

Eco-AlpsWater

Innovative Ecological Assessment and Water Management Strategy
for the Protection of Ecosystem Services in Alpine Lakes and Rivers

Priority 3: Liveable Alpine Space. SO3.2 - Enhance the protection, the
conservation and the ecological connectivity of Alpine Space

Deliverable D.T2.1.3

Pan-European survey evaluating different ways to assess EU water ecological status, and downscaling to the Alpine Space region

Project Eco-AlpsWater
Work Package WPT2
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Deliverable D.T2.1.3
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Abstract

The output of the Deliverable D.T2.1.3 consisted in a collection of methods adopted in the Pan-European countries for the assessment of the ecological status of lake and river waters, using the biological quality elements selected in the Eco-AlpsWater project (phytoplankton, benthic diatoms, and fish). Methods were retrieved from a previous survey, the WISER project (2012). The output of Deliverable D.T2.1.1 and D.T2.1.2 were compared with this wide survey to highlight possible improvement of methods applied in the alpine region, and suggest a advantageous common approach to combine with the innovative eDNA method.

Below a summary of BQE methods adopted in lakes and rivers in the Pan-European countries, reported in the WISER database.

BQE Methods in Pan Europe		Phytoplankton	Diatoms (Phytobenthos)	Fish
Austria	Lakes			
	Rivers		✓	
Belgium	Lakes	✓	✓	✓
	Rivers		✓	✓
Bulgaria	Lakes			
	Rivers		✓	
Croatia	Lakes			
	Rivers		✓	
Cyprus	Lakes	✓		
	Rivers		✓	
Czech Republic	Lakes			
	Rivers		✓	✓
Denmark	Lakes	✓		
	Rivers			
Estonia	Lakes	✓		✓
	Rivers		✓	✓
Finland	Lakes	✓		✓
	Rivers		✓	✓
France	Lakes	✓		✓
	Rivers		✓	✓
Germany	Lakes	✓	✓	✓
	Rivers		✓	✓
Greece	Lakes	✓		
	Rivers			
Hungary	Lakes	✓	✓	✓
	Rivers		✓	✓
Ireland	Lakes	✓		✓
	Rivers		✓	
Italy	Lakes	✓		✓
	Rivers		✓	✓

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Latvia	Lakes	✓		
	Rivers			
Lithuania	Lakes	✓		
	Rivers			✓
Luxembourg	Lakes			
	Rivers		✓	✓
Netherlands	Lakes	✓		✓
	Rivers		✓	✓
Norway	Lakes	✓		✓
	Rivers			
Poland	Lakes	✓	✓	✓
	Rivers		✓	
Portugal	Lakes	✓		
	Rivers		✓	✓
Romania	Lakes	✓		
	Rivers		✓	✓
Slovakia	Lakes			
	Rivers		✓	✓
Slovenia	Lakes			
	Rivers		✓	✓
Spain	Lakes	✓	✓	
	Rivers		✓	✓
Sweden	Lakes	✓		✓
	Rivers		✓	✓
United Kingdom	Lakes	✓	✓	
	Rivers		✓	✓

PAN-EUROPEAN COUNTRIES

WISER project (<http://www.wiser.eu/results/method-database/>)

Water Category: Lakes

GIG: Baltic OR Black Sea OR Central-Baltic OR Eastern Continental OR Mediterranean OR Northern OR North-East-Atlantic

Biological Quality Element: Benthic Diatoms OR Other Phytobenthos OR Fish Fauna

1. [Flemish phytoplankton assessment method for lakes](#)
Belgium (Flanders) | Lakes | Central-Baltic | Phytoplankton
2. [Assessment of phytoplankton in reservoirs](#)
Belgium (Wallonia) | Lakes | Central-Baltic | Phytoplankton
3. [Proportions of Impact-Sensitive and Impact-Associated Diatoms](#)
Belgium (Flanders) | Lakes | Central-Baltic | Benthic Diatoms
4. [Flemish Index of Biotic Integrity](#)
Belgium (Flanders) | Lakes | Central-Baltic | Fish Fauna
5. [Mediterranean Assessment System for Reservoirs Phytoplankton](#)
Cyprus | Lakes | Mediterranean | Phytoplankton
6. [Assessment system for lakes using Chlorophyll-a](#)
Denmark | Lakes | Central-Baltic | Phytoplankton
7. [Assessment of status of lakes on the basis of phytoplankton](#)
Estonia | Lakes | Central-Baltic | Phytoplankton
8. [Lake Fish in Estonia. Assessment EQR 3,5](#)
Estonia | Lakes | Central-Baltic | Fish Fauna
9. [Lake ecological status assessment using phytoplankton](#)
Finland | Lakes | Northern | Phytoplankton
10. [Finnish Lake Fish Classification Index](#)
Finland | Lakes | Northern | Fish Fauna
11. [Lake phytoplankton index](#)

