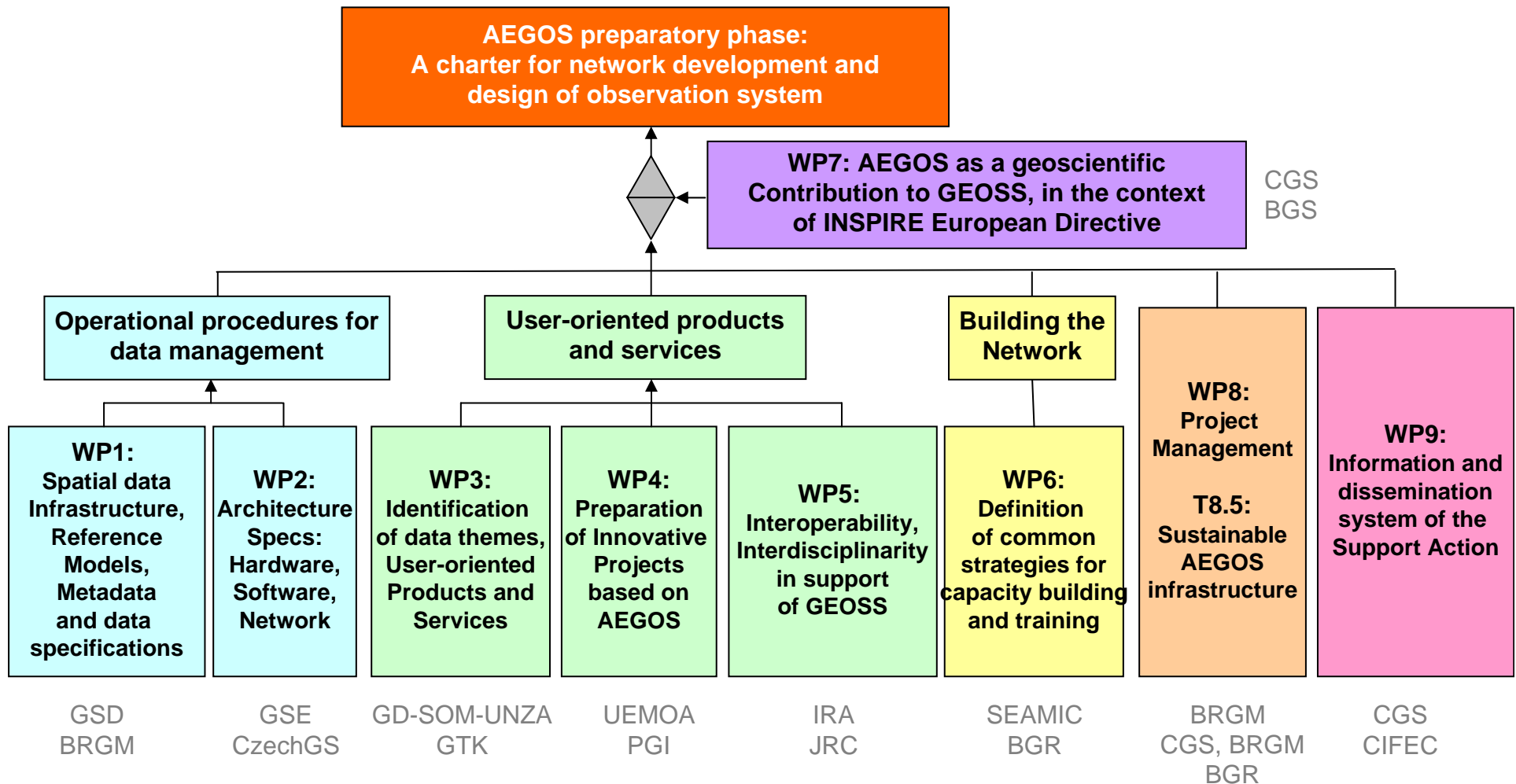


## Evaluating Sustainability of the Georesources Observation System

**Michael Mente**  
**Federal Institute for Geosciences  
and Natural Resources**  
**Germany, Hannover**

***GEOSS-CBC Meeting***  
***Athens – April 27th – 28th, 2009***



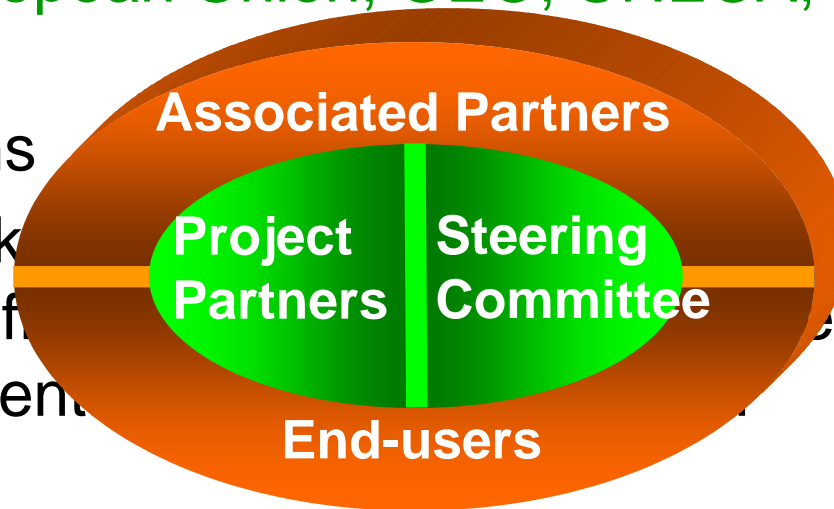


## Stakeholder

- **GSAf, OAGS, African Union, SADC, ACP Secretariat, AfDB, European Union, GEO, UNECA, UNESCO, WB....**

