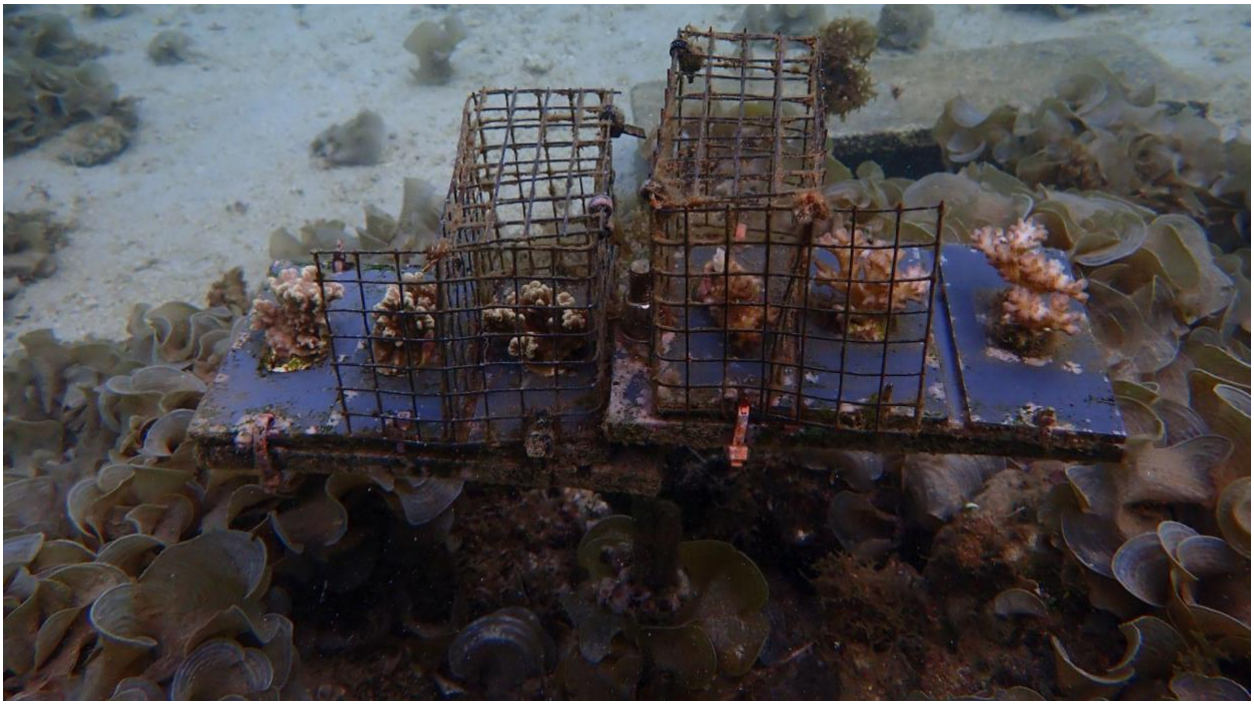
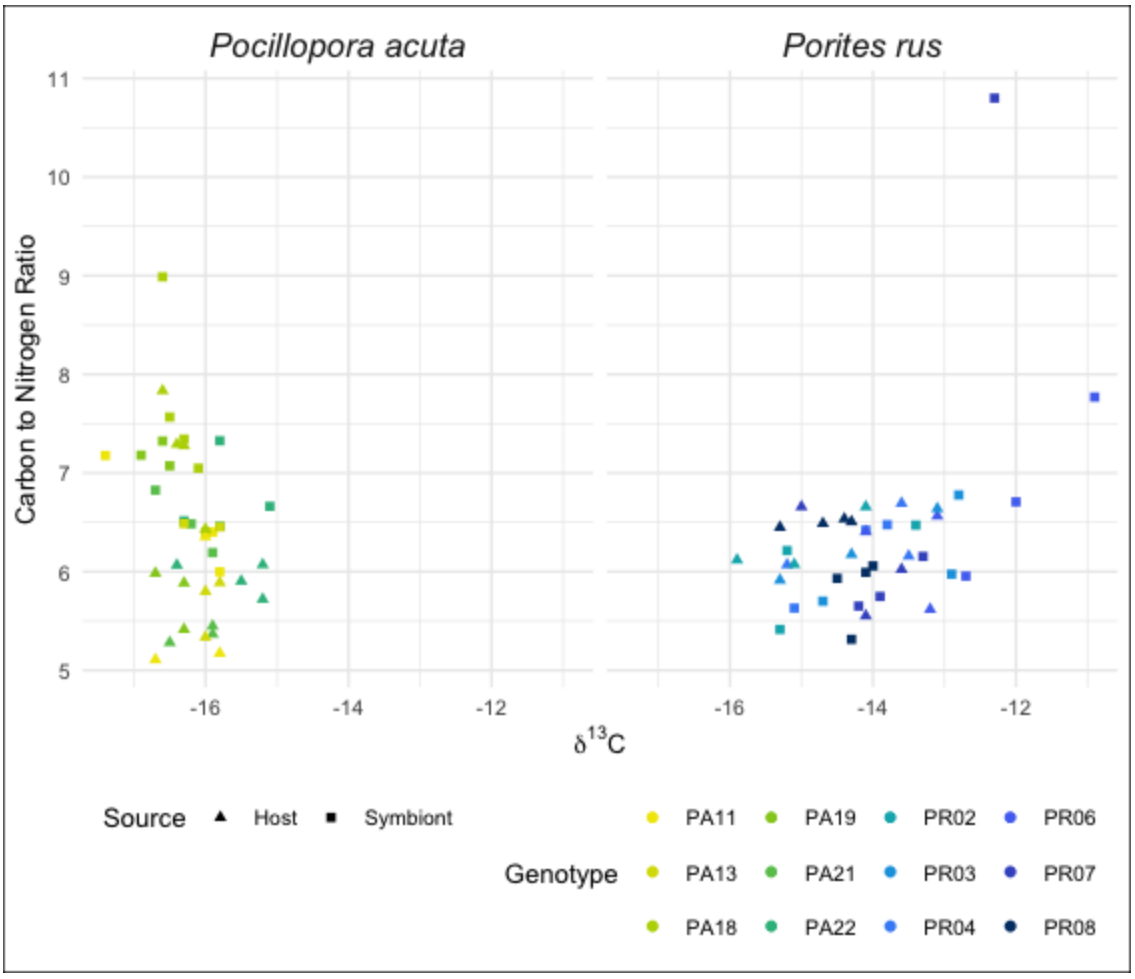
Supplement



