REMOTE SENSING AND DEMAND MANAGEMENT

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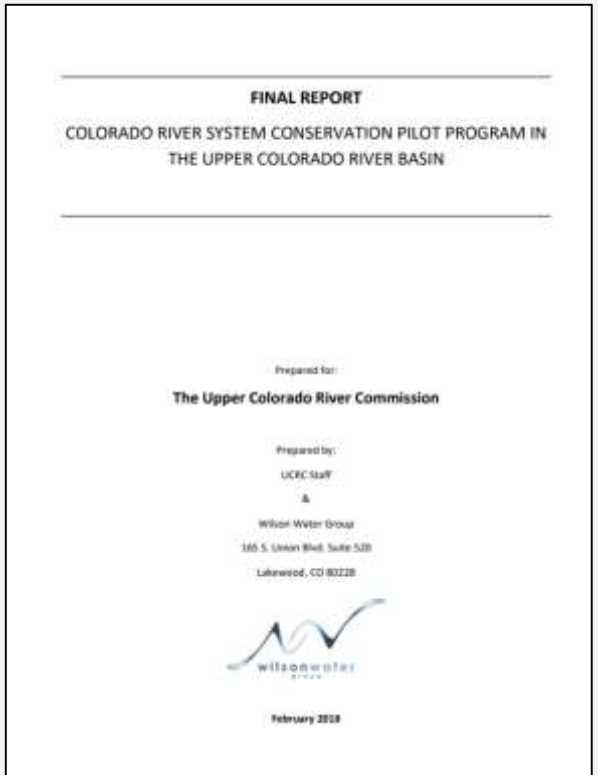
CHALLENGES IDENTIFIED IN SCPP

1. Methods to estimate consumptive use are constrained by data available in each state
2. Most of the Upper Colorado River Basin is supply limited
3. Accounting for moisture stored in the soil in consumptive use estimates



FINAL REPORT

COLORADO RIVER SYSTEM CONSERVATION PILOT PROGRAM IN THE UPPER COLORADO RIVER BASIN

Prepared for:

The Upper Colorado River Commission

Prepared by:

UCRC Staff

&

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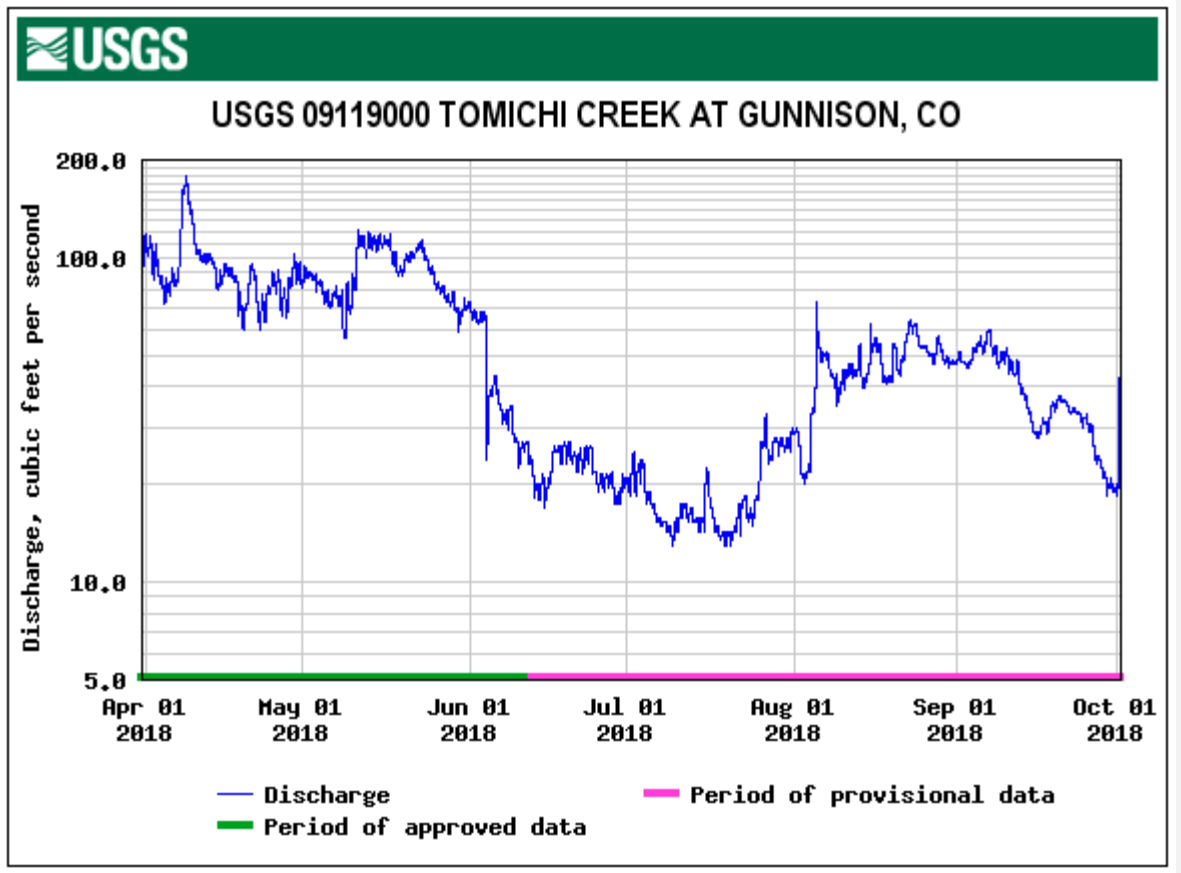
DATA AVAILABILITY

