

**100% Postdoctoral researcher position, 2024–2026 (3 years)**  
**“Scaling-up island ecosystem monitoring with remote sensing”**

**Background:** Oceanic islands contribute disproportionately to global biodiversity and harbor a high number of endemic species that exhibit unique evolutionary and functional adaptations, shaped by their life in isolation. Owing to their exceptional endemism and diversity, high vulnerability to multiple global change drivers, and under-representation in many global biodiversity databases and initiatives, oceanic islands are a top priority for assessing the status and monitoring the trends of biodiversity.

Remote sensing provides opportunities to track changes in biodiversity and ecosystems at policy-relevant time scales (years to decades) and across spatial scales (from local to global). Satellite remote sensing is particularly well suited to deliver information on ecosystem structure and function, and to provide covariates for modeling species distributions. Essential biodiversity variables (EBV) and essential ecosystem service variables (EESV) capture biodiversity and ecosystem change across spatial scales and socio-economic contexts by integrating field-based monitoring with remote sensing from multiple sources. However, integration remains a challenge due to mismatches in resolution and gaps in spatiotemporal coverage. Addressing this challenge requires data harmonization, modeling, and expansion of monitoring programs. In situ technologies such as terrestrial laser scanners (TLS) and unmanned aerial vehicles (UAV) have the potential to fill the gaps by providing information on ecosystem structure and function at the ecosystem and landscape level in a cost-effective, consistent, and accurate manner.

**Objectives of the project:**

- 1) Identify the EBV and EESV that can be derived from the integration of field survey and remote sensing.
- 2) Develop and apply a monitoring framework to quantify three-dimensional (3D) habitat structure at the landscape level from TSL and UAV.
- 3) Reveal changes in EBV and EESV over time and space at levels relevant for decision-makers (years to decades, landscapes to archipelagos).

**Study sites:** Three iconic archipelagos, namely the Canary Islands (ES), Azores (PT), and Mascarenes (FR, Mauritius).

**Your tasks:** You will retrieve, homogenize and integrate existing satellite products and field-based data from existing plot networks on islands. You will use individual products or fused time series from Moderate Resolution Imaging Spectroradiometer (MODIS), Landsat and Copernicus Sentinel imagery that are available at various spatial (10 to 250 meters) and temporal (daily to monthly) resolutions and that cover different periods (from the 1980s until today). You will then integrate measurements of field surveys and aggregate the measurement over space (i.e. stand level), which will result in an integrated dataset from remote sensing and field-based studies. You will measure 3D habitat structure using TLS and UAV-based structure-from-motion techniques in the field. This will be used to derive indicators of structural complexity at ecosystem and landscape levels. You will combine the field-based and remote sensing data using a cross-scale analysis (i.e. pixel-to-point comparison) and species distribution modeling. This will allow us to identify gaps in field-

based data coverage. For regions where data could be matched, you will analyze the spatio-temporal variability. You will contribute analysing the drivers of biodiversity change, evaluating scenarios and communicating with stakeholders including researchers, citizen scientists, conservation managers, (non-)governmental organizations and public institutions.

**Funding:** The position is funded by Biodiversa+, the new European co-funded biodiversity partnership supporting excellent research on biodiversity with an impact for policy and society.

**Project title:** “BIOMONI: Biodiversity monitoring of island ecosystems”

**Work package title:** “Scaling-up island ecosystem monitoring with remote sensing”

**Main supervision:**

- Prof. Clara Zemp, Conservation Biology Lab, University of Neuchâtel, Switzerland

**Project partners:**

- Prof. Holger Kreft, Biodiversity, Macroecology & Biogeography, University of Göttingen, Germany
- Dr. Bernd Lenzner, Botany and Biodiversity Research, University of Vienna, Austria
- Prof. Paulo Borges, Azorean Biodiversity Group, University of Azores, Spain
- Dr. Claudine AH-PENG, UMR PVBMT, University of La Reunion, France
- Dr. Jairo Patiño, Instituto de Productos Naturales y Agrobiología, CSIC, Portugal
- Prof. José Maria Fernández-Palacios, Department of Botany, Ecology and Plant Physiology, Universidad de La Laguna, Spain

**We offer:** An inclusive and supportive working environment that encourages scientific curiosity, creativity and engagement with practice. Salary (100 % postdoctoral researcher) and social benefits follow the rules of the University of Neuchâtel. The position is planned for three years.

**Your profile:**

- PhD in ecology, conservation biology or related field
- Motivated by collaborative work; interest in conservation science and practice
- Good organizational, writing and communication skills
- Experience in remote sensing
- Knowledge of biodiversity monitoring methods and datasets
- Good skills in statistical modeling and data analysis with R
- Fluent English (written and spoken) is essential; French is an advantage

**Starting date:** The anticipated starting date is between January and April 2024.

**Application:** To apply, please provide until **01.12.2023**: (1) a one-page letter describing your motivation, (2) a CV including contact information of two references, (3) complete list of publications and access to the most relevant paper. Please, send all the information in a single PDF with the subject “Postdoc application\_ [your name]” to Prof. Dr. Clara Zemp ([clara.zemp@unine.ch](mailto:clara.zemp@unine.ch)). For any questions, contact me using the same email address.