Machine based image analysis in seabed assessments for decommissioning and wreck recovery

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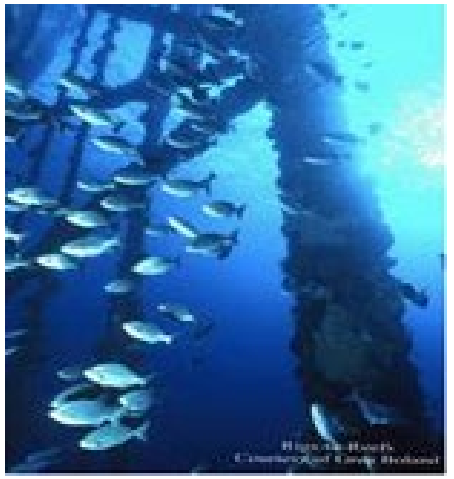
The problem



> Marine environments are **generally less visible** and **accessible** for observation and monitoring… therefore needs to be **recognised** for benthic Environmental impact assessments [1]

CIEEM Chartered Institute of Ecology and Environmental Management

[1] Chartered institutes of ecology and environmental management guidelines for ecological impact assessment in the UK and Ireland Terrestrial, Freshwater, Coastal and Marine

Current methods

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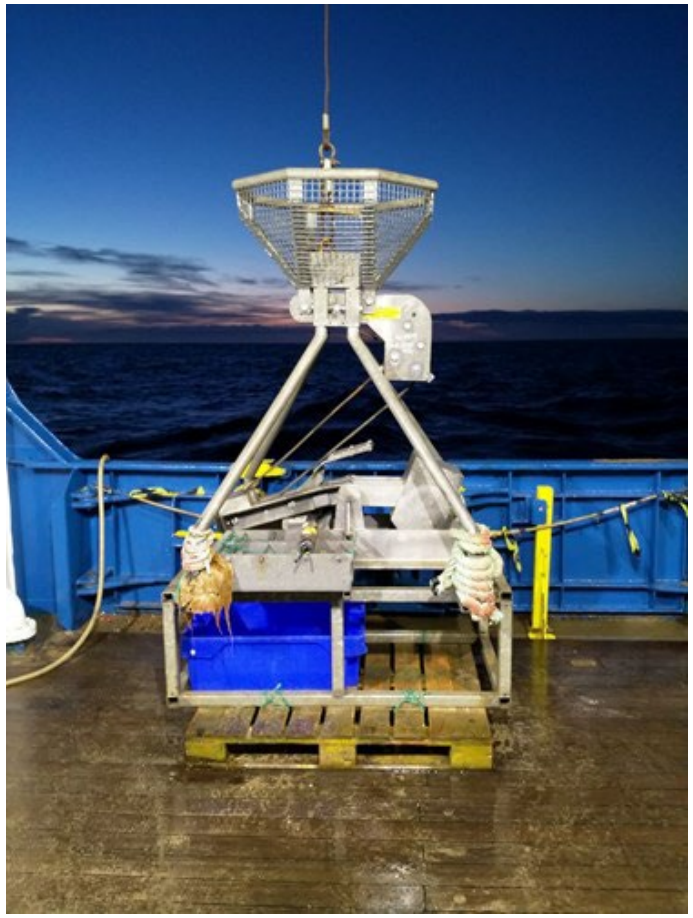
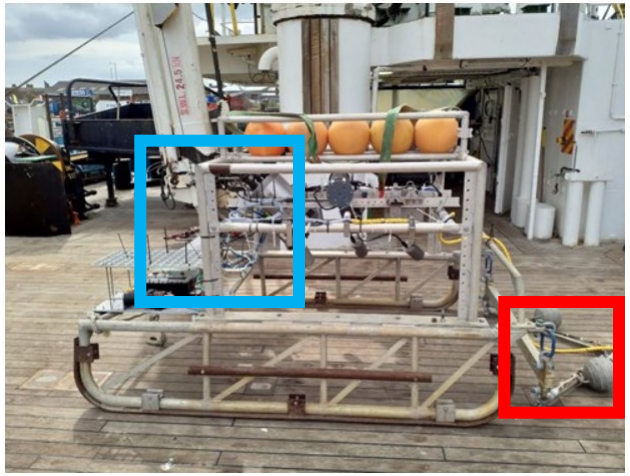
Current methods

