Passage Behavior and Survival for Radio-tagged Subyearling Chinook Salmon at Lower Monumental Dam, 2007

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2007 Lower Monumental Dam Study Design

- Evaluate Passage Behavior
  - Forebay delay
  - Arrival distribution
  - Passage distribution
  - Tailrace egress
- Estimate Relative Survival Using a Paired Release Design
  - Dam
  - Concrete
  - Route specific survival

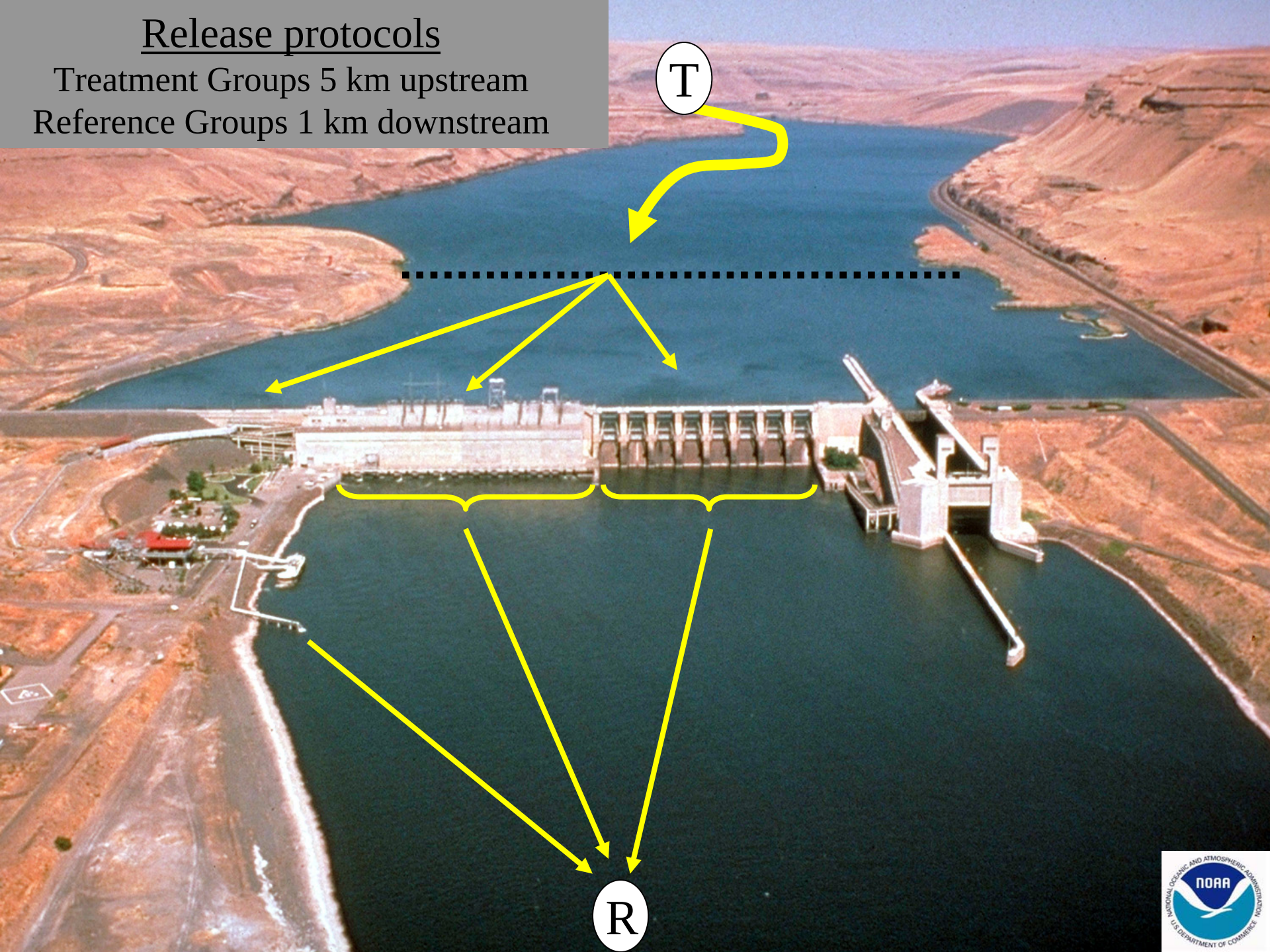
- One operation/condition evaluated

- RSW not installed for 2007

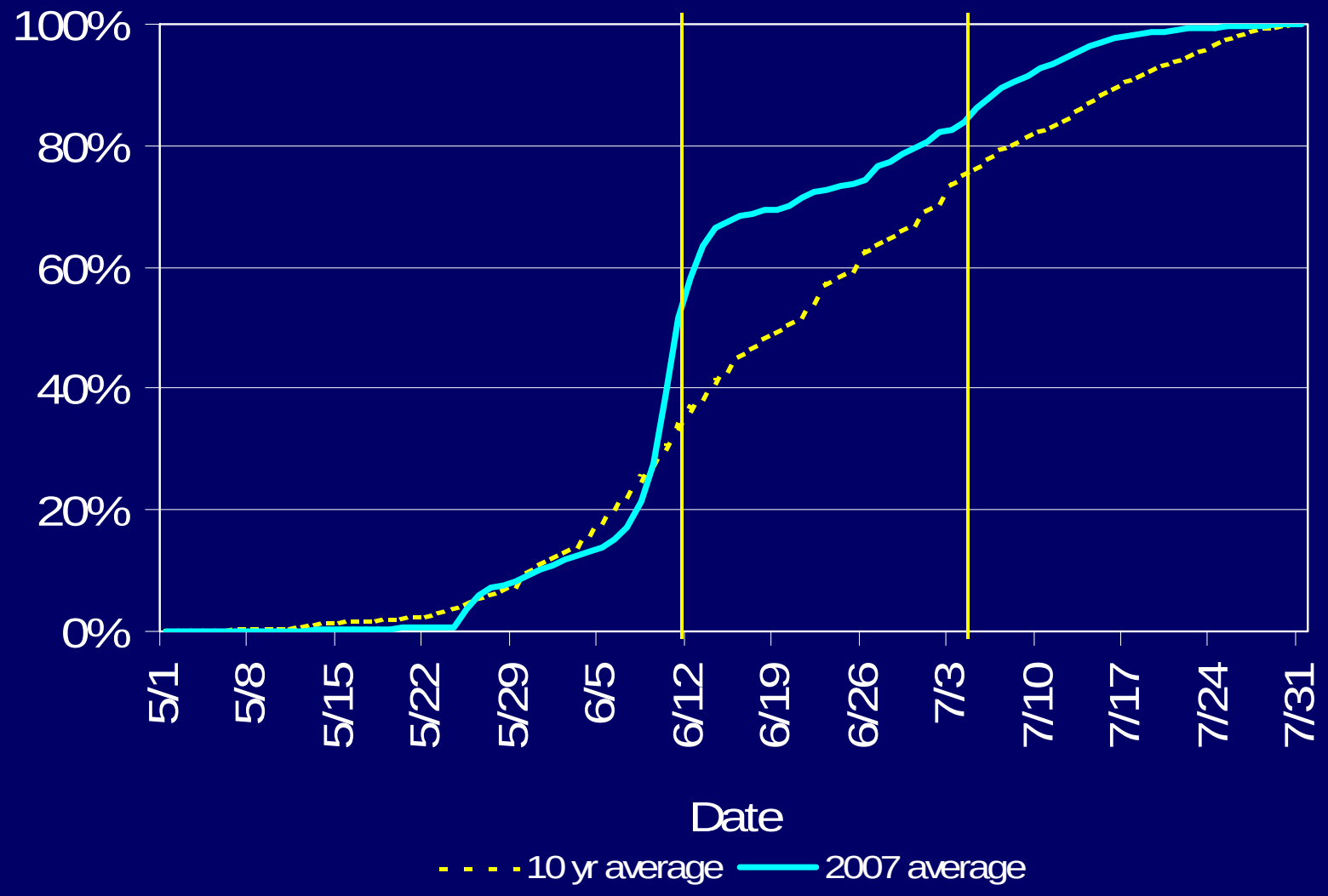
Release protocols

