MIND STEP

MODELLING INDIVIDUAL DECISIONS TO SUPPORT THE EUROPEAN POLICIES RELATED TO AGRICULTURE

Deliverable D 7.6: Prototype of the data services and download services

AUTHORS	Ian McCallum, Anto Subash (IIASA)
APPROVED BY WP MANAGER:	Gocht, Alexander (Thuenen)
DATE OF APPROVAL:	21-05-2021
APPROVED BY PROJECT COORDINATOR:	Hans van Meijl (WR)
DATE OF APPROVAL:	31-5-2021
WP NUMBER & TITLE	WP 7 ICT platform of MIND STEP and the MIND STEP model toolbox
DISSIMINATION LEVEL	Public
PROJECT WEB SITE:	https://mind-step.eu

This document was produced under the terms and conditions of Grant Agreement No. 817566 for the European Commission. It does not necessary reflect the view of the European Union and in no way anticipates the Commission's future policy in this area.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 817566.

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EXECUTIVE SUMMARY

Deliverable D7.6 describes the initial prototype of the MIND STEP data and download services (https://mindstep.geo-wiki.org/). In order to deliver and visualize the various geo-spatial results produced by the various MIND STEP modeling teams, MIND STEP has installed a GeoServer instance, connected to a PostgreSQL database in combination with a Content Management System (CMS) for designing the web map content and a User Interface (UI) to provide data services and download services. This effort will eventually form part of the basis for interacting with stakeholders, the research community and the public. For this prototype version, published GLOBIOM results have been added to the GeoServer for demonstration purposes. A unique landing page was created with additional information as well as common web map features.

This deliverable will be followed in six months time by the Deliverable D7.7 describing the final release of the data services and download services.

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1. BACKGROUND

As per the MIND STEP proposal, MIND STEP provides an ICT platform that hosts the MIND STEP models, tools and data. We develop under the general public license (GPL) and use open source software, where applicable. In order to deliver and visualize results, MIND STEP applies a GeoServer in combination with a geo-database to provide data services and download services, e.g. web feature, web map services. The setup conforms to INSPIRE. This document describes the web map application to visualize spatial model results from the various MIND STEP models.

2. DATA SERVICES

The following describes the various steps taken in designing and implementing the MIND STEP geo-spatial data services.

2.1. User requirements / data exchange

Initial user requirements are taken from the MIND STEP proposal, from the survey and findings reported in D7.5 and the GLOBIOM modelling team at IIASA. At this stage it is assumed that the large scale models (i.e. GLOBIOM) will not necessarily provide spatially explicit results, but could potentially report on a national, regional or NUTS level or similar. Where model results link to spatial polygons, attribute tables with the necessary ID's for linkage will be required, along with the necessary vector files in standard formats. Preferred data exchange would involve .csv for attribute data and shapefiles or similar vector formats. Model specific vector files in standard geospatial formats are acceptable as long as the files are provided. The service also works with raster data in standard formats. Furthermore, the provision of data in the various Open Geospatial Consortium (OGC) standard formats is also easily ingestible (i.e. web feature services).

2.2. Prototype Workflow

Based on the user requirements and the available resources within MIND STEP we have established the following prototype workflow (Figure 1). Standard means of data exchange will be used to transfer model data for entry into the GeoServer. The appropriate datasets will be added to the GeoServer and if needed (owing to large file size), related attribute data will be added to the related PostgreSQL database. Data styling will occur directly in the GeoServer, adding legends, colour coding etc. The Strapi CMS will then be used to add the necessary layers to the UI. These will then appear in the UI, with standard web mapping options including download capabilities.

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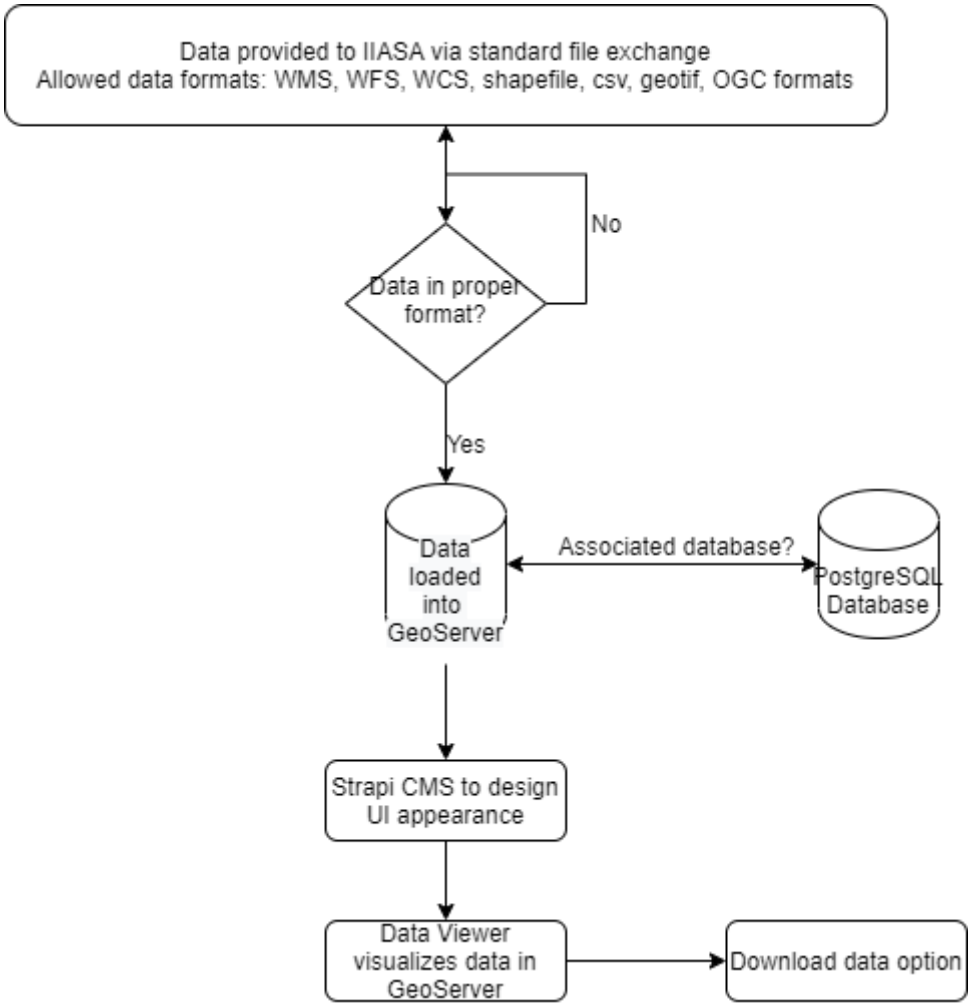

