

Ground Water Investigation Program

Montana Bureau of Mines and Geology



2016 Lolo Watershed Symposium
September 14, 2016

Montana Bureau of Mines and Geology

State
Geologist/
Director

Research

Communication

Geology

Hydrology

Analytical
Laboratory

Publications

Data
Center

Data
Preservation



Ground Water Investigation Program (GWIP)

Addresses specific groundwater questions across Montana

- ✓ Competition for water resources;
Answer locally identified questions, crucial for water management;
- ✓ Focused, intensive studies in a structured, widely accepted program

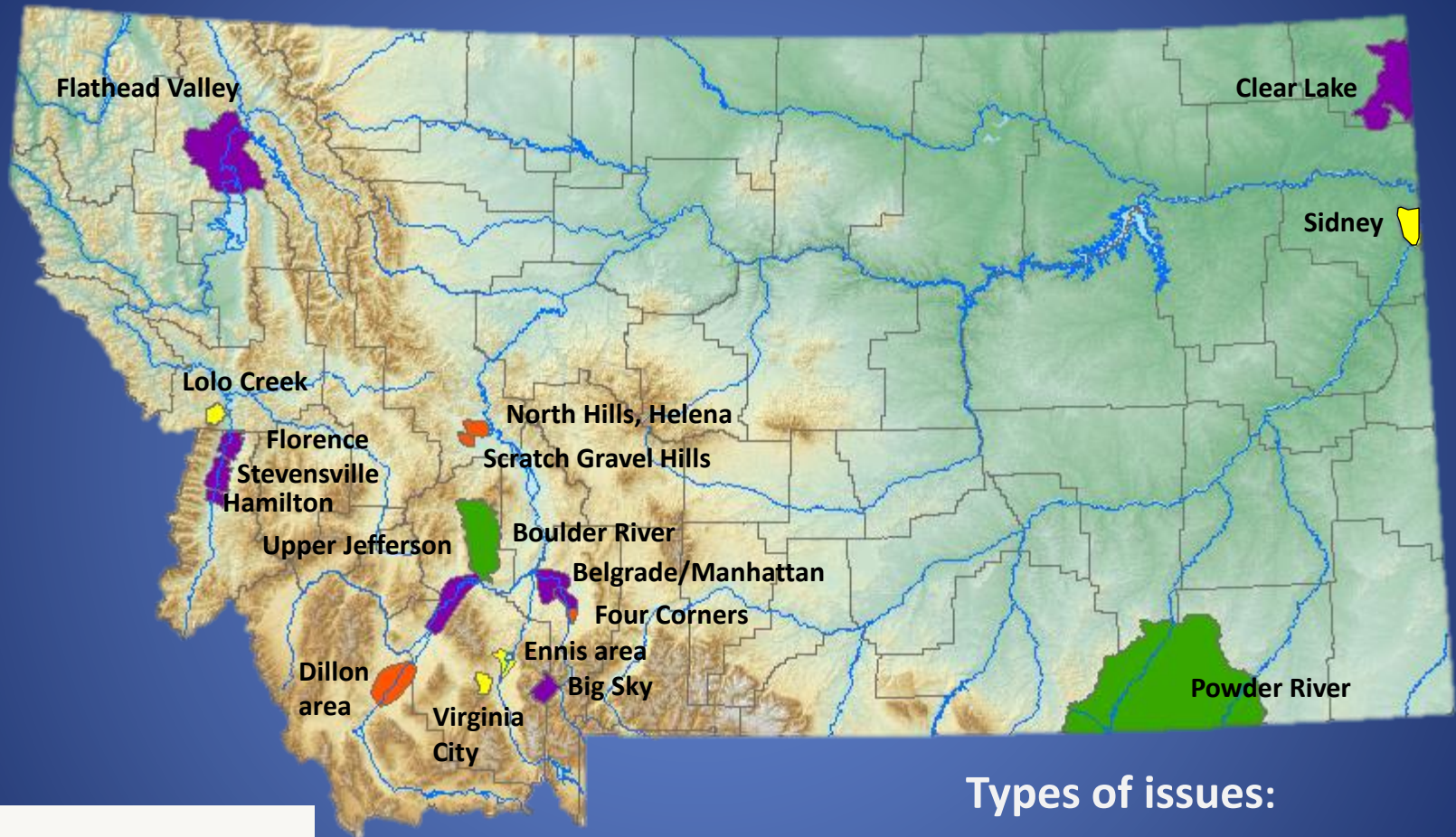


*Understanding impacts and **lack** of impacts, both are equally important*

Provide information so aquifers can be managed, Not just used

GWIP Project Areas

GWIP adds to Montana's capability to deal with complex water resource issues



Types of issues:

- stream depletion from pumping wells
- effects of changing land use on water resources
- the impacts of irrigation practices on groundwater surface water
- evaluating mitigation success and offset plans in closed basins.

- Active projects
- Completed projects
- Scheduled projects
- In review

Lolo Creek Project

Montana Bureau of Mines and Geology



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A Gebril

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Purpose

The purpose of this GWIP project is to document and determine the cause(s) of changes in streamflow that occur in Lolo Creek's lower reach.



Nominated: April, 2015
Ranked: October, 2015
Started: Spring, 2016

Tonight's Topics

- Study focus
- How work meets that focus



Products

Documentation and explanation of causes that impact streamflow including predictive tools

