

ECO-PTM Output

April 16, 2024



Delta Smelt



Longfin Smelt



Chinook Salmon

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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:

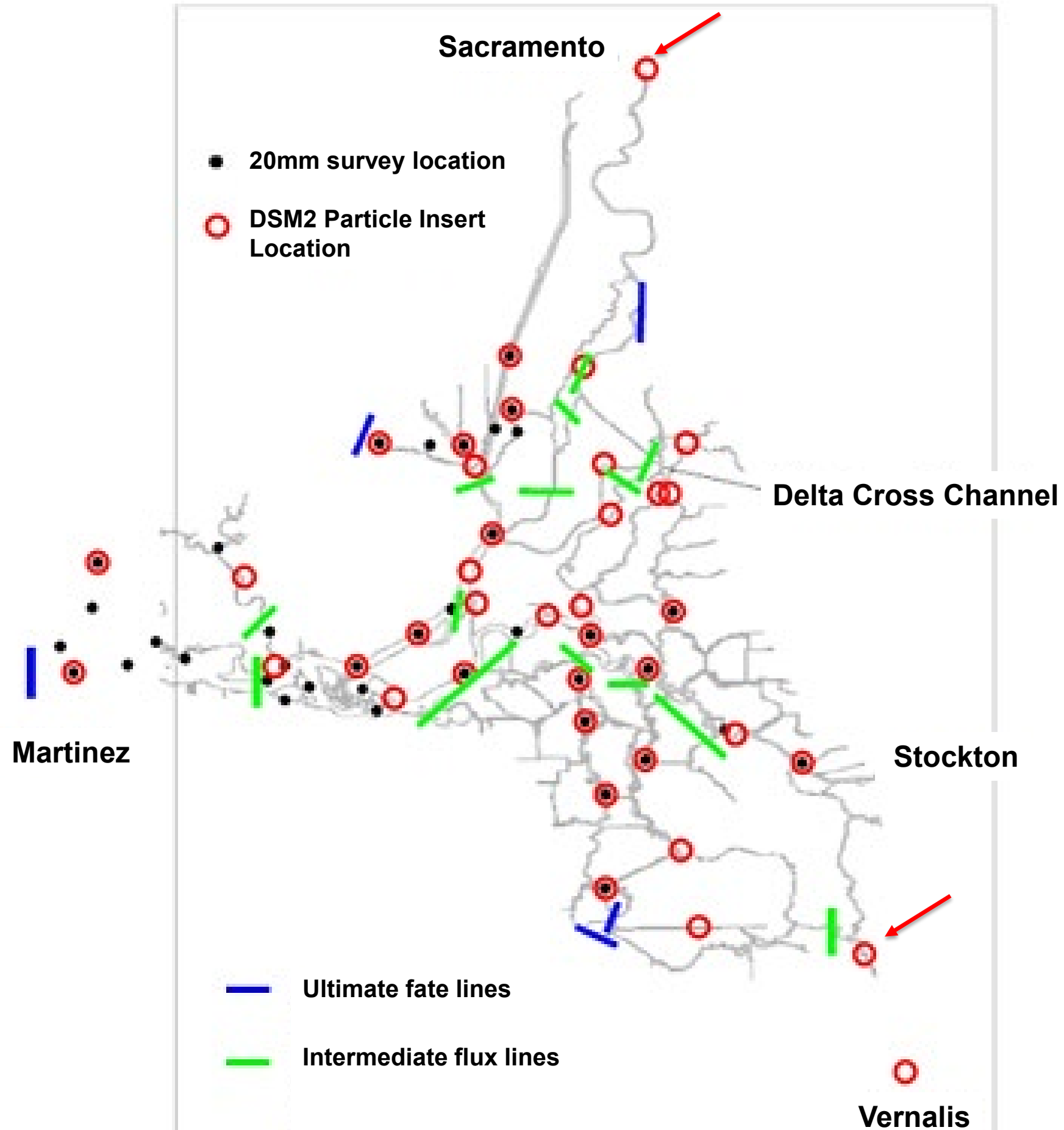
- Entrainment into SWP, CVP facilities (smelt larvae)
- Survival through the Delta (salmon smolt)

