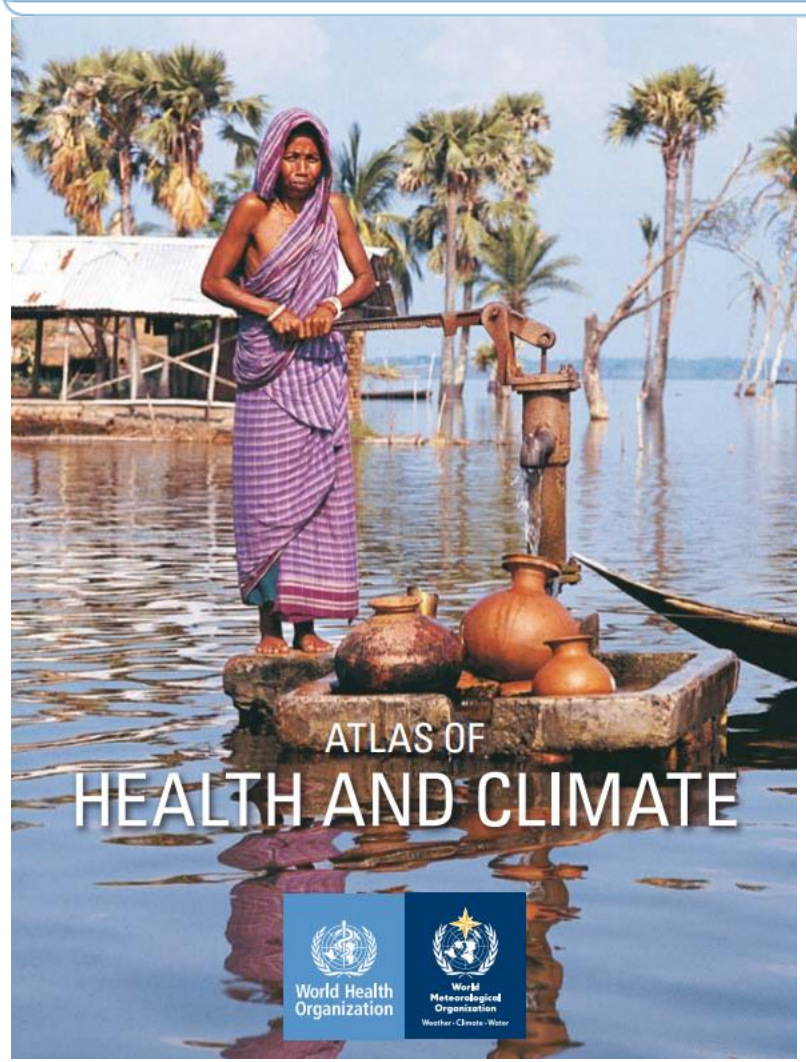
Data integration in monitoring environmental health under the SDGs



Geospatial Information and Earth Observations:

Supporting Official Statistics in Monitoring the SDGs

47th Statistical Commission
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Global goals, targets and indicators…

- Tool of global governance
  - Measuring progress for the global community
  - Informing global investments
- Objective: mobilize political support for neglected priorities
- MDG: mobilized support for development, focused on poverty and human well being for developing countries
- SDG: sustainability (economic, social, environmental) in development under good governance – for all countries and for all people – 'leave no one behind'

Lessons from MDG monitoring

- Focus on development: silent on sustainability, etc.
- Huge contributions from household surveys
  - Cost effective
  - Limit different aspects and timely reporting
    - Info on access to water sources, but not quality
- To complement other data like EO and GI
  - Data available for cost effective monitoring
  - Huge investments in EO: developed countries contribution to monitoring next goals and targets?

