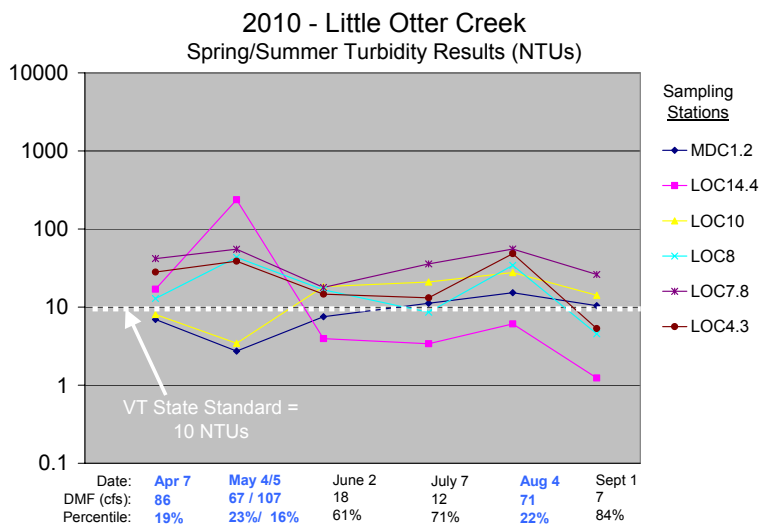
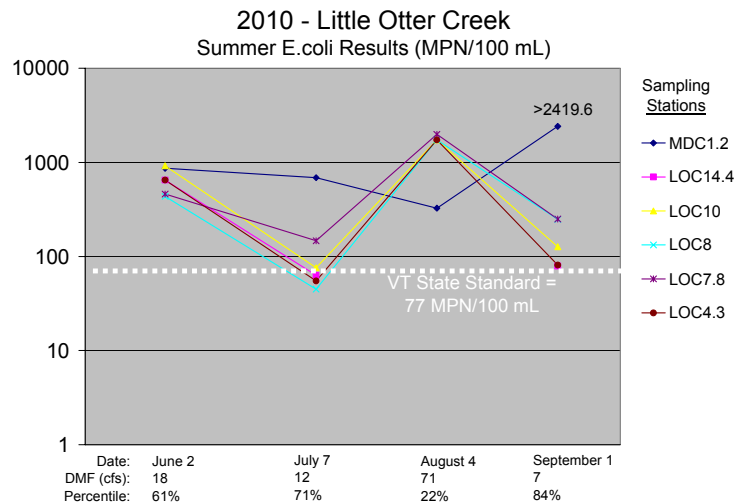


Addison County Riverwatch Collaborative Little Otter Creek - 2010 Water Quality Summary

The Addison County Riverwatch Collaborative has been monitoring water quality in the Little Otter Creek since 1997. During 2010, six sites were tested for phosphorus, nitrogen and turbidity on the first Wednesday in April and May (Spring sampling dates) and in June, July, August and September (Summer sampling dates). E.coli was tested only on the Summer dates. Flow in the river during 3 of the 4 Summer sampling dates was relatively low, representing baseflow to small storm conditions (based on records for the USGS gage on Little Otter Creek near the Route 7 crossing). Flows on the April, May and August dates were moderate, due to snow melt and rain events.

Site	Location	Town
LOC14.4	Plank Rd.	New Haven
LOC10	Monkton Road	Ferrisburgh
LOC8	Wing Rd bridge	Ferrisburgh
LOC7.8	Middlebrook Rd (North)	Ferrisburgh
LOC4.3	Route 7 Bridge	Ferrisburgh
MDC1.2	Wing Rd./Middlebrook Rd. (South)	Ferrisburgh

E.coli concentrations in the Little Otter Creek stations were well above the state standard of 77 MPN / 100 mL on all four sample dates: June 2, July 7, August 4, and September 1 – except for a few stations (LOC4.3, LOC8, LOC10, and LOC14.4) on July 7. Flows on the June, July and September sample dates were very low, ranging from 7 to 18 cfs. Flow during the August 4 event was moderate in response to 1.12 inches of rain which fell on August 2 – 4 (as recorded at the Burlington Airport). Daily mean flows in the Little Otter Creek, as measured at the USGS gage near LOC4.3, rose from 13 cfs on August 2 to a maximum of 94 cfs on August 5, and slowly declined to 15 cfs by August 8. E.coli concentrations detected at these stations during 2010 are relatively consistent with historic monitoring results. LOC10 is a new sampling station for which there are no historic data. Mud Creek station (MDC1.2) has traditionally had elevated E.coli as it is located directly downstream of a dairy pasture where livestock have direct access to the stream.



