

# Lake Winnepesaukee Watershed Management Plan – Final Report

**Project Title: Lake Winnepesaukee Watershed Management Plan**

**Award Number: NA09NOS4690247**

**Award Period: 10/01/2009 – 02/29/2012**

**Reporting Period: 10/01/2009 – 2/29/2012 – Final Report**

## **1. Website Development**

### **YEAR 1 (10/2009 – 9/2010)**

December 2009 – January 2010: Staff met to outline components of the website, project, and timeline for moving forward on specific items in the scope of work.

February 2010: Met to outline components of the Lake Winnepesaukee Watershed Management Plan (LWWMP) website, project, and timeline for moving forward on specific items in the scope of work. Staff researched and drafted an RFP for a web designer. Researched issues involved in the management of interactive mapping websites.

March 2010: Spoke with LRPC's ESRI customer representative to learn about web mapping options, pricing, and hardware requirements. Acquired bathymetry data for Lake Winnepesaukee from NHDES, and created maps displaying it.

April 2010: A Request for Proposal (RFP) was developed for the Lake Winnepesaukee Watershed Management Plan (LWWMP) Website. Inquiry was made to the NH Department of Environmental Services on the possibility and ability to interface the website with water quality data contained in the NH DES Environmental Monitoring database.

May 2010: The RFP for the website was finalized and posted to the public on May 17.

June 2010: Proposals were received, reviewed, and rated for the RFP for the Lake Winnepesaukee Watershed Management Plan website.

July 2010: The website consultant team of Applied Geographics and GreenInfo was selected to develop the LWWMP website. The consultants were provided documents as guidance for the required information that will be included on the website, as well as long term LWWMP Management Plan goals.

August and September 2010: Meetings were held between staff and the website consultants to discuss proposed navigation, input on look & feel, content for the Winnepesaukee Watershed Management Plan, and additional photos, charts, graphs, etc. needed. An initial draft of the website is anticipated for mid to late fall 2010.

### **YEAR 2 (10/2010 – 9/2011)**

October 2010: Final website design and content for the website were developed. Consultants provided training on Word Press, the content management system to be utilized

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on the site. The website consultant and Lakes Region Planning Commission worked to finalize format and desired content for the “Winnepesaukee Gateway” website.

November 2010: The draft website was released for review and comment by the project partners.

December 2010: Draft website was updated, edited, and reformatted based on feedback received from project partners. Coordination and publicity for the public presentation of the website was conducted throughout the month.

January 2011: A public meeting and unveiling of the Winnepesaukee Gateway website (<http://winnepesaukeegateway.org>) was held on January 19, 2011. An interview was conducted with New Hampshire Public Radio and aired on January 20, 2011.

February and March 2011: The website consultants continue to work with the NH Department of Environmental Services, Lakes Region Planning Commission, and the Lake Winnepesaukee Watershed Association to add more interactive features to the website.

June 2011: The Winnepesaukee Gateway project and website received the 2011 NH Planning Project of the Year Award from the NH Planners Association.

### **YEAR 3 (10/2011 – 2/2012)**

October 2011 – February 2012: Lakes Region Planning Commission and the Lake Winnepesaukee Watershed Association have continued to work with the website consultants to enhance the website and add more interactive features. The website has received a favorable response from the NH planning community. The major focus for this reporting period was the completion of a Water Quality Interactive map. The map (online at: <http://winnepesaukeegateway.org/monitoring-the-lake/monitoring-sites-map/>) provides the user with a summary of the water quality data available for sampling sites or stations on Lake Winnepesaukee. Users have the option to view the average annual values for the most recent sampling year, the previous 10 yrs, or all years sampled. Water quality data for all sampling locations will be updated annually.

## **2. Updated Land use/Land Cover Dataset based on 2006 imagery**

### **YEAR 1 (10/2009 – 9/2010)**

December 2009: Updated overall land cover data with the new Laconia dataset. Conducted statistical analyses for Meredith, Paugus, Sanders, and Waukewan subwatersheds, as well as the entire Winnepesaukee River watershed, to provide the most accurate data possible for the STEPL analysis and upcoming public meeting.