Supplemental Figure 1. Experimental set-up demonstrating uncaged, partially caged, and caged corals of both species. Photo taken at the conclusion of the experiment.



Supplemental Figure 2. Comparison of the values of $\delta^{13}C$ to Carbon to Nitrogen ratio. We observed no relationship between these factors for either the symbiont ($p = 0.827$) or the host ($p = 0.345$) when accounting for the potential influence of genotype.

Impact of Varied TDFs on MixSIAR results:

If TDF was not amended for nutrient recycling, as was done in Wang et al., 2024 and used in the main text, the coral host and symbiont TDF values would be used similar to an increase in one trophic level, as was used in Price et al., 2021.

Supplemental Table 1. Trophic discrimination factors (TDF) for zooplankton, POM, and symbionts adopted from both Price et al., 2021 and Wang et al., 2024.

	Symbiont		Zooplankton		POM	
TDF Source	Price et al., 2021	Wang et al., 2024	Price et al., 2021	Wang et al., 2024	Price et al., 2021	Wang et al., 2024
$\delta^{13}C$ TDF	0.5 ± 1.3	1.0 ± 1.0	0.5 ± 1.3	1.0 ± 1.0	0.5 ± 1.3	1.0 ± 1.0
$\delta^{15}N$ TDF	1.5 ± 1.3	3.4 ± 1.0	2.3 ± 1.5	3.4 ± 1.0	2.3 ± 1.5	3.4 ± 1.0

Running both models produced similar results, supporting the interpretation of minimal input from seep-derived heterotrophy. In both cases, the primary contributor to $\delta^{13}C$ values for both species was their symbionts, suggesting a high level of autotrophy and resource recycling. The order of secondary contributors remained consistent, though their contributions decreased slightly with higher TDFs. This demonstrates that while the results are somewhat sensitive to the choice of TDFs used in the models, both sets of values previously applied to corals lead to a consistent and robust interpretation.

