



SCV
WATER

Water Resiliency Plan Initiative Activities

GoldSim Model Development Update

Water Resources and Watershed Committee

April 13, 2022

Item No. 6.2

Outline

- Introduction
- Modeling Methodology
- Key Operating Strategies
- Input and Output
- User Interface
- Future Development/Applications



Introduction

- SCV Water has been using an Excel-based Water Resources Model to:
 - Assess the reliability of its supplies.
 - Evaluate the need for new investments.
- The Excel model uses an annual time step, but water resources decisions occur at a finer timescale.
- Currently transitioning to the GoldSim platform, with a monthly time step.

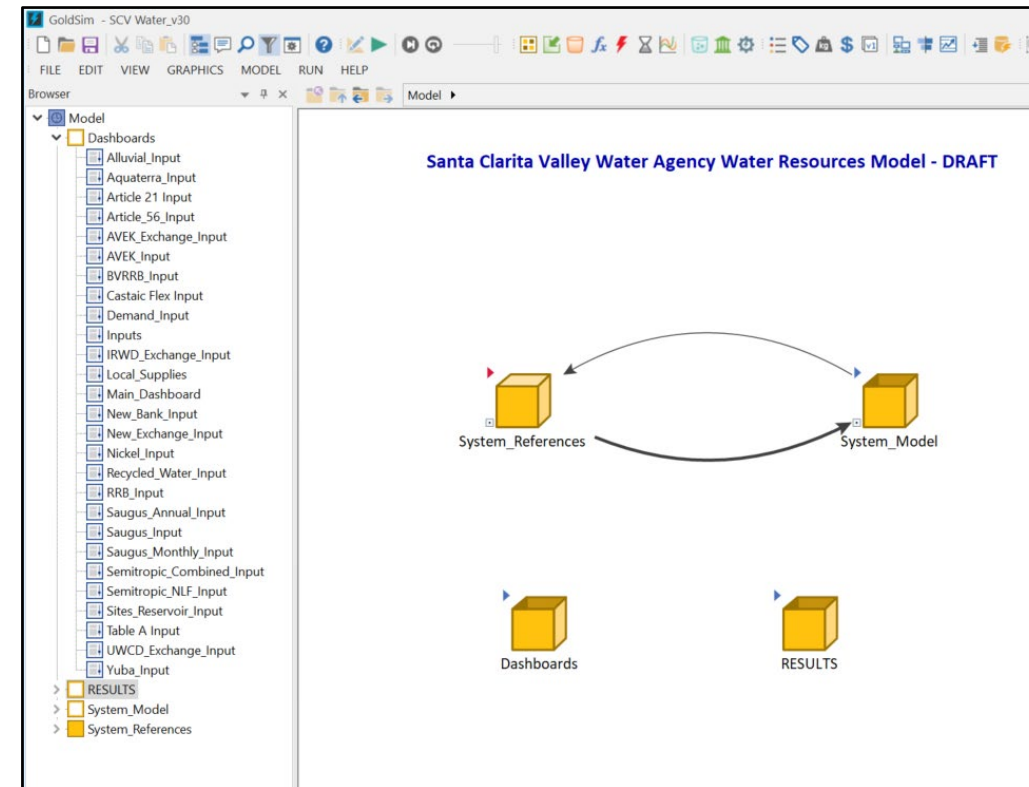
The screenshot displays an Excel spreadsheet with the following structure:

- Article M6:** Columns for 'Article M6' (A10-A14), 'Custom Five Forced Parked' (A15-A19), 'Imported Supply' (A20-A24), and 'Local Groundwater' (A25-A29).
- Columns:** 'Article M6' (A10-A14), 'Custom Five Forced Parked' (A15-A19), 'Imported Supply' (A20-A24), and 'Local Groundwater' (A25-A29).
- Rows:** Multiple rows representing different articles and time steps, with columns for 'Article M6', 'Custom Five Forced Parked', 'Imported Supply', and 'Local Groundwater'.
- Formulas:** The spreadsheet contains various formulas, including logical conditions (TRUE/FALSE) and numerical calculations.



Introduction

- The logic built into the GoldSim model assumes no foresight on State Water Project Allocations.
- The model makes decisions every time step based on assumptions, rules, and thresholds we set.
- Refinements to logic and assumptions will be made during QA/QC.



Modeling Methodology

- Similar to the existing model, the approach used in the new GoldSim model assesses how different **supplies are used to meet monthly demand over wet and dry year sequences.**
- The analysis simulates the wet and dry year sequences based on the same **monthly hydrologic record** used in CalSim.

