



Prepare Ships

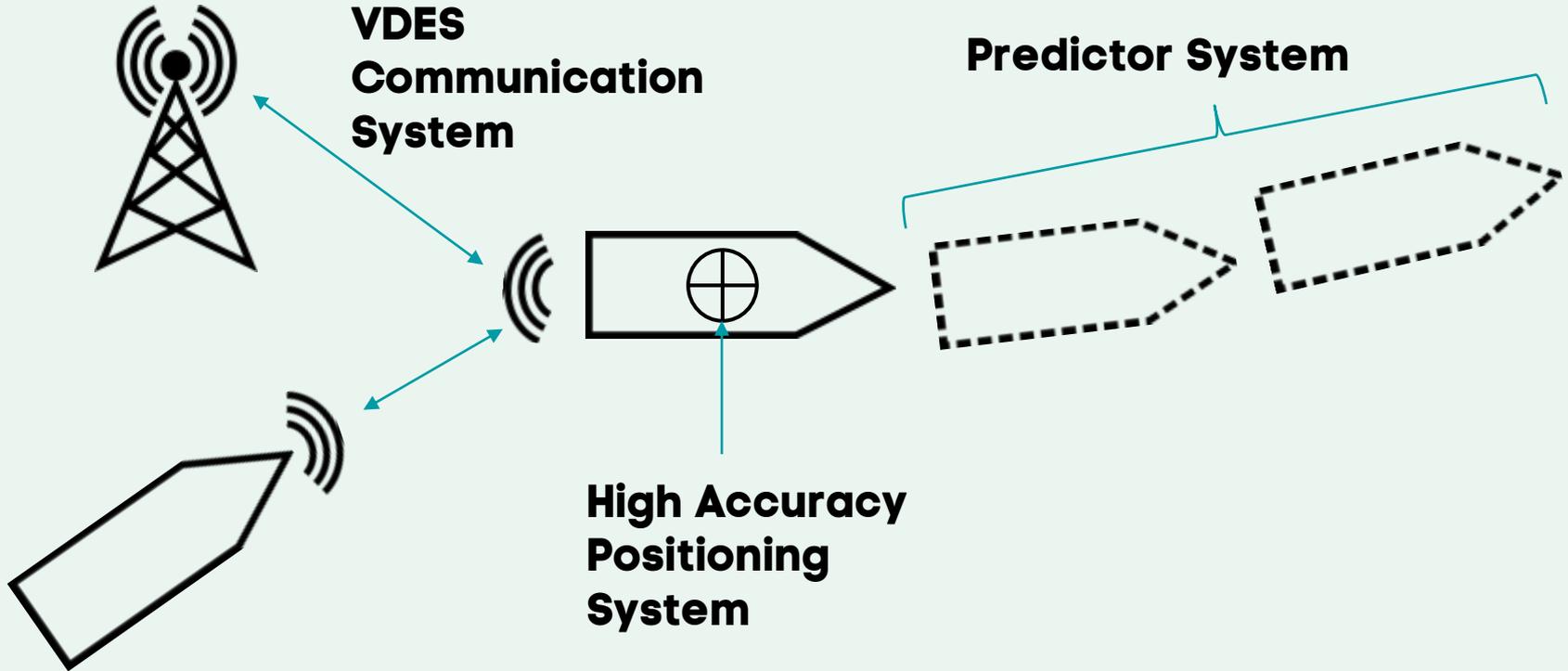


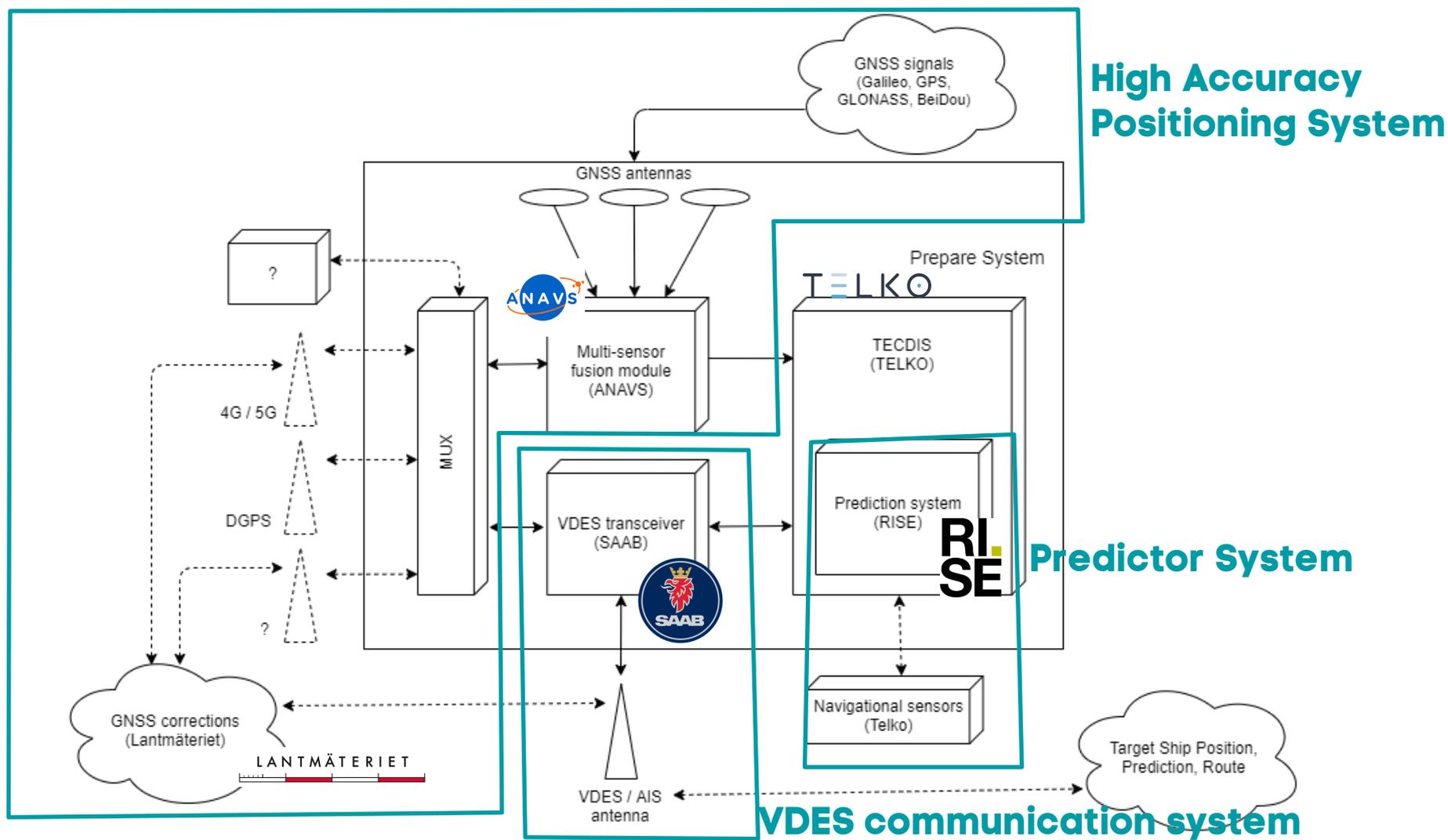
Prepare Ships

Financed by



What is Prepare Ships?





