



SWOS
Satellite-based Wetland
Observation Service



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 642088

Projet SWOS

Introduction – généralités – produits

Rencontre Gestionnaires ZH Med (France)

Tour du Valat, 22/03/2018

Anis GUELMAMI (Tour du Valat)

The project

Horizon 2020 call:

Making Earth Observation and Monitoring Data usable for ecosystem modelling and services

 **SWOS**
Satellite-based Wetland
Observation Service
is an EU H2020
funded project,
start 1 June 2015,
duration 3 years,
coordinated by Jena-Optronik

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Lake Chad Landsat satellite image April 2015

The SWOS team

Partnership with
13 partners
coordinated by
Jena-Optronik GmbH

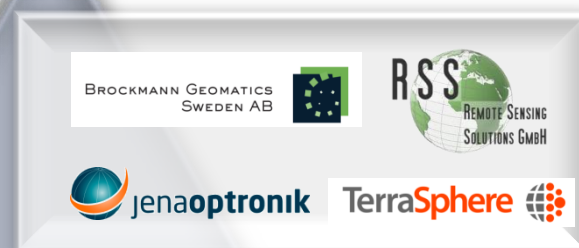


6 user
organisations /
NGOs

**SWOS
Team**



3 Universities



4 Companies

SWOS Background

GlobWetland I (2003 – 2008)



- ⇒ Test and assess the potential of EO technology to support Convention implementation



GlobWetland II (2010 – 2014)



- ⇒ Integration of satellite images into the conservation and management of wetlands
- ⇒ Create standard and comparable geo-information products about the status and trends in wetlands ecological character
- ⇒ Contribute to the set up of a Global Wetlands Observing System (GWOS)



SWOS + GlobWetland Africa



SWOS is a Service



- **Hotspots of biodiversity** providing diverse and valuable ecosystem services
- One of the **fastest declining** ecosystem types worldwide
- **Insufficient methods and tools** to assess and monitor wetland conditions

SWOS is a Service



Satellite data for wetland mapping:

1. World wide available
2. Long term programs
3. Historical data from 70ies
4. Weather independent (Radar data)
5. For free

SWOS is a service



SWOS
Satellite-based Wetland
Observation Service

Maps and indicators production

Software delivery

Training/Capacity Building

Portal (Middleware/Data
broker/Clients)

Service
components

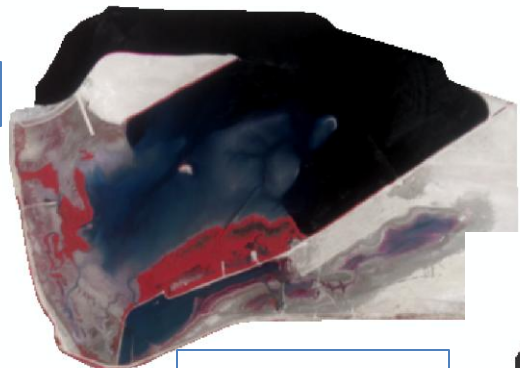
Service
demonstration via
Multilevel Service
cases

Optic data for wetland monitoring

Ras Al Khor Sentinel-2 time series (2017)



