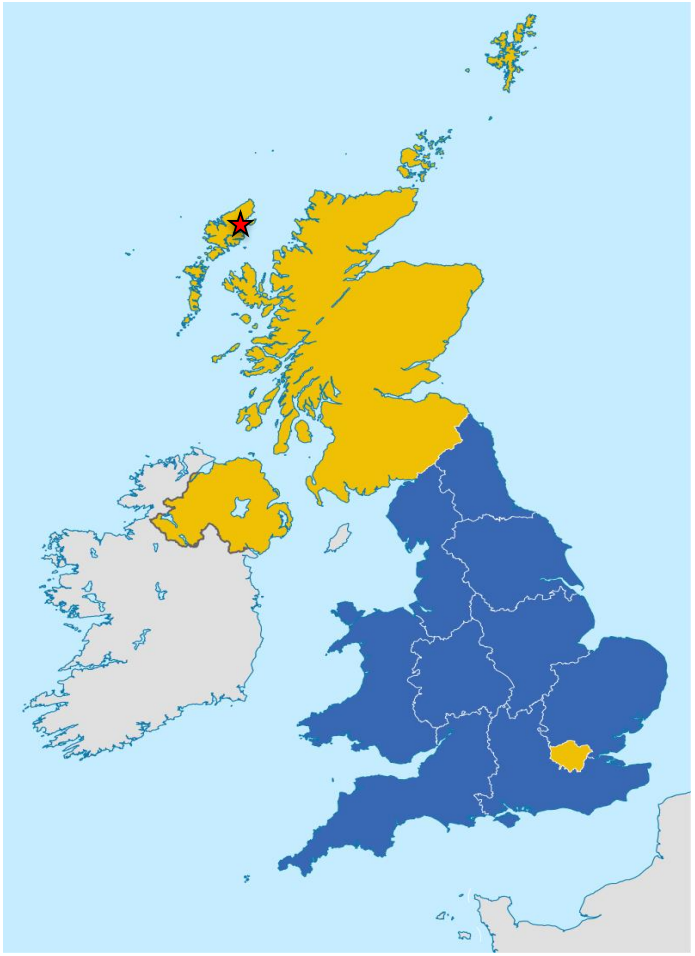
University of the Highlands and Islands
Lews Castle College
Oilthigh na Gàidhealtachd agus nan Eilean
Colaisde a' Chaisteil

Ceud Mìle Fàilte gu Eilean Siar!



United Kingdom NUTS location map.svg, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=49686687

MERIKA
Marine Energy Research Innovation and Knowledge Accelerator

- Renewable energy focussed engineering curriculum
- Energy research:
  - Low carbon buildings
  - Hydrogen economy
  - Coastal processes and marine energy

