stelzenmüller¹; Gunnar Dressler²; Christian Möllmann³; Birgit Müller²

¹ *Thuenen Institute of Sea Fisheries*; ² *Helmholtz Centre for Environmental Research - UFZ*; ³ *Institute for Marine Ecosystem and Fisheries Science, University of Hamburg*

11:10 Modelling the motivation and acceptance dynamics for implementation of climate change adaptation measures – Realisation of Sponge City measures within different urban residential areas

Christoph Schünemann¹; Hendrik Herold

¹ *Leibniz Institute of Ecological Urban and Regional Development*

11:30 Modelling changes in traffic-habitat interactions at a global scale

Maarten J. van Strien; Adrienne Grêt-Regamey

ETH Zurich

11:50 The road to integrate climate change projections with regional land-use-biodiversity models

Juliano Sarmiento Cabral¹; Alma Mendoza-Ponce²; André Pinto da Silva³; Johannes Oberpriller⁴; Anne Mimet⁵; Julia Kieslinger⁶; Thomas Berger⁷; Jana Blechschmidt⁸; Maximilian Brönnner⁶; Alice Classen⁸; Stefan Fallert⁸; Florian Hartig⁴; Christian Hof⁵; Markus Hoffmann⁵; Thomas Knoke⁵; Andreas Krause⁵; Anne Lewerentz⁹; Perdita Pohle⁶; Uta Raeder⁵; Anja Rammig⁵; Sarah Redlich⁸; Sven Rubanschki⁵; Christian Stetter⁵; Wolfgang Weisser⁵; Daniel Vedder¹⁰; Peter H. Verburg¹¹; Damaris Zurell¹²
¹ University of Birmingham; ² Universidad Nacional Autónoma de México; ³ Uppsala University; ⁴ University of Regensburg; ⁵ Technical University of Munich; ⁶ Friedrich-Alexander University Erlangen-Nuernberg; ⁷ Hohenheim University; ⁸ University of Wurzburg; ⁹ Karlsruhe Institute of Technology; ¹⁰ Helmholtz Center for Environmental Research - UFZ; ¹¹ VU University Amsterdam; ¹² University of Potsdam

12:10 Modelling the trilemma: biodiversity, ecosystem services and socioeconomic returns through a financial compensatory trade-off scheme

Diogo Alagador
 Universidade de Évora

12:30 Lunch break & Poster session

14:00 Predicting Land Use and Environmental Changes in Argentina's Pampas Region Under Varying Price and Climatic Conditions Using an Agent-Based Model

Diego Omar Ferraro¹; Felipe Ghera¹; Rodrigo Castro²
¹ IFEVA, Universidad de Buenos Aires; ² Universidad de Buenos Aires, Argentina.

14:20 Tropical landscape design modulates trade-offs among ecological and socio-economic functions at different spatial and temporal scales

Sebastian Fiedler¹; Julia Henzler; Jann Lay; Suria Tarigan; Kerstin Wiegand
¹ Universität Göttingen

14:40 Simulation of spatial crop expansion and its consequences on groundwater resource use in dryland farming systems: how the shift of subsistence to commercial farming can shape landscapes

Kira Fastner; Thanh Thi Nguyen; Andreas Buerkert
 University of Kassel

15:10 General discussion and short poster introduction

15:40 Coffee break

S 16 – Modelling climate-biosphere feedbacks

Chair: Ana Bastos, Sönke Zaehle, Jian Peng, Nadja Rüger

16:10 Conserving biodiversity under global change: towards a universal biodiversity projection platform

Damaris Zurell¹; Greta Bocedi²; Mark Urban³
¹ University of Potsdam; ² University of Aberdeen; ³ University of Connecticut

16:30 Acclimation of plant nutrient-reuse strategies to global change in a next generation ecosystem model

Gabriela Sophia
 Max-Planck-Institut für Biogeochemie, Jena

16:50 Modelling the future distribution and biodiversity of European fen habitats under global change

