

Southern URGWOM Modeling

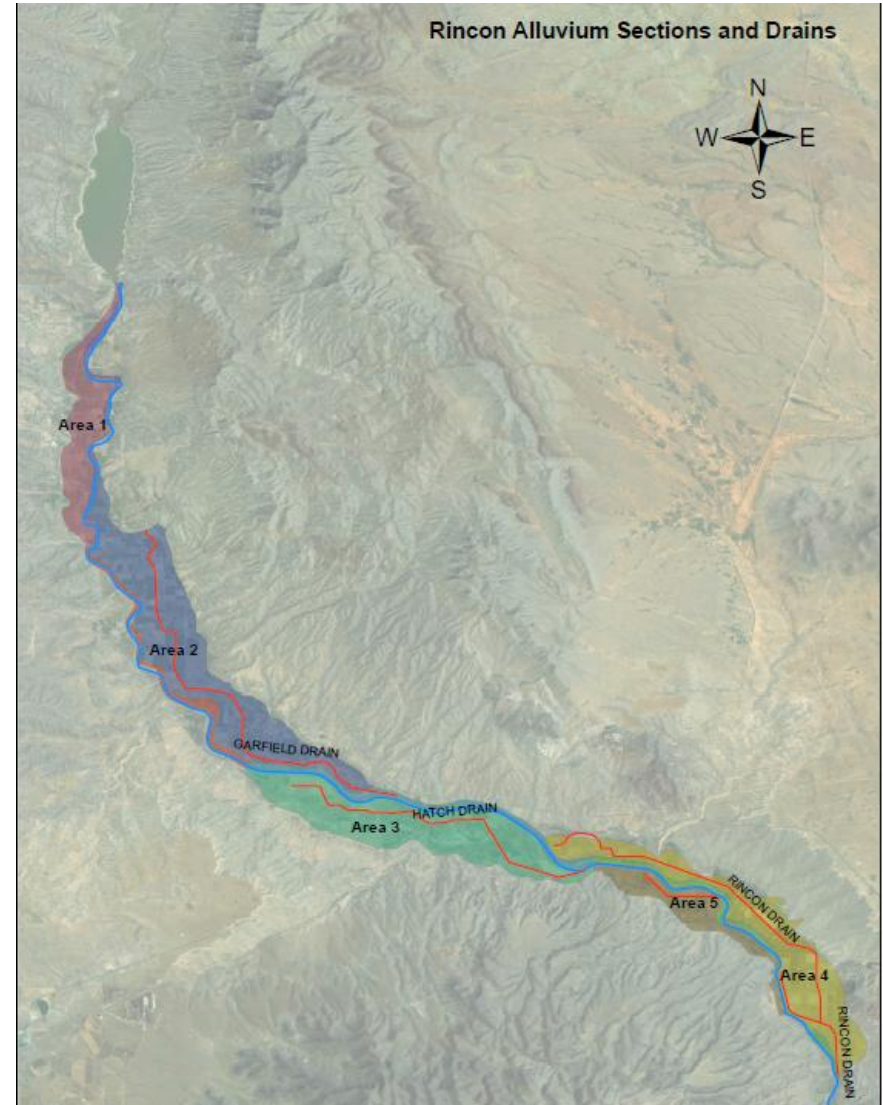


Southern Rio Grande

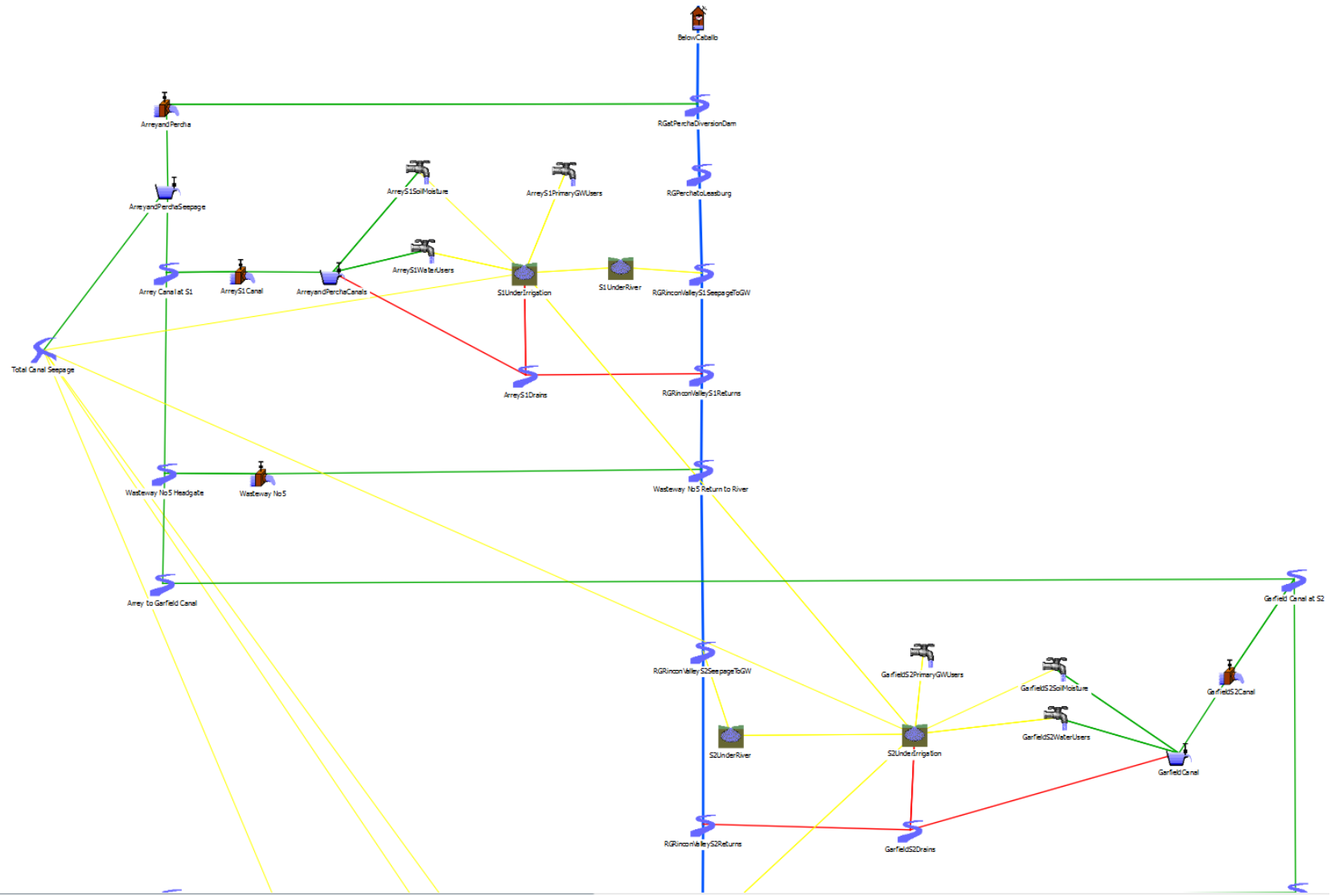
- ✂ Hydros Consulting – working on development
- ✂ Currently three models for southern Rio Grande – Rincon, Mesilla, and El Paso
- ✂ Using previous developed monthly model and previous work by Paseo del Norte Watershed Council
