Colorado's Decision Support Systems (CDSS) Overview

New Mexico water data meeting, April 28, 2020

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Colorado Water Conservation Board

CDSS History

- CRDSS Feasibility Study 1992-1993 (Dames & Moore and CADSWES)
- Surface Water model was needed for planning
- Originally MODSIM (CSU) was chosen but abandoned
- BESTSM was adapted from Boyle Engineering 1985 Model and turned into StateMod (Denver's PACSIM model also came out of this)
- Other software and data analysis tools developed to support StateMod
- Enhancements have typically come through Basin DSS efforts (CRDSS in 1993, RGDSS in 1998, SPDSS in 2001, ArkDSS in 2011)

Basin DSS Approach

CDSS (Statewide)

Basin DSSs

CRDSS | RGDSS | SPDSS | ArkDSS

HydroBase
- Diversion records
- Water Rights transactions
- Groundwater levels
- Climate data

Software
- StateMod
- StateCU
- StateDMI
- TSTool
- Map Viewer

GIS Layers
Interviews/Task Memos
CU models
Surface water models
Groundwater models
Administration tools
Basin-specific issues

CDSS Program

- Joint program between CWCB and Colorado DWR
  - CWCB is a planning agency, DWR is administration, (akin to ISC and OSE in NM?)
- ~2 staff from CWCB and ~8 staff from DWR-SEO comprise CDSS team
- ~120 water commissioners around Colorado gather data and administer rivers (~1/4 time data collection)
- Average of $975,000 per year has been contracted from CWCB Projects Bill for CDSS since 2001

- Total ~$3-5 million annually

CDSS Tools available to the public:

www.colorado.gov/cdss

- HydroBase
- Online Data Tools
- GIS / Map Viewer
- Crop Consumptive Use Modeling (StateCU) Datasets
- Water Allocation Modeling (StateMod) Datasets
- Supporting software (TSTool, StateDMI, StateDGI, Lease Fallow Tool, etc.)

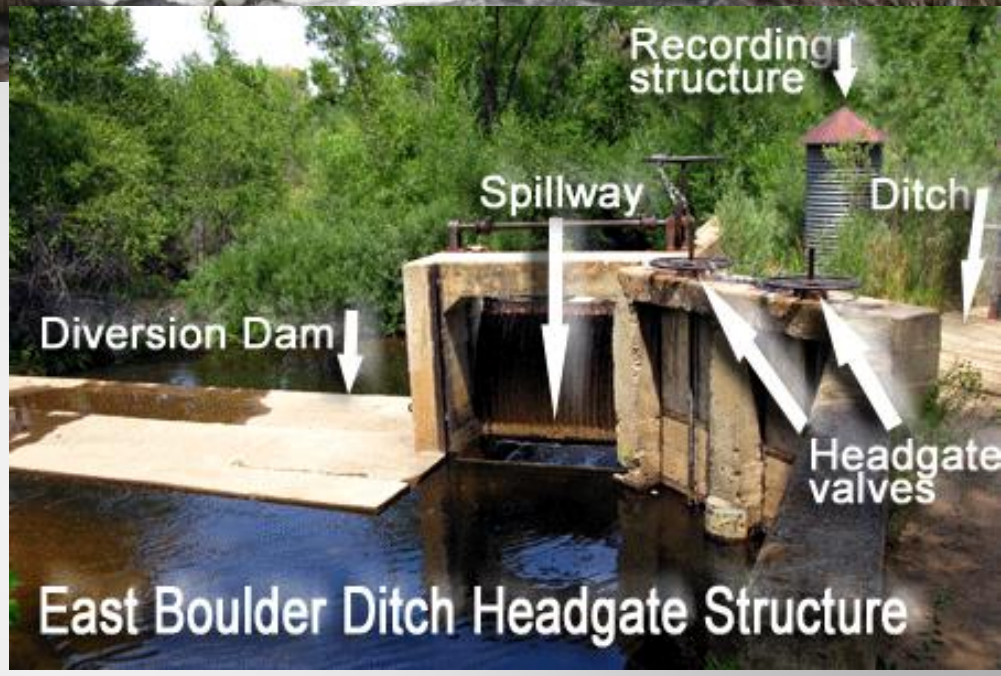
Other items:

- Model documentation, Studies, and Reports (CWCB planning)
- Colors of Water Tool
- Groundwater models

