Colorado's Decision Support Systems

AWSE 87th Annual Meeting

September 28-October 1, 2014

Galveston, Texas

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State Engineer

COLORADO
Division of Water Resources
Department of Natural Resources

Basins	Online Tools	Software Products	Modeling Data	GIS Data	Documents
Arkansas	Call Chronology	StateCU	Consumptive Use (StateCU)	Division 1 South Platte	Basin Reports
Colorado	Streamflow Stations	StateDMI	Surface Water (StateMod)	Division 2 Arkansas	Meeting Materials
Gunnison	Structures (Diversions)	StateMod	Groundwater (MODFLOW)	Division 3 Rio Grande	Modeling Briefs
Rio Grande	Water Rights	StateView	Water Budget (StateWB)	Division 4 Gunnison	Modeling Dataset Documentation
San Juan / Dolores	Map Viewer	StateWB		Division 5 Colorado	Peer Review
South Platte	Ground Water (Water Levels)	TSTool		Division 6 Yampa / White	Publications
Yampa / White		Third Party Software		Division 7 San Juan / Dolores	Reports
	More ...			**More ...**	**More ...**

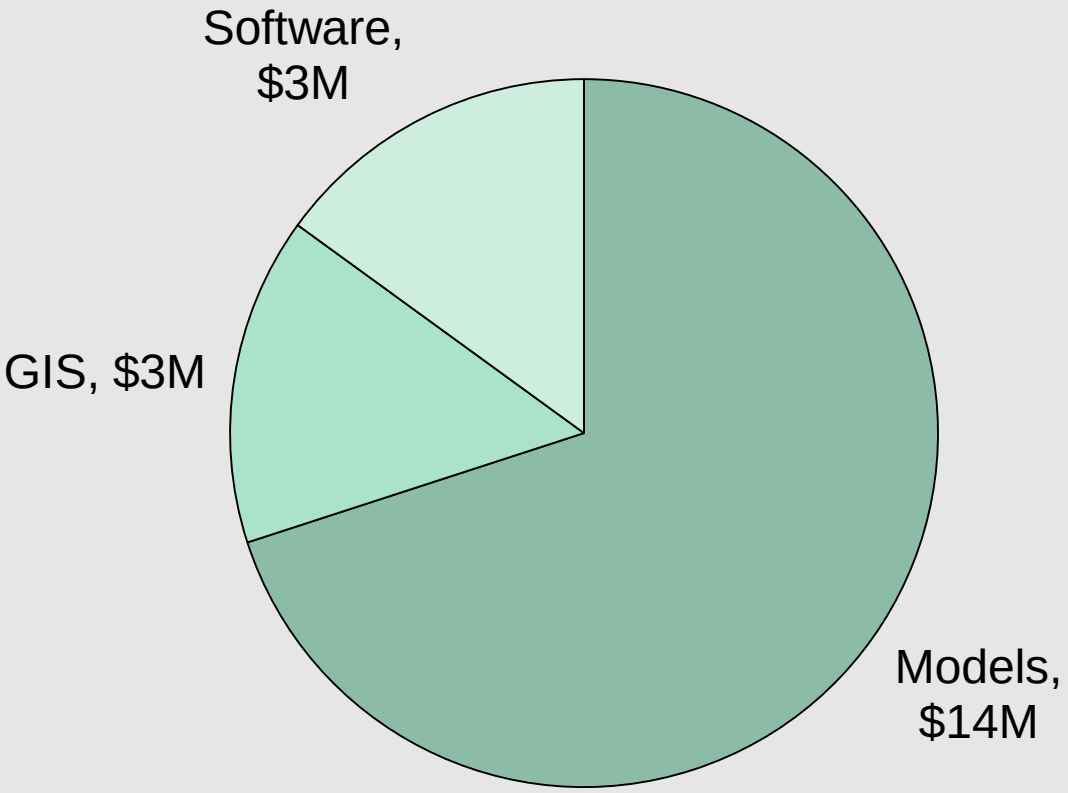
Welcome to Colorado's Decision Support Systems!

Staff Investment

- CWCB (3) – Program Manager, Project Manager, GIS Specialist
- DWR (5) – 4 Engineers/Modelers, GIS Specialist
- OIT (6) – Application Developers

