

THORNTON LAB.

Ocean technology bringing our frontiers closer



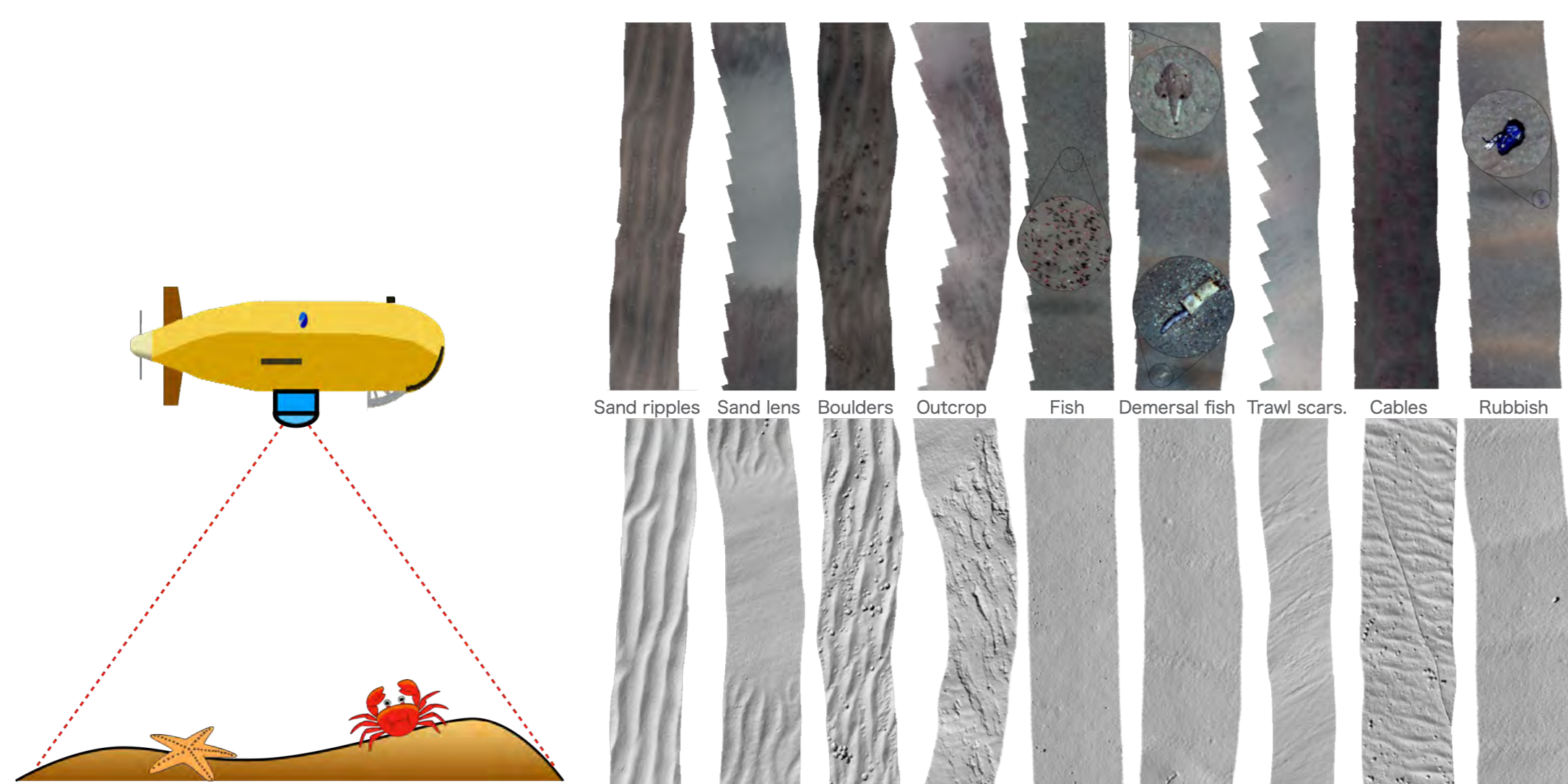
Department of Mechanical and Biofunctional Systems

