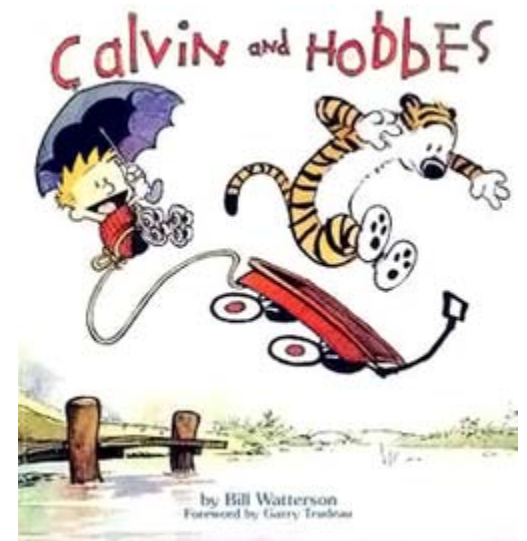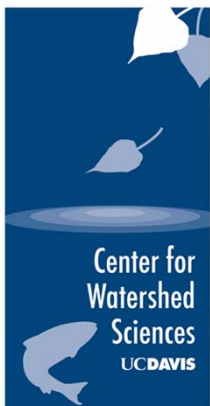# Data Management & Documentation System (DMDS)