COLORADO'S
Decision Support Systems
CWCB/DWR

Types of Data in HydroBase

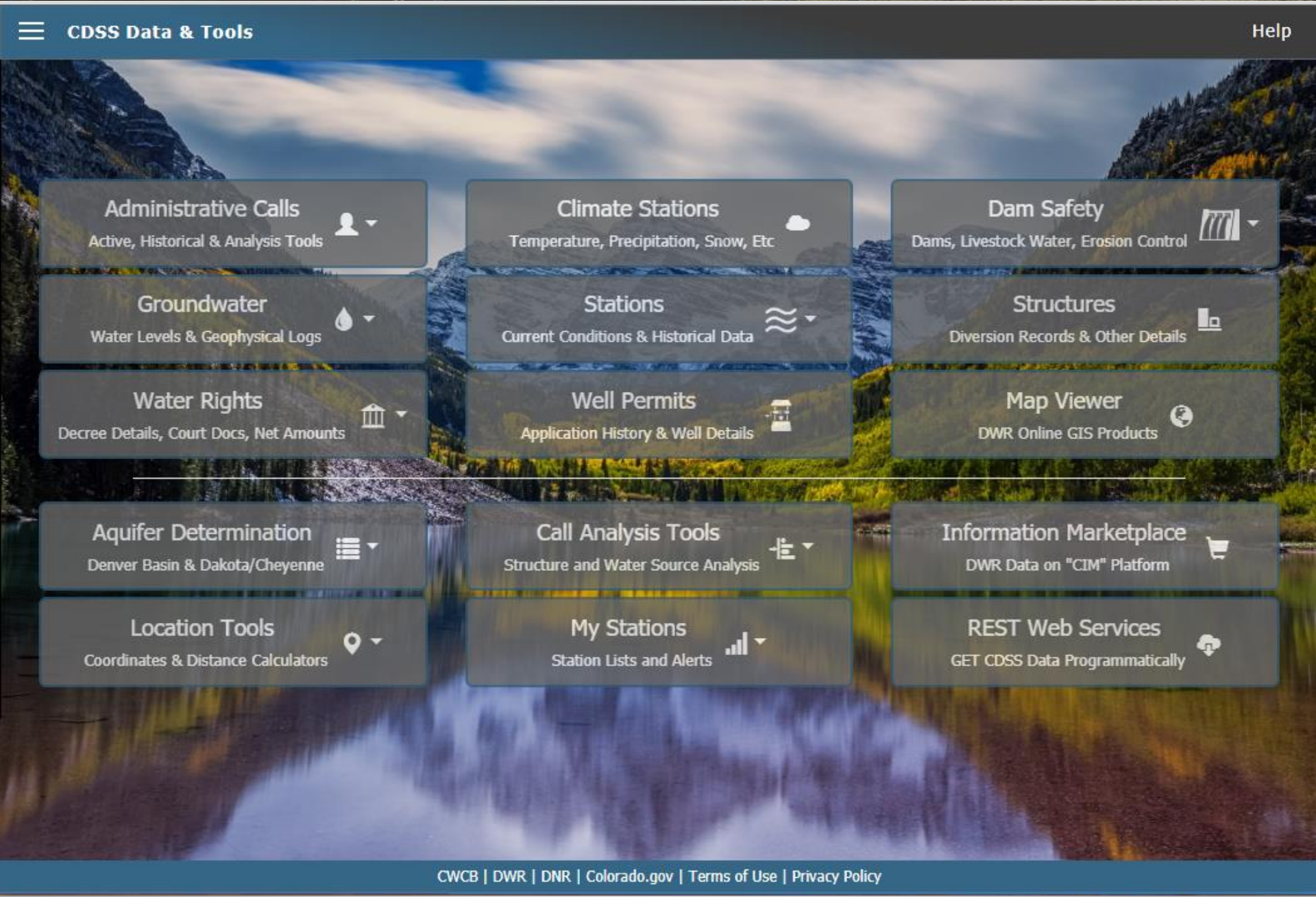
- Diversions
- Well Metering
- Streamflow
- Reservoir Stage and Releases
- Water Rights
- Call Chronology
- Aquifer Levels
- GIS



Online Data Tools

https://dwr.state.co.us/Tools

- Query and visualization of HydroBase
- Call Analysis Tool
- Aquifer Determination Tool
- My Stations / Alerts
- Colors of Water
- REST Web services



https://dwr.state.co.us/Tools

Water Rights - Transactions

Water Right Name: GUNNISON RIVER (NAT PARK) (6201498) **Permit:**

Structure Type: Minimum Flow **Water Source:** GUNNISON RIVER

Location

Water Right Net Amounts

Adjudication Date	Appropriation Date	Priority Admin	Order	Priority No	Net Absolute	Net Conditional	Net APEX

Structures | Report | Help | Login

Structure Overview | Diversion Records | Water Rights | Measuring Points | Irrigated Lands | Imaged Documents

Structure Name MOFFAT WATER TUNNEL (5104655) **Associated Permits**

Structure Type PIPELINE **Water Source Type** Tributary

CIU Code Active Structure with contemporary diversion records (A) **Water Source** FRASER RIVER [00178386] @ Stream Mile: 25.36

Search Fields

Record Type: Diversions - Summary

Full Record: **1975 to 2017**

From 1975 To 2017

Totals Water Classes

Include all associated water classes

Water Class	
5104655 S:1 F: U:0 T: G: To:	
5104655 S:1 F: U:2 T: G: To:	
5104655 S:1 F: U:Q T: G: To:	
5104655 S:1 F: U:Q T: G: To:5101327	
5104655 S:1 F: U:Q T:0 G: To:	

