UMEÅ UNIVERSITET
Att: Per Stenberg
per.stenberg@umu.se

Ändring av beslut om stöd

Stödmottagare: UMEÅ UNIVERSITET
Org. nr: 202100–2874
Projektnamn: NorthDIVeRSITY
Ärende-ID: 20366791
Diarienummer: REGAC - 102 - 2024

Beslut

Region Västerbotten beslutar att ändra tidigare beslut om stöd till ovan angivet projekt. Beslutet avser följande ändringar: Ändringsbeslut för projektet "NorthDIVeRSITY" gällande ändrad projekttid till 2024-08-01--2027-11-30, i enlighet med beslut från EU-finansiär Länsstyrelsen i Norrbotten, Interreg Aurora, projektägare UMEÅ UNIVERSITET.

Beslutet har fattats med stöd av förordningen (2003:596) om bidrag för projektverksamhet inom den regionala tillväxtpolitiken.

Projektägare UMEÅ UNIVERSITET beviljades stöd år 2024 innan nytt nationellt register (eAid-Register) som gäller fr.o.m. 2026-01-01. Eventuella de-minimisintyg kontrolleras av EU-finansiär.

Beslutet kan inte överklagas.

I övrigt gäller tidigare beslut från den 2026-05-04.

Bakgrund

Ni har den 2026-05-05 kommit in med en begäran om ändring av projekttid till 2024-08-01--2027-11-30 eftersom finansiärers medfinansieringsbeslut inte var på plats vid ursprunglig projektstart, i enlighet med ändringsbeslut från EU-finansiär Länsstyrelsen i Norrbotten, Interreg Aurora, projektägare UMEÅ UNIVERSITET.

Motivering till beslut

Region Västerbotten beviljar ändring av beslutet av följande skäl:
Ändringsbeslut för projektet "NorthDIVeRSITY" gällande ändrad projekttid till 2024-08-01--2027-11-30 eftersom finansiärers medfinansieringsbeslut inte var på plats vid ursprunglig projektstart. Detta har legat utanför den sökandes kontroll och har redan beviljats hos EU-finansiär Länsstyrelsen i Norrbotten, Interreg Aurora.

Projektperiod

2024-08-01 - 2027-11-30

Reviderad Tid- och aktivitetsplan

WP1 Northern needs and possibilities for eDNA

Both future EU initiatives such as the New Restoration Law and existing directives (e.g., the Water Framework Directive), alongside requirements set by national legislation, emphasize the importance of monitoring restoration efforts. Northern regions also face faster climate change of greater magnitude, and the areas with suitable conditions for cold-adapted species are shrinking. At the same time, large sparsely populated geographic areas in the North make the logistic challenges of traditional biodiversity monitoring methods severe. In light of this, there is a pressing need to promptly implement modern, user-friendly monitoring methods. We propose to develop environmental DNA (eDNA) based monitoring approaches specifically tailored to northern habitats. eDNA refers to the genetic material (DNA) that organisms shed into their surrounding environment through pollen, spores, skin cells, scales, feces, urine, mucus etc. It can be found in soil, water, air, and surfaces of plants etc. This means species can be detected non-invasively without directly observing or capturing them. In WP1, we will update lists of target species and target habitats in need of monitoring together with stakeholders to ensure that eDNA toolkits are tailored towards their specific needs. We will also analyze what features eDNA tools need to have in terms of standardization, costs, etc. to be applicable for monitoring by different stakeholders. The outcomes of WP1 include (1) an assessment of the species and habitats that would benefit from eDNA monitoring, and (2) compilation of tools encompassing various eDNA methods and their suitability in northern environments. Stakeholders will be partners in the project, including the county administrations of Norr- and Västerbotten in Sweden, and ELY Lapland in Finland. WP Leader: UmU, partners Luke and U Oulu.