SWP: State Water Project

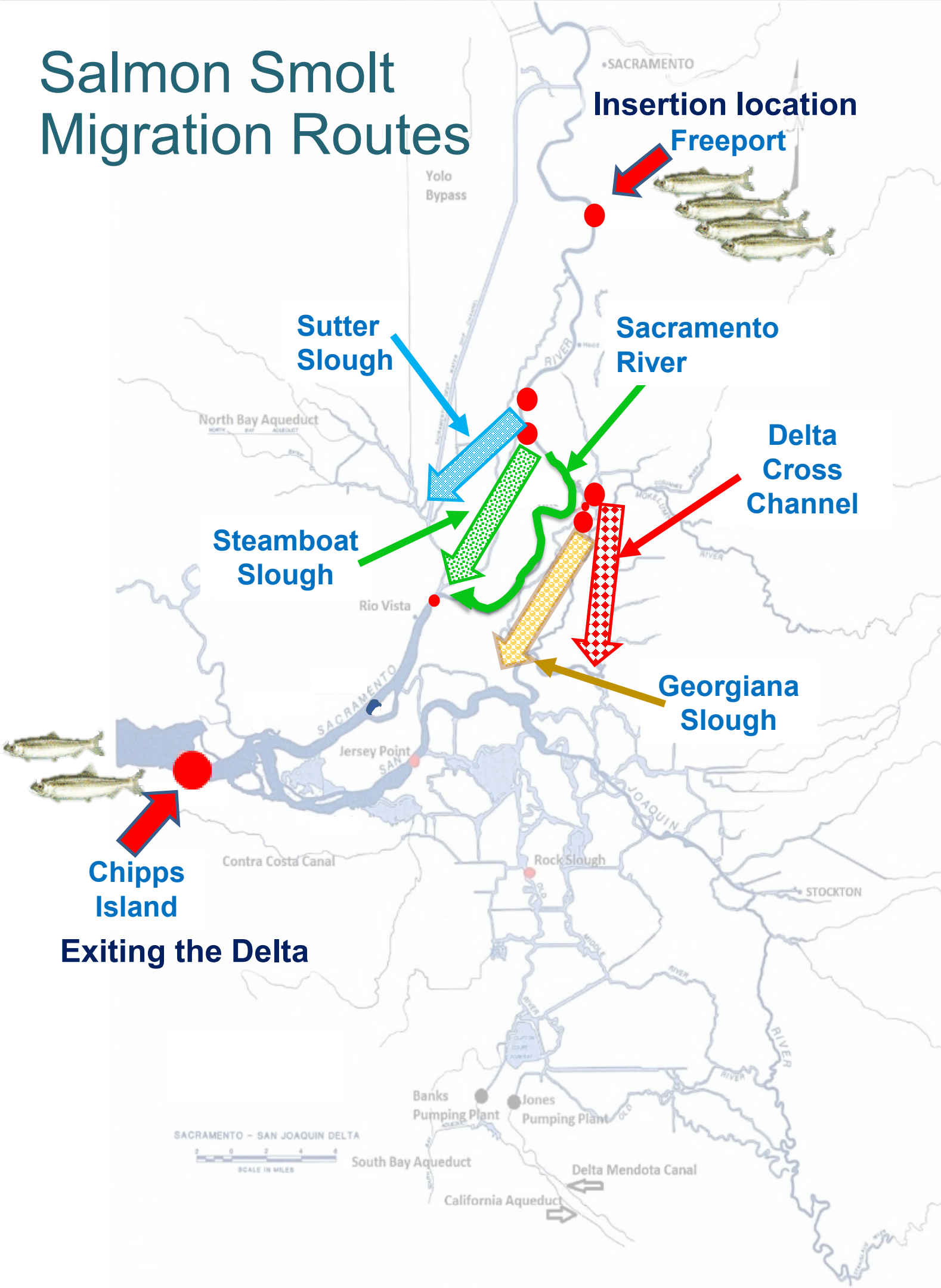
CVP: Federal Central Valley Project

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 Smolt Migration Routes



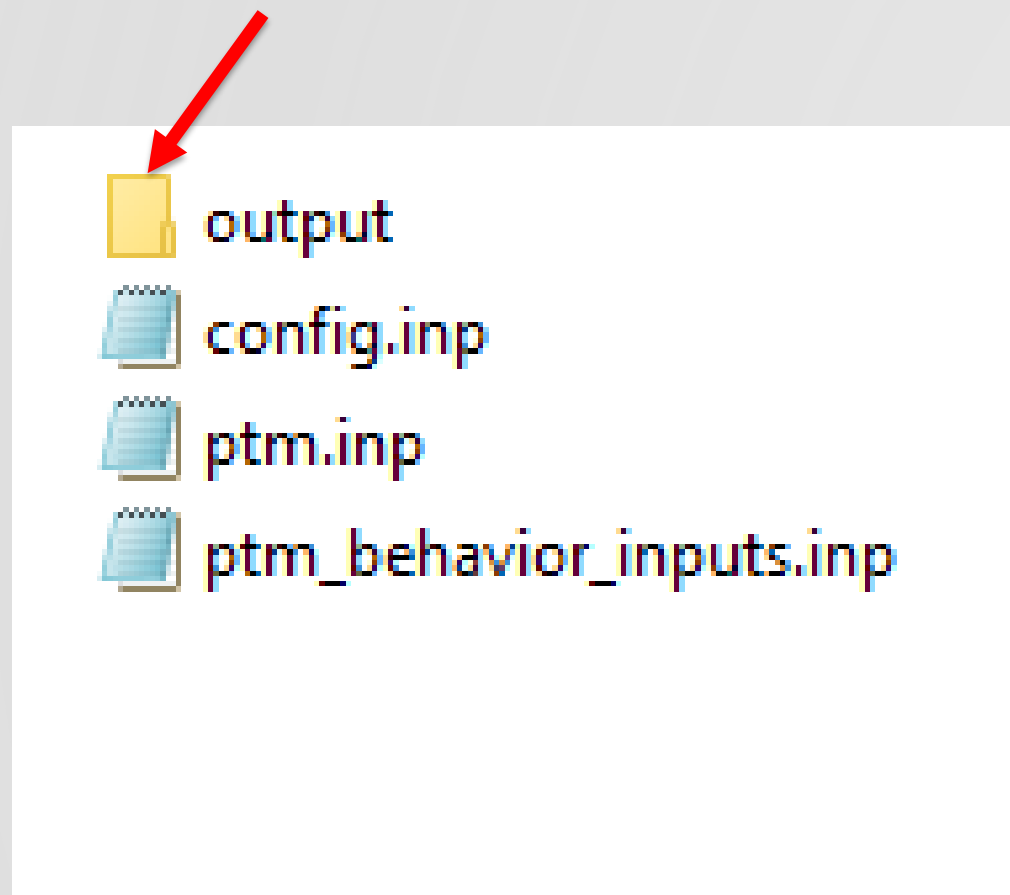
Salmon particles (salmon smolt):

