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Workshop on Regional- National Water Information Systems in Arab region

MedWIS Geographical References

Eduardo García Carreras – ADASA Sistemas

Damascus, Syria (December 2010)

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Agenda

- **Objective of MedWIS geographical reference definition**

- **WISE geographical references**

- **Basis of the proposal**
  - **Specificities of Mediterranean environment and water management**
  - **WISE vs. MedWIS differences and conditionals**

- **Data model structure: meta-model**
  - **Classes**
  - **Elements**
    - **Features**
    - **Variables**

- **Elements of geographical reference proposal**

Objective

- Identify a set of relevant features to observe water-cycle status in the Mediterranean countries

- Agree upon these set of features and its characteristics to enable semantic interoperability of water information between Mediterranean countries

- Provide the backbone data specifications for building the data infrastructure of the Mediterranean water information system and for national water information systems in the Mediterranean

WISE Geographical reference datasets

- WISE current datasets:

  - **Spatial data submitted by MS according to Directives**:
    - Named by the Directive e.g. "WFD River Basin Districts".

  - **WISE Reference GIS datasets**:
    - Aggregated from MS submissions

  - **Background GIS datasets:**
    - refer to datasets such as administrative borders of the Member States, coastline, main cities/towns and roads. They provide the background and context for mapping the WISE Reference GIS datasets

  - **External GIS datasets:**
    - these can be used to support further analysis and the visualisation of the WISE Reference GIS datasets, such as CCM2, Corine Land Cover and EEA European River Catchments
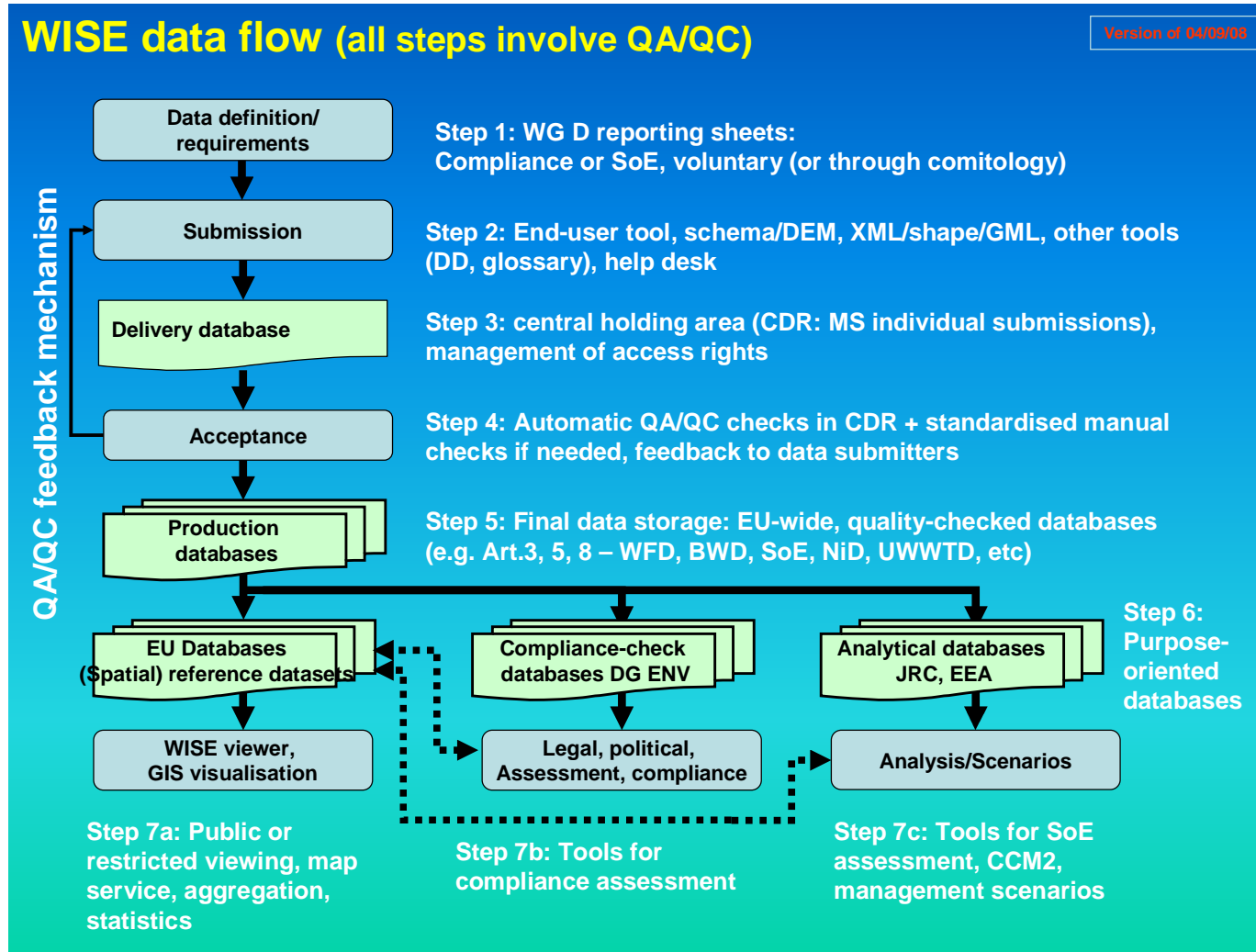
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WISE Geographical reference datasets

- **Spatial data submitted by MS according to Directives**:
  - Defined according to WFD reporting sheets
  - Used for compliance checking of MS
  - All data specifications compiled in a pan-European water data model defined by the CIS WorkGroup D "*Guidance on Implementing the Geographical Information System (GIS) Elements of the EU Water policy*" document
    - Coding
    - Hierarchies
    - Structures
    - Symbols
    - etc.

