StateDMI Training

Modeling Locations as Collections (Aggregates, Systems, and Multi-structures)

Version: 3.10.00, 2010-05-10

Duration: Approximately 30 minutes

Level: Advanced

This Presentation

- Provides an overview of model nodes that are “collections”
- Builds on introductory StateDMI training presentations
- Is designed for self-paced training
- Is illustrative but does NOT include examples that can be run
- Should be supplemented by other training presentations, such as for Wells and the Model Network.

StateCU and StateMod Modeled Locations

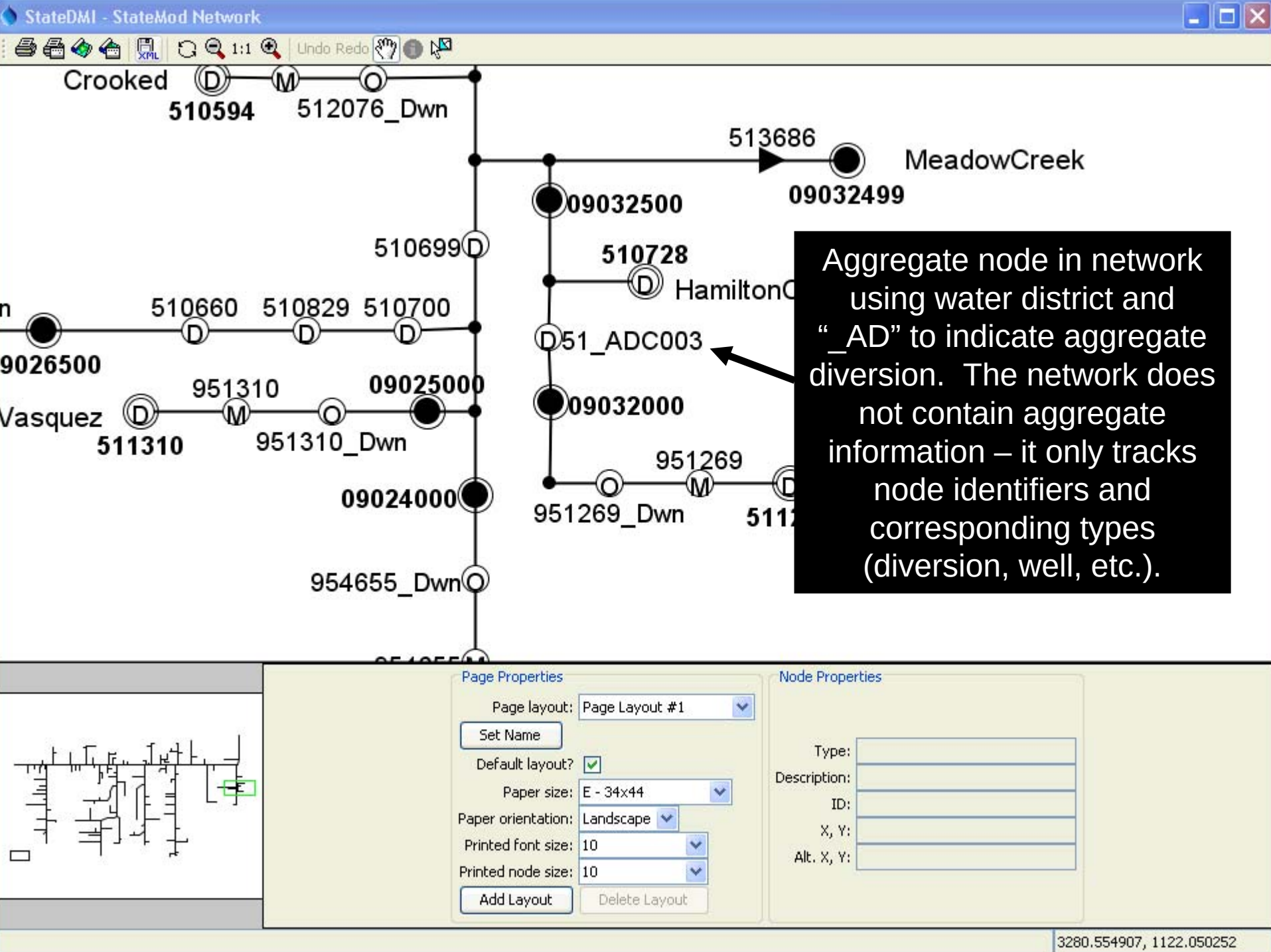
- StateCU's "structure" file (*.str) includes locations that have consumptive use, but there is no distinction in this file of whether a location is a well, diversion, etc.
- StateMod has separate station files for diversions, instream flows, reservoirs, wells, plans, and stream gages. These files are also included as "nodes" in the river network file. All stations are represented in the model network

