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sDiv working group meeting report

”sModelProBio I”

The sModelProBio - **Modelling the way forward for protecting biodiversity during climate change** - first workshop took place at iDiv, Leipzig, from Monday 9th to Friday 13th March 2026.

Project Summary

Time is running out to prevent devastating biodiversity losses from climate change and safeguard human wellbeing. Addressing this crisis requires accurate projections about which species and ecosystems are most at risk to ensure efficient use of limited management resources. **We cannot efficiently protect what we cannot predict.** Unlike climate scientists, biologists have not yet built a solid mechanistic basis for projecting future biodiversity change. Most biodiversity projection models ignore underlying biological processes, while extrapolating correlations between current species’ ranges and climate. However, as correlations between current species distributions and climate become uncoupled, we cannot rely solely on tools based on statistical descriptions of the past. Model intercomparison projects (**MIPs**) have been pivotal in climate science but are only just emerging in biodiversity science. Currently, no biodiversity MIP exists that considers process-based models at the regional scale and population level, the relevant scales for conservation and national action planning under the Kunming-Montreal Global Biodiversity Framework.

The sModelProBio synthesis group will address these gaps by performing **the first rigorous and reproducible regional biodiversity MIP (BMIP) and impact attribution** using models, ranging from correlative to mechanistic. We will validate models on historical data, project future biodiversity under climate and land use change scenarios, and develop a conceptual framework to scale between existing global biodiversity projections and regional species-specific projections. The framework and results will create a step change in predictive biodiversity science under climate change, and support decision makers and the community of practice through robust tools and scientific evidence.

This first workshop focused on implementing **Objective 1**: Perform the first terrestrial biodiversity BMIP using models projecting species’ distributions and abundances at regional levels.

Participants

Greta Bocedi (GB), University of Aberdeen; Natalie Briscoe (NB), The University of Melbourne (online); Lauren Buckley (LB), University of Washington; Francisco Cervantes Peralta (FCP), Instituto Pirenaico de Ecología – CSIC; Rob Cooke (RC), UK Centre for Ecology and Hydrology; Lucas da Cunha Godoy (LCG), University of California, Santa Cruz; Admir Cesar de Oliveira Junior (ACOJ), Federal University of Latin American Integration (online); Samuel Gascoigne, University of Aberdeen (SG); Gurutzeta Guillera-Arroita, IPE-CSIC

(GGA); Raya Keuth, University of Potsdam (RK); Andres Marmol Guijarro (AMG), iDiv; Henrique Pereira (HP), iDiv; Juliano Sarmento Cabral (JSC), University of Bonn; Katrin Schifferle (KS), University of Potsdam; Alice Semple (AS), University of Aberdeen; Justin Travis (JT), University of Durham; Mark Urban (MU), University of Connecticut; Santiago Velazco (SV), San Diego State University; Brendan Wintle (BW), The University of Melbourne; Damaris Zurell (DZ), University of Potsdam; Josef Settele (JS), UFZ/MLU/iDiv (Friday, online).

Activities

The first day was dedicated to setting the scene, introductions and code of conduct. After a brief introduction of the working group goals (GB) and a fun icebreaker (participants divided in groups of three had to find three things they all had in common and then report to the whole group), we heard a set of introductory presentations: history of the EcoCode network (MU), introduction to biodiversity model intercomparison projects (DZ), introduction to BES SIM2 (HP, AMG). These were followed by updates on the status of the pre-workshop activities, specifically the data pipelines and data paper (MU), the modelling pipelines and the protocol paper (SV), and brief presentations of all the models to be included in the intercomparison (one slide per modelling team). Models that will be included in BMIP (conditional on meeting the internal deadlines) are: correlative species distribution models (SDMs); abundance-based distribution models (ASDMs); MigClim (SDM hybrid); dynamic occupancy models; metaRange; RangeShifter (run as SDM hybrid); STEPS (run as SDM hybrid); species exposure models; NicheMapR and TrenchR. We finished the first day by defining goals and working groups for the rest of the week.

Each following day started with a check-up and setting the day's goals.

Tuesday, after a couple of presentations on the cyber infrastructure (SV) and research agreements (GB), we heard updates on model runs on pilot species and discussed technical issues arising. We then broke out in 4 groups: data, modelling, model validation and comparison, and data and code management plan. The data paper (to be submitted in parallel to the BMIP protocol paper prior to the first BMIP intercomparison paper) will provide the benchmarking datasets used in BMIP. It is almost completed and to be submitted in early summer 2026. Mechanistic models also need various species traits data – those were also discussed. The modelling group refined decisions for the BMIP protocol and worked on the protocol paper across the week which is planned to be submitted in summer 2026. Modelling groups will perform model calibration on the training data (first 70% of years in the time series data) but will not have access to the validation data (later 30% of years). Validation will be done by a dedicated group (MU; Nick Isaac, CEH; JT) who discussed that part of the protocol. We finished with an introduction to Git for code management (SV).

On Wednesday new break-out groups worked on full steam on the trait data, the modelling protocol, the protocol for the attribution phase (attribution of historical changes to drivers) and specific models. We defined key modelling decisions, output formats and protocol details. Meanwhile a policy group prepared for meetings on Friday for discussing the opportunities and next steps for pushing towards the establishment of a World Biodiversity Research Program (WBRP; Zurell et al. 2025).

Thursday was dedicated to making progress with the various breakout groups, and to plenary discussions on (1) community engagement, capacity building and training; (2)

possible synergies between the BES SIM2 working group and sModelProBio (led by HP) – to set the scene for the third sModelPropBio objective of scaling between regional and global models; (3) spin-offs papers; (4) further funding and fund raising strategies. We finally set milestones and deadlines for the coming months leading to the second workshop in March 2027. We will have monthly update meetings (online). At the next workshop we will be ready to finish the first intercomparison, have preliminary results for the attribution and run the first future projections.

On Friday, the group was joined by several online participants for policy discussion, in particular to brainstorm about the opportunity and logistics of establishing a WBRP to support international coordination of future BMIPs, including discussing an expert consultation phase to define what such programme would look like and how it could be formed. Marten Winter and JS from iDiv joined the discussion online, together with Alejandro Ordonez Gloria, Franziska Schrodt, Simon Ferrier, Lluís Brotons, Carolyn Lundquist, Andy Purvis, Cornelia Krug, Laetitia Navarro, Andy Gonzalez and Jillian Campbell. There was a general enthusiasm for working towards such an ambitious objective and next steps were decided. A policy brief directed to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the Convention on Biological Diversity (CBD), has been started to be ready ahead of the SBSSTA-28 meeting in August 2026.

The general atmosphere of the workshop was fantastic: engaged, productive but easy at the same time. All the participants were engaged and enthusiastic and participated to the works and discussions. Participants also joined for socials such as dinners and drinks throughout the week. The logistic help from iDiv was extremely helpful and ensured the week proceeded smoothly and stress-free. We look forward to the second workshop!

Zurell, Damaris, Greta Bocedi, Santiago J. E. Velazco, *et al.* 'Predicting the Way Forward for the Global Biodiversity Framework'. *Proceedings of the National Academy of Sciences* 122, no. 41 (2025): e2501695122. https://doi.org/10.1073/pnas.2501695122.