



Public Private Partnership based Actions and Policy Needs in the Area of Natural Hazards and Spatial Data Infrastructure (SDI)

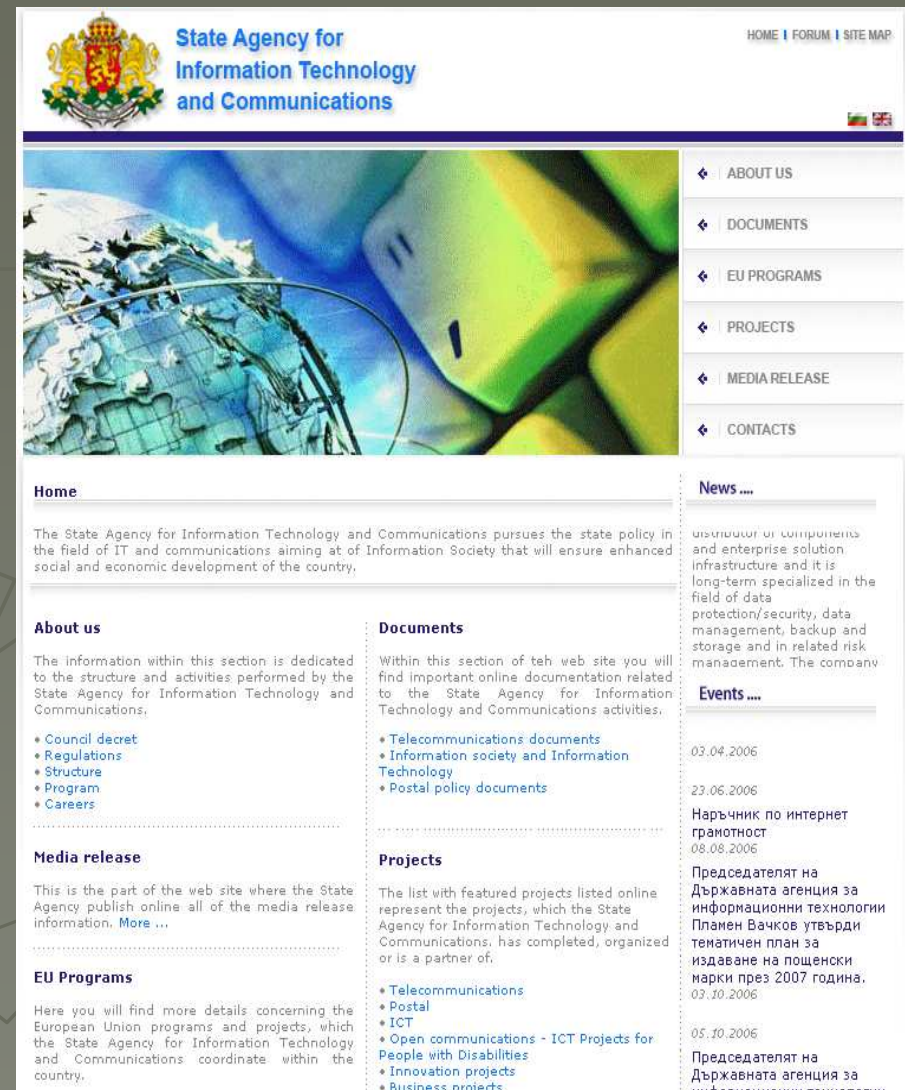
Kristian Milenov

Agency for Sustainable Development and Eurointegration (ASDE)

Note: The presentation is a brief overview of the fruitful collaboration between state administration – the State Agency for Information Technologies and Communications (SAITC), R&D non-governmental organizations – ASDE, the Remote Sensing Application Center (ReSAC) and others, partners from EC – JRC and EU member states under FP6, FP7...

