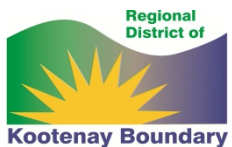




Kettle River Watershed Management Plan

Presentation to Grand Forks Rotary
Graham Watt, Project Coordinator
October 25, 2012



Kettle River Watershed Management Plan
The Kettle River Starts Here

Overview

- Key needs of watershed management planning
- Kettle River Watershed Management Plan
- Focal questions
 - Water supply and demand
 - Groundwater impacts
 - Riparian systems & fisheries



Challenge



Mandate



Capacity



Support



Understanding

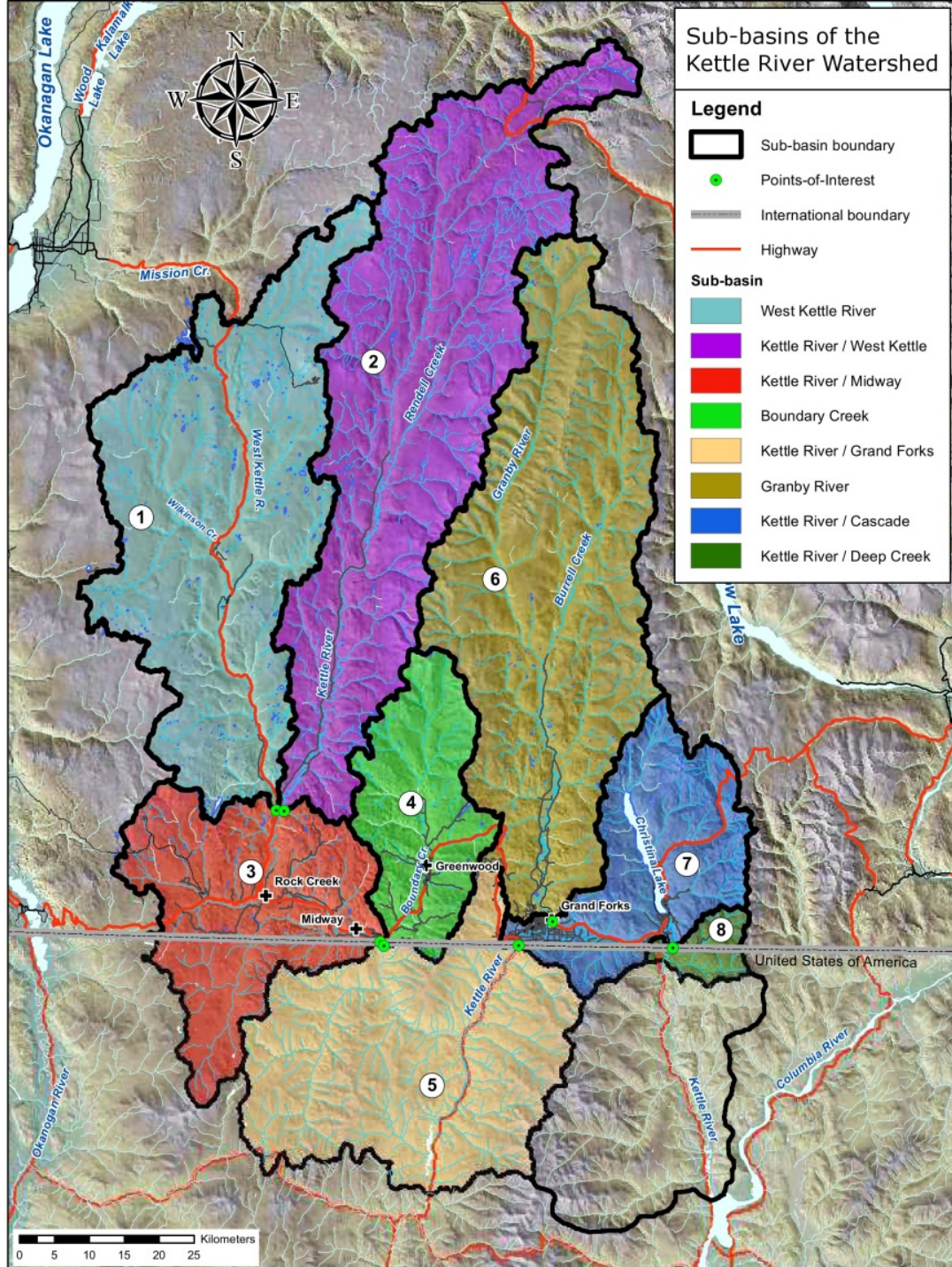
Sub-basins of the Kettle River Watershed

Legend

- Sub-basin boundary
- Points-of-Interest
- International boundary
- Highway

Sub-basin

- West Kettle River
- Kettle River / West Kettle
- Kettle River / Midway
- Boundary Creek
- Kettle River / Grand Forks
- Granby River
- Kettle River / Cascade
- Kettle River / Deep Creek



Kettle River Watershed Management Plan

RDKB initiative to

- *study* water supply, use, quality, and aquatic ecosystem (Phase 1 “State of the Watershed”)
- *plan* for the future – develop recommendations with stakeholders on policy, planning, and stewardship (Phase 2 “Watershed Management Plan”)