Why a High Accuracy Positioning System?



Ever Given gets stuck in the Suez canal

- Stuck for 6 days.
- Approximated cost of 54 billion dollars.
- Caused by "technical and human errors" during a sandstorm.

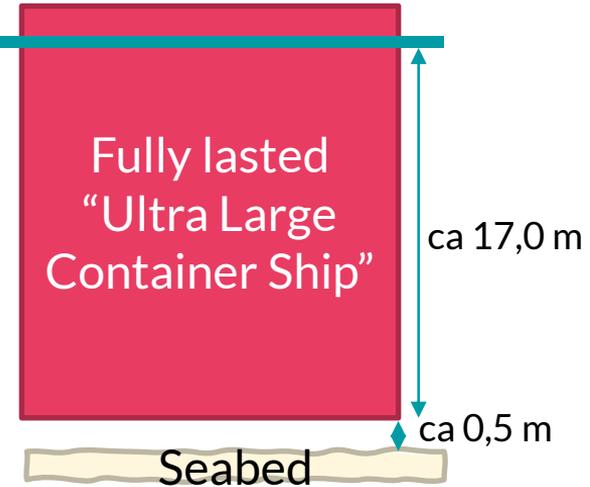
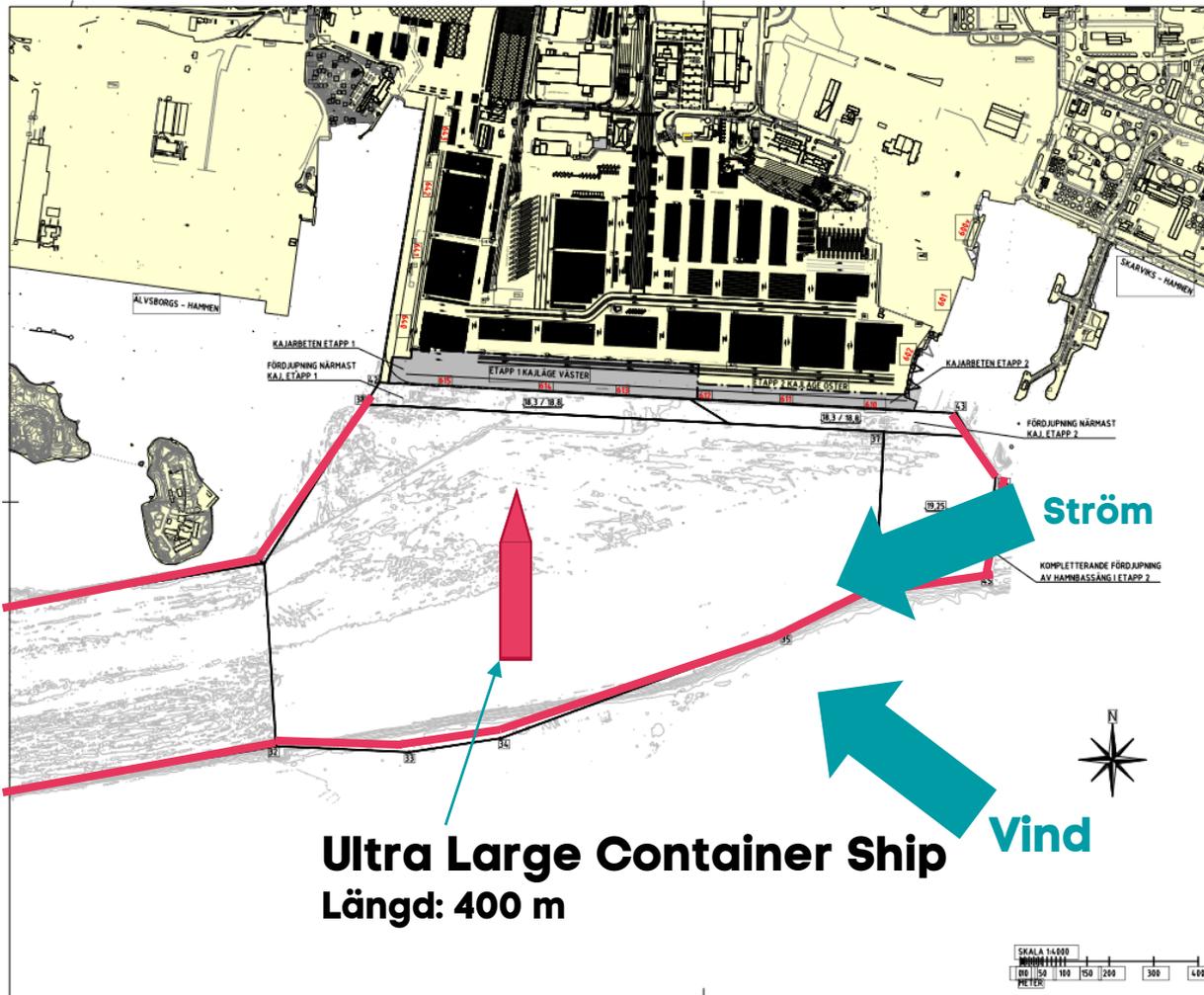
**A stuck ship is expensive
(and embarrassing)**



Widening and deepening of the fairway to the Port of Gothenburg

- Must be done to be able to receive the largest ships.
- Approximated cost of 2.5 billion crowns.
- 13,5 milion cubic meters of soil must be dragged.

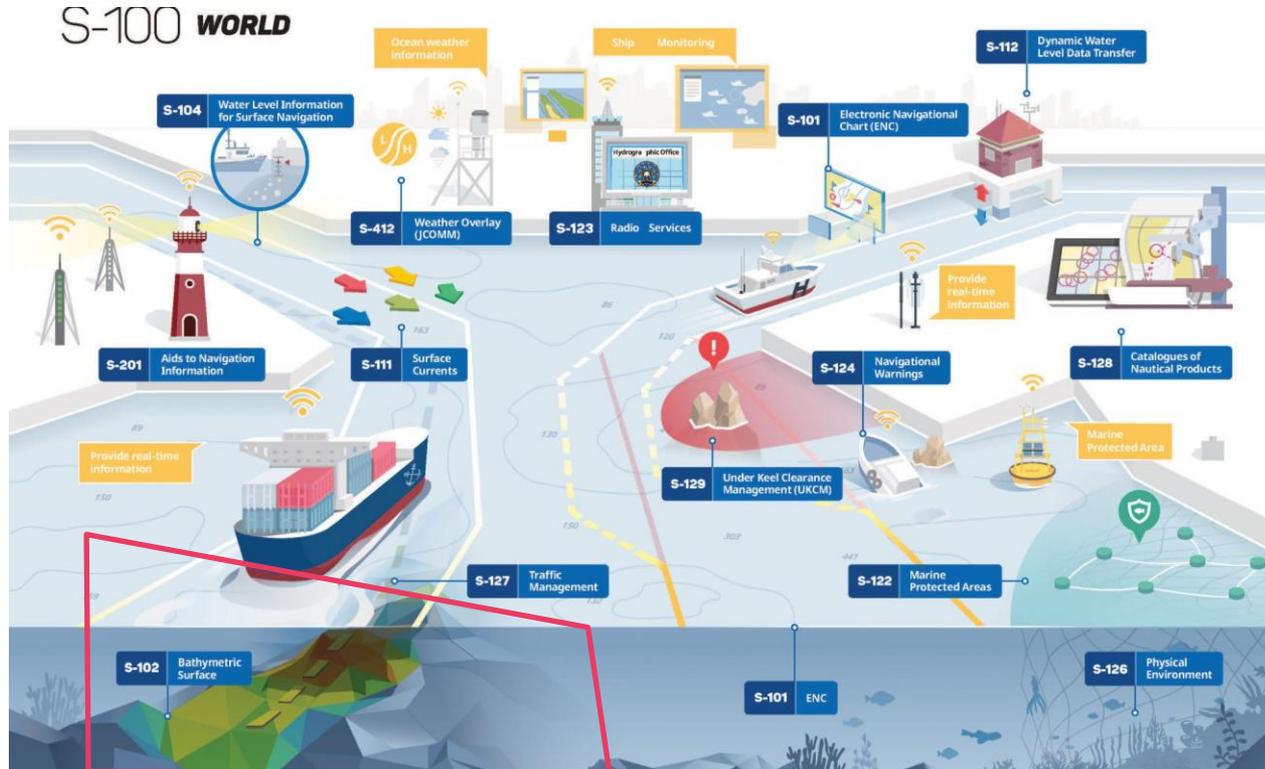
To widen and deepen a fairway is expensive (and cumbersome)