Who we are?-1

- ▶ The State Agency for Information Technology and Communications was created in 2005 and pursues the state policy in the field of IT and communications aiming at of Information Society that will ensure enhanced social and economic development of the country .
- ▶ Main tasks of SAITC related to GMES
 - **Governance/Integration and organization**
 - **Regional GMES Architecture**
 - **Networking and collaboration**
 - **Regional monitoring and foresight**



The screenshot shows the official website of the State Agency for Information Technology and Communications. The header includes the agency's name and logo, along with navigation links for HOME, FORUM, and SITE MAP. A main banner image depicts a globe and a computer monitor. A sidebar on the right contains a menu with links to ABOUT US, DOCUMENTS, EU PROGRAMS, PROJECTS, MEDIA RELEASE, and CONTACTS. The main content area is divided into several sections: Home, About us, Media release, EU Programs, Documents, and Projects. Each section provides a brief description and links to relevant information. For example, the 'About us' section lists links for Council decret, Regulations, Structure, Program, and Careers. The 'Documents' section lists links for Telecommunications documents, Information society and Information Technology, and Postal policy documents. The 'Projects' section lists links for Telecommunications, Postal, ICT, Open communications - ICT Projects for People with Disabilities, Innovation projects, and Business projects. The 'News' section on the right shows a list of recent news items with dates and titles, such as 'Наръчник по интернет грамотност' dated 08.08.2006 and 'Председателят на Държавната агенция за информационни технологии' dated 05.10.2006.

www.daits.government.bg

Who we are?-2

- ▶ **THE AGENCY FOR SUSTAINABLE DEVELOPMENT AND EUROINTEGRATION - ECOREGIONS /ASDE/** is a non-governmental organization. It is a legal entity. All activities of ASDE are realized with governmental, municipal and public support with the aim to foster the sustainable development of Bulgaria and the successful integration in the European Union. These activities are in correlation with the national economical, environmental and social interest and with the priorities of the Agenda 21 of the United Nations Organization, the Strategy for sustainable development of the European Union.

Агенция
за устойчиво развитие
и евроинтеграция

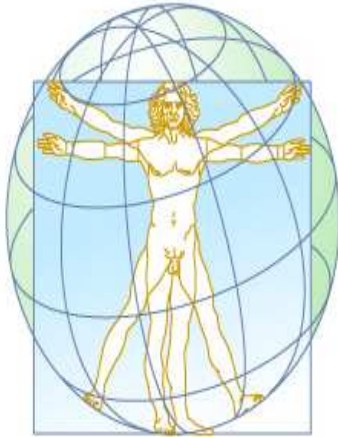
AYPE

Вход
{ Българска версия }

Entrance
{ English Version }

ASDE

Agency
for Sustainable Development
and Eurointegration



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asde@online.bg

Who we are?-3

- ▶ The **Remote Sensing Application Center (ReSAC)** was established in 1998 with the support of FAO/UN. The main objective of the project FAO/TCP/BUL/8922 was an establishment of a Remote Sensing Application Center in Bulgaria.
- ▶ Main tasks
 - Develop RS/GIS applications for agricultural, environmental and security management (land cover/land use, soil and forest inventory, water resources, disaster management, urban planning, food security, etc.)
 - Participate in regional and international projects and cooperation.



The screenshot shows the ReSAC website interface. At the top, there is a navigation menu with links for Home, News, About Us, Projects, Services, Partners, and Contact. The main content area is divided into several sections:

- Welcome to Remote Sensing Application Center (ReSAC)**: This section includes a welcome message, a list of services (RESEARCH, KNOW-HOW, INNOVATION, CONSULTANCY), and information about ReSAC's affiliation with ASDE and its role as an Observer Member of EARSC (European Association of Remote Sensing Companies). It also mentions the Seventh Framework Programme.
- News**: A list of recent news items with dates and brief descriptions:
 - 10.2008**: The fourth training workshop under the Bulgarian-French project BulgaRisk was held on 8th and 9th of October 2008 at SAITC.
 - 09.2008**: National experts from Bulgaria were sent on educational trip to France in the frame of the Bulgarian-French project BULGARISK.
 - 07.2008**: ReSAC monitored the condition of the region of the military unit 18 250 near Chelopheche, where about 1600t munition and 15t trotyl on 3 July 2008 had exploded.
 - 06.2008**: ReSAC was a sponsor and participant in the Third International Scientific Conference BALWOIS 2008, which was held in Ohrid, 27, 31 May 2008.
- Services**: A section featuring an aerial image of an urban area with a red box highlighting a specific location. The text below states: "ReSAC offers services in the area of earth observation applications, GIS, orthophoto mapping as well as consultancy for projects and tasks within this scope."
- Projects**: A section featuring a satellite image of an urban area. The text below states: "ReSAC has participated in many projects in which it has been a leading institution as well as members from ReSAC have been consultants and subcontractors in projects lead by other organisations."
- Contact**: A section with the text: "If you need satellite or aerial image, or need a ready to use GIS product derived from remote sensing data, please [contact us](#) to see how we can help you".

At the bottom of the website, there is a footer with the text: "© 2008 ReSAC®. All rights reserved."

Our Partners

- ▶ Institutions participating in the implementation of the Lisbon Strategy, Directive 2007/02/EU-INSPIRE and GMES Program in Bulgaria:
 - Ministries,
 - State Agencies,
 - Research Institutes,
 - Local Administrations

- ▶ International organizations in the area of Sustainable Development (SD), Spatial Data Infrastructure (SDI) and Remote Sensing:
 - Joint Research Center of the EC in Ispra, Italy
 - Pilot projects (done by ReSAC) with IPSC of JRC, related to the implementation EU Common Agricultural Policy (CAP) in Bulgaria;
 - Testing of different spaceborne sensors (eg.FORMOSAT-2) data for the purposes of CAP
 - Joint workshops (with ASDE)
 - Collaboration with the INSPIRE team of IES of the JRC/EC
 - European Association of the Remote Sensing Companies (EARSC)
 - ReSAC is an Observer member.
 - Spot Image, France
 - Common project for Disaster Management financed by the French Government.
 - Eurimage; Italy
 - EUSI, Infoterra and DLR, Germany....
 - Partners of ASDE in two ERA-NET projects – URBAN-NET and ERACOBUILD

Potential for GMES, FP7, GEO

- ▶ **ASDE has a collaboration agreement with EC JRC;**
- ▶ ASDE is member of two ERA-NET projects – URBAN-NET and ERACOBUILD, as well as partners in other FP7 projects;
- ▶ ASDE and RESAC are participating in the Bulgarian activities in GEO/GMES-KOPERNIKUS, the European Space Program

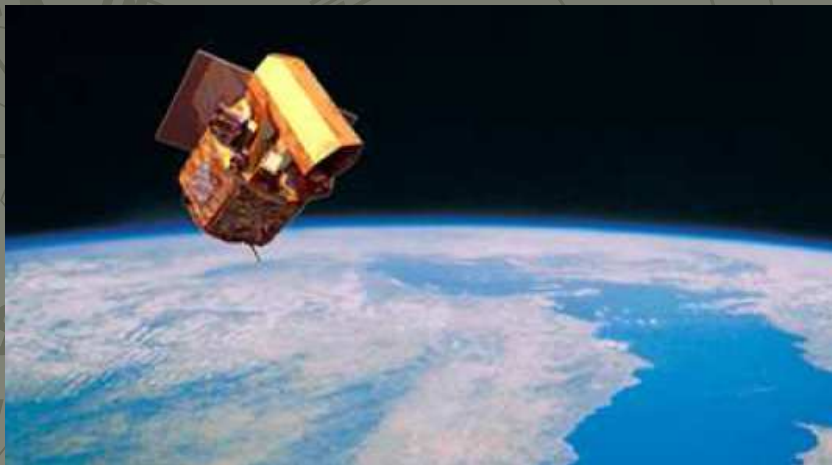
- ▶ ReSAC is involved as a partner and SAITC as beneficiary in several consortia:
 - Geoland2 and SAFER
 - Cooperation of Space NCPs as a Means to Optimise Services (COSMOS) project