Highly dynamic environment

- Open Atlantic coast
- Large wave fetch
- Jet stream exposure

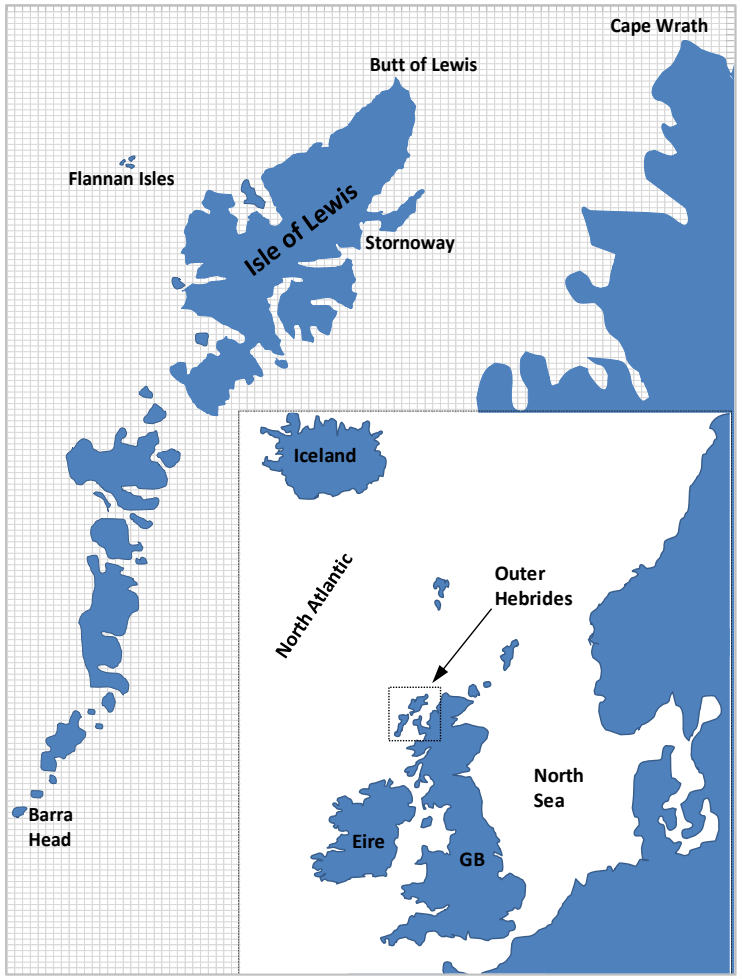
→ **Great wave resource!**

→ **annual average power = 42.4 kWm^{-1}**

adapted from https://www.google.co.uk/maps/

- 200 km from Butt of Lewis to Barra Head
- 200 km x 42.4 kWm^{-1} = 8.48 GW annual average power
- Compared against 3.2 GW rated output of new nuclear plant Hinkley Point C

(at £18bn budget + 35 year guarantee of £92.50 MWh^{-1})



- Marine Research at Lews Castle College UHI:
  - Physical environment and processes
  - Resource assessment
    - Numerical modelling
    - Data acquisition + management
  - Other
    - Beach morphology (numerical and surveying)
    - GIS mapping + spatial planning tools
    - Device performance testing (wave and tidal)
    - Hydrogen in marine applications

- Butt of Lewis lighthouse:
  - Build 1862 by David Stevenson
  - Windiest spot in the UK (Guinness Book of Records)
  - Light at 52 m
  - Huge waves, strong currents