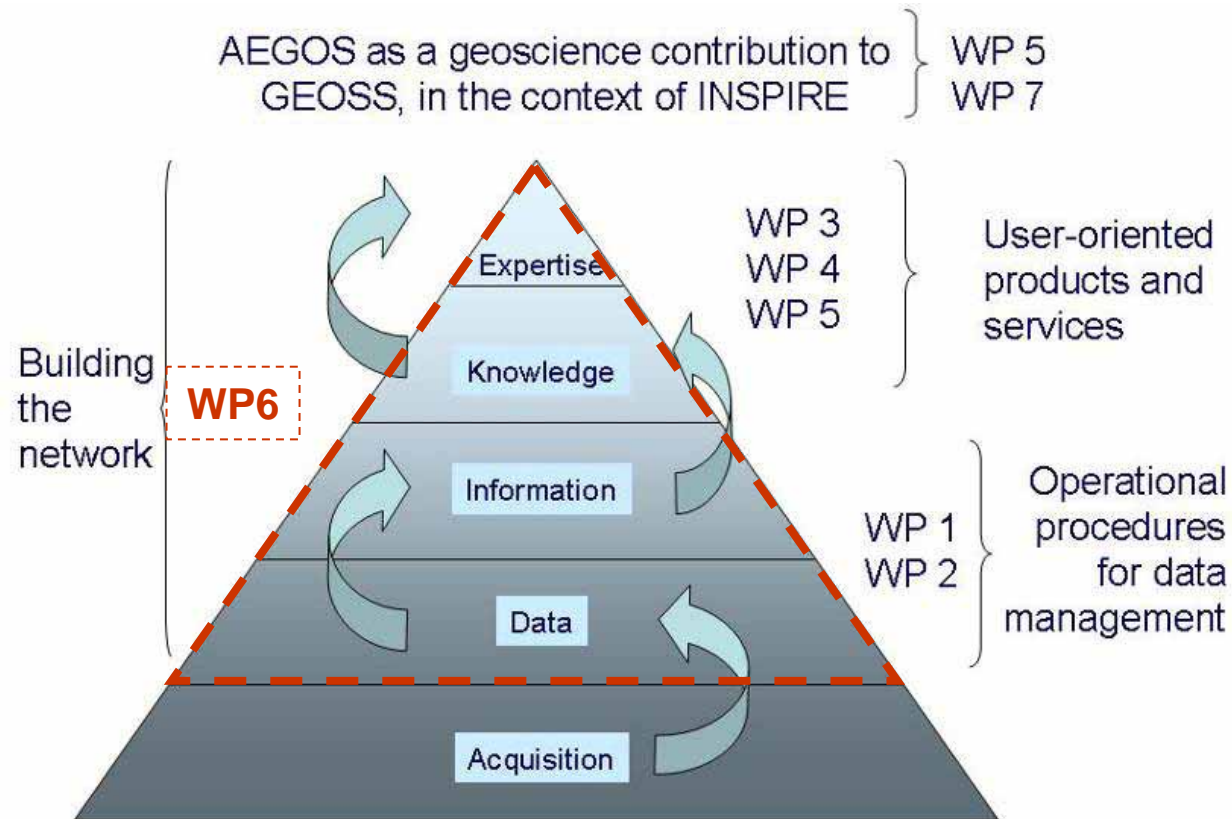
## Organisations

- Policy makers, geoscientific research, education and



## Applications/Data use for.....

- Mines, energy, environment, land use, agriculture and forest, water, hydraulics, natural hazards, socio-economy



**Contribution of work packages to the geoscience information system**  
 (AEGOS\_Grant\_Agreement\_Annex-I-DoW\_2008-10-20, p. 10/72)

# AEGOS Ongoing activities, general overview

---

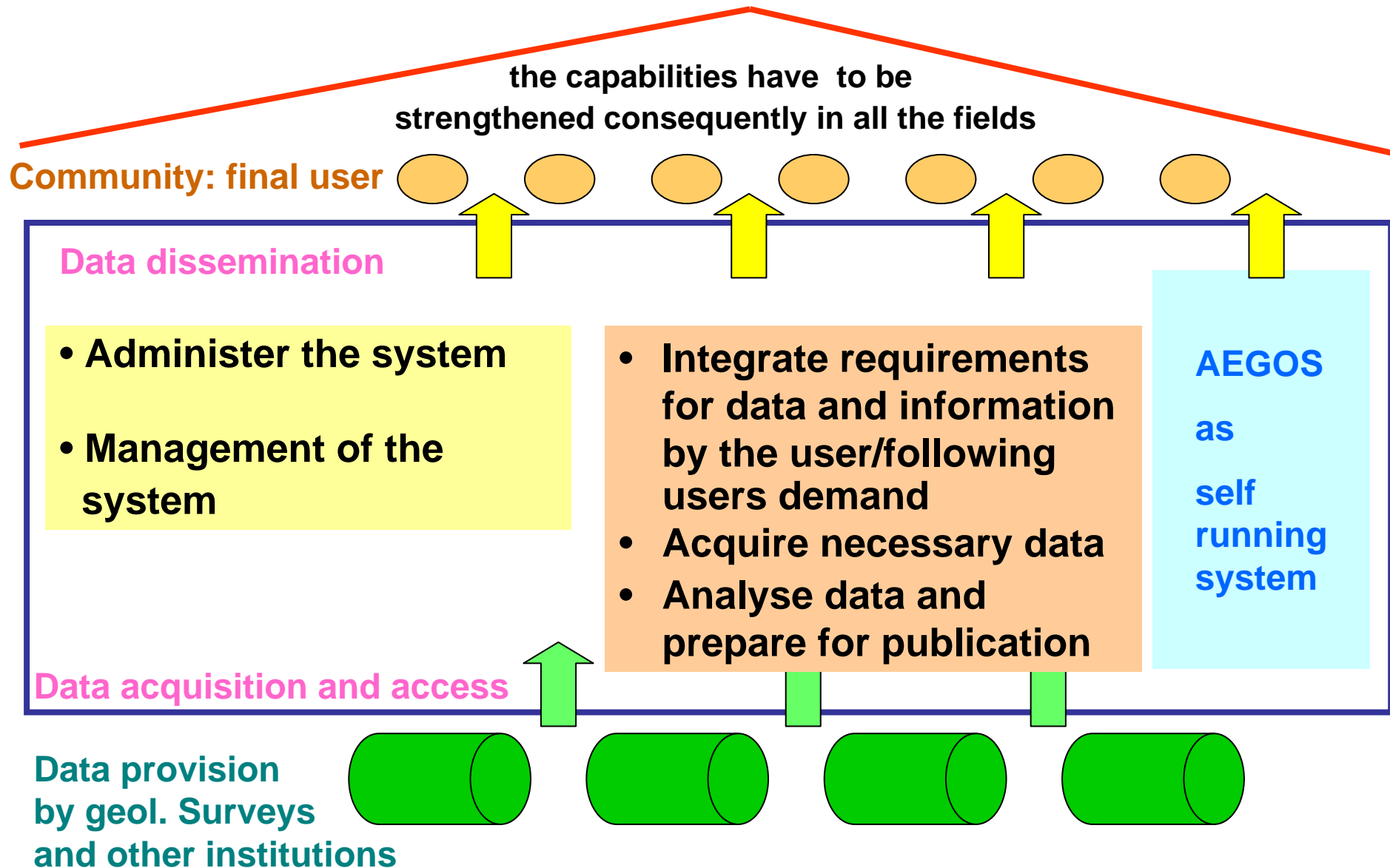
## Questionnaire

Goal: Inventory across Geological Surveys and International Organizations

Purpose: to help in the definition of the AEGOS Architecture  
to know where improvements are required  
to identify the gaps in staff skill for providing adequate training