Patrícia Singh¹; Borja Jiménez-Alfaro²; Liene Auniņa³; Petra Hájková¹; Tatiana Ivchenko⁴; Florian Jansen⁵; Tiina Kolari⁶; Paweł Pawlikowski; Tomáš Peterka¹; Alessandro Petraglia⁷; Teemu Tahvanainen⁶; Michal Hájek¹
¹ Masaryk University Brno; ² University of Oviedo; ³ University of Latvia; ⁴ Russian Academy of Sciences; ⁵ Rostock University; ⁶ University of Eastern Finland; ⁷ University of Parma

17:10 Assessing human pressure on biomass production and the corresponding risk of ecosystem degradation in the dynamic global vegetation model LPJmL

Fabian Stenzel¹; Wolfgang Lucht; Dieter Gerten

¹ Potsdam Institute for Climate Impact Research (PIK)

17:30 The effect of plant trait diversity on the coupled vegetation-climate system

Pinhsin Hu¹; Christian H. Reick²; Axel Kleidon¹; Martin Claussen²

¹ Max Planck Institut for Biogeochemistry Jena; ² Max Planck Institute for Meteorology

Thursday, 7th September

Hall 2

S 15 – Modelling variation and evolution of traits within individuals, populations and communities

Chair: Martin Zwanzig, Viktoriia Radchuk, Tobias Kürschner, Thomas Banitz, Aimara Planillo

10:50 Effects of nonlinearity in relations between climate, phenotypic traits and demographic rates on stability of populations facing global warming

Julie Louvrier¹, Guillaume Chero¹, Cédric Scherer¹, Jean Clobert^{2,3}, Stéphanie Jenouvrier⁴, Alexandre Courtiol¹, Thomas Reed⁵, Stephanie Kramer-Schadt^{1,6}, Viktoriia Radchuk¹

¹ Leibniz Institute for Zoo and Wildlife Research, Berlin, Germany, ² Station of Experimental and Theoretical Ecology (SETE), France, ³ University Paul Sabatier, France, ⁴ Woods Hole Oceanographic Institution, USA, ⁵ University College Cork, Ireland, ⁶ Technische Universität Berlin, Germany

11:10 The relative effects of climate and habitat on changes of moth communities in Finland: insight from site specificities and species traits

Emy Guilbault¹; Ass. Jarno Vanhatalo¹; Ass. Marjo Saastamoinen¹; Anna-Liisa Laine¹; Tomas Roslin²; Pasi Sihvonen³; Anna Suuronen⁴; Juha Pöyry⁵

¹ University of Helsinki; ² Swedish University of Agricultural Sciences (SLU); ³ Finnish Museum of Natural History, University of Helsinki; ⁴ Finnish Environment Institute (SYKE); ⁵ Finnish Environment Institute

11:30 Effects of cyclones: influence on the fish community in a tropical estuary

Joyita Mukherjee¹; Mahammed Moniruzzaman²

¹ Krishna Chandra College, West Bengal, India; ² Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India

11:50 Plankton community structure, biodiversity, and related ecological services

C. Solidoro¹; M. De Pasquale¹; M. Fianchini¹; E. Alvarez; P. Lazzari¹

¹ National Institute of Oceanography and Applied Geophysics OGS

12:10 Using an individual-based model to identify local drivers of post-colonization population demogenetics within ephemeral patches

Tiago Crispim-Mendes¹; Clara Mendes Ferreira²; Joana Paupério³; João Paulo Silva³; Sérgio Godinho⁴; Paulo Célio Alves³; António Mira¹; Xavier Lambin⁵; Pedro Beja³; Ricardo Pita¹

¹ MED –Universidade de Évora, Portugal; ² University of Potsdam, Germany; ³ CIBIO, Universidade do

12:30 Lunch break & Poster session

S 17 Sustaining insect pollination in a changing world using mechanistic simulation

