Appendix DR1. Radiocarbon Dating of Corals.

Samples selected for radiocarbon dating were sectioned and microsampled to remove surficial calcareous encrustation, washed in distilled water, subjected to ultrasonic agitation in distilled water to remove detrital particles, oven dried (40^{o}C) and then sealed in plastic bags. Dates were calibrated using Calib 5.0.2 and calibration curve Marine04 (http://calib.qub.ac.uk/marine). The conventionally employed Marine Reservoir Correction in Australian waters is 450 ± 35 years (Gillespie, 1977). However, various studies have indicated significant deviations in regional marine reservoir signatures. The geographically closest sites to Dunk Island are from Port Curtis and Gladstone where marine reservoir ages ranging from 240 ± 61 to 419 ± 61 ^{14}C y BP are reported (Ulm, 2002). These combined give a weighted mean ΔR value of +10 ± 7, currently the best estimate of variance in the local open water marine reservoir effect for the central Queensland coast (Ulm, 2002).

Core number and sample depth.	Lab. code	Material	δ ^{13}C ratio	Conventional ^{14}C age (years BP)	Calibrated (68.2% probability) cal BP
DK-PC2-70	Wk 24176	Coral	-2.4 ± 0.2	4436 ± 44	4514-4675
DK-PC2-95	Wk 26573	Coral	-2.2 ± 0.2	4809 ± 75	4968-5212
DK-PC3-60	Wk 24177	Coral	-1.1 ± 02	4482 ± 42	4590-4730
DK-PC4-55	Wk 24178	Coral	-0.2 ± 0.2	1462 ± 52	933-1050
DK-PC5-20	Wk 24179	Coral	-1.2 ± 0.2	514 ± 53	61-150
DK-PC5-40	Wk 24180	Coral	-0.8 ± 0.2	679 ± 46	269-374
DK-PC5-60	Wk 24181	Bivalve	2.1 ± 0.2	1600 ± 75	1066-1232
DK-PC6-25	Wk 24182	Coral	-2.6 ± 0.2	961 ± 65	505-606
DK-PC6-75	Wk 24183	Coral	-0.8 ± 0.2	1503 ± 39	975-1090
DK-PC6-150	Wk 24184	Bivalve	2.3 ± 0.2	1997 ± 43	1489-1611
DK-PC6-200	Wk 24185	Gastropod	1.7 ± 0.2	2409 ± 76	1974-2098
DK-PC7-50	Wk 24186	Coral	-0.3 ± 0.2	1826 ± 38	1300-1385
DK-PC7-80	Wk 24187	Coral	-0.7 ± 0.2	2084 ± 59	1560-1717
DK-PC1-30	Wk 24188	Coral	-0.9 ± 0.2	6174 ± 44	6537-6659
DK-PC1-60	Wk 24189	Coral	-1.1 ± 0.2	6249 ± 51	6626-6753
DK-PC1-95	Wk 24190	Coral	-2.5 ± 0.2	6417 ± 47	6817-6953

Table DR1. Dates from cores from Dunk Island. Samples were dated at the Waikato Radiocarbon Dating Laboratory in New Zealand. Conventional dates were calibrated using Calib 5.0.2 and calibration curve Marine04 (http://calib.qub.ac.uk/marine).

References:

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Figure DR1. Relict reef flats and contemporary coral assemblages at Dunk Island.

