NCA-LDAS Mtg

Mar 19, 2014

Agenda

1. Update on modeling work (Sujay)
2. QUESTIONS:

Which NCA-LDAS model is best for evaluating water storage and flux components wrt:

- *Long term trends?*
- *Seasonal trends?*

What further work needs to be done to answer these questions?

3. Slides NASA NCA mtg @ Hq, April 8-9

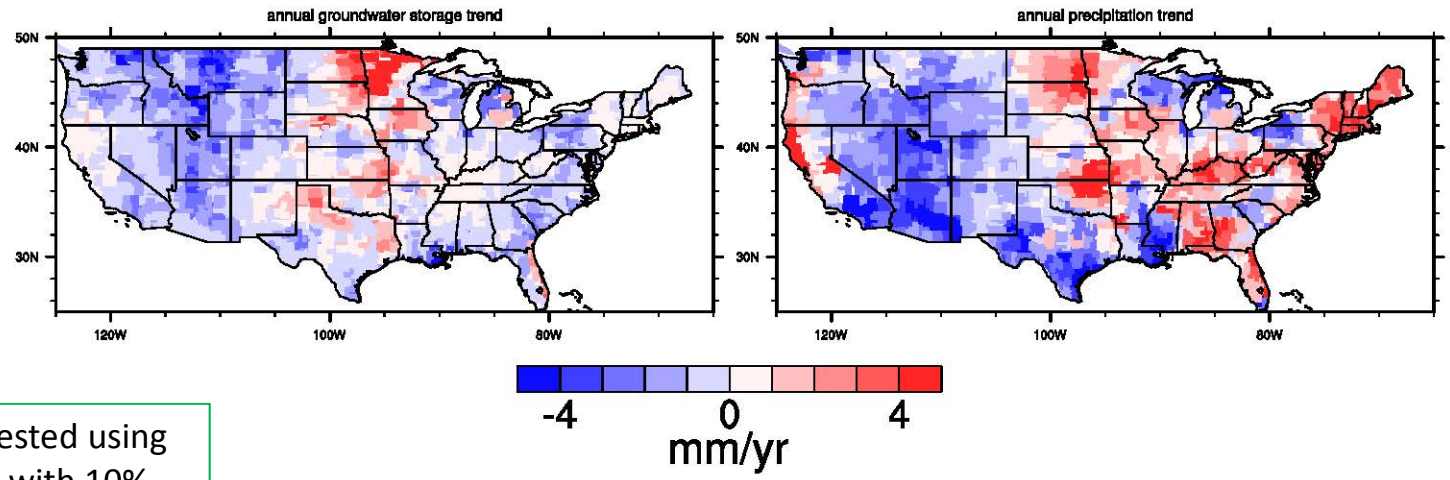
Number: 866-914-7196
Passcode: 8850831

Trends and Standardized Anomalies

- Model: free stand CLSM (integrated on irregular shaped catchments)
- Forcing: Princeton (1 degree and 3-hr)
- Data period: 1976-2009

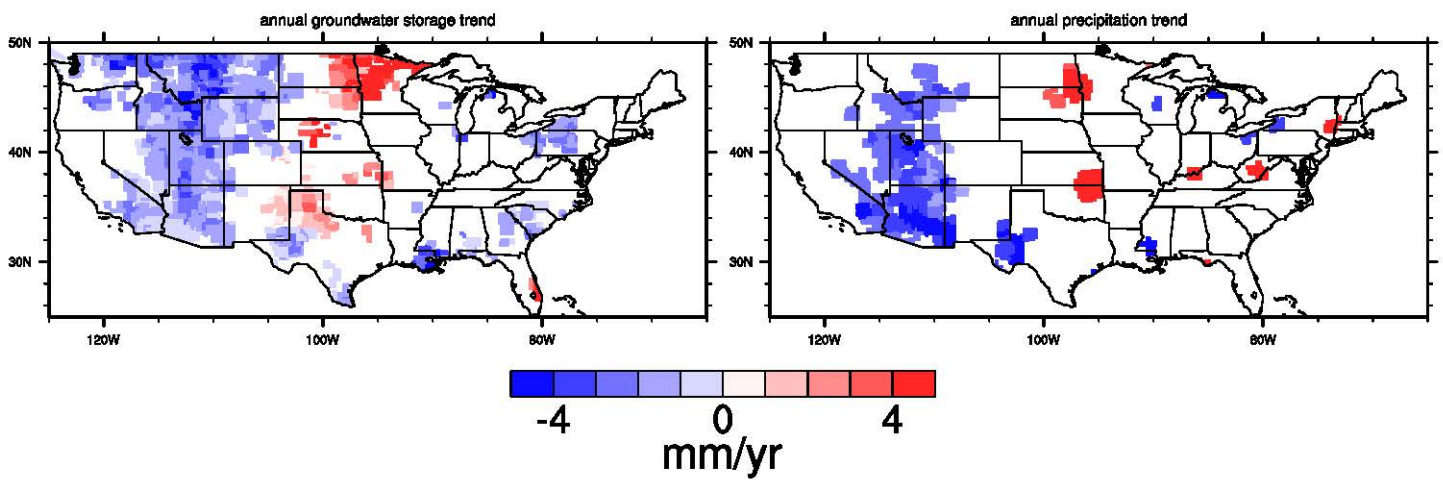
Trends in annual groundwater storage and annual precipitation

