Big vs Small AUV

UDT 2019

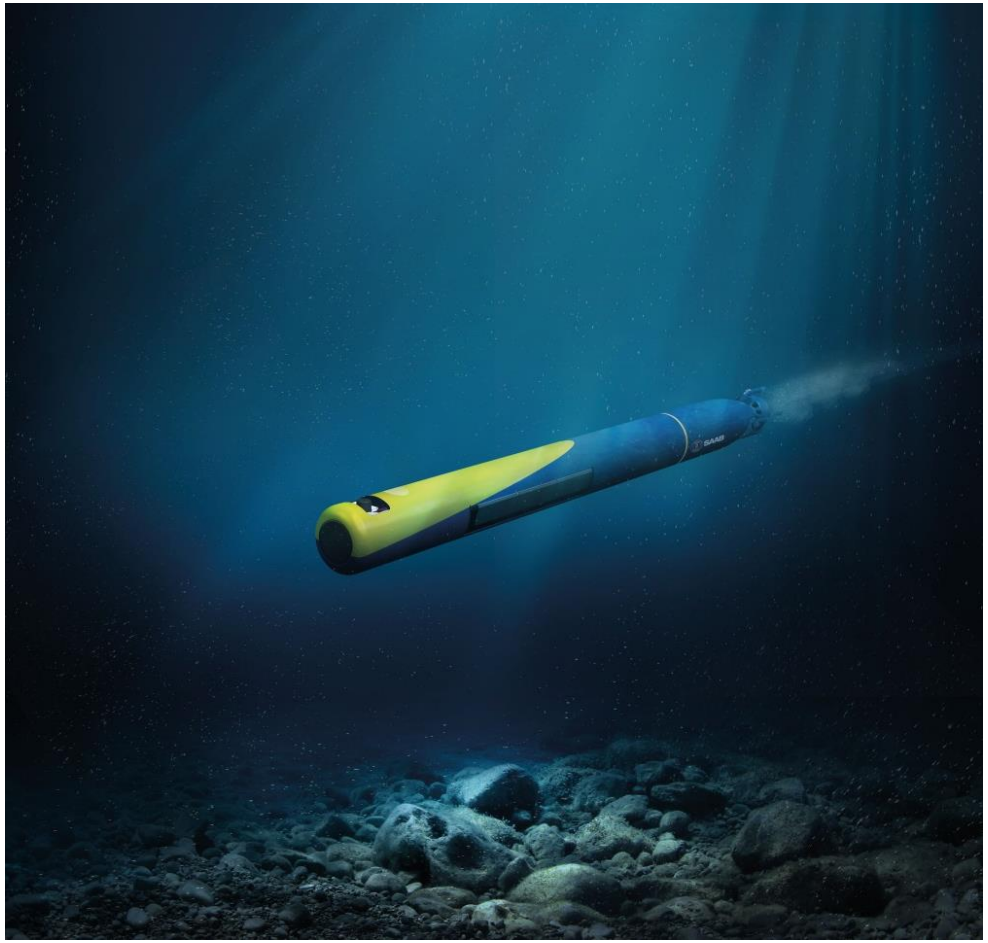
Thomas Ljungqvist (Commander reservist)

Director Business development & Strategy

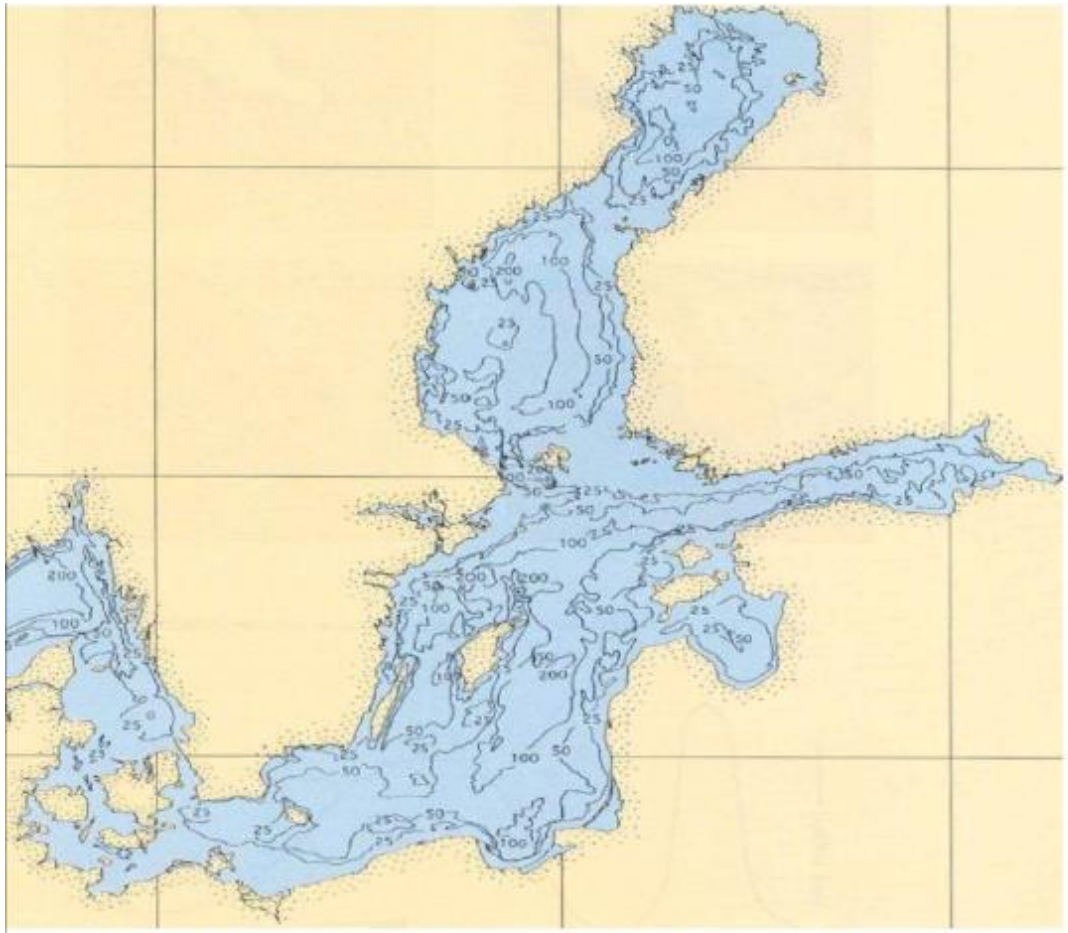
Saab Dynamics, Business unit Underwater systems

Agenda

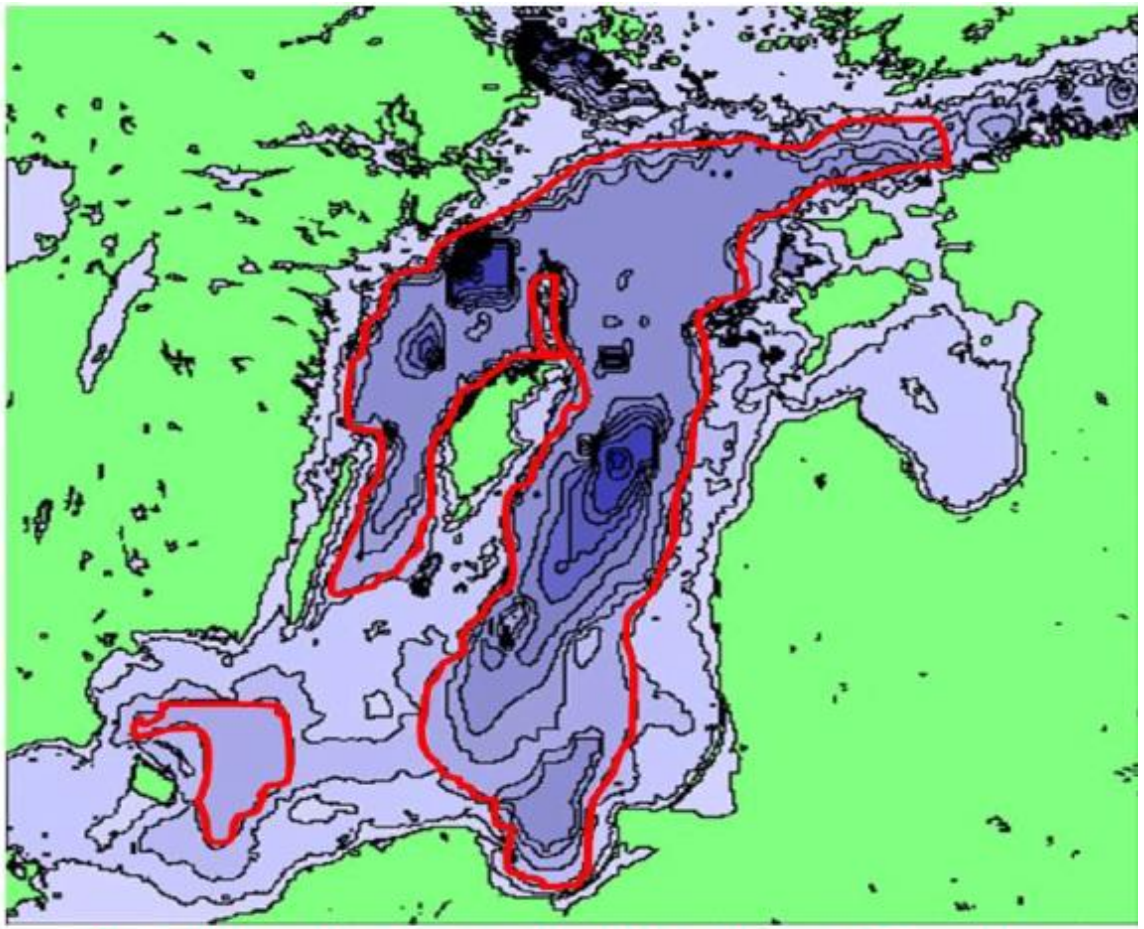
- The environment
- Traditional MCM
- Future MCM
- Pros & Cons for different MCM solutions



