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AFEP 2008

Fish Passage Performance of Tandem TSW Operation at McNary Dam during 2008

By
Noah Adams
and
John Plumb, Tyson W. Hatton,
Rachel E. Reagan, Matthew D. Sholtis, Nicholas M. Swyers, Chris E. Walker, Scott J. Brewer, and Edward C. Jones

Presentation Outline

- Spring study
  - Treatments & operations
  - Passage & survival
- Summer study
  - Treatments & operations
  - Passage & survival
- Survival comparison 07- 08
- Mid-Columbia survival (Sockeye 07)
- Forebay behavior
- Flow patterns in the tail race
- Conclusions

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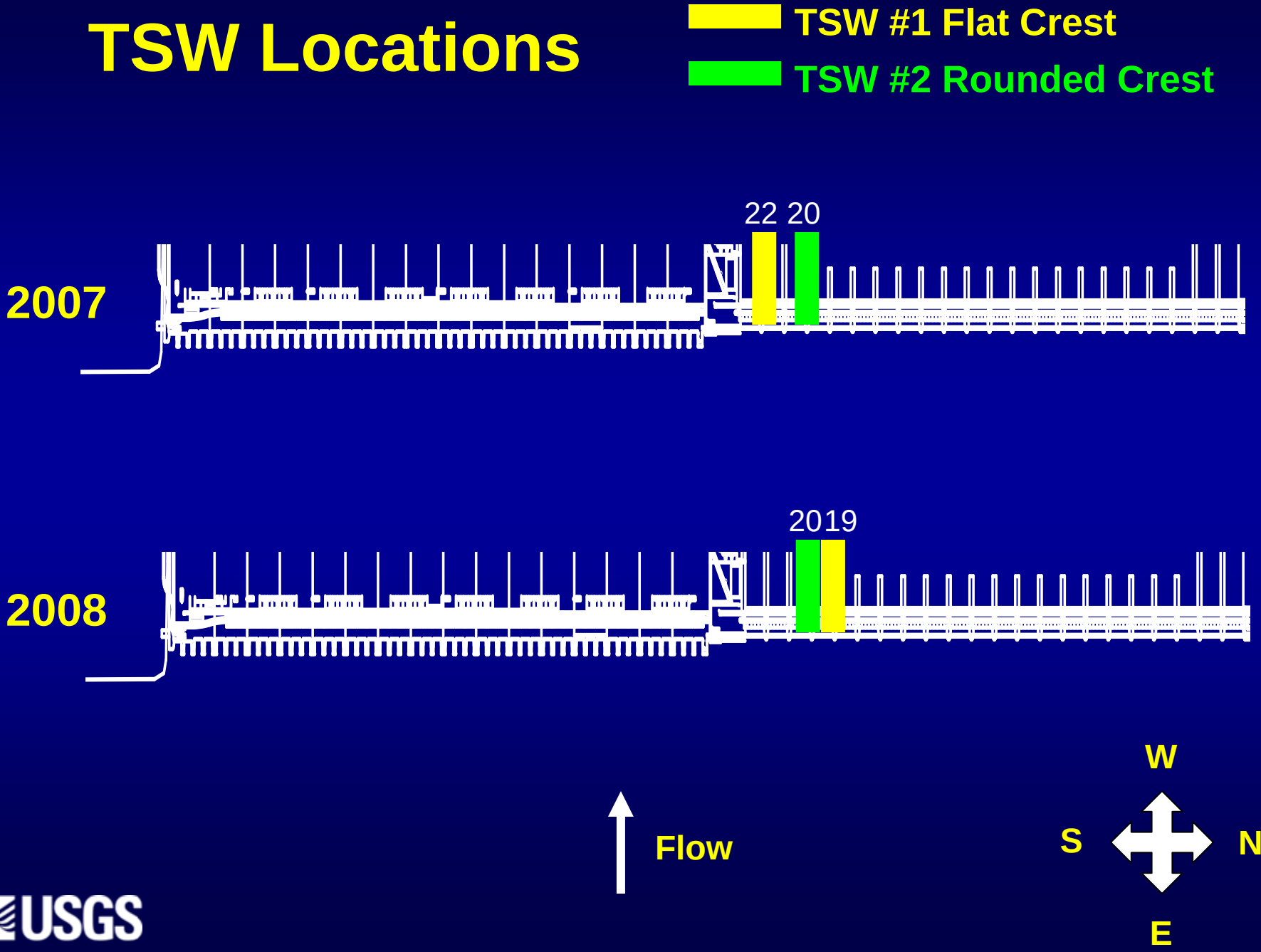
TSW Locations



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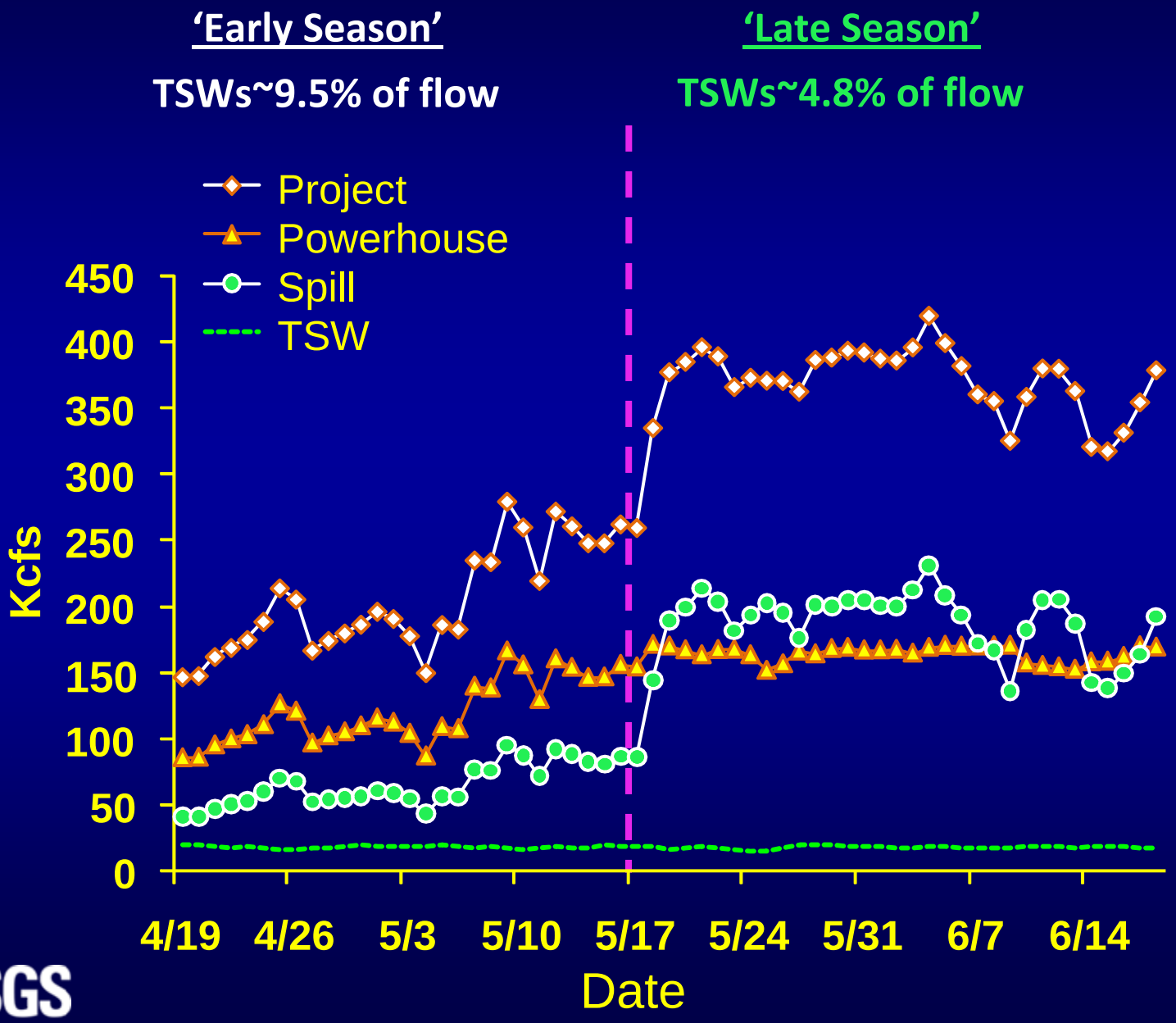
Spring Treatments & Dam Operations



