MAPPING SEAGRASS HABITATS AND BUILDING CAPACITY FOR SATELLITE-BASED MONITORING IN SRI LANKA

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BACKGROUND

In Sri Lanka, national-scale data on seagrass habitat extent are limited, constraining effective conservation and management. At the same time, there is a requirement to build technical capacity in satellite-based monitoring among Sri Lankan institutions. Recent advances in cloud-based remote sensing, particularly through Google Earth Engine and Sentinel-2 imagery, now enable large-scale, standardised mapping of coastal habitats[1-3]. Harnessing these tools provides an opportunity to establish the first national seagrass baseline for Sri Lanka while strengthening national expertise in Earth observation for coastal ecosystem management.

SATELLITE BASED SEAGRASS MAPPING
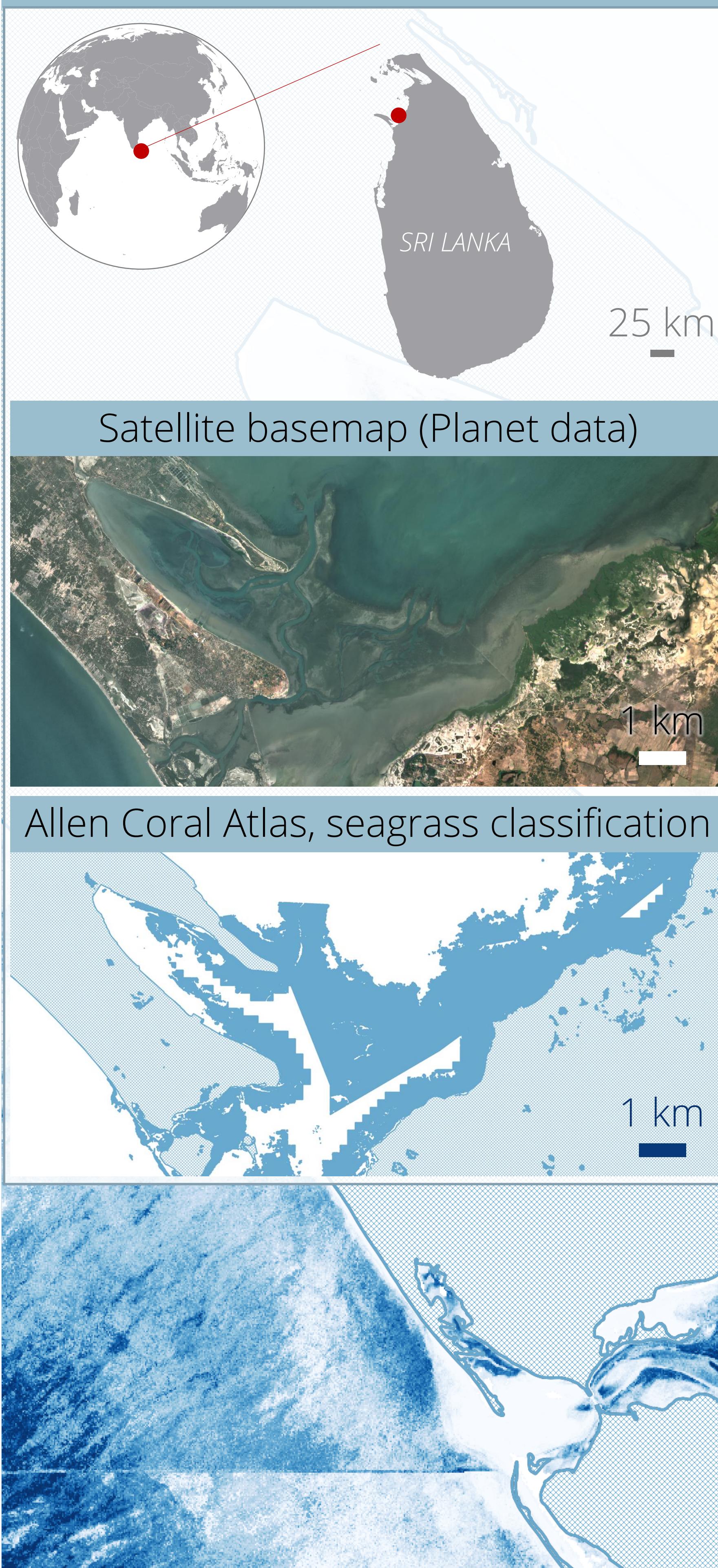
We have produced a national-scale seagrass probability map at 10 m pixel size. See below an example from Mannar (northwest Sri Lanka)

Satellite basemap (Planet data)

