

# Sustainable Development Goal 6

Clean Water and Sanitation For All



Ensure availability  
and sustainable  
management of  
water and  
sanitation for all

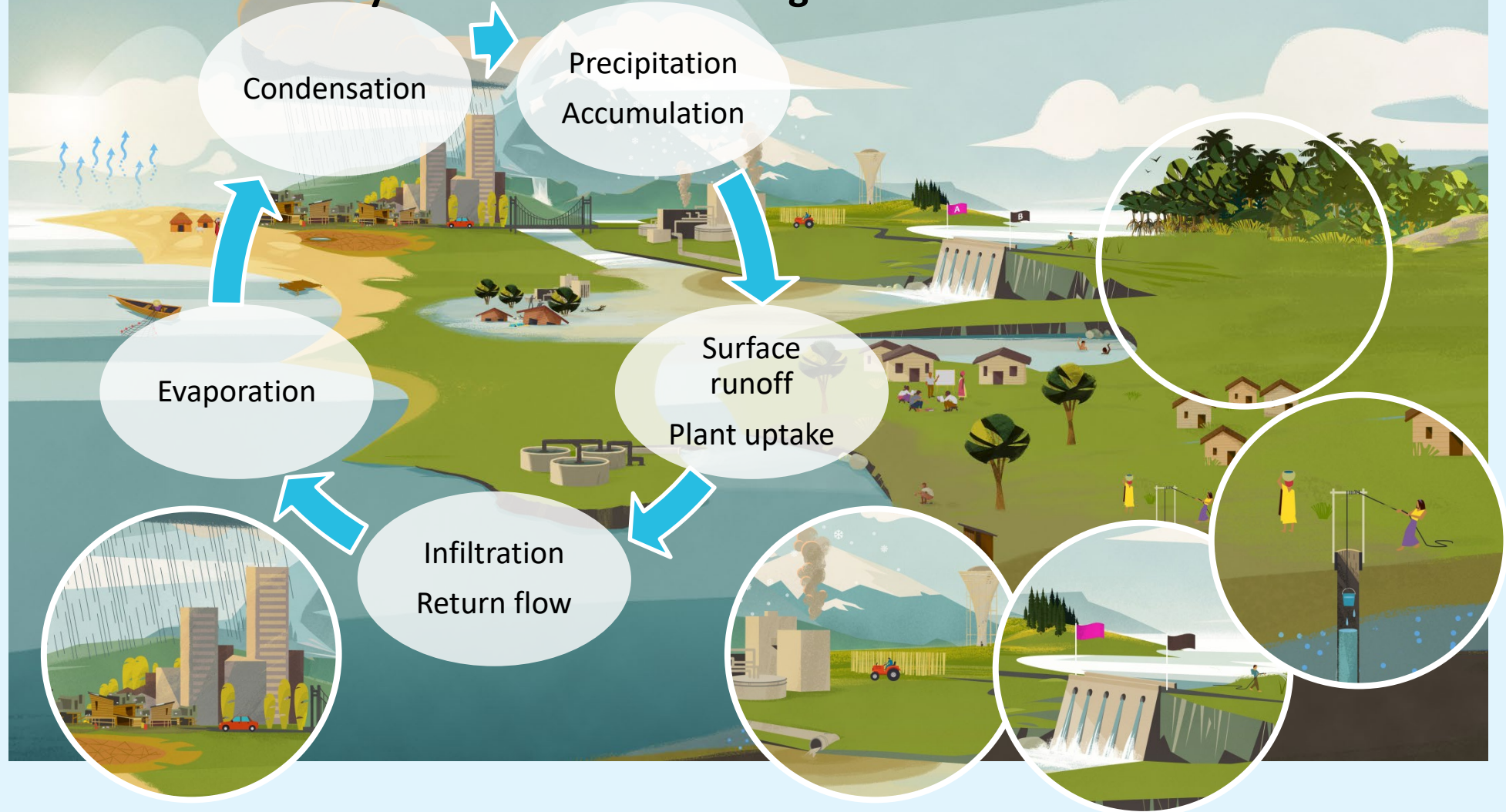


<http://www.un.org>

# SDG 6



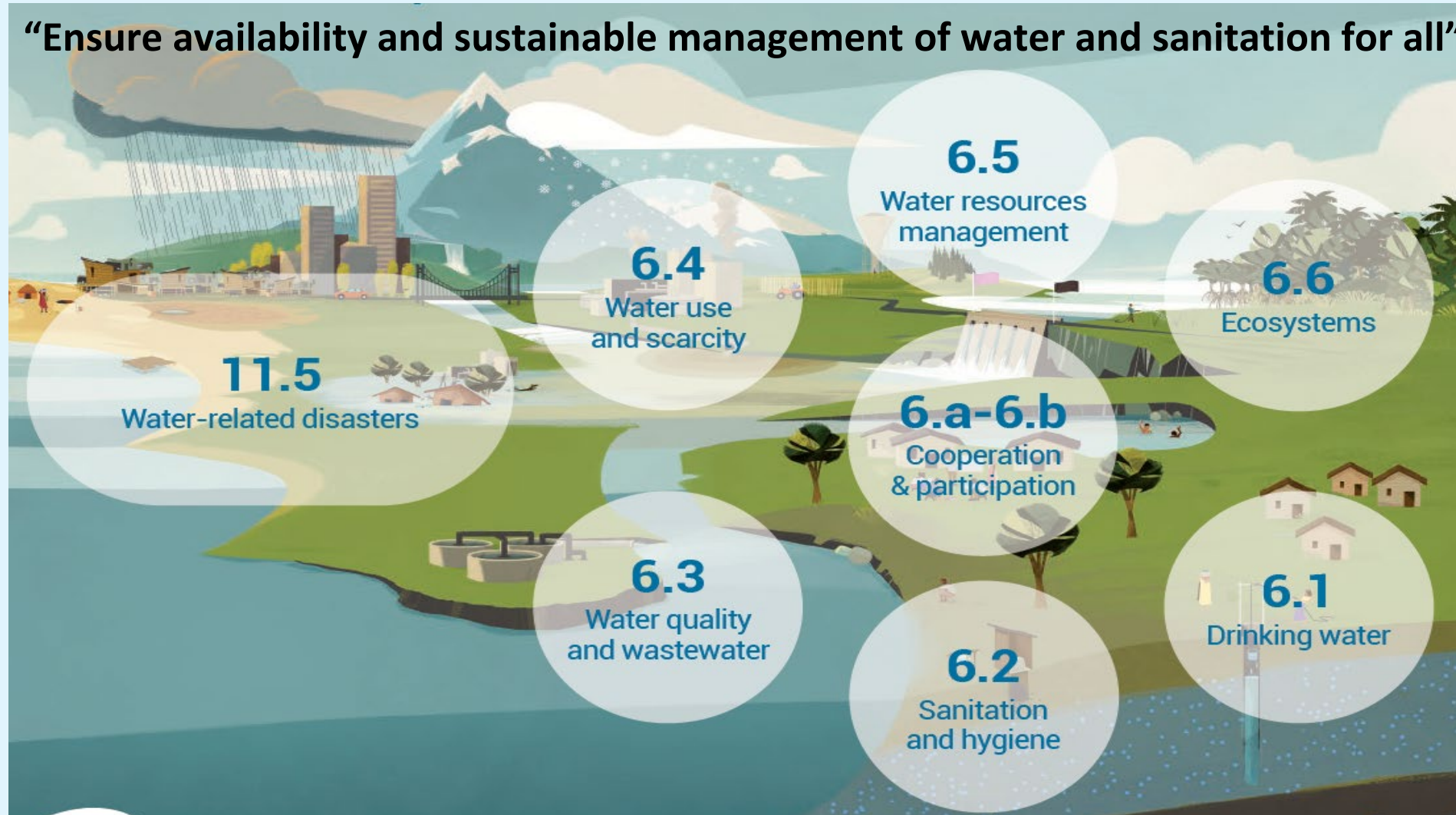
**“Ensure availability and sustainable management of water and sanitation for all”**



# SDG 6

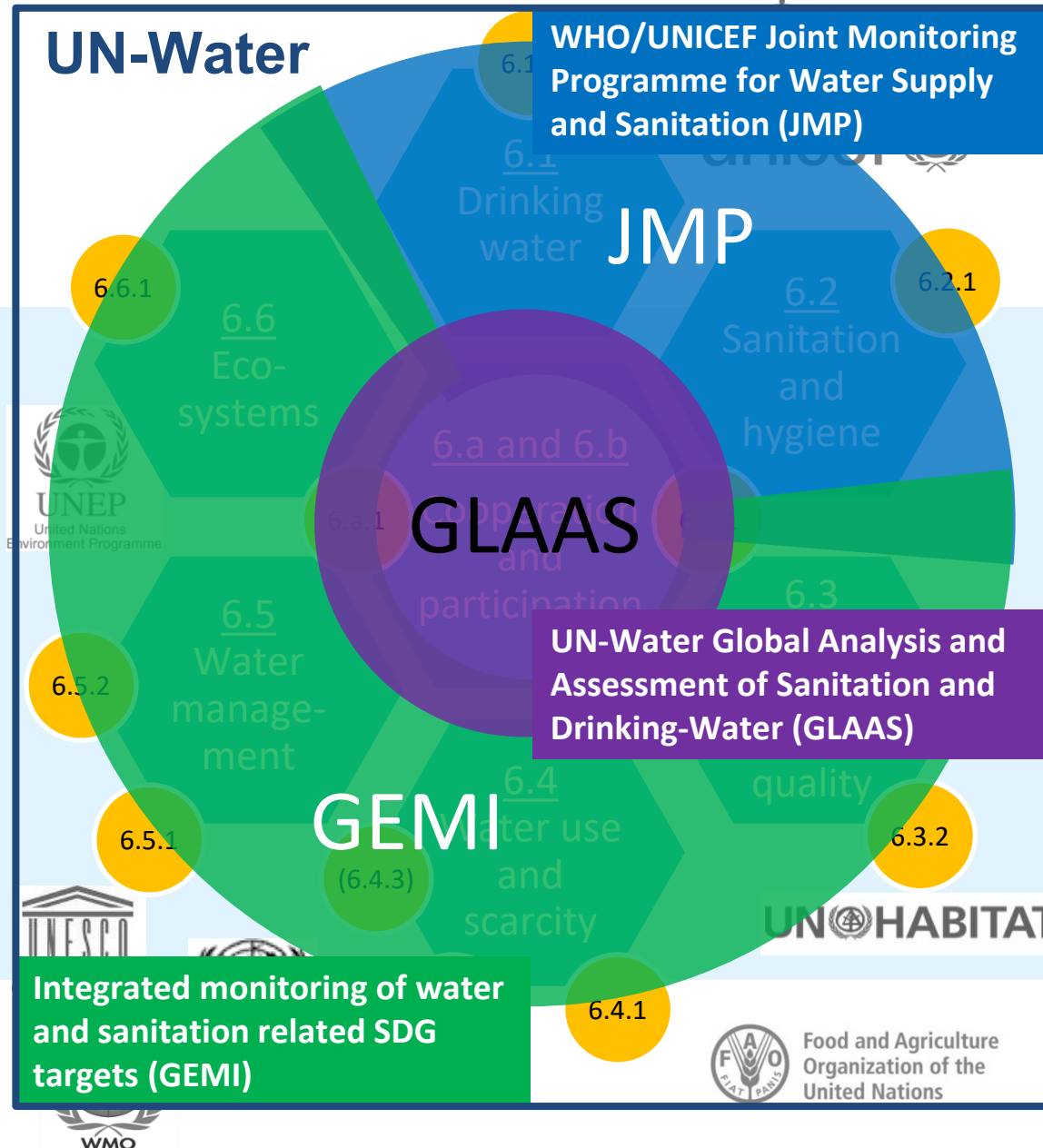


“Ensure availability and sustainable management of water and sanitation for all”





# SDG 6 global monitoring

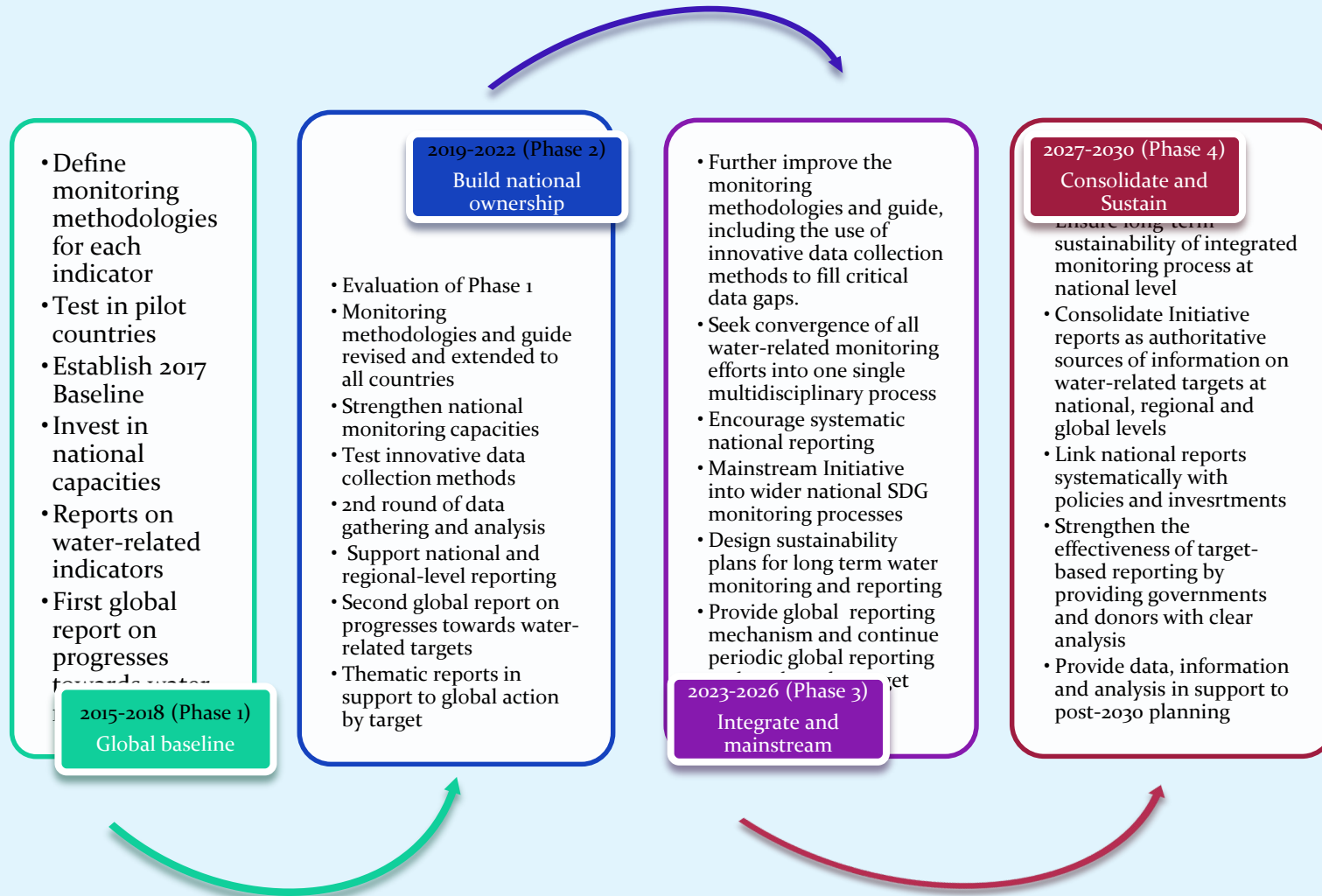


6.1.1	Safely managed drinking water services (WHO, UNICEF)
6.2.1	Safely managed sanitation and hygiene services (WHO, UNICEF)
6.3.1	Wastewater safely treated (WHO, UN-Habitat, UNSD)
6.3.2	Good ambient water quality (UNEP)
6.4.1	Water use efficiency (FAO)
6.4.2	Level of water stress (FAO)
6.5.1	Integrated water resources management (UNEP)
6.5.2	Transboundary basin area with water cooperation (UNECE, UNESCO)
6.6.1	Water-related ecosystems (UNEP)
6.a.1	Water- and sanitation-related official development assistance that is part of a government coordinated spending plan (WHO, UNEP, OECD)
6.b.1	Participation of local communities in water and sanitation management (WHO, UNEP, OECD)

# Objectives of the Integrated Monitoring Initiative

1. Develop methodologies and tools to monitor SDG 6 global indicators
2. Raise awareness at national and global levels about SDG 6 monitoring
3. Enhance country capacity in monitoring (technical and institutional)
4. Compile country data and report on global progress towards SDG 6