Treatment Groups 5 km upstream

Reference Groups 1 km downstream



Subyearling Chinook Salmon Passage Distribution
Lower Monumental Dam, 2007

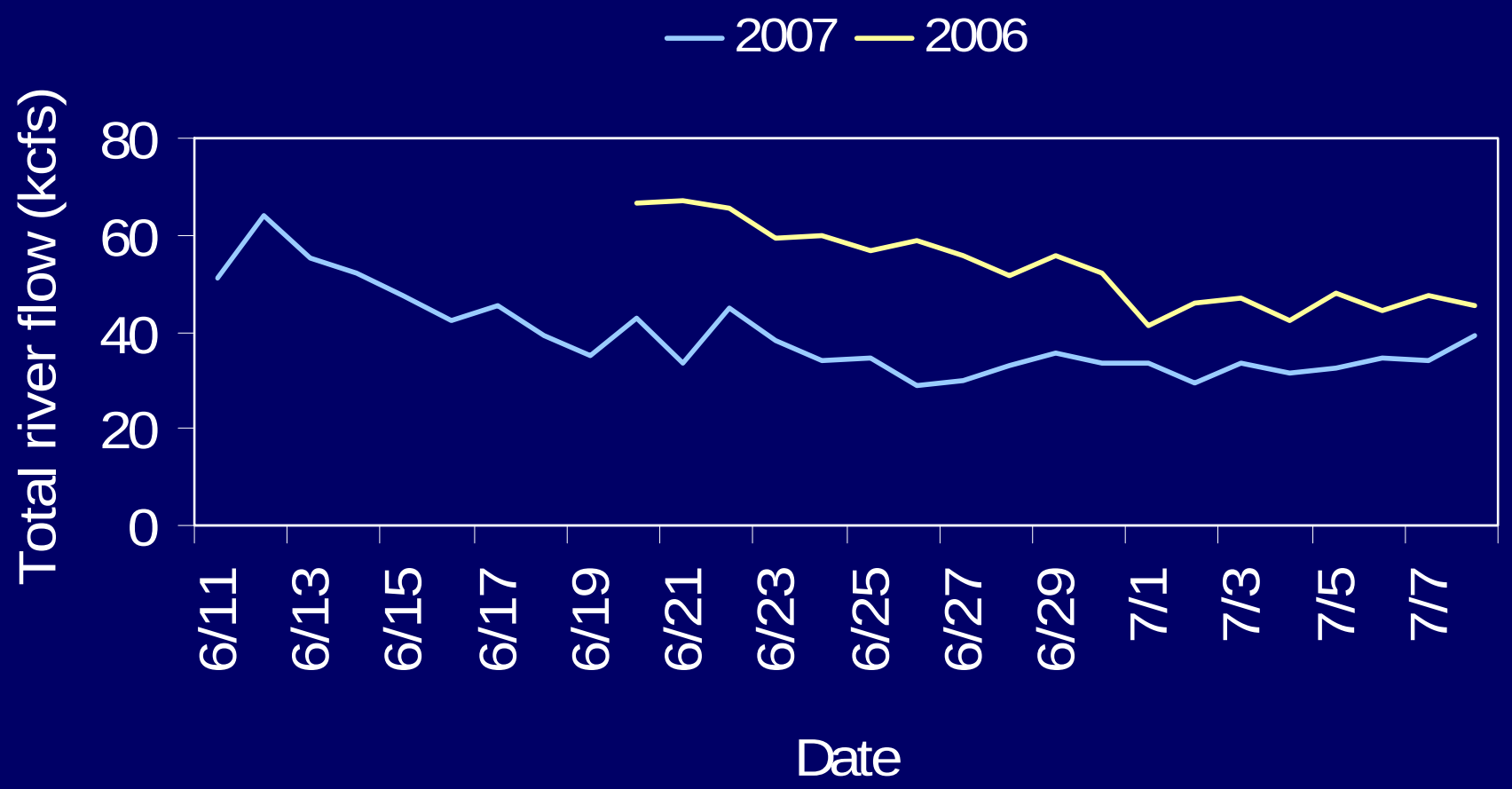


Lower Monumental Dam Project Operations

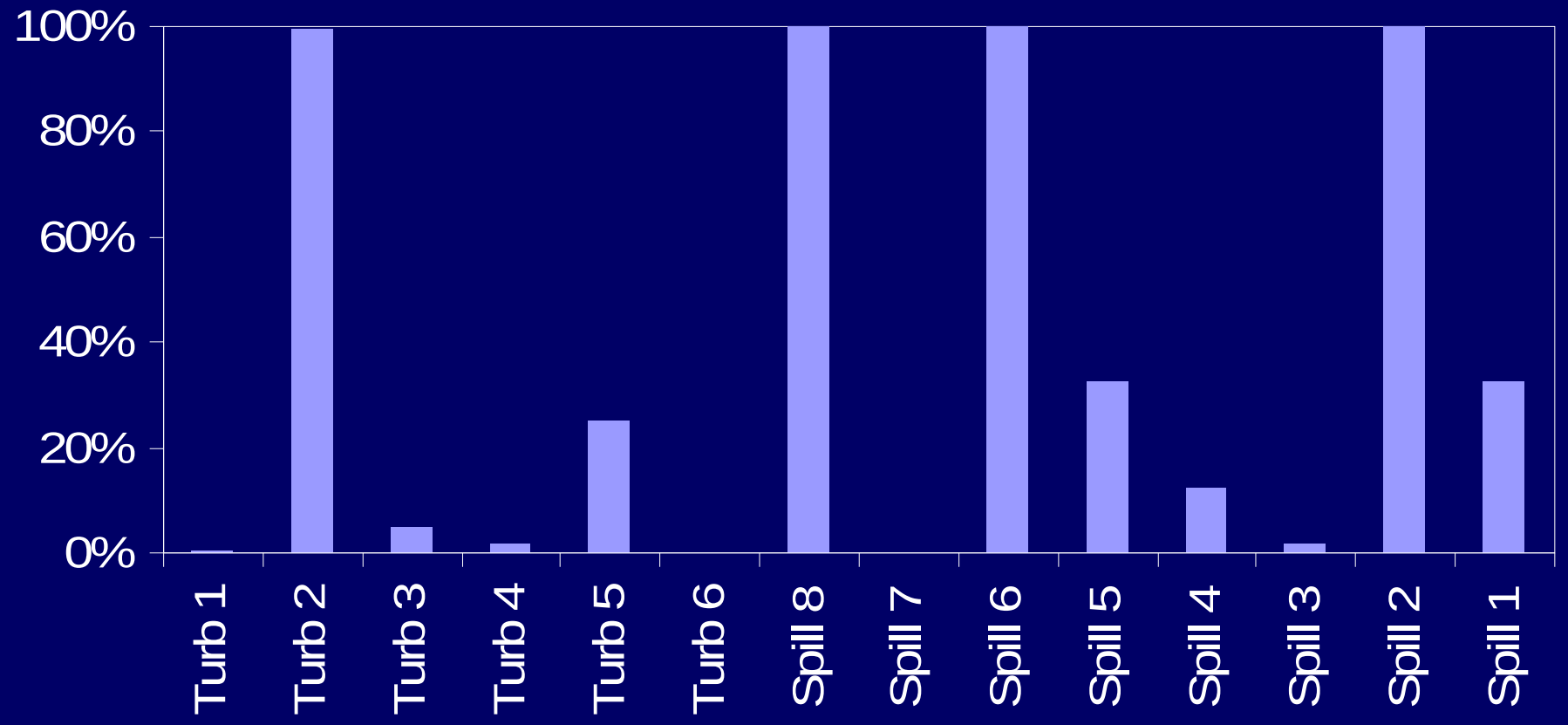
2007		
	Average	Range
Project discharge (kcfs)	37.5	17.1 - 82.2
Tailwater elevation (ft msl)	437.6	436.2 - 440.0
Spill volume (kcfs)	18.6	11.8 - 25.3
Percent spill	50	21 - 69

2006		
	Average	Range
Project discharge (kcfs)	49.8	25.7 – 89.3
Tailwater elevation (ft msl)	438.1	436.3 - 440.7
Spill volume (kcfs)	16.1	10.1 - 21.5
Percent spill	32	16 - 55

