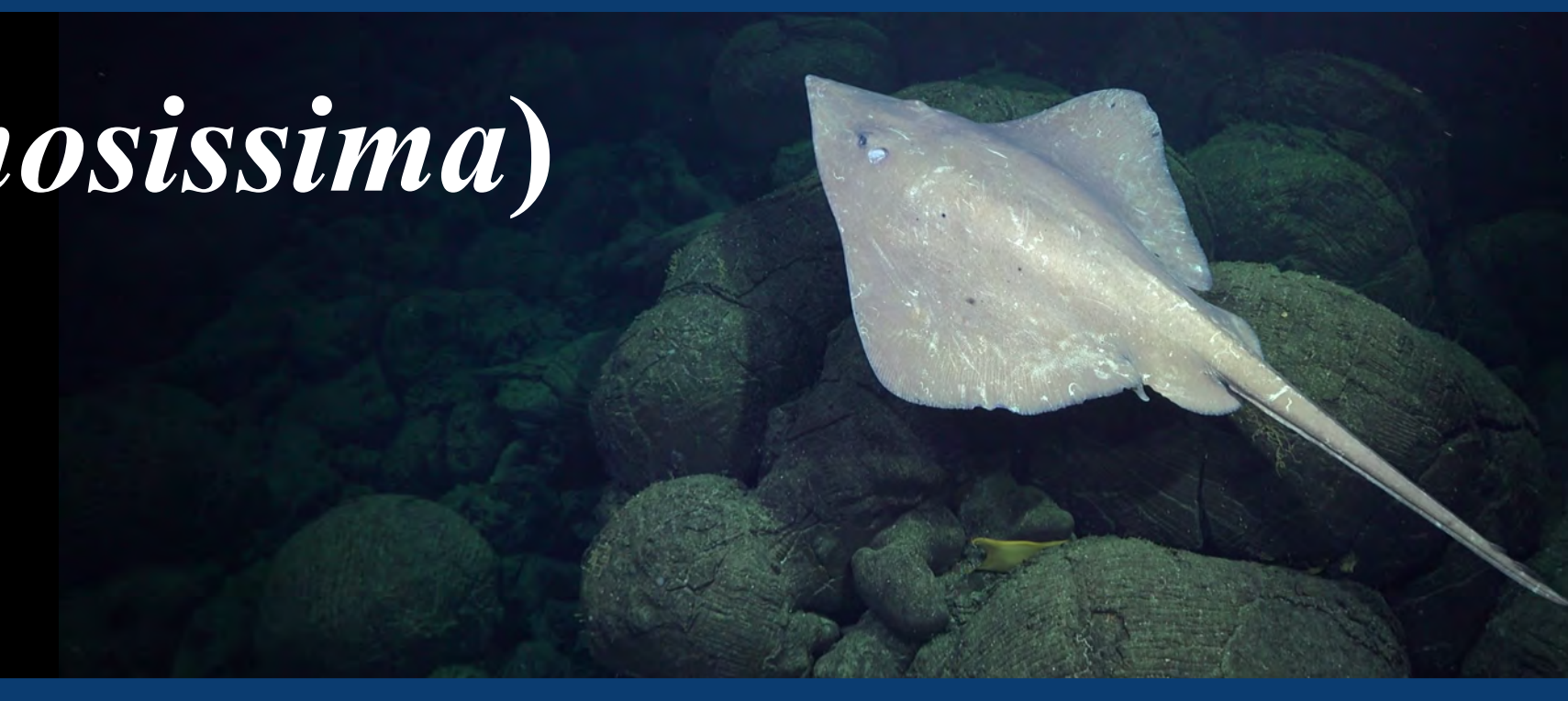


# High-resolution mapping of Pacific white skate (*Bathyraja spinosissima*) nursery habitats at a Galápagos hydrothermal vent field

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## Introduction

- Pacific white skate (*Bathyraja spinosissima*) eggs were discovered at an active Galapagos hydrothermal vent field.
- *B. spinosissima* were speculated to incubate their eggs at these vents, but habitat selection for these skate egg nurseries remains unconfirmed.
- Our study aimed to investigate what environmental predictors and geomorphological structures are these skates targeting.

