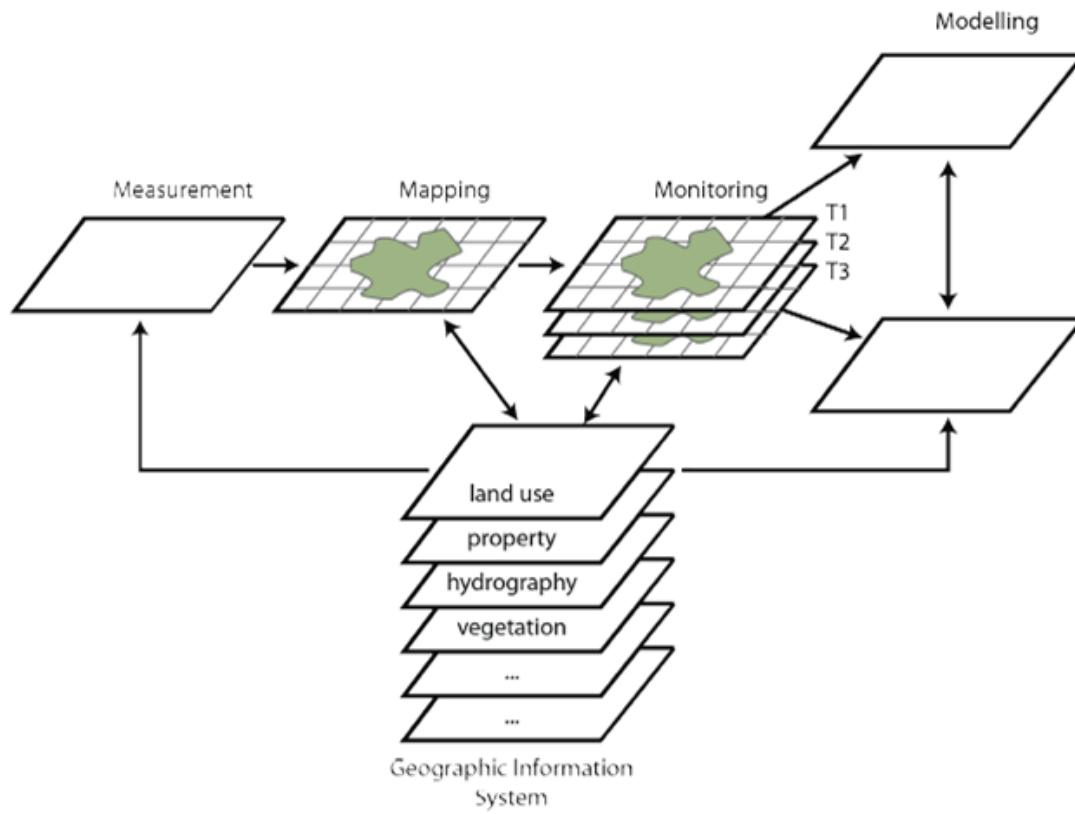


WEB-GIS LOCAL TRAINING ACTIVITIES

D.T2.2.5

Report on local training activities for PA technicians and
Stakeholders related to the use of the web-GIS tool



McHarg's Map Layering Concept

This report presents the contents of the training session done by technical partners, in the context of Consortium Meeting n.5, in order to introduce general functionalities of the GIS platform and train non-expert on its usage.

Date and place:

The training took place in Bratislava, Slovakia, the 6th of November 2018. A dedicated session of Consortium Meeting was dedicated to the training.

Represented partners and participants:

All partners took part to the training.