Underwater Photonics

Robotic Sensing and Autonomy for Scalable Seafloor Monitoring

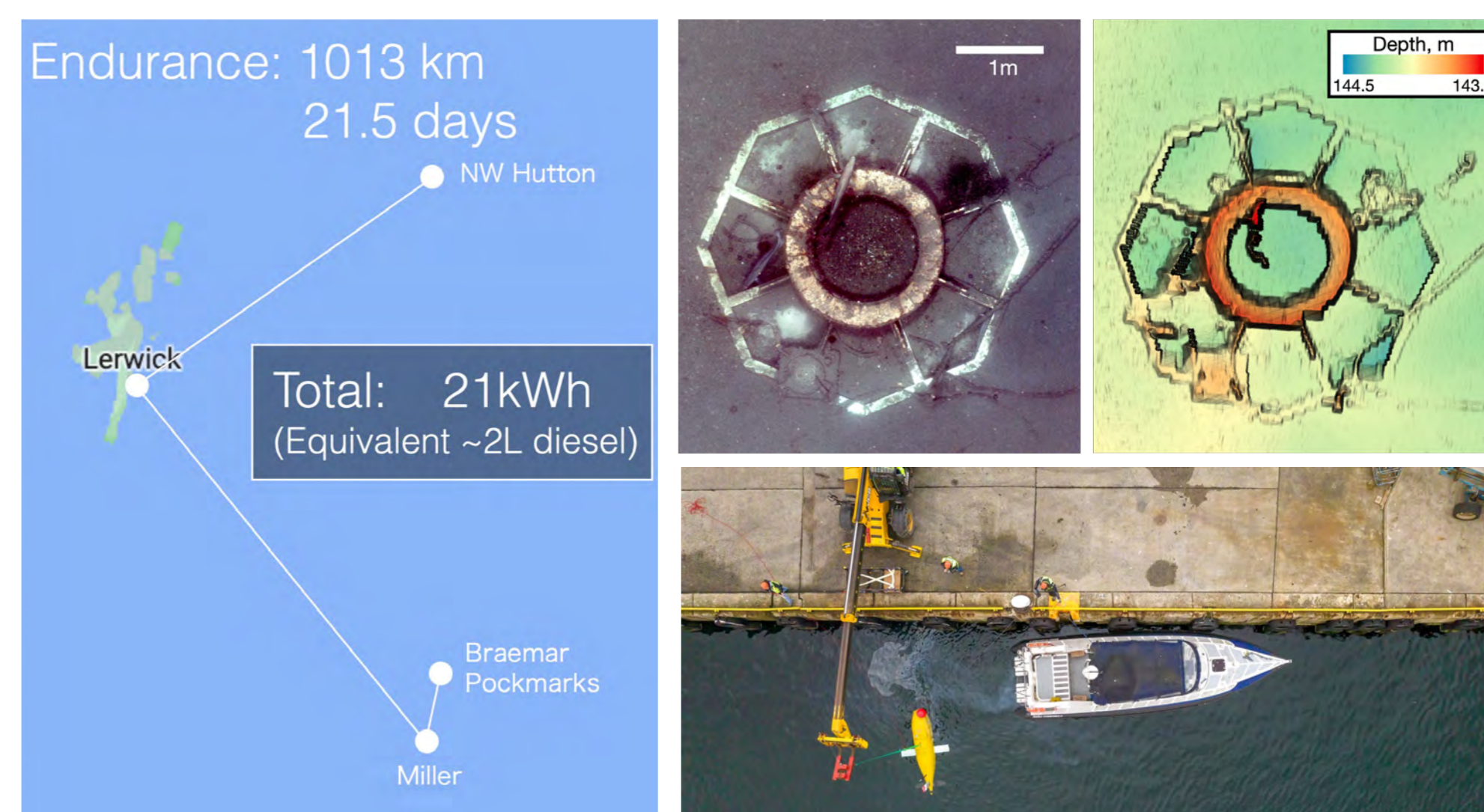
The ocean produces half the oxygen we breath and an increasing proportion of the food we consume. It is also home to the subsea cables that make the internet work and transmit renewable energy needed to meet global decarbonization targets. Monitoring the ocean and infrastructure we put in it is challenging because water limits the range of both our platforms and the signals they use to sense and communicate. Our laboratory develops the sensing and intelligence needed for robotic submersibles to interpret and efficiently summarize their observations so that they can operate independently for longer and monitor larger areas without relying on the physical human presence to support their operation.