Questions:

- *General Information concerning the organisations (departments, staff, etc.)*
- *Existing metadata and metadata management system*
- *Existing datasets relevant for AEGOS*
- *Existing IT systems*
- ***Man Power***



- **Identification of training facilities**
  - Questionnaires, workshops, tele-conferences
- **Identification of existing curricula in Africa and Europe**
  - Questionnaires, workshops, tele-conferences
- **Identification of requirements by AEGOS WPs**
  - Information by WP-leader and participation in specific workshops
- **Identification of gaps and needs**
  - Evaluation of questionnaires and workshops
- **Formulation of a concept note**
  - Agreed proposal elaborated by WP6 leaders and presented on the final conference

**→ train the trainers strategy**

**User**



**Data Manage**



Server + Database

**Provider**

**Input**

**Technical requirements:**

- Server
- Server Infrastructure
- Network (terrestrial or airborne)

**Skills:**

- Management of data
- Design of database
- Create of Web Services
- Creating of digital maps
- Design of web page
- Use of open source software
- Admin/financial/management

**Training:**

- Computer science
- IT, ITC
- Cartography, GIS
- Geology
- Management

**User Management**



**Example 2**

**Output: Information**

- Define adequate measures for capacity building
  - » Data processing
  - » Data management
  - » Data interpretation
  - » Organisation management

- User:** Levels of government, Industry, Commerce, Civil society, Media, General public
- Need for:** General information on geology and georesources  
e.g. Land use planning, Waste disposal siting,  
Mineral exploration
- Product:** Maps, Geodata on rock properties, groundwater, etc.
- Dissemination  
of data:** **Web Mapping Service**  
**Web Feature Service**

## Definitions:

### Web Map Service (WMS)

- produces maps (raster format) of spatially referenced geodata
- enables simple queries of users in predefined manner

### Web Feature Service (WFS)

- produces maps (vector data) of spatially referenced geodata
- provides an interface allowing requests for geographical features
- **WFS-T** defines interfaces for manipulation of data (e.g. creation)

---


**Example: International Geological Map of Europe  
and Adjacent Areas (IGME 5000)**

- **Organisation:** Commission of the Geological Map of the World (CGMW)
- **Coordination:** Dr. Asch, BGR, Germany
- **Subject:** Prequaternary of Europe and adjacent areas
- **Objective:** Dissemination of data on geology, georesources
- **Participants:** 48 Geological Services
- **Data:** 32.000 areas, 2.570 attributes



- **Web application** (online since 2006)  
[http://www.bgr.de/app/igme5000/igme\\_frames.php](http://www.bgr.de/app/igme5000/igme_frames.php)
- GIS-like operations via internet
  - Visualization of data
  - Preparation of maps by combining different layers
  - Simple query


**- Technical implementation:**

- Use based on MapServers
- Use of interface including PHP, MapScript, JavaScript
- Data: MS SQL-Server
- Geodaten: shape-format  
(Export of Personal GDB (ESRI))



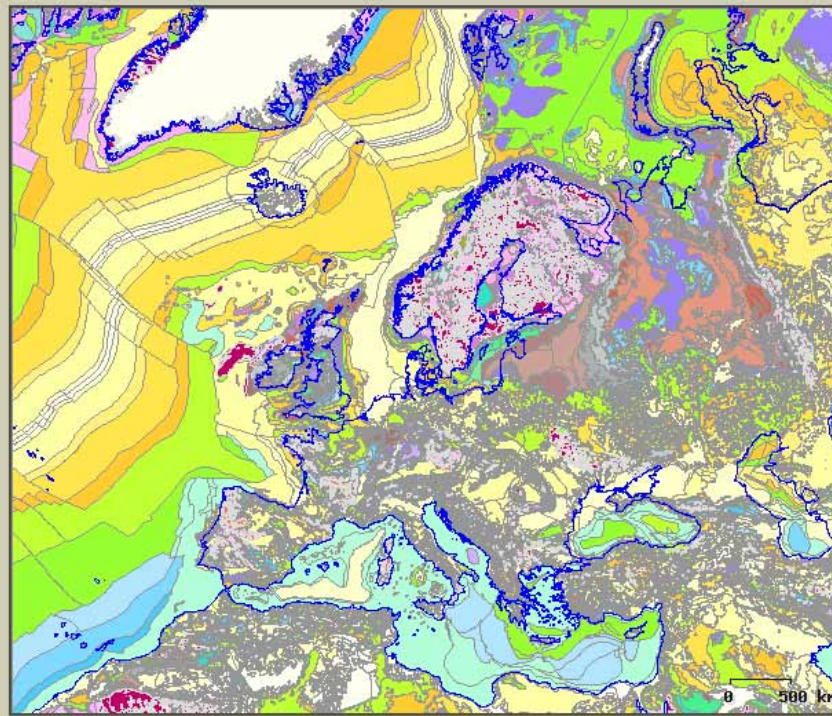
**IGME 5000** International Geological Map of Europe and Adjacent Areas



Layer

- Onshore Geology
- Offshore Geology
- Topography
- Navigation
- Zoom In
- Zoom Out
- Recenter
- Zoom Rectangle
- Full Extent
- Last View
- Miscellaneous
- Query
- Info
- Maps and
- Contributors
- Imprint & contact
- Reference




0 500 km

**Dynamic Legend**

**Age**

- Holocene
- Pleistocene
- Quaternary
- Pliocene
- Pliocene - Pleistocene
- Pliocene - Quaternary
- Miocene
- Neogene
- Neogene - Quaternary
- Oligocene
- Oligocene - Miocene
- Eocene
- Eocene - Oligocene
- Eocene - Miocene
- Eocene - Pliocene
- Palaeocene
- Palaeocene - Eocene
- Palaeogene
- Palaeogene - Miocene
- Palaeogene - Neogene