Trends

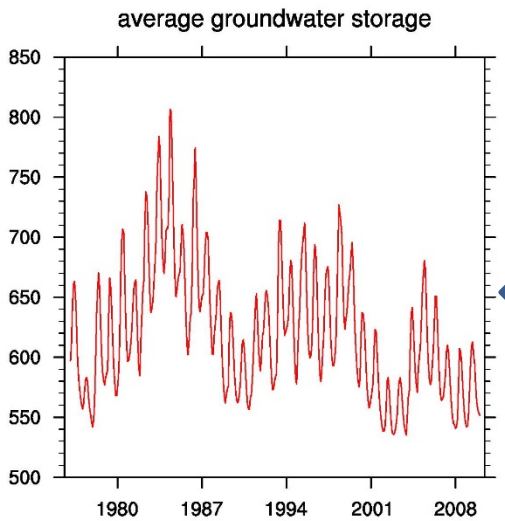


Significance tested using Mann-Kendal with 10% confidence interval

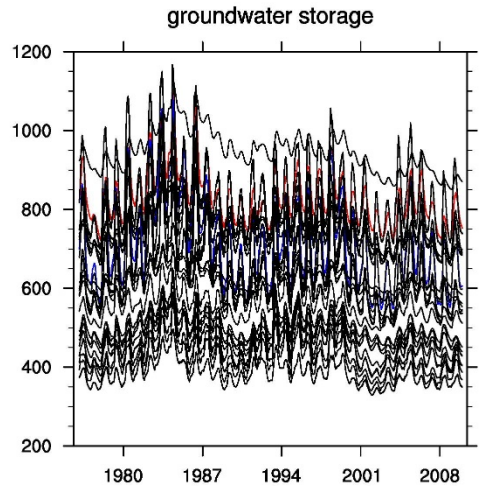
Significant trends



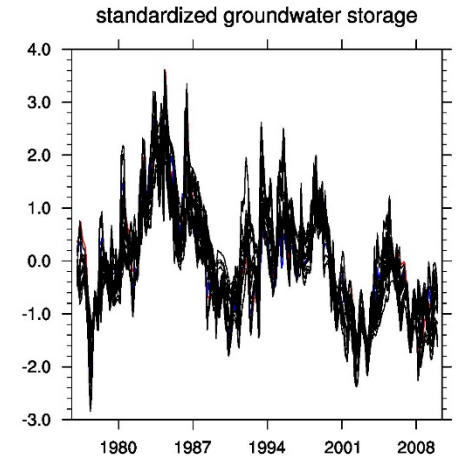
Standardized Monthly Groundwater Storage Anomalies and SPI12 over the box of 40~42 N and 112 ~108 W

