



# ESPAS

near earth space data infrastructure for e-science

## The ESPAS e-infrastructure: Access to data from the near-Earth space

Anna Belehaki and the ESPAS Consortium  
<http://www.espas-fp7.eu>



**11TH EUROPEAN SPACE WEATHER WEEK**

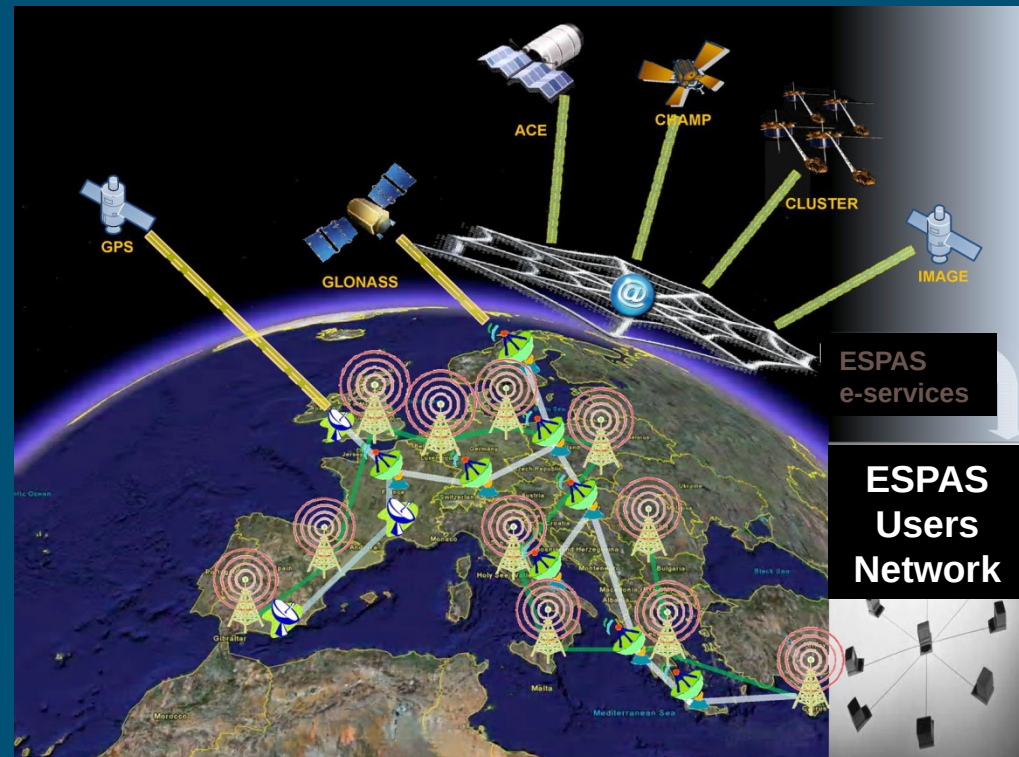
NOVEMBER 17-21 2014, LIEGE, BELGIUM

LIEGE



# ESPAS Goals

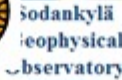
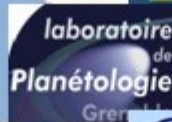
- **Integrated access to heterogeneous data** on conditions in near-Earth space: ionised & neutral upper atmosphere, magnetosphere, ...
- Encourage more systematic **exploration of multi-point measurements** in this region - homogeneous interfaces to diverse data
- **Support for modelling:**
  - New models that advance our understanding
  - Validation
  - Data assimilation
- **Extensible** to new datasets
- Link wider **global community**





# Consortium overview

22 providers, representing 40+ Open Access repositories across Europe, span a wide range of expertise that is critical to ESPAS aims



Third party "partners" bring in more data

LDI provides critical expertise, access to UML resources, excellent links with European partners



# Homogenised searches across repositories

## Why?

- Rich set of observational techniques => diversity
- In-situ and remote sensing, moving platforms (spacecraft, rotating Earth, ...), global/regional products
- Diversity of terminology arising from range of communities and their history (developed since IGY in 1957)
- **Scientific progress requires combination of diverse datasets!**



