# SUPPLEMENTARY INFORMATION

## 1. Carbonate budget calculations

To quantify gross carbonate production and erosion and thus to determine net carbonate production (G, where G = kg CaCO3 m2 yr-1) we used an adaptation of the framework production states approach [1] adapted and parameterised for the Indian Ocean [2]. Carbonate production by corals and coralline algae is calculated using geometric relationships derived from individual colony morphology, rather than calculated using rugosity at the level of the transect; and endolithic bioerosion is calculated using published rates and the proportion of hard substrate under the transect line available for erosion.

Within each point count at each reef in 2014 we measured the distance covered by each category of benthic cover within a 10m line-intercept transect to the nearest 5cm. In contrast to Perry et al. [2], while coral colony size was measured using a chain method (i.e., across the total surface of the colony under the line), this was not applied to other benthic substrate classes. The following groups were recorded: scleractinian corals to the genera and morphological level (e.g., *Acropora* branching, *Porites* massive etc.); crustose coralline algae (CCA); epilithic algal matrix; macroalgae; bare substrate (e.g., granitic rock, limestone pavement); sediment; rubble; and other benthic organisms. We also collected the following in order to characterise the site: (1) gross scale measures of reef topographic complexity; (2) management status; (3) habitat, zone and depth data.

### *1.1 Calculating Carbonate Production*

We used the morphology and size of individual coral colonies in combination with genera specific skeletal density (g cm$^{-3}$) and linear growth rates (cm year$^{-1}$) across each transect to produce carbonate production rates in kg $CaCO_3$ m$^{-2}$ year$^{-1}$ (where m$^2$ refers to the planar surface of the reef) – see Table S1 for rates. Where possible, we used published growth rates and skeletal densities from the Western Indian Ocean, but when these were not available means of published growth rates and densities for each coral genera were used. We then used geometric transformations based on colony morphology to give a growth rate for each colony for the area under the transect line (taking a transect line width of 1cm). Massive colonies were assumed to be hemispherical in cross-section, encrusting, foliose and plating colonies, as well as colonies of crustose coralline algae (CCA) were assumed to be growing primarily at the edge of the colony (and at 10% of this growth rate across the remainder of the colony), and for branching colonies, the proportion of the colony area of growing branch tips was assumed to be growing at published rates, and the remainder of the colony at 10% of these rates. The equations used are:

Massive:

$$CP_i = \left(\left(g + \left(\frac{x}{\pi}\right)\right)^2 \pi - \left(\frac{x}{\pi}\right)^2 \pi\right).d$$

Encrusting etc.:

$$CP_i = 2(g.d) + 0.1g.x.d$$

Branching/corymbose etc.:

$$CP_i = (r.c_a.g.d) + (x - c_a.x).0.1g.d$$

Where $CP_i$ = carbonate production for colony *i*, *g* = growth rate, *x* = surface length of colony, *d* = skeletal density and $c_a$ = proportion of colony that are growing axial branches. Measuring the linear surface of growing tips on branching corals is time-consuming, and often impractical. We used data on the size of arborescent, branching, corymbose and digitate colonies and the length of growing tips of each colony across 405 colonies in northern Mozambique (293 Acropora, 62 Pocillopora, 26 Porites, 24 other). We conducted linear regressions between colony size and length of growing tips for each genera/morphology combination for which we had greater than 20 replicates in order to calculate $c_a$ (see Table S2).

Where $CP_j$ is the total carbonate production of both corals and crustose coralline algae for transect $j$ (covering an area of 1000 $cm^2$ in kg $CaCO_3$ $year^{-1}$). To estimate the production rate of the reef in kg $CaCO_3$ $m^{-2}$ $year^{-1}$, we then multiplied $CP_j$ by 10.

**Table S1|** Growth rates for genera and morphology combinations used to calculate 2014 carbonate production.

| Genera/Taxon | Morphology | Mean Extension rate (cm/yr) | 95% CI | Mean Density ($g/cm^3$) | 95% CI | Notes | Refs |
|---|---|---|---|---|---|---|---|
| *Acropora* | arborescent | 6.931 | 2.195 | 1.294 | 0.373 | | 3-12 |
| *Acropora* | branching | 4.154 | 1.239 | 1.340 | 0.184 | | 3,5,8,13,14 |
| *Acropora* | corymbose | 4.282 | 1.371 | 1.340 | 0.184 | | 5,14,15,16 |
| *Acropora* | digitate | 2.987 | 1.055 | 1.227 | 0.182 | | 3,5,16,17 |
| *Acropora* | table | 8.285 | 2.825 | 1.455 | 0.100 | | 3,16,17,18,19 |
| *Astreopora* | encrusting, massive | 1.029 | 0.335 | 1.480 | 0.240 | | 14,21 |
| *Coscinarea* | columnar, encrusting, massive | 1.785 | 2.283 | 1.405 | 0.062 | Average for Siderastredae due to place in phylogentic tree | 21,29,36 |
| Cyphastrea | columnar, encrusting, massive | 0.532 | 0.297 | 1.358 | 0.294 | | 3,14,36 |
| *Echinopora* | encrusting, foliose, massive | 0.821* | 0.274 | 1.358* | 0.132 | used Merulinidae average, Faviidae for density | 8,14,19,21 |
| *Favia* | encrusting, massive | 0.624 | 0.189 | 1.345 | 0.167 | | 3,14,21,30 |
| *Favites* | encrusting, massive | 0.624* | 0.189 | 1.345* | 0.167 | | 3,14,21,30 |
| *Fungia* | mushroom | 0.730 | 0.411 | 1.990 | 0.490 | | 8,16,37 |
| *Galaxea* | columnar, encrusting, massive | 0.900 | 0.176 | 1.910 | 0.529 | | 14 |
| *Goniastrea* | columnar, encrusting, massive | 1.200 | 0.192 | 1.726 | 0.168 | | 3,14,21,36,38,39 |
| *Goniopora* | columnar, massive | 3.360 | 1.680 | 1.373* | 0.076 | | 14 |
| *Leptastrea* | encrusting, massive | 0.624* | 0.189 | 1.345* | 0.167 | | 8 |
| *Leptoria* | encrusting, massive | 0.821* | 0.274 | 1.358* | 0.132 | used Platygyra averages | 14,21,38,40 |
| Leptoseris | encrusting, foliose, plating | 1.669 | 0.200 | 1.726* | 0.168 | | 15 |
| *Lobophyllia* | encrusting, massive | 1.500 | 0.750 | 1.370 | 0.250 | | 14 |
| *Merulina* | encrusting, plating | 1.200 | 0.192 | 1.726* | 0.168 | used the goniastrea averages based on phylogenetic tree similarity | 19 |
| *Montastrea* | columnar, encrusting, massive | 0.260 | 0.020 | 1.358* | 0.132 | density average for faviidae | 3 |
| Monitopora | branching | 3.485 | 0.593 | 1.230 | 0.647 | genera average for density | 27 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Montipora* | encrusting | 1.625 | 0.260 | 1.230 | 0.647 | genera average for density | 15 |
| *Montipora* | foliose, plating | 2.985 | 1.170 | 1.230 | 0.647 | genera average for density | 4,14,15,16,19,41 |
| *Pavona* | columnar | 1.215 | 0.214 | 1.726 | 0.168 | | 14,16,42 |
| *Pavona* | encrusting | 0.335 | 0.029 | 1.726 | 0.168 | | 29,42 |
| *Pavona* | foliose | 2.712 | 0.283 | 1.726 | 0.168 | | 15 |
| *Pavona* | massive | 1.229 | 0.151 | 1.726 | 0.168 | | 15,29,42,43 |
| *Platygyra* | encrusting, massive | 0.874 | 0.114 | 1.527 | 0.462 | | 14,21,38,40 |
| *Pocillopora* | branching | 2.735 | 0.660 | 1.400 | 0.081 | | 3,8,14,16,29,43-48 |
| *Pocillopora* | submassive | 3.536 | 1.275 | 1.400 | 0.081 | | 8,16,21 |
| *Porites* | branching | 2.719 | 0.401 | 1.400 | 0.081 | | 8,9,27,39,41 |
| *Porites* | columnar | 0.568 | 0.094 | 1.376* | 0.079 | density average for poritiidae | 31 |
| *Porites* | encrusting, massive | 1.169 | 0.148 | 1.372 | 0.092 | | 3,8,14,20-35 |
| *Psammacora* | encrusting, massive, plating | 1.785 | 1.648 | 1.405* | 0.062 | | 21,29,36 |
| *Stylophora* | branching | 2.550 | 0.129 | 1.405 | 0.062 | | 31 |
| *Turbinaria* | foliose, plating | 1.983 | 1.499 | 1.371 | 0.066 | | 3,4,14 |