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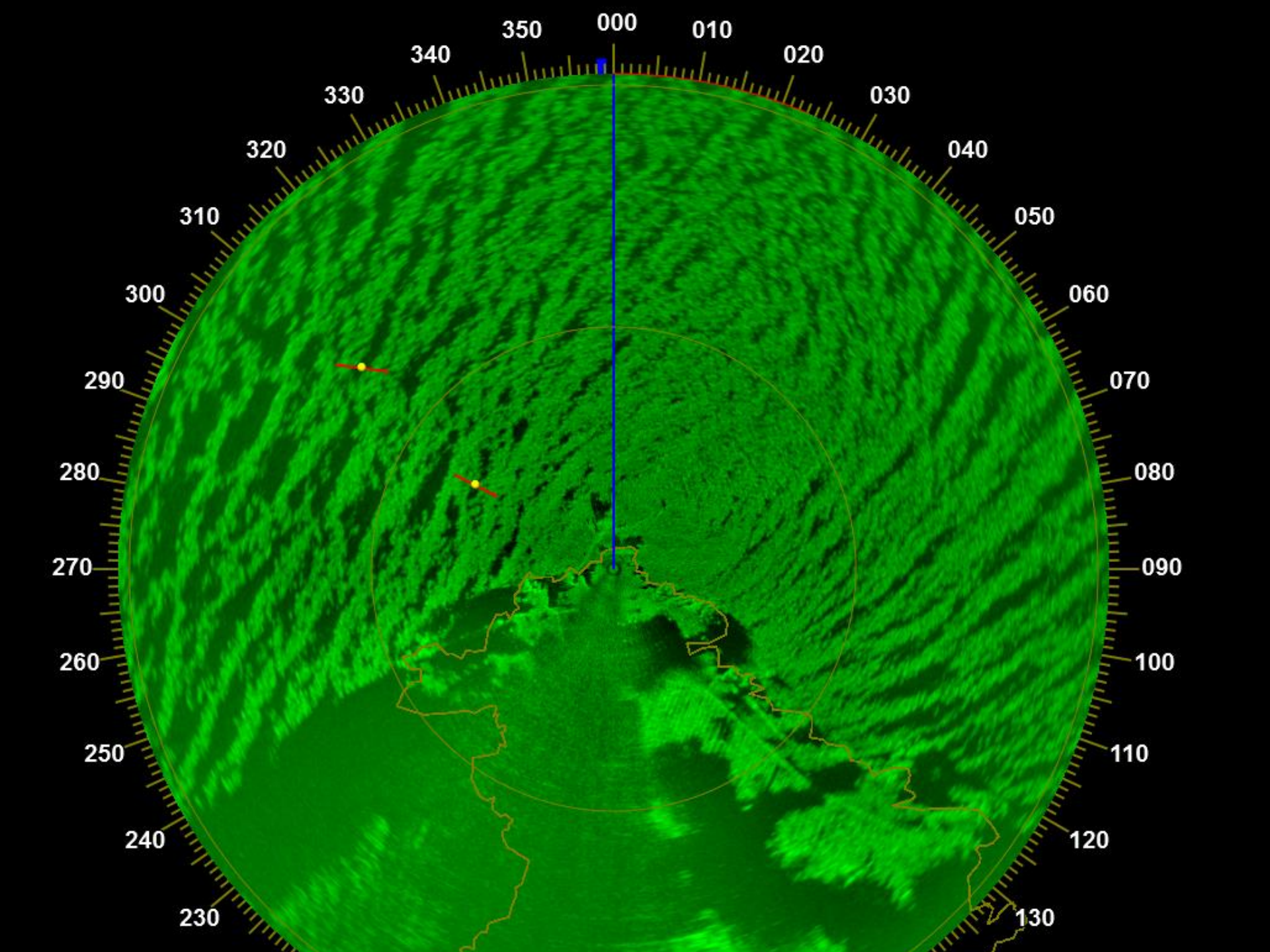
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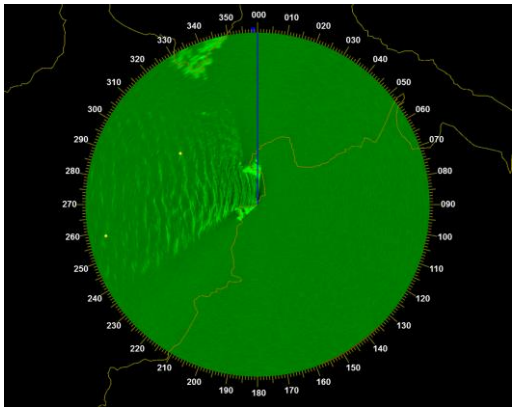
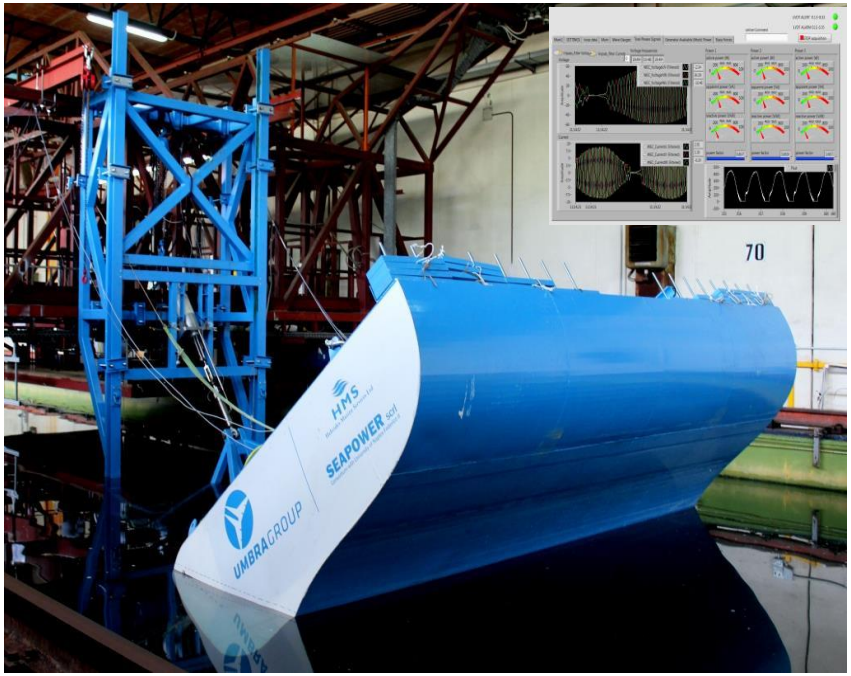
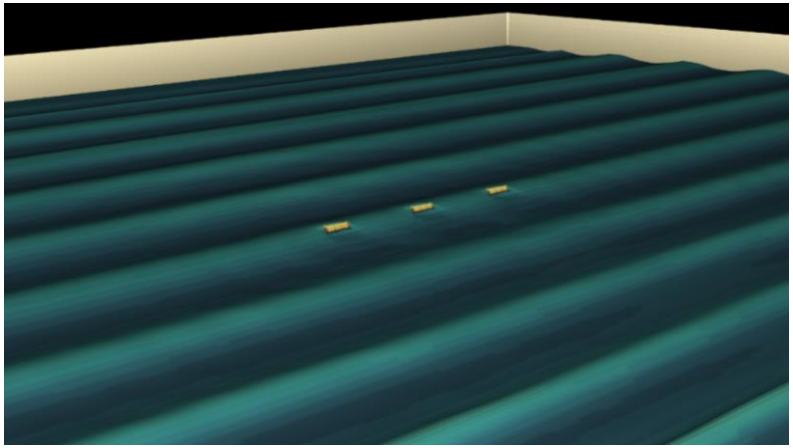
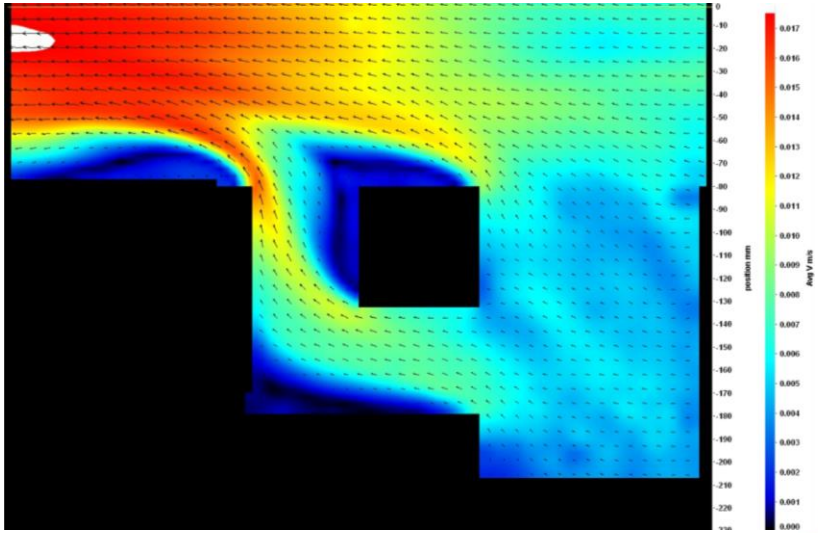
- X-Band radar applications
  - Short term wave forecasting
  - Marine energy converter device tuning
  - Extreme wave analysis
  - Quiescent Period Predictions (QPP)
    - Offshore helicopter landing operations
    - Crew transfer to offshore structures
    - Offshore lifting operations
  - Beastie detection and monitoring
  - Oil spill detection and tracking
  - Bathymetry changes