Startdatum: 2024-08-01
Slutdatum: 2027-11-30
Kostnad: 2 213 904

Aktiviteter

Activity 1.1. Needs for eDNA monitoring

A first step in efficient monitoring is to assess the need for monitoring of changes in the abundance and extent of species and ecosystems, and to what degree this can be performed using eDNA tools. In this activity, we will identify the needs for new methods in biodiversity monitoring: Which species in need of monitoring would benefit from eDNA tools? Which habitats and management actions are suitable for eDNA monitoring and assessments? These questions are addressed by surveying the needs of stakeholders and their financial realities (how much it can cost) through a questionnaire, interviews and joint workshops across countries. Workshops are held online to facilitate cross-country participation and collaboration.

Although the needs for biodiversity monitoring are determined by national and EU policies and legislation, northern regions face unique challenges necessitating tailoring eDNA sampling strategies. Many species of conservation concern, such as wood-inhabiting fungi, are inconspicuous and hard to monitor by traditional methods, but amenable to eDNA identification. Many ecological restoration activities underway in the North (stream and forest restoration, mine reclamation) necessitate cost and labor efficient methods to evaluate their success. Many invasive species are expected to be favored by a warmer climate in the North, calling for eDNA monitoring to detect spread early in the process while mitigative strategies are still possible.

The outcome will be 1) a report listing species and habitats that would benefit from eDNA monitoring.
2) Joint Workshops with stakeholders, primarily authorities, environmental consultants and companies, during the project through online workshops and seminars to enable cross-country participation.
Kostnad 1 897 632

Activity 1.2. Survey of current knowledge on eDNA methods

The rapid technical development of many eDNA tools has posed challenges for both stakeholders utilizing the tools and researchers developing tools and analytical methods to align with evolving needs and possibilities. In this activity we will list methods and tools already available from other studies and assess how they can be used or optimized to be functional in northern habitats. For the habitats and species identified as suitable for eDNA monitoring, what are the methods available, and their pros and cons? What is needed for them to be useful? What gaps in the available methods can we identify in relation to the monitoring needs?

The demand on eDNA tools varies depending on the type of biodiversity monitoring being employed, which goes from detecting long-term regional trends, to place-specific changes in abundance following e.g., a restoration action. What kind of data is obtained by different methods, and what is the required sampling intensity and costs involved? Different approaches can be taken to analyze eDNA: metabarcoding that targets specific genetic markers to detect different species, or metagenomics that involves sequencing all the genetic material in a sample. Data obtained from targeted metabarcoding vs non-targeted metagenomics differ in the power of detecting species in the sample - as well as in the costs.

The outcome of the activity will be:
1) review of current eDNA methods for biodiversity monitoring and their fit for Northern habitats and species
2) identification of the most cost-effective eDNA methods

We will have a reference group with stakeholders to meet online regularly during the project, to follow project progress, ensuring the relevance of the results and facilitating result communication.
Kostnad 316 272

WP2 Developing eDNA-based biodiversity monitoring tools for Northern habitats

In WP2, we test, validate, and improve existing eDNA-based methods for target species, species groups and Northern habitats (identified in WP1). Furthermore, to simplify the process of planning biodiversity monitoring strategies, we identify features in Northern habitats, which can routinely be used for biodiversity monitoring, such as streams, vegetation (moss, trees), and air. We provide tools and recommendations for both (1) general biodiversity monitoring focusing on species groups (such as insects) to obtain standard biodiversity indices and (2) targeted monitoring of invasive species or species listed in the Habitats Directive Annex 4. The major deliverables of WP2 will be: (1) the

development of efficient eDNA-based monitoring tools, evaluated and tested for Northern habitats (ACT 2.1), (2) guide for stakeholders regarding the use of eDNA-based biodiversity monitoring of typical Northern habitats (ACT 2.2), (3) characterization of biases and which species are hard to detect using the more simple and most commonly used targeted approaches (metabarcoding) by comparing to unbiased, non-targeted and more costly methods (metagenomics). Methods will also be compared on the basis of sensitivity (ability to detect rare organisms) and specificity (accuracy to identify individual species) (ACT 2.3), (4) dissemination of the results via scientific publications, reports to the stakeholders, and public print and online media. WP2 leader: U Oulu, partners UmU and Luke
Startdatum: 2024-09-30
Slutdatum: 2027-11-30
Kostnad: 3 162 720

Aktiviteter

Activity 2.1Evaluation and optimization of efficient eDNA protocols

Objective: Find methods for sampling, data generation and data analysis that are most suitable for the species and habitats identified in WP1.