- ✂ Simulate the physical system and water operations (rules)
- ✂ Simulates conjunctive use of surface-water and groundwater
- ✂ Daily time-step

Rincon

- Base physical simulation setup on the irrigated area, canal, and drain current layout
- Simulate shallow groundwater system for surface-water groundwater interaction

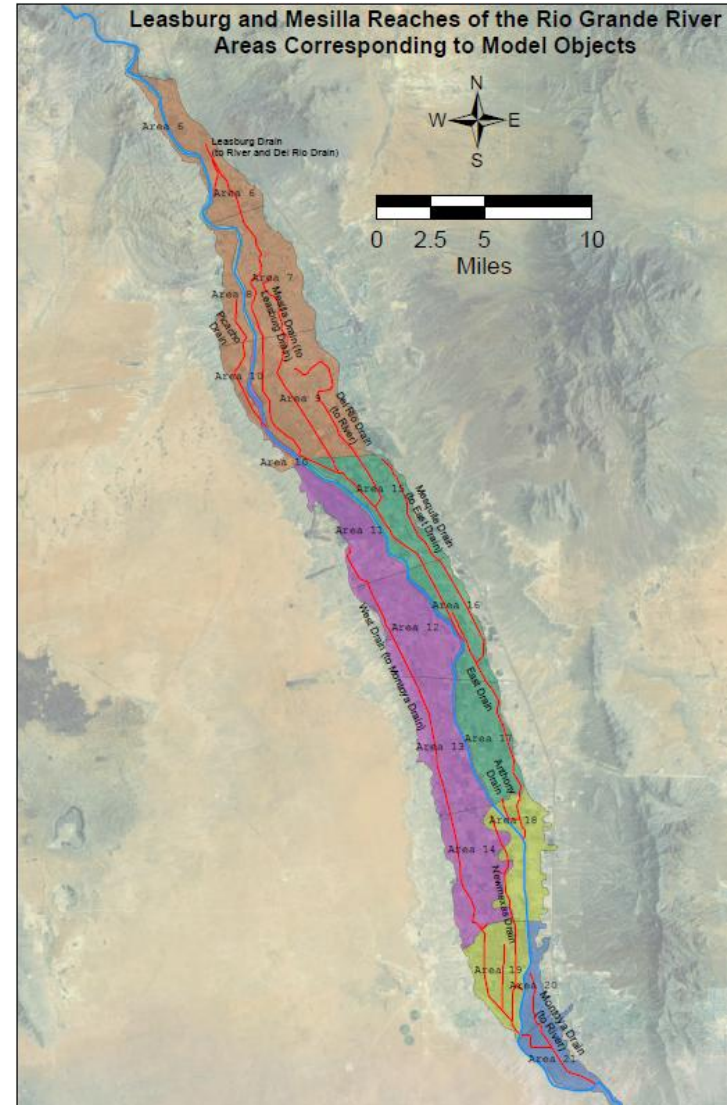


Rincon cont.