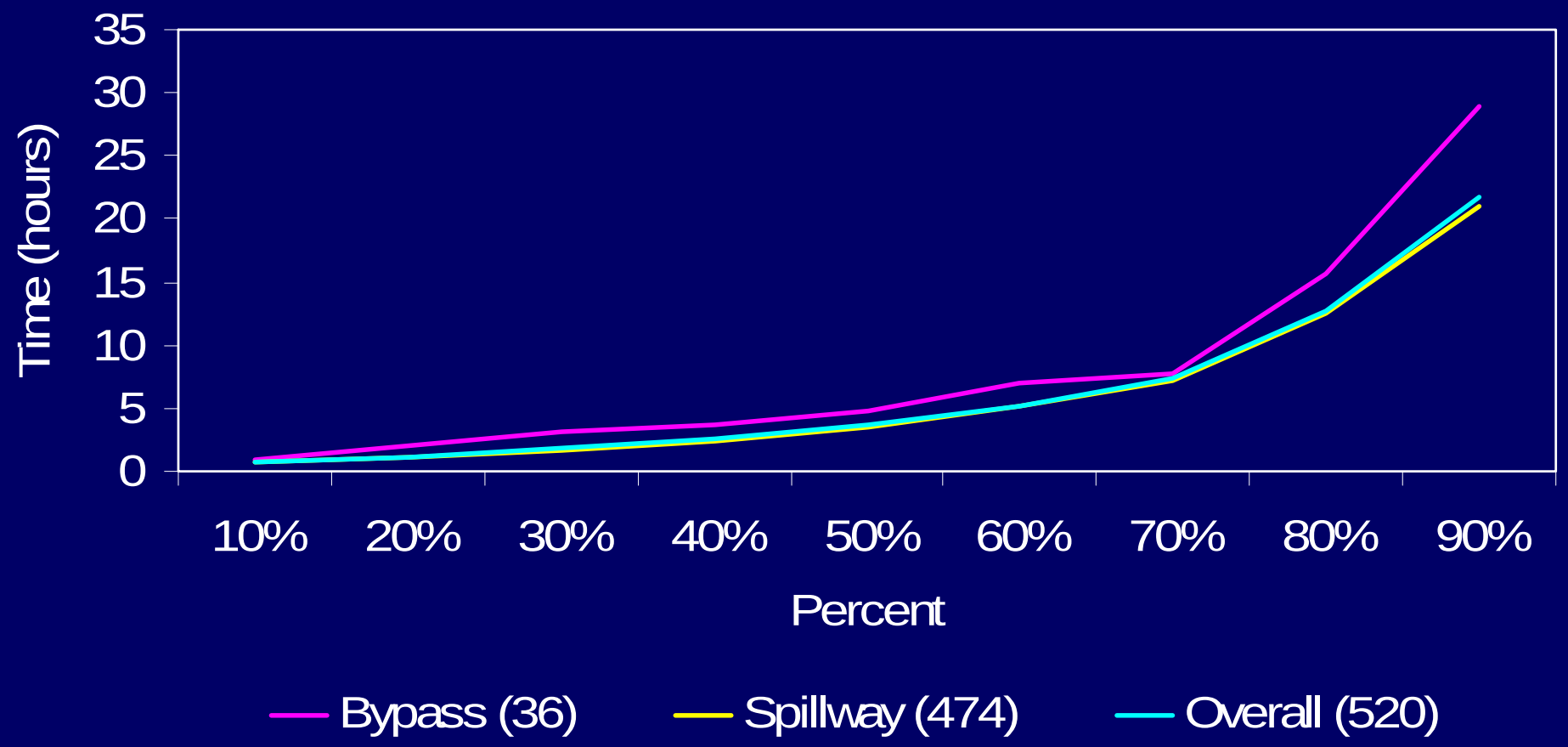
Lower Monumental Dam – Total River Flow



Lower Monumental Dam Operations, 2007

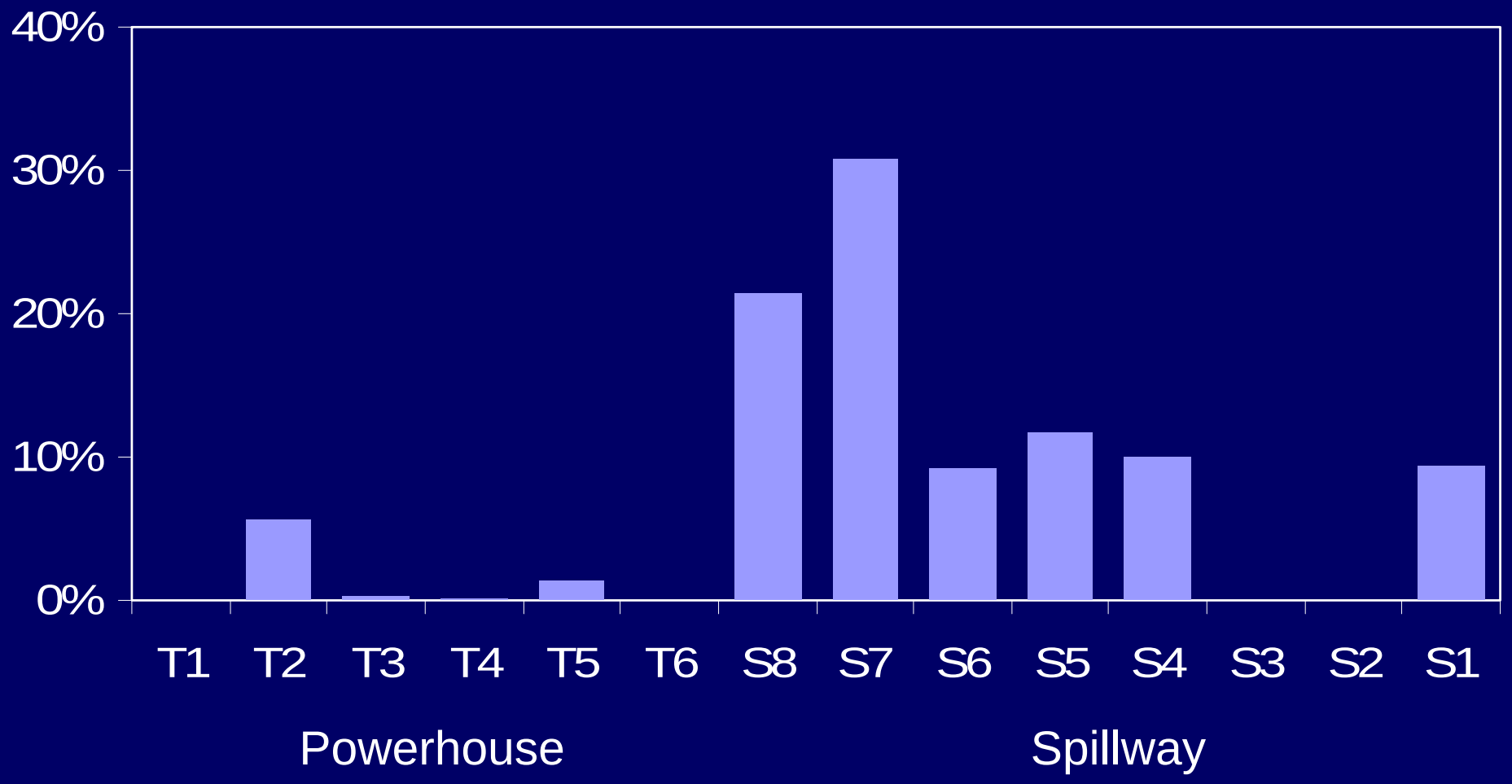


