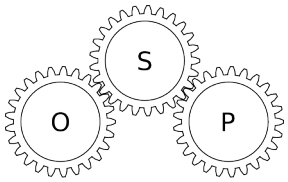

Open Science Papers

Analytic complexity decreases in a workflow for ecosystem functioning analysis

Claas-Thido Pfaff[1], Karin Nadrowski[1]

Affiliation: 1 University of Leipzig, Departement of Special Botany and Functional Biodiversity

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Abstract

We investigate the workflow for an ecological analysis on plot level carbon stocks. We ask, if the complexity of calculations needed in finite operations that make up the workflow change in the course of the workflow. We further investigate if all datasets are used in the same way. We find that complexity of operations decreases in the course of the workflow. Thus, semantic tools may be best suited to be used towards the end of workflows. For research cooperations we recommend to provide data in several levels, as primary data as collected in the field but at the same time at an aggregated level at plot or species level.

Introduction

Scope Under ever increasing pressure on ecosystems by climate and land use change, biodiversity continues to decline. At the same time, there is a growing evidence, that biodiversity is crucial for ecosystem functioning. To inform decision makers, scientists from different disciplines increasingly collaborate to show the impact of decreasing biodiversity on ecosystem functioning. However, data describing biodiversity and ecosystem functioning are complex in structure and distributed across different repositories and research groups. To make use of the opportunities of accessing data online, biodiversity scientists are exploring how semantic tools can help in the automatic assembly of data from distributed resources. Due to the complexity of the data, semantic tools will be of highest use and generality, when the complexity involved in analytic operations is low.

Aim We want to analyse a typical scientific workflow that combines datasets from different research groups and look for an optimal entry point for semantic tools.

Questions

- How can complexity be quantified for finite operations calculated within a scientific workflow?
- Does the complexity of operations stay constant throughout the scientific workflow?
- Can workflow operations be grouped meaningfully into tasks?
- Do tasks differ in complexity?
- Are all tasks used similarly in the course of the workflow?
- Do datasets differ in the usage of their variables?

Material And Methods

Results

Discussion

Acknowledgements

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