

URGSiM Interface Development

URGSiM THE UPPER RIO GRANDE SIMULATION MODEL

Summary

SW Reaches

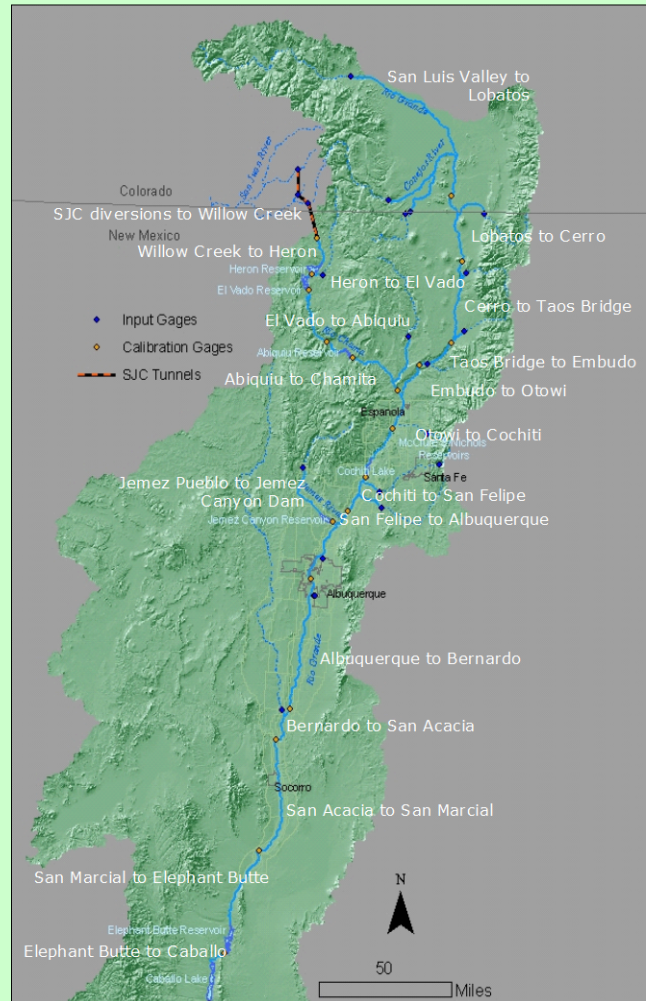
Reservoirs

GW

ET

Ag

MI



URGSiM

The Upper Rio Grande Simulation Model (URGSiM) models monthly hydrologic mass balance in 20 river reaches, 10 reservoirs (Heron, El Vado, Abiquiu, Nambe Falls, McClure, Nichols, Cochiti, Jemez, Elephant Butte, and Caballo), 10 cities (Espanola, Los Alamos, Santa Fe, Bernalillo, Rio Rancho, Albuquerque, Los Lunas, Belen, Socorro, and Truth or Consequences) and 3 regional groundwater systems (Espanola Basin, Albuquerque Basin, and Socorro Basin). URGSiM extends along the Upper Rio Grande from the Colorado Department of Water Resources (CDWR) stream gage near Del Norte (RIODELCO) to the United States Geologic Survey (USGS) stream gage below Caballo Reservoir (USGS 8362500). URGSiM includes the Rio Chama downstream from the USGS gage near La Puente (USGS 8284100) including the San Juan-Chama Project from the diversion points on the Navajo River, Little Navajo River, and Rio Blanco in Colorado. URGSiM also includes the Jemez River from the USGS gage near Jemez pueblo (USGS 8324000) to the Rio Grande.

River reaches begin either at an input gage for headwater reaches or at a calibration gage marking the end of the reach above. Input gages are located on the model boundary and provide inflows to the top of headwater reaches as well as tributary inflows to reaches throughout the system. Calibration gages are stream gages at the end of river reaches that are internal to the model extent and that have continuous¹ historic records (starting no later than 1975). At the calibration gages, modeled values can be compared to observed values during the historic period.

In addition to hydrologic surface water inputs, URGSiM uses temperature and precipitation data from historic climate station locations. This information is used to calculate reference evapotranspiration (ET), effective precipitation, and reservoir gains from precipitation.

