

AlpES WebGIS

- Role and integration of EBM LAU2 units -

Nadine Houbé, MSc

*Institute for Interdisciplinary
Mountain Research (IGF/ÖAW)*

9 May 2017; Leuven, Belgium



AlpES

Alpine Ecosystem Services – mapping, maintenance and management

EU-Project

Duration: 12/2015 – 12/2018

Funding ~ 2,2 Mio. Euro

co-funded by the ERDF (European Regional Development Fund) via Interreg Alpine Space programme

Website: www.alpine-space.eu/projects/alpes

Ecosystem Services ...

- ... are benefits that people obtain from ecosystems



Source: <https://freshwaterwatch.thewaterhub.org/content/ecosystem-services>

Example: Drinking Water of New York City

- available on

[https://yosemite.epa.gov/SAB/sabcvpress.nsf/06347c93513b181385256dbf00541478/9a8590d73802c75085256f9d00485e36/\\$FILE/Catskills%20Parable.pdf](https://yosemite.epa.gov/SAB/sabcvpress.nsf/06347c93513b181385256dbf00541478/9a8590d73802c75085256f9d00485e36/$FILE/Catskills%20Parable.pdf)

The Alpine Space...

- ... is an important provider of Ecosystem Services (ES)
- For people in and outside the Alps
- Many near-natural ecosystems → numerous essential goods and services that are particularly important in these fragile ecosystems, often characterised by steep slopes, a variety of altitudes, thin soil layers, highly adapted biodiversity



The Alpine Space...

- Alpine ES are a pillar of a Green Economy
- They are a key driver of Alpine development

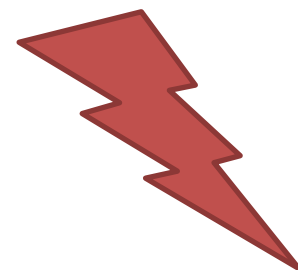
Filtration of surface water

Fuel wood for energy production

Landscapes for outdoor recreation

Protection against mass movements

The problem



- Ecosystem Services is a powerful concept
- Applied in environmental sciences
- Potentially useful for environmental planning
- Unfortunately hardly applied in practice
- **→ Tools needed to introduce the ES concept to planners, public authorities, policy makers, NGOs and economic actors**

AlpES objective

- Development of a common understanding of ES in the Alpine Space area
- harmonized ES mapping and assessment
- **Provision of Stakeholders with the results through an interactive and userfriendly WebGIS**

AlpES objective

- ES do not follow administrative boundaries
- Introduction as a regional and transnational environmental governance framework
- for dynamic protection, sustainable use, management and risk prevention
- **Support (cross-border) planning**

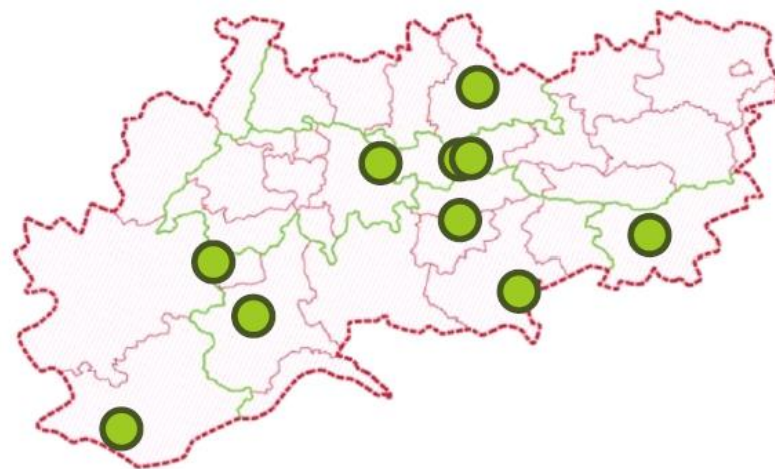
AlpES partnership

Lead partner:

- European Academy of Bozen (EURAC)