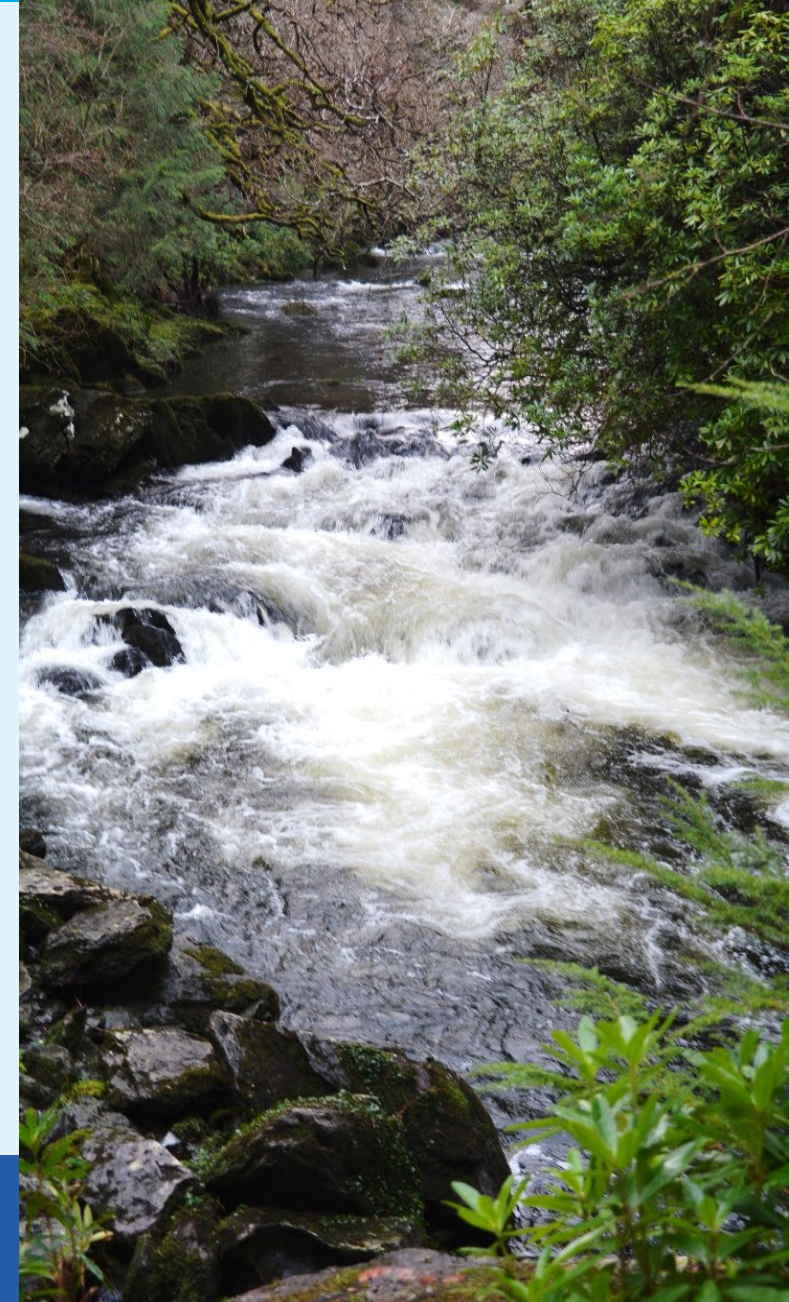






## **Indicator 6.3.2**

**Proportion of Water Bodies  
with Good Ambient Water  
Quality**

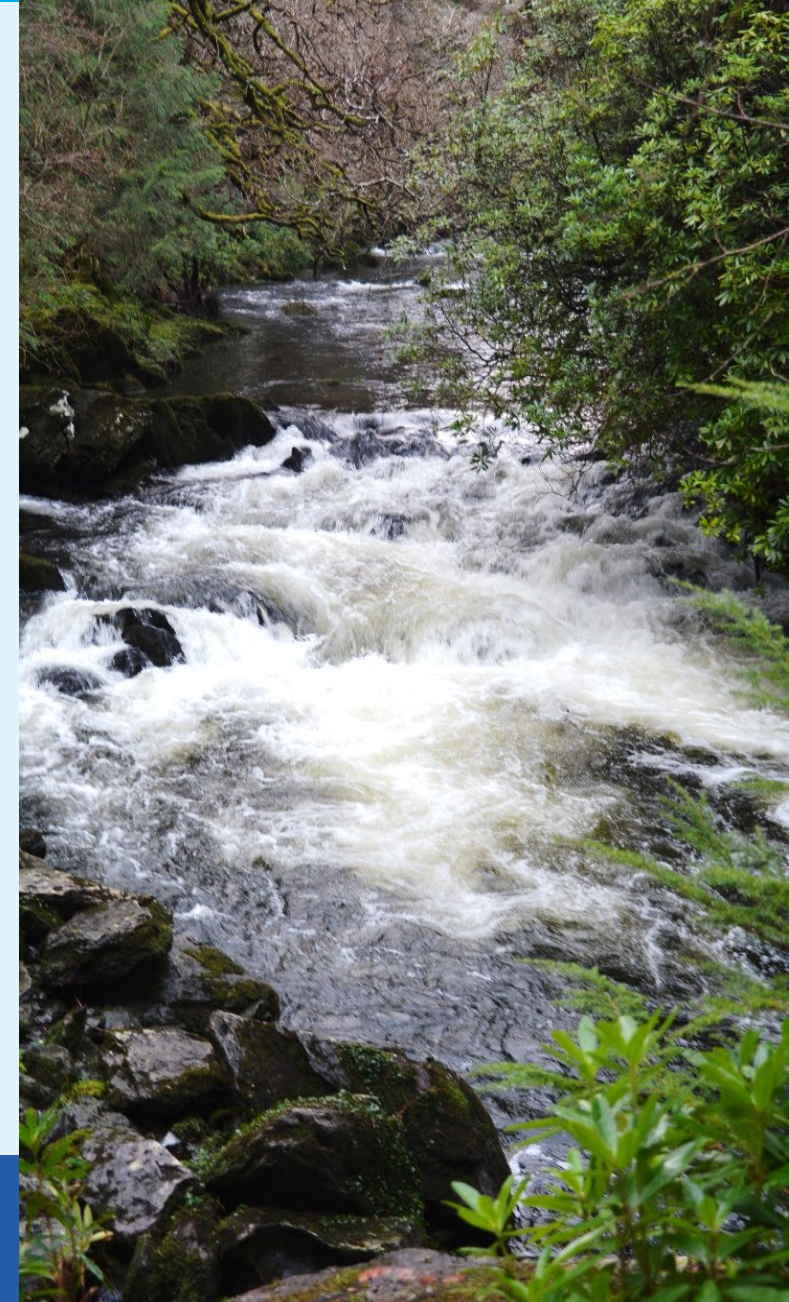






By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

- Indicator 6.3.1 - Proportion of wastewater safely treated
- Indicator 6.3.2 - Proportion of bodies of water with **good ambient water quality**

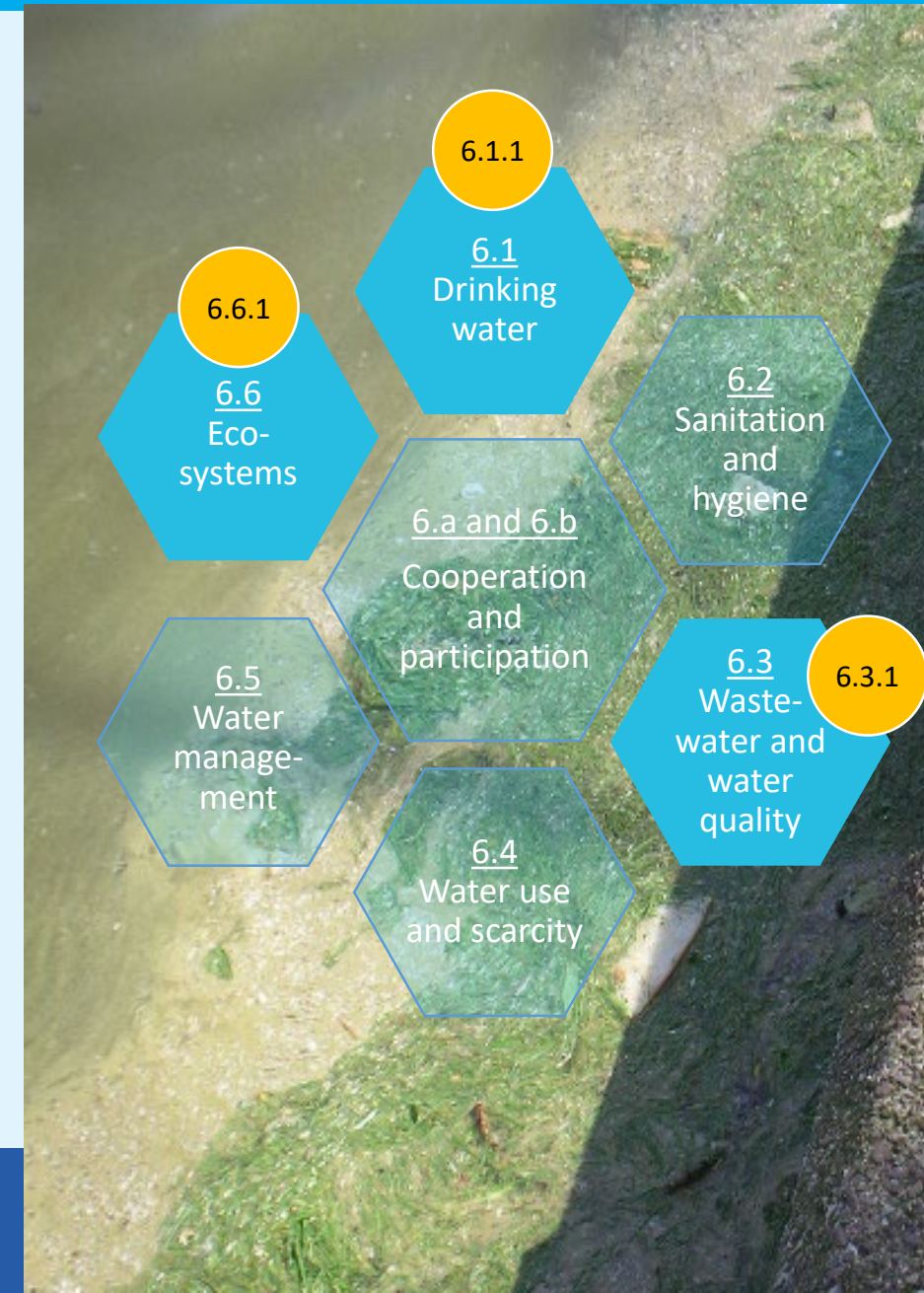


# Indicator 6.3.2 supports water management at national level



No information, or inaccurate information, could lead to incorrect management actions, such as:

- Lack of appropriate controls on discharges to waterbodies
- Inadequate treatment to waters used for drinking water supplies
- Delayed or inadequate conservation or remediation of waterbodies and wetlands





# Development of indicator 6.3.2



2014-15

- Water quality index developed in 2007 modified for global use

2016

- Index was tested in 2016 in five 'Proof of Concept' countries
- Feedback from PoC countries and expert input led to revision of indicator methodology

2017

The revised methodology was tested globally  
52 submissions were received

2018

Analysis of submissions and further feedback led to new indicator revision  
New revision of methodology accepted for tier upgrade to tier II  
Indicator report to be completed

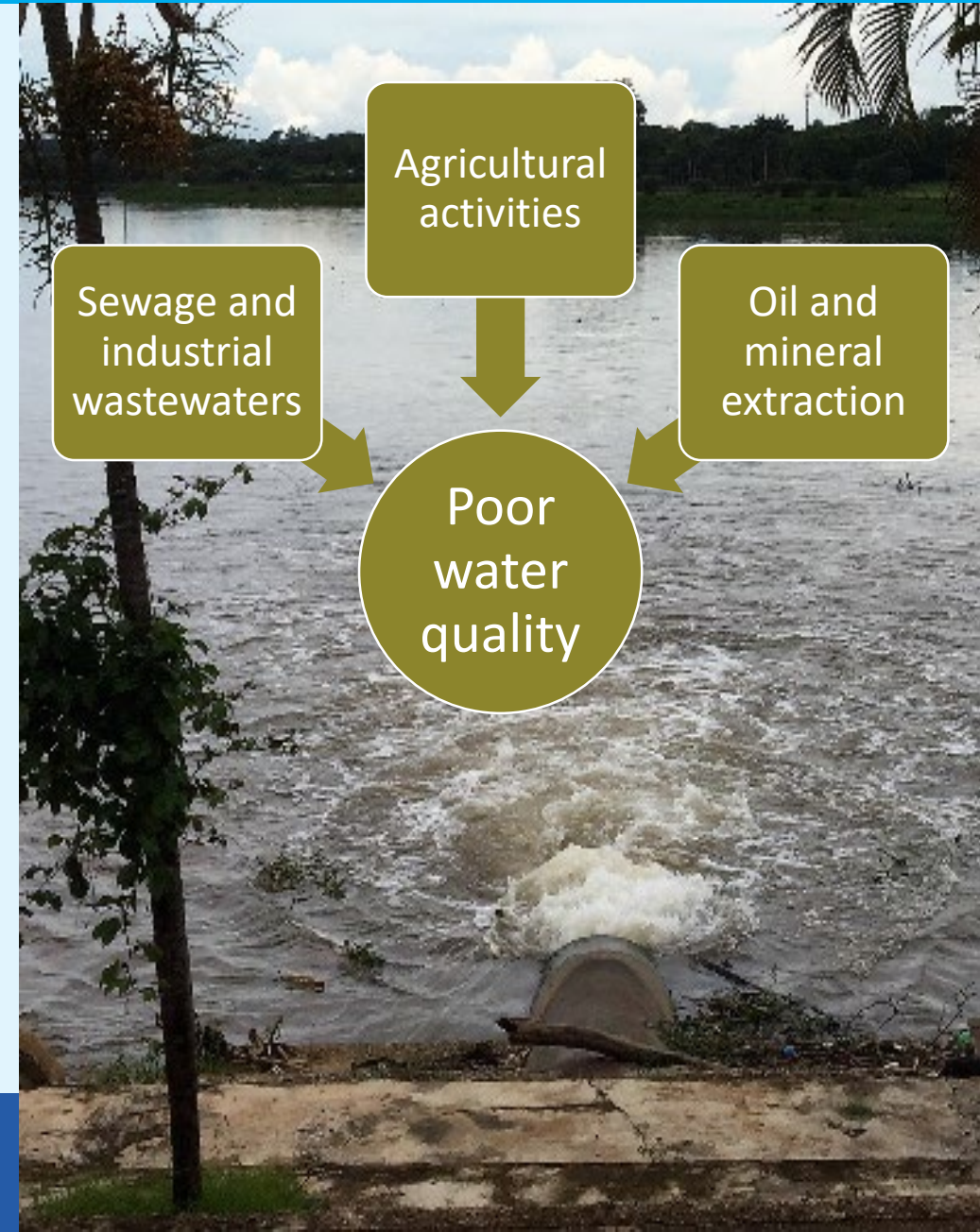


Good ambient water quality does not damage ecosystem function or present a risk to human health

Supports a balanced ecosystem including fisheries

Requires minimum treatment before domestic, agricultural or industrial use

Safe for recreation, such as water contact activities

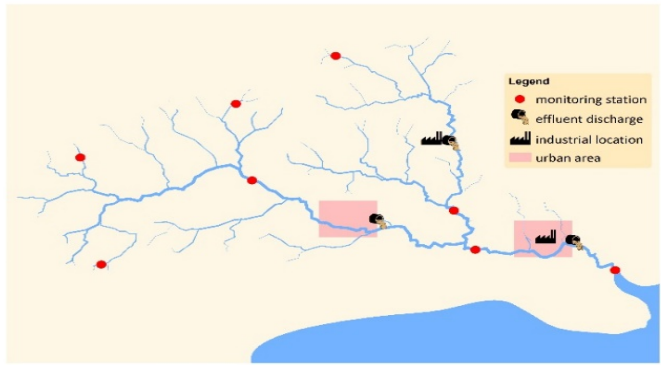




# A monitoring programme is essential



## Comprising:



Network of monitoring stations in designated waterbodies



In situ measurements, and sample collection for laboratory analysis

	A	B	C	D	E	F
8	DATE:					
9	06-Jan-16	7.0	7.01	194.7	12	2.18
10	02-Feb-16	7.5	7.35	193.1	13	2.7
11	09-Mar-16	7	7.45	198.4	24	4.33
12	12-Apr-16	10.5	7.23	203	20	5.53
13	17-May-16	17.7	7.54	230	35	10.0
14	14-Jun-16	19.3	8.44	227	63	10.5
15	12-Jul-16	17.7	9.34	200	89	19.1
16	16-Aug-16	19.8	8.58	226	120	22
17	14-Sep-16	15.4	7.86	233	63	11
18	11-Oct-16	13.2	7.13	251	36	9.1
19						
20	Average:	13.5	7.8	215.6	47.5	9.6
21	Max:	19.8	9.3	251.0	120.0	22.0
22	Min:	7.0	7.0	193.1	12.0	2.2
23						

Data handling and interpretation facilities

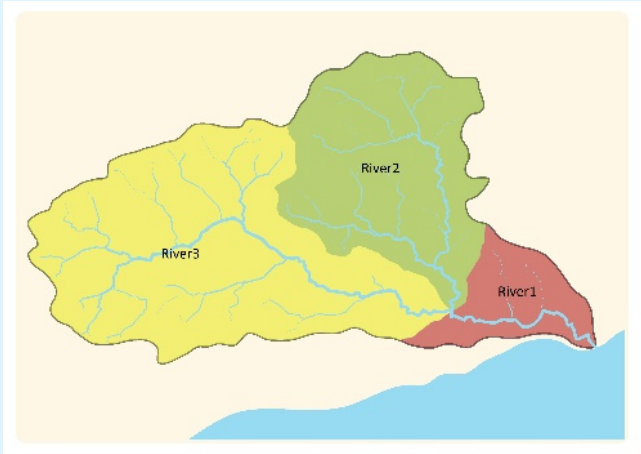
# Proportion of bodies of water with good ambient water quality



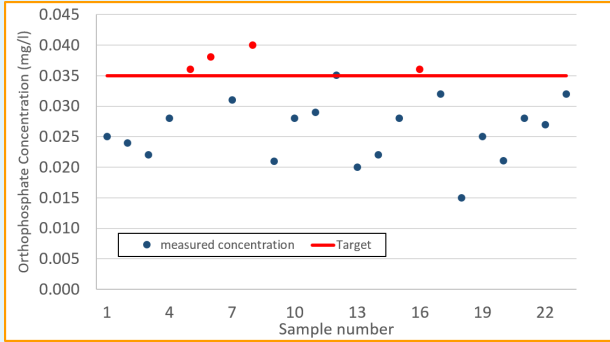
Waterbodies need to be defined within the country - **rivers, lakes and groundwaters**

Good water quality is assessed by comparing measurements with designated **target values** for specific **parameters** from specific **parameter groups**

Good water quality represents at least **80%** compliance of measurements with target values



Parameter group	Parameter
Oxygen	Dissolved oxygen, Biological oxygen demand, Chemical oxygen demand
Salinity	Electrical conductivity, Salinity, Total dissolved solids
Nitrogen*	Total oxidised nitrogen, Total nitrogen, Nitrite, Ammoniacal nitrogen
	Nitrate
Phosphorous	Orthophosphate, Total phosphorous
Acidification	pH



# “Good” water quality



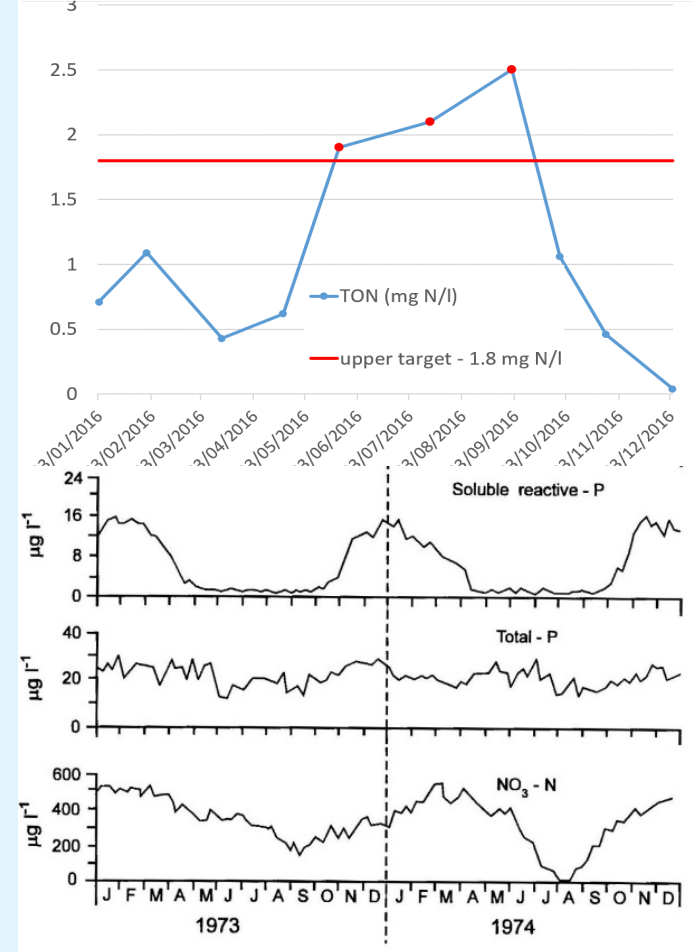
“Good quality” is assessed in relation to **target values** for ambient water quality parameters