A crucial step in developing efficient, standardized biodiversity monitoring strategies is the optimization and standardization of sampling, laboratory and computational procedures. In this activity, we aim to evaluate and optimize procedures agreed upon in WP1 to generate standard operating procedures (SOPs) for applying those in routine biodiversity and restoration efforts monitoring. Laboratory procedures such as DNA extraction methods and primer choice (for the amplification of universal DNA barcodes), as well as computational processing and completeness of the existing sequence reference databases can have strong effects on the inferred biodiversity indices. It is thus crucial that the procedures are validated as well as adapted to species and species groups found in Northern environments. We evaluate and optimize procedures for those identified as important bioindicators in WP1 ACT 1.1. We target both, (1) species groups, to generate standard biodiversity indices (such as species richness) to identify habitats in need of restoration and to monitor the success of restoration programs, and (2) targeted individual species to monitor the presence of invasive or endangered species, especially ones listed in the EUs habitat directive.

OUTCOMES: Standard operating procedures (SOPs) for (1) sampling methods specifically tailored to Northern habitats (aquatic environment, air samples, terrestrial (vegetation, ponds, soil)), (2) laboratory methods (DNA barcodes and primer pairs) efficient for the detection and characterization of Northern biodiversity, e.g., Habitats Directive species, invasive species, species groups selected in WP1, and (3) stream-lined and simple computational analyses.

DISSEMINATION: SOPs, best practice guides, and reports to be used in WP3
Kostnad 632 544

Activity 2.2 Testing eDNA tools in different environments

OBJECTIVE: Test how well the developed tools work in aquatic and terrestrial environments.

When the key indicator species and species groups are identified, the next question is how well species are found in samples collected from the field for eDNA analysis. We investigate the use of different habitat features (such as streams, vegetation, air) for their use in routine biodiversity monitoring in Northern habitats. Habitat features and important bioindicator species and species groups are identified in WP1. We establish best practice guides for different features in a habitat. For these features, we test and outline how environmental samples should be taken and processed, and which species or species groups can be monitored using these. Criteria for selection include: (1) presence and absence of species to monitor, (2) the ease and habitat impact of sampling, and (3) their DNA preservation qualities.
We showcase these procedures using both aquatic and terrestrial habitats. The habitats to be sampled will be selected together with the stakeholders in WP1. In the aquatic case, we assess eDNA-based biodiversity monitoring in streams. Despite the intensive research on aquatic eDNA, there is a need to target sampling procedures to Northern conditions. For terrestrial habitats, we conduct a pilot test in northernmost Scandinavia where terrestrial environmental samples obtained from different features (such as moss) can differ strongly from ones obtained in temperate countries where eDNA is routinely used. We plan to specifically investigate air as a habitat feature and its use for biodiversity monitoring.
OUTCOMES: Guides for the eDNA-based biodiversity monitoring in Northern (1) aquatic, and (2) terrestrial habitats.

Kostnad 632 544

Activity 2.3 Resolution of eDNA: identifying limitations and the spatial scale of detection

1. Assessing possible biases in eDNA analyses:
Non-targeted methods (metagenomics) have the potential to identify a wider range of organisms with higher accuracy and fewer biases than targeted methods (metabarcoding). However, non-targeted methods are more expensive, and differences in accuracy and the ability to detect low-abundant species is unknown. We will use archived air samples from an existing Swedish air monitoring station in Norrbotten shown to capture DNA from a very wide range of organisms (viruses, bacteria, fungi, plants and animals) from a wide range of habitats (both terrestrial and aquatic), to compare the methods and quantify limitations and biases. The data from the non-targeted approach will also be used to improve design of targeted eDNA tools. The data for the targeted approach will be the data from air samples in WP2.2 and the data from the non-targeted approach is already available for samples.