Jay Lund, Samuel Sandoval, Josué Medellín, Wei Chu, Alvar Escriva, Ashley Vincent, Erik Porse, Prudentia Zikalala, Timothy Nelson, Rui Hui
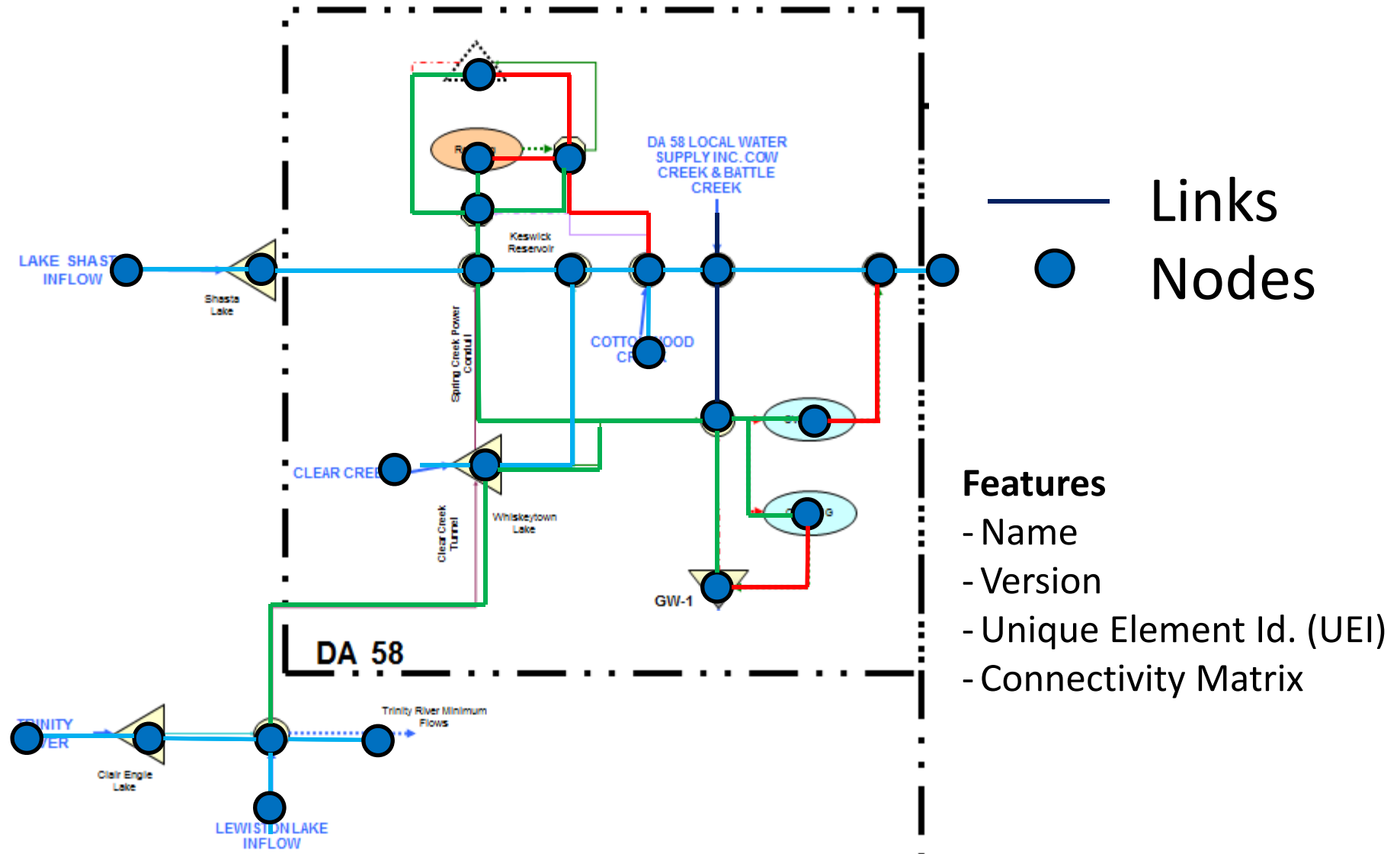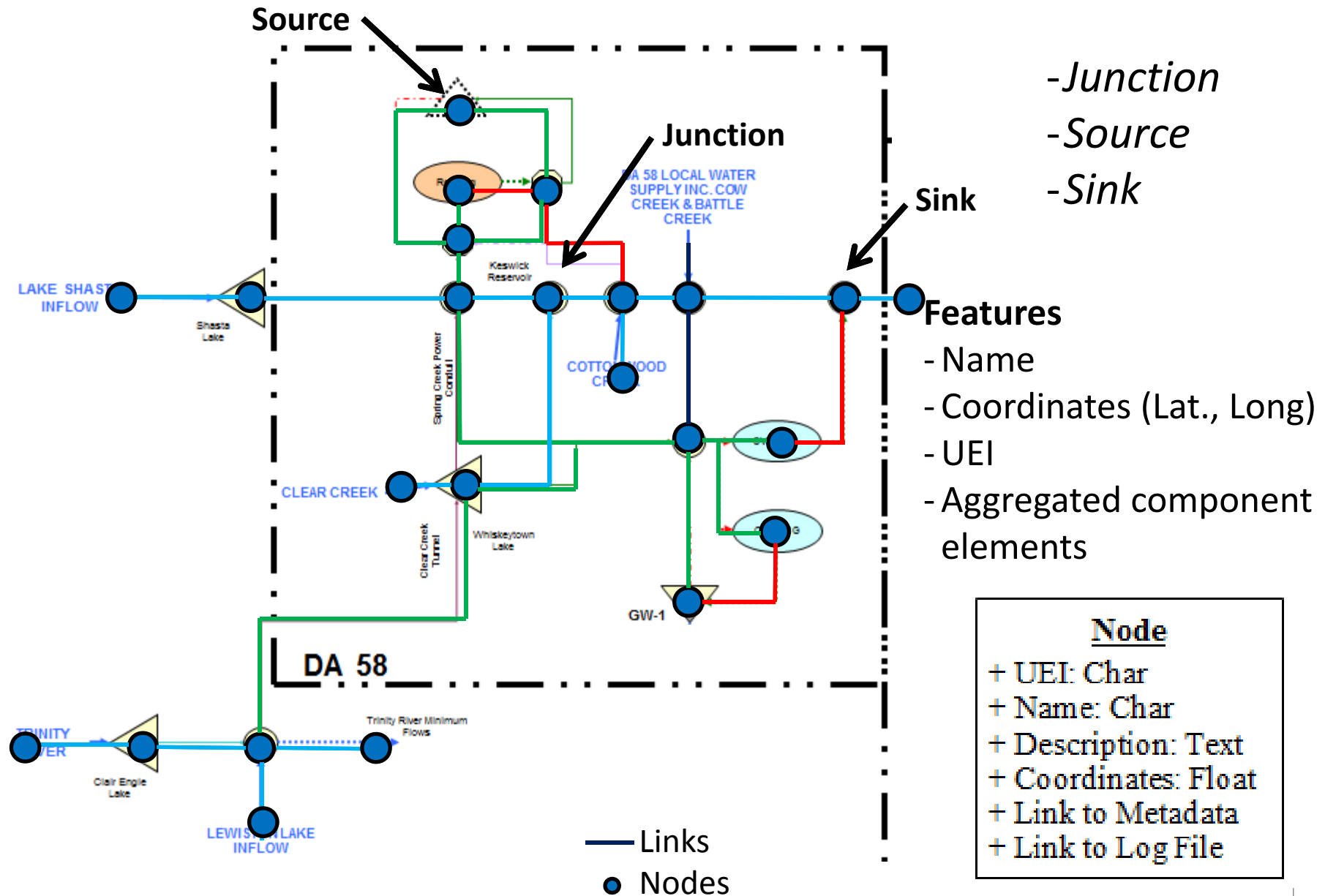
June 14, 2013

