GMES/GEOSS in Ukraine

Twinning Workshop
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World Summit on Sustainable Development, (Johannesburg, 2002)

10-Year Implementation Plan of the Global Earth Observation System of Systems

European system of the Global Monitoring for Environment and Security

GEOSS

GMES/Kopernikus

Ideas and principles of the Earth remote sensing data using for environment monitoring
The main obstacles on the way of RS technologies implementation

- lack of RS data user’s market
- lack of normative-legal base and certified methods of RS data processing
- complicated access to current and archive remote sensing data, caused with institutional, customs, operating, financial barriers
- considerable initial investments
- national EO satellites constellation does not still exist
- insufficient quantity of experts on RS data processing
GEOUA objective – users needs forming and provision

DATA NEEDS
- Elevation
- Physical & Biological environment
- Land cover
- Natural resources
- Production/economy
- Constructions
- Transport
- Utilities
- Administrative units
- Area regulation
- Risk zones
- Polluted sites
- Society & Culture
- Geographic location
- ...

ENVIRONMENT
- Water
- Air
- Soil
- Land
- Biodiv
- Urban
- Coastal
- Waste
- ...

TARGETS, ACTIONS, PROJECTS
- Organisation, coordination, bodies
- Guidelines, standards, specifications
- Technical tools for implementation
- Data projects core European, national and local level
- Other data harmonisation projects
- Environment Data & Metadata provision on infrastructure

PRIORITISING NEEDS
- 1
- 2
- 3

How to fulfil user needs?

Merge data needs
Ukraine in GMES/Kopernikus

Ukraine has got all elements of the Earth Remote Sensing Infrastructure

Space Segment

Space system operators

Ground Segment

Data providers

GEOUA

Users Segment

Services providers

Ukrainian Users

Users

Internet
GEOUA Temporary Association

**Team 1 – CosmoGIS Designers under the NSAU umbrella:**

**State Company "Dniprocosmos" NSAU (Dniepropetrovsk) - Coordinator,**

- Space Research Institute NASU&NSAU (Kiev)
- Centre for Aerospace Research of the Earth NASU (Kiev)
- National Center for Space Satellites Management and Testing NSAU (Yevpatoriya, Dunayevtsy)
- Kalmykov Center for Radiophysical Sensing of Earth NASU&NSAU (Kharkov)
- Marine Gydrophysical Institute NASU (Sevastopol)
- State Scientific Production Center “Pryroda” NSAU (Kiev)

**Team 2 - Collaborating organizations:**

- State Ecological Institute MEPU (Kiev)
- Nature Management Problems & Ecology Institute NASU (Dniepropetrovsk)
- Dniepropetrovsk State Agrarian University MAPU (Dniepropetrovsk)

and other profile organizations, which are keeping users interest in remote sensed data and are collaborating with the **Team 1**
NSAU
Remote Sensing, methodical and technical support of users

GEOUA
Normative Ensuring Subsystem
Data Processing Subsystem
Information Subsystem

Central and local Departments of State Management
International Programs
Ukrainian departments for remote and ground based monitoring
Ministry for Environmental Protection of Ukraine
Ministry of Agrarian Policy
Ministry of Human Health
Water Resources State Committee
Nature Resources State Committee

Ministry of Emergency Accidents
Land State Committee
Forest Resources State Committee
Municipal Resources State Committee

Novel information technologies of Earth, scientific and applied problems decision regarding to sustainable development goals

Resources

NASU
Methods and models of data processing
Society Needs in the CosmoGIS data

GEOUA PRODUCTS

- technologies of thematic tasks decision
- hardware & software facilities for RSD processing
- normative documents
- directed interdepartments and regional programs for RSD using
- suggestion to NSAU regarding to remote sensing space research

According to user’s requests:

- thematic maps
- separate case studies objects description
- analytic reports
Functions of Information Subsystem

- Market analyses in remote sensing data needs
- The remote sensing data program forming and development new observing means
- Coordination and management for the program of the remote sensing data using
- Users access ensuring to the remote sensing WWW resources
- Interaction with CEOS and other international organizations and programs (GMES, GEOSS, INSPIRE etc.)
- GEOUA activity coordination
- Interaction with branch and regional Information & Analytical Systems
- Forming of environment indexes system with remote sensing application
The architecture reference model for Information Subsystem

- User applications
  - Access to transformed data, pictures, maps, reports, multi-media content
  - Service chain: search, display, access, e-business, ….

- Catalogues
  - RSD Catalogues
  - Geo-processing and catalogue services
  - Metadata update
  - Direct data access

- Servers
  - Other data e.g., administrative, statistical, etc.
  - Geospatial data
  - Remote sensing data
Functions of subsystem

Data processing

- New methods and approaches thematic problem decision
- Approbation and methods official registration
- Users ensuring with software means (on contracts)
- Thematic data processing according to user's request
- Training and learning of users
- Marketing and advertising
**Completed methods**

1. Forests composition and quality assessment
2. Black and Azov Sea water temperature mapping on the base of AVHRR scanner
3. Rapid observing of the cyclones, frontal zones and whirlpools on sea surface
4. Ice-Water verge observing and control
5. Scanner data atmosphere correction
6. Land cover classification

**Prospect Methods for implementation**

1. Methods oriented on temporary and accepted information sources
2. Methods connected with NewEUser project and oriented on next thematic services:
   - Land management
   - Crisis management
   - Marine services

**Actual tasks**

1. Methods attestation
2. Unified software for RSD processing
3. Orientation on temporary remote sensing sources (Sich, Terra, NOAA, IRS)
4. Creation of classifier of remote sensing data processing methods
Functions of Normative Ensuring Subsystem

- Normative base, determining the remote sensing data using
- Normative base with remote sensing sources and products quality controlling
- Harmonization with international standards for remote sensing data receiving, processing and using
- Participation in the international committees on remote sensing data specification
- Official registration of information sources and remote sensing production
Normative Ensuring of Remote Sensing Service for Users

Remote Sensing Subcommittee within National Committee of Standartization №117 (rocket and space-rocket technique)

Ground based stations and engineering buildings of NSAU are involved into radiometric and geometric calibration remote sensing data for satellites exploitation
‘Crisis management’
(floods, storms, forest fires, landslides and technology disasters)

‘Land Management’
(CORINE, INSPIRE, LUCAS and other)

‘Oceanography’
(Sea of Azov and Black Sea)
Level of anthropogenic stress

- High level
- Middle level
- Good conditions

Dnipropetrovsk (Spot Image)