OCTs Regional Risk Reduction Initiative (R3I)
Provision of Services to Caribbean OCTs
Lot 1: GIS and Vulnerability Assessment

Quality Assurance

Quality Assurance

Quality assurance is the monitoring and evaluation of the various aspects of the project to:

- maximize the quality of the production process and its reproducibility
- Monitor the project scheduling, in order to minimize delays in the activities
- Ensure that all the involved stakeholders are adequately informed on the project development and on the ongoing results
- Guarantee an easy sharing and interoperability of the managed data

Quality Assurance

This will be achieved through:

- Standardization of processes and workflow (UML)
- Updated Gantt-charts to monitor the project advancement
- Progress reports (monthly frequency) on the performed activities and achieved results
- The putting into service of the "**indexed spatial repository"** for sharing all project documentation and data
- The usage of standards In data exchange protocols and data structuring, following ***Inspire*** framework guidelines
- The assistance and supervision of the UNDP Experts

Progress Reports

Monthly-based they will contain:

- ***Summary of Progress***
- ***Important Events***
- ***Possible Area of Concern***
- ***Performed Activities***
- ***Upcoming activities***
- ***Achieved Results***

Indexed spatial repository

Installed at GESP premises and accessible via web by OCTs and stakeholders, it will be used to collect all the material gathered during all the Project.

Such a repository will remain on-line (and accessible) till when it will be replaced by the final system version (Phase V).

It will collect:

- Spatial data and documents repository for all the data collected with a particular focus on metadata;
- Information source to be accessed to all the stakeholders and entities involved in the Project.

Standardization: the INSPIRE Program

INSPIRE is a Directive proposed by the European Commission in July 2004 setting the legal framework for the establishment of the Infrastructure for Spatial Information in the European Community, for the purposes of Community environmental policies and policies or activities which may have an impact on the environment.

One of the main tasks of the INSPIRE programme is to enable the interoperability and, where practicable, harmonization of spatial data sets and services

Standardization: the INSPIRE Programme

It is important to note that "**interoperability**" is understood as providing access to spatial data sets through network services in a representation that allows for combining them with other such spatial data sets in a coherent way.

This includes agreements about the different interoperability components. In other words, by enabling interoperability data can be used coherently, independent of whether the existing data set is actually changed (harmonized) or "just" transformed by a download service for publication depending on the chosen approach

Standardization: the INSPIRE Programme

Some definitions:

data interoperability process is the process of developing harmonised data product specifications and implementing the necessary arrangements to transform spatial data into interoperable spatial data

metadata is the information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them

thematic identifier is the descriptive unique object identifier applied to spatial objects in a defined information theme

Standardization: the INSPIRE Programme

(A) INSPIRE Principles	(B) Terminology	(C) Reference model
(D) Rules for application Schemas and feature catalogues	(E) Spatial and temporal aspects	(F) Multi-lingual text and cultural adaptibility
(G) Coordinate refe-rencing and units model	(H) Object referencing modelling	(I) Identifier Management
(J) Data transformation	(K) Portrayal model	(L) Registers and registries
(M) Metadata	(N) Maintenance	(O) Quality
(P) Data Transfer	(Q) Consistency between data	(R) Multiple representations
(S) Data capturing	(T) Conformance	

Figure 2 - Data interoperability components – overview

Standardization: the INSPIRE Programme

(A) Principles

The first three of the five principles are to be considered to help define the data interoperability process:

- *that spatial data are stored, made available and maintained at the most appropriate level;*
- *that it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications;*

- *that it is possible for spatial data collected at one level of public authority to be shared between other public authorities.*

Standardization: the INSPIRE Programme

(C) Reference model

This component will define the framework of the technical parts including topics like information modelling (i.e. conceptual modelling framework with rules for application schemas) and data administration (i.e. reference systems). It will provide a structure which allows the components of INSPIRE which are related to data specifications to be described in a consistent manner.

(D) Rules for application schemas and feature catalogues

The purpose of this component is to

- provide a computer-readable data description defining the data structure - enabling automated mechanisms for data management;
- achieve a common and correct understanding of the data, by documenting the data content of the particular theme, thereby making it possible to unambiguously retrieve information from the data.

Standardization: the INSPIRE Programme

(E) Spatial and temporal aspects

Conceptual schema for describing the spatial and temporal characteristics of spatial objects:

- Spatial geometry and topology
- Temporal geometry and topology
- Coverage functions (examples of coverage functions include rasters, triangulated irregular networks, point coverages, and multi-dimensional grids)

Standardization: the INSPIRE Programme

(H) Object referencing modelling

This component describes how information is referenced to existing spatial objects, typically base topographic spatial objects, rather than directly via coordinates.

It will be specified how the spatial characteristics of a spatial object can be based on already existing spatial objects.

The aim is to promote the easy and reliable exchange of data that is associated with spatial objects (e.g. river quality sample records) across several users who use a common base (thus avoiding spatial inconsistencies and massive data transfers to support regular reporting). The approach improves data integrity across distributed systems and services as well as more reliable data sharing.