January 2010 Updated the 2000 land cover classification for the city of Laconia to make its methodology comparable to our 2009 classification, and make comparisons between the two years more meaningful.

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### 3. Social Marketing/Public Involvement

#### YEAR 1 (10/2009 – 9/2010)

January 2010: Reviewed websites of other regional and watershed groups to identify effective methods of distributing maps and GIS data.

April 2010: “Adopt Winni” campaign. Outreach has been conducted to various organizations and the communities to recruit volunteers and sponsors for water quality monitoring and other efforts to protect the natural resources in the watershed. Outreach has consisted of flyers, press releases, presentations, display boards, etc.

May 2010: Staff met with seasonal resident interested in assisting the Winnepesaukee watershed effort and potentially supporting specific projects or actions needed. The results from the April ice out monitoring were summarized and sent out to all the participants and sponsors, as well as a press release sent to all the local media.

June 2010: Staff reviewed and rated the RFQs for the Winnisquam Black Brook Watershed Management Plan. Staff also attended the interview process of the consultants providing proposals to the RFQ.

Presentations were made on water quality results from the 2009 Monitoring season to the Gilford Island Association in July.

Presentations on the Lake Winnepesaukee Watershed Management Plan have been made to the public and communities in July, August, and September. In response to community requests, staff developed a PowerPoint presentation for the communities to use with their local land use boards to convey the approach and phosphorus focus of the subwatershed management plan.

In addition, materials and updates on the project have been posted to the temporary website at Lakes Region Planning Commission, [www.lakesrpc.org/lwwmp/](http://www.lakesrpc.org/lwwmp/)

Staff contacted residents and community officials in Center Harbor, Moultonborough, and Tuftonboro to gauge their interest in participating in the next management plan phase of the LWWMP. Staff drafted a NH DES pre-proposal application for Watershed Restoration Grants for Impaired Waters for Moultonborough Bay Inlet, and a pre-proposal application for High Quality Waters for Center Harbor subwatershed.

July-August 2010: Contract has been finalized between the LRPC and the Lake Winnepesaukee Watershed Association to hire a Watershed Coordinator to conduct an effective outreach program to the municipalities, organizations, and citizens throughout the watershed. A Watershed Coordinator has met with a homeowner association to conduct a site evaluation of erosion issues. Future assistance has been requested. Workshops for Department of Public Works personnel on road maintenance best management practices are scheduled to be held in October. Staff has been requested to assist in presentations.

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### YEAR 2 (10/2010 – 9/2011)

October 2010: Public presentation made to the Gilford Planning Board on the Lake Winnepesaukee Watershed Management Plan.

December 2010: Public presentation made to the Laconia Planning Board on the Lake Winnepesaukee Watershed Management Plan.

January 2011: A public meeting and unveiling of the Winnepesaukee Gateway website (<http://winnepesaukeegateway.org>) was held on January 19, 2011. An interview was conducted with New Hampshire Public Radio and aired on January 20, 2011.

February 2011: A social marketing component (Facebook) was developed for the “Winnepesaukee Gateway” website to help publicize the website, and keep the public informed/updated on happenings in the watershed.

Articles regarding the innovative tool that the Gateway provides to communities were submitted for the spring newsletter of the NH Planners Association and the Source and Supply Newsletter of the NH Dept. of Environmental Services.

The City of Laconia is implementing a “Don’t P in the Lake” program/campaign to eliminate the use of phosphorus containing fertilizers on public parks and recreational fields.

The community of Meredith has requested assistance from the watershed outreach coordinator to coordinate and hold a water quality workshop for public officials.