Explicit Locations, Collections, and Other Locations

- Explicitly-modeled locations match actual locations, for example a ditch with a State of Colorado Water District Identifier (WDID).
- Collections represent 1+ structures that are grouped for modeling purposes.
- Other identifiers may also be used to indicate locations included for modeling purposes (e.g., an intermediate location to compute natural flow).

Types of Collections: Aggregates

- Locations where there is no need (or it may be difficult) to explicitly model the locations
- Water rights are weighted by decree into administration number classes indicating water right priority
- Are used to limit the number of rights and correspondingly reduces the amount of model detail and results
- Typically cannot be used where relationships to individual rights are required (e.g., augmentation plans)


StateDMI - StateMod Network
Crooked
510594
512076_Dwn
513686
MeadowCreek
09032499
09032500
510699
510728
HamiltonC
510660
510829
510700
51_ADC003
9026500
951310
09025000
Vasquez
511310
951310_Dwn
09032000
951269
951269_Dwn
09024000
954655_Dwn
Aggregate node in network using water district and "_AD" to indicate aggregate diversion. The network does not contain aggregate information – it only tracks node identifiers and corresponding types (diversion, well, etc.).
Page Properties
Page layout:
Page Layout #1
Set Name
Default layout?
Paper size:
E - 34x44
Paper orientation:
Landscape
Printed font size:
10
Printed node size:
10
Add Layout
Delete Layout
Node Properties
Type:
Description:
ID:
X, Y:
Alt. X, Y:
3280.554907, 1122.050252

Types of Collections: Systems

- Locations where there is no need (or it may be difficult) to explicitly model the locations
- Water rights are explicitly represented (no aggregation)
- Will result in slower run-times and more output than when aggregates are used
- Are appropriate where relationships to individual rights are required (e.g., augmentation plans)