Project partners:

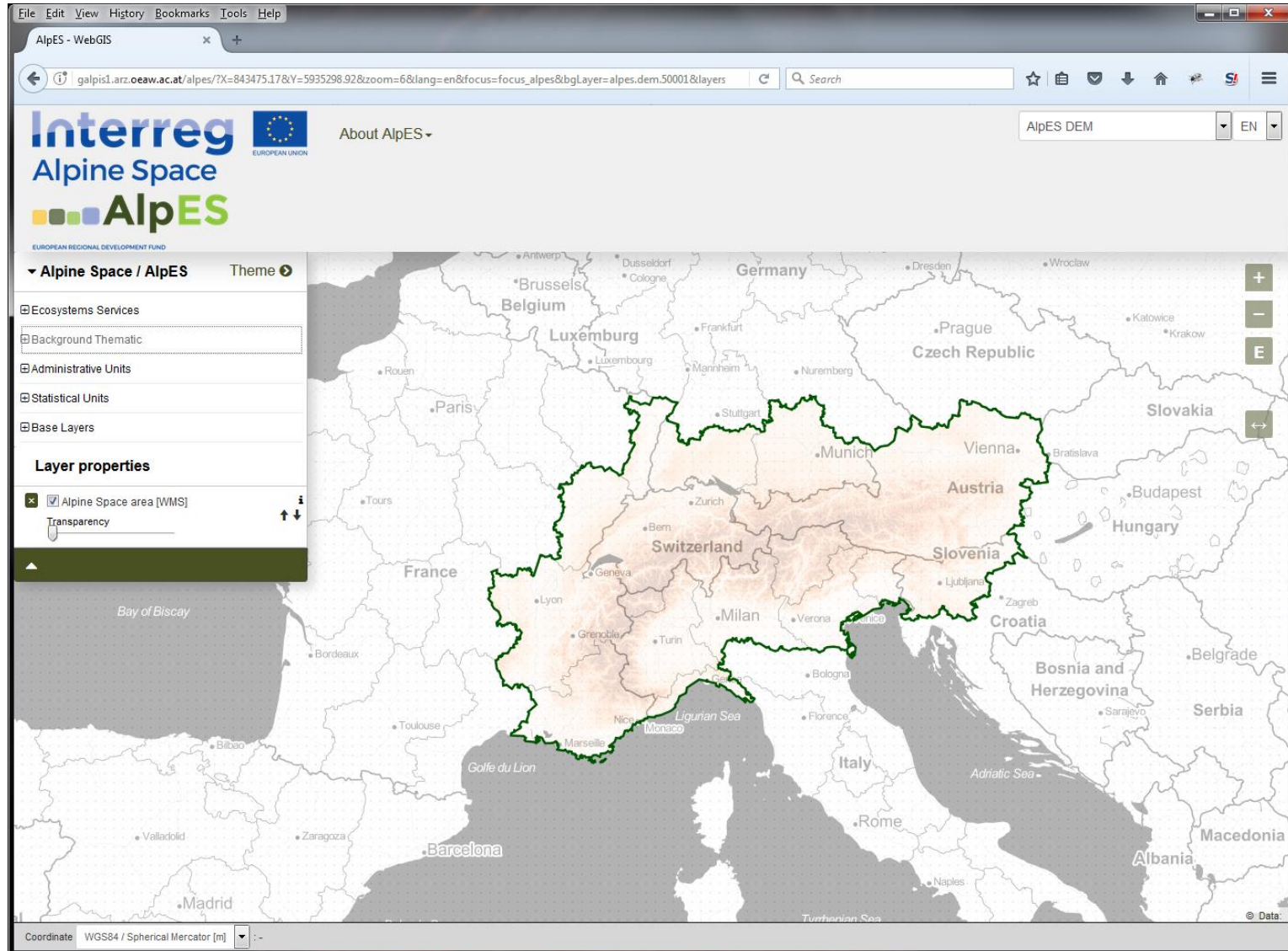
- University of Innsbruck (AT)
- Austrian Academy of Sciences (AT)
- Centre For Studies and Expertise on Risks, Environment, Mobility, and Urban and Country planning (FR)
- Safe Mountain Foundation (IT)
- Veneto Region (IT)
- Piedmont Region (IT)
- The Institute of the Republic of Slovenia for nature conservation (SI)
- Principality of Liechtenstein, Office of Environment (LI), CIPRA International (LI)
- Institute for Environmental Planning and Spatial Development (DE)



The AlpES WebGIS...