- Numerical models
- Physical modelling







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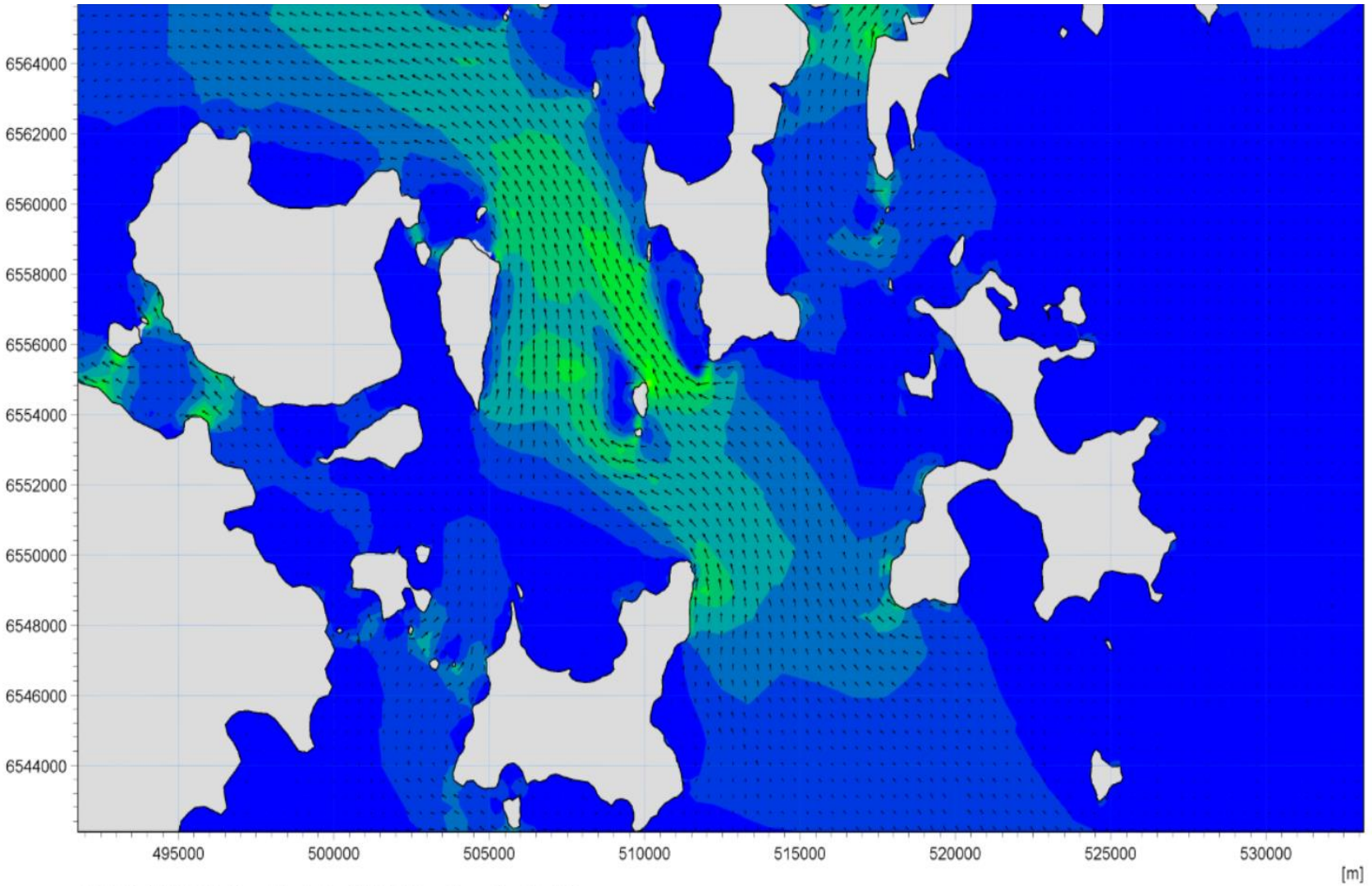