- 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

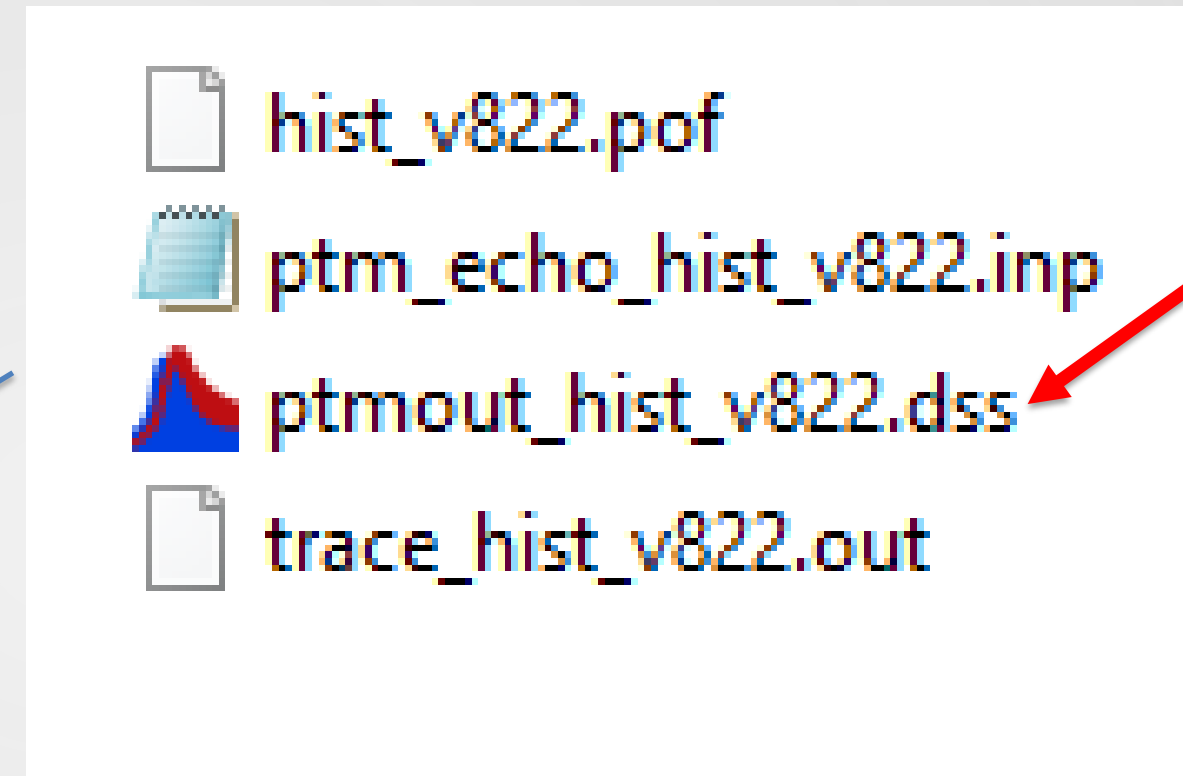
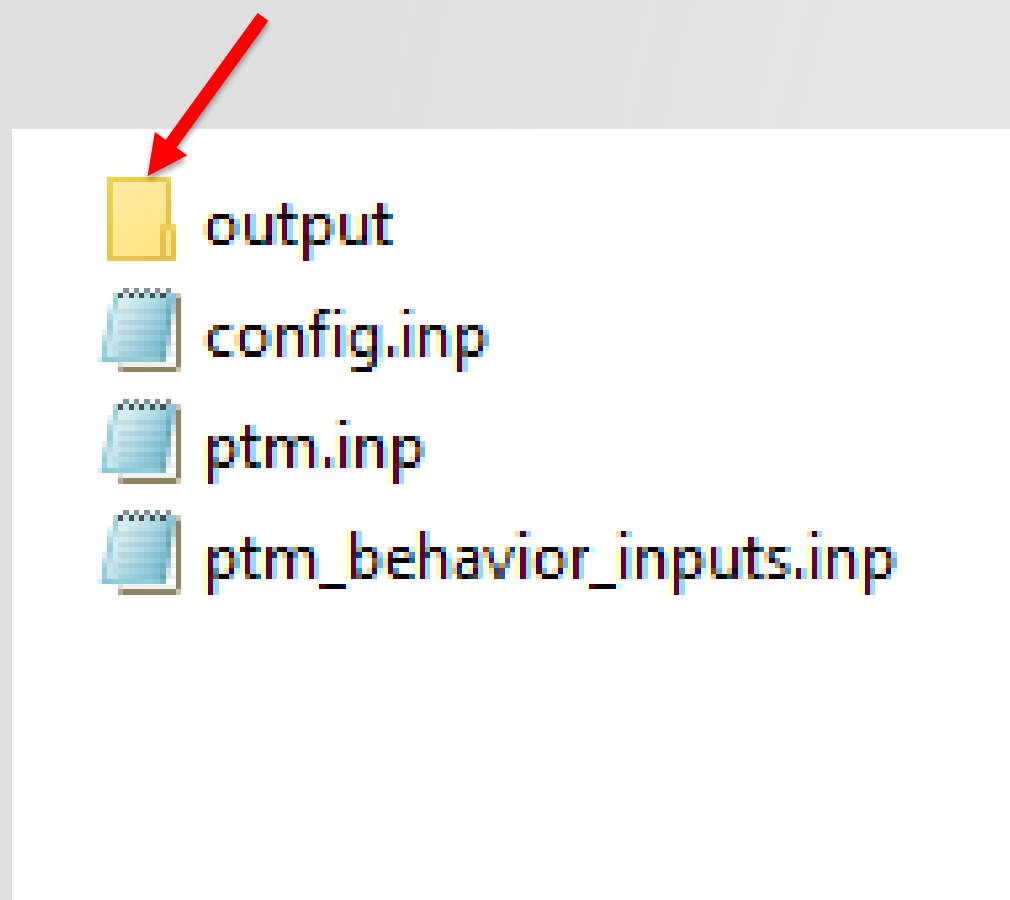


Raise hand in Teams when done

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 X						
Search A: C: By Parts: B: 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
6	PTMV8.2.2	GS_FLUX	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
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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)

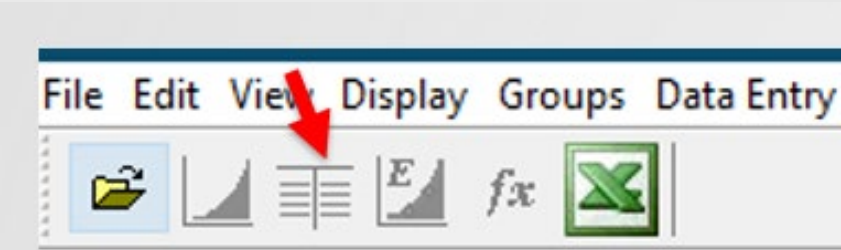
ECO-PTM DSS Output: view a table

Step 1: single click on

2 PTMV8.2.2	EXPORT_SWP	FLUX
3 PTMV8.2.2	EXPORT_SWP	FLUX
4 PTMV8.2.2	EXPORT_SWP	FLUX

row will become highlighted

Step 2: click on the table button



a table will pop up

Flux at SWP Export Location (% particles)

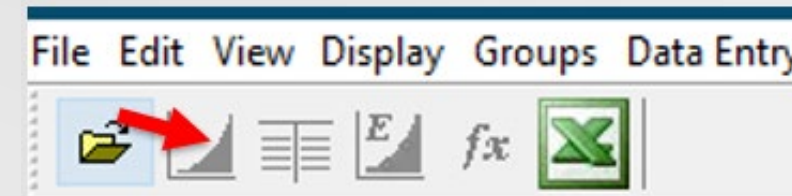
Ordinate Row #	Date / Time	EXPORT_SWP FLUX HIST_V822
2019	05 Apr 11, 00:30	5.5000
2020	05 Apr 11, 00:45	5.5000
2021	05 Apr 11, 01:00	5.5000
2022	05 Apr 11, 01:15	5.5000
2023	05 Apr 11, 01:30	5.5000
2024	05 Apr 11, 01:45	5.5000
2025	05 Apr 11, 02:00	5.5000
2026	05 Apr 11, 02:15	5.5000
2027	05 Apr 11,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