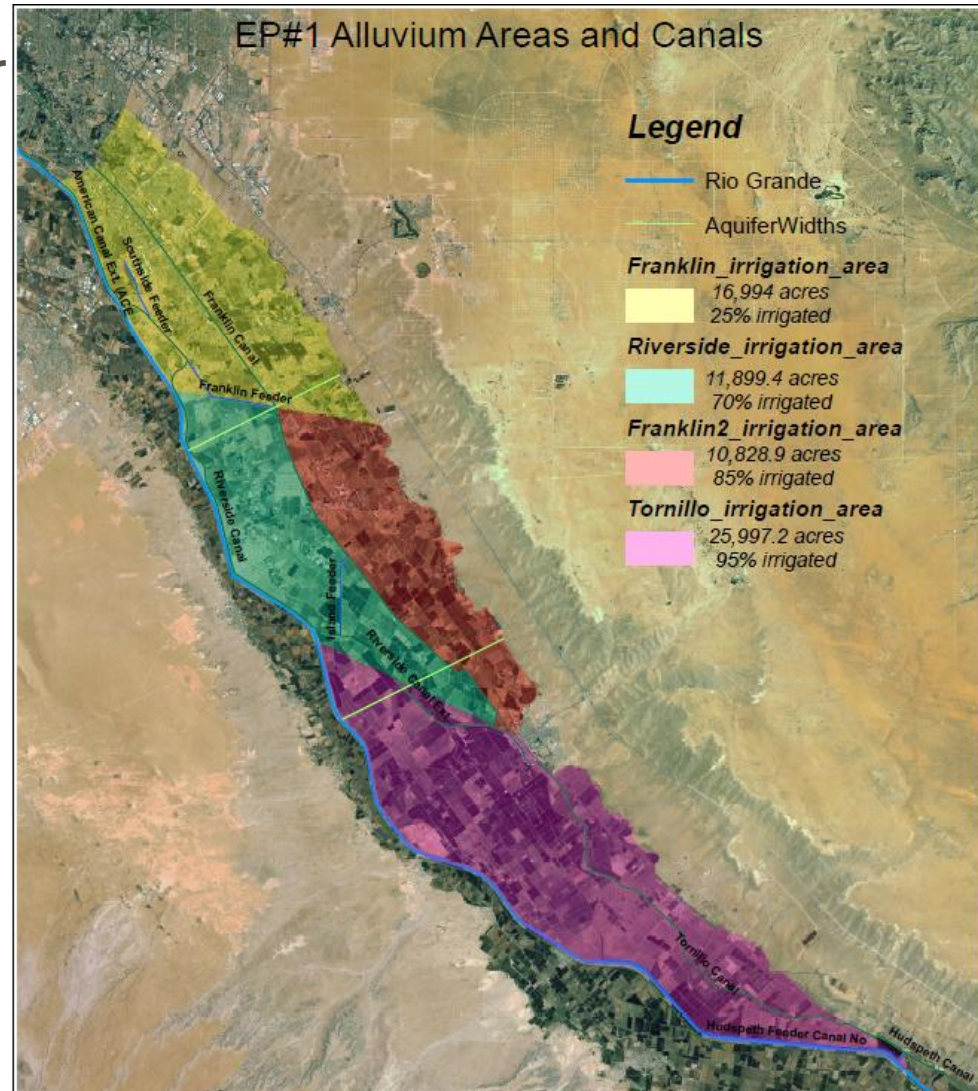
Mesilla

- Simulates irrigated areas in the same way is the Middle Valley
- Simulate pumping for irrigation
- D3 operating logic for Rio Grande water operations



El Paso

- Hydros putting together all crop data and ET data for previous work
- Wastewater included in the simulation.
- Layout for all reaches being reviewed by engineers familiar with area.



Middle Valley Calibration



Steps to Prepare Model for Calibration

- ✎ Craig compiled all needed data that was missing into model
- ✎ ET calculated by crop for all of the model
- ✎ ET input into model- potential ET
- ✎ ET in model reduced by 20% to estimate actual ET
- ✎ Many object had name change – repaired the water budget tool
- ✎ Found that flow into model at Cochiti was incorrect
- ✎ Found that links to diversions at Cochiti were incorrect
- ✎ Set up SCT for drains and river hydraulic conductivities

River and Drain SCT

SCT gridSWinputCalibration.SCT (MRGV_2013_calibration_1990to2010_4_8_13.rw.gz)