PP1 - MUM

- Sofia Salardi

PP2 - POP

- Martin Baloga
- Michal Labus

PP3 - MuK

- Robert Vodopic
- Kristina Benko

PP4 - SZRDA

- Anett BAUER
- Botond FELFÖLDI
- Sándor KOVÁCS

PP5 - ICRA

- Ana Brdnik
- Jožica Lazar

PP6 - RER

- Massimo Bottacini
- Apollonia Tiziana De Nittis

PP7 - SPECTRA

- Vladimír Ondrejčka
- Milan Husár
- Maroš Finka
- Marian Spacir

PP8 - UIRS

- Vlasta Vodeb

PP9 - BOKU

- Ulrike Pröbstl-Haider
- Oliver Schmid-Selig

PP10 - REGEA

- Tamara Lišnjić Lang
- Srećko Vrčec

PP11 - KEK

- Krisztián Szabados
- Balázs Darnai

PP12 - IURS

- Karel Barinka
- Blanca Marková

PP13 - PLT

- Maria Cristina Fregni

Training about Web-GIS platform

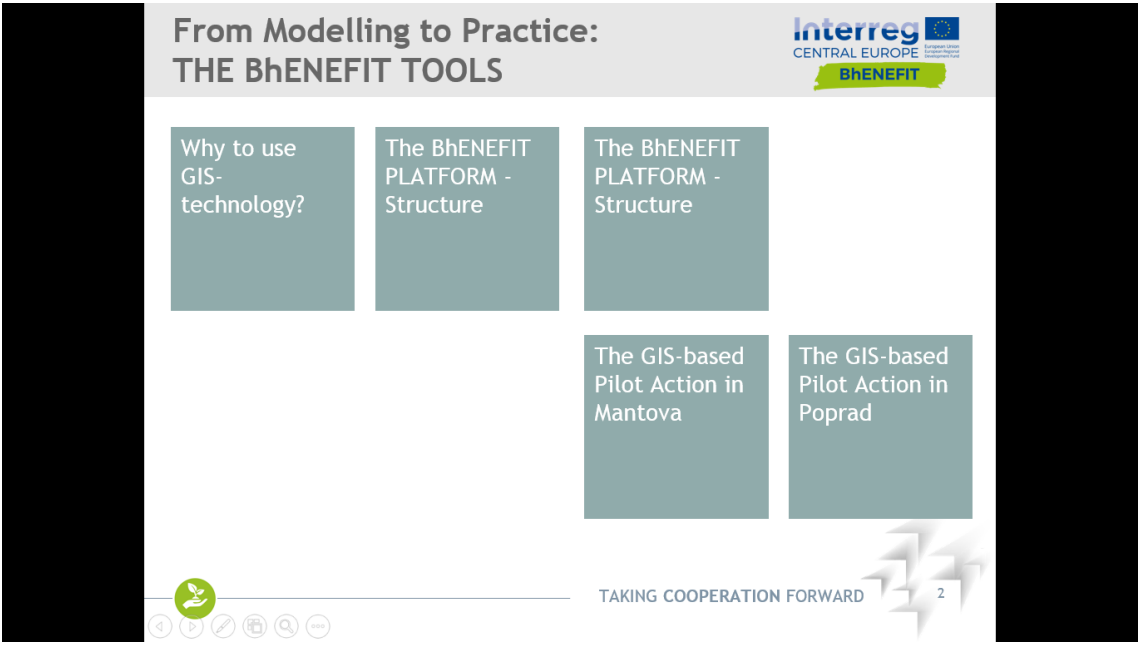
Speakers

- Maria Cristina Fregni, Politecnica, Partner 13 and WPT2 coordinator
- Marian Spacir, SPECTRA, Partner 7

Main points of discussion

The training was divided into two sub-session: a first general introduction about GIS and a second practical sub-session to learn how to include and analyse data from the GIS platform.

General introduction

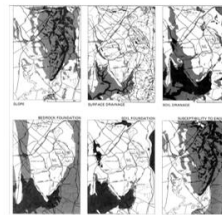


The screenshot shows a presentation slide with the following content:

- Title:** From Modelling to Practice: THE BhENEFIT TOOLS
- Logos:** Interreg CENTRAL EUROPE and BhENEFIT logos in the top right corner.
- Content Boxes:**
 - Why to use GIS-technology?
 - The BhENEFIT PLATFORM - Structure
 - The BhENEFIT PLATFORM - Structure
 - The GIS-based Pilot Action in Mantova
 - The GIS-based Pilot Action in Poprad
- Footer:** TAKING COOPERATION FORWARD and a page number '2'.
- Navigation:** A set of small navigation icons (back, forward, search, etc.) is located at the bottom left.

Ian L. McHarg

Ian L. McHarg (20 November 1920 – 5 March 2001) was a Scottish landscape architect and writer on regional planning using natural systems. He was the founder of the department of landscape architecture at the University of Pennsylvania in the United States. His 1969 book *Design with Nature* pioneered the concept of ecological planning. It continues to be one of the most widely celebrated books on landscape architecture and land-use planning. In this book, he set forth the basic concepts that were to develop later in **geographic information systems**.



