

An example of the co-creation process for online tools
on SacPAS

Online tools for the San Joaquin River Restoration Program

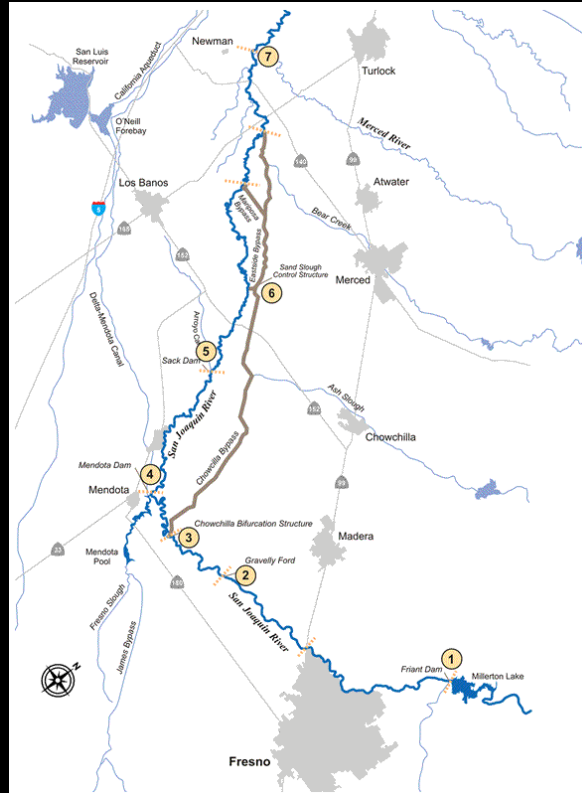
SacPAS team: Susannah Iltis & Jennifer Gosselin
SJRRP: Chadwick Moore & Erika Kegel



Background on SJRRP

The **San Joaquin River Restoration Program (SJRRP)** is a comprehensive, long-term effort to release flows from Friant Dam to the confluence of Merced River, implement channel and structural improvements and restore a self-sustaining Chinook salmon population while reducing or avoiding adverse water supply impacts from Restoration Flows.

<https://www.restoresjr.net/>



San Joaquin River Restoration Settlement

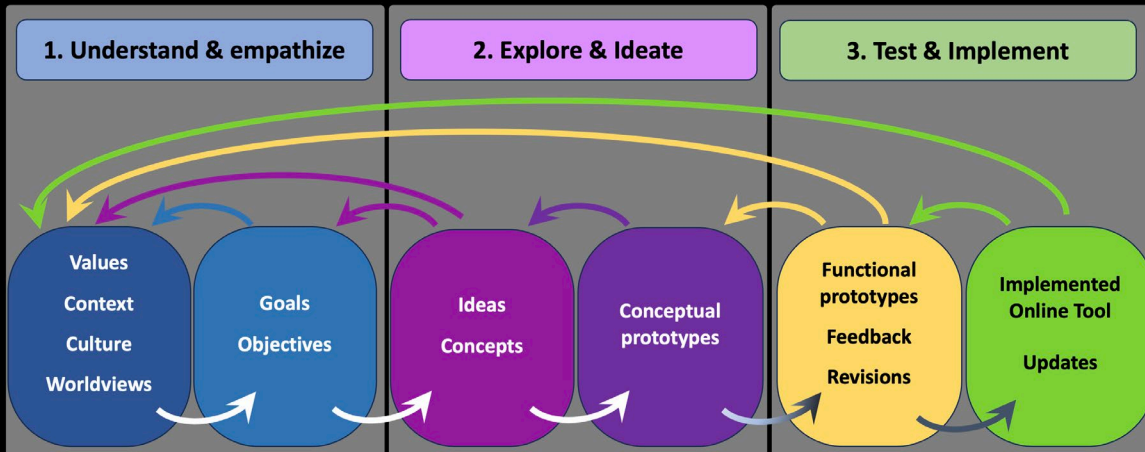
- The San Joaquin River Restoration Program is the direct result of the San Joaquin River Restoration Settlement reached in September 2006 by the U.S. Departments of the Interior and Commerce, the Natural Resources Defense Council (NRDC), and the Friant Water Users Authority (FWUA). The Settlement, which followed an 18-year lawsuit, received Federal court approval in October 2006.
- Federal legislation, the San Joaquin River Restoration Settlement Act, was passed in March 2009 authorizing Federal agencies to implement the Settlement.

