Gap Analysis of Earth Observation capacity in the Balkans

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OBSERVE at-a-glance

OBSERVE consortium consists of:

- **15** institutions from
- **13** different countries,
- **8** of which belong to the Balkan region.
- **10** of which are Universities/Research Institutes
- **5** are from private sector.

Developing synergies with

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Analysis of EO capacity

Stakeholders Database » Questionnaire » Gap Analysis » Roadmap Strategy Plan

Stakeholders Database + National Reports

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276 stakeholders
12 countries

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Stakeholders Database

Which GEOSS societal benefit areas do you cover?

- Reducing loss of life and property from natural and human-induced disasters (130)
- Understanding environmental factors affecting human health and well-being (109)
- Improving the management of energy resources (93)
- Understanding, assessing, predicting, mitigating, and adapting to climate variability and change (97)
- Improving water resource management through better understanding of the water cycle (96)
- Improving weather information, forecasting and warning (44)
- Improving the management and protection of terrestrial, coastal and marine ecosystems (122)
- Supporting sustainable agriculture and combating desertification (91)
- Understanding, monitoring and conserving biodiversity (100)

Type of the organization

- Governmental (91)
- Commercial (private) (67)
- Public company (state-owned) (23)
- Academic (49)
- Scientific research (31)
- NGO (Non-governmental organization) (11)
- International (3)
- Other (11)
Strengthening and development of Earth Observation activities for the environment in the Balkan area

D2.3 Stakeholders’ Database
Analysis of EO capacity

Questionnaire

Number of questions: 87
Total Responses: 276

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The survey is contacted in 10 Balkan countries
- Albania
- Bosnia & Herzegovina
- Bulgaria
- Croatia
- FYROM
- Greece
- Montenegro
- Romania
- Serbia
- Slovenia

and in addition in
- Turkey
- Israel
- Cyprus
Analysis of EO capacity

Questionnaire

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Sectors vs Countries

SBAs vs Countries
Analysis of EO capacity

- EO communities are at a rather disparate level of development but differences seem to be larger between different EO fields than between countries.

- Two major problems seem to be fragmentation of communities and lack of awareness of the larger EO picture. Thus the approach to all EO activities is bottom-up targeting mostly scientific community and not the broad society. In most countries there is no clear coordination or governmental awareness of EO activities.

- The production of EO data is fully regulated by law in 29% of the cases and partially in 24%.

- Only 39% of data providers collect data continuously.

- 67% of data providers are willing to register their data on GEOSS.

- 100% of EO data providers produce their data electronically. 32% make it available over the Internet. 47% do not use any national or international standards.

- 45% of potential EO data users identified lack of funds or unavailability of data to be the major challenges in the past.

- 73% of the existing EO data users declared that their business would become more efficient if they had easy and uniform access to EO data. 50% of them estimate the annual income growth 10%-25%.
Strengthening and development of Earth Observation activities for the environment in the Balkan area

D2.1 Multilevel assessment and gap analysis methodology
### Analysis of EO capacity

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<table>
<thead>
<tr>
<th>Policies</th>
<th>Data – Applications</th>
<th>Capacities</th>
</tr>
</thead>
<tbody>
<tr>
<td>National policies and implementation</td>
<td>Existing national data sets</td>
<td>Institutional and public awareness on benefits of EO systems in environmental monitoring</td>
</tr>
<tr>
<td>Official national datum and projection</td>
<td>Processing capability of EO data</td>
<td>National budget allocation to EO programs</td>
</tr>
<tr>
<td>Information sharing policies</td>
<td>Data collection capability (Aerial Photography, LIDAR)</td>
<td>Funding initiatives and participation to research programs</td>
</tr>
<tr>
<td>Need of military clearance for specific data sets</td>
<td>EUPOS data availability and costs</td>
<td>Dedicated undergraduate and graduate programs, curricula and personnel – Relevant education and training centers</td>
</tr>
<tr>
<td>Use of EO application on environmental decision making processes</td>
<td>Level of conformation with the INSPIRE Directive (if it applies)</td>
<td></td>
</tr>
<tr>
<td>National remote sensing data distribution centers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant national public and private administration institutes, officials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinators of identified ongoing or completed EU or national sponsored projects</td>
<td></td>
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</table>

**Figure 1:** Type of collected Data and Information
Analysis of EO capacity

National Thematic Reports on EO

Capeicities in the Balkan Region

GREECE

Table 6. Relevant national public and private administration institutes, officials

