

APPENDIX

Photochemical Experiments (Estuarine Water)

A photochemical experiment was performed on overlying water collected during the June 2001 sediment flux experiment. The water was collected from 15 meters down in the Cape Fear River estuary near the Southport ferry terminal.

The 0.2 μm filtered water was placed into three teflon capped 500mL quartz flasks wrapped in aluminum foil (dark samples) and three teflon capped 500 mL quartz flasks not wrapped in aluminum foil (light samples). All six quartz flasks were placed outside in a large water bath that was kept at approximately 27°C. The samples were exposed to natural sunlight for 7.5 hours.

Photochemical Results (Estuarine Water)

The triplicate light and dark samples were extracted for Cu(I) (Table 12). The average Cu(I) concentration for the light samples was 2.3 ± 0.1 nM. This is approximately 3 times higher than the average Cu(I) concentration for the dark samples, 0.8 ± 0.2 nM. These estuarine results are consistent with a photochemical mechanism for Cu(I) formation. Moffett and Zika (1987) demonstrated the formation of Cu(I) in seawater during sunlight irradiation. Seawater from the Florida coast, Sargasso Sea, and Gulf of Mexico showed a surface maxima of Cu(I) and a decrease with depth (Moffett and Zika, 1988).

Table 12. Copper(I) photochemical results for Cape Fear River estuary water. Southport ferry terminal, depth of 15 meters, June 2001. Samples exposed to natural sunlight for 7.5 hours. Total Cu = 11.7 nM (C. Shank, unpublished data).

Sample	Replicates	Cu(I) concentration(nM)
Dark	3	0.8 ± 0.2
Light	3	2.3 ± 0.1