**Table S2|** Growing branch tips to colony size ratio

| Genera | Morphology | Growing tips: colony size | 95% CI | N |
|---|---|---|---|---|
| Acropora | Arborescent | 0.059 | 0.009 | 28 |
| | Branching/Corymbose | 0.190 | 0.012 | 145 |
| | Digitate | 0.253 | 0.016 | 65 |
| Pocillopora | Branching | 0.364 | 0.027 | 33 |
| | Submassive | 0.338 | 0.032 | 17 |
| Porites | Branching | 0.221 | 0.056 | 21 |
| Stylophora/Stylocoeniella | Branching/submassive | 0.327 | 0.064 | 10 |

To calculate the production for a single transect over a year, the following equation was used:

$$CP_j = \sum_{i=1}^{n} CP_1 + CP_2 + \cdots + CP_n$$

## *1.2 Calculating Reef framework bioerosion*

### *1.2.1 Macro and micro-bioerosion*

In general, the macro-borer and endolithic bioerosion communities are less well-characterised in the Indo-Pacific than the Caribbean. This is particularly true of clionaid sponges, which are generally cryptic and difficult to identify in the field, particularly for a non-expert, and are less dominant a part of the macroborer than in the Caribbean. To this end, instead of conducting an intensive search of the substrate for clionaid sponges as described in Perry et al. [1], we utilized published rates of total macrobioerosion in concert with a census of substrate available for bioerosion from the benthic line-intercept transect. This consists of all dead carbonate substrate, rubble and corals. While live corals can prevent settlement of most bioeroding sponges, they are often colonised by other bioeroders. All substrate not available to bioeroders was excluded, and the following equation used:

Microbioerosion = $S*R*E_m$

Macrobioerosion = $S*R*E_a$

Where $S$ is the percentage of surface area of the transect available for erosion, $R$ is the rugosity of the transect, $E_m$ is the erosion rate of microborers (0.055 for shallow sites [49]; 0.258 for reefs >4m depth [50,51], and $E_a$ is the erosion rate of macroborers (0.261 [52]) in kg $m^{-2}$ $yr^{-1}$.

### 1.2.2 *Calculating reef rugosity from visual estimates of topography*

In order to calculate macrobioerosion and endolithic bioerosion, the total surface area under the line intercept transect has to be estimated, and the proportion of surface occupied by substrates not susceptible to bioerosion (sand, seagrass, granite etc.) removed. The *Reefbudget* method measures the length of every surface under the transect line, and uses this length divided by the length of the transect line as a complexity conversion factor when calculating the amount of substrate susceptible to either macro or microbioerosion [1]. To convert the visual estimates of reef topography to estimates of complexity for use in calculating macrobioerosion and endolithic microbioerosion, we used the relationship obtained by non-linear least squares regression analysis between the 6-point scale of Polunin and Roberts [53] and measured rugosity (the length of substrate below a 10m transect line) collected by F Januchowski-Hartley across 96 transects in East Africa. The best fitting model was a power relationship of the form:

$$R = e^{b*VT}$$

Where $R$ is the measured rugosity, $b$ is constant equal to 0.29764 and $VT$ is the visual estimate of topography. We estimated the proportion of the variation explained with a pseudo-$R^2$ that was equal to 1 minus the residual sum of squares of the model divided by the total sum of squares.

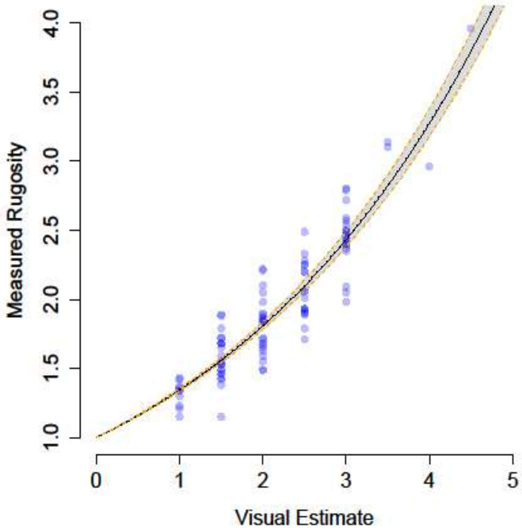


**Figure S1|** Regression of visual estimates of topography against measured rugosity. $R^2$=0.85.

### 1.2.3 *Urchin bioerosion*

The primary agents of echinoid bioerosion belong the family Diadematidae, (*Diadema* spp., and *Echinothrix* spp.) and the genera *Echinometra*, *Echinostrephus* and *eucidaris*. We censused urchin abundance, size and species composition within 10 x 2 m belt transects along the LIT in 2014. We used carbonate ingestion rates from the literature to calculate erosion rate for different sizes of urchins. These census data were combined with carbonate ingestion rates obtained from published literature. Evaluating the published data on erosion rates against test size across all urchin species suggest a relatively tightly correlated plot. Figure S2A shows the pooled bioerosion rates relative to test size for six species of urchins across 10 studies in the Indian and Pacific Oceans, with Figure S2B showing the rates for *Echinometra mathaei* and the *Diadematidae*. This allows us to calculate the erosion rate (kg urchin$^{-1}$ year$^{-1}$) for each individual urchin using one of the following equations:

*Diadematidae* bioerosion ($B_D$) = $(0.000001*x^{3.4192})*0.365$

*Echinometra mathaei* bioerosion ($B_E$ ) = $(0.0004*x^{1.9786})*0.365$

General equation for all other bioeroding species ($B_G$) = $(0.0001*x^{2.323})*0.365$

To calculate bioerosion by urchins in kg m$^{-2}$ year$^{-1}$, we summed the erosion rates of all individual urchins within each transect ($U_E$), and divided by the surface areas within each transect.

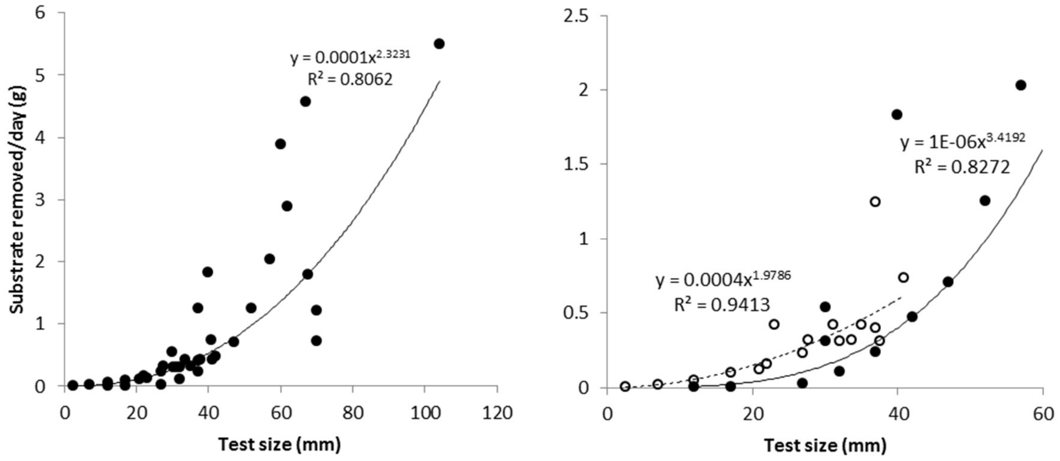


**Figure S2**| (A) Bioerosion rates (substrate removed/day (g)) for urchins across a range of test size (Indo-Pacific data only). Data aggregated from [refs 54-62]. (B) Bioerosion rates for Diadematidae (closed circles) and Echinometra metra (open circles).

### *1.2.4 Parrotfish bioerosion*

To determine the species-size abundances of parrotfish at each site we used underwater census data for the Seychelles collected in 7m radius point counts by S Jennings (1994) and NAJ Graham (2005-2014). The method we used to calculate bioerosion by fish is based on a model that uses total length to predict bites hr$^{-1}$ for each individual, and then multiplies this by the number of bites leaving feeding scars and the volume of each bite. For species for which data is not available in the published literature, we have either made observations of bite rate in the field, or have used data from similar sized species with the same feeding functional. Daily bite numbers were calculated using diurnal feeding activity reported in Bellwood [63]. Bite volume data has been obtained from published studies [63,64]. Where no bite volume data exists, we have either measured the size of individual bites *in situ* using Vernier callipers to obtain width and length of bite, or obtained from published studies estimates of bite area [e.g., 65]. We have then used a bite depth of 0.1 mm to obtain a conservative estimate of bite volume for *Scarus* sp. Not all bites on the substratum remove material, and we have assumed following Bellwood & Choat [66] that only bites that leave visible scars are eroding the substrate. In order to estimate the proportion of bites resulting in scars on the substratum for each size class, we extrapolated from published literature [65] and used the same method as above where data was missing. We used the following equation to calculate species specific erosion rates for the median value within each size class:

$$\text{Bioerosion rate (kg.ind}^{-1}\text{yr}^{-1}) = v.s_{prop}.br.d*365$$

Where $v$ is bite volume (cm$^3$), $s_{prop}$ is the proportion of bites leaving scars, $b_r$ is bite rate (bites day$^{-1}$) and $d$ is substratum density (kg cm$^{-3}$), here taken to be $1.49*10^{-3}$ kg cm$^{-3}$.