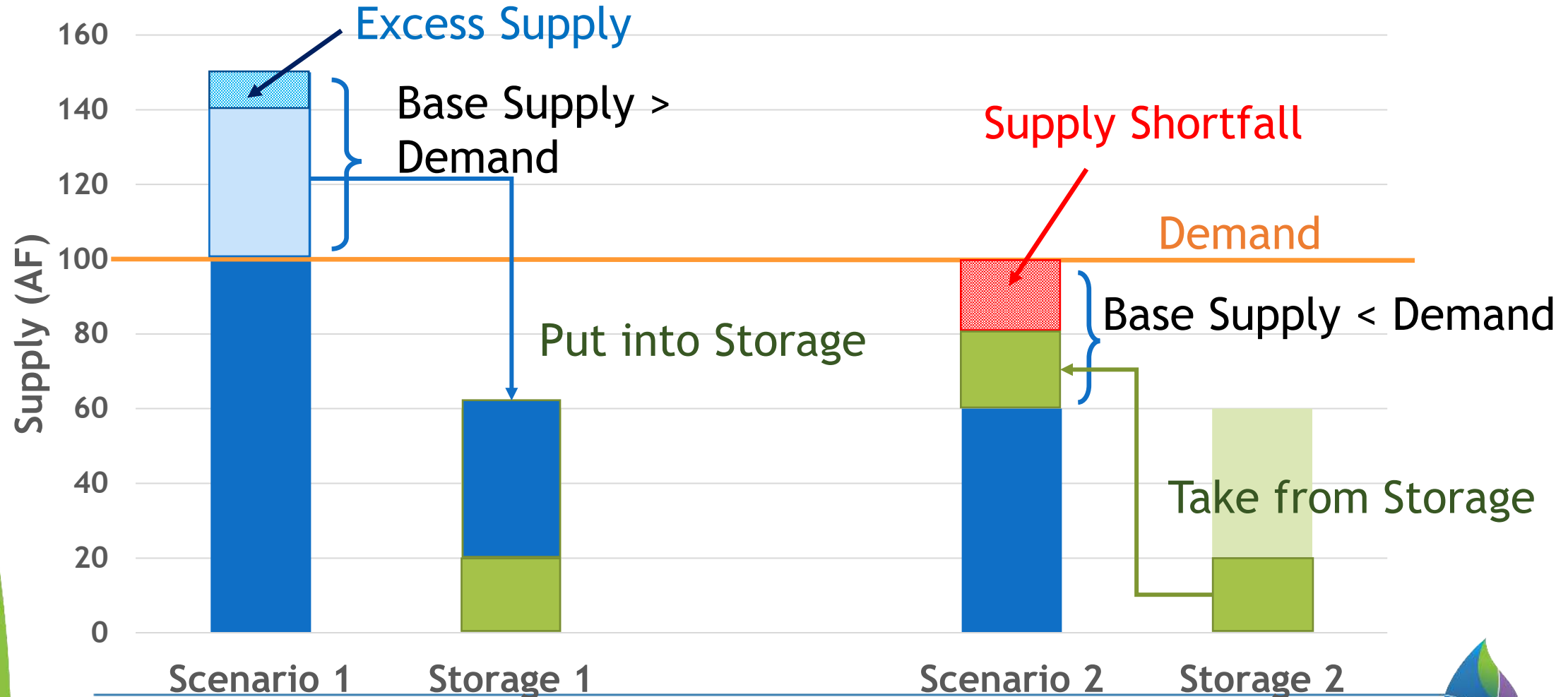


Modeling Methodology

- For each hydrologic trace, the model steps through each year of the study period, comparing annual supplies to demands and operating storage and exchange programs as needed.
- In years when **supplies are greater than demands**, water is **added** to storage programs.
- In years when **supplies are less than demands**, water is **taken** from storage.

