

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Operations and Particle Tracking

February 29, 2024



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Operations Outlook

- Weekly estimates of operations that will impact conditions in the Delta
- Estimates for some flow indexes used in considerations
- Used to inform risk assessments and as model inputs

Weekly Fish and Water Operations Outlook 2/20/2024 – 2/26/2024

Water Project Operational Intent for Week

- Effective 2/7 operations will be limited to a 7-day average OMRI flow no more negative than -3,500 cfs per the 2023 IOP/ITP COA 8.5.2. until the average measured Secchi depth, as defined in the IOP and ITP, is greater than 1 meter; X2 at Chipps for 28 days in February; $E/I \leq 0.35$.
- Proposed Action Section 4.10.5.10.2 - Effective 2/13 operations will be limited to a 14-day average OMRI of no more negative than -3,500 cfs based on the 50% loss threshold for Steelhead being exceeded on 2/11 through 3/31.
- The projects are operating to a OMRI no more negative than -2,500 cfs.

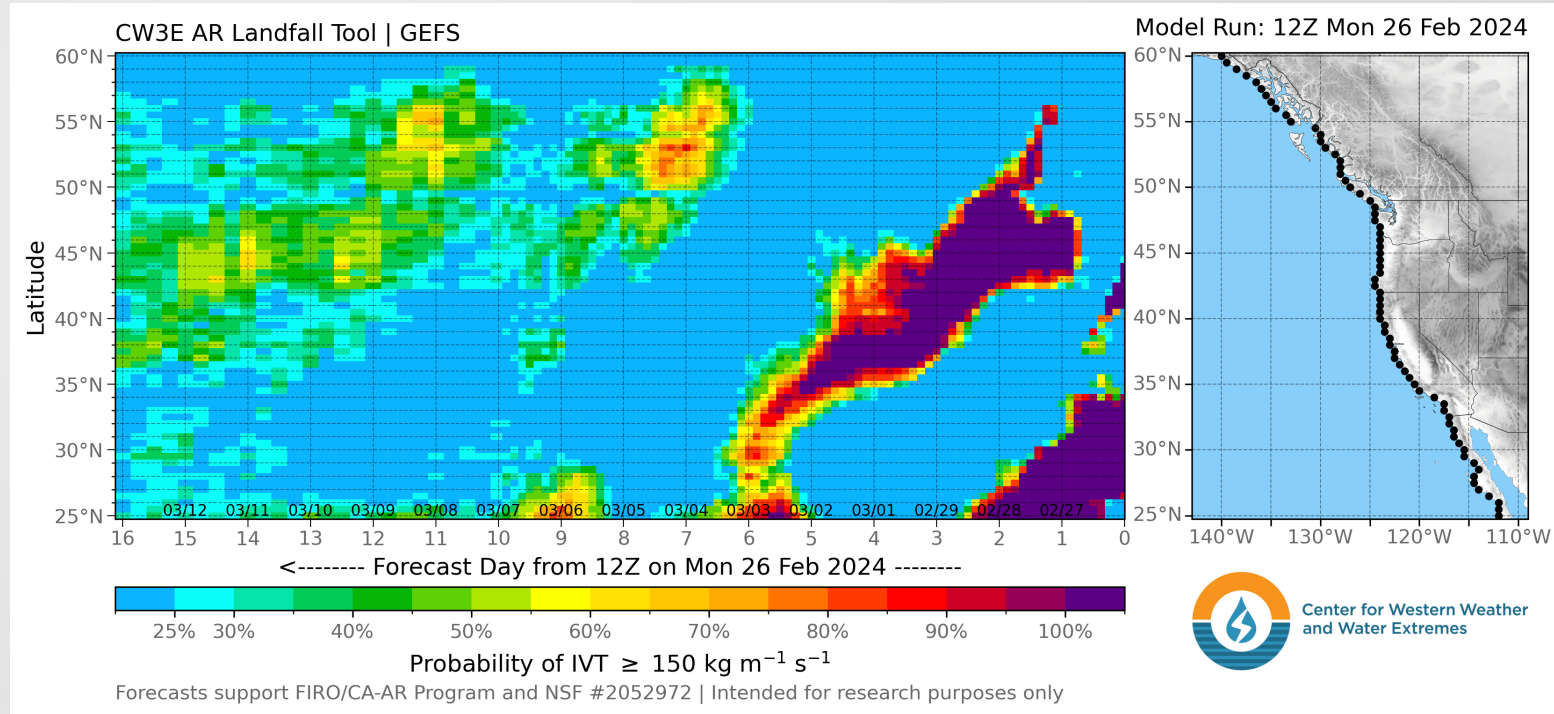
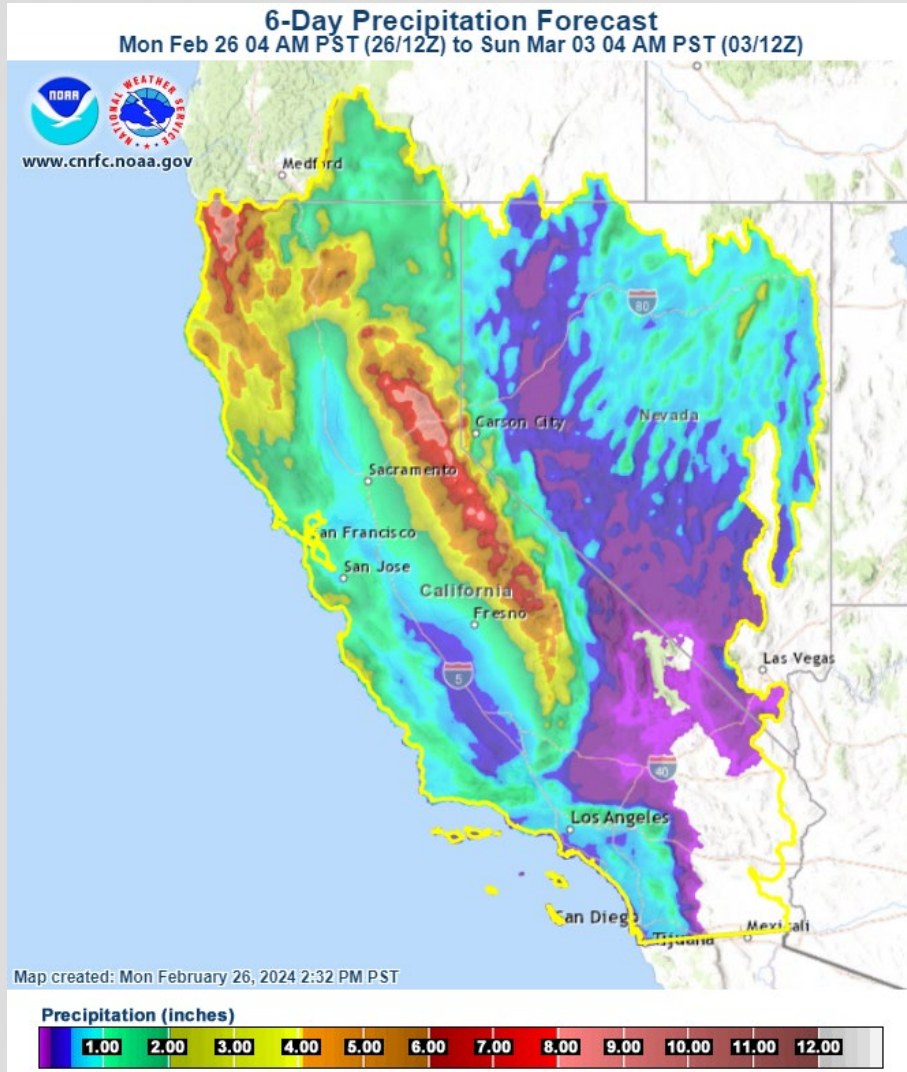
Forecasted Weather

- Showers, thunderstorms and snow continue to start the week. By mid-week, a drying trend begins and continues into the weekend.