Capital Investment

- About $1M/Yr for 20 years

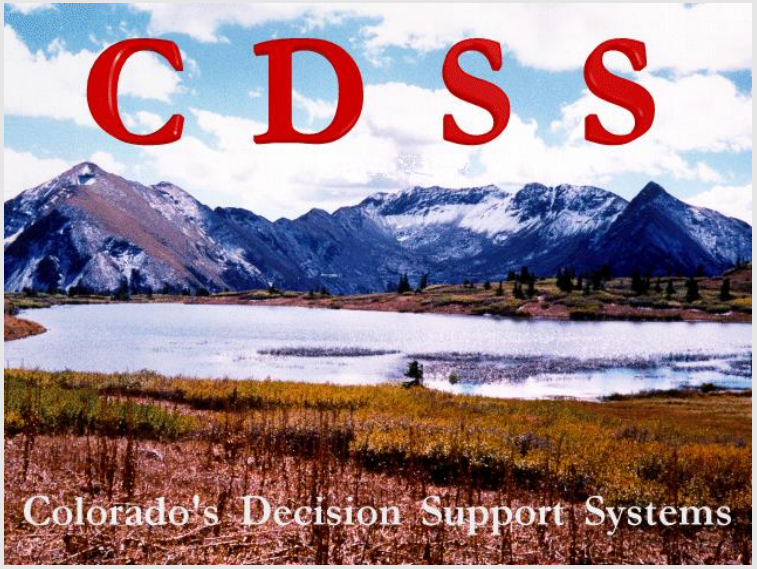


Colorado's Decision Support Systems

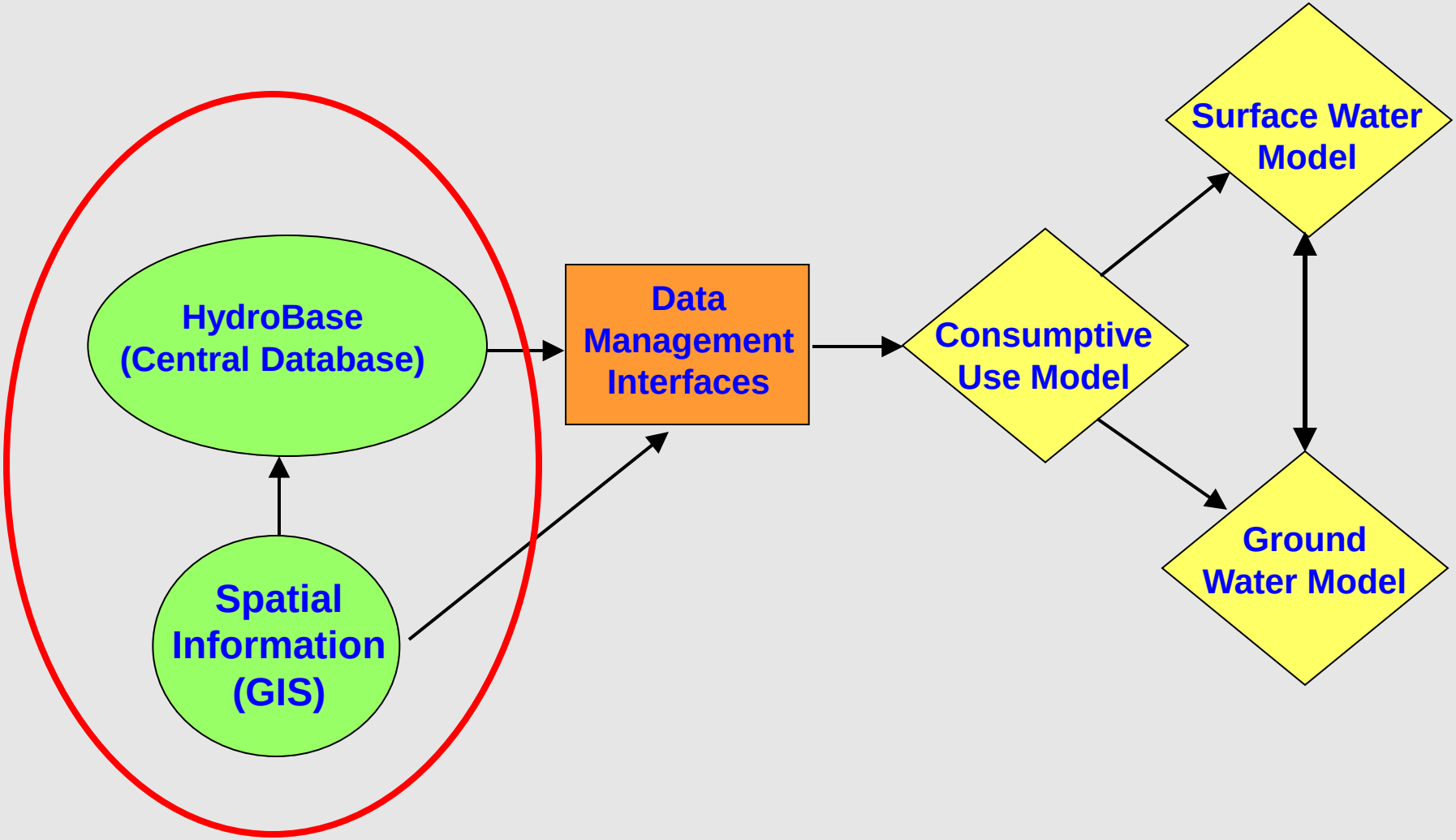
Developed by DWR and CWCB

"A system of Data and Tools developed to assist in making informed decisions regarding historic and future use of water"