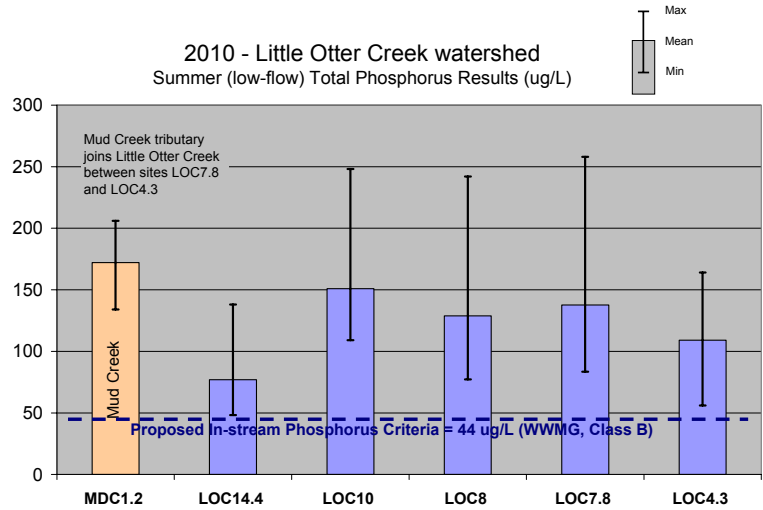
Turbidity levels in the Little Otter Creek at the six stations were moderate to high and often exceeded the Vermont standard of 10 NTUs (for Class B cold-water fisheries). Values ranged from 1.2 to 237 NTUs, with a mean level of 25 NTUs for the six sample dates, including the two spring sampling dates on April 7 and May 4/5. Samples were collected on May 4 at MDC1.2, LOC14.4 and LOC10, while the remaining stations were sampled on May 5. The high Turbidity value at LOC14.4 (237 NTUs) may represent an outlier; this result was flagged “E” by the laboratory. Such a high value has not been detected previously at this station (turbidity

sampling in the Little Otter Creek was conducted previously in 2008). However, Total Suspended Solids were also elevated at this station on the May 4 sample date. A total of 0.51 inch of precipitation was recorded on May 3 – 4 at the Burlington Airport. Based on a separate flow monitoring study, the headwaters of Little Otter

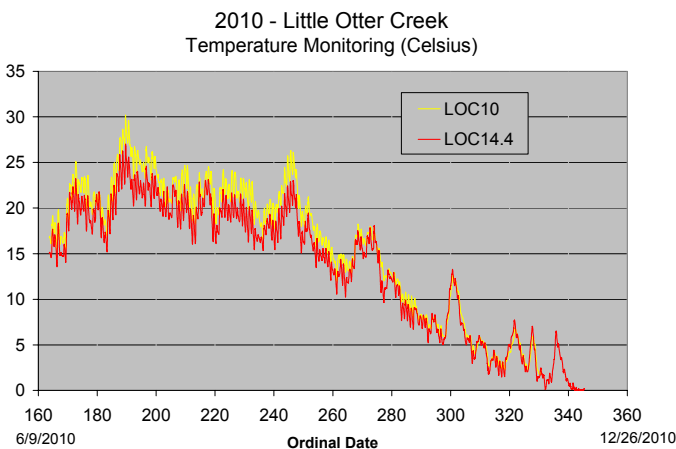
Creek (upstream of LOC14.4) exhibit a flashier response to precipitation than the middle and lower portions of the watershed. Geomorphic assessments in the mile of river channel upstream of LOC14.4 identified significant streambank erosion and recent channel adjustments. Therefore, it is possible that the May 4 sample at LOC14.4 captured a local turbidity event.

Phosphorus levels were detected at relatively low concentrations during the six Spring and Summer sampling dates. Concentrations ranged from 48 to 306 ug/L, with an average of 131 ug/L for the May through September sample dates (due to quality control issues, April sample results for Total Phosphorus were qualified). A somewhat elevated concentration of Total Phosphorus was detected at LOC14.4 on May 4 (306 ug/L) – the same sample for which elevated Turbidity and TSS were reported. As discussed above, the May 4 sample date coincided with a Spring precipitation event that resulted in a moderate-flow condition in Little Otter Creek (daily mean flow of 67 cfs near LOC4.3 on May 4).

Total Phosphorus concentrations detected in 2010 were generally consistent with historic data. Moderate to high concentrations of Total Phosphorus have been recorded in past years at times of high flow and runoff. Vermont recently proposed in-stream phosphorus criteria for aquatic life and aesthetics uses in wadeable streams (VTDEC, 2009). The mean concentration of Total Phosphorus for four Summer sample dates exceeded the proposed criteria of 44 ug-P/L for the warm-water medium gradient (WWMG) wadeable stream ecotype in Class B waters.



Nitrogen concentrations in the Little Otter Creek were very low (ranging from 0.47 to 2.5 mg-N/L) and below the state standard for nitrogen as nitrate (5 mg/L). Vermont recently proposed in-stream nitrogen criteria for aquatic life and aesthetics uses in wadeable streams (VTDEC, 2009). The mean concentration of Total Nitrogen for the four Summer sample dates exceeded the proposed criteria of 0.75 mg-N/L for the warm-water medium gradient (WWMG) wadeable stream ecotype in Class B waters.



