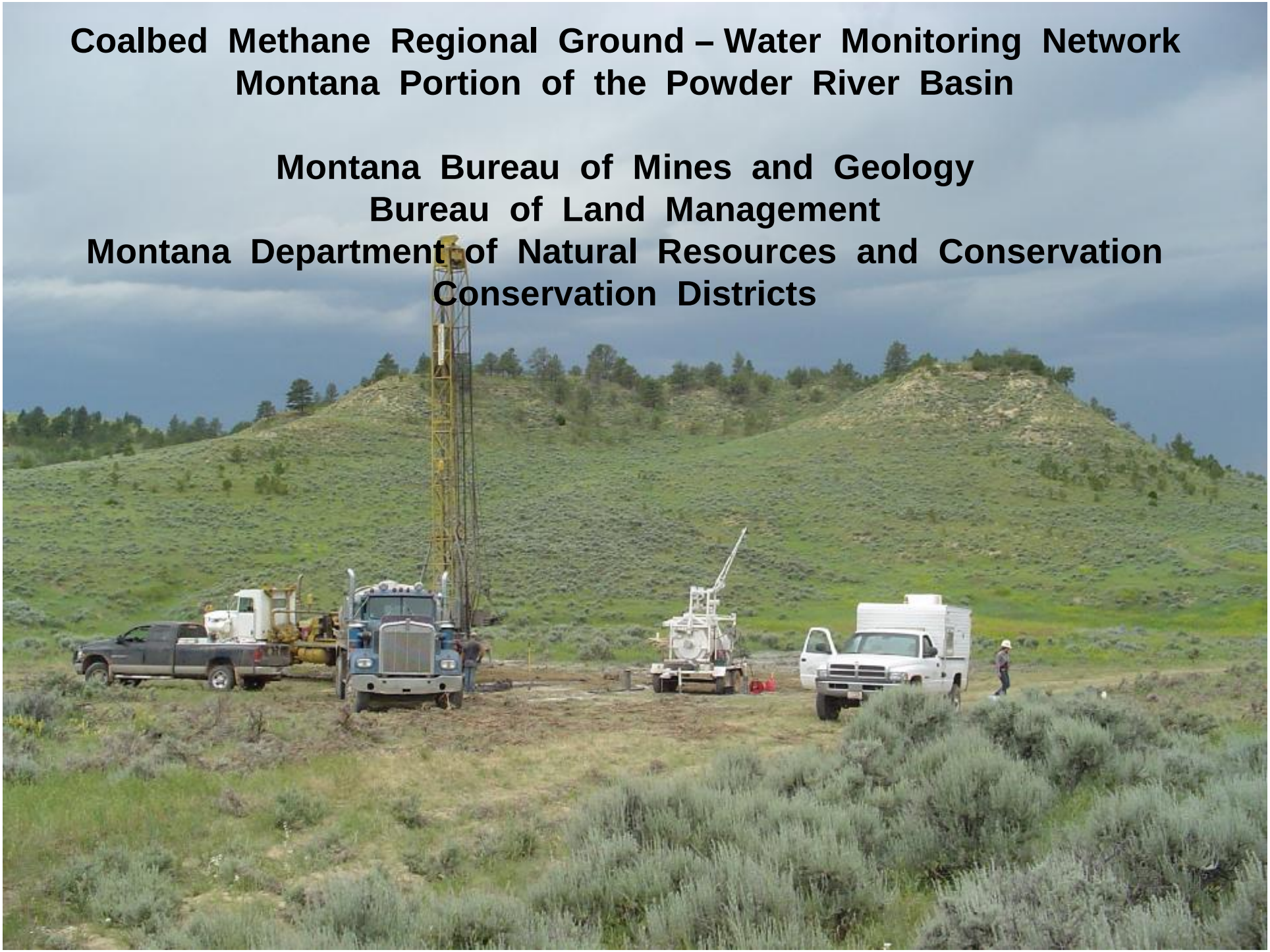
Coalbed Methane Regional Ground – Water Monitoring Network
Montana Portion of the Powder River Basin

Montana Bureau of Mines and Geology
Bureau of Land Management
Montana Department of Natural Resources and Conservation
Conservation Districts



