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D6.4 Policy dashboard and e-learning course

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BESTMAP
BEHAVIOURAL, ECOLOGICAL & SOCIO-ECONOMIC TOOLS FOR MODELLING AGRICULTURAL POLICY

Policy dashboard and e-learning course

Deliverable D6.4

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BESTMAP

Behavioural, Ecological and Socio-economic Tools for Modelling Agricultural Policy

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Table of contents

List of figures 5
List of tables 5
Preface 6
Summary 6
1. BESTMAP Dashboard 6
1.1. Final enhancements 6
2. Implemented layers and storymaps 7
3. E-learning courses 8
3.1. Exploring layers script description 9
3.2. Creating statistical charts script description 9
3.3. Data analysis script description 10
3.4. Storymaps of policy briefs script description 11

List of figures

Figure 1. Legend and Layer control window indicating the available dimensions for each layer. 7
Figure 2. YouTube channel where e-learning courses can be found 9

List of tables

Table 1. Dimensions supported for each model output 7
Table 2: Layers implemented in the final version 7
Table 3: Story maps implemented in the final version 8

Preface

The outcomes of BESTMAP, including the results of biophysical models, agent-based models at local scales, and upscaling at the European level, are consolidated within the dashboard.
Dashboards for data visualization and decision-making serve as indispensable information management tools that visually present, analyze, and provide metrics of data, enhancing decision-making processes and understanding.
Dashboards offer critical reporting of spatialized data and associated metrics, playing a vital role in displaying model results, guiding decisions, and facilitating navigation through complex landscapes. In pursuit of maximum dissemination, BESTMAP endeavors to enhance the utilization of the dashboard through the creation of video tutorials. These tutorials are designed to provide comprehensive guidance on utilizing the various tools and features available within the dashboard, empowering users to navigate the platform effectively and engage in meaningful actions.

Summary

The BESTMAP dashboard, a pivotal element of the H2020 BESTMAP project, stands as a vital instrument for disseminating project findings and fostering informed decision-making processes.

This platform enables exploration, analysis, and reporting on the outcomes of biophysical models, offering users valuable insights into various environmental factors.

This deliverable offers a comprehensive overview of the dashboard's architecture, outlining its seamless integration into diverse environments. It also provides updates on the dashboard's final status, its content, and the creation of e-learning courses aimed at guiding users in effectively utilizing the tools and features available within the dashboard.

1. BESTMAP Dashboard

As explained in Deliverable 2.3 (Dashboard prototype) and Deliverable 6.6 (Virtual Lab Integration) BESTMAP dashboard was designed to facilitate end-users such as stakeholders, policy makers, scientists, and regular citizens, to access analysis and reporting of BESTMAP model results that simulate future scenarios. The prototype was created by the consortium members and subsequently co-designed with end-users (stakeholders and decision makers). The dashboard is available at https://www.ogc.grumets.cat/bestmap/.

1.1. Final enhancements

Due to the intricate nature of BESTMAP outputs, the latest enhancement to the dashboard is the introduction of support for multi-dimensional data visualization. This innovative functionality is specifically crafted to visualize and analyze spatial data across multiple dimensions directly within the web browser environment.

This advancement empowers users to delve into geographical data with unparalleled depth, allowing exploration across various dimensions such as different scenarios or diverse attributes including bird species, soil carbon conditions, or water quality attributes.

Implemented with user convenience in mind, each dimension can be effortlessly selected from a dropdown menu (Figure 1), facilitating seamless exploration and comparison.

The dimensions available for each model include the following (Table 1):

Table 1. Dimensions supported for each model output

BIOPHYSICAL MODELLING			
Biodiversity			
Bird Habitat Suitability	Species	Scenario	
Relative Bird Species Richness	Scenario	Threshold	
Food & fodder	Scenario		
Carbon sequestration	Scenario		
Water Nutrient delivery	Scenario	Borselli K	Flow Accumulation
AGENT BASE MODELLING	Scenario		