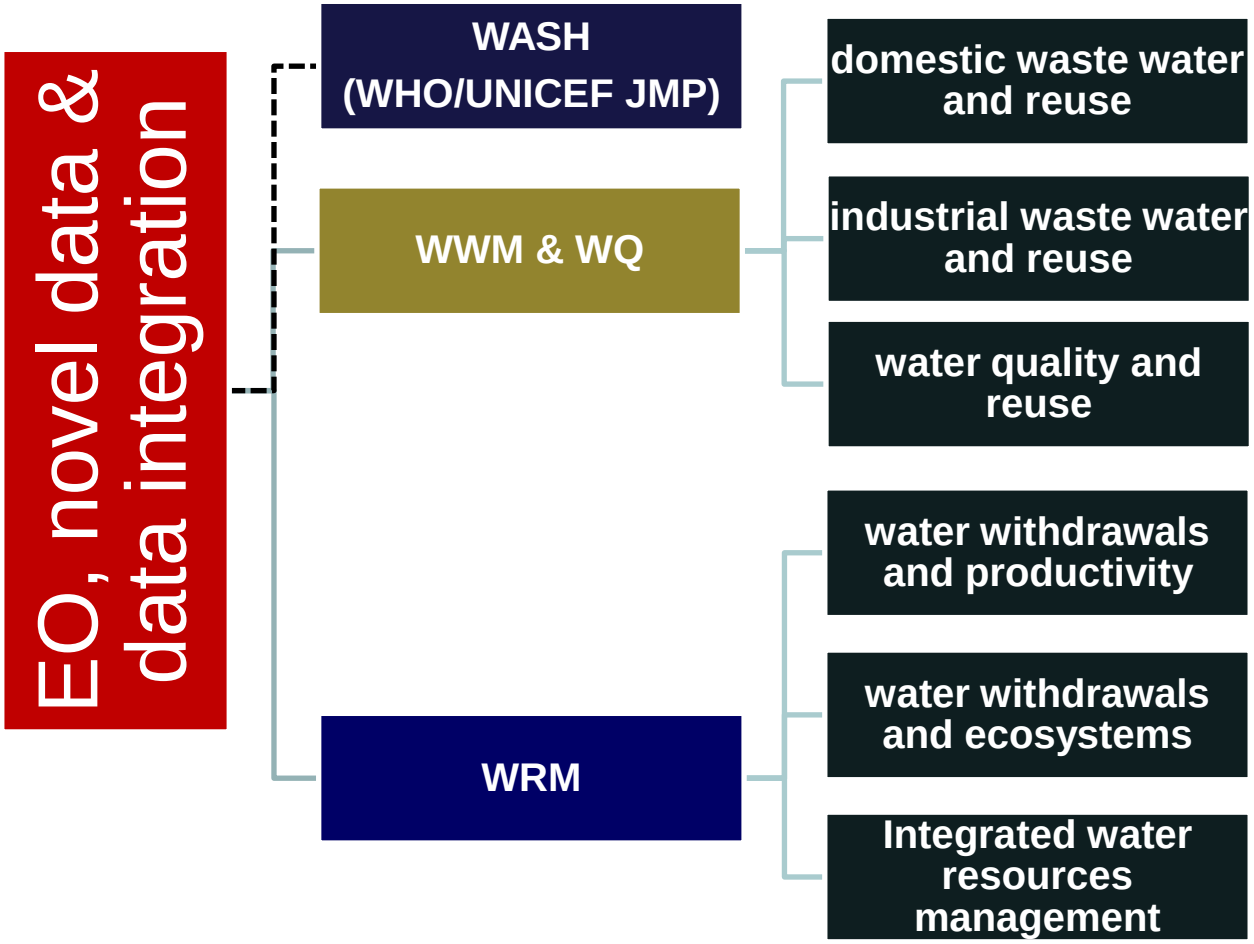
The 17 SDGs, Targets…

WHO – environmental health in the SDGs

- Lack of safely managed water, sanitation/hygiene, poor air quality poses acute health risk, disease burden and mortality
- World Health Resolutions calls for enhanced monitoring and solid evidence base for effective interventions, communications
- SDG 3.3, 3.9, 6.1-6.3 and 11.6
- GI and EO provides high resolution spatial and temporal variations
- More precise estimates over time, location – help track impact of policy changes

WASH and Wastewater: health impacts

EO in SDG water monitoring: a UN initiative



Task Team Contributors

- **International:** WHO, GEO, WMO, UNU-FLORES, WCRP (GEWEX), WMO-CHY, CIESIN, World Bank, UN Global Pulse
- **Countries:** Australia (CSIRO), Bangladesh, China, Colombia, Japan (MEXT), Germany, Pakistan, USA (USEPA, USGS, NSF, USACE, US GEO),
- **Space Agencies:** ESA, JAXA, NASA, NOAA
- **Academia and institutes:** Chouaib Doukkali University (Morocco), U of Tokyo, Chinese Academy of Sciences, U of Bonn, Vrije Universiteit Amsterdam, University of Twente, CUNY, U of Texas, GMU, Delatres, Fraunhofer Institute of Optronics, WRI
- **Two members from SG IEAG on data revolution for SD**