# Underpinning concepts

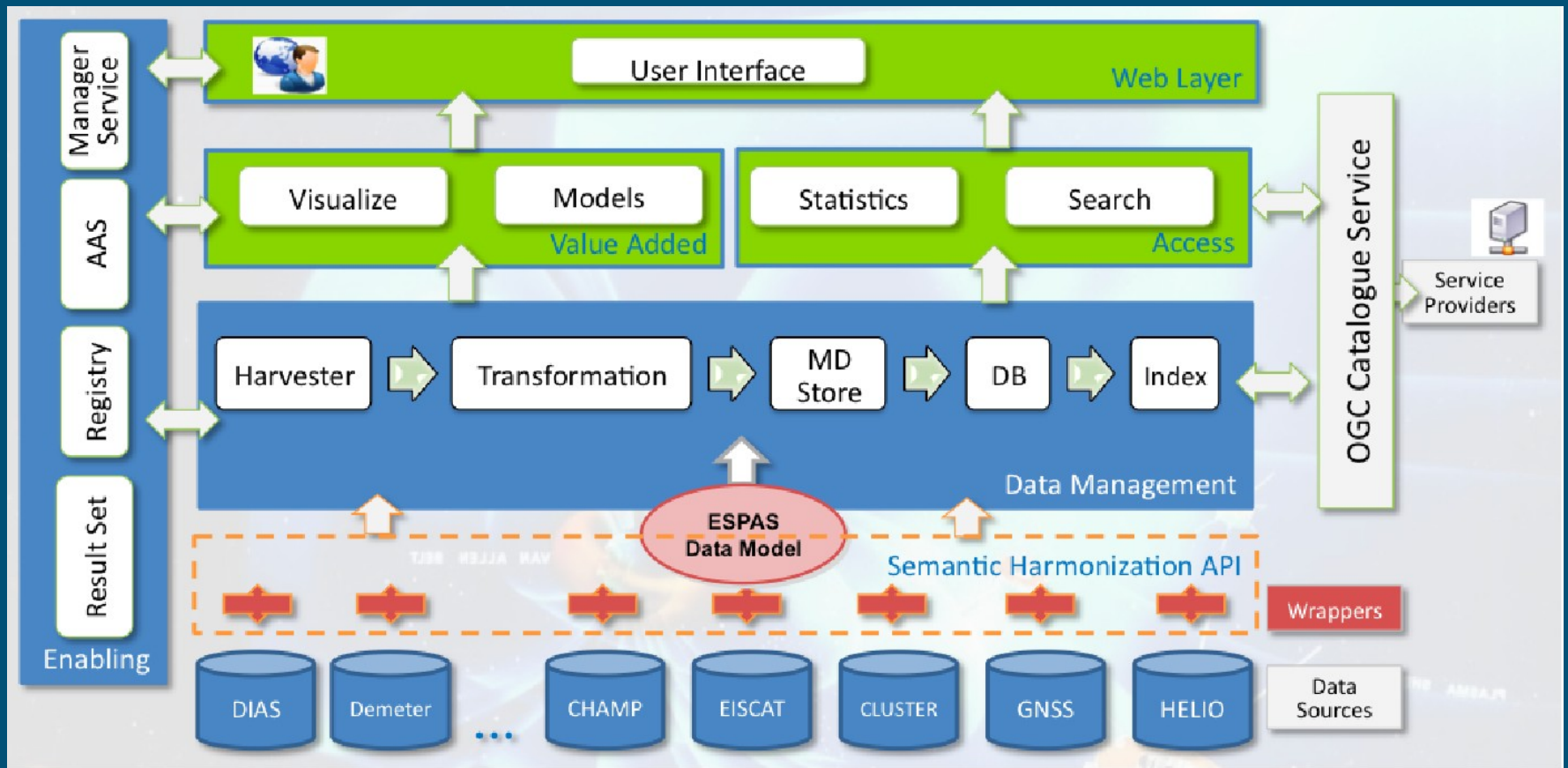
 To facilitate homogenised searches, ESPAS is:

- Developing comprehensive & flexible **data model**
- Supported by wide discussion on ontologies, vocabularies
- Developing standards for **metadata** in this domain
- *Helping scientists to help users produce metadata!*
- Ensuring system will be **expandable**