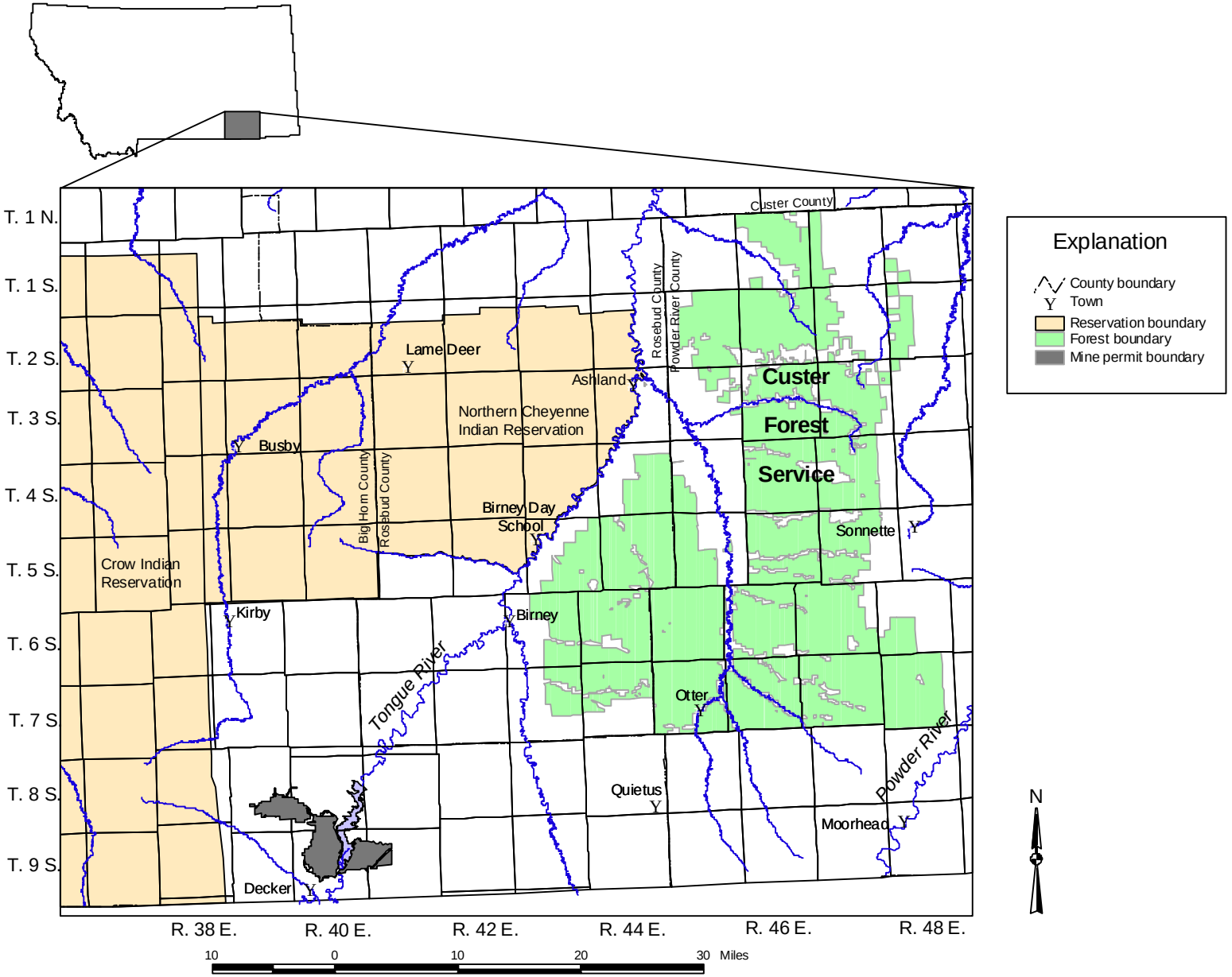
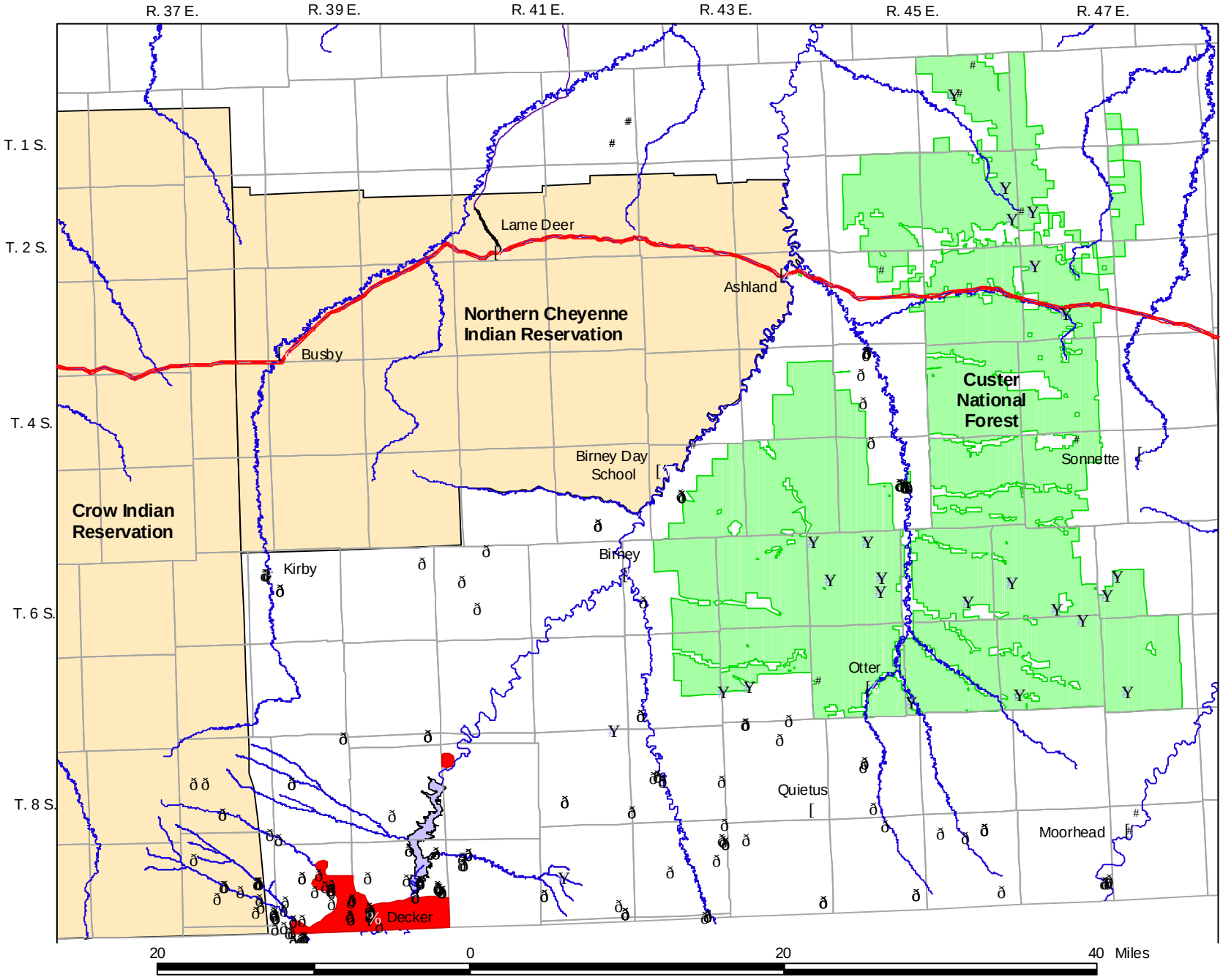