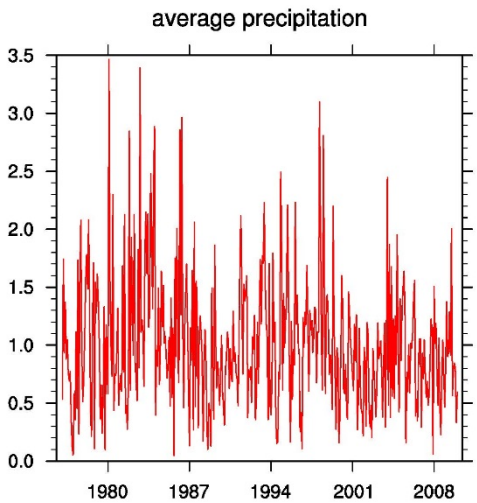


Simple average

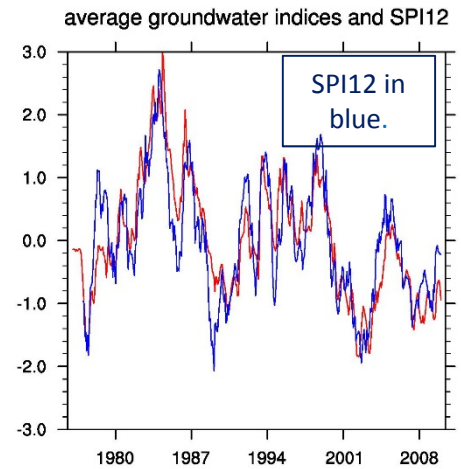


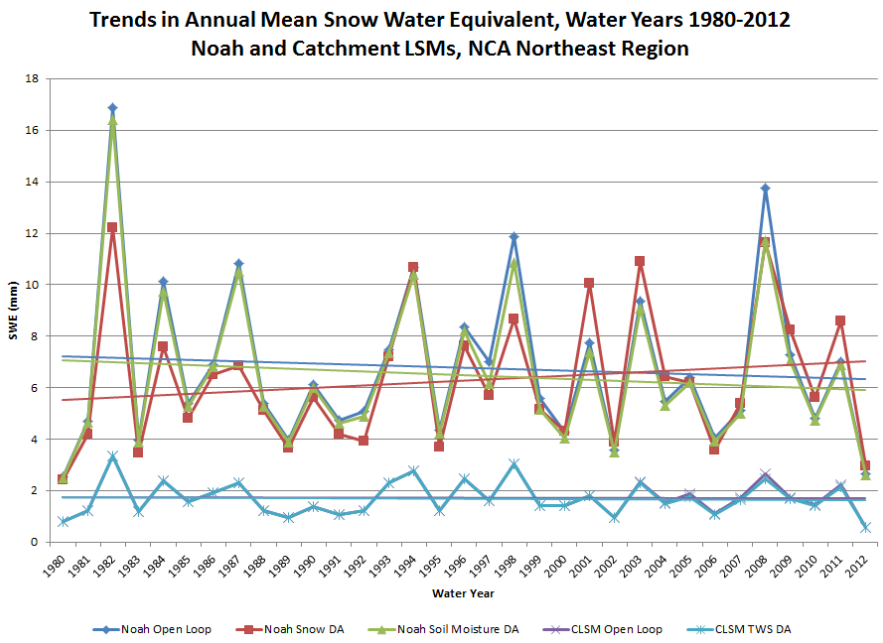
De-seasoned and standardized

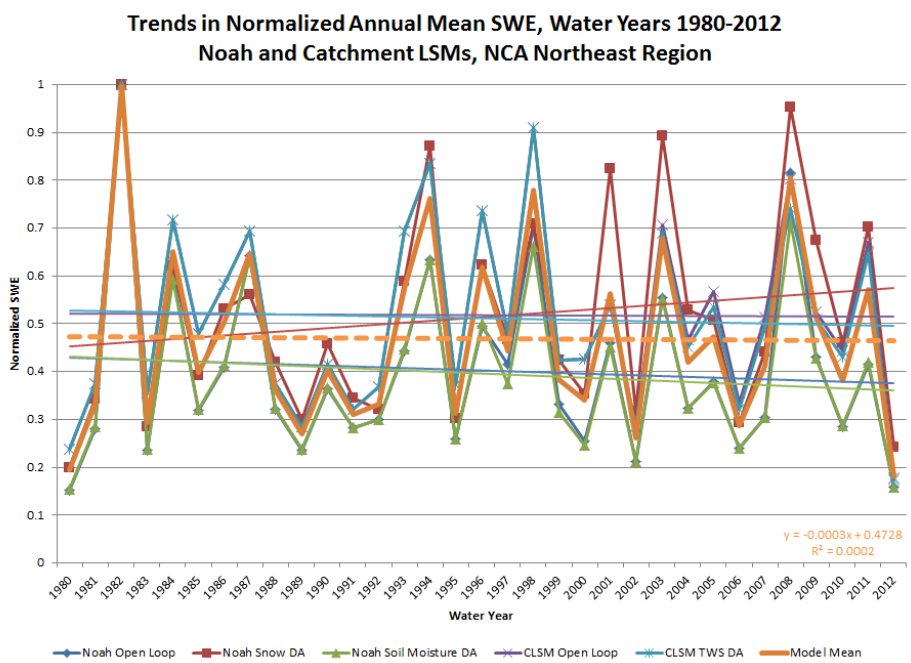


