

Amsterdam, 24 June 2020

# Scientific developer for essential biodiversity variables workflows

## Vacancy - Terms of reference

**JOB TITLE:** Scientific developer for essential biodiversity variables workflows.

**PURPOSE:** Contribute to building workflows, Virtual Research Environments and Virtual Laboratories for Essential Biodiversity Variables.

**LOCATION:** LifeWatch-ERIC Virtual Laboratory and Innovation Center, Amsterdam, The Netherlands.

**POSITION:** Full-time, two-year term with a possible extension, starting as soon as possible.

**COMPENSATION:** Between €3,353 and €4,402 gross per month, depending on relevant experience (equivalent to University salary scale 10), based on 38 hours per week.

## Job Description

We have a job opening for a 2-year scientific workflow developer for essential biodiversity variables (EBVs). The person will be responsible for developing workflows that integrate heterogeneous, multi-source data of species distributions and population abundances, including direct observations as well as genomic, image, sound and GPS tracking information. The person will closely interact with computer scientists and software engineers to make the scientific workflows and tools suitable in the context of developing a Virtual Research Environment (VRE), which is the core part of the LifeWatch-ERIC Virtual Laboratory Innovation Center (LW-VLIC). This includes using interoperable and machine-readable (meta)data standards (e.g. Darwin Event Core) and model-based data integration to generate integrated EBV datasets and to link biodiversity information to environmental data at the appropriate spatial and temporal resolution. An important internal focus of LifeWatch ERIC is currently on alien invasive species, but workflows should also be applicable to other species and taxa (pests, rare and threatened species, indicator taxa, species relevant for ecosystem services or ecosystem functioning etc.).

We are looking for a candidate with exceptionally strong skills data-intensive biodiversity science and ecological modelling, and who can communicate and collaborate with computer scientists. The person will develop scientific workflows for data integration using public and non-public biodiversity observation databases (e.g. specimen records, citizen science observations, eDNA, image and sound recordings, movement tracks) and test the use of statistical models and artificial intelligence methods to fill spatial and temporal gaps in in-situ observations. The integration of environmental variables (weather and climate, soil moisture, land-cover, topography, habitat structure etc.) to model and predict EBV values will be relevant for producing EBV modelled datasets. Excellent programming skills (e.g. R or Python) are required, and experience in geospatial analyses are advantageous. The candidate should also show strong writing and verbal communication skills and have a successful track-record of publications.



You will develop scientific workflows for integrating species observations in the context of establishing a Virtual Lab for measuring and monitoring biodiversity change. This will require to explore the characteristics and observation processes of different types of biodiversity data (presence–absence, presence-only, occupancy, abundance) using different types of models for data integration (species distribution models, point process models, hierarchical state-space models etc.). The aim is to generate integrated EBV datasets that build on raw observations from multiple and heterogeneous sources (e.g. citizen science data, camera trap images, sound recordings, eDNA samples, GPS tracking). Filling of spatial and temporal data gaps could be achieved with statistical models and artificial intelligence methods. An integration with web services on environmental data (e.g. Copernicus) would allow a link to potential drivers of biodiversity change. In this context, you will explore open-source software toolkits that support data management workflows ranging from primary biodiversity data to geospatial and tabular data. Exploring semantic and technical interoperability and data/metadata standards will be an important part of your work.

### **Contract and Working Environment**

The candidate will be contracted by the LifeWatch ERIC, Virtual Laboratory and Innovation Center in Amsterdam, The Netherlands and will work within the premises of the University of Amsterdam, Institute for Biodiversity and Ecosystem Dynamics (IBED)

[LifeWatch ERIC](#) is a European Infrastructure Consortium providing e-Science research facilities to scientists seeking to increase our knowledge and deepen our understanding of biodiversity organisation and ecosystem functions and services in order to support civil society in addressing key planetary challenges.

LifeWatch ERIC seeks to understand the complex interactions between species and the environment, taking advantage of High-Performance, Grid and Big Data computing systems, and the development of advanced modelling tools to implement management measures aimed at preserving life on Earth.