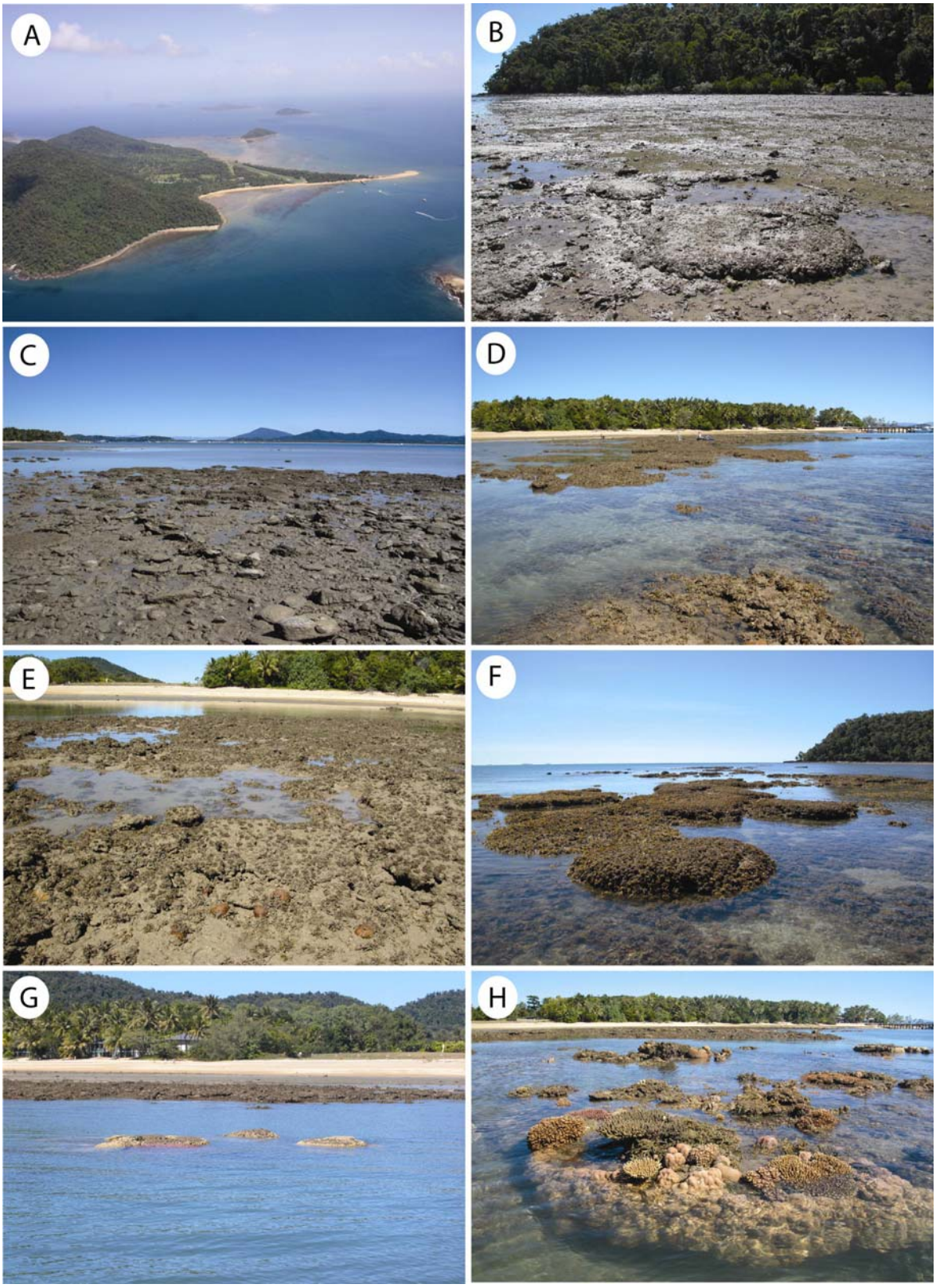

Fig. DR1. Relict reef flats and contemporary coral assemblages at Dunk Island. (A) Oblique aerial view looking south across Dunk Island. The study site is the obvious bay in the centre of the photograph. (B, C) Views across the higher elevation (+ 0.8 – 1.0 m above LAT) reef flat in the NE

corner of the bay. Note the relict microatolls and the partial burial of the reef flat with muds and, in places, larger lithic clasts. (D) View looking south-west across the lower elevation (+0.5-0.8 m above LAT) reef flat. Water level is close to LAT in this picture. (E) View landward across the reef flat. Note the muddy sediment cover on the relict reef flat surface. Isolated *Goniastrea aspera* colonies have settled on this surface. (F) Dead *Porite*s microatolls along the seaward areas of the lower elevation reef flat. (G) View across the zone of living *Porites* bommies. Water level is approaching LAT level. (H) Corals colonising the dead, upper surfaces of living (but sea-level constrained) *Porites* microatolls with the relict reef flat in the background.