Supplemental Table 2. Trophic discrimination factors (TDF) for zooplankton, POM, and symbionts adopted from both Price et al., 2021 and Wang et al., 2024.

TDF Source	Price et al., 2021				Wang et al., 2024			
Species	*Pocillopora acuta*		*Porites rus*		*Pocillopora acuta*		*Porites rus*	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Symbiont	82.7 %	2.4 %	90.8 %	2.5 %	80.6 %	6.4 %	85.0 %	4.7 %
Ambient Seawater	7.0 %	3.8 %	3.1 %	2.3 %	3.1 %	2.7 %	3.6 %	3.0 %

POM								
Ambient Seawater Zooplankton	4.5 %	4.0 %	2.8 %	2.4 %	10.4 %	7.6 %	6.4 %	2.5 %
Seep-Derived POM	2.7 %	2.5 %	1.6 %	1.6%	2.9 %	2.7 %	2.5 %	2.5 %
Seep-Derived Zooplankton	3.1 %	2.7 %	1.7 %	1.5%	3.0 %	2.7 %	2.5 %	2.3 %

Supplemental Table 3. Mean, minimum and maximum of coral physiology parameters observed in *P. acuta*. Stable isotope variables were only measured for caged corals (n = 20), while percent change in buoyant weight and total chlorophyll content were measured for each surviving experimental colony (n = 58).

Variable	Mean	Min	Max	Standard Deviation	n
Percent Change in Buoyant Weight	10.16%	2.32%	22.74%	5.39%	58
Total Chlorophyll Content ($\mu g\ cm^{-2}$)	2.026	0.6106	4.201	0.8767	58
$\delta^{15}N_H$	6.72	6.1	7.7	0.39	20
$\delta^{15}N_S$	6.2	5.4	6.9	0.35	20
$\delta^{13}C_H$	-16.1	-16.8	-15.2	0.44	20
$\delta^{13}C_S$	-16.2	-17.4	-15.1	0.50	20
$\delta^{15}N_{H\text{-}S}$	0.52	-0.6	1.6	0.44	20
$\delta^{13}C_{H\text{-}S}$	0.15	-0.1	0.7	0.23	20

Supplemental Table 4. Mean, minimum and maximum of coral physiology parameters observed in *P. rus*. Stable isotope variables were only measured for caged corals (n = 20), while percent change in buoyant weight and total chlorophyll content were measured for all surviving experimental colony (n = 60). One colony was excluded from total chlorophyll analysis due to lack of material.

Variable	Mean	Min	Max	Standard Deviation	n
Percent Change in Buoyant Weight	10.42%	0.65%	33.02%	7.41%	60
Total Chlorophyll Content ($\mu g\ cm^{-2}$)	4.145	0.5592	11.87	2.40	59
$\delta^{15}N_H$	6.1	5.2	6.6	0.39	19
$\delta^{15}N_S$	6.0	5.1	6.8	0.35	20
$\delta^{13}C_H$	-14.3	-15.9	-13.1	0.83	19
$\delta^{13}C_S$	-13.7	-15.3	-10.9	1.14	20
$\delta^{15}N_{H-S}$	0.03	-0.90	0.40	0.33	19
$\delta^{13}C_{H-S}$	-0.56	-3.20	0.60	0.80	19

Supplemental Table 5. Summary statistics of univariate models of low tide water chemistry parameters associated with SGD against the total chlorophyll cm^2 in *P. acuta*. Bold values indicate values where the model has statistical significance ($p < 0.05$).

Parameter	Beta Value	p	AIC	Marginal R^2	Conditional R^2
pH	**- 65.50**	**0.03 ***	**145**	**0.07**	**0.23**

N+N	**2.67**	**0.004 ***	**147**	**0.14**	**0.28**
Phosphate	110.06	0.51	149	0.007	0.19
Salinity	- 1.60	0.31	153	0.02	0.17
Silicate	**1.15**	**0.03 ***	**155**	**0.07**	**0.19**
TA	0.04	0.08	160	0.05	0.22

Supplemental Table 6. Summary statistics of univariate models of low tide water chemistry parameters associated with SGD against the percent change in buoyant weight in *P. acuta*. Bold values indicate values where the model has statistical significance ($p < 0.05$).

