

# WRWC Modeling Update

October 29th, 2020  
Kendra Kaiser

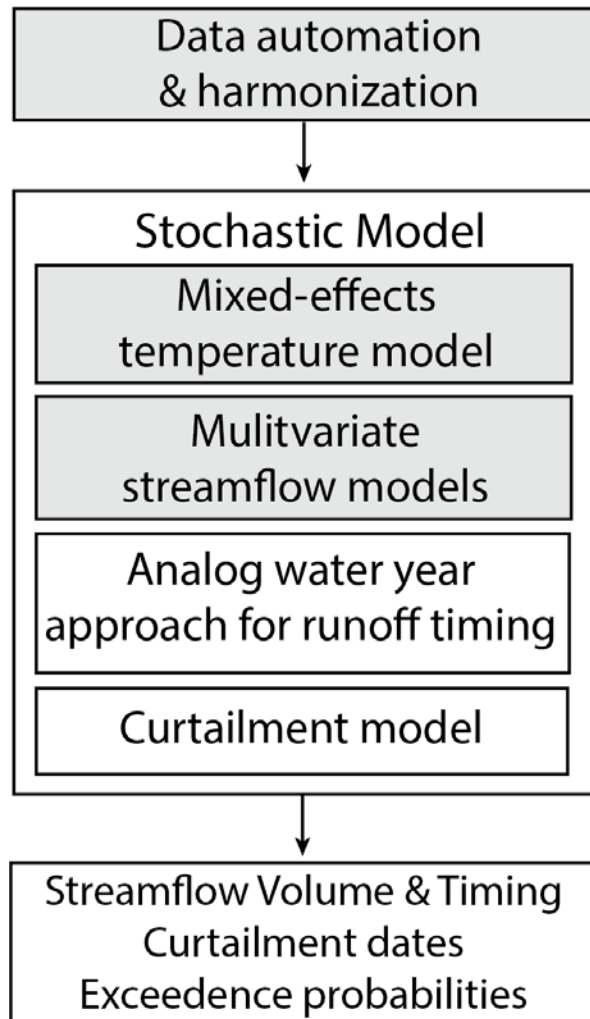


**BOISE STATE  
UNIVERSITY**

# Modeling Objectives

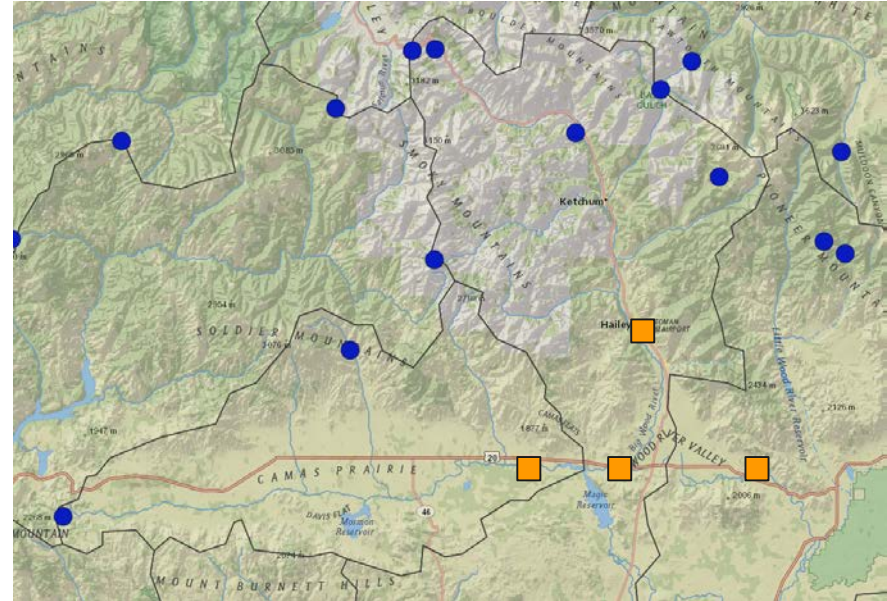
- Predict Streamflow at the following gages:
  - Big Wood River @ Bullion Bridge (Hailey)
  - Big Wood River @ Stanton Crossing
  - Camas Creek
  - Silver Creek
- This entails predicting the following:
  - Temperature
  - Total Streamflow volume April - September
  - Streamflow timing
- Predict Curtailment dates for the following priority dates
  - March 24, 1883
  - October 14, 1884
  - June 1, 1886