The screenshot displays the ESPAS web interface. At the top, there is a navigation bar with the ESPAS logo and links for Home, Data Search, Data Providers, Data Registration, and Logout. Below the navigation bar, the main content area is titled 'Edit/Delete the existing Individual entry'. On the left side, there is a tree view for 'Choose to edit/delete an existing entry' with categories like Individuals, Organisations, Platforms, Projects, Instruments, Operations, Computations, Acquisitions, and Composite Processes. The main form area contains several sections: 'Identifier' with fields for LocalID, Namespace, Version, Creation Date, and Last Modification Date; 'Name' with a text field containing 'Anne Sefehli'; 'Position Name' with a text field containing 'Research Director'; 'Organisation' with a dropdown menu set to 'National Observatory of Athens'; and 'Contact Info' with a 'Contact' section containing fields for Address First Line, Address Second Line, City, Administrative Area, Postal Code, Country, E-mail, Telephone, Fax, Online Resource, Hours of Service, and Contact Instructions. At the bottom right of the form, there are buttons for 'Save Changes', 'Cancel', and 'Delete'.

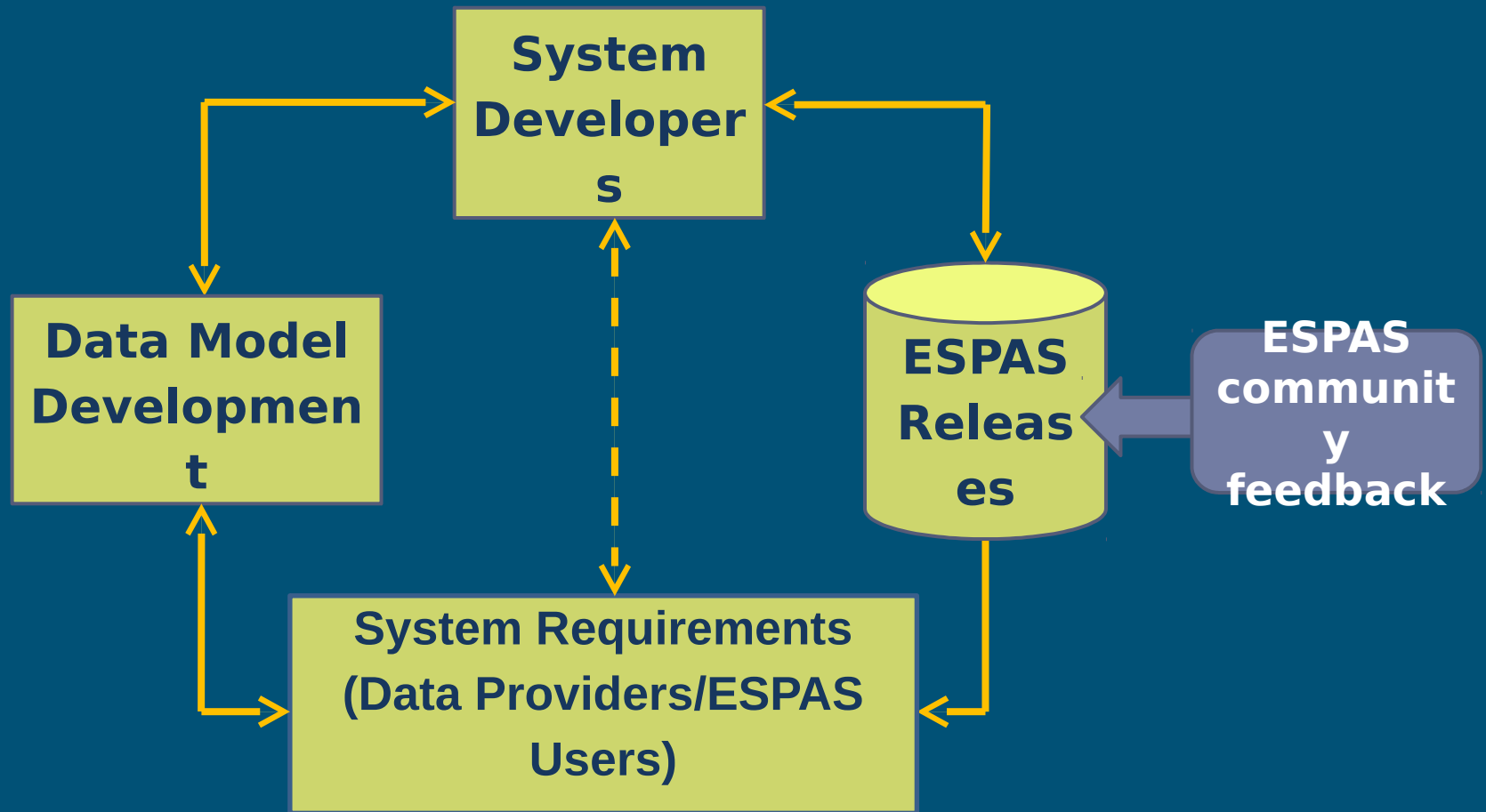


# General Architecture





# ESPAS development cycles

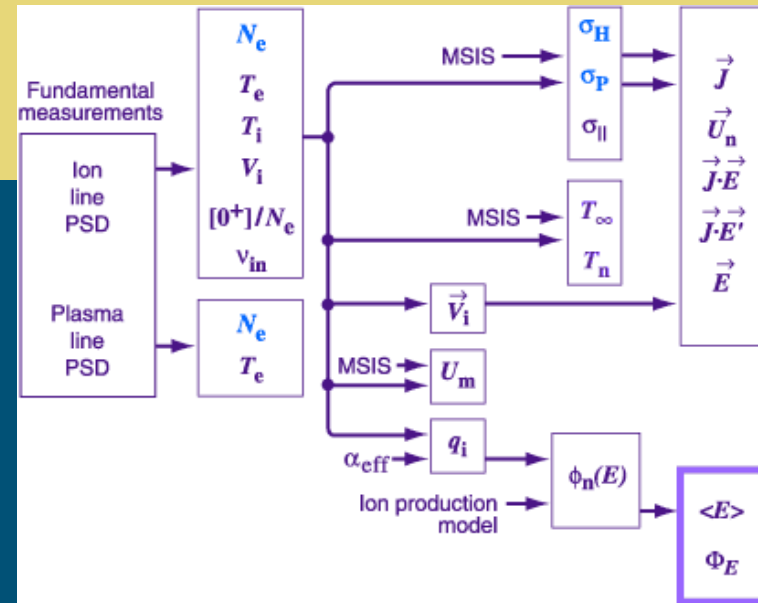




# ESPAS Phase 1

## Observational Data

- High level **metadata** search
- Download **datasets**



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3.726 3.476 3.204 2.924 2.65 2.387 2.14 1.913 1.705 1.516 1.346 1.193 1.057 0.935
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```

Search fields:  
organization,  
observatory,  
characteristics,  
instruments, temporal  
and spatial constraints,  
observed vs generated  
data