The environment

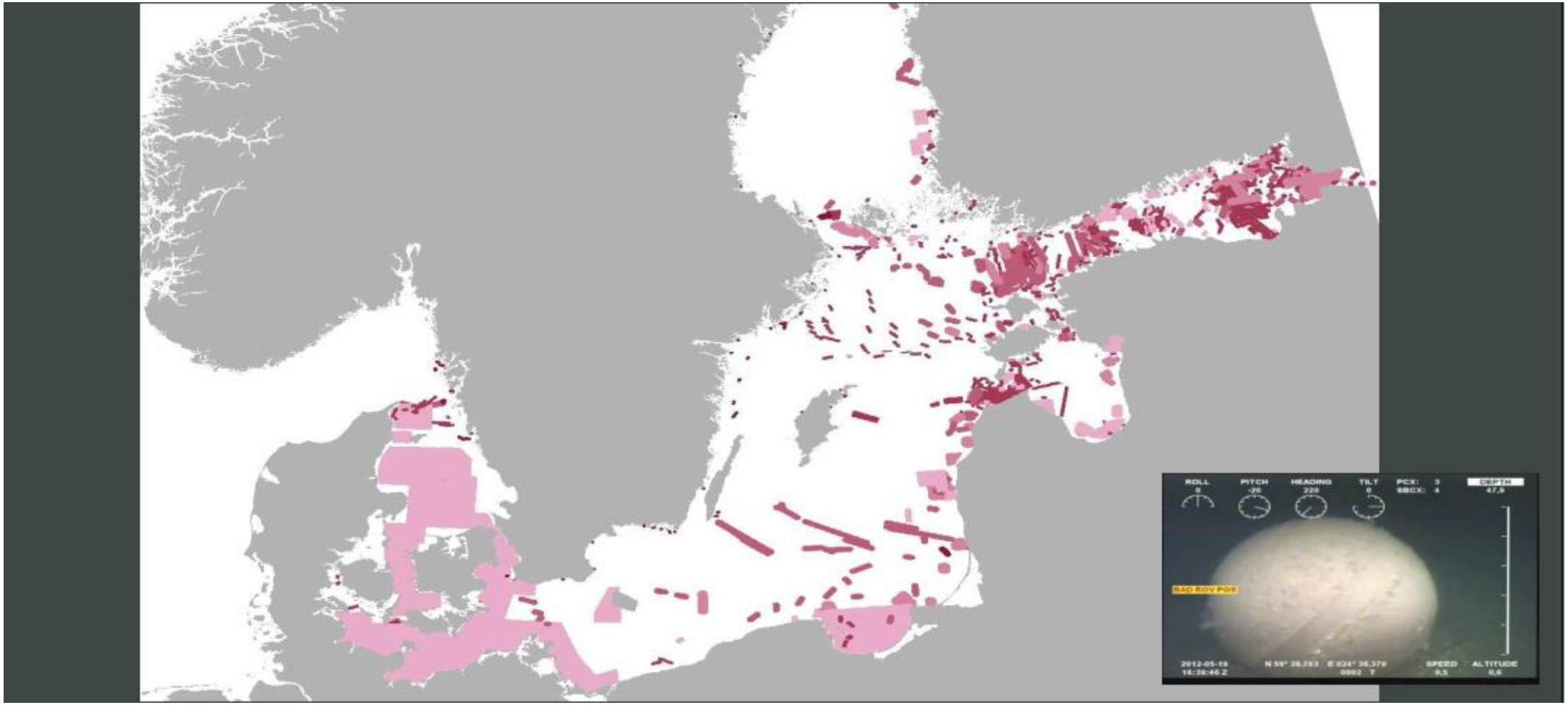


Shallow, with rapidly changing depth



Red line: bottom depth below 60 meter

Mine chart over the Baltic Sea



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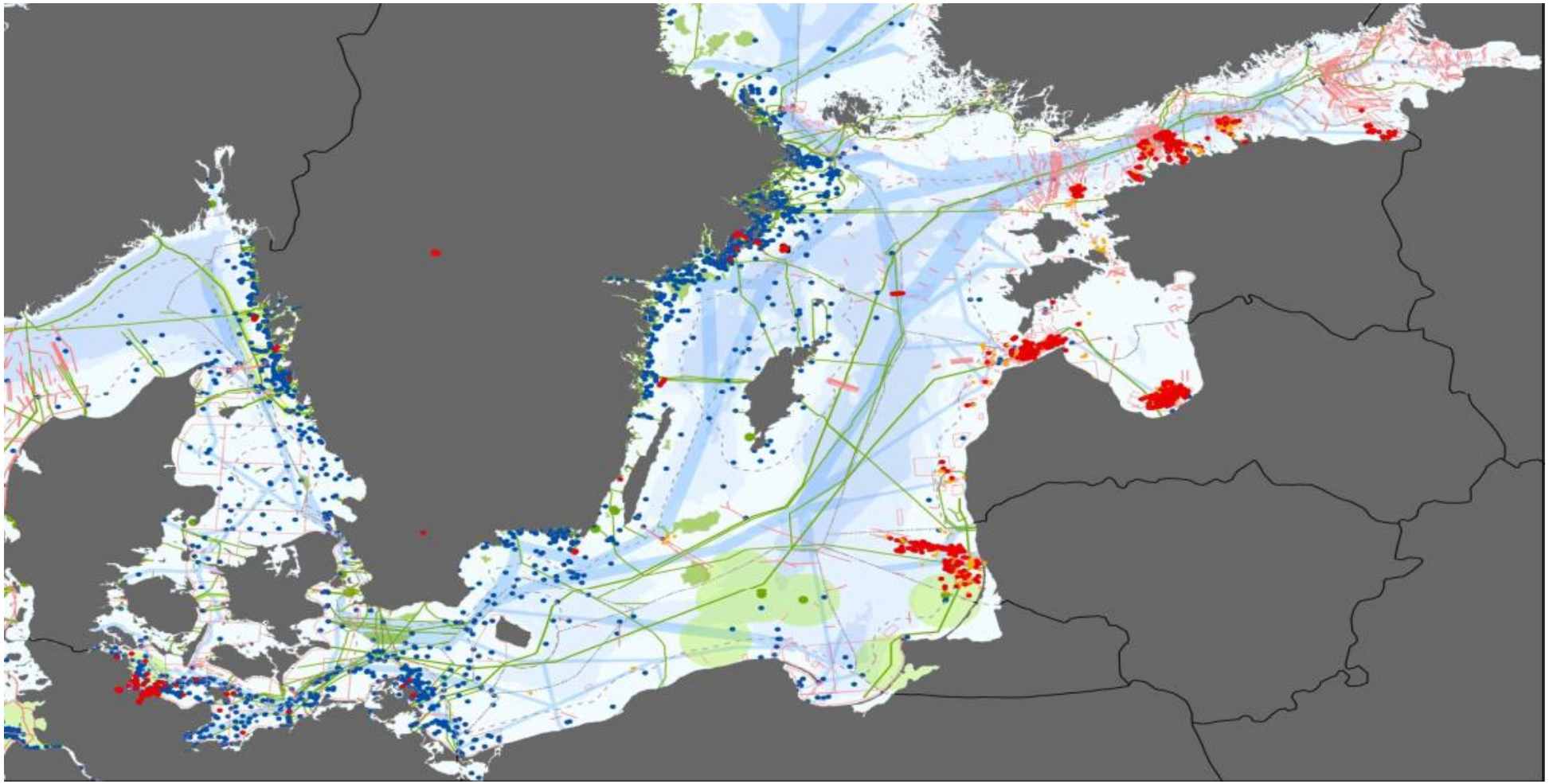
Sea mines & Sea lanes in the Baltic Sea



