



Role of a metadata catalogue in a Water Information System

**Expert Workshop
on metadata
management &
referential data sets**

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Objective of any information system
=> to produce useful information!..... ;-)





Analysis of the existing situation concerning water data management at Mediterranean level

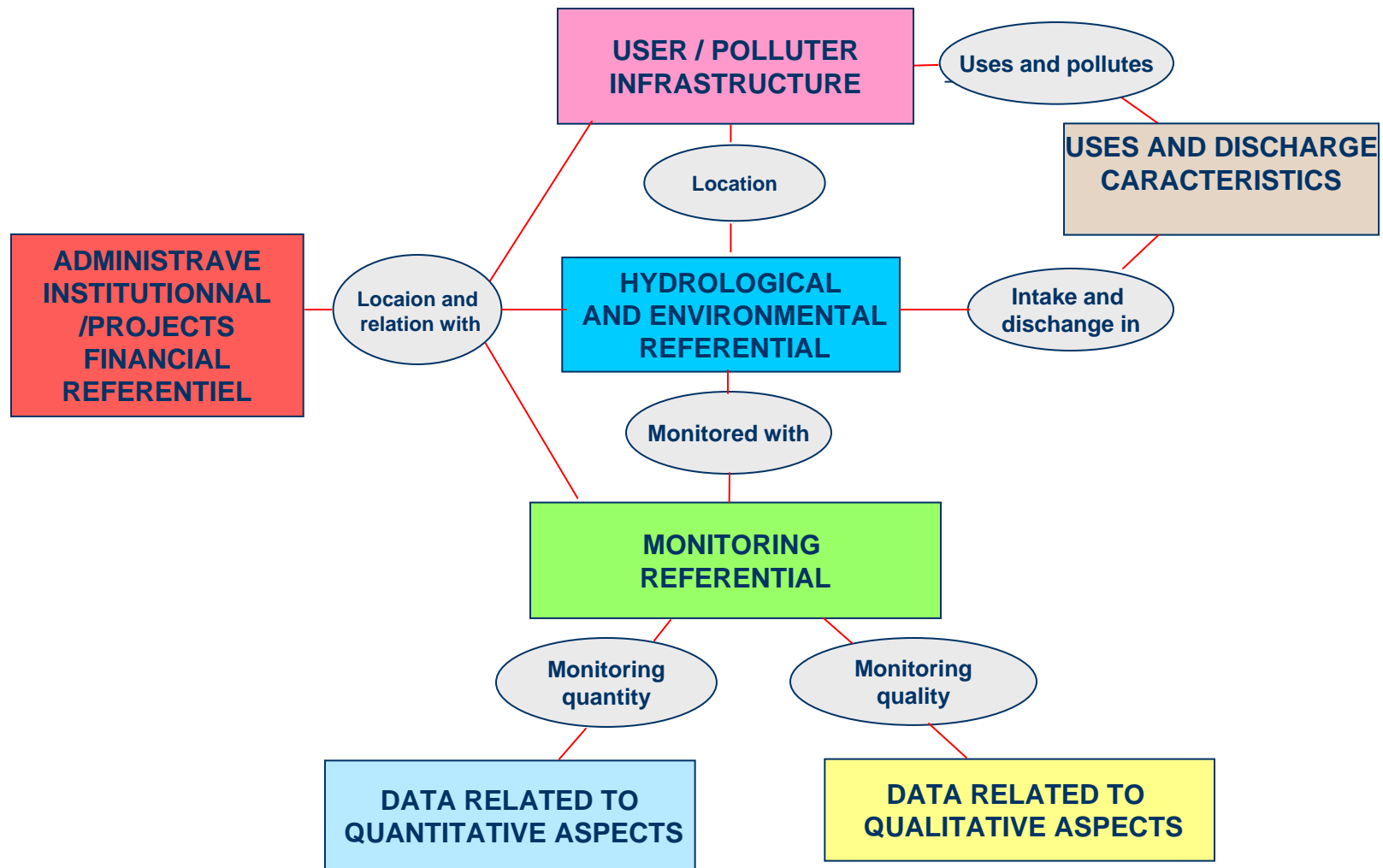


Global context

- Easy access to information on the status and evolution of water resources and uses is one of the keys to a successful water policy.
- Water resource managers need to be able to get hold of reliable, up-to-date and relevant information for issues such as regulations, planning, risk management and informing the public.
- The necessary information exists, either at international or national level, only in a fragmented, incomplete dispersed and heterogeneous way
- Therefore it is necessary to make an effort to rationalize and make this information readable, easily accessible and available.