WISE Geographical reference datasets

WISE data flow (all steps involve QA/QC)

Version of 04/09/08

QA/QC feedback mechanism

Data definition/requirements
→ **Step 1: WG D reporting sheets:** Compliance or SoE, voluntary (or through comitology)

Submission
→ **Step 2: End-user tool, schema/DEM, XML/shape/GML, other tools (DD, glossary), help desk**

Delivery database
→ **Step 3: central holding area (CDR: MS individual submissions), management of access rights**

Acceptance
→ **Step 4: Automatic QA/QC checks in CDR + standardised manual checks if needed, feedback to data submitters**

Production databases
→ **Step 5: Final data storage: EU-wide, quality-checked databases (e.g. Art.3, 5, 8 – WFD, BWD, SoE, NiD, UWWTD, etc)**

EU Databases (Spatial) reference datasets

Compliance-check databases DG ENV

Analytical databases JRC, EEA

Step 6: Purpose-oriented databases

WISE viewer, GIS visualisation

Legal, political, Assessment, compliance

Analysis/Scenarios

Step 7a: Public or restricted viewing, map service, aggregation, statistics

Step 7b: Tools for compliance assessment

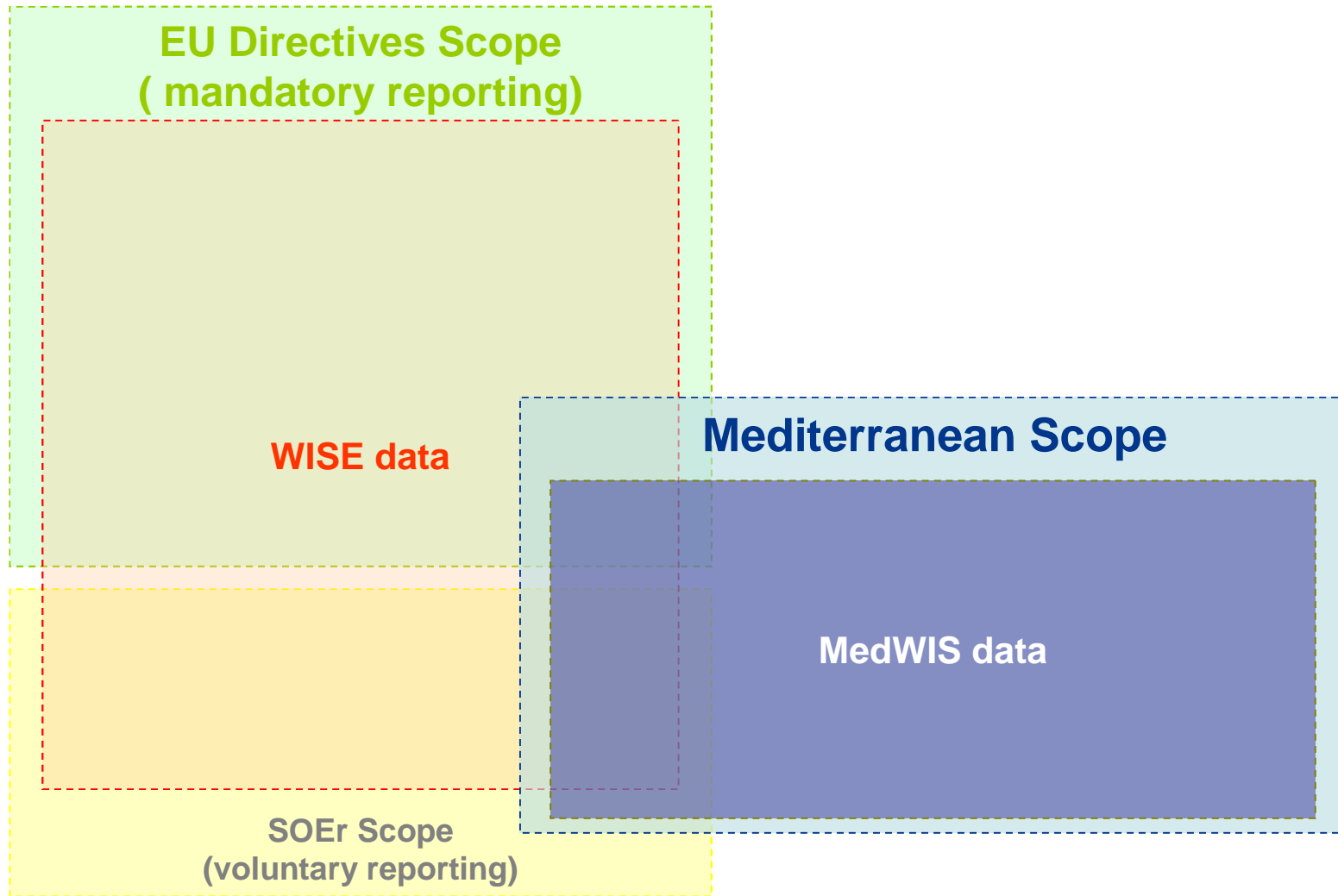**Step 7c: Tools for SoE assessment, CCM2, management scenarios**
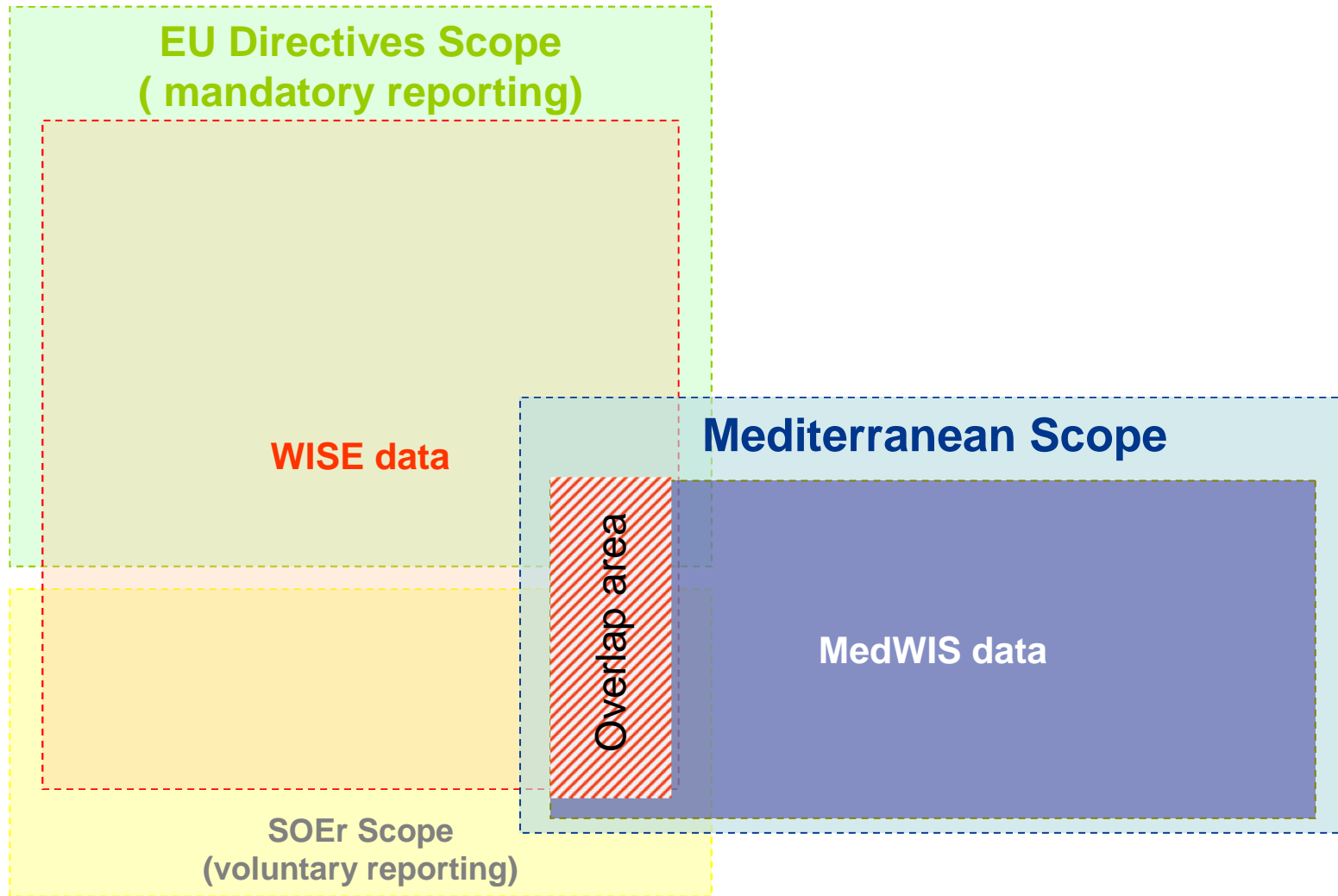
WISE vs MedWIS Datasets

