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A) Table DR1. Locality, seacliff descriptions, and GPS coordinates for the eight Holocene sections from the Huon peninsula, Papua New Guinea.

Locality	*GPS Coordinate*	*Description*
Kilasairo River	6° 7' 31.20" S 147° 37' 44.33" E	Holocene reef crest deposits; 8.5 m high seacliffs.
Bonah River	6° 10.4598 S 147° 40.0110 E	Holocene reef crest deposits; 7.3 m high seacliffs. Holocene lagoonal deposits landward; approx 4 m high exposure.
Pukau	6° 12.0762 S 147° 40.4047 E	Holocene reef crest deposits; lower 4 m of seacliffs.
Loto Beach	6° 17.2063 S 147° 45.3676 E	Holocene reef crest deposits; 9.5 m high seacliffs.
Sang River	6° 17' 46.02" S 147° 46 40.38" E	Holocene reef crest deposits; 5.5 m high seacliffs.
Midway Cove	6° 18.2800 S 147° 47.0428 E	Holocene reef crest deposits; 12 m high seacliffs.
Hubegong dive site	6° 18.84 S 147° 47.52 E	Holocene reef crest deposits; lower 2 m seacliffs.
Wondakai	6° 17.04 S 147° 44.67 E	Holocene reef crest deposits; lower 2 m of seacliffs.

B) Table DR2. Sampling protocol for the Holocene paleoecological surveys based on 25 m long transects from the Huon Peninsula, Papua New Guinea.

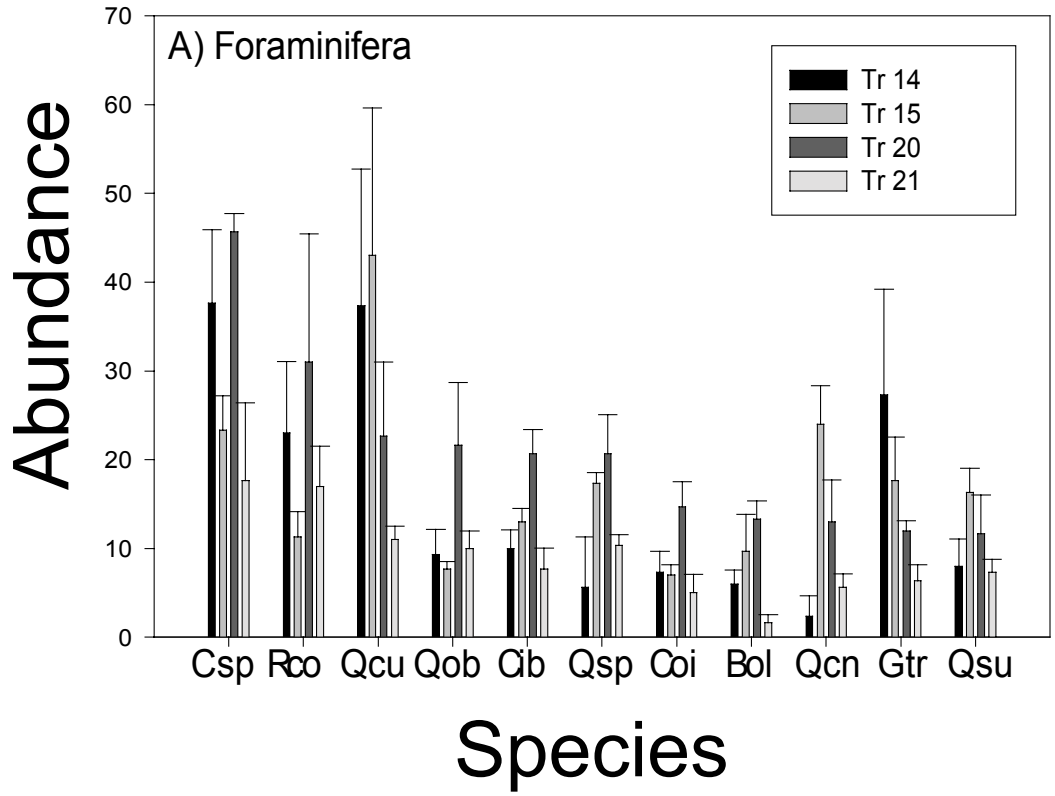
Taxa	***Transect length (m)***	***Sampling protocol***	***Taxonomic level***	***Overall diversity***
Corals	25	Length of every coral colony was measured, along with growth form and position and fragmentation[1]	Genus and *Acropora* species groups	25 OTUs
Coralline algae	10	All corallines collected and relative abundance estimated in field and confirmed in lab	Species	24
Gastropods	25	Sampled for 5 h from 50 cm above to 50 cm below transect tape	Species	294
Foraminifera	25	Three bulk samples, each separated into 10 cc splits to each yield > 300 specimens	Species	73