Countries **set their own targets values** for good ambient water quality

Different target values may be needed for different types of waterbody, and also for different monitoring stations

Natural fluctuations in parameters, e.g. seasonally driven, need to be considered before setting the target values

Parameter Name	Parameter Short name	Target Value	Unit	Target Type
Dissolved Oxygen	DO	6	mg/l	Lower
Electrical Conductivity	EC	300 - 500	µS/cm	Range
pH	pH	6 - 8	-	Range
Orthophosphate	OP	0.035	mg P/l	Upper
Total Oxidised Nitrogen (Nitrate + Nitrite)	TON	1.8	mg N/l	Upper



# Reporting indicator 6.3.2

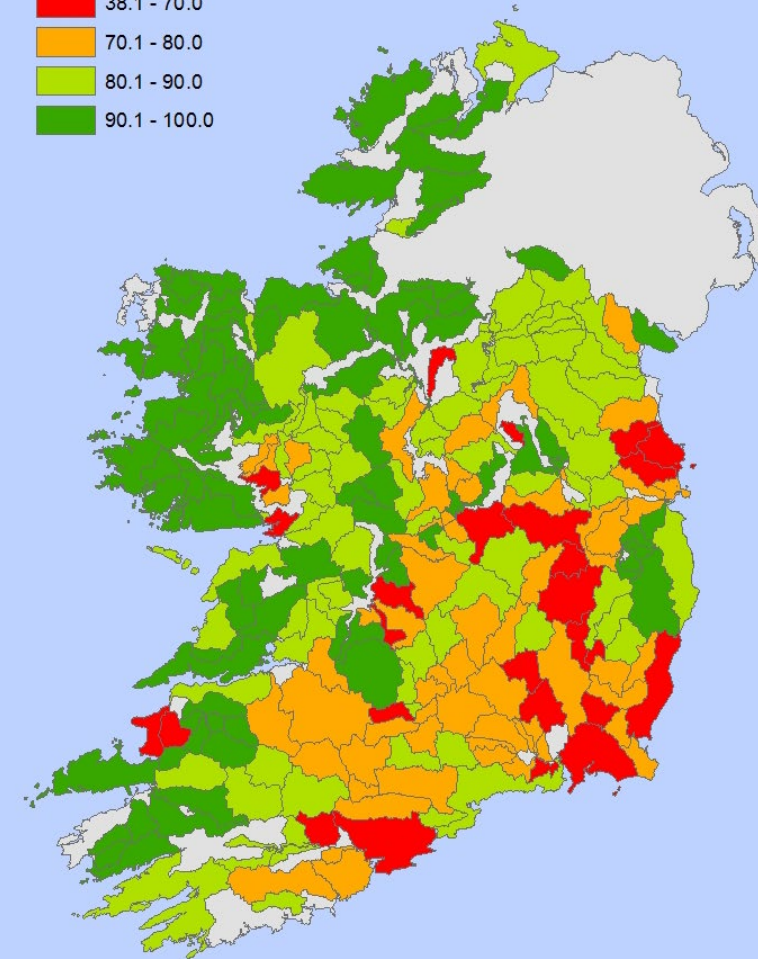
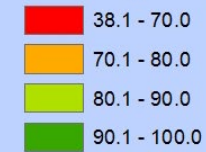


The indicator is reported as the percentage of the total number of waterbodies monitored that meet the criteria for “good” quality.

To ensure the data provided are globally comparable, it is recommended that only data from the preceding five years be used to ensure that the results are up-to-date and globally comparable.

The next year countries will be asked to report on indicator 6.3.2 will be **2020 or 2021**.

Percentage Compliance



Waterbodies = Hydrobasins Level 9

SDG Indicator 6.3.2 = 66.0



# Methodology Details

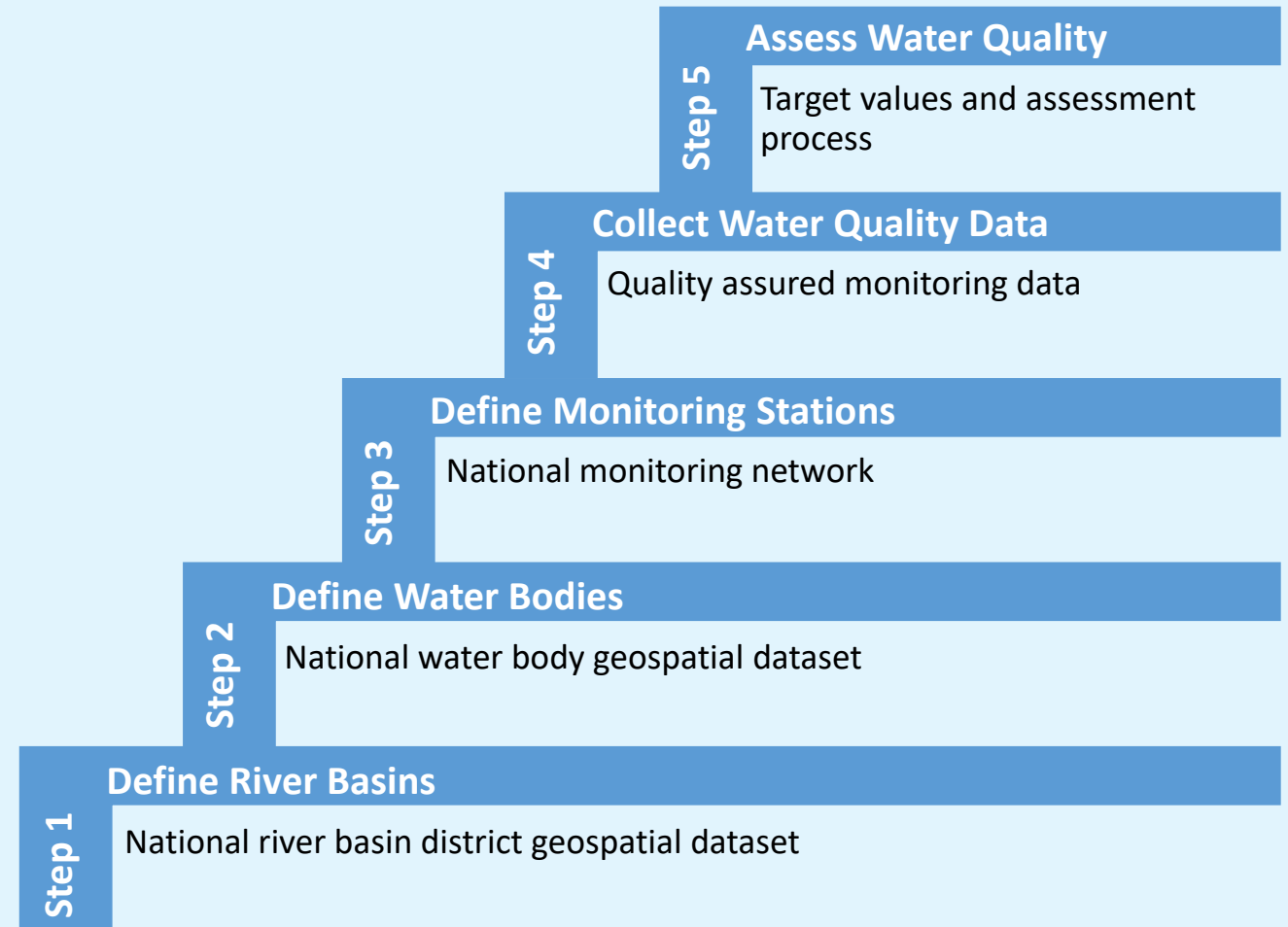
# Steps of indicator 6.3.2



Reporting on indicator 6.3.2 is divided into 5 steps

During the 2017 data drive it was recognised that many countries struggled with the implementation of several steps of the methodology

Countries are encouraged to engage with UNEP at each step regardless of whether the capacity is present in the country to ensure the final global indicator calculated fulfills the indicator objectives and is globally comparable



# River basins

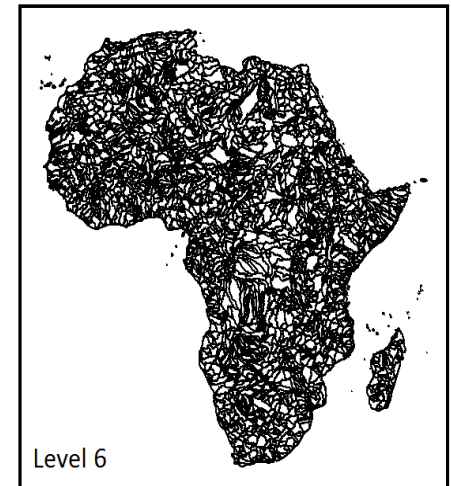
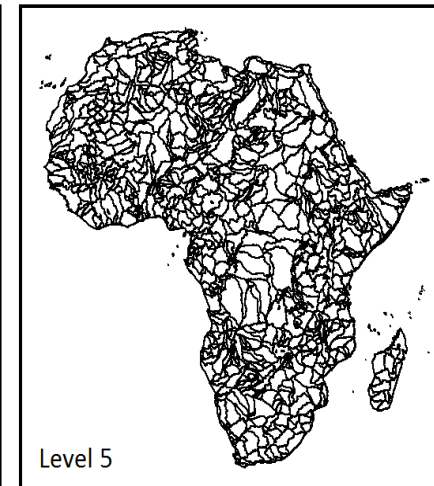
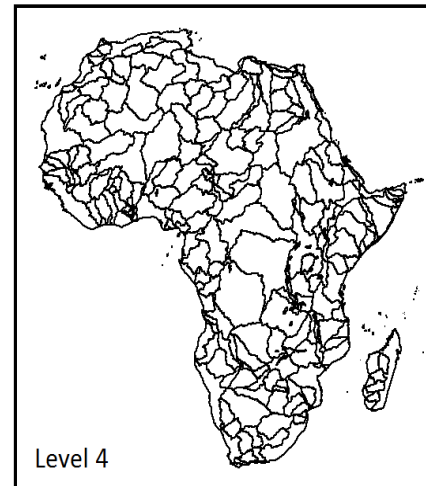
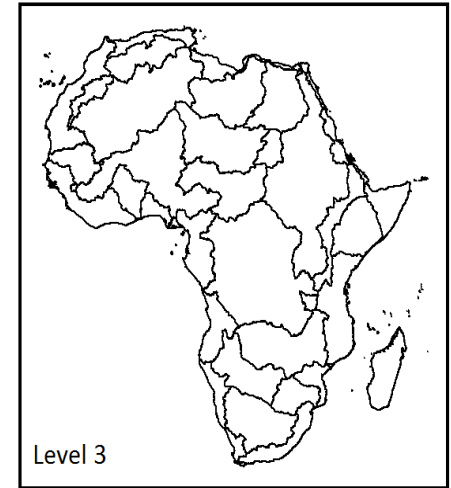
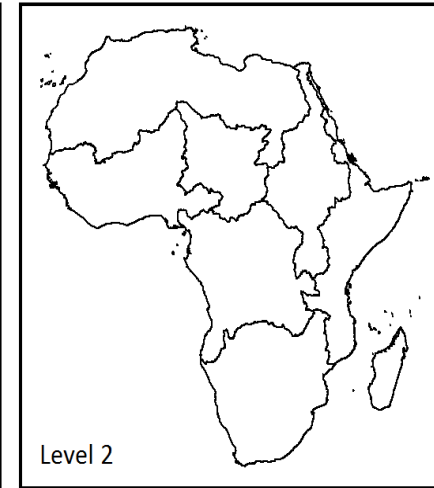
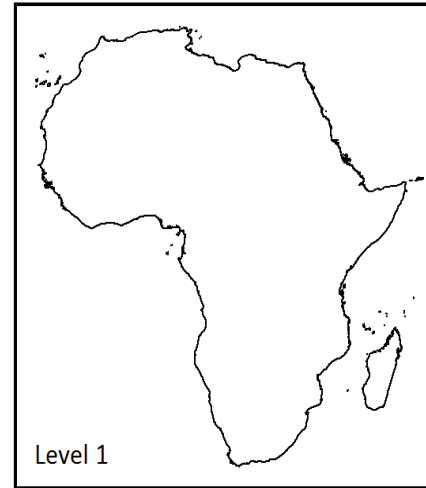


The river basin unit is the unit of disaggregation from the national indicator score

For transboundary river basins, countries report on their portion of the basin

Ideally river basin units align with existing reporting units used in a country

River basin districts are the unit of reporting for both surface and ground waters



Lehner, B. 2014 HydroBASINS Global watershed boundaries and sub-basin delineations derived from HydroSHEDS data at 15 second resolution Technical Documentation Version 1.c (with and without inserted lakes). Available at: [http://www.hydrosheds.org/images/stories/HydroBASINS\\_TechDoc\\_v1c.pdf](http://www.hydrosheds.org/images/stories/HydroBASINS_TechDoc_v1c.pdf)



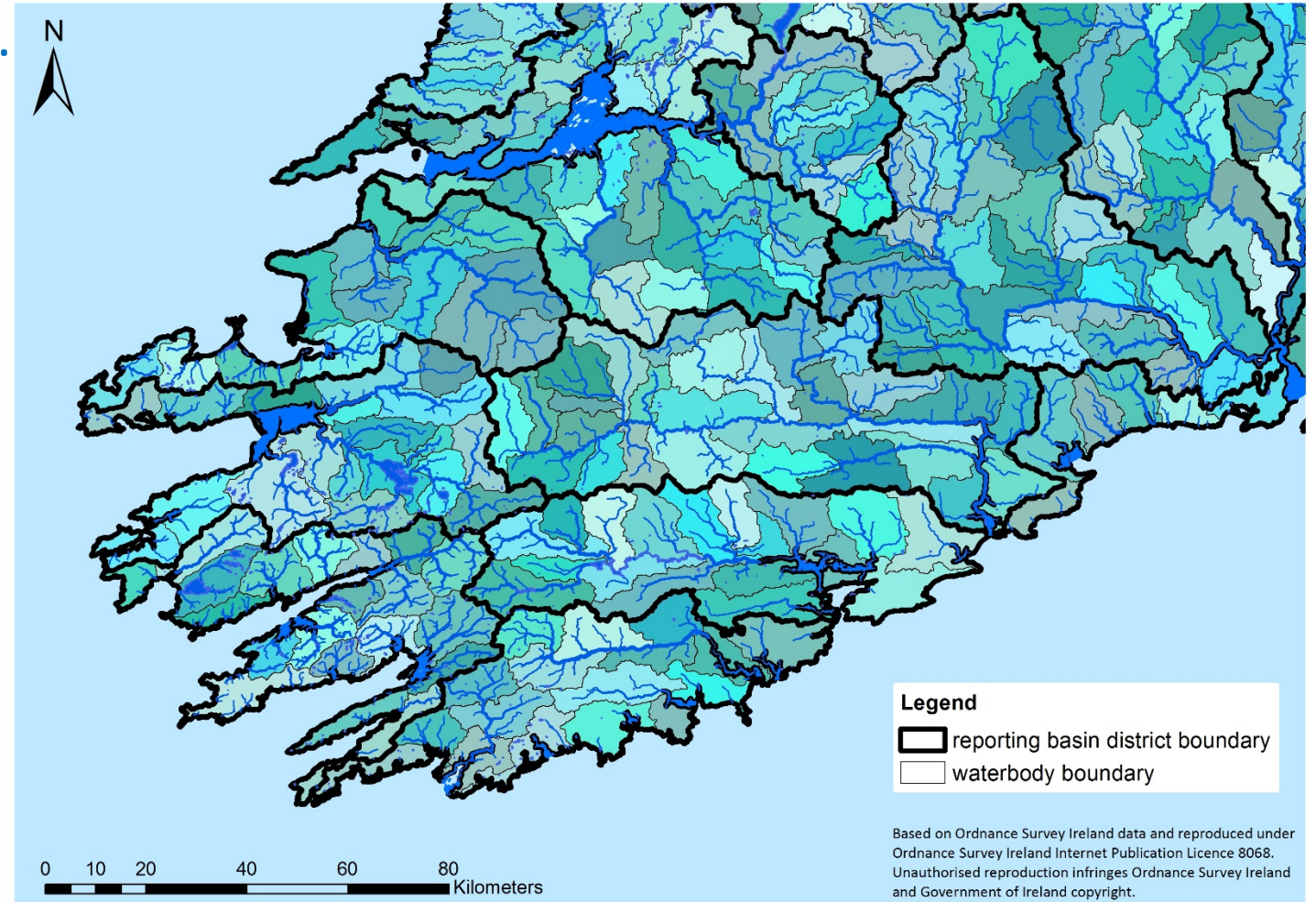
# Delineate water bodies



This map shows the river network has been divided into **river basin districts**. River basin districts are made up of one or more **river basins**. As you can see along the southern coast, some river basins have been grouped together to form a single **river basin district**.

The next stage is to subdivide each reporting basin district into waterbodies.

This map shows the catchment areas for each river waterbody in the basin.