Figure 1. Location of study area.


R. 37 E.
R. 39 E.
R. 41 E.
R. 43 E.
R. 45 E.
R. 47 E.
T. 1 S.
T. 2 S.
T. 4 S.
T. 6 S.
T. 8 S.
Lame Deer
Ashland
Busby
Northern Cheyenne Indian Reservation
Custer National Forest
Crow Indian Reservation
Birney Day School
Sonnette
Kirby
Birney
Otter
Quietus
Moorhead
Decker
20
0
20
40 Miles

Coalbed Methane Regional Ground – Water Monitoring Network

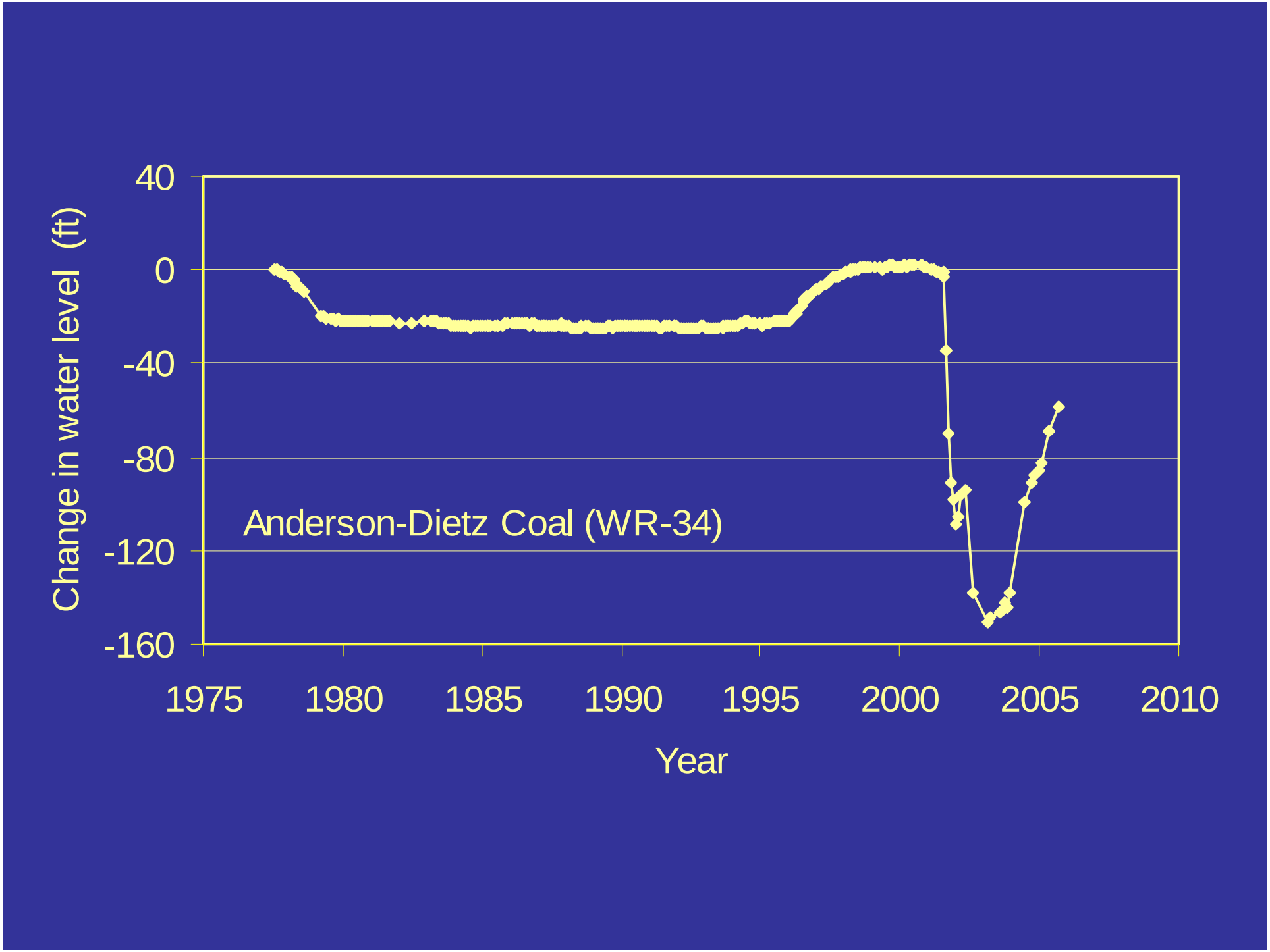
Regular site visits and measurements at -