Two Settlement Goals

- **Restoration:**
To restore and maintain fish populations in “good condition” in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.
- **Water Management:**
To reduce or avoid adverse water supply impacts to all of the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided for in the Settlement.



Design Thinking process of co-creating a SacPAS tool



- Initial meeting:
 - SacPAS to hear: What's needed
 - SJRRP to hear: What's possible
- SacPAS aims to meet needs of users
 - Data automation
 - Online tools
 - Schedule of development of tools
- In this presentation, we'll share the design thinking process thus far in tools for SJRRP...

Initial meeting with SacPAS

- Met December 2022
- Online Tools related to D-1641?
- Data and how to access?
 - Data sheet via email
 - Data from pdfs
 - Static url
- Can SacPAS handle the complex spreadsheets?

Follow-up meetings in July 2023 - present:

Request for Two Team Pages

- **Team Page #1:
River Restoration Flows**

- Identifies location and amount of environmental flows, Friant Dam – Delta
 - Restoration Year Flow Volumes (by month and year)
 - Restoration Year Flows (rates by day)
- Volumes organized around Restoration Year (Mar-Feb); Flows organized around Water Year (Oct-Sep)
- Data derived from SJRRP Operations spreadsheet

Currently focusing on co-creating Team Page #1

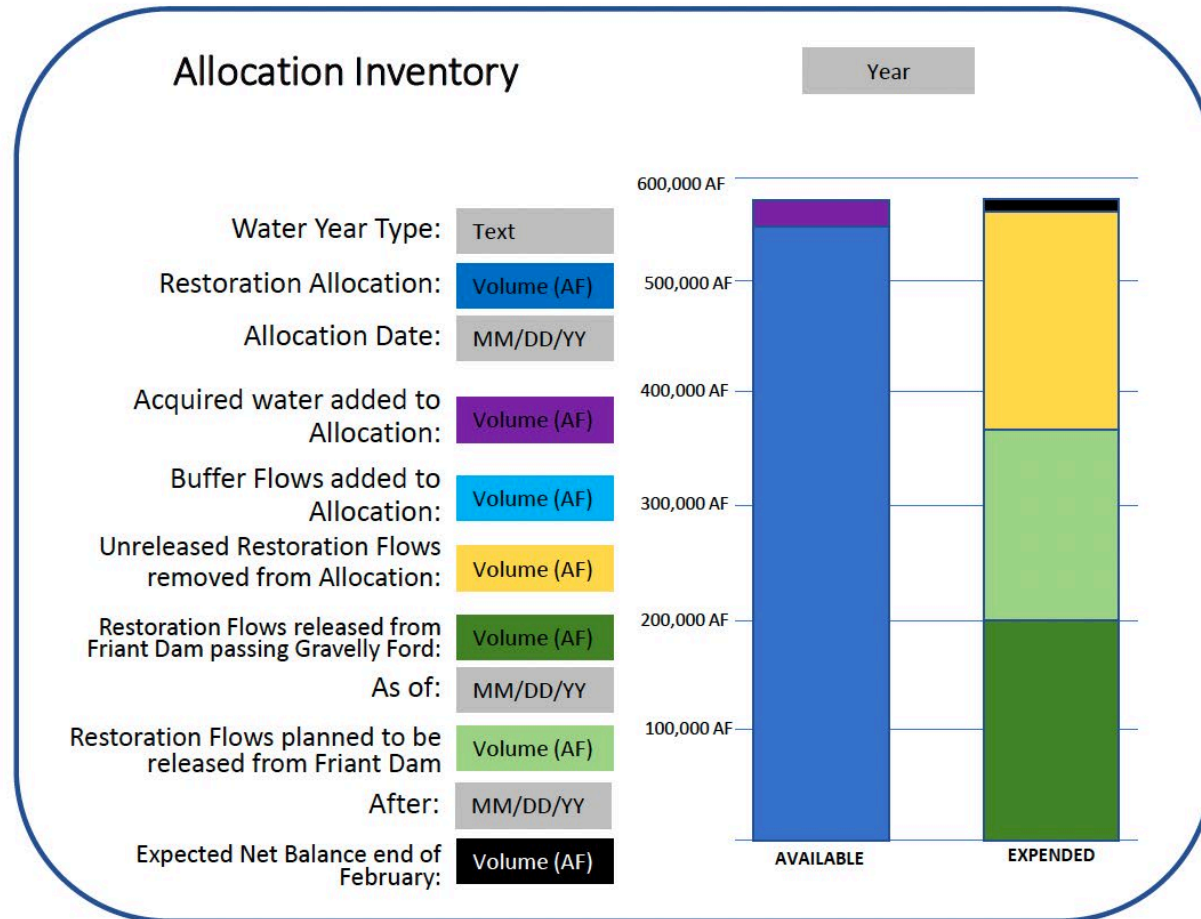
- **Team Page #2:
Delta Water Quality (WQ)**