Understanding watershed issues

- Surveys
- Public meetings
- June-December 2012



Developing Goals, Objectives, Priorities

- Issue analysis
- Scenario analysis
- Public engagement
- January-June 2012



Watershed solutions

- Working Groups
- Charrettes
- July-December 2013



Draft watershed plan

- Working Groups
- Technical advice
- Public engagement
- Jan-March 2014



Implementation planning

- April-June 2014



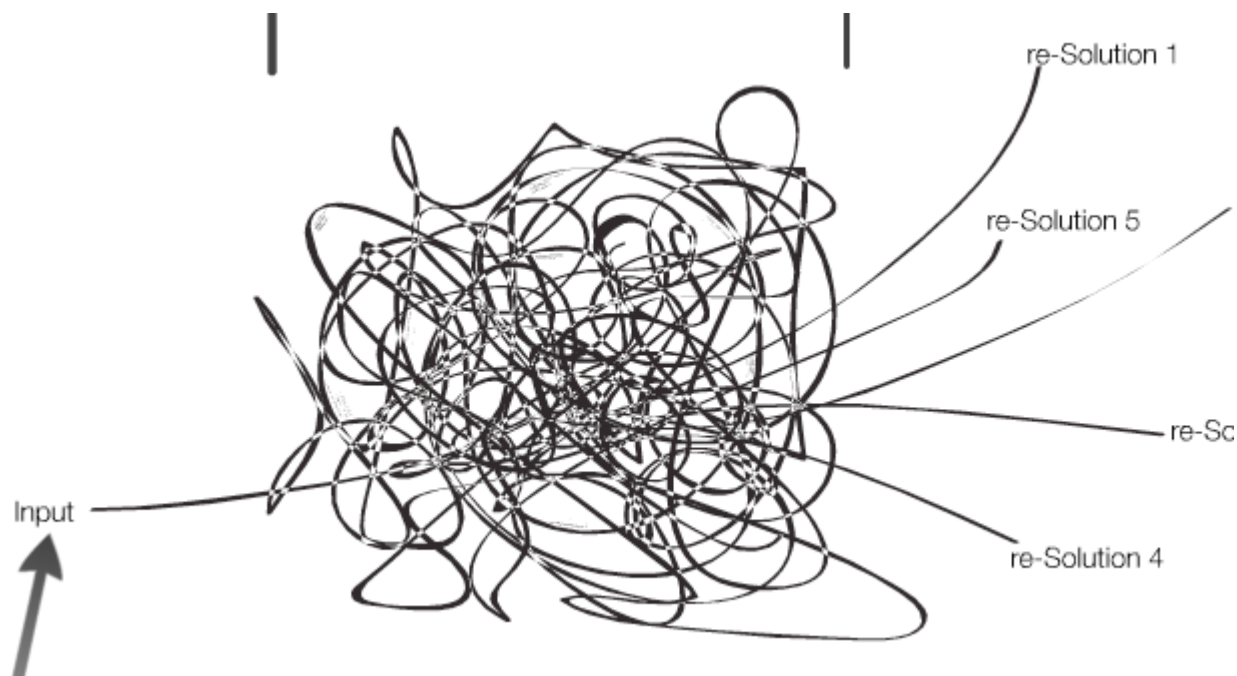
Great network of people involved

- Kettle River Watershed Steering Committee
- Technical Advisory Committee
- Stakeholder Advisory Group
- Interested public



“The choice of explanation determines the outcome”

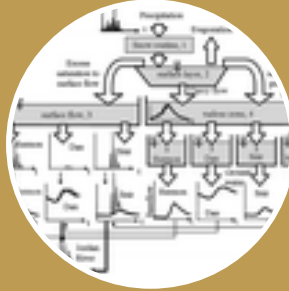
Shona Bose, Salon |e| Aspire



Tools for understanding



What's
going on?



How is it
working?



What if
we...?



Objectives



Adaptive
Management

State of the Watershed Overview

- Scope of State of the Watershed Report
 - Watershed description
 - Water quantity (flow & use, surface & groundwater)
 - Water quality (surface & groundwater)
 - Aquatic ecosystem
 - Data gaps

