Modeling of Dworshak Summer 2005 Operations

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Columbia River Inter-Tribal Fish Commission

Introduction

- Goals: (1) Model Dworshak flows and elevations from summer operation proposals. (2) Evaluate impacts on Dworshak pool elevation and lower Snake water temperature and flow.
- CRITFC's Hydro spreadsheet: modeled outflows and elevations. Inflows are given by NWRFC.
- EPA's RBM-10 model: water temperature. Assumes (1) 1979, 1994, 1995, and 1998 composite meteorology and tributary inflows, (2) 2000 Dworshak and Brownlee water temperatures, and (3) Dworshak release temperature is 45 degF.

Weather Assumptions

Lewiston air temperature (degF)	MAY	JUN	JUL	AUG	SEP	Dworshak April-July Inflow (KaF)
1979	59.15	67.12	76	74.95	68.95	2690
Departure	1.0	1.5	2.3	3.1	5.5	
1994	61.53	66	77.76	75.15	67.42	1386
Departure	3.1	-0.9	3.7	1.5	3.3	
1995	59.82	63.72	74.02	69.94	66.28	1734
Departure	1.4	-3.2	-0.1	-3.8	2.2	
1998	58.87	65.5	78.68	76.39	69.27	2035
Departure	0.5	-1.4	4.6	2.7	5.2	
Average Departure:	1.5	-1.0	2.6	0.9	4.0	1,961

	MAY	JUN	JUL	AUG	SEP	June final WSF (KaF):
2005 departure	2.1	-3.4				1800

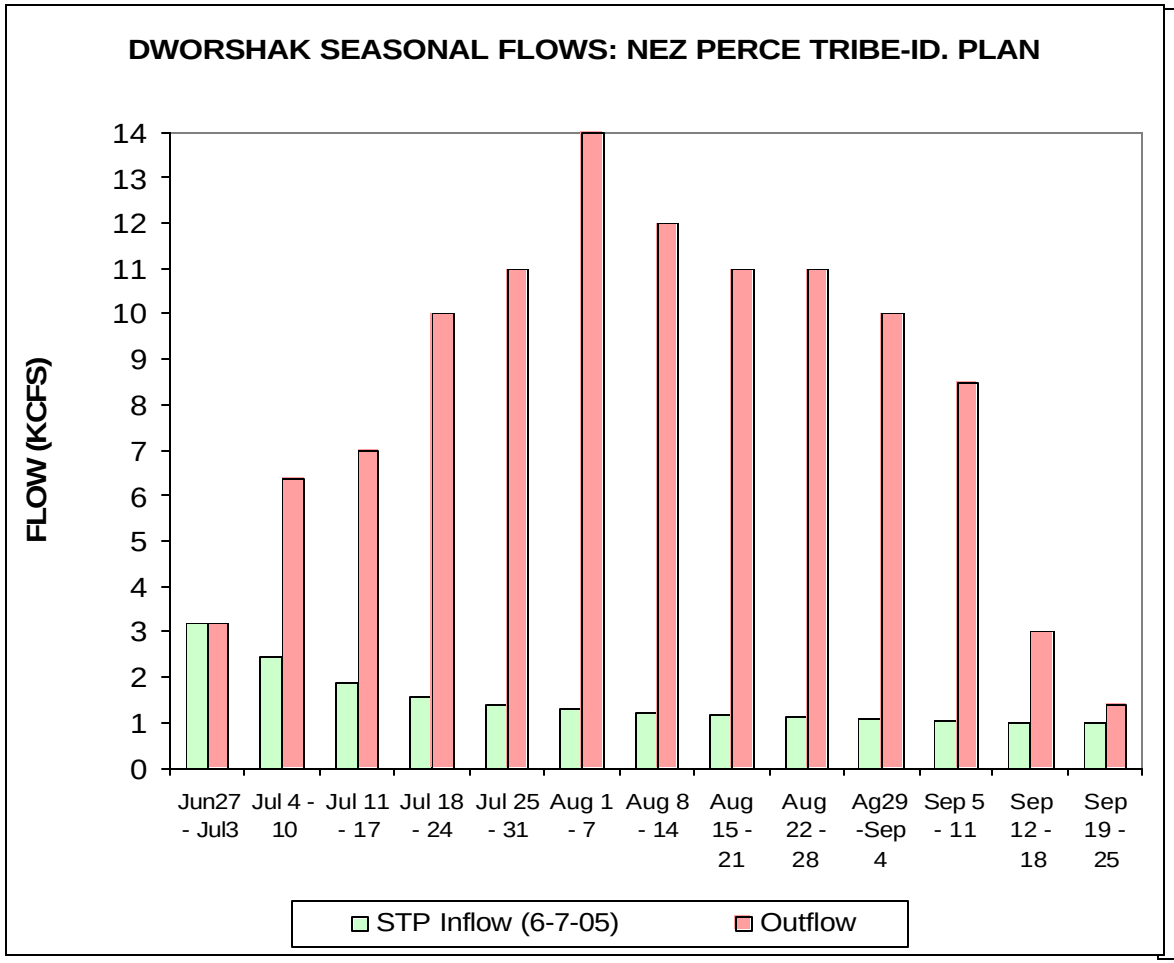
Assumption: "PDO-neutral / ENSO-warm / ENSO-neutral"

