

# Geospatial data for environment

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**Sixth expert meeting of the Working Group on Geospatial Information (WGGI) of the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs)**

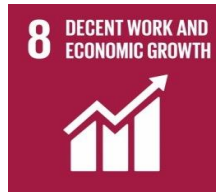
**9-11 March 20120**

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# UNEP's Role as Custodian Agency



Water quality, water resource management and freshwater ecosystems



Sustainable consumption and production, including material flow accounts, chemicals and wastes, environmental policy, food waste and fossil fuels.



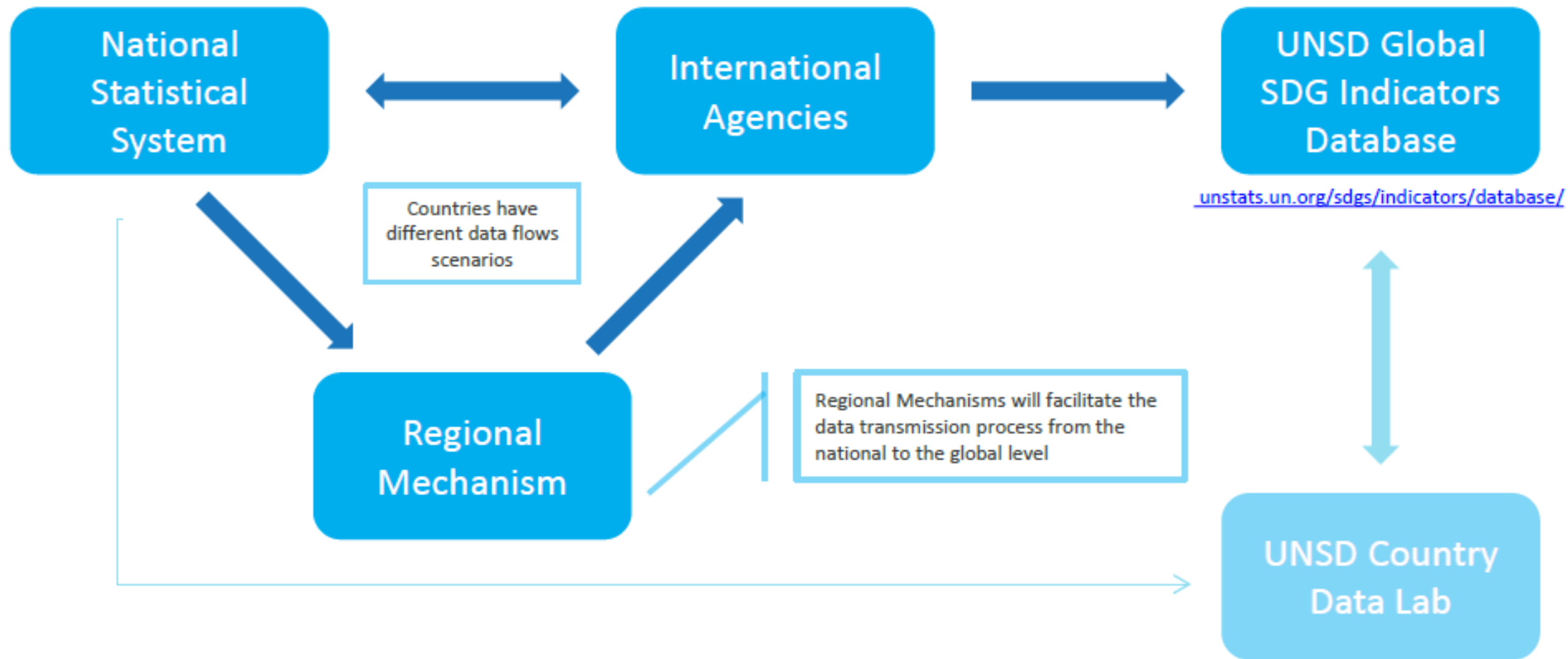
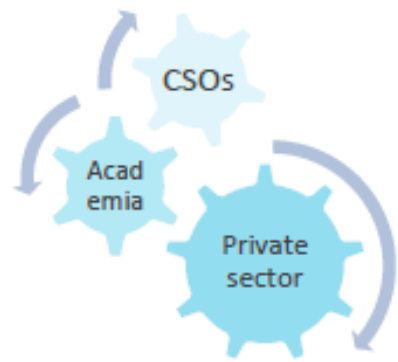
Ocean related indicators on marine litter, acidification, marine management and coverage of protected areas



Protected areas, including mountains, and national CBD targets, public expenditure on conservation and biodiversity



Environmentally sound technology and sustainable development policy



# Geospatial Data for environment

*Without geospatial data, it is impossible to understand the challenges facing ecosystems or the relationships between environment and people*

Environment-related SDGs indicators underpinned by geospatial data:

- **Goal 6:** Water quality (6.3.2); Water cooperation (6.5.2); Water-related ecosystems (6.6.1)
- **Goal 14 :** Coastal eutrophication and marine litter (14.1.1); Management of marine areas (14.2.1); Marine protected areas (14.5.1)
- **Goal 15:** terrestrial protected areas (15.1.2; 15.4.1);
- Forest area (15.1.1), land degradation (15.3.1), and mountain green cover (15.4.2).