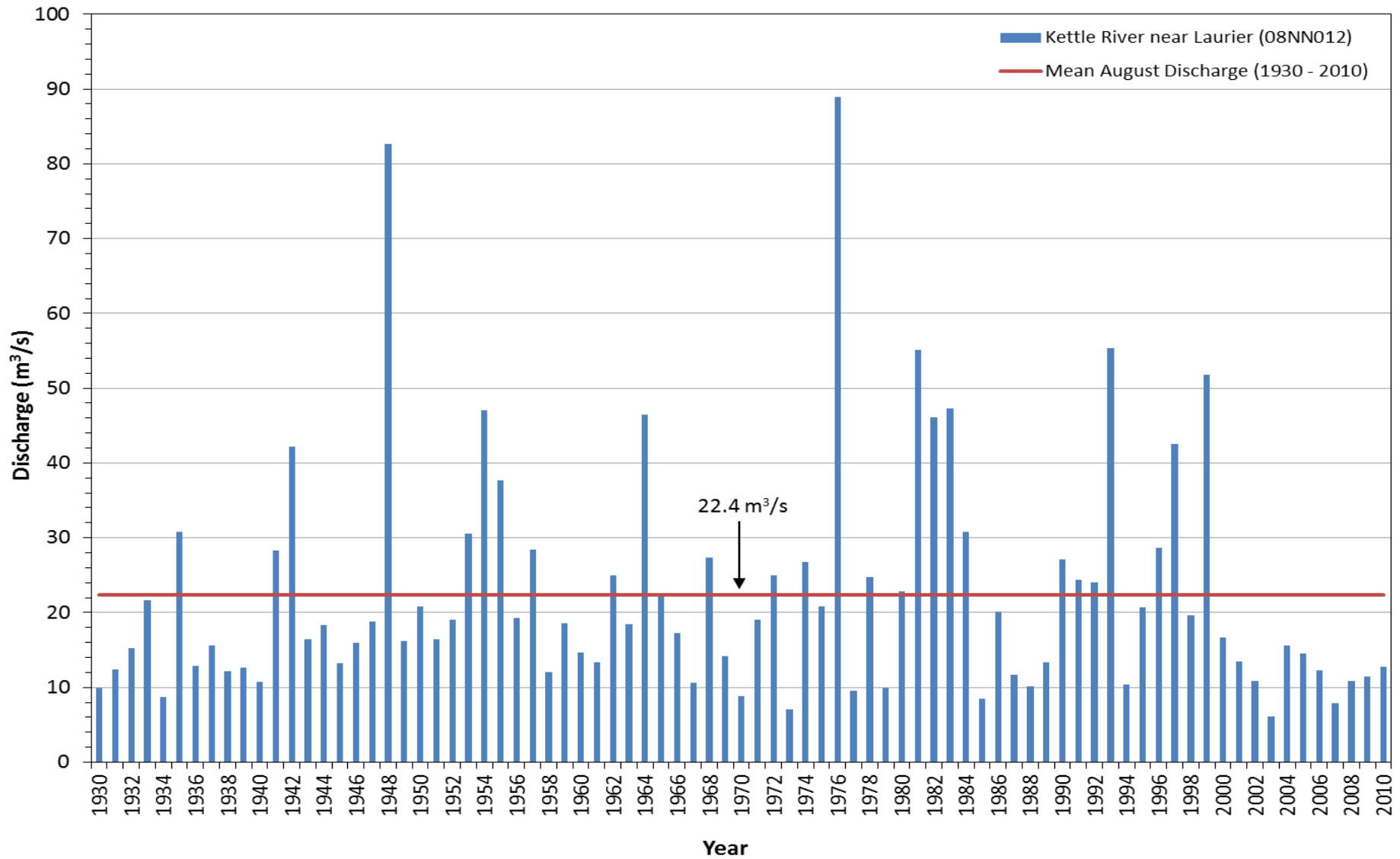
KEY FINDINGS

- Surface water: Aug-Sept flows much less than average; difference more pronounced in drought years & exacerbated by withdrawals. Actual surface use less than licensed.
- Groundwater: Major suppliers use it instead of surface water; connected to surface water; data gaps outside Grand Forks
- Water Quality: SW good except for temperature; GW has nitrate issues in GF; little data in northern 70% of basin
- Aquatic Life: Natural conditions limit fish; exacerbated by withdrawals in below-average years; work needed on potential to improve habitat