Data collection





Tether

Camera

Photo credits:
Grab sampler, trawl and Camera sled: JNCC Data Collection: Survey Methods and Equipment https://jncc.gov.uk/our-work/data-collection-survey-methods-and-equipment/#scientific-trawls
ROV and annotated image: John Halpin

Current methods

Data annotation

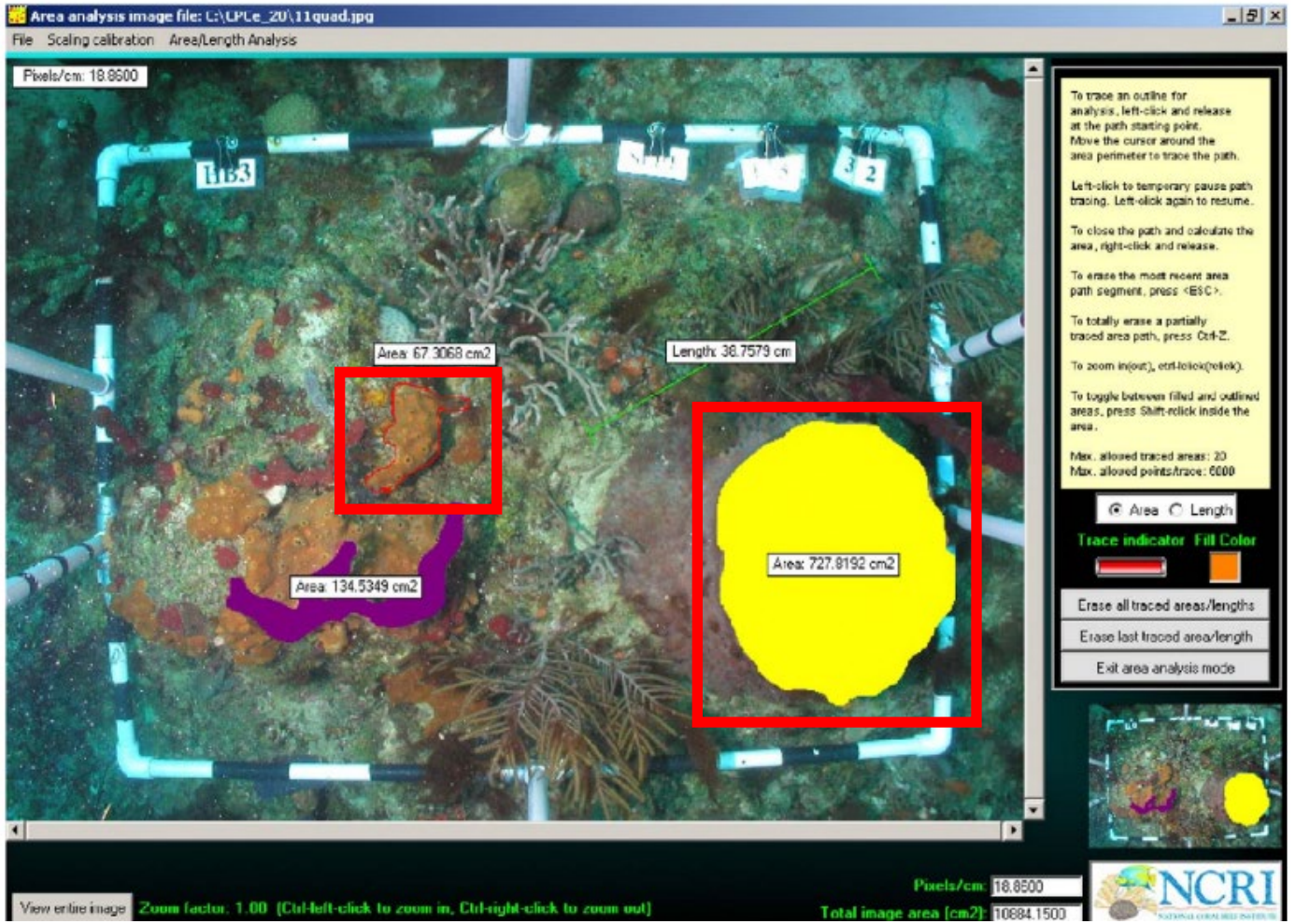


Photo credits:
Coral Point Count with Excel extensions (CPCe): A Visual Basic program for the determination of coral and substrate coverage using random point count methodology$ Kevin E. Kohler, Shaun M. Gill

