

SDG Indicator 6.3.2

27th July 2022



Level 2 Reporting: Description and Data sources

This presentation:

- Provides an update on the Level 2 concept
- describes examples of Level 2 data, and
- provides guidance on how to report Level 2 data

Countries have not been requested to report at Level 2

In 2023, UNEP will ask for Level 2 submissions for the first time

Level 2 is optional, and can be adapted to meet a country's needs

What is Level 2 Reporting?

Level 1

maintains the global comparability

covers the parameters that are relevant at the global scale

it is limited in scope and cannot represent all pressures to freshwater quality

Level 2

provides the opportunity to report any water quality data

to report on parameters and using approaches that match national capacity

provides the flexibility to report beyond Level 1

and to focus on water quality issues that may be significant locally, nationally or regionally

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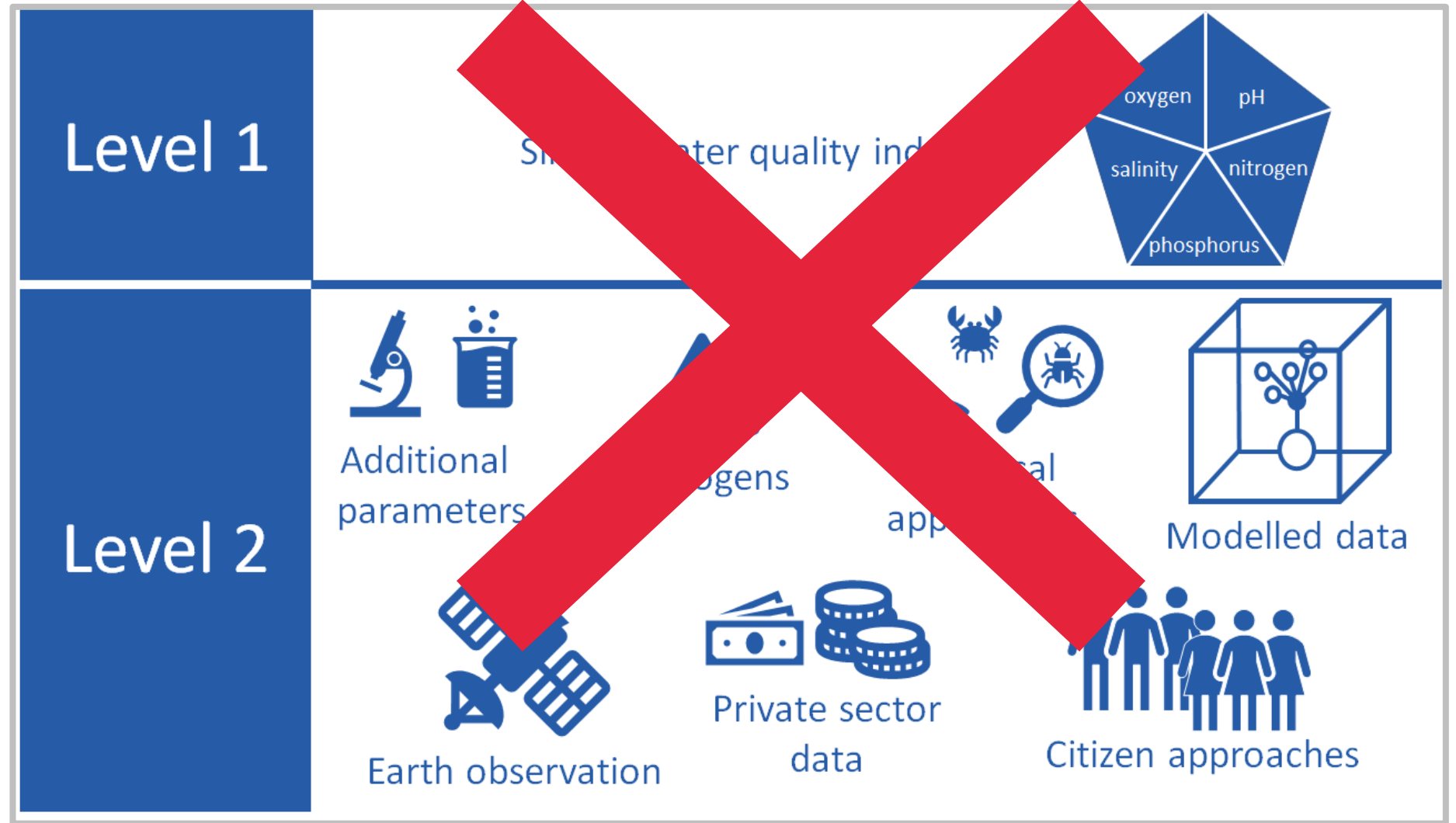
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and to focus on water quality issues that may be significant locally, nationally or regionally

Introduction

2020
guidance
shown here

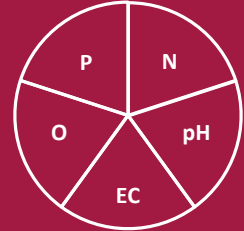


New guidance


| Reporting Level | Level 1: Global Indicator | Level 2: National Indicator |
|-----------------|--|--|
| Data Source | <ul style="list-style-type: none"> National monitoring programme Citizen initiatives Private sector Academic sector | <ul style="list-style-type: none"> National monitoring programme data Citizen initiatives Private sector Academic sector Satellite-based Earth observation Models |

Level 1: Global Indicator

In-situ data
Simple water quality index



Level 2: National Indicator


Additional physico-chemical parameters

Biological monitoring



Pathogens

Reporting Level

Data Source

National monitoring programme

Citizen initiatives

Private sector

Academic sector

National monitoring programme data

Citizen initiatives

Private sector

Academic sector

Satellite-based Earth observation

Models

Level 1: global, mandatory indicator that can be disaggregated to provide parameter-specific information