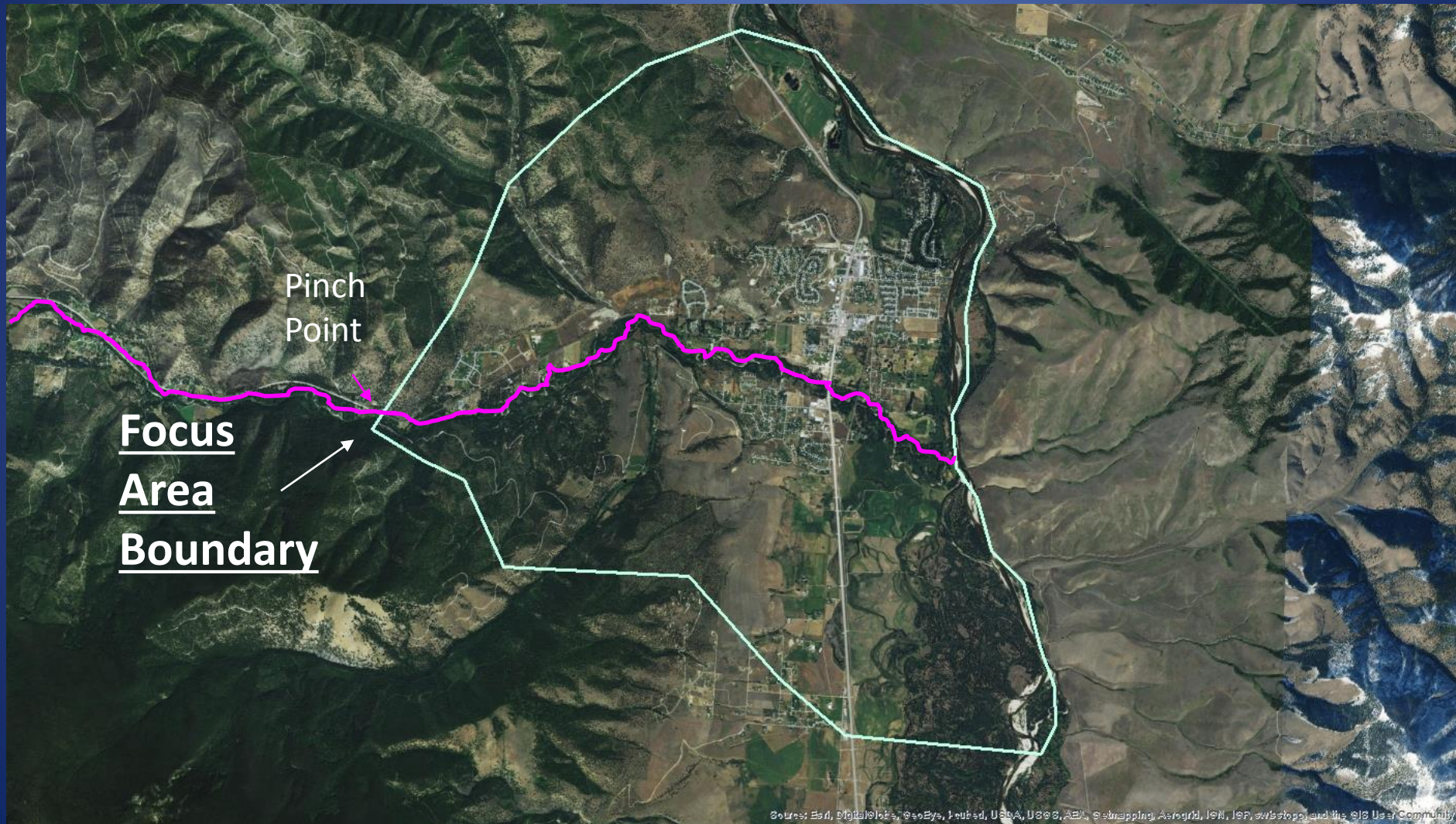


Process

- Theories
- Data collection
- Interpretation (maps)
- Predictive models



With help from the DNRC, we will measure watershed components at the Lolo Watershed scale, but will focus