File Edit Slots Aggregation View Config DMI Run Diagnostics Go To

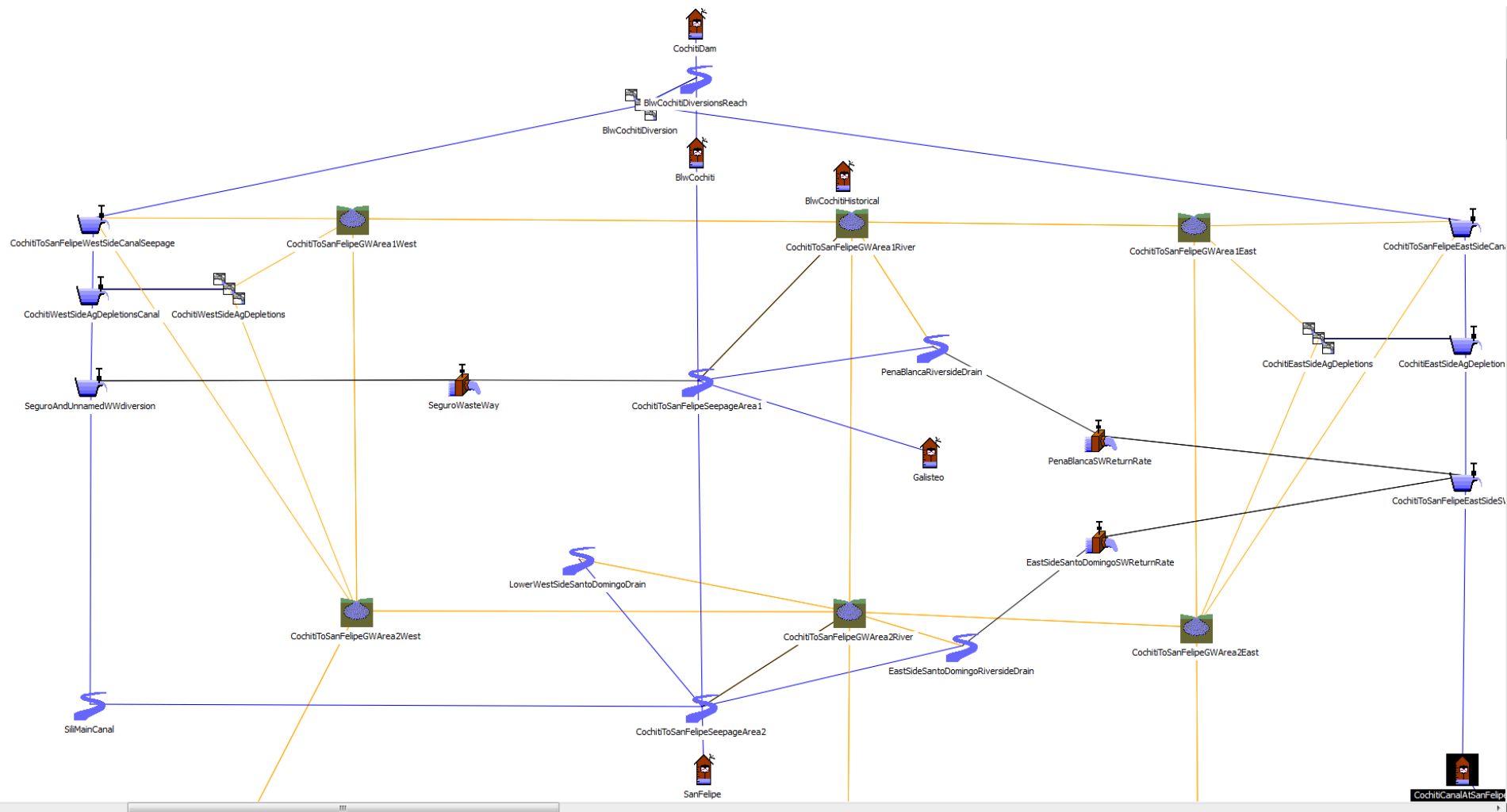
Series Slots Edit Series Slot List Scalar Slots Other Slots Object Grid

☐ Configure

	1	2	3
1		<p> CochitiToSanFelipeSeepageArea1 </p> <p> Hydraulic Conductivity 0.0500 ft/day</p> <p> Seepage Area 443.9200 acre</p> <p> Conductance 966,858 ft2/day</p>	<p> PenaBlancaRiversideDrain </p> <p> Hydraulic Conductivity 0.3000 ft/day</p> <p> Seepage Area 19.10 acre</p> <p> Conductance 249,598.80 ft2/day</p>
2	<p> LowerWestSideSantoDomingoDrain </p> <p> Hydraulic Conductivity 0.0054 ft/day</p> <p> Seepage Area 10.01 acre</p> <p> Conductance 2,355.21 ft2/day</p>	<p> CochitiToSanFelipeSeepageArea2 </p> <p> Hydraulic Conductivity 0.0500 ft/day</p> <p> Seepage Area 390.4000 acre</p> <p> Conductance 850,291 ft2/day</p>	<p> EastSideSantoDomingoRiversideDrain </p> <p> Hydraulic Conductivity 0.0190 ft/day</p> <p> Seepage Area 15.54 acre</p> <p> Conductance 12,864.42 ft2/day</p>
3	<p> SanFelipeToCentralDrainWest1 </p> <p> Hydraulic Conductivity 0.0070 ft/day</p> <p> Seepage Area 5.13 acre</p> <p> Conductance 1,562.92 ft2/day</p>	<p> SanFelipeToCentralSeepageArea1 </p> <p> Hydraulic Conductivity 0.1021 ft/day</p> <p> Seepage Area 336.7500 acre</p> <p> Conductance 1,497,688 ft2/day</p>	<p> SanFelipeToCentralDrainEast:Reach1 </p> <p> Hydraulic Conductivity 0.0500 ft/day</p> <p> Seepage Area 15.88 acre</p> <p> Conductance 34,582.50 ft2/day</p>
4		<p> SanFelipeToCentralSeepageArea2 </p> <p> Hydraulic Conductivity 0.0986 ft/day</p> <p> Seepage Area 511.4700 acre</p> <p> Conductance 2,196,772 ft2/day</p>	<p> SanFelipeToCentralDrainEast:Reach2 </p> <p> Hydraulic Conductivity 0.3000 ft/day</p> <p> Seepage Area 23.70 acre</p> <p> Conductance 309,712.50 ft2/day</p>
5	<p> SanFelipeToCentralDrainWest3 </p> <p> Hydraulic Conductivity 0.5000 ft/day</p> <p> Seepage Area 21.88 acre</p> <p> Conductance 476,546.40 ft2/day</p>	<p> SanFelipeToCentralSeepageArea3 </p> <p> Hydraulic Conductivity 0.2489 ft/day</p> <p> Seepage Area 466.2600 acre</p> <p> Conductance 5,055,230 ft2/day</p>	<p> SanFelipeToCentralDrainEast:Reach3 </p> <p> Hydraulic Conductivity 0.4000 ft/day</p> <p> Seepage Area 24.17 acre</p> <p> Conductance 421,180.00 ft2/day</p>
	<p> SanFelipeToCentralDrainWest4 </p>	<p> SanFelipeToCentralSeepageArea4 </p>	<p> SanFelipeToCentralDrainEast:Reach4 </p>

