

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

Project Eco-AlpsWater

Work Package WPT3

Activity A.T3.6

Deliverable D.T3.6.1

Version 1.0

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From proposal:

AT3.5

The workout in A.T3.5 will create a living network, providing transferable instruments to be applied in other contexts: following EUSALP AG1, the aim is to expand the coop. between govern. agencies and academia, for a mutual exchange of knowledge and creation of a network (PPs, Obs., target gr.) deputed to the assessment of ecological status of the water resources in the AS area. The project (and extended network) will relate with other networks (LTER; lake observatories, e.g. Bourget; ISPRA...).

From proposal: D.T3.6.1.

Activities & meetings will lay the basis for drafting the agreement to build a transnational cooperation to promote innovative water quality assess., improving cooperation and knowledge sharing, and links with govern./stakehold. at all levels.

Introduction

This document gives a general overview on the role of each of the 12 PPs in the project and the realised or anticipated areas of collaboration. In particular networking and outreach activities have been documented in detail in WPC and can be accessed under the respective deliverables, D.C.2.1. – D.C.2.3, i.e. booklets with ongoing activities, technical protocols, and manual for stakeholders.

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Individual PPs areas of collaboration

1. LP, FEM, San Michele all'Adige

Collaboration preparatory phase

+) In synergy with the other PPS, FEM coordinated the preparation phase of the project by drafting the proposal and collecting the materials from all the partners and members in charge of coordinating the respective work packages.

+) FEM, along with ARPAV (PP3) and ISPRA (PP9) contacted several national observers to invite them to follow and participate in the activities of the project.

Collaboration during project duration

+) During the project lifetime, LP coordinated eight PSG meetings, including the kick off meeting. The meetings were participated by both academic and government partners. A large part of the discussion were focused on the optimization of activities to transfer analytical, technical and logistic knowledge among partners and stakeholders.

+) During the project lifetime, LP coordinated or participated actively to several informal project meetings open to observers and stakeholders. Four of these conferences were organized at the national level, involving the major environmental agencies representatives of the Italian Regions.

+) LP coordinated all the management activities linked to the project and actively contributed to the formalisation of several protocols planned in the four technical work packages, and to the coordination of the activities among WPs.

+) Along with ARPAV and ISPRA, FEM established cooperation with a several observers in the provinces of Trento and Bolzano, and in the regions Lombardia, Veneto and Friuli Venezia Giulia organizing activities focused on field sampling and laboratory analyses. In the last year of the project, these activities were extended to central Italy (Lazio Region), involving environmental agencies and the local offices of ISPRA.

+) LP co-organised with INRAE the training school to transfer eDNA tools and protocols to young researchers (31 August – 3 September 2021).

+) LP contributed actively to the valorisation and dissemination of the EAW results through its participation in academic conferences and workshops, e.g. AIOL (Italian Association of Limnology and Oceanology), IAGLR (International Association for Great Lakes Research), SEFS (Symposium for European Freshwater Sciences), ICTC (International Conference on Toxic Cyanobacteria), EPC (European Phycological Congress).

Collaboration after the project duration

+) LP will continue to communicate the project results (data from eDNA sequencing) to interested observers and to academics.

+) LP will continue to valorise the project results towards academics and to update the eDNA - open access- protocols formalised within EAW program if necessary.

+) LP will make further use of the Eco-AlpsWater results to propose future projects based on the use of eDNA biomonitoring tools, both at national and international scale.

2. PP2, LFUI, University of Innsbruck, Research Department for Limnology, Mondsee

Collaboration preparatory phase

+) In the project preparation phase PPs in Germany and Austria were actively motivated to participate. Since the former prospective PP in Austria BAW Scharfling could not be a PP because of administrative reasons, a new PP had to be found in short time, which was successfully achieved by including PP8 (AGES).

+) In total 6 national observers could be invited to indicate their interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) Coordinator of WP3.

