

Update: The Wyoming Soil Moisture Monitoring Network

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Wyoming Soil Moisture Site Network

1) Determine local relationships between spring soil moisture and forage production

2) Develop drought risk prediction tool

19 rangeland sites (2005-2008)

soil moisture sensors (CS615 probes*) in profile (3 depths) Campbell Scientific CR200 data loggers

Biomass (production) enclosures

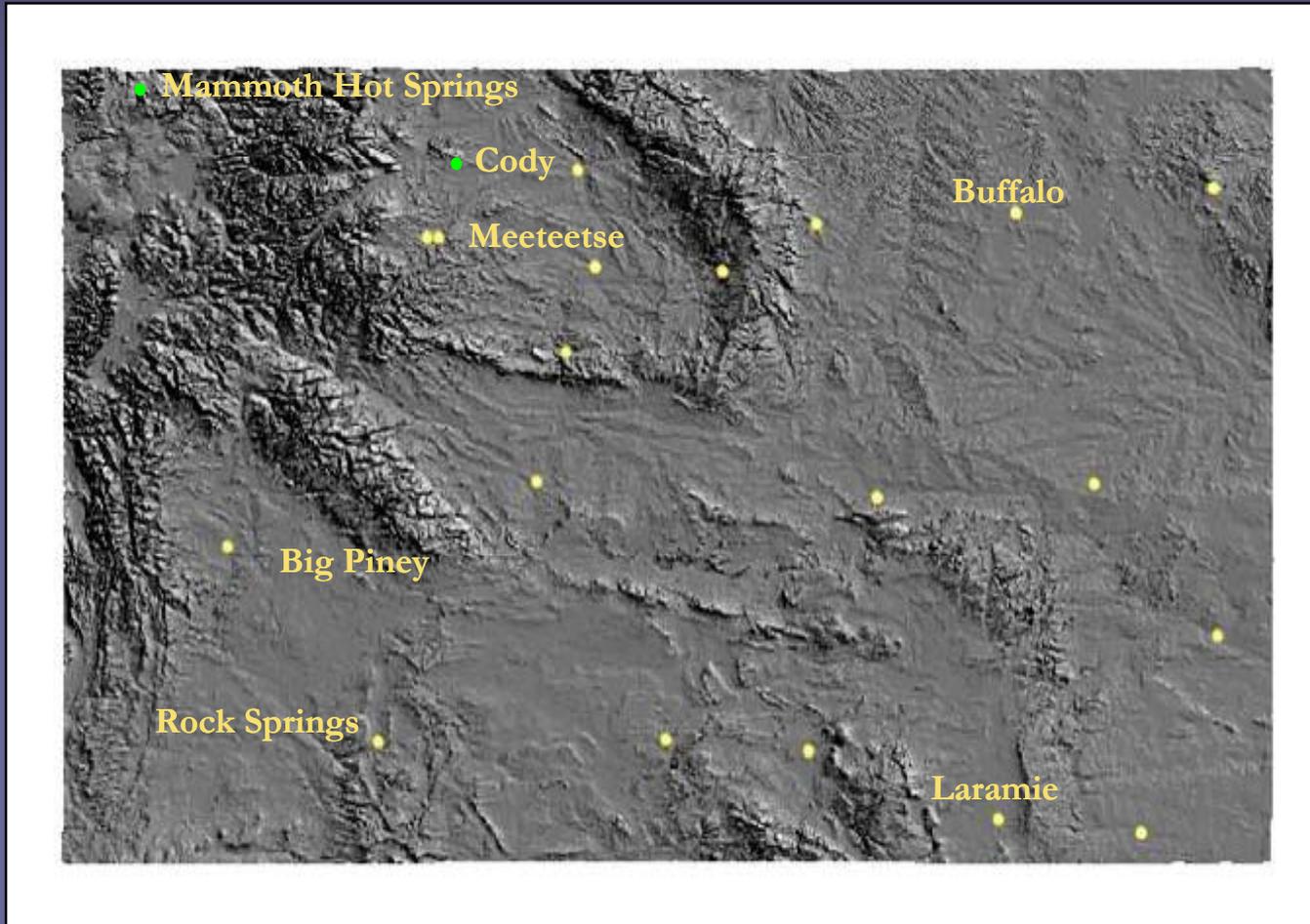
Additions (2008):

Tipping bucket rain gages, solar panels, and weather proof enclosures

Site specific soil calibrations



Wyoming Soil Moisture Site Network



- Soil moisture sites
- NWS sites (Yellowstone National Park)

Additional Soil Moisture Sites



EasyAG probes installed with
National Weather Service stations
Yellowstone National Park



