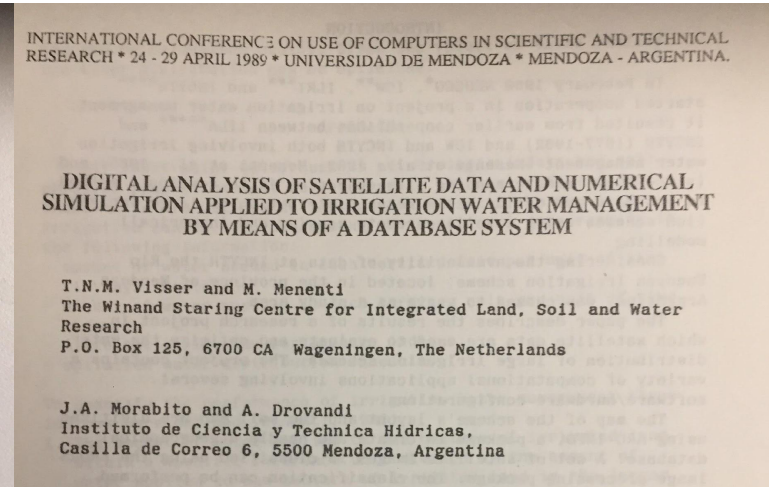
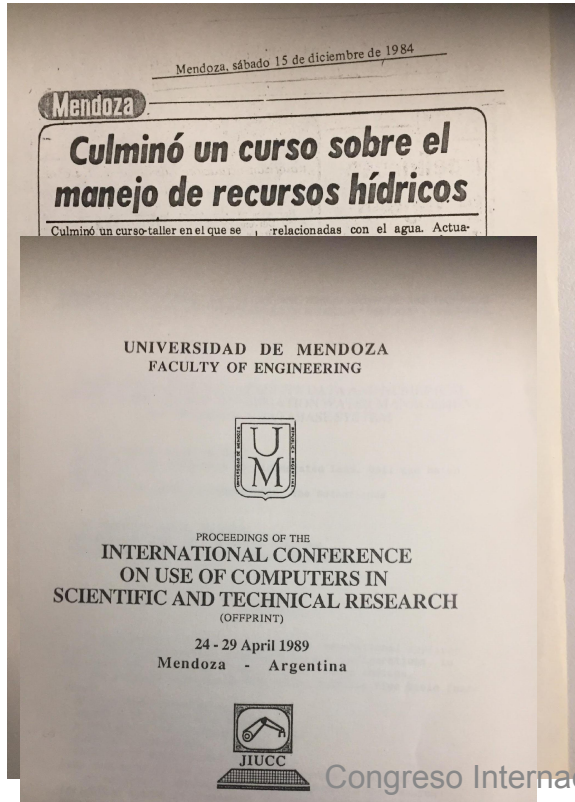


“Remote Sensing information services to support irrigation management: 40 years of evolution”

“Massimo Menenti”

Aerospace Information Research Institute (AIR)
Chinese Academy of Sciences (CAS)

The dawn of remote sensing and irrigation management: Mendoza 1981 - 1985



Early need 1978: how to estimate and locate the non irrigated fields in Mendoza? How large was the difference with the area having water rights?

Early need 1985: how to estimate and map crop water requirements?

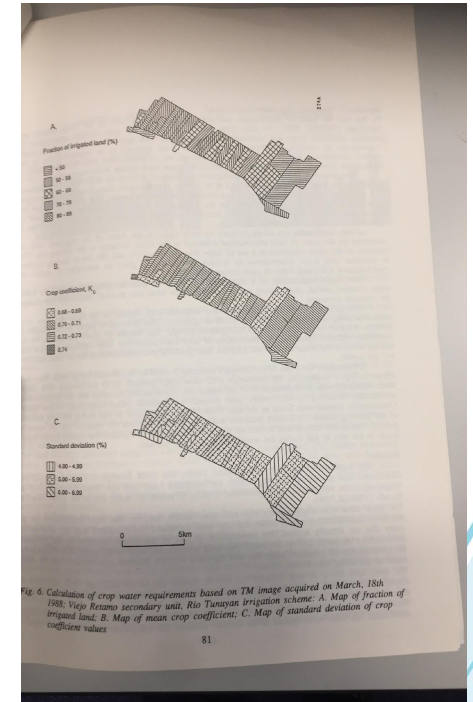


Fig. 6. Calculation of crop water requirements based on TM image acquired on March, 18th 1985, in Rio Tunuyan secondary unit, Rio Tunuyan irrigation scheme. A. Map of fraction of irrigated land; B. Map of mean crop coefficient; C. Map of standard deviation of crop coefficient values.