- Diversions are not generally measured in Utah
- Roughly 35% of diversions are measured in Wyoming
- Colorado generally measures diversions, but they do not typically have telemetry
- Can typically assume that New Mexico can get a full supply off the mainstem San Juan
- Without diversion records how do we determine supply limitations for consumptive use?

WATER SUPPLY LIMITATIONS

- Without diversion records how do we account for supply limitations?
  - Reclamation's Indicator Gage Method
  - Rely on Water Commissioners for rough approximations of shortages that occurred

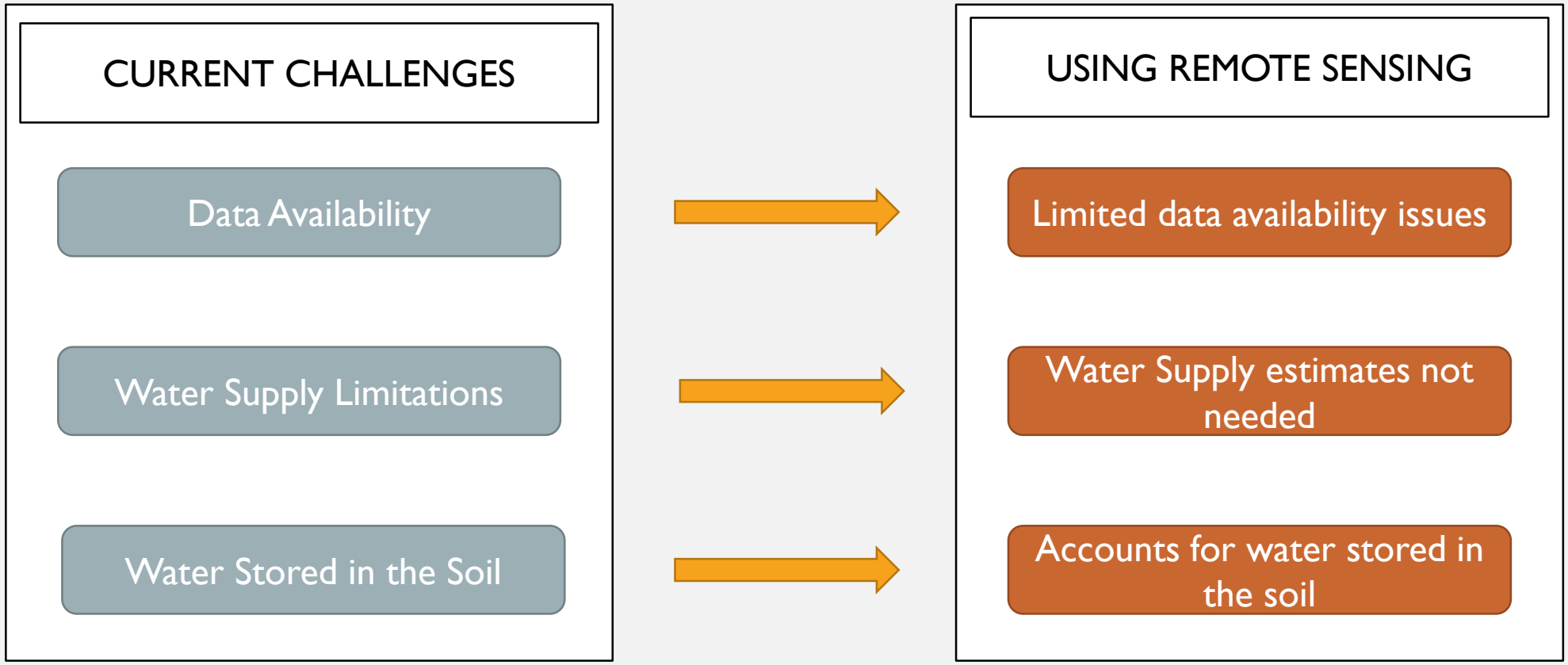


WATER STORED IN THE SOIL

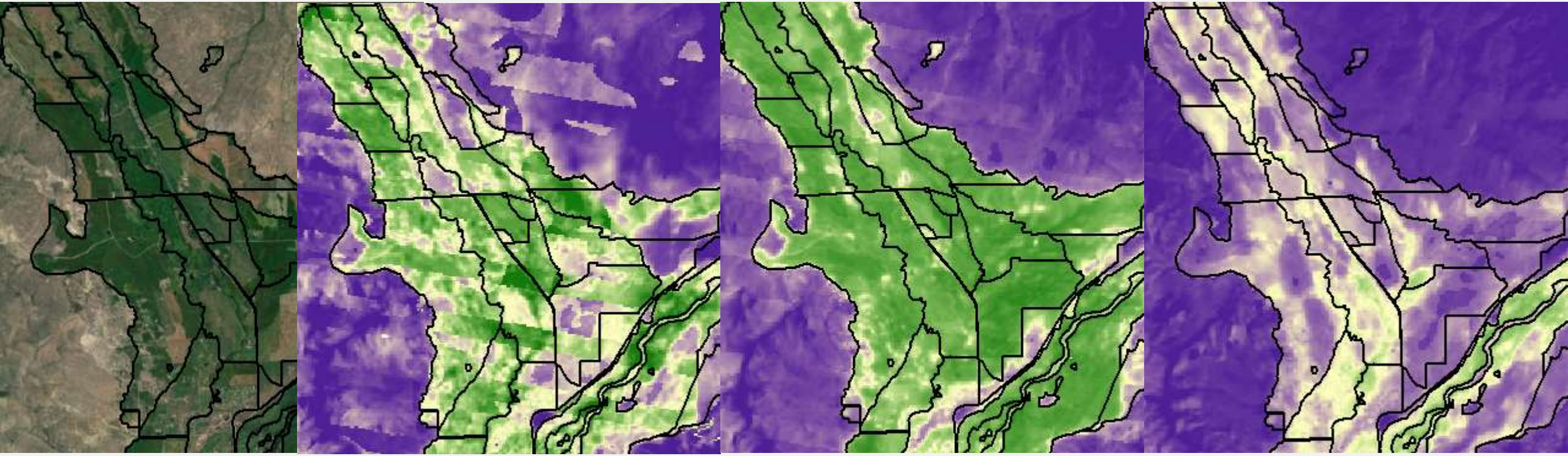
- SCPP CU estimates assumed that when irrigation stopped, there was no water stored in the soil zone for the crops to continue consuming
- Either diversion records are required to estimate soil moisture or soil moisture sensors must be installed to measure soil moisture

USING REMOTE SENSING TO CALCULATE CU

- Landsat Satellite Imagery can be used to calculate crop CU
- Remote Sensing models estimate how much water the crop is **actually** using



METRIC EXAMPLE



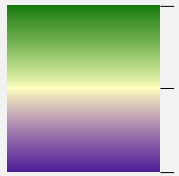
AERIAL IMAGERY

MAY 2017

JULY 2017

SEPTEMBER 2017

The brighter the green, the higher the CU
The darker the purple, the closer to zero CU



High CU

Zero CU

REMOTE SENSING IN THE FUTURE

- CU determined from Remote Sensing may become cheaper and more readily available in the future
- **Open ET** is a project working on providing low cost and easily accessible ET data for improved water management.
  - Models provided on OPEN ET will include METRIC, SSEBop, and SEBAL and will be run on the Google Earth Engine platform (https://etdata.org/)
- SSEBop, developed by the USGS, could be made freely available in the future