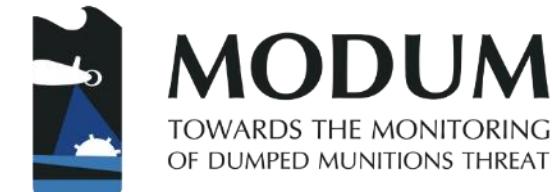


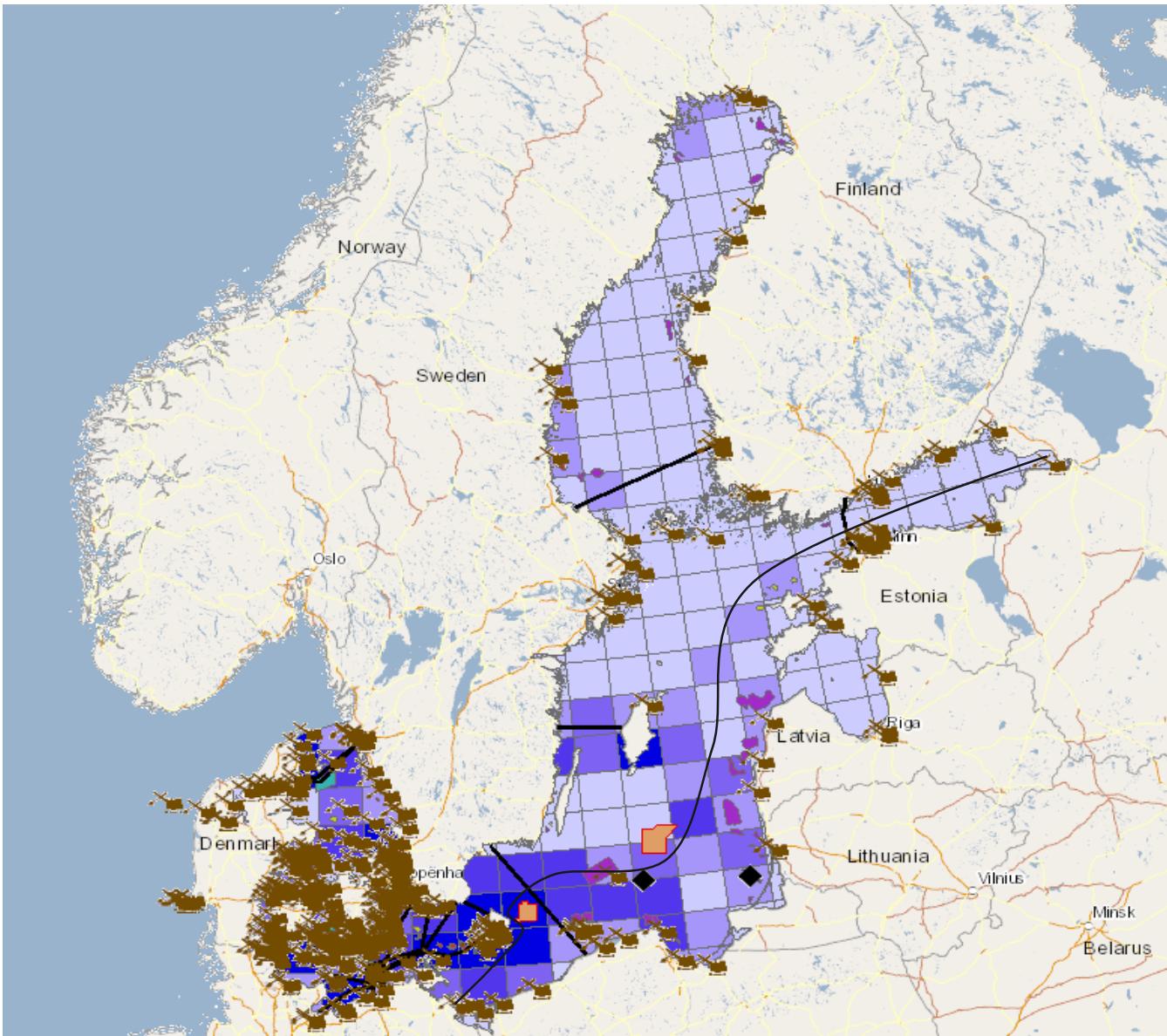


# Control the sources of historical contamination

Jacek Bełdowski, Institute of Oceanology PAS

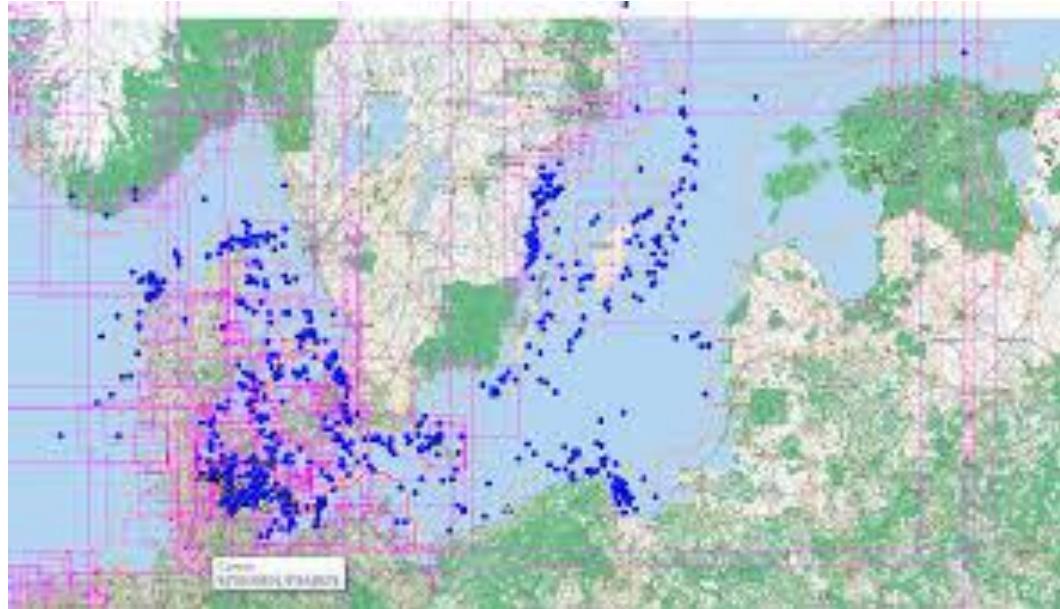
## Chemical Munition dumpsites



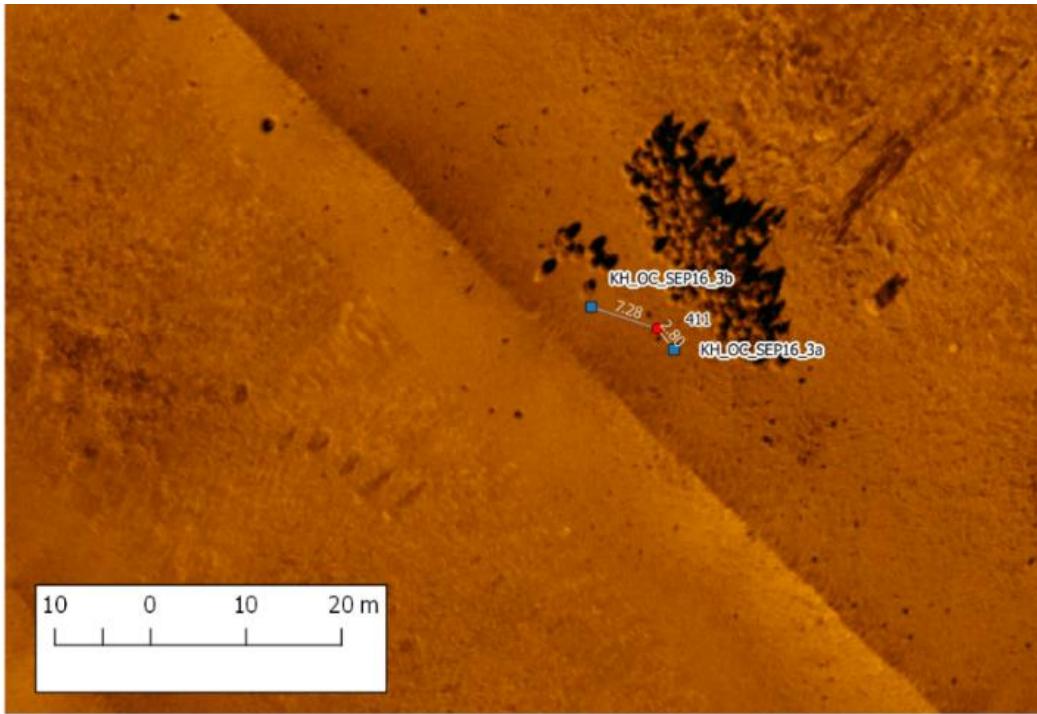


Legend:

- CWA Dumps
- Dredge sites
- Offshore wind farms (planned)
- Bottom Trawling intensity
- Pipelines and Cables

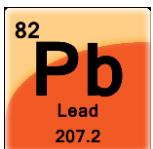
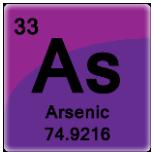
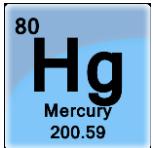