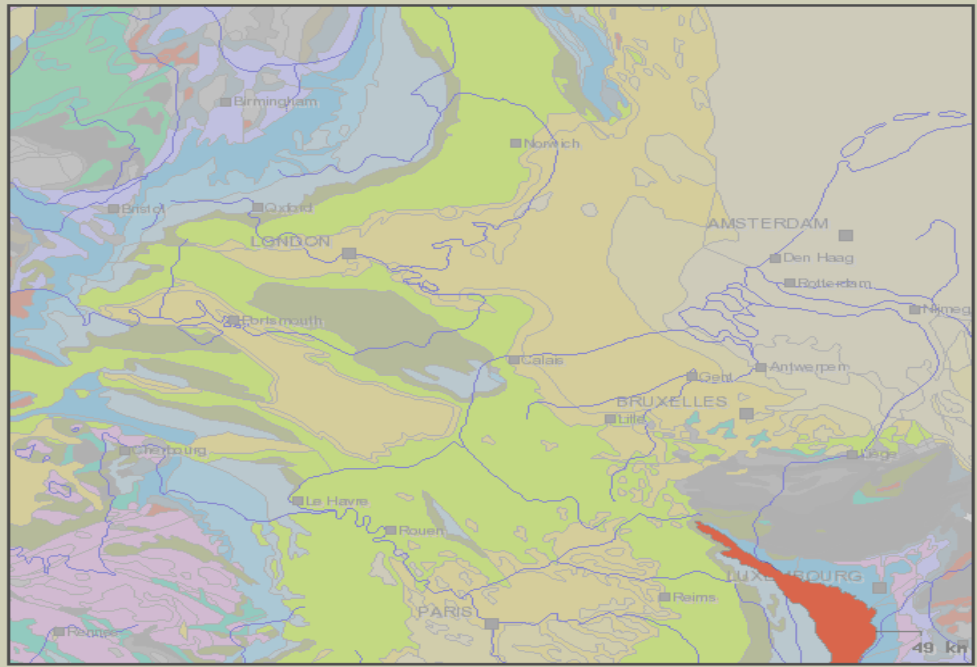
[http://www.bgr.de/app/igme5000/igme\\_frames.php](http://www.bgr.de/app/igme5000/igme_frames.php)



- Layer
- Onshore Geology
- Offshore Geology
- Topography
- Navigation
- Zoom In
- Zoom Out
- Recenter
- Zoom Rectangle
- Full Extent
- Last View
- Miscellaneous
- Copy
- Info**
- Maps and
- Contributors
- Imprint & contact
- Reference

**IGME-Info**

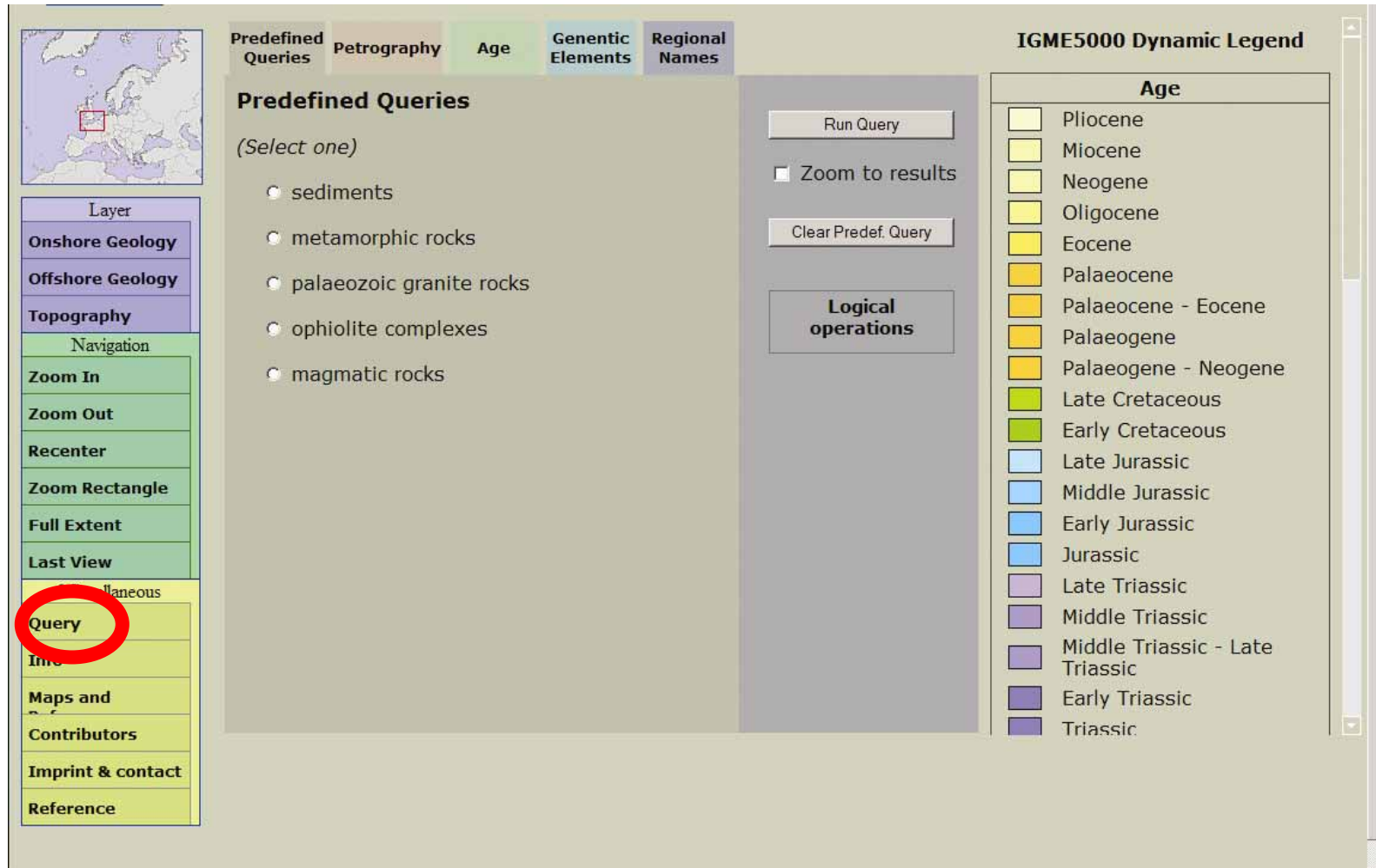
GEO	3100023
Age	Middle Jurassic
Petrography	limestone marlstone sandstone dolomite/dolostone
Genetic Element	mostly biogenic deposit
Tectonic feature	sedimentary basin



