Middle Rio Grande Salinity Modeling

Background

- Develop methods in RiverWare for modeling salinity
  - Most Surface-water functionality already present
  - Ground water salinity added
  - Interactions between groundwater and surface-water

- Testing
  - Theoretical
  - MRG sub reach

- Full Middle Valley Model

Full Middle Valley Model

- Used newest Middle Valley flow model
- Rio Grande below Cochiti salinity based on continuous water quality data 11-2002 to 12-2010
- Initial riverside drain salinity same as river adjacent to drain
- Tributary inflow salinity set constant based on long term measured concentrations
- Deep aquifer salinity and initial salinity in groundwater objects based on published data
- Limited data for comparison
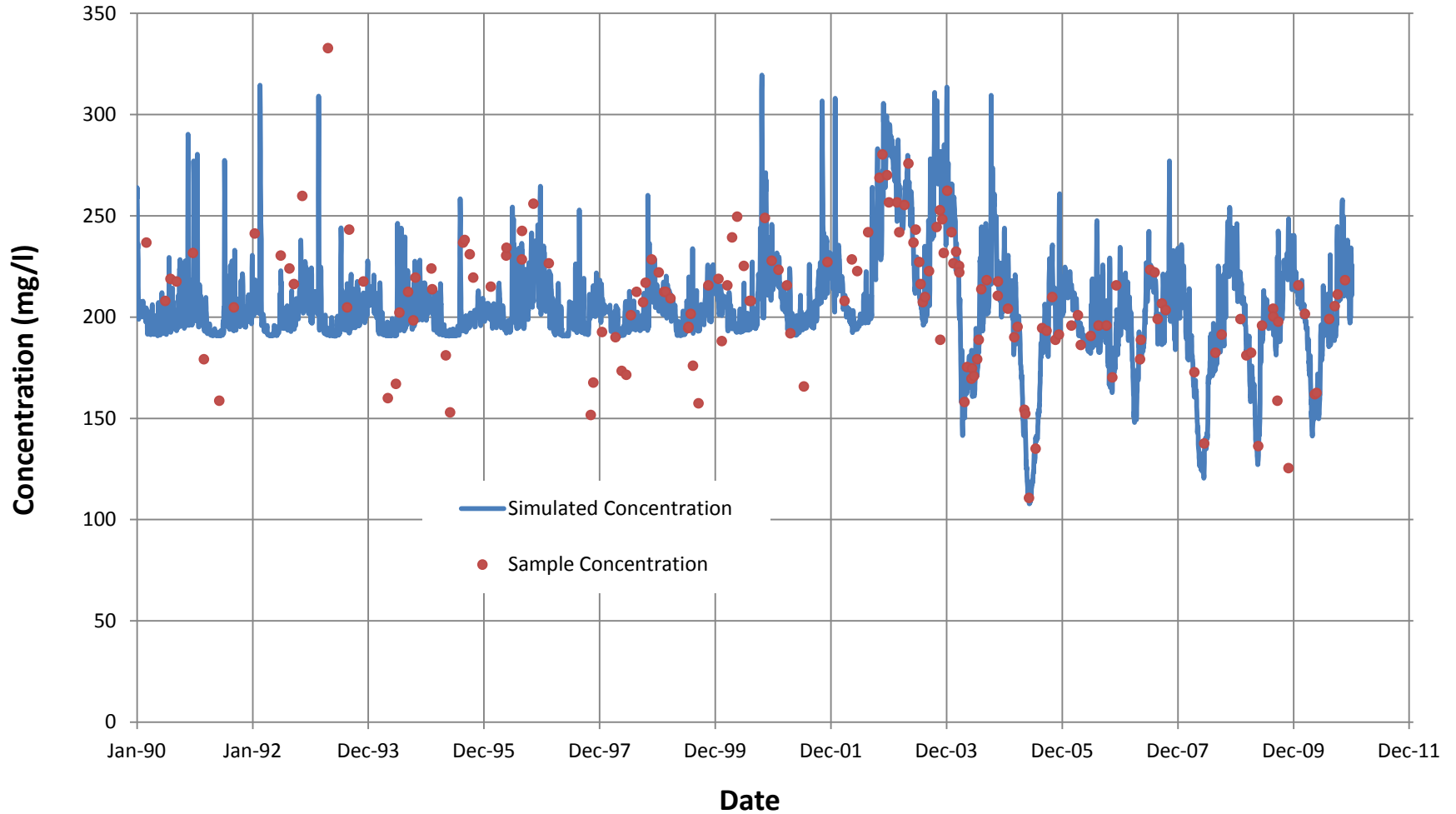- Initial model run results

