

Description of Additional Supplementary Files

File name: Supplementary Data File S1.

Description: Sequencing effort and quality of shotgun metagenome and metatranscriptome samples.

File name: Supplementary Data File S2.

Description: Taxonomic identity and statistics of binned metagenome-assembled genomes (MAGs).

File name: Supplementary Data File S3.

Description: Copy number of selected genes in the carbon, nitrogen, and sulfur cycles, and terminal oxidases from all metagenome assembled genomes (MAGs).

File name: Supplementary Data File S4.

Description: Mean normalized gene expression of predicted genes from genomospecies 31 (*Ca. Thiodiazotropha* sp.) by *Spartina alterniflora* phenotype and compartment.

File name: Supplementary Data File S5.

Description: Mean normalized gene expression of predicted genes from genomospecies 33 (*Sedimenticolaceae* sp.) by *Spartina alterniflora* phenotype and compartment.

File name: Supplementary Data File S6.

Description: Mean normalized gene expression of predicted genes from genomospecies 68 (*Desulfosarcinaceae* sp.) by *Spartina alterniflora* phenotype and compartment.

File name: Supplementary Data File S7.

Description: Mean normalized gene expression of predicted genes from genomospecies 134 (*Desulfosarcinaceae* sp.) by *Spartina alterniflora* phenotype and compartment.

File name: Supplementary Data File S8.

Description: Amplicon Supplementary Dataset of prokaryotic small subunit rRNA from plant root and paired soil/sediment and rhizosphere samples.

File name: Supplementary Data File S9.

Description: List of genera containing species with known sulfur/sulfate reducing and sulfur oxidizing metabolism.

File name: Supplementary Data File S10.

Description: Source and taxonomic identity of genomes used for phylogenetic analysis of the *Sedimenticolaceae* family