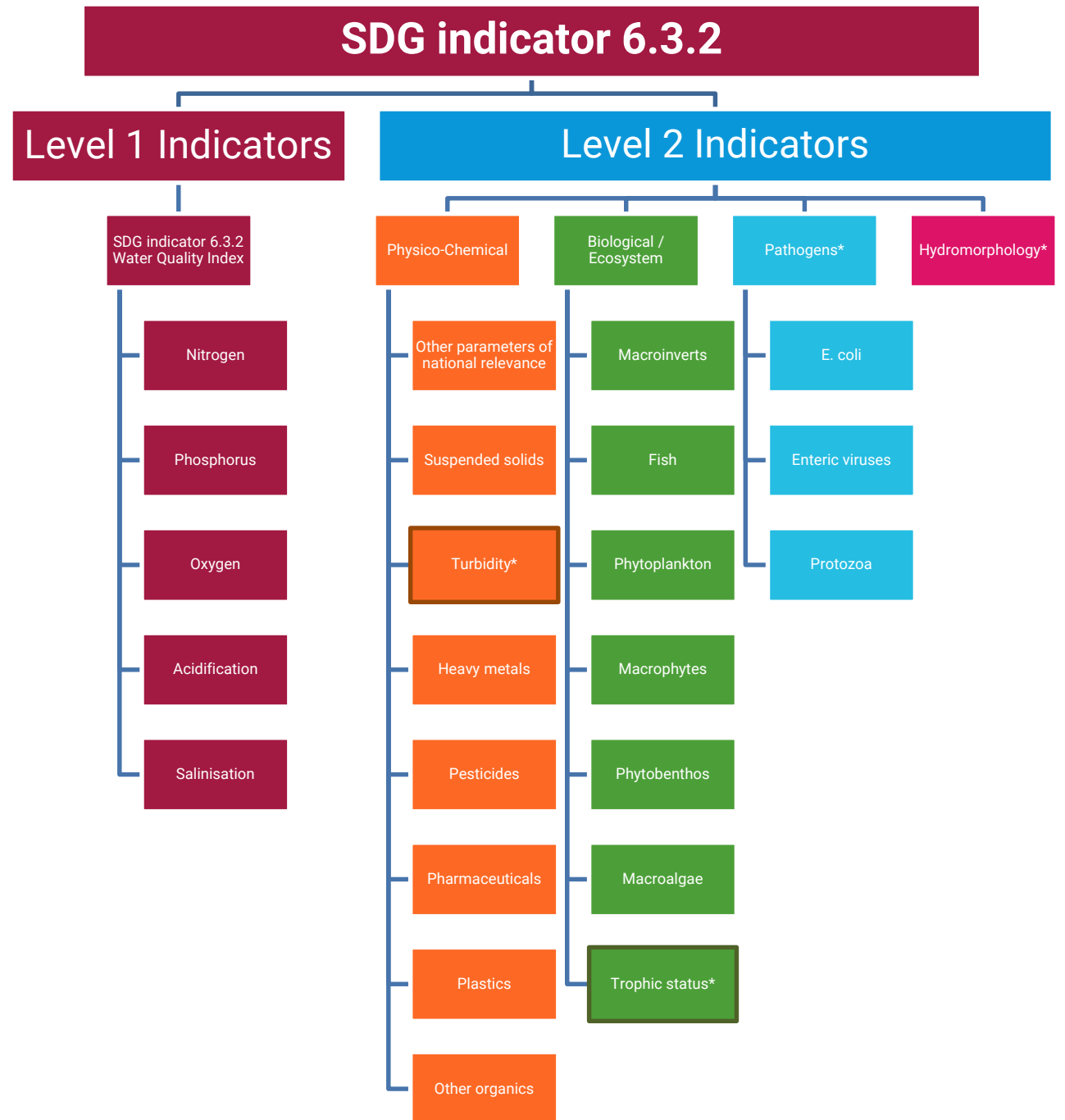
Physico-chemical: can include any or all of listed parameter groups. Suggested to adopt the CCME index calculation tool.

Pathogens: Suggest to include if water body used as drinking water source

Turbidity: for large water bodies, turbidity can be estimated using satellite-based Earth observation

Trophic Status: for large water bodies, trophic status can be estimated using chlorophyll a measurements from satellite-based Earth observation

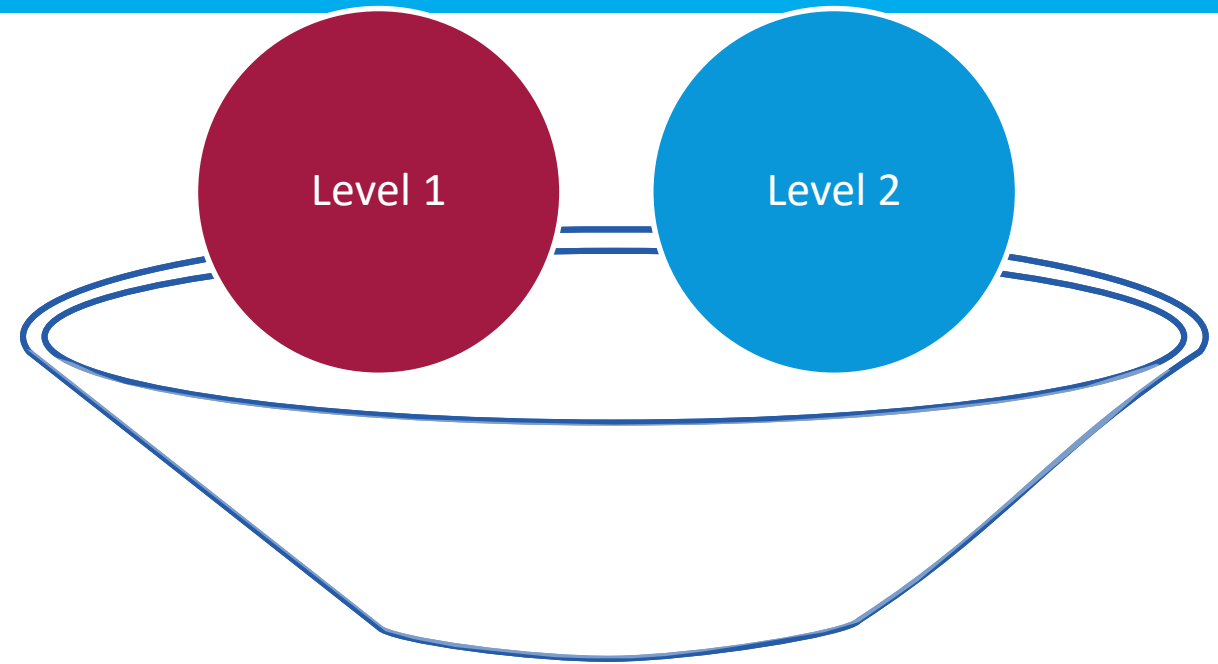
Hydromorphology: Included to enable WFD-reporting countries to be able to use most recent WFD



How to report Level 2 information

Level 2 data may:

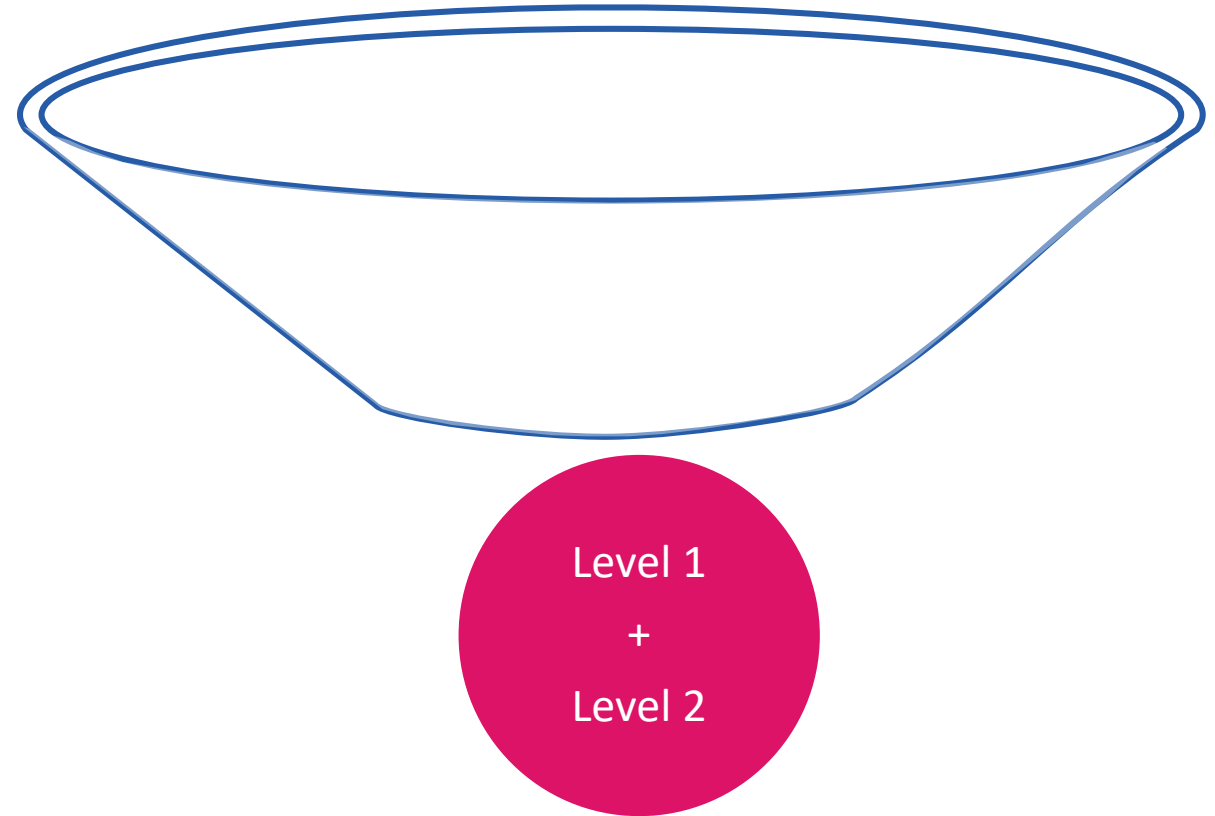
- **supplement** existing Level 1 data by adding parameters;



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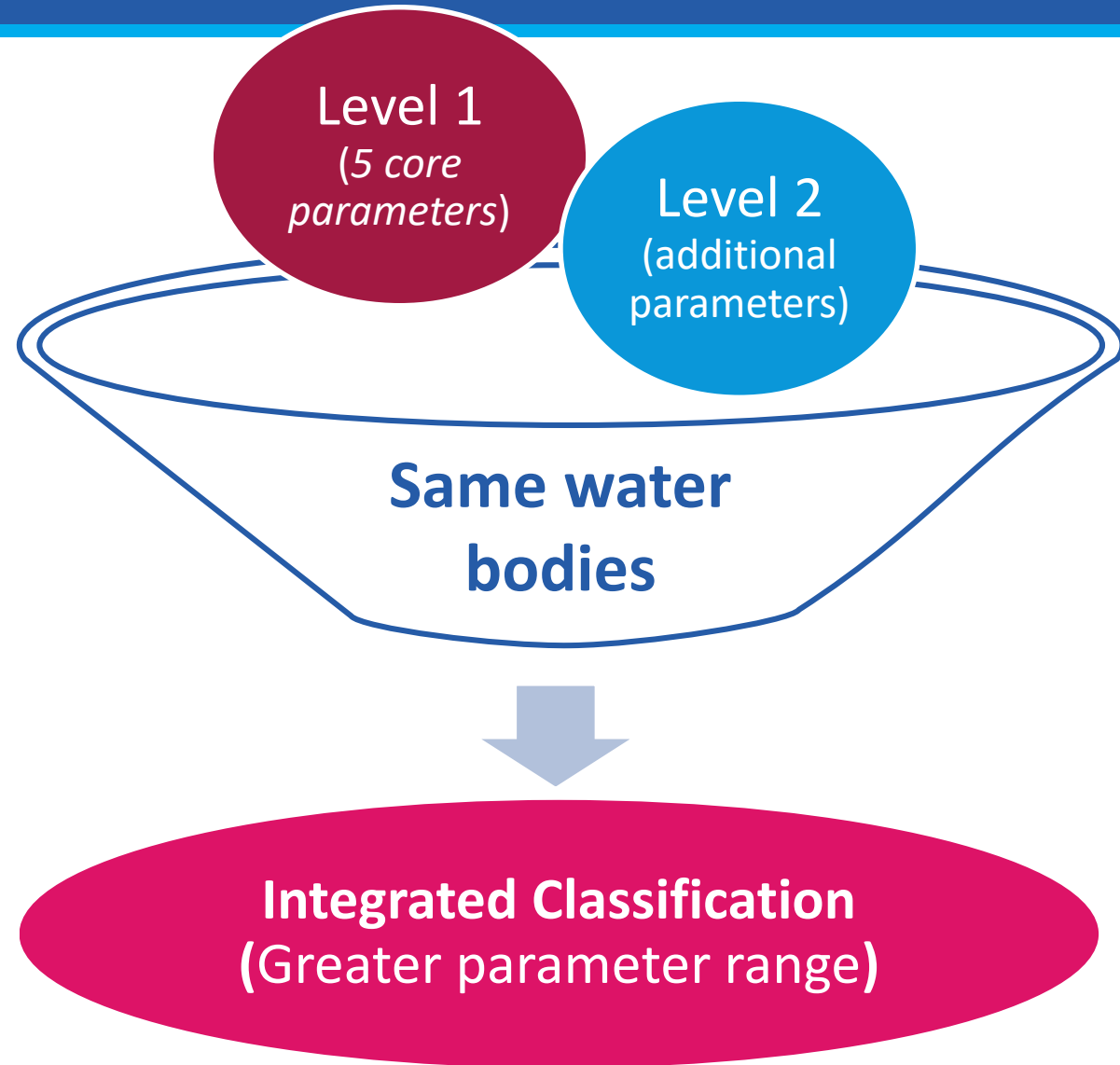


Integration Methods

Level 2 data may:

- **supplement** existing Level 1 data by **adding parameters**;

| | Level 1 | | | | |
|---|--------------------------------------|-------------------------|----------|------------|------|
| | Dissolved oxygen | Electrical conductivity | Nitrogen | Phosphorus | pH |
| Number of measurements | 12 | 12 | 12 | 12 | 12 |
| Number of measurements meeting target | 11 | 12 | 8 | 10 | 10 |
| Proportion of measurements meeting target | 91.7 | 100 | 66.7 | 75 | 83.3 |
| Level 1 | Total = 51 of 60 values meet targets | | | | |
| | Indicator Score = 85% = good | | | | |