**Table S3|** Categorisation of parrotfish species into functional group

| Browsers | Excavators | Scrapers |
|---|---|---|
| *Calatomus carolinus* | *Cetoscarus bicolor (> 30cm)* | *Scarus caudofasciatus* |
| *Hipposcarus harid* | *Chlorurus atrilunula* | *Scarus falcipinnis* |
| *Leptoscarus viagiensis* | *Chlorurus caprastroides* | *Scarus ferrugineus* |
| | *Chlorurus japanensis* | *Scarus festivus* |
| | *Chlorurus sordidus* | *Scarus grenatus* |
| | *Chlorurus strongylocephalus* | *Scarus ghobban* |
| | *Scarus rubroviolaceus (TP)* | *Scarus globiceps* |
| | | *Scarus niger* |
| | | *Scarus prasiognathus* |
| | | *Scarus psitticus* |
| | | *Scarus rubroviolaceus (IP)* |
| | | *Scarus russellii* |
| | | *Scarus scaber* |
| | | *Scarus tricolor* |
| | | *Scarus viridifucatus* |

## 2. Contribution of urchin bioerosion to carbonate budget

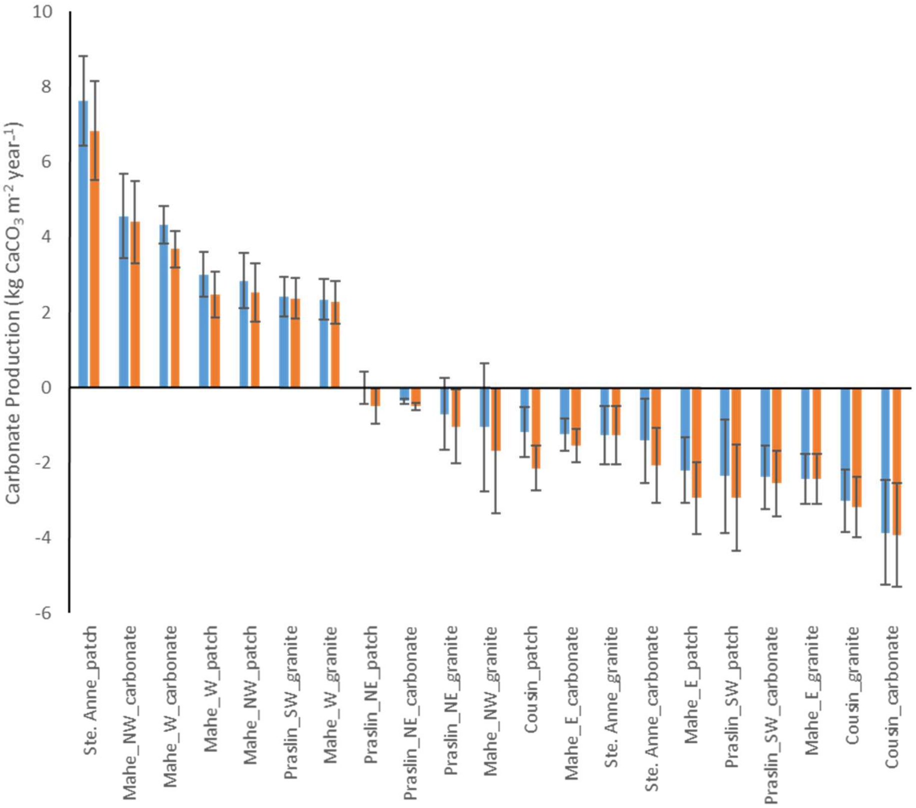


**Figure S3|** 2014 net carbonate balance across reefs excluding urchin erosion (blue) and including urchin erosion (red).

## 3. Multiple-regression analysis of carbonate production versus coral cover estimates and sensitivity analysis

**Table S4|** Multiple regression results for carbonate production relative to estimated cover of coral morphologies. Asterisks indicate significance level: * < 0.05; ** < 0.01; *** < 0.001.

| Estimates | Model | $R^2$ | AICc | Coefficients | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Total Coral | Branching Coral | Encrusting Coral | Massive Coral | Table Coral |
| Mean | Total cover | 0.87 | 229.1 | 0.053*** | - | - | - | - |
| | Morphological cover | 0.89 | 213.4 | - | 0.042*** | 0.048*** | 0.096*** | 0.107*** |
| Lower 95% CI | Total | 0.82 | 197.6 | 0.040*** | - | - | - | - |
| | Morphological cover | 0.85 | 175.8 | - | 0.030*** | 0.037*** | 0.088*** | 0.048* |
| Upper 95% CI | Total | 0.88 | 287.1 | 0.065*** | - | - | - | - |
| | Morphological cover | 0.89 | 272.3 | - | 0.052*** | 0.059*** | 0.109*** | 0.155*** |

## 4. Sensitivity Analysis of Coral Growth Rates

We further calculated the 95% confidence intervals of these mean rates and calculated carbonate production based on these values as well. We then conducted two analyses. First, we repeated the multiple linear regression prediction, and linear mixed effects models for both carbonate balance and production with both the upper and lower 95% confidence interval values. Second, we produced a distribution of the mixed effect model coefficients by randomly sampling 9,999 times from the mean, upper and lower 95% CI hindcasted carbonate balance and production estimates and re-running the models. We then produced histograms of the distribution of co-efficients. No substantial differences were found for overall patterns of carbonate budget state between or within years using either 95% confidence intervals or random resampling, except that mean carbonate budget for all sites in 2011 was potentially not substantially different from 2005 or 2008.

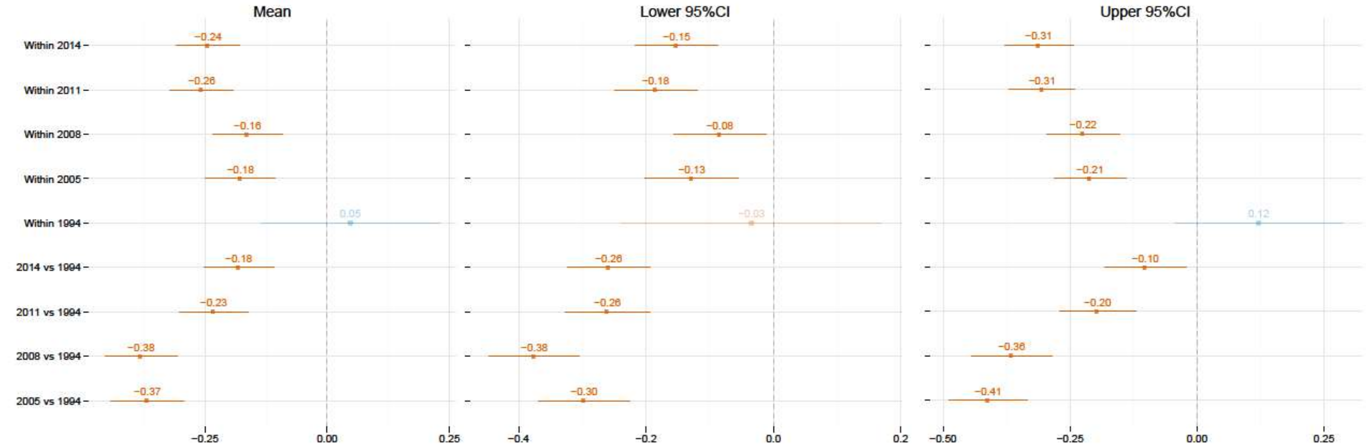


**Figure S4|** Forrest plots of standardised co-efficients and 95% confidence intervals for linear mixed effects models using mean, lower and upper 95% confidence intervals for genera specific growth rates for within year differences, and between each year and 1994. If confidence intervals overlap zero, it is indicative of there being no significant difference between groups.

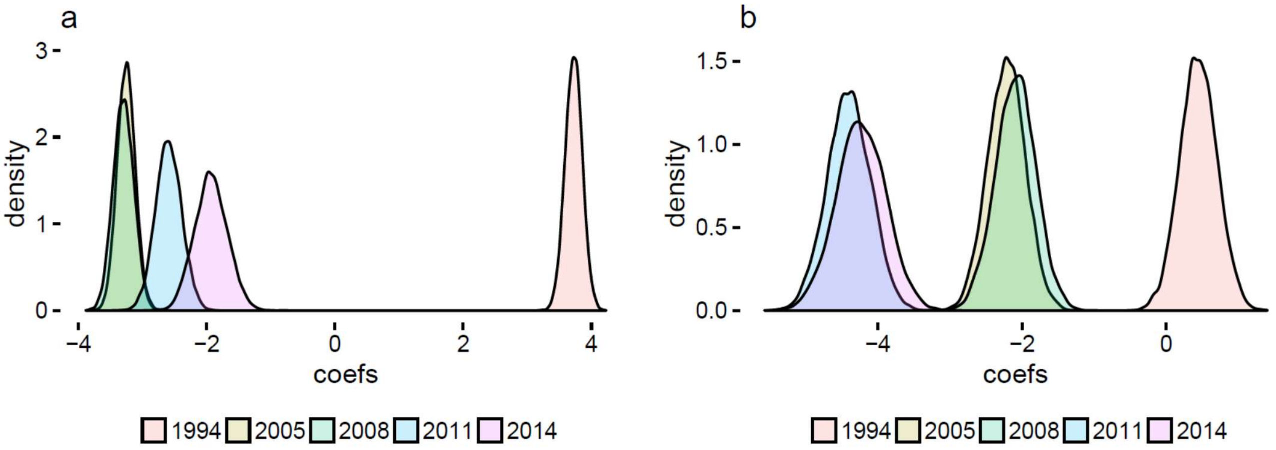


**Figure S5|** Distribution of coefficients (non-standardised) from bootstrapped resampling of estimates of carbonate balance based on mean, and upper and lower 95% confidence intervals: a) between years; and b) within years.