My project

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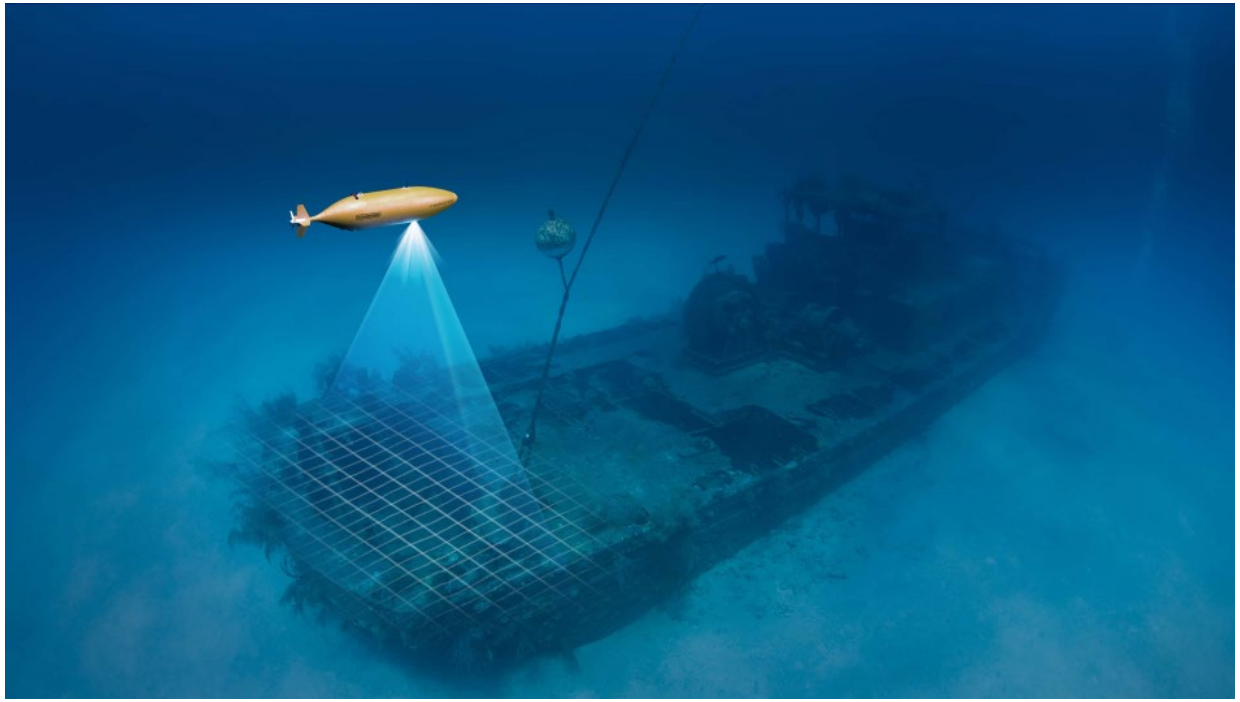
Goal:

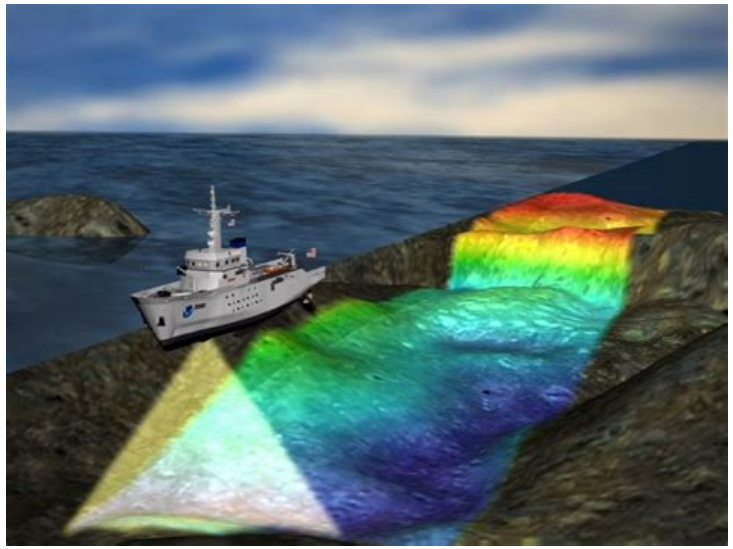
Have a machine (**software** and **hardware**) to assess the seabed and the species on it, in **cost effective, repeatable** and **certain** manner.