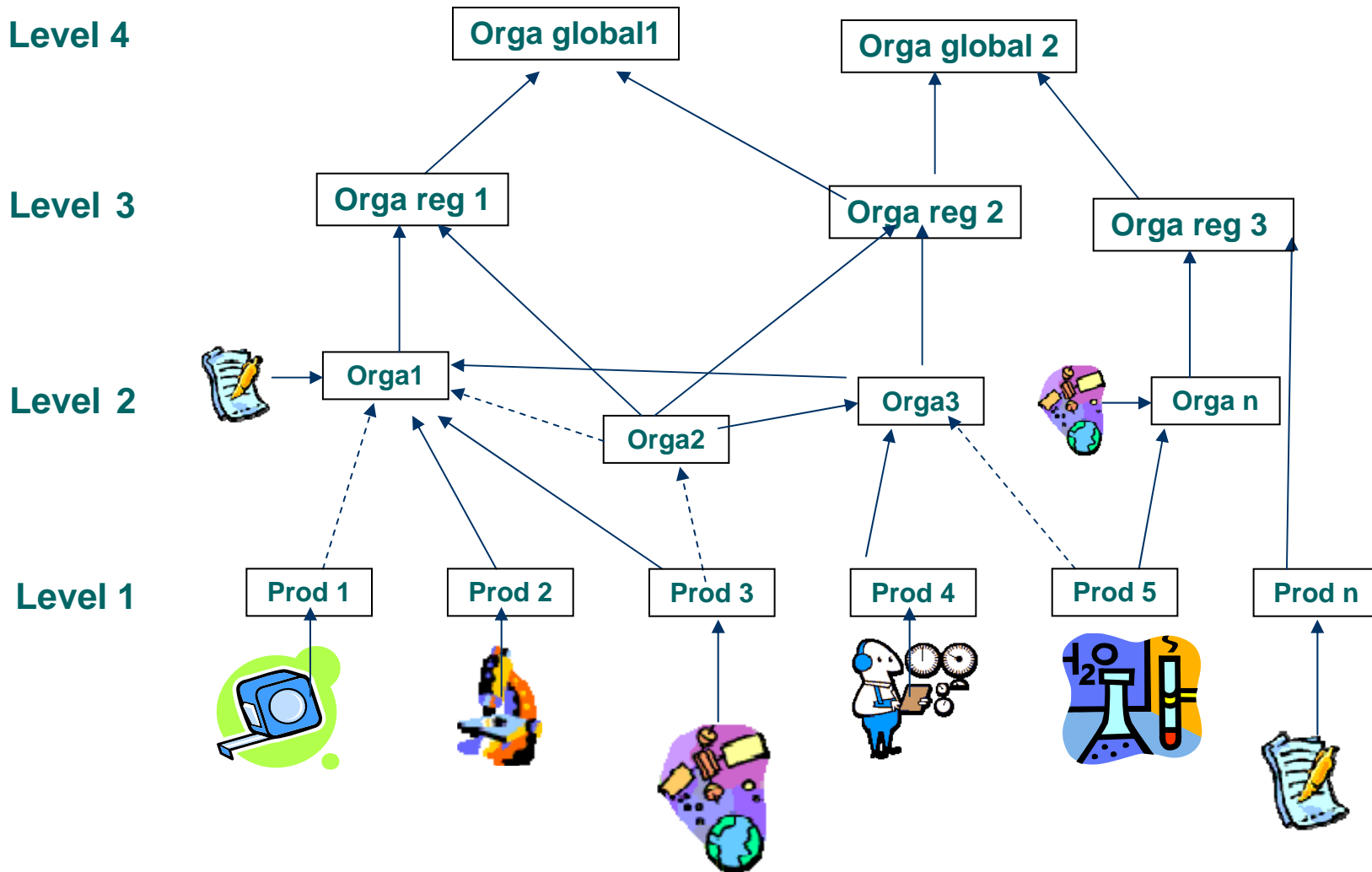


Main data domain to be dealt with for water management



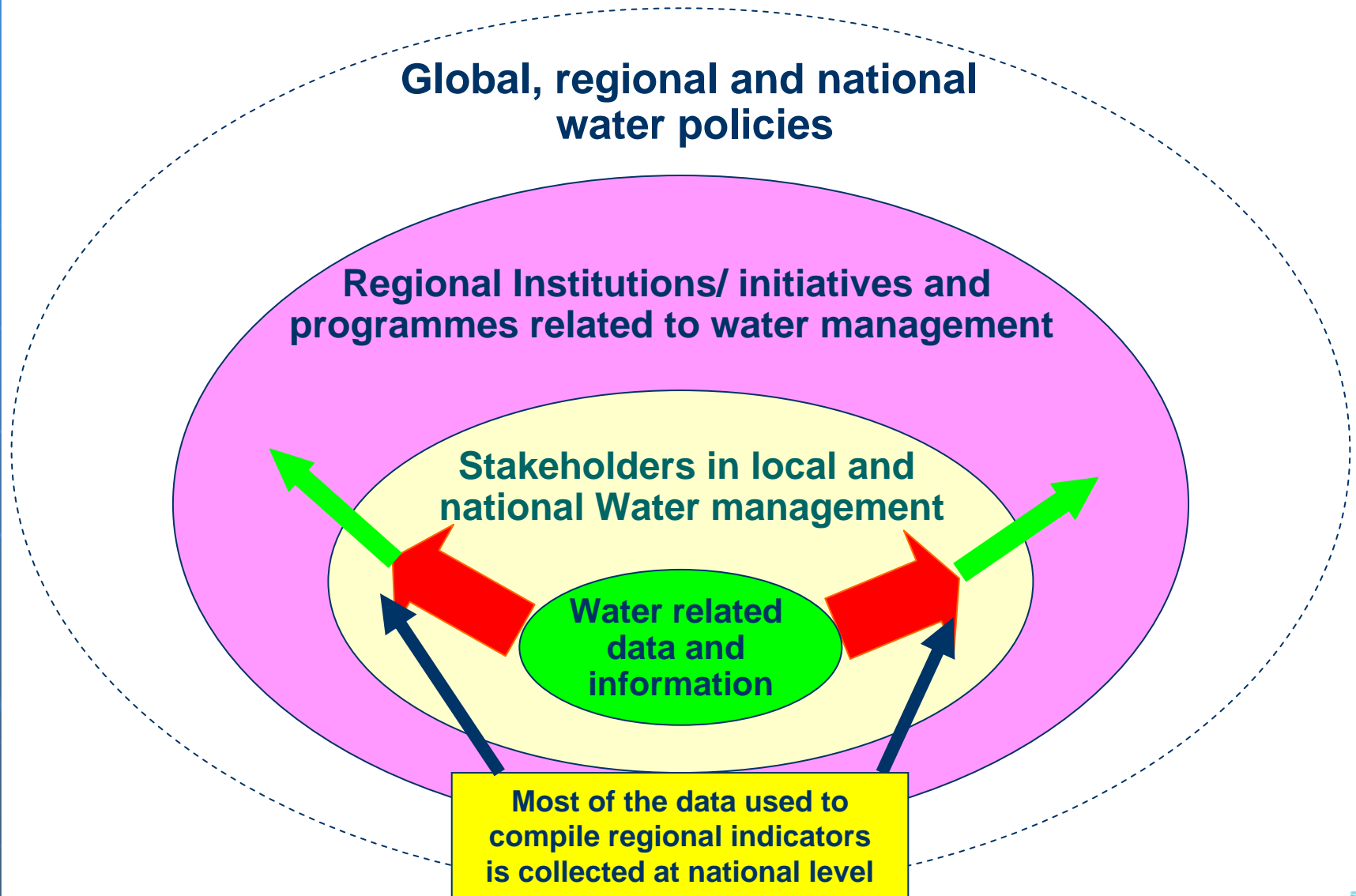


Successive data aggregations phenomena =>lack of traceability = losing quality of information



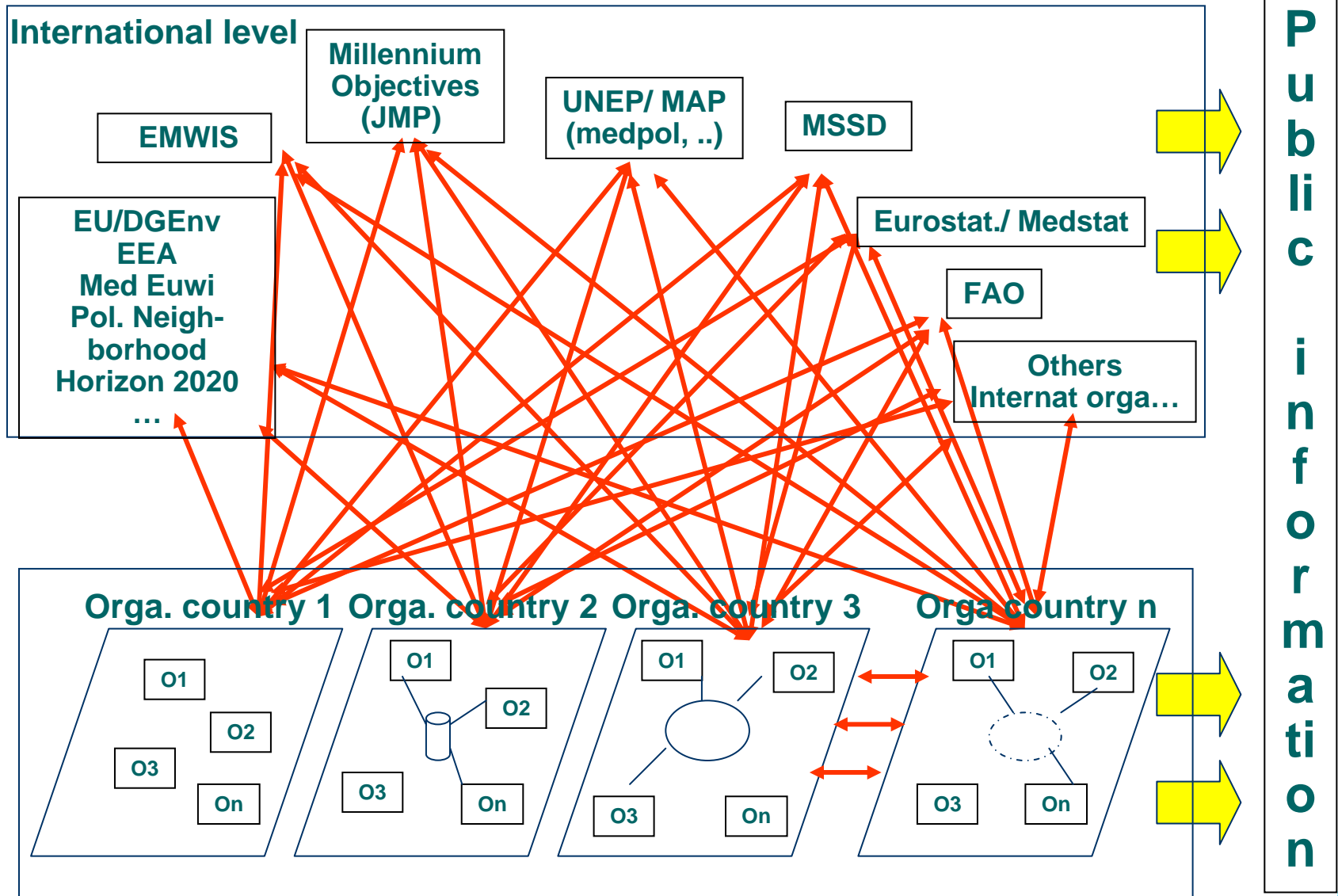


Global context overview at mediteranean level





Global context overview: national/regional interface





Specificities of the national context

- Political framework for water management specific to each country, except for the European and Candidate countries (Water Framework Directive);
- Organisation of the monitoring and data management specific to each country;
- Multiple information systems exist in each country;
- The data are usually heterogeneous, dispersed and not very accessible at the national level, therefore:
 - Little fluidity of exchanges between national institutions
 - Small data enhancement
- Few countries have a national water data management system, but most of them wish, or are in phase to develop their own NWIS (National Water Information System)