on detailed measurements in the smaller watershed that is our **Focus Area**



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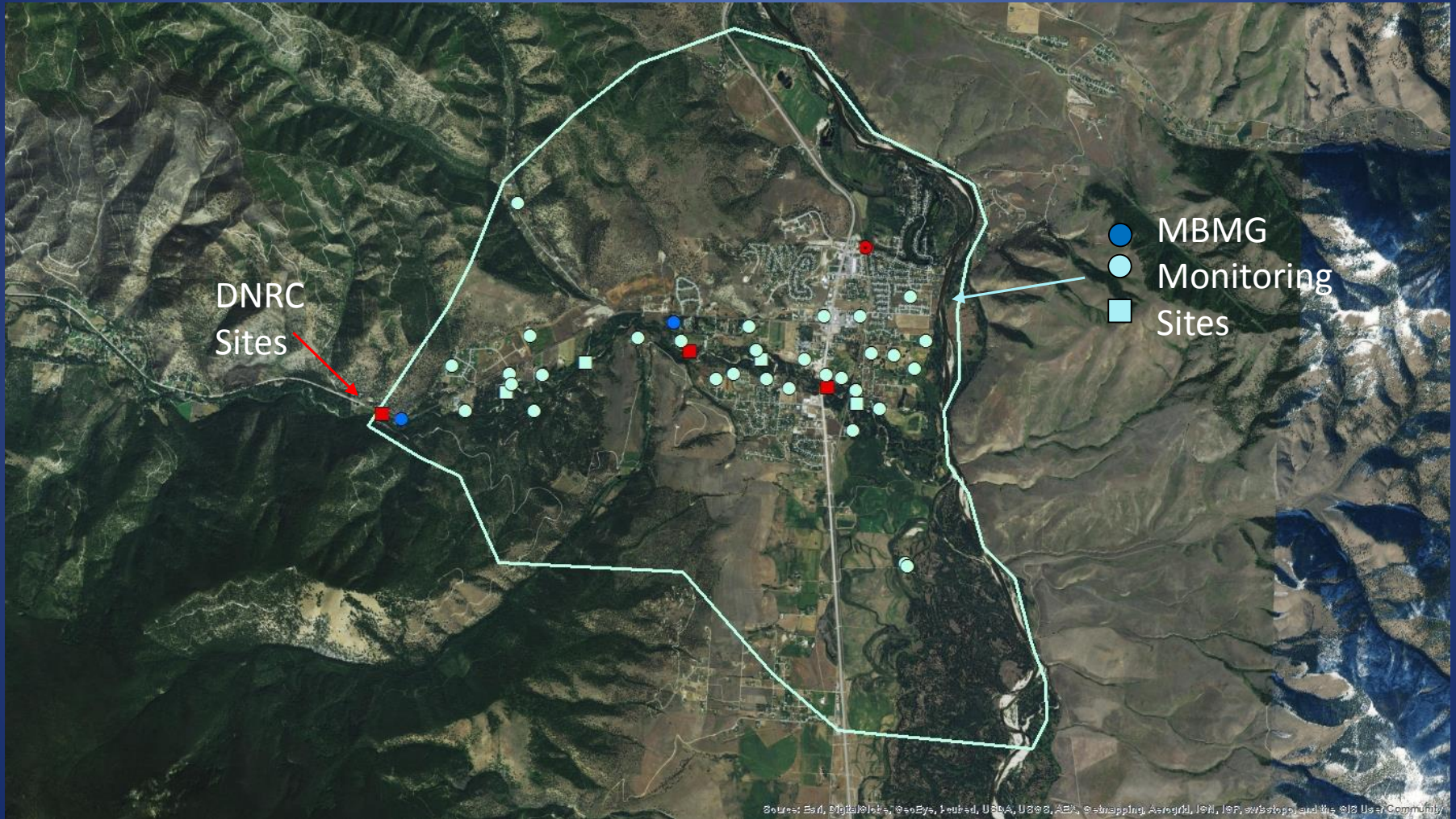
To understand how and why water flows in Lolo Creek, we will,