Results - *Forebay Delay (hours)*

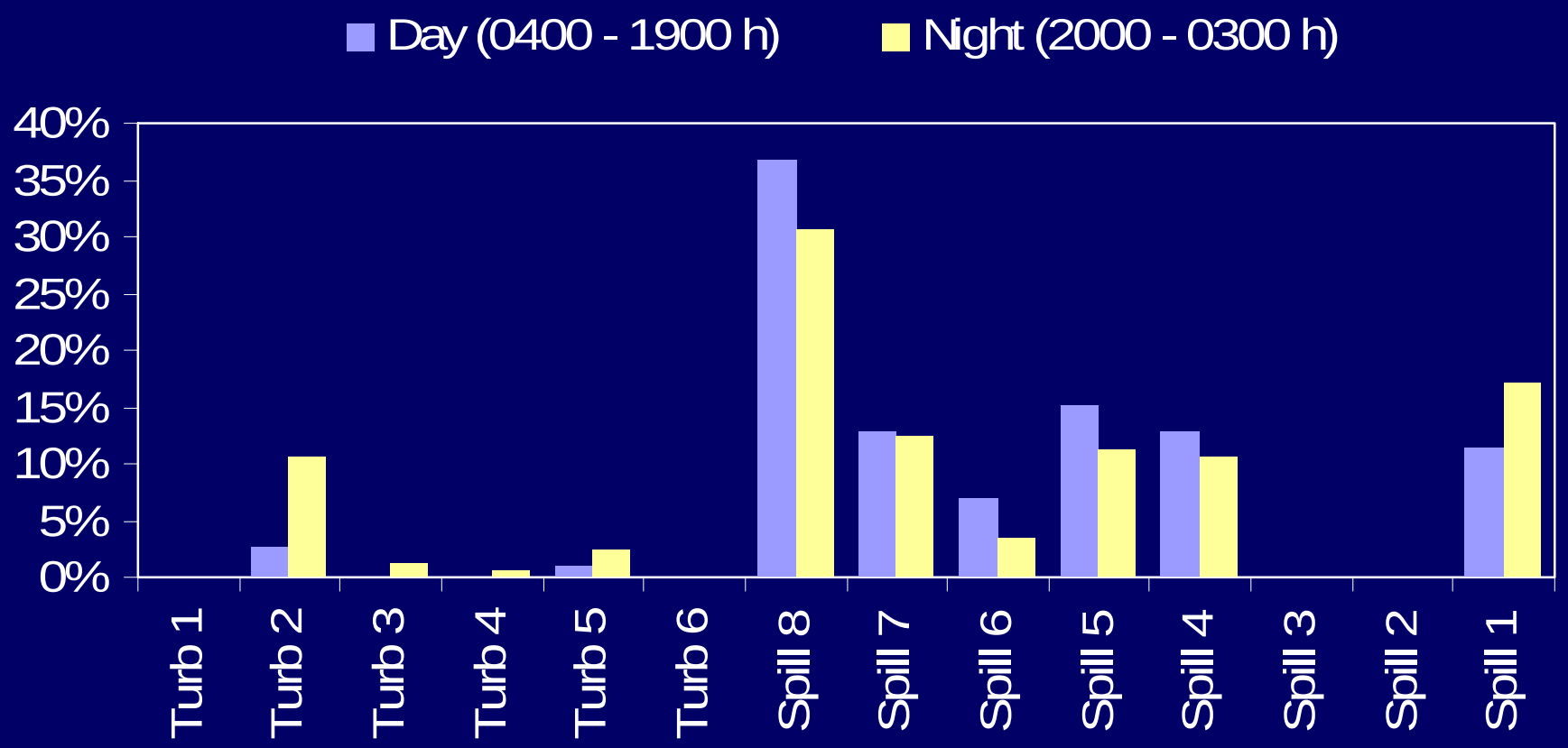


4.7 hours **3.5 hours** **3.6 hours**

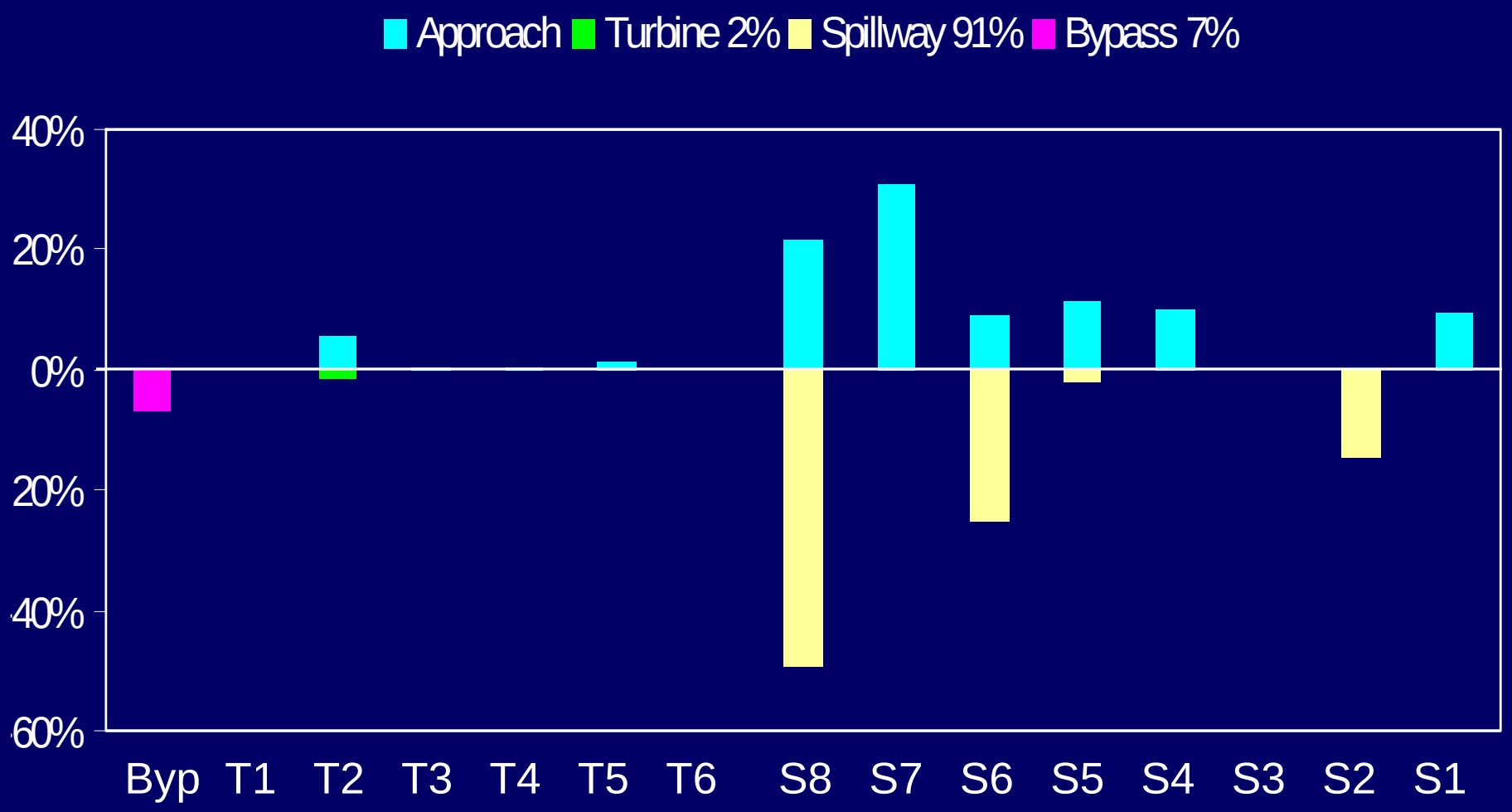
