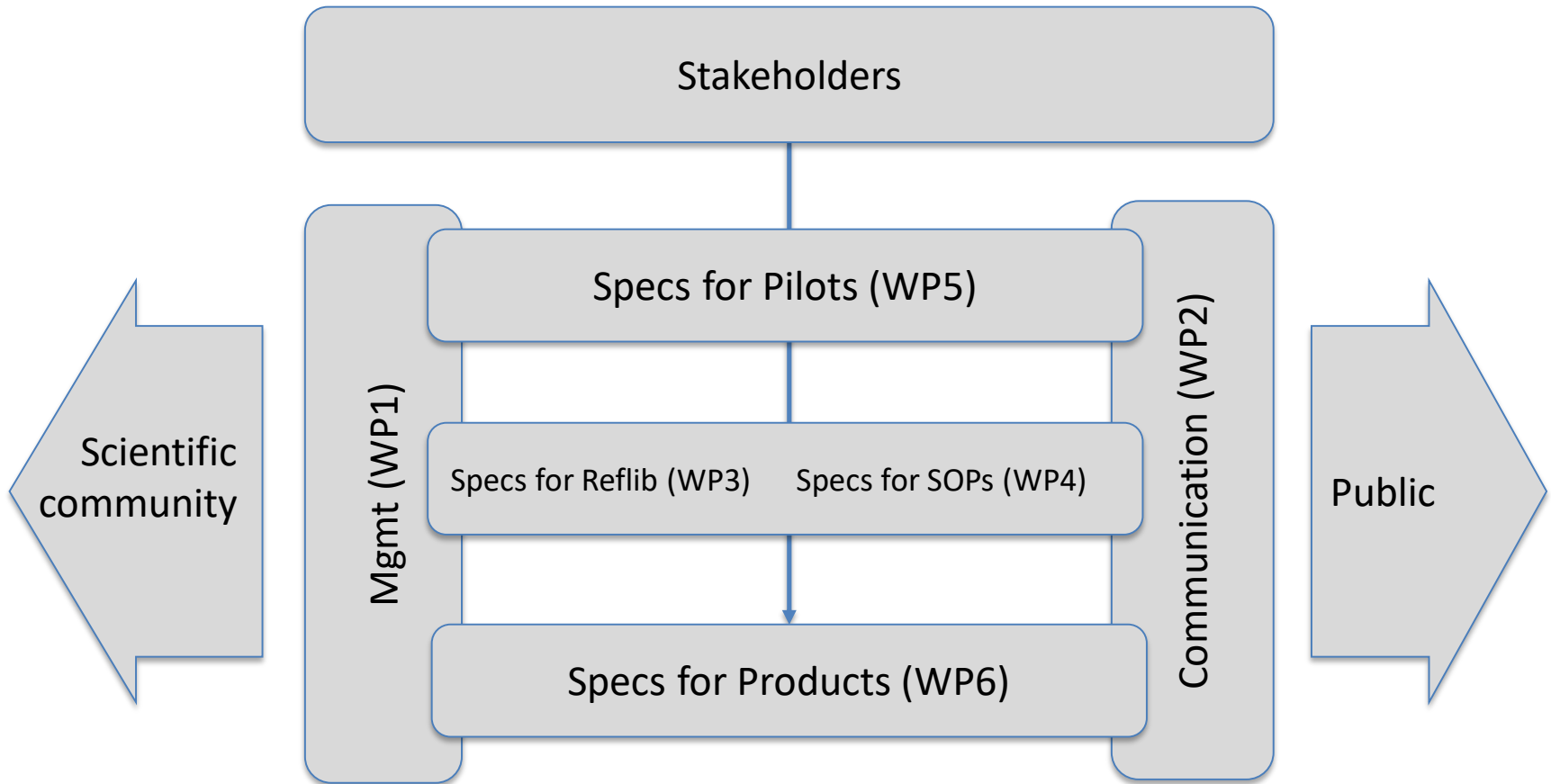


Genetic tools for Ecosystem health Assessment in the North Sea region (GEANS)