Allen Coral Atlas, seagrass classification

Photo-quadrat

Validation site

Highest probability seagrass

Lowest probability seagrass
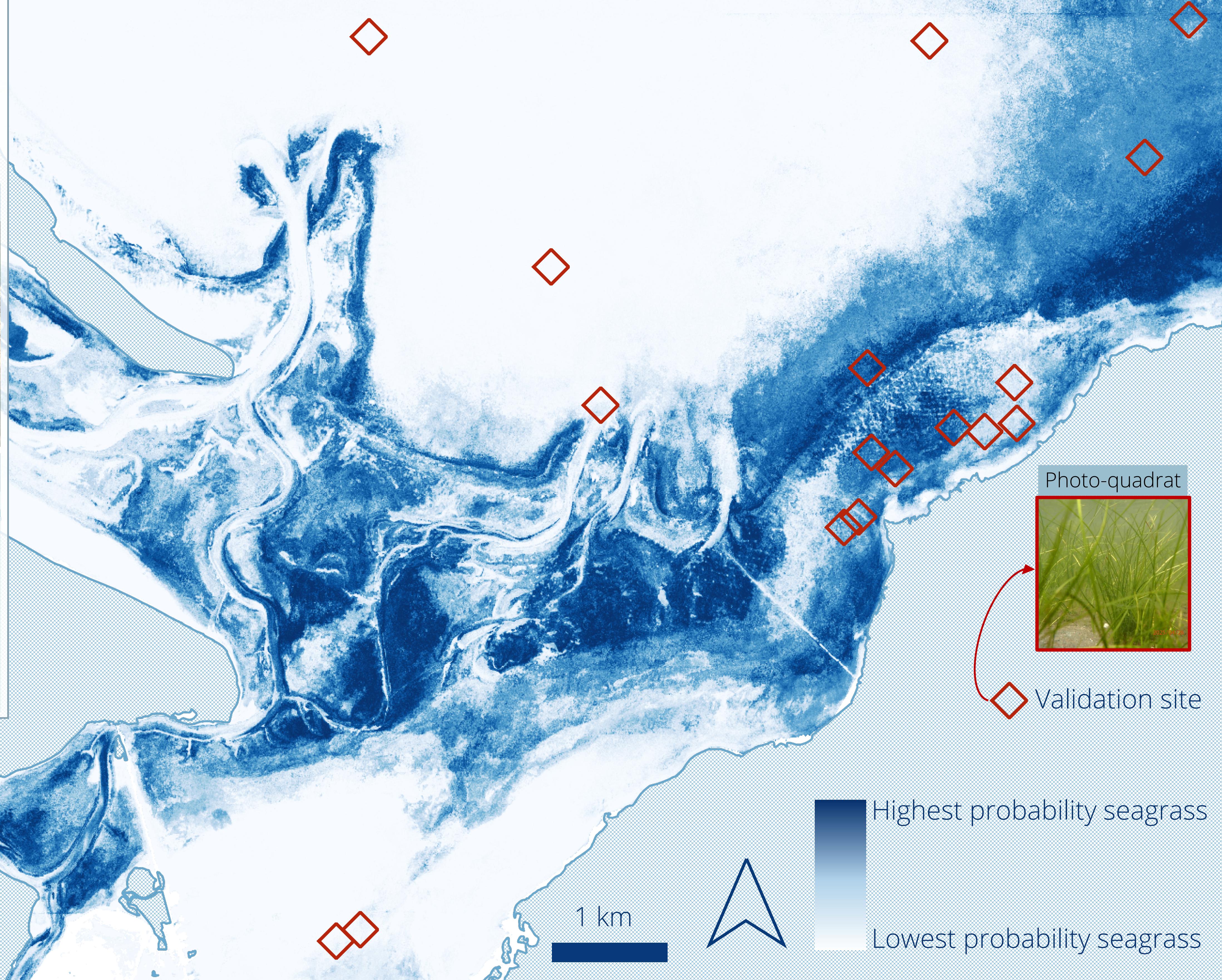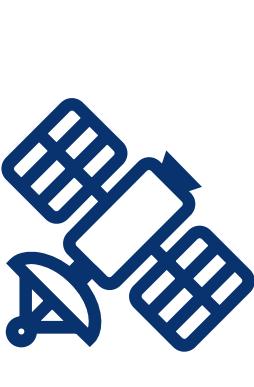
In Google Earth Engine we collated 3,579 Sentinel-2 scenes and used them to generate an image composite

We trained a Random Forest classifier to identify seagrass areas using >30,000 data points
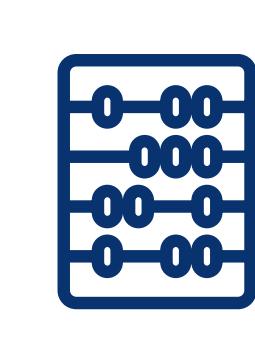
Classification outputs will be validated with data from 3,587 *in-situ* survey sites