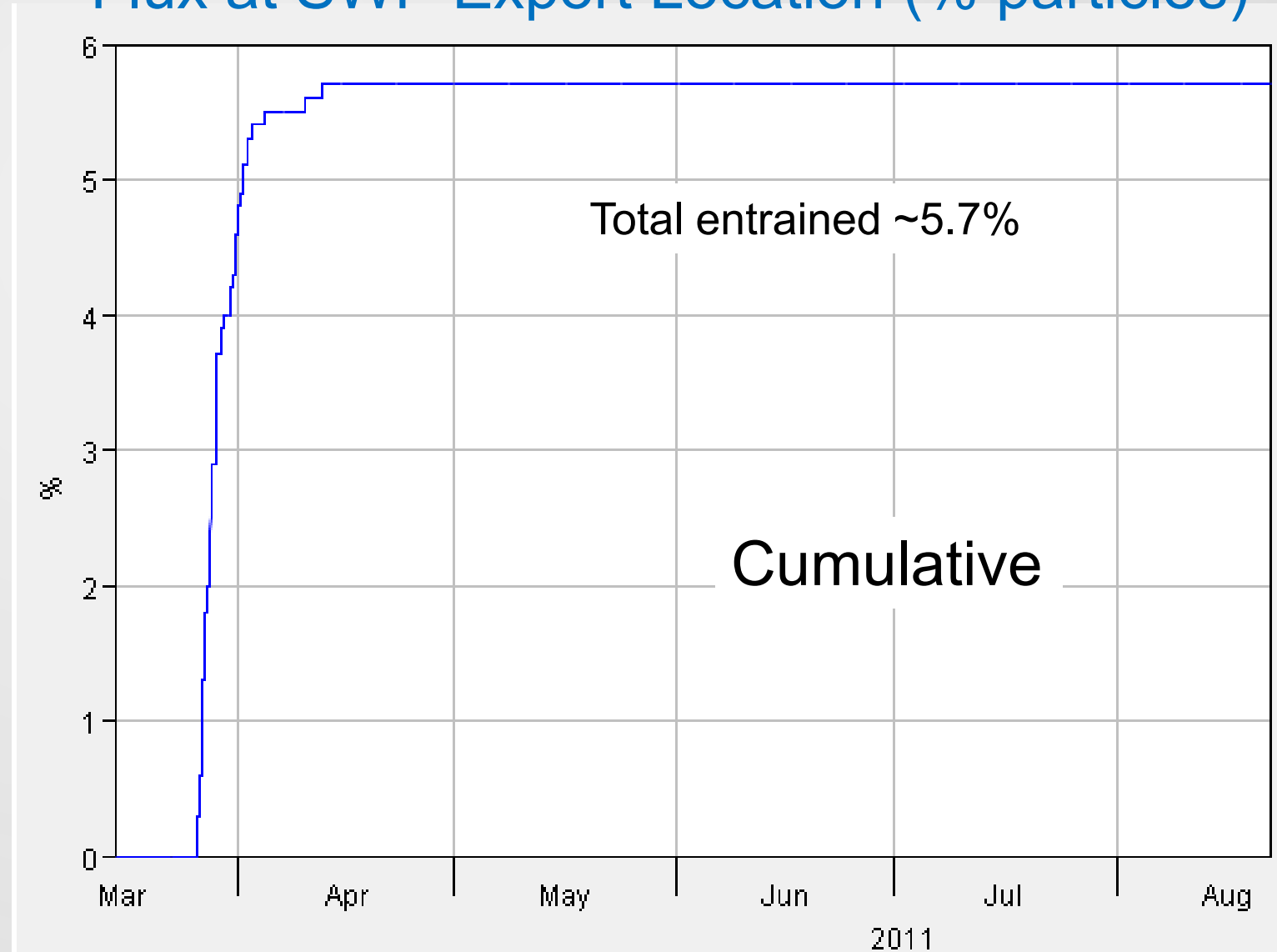
ECO-PTM DSS Output: Graph

Step 1: click on the graph button



Graph window pops up

Flux at SWP Export Location (% particles)

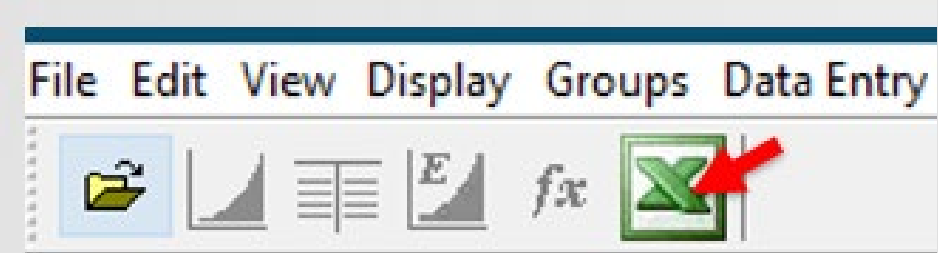


Raise hand in Teams when done

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	Row #	1	15Mar2011 0000
9		2	15Mar2011 0015
10		3	15Mar2011 0030
11		4	15Mar2011 0045
12		5	15Mar2011 0100
13		6	15Mar2011 0115
14		7	15Mar2011 0130
15		8	15Mar2011 0145
16		9	15Mar2011 0200
17		10	15Mar2011 0215
18		11	15Mar2011 0230
19		12	15Mar2011 0245
20		13	15Mar2011 0300








Raise hand in Teams when done

ECO-PTM Output

Homework: repeat for WHOLE PTM_GROUP

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

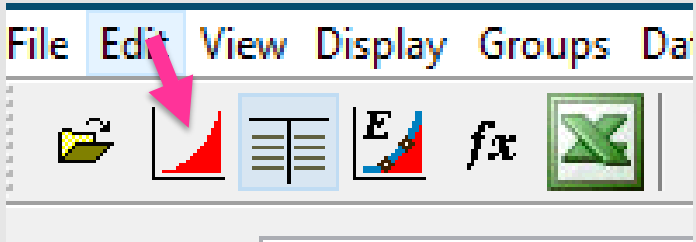
ptmout_hist_v822.dss X

Search A: C:

By Parts: B: D:

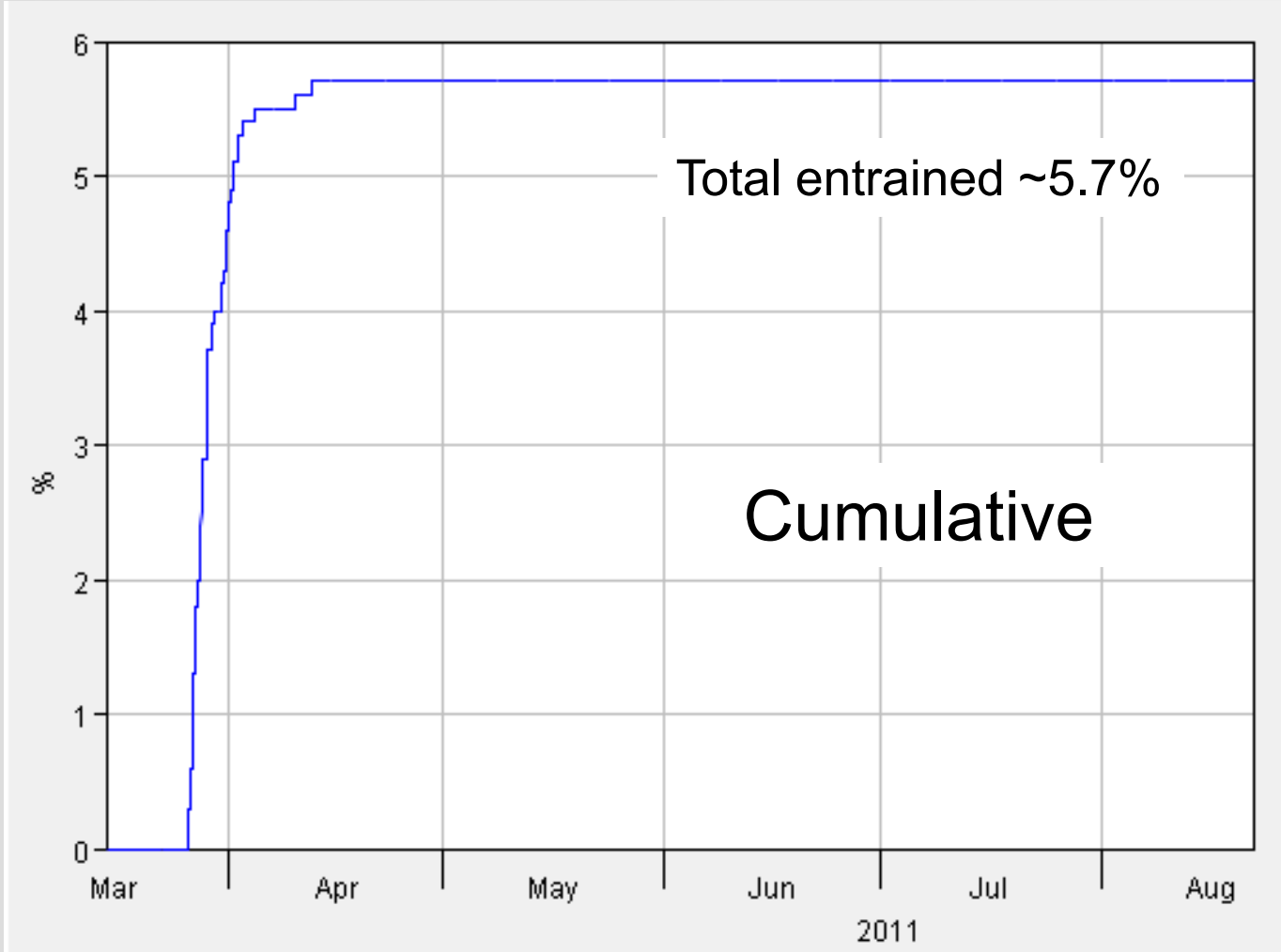
Number	Part A	Part B	Part C	Part D / range	Part E	Part F
1	PTMV8.2.2	DIVERSION_AG	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
2	PTMV8.2.2	EXPORT_CVP	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
3	PTMV8.2.2	EXPORT_SWP	FLUX	14Mar2011 - 22Aug2011	15MIN	HIST_V822
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12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



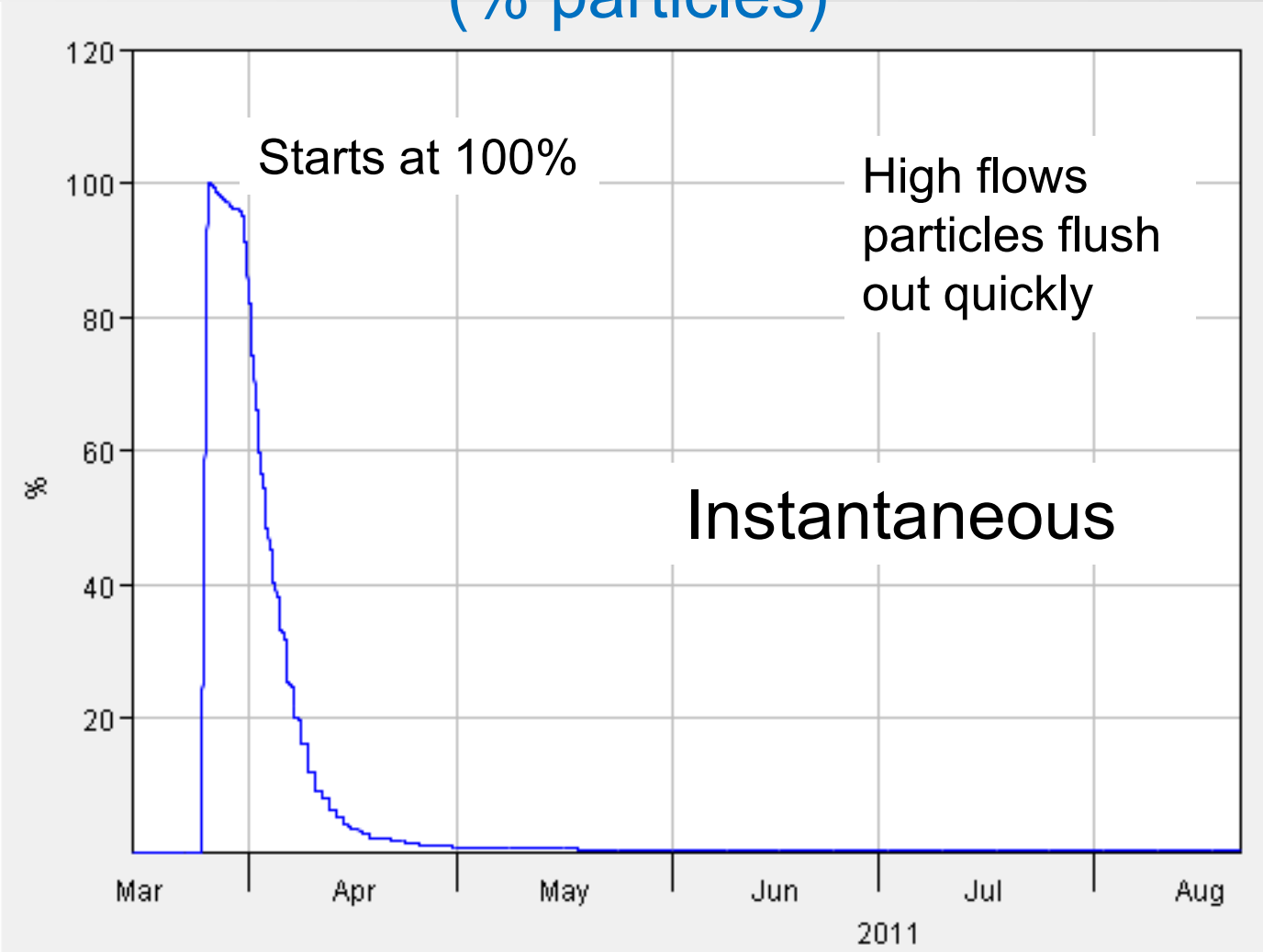
Number	Part A	Part B	Part C
1	PTMV8.2.2	DIVERSION_AG	FLUX
2	PTMV8.2.2	EXPORT_CVP	FLUX
3	PTMV8.2.2	EXPORT_SWP	FLUX