WP5 (Pilots)

Matthias Obst & Per Sundberg
SEAnalytics

Organisational structure (supporting decisions and priorities)



WP5 - overview

| Deliverables | Targets | Timeline |
|---|--------------------|----------------------|
| Stakeholder consultations (incl annual AB meetings) | 20 events, 80 pers | 1 / yr x pilot |
| Stakeholder board (AB) | 1 | Before summer 2019 |
| Pilot studies | 6 | avg 2/year |
| Individual pilot reports | 6 | starting autumn 2020 |
| Progress meetings | 10 | continuous |

Activities & outputs

Phase 1: Design

- Stakeholders consultation to specify outcome & related product(s)
- Description of work, partners, and time line

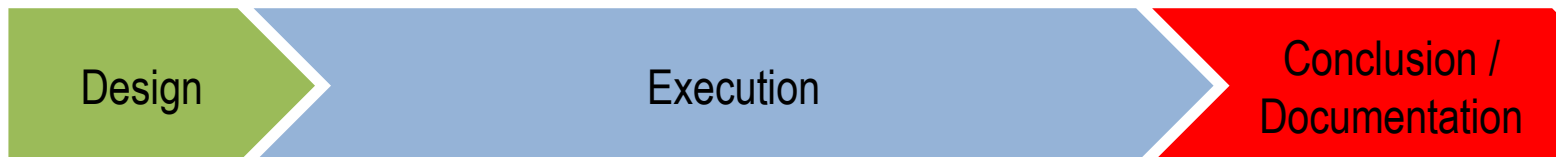
Phase 2: Execution

- Organisation of work
- Generate Reference libraries and methodological protocols

Phase 3: Conclusion / Documentation

- Documentation of methods, results, cost- and time savings
- Product development
- Communication to stakeholder community

Pilot time line



Topical areas (value chains)

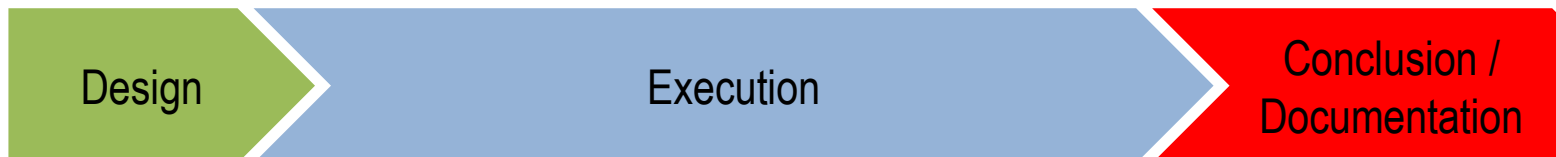
#1: Monitoring NIS

#2: Environmental Impact and Status Assessments in relation to industrial activities