Types of Collections: Multi-Structures

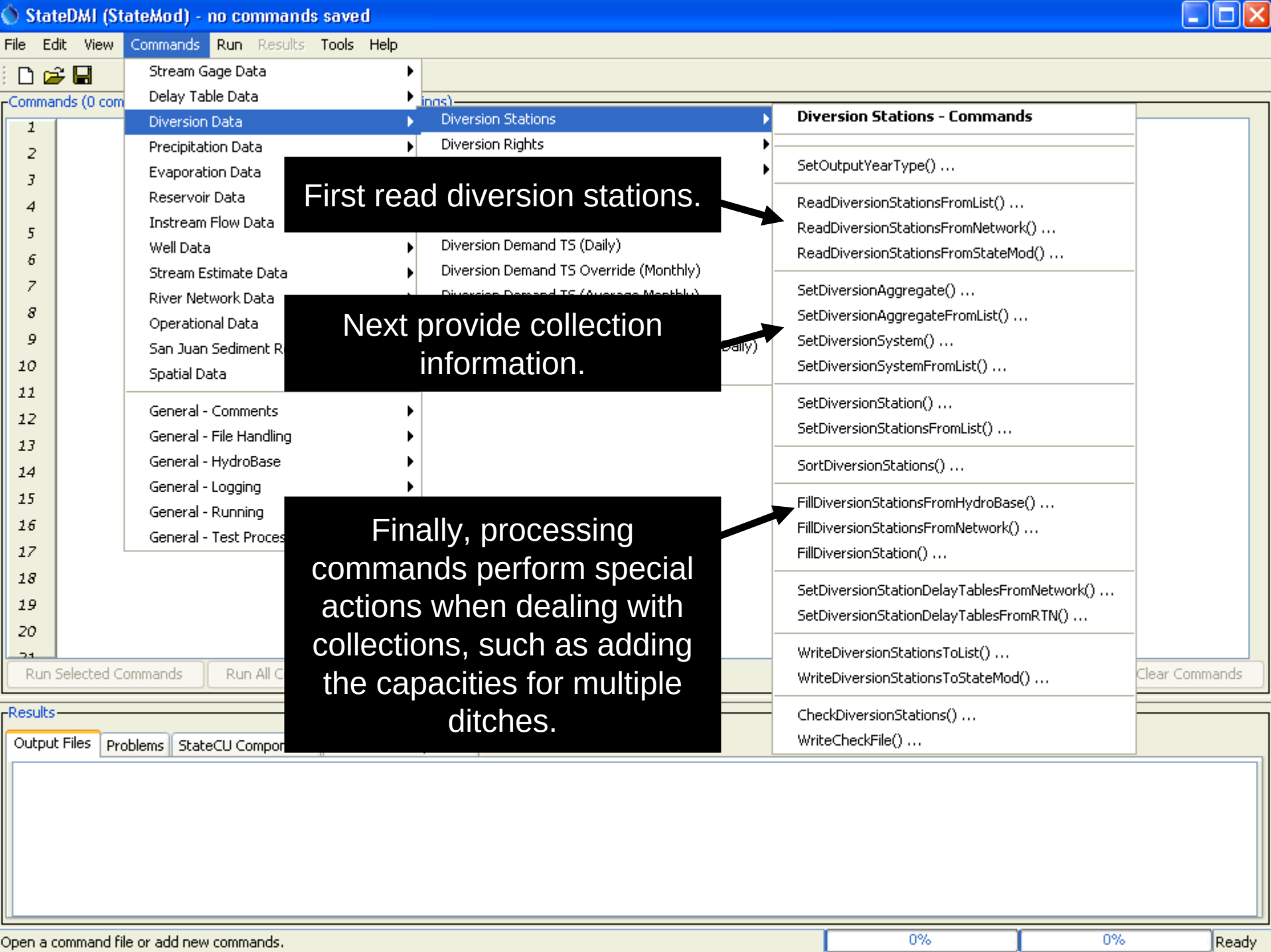
- Are only used when processing diversion demands
- See the StateDMI CalculateDiversionDemandTSMonthly() command