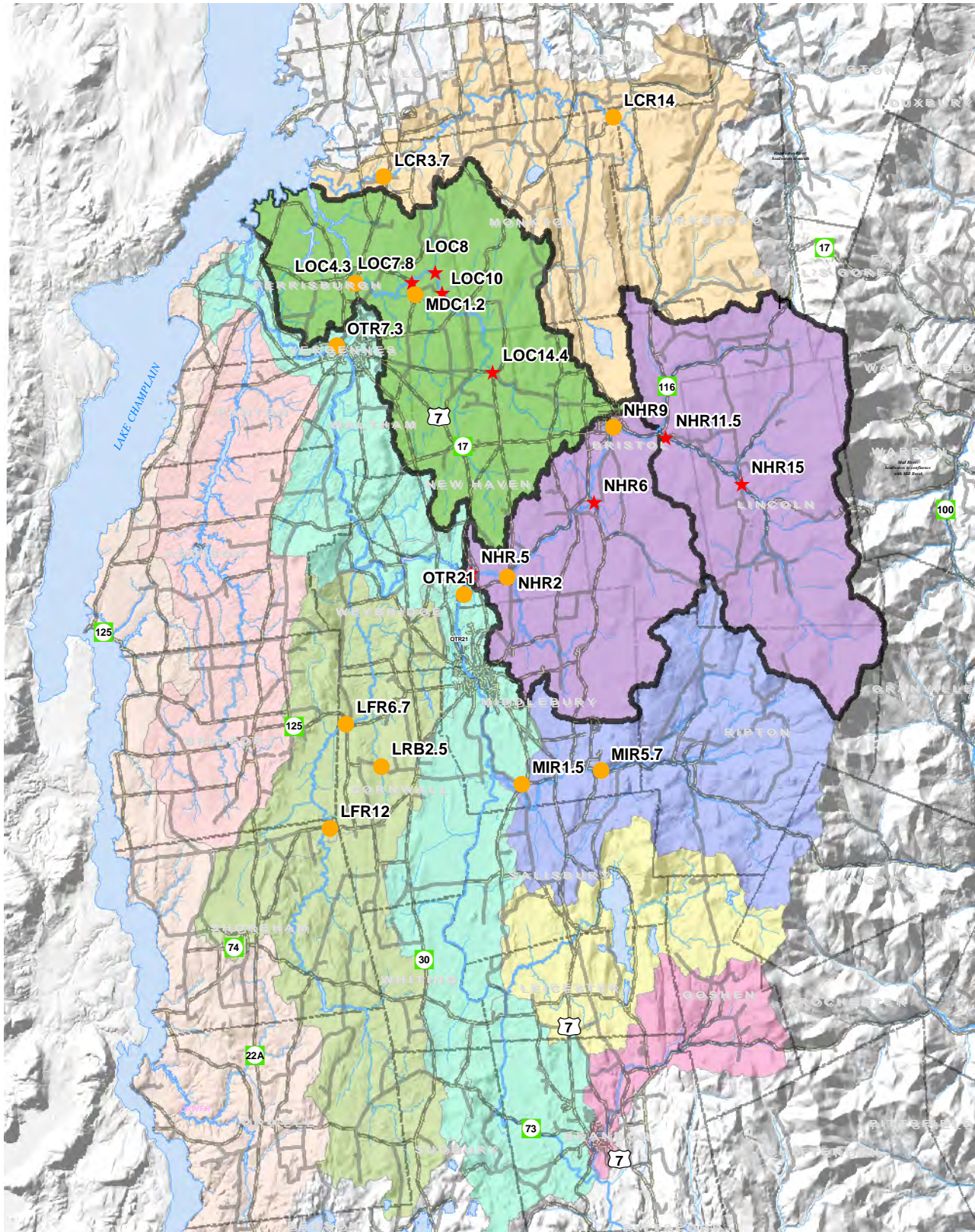
Temperature was monitored at two stations on the Little Otter Creek (LOC14.4 and LOC10) during 2010 as part of a separate flow study. Data loggers installed at these sites recorded temperature at 15-minute intervals. Temperatures at both sites exceeded 20 degrees Celsius for several days during the mid-Summer months. Temperature at downstream site LOC10 was consistently higher than upstream site LOC14.4 during July, August, and September. The Little Otter Creek channel between these sites is characterized by minimal forested buffers and extensive wetlands.

2011: For years 2010 and 2011, the Little Otter Creek watershed is the subject of focused monitoring, including a flow study to evaluate nutrient and sediment loading.

For more information, contact the Little Otter Creek sampling coordinator:
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Addison County Riverwatch Collaborative

Water Quality Monitoring Sites by Watershed, 2010



- ★ Rotation Basin Site 2010
- Sentinel Site
- Little Otter Creek
- New Haven River
- Lake Champlain direct
- Lewis Creek
- Lemon Fair River
- Little Otter Creek
- Otter Creek
- New Haven River
- Dead Creek
- Leicester River
- Middlebury River
- Neshobe River
- Roads**
- Pavement
- Gravel

The Addison County Riverwatch Collaborative is a citizen organization whose mission is to collect and assess the water quality of Vermont surface waters, and to facilitate water quality and stream corridor improvement measures on a watershed scale.

