State SWSI Transition

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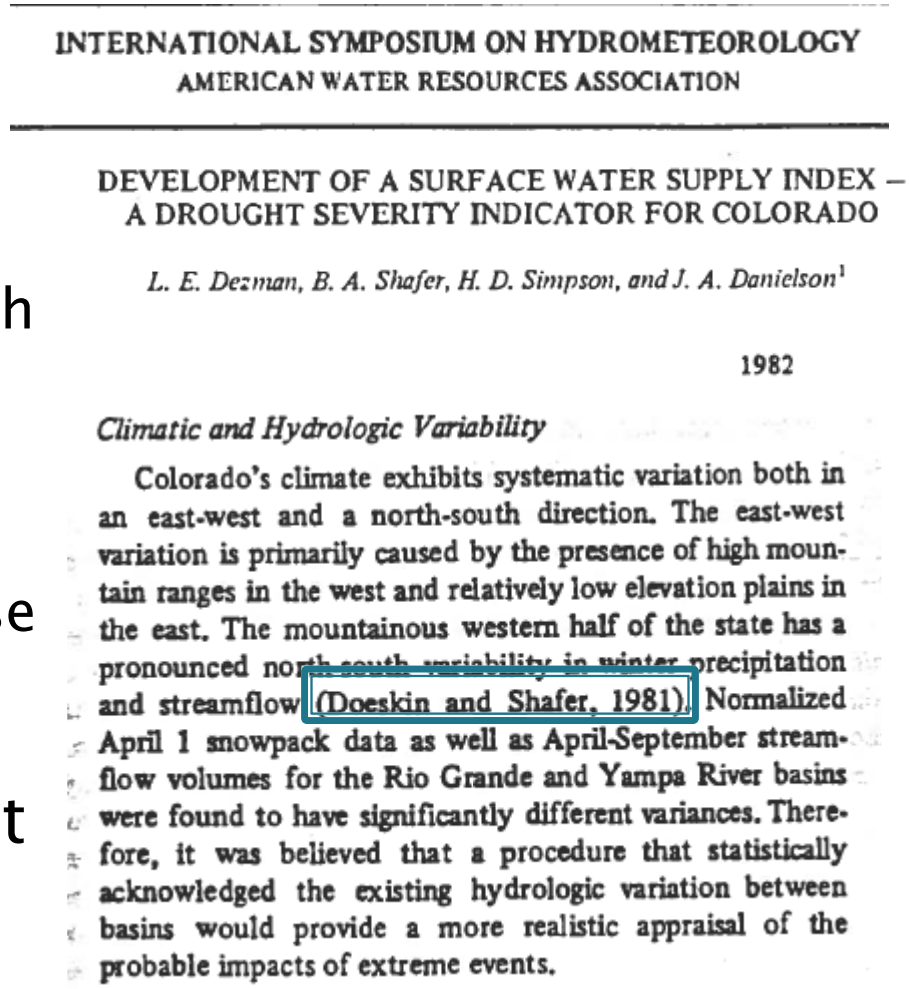
Origin & Purpose of SWSI

- Early 1980s
  - Developed jointly by SEO & USDA SDS (now NRCS)
  - Used by the WATF (along with Palmer Index) to judge drought conditions and trigger activation and deactivation within Colorado's Drought Response Plan
- Now – inform decision making regarding drought
  - Other ongoing uses?