## 5. Boosted regression trees

**Table S5|** Predictor variables used in the boosted regression tree analysis

| **Variable** | **Description** | **Range (mean values at reef scale)** | | **Justification** |
|---|---|---|---|---|
| | | 1995 | 2005 | |
| Scraper biomass | Scraper biomass in kg hectare$^{-1}$ | 16.9 – 170.9 | 17.4 – 296.1 | Scraping parrotfishes scrape the surface of the reef, removing small amounts of reef substrate with each bite. They also play a role in preventing macroalgal proliferation [66,67]. |
| Excavator biomass | Excavator biomass in kg hectare$^{-1}$ | 27.6 – 107.2 | 15.8 – 220.9 | Excavating parrotfishes remove a portion of the reef substrate with each bite, and are often the primary bioeroders on coral reefs. Their impact scales exponentially with size, and therefore biomass is likely to be more closely associated with erosion than abundance [65,66]. |
| Browser biomass | Browser biomass in kg hectare$^{-1}$ | 0 – 75.1 | 0 – 137.1 | Browsing parrotfish crop vertical algae without removing substrate, and therefore can be important in maintaining space for coral colonisation. |
| Massive coral cover | Cover of corals with massive morphology in % | 1.3 – 39.6 | 0 – 16.5 | Massive corals are slow growing but primarily have life-history strategies that are more resistant to disturbance. They can also provide a degree of habitat complexity [52,53]. |
| Branching coral cover | Cover of corals with branching morphology in % | 2.8 – 48.4 | 0 – 6.6 | Branching corals tend to be fast growing and can be the main source of carbonate production on healthy reefs. They also provide considerable habitat complexity and niche space for diverse organisms. However, they are more susceptible to disturbance (particularly *Acropora* sp.) and often show the highest mortality caused by bleaching [68,70,71]. |
| Encrusting coral cover | Cover of corals with encrusting morphology in % | N/A | 0 – 8.2 | Encrusting corals are generally resilient to disturbance, and may expand post-disturbance. However, they have low carbonate production rates and provide little to no habitat complexity [68,72]. |
| Depth | Depth in metres | 2.9 – 10.0 | 2.9 – 10.0 | Light intensity and temperature, greater in shallow water, are critical for both coral and macroalgae growth. Bioerosion by endolithic organisms can also vary with depth [73,74]. |
| Wave exposure | Wave energy in J m$^{-3}$ | 0.04 – 0.57 | 0.04 – 0.57 | Wave exposure influences coral distribution patterns, growth forms, colony sizes and persistence that will likely affect carbonate budgets [75,76]. |
| Structural complexity | Topographic complexity of the substrate from scaled from 0 to 5 | 2.56 – 3.69 | 1.63 – 3.44 | The structural complexity of a reef provides niche space for settlement and survival of a diverse range of organisms. It is also a broad measure of the complexity of coral morphologies, which can influence carbonate production rates [77]. |
| Macroalgal cover | Presence/percent cover of fleshy macroalgae | Present/ Absent | 0 - 47 | Macroalgae cover often expands when new space is open to colonisation and can outcompete corals, preventing settlement, reducing growth rates and increasing mortality [78]. |
| Habitat | Patch, carbonate or granitic reef | N/A | N/A | Three habitat types were surveyed in Seychelles, including carbonate fringing reefs, granitic rocky reefs, and patch reef habitats. These habitats differ in stability for recruitment of sessile larvae, |

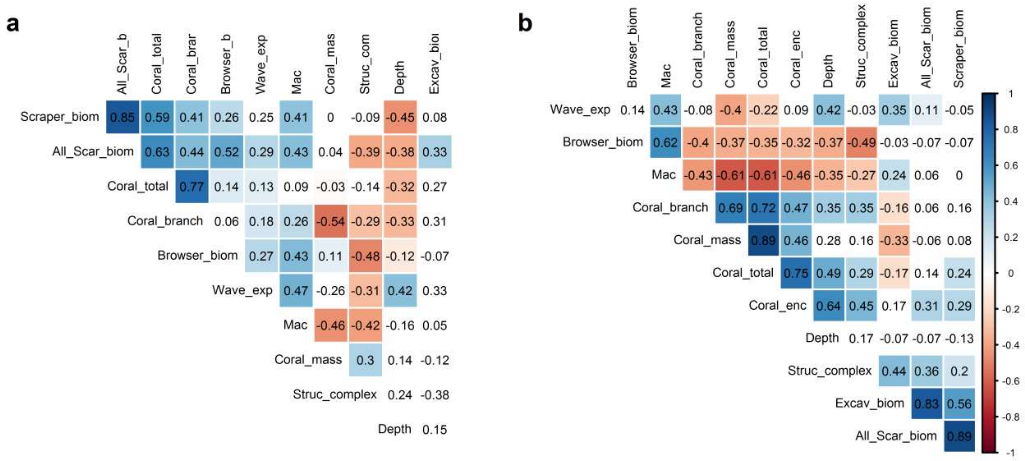
| | | | | |
|---|---|---|---|---|
| | | | | susceptibility to erosion and levels of isolation [79,80]. |
| Reserve status | No-take reserve or open for fishing | N/A | N/A | No-take marine reserves are expected to reduce fishing, increasing the abundance and biomass of parrotfishes, which are important bioeroders. They may also enhance other ecosystem processes and promote coral recovery [80-82]. |

### *5.1 Boosted Regression Tree Methods*

Pairwise relationships between all variables for data from both 1994 and 2005 were assessed using Spearman rank correlation. There were significant correlations > 0.7 between all parrotfish biomass and scraper biomass for both 1994 and 2005, and between all parrotfish biomass and excavator biomass in 2005. There were also correlations > 0.7 between total coral cover and branching coral cover in 1994, and between total coral and the cover of branching, encrusting and massive coral in 2005 (Figure S6). We therefore ran BRT analyses for both 1994 and 2005 starting conditions for both combined coral and parrotfish variables, and for the sub-categorised variables.

Cross-validation (CV) deviance and standard error (se) were used to assess model performance (where lower values indicate a better model). Model optimisation was achieved by adjusting three parameters: tree complexity (tc – the number of nodes in a tree); learning rate (lr – establishes the contribution of each tree to the model); and bag-fraction (bf – specifies the proportion of data to be selected at each step). All possible combinations of tc (1, 2, 3, 4, 5), lr (0.01, 0.001, 0.005) and bf (0.5, 0.75) were run in a loop, and the combination with the lowest deviance was used to fit the final Boosted Regression Trees (BRT). Finally, we used the *gbm.simplify* routine in the *dismo* package [83] to perform a backward selection that drops variables contributing little (assessed using the average CV error to decide how many variables can be removed from the original model without affecting predictive performance) and therefore increases predictive efficiency.

Where we have given potential threshold values this is only in the cases where the shape of the partial dependence plots (which show the effect of a variable on the dependent variable after accounting for the average effect of the other variables) best matches the distribution of fitted values. The final BRT models for both pre-bleaching and post-collapse starting conditions excluded both habitat and reserve status variables in all cases.



