

White River Basin

Colorado Decision Support System (CDSS)

CDSS was developed to provide credible information so water users can make timely decisions regarding historical and future management of Colorado's water resources.

CDSS is data-centered around a central database (HydroBase) containing real-time and administrative water resources data.

CDSS tools have been developed to access historical and current data stored in HydroBase for:

- 1) general information such as historical water use changes over time, and
- 2) input to surface water, ground water, and consumptive use models used to investigate both historical water uses and future "what-if" scenarios.

HydroBase, GIS Coverages, and planning tools can be viewed and accessed directly from the CDSS website without the need for special software.



How Does CDSS Help with White Water Resource Management?

HydroBase is used by White River water commissioners to view real-time streamflow and diversion data to assist in administering water rights; and to quality control and store information such as diversion records and reservoir contents.

The CDSS Consumptive Use Model (StateCU) is used to estimate the White Basin portion of Upper Colorado Basin Compact uses as required by the Colorado River Basin Project Act of 1968.

The CDSS Water Resources Planning Model (StateMod) was used to quantify available flow on the White River tributaries for the Statewide Water Supply Initiative (SWSI) Project.

CDSS is sponsored by the Colorado Water Conservation Board and the Colorado Division of Water Resources



<http://cdss.state.co.us/>

Specific CDSS Products

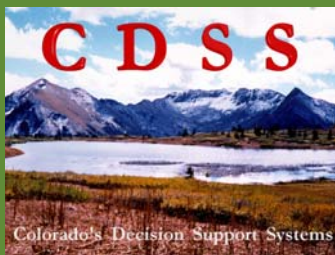
GIS Coverages

- Irrigated acreage coverages with water supply and crop types
- Physical coverages such as hydrology, stream gages, topography, reservoirs, diversions, and soil information
- Administrative coverages such as counties, roads, water districts, and public land survey

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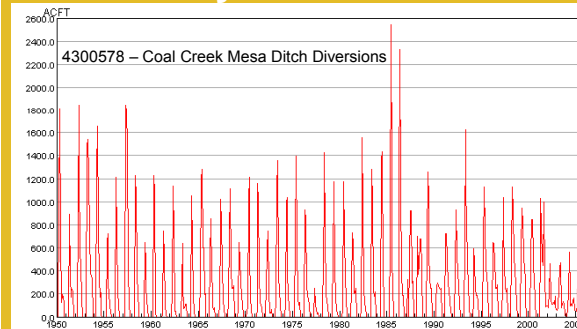


CU & Losses Report and StateCU Model



- Historical consumptive use by use category reported every five years
- Monthly Crop CU by basin, water district, and ditch
- Shortages and efficiency information

HydroBase



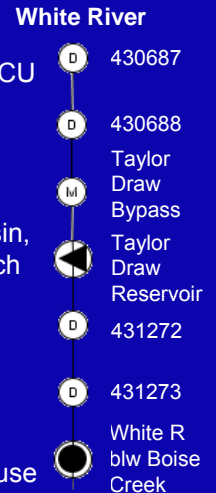
- Real-time streamflow and call data
- Historical data such as streamflows, storage, diversions, climate data, and population data
- Water rights information such as appropriation dates, absolute and conditional decreed rates, uses, and transactions
- StateView Interface with user-friendly query options



The combined CDSS products provide information regarding historical and current water management and tools to investigate future changes in water use

StateMod Water Resources Planning Model

- Represents 100% of basin CU and water rights
- Operates based on prior appropriation doctrine
- Historical depletions by basin, water district, and river reach
- Detailed project operations
- Available flow for future development
- Model to analyze proposed projects, changes in water use



Basin Information Report

- Water Rights for Key Municipal Systems

| Town of Meeker Rights | | |
|-----------------------|-------------------|--------|
| WDID | Adjudication Date | Amount |
| 430810 | 1958-11-26 | 4.00 |
| 430810 | 1958-11-26 | 3.00 |
| 430811 | 1925-08-17 | 3.42 |
| 436045 | 1976-12-31 | 1.22 |
| 436046 | 1976-12-31 | 1.33 |
| 436139 | 1980-12-31 | 1.22 |

- Basin current and potential human and economic factors
- Key diversion structures in the basin and water commissioner meeting notes
- Operations for reservoirs such as Taylor Draw and Big Beaver Creek Reservoirs

Example Questions the CDSS Products Can Address

How many direct flow conditional water rights in the White River basin list Exxon Mobil as owner?

