



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** ND3021

**Title:** New Methods to Detect Chlorinated Organic Pollutants in Water

**Focus Categories:** Methods, Water Quality

**Keywords:** analytical methods, spectroscopy, PCBs

**Start Date:** 03/01/2001

**End Date:** 02/28/2002

**Federal Funds:** \$11,312

**Non-Federal Matching Funds:** \$24,310

**Congressional District:** ND First

**Principal Investigator:**

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**Abstract**

The development of new methodology for the analysis of polychlorinated biphenyls (PCBs) in water samples has been a consistent theme of our research group at NDSU. Good quality water is important for residents in the Red River Valley. Approximately 36% of the withdrawals from surface water are used for public supply in the Fargo-Moorhead area and Grand Forks. Current methodology for the analysis of PCBs relies on tedious, laborious, time-consuming and expensive chromatographic procedures. These are important considerations when routine analysis of numerous samples is contemplated. A more significant limitation, however, arises in the case of PCBs isomer identification. Since all chromatographic techniques are based on non-specific isomer detection schemes and none of the stationary phases currently available are able to resolve all 209 PCBs congeners, inaccurate information is often obtained. Due to the differences in their toxicity and biological activity, there is currently a great deal of interest in unambiguous PCBs isomers determination. Only with an appropriate analytical tool, a detailed insight in their environmental behavior, i.e. their formation and presence in various environmental sites, and their fate, including physical and chemical decomposition as well as biodegradation pathways can be accurately obtained. The proposed methodology, which is based on solid-liquid extraction, room temperature and low temperature phosphorimetry, will provide not only a rapid and simple screening technique for routine analysis, but also a highly selective approach for unambiguous identification of PCBs isomers. Funding requested in this proposal will be used for the Graduate Research Fellowship stipend of doctoral graduate student Andrea Arruda.