For more information see

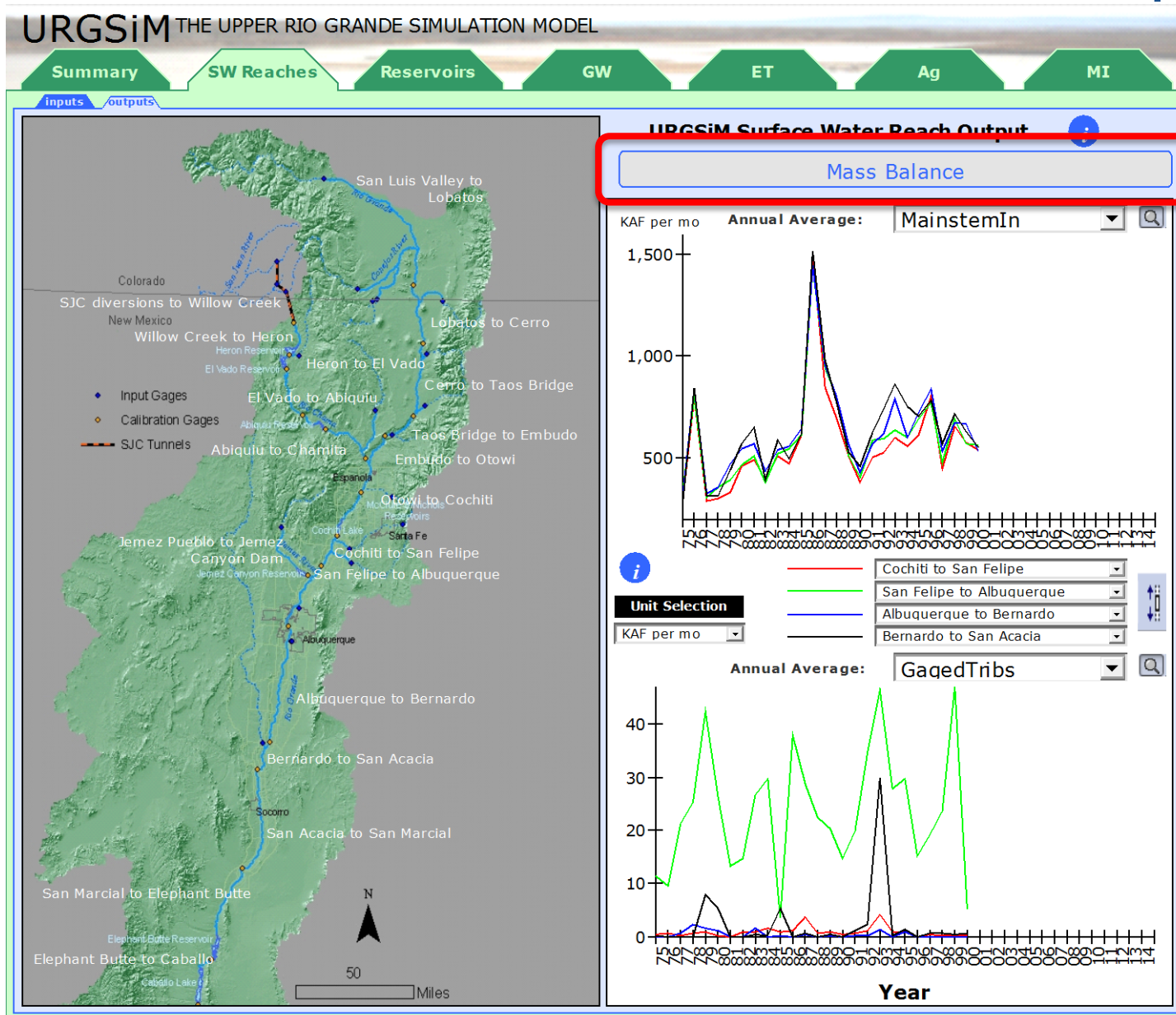
<http://www.usbr.gov/WaterSMART/wcra/docs/urgia/URGIAAppxE.pdf>