Results – *Approach Distribution (overall)*



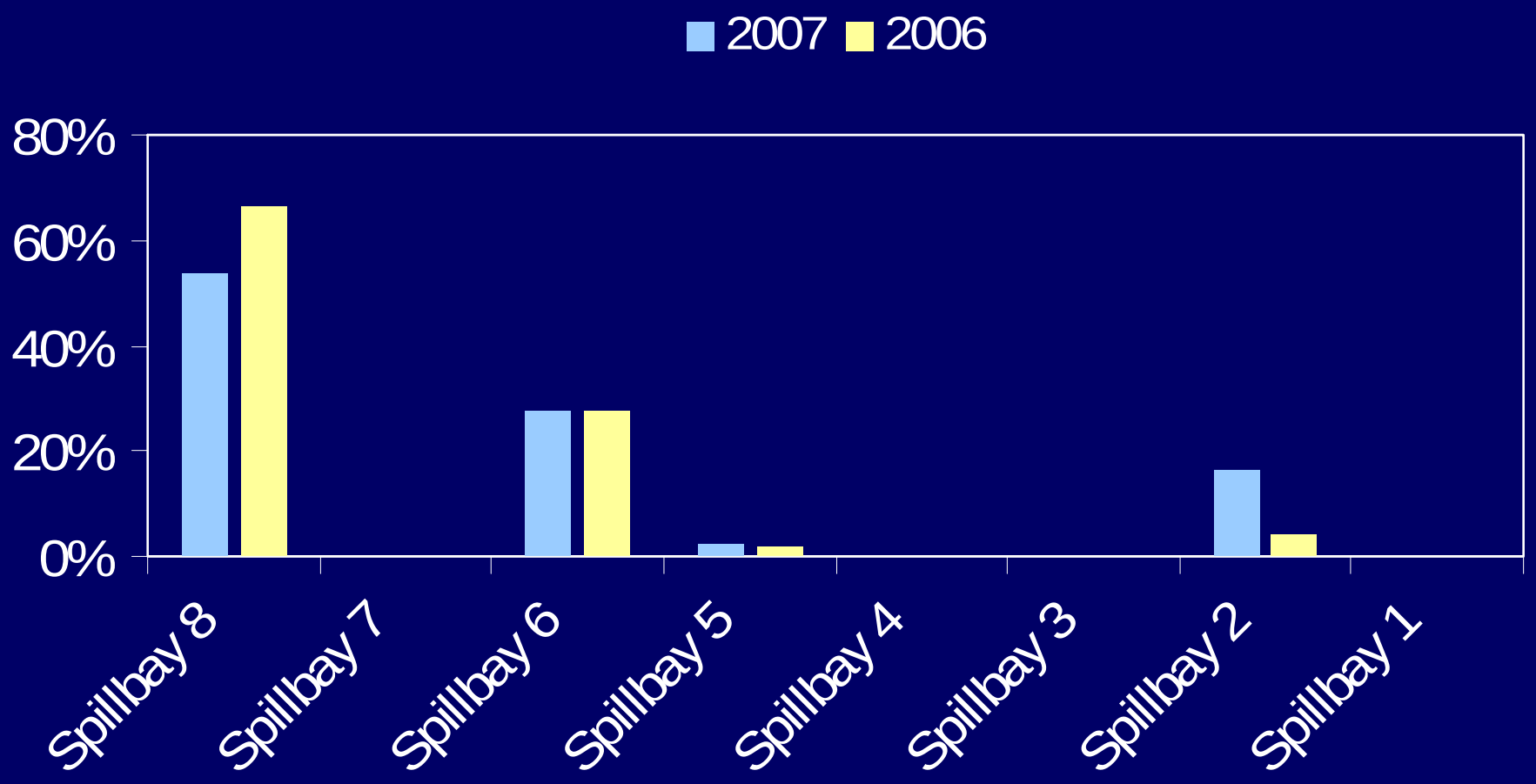
Results – *Approach Distribution (diel)*