Input Concentrations

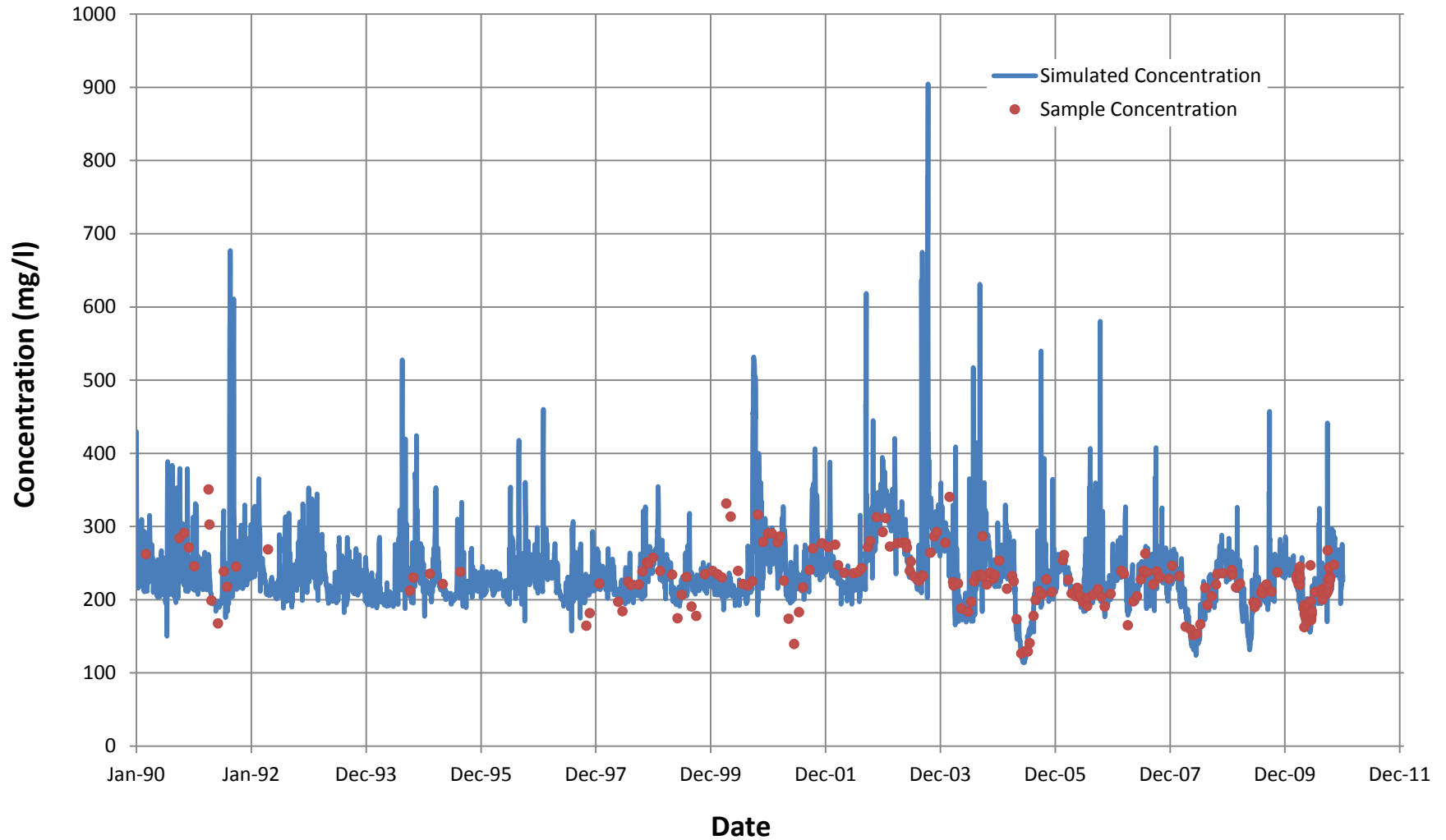| Time Series Concentrations	Concentration (mg/l)
Cochiti Dam Inflow	historical data
Blw Jemez	variable conc
Galisteo Creek	340
North Floodway Channel	110
Rio Puerco	1000
South Diversion Channel	110
Tijeras Arroyo	185
Albuquerque Wastewater Treatment Plant	515
Belen Wastewater Treatment Plant	515
Bernalillo Wastewater Treatment Plant	515
Los Lunas Wastewater Treatment Plant	515
Rio Rancho Wastewater Treatment Plant	515
Socorro Wastewater Treatment Plant	515