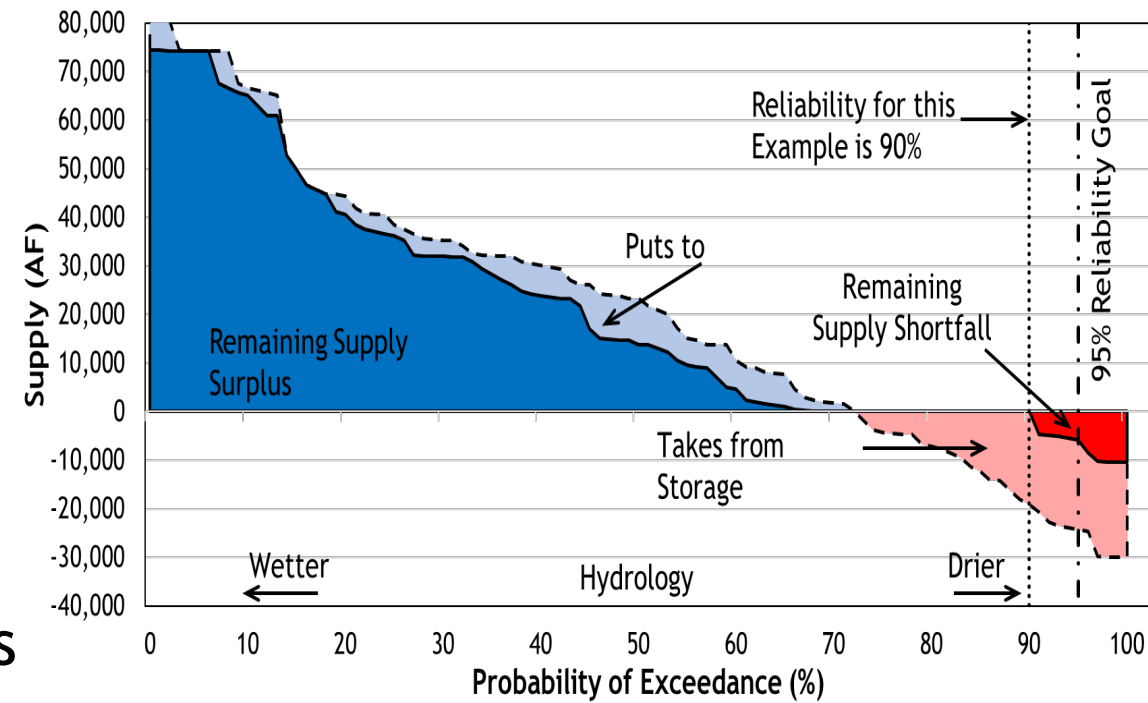


Modeling Methodology: Water Operations in a Single Year



Modeling Methodology

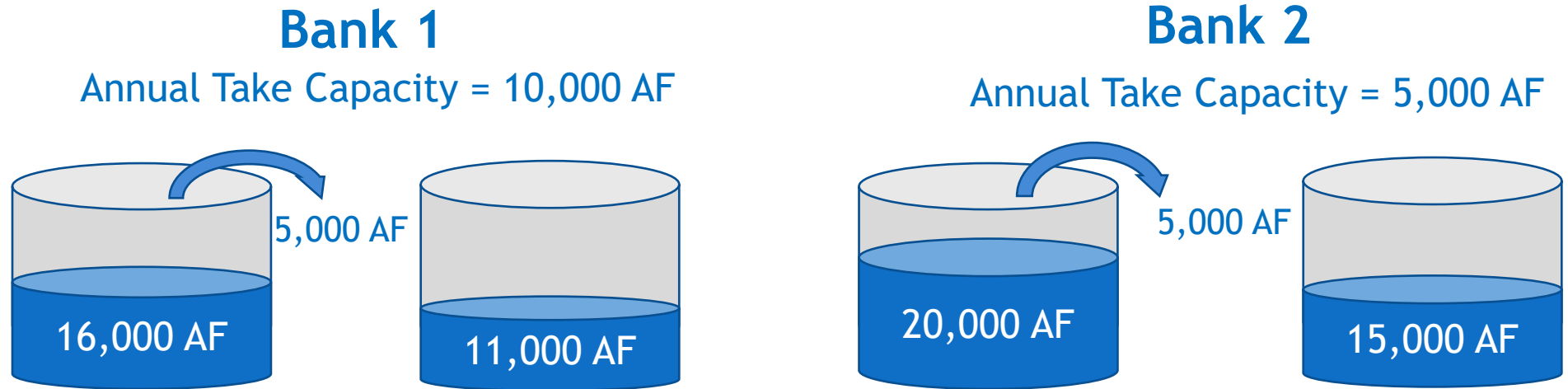
- Study period results from the number of hydrologic traces used are summarized to provide a statistical assessment:
 - Of the reliability of SCV Water's supplies and storage programs.
 - To evaluate and compare the benefits of different investments for maintaining water supply reliability.