a

| | All_Scar_b | Coral_total | Coral_brar | Browser_b | Wave_exp | Mac | Coral_mas | Struc_com | Depth | Excav_bioi |
|---|---|---|---|---|---|---|---|---|---|---|
| Scraper_biom | 0.85 | 0.59 | 0.41 | 0.26 | 0.25 | 0.41 | 0 | -0.09 | -0.45 | 0.08 |
| All_Scar_biom | | 0.63 | 0.44 | 0.52 | 0.29 | 0.43 | 0.04 | -0.39 | -0.38 | 0.33 |
| Coral_total | | | 0.77 | 0.14 | 0.13 | 0.09 | -0.03 | -0.14 | -0.32 | 0.27 |
| Coral_branch | | | | 0.06 | 0.18 | 0.26 | -0.54 | -0.29 | -0.33 | 0.31 |
| Browser_biom | | | | | 0.27 | 0.43 | 0.11 | -0.48 | -0.12 | -0.07 |
| Wave_exp | | | | | | 0.47 | -0.26 | -0.31 | 0.42 | 0.33 |
| Mac | | | | | | | -0.46 | -0.42 | -0.16 | 0.05 |
| Coral_mass | | | | | | | | 0.3 | 0.14 | -0.12 |
| Struc_complex | | | | | | | | | 0.24 | -0.38 |
| Depth | | | | | | | | | | 0.15 |

b

| | Browser_biom | Mac | Coral_branch | Coral_mass | Coral_total | Coral_enc | Depth | Struc_complex | Excav_biom | All_Scar_biom | Scraper_biom |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wave_exp | 0.14 | 0.43 | -0.08 | -0.4 | -0.22 | 0.09 | 0.42 | -0.03 | 0.35 | 0.11 | -0.05 |
| Browser_biom | | 0.62 | -0.4 | -0.37 | -0.35 | -0.32 | -0.37 | -0.49 | -0.03 | -0.07 | -0.07 |
| Mac | | | -0.43 | -0.61 | -0.61 | -0.46 | -0.35 | -0.27 | 0.24 | 0.06 | 0 |
| Coral_branch | | | | 0.69 | 0.72 | 0.47 | 0.35 | 0.35 | -0.16 | 0.06 | 0.16 |
| Coral_mass | | | | | 0.89 | 0.46 | 0.28 | 0.16 | -0.33 | -0.06 | 0.08 |
| Coral_total | | | | | | 0.75 | 0.49 | 0.29 | -0.17 | 0.14 | 0.24 |
| Coral_enc | | | | | | | 0.64 | 0.45 | 0.17 | 0.31 | 0.29 |
| Depth | | | | | | | | 0.17 | -0.07 | -0.07 | -0.13 |
| Struc_complex | | | | | | | | | 0.44 | 0.36 | 0.2 |
| Excav_biom | | | | | | | | | | 0.83 | 0.56 |
| All_Scar_biom | | | | | | | | | | | 0.89 |

**Figure S6|** Correlation matrices for the ecological variables used in the Boosted Regression Tree models. (a) pre-bleaching (1994) starting conditions, and (b) post-collapse (2005) starting conditions.

**Table S6|** Influence of historical ecological conditions on current reef accretion regimes: optimal parameters and predictive performance of the final Boosted Regression Tree models. Cross-validation deviance (cv) and standard error (se) were used as measures of model performance (lower values indicate superior models)

| Year | Categorisation | Number of predictor variables | Learning rate | Tree complexity | Bag-fraction | # of trees | Mean total deviance | CV | SE |
|---|---|---|---|---|---|---|---|---|---|
| 1994 | Ungrouped | 9 | 0.01 | 1 | 0.75 | 1750 | 1.35 | 0.684 | 0.087 |
| 2005 | Ungrouped | 3 | 0.001 | 5 | 0.5 | 3050 | 1.358 | 0.735 | 0.077 |

## 6. Benthic cover results

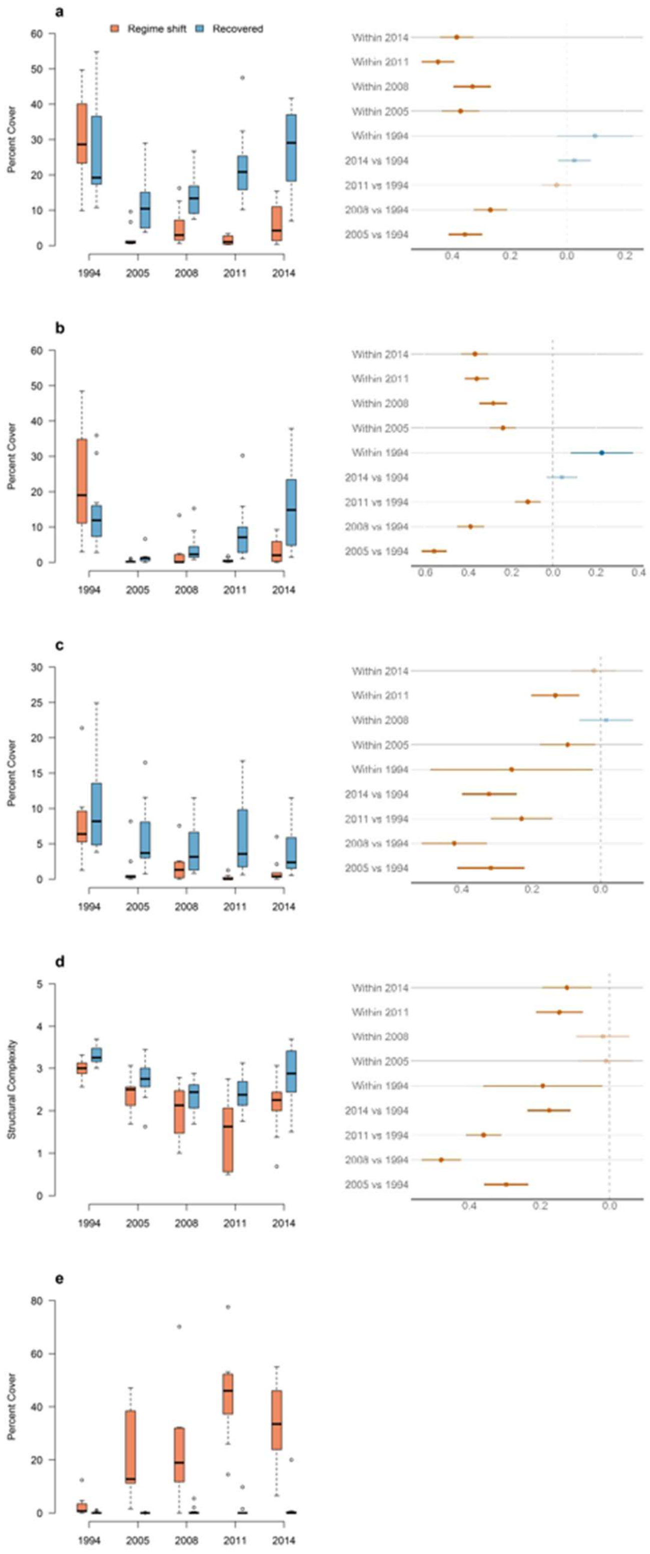


**Figure S7| Benthic cover and forrest plots of standardised coefficients on Inner Seychelles reefs from 1994 – 2014. a**, total coral; **b**, branching coral; **c**, massive coral; **d**, structural complexity and **e**, macroalgae, at 21 reefs in 1994, 2005, 2008, 2011 and 2014.

**Table S7|** Cover of massive coral and macroalgae, and budget and ecological state at each reef in 1994, 2005 and 2014.

| **Reef** | **Massive Coral (%)** | | | **Macroalgae (%)** | | | **Reef budget State 2014** | **Ecological State** |
|---|---|---|---|---|---|---|---|---|
| | **1994** | **2005** | **2014** | **1994** | **2005** | **2014** | | |
| Ste. Anne_patch | 39.6 | 5.6 | 2.5 | 0.0 | 0.0 | 0.0 | Positive | Recovered |
| Mahe_W_carbonate | 24.9 | 10.6 | 8.9 | 0.0 | 0.0 | 0.8 | Positive | Recovered |
| Mahe_NW_carbonate | 7.7 | 5.1 | 4.9 | 0.0 | 0.0 | 0.0 | Positive | Recovered |
| Mahe_W_patch | 10.8 | 16.5 | 11.5 | 0.0 | 0.0 | 0.0 | Positive | Recovered |
| Mahe_NW_patch | 10.1 | 11.6 | 5.9 | 0.0 | 0.0 | 0.0 | Positive | Recovered |
| Mahe_W_granite | 8.0 | 3.8 | 0.9 | 0.0 | 0.0 | 0.0 | Positive* | Recovered |
| Praslin_SW_granite | 4.1 | 0.8 | 2.1 | 0.3 | 0.0 | 0.4 | Positive* | Recovered |
| Praslin_NE_patch | 8.4 | 3.4 | 5.9 | 0.0 | 0.0 | 0.0 | Positive | Recovered |
| Praslin_NE_carbonate | 21.4 | 0.5 | 0.3 | 0.0 | 11.2 | 46.0 | Negative | Regime-shifted |
| Mahe_NW_granite | 5.6 | 2.9 | 1.0 | 0.0 | 0.0 | 0.0 | Negative† | Recovered |
| Praslin_NE_granite | 3.9 | 1.0 | 0.5 | 0.0 | 0.0 | 0.1 | Negative† | Recovered |
| Mahe_E_carbonate | 5.3 | 8.2 | 6.0 | 2.0 | 12.8 | 33.5 | Negative | Regime-shifted |
| Ste. Anne_carbonate | 9.6 | 0.2 | 2.1 | 12.4 | 47.1 | 6.5 | Negative | Regime-shifted |
| Ste. Anne_granite | 3.8 | 3.6 | 2.0 | 1.0 | 0.1 | 20.0 | Negative† | Recovered |
| Cousin_patch | 6.8 | 0.1 | 0.3 | 0.0 | 35.0 | 23.9 | Negative | Regime-shifted |
| Mahe_E_patch | 16.4 | 3.1 | 2.3 | 0.6 | 0.1 | 0.4 | Negative | Regime-shifted |
| Mahe_E_granite | 6.4 | 2.5 | 0.6 | 0.7 | 1.6 | 40.4 | Negative | Regime-shifted |
| Praslin_SW_carbonate | 3.1 | 0.0 | 0.1 | 3.4 | 38.4 | 48.3 | Negative | Regime-shifted |
| Praslin_SW_patch | 5.6 | 0.4 | 0.4 | 4.7 | 12.0 | 11.9 | Negative | Regime-shifted |
| Cousin_granite | 10.2 | 0.5 | 0.9 | 0.6 | 3.6 | 29.8 | Negative | Regime-shifted |
| Cousin_carbonate | 1.3 | 0.3 | 0.0 | 0.4 | 41.3 | 55.0 | Negative | Regime-shifted |

*budget state was negative using growth rates from lower 95% CI.