CAPACITY BUILDING

This year we ran a week-long training workshop for 30 environmental professionals from Sri Lanka and the Maldives. The workshop covered GIS principles, remote sensing, and marine habitat mapping. Participants gained hands on experience using Google Earth Engine to map seagrass habitats in Sri Lanka.
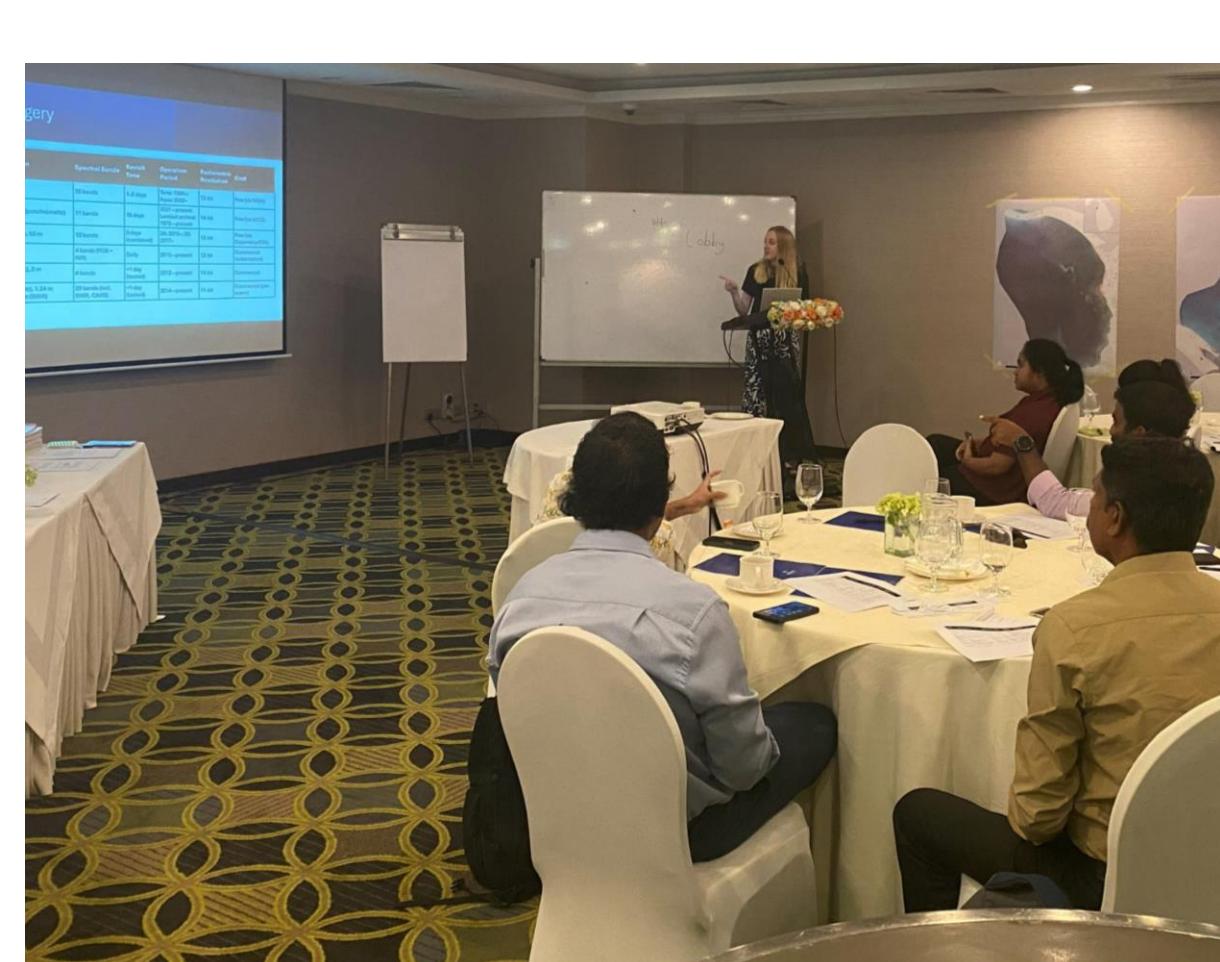
PARTICIPATORY MAPPING