- ... is interactive, interoperable and userfriendly
- ... makes ES indicators accessible to stakeholders
- ... does not allow data download
- ... has a responsive and up-to-date webdesign
- ... uses open web standards (OGC WMS, WMTS, WFS)
- ... is multilingual (DE, EN, FR, IT, SL)

WebGIS – current state



WebGIS – current state

The screenshot displays the AlpES WebGIS interface in a web browser. The browser's address bar shows the URL: `galpis1.arz.oeaw.ac.at/alpes/7X=843475.17&Y=5935298.92&zoom=6&lang=en&focus=focus_alpes&bgLayer=alpes.demhillshade.5000`. The page header includes the Interreg Alpine Space AlpES logo and the European Union flag. A sidebar on the left contains a menu with the following sections:

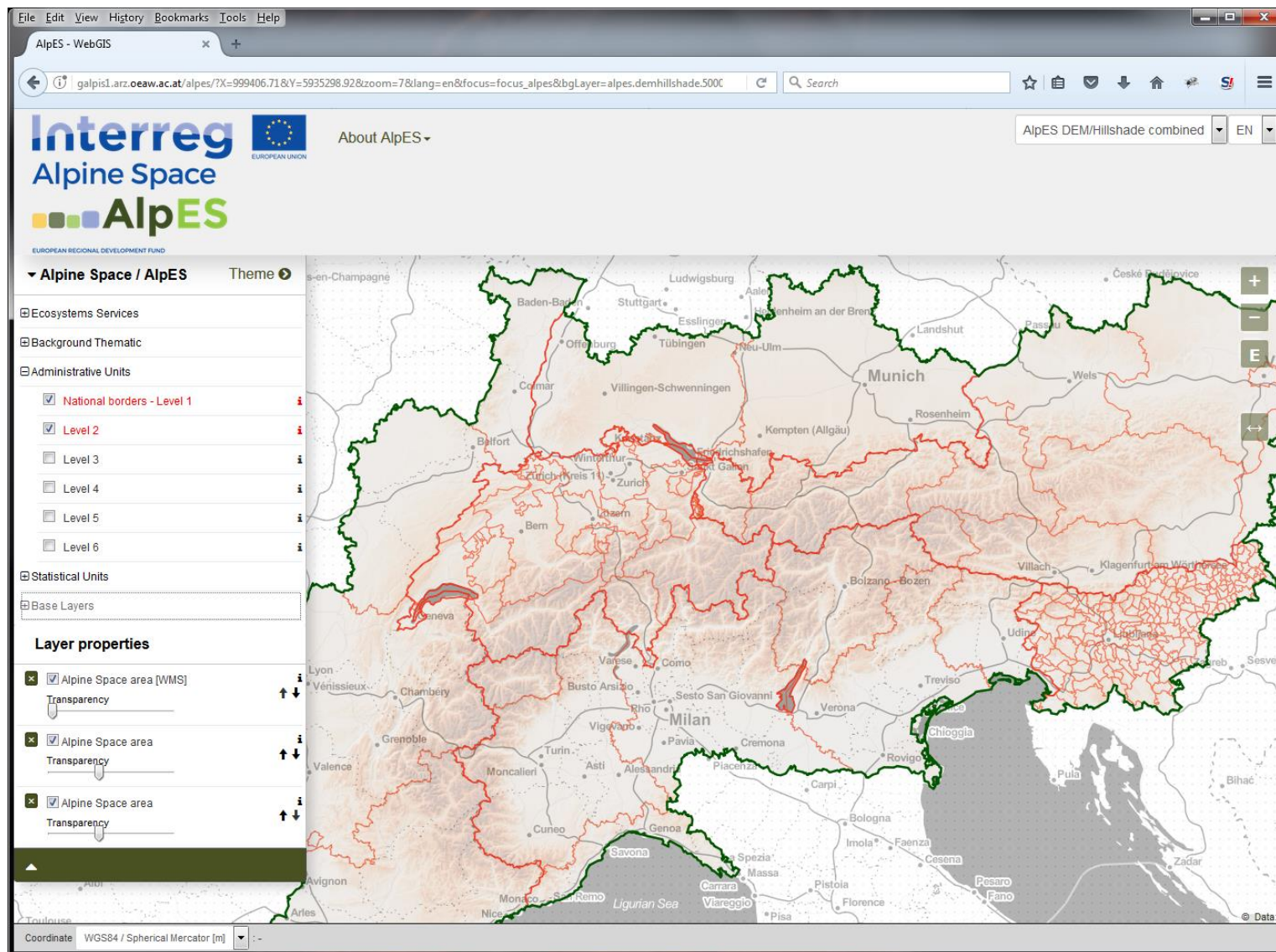
- Alpine Space / AlpES** (Theme)
- Ecosystems Services**
- Background Thematic**
 - Land Cover
 - Conservation Areas
 - IGF Curated
 - ☒ Biosphere Reserves
 - ☒ National Park
 - ☐ Natural Park
 - ☒ World Heritage Site
- Administrative Units
- Statistical Units
- Base Layers