NWS Met-Site Mammoth, WY

Realtime data - GOES telemetry

■ Hydrologic and soil moisture instrumentation

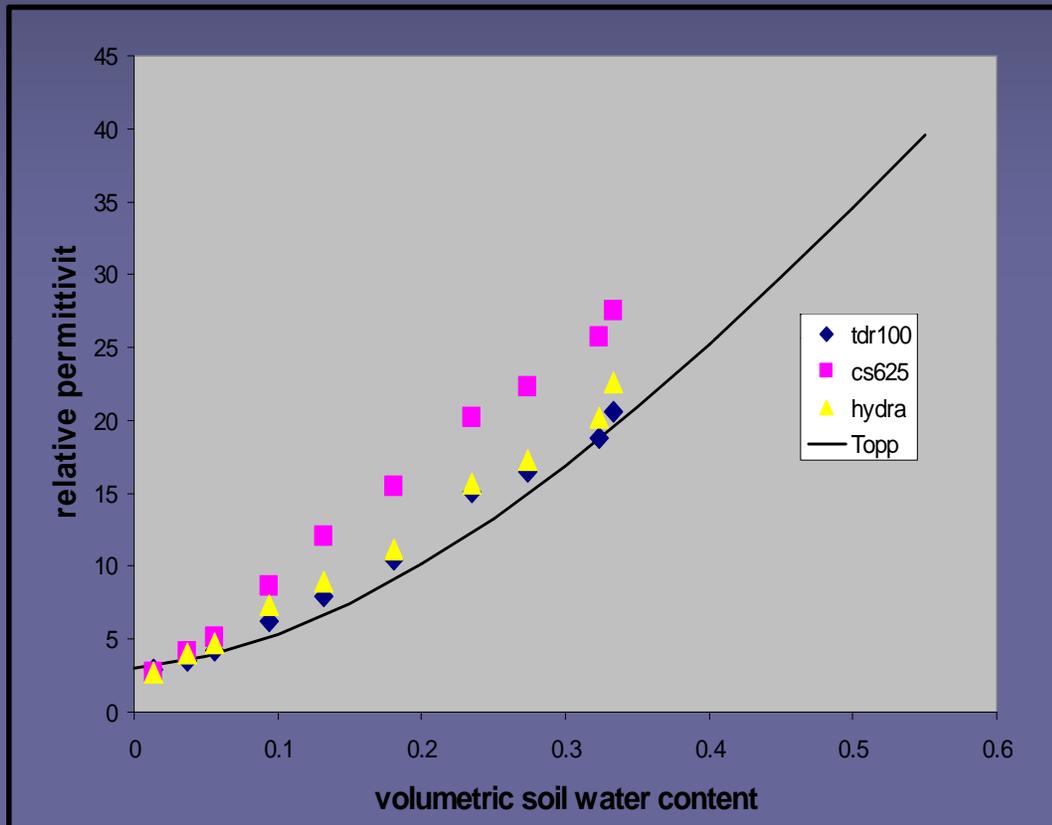
- Precipitation and soil moisture monitoring across the state.

- WRDS, SEO, USGS, Dept of Renewable Resources, NWS

- Increased runoff and meteorological instrumentation focused in key basins (Green and North Platte)

- WWDC, RIENR, SEO, USGS, Dept of Renewable Resources

Soil Moisture Probe Calibrations



Laboratory calibration
repacked soil from top 30cm :

Campbell Scientific CS625
probes* (installed at sites)

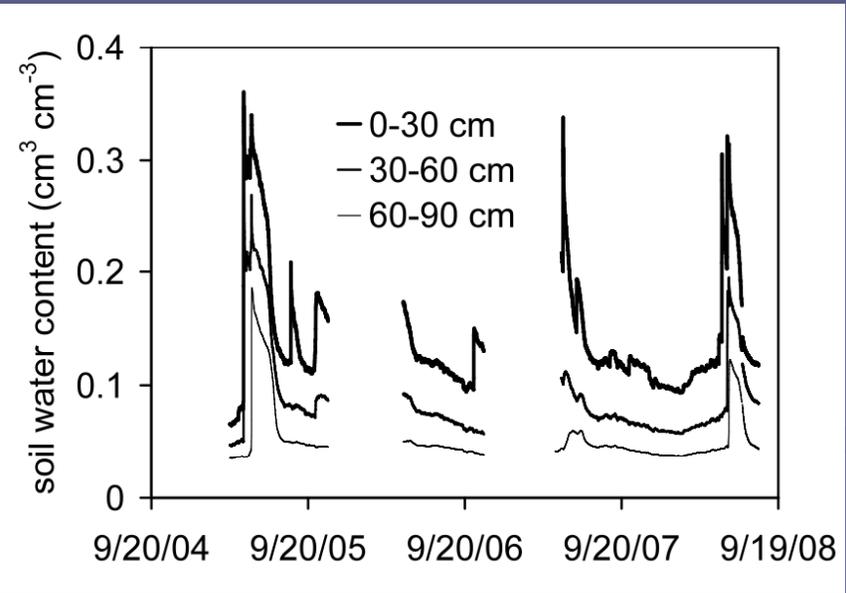
- TDR, Vitel Hydra Probes
- minimum of 9 points

➤ Site specific calibration
programs developed and
installed

➤ Added sites (2008)

*mention of trade names for
information only

Building a Baseline of Soil H₂O & Precipitation Measurements



Soil water content data from the Little Buffalo Basin site, south of Meeteetse

Current Status

- Expanding measurement and data collection sites as possible across the state
- Hired a graduate student (Ph.D.) - will start later this summer

Immediate Tasks:

Streamline data collection and database

Improve data access and applications in decision support

Ongoing Project Objectives

Characterize the climate, hydrology, soil, and vegetation at all 18 sites while continuing measurements of precipitation, depth-wise soil moisture, and forage production

Calibrate a detailed soil water flow and heat transport model by optimizing soil hydraulic and plant parameters for all sites

Use the calibrated model to determine long term (30-year) average and extreme soil moisture conditions for each site against which current and future soil moisture data can be compared