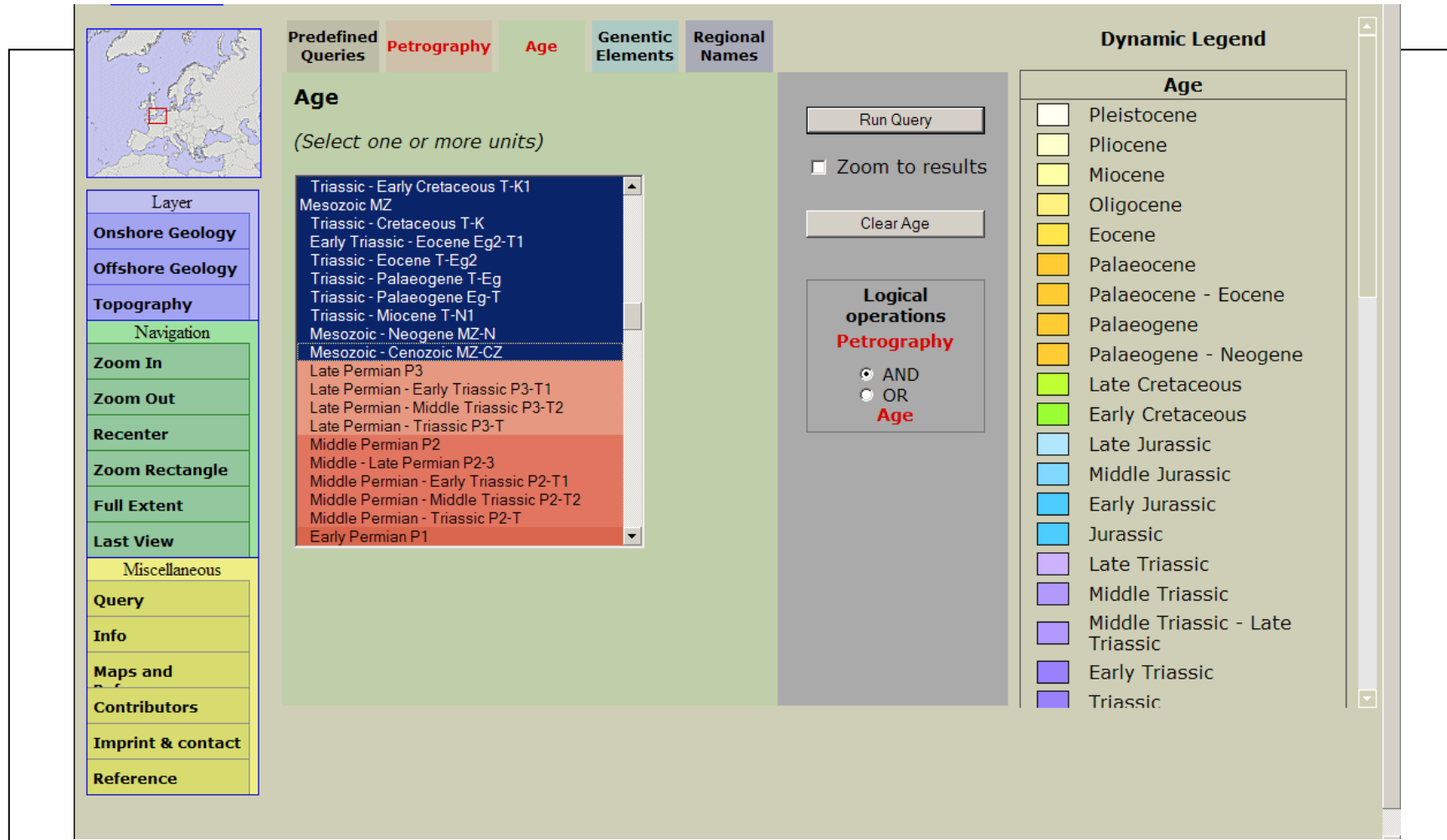
**Dynamic Legend**

**Age**

- Pleistocene
- Pliocene
- Miocene
- Oligocene
- Eocene
- Palaeocene
- Palaeocene - Eocene
- Palaeogene
- Palaeogene - Neogene
- Late Cretaceous
- Early Cretaceous
- Late Jurassic
- Middle Jurassic
- Early Jurassic
- Jurassic
- Late Triassic
- Middle Triassic
- Middle Triassic - Late Triassic
- Early Triassic
- Triassic



The screenshot displays the AEGOS web application interface. On the left, a navigation menu includes 'Layer', 'Onshore Geology', 'Offshore Geology', 'Topography', 'Navigation', 'Zoom In', 'Zoom Out', 'Recenter', 'Zoom Rectangle', 'Full Extent', 'Last View', 'Miscellaneous', 'Query' (highlighted with a red circle), 'Info', 'Maps and', 'Contributors', 'Imprint & contact', and 'Reference'. The main content area features a map of Europe with a red box indicating the study area. Below the map, there are tabs for 'Predefined Queries', 'Petrography', 'Age', 'Genetic Elements', and 'Regional Names'. The 'Predefined Queries' section lists several options: 'sediments', 'metamorphic rocks', 'palaeozoic granite rocks', 'ophiolite complexes', and 'magmatic rocks'. A 'Run Query' button and a 'Zoom to results' checkbox are present. A 'Clear Predef. Query' button is also visible. A 'Logical operations' button is located in a separate box. On the right, the 'IGME5000 Dynamic Legend' is displayed, showing a color-coded list of geological ages: Pliocene, Miocene, Neogene, Oligocene, Eocene, Palaeocene, Palaeocene - Eocene, Palaeogene, Palaeogene - Neogene, Late Cretaceous, Early Cretaceous, Late Jurassic, Middle Jurassic, Early Jurassic, Jurassic, Late Triassic, Middle Triassic, Middle Triassic - Late Triassic, Early Triassic, and Triassic.



**Predefined Queries** | **Petrography** | **Age** | **Genetic Elements** | **Regional Names**

**Age**  
(Select one or more units)

- Triassic - Early Cretaceous T-K1
- Mesozoic MZ
- Triassic - Cretaceous T-K
- Early Triassic - Eocene Eg2-T1
- Triassic - Eocene T-Eg2
- Triassic - Palaeogene T-Eg
- Triassic - Palaeogene Eg-T
- Triassic - Miocene T-N1
- Mesozoic - Neogene MZ-N
- Mesozoic - Cenozoic MZ-CZ
- Late Permian P3
- Late Permian - Early Triassic P3-T1
- Late Permian - Middle Triassic P3-T2
- Late Permian - Triassic P3-T
- Middle Permian P2
- Middle - Late Permian P2-3
- Middle Permian - Early Triassic P2-T1
- Middle Permian - Middle Triassic P2-T2
- Middle Permian - Triassic P2-T
- Early Permian P1