- ▶ Institute for Oceanology:
 - MyOcean Project

Some results from the partnership with JRC-1

Test of the Geometric accuracy of FormoSAT-2

- ▶ VHR backup sensor, used for the first time in 2006 years in the Control with Remote Sensing of the farmer aid applications in the frame of the Common Agriculture Policy of EU :
 - Resolution (GSD) of 2 meters at nadir (PAN) and 8 meters at nadir (MS)
 - High acquisition success rate due to its daily revisit capacity (especially on the territory of Bulgaria and Romania)
 - Geometric accuracy of the orthorectified product needed to be tested
 - 3 test areas – Mausanne (France), Sofia and Sozopol (Bulgaria)
 - Results reported in the JRC MARS conference in Madrid, November 2007



Joint project, financed and managed by JRC

**Study performed by JRC, ReSAC (BG),
SPOT Image (FR), and Spacemetric (SE)**

Some results from the partnership with JRC-2

Workshop on “Land Parcel Identification System - Application and Quality”, Sofia, 2008

- ▶ Jointly organized by the **Agriculture Unit of the Institute for the Protection and Security of the Citizen (IPSC) of the Joint Research Centre** and the **Agency for Sustainable Development and Euro-Integration (Bulgaria)**.
 - 17th-18th of September 2008 at Hotel Arena di Serdica in Sofia, Bulgaria
 - Under the auspices of the State Agency for Information Technology and Communications and the Ministry of Agriculture and Food of the Republic of Bulgaria.
 - Targeting the key technological issues and examples of solutions that are relevant for operating a LPIS in the dynamic IACS environment
 - Additional closed experts group session of the INSPIRE IACS-CAP Spatial Data Interest Community



Some results from the partnership with JRC-3-1

EU Programmes and EO applications

GMES Initiative

Fast Track Disaster Event Mapping

On the morning of October 2nd 2006, a large oil slick was detected flowing into Bulgarian territory on the Danube River from Serbia.



According to the Vidin Regional Border Service, the oil spill was 28km long and 0.4km wide. In the following days the pollution spread along the river up to Rousse City as well as a big amount of oil was deposited on the river banks.



Location of the study area

The **International Charter "Space and Major Disasters"** Call 132 - Danube Oil Spill – was activated on 05/10/2006 when ECO contacted International Charter data providers with Emergency Request Forms. These indicated the disaster type of Oil Spill for the region of interest along the river.

ReSAC, Bulgaria, on behalf of the State Agency for Information Technologies and Communications, requested information on the satellite data acquired in this call. On 10 Oct ReSAC was invited by the project management of the charter to take part as a value adding partner.

Some results from the partnership with JRC-3-2

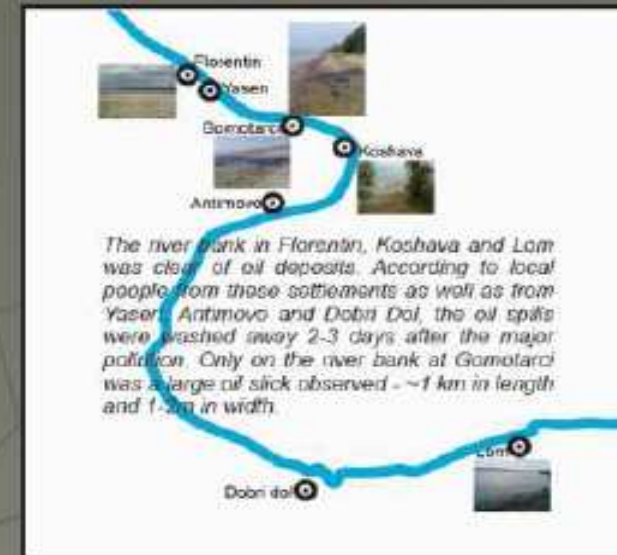
EU Programmes and EO applications

GMES Initiative

Fast Track Disaster Event Mapping



Map of the affected area in scale 1:25000 provided to the responsible authorities (Copyright ReSAC).