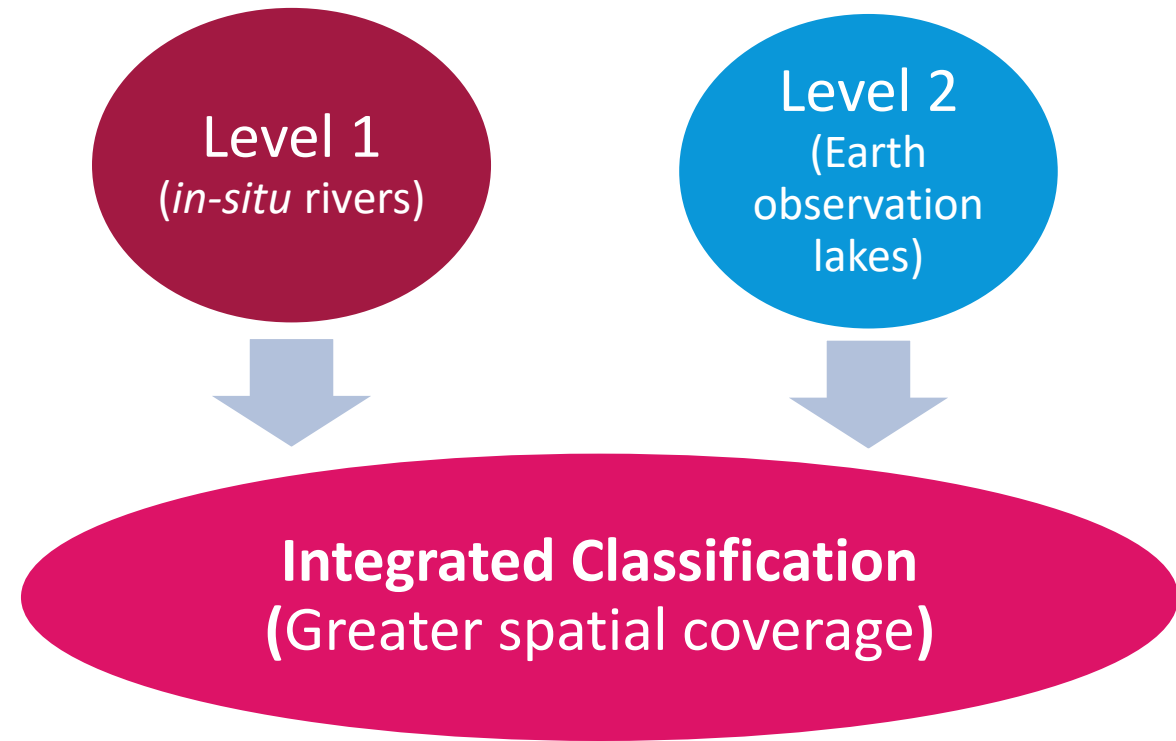


How to report Level 2 information

Level 2 data may:

- **supplement** existing Level 1 data by increasing **spatial coverage**

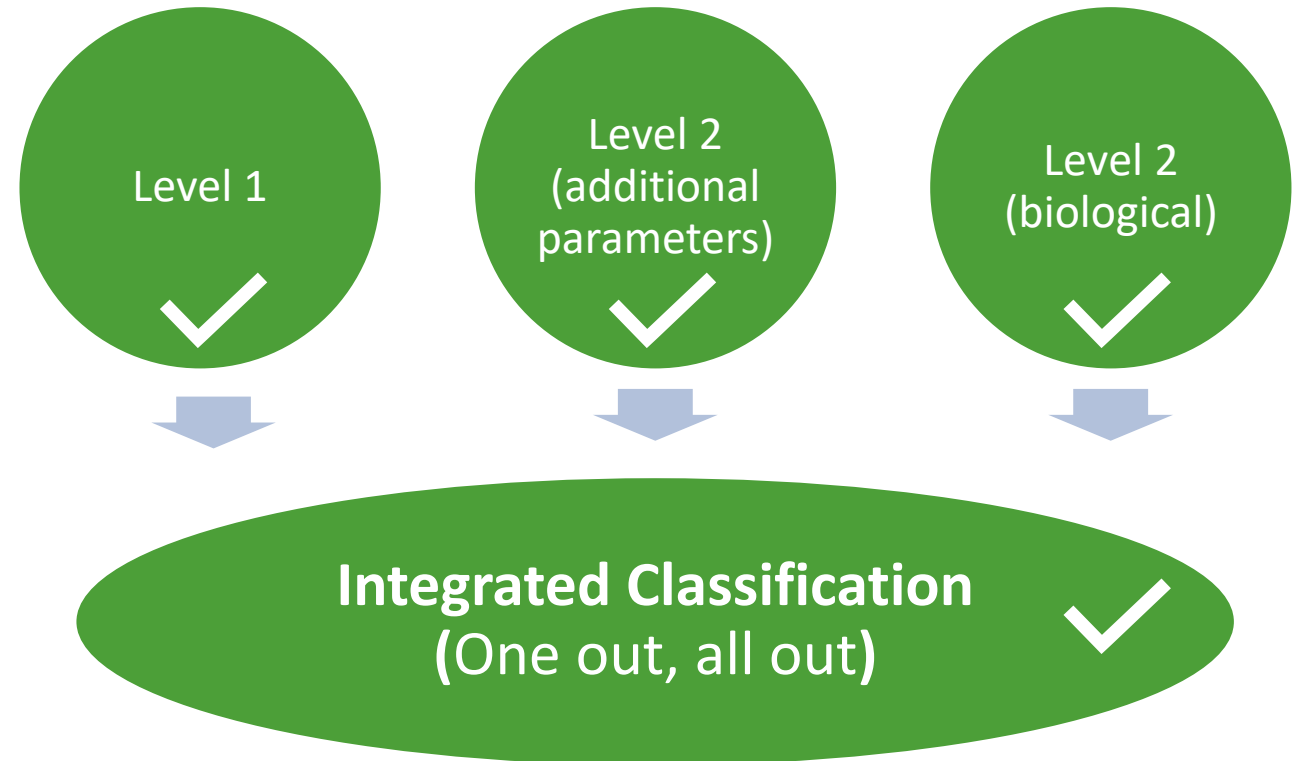
| Water body type | Level 1 Number of water bodies |
|-----------------|--------------------------------|
| River | 100 |
| Lake | 0 |
| Groundwater | 10 |



How to report Level 2 information – One out, all out

Level 2 data may:

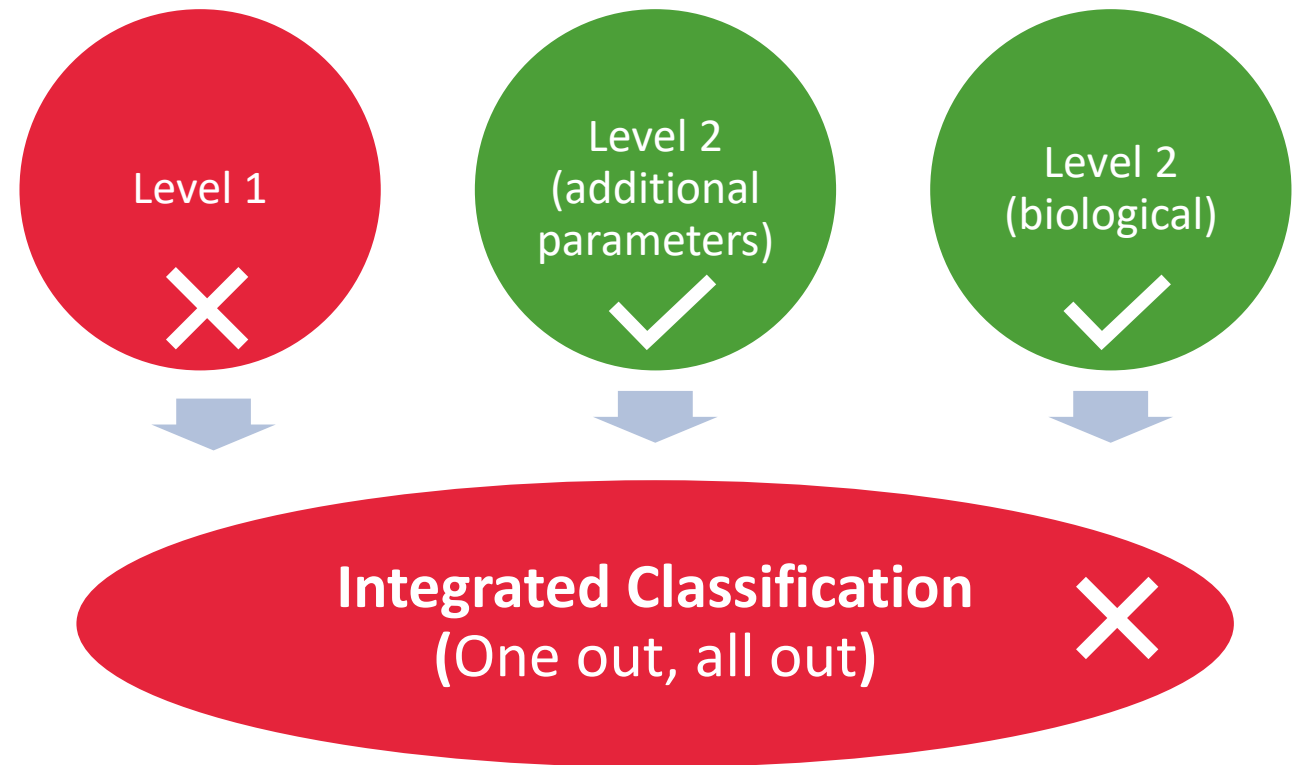
- **supplement** existing Level 1 data;
- used in a **“one out, all out”** approach of classification; or



How to report Level 2 information – One out, all out

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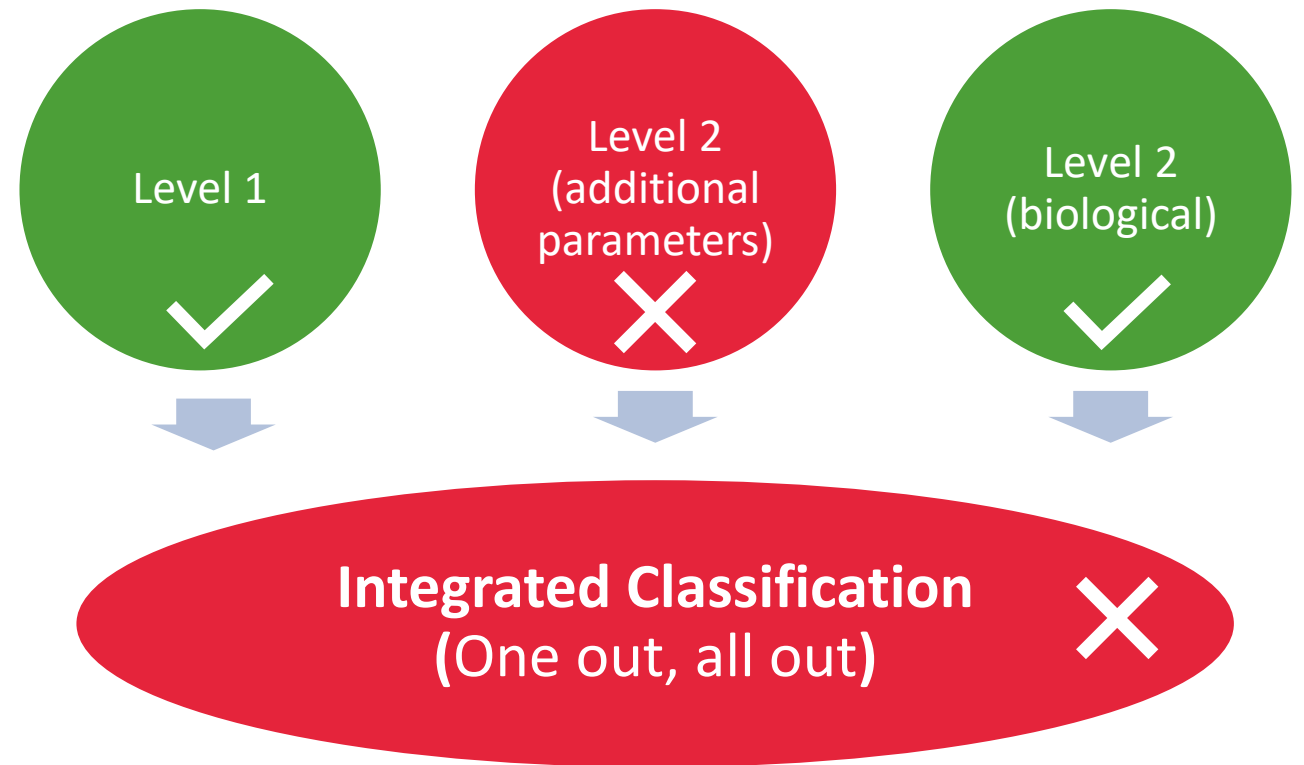
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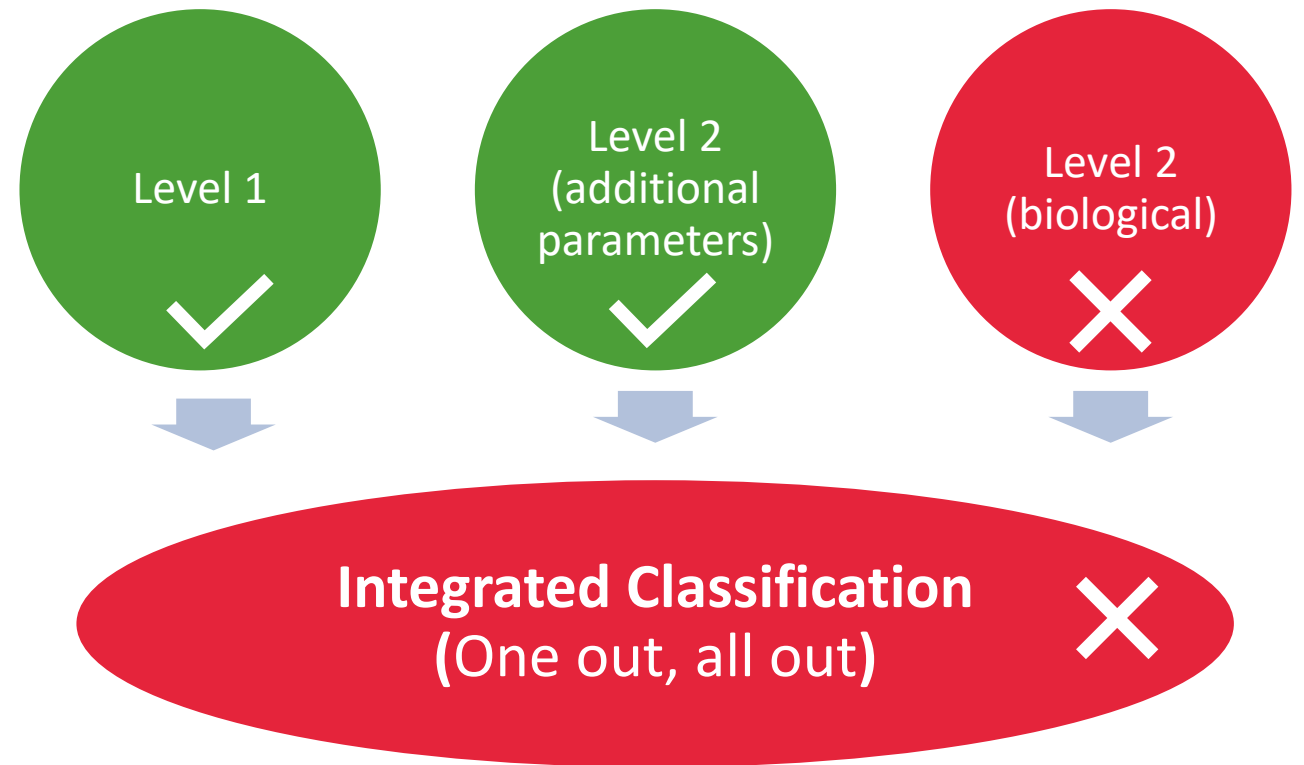
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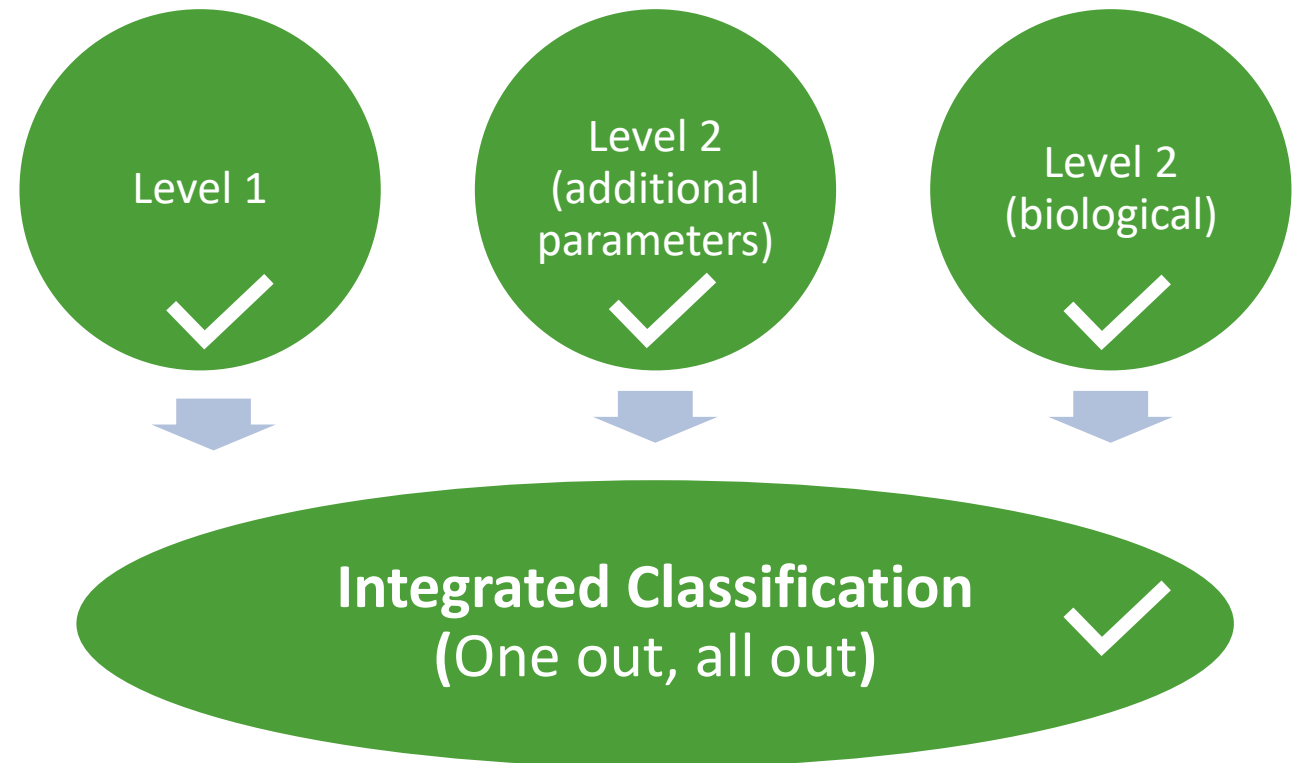
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How to report Level 2 information – One out, all out

