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## **Pilot Arno Water Accounts**



**Deliverable:** D1.1 Catalogue of data sources and tools

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## 1 Introduction

In order to make the inventory of all relevant datasets available to compile water accounts, the partners proposed to set up an INSPIRE compliant metadata catalogue. In the project proposal, EMWIS was planned to set up such catalogue, but in the meantime ARBA set-up its own catalogue in the framework of the development of a common territorial data infrastructure with an open data approach. Therefore, it was decided to register all the description of data sources in the ARBA catalogue and to harvest the metadata into a Mediterranean metadata catalogue maintained by EMWIS. These two catalogues represent together the project deliverable planned by the end of the “Activity 1 – Setting the scene”. A synthetic description of two catalogues’ content is provided here.

The type of data sources of interest have been defined during inception workshop and training held in Florence on 20–21 March 2014 (see <http://www.emwis.net/initiatives/pawa/meetings/Inception>). A table listing the type of datasets necessary for the water accounts and the criteria that will be used for analysis is provided in annex.

The approach proposed for the data analysis is as follow:

- Description of data sources available in the metadata catalogue;
- Review of data source availability for each individual item necessary for the water account based on the table “Inventory and analysis of data sources”;
- Review of data quality in terms of temporal and geographical resolution, time extent, accessibility and accuracy.

Based on the results of this analysis, it might be decided to look for additional data sources or for outputs of modelling/simulation.

## 2 Metadata

A metadata catalogue is a tool to declare and search for sources of data. The EU INSPIRE Directive 2007/2/EC<sup>1</sup> requires metadata (i.e., data about data) to be defined for all spatial data managed by public authorities. The format of the metadata has been standardised by ISO under ISO19115/119 and described as an XML schema under ISO19139. The implementation rules of the INSPIRE Directive have defined a specific profile of ISO19139.

ARBA and EMWIS both decided to use the open-source software solution GeoNetwork to implement their metadata catalogues. Indeed, GeoNetwork supports both ISO19139 and INSPIRE profile.

The catalogue provides three main features:

- *DISCOVERY* – search and access information on data sources. Access might be limited by the data provider, but a minimum set of information describing the source of data is always available as well as a contact point;

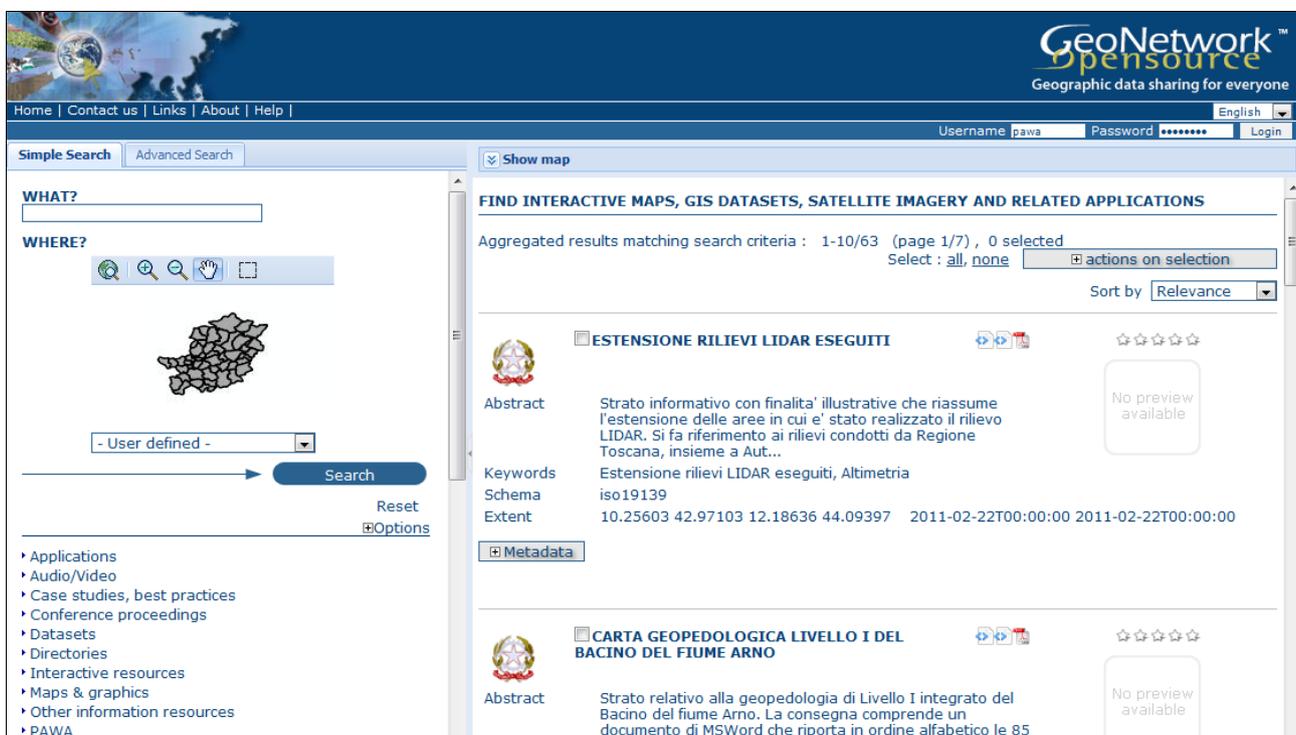
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<sup>1</sup> [Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community.](#)