Combining a wide range of ICT tools and resources with deep knowledge of the domain, LifeWatch ERIC's mission is to be a "first class" worldwide provider of content and services for the biodiversity research community by:

- Offering new opportunities for large-scale scientific development
- Enabling accelerated data capture with innovative new technologies
- Supporting knowledge-based decision-making for biodiversity and ecosystem management
- Providing training, dissemination and awareness programmes.

The [Institute for Biodiversity and Ecosystem Dynamics \(IBED\)](#) is one of eight research institutes within the [Faculty of Science](#) at the University of Amsterdam. Our scientific work aims at a better understanding of the dynamics of ecosystems at all relevant levels, from genes to ecosystems, using a truly multi-disciplinary approach, and based on both experimental and theoretical research. Scientific focus is on aquatic (both freshwater and marine) and terrestrial ecosystems, evolutionary and population biology, ecosystem and landscape dynamics, and theoretical and computational ecology. We want to unravel how ecosystems function in all their complexity, and how they change due to natural processes and human activities.



You will closely collaborate with computer scientists and software engineers who are developing the technical functionality of Virtual Research Environments (VREs) and the containerization of the applications. It is expected that your work results in scientific papers, and that you participate and present the research at LifeWatch and other international meetings. In your daily work, you will be embedded in the Biogeography & Macroecology (BIOMAC) lab (<http://biomac.org/>) and the Department Theoretical and Computational Ecology (<http://ibed.uva.nl/research>), and have close links to the [Quality Critical Distributed Computing team](#) of the [Multiscale Networked Systems \(MNS\)](#) research group.

### **The ideal candidate should meet the following requirements**

- A PhD degree in ecology, biodiversity informatics, or a related discipline;
- interest, passion and experience in biodiversity, computational ecology and data science;
- exceptional quantitative skills and profound experience in handling, processing and modelling different types of biodiversity observations (e.g. scripting/programming in Python and R, geospatial analyses, integration of large species distribution datasets);
- experience with computational workflows;
- willingness to work in a multidisciplinary team (ecology, computer science; software engineering)
- proficiency in scientific writing;
- ability to speak and communicate in English at an academic level;
- successful and strong track-record of publications.

Of additional advantage:

- strong skills in ecological modelling and artificial intelligence methods
- background in biodiversity informatics and open data science;
- experience in data and computer science;

### **The call for interest is subject to the following procedure**

#### **Further information**

Interested? For more information on this position please contact:

Dr W. Daniel Kissling, associate professor of quantitative biodiversity science, daily supervisor),  
Email: [W.D.Kissling@uva.nl](mailto:W.D.Kissling@uva.nl) ; Visit [Profile Page of Daniel Kissling](#)

#### **Appointment**

We offer a position for 38 hours a week in an exciting, dynamic and international research environment, starting as soon as possible. The full-time appointment will be on a temporary basis for a maximum period of 2 years with opportunities for an extension.

The Collective Labour Agreement for Dutch Universities will be applicable for salary. The annual salary will be increased by 8 % holiday allowance and 8.3 % end-of-year bonus. You will participate in the LifeWatch-ERIC Netherlands pension scheme with RESAVER.

#### **Job application**

Applications should include the following documents, all in one PDF file and in the following order:

- motivation letter (max. 1-2 pages, containing your motivation for applying and a description of your previous research experience);
- list of your 2-3 most significant publications (incl. a short description in 2-3 sentences what is interesting in each paper);
- short outline (max. 1 page) of ideas how to develop EBV data integration workflows and for which specific taxa and ecosystem types (will only be used for evaluating the applicants).
- CV (with applicant's e-mail address and telephone number, documentation of education and complete publication list, and contact details of two professional references [name, address, telephone and email]). References will only be contacted if the candidate is short-listed.

Applications should be sent ultimately at 31 August 2020 to [W.D.Kissling@uva.nl](mailto:W.D.Kissling@uva.nl) with the job title in the subject field.