- Identifies D-1641 compliance and trends; WQ objectives for:
 - Municipal & Industrial beneficial use
 - Agricultural beneficial use
 - Fish and Wildlife beneficial use
 - Salinity (X2)
- Organized around Water Year and seasonal compliance
- Data available on CDEC, CVO reports and DWR Delta operations summary

Request included prototype & context

SJRRP Restoration Year Flow Volumes

Restoration Year:

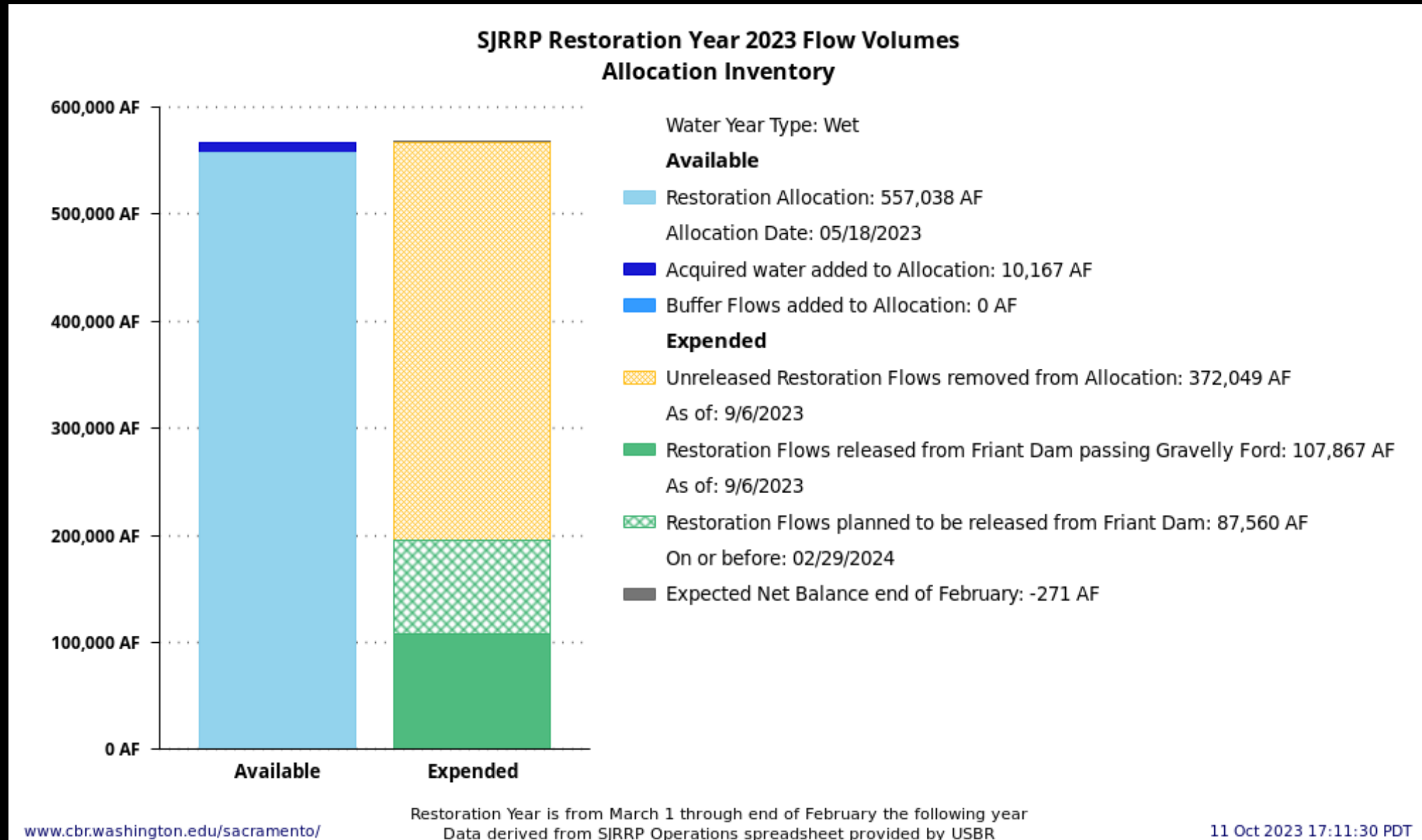


Key messages:

- Restoration Flows begin as a volume of water in Millerton Lake (behind Friant Dam). As they are released to the San Joaquin River, they become Restoration Flows
- Not all of the allocation volume can be released, with some becoming Unreleased Restoration Flows
- Reclamation can acquire more water if it needs, or draw upon an additional block of water called "Buffer Flows"
- As the year goes on, more and more volume is released as Restoration Flows, and less and less as planned Restoration Flows.
- Allocation ranges from 0 AF to 557,000 AF depending on the water year type and runoff.

Data Source: SJRRP Operations Spreadsheet/SacPAS Volumes worksheet/T24:T35

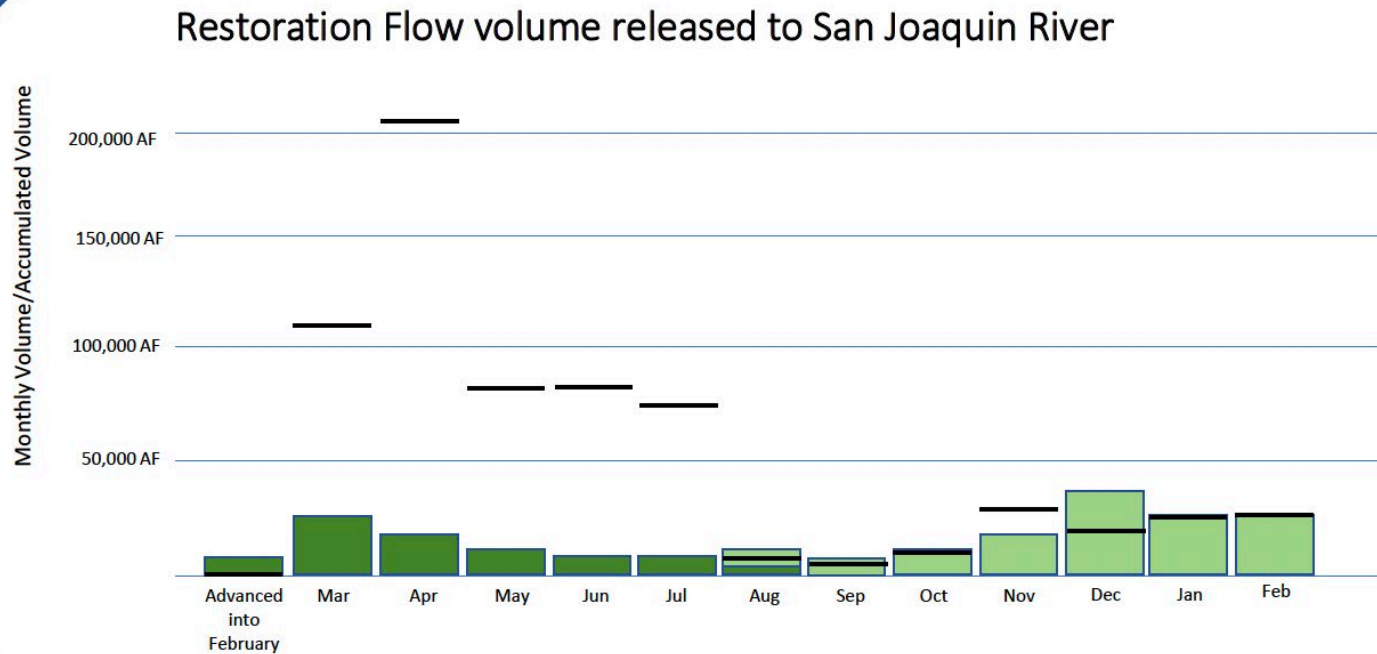
SacPAS recreates prototype with data



Another example of prototype in request

SJRRP Restoration Year Flow Volumes

Restoration Year:



Display:

Station:

Restoration Flows Released to Date

Planned Restoration Flows

Settlement Exhibit B Restoration Flows

Restoration Flows shown include Buffer Flows and Acquired Water

Other Flows (Only available at Friant Dam and Gravelly Ford)