EO applicability for SDG water monitoring

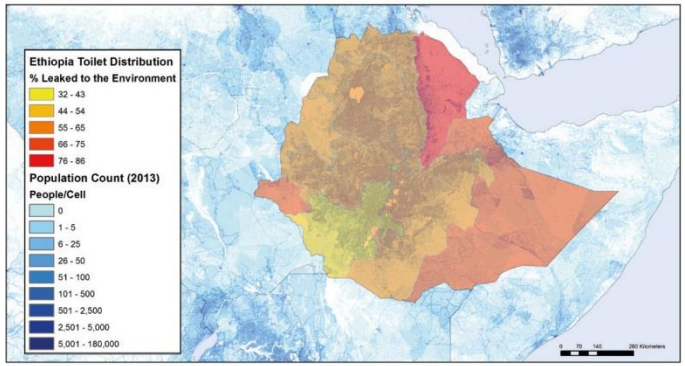
Indicator/EO applicability	EO + EO-Based Data Assimilation Model Relevance	Other Socio-Economic, and Census/Statistical Data Relevance	Direct Measurability	Analytical Soundness	Limitations
6.1+6.2 WASH					Computed as a residual product using EO
6.3 Wastewater and Water Quality					For Nitrates, Phosphates and Algae, Phytoplankton Blooms and Sediment
6.4 Water Efficiency					Accurate Quantification of Water Use and Type Required
6.5 Water Resource Management					Associated “management” inputs combined with EO on Water availability/change variables
6.6 water ecosystems					Resolution and accuracy is dependent on type of parameter, data availability and application

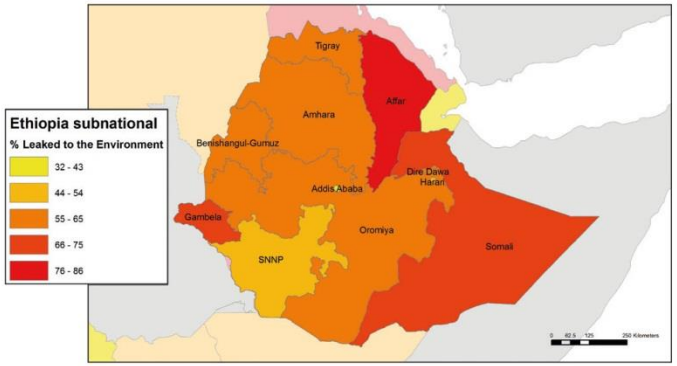
Application of EO in wastewater monitoring

EO support for the indicators (pop density, landuse, landcover) integrated with other GI, survey, admin data

Target 6.3 By 2030, improve water quality by reducing pollution, illuminating dumping and minimizing the least hazardous chemicals and materials, halving the proportion of untreated waste water and substantially increasing recycling and safe reuse globally.

POPULATION DENSITY OVERLAID ON UNTREATED WASTEWATER LEAKING TO THE ENVIRONMENT, ETHIOPIA SUB NATIONAL





WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation

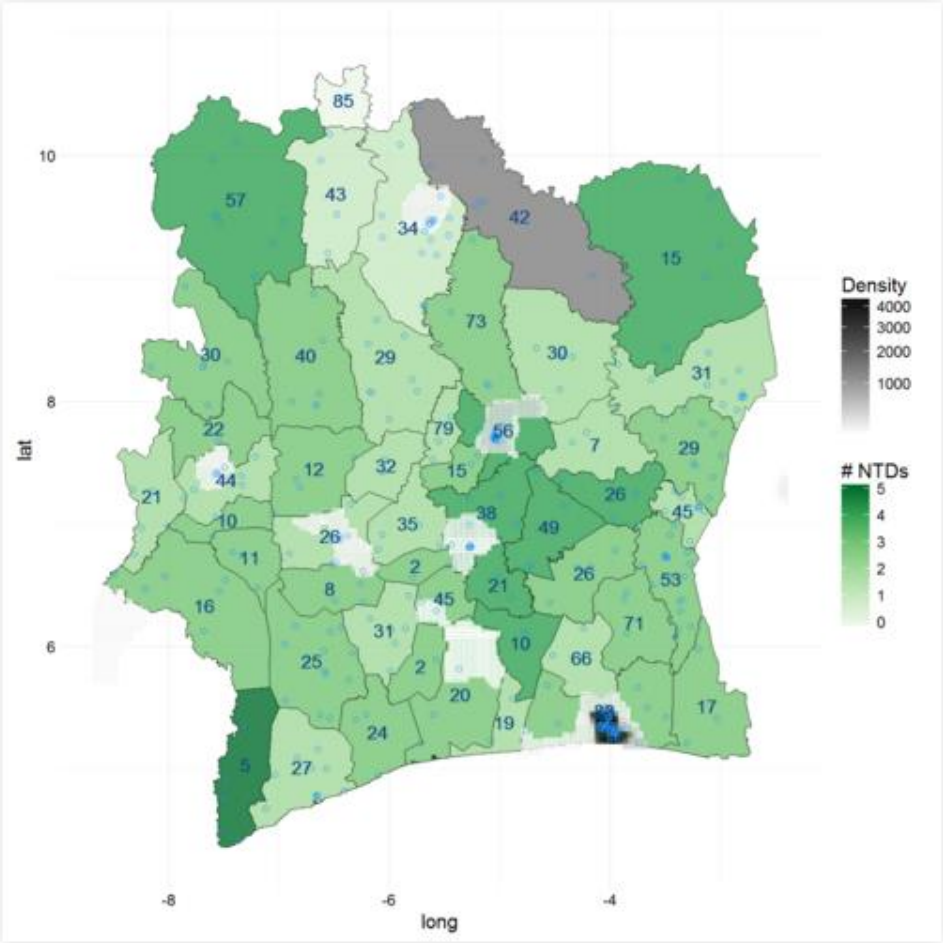
Integrating data from Earth observations and geospatial information with national surveys to monitor the impact of untreated wastewater on the population. The map on the left shows the extent of leakage of wastewater, excreta and grey water, with areas in red denoting extensive pollution. The map on the right integrates all data and shows where there is high impact, i.e., high leakage in densely populated areas.