- *REGISTRY* – declare data sources using standardised metadata with an interactive online editor. A source of information can be data sets (spatial or numerical data), data services, publications containing data (including reports, website), maps, satellites images, etc. The dataset can be provided as web links, FTP links, direct upload or as web services (such as, Web Map Service or Web Feature Services);
- *VIEW* – Display datasets on an interactive map;
- *DOWNLOAD* – download of a dataset for local use.

View, download data and access to data services are subject to the level of access defined by the data providers.

The ARBA catalogue (<http://dati.adbarno.it/geonetwork>) is available with an interface in Italian, English and French. Some 63 description of data sources are available from the public interface (**Figure 1**).



**Figure 1 – Public interface of ARBA metadata catalogue.**

A specific user group and a category have been created for the project in order to register the description of relevant data sources for the PAWA project. More than 100 metadata records have been entered in English to describe datasets of interest for the water accounting. More will be added as the project will be further developed (**Figure 2**).

Access to these metadata is password protected, as it will also provide full access to the datasets and open access policy has not yet been defined with the local stakeholders.

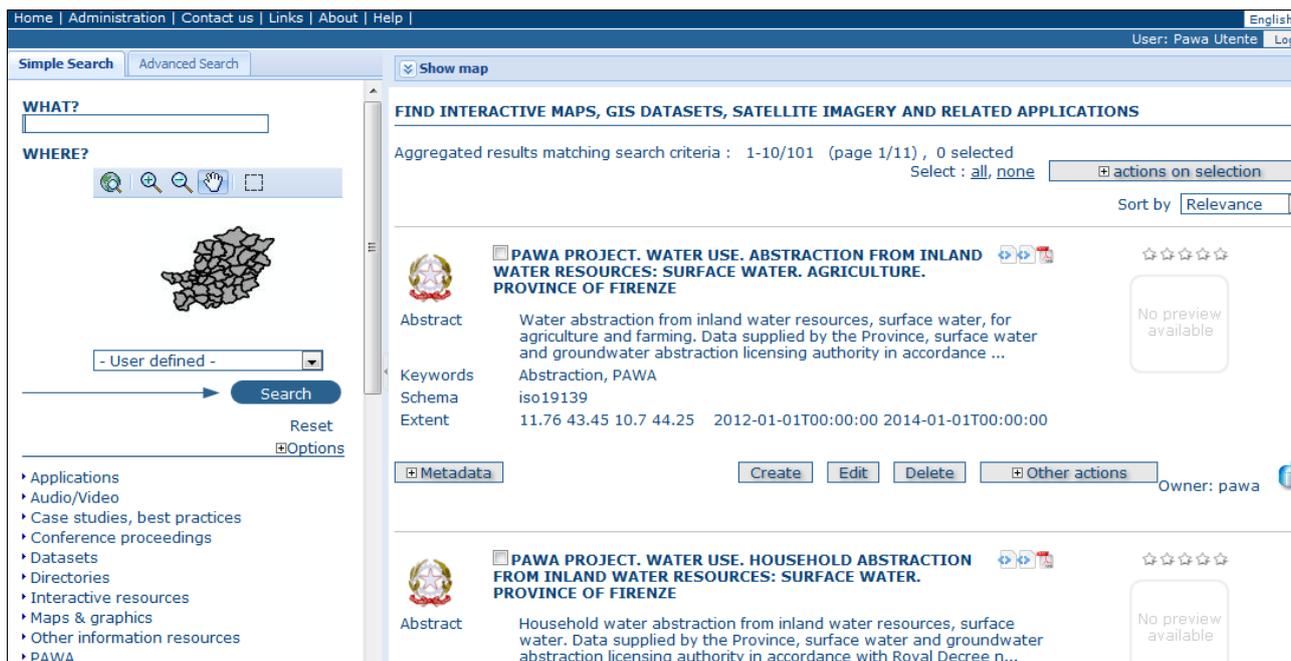


Figure 2 – List of metadata entry for water accounting (more than 100).