Input Concentrations

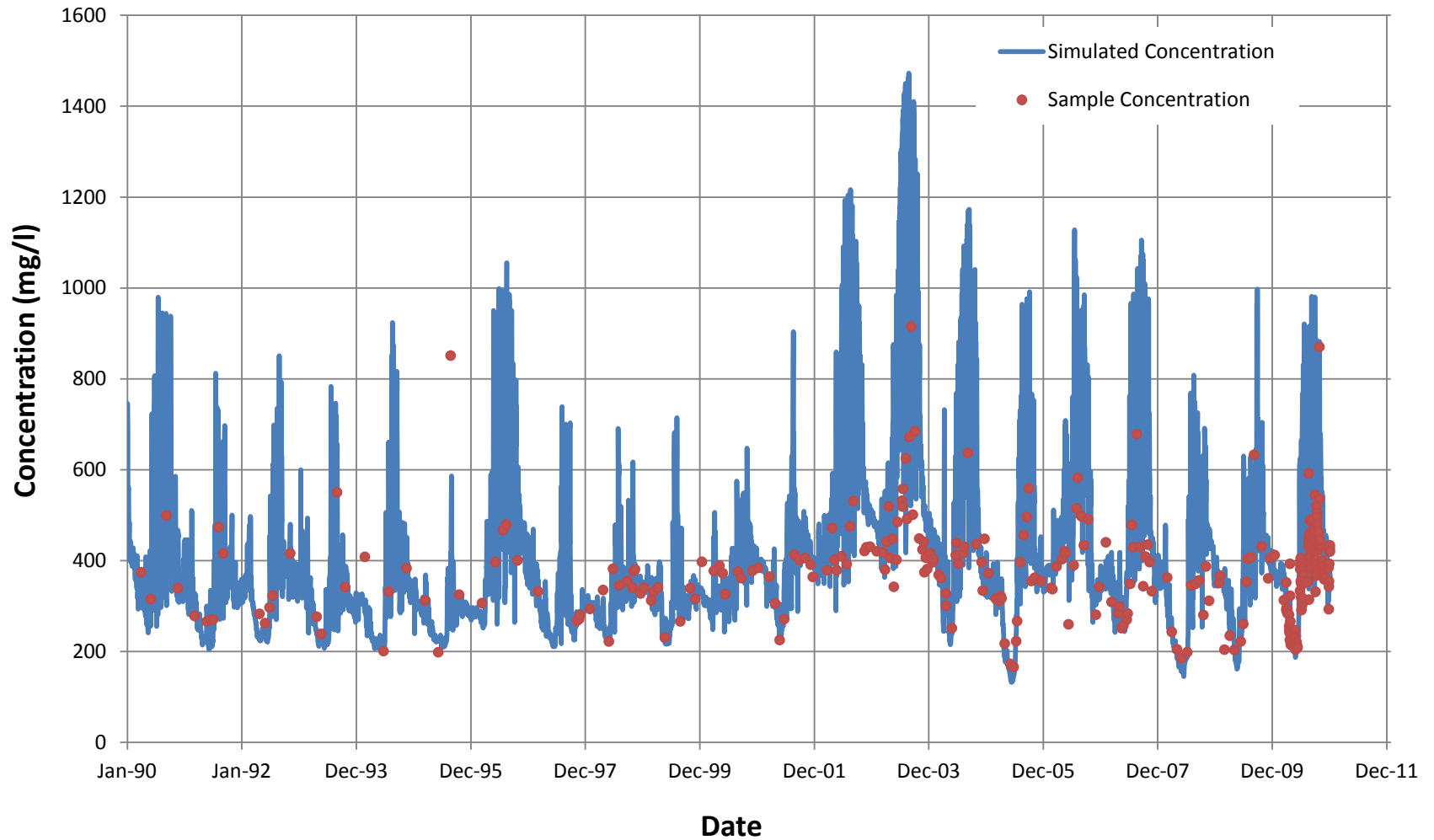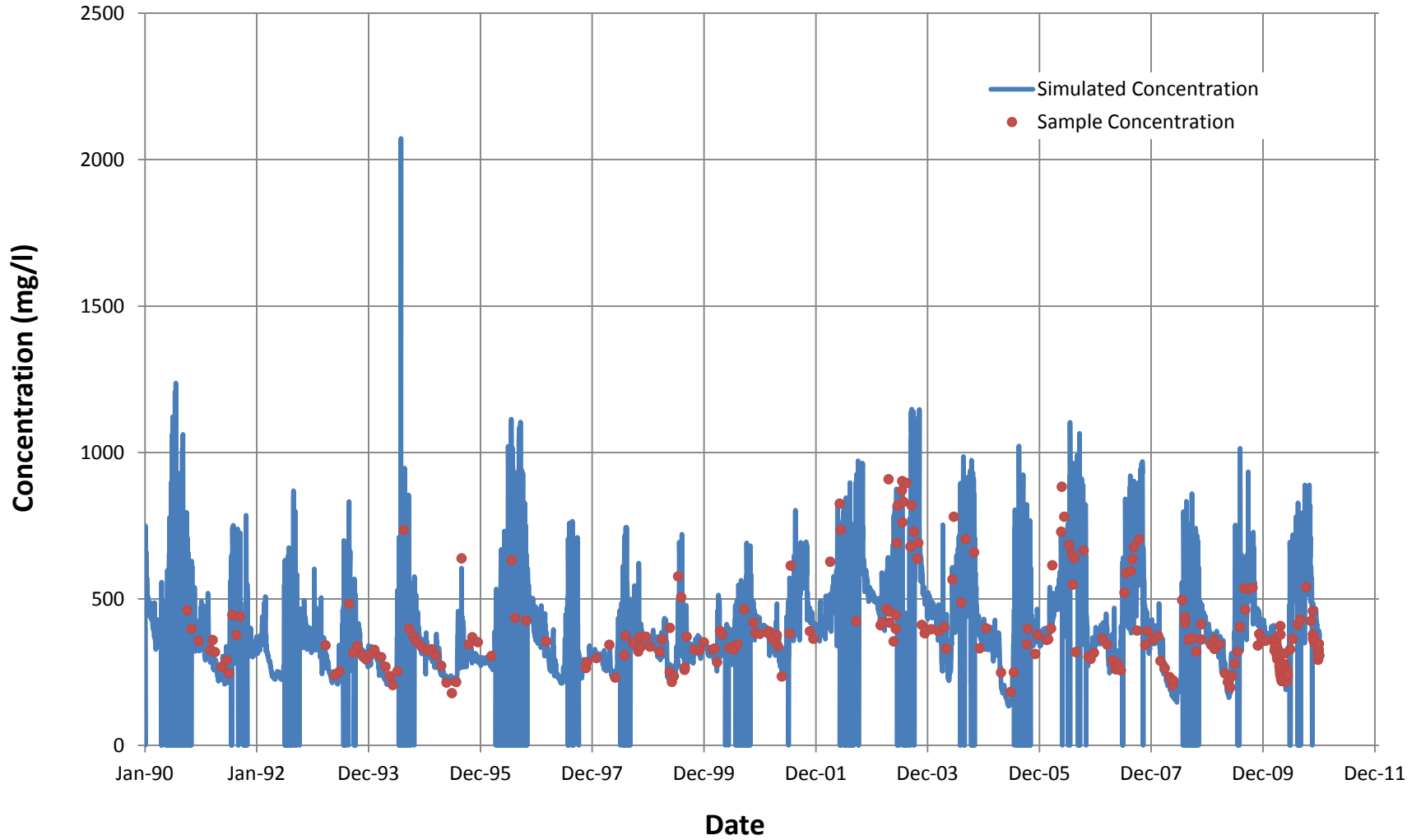| DEEP AQUIFER SALT CONCENTRATION (MG/L)	Concentration
Cochiti to San Felipe GW 1- Santa Domingo	400
Cochiti to San Felipe GW 2	800
San Felipe to Central GW 1-Algadones	435
San Felipe to Central GW 2-Bernalillo south	435
San Felipe to Central GW 3-Alameda	435
San Felipe to Central GW 4	310
Central to Isleta GW 1-Rio Bravo	310
Central to Isleta GW 2	310
Isleta to Bernardo GW 1-Los Lunas	310
Isleta to Bernardo GW 2-north of Belen	310
Isleta to Bernardo GW 3-Jarales	310
Isleta to Bernardo GW 4-Vegita	310
Isleta to Bernardo GW 5	1200
Bernardo to San Acacia GW 1	1500
San Acacia to San Marcial GW 1-Lemitar	1860
San Acacia to San Marcial GW 2-Socorro	620
San Acacia to San Marcial GW 3-San Antonio	750
San Acacia to San Marcial GW 4-north end of Bosque	1100
San Acacia to San Marcial GW 5-Black Mesa	750

