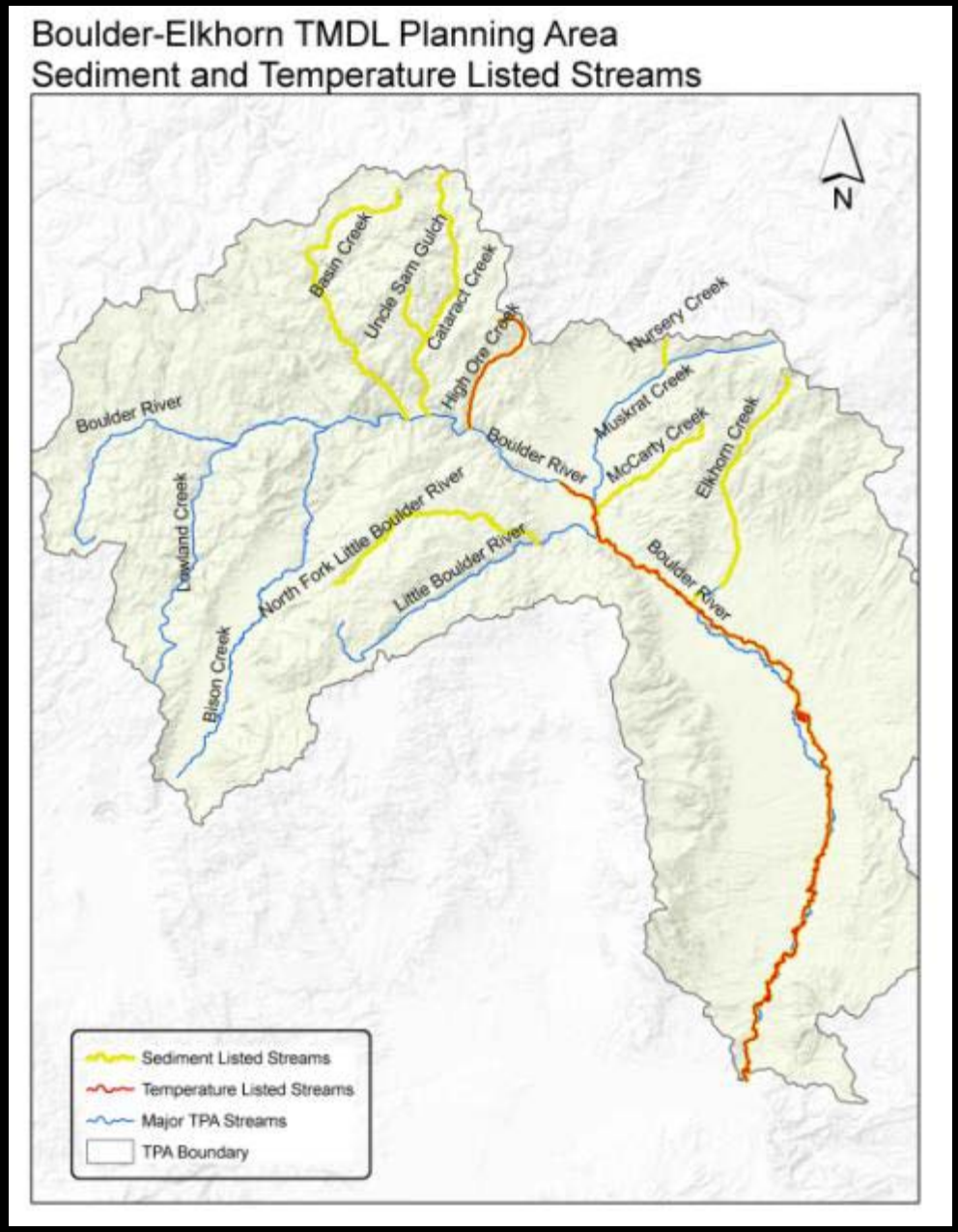
Sediment & Temperature TMDLs

Listed Sediment Impaired Streams

- Basin Creek
- Boulder River (Town of Boulder to the mouth)
- Cataract Creek
- Elkhorn Creek
- High Ore Creek
- McCarty Creek
- North Fork Little Boulder River
- Nursery Creek
- Uncle Sam Gulch

Listed Temperature Impaired Streams

- Boulder River (Town of Boulder to the mouth)
- High Ore Creek



Sediment TMDLs

Sediment: naturally occurring component of healthy and stable stream ecosystems

Excess inputs of sediment may:

- alter channel form and function (over-widen)
- cause excess sediment to accumulate in fish and aquatic life habitats by:

-Interfering with reproduction and survival of fish and macroinvertebrates

-Reducing availability of suitable spawning habitat

Sediment TMDLs

What are we looking for?