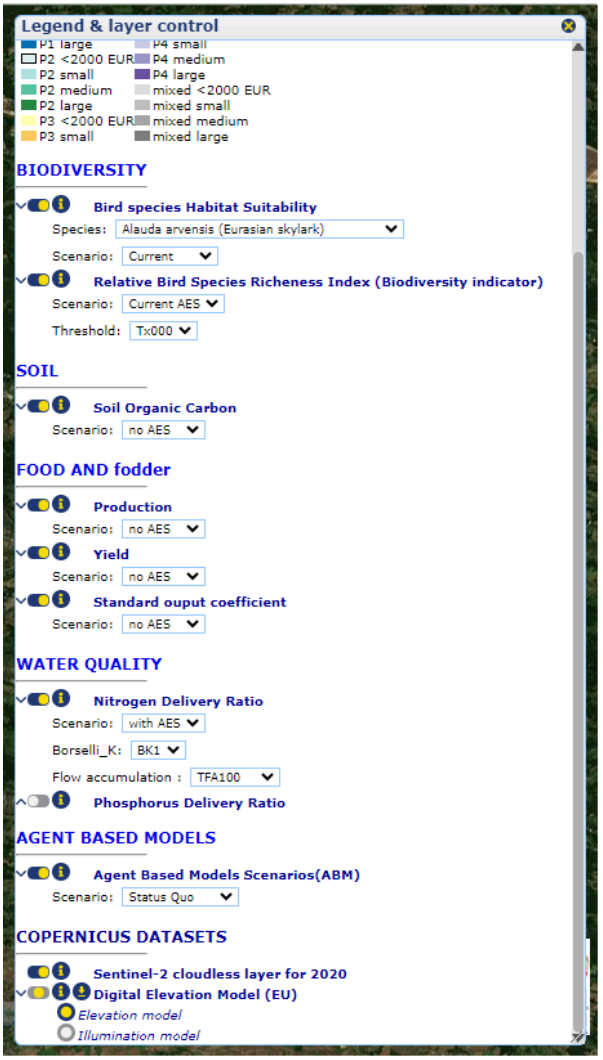

Figure 1. Legend and Layer control window indicating the available dimensions for each layer.

2. Implemented layers and storymaps

At the end of the project, the following layers (Table 1) and storymaps (Table 2) for the case studies and topics are implemented into the final dashboard version.

Table 2: Layers implemented in the final version

Layers	South Moravia	Mulde	Bačka	Humber	Catalunya
FARMING SYSTEM ARCHETYPES	●	●	●	●	●
BIOPHYSICAL MODELLING					
Biodiversity	●	●	●	●	●
Food & fodder	●	●	●	●	●
Carbon sequestration	●	●	●	●	●
Water Nutrient delivery	●	●	●	●	●
AGENT BASE MODELLING		●	●		
OTHER ANCILLARY DATA					
Zones			●		
EUROPEAN UPSCALING	●	●	●	●	●

● Implemented ● In progress

Table 3: Story maps implemented in the final version

Story maps	South Moravia	Mulde	Bačka	Humber	Catalunya
FARMING SYSTEM ARCHETYPES	●	●	●	●	●
BIOPHYSICAL MODELLING					
Biodiversity		●			●
Food & fodder					
Carbon sequestration					
Water nutrient delivery					
AGENT BASE MODELLING	●	●			●
POLICY BRIEFS					

● Implemented

3. E-learning courses

To assist users in navigating the dashboard effectively, we have developed a series of instructional videos designed to familiarize them with its basic functionalities as well as its advanced analytical capabilities.

This e-learning course comprises four tutorials covering a range of topics, including layer exploration, statistical chart creation, data analysis techniques, and utilizing storymaps as effective communication tools to illustrate results and aid stakeholder interpretation.

These tutorials are accessible through the project's YouTube channel, available at (https://www.youtube.com/playlist?list=PLtEf9fFCbNsxylcUmNITx0yylZL3tZvMI), as well as on the project's website.

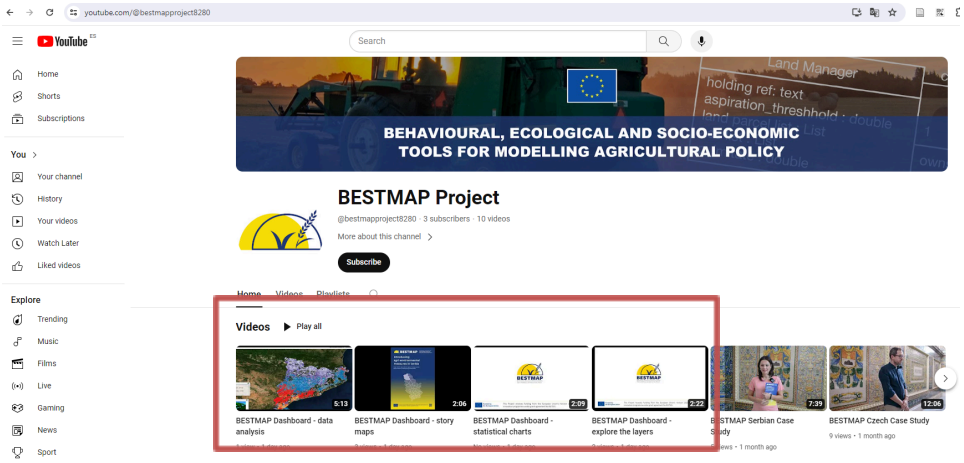

Figure 2. YouTube channel where e-learning courses can be found

3.1. Exploring layers script description

The platform enables various stakeholders, including scientists, policymakers, and the general public, to explore, analyze, and report on the outcomes of biophysical models. These models encompass diverse domains such as biodiversity, soil health, water quality, and food and fodder production. They estimate the impacts of Common Agricultural Policy (CAP) agri-environmental schemes (AES) in both present and projected future scenarios without such schemes.

Users can select their area of interest through the dropdown menu provided.