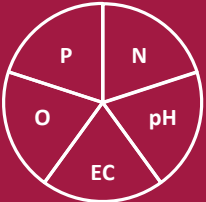
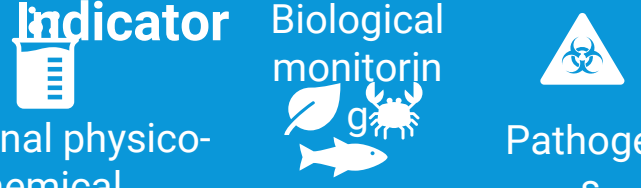










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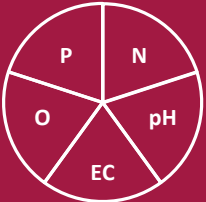
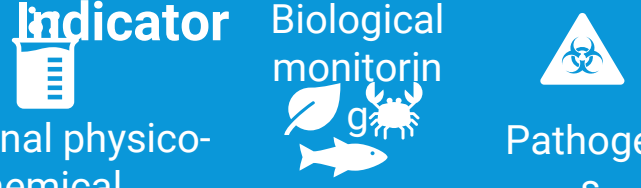










Level 2 Data Sources

Data Sources

| Reporting Level | Level 1: Global Indicator In-situ data Simple water quality index  | Level 2: National Indicator Additional physico-chemical parameters Biological monitoring Pathogens  |
|-----------------|---|--|
| Data Source | <ul style="list-style-type: none">  National monitoring programme  Citizen initiatives  Private sector  Academic sector | <ul style="list-style-type: none">  National monitoring programme data  Citizen initiatives  Private sector  Academic sector  Satellite-based Earth observation  Models |

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Examples of Level 2 Data – Additional Parameters

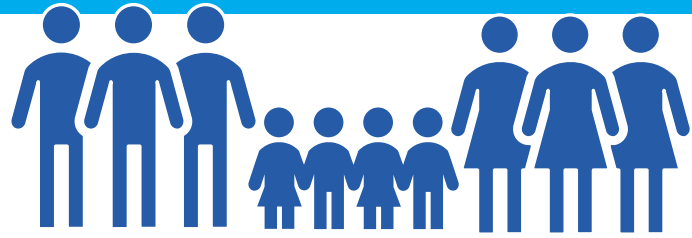


Many countries routinely collect data on parameters beyond those required for Level 1.