5 1 - 5 of 18 items

Search

Graph Options

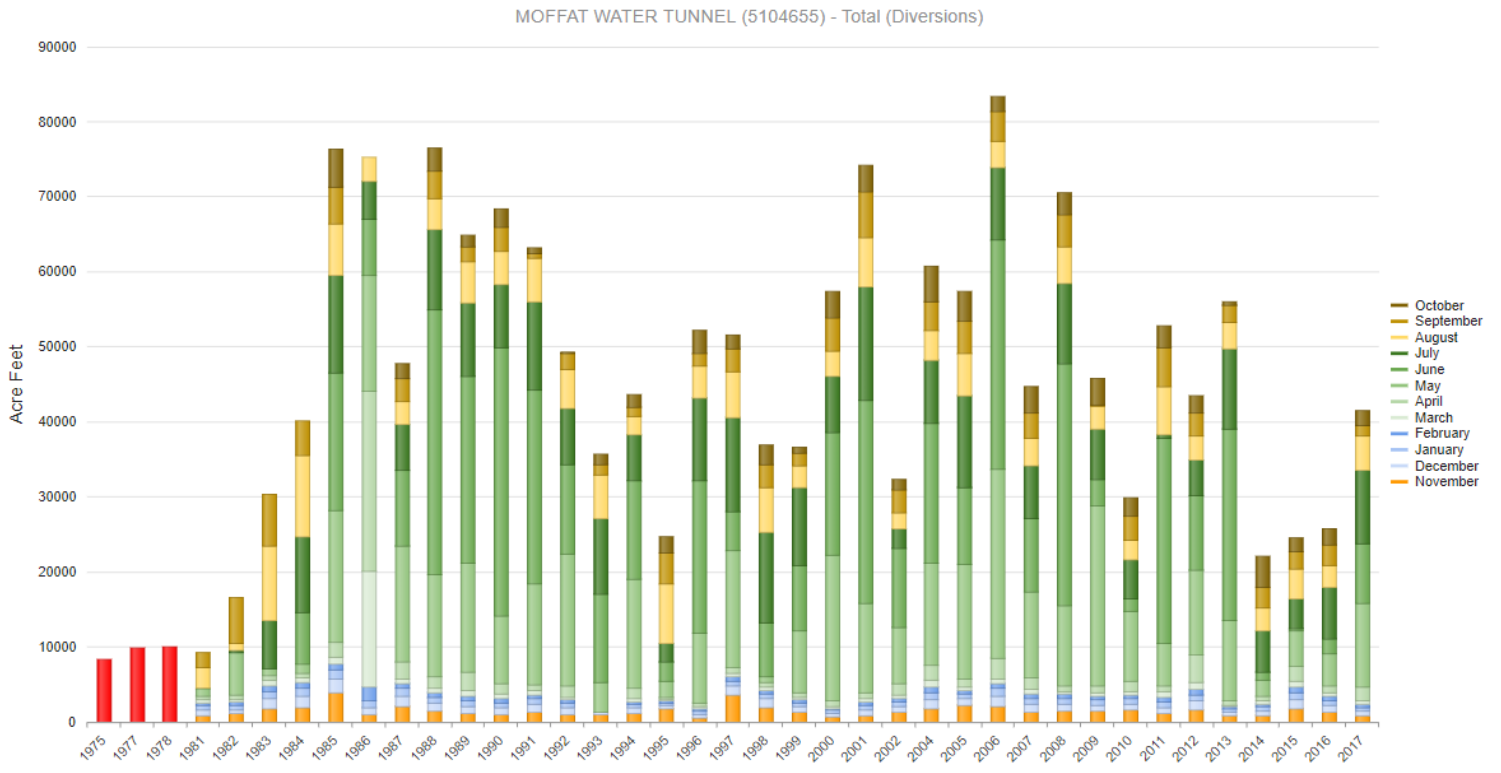
Title MOFFAT WATER TUNNEL (5104655) - To

Y Axis Max

Y Axis Min

Refresh

Table Graph PDF



Active Calls

dwr.state.co.us/Tools/AdministrativeCalls/Active?submitButton=Submit#

Administrative Calls - Active

Export Help My Account

>> Table Map

Map Options

Map Points: 46

Map Satellite

GREEN MTN HYDRO-ELECTRIC
SAINT NO 2 DITCH
RIFLE GAP RESERVOIR
SHOSHONE POWER PLANT
MIN FLOW BEAVER CREEK
MOCKING BIRD DITCH
GARDNER DITCH
WALTHEN DITCH
VEGA RESERVOIR
LEON PARK FEEDER CANAL

Sheephorn Heeney McCoy Burns Bond Gypsum Eagle Avon Vail Silverthorne Frisco Keystone New Castle Glenwood Springs Silt Rifle Carbondale Basalt Norrie Woody Creek Aspen Leadville Alma Breckenridge De Beque Mesa Fruita Palisade