The **Layer properties** section on the left shows the following layers with their transparency settings:

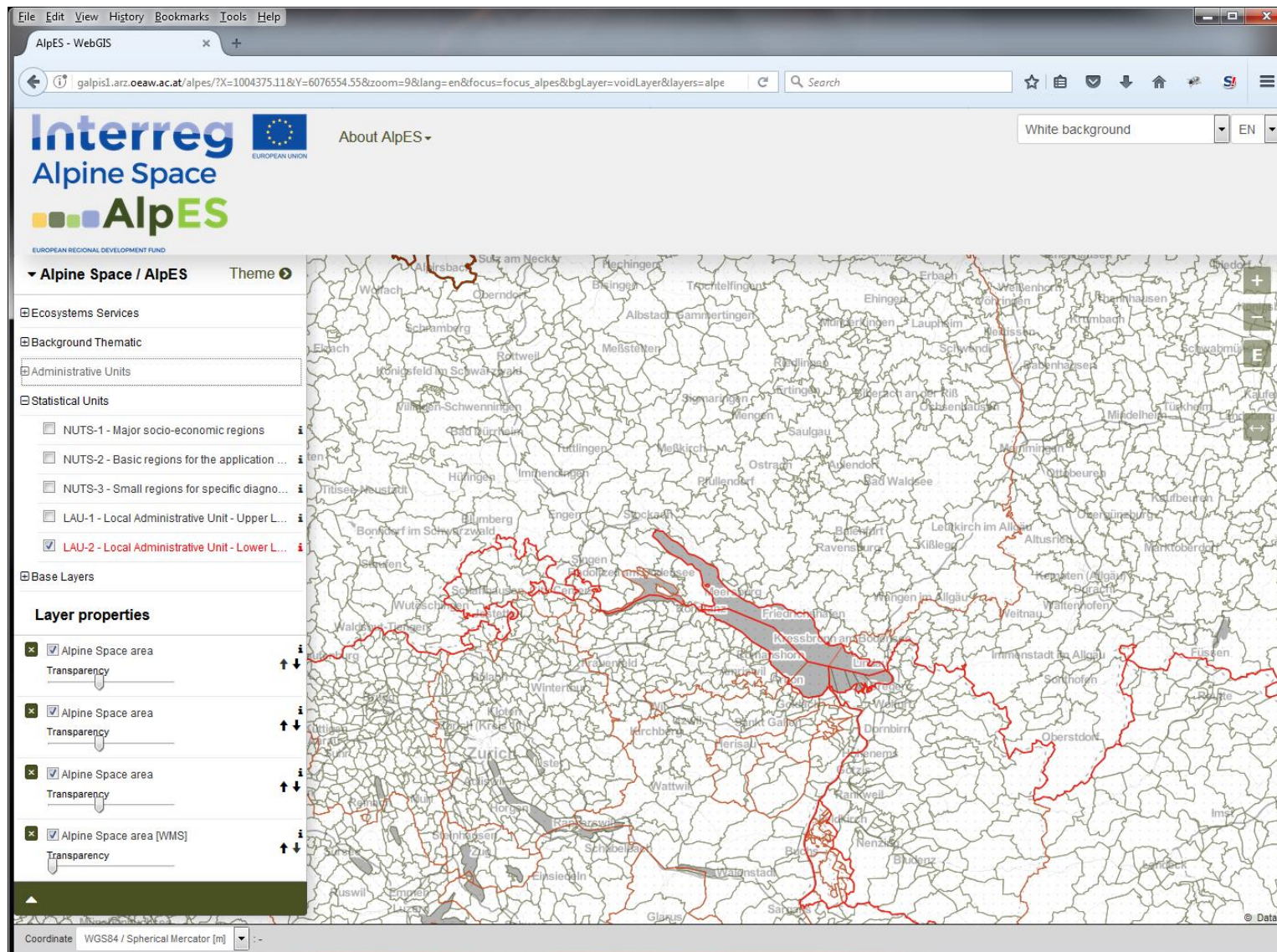
- ☒ World Heritage Sites (Transparency: 100%)
- ☒ National Parks (Transparency: 100%)
- ☒ Biosphere Reserves (Transparency: 100%)
- ☒ Alpine Space area [WMS] (Transparency: 100%)