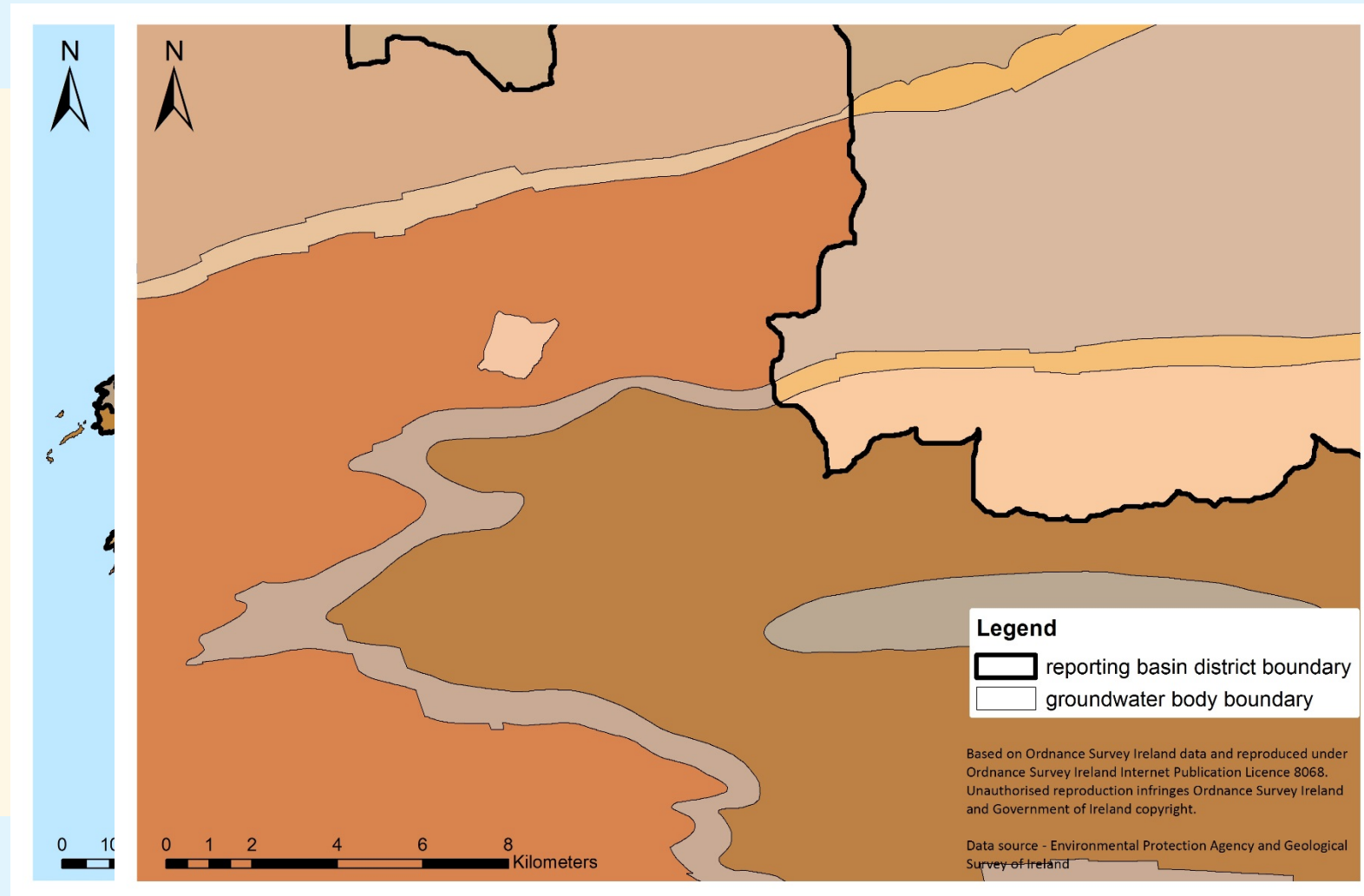




# Delineate water bodies



Delineation of water bodies can only be completed following the identification of the river basin districts, because water bodies have to be located within a single river basin district. It is critical to understand that the river basin districts, although derived from one or more river basins, are used as the reporting units for lake and groundwater bodies also.



# Parameter groups and parameters



One major development in the latest methodology revision is that countries have more flexibility when choosing parameters

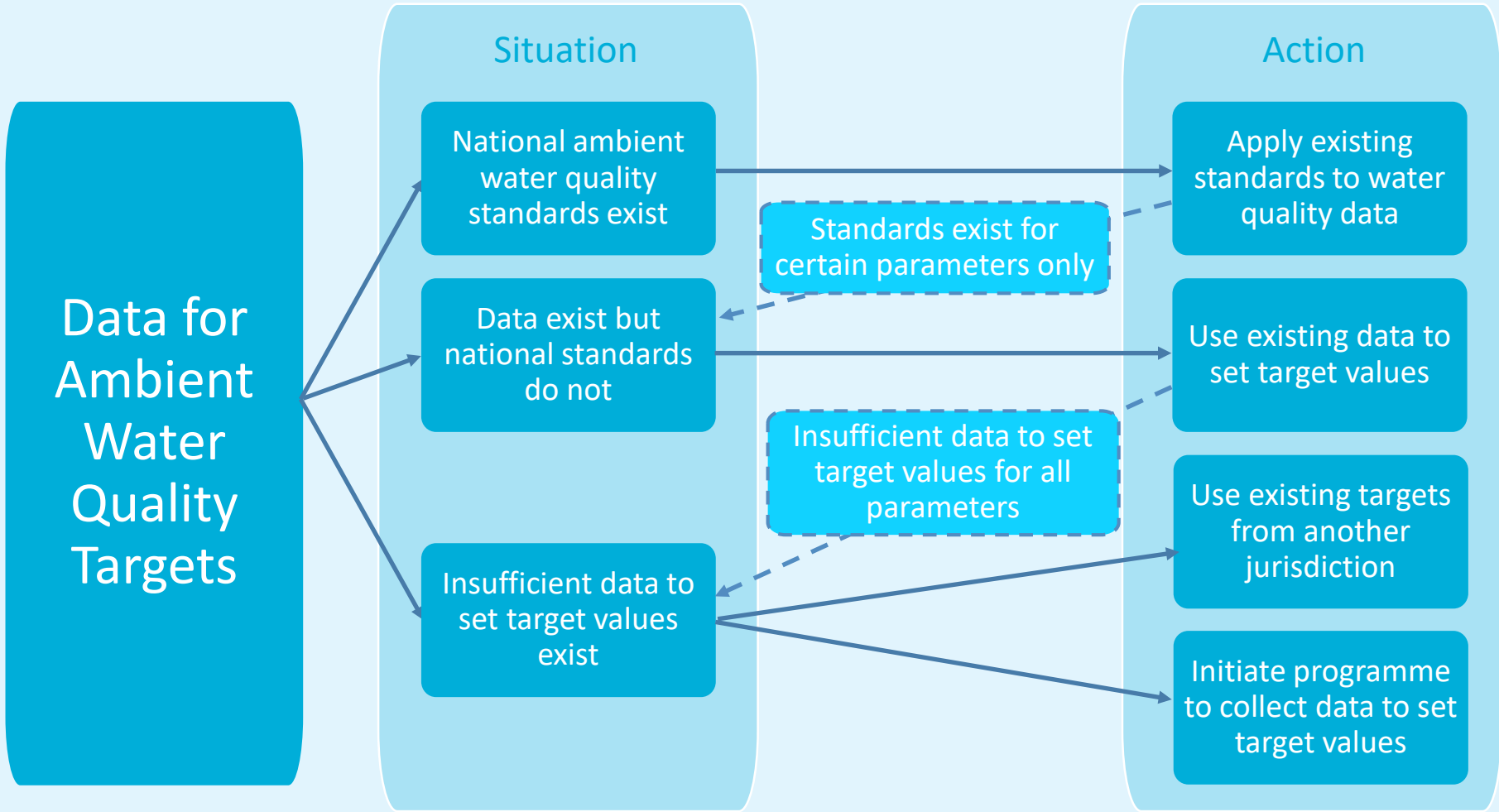
For example, rather than having to use electrical conductivity, TDS can be used instead

Parameter group	Parameter	River	Lake	Groundwater
Oxygen	Dissolved oxygen	x	x	
	Biological oxygen demand, Chemical oxygen demand	x		
Salinity	Electrical conductivity	x	x	x
	Salinity, Total dissolved solids			
Nitrogen*	Total oxidised nitrogen	x	x	
	Total nitrogen, Nitrite, Ammoniacal nitrogen			
	Nitrate**			x
Phosphorous*	Orthophosphate	x	x	
	Total phosphorous			
Acidification	pH	x	x	x
* Countries should include the fractions of N and P which are most relevant in the national context				
** Nitrate is suggested for groundwater due to associated human health risks				



A critical element of the methodology is the comparison water quality data against target values

Countries may fall into one of three categories





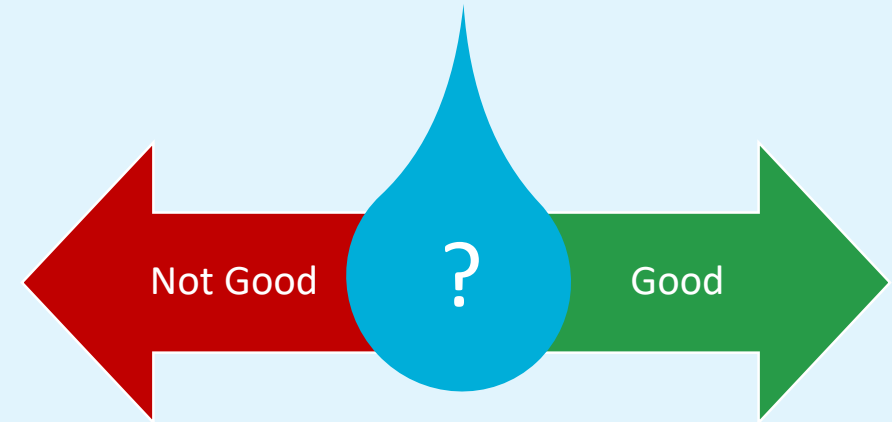
# Classify water quality



If 80% of the monitoring values comply with their specific targets within a water body, that water body is classified as “good”

A percentage compliance of less than 80% means the water body is classified as “not good”

The national indicator is simply the number of water bodies (of those which were assessed) where 80% compliance is met



$$\text{Percentage Compliance} = (n_{\text{comply}} / n_{\text{measure}}) * 100$$

80%



The progressive monitoring approach for indicator 6.3.2 is divided into two levels:

- Level 1 uses a water quality index comprised of core physico-chemical water quality parameters; and
- Level 2 includes monitoring of additional parameters and approaches such as biological, microbiological or earth observation.

## Level 1

Reported by all countries where possible

- core parameters only combined into water quality index

## Level 2

Optional, based on country's water quality monitoring capacity

- additional parameters
- additional approaches



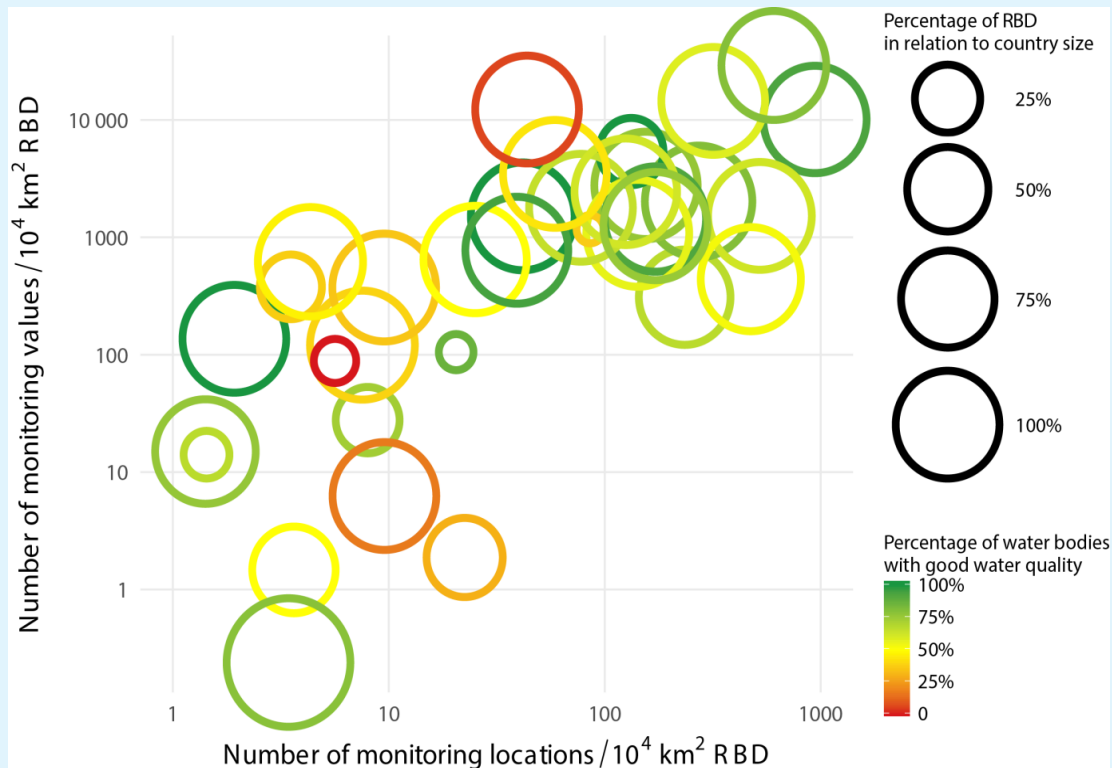
To ease the reporting burden on countries, UNEP are planning on providing a number of services for the 2020 reporting year:

- Provision of river basin and water body hydrological units
  - Based on existing global datasets (<http://www.hydrosheds.org/>)
- Monitoring station selection/definition
  - Advice of using a subset of existing monitoring stations
  - Guidance on selecting new ones
- Support for data collection
  - In countries where water quality monitoring activities are absent or limited, UNEP will work to build capacity with the country
- Assessment of water quality and indicator calculation
  - UNEP can calculate the indicator on behalf of the country if the monitoring data and target values are supplied





# Results from 2017 Data Drive for indicator 6.3.2



## Summary of baseline of indicator 6.3.2 submissions

Notes: RBD is reporting basin district. The circle size relates to the proportion of the individual country covered. The location of the circle indicates the number of monitoring stations and monitoring values used in the indicator calculation in the individual country.

## Status of baseline reporting

- 52 countries reported (31 on open water bodies, 36 on rivers, 26 on groundwater and 23 on all three)

## Many challenges faced

- Methodology revision
- Alignment with existing reporting frameworks
- Greater support needed
- Monitoring programme resourcing
- Importance of quality-assured data

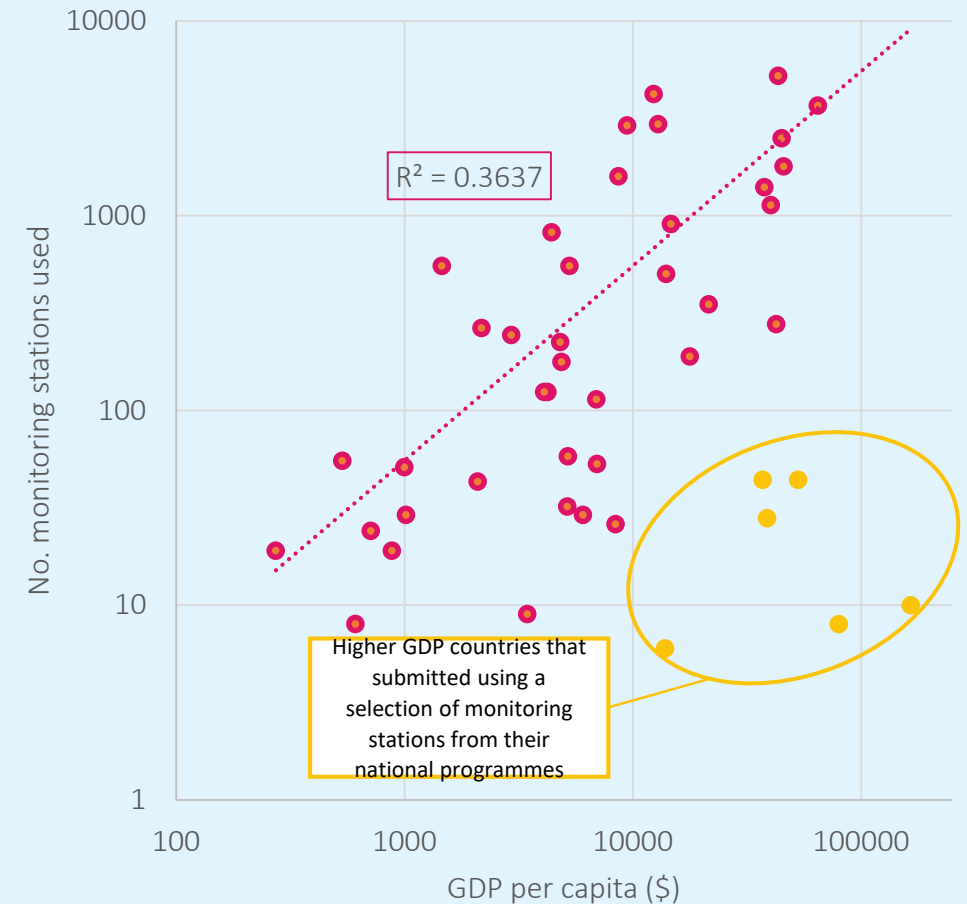


Freshwater quality is at risk globally.

**Modelling analysis** shows:

Freshwater pollution is prevalent and increasing in many parts of Latin America, Africa and Asia.

Monitoring and assessment are essential for an exact global estimate of water pollution. Yet the current **lack of water quality monitoring, data coverage and accessibility** does not provide a comprehensive picture.







Questions on indicator 6.3.2?