All available model results are conveniently listed in the legend as layers, each accompanied by associated information to aid users in comprehending and interpreting the content. This information can be accessed by clicking on the title of the section or by right-clicking on the layer and selecting "Explanation."

Users have the flexibility to toggle individual layers on and off using the slider button next to each one. The legend of each layer is also displayed and can be managed by pressing the arrow.

Certain layers offer the option to select different variables. For example, in the Bird Habitat Suitability layer, users can choose among several bird species and two distinct scenarios.

The current position on the map is prominently displayed, along with the values of the active layers. Users can access detailed information about any location on the map by clicking on it, which opens a new window revealing the coordinates and the values associated with the layers at that specific point.

This course is available at: https://www.youtube.com/watch?v=3Gt4UCHwaRQ

3.2. Creating statistical charts script description

The platform enables exploration, analysis, and reporting on the outcomes of biophysical models, covering various domains such as biodiversity, soil health, water quality, and food and fodder production. These models estimate the impacts of Common Agricultural Policy (CAP) agri-environmental schemes (AES) in both present and projected future scenarios without such schemes.

One of its functionalities includes the ability to examine the statistical distribution of variables or layers.

To access this feature, users can simply right-click on the layer name and choose the "Histogram" option, available for quantitative data layers. Upon selection, a new window emerges, presenting a dynamic histogram illustrating the distribution of the data. This histogram remains responsive to changes in the view, ensuring real-time updates.

For categorical layers, distribution is depicted through a pie chart, mirroring the dynamic nature of the histogram.

Users can effortlessly compare distributions across different case studies. For example, one can create a pie chart illustrating the Farming system archetypes of South Moravia (Czech Republic) and then transition to the Mulde case study in Germany to generate a similar visualization. This facilitates visual comparisons, allowing users to observe that while South Moravia predominantly features general cropping, covering nearly 75% of its surface area (equivalent to almost 900 km2), the situation in Mulde is more diverse.

This course is available at: https://www.youtube.com/watch?v=TEOkchraFak

3.3.Data analysis script description

The dashboard offers various functionalities, including the analysis of data from different layers by computing new results or selecting by condition.

The Yellowhammer, a passerine bird native to Eurasia, is found in the mountainous northern Eurosiberian part of Spain. Recent decades have seen a decline in its populations, rendering it a vulnerable species. It is believed that changes in agricultural practices have contributed to reduced breeding densities, although environmentally respectful practices may improve habitat suitability.

The BESTMAP biodiversity model assesses the habitat suitability of the Yellowhammer in scenarios with and without agri-environmental practices. Comparison of resulting maps indicates a noticeable effect of these practices on the bird's habitat suitability.

By utilizing the dashboard's calculator function, users can compute the difference between the two scenarios. This involves selecting the Bird Species Habitat Suitability layer, specifying Yellowhammer, choosing the current scenario, and adding the subtraction operator to compare it with the scenario without agri-environmental practices.

Upon creating the new difference layer, it becomes evident that agri-environmental practices have notably enhanced habitat suitability for the Yellowhammer, particularly in the northern part of Catalunya and the Pyrenees. Zooming into these areas reveals that grazing livestock and forage farms contribute significantly to these improvements.

Further analysis involves selecting pixels with significant improvement and overlaying them with farming system archetype information to quantify which farming systems contribute most to the Yellowhammer's habitat improvement.

To isolate areas with the greatest improvement, a mask highlighting significant improvement areas is created and combined analytically with Farming System Archetype (FSA) information. This process helps identify Medium Grazing Livestock and Forage FSA as significant contributors to habitat improvement for the Yellowhammer.

This information can be exported for further analysis and to inform decision-makers in developing new agricultural practices to support Yellowhammer conservation efforts.

This course is available at: https://www.youtube.com/watch?v=ls6XHKgA0uU

3.4.Storymaps of policy briefs script description

The dashboard possesses a multitude of functionalities, including the capability to generate storymaps.

A StoryMap, a feature integrated into the dashboard, serves as a tool to present information dynamically and interactively. It combines text, images, and maps to construct a captivating narrative that engages its audience. Users leverage this feature to develop thematic storymaps aimed at aiding end-users in data interpretation.

For instance, as part of the BESTMAP project's endeavor to influence informed policy and decision-making, six policy briefs have been crafted, addressing significant facets within the European agricultural sector and the project's Case Studies across various countries including the UK, Germany, the Czech Republic, Spain, and Serbia. These policy briefs have been transformed into StoryMaps within the dashboard.

Within the StoryMaps, a narrative unfolds alongside dynamic map adjustments that visually represent the explanations provided, facilitating readers in understanding the content. A landscape icon signals each transition within the map.

Additionally, StoryMaps support the inclusion of figures such as images or graphs that complement the narrative and can be linked to web pages for further information or reference.

Through the utilization of StoryMaps, key messages intended for stakeholders can be effectively conveyed, providing valuable insights into the complex dynamics of agricultural and environmental interactions.

This course is available at: https://www.youtube.com/watch?v=Itvhnr03ZiA