Data Types

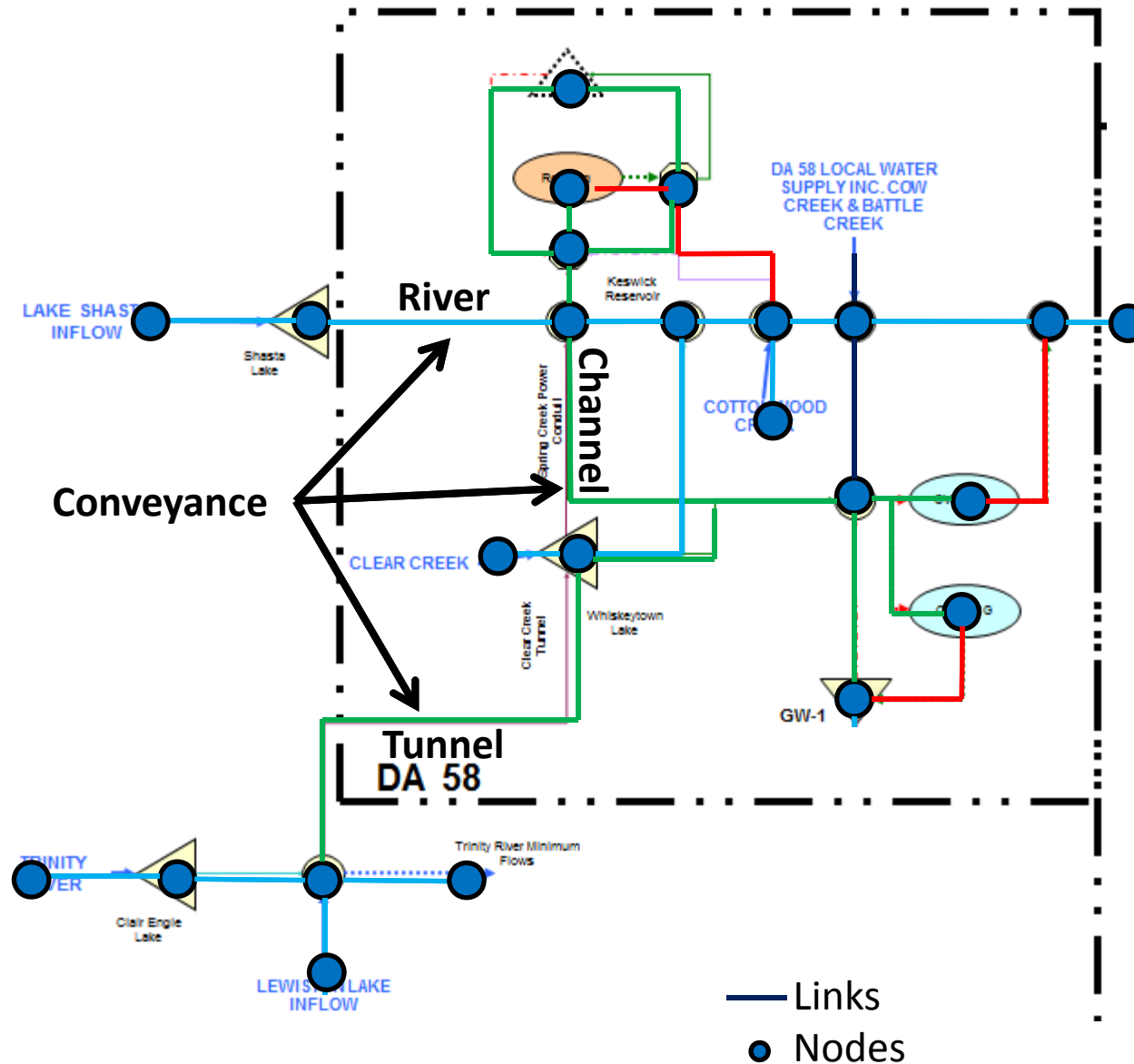| Type		Set	Features
Network Structure		Set of network elements (links and nodes)	Name, version, Unique Element Identifier (UEI) and connectivity matrix
Network Elements	Node	Junction, Source, and Sink	UEI, name, coordinates, aggregated component elements
	Link	• Conveyance: Artificial channels, pipelines, and rivers • Storage: Surface and ground-water storages • Facility: Power plants, pumping plants, potable and wastewater treatment plants • Demands Area: Agricultural, urban, environmental	UEI, name, version, coordinates of end points, length, capacities, unit or non-linear costs, unit or nonlinear energy use, energy source, aggregated component elements, and other specific features
Timeseries		Rim inflows, accretions and depletions, environmental constraints, evaporation, constrained flows	UEI, version, unit, corresponding physical elements, start and end time, and time steps
Paired Data (PD)		Cost and benefit functions, reservoir elevation-area-capacity relationships, energy use curves, environmental flows by year type relationships	UEI, version, unit, and other specific features
Spatial layers		Precipitation, temperature, ET, land cover	UEI, version, unit, spatial resolution, time, and projection
Grid cells		Grid cells for finite element/difference models of ground and surface water	UEI, version, location, shape, transmissivity, storativity, etc.