## **SDG Indicator 6.5.1**

**Degree of Integrated Water Resources  
Management Implementation**

# “What do you think is needed to achieve SDG 6?”

## (HLPF, July 2018, NYC)





# Sustainable Development Goal Target 6.5

***“By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate”***

**Indicator: 6.5.1:** Degree of integrated water resources management implementation (0-100)


**Indicator 6.5.2:** Proportion of transboundary basin area with an operational arrangement for water cooperation

UN Environment-DHI Centre  
on Water and Environment



# SDG Indicator 6.5.1:

## Degree of integrated water resources management implementation (0-100)

Custodian Agency: 



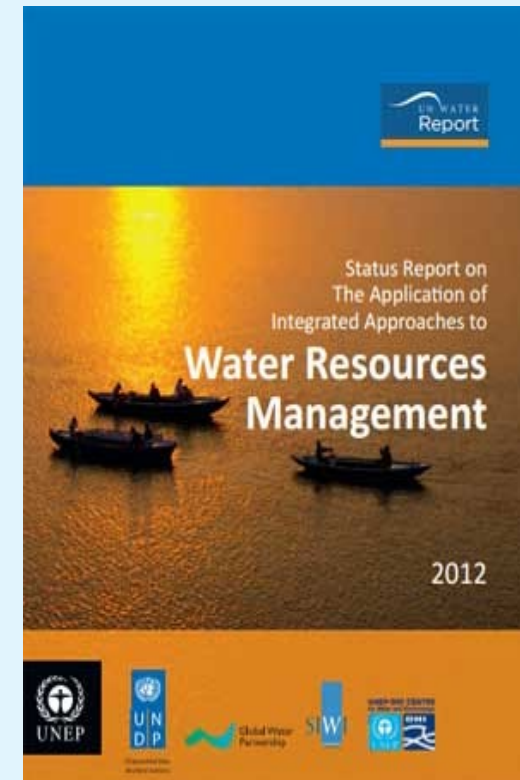
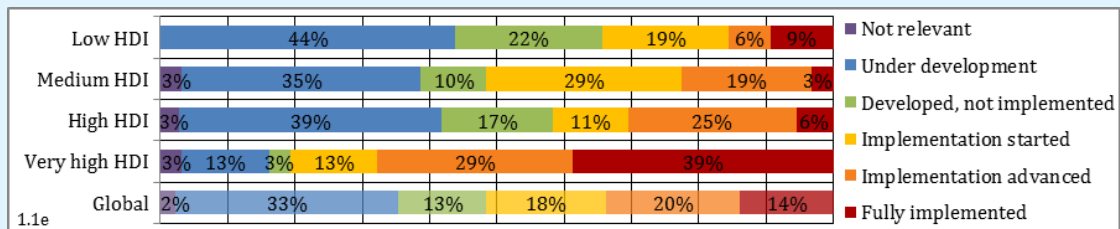
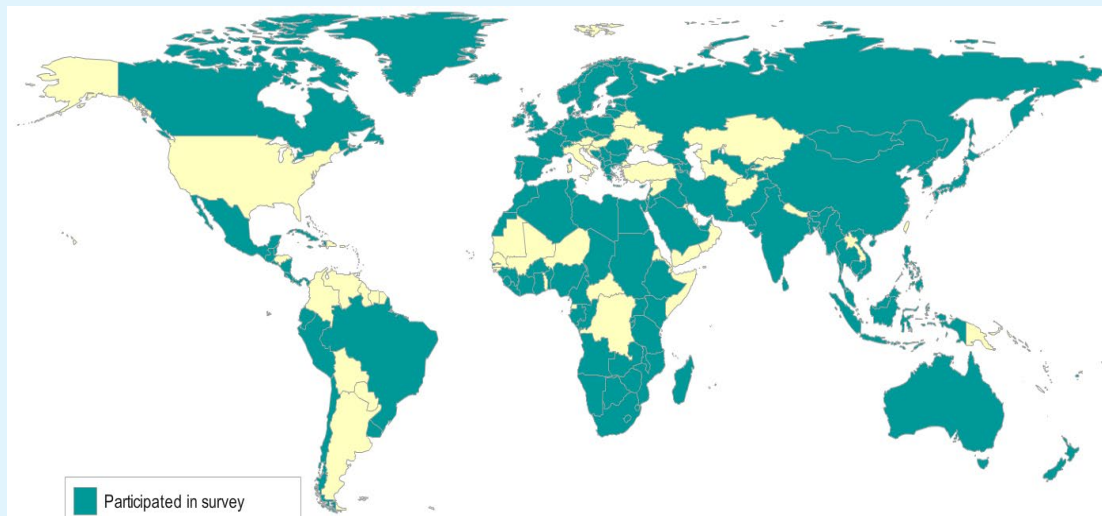
# Methodology SDG Indicator 6.5.1

- Under integrated monitoring initiative GEMI
- Supported by 35 country workshops in collaboration with GWP
- Country survey with 33 questions, covering 4 dimensions of IWRM:
  - Enabling Environment
  - Institutions
  - Management Instruments
  - Sustainable Financing

Degree of implementation (0 – 100)	
Very high (100)	Objectives consistently achieved, and <b>periodically reviewed and revised</b> .
High (80)	Policy <b>objectives consistently achieved</b> .
Medium-high (60)	<b>Being used by the majority</b> of relevant authorities to guide work.
Medium-low (40)	<b>Based on IWRM, approved</b> by government and <b>starting to be used</b> by authorities to guide work.
Low (20)	Exists, but <b>not based on IWRM</b> .
Very low (0)	Development <b>not started</b> or not progressing.



# WRM Status Report 2012



# SDG Indicator 6.5.1:

## Degree of IWRM implementation

- Support monitoring of SDG Target 6.5  
*"Implement IWRM at all levels, including through transboundary cooperation as appropriate"*
- Support monitoring of IWRM aspects of other targets
- One aggregated indicator (zero – 100)
- A diagnostic tool by/for countries

# Multiple dimensions

- aspects of IWRM
- "at all levels"
- across all sectors
- supporting other targets
- implementation progress (steps vs coverage)



# 4 Categories of IWRM Indicators

1. **Enabling Environment:** Policy, laws, plans
2. **Institutions:** cross-sector coordination, stakeholder participation, capacity, gender and effectiveness
3. **Management Instruments:** programs, monitoring, knowledge sharing, capacity development
4. **Sustainable Financing:** for water resources development and management

# 1. Enabling Environment: Policy, laws, plans

1.1 Are there policies, laws and plans that support Integrated Water Resources Management (IWRM) at the national level?

- National Water Policy?
- National Water Law(s)?
- National IWRM Plan or Equivalent?

1.2 Are there policies, laws and plans that support IWRM at other levels?

- Sub-national/provincial/State water resource policies?
- Basin Management plans?
- Agreements for transboundary water management?

## **2. Institutions: cross-sector coordination, stakeholder participation, capacity, gender and effectiveness**

2.1 Is there institutional support for IWRM implementation at the national level?

- Government organisation responsible for WRM?
- Governmental inter-sectorial coordination for WRM
- Stakeholder participation in WRM



## **2.2 Is there institutional support for IWRM implementation at other levels?**

- Basin level organisation?
- Stakeholder participation in WRM at the local level?
- Gender-specific objectives at sub-national levels?
- Gender-specific objectives and plans at transboundary level?
- Institutional framework for transboundary water management?

### **3. Management Instruments: programs, monitoring, knowledge sharing, capacity development**

#### **3.1 Do water resources management programs support IWRM implementation at the national level?**

- Monitoring programs for water availability and use?
- Programs for sustainable and efficient water use?
- Programs for pollution control incl. water quality monitoring?
- Capacity development programs for WRM

# Evaluation Questions:

3. **Management Instruments:** programs, monitoring, knowledge sharing, capacity development

## 3.2 Do water resources management programs support IWRM implementation at other levels?

- Aquifer and basin level management programs?
- Mechanisms for data and information exchange between countries?

# Evaluation Questions:

- 4. **Sustainable Financing:** for water resources development and management
  - 4.1 **Is there financing for water resources management (WRM) at the national level?**
    - National budget for WRM investment projects including infrastructure?
    - National budget for the recurrent costs of the IWRM elements specified in sections 1 to 3 above?



# Evaluation Questions:

## 4. **Sustainable Financing:** for water resources development and management

### 4.2 Is there financing for water resources management (WRM) at other levels?

- WRM in sub-national or basin budgets or investment plans?
- Revenues raised from dedicated levies on water users to cover the costs of WRM at basin or sub-national levels?
- Sustainable financing for transboundary cooperation arrangements?

# 1: Indicators for Enabling Environment: Policy, Laws, Plans

1/2

		Level of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
<b>1.1 Are there policies, laws and plans that support Integrated Water Resources Management (IWRM) at the national level?</b>							
a	National water resources <b>policy</b>	Development <b>not started</b> , or not based on an IWRM approach.	<b>Being prepared</b> , based on IWRM, but not approved by government.	<b>Approved</b> by government.	<b>Being used</b> by the majority of relevant authorities to guide work.	Policy <b>objectives consistently achieved</b>	Objectives consistently achieved, and periodically <b>reviewed and revised</b> .
	Score: select 2.	Further info. or reason for n/a		Click here to enter text.			
b	National water <b>law(s)</b>	Development <b>not started</b> or not based on an IWRM approach.	<b>Being prepared</b> , based on IWRM, but not approved by government.	<b>Approved</b> by government.	Authorities <b>clearly mandated to apply laws</b> .	<b>All provisions</b> in the water law <b>applied</b> across the country.	<b>All</b> people, companies and organizations found breaking the water law are <b>held to account</b> .
	Score: select 2.	Further info. or reason for n/a		Click here to enter text.			
c	National <b>IWRM plan</b> or equivalent	Development <b>not started</b> .	<b>Being prepared</b> , but not approved by government.	<b>Approved</b> by government.	<b>Funding allocated</b> , and the plan is <b>being used</b> by majority of relevant authorities.	Plan <b>objectives consistently achieved</b> .	Objectives consistently achieved, and periodically <b>reviewed and revised</b> .
	Score: select 2.	Further info. or reason for n/a		Click here to enter text.			

## 2: Institutions: cross-sector coordination, stakeholder participation, capacity, gender and effectiveness

		Level of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
<b>2.1 Is there institutional support for IWRM implementation at the national level?</b>							
a	<b>Government organisation<sup>4</sup></b> responsible for WRM	<b>No dedicated organisation</b> for WRM.	Exists, with <b>clear mandate.</b>	Has <b>adequate capacity.</b>	Has <u>resources</u> to lead IWRM implementation to a <b>limited extent.</b>	Leads <b>IWRM implementation effectively.</b>	Leads <b>IWRM implementation effectively and is sustainable<sup>5</sup>.</b>
Score: select .		Further info. or reason for n/a		Click here to enter text.			
b	<b>Governmental inter-sectoral coordination for WRM</b>	<b>No inter-sectoral coordination.</b>	<b>Partial/ad-hoc</b> inter-sectoral coordination.	<b>Formal mechanisms</b> for inter-sectoral cooperation <b>exist.</b>	Mechanisms <b>regularly used across some sectors.</b>	Mechanisms <b>regularly used across most sectors.</b>	Mechanisms <b>regularly and effectively used across all relevant sectors.</b>
Score: select .		Further info. or reason for n/a		Click here to enter text.			
c	<b>Stakeholder participation in WRM<sup>6</sup></b>	<b>No stakeholder consultation.</b>	<b>Some consultation mechanisms</b> exist for <b>some stakeholders</b>	<b>Consultation mechanisms</b> exist for a <b>wide range of stakeholders</b> but not well used.	Consultation mechanisms <b>well established and used</b> with a <b>range of stakeholder groups.</b>	Consultation mechanisms well established and used for <b>all relevant stakeholder groups</b> , but outputs not often acted on.	Consultation <b>results</b> often <b>incorporated</b> into relevant stages of <b>planning and implementation.</b>
Score: select .		Further info. or reason for n/a		Click here to enter text.			
d	<b>Gender-specific objectives</b> addressed at national level	<b>Not explicitly covered</b> in national laws, policy or plans.	<b>Partially included</b> in national laws, policies or plans.	<b>Included</b> in national plans but inadequate budgets and not implemented.	In national plans, <b>partially funded and objectives partly achieved.</b>	<b>Fully achieved.</b> However, objectives do not fully address gender issues.	Fully achieved and <b>adequately address gender issues.</b>
Score: select .		Further info. or reason for n/a		Click here to enter text.			

# 3: Management Instruments: Programs, monitoring, knowledge sharing, capacity development

		Level of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
<b>3.1 Do water resources management programs support IWRM implementation at the national level?</b>							
a	<b>Monitoring programs for water availability and use</b> (includes surface and/or groundwater, as relevant to the country).	<b>Very limited</b> monitoring. Only ad-hoc projects.	<b>Programs exist</b> for ongoing monitoring and information management.	<b>Monitoring undertaken</b> but with spatial or temporal gaps.	Monitoring and information management <b>developed to a high degree</b> . Includes sectoral water use and availability monitoring	Monitoring and information management <b>advanced</b> . Data sharing with relevant stakeholders is moderate.	National information system <b>updated with adequate frequency, sustainably funded</b> , and all relevant stakeholders have access to data and information <sup>11</sup> .
	Score: select .	Further info. or reason for n/a		Click here to enter text.			
b	<b>Programs for sustainable and efficient water use</b> (includes surface and/or groundwater, as relevant to the country).	<b>Very limited</b> . Only ad-hoc projects cover either surface or groundwater.	<b>Programs exist</b> for sustainable and efficient development and use of water resources.	<b>Some</b> demand management <b>measures being implemented</b> .	Demand management <b>measures adequate and effective</b> in the majority of the country.	Environmental water requirements well understood. Tools exist for <b>efficient allocation of water between users</b> , including environmental considerations.	Water allocation and demand management <b>measures are effective</b> . Programs <b>sustainably funded</b> and periodically reviewed and revised.
	Score: select .	Further info. or reason for n/a		Click here to enter text.			
c	<b>Programs for pollution control, including water quality monitoring</b> .	<b>Very limited</b> . Ad-hoc projects monitor water quality or incorporate pollution control.	<b>Programs exist</b> for pollution control and ongoing monitoring of water quality.	<b>Water quality monitoring undertaken</b> but spatial or temporal gaps. <b>Some</b> pollution control measures in place.	Water quality <b>monitoring</b> , with adequate frequency, and pollution control <b>measures, cover majority of country</b> .	Pollution control measures adequate and <b>effective for the whole country</b> .	Programs <b>effective, sustainably funded</b> and periodically reviewed and revised.
	Score: select .	Further info. or reason for n/a		Click here to enter text.			



# 4: Sustainable Financing for water resources development and management

		Level of implementation (0 – 100)					
		Very low (0)	Low (20)	Medium-low (40)	Medium-high (60)	High (80)	Very high (100)
<b>4.1 Is there financing for water resources management (WRM) at the national level?</b>							
a	<b>National budget for WRM investment projects including infrastructure.</b>	<b>No specific budget</b> allocated for WRM in national investment plans.	<b>Budget allocated</b> for WRM investment but funds <b>not made available</b> to relevant implementing agencies.	<b>Budget allocated</b> and funds made <b>available but insufficient funds</b> from other sources for implementation of planned projects	Budget allocated and funds made available for all planned projects <b>with other funding sources available</b> for some projects.	Adequate funds from multiple sources available. All <b>planned projects under implementation and new projects planned.</b>	Planned programs <b>completed</b> , evaluated and lessons shared, new funding cycle for programs underway.
Score: select .		Further info. or reason for n/a		Click here to enter text.			
b	<b>National budget for the recurrent costs of the IWRM elements specified in sections 1 to 3 above.</b>	<b>No specific budget</b> allocations made for recurrent costs of the IWRM elements listed in Questions 1 to 3 above.	<b>Allocations</b> made for <b>only a few</b> of the elements and implementation at an early stage.	Allocations made for <b>at least half</b> of the elements but insufficient for others.	Allocations for <b>most of the elements</b> and some implementation under way.	Allocations include <b>all elements</b> and implementation substantially complete.	Planned budget allocations for all elements of the IWRM approach <b>fully utilised, evaluated and lessons shared.</b>
Score: select .		Further info. or reason for n/a		Click here to enter text.			

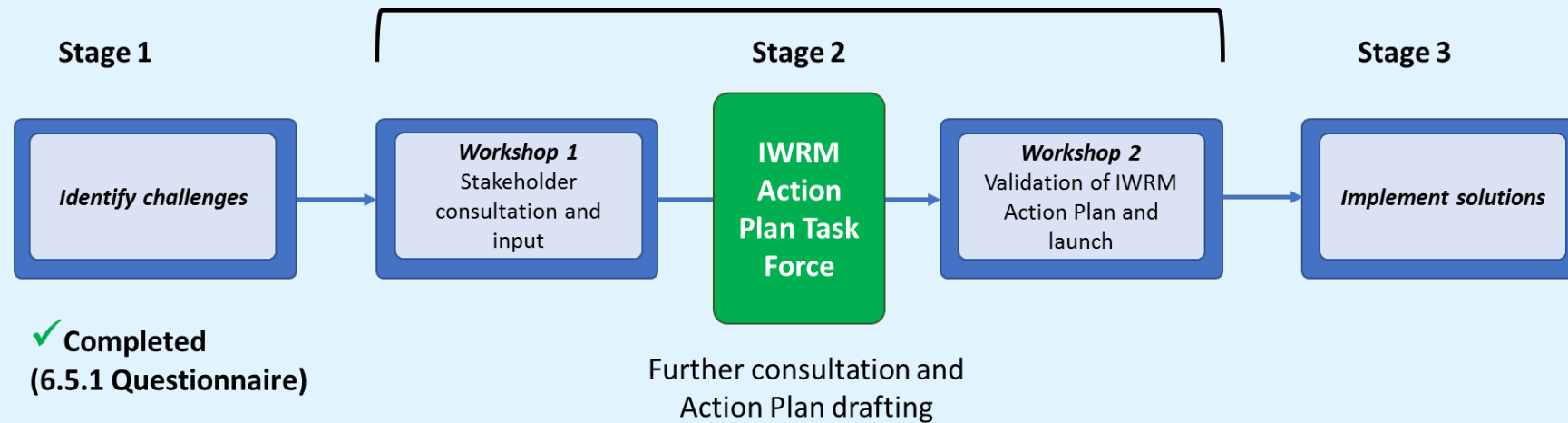
# Calculation of overall IWRM Score

Average score for "Enabling Environment" (6Q)  
+ Average score for "Institutions"(9Q)  
+ Average score for "Management" (6Q)  
+ Average score for "Financing" (5Q)

=====

Overall Score =  $SUM/4$  (0-100%)