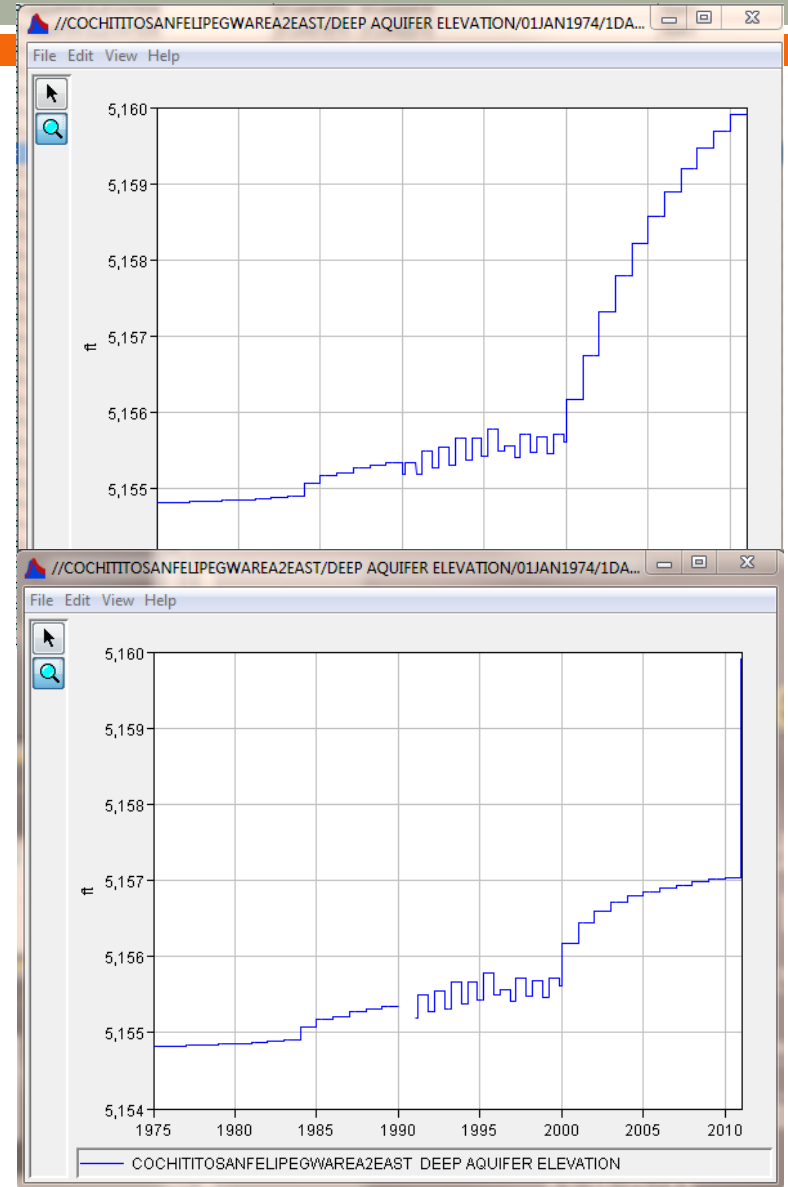
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Cochiti Reach