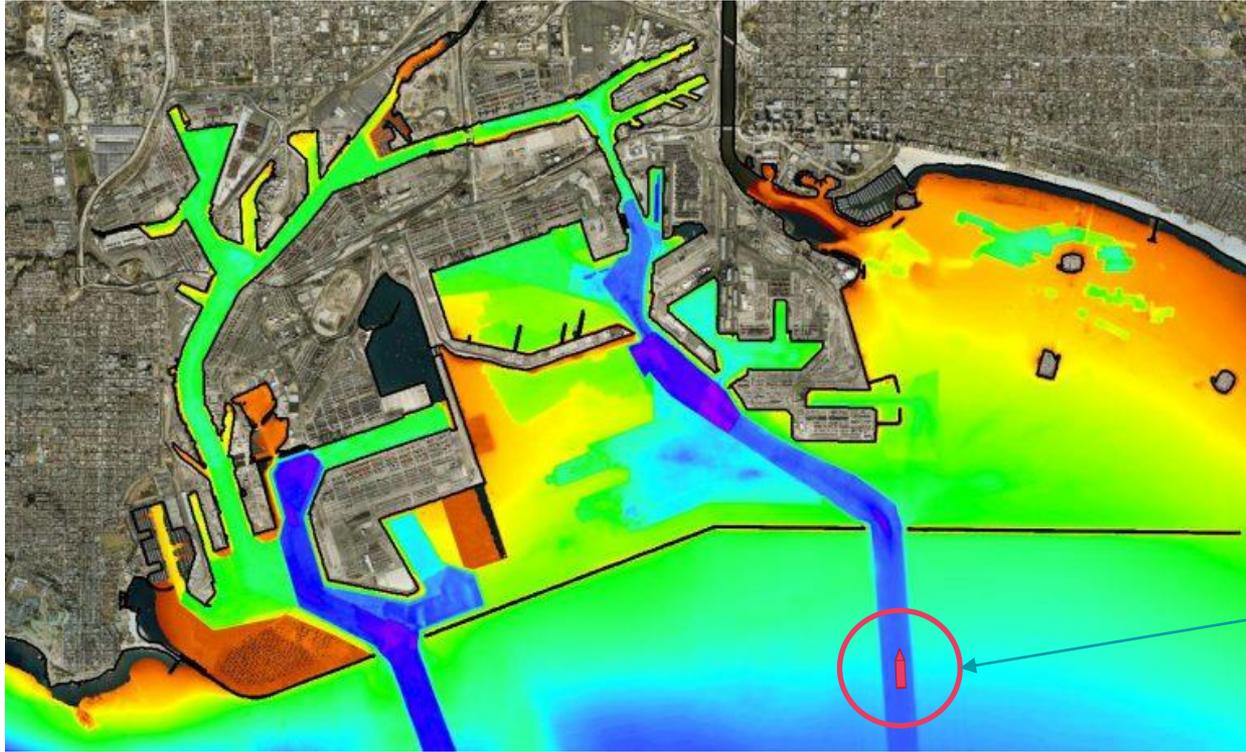
Despite of the changes there wont be a "lot of space" for manoeuvring