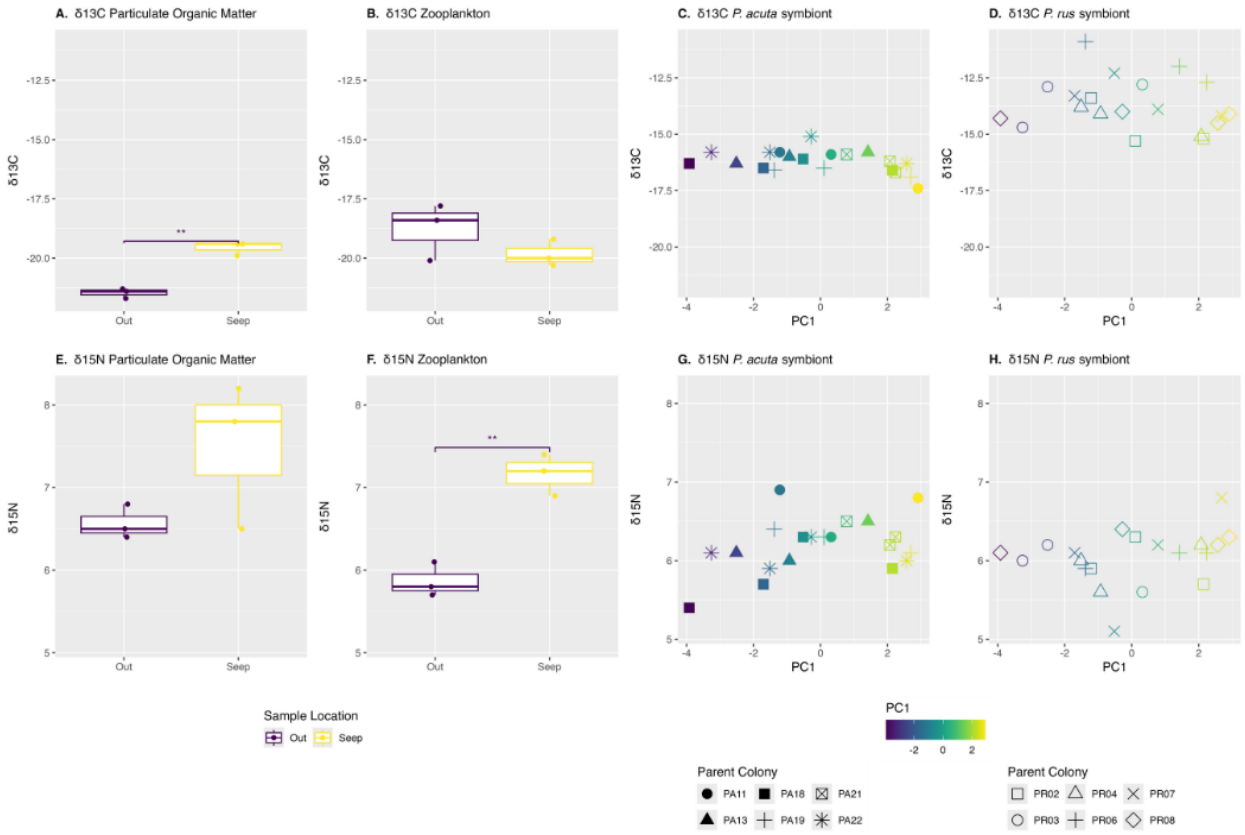
Parameter	Beta Value	p	AIC	Marginal R^2	Conditional R^2
pH	-65.46	0.31	353.77	0.02	0.16
N+N	5.08	0.42	358.82	0.01	0.19
Phosphate	110.06	0.11	352.20	0.04	0.22
Salinity	-16.13	0.10	355.88	0.05	0.21
Silicate	1.15	0.07	360.78	0.051	0.22
TA	0.039	0.70	367.56	0.00	0.17

Supplemental Table 7. Summary statistics of univariate models of low tide water chemistry parameters associated with SGD against the percent change in buoyant weight in *P. rus*. Bold values indicate values where the model has statistical significance ($p < 0.05$).