- Why can't we use the same WISE reference dataset for MedWIS?
  - There's no reporting obligation associated to Mediterranean information
    - Core WISE data is derived from WFD implementation mandatory reporting from Member States which does not apply to Med Countries.
  - Water management problematic is substantially different in Europe than in the Mediterranean countries
    - Only southern European countries face similar situations
    - WFD does not focus con southern European issues
      - WFD does not refer to drought nor drought management and monitoring
      - Little references to regenerated water
      - …
  - Resources of UE MS larger than Mediterranean countries
    - Is not feasible to use the same standards and requirements
    - Complexity of capturing environmental data in med countries
      - Environment
      - Flow regime of rivers
      - Etc.

WISE vs MedWIS Datasets

EU Directives Scope
(mandatory reporting)

WISE data

Mediterranean Scope

MedWIS data

SOEr Scope
(voluntary reporting)

WISE vs MedWIS Datasets

**EU Directives Scope
(mandatory reporting)**

WISE data

Mediterranean Scope

Overlap area

MedWIS data

**SOEr Scope
(voluntary reporting)**

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WISE vs MedWIS Datasets

	WISE datasets	MedWIS datasets
Obligation	Mandatory	Voluntary
Legislation	WFD centric	Non-WFD centric
Complexity	High	Low
Main focus	Water good status	Water availability & good status
Aggregation level	Medium	High
Local capability	High	Has to be developed

