

## Moving Toward Sustainable Groundwater Use in Colorado – A Look at 3 Basins

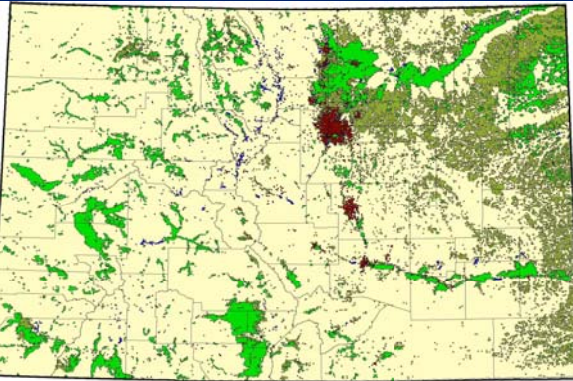
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## Colorado Groundwater

- 85% of groundwater withdrawals are for agriculture
- 18% of population relies on groundwater – sole source for most
- DWR issues ~ 5,000 well permits per year (70% domestic)
- Groundwater represents approx. 17% of all water diverted in CO
- Over-appropriated basins / junior groundwater users



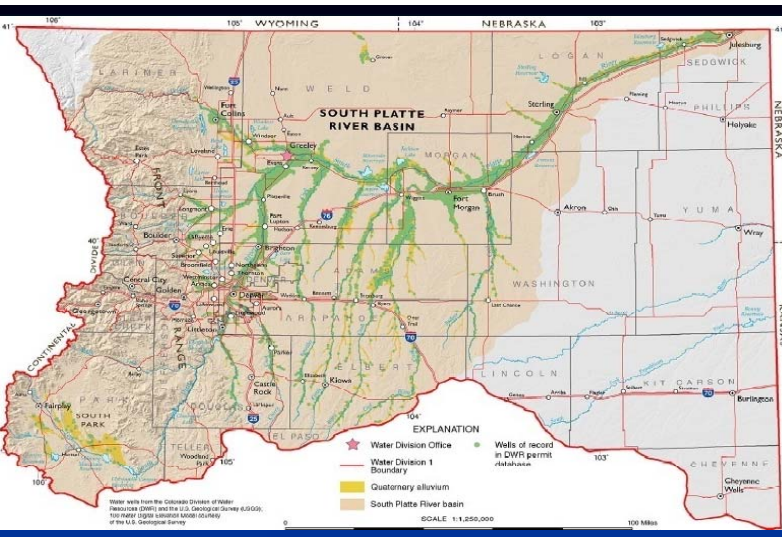
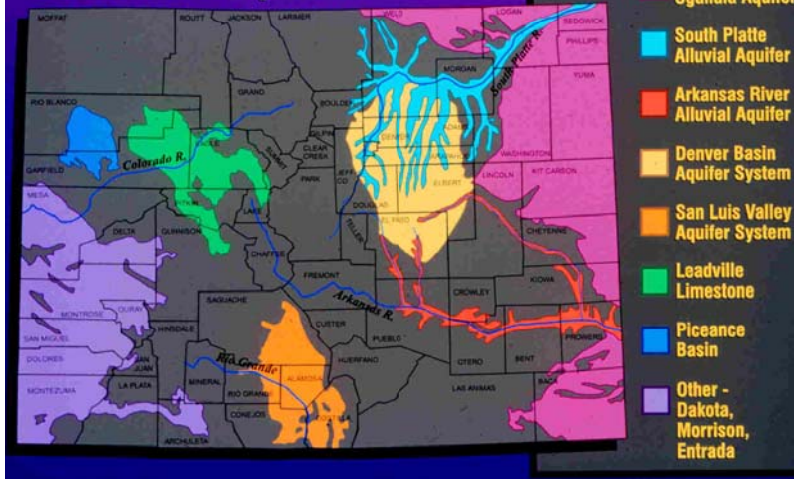
## Colorado Agricultural Lands



Reclassified NLCD Land Use with Irrigation

- Water/ice
- Natural
- Urban
- Cultivated
- Irrigated Crops

## Colorado Aquifers



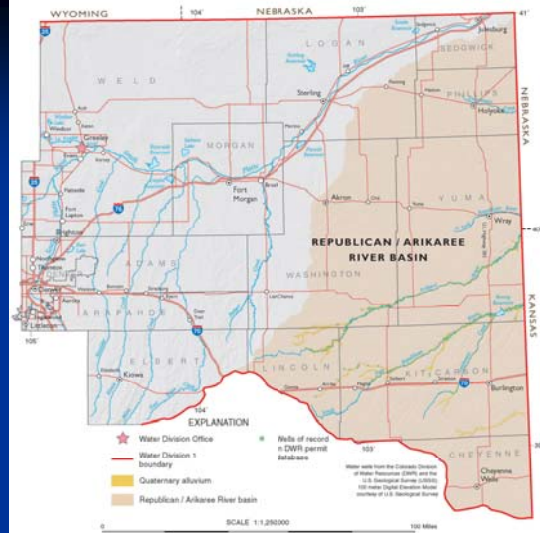
## South Platte Alluvial Groundwater

- 7,400 high capacity irrigation wells permitted
- 4,000 wells operating with decreed augmentation plans
- Supreme Ct case in 2000 and ensuing drought resulted in:
  - Over 1,000 wells operating at greatly reduced capacity
  - 1,200 wells completely curtailed