Inequality in WASH: disease burden

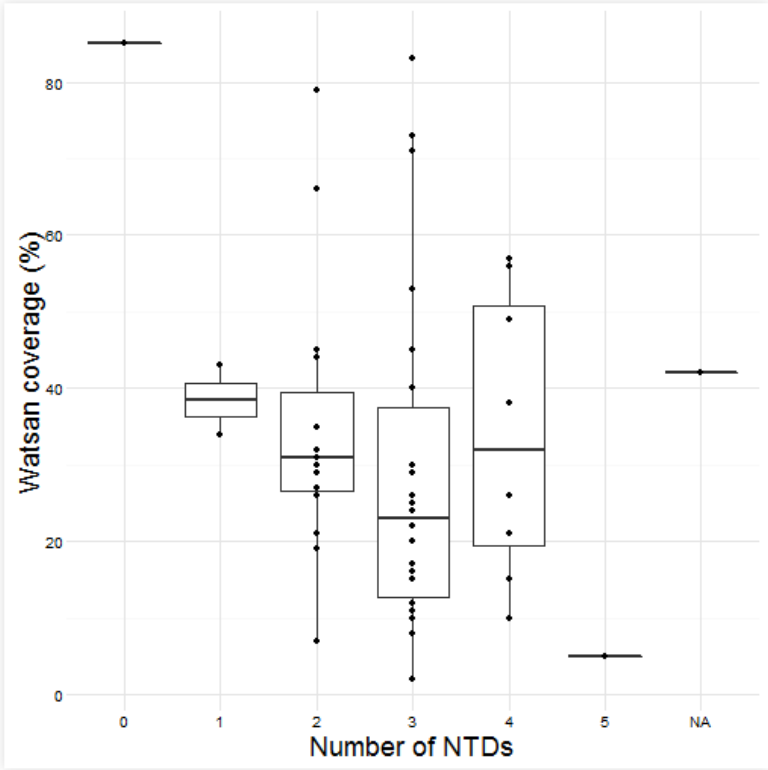
WASH-NTD mapping: leave no one behind

- 1 billion people in 149 countries suffer from NTDs. thrive in areas where there is lack of basic sanitation
- 2.4 billion people worldwide do not have adequate sanitation facilities, and over 1.8 billion lack clean water.
- WASH-NTD mapping to highlight neglected population:
  - NTD data from Joint Reporting Forms plus the Global Trachoma Mapping Project
  - District-level endemicity determined on the basis of prevalence surveys (min. thresholds) and treatment history
  - WASH cluster coverage from household surveys , we extracted data from household surveys
  - Population density from Landscan