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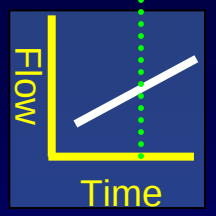
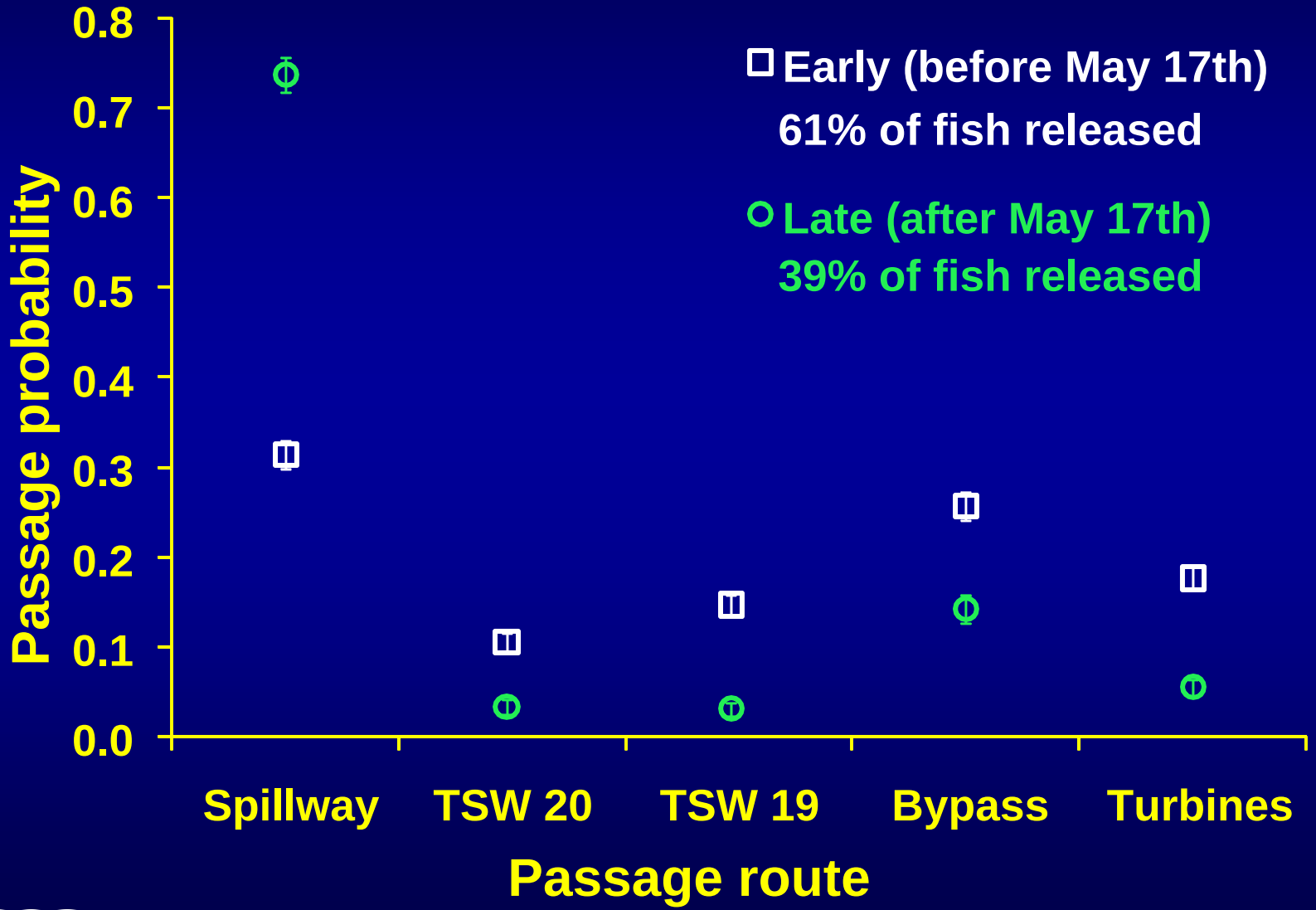
Passage - Yearling Chinook Salmon





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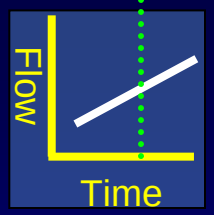
Survival for Yearling Chinook Salmon



Early (before May 17th)

Late (after May 17th)

Survival probability

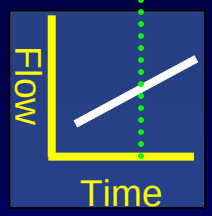
1.00
0.95
0.90
0.85
0.80
0.75
0.70

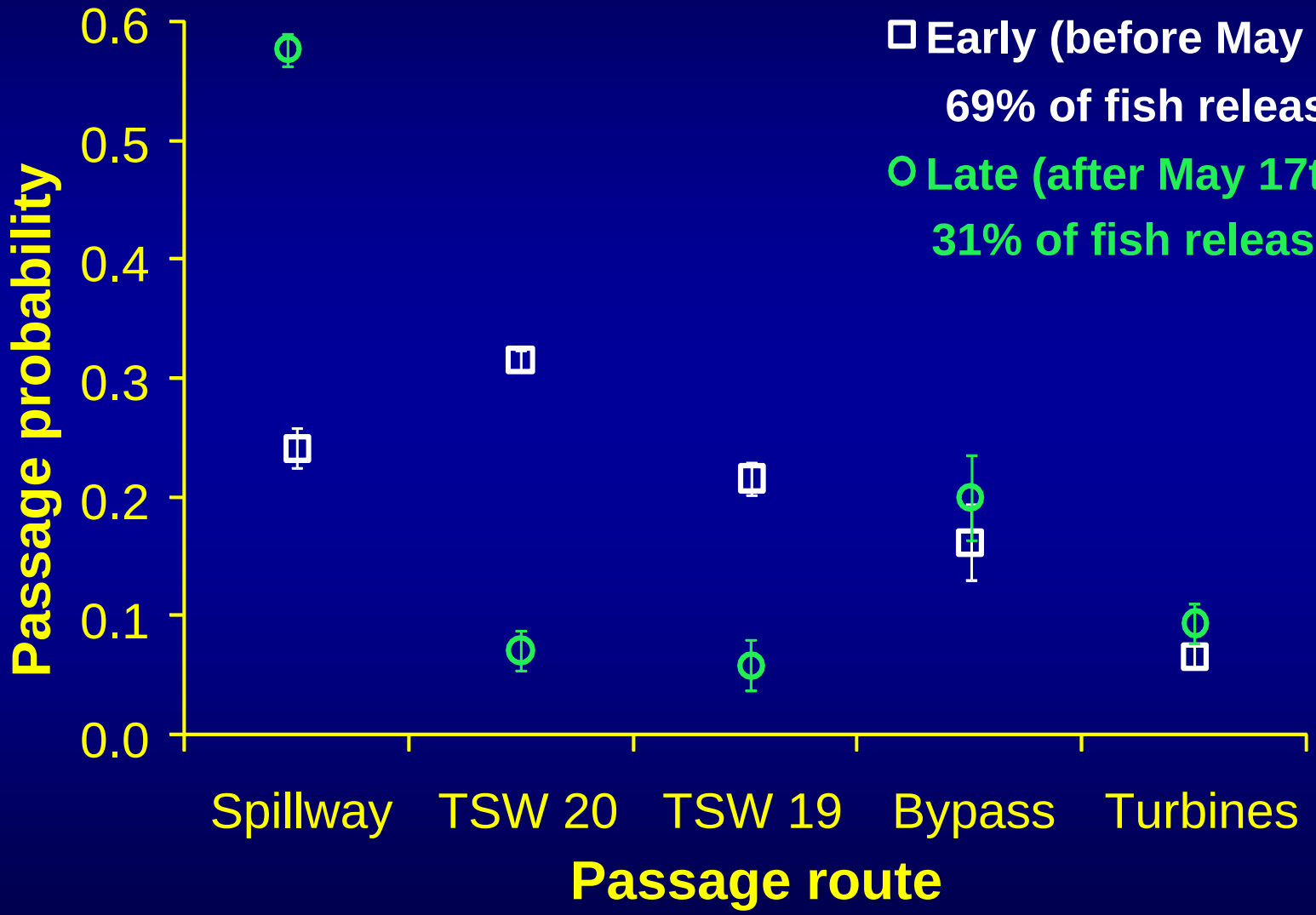
Dam
Spillway
TSW 20
TSW 19
Bypass
Turbines

Passage route

USGS

Passage – Juvenile Steelhead





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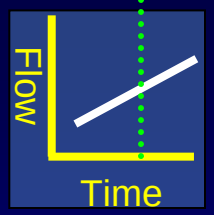
Survival for Juvenile Steelhead



Early (before May 17th)
Late (after May 17th)