URGWOM
AC Meeting
February 17th, 2015

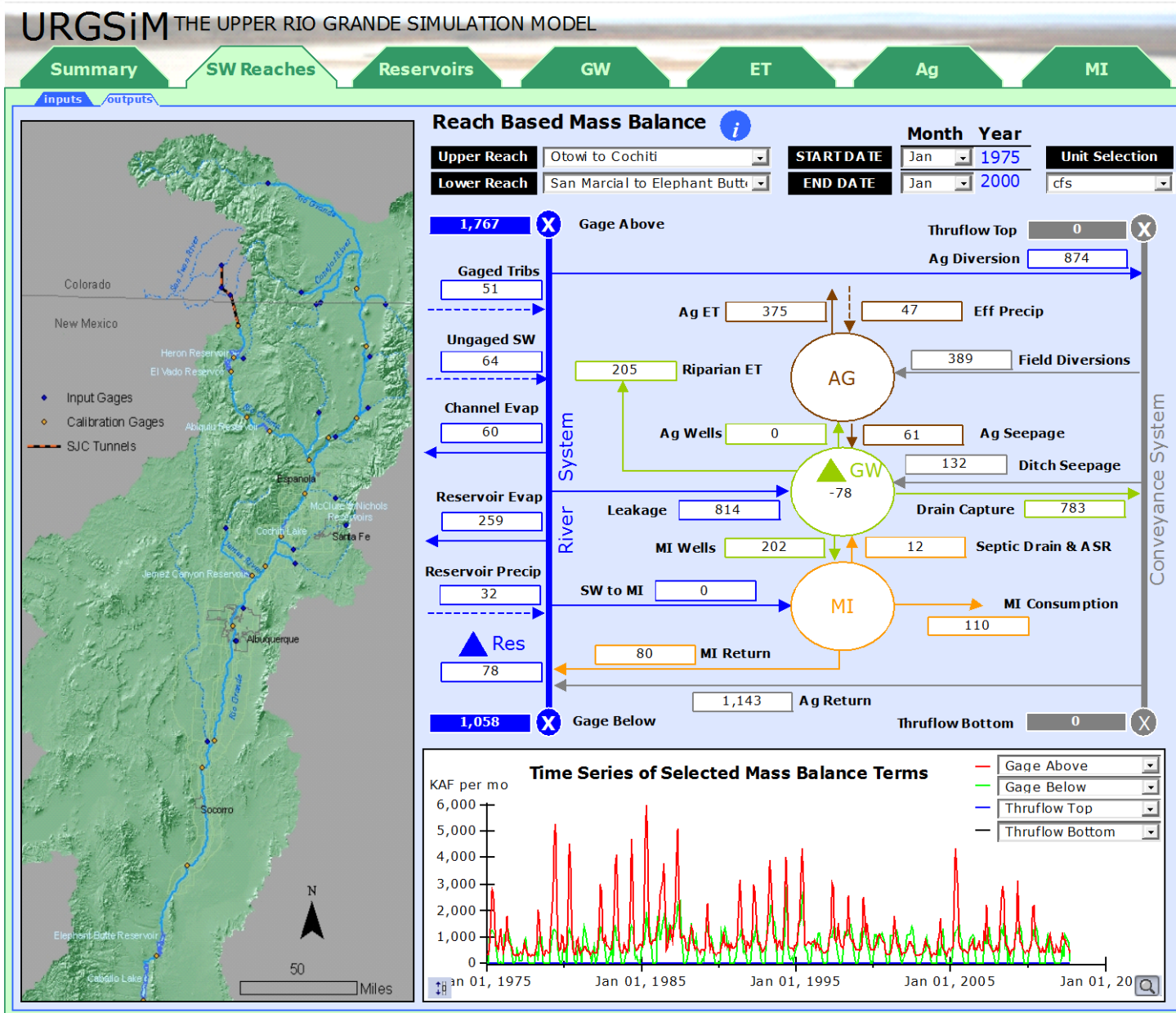
Jesse Roach

Jesse.Roach@tetrattech.com

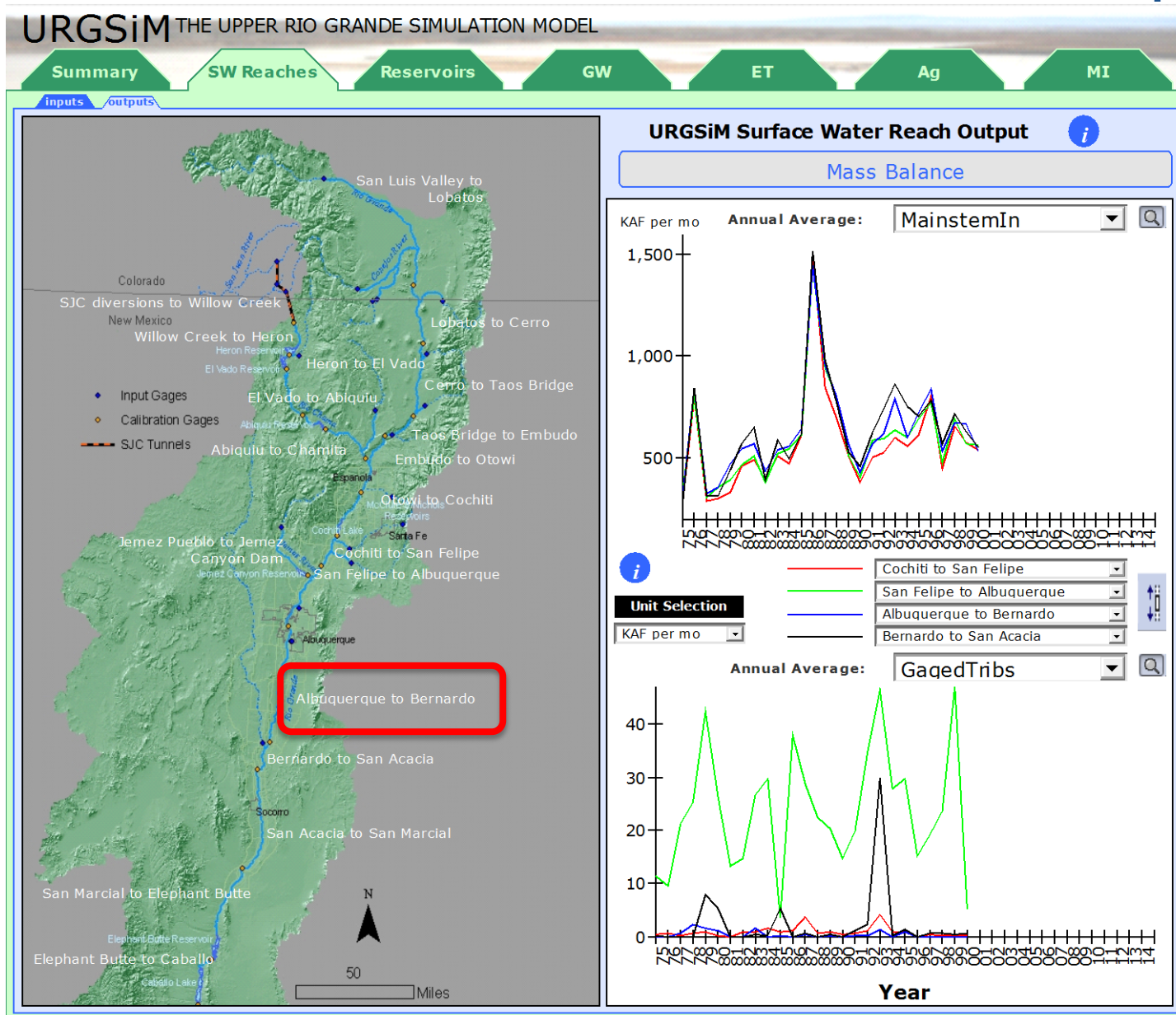
URGSiM User Interface Development



SW Mass Balance Calculation & Display



URGSiM User Interface Development



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inputs outputs

Rio Grande: Albuquerque to Bernardo



Sources: Esri, DigitalGlobe, GeoEye, IGN, GeoEye, Earthstar Geographics, CNES/AirbusDS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Rio Puerco near Bernardo Rio Grande near Bernardo

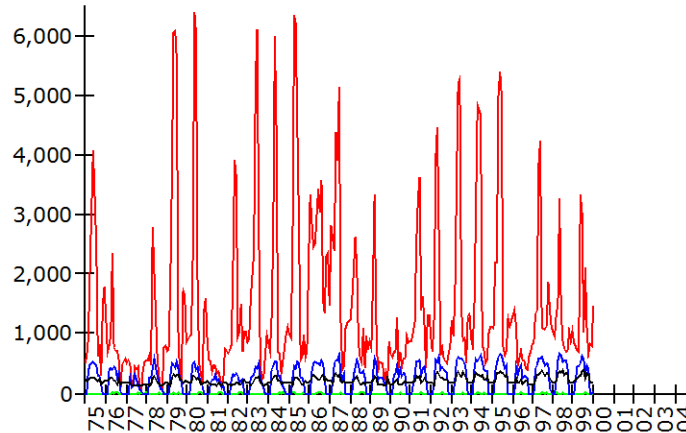


Unit Selection

cfs

Monthly Average Flows:

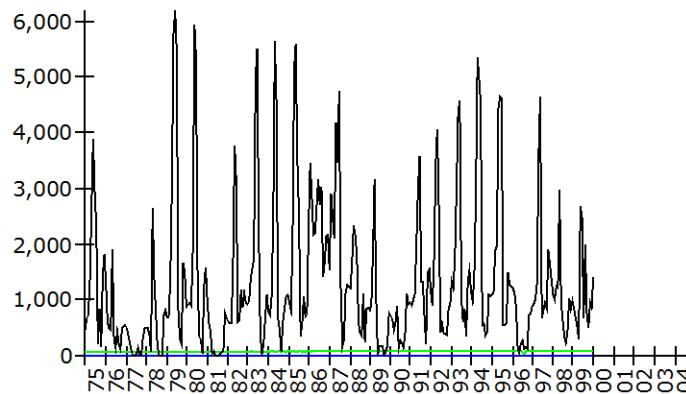
- Gage Above
- Gaged Tributaries
- Aq Diversion
- Aq Return



cfs

Monthly Average Flows:

- SW to MI
- MI Return
- Res Storage Change
- Gage Below

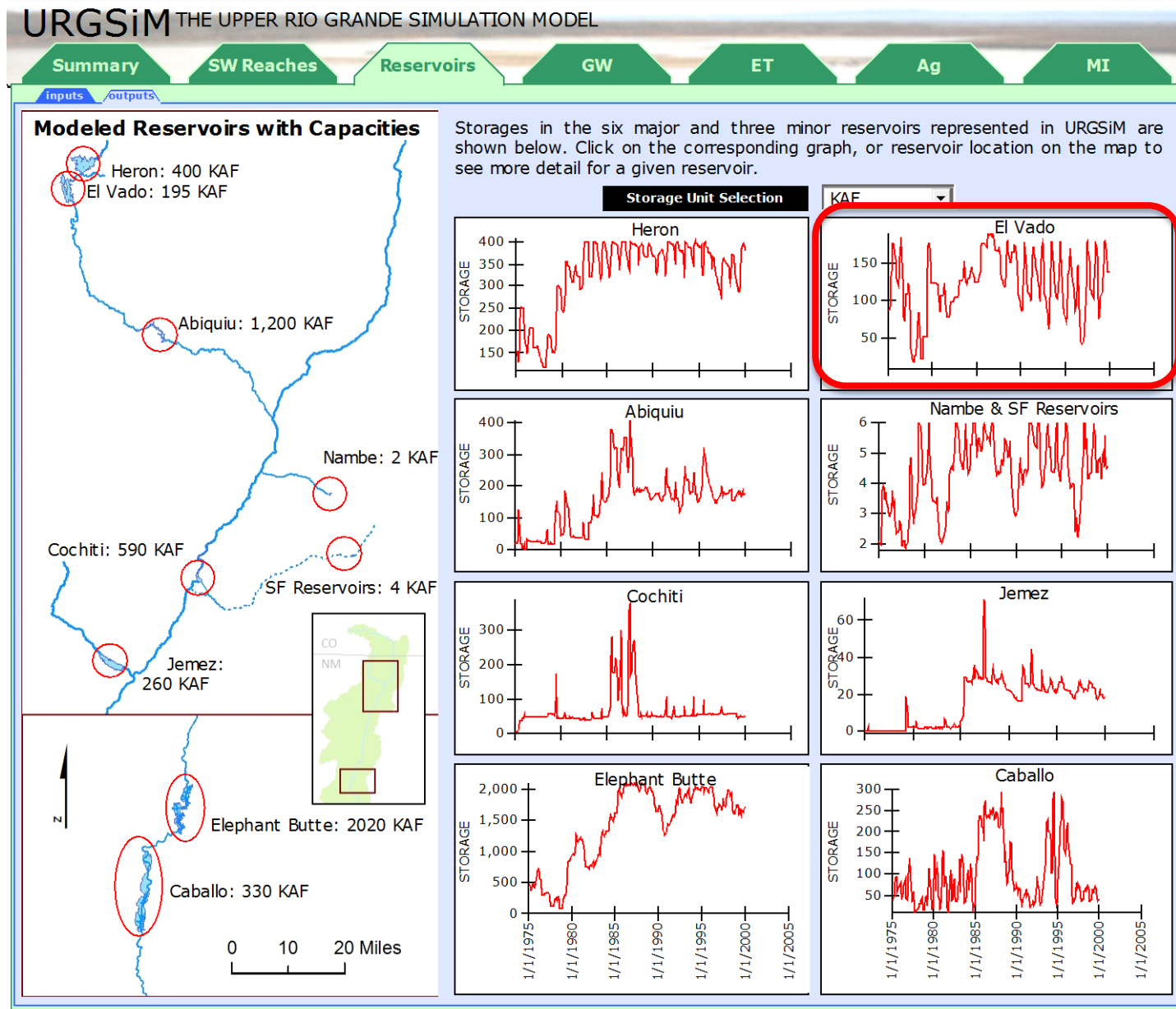


Year

Dropdowns include:

- Gage Above
- Gaged Tributaries
- Ungaged SW
- Ag Return
- MI Return
- Reservoir Precip
- Ag Diversions
- SW to MI
- River Leakage
- Channel Evap
- Reservoir Evap
- Gage Below
- Res Storage Change

