BioSpace25 - Biodiversity insight from Space
10 - 14 February 2025 | ESA-ESRIN | Frascati - Italy

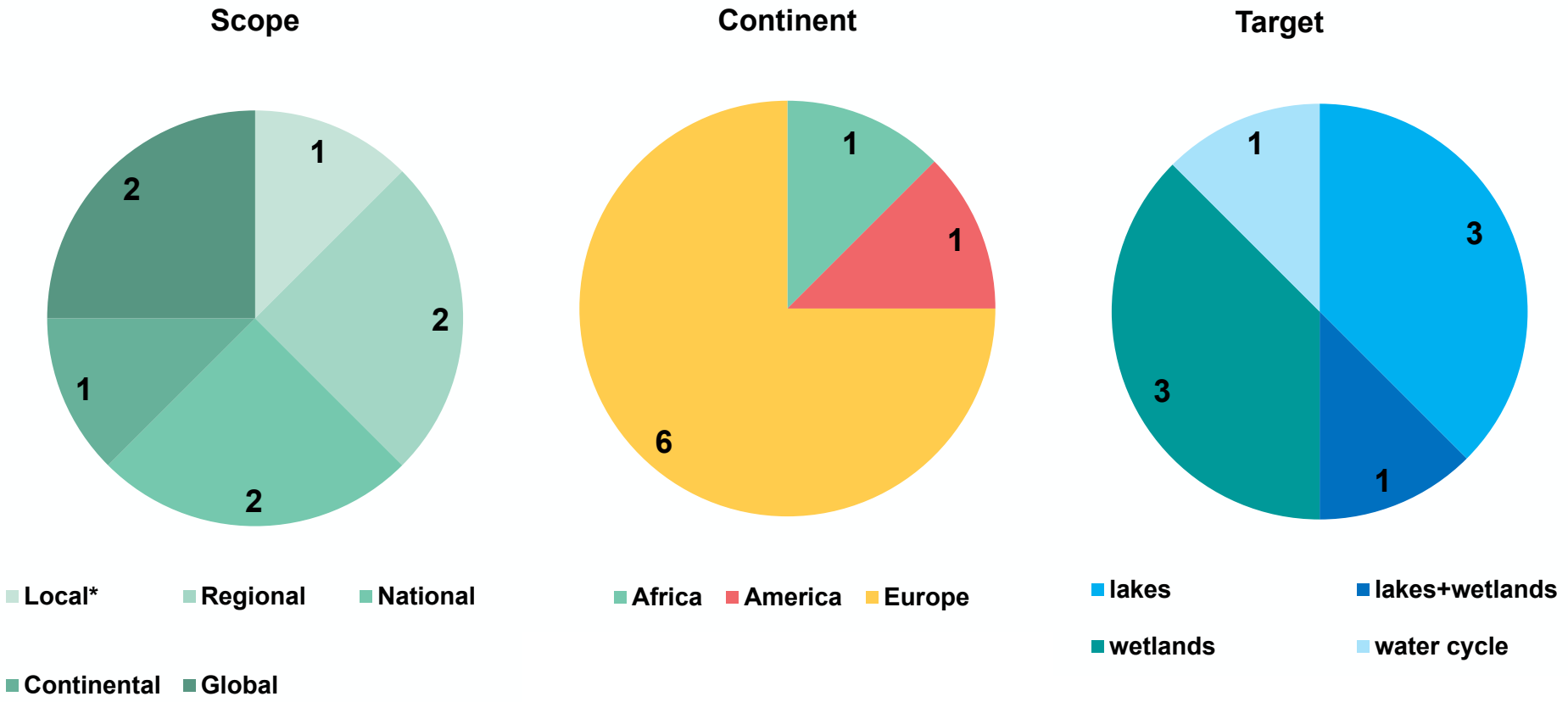
Freshwater and Inland Wetland Ecosystems

OVERVIEW

Focus:

i. policy - service nexus
ii. habitat mapping
iii. monitoring to reporting
iv. peatland conditions
v. diversity threats demos
vi. phytoplankton phenology
vii. eutrophication dynamics
viii. water resilience drivers

-> Target 1&2 of GBF



SUMMARY

SENSOR
- Multi-sensor, multi-data
- Ex situ dominating, In situ emerging
- Drones (HR)

METHODS
- AI and cloud computing contribution (capabilities increasing applications)
- Time series analysis (big data)
- Last decade advancements in data availability (quality and quantity)

BIODIVERSTY ATTRIBUTES
- Ecosystem types
- Hydroperiod
- Ecological conditions/degradation
- Synoptic indices to track changes (and drivers)
- Testing of EBVs and metrics

DATA
- Last decade advancements in data availability (quality and quantity)
- Ex situ and In situ, EO and non-EO
- Citizen Science contributes (Apps! Monitoring changes)
- Uncertainty/representation?

RECOMMENDATIONS

i. **Christelle Vancutsem (JRC):**
   - additional EO products on wetlands (HR, long-term, wetland-specific changes)
   - uncertainty characterization (insufficient reference data)
   - establishing clear connections between habitat characteristics - EO signals (landscape variability)
   - integrate multiple data sources: EO and non-EO

ii. **Jennifer Hird (Alberta BMI):**
   - continue to build open-access EO data archives and tools
   - support to foster international connections and collaborations (and funding)

iii. **Heidi van Deventer (CSIR):**
   - funding for wetland validation challenging (esp. Africa)
   - citizen involvement to monitor ecosystem types and pollution
   - hybrid attendance to intl. conference allowed to African scientists

iv. **Eleanor Thomson (Gentian UK):**
   - consider microtopes and spatial patterns in condition assessment
   - connect peatland conditions to biodiversity indicators

RECOMMENDATIONS

v. **Petra Philipson (Brockman SWE - BIOMONDO):**
   - merging multiple information and metrics (habitat type, pressures, models) to assess impact of drivers of change on biodiversity variables

vi. **Clara Backens (Brockman GER):**
   - estimation and monitoring of freshwater phenology as an important biodiversity metric
   - development of workflows and indicators for assessing biodiversity and ecosystem change

vii. **Mathilde Joffre (Univ. Toulouse):**
   - monitoring of key in-situ variables (EO and non-EO)
   - uncertainty quantification for EO based indicators

viii. **Romi Lotcheris (Stockholm Univ.):**
   - multisensor integration for long-term assessment
   - multisensor time series adjustment for robust analysis of resilience over time