UTOPIA

aUtomaTed Open PrecIsion fArming Platform

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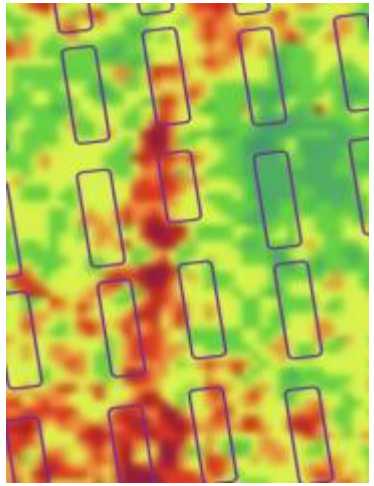
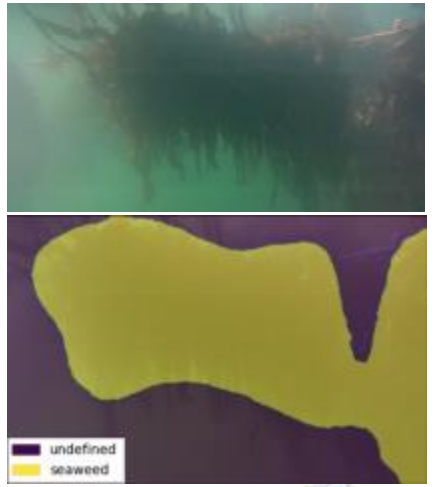


2019 cofunded Call

End-term Project Seminar

30th January 2024



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grand agreement no 862665 ICT-AGRI-FOOD.

Project Highlights

UTOPIA

IAM Intelligent Autonomous Mobility	**Coordinator & World Framework**
Wageningen University & Research	**Vision, Processing & Evaluation**
Boğaziçi Üniversitesi 1863	**Cooperative localisation & planning**
University of Antwerp	**Vision based estimation**
aqitec	**Use-case provider Seaweed & stakeholder**

Duration: 36 months (extended)

Overall budget: 664kEuro

Countries involved: The Netherlands, Turkiye, Belgium, ‘the North Sea’

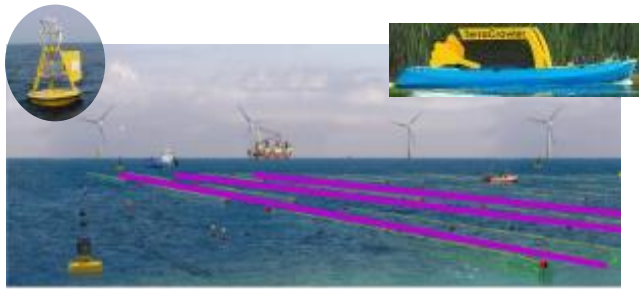
Consortium Composition: 3 universities, 1 robotics technology provider, 1 offshore specialist / engineering company.

Objective

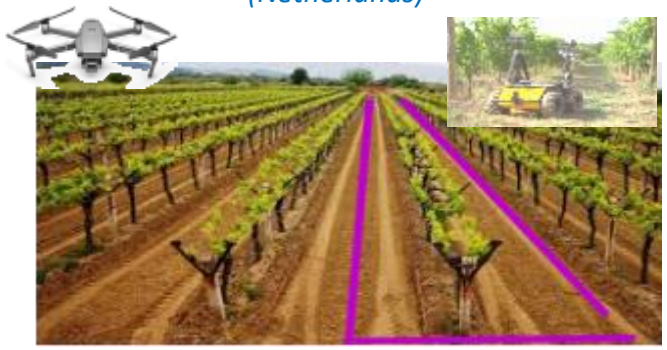
“aUtomaTed Open PrecIsion fArming platform”

- Smart Farming ICT-framework: Automated management using **data-linked drones and vehicles**, requiring **no extra labor** or tech skills. **Simplifying** precision agriculture for farmers and **other stakeholders.**
- **Open source** framework for machinery manufacturers and start-ups.