Scheme of the in-situ measurements during the field trip.

During the charter ReSAC had a cooperation with the National Institute for Meteorology and Hydrology, Institute for Botany in order to obtain every day info.

New target – The Global, European and National Reference Land Cover Layer

Preliminary priorities - two parallel targets on European, national, regional, local level:

A. European/Bulgarian Infrastructure for Spatial Data/Information under the Directive 2007/02/EU-INSPIRE

- Pilote application of a reference layer for SD harmonization and monitoring
- European/ National Geo-portal (preliminary project – BSDI)
- Beneficiary– Bulgarian Government, member states, EC structures

B. Developing capacity/services under GMES-KOPERNIKUS priorities for the European Union/ Bulgaria:

- Land management- including urban sustainability, agriculture, natural biodiversity, trans-European transport, energy, pipeline networks;
- EU borders security (including Maritime Surveillance);
- Natural Risk Management, Crisis Management and Civilian Protection;
- Information and Communication Technologies' Network and Data Security;
- Supply Chain Security;
- Energy Infrastructure Security;
- Security of Transport for Surface Passengers;
- Transversal Issues (Interoperability, Human Factors, Validation & Certification Network, etc.);

The Proposal

BULGARIAN PROPOSAL FOR GMES-KOPERNIKUS PRIORITY TASK AND FOR THE GEO 2009-2011 WORK PLAN-VERSION 1 (GEOSS SERVICE)

Title: EARTH OBSERVATION (EO) CORE REFERENCE LAND COVER DATA LAYER/MODEL AND SERVICE TOOL FOR SDI HARMONIZATION, SUSTAINABLE LAND MANAGEMENT AND RISK/SECURITY MANAGEMENT, based on UN-FAO-LAND COVER CLASSIFICATION SYSTEM (LCCS)

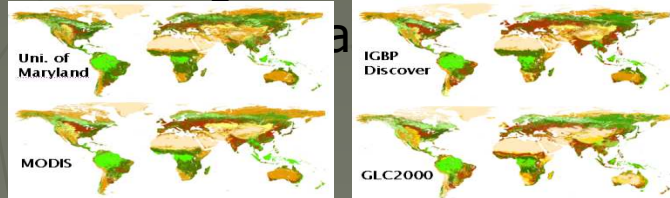
Proposed for collaboration with JRC and to be included in the GEO Work Plan 2009-2011

Aim

- ▶ Establishing a reliable reference land cover/land use layer at minimum scale of 1:25 000-1:50 000 as a core service for harmonization, monitoring and coordination of different spatial data bases, uses and services (land management, biodiversity, services-Mapping, Support for emergency management, **Forecasting** services and risk/security management solutions) on local, national, European and global level.
- ▶ International Collaboration with – GEO/GEOSS, JRC, ESA/EEA...
- ▶ Main targets:
 - 1. EO tool - Land cover/land use layer as basic component of the spatial data infrastructure (Directive 2007/02/EU) harmonization and updating
 - 2. EO tool - Land cover/land use layer for the monitoring of Risk&Security management national and international policy and action plans
 - 3. EO tool - Land cover/land use layer for the monitoring of the sustainable land management;

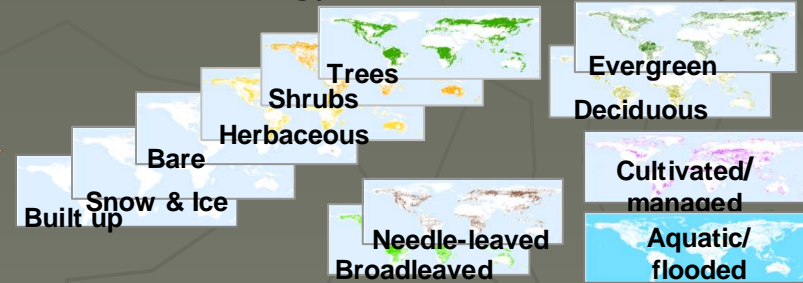
The Proposal - Principles of LCCS

LCCS Categories in existing global



Translation

LCCS Terminology: land cover classifiers (LCCS)