Run Query

Zoom to results

Clear Age

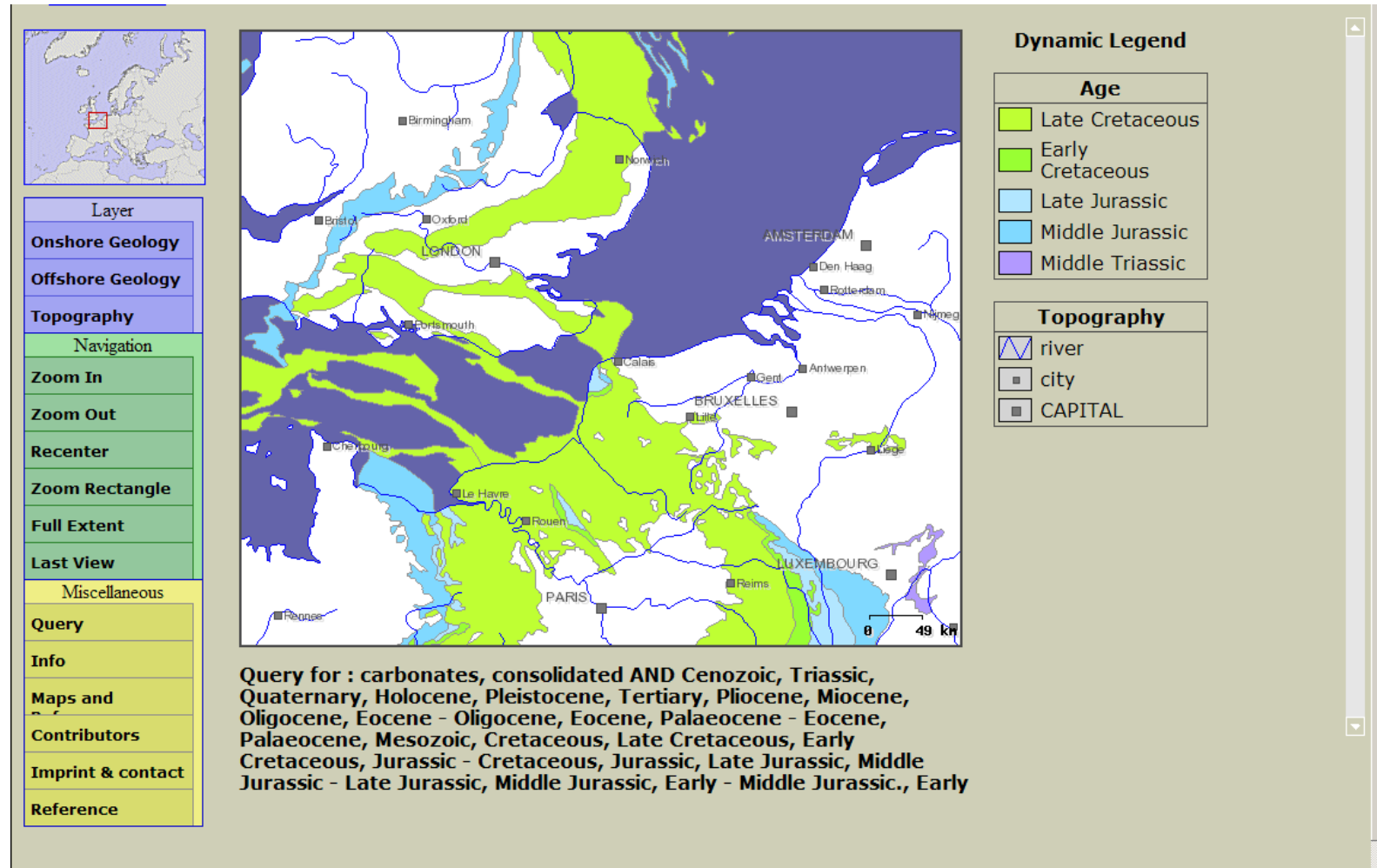
**Logical operations**  
**Petrography**

AND  
 OR  
**Age**

**Dynamic Legend**

**Age**

- Pleistocene
- Pliocene
- Miocene
- Oligocene
- Eocene
- Palaeocene
- Palaeocene - Eocene
- Palaeogene
- Palaeogene - Neogene
- Late Cretaceous
- Early Cretaceous
- Late Jurassic
- Middle Jurassic
- Early Jurassic
- Jurassic
- Late Triassic
- Middle Triassic
- Middle Triassic - Late Triassic
- Early Triassic
- Triassic



**User:**                    **Research, Academia**

**Need for:**            Detailed information on geology and  
georesources  
e.g. for own desktop operations

**Product:**            Basic data

**Dissemination**

**of data:**            **Metadata**  
**Data warehouse**

**Example: Africover****Multipurpose Africover Databases on Environmental Resources  
(MADE)**

- **Organisation:** FAO
- **Subject:** Land cover classification
- **Objective:** Information for environmental planning, agriculture etc.
- **Period:** Eastern Africa module: 1995-2002
- **Participants:** 10 countries
- **Data:** 8.5 million km<sup>2</sup> mapped

## - Data distribution

[http://www.africover.org/data\\_dissemination.htm](http://www.africover.org/data_dissemination.htm)

- **Metadata** (ISO standard)
- Web mapping
- **Data warehouses**

# Metadata

Data Set Title	Producer	Status	Metadata	Data Type	Classification
** Burundi - Multipurpose Landcover database (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Full Resolution Data Set	On Demand
Burundi - Boundaries	FAO Africover	Complete	<a href="#">Available</a>	Full Resolution Data Set	Public Domain
Burundi - Rivers (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Full Resolution Data Set	Public Domain
Burundi - Roads (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Full Resolution Data Set	Public Domain
Burundi - Towns	FAO Africover	Complete	<a href="#">Available</a>	Full Resolution Data Set	Public Domain
Burundi - Spatially Aggregated Multipurpose Landcover database (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Spatial Aggregation	Public Domain
Burundi - Thematic Agriculture Aggregation (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Thematic Aggregation	Public Domain
Burundi - Thematic Grassland Aggregation (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Thematic Aggregation	Public Domain
Burundi - Thematic Woody Aggregation (Africover)	FAO Africover	Complete	<a href="#">Available</a>	Thematic Aggregation	Public Domain
Burundi - Geomorphology / Landform and Lithology	FAO Africover	Complete	<a href="#">Available</a>	Full Resolution Data Set	On Demand
Burundi - Thematic Aggregation Geomorphology / Landform	FAO Africover	Complete	<a href="#">Available</a>	Thematic Aggregation	Public Domain
Burundi - Thematic Aggregation Geomorphology / Lithology	FAO Africover	Complete	<a href="#">Available</a>	Thematic Aggregation	Public Domain

<http://www.africover.org/system/area.php?place=4>

## Metadata

Metadata Page

[\[ Printable Version \]](#)

**National Focal Point Institution:**  
 Organisation: [FAO - Africover](#)

**Data Set Description Fields:**

Title: \*\* Burundi - Multipurpose Landcover database (Africover)

Dataset Reference Date: 2002-04-04

Dataset Reference Date Type: Publication

Dataset Edition: First

Presentation Format: mapDigital

Abstract: The land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (Bands 4,3,2) acquired mainly in the year 1999. The land cover classes have been developed using the FAO/UNEP international standard LCCS classification system.

Purpose: The purpose of the Africover landcover database is to provide the information required for natural resource assessment and management, environmental modeling and decision-making.

Completedness/Progress Code: Complete

Theme Keywords: Landcover, environment, natural resources, agriculture, forest, rangeland, management

Place Keyword: Burundi

ISO Topic Category: Earth Cover

Supplemental Information: The LCCS legend for the country, a list of the LCCS classifiers used in the interpretation, LCCS glossary of terms, a list of thematic classes and their frequency in a mixed unit, and a report on the frequency and scale adequacy, can be found in the full resolution landcover database report.