Depending on the parameter, these can either be used to **supplement** Level 1 data, or in a “**one out, all out**” integration method.

| Parameter group | Examples |
|------------------------------|--|
| general parameters | temperature, colour, hardness, alkalinity, cations/anions |
| suspended particulate matter | total suspended solids, turbidity, organic carbon, transparency, chlorophyll |
| toxic compounds | arsenic , fluoride, mercury, cadmium |
| metals | zinc, copper, iron |
| organic pollutants | Pesticides, PCBs, PAH |
| radioactivity | ^{137}Cs , ^{90}Sr |
| emerging contaminants | pharmaceutical residues, microplastics |

Examples of Level 2 Data – Citizen Approaches



Many citizen data collection initiatives are in operation already.

Fuelled by developments in ICT, and field-based analytical methods.

Potential to deliver greater spatial and temporal coverage, that may overcome limitations of precision and accuracy.



ADOPT-A-RIVER INITIATIVE REPORT

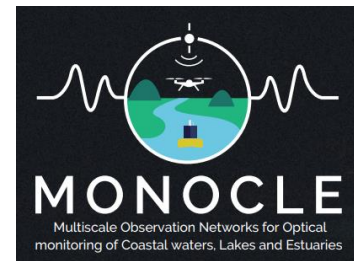


Mobilizing and Empowering Youths to Champion Monitoring and Restoration of Rivers and other Wetlands within the Nairobi River Basin

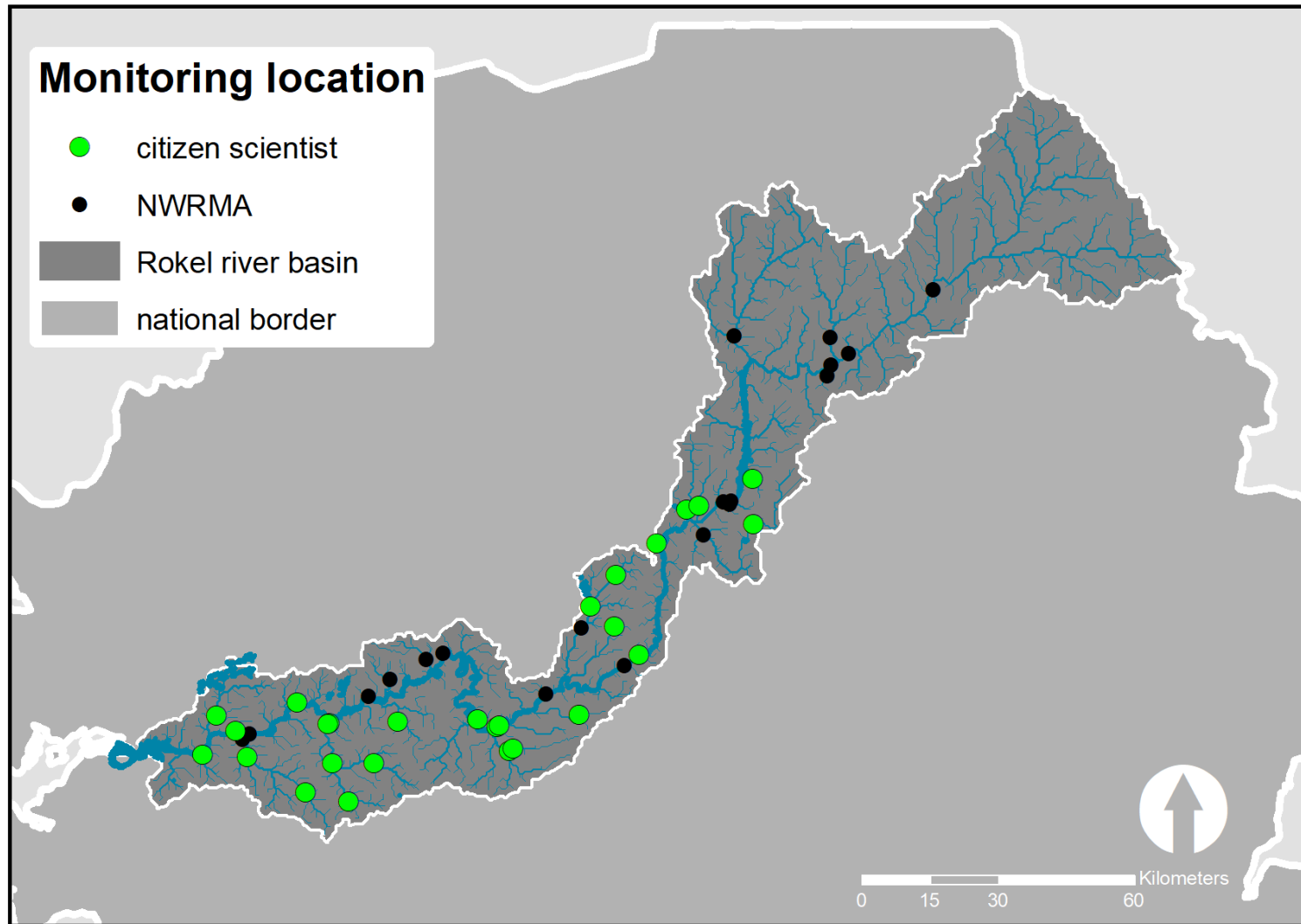


Lake Observer

A Mobile App For Recording Lake And Water Observations



Sierra Leone Example



Citizen Science examples

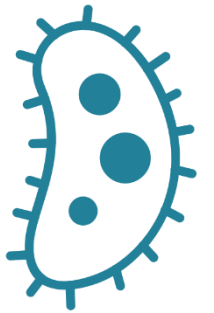
- Established WWQA Working Group on Citizen Science and SDG indicator 6.3.2
- Sierra Leone project expanding to three other African countries
 - Zambia, Malawi and Tanzania
- Exploring other examples
 - Canada (Gordon Foundation)
 - England (FreshwaterWatch and Environment Agency)
- Links to FreshwaterWatch
 - <https://freshwaterwatch.thewaterhub.org/language-es>
 - <https://freshwaterwatch.thewaterhub.org/language-pt-br>

Examples of Level 2 Data - Pathogens

Untreated domestic sewage effluent is one of the most serious and prevalent forms of water pollution globally.



Pathogens carried in the wastewater can lead to serious health issues and contribute to high mortality rates.



Many pathogens are included in routine monitoring of drinking water sources.

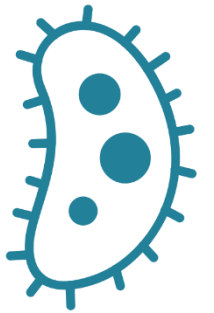


Examples of Level 2 Data - Pathogens

Where water bodies are used directly for drinking water without treatment, inclusion of microbiological parameters is highly recommended.



Combining pathogen data with Level 1 should follow the “one out, all out” approach of classification.



If a waterbody does not meet good status due to pathogenic contamination, it should be classified as **not good**.



Examples of Level 2 Data – Biological Approaches

There are many biological and ecological approaches to monitoring ambient water quality, but no single method has been tried and tested globally.