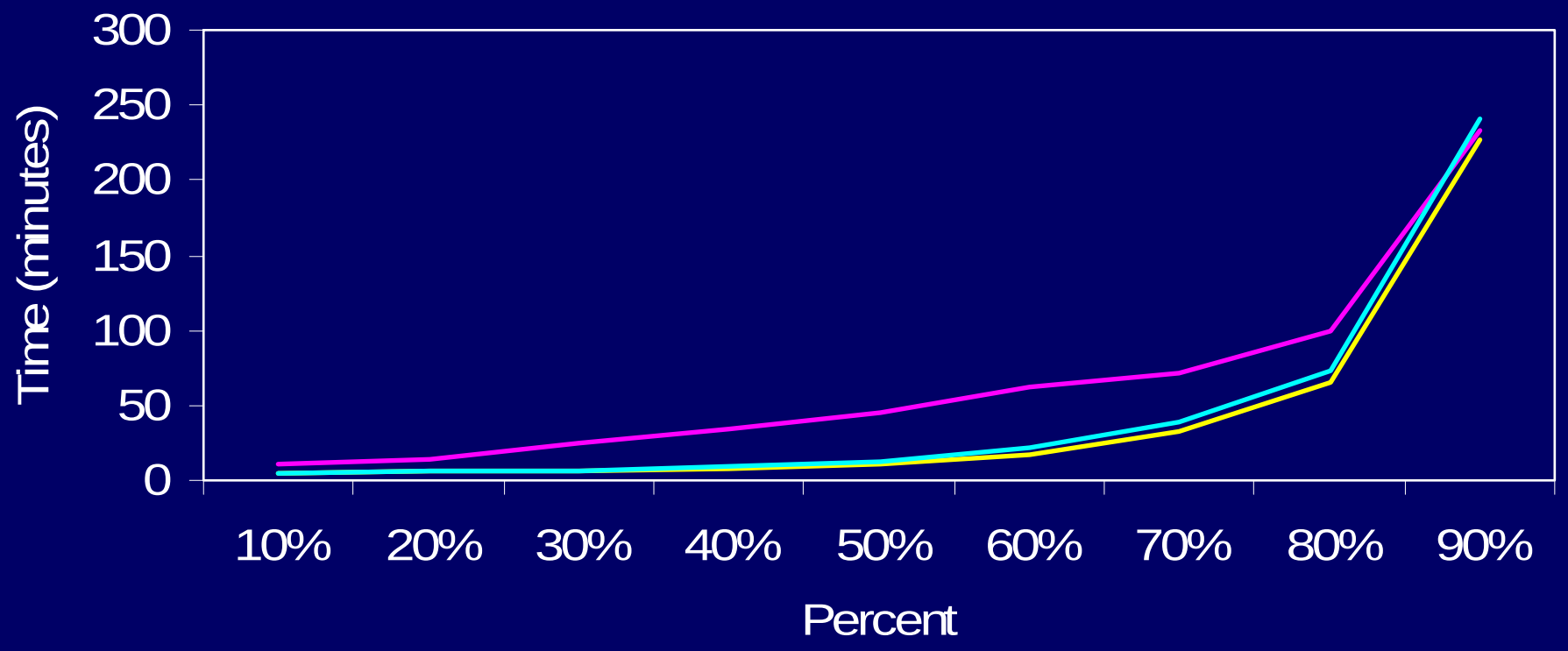
Results – *Approach & Passage Distribution*



Results – *Spillway passage*



Results – *Median Tailrace Egress (minutes)*



Bypass (36) — Spillway (499) — Overall (546)