IHO's Universal Hydrographic Data Model

A geospatial data standard



Precision navigation



High
precision
positioning

**S-102 Bathymetry surface
(raster data)**

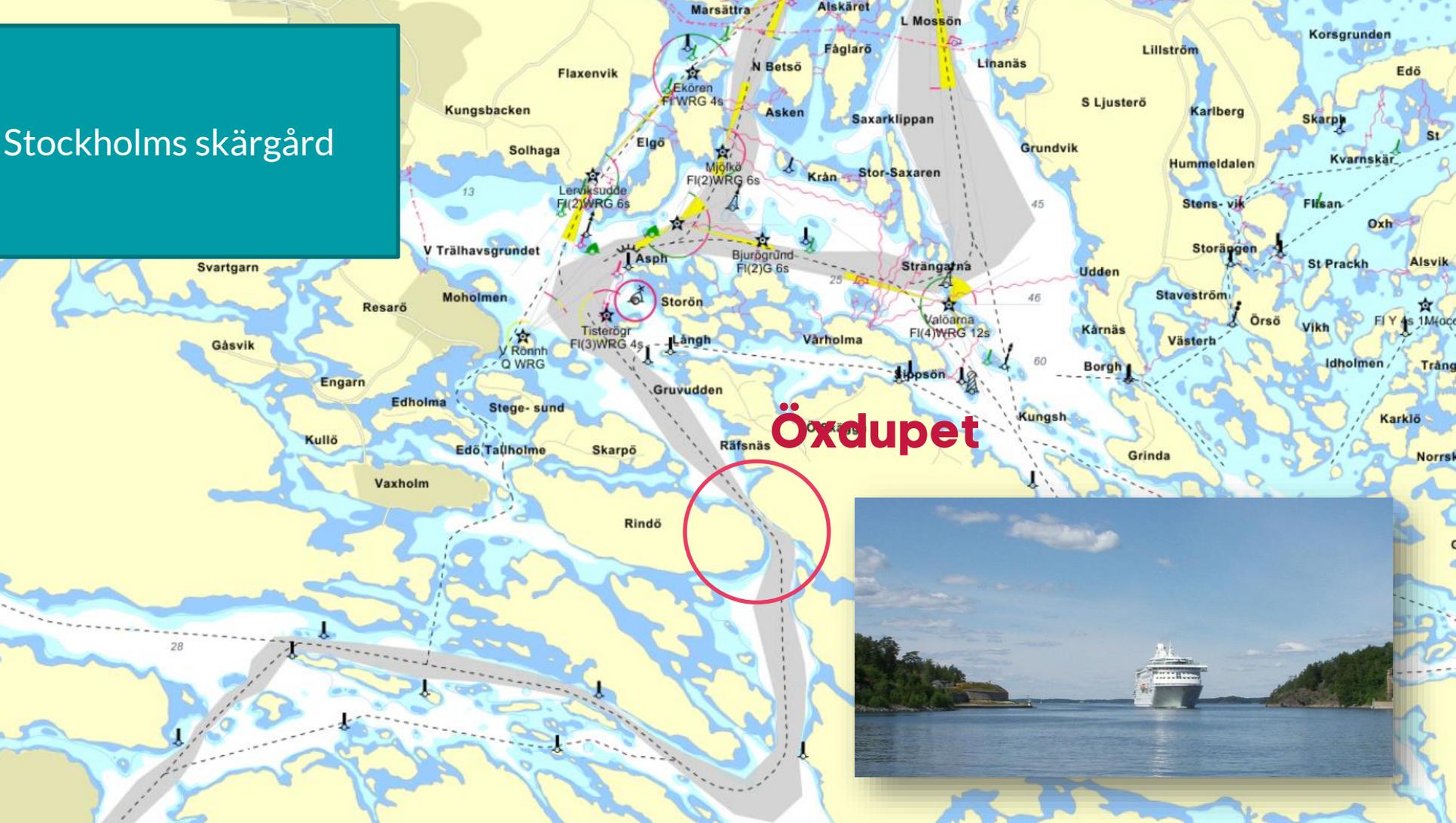
Conclusion

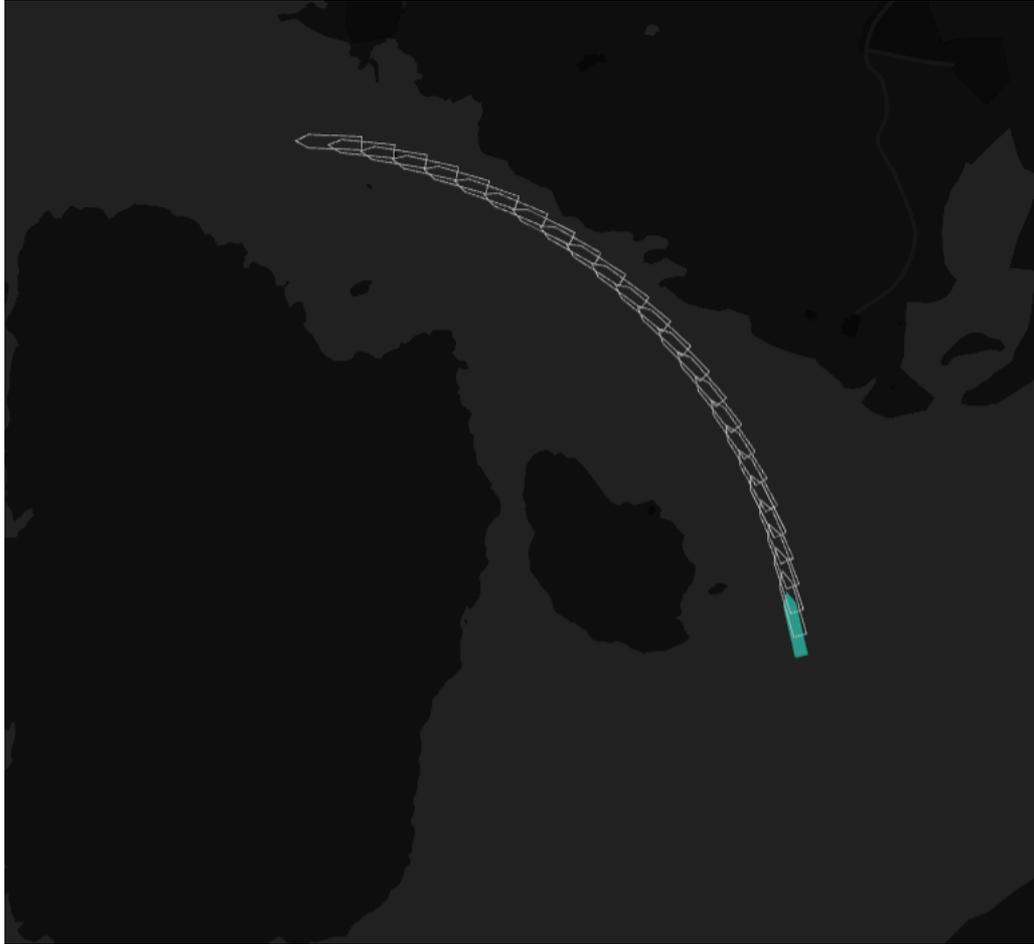
High precision positioning and bathymetry raster data support safe and effective navigation

Safe distances can be precisely determined enabling maximum use of the resources within the safety boundaries.

Why a Predictor System?

Stockholms skärgård





Conclusion

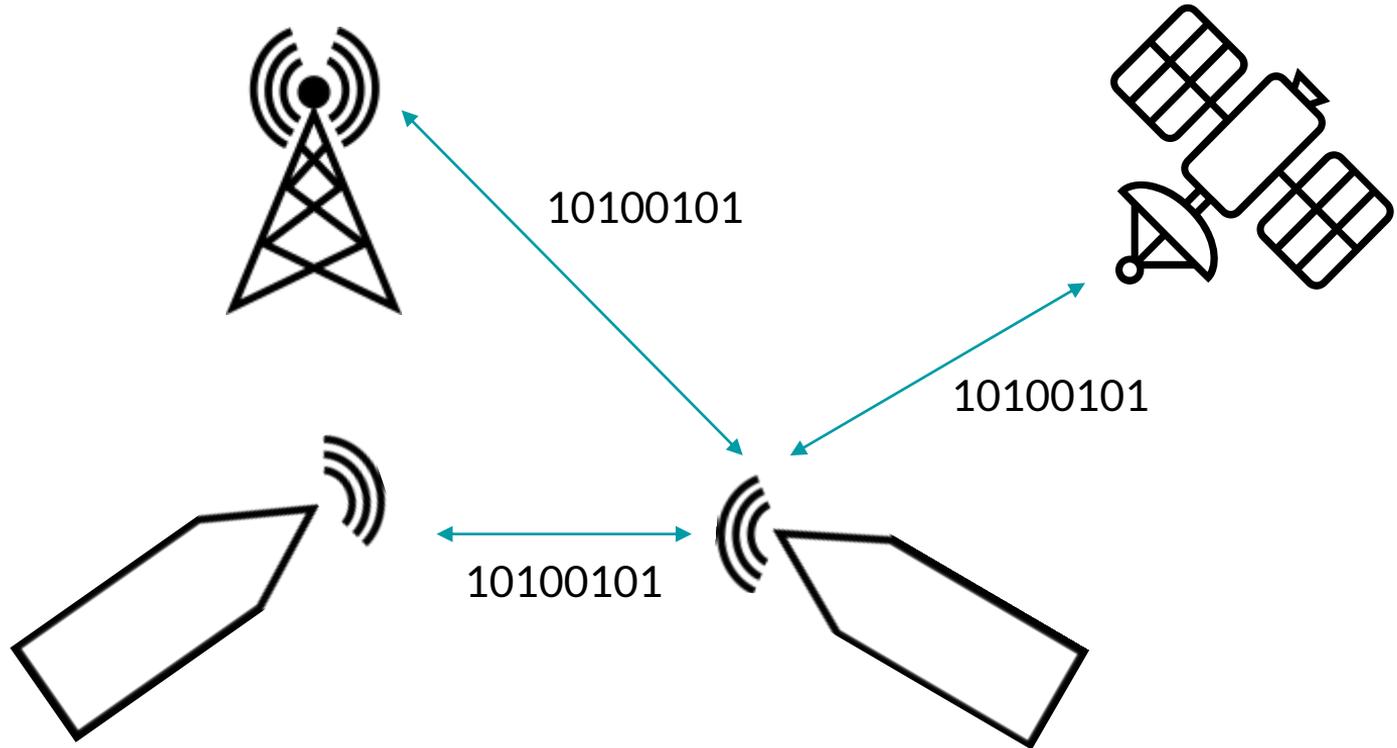
High precision positioning and a predictor system support safe navigation

Future position predictions are based on the precise current position.