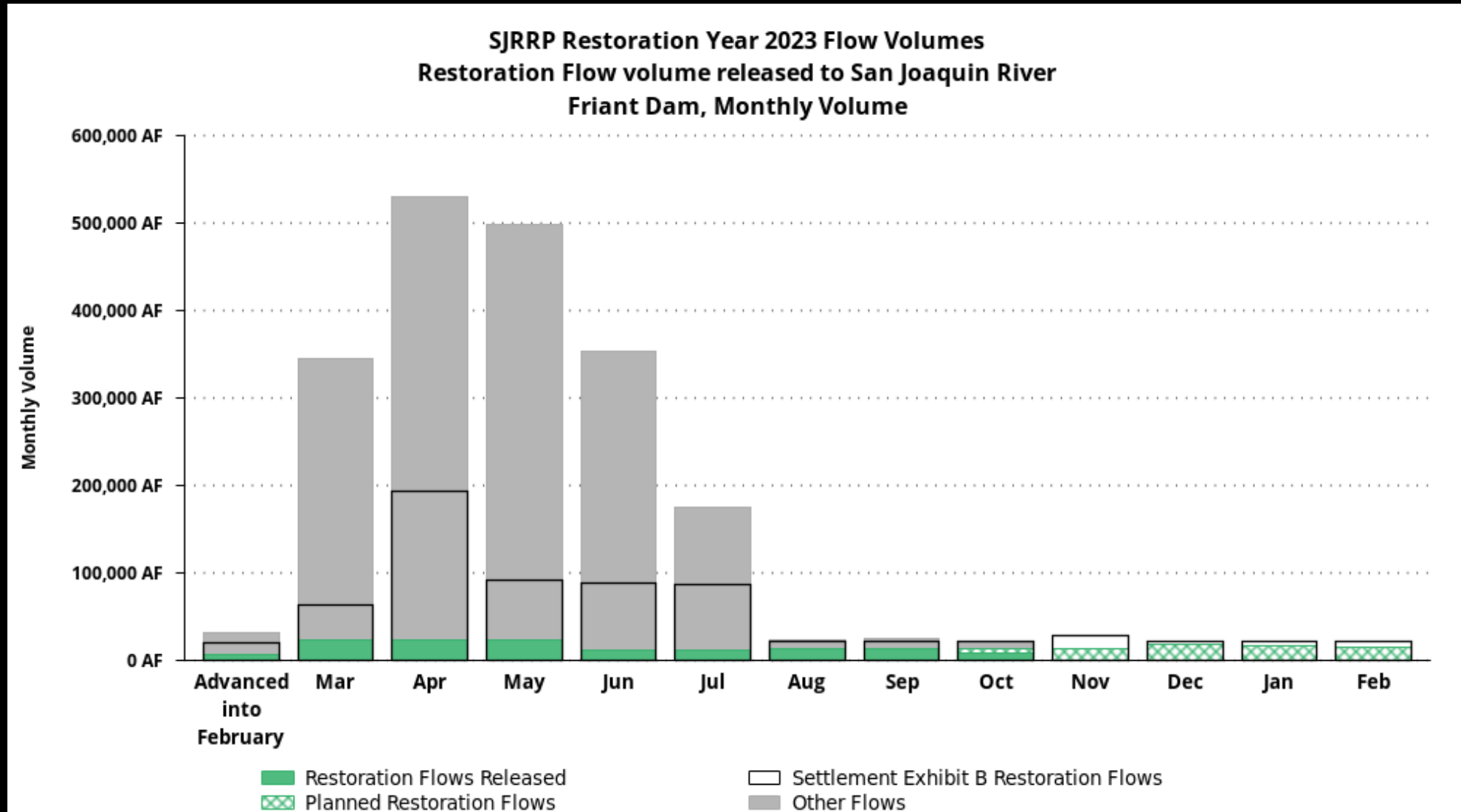
Key messages:

- Visualization of how the allocation is spent across the Restoration Year.
- Shows comparison with Exhibit B of the Settlement, which has ambitious release targets
- Differentiate planned and actual Restoration Flows, which will update as the year goes
- Depicts discrete months or cumulative
- Planned Restoration Flows are only available at Gravelly Ford, Below Sack Dam, and Vernalis stations

Option for Table vs Graph?