Common classifiers (Terminology standard)

- Classifiers commonly used to characterize land cover worldwide
- i.e. life form & surface type, leaf type & phenology, terrestrial/aquatic

Generic classes (Thematic standard)

- Basic set of standardized classes based on combination of common classifiers and independent of any cartographic standard
- i.e. broadleaved evergreen trees, herbaceous crops, built up area

Mapping Categories (Cartographic standard)

- Application of cartographic generalization (MMU) to generic classes
- Definition of mixed categories or using density thresholds
- i.e. Closed to open (>15%) broadleaved evergreen forest (> 5m)

The Proposal - Remote Sensing Applications for the Reference Layer

LEVEL OF IMPORTANCE OF THE SATELLITE SPATIAL RESOLUTION FOR LAND COVER/LAND USE MAPPING

ADMINISTRATIVE LEVEL	VERY HIGH RESOLUTION	HIGH RESOLUTION	MEDIUM RESOLUTION	GLOBAL SCALE RESOLUTION
LOCAL	1M (URBAN) 2.5M	5-10M	20-60M	0.2-1KM
DISTRICT/NATIONAL	1M (URBAN) 2.5M	5-10M	20-60M	0.2-1KM
REGIONAL(EU)	1M (URBAN) 2.5M	5-10M	20-60M	0.2-1KM
CONTINENTAL	1M (URBAN) 2.5M	5-10M	20-60M	0.2-1KM
GLOBAL	1M (URBAN) 2.5M	5-10M	20-60M	0.2-1KM
	NO/VERY LOW IMPORTANCE	LOW IMPORTANCE	HIGH IMPORTANCE	VERY HIGH IMPORTANCE

The Proposal – Links to existing international activities

Links and contribution to GEO-WP existing tasks (the list may be enlarged):