Direct Spatial Reference Method: Vector

Data Format: ESRI ArcView Shapefile (.shp)

Scale of the Dataset: 1:100 000

Dataset Language: English

Dataset Character Set: usAscii

Resource Provider: [Mr. Antonio Di Gregorio - FAO Africover](#)

Point of Contact: [Mr. Antonio Di Gregorio - FAO Africover](#)

Custodian: [Mr. Cyprien Hakizimana - Institut Geographique du Burundi \(IGEBU\)](#)

Owner: [Mr. Cyprien Hakizimana - Institut Geographique du Burundi \(IGEBU\)](#)

Originator: [Mr. Antonio Di Gregorio - FAO Africover](#)

Processor: [Mr. Antonio Di Gregorio - FAO Africover](#)

Publisher: [Mr. Antonio Di Gregorio - FAO Africover](#)

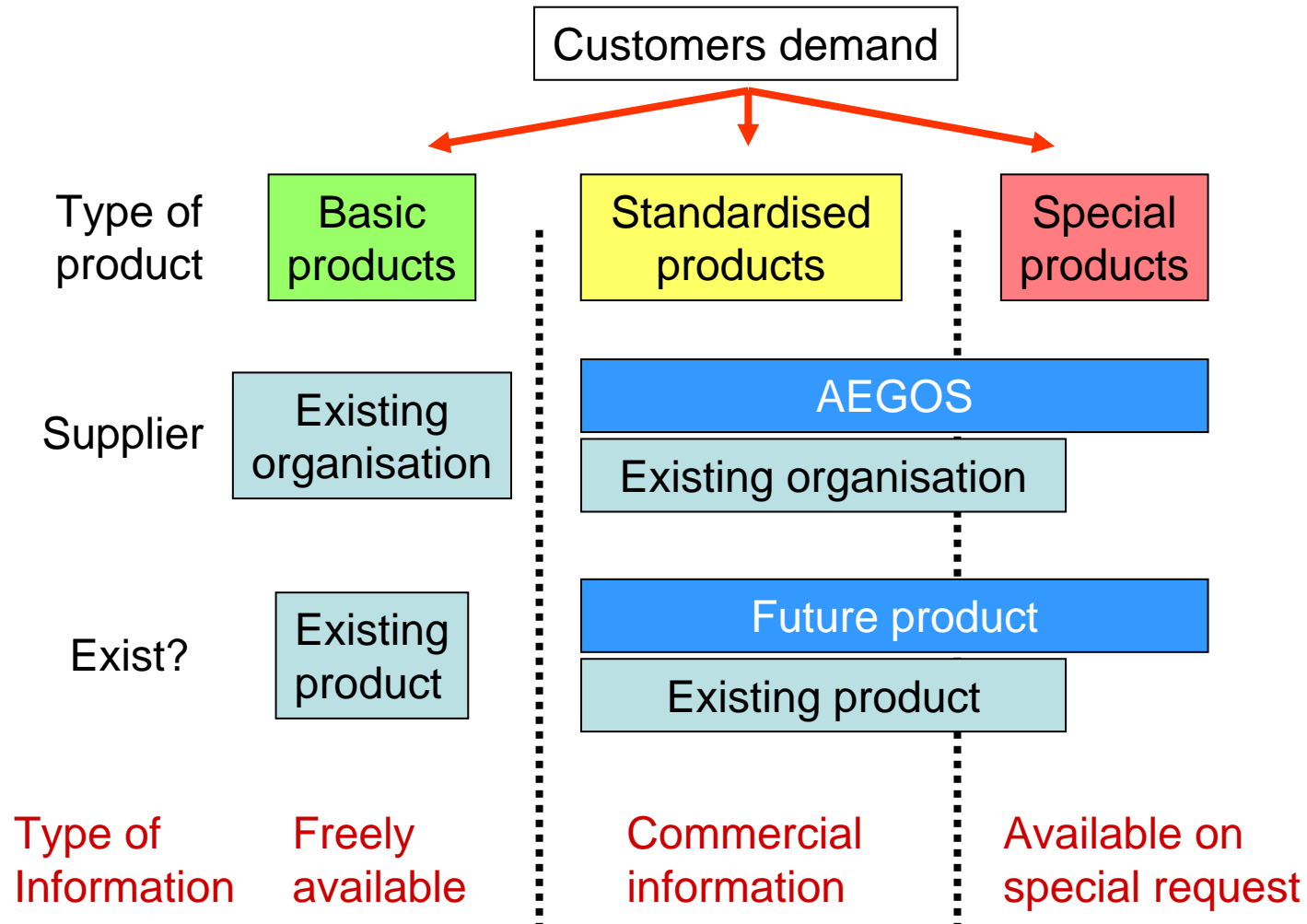
Distributor: [Mr. John Latham - FAO](#)