### March 2011:

March 10: A meeting was held with the Alton Conservation Commission in follow up to a property owner’s issue raised on the Winnepesaukee Gateway website. The Alton CC voted to follow-up on the issue and seek funding to address it through the Aquatic Resource Mitigation funds. The LWMP and the Winnepesaukee Gateway was also presented to a Graduate School Planning Seminar at Boston University.

March 12: Presentation was made by University of New Hampshire Cooperative Extension and the Lake Winnepesaukee Watershed Association (LWWA) at the spring meeting of the Gilford Island Association. The GIA voted to sponsor a site for water quality monitoring for \$500.

March 13: The LWWA and LRPC attended the documentary showing of “Clearing the Water”. LWWA obtained a release from the Lakes Region Clean Waters Association to upload the movie to the “Winnepesaukee Gateway”.

March 23: Presentation made to the Moultonborough Planning Board regarding the Lake Winnepesaukee Watershed Management Plan and “Winnepesaukee Gateway”.

March 26: Presentation was made at the 2011 NH Water and Watershed Conference regarding the Lake Winnepesaukee Watershed Management Plan and “Winnepesaukee Gateway”.

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March 28: A presentation was made to the Center Harbor Conservation Commission regarding the Lake Winnepesaukee Watershed Management Plan and “Winnepesaukee Gateway”.

The “Winnepesaukee Gateway” was nominated for “Project of the Year” to the NH Planners Association. Awards are made in June.

April 2011: Presentations about the Lake Winnepesaukee Watershed Management Plan effort and the Winnepesaukee Gateway were made to the Lakes Region Board of Realtors, and to the communities of Center Harbor, Moultonborough, and Alton. A meeting was held with the Town of Meredith and the Waukegan Shoreowners Association to discuss plans and strategies to address water quality impairment of Monkey Pond. Outreach was conducted to the president of the Pickerel Cove Association and to a resident of Krainewood Shores, Moultonborough.

News articles about the Lake Winnepesaukee Watershed Management Plan and the Winnepesaukee Gateway were published in the Spring 2011 issues of “Supply Lines with the Source” (newsletter of the NHDES Drinking Water & Groundwater Bureau) and the Granite State Planner (newsletter of the NH Planners Association).

May 2011: A presentation was made to the Gilford Rotary on the Winnepesaukee Gateway and Management Plan effort. 35 Rotarians present. Technical assistance was provided to residents of Dockham Shore Estates, Gilford to assess stormwater and erosion issues.

The Watershed Outreach Coordinator conducted a site visit to Sands of Brookhurst community in Meredith with Belknap County Conservation District to look at erosion issues and discuss water quality concerns. Several community members participated in this site visit, and in follow up to it, the Watershed Outreach Coordinator was asked to come and discuss these issues with the Board of Directors.

June 2011: A site visit was made to Dockham Shores, Gilford to assess beach erosion and other issues. A meeting was held with Patti Taylor, president of the Pickerel Cove Association to discuss water quality concerns.

Outreach was made to local community leaders to assist in efforts to raise awareness and promote networking.

The watershed outreach coordinator and intern participated in Lake Ecology Day at Interlakes Middle School, Meredith. Lake Ecology Day is a day program for 7<sup>th</sup> grade students which provides an opportunity for education and hands on learning about why water quality is important, how and why water sampling is done, and active participation by the students in conducting some sampling and testing.

The Winnepesaukee Gateway and Lake Winnepesaukee Watershed Management Plan effort were publicized at the NH Lakes Congress, which was attended by approximately 100 lake association members.

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The Lake Winnepesaukee Watershed Management Plan and Winnepesaukee Gateway were recognized at the NH Planners Association conference, receiving the 2011 NH Planners Project of the Year award.

July 2011: Marketing materials to promote the Winnepesaukee Gateway and Lake Winnepesaukee Watershed Management Plan were sent out to 2500 residents in the Gilford, Laconia, and Meredith communities.

Outreach and planning for a water quality forum was conducted with John Edgar, Community Development Director, town of Meredith. Information and assistance was provided to a local business owner regarding milfoil management and control.