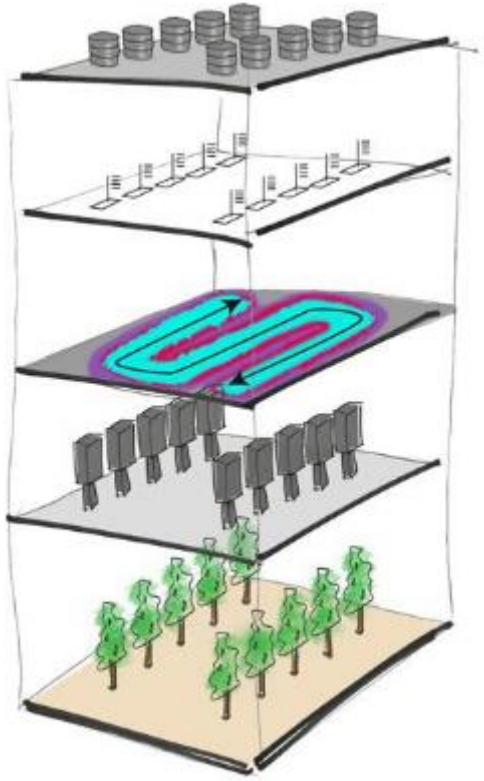
Selected research approach, methodology



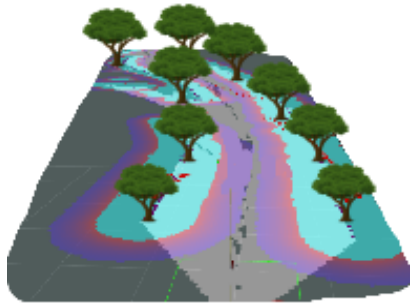
Seaweed use-case
(Netherlands)



Vineyard use-case
(Turkey)



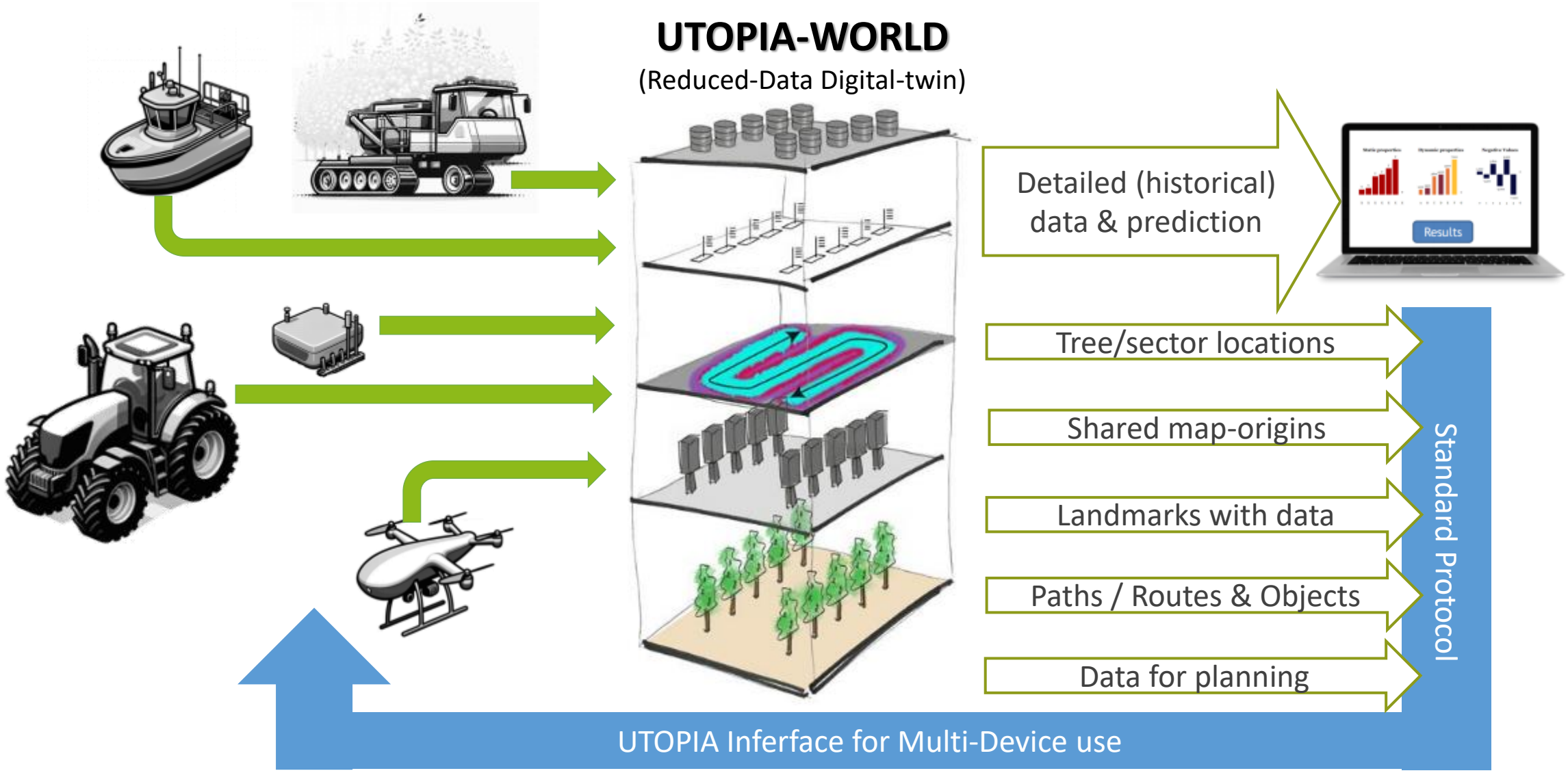
GIS + Robotics
...in a low-bandwith environment