Specificities of the regional context

- **Many regional stakeholders** intervening in action plans of the various regional political frameworks:
 - OMD : JMP, EUWI/ MED-EUWI, ...
 - MSSD : MAP unit, Blue Plan, ...
 - MAP : UNEP, MAP unit, Medpol, 6 RAC, ...
 - Pol Europ Water : EU DG Env, Eurostat, EEA, JRC,, ...
 - Pol Med of EU : ENPI, Horizon 2020, EEA, RMSU, ...
 - PEM : EMWIS, Medstat, ...
 - African Vision : AMCOW, ADB/FAE, ...
 - Others: FAO, WWC, GWP med, MEMBO, WWAP, UNSD, GEF, BM, OECD, IME, CEDARE, OSS, EXACT group, IUCN, WWF....

- **Multiple bilateral/multilateral partners**

- **Various information systems:** WISE, Eurowaternet, EIONET, INFO/MAP, EMWIS, JMP database, Monitoring water alliance, AQUASTAT, IBnet, Geonetwork FAO,

- **Various groups** (think tanks) for improving the processes: UN-WATER, DGenv/EEA/JRC on Wise, EEA/UNEP/MAP, ..



Expectations at national level

- **Need for support to the development of the NWISs**
 - Organisation of inter-institutional co-operation
 - Organisation of monitoring
 - Support to the development of a common language
 - Support to the organisation of the access to data
 - Support to data enhancement

- **With specific expectations related to:**
 - **The support to the production of missing information at the regional level**
 - **The promotion of common methods for analyses** at the regional level (in particular method for assessing the resources, uses, socioeconomic impact ,...)
 - The strengthening of **international co-operation between Mediterranean countries**



Problems at regional level

- **Difficulties in identifying and accessing to the data**
- **Difficulties in collecting** data even with established processes
- **Major problems of heterogeneity, completeness and quality of the received data**
 - Problems linked to **the lack of** clear production **processes** and common technical language
 - Problems linked to **the lack of metadata**
 - **Discontinuity in monitoring** over time or geographically
 - **Incomplete or not adapted** data provided



Introduction to metadata concepts



Digital data = abstraction always partial

- Digital data is **an attempt to model and describe the real world** for use in computer analysis and graphic display of information
- Any description of reality is always **an abstraction, always partial, and always just one of many possible "views"**.
- This "view" or model of the real world is **not an exact duplication**; some things are approximated, others are simplified, and some things are ignored. There is seldom perfect, complete, and correct data.
- To ensure that data is not misused, the assumptions and limitations affecting the creation of **data must be fully documented.**



Definition and role of metadata (from iso 19115)

■ Definition

- Metadata= data about data

■ Role

- “Metadata allows a producer to describe a dataset fully so that users can understand the assumptions and limitations and evaluate the dataset's applicability for their intended use.”



Complementary definitions (from norme iso 19115)

- **Dataset:**
 - *identifiable collection of data*

- **dataset series:**
 - *collection of datasets sharing the same product specification*

- **metadata element**
 - *discrete unit of metadata*

- **metadata entity**
 - *set of metadata elements describing the same aspect of data*

- **metadata section**
 - *subset of metadata which consists of a collection of related metadata entities and metadata elements*