INTERNATIONAL SYMPOSIUM ON HYDROMETEOROLOGY
AMERICAN WATER RESOURCES ASSOCIATION

DEVELOPMENT OF A SURFACE WATER SUPPLY INDEX – A DROUGHT SEVERITY INDICATOR FOR COLORADO

L. E. Dezman, B. A. Shafer, H. D. Simpson, and J. A. Danielson[1]

1982

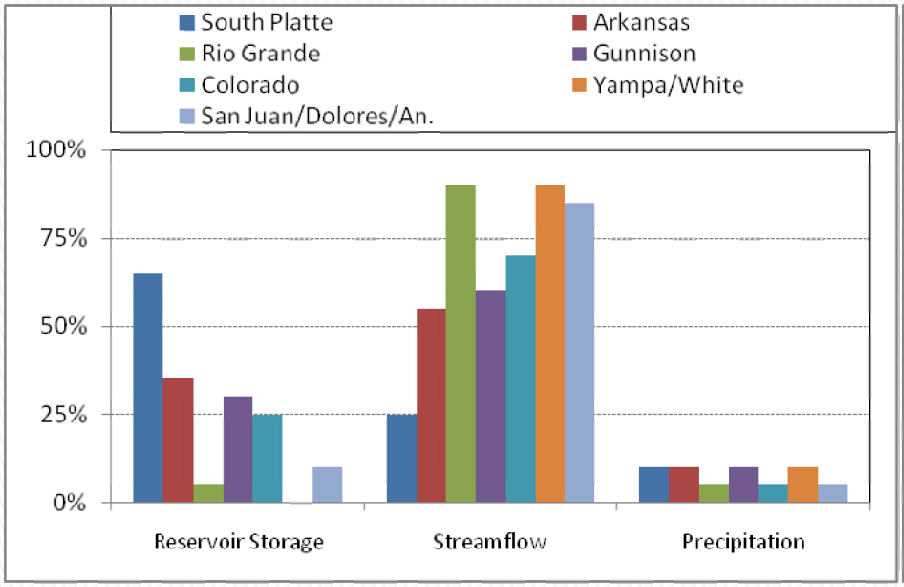
Climatic and Hydrologic Variability

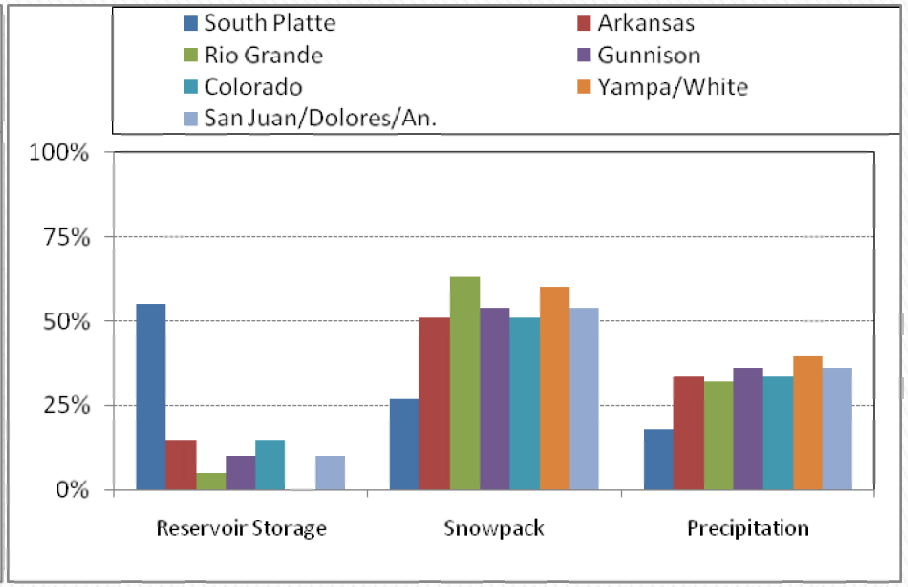
Colorado's climate exhibits systematic variation both in an east-west and a north-south direction. The east-west variation is primarily caused by the presence of high mountain ranges in the west and relatively low elevation plains in the east. The mountainous western half of the state has a pronounced north-south variability in winter precipitation and streamflow (Doeskin and Shafer, 1981). Normalized April 1 snowpack data as well as April-September streamflow volumes for the Rio Grande and Yampa River basins were found to have significantly different variances. Therefore, it was believed that a procedure that statistically acknowledged the existing hydrologic variation between basins would provide a more realistic appraisal of the probable impacts of extreme events.

