

Monitoring NON-INDIGENOUS SPECIES (NIS) in the marine environment




WHAT are non-indigenous species and WHY do they need to be monitored?



As a result of human activities such as shipping (with biofouling and ballast water transfer), non-native species find access to ecosystems outside their natural range. Due to the absence of predators or other control mechanisms, they have the potential to become invasive and harm the local ecosystem. Consequently, early detection is key and monitoring a must.

HOW can they be effectively monitored, and what are the current CHALLENGES?

Sampling method depends on life stage and habitat

	Water column	Soft seafloor	Hard seafloor
Adult individual/colony	<ul style="list-style-type: none"> Plankton or shrimp net Video  	<ul style="list-style-type: none"> Grab or corer  Video 	<ul style="list-style-type: none"> Diver census Scrape samples Settling panels (ARMS) <p>Read More >></p>
Larvae	Plankton net	Plankton net	Plankton net 

Traditional identification



- Taxonomic expertise is required
- Some taxa are hard to identify
- Time consuming
- Impact to the environment
- Low detection of rare species

WHY is there so much EMPHASIS on DNA-based monitoring when dealing with NIS?

DNA-based monitoring has great potential as an early warning and screening tool:

- There is a high detection level
- It is cost-effective (provided that it can rely on a curated **sequence library**)
- It has the potential to become automated
- Both target species and broad spectrum analyses are possible
- More information is gathered at a lower environmental impact (**eDNA**)
- ‘Difficult’ taxa (bryozoans, barnacles,...) are easier to detect

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