- +) The project was represented within the organisation (University) through one PhD thesis and two BSc theses. Results of the project were presented through the University PhD seminar as well as through the doctoral program “Alpine Biology”.
- +) During the project lifetime PP2 participated actively in the eight PSG meetings (incl. the kick off meeting).
- +) During the project lifetime PP2 participated actively in the seven informal project conferences open to observers and stakeholders.
- +) PP2 informed all 6 national observers regularly about the half year meetings, its agenda and the overall project progress.
- +) PP2 established cooperation with a few observers regarding sampling activities and sequence data exploitation.
- +) Additional cooperation with PPs was established, i.e. regarding fish stock assessment and monitoring of toxigenic cyanobacteria at bathing water sites according to EU directive.
- +) PP2 established cooperation with additional relevant stakeholders, i.e. state government of Upper Austria regarding the comparison of sequencing results with traditional phytoplankton microscopical monitoring.
- +) Organisation and participation in academic conferences and academic workshops.

Collaboration after the project duration

- +) PP2 will continue to present and explain the project results including the data from HTS sequencing to interested observers.
- +) PP2 will advocate the project results and make further use on national scale, i.e. Biodiversity funds 2021+ of the Austrian ministry for environment, Austrian Barcode of Life, yearly meeting of Federal Agency for Water Management (Fischereifachtagung) etc.
- +) PP2 will inform about project results to the Austrian ministry of agriculture (responsible for WFD in Austria) through a webinar.

3. PP3, ARPAV, Environmental Protection Agency of the Veneto Region, Verona

Collaboration preparatory phase

- +) PP3 contributed to the project preparation phase by hosting the 'preparation meeting' (WP0) in Verona, 28/11/2017 (Italy).

+) In total 16 national observers were invited, by Italian PPs, to indicate their interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) PP3 actively participated at all PSG meetings (incl. The preparation meeting and the kick-off meeting).

+) During the project lifetime PP3 participated actively in several informal project conferences open to the environmental protection agencies of others regions (observers and stakeholders).

+) During the project lifetime, PP3, together with LP and PP9, organised several events for Italian observers and stakeholders.

+) PP3 established cooperation with a few observers regarding sampling activities, data analysis and sequence data exploitation.

+) Additional cooperation with some italian observers (Italian Environmental Agencies) regarding identification of some critical species of diatoms and phytoplankton, important for the ecological assessment.

+) PP3 established cooperation with PP9 and other Italian Environmental Agencies to carry out the experimentation of EAW methods outside Alpine Area.

+) PP3 established cooperation with additional relevant Italian stakeholders regarding the possibility of enriching the WFD method with EAW protocols and results.

+) Organization and participation in conferences and workshops in some Italian schools.

Collaboration after the project duration

+) PP3 will continue to present and explain the project results including the data from HTS sequencing to interested observers.

+) PP3 will use new data from the project for increase the efficiency of the WFD methods.

4. PP4, NIB, National Institute of biology

Collaboration preparatory phase

+) Slovenian PPs were actively participate in the project preparation phase. In Slovenia, that kind of research and comparison was never done in a systematic way for freshwater environments, so the interest was huge.

+) In total, 5 national observers were invited to indicate their interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) Coordinator of WP C.

+) PP4 actively participated at all PSG meetings (incl. the kick-off meeting).

+) PP4, together with PP5, informed all five national observers regularly about the half-year meetings, its plan, and the overall project progress (also through biannual Newsletter).

+) During the project lifetime, PP4, together with PP5, organised several events for observers and stakeholders:

- On 20. 12. 2018 was first Slovenian meeting stakeholders, organized by ARSO and NIB. The event was attended by 12 participants from 3 Slovenian Institutions.
- National stakeholders were present also at EAW partners meeting 20. and 21.11.2019, discussing the situation in Slovenia (with very active input from Fisheries Research Institute of Slovenia).
- Communication with Slovenian stakeholders about EAW were held also as a part of meetings where water related problems were the key word (meeting with TNP 10.4.2019, meeting at Bled Municipality 26.5.2020, meeting with Minister of Environment at NIB 2.6.2020)
- On 8.9.2021, ARSO and NIB organized the Slovenian closing conference as a national meeting for policymakers, observers, and others. The event was attended by 40 participants from 17 Slovenian institutions, which is in contrast to first meeting in 2018, a huge success of the project activities.

+) Participation at two academic conferences and academic workshops.

Collaboration after the project duration

+) PP4 will continue to present and explain the project results including the data from HTS sequencing to interested observers and stakeholders.

