

## TRACE ELEMENT ANALYSIS BY HIGH-RESOLUTION ICP-MS AND ISOTOPE DILUTION HR-ICP-MS

W.M. Landing (FSU, Oceanography)

---

### Introduction

In 2005, analyses of trace elements (primarily iron) in seawater, rainwater, and aerosol solubility solutions were conducted by the technique of isotope dilution using the Finnigan Element ICP-MS in the Geochemistry division at the NHMFL.

### Results and Discussion

Samples from the CLIVAR Repeat Hydrography sections (A16N, P02, and P16S) and the NSF-sponsored Sampling and Analysis for Iron (SAFe) research cruise were analyzed in order to compare the land-based analysis of dissolved iron by isotope dilution ICPMS with ship-board flow-injection analysis. This intercomparison will continue into 2006, but the initial comparisons showed that the ship-board FIA method generally agreed very well with the ICPMS analyses, although the ICP-MS analyses are routinely 0.1-0.25 nM lower than the ship-board measurements.

Samples of rainwater and aerosol leachate were also used to develop an instrument method to quantify a suite of over 40 soluble trace elements.

Numerous seawater samples were analyzed for dissolved Fe, Ni, Cu, Zn, Cd, and Pb by a multiple-tracer isotope dilution method.

These data were used to support a proposal to NSF to fund three additional years of sample collection and analysis. This proposal (\$320,228) was chosen to be funded, and the additional analyses will continue through 2006-2008.

### Conclusions

Our efforts to develop new analytical methods using the ICPMS to quantify trace element concentrations in seawater, rainwater, and aerosol leachates have been extremely successful. The results have been used to support a successful NSF proposal, and have been used in two recent publications.

### Acknowledgements

The expert assistance of Dr. Vincent Salters, Dr. Michael Bizimis, and Ted Zateslo is gratefully acknowledged.

### References

- [1] Matthew T. Brown, *et al.*, *Geochemistry, Geophysics, Geosystems*, **6**, 10, 1-20 (2005).
- [2] Clifton S. Buck, *et al.*, *Geochemistry, Geophysics, Geosystems*, in press, (2005).