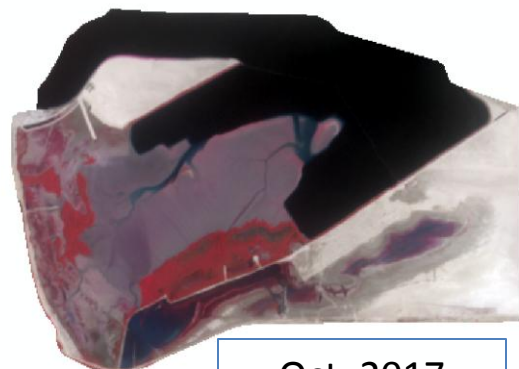
April 2017



Jun 2017

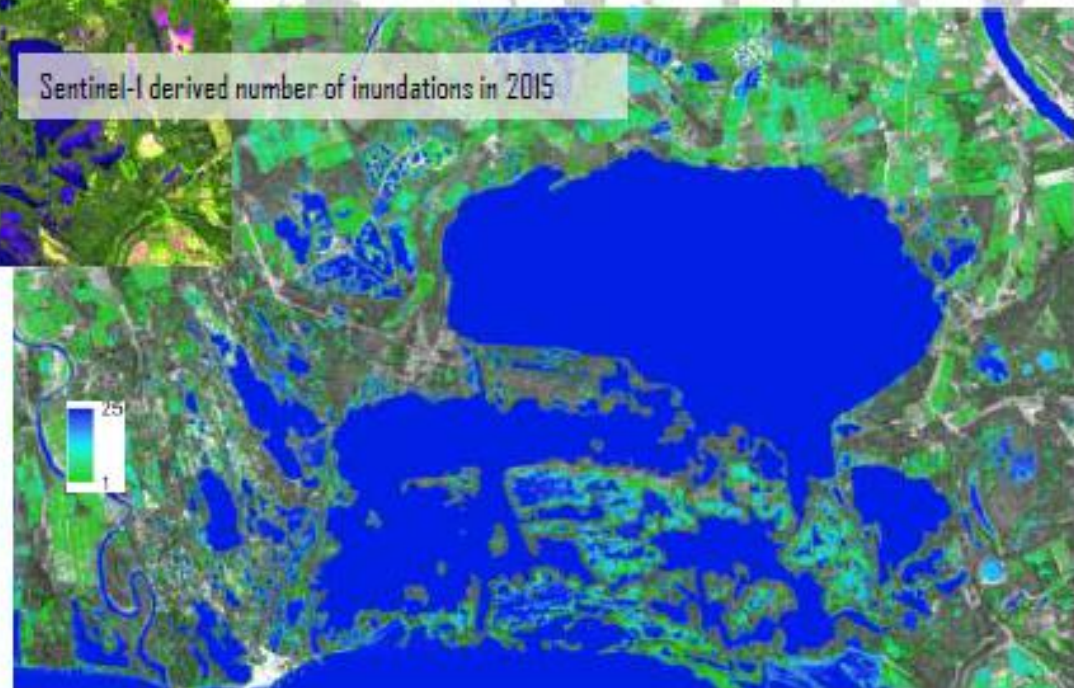


August 2017



Oct. 2017

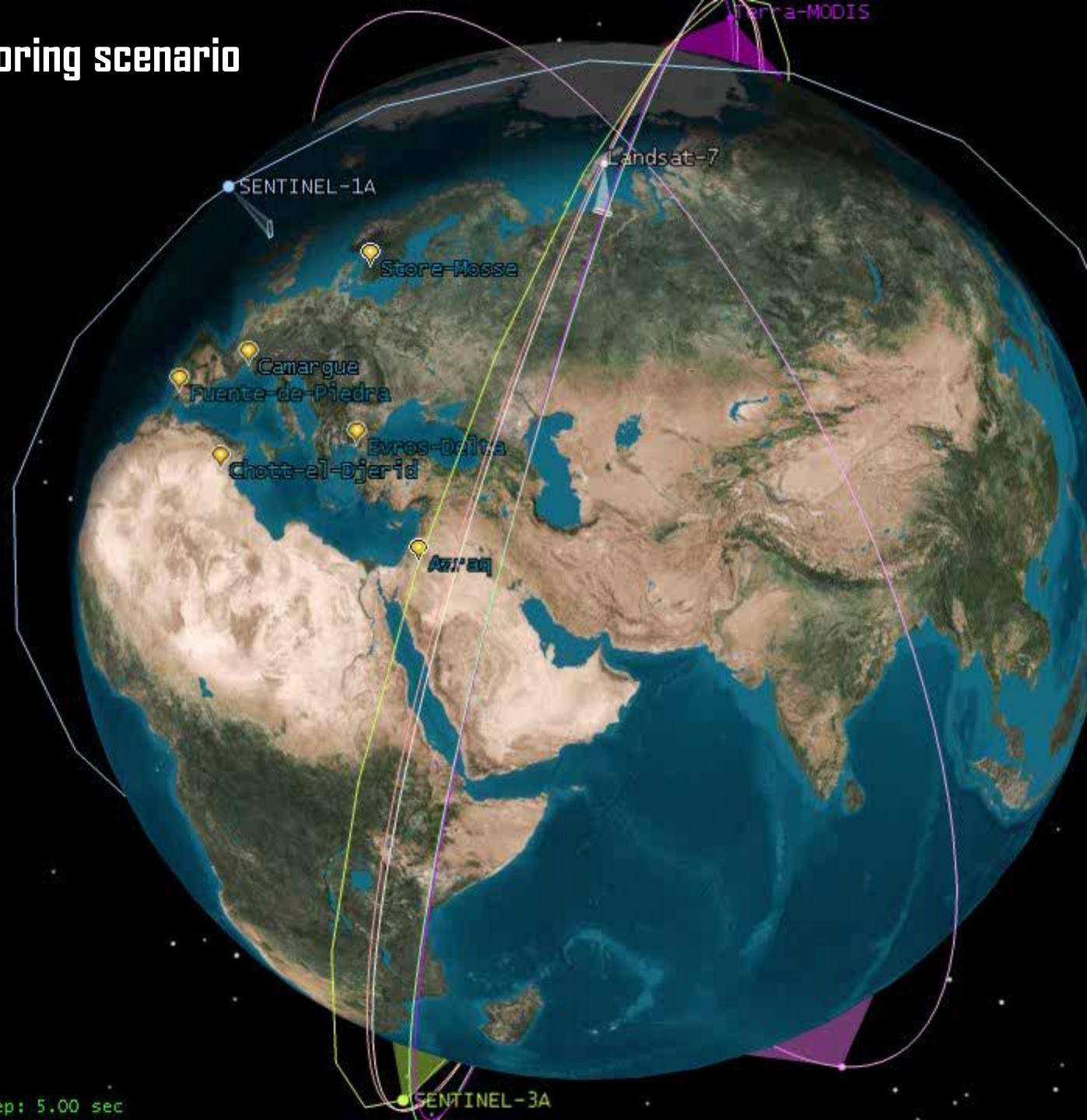