+) PP4 will use new data from the project (on cyanotoxic species and toxins) and in 2022 launch the new platform www.ciano.si including citizen science approach.

+) PP4 will advocate the project results and make further use on a national scale (national Environment Agency, Ministry of environment, EUSALP representatives). PP4 will use the e-mail addresses from Eco-AlpsWater Alpine Cooperation Network to further inform interested stakeholders and national EUSALP representatives about future activities.

5. PP5, ARSO, Slovenian Environment Agency

Collaboration preparatory phase

+) Slovenian PPs were actively motivated in participation in the project preparation phase. In Slovenia, that kind of research and comparison was never done, and we were aware that an innovative (eDNA) approach could be important in the future.

+) In total, 5 national observers were invited to indicate their interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) During the project lifetime, PP5 participated actively in the eight PSG meetings (incl. the kick-off meeting).

+) During the project lifetime, PP5 participated actively in the seven informal project conferences open to observers and stakeholders.

+) PP5 informed all five national observers regularly about the half-year meetings, its plan, and the overall project progress.

+) PP5 established close cooperation with two observers (Fisheries Research Institute of Slovenia and Slovenian Water Agency) regarding sampling activities, sequence data exploitation and policy.

+) PP5, together with PP4, organized a conference for observers, experts, stakeholders, and policy makers.

+) PP5 organized a webinar about project results for Slovenian Environment Agency employees.

Collaboration after the project duration

+) PP5 will continue to present and explain the project results, including the data from HTS sequencing, to interested observers.

+) PP5 will advocate the project results and make further use on a national scale in the framework of its regular work of ecological status assessment.

6. PP6, INRAE, CARRTEL, Thonon les Bains

Collaboration preparatory phase

+) In synergy with the other PPS, INRAE participated in the preparation phase of the project by collaborating in the drafting of the proposal. In particular, INRAE contributed to define the objectives of the WP1 and its articulation with other WPs.

+) INRAE contacted (French) national observers to invite them to follow the project.

Collaboration during project duration

+) Coordinator of WP1.

+) During the project lifetime, PP6 participated actively in the eight PSG meetings, including the kick off meeting.

+) During the project lifetime, PP6 participated actively in the seven informal project conferences open to observers and stakeholders, including the final conference (Oct 2021).

- +) PP6 coordinated WP1 and actively contributed to the formalisation of eDNA protocols for plankton, biofilms and fish metabarcoding: this has necessitated numerous interactions with all PPs to validate the eDNA protocols to be used within WP3 to collect new data on lakes and rivers of the Alpine space region.
- +) PP6 informed national observers regularly about the overall project progress.
- +) PP6 established cooperation with a few observers regarding sampling activities and sequence data exploitation in particular for rivers.
- +) PP6 established cooperation with additional relevant stakeholders, to promote the use of innovative ecological diagnosis based on eDNA tools i.e. to illustrate the comparison of DNA sequencing results with traditional biomonitoring.
- +) PP6 organised in France (Thonon) one of the project meeting (2019) to host all the participants.
- +) PP6 co-organised with FEM the training school to transfer eDNA tools and protocols to young researchers (August 2021).
- +) PP6 contributed actively to the valorisation and dissemination of the EAW results through its participation in academic conferences and workshops.

Collaboration after the project duration

- +) PP6 will continue to communicate the project results (data from eDNA sequencing) to interested observers and to academics.
- +) PP6 will continue to valorise the project results towards academics and to update the eDNA - open access- protocols formalised within EAW program if necessary.
- +) PP6 will make further use of the EcoAlpsWater results to propose future projects based on the use of eDNA biomonitoring tools, both at national (e.g. Pole R&D ECLA) and international scale (e.g. project of doctoral networks) etc.

7. PP7 (LfU), Bavarian State Research Center for Agriculture

Collaboration preparatory phase

- +) In the project preparation phase PPs in Germany were actively motivated to participate. PP7 together with PP10 proposed Lake Starnberg and River Wertach as possible pilot study sites.
- +) 2 national observers from fisheries agencies of the Bavarian government districts could be invited to indicate their interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) There was an intensive collaboration with PP2 regarding activities at the local pilot site Lake Starnberg. Results of the EAW project were presented through the two regional stakeholder events (6.2.2019 1day; 19.05.2021 teleconference).