# Modeling Workflow



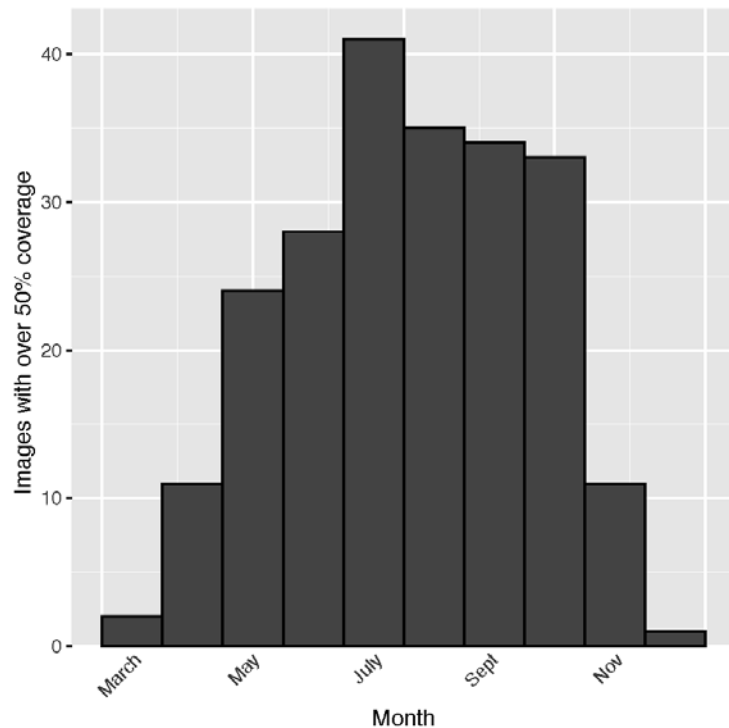
# Automated Data Retrieval & Processing

- USGS ■
  - Big Wood at Hailey, Big Wood at Stanton, Camas Creek, Silver Creek
- Snotel ●
  - 10 sites
- Agrimet
  - Fairfield and Picabo
- Data is restructured and synthesized for modeling tasks



# Exploration of Snow Covered Extent Data

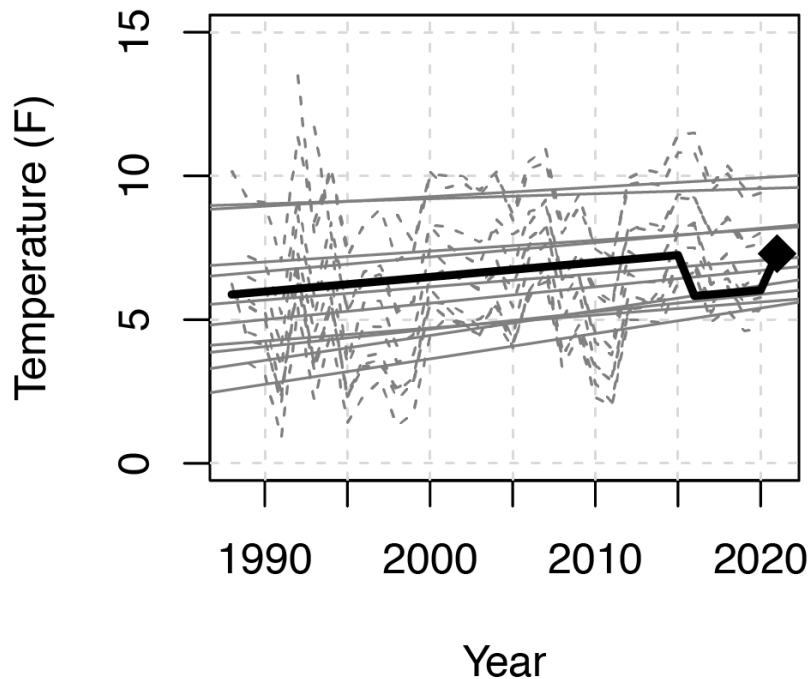
- Automated data retrieval of Landsat imagery for entire basin from 1984-2013 using Google Earth Engine
- Take homes:
  - Winter months have very few images that are at least 50% cloud-free
  - Additional modeling would need to be done to relate SCE to watershed water availability and /or snow melt patterns