- Developed using a phased approach by river basin
- Each basin is unique; the data storage, management, and modeling tools are consistent
- Cooperative Program – Managed by CWCB with technical support from DWR/OIT



Information Management



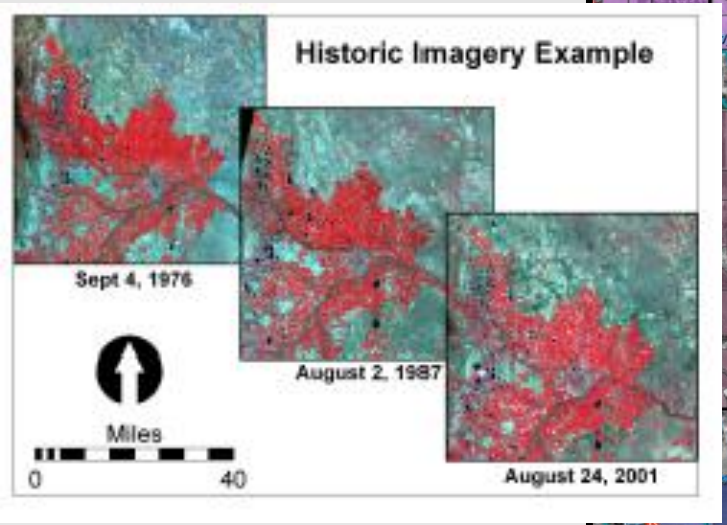
Data Collection and Review

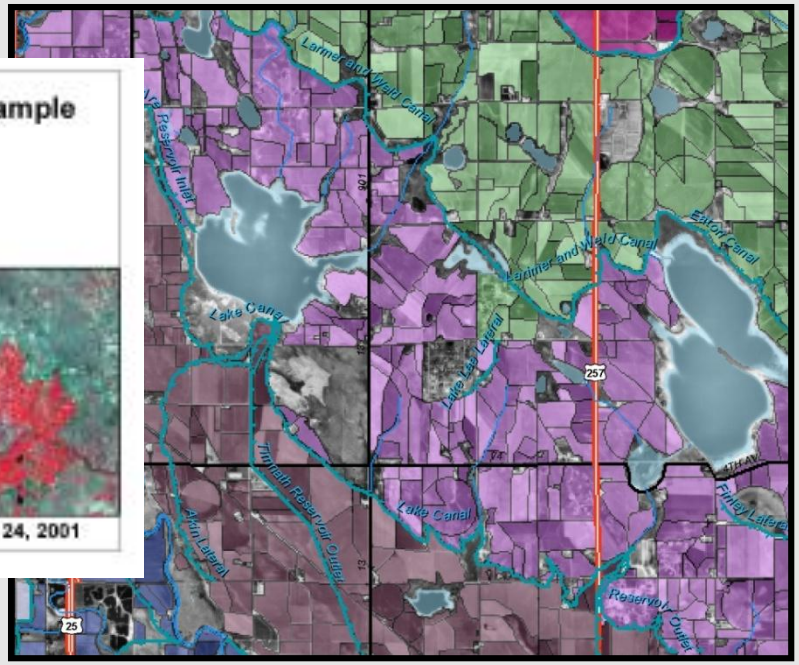