Map data ©2020 Google 10 km Terms of Use Report a map error

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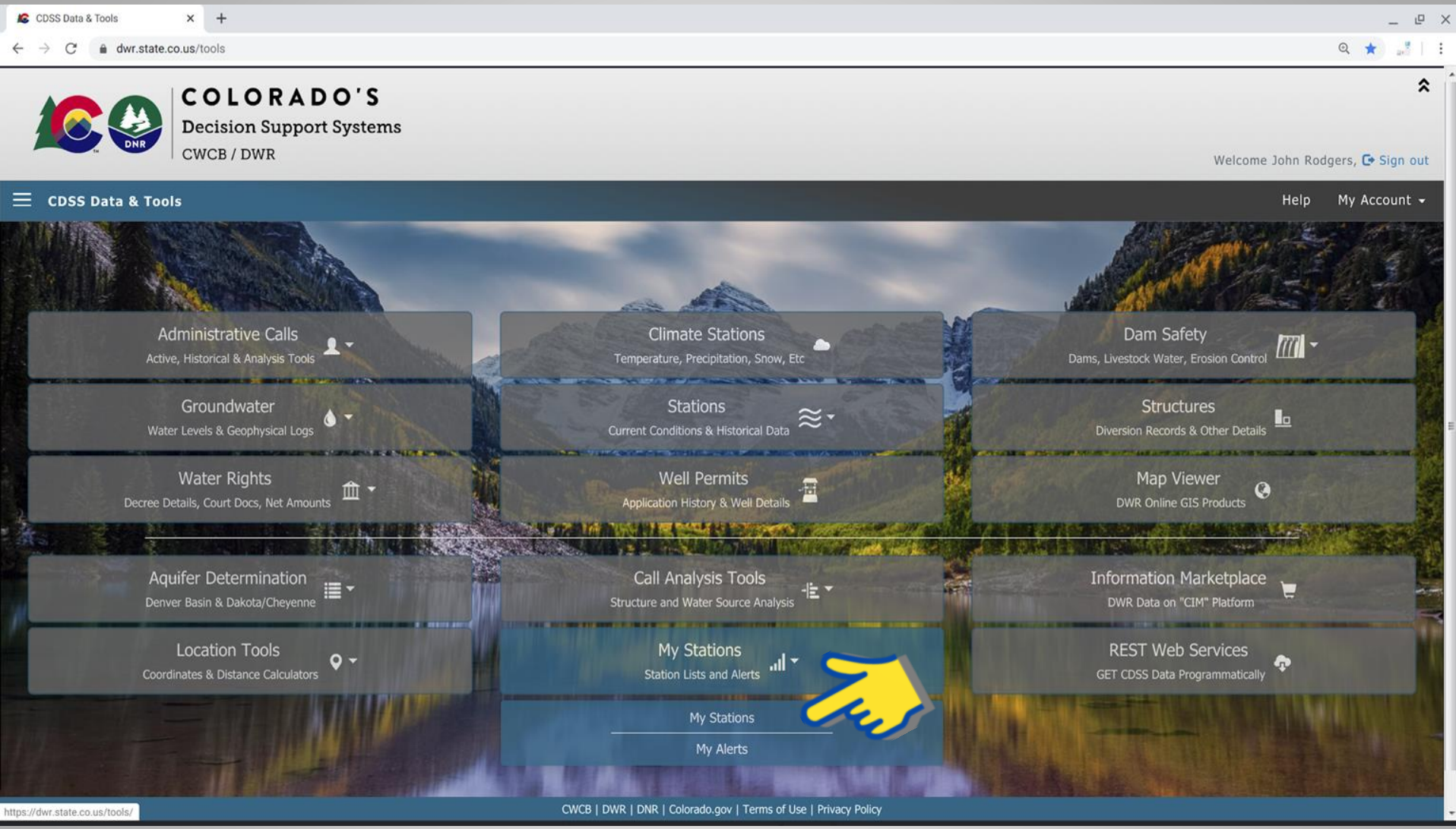
CDSS Data & Tools
dwr.state.co.us/tools
COLORADO'S
Decision Support Systems
CWCB / DWR
Welcome John Rodgers, Sign out
CDSS Data & Tools
Help
My Account
Administrative Calls
Active, Historical & Analysis Tools
Climate Stations
Temperature, Precipitation, Snow, Etc
Dam Safety
Dams, Livestock Water, Erosion Control
Groundwater
Water Levels & Geophysical Logs
Stations
Current Conditions & Historical Data
Structures
Diversion Records & Other Details
Water Rights
Decree Details, Court Docs, Net Amounts
Well Permits
Application History & Well Details
Map Viewer
DWR Online GIS Products
Aquifer Determination
Denver Basin & Dakota/Cheyenne
Call Analysis Tools
Structure and Water Source Analysis
Information Marketplace
DWR Data on "CIM" Platform
Location Tools
Coordinates & Distance Calculators
My Stations
Station Lists and Alerts
REST Web Services
GET CDSS Data Programmatically
My Stations
My Alerts
https://dwr.state.co.us/tools/
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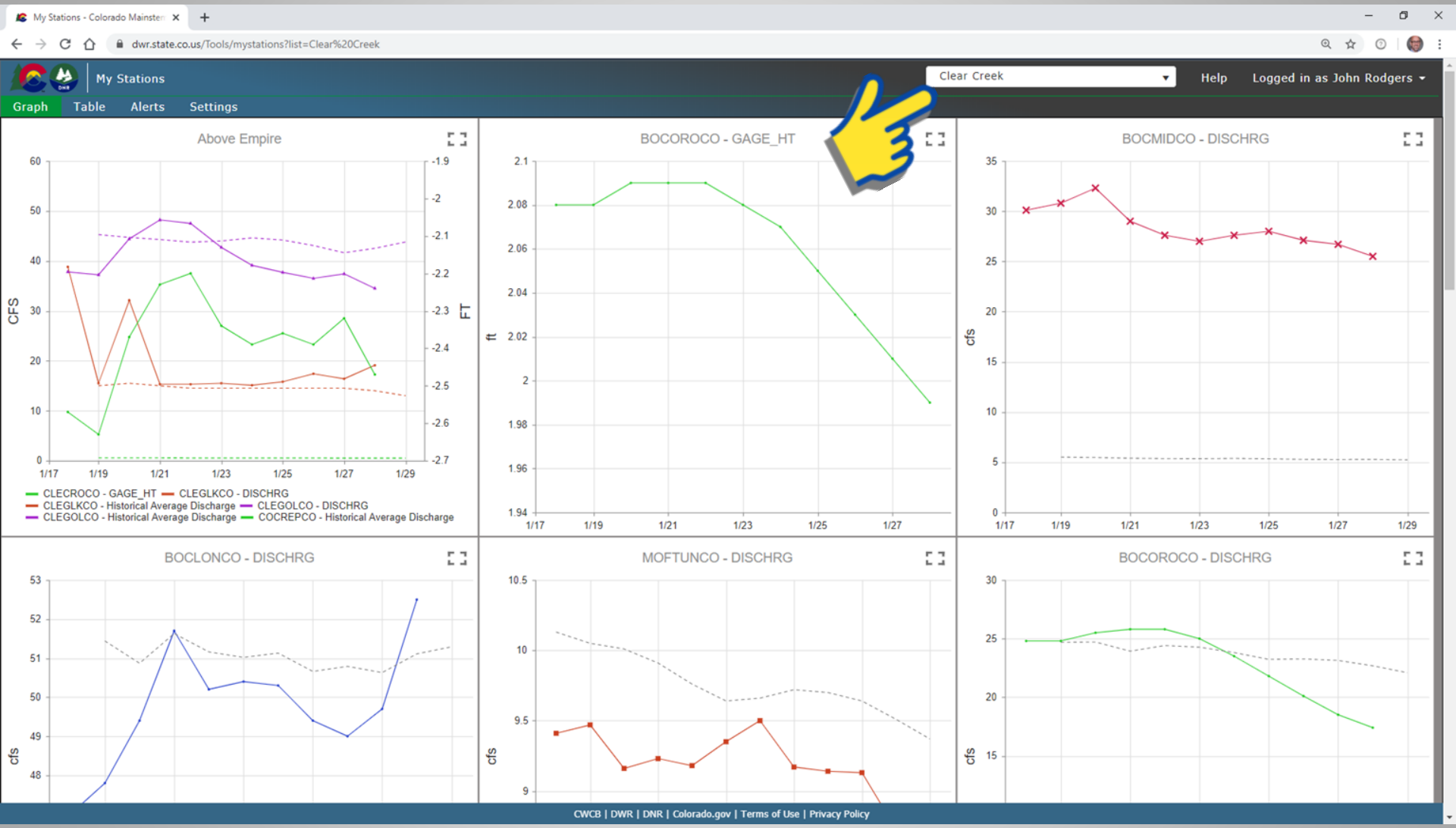
My Stations


