Electronic Supplementary Material

Figure Captions

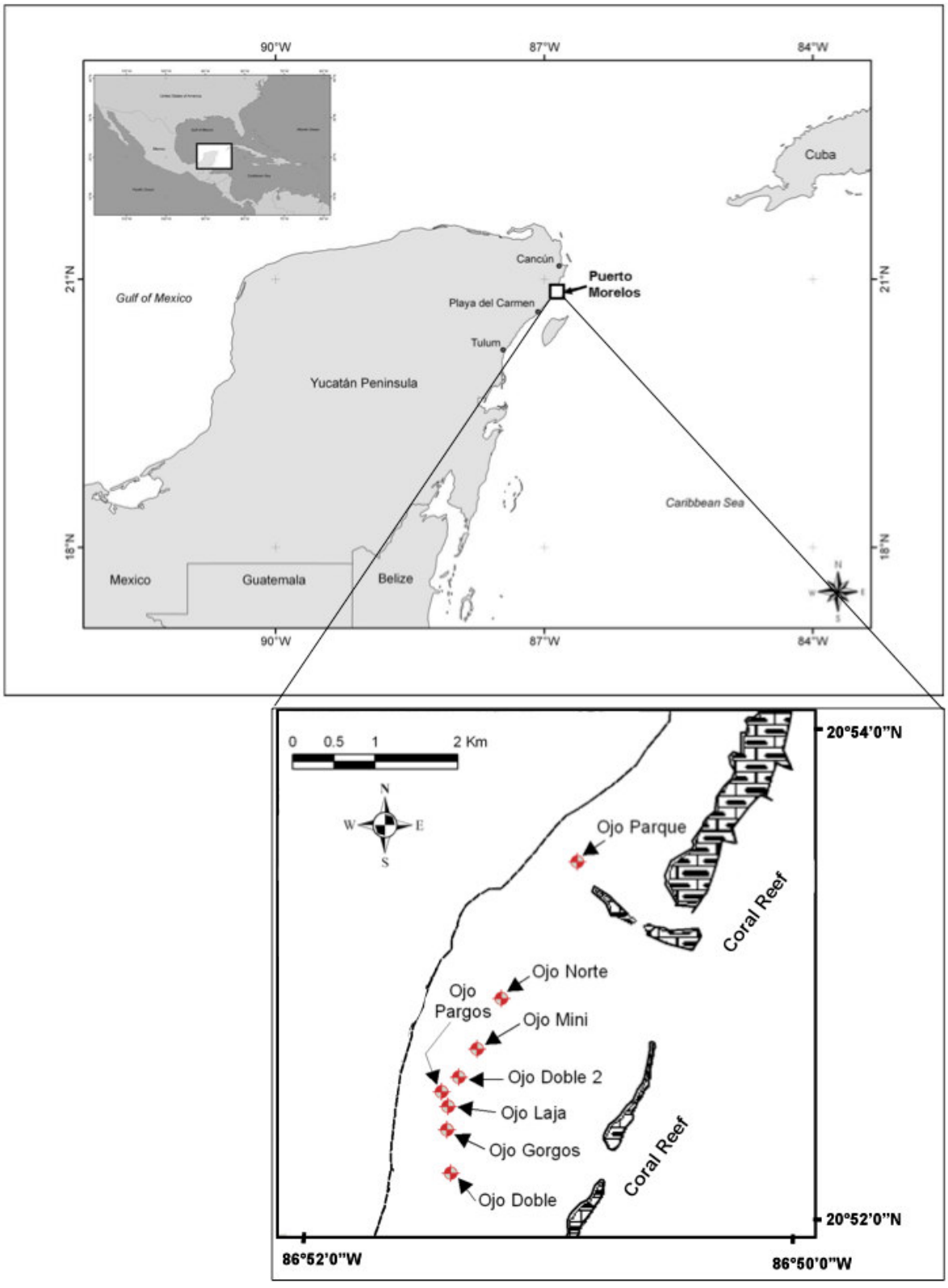
Figure ESM 1: Location map of Puerto Morelos, Mexico. The submarine springs, referred to locally as "ojos," exist approximately 500 m offshore in shallow (~5 m) lagoon waters.

