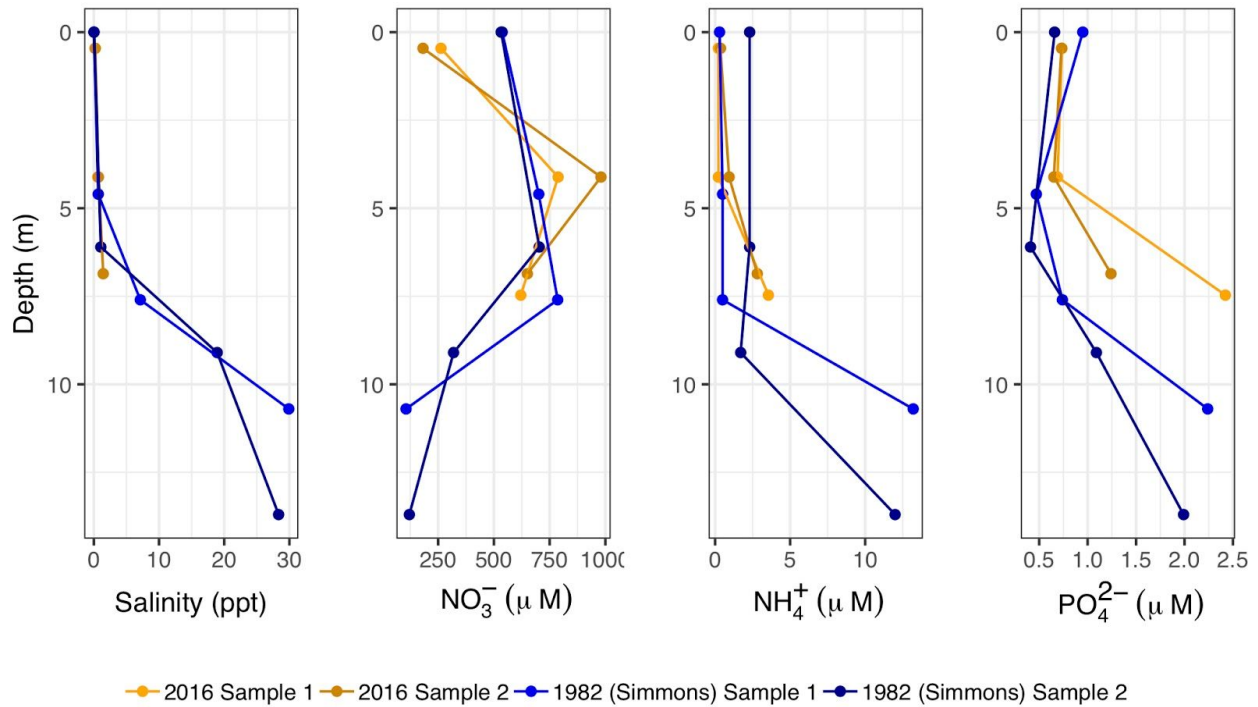


Electronic Supplementary Material

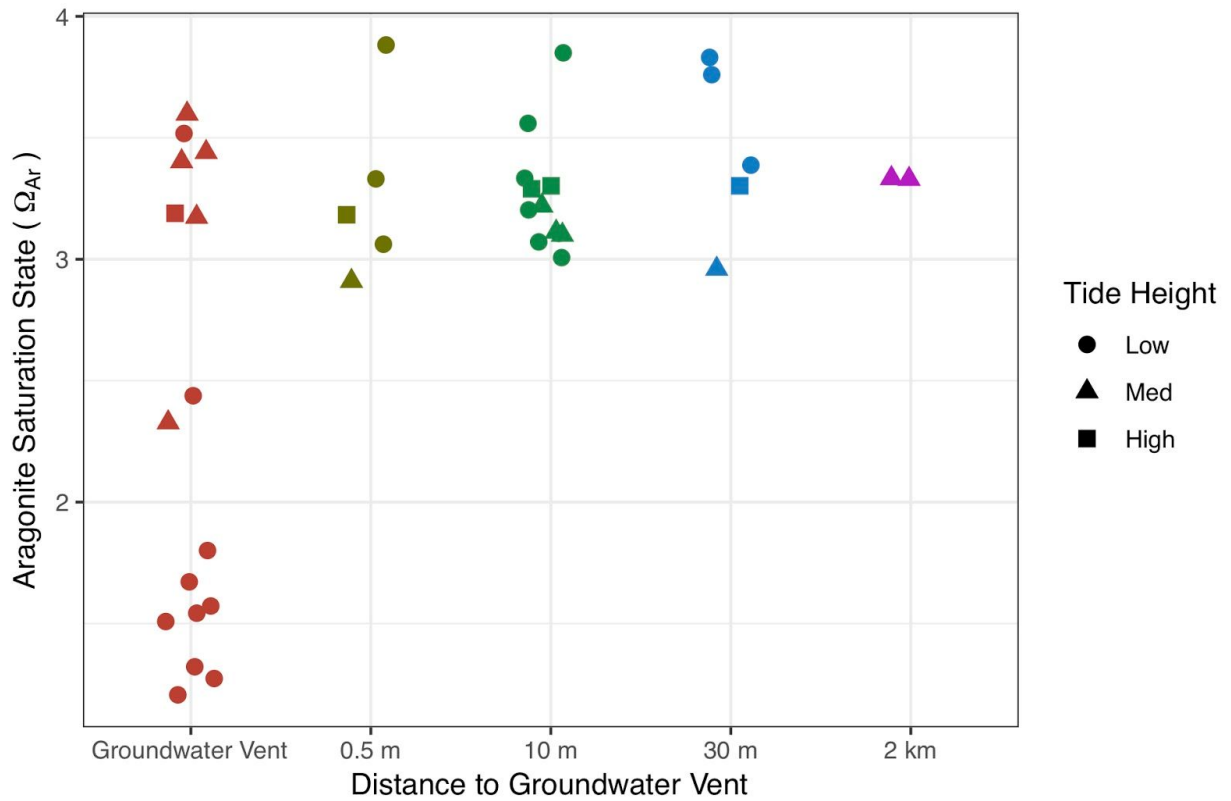
ESM Table 1. Water chemistry along a depth profile of Bermuda’s Devonshire groundwater lens, taken at West Pembroke School, inshore from the study reef site. Two replicate samples were collected at each depth. We performed nitrite removal on one sample each from the top and the bottom of the well (n.d. = no data).

Depth (below water surface)	Salinity (ppt)	[SiO ₄ ²⁻]	[NH ₄ ⁺]	[PO ₄ ³⁻]	[NO ₃ ⁻ + NO ₂ ⁻]	[NO ₃ ⁻]	[NO ₂ ⁻]	NO ₃ ⁻ + NO ₂ ⁻ δ ¹⁵ N	NO ₃ ⁻ δ ¹⁵ N
0.5 m (Top)	0.21	104.0	0.21	0.74	262.3	257.8	4.5	8.8	8.8
	0.19	117.7	0.35	0.73	182.0	n.d.	n.d.	8.2	n.d.
4.0 m (Middle)	0.61	101.0	0.22	0.69	788.1	n.d.	n.d.	17.1	n.d.
	0.70	102.7	0.93	0.65	980.2	n.d.	n.d.	17.6	n.d.
7.5 m (Bottom)	n.d.	89.9	3.56	2.42	620.6	595.2	25.5	20.8	21.4
	1.44	79.4	2.81	1.24	650.3	n.d.	n.d.	19.3	n.d.