Survival probability

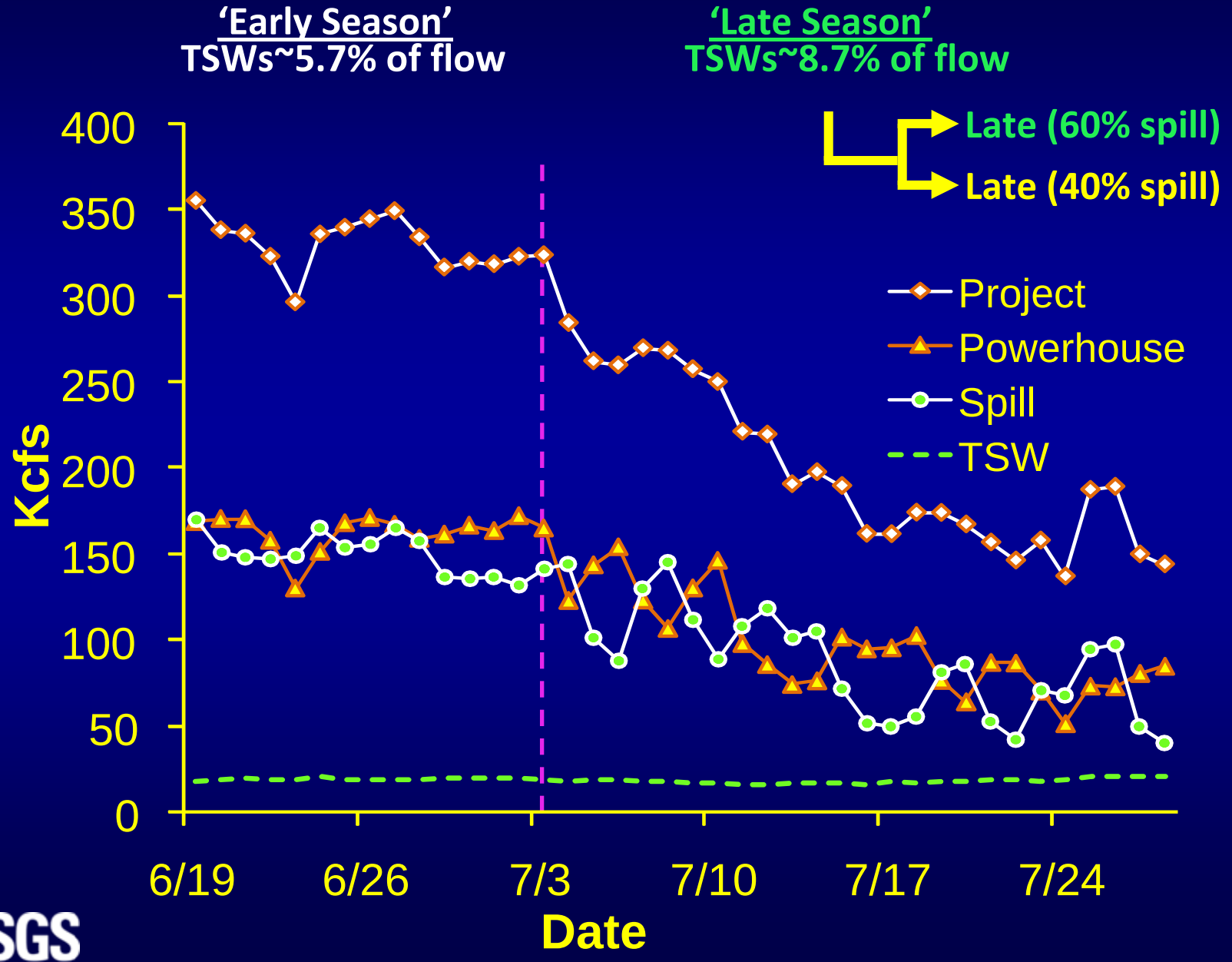
1.10
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70

Dam
Spillway
TSW 20
TSW 19
Bypass
Turbines

Passage route

USGS

Summer Treatments & Dam Operations



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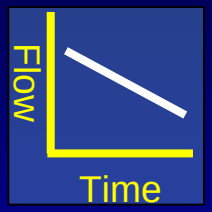
Passage - Subyearling Chinook Salmon



Early (before July 4th)
35% of fish released

Late (60% spill)
32% of fish released

Late (40% spill)
33% of fish released

Passage probability

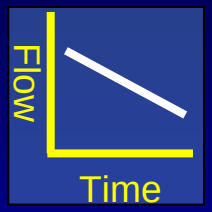
0.0
0.1
0.2
0.3
0.4
0.5
0.6

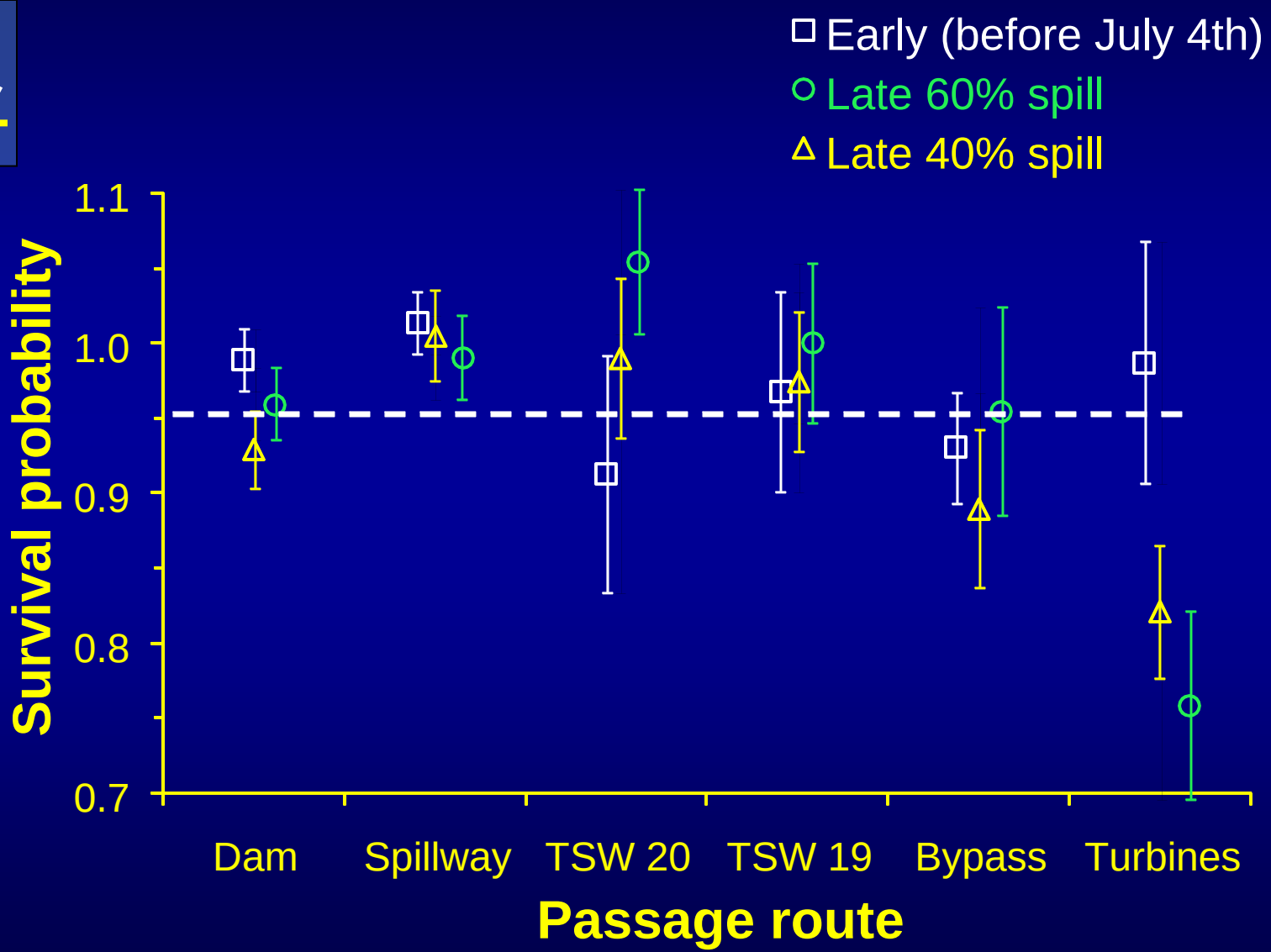
Spillway
TSW 20
TSW 19
Bypass
Turbines

Passage route

USGS

Survival- Subyearling Chinook Salmon





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Annual TSW Survival (Paired-Release) Yearling Chinook Salmon

2007

	Bay 22	Bay 21	Bay 20	Bay 19	Bay 18
'06 spill	0.94		0.95		
'07 spill	0.95		0.91		

2008

	Bay 22	Bay 21	Bay 20	Bay 19	Bay 18
Early			0.99	0.92	
Late			0.98	0.97	

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Annual TSW Survival (Single-Release) Juvenile Steelhead

2007	Bay 22	Bay 21	Bay 20	Bay 19	Bay 18
'06 spill	0.89		0.98		
'07 spill	0.92		0.95		

2008	Bay 22	Bay 21	Bay 20	Bay 19	Bay 18
Early			0.96	0.97	
Late			0.94	0.96	

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Annual TSW Survival (Paired-Release) Subyearling Chinook Salmon