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France | Lakes | Central-Baltic, Mediterranean | Phytoplankton

12. [Assessment of fish fauna in lakes](#)

France | Lakes | Central-Baltic, Mediterranean | Fish Fauna

13. [German Phyto-Lake-Index](#)

Germany | Lakes | Alpine, Central-Baltic | Phytoplankton

14. [German Assessment System for Macrophytes and Phytobenthos for the WFD](#)

Germany | Lakes | Alpine, Central-Baltic | Benthic Diatoms, Macrophytes, Other Phytobenthos

15. [Assessment of fish fauna in lakes](#)

Germany | Lakes | Central-Baltic | Fish Fauna

16. [Greek Assessment System for Reservoirs and Lakes Phytoplankton](#)

Greece | Lakes | Mediterranean | Phytoplankton

17. [Hungarian Lake Phytoplankton Index](#)

Hungary | Lakes | Eastern Continental | Phytoplankton

18. [Improvement of the Hungarian ecological water qualification system - Phytobenthos in Lakes](#)

Hungary | Lakes | Eastern Continental | Benthic Diatoms

19. [Assessment of fish fauna in lakes](#)

Hungary | Lakes | Eastern Continental | Fish Fauna

20. [Chlorophyll-a metric - Phytoplankton Biomass](#)

Ireland | Lakes | Central-Baltic, Northern | Phytoplankton

21. [Irish Phytoplankton composition and abundance Index](#)

Ireland | Lakes | Central-Baltic, Northern | Phytoplankton

22. [Fish in Irish lakes classification tool](#)

Ireland | Lakes | Northern | Fish Fauna

23. [Mediterranean Phytoplankton Trophic Index](#)

Italy | Lakes | Mediterranean | Phytoplankton

24. [Lake Fish Index - Index for the assessment of quality of the fish communities in italian lakes](#)

Italy | Lakes | Alpine, Mediterranean | Fish Fauna

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25. [Latvian phytoplankton assessment method](#)
Latvia | Lakes | Central-Baltic | Phytoplankton

26. [Assessment method of lakes using part of biomass of Bacillariophyta and Chrysophyta \(%\)](#)
Lithuania | Lakes | Central-Baltic | Phytoplankton

27. [Assessment method of lakes using Chlorophyll-a](#)
Lithuania | Lakes | Central-Baltic | Phytoplankton

28. [Assessment method of lakes using part of biomass of Cyanobacteria \(%\)](#)
Lithuania | Lakes | Central-Baltic | Phytoplankton

29. [WFD-metrics for natural watertypes](#)
Netherlands | Lakes | Central-Baltic | Phytoplankton

30. [WFD-metrics for natural watertypes](#)
Netherlands | Lakes | Central-Baltic | Fish Fauna

31. [Assessment of ecological status of Lake Phytoplankton](#)
Norway | Lakes | Northern | Phytoplankton

32. [Norwegian Method for Fish in Lakes](#)
Norway | Lakes | Northern | Fish fauna

33. [Phytoplankton Metric for Polish Lakes \(PMPL\)](#)
Poland | Lakes | Central-Baltic | Phytoplankton

34. [Assessment system for lakes using diatom phytobenthos](#)
Poland | Lakes | Central-Baltic | Benthic Diatoms

35. [Lake Fish Index](#)
Poland | Lakes | Central-Baltic | Fish Fauna

36. [Lakes and Reservoirs Biological Quality Assessment Method - Phytoplankton](#)
Portugal | Lakes | Mediterranean | Phytoplankton

37. [Assessment system for natural lakes status based on Phytoplankton according to the WFD](#)
Romania | Lakes | Eastern Continental | Phytoplankton