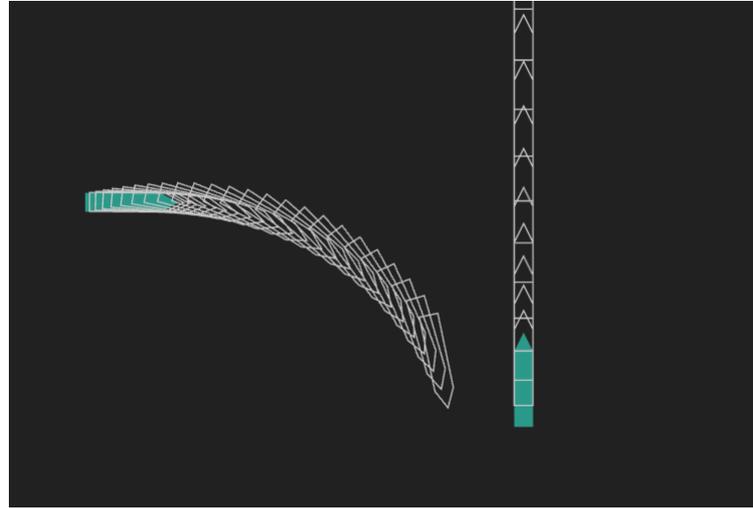
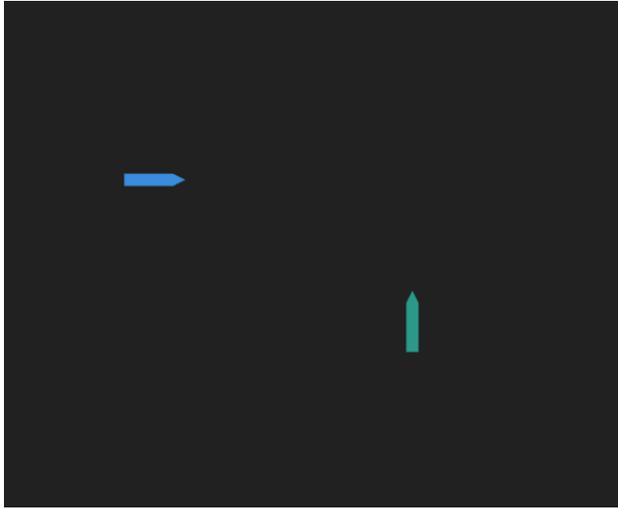
Future position predictions aids manoeuvring.

Why a VDES Communication System?