Network Structure

Features
- Name
- Version
- Unique Element Id. (UEI)
- Connectivity Matrix

Links
Nodes

Network Elements: **Nodes**

Source

Junction

A 58 LOCAL WATER SUPPLY INC. COW CREEK & BATTLE CREEK

Sink

Keswick Reservoir

LAKE SHASTA INFLOW

Shasta Lake

Spring Creek Power Conduit

COTTONWOOD CREEK

CLEAR CREEK

Clear Creek Tunnel

Whiskeytown Lake

GW-1

G

DA 58

TRINITY RIVER

Clair Engle Lake

Trinity River Minimum Flows

LEWISTON LAKE INFLOW

-Junction
-Source
-Sink

Features
- Name
- Coordinates (Lat., Long)
- UEI
- Aggregated component elements

— Links
• Nodes

Node
+ UEI: Char
+ Name: Char
+ Description: Text
+ Coordinates: Float
+ Link to Metadata
+ Link to Log File

Network Elements: **Links**

- *Conveyance*: channels, pipelines and rivers

Features
- Name
- Coordinates of end points
- UEI
- Version
- Length
- Capacity
- Unit or non-linear cost
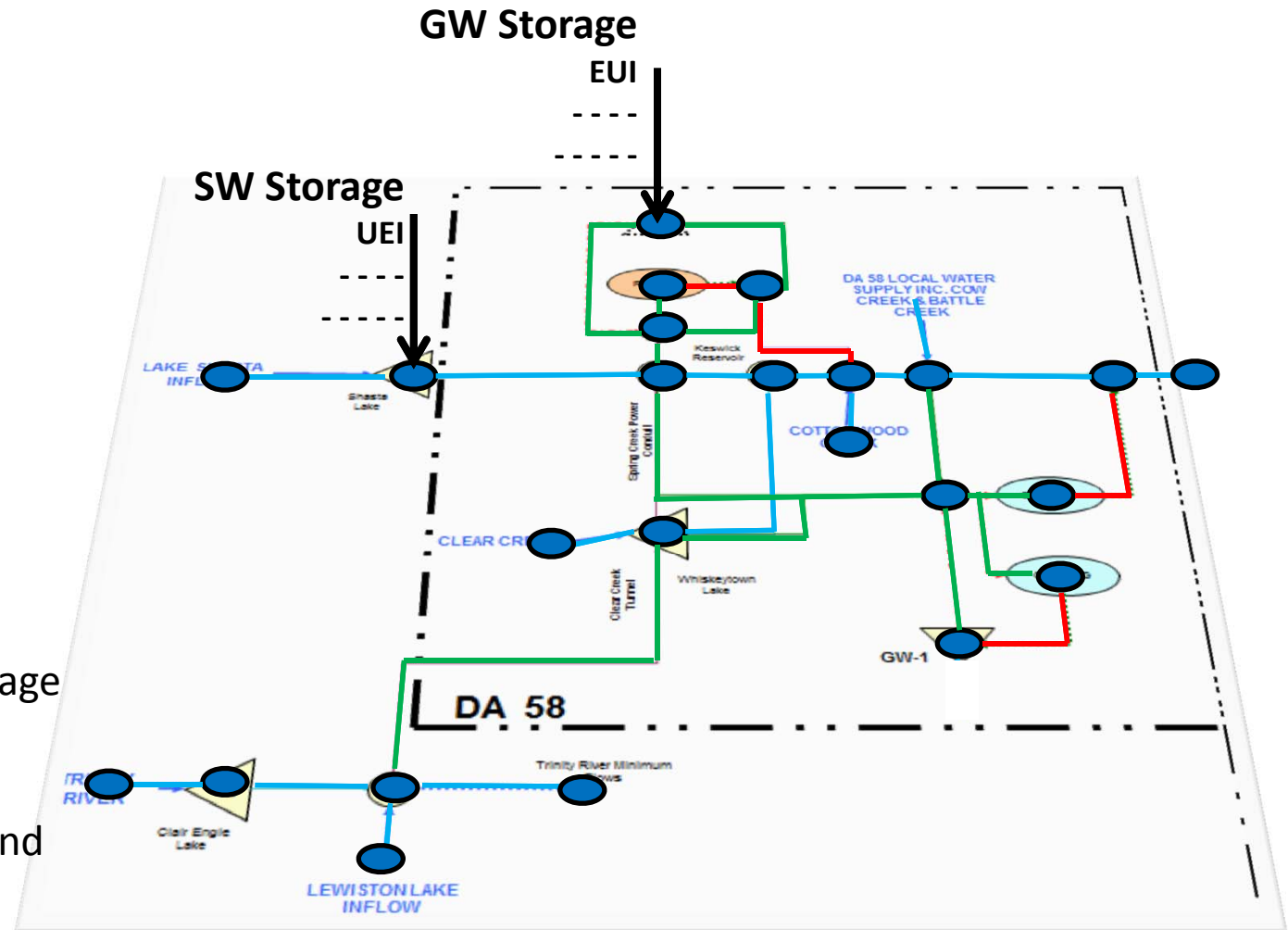- Unit or non-linear energy use
- Aggregated Component Elements