An Update to the State SWSI Is Needed

- A change is needed to the State SWSI
  - State SWSI is based on outdated data
  - Monthly effort is manual and time consuming

State SWSI Components

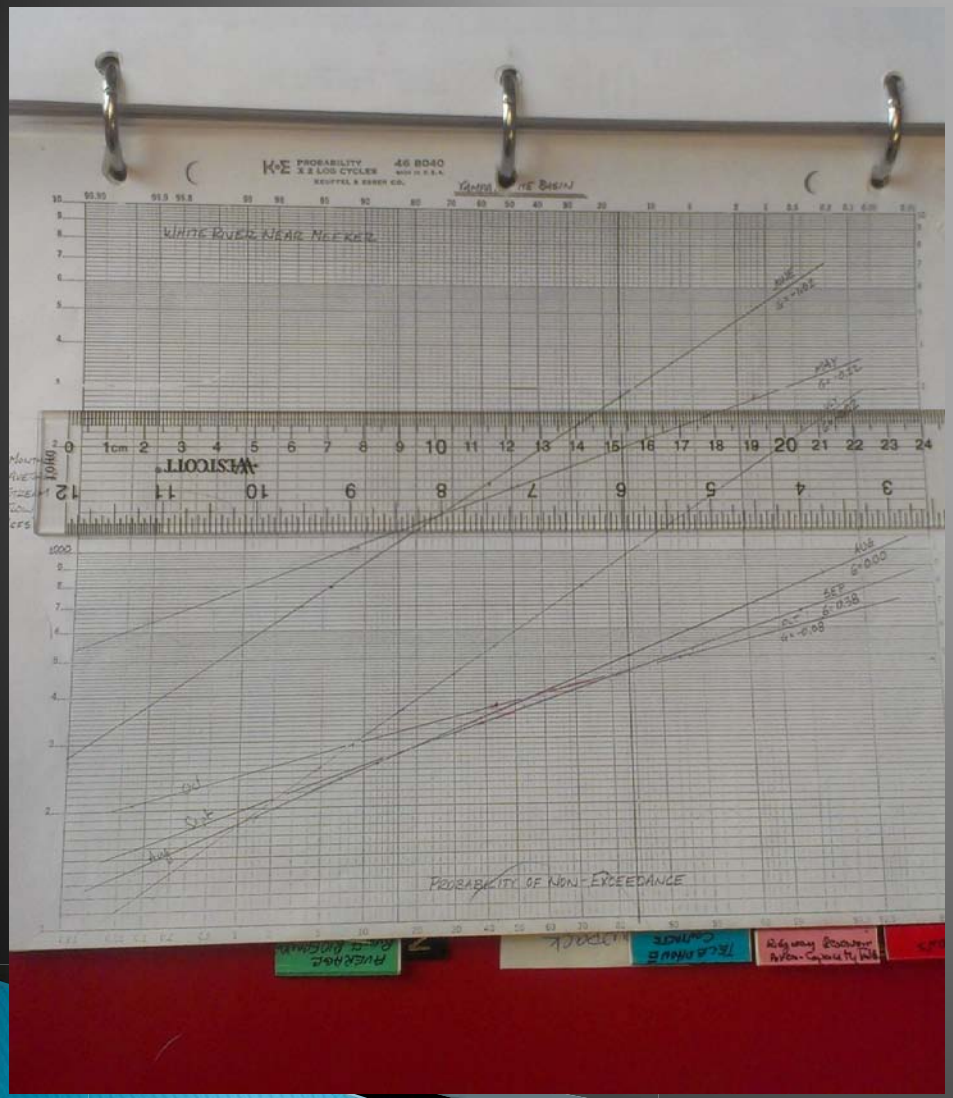




Summer

Winter

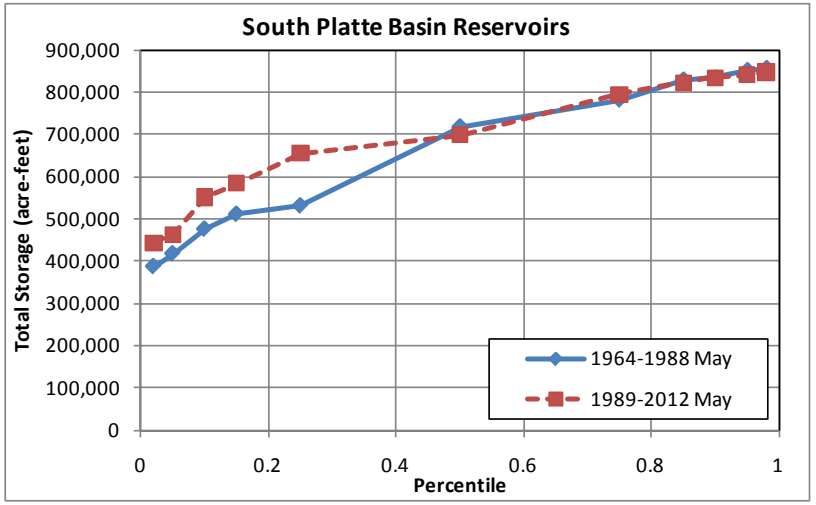
Current State SWSI

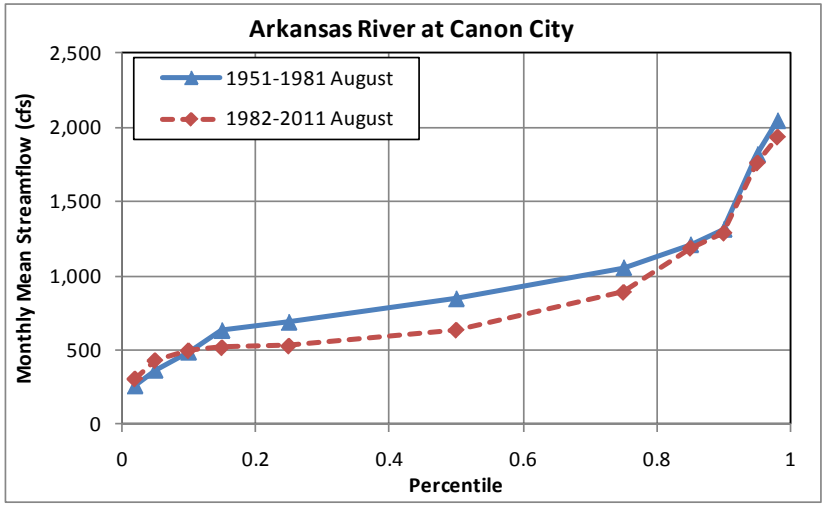


- Nonexceedence curves (PNs)