Radar data for wetland monitoring



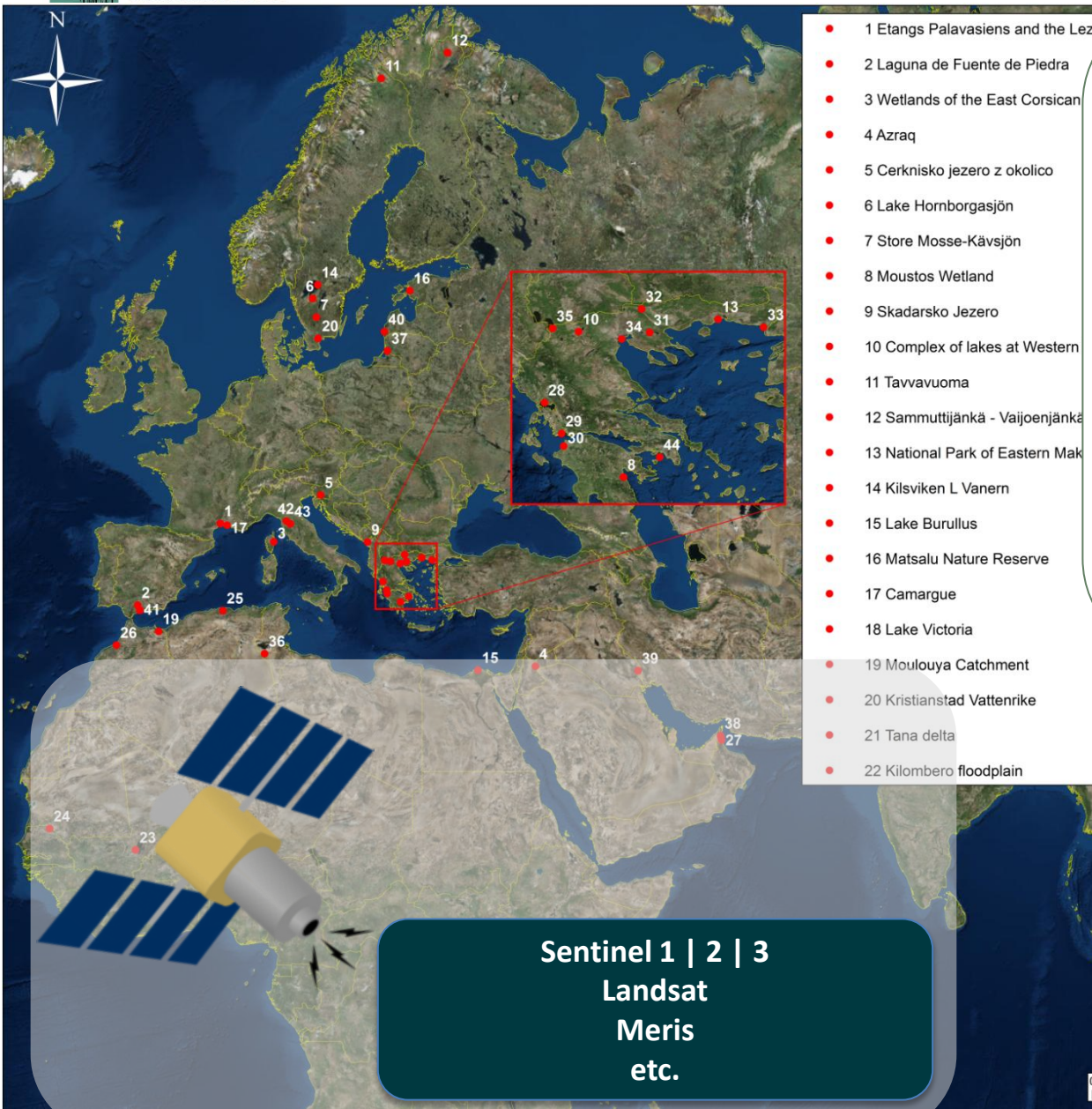
The Radar perspective: SAR-based monitoring of inundation (Camargue, France)