The main map area shows a topographic map of the Alpine region, with various countries and cities labeled. The map is overlaid with a green boundary representing the Alpine Space area. The bottom status bar indicates the coordinate system: `Coordinate: WGS84 / Spherical Mercator [m]`.

WebGIS – current state



WebGIS – current state



The screenshot displays the AlpeES WebGIS interface within a web browser. The browser's address bar shows the URL: `galpis1.arz.oew.ac.at/alpes/?X=1004375.11&Y=6076554.55&z=9&lang=en&focus=focus_alpes&bgLayer=voidLayer&layers=alpe`. The page header includes the Interreg Alpine Space and AlpeES logos, along with a search bar and language settings (White background, EN).

The main content area features a map of the Alpine region, showing administrative boundaries and thematic layers. The left sidebar contains a list of layers and their properties:

- Alpine Space / AlpeES Theme**
 - Ecosystems Services
 - Background Thematic
 - Administrative Units
 - Statistical Units
 - ☐ NUTS-1 - Major socio-economic regions
 - ☐ NUTS-2 - Basic regions for the application ...
 - ☐ NUTS-3 - Small regions for specific diagno...
 - ☐ LAU-1 - Local Administrative Unit - Upper L...
 - ☒ LAU-2 - Local Administrative Unit - Lower L...
 - Base Layers
- Layer properties**
 - ☒ Alpine Space area
Transparency: [slider]
 - ☒ Alpine Space area
Transparency: [slider]
 - ☒ Alpine Space area
Transparency: [slider]
 - ☒ Alpine Space area [WMS]
Transparency: [slider]

The map shows a detailed view of the Alpine region, with various administrative boundaries and thematic layers. The bottom status bar indicates the coordinate system: WGS84 / Spherical Mercator [m].