Network Elements: **Storage Link at Node**

Storage

Surface water
Groundwater

Features

- UEI
- Name
- Description
- Type
- Coordinates
- Initial and ending storage
- Area-Capacity factor
- Evaporation rate
- Lower and Upper bound
  (Capacity)
- Storage cost
- Spatial layer
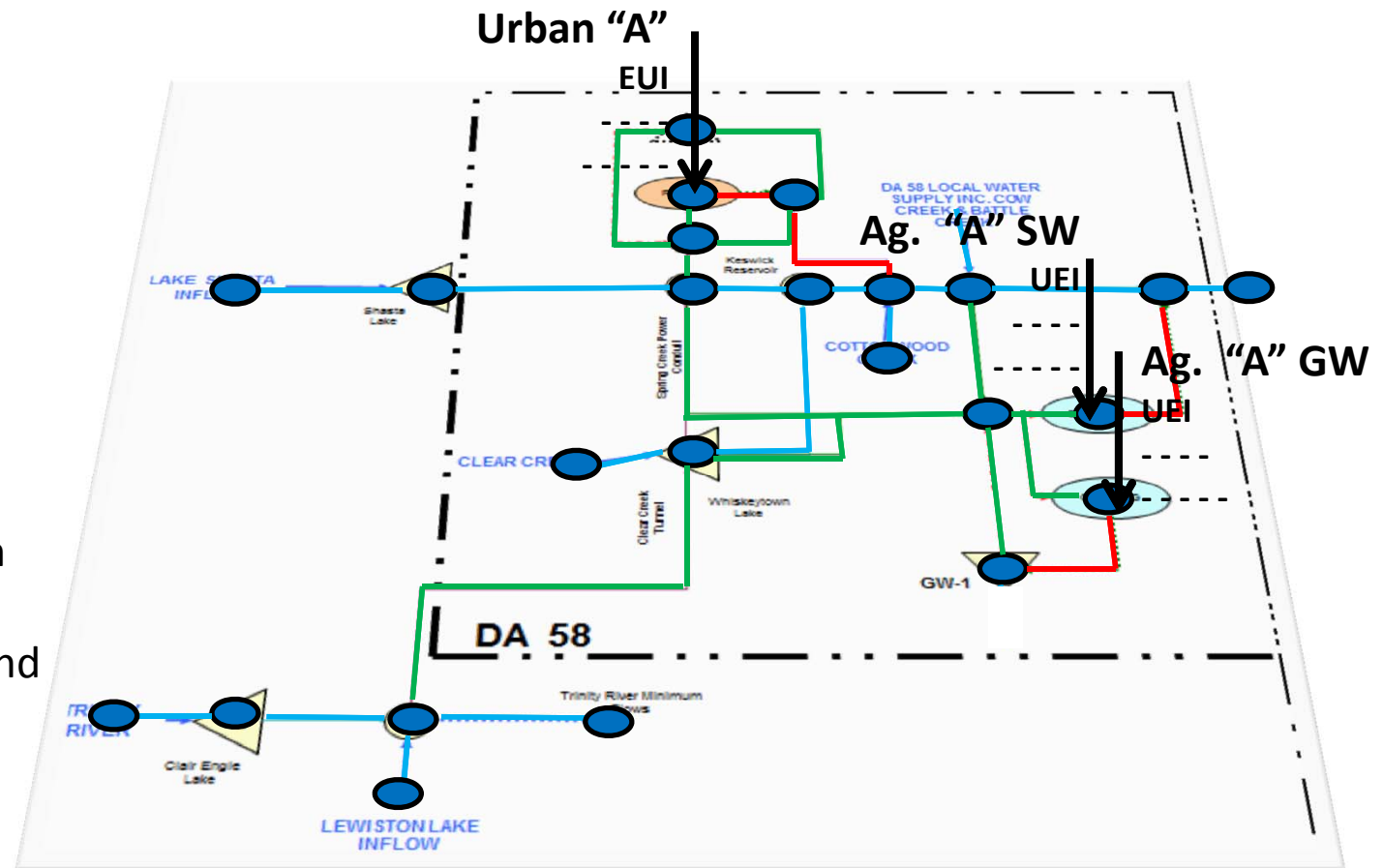- Link to metadata
- Link to log file

