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EFFECTS OF LAND USE ON WATER QUALITY IN A CHANGING LANDSCAPE

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EFFECTS OF LAND USE ON WATER QUALITY IN A CHANGING LANDSCAPE

Principal Investigators: *Dr. Jeffrey Schloss, Dr. William McDowell*, University of New Hampshire

Descriptors: *lake, stream, water quality, nutrients, land use*

Problem and Research Objectives:

Objectives

- The continued collection and analysis of long-term water quality data in selected watersheds.
- The dissemination of the results of the analysis to cooperating agencies, water managers, educators and the public on a local, statewide and regional basis.
- To offer undergraduate and graduate students the opportunity to gain hands-on experience in water quality sampling, laboratory analysis, data management and interpretation.
- To further document the changing water quality in the College Brook Watershed in the face of land use changes and management efforts.
- To document the effectiveness of constructed BMPs in the Chocorua Lake Watershed
- To determine the next steps for further analysis of long-term data sets.

Principal Findings and Significance:

Ongoing collection of ambient water quality data across the state continues. We added new sites for our statewide lake study. We saw an 8% increase in monitoring samples collected statewide with an over 25% increase in samples collected specifically in the Lakes region of NH: In all, we saw the addition of 3 new lakes, and the expansion of programs on 9 other lakes with the addition of 11 new or reactivated sampling sites (Table 1). We provided training for 29 new volunteer monitors!

Lake	Association/Sponsors	Town(s)
<i>New Programs Initiated:</i>		
Big Dan Hole Pond	Dan Hole Pond Watershed Assn.	Tuftonboro, Ossipee
Little Dan Hole Pond	Dan Hole Pond Watershed Assn.	Ossipee
Whitton Pond	Whitton Pond Cottage Assn.	Albany, Madison
<i>Existing Programs Expanded (new monitoring sites):</i>		
Bow Lake	Bow Lake Campowners Assn.	Strafford, Northwood
Crystal Lake	Eaton Conservation Commission	Eaton
Crystal Lake	Crystal Lake Association	Enfield
Great East Lake	Great East Lake Association	Wakefield
Goose Pond	Goose Pond Association	Canaan, Hanover

Lake Kanasatka	Lake Kanasatka Watershed Assn.	Moultonboro
Naticook Lake	Naticook Lake Assn. and Town of Merrimack	Merrimack
Newfound Lake	Newfound Lake Region Assn.	Alexandria, Bristol, Bridgewater, Hebron
Lake Winnepesaukee, Moultonboro Bay	LWA* and Tuftonboro Assn	Tuftonboro, Moultonboro
Lake Winnepesaukee, Meredith Bay	LWA and Meredith Rotary Club	Meredith
Lake Winnepesaukee, Wolfeboro Bay	LWA and Town of Wolfeboro	Wolfeboro

* LWA= Lake Winnepesaukee Association

The Lake Chocorua BMP Evaluation Study disclosed that a significant reduction in the phosphorus loading was due to the road drainage mitigation techniques. The combination of the use of plunge pools, diversions to settling areas and a large collecting swale reduced loadings during storm events by 82-94%. The P concentration range from the runoff was also reduced significantly (pre-range of 34 to 281ppb post range of 13 to 23 ppb). Further monitoring will be done to capture spring runoff and additional storm events in the upcoming year.

Analysis of the Squam Lake Watershed nutrient budget disclosed that subwatersheds with construction activity or active agriculture were the largest contributor of phosphorus on an aerial basis. Further study will be done on analysis of the effect of riparian buffer extent and updated nutrient export coefficients will be calculated in the upcoming year.