Figure 1. A prototype version of the MIND STEP spatial data services workflow.

2.3. Prototype and next steps

Based upon the prototype workflow described in 2.2, we have established the following url to visualize the spatial MIND STEP model output https://mindstep.geo-wiki.org/. Prior to the delivery of the final service (in 6 months' time), the prototype workflow will be further tested and modified to meet the user requirements as best as possible. We will be determining the actual load on the GeoServer to determine if the current setup is adequate or if a dedicated server is required. The present UI contains no user authentication; however, this will be reviewed for the final release. We will also be exploring the linkages between the data and download services described here and the MIND STEP toolbox.

Figures 2 and 3 contain screenshots of the service. Figure 3 contains GLOBIOM data from https://www.nature.com/articles/s41893-019-0287-1. This data describes the water security index for three scenarios, namely the baseline, climate friendly and exploitation. Further

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demonstration data will be added to the prototype over time, along with descriptions of the data, etc.

Figure 2. Screen shot of MIND STEP data and download service interface. Further features can be added here including a description of the service.

Figure 3. Prototype web map featuring demonstration data from the GLOBIOM model, with the ability to download the data and query the data by selecting features.

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ANNEX I MIND STEP WP7 TEAM

Mr Sebastian Neuenfeldt (THUENEN)
Mr Alexander Gocht (THUENEN)
Mr John Helming & Mr Marc Müller (WEcR)
Mr Albert Brouwer, Mr Stefan Frank, Mr Ian McCallum, Mr Anto Subash, Mr Petr Havlik (IIASA)

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CONSORTIUM DESCRIPTION

The consortium of MIND STEP consists of 11 partners from 7 countries in Europe (the Netherlands, Germany, Austria (IIASA), Italy, France, Spain (JRC-Seville), Norway and Hungary). It includes partners from the private and public sector representing:

- Academia and higher education (UBO, UCSC, WU).
- SME dealing with research consultancy, data collection, strategic advice, normalization and policy in the field of energy, environment and sustainable development. This SME has also a strong track record in the field of communication, stakeholder engagement and exploitation (GEO)
- Public government bodies dealing with agricultural and environmental research and data collection and building agricultural models at different scales (WR, IIASA, IAMO, THUENEN, INRA, NIBIO, JRC)

The consortium has been carefully constructed in such a way that it is capable of jointly managing all activities and risks involved in all project stages. Each partner contributes its own particular skills, (inter) nationally wide network and expertise, and has a critical role in MIND STEP. Partner expertise smoothly complements each other and all together form the full set of capabilities necessary to lead MIND STEP to a success. Achieving the overall objective is determined by all partners in the consortium as well as their ability to involve other interested stakeholders in the process of developing, validating and disseminating the IDM models, indicators and methodologies (WR, UBO, IAMO, UCSC, WU, THUENEN and INRA) and linking IDM models to current agricultural policy models (WR, IIASA, UBO) included in the MIND STEP model toolbox. Dissemination and communication activities are steered by partner GEO who has graphic design, IT and marketing communication teams to deliver out-of-the-box and novel solutions for dissemination and communication and JRC who has a large network with policy makers. GEO has experience in leading comparable activities in H2020 projects as UNISECO and COASTAL. The coordinator WEcR is part of Stichting Wageningen Research (Wageningen Research Foundation, WR). WR consists of a number specialised institutes for applied research in the domain of healthy food and living environment. WR collaborates with Wageningen University (WU) under the external brand name Wageningen University & Research. One of the strengths of Wageningen University & Research (including WR) is that its structure facilitates and encourages close cooperation between different disciplines. The institutes Wageningen Economic Research (proposed coordinator of MIND STEP, WEcR) and Wageningen Environmental Research (WEnR) are involved in this proposal. The One-Wageningen approach will also be applied to MIND STEP. WEcR has a long standing reputation of leading large scale EU projects, such as SUPREMA, Foodsecure, SUSFANS, FLINT, SAT-BBE, and SIM4NEXUS.

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