Document and Quantify:

- surface water flow
- groundwater/surface water - interaction and patterns
- groundwater use and flow
- precipitation amounts and trends



Monitoring Sites

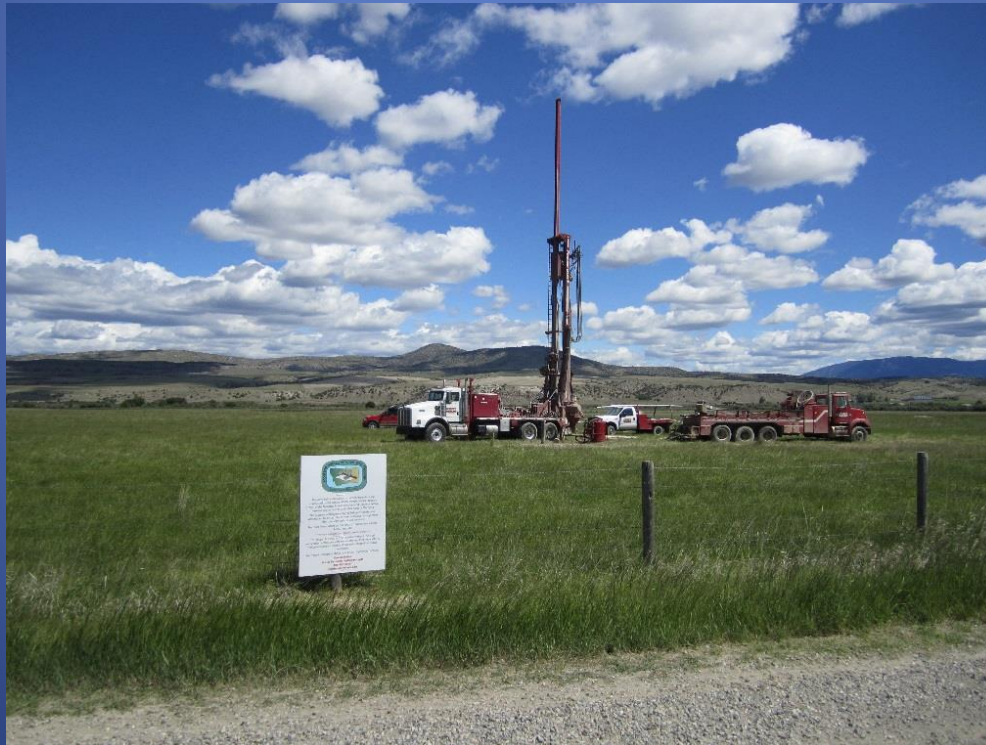


Drilling Program

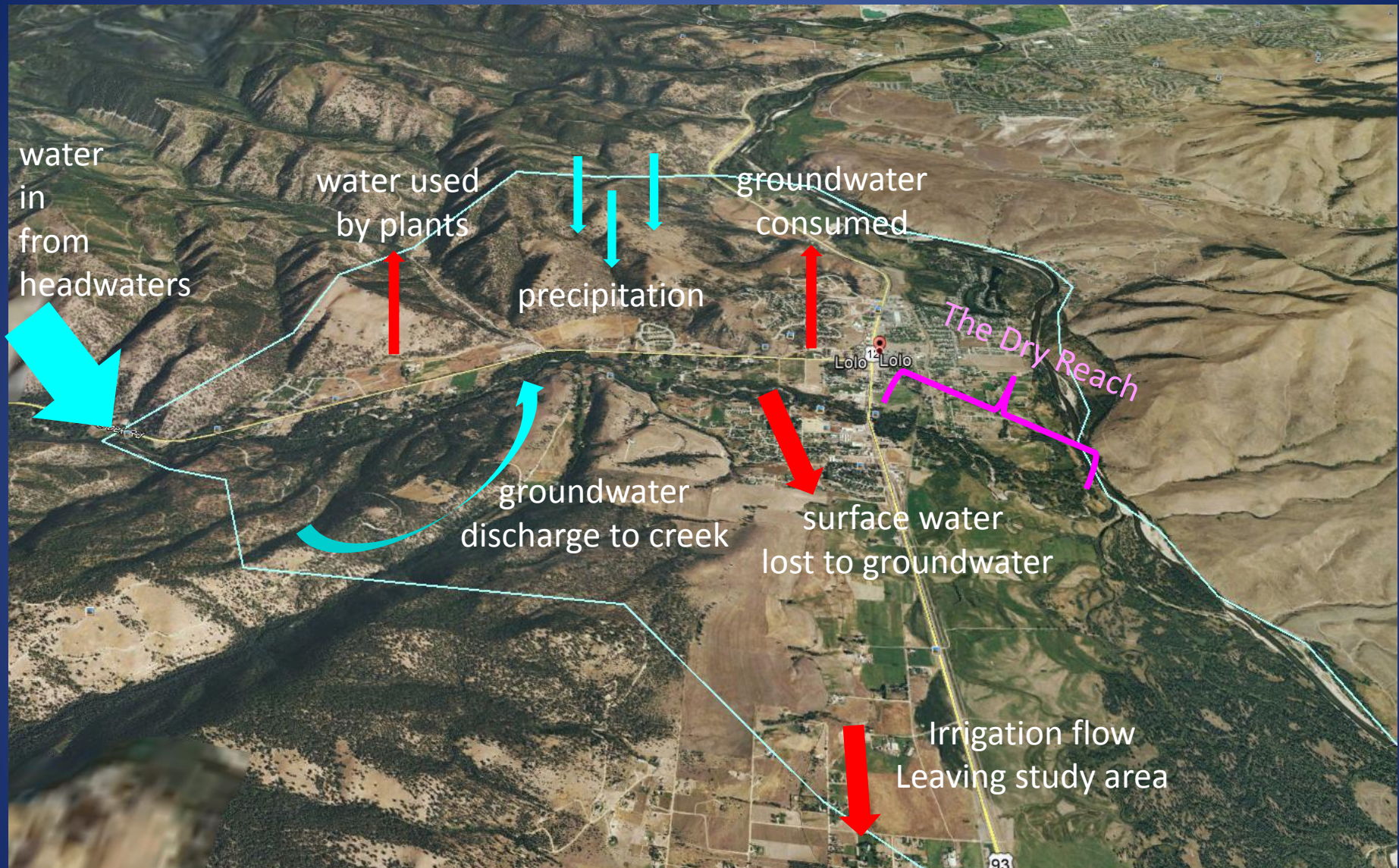
drilling dedicated monitoring wells where we need data

Starting 9/26/2016.....