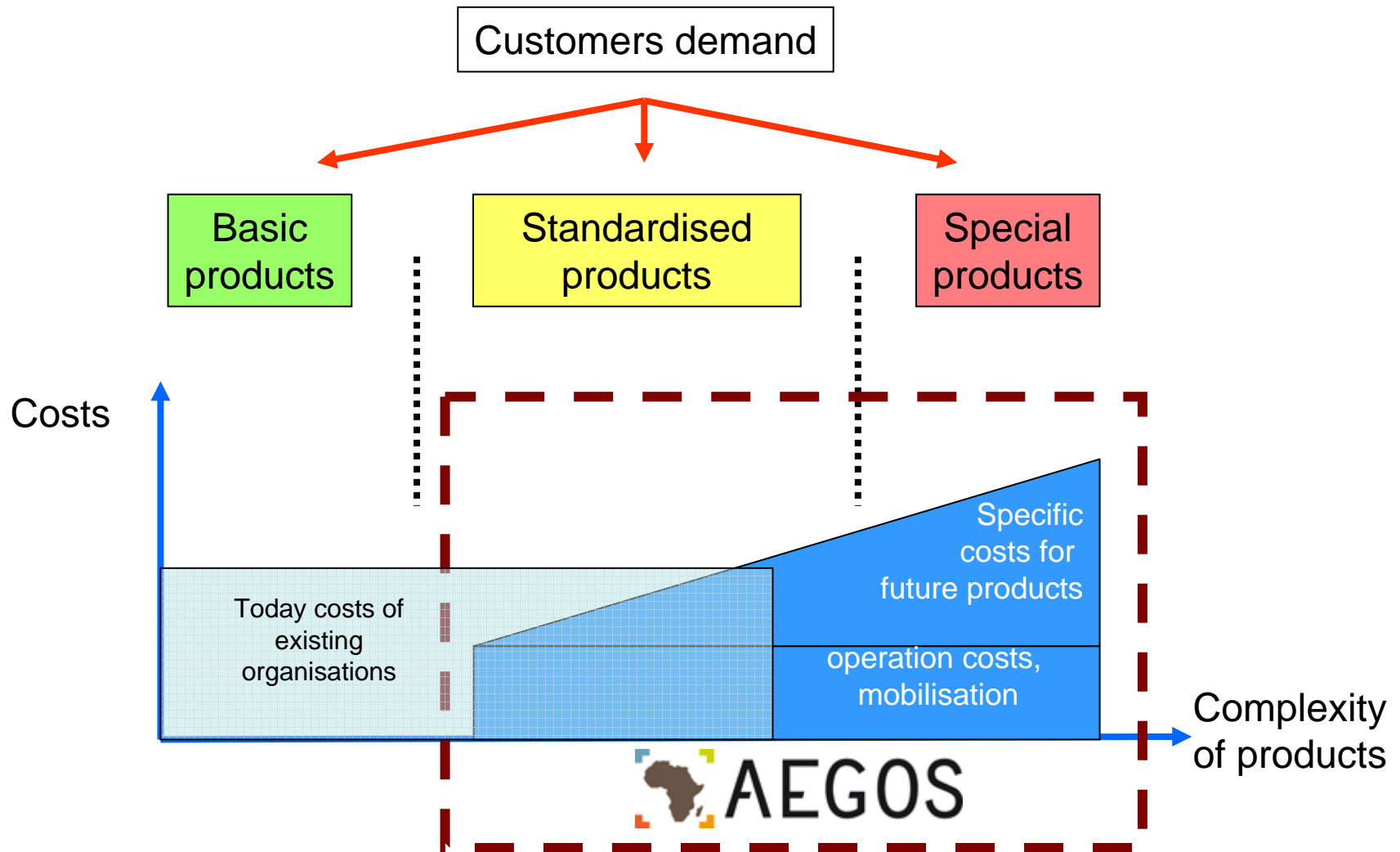
Lineage Statement: The land cover was interpreted from LANDSAT imagery (Bands 4,3,2) acquired mainly in the year 1999, verified by field work, digitised, checked for topological and attribute errors and mosaiced.

<http://www.africover.org/system/metadata.php?metadataid=66>

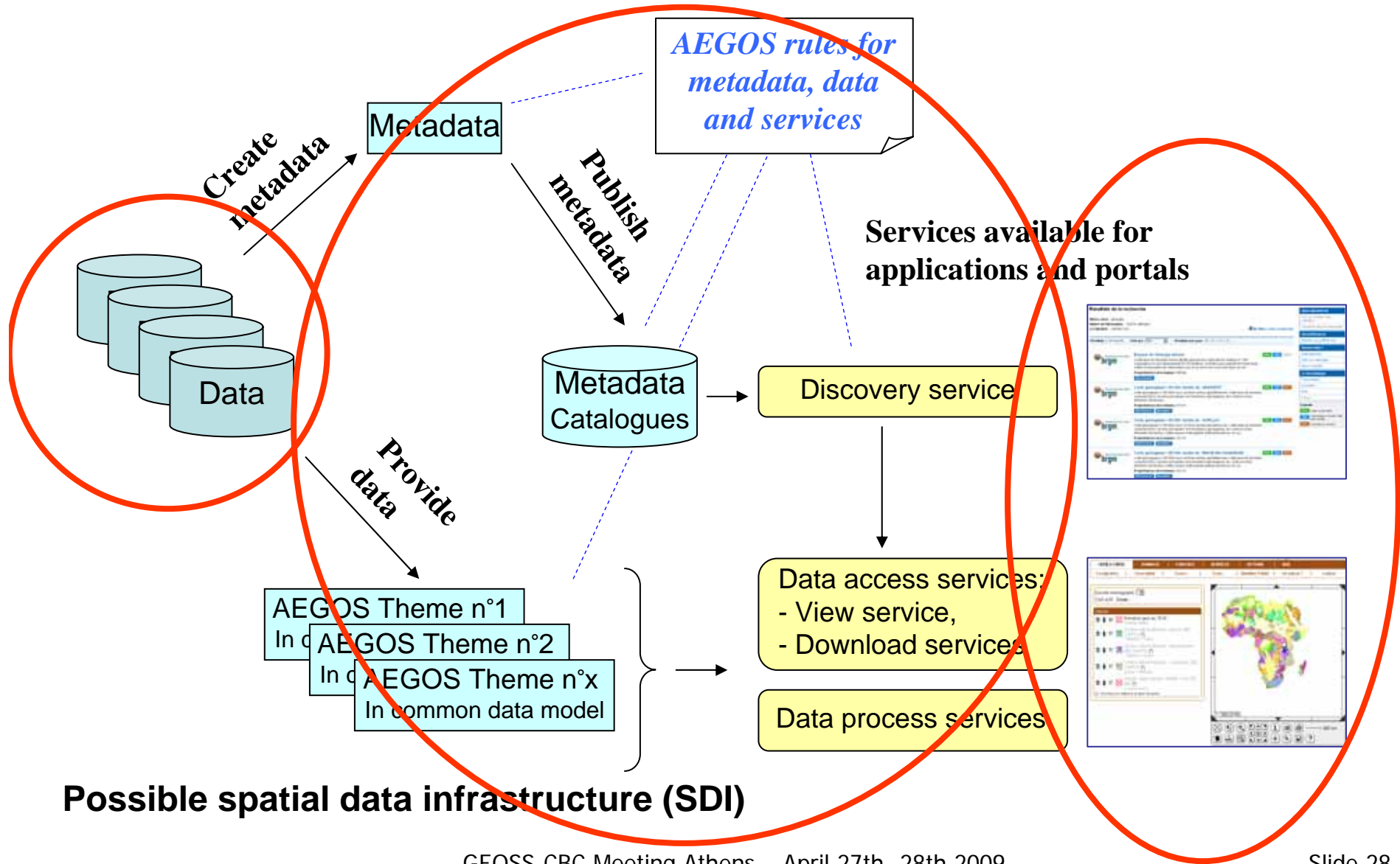
- organises public domain data
- allows performance of easy GIS operations
  
- **Dynamic Maps:**
  - software (freeware on Africover web site)
  - to get connection to warehouse for the extraction of information
  - no specific knowledge of GIS required
  - generic, not database or system-specific
  - integrates with MS Excel
  - integrates with MS Power Point
  - with query function

## Structure of future products





# AEGOS Infrastructure, service and products



Thank you for your  
attention!

Questions?

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**+49-511-642-2246**  
**Michael.mente@bgr.de**