2007	Bay 22	Bay 21	Bay 20	Bay 19	Bay 18
40% spill	0.95		0.84		
60% spill	0.95		0.95		

2008	Bay 22	Bay 21	Bay 20	Bay 19	Bay 18
Early			0.91	0.97	
40% spill			0.99	0.98	
60% spill			1.05	1.00	

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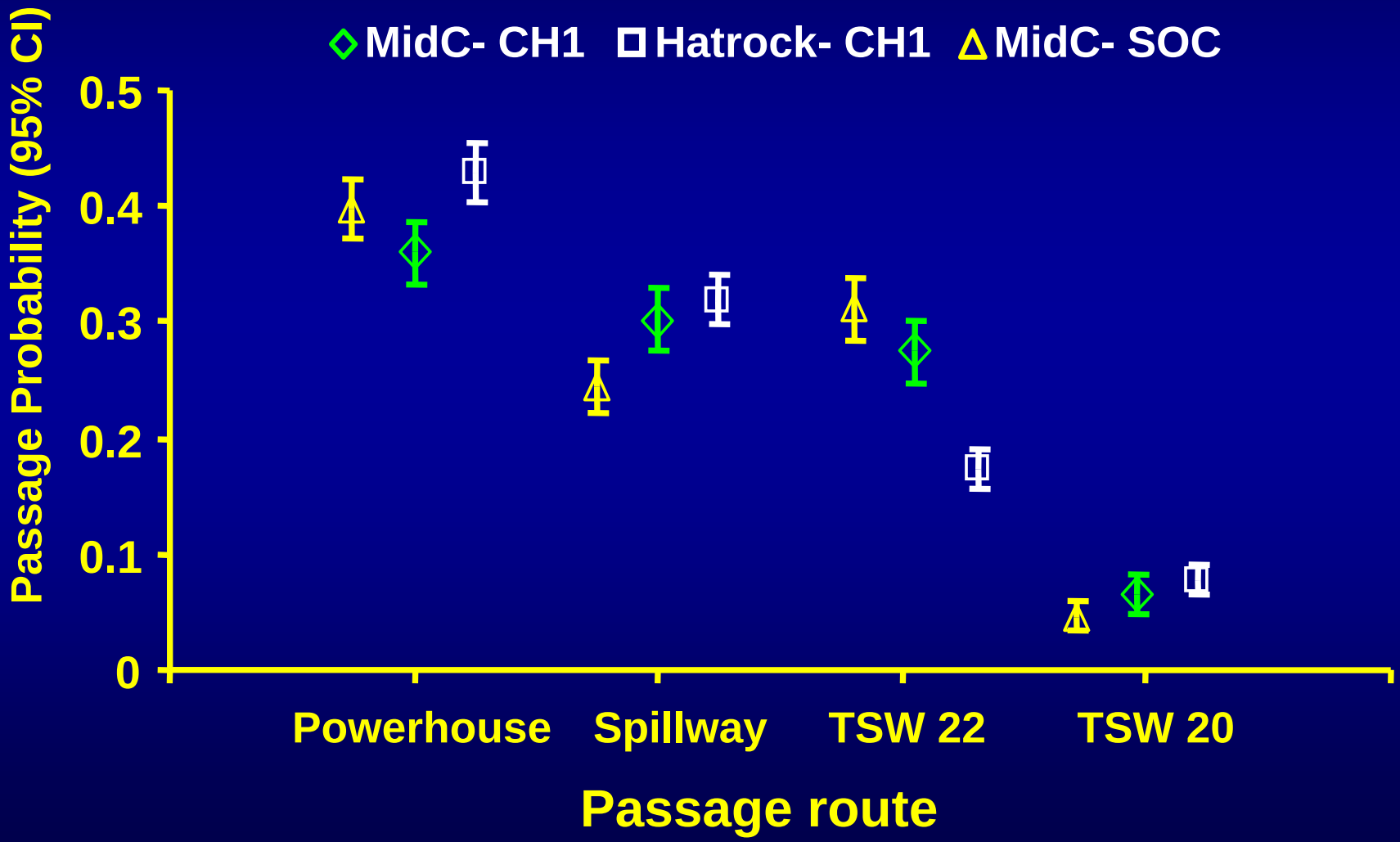
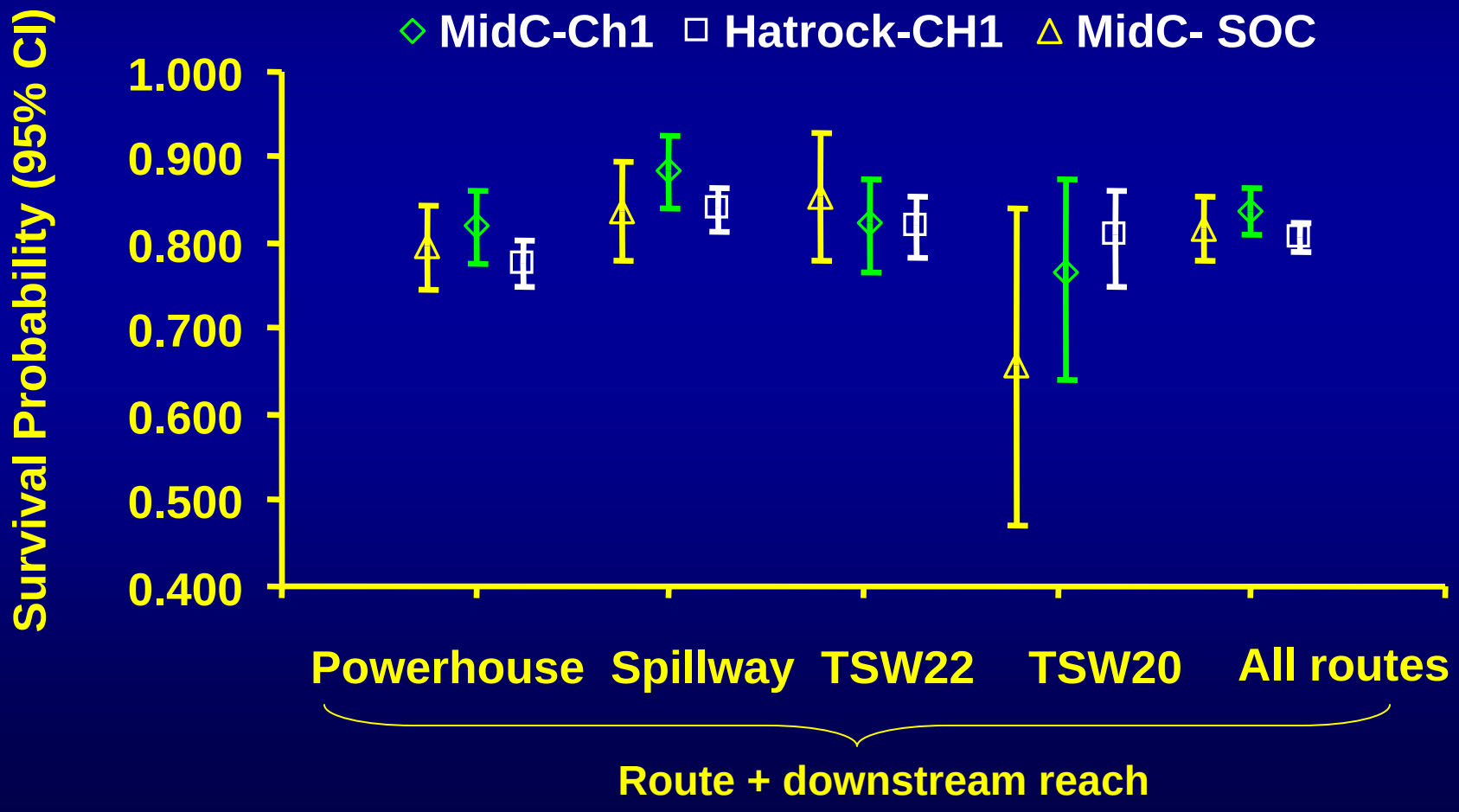
Passage by route for Mid-Columbia and Hatrock released CH1 and SOC, 2007

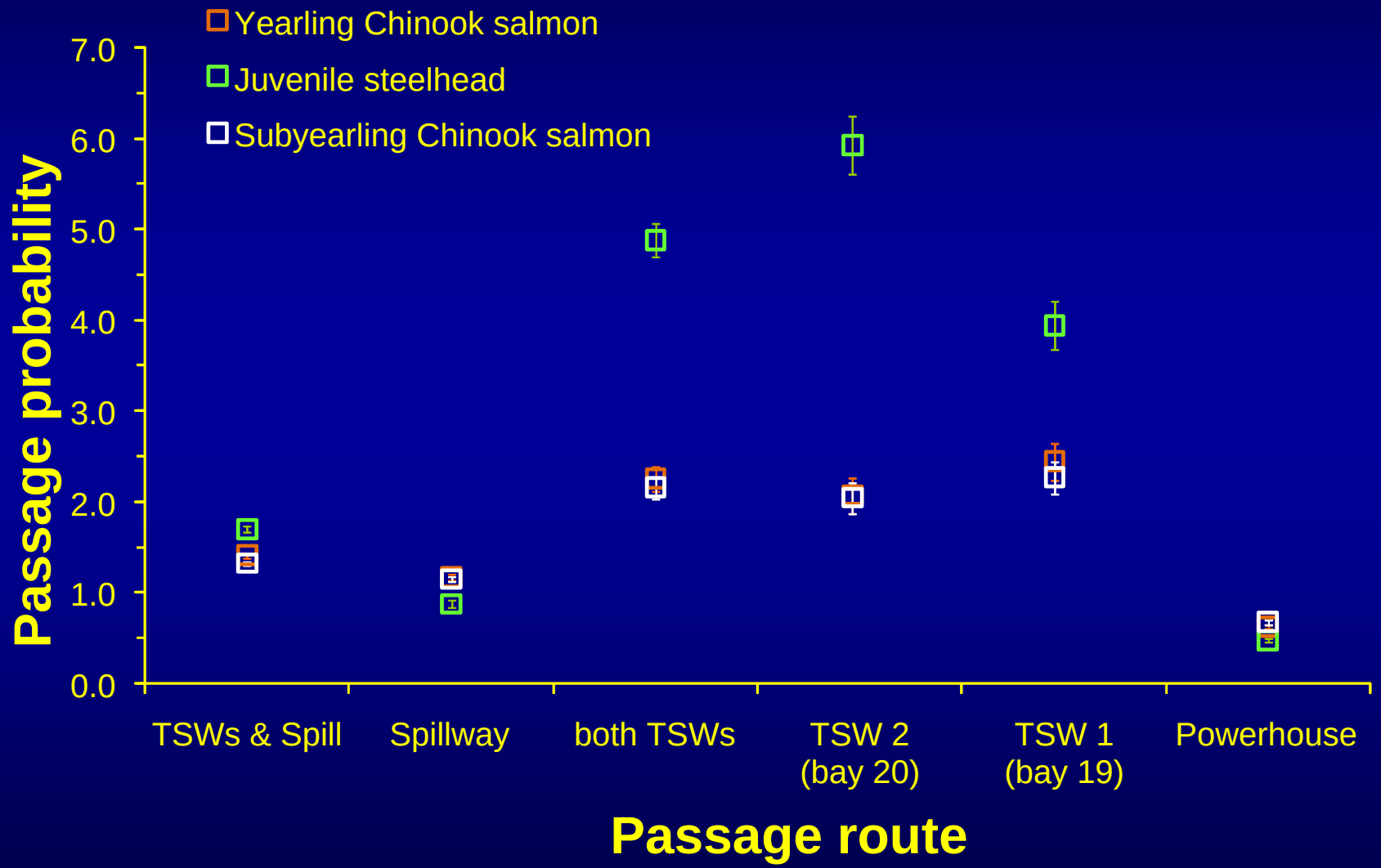


Survival - Mid-Columbia and Hatrock released CH1 and SOC, 2007

Single Release estimates for CH1 and SOC released in the Mid-Columbia River and CH1 released from Hatrock State Park to 55 rkm downstream of McNary Dam