Watershed Outreach Coordinator and volunteers participated in the Great Park Pursuit, Ellacoya State Beach and presented at the water quality station. Over 100 families attended the event and received information on water quality issues facing Lake Winnepesaukee, as well as the opportunity to conduct some simple water quality measurements.

August 2011: Provided grant writing services to the communities of Meredith and Moultonborough to obtain future funding to address water quality issues and concerns within their communities.

Outreach and public presentations were made throughout the month and specific dates are listed below.

Aug. 2: Meeting with Dockham Shores Estate residents to review beach erosion issues

Aug. 3: Annual Meeting of the Lake Winnepesaukee Watershed Association. Presentation of the Winnepesaukee Gateway along with updates by the communities involved (50 attendees)

August 8: Conference call with the Black Brook Watershed Advisory Committee

August 9: Presenter at the Cyanobacteria forum hosted by the Town of Meredith (over 100 attendees).

August 10: Coordination of projects with Belknap County Conservation District (BCCD)

August 11: Provided assistance to BCCD with solar water pump at the community gardens

August 18: Boat tour of Lake Waukegan with the president of the Waukegan Shore Owners Association.

August 18: Meeting with LRPC to prepare for Center Harbor Subwatershed Management Plan kickoff meeting.

August 18: Presenter at Gunstock Brook Fluvial Geomorphology kickoff meeting

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August 23: Outreach to Patrician Shores residents

August 24: Center Harbor Subwatershed Management Plan kickoff meeting (40 attendees)

August 25: Interview with reporter from the Union Leader on the kickoff meeting for Center Harbor.

August 31: Participant in discussion with Conservation Commissions and Planning Board members on local adoption of stricter guidelines than the recently amended Shoreland Water Quality Protection Act.

September 2011: Research and outreach conducted to the communities of Meredith, Laconia, Gilford, and Moultonborough regarding the initiative to draft a local Shoreland Protection Act ordinance.

Technical assistance was provided to the Town of Alton regarding Loon Cove pollution issues.

Technical and professional assistance was provided to the Gilford Conservation Commission on draft ordinance language for the Town of Gilford Planning Board regarding Shoreland Protection Act. A meeting was held with John Ayer, Planner, Gilford; John Morgenstern, Planning Board, and Polly Sanfacon, Gilford Planning Board to discuss the ordinance language changes affecting the Island and Shorefront District.

The NH Department of Environmental Services invited the Lakes Region Planning Comm., the Lake Winnepesaukee Watershed Association and community representatives from Moultonborough to participate in an interview regarding the Moultonborough Bay Inlet Restoration Plan 319 grant application.

### **YEAR 3 (10/2011 – 2/2012)**

October 2011 – February 2012: Lakes Region Planning Commission and the Lake Winnepesaukee Watershed Association worked with stakeholders from the towns of Moultonborough and Sandwich in the Moultonborough Bay Inlet of Lake Winnepesaukee to develop a strategy for a potential watershed restoration plan. As the result of three meetings, a now-active water-quality monitoring program was developed to identify pollution sources. It is hoped that this effort will support an application in 2012 to attract funding to complete the third Lake Winnepesaukee sub-watershed.

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### 4. Water Quality Monitoring

#### **YEAR 1 (10/2009 – 9/2010)**

April 2010: Following ice out, a team of staff and volunteers conducted water quality sampling to obtain water samples at spring turnover for the first time ever on Lake Winnepesaukee. 160 water samples were collected from twelve deep lake sites covering all assessment unit areas on Lake Winnepesaukee.

The purpose of the sampling was to determine the nutrient levels of phosphorus in Lake Winnepesaukee at spring overturn. The values of phosphorus at spring overturn, when the lake is fully mixed vertically (from surface waters to bottom waters), are used to predict summer productivity and biological activity in Lake Winnepesaukee, as phosphorus is a limiting nutrient and key indicator of productivity in freshwater lakes. High values of phosphorus lead to increased algal blooms, and growth of vegetation in lakes. A second outcome of the ice out phosphorus sampling is the calibration of computer models that are being used to determine the trophic state of the bays and inlets on Lake Winnepesaukee.