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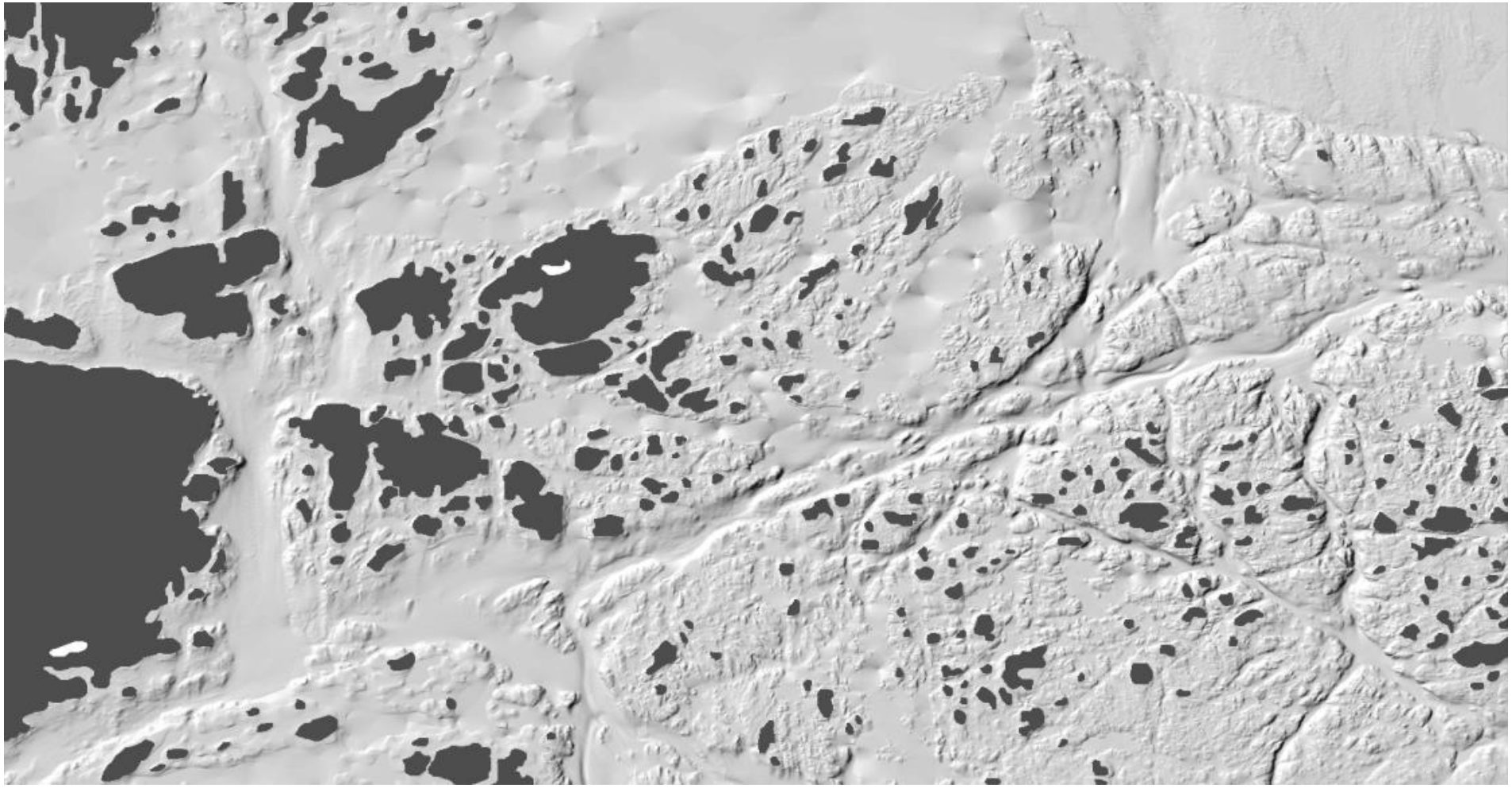

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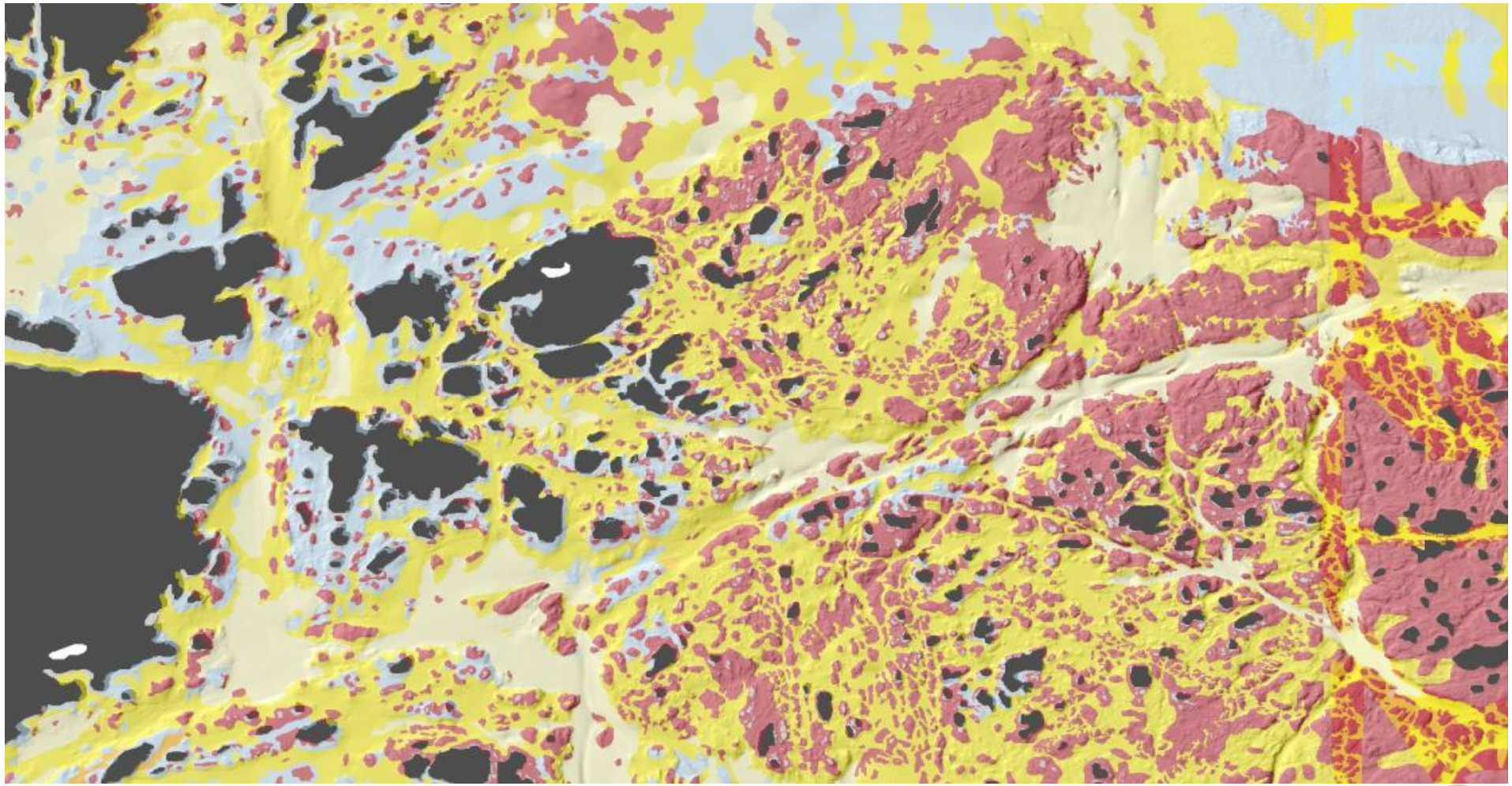
Understand the environment



