The Mediterranean Wetlands Observatory

Wetlands monitoring using spatial indicators derived from EO data (SDG 6.6.1)

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TOUR DU VALAT
A programme implemented by multidisciplinary teams

- Hydrology
- Ornithology
- Training and Education
- Aquatic fauna Ecology
- Plant Ecology
- Integrated Management
- Geomatics
- Socio-Economics
Mediterranean wetlands are among the most productive ecosystems in this region with a very high biodiversity richness.

...Paradoxically, they are also the most threatened by human activities.
Many knowledge gaps:

- *What is the total extent of wetland ecosystems in the Mediterranean countries?*
- *Their water quality*
- *What is the status of their biodiversity?*
- *How to evaluate their ecosystem services?*
- *What are their positions in the political agendas?*
- ...
In this context...

The MWO aims to monitor the status and trends of wetlands in all Mediterranean countries.

**Objective:**
A better dissemination of the knowledge and build links between science and policies in order to improve the conservation and the protection of wetlands.

**How? ➔ by developing a set of indicators to assess the status and trends of Mediterranean wetlands as well as their ecosystem services.**
What can EO-based data do for that?
Improve our knowledge about the status and trends of wetlands
Improve our knowledge about the status and trends of wetlands

...However, mapping wetland habitats and conditions is very challenging
Mapping Mediterranean Wetlands With Remote Sensing: A Good-Looking Map Is Not Always a Good Map

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It is very difficult to capture the complex spatiotemporal dynamics of some wetland habitats
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The max. flood extent in 6 years (2009-2015)
The max. flood extent in 6 years (2009-2015) ➔ Where are the wetland habitats boundaries?
The max. flood extent in 6 years (2009-2015) does not represent the wetlands extent ➔ there are common confusions between “surface water” and “wetland habitats”
EO-based approaches

Global datasets to monitor surface water trends

- However, they should NOT be used as baselines to map wetland ecosystem extents and to assess their changes over time.
There is a need to develop reliable EO-based tools that allows the mapping of wetland habitats at wide scales and to assess their changes over time.
Using satellite time series ➔ Assess inter-annual and long-term changes (ex. Chott Chergui, Algeria)
Sustainable Development Goal (SDG) Indicator 6.6.1

Change in the extent of water-related ecosystems over time
How to use EO-based tools to collect information about wetlands, at a national scale, and support national reporting obligations (e.g. Ramsar and SDG’s)?
Demonstration for a national case (Albania) with a high diversity of natural and human-made wetlands (lagoons, coastal/inland marshlands, rivers, dams/reservoirs, canals, natural lakes, riparian forests...)

**SWOS approach: National Service Case - Albania**
Wetlands extent mapping

**SWOS approach: National Service Case - Albania**

- TW
- TSC
- MrVBF
- Floodplain Index
- Inundation level (2014)

**EU-DEM**

Landsat-8 (2014 time series)
Additional ancillary data...

- Soil data (HWSD)
- Built-up areas (GUF v04)
- Updated gridded climate dataset (CRU TS3.10)

Precipitation time series (1950-2014)
Wetlands extent mapping

SWOS approach: National Service Case - Albania

Potential Wetlands (Probability of occurrence)
- Built-up areas
- Very low probability
- Low probability
- Medium probability
- High probability
- Very high probability
- Temporarily flooded areas
- Permanently flooded areas

Legend:
1.48 2.29 0.48 2.90 1.40
4.55 5.25
81.64
Delimitation of a “functional” area that could be used to map and monitor water-related ecosystems

(18% of the national territory)
Wetlands extent mapping

SWOS approach: National Service Case - Albania

Wetland classes based on CLC-Ramsar definitions (Albania, 2015)
- CLC 1311: Excavations; gravel/brick/coal pits; borrow pits, mining pools
- CLC 2313: Wet pastures
- CLC 3112: Wet forests including riparian
- CLC 3311: Sand, shingle or pebble shores
- CLC 4111: Inland marshes
- CLC 412: Peatbogs
- CLC 421: Salt marshes
- CLC 422: Salines
- CLC 5111: Inland water courses
- CLC 5114: Canals and drainage channels, ditches
- CLC 512: Inland water bodies
- CLC 512: Permanent freshwater lakes (over 8 ha) with aquatic bed vegetation
- CLC 5129: Aquaculture (e.g., fish/shrimp) ponds
- CLC 5130: Ponds: includes farm ponds, stock ponds, small tanks; (generally below 8 ha)
- CLC 5131: Water storage areas; reservoirs/barrages/dams/impoundments (generally over 8 ha)
- CLC 5132: Wastewater treatment areas; sewage farms, settling ponds, oxidation basins, etc
- CLC 521: Coastal lagoons
- CLC 5231: Permanent shallow marine waters less than six metres deep at low tide

Exists also in a MAES version 😊
What could be the links with SDG’s indicators and the SEEA framework?

Reporting indicators
Ramsar: Total wetlands extent reporting indicator

SWOS approach: National Service Case - Albania

Coastal wetlands
Inland wetlands
Man-made wetlands
SDG 6.6.1: Wetlands and water related ecosystems extent
Algeria, Tunisia | Coastal watershed

Wetland Inventory
What do we need now…?
Needs and requirements

Development of a harmonized pan-Mediterranean wetlands database as a support to national inventories
The ultimate objective is to...

Promote a regional framework for wetland protection and conservation through national legislations or through multilateral agreements

How?

By providing a harmonized pan-Mediterranean general picture of wetland status regarding their:

- location;
- delineation;
- main ecological characteristics;
- Threats; and
- conservation status
This general picture should be…

- Developed using a broad definition of wetland ecosystems
- Generated through geo-referenced layers and maps linked to a regional datasets
- “Downscaled” and adapted by each country according to its national specifications (e.g. using their proper wetlands definition)
- Used as a baseline to help countries to:
  - start, finalize or update their national inventories;
  - use their up-to-date inventories as a significant tool for the implementation of appropriate conservation and/or restoration measures
We need to set-up a regional platform (for data providing and processing) on Mediterranean wetlands, integrating existing datasets and products based on tools and approaches that have been already developed.
Thank you

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