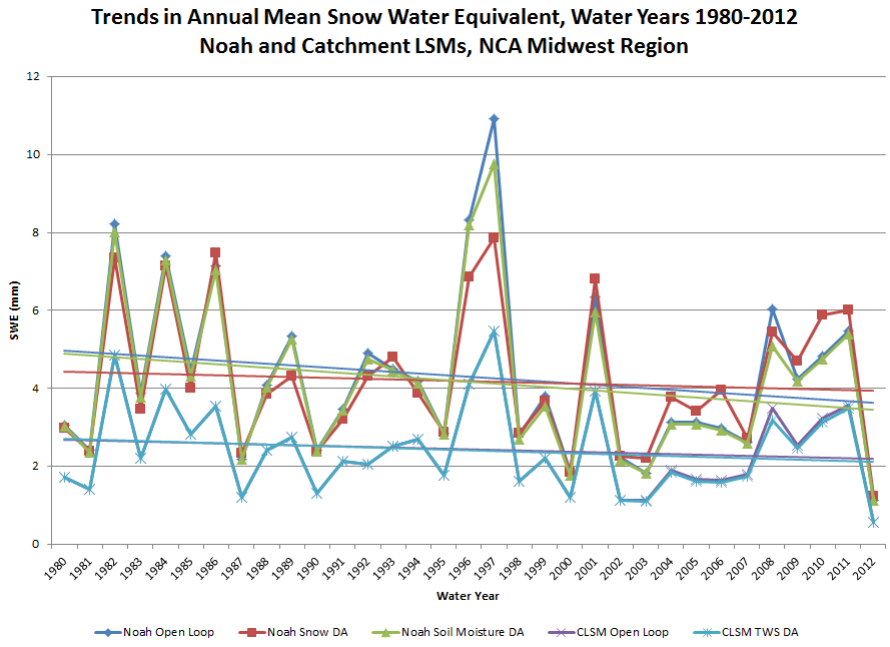


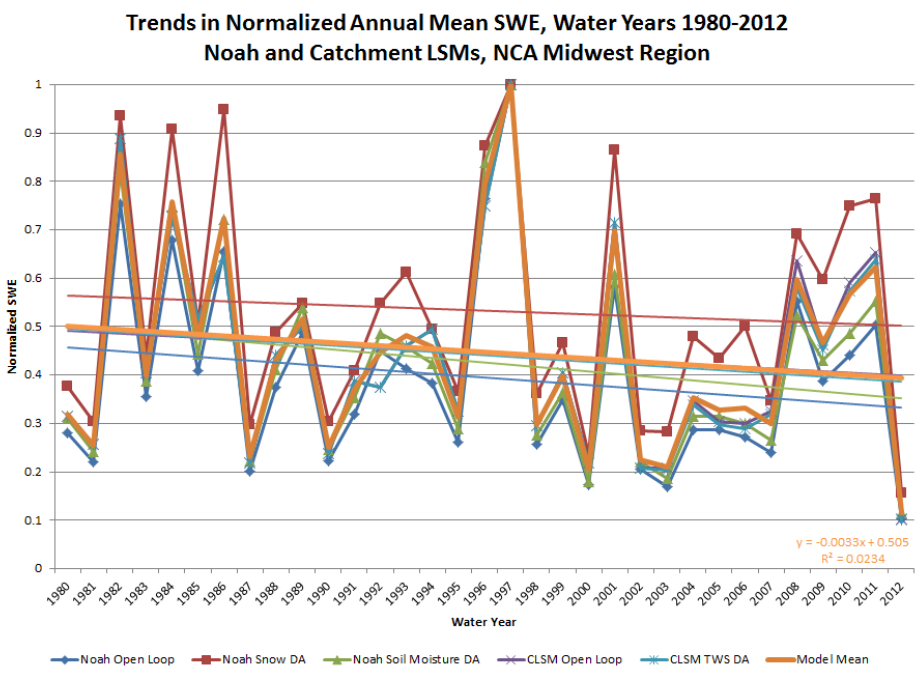
De-seasoned and standardized anomalies are comparable across different regions and across different types of indices