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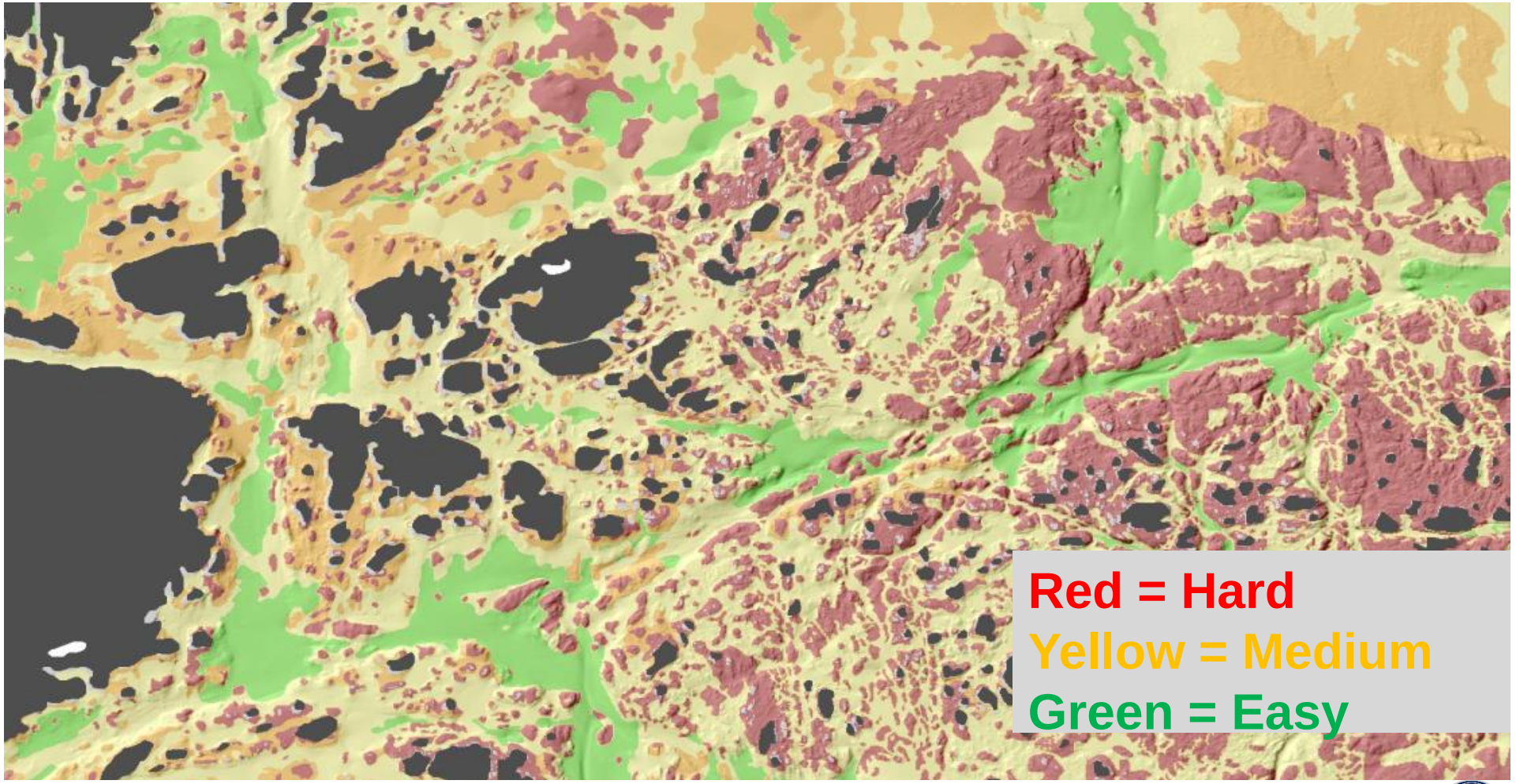
Understand the environment



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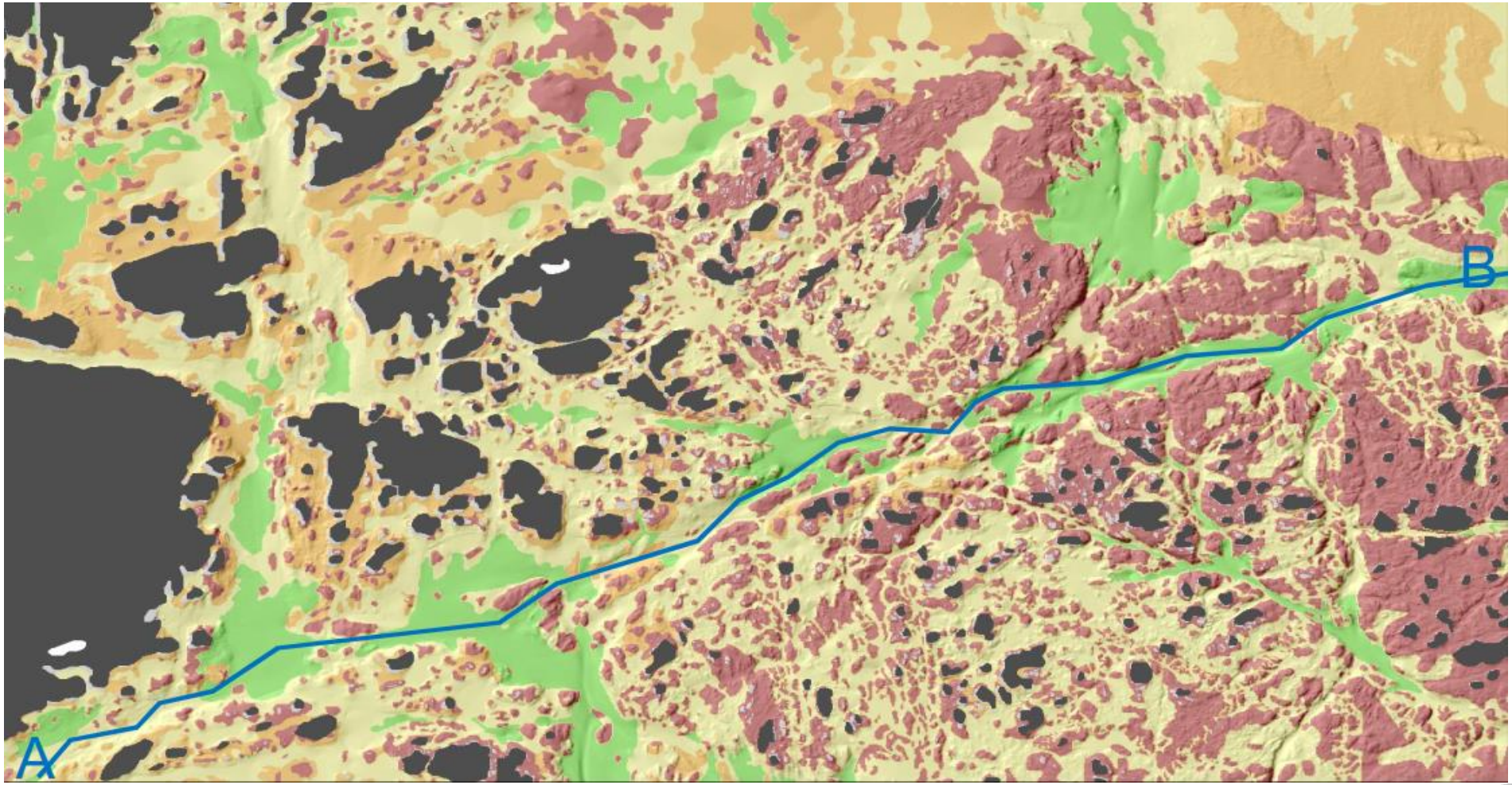
Understand the environment



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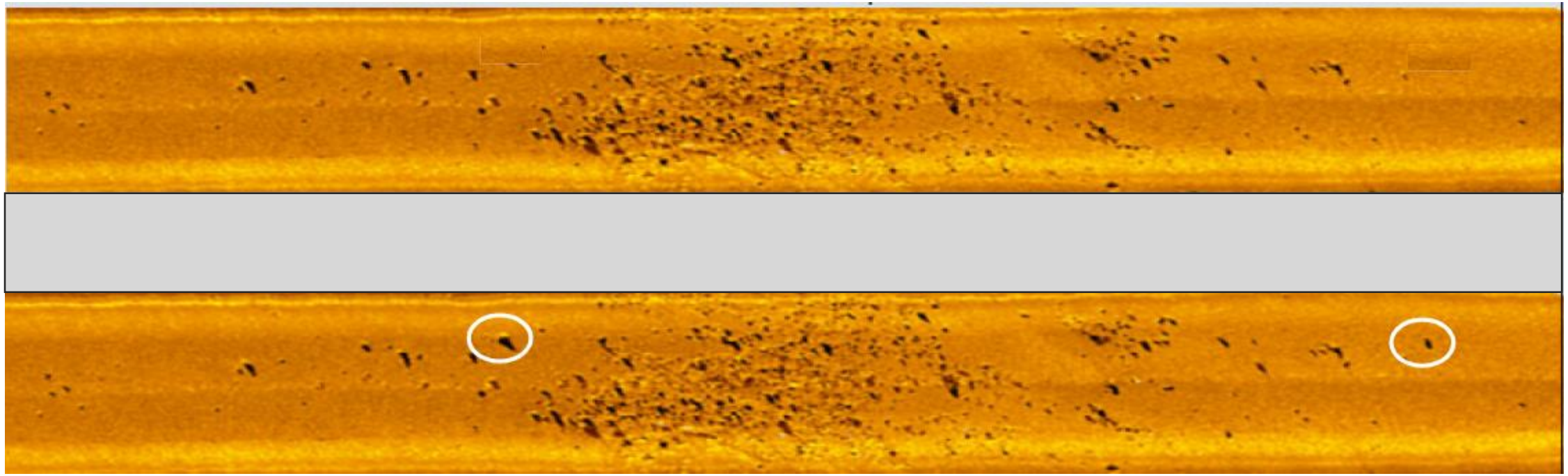
Change detection