In-stream Sediment and Habitat Information:

- a general condition of stream character at a number of selected locations

Sediment Source Information:

- where sediment is coming from and how much is getting to the stream

Sediment TMDLs

How is this information used?

1. Water Quality Targets
2. Sediment Load Quantification
3. TMDLs and Allocations
4. Monitoring & Restoration

Sediment and Habitat Investigations

Parameters of Interest

- Fine sediment
  (<6mm and <2mm in riffles and in pools)
- Channel form stability
  (W/D ratio and entrenchment)
- Instream habitat
  (LWD, pools/mile, and pool depth)
- Riparian health
  (% understory shrub cover)
- Bank Erosion
  (Number of banks, loads, and associated causes and severity)

Parameters of interest are selected for their ability to display response to increases or decreases in sediment loading, and their linkage to effects upon aquatic life/cold water fish.

Sediment Source Categories

Natural erosion

- Result of climatic and hydrologic processes

Human influenced sediment/erosion

- Streambank erosion
  - Streamside Vegetation Removal
  - Unnatural Flow Fluctuations
  - Livestock trampling
- Sediment from unpaved roads & road crossings
  - Non-"BMP'ed" roads and crossings
  - Culvert failure
- Sediment from land use (upland sediment)
  - Grazing practices
  - Timber harvest
  - Streamside Vegetation Removal
  - Crop Production
  - Development
- Point Sources
  - Permitted entities

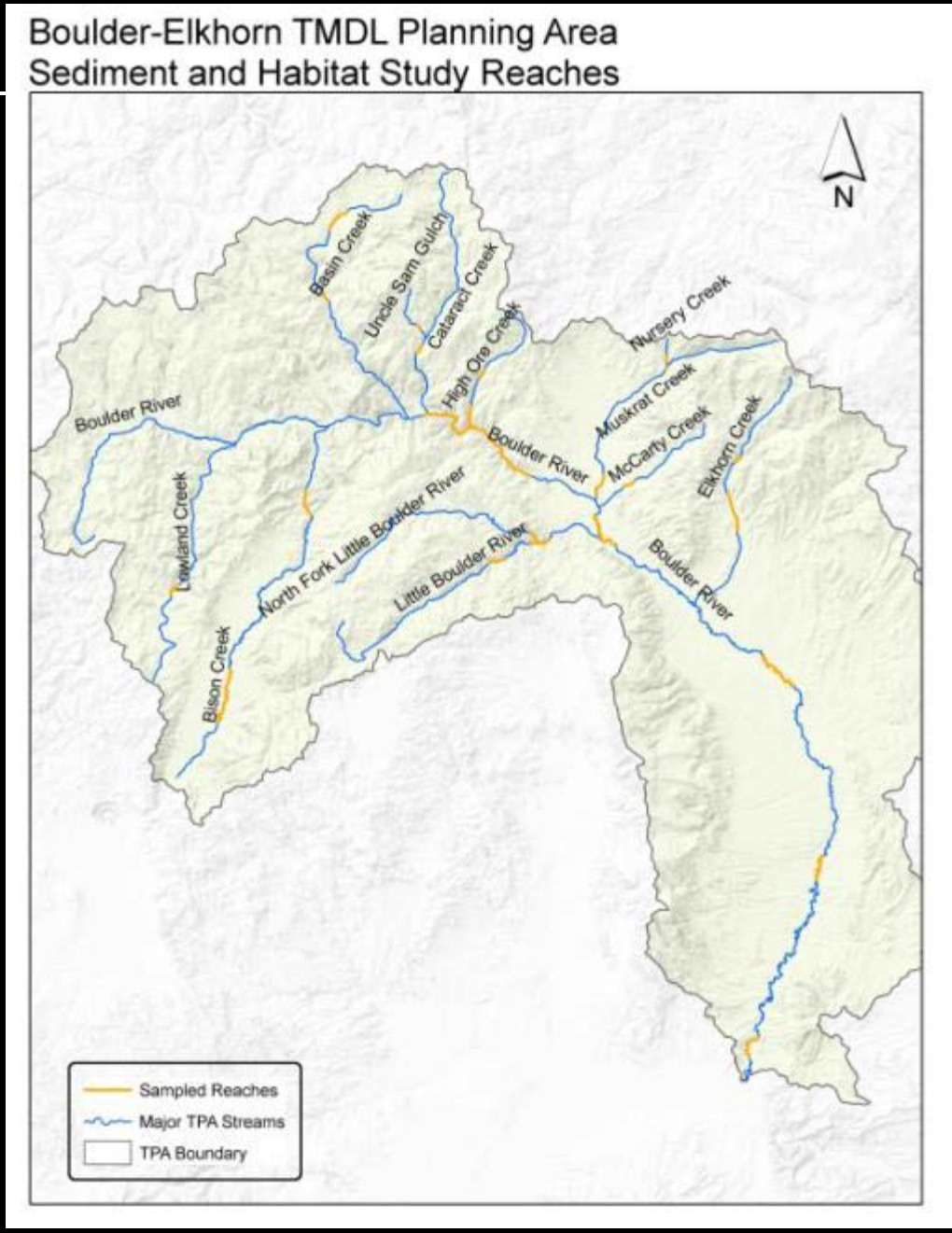
Sediment TMDLs

What do we have?

