



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003NJ48B

**Title:** Automated Identification and Quantification of VOCs Using Electronic Nose Systems

**Project Type:** Research

**Focus Categories:** Methods, Toxic Substances, Water Quality

**Keywords:** VOCs, surface water, analytical methods, Enose, Electronic Nose, signature patterns, neural network, binary mixture

**Start Date:** 03/01/2003

**End Date:** 03/01/2004

**Federal Funds:** \$24918.00

**Matching Funds:** \$13829.00

**Congressional District:** 1

**Principal Investigators:** Polikar, Robi (Rowan University); Jahan, Kauser

**Abstract:** Potential health hazards and environmental degradation resulting from widespread use of VOCs has prompted increasing concern and interest in ambient levels of VOCs in the environment. Analysis, in a laboratory setting, of VOCs which are found in surface waters requires expensive and bulky equipment which cannot be deployed in the field. Analysis by human odor assessors also has many drawbacks. Electronic nose technology (Enose) has been applied to detection of odorous compounds in wastewater plants, agricultural and landfioll sites. The goal of this research is to develop an artificial neural network based on automated and portable electronic nose (Enose) for objective, fast, accurate, cost effective and quantifiable long term and on-site continuous monitoring of water quality, a multi-year project. Specifically the focus of this grant will be on the most challenging single aspect of the long-term project, to develop an artificial neural network based system for automated identification of individual components of a mixture.

Objectives will be to:

1. Concentrate first on handling binary mixture of compounds
2. Use QCM sensors to enable long term, continuous and stable operation fo the system.

3. Use presentaly available data featuring 24 binary mixtures of 12 different VOCs acquired duiring earlier work with 6-QCM array.

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