†budget state was positive using growth rates from upper 95% CI.

**Table S8|** Reef abiotic and biotic characteristics 1994 – 2014

| Year | Location | Habitat | Protection | Status | Wave exposure (kj $m^{-3}$) | Depth | Structural complexity | Benthic cover (%) | | | | Parrotfish biomass (kg $hectare^{-1}$) | | | Carbonate production rate (kg $CaCO_3$ $m^{-2}$ $yr^{-1}$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Branched coral | Encrusting coral | Massive coral | Macroalgae | Browsing | Scraping | Excavating | Carbonate production | Total Erosion |
| 1994 | Cousin | carbonate | Reserve | Regime shift | 0.57 | 5.98 | 3.06 | 48.44 | 0.00 | 1.25 | 0.44 | 5.03 | 81.78 | 24.33 | 7.66 | -1.63 |
| 1994 | Cousin | granite | Reserve | Regime shift | 0.13 | 5.61 | 3.00 | 12.50 | 0.00 | 10.19 | 0.56 | 10.20 | 82.42 | 20.06 | 4.86 | -1.38 |
| 1994 | Cousin | patch | Reserve | Regime shift | 0.49 | 6.69 | 3.13 | 31.88 | 0.00 | 6.75 | 0.00 | 6.88 | 76.89 | 17.45 | 6.67 | -1.80 |
| 1994 | Mahe_E | carbonate | Fished | Regime shift | 0.49 | 6.19 | 2.81 | 19.00 | 0.00 | 9.63 | 12.38 | 12.09 | 56.97 | 11.48 | 5.51 | -2.48 |
| 1994 | Mahe_E | granite | Fished | Regime shift | 0.50 | 9.36 | 2.56 | 2.94 | 0.00 | 6.38 | 0.69 | 14.42 | 42.03 | 7.10 | 2.35 | -1.45 |
| 1994 | Mahe_E | patch | Fished | Recovery | 0.50 | 8.61 | 3.56 | 2.81 | 0.00 | 16.38 | 0.56 | 4.45 | 61.81 | 17.44 | 4.92 | -2.68 |
| 1994 | Mahe_NW | carbonate | Reserve | Recovery | 0.12 | 6.13 | 3.00 | 30.94 | 0.00 | 7.69 | 0.00 | 0.00 | 42.71 | 25.07 | 6.78 | -2.27 |
| 1994 | Mahe_NW | granite | Fished | Recovery | 0.13 | 6.83 | 3.19 | 5.13 | 0.00 | 5.63 | 0.00 | 5.73 | 35.05 | 21.50 | 2.32 | -2.05 |
| 1994 | Mahe_NW | patch | Fished | Recovery | 0.08 | 5.58 | 3.31 | 7.06 | 0.06 | 10.13 | 0.00 | 5.11 | 16.85 | 24.05 | 3.85 | -1.41 |
| 1994 | Mahe_W | carbonate | Fished | Recovery | 0.04 | 5.89 | 3.25 | 9.31 | 0.00 | 24.94 | 0.00 | 0.00 | 42.01 | 23.49 | 8.25 | -1.23 |
| 1994 | Mahe_W | granite | Fished | Recovery | 0.16 | 8.47 | 3.38 | 11.25 | 0.00 | 8.00 | 0.00 | 3.68 | 47.11 | 30.19 | 3.89 | -1.83 |
| 1994 | Mahe_W | patch | Fished | Recovery | 0.22 | 6.50 | 3.13 | 7.50 | 0.00 | 10.75 | 0.00 | 15.16 | 48.27 | 26.52 | 4.08 | -1.81 |
| 1994 | Praslin_NE | carbonate | Fished | Regime shift | 0.07 | 4.51 | 3.31 | 6.88 | 0.00 | 21.38 | 0.00 | 11.50 | 83.50 | 8.94 | 6.90 | -1.80 |
| 1994 | Praslin_NE | granite | Fished | Recovery | 0.11 | 4.87 | 3.25 | 12.50 | 0.00 | 3.88 | 0.00 | 10.78 | 46.69 | 19.66 | 2.95 | -1.58 |
| 1994 | Praslin_NE | patch | Fished | Recovery | 0.13 | 7.08 | 3.56 | 16.88 | 0.00 | 8.38 | 0.00 | 21.26 | 35.93 | 7.29 | 4.85 | -1.63 |
| 1994 | Praslin_SW | carbonate | Fished | Regime shift | 0.35 | 6.26 | 2.88 | 39.00 | 0.00 | 3.13 | 3.44 | 0.00 | 54.77 | 12.86 | 6.75 | -2.09 |
| 1994 | Praslin_SW | granite | Fished | Recovery | 0.18 | 7.14 | 3.69 | 13.38 | 0.00 | 4.06 | 0.25 | 6.22 | 56.11 | 19.78 | 3.14 | -1.35 |
| 1994 | Praslin_SW | patch | Fished | Regime shift | 0.18 | 4.93 | 2.94 | 11.13 | 0.00 | 5.56 | 4.69 | 0.00 | 49.90 | 24.22 | 3.21 | -1.79 |
| 1994 | Ste. Anne | carbonate | Reserve | Regime shift | 0.06 | 5.57 | 3.19 | 34.81 | 0.00 | 5.25 | 2.00 | 0.00 | 170.94 | 15.95 | 6.70 | -1.55 |
| 1994 | Ste. Anne | granite | Reserve | Recovery | 0.49 | 7.11 | 3.13 | 35.94 | 0.00 | 3.81 | 1.00 | 12.28 | 76.76 | 14.09 | 6.48 | -2.56 |
| 1994 | Ste. Anne | patch | Reserve | Recovery | 0.46 | 7.61 | 3.25 | 15.19 | 0.00 | 39.63 | 0.00 | 26.39 | 111.34 | 38.24 | 13.16 | -2.23 |
| 2005 | Cousin | carbonate | Reserve | Regime shift | 0.57 | 4.45 | 2.50 | 0.00 | 0.31 | 0.31 | 41.31 | 13.85 | 136.48 | 22.34 | 0.11 | -3.78 |
| 2005 | Cousin | granite | Reserve | Regime shift | 0.13 | 4.93 | 2.13 | 0.19 | 0.31 | 0.50 | 3.56 | 24.74 | 61.26 | 25.91 | 0.19 | -0.57 |
| 2005 | Cousin | patch | Reserve | Regime shift | 0.49 | 6.19 | 2.75 | 0.06 | 0.31 | 0.13 | 34.97 | 21.59 | 44.31 | 22.60 | 0.08 | -2.32 |
| 2005 | Mahe_E | carbonate | Fished | Regime shift | 0.49 | 6.15 | 2.50 | 0.19 | 0.75 | 0.19 | 47.09 | 12.56 | 32.61 | 18.02 | 0.17 | -1.75 |
| 2005 | Mahe_E | granite | Fished | Regime shift | 0.50 | 9.38 | 2.00 | 1.06 | 2.63 | 2.50 | 1.56 | 1.55 | 45.84 | 26.88 | 1.16 | -1.34 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | Mahe_E | patch | Fished | Recovery | 0.50 | 7.71 | 2.63 | 0.63 | 1.75 | 3.06 | 0.13 | 3.66 | 61.17 | 20.52 | 1.10 | -2.76 |
| 2005 | Mahe_NW | carbonate | Reserve | Recovery | 0.12 | 5.54 | 2.94 | 0.38 | 3.88 | 5.06 | 0.00 | 3.06 | 66.33 | 37.31 | 1.80 | -1.77 |
| 2005 | Mahe_NW | granite | Fished | Recovery | 0.13 | 7.33 | 2.31 | 0.00 | 6.31 | 2.94 | 0.00 | 0.00 | 147.06 | 24.91 | 1.39 | -1.52 |
| 2005 | Mahe_NW | patch | Fished | Recovery | 0.08 | 6.21 | 2.88 | 0.50 | 1.88 | 11.56 | 0.00 | 10.23 | 17.39 | 10.12 | 3.42 | -0.85 |
| 2005 | Mahe_W | carbonate | Fished | Recovery | 0.04 | 5.64 | 2.56 | 1.63 | 2.38 | 10.56 | 0.00 | 0.03 | 151.38 | 27.72 | 3.36 | -1.17 |
| 2005 | Mahe_W | granite | Fished | Recovery | 0.16 | 10.04 | 3.44 | 1.44 | 7.13 | 3.75 | 0.00 | 6.66 | 106.78 | 31.13 | 1.90 | -2.25 |
| 2005 | Mahe_W | patch | Fished | Recovery | 0.22 | 7.48 | 2.88 | 6.63 | 3.50 | 16.50 | 0.00 | 11.48 | 39.65 | 26.83 | 5.88 | -0.86 |
