# National Water Model Assessment for Reclamation's Water Management Needs

Assess the National Water Model's hydrological information to support water management decision making processes over a range of forecast lead times

Objectives

- Evaluation in key watersheds across all Reclamation regions
- Evaluation includes:
  - NWM Retrospective analysis
  - NWM operational performance v1.1 – v1.2
  - Process study analysis in snow and rain dominated basins

- Streamflow analysis (operational + retrospective)
- Total inflow analysis
- Gains and losses (event)
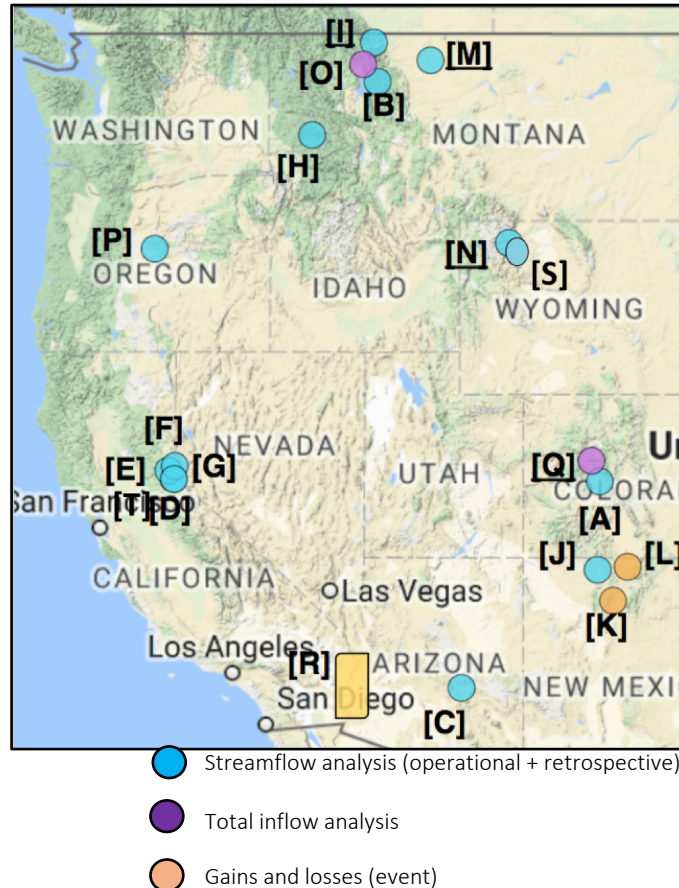
Potential Partnership Activities

- Gains and losses using the NWM over selected watershed regions
- Possible improvements from forcing the NWM using a GEFS ensemble approach
- Sensitivity of NWM forced by the new AORC dataset
- Impact of accounting for agricultural diversions in one or more basins
- Water balance, land surface processes in selected basin(s)