VDES: Vessel Data Exchange System via *Marine mobile VHF*

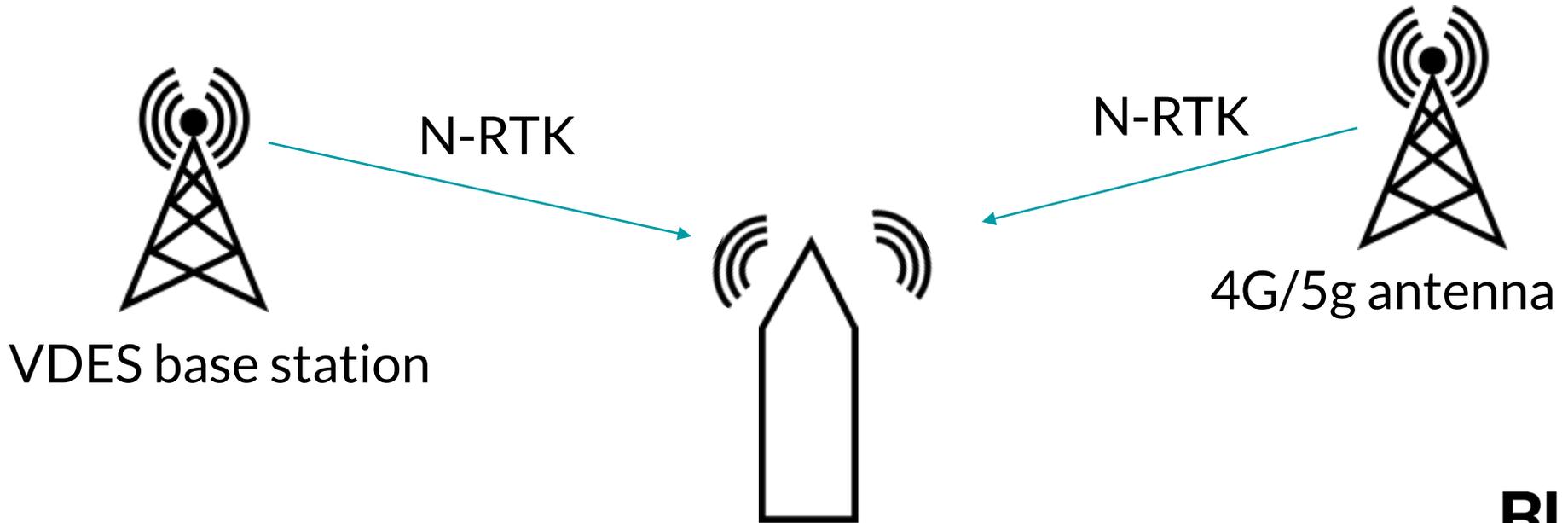


1:a reason: Share *the predictions* with other ships via VDES



2: reason

Send *Network RTK corrections* to a ship



**Deeper dive into the
High accuracy
positioning system**

High Accuracy Positioning System

Developed by 

Tested by  and 

High Accuracy Positioning System

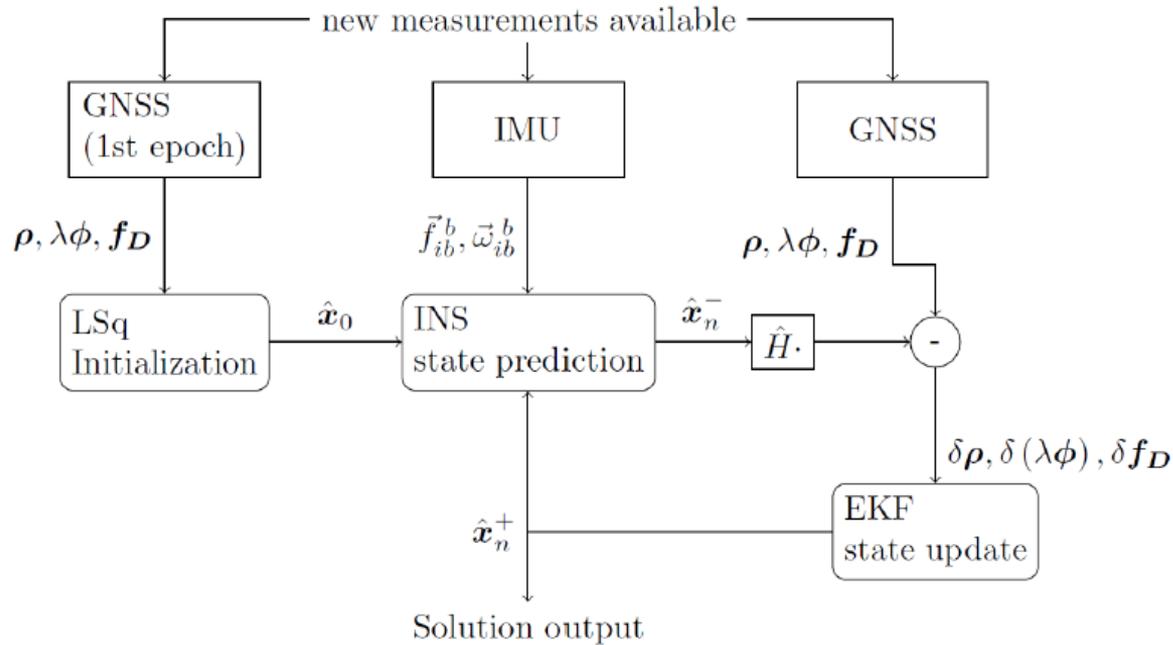
Developed by 

Tested by  and 

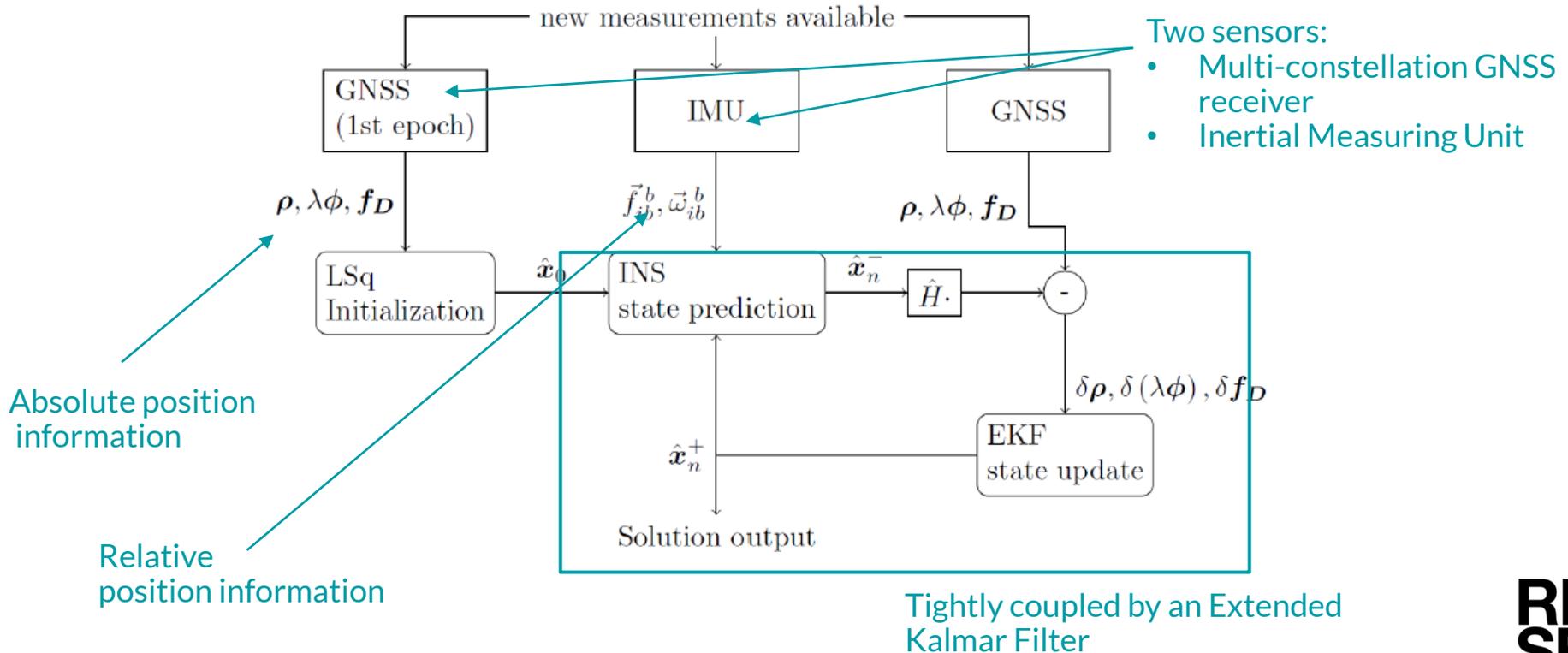
High Accuracy Positioning System

A precise and resilient position and attitude determination system, that uses a **tightly coupled Multi-Sensor RTK** positioning in coastal areas close to reference stations and a tightly coupled Multi-Sensor PPP in areas that are more far away from reference stations.