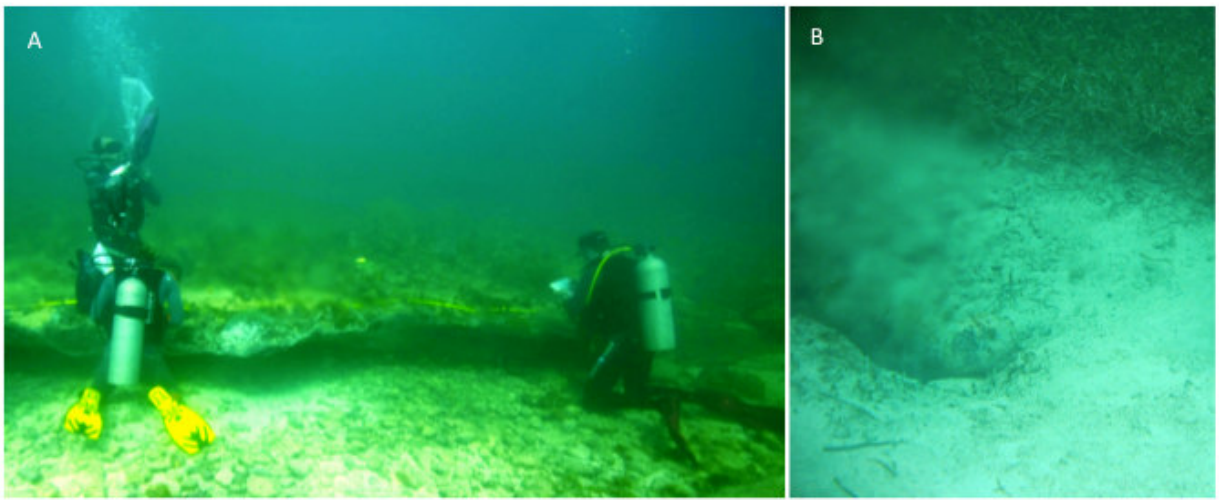
Figure ESM 2: Two examples of ojo sites. (A) depicts a "fracture" approximately 8m long, directly beneath a rocky shelf which overhangs the spring. (B) shows a circular hole in a sandy bed from which groundwater seeps. Note the blurred image, due to salinity differences in the water. For the purposes of this study, sandy beds and seeps were omitted due to lack of rocky substrate.

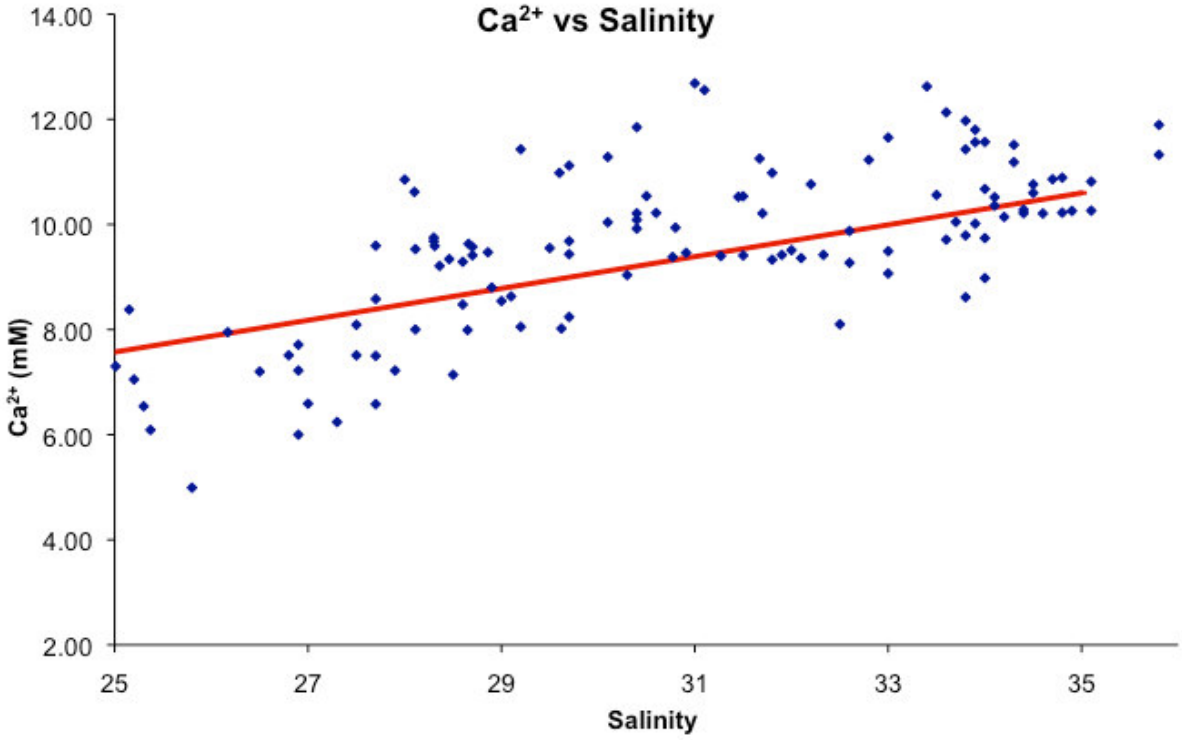
Figure ESM 3: Ca^{2+} concentrations as a function of salinity (R^2=0.53). For certain ojo waters, Ca^{2+} concentrations were higher than expected based on a linear mixing model between freshwater of zero salinity and zero Ca^{2+} and ambient seawater (linear mixing line shown in red). This is a result of the dissolution of limestone in groundwater. In the case of high Ca^{2+} concentrations, the correction factor $[Ca^{2+}_{observed}]/[Ca^{2+}_{expected}]$ was used in the CO_2-Sys program to calculate saturation values. If lower than expected values were found, a correction factor— was not used (i.e., conservative saturation values are reported in both cases).