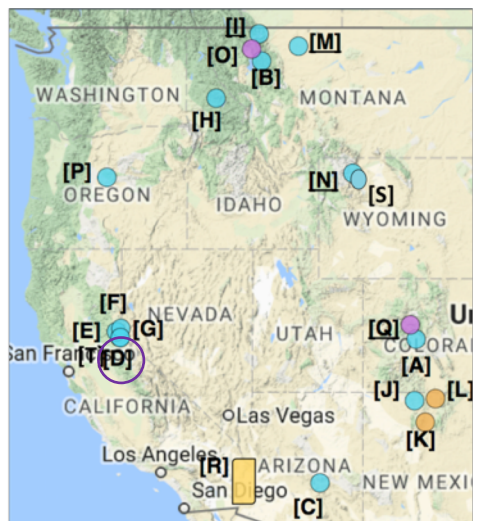Retrospective Assessment Results

NLDAS FORCING: 5 years (2010-2016)
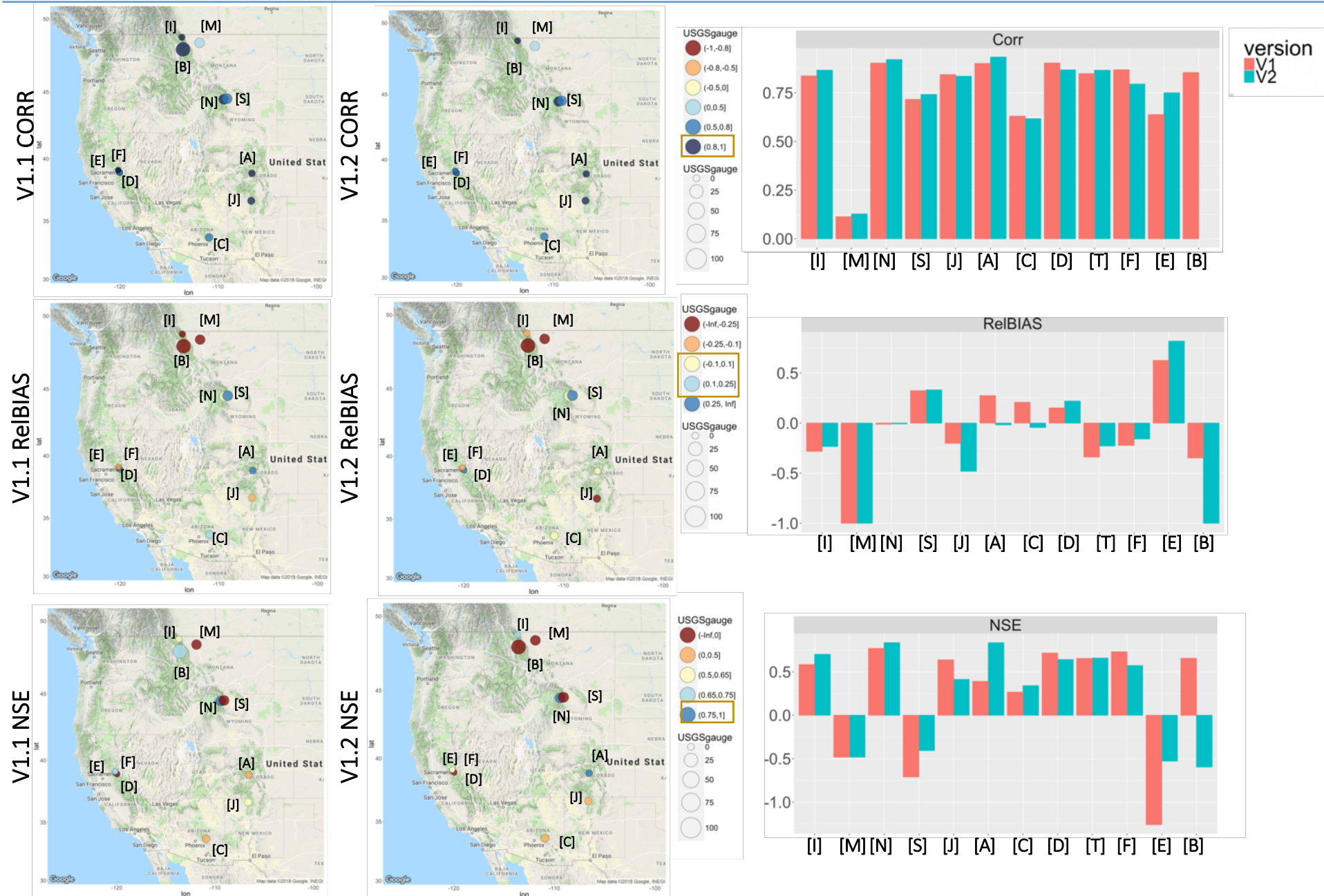
AREA: 54.9 mi^2
MANAGEMENT:
Two small dams may cause slight regulation at times. Some small diversions for domestic use upstream from station. Echo Lake conduit (station 11434500) diverts from Echo Lake (station 10336608), to South Fork American River Basin.