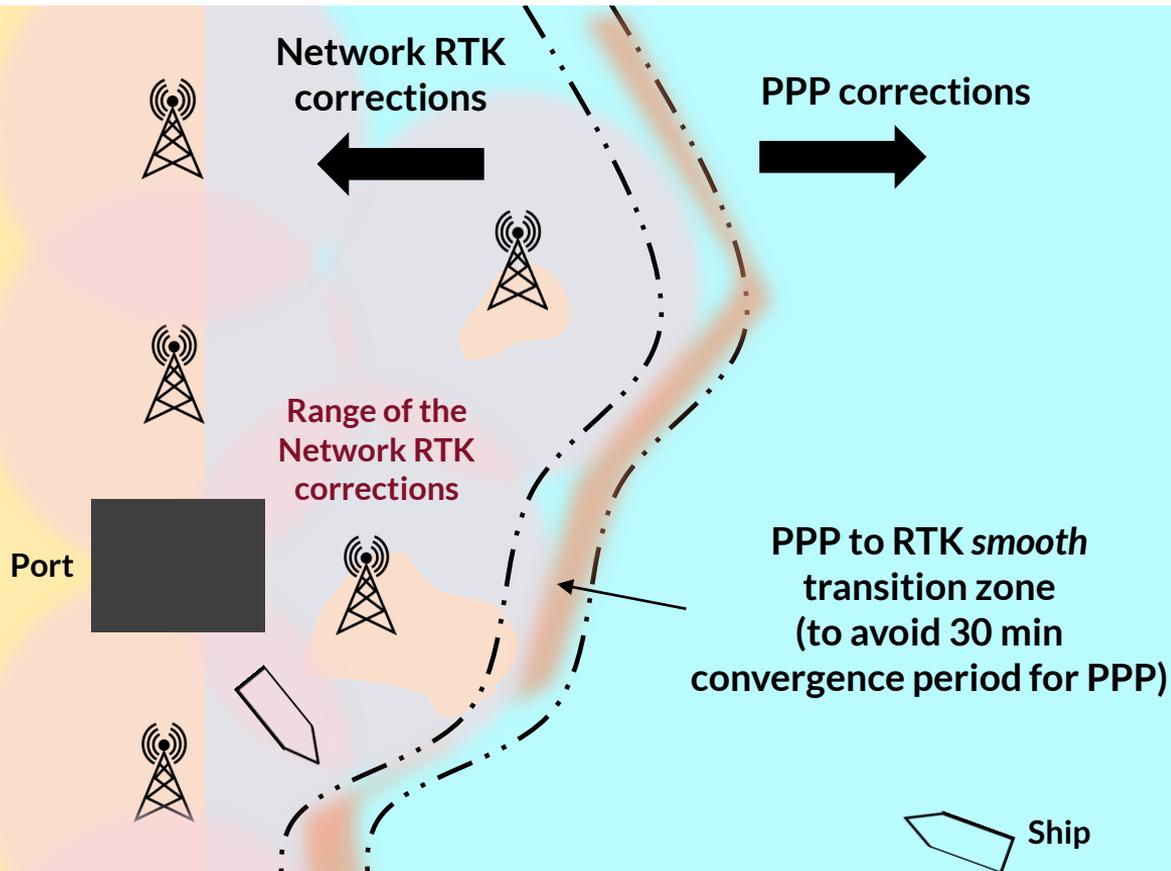
Tightly coupled and multi-sensor



Tightly coupled and multi-sensor



RTK and PPP positioning



4G/5G coverage

No mobile coverage



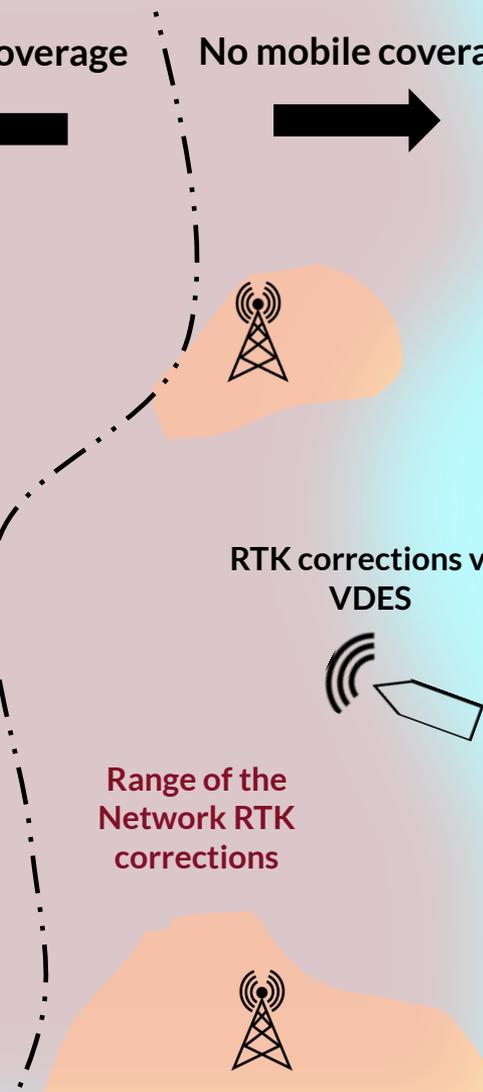
RTK corrections via
VDES or 4G/5G



RTK corrections via
VDES



Range of the
Network RTK
corrections



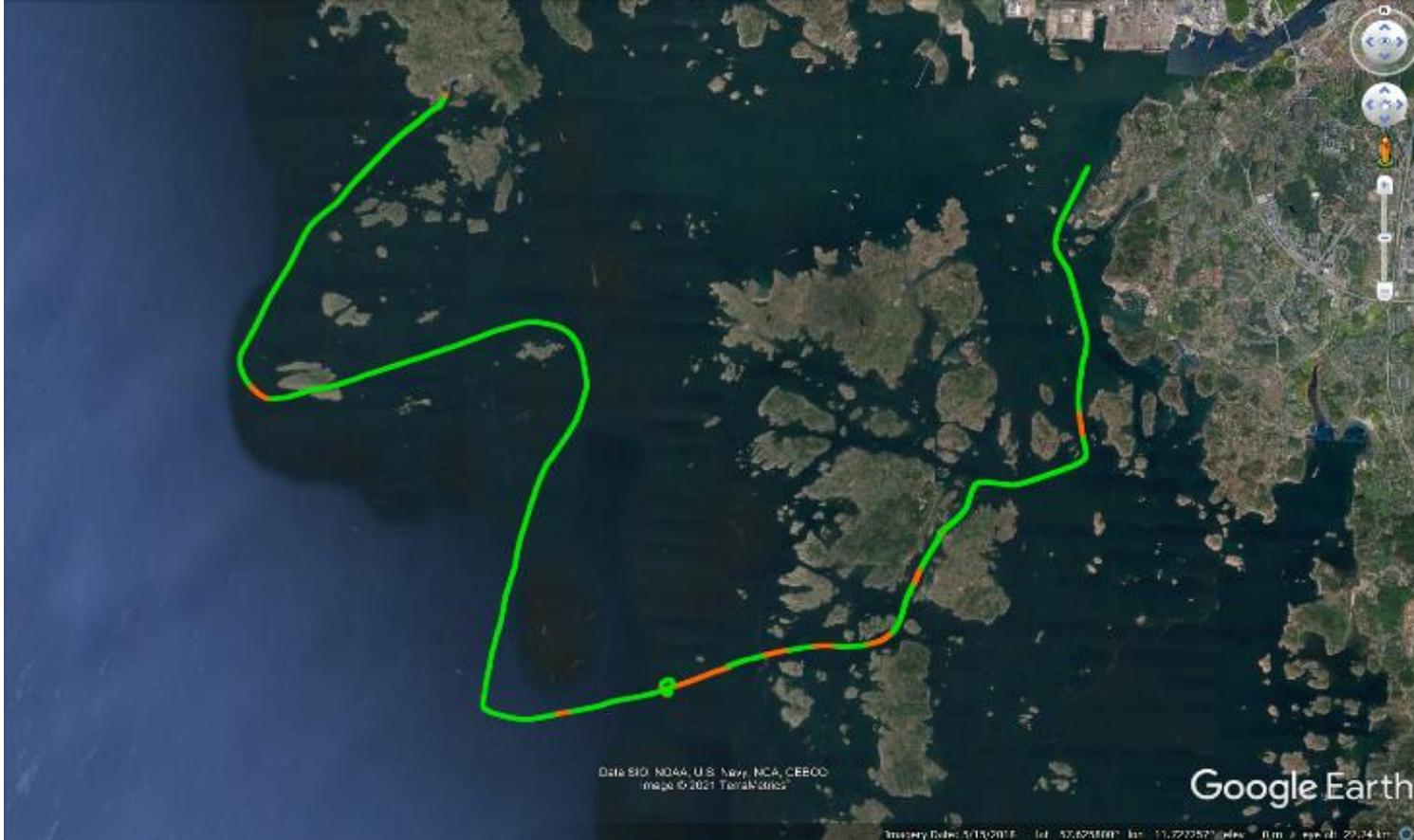
Reference stations i Göteborgs skärgården



