CALIFORNIA DEPARTMENT OF WATER RESOURCES
UNITED STATES GEOLOGICAL SURVEY

ECO-PTM Output

April 16, 2024

Delta Smelt

Longfin Smelt

Chinook Salmon

Xiaochun Wang, DWR Delta Modeling Section

DISCLAIMER

Hands-on Exercise Materials Should ONLY BE USED FOR TRAINING

ECO-PTM model for this class is the same one used for applications

Goals of these exercises

Neutrally buoyant/position oriented particles:

- Graph results
- Make tables of results
- Export tables to Excel

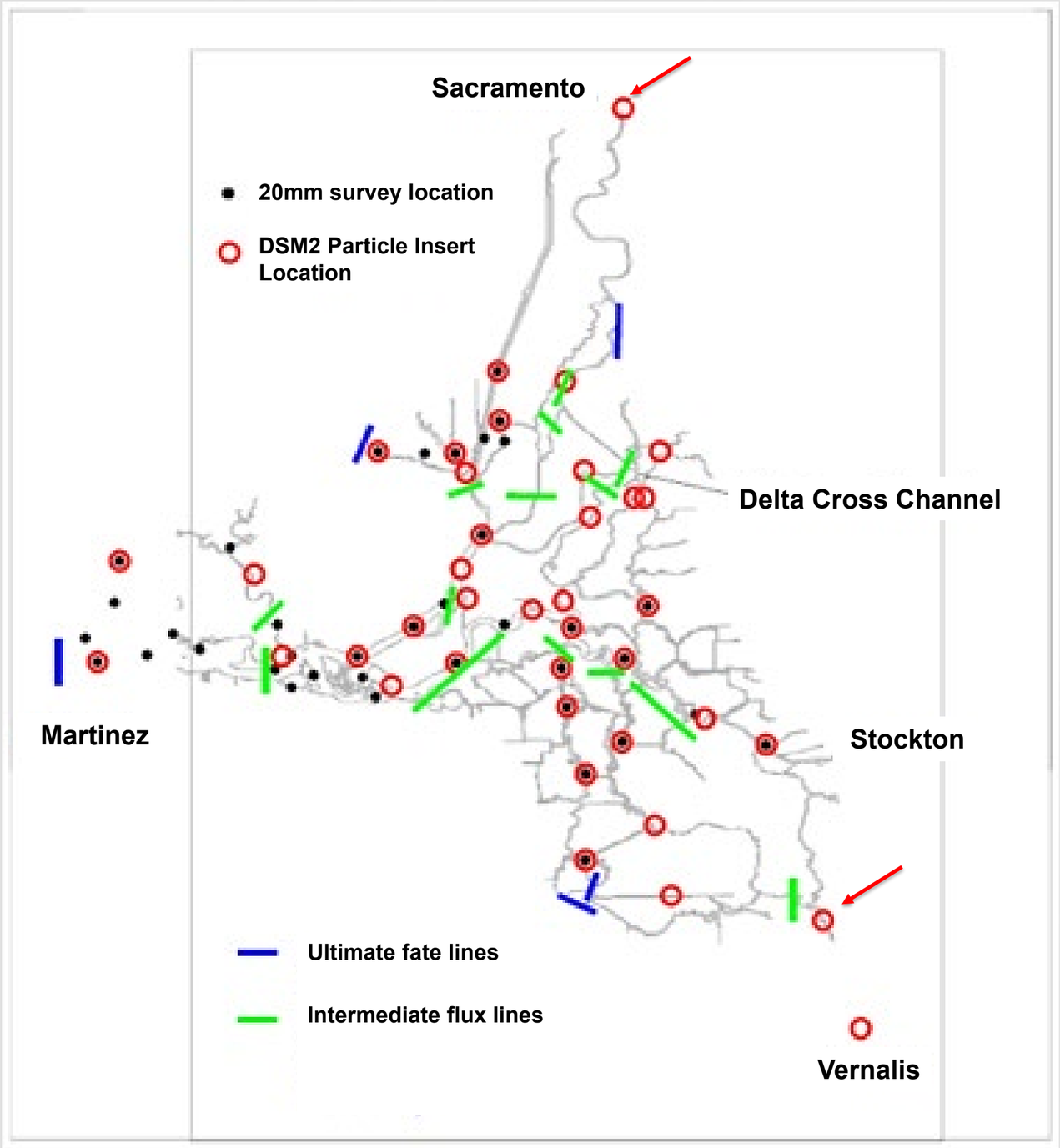
Salmon particles:

- Understand each column

ECO-PTM Output Includes:

- Entrainment into SWP, CVP facilities (smelt larvae)
- Survival through the Delta (salmon smolt)

