

	<i>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</i>
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). <i>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.</i> http://data.europa.eu/eli/dir/2000/60/oj European Commission. (2012). <i>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.</i>

4.55 Biological quality of surface waters

Project Name: UNaLab (Grant Agreement no. 730052)

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Water Quality: Biological 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	Biological quality of surface waters - 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	<p>The following procedure is based off the requirements set by the Water Framework Directive (2000/60/EC):</p> <ol style="list-style-type: none"> 1. Characterise water bodies within a river basin area per Annex II: <ol style="list-style-type: none"> a. Rivers, lakes, transitional waters or coastal waters — or artificial surface water bodies or heavily modified surface water bodies 2. Establish type-specific biological 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: <ol style="list-style-type: none"> 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 biological status for surface waters:

	<ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 5. Present monitoring results as maps in accordance with Annex V 6. Classify biological status of surface waters per Annex V 																									
Scale of measurement	River basin; Member State																									
Data source																										
Required data	Biological reference conditions; Anthropogenic pressures																									
Data input type	Qualitative, quantitative																									
Data collection frequency	<p>For surveillance monitoring period:</p> <table border="1"> <thead> <tr> <th>Quality element</th> <th>Rivers</th> <th>Lakes</th> <th>Transitional</th> <th>Coastal</th> </tr> </thead> <tbody> <tr> <td>Phytoplankton</td> <td>6 months</td> <td>6 months</td> <td>6 months</td> <td>6 months</td> </tr> <tr> <td>Other aquatic flora</td> <td>3 years</td> <td>3 years</td> <td>3 years</td> <td>3 years</td> </tr> <tr> <td>Macroinvertebrates</td> <td>3 years</td> <td>3 years</td> <td>3 years</td> <td>3 years</td> </tr> <tr> <td>Fish</td> <td>3 years</td> <td>3 years</td> <td>3 years</td> <td></td> </tr> </tbody> </table> <p>For operational monitoring, the frequency of monitoring required for any parameter shall be determined by Member States so as to provide sufficient data for a reliable assessment of the status of the relevant quality element. As a guideline, monitoring should take place at intervals not exceeding those indicated for surveillance monitoring.</p>	Quality element	Rivers	Lakes	Transitional	Coastal	Phytoplankton	6 months	6 months	6 months	6 months	Other aquatic flora	3 years	3 years	3 years	3 years	Macroinvertebrates	3 years	3 years	3 years	3 years	Fish	3 years	3 years	3 years	
Quality element	Rivers	Lakes	Transitional	Coastal																						
Phytoplankton	6 months	6 months	6 months	6 months																						
Other aquatic flora	3 years	3 years	3 years	3 years																						
Macroinvertebrates	3 years	3 years	3 years	3 years																						
Fish	3 years	3 years	3 years																							
Level of expertise required	Moderate to High																									
Synergies with other indicators	Indicators forming parts of the Member States' River Basin Management Plans: <i>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</i>																									
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	<p>European Parliament. (2000). <i>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.</i> http://data.europa.eu/eli/dir/2000/60/oj</p> <p>European Commission. (2012). <i>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.</i></p>

4.56 Total number and species richness of aquatic macroinvertebrates

Project Name: UNaLab (Grant Agreement no. 730052) and PHUSICOS (Grant Agreement no. 776681)

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Total number and species richness of aquatic macroinvertebrates	Water Management
Description and justification	<p>The Extended Biotic Index (EBI) is based on the analysis of macroinvertebrate communities that colonize river ecosystems. Aquatic macroinvertebrates are animals that do not have a backbone, can be observed without magnification and spend at least part of their life in water. Most macroinvertebrates spend part of all of their life attached to submerged rocks, logs and vegetation. They are good indicators of the health of aquatic ecosystems because:</p> <ul style="list-style-type: none"> • Macroinvertebrates are affected by physical, chemical and biological conditions of the stream