#### **YEAR 2 (10/2010 – 9/2011)**

May 2010 – September 2010: Staff conducted outreach, coordinated volunteers and developed monitoring plans for the 2010 water quality-monitoring season for the three subwatershed communities of Meredith, Laconia, and Gilford.

Three trainings of new volunteer monitors were held beginning in May. Subsequent trainings were held in June and July. Professional staff from the University of New Hampshire (UNH) Center for Freshwater Biology and the Education Coordinator for the UNH Lakes Lay Monitoring Program conducted all trainings.

Water samples have been collected from approximately 21 near shore and deep lake sites in Meredith, Paugus, and Saunders Bay during the summer sampling season of May through September.

February 2011: The community of Laconia has implemented a voluntary water quality monitoring program coordinating their efforts through the “Adopt Winni” effort in conjunction with the Lake Winnepesaukee Watershed Association.

March 2011: Outreach and coordination of water quality monitoring on Lake Winnepesaukee continues for the 2011 sampling season. The Watershed Outreach Coordinator recruited a new volunteer to conduct monitoring in Center Harbor Bay; which has been inactive since 2007.

May 2011: Worked with the Laconia Planning Dept. and Conservation Commission to organize and publicize an informational meeting to recruit volunteers for both lake and tributary monitoring for Paugus Bay. Water Quality Recruitment meeting sponsored by City of Laconia CC. Watershed Outreach coordinator gave overview of water quality monitoring efforts and need for volunteers for both tributaries and lake. Bob Craycraft/UNH gave a presentation on the lake data for Paugus Bay, and the parameters tested and rationale.

New volunteers were recruited to conduct monitoring in Center Harbor Bay.



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Work plan developed for summer intern to assist in water quality monitoring efforts. Trained intern in stream sampling protocols, and assisted intern in conducting tributary monitoring.

Conducted outreach to volunteers to coordinate and schedule both lake and tributary sampling training.

June 2011: Coordinated and assisted in four trainings for volunteers for lake and tributary monitoring in the Winnepesaukee watershed. 10 volunteers received training.

Developed a water quality monitoring plan and budget for Paugus Bay, City of Laconia.

July 2011: Ongoing coordination was provided for water quality monitoring, transport & transfer of samples & equipment to UNH.

Assistance and sampling was provided for tributary and lake monitoring. Additional training was provided to new and existing volunteers.

August 2011: General coordination of volunteers interested in monitoring the water quality of lakes and tributaries in the Lake Winnepesaukee watershed throughout the month. Specific dates of Outreach coordinator's direct sampling listed below.

Aug. 4: Tributary monitoring in Gilford and Laconia

Aug. 12: Lake sampling on Paugus Bay

Aug. 18: Tributary monitoring

Aug. 25: Lake sampling on Paugus Bay

September 2011: The watershed outreach coordinator provided general coordination of volunteer water quality monitoring of lakes and tributaries on Lake Winnepesaukee throughout the month. Also provided assistance to volunteers in completing sampling for the season. Field data sheets were collected, entered into the database, and submitted to the appropriate reporting agencies.

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**Lakes Region Planning Commission**  
 Lake Winnepesaukee Watershed Management Plan  
 NOAA NA09NOS4690247  
 October 1, 2009 – February 29, 2012

**Project Budget**

**Lake Winnepesaukee Watershed  
 Management Plan**

Description	Budgeted	Expended	
			Budget categories
LRPC	49,400	42,634	Salary/Fringe
Lake Winnepesaukee Watershed Outreach Coordinator	23,000	22,500	Contractual
Web Site	27,500	32,170	Contractual
Equipment Supplies	1,300	1,151	Supplies
Travel	1,550	1,446	Travel
<b>Total</b>	<b>99,900</b>	<b>99,900</b>	