A one-day SWOS monitoring scenario for selected wetlands

22.02.2016



50 test-sites



- 1 Etangs Palavasiens and the Lez Riv
- 2 Laguna de Fuente de Piedra
- 3 Wetlands of the East Corsican
- 4 Azraq
- 5 Cerknisko jezero z okolico
- 6 Lake Hornborgasjön
- 7 Store Mosse-Kävsjön
- 8 Moustos Wetland
- 9 Skadarsko Jezero
- 10 Complex of lakes at Western
- 11 Tavvavuoma
- 12 Sammutjäjäkä - Vajoenjäkä
- 13 National Park of Eastern Mak
- 14 Kilsviken L Vanern
- 15 Lake Burullus
- 16 Matsalu Nature Reserve
- 17 Camargue
- 18 Lake Victoria
- 19 Moulouya Catchment
- 20 Kristianstad Vattenrike
- 21 Tana delta
- 22 Kilombero floodplain

Wetland Information Maps:

1. Land Use Land Cover
2. Land Use Land Cover Change
3. Water Cycle Regime
4. Soil Moisture
5. Surface Water Dynamics
6. Wetland Delineation
7. Land Surface Temperature
8. Water Quality
9. ...

Indicators:

1. Change in wetland area
2. Inundation of the ecosystem
3. Change in wetland area due to urbanization and agriculture
4. Status and trends of wetland threats

Functions

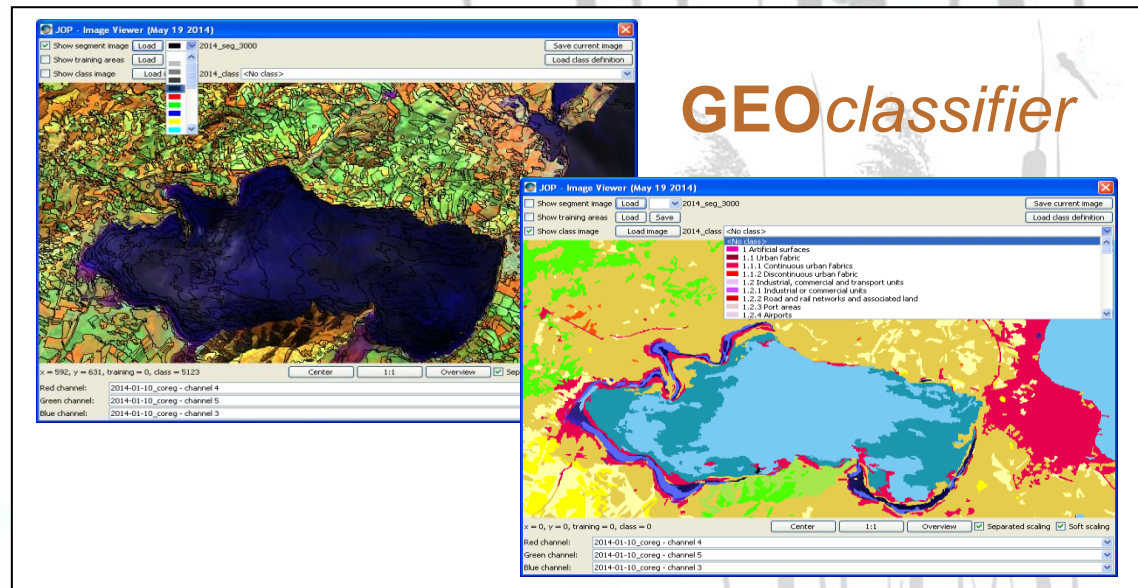
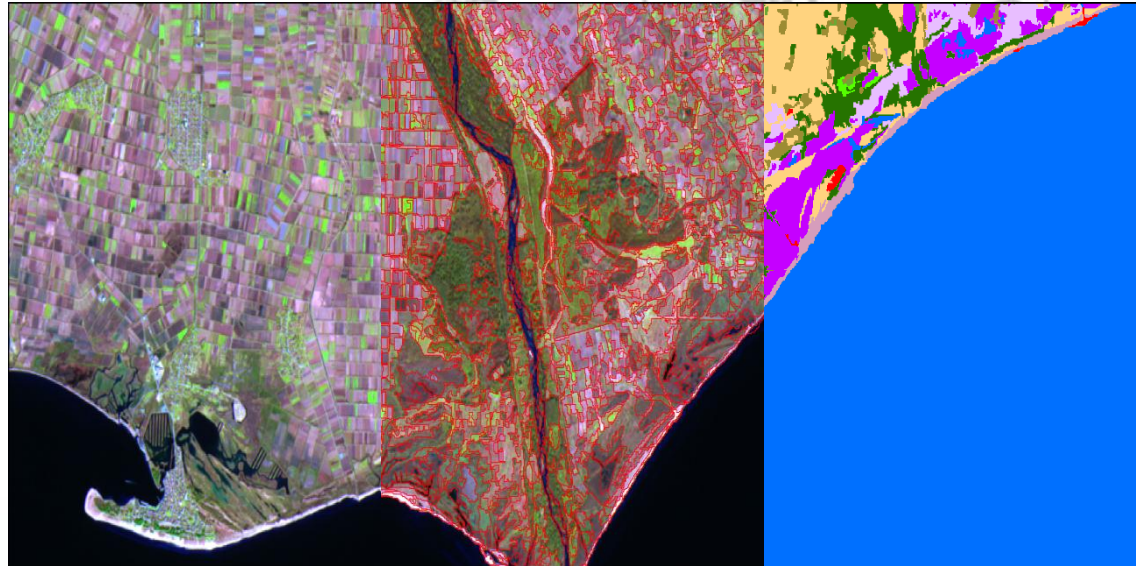
- EO data pre-processing (Optical + SAR)
- Map product generation
- Indicator calculation
- Use GEOportal online services