- Manual Process
- Data from 1951 to 1981
- Three weighted components
  - Reservoir Storage
  - Precipitation
  - Streamflow (Summer) or Snowpack (Winter)

Outdated Data

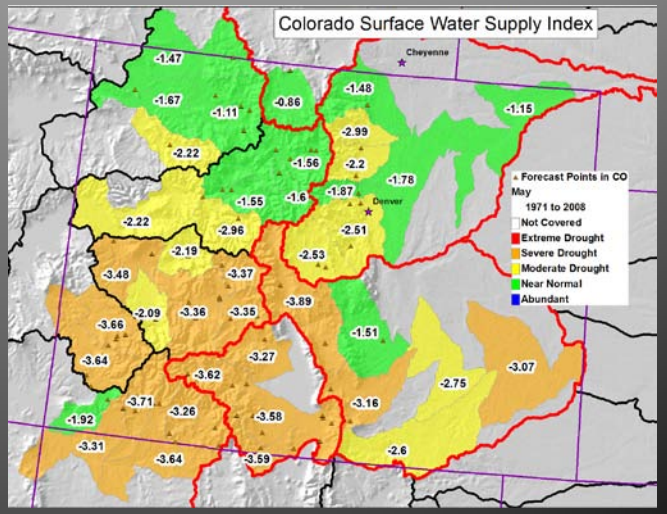
- Changes in River & Storage Operations
  - Streamflow & Reservoir Curves maybe not valid now
- Precipitation stations no longer exist
  - Must use work around





Adopt the NRCS SWSI?