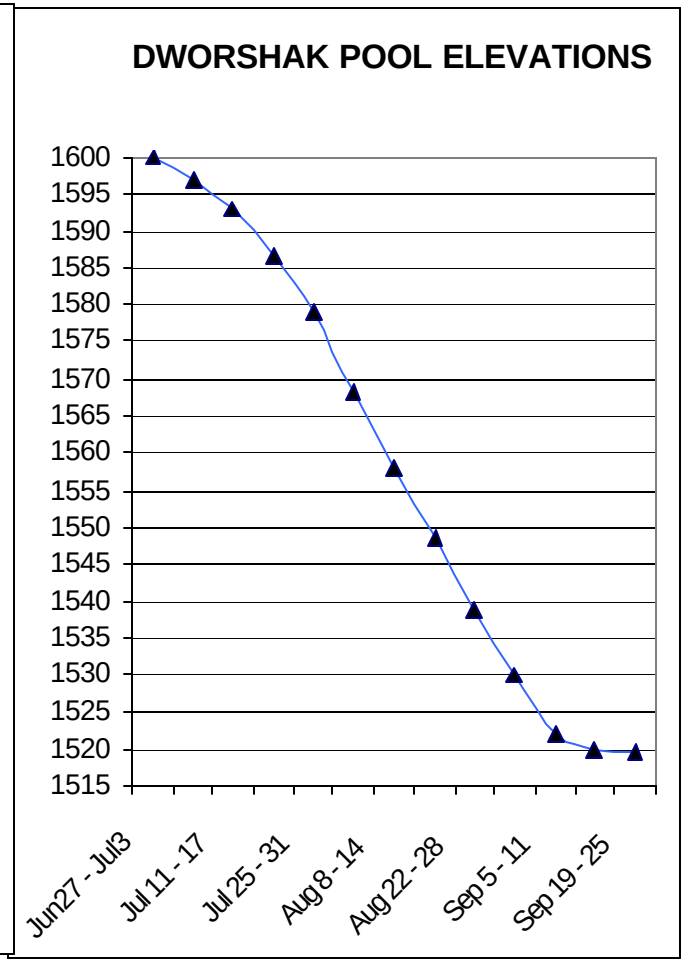
Oct. 2004 - May 2005: PDO = 0.57 (+/- 0.79) MEI = 0.66 (+/- 0.18)