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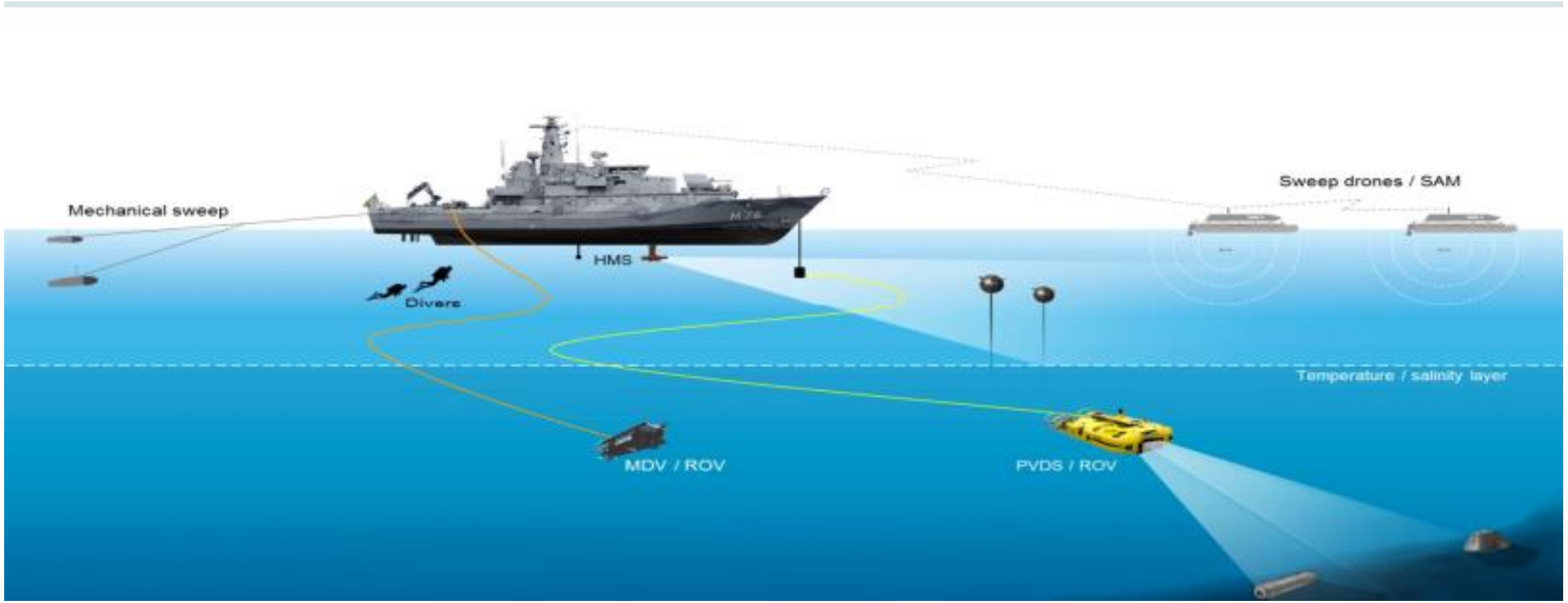
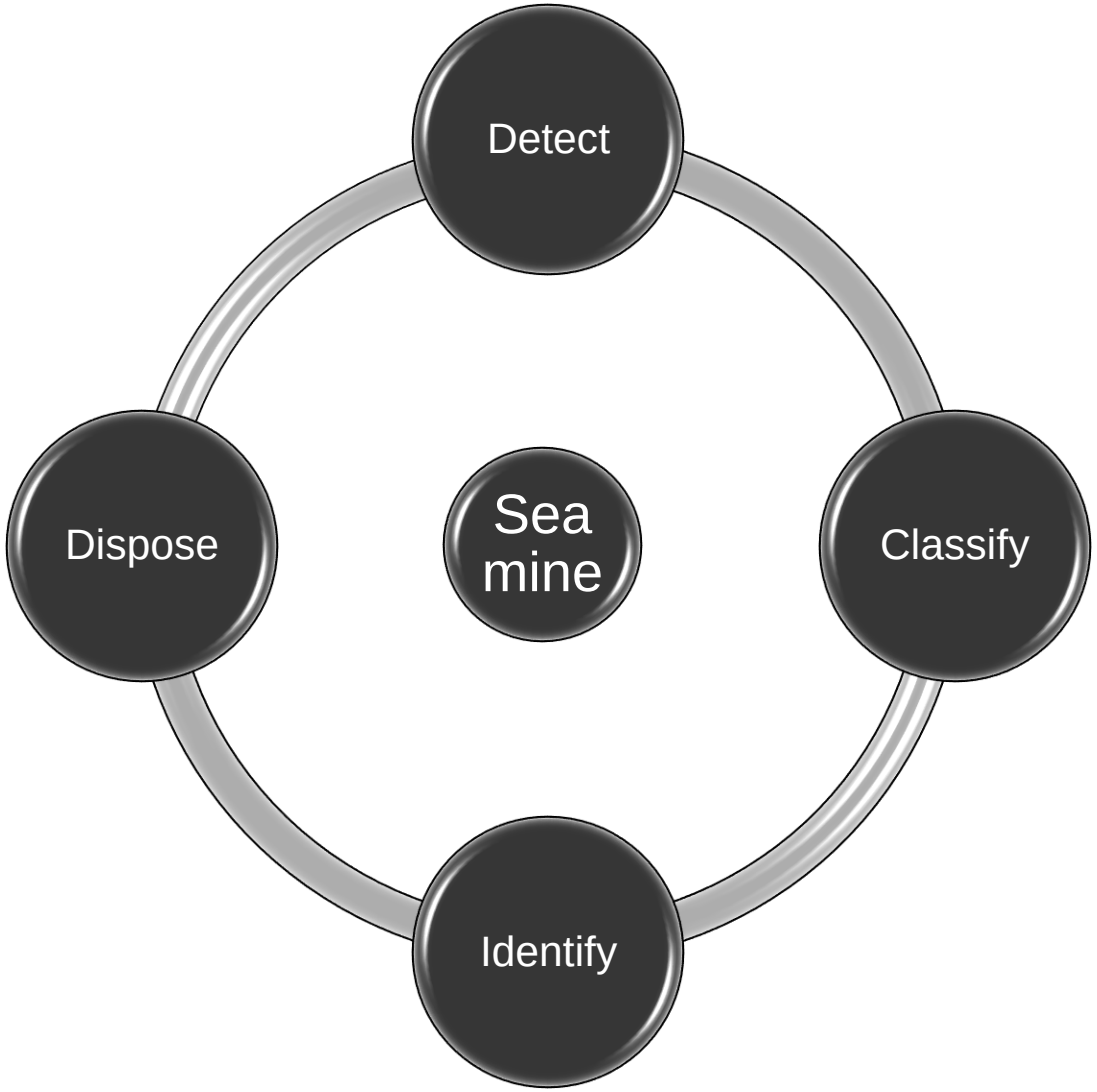
Traditional MCM



THE FOUR PHASES OF TRADITIONAL MCM OPERATION

1. Initial Planning (REA) –Ship based
2. Mine Recognizance (Search) - Ship based
3. Mine Identification – ROV/Diver
4. Mine Disposal – ROV/Diver