High-resolution seafloor mapping



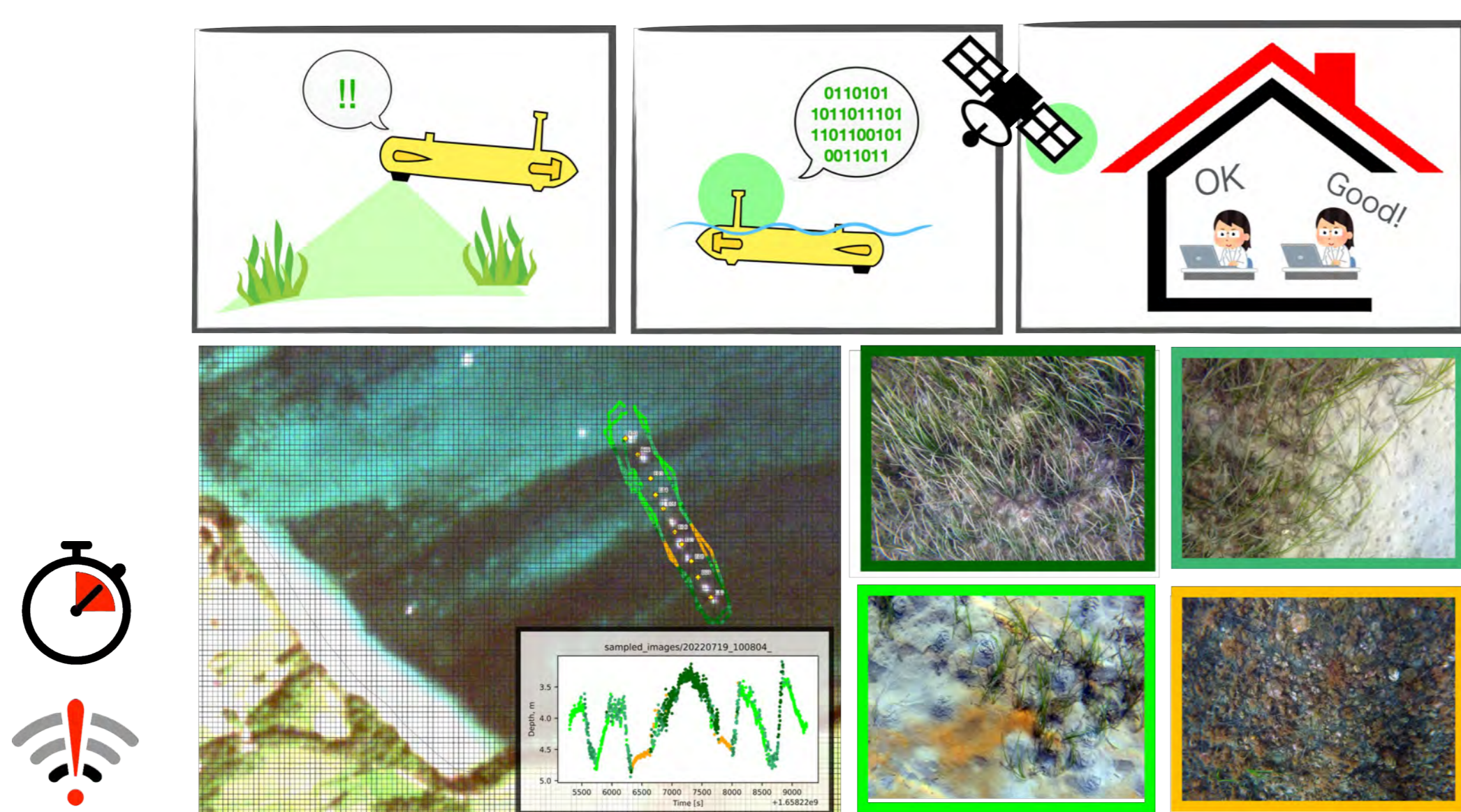
Mobile sensing to gather mm-resolution images and shape information for km-extent whole site survey