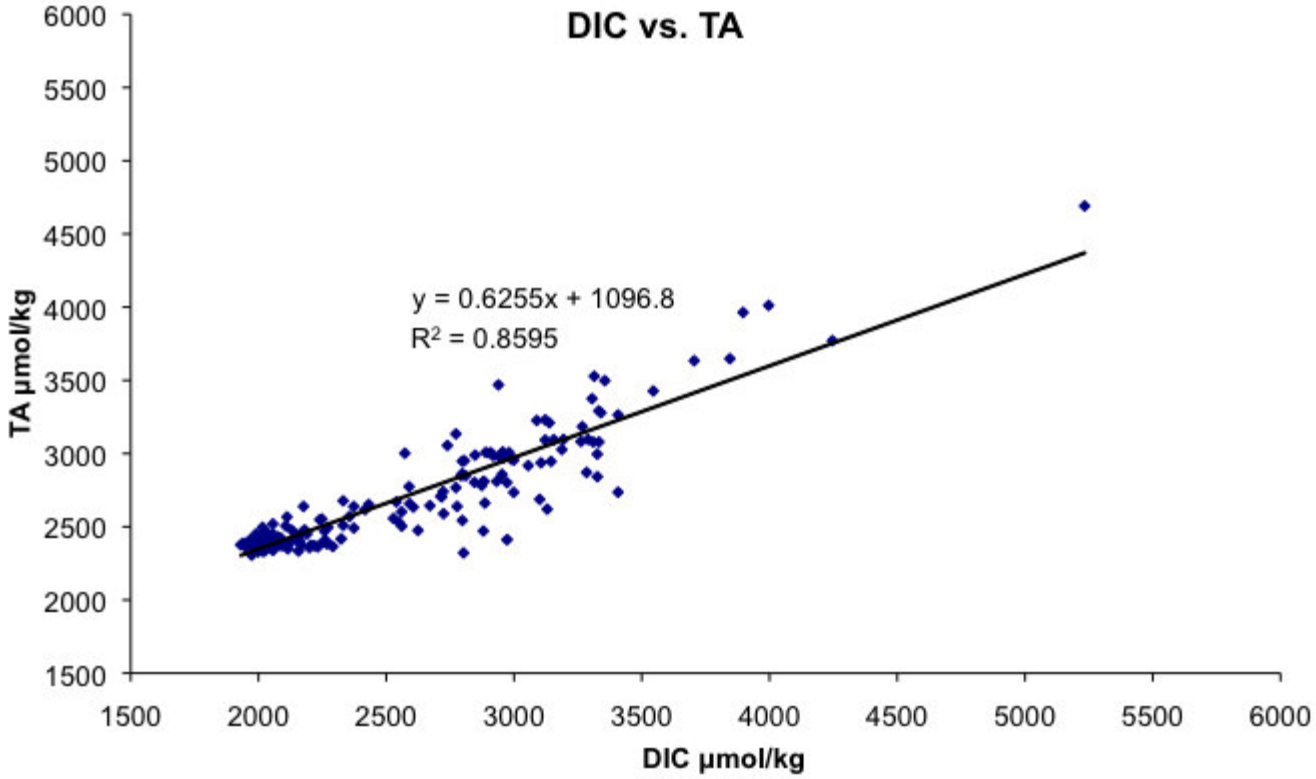
Figure ESM 4: Dissolved Inorganic Carbon (DIC) and Total Alkalinity (TA) correlated strongly at all ojo sites. Both DIC and TA were highest in near the freshwater discharge.

