



**Cold River Local Advisory Committee**  
P.O. Box 68, South Acworth, NH 03608  
*Serving the Watershed Towns Of:* Acworth, Alstead,  
Charlestown, Langdon, Lempster, Marlow, Unity & Walpole  
*Online at:* [www.coldriver.org](http://www.coldriver.org)



## **COLD RIVER WATER QUALITY CHARACTERIZATION PROJECT** **Sampling Results: 2005**

**The Project:** Now in its fourth year of service to the towns in the Cold River watershed, the Cold River Local Advisory Committee's (LAC's) sampling team is pleased to present the results of its innovative watershed-wide characterization project. The project focuses on assessing surface water quality and flow by developing a comprehensive long-term database of representative physical, chemical and biological measurements at 28 key sites in Acworth, Alstead, Langdon, Lempster and Walpole.

**Why Are We Doing This?** In 1999, landowners in the watershed identified water quality as their top concern in two detailed surveys. The LAC is completing this project to better understand the watershed we live in, to identify new or recurring sources of pollution, to encourage discussions in our communities about water resources and to provide an objective and credible scientific basis for local, state and federal planning and law enforcement decisions. The data needed to make those decisions are not being collected on a regular basis by those agencies due to resource limitations.



**How Are We Funded?** We are a volunteer group that is largely self-funded. In 2003, we purchased state-of-the-art sampling equipment by securing local donations and grants from the CT River Joint Commissions and New England Grassroots Environmental Fund. That equipment has allowed us to develop an extensive and innovative sampling program that is quick, efficient and requires a minimum amount of labor. We have also received valuable technical assistance and laboratory analysis funding from the NH Department of Environmental Services (DES).

**What's So Special about the Cold River Watershed?** The Cold River was recognized as a significant statewide natural, cultural, scenic and scientific resource by the NH Legislature in 1999 upon acceptance as a Designated River. It is one of only 14 such rivers in the state. The watershed is regionally, nationally and globally recognized for its outstanding wildlife habitat and plant communities. The rural character of the watershed creates opportunities for working forests, farms, recreation and peaceful homes.

**Water Quality Testing Results:** Between 06/05 and 11/05, water quality in the Cold River and its tributaries generally remained *Good* to *Excellent*, but was occasionally *Poor*:

- ▶ **Dissolved Oxygen** is the amount of oxygen in the water, which is critical to aquatic life. All measurements were well above the minimum standard of 5.0 mg/L.
- ▶ **pH** is the acidity of water, which can impact fish health. Many measurements were below the minimum standard of 6.5, most likely due to the soils, geology and acid rain.

- ▶ **Turbidity** is the amount of suspended material in the water. Most Turbidity readings were very low. Turbidity increased after the October flood due to sediment and debris that washed into the water. Turbidity dropped as suspended particles settled and moved downstream, but remains susceptible to increases due to vast exposures of eroded soils.
- ▶ **Specific Conductance** is an indicator of pollutants such as road salt, septic waste or yard and field runoff entering the water. Specific Conductance was low on all occasions.
- ▶ **Temperature** ranged from 43°F to 82°F. Temperature is a critical parameter for many processes, and values in excess of 70°F are considered stressful to lethal for trout/salmon.
- ▶ **Bacteria (*Escherichia coli*)** presence may suggest harmful pathogens in the water. Seven sites, including three swimming holes, exceeded the maximum standard. In addition to the flood, causes may have included summer rains, wildlife or septic waste.
- ▶ **Phosphorus and Nitrate** can increase algae and plant growth which can decrease the amount of oxygen in the water. Very low Nitrate levels were observed at several sites. Before the flood, one site exceeded the level of concern for Phosphorus. After the flood, many sites were above the level of concern. Possible sources included natural materials, residential/agricultural fields and septic systems.
- ▶ **Aluminum and Other Metals** can be toxic to aquatic life. One Aluminum measurement exceeded the applicable standard. Copper, Lead and Zinc were not detected.
- ▶ **Chloride and Volatile Organic Compounds** can be toxic to aquatic life. Very low Chloride levels were observed at all sites. None of the 70+ VOCs were detected in two of the post-flood samples. A trace of one VOC was detected in a third post-flood sample.

**Water Flow Monitoring Results:** The LAC measured stage (stream level) at most sampling sites. Stage is directly proportional to flow and can impact water chemistry. Stage readings were within previously observed ranges until the flood occurred. Prior to the flood, the LAC assisted DES with a pilot flow monitoring project at the Drewsville Gorge. This unique and successful project showed a *Good* relationship between stage readings and actual flow measurements in the Cold River and the Saxtons River (VT).



**Biological Sampling Results:** The LAC did not collect macro-invertebrate (aquatic insect) samples in 2005. Prior screening by the LAC, DES and Colby-Sawyer College suggested that insect populations range from *Fairly Poor* to *Excellent*. Aquatic insects are a staple in the diet of trout and salmon, and a good overall indicator of stream health. Additionally, the NH Fish & Game Department is conducting detailed temperature and fish community studies in the watershed. Past results have suggested that the upper (Acworth) and lower (Walpole) reaches of the river are less stressful or lethal to trout and salmon than the middle reach (Alstead-Langdon). The results for 2005 are not available yet.



For more information on this project, contact the LAC (835-2328) or DES (271-2083). New volunteers are always welcome and needed. A detailed report on the 2005 results is available at <http://www.des.state.nh.us/wmb/vrap>.