(REA): **R**apid **E**nvironmental **A**ssessment



FUTURE MCM

Space needed

TOOLBOX

1 UAV

Ac-Mag Sweep

Divers

RHIB

3 ROV

MIDS

2 USV

2 TSSS/TSAS

4 LAUV

3 MAUV

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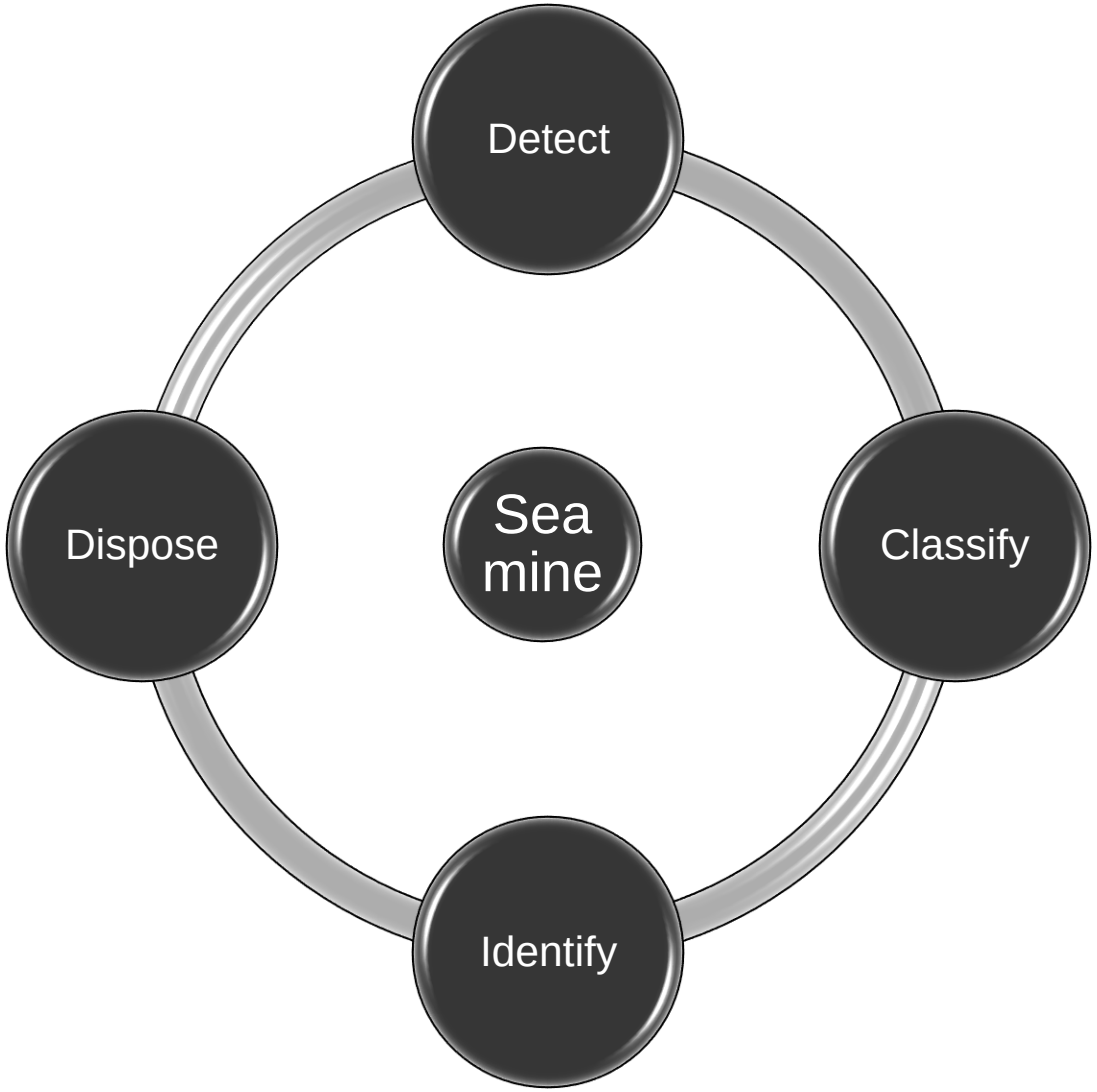
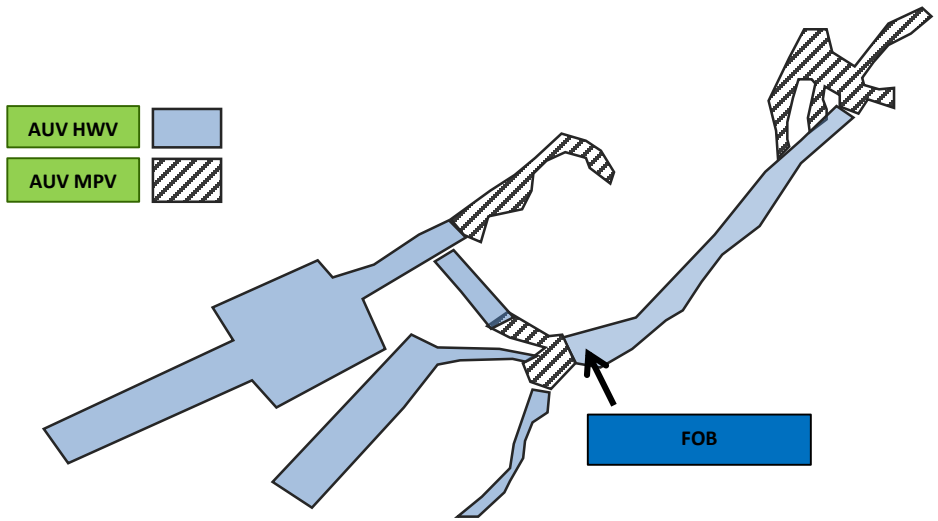


New CONOPS for MCM operations



AOR	Length (meter)	Width (meter)	Area (km^2)
1	20 000	800	16
2	8 000	600	4,8
3	8 000	600	4,8
4	8 000	600	4,8
5	5 000	4 000	20
SUM			**50,4**

Prerequisites

- The enemy develop more advanced systems

Area to search increase

Time calculation

3 knots x 1 852 meters = 5,56 km/h

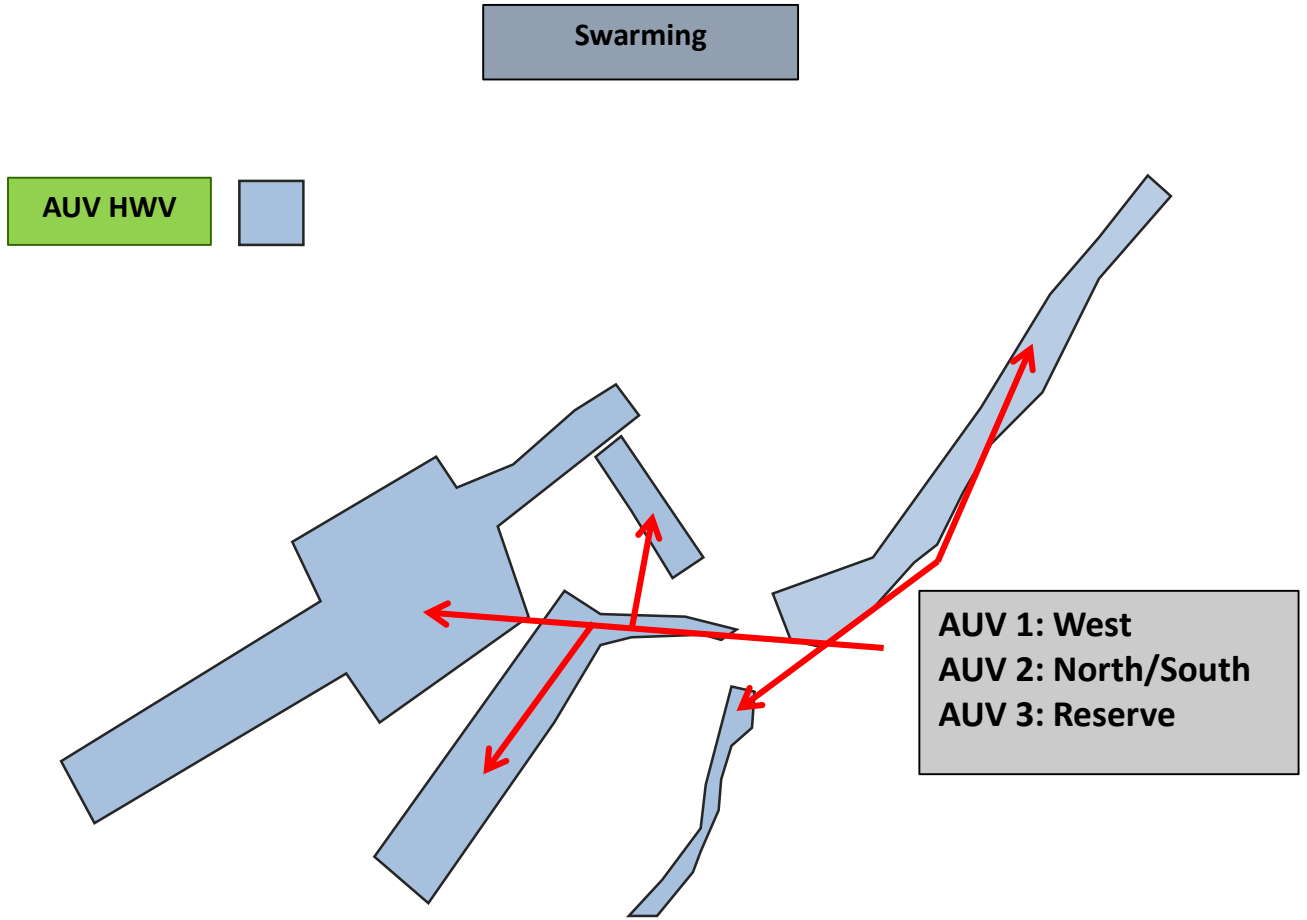
5,56 km/h x 400 (2 x 200) meters = 2,22 km^2/h