Reservoir Mass Balance & Time Series:



Reservoir Mass Balance & Time Series:

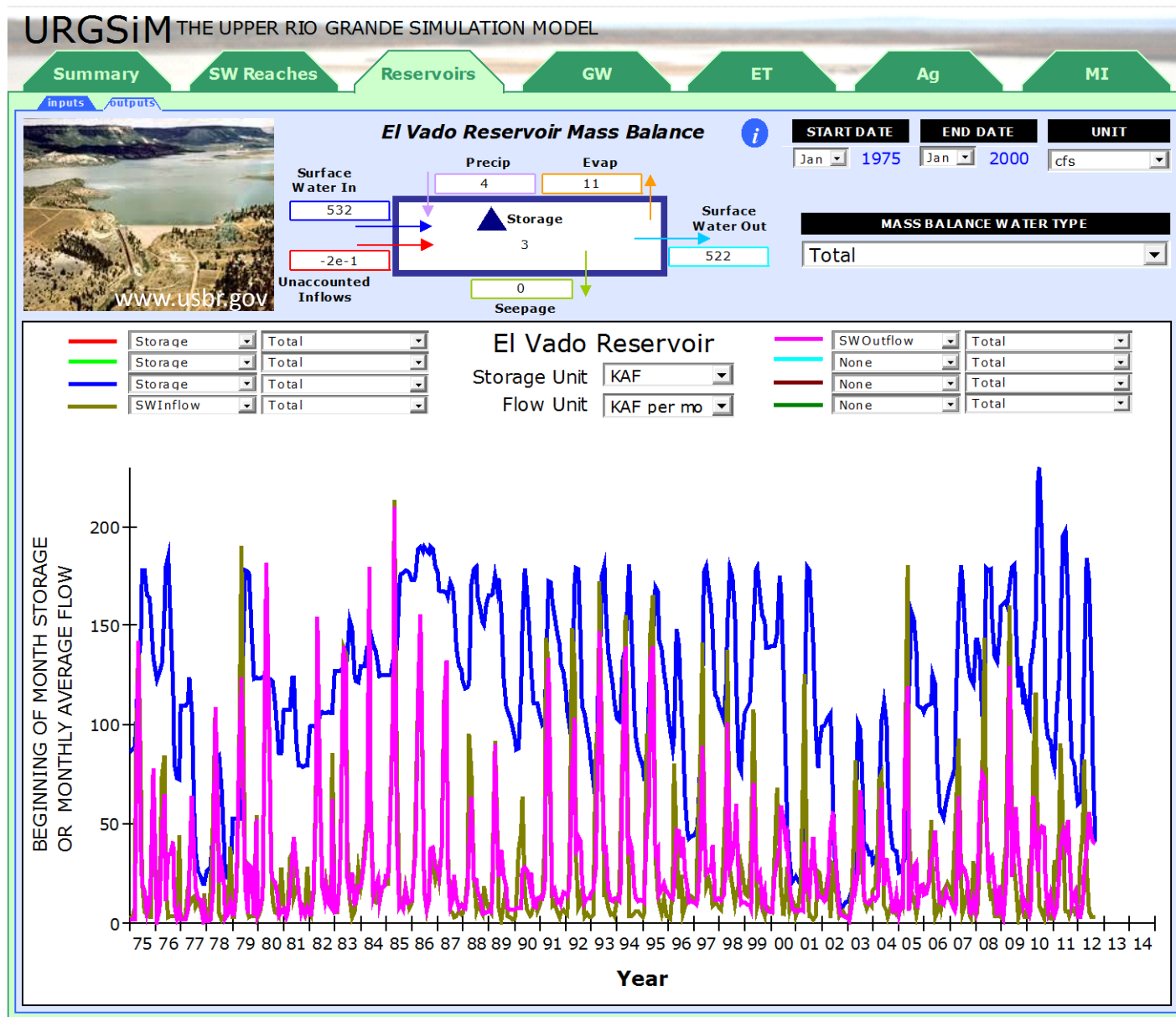
Terms:

- Storage
- SW In
- Precip
- Evap
- SW Out
- Seepage
- Unaccounted
- Storage Change

Accounts:

❖ Total

- Native
 - 0 MRGCD
 - 0 P and P
 - 0 Em. Drought
- SJC
 - 0 ABCWUA
 - 0 MRGCD
 - 0 Cochiti Rec
 - 0 Santa Fe
 - 0 Other
 - 0 BoR leased



GW Mass Balance & Time Series:

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Regional Groundwater Models

Espanola GW Basin

Albuquerque GW Basin

Socorro GW Basin

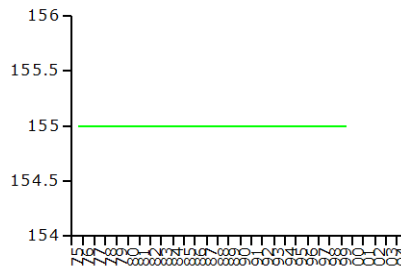
0 12.5 25 Miles

The three major ground water basins represented in URGSIM are shown in the map at left. Graphs corresponding to each of these basins, and the more simply treated areas above Espanola are shown below. Use the dropdowns for unit and terms to modify the graphs. Clicking on any individual basin (map) or its corresponding graph will take you to more detailed mass balance information for that basin.