<table>
<thead>
<tr>
<th>Distribution Center</th>
<th>Organization Status</th>
<th>Contact Info</th>
<th>Type of Data</th>
<th>Data Availability</th>
<th>Sharing policy</th>
<th>Data costs</th>
<th>Metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNCS</td>
<td>Government</td>
<td>Link</td>
<td>Orthophotos, geoidic, bathymetric</td>
<td>Off-line</td>
<td>Sold</td>
<td>Link</td>
<td>YES</td>
</tr>
<tr>
<td>HRNS</td>
<td>Government</td>
<td>Link</td>
<td>Orthophotos, geoidic, bathymetric</td>
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<td>YES</td>
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<td>Government</td>
<td>Link</td>
<td>Orthophotos, geoidic, bathymetric</td>
<td>Off-line</td>
<td>Sold</td>
<td>Link</td>
<td>YES</td>
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<tr>
<td>NOME</td>
<td>Government</td>
<td>Link</td>
<td>Cartographic</td>
<td>Off-line</td>
<td>Sold</td>
<td>Link</td>
<td>YES</td>
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National Thematic Reports on EO

Capeicities in the Balkan Region

SLOVENIA

Table 6. Relevant national public and private administration institutes, officials

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</tr>
</thead>
<tbody>
<tr>
<td>Geosystems Italia</td>
<td>Private company</td>
<td>Link</td>
<td>SRTM, GEOME, QuickBird WorldView-2</td>
<td>Off-line</td>
<td>N/A</td>
<td>Variable</td>
<td>Available</td>
</tr>
<tr>
<td>Intersect Research G.</td>
<td>Private company</td>
<td>Link</td>
<td>ASTER LANDSAT IRS-1/2 Cartosat-2 INSPIRE</td>
<td>Off-line</td>
<td>N/A</td>
<td>Variable</td>
<td>Available</td>
</tr>
<tr>
<td>Space Consulting</td>
<td>Private company</td>
<td>Link</td>
<td>Various</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

1.7 Relevant national public and private administration institutes, officials

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Copyright and Related Rights Act,
Spatial Planning Act,
Zoning and estate legislation.

Field of infrastructure for spatial information is also limited and outlined in some national strategic documents such as, for example:

Slovenia’s Development Strategy (www.grezn.gov.si),
Spatial Planning Act, etc.

Commercialization in the public administration bodies and the action plan for development of the field of commerce in the public administration (www.njz.gov.si).

Recently, the national Geoportal as foreseen by the Spatial Information Act has not been yet established in Slovenia. It is planned to be established in the second half of this year. The existing spatial data sets and particular web services are still available to the users via various web portals and access points of public utilities.

Slovenia has a satisfactory institutional and public awareness on benefits of EO systems in environmental monitoring, being even increased by extensive natural disasters in the last years (floods, droughts, fires, etc.).

National budget allocation to EO programs

Annual or biannual plans; public tenders; mainly for production and infrastructure, methodological projects and expert work, few research projects.

Funding initiatives and participation to research programs

Slovenia’s Ministry of Education, Social Affairs, Health and Sports provides financial support for research projects.

National programs: EU Frame Programs, COST, Interreg programs, etc.

Dedicated undergraduate and graduate programs, curricula and personnel – Relevant education and training centers

- Dedicated undergraduate and graduate programs, curricula and personnel – Relevant education and training centers

Institute Undergraduate program Graduate program Training Personnel Web site Curricula
- University of Ljubljana, Faculty of Civil and Geodetic Engineering, Department of Geodesy
  - Bachelor of Science in Geodesy (3 years)
  - Master of Science in Geodesy (2 years)
  - Yes
  - Yes
  - 40
  - [link]
  - [link]

University of Ljubljana, Faculty of Arts and Architecture, Department of Geography
  - Bachelor of Arts in Geography (3 years)
  - Master of Arts in Geography (2 years)
  - Yes
  - Yes
  - 20
  - [link]

University of Maribor, Faculty of Architecture and Civil Engineering, Department of Geography
  - Bachelor of Science in Geography (3 years)
  - Master of Science in Geography (2 years)
  - Yes
  - Yes
  - 30
  - [link]

University of Ljubljana, Faculty of Arts and Architecture, Department of Geography
  - Bachelor of Arts in Geography (3 years)
  - Master of Arts in Geography (2 years)
  - Yes
  - Yes
  - 10
  - [link]

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D2.2 Individual countries reports on EO capacity