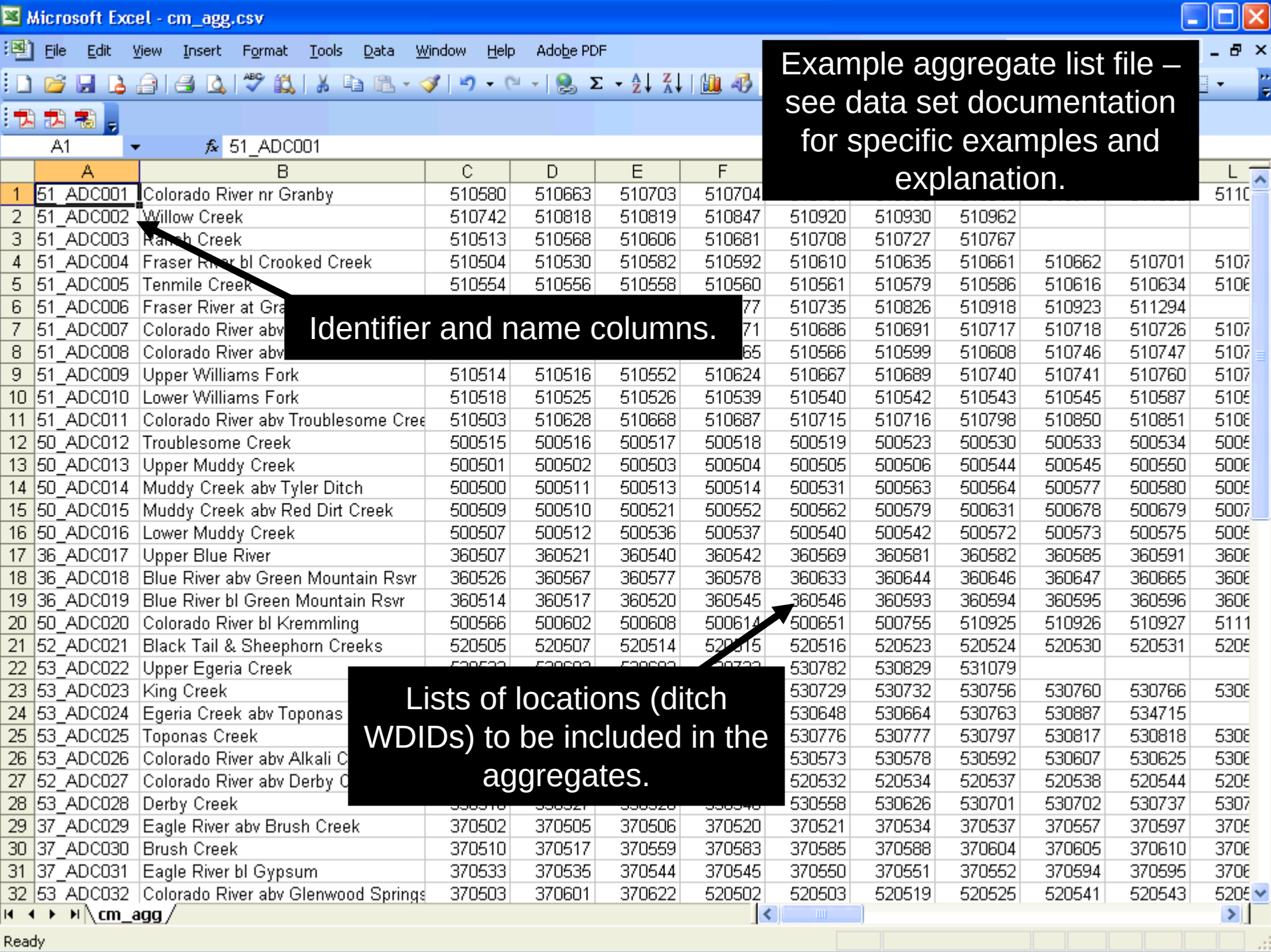
Choosing to use Collections

- Modelers decide to use collections based on study of water systems, integration of system operations, and data availability
- Refer to model data set documentation for a discussion of modeling decisions

Specifying Diversion Collections in StateDMI

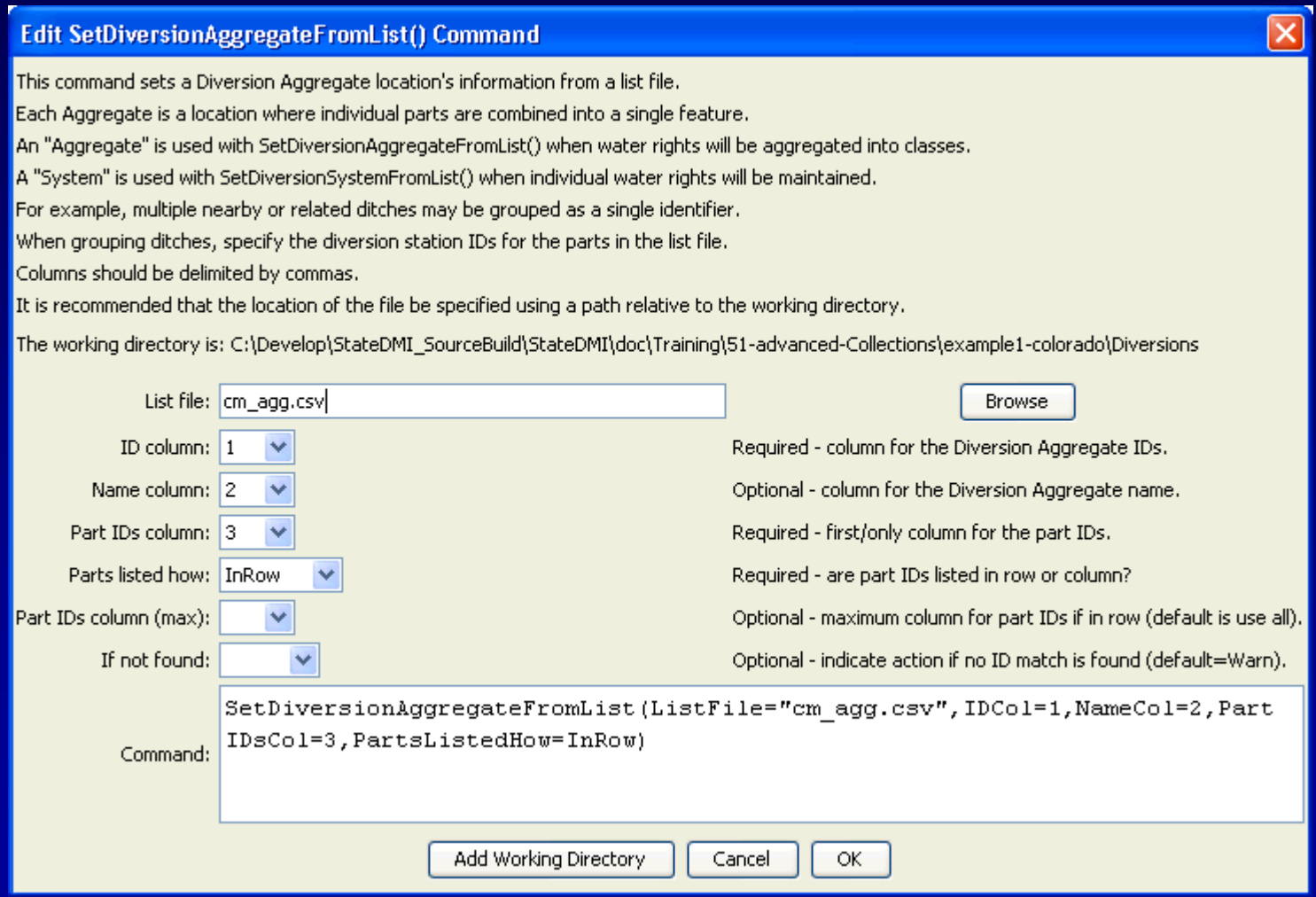
- Typically use a delimited (comma-separated value) file to define collections
- First read stations into StateDMI
- Then use SetDiversionAggregateFromList() command(s) to associate aggregate diversion information with matching locations
- Commands can read row- or column-oriented files
- Use a similar approach for reservoirs and wells