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In the sixties, the landscape architect Ian L. Mc Harg was studying how to design new roadway damaging as less as possible natural heritage and biodiversity. To do that, he developed an eligibility analysis through a technique he called “overlay mapping”. The technique consists of the overlapping of different thematic maps.

The first step is to identify the values (historical, hydrogeological, panoramic, residential, institutional, etc.) of the affected area. For each value Mc Harg drew a map, on a transparent paper, using shades of grey that represent the degree of importance of every area related to its social/economic/environmental cost. In a passage describing the process he and his colleagues used to determine the least destructive route for a new roadway, McHarg (1971) wrote:

“let us map physiographic factors so that the darker the tone, the greater the cost. Let us similarly map social values so that the darker the tone, the higher the value. Let us make the maps transparent. When these are superimposed, the least-social-cost areas are revealed by the lightest tone” (p. 34).

Overlapping the map you obtain a composition that include all the social/economic/environmental costs and that permit to see where phenomena are concentrated in an area.

Mc Harg achieved to see there the rout of the new roadway will have caused less damages (lighter grey = minor cost) and what values it will have destroyed.

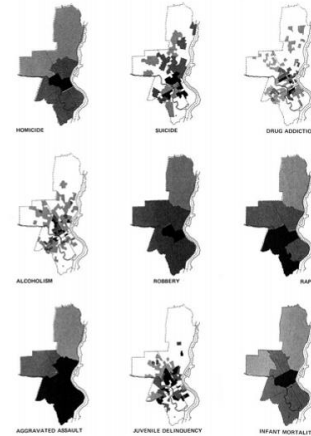
Mc Harg’s methodology permits to measure, to map, to monitor and to model areas.

Ian L. McHarg

McHarg also demonstrated that a plethora of **societal plethora** of traits could be represented on maps as well, and overlain in much the same in much the same manner as composite physiographic obstructions.

These tended to mimic property values.

McHarg's McHarg's map overlay method gained national recognition in a consulting project for a 5-mile stretch of the controversial Richmond Parkway on Staten Staten Island in 1968



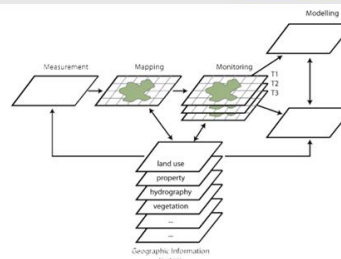
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Ian L. McHarg

McHarg's Map Layering Concept and its four M: Measurement, Mapping, Monitoring and Modelling.

From this scheme, GIS permit unlimited combinations of mappable features, arbitrarily "weighed" (lighter or darker grey) and electronically combined.



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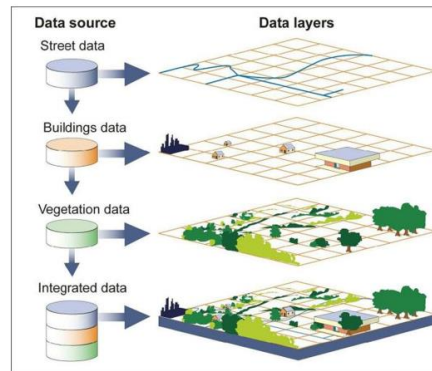


GIS-system

The technology behind these systems integrates the characteristics of data bases, which allow to perform searches, store data, draw up graphs, with those of a map, which provides spatial data and geographical representations

The GIS system is a software that can handle a lot of geo-referenced information.