National Reports
Gap Analysis

1. POLICIES
   1.1 Data sharing
   1.2 Data access/clearance
   1.3 R+D funding
   1.4 Decision making & EO implementation

2. DATA
   2.1 National data sets
      - Distribution centers
      - Format / Metadata / NSDI compliance
      - Coverage
      - Costs
      - Use / applications
      - Cooperation
   2.2 Regional data sets
   2.3 Global data sets

3. CAPACITIES
   3.1 Educational and R+D institutes
   3.2 National & Regional EO collection and processing
   3.3 Public awareness

4. RESEARCH & INDUSTRY
   4.1 National & Regional stakeholders
   4.2 R+D projects
   4.3 National & regional Industry
      - Technology push
      - Market pull

5. EVALUATION
The most important weaknesses, critical points and gaps that are identified in the national analyses and are not limited only to the local environment (i.e. country) are the following:

1. EO data regulation is not clear to data producers.
2. In general data in many countries are expensive, incomplete/limited, outdated, not available or incorrect.
3. The use of standards regarding EO data could be improved.
4. Collaboration of data producers and providers are not regular and could be improved.
5. The share of regional datasets (former Yugoslav republics, Balkan countries) could be improved.
6. Data compatibility with GEOSS can be improved.
7. Most of the data providers are only partially aware of end-users needs.
8. The export of products or services in most of the countries is low.
9. EO related issues reported on media in most of the countries could be improved.
10. Professional societies in many countries are not adequately informed about new data sources, data availability and data use.
11. The full and easy access to all EO data the end-users might need can considerably increase the annual income by 10-25%.
12. Collaboration of academic institutions and decision makers for EO data development and implementation could be improved.
1. INTRODUCTION

2. WEAKNESSES, CRITICAL POINTS AND GAPS
   2.1 Policies
   2.2 Data
   2.3 Capacities
   2.4 Research and industry

3. KEY NATIONAL AND REGIONAL PRIORITIES, FUTURE TRENDS

4. ACTION POINTS AND ACTION PLANS
   4.1 Short term (1-2 years)
   4.2 Medium term (5-7 years)

5. EXAMPLES OF GOOD PRACTICE
The partners of the Observe from the Balkan region have defined the following key priorities and future trends, referring to the recognized regional priorities:

1. The interest to a joint (national, regional and international) approach to EO is highly expressed. The main identified problems are:
   - absence of a common body for coordination and cooperation
   - lack of harmonization of activities of EO players across the Balkan
   - lack of jurisdiction over the establishment of regional Balkan EO system on a high political level
   - need for financial means for establishing regional EO system (who/how)
   - lack of recognition of national interests in some participating countries

2. The expected or desired key characteristics of the EO data in the future are:
   - easier access and exchange of various EO data - less expensive data for the end-users
   - data standardization - uniform metadata system
   - access to all data in one place - efficient on-line services
   - emphasis on the data quality and quality control
   - improvement of management in hazardous or disastrous situations
Analysis of EO capacity

Action Points

Short term (1-2 years)

- Establishment of a common GEO and GMES **forum** for networking and application exchange in the country levels.
- Market research on the **end-users needs** (at the national and regional level)
- Developing a **concept of a common data portal** in the region for data producers, providers and end-users that will allow the sharing and exchange of EO data
- Developing a **model for training** courses and workshops (for the region) as a permanent education for the professional community.
- **Institutional support** to the countries that are not yet members of GEO in order to help them join the GEO, as well as support to approach ESA

Medium term (5-7 years)

- Creation of a common **data portal** in the region for data producers, providers and end-users.
- Organization of **permanent training** courses and workshops in the region.
- Increased **cooperation** between universities in the region (student and teacher exchange; organization of specialized courses etc.).
- Actions aiming at increasing funding of scientific **research** in the EO field.
Best practices

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Roadmap
Strategy Plan

Bosnia & Herzegovina

Mine situation in Bosnia & Herzegovina

Bulgaria

Assessment of flood risks
Best practices

Roadmap
Strategy Plan

Serbia
NSDI portal

Greece
Cadastral portal
Best practices

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Best practices

Nature protection

Croatia

Biodiversity Information System

FYROM

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The GEO definition of capacity building focuses on three elements of clearest relevance to Earth observations: human, institutional and infrastructure capacity:

- **Human capacity building** refers to the education and training of individuals to be aware of, access, use and develop Earth observation data and products.