Delta	• Freeport: 40,000 to 65,000 cfs • Vernalis: 6,000 to 13,000 cfs • Delta Outflow index: 60,000 to 110,000 cfs • Combined Exports: 4,400 to 10,100 cfs • JPP: Current 4,200 cfs, Range 3,600 cfs to 4,200 cfs • CCF: Current 1,800 cfs, Range 1,000 cfs to 6,500 cfs • Expected Daily OMR Index Values: -2,000 cfs to -3,500 cfs • DCC Gates: Closed on 11/27 for season • X2 is 62 km
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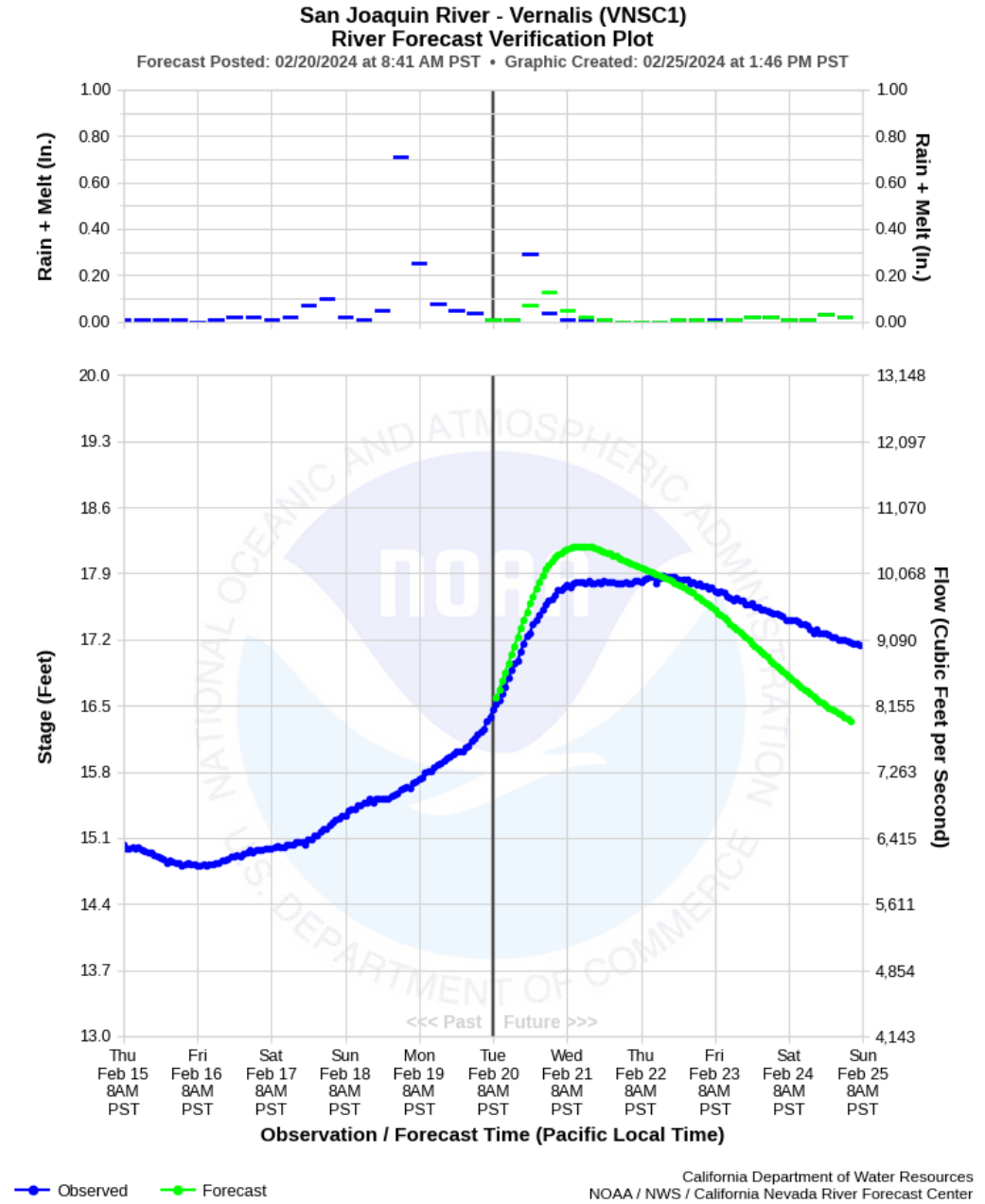
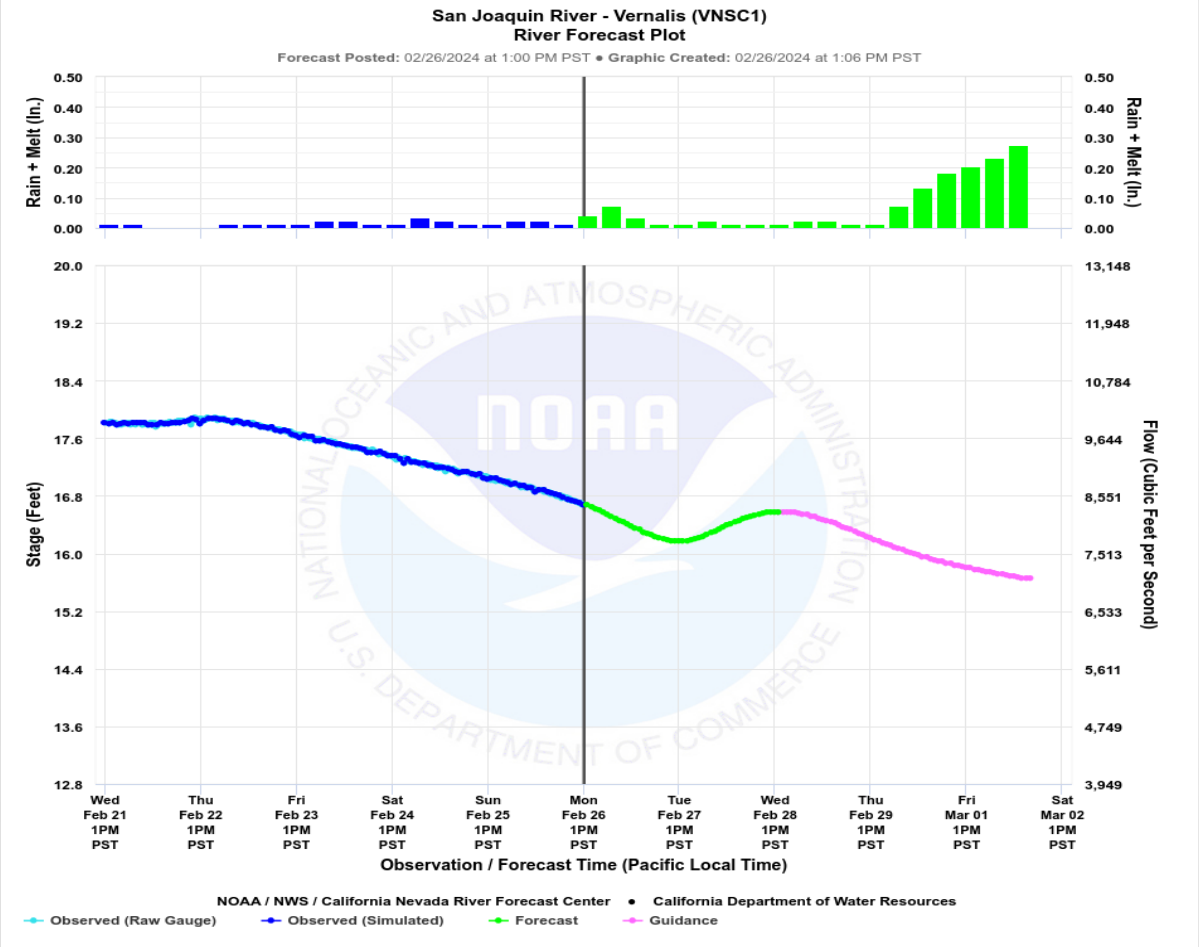