+) During the project lifetime PP7 participated actively in the eight PSG meetings.

+) During the project lifetime PP7 participated actively in the seven informal project conferences open to observers and stakeholders.

Collaboration after the project duration

+) PP7 will follow up using eDNA approach for the investigation of specie inventory of natural waters for example the possible occurrence of minnow in Lake Starnberg in collaboration with PP2.

8. PP8 (AGES), Agency for Environmental Health

Collaboration preparatory phase

+) PP8 (AGES) joined the project Eco-AlpsWater at the end of the preparatory phase when it turned out that BAW Scharfling was not able to participate and PP2 was looking for a substitute.

Collaboration during project duration

+) During the project PP8 intensely collaborated with PP2 (high throughput sequencing, HTS).

+) During the project lifetime PP8 participated actively in the eight PSG meetings (incl. the kick off meeting) and in the seven informal project conferences open to observers and stakeholders.

+) Ddditional cooperation regarding monitoring of toxigenic cyanobacteria at bathing water sites according to EU directive.

Collaboration after the project duration

+) PP8 will continue HTS of environmental DNA in cooperation with PP2.

9. PP9, ISPRA, Italian National Institute for Environmental Protection and Research

Collaboration preparatory phase

+) In synergy with the other Italian PPS, ISPRA participated in the preparation phase of the project by collaborating in the drafting of the proposal and, in particular, to develop the related tasks: joint harmonization of monitoring approaches; implementing the Eco-AlpsWater approach into actual biomonitoring protocols, planning and management. ISPRA also took care of the task of transferring the knowledge acquired in the project to the institution directly involved in the national monitoring activities (SNPA and Environmental Protection Regional Agencies).

Collaboration during project duration

+) ISPra has set up an internal working group and a second working group with the representatives of the ARPAs aimed at applying the new monitoring techniques developed during the application phases of the project. In total eleven Environmental Protection Regional Agencies (Campania, Emilia Romagna, Friuli Venezia Giulia, Lazio, Liguria, Lombardy, Marche, Puglia, Tuscany, Umbria and Val d'Aosta) took part in this working group, coordinated by ISPra.

- 01/07/2020. Meeting of working group SNPA. The event was attended by more than 20 participants. Organized by ISPra
- 10/09/2020. Meeting of working group SNPA. The event was attended by more than 20 participants. Organized by ISPra.

+) ISPra presented the project within several educational and didactic events received by students (work-related learning experience) and some citizen-science events (Science Together 2019-2021).

+) ISPra organized several national and regional meetings to presented the project, disseminate the monitoring techniques applied by the project participants and to discuss the results.

- 11/04/2019, Verona. Regional meeting: ARP AV, APPA TN, FEM, ISPra, SUPSI
- 16/10/ 2019, Rome. Regional meeting: ISPra, ARP AV, FEM
- 19/05/2021, Italian and Switzerland Regional Stakeholder meeting online. Organized by: PP3 ARP AV; PP12 SUPSI; PP9 ISPra; LP FEM
- 10/09/2021, Italian national meeting online. Coordinated by ISPra with ARP AV and FEM
- 13/10/2021, Italian and Switzerland technical workshop online. Organized by: PP3 ARP AV; PP9 ISPra; LP FEM.

+) ISPra designed, organized and implemented a pilot study in extra alpine freshwater bodies with the following aims:

- Replicability in extra alpine freshwater bodies to implement and develop methods and protocols applied in EAW project;
- Knowledge transfer of achievements at national scale;
- Fast and low-cost identification of aquatic organisms;
- Integration and support of traditional freshwater monitoring approaches.

+) ISPra designed, organized and implemented sampling campaign aimed at applying the HTS techniques developed in the project.

+) During the project lifetime PP9 participated actively in all the eight PSG meetings (incl. the kick off meeting).

+) During the project lifetime PP9 participated actively in the seven informal project conferences open to observers and stakeholders.

+) PP9 shared with all eleven Environmental Protection Regional Agencies regularly about the half year meetings, its agenda and the overall project outcomes and progress.

+) PP9 established cooperation with a few observers regarding sampling activities and sequence data exploitation.