- **Institutional capacity building** is focused on developing and fostering an environment for the use of Earth observations to enhance decision making. This includes building policies, programs and organizational structures in governments and organizations aimed at enhancing the understanding of the value of Earth observation data and products.

- **Infrastructure capacity building** is related to the hardware, software and other technology required to access, use and develop Earth observation data and products for decision making.
Capacity Building and GEO

Strategic Targets \textit{(from GEO-VI Document 12 Rev1)}

\textbf{Capacity Building:}
- Networking activities that specifically build individual, institutional and infrastructure capacity.
- Increased use of Earth observation in policy and decision making.
- Enhanced participation of developing countries in GEO and GEOSS.

\begin{itemize}
\item ID-02-C1: Institutional Development
\item ID-02-C2: Individual Development
\end{itemize}
ID-02-C1: Institutional Development Priority Actions

- Establish **regional capacity-building networks**: Organize and reinforce international networks (incl. training opportunity networks) for the use and provision of Earth observations. Improve coordination of these networks through the GEO Portal and GEONETCast capacity building networks, include key institutions in data provision (e.g. space agencies) and academic higher education institutions. Training opportunity networks rely on virtual and e-learning knowledge transfer.

- Create conditions for **expanding GEO capacity building activities** and improving their effectiveness across Societal Benefit Areas: Build upon ongoing projects such as the GEO Network for Capacity Building (GEONetCab), the GEO capacity building initiative in Central Asia (SEOCA), OBSERVE and BalkanGEOOnet projects in the Balkan region, ACQWA, enviroGRIDS, AFROMAISON; and existing networks such as AFRIMET, the Latin American Network of Climate Change Offices (RIOCC); and the Regional Gateway for Technology Transfer and Climate Change Action in Latin America and the Caribbean (REGATTA).

- Develop qualitative and quantitative **Performance Indicators** for measuring the efficacy of institutional and individual capacity building programs.
ID-02-C2: Individual Development Priority Actions

- Coordinate capacity building components across Societal Benefit Areas: Organize **summer schools or training workshops** within and/or across Societal Benefit Areas (and related areas), e.g. Disasters, Health, Energy, Climate, Agriculture, Forest Monitoring. Build upon ongoing activities such as the CLIVER program for Latin America.

- Foster **recognition of cross-border education**: Bring together (i) providers of international (and cross-border) capacity building; (ii) experts in recognition (credential valuation and accreditation) and governance (quality assurance) of higher-education qualifications; and (iii) professionals from the Earth observation and information sectors – to exchange knowledge and propose solutions to the issues of recognition and exchange of cross-border/international education.

- **Develop open-source software** and open systems: Encourage the development of open-source solutions across and along the Earth observation value chain – building upon existing efforts and drawing upon networks of Open Source Software (OSS) developers.

- Develop **adequate dissemination schemes** that reflect the reality of limited bandwidth in developing countries. Build upon the Data Democracy initiative (e.g. the Fundisa disk distribution to Africa) and support CBERS, GEONETCast, DEVCOCAST and SERVIR training.
### OBSERVE contribution to GEO task

**ID-02 Developing Institutional and Individual Capacity**

<table>
<thead>
<tr>
<th>GEO ID-02 Priority Actions</th>
<th>OBSERVE Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey - Questionnaire</strong></td>
<td><strong>Gap Analysis - Roadmap and Strategy Plan</strong></td>
</tr>
<tr>
<td><strong>Workshops-training</strong></td>
<td><strong>OBSERVE dissemination</strong></td>
</tr>
<tr>
<td>1 Establish regional capacity-building networks</td>
<td>Database of 276 stakeholders</td>
</tr>
<tr>
<td>2 Include key institutions in data provision (e.g. space agencies and academic institutions)</td>
<td>12 National Reports</td>
</tr>
<tr>
<td>3 Establish training networks</td>
<td>Analysis &amp; Report</td>
</tr>
<tr>
<td>Organize summer schools or training workshops</td>
<td>Analysis &amp; Report</td>
</tr>
<tr>
<td>4 Expand GEO capacity building activities and improving their effectiveness across Societal Benefit Areas</td>
<td>Analysis &amp; Report</td>
</tr>
<tr>
<td>5 Foster recognition of cross-border education</td>
<td>CARAVAN workshops:</td>
</tr>
<tr>
<td>6 Develop adequate dissemination schemes that reflect the reality in Balkan countries</td>
<td>OBSERVE-BalkanGeoNet-EGIDA joint workshops:</td>
</tr>
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Thank you for your attention

patias@auth.gr

www.observe-fp7.eu