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)










ECO-PTM: Comparing NP & SP Output

Neutrally Buoyant (DSS output)

 hist_v822.pof
 ptm_echo_hist_v822.inp
 ptmout_hist_v822.dss
 trace_hist_v822.out

Salmon Particles (Excel output survival only)

 hist_v822.pof
 ptm_echo_hist_v822.inp
 survival_3-25-2011.csv

 output
 config.inp
 ptm.inp
 ptm_behavior_inputs.inp

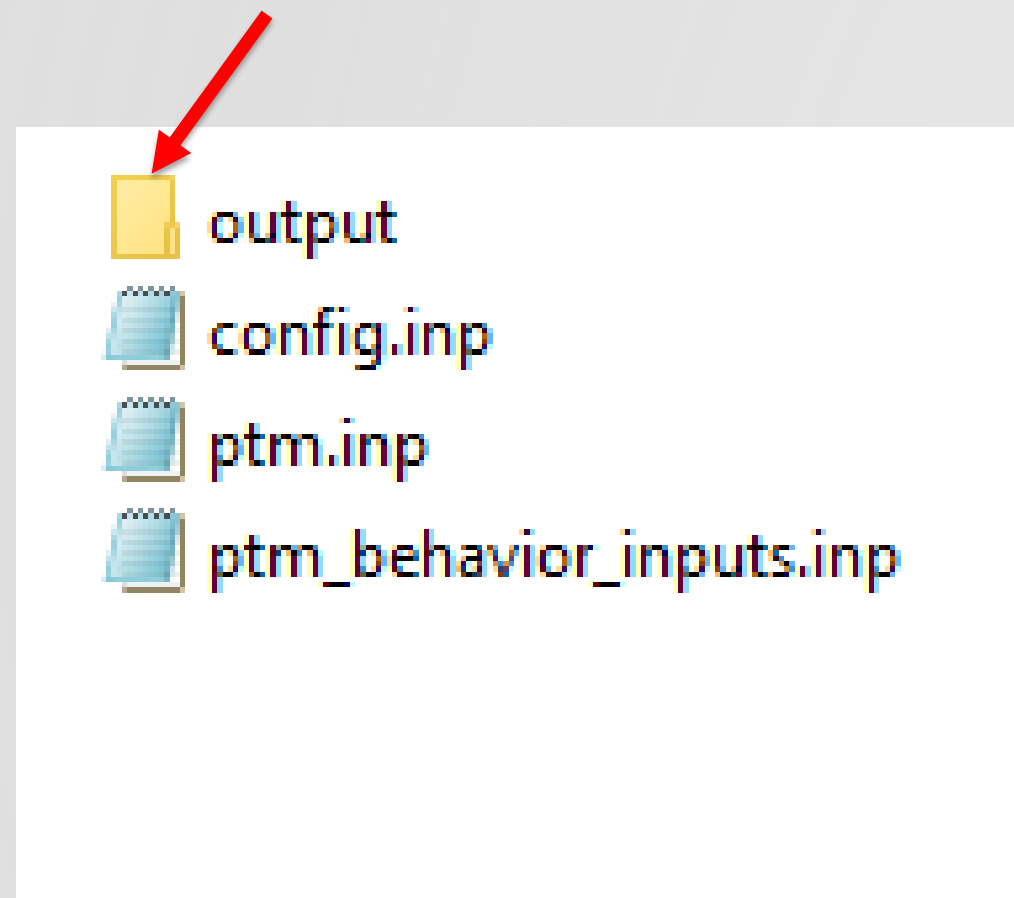
ECO-PTM Hands-On: SP output

Step 1: open file explorer

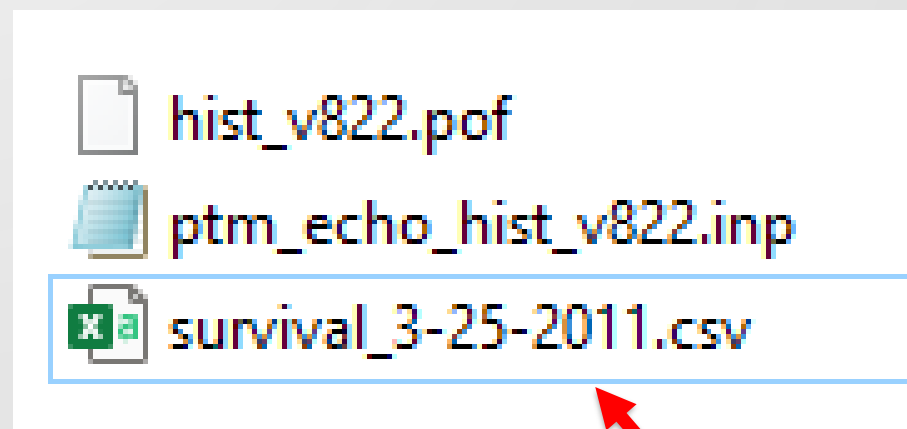
Step 2: find **SP** study folder
delta → *dsm2* → *studies*
→ *historical_ECO-PTM* → *sp*