SWP: State Water Project
CVP: Federal Central Valley Project



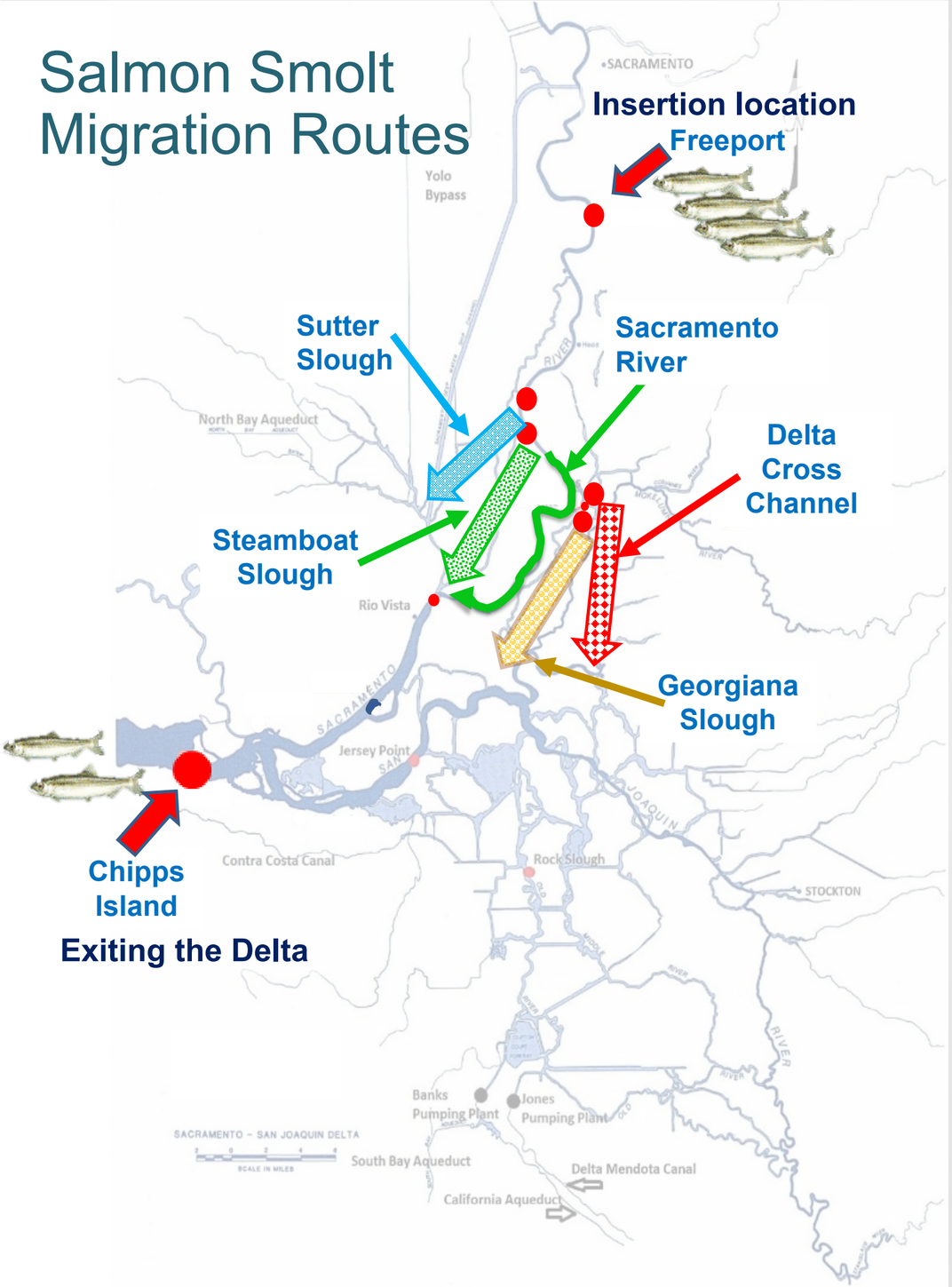
Neutrally buoyant position oriented particles (smelt larvae):

- PTM_GROUP output:

  Instantaneous percentage of particles in channel/reservoir groups

- FLUX output:

  cumulative percentage of particles passing specified locations



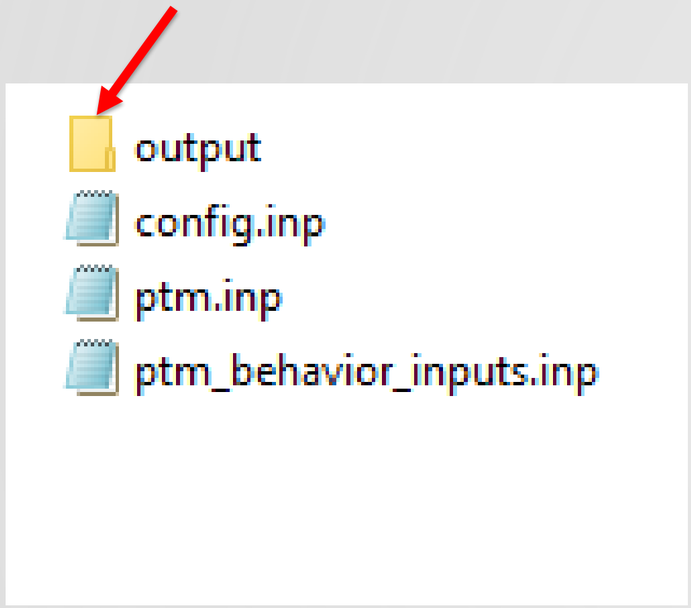
Salmon particles (salmon smolt):

- Route specific survival
- Combined survival
- Ratio to each route

Note: model to simulate salmon migration from the San Joaquin River is being developed and calibrated.