Demo / Evaluation;
Collaborative autonomous driving, flying or sailing for **yield estimation.**

USE-CASE & STAKEHOLDER INPUT → FRAMEWORK DEVELOPMENT → EVALUATION & DEMONSTRATION

Conceptual Foundation



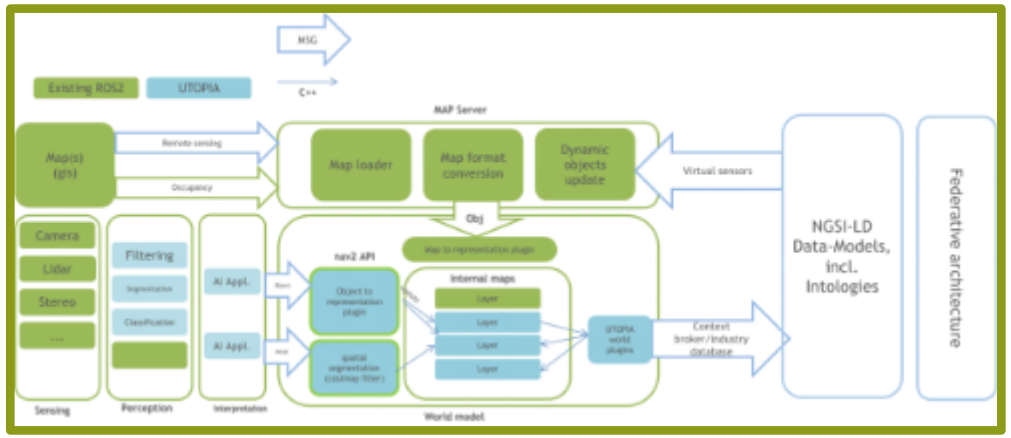
UTOPIA-WORLD: Combined ROS2 Virtual Sensors, Zenoh, NGSI-LD & JSON-LD Datamodels.


ERA-NET
COFUND
ICT AGRI
FOOD
UTOPIA
aUtomaTed Open Precision fArming Platform

Vineyard / Ochard use-case (Ongoing)