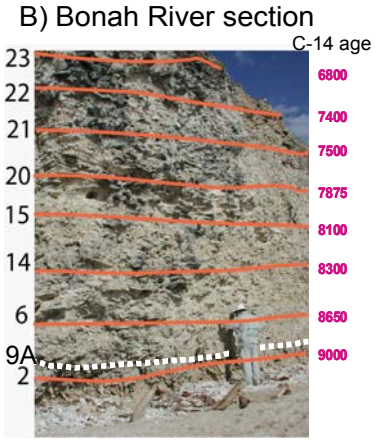
[1]Each coral was photographed and a portion was collected for subsequent identification.

C) Table DR3. Radiocarbon-dated samples used in this study. Correction to calendar years before present achieved using the intcal04.14c calibration dataset via the CALIB program (Reimer et al., 2004; Stuiver and Reimer, 1993; see main text for references)

Locality	Locality sample prefix	Sample #	Material	Elevation above mean high water spring tide level (metres)	conventional ^{14}C age (years BP)	+/-	reservoir corrected* ^{14}C age (years BP)	+/-	Calibrated 1 sigma age range (cal yr BP)	Calibrated 2 sigma age range (cal yr BP)
Kilasairo R. SE	KIL-	3762	head coral	1.5	8212	76	7805	92	8451-8716	8412-8976
		3801	head coral	1.5	8308	74	7901	90	8597-8972	8541-9006
		4216	*Goniastrea*	1.6	8248	62	7841	81	8485-8852	8451-8978
		4217	*Acropora*	1.6	8036	94	7629	107	8352-8543	8193-8626
		3800	platy coral with clam embedded in it	1.7	8068	58	7661	78	8400-8538	8346-8595
Bonah River	BON-	3789	*Acropora hyacinthus*	1.5-1.8	7452	48	7045	71	7796-7951	7711-7997
		B-134432	coral	1.5-1.8	8190	70	7783	87	8433-8640	8398-8971
		B-134434	coral	2.9	8350	60	7943	79	8647-8976	8597-9001
		B-134602	coral	2.9	8340	90	7933	104	8638-8977	8481-9031
Bonah River Lagoon	BONL-	1529	*Porites*	6.1	3890	70	3483	87	3640-3861	3488-3981
		H02-R2	*Porites*	6.2	4025	66	3618	84	3832-4082	3697-4152
		H02-R3	infaunal bivalve	6.4	4158	45	3751	69	3987-4232	3905-4401
Pukau SE	PUK-	3763	coral	2.8-3.0	8680	67	8273	85	9134-9402	9031-9451
		B-134443	coral	2.8-3.0	8630	70	8223	87	9032-9296	9009-9428
		3765	gastropod	3.3	8584	65	8177	83	9020-9254	8813-9428
		B-134433	coral	4.3	8800	70	8393	87	9303-9492	9138-9536
Wondakai	WON-	2508	coral	1.5	8112	67	7705	85	8413-8556	8348-8683
		2509	coral	1.5	8913	60	8506	79	9453-9545	9305-9658
		2523	*Porites*	3.0	8727	76	8320	92	9144-9463	9032-9496
Loto Beach	LOT-	2465	coral	1.0	8810	52	8403	74	9309-9516	9150-9537
		4294	coral	1.0	8694	51	8287	73	9140-9418	9034-9466
		4295	coral	1.1	8676	52	8269	74	9134-9400	9031-9439
		H01-5-2.4	*Porites*	1.5	8850	60	8443	79	9334-9532	9272-9547
		H01-6-1.2	*Porites*	1.5	8548	58	8141	78	9000-9244	8779-9398
		4297	coral	2.0	8365	51	7958	73	8719-8980	8608-9003
Sang River SE	SAN-	3096	coral	2.5	9146	97	8739	110	9557-9894	9537-10154
		3177	coral	2.5	9072	65	8665	83	9537-9735	9493-9911
		4782	coral	2.5	8929	75	8522	91	9430-9582	9302-9696
		1585	coral	2.5	8840	70	8433	87	9322-9531	9143-9550
		4784	*Porites*	3.0	8767	80	8360	95	9268-9486	9093-9532
		3095	*Porites*	3.5	8802	76	8395	92	9302-9495	9136-9538
		1586	coral	3.5	8990	70	8583	87	9486-9658	9429-9886
		2367	*Porites*	3.5	8723	59	8316	79	9146-9446	9039-9486
Midway Cove	MID-	5934	coral	7.0	8570	68	8163	86	9010-9253	8785-9422
		5967	coral	7.5	8541	44	8134	68	8998-9237	8781-9299
		5933	*A. palifera*	7.9	8469	45	8062	69	8778-9086	8649-9239
		5966	*A. palifera*	8.0	8351	43	7944	67	8648-8976	8608-8995
Hubegong Dive Site	DIV-	1584	*Porites*	4.5	7670	60	7263	79	8013-8164	7938-8298
**** Marine reservoir correction of -407 +/- 52 years (Edwards et al, 1993; reference in main text)***										