Step 3: open the output folder

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



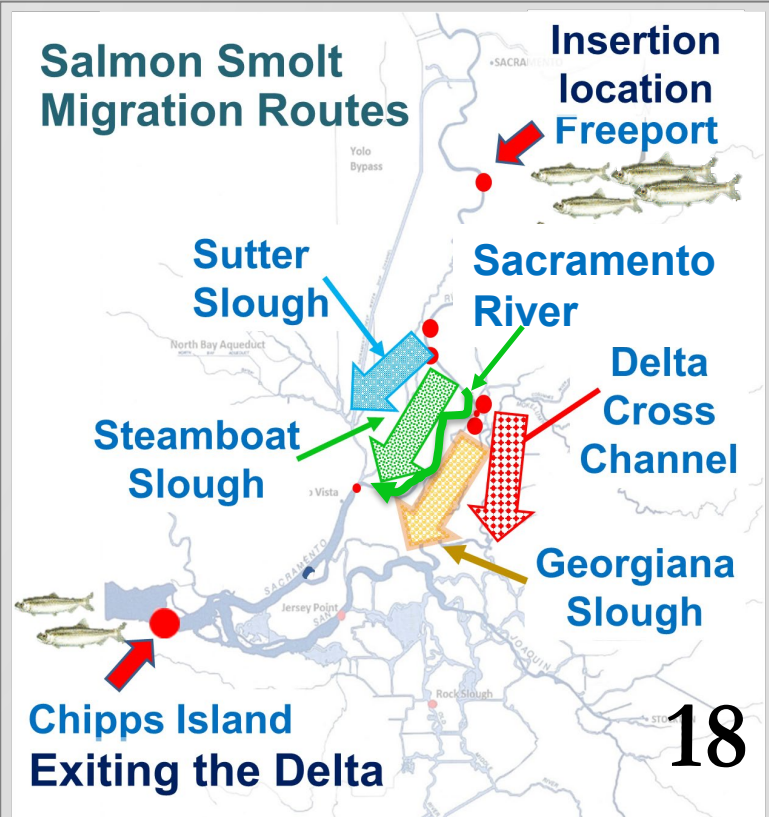
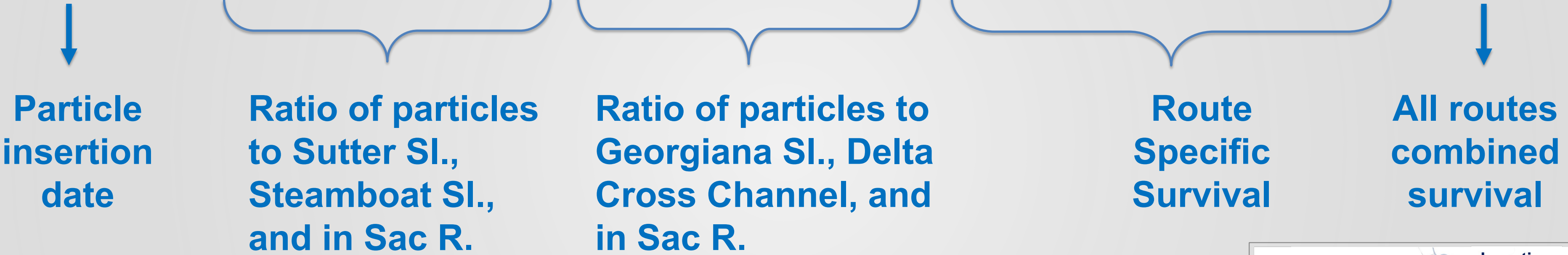
Salmon Particles
(Excel output survival only)