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WISE vs MedWIS Datasets

- MedWIS / WIS data compatibility principles
  - Common datasets are compatible at a high aggregation level
  - Metadata is compatible
  - Data models are compatible
  - Feature definition is coherent
  - MedWIS data could be use 'out-of-the-box' for SOEr reporting
  - MedWIS and WISE share technical interoperability
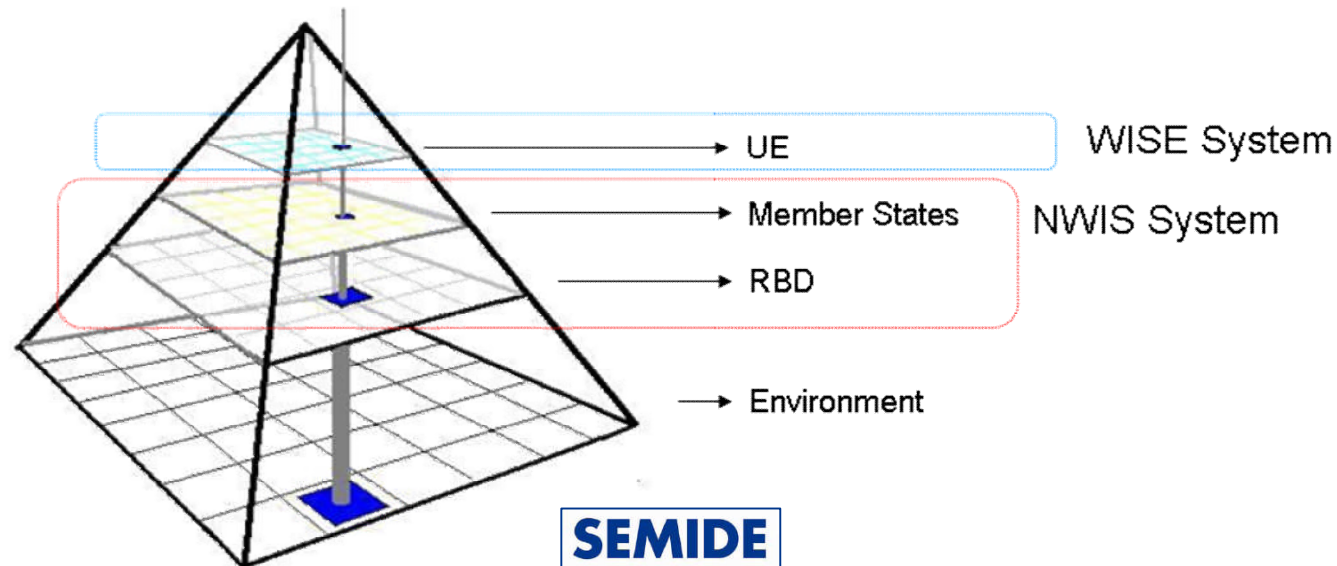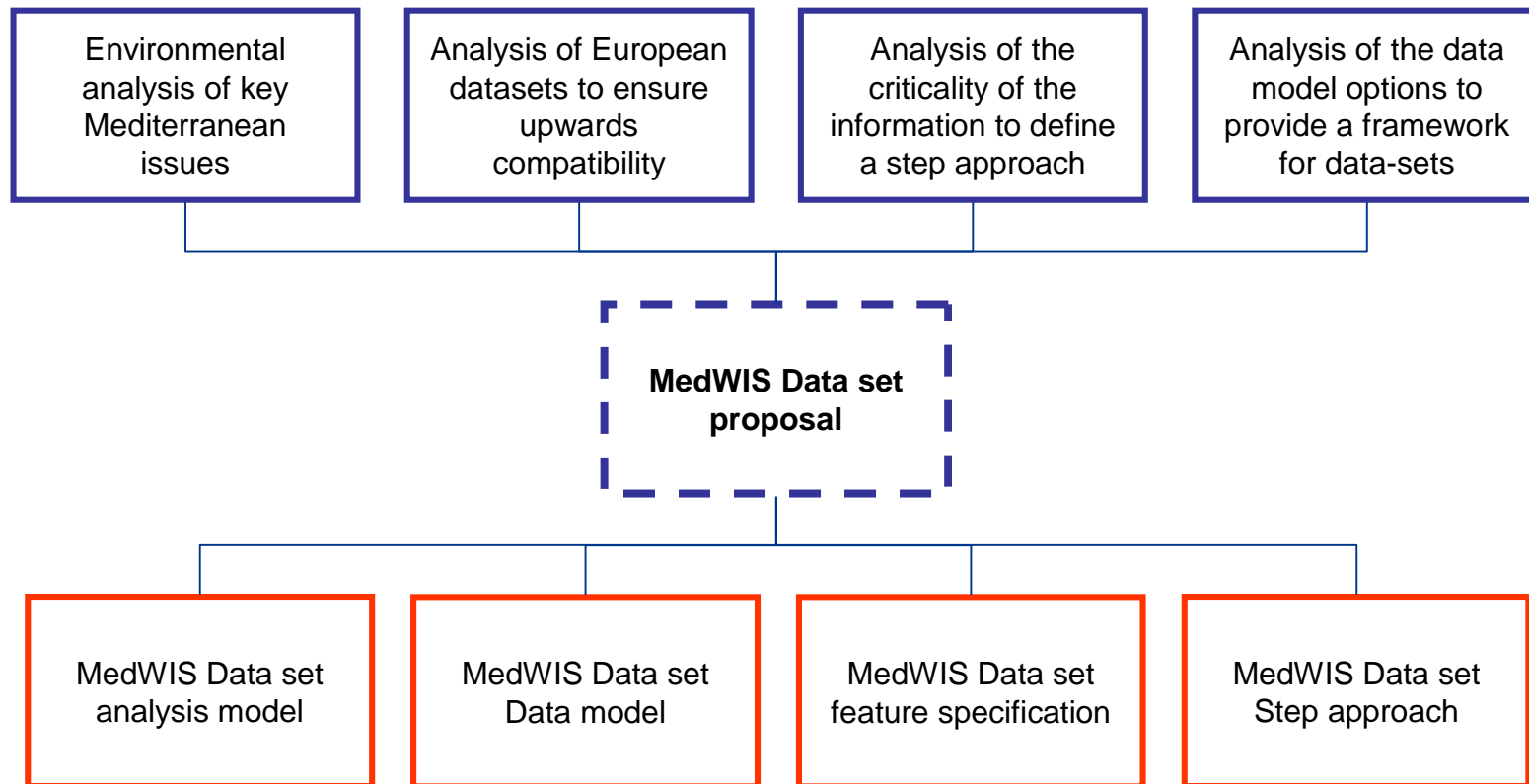
Proposal for MedWIS data sets

- Basis for the proposal
  - Analysis of the Mediterranean problematic
    - Derive a classification / analysis model to data-sets
  - Analysis of European Datasets to ensure upwards compatibility
    - WISE
    - INSPIRE
  - Analysis of the criticality of the information
    - To define a step approach
  - Analysis of a meta-data model to frame the proposed data-sets
    - Based on WISE experiences
- Components of the proposal
  - A data-set classification / analysis model based on the Mediterranean water management issues
  - A data model proposal supporting the data-set organization and normalization
  - A data-set detailed specification
  - A step approach to define an implementation path (different levels of compliance)

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Proposal for MedWIS data sets

INPUTS

| Environmental analysis of key Mediterranean issues | Analysis of European datasets to ensure upwards compatibility | Analysis of the criticality of the information to define a step approach | Analysis of the data model options to provide a framework for data-sets |

MedWIS Data set proposal

| MedWIS Data set analysis model | MedWIS Data set Data model | MedWIS Data set feature specification | MedWIS Data set Step approach |

OUTPUTS

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Key elements of the proposal

- Analysis model

    - <u>Reference information</u>: definition of the environment that has impact over the water cycle but it's not direct part of it