- Adopting the NRCS SWSI is a potential option
  - NRCS approach is standard throughout the west
  - NRCS SWSI is based on 8-digit HUCS, State SWSI is based on Divisions (7 in Colorado)
    - Does this affect the usefulness to anyone?
- Potential to develop web-based tool



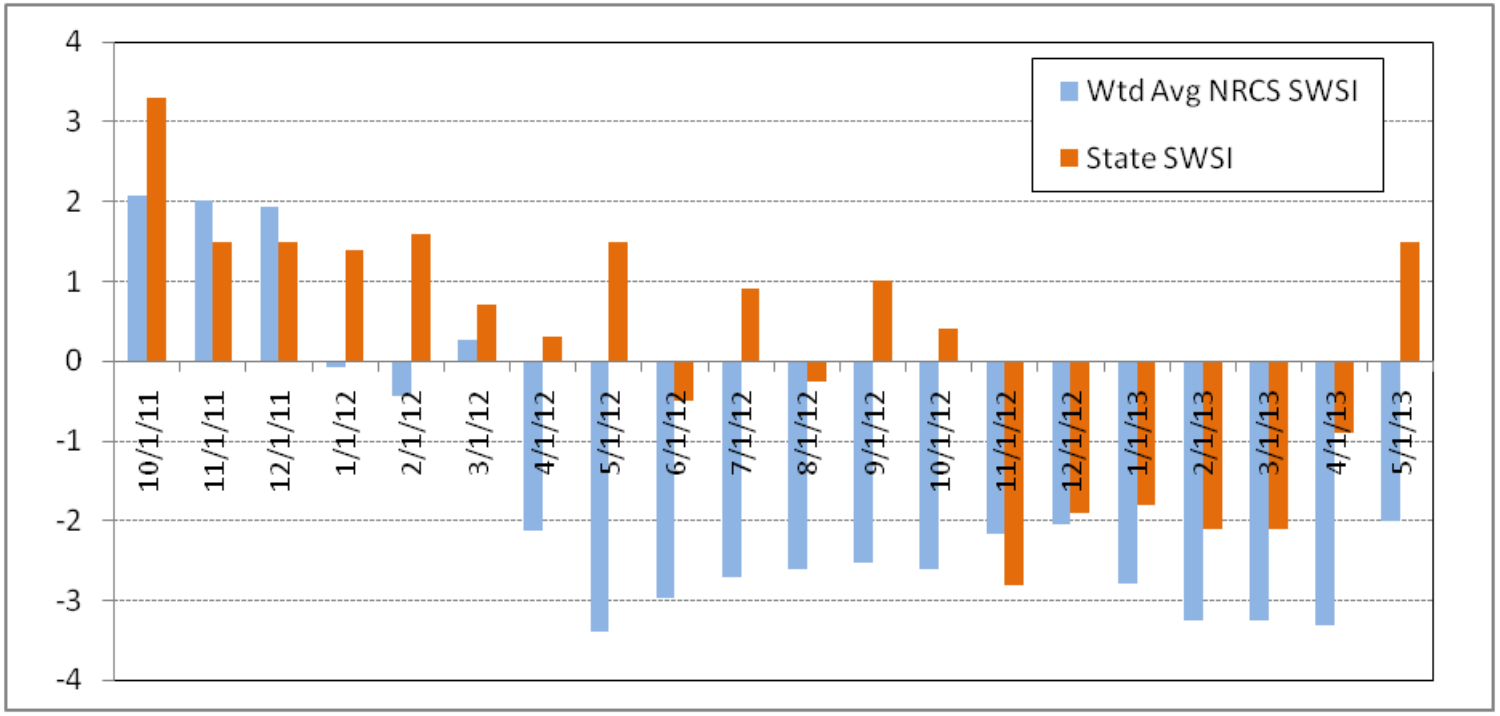
NRCS SWSI

- Sum of total volume in HUC- no weighted components
- PNs for total volume from 1971-2008 (data through 2010 is to be added; then update every 10 years after)
- Data components are automatically populated in NRCS database
- Stations were selected with input from Division Engineers

