



1st NEWSLETTER - August 2019

This is the first **GEANS Newsletter**

After a successful kick-off meeting in March, the GEANS partners dived headfirst into strategic planning, sampling campaigns, lab work and communication. This newsletter provides an overview of events so far and of upcoming work, and introduces you to the people involved in the research. Consultation, expertise and enthusiasm are the key words. Enjoy the read and do not hesitate to contact us!



Read more about **GEANS**: <https://northsearegion.eu/geans/>

14th – 15th March 2019

GEANS Kick-off meeting in Ostend, Belgium: Mapping North Sea bottom-dwellers via automated DNA-recognition

In the next three years, monitoring of the marine ecosystem in the North Sea will become more accurate and more efficient thanks to the Interreg North Sea Project GEANS, coordinated by Flanders Research Institute for Agriculture, Fisheries and Food (ILVO). Scientists from all North Sea countries participate. For several hundred benthos (seabed-dwelling) species such as worms, amphipods, shells, brittle stars, and so on, "DNA barcodes" are developed. After setting up a digital DNA library, the presence of the species in question can be automatically machine-detected in a sample of seawater or substrate. In almost all human activities in the North Sea (aquaculture, sand extraction, dredging, marine

wind farms, shipping and fishing...) monitoring of environmental impact is a legal requirement. 'We first aim for DNA passports of species known as "canaries in the coal mine" for ecosystem changes, so we can quickly receive important alerts from our system.' says coordinator Annelies De Backer (ILVO).

[Read the complete press release](#)

The kick-off event of the project included a stakeholder event, during which Belgian stakeholders were informed about the project. We had fruitful discussions and the stakeholders provided valuable input and we listened to them to include their needs in the pilots studies.

[View the presentations given during the stakeholder event](#)



June 2019

Deployment of a DNA-based hard substrate-monitoring network across Europe's coastal seas

The observatories consist of small three-dimensional units, which are attached to the sea floor, and consist of a stack of settlement plates, so-called [Autonomous Reef Monitoring Structures](#) (ARMS). These monitoring systems were originally developed during the Census of Marine Life project, and are today frequently used for passive collection of marine fauna. Because of their

three-dimensional structure, ARMS mimic the complexity of hard bottom marine substrates, and attract both encrusting species and motile organisms.

Through GEANS, ARMS have been deployed in Denmark, Norway, Sweden and Belgium. The GEANS- ARMS will be used to monitor the presence of Non-Indigenous species and set-up a standardized hard bottom monitoring as part of the European Marine Strategy Framework Directive (MSFD). ARMS, as a standardized sampling technique, combined with today's powerful molecular methods will enable the monitoring of marine communities over large areas, such as the North Sea, says Matthias Obst, the coordinator of the network.



Picture courtesy of Dr. Joanna Norkko

25th – 27th June 2019

WP3 workshop on an open and reliable DNA sequence reference library for macrobenthos from the North Sea

To be able to apply DNA-based identification in monitoring programs, species barcodes are essential and must cover the biodiversity in the target area.

Therefore, GEANS partners met in Senckenberg (Wilhelmshaven) to define a strategy to fill the barcoding gap for macrobenthos of the North Sea. To this end, partners compiled species lists covering the most important species for monitoring in their area and the marine non-indigenous species for their country (NIS). This list contains over 800 North Sea species.



A significant portion of the species have not yet been barcoded, a situation that GEANS aims to remedy. We agreed

on a field protocol on how to sample, and streamlined a workflow to generate reliable barcodes linked to morphological voucher species. All new generated barcodes will be made publicly available.

Partner in the picture

Wageningen University (WU) – [listen to a radio interview with WU researchers Reindert Nijland and Tinka Murk](#) (starting at 23:40)

Wageningen University (WU) aims to “explore the potential of nature to improve the quality of life”. This mission is achieved through scientific research, and education of a new generation of scientists. Dr. Reindert Nijland (project leader) and prof. dr. Tinka Murk of the chair group Marine Animal Ecology (MAE) are representing WU within GEANS. They study the ecological interaction of marine animals with their environment. To be able to get an as complete as possible picture of this environment, DNA metabarcoding and eDNA analysis are gaining importance rapidly. “We have recently adapted the use of innovative mobile DNA sequencing devices that can be used outside of the laboratory, to enable more rapid and cost effective data collection. At MAE we strive to always work at the forefront of novel scientific developments, also concerning metabarcoding and eDNA approaches.” GEANS provides a solid network of collaborators all working on this topic, and allows for the rapid adoption of best practices across the whole North Sea Region.

WU leads the work package on optimization and standardization of DNA-based field and laboratory protocols (WP4), and contributes to the other WPs. “We have already made an inventory of all benthic DNA metabarcoding approaches and techniques currently in use at all GEANS partner institutes. Next to that, we also compiled a global overview of these approaches through analysis of the scientific literature.

In the upcoming GEANS meeting, we will discuss the results of this analysis with all partners, and aim to agree on a common approach toward future DNA based biodiversity assessments.” Furthermore, the outcomes of harmonization (WP4) and pilot projects (WP5) will be used directly in a newly developed MSc course on Advanced Molecular Ecology (starting January 2020), directly transferring the obtained knowledge in GEANS to the new generation of marine ecologists.



Reindert: “Already from the kick-off meeting it was clear that there was a lot of very valuable and complementary expertise present among the

GEANS partners. Not only that, also personally the group seems like a great set of people with a very positive atmosphere toward the combined goals of GEANS. I am very happy to be part of this partnership.”

Upcoming events

Late summer 2019 – start of soft bottom pilot sampling: GEANS aims to produce a common metabarcoding approach and a set of guidelines for DNA-based analyses of soft sediment samples in the North Sea. These genetic protocols will be tested in the field simultaneously with the traditional morphological analyses in order to be able to assess pros and cons of either analysis method. The first samples for this pilot will be taken in late summer in Germany and Belgium. Watch our website and Twitter for more news on the sampling!

30 September – 2nd October 2019 – [MC5 meeting DNAqua Net in Limassol \(Cyprus\) with participation of GEANS members to ensure interaction between both projects](#)

8-10 October 2019 - Second GEANS partner meeting in Gothenburg (Sweden) organized by SeAnalytics

22-25 October 2019 – [Biodiversity Next in Leiden](#)



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