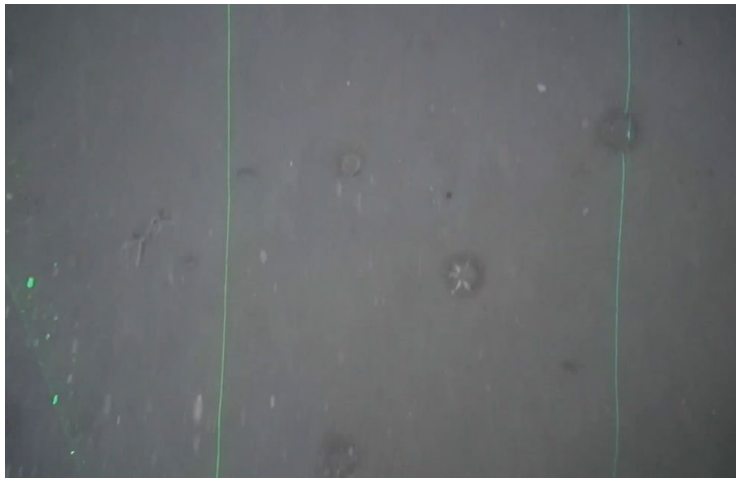


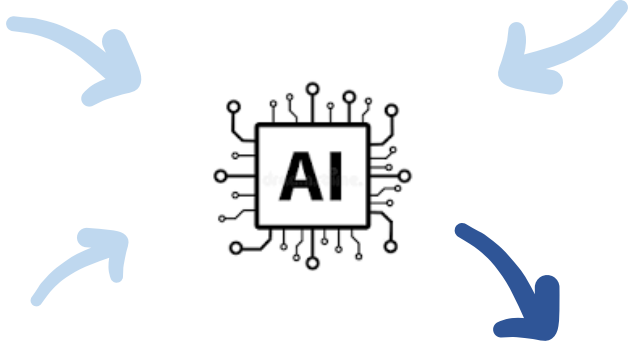
AUV

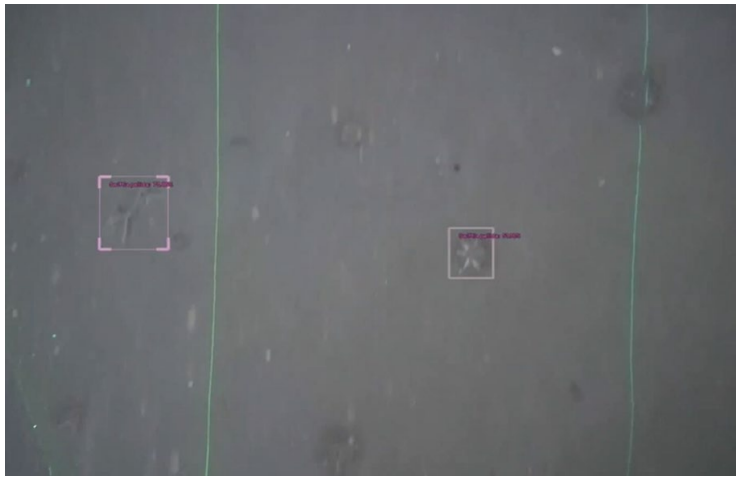
Photo credits:
AUV - Scottish Association of Marine Science website: https://www.sams.ac.uk/facilities/robotics/