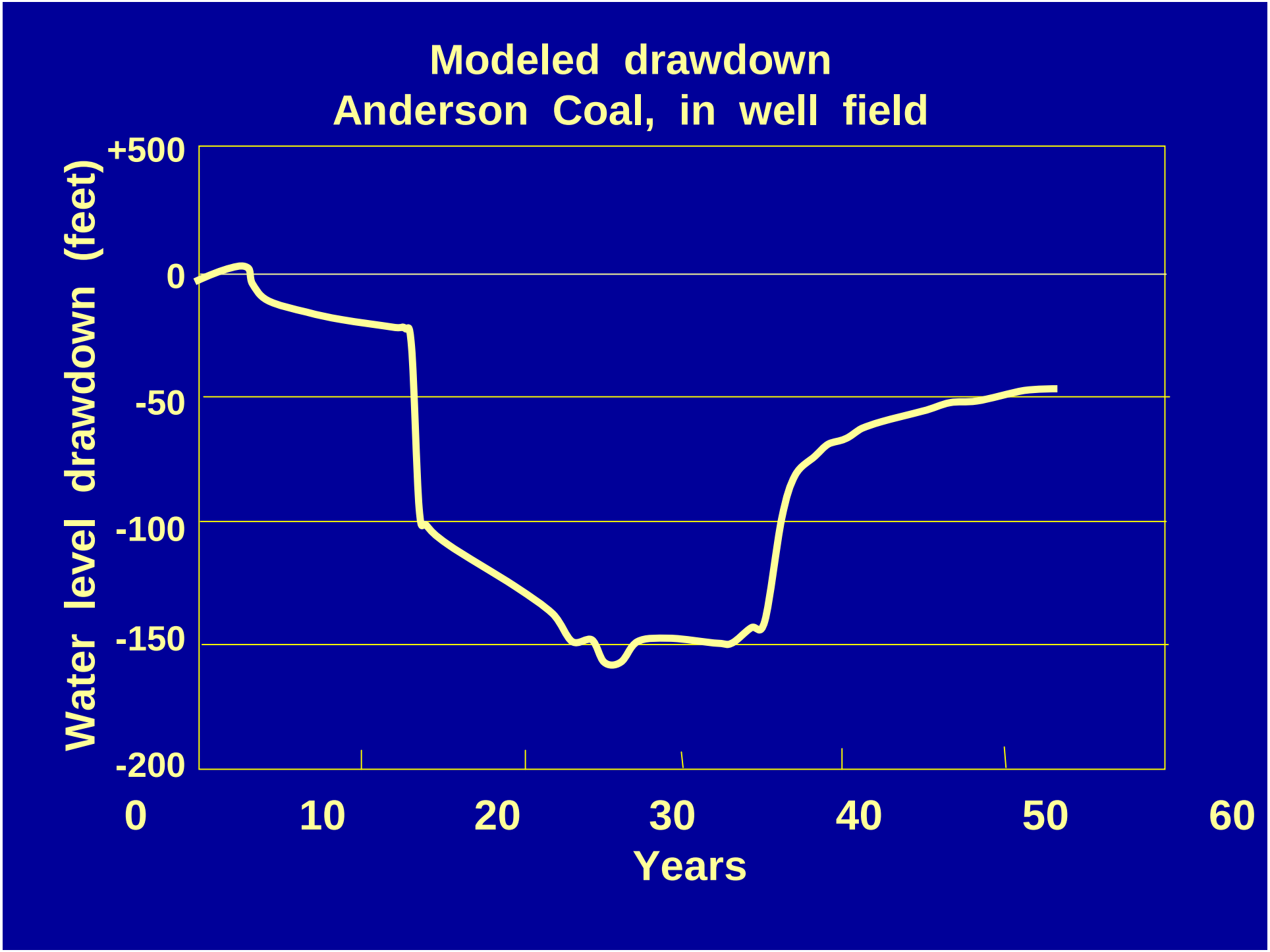
Springs : 25

Monitoring Wells : 195

All data available at

http://mbmggwic.mtech.edu/


Change in water level (ft)
40
0
-40
-80
-120
-160
Anderson-Dietz Coal (WR-34)
1975
1980
1985
1990
1995
2000
2005