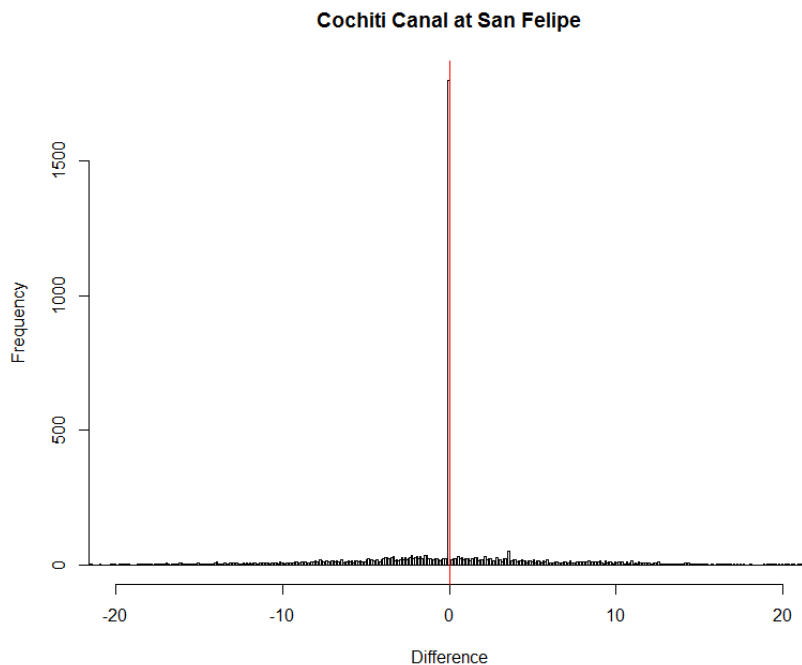


Deep Aquifer Head

- Received deep aquifer head data but were some issues
- Heads after 2000 jumped without any reason



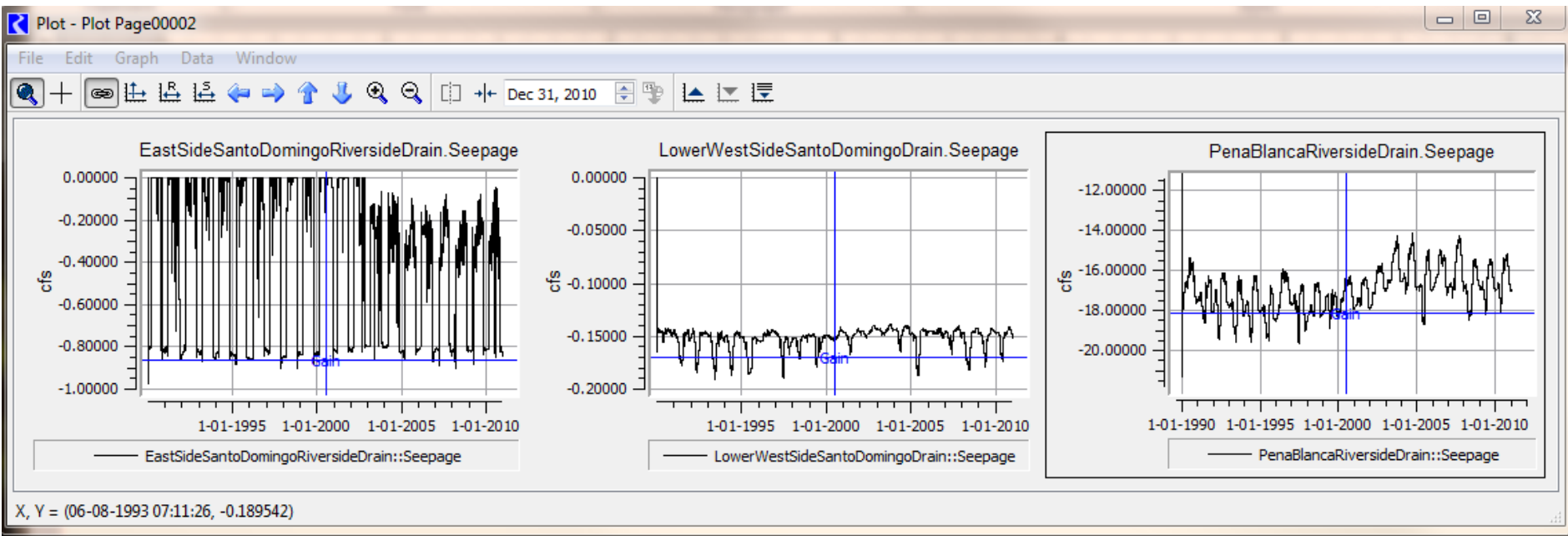
Cochiti to San Felipe



- ∞ Cochiti Canal – outflow from reach
- ∞ Calibrated by adjusting the canal seepage fraction from 1.5 to 1.0
- ∞ Mean difference between simulated and measured = 0.42 cfs