| 2005 | Praslin_NE | carbonate | Fished | Regime shift | 0.07 | 4.24 | 1.69 | 0.00 | 0.00 | 0.50 | 11.19 | 0.00 | 33.10 | 32.44 | 0.14 | -0.68 |
| 2005 | Praslin_NE | granite | Fished | Recovery | 0.11 | 5.23 | 3.44 | 1.25 | 1.50 | 1.00 | 0.00 | 15.12 | 70.83 | 42.76 | 0.60 | -2.50 |
| 2005 | Praslin_NE | patch | Fished | Recovery | 0.13 | 8.48 | 2.56 | 0.13 | 0.75 | 3.44 | 0.00 | 11.14 | 34.54 | 20.09 | 1.03 | -1.44 |
| 2005 | Praslin_SW | carbonate | Fished | Regime shift | 0.35 | 6.63 | 2.56 | 0.00 | 0.44 | 0.00 | 38.44 | 9.57 | 68.77 | 37.62 | 0.08 | -1.68 |
| 2005 | Praslin_SW | granite | Fished | Recovery | 0.18 | 6.64 | 2.56 | 1.13 | 1.63 | 0.75 | 0.00 | 8.42 | 58.57 | 41.92 | 0.62 | -1.22 |
| 2005 | Praslin_SW | patch | Fished | Regime shift | 0.18 | 5.06 | 3.06 | 0.19 | 0.19 | 0.38 | 12.00 | 0.00 | 64.44 | 23.14 | 0.15 | -2.82 |
| 2005 | Ste. Anne | carbonate | Reserve | Regime shift | 0.06 | 2.86 | 2.31 | 0.69 | 0.25 | 8.19 | 12.75 | 0.00 | 120.86 | 20.30 | 2.37 | -1.31 |
| 2005 | Ste. Anne | granite | Reserve | Recovery | 0.49 | 7.18 | 3.06 | 1.38 | 8.19 | 3.63 | 0.06 | 9.03 | 296.91 | 51.61 | 2.03 | -2.98 |
| 2005 | Ste. Anne | patch | Reserve | Recovery | 0.46 | 6.76 | 1.63 | 1.31 | 0.25 | 5.56 | 0.00 | 15.63 | 57.83 | 35.68 | 1.75 | -0.48 |
| 2008 | Cousin | carbonate | Reserve | Regime shift | 0.57 | 3.76 | 2.47 | 0.06 | 0.81 | 0.19 | 32.00 | 2.12 | 97.04 | 14.67 | 0.15 | -2.00 |
| 2008 | Cousin | granite | Reserve | Regime shift | 0.13 | 5.50 | 1.47 | 0.00 | 0.44 | 2.56 | 24.63 | 10.75 | 75.76 | 19.33 | 0.74 | -2.49 |
| 2008 | Cousin | patch | Reserve | Regime shift | 0.49 | 5.83 | 2.34 | 0.00 | 0.44 | 0.06 | 32.19 | 2.77 | 108.34 | 16.58 | 0.06 | -4.28 |
| 2008 | Mahe_E | carbonate | Fished | Regime shift | 0.49 | 5.84 | 2.78 | 13.31 | 1.13 | 1.31 | 2.44 | 0.00 | 49.03 | 29.83 | 2.58 | -2.81 |
| 2008 | Mahe_E | granite | Fished | Regime shift | 0.50 | 10.24 | 2.09 | 2.19 | 2.31 | 2.44 | 0.00 | 5.70 | 48.13 | 48.15 | 1.21 | -1.97 |
| 2008 | Mahe_E | patch | Fished | Recovery | 0.50 | 7.73 | 2.53 | 1.69 | 2.75 | 3.44 | 2.06 | 3.86 | 117.36 | 26.60 | 1.49 | -2.34 |
| 2008 | Mahe_NW | carbonate | Reserve | Recovery | 0.12 | Not collected | 2.53 | 2.13 | 1.50 | 3.81 | 0.00 | 0.44 | 88.13 | 16.19 | 1.50 | -1.50 |
| 2008 | Mahe_NW | granite | Fished | Recovery | 0.13 | Not collected | 2.06 | 1.25 | 5.88 | 1.31 | 0.00 | 17.38 | 169.83 | 15.85 | 1.09 | -4.00 |
| 2008 | Mahe_NW | patch | Fished | Recovery | 0.08 | Not collected | 2.81 | 1.63 | 0.75 | 8.56 | 0.00 | 25.57 | 33.37 | 41.56 | 2.66 | -1.08 |
| 2008 | Mahe_W | carbonate | Fished | Recovery | 0.04 | Not collected | 2.41 | 2.38 | 0.75 | 11.50 | 0.00 | 21.85 | 70.90 | 17.65 | 3.60 | -1.50 |
| 2008 | Mahe_W | granite | Fished | Recovery | 0.16 | Not collected | 2.41 | 1.19 | 16.38 | 0.88 | 0.00 | 6.16 | 81.74 | 16.71 | 2.00 | -1.72 |
| 2008 | Mahe_W | patch | Fished | Recovery | 0.22 | Not collected | 2.06 | 5.75 | 0.31 | 8.50 | 0.00 | 3.21 | 42.84 | 36.93 | 3.35 | -1.33 |
| 2008 | Praslin_NE | carbonate | Fished | Regime shift | 0.07 | 4.12 | 1.16 | 0.06 | 0.50 | 1.81 | 18.94 | 0.00 | 14.38 | 17.63 | 0.55 | -0.87 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | Praslin_NE | granite | Fished | Recovery | 0.11 | 4.83 | 2.88 | 15.25 | 3.31 | 0.81 | 0.00 | 14.41 | 64.15 | 31.56 | 4.43 | -1.37 |
| 2008 | Praslin_NE | patch | Fished | Recovery | 0.13 | 9.02 | 1.69 | 0.81 | 1.31 | 4.75 | 0.00 | 10.23 | 69.38 | 33.31 | 1.55 | -1.21 |
| 2008 | Praslin_SW | carbonate | Fished | Regime shift | 0.35 | 7.73 | 1.00 | 0.06 | 0.13 | 0.00 | 70.19 | 0.00 | 9.04 | 34.66 | 0.06 | -1.20 |
| 2008 | Praslin_SW | granite | Fished | Recovery | 0.18 | 6.83 | 2.47 | 3.19 | 3.81 | 1.25 | 0.06 | 8.70 | 216.20 | 29.16 | 3.38 | -4.50 |
| 2008 | Praslin_SW | patch | Fished | Regime shift | 0.18 | 4.80 | 2.66 | 0.56 | 0.81 | 1.06 | 11.69 | 0.00 | 191.52 | 21.65 | 0.49 | -2.79 |
| 2008 | Ste. Anne | carbonate | Reserve | Regime shift | 0.06 | Not collected | 2.13 | 2.50 | 1.88 | 7.56 | 18.88 | 4.49 | 31.88 | 7.61 | 2.68 | -1.37 |
| 2008 | Ste. Anne | granite | Reserve | Recovery | 0.49 | 6.81 | 2.69 | 2.50 | 9.19 | 1.56 | 0.50 | 8.38 | 199.69 | 13.02 | 1.76 | -2.91 |
| 2008 | Ste. Anne | patch | Reserve | Recovery | 0.46 | Not collected | 2.06 | 8.94 | 1.00 | 2.88 | 5.44 | 0.00 | 40.77 | 34.37 | 2.30 | -1.91 |
| 2011 | Cousin | carbonate | Reserve | Regime shift | 0.57 | Not collected | 2.50 | 0.00 | 0.38 | 0.00 | 49.25 | 4.64 | 74.22 | 27.07 | 0.03 | -4.53 |
| 2011 | Cousin | granite | Reserve | Regime shift | 0.13 | Not collected | 1.63 | 0.63 | 0.88 | 1.25 | 37.25 | 9.17 | 85.12 | 28.72 | 0.52 | -3.77 |
| 2011 | Cousin | patch | Reserve | Regime shift | 0.49 | Not collected | 2.75 | 1.75 | 1.00 | 0.00 | 26.00 | 0.00 | 87.74 | 17.85 | 0.36 | -5.93 |
| 2011 | Mahe_E | carbonate | Fished | Regime shift | 0.49 | Not collected | 1.44 | 0.50 | 1.38 | 0.00 | 52.25 | 7.07 | 36.86 | 11.19 | 0.20 | -3.00 |
| 2011 | Mahe_E | granite | Fished | Regime shift | 0.50 | Not collected | 1.94 | 0.38 | 0.63 | 0.00 | 46.00 | 0.35 | 75.94 | 21.56 | 0.11 | -2.84 |
| 2011 | Mahe_E | patch | Fished | Recovery | 0.50 | Not collected | 2.13 | 1.00 | 6.13 | 5.00 | 0.13 | 2.21 | 261.75 | 4.15 | 2.12 | -4.79 |