38. [Mediterranean Assessment System for Reservoirs Phytoplankton](#)

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Spain | Lakes | Mediterranean | Phytoplankton

39. [Aquatic Flora Spanish Assessment Method](#)

Spain | Lakes | Mediterranean | Benthic Diatoms, Macrophytes, Other Phytobenthos

40. [Ecological Assessment methods of lakes, quality factor phytoplankton, parameter chlorophyll](#)

Sweden | Lakes | Northern | Phytoplankton

41. [Ecological assessment methods for lakes, quality factor phytoplankton, parameter Proportion of cyanobacteria](#)

Sweden | Lakes | Northern | Phytoplankton

42. [Assessment criteria for ecological status of fish in Swedish lakes](#)

Sweden | Lakes | Northern | Fish Fauna

43. [Ecological assessment methods for lakes, quality factor phytoplankton, parameter Number of species](#)

Sweden | Lakes | Northern | Phytoplankton

44. [Ecological assessment methods for lakes, quality factor phytoplankton, parameter Trophic Plankton Index](#)

Sweden | Lakes | Northern | Phytoplankton

45. [Ecological assessment methods for lakes, quality factor phytoplankton, parameter total biomass](#)

Sweden | Lakes | Northern | Phytoplankton

46. [Lake Phytoplankton ? Chlorophyll-a and Percentage nuisance cyanobacteria](#)

United Kingdom | Lakes | Central-Baltic, Northern | Phytoplankton

47. [Lake Trophic Diatom Index Method](#)

United Kingdom | Lakes | Central-Baltic, Northern | Benthic Diatoms

WISER project (<http://www.wiser.eu/results/method-database/>)

Water Category: Rivers

GIG: Baltic OR Black Sea OR Central-Baltic OR Eastern Continental OR Mediterranean OR Northern OR North-East-Atlantic

Biological Quality Element: Benthic Diatoms OR Other Phytobenthos OR Fish Fauna

1. [Assessment of the biological quality elements - part phytobenthos](#)

Austria | Rivers | Alpine, Central-Baltic, Eastern Continental | Benthic Diatoms, Other Phytobenthos

2. [Proportions of Impact-Sensitive and Impact-Associated Diatoms](#)

Belgium (Flanders) | Rivers | Central-Baltic | Benthic Diatoms

3. [Pollution Sensitivity Index](#)

Belgium (Wallonia) | Rivers | Central-Baltic | Benthic Diatoms

4. [Biological Index for Fish Integrity](#)

Belgium (Wallonia) | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna

5. [Flemish Index of Biotic Integrity](#)

Belgium (Flanders) | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna

6. [Sampling, preservation and pretreatment of benthic diatoms](#)

Bulgaria | Rivers | Eastern Continental | Benthic Diatoms

7. [Croatian Diatom Trophic Index](#)

Croatia | Rivers | Eastern Continental | Benthic Diatoms

8. [Specific Pollution-sensitivity Index](#)

Cyprus | Rivers | Mediterranean | Benthic Diatoms

9. [Assessment system for rivers using phytobenthos](#)

Czech Republic | Rivers | Eastern Continental | Benthic Diatoms, Other Phytobenthos

10. [Czech national method of the river ecological status classification according to the fish biocoenosis](#)

Czech Republic | Rivers | Cross-GIG (Central-Baltic, Eastern Continental) | Fish Fauna

11. [Assessment system for rivers using phytobenthos in Estonia](#)