My Stations - Colorado Mainsten
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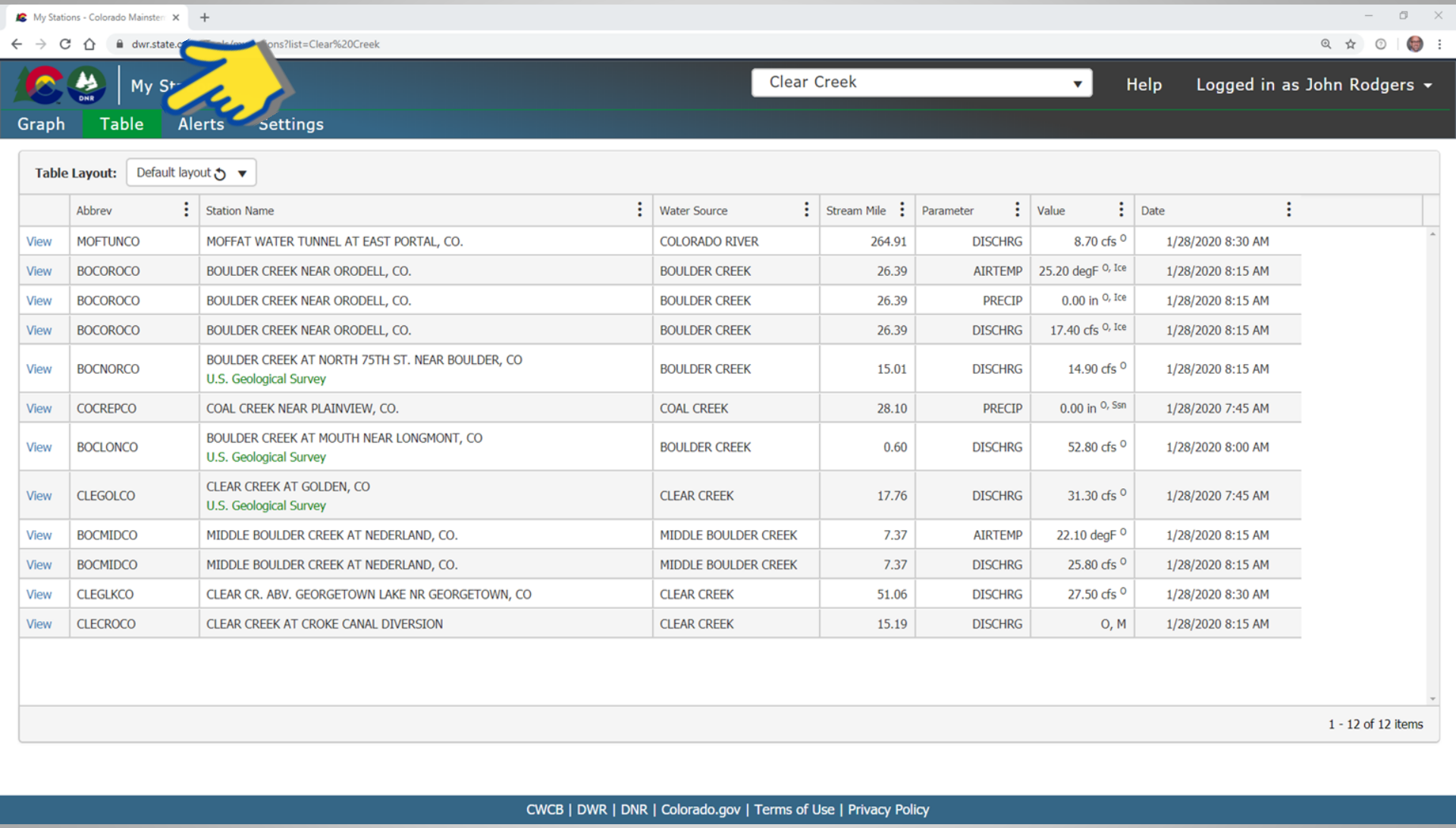
My Stations - Colorado Mainsten
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Clear Creek
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Table Layout:
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Water Source
Stream Mile
Parameter
Value
Date
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View BOCOROCO BOULDER CREEK NEAR ORODELL, CO. BOULDER CREEK 26.39 AIRTEMP 25.20 degF O, Ice 1/28/2020 8:15 AM
View BOCOROCO BOULDER CREEK NEAR ORODELL, CO. BOULDER CREEK 26.39 PRECIP 0.00 in O, Ice 1/28/2020 8:15 AM
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View BOCNORCO BOULDER CREEK AT NORTH 75TH ST. NEAR BOULDER, CO U.S. Geological Survey BOULDER CREEK 15.01 DISCHRG 14.90 cfs O 1/28/2020 8:15 AM
