



	<b>Experiment title:</b> Environmental studies on contaminated marine sediment: Sulfur mapping with high spectral and spatial resolution using the ID 21 scanning X-ray microscope	<b>Experiment number:</b> ME-398
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**Report:**

**Results acquired during this experiment were presented as a poster at the 7th International Conference on X-ray microscopy, 29.7.-2.8.2002, Grenoble, France**

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**Abstract see next page.**

# Characterization of Sulfur in New York/New Jersey Waterway Sediment

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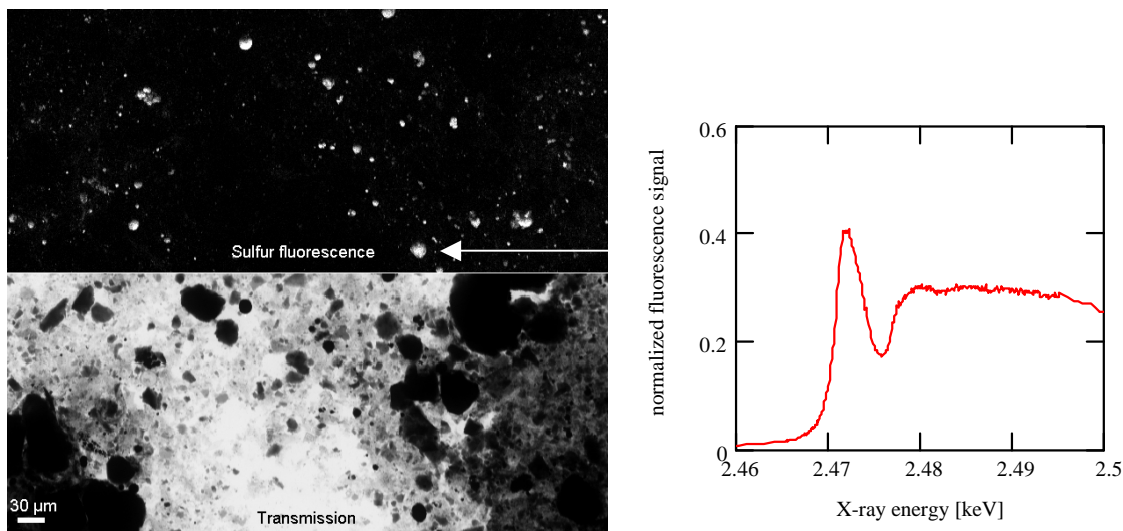
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Sulfur plays an important role in the biogeochemical cycle of trace elements and early diagenesis of organic matter in sediments/soils [1,2]. It is also important from an environmental standpoint for consideration of the fate and transport of toxic metals (contaminants) from anthropogenic sources found in estuarine sediments as metal sulphides. We investigated the latter point by studying sulfur compounds and speciation in contaminated sediments found in the waterways of New York and New Jersey in the region of New York City. Measurements were made on particles from the National Institute of Standards and Technology Standard Reference Material 1944 (a composite from 6 locations) and from a mud flat on the Passaic River in New Jersey. The experimental measurements were made at the ID-21 X-ray Microscopy Beam Line at the ESRF. Maps of the Si, P, and S distributions were made with a sub- $\mu\text{m}$  beam on individual sediment particles. Absorption and S maps are shown in Figure 1. X-ray absorption near-edge spectroscopy (XANES) measurements were made on selected areas on these maps. Our work shows that the S distribution in the sediments is heterogeneous and that the XANES spectra differ from those found in previous work [1,2].  
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## References

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*Figure 1: Transmission (left-bottom), S (left-top) maps for sediment particles from New York/ New Jersey waterways. Sulfur-XANES spectrum (right) obtained from a sulfur rich region (as indicated).*