AI species detection utilising data fusion



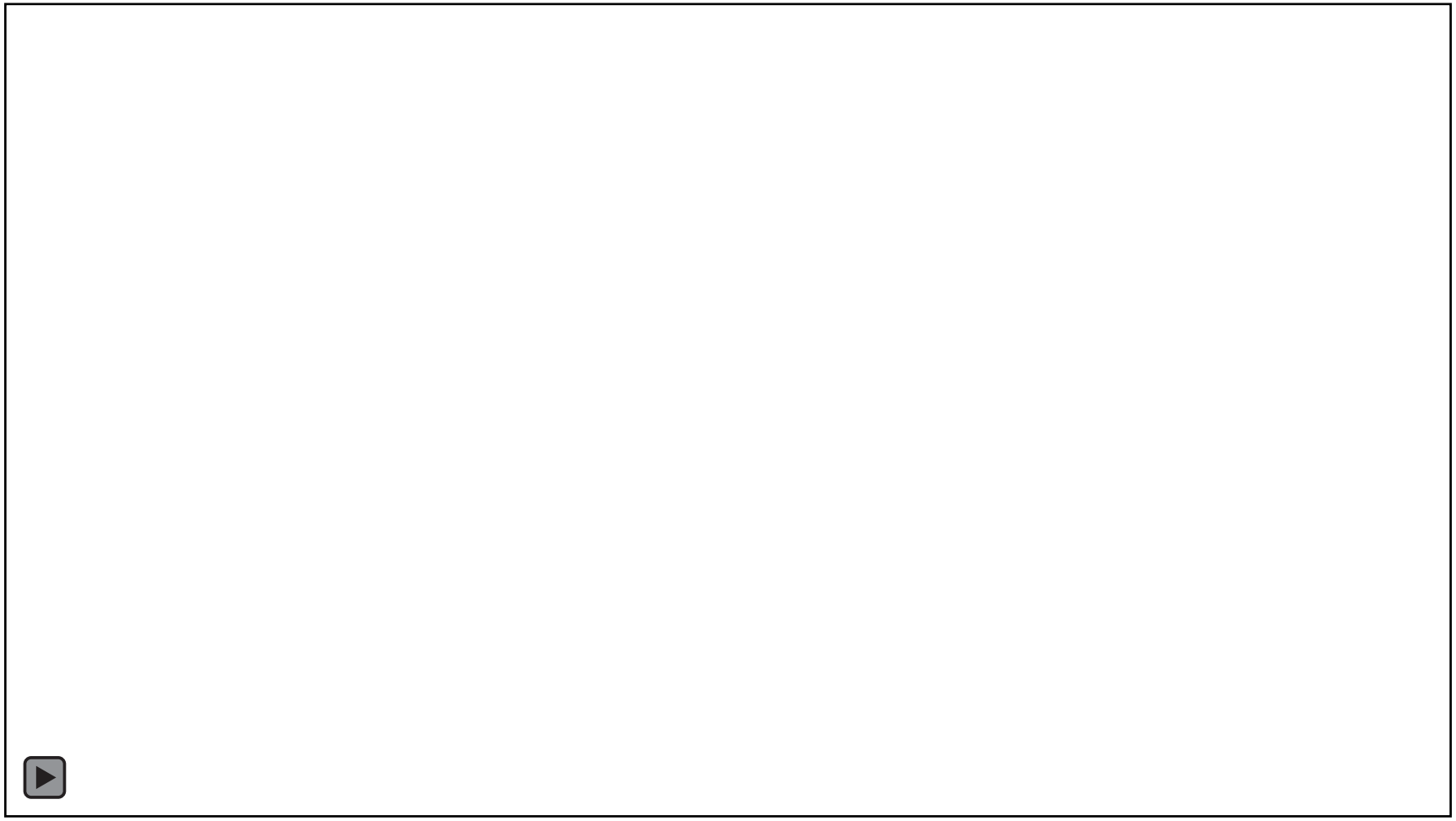






SEA AI at poster session 1 by John Halpin

Output of the AI



Video credits:
NS3D – North sea 3D poster at poster session 1 by Joe Marlow

The project

Previous data

Training data

AI

A usable product

GPUs

Assess

Varying hardware

Varying conditions

AUV data collection

Summary:

The problem

- The seabed observation is difficult but necessary for decommissioning and wreck recovery

We can collect data

- The AUV allows us to survey large sites and efficiently collect several different forms of data

We can categorise this with AI

- Can use machine learning to label these images giving a, relatively, cheap and effective surveying technique for decommissioning and wreck recovery

Any questions

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