- Filling in groundwater-data gaps
- Characterizing the aquifers

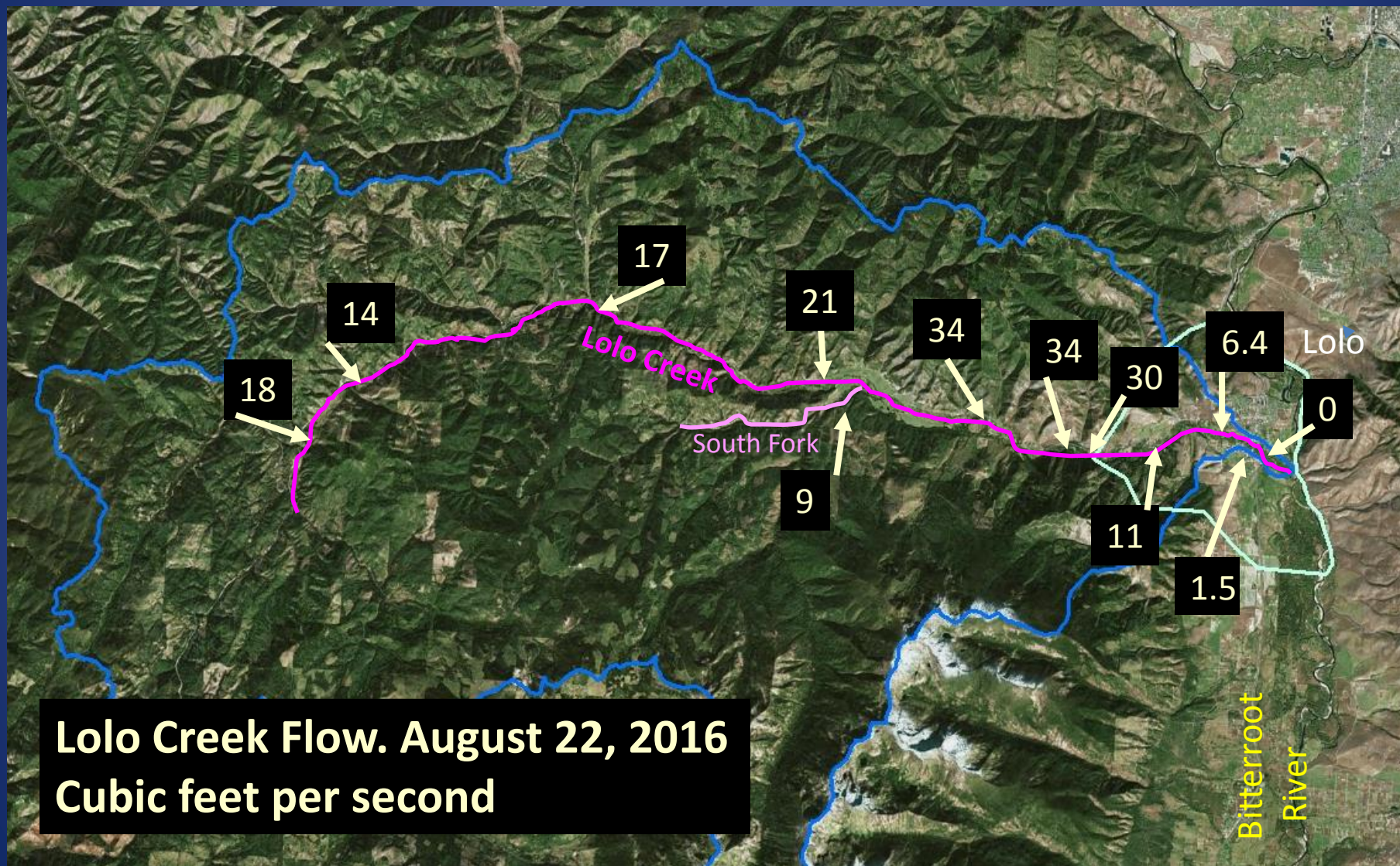


What determines the flow in Lower Lolo Creek?



Changes in any one or more than one of these factors will cause changes in Lolo Creek flow.

Streamflow was measured on August 22, 2016 by combined team of MBMG and DNRC.