Parameter	Beta Value	p	AIC	Marginal R^2	Conditional R^2
pH	87.79	0.28	394.80	0.02	0.09
N+N	-9.68	0.19	399.07	0.03	0.09
Phosphate	-33.15	0.73	395.51	0.00	0.09
Salinity	**41.71**	**0.00012**	**387.86**	**0.20**	**0.20**
Silicate	0.25	0.78	404.90	0.00	0.09
TA	-0.04	0.76	408.76	0.00	0.08

Supplemental Table 8. Results of linear mixed-effects models testing the effect of caging treatment on two response variables, percent change in buoyant weight and total chlorophyll content, in both species. Models included random intercepts for coral genotype and experimental station. Reported are the p-values for the fixed effect of caging and the marginal R^2 values, which represent the proportion of variance explained by the caging treatment alone.

Species	Response Variable	p-value	Marginal R^2
Pocillopora acuta	Percent Change in Buoyant Weight	0.218	0.030
	Total Chlorophyll Content	0.077	0.053
Porites rus	Percent Change in Buoyant Weight	0.927	0.001
	Total Chlorophyll Content	0.033	0.115



Supplemental Figure 3. Isotopic values for sources used in MixSIAR models. Isotopic values of particulate organic matter of δ13C (A) and δ15N (E) and zooplankton of δ13C (B) and δ15N (F) represented as boxplots. Stars denote significance and color designates sample location, where purple designates samples taken from outside of the seep and yellow designates samples taken adjacent to the seep. Scatterplots of *P. acuta* symbiont isotopic values for of δ13C (C) and δ15N (G) and *P. rus* isotopic values of of δ13C (D) and δ15N (H) against the principal components axis, where higher numbers represent more exposure to SGD-associated water quality parameters. No significant relationships exist for the isotopes of symbionts from either species when regressed against the PC axis. Shapes in symbiont plots signify different parent colonies.

Supplemental Table 9. Mean values of nutrients associated with SGD and salinity values at seeps from published literature. (*) Denotes studies which only measured Nitrate, not N+N. N:P is only shown as the ratio of Nitrate or N+N to Phosphate, due to a lack of reporting on Ammonium values. The top row, Varari, represents the gradient used in this study.

Island	Site	Location of Seepage Point	Source	Silicate (µmol L-1)	Salinity (psu)	N+N (µmol L-1)	Phosphate (µmol L-1)	N:P
	Station Aloha	N/A	Richardson et al 2017	1.2	35.2	0.03	0.2	0.15
Moorea	Varari	Fringing Reef	Silbiger et al 2022	129.54 ± 298.11	30.185 ± 15.00	6.169 ± 12.475	0.794 ± 1.35	7.77

	Cabral	Fringing Reef	Silbiger et al 2022	225.71 ± 302.21	25.42 ± 15.753	10.57 ± 11.87	1.20 ± 1.41	8.81
	Reef Flat West	Beach Pit	Knee et al 2016	341	7.9	7.8	1.7	4.59
	Lagoon West	Beach Pit	Knee et al 2016	627	2.8	2.5	3.3	0.76
	Gump Station	Beach Pit	Knee et al 2016	170 ± 50	11 ± 6	2.5 ± 0.5	22 ± 8	0.11
	Lagoon East	Beach Pit	Knee et al 2016	208	1.4	6.8	4.8	1.42
	Reef Flat East	Beach Pit	Knee et al 2016	567	2.2	2.8	4.3	0.65
O‘ahu	Black Point	Fringing Reef	Richardson et al 2017	740 ± 25.48	4.9 ± 0.2	163 ± 1*	3.7 ± 0.1	44.05
	Wailupe	Fringing Reef	Richardson et al 2017	810 ± 52	2.0 ± 0.5	39.5 ± 11.5	1.7 ± 0.1	41.76
Hawai‘i	Puako Beach Pits	Beach Pit	Knee et al 2010	230 ± 50	23.85 ± 2.35	28 ± 23	2.65 ± 0.25	10.57
	Puako Springs	Shoreline	Knee et al 2010	350 ± 320	14.7 ± 7.4	62.5 ± 26.5	3.6 ± 1.6	17.36