- More than 20 000 wrecks
- Oil
- Hazardous substances

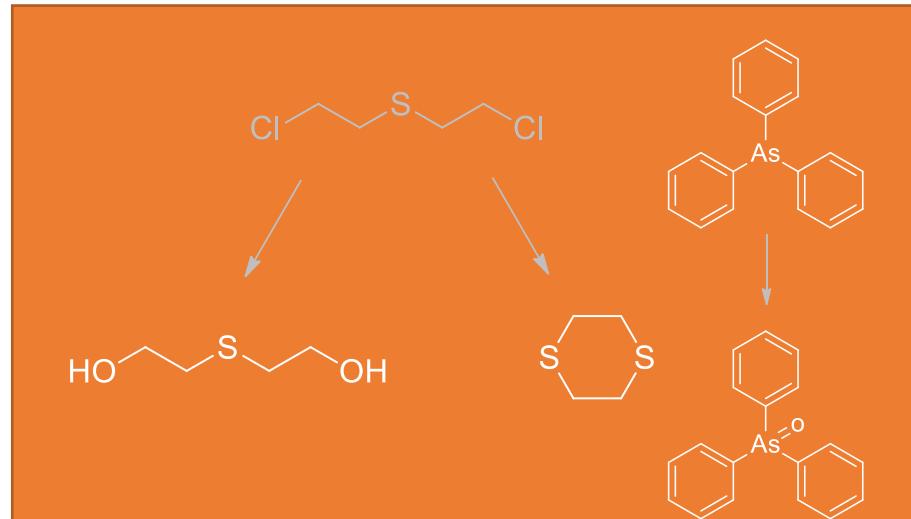


- 200 000 Sea mines
- Carcinogenic explosives

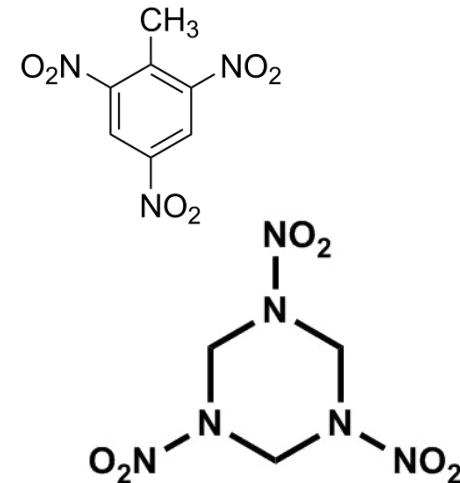