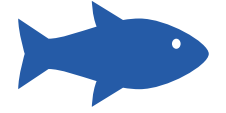
They provide a better overall assessment of water quality if implemented correctly, when compared to physico-chemical approaches.

Many biological methods work on the principle that aquatic organisms respond to changes in their environment in measurable ways.



Examples of Level 2 Data – Biological Approaches

Macroinvertebrates are commonly used to monitor the quality of streams and wadeable rivers.



Some methods rely on the identification of indicator species (presence/absence) or look at the diversity and abundance of the species found.



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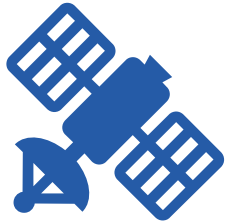


Examples of Level 2 Data – Earth Observation

Earth Observation satellite data are increasingly being used for water-quality monitoring.

The extensive spatial and temporal coverage of satellite data could prove to be an important additional data source for monitoring in the near future, however, they are:

- limited to optically-detectable water quality parameters,
- most suitable for large bodies of water, such as lakes and wide rivers,
- only monitor the surface of water bodies.



Examples of Level 2 Data – Modelled Data

Mathematical models have been used to estimate pollutant concentrations and distribution for several decades.

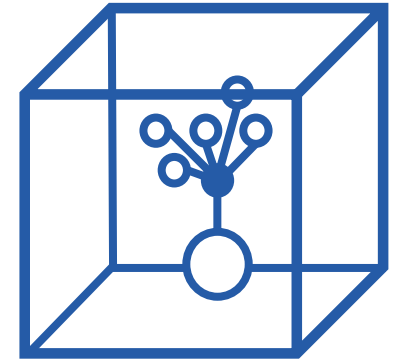
Calibration and **validation** using real-world data are essential steps.

Models can be specific and applied to national-scale

A good example is a map of fluoride concentrations in groundwater in India which used real-world data and information on:

- geology,
- Climate, and
- soil types.

The model predicts areas where the fluoride concentration is likely to be over 1.5 mg L^{-1} (Podgorski *et al.*, 2018).



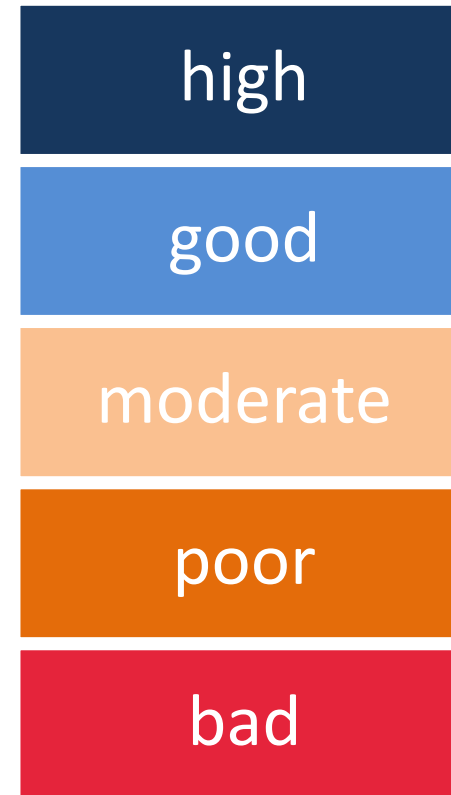
Alternative Classification Methods

Level 1 is a simple binary method of classification – good vs not good

Countries can choose more complex methods of classification.

For example, the WFD uses five categories: high, good, moderate, poor and bad.

Using this example, water bodies classed as either “high or “good” would qualify as “good” for indicator 6.3.2.



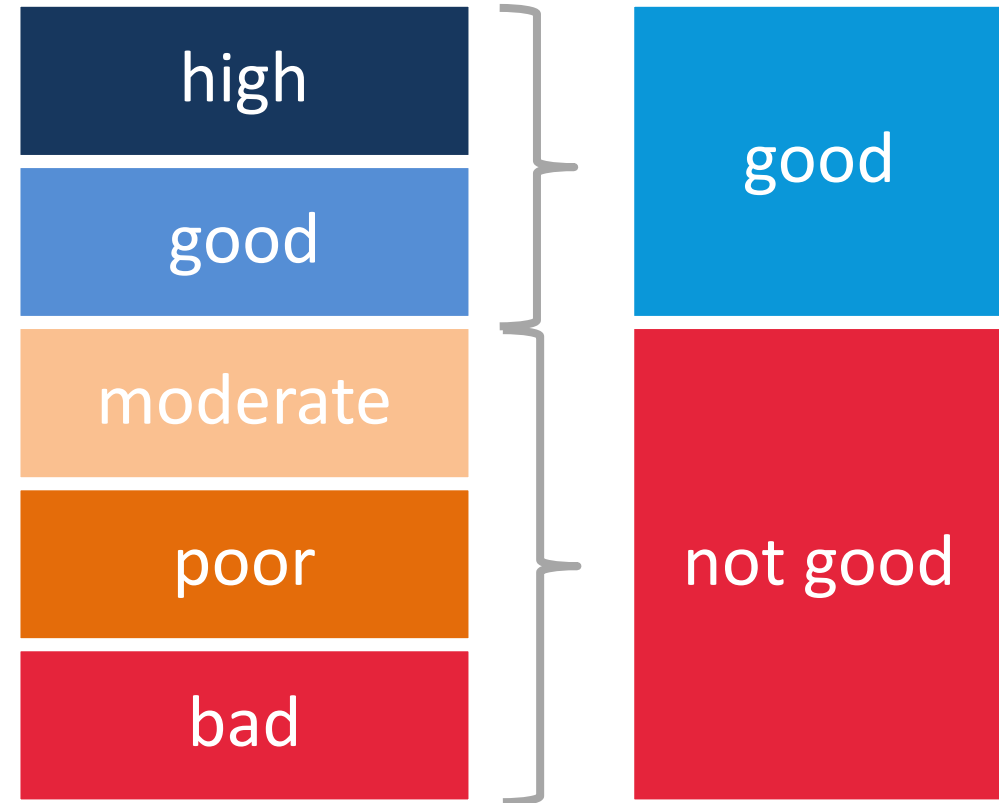
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Alternative Classification Methods

Level 1 also uses a binary approach when comparing measured values to targets. How frequently, or to what degree, a target is missed is not considered.

For Level 2, countries can choose to adopt more complex methods such as: the

- proximity-to-target (PTT) method, or
- choose to apply weightings to different parameters.

Countries can apply a more advanced classification method, such as Canadian Council of Ministers of the Environment WQI*.

Regardless of the classification method used, countries are requested to apply the simple binary method for Level 1 reporting.

*https://www.ccme.ca/en/resources/canadian_environmental_quality_guidelines/calculators.html

Summary

- Level 2 reporting guidance has been updated for 2023 data drive
- Level 2 reporting is optional and unconstrained
- It allows countries the freedom to report additional data if they have the resources available to do so
- It provides countries with the facility to report the quality of their freshwaters beyond the scope possible with Level 1

Thank you



Indicator 6.3.2 Support Platform

<https://communities.unep.org/display/sdg632/SDG+6.3.2+Home>

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SDG632@un.org

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