

# California WaterFix Economic Analysis

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# Water Fix Economic Analysis

- Goal of the study: Quantify the benefits and costs of the project to the south of Delta contractors
  - CVP
  - SWP
  - Excluded: Exchange contractors, Friant, wildlife refuges

# WaterFix Water Supply

- Proper frame of reference for an economic analysis is water supply with and without the project
  - Comparing some state of the world to the status quo
  - What does it cost vs. what do you get
- WaterFix is a long-term project, so the baseline is dynamic and not static
- We settled on the “eroding baseline” to isolate the effects of the tunnels
  - Apply same operating criteria for the tunnel and no-tunnel states of the world

# Water Supply

- At present: 4.7 maf
  - EIR/EIS No Action Alternative
- Post-WaterFix: 4.9 maf
  - Combined CVP and SWP at Early Long Term
- No-tunnel eroding baseline: 3.9 maf
  - Incorporates effects of future regulations
  - Isolates impacts of new conveyance
- Implies incremental yields of ~1.0 maf
  - Most of this is supply preserved and not new supply created

# Water Supply

- Effects of climate change are significant over the longer term
- Assuming 140cm of sea level rise, SWP yields are
  - With tunnels: 2.5 maf
  - Without tunnels: 1.3 maf
  - Implies that climate change could reduce SWP yields by nearly half
  - Tunnels basically eliminate this risk
  - Not monetized in my economic analysis

# WaterFix Cost

- Present value cost is \$13.9 billion including construction, mitigation, land, O&M
- \$10.0 billion assigned to south of Delta contractors
- \$3.9 billion assigned to the exchange contractors, Friant and the refuges – outside the scope of the analysis
- Implies that WaterFix has an annualized incremental cost of ~\$400/af
  - Untreated, incremental annual cost at the Delta
  - How is this derived?

# Incremental Cost

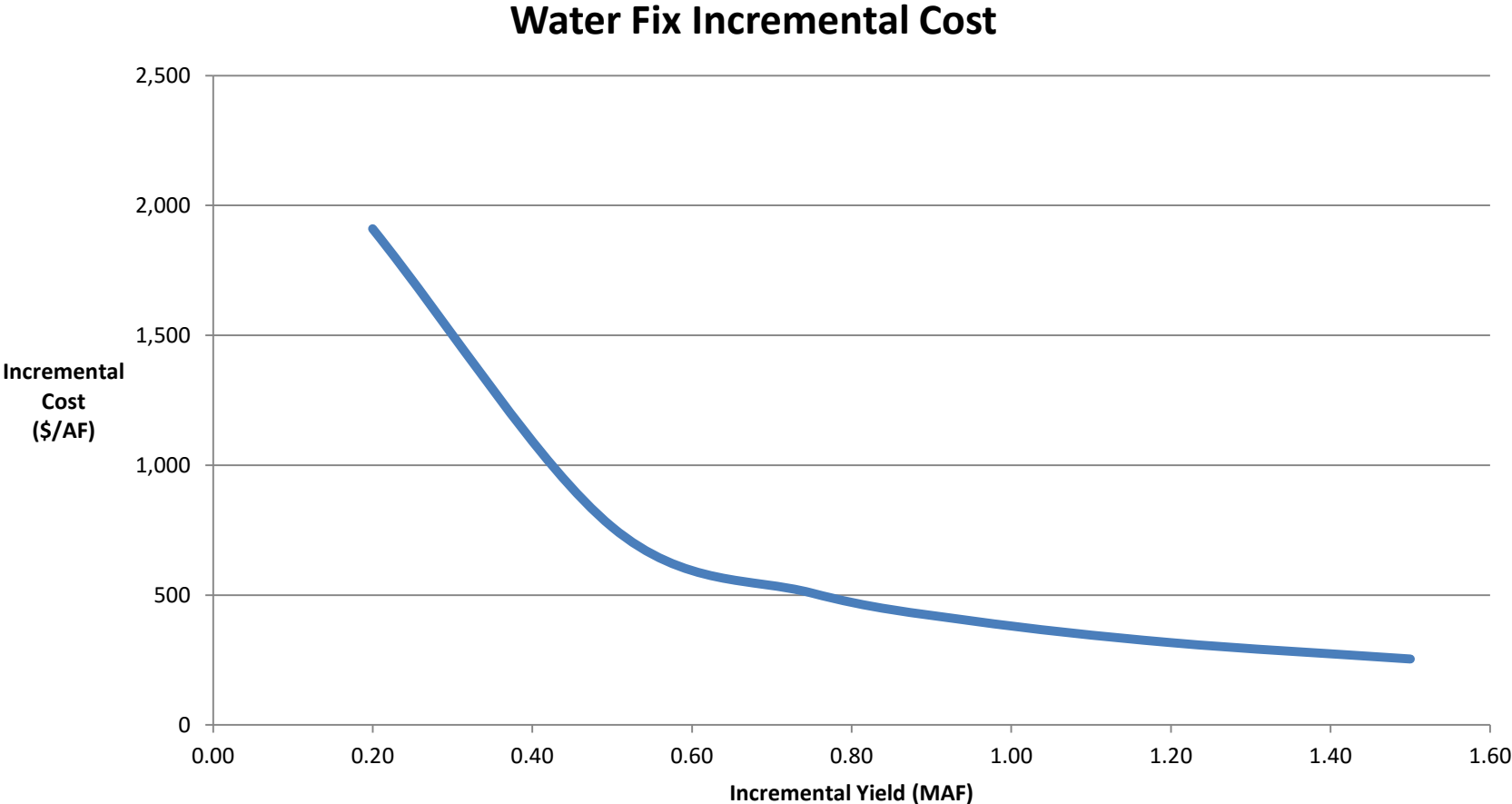
- Present value cost to SOD contractors is \$10.0 billion.
- Assume project produces ~1 maf of improvement in water supply
- Implies a present value cost of \$11,000 per acre-foot
- Assume a 3 percent real rate of interest
- What is the annual payment that will produce a present value of \$11,000 at a 3 percent real rate?  
Answer: \$400
- Levelizing costs makes them easy to compare