2010 Sediment and Habitat investigations: conducted at 23 sites throughout the Boulder-Elkhorn planning area

Analysis of Base Parameter Data and Erosion Inventory Data for Sediment TMDL Development within the Boulder-Elkhorn TPA

Available for review on the web:
montanatmdlflathead.pbworks.com



Sediment TMDLs

Next Steps?

- Develop target values
- Integrate all source assessment info for load quantification, TMDL development and allocations
- Draft and distribute stakeholder review documents
- Write and publish TMDL document

Temperature TMDLs

Excess inputs of thermal loading may increase in-stream temperatures to levels that harm fish and other aquatic life populations

In most cases, temperature impairment listings are associated with fish and aquatic life beneficial uses.

Temperature TMDLs

What are we looking for?

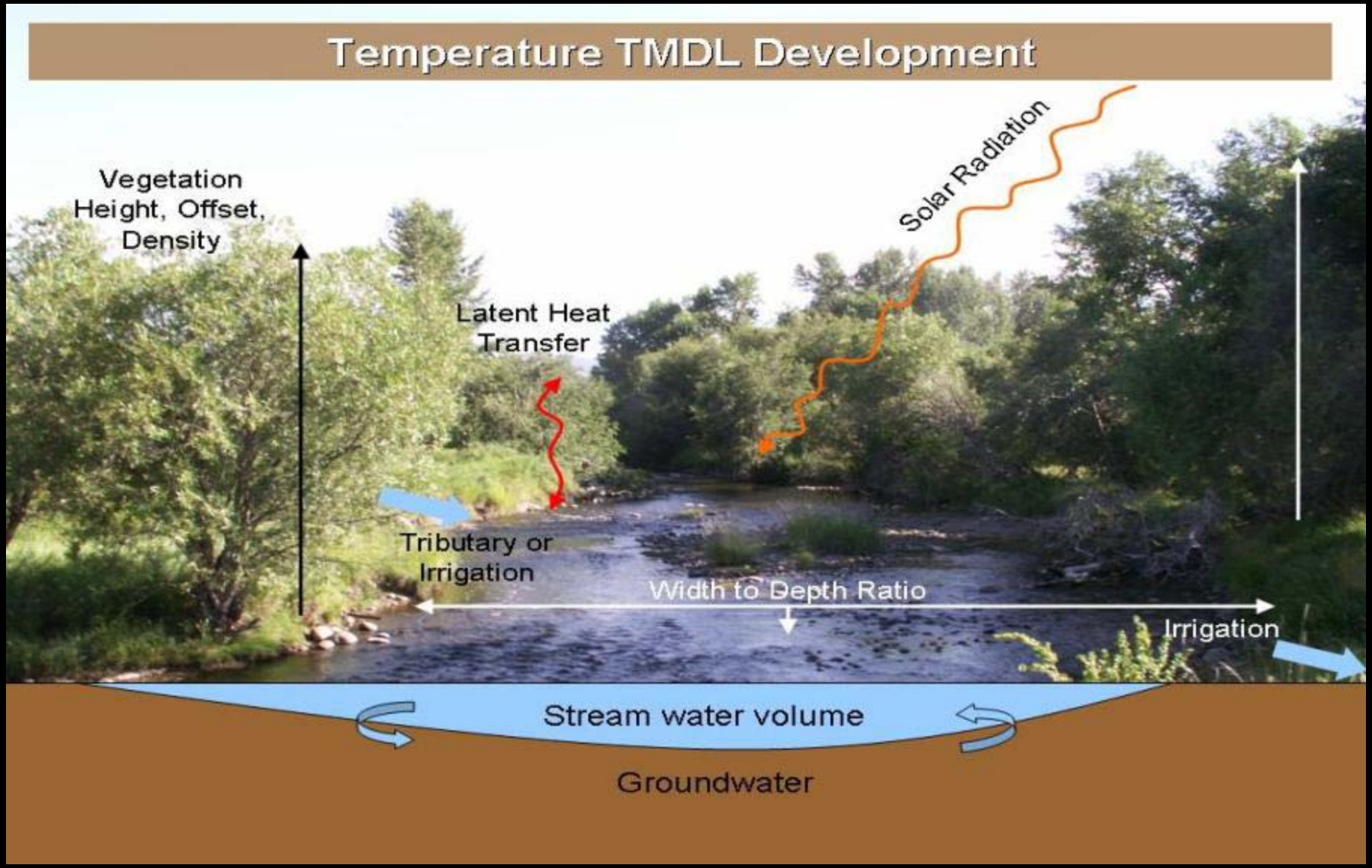
In-stream temperatures and flows:

- continuous temperature recordings at a number of selected locations during the hottest months of the year, including associated flow conditions

Potential sources of temperature fluctuation:

- riparian condition (available shade), channel morphology, flow conditions

Temperature TMDLs



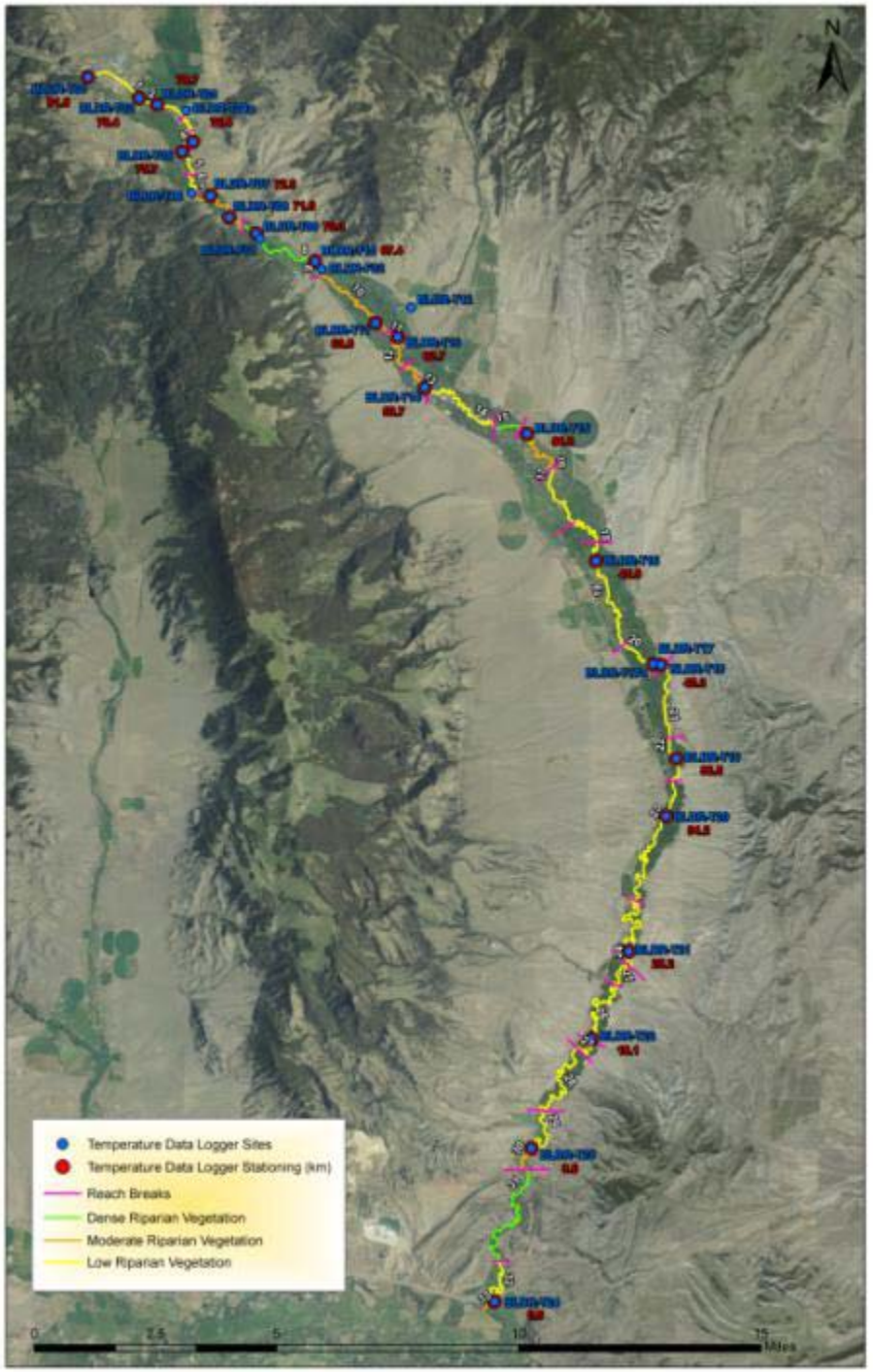
Temperature TMDLs

What do we have?

2010 Temperature data collection and associated QUAL2K modeling on the Boulder River

Stream Temperature Assessment for the Boulder River (March 2011)

Available for review on the web:
montanatmdlflathead.pbworks.com



Temperature TMDLs

Next Steps?

- Use QUAL2K results and associated report to develop target values and develop TMDL and allocations

- Draft and distribute stakeholder review documents

- Write and publish TMDL document