# SDG-6 IWRM Action Programme

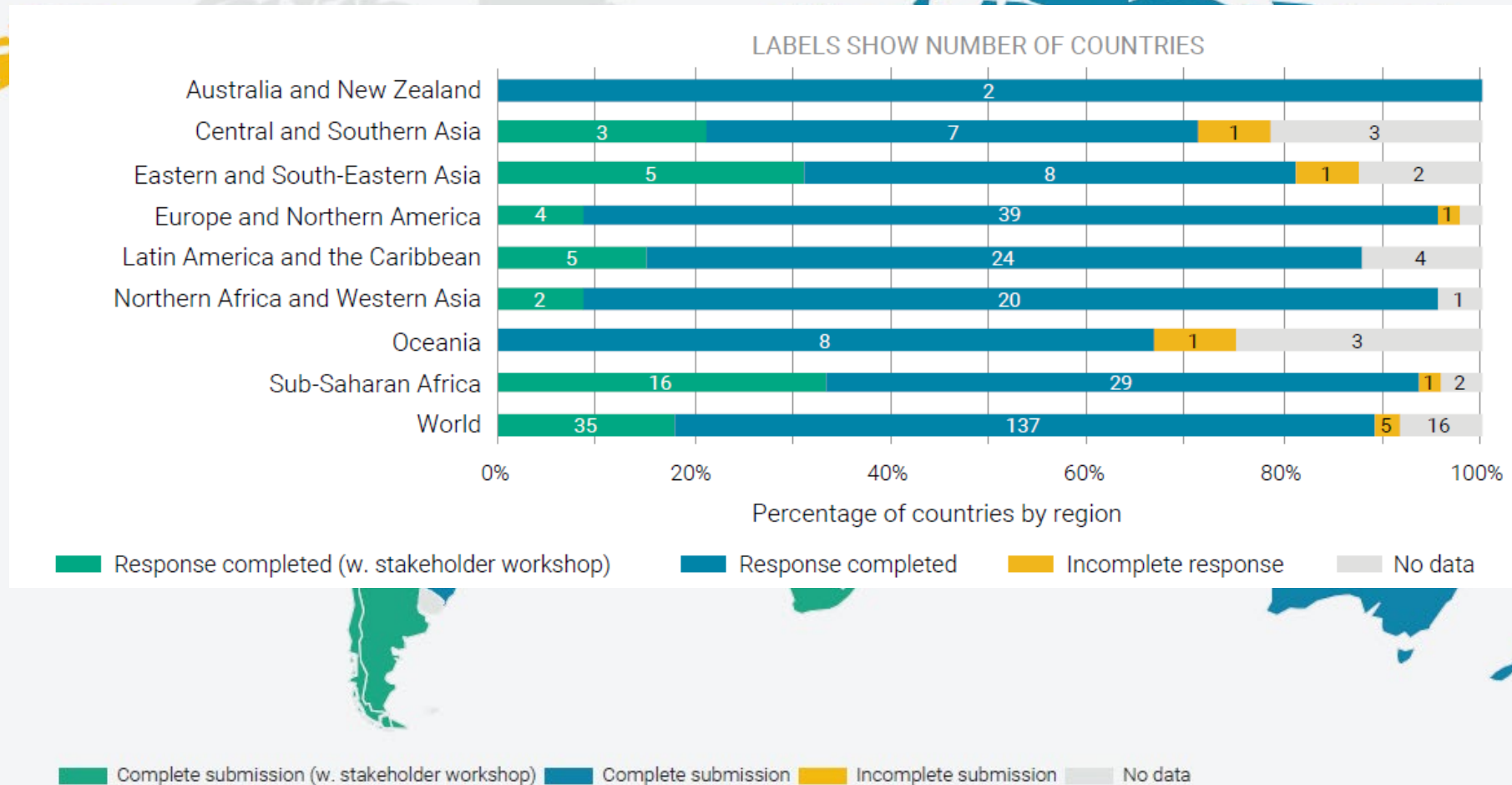


# Global baseline results SDG Indicator 6.5.1

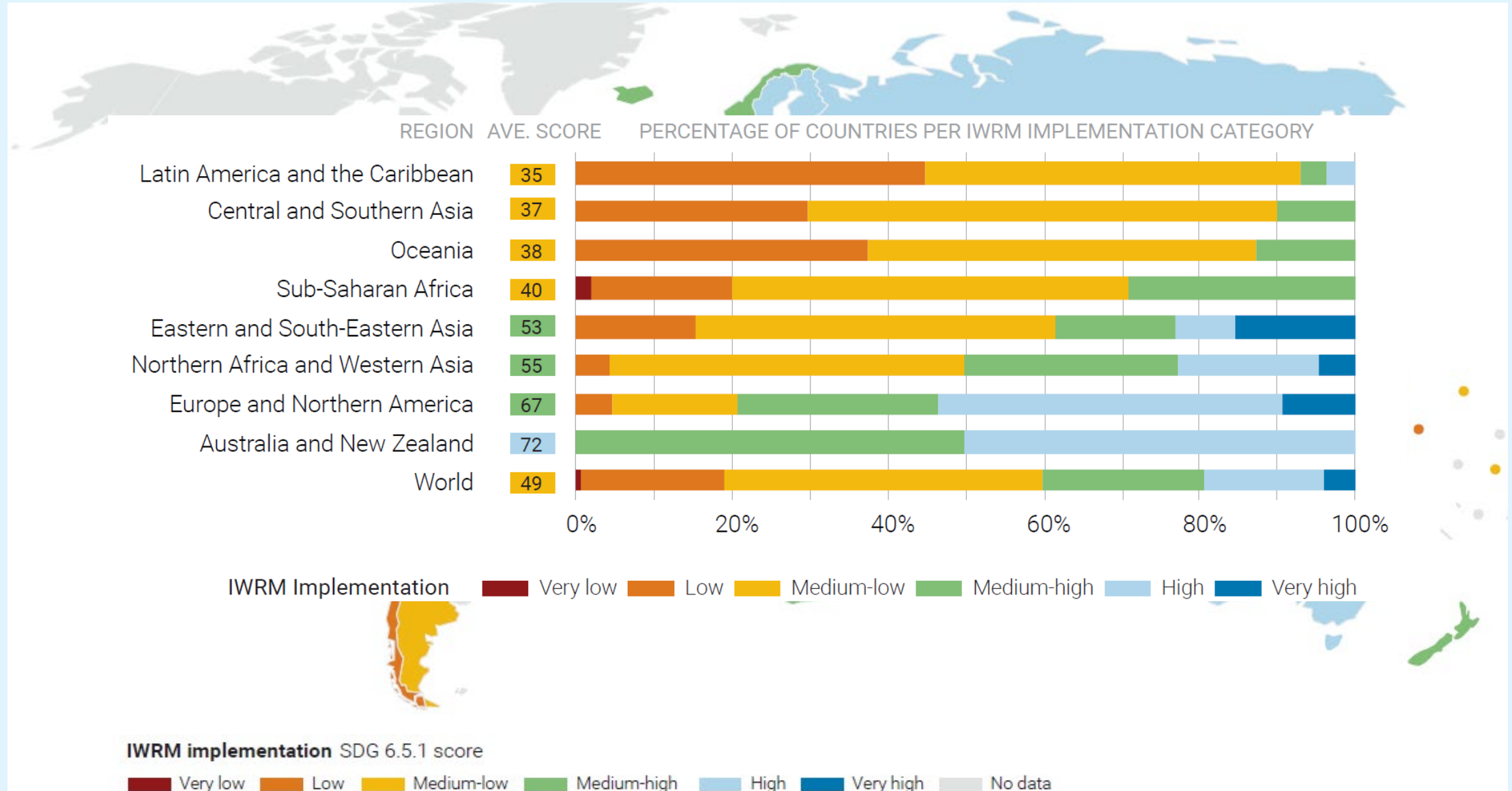
Degree of integrated water resources management implementation



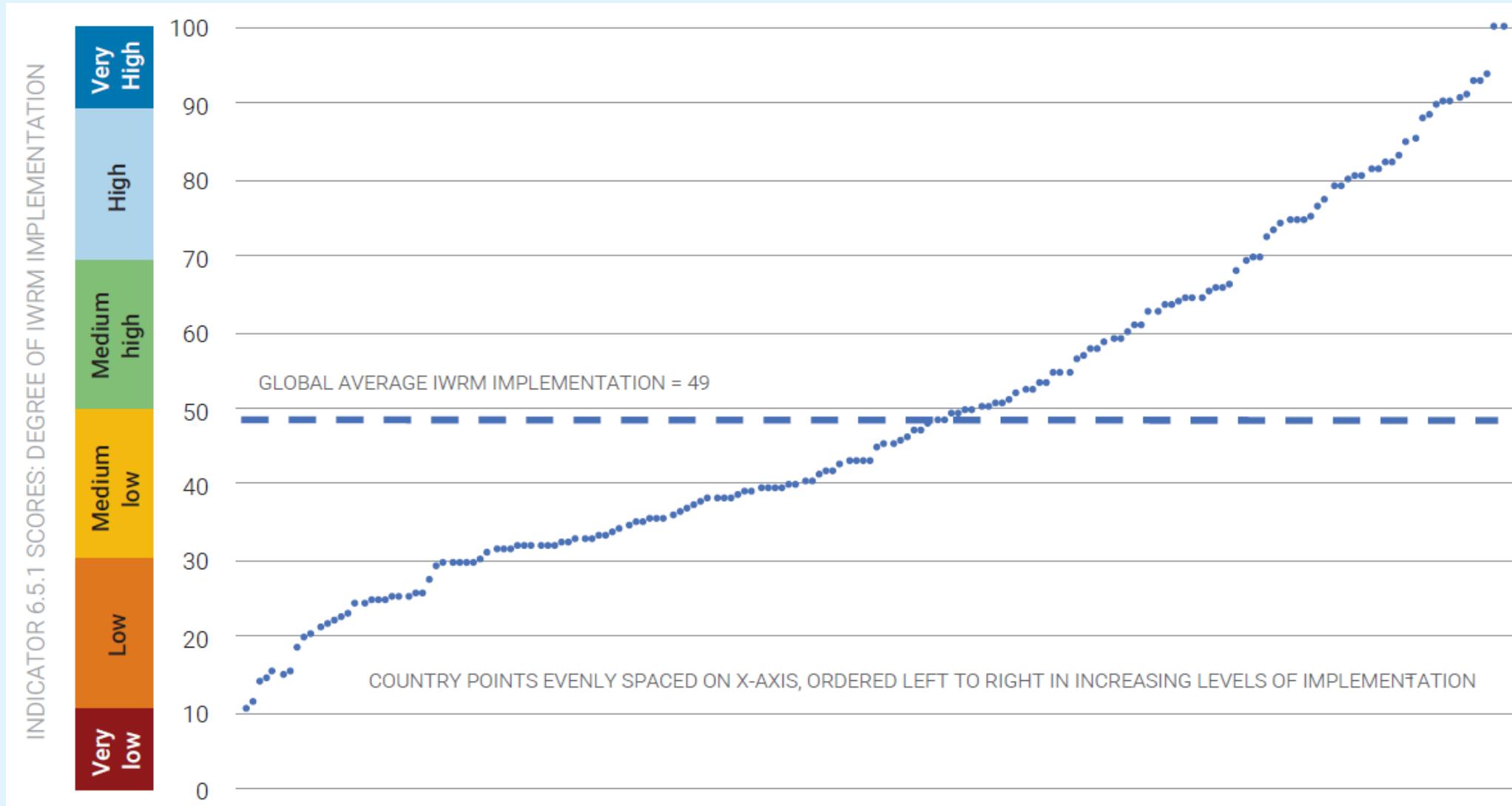
# 172 countries participating: 75 %of total global population, and 80% of country area



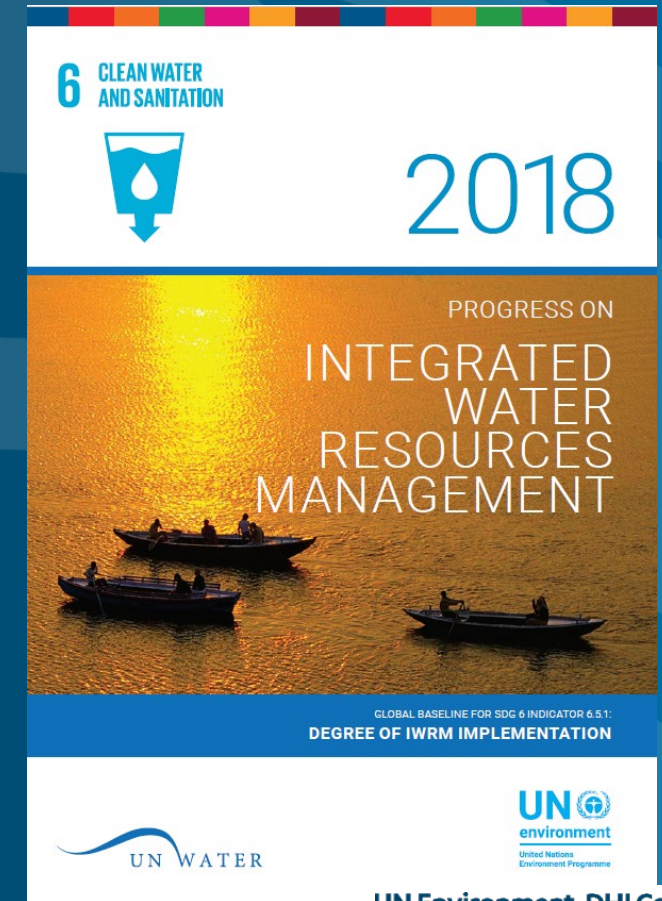
# Global status of IWRM Implementation



# Country scores range from 10 to 100



Baseline report and data available on  
<http://iwrmdataportal.unepdhi.org/>



UN Environment-DHI Centre  
on Water and Environment

UN  
environment

DHI



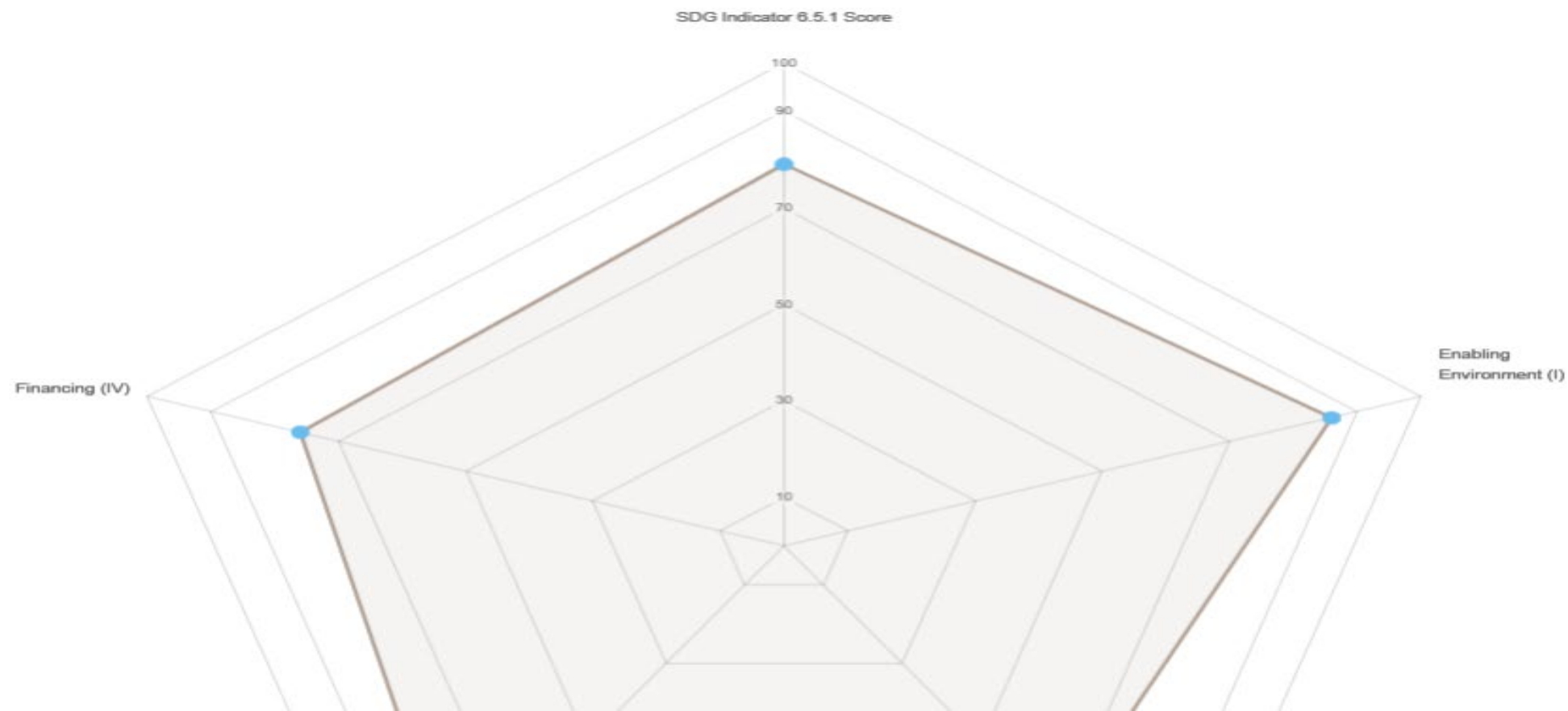
## Country Data: Russian Federation

Water Profile   2007   2011   2017 SDG 6.5.1 baseline   Comparison

## SDG 6 Indicator 6.5.1 on the Degree of implementation of IWRM

Download the complete final national submission on SDG indicator 6.5.1 [here](#).

## Main section scores SDG 6.5.1 baseline year 2017





## **Questions on SDG indicator 6.5.1?**





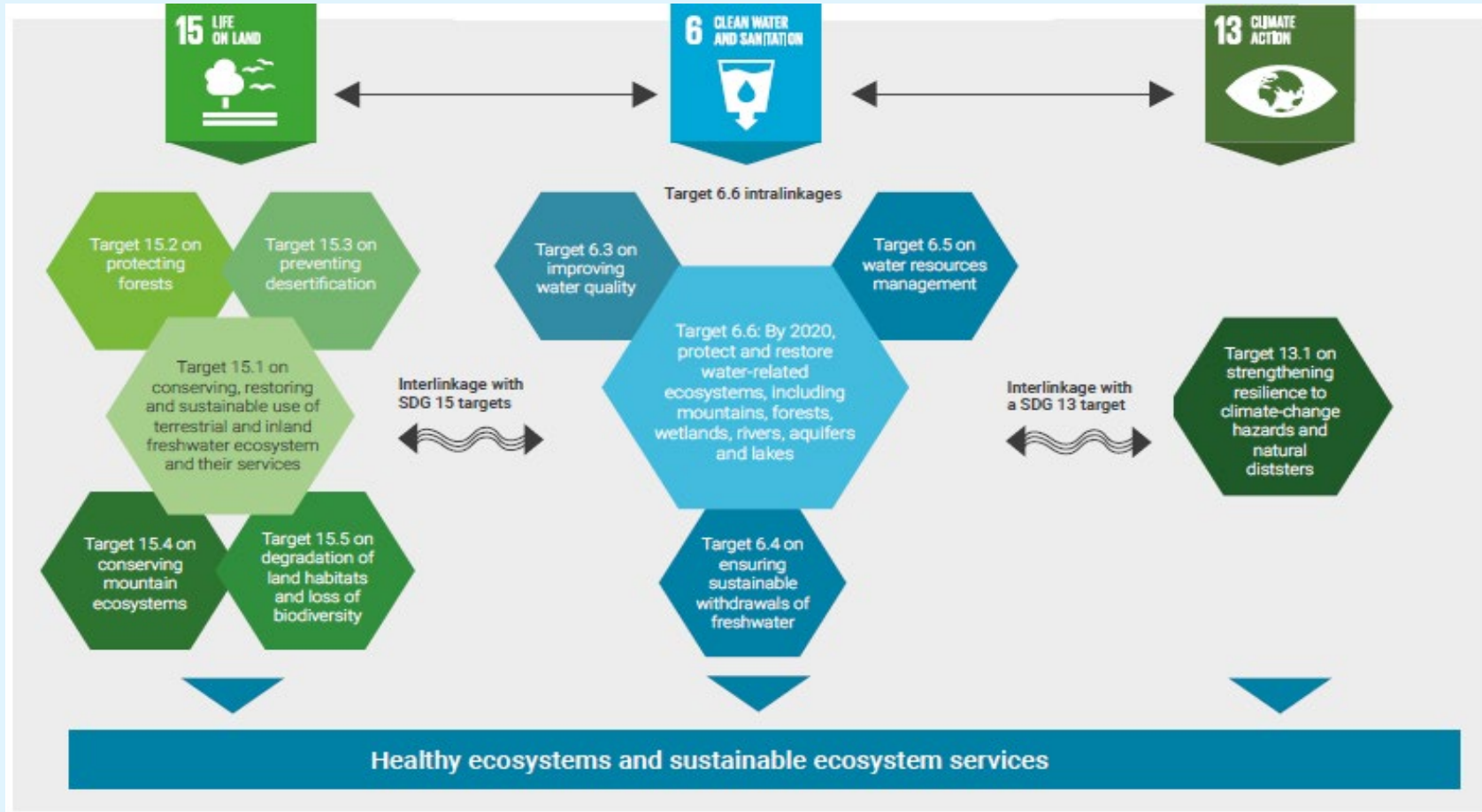
**Target 6.6 By 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes**