Precipitation Forecast



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CNRFC Flow Forecast



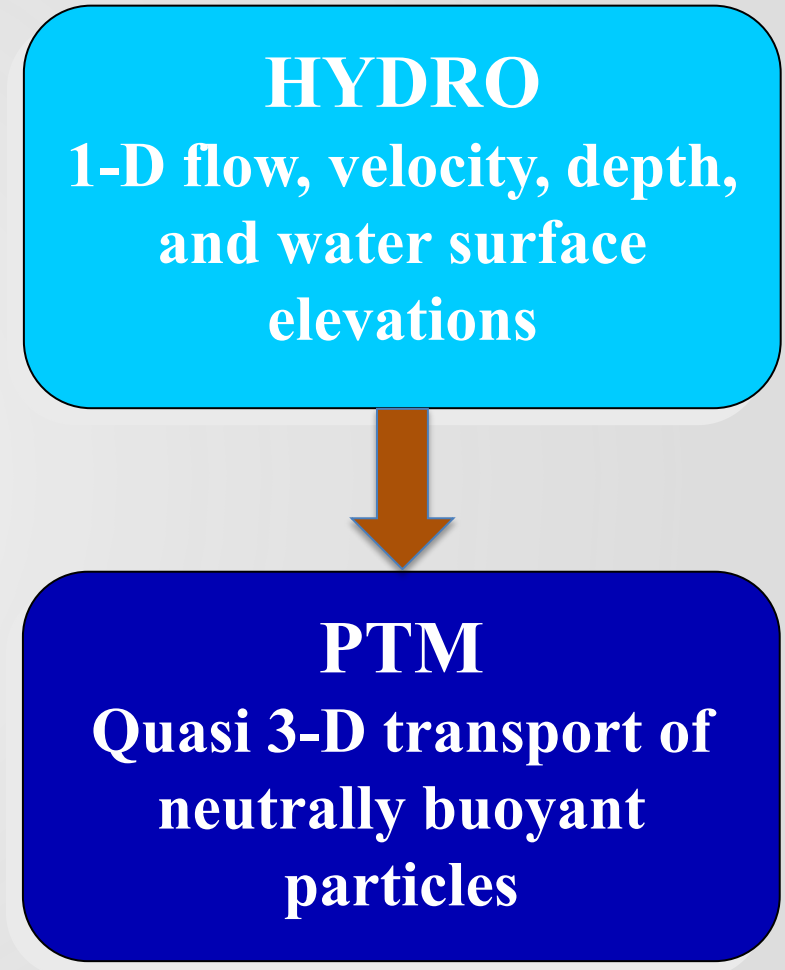
Scenario Development

- Key Question for modeling: **What effect will a change to OMRI Operations have on entrainment risk?**
- **Baseline:** Plausible OMR for the forecast period
- **Alternatives:** Operational Implementation of alternate objectives
 - OMR recommendation may or may not control for entire simulation period.
 - Alternatives include any exceptions in the BiOps/ITP that would be implemented into actual operations



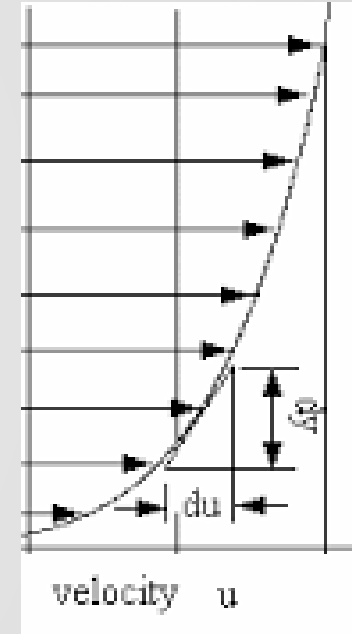
DSM2 Summary

- Delta Simulation Model II (DSM2) is a one-dimensional hydrodynamics model applied in historical simulation, real-time forecasting, and long-term planning practices in the Sacramento-San Joaquin Delta
- Hydro Module forms the primary input for the Particle Tracking Module (PTM)