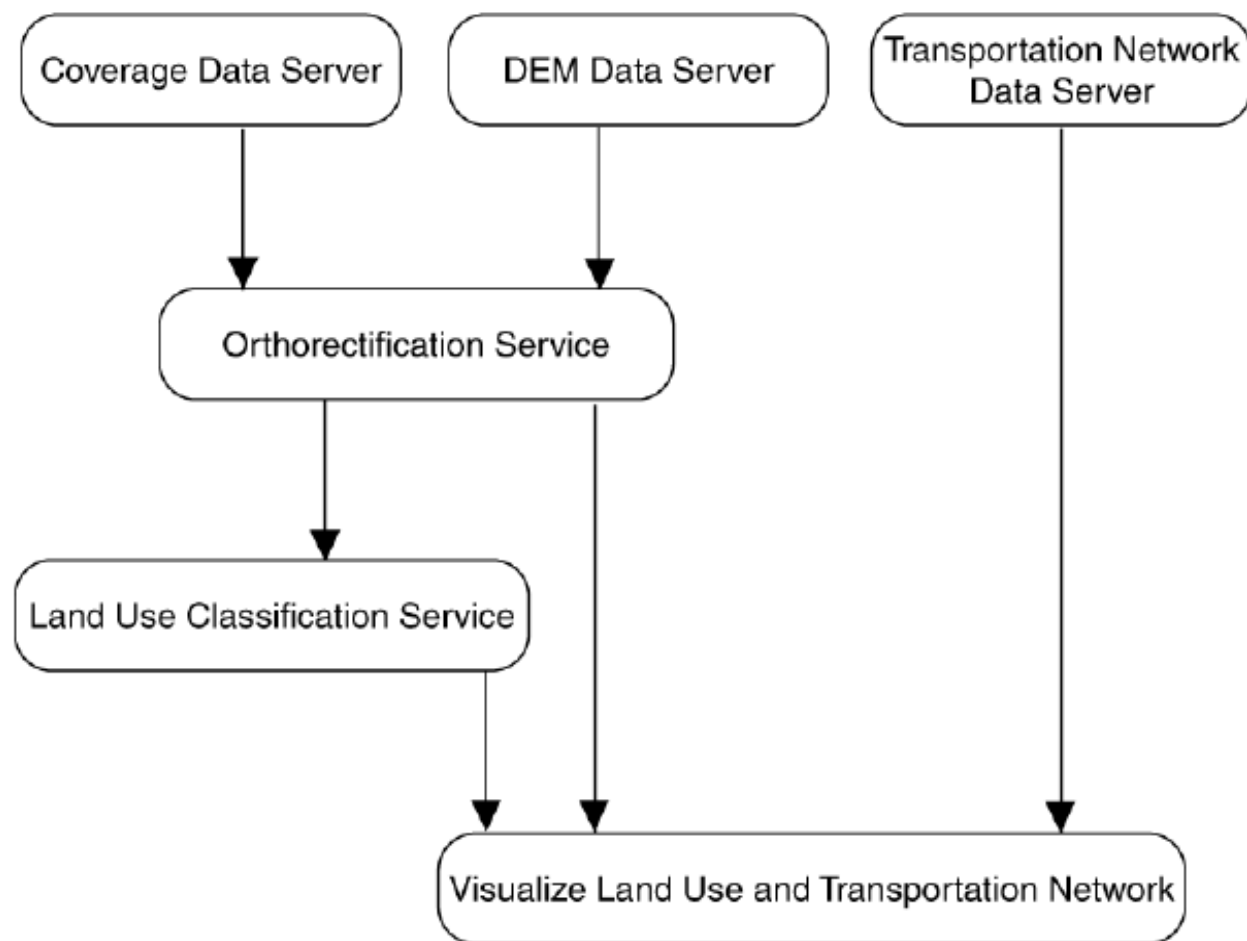


ISO 19115

- Defines **metadata elements**,
- Provides a **schema** required for describing geographic information and services about the identification, the extent, the quality, the spatial and temporal schema, spatial reference, and distribution of digital geographic data.
- Establishes a **common set of metadata terminology**, definitions, and extension procedures.
- “Though this International Standard is applicable to digital data, its **principles can be extended to many other forms of geographic data such as maps, charts, and textual documents as well as non-geographic data.**”
- **More detailed metadata for geographic datatypes and geographic services are defined in other ISO 19100 series standards and user extensions**