2. Spatial scale of detection:
The distribution of DNA-containing particles in air depends on aerodynamic properties of the particles as well as weather conditions, such as wind and precipitation. By modelling atmospheric conditions, based on data from the Swedish Meteorological and Hydrological Institute, spatial footprints, or catchments, for the aerosol sampling stations mentioned above will be estimated. To validate the estimated aerosol catchment areas for different species, the predicted areas will be compared to known species distribution areas (data from

GBIFthe Global Biodiversity Information Facility). Accurate determination of where the eDNA originated from, when sampled in air, is vital for the implementation of air-based monitoring of organisms. Knowledge will be used in decisions on where to place air samplers to monitor a specific area.
OUTCOMES: 1) Limitations and biases of the metabarcoding approach in Northern regions, and (2) recommendations for determining spatial scales of eDNA captured from air in Northern regions.

Kostnad 1 897 632

WP3 Communication and cocreation

WP3 will be running for the whole duration of the 3-year project and will have the target to coordinate main objectives of projects communication which are (1) inform possibilities to utilize eDNA in routine biodiversity monitoring and new developments of eDNA methods and their applications developed in WP2 (2) pool together, distribute and store knowledge gathered in WP1, and new developments in eDNA methods produced in WP2 and together with WP1 and WP2, produce comprehensive guidelines and policy briefs for stakeholders how to utilize eDNA in biodiversity monitoring in the northern environments (knowledge transfer), and (3) bring together different stakeholders to cocreate: what are the most urgent needs and possibilities for eDNA as a monitoring tool (workshop and discussion in WP1), and what are the joint steps towards in making eDNA as an efficient transnationally standardized monitoring tool. Dissemination is conducted also in WP1 and WP2. WP3 will coordinate activities and is responsible of pooling results of WP1 and WP2 and forming comprehensive dissemination on the basis of those results (e.g., policy briefs, recommendations, summaries on what service buyer and service provider should know about possibilities and specific requirements when using eDNA in biomonitoring in northern environments etc). WP3 will be led by Luke, and all other partners, together with stakeholders, will participate in the work.
Startdatum: 2024-08-01
Slutdatum: 2027-11-30
Kostnad: 632 544

Aktiviteter

Activity 3.1 Communication

For efficient communication, a plan for dissemination, exploitation & communication (PDEC) will be written in the beginning of the project, and it will be updated and implemented during the project. The detailed PDEC will: 1) Identify the target audiences and 2) define objectives and tailor the most effective channels, tools, and schedules. The identified target groups include 1) Policy, e.g., regional and national administrators in environmental matters, including rural or regional development agencies, 2) landowners (including forest companies) with an interest and need to monitor impacts of own activities 3) companies interested in eDNA possibilities as possible service providers , 4) companies interested in eDNA as possible users of services (e.g., consulting and land use planning companies) 5) academia and researchers and 6) other: rural communities, peer groups, citizens, NGOs, ENGOs, and other organizations.
Co-creation: Stakeholders are invited to co-creation activities throughout the project. The two major contributions from co-creation address WP1 activity 1.1 where the most urgent needs to develop eDNA tools are identified, in WP2 activity

2.2 where case studies are designed together with stakeholders, and in WP3 activity 3.2 in a stakeholder workshop where possibilities and the future of eDNA in monitoring will be discussed. Some stakeholders have already been identified during application preparation and discussions started. Key stakeholders will also be invited to the steering group to follow the project.

OUTCOME: Plan for dissemination and communication prepared and updated, website created and actively updated, portfolio of communication resources (e.g., project poster, ppt slides with logos, social media accounts for communication) created. Efficient targeted communication with different groups via different media, productive co-creation producing outcomes in WP1 act 1.1, WP2 act2.2 and contribution to the exit plan for the project.