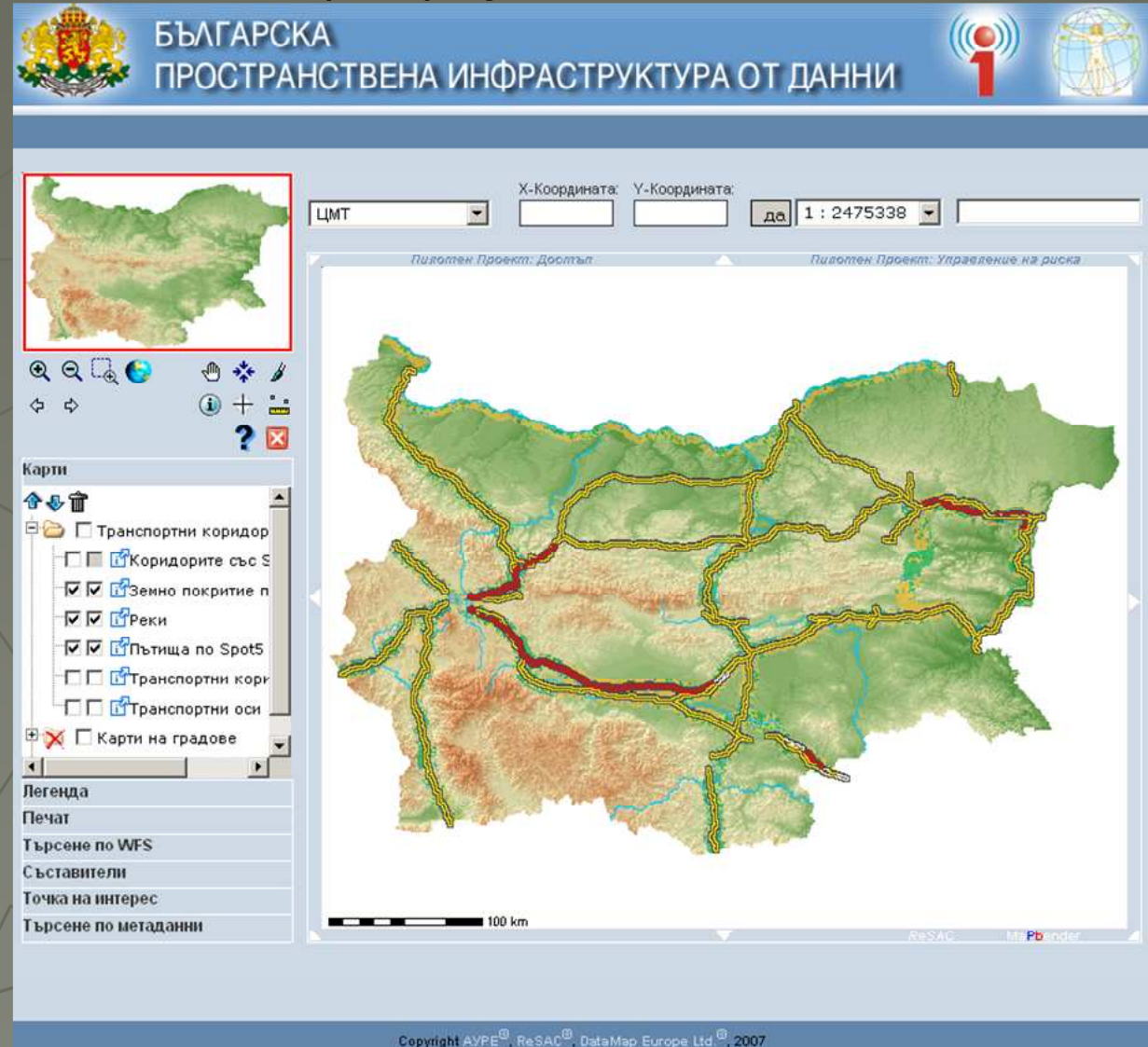
- ▶ **DA-07-02 (Data and Architecture)DA-09-03: Global Data Sets**
- ▶ *a) Global Land Cover (former DA-07-02)* - Implement production of a high-resolution global land-cover change dataset – utilizing global, regional and earlier 1-km resolution land cover data sets. Initiate regular analysis and reporting on land cover change and promulgate the use of these products, especially in developing countries. Activities will benefit directly from the establishment of the Land Surface Imaging virtual constellation (see CB-09-04d).
- ▶ **US-09-01: Socio-Economic Indicators**
- ▶ *a) Socio-Economic Benefits of GEO and GEOSS* - Build on the GEOBENE project (Global Earth Observation - Benefit Estimation: Now, Next and Emerging) and assess Earth observation benefits and GEOSS added-value . For this purpose, define test-cases, develop methodologies and analytical tools in each of the 9 GEOSS societal benefit areas: Disasters, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture and Biodiversity. In addition, develop an integrated model that will also serve as an effective decision making tool to evaluate impacts and benefits of multiple scenarios across societal benefit areas. Cooperation and data sharing benefits will also be analyzed. The ass. will be carried out using quantitative&qualitative methods/ data.
- ▶ **DA-09-01: Data Management**
- ▶ *a) GEOSS Data Sharing Principles (former DA-06-01)* - Invite experts to identify steps required to further the practical application of the agreed GEOSS data sharing principles. Ensure data access for Capacity Building.

Contributions to the 9 GEOSS Societal Benefit Areas, mainly in:

- ▶ DISASTERS - Reducing loss of life and property from natural and human-induced disasters
- ▶ ECOSYSTEMS (AND URBANNISED AREAS)- Improving the management&protection of terrestrial, coastal and marine resources
- ▶ AGRICULTURE - Supporting sustainable agriculture and combating desertification
- ▶ BIODIVERSITY - Understanding, monitoring and conserving biodiversity

First steps in Bulgaria –
FAO supported pilot project-1999/2001; R&D pilot project – 2005-2007;