Data Source: SJRRP Operations Spreadsheet/SacPAS Volumes worksheet/Friant (H7:I19, J7:K19, L7:M19, P7:Q19), Gravelly Ford...

SacPAS recreates prototype with data



Data from spreadsheet downloaded from SJRRP website

• Operations spreadsheet

- SacPAS worksheet, introduced into a process that already exists

	FRONT DAM														GRAVELLY FORD														SAC PAS VOLUME										
	Exhibit B Frigate Dam River Releases		Frigate Dam River Releases		BY Restoration Releases at Frigate Dam		Planned BY Restoration Releases at Frigate Dam		Other Frigate Dam River Releases		Unflooded Restoration Flow Released from Allocation		Exhibit B Restoration Flow at Gravelly Ford		Gravelly Ford Flows		BY Restoration Flows at Gravelly Ford		Planned BY Restoration Flows at Gravelly Ford		Restoration Flows from Allocation at Gravelly Ford		Planned BY Restoration Flows from Allocation at Gravelly Ford		Acquired BY Water Releases at Gravelly Ford		Planned BY Acquired Water at Gravelly Ford		BY Buffer Flow Releases at Gravelly Ford		Planned BY Buffer Flows at Gravelly Ford		Other Water at Gravelly Ford		Exhibit B Release from Allocation				
	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use	Mon. Use	Thurs. Use			
2023																																							
2023-2024																																							
January	18,438	10,433	30,290	30,290	4,888	4,888	0	0	75,301	15,811	0	13,438	13,884	13,884	31,820	33,833	4,245	4,245	0	0	4,245	4,245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
February	42,478	41,517	344,468	376,128	23,978	26,068	0	0	571,790	347,097	165,263	184,761	54,486	68,370	320,493	354,313	23,058	27,302	0	0	23,058	27,302	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	258,388	275,366	328,488	366,438	21,829	26,995	0	0	586,569	353,880	284,705	384,765	234,633	482,239	335,458	22,509	26,212	0	0	22,509	26,212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	30,284	265,380	498,220	1,400,875	21,669	72,664	0	0	476,953	1,330,211	81,054	263,753	78,651	331,435	461,784	1,299,442	22,108	21,317	0	0	22,108	21,317	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	42,322	432,962	353,787	1,336,441	10,413	83,278	0	0	843,355	1,373,366	96,000	361,753	70,966	407,500	336,821	1,626,263	10,413	82,722	0	0	10,413	82,722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
June	55,843	538,809	273,691	1,330,244	10,760	93,838	0	0	162,930	1,836,336	29,732	393,487	71,736	479,206	365,609	1,793,871	10,760	93,838	0	0	10,760	93,838	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
July	21,322	560,310	22,187	1,932,521	12,391	106,229	0	0	1,796	1,886,932	0	393,487	2,379	486,585	11,942	1,807,813	12,391	106,229	0	0	12,391	106,229	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
August	26,824	581,154	23,378	1,976,488	12,850	113,139	0	0	11,068	1,877,340	0	393,487	8,331	484,915	12,205	1,821,082	12,850	113,139	0	0	12,850	113,139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
September	21,322	560,310	22,187	1,932,521	12,391	106,229	0	0	1,796	1,886,932	0	393,487	2,379	486,585	11,942	1,807,813	12,391	106,229	0	0	12,391	106,229	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	21,322	602,677	14,491	1,990,900	7,893	128,962	4,582	4,582	6,488	1,864,028	0	393,487	12,883	506,538	8,410	1,829,472	8,232	128,962	4,582	4,582	8,232	128,962	4,582	4,582	8,232	128,962	4,582	4,582	8,232	128,962	4,582	4,582	8,232	128,962	4,582	4,582	8,232	128,962	
November	21,322	636,646	0	1,990,900	0	128,962	13,203	17,782	0	1,864,028	0	393,487	20,463	527,038	0	1,829,472	0	128,962	13,203	17,782	0	128,962	13,203	17,782	0	128,962	13,203	17,782	0	128,962	13,203	17,782	0	128,962	13,203	17,782	0	128,962	
December	21,322	651,366	0	1,990,900	0	128,962	17,782	25,374	0	1,864,028	0	393,487	14,242	541,170	0	1,829,472	0	128,962	17,782	25,374	0	128,962	17,782	25,374	0	128,962	17,782	25,374	0	128,962	17,782	25,374	0	128,962	17,782	25,374	0	128,962	
January	21,322	676,467	0	1,990,900	0	128,962	16,270	20,945	0	1,864,028	0	393,487	15,370	556,542	0	1,829,472	0	128,962	16,270	20,945	0	128,962	16,270	20,945	0	128,962	16,270	20,945	0	128,962	16,270	20,945	0	128,962	16,270	20,945	0	128,962	
February	20,132	693,619	0	1,990,900	0	128,962	14,380	18,526	0	1,864,028	0	393,487	14,380	570,922	0	1,829,472	0	128,962	14,380	18,526	0	128,962	14,380	18,526	0	128,962	14,380	18,526	0	128,962	14,380	18,526	0	128,962	14,380	18,526	0	128,962	
Total	881,612	1,890,990	226,982	65,326	2,884,022	372,049	372,049	372,049	372,049	372,049	372,049	372,049	372,049	372,049	372,049	1,829,472	128,962	66,233	9,074	1,891	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

