

# BENEFITS AND COSTS OF THE CALIFORNIA WATERFIX

Dr. Jeffrey Michael  
Executive Director  
Center for Business and Policy Research  
Eberhardt School of Business  
McGeorge School of Law  
University of the Pacific

Albuquerque, New Mexico  
October 22, 2017

[jmichael@pacific.edu](mailto:jmichael@pacific.edu)

# California Inter-regional Water Transportation System

Red Lines are State Water Project  
Yellow Lines are Federal Central Valley Project.

Arrow indicates the location of the Delta. Water from Northern California (much of it stored in Shasta and Oroville) that is exported to Southern California is pumped through natural Delta Channels to aqueducts that originate in South Delta.

The pumps cause rivers in the Delta to flow backwards with devastating impacts on fish. But moving the water through Delta channels prevents saltwater intrusion from SF Bay.



# California Water Fix- Overall Program

**DRAFT**



# Goals of the WaterFix Project

- Secure Future Water Exports from the Delta
- Reduce Physical Risk of Relying on Delta Levees
  - Earthquakes
  - Sea-level Rise
- Reduce Regulatory Risk By Reducing Conflicts With Endangered Fish
  - Moving intakes reduces reverse flow and fish entrainment in South Delta
  - But creates new problems: new intakes directly on migratory path of threatened/endangered salmon and degrades downstream water quality.

# Water Fix Description

- \$17 billion (\$2017, 10% design)
- Nearly 15 years of construction
- Three 3,000 cfs intakes on Sacramento River, a few miles south of Sacramento
- Two 40+ foot diameter tunnels
  - ▣ 35 miles long
  - ▣ 150 feet below the Delta
- Will be used together with current south Delta intakes

# History of Delta Tunnels Benefit-Cost

- Pacific Center Publishes First B-C Analysis, June 2012
  - ▣ Finds B-C ratio of 0.3-0.5, Financially infeasible as proposed.
  - ▣ Financing will require massive subsidy of agricultural cost share from urban ratepayers or taxpayers
- Brattle Group (August 2013)
  - ▣ Only looks at water contractor perspective, assumes much higher water yield without accounting for its impact on environment or other water users.
  - ▣ Finds B-C ratio of 1.4
- Major Project Revision in 2015, renamed WaterFix

# 2016 WaterFix Benefit-Cost Analysis: Key Assumptions

- Export Water Yield: annual average of 225,432 acre feet per the January 2016 WaterFix Biological Assessment
- Timeline: Construction 2017-2031, Operation benefits valued from 2032 to 2131(100 year useful life)
- Real Discount Rate: 3.5%
- Two Scenarios:
  - Optimistic: Water Value from 2013 Brattle Analysis.
  - Base: Water Value from other state reports that are not promoting the tunnels.

# The Base Scenario Still Includes Some Pro-Tunnel Biases

- Low discount rate, long time-horizon, and no risk of cost escalation.
- Excludes some areas of potential social costs.
  - ▣ Delta recreation and upstream reservoirs
- Assumes Zero environmental costs
  - ▣ EIR predicts 25% decline in winter-run chinook salmon
  - ▣ Risk of algal blooms and construction impacts
- Assumes no technological improvements in alternative water supplies and conservation.
- Valued Delta Water exports 25% higher than current cost of alternatives.



# Valuing Export Water Supply in the Base Scenario

Agricultural Value: \$150 af

Urban Value: \$800 af

□ Cost of Alternatives DWR California Water Plan.

	Low Cost (\$ af)	High Cost (\$ af)	Midpoint Cost (\$ af)	Potential 2030 Supply (million af)
<b>Brackish Groundwater Desalination</b>	500	900	700	.1-.2
<b>Ocean Desalination</b>	1000	2500	1750	.1-.2
<b>Municipal Recycled Water</b>	300	1300	800	1.8-2.3
<b>Surface Storage</b>	300	1100	700	.1-1.1
<b>Urban Water Use Efficiency</b>	223	522	372.5	1.2-3.1

# Valuing Export Water Supply in Optimistic Scenario

Optimistic Scenario from Brattle analysis:

- Assumes very rapid urban population growth.
- Assumes no development of alternative water supplies or growth in conservation.
- Averages \$785 af across urban and agriculture

Scenario	Tunnels' Annual Water Yield	Average Value of Water Supply	Annual Value	Present Value over 100 years
Optimistic	225,432 af	\$785	\$176.9 mil	\$2,822.4 mil
Base	225,432 af	\$367	\$82.7 mil	\$1,319.5 mil

# Seismic Risk Reduction Benefit

- “Optimistic” Scenario: avg. annual value \$27.4 mil from Brattle report, present value \$436 million.  
Why so low?
  - ▣ Low probability event
  - ▣ Tunnels only protect 50% of exports.
  - ▣ Worst case scenario is less than 1/4 the loss of surface water in recent drought years
- Base Scenario: 0
  - ▣ Vast majority of economic damage is not water exports
  - ▣ Higher level of flood protection investment will occur without WaterFix

# In-Delta Costs

- Agriculture
- In-Delta Transportation Impacts
- Municipal Water Quality
- Increased Flood Risk
- Total In-Delta Costs could be near \$1 billion
  - ▣ Significant locally but not critical to statewide B-C ratio.

# Environmental Costs/Benefits

- WaterFix draft EIR/EIS and biological assessment does not support any claim of environmental benefit.
  - ▣ Several species negatively impacted
  - ▣ Section 7 ESA permit is for No Jeopardy not Overall Improvement.
  - ▣ Other environmental risks.
- \$0 Environmental Benefit/Cost seemed most consistent with preliminary EIR and BA

# Summary

	Base scenario	Optimistic Scenario
<b>Benefits</b>		
<b>Export Water Supply</b>	\$1,319,521,208	\$2,822,409,124
<b>Export Water Quality</b>	\$1,677,361,307	\$1,677,361,307
<b>Earthquake Risk Reduction</b>	\$0	\$435,796,554
<b>Total Benefits</b>	\$2,996,882,515	\$4,935,566,984
<b>Costs</b>		
<b>Construction and Mitigation</b>	\$11,676,474,531	\$11,676,474,531
<b>Operation and Maintenance</b>	\$591,658,075	\$591,658,075
<b>Ecosystem</b>	\$0	\$0
<b>In-Delta Municipal</b>	\$111,279,332	\$37,093,107
<b>In-Delta Agriculture</b>	\$682,807,143	\$293,953,421
<b>In-Delta Transportation</b>	\$132,205,755	\$132,205,755
<b>Total Costs</b>	\$13,194,424,836	\$12,731,384,889
<b>Net Benefit</b>	<b>(\$10,197,542,281)</b>	<b>(\$7,795,817,905)</b>
<b>Benefit/Cost ratio</b>	<b>0.23</b>	<b>0.39</b>

# Benefit-Cost Conclusions

- WaterFix is much worse than the “status quo” as defined by its EIR/EIS.
- Net Benefit is -\$10 billion, and b-c ratio is 0.23 under base scenario.
- No Pessimistic Scenario
- Agriculture cost share is unfinanceable
- If it's so bad, why do agencies want it?
  - ▣ Political opportunity, Gov. Brown
  - ▣ Physical capacity to increase exports
  - ▣ OPM

# Recent Developments – what happens next.

- In past 2 months, water agencies have voted on whether they will fund the WaterFix proposal.
  - Largest agricultural district rejected project.
  - Largest urban district supported.
  - Overall, only approved 40% funding.
- What now? Governor has vowed to go forward.
  - Subsidies?
  - Smaller, 1-tunnel project.