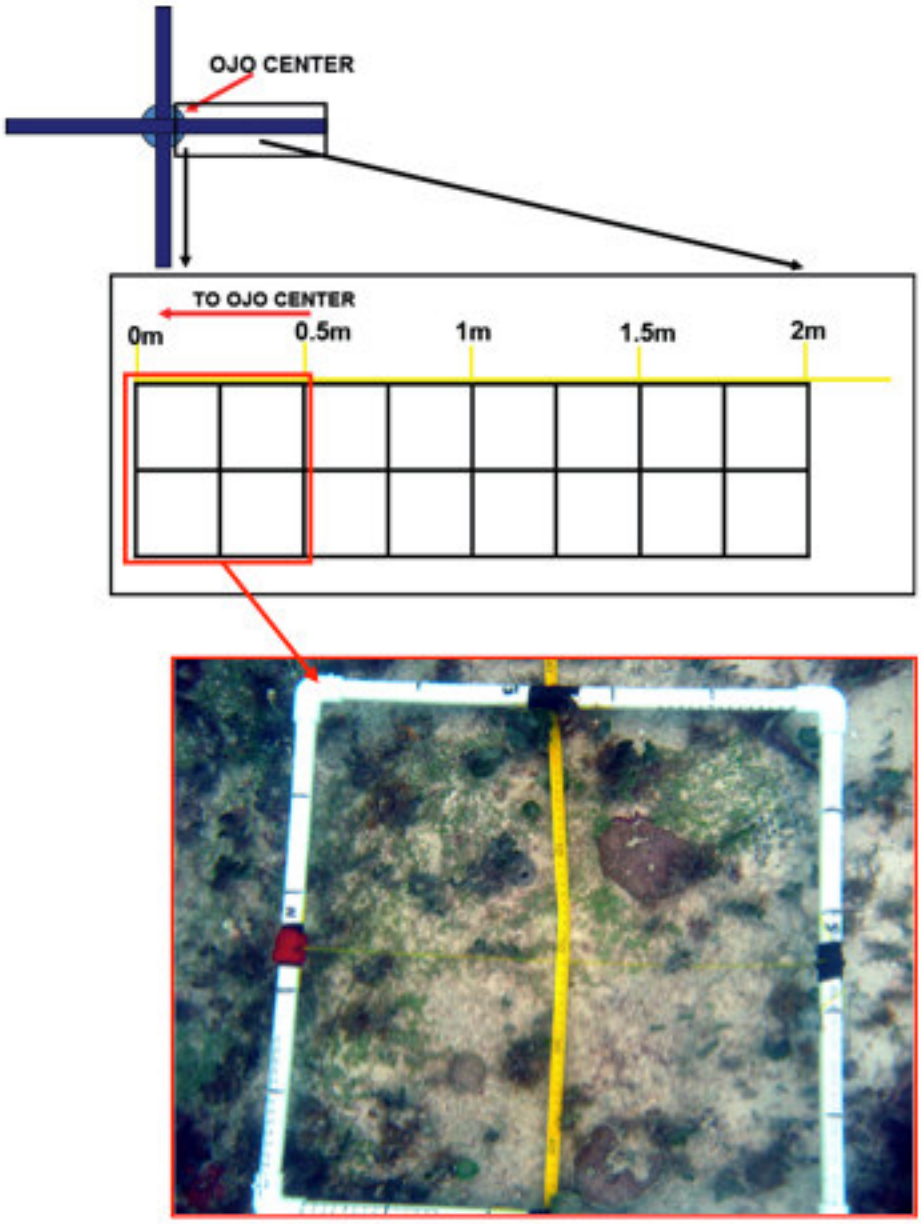
Figure ESM 5: Diagram of an underwater transect. At least two transects (up to 9 m long) were completed at each ojo, and in the case of larger "fractures" up to 5 cross-transects were made. Water was sampled every 0.25 m along each transect line. To sample the biota (identity, density, size, location), 0.50 x 0.50 m grids were broken into 4 quadrats of 0.25 x 0.25 m. Corals were directly measured on site, and extensive underwater photographs were taken.


90°W
87°W
84°W
21°N
18°N
Cuba
Cancún
Puerto Morelos
Playa del Carmen
Tulum
Gulf of Mexico
Yucatán Peninsula
Caribbean Sea
Mexico
Guatemala
Belize
0 0.5 1 2 Km
N
W
E
S
Ojo Parque
Coral Reef
Ojo Norte
Ojo Pargos
Ojo Mini
Ojo Doble 2
Ojo Laja
Ojo Gorgos
Ojo Doble
Coral Reef
20°54'0"N
20°52'0"N
86°52'0"W
86°50'0"W


A
B


Ca2+ vs Salinity
14.00
12.00
10.00
8.00
6.00
4.00
2.00
Ca2+ (mM)
25
27
29
31
33
35
Salinity


DIC vs. TA
y = 0.6255x + 1096.8
R2 = 0.8595
TA µmol/kg
DIC µmol/kg
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000


OJO CENTER
TO OJO CENTER
0m
0.5m
1m
1.5m
2m