StateDMI (StateMod) - no commands saved
File
Edit
View
Commands
Run
Results
Tools
Help
Stream Gage Data
Delay Table Data
Diversion Data
Precipitation Data
Evaporation Data
Reservoir Data
Instream Flow Data
Well Data
Stream Estimate Data
River Network Data
Operational Data
San Juan Sediment R
Spatial Data
General - Comments
General - File Handling
General - HydroBase
General - Logging
General - Running
General - Test Proces
Diversion Stations
Diversion Rights
Diversion Demand TS (Daily)
Diversion Demand TS Override (Monthly)
Diversion Stations - Commands
SetOutputYearType() ...
ReadDiversionStationsFromList() ...
ReadDiversionStationsFromNetwork() ...
ReadDiversionStationsFromStateMod() ...
SetDiversionAggregate() ...
SetDiversionAggregateFromList() ...
SetDiversionSystem() ...
SetDiversionSystemFromList() ...
SetDiversionStation() ...
SetDiversionStationsFromList() ...
SortDiversionStations() ...
FillDiversionStationsFromHydroBase() ...
FillDiversionStationsFromNetwork() ...
FillDiversionStation() ...
SetDiversionStationDelayTablesFromNetwork() ...
SetDiversionStationDelayTablesFromRTN() ...
WriteDiversionStationsToList() ...
WriteDiversionStationsToStateMod() ...
CheckDiversionStations() ...
WriteCheckFile() ...
First read diversion stations.
Next provide collection information.
Finally, processing commands perform special actions when dealing with collections, such as adding the capacities for multiple ditches.
Run Selected Commands
Clear Commands
Results
Output Files
Problems
Open a command file or add new commands.
Ready