2010
Year


Modeled drawdown
Anderson Coal, in well field
Water level drawdown (feet)
+500
0
-50
-100
-150
-200
0
10
20
30
40
50
60
Years

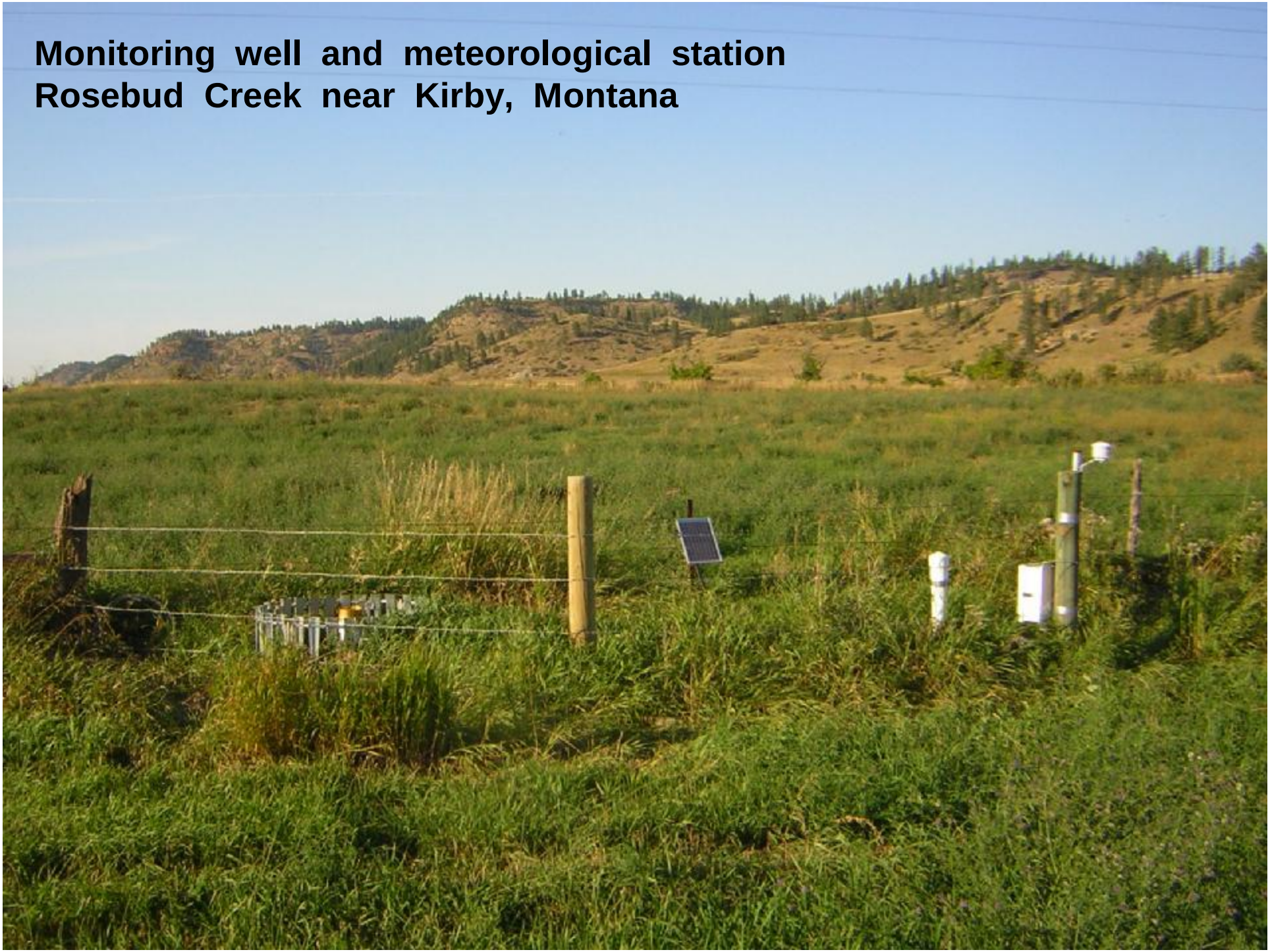
Coalbed Methane Regional Ground – Water Monitoring Network