Network Elements: **Demand Link at Node**

Demand Area

Agricultural
Urban
Environmental

Features
- UEI
- Name
- Description
- Link amplitude
- Origin and destination Node
- Lower and upper bound
- Link to cost (Table)
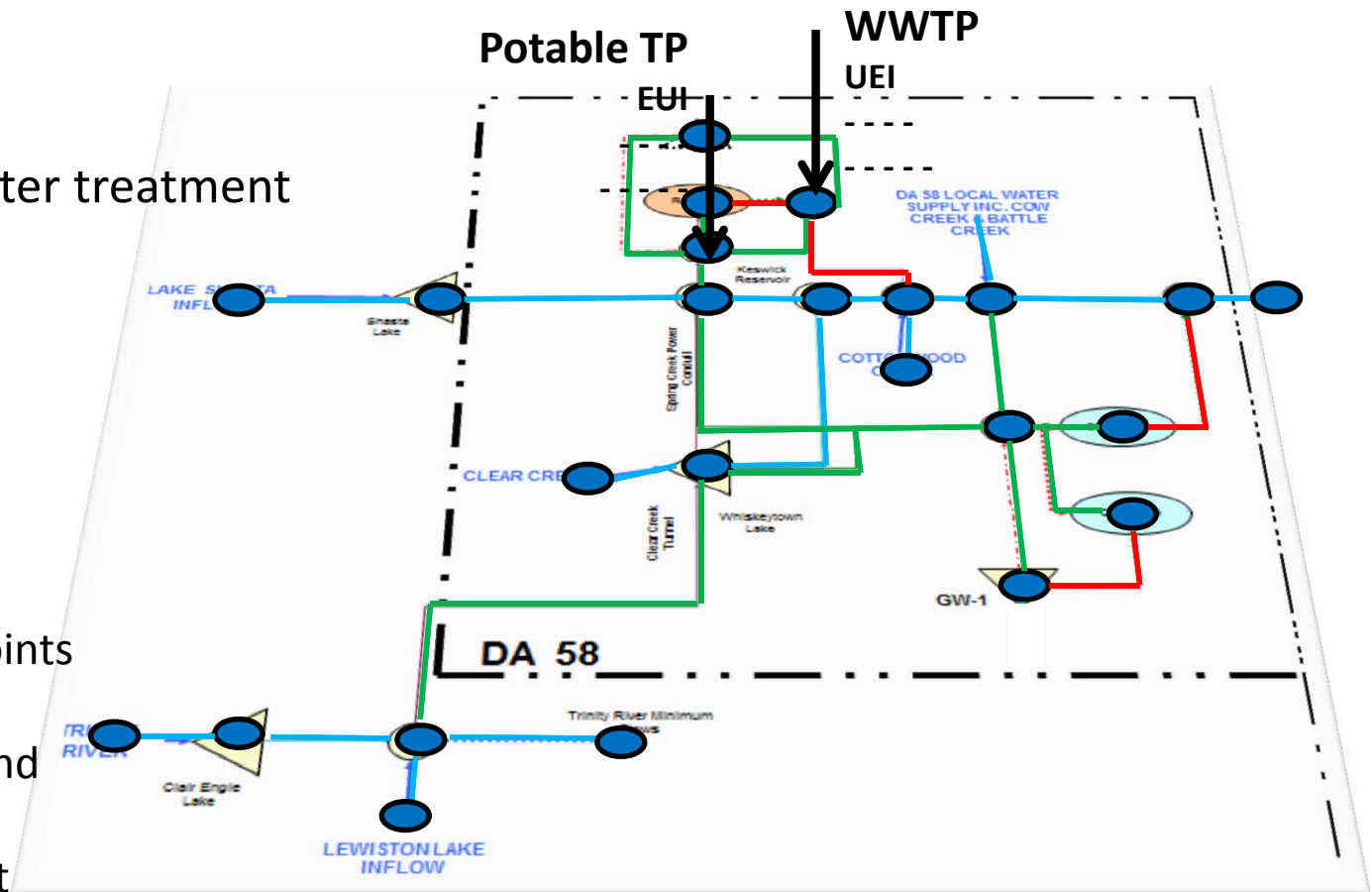- Spatial layer
- Link to metadata
- Link to log file