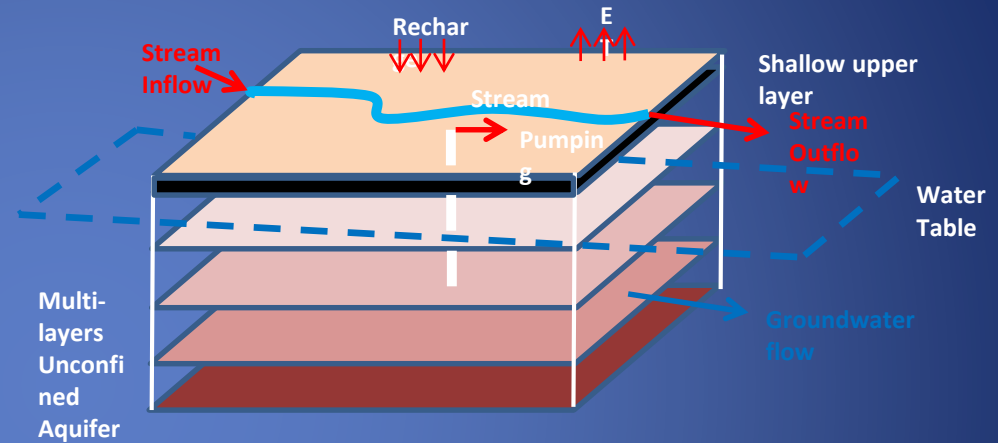
Lolo Creek Flow. August 22, 2016
Cubic feet per second

The bottom line: Products

Interpretive Technical Report



Numerical models



Public presentations to answer your questions.



Montana's Ground-Water

mbmgwic.mtech.edu

Ground Water Information Center | MBMG Data Center
 Montana Bureau of Mines and Geology
 Montana Tech of The University of Montana
 1300 West Park Street - Natural Resources Building Room 200
 Butte, Montana 59717-6997
 Ph: (406) 496-4336 Fax: (406) 496-4343

Comprehensive data set

data | Reports | Data.Coop | DrillerWeb | DNRG | Help

Menus: | Main | SWL | GWCP | Projects | Coal | Coal Quality | Geothermal

In the tables below are the Montana Bureau of Mines and Geology projects that have data available through GWIC. Use the selection box on the left to choose the GWIC main project area that you want to review. To retrieve data, click on the purple dot that corresponds to the type of data and project you want. If there is no dot in a box then there is no data available at this time.

Project Name	Water Quality									
	Site Location	Site Visit	Inorganic	Isotope	Organic	Surface Water	Water Level	Photo	Weather	DocMan
GROUNDWATER INVESTIGATION PROGRAM * LOLO (BWIPLQ)	●	●	●	●	●		●			
GROUNDWATER INVESTIGATION PROGRAM * LOLO - LITHOLOGY WELLS (BWIPLQ/LITH)	●									
GROUNDWATER INVESTIGATION PROGRAM * LOLO - WATER-LEVEL MONITORING SITES (BWIPLQ/W)	●	●	●	●	●		●			
GROUNDWATER INVESTIGATION PROGRAM * LOLO - SURFACE WATER SITES (BWIPLQ/SW)	●	●	●	●	●	●	●			
GROUNDWATER INVESTIGATION PROGRAM * LOLO - SYNOPSIS SURFACE WATER SITES (BWIPLQ/SYN)	●	●	●	●	●	●	●	●	●	●

Project Groups

- Abandoned/Inactive Mines
- Clark Fork River Basin
- Coalbed Methane and Coal Hydrology
- Controlled Groundwater Areas
- DEQ 319 Projects
- Energy Development Baseline Sampling
- General MBMG Program Data
- Geothermal Data
- Ground-Water Characterization Program Data
- Groundwater Investigation Program
 - Belgrade/Manhattan
 - Bio Sky
 - Boulder River
 - Clear Lake
 - Flathead Valley
 - Florence
 - Four Corners
 - Fox Hills-Bakken
 - Hamilton
 - Lolo
 - Lower Beaverhead River

YOU!

Thank you!

Our co-operators:



We will see you again!