During the workshop we facilitated a participatory mapping activity. Many of the workshop participants have expertise on seagrass habitat distribution and condition at specific sites and more generally across the country. The results from this activity will help validate the satellite maps.
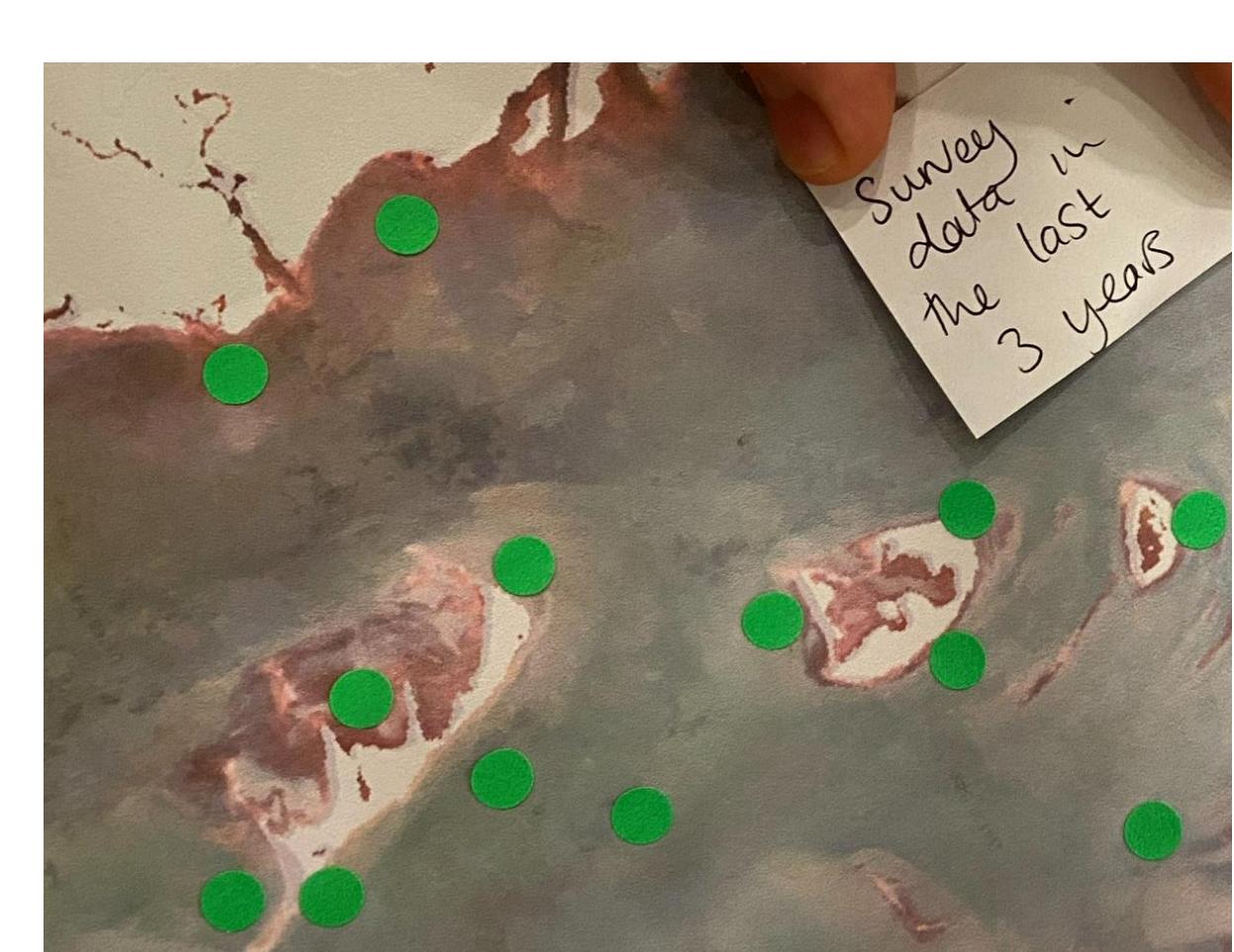
SUMMARY

The results from this work will provide the first national-scale seagrass habitat map for Sri Lanka. The data can inform localised habitat management and ecosystem accounting at the national level. Feedback from the workshop indicated that a high proportion (88%) of the workshop participants will use the skills learned in their own work. We hope that this workshop can build capacity for satellite-based habitat monitoring in Sri Lanka using open-source methods in Google Earth Engine.

REFERENCES

1. Floyd, M., East, H. K., & Suggitt, A. J. (2025). Evaluating methods for high-resolution, national-scale seagrass mapping in Google Earth Engine. *Remote Sensing in Ecology and Conservation*
2. Floyd, M., East, H. K., Traganos, D., Musthag, A., Guest, J., Hashim, A. S., Evans, V., Helber, S., Unsworth, R. K. F., & Suggitt, A. J. (2024). Rapid seagrass meadow expansion in an Indian Ocean bright spot. *Scientific Reports, 14*(1), 10879.
3. Traganos, D., Lee, C. B., Blume, A., Poursanidis, D., Čižmek, H., Deter, J., Mačić, V., Montefalcone, M., Pergent, G., Pergent-Martini, C., Ricart, A. M., & Reinartz, P. (2022). Spatially Explicit Seagrass Extent Mapping Across the Entire Mediterranean. *Frontiers in Marine Science, Volume 9-2022*.