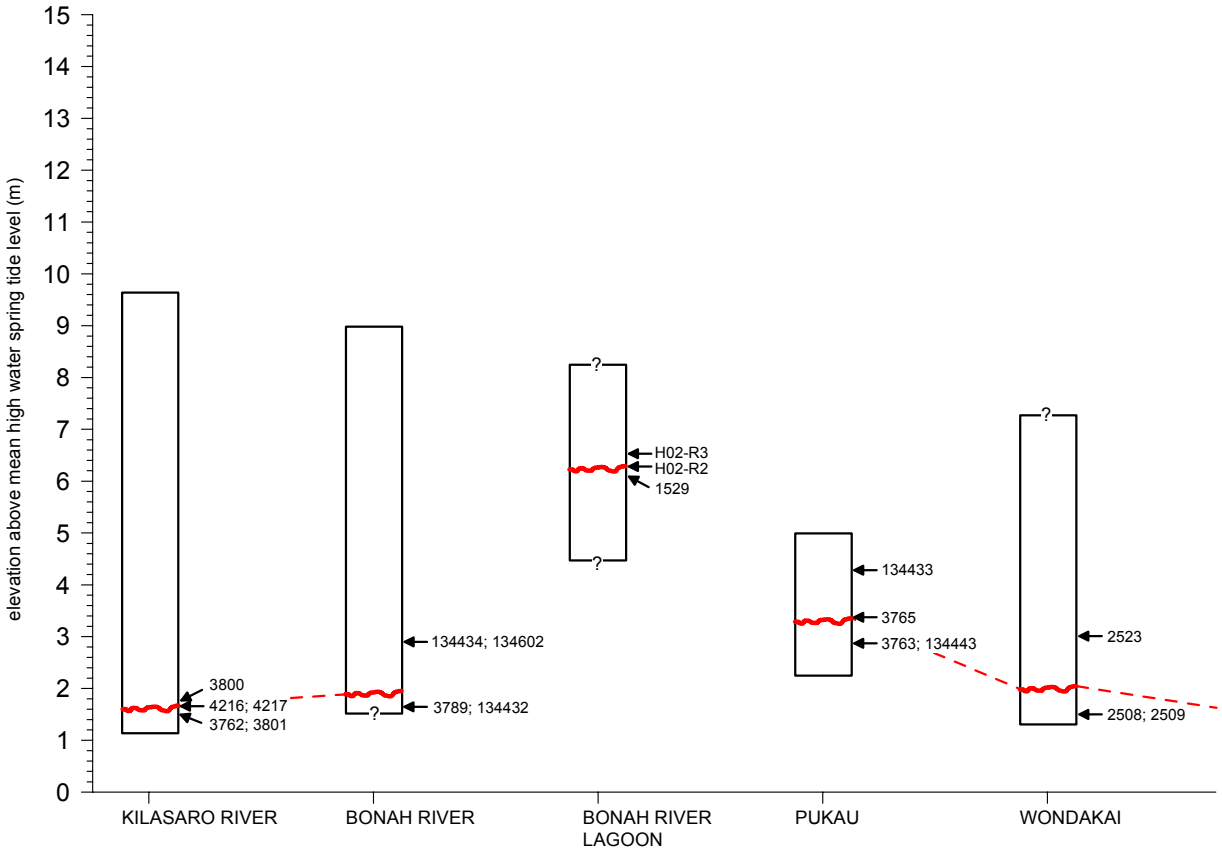
D) Figure DR1. A) Foraminifera species composition of several post-disturbance communities; Csp, *Cyclogyra* sp.; Rco, *Rosalina columbiensis*; Qcu, *Quinqueloculina cuvieriana*; Qob, *Q. oblonga*; Cib, *Cibicides* sp.; *Q.* sp 1 (thin walled); Coi, *Cornuspira involvens*; Bol, *Bolivina*; Qcn, *Q. cuvieriana* subsp. 1 (protruding neck); Gtr, *Gavelinopsis transluscens*; Qsu, *Q. sulcata*. Plotted are the 12 most abundant Foraminifera species (51% of occurrences). **B)** Picture of the Bonah River section showing the age and sequence of numbered transects.

