

# Policy Directions for Desalination & Advanced Water Treatment

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# Outline and Topics

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- Focus: Problem; Research; Policy; Vision
- Quotes
- Defining the Problem (Broadly)
- Learning from History: An Historical Analogy
- Research and Research Funding
- Water Policy
- Vision for the Future
- Conclusions

# Meaningful Quotes

*"If we could produce fresh water from salt water at a low cost, that would indeed be a service to humanity, and would dwarf any other scientific accomplishment."*

--John F. Kennedy  
April, 1961

*"Those who do not Learn from History are Doomed to Repeat it."*

– George Santayana

*"Have we Learned Nothing from the Past? Our Nation's Water Policy is Still Largely Projects-based."*

-- Earl Blumenauer, John Linder, and  
Mary Bono Mack (Members of Congress)

# Defining the Problem Broadly

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- No Comprehensive Water Policy Assessment from Federal Government Since National Water Commission report in 1973
- Currently Trying to Solve 21<sup>st</sup> Century Problems with 20<sup>th</sup> Century Legislation
- Water Policy in Washington is Highly Fragmented
- Water Policy/Funding is Not a High National Priority

# Barriers and Challenges

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- *"If Federal Investment is Warranted, then Which Agencies or Organizations Should Undertake Which Tasks?"*
  - 20 Federal agencies under six Cabinet Departments have responsibility for Water Resources...
  - They are Directed by 13 Congressional Committees with 23 Subcommittees and 5 Appropriations Subcommittees

Source: *Erik Webb & Josh Johnson, Journal of Contemporary Water Research and Education, 2007*

# What is Needed

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- A National Water Policy and a Framework for Implementing it
- Elements would Include:
  - A Department of Water
  - New Legislation to Provide for Funding of Infrastructure, Research
  - A Focus on Major Emerging Issues and Needs (e.g., Increasing Available Supplies, Energy/Water Nexus, Climate Change)
  - Minimal Intrusion on States' Rights

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# *An Historical Analogy*

# Timeline of DOI Involvement in Desalination

Using Desalination Technologies  
for Water Treatment

Background Paper



## 1950 – 1960

1952: Research initiated under Saline Water Conversion Act

1955: DOI Office of Saline Water

## 1960 – 1970

1967: Peak funding year (\$100 million)

Research and demonstration facilities built in NM, TX, SD, CA, NC

DOI established technical leadership throughout the world (fundamental membrane technology)

## 1970 – 1980

- Oil embargo
- Desalination industry presence

1974: Transition from desalination R&D to energy R&D

## 1980 – 1990

1980: YDP/WQIC authorized

1982: DOI abolishes Office of Saline Water....shifts remaining R&D to Reclamation

1983: R&D facilities built in NM, TX, SD, CA, NC transferred to local communities.

1985: R&D shift to USGS

# Timeline of DOI/Reclamation Involvement in Desalination

## 1990 - Present

**1992:** Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI) authorizes funding external R&D grants, including desalination.

**1996:** Desalination and Water Purification Research Program (aka Desal Act or DWPR) authorizes external R&D grants.

Internal R&D conducted at Yuma Desalting Plant (WQIC) and Denver based R&D Programs

Assisted State Dept in technology support to Saudi Arabia, Libya, Middle East peace process

**2002:** Congress request a study for construction of a desalination research facility at Tularosa, NM and development of a *“technology progress plan”*