## Metals



## Chemical Warfare Agents

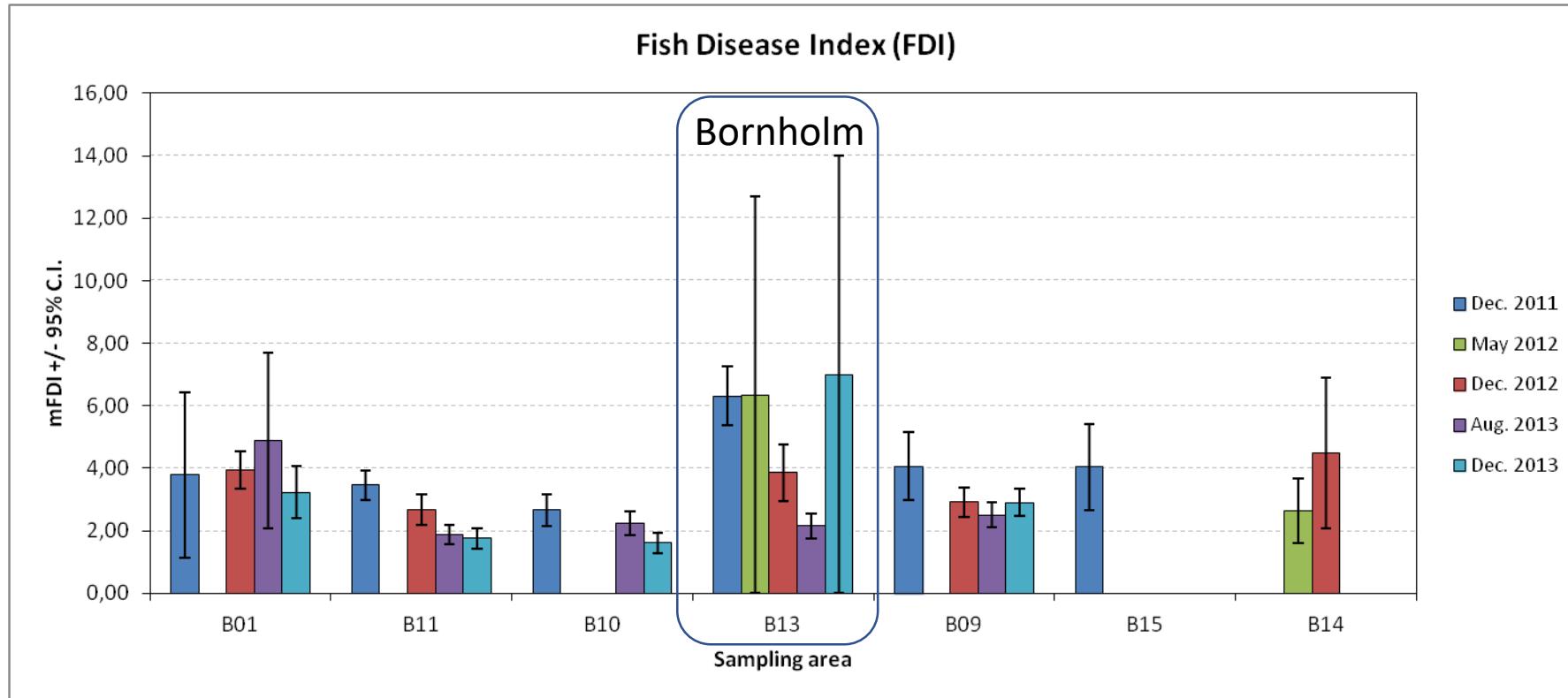


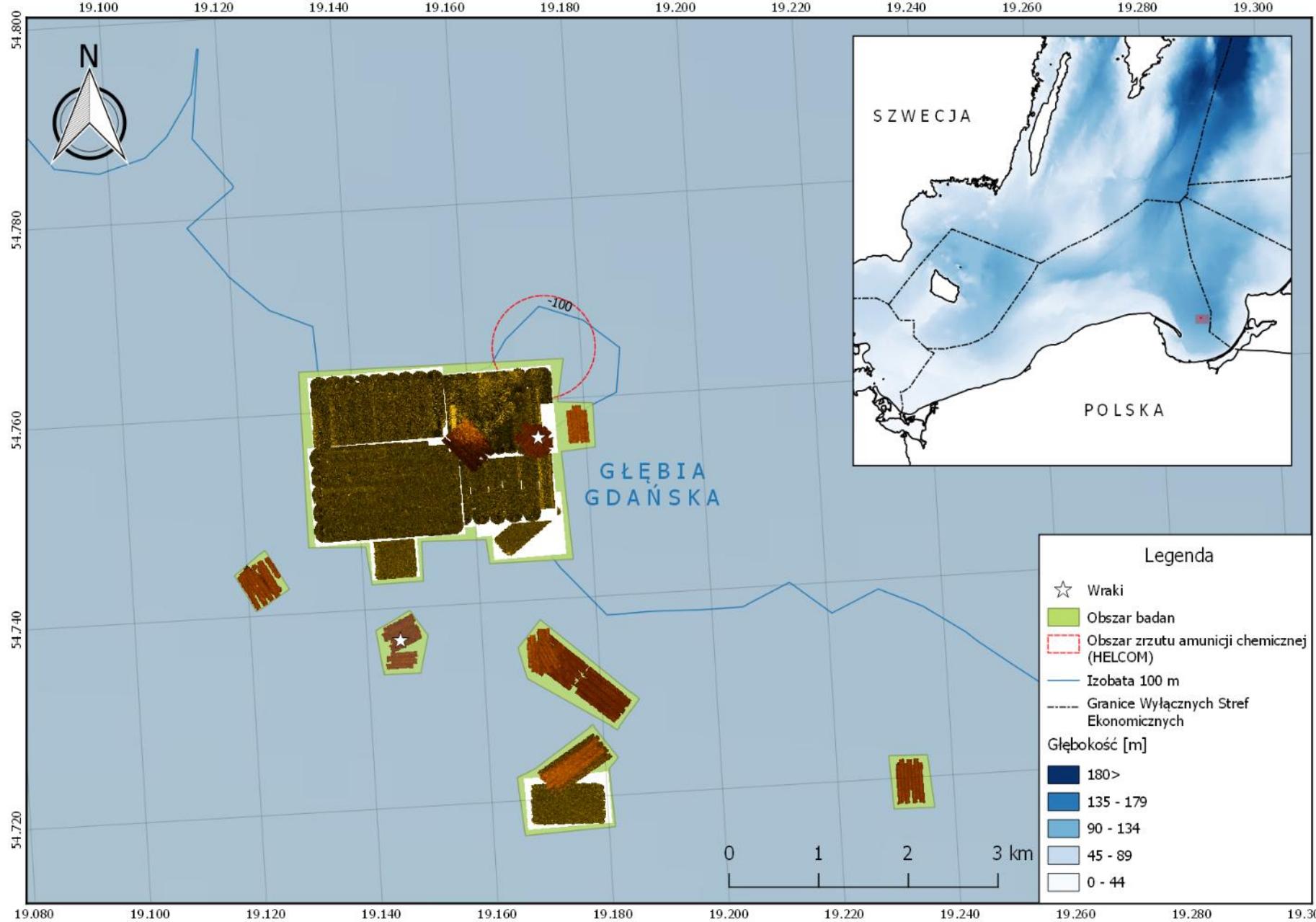
## Explosives

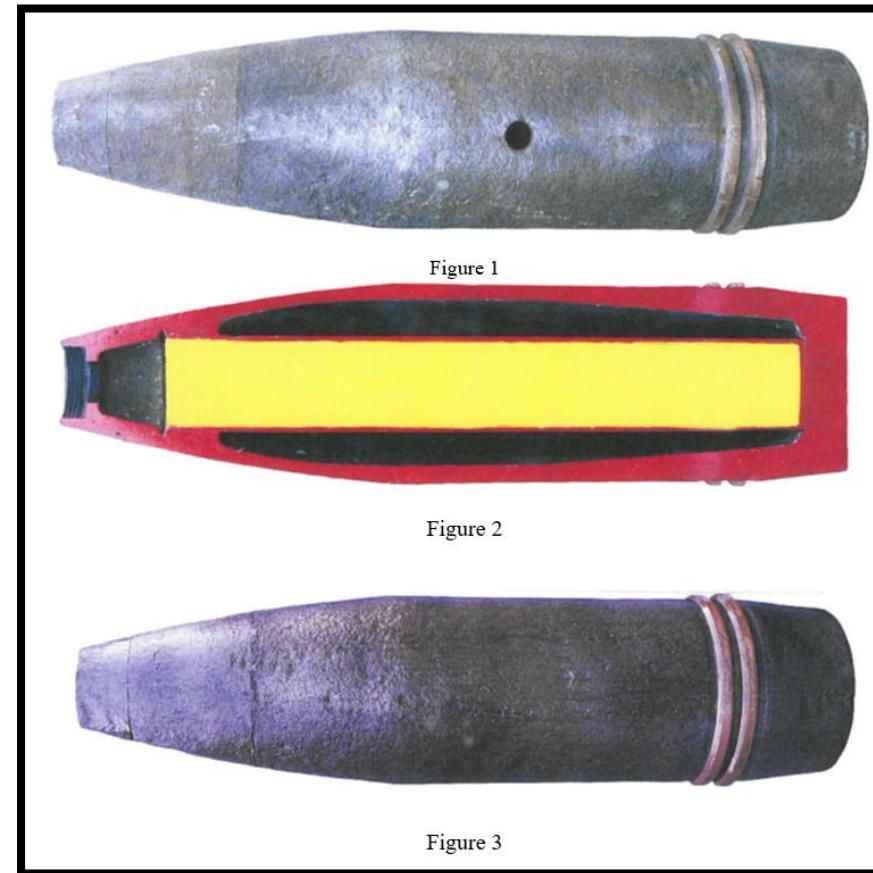
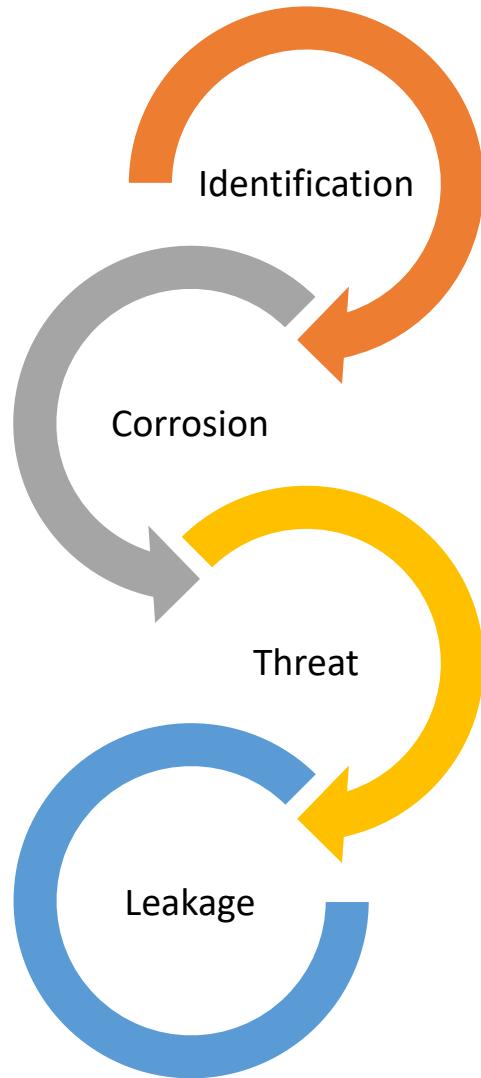