ECO-PTM Hands-On: NP Output

Goal: Navigate to the output folder from the NP (Delta smelt larvae) folder



Step 1: open file explorer

Step 2: find NP study folder
delta → ***dsm2*** → ***studies***
→***historical_ECO-PTM*** → ***np***

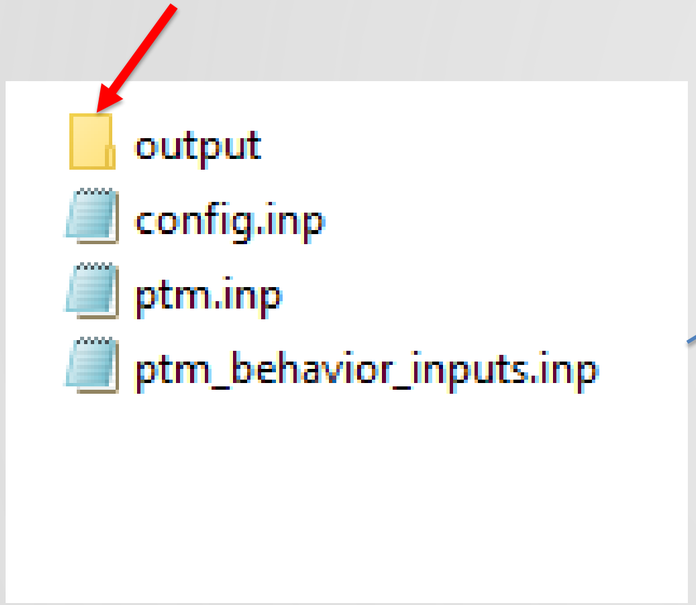
Step 3: open the output folder

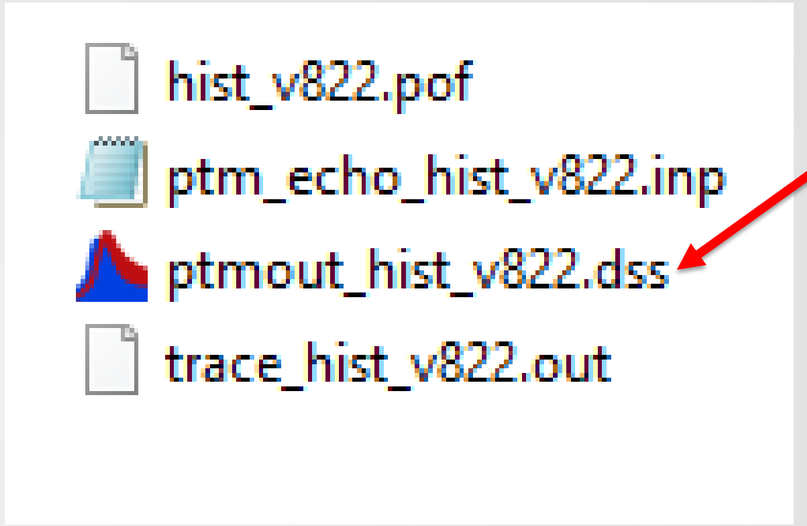

Raise hand in Teams when done

ECO-PTM Hands-On: NP Output

Goal: Open DSS output file in HEC-DSSVue

Neutrally Buoyant Particles
(Delta smelt larvae)





Step 1: find DSS output file
(HEC-DSS data base)
icon should look like this  if HEC-DSSvue installed

Step 2: double click on the DSS output file

Raise hand in Teams when done

HEC-DSS Database Overview

		B-Part Output Name	C-Part Type of Output	D-Part Date Range	E-Part Time Interval	F-Part Study Name
Number	Part A	Part B	Part C	Part D / range	Part E	Part F
1	PTMV8.2.2	DIVERSION_AG	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
2	PTMV8.2.2	EXPORT_CVP	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
3	PTMV8.2.2	EXPORT_SWP	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
4	PTMV8.2.2	FRANKS	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
5	PTMV8.2.2	GS	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
6	PTMV8.2.2	GS_FLUX	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
7	PTMV8.2.2	PASS_RIO	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
8	PTMV8.2.2	PAST_CHIPPS	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
9	PTMV8.2.2	PAST_MTZ	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
10	PTMV8.2.2	RIO	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822

Software package for viewing HEC-DSS data

ECO-PTM Output: Examples for Class

File Edit View Display Groups Data Entry Tools Advanced Help

File Name: D:/wkdir/training_materials/2024 training/package/studies/historical_ECO-PTM/np/output/2011/ptmout_hist_v822.dss

Pathnames Shown: 15 Pathnames Selected: 0 Pathnames in File: 90 File Size: 1.16 MB

ptmout_hist_v822.dss

Search By Parts: A: B: C: D:

Number	Part A	Part B	Part C	Part D / range	Part E	Part F
1	PTMV8.2.2	DIVERSION_AG	FLUX	.ug2011	15MIN	HIST_V822
2	PTMV8.2.2	EXPORT_CVP	FLUX	.ug2011	15MIN	HIST_V822
3	PTMV8.2.2	EXPORT_SWP	FLUX	.ug2011	15MIN	HIST_V822
4	PTMV8.2.2	FRANKS	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
5	PTMV8.2.2	GS	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
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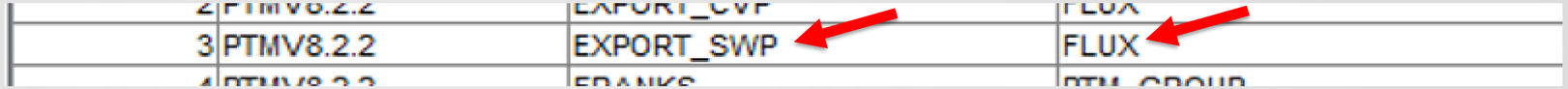
8	PTMV8.2.2	PAST_CHIPPS	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
9	PTMV8.2.2	PAST_MTZ	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
10	PTMV8.2.2	RIO	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
11	PTMV8.2.2	STM	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
12	PTMV8.2.2	STM_FLUX	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
13	PTMV8.2.2	SUT	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822
14	PTMV8.2.2	SUT_FLUX	FLUX			HIST_V822
15	PTMV8.2.2	WHOLE	PTM_GROUP			HIST_V822

Flux at SWP Exports (in class)

Group output for the whole Delta (homework)

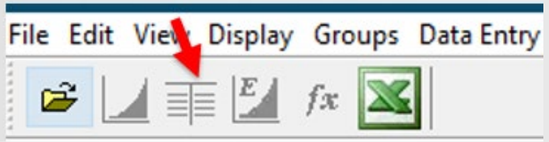
ECO-PTM DSS Output: view a table

Step 1: single click on



row will become highlighted

Step 2: click on the table button



a table will pop up

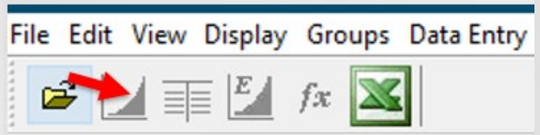
Flux at SWP Export Location (% particles)

Ordinate Row #	Date / Time	EXPORT_SWP FLUX HIST_V822
2019	05 Apr 11, 00:30	5.5000
2020	05 Apr 11, 00:45	5.5000
2021	05 Apr 11, 01:00	5.5000
2022	05 Apr 11, 01:15	5.5000
2023	05 Apr 11, 01:30	5.5000
2024	05 Apr 11, 01:45	5.5000
2025	05 Apr 11, 02:00	5.5000
2026	05 Apr 11, 02:15	5.5000
2027	05 Apr 11, 02:30	5.5000
2028	05 Apr 11, 02:45	5.5000
2029	05 Apr 11, 03:00	5.5000
2030	05 Apr 11, 03:15	5.5000
2031	05 Apr 11, 03:30	5.5000
2032	05 Apr 11, 03:45	5.5000

✋ Raise hand in Teams when done

ECO-PTM DSS Output: Graph

Step 1: click on the graph button

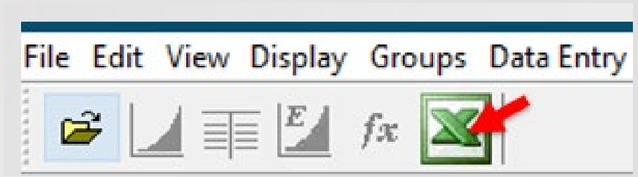


Graph window pops up

Raise hand in Teams when done

ECO-PTM DSS Output: export to Excel

Step 1: click on the Excel export button



Excel workbook pops up

Flux at SWP Export Location (% particles)