- ▶ <http://bsdi.asde-bg.org>
- ▶ Integration of data from different sources
- ▶ The application provides several services as:
 - Management of theme layers ; Different functions
 - Requests to attributive info from thematic layers
 - Possibility for searching and navigation-objects and names
 - User's help
- ▶ The application is a pilot project using minimum resources and shows various possibilities.
- ▶ Links to IS on local level; exchange of information ...
- ▶ Risk&Security management section



БЪЛГАРСКА
ПРОСТРАНСТВЕНА ИНФРАСТРУКТУРА ОТ ДАННИ

ЦМТ

X-Координата: Y-Координата:

да 1 : 2475338

Пилотен Проект: Достъп

Пилотен Проект: Управление на риска

Карты

- Транспортни коридор
- Коридорите със S
- Земно покритие п
- Реки
- Пътища по Spot5
- Транспортни кори
- Транспортни оси
- Карты на градове

Легенда

Печат

Търсене по WFS

Съставители

Точка на интерес

Търсене по метаданни

100 km

Copyright AVPE[®], ReSAC[®], DataMap Europe Ltd.[®], 2007

Reference layer/model - EO land cover/Land use based on satellite images-from local to global and vice-versa – no boundaries/accurate/public awareness/various applications



Recent R&D pilot projects in the field of risk&security management

New tools for monitoring and management of critical infrastructure(CI) – **A) scanning the INTERNET** and **B) Information system -register of the status of the critical infrastructure(CI) and risk prevention measures**

- A**
- ▶ Scanning the INTERNET using ontologies, in order to retrieve and geocode specific thematic data.
 - ▶ Themes: Natural disasters, Man-made disasters, Security, Conflicts, Terrorism, Climate change, Cyber Security....

B
Prevention CI status
Floods



+

Prevention CI status
earthquakes



=

Preventions CI status
integrated



Година	Риск фактор RPNF	Ефективност на планираните мерки спрямо предходна година	Риск фактор прогнозна Щета
2006	4000	1.04	24.49%
2007	3117	0.45	11.61%
2008	1953	0.45	3.22%
2009	880	0.03	0.33%
2010	30		0.33%
2011			

Capacity – Fast track mapping, simulation flood models , assessment of and assets, others... - related to GMES Services; damaged areas

Example8 – *Risk Management – integrated data collection and assessment approach*

Passive Radar or Microwave Radiometry (PMR) Remote Sensing From Aircraft of Soil Moisture, Depth to Shallow Water Table, Water Seepage Through Levees, Vegetation Biomass, Water Surface Salinity, Chemical Pollution and Temperature

▶ Projects Objectives:

- To prepare soil moisture maps and to analyze depth to shallow water table;
 - To monitor levees and ditches and to detect water seepage through them;
 - To prepare a model for maps of the crisis objects in Bulgaria.
- ▶ The project will be developed in the next couple of months jointly by the, the Agency for Sustainable Development and Eurointegration and ReSAC, Institute of Radiotechnic and Electronics – RAS, MIRAMAP in a pilot region of the Rousse City on the bank of Danube River.

sensor	Type	Wave length	Spatial resolution/accuracy	Application
Digital camera	Rollei AIC 50 mm lens	Visible 0.4 – 0.7 μ	10 cm GSD sub pixel accuracy	Detailed visible interpretation, cartography
Laser scanner (LIDAR)	Optec ALTM 25 000 τ ./sec.	Short infrared 1064 nm	2 m GSD 0.10 m accuracy	Vertical model Hydrological model Deformations
Passive radiometry scanner	Radius	Microwaves 2, 5, 21 cm	5 m GSD 0.15 K	surface and underground scanning of moisture;
Thermal/Infrared camera	Flir systems	Long infrared 7.5- 13 μ	3 m GSD 0.1 $^{\circ}$ C	Surface temperature; Fireplace; Pollution



Thank you for your attention!

Agency for Sustainable Development and Eurointegration – ASDE

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In collaboration with the State Agency for Information Technologies and Communications, R&D institutes and non-profit organizations