## Oil







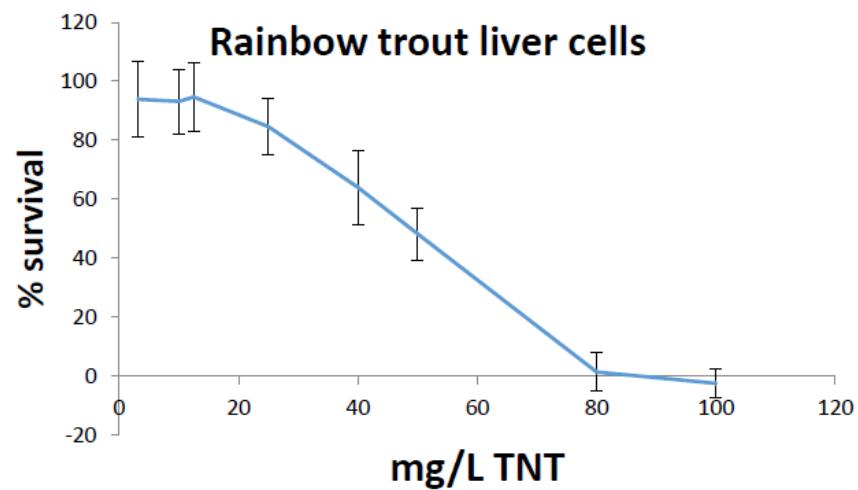




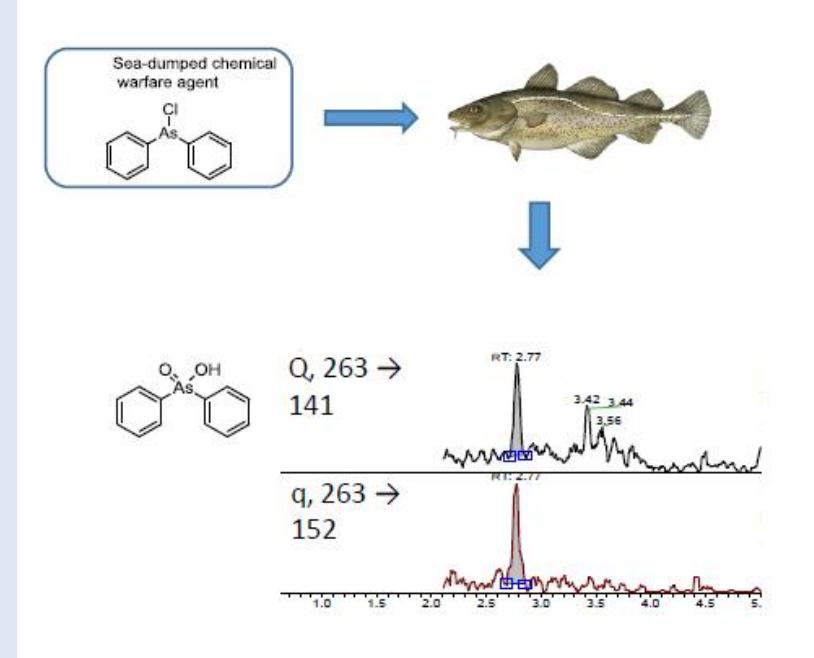
Corrosion



## Toxicity

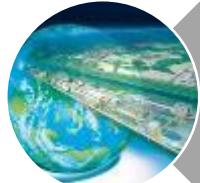


## Bio accumulation





Costs



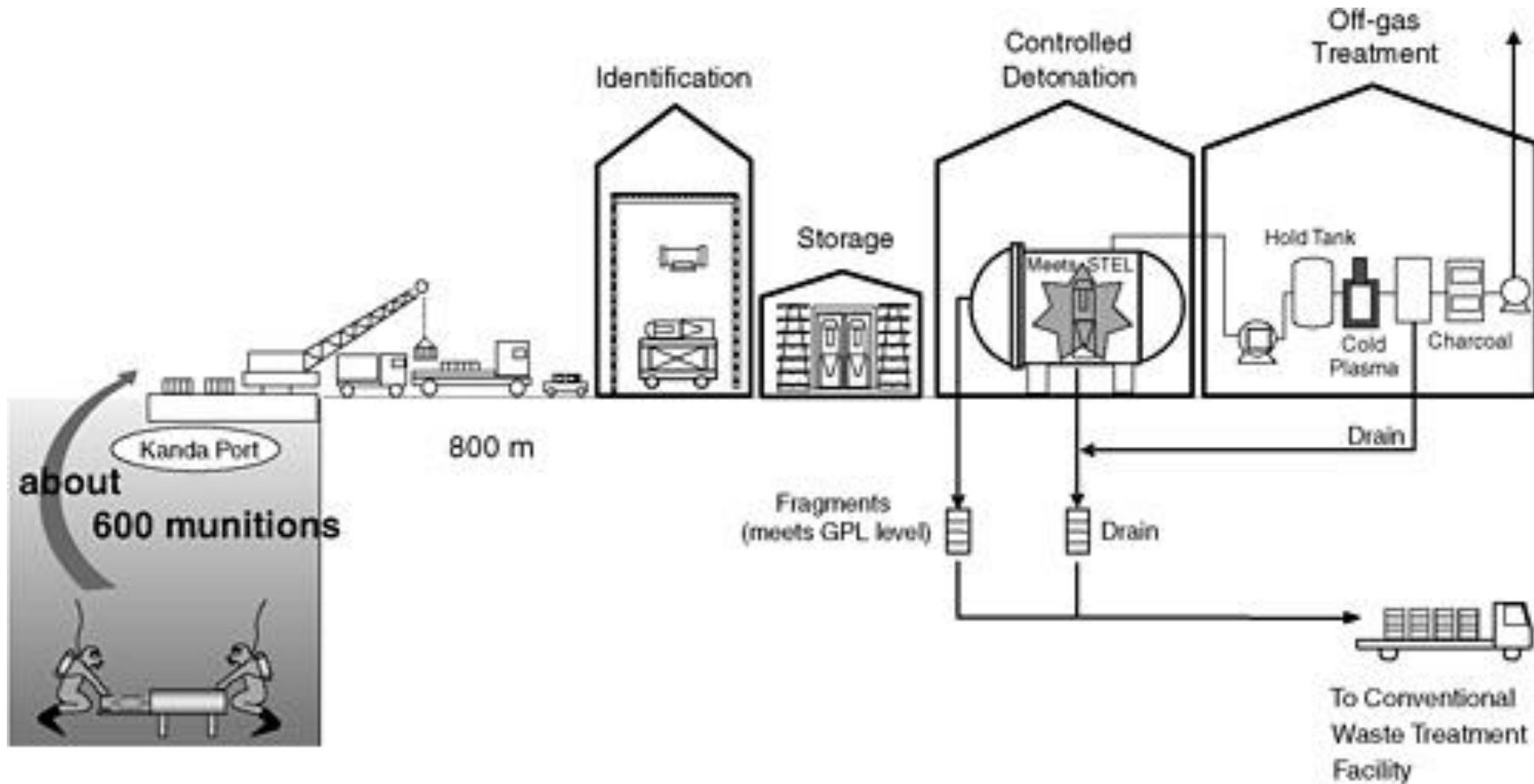
Environmental impact