| 2011 | Mahe_NW | carbonate | Reserve | Recovery | 0.12 | Not collected | 2.13 | 15.88 | 0.75 | 9.63 | 0.00 | 15.18 | 246.33 | 41.56 | 5.25 | -3.21 |
| 2011 | Mahe_NW | granite | Fished | Recovery | 0.13 | Not collected | 2.63 | 2.88 | 14.38 | 1.50 | 0.00 | 13.46 | 142.23 | 61.49 | 2.24 | -1.87 |
| 2011 | Mahe_NW | patch | Fished | Recovery | 0.08 | Not collected | 2.38 | 9.00 | 1.63 | 10.00 | 0.00 | 20.24 | 40.66 | 50.18 | 4.43 | -1.79 |
| 2011 | Mahe_W | carbonate | Fished | Recovery | 0.04 | Not collected | 2.38 | 6.88 | 0.88 | 16.13 | 0.00 | 24.48 | 279.32 | 18.09 | 5.54 | -3.61 |
| 2011 | Mahe_W | granite | Fished | Recovery | 0.16 | Not collected | 2.75 | 7.25 | 20.13 | 2.75 | 0.00 | 28.61 | 122.26 | 36.77 | 4.35 | -2.87 |
| 2011 | Mahe_W | patch | Fished | Recovery | 0.22 | Not collected | 2.13 | 30.25 | 0.50 | 16.75 | 0.00 | 12.15 | 65.42 | 24.71 | 9.21 | -2.55 |
| 2011 | Praslin_NE | carbonate | Fished | Regime shift | 0.07 | Not collected | 0.50 | 0.00 | 0.50 | 0.50 | 53.13 | 0.00 | 3.47 | 33.90 | 0.18 | -0.60 |
| 2011 | Praslin_NE | granite | Fished | Recovery | 0.11 | Not collected | 3.13 | 6.75 | 14.38 | 0.63 | 0.13 | 18.01 | 210.33 | 42.24 | 3.09 | -2.68 |
| 2011 | Praslin_NE | patch | Fished | Recovery | 0.13 | Not collected | 1.75 | 2.25 | 3.50 | 4.38 | 0.00 | 12.54 | 47.57 | 14.92 | 1.86 | -1.26 |
| 2011 | Praslin_SW | carbonate | Fished | Regime shift | 0.35 | Not collected | 0.56 | 0.13 | 0.25 | 0.00 | 77.63 | 1.35 | 63.49 | 6.81 | 0.04 | -1.16 |
| 2011 | Praslin_SW | granite | Fished | Recovery | 0.18 | Not collected | 2.50 | 8.25 | 4.38 | 2.38 | 0.00 | 16.06 | 81.67 | 8.57 | 3.02 | -2.82 |
| 2011 | Praslin_SW | patch | Fished | Regime shift | 0.18 | Not collected | 2.06 | 1.38 | 1.50 | 0.25 | 14.50 | 19.71 | 216.61 | 35.01 | 0.49 | -3.89 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | Ste. Anne | carbonate | Reserve | Regime shift | 0.06 | Not collected | 0.56 | 0.13 | 0.13 | 0.00 | 40.00 | 6.96 | 9.35 | 20.97 | 0.03 | -1.77 |
| 2011 | Ste. Anne | granite | Reserve | Recovery | 0.49 | Not collected | 3.00 | 2.75 | 15.38 | 1.25 | 1.50 | 7.48 | 226.65 | 32.75 | 2.46 | -5.54 |
| 2011 | Ste. Anne | patch | Reserve | Recovery | 0.46 | Not collected | 1.94 | 11.00 | 0.38 | 2.00 | 9.75 | 0.00 | 94.95 | 28.27 | 2.46 | -1.57 |
| 2014 | Cousin | carbonate | Reserve | Regime shift | 0.57 | 4.45 | 2.38 | 0.13 | 0.38 | 0.00 | 55.00 | 0.00 | 4.16 | 22.85 | 0.05 | -3.90 |
| 2014 | Cousin | granite | Reserve | Regime shift | 0.13 | 4.93 | 2.44 | 0.25 | 0.25 | 0.88 | 29.75 | 0.00 | 68.78 | 18.01 | 0.30 | -3.21 |
| 2014 | Cousin | patch | Reserve | Regime shift | 0.49 | 6.19 | 3.06 | 8.88 | 1.88 | 0.25 | 23.88 | 0.00 | 138.34 | 19.17 | 1.58 | -3.13 |
| 2014 | Mahe_E | carbonate | Fished | Regime shift | 0.49 | 6.15 | 2.00 | 3.00 | 1.38 | 2.13 | 6.50 | 0.00 | 52.33 | 45.90 | 1.27 | -2.40 |
| 2014 | Mahe_E | granite | Fished | Regime shift | 0.50 | 9.38 | 1.38 | 0.75 | 0.25 | 0.63 | 40.38 | 0.44 | 44.61 | 12.39 | 0.38 | -2.79 |
| 2014 | Mahe_E | patch | Fished | Recovery | 0.50 | 7.71 | 2.19 | 1.44 | 3.00 | 2.25 | 0.38 | 9.48 | 139.83 | 34.03 | 1.18 | -3.12 |
| 2014 | Mahe_NW | carbonate | Reserve | Recovery | 0.12 | 5.54 | 2.31 | 32.00 | 0.88 | 4.88 | 0.00 | 5.89 | 105.03 | 25.25 | 6.36 | -2.84 |
| 2014 | Mahe_NW | granite | Fished | Recovery | 0.13 | 7.33 | 3.69 | 6.50 | 16.13 | 1.00 | 0.00 | 19.53 | 97.55 | 39.99 | 2.74 | -3.61 |
| 2014 | Mahe_NW | patch | Fished | Recovery | 0.08 | 6.21 | 2.56 | 19.13 | 0.50 | 5.88 | 0.00 | 21.03 | 52.82 | 24.30 | 4.58 | -1.98 |
| 2014 | Mahe_W | carbonate | Fished | Recovery | 0.04 | 5.64 | 2.88 | 27.13 | 2.13 | 8.88 | 0.00 | 54.76 | 385.62 | 2.41 | 6.73 | -2.61 |
| 2014 | Mahe_W | granite | Fished | Recovery | 0.16 | 10.04 | 3.38 | 10.50 | 19.88 | 0.88 | 0.00 | 0.00 | 112.20 | 0.00 | 5.02 | -3.14 |
| 2014 | Mahe_W | patch | Fished | Recovery | 0.22 | 7.48 | 2.88 | 19.75 | 0.75 | 11.50 | 0.00 | 0.00 | 52.13 | 0.00 | 6.35 | -2.93 |
| 2014 | Praslin_NE | carbonate | Fished | Regime shift | 0.07 | 4.24 | 0.69 | 0.00 | 0.13 | 0.25 | 46.00 | 0.79 | 8.28 | 40.37 | 0.08 | -0.41 |
| 2014 | Praslin_NE | granite | Fished | Recovery | 0.11 | 5.23 | 3.25 | 10.50 | 10.38 | 0.50 | 0.13 | 0.00 | 115.22 | 0.00 | 3.04 | -4.10 |
| 2014 | Praslin_NE | patch | Fished | Recovery | 0.13 | 8.48 | 1.50 | 2.00 | 1.50 | 5.88 | 0.00 | 0.00 | 49.02 | 0.00 | 2.05 | -1.38 |
| 2014 | Praslin_SW | carbonate | Fished | Regime shift | 0.35 | 6.63 | 2.25 | 2.00 | 1.88 | 0.13 | 48.25 | 12.89 | 70.06 | 27.82 | 0.58 | -3.03 |
| 2014 | Praslin_SW | granite | Fished | Recovery | 0.18 | 6.64 | 3.63 | 19.50 | 7.63 | 2.13 | 0.38 | 0.00 | 76.47 | 0.00 | 5.20 | -3.69 |
| 2014 | Praslin_SW | patch | Fished | Regime shift | 0.18 | 5.06 | 2.63 | 5.88 | 2.75 | 0.38 | 11.88 | 17.74 | 159.38 | 23.93 | 1.93 | -4.72 |
| 2014 | Ste. Anne | carbonate | Reserve | Regime shift | 0.06 | 2.86 | 2.06 | 9.25 | 0.13 | 6.00 | 33.50 | 19.19 | 90.49 | 43.10 | 3.06 | -4.17 |
| 2014 | Ste. Anne | granite | Reserve | Recovery | 0.49 | 7.18 | 3.44 | 3.13 | 5.13 | 2.00 | 20.00 | 251.06 | 0.00 | 0.00 | 2.53 | -3.97 |
| 2014 | Ste. Anne | patch | Reserve | Recovery | 0.46 | 6.76 | 2.75 | 40.00 | 0.75 | 2.50 | 0.75 | 460.08 | 0.00 | 0.00 | 7.09 | -1.28 |

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