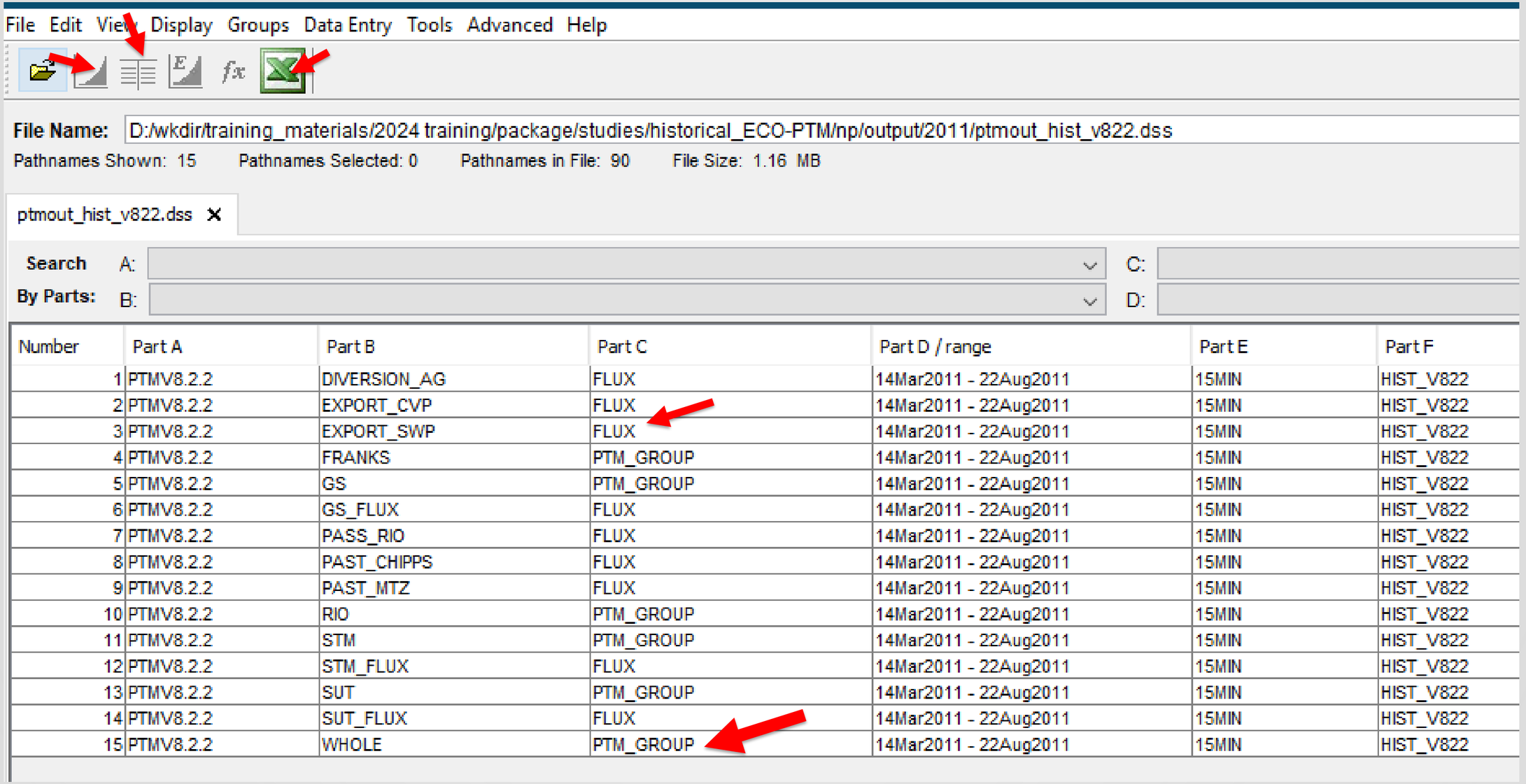
	A	B	C
1	A		PTMV8.2.2
2	B		EXPORT_SWP
3	C		FLUX
4	E		
5	F		HIST_V822
6	Units		PERCENT
7	Type		INST-CUM
8	1	15Mar2011 0000	0.0000
9	2	15Mar2011 0015	0.0000
10	3	15Mar2011 0030	0.0000
11	4	15Mar2011 0045	0.0000
12	5	15Mar2011 0100	0.0000
13	6	15Mar2011 0115	0.0000
14	7	15Mar2011 0130	0.0000
15	8	15Mar2011 0145	0.0000
16	9	15Mar2011 0200	0.0000
17	10	15Mar2011 0215	0.0000
18	11	15Mar2011 0230	0.0000
19	12	15Mar2011 0245	0.0000
20	13	15Mar2011 0300	0.0000

Row #

Raise hand in Teams when done

ECO-PTM Output

Homework: repeat for WHOLE PTM_GROUP



Number	Part A	Part B	Part C	Part D / range	Part E	Part F
1	PTMV8.2.2	DIVERSION_AG	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
2	PTMV8.2.2	EXPORT_CVP	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
3	PTMV8.2.2	EXPORT_SWP	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
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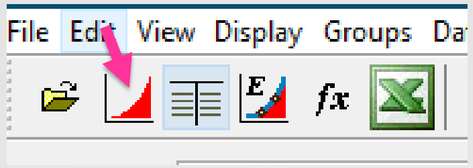
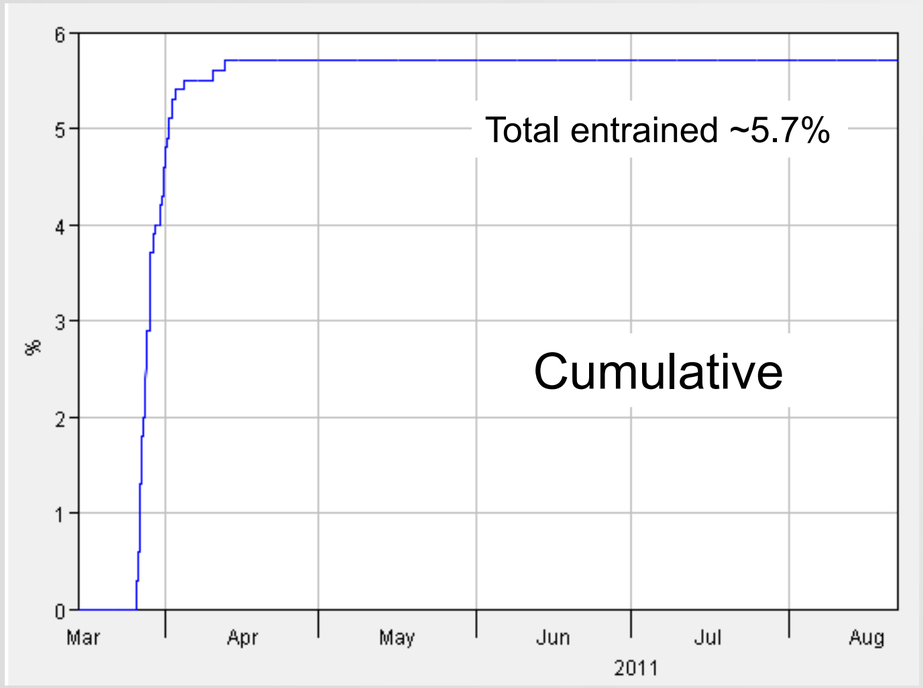
15	PTMV8.2.2	WHOLE	PTM_GROUP	14Mar2011 - 22Aug2011	15MIN	HIST_V822

