People,
Places,
and Parks

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Nature-GIS: Unification of Nature Protection in Europe—Building a Unified Information System

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Introduction

All EU (European Union) members have similar legislation on nature protection. Nevertheless there are differences in attitudes toward different types and levels of protected areas. What has been missing is a unified data model for maintenance of information on protected areas. Nature-GIS is a pan-European project whose aim is to create a thematic network of nature-protection organizations and promote the use of geographic information systems (GIS) in nature protection. An information portal for European protected areas is being created on the Internet to inform the public (Figure 1). The Czech Republic is one of the "national nodes" taking part in this pilot project (Figure 2). This paper will stress some difficulties arising from the national differences and will describe the data structure of the system.

Structure of Nature-GIS

Nature protection has a strong geographical content, implying that experts from the GIS disciplines will be working alongside end users having different cultural or technical backgrounds. The potential of GIS technology is often not properly exploited; a key goal of

Figure 1. Nature-GIS portal (www.naturegis.net) linking together case studies in different countries.
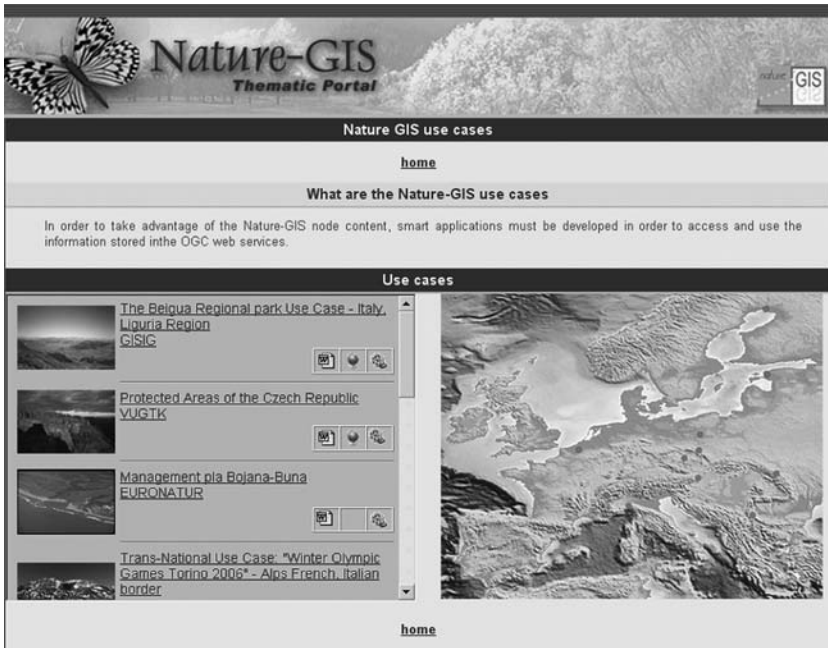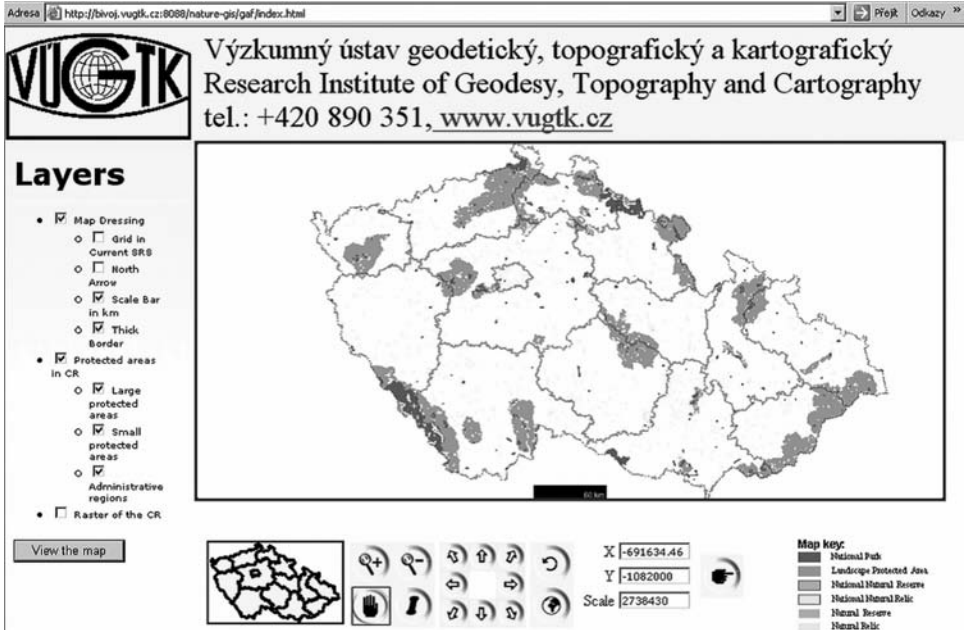
Figure 2. National Node for the Czech Republic: services for publishing maps of protected areas in the republic.

Nature-GIS is to bridge this gap by bringing together the different categories of specialists working in this field.