View COCREPCO COAL CREEK NEAR PLAINVIEW, CO. COAL CREEK 28.10 PRECIP 0.00 in O, Ssn 1/28/2020 7:45 AM
View BOCLONCO BOULDER CREEK AT MOUTH NEAR LONGMONT, CO U.S. Geological Survey BOULDER CREEK 0.60 DISCHRG 52.80 cfs O 1/28/2020 8:00 AM
View CLEGOLCO CLEAR CREEK AT GOLDEN, CO U.S. Geological Survey CLEAR CREEK 17.76 DISCHRG 31.30 cfs O 1/28/2020 7:45 AM
View BOCMIDCO MIDDLE BOULDER CREEK AT NEDERLAND, CO. MIDDLE BOULDER CREEK 7.37 AIRTEMP 22.10 degF O 1/28/2020 8:15 AM
View BOCMIDCO MIDDLE BOULDER CREEK AT NEDERLAND, CO. MIDDLE BOULDER CREEK 7.37 DISCHRG 25.80 cfs O 1/28/2020 8:15 AM
View CLEGLKCO CLEAR CR. ABV. GEORGETOWN LAKE NR GEORGETOWN, CO CLEAR CREEK 51.06 DISCHRG 27.50 cfs O 1/28/2020 8:30 AM
View CLECROCO CLEAR CREEK AT CROKE CANAL DIVERSION CLEAR CREEK 15.19 DISCHRG O, M 1/28/2020 8:15 AM
1 - 12 of 12 items
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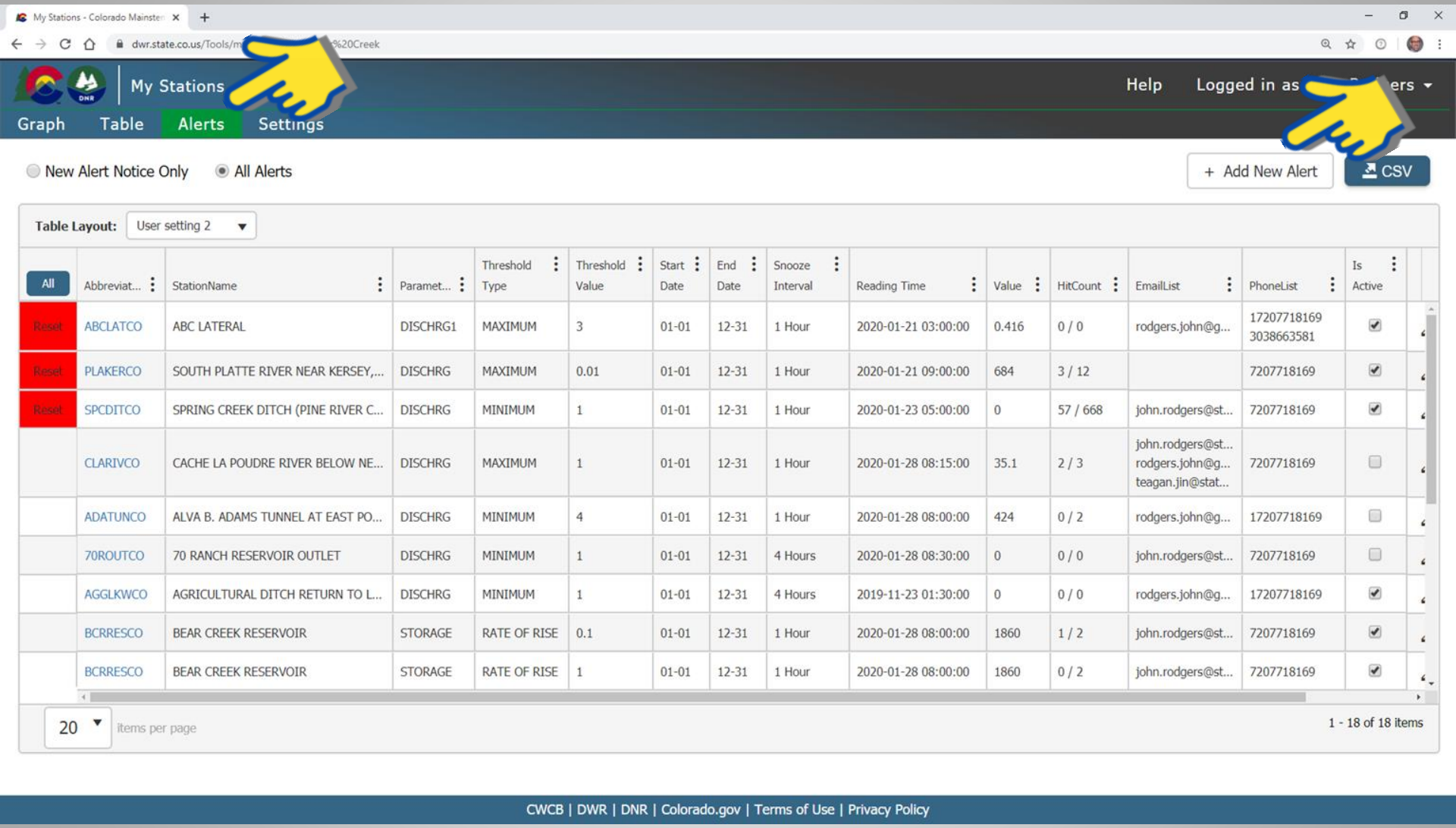
My Alerts