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



# SDG Target 6.6

Protect and restore water-related ecosystems including: vegetated wetlands, rivers, lakes, reservoirs and groundwater



## SDG Indicator 6.6.1

*Change in the extent of water-related ecosystems over time*



### **Sub-indicators:**

- Spatial Extent
- Quantity
- Quality

### **Water-related Ecosystems:**

- Open Water Bodies
    - lakes & rivers, artificial (reservoirs)
  - Vegetated Wetlands
    - coastal – mangroves
    - inland – peatlands, swamps, marshes, paddies,
  - Groundwater
-



# Piloting phase for Indicator 6.6.1 (2015-17)

- Methodology developed with pilot countries
- 40 national data sets during 2017
- Significant reporting challenges due to lack of data, burden of reporting, complex indicator



# **Global (satellite based) data**

**Level 1 includes 2 Sub-Indicators based on globally available data from earth observations which will be validated by countries against their own methodologies and datasets:**

- Sub-Indicator 1 – spatial extent of water-related ecosystems (Km<sup>2</sup>)**
- Sub-Indicator 2 – water quality of lakes and artificial water bodies (Chl-a, TSS)**

# National (in situ) data

**Level 2 data includes the following 3 Sub-Indicators:**

- **Sub-Indicator 3 – quantity of water (discharge) in rivers and estuaries**
- *Sub-Indicator 4 – water quality imported from SDG Indicator 6.3.2*
- **Sub-Indicator 5 – quantity of groundwater within aquifers**

# Calculating National Percentage Change of Spatial Extent of Lakes, Rivers and Estuaries

To calculate percentage change of national spatial extent of lakes, rivers and estuaries using the 2001-2015 dataset, a baseline period needs to be defined against which to measure change. This methodology uses 2001-2005 as the 5-year baseline period. Averaging all earth observations annually and over a five year period accounts for seasonal and climactic fluctuations in water-related ecosystems. Using this baseline period, percentage change of spatial extent is calculated using the following formula:

$$\text{Percentage Change in Spatial Extent} = \frac{(\beta - \gamma)}{\beta} \times 100$$

Where  $\beta$  = the average national spatial extent from 2001-2005

Where  $\gamma$  = the average national spatial extent of any other subsequent 5 year period

 **Table 2 Example Annual Chl and TSS Report for Hypothetical Country X**

Water Quality Parameter	Date Range of "Present Day" Annual Average	Latitude	Longitude	Baseline Concentration	Present Day Average Concentration
<u>Chl</u>	01-01-2018 to 31-12-2018	XXX	XXX	XX mg/m3	XX mg/m3
TSS	01-01-2018 to 31-12-2018	XXX	XXX	XX mg/m3	XX mg/m3



# 2018...a new and 'IAEG approved' methodology formulated



- Statistically robust and comparable
- Global coverage
- National and sub-national relevance
- Quality assured
- Cost effective
- Reduce reporting burden



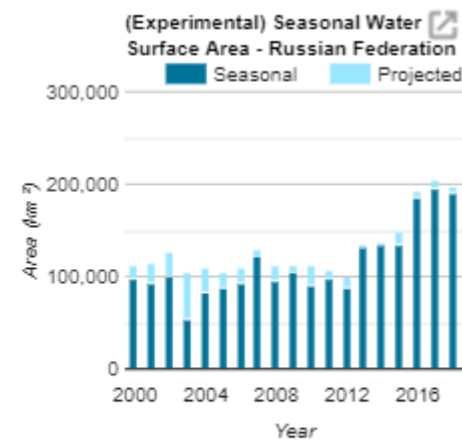
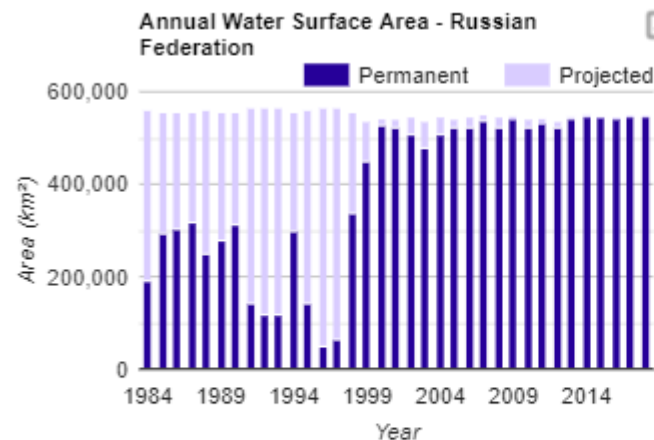
# Water-Related Ecosystems

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.

[www.sdg661.app](http://www.sdg661.app)



Clear results

Display results as table

Download CSV

### Boundary Lines

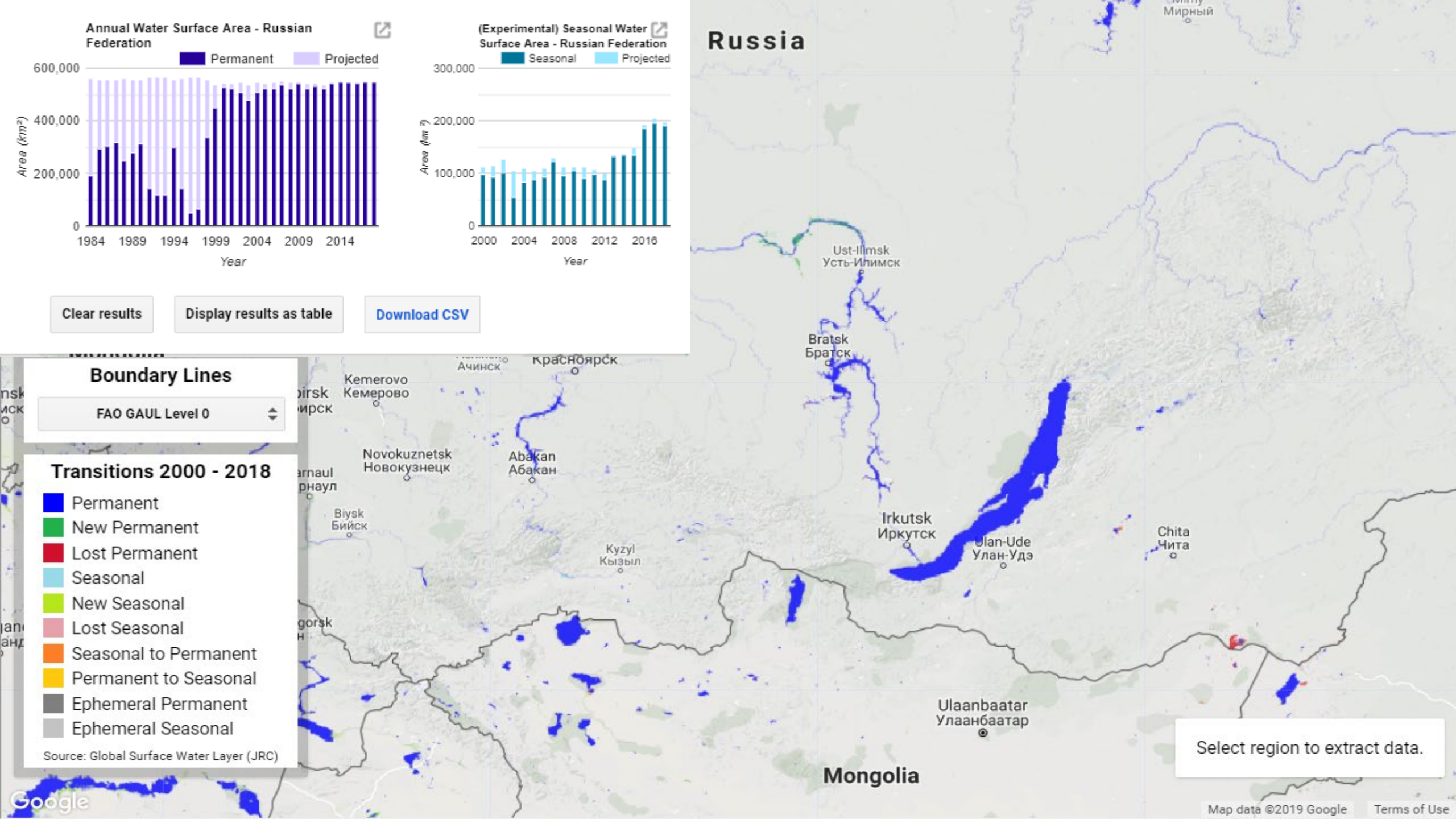
FAO GAUL Level 0

### Transitions 2000 - 2018

- Permanent
- New Permanent
- Lost Permanent
- Seasonal
- New Seasonal
- Lost Seasonal
- Seasonal to Permanent
- Permanent to Seasonal
- Ephemeral Permanent
- Ephemeral Seasonal

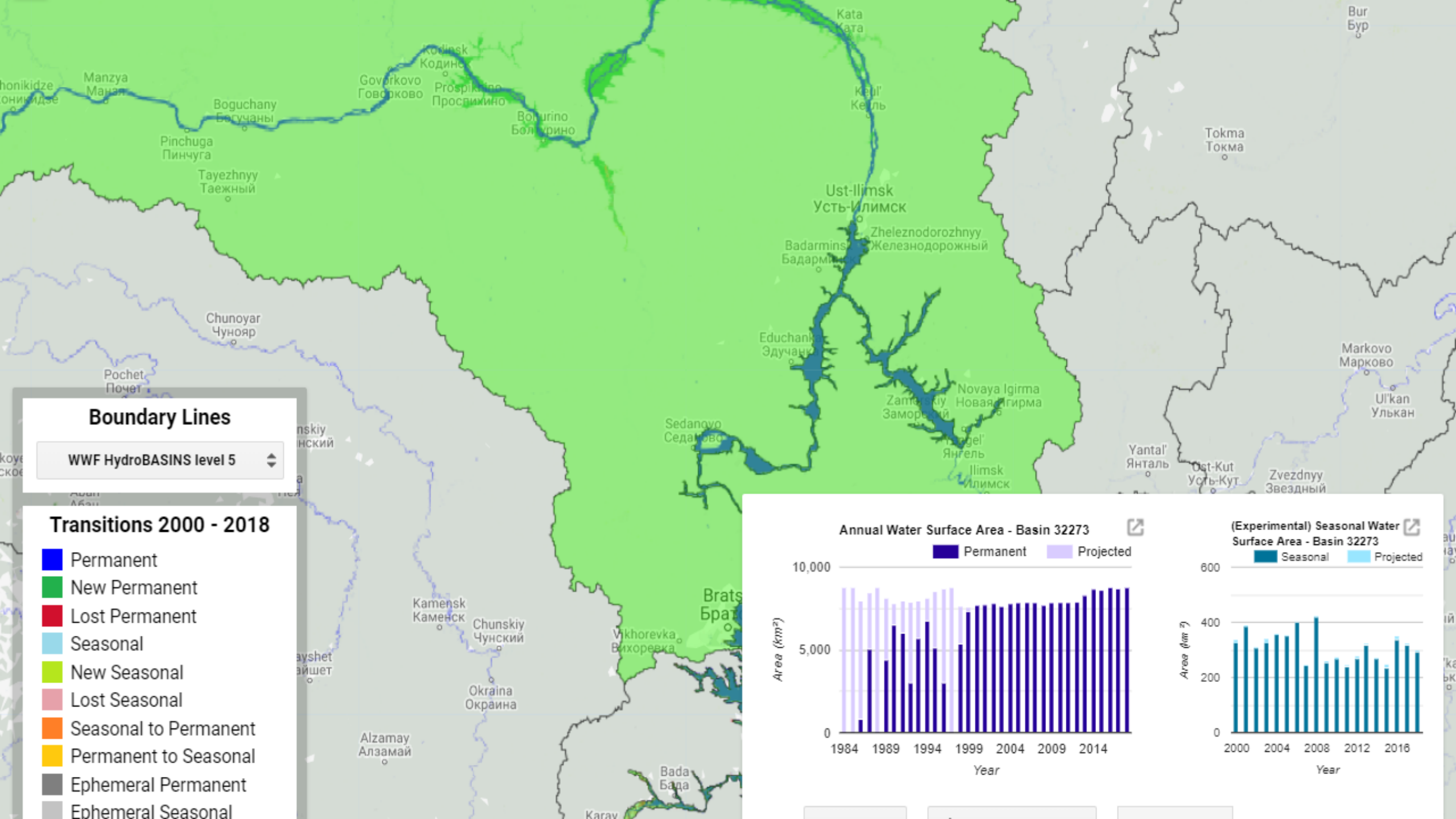
Source: Global Surface Water Layer (JRC)

## Russia



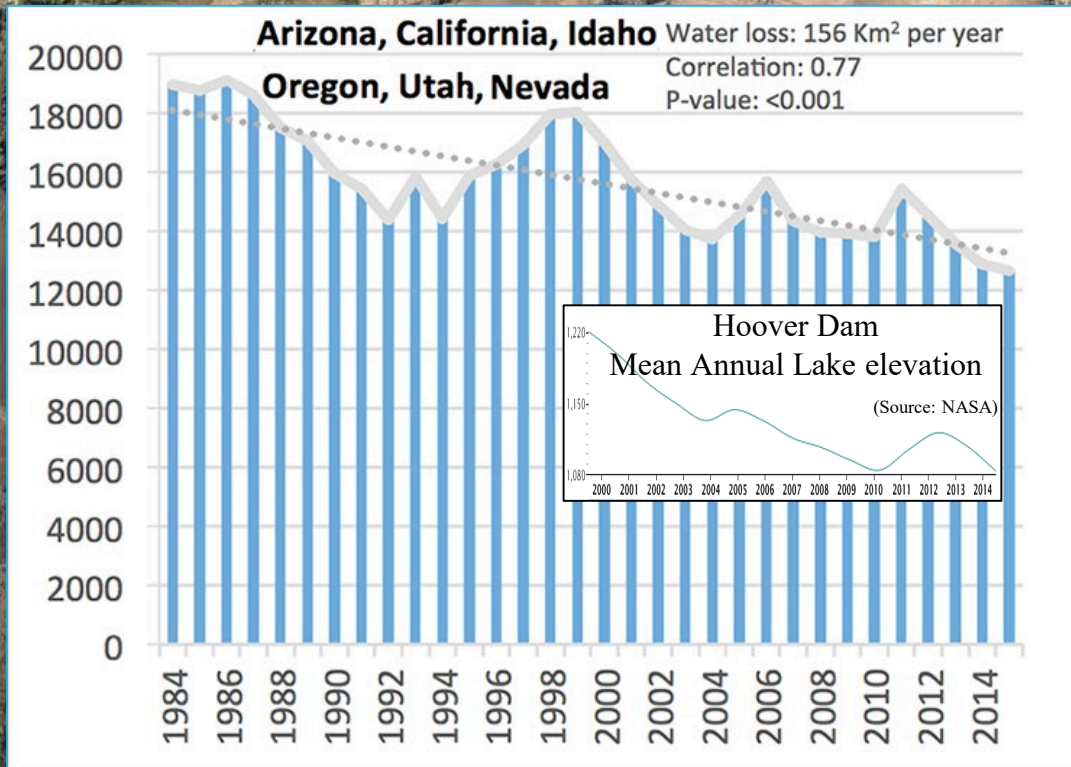
Select region to extract data.







# Drought and sustained demands for water have seen six western states lose more than 6,000 km<sup>2</sup> of their permanent surface water (33%)



Las Vegas

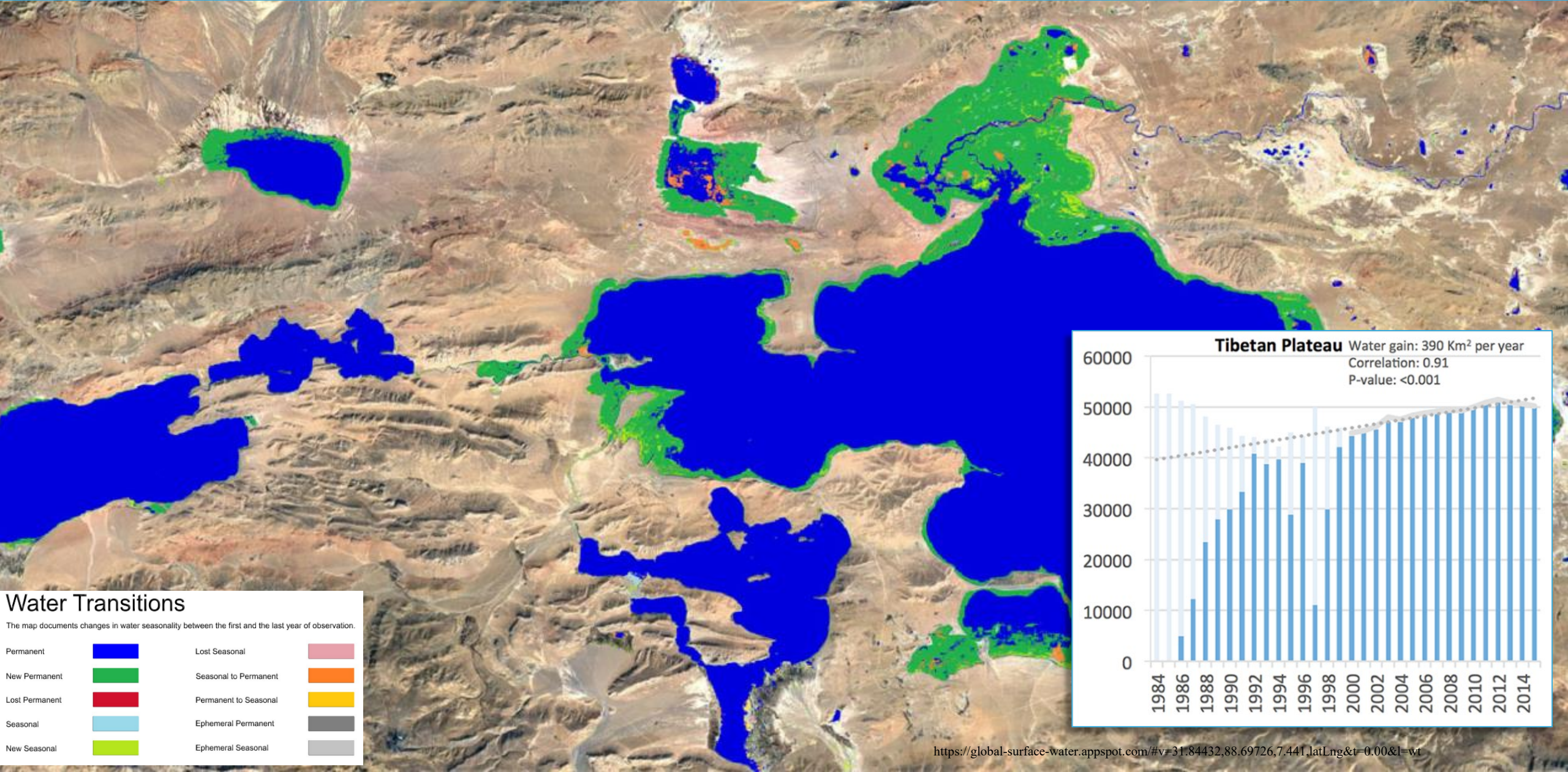
Lake Mead





Lakes on the Tibetan Plateau have **increased in area by 20%** with respect to the 1980s