Nature-GIS creates a pan-European network linking all the different organizations and stakeholders who have an interest in GI (geographic information) and GIS in relation to protected areas. Nature-GIS is intended to make a contribution to the EU's Sixth Environmental Action Plan, and will form a focal point for the exchange of information and the identification of specific GI/GIS requirements across a range of EU policies and initiatives, such as INSPIRE (INfrastructure for SPatial InfoRmation in Europe).

Some action items include:

- Produce technical guidelines on geo-data access and exchange through standardization of data infrastructures for protected areas;
- Define and realize web access to information on European protected areas; and
- Disseminate the results to the GIS and nature preservation communities.

Final expected outcomes of the network:

- Use of the guidelines to implement GIS in protected areas.
- Demonstration of how web access to information is applicable in the field (thematic portal).
- Raising of European awareness of a supranational approach in GI management in the field and a push for more concerted and integrated actions.

- Establishment of a pan-European "Nature-GIS Group" that will continue after the project's end.

Tasks of VÚGTK, the Czech Research Institute of Geodesy, Topography and Cartography, include:

- Project coordination at national level: comments on the deliverables and acquisition of comments from other stakeholders in the Czech Republic;
- Communication with project coordinators;
- Preparation of the National Node: creation of pilot version of the portal for nature protection in the Czech Republic as a way to access data on the Internet;
- Provision of information to partners from the domain of nature protection; and
- Cooperation with the creation of the database structure.

Partners of Nature-GIS are shown in Table 1 and Figure 3.

Problems being solved

The categorization of protected areas is different in each country and the national terminology differs as well—there are even identical terms that mean something different. Therefore, unified categories were prepared. Another problem relates to national bound-

Figure 3. Countries participating in Nature-GIS. B = Belgium, BG = Bulgaria, CY = Cyprus, CZ = Czech Republic, D = Germany, E = Spain, EE = Estonia, F = France, H = Hungary, I = Italy, P = Portugal, PL = Poland, S = Sweden, SK = Slovakia, UK = United Kingdom.

Table 1. Partners of the Nature-GIS project.

aries: the extent of national parks differs from country to country and national boundaries make for unnatural boundaries in terms of protection.

Another problem has to do with national mapping systems. Each country has a history of having its own co-ordinate system and projection method. When one puts such different maps together, the boundaries are not continual. Therefore, the use of unified mapping method is needed. Likewise, each country has a different structure for its protected areas database. To address these issues, there is a proposal for recommended data structure. It is composed of seven data themes/feature types:

Institutional partners
GISIG — Italy
JRC — Joint Research Centre
EU University of Aberdeen — United Kingdom
IONIC Software SA — Belgium
University of Evora — Portugal
Cemagref — France
Regione Piemonte — Italy
Tarnium Sarl — France
University Joseph Fourier — France
Euronatur — Germany
University of Girona — Spain
Lulea University of Technology — Sweden
Ursit Ltd — Bulgaria
University of Cyprus
VÚGTK — Czech Republic
Estonian Environment Information Centre
University of West Hungary
Jagiellonian University — Poland
University of Zilina — Slovakia
nature protection companies, SW companies across Europe

Czech national partners
Czech Office for Survey, Mapping and Cadastre (CUZK)
Ministry of Environment of the Czech Republic (MZP CR)
Agency for Nature Conservation and Landscape Protection of the Czech Republic (AOPK CR)
State foundation of environment of the Czech Republic
Nature Conservation Authority (SOP), especially GIS
Laboratory
Czech National Parks

1. Base Map Themes: reference layers that provide a foundation for other layers and that are frequently needed by a large number of users.
2. Governmental/Service and Administrative Districts/Areas: Layers that represent boundaries of governmental jurisdictions (at different levels), areas designated for administration by agencies/organizations, and political districts associated with elections.
3. Utility and Infrastructure: Layers that deal with human-made facilities, including utilities, transport, buildings.
4. Emergency Planning and Management: Layers that are necessary for hazard management and emergency planning and response.
5. Natural Resources and Physical Landscape: Layers that delineate and characterize land, air, water, and biological features and areas. Includes habitats, species, and areas designated for protection.
6. Property-Related Data representing land ownership and rights, etc.

7. Tourism/Leisure/Socioeconomic Data themes dealing with tourism and leisure facilities.

All these categories contain features with attributes that are recommended to be maintained, and the rationale for such maintenance is explained as part of the metadata.

To demonstrate the possibilities for informing the public, stakeholders, and others, the Nature-GIS portal has been created. It will include links to the National Nodes, which will contain information on protected areas in each country. Then a user can easily find whatever information is available on nature protection in a particular locality. The objective is to cover the whole of Europe. A discussion forum on the website also is planned.

Website links
- http://www.naturegis.net (Nature-GIS portal)
- http://www.gisig.it/nature-gis (webpages for the project)
- http://bivoj.vugtk.cz:8088/nature-gis/gaf/index.html (National Node for the Czech Republic)