- Summer
  - Streamflow forecast for runoff period
  - Reservoir storage
- Winter
  - Actual streamflow for the month
  - Reservoir storage

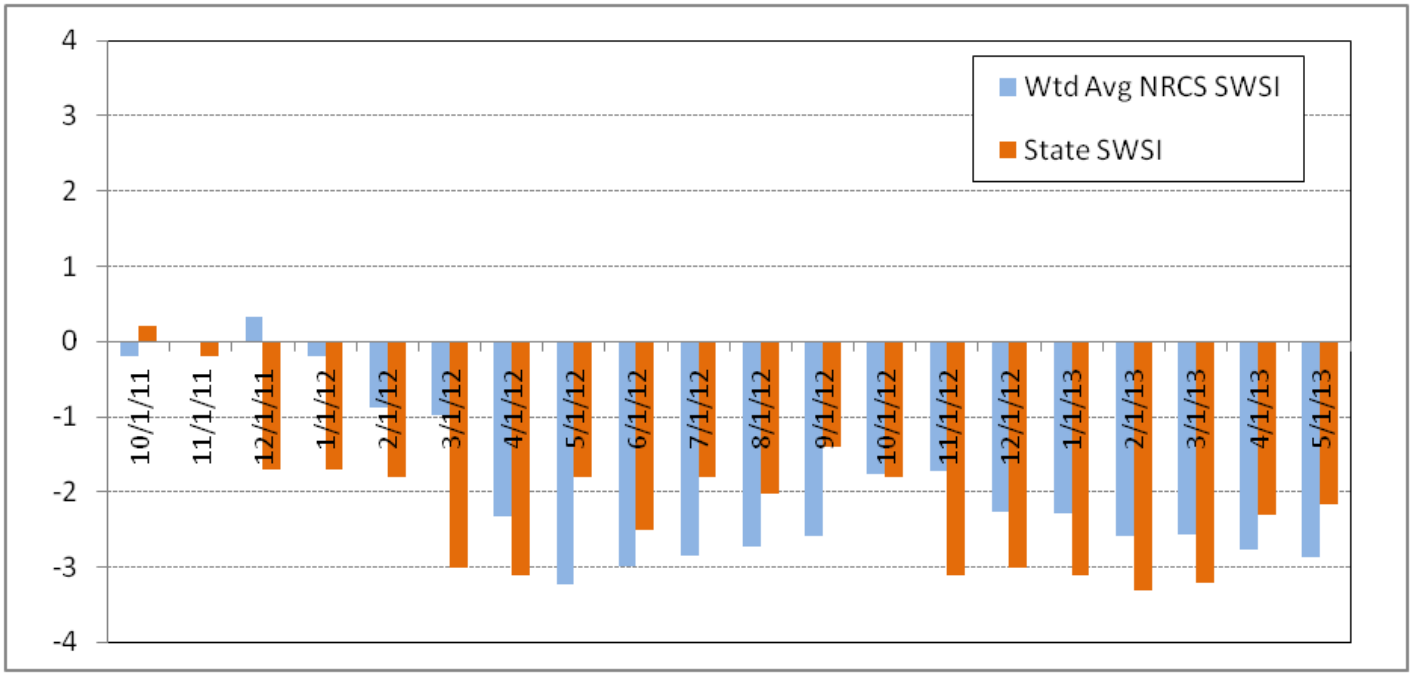
State & NRCS SWSI Comparison

- Division 1 – South Platte



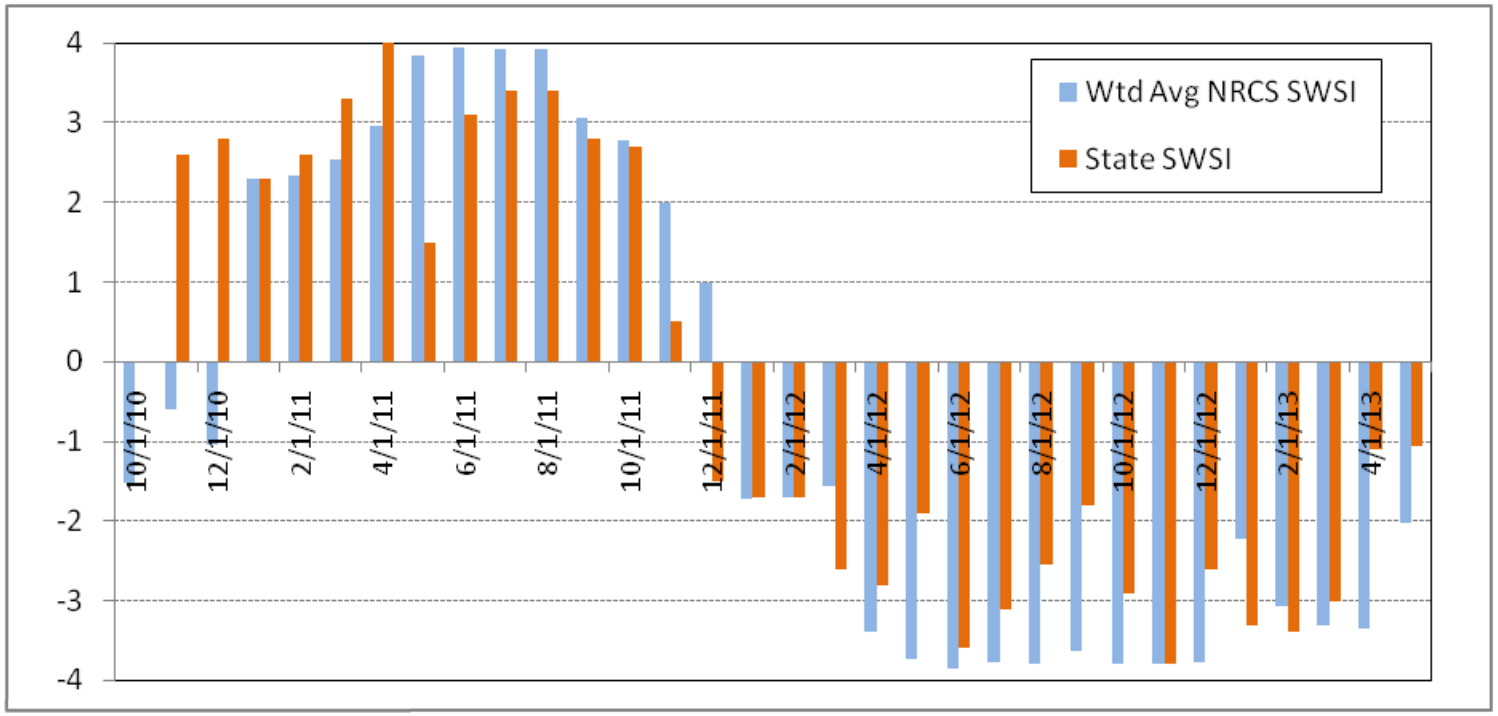
State & NRCS SWSI Comparison