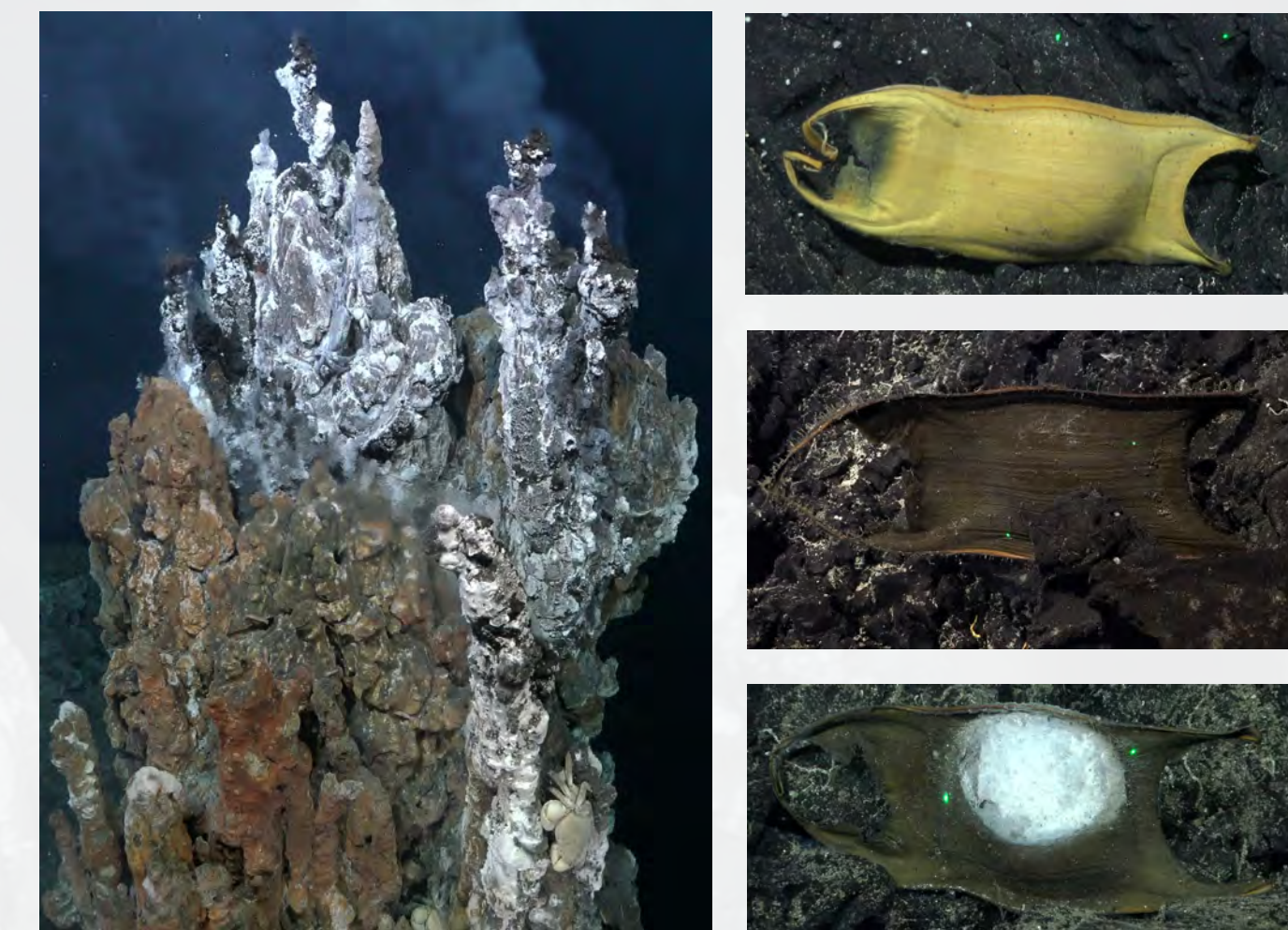


Figure 1 Active vent (left) and skate eggs (right) showing 3 colours: yellow-green (top), brown (middle), and white (bottom).

## Methods

- Processed ROV footage and georeferenced skate eggs and vents on BIIGLE.
- Derived bathymetry into environmental predictors and generated a geomorphology map on ArcGIS Pro.
- Extracted vent distance and direction from skate egg and vent points.
- Generated random forest habitat suitability model on RStudio.