A harvesting process has been set up within the Mediterranean Water information catalogue of data sources (<http://geo.semide.net/geonetwork>; see Figure 3) to collect the metadata from ARBA catalogue using a standardised Catalogue Web Service.



Figure 3 – Mediterranean metadata catalogue with records harvested from Arno.

## Annex Data inventory

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)	
Water use table (A TableIII.3)	Water use	<u>Abstraction from inland water resources:</u> <b>surface water</b> (Specify which purpose: distribution or own use)	Agriculture, farming						
			Electricity						
			Water collection, purification and supply						
			Sewerage, waste collection, treatment, disposal and remediation activities						
			Other services						
		<u>Abstraction from inland water resources:</u> <b>groundwater</b> (Specify which purpose: distribution or own use)	Agriculture, farming						
			Electricity						
			Water collection, purification and supply						
			Sewerage, waste collection, treatment, disposal and						

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)		
			remediation activities							
			Other services							
		Abstraction from inland water resources: <b>soil water</b> (Specify which purpose: distribution or own use)	Agriculture, farming							
			Electricity							
			Water collection, purification and supply							
			Sewerage, waste collection, treatment, disposal and remediation activities							
			Other services							
		Water urse	Abstraction from <b>precipitation</b> (Specify which purpose: distribution or own use)	Agriculture, farming						
				Electricity						
				Water collection, purification and supply						

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)		
		Sewerage, waste collection, treatment, disposal and remediation activities								
			Other services							
		<u>Abstraction from the sea</u> (Specify which purpose: distribution or own use)	Agriculture, farming							
			Electricity							
			Water collection, purification and supply							
			Sewerage, waste collection, treatment, disposal and remediation activities							
			Other services							
		Water use	Households <u>abstraction from inland water resources</u> (Specify which purpose: distribution or own use)	Surface water						
				Groundwater						
				Soil water						

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
	Water use	Households <u>abstraction</u> from <b>precipitation</b> (Specify which purpose: distribution or own use)						
	Water use	Household <u>abstraction</u> from the <b>sea</b> (Specify which purpose: distribution or own use)						
	Water use	Household water received from <b>other units</b>	Reused water					
			Desalinated water					
	Water use	Water exports	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other service					
	Water supply table	Water supply	Industry, service returns water as	Agriculture, farming				

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
(BTableIII.3)		<b>reused water</b>	Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other services					
	Water supply	Industry, service returns water as <b>desalinated water</b>	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other services					
	Water supply	Industry, service	Agriculture,					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)	
		returns water as <b>wastewater to sewerage</b>	farming						
			Electricity						
			Water collection, purification and supply						
			Sewerage, waste collection, treatment, disposal and remediation activities						
			Other service						
	Water supply	Industry, service returns water to inland water resources: <b>surface water</b>	Agriculture, farming						
			Electricity						
			Water collection, purification and supply						
			Sewerage, waste collection, treatment, disposal and remediation activities						

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)	
		Industry, service returns water to inland water resources: <b>groundwater</b>	Other service						
			Agriculture, farming						
			Electricity						
			Water collection, purification and supply						
			Sewerage, waste collection, treatment, disposal and remediation activities						
			Other service						
			Industry, service returns water to inland water resources: <b>soil water</b>	Agriculture, farming					
				Electricity					
				Water collection, purification and supply					
				Sewerage, waste collection, treatment, disposal and remediation					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
			activities					
			Other service					
		Industry, service returns water to <b>other sources</b>	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other service					
	Water supply	<u>Households</u> returns water as <b>wastewater to sewerage</b>						
	Water supply	<u>Households</u> returns to <b>inland water resources</b>	Surface water					
			Groundwater					
			Soil water					
	Water supply	<u>Households</u> returns to <b>other sources</b>						
	Water supply	<u>Water imports</u>	Agriculture,					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
		(water supply/discharged for the rest of the world to)	farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other service					
Loses in distribution (Table III.5)	Hydrological loses (Specify type of industry and service)	Water supply to industry, service						
	Hydrological loses (Specify type of industry and service)	Leakages						
	Hydrological loses (Specify type of industry and service)	Other: evaporation, wrong metering						
Gross and net emission (A.	Pollutant chemical oxygen demand (Specify	Discharge to sewerage						

