

AVEO

WATER QUALITY BIOMONITORING SUMMARY

2007-2008

Aquatic insects and other river-dwelling macroinvertebrates are important indicators of river health because some of these organisms are sensitive to physical disturbance and/or deteriorating water quality. The Ashuelot River Local Advisory Committee (ARLAC) conducts chemical and bacteriological water quality monitoring in the Ashuelot River; to supplement these chemical and bacteriological data and to provide a deeper, long-term picture of the river's health, Ashuelot Valley Environmental Observatory (AVEO) volunteers monitor aquatic macroinvertebrate communities in the Ashuelot River and its tributaries. In autumn 2007, volunteers sampled and preserved macroinvertebrates at **12 sites throughout the Ashuelot watershed**; the preserved samples were identified to Family level during "Bug Nights" in the Keene State College lab in early 2008, and assessed for water quality in accordance with Hudson Basin River Watch guidelines for benthic macroinvertebrates.

PROJECT PARTNERS & SUPPORTERS

AVEO's water quality monitoring is conducted in partnership with **ARLAC**, with support from **THE SWITZER FOUNDATION** and **KEENE STATE COLLEGE**.

VOLUNTEERS

Janet Altobello	David Moon
Larry Antonuk	Kathleen Murphy
Amy Biddle	Mary O'Rourke
Laurie Callahan	Jackie Oster
Kate Edes	Russ Provost
Patrick Eggleston	Mary Kate Sheridan
Linda Fuerderer	Erin Stoub
Ethan Hawkins	Jenny Twohig
Erik Kokal	Peter Wade
Cliff Lerner	Wendy Ward
Nancy McGartland	Lacie Westbrook
Matt McGrail	Dan Zeh

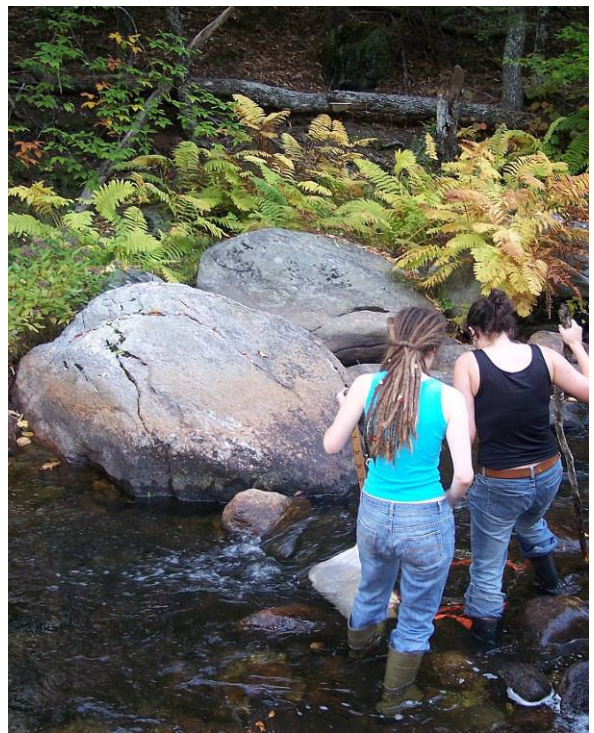


photo: Erin Stoub

SPECIAL THANKS TO "AVEO BUG GURU" LACIE WESTBROOK



photo: Larry Antonuk

Lacie's sharp eye, dedication, and macroinvertebrate identification expertise – honed during a freshwater ecology undergraduate research project at Eastern Washington University – were critical to AVEO's first-time efforts to identify aquatic insects to Family.



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Site	Town	EPT Family Richness	Impacted Water Quality? (EPT Richness)	Total Family Richness	Impacted Water Quality? (Family Richness)	Family Biotic Index	Impacted Water Quality? (Family Biotic Index)	% Model Affinity	Impacted Water Quality? (Model Affinity)
ARLAC 1.5*	E. Washington	11	none	18	none	4.63	slight	76.22	none
ARLAC 3*	Gilsum	10	none	18	none	4.43	none	77.26	none
Shaws Corner*	Surry	7	slight	14	none	5.033	slight	57.27	slight
Woolen Mill Dam*	W. Swanzey	8	none	14	none	4.73	slight	36.61	moderate
Riverside Park*	Hinsdale	9	none	17	none	4.583	slight	64.65	none
California Brook	W. Swanzey	8	none	13	slight	4.94	slight	56.45	slight
Hurricane Brook	Keene	9	none	15	none	4.19	none	58.61	slight
Minewawa South	Keene	10	none	14	none	5.17	slight	49.63	moderate
Minewawa North	Marlborough	6	slight	10	slight	3.18	none	70.34	none
South Branch	Troy	10	none	17	none	4.26	none	66.30	none
Otter Brook South	Keene	10	none	16	none	5.13	slight	56.02	slight
Otter Brook North	Keene	11	none	16	none	4.02	none	63.46	slight

Metrics were calculated according to Hudson Basin River Watch guidelines, available at www.hudsonbasin.org. Asterisks indicate sites on the Ashuelot River mainstem. "None" indicates no measureable impact to water quality, and is the highest water quality designation for these metrics.

EPT Family Richness = the total number of mayfly (Ephemeroptera), stonefly (Plecoptera), and caddisfly (Trichoptera) Families. Mayflies, stoneflies, and caddisflies are fairly sensitive to disturbance, so the more "EPT" families, the better the water quality.

Total Family Richness = the total number of macroinvertebrate Families represented in the sample. As with EPT family richness, generally speaking, the more families, the better the water quality.

Family Biotic Index = a measure based on the relative tolerance of various Families to organic pollution. The higher the score, the lower the water quality.

Percent Composition Model Affinity = a comparison between the percent composition of the major macroinvertebrate groups found at each sampling site and a model "healthy" summertime macroinvertebrate community. There may be some inflated "impacts" because some of our sampling took place in fall, and this model is based on summertime communities.

THOSE DAM CADDISFLIES!

The Woolen Mill Dam site, located just below the Homestead Woolen Mill dam in West Swanzey, had a particularly high concentration of net-spinner caddisflies. This macroinvertebrate Family is often found in high densities below dams, where they feed on algae produced in the dam reservoir. The dam is slated for removal in the near future, and we look forward to seeing how this change affects the macroinvertebrate community!

THE SKINNY. So, what do all these metrics *mean*, exactly? Generally speaking, **water quality throughout the Ashuelot watershed – as measured by macroinvertebrate communities – is very good.**



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