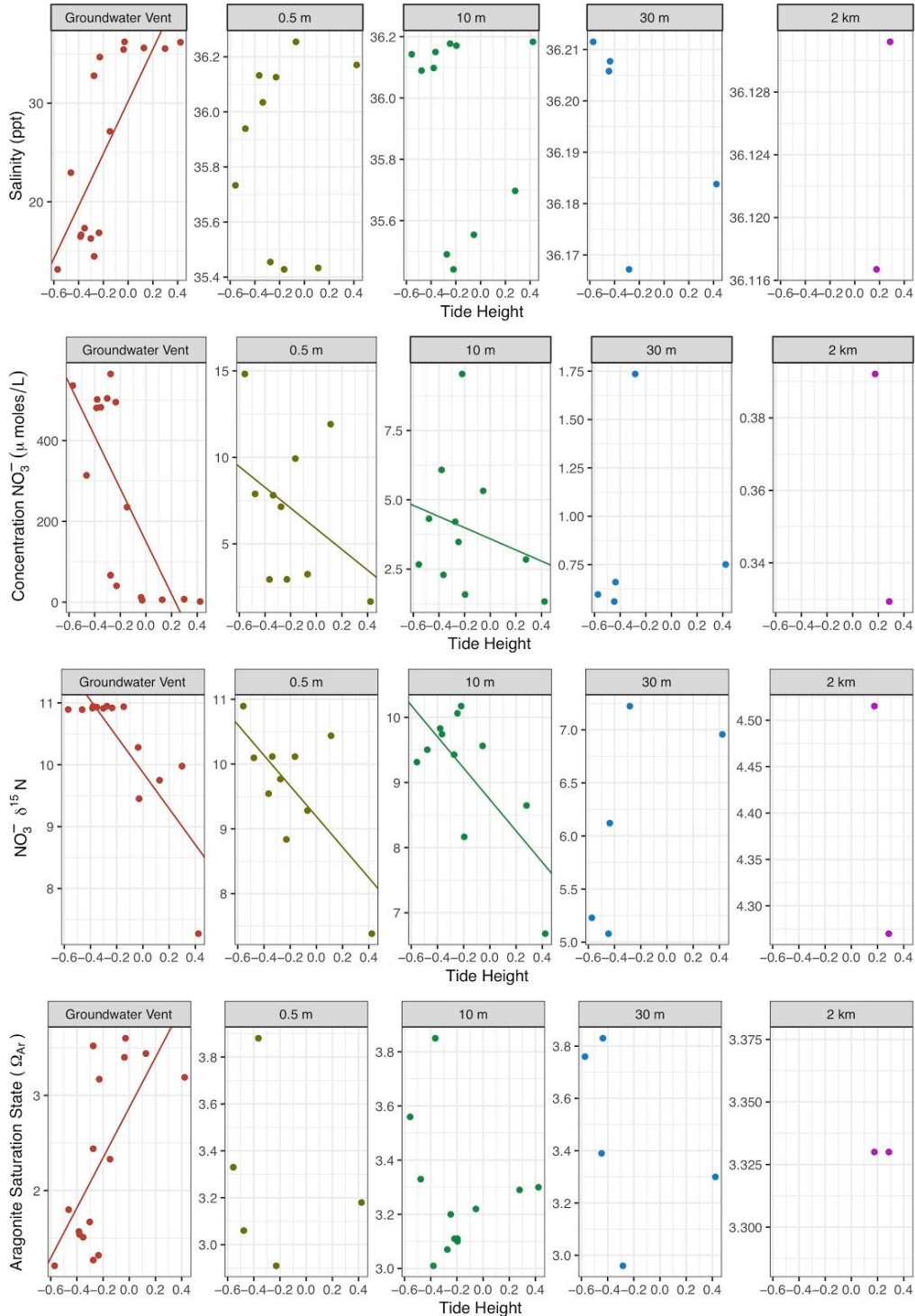
ESM Fig. 1 Groundwater profile data from West Pembroke School well, ~800 m inshore of study reef site. Data from our samples (2016) and from Simmons et al. (1982) are combined for comparison. 2016 data were collected as duplicate measurements on a single day; 1982 data were collected on two separate days (10 August and 19 August 1981).