Network Elements: **Facility Link at Node**

Facility

Power plants
Pumping plants
Potable and wastewater treatment
Reuse, desalination

Features
- UEI
- Name
- Description
- Type
- Coordinates of end points
- Efficiency
- Lower and upper bound
  (Capacity)
- Unit or non-linear cost
- Link to metadata
- Link to log file

Time Series

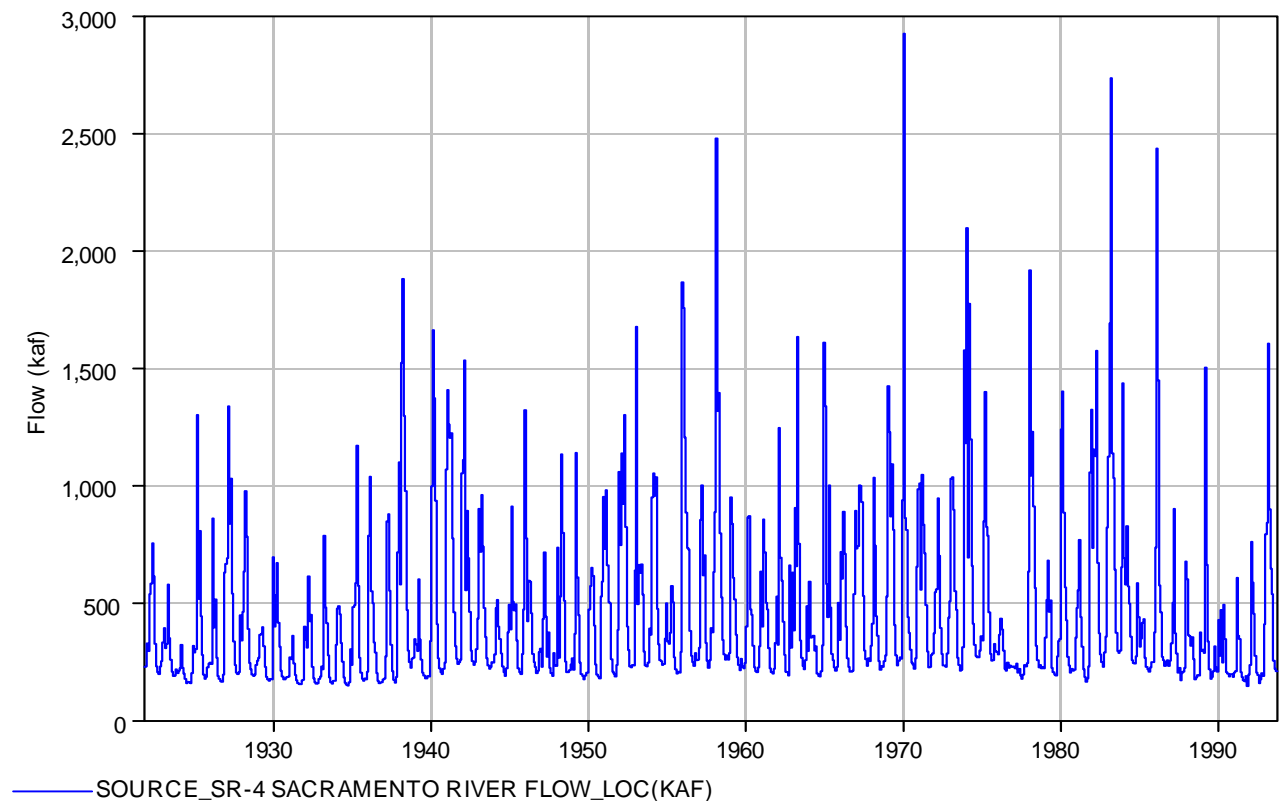|		UCD CAP1
A		SOURCE_SR-4
B		FLOW_LOC(KAF)
C		
E		
F		SACRAMENTO RIVER
Units		KAF
Type		PER-AVER
1	31Oct1921	230.0
2	30Nov1921	232.0
3	31Dec1921	330.0
4	31Jan1922	297.0
5	28Feb1922	540.0
6	31Mar1922	585.0
7	30Apr1922	756.0
8	31May1922	614.0
9	30Jun1922	328.0