GUI

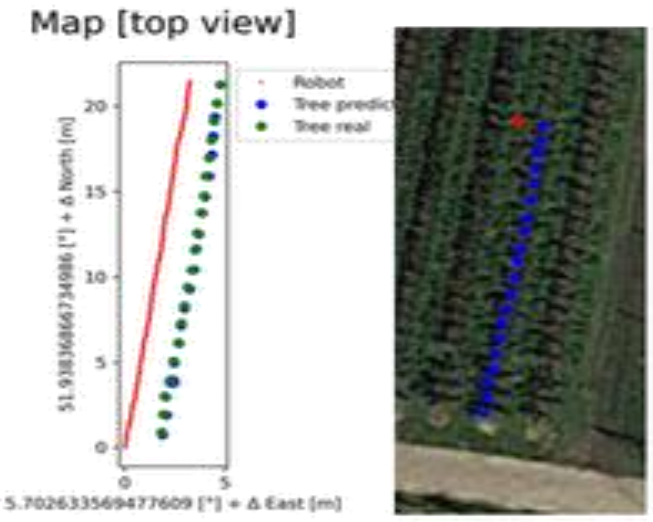
Software & Data Architecture



Yield est.

Collaborative Navigation

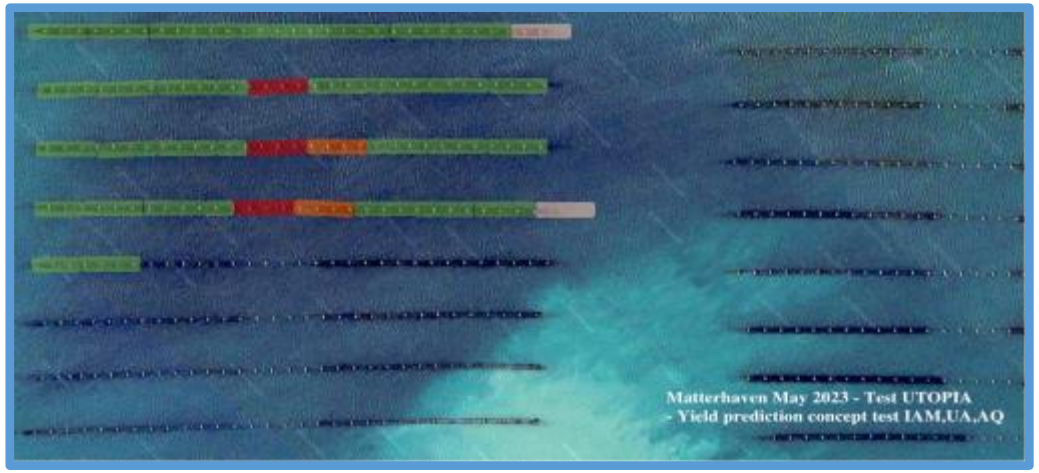
Automated acturate mapping of individual trees and floaters



Seaweed use-case (Yield estimation)