COMMON POINT A1 OR

INVENTORY: 557,238 From ALLOCATION 1b

Date of Allocation: 3/12/21 From ALLOCATION 1b

Water Year Type: WY From ALLOCATION 1b

Acquired Water Volume Used: 9,074

Acquired Water Volume Planned: 9,074

Buffer Flows Used: 0

Buffer Flows Planned: 0

UMF Removed from Allocation: 372,049

Restoration Flow Released Passing OIR: 226,982

Restoration Flows Planned to be Released: 372,049

Net Balance at Year's End: 2449

Date of Restoration Year End: 3/31/21

Date of Most Recent Data: 3/12/21

Initial prototyping on the web – Query interface and sample outputs

SacPAS: Central Valley Prediction & Assessment of Salmon [UW Columbia Basin Research](#)

Home	Data Queries & Alerts	Work Groups & Teams	Fish Model	Tools	Contact			
Data Queries & Alerts	Alert: Weir Overtopping	Temperature Thresholds	Juvenile Monitoring & Sampling	Juvenile Salvage & Loss	Adult Escapement	River Conditions	Exposure Index	Data Sites & Inventory

SJRRP Restoration Flow Snapshot Query

Data Courtesy of [CDEC](#)

Queries: [Allocation Inventory](#) || [Flow Volumes Released](#) || [Allocation Management](#) || [Flow Hydrograph](#) || **Daily Flow Snapshot** || [Daily Flow Snapshot - Simple](#)

Select Output Format

Graph and Table with CSV Download CSV Only [single data pt/row]

Select Restoration Year, Month, Flow Type

2023 Current Total Flow (includes RF and other water)

Select Stations

Friant Dam Gravelly Ford Below Bifurcation Below Sack Dam Head of Sand Slough Bypass
 Eastside Bypass Above Confluence with Merced Below Confluence with Merced Patterson Vernalis

Multiple selections for stations allowed.

Set Graph Line Style -- (intended for demo purposes)

Line-points Steps

Show Update Form -- (intended for demo purposes)