Grazing land is lost and transport links threatened





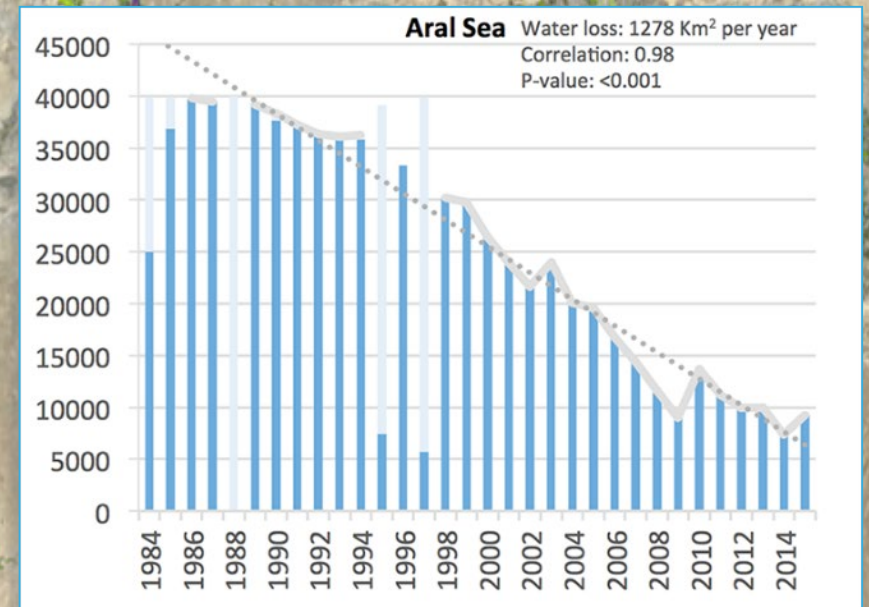
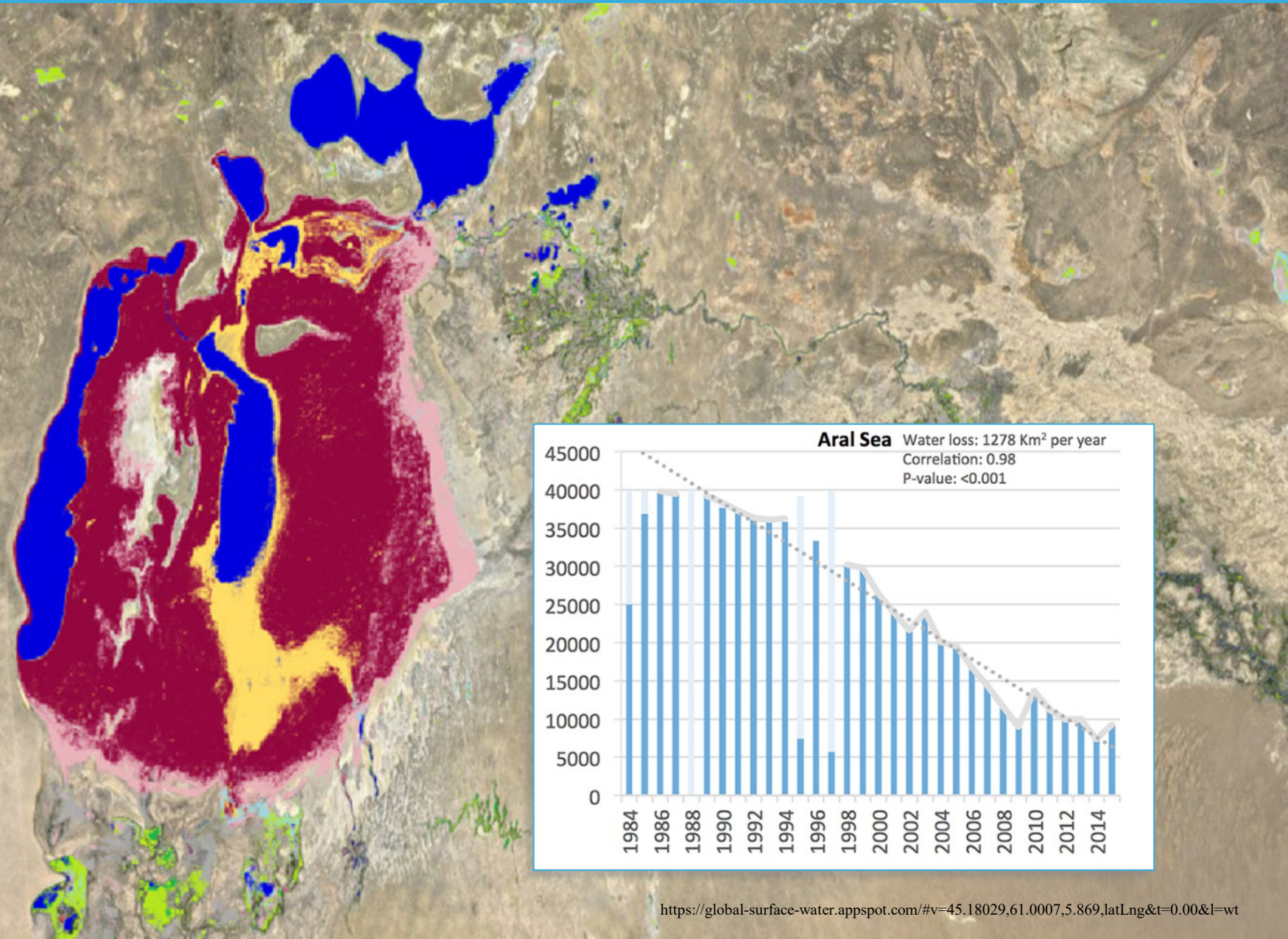
# The Aral Sea has **lost around 1,200 km<sup>2</sup> per year** since 1986

## Some recovery has been noticed since 2015

### Water Transitions

The map documents changes in water seasonality between the first and the last year of observation.

Permanent		Lost Seasonal	
New Permanent		Seasonal to Permanent	
Lost Permanent		Permanent to Seasonal	
Seasonal		Ephemeral Permanent	
New Seasonal		Ephemeral Seasonal	

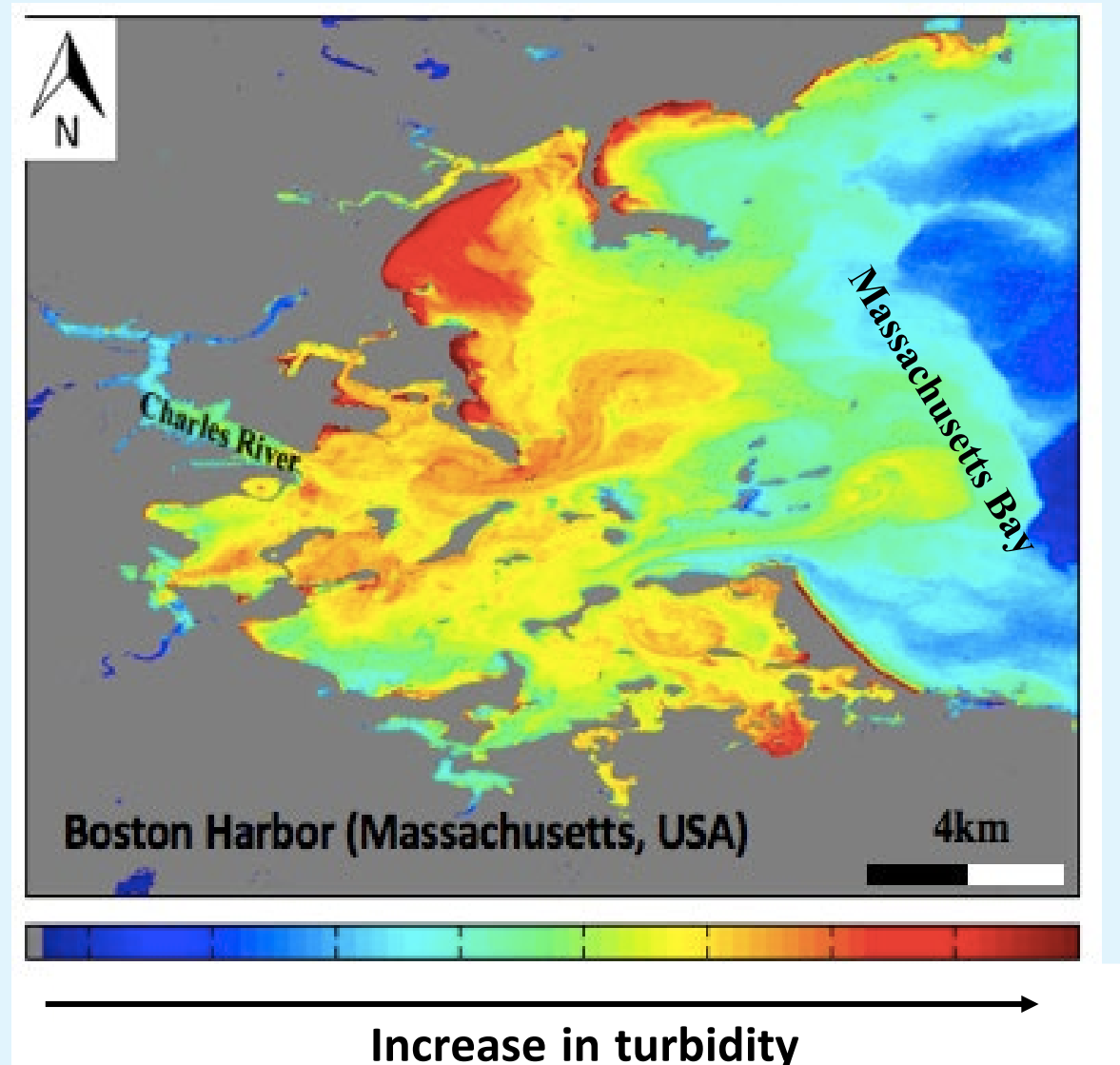




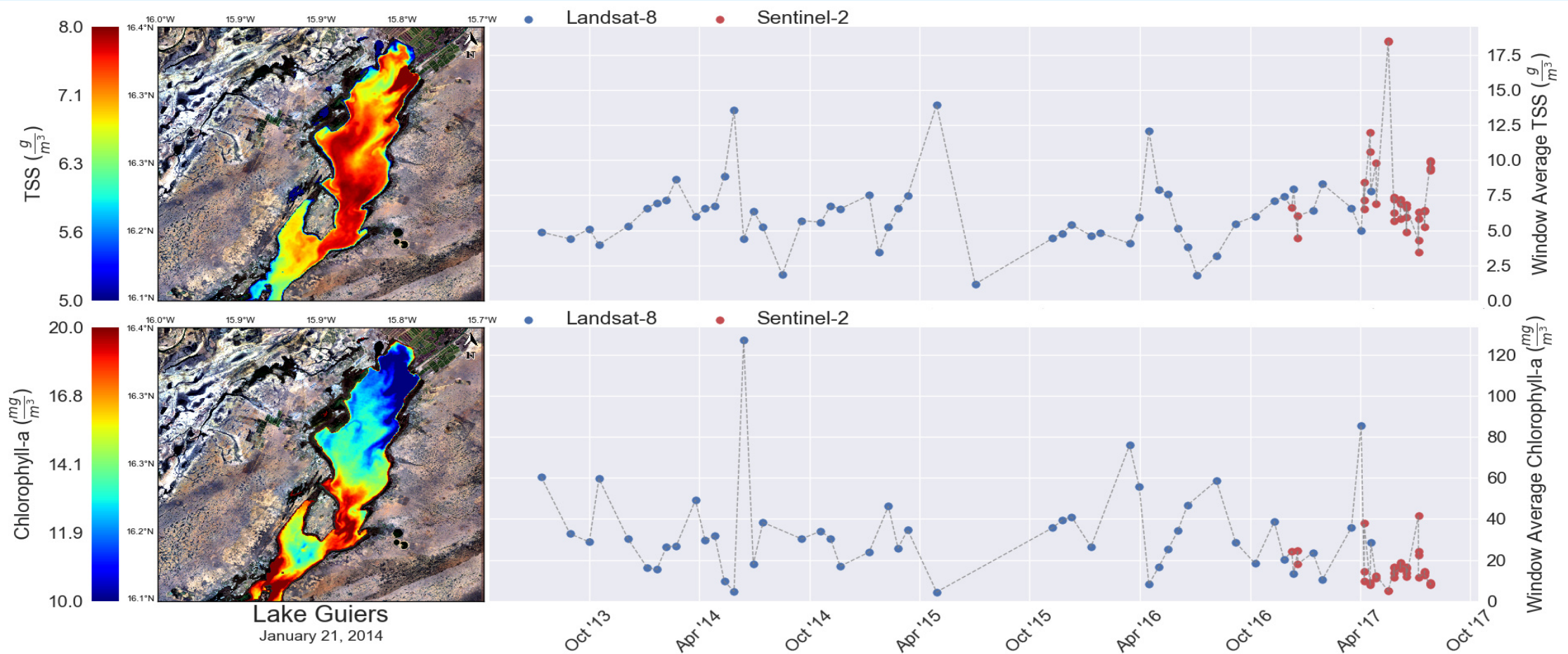
# Aquatic remote sensing: Turning an image into useful information



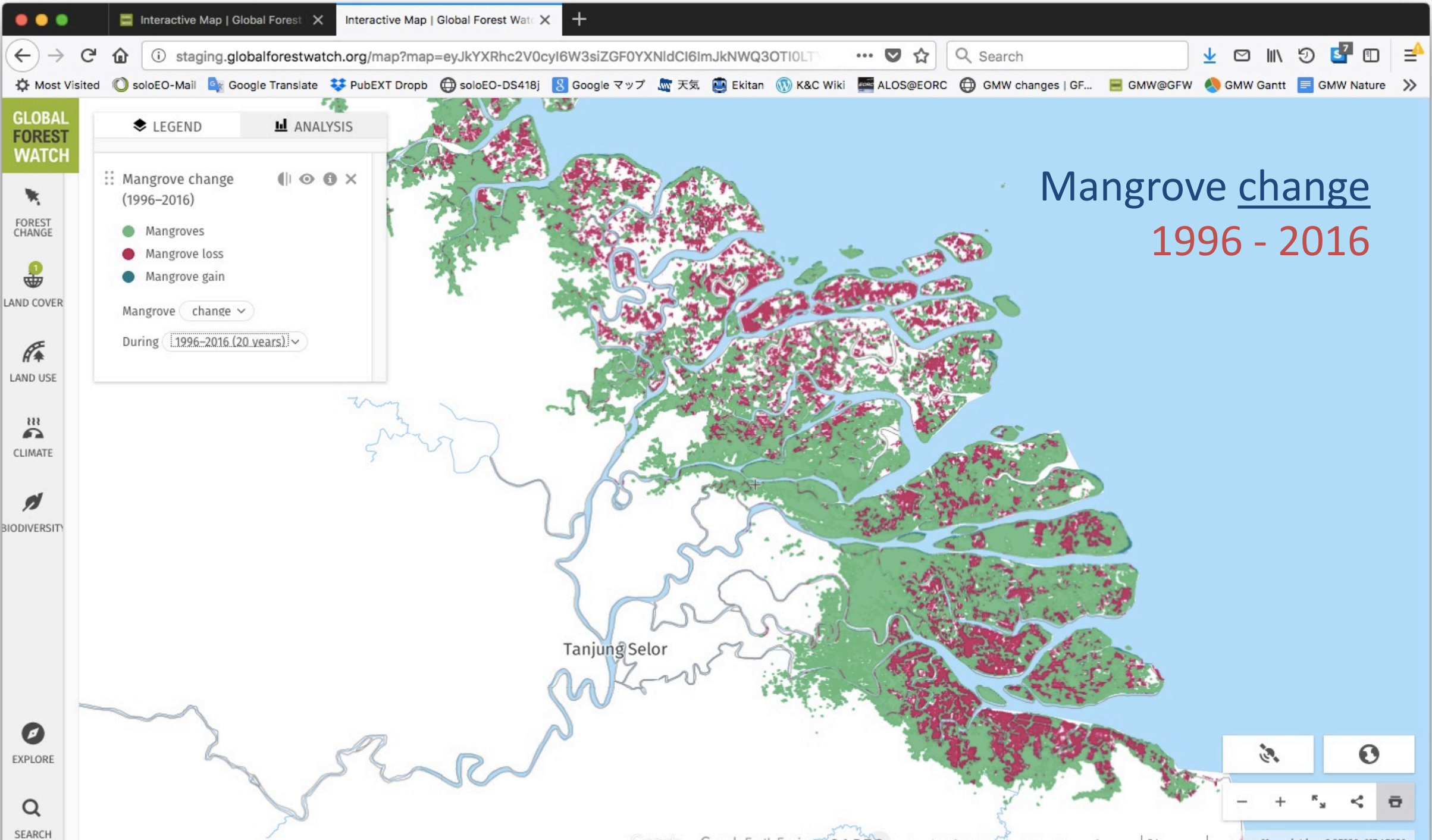
**Boston Harbor,  
MA**



# Lake Guiers (Senegal)









# Meeting country requirements over the long term

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- **Spatial extent of open water at *basin level* (*available now*)**
- **Delineation of reservoirs (*available Q2 of 2020*)**
- **Water dynamics (quantity) of reservoirs (*available Q2 of 2020*)**
- **Water quality of [large] lakes (*available Q1 2020*)**
- **Global mapping of vegetated wetlands (*rapid assessment possible in 2019*)**
- **Maps and statistics at decision making levels (national, basin, ecosystem)**
- **Guidance and training tools to accompany data provision (*2019-2020*)**

An aerial photograph of a river system. A large, irregularly shaped reservoir, colored in a vibrant blue, dominates the center-left of the image. The reservoir has a highly convoluted shoreline with many small, finger-like extensions reaching into the surrounding landscape. To the right of the reservoir, a long, narrow dam structure is visible, crossing the river. The river continues downstream from the dam, winding through a valley. The surrounding terrain is a mix of brown and tan colors, indicating a dry or semi-arid environment. The text "Questions on indicator 6.6.1?" is overlaid in the upper right quadrant of the image.

**Questions on indicator 6.6.1?**

**Thank you for listening!**