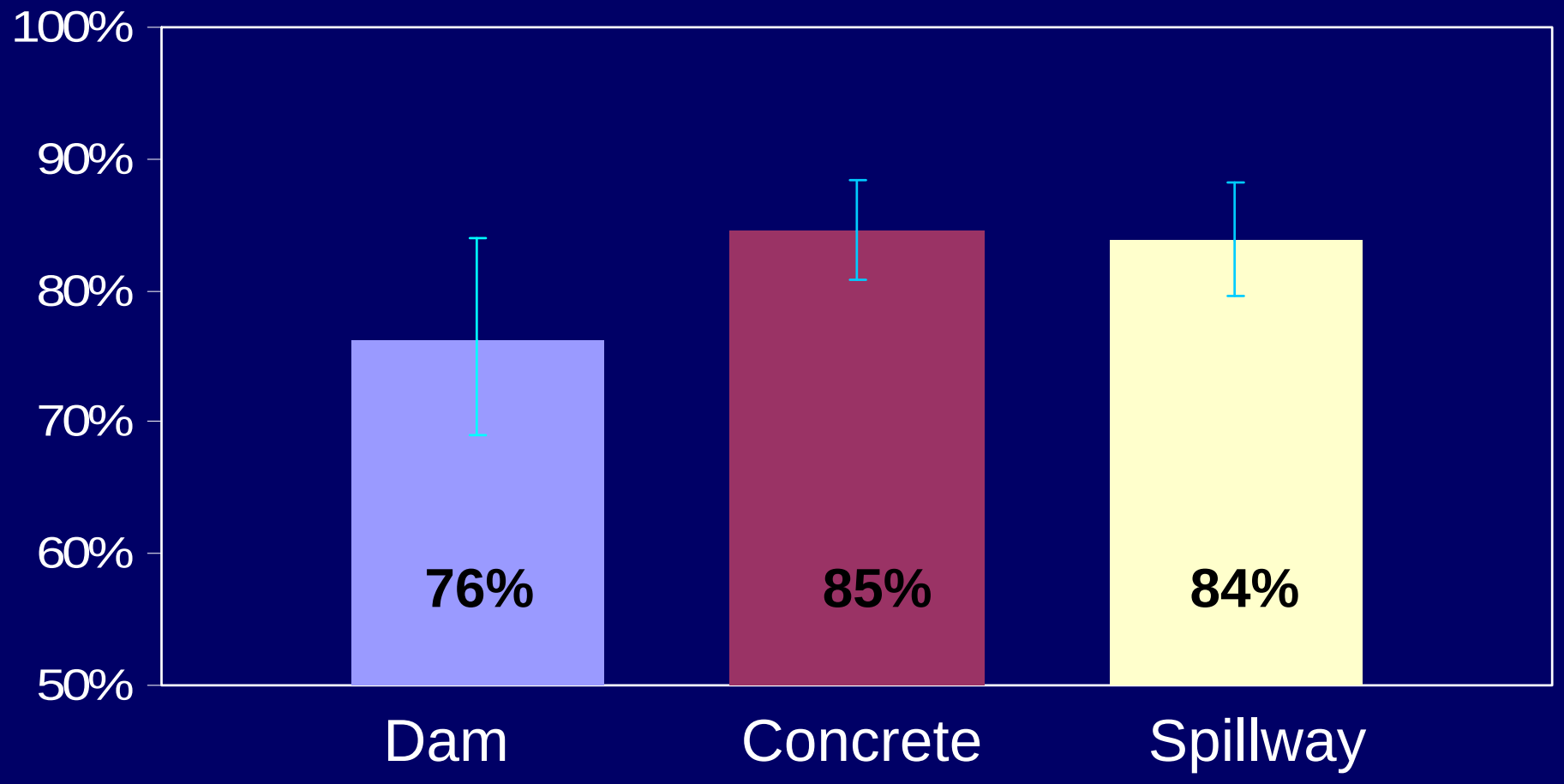
46 min **11 min** **13 min**

Results - *Fish Passage Metrics*

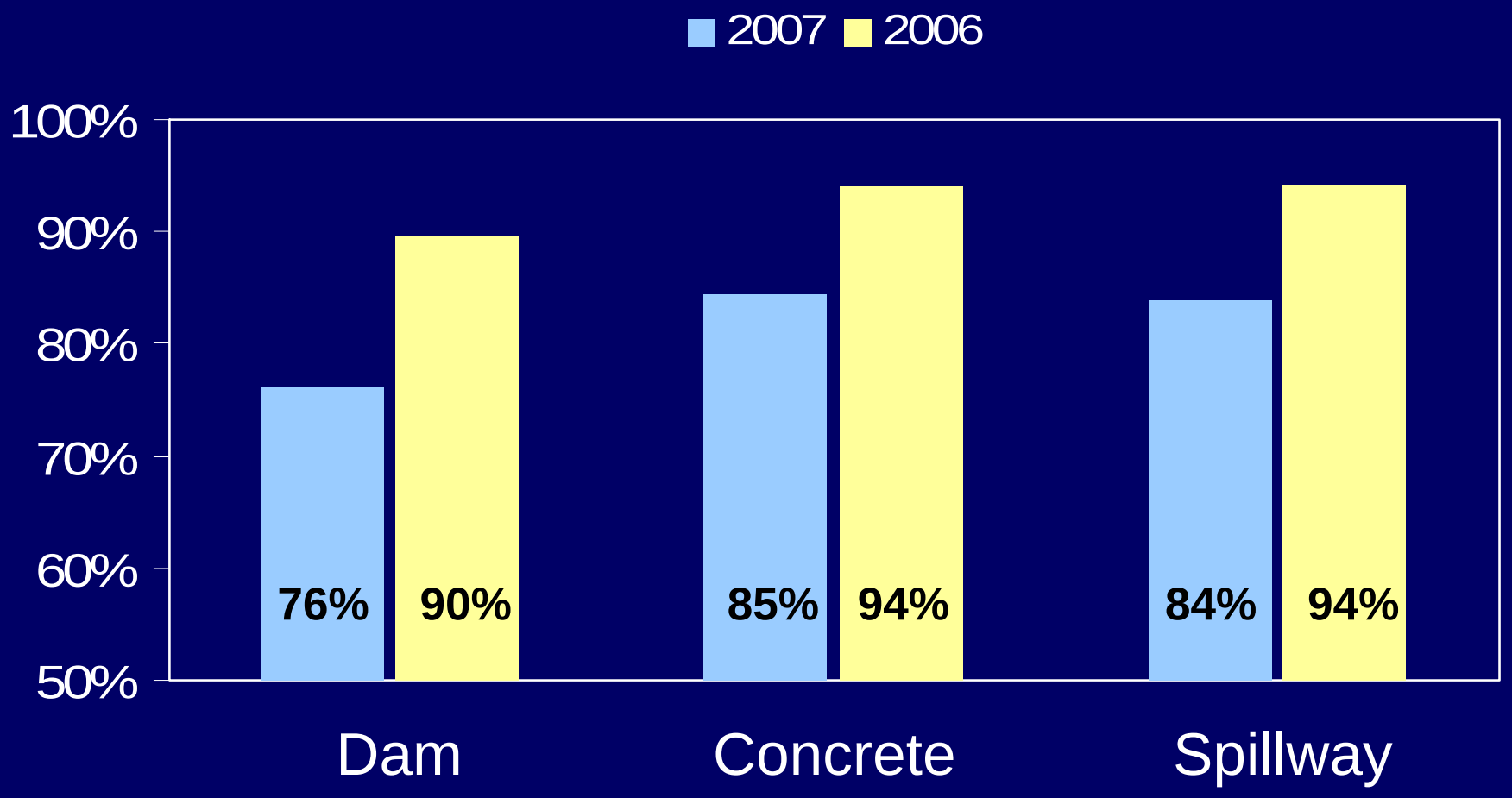
2007		
Metric	Estimate	95% CI
Fish Guidance Efficiency	0.796	0.681-0.911
Fish Passage Efficiency	0.982	0.971-0.993
Spill Efficiency	0.914	0.890-0.937
Spill Effectiveness	1.84	1.75-1.93

2006		
Metric	Estimate	95% CI
Fish Guidance Efficiency	0.650	0.480-0.810
Fish Passage Efficiency	0.935	0.916-0.953
Spill Efficiency	0.814	0.785-0.842
Spill Effectiveness	2.54	2.43-2.65