# Temperature Model

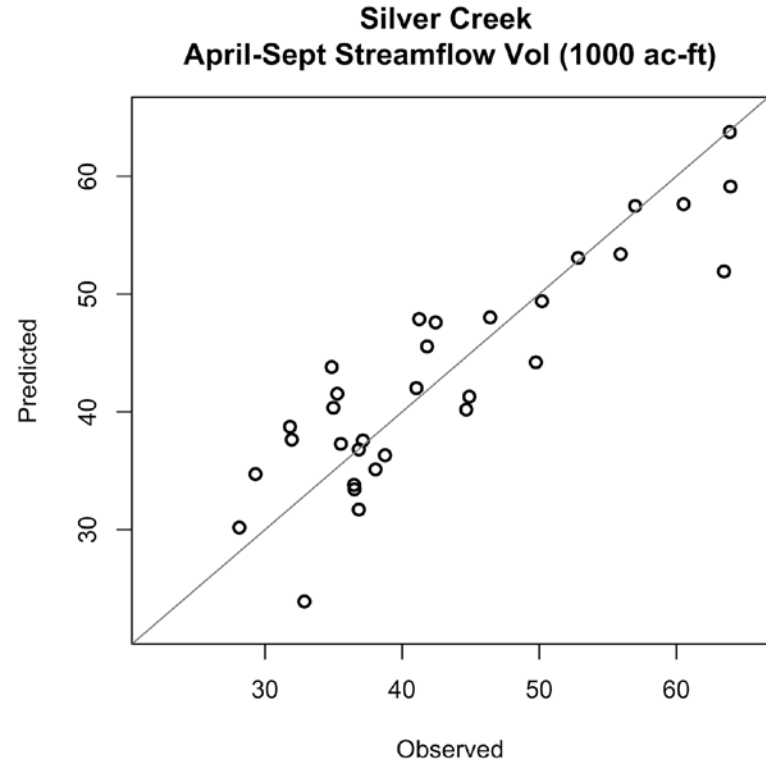
- Uses temperature data from each Snotel site
- Individual temperature models may be used for sub-basins
- Results will be used in the streamflow timing model

**Mean April–June Temperature**



# Streamflow Volume Model Fits

Subwatershed	R2 (fit)
<b>Big Wood Hailey</b>	0.838
<b>Big Wood Stanton</b>	0.805
<b>Camas Creek</b>	0.924
<b>Silver Creek</b>	0.765



# Streamflow Timing Models

- Multiple ways to evaluate timing of streamflow
  - Peak flow : peak / x # days
  - Percentage of flow: date at which x% of flow has left the system
  - Center of mass: date at which half of the streamflow volume has gone through the system
- Starting with center of mass for statistical properties

Subwatershed	R2 (fit)
<b>Big Wood Hailey</b>	0.944
<b>Big Wood Stanton</b>	0.915
<b>Camas Creek</b>	0.393
<b>Silver Creek</b>	0.135



# Model Run Report

- Will automatically plot summary statistics and modeling results
- Your input will be really valuable here!

## WRWC Model Run

Kendra Kaiser

10/28/2020

## Wood River Model Summary

The WRWC Modeling Suite predicts spring air temperatures, total summer runoff volumes, "center of mass", and timing of delivery calls in the Big Wood River Basin, Camas Creek and Silver Creek (Table 1, Figure 1).

## Data Inputs

USGS Sites

	station_nm	huc_cd	begin_date	end_date	abv
1	BIG WOOD RIVER AT HAILEY ID TOTAL FLOW	17040219	2006-10-01	2020-10-21	bwb
2	BIG WOOD RIVER AT STANTON CROSSING NR BELLEVUE ID	17040219	1996-09-18	2020-10-21	bws
3	CAMAS CREEK NR BLAINE ID	17040220	1987-08-17	2020-10-21	cc
5	SILVER CREEK AT SPORTSMAN ACCESS NR PICABO ID	17040221	1987-08-18	2020-10-21	sc

# Next Steps

- Fine-tuning streamflow models
  - Add new diversion data
  - Add February and March SWE
- Create model predictions
- Create curtailment model
- Continue development of model run report
- Development of model training materials