WebGIS – current state

The screenshot displays the AlpES WebGIS interface. The main map shows the Alpine region with administrative boundaries. A 'Parameter info' dialog box is open, showing the following information:

- Parameter info**
- alpes.admin.level1.30001**
- Administrative Units - Level 1**
- Information**
- EuroGeographics - EuroBoundaryMap v10 - Administrative Units - Level 1**

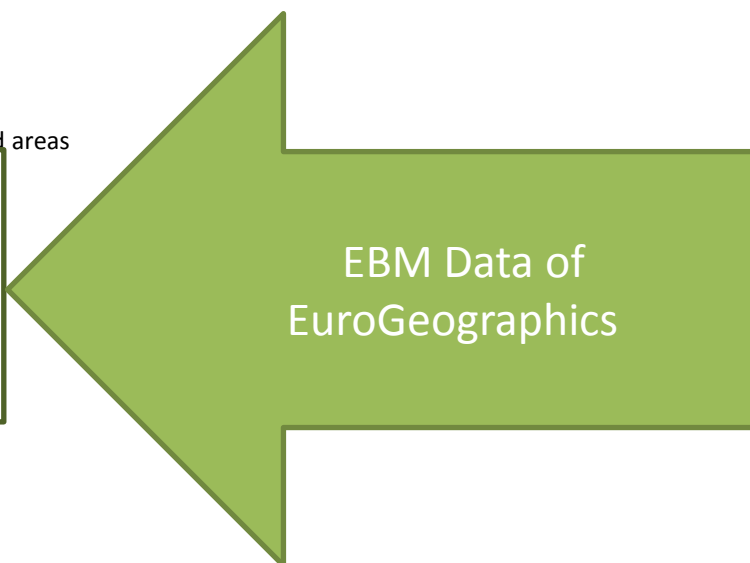
The interface includes a sidebar with the following sections:

- Alpine Space / AlpES**
- Theme**
- Ecosystems Services**
- Background Thematic**
- Administrative Units**
 - ☒ National borders - Level 1
 - ☐ Level 2
 - ☐ Level 3
 - ☐ Level 4
 - ☐ Level 5
 - ☐ Level 6
- Statistical Units**
- Base Layers**
 - ☒ DEMs and Hillshades
- Layer properties**
 - ☒ Alpine Space area [WMS]
 - Transparency
 - ☒ Alpine Space area
 - Transparency

The map shows the Alpine region with administrative boundaries. The coordinate system is set to WGS84 / Spherical Mercator [m].

WebGIS – basic data integrated

- **1. Ecosystem Services**
 - 1.1 *ES Indicators*
 - 1.1.1 ES Indicator 1
 - 1.2 *Sustainability Indicators*
 - 1.2.1 SUST Indicator 1
- **2. Background Thematic**
 - 2.1 *Land Cover*
 - 2.1.1 CORINE Land Use Cover
 - 2.2 *Conservation Areas*
 - 2.2.1 *IGF Curated - Protected Areas Alpine Convention Area*
 - 2.2.1.1 Biosphere Reserves
 - 2.2.1.2 National Parcs
 - 2.2.1.3 Natural Parcs
 - 2.2.1.4 World Heritage Sites
 - 2.2.2 Natura 2000
 - 2.2.3 CDDA - Nationally designated areas
- **3. Administrative & Statistical Units**
 - 3.1 AdminUnit1 - States
 - 3.2 AdminUnit2 - Federal States
 - 3.3 NUTS 1
 - 3.4 NUTS 2
 - 3.5 NUTS 3
 - 3.6 LAU 2 - Communes
- **4. Alpine Space**
 - 4.1 Alpine Space Area
 - 4.2 Alpine Convention Area
 - 4.3 Test regions
- **5. Baselayer**
 - 5.1 Digital Elevation Model
 - 5.2 Hillshade
 - 5.3 Digital Elevation Model and Hillshade in combination
 - 5.4 Baselayer OSM