Highlights of Proposals

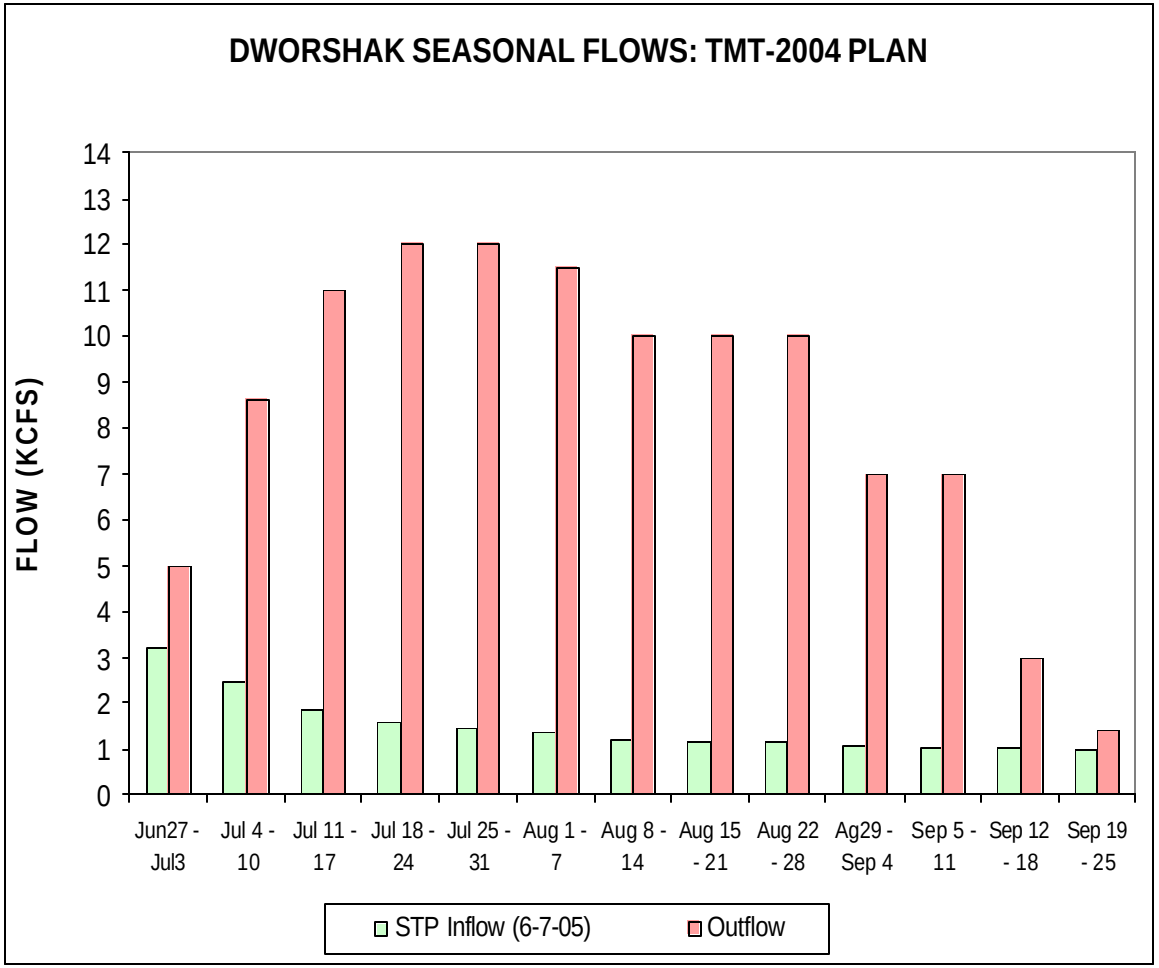
- Nez Perce Tribe - Idaho (NPT-ID) Plan: draft to 1535 ft by Aug. 31, then 1520 feet by Sept. 30.
- TMT-2004 Plan: blend of NPT-ID & BiOp plans.
- 2000 Biological Opinion Plan: draft to 1520 feet by August 31.