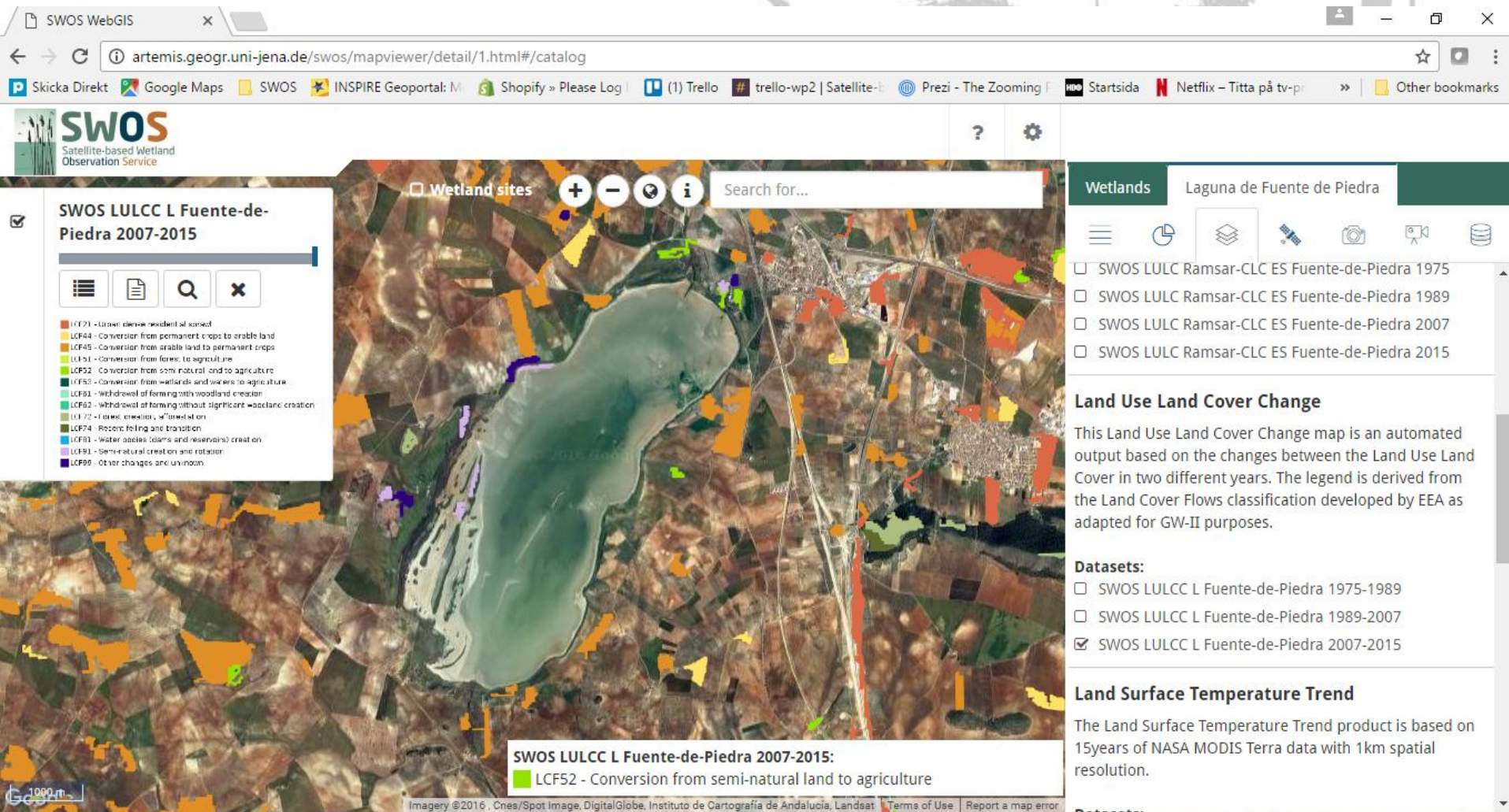
Easy integration of

- Local knowledge for supervised classification and interpretation
- New and updated nomenclatures

Available as

- standalone version (GUI & command line)
- integrated in external software e.g. ArcGIS, QGIS
- Integration from external tools





Wetlands

Laguna de Fuente de Piedra

- ☐ SWOS LULC Ramsar-CLC ES Fuente-de-Piedra 1975
- ☐ SWOS LULC Ramsar-CLC ES Fuente-de-Piedra 1989
- ☐ SWOS LULC Ramsar-CLC ES Fuente-de-Piedra 2007
- ☐ SWOS LULC Ramsar-CLC ES Fuente-de-Piedra 2015

Land Use Land Cover Change

This Land Use Land Cover Change map is an automated output based on the changes between the Land Use Land Cover in two different years. The legend is derived from the Land Cover Flows classification developed by EEA as adapted for GW-II purposes.