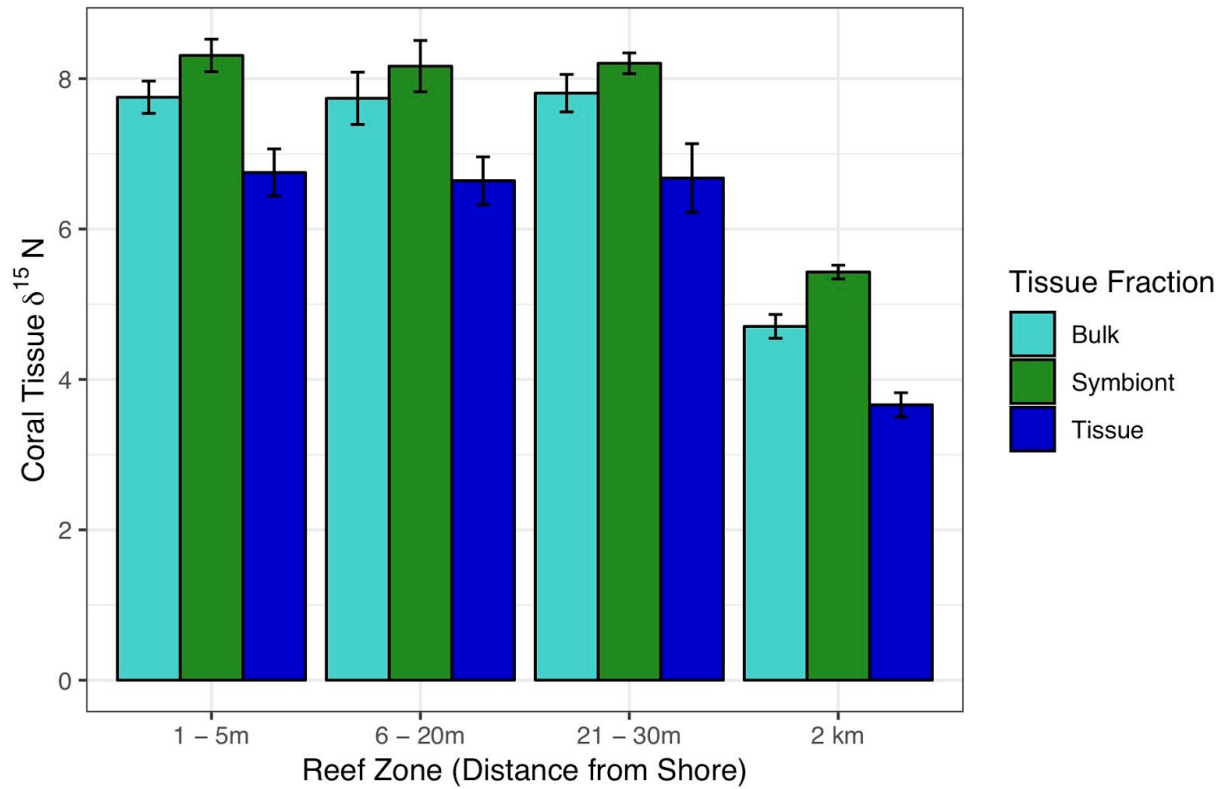
ESM Fig. 2 Aragonite saturation state (Ω_{ar}) in water samples collected from the groundwater vent on the study site and across the reef, moving away from the vent. High dissolved inorganic carbon in the groundwater drives low Ω_{ar} at the discharge vent at low tide, but Ω_{ar} elsewhere across the reef remains high.



ESM Fig. 3 Water sample salinity, $[\text{NO}_3^-]$, $\text{NO}_3^- \delta^{15}\text{N}$, and aragonite saturation state (Ω_{ar}) across the tidal cycle. Horizontal axes are centered at mean tide height, with negative numbers indicating low tide and positive numbers indicating high tide. Regression lines used to calculate tide-corrected means are shown where the tide-corrected mean (the regression line intercept with mean tide height) is significantly different than the samples' arithmetic mean without tide-correction.



ESM Fig. 4 Average coral tissue $\delta^{15}\text{N}$ across the study reef and at the comparison site, measured as symbiont, non-symbiont (“tissue”), and mixed symbiont and tissue (“bulk”) fractions. The 1-5 m, 6-20 m, 21-30 m, and ~ 2 km zones represent increasing distance from shore and from shoreline-based groundwater discharge; they respectively include data from 4, 3, 3, and 6 individual coral colonies. Each bar represents the average $\delta^{15}\text{N}$ (\pm standard error) for coral colonies sampled in that zone. Across all sampling locations, symbiont $\delta^{15}\text{N}$ is significantly elevated relative to coral tissue $\delta^{15}\text{N}$, by an average of 1.6‰.



ESM Fig. 5 Macroalgal $\delta^{15}\text{N}$ for three algal species plotted against average $\text{NO}_3^- \delta^{15}\text{N}$ at each sample's location on the study site ($\text{NO}_3^- \delta^{15}\text{N} > 6\text{‰}$) or comparison site 2km from shore ($\text{NO}_3^- \delta^{15}\text{N} = 4.4\text{‰}$).