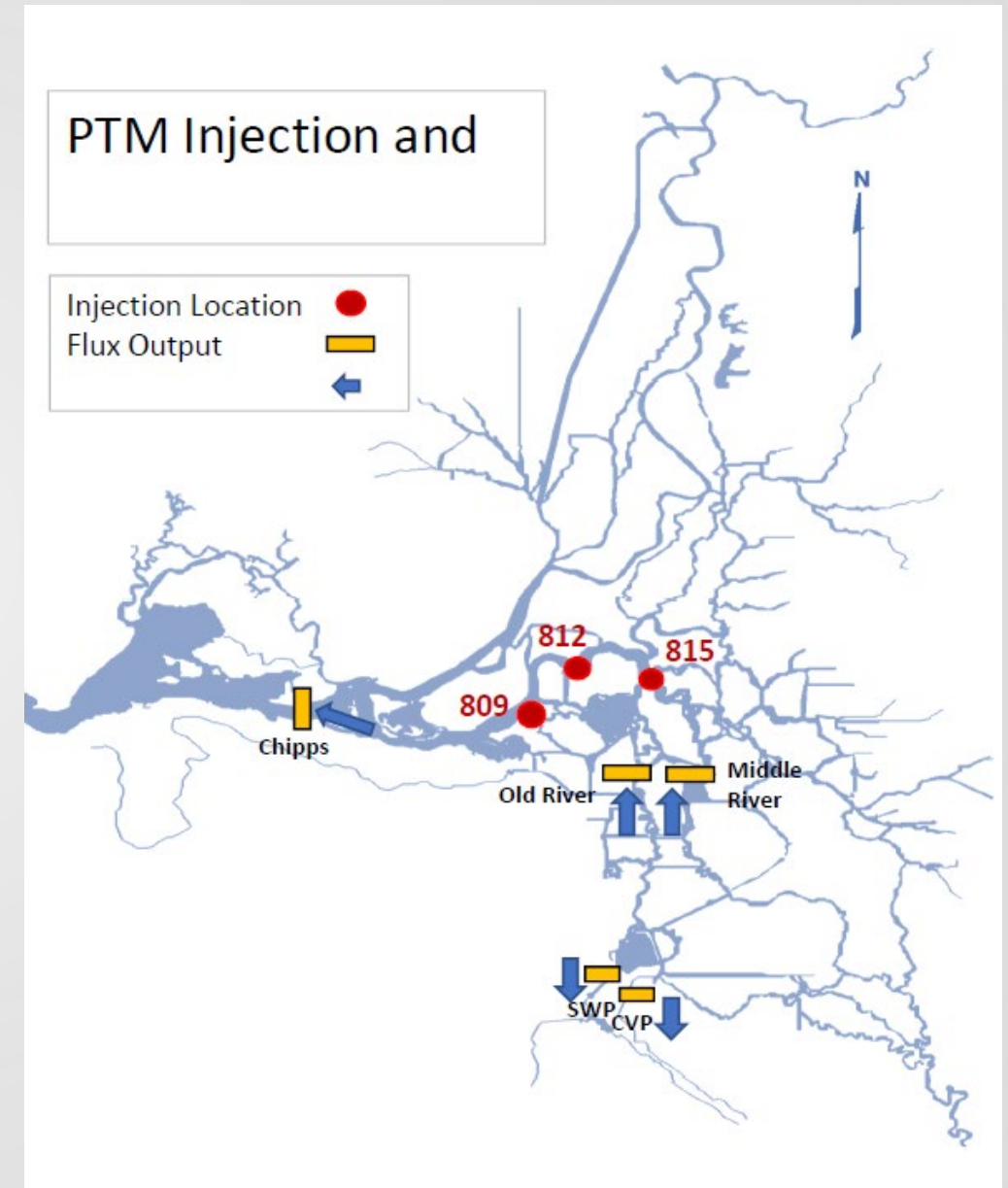
PTM Background

- Simulates the ***quasi-3D*** fate and transport of ***neutrally buoyant*** particles based on flow field from a hydro run
- **Quasi-3D:**
 - Vertical and longitudinal velocity distributions approximated based on 1-D flow field from DSM2 Hydro
- **Neutrally Buoyant:**
 - Particles have no tendency to sink to the bottom or float to the top of the channel



