

Table S1. Results (p-values) from the pairwise Mann-Whitney Wilcoxon tests comparing the average growth (cm) measured at all sites (annual growth rates: AT357, MC294, MC297 and MC344; growth between 2016 and 2017: GC852, MC294, MC297 and MC344).

Annual growth (cm)	MC294	MC297	MC344
AT357	0.752	0.149	0.007* ^a
MC294	- ^b	0.179	< 0.001*
MC297	-	-	0.013
Growth between 2016 and 2017 (cm)	MC294	MC297	MC344
GC852	0.611	0.015	0.005*
MC294	-	0.007*	0.002*
MC297	-	-	0.523

^a An asterisk indicates significant results, where significance is defined as p-value < 0.008 after Bonferroni correction of $\alpha = 0.05$.

^b A dash replaces redundant results.

Table S2. Coefficients from the generalized linear models testing the effect of total size on growth proportion at each site.

Site	Estimate	Size	Standard error
AT357 (2012–2016)	–0.01087		0.14683
GC852 (2016–2017)	–0.3574* ^a		0.1222
MC294 (2012–2017)	–0.1679		0.1356
MC297 (2012–2017)	–0.03083		0.05779
MC344 (2012–2017)	–0.2646		0.2383

^a The asterisk indicates significance at p-value < 0.05.

Table S3. Coefficients from the generalized linear mixed models testing the effect of initial impact (2011), current impact (level at the beginning of any of the shorter time increments) and initial proportions of unhealthy and hydroid-colonized branches on growth proportion. Imaging year and coral individuals nested within sites were used as random effects all three models.

Models	Fixed effect	Model coefficients	
		Estimate	Standard error
Model 1	IMPini ^b	1.5406* ^a	0.6103
Model 2	IMP ^c	0.4099	0.8421
Model 3	Uini ^d	2.4342**	1.3574
	Hyini ^e	-0.3860	1.6784
	Uini x Hyini	6.8189	7.4557

^a Asterisks indicate the degree of significance: *p-value < 0.05; ** p-value < 0.01.

^b Initial total visible impact proportion.

^c Current total visible impact proportion.

^d Initial proportion of unhealthy branches

^e initial proportion of branches colonized by hydroids

Table S4. Coefficients from the generalized linear mixed models testing the effect of initial impact (2011) on growth proportion between each of the indicated time increments. Coral individuals nested within sites were used as random effects in every model.

Year	Fixed effect: IMPini	
	Estimate	Standard error
2011–2012	–1.4726	1.8816
2012–2014	–0.2534	0.9355
2014–2015	1.8642*** ^a	0.7159
2015–2016	2.2451**	0.7476
2016–2017	3.0438***	0.7540

^a Asterisks indicate the degree of significance: **p-value < 0.01; *** p-value < 0.001.

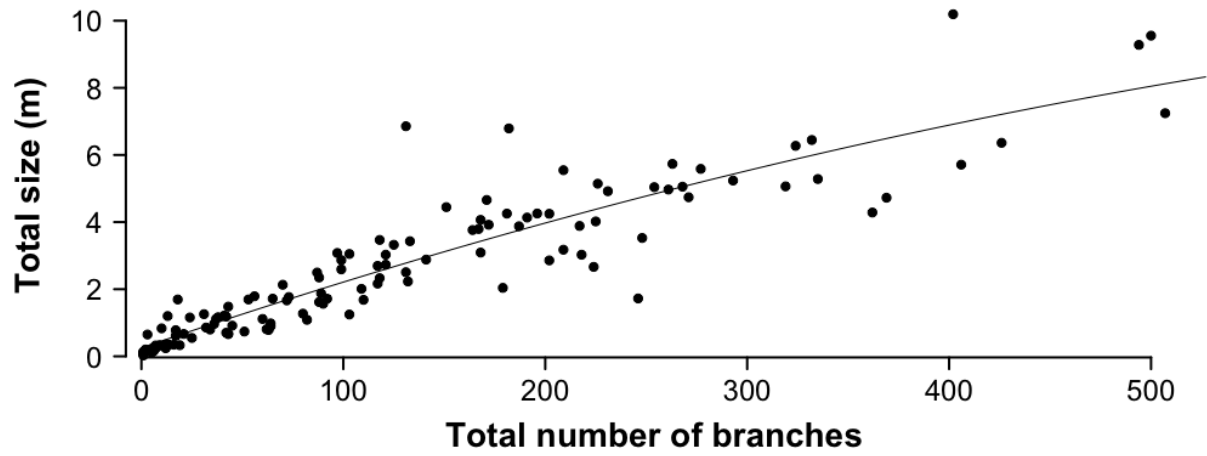


Figure S1. Relation between total coral size and total number of branches for *Paramuricea biscaya* corals. Data were obtained at sites MC294, MC297 and MC344. A polynomial regression model was fitted to the data and then used to predict the total size of coral colonies at GC852.

