Climate Change Scenarios for Surface water Groundwater Model

WWBIFES Steering Committee Meeting
February 9th, 2017
Model Overview

- Integrated Water Flow Model (IWFM)
  - Developed by CA DWR
- Surface water/Groundwater numerical model
Climate Change Scenarios

• WWBIFES Task 2 – Develop Climate Change Scenarios for SW/GW Model

• Modelers used data from Climate Impact Group (UW) for model predictions

• Found water years with similar trends to the CIG data and used those years to develop the model datasets.

• Temperature, precipitation, model boundaries were modified however crop type, diversion rates, aquifer recharge were not changed.
Climate Change Scenarios

**Precipitation**

- **Monthly Precipitation (in.)**
- **Cumulative Precipitation (in.)**

**Milton-Freewater Temperature**

- **Monthly Average Temperature (°F)**
- **Variation from 1928-2016 Mean Temperature (°F)**

**Graphs showing precipitation and temperature trends for different years and scenarios.**

- **WY 2016**
- **WY 2003**
- **Baseline**
Climate Change Scenarios

Compared agricultural water demand use

Model area ET

Agricultural Water Demand

Total Applied Water

WY 2003  WY 2016  Baseline
Predicted agricultural water use budget for model area

Baseline

Water Year 2016

Water Year 2003
Climate Change Scenarios

Groundwater Storage

Groundwater Budget

Net deep percolation
Gain from stream seepage
Recharge from Ag land
Gain from MAR
Boundary inflow
Pumping
Climate Change Scenarios

Model area groundwater discharge to streams

Acre-feet/day

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

WY 2016
WY 2003
Baseline
Climate Change Scenarios

Predicted flow at Walla Walla River gauge locations

Daily Average Streamflow (cfs)

- Nursery Bridge
- Pepper Bridge
- Beet rd.
- McDonald Bridge
- Touchet R

- WY 2016
- WY 2003
- Baseline Model
Climate Change Scenarios

Predicted change in tributary flow from baseline scenario

Little Mud Creek

Pine Creek

Walsh Creek

W Branch Big Spring