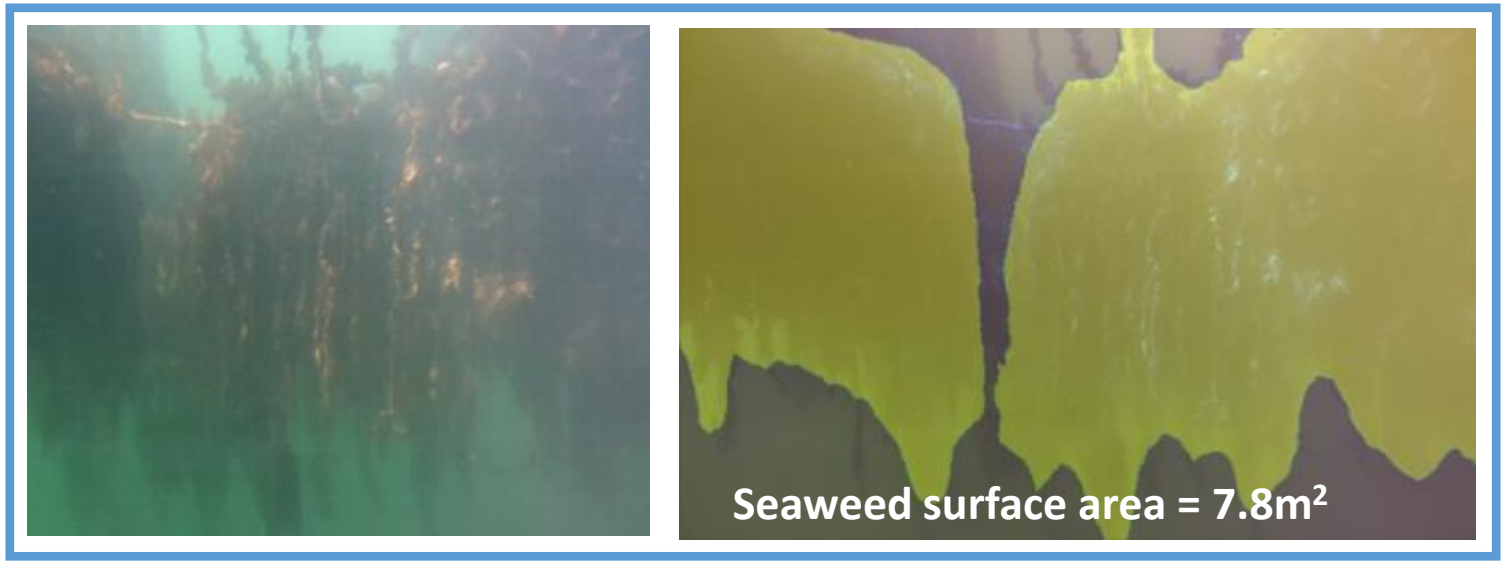
Autonomous Collaborative Navigation

Mapping

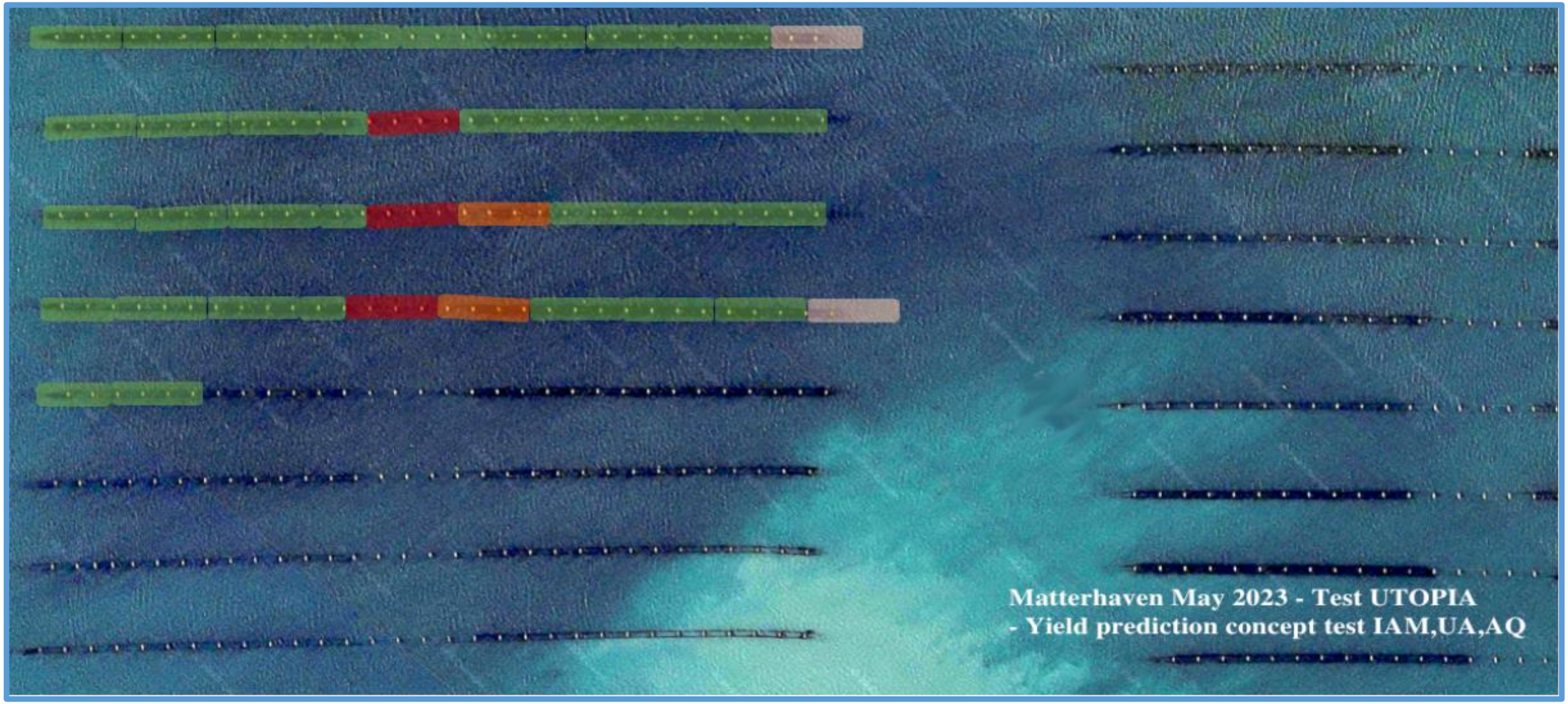


