Large scale modelling resources for biodiversity forecasting using EGI infrastructure

Ms. FETYUKOVA, Yuliya (University of Eastern Finland, Joensuu, Finland) ; Dr. SAARENMAA, Hannu (University of Eastern Finland, Joensuu, Finland); Mr. OBST, Matthias (University of Gothenburg, Gothenburg, Sweden) ; Mrs. BOURLAT, Sarah (University of Gothenburg, Gothenburg, Sweden) ; Mr. DE GIOVANNI, Renato (Reference Center on Environmental Information, Campinas SP, Brazil) ; Mr. WILLIAMS, Alan (University of Manchester, Manchester, UK) ; Mr. MORRISON, Norman (University of Manchester, Manchester, UK) ; Mr. QUEVEDO, Francisco (Cardiff University, Cardiff, UK)

Abstract

Printable summary: Ecological systems around us provide a wide range of essential and economically important products and services to society, and these functions are directly dependent on the biological diversity in these environments. Today, our ecosystems are under enormous pressure worldwide and experience rapid declines in biodiversity. In response to these changes, numerous management programs have been established to help establishing sustainable ecological conditions. Such initiatives however, critically depend on efficient information systems that allow comprehensive studies of patterns and processes of biodiversity and forecasts under different environmental scenarios. These systems have to explore large and diverse data sources, and run complex analytical cycles. In BioVeL, scientists and computer engineers are working together to develop tools for pipelining data and analysis into efficient analytical pipelines, called workflows. Workflows are complex digital data manipulations and modelling tasks that execute sequences of web services. Many of the data and analysis services are now deployed the EGI infrastructure, providing robust and scalable instances for large scale ecological experiments. The demonstration will guide you through an example, how EGI infrastructure components are used by scientists to generate large-scale and long-term forecasts of biodiversity.

Description of content: The demonstration will present technical details from a large scale analysis of distribution the of European butterflies species in relation to climatic change. The full scientific study will be presented at the plenary session (Title: Large scale modelling of the distribution of butterfly biodiversity in Europe using the BioVeL portal on the EGI infrastructure). The objective of the demo is to present the EGI deployment of BioVeL ecological niche modelling and related services, which allow parallelized computation and hence scalable workflow execution. More specifically, the demo will show how EGI resources are used by scientists (i) to explore and integrate relevant biological information from global species and environmental data repositories, (ii) to run bioinformatically as well as computationelly intense experiments, and (iii) to make the results of such large eco-informatic studies transparent and repeatable.

Relevant URL (if any):

- BioVeL portal at EGO https://portal.biovel.eu/
- Spatio-temporal interface at EGI (BioSTIF): https://wiki.biovel.eu/display/doc/BioVeL+Service+-+BioSTIF
- OpenModeller services at EGI https://wiki.biovel.eu/display/doc/BioVeL+Service+-+openModeller+web+service+2.0