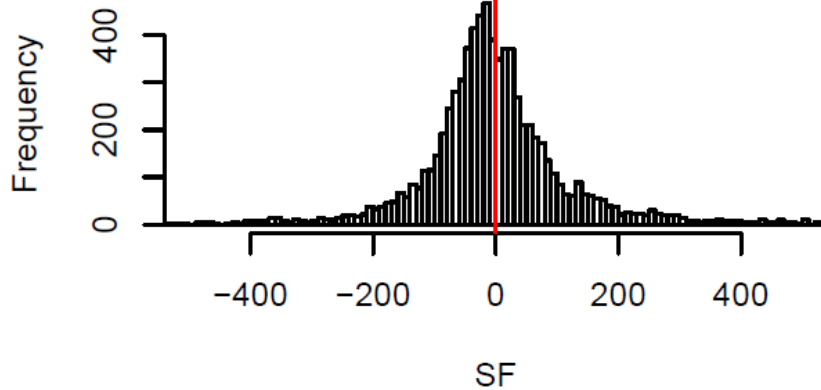
Cochiti to San Felipe Drains

- Adjusted Kv of drains to match seepage measured during seepage study



Cochiti to San Felipe

San Felipe All Flow



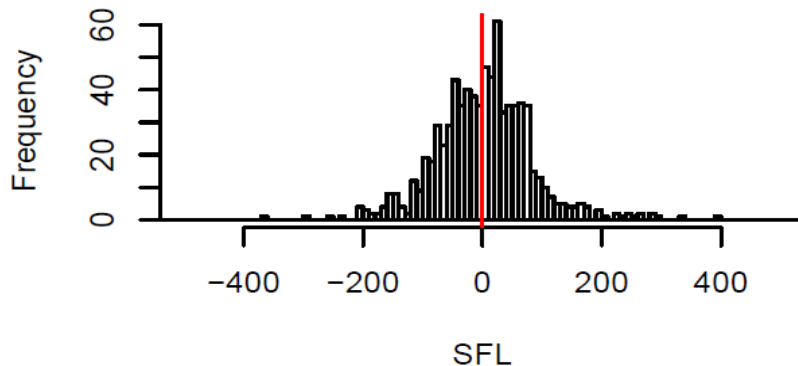
Mean Difference

All Flow = 0.76 cfs

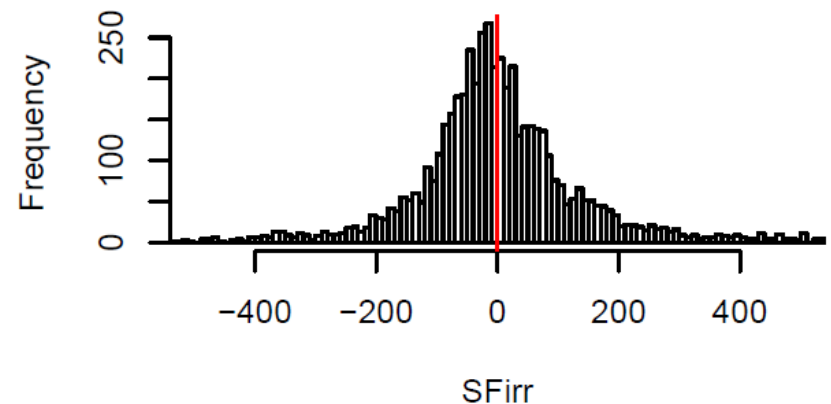
Low Flow = 26.56 cfs

Irrigation Flow = -3.60

San Felipe Low Flow

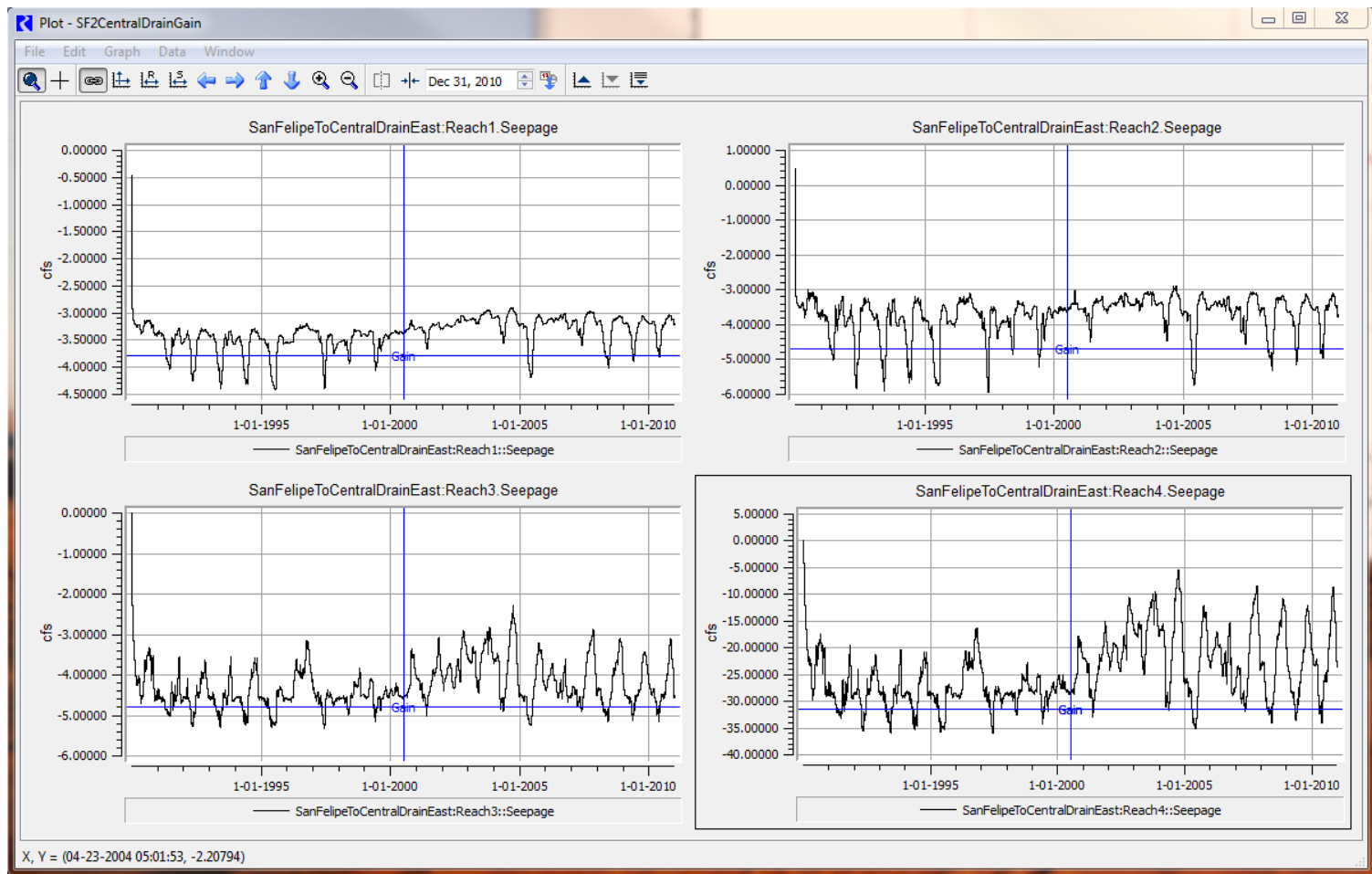


San Felipe Irrigation Season



