	technical expertise. In-situ analysis only requires technical expertise in relation to installation of equipment.
Synergies with other indicators	Improved water quality can have correlations with nature, health and social value of a waterways, particularly in relation to biodiversity indicators. There are also links to climate change mitigation due to the links to the carbon cycle story.
Connection with SDGs	SDG3, SDG4, SDG6, SDG8-SDG12; SDG14-SDG17: Clean water supply; Links to environmental education; Clean water; Job creation; Cleaner water supply; Social equality in relation to water quality; Sustainable urban development; More sustainable water management; Improved water quality (for life below water); Improved water quality (for life on land); Environmental Justice; Opportunities for collaborative working
Opportunities for participatory data collection	Opportunities are available for participatory processes, particularly in relation to taking water samples for subsequent analysis. Automated dataloggers offer less opportunity for such participation with participation limited to observing and processing the data produced. There are also opportunities for stewardship of equipment or nature-based solution, etc.
Additional information	
References	Fung, YS, Wu, Z and Dao, KL (1996) Determination of Total Organic Carbon in Water by Thermal Combustion-Ion Chromatography. *Analytical Chemistry 68*(13), 2186-2190.

4.53 General ecological status of surface waters

Project Name: UNaLab (Grant Agreement no. 730052)

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Ecological status of surface waters	**Water management**
Description and justification	Water covers ca. 71 % of the Earth's surface but only 2.5 % of it is fresh, stored as groundwater and in glaciers. Water is vital for living organisms, and it enables a multitude of human activities such as agriculture, manufacturing and transportation of goods. Available water resources are being extensively used for a variety of purposes, and ensuring that the water quality is monitored and the degraded water bodies are enhanced is essential

	for protecting the water resources. EU Water Framework Directive (2000/60/EC) sets forth the framework for integrated management of surface waters and groundwater resources in the EU Member States, which are presented as River Basin Management Plans.
Definition	General ecological status of surface waters applicable to rivers, lakes, transitional waters and coastal waters (rated high, good, moderate, poor, bad)
Strengths and weaknesses	+ A comparable EU-wide applied assessment - Requires arrangements on Member State-level
Measurement procedure and tool	The following procedure is based off the requirements set by the Water Framework Directive (2000/60/EC): 1. Characterise water bodies within a river basin area per Annex II: a. Rivers, lakes, transitional waters or coastal waters — or artificial surface water bodies or heavily modified surface water bodies 2. Establish type-specific ecological reference conditions per Annex V 3. Identify significant anthropogenic pressures, and estimate point and diffuse source pollution in particular by substances listed under Annex VIII: a. Organohalogen compounds and substances which may form such compounds in the aquatic environment b. Organophosphorous compounds c. Organotin compounds d. Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine related functions in or via the aquatic environment e. Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances f. Cyanides g. Metals and their compounds h. Arsenic and its compounds i. Biocides and plant protection products j. Materials in suspension k. Substances which contribute to eutrophication (in particular, nitrates and phosphates)

	l. Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.) 4. Establish monitoring of ecological status for surface waters (The monitoring network shall be designed so as to provide a coherent and comprehensive overview of ecological and chemical status within each river basin and shall permit classification of water bodies into five classes consistent with the normative definitions): a. Design of surveillance, operational and/or investigative monitoring per Annex V b. Frequency of monitoring c. Additional monitoring requirements for protected areas as listed under Annex IV 5. Present monitoring results as maps in accordance with Annex V 6. Consider quality elements for classifying the ecological status per Annex V: a. Biological elements b. Chemical and physicochemical elements c. Hydromorphological elements d. Specific pollutants 7. Classify ecological status of surface waters (separate for rivers, lakes, transitional waters and coastal waters) per Annex V
Scale of measurement	River basin; Member State
Data source	
Required data	Biological, physicochemical, hydromorphological quality of surface waters
Data input type	Quantitative and qualitative
Data collection frequency	Different frequencies for biological, physicochemical, hydromorphological and other quality elements determined by Member States so as to provide sufficient data for a reliable assessment of the status of the relevant quality element.
Level of expertise required	Moderate to High
Synergies with other indicators	Indicators forming parts of the Member States' River Basin Management Plans: *Quantitative status of groundwater, Chemical status of groundwater, Ecological status of surface waters, Biological status of surface waters,*

	Hydromorphological status of surface waters, *Physicochemical status of surface waters* and *Ecological potential for heavily modified or artificial water bodies*
Connection with SDGs	SDG 6 Clean water and sanitation, SDG 11 Sustainable cities and communities, SDG 12 Responsible consumption and production, SDG 13 Climate action, SDG 14 Life below water
Opportunities for participatory data collection	No opportunities identified
Additional information	
References	European Parliament. (2000). *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy*. http://data.europa.eu/eli/dir/2000/60/oj European Parliament. (2006). *Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration*. http://data.europa.eu/eli/dir/2006/118/2014-07-11 European Commission. (2012). *Report from the Commission to the European Parliament and the Council on the Implementation of the Water Framework Directive (2000/60/EC). River Basin Management Plans*.

4.54 Ecological potential for heavily modified or artificial water bodies

Project Name: UNaLab (Grant Agreement no. 730052)

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Ecological potential for heavily modified or artificial water bodies	**Water management**
Description and justification	Water covers ca. 71 % of the Earth's surface but only 2.5 % of it is fresh, stored as groundwater and in glaciers. Water is vital for living organisms, and it enables a multitude of human activities such as agriculture, manufacturing and transportation of goods. Available water resources are being extensively used for a variety of purposes, and ensuring that the water quality is monitored and the degraded water bodies are enhanced is essential for protecting the water resources. EU Water Framework