Estonia | Rivers | Central-Baltic | Benthic Diatoms

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12. [The Estonian fish-based assessment method for the ecological classification of rivers](#)
Estonia | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna
13. [Biological Diatom Index 2006](#)
France | Rivers | Alpine, Central-Baltic, Mediterranean | Benthic Diatoms
14. [Fish Biotic Index](#)
France | Rivers | Cross-GIG (Alpine, Central-Baltic, Mediterranean) | Fish Fauna
15. [Indice de Polluo-Sensibilité Spécifique \(Specific Pollution sensitivity Index SPI\)](#)
Finland | Rivers | Northern | Benthic Diatoms
16. [Finnish River Fish Index](#)
Finland | Rivers | Cross-GIG (Northern) | Fish Fauna
17. [German Assessment System for Macrophytes and Phytobenthos according to the EU WFD](#)
Germany | Rivers | Alpine, Central-Baltic | Benthic Diatoms, Macrophytes, Other Phytobenthos
18. [Fish-based Assessment System](#)
Germany | Rivers | Cross-GIG (Alpine, Central-Baltic) | Fish Fauna
19. [Improvement of the Hungarian ecological water qualification system - Phytobenthos in Rivers](#)
Hungary | Rivers | Eastern Continental | Benthic Diatoms
20. [Ecological Quality Index of Hungarian Riverine Fishes](#)
Hungary | Rivers | Cross-GIG (Eastern Continental) | Fish Fauna
21. [Intercalibration Common Metrics Index](#)
Italy | Rivers | Central-Baltic, Mediterranean | Benthic Diatoms
22. [Index of Ecological Status of Fish Communities](#)
Italy | Rivers | Cross-GIG (Mediterranean, Central-Baltic) | Fish Fauna
23. [Revised form of Trophic Diatom Index](#)
Ireland | Rivers | Central-Baltic, Northern | Benthic Diatoms
24. [Assessment method of rivers using Lithuanian fish index](#)
Lithuania | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna
25. [Assessment system for rivers using fish - macrozoobenthos - macrophytes - diatoms](#)

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Luxembourg | Rivers | Central-Baltic | Benthic Diatoms, Benthic Invertebrates, Fish Fauna, Macrophytes

26. [Biological Diatom Index](#)

Luxembourg | Rivers | Central-Baltic | Benthic Diatoms

27. [Fish Biotic Index](#)

Luxembourg | Rivers | Central-Baltic | Fish Fauna

28. [WFD-metrics for natural watertypes](#)

Netherlands | Rivers | Central-Baltic | Benthic Diatoms

29. [Netherlands References and Metrics for Fish in Large Rivers](#)

Netherlands | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna

30. [Netherlands References and Metrics for Fish in Small Rivers](#)

Netherlands | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna

31. [Netherlands References and Metrics for Fish in Large Rivers](#)

Netherlands | Rivers | Cross-GIG (Central-Baltic) | Fish Fauna

32. [Assessment system for rivers using diatom phytobenthos](#)

Poland | Rivers | Central-Baltic | Benthic Diatoms

33. [Rivers Biological Quality Assessment Method - Diatoms](#)

Portugal | Rivers | Mediterranean | Benthic Diatoms

34. [Rivers Biological Quality Assessment Method - Fish Fauna Wadeable Streams](#)

Portugal | Rivers | Cross-GIG (Mediterranean) | Fish Fauna

35. [Assesment Method for Ecological Status of the Water Body \(rivers\) based on Phytobenthos](#)

Romania | Rivers | Eastern Continental | Benthic Diatoms

36. [New European Fish Index](#)

Romania | Rivers | Cross-GIG (Eastern Continental) | Fish Fauna

37. [Slovak assessment of benthic diatoms in rivers](#)

Slovakia | Rivers | Eastern Continental | Benthic Diatoms

38. [Fish Index of Slovakia](#)

Slovakia | Rivers | Cross-GIG (Eastern Continental) | Fish Fauna

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39. [Ecological status assessment system for rivers using phytobenthos](#)

Slovenia | Rivers | Alpine, Eastern Continental, Mediterranean | Benthic Diatoms

40. [Assessment of fish fauna in rivers](#)

Slovenia | Rivers | Cross-GIG (Eastern Continental, Mediterranean) | Fish Fauna

41. [Pollution Sensitivity Index](#)

Spain | Rivers | Alpine, Mediterranean | Benthic Diatoms

42. [Spanish Fish Index](#)

Spain | Rivers | Cross-GIG (Alpine, Mediterranean) | Fish Fauna

43. [Benthic algae in running water - diatom analysis](#)

Sweden | Rivers | Central-Baltic, Northern | Benthic Diatoms

44. [Environmental quality criteria to determine the status of fish in running waters - development and application of VIX](#)

Sweden | Rivers | Cross-GIG (Northern) | Fish Fauna

45. [WFD River Diatom method or Trophic Diatom Index version 3 Method](#)

United Kingdom | Rivers | Central-Baltic, Northern | Benthic Diatoms

46. [Fisheries Classification Scheme 2](#)

United Kingdom | Rivers | Cross-GIG (Central-Baltic, Northern) | Fish Fauna