Time Series

Inflows,

Accretions and depletions

Environmental constraints

Evaporation

Operating constraints

Features

- UEI

- Units

- Physical element

- Description

- DSS file and pathname

- Start and end time

- Time step

- Link to metadata

- Link to log file

SOURCE_SR-4 SACRAMENTO RIVER FLOW_LOC(KAF)

Paired Data

Paired Data

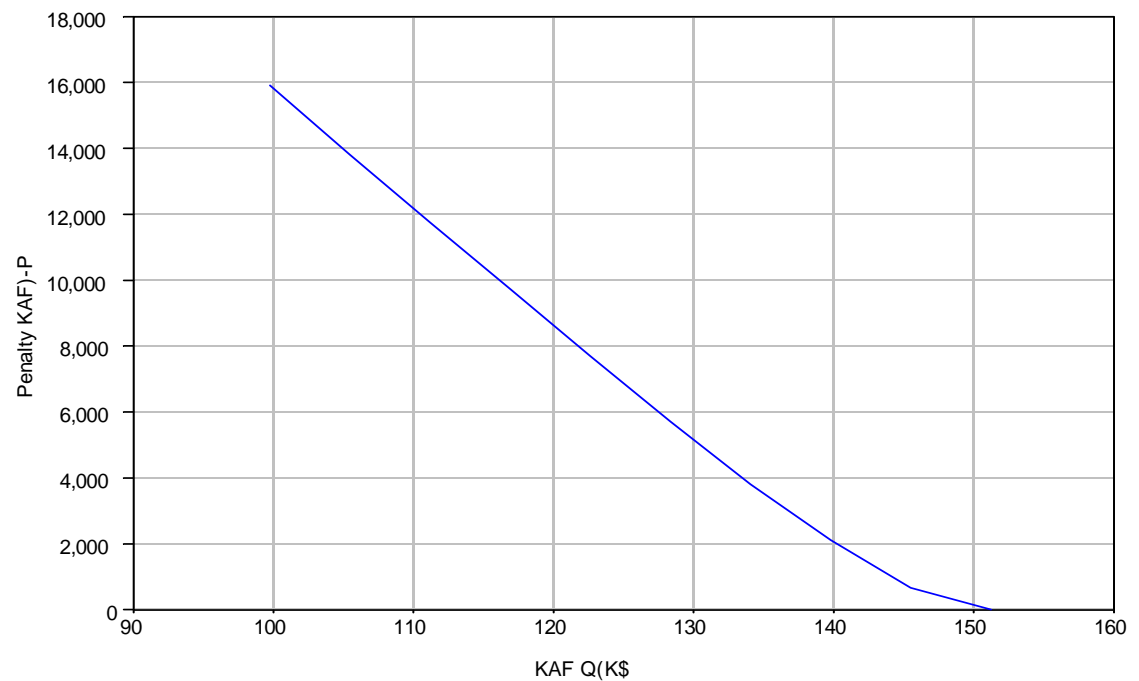Cost and benefit functions

Reservoir elevation-area-storage curves

Energy use curves

E-flows by type of year

Features

- UEI
- Units
- Physical element
- Description
- DSS file and pathname
- Link to metadata
- Link to log file

		C91_CVPM14S
Ordinate	Q(K$	KAF)-P
		JUL
Labels		JUL
Units	KAF	Penalty
Type	DIVR	
1	99.75	15915
2	105.47	13807
3	111.19	11757
4	116.91	9719
5	122.63	7695
6	128.35	5702
7	134.07	3811
8	139.79	2113
9	145.5	660
10	151.22	0

C91_CVPM14S JMA04112012 JUL JUL

Metadata

<ins>Metadata</ins>

+ Corresponding Element UEI: Char
+ Author: Char
+ Date: Date
+ Commentary: Text
+ Quality: Provisional, Draft, or Final
+ Contact Information: Text
+ Data Checking: Text
+ Source: Text
+ Source Notes: Text
+ Last Updates: Text

Log File

Log File

+ Corresponding Element UEI: Char
+ Author: Char
+ Date: Date
+ Commentary: Text
+ Procedure: Text
+ Previous Data: Text

Permissions for the DMDS

Administrator can READ and MODIFY all data files and designate authors and other administrators ;

Author can CREATE new elements, READ all public data files and can MODIFY data uploaded;

General User can READ all public data.

Thank you!

Any Feedback?