

## Conference Abstract

# Analyzing Essential Biodiversity Variables with the VAT System

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## Abstract

The Essential Biodiversity Variables (EBVs) are important information sources for scientists and decision makers. They are developed and promoted by the Group on Earth Observations Biodiversity Observation Network (GEO BON) together with the community. EBVs provide an abstraction level between measurements and indicators. This enables access to biodiversity observations and allows different groups of users to detect temporal trends as well as regional deviations. In particular, the analysis of EBVs supports finding countermeasures for current important challenges like biodiversity loss and climate change. A visual assessment is an intuitive way to drive the analysis. As one example, researchers can recognize and interpret the changes of forest cover maps over time.

The VAT System, in which VAT is an acronym for visualization, analysis and transformation, is an ideal candidate platform for the creation of such an analytical application. It is a geographical processing system that supports a variety of spatio-temporal data types and allows computations using heterogeneous data. For user interaction, it offers a web-based user interface that is built with state-of-the-art web technology. Users can perform interactive analysis of spatio-temporal data by visualizing data on maps and using various graphs and diagrams that are linked to the user's area of

interest. Furthermore, users are enabled to browse through the temporal dimension of the data using a time slider tool. This provides an easy access to large spatio-temporal data sets.

One exemplary use case is the creation of EBV statistics for selected countries or areas. This functionality is provided as an app that is built upon the VAT System. Here, users select EBVs, a time range and a metric, and create temporal charts that display developments over time. The charts are constructed internally by employing R scripts that were created by domain experts. The scripts are executed using VAT's R connectivity module. Finally, users can export the results to their local computers. An export contains the result itself and additionally, a list of citations of the included EBVs as well as a workflow description of all processing steps for reasons of reproducibility. Such a use case exemplifies the suitability of the VAT System to facilitate the creation of similar projects or applications without the need of programming, using VAT's modular and flexible components.

## **Keywords**

Essential Biodiversity Variables, GIS, interactive data exploration, workflow, spatio-temporal processing

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