Passage Effectiveness in 2008



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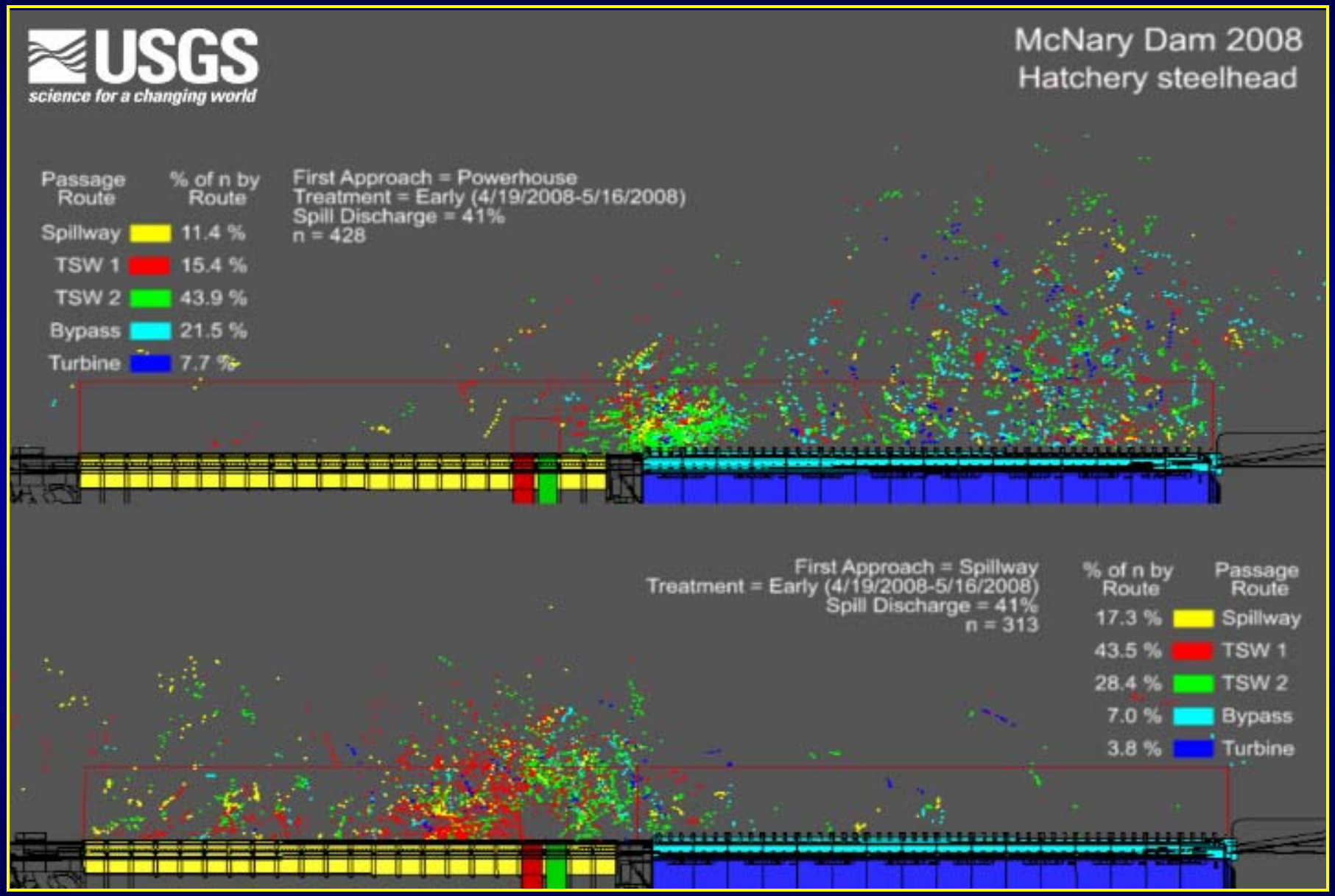
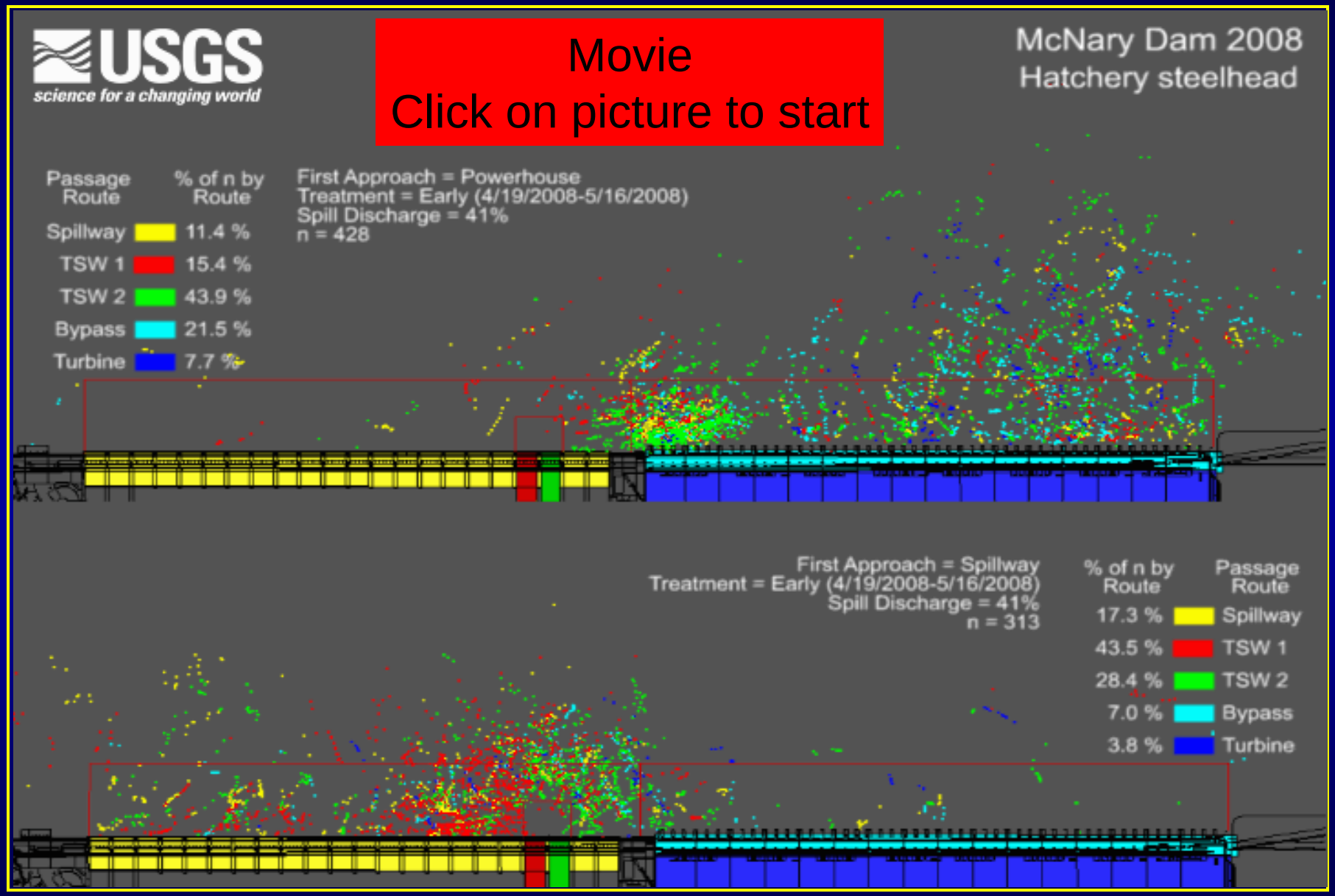
JPEG