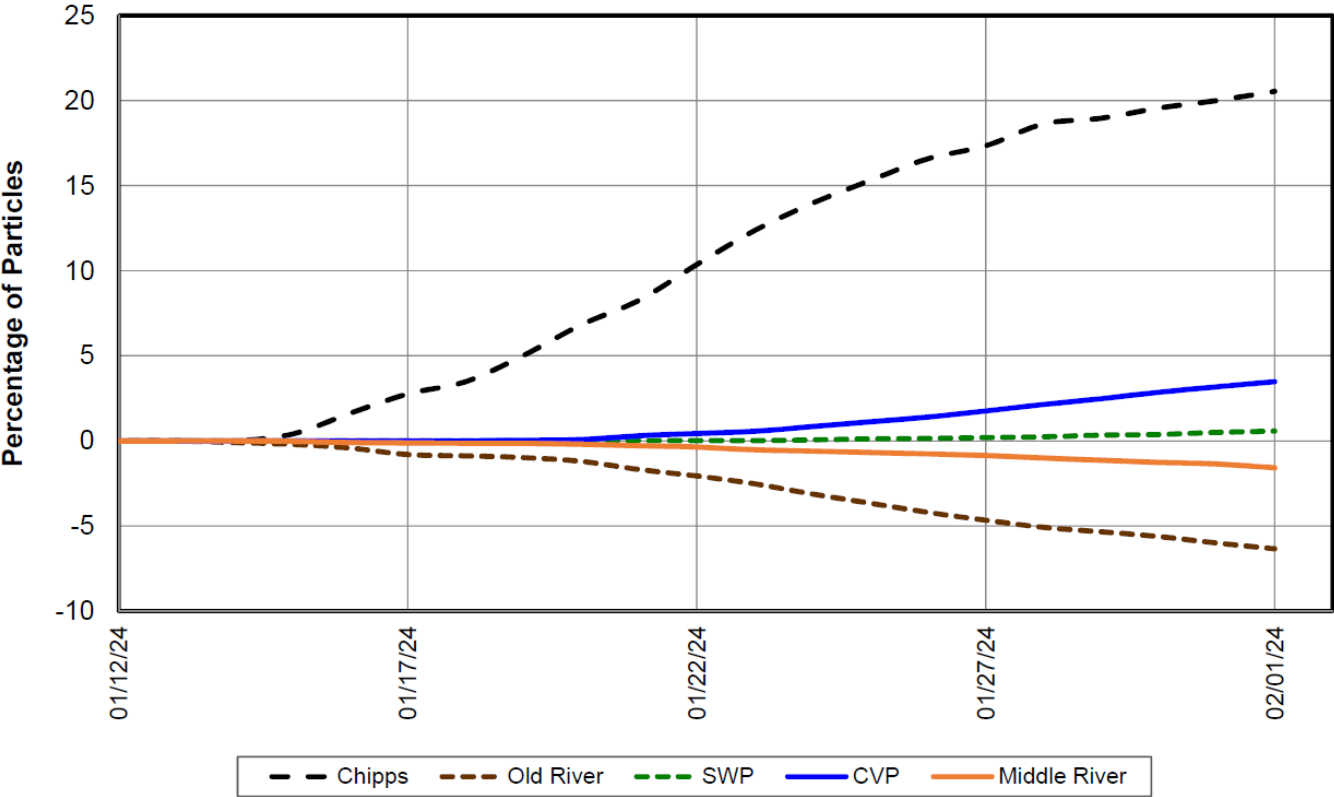
PTM Inputs

- Choose points to inject particles
- Date of injection
- Where to produce output data
- Note flux conventions with Arrows
- Positive = Same direction as arrow



Example Output

SWP Share of -2000 cfs OMR Case, Particles inserted at Sampling Site 812 on 01-12-2024



End of Week Summary

Particles Injected
1/12/2024

1 Week (01-19-2024)

		Particles Entrained by Projects	Particles in OMR Corridor	Particles Passed Chippis
809	Base OMR	0%	2%	16%
	SWP Share of -3500 cfs OMR	0%	1%	19%
	SWP Share of -2000 cfs OMR	0%	1%	20%
812	Base OMR	0%	2%	4%
	SWP Share of -3500 cfs OMR	0%	2%	5%
	SWP Share of -2000 cfs OMR	0%	1%	5%
815	Base OMR	1%	7%	1%
	SWP Share of -3500 cfs OMR	1%	5%	1%
	SWP Share of -2000 cfs OMR	0%	4%	1%

2 Weeks (01-26-2024)

		Particles Entrained by Projects	Particles in OMR Corridor	Particles Passed Chippis
809	Base OMR	2%	2%	50%
	SWP Share of -3500 cfs OMR	2%	2%	54%
	SWP Share of -2000 cfs OMR	1%	1%	58%
812	Base OMR	4%	4%	13%
	SWP Share of -3500 cfs OMR	3%	3%	15%
	SWP Share of -2000 cfs OMR	2%	3%	17%
815	Base OMR	11%	10%	7%
	SWP Share of -3500 cfs OMR	7%	9%	9%
	SWP Share of -2000 cfs OMR	5%	6%	9%

3 Weeks (02-01-2024)

		Particles Entrained by Projects	Particles in OMR Corridor	Particles Passed Chippis
809	Base OMR	4%	1%	57%
	SWP Share of -3500 cfs OMR	3%	2%	62%
	SWP Share of -2000 cfs OMR	2%	1%	66%
812	Base OMR	7%	5%	17%
	SWP Share of -3500 cfs OMR	5%	4%	18%
	SWP Share of -2000 cfs OMR	4%	4%	21%
815	Base OMR	21%	9%	11%
	SWP Share of -3500 cfs OMR	14%	9%	13%
	SWP Share of -2000 cfs OMR	10%	7%	14%