My Stations - Colorado Mainsten
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My Stations
Help
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Alerts
Settings
New Alert Notice Only
All Alerts
+ Add New Alert
CSV
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StationName
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Threshold Type
Threshold Value
Start Date
End Date
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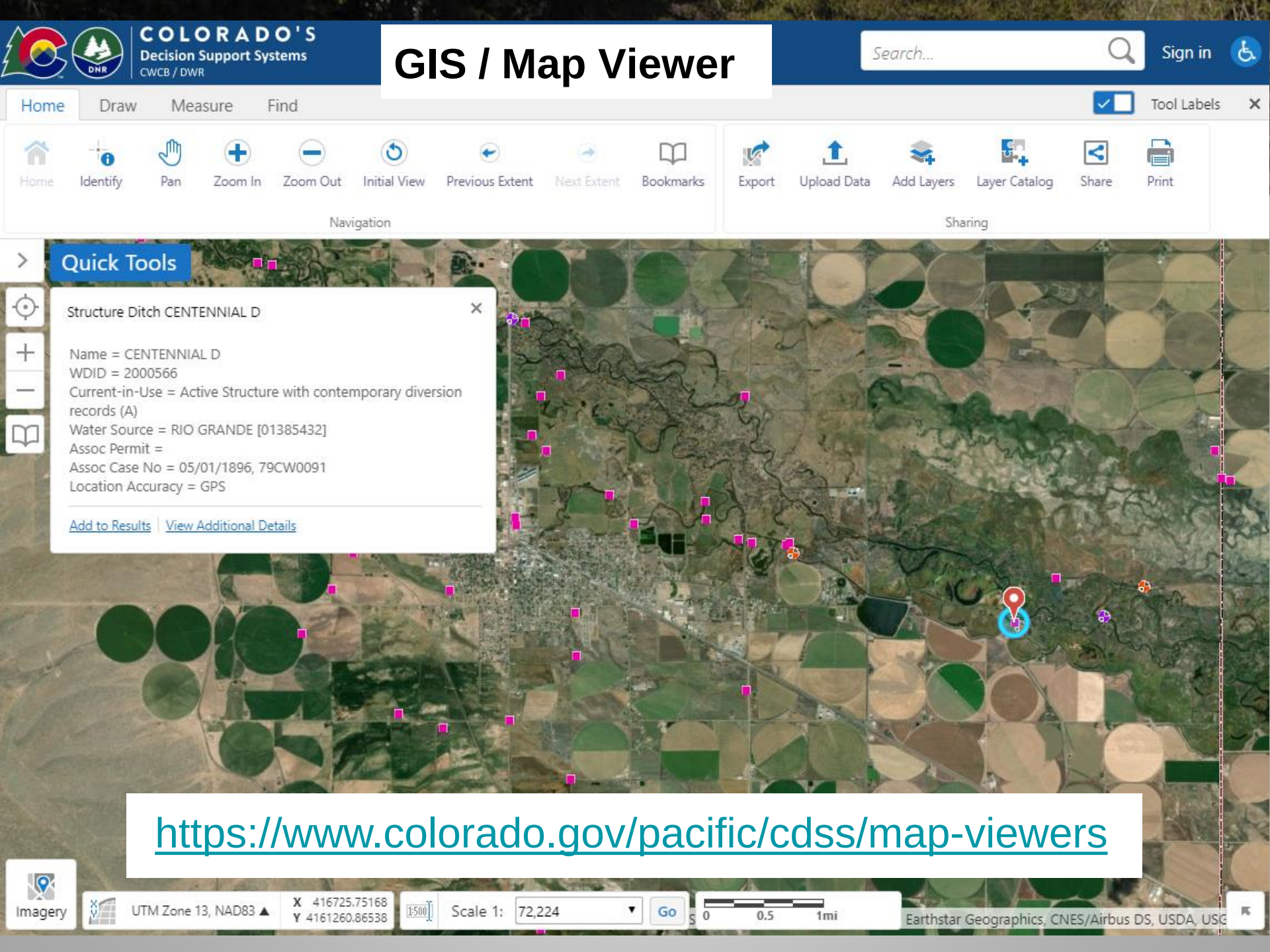
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Sign in
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Measure
Find
Tool Labels
Home
Identify
Pan
Zoom In
Zoom Out
Initial View
Previous Extent
Next Extent
Bookmarks
Export
Upload Data
Add Layers
Layer Catalog
Share
Print
Navigation
Sharing
Quick Tools
Structure Ditch CENTENNIAL D
Name = CENTENNIAL D
WDID = 2000566
Current-in-Use = Active Structure with contemporary diversion records (A)
Water Source = RIO GRANDE [01385432]
Assoc Permit =
Assoc Case No = 05/01/1896, 79CW0091
Location Accuracy = GPS
Add to Results
View Additional Details
https://www.colorado.gov/pacific/cdss/map-viewers
Imagery
UTM Zone 13, NAD83
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Y 4161260.86538
Scale 1: 72,224
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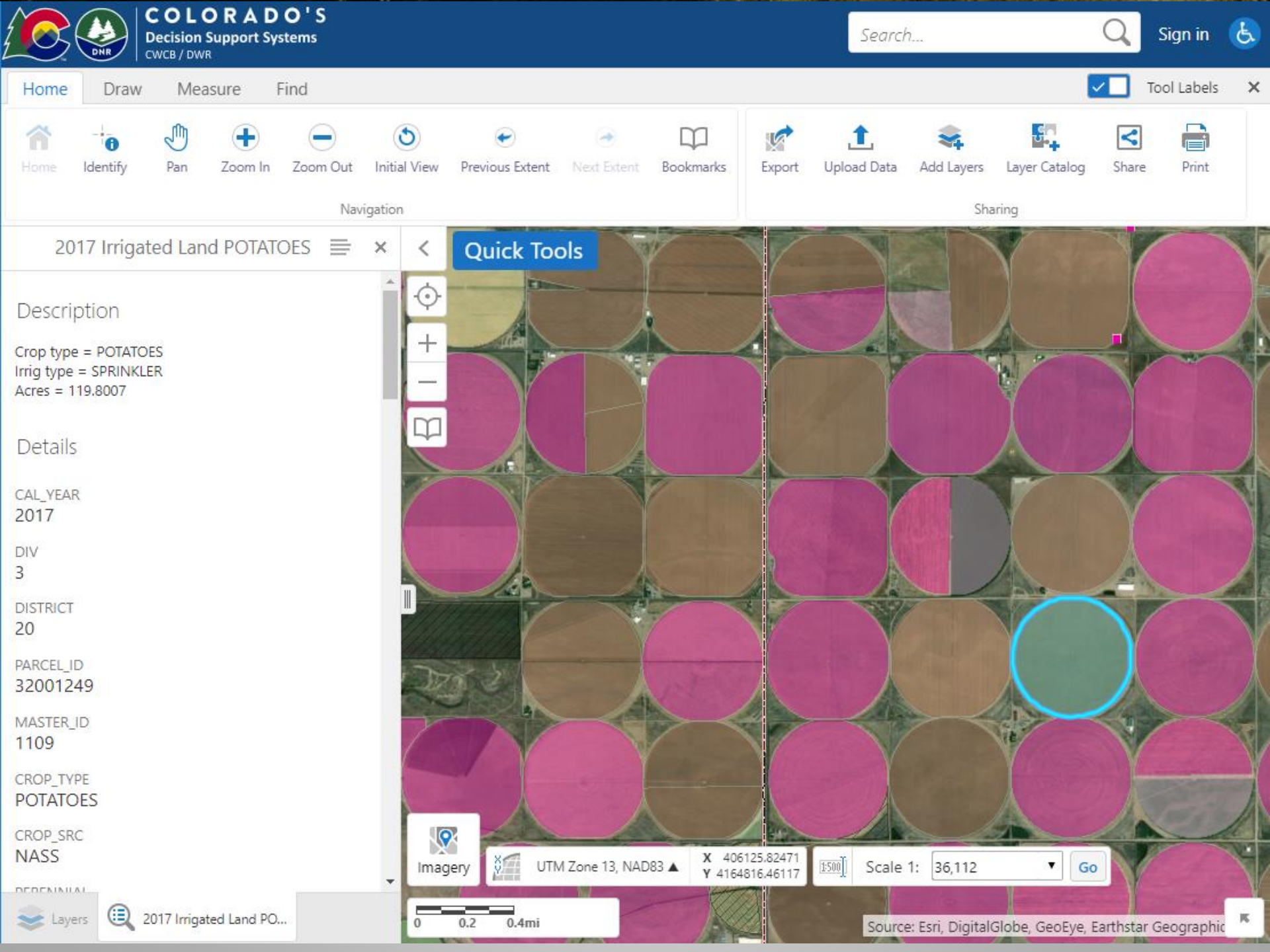
1mi
Earthstar Geographics, CNES/Airbus DS, USDA, USG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Zoom In
Zoom Out
Initial View
Previous Extent
Next Extent
Bookmarks
Navigation
Export
Upload Data
Add Layers
Layer Catalog
Share
Print
Sharing
2017 Irrigated Land POTATOES
Description
Crop type = POTATOES
Irrig type = SPRINKLER
Acres = 119.8007
Details
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PARCEL_ID
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POTATOES
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Quick Tools
Imagery
UTM Zone 13, NAD83
X 406125.82471
Y 4164816.46117
Scale 1: 36,112
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0 0.2 0.4mi
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographic
Layers
2017 Irrigated Land PO...

