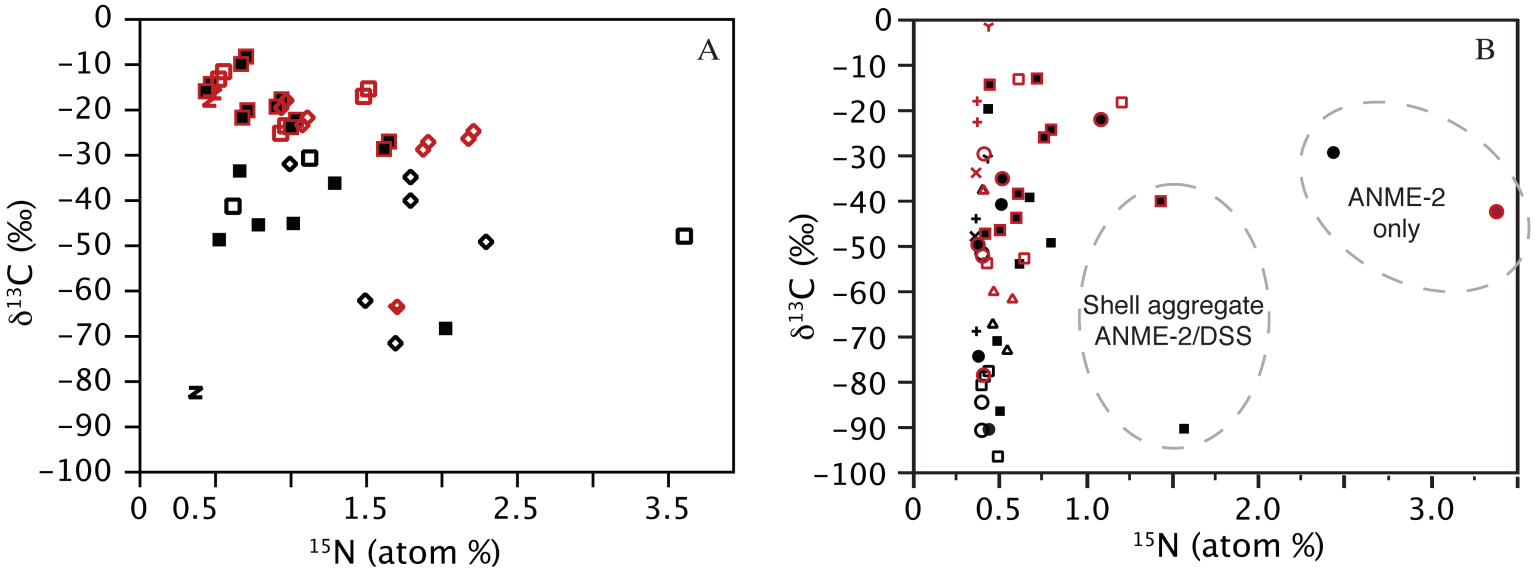

Figure S1: Relationship between $\delta^{3}C$ (‰) and ^{5}N (atom %) for shell ANME-2/DSS after a 5-day incubation with ^{15}N labeled ammonium or amino acids from (A) PC-55 (diamonds; n=6) and PC-76 (squares; n=10). 'z' symbol denotes paired $\delta^{3}C$ /^{15}N values for a mixed ANME-2/DSS aggregate. (B) Paired $\delta^{3}C$ /^{15}N values for PC-59 cell aggregates after 4-day incubation (open symbols) and 85-day incubation (closed symbols) with ammonium and amino acids. Shell aggregates are represented by a square symbol, mixed aggregates (triangle) and mono-specific ANME-2 clusters are represented by a circle. Plus signs denote ANME/DSS shell aggregates from control incubation without exogeneous ^{15}N labeled nitrogen. In both panels, plotted values include heaviest $\delta^{3}C$ (red) and lightest $\delta^{13}C$ (black) data points for each ANME-2 or ANME/DSS aggregate measured during the FISH-SIMS analysis. An example of a mono-species ANME-2 and shell ANME-2/DSS aggregate are highlighted (dashed elipse).

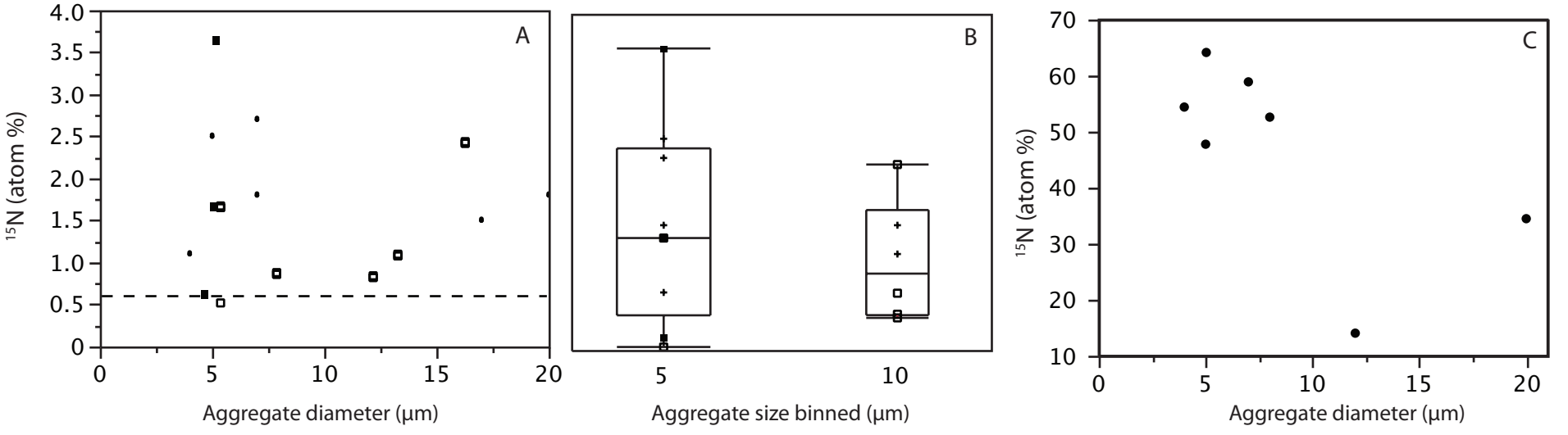

Figure S2: Comparison of the relationship between aggregate size and enrichment in ^{15}N (atom %) for shell ANME-2/DSS consortia. A) Maximum ^{15}N enrichment after 5-day incubation for shell aggregates in PC-76 and PC-55 B) Box plot of ^{15}N value (atom %), range, and 95% confidence intervals for same PC-76 and PC-55 shell aggregate data binned into small (diameters between 2-7µm) and large size class (between 7µm and 20µm). Average ^{15}N value for each size class represented by horizontal bar (small aggregate mean ^{15}N atom %= 1.8, n=9 and large aggregate mean ^{15}N atom %=1.4, n=6). C) Maximum ^{15}N enrichment after 112-day incubation for shell aggregates in PC-76 (note difference in scale for y axis). Although a general trend of greater ^{15}N assimilation by smaller shell aggregates was present, the statistical significance of aggregate size and ^{15}N enrichment was not observed (P=0.44, Wilcoxon test).