# Approach

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- Encourage the use of globally available environmental data to enhance country-derived data, filling data gaps and enabling countries to more rapidly make progress towards achieving SDG targets.
- For SDG 14.1.1, both coastal eutrophication and marine plastic debris, a progressive monitoring approach is proposed which brings together globally modelled data and national data.
- This same approach has been adopted for other SDG indicator methodologies, such as Indicator 6.6.1 and 15.4.1
- The progressive monitoring approach encourages different levels of ambition, depending on a country's capacity

# Global data products

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- The people who need access to environmental information often do not have the capacity to produce / use geospatial data
- There is asymmetry between countries and across Ministries within countries in the capacity for data generation and data technology
- *Where can existing geospatial data for the SDGs indicators be accessed and analysed?*

## 14.1.1 coastal eutrophication index; 14.1.1 Marine plastic debris

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The progressive monitoring approach uses 3 Levels

- Level 1 data - utilizes data already globally available and for which UNEP will produce data products - foundation which can be strengthened by countries as they develop capacity and ability to report on Level 2 data and Level 3 data.
- Level 2 data - national data collection in all countries
- Level 3 data - supplementary information for countries to consider
- All globally available data will be shared with national statistical offices and other relevant authorities for in-country validation
- Global data is derived from global algorithms - some countries may choose to provide their own data derived from regionally tuned algorithms as part of the Level 2 data

# Indicator 14.1.1a: Index of Coastal Eutrophication (including ICEP)

UN Environment; IOC-UNESCO, FAO

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Level 1: Proposed global indicators

Indicator for Coastal Eutrophication Potential (based on Nitrogen and Phosphate loadings)

Chlorophyll-a deviations (percentage of EEZ area with a deviation of more than 50%) per year

The European Space Agency (ESA) Ocean Colour Climate Change Initiative (OC\_CCI) project, led by the Plymouth Marine Laboratory (PML)



# Indicator 14.1.1.b: Marine plastic debris

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## Level 1 - global indicators

- Plastic patches greater than 10 meters (for Areas Beyond National Jurisdiction or Total Oceans)
- Beach litter originating from national land-based sources

## Level 2 - national indicators:

- Beach litter count per km<sup>2</sup> of coastline (surveys and citizen science data)
- Floating plastic debris density (visual observation, manta trawls)
- Water column plastic density (demersal trawls)
- Seafloor litter density (benthic trawls (e.g. fish survey trawls), divers, video/camera tows, submersibles, remotely operated vehicles)



# Water-Related Ecosystems

Free and open access to national, sub-national, basin and sub-basin aggregated data on water extent.



Sustainable Development Goal Target 6.6 seeks to halt the degradation and destruction of water-related ecosystems, and to assist the recovery of those already degraded. The target includes water-related ecosystems such as vegetated wetlands, rivers, lakes, reservoirs and groundwater, as well as those occurring in mountains and forests, which play a special role in storing freshwater and maintaining water quality.



# SDG 6.6.1 Experience

**SDG Indicator 6.6.1: Change in the extent of water-related ecosystems over time**

**Sub-indicators:**

- Ecosystem extent
- Water quality and ecosystem health
- Quantity

**UN Environment did a data collection round in 2017 and reached out to all countries with a questionnaire to collect SDG 6.6.1 sub-indicators.**

- Around 40 countries had some data, but the data was not comparable across countries and in many cases there was little information available on the quality of data
- Many countries reported that they had no data available

# About

## About us

This partnership is founded on the belief that data is the foundation for our understanding of the environment. Data provides a basis for assessing change across time, for analyzing the environmental challenges facing a particular area, and for determining the need for local, national and global action on the environment. However, data on the environment is often not comparable across locations and time, it is not compiled at a frequency that can support regular analysis and it is often difficult to access and use environmental data.

