Study provides framework to measure animal and plant traits for sustainability goals

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Researchers have outlined a plan to detect and report changes in global biodiversity. The monitoring of species traits will improve natural

resource management.

Biological diversity is crucial for ecosystem functioning and the provision of its services. When the impact of climate change, habitat loss and similar threats on biodiversity are taken into consideration, analysing the responses of animals and plants plays a key role in conservation and sustainability policies.

To address this challenge, an international team of researchers partially supported by the EU-funded GLOBIS-B project has developed a roadmap for creating biodiversity data products. Writing in the journal *Nature Ecology & Evolution*, the team proposed a refined set of species traits to be incorporated in essential biodiversity variables (EBVs). These are used to monitor how organisms respond to global change. As explained in the paper, EBVs enable the observation and reporting of global biodiversity change, "but a detailed framework for the empirical derivation of specific EBVs has yet to be developed."

Quoted in a news release by the University of Amsterdam, lead author W. Daniel Kissling said the study provides "a conceptual framework with practical guidelines for building global, integrated and reusable EBV data products of species traits." He added: "This facilitates the monitoring of intra-specific trait changes in response to global change and human pressures, with the aim to use species trait information in national and international policy assessments."

Traits and responses

The research is the outcome of a workshop organised by the GLOBIS-B project that ended in mid-2018. During the workshop, scientific experts discussed the requirements for developing the EBV class species traits. According to the team's suggestions, these could include characteristics related to phenology (timing of periodic biological events), morphology

(form and structure of organisms), physiology, reproduction and movement (spatial mobility). For example, characteristics such as migration patterns, timing of flowering, body mass and plant height can help the quantification of how species respond to climate change, overexploitation and habitat fragmentation.

Robert P. Guralnick, another author of the paper, explained the process in a news article posted on the Florida Museum of Natural History website. "Instead of having everyone measuring a bunch of things in different ways and trying to draw different conclusions, we have to build a system for monitoring the planet's biodiversity in a way that coordinates efforts and creates standards for how those data get to people who make decisions."

The team outlined a workflow that combines trait data from published literature, specimen collections, observations on the ground, and remote sensing from air and space. In the same news article, Guralnick highlighted the monitoring systems that can show the rate of forest loss per year or per month. "What if we were able to do the same kind of thing for how body size change is happening in fish populations across the globe in response to harvesting? Those are the kinds of models we want to be able to produce."

The GLOBIS-B (GLOBal Infrastructures for Supporting Biodiversity research) project was designed to foster the global cooperation of biodiversity research infrastructures and biodiversity scientists. It has worked to advance the implementation and calculation of EBVs. The project website notes that the concept of EBVs has been introduced by the Group on Earth Observations Biodiversity Observation Network "as one of the benefit areas of the Global Earth Observation System of Systems (GEOSS)."

More information: GLOBIS-B project website: www.globis-b.eu/

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W. Daniel Kissling et al. Towards global data products of Essential Biodiversity Variables on species traits, *Nature Ecology & Evolution* (2018). DOI: 10.1038/s41559-018-0667-3

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