StateCU (CU Modeling)

- Consumptive Use modeling software produced by Colorado
- Monthly Modified Blaney-Criddle or Daily Penman-Monteith

- **Inputs:**
  - GIS coverage of acreage, crop type, irrigation type, and structure association
  - Climate data

- **Outputs:**
  - Potential consumptive use
  - Supply-limited consumptive use
  - Unlagged return flow
  - Effective Precipitation

StateMod (Water Allocation Modeling)

- Water allocation modeling software produced by Colorado
- Prior appropriation and Colorado operations (Compacts, augmentation, etc.)

- **Inputs:**
  - Crop/municipal/industrial demands
  - Water Rights
  - Natural Flows

- **Outputs:**
  - Streamflow
  - Diversions
  - Well pumping

Division 6
North Platte
StateCU
StateMod
Division 1
Yampa/White
South Platte
StateCU
StateMod
StateCU
StateMod (except Poudre)
MODFLOW
Republican
Division 5
Colorado
StateCU
StateMod
None
StateCU
StateMod
Division 2
Arkansas
Division 4
Gunnison
Division 3
Rio Grande
StateCU (soon)
StateMod (soon)
StateCU
StateMod
MODFLOW
Division 7
San Juan/Dolores

Other items:

Model documentation, Studies, and Reports: https://www.colorado.gov/pacific/cdss/documents-and-resources

Colors of Water: http://div2waterops.com/ColorsOfWater

Groundwater modeling: https://www.colorado.gov/pacific/cdss/groundwater-modflow

Questions?

Brian.Macpherson@state.co.us