## S. Platte today...

- Non-exempt well owners must procure surface water to augment out of priority depletions
- Augmentation plans must be approved by Water Court
- Wells in new augmentation plans on strict metering and allocation
- Individual producers and management organizations divert water when river is “free” to recharge pits for augmentation credits
- New Cooperative forming to market excess augmentation credits

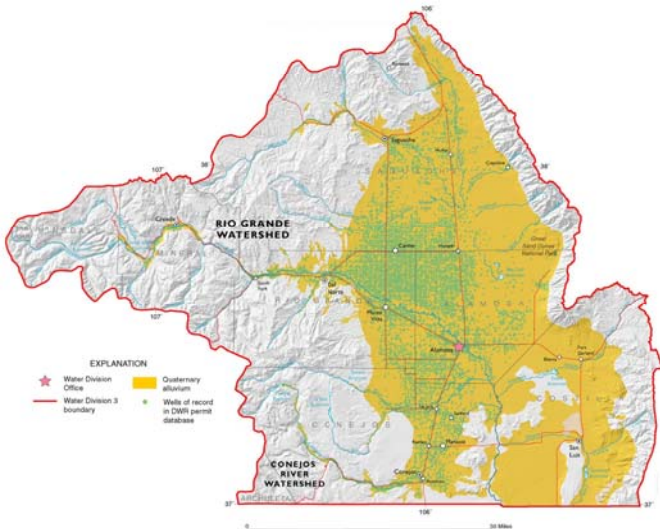


## Republican River Basin

- 1998 Kansas claimed Nebraska had violated the Republican River Compact by well development
- 570,000 irrigated acres (500,000 irrigated with groundwater)
- Special Master ruled Compact violated through pumping Ogallala

## Republican River Basin Today...

- Formed RRWCD with authority to assess a per irrigated acre fee to fund solutions
- Purchased all available surface water rights
- Republican River CREP may retire up to 60,000 acres irrigated land (target within 3 miles of river)
- 11,000 irrigated acres retired through EQIP
- RRWCD proposed pipeline to put “wet” water in river to meet compact compliance



## San Luis Valley / Rio Grande

- 600,000+ irrigated acres in the SLV
- Over-appropriation of groundwater apparent after 2002 drought with over one million AF depletion to unconfined aquifer
- Local action preferred to regulation by State Engineer



## San Luis Valley Unconfined Aquifer Today...

- ◆ Formed groundwater management subdistrict of the RGWCD.
- ◆ Passed act requiring meters and rules for “sustainable” use of the aquifer
- ◆ Rules process to create a “management zone” at top of aquifer based upon monitoring and definition of sustainability; Implement an irrigation season.
- ◆ Plan to use CREP and other local mechanisms to temporarily remove 40,000 irrigated acres from production

## Producer Responses to Reduced Groundwater Availability

- ✓ Rotational and split cropping with dryland crops or fallow;
- ✓ Limited irrigation; Partial season irrigation
- ✓ Shift to sunflowers, sorghum, wheat, forage crops
- ✓ Higher level of scheduling and water management
- ✓ Reduced tillage; Re-nozzle and remove pivot end guns
- ✓ Use of EQIP and other federal farm programs

Solutions needed to overcome current policy/decision making challenges

- Real-time pumping and aquifer level monitoring needed to inform decision support systems
- Better accounting methods for streamflow depletions caused by pumping
- Basin-scale institutions for flexible conjunctive management of surface and groundwater

[Agwaterconservation.colostate.edu/](http://Agwaterconservation.colostate.edu/)

### AGRICULTURAL WATER CONSERVATION CLEARINGHOUSE

**PROJECT GOALS**

- INCREASE access to information helping to build collaborative relationships between and among agencies region and nation-wide
- PROVIDE technical expertise regarding agricultural water conservation
- CIRCULATE materials on the management, policies, and laws surrounding agricultural water conservation

**WHAT IS AG WATER CONSERVATION?**

- Increased crop water use efficiency
- Improved irrigation application efficiency
- Increased capture and utilization of precipitation
- Decreased crop consumptive use
- Increased irrigation water diversion and delivery efficiencies
- Reduced water use through adoption of conservation measures and new technologies for water management

**WHAT'S NEW:**

**REPORTS:**

REPORT: Meeting Colorado's Future Water Supply Needs  
September 2008  
Colorado Agricultural Water Alliance [ + ]

**EVENTS:**

EVENT: 24th Annual WaterReuse Symposium  
September 13-16, 2009  
Seattle, Washington  
Water ReUse Association [ + ]

**ANNOUNCEMENTS:**

ANNCHMT: The 1st call for papers of the IAALD 2010 Congress [ + ]