- Query HydroBase (using StateView) for Decreed rate (cond) greater than '0' and Owner Name contains "Exxon" in Water District 43. There are 25 decreed conditional rights totaling 513 cfs .

StateView - Structure Data - Query

Query Options:
Div/Dist: 43 - White River Basin

Where: Decreed rate (cond) Greater than 0
Where: Owner Name Contains Exxon
Where: Matches

Structure Records: 25 records returned in 0.469 seconds

| ID | OWNER | STRUCTURE TYPE | CURRENTLY IN USE | TRANS-BASIN | DECREED RATE ABS (CFS) | DECREED RATE COND (CFS) |
|----|------------------|----------------|------------------|-------------|------------------------|-------------------------|
| 14 | EXXON MOBIL CORP | Headgate | N | | 0.0000 | 1.0000 |
| 15 | EXXON MOBIL CORP | Headgate | N | | 0.0000 | 1.0000 |
| 16 | EXXON MOBIL CORP | Headgate | N | | 0.0000 | 1.0000 |
| 17 | EXXON MOBIL CORP | Headgate | N | | 0.0000 | 1.0000 |

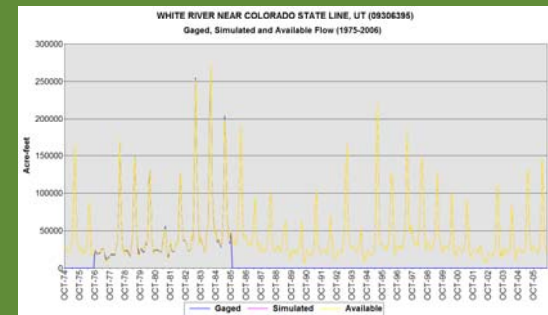
- Exxon Mobile also has 9 conditional storage rights totaling 35,423 acre-feet.

What are the three largest irrigation users in the basin?

- The White River basin crop consumptive use analysis determines consumptive use by diversion structure. Results of the StateCU analysis can be viewed in report, tabular, and graphical formats.
- The Water-Supplied Limited CU Report shows that the following three structures have the highest average annual crop consumptive use for the 1950 through 2006 period:
 - Miller Creek Ditch = 2,709 af/yr
 - Highland Ditch = 2,289 af/yr
 - Oak Ridge Park Ditch = 2,183 af/yr

How much flow leaves the State during a drought year?

- Figures in Section 6 of the Water Resources Planning Model User's Manual show simulated physical flow and available flow at key stream gages for the Baseline dataset.
- There was less than 250,000 af of estimated annual flow at the White River near Colorado State Line in 1977 and 2002, compared to over 900,000 af in 1984.



How much water is available to Exxon Mobile's 1955 conditional storage right for Stillwater Reservoir?



- The nearest structure represented in the StateMod Baseline model (Sweede Ditch) can be determined from the CDSS GIS coverages of diversions and reservoirs.
- The StateMod Baseline model output reports legally available flow at each node. Legally available flow to Sweede Ditch can be used to estimate storable inflow to the proposed Stillwater Reservoir.

What is the impact to existing water rights if these conditional water rights are perfected?

- Estimated demands and associated conditional water rights can be added to the StateMod Baseline dataset. Simulated shortages for existing water rights can be summarized.

StateCU can address questions about crop acreage, demands, shortages, and delivery efficiencies from basin to ditch level

What agreements or policies may affect water development in the basin?

- Section 2.5 of the Basin Information Report, describes the temperature and bypass flow requirements for the endangered Colorado squawfish as outlined in the Environmental Impact Statement and FERC license.

StateMod can provide depletions and available flows by river reach and can answer "what-if" questions about future water development