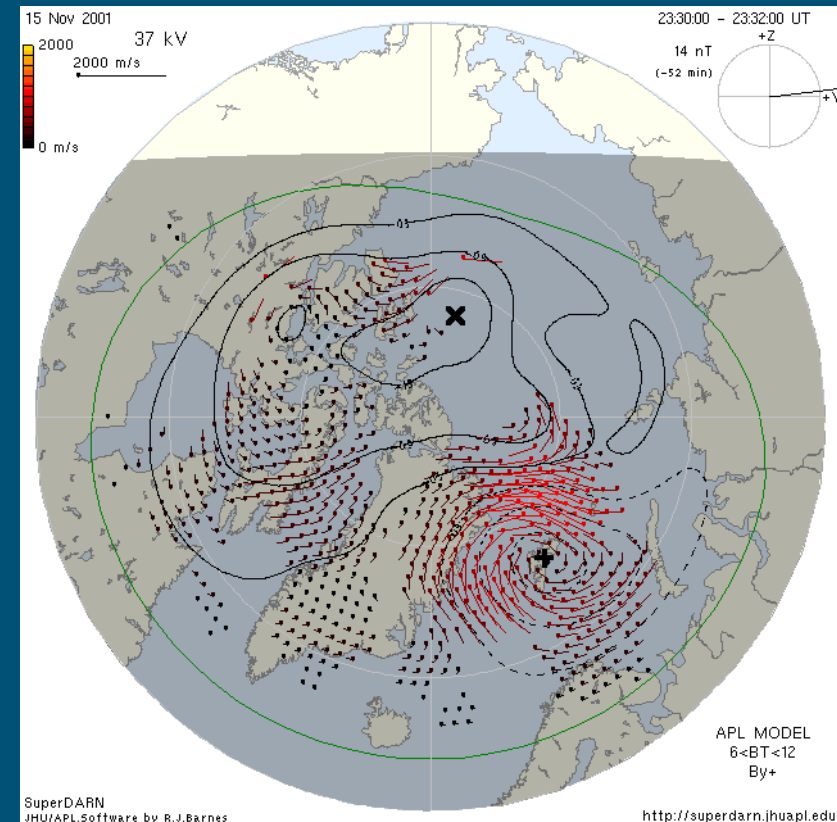
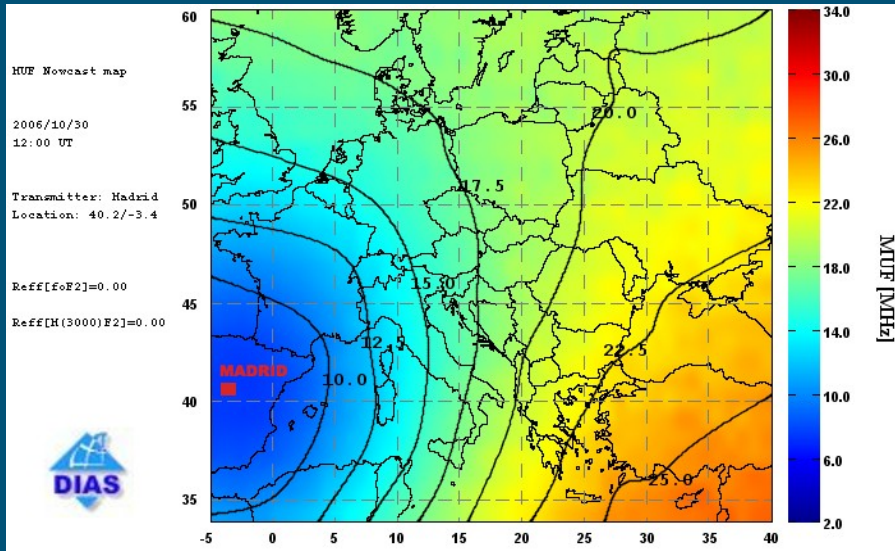
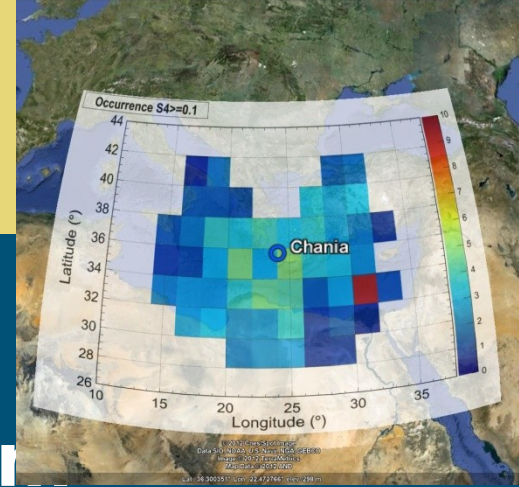