Use of results and data:

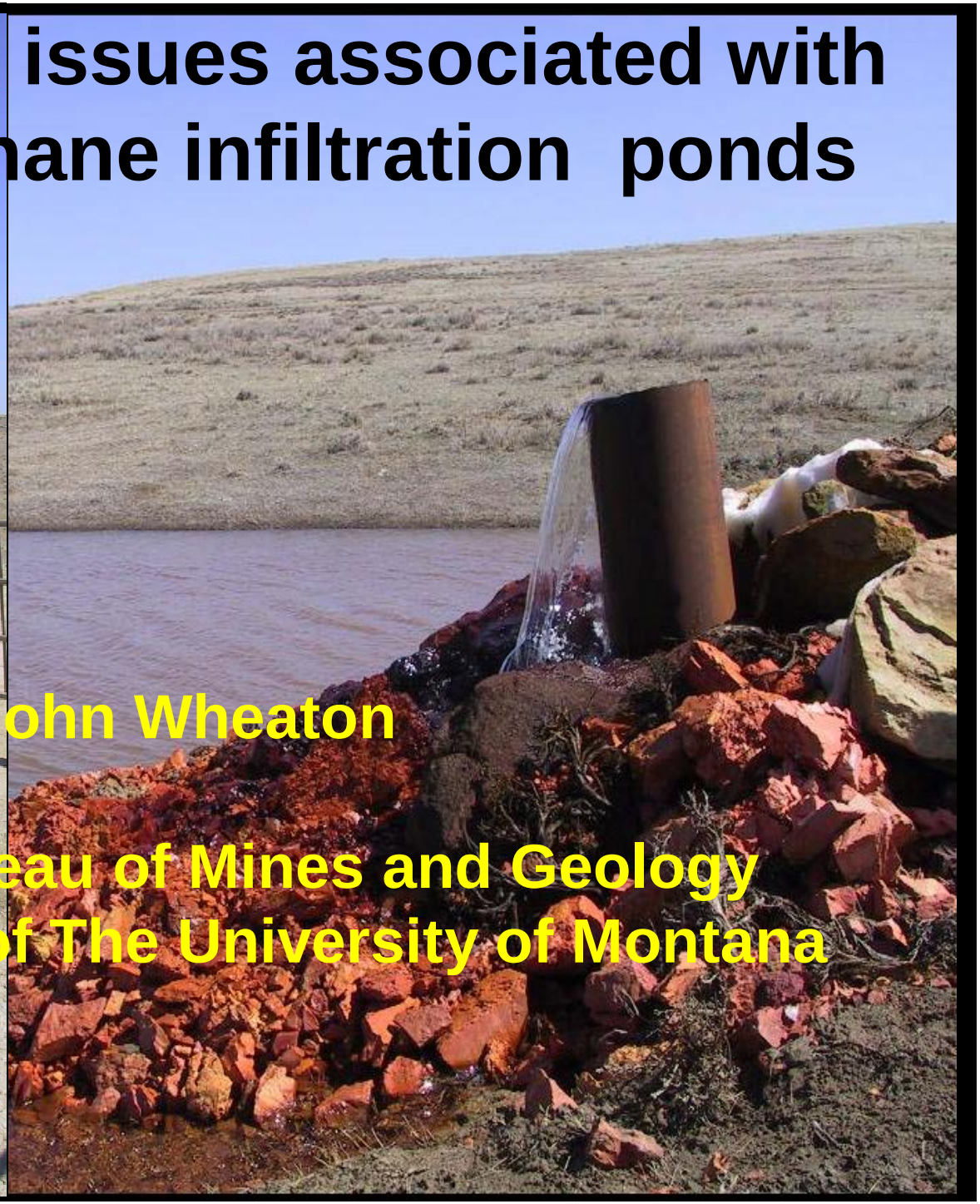
- **Annual update on ground – water impacts (and lack of impacts)**
- **Regulatory permitting assessments**
- **Exploration data**
- **Public knowledge**