    - <u>Pressures</u>: human conditionals on the water cycle

    - <u>Hydrological information</u>: natural elements of the water cycle

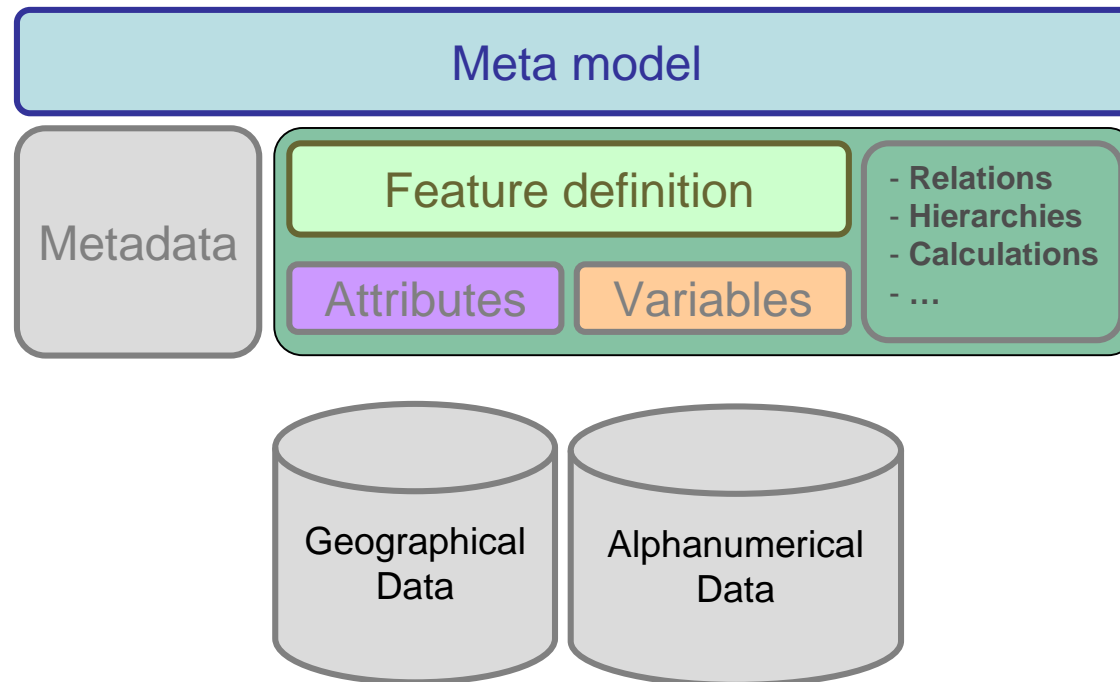   - <u>Monitoring</u>: water management tools

Key elements of the proposal

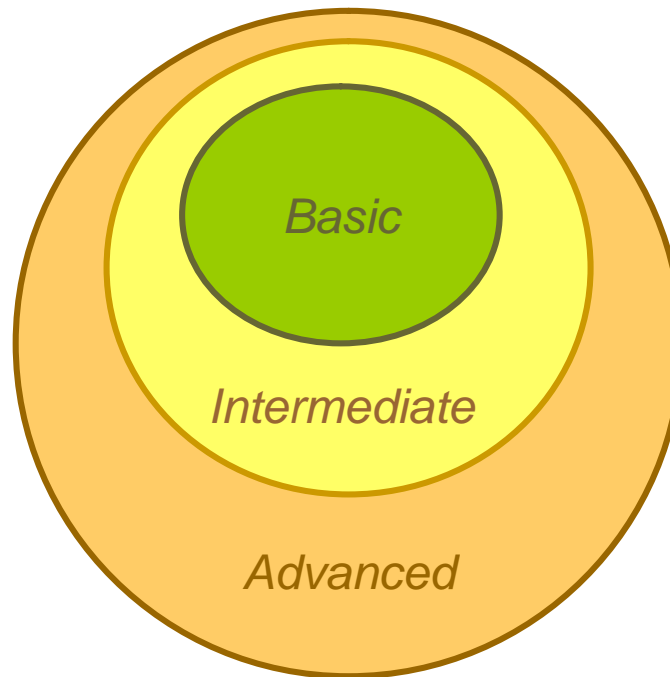- Analysis model
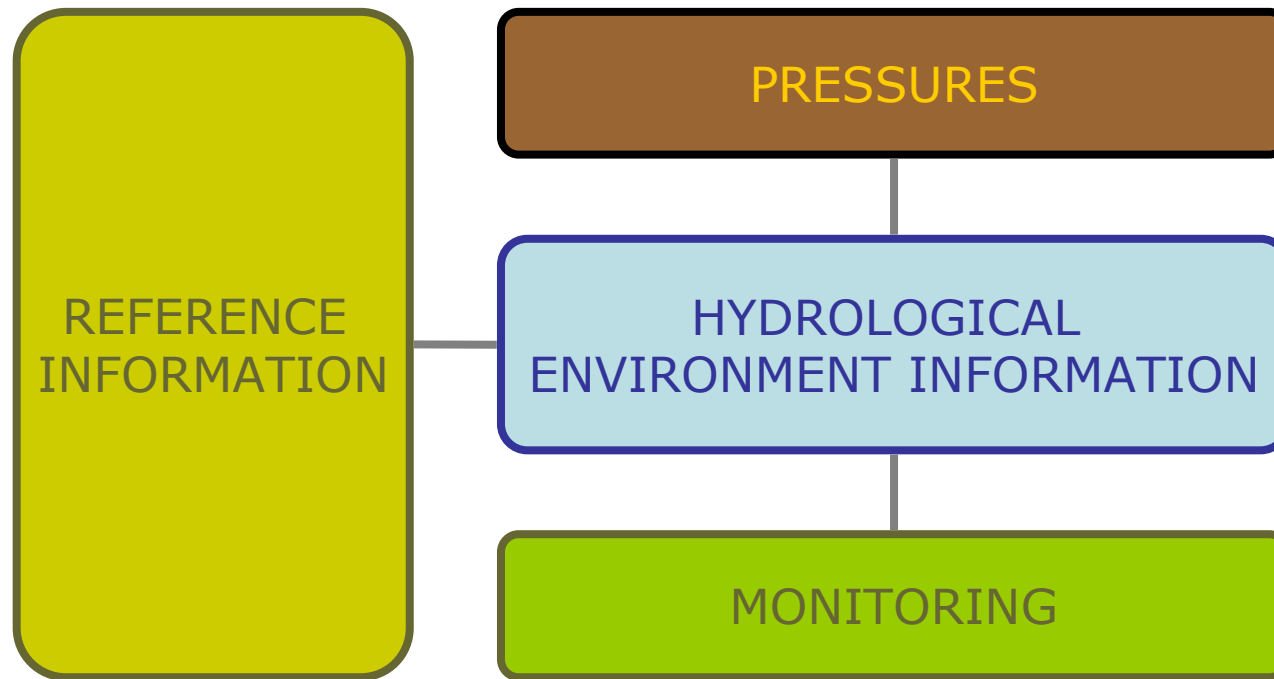
Key elements of the proposal