Steelhead - Early season

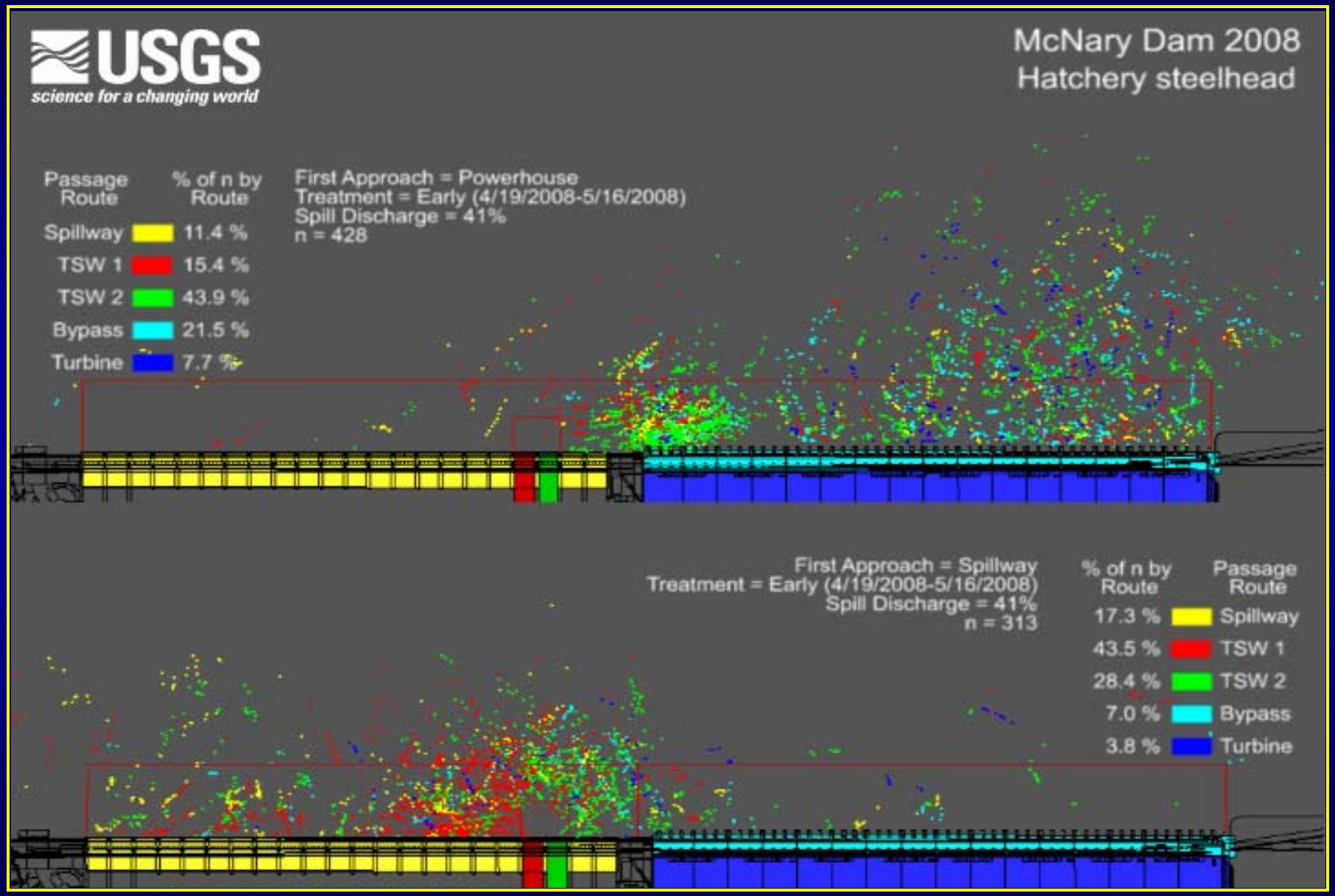


Steelhead - Early season



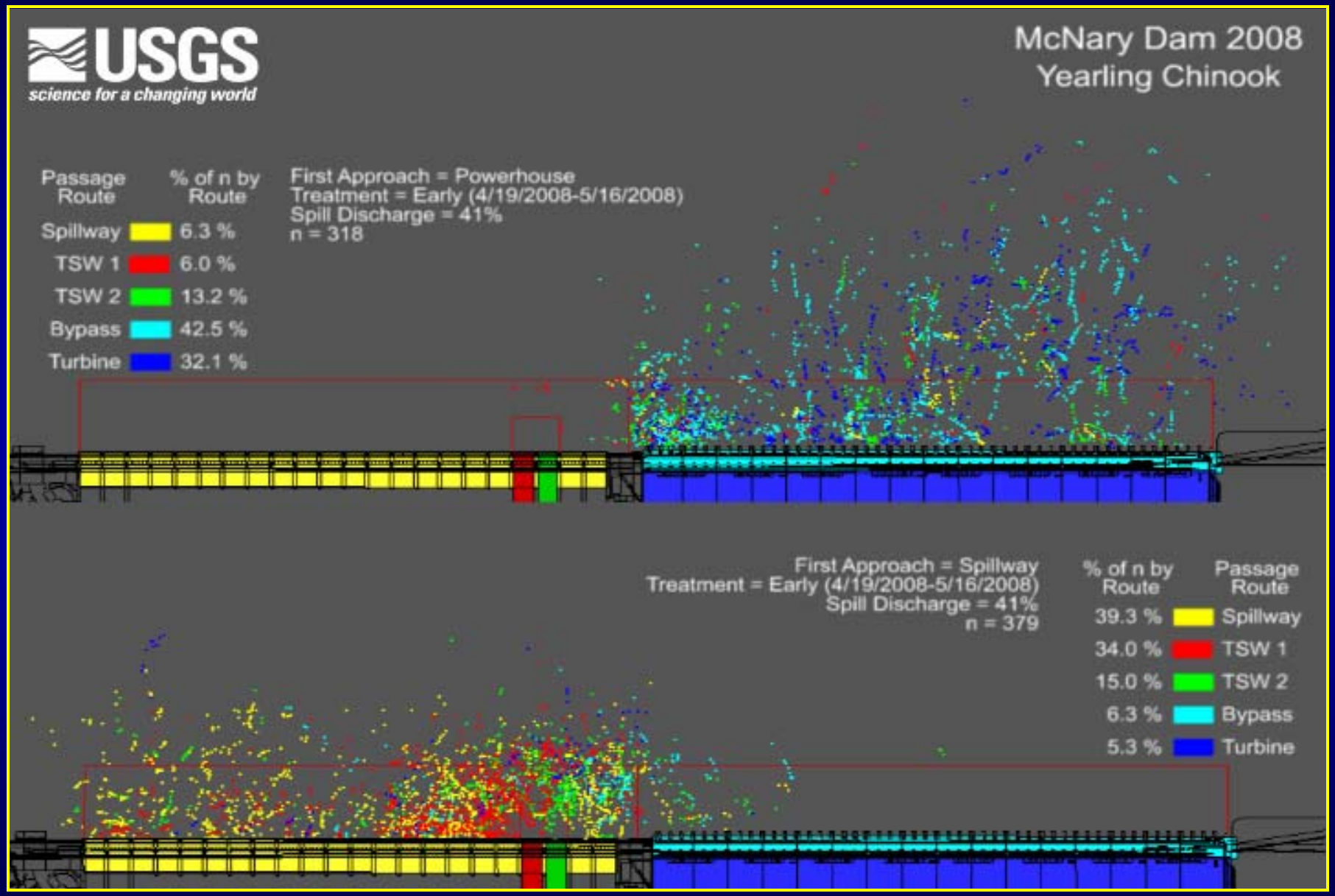
JPEG

Steelhead - Early season



JPEG

Yearling Chinook - Early season



MCN Drogue Overview 2008

- 12 Release Sites in McNary Dam Tailrace
  - TSW Bay 19 (North, Middle, South)
  - TSW Bay 20 (North, Middle, South)
  - Spill Bay 22 (North, Middle, South)
  - Emergency Bypass Outfall
  - Turbine Unit 08
  - JBS

Measured Travel Time from Release to the BRZ

- Spring Spill Season
  - April 24 - May 29
  - 254 Drogue Releases During Day Spill
- Summer Spill Season
  - June 4 - July 24
  - 138 Drogue Releases During Day Spill
  - 123 Drogue Releases During Night Spill