Chair: Reinhard Prestele, Jürgen Groeneveld

- 14:00 SyrFitSources: An agent-based model for hoverflies in agricultural landscapes**
Mario App¹; Jan Thiele¹; Johannes Burmeister²; Boris Schröder³
¹ Thünen Institute of Biodiversity; ² Bayerische Landesanstalt für Landwirtschaft (LfL); ³ Technische Universität Braunschweig
- 14:20 March to April 'hungry gap' poses an existential threat to bumblebees in a Bumble-BEEHAVE simulation study**
Matthias A. Becher¹; Grace Twiston Davies²; Juliet L. Osborne³; Tonya A. Lander⁴
¹ RIFCON GmbH; ² University of Exeter, Environment & Sustainability Institute; ³ University of Exeter - Penryn Campus; ⁴ University of Oxford
- 14:40 How do honeybees respond to landscape structure and other stressors?**
Jürgen Groeneveld¹; Anna Wendt²; Jasmin Krebs³; Volker Grimm⁴
¹ Helmholtz Center for Environmental Research UFZ; ² University of Freiburg; ³ University of Leipzig; ⁴ Helmholtz - Centre for Environmental Research - UFZ
- 15:00 A Comprehensive Agent-Based Model for Bumblebees with Temperature Feedback**
Jordan Chetcuti; Christopher John Topping
Aarhus University
- 15:20 SolBeePop: a trait-based population model of solitary bees in agricultural landscapes**
Nika Galic¹; Amelie Schmolke²; Silvia Hinarejos³
¹ Syngenta Crop Protection AG; ² Waterborne Environmental, Inc.; ³ Sumitomo Chemical

15:40 Coffee break

Session: Open Topic

Chair: Volker Grimm

- 16:10 Elucidating African swine fever transmission cycle dynamics at the domestic-wildlife interface: Multihost epidemic modelling in Romania**
Brandon Hayes DVM,¹ Assoc. Timothée Vergne DVM,, HDR, Dipl. ECVPH²; Mathieu Andraud³; Nicolas Rose DVM,, HDR, Dipl. ECPHM, ECVPH³
¹ INRAE (Institut national de la recherche agronomique); ² ENVT (Ecole Nationale Veterinaire De Toulouse); ³ ANSES (Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail)
- 16:30 Modelling changing mosquito abundance and distribution in the Netherlands**
Martha Dellar¹; Louie Krol²; Maarten Schrama²; Gertjan Geerling³; Adolfo Ibanez Justicia⁴; Eline Boelee⁵; Peter van Bodegom²
¹ Leiden University / Deltares; ² Leiden University; ³ Deltares/Radboud University; ⁴ NVWA; ⁵ Deltares
- 16:50 An exploratory model for ecosystem services in the Venice lagoon**
Daniele Brigolin¹; Alice Stocco²; Fabio Pranovi²; Silvia Rova²
¹ Univesità IUAV di Venezia; ² Università Ca'Foscari di Venezia
- 17:10 Multi-model assessment of forest carbon stocks responses to climate change**
Katarína Merganičová¹; Ján Merganič.²; Laura Dobor¹; Ivan Barka³
¹ Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague; ² Technical University Zvolen; ³ National Forest Centre
- 17:30 Trapped in Nature's Labyrinth: Exploring Landscape Barriers and Spatial Genetic Connectivity in Red Panda Populations of Eastern Himalaya, Arunachal Pradesh, India**
Supriyo Dalui 1, 2, Mukesh Thakur 1, Lalit Kumar Sharma 1
1Zoological Survey of India, University of Calcutta, Kolkata, India

Friday, 8th September

Hall 1

- 09:00 Keynote**
Sara Mitri: Predicting and controlling the ecological dynamics of small bacterial communities
- 09:40 Keynote**
Benjamin Martin: Mechanistic modeling of thermal stress for improved conservation and ecological theory
- 10:20 Coffee break**

Hall 1 A

S 31a – From dynamic forest models to decision support for forest transformation – How can synergies be achieved?