# Cost

- To compare the cost of WaterFix to the cost of replacing lost SWP supplies with alternatives, need to add the cost of conveyance and treatment to the WaterFix incremental costs
  - Comparing apples-to-apples costs on a delivered, treated basis
- Thus, WaterFix incremental costs vary by agency
- Assumptions about yields are also critical



# Incremental Cost vs. Yield



# Urban Benefits

- Calculated the value of avoided shortages resulting from WaterFix for 36 urban water agencies receiving SWP supplies
- Analysis based on CalSim II modeling runs and the SDBSIM shortage value model
- Value of shortages avoided by implementing WaterFix is >\$1,400/af
- Compared to incremental cost of WaterFix
- Also compared to the cost of water supply alternatives – generally less expensive

# Agricultural Benefits

- Farmers respond to shortage by pumping more groundwater and by fallowing
- Agricultural benefits analysis conducted using SWAP – a calibrated programming model
- SGMA is incorporated into the agricultural analysis
  - Assumed sustainable yields for major groundwater basins in the San Joaquin Valley
- Fallowing becomes more important going forward

# Agricultural Benefits

- Land price is a good indicator of farm water value
- Assuming land price of \$18,000/acre
  - Implies annual net income of \$900/acre using a 5 percent capitalization rate
- Assuming water use of 2.5 af/acre implies annual value of \$360/af
  - Measured at the place of use
  - Less at the Delta (~\$300/af)
  - Less than the incremental cost of WaterFix

# Comparing Costs and Benefits

- Aggregate analysis
  - Summing all incremental benefits and costs across south of Delta contractors
  - Benefits: \$16.1 billion vs. Costs: \$10.0 billion
  - Passes a benefit-cost test

# Comparing Costs and Benefits

- Disaggregated costs and benefits
  - Assuming a proportional cost allocation:
  - (\$0.6) billion for SWP ag
  - (\$1.0) billion for CVP ag
  - +\$7.6 billion for SWP urban
- Once the cost allocation and financing plan is complete, can recalculate benefits and costs for various groups

# Questions