ECO-PTM Output: DSS File



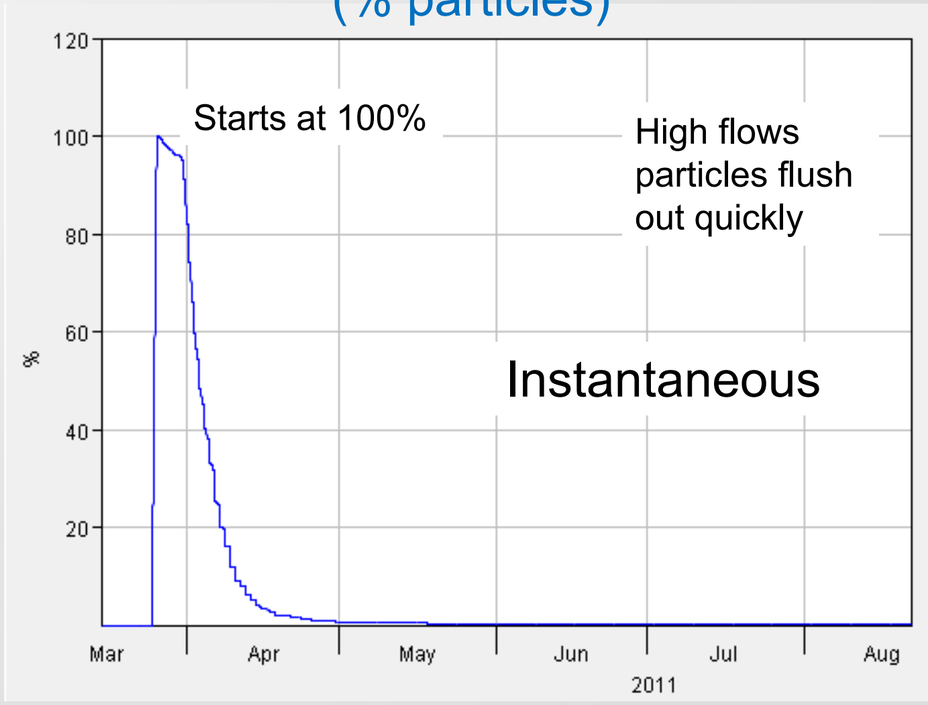
Number	Part A	Part B	Part C
1	PTMV8.2.2	DIVERSION_AG	FLUX
2	PTMV8.2.2	EXPORT_CVP	FLUX
3	PTMV8.2.2	EXPORT_SWP	FLUX

FLUX at SWP Export Location (% particles)



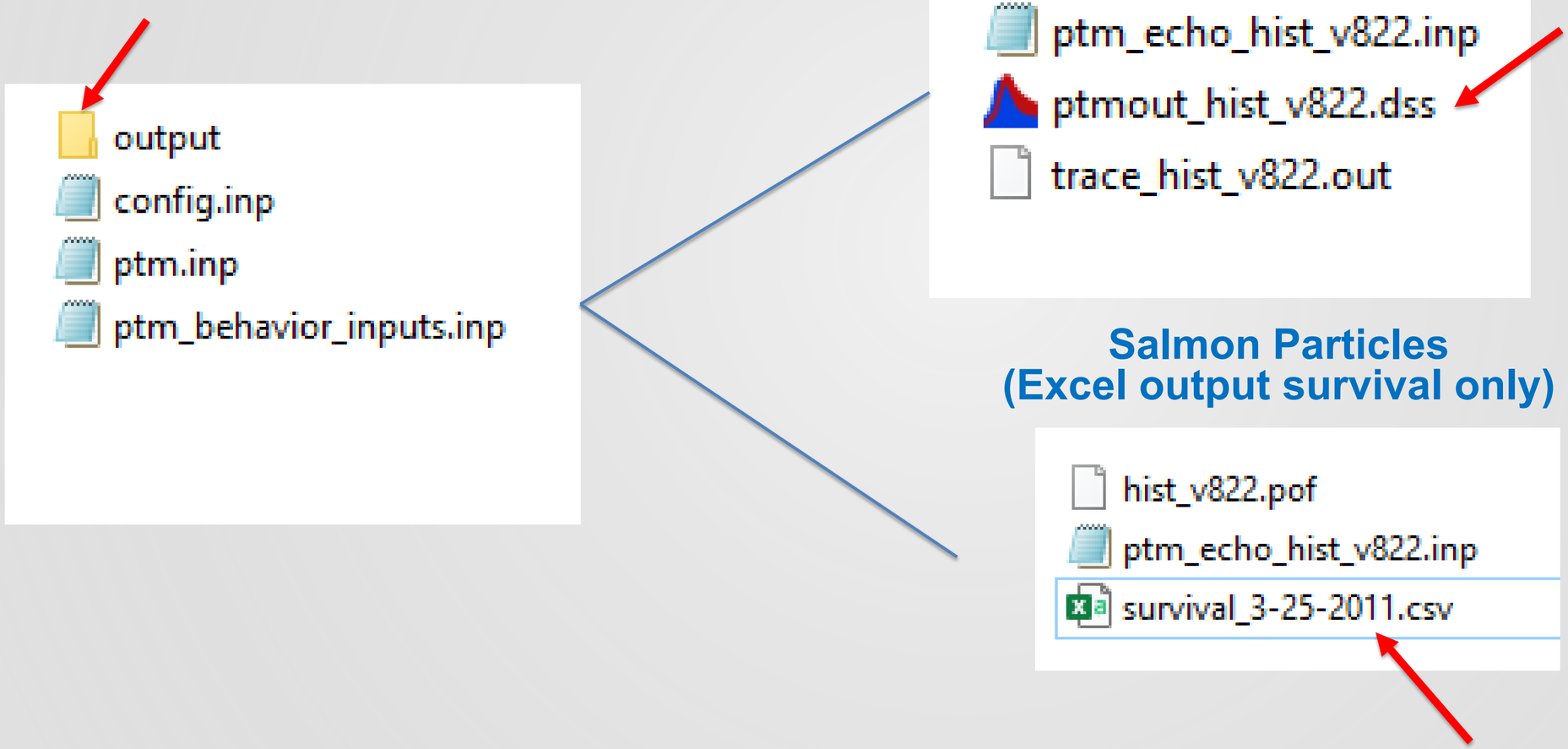
13	PTMV8.2.2	SUT	PTM_GROUP
14	PTMV8.2.2	SUT_FLUX	FLUX
15	PTMV8.2.2	WHOLE	PTM_GROUP