These data can be expressed through cartograms or tables and can refer to portions of territory more or less extensive, according to the needs



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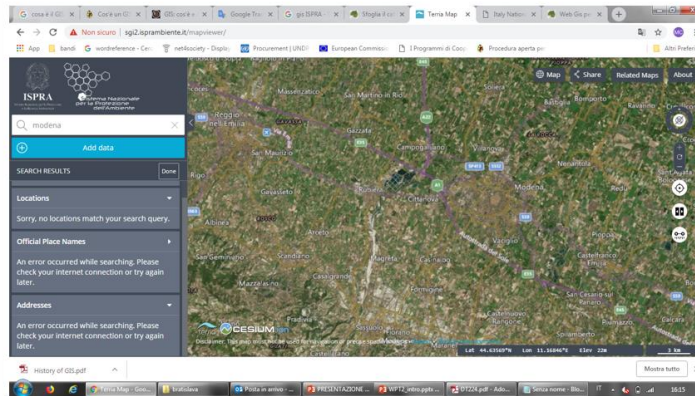
7

Storing digital data in multiple “layers” is not unique to GIS, of course; computer-aided design (CAD) packages and even spreadsheets also support layering. What’s unique about GIS, and important about map overlay, is its ability to generate a new data layer as a product of existing layers”

GIS has evolved with computing technology. Today, GIS has evolved with computing technology. Today, raster and vector data can be combined with raster and vector data can be combined with increasingly sophisticated digital imagery, manipulating increasingly sophisticated digital imagery, manipulating large data files.

GIS-portal: examples

Geological Survey of Italy Portal

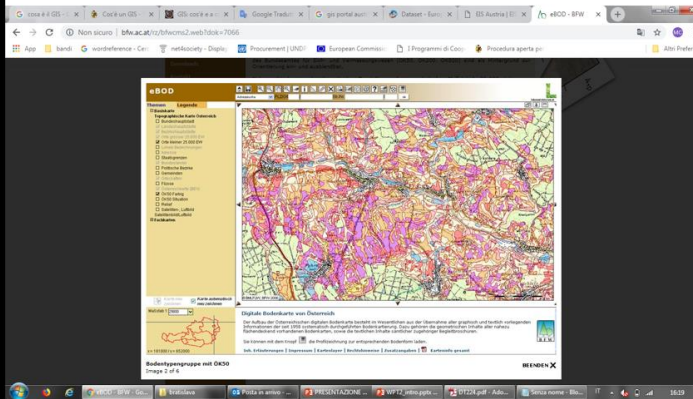


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GIS-portal: examples


eBOD - Digitale Bodenkarte




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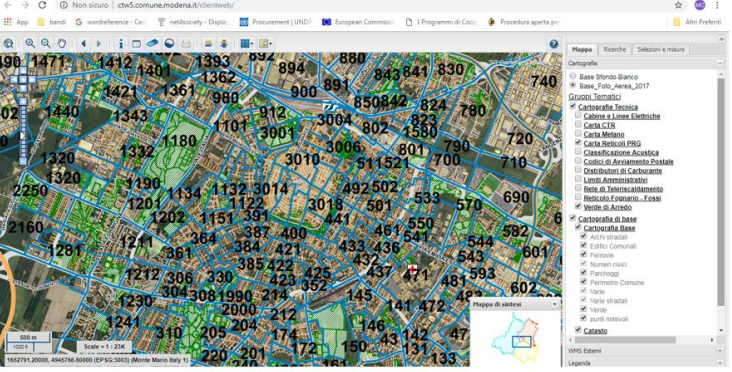
9


GIS-portal: limits






GIS SYSTEMS ARE VERY TECHNICAL





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At present, the most of Geographic Information Systems are managed through GIS software difficult to understand by non-technicians and non- GIS-experts. It is uncommon for people to own GIS software, to be able to use it and to implement it with data.

B.h.EN.E.F.I.T. rises the challenge of overtake these limits. It is determined to detect and test ICT solutions able to extend the number of GIS systems' users, including non-technicians, to support the confrontation between different people and departments. Make GIS systems user-friendly means not only to simplify the planning procedure but also to built a context where the different knowledge interact through debate.

GIS-portal: limits

GIS SYSTEMS REQUIRE SPECIFIC SKILLS

- **Spatial Data and Algorithms understanding**
- **Data entry**
- **Data conversion**
- **Data maintenance**
- **Metadata creation and editing**
- **GIS Analysis**
- **GIS Workflow**
- **Model Building**
- **Cartography and Graphic Design**



- *Database Skills*
- **Basic Programming Knowledge**
- *Project Management and Design*
- *Portability of skills on multi-platforms and online/offline world*

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Spatial Data and Algorithms understanding: Understand the special case of spatial data how they work and their internals. Also, be familiar with how certain operations are carried out and when they are applicable. Many operations will run in the software, but not necessarily produce valid results. (Contributed by reader Duane Marble)

Data entry: Be able to enter data into a database successfully with minimal errors. This includes editing said data as needs arise.