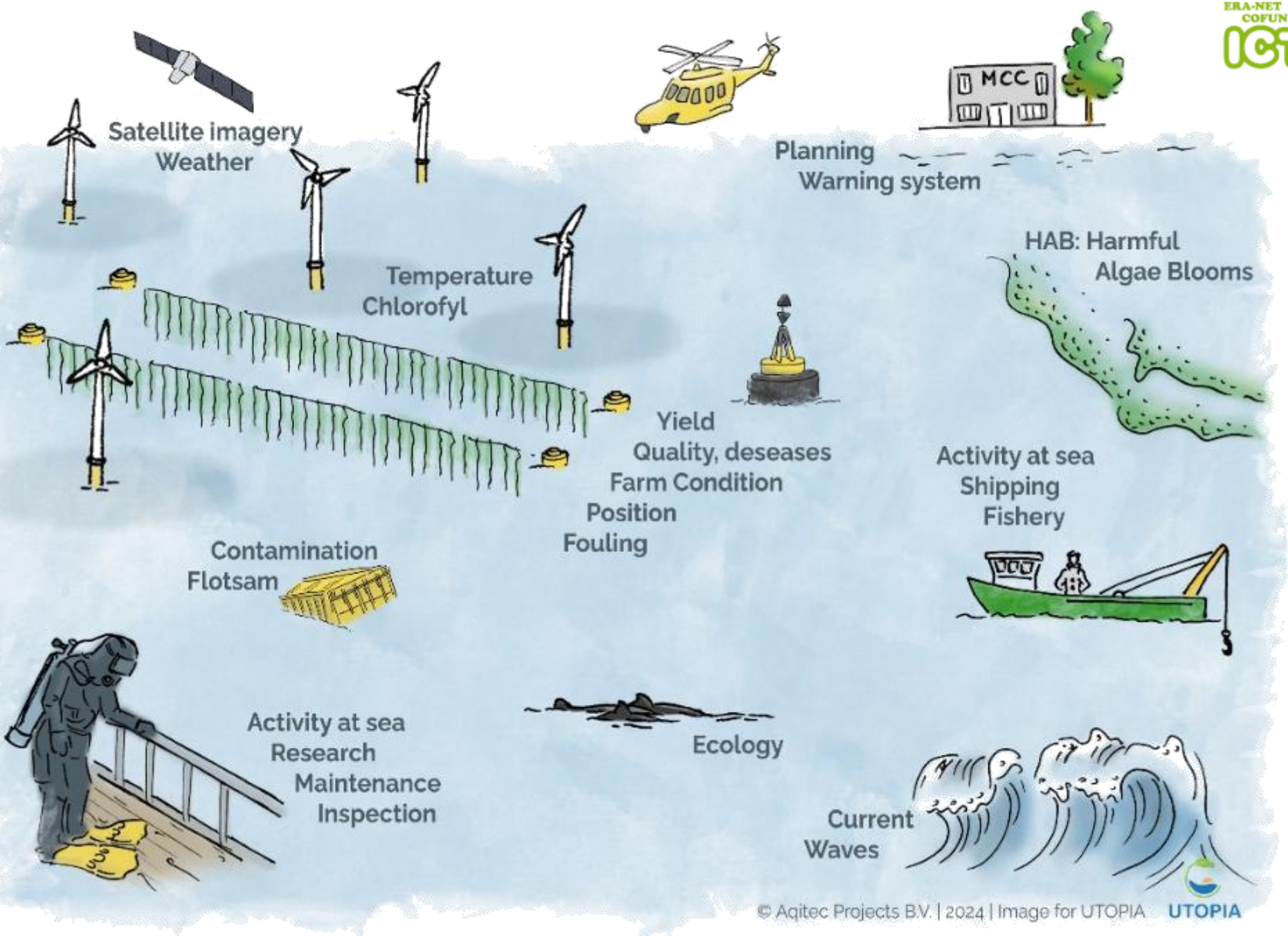
Sector Identification

Automated Yield est.