EBM Data of
EuroGeographics

Why we use LAU2 units

- Requirement of future ES-related project data (indicators):
 - Alignment with administrative/statistical boundaries necessary
 - smallest existing areal units: LAU2
 - **ES data provide highest accuracy and resolution possible**
 - ES project data will be calculated and visualised on LAU2 basis
 - stakeholders (communes) can search for municipality-related ES data

Why we use EuroGeographics' EBM

- **EU-wide** (Alpine Space wide)
- Most **exact** boundaries (spatial quality, resolution)
- **Current** (legal regulations, political correct)
- **Complete** dataset
- **Different datasets** (AdminUnits 1&2, LAU2, NUTS1-3) **perfectly synchronized/aligned/harmonised**
- **Harmonised** and **consistent** boundaries
- **No overlapping or missing parts** (especially on state borders)

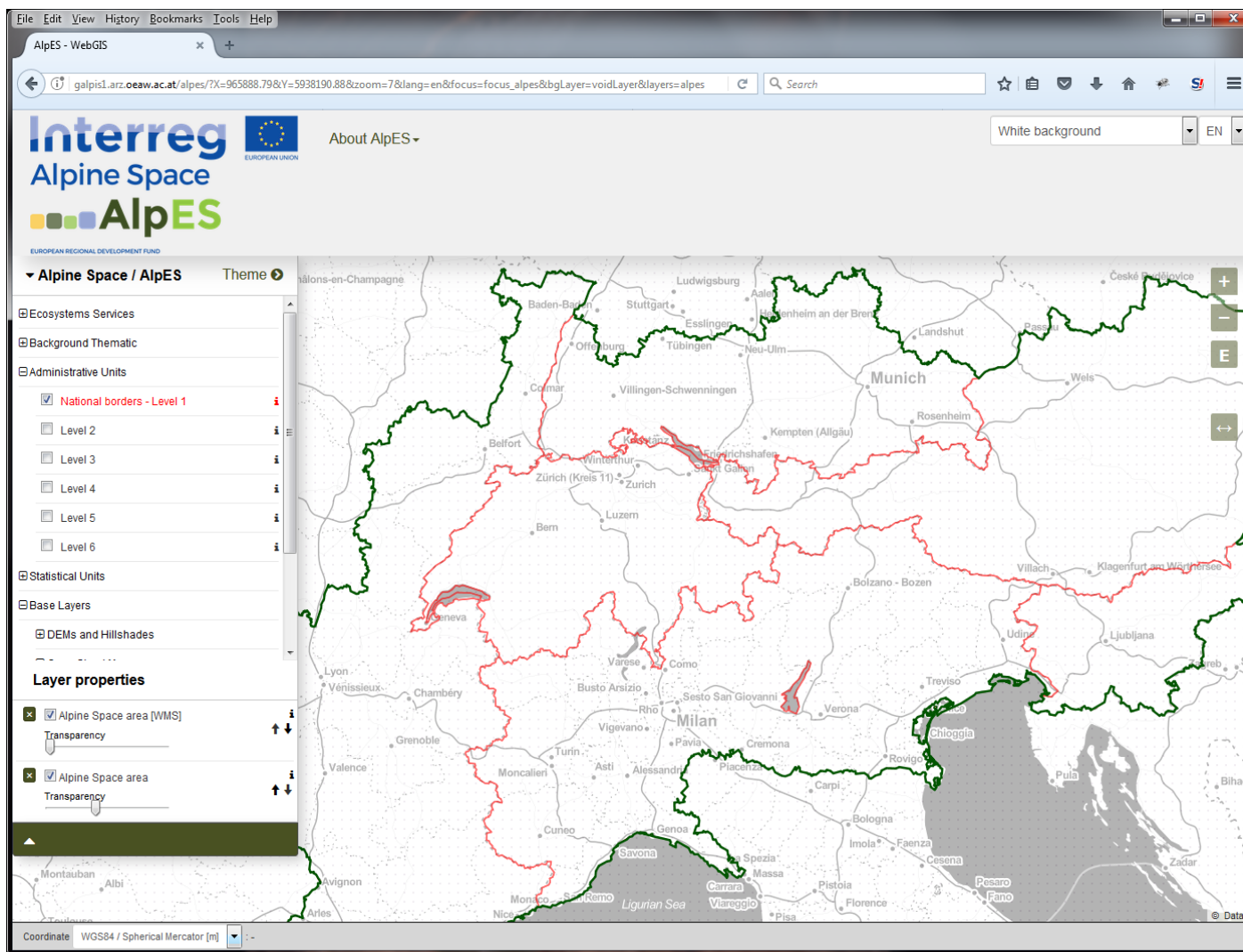
Why we use EuroGeographics' EBM

- **Time saving:** no need of harmonization of datasets of different countries and additional statistical EU datasets
- **No costs** (research project), otherwise partly very high costs depending on the country and resolution - if even available
- **Most exact computation and visualization of ES indicators**
- best choice for our project

3 proposals for improvement

- One page with **brief description** of all datasets, that are available on the DVD
- **Seperate shapefiles** on DVD with projection ETRS89-LAEA (EPSG: 3035) – for a fast selection of data, that should be visualised 2D (units: meter)
- **Additionally dataset Admin1 without big lakes** (Lake Constance & Lake Garda & Lake Geneva) because they don't really fit into the total view
Why are (only, exactly) these lakes visualised?