Neglected Tropical Diseases: Inequality in WASH



NTD endemicity: clusters of low WASH access

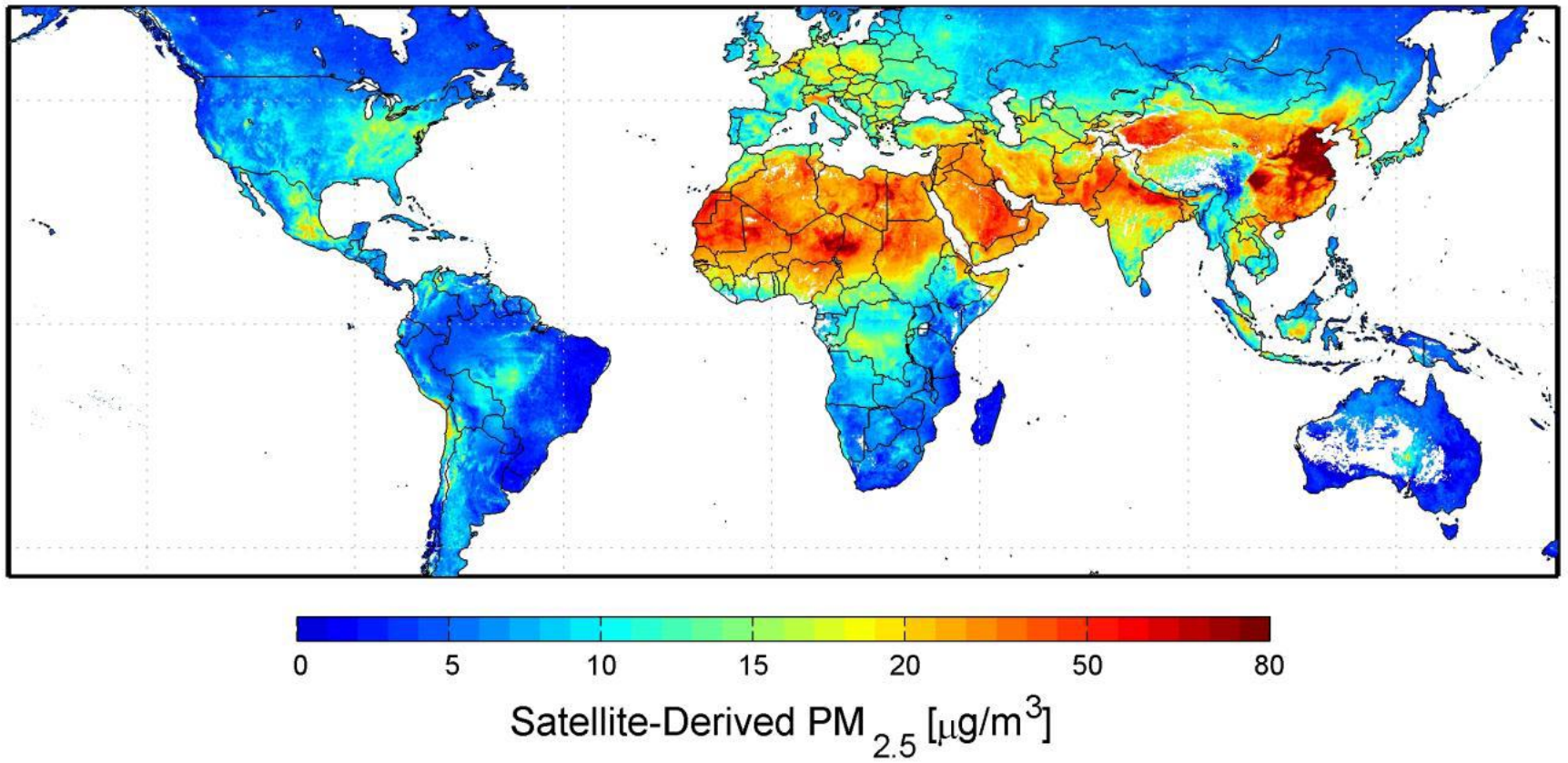


Air pollution and health impacts

AP to NCDs – call for better monitoring

- Globally 2 in 3 deaths are from NCDs
- 7 million deaths annually due to AP: interventions
- Particles smaller than 2.5mm penetrate deep into the lungs and lead to diseases: stroke, heart disease, etc.
- based on monitoring can rapidly reduce health impacts
- 3000 cities: optical density measures from satellites, emission inventories, source apportionment studies and air transport models that are interpolated with ground level monitoring
- WHA 2015 called for better monitoring: a global platform of air quality and health with experts from EO community

Air transport models+ground monitors+EO



EO data integration: more than filling gaps…

- Indicator framework will place many demands on national statistical systems
- Lack of capacity for additional monitoring is acute
- Huge cost to support more demanding indicators
- **Cost effective gains can be made when EO data are considered**
- WHO/UNICEF JMP-SDSN work on cost effective monitoring of the water sector will be informative for SDG monitoring in general

Can help discussions indicators tier-ing?

THANK YOU

Use of all available and **relevant data** is the real **data revolution** and **integrating** them into the monitoring framework will be **transformational**…

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