Interoperability of services – ISO 19119





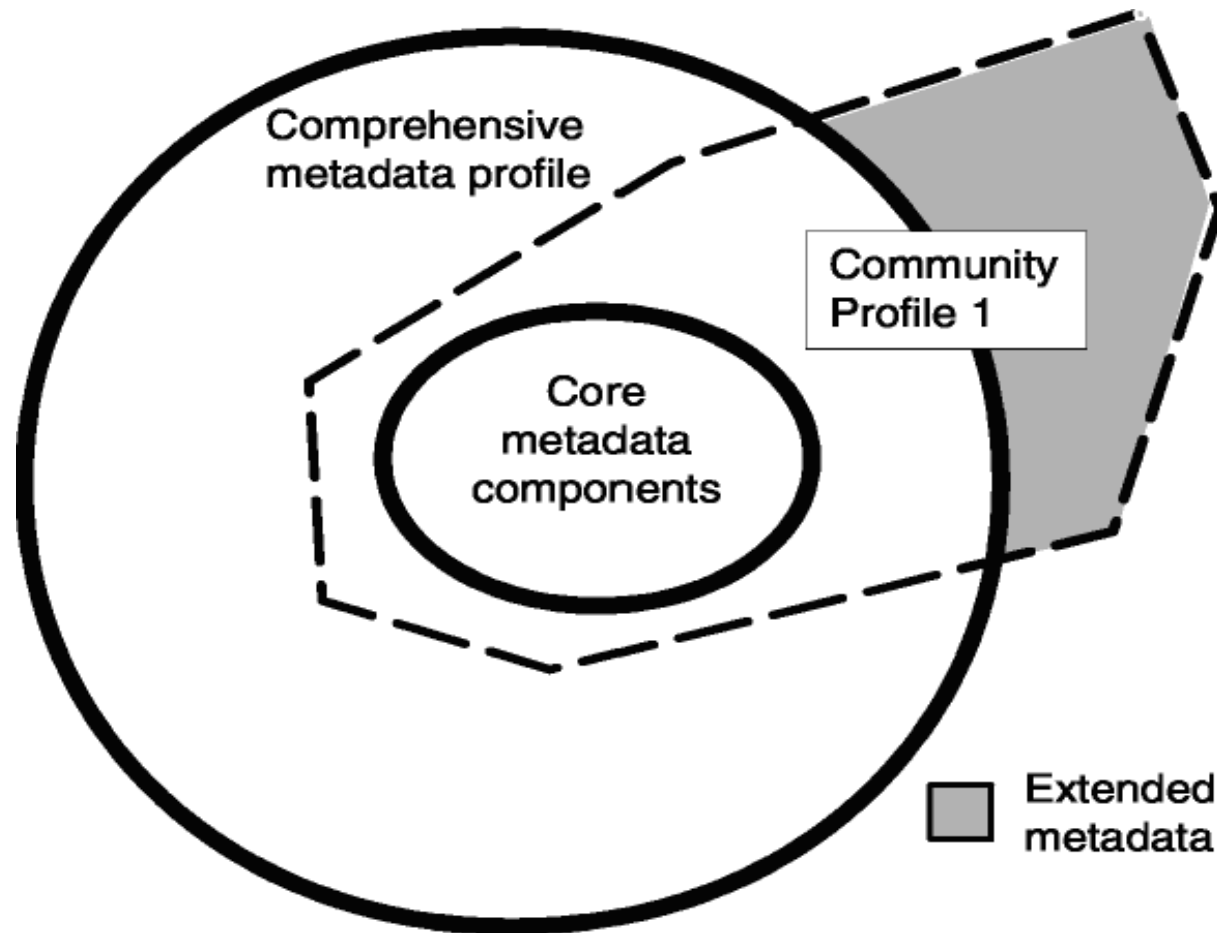
About ISO 19115

- Defines metadata elements, provides a schema and establishes a common set of metadata terminology, definitions, and extension procedures.

- When implemented by a data producer,
 - Provide data producers with appropriate information to characterize their geographic data properly.
 - Facilitate the organization and management of metadata for geographic data.
 - Enable users to apply geographic data in the most efficient way by knowing its basic characteristics.
 - Facilitate data discovery, retrieval and reuse. Users will be better able to locate, access, evaluate, purchase and utilize geographic data.
 - Enable users to determine whether geographic data in a holding will be of use to them.



Introduction to metadata profile profil (norme 19115)





Packages de la normes ISO 19115

- More than 300 metadata element presented in UML Packages

Metadata entity set information
Identification information
Constraint information
Data quality information
Maintenance information
Spatial representation information
Reference system information
Content information
Portrayal catalogue information
Distribution information
Metadata extension information
Application schema information
Extent information
Citation and responsible party information