Key Operating Strategies

- Extend the life of each storage program by balancing the stored water to take ratio

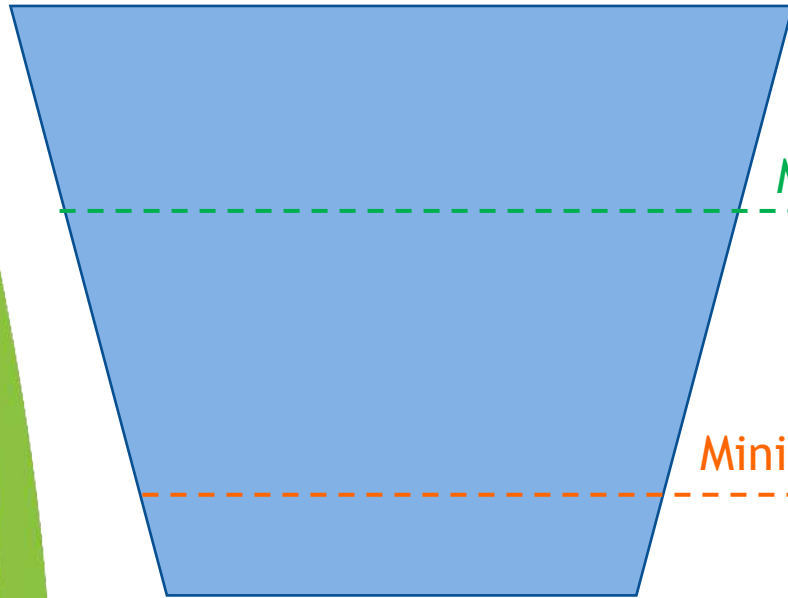
10,000 AF is needed from storage



Key Operating Strategies

- Management of storage in San Luis Reservoir

Projected End of Year Balance



Monthly Strategy

Fill banks with excess water

No fill of banks

Take from banks



Model Input and Output

INPUT

- Demand Forecast
- State Water Project Supplies
- Local Groundwater
- Recycled Water
- Banking and Exchange Programs