	A	B	C	D	E	F						L
1	51_ADC001	Colorado River nr Granby	510580	510663	510703	510704						511
2	51_ADC002	Willow Creek	510742	510818	510819	510847	510920	510930	510962			
3	51_ADC003	Ranch Creek	510513	510568	510606	510681	510708	510727	510767			
4	51_ADC004	Fraser River bl Crooked Creek	510504	510530	510582	510592	510610	510635	510661	510662	510701	5107
5	51_ADC005	Tenmile Creek	510554	510556	510558	510560	510561	510579	510586	510616	510634	5108
6	51_ADC006	Fraser River at Gra				77	510735	510826	510918	510923	511294	
7	51_ADC007	Colorado River abv				71	510686	510691	510717	510718	510726	5107
8	51_ADC008	Colorado River abv				65	510566	510599	510608	510746	510747	5107
9	51_ADC009	Upper Williams Fork	510514	510516	510552	510624	510667	510689	510740	510741	510760	5107
10	51_ADC010	Lower Williams Fork	510518	510525	510526	510539	510540	510542	510543	510545	510587	5105
11	51_ADC011	Colorado River abv Troublesome Cree	510503	510628	510668	510687	510715	510716	510798	510850	510851	5108
12	50_ADC012	Troublesome Creek	500515	500516	500517	500518	500519	500523	500530	500533	500534	5005
13	50_ADC013	Upper Muddy Creek	500501	500502	500503	500504	500505	500506	500544	500545	500550	5006
14	50_ADC014	Muddy Creek abv Tyler Ditch	500500	500511	500513	500514	500531	500563	500564	500577	500580	5005
15	50_ADC015	Muddy Creek abv Red Dirt Creek	500509	500510	500521	500552	500562	500579	500631	500678	500679	5007
16	50_ADC016	Lower Muddy Creek	500507	500512	500536	500537	500540	500542	500572	500573	500575	5005
17	36_ADC017	Upper Blue River	360507	360521	360540	360542	360569	360581	360582	360585	360591	3606
18	36_ADC018	Blue River abv Green Mountain Rsvr	360526	360567	360577	360578	360633	360644	360646	360647	360665	3606
19	36_ADC019	Blue River bl Green Mountain Rsvr	360514	360517	360520	360545	360546	360593	360594	360595	360596	3606
20	50_ADC020	Colorado River bl Kremmling	500566	500602	500608	500614	500651	500755	510925	510926	510927	5111
21	52_ADC021	Black Tail & Sheephorn Creeks	520505	520507	520514	520515	520516	520523	520524	520530	520531	5205
22	53_ADC022	Upper Egeria Creek					530782	530829	531079			
23	53_ADC023	King Creek					530729	530732	530756	530760	530766	5306
24	53_ADC024	Egeria Creek abv Toponas					530648	530664	530763	530887	534715	
25	53_ADC025	Toponas Creek					530776	530777	530797	530817	530818	5306
26	53_ADC026	Colorado River abv Alkali C					530573	530578	530592	530607	530625	5306
27	52_ADC027	Colorado River abv Derby C					520532	520534	520537	520538	520544	5205
28	53_ADC028	Derby Creek					530558	530626	530701	530702	530737	5307
29	37_ADC029	Eagle River abv Brush Creek	370502	370505	370506	370520	370521	370534	370537	370557	370597	3705
30	37_ADC030	Brush Creek	370510	370517	370559	370583	370585	370588	370604	370605	370610	3706
31	37_ADC031	Eagle River bl Gypsum	370533	370535	370544	370545	370550	370551	370552	370594	370595	3706
32	53_ADC032	Colorado River abv Glenwood Springs	370503	370601	370622	520502	520503	520519	520525	520541	520543	5205