- Division 2 – Arkansas



State & NRCS SWSI Comparison

- Division 5 – Colorado River

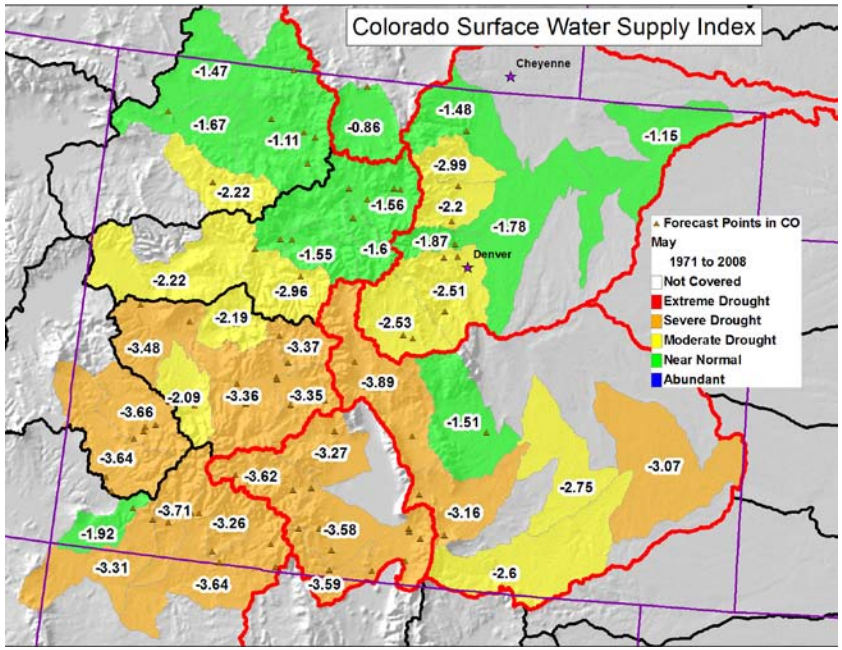


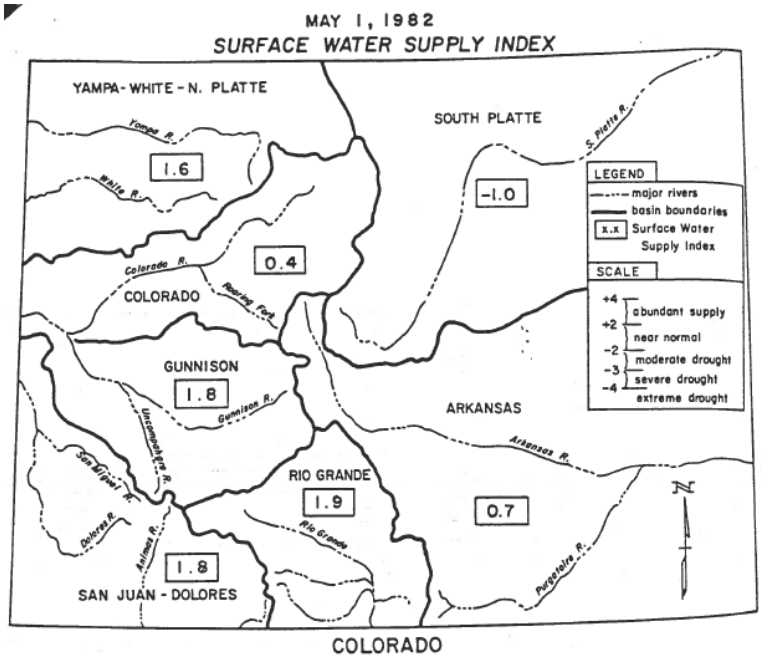
Concern Over Conversion

- State loses control of SWSI
  - Personnel changes or shift of priority for NRCS, will SWSI be supported and produced timely?
  - Software upgrades & tool breaks?
  - Currently Jim needs to run spreadsheets each month
  - Jim to retire in October 2013…

Convert to percentiles?

- Convert from −4 to +4 scale to percentiles?
  - (Palmer is now −5 to +5)





Other Feedback?

- Tool design?
  Change station inputs?
- Volunteers?
- Other uses of SWSI?