Chair: Gina Marano

- 10:50 To what extent can silviculture foster forest adaptation to climate change? a demo-genetic modelling approach with stress and disturbance regimes**
Victor Fririon¹; Hendrik Davi¹; Sylvie Oddou-Muratorio¹; Gauthier Ligot²; François Lefèvre¹
¹ INRAE (*Institut national de la recherche agronomique*); ² University of Liège
- 11:10 Multi-objective forest management – an ecological-economic optimization approach**
Markus Schorn; Nadja Rüger; Hanna Schenk; Christian Wirth; Martin Quaas
German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig; Leipzig University
- 11:30 Is climate change threatening the re-emergence of old-growth forests in Central Europe? A simulation study**
Rupert Seidl¹; Dominik Thom; Sebastian Seibold; Werner Rammer
¹ TUM Technical University of Munich
- 11:50 Biodiversity conservation in the Leipzig Floodplain forest – Using a demographic forest model to support conservation planning**
Jack Boyce¹; Lucian Elles²; Mathias Scholz³; Christian Wirth⁴; Andreas Sickert⁵; Markus Schorn⁶; Hans Kasperidus³; Stefanie Henkel⁴; Michael Vieweg³; Adam Clark⁷; Martin Quaas¹; Nadja Rüger¹
¹ iDiv / Leipzig University; ² University of Graz / Leipzig University; ³ UFZ - Helmholtz Centre for Environmental Research; ⁴ Leipzig University; ⁵ Leipzig Stadtforsten; ⁶ iDiv; ⁷ University of Graz
- 12:10 “Poster Pitches” by the authors of all posters related to this session**

Friday, 8th September

Hall 1 B

S 28 – The use of artificial intelligence in ecological modelling

Chair: Werner Rammer & Rupert Seidl

- 10:50 Metamodeling of Ecological Models in the context of Digital Twins**
Merijn de Bakker¹; Franziska Taubert²; Thanasis Trantas¹
¹ TNO; ² UFZ
- 11:10 Towards a bottom-up assessment of the climate sensitivity of Europe's forests**
Marc Grünig; Werner Rammer; Rupert Seidl
Technical University Munich
- 11:30 Scaling connectivity conservation planning with deep reinforcement learning.**
Julian Equihua; Ralf Seppelt; Michael Beckmann
Helmholtz Centre for Environmental Research - UFZ
- 11:50 Combining machine learning and coastal ocean models for spatial predictions of seagrass seasonal growth: an example based on the Arcachon bay's Zostera Noltii meadows.**
Héloïse Muller; Etienne Auclair; Aubin Woehrel; Martin Marzloff
Ifremer
- 12:10 Modelling global tree species composition**
Nina van Tiel¹; Devis Tuia¹; Thomas W. Crowther²; Loïc Pellissier²
¹ Ecole Polytechnique Fédérale de Lausanne; ² ETH Zurich

Friday, 8th September

Hall 1 CD

S 22 – Functional responses: from theory to practice

Chair: David Alonso

- 10:50 New perspectives on multi-species functional responses**
Daniel Stouffer
University of Canterbury
- 11:10** Daniel Stouffer (continued)
- 11:30 The implicit Assumptions of Functional Responses**
Gian Marco Palamara¹; Jose A. Capitan²; David Alonso³
¹ University of Bern and Eawag.; ² Universidad Politécnica de Madrid; ³ Center for Advanced Studies of Blanes (CEAB-CSIC)
- 11:50 A functional response model accounting for information flow and decision-making**
Jingyi Li; Emilio Berti; Ulrich Brose
German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig
- 12:10 Design and analysis of feeding experiments for multi-species functional responses**
Benjamin Rosenbaum
German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig