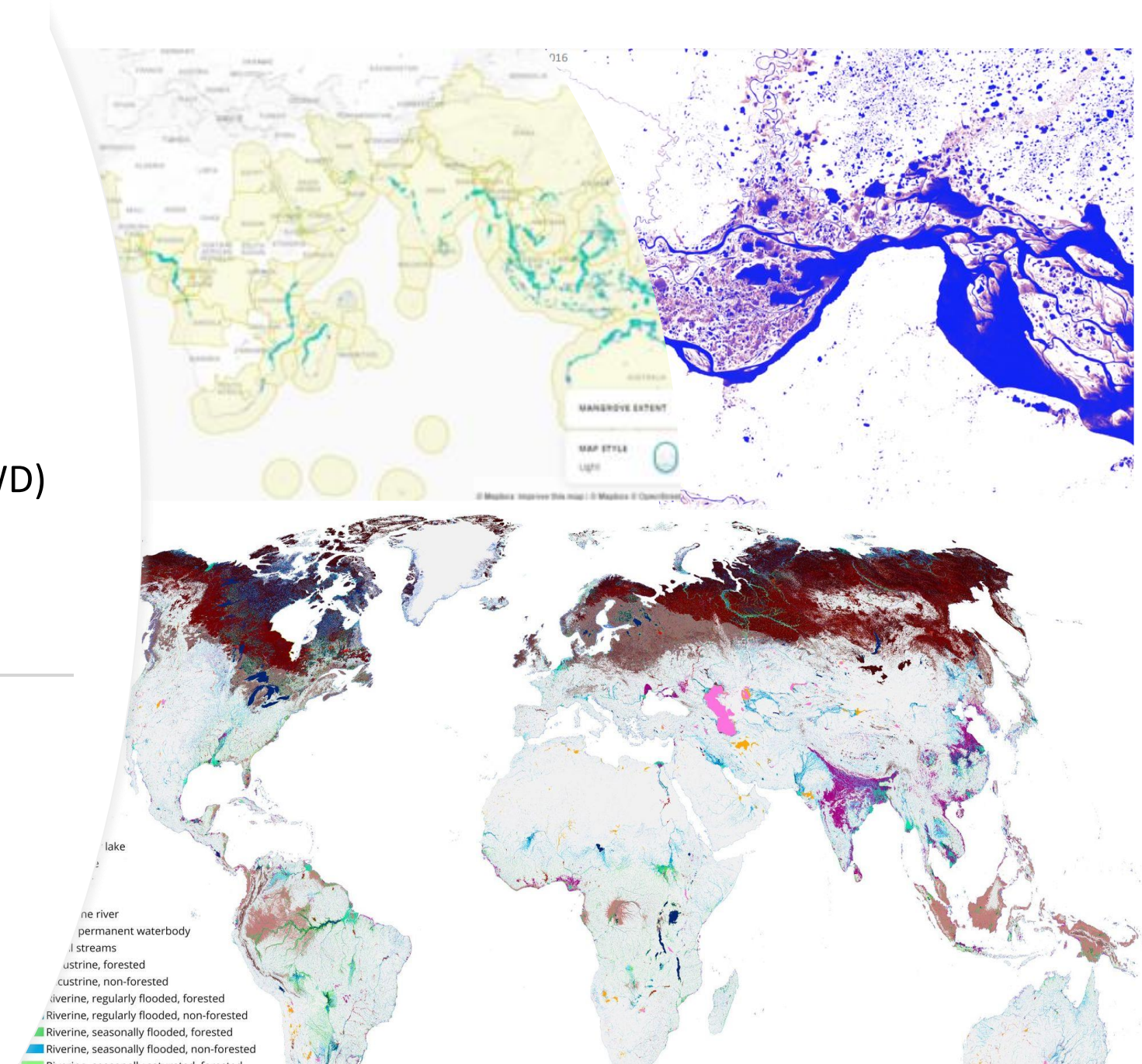
GLOBAL WETLAND WATCH

A new system for globally mapping and monitoring changes to wetland ecosystems

Towards high resolution global datasets

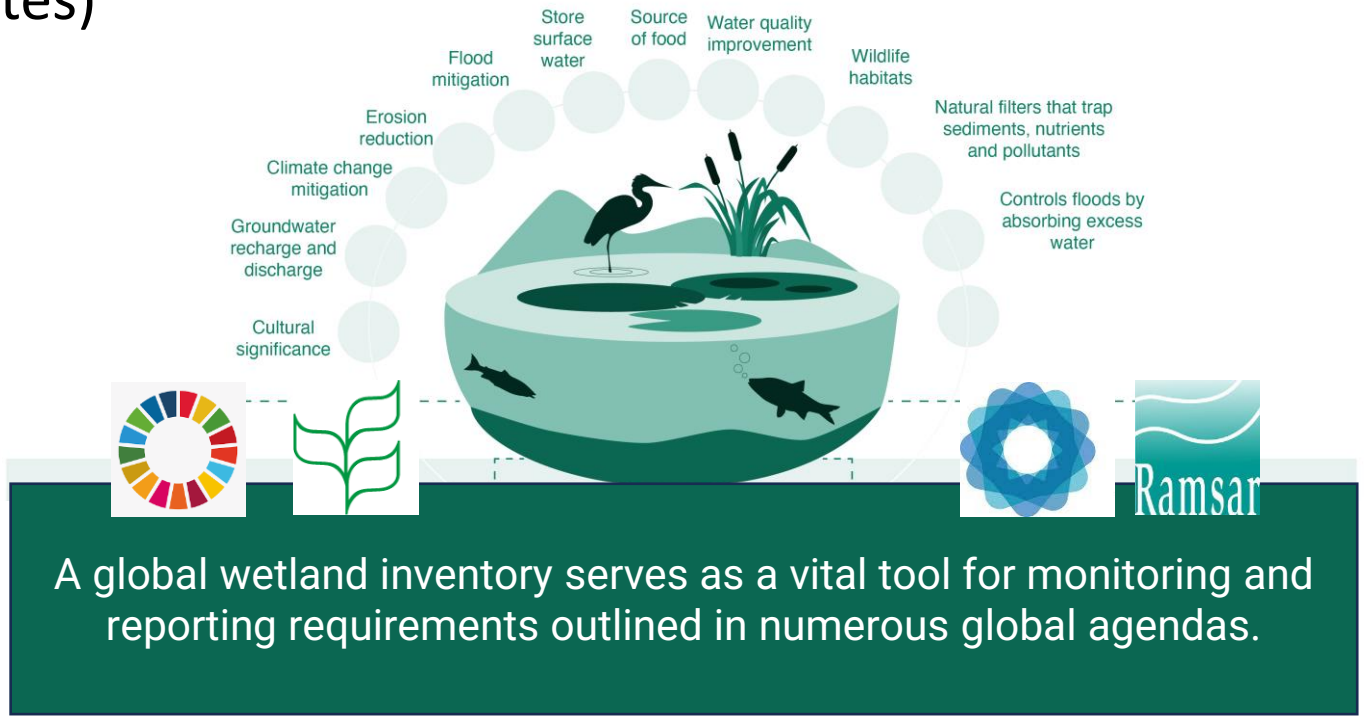
- Global Mangrove Watch
- Global Surface Water Explorer
- Global Lakes and Wetlands Database (GLWD)
- Global tidal flat
- Etc.

Limited in thematic, and or spatial/temporal resolution



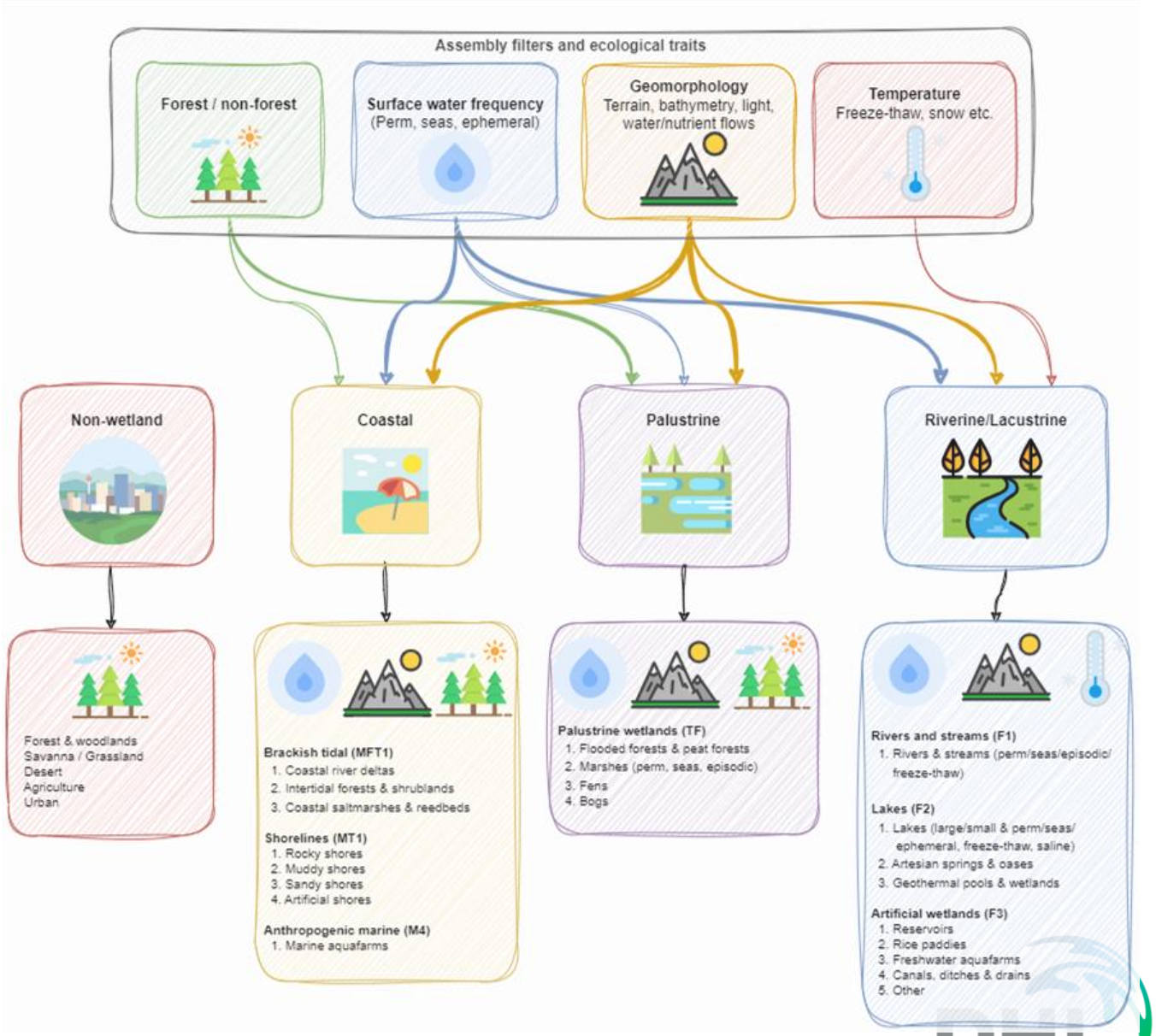
Objective and scope

- Monitor and map ‘all’ wetlands at scale in 10m spatial resolution (with annual updates)
- Contribute to global agendas and frameworks
- In collaboration with UNEP and UNEP-DHI
- Funded by Google.org

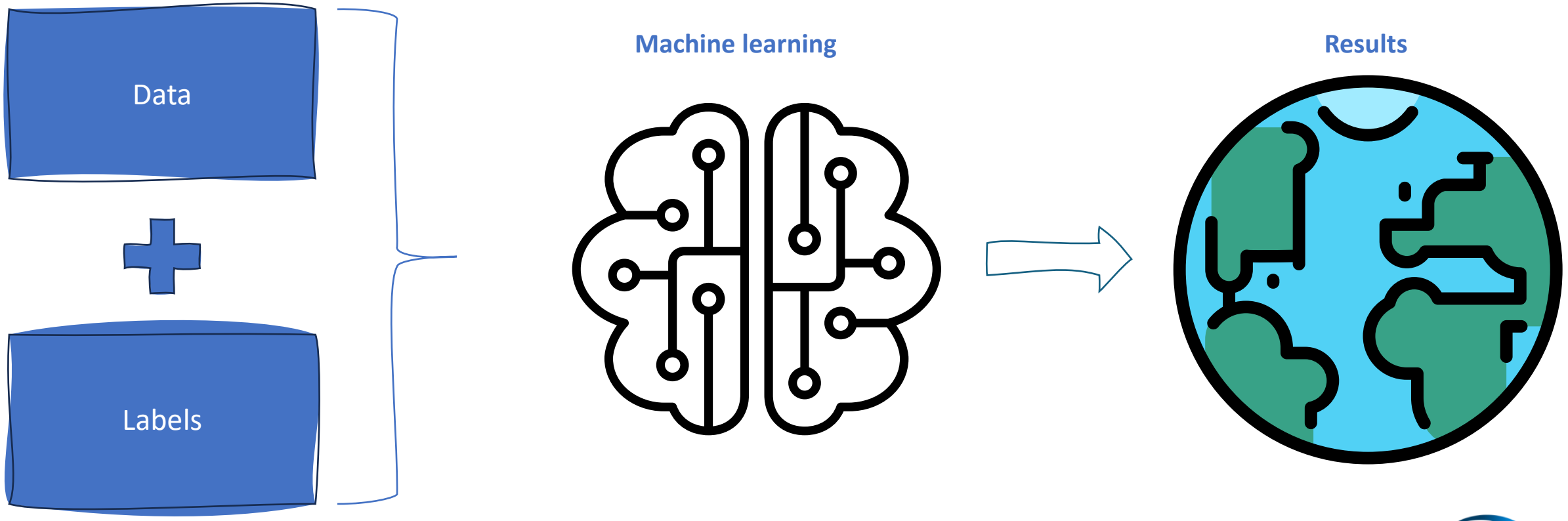


Classification framework

- Wetland types classified using **IUCN Global Ecosystem Typology**
- One-size-fits-all approach not feasible
- **Tailored models** for biomes, ecoregions and a wetland categories
- **Individual workflows** for coastal, palustrine and lacustrine/riverine ecosystems

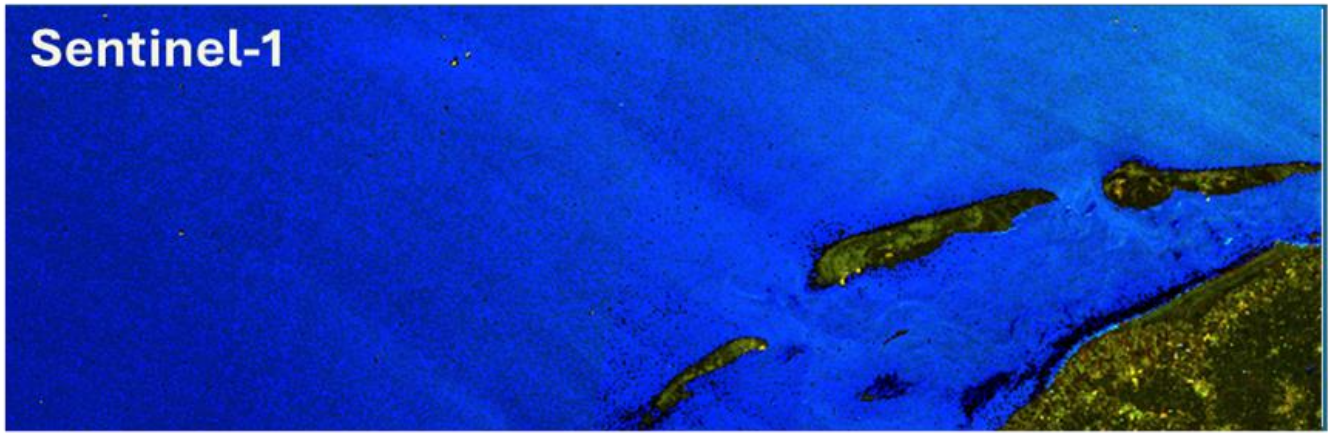


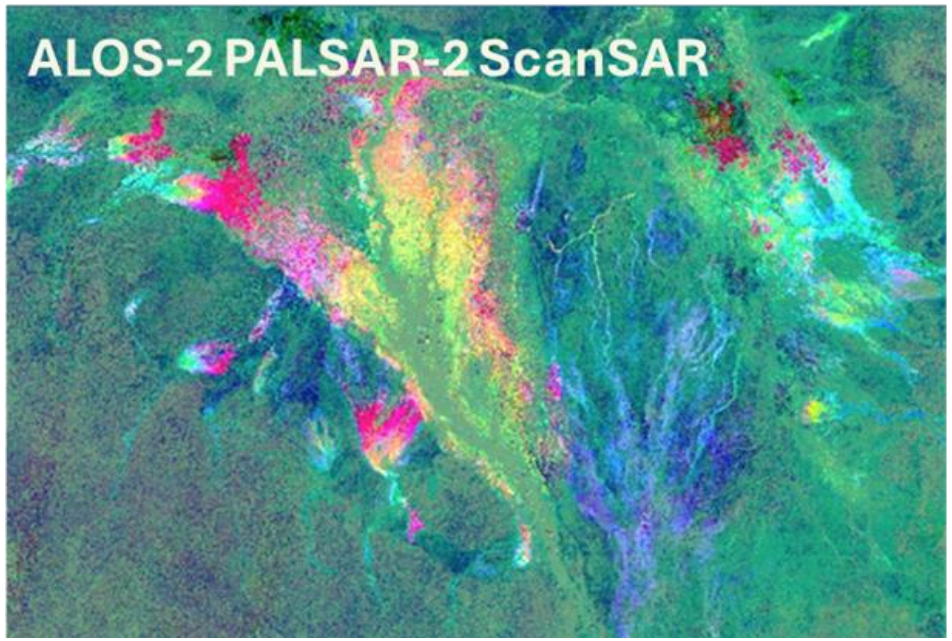
Method

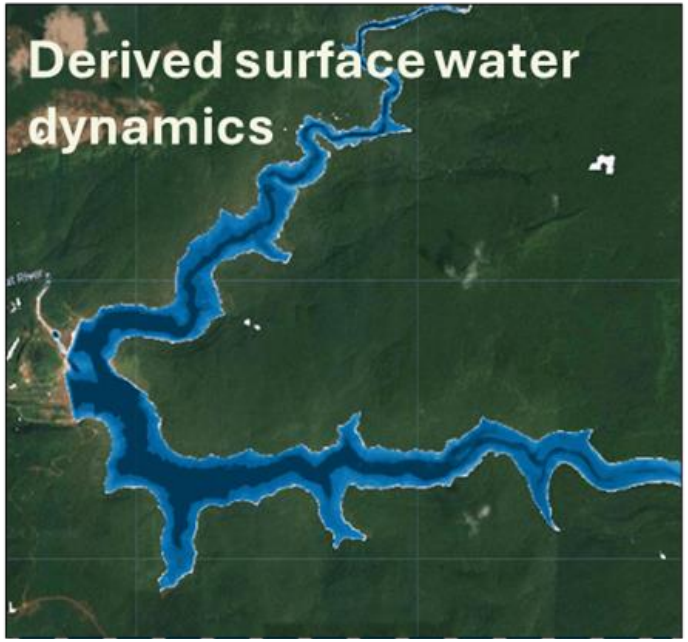


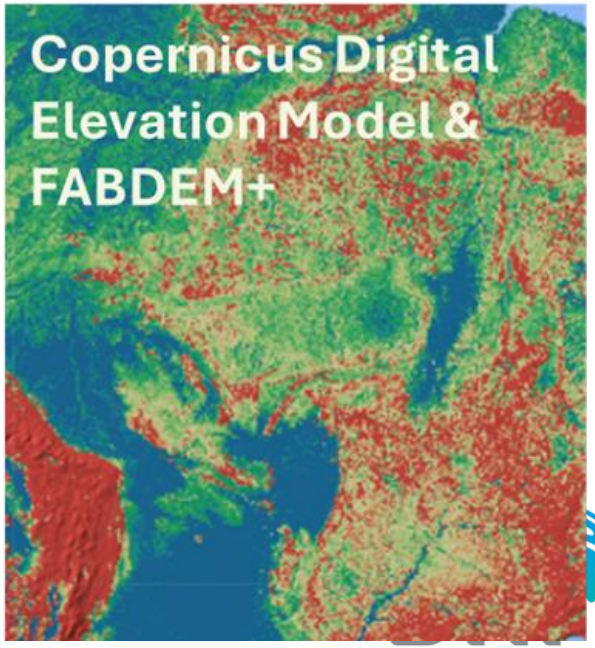
Input data

Multi-data approach allows different types of environmental parameters and processes to be observed





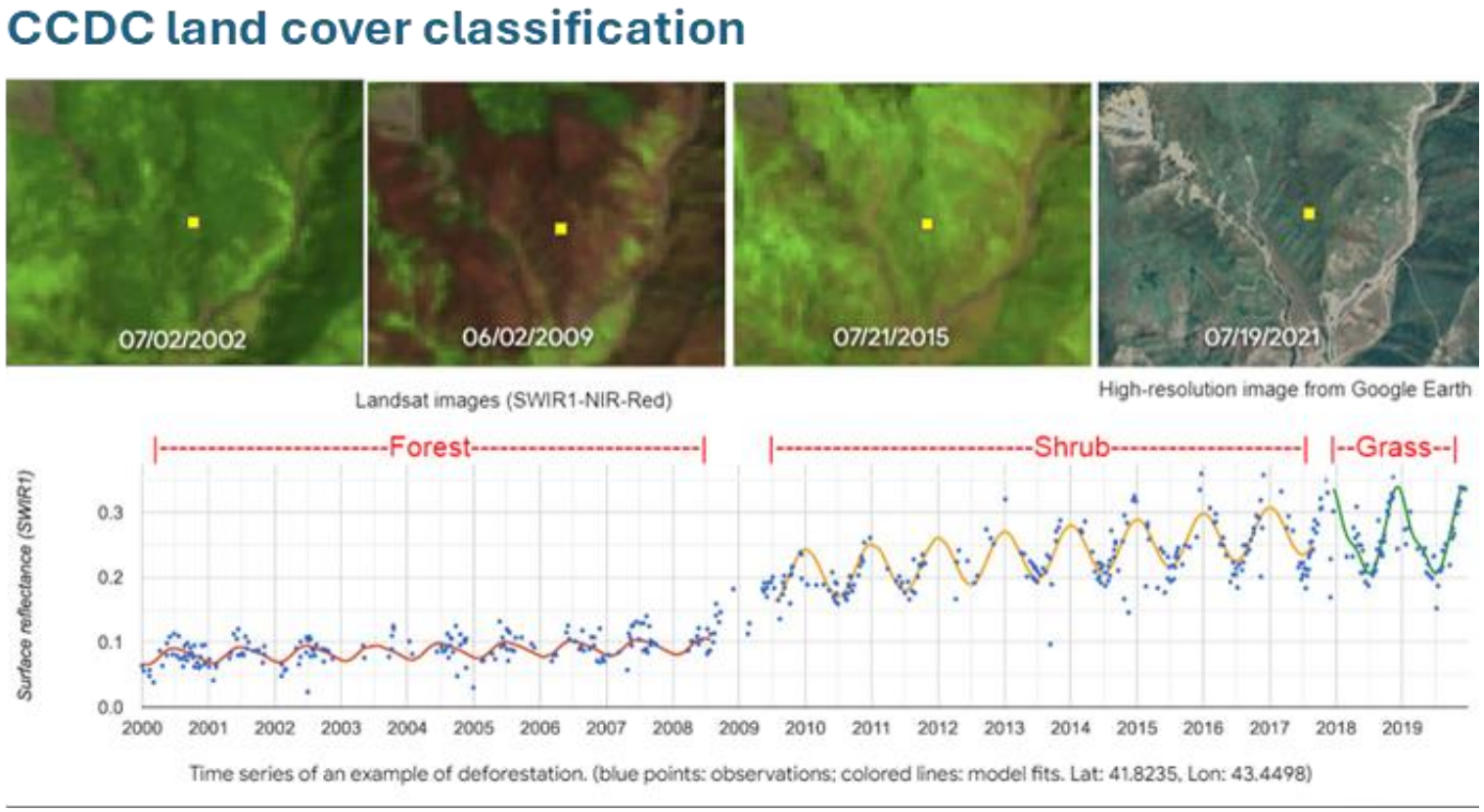




Time series data critical for wetland characterization

Continuous Change Detection and Classification (CCDC)

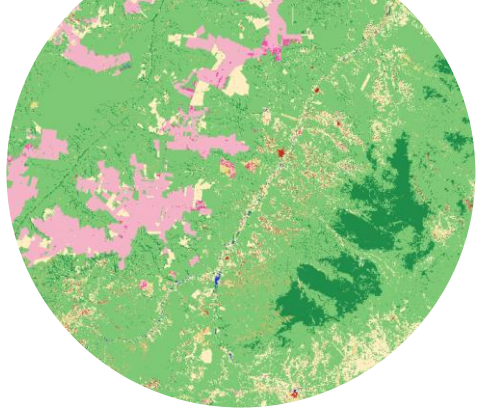
- Uses harmonic regression and trend models to estimate vegetation growth cycles that are critical for distinguishing various types of wetlands

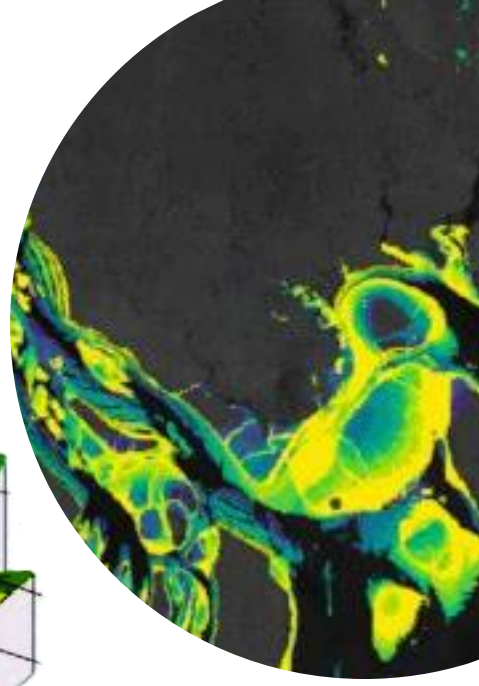


Gradual/seasonal changes vs sudden deviations in CCDC time series

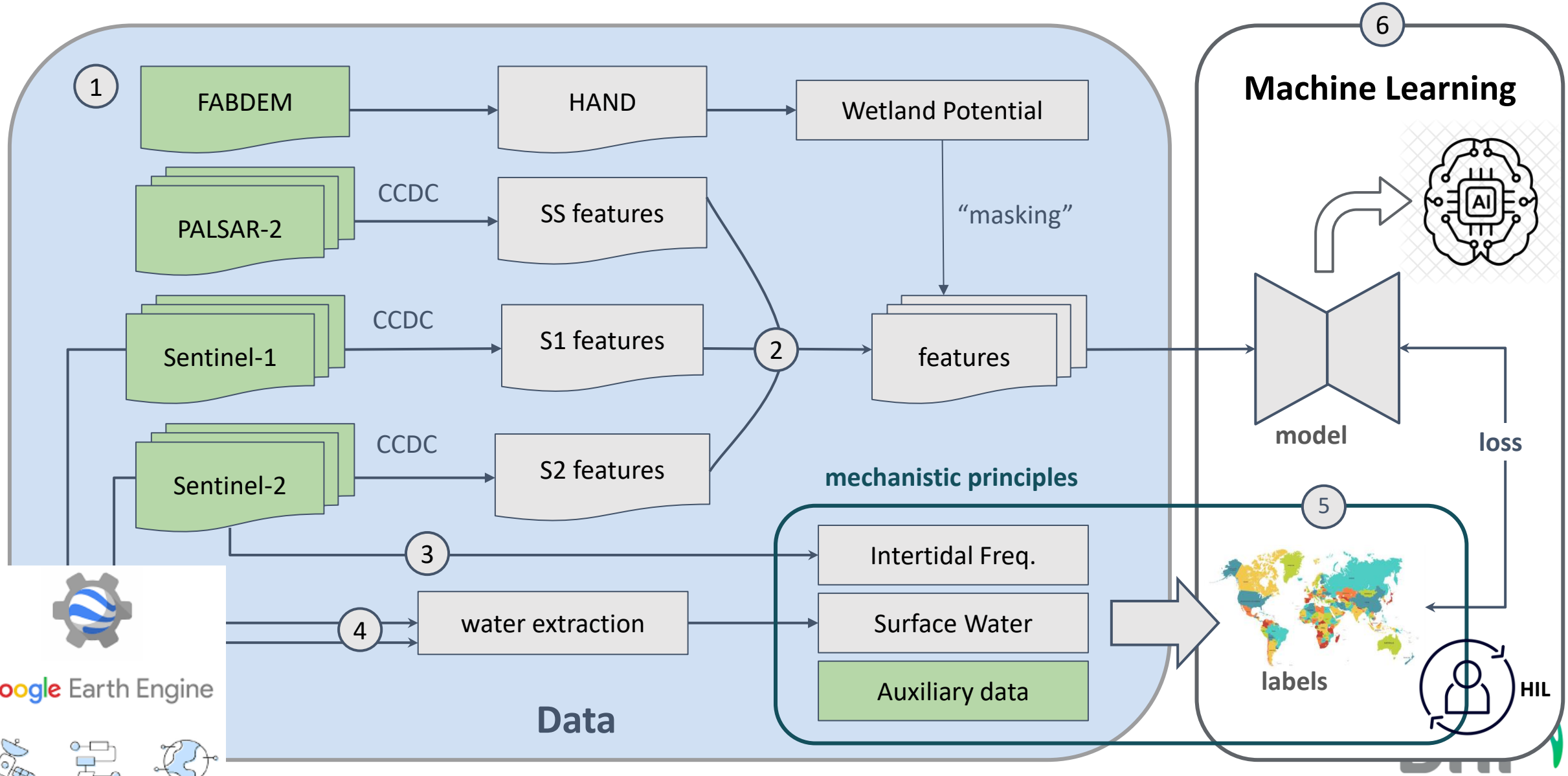
Labels

- High quality labels are required for ML (pixel/patches). No single dataset exists and those that do are imperfect and may require cleaning, and harmonizing.

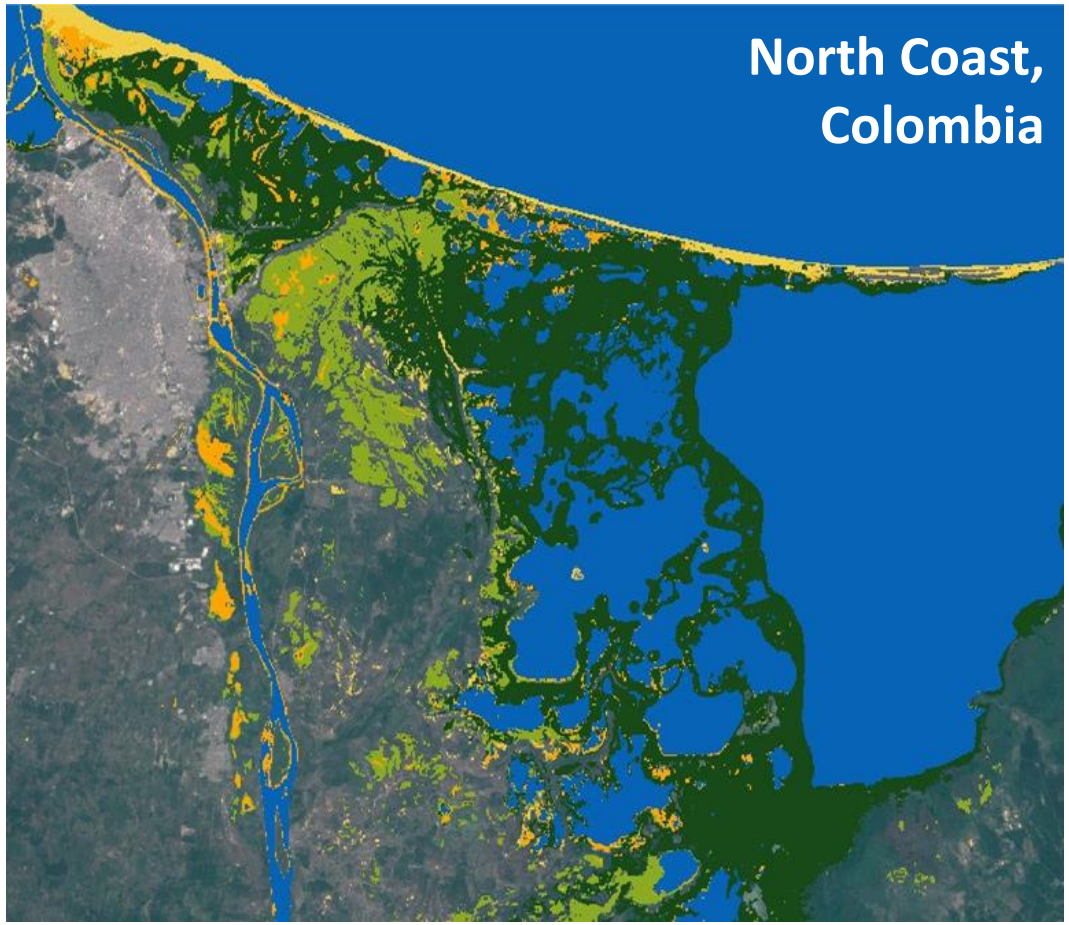


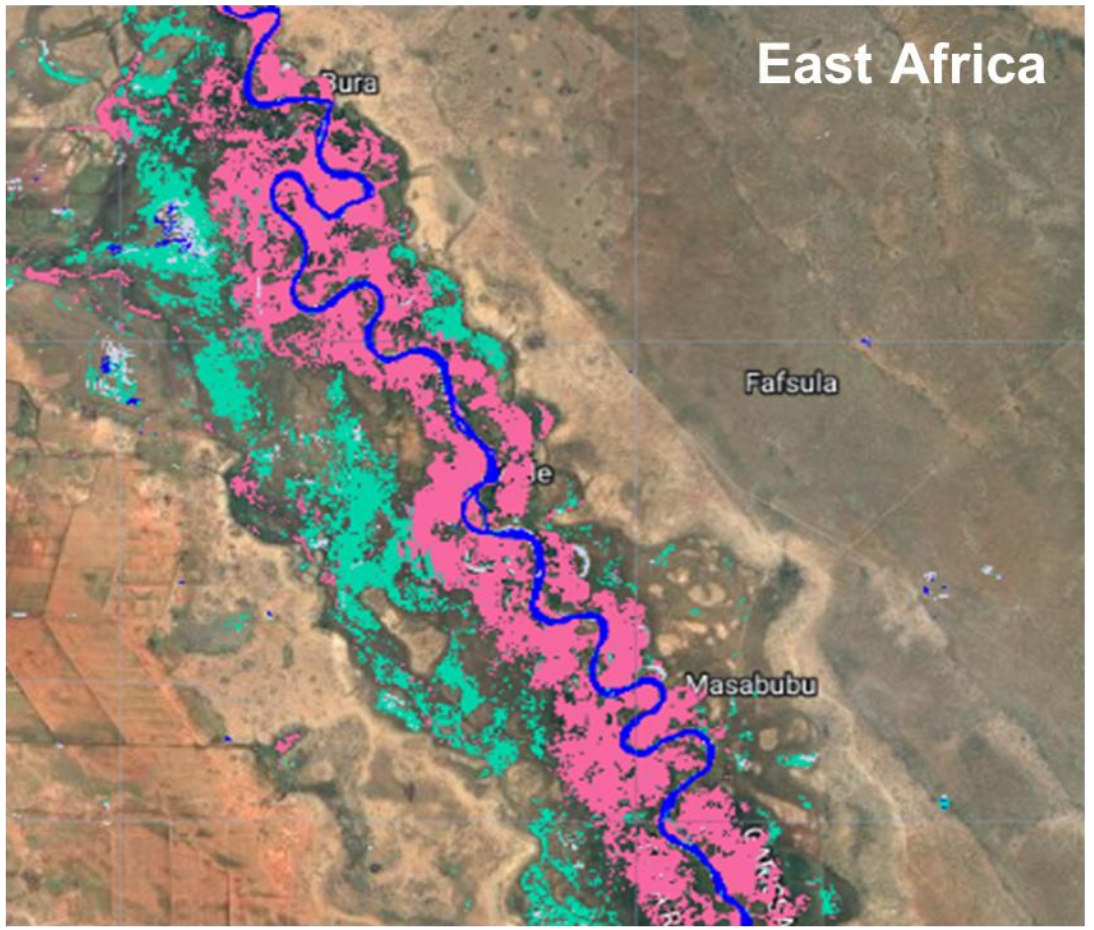


GWW Flowchart: empowered by cloud processing at scale

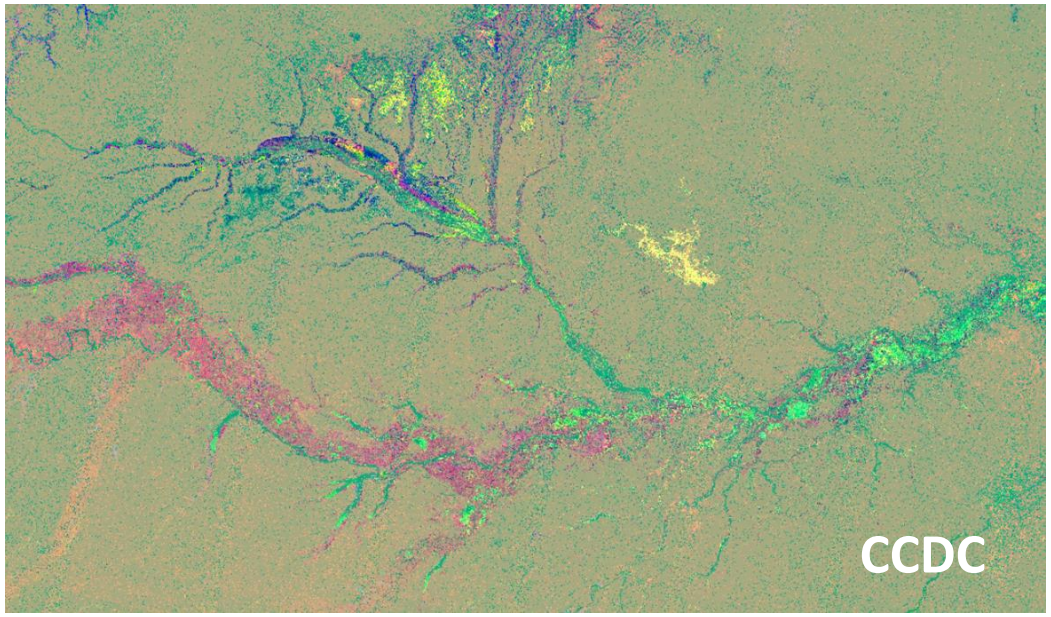


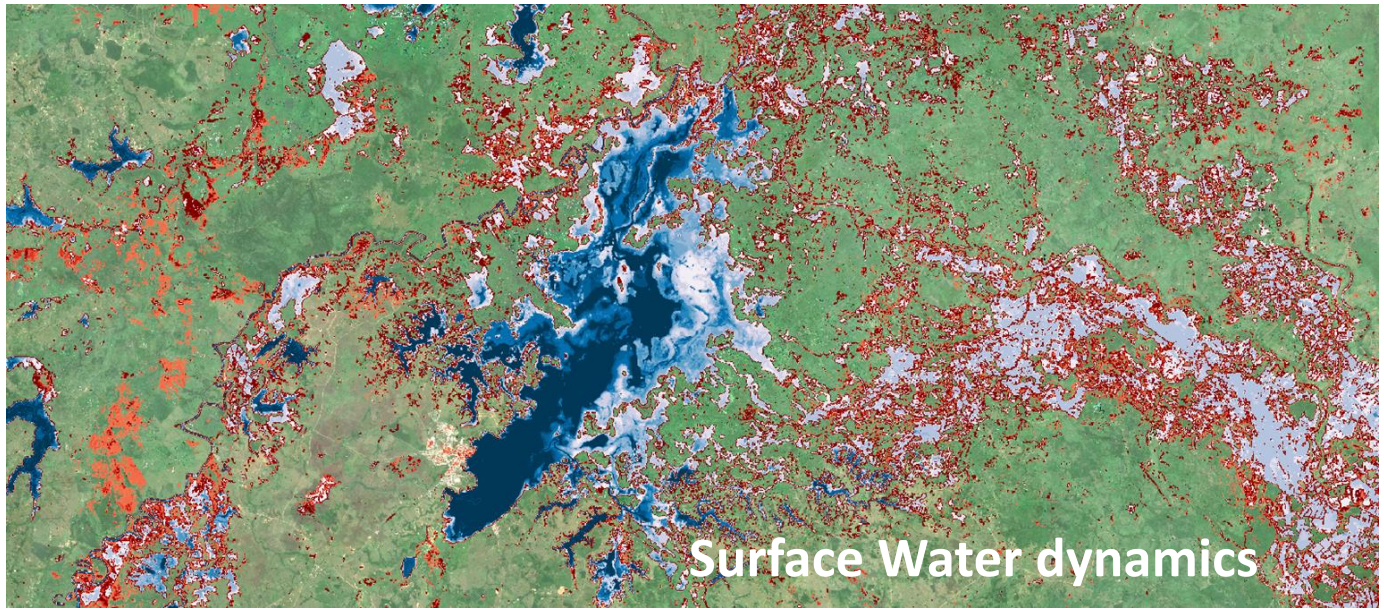
Coastal and Inland Wetland Classification Maps

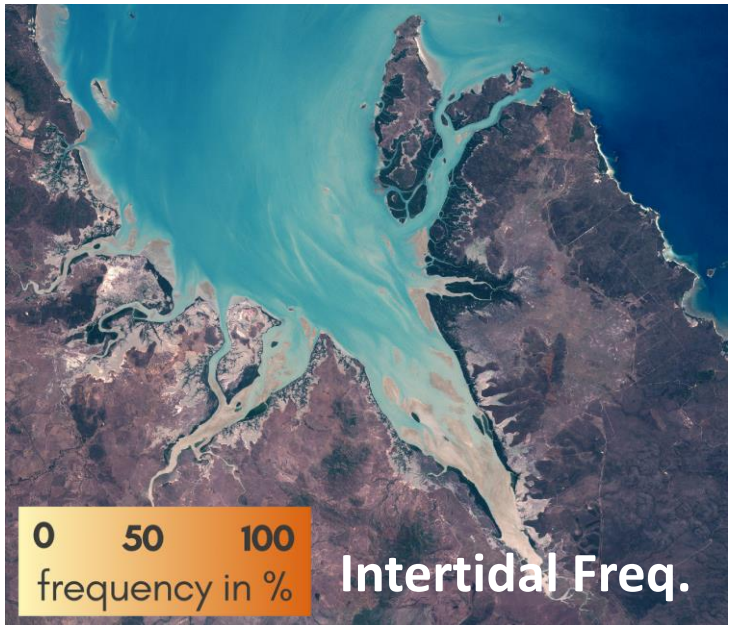


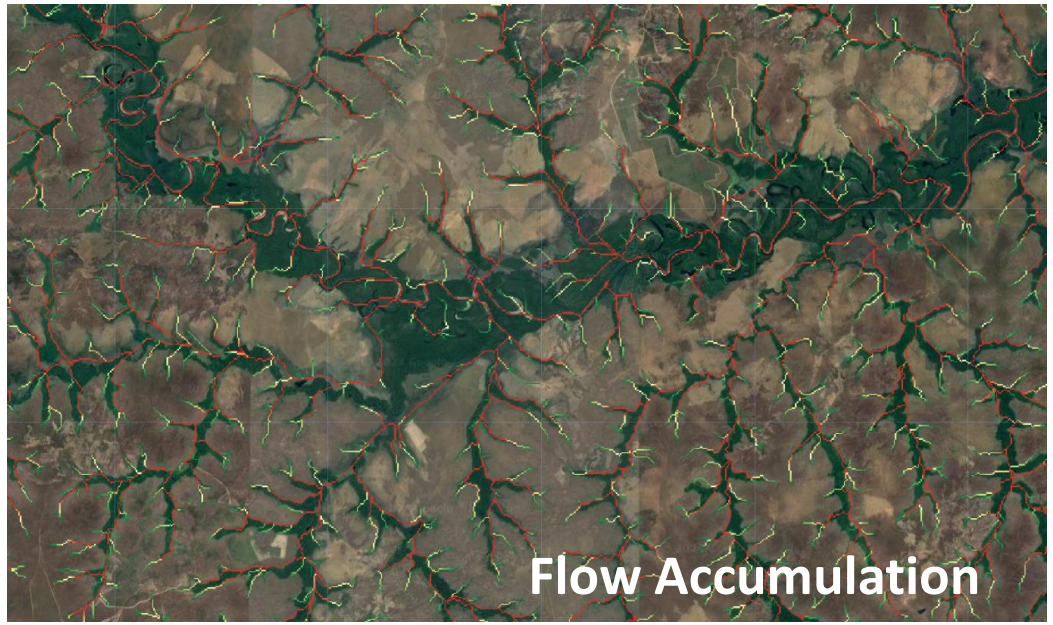


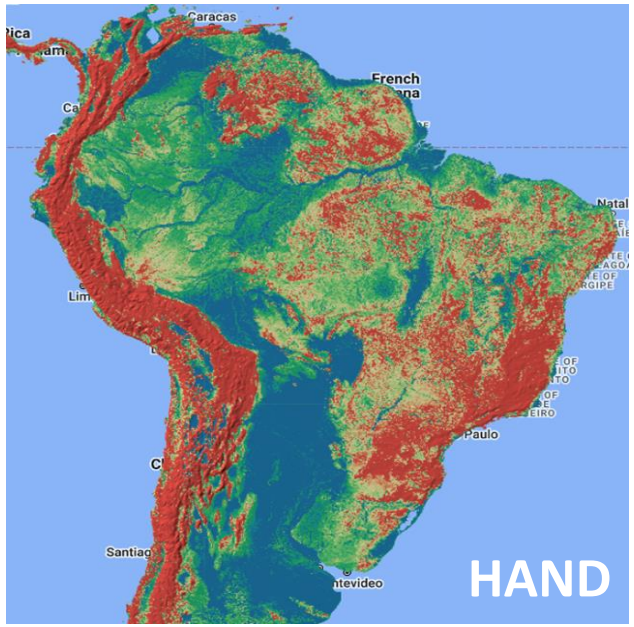
Beyond Classification - Associated products will also be released!







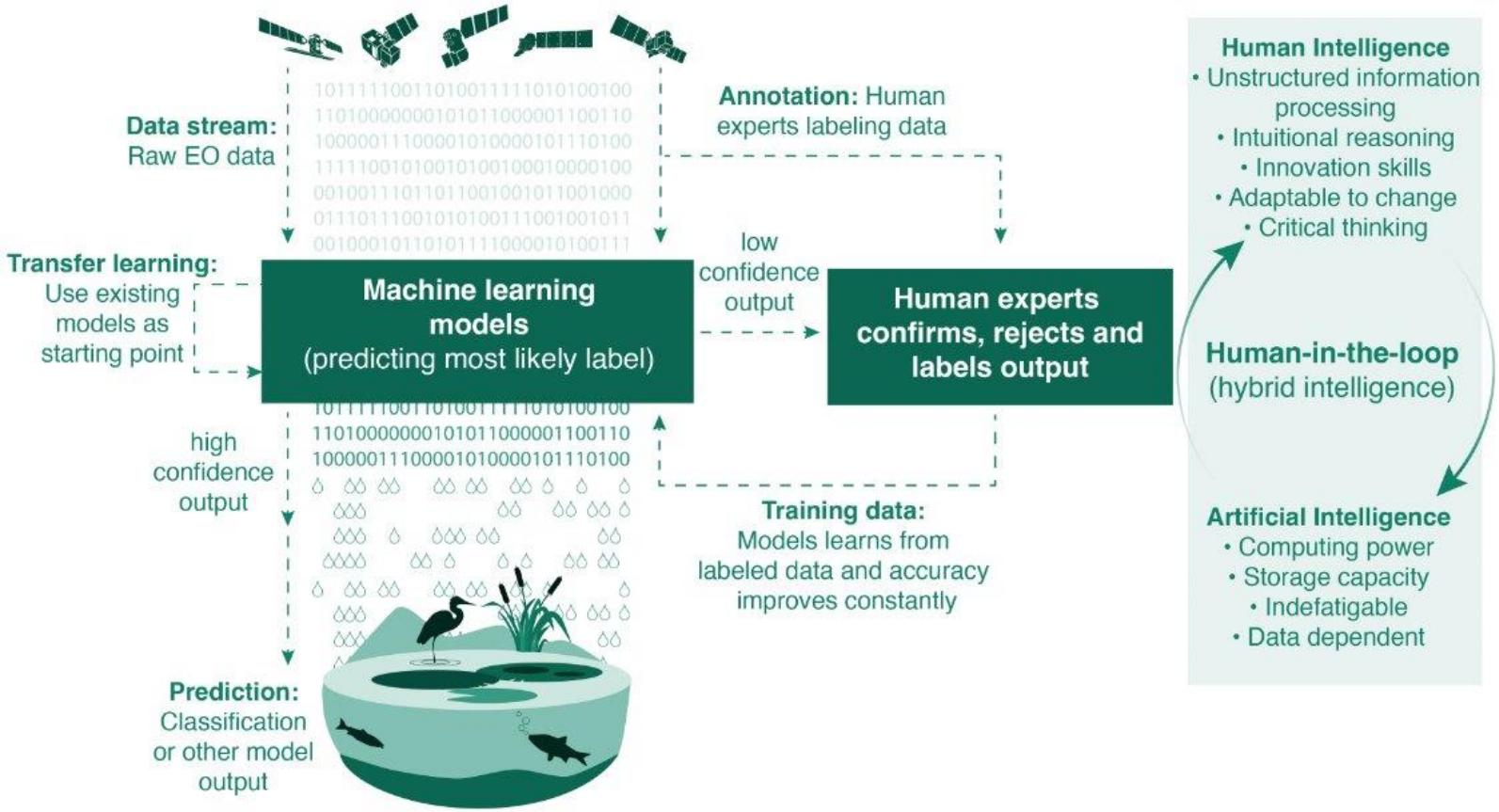




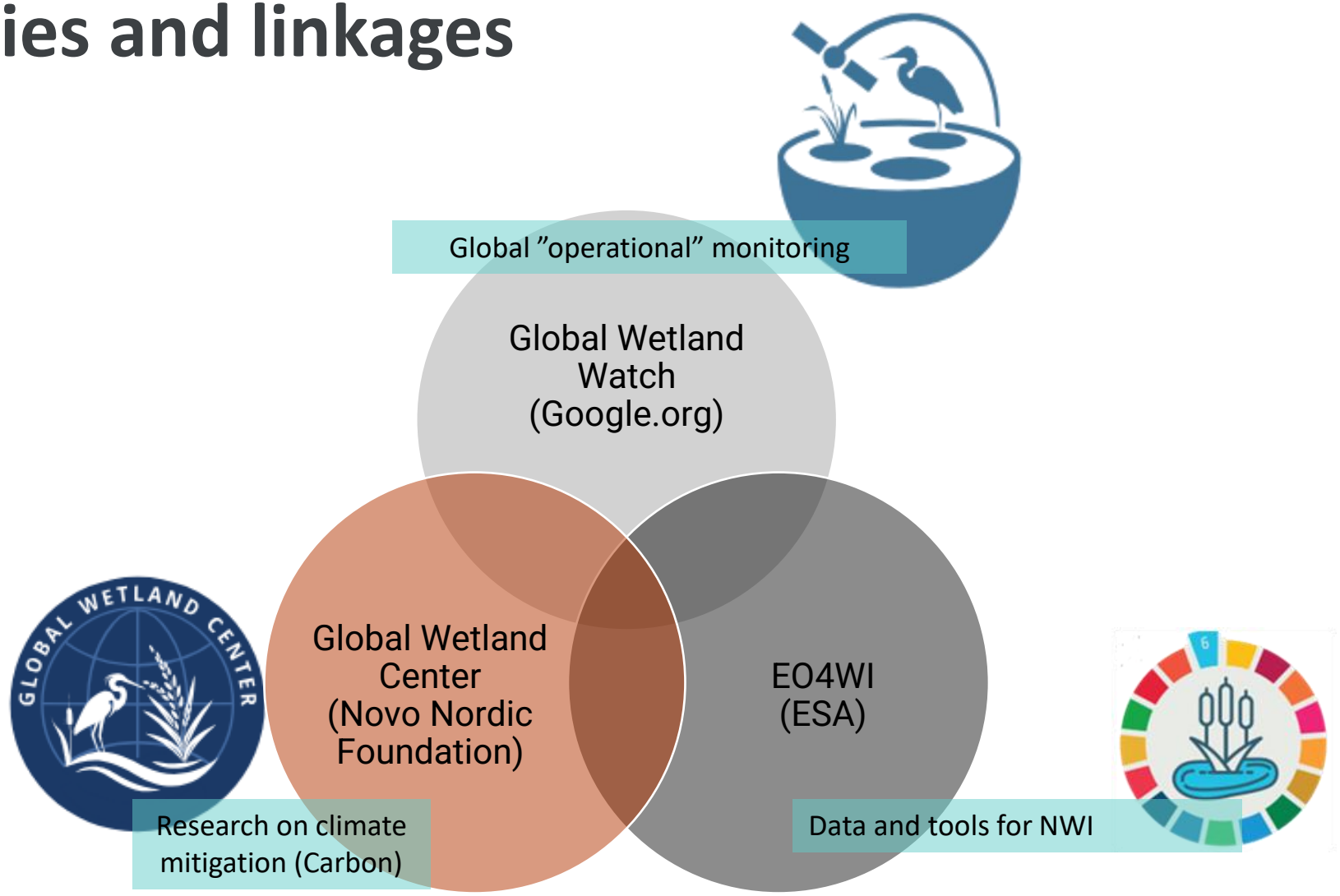
Human-in-the-loop:

Models are only as good the data they are trained on!

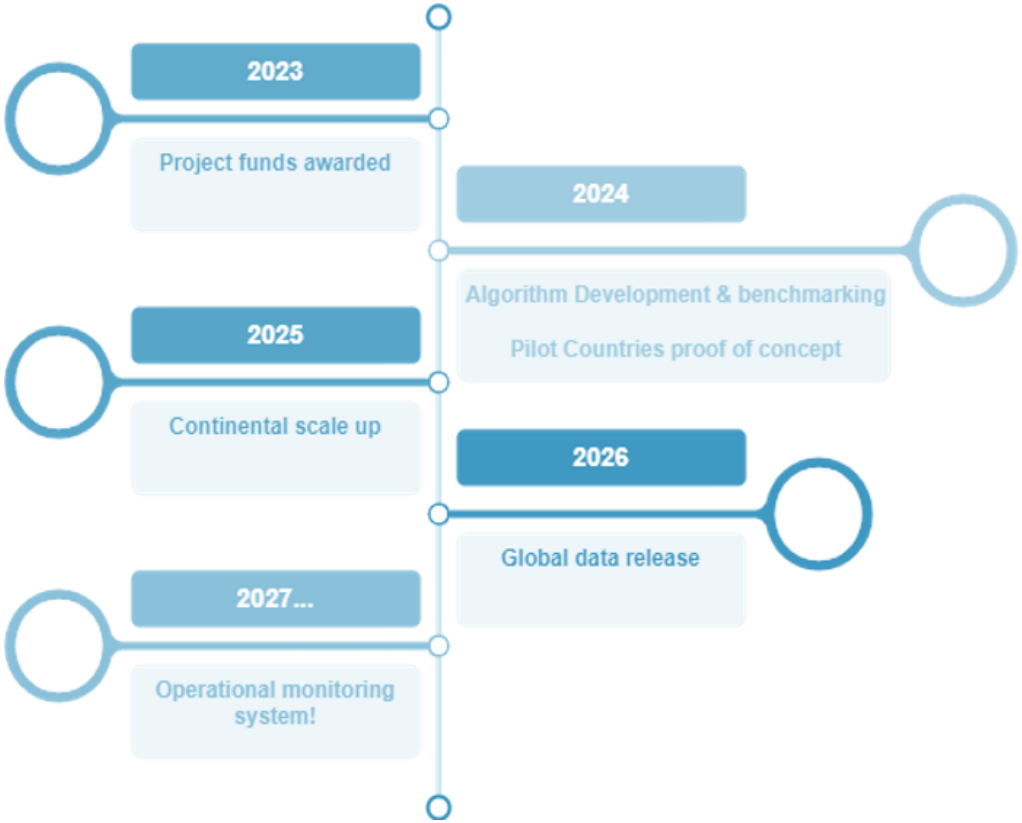
- Space-borne observations are inherently borderless, impartial, and inclusive.
- Yet, global maps tend to have local biases
- Humans can be involved in tuning the model to improve its accuracy (and validate the outcome)

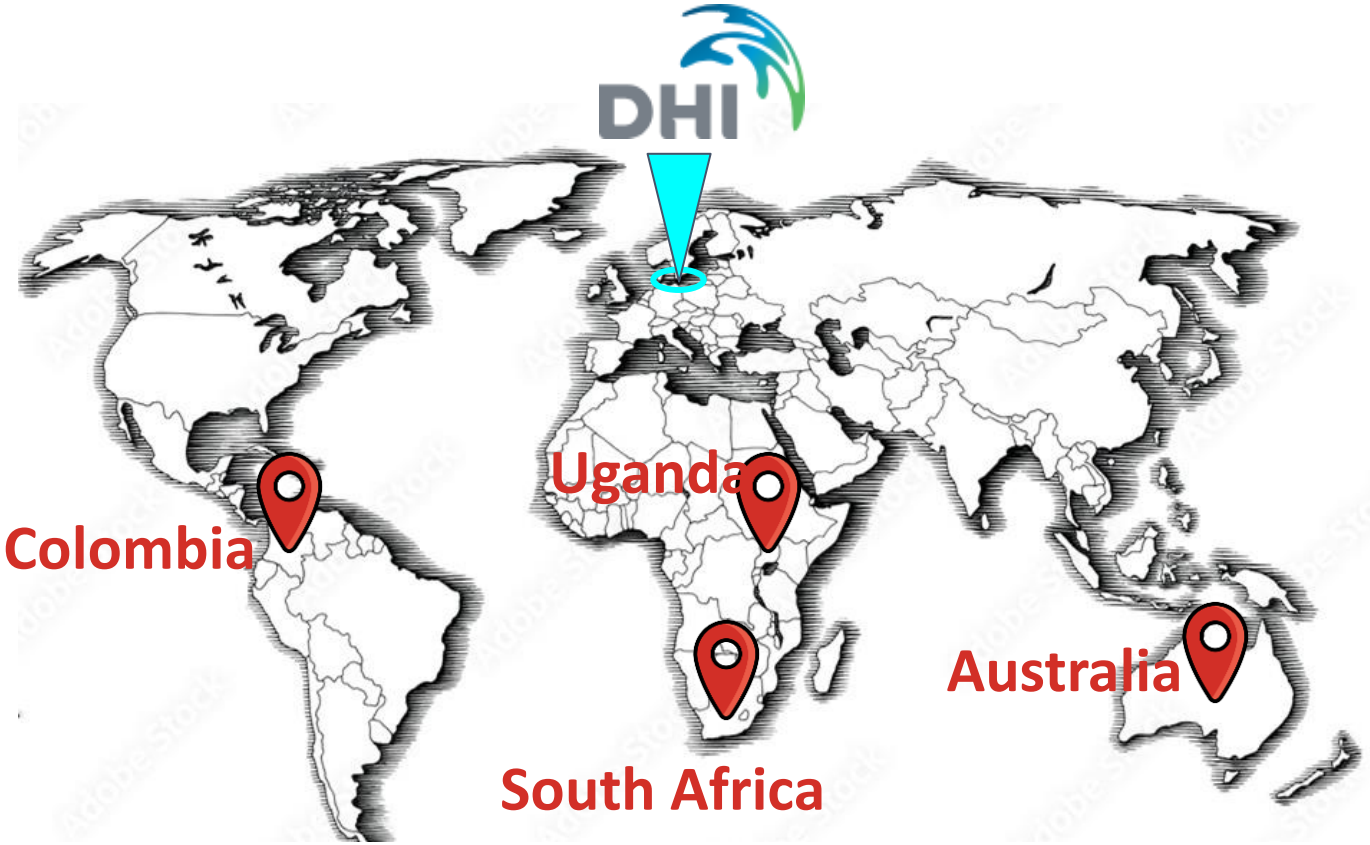


Synergies and linkages



Project timeline & Pilot Countries





labels, validation & feedback

Summary

- Built on Google Earth Engine the GWW will support implementation of relevant Global Agendas
- Promote improved wetland monitoring and reporting
- An open platform with option to adapt to national needs
- Interoperable with other global platforms of relevance (incl. www.sdg661.app)
- Support management decision-making and guide coordinated and effective on-the-ground action for wetland restoration and protection.

Acknowledgement and Collaborations

Partners

DHI

UN environment programme

UN environment programme | DHI
UNEP-DHI CENTRE

Supports from

Google Earth Engine

Funded by

Google.org

www.globalwetlandwatch.org

Contact us

info@globalwetlandwatch.org

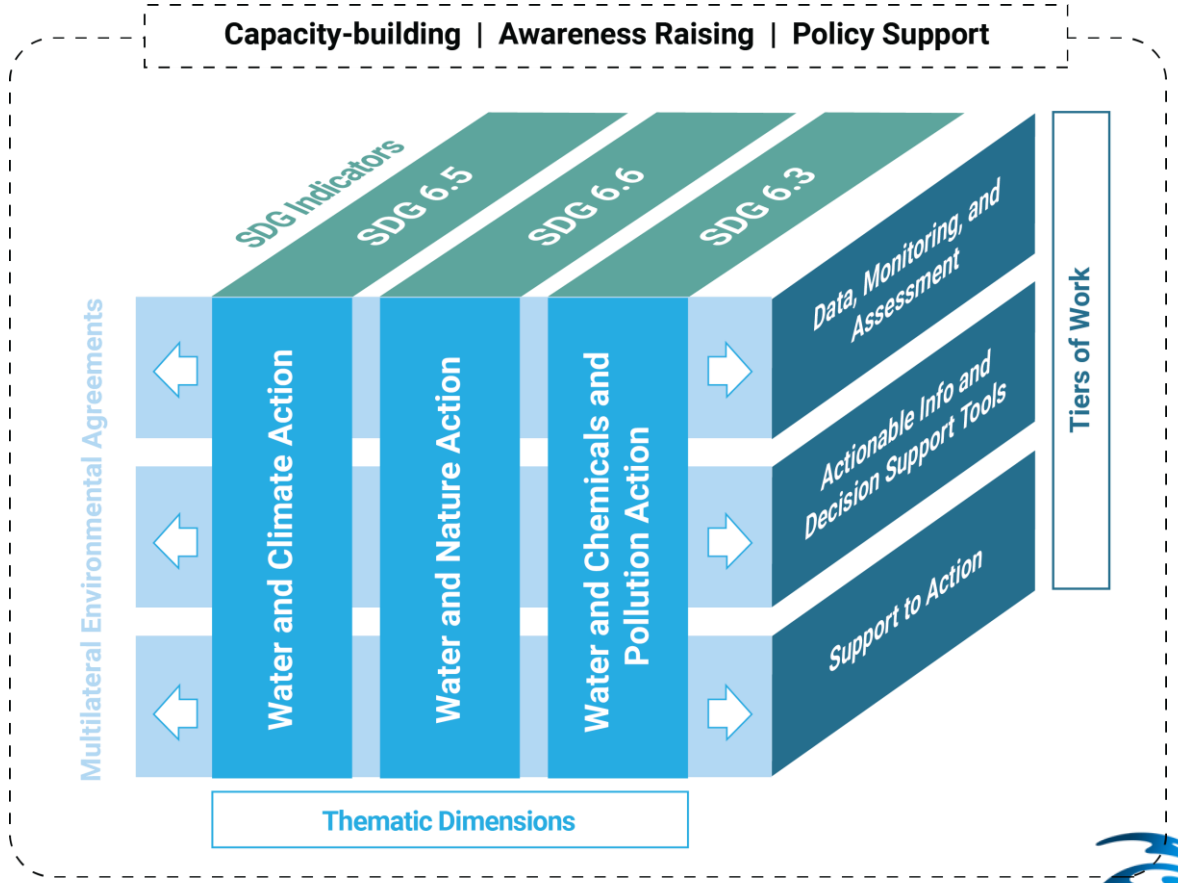
DHI

How UNEP supports Member States in freshwater

- UNEP helps Member States to **understand, protect and restore** freshwater ecosystems.
- We support **national monitoring and coordinate global reporting** for freshwater ecosystem health and management worldwide.
- We help by **transforming data into actionable information and decision support tools**.
- We **develop and implement programmes and projects** to support and catalyse action.
- **Awareness raising, capacity building and policy support** are a foundation running through all areas of UNEP's freshwater work.

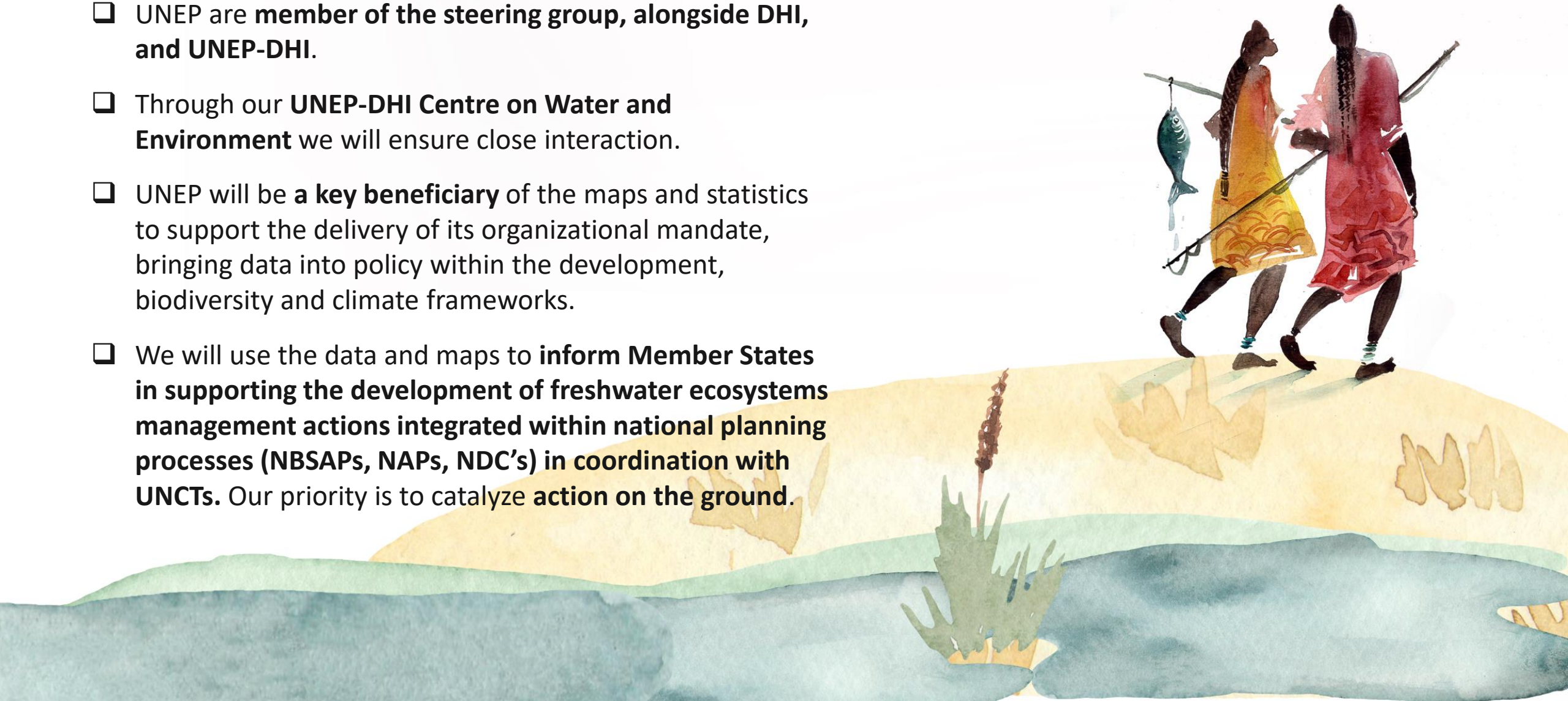
UNEPs core mandate is related to combatting climate change, biodiversity loss and pollution

- **Healthy wetlands** are critical for climate mitigation, adaptation, biodiversity, human health and prosperity – **they punch above their weight in terms of benefits**.
- UNEP is the custodian agency for SDG 6.3.2, 6.51, 6.6.1 (+ Ramsar) – **all relate to wetlands!**
- **UNEP has lead role in biodiversity climate** and co-hosts the IPCC and hosts the CBD secretariat



How UNEP will engage with the Global Wetland Watch

- UNEP are **member of the steering group, alongside DHI, and UNEP-DHI**.
- Through our **UNEP-DHI Centre on Water and Environment** we will ensure close interaction.
- UNEP will be **a key beneficiary** of the maps and statistics to support the delivery of its organizational mandate, bringing data into policy within the development, biodiversity and climate frameworks.
- We will use the data and maps to **inform Member States in supporting the development of freshwater ecosystems management actions integrated within national planning processes (NBSAPs, NAPs, NDC's) in coordination with UNCTs.** Our priority is to catalyze **action on the ground**.



Example: Conservation and Sustainable Management of the Congo Peatlands

- Worlds largest peatland
- Is estimated to contain the equivalent of **two annual global greenhouse gas emissions**!
- UNEP is developing a management plan for the peatlands including the impacts of climate change on its **water balance**
- But what is the freshwater biodiversity and climate impact of the peatlands themselves? Need for **knowledge, data and information to inform decision-making!**