AGU FALL MEETING
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Groundwater-Surface Water Exchange in Agro-Urban River Basins as Impacted by Climate Change

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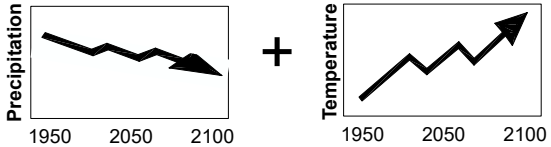
Challenges

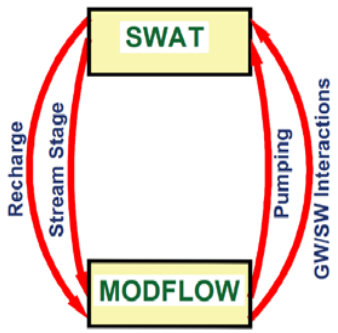
- Necessity of considering the surface water and groundwater as a holistic system.
- Necessity of applying the model at a large scale (>1000 km^2)

The developed model is tested in South Platte River basin (SPRB), Colorado and can be used in similar large agro-urban river basins across the world.

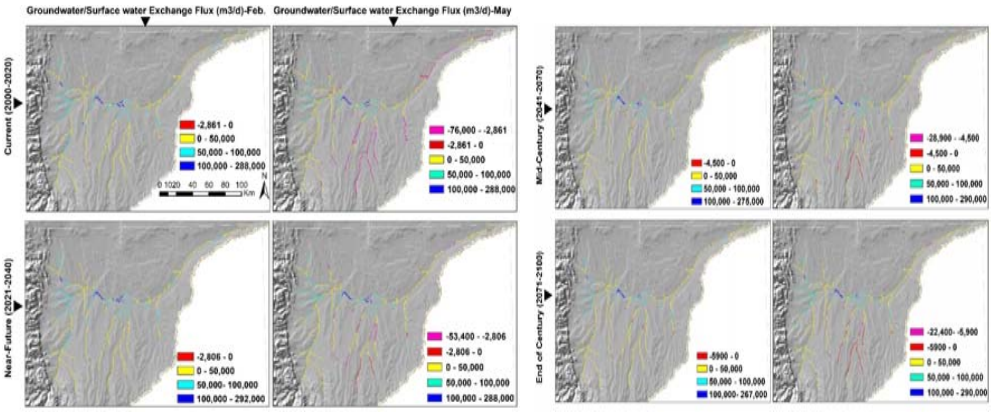
Solutions

- A hydrological modeling tool is developed (entitled SWAT-MODFLOW) that integrates groundwater (GW) and surface water (SW) in large-scale regions with urban, agricultural and industrial water demand.
- This explicit approach considers various interactions between water resources, climate, irrigation, crop yield, and human activities. All major water transfer pathways are included in the model.
- Addressing the basin-wide impacts of climate change on water availability and agricultural productivity under the worst climate conditions.





Results



Positive values show the volume of water entering the stream from the aquifer, and the negative values indicate the volume seeps from the stream to the aquifer.

		Stream Seepage (m^3/d)	Groundwater Discharge (m^3/d)
Feb.	2000-2020	**-634**	**38600**
	2021-2040	**-580**	**39300**
	2041-2070	**-1070**	**36700**
	2071-2100	**-1470**	**35200**
May	2000-2020	**-16600**	**39400**
	2021-2040	**-12300**	**40100**
	2041-2070	**-6930**	**40400**
	2071-2100	**-5320**	**39600**

Audience

- Water managers, who quantify the total available water supply in large agro-urban river basins;
- Environmental managers, who assess the risk of surface water contamination, which might be transferred by groundwater;

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