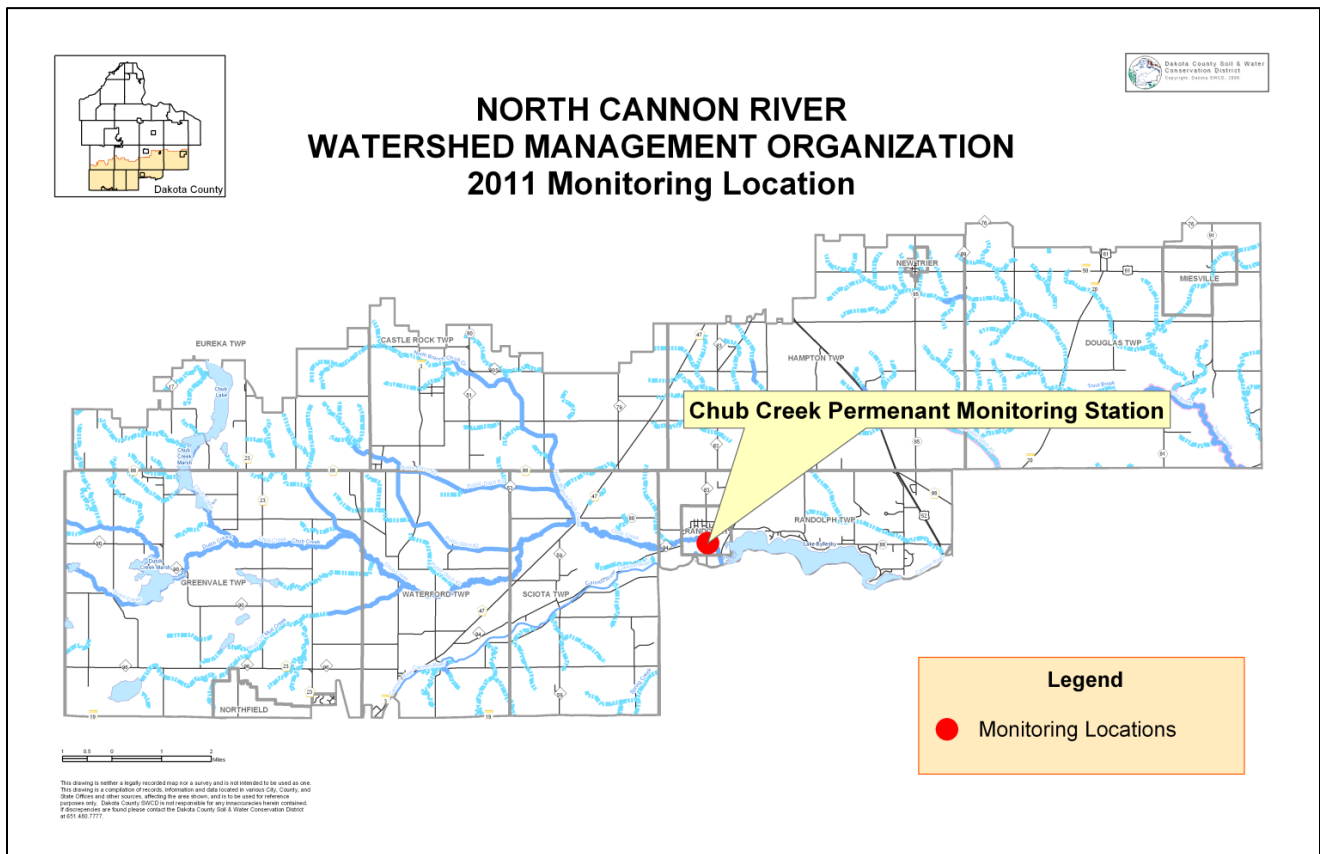


**North Cannon River Watershed Management Organization
2011 Water Quality Monitoring Summary**

1. 2011 Water Quality Monitoring Activities:

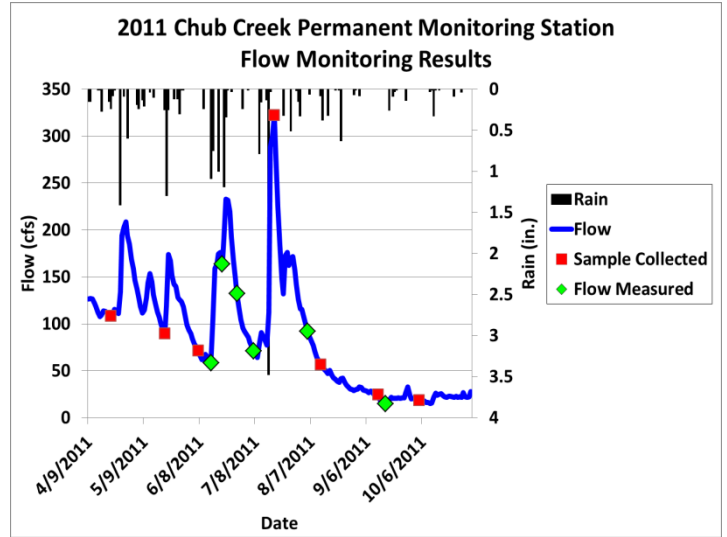
- Installed automated stage (depth) monitoring equipment at the Chub Creek Permanent Monitoring Station.
- Measured flow at the Chub Creek Permanent Monitoring Station to allow conversion of stage data to flow data.
- Collected 7 scheduled grab samples from the Chub Creek Permanent Monitoring Station.
- Reviewed and submitted all water quality data to the Minnesota Pollution Control Agency where it will be used for assessment purposes.