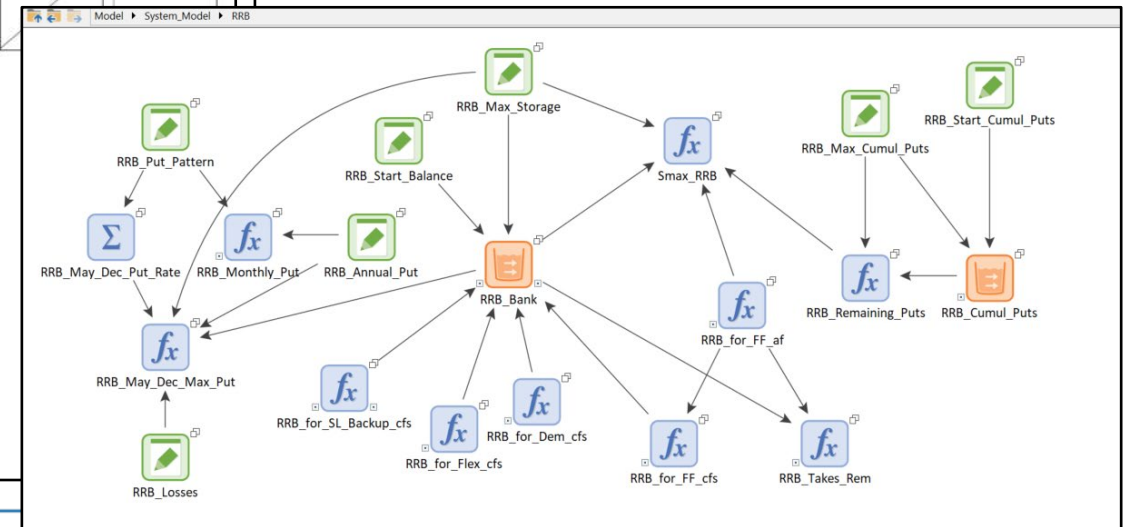
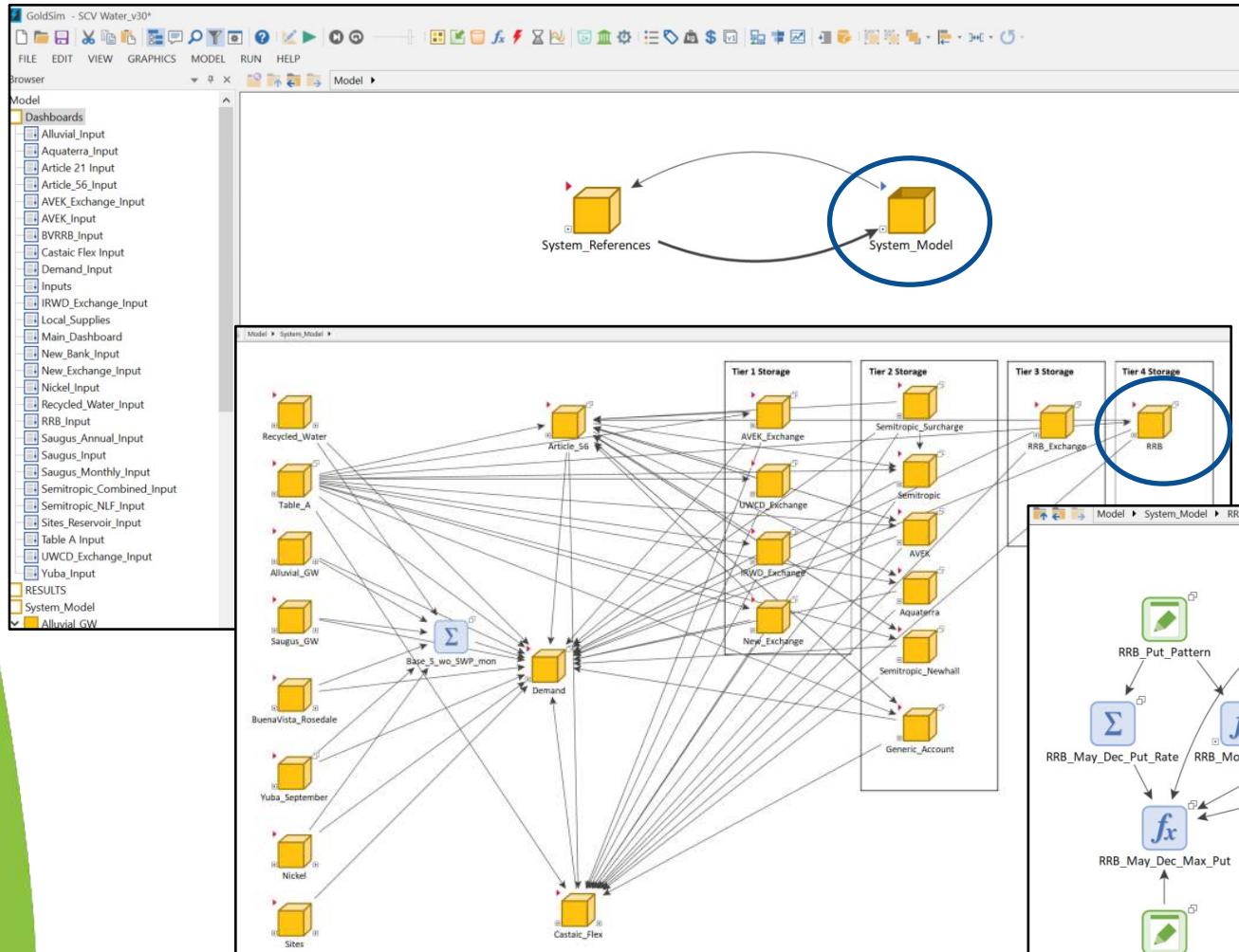
Model Input and Output