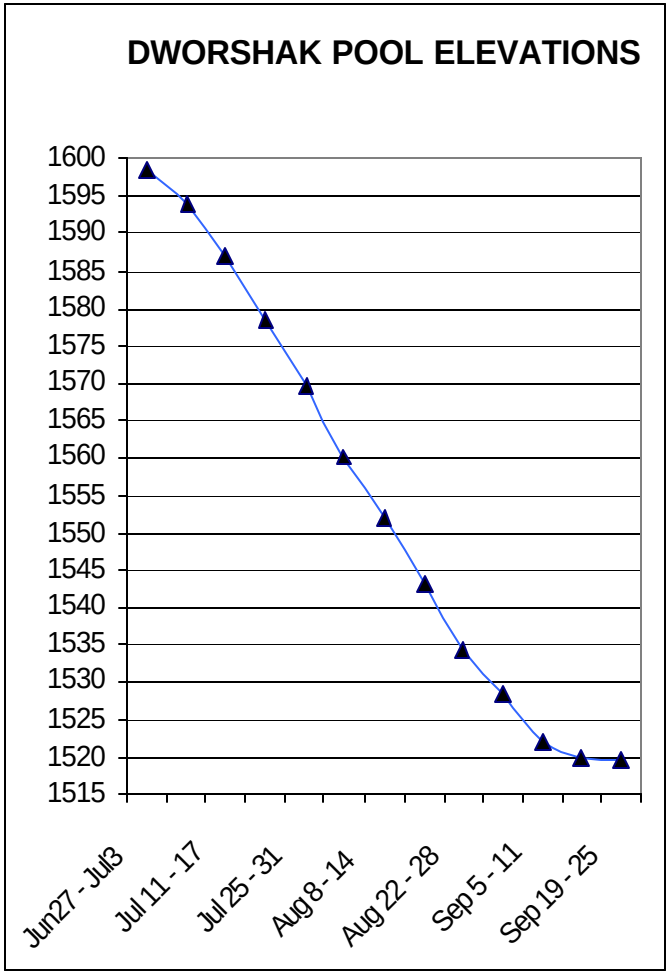
NPT-Idaho Plan



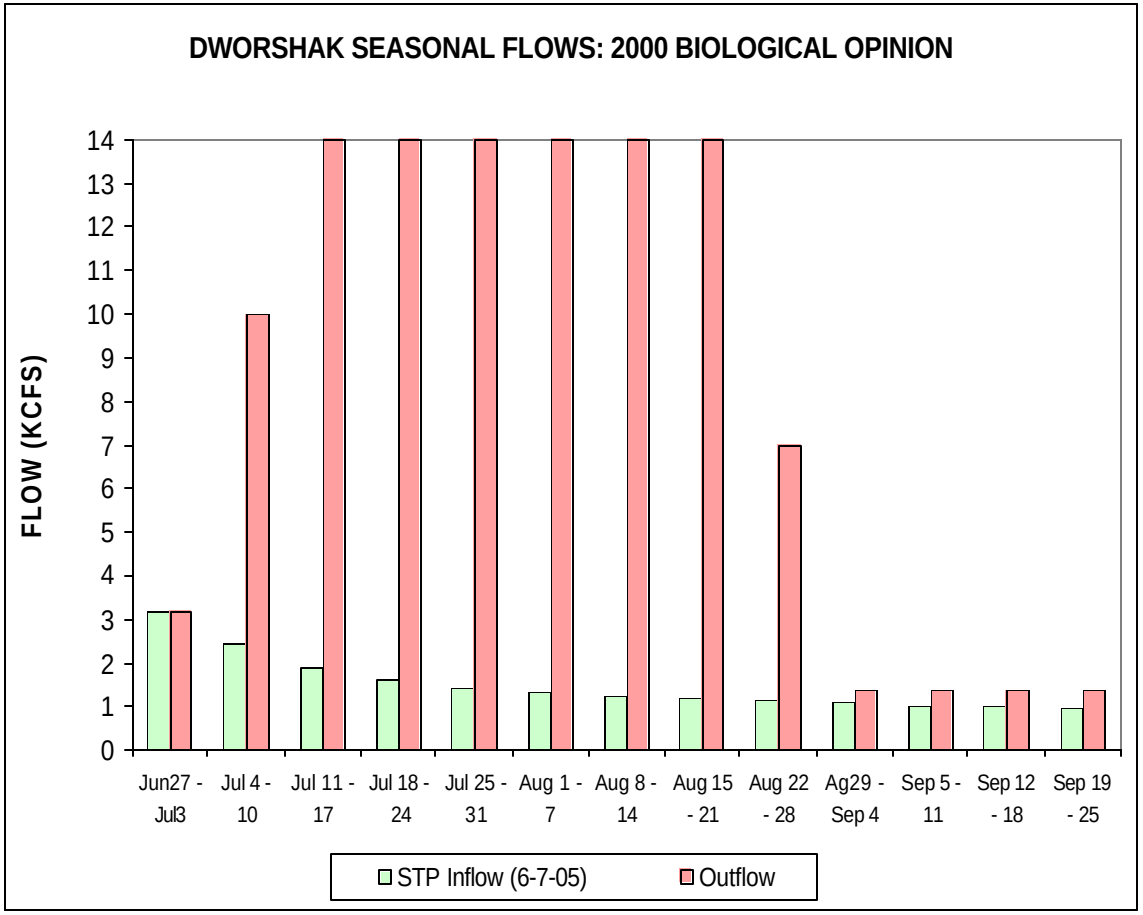


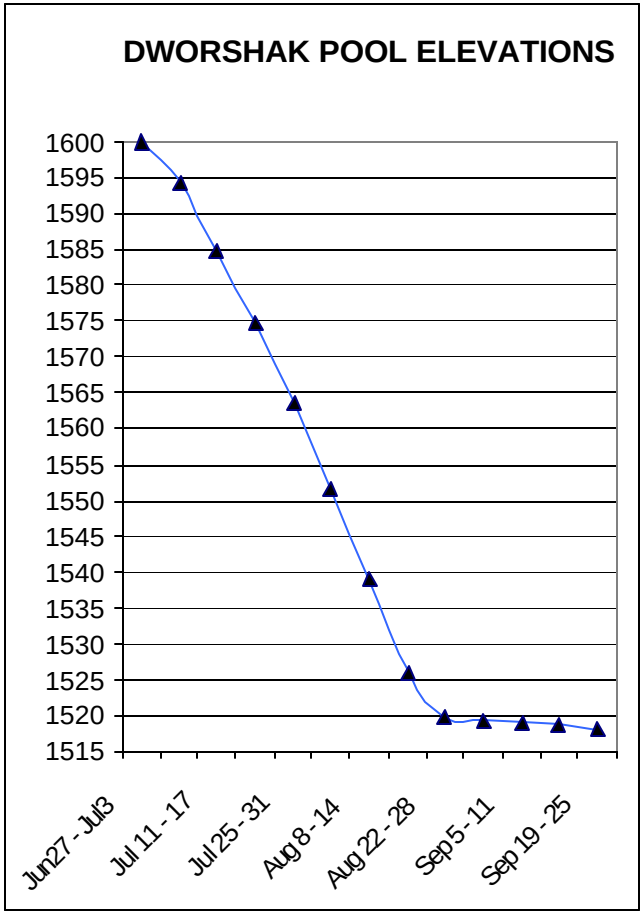
TMT-2004 Plan





Biological Opinion Plan



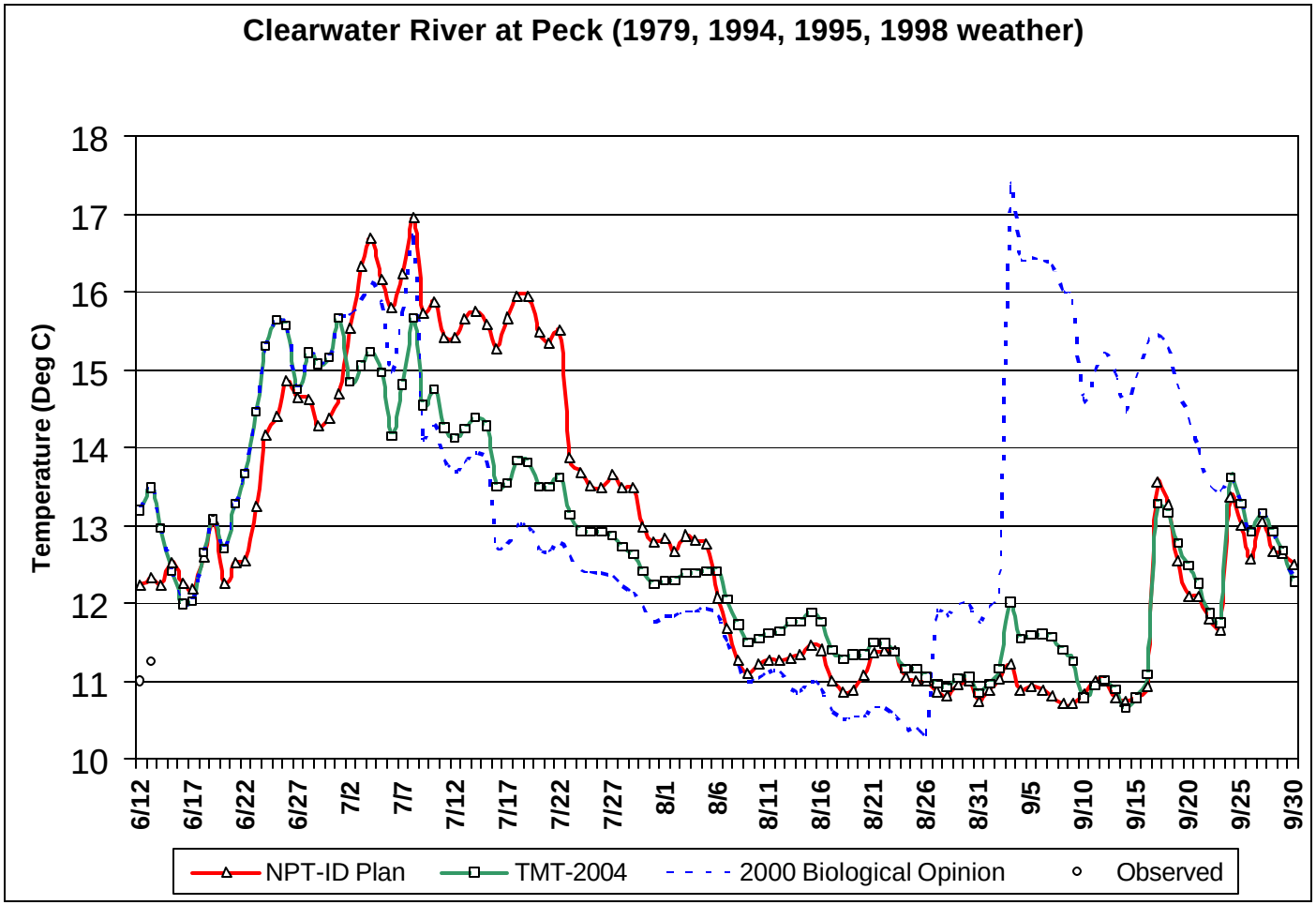


CRITFC Modeling Results

CURRENT (June 7, 2005) CRITFC MODEL FORECAST RESULTS			
Dworshak Outflows (cfs):	NPT-Idaho	TMT-2004	Biological Opinion
July 1-15	6000	8700	10000
July 16-31	10000	11900	14000
August 1-15	12900	10700	14000
August 16-31	10800	9400	8600
September	4600	3800	1400
SEP DWR Augmentation (KaF):	200	157	0
Lower Granite Outflows (cfs):	NPT-Idaho	TMT-2004	Biological Opinion
July 1-15	34500	37200	38500
July 16-31	36800	38600	40800
August 1-15	28000	25800	29100
August 16-31	25400	24000	23100
September	19200	18400	16000
Dworshak at 1570 ft:	6-Aug	31-Jul	27-Jul
EPA: Days > 20 degC at LWG:	NPT-Idaho	TMT-2004	Biological Opinion
July	11	7	0
August 1-15	8	3	0
August 16-31	0	0	0
September	0	0	6

Water Temperature

(Courtesy of Ben Cope, EPA-Seattle)