[UN Environment and Google](#) are partnering with the [European Commission Joint Research Centre \(JRC\)](#), the European Space Agency (ESA), the United States National Aeronautics and Space Administration (NASA) and the Group on Earth Observations (GEO) to provide free and open data on the environment in a way that is policy-friendly, so that citizens and governments can easily assess what is actually happening to the world's natural resources, starting with data on water extent as a priority environmental issue.



The [United Nations Environment Programme \(UN Environment\)](#) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. UN Environment is also the custodian for 26 Sustainable Development Goal indicators related to the environment. The data on this portal directly contributes to the official global monitoring of [SDG indicator 6.6.1](#) on changes to freshwater ecosystem extent.



Google's mission is to "Organize the world's information and make it universally accessible and useful." [Google Earth Outreach](#) and [Google Earth Engine](#) are part of a broader team dedicated to leveraging and developing Google's infrastructure to address global environmental, health and humanitarian issues. Projects are generally in partnership with area experts, focus on data driven approaches and visualizations at scale to bring greater transparency and awareness, create new tools to understand system dynamics and better inform decision making.



The European Commission is an institution of the European Union, responsible for proposing legislation, implementing decisions, upholding the European Union treaties and managing the day-to-day business of the European Union. The [Joint Research Centre \(JRC\)](#) is the European Commission's science and knowledge service which employs scientists to carry out research in order to provide independent scientific advice and support to European Union policy.


Aim: to create national, sub-national and boundary data based on the best available information and algorithms