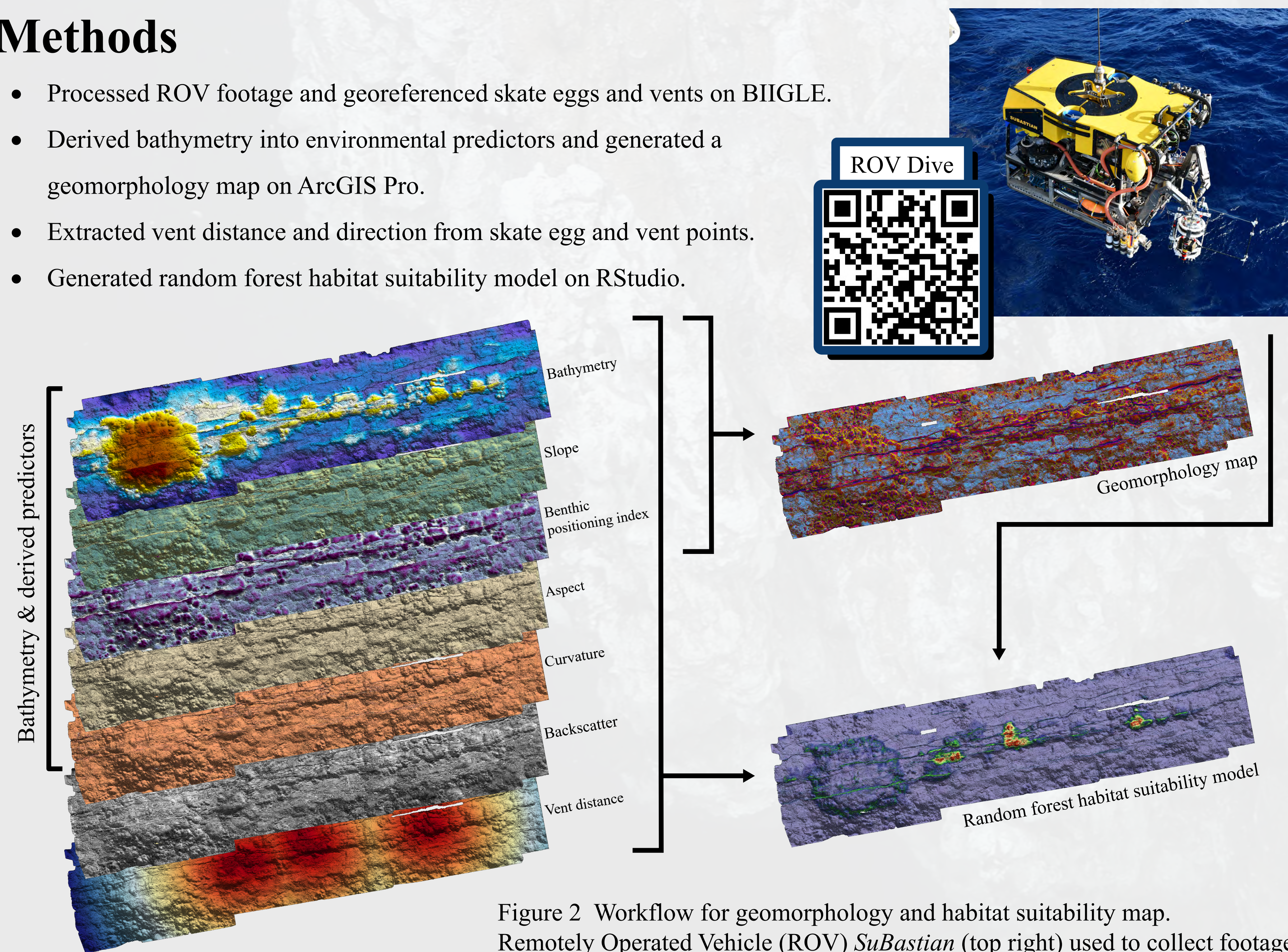


Figure 2 Workflow for geomorphology and habitat suitability map. Remotely Operated Vehicle (ROV) *SuBastian* (top right) used to collect footage.

## Conclusion

- Skate eggs are within 50 m and southeast from active vents.
- Our study reveals that Pacific white skates are targeting vent distance, bathymetry, broadscale BPI and narrow-flat ridges for their nurseries.