2. Sample Locations:

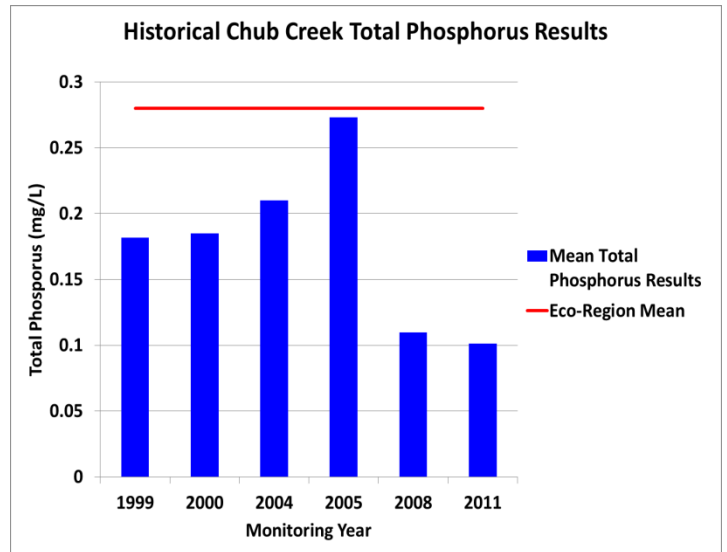


3. Water Quality/Quantity Monitoring Results:

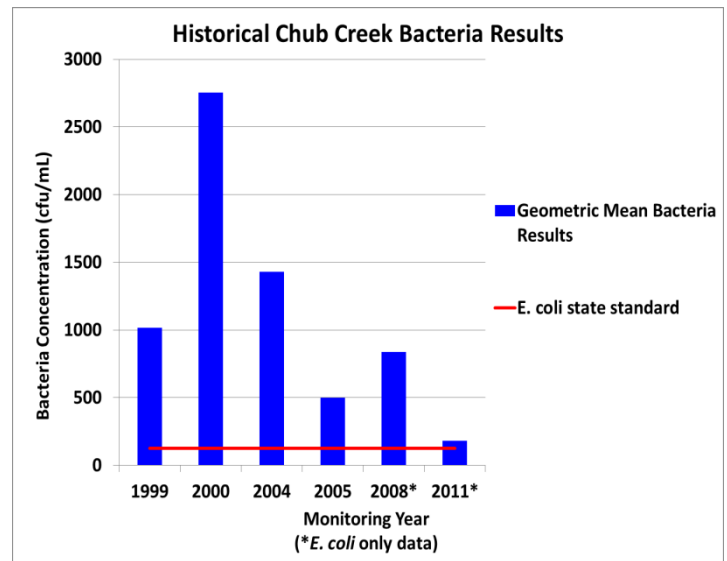
- Continuous stage (water level) data were collected, without interruption, at the Chub Creek Permanent Monitoring Station.
- 7 grab samples were collected and 6 flow measurements were made at the Chub Creek Permanent Monitoring Station.
- High flow values were recorded in the early season but gradually receded as less precipitation was recorded in the fall of 2011.



- Low total phosphorus concentrations are generally considered a strong indicator of high water quality.
- Recent trends suggest a slight decrease in total phosphorus concentrations. However, this may be a reflection of fewer storm samples, rather than a decrease in total phosphorus concentrations.



- Chub Creek has been designated as impaired for fecal coliform bacteria
- 2011 bacteria results were less than historical averages, but may be a reflection of fewer storm samples.
- *1999-2005 samples were analyzed for fecal coliform concentrations, while 2008-2011 samples were analyzed for *E. coli* concentrations (change in state standard).



4. Conclusions:

The 2011 water quality monitoring results for the Chub Creek Permanent Monitoring Station are relatively good, with most sample results falling well below state water quality standards or Minnesota Pollution Control Agency recommended eco-region mean concentrations. However, several issues appear to be noteworthy in this watershed.

Bacteria concentrations continue to exceed the state standard on Chub Creek. Recent results have decreased from more elevated values detected in 2000. However, this could be the result of a change in laboratory endpoints (fecal coliform to *E. coli*) in 2008. Regardless, bacteria results still remain above the state standard. Grant funding secured for the North Cannon Watershed (Clean Water Fund and MPCA 319) will be used to install projects to reduce bacteria contamination in Chub Creek.

Although mean nitrate concentrations in Chub Creek in 2011 were relatively low, individual measurements exceed the proposed state standard (Appendix 1). Should the proposed standard be implemented, Chub Creek could be designated as impaired for nitrates in the near future.

The 2011 mean turbidity and mean total suspended solids results (Appendix 1) were markedly lower than mean historical results for these parameters. However, this is also likely the result of a recent change in monitoring strategies. Rather than targeting both high flow and low flow events, the NCRWMO monitoring program has adopted a scheduled sampling approach, where more typical conditions will be reported to state agencies.

Appendix 1

Site	Parameter	Historical Mean Results	2011 Mean Results	Notes – 2011 Results
ChubPMS	Dissolved Oxygen (mg/L)	9.07	8.80	Above state standard, slightly below historical average
ChubPMS	<i>E. coli</i> (per 100 mL-geometric mean)	na	183.1	Exceeds state standard
ChubPMS	Nitrate (mg/L)	na	4.68	Below proposed state standard (4.9 mg), individual samples exceed proposed standard
ChubPMS	Total phosphorus (mg/L)	0.18	0.10	Below ecoregion mean, less than historical average
ChubPMS	Suspended Solids (mg/L)	42.04	13.43	Below ecoregion mean, less than historical average
ChubPMS	Turbidity (NTRU)	12.15	6.86	Below state standard, less than historical average