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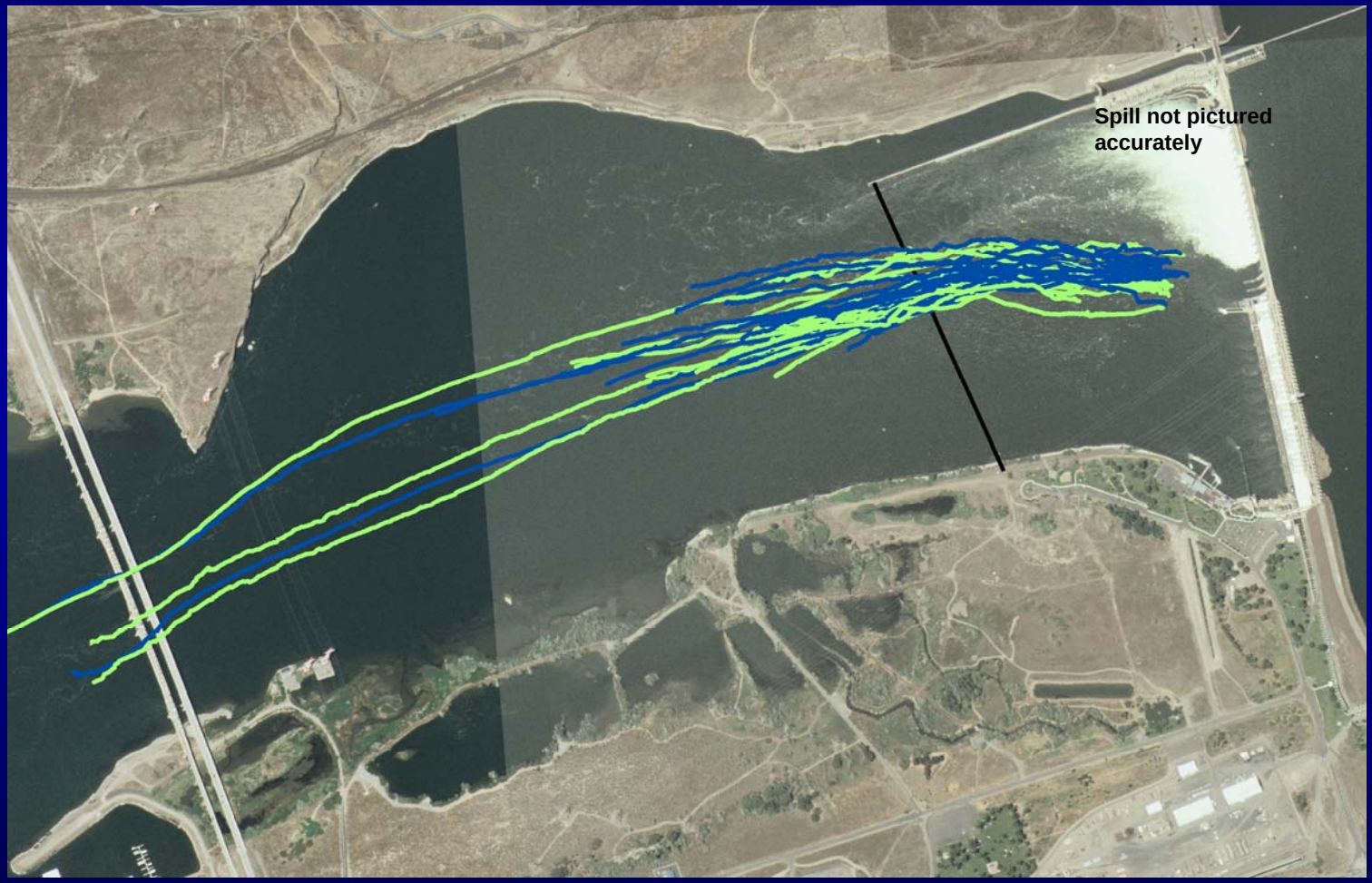
Mid Season 2008 - High Discharge, High Spill
TSW Releases
Averaged Spill: 55%
Averaged Project Discharge: 367 kcfs
Averaged Tailrace Elevation: 269.6 ft

- **Spill Bay 19 n=29**
- **Spill Bay 20 n=28**



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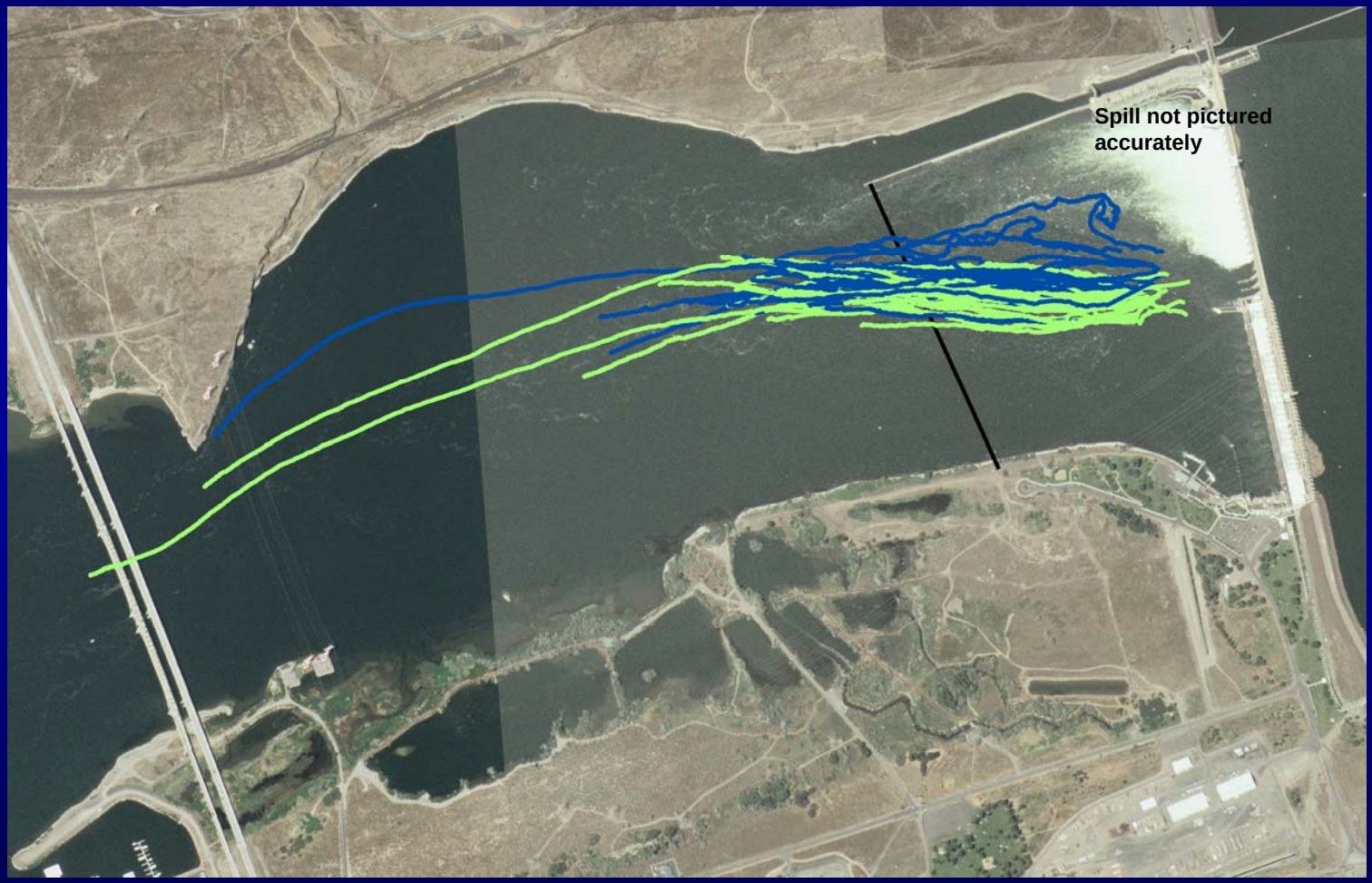
Early Spring 2008 - Low Discharge, 40% Spill
TSW Releases
Averaged Spill: 41%
Averaged Project Discharge: 204 kcfs
Averaged Tailrace Elevation: 265.7 ft

- **Spill Bay 19 n=23**
- **Spill Bay 20 n=24**



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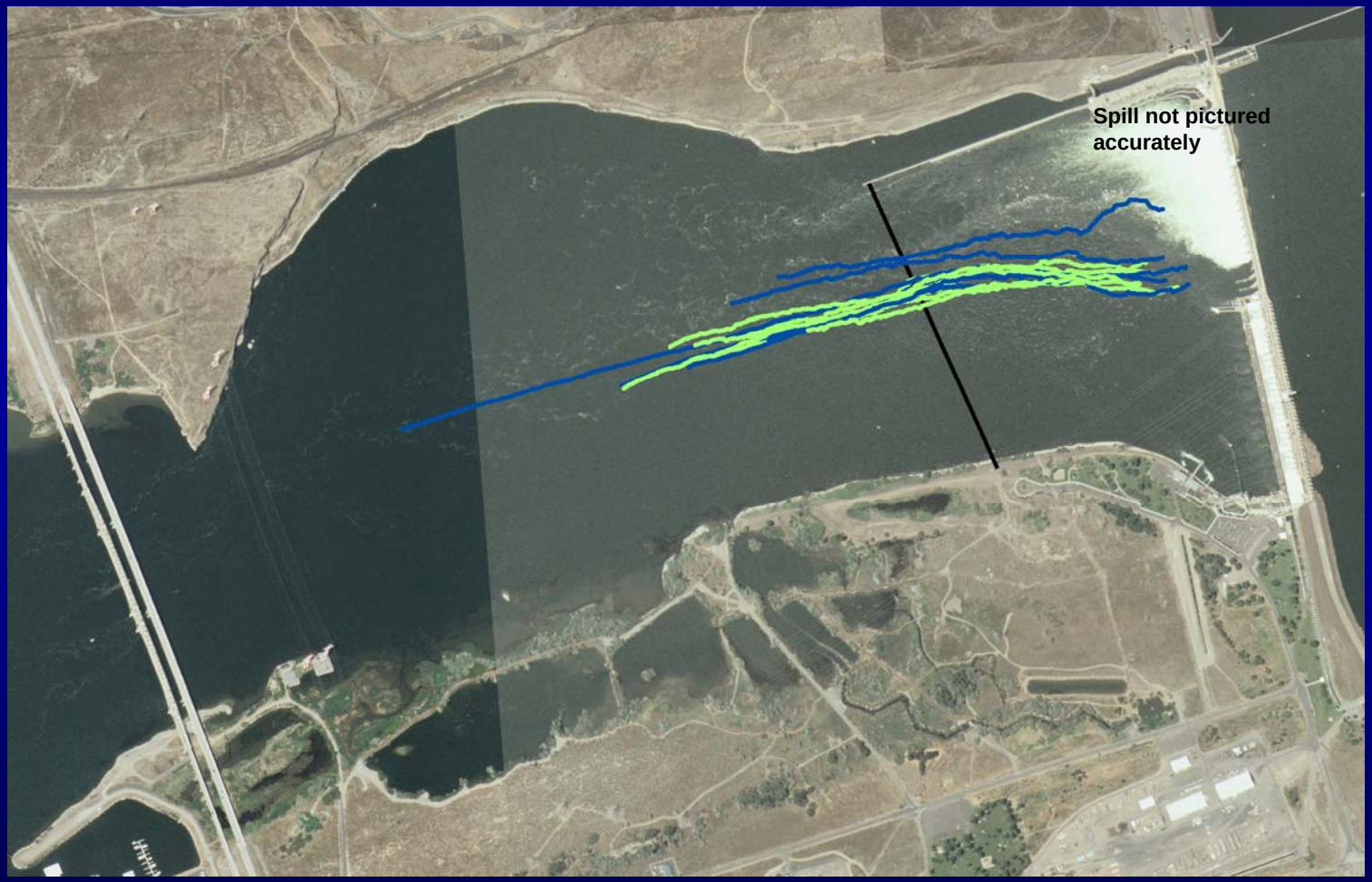
Late Summer 2008 – High Discharge, 60% Spill
TSW Releases
Averaged Spill: 62%
Averaged Project Discharge: 230 kcfs
Averaged Tailrace Elevation: 265.5 ft