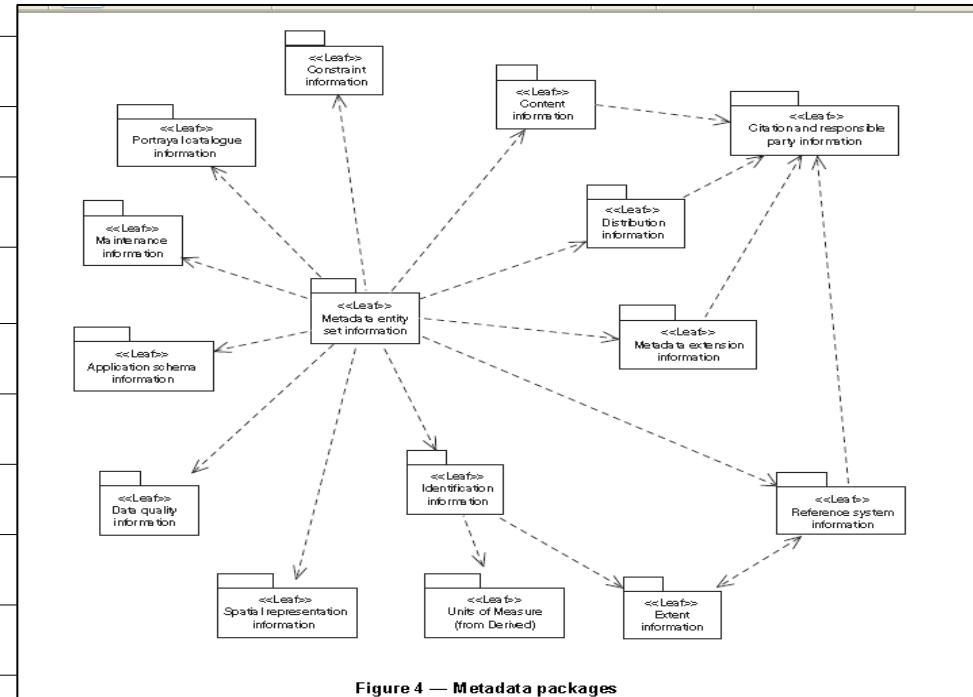


Figure 4 — Metadata packages



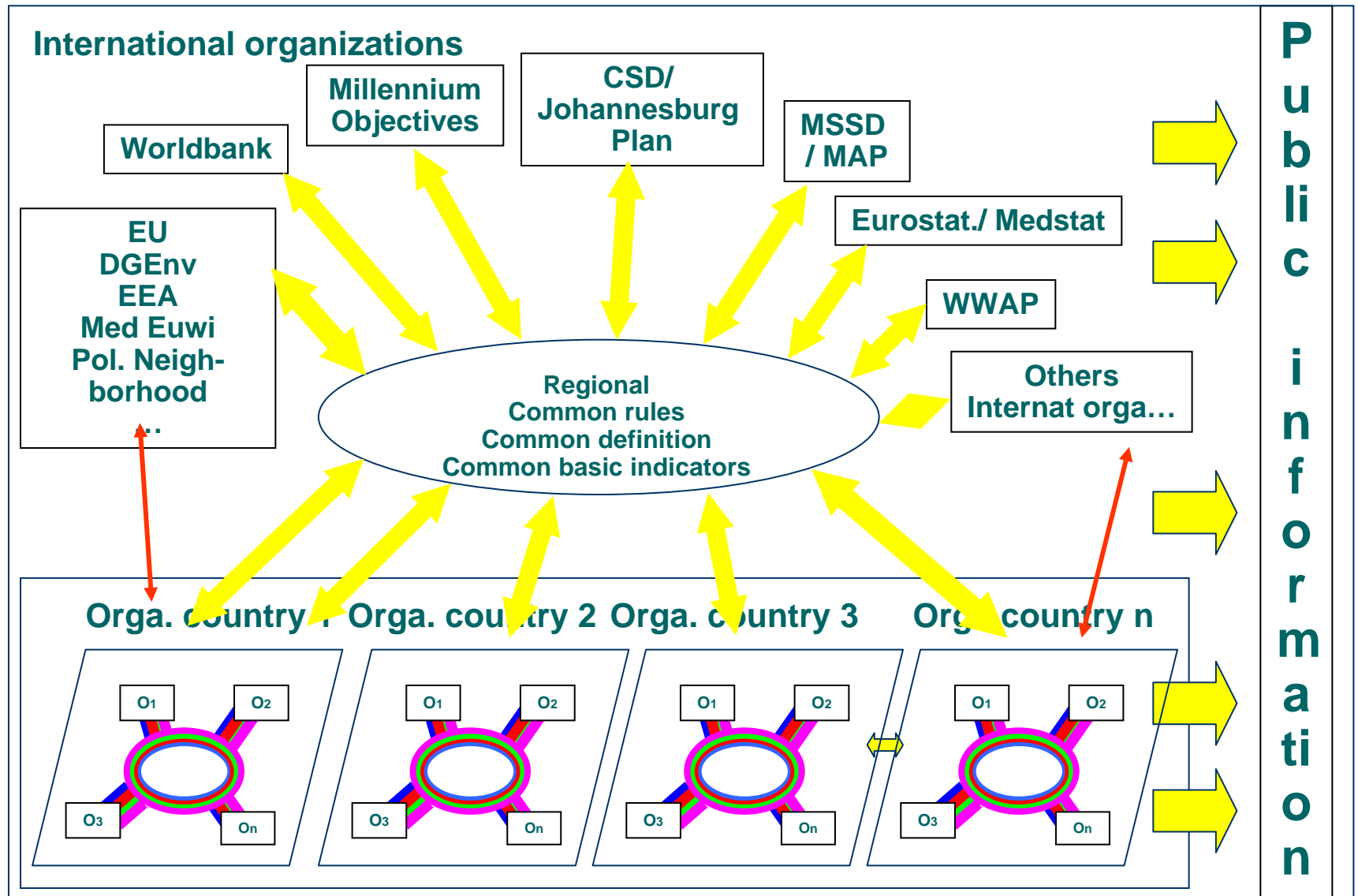
Some metadata elements among the most important

- Dataset title (M)
- Dataset reference date (M)
- Geographic location of the dataset (by four coordinates or by geographic identifier) (C)
- On-line resource (O)
- Dataset language (M)
- Dataset topic category (M)
- Metadata language (C)
- Abstract describing the dataset (M)
- Metadata character set (C)
- Distribution format (O)
- Metadata point of contact (M)
- Metadata date stamp (M)



Expected results of metadata development in mediterranean countries

Potential outputs at regional level: Contributing to regional rules definition and dissemination