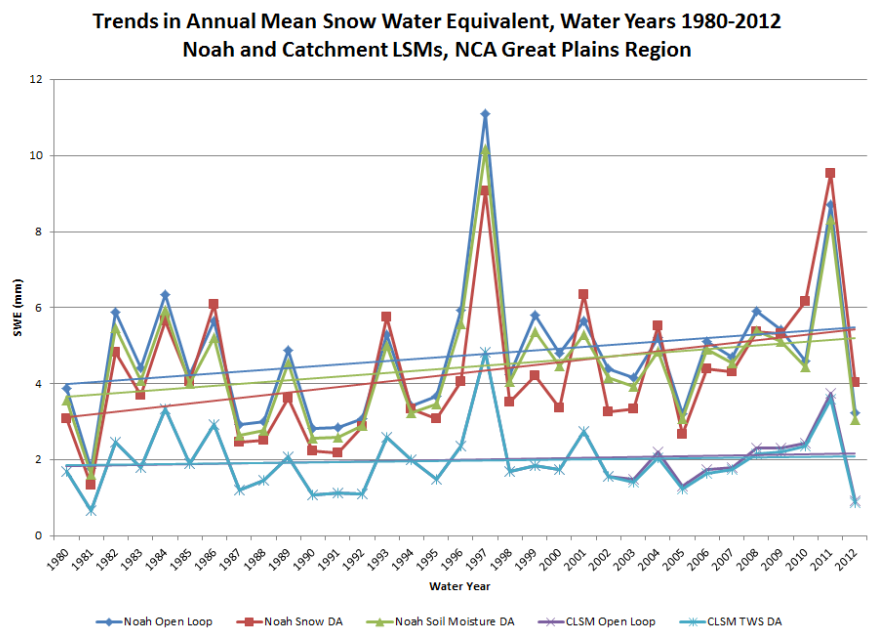


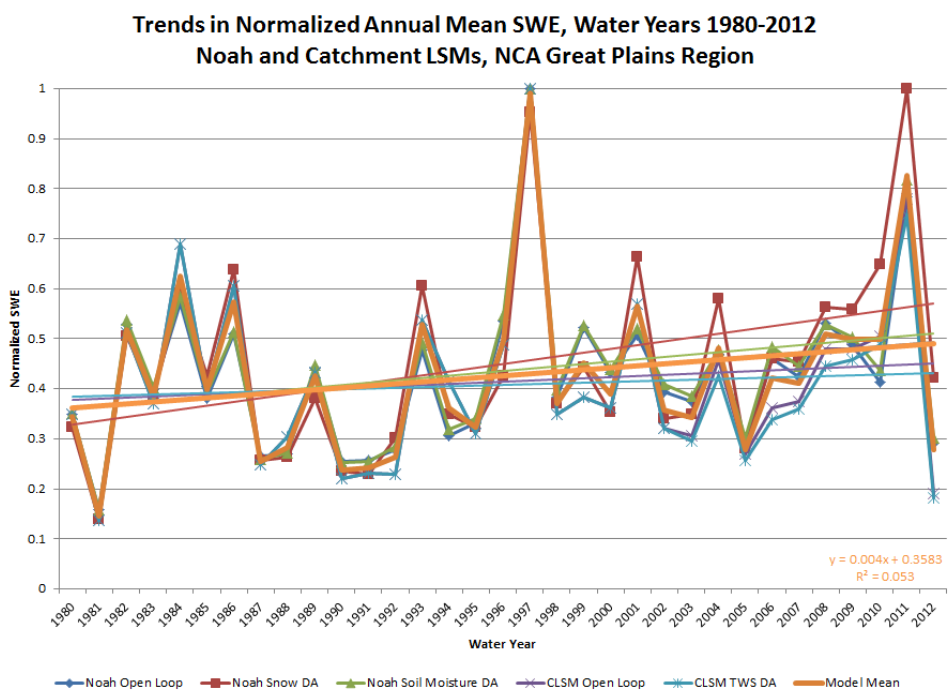

Trends in Annual Mean Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, NCA Northeast Region
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA

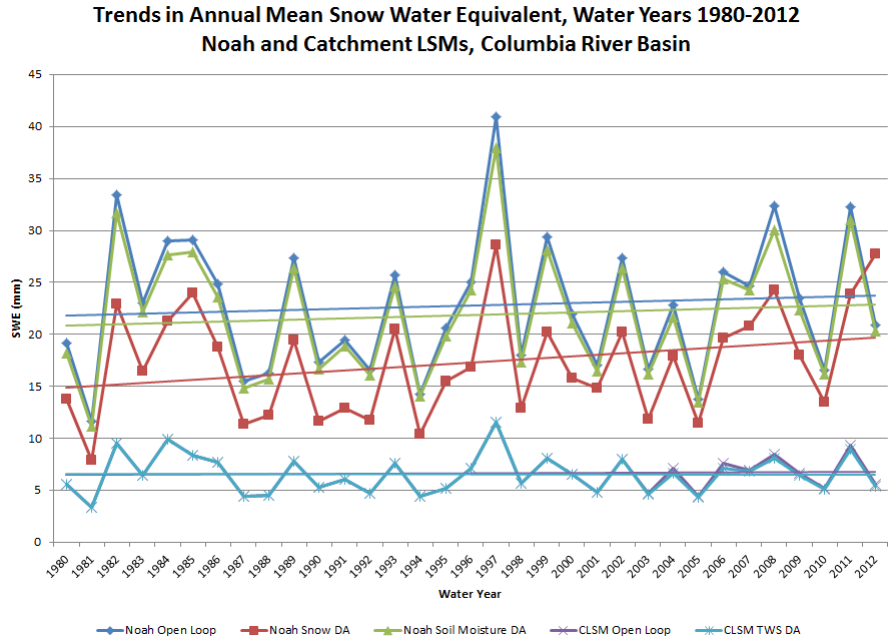

Trends in Normalized Annual Mean SWE, Water Years 1980-2012
Noah and Catchment LSMs, NCA Northeast Region
Normalized SWE
Water Year
y = -0.0003x + 0.4728
R² = 0.0002
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean

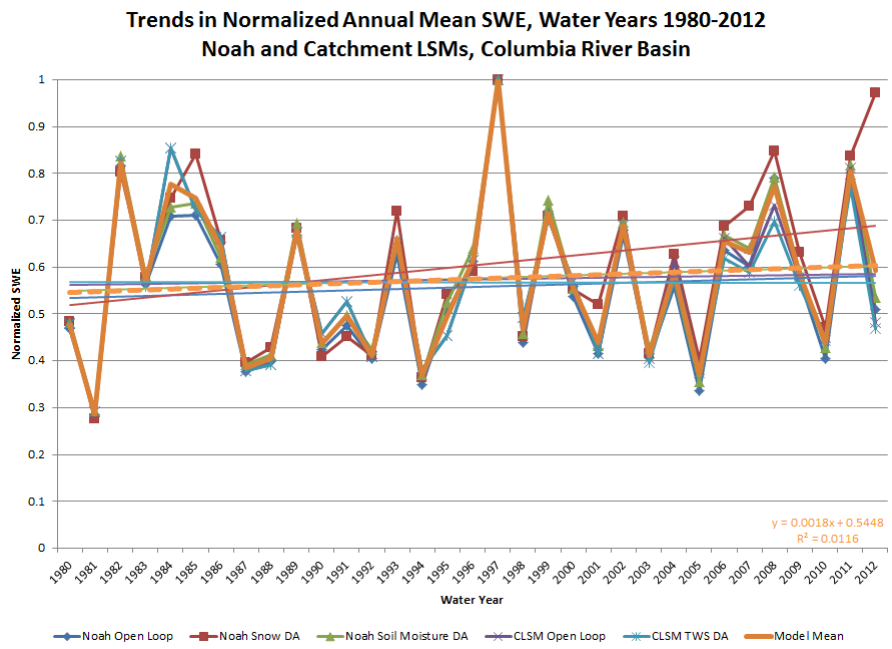

Trends in Annual Mean Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, NCA Midwest Region
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA

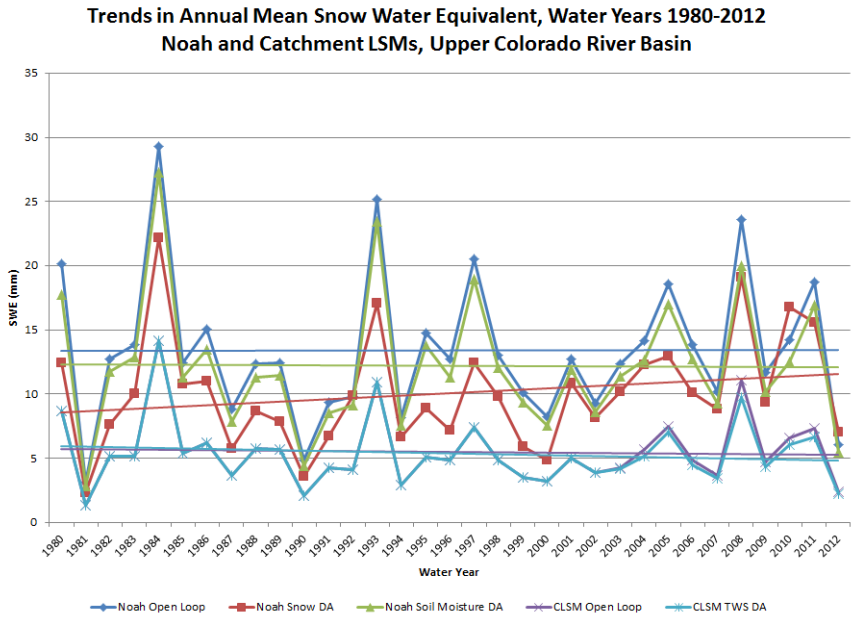

Trends in Normalized Annual Mean SWE, Water Years 1980-2012
Noah and Catchment LSMs, NCA Midwest Region
Normalized SWE
Water Year
y = -0.0033x + 0.505
R² = 0.0234
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean

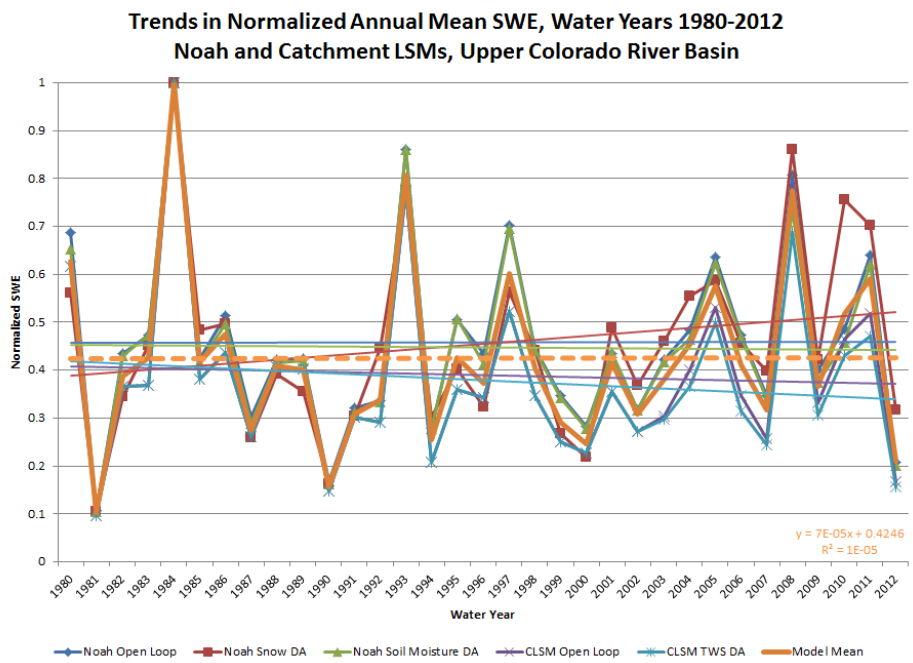

Trends in Annual Mean Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, NCA Great Plains Region
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA

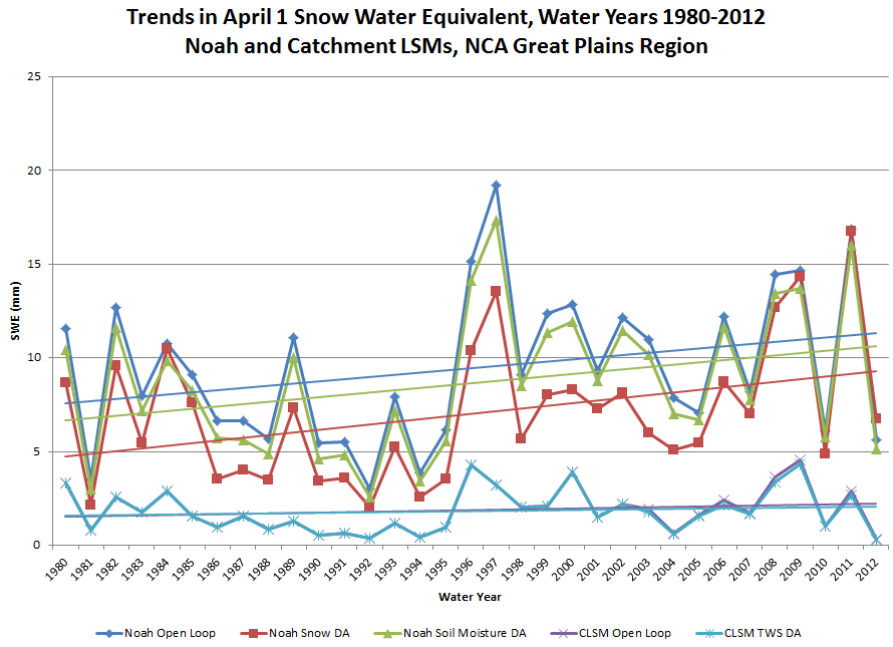

Trends in Normalized Annual Mean SWE, Water Years 1980-2012
Noah and Catchment LSMs, NCA Great Plains Region
Normalized SWE
Water Year
y = 0.004x + 0.3583
R² = 0.053
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean

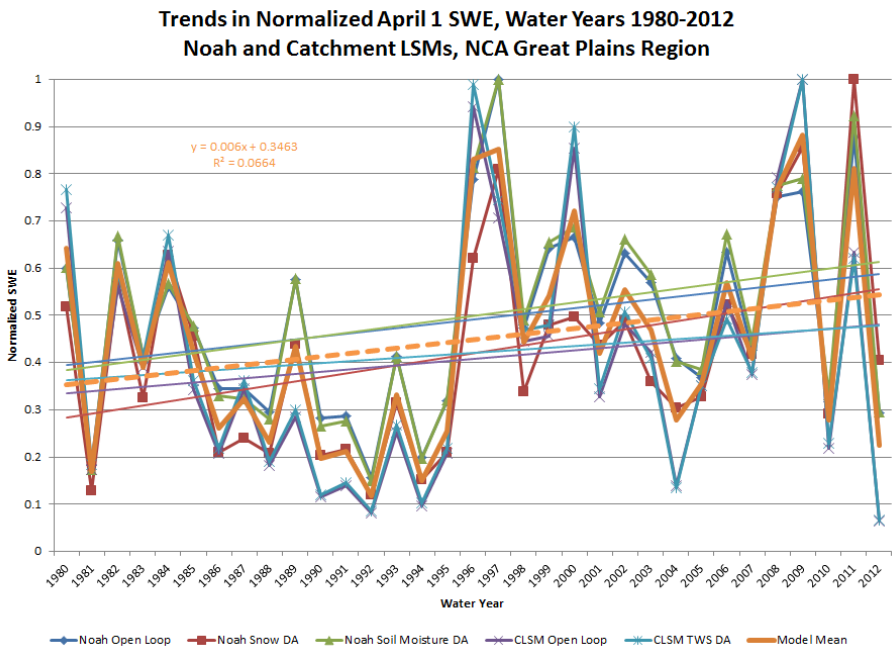

Trends in Annual Mean Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, Columbia River Basin
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA

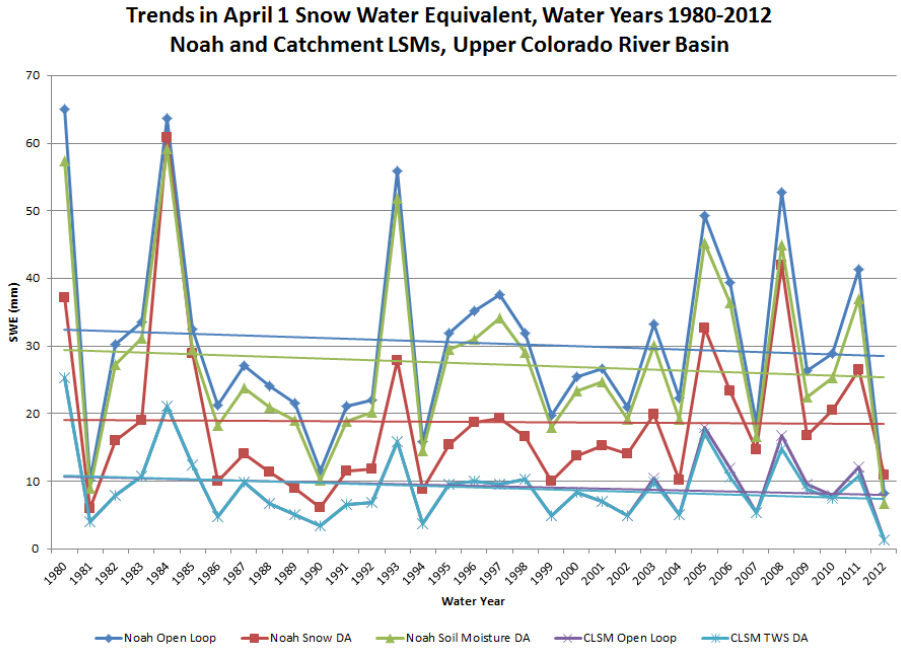

Trends in Normalized Annual Mean SWE, Water Years 1980-2012
Noah and Catchment LSMs, Columbia River Basin
Normalized SWE
Water Year
y = 0.0018x + 0.5448
R² = 0.0116
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean

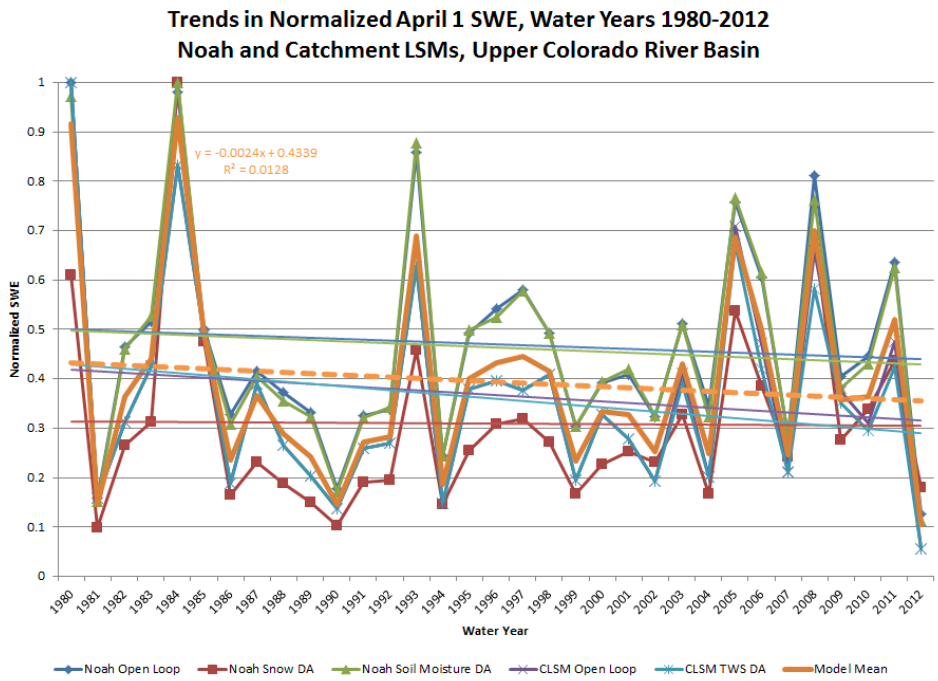

Trends in Annual Mean Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, Upper Colorado River Basin
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA


Trends in Normalized Annual Mean SWE, Water Years 1980-2012
Noah and Catchment LSMs, Upper Colorado River Basin
Normalized SWE
Water Year
y = 7E-05x + 0.4246
R² = 1E-05
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean


Trends in April 1 Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, NCA Great Plains Region
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA


Trends in Normalized April 1 SWE, Water Years 1980-2012
Noah and Catchment LSMs, NCA Great Plains Region
y = 0.006x + 0.3463
R² = 0.0664
Normalized SWE
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean


Trends in April 1 Snow Water Equivalent, Water Years 1980-2012
Noah and Catchment LSMs, Upper Colorado River Basin
SWE (mm)
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA


Trends in Normalized April 1 SWE, Water Years 1980-2012
Noah and Catchment LSMs, Upper Colorado River Basin
y = -0.0024x + 0.4339
R² = 0.0128
Normalized SWE
Water Year
Noah Open Loop
Noah Snow DA
Noah Soil Moisture DA
CLSM Open Loop
CLSM TWS DA
Model Mean