Yes No

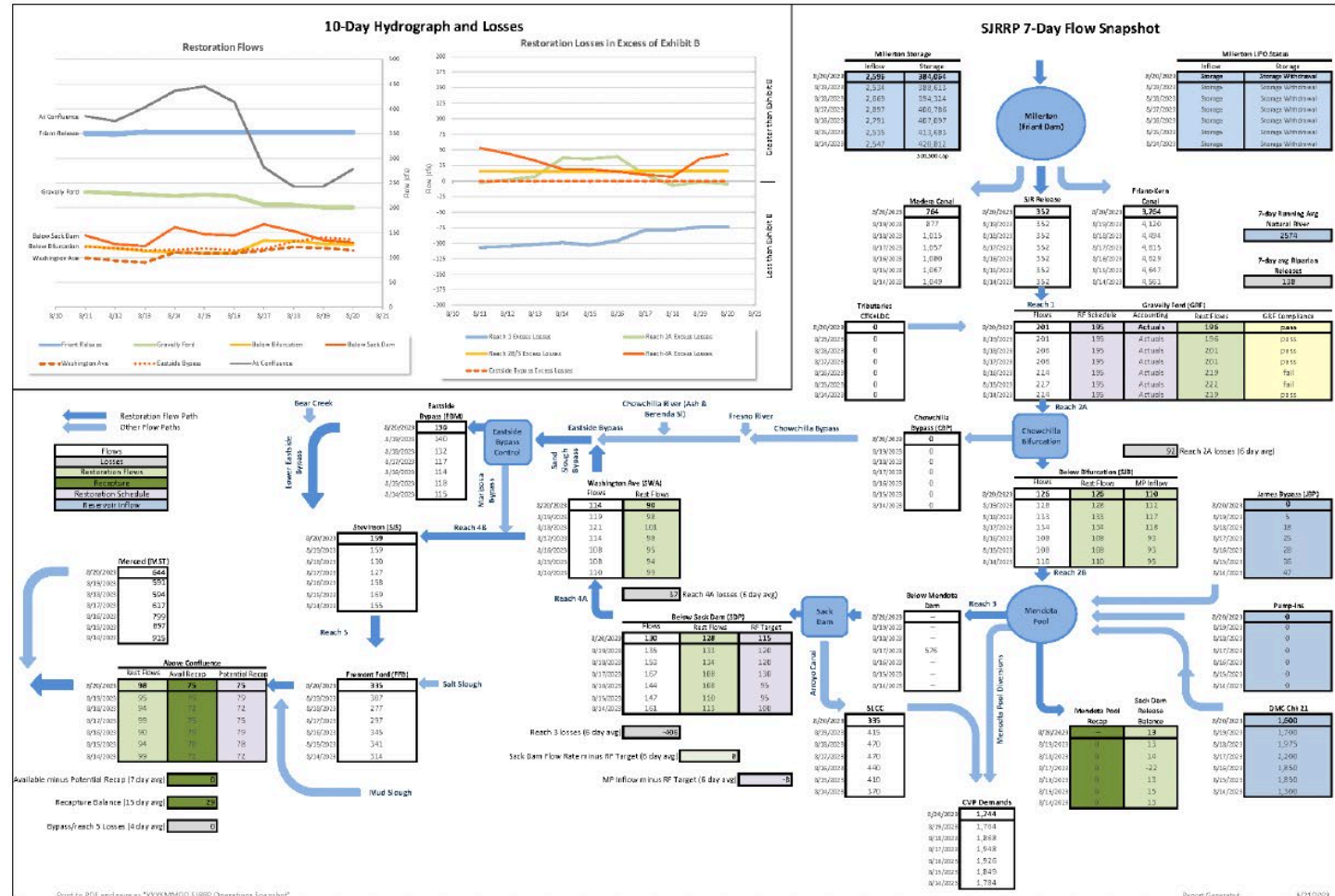
Generate Query Result Link Only

More products to come...

Snapshot

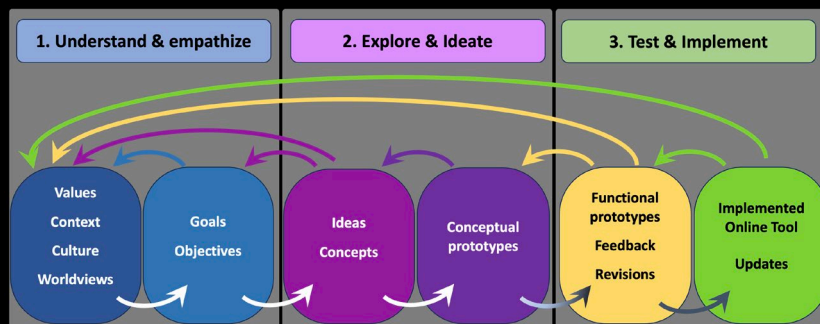
Key messages:

- Understand routing and magnitude of Restoration Flows.
- Potentially use a “Subway Diagram” like this to depict data and/or to call up more detailed data.



Design Thinking process of co-creating a SacPAS tool

- Initial meeting
 - Understand needs & SacPAS capabilities
- Given complexity of requests, monthly meetings to help keep the process going
- Aim to meet needs of users
- Accuracy of information
- Improved workflow for data management and automation
- Types of graphs
- Colors (vision deficiency options)
- User interface
- Interaction design



- Accessibility
- 508 compliance
- Debugging
- New ideas

Hearing from Chad and Erika about their experiences with SacPAS in this process thus far...

- SacPAS is an established source of information for Delta and fisheries management. It made much more sense to build upon SacPAS than to build a separate data product.
- The presentation of Restoration Flow data is critical to integrating SJRRP operations into Delta operations and protecting those flows.
- The SacPAS team has a good understanding of CA water while also having the expertise to artfully present the data. We think this combination is essential to this project.
- We immediately found a good synergy working with the SacPAS team