## Acknowledgment

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## Results

- Skate eggs were 0-50 m and southeast from active vents and were on narrow-flat ridges.
- Mean AUC: 0.98; OOB: 6.01%; Variable of importance: vent distance, bathymetry, and broadscale benthic positioning index; Model accuracy: 94%; Kappa value: 0.94.

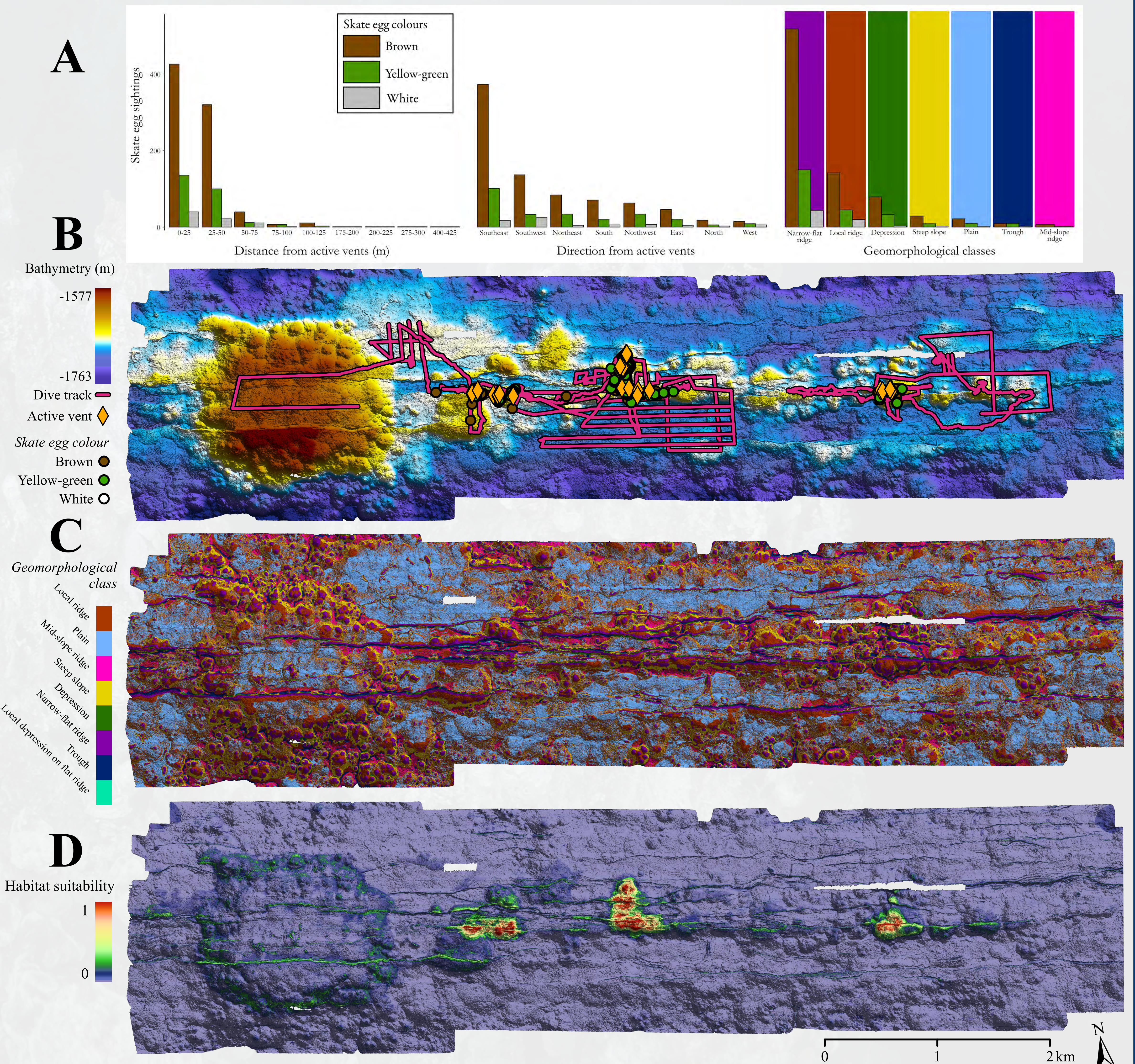


Figure 3 (A) Skate egg histograms for vent distance, vent direction and geomorphology. (B) Bathymetry map with skate eggs, active vents and dive track. (C) Geomorphology map. (D) Random forest habitat suitability map.