- Spill Bay 19 n=6
- Spill Bay 20 n=6



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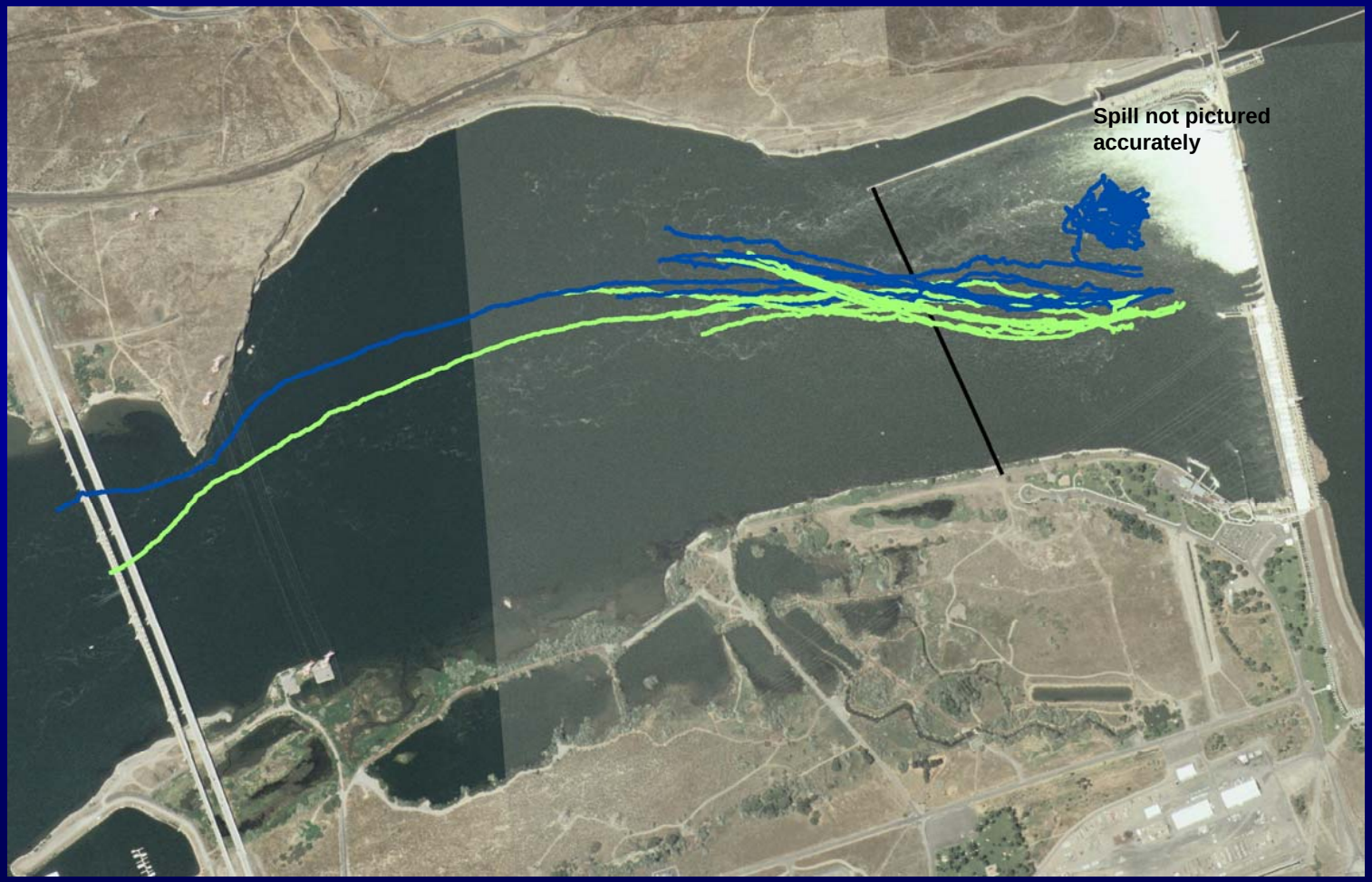
Late Summer 2008 - Low Discharge, 40% Spill
TSW Releases
Averaged Spill: 42%
Averaged Project Discharge: 153 kcfs
Averaged Tailrace Elevation: 264.7 ft

- Spill Bay 19 n=19
- Spill Bay 20 n=20



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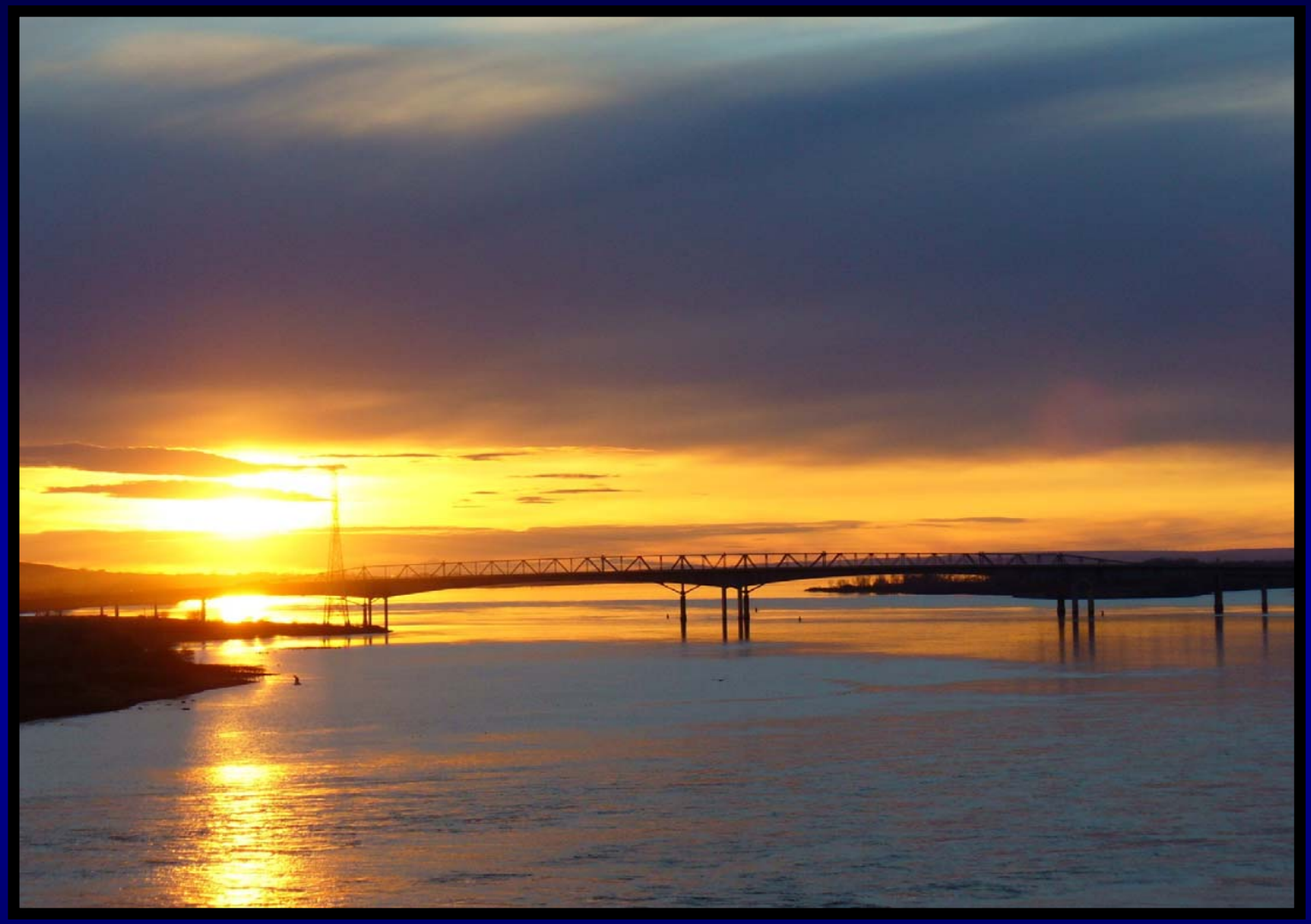

US Army Corps of Engineers
Walla Walla District

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Washington Department of FISH AND WILDLIFE