Rio Grande At San Felipe
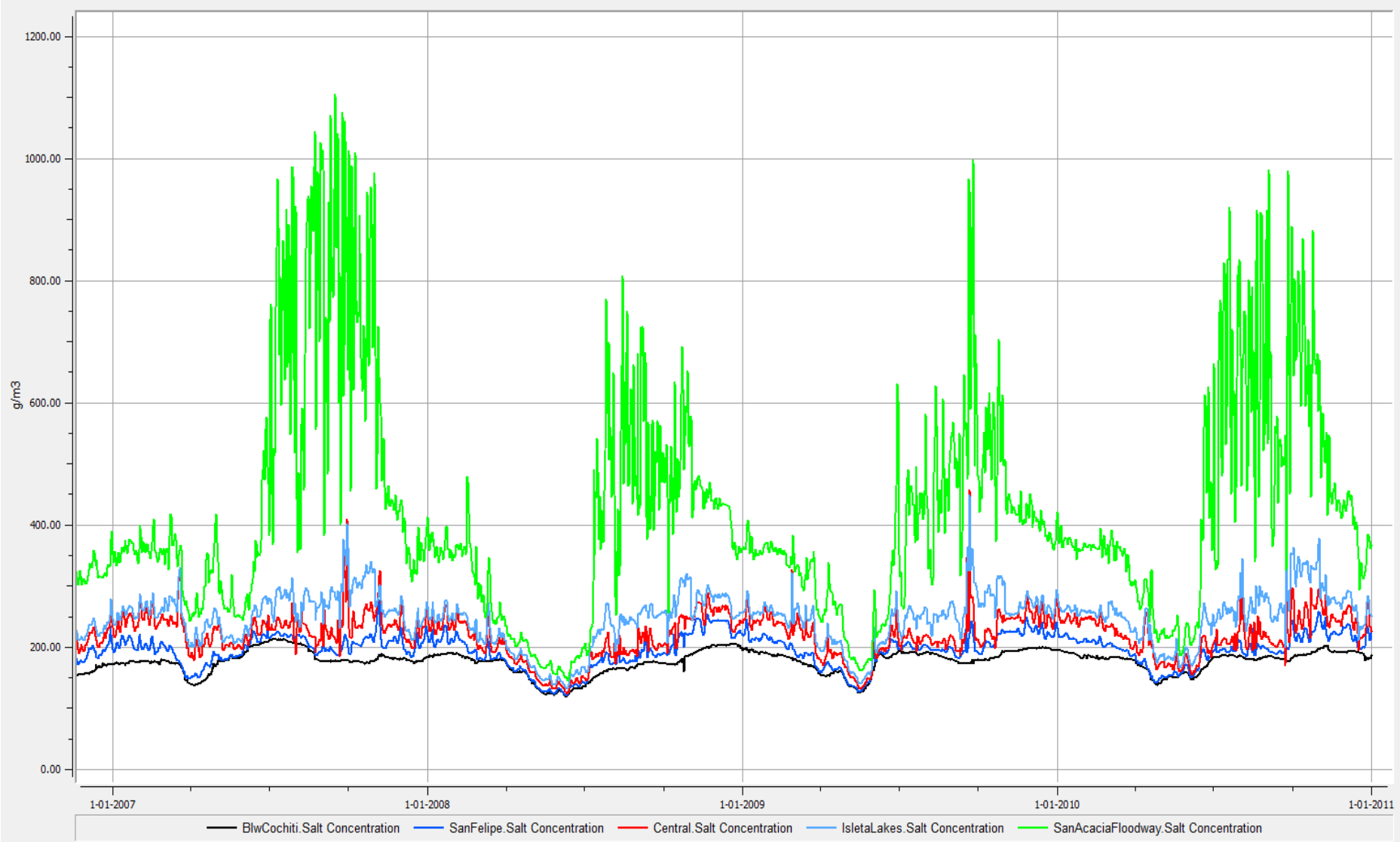
Rio Grande at Central

Rio Grande at San Acacia

Rio Grande at San Marcial

Rio Grande Salinity Concentration

Next Steps

- Evaluate RiverWare for correct salinity methods using the middle Valley scale model;

- Determine why model underestimates flow at Central during non-irrigation season;

- Determine why model underestimates flow at San Acacia and San Marcial after snowmelt runoff during irrigation season;

- Document models and what was done;