Admin1 – big lakes



LAU2 data plays a key role

LAU2 data of EuroGeographics plays a key role in AlpES project

- for the ES-related project data computation
- for the WebGIS integration and visualisation
 - expected ES tables will be joined
by key column “inspireID” as
per EBM data

Outlook

- **First ES data** integrated in 06/2017
- **Stakeholder involvement**
 - Interviews
 - Learning and training tools
 - Workshops
- **WebGIS plays an important role in representing the AlpES project results**

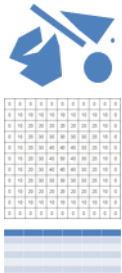
Take-Home-Message

- **Your EBM data** – especially the smallest areal units LAU2 – play a very important **key role** in our **AlpES** research project and its **WebGIS** because of its prominent benefits

→ *Thanks a lot for
providing the EBM!*

Data Preparation - local

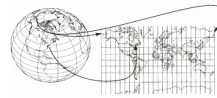
Input



Data Check



Project



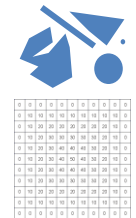
Clip



Processing



Output



Data Preparation – Server

Import PostGIS DB



Import in Geoserver

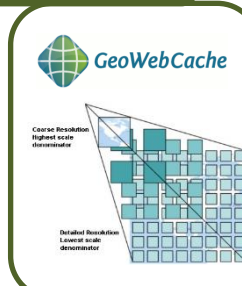


Styling

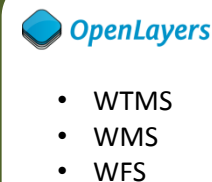
Css or sld file
Scale limits and filter

```
* {
  stroke: #e7e5e5;
  stroke-width: 0.5;
  stroke-linejoin: round;
  fill: #eaeaea;
  fill-opacity: 80%;
}
```

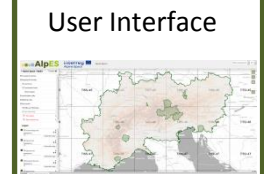
Tile Layers



Embedding in WebGIS



WebGIS Maps



Contact

- **Nadine Houbé, MSc**
- Institute for Interdisciplinary Mountain Research
- ICT Building, Technikerstraße 21a, 6020 Innsbruck, Austria
- **nadine.hoube@oeaw.ac.at** or
- **nadine.hoube@mailbox.org**
- +43 512 507 49410
- <http://www.mountainresearch.at/index.php/en/26-team-fernerkundung/215-hoube-nadine-en>