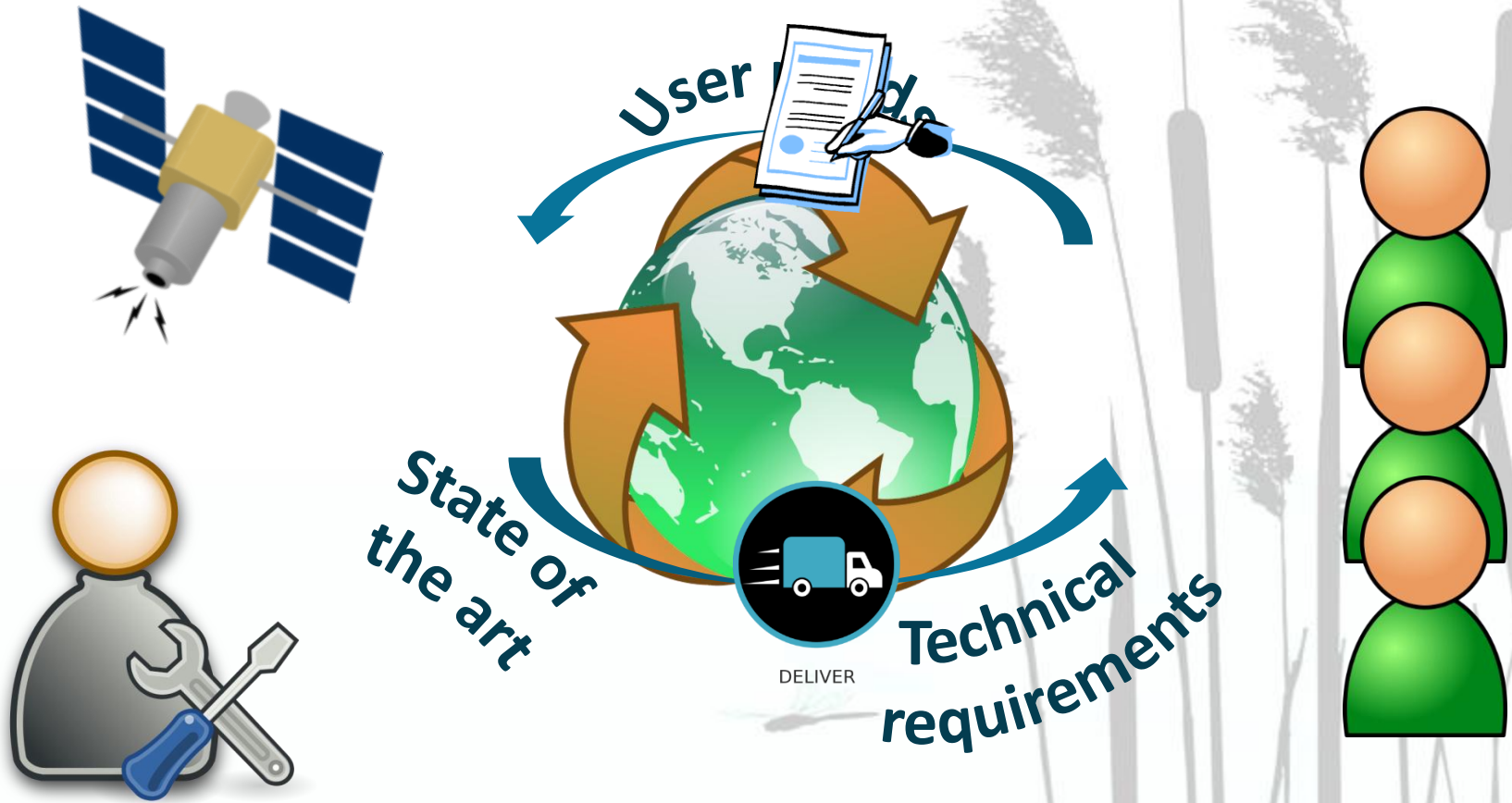
Datasets:

- ☐ SWOS LULCC L Fuente-de-Piedra 1975-1989
- ☐ SWOS LULCC L Fuente-de-Piedra 1989-2007
- ☒ SWOS LULCC L Fuente-de-Piedra 2007-2015

Land Surface Temperature Trend

The Land Surface Temperature Trend product is based on 15 years of NASA MODIS Terra data with 1 km spatial resolution.

User focus



- Has the ecological character of the site changed?
- Is there a reduction in species X due to observed changes in water quality, habitat loss, fragmentation?
- Has the water cycle regime changed over time?
- Is there a reduction in total surface water area observed?

Multi level user approach Who will use SWOS?

Local acting ecosystem and wetland management bodies

(national park and protected area managers, scientific local and regional administrations)



National authorities reporting on the status and trends of ecosystems

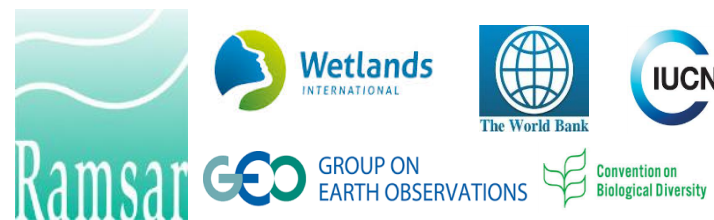
(national administrations, Natura2000, WFD, EU member states)



Regional users working on supra-national levels coordinating wetland related efforts