# ESPAS Phase 2

## Extract Observed Properties from datafiles

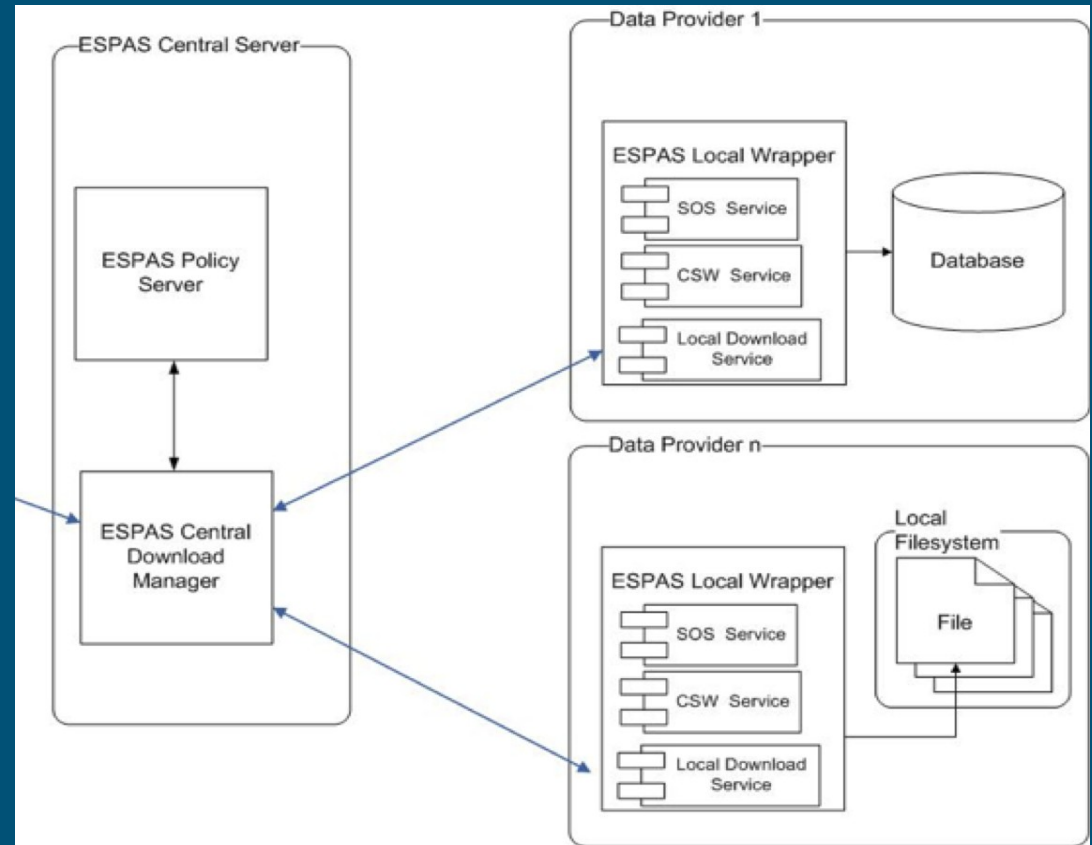
- Test-bed for new models
- Validation tools
- Visualization tools





# Interoperability services

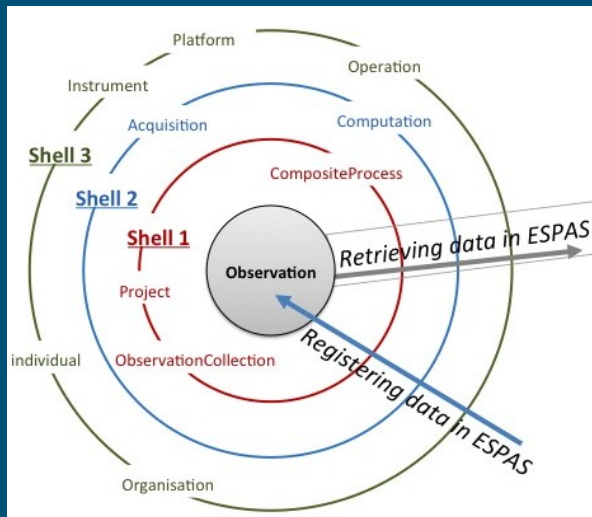
- An **OGC compliant Catalogue Service (CSW)**, which supports the discovery of ESPAS resources offered by each data provider.
- A **Download Service**, that facilitates the download of data bundles in terms of data collections offered by each provider.
- An **OGC Compliant Sensor Observation Service (SOS)** with the goal to facilitate the collection of selected data parameters/values from the observations of each data provider.





**Search and Download**  
observations, collections, files or data from 40 providers

**Register and Validate**  
your data source in ESPAS



**Progressive Search** - Filter your search with different options as you go along (real-time)



Time Period



Assets



Observed Properties



Observation Collections

**Spatial/temporal Search** - Filter your search by time and location (off-line)



Location

ESPAS final  
release:  
April 2015

<http://www.espas-fp7.eu>



Thank you for your attention

<http://www.espas-fp7.eu>

Your recommendations are welcome!  
Please send us an email at: [belehaki@noa.gr](mailto:belehaki@noa.gr)