Seaweed use-case (Yield estimation)




Satellite imagery
Weather
MCC
Planning
Warning system
HAB: Harmful
Algae Blooms
Temperature
Chlorofyl
Yield
Quality, deseases
Farm Condition
Position
Fouling
Activity at sea
Shipping
Fishery
Contamination
Flotsam
Activity at sea
Research
Maintenance
Inspection
Ecology
Current
Waves
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UTOPIA

Standardisation efforts (Seaweed)

Long-Term Engagement

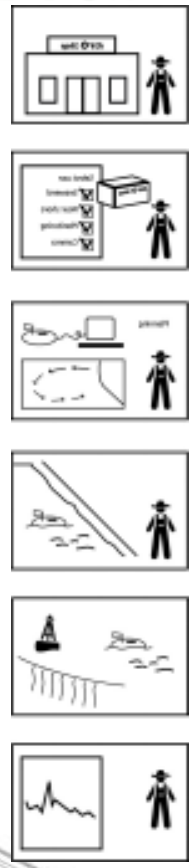
The **sea is an open system** with external effects and **many users**.

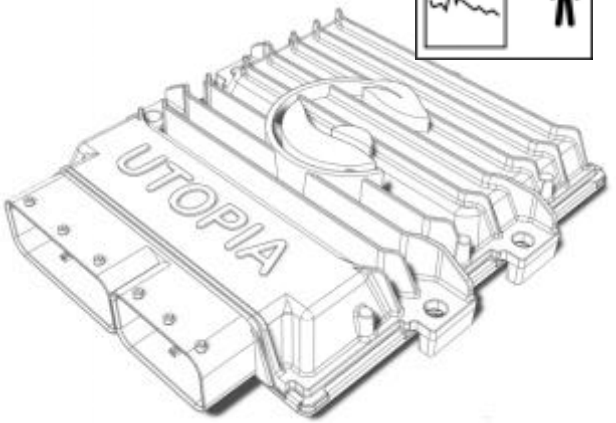
Smart seaweed farming can be part of integrated offshore data collection. A *smart seaweed farming system* will use data from (existing) sources and **generate site specific data** that may serve other stakeholders:

- Marine Coordination Centre (MCC) planning and controlling site operations
- Other users of offshore sites. For example wind park operators, wave or solar energy producers and nature enhancing initiatives
- Coast guard and regulating authorities
- Research institutes
- Certification and insurance companies

Cooperation with stakeholders, industry partners and/or public and private sector

- Interviews and Questionnaires with:
  - Farmers, Equipment Providers, Breeders & Propagators
  - Scientists, Buyers
  - Agri-Tech Startups (ongoing)
- Collaboration with selected farmers & foundations for experimen
  on their land. Outcomes are still to be discussed.
- Sister Company: Hardware with the pre-installed UTOPIA
  Framework to support agri-SMEs' adoption of smart farming.





Ongoing Review: Initial Conclusions and Lessons

- **Established Tech for Fast Adoption**: Leveraging ROS2, NGSI-LD/JSON-LD, Zenoh, and UTOPIA “virtual ROS2 sensor” interfaces for quick integration.
- **Diverse Use-Cases, Similar Functions**: Two distinct applications with almost identical core functional requirements.
- **Offshore Farming Potential**: A key enabler, though the industry is still gearing up for full readiness.
- **Proved crucial for the objectives**:
  - Accurate, Reliable (Multi-Source) Localization.
  - Datamodels with Tree/Sector-Specific Ontology
- **Multidisciplinary!**

LET'S KEEP IN TOUCH!

Please feel always free to reach out to us.

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