MENU ▾

**nature**  
International journal of science

Letter | Published: 07 December 2016

## High-resolution mapping of global surface water and its long-term changes

Jean-François Pekel , Andrew Cottam, Noel Gorelick & Alan S. Belward

*Nature* **540**, 418–422 (15 December 2016) | [Download Citation](#) ↓

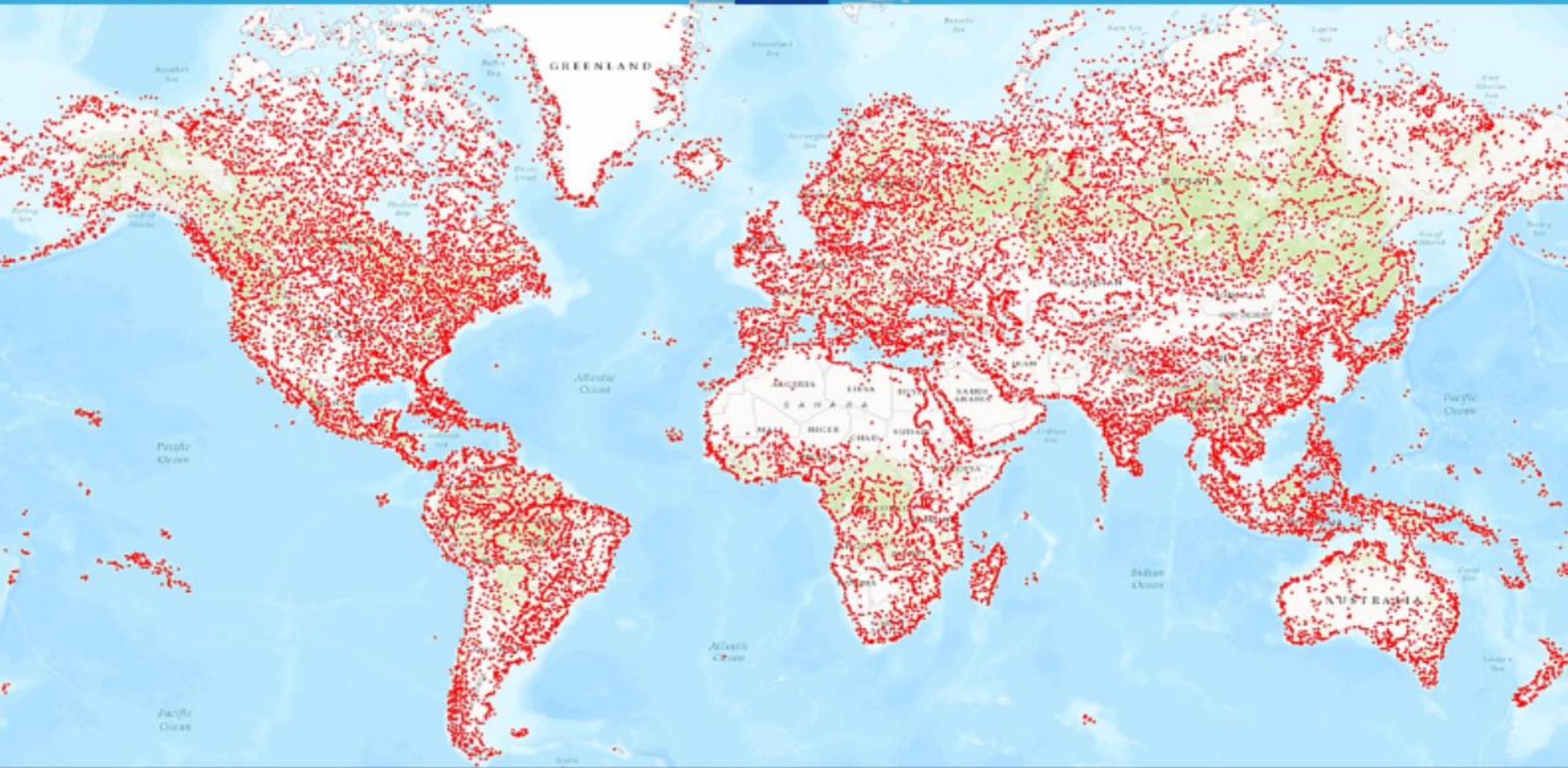


# Spatio-Temporal Validation

Based on 40.124 validation samples



Omission < 5%  
Commission < 1%



# Flooding in Pakistan: increase in seasonal water

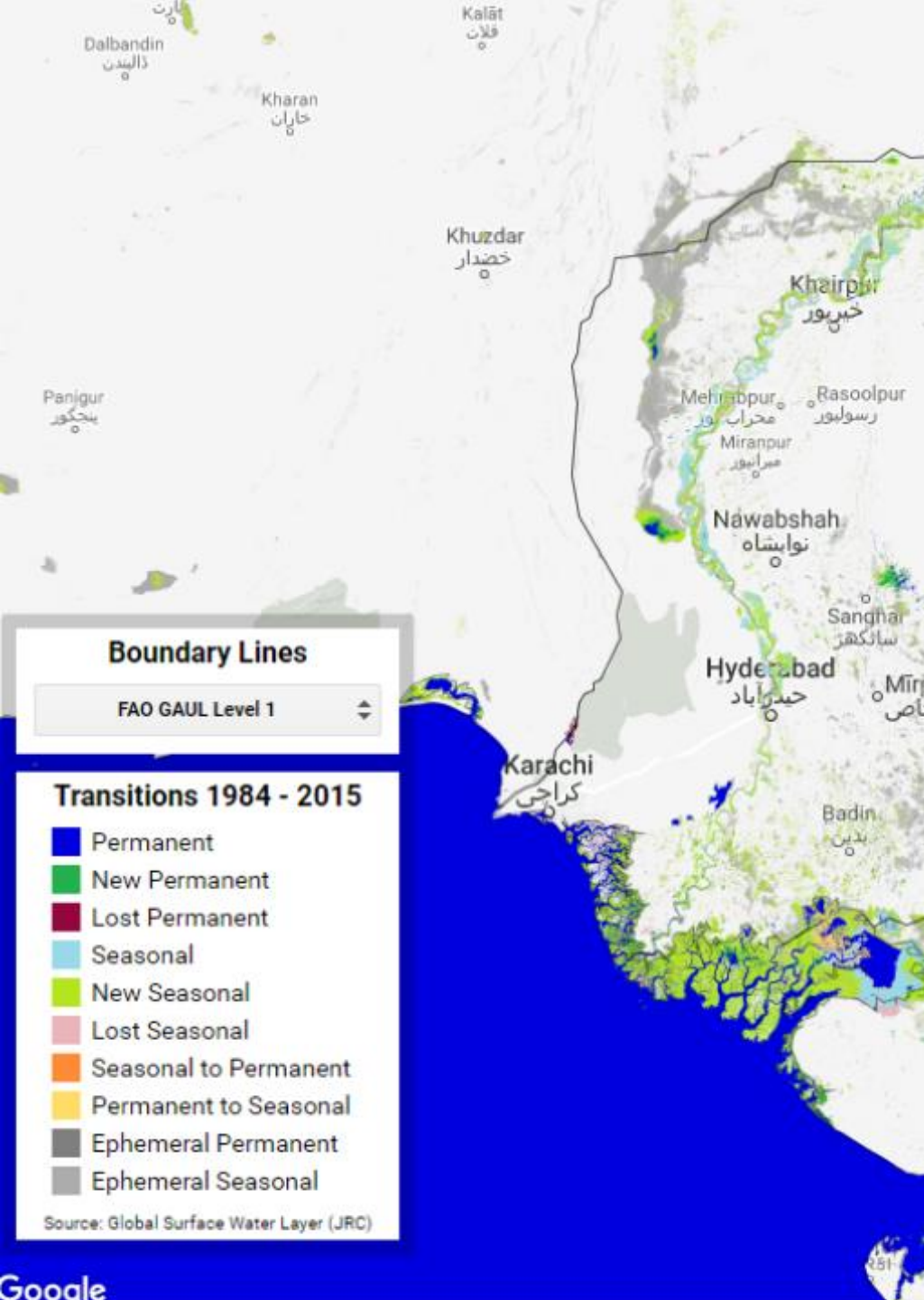


August 19, 2010



July 31, 2009

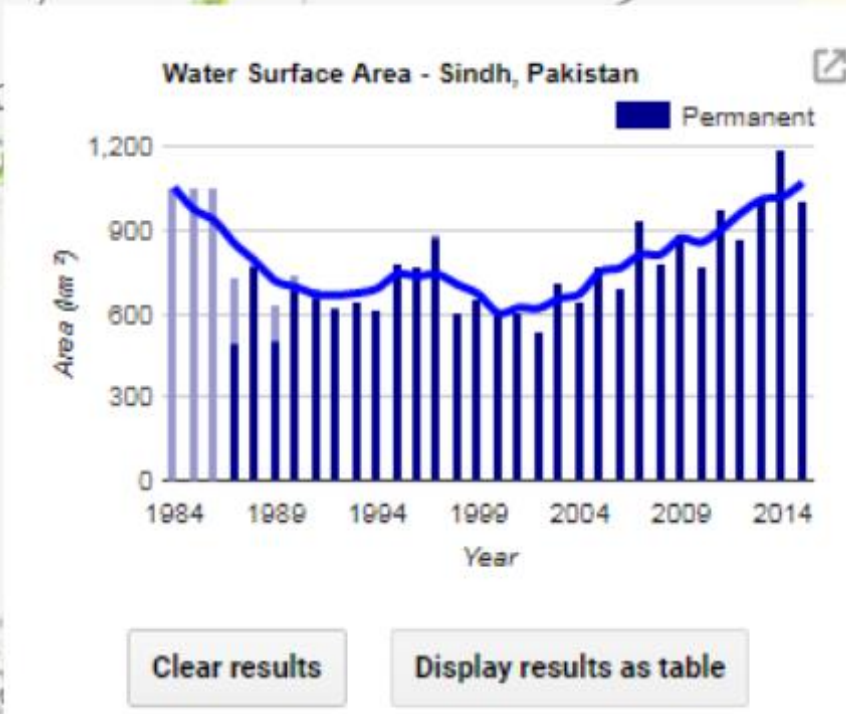