Early european projects



1985 – 2005: STD1, STD2, STD3, FP4

SDT2: Watershed hydrology and irrigation water management

FP4 ASTIMWR 1997 – 1999:

Water managers can find on the software market a very wide choice of 'horizontal' products that allow expert customer to perform a huge amount of GIS operations. Nevertheless, water managers request 'vertical' products, with few functionalities, tailored to the routine water problems and easy to use by their technicians.

System design: PC-based Visual Basic User Interface (UI) to link data with the Integrated Land and Water Information System' (ILWIS) through Dynamic Data Exchange (DDE)

The connection Wageningen – Mendoza – Albacete: crop water requirements, actual ET, irrigation performance



Application of Space Techniques to the Integrated
Management of river basin Water Resources

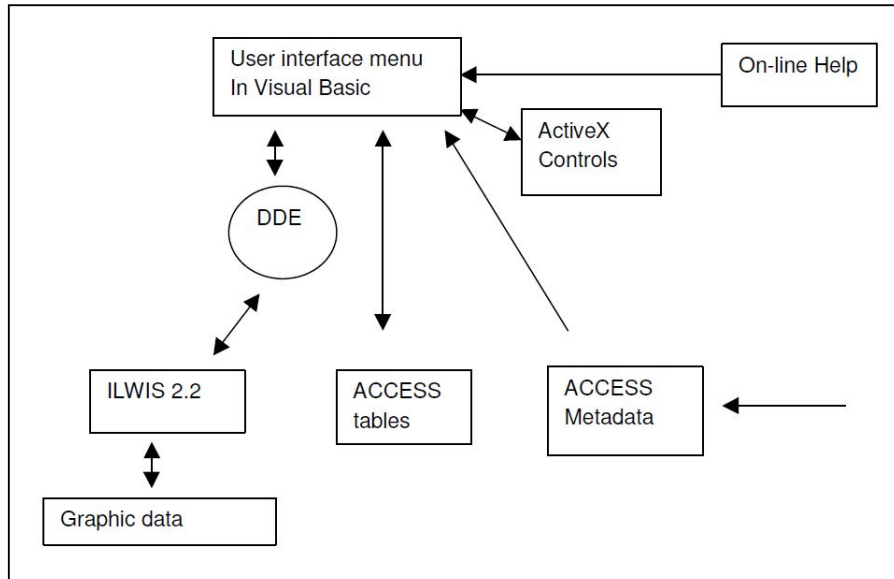


MONTESINOS & CASTAÑO (Eds.)

Early european projects

1985 – 2005: STD1, STD2, STD3, FP4

ASTIMWR: A very important component of the system was the meta database in which all information on the capture, processing and output of data analysis is maintained.



- Loading into the system of the data sets.
- The conversion of these data to the formats of the ASTIMWR system required a carefully planned procedure
- The data base administrator had to control the quality of the data before loading.

European Commission
Directorate General XII
IV Framework Programme
Centre for Earth Observation