Data Viewing and Format

Modeling Tools

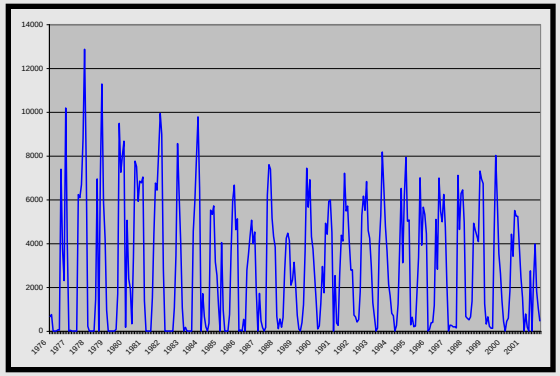
Data Collection and Review

- Historical Crop Acreage and Irrigation Source





- Streamflow Data
- Diversion Records
- Climate Data

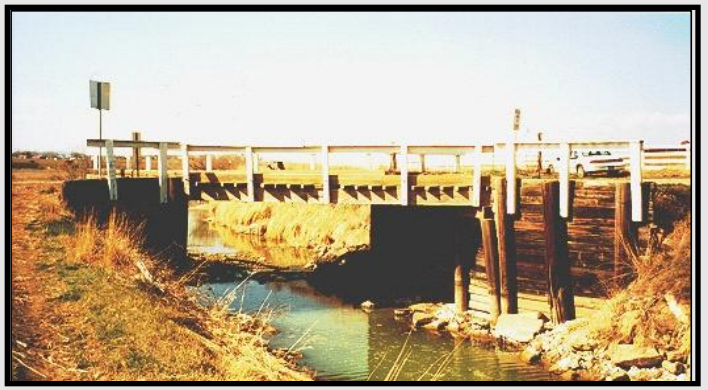


Data Collection and Review

- Irrigation Practices, Use of Supplemental Sources