http://mbmggwic.mtech.edu/

Monitoring well and meteorological station
Rosebud Creek near Kirby, Montana



Ground-water issues associated with coalbed methane infiltration ponds



John Wheaton

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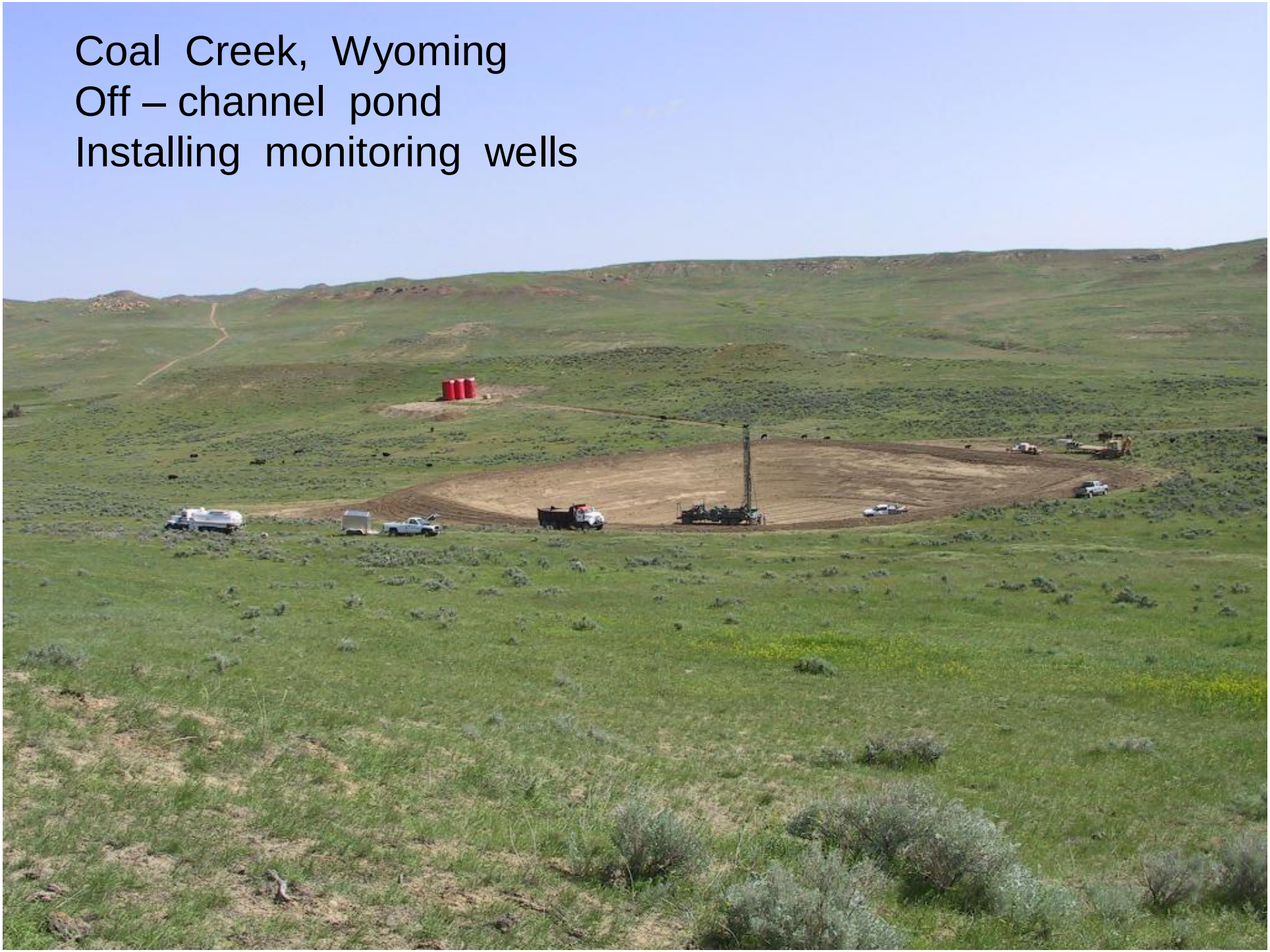
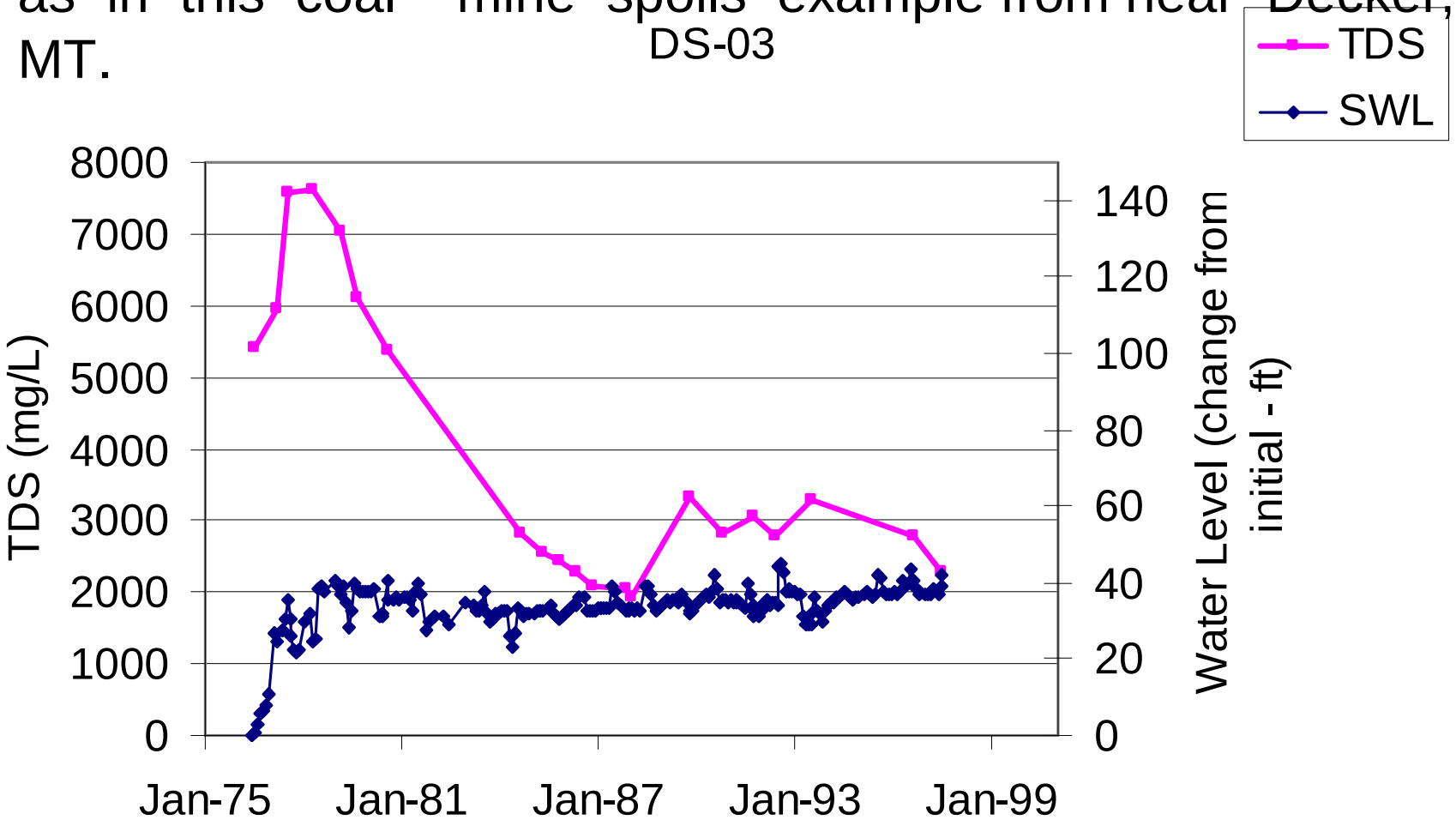
Montana Tech of The University of Montana

Research Focus

- Changes in major ion chemistry
  - Predictions using saturated paste extract
    - Ratios of ions
    - Problem depths
  - Predictions using computer modeling
    - Concentrations
    - Possibly less costly
- Infiltration rates and clay content
- Formation of saline seeps or springs
- Applicability of coal mine spoils research


Coal Creek, Wyoming
Off – channel pond
Installing monitoring wells

Available reactants are finite, and will eventually be flushed
as in this coal – mine spoils example from near Decker, MT.



Conclusions

- TDS and SO_4 will increase
- Primary source of salts is dissolution of minerals along flow path
- Salts will eventually be flushed and TDS will decrease. These salts may migrate to some other water resource or may become sequestered.
- Timing of decrease in TDS is not yet known

Conclusions

- Computer modeling is helpful, but requires site - specific data
- Clay content will control infiltration rates
- Dispersion of clay by Na may block infiltration completely within a short period of time

Infiltration Basin Evaluation Decision Tree