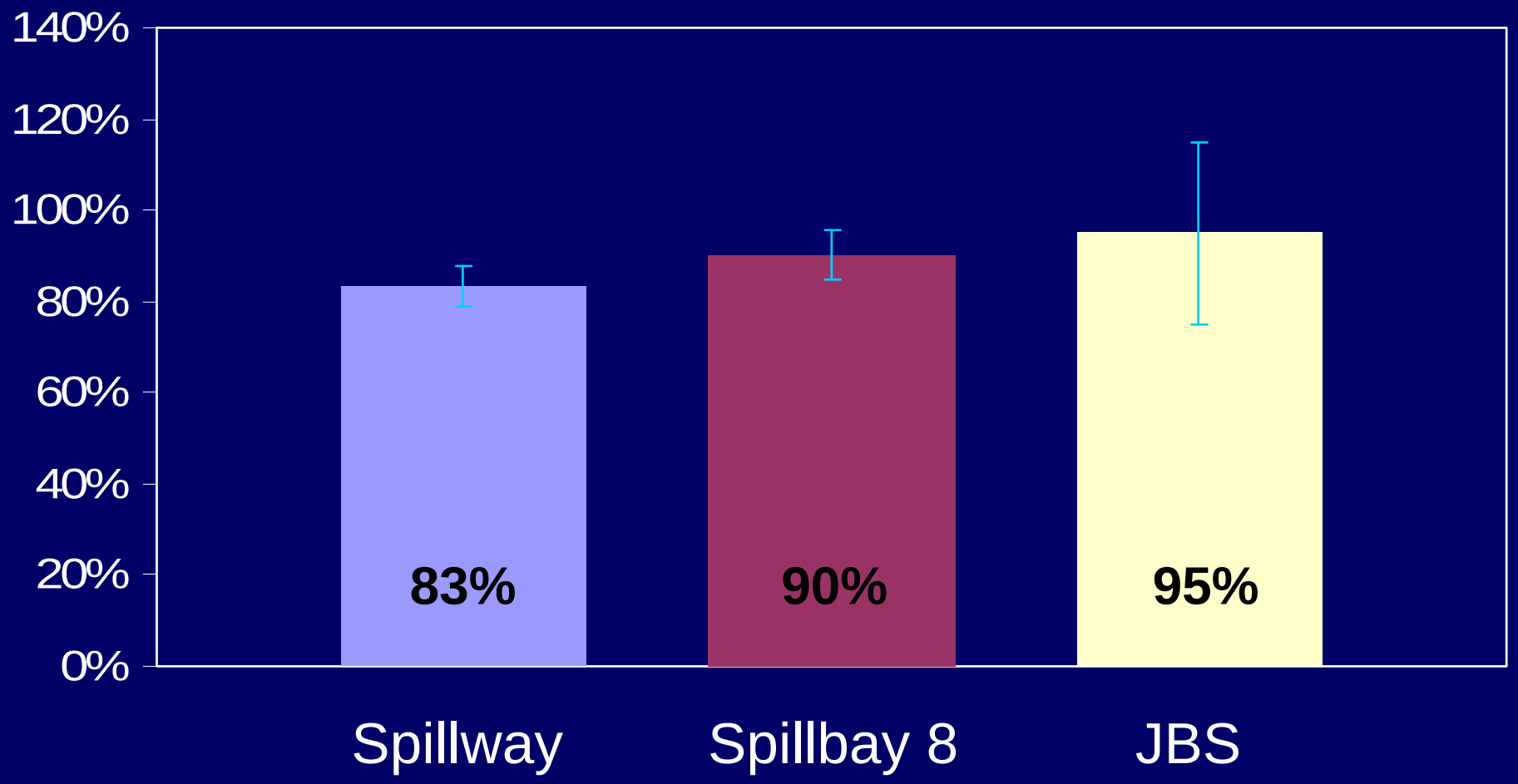
Results - *Relative Survival, 2007*



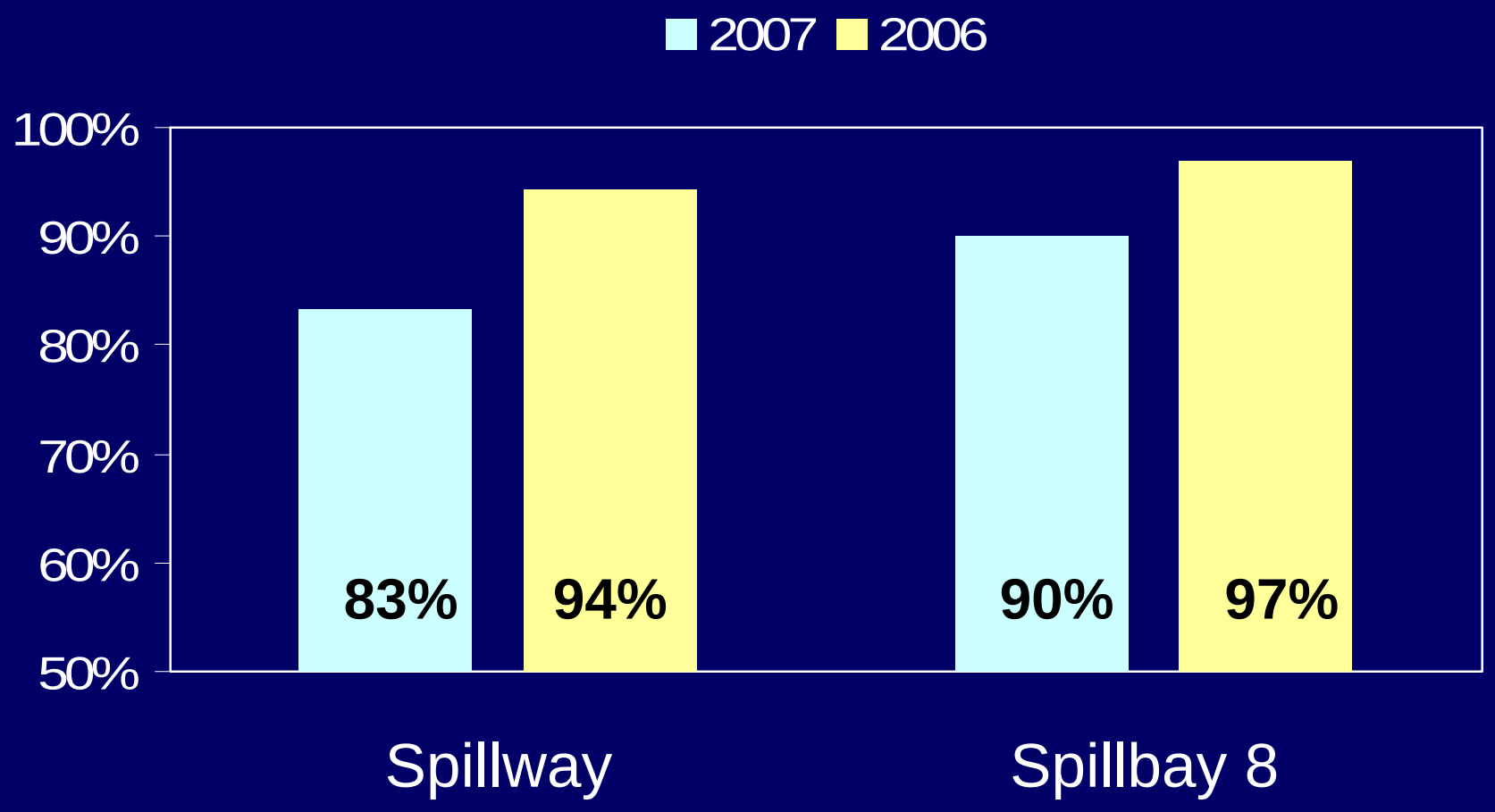
Results - *Relative Survival*



Results - *Relative Survival, 2007*



Results - *Relative Survival*



Summary of Results, 2007

- River flow was lower, spill percentage was higher
- Forebay delay and tailrace egress times were longer
- Fish passage and fish guidance efficiencies were higher
- Spill effectiveness was lower
- Survival estimates were lower
  - Longer forebay entry and tailrace egress times
  - Lower tailwater elevation
  - More fish passing through spillbays other than Spillbay 8

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