Command Editor for Setting Aggregate Parts

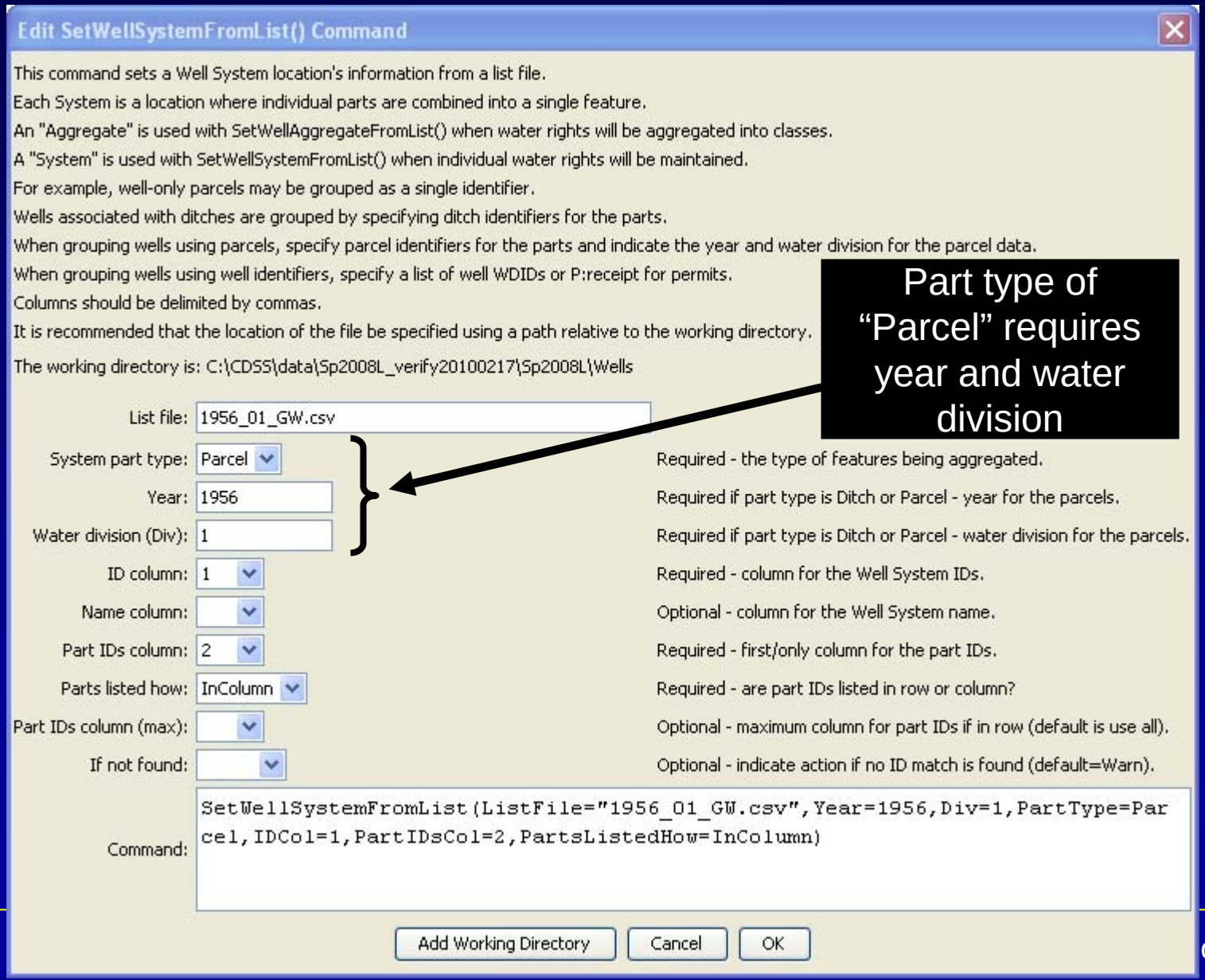


Location Types that can be Modeled as a Collection

- Diversions (StateCU and StateMod)
- Reservoirs (StateMod)
- Wells (StateCU and StateMod)

StateDMI commands for StateCU and StateMod can use the same list files. Lists of locations in a collection have a part type, indicating how lists are specified. In particular for wells, the part type can be “well”, “ditch”, or “parcel”.

Specifying Well Systems



Setting Collection Information for StateCU and StateMod

- For StateMod, use diversion commands to set collection information for diversions, well commands for wells, etc.
- For StateCU, because node types are not known in the “structure” file, use either diversion or well aggregate/system commands.
- StateDMI provides the appropriate commands to guide modelers.

Collections Result in Special Data Processing

- Stations – have summed capacities, acreage
- Water rights – are grouped under one identifier
- Time series – are summed for one identifier
  - Data filling occurs on parts before adding to total

StateMod Well Collections

- If a list of wells (collection part type “well”, e.g., for a well field):
  - The list of well identifiers is provided
- If a well station is associated with a diversion station (collection part type “ditch”), wells are determined as follows:
  - The list of parcels for the diversion(s) is determined
  - The list of wells for the parcels is determined
- If a well station associated with groundwater-only parcels (collection part type “parcel”):
  - The list of wells is determined from the parcel list

Individual wells can be identified by WDID and/or permit numbers.

More Information

Help…View Documentation to view the StateDMI documentation.

Basin model documentation describes in detail the sources of data, estimates, and processes that were used to create the data sets, and summarizes results.

Numerous task memoranda, reports, software documentation, and other documents provide technical information and are available on the CDSS web site:

http://cdss.state.co.us (see Products links)