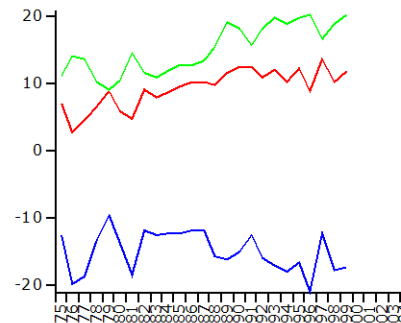
Unit:

- ☒ Total GW Basin Recharge
- ☒ Total GW Basin Discharge
- ☒ Total GW Storage Change

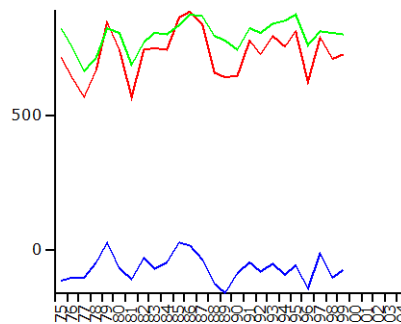
GW Discharge to Rivers Above Espanola (Recharge & storage change are not modeled.)



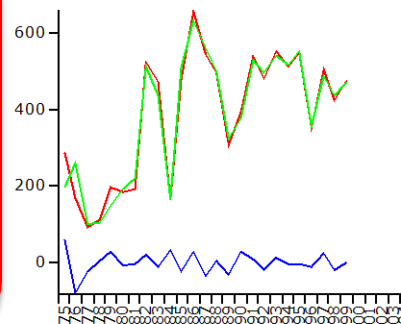
Espanola GW Basin



Albuquerque GW Basin



Socorro GW Basin



GW Mass Balance & Time Series:

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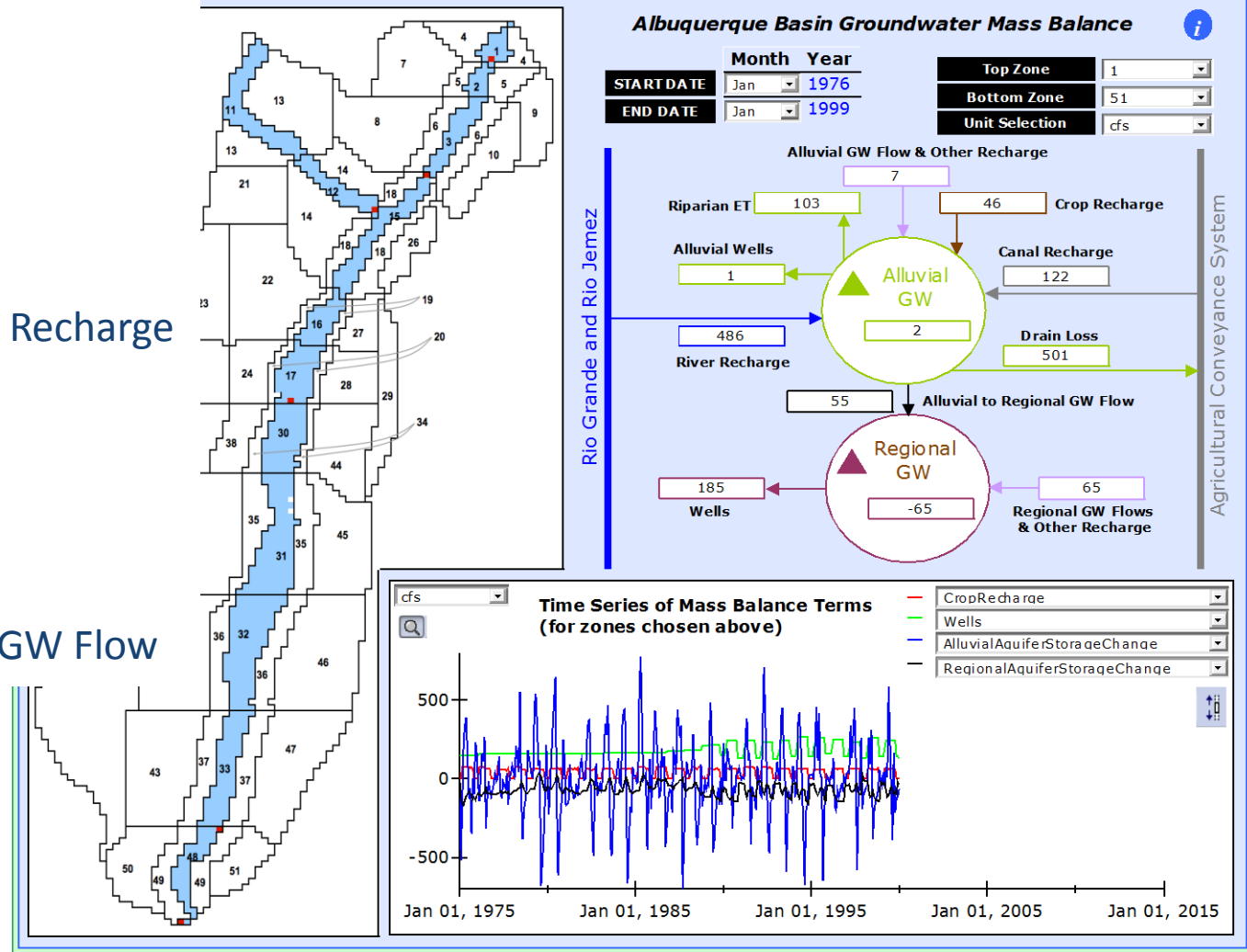
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MI

Tracked Terms:

- River Recharge
- Crop Recharge
- Canal Recharge
- Drain Loss
- Riparian ET
- GW Flow & "Other" Recharge (alluvial & regional)
- Wells (alluvial & regional)
- Storage Change (alluvial & regional)
- Alluvial to Regional GW Flow



ET (Weather Data) Tab:

Vegetation:

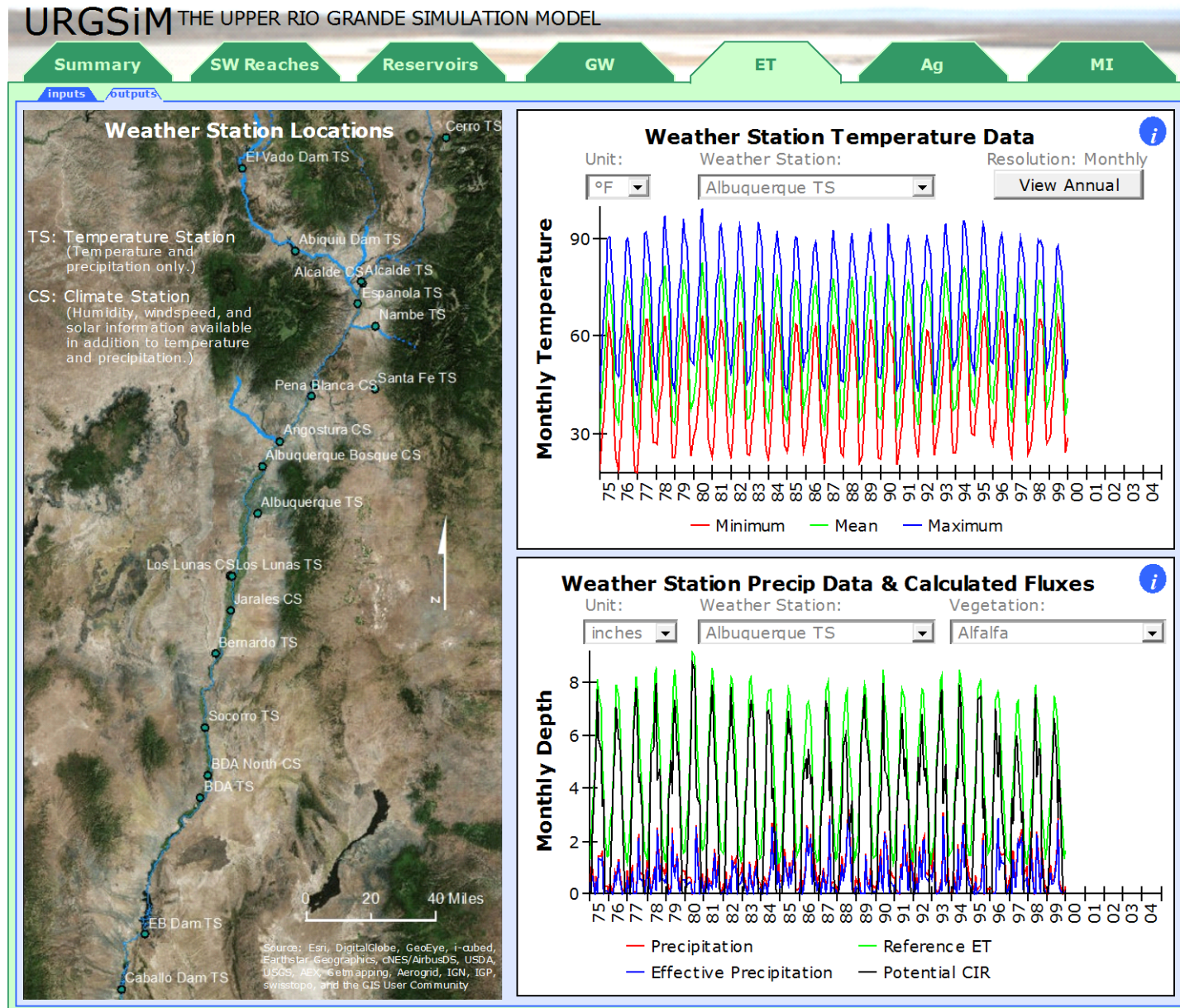
- Alfalfa
- Pasture Grass
- Grains
- Fruits & Vegetables
- Riparian

Temperature Units:

- °F
- °C

Depth Units:

- inches
- feet
- cm
- meters

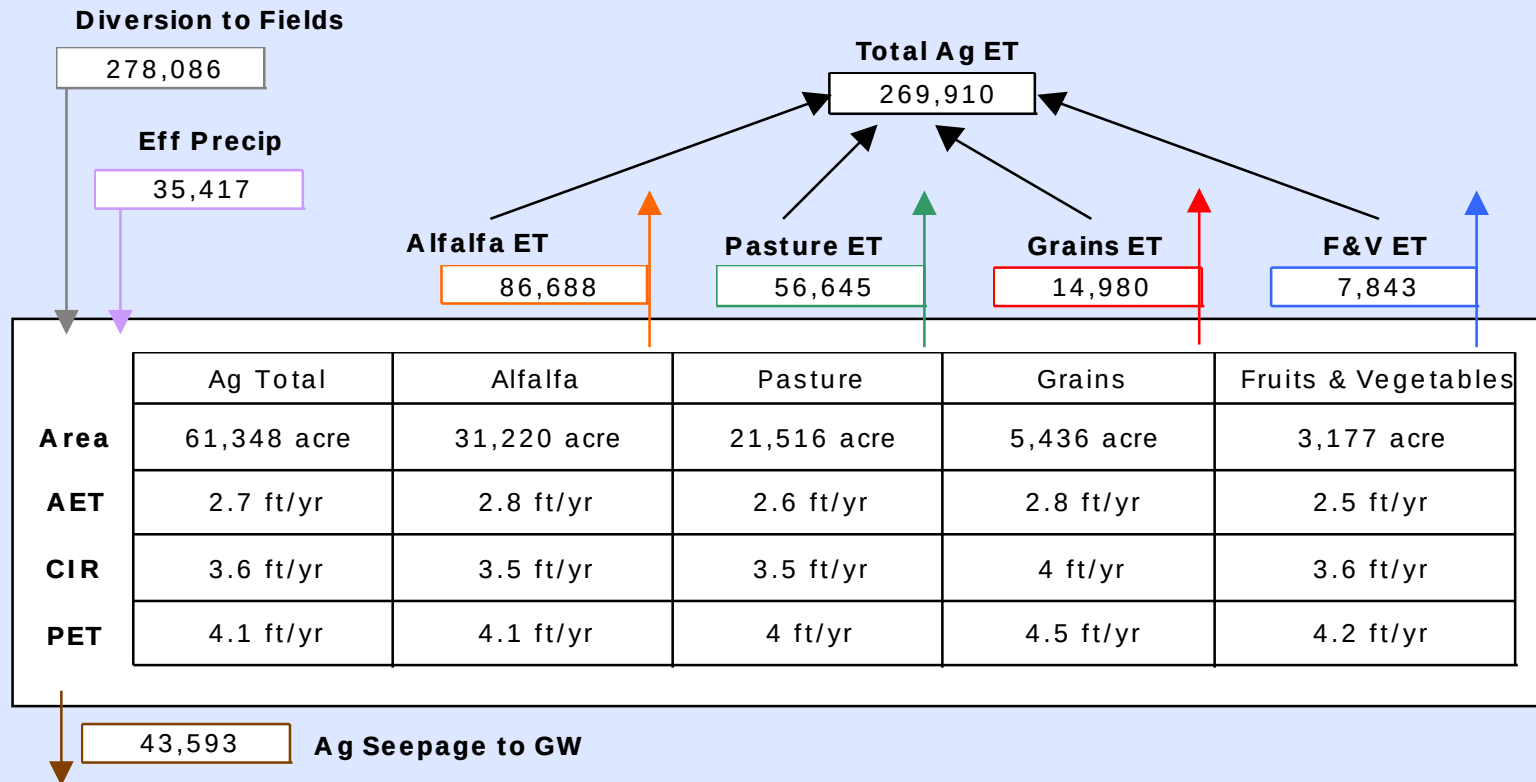


Agricultural Mass Balance



Upper Reach
START DATE
Unit Selection

Lower Reach
END DATE



Average Riparian ET Information for Same Time & Area For Comparison Purposes

Potential ET (PET) as Depth	Actual ET (AET) as Depth	Area	Riparian ET as Volume (Selected Unit)
3.9 ft/yr	2 ft/yr	50,767 acre	101,927

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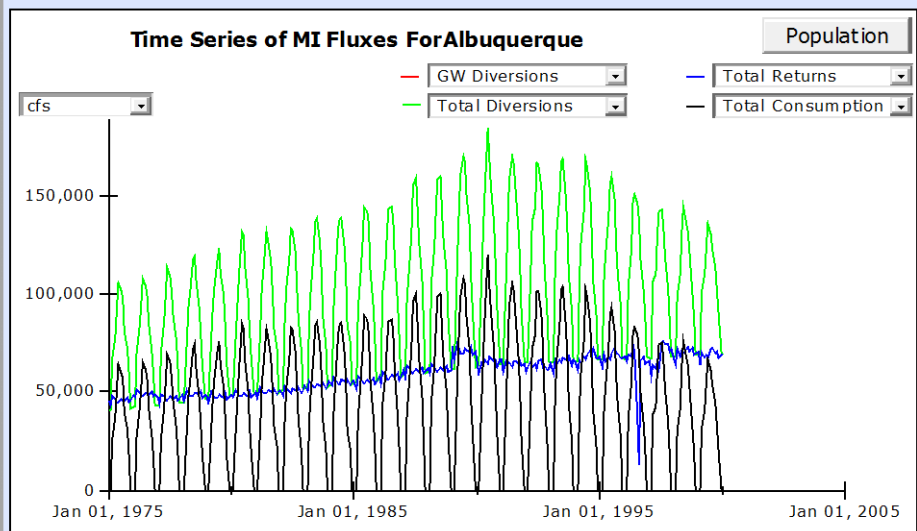
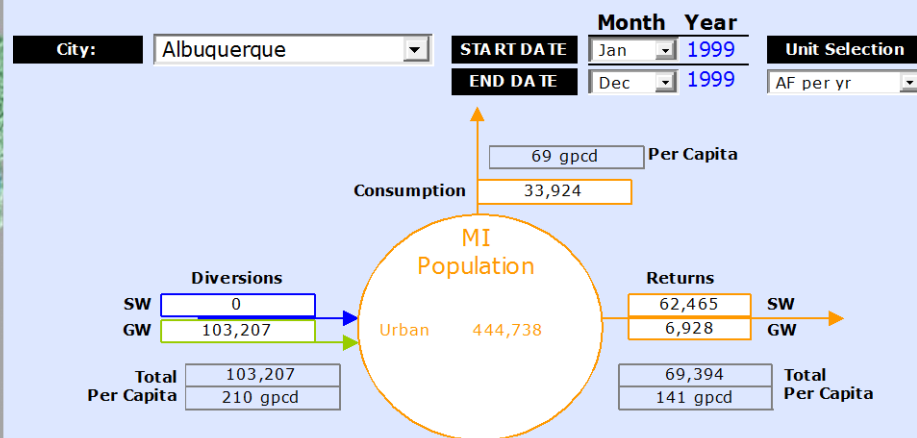
Inputs

Outputs



Period Averaged City MI Use

Reach Based



Drop Downs:

Cities:

- Espanola
- Los Alamos (county)
- Santa Fe
- Bernalillo
- Rio Rancho
- Albuquerque
- Los Lunas
- Belen
- Socorro
- T or C

Flow Units:

- cfs
- AF per mo
- KAF per mo
- AF per year
- KAF per year
- MGD