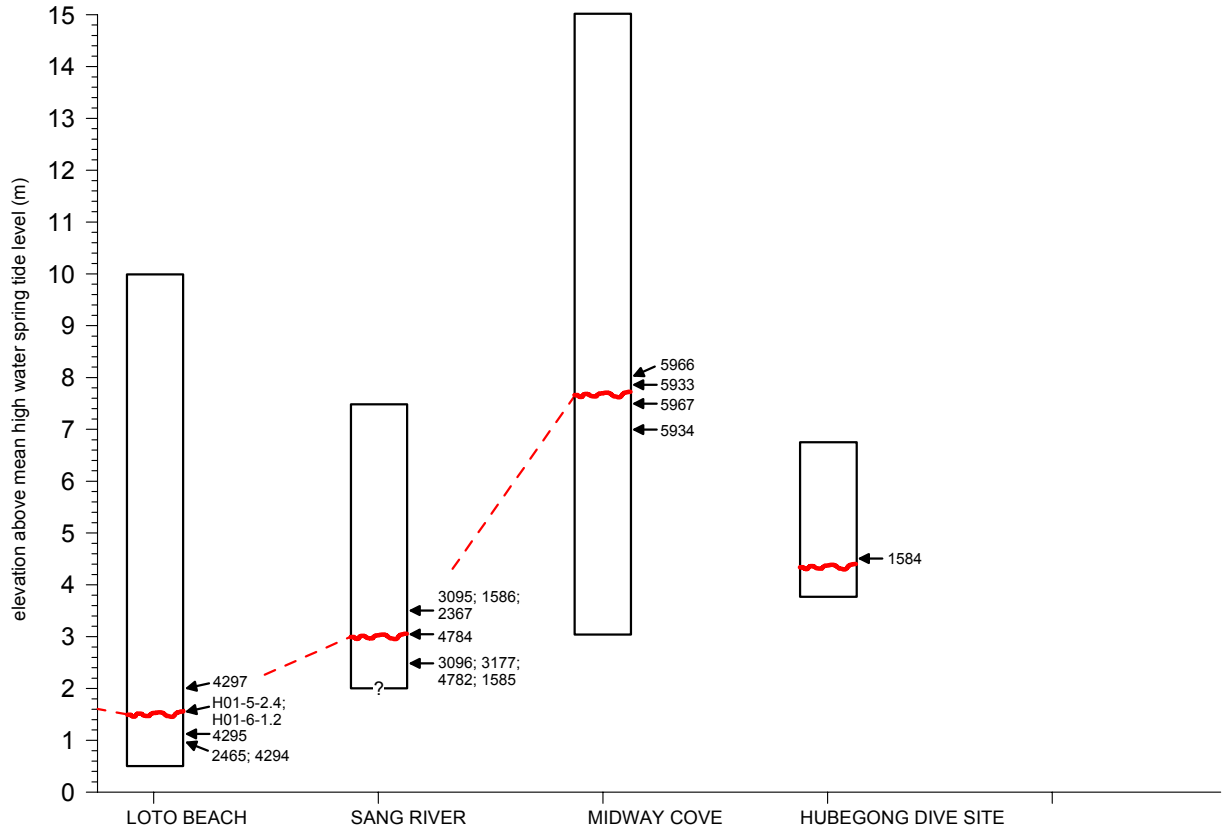




Pandolfi et al SOM Fig. 1

E) Figure DR2. Summary stratigraphic logs of surveyed vertical cliff sections showing elevations of dated samples and of disturbance layers. For each site, the vertical box represents the height of the fully-exposed vertical section; question marks at the top or bottom of these boxes imply that these elevations were visually estimated in the field. Solid red wavy lines represent the occurrence of a disturbance layer in the section and the dashed red lines connect disturbance layers that are inferred to be contemporaneous on the basis of stratigraphic considerations and results of subsequent dating (see main article Figure 3). Black arrows show the elevation of samples that have been dated. To get full sample labels add location prefixes to the labels shown in the figure as follows: Kilasairo River, Kil-; Bonah River, Bon-; Bonah River Lagoon, Bonl-; Pukau, Puk-; Wondakai, Won-; Loto Beach, Lot-; Sang River, San-; Midway Cove, Mid-; Hubegong Dive Site, Div-.




elevation above mean high water spring tide level (m)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
4297
H01-5-2.4;
H01-6-1.2
4295
2465; 4294
?
3095; 1586;
2367
4784
3096; 3177;
4782; 1585
5966
5933
5967
5934
1584
LOTO BEACH
SANG RIVER
MIDWAY COVE
HUBEGONG DIVE SITE