PTM_GROUP Output for the entire Delta (% particles)

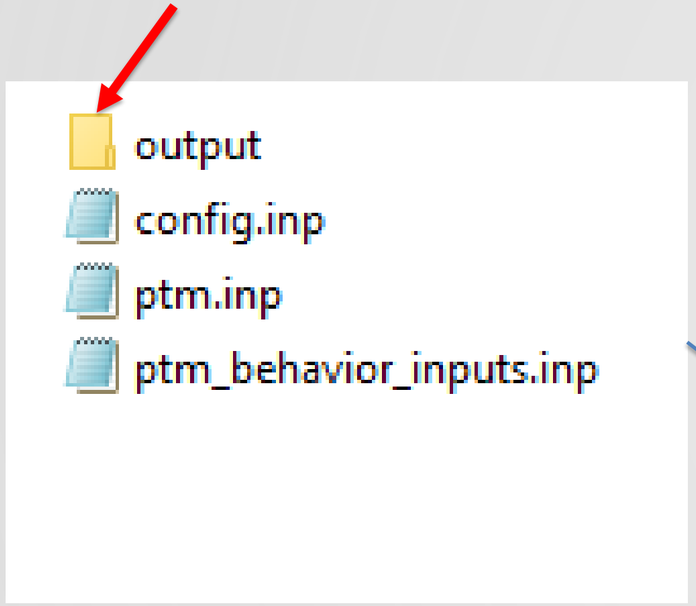


SWP State Water Project

ECO-PTM: Comparing NP & SP Output



ECO-PTM Hands-On: SP output



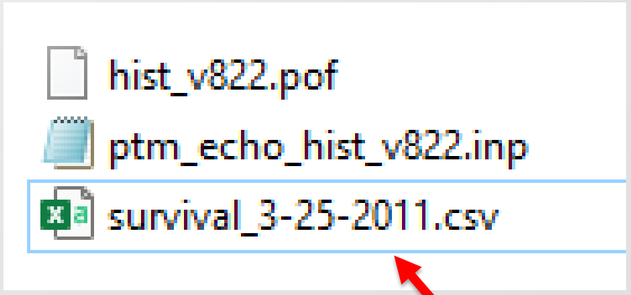
Step 1: open file explorer

Step 2: find SP study folder
delta → *dsm2* → *studies*
→*historical_ECO-PTM* → *sp*

Step 3: open the output folder

Step 4: double click on CSV file to open in Excel

Salmon Particles
(Excel output survival only)



Raise hand in Teams when done

ECO-PTM Output: Salmon Survival

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Date	Scenario	SUT_RATIO	STM_RATIO	SACR_SS_RATIO	SACR_GEO_RATIO	GEO_RATIO	DCC_RATIO	SUT_SUV	STM_SUV	SAC_SUV	GEO_SUV	DCC_SUV	Combined_suv
2	3/25/2011	historical	0.32795948	0.28834638	0.38369414	0.8227384	0.17726162		0.6723424	0.7176852	0.6951399	0.40274566		0.6742771

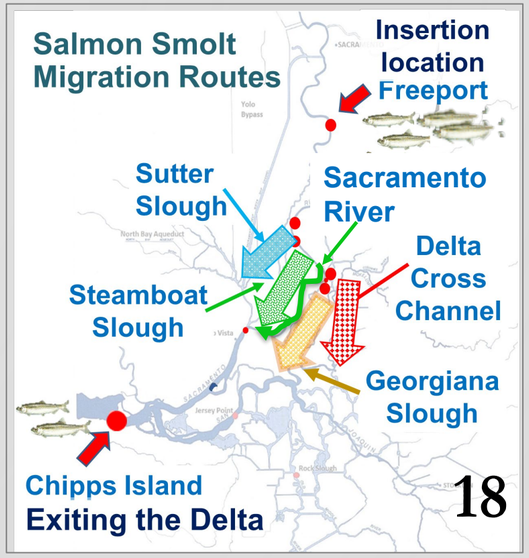
Particle insertion date

Ratio of particles to Sutter Sl., Steamboat Sl., and in Sac R.