- Data model
  - All data elements to be classified as features or variables
    - Feature: data element of a predefined type
    - Variable: measure of a characteristic of a feature
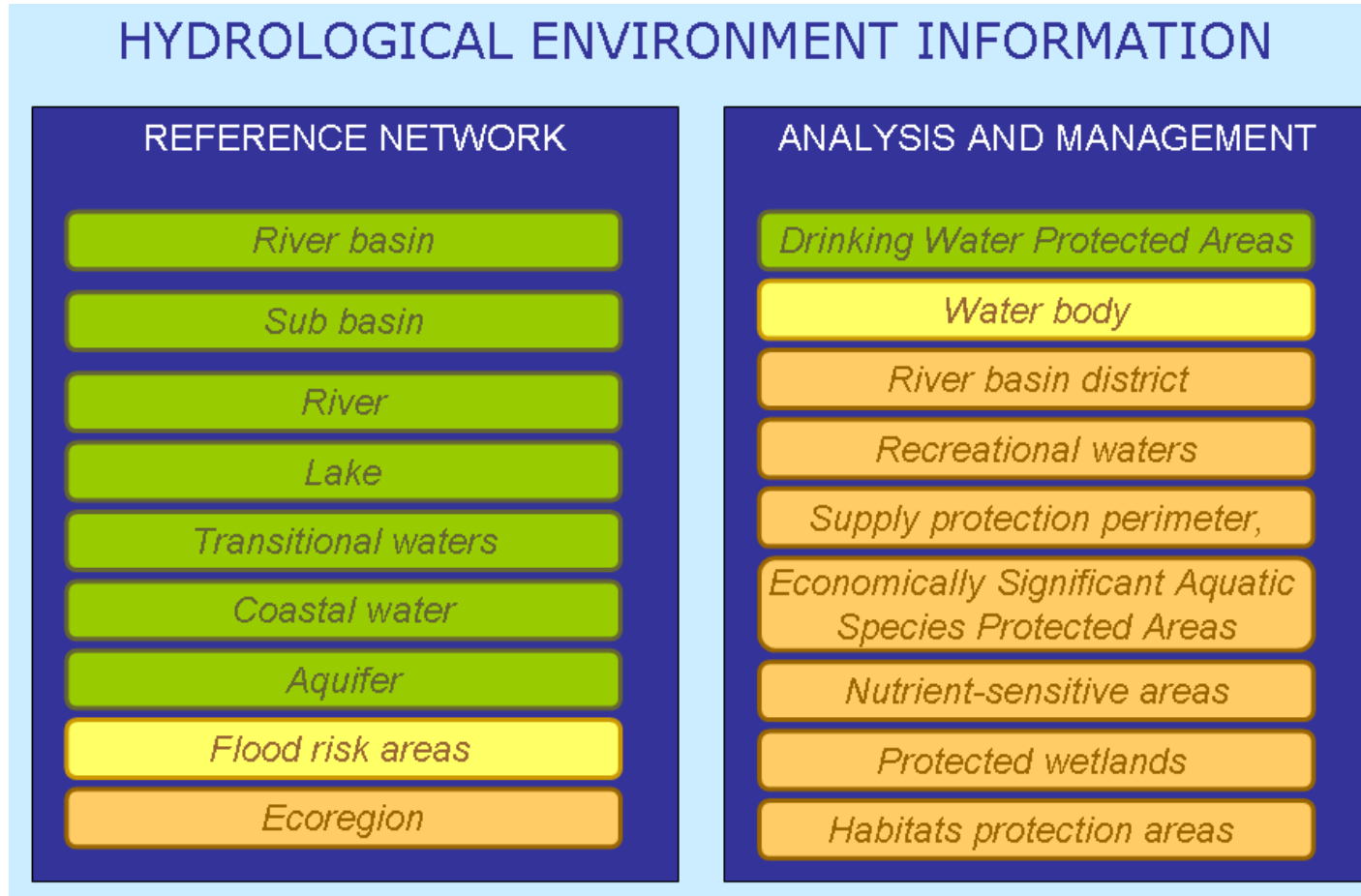
Key elements of the proposal

- Step approach:
  - All elements to be classified based on its degree of criticality