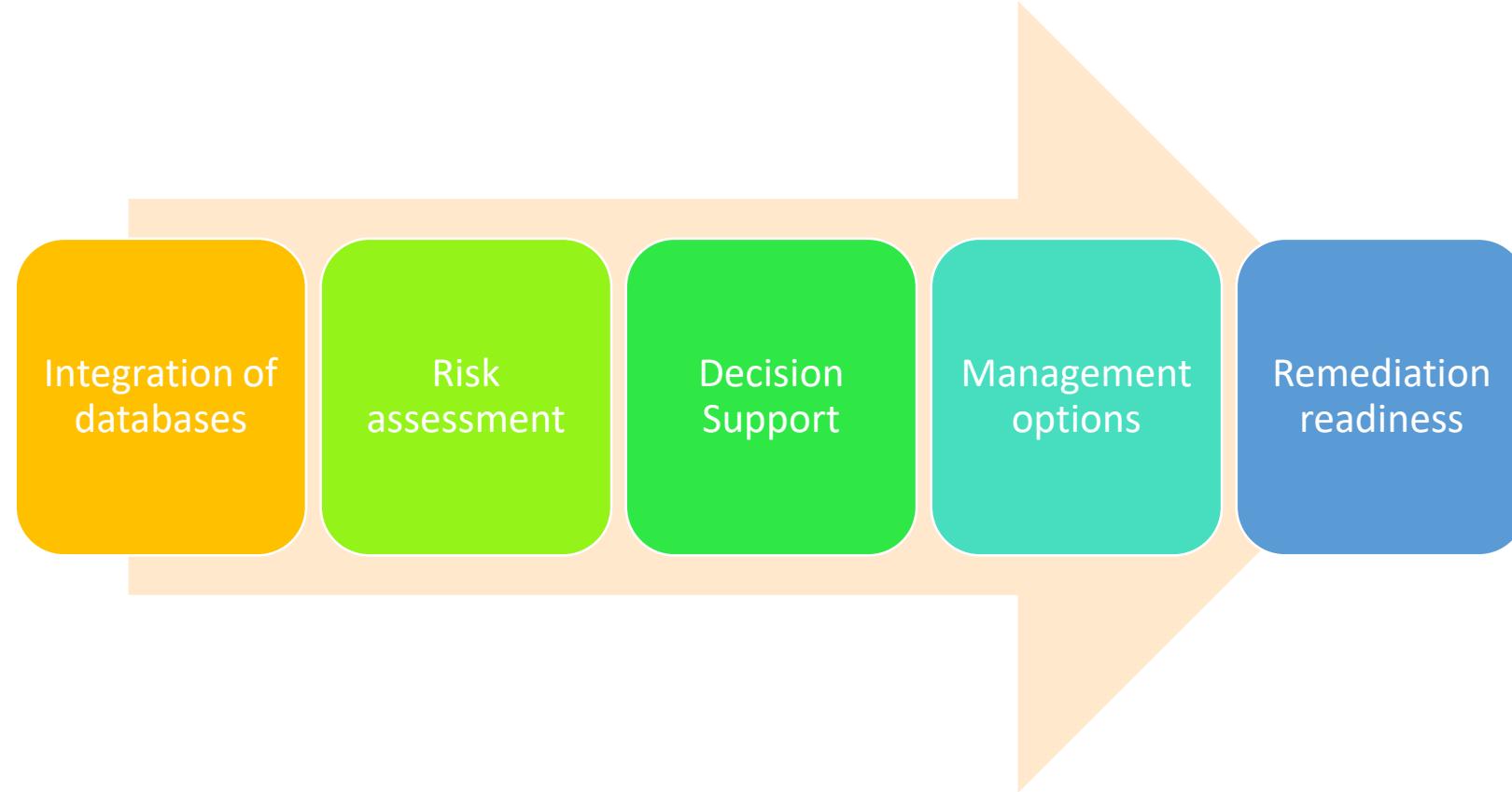


Legal considerations

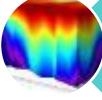


Decision support tool







-  Object Status Examination
-  Modelling of possible release
-  Pollution of sediments and water
-  Impact on biota assessment
-  Risk categorization procedure