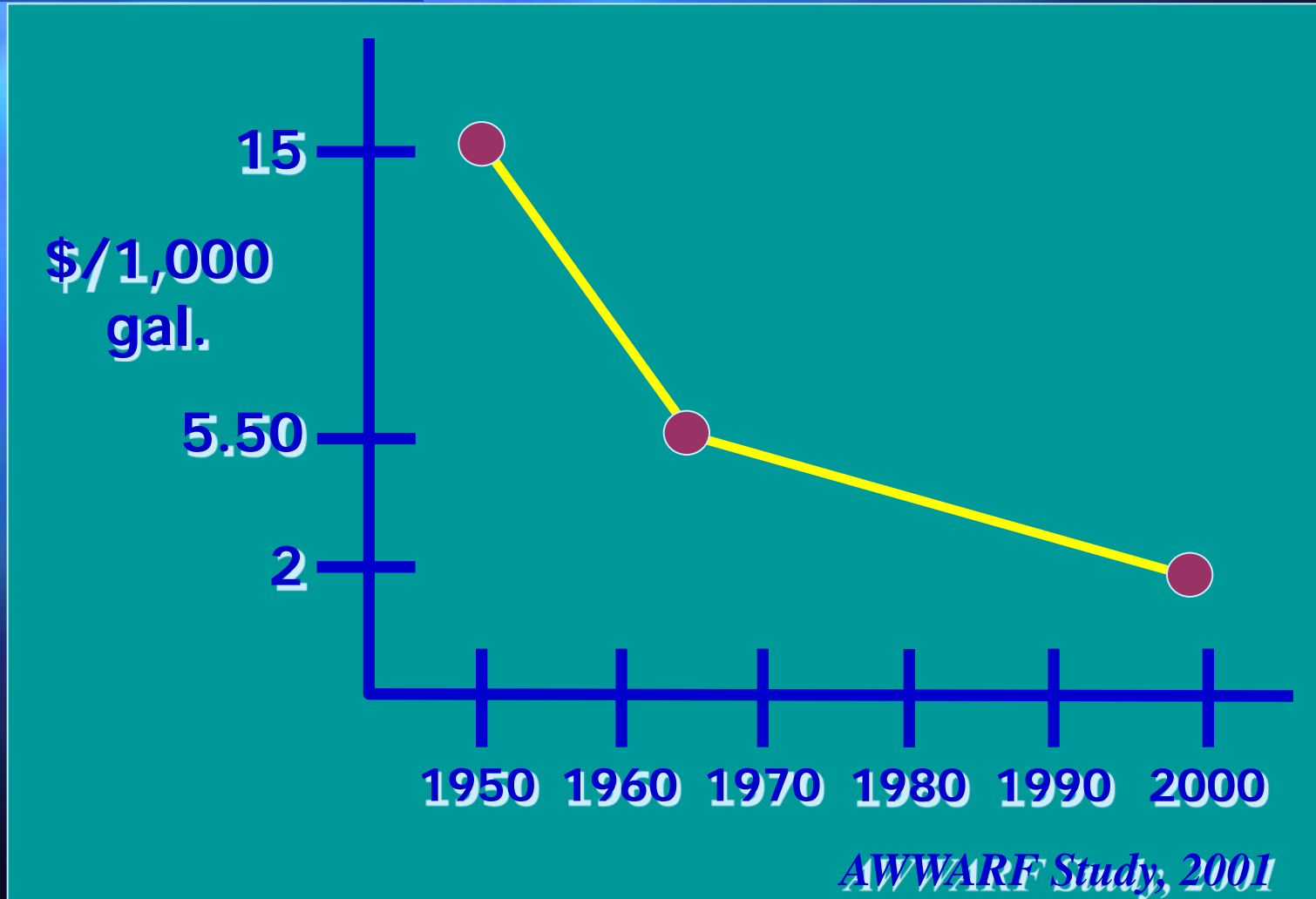
**2003:** Congress amends Desal Act to fund construction of a desalination research facility at Tularosa, NM and implement the *“technology progress plan”* (now aka *“Desalination and Water Purification Technology Roadmap”*)

**2003:** Congress requests Reclamation to assess potential use of advanced water treatment technologies as a resource to create net new water supplies

# Historical Federal Funding

*Much of the development of desalination technologies in the past three decades was sponsored by the U.S. Government. ...since 1952, the Federal Government has spent just over \$900 million (1985 \$) in support of desalination [R, D, and D] projects. Federal funding for most desalination research was discontinued in 1982. This research program was primarily responsible for the development of reverse osmosis, and for many advances and improvements in distillation technologies.*