100,8 km^2 / 2,22 km^2 = **45,4 h**

- Add on friction

- Including transportation 200 h = **8 day and night**

New CONOPS for MCM operations

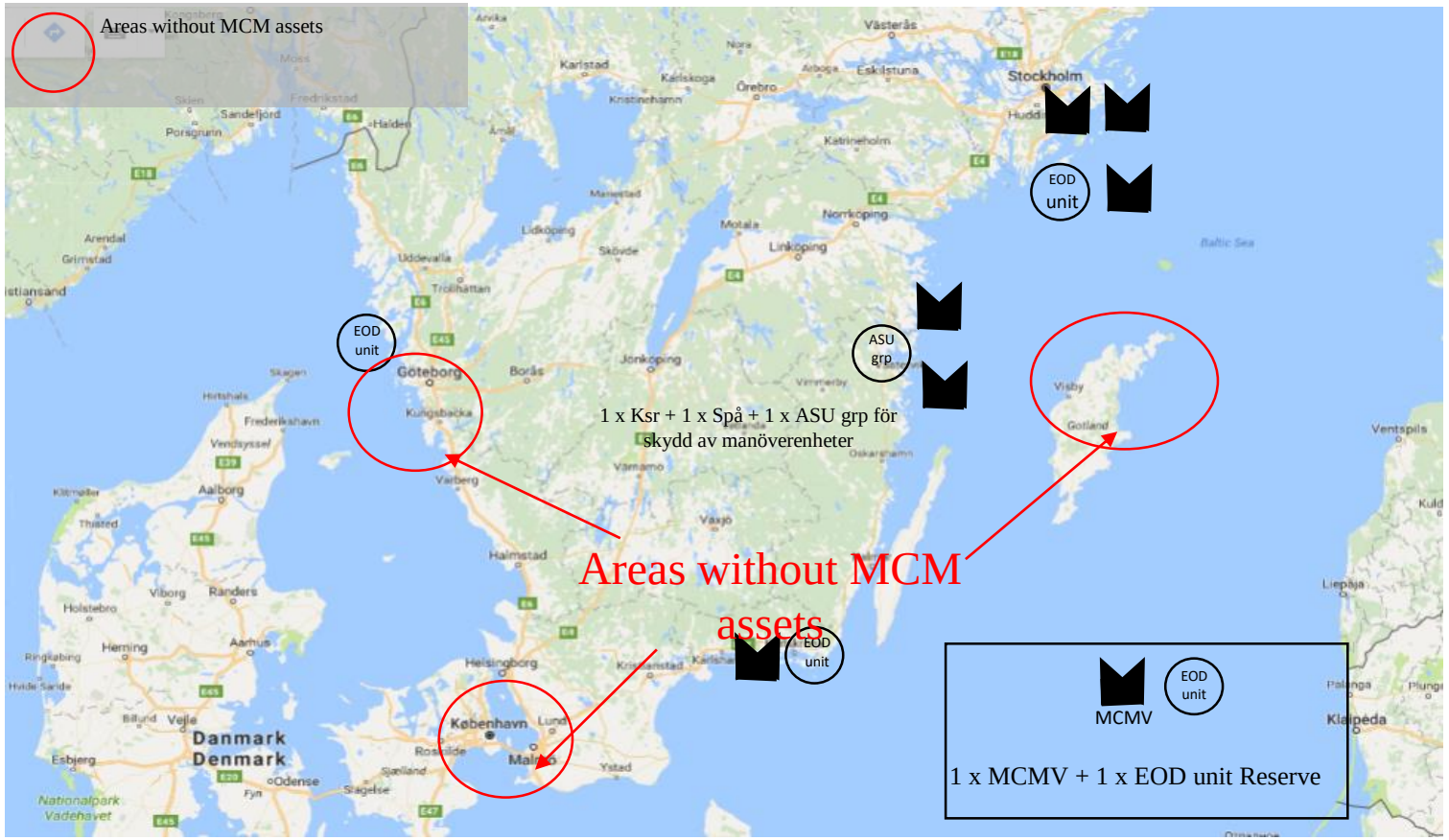


Swarming

Factor for succes!

