

Open surface water areas monitoring for the Black Sea and Greece –
Ioannis Manakos in cooperation with *Richard Lucas*



OPEN DATA & OPEN KNOWLEDGE Workshop

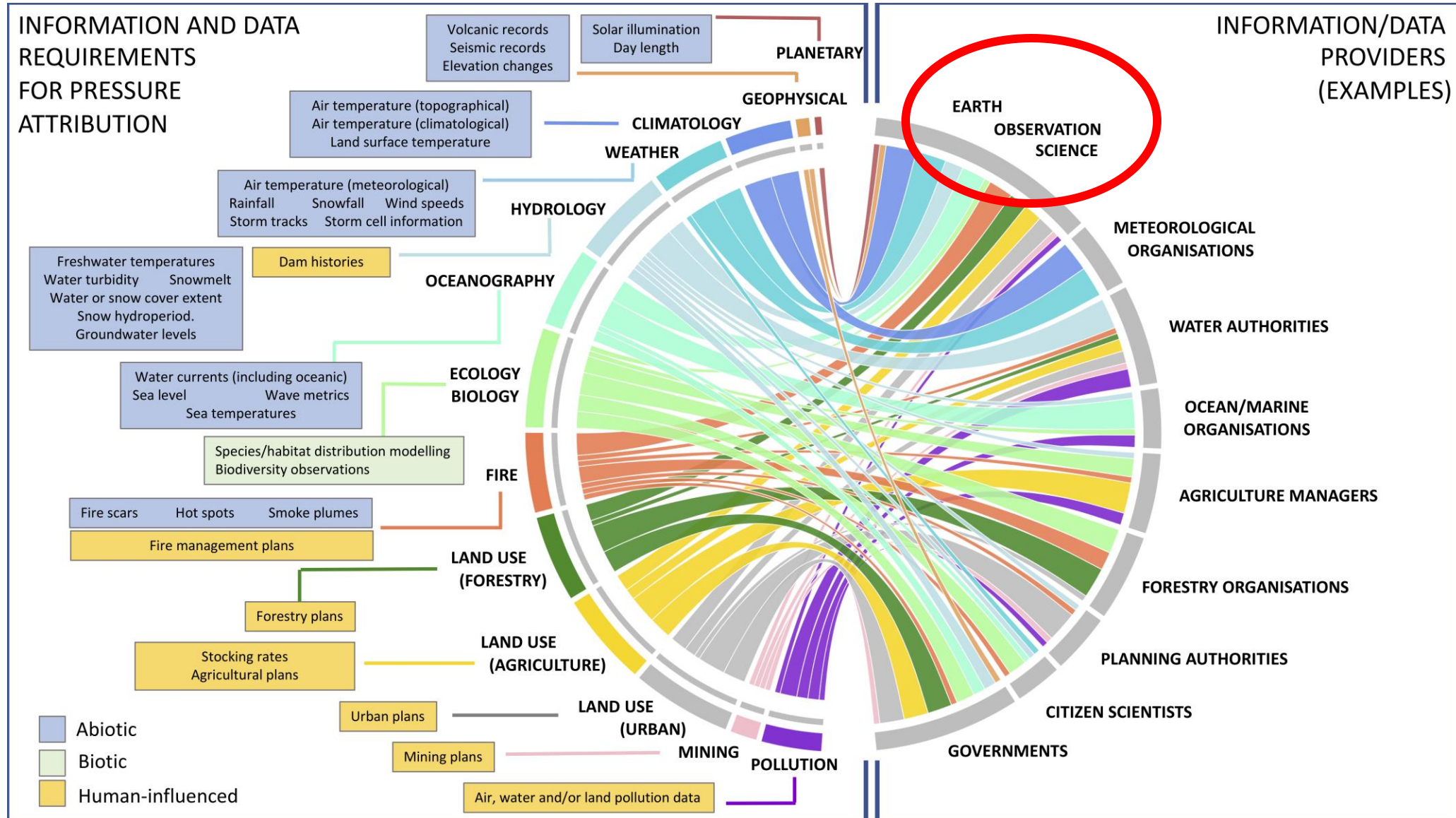


This project has received funding from the European Union's Horizon 2020 Research and Innovation Action programme under Grant Agreement No 101004157

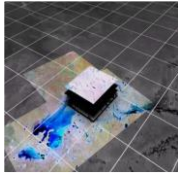


Copernicus Assisted Lake Water Quality Emergency
Monitoring Service

EO supports input data needs



International perspective

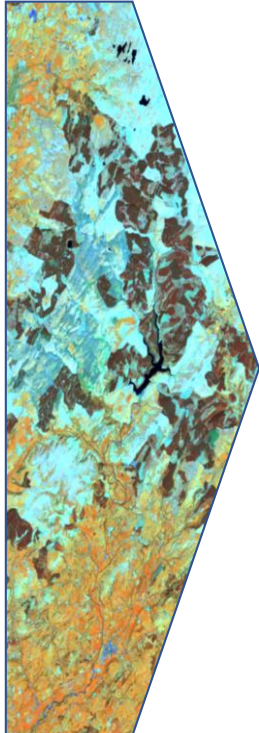


Monitoring progress towards ambitions

DIGITAL INFRASTRUCTURE

Provide capacity for detection of change in the past over varying time-frames

Earth Observation Data
Acquisition and Processing to an Analysis Ready Format



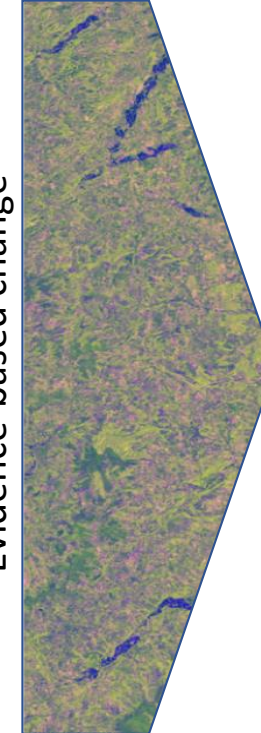
Environmental Descriptors



Land Cover Classifications
Historical and near real time



Evidence-based change



Delivery to Stakeholders
Policy, Economy, Environment and Society

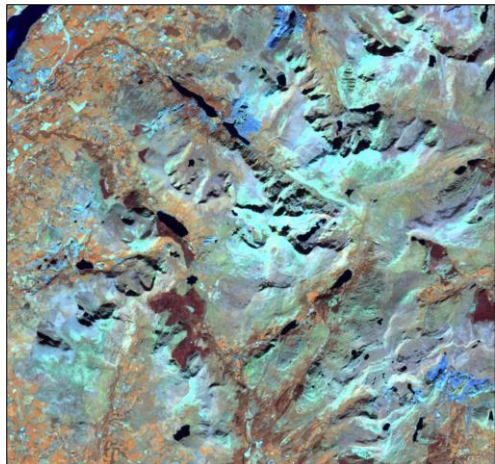
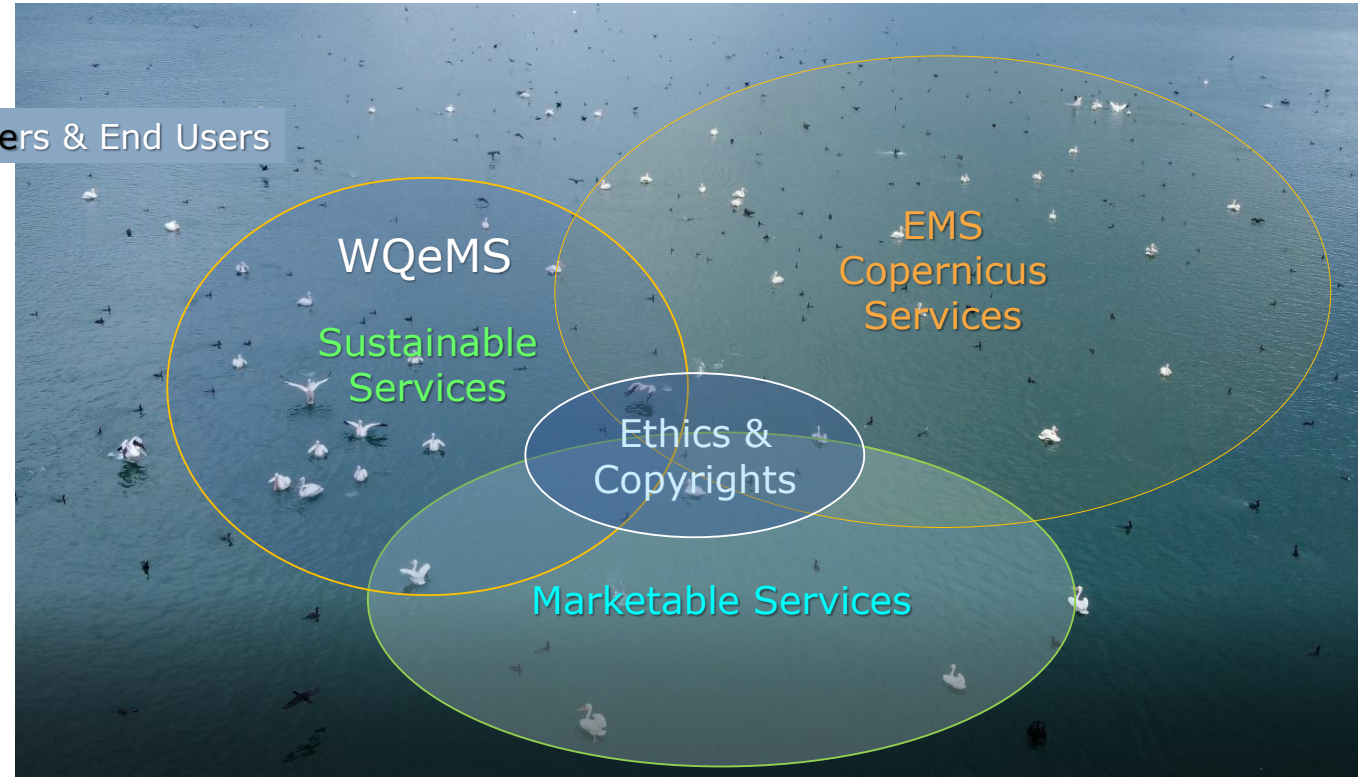
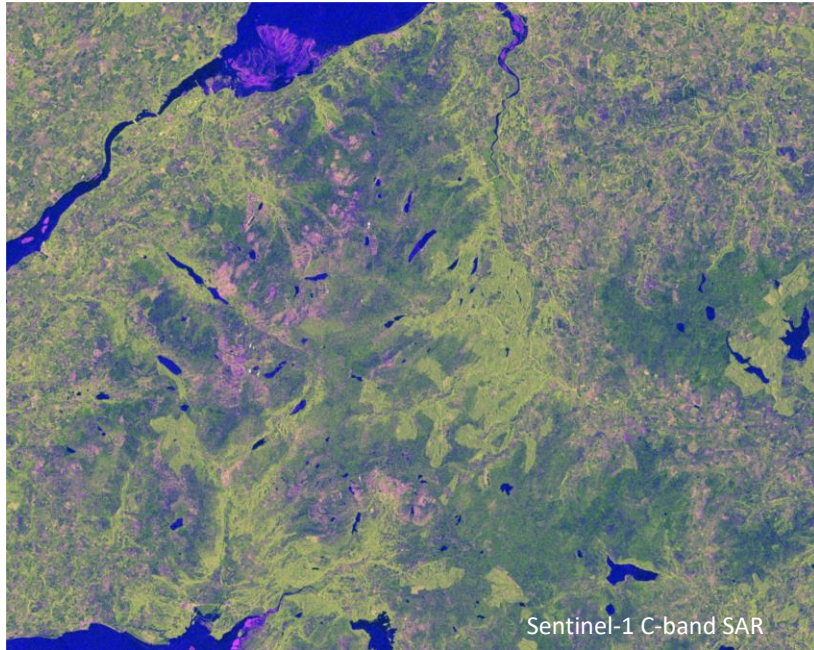


Calibration and Validation
(Field and airborne)

Provide options for ensuring that this capacity is transferred into Governments or similar; and as an open resource.

ENGAGEMENT

Seeking cross-border solutions



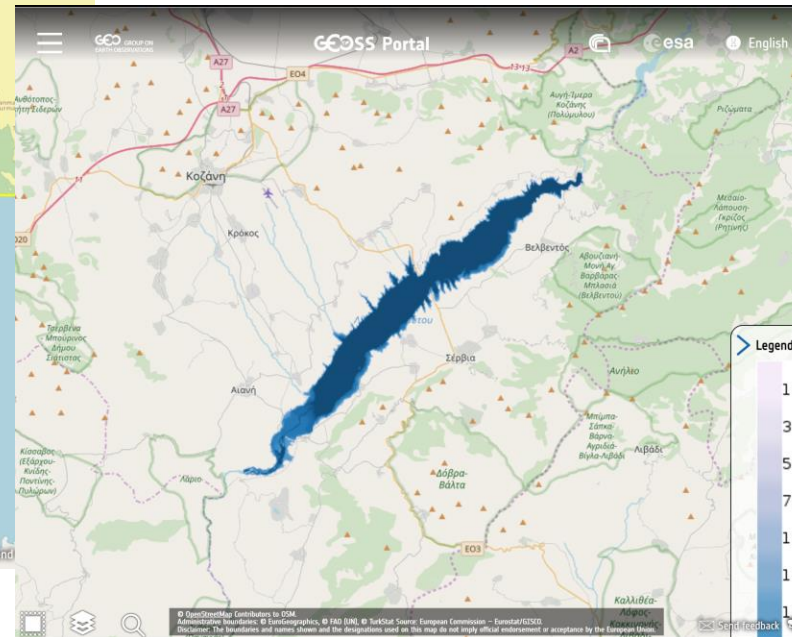
Sentinel-2 Optical Data

Analysis Ready Data

Products &
Services

to overcome expertise,
capacity, infrastructure and
IPR barriers

EDs linking to GEOSS

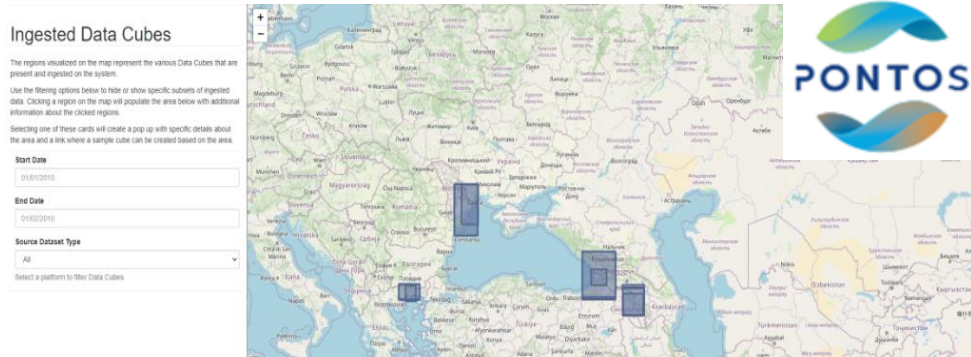
GEOSS is a set of coordinated, independent Earth observation, information and processing systems that interact and provide access to diverse information for a broad range of users in both public and private sectors. This 'system of systems', through its GEOSS Platform, proactively links together existing and planned observing systems around the world and support the need for the development of new systems where gaps currently exist. It will promote common technical standards so that data from the thousands of different instruments can be combined into coherent data sets. The WQeMS Platform has been federated with the GEOSS Platform, so that all the open datasets generated by the platform are made available on the GEOSS ecosystem. Click on the button to reach the Portal and visualize WQeMS data.

[Go to GEOSS Portal →](#)



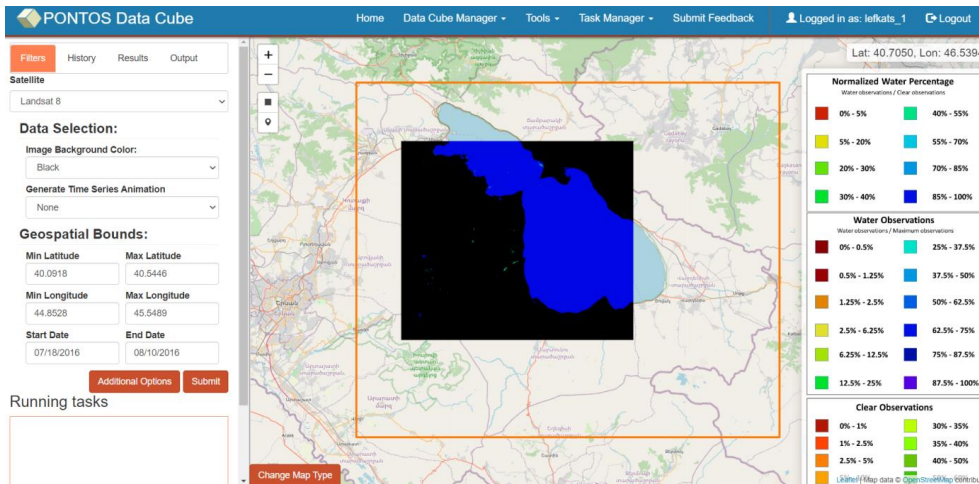
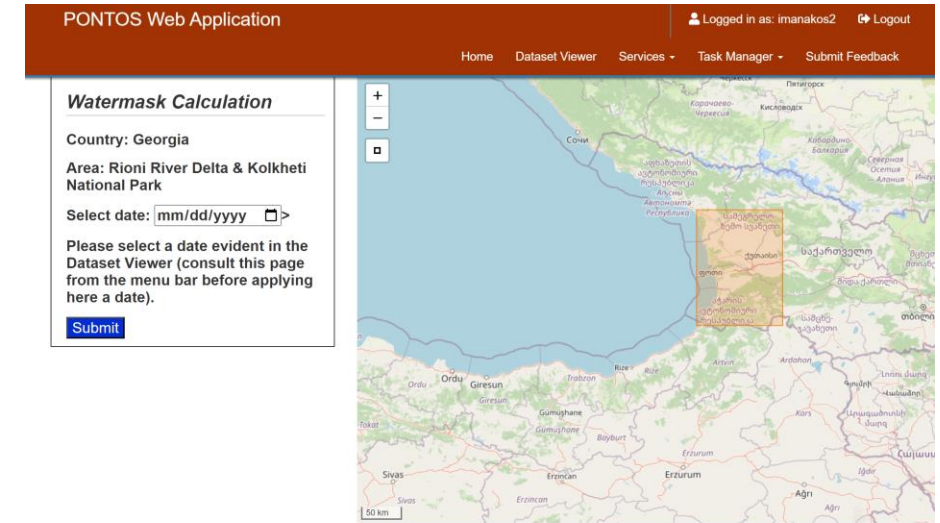
Incl. muddy water mapping service; Hydrocarbon mapping service for inland waters; Flood mapping | CC-BY-NC-SA 4.0

What about ODCs: National examples

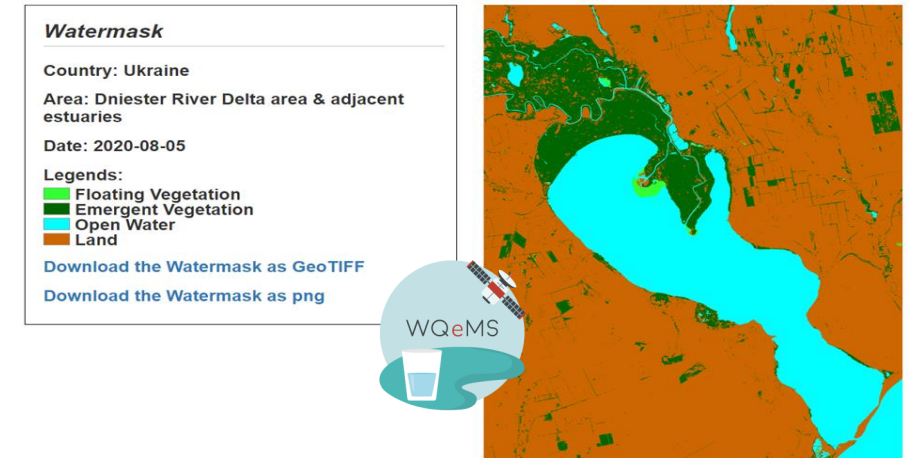


← Utilization of Existing tools

Including capacity building activities, such as practical schools for professionals and training for trainers, webinars

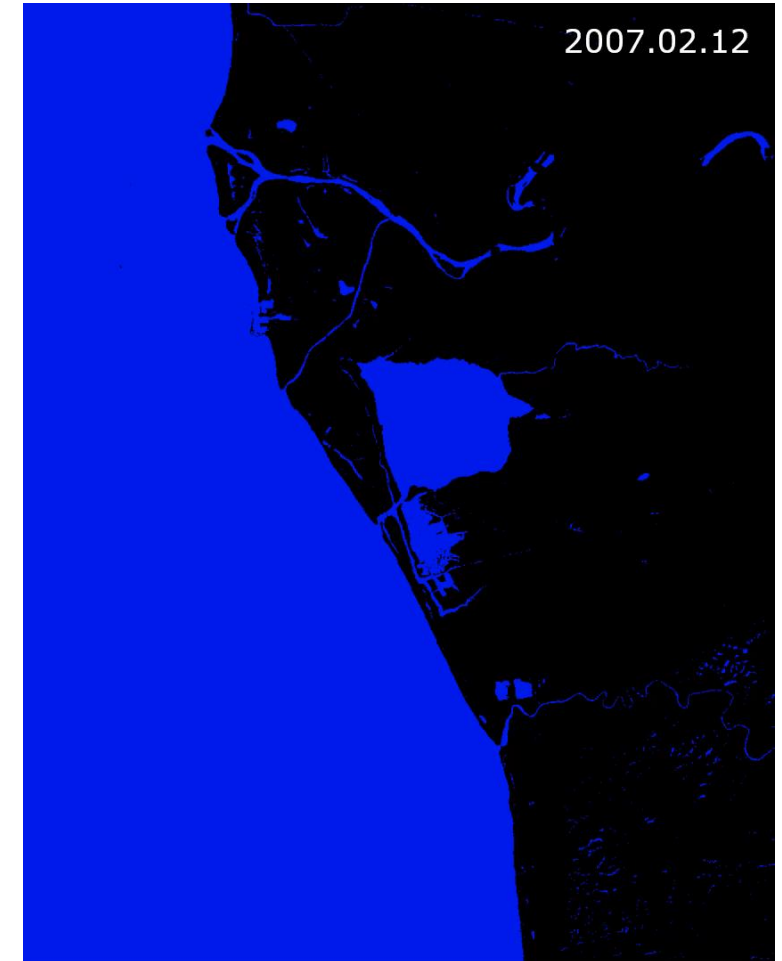
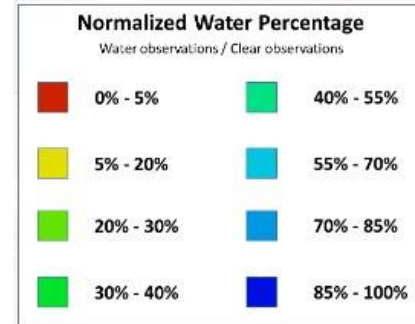
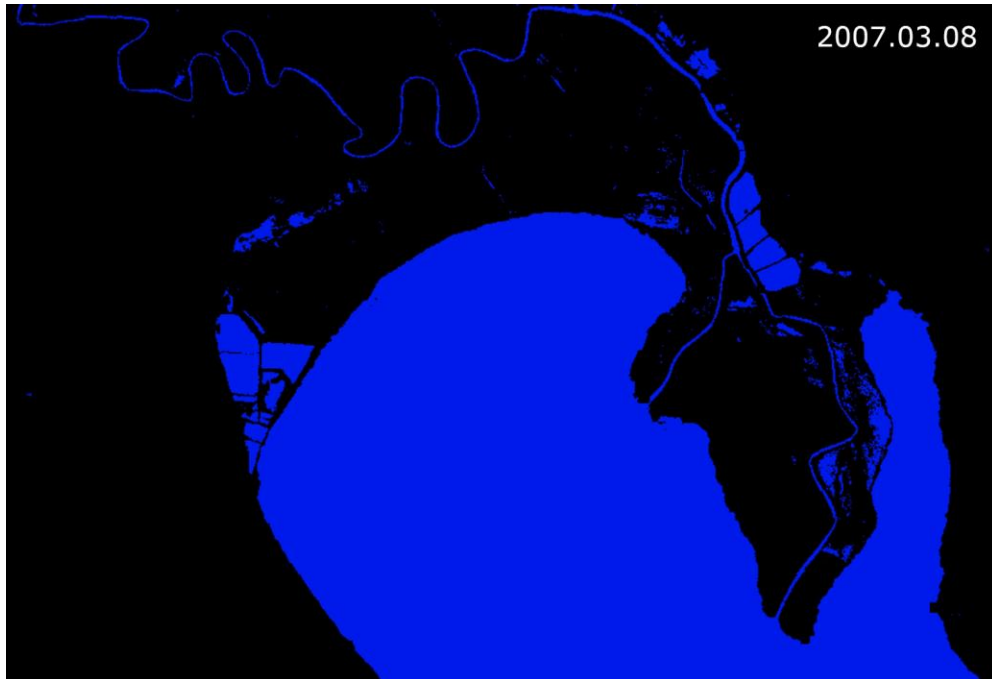


Development of New tools →

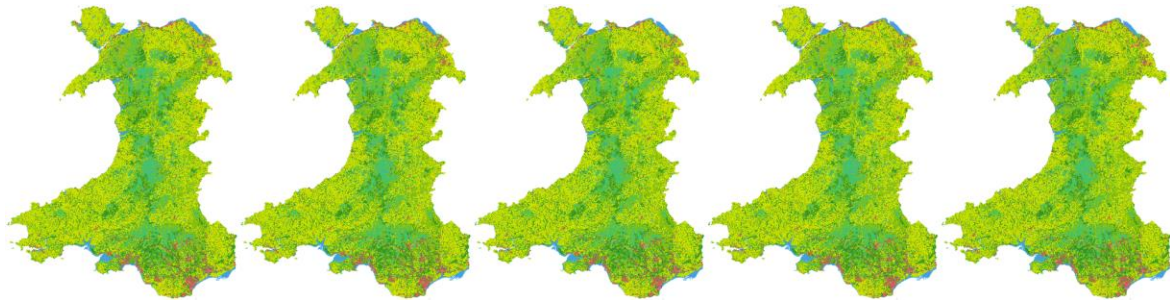


I. Manakos, E. Katsikis, S. Medinets, Y. Gazyetov, L. Alagialoglou, V. Medinets, Identification of Emergent and Floating Aquatic Vegetation Using an Unsupervised Thresholding Approach: A Case Study of the Dniester Delta in Ukraine, 9th International Conference on Geographical Information Systems Theory, Applications and Management, April 25-27 2023, Prague, Czech Republic, DOI: 10.5220/0012024000003473

Monitoring through time

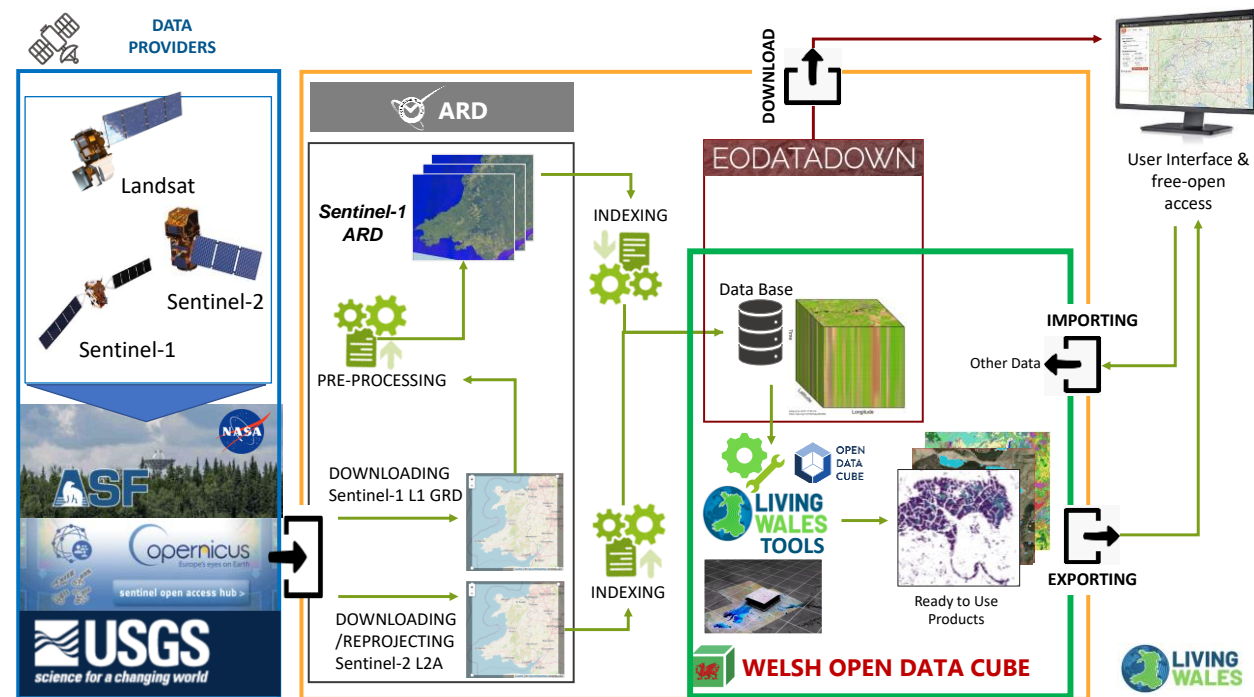
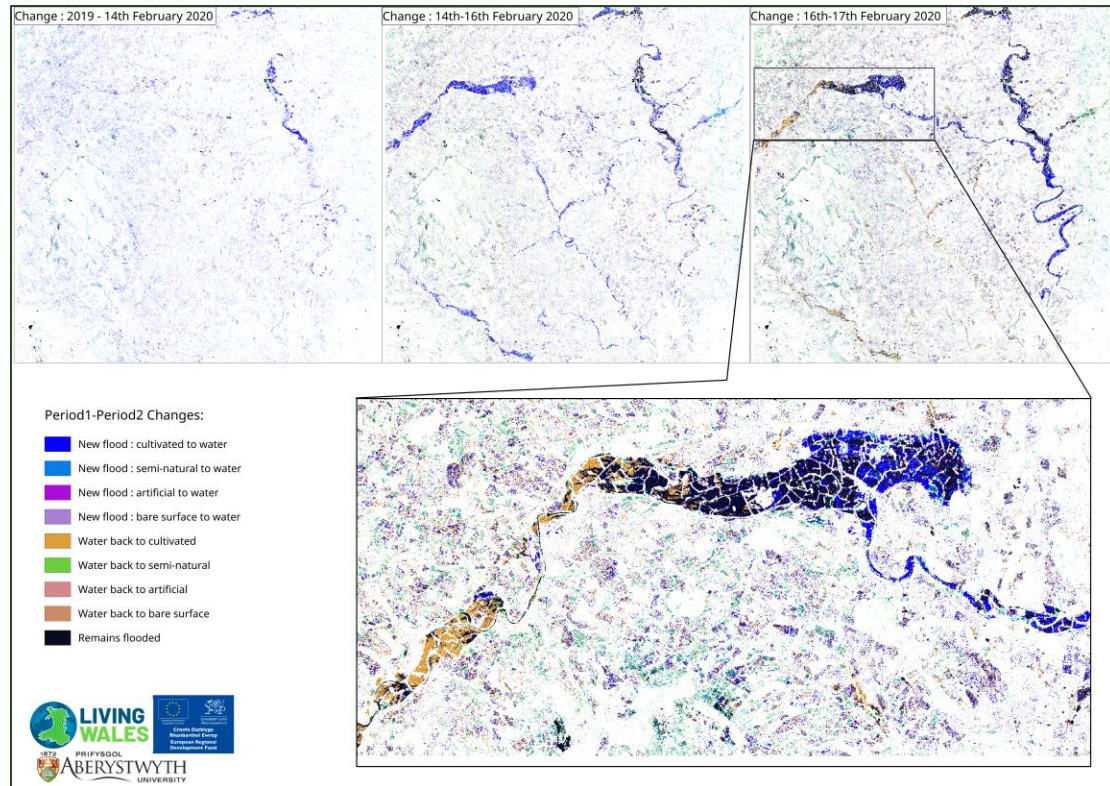


Change detection ability towards ODC



In 2020, Wales experienced some of the largest flooding on record.

Living Wales was able to map the progression of the flood waters through the landscape, the land covers that were inundated and also re-exposed as the flood waters receded.



ODCs contribution to GEO

- Awareness of the open platform helps to give other members something to consider in responding to their own needs for large scale EO processing, so a coordinated approach is fairly essential
 - GEO is one option in this regard.
- The platform also can help generate community contributions – ODC is already a community with many implementations, and code sharing is at its core
 - This fits well in GEO.
- While the data cubes are separate, they share the ODC API, so there is considerable scope for sharing and even adapting algorithms from one data set to another, as has been demonstrated between DE-Australia and DE-Africa, Living Wales and other ODC instances
 - Tools developed in Australia are being successfully used in other countries for their own needs.
- GEO infrastructure itself need not necessarily change. A community of practice is needed to help share ideas and develop the ODC API as new technologies and sensors become available
 - For instance, better ARD methods, sensor agnostic algorithms, multi-sensor approaches, and synthetic data (such as possible through data blending). [CEOS is already working in this space (e.g., WGISS), so there is an opportunity is to collaborate with CEOS in building the community]



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Tackling Challenges I



The Food and Agriculture Organisation (FAO) Land Cover Classification System (LCCS) provides an avenue for Global Consistency and Scalability over space and time.

The Global Change Taxonomy provides capacity to detect and describe change based on change impacts and pressures, and links to the Driver-Pressure-State-Impact-Response (DPSIR) framework

Many of the pressures leading to change could be contributed by information provided through GEO and Open Data Cubes (based on open data).

Provide capacity to address all levels of users, from landholders (e.g., farmers) to authorities/agencies (e.g., water) to policy (local to international).

Wiley Online Library

Global Change Biology

RESEARCH ARTICLE | Open Access | CC BY

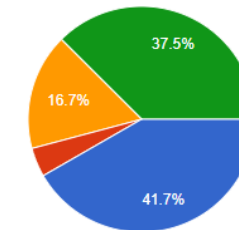
A globally relevant change taxonomy and evidence-based change framework for land monitoring

Richard M. Lucas, Sophia German, Graciela Metternicht, Rebecca K. Schmidt, Christopher J. Owers, Suzanne M. Prober, Anna E. Richards, Sally Tetreault-Campbell, Kristen J. Williams ... See all authors

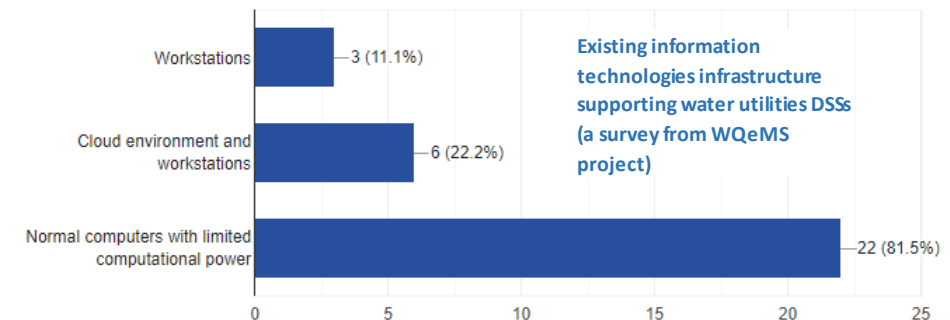
First published: 01 September 2022 | <https://doi.org/10.1111/gcb.16346>

R. M. Lucas, S. German, G. Metternicht, R. K. Schmidt, C. J. Owers, S. M. Prober, A. E. Richards, S. Tetreault-Campbell, K. J. Williams, N. Mueller, B. Tissot, S. M. T. Chua, A. Cowood, T. Hills, D. Gunawardana, A. McIntyre, S. Chognard, C. Hurford, C. Planque, S. Punalekar, D. Clewley, R. Sonnenschein, N. J. Murray, I. Manakos, P. Blonda, K. Owers, S. Roxburgh, H. Kay, P. Bunting, C. Horton, A globally relevant change taxonomy and evidence-based change framework for land monitoring, 2022, Global Change Biology, 00, 1–25, DOI: <https://onlinelibrary.wiley.com/doi/10.1111/gcb.16346>

Main monitoring means by the users (source : WQeMS)

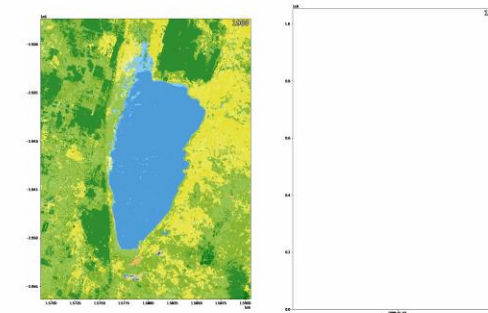


- In situ sensors
- In situ sensors, remote sensors (airborne sensors)
- In situ sensors, remote sensors (airborne sensors, spaceborne sensors)
- Remote sensors (airborne sensors or spaceborne sensors)



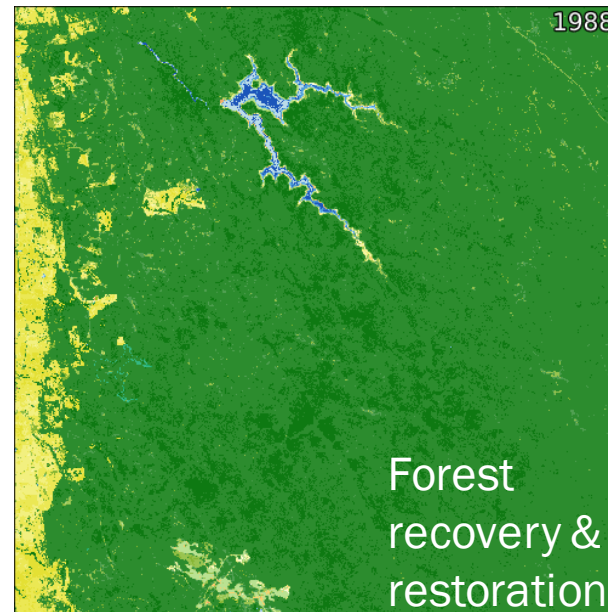
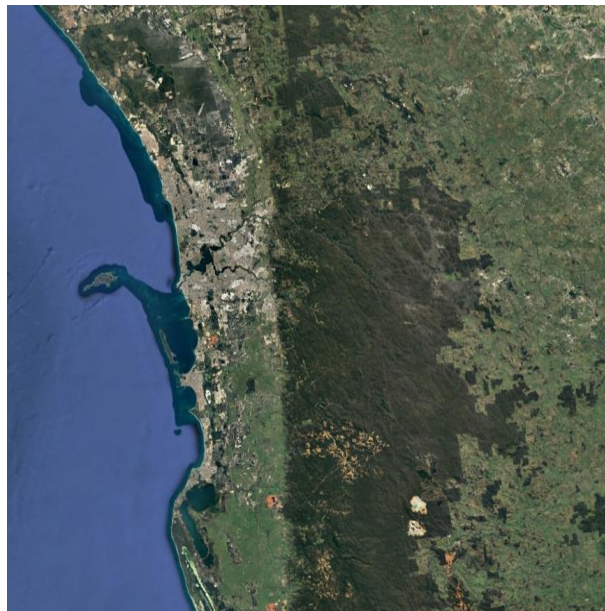
Tackling Challenges II

Help other countries set up data cubes (as Australia did for Wales) in strong partnerships that allows transfer of ODC capability but also applications

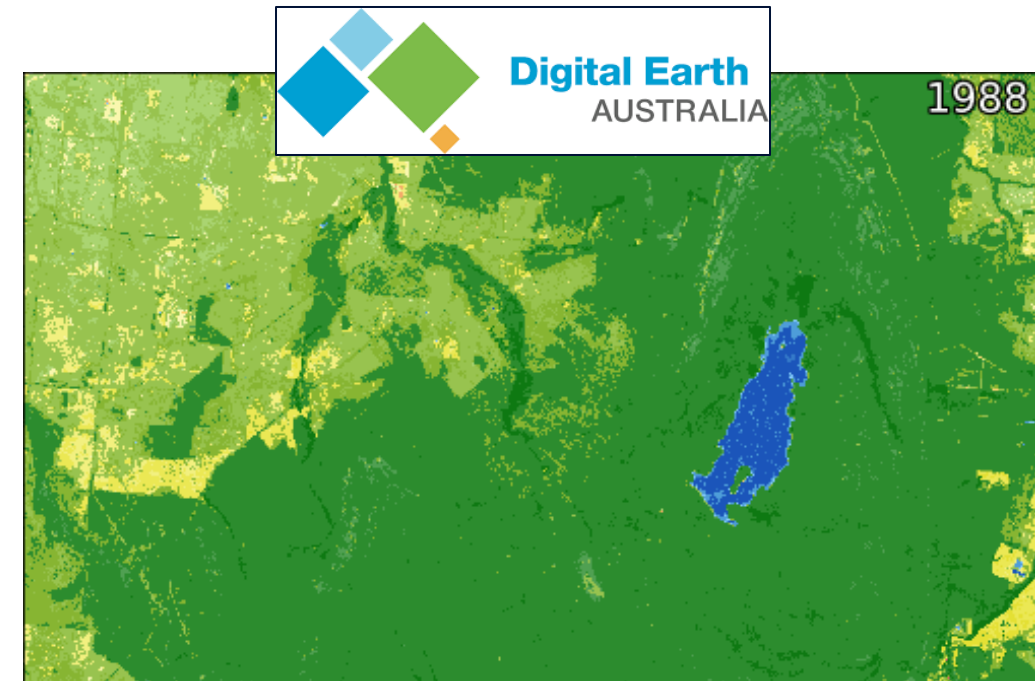


Water dynamics
(Lake George, New South Wales)

Use this information to help proactive restoration and sustainable use of landscapes.



Forest
recovery &
restoration



Assessing risk based on the probability of change (1984- 2020)

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