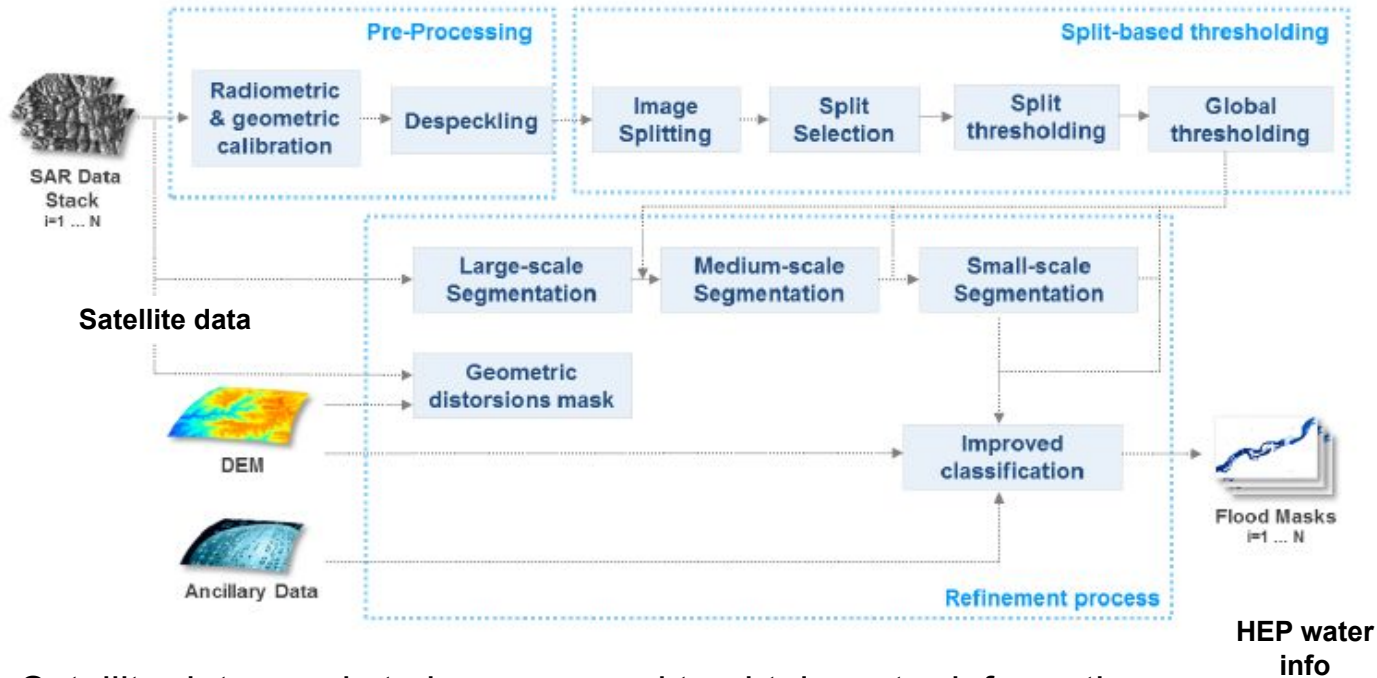
ASTIMWR

Application of Space Techniques to the Integrated
Management of river basin Water Resources



From satellite data to HEP water information (TEP family)

2015 - 2018



Satellite data needs to be processed to obtain water information
Data quality and reliability is a main requirement from users

Main characteristics of HEP satellite data

Spatial Resolution, Temporal Resolution and Accuracy shall be adequate for water resource management applications

Variables		EO mission	Time resolution	Spatial resolution	Accuracy
Water Quality	Surface temperature	Sentinel 3 / SLSTR	2 d 1d (from 2017)	1 km	0.3 K
	Total Suspended Matter	S2/S3 Landsat 7/8 MODIS A/T	1-8 d	10-500 m	20%
	Chlorophyll-a	S2/S3 Landsat 7/8 MODIS A/T	1-8 d	10-500 m	30%
	Total Organic Carbon	S2/S3 Landsat 7/8	2-8d	10-300m	50%
	Cyanobacteria	S2/S3 Landsat 7/8	2-8 d	10-300 m	False detection 25%
	Harmful algae bloom indicator	S2/S3 Landsat 7/8	2-8 d	10-300 m	False detection 25%
Soil Moisture		SMOS/ SMAP/ AMSR-2/ ASCAT	2-3 d	1 km	0.05 m ³ /m ³
Water Extent		Sentinel-1A Sentinel-1B	12 d 6 d (from 2016)	5 – 20 m	1 dB
		Sentinel-3	1 d	1 km	95%
Water Level		CryoSat -2/ Sentinel -3A/ Sentinel -3B	30 d 13.5 d (from 2017)	300 m	10 cm
Snow Water Equivalent		SSMIS/ AMSR2	1 d	2.5 km	30 mm
Evapotranspiration		AVHRR/MODIS/S3	1 d	5 km	85%

Selection of input data

The screenshot displays the hydrology tep web interface. At the top, there is a search bar and navigation links. The main area is a map of West Africa with several colored overlays: a purple box over the Niger River region, an orange box over a larger area, and a white box over a specific location. A pop-up window shows details for a selected product: 'S1A SLC IW_DP L1 VV, VH 16 2016-10-19T18:44:25.4120290Z'. Below the map, there is a search results list and a 'Features Basket' section. Red callout boxes provide annotations: '3a: Default area box: 5504 products' points to the orange box; '3a Orange products: Data search results' points to the search results list; '3a Purple products: Featured basket selected' points to the purple box; and '3a: products meta data description' points to the pop-up window.