OUTPUT

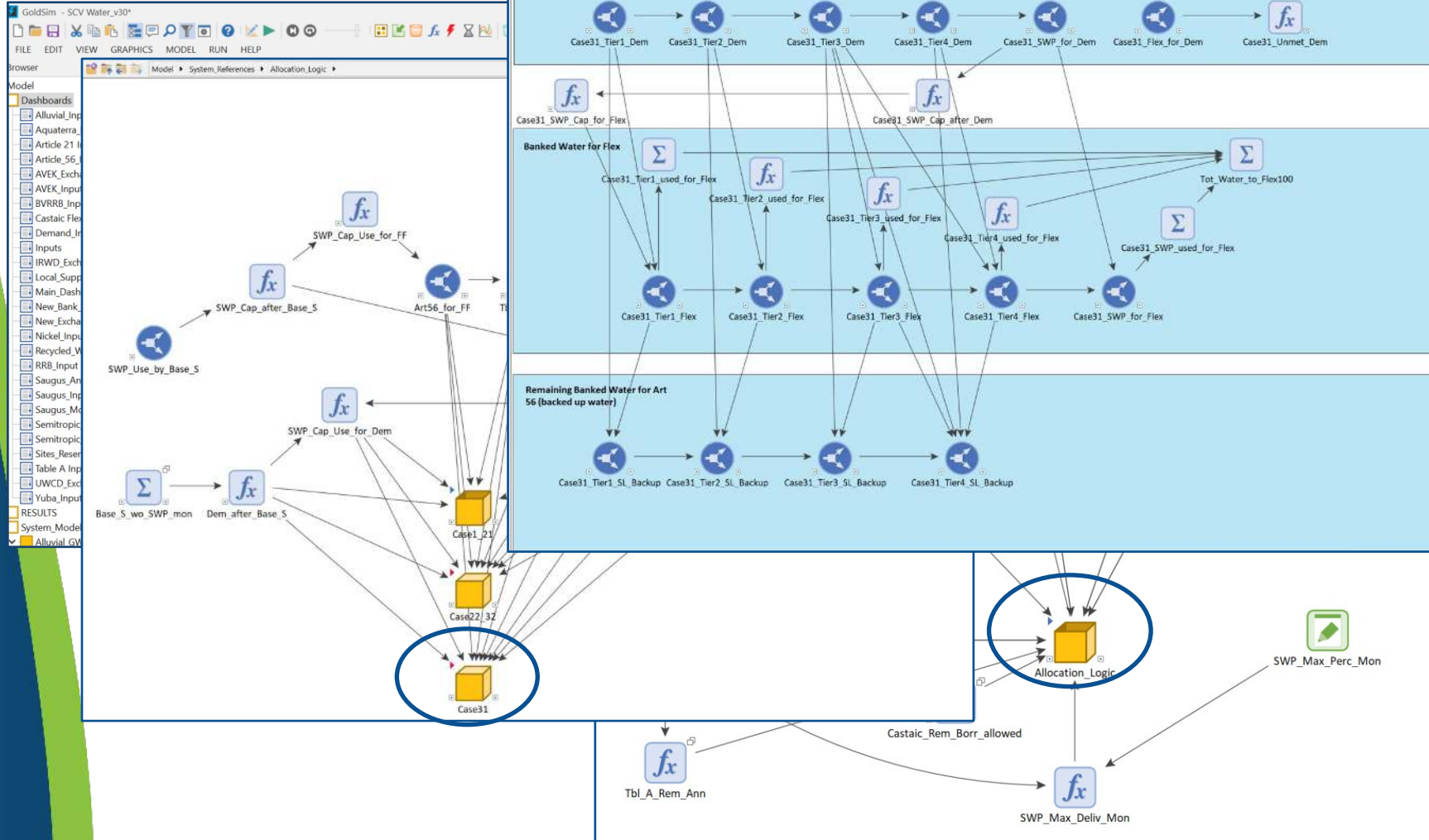
- Probability and exceedance graphs for different variables:
 - Water Supply Reliability
 - Status of Water Balance in Banking Programs
 - Status of Article 56 supplies in San Luis Reservoir
- Tables that can be exported to excel for further analysis



Model and User Interface



Model and U



Model and User Interface

GoldSim - SCV Water_v31*

FILE EDIT VIEW GRAPHICS MODEL RUN HELP

Model Dashboards Main_Dashboard

Santa Clarita Valley Water Agency Water Resources Reliability Model

Demand
 Demand Start Year: 2021
 Demand Scenario: Without Active Conservation
 Percent of projected end-of-year excess SWP supplies to be sent to RRB Exchange Program (%): 50
 [Edit Demand Data]

Recycled Water
 Run Simulations with Recycled Water:

Groundwater
 Use Alluvial Groundwater:
 Use Saugus Groundwater:

	Saugus Future Wells
Saugus_WO_3_8	<input checked="" type="checkbox"/>
Saugus_3	<input type="checkbox"/>
Saugus_4	<input type="checkbox"/>
Saugus_5	<input type="checkbox"/>
Saugus_6	<input type="checkbox"/>
Saugus_7	<input type="checkbox"/>
Saugus_8	<input type="checkbox"/>

[Edit Imported Supplies]
[Edit Local Supplies]

State Water Project Supplies
Table A Allocations
 Run Simulations with Table A:
 First Year of Historic Hydrologic Record: 1922
 First Year of Sequence (simulated): 1922
 Last Year of Sequence (simulated): 2015
 First Month (simulated): 1

Article 21
 Simulate Kern Article 21 (for triggering Article 56 spill):

Article 56
 Simulate Article 56:
 Maximum End of Year Target (AF): 30000
 Minimum End of Year Target (AF): 10000

Sites Reservoir
 Simulate Sites Reservoir:
 Sites Reservoir Scenario: Alt_1B

Other Supplies

	Check box to use supply
Nickel Water	<input checked="" type="checkbox"/>
BVRRB	<input checked="" type="checkbox"/>
Yuba	<input checked="" type="checkbox"/>