Kostnad 316 272

Activity 3.2 Knowledge transfer activities

All partners will work together to identify and engage with key stakeholders across Nordic countries, to raise awareness of possibilities of eDNA in biodiversity monitoring, best practices in performing monitoring using eDNA (e.g., optimal sampling in different habitats, specific requirements for eDNA analysis in the northern environments, what service buyers and service providers should know about using eDNA when monitoring in different habitats.

Knowledge will be transferred via several channels:

1. Meetings and workshops.

a) Small, national online meetings with stakeholders will be held regularly,

b) Large international stakeholder workshops at the beginning of the project (Needs for eDNA: most urgent needs and most promising possibilities as a part of WP1) and at the end of the project (How to make eDNA an efficient monitoring tool together, discussions between researchers, bodies in need of biodiversity monitoring and bodies interested in providing eDNA as a service) as part of the exit strategy of the project.

2. Summary reports for stakeholders, best practices, policy briefs.

Written products will summarize all the information achieved in the project and disseminate that to different stakeholders (organisations and bodies in need for biodiversity monitoring, stakeholders interested in providing eDNA analyses as a service, and other groups or citizens interested in biomonitoring/biodiversity.

3. Scientific, open-access reports on the results of the project.

OUTCOME: Organized meetings, written summary reports, best practices reports, policy brief.

Kostnad 316 272

WP4 Project management and administration

The project consists of work packages where activities are designed together with stakeholders and carried out by international teams of all partners, associated partners, and stakeholders. WP4s overall objective is to ensure that NorthDIVeRSITY is successfully, timely, ethically, sustainable, and impactfully managed. Main activities of WP4 include preparation of the Partnership Agreement including IPR agreements, the

establishment of the steering group, planning and conducting internal organization and communication, and follow-up of the progress of WPs.
Startdatum: 2024-08-01
Slutdatum: 2027-11-30
Kostnad: 316 272

Aktiviteter

Activity 4.1 Partnership Agreement including IPR agreements

Preliminary agreement between partners has already been made during the application preparation, however, a more concise version will be prepared and signed by all partners. The IPR agreement will be based on common practices for project implementation concerning background/result ownership, access rights, and result exploitation, bearing in mind that the project will manage its research data and other research outputs (e.g. protocols, models, policy briefs) according to FAIR principles: Findable (data and results can be discovered by others), Accessible (your data/results can be made available to others), Interoperable (your data/results can be integrated with other data/results) and Reusable.
Kostnad 158 136

Activity 4.2 Project management procedures

Luke will be acting as the main responsible partner in the management and reporting of the project. Luke will establish and maintain contact lists and a Microsoft Teams workspace for internal communication and data storage.
Work package leaders and PIs of the partners form a project operational management group that regularly meets online to agree on operational matters of the project, follow the synchrony and interaction of WPs, organizes general meetings of which at least the kick-off meeting will be in person.
A steering group will be established (e.g., representatives of research organizations, env. administration, and private sector representatives) that will oversee the implementation of the project, monitor project implementation effectiveness; identify, mitigate, and adapt to risks and analyze information on project progress; assess compliance with the workplan and propose any necessary modifications. The steering group will meet at least twice a year (more regularly if needed).
Work package leaders will guide work in activities for successful task implementation to reach the promised outcomes needed to fulfill output and result indicators. Regular WP meetings will be held to follow the progress.
Kostnad 158 136

Indikator; Antal framtagna kunskapsunderlag, strategier och program är målvärde: 5.

Villkor
Allmänna villkor för stöd – se tidigare utskickad bilaga

Beslutets giltighet

Beslut i detta ärende har fattats av Nils Enwald efter föredragning av Anna-Karin Lönnebo. Denna handling är beslutad och godkänd i Region Västerbottens ärendehanteringssystem och saknar därför namnunderskrift.

Beslutet skickas enbart via e-post till: **per.stenberg@umu.se** med kopia till: **frida.olofsson@umu.se**

Vid frågor kontakta:
Handläggare Anna-Karin Lönnebo
Telefon: 070-217 57 32
E-post: anna-karin.lonnebo@regionvasterbotten.se