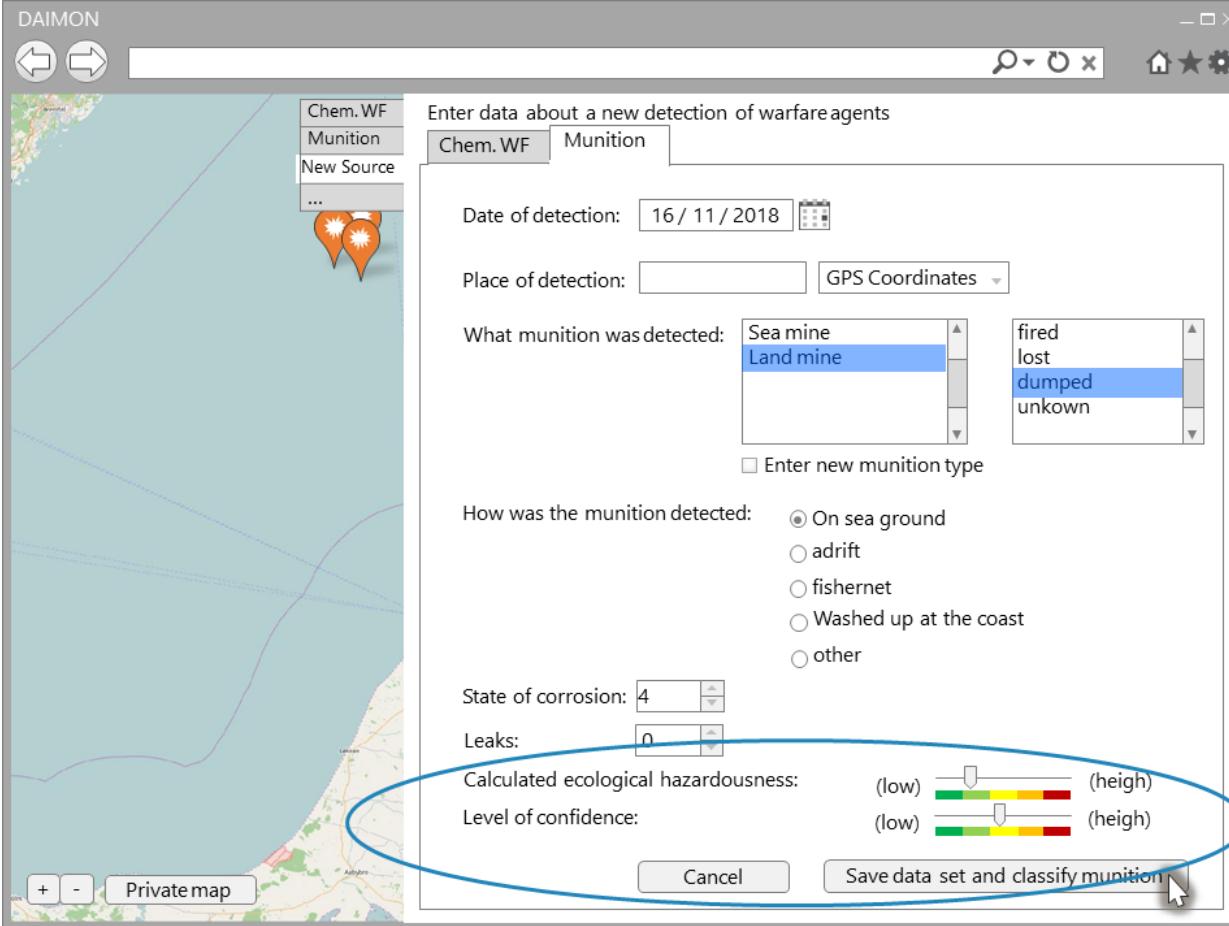
## Risk assessment

## Hot spots

## Classification

## Priorities

DAIMON



Enter data about a new detection of warfare agents

Chem. WF    Munition

Date of detection: 16 / 11 / 2018

Place of detection:  GPS Coordinates

What munition was detected:

- Sea mine
- Land mine
- fired
- lost
- dumped
- unkown

Enter new munition type

How was the munition detected:

- On sea ground
- adrift
- fishernet
- Washed up at the coast
- other

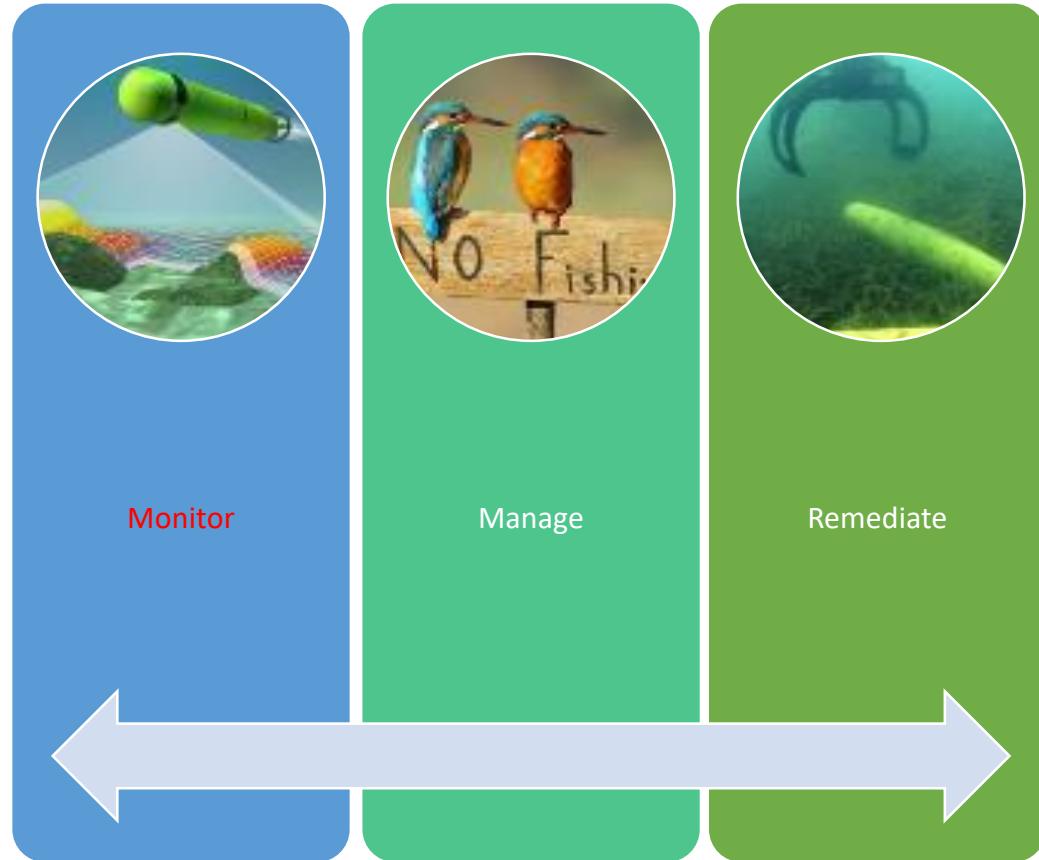
State of corrosion: 4

Leaks: 0

Calculated ecological hazardousness: (low)  (high)

Level of confidence: (low)  (high)

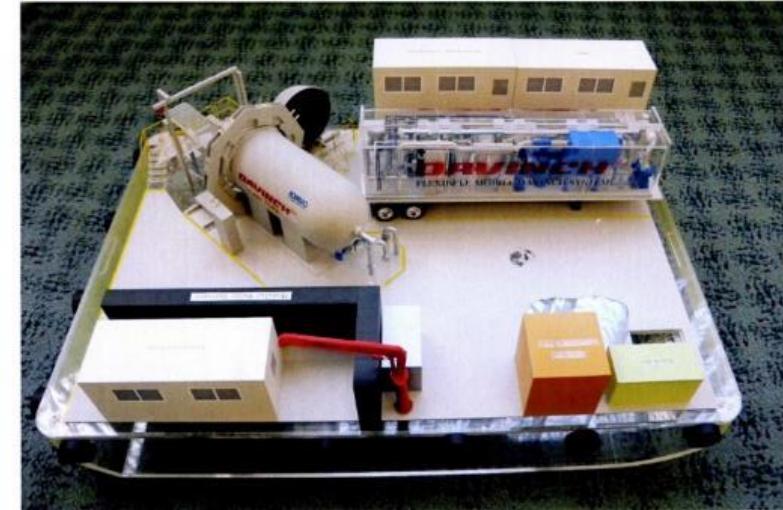
## Management Options



## Remediation Readiness



DAVINCH *float* on a Barge



29

Integrate  
data

Perform risk  
assessment

BAT & BEP

Technology  
Entry points





Decision Aid for Marine Munitions  
PRACTICAL APPLICATION

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Institute of Oceanology PAS  
Powstańców Warszawy 55 Sopot  
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