Over-horizon remote awareness



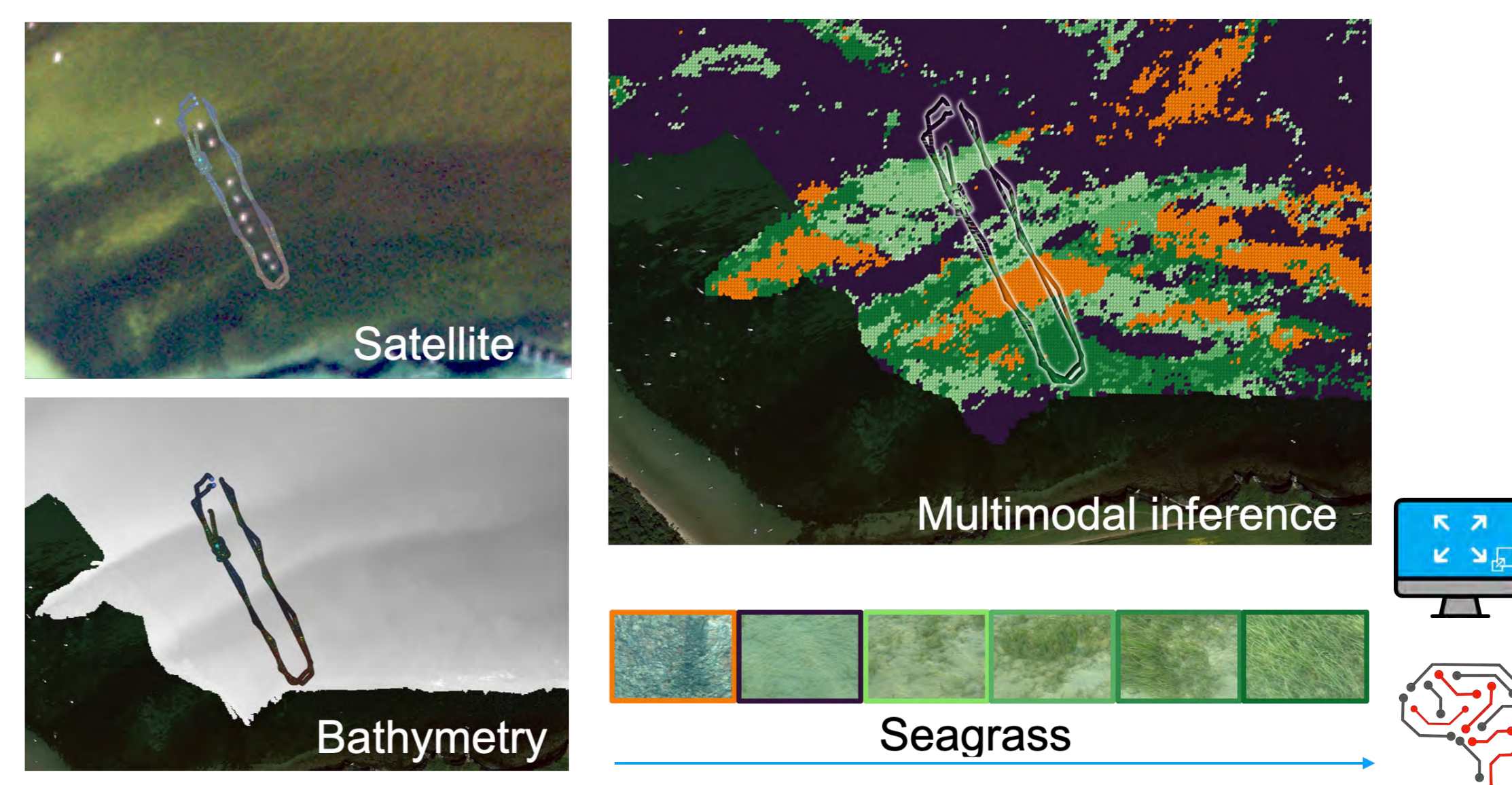
Remote awareness and mission management over satellite bandwidths for ship-free robotic operation

Automated survey summary generation



Rapid robotic summery generation of large image datasets for remote dataset interaction

Multimodal inference with remote sensing



Combining remote sensing data with in situ observations for wide area understanding of seafloor environments