Lotsbåten 729

**GNSS
antennas**

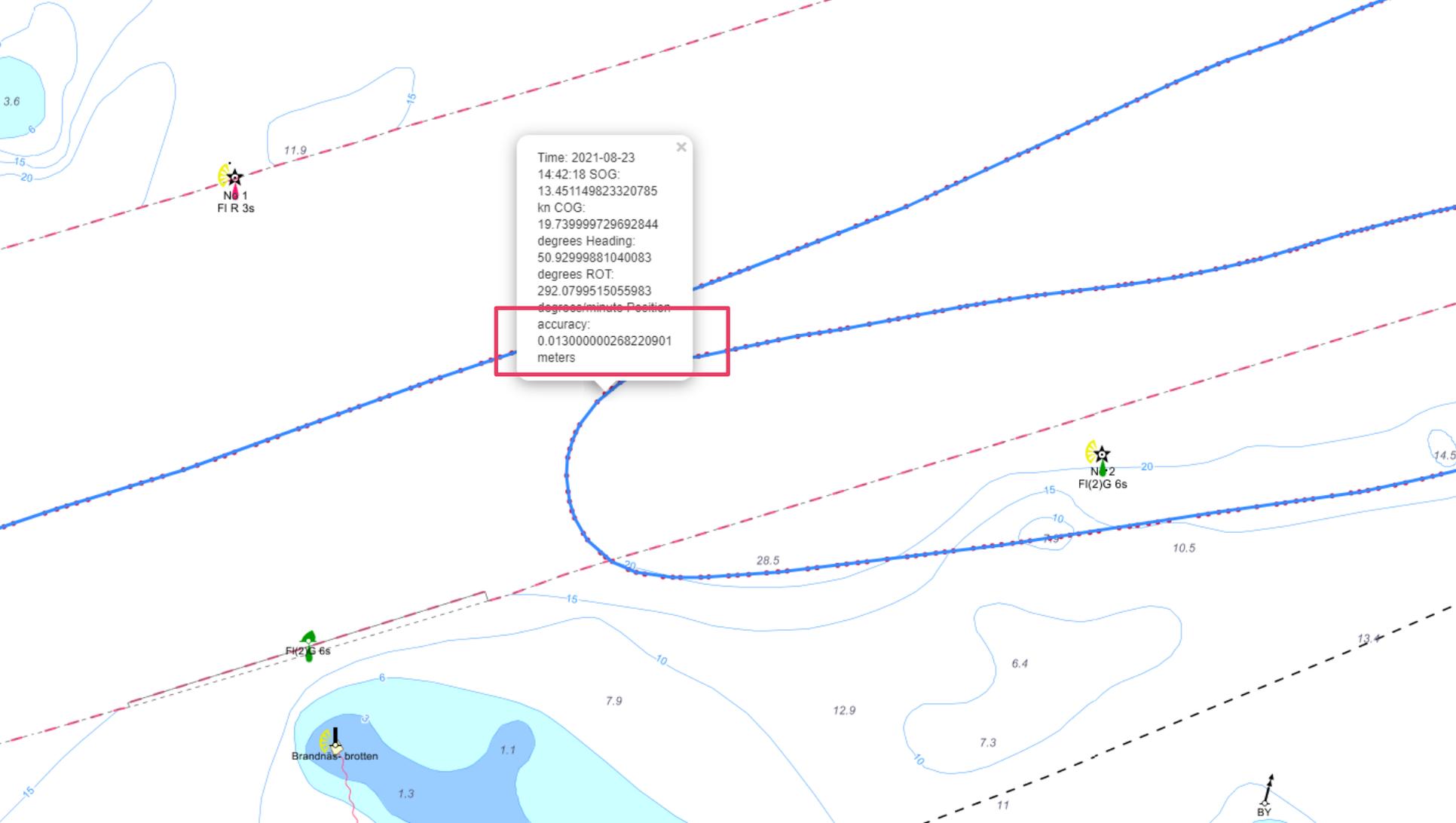


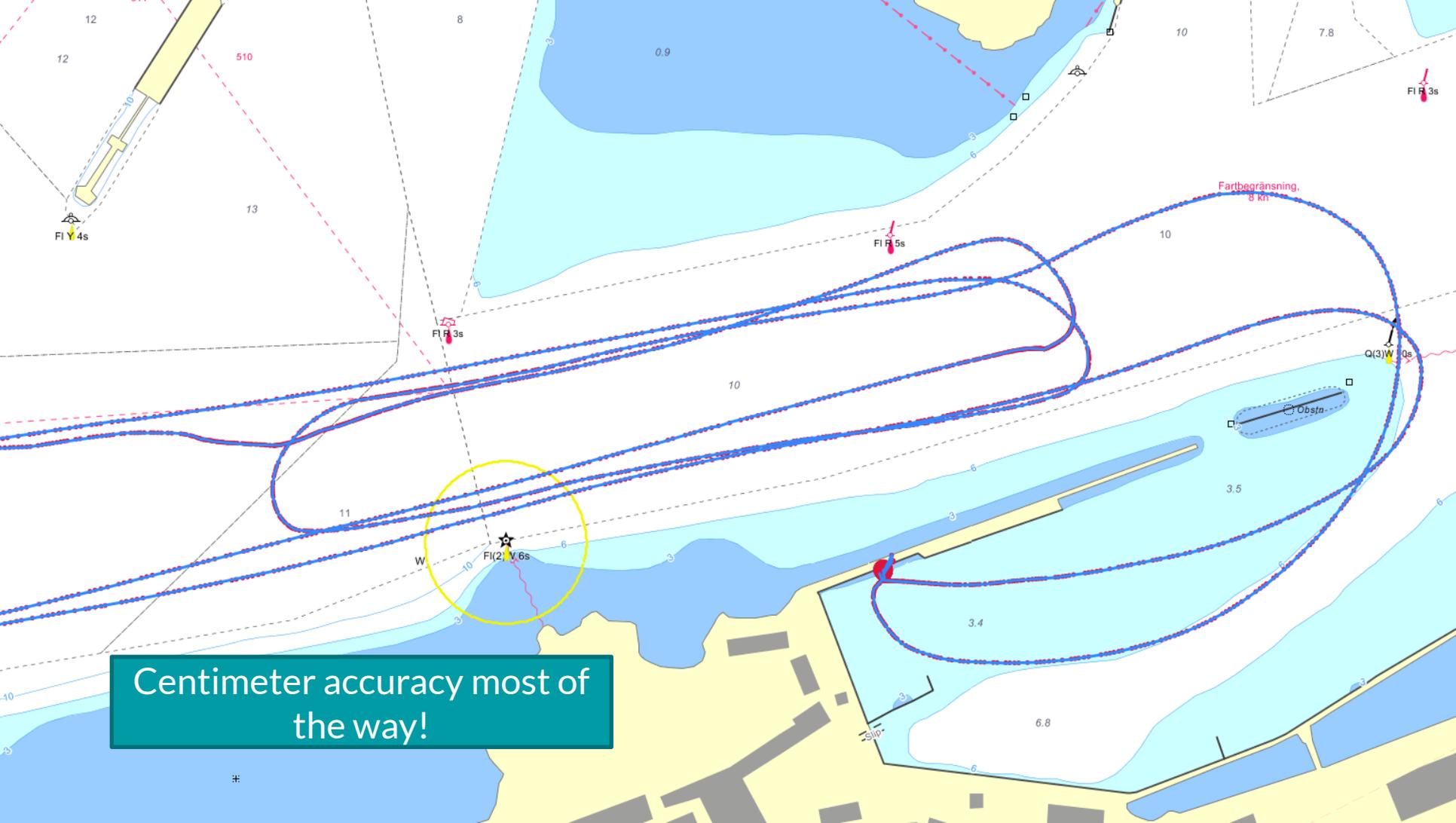


Float RTK (decimeter level accuracy)
Fixed RTK (centimeter level accuracy)

Princess yacht My@Sea







Centimeter accuracy most of the way!

Tack!
Frågor?