CAD/CAC & change detection

New CONOPS for MCM operations



MCM resources

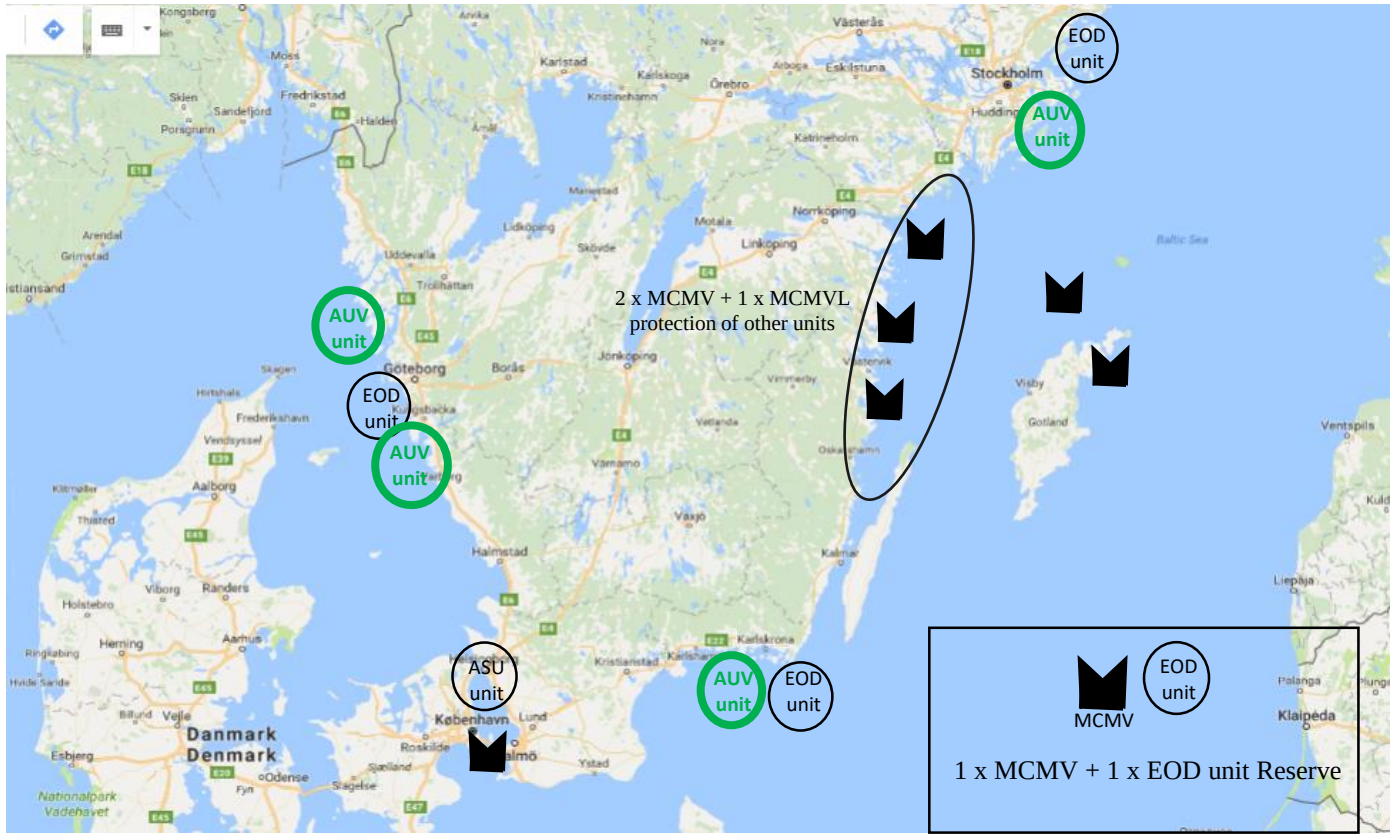
5 MCMV

2 MCMV (Clearance diver ship)

4 EOD-units

1 Area Search Unit with AUV-MPV

New CONOPS for MCM operations



MCM resources

5 MCMV

2 MCMVL (Clearance diver ship)

4 EOD-units

1 Area Search Unit with AUV-MPV

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Summary of Pros & Cons

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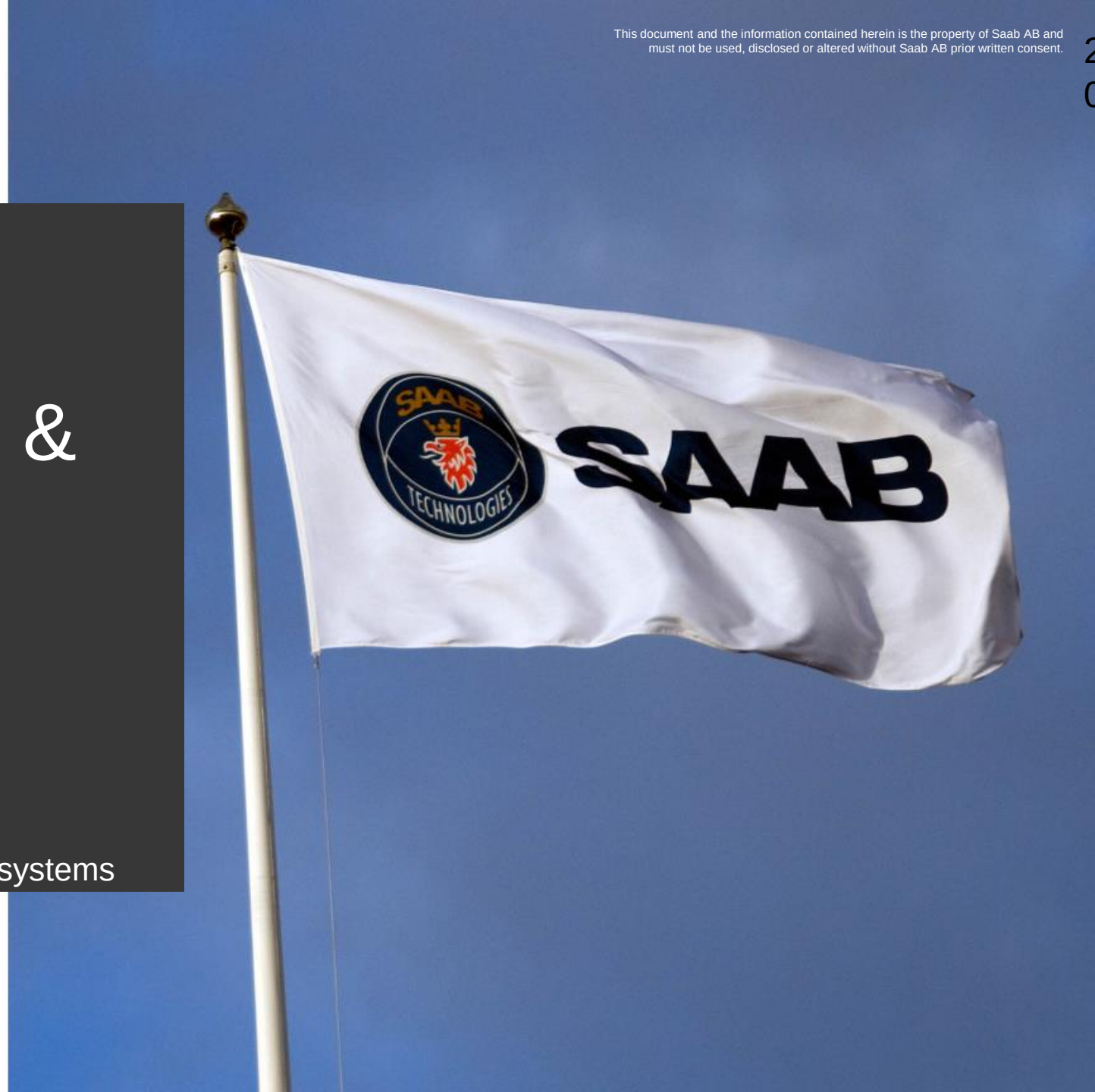


Traditional vs Future MCM

Traditional

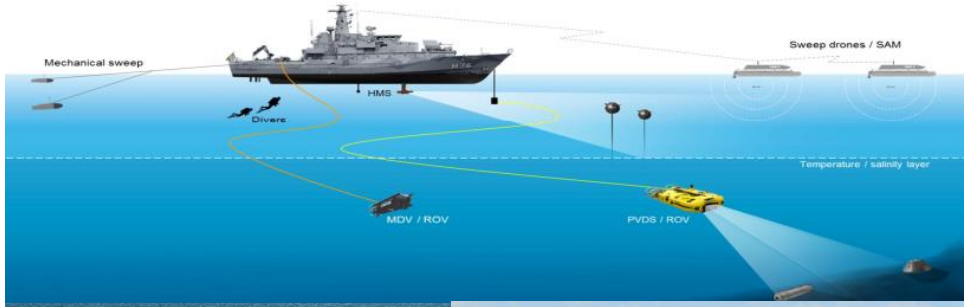
+ Experience
  - Training
  - Personnel
  - Equipment
  - SOP/Regulations
- Time consuming
- Bigger risk
- Expensive
- More environment dependent

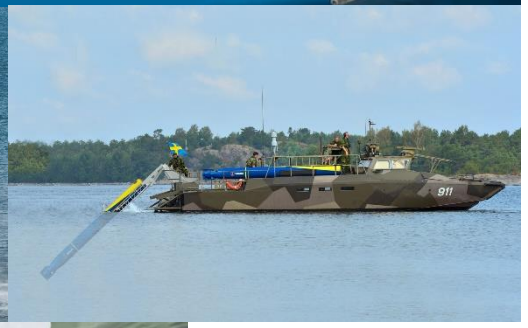
Future

+ Safer
  - Less men in the minefield
+ Faster
+ Cheaper
+ Less environment dependent
- Unknown
- Training of personnel

Traditional & Future fusion/simultaneously

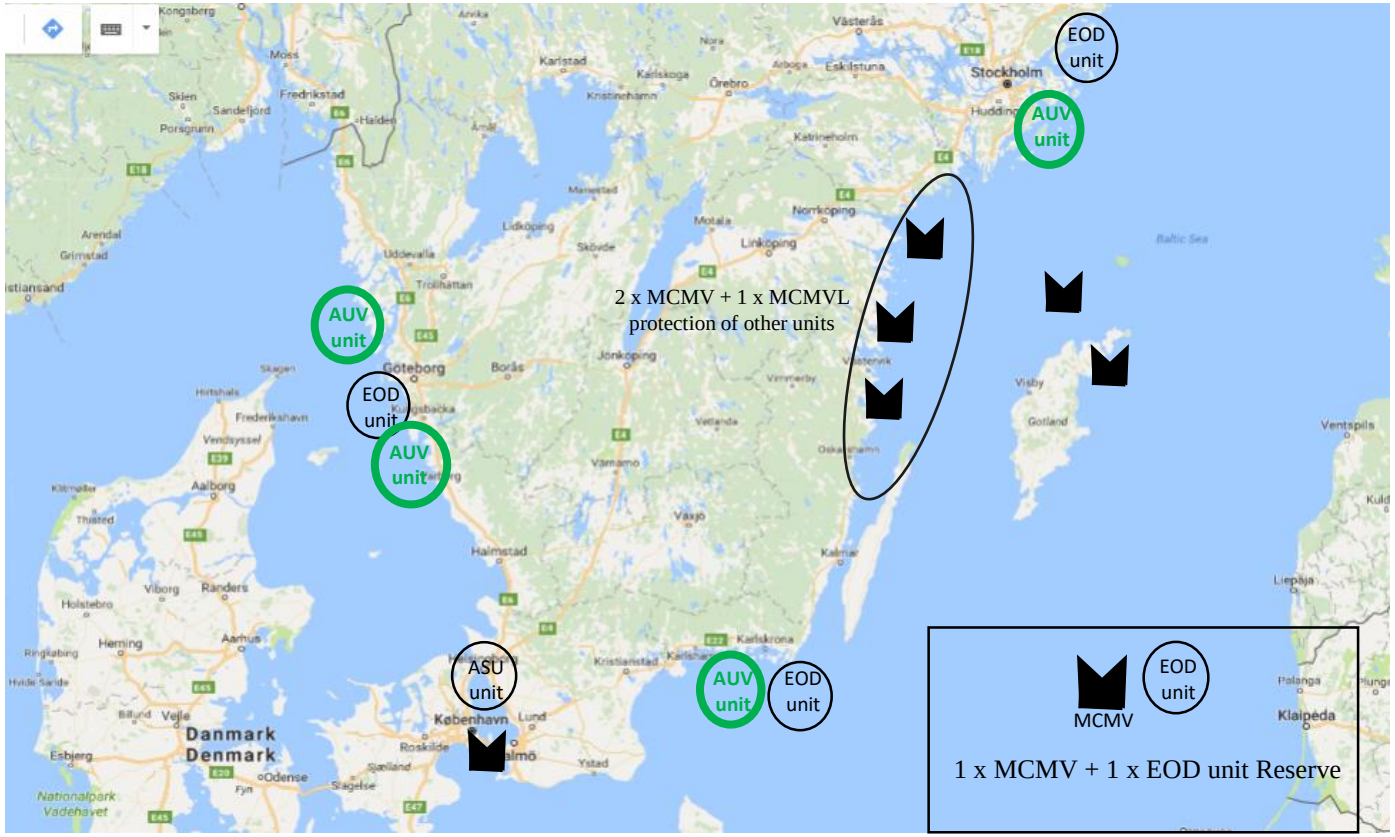
- Usage of AUV for REA
  - Safer and faster
  - Less environment dependent
  - Cost effective
- Optimization of assets
  - Divers & ROV (MCMV's) for disposal
  - Continuously MCM operation
  - Ability to fight in more AOR at the same time
- LARS systems
- The mix of experienced sailors and new equipment





Fusion success

- Planning
- CAD/CAC
- Change detection
- Data management (MWDC)
  - Quality of data
  - Analysis capability
- Usage of smaller mobile units
- Stationary infrastructure



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