Organising data exchanges at national level

Initial data provider

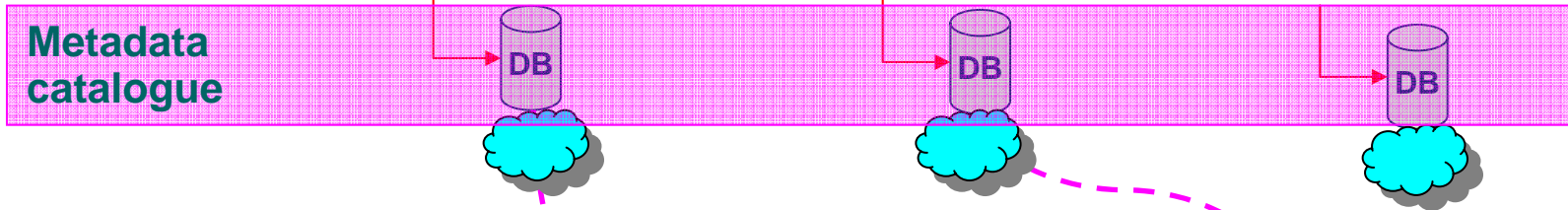


Prod 1

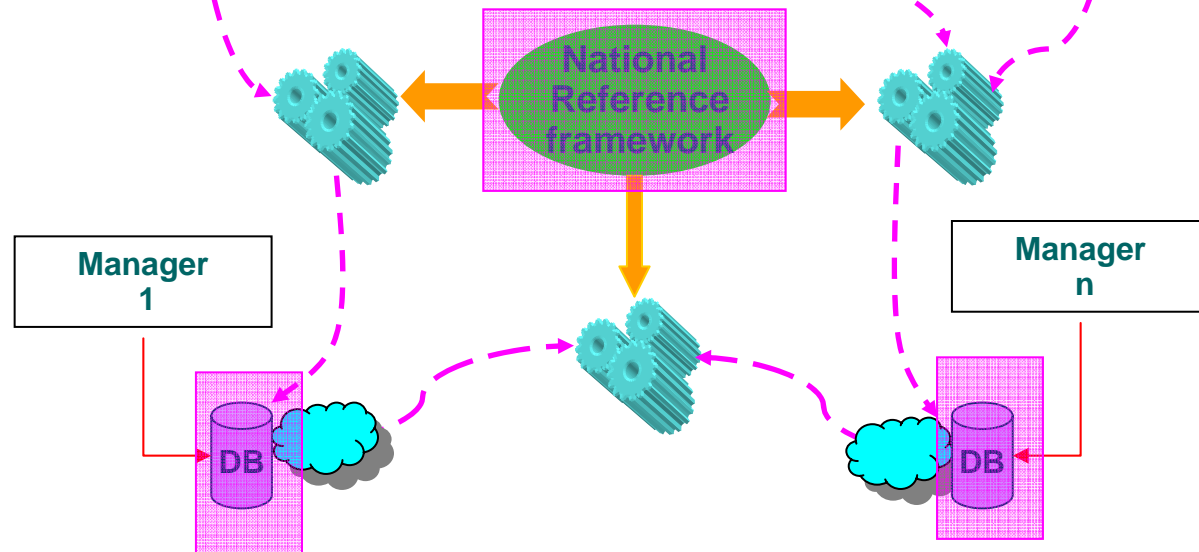
Prod 2

Prod n

Metadata catalogue

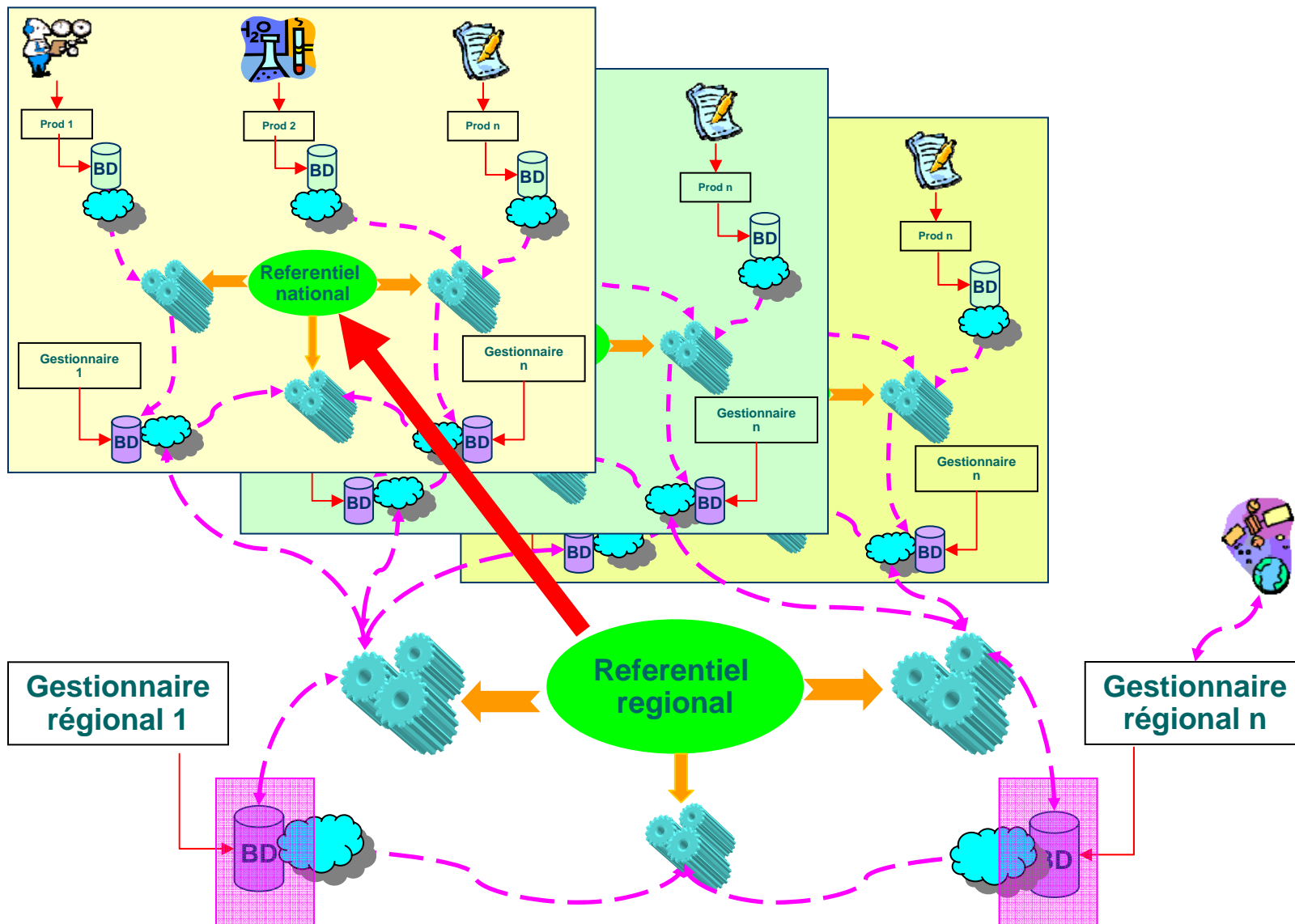


Aggregation /exploitation e.g. national, basin, administrative unit level





Example of exchange scenario at regional level





Expected benefits from metadata catalogue

- More efficient water management thanks to:
 - Tools and network of services allowing:
 - Existing data identification on specific topics and/or geographic areas (ex: on a specific transboundary basin)
 - Consultation and downloading of data made available (following access right given by the producers)
 - Metadata management of regional and national data sources
 - Inventory of actors and existing aggregated indicators produced by various national and regional indicators
 - Access to more homogeneous and controlled quality data



Thank you for your attention

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