#3: MSFD/WFD

#4: Protection & management of MPA's and N2000

Pilot time line

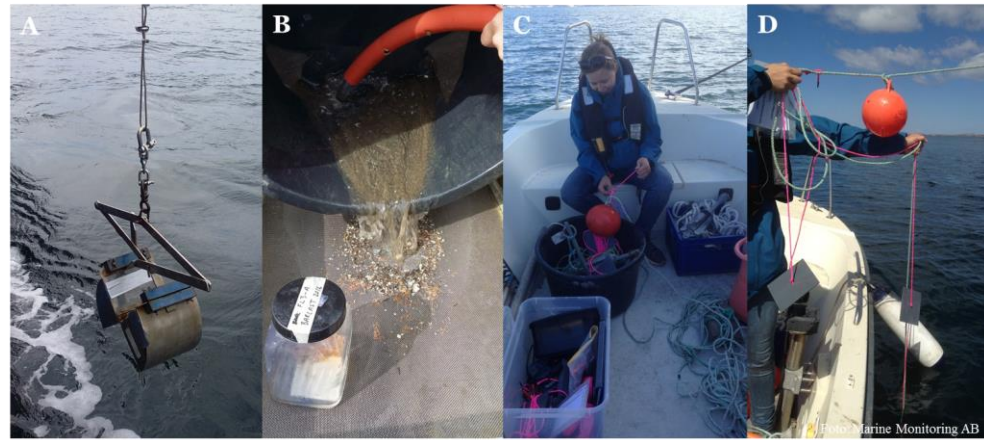


Some examples

Pilot description will include

- Product description
 - E.g. a service, a standard operating procedure (SOP), a reference library
- Stakeholders list and incentives
 - E.g. Who are the end users and why are they interested
- Case description
 - Added value
 - When, where, how,

Monitoring alien species in the vicinity of ports and marinas



Traditional identification

| | Zooplankton | Soft-bottom | ARMS | Total |
|----------------------------------|-------------|-------------|------|-------|
| No. of taxa | 61 | 123 | 28 | 212 |
| No. of identified species | 9 | 101 | 21 | 131 |
| Portion identified | 15% | 82% | 75% | 62% |
| No. of known NIS | 1 | 0 | 3 | 4 |
| | | | | |

DNA-based identification

| | zooplankton | Soft-bottom | ARMS | Total |
|----------------------------------|-------------|-------------|------|-------|
| No. of taxa | 143 | 72 | 52 | 153 |
| No. of identified species | 95 | 46 | 29 | 119 |
| Portion identified | 66% | 64% | 56% | 77% |
| No. of known NIS | 4 | 3 | 2 | 6 |



Monitoring alien species in the vicinity of ports and marinas

Product

- Toolkit, SOP's, or analytical service for early warning and monitoring of NIS

Stakeholders

- NGOs (e.g. Water Quality Association), County boards, Environmental authorities, SMEs

Case description

- Protocol to replace benthic-microscopic monitoring of NIS with planktonic NIS scans
- Based on ddPCR (for few species, days) and metabarcoding (many species, weeks)

Target species

- *OSPAR NIS, Union list, ...*

Aquacultures

Product

- Toolkit, SOP's, and analytical service for fast description of larval community composition

Stakeholders

- At least 2 companies would like to commission this product

Case description

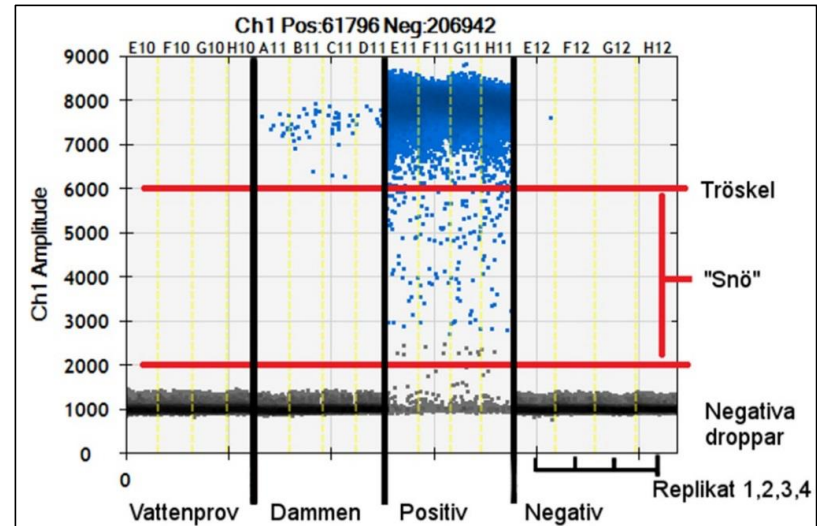
- AQ companies interested to put out their lines when the right recruitment community is in the water and to monitor HABs

Target species

- *Ostrea edulis*, *Magallana gigas*, *Mytilus edulis*, *Spirobranchus spp*, *Ciona intestinalis*, *Balanus balanus*
- *HAB species*