Banking Programs

	Check box to turn on program
Semitropic Surcharge	<input checked="" type="checkbox"/>
Semitropic	<input checked="" type="checkbox"/>
AVEK	<input checked="" type="checkbox"/>
Aquaterra	<input checked="" type="checkbox"/>
Semitropic_NLF	<input checked="" type="checkbox"/>
RRB	<input checked="" type="checkbox"/>
New Bank	<input type="checkbox"/>

Exchange Programs

	Check box to turn on program
AVEK Exchange	<input type="checkbox"/>
UWCD Exchange	<input checked="" type="checkbox"/>
IRWD Exchange	<input type="checkbox"/>
RRB Exchange	<input type="checkbox"/>
New Exchange	<input type="checkbox"/>

Single Trace Supply Shortage
 [View Additional Output]

Distribution of Supply Shortage

Probability of Supply Shortage

 Statistics for Shortage_Real
 1%..5% / 99%..99%
 5%..15% / 85%..95%
 15%..25% / 75%..85%
 25%..35% / 65%..75%
 35%..45% / 55%..65%
 45%..55%
 50%

System Model
 Alluvial_GW
 Aquaterra
 Article 56
 Amt to Min_Art56_Target
 Art56
 Art56_Bal_after_FF
 Art56 for Dem cfs

Model and User Interface

The screenshot displays a software interface with a menu bar (FILE, EDIT, VIEW, GRAPHICS, MODEL, RUN, HELP) and a toolbar. A sidebar on the left lists various input categories under 'Dashboards' and 'RESULTS'. The main window is titled 'Model > Dashboards > Demand_Input' and contains a 'DEMAND DATA' section with a 'Back to Main Dashboard' button. Below this is a 'Historical Monthly Use Pattern' section with an 'Edit 1-D Table' dialog box open. The dialog box shows a table with columns 'Year' and 'Result [af]' and a list of rows from 1 to 23. The table data is as follows:

	Year	Result [af]
1	2021	72063
2	2022	74852
3	2023	77995
4	2024	79997
5	2025	82140
6	2026	83474
7	2027	84998
8	2028	86693
9	2029	87945
10	2030	89293
11	2031	90544
12	2032	92335
13	2033	93838
14	2034	95568
15	2035	97615
16	2036	99380
17	2037	100964
18	2038	102232
19	2039	103248
20	2040	104291
21	2041	105343
22	2042	106402
23	2043	107467

The dialog box also includes buttons for 'OK', 'Cancel', 'Help', 'Add Row(s)', 'Remove Row(s)', and 'Import Table...'. The table is referenced in the model as 'Demand_Base(Year)'.

Model and User Interface

Model > Dashboards > Inputs

SCV Water Water Resources Model - Imported Supplies

AVEK BANKING PROGRAM [Back to Additional Inputs](#)

AVEK is a potential dry year banking program that would start in 2025 and expire in 2040. Monthly takes and puts are set by the terms of the agreement. The water banked is subject to losses.

Program Start Year:

Program End Year:

Maximum Storage (AF):

Storage Losses (%):

Annual Put (AFY): Annual Take (AFY):

Monthly Put Pattern

	AVEK_Put_Pattern [%]
January	8.33
February	8.33
March	8.33
April	8.33
May	8.33
June	8.33
July	8.33
August	8.33
September	8.33
October	8.33
November	8.33
December	8.33