Data conversion: The ability to convert data from either older sources (digitization) or from multiple sources to either a common format or common schema. It is extremely useful to be able to work with data coming from GPS and performing data corrections as needed. (With contribution by Jimmy Xu)

Data maintenance: Be able to maintain data, correctly archive and ensure quality control.

***Metadata creation and editing:** Maintain logs of data processing and relevant information to include in metadata and ensure accurate creation and maintenance of said metadata.

GIS Analysis: Be able to perform GIS Analysis as it is often used to solve common problems. An ability to extend and alter the standard analysis to meet requirements is a plus. Remember, data analysis can be performed on vector or raster data, therefore some remote sensing skills are required. (With contribution by Jimmy Xu)

GIS Workflow: Understand the workflow to perform some procedure and be able to follow it and enhance it as needed.

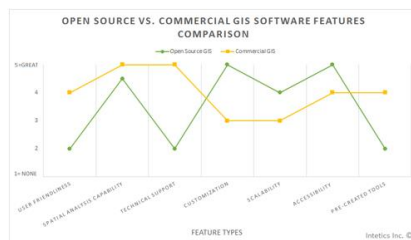
Model Building: Be able to create models of processes to allow for a workflow to be built. Also, model building in the ArcGIS sense is very helpful in this regard.

Cartography and Graphic Design: Familiarize yourself with cartographic principles and graphic design principles. Maps are used in a variety of ways and presented in a multitude of media. You need to be able to work with that. Think of color, symbology, fonts, etc. Bad cartographic design will often make your analysis hard to decipher and interpret.

GIS-portal: limits



GIS SYSTEMS COST A LOT!



ArcGIS	Mapbox	TerraSync	MapInfo Pro	QGIS	CARTO	GRASS GIS	FME Hub	MapViewer	Bentley Map



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GIS-system: PRO



- **Decision making** is improved because you get detailed as well as specific information about locations.
- You can increase **efficiency** and reduce expenses especially regarding scheduling timetables, fleet movements, and maintenance schedules.
- The **visual format** is easy to understand which helps to enhance communication between involved departments or organizations.
- GIS software enables **effortless recordkeeping** as it easily records geographical changes.
- Helps in **geographic management** as you can get to know what is happening in a geographic location and space, and use it to plan actions.
- Cloud GIS software solutions facilitate **instantaneous collaboration**.
- Offers **enhanced transparency** for citizen engagement.
- **Enables identification** of underserved and at-risk populations in a community.
- Helps in planning and **allocation of resources**.
- **Improves management** of natural resources.
- **Enhances communication** during a crisis.
- GIS software can be used to **plan for the impact** of changes in a community.



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GIS-system: PRO 

Routing tools

These give the ability to design accurate stops and to manage, compare, and manipulate routes.

Territory tools

Businesses need territory creation tools that help to handle data tables and to visually represent and manipulate service areas.

Reports

Top GIS software applications enable you to intuitively and quickly create top quality reports in PDF and MS Excel file formats.

Interoperability

Quality GIS platforms support the most recent data standards and a range of file formats including those for MS Excel, MS MapPoint, and Google Maps.

Data

On top of that, they provide new data sets for different countries with access to the latest available geographic information.

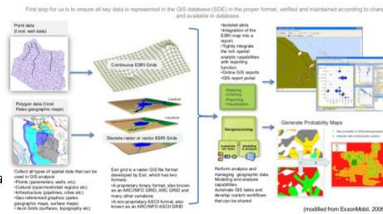
Logistics and Operations

A distance and drive-time feature that creates an Excel table that shows the costs of travel between any numbers of locations. You can quickly find out the nearest and backup locations ranked by distance or travel time.





Location analysis

This technique is used identify ideal locations for new retail outlets.

YOU CAN QUERY!