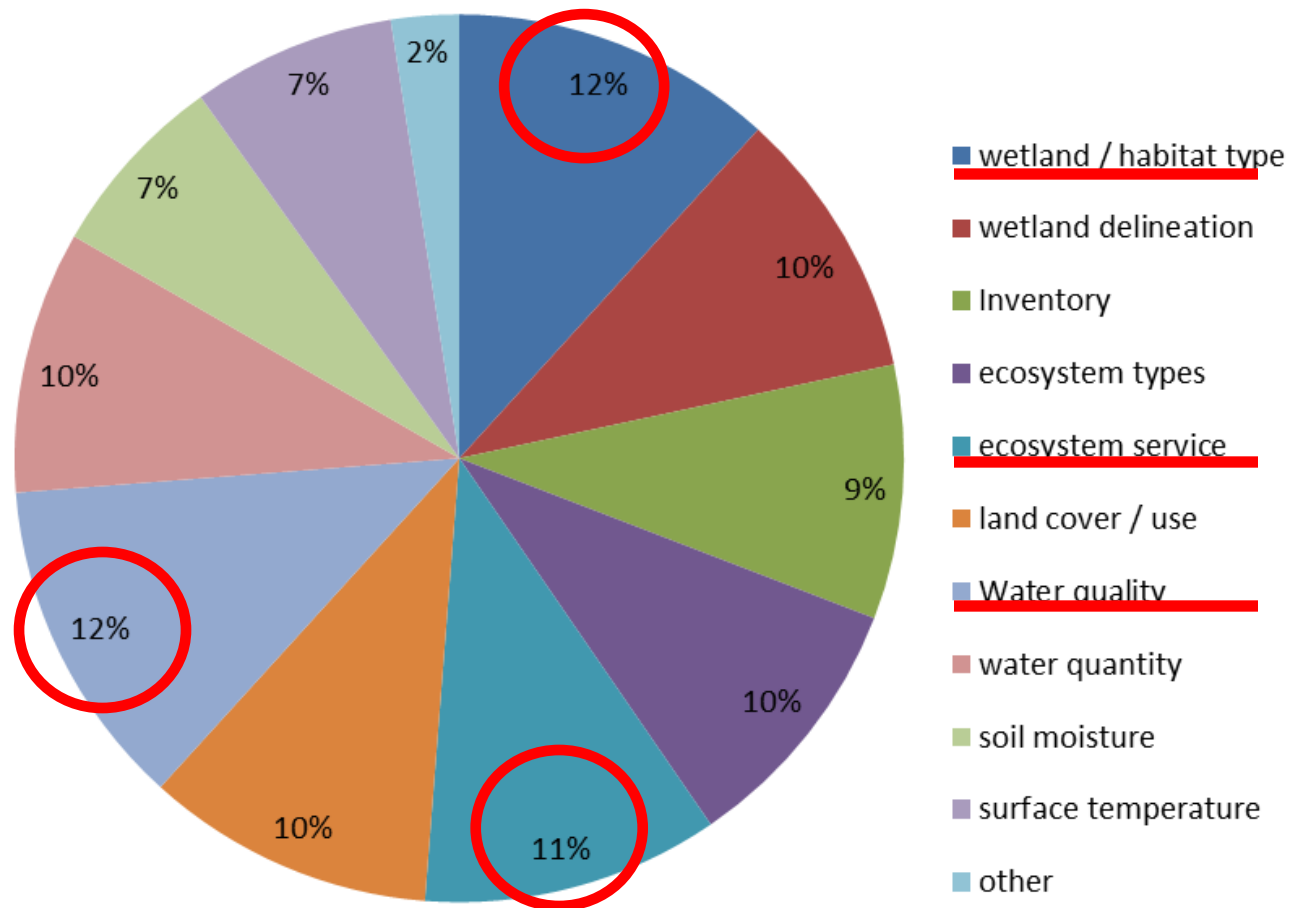


Global level of ecosystem monitoring
(e. GEO/GEOSS, Ramsar, CBD, SDGs)





Current data gaps



Source: Wetland user requirement survey

SWOS Service Case

SWOS
Multi-level
service cases

testing & validation

Policy Background

User

Information needs

SWOS information products

User requirements

Service Case: Ramsar Convention

Users

**Ministry of Environment
Management bodies of the 10 Ramsar sites**

Policy Background

**Ramsar Convention
Incl. MedWet Regional Initiative**

Information needs

**Maps for the Ramsar Database
Wetland extent in dry and wet season
Wetland ecological character and services
Wetland changes and trends**

**SWOS information
product**

**Wetland delineation
Surface water dynamics
Land use / Land cover & Change**

Information needs

**Ramsar wetland typology
Updated every 6 years**



Thank you

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