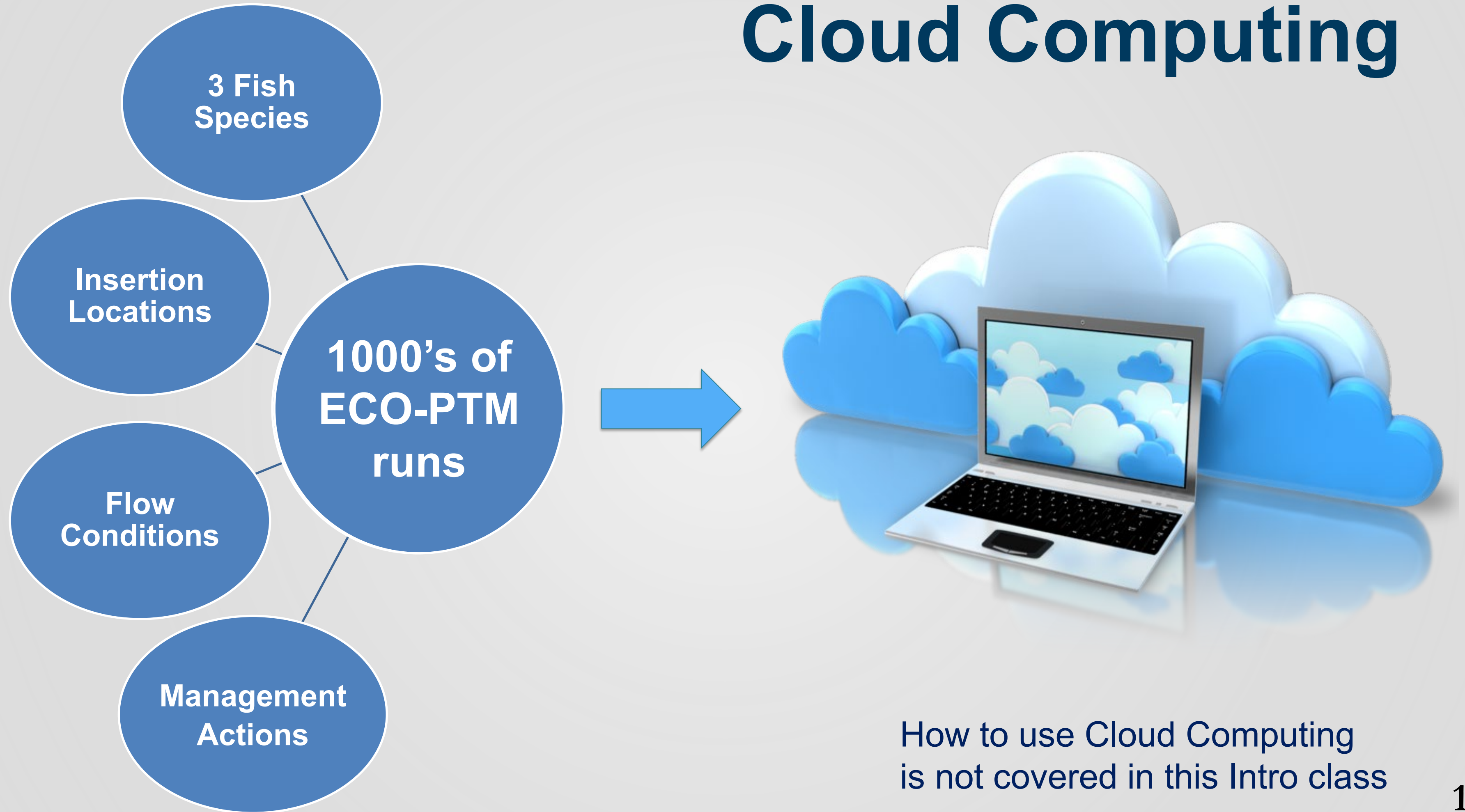
Raise hand in Teams when done

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



Cloud Computing



ECO-PTM: Take Home Points



**Collaborative
Development**

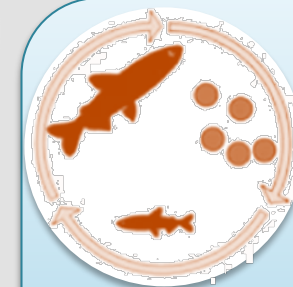
3 Fish Species

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)

EXTRA SLIDES

ECO-PTM Output: Trace File

start time
(minutes since 12/31/1899)

end time

time step
(minutes)

number of particles

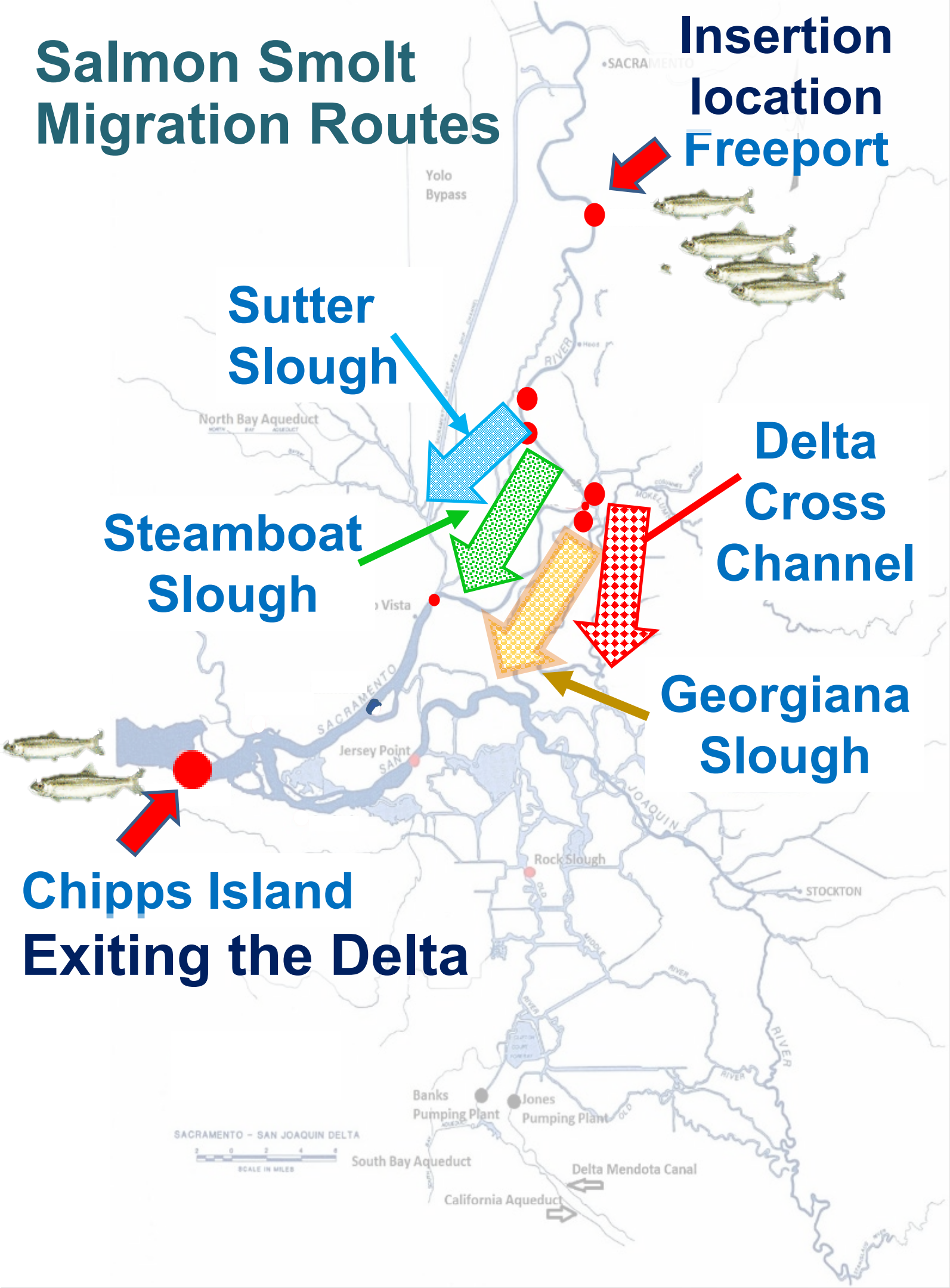
time

channel ID

node ID

particle ID

Salmon Smolt Migration Routes



ECO-PTM Output

Salmon Particles:

- 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.