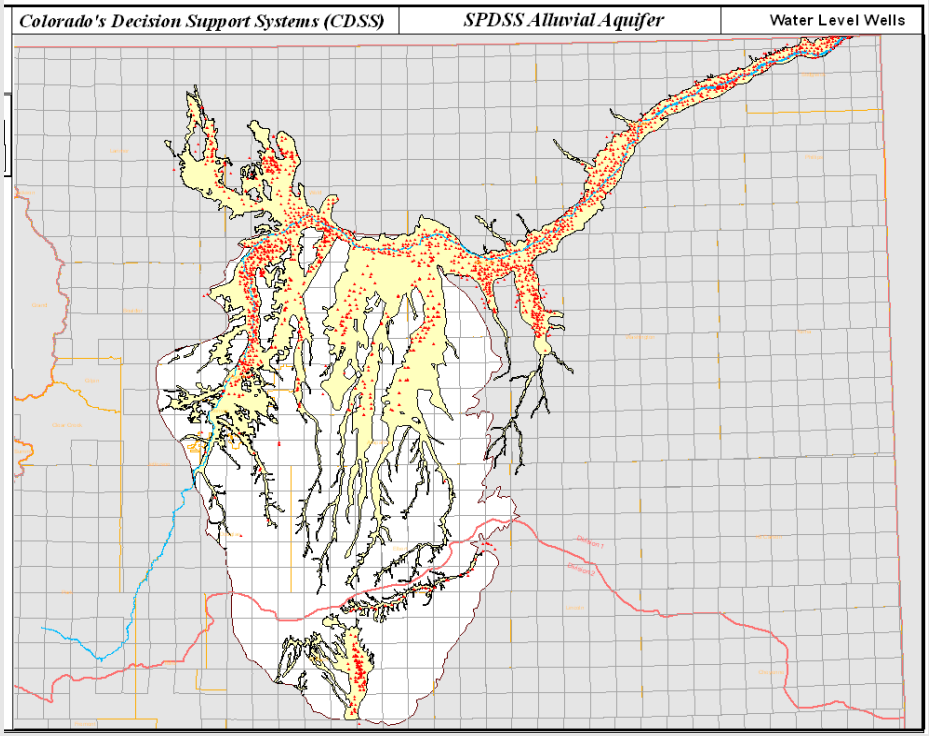
- Delivery Efficiencies

- Physical Information

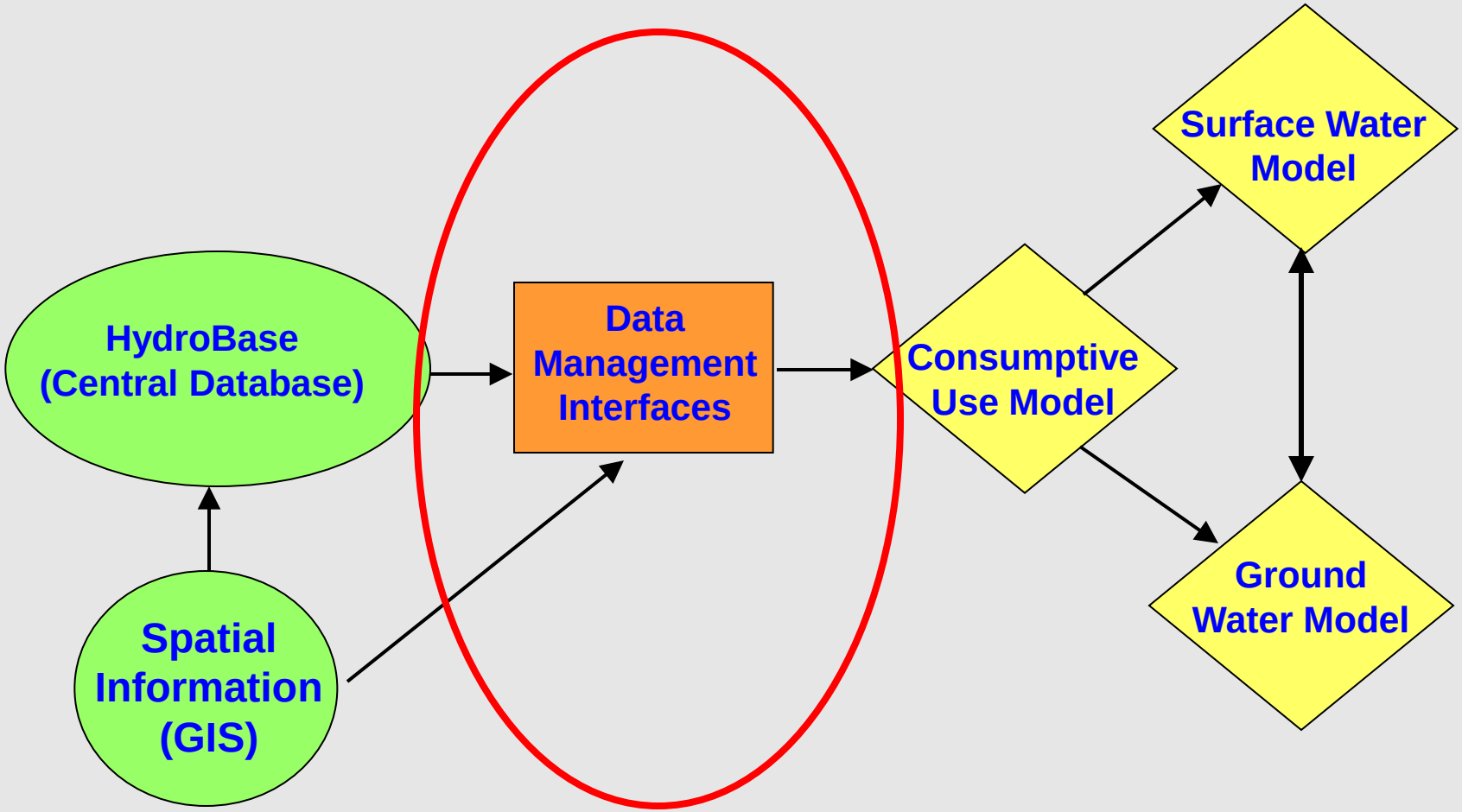


Data Collection and Review

- Water Levels
- Pumping Records
- Geophysical Information
- Aquifer Properties



Information Access



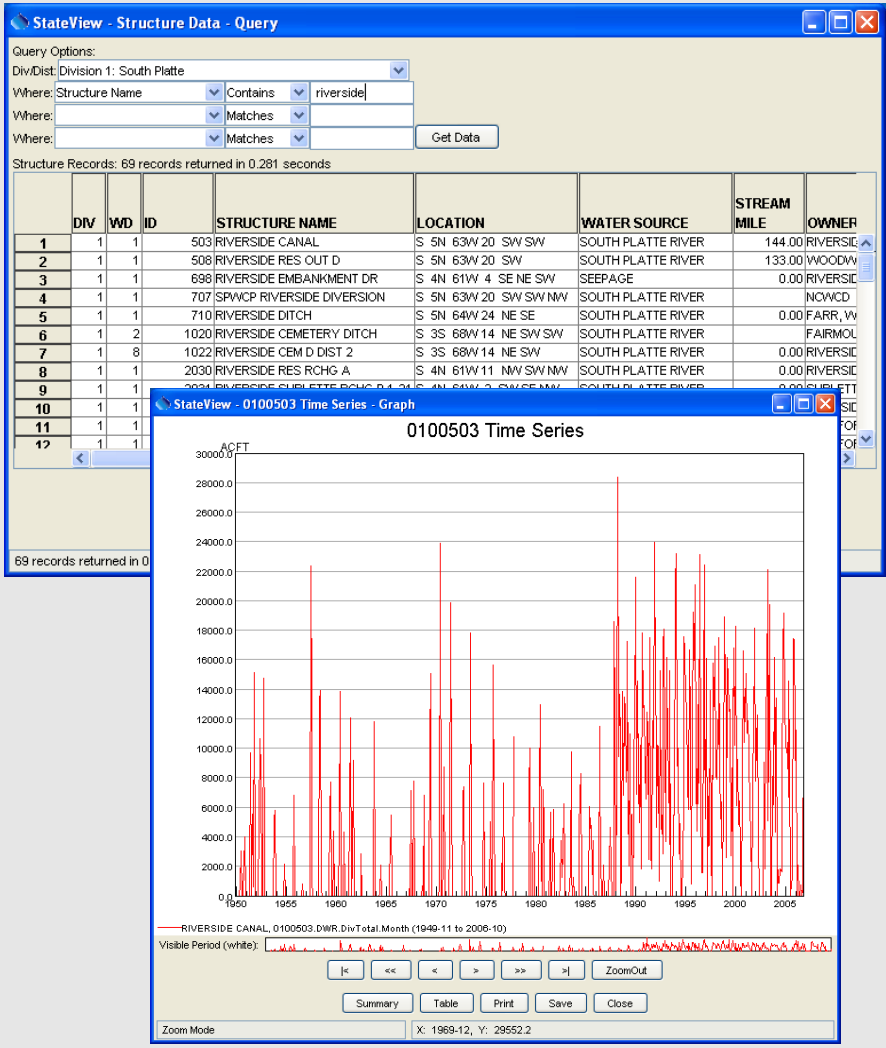
Data Collection and Review

Data Viewing and Format

Modeling Tools