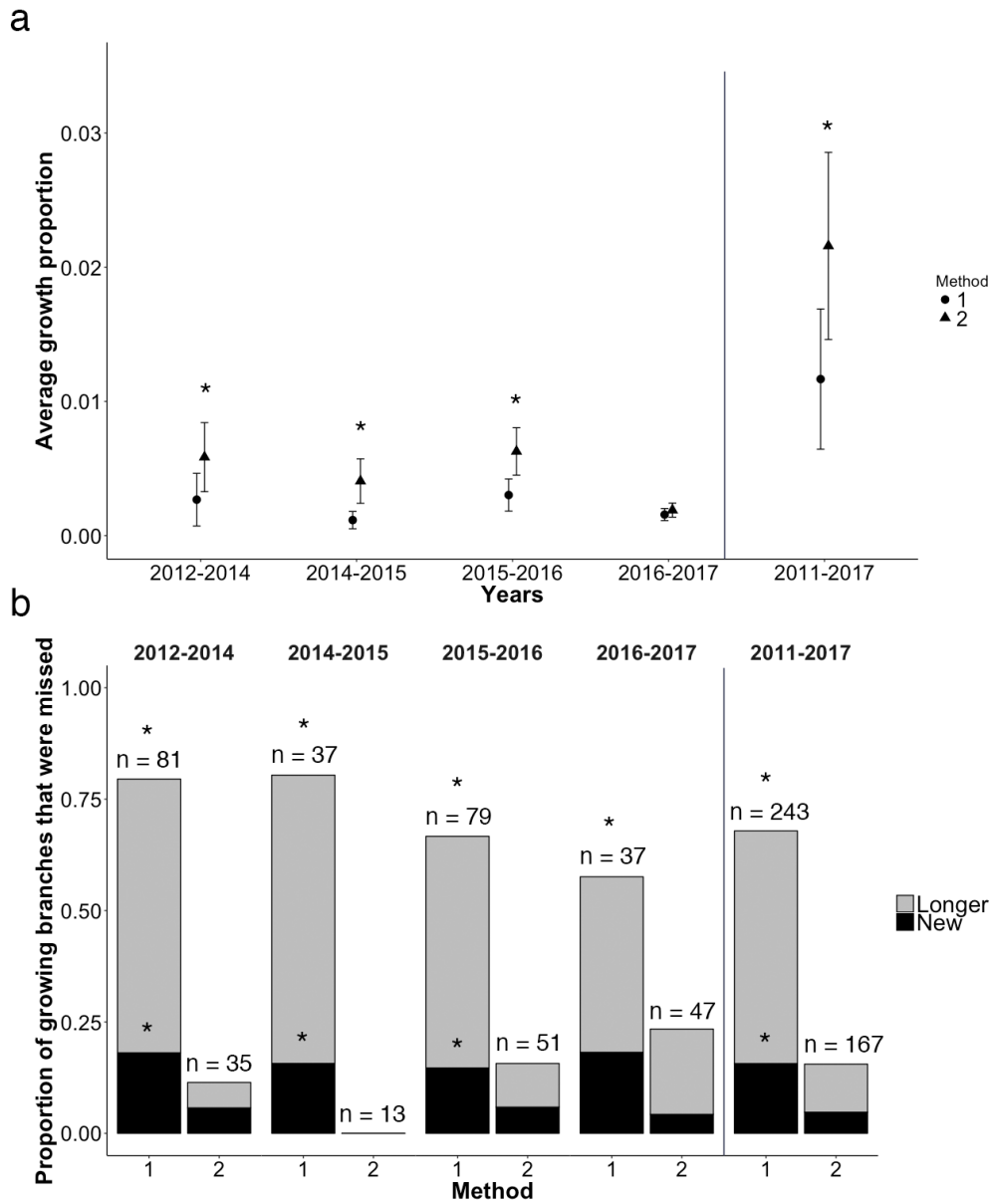


Figure S2. Methods comparison. (a) Average growth proportion measured between each of the indicated time increments and between 2011 and 2017 using Method 1 and Method 2. (b) Proportion of new branches or branches that increased in length that were detected with a method and missed with the other between every indicated time increment and between 2011 and 2017. The total numbers of growing branches detected are indicated above each bar. An asterisk indicates when differences were significant. Results were considered significant for a p-value < 0.01 after Bonferroni correction of $\alpha = 0.05$.