Bohus Havsbruk

Orust Shellfish
SHELLFISH & SPECIALITIES



Environmental Impact Assessments



Fehmarn Belt Tunnel



| | Conventional | DNA based | Added value |
|---------------------------|--------------------------|---------------------|---|
| Habitat quality | BQI | ? | --- |
| Rare/Endangered species | Check list | Check list | Better due to larger spatio-temporal resolution |
| Community tolerance level | Check list | Check list | Better, cheaper, faster with RefLib |
| Species richness | Number species/taxa | Number species/taxa | Better, cheaper, faster with RefLib |
| Biomass | Weight/No of individuals | ? | --- |

Marine Strategy Framework Directive Water Framework Directive

Product

- SOPs for MSFD hard bottom monitoring

Stakeholders

- National environmental authorities
- NGOs (OSPAR)

Case description

- Currently no hard bottom monitoring (in Sweden)
- We hence not need to improve existing methods/standards, but provide a new program



Autonomous Reef Monitoring Structures

"Standardizing marine biodiversity assessment and monitoring"



Smithsonian
National Museum of Natural History

Home

Search Projects

Protocols +

Getting Involved

Data Portal

Publications



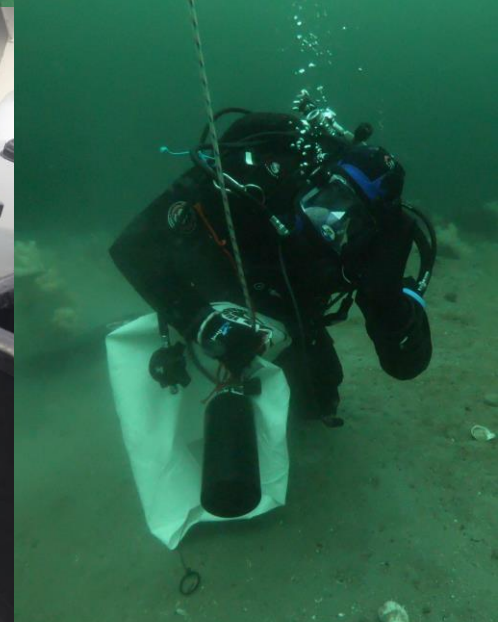
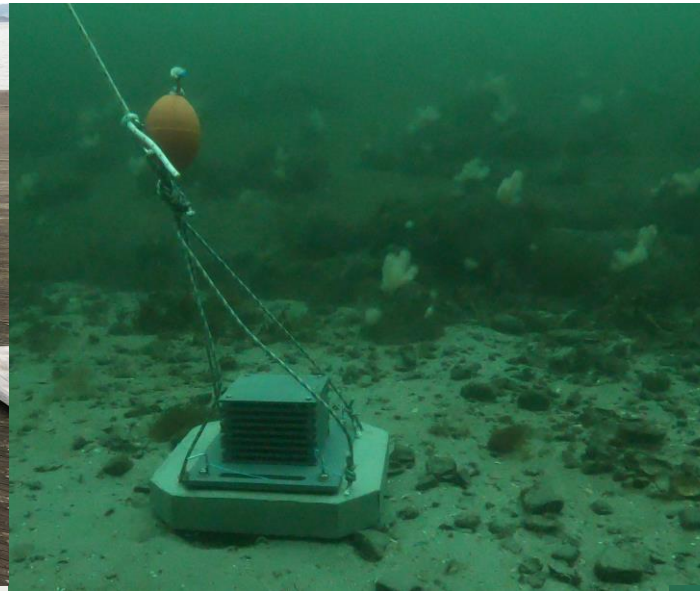
The Global ARMS Program is a Smithsonian Institution initiative hosted at the National Museum of Natural History in Washington DC. The program centralizes and makes available information and documentation on the ARMS and standardized processing protocols. The program curates a database of worldwide ARMS deployments that can be searched freely on the ARMS portal.

Search

News

- MarineGEO survey conducted in Hong Kong

ARMS deployments in 2018



16 ARMS sites in 2018 (10 continental Europe, 5 polar, 1 subtropical)