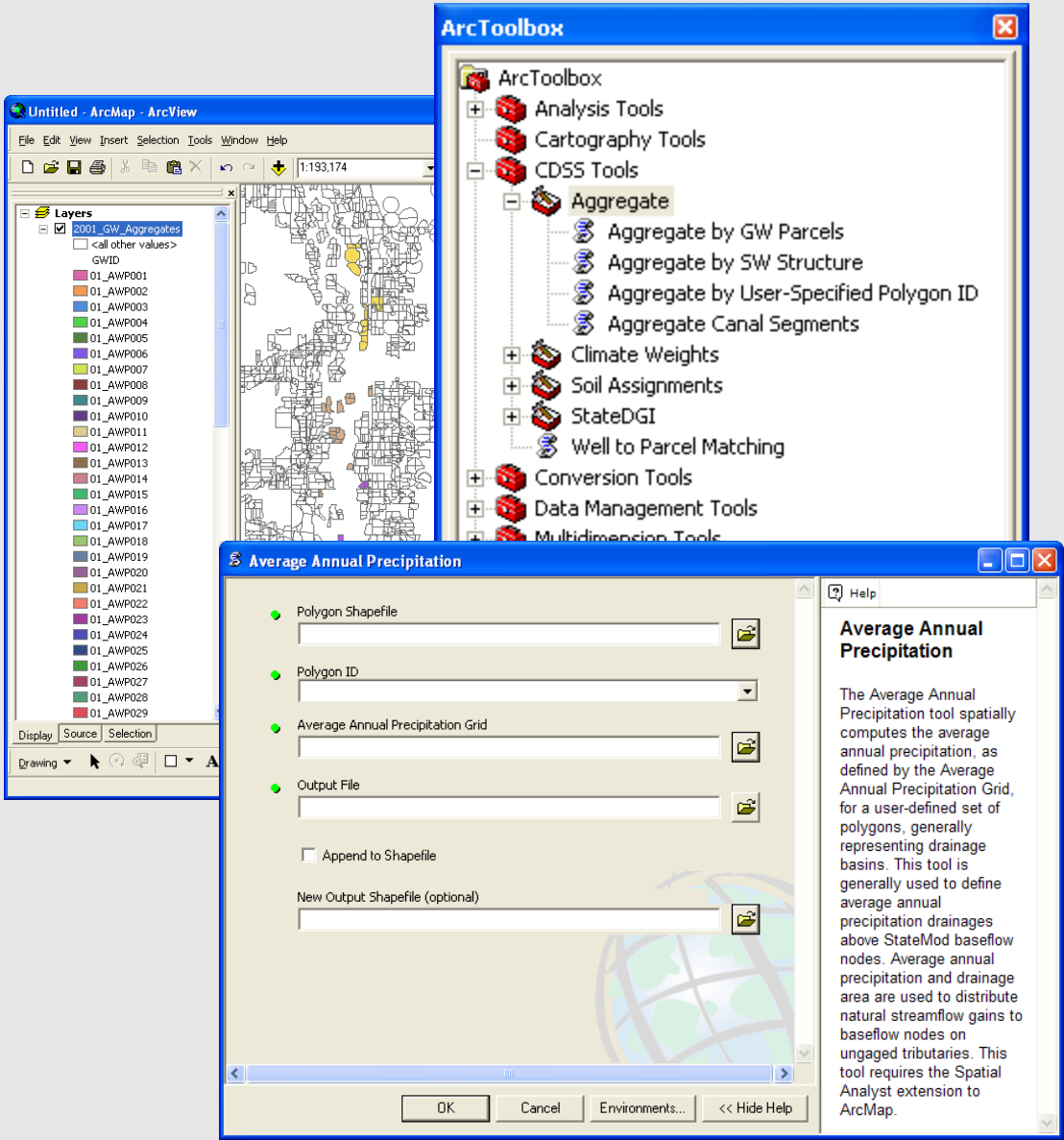
HydroBase Data Viewing/Formatting Tools "Data Centered"

- Allows non-database users to easily query and view information
- Extracts and formats data for model input
- Includes methods for data filling and extension
- Creates "command files" so model input files can be duplicated and updated
- On-line and accessible