+) PP9 established additional cooperation with other PPs, i.e. regarding BQA monitoring according to EU directive.

+) PP9 organised and participated in academic conferences and academic workshops.

Collaboration after the project duration

+) PP9 will continue to present and explain the project results, including the data from HTS sequencing to interested observers.

+) PP9 will inform about project results to the National System for Environmental Protection - SNPA and to the Ministry for Ecological Transition - MiTE.

10. PP10, LFU, Bavarian Environmental Agency, Wielenbach

Collaboration preparatory phase

+) In the project preparation phase PPs in Germany were actively motivated to participate. PP10 accepted to take over the lead of WP4 as a representing a bio-monitoring institution.

+) 2 national observers plus 2 regional monitoring institutions (WWA) could be invited to indicate their interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) Within the organisation (LfU) the project cooperated with another metabarcoding project in parallel for macrozoobenthos. Results of the EAW project were presented through the two regional stakeholder events (6.2.2019 1day; 19.05.2021 teleconference).

+) During the project lifetime PP10 participated actively in the eight PSG meetings.

+) During the project lifetime PP10 participated actively in the seven informal project conferences open to observers and stakeholders.

+) PP10 informed the 2 national observers and the two cooperating WWA about the half year meetings, its agenda and the overall project progress.

+) PP10 established cooperation regarding sampling activities of Bavarian waters and sequence data exploitation and feedback with regional state institutions (Wasserwirtschaftsämter WWA-WM, WWA-RO).

+) PP10 established cooperation with university of Munich, Prof. Marc Gottschling to interpret the eDNA results for dinoflagellates.

+) Participation in the annual conference with academic and applied scope, which covering water manager in Germany (DGL 2021) with a talk about project results.

Collaboration after the project duration

+) PP10 will continue to present and explain the project results including the data from HTS sequencing available in the EAW taxa analysis tool and in the additive SEM report to interested observers.

+) PP10 will inform about project results to the Bavarian State Ministry of the Environment and Consumer Protection (responsible for WFD in Bavaria) through a report.

+) PP10 will perform tests to integrate the eDNA-sampling for quality assurance aspects for taxa inventories especially for microorganisms difficult to determine with morphological characters.

11. PP11 AFB (OFB), Agence Francaise pour la Biodiversité

Collaboration preparatory phase

+) PP11 (AFB) joined the project Eco-AlpsWater at the end of the preparatory phase by invitation of PP6 (INRA).

Collaboration during project duration

+) During the project PP11 intensely collaborated with PP6 (sampling and data analysis).

+) During the project lifetime PP11 participated actively in many of the PSG meetings and in informal national conferences open to observers and stakeholders.

Collaboration after the project duration

+) PP11 will continue HTS of environmental DNA in cooperation with PP6.

12. PP12, SUPSI, University of Applied Sciences and Arts of Southern Switzerland, Institute of Earth Sciences, Mendrisio, Switzerland

Collaboration preparatory phase

+) PP12 actively participated in the project preparation phase. Since SUPSI works both as research institute and in monitoring on behalf of Canton Ticino, it was the only Swiss PP included in the project.

+) 1 regional observers was invited to indicate its interest during the projects lifetime and motivated to share the progress reports.

Collaboration during project duration

+) Coordinator of WP2.

- +) PP12 actively participated at all PSG meetings (incl. the kick-off meeting).
- +) PP12, informed the Swiss observer regularly about the half year meetings, its agenda and the overall project progress.
- +) PP12 established cooperation with additional relevant stakeholders, i.e. regarding fish stock assessment.
- +) During the project lifetime, PP12, together with Italian Partners, organised two regional events for observers and stakeholders:
 - On 11.04.2019 in Verona to present the objective of the project and the eDNA approach
 - On 19.05.2021 in videoconference to present preliminary project results.
- +) Participation at academic conferences (12th Symposium for European Freshwater Sciences).

Collaboration after the project duration

- +) PP12 will continue to present and explain the project results including the data from HTS sequencing to interested observers and stakeholders.
- +) PP12 will advocate the project results and make further use on a national scale (Federal Office for Environment, International Commission for the Protection of Italian and Swiss Waters, Cercl'eau, EUSALP representatives).