

Supplementary Material

Identification of Black Reef Shipwreck Sites Using AI and Satellite Multispectral Imagery

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List of all known shipwrecks that have developed a discoloration in their surrounding environment developing a “black reef” (Table S1). We have available imagery only for the ones that were used in this study while for the rest there is bibliography that indicates their existence.

Table S1: List of all known shipwrecks that have developed a discoloration in their surrounding environment developing a “black reef”.

Reef	Number of shipwrecks	Coordinates (WGS84)
Canton	1	-2.814997, -171.7151
Nikumamoro	1	-4.6608, -174.5450
Kingmans	1	6.4049 -162.351339
Kenn	11	Used for training 1. -21.257019, 155.780382 2. -21.254144, 155.780249 3. -21.256865, 155.785203 4. -21.253460, 155.792848
		Used for testing 5. -21.266294, 155.751474 6. -21.261727, 155.765001 7. -21.260455, 155.763734 8. -21.260200, 155.766308 9. -21.258671, 155.770358 10. -21.256630, 155.768815 11. -21.258416, 155.771783
Rose	1	Used for testing -14.549244 -168.166467
Palmyra		5.8773 -162.1188
Myrmidon		-18.265867 147.385947

Millennium		–10.0028, –150.221170
Tabuaeran		3.9096, –159.3845 plane wreck 3.857900, –159.3585 shipwreck
McKean		–3.595437, –174.123249
Enderbury		–3.130241, –171.084144 Only small iron objects
Jarvis		–0.3741, –159.99 Only small iron objects
Starbuck		–5.6428, –155.8838
Rawaki		–3.7207, –170.7117
Carondelet reef		–5.5669, –173.8484 Shipwreck debris

The figures below show the Kenn (Figure S1) and Kingman (Figure S2) reef respectively and a zoomed part indicating the location of black reefs in their surrounding environment. In both cases the wrecks are not visible, however, we can confirm their presence by the development of this discoloration.

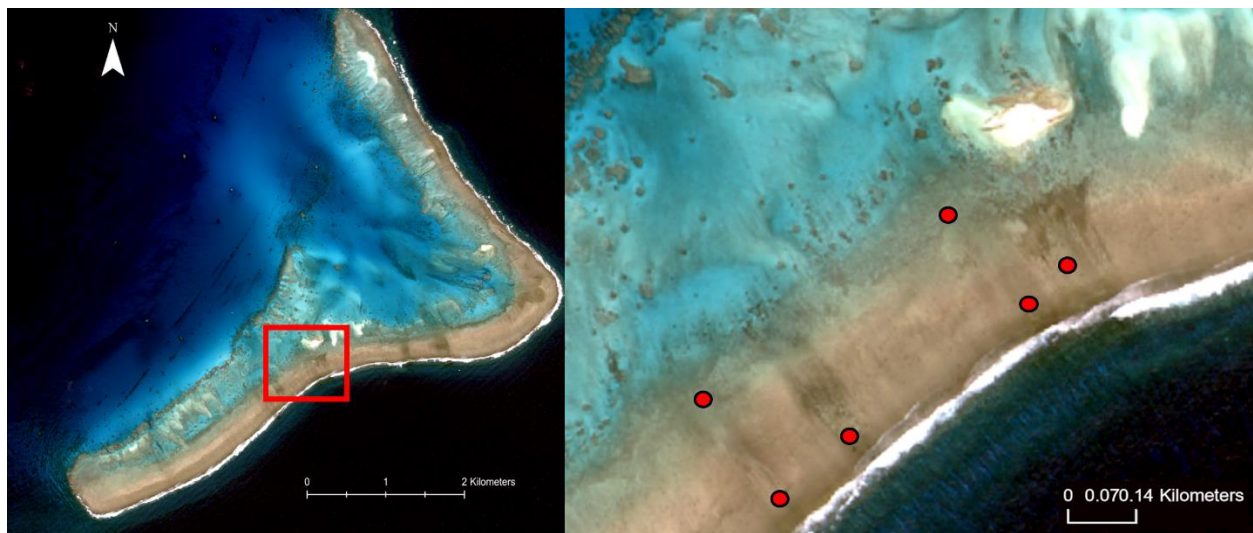


Figure S1: The left image shows the Kenn reef (Vision-1) and right image is the zoomed part included in the red rectangle of the left image. The red dots indicate the location of the shipwrecks.

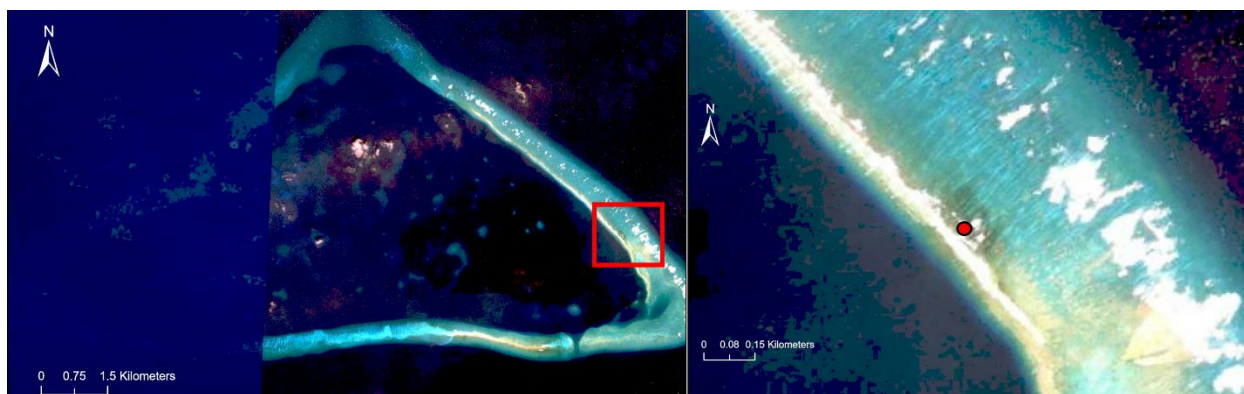


Figure S2: The left image shows the Kingman reef (Google Earth imagery, 2013) and the right image is the zoomed part included in the red rectangle of the left image. The red dot indicates the location of the shipwreck.

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