# The Benefits of Research

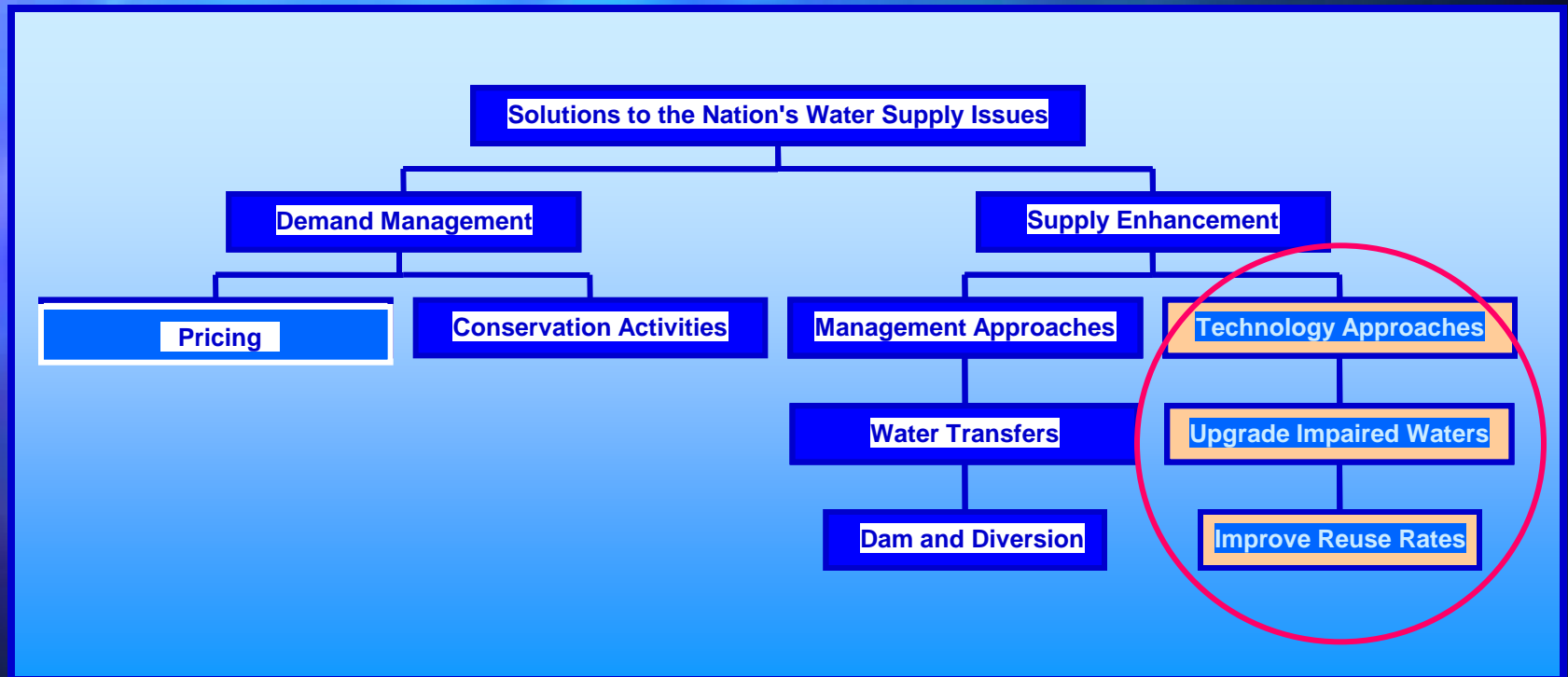


# Desalination and Water Purification Technology Roadmap

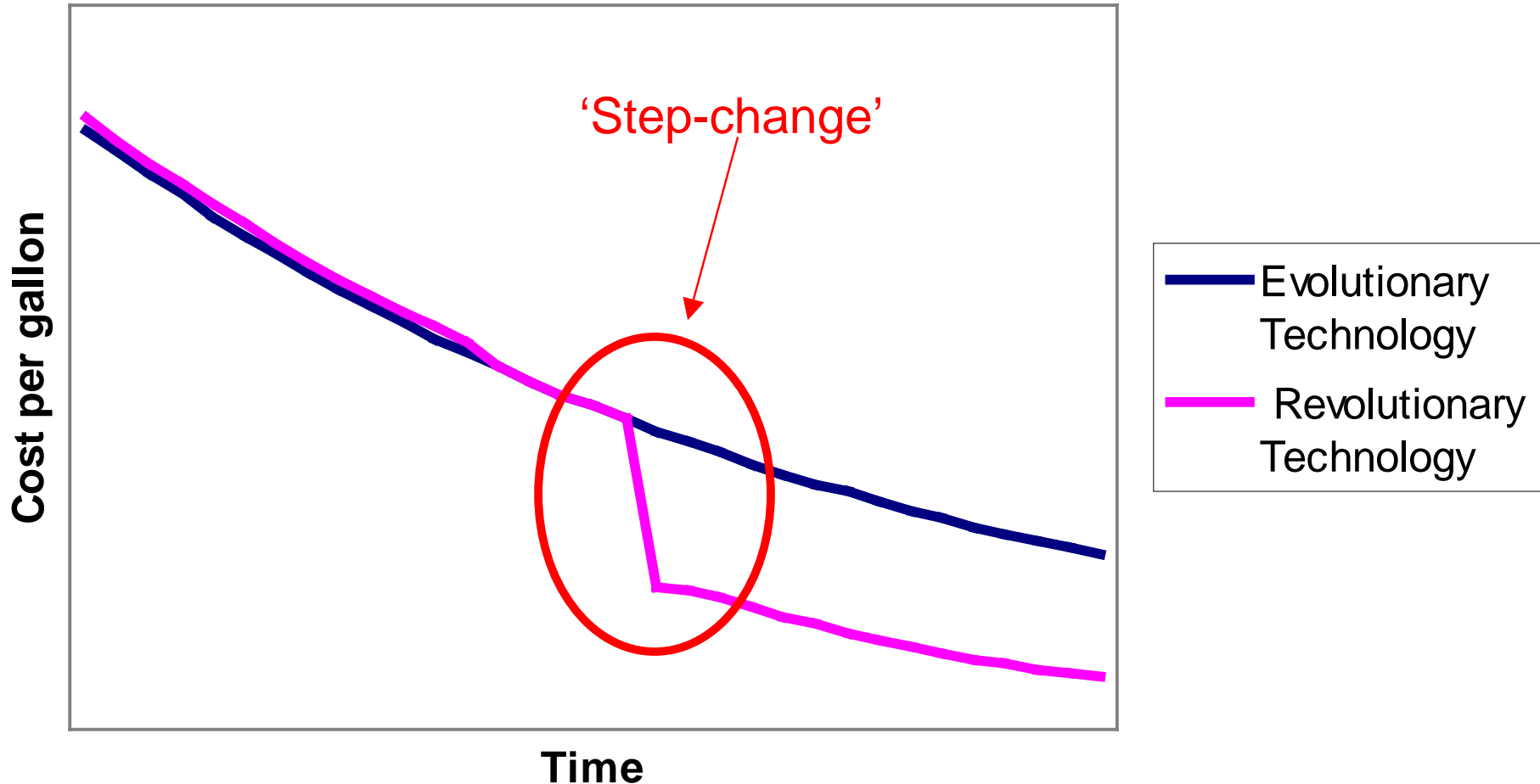
- Development Facilitated by USBR and Sandia Labs
- Purpose: Summarizes water supply challenges and lists areas of research for “technological solutions”
- “Make additional water resources available”
- Addresses seawater desalination, brackish water desalination, water reuse, and other “unconventional sources”
- NRC review of Desal Roadmap in 2004

# Refining the Bounds of the Problem

## Water Solution Toolbox



# Impact of Revolutionary Technology



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# *Research Funding*

# Water Research Funding Around the World

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- Australia – Centres of Excellence in Desalination & Water Recycling -- \$20MM (AUD) each over five years (\$0.40/pp/yr.)
- Canada – Alberta Water Research Institute received \$30MM (CAD) in start-up monies from Canadian government
- Singapore PUB – Has a \$40MM/yr. (US) Water Research Program (\$8/pp/yr