



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2002VT5B

**Title:** Detection of cyanobacterial blooms using remote sensing

**Project Type:** Research

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

**Keywords:** algal blooms, blue green algae, cyanobacteria, toxic algae, monitoring, nuisance species, remote sensing

**Start Date:** 03/01/2004

**End Date:** 02/28/2005

**Federal Funds:** \$32,000

**Non-Federal Matching Funds:** \$59,167

**Congressional District:** First

**Principal Investigator:**

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**Abstract**

Cyanobacterial blooms are a common nuisance in Lake Champlain and many smaller lakes throughout Vermont. Besides reducing the lakes' aesthetic appeal, these blooms adversely affect food webs and create water quality problems. Drinking water withdrawn from lakes experiencing a blue-green algal bloom may have an unpleasant taste and odor and in some cases is toxic, due to cyanobacterial production of phytotoxins. The recent death of several dogs after consumption of cyanobacterial-laden water from Lake Champlain has caused considerable concern about the State's many blooms and their potential impacts on swimmers as well as animals that drink the water. Beaches and boat access points now are posted with warning signs when blooms are present, and small eutrophic lakes with drinking water intakes are treated with copper sulfate to prevent bloom development. Lake Champlain is too large for treatment however, thus Burlington and the numerous small towns that obtain drinking water from the lake must rely on filtration to reduce phytotoxin levels.

Satellite remote sensing and modern image processing techniques offer the potential to aid lake managers in detecting blooms and thus in extending and refining their monitoring efforts across the state. The proposed study would begin the groundwork needed to use remote sensing for bloom detection. To this end we request \$6000 to purchase equipment upgrades, supplies and limited satellite data needed to examine reflectance spectral signatures for cyanobacteria blooms in local waters and for limited summer salary support to carry out this investigation. Our goal is to obtain sufficient evidence to prepare and support a formal proposal in 2002/2003 to develop algorithms to estimate cyanobacterial density using satellite remote sensing imagery.