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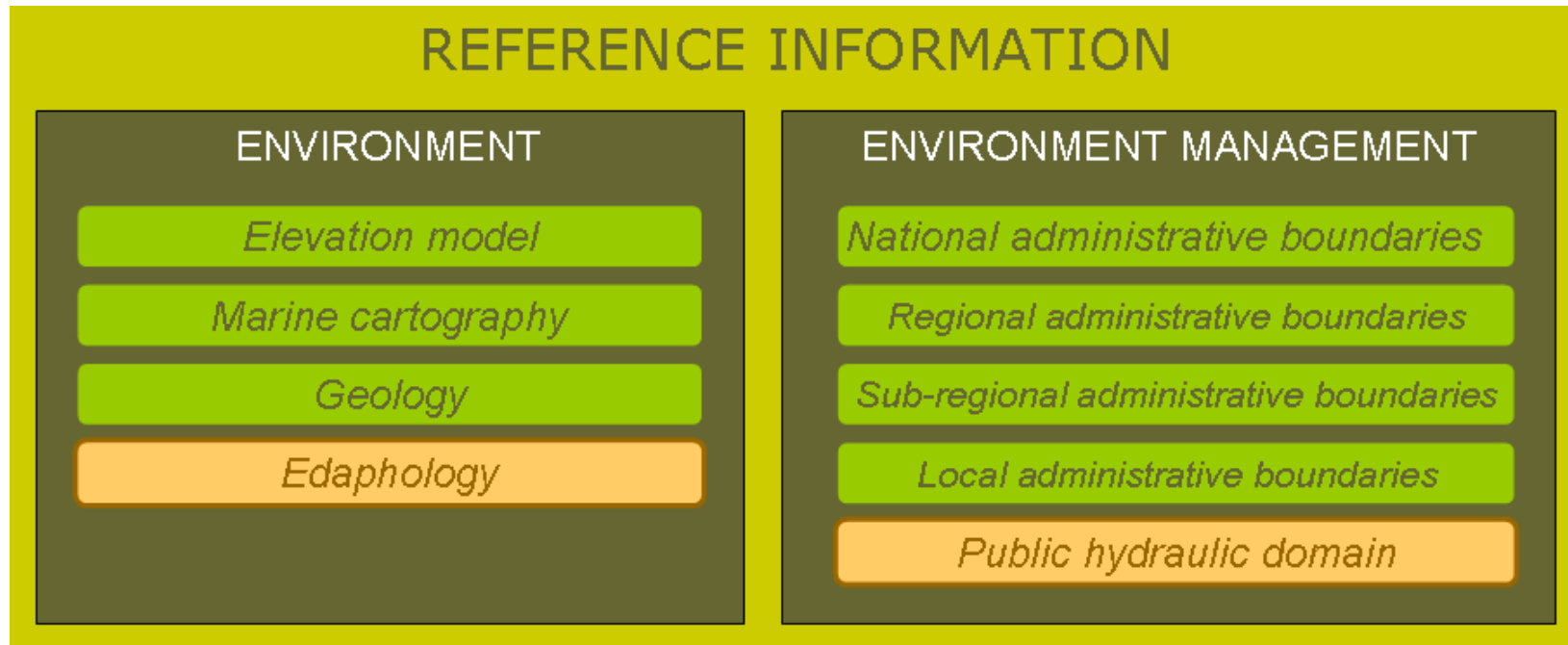**ADASA**

Key elements of the proposal

- Data set definition

HYDROLOGICAL ENVIRONMENT INFORMATION

REFERENCE NETWORK
- River basin
- Sub basin
- River
- Lake
- Transitional waters
- Coastal water
- Aquifer
- Flood risk areas
- Ecoregion

ANALYSIS AND MANAGEMENT
- Drinking Water Protected Areas
- Water body
- River basin district
- Recreational waters
- Supply protection perimeter,
- Economically Significant Aquatic Species Protected Areas
- Nutrient-sensitive areas
- Protected wetlands
- Habitats protection areas

Key elements of the proposal

- Data set definition

Key elements of the proposal

- Data set definition

PRESSURES

Urban agglomeration	Irrigation system
Wastewater treatment plant	Hydroelectric plants
Discharge point	Industry
Dams and lowhead dam	Dredging
Longitudinal alterations	Aggregates extraction
Water abstraction points	Coastal morphological alterations
Land use	Mining
Animal husbandry	Non-native species