NASA Landsat images (<https://earthobservatory.nasa.gov/>)



**Boundary Lines**  
 FAO GAUL Level 1

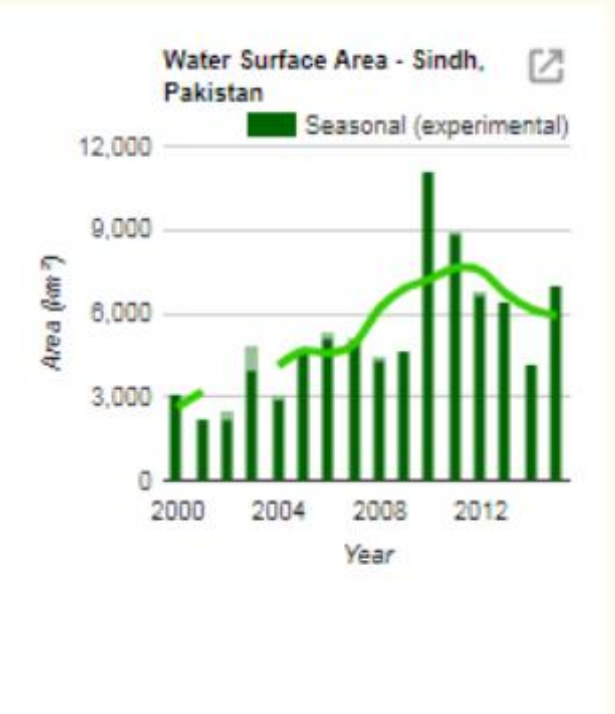
- Transitions 1984 - 2015**
- Permanent
  - New Permanent
  - Lost Permanent
  - Seasonal
  - New Seasonal
  - Lost Seasonal
  - Seasonal to Permanent
  - Permanent to Seasonal
  - Ephemeral Permanent
  - Ephemeral Seasonal

Source: Global Surface Water Layer (JRC)



Clear results

Display results as table



- Greater water surface area
- Increased seasonal fluctuation

(<https://sites.google.com/view/sdg661>)



# Thank you



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