Standardization: the INSPIRE Programme

(I) Identifier management

Spatial objects should have an external object identifier. This component will define the role and nature of unique object identifiers (or other mechanisms) to support unambiguous object identification.

This does not mean that all organizations need to adopt a common form of identifier or other mechanism but the identifier management mechanisms (e.g. registers) in use at higher level will need to be synchronised/mapped to ensure integration

Standardization: the INSPIRE Programme

(M) Metadata

This component cover metadata on the following levels:

- Discovery
- Evaluation
- Use

Standardization: the INSPIRE Programme

- **Part B 1 Identification:**
  - **Part B 1.1 Resource Title:** Image2000 Product 1 (nl2) Multispectral
  - **Part B 1.2 Resource Abstract:** IMAGE2000 product 1 individual orthorectified scenes. IMAGE2000 was produced from ETM+ Landsat 7 satellite data and provides, etc. etc...
  - **Part B 1.3 Resource Type:** dataset
  - **Part B 1.4 Resource Locator:** http://image2000.jrc.it
  - **Part B 1.5 Resource Unique Identifier:**
    - **code:** image2000_1_nl2_multi
    - **codeSpace:** http://image2000.jrc.it
  - **Part B 1.7 Resource language:** eng
- **Part B 2 Classification of data and services:**
  - **Part B 2.1 Topic category:** imageryBaseMapsEarthCover
- **Part B 3 Keyword:**
  - **Part B 3.1 Keyword value:** Land cover
  - **Part B 3.2 Originating Controlled Vocabulary:**
    - **title:** GEMET Thesaurus version 1.0
    - **reference date:**
      - **date:** 2001-01-01
      - **date type:** publication
- **Part B 4 Geographic Location:**
  - **Part B 4.1 Bounding Box:**
    - **West:** +3.93
    - **East:** +7.57
    - **North:** +52.10
    - **South:** +54.10
- **Part B 5 Temporal Reference:**
  - **Part B 5.2 Date of publication:** 2000-01-01
- **Part B 6 Quality and validity:**
  - **Part B 6.1 Lineage:** Product 1 scenes correspond to the path/row of the Landsat orbit. All Image2000 product 1 scenes are ortho-corrected, etc. etc..
  - **Part B 6.2 Spatial Resolution:** 25.0
  - **Part B 7.1 Specification:**
    - **title:** INSPIRE Data Specification on Orthoimagery – Guidelines
    - **publication date:** 2011-05-15
  - **Part B 7.2 Degree:** true
- **Part B 8 Constraints related to access and use:**
  - **Part B 8.2 Limitation on public access:** no limitations
- **Part B 8 Constraints related to access and use:**
  - **Part B 8.1 Condition applying to access and use:** no conditions apply
- **Part B 9 Responsible Organisation:**
  - **Part B 9.1 Responsible party:**
    - **organisation:** Joint Research Centre
    - **e-mail:** image2000@jrc.it
  - **Part B 9.2 Responsible party role:** custodian
- **Part B 10 Metadata on metadata:**
  - **Part B 10.1 Metadata point of contact:**
    - **organisation:** Joint Research Centre
    - **e-mail:** image2000@jrc.it
  - **Part B 10.2 Metadata date:** 2005-04-18
  - **Part B 10.3 Metadata language:** eng

Example of *XML*

Metadata Sets

Standardization: the INSPIRE Programme

(N) Maintenance

This component define best practice in ensuring that spatial data can be managed against updates of reference information without interruption of services. This will require, where practicable, the definition of mechanisms by different stakeholder areas to manage where this is required and it is feasible

- change only updates
- spatial object life-cycle rules

(O) Data & information quality

This component advise the need to publish quality levels of each spatial data set using the criteria defined in the ISO 19100 series of standards, including *completeness*, *consistency*, *currency* and *accuracy*

Standardization: the INSPIRE Programme

(P) Data transfer

This component describe methods for encoding application and reference data as well as information products

The encoding of spatial objects will in general be model-driven, i.e. fully determined by the application schema in UML.

To support network services that are implemented as web services, spatial objects are expected to be primarily encoded in GML and metadata. Coverage data is expected to use existing encodings for the range part, e.g. for the pixels of an orthophoto.

Geography Markup Language (GML) is the XML grammar defined by the Open Georspatial Consortium (OGC) to express geographical features

Standardization: the INSPIRE Programme

(Q) Consistency between data

This component describe guidelines on how the consistency between the representation of the same entity in different spatial data sets as published in INSPIRE (for example along or across borders, themes, sectors or at different resolutions) shall be maintained

(R) Multiple representations

This component describe best practices how data can be aggregated

- across time and space
- across different resolutions ("generalisation" of data)

Such aggregation processes are used in particular to create the following results:

- - Multiple representations
- - Derived reporting (example: typically water samples at 1 km intervals are reported to the European level)

Standardization: the INSPIRE Programme

(S) Data capturing rules

This component describe the data specification-specific criteria regarding which spatial objects are to be captured and which locations/points will captured to represent the given spatial object (e.g. all lakes larger than 2 ha, all roads of the Trans European Road Network, etc.).