10336610
Upper Truckee River At South Lake Tahoe, CA

Simulation V1.1
Simulation V1.2
Observation

V 1.1
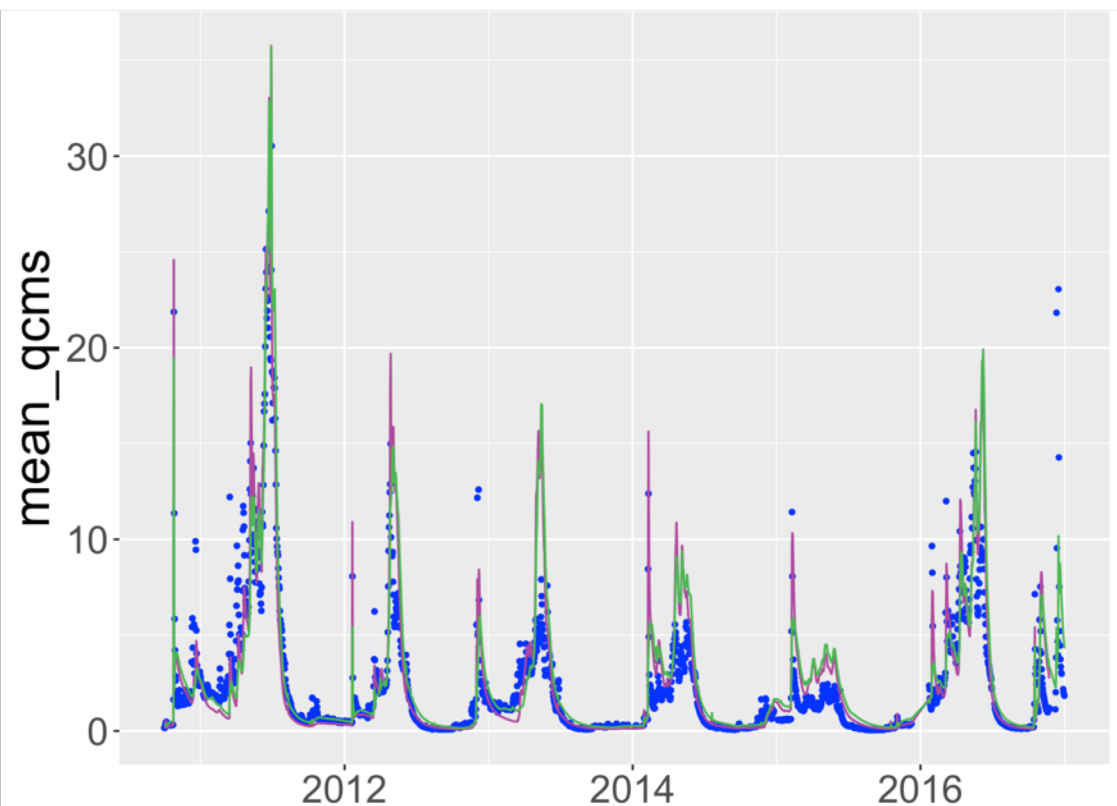
	Total	snow-AMJ	wet-ONDJFM	mon-JAS
Corr	0.9	0.87	0.77	0.98
NSE	0.72	0.55	0.48	0.96
RelBIAS	0.15	0.26	0.01	-0.04
RMSE	1.85	3.15	1.29	0.5

V 1.2

	Total	wet-ONDJFM	snow-AMJ	mon-JAS
Corr	0.87	0.65	0.83	0.99
NSE	0.64	0.38	0.46	0.91
RelBIAS	0.22	0.06	0.28	0.4
RMSE	2.12	1.63	3.43	0.8