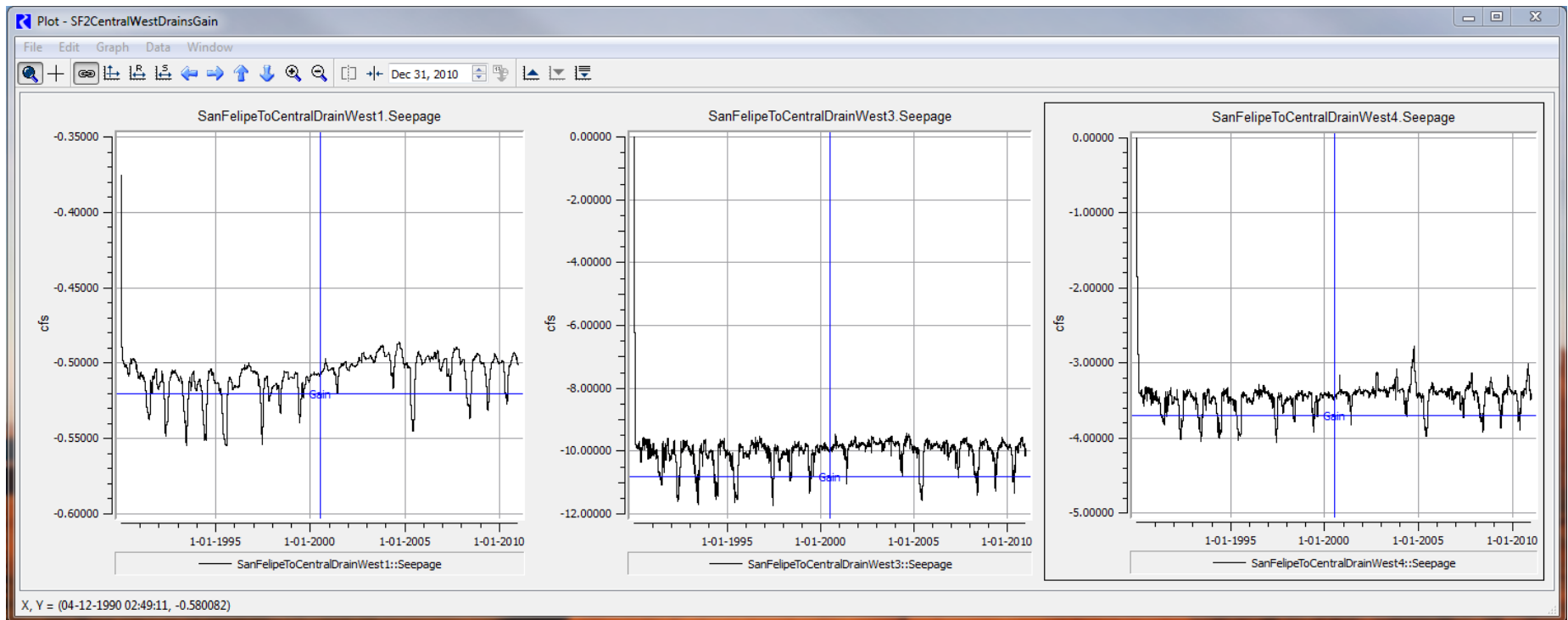
San Felipe to Central East Drains

Adjusted Kv for drains to match measured seepage



San Felipe to Central West Drains

Adjusted Kv for drains to match measured seepage



Planned

- ⌘ Check all inputs into model in Central Reach
- ⌘ Calibrate canals and waste ways for Central Reach
- ⌘ Calibrate to GW heads in Central Reach
- ⌘ Calibrate river seepage Central Reach
- ⌘ Continue down river with calibration