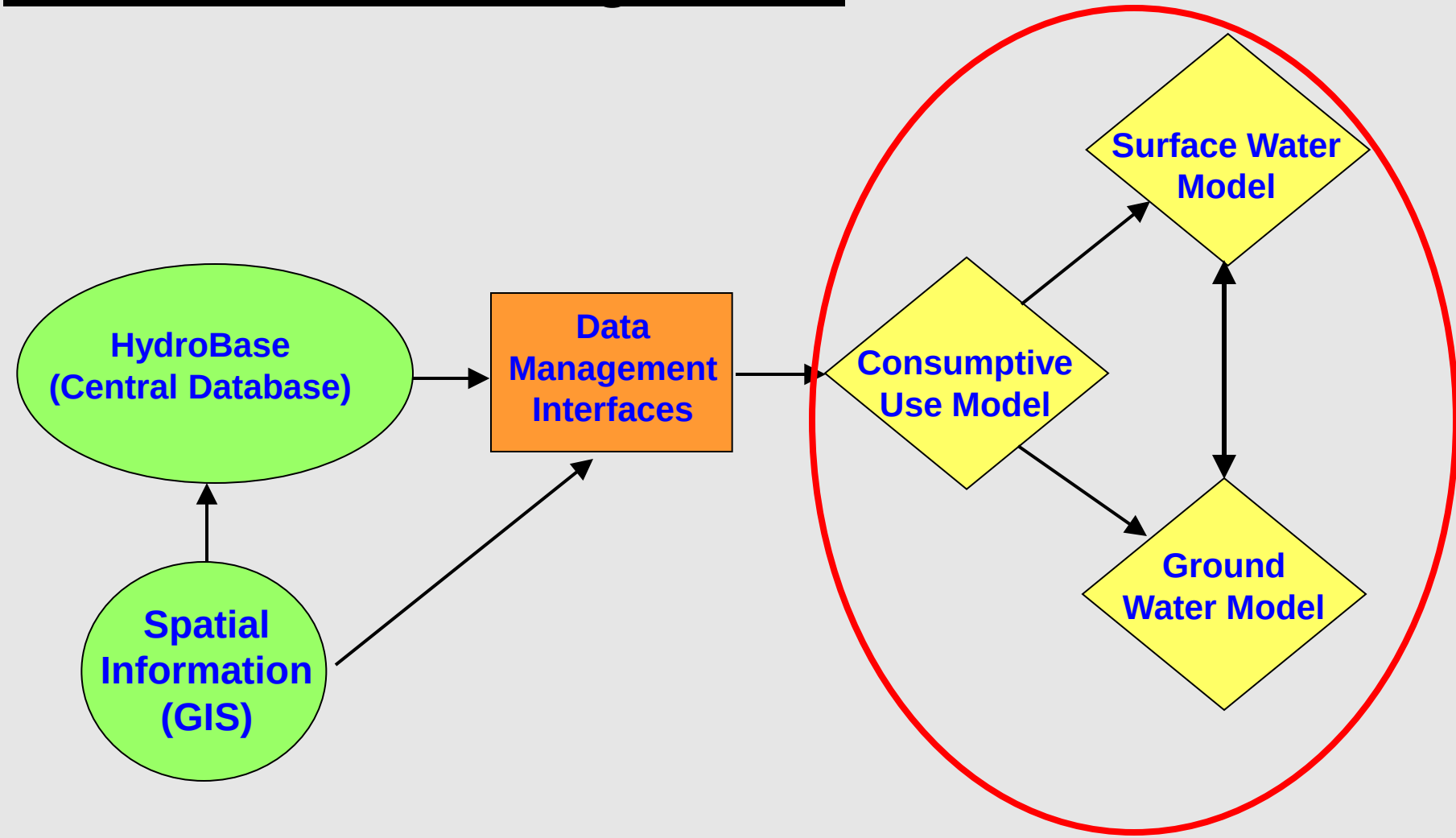


Spatial Data Viewing/Formatting Tools "Data Centered"

- Allows non-GIS users to easily query and extract spatial information
- Extracts and formats data for model input
- On-line and accessible