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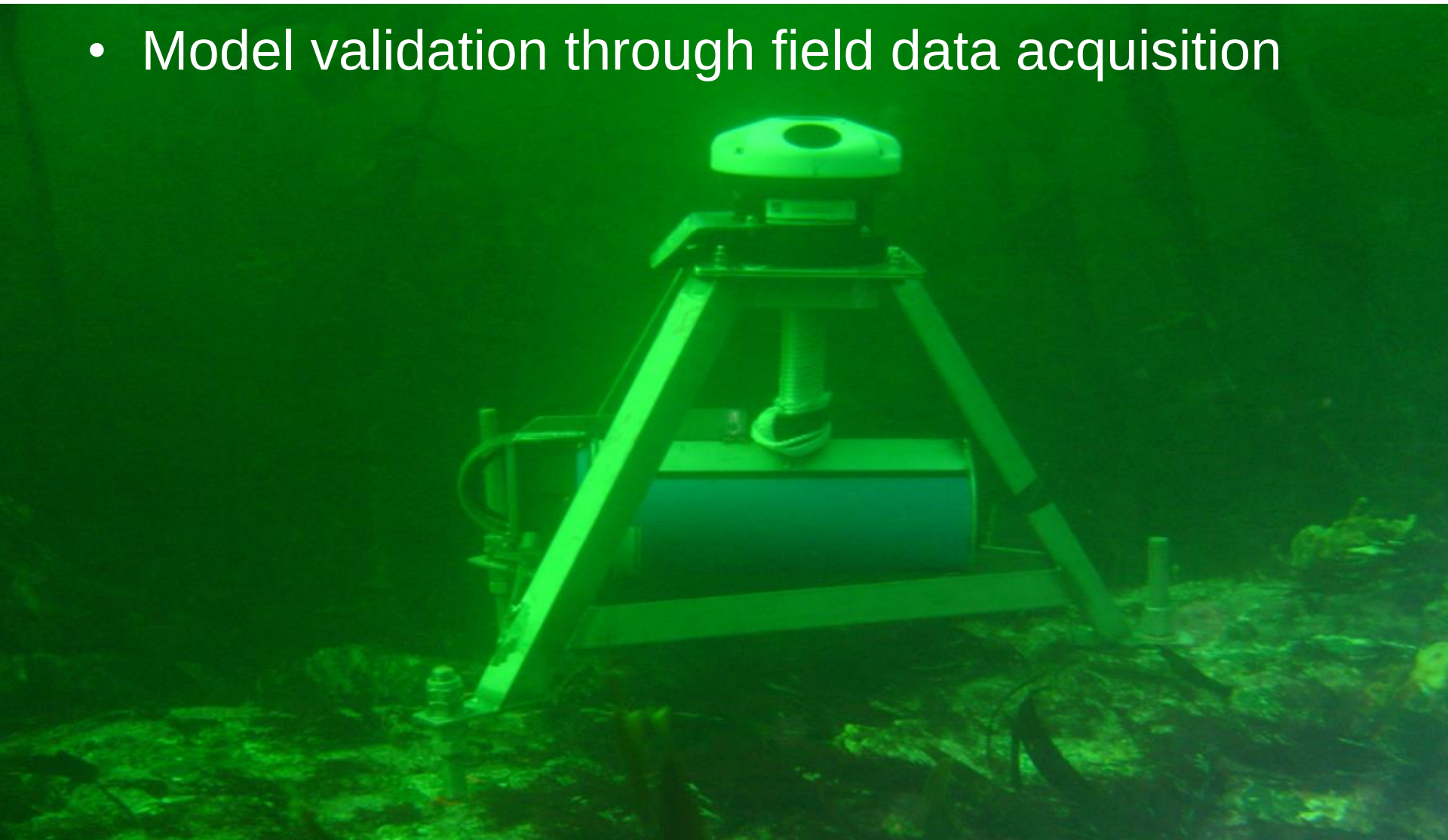
- Model validation through field data acquisition



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- Hydrogen in marine applications

- Transferability of skills: salvage and survey

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Thank you for your attention

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