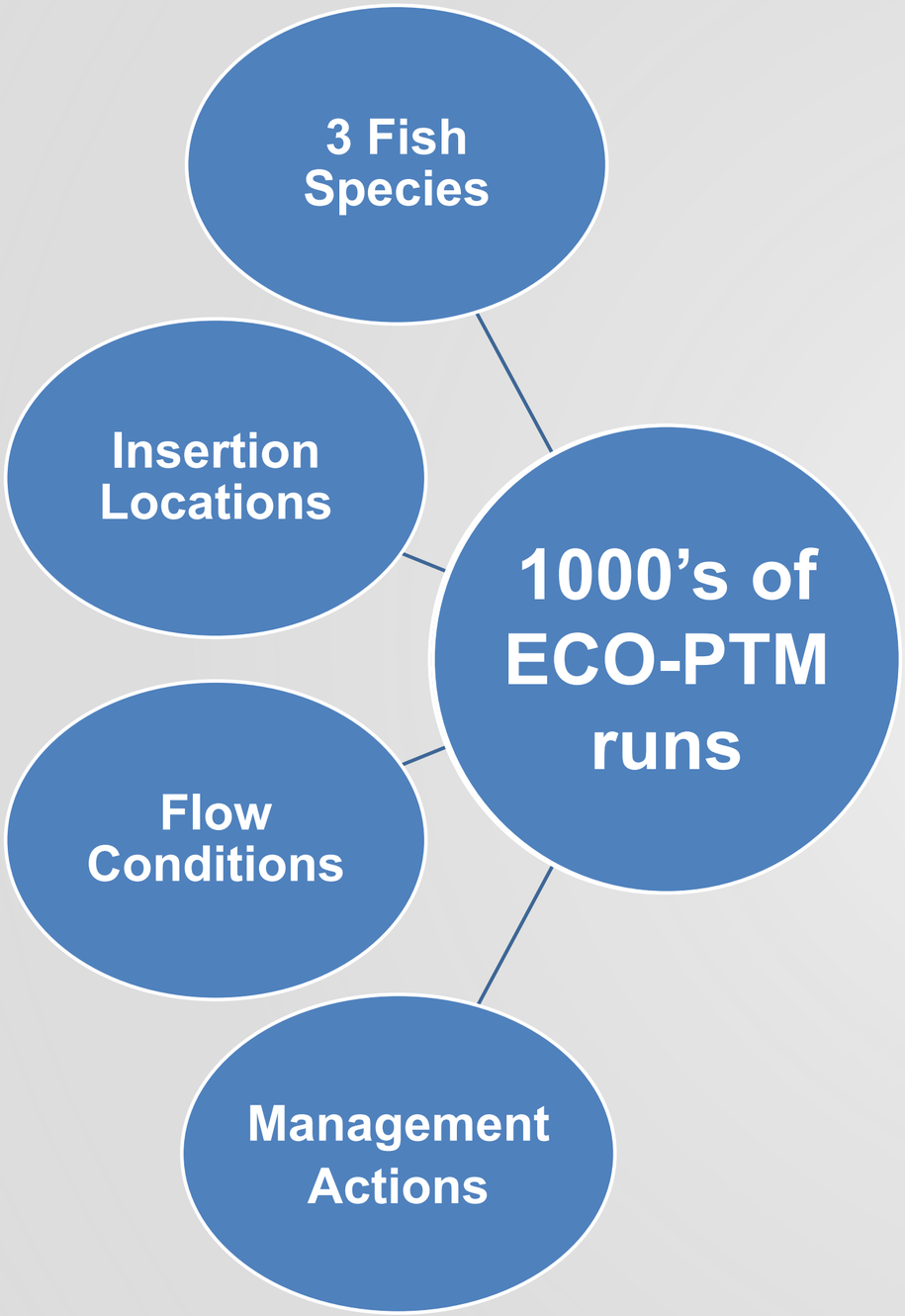
Ratio of particles to Georgiana Sl., Delta Cross Channel, and in Sac R.

Route Specific Survival

All routes combined survival



Cloud Computing



How to use Cloud Computing is not covered in this Intro class

ECO-PTM: Take Home Points

Collaborative Development

3 Fish Species
- Delta Smelt Larvae
- Longfin Smelt Larvae
- Chinook Salmon Smolts

DATA

Calibrated & Validated to Fish tag data

Entrainment & Survival
- Routing
- Movement
- Survival

Acknowledgements

- Ryan Reeves
- Bill McLaughlin
- Jacob McQuirk
- Tara Smith
- Kevin Clark
- Robert Trang
- Mohammed (Shahid) Anwar
- Kevin Reece
- Prabhjot (Nicky) Sandhu
- Steve Lindley’s team in NOAA Fisheries

Special thanks to Jamie Anderson!

Questions? Please type them into Teams chat

Include slide # if possible

Follow-Up Survey

Xiaochun Wang (Xiaochun.Wang@water.ca.gov)