Monthly Take Pattern

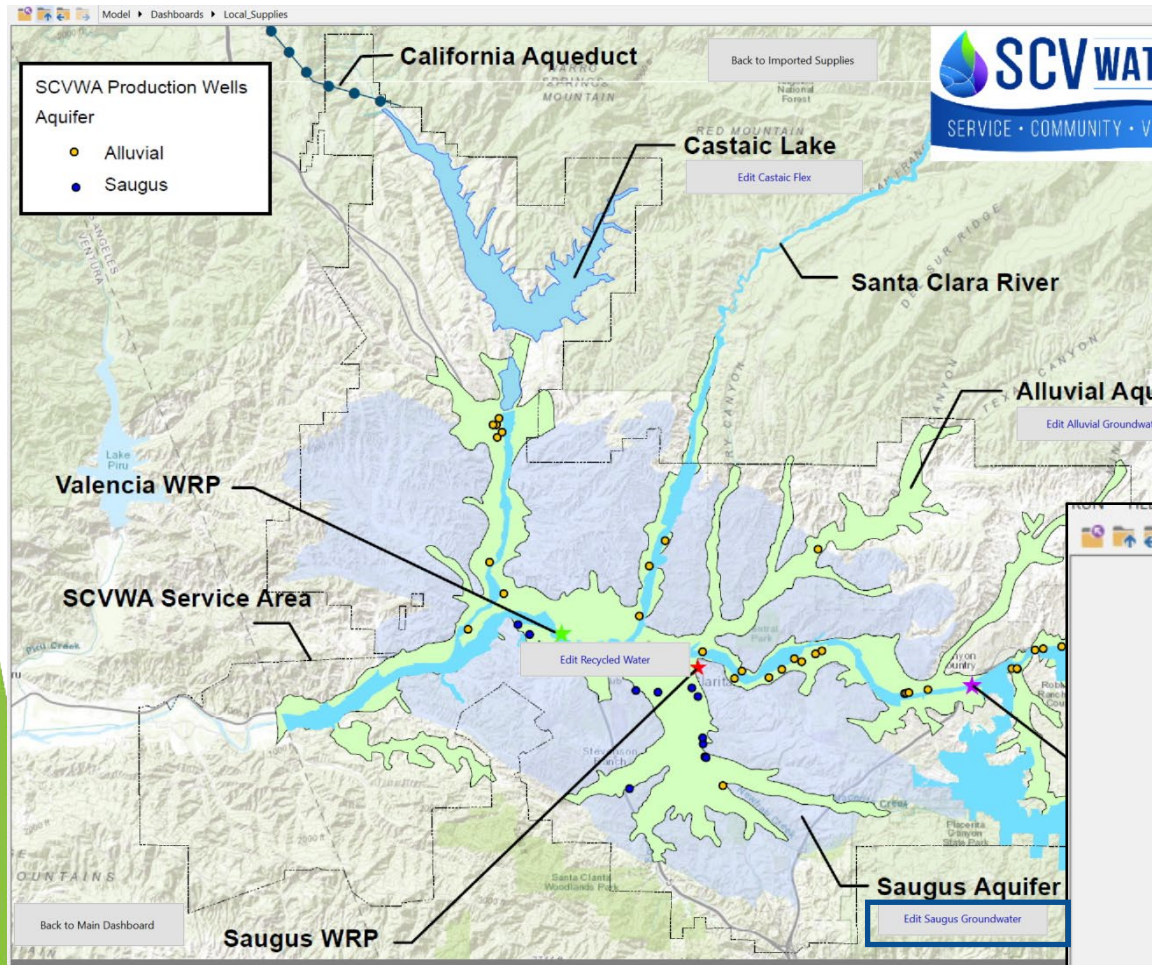
	AVEK_Take_Pattern [%]
January	0
February	0
March	10
April	10
May	10
June	10
July	10
August	10
September	10
October	10
November	10
December	10

[Back to Main Dashboard](#)

[Back to Main Dashboard](#)

[Go to Local Supplies](#)

Model and User Interface



Model Dashboards Saugus_Annual_Input

Saugus Annual Sustainable Yield

Annual Total Saugus without Wells 3 - 8 - GSP

Annual Saugus 3 - GSP

Annual Saugus 4 - GSP

Annual Saugus 5 - GSP

Annual Saugus 6 - GSP

Annual Saugus 7 - GSP

Annual Saugus 8 - GSP

Saugus Well Production Capacities

Buildout Year: 2030

Dry Year Production Capacities

	Saugus_WO_3_8	Saugus_3	Saugus_4	Saugus_5	Saugus_6	Saugus_7	Saugus_8
2021	14980	0	0	0	0	0	0
2022	17880	0	0	0	0	0	0
2023	17880	0	0	0	0	0	0
2024	20930	0	0	0	0	0	0
2025	20930	3020	3020	0	0	0	0
2026	20930	3020	3020	0	0	0	0
2027	20931	2620	2620	2420	2420	0	0
2028	20931	2620	2620	2420	2420	0	0
2029	20931	2620	2620	2420	2420	0	0
2030	20800	2620	2620	1940	1940	1940	1940

Normal Year Production Capacities

	Saugus_WO_3_8	Saugus_3	Saugus_4	Saugus_5	Saugus_6	Saugus_7	Saugus_8
2021	13490	0	0	0	0	0	0
2022	16070	0	0	0	0	0	0
2023	16070	0	0	0	0	0	0
2024	17450	0	0	0	0	0	0
2025	17050	200	200	0	0	0	0
2026	9840	30	30	0	0	0	0
2027	9780	30	30	30	30	0	0
2028	9780	30	30	30	30	0	0
2029	9780	30	30	30	30	0	0
2030	9720	30	30	30	30	30	30

Saugus Annual Input

Saugus Monthly Input



Future Development/Applications