PEOPLE INVOLVED in the platform's activities

<p>Viewer</p>  <p>For everybody that views and interacts with existing maps</p>	<p>Contributor</p>  <p>For knowledge workers who create, update and share maps and related content</p>	<p>Analyst</p>  <p>For people that perform geospatial analysis, visualization and mapping</p>	<p>Curator</p>  <p>For professional who curate and maintain authoritative maps and geospatial databases</p>	<p>Expert</p>  <p>For GIS professional and data scientist who perform advanced geospatial analysis, visualization, mapping and data management</p>
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PEOPLE INVOLVED in the platform's activities

WHO YOU ARE:

Viewer



For everybody that views and interacts with existing maps

WHAT YOU CAN DO:

WHAT YOU NEED TO DO IT:

* Person interested in the topic of the platform

* student, researcher etc

* Search for thematic data on a map

* Discover additional thematic contents

* ICT device with a browser and a web connection

* Limited familiarity with social network and websites



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PEOPLE INVOLVED in the platform's activities

WHO YOU ARE:

Contributor



For knowledge workers who create, update and share maps and related content

WHAT YOU CAN DO:

WHAT YOU NEED TO DO IT:

* Person involved in the platform project by the related PA

* Active citizens

* Download support's tools for creating a similar platform

* Add data

* ICT device with a browser and a web connection

* Access credentials



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PEOPLE INVOLVED in the platform's activities

WHO YOU ARE:

** Person engaged for the implementation of the platform by the owner*

Analyst



WHAT YOU CAN DO:

** gis-expert of the PA*

For people that perform geospatial analysis, visualization and mapping

** Collect and prepare data*

** Contribute to the shapefiles creation*

WHAT YOU NEED TO DO IT:

** Basic GIS-competences and specific competences on the topic of the platform*
** Specific Access credentials*



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PEOPLE INVOLVED in the platform's activities

WHO YOU ARE:

** Responsible person engaged by the PA*

Curator



WHAT YOU CAN DO:

** Update and select data*

For professional who curate and maintain authoritative maps and geospatial databases

** Monitor results*

** Manage the involved staff*

WHAT YOU NEED TO DO IT:

** Limited familiarity with GIS-system and high familiarity with platform web-features*



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PEOPLE INVOLVED in the platform's activities

WHO YOU ARE:

* *Responsible person engaged by the PA*

Expert



WHAT YOU CAN DO:

For GIS professional and data scientist who perform advanced geospatial analysis, visualization, mapping and data management

* *Prepare shape files*

* *Shift and manage axisting shape files*

WHAT YOU NEED TO DO IT:

* *High familiarity with GIS-system*

* *Limited familiarity with topic of the platform*



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RESOURCES NEEDED - SOFTWARES



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RESOURCES NEEDED - WEB SPACE



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RESOURCES NEEDED - TIME!



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PAY ATTENTION TO...

PRIVACY ISSUES



KEEPING UPDATED



DURABILITY



DURABILITY

ADAPTABILITY



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Specific practical session

Poprad Web-GIS (description)

- **energy efficiency** and **urban heat islands** - main topics for a monitoring process

Logic:

- Data processing with a desktop software
- WebGIS compatible with a desktop software (ArcGIS)
- Cloud based solution
- Back interface for an administration
- Front interface for users / public



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Poprad Web-GIS

Back interface allows **to setup:**

- data visualization
- Map application layout and content
- tools for users
- collaboration with colleagues



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Poprad Web-GIS

Front interface



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Poprad Web-GIS



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Poprad Web-GIS - tools

- | | | | |
|---|-------------|---|--------------------------------------|
|  | Legend |  | Add data |
|  | Data layers |  | Measure |
|  | Basemaps |  | Draw |
|  | Print |  | Attributes (descriptive information) |
|  | About | | |



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Poprad Web-GIS

Task: You are the manager of the building on „Jarná 13, Poprad“.
You want to know which part of the roof is most overheated in midday and what is its temperature.

1. Find the address
2. Activate the relevant layer
3. Look at the legend / click on the map

<https://gis-riesenia.maps.arcgis.com/apps/webappviewer/index.html?id=7e04bc885d644247b0f3ebe1215a62c4>

arcg.is/1unuy8



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Every partner, with a personal PC, tested the platform and answered to the tasks provided by PP7.

The last part of the session was dedicated to the presentation of Poprad platform next steps for finalization:

Next steps

- To fix bugs in some data
- Searching by parcels (cadastral data)
- To prepare and add next data about:
 - land-use plan
 - current land cover
 - ownership
 - energy consumption
 - building condition
 - population



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