Decision Modeling Tools



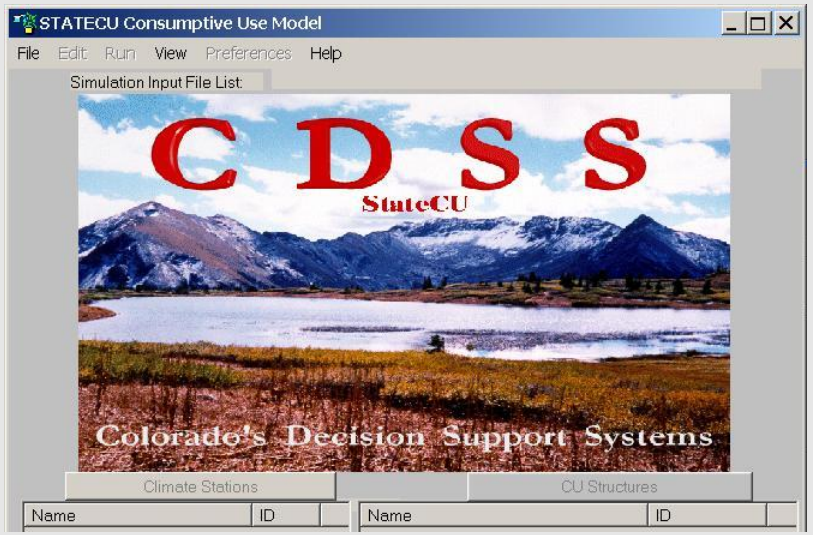
Data Collection and Review

Data Viewing and Format

Modeling Tools

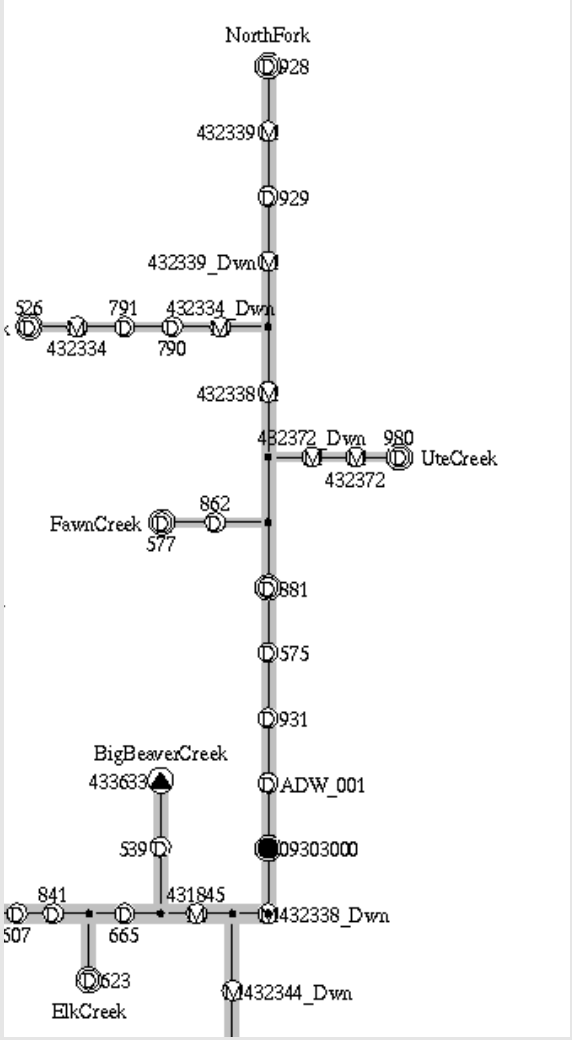
Modeling Tools
Crop Consumptive Use Model - StateCU

- Monthly and Daily ET Methods
- Time-Series Inputs from HydroBase Include
  - Climate Data
  - Irrigated Acreage
  - Water Supply Data
  - Irrigation Method
  - Canal Efficiency
  - Maximum Application Efficiency



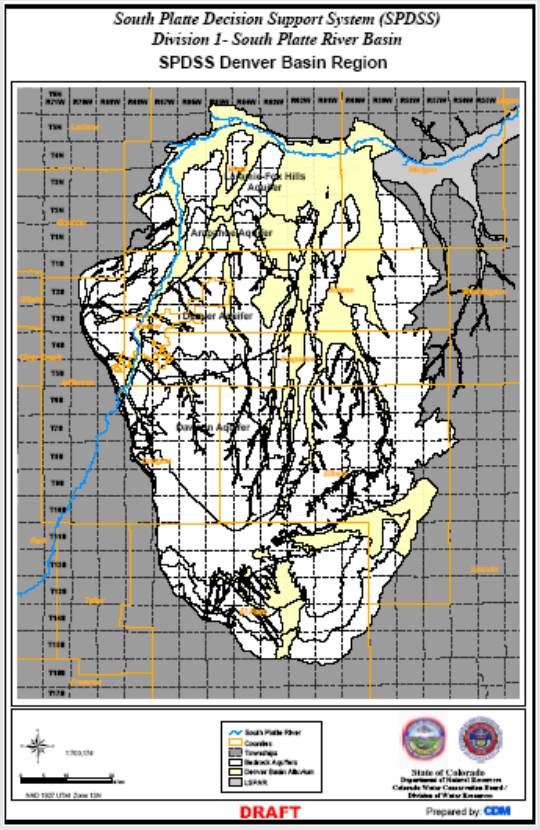
Modeling Tools
Water Allocation Model - StateMod

- Monthly and Daily Time Step
- Inputs from HydroBase Include
  - Streamflow Data
  - Water Rights
  - Diversion Records
  - Physical Structure Location and Capacities
  - Reservoir Operations
- Crop Requirements from StateCU



Modeling Tools
Numerical Ground Water Model - MODFLOW

- Monthly Time Step
- Inputs from HydroBase Include
  - Aquifer Parameters
  - Irrigated Acreage
  - Well Locations
  - Diversion Locations
  - Pumping Records
- Canal Loss and Irrigation Recharge from StateCU



CDSS – How Has It Been Used?

- Administration and Compact Compliance
  - Maximize beneficial use of water
  - Evaluate alternate water supply & use strategies
  - Examine impact of changes on water supply
- Rules and Regulations
  - Rio Grande Basin
- Engineering Support for Consultants and Water Providers
  - General planning efforts
  - Water availability for new water rights
  - Exchange potential for changed water rights

CDSS – How Has It Been Used?

- Endangered Species Issues
- Promote Data Sharing
  - Water resource planning (e.g., State Water Plan)
  - SWSI / IBCC Support
- Special Projects
  - HB-12-1278 study on South Platte