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
Table IV.2)	type of industry and service)							
	Pollutant chemical oxygen demand (Specify type of industry and service)	Emissions into water, After/without treatment into: water resources or into the sea.						
Gross and net emission (B. Table IV.2)	Pollutant chemical oxygen demand	Emissions into water after treatment into water resources or into the sea from sewerage systems.						
	Pollutant chemical oxygen demand	Emissions into water without treatment into water resources or into the sea from sewerage systems.						
Hybrid supply (Table V.1)  [Origin of products]	Monetary/  Economic	Cost of water-related products as (using <u>natural water</u> (collection, treatment and supply) supplied by industry, service.  <u>Reused water too.</u>	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other service					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)	
	Monetary/ Economic	Cost of water-related products as (using <u>sewerage services</u> (sewage treatment and septic tank cleaning services) supplied by industry, service	Agriculture, farming						
			Electricity						
			Water collection, purification and supply						
			Sewerage, waste collection, treatment, disposal and remediation activities						
			Other service						
	Monetary/ Economic	Imports supplies products as natural water or sewerage services	Agriculture, farming						
			Electricity						
			Water collection, purification and supply						
Sewerage, waste collection, treatment, disposal and remediation activities									

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
			Other service					
	Monetary/ Economic	Taxes on supplied products	Natural water					
			Sewerage service					
	Monetary/ Economic	Subsides on supplied products	Natural water					
			Sewerage service					
	Monetary/ Economic	Trade and transport margins (the delivery at required time and place)	Natural water					
			Sewerage service					
	Hybrid use (Table V.2)  [destination of products]	Monetary use	Industry, service total (intermediate) consumption and use of natural water costs.	Agriculture, farming				
Electricity								
Water collection, purification and supply								
Sewerage, waste collection, treatment, disposal and remediation activities								
Other service								

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
	Monetary/ Economic	Domestic final consumption expenditures cost.	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other service					
	Monetary/ Economic	Final consumption domestic social transfers from Government and non-profit institutions serving households costs.	Natural water					
			Sewerage services					
	Monetary/	Government final consumption (Ex. administrative	Natural water					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
	Economic	services of water control and water quality monitoring) cost.	Sewerage services					
	Monetary/ Economic	Capital formation (the total of <u>gross fixed capital formation</u> and changes in inventories and acquisitions less the disposal of values)	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment, disposal and remediation activities					
			Other service					
	Monetary/ Economic	<u>Exports</u> (sale of products from residents to non-residents)	Agriculture, farming					
			Electricity					
			Water collection, purification and supply					
			Sewerage, waste collection, treatment,					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
			disposal and remediation activities					
			Other service					
Water Asset Accounts	Hydrologic	From/To artificial reservoir:	Returns					
			Precipitation					
			Inflows from upstream territories					
			Inflow from other resources					
			Abstraction					
			Evaporation					
			Outflow to downstream territories					
			Outflow to the sea					
			Outflow to other resources in the territory					
			Other changes in volume					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
	Hydrologic	From/to lakes :	Returns					
			Precipitation					
			Inflows upstream territories					
			Inflow from other resources					
			Abstraction					
			Evaporation					
			Outflow to downstream territories					
			Outflow to the sea					
			Outflow to other resources in the territory					
			Other changes in volume					
	Hydrologic	From/to rivers:	Returns					
			Precipitation					
			Inflows from upstream					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)	
			territories						
			Inflow from other resources						
			Abstraction						
			Evaporation						
			Outflow to downstream territories						
			Outflow to the sea						
			Outflow to other resources in the territory						
			Other changes in volume						
	Hydrologic	From/To groundwater:	Returns						
			Precipitation						
			Inflows from upstream territories						
			From other resources						

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
			Abstraction					
			Evaporation					
			Outflow to downstream territories					
			Outflow to the sea					
			Outflow to other resources in the territory					
			Other changes in volume					
	Hydrologic	From/To soil water	Returns					
			Precipitation					
			Inflows from upstream territories					
			From other resources					
			Abstraction					
			Evaporation					
			Outflow to downstream					

SEEA-W 2012	Type	Parameter	Data source	Location (web-site)	Temporal scale (monthly)	Temporal extend	Physical scale	Comments (Ex. Modelled data or real data , access rights)
		territories						
		Outflow to the sea						
		Outflow to other resources in the territory						
		Other changes in volume						

	Type	Parameter	Data source	Location (web-site)	Temporal scale	Temporal extend	Physical scale	Comments Ex. Modelled data or real data )
Hybrid and Economic Accounts	Monetary	Cost associated with the production of the water-related products						
	Monetary	Income associated with the production						

		of the water-related products						
	Monetary	The investment in water-related infrastructures						
	Monetary	The fees paid by users						
	Monetary	The subsidies paid for users						