Key elements of the proposal

- Data set definition

Key elements of the proposal

- Data set definition

Key elements of the proposal

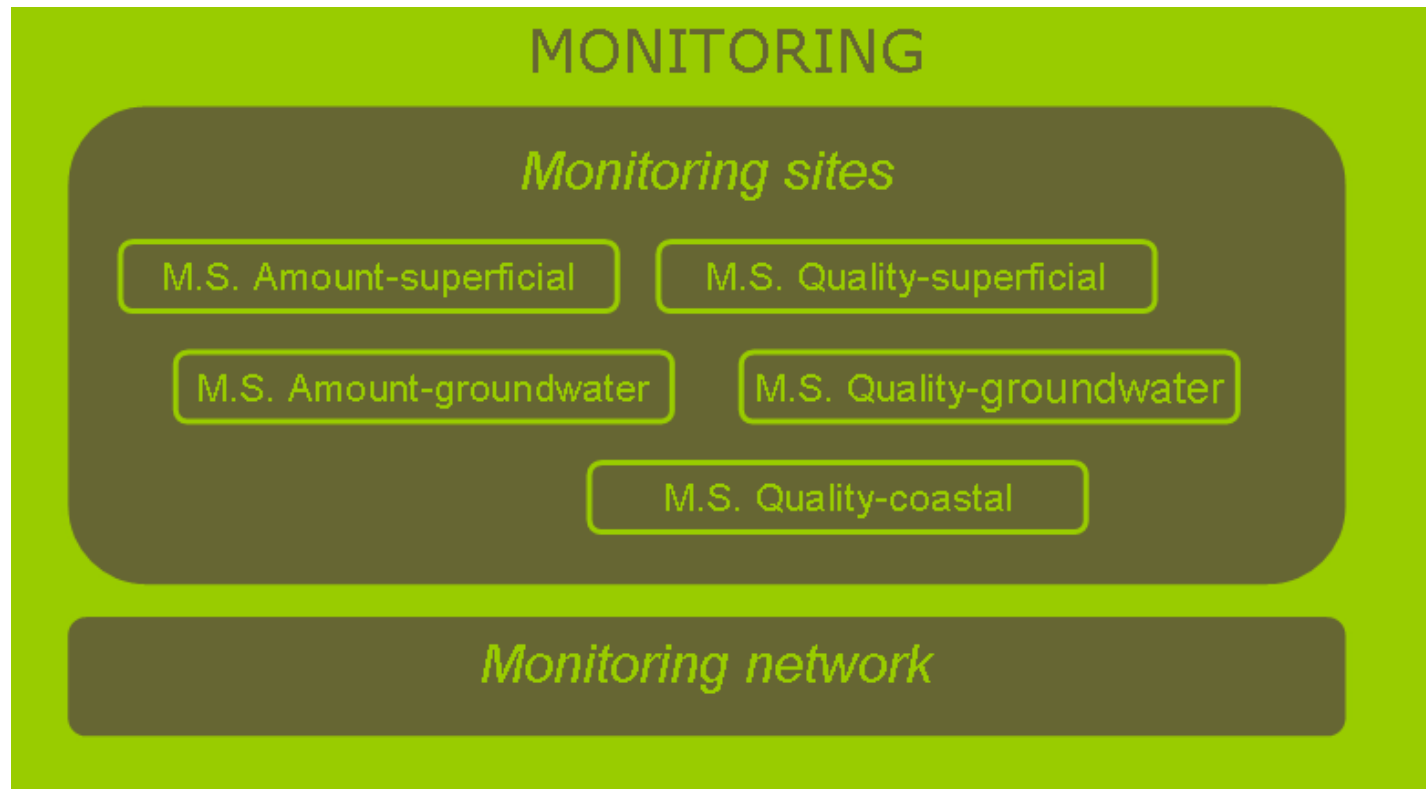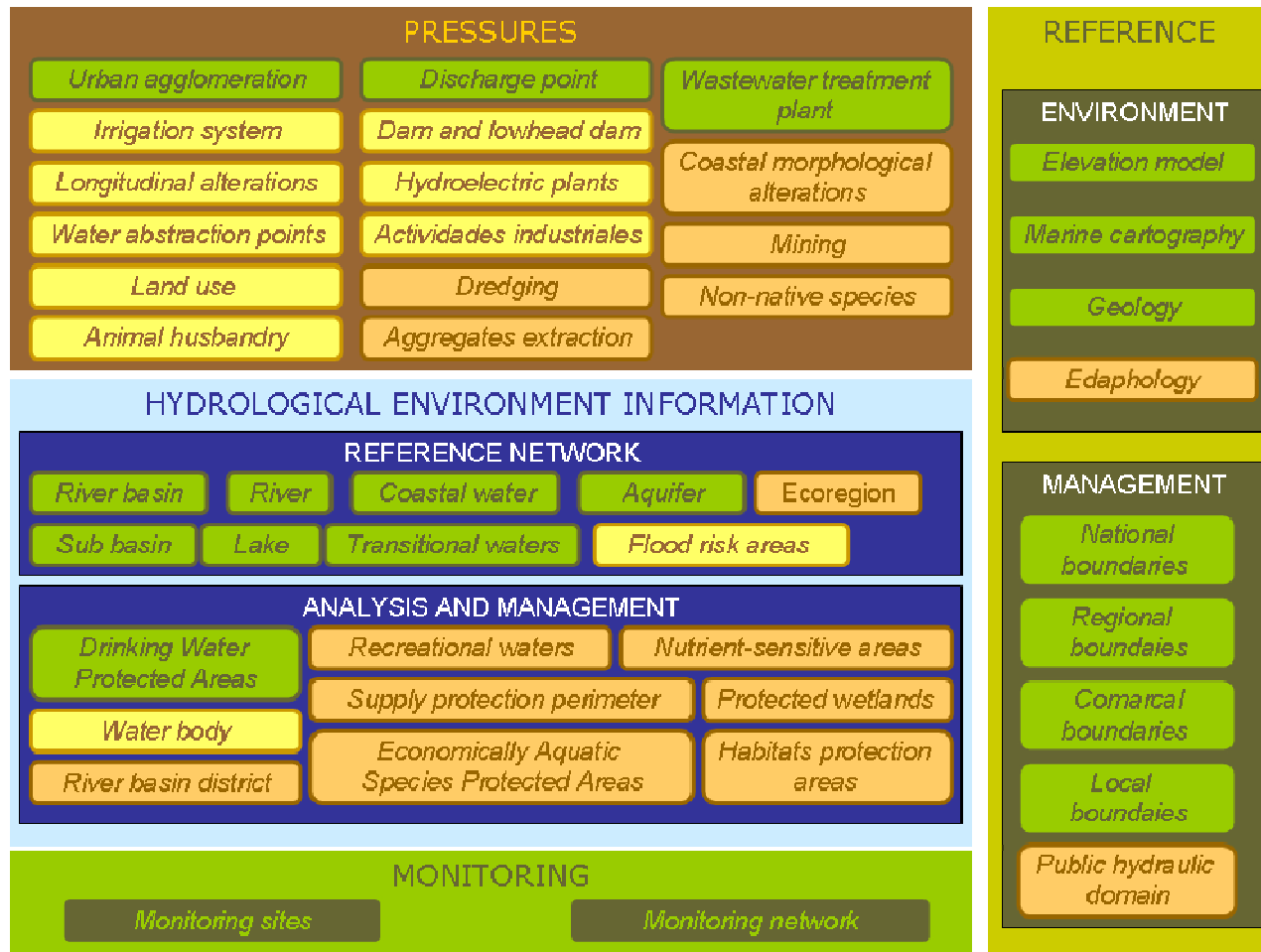- Data set definition: for each feature a detailed definition sheet is proposed including
  - Name
  - Unit name
  - Category
  - Description
  - Levels of resolution
  - Data type
  - Attributes
  - Associated variables to be captured
- In the following versions some reference will be provided for:
  - Coding
  - Symbols
  - Trans-border matching requirements

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Key elements of the proposal

ENTITY	River
UNIT	Environment
CATEGORY	Reference Network
DESCRIPTION	Body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course
RESOLUTION	1:25.000 1:50.000 1:200.000 watershed 10km2 Discharge 100 l/s 75% of the months discharge > 0
DATA TYPE ALPHANUMERIC CARTOGRAPHIC	 x x
ATTRIBUTES GENERAL	 Emwis code Country code Name Country Sub-Type: River State: natual / artificial / very modified Longitude of the centroid Latitude of the centroid Remarks Database insert date
SPECIFIC	Stream max height Stream min height Length of the channel Sloop of the stream Watershed area Annual mean discharge l/s
PARAMETERS	Metric derivative (index, contribution,...) Diagnosis historical series

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