- Calibrated
- Overall good performance, matching the statistics.
- Slight decrease of performance in V1.2 respect to V1.1.
- The Monsoon season has too few rain to be a reliable stat.
- We should zoom in to understand better the performance (many sites close to each other with different signals)
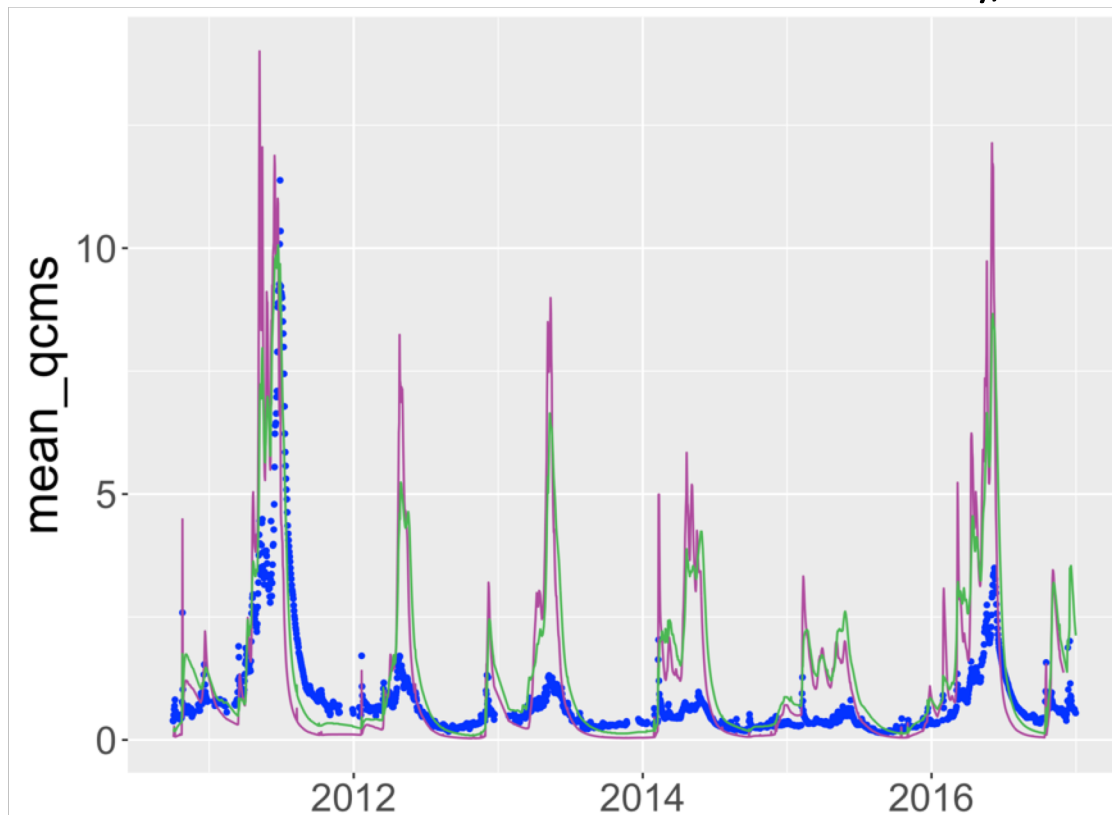
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AREA: 36.7 mi^2
MANAGEMENT:
Minor diversions upstream from station.
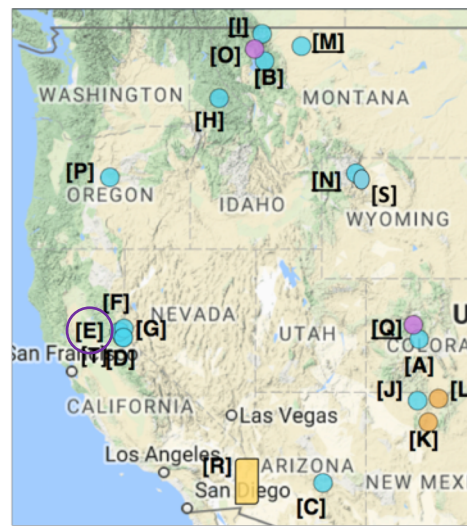
10336780 Trout Creek Near Tahoe Valley, CA

—•— Simulation V1.1
—•— Simulation V1.2
—•— Observation

V1.1

	Total	snow-AMJ	wet-ONDJFM	mon-JAS
Corr	0.64	0.71	0.47	0.94
NSE	-1.26	-2.78	-7.82	0.45
RelBIAS	0.63	1.47	0.33	-0.64
RMSE	1.75	2.96	0.79	1

V1.2

	Total	wet-ONDJFM	snow-AMJ	mon-JAS
Corr	0.75	0.39	0.81	0.96
NSE	-0.53	-8.82	-1.54	0.88
RelBIAS	0.82	0.68	1.43	-0.17
RMSE	1.43	0.86	2.43	0.46

- Uncalibrated
- Overall overestimation of main peaks and underestimation of low flows
- Improvement from V1.1 to V1.2, more evident during the snow melt season.

Operational assessment results: LONG RANGE

10336610 UPPER TRUCKEE RV AT SOUTH LAKE TAHOE, CA