3a: Default area box: 5504 products

3a Orange products: Data search results

3a Purple products: Featured basket selected

3a: products meta data description

Search Terms: Geo Filter:

Search Results:

- S1A SLC IW_DP L1 VV, VH 16 2016-10-19T18:44:25.4120290Z
- S1A GRD IW_DP L1 VV, VH 16 2016-10-19T18:44:26.6015160Z
- S1A RAW IW_DP L1 VV, VH 16 2016-10-19T18:43:30.7190Z
- S1A SLC IW_DP L1 VV, VH 16 2016-10-19T18:44:00.5911870Z
- S1A GRD IW_DP L1 VV, VH 16 2016-10-19T18:44:27.5251430Z
- S1A GRD IW_DP L1 VV, VH 16 2016-10-19T18:44:01.8013260Z

Features Basket: 51 items

- S1A GRD IW_DP L1 VV, VH 45 2016-10-09T18:27:34.6121103Z
- S1A GRD IW_DP L1 VV, VH 118 2016-10-02T18:33:32.312660Z
- S1A GRD IW_DP L1 VV, VH 45 2016-09-27T18:27:34.6211430Z
- S1A GRD IW_DP L1 VV, VH 45 2016-09-27T18:27:09.6218660Z
- S1A GRD IW_DP L1 VV, VH 118 2016-09-20T18:35:32.1013510Z
- S1A GRD IW_DP L1 VV, VH 45 2016-09-15T18:27:09.2079810Z

Default area selected is Niger River wide area

Community Sharing (2)

The screenshot displays the hydrology tep web application interface. On the left, a map of West Africa is shown with several orange-outlined polygons representing processing areas. A red callout box with the text "5b: My private workspace" points to a specific job in the "Processing Services" panel on the right. Below this, another red callout box with the text "5b: Share it: community tools" points to the social media sharing icons in the same panel. The "Processing Services" panel shows details for a job named "Lake_Bernat_mask", including its ID, location, status (Success), and a table of parameters.

5b: My private workspace

5b: Share it: community tools

Processing Services
Lake_Bernat_mask

Job Info

Job Name: Lake_Bernat_mask
Wps Job Id: 445dd93e-48aa-45fc-b04b-388801145ee
Remota Id: 99c5283e-9519-432e-9d5c-0b9c4c458377
Started at: Nov 3rd 2016
Created by: bernatmartinez
Status/Result Location: [Success](#)
Status: Success
visibility: private
Share: <https://hydrology->

Parameters

Name	Value
master	https://catalog.terradue.com/serineline1/search?format=atom&id=S1A_IW_GRDH_L1_SIDV_20160830T185257_20160830T185322_013286_0152A2_2080
slave	https://catalog.terradue.com/serineline1/search?format=atom&id=S1A_IW_GRDH_L1_SIDV_20160813T185231_20160813T185258_012586_013B99_E4C6
subset	POLYGON[-10.546 13.285, -10.525 12.881, -10.184 12.794, -10.139 13.215, -10.331 13.351, -10.546 13.285]
result_prefix	Lake_bernat_1product
result_type	All