Water Temperature

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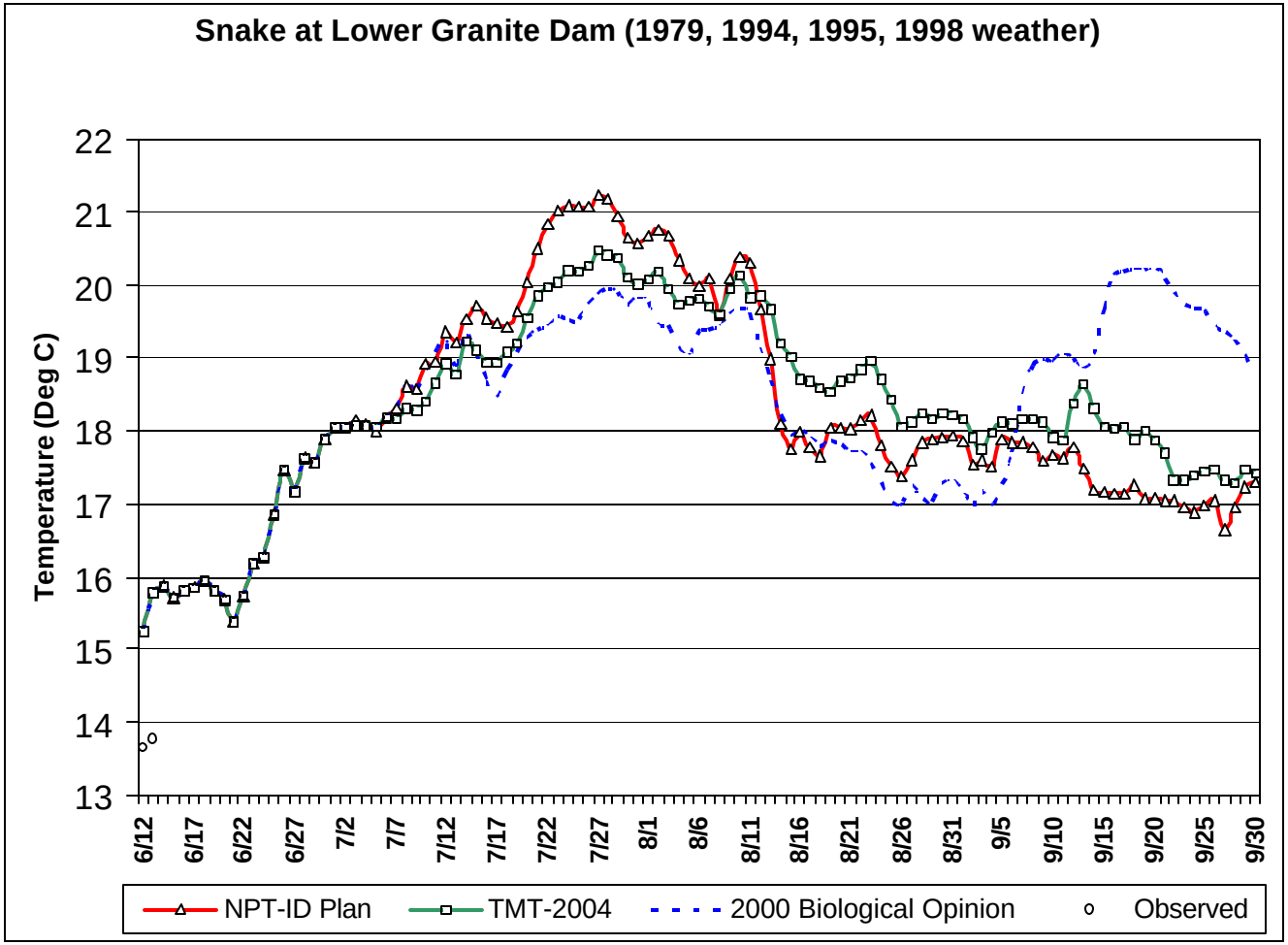

Conclusions

- Biological Opinion Plan: drafts in July will lower lake levels at the fastest rate. High outflows in early July will slow Clearwater juvenile salmon growth. Benefits lower Snake flows in July. Impacts late migrating Clearwater juveniles and adults, especially with high water temperatures in September.
- TMT-2004 Plan: drafts in July will lower lake levels, but not as fast. Modest rises in mid-July flows are followed by a step-wise reduction in August. September has a 157 KaF carryover from summer flows-- not as much as prescribed in the NPT-ID Plan, which calls for a 200 KaF carryover.
- Nez Perce Tribe-Idaho Plan: better timed outflows benefit juvenile <u>and</u> adult salmon while providing cooler water for lower Snake through Sept. Lake levels stay higher, longer.