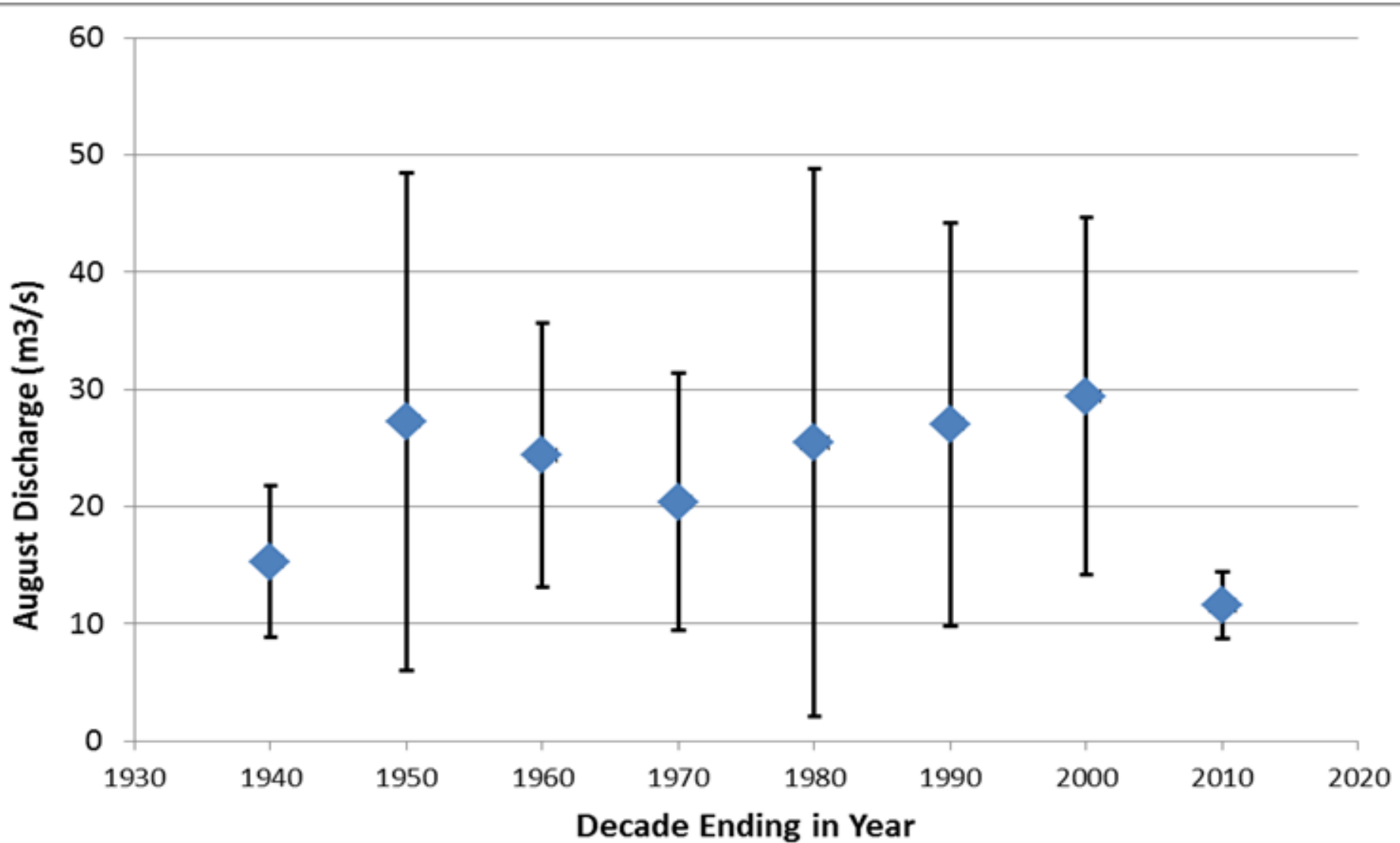


Are the river flows declining?
What impacts will climate change bring?

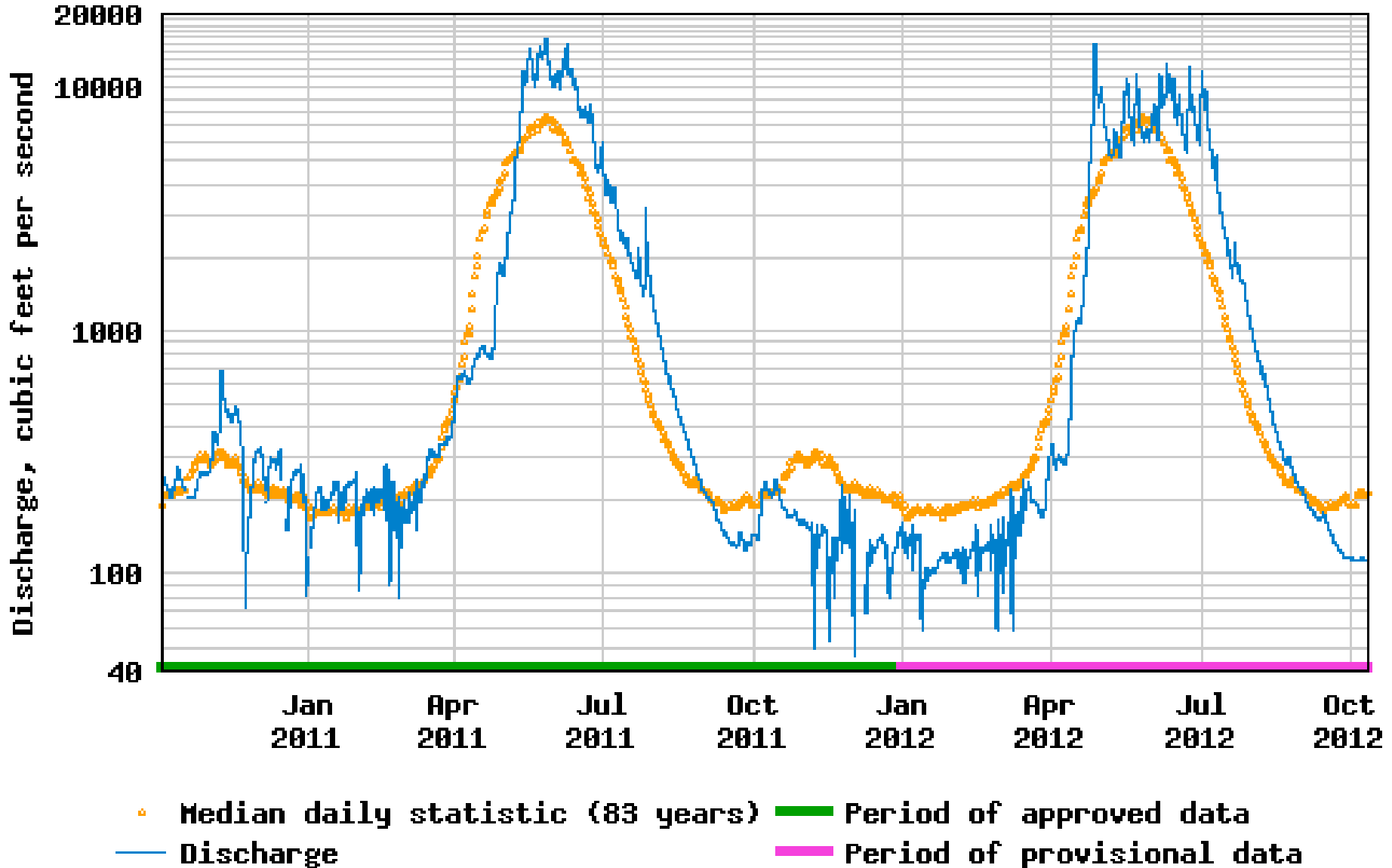
Kettle River Near Laurier – August (1930-2010)



Kettle River Flow (Laurier) – Decade Averages



USGS 12401500 KETTLE RIVER NEAR FERRY, MA

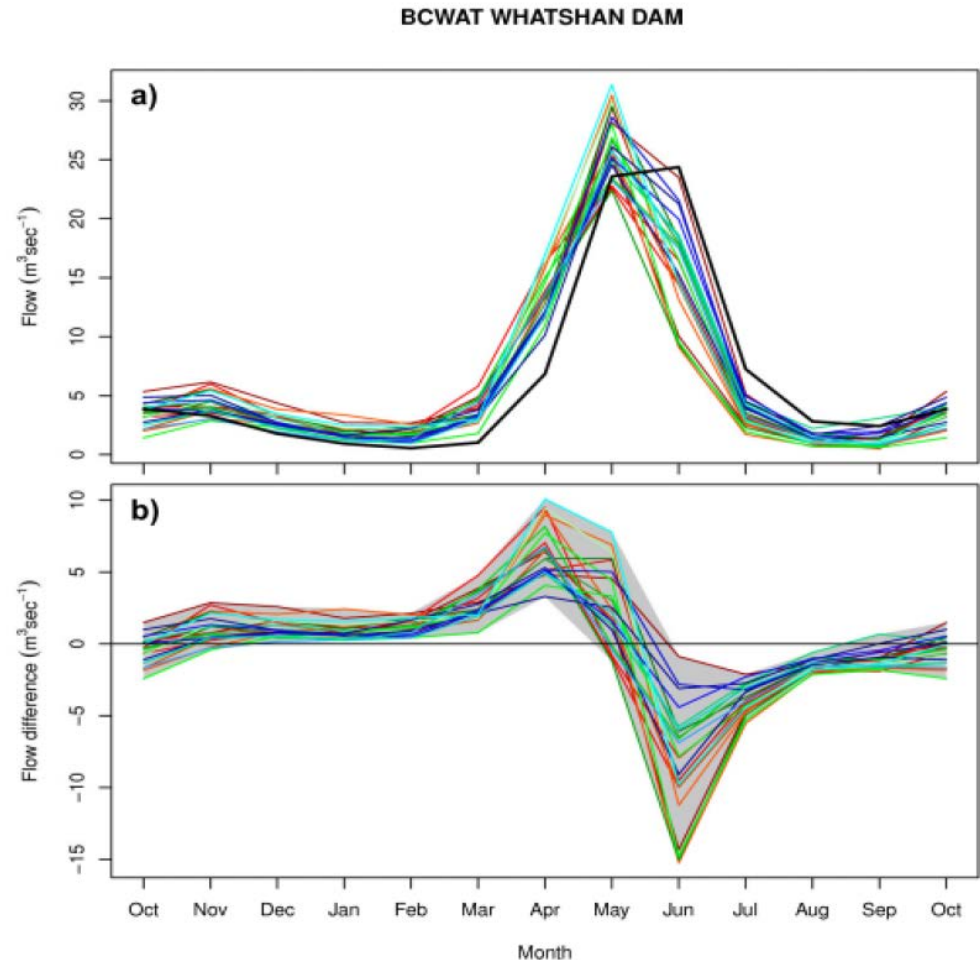


Are river flows declining?

- There is no significant trend (downward or upward) across the entire record for annual data
- 2000-2010 was the decade with lowest annual flows, well below average
- Last two years are in line with historical median

What about climate change?

- Prediction of warmer, wetter winters
- Earlier, potentially higher spring freshet
- Longer dry season with higher temperatures and lower precipitation
 - Implications?



Kettle River Watershed Management Plan

The Kettle River Starts Here

Climate Change Implications

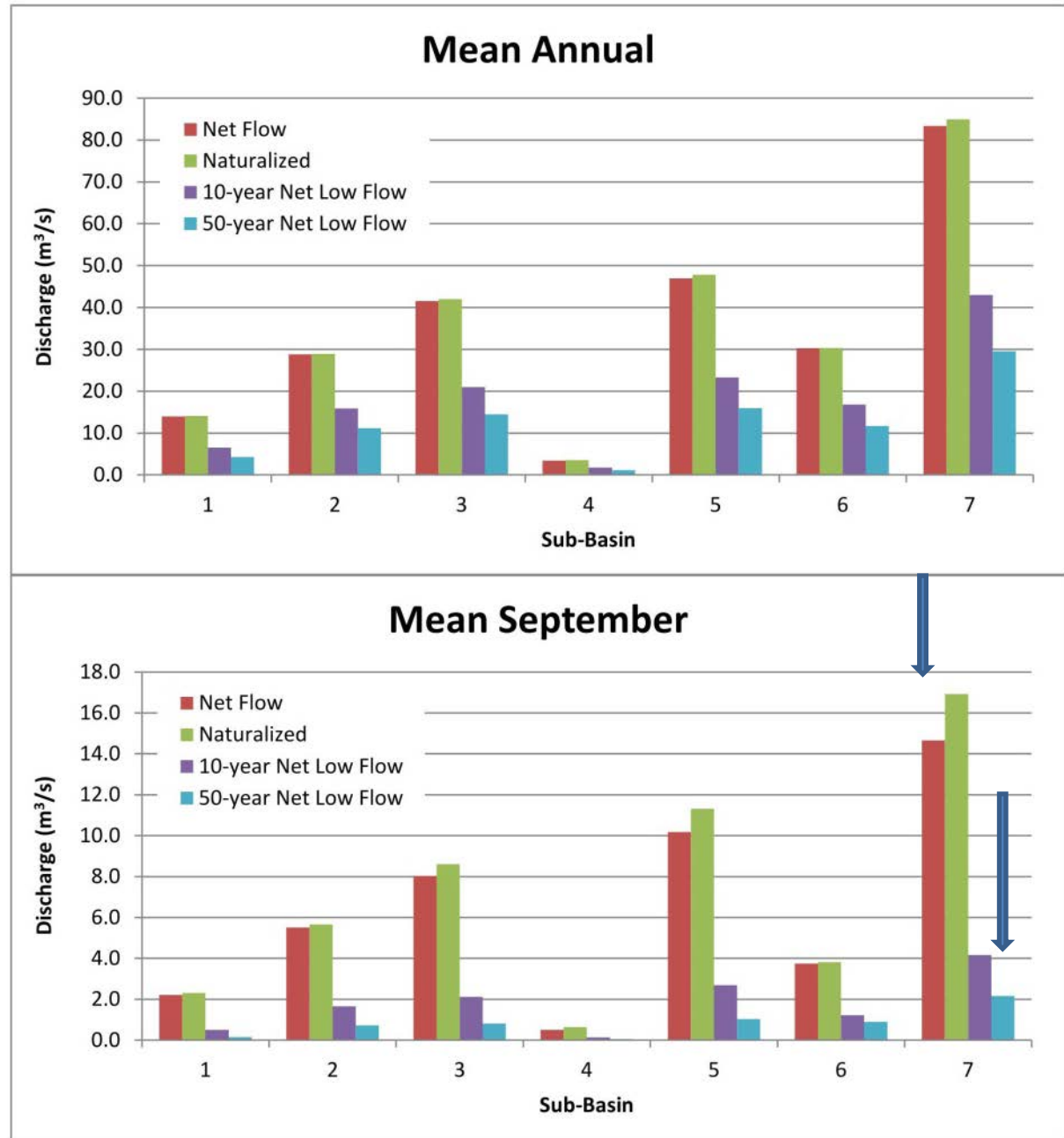
- Greater reliance on aquifers and stored water as dry season length increases
- Potentially increased risks of flooding damage and changes to river morphology
- Increased stresses on aquatic ecosystem

Are we using “too much” water?

- Overall, available water in summer is “over allocated” in terms of total surface licences
- BUT only about 50% of surface licences are used, depending on the year
 - Many licencees have switched to groundwater (unregulated)
- Generally a surplus of water in spring months

In some years...

- In very dry years (2003), late summer water use is slightly higher than river flows!
- Why doesn't the river run dry?
- implications for fish & aquatic ecosystems



Groundwater role



- Majority of residents and economic activity depends to some degree on groundwater
- Many home, agricultural, and municipal water systems have switched to groundwater (maintaining their surface licences)
- Good information for GF aquifer but “spotty” in other areas

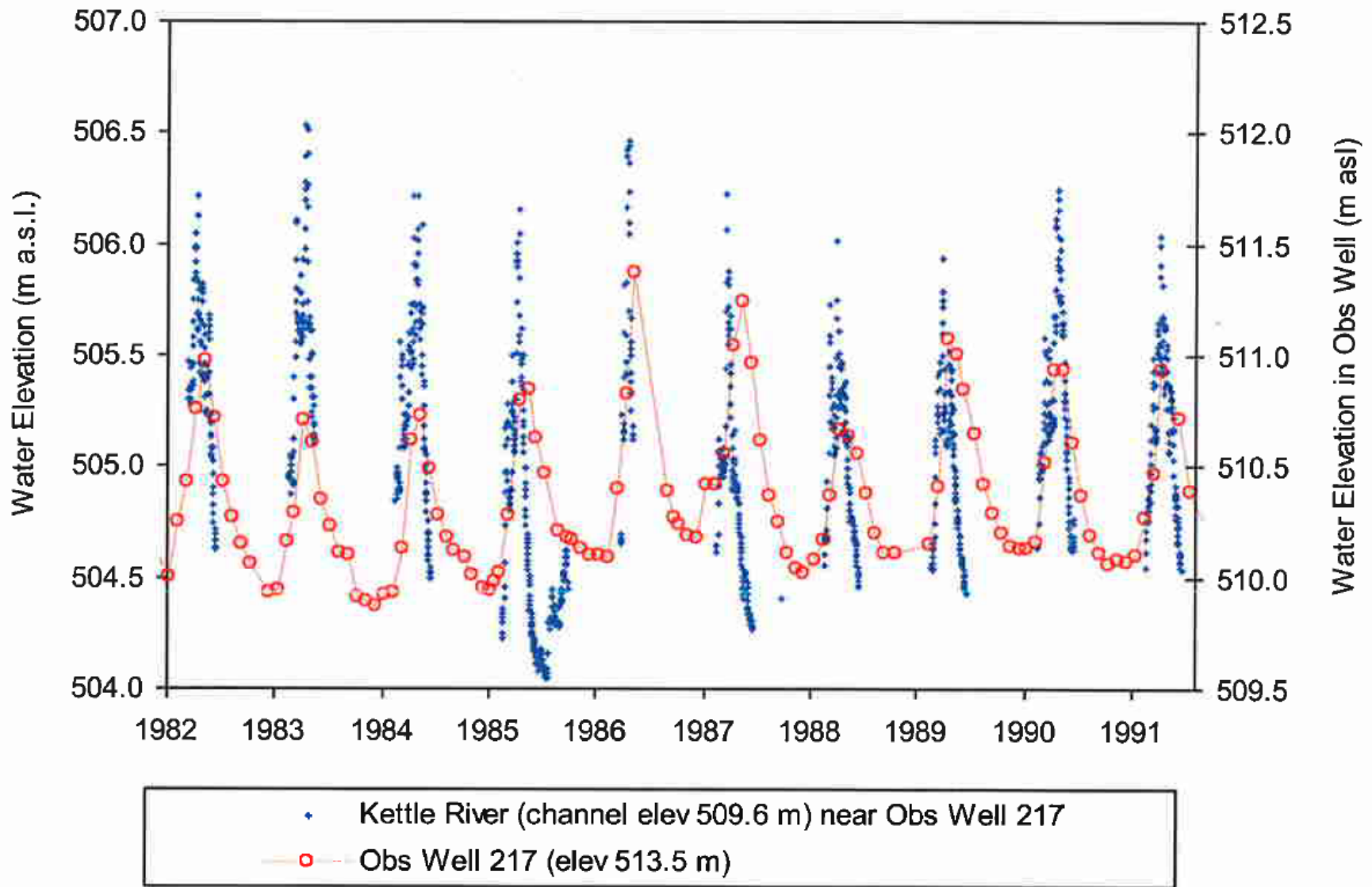
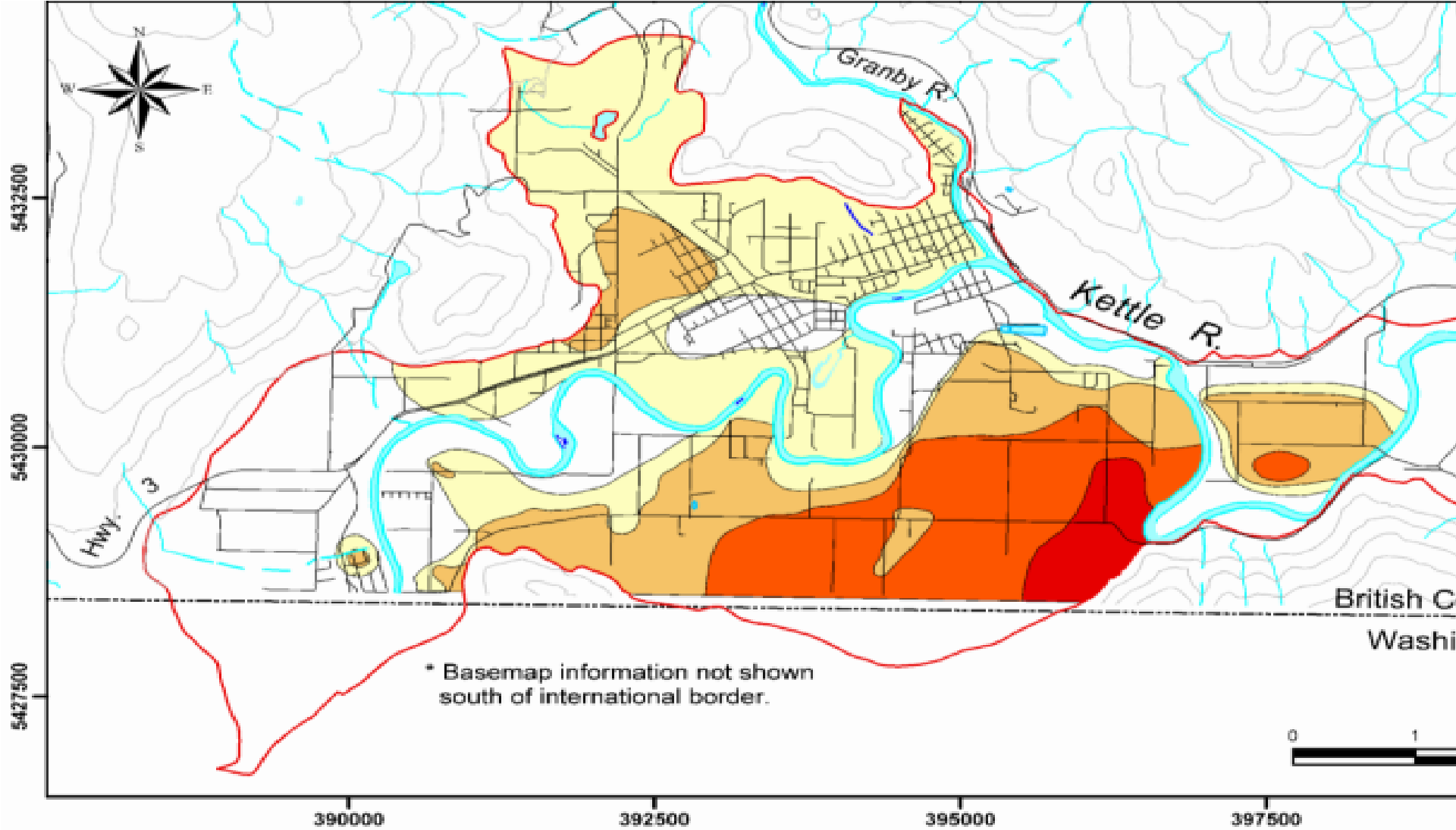


Figure 24

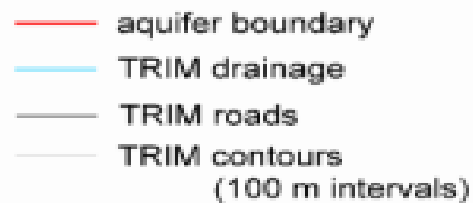
Water elevations at Observation Well 217 and on the Kettle River (08NN024), for the selected period of record from 1982 to 1991.



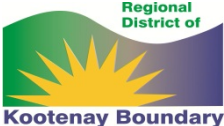
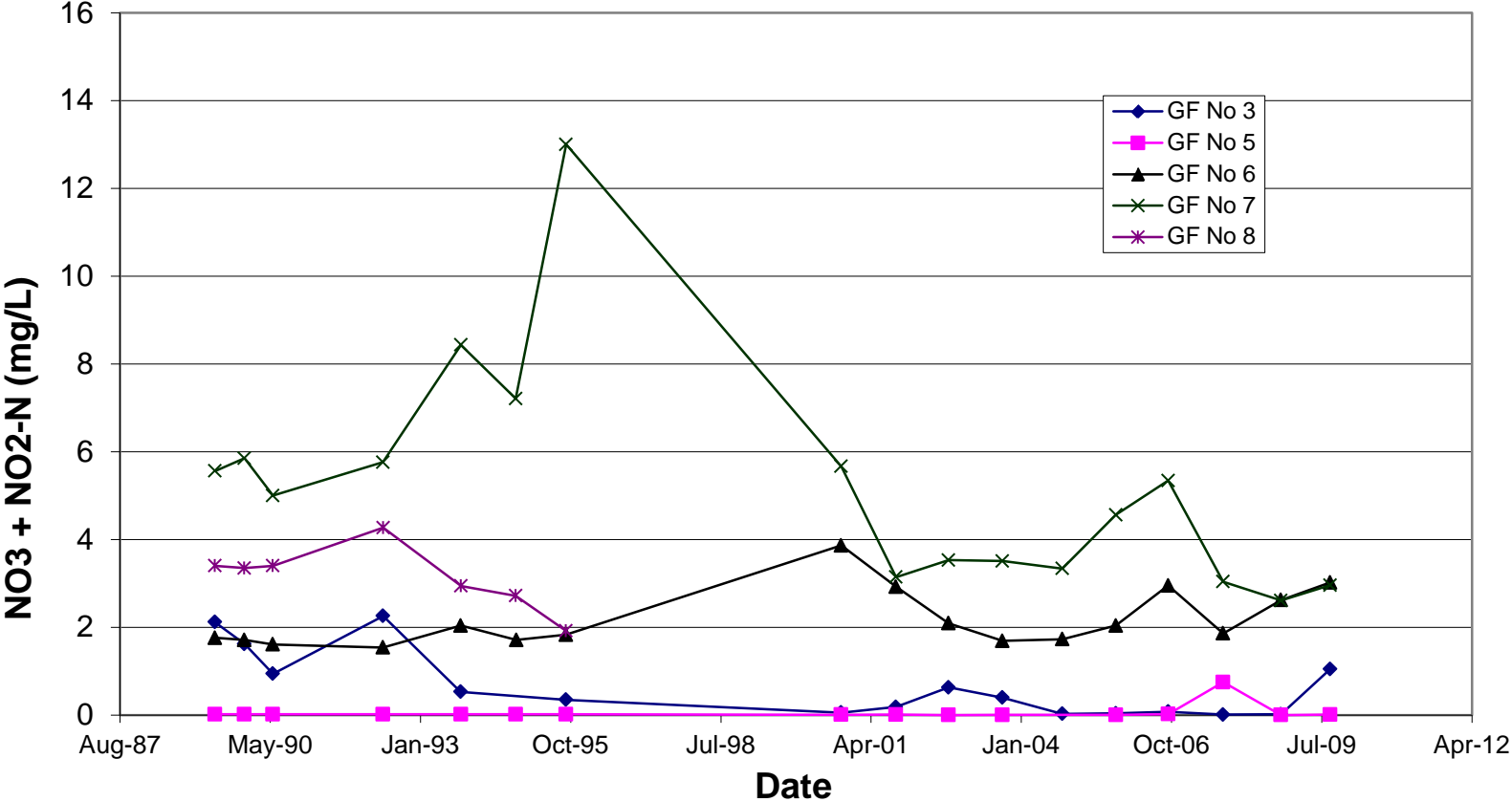
Nitrate-Nitrogen (mg/L)



Basemap



Nitrate Trends, Grand Forks



Kettle River Watershed Management Plan

The Kettle River Starts Here

...Groundwater

- Very valuable resource – acts as a reservoir
- Appears to be “renewed” from year to year from spring runoff
- Tightly connected to surface water and surface activities
 - High water extraction may further decrease late summer river flows
 - Need to safeguard against contamination

Riparian ecosystems

- High level of public concern over:
 - Range management, forestry, recreation impacts
 - Degraded riparian areas



Fisheries Issues

Kettle River sport fishery has been deteriorating due to natural and anthropogenic factors

- Seasonal low flow
- High water temperatures
- Habitat availability, especially a lack of deep water habitats for adult and sub-adult rainbow trout
- Over-fishing

Next Steps

- Riparian working group
- Water supply & demand scenario analyses
- Working group on storage opportunities
- Water conservation education & programming
- Other studies as recommended by State of the Watershed & Technical Advisory Committee

<http://kettleriver.ca>