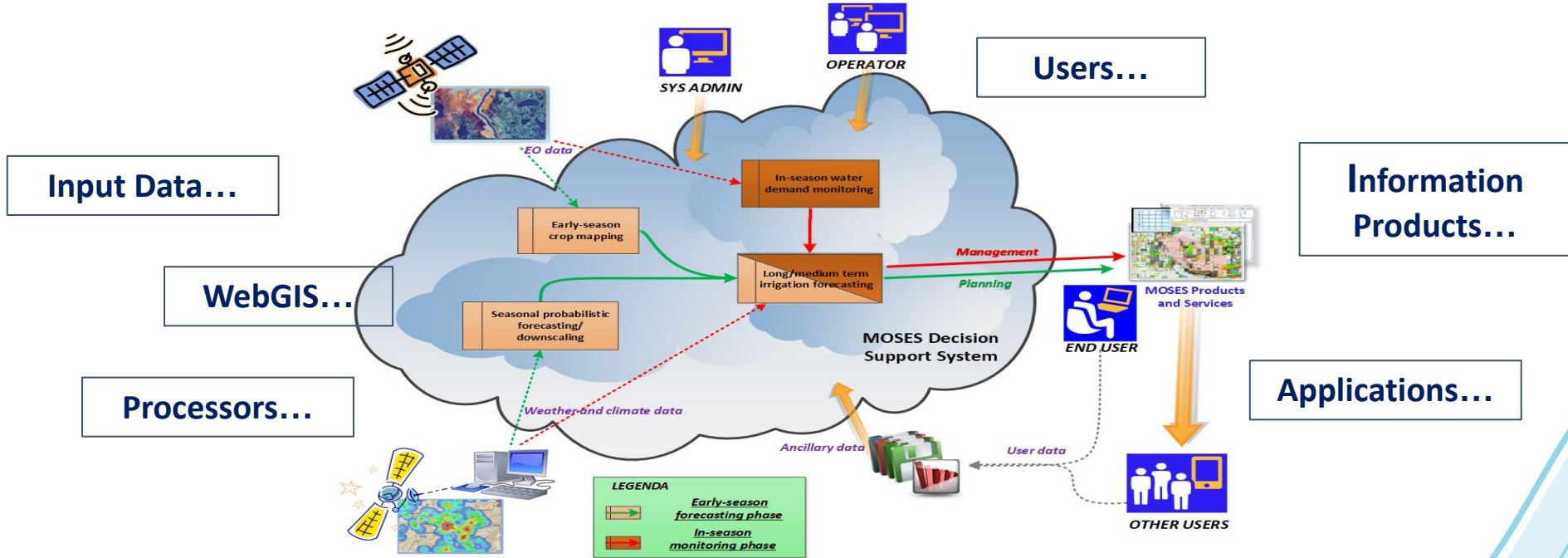
Success
The job was completed successfully.

Results
Found layers in the result. [Show results](#)

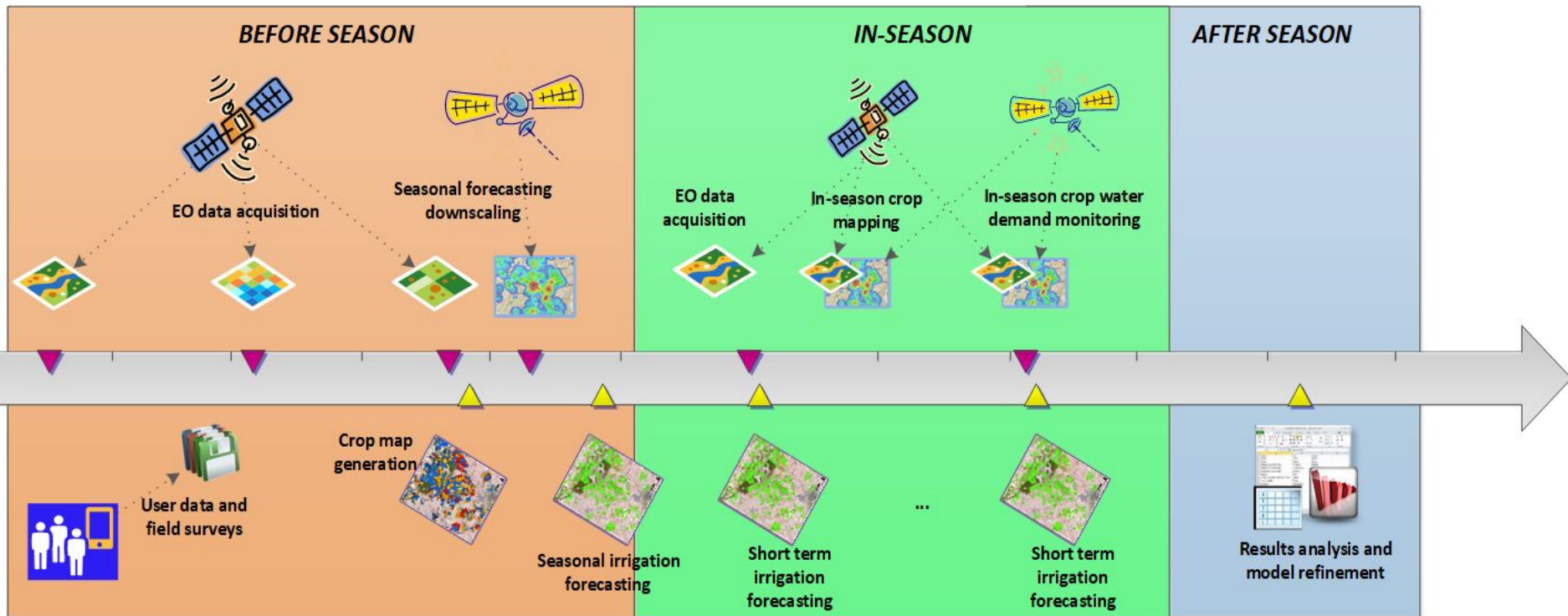
The “Managing crOp water Saving with Enterprise Services MOSES platform



2015 - 2018

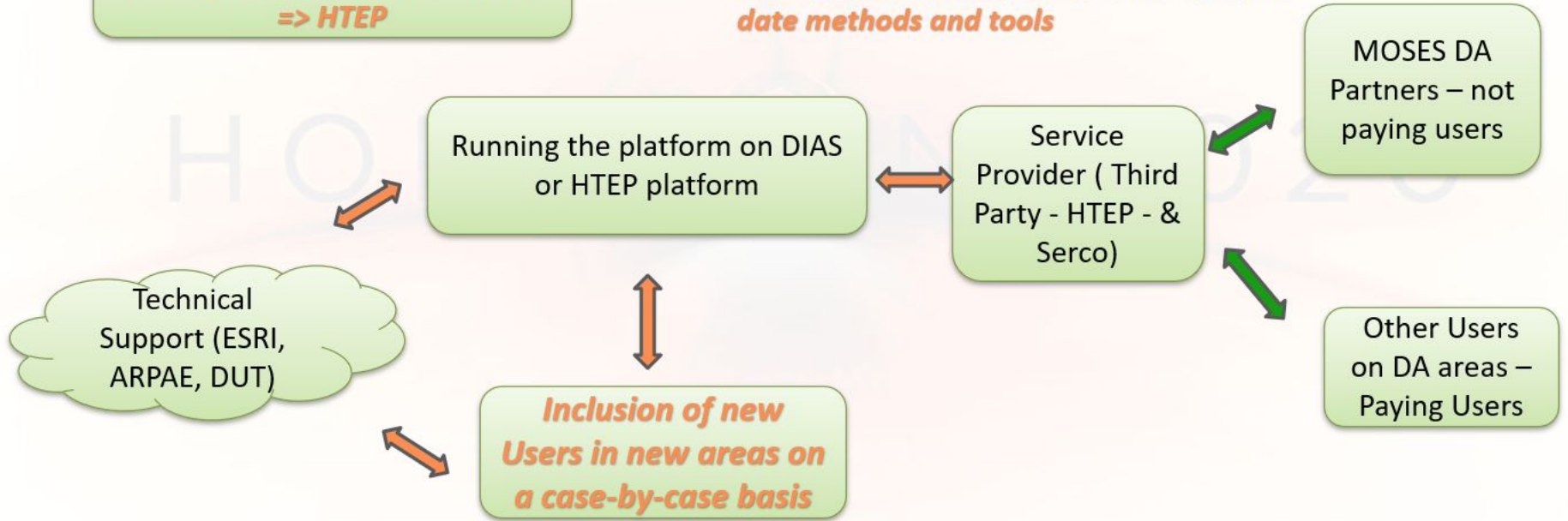


MOSES products and services



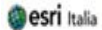
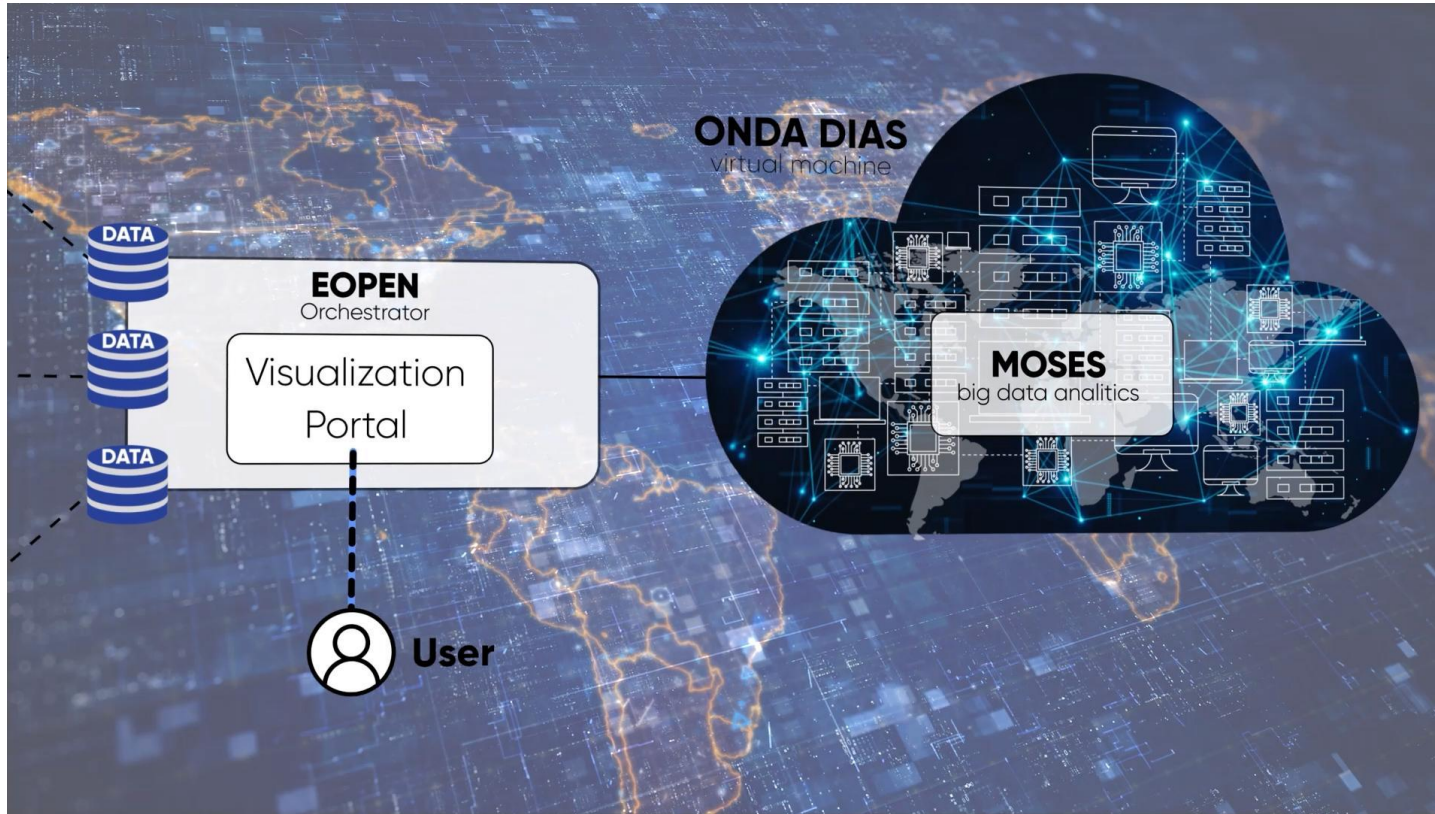
**Perspective – MOSES Service
Through Other Funded Projects
=> HTEP**

- **HTEP customized applications improve and complement MOSES service;**
- **Joining a community allows sharing up-to-date methods and tools**



MOSES on a virtual machine

HERRAMIENTAS PARA
LA GESTIÓN FUTURA
DEL AGUA



Concluding remarks



- Platforms developed to support specific applications vs. Google Earth Engine
- Remote access to data and algorithms
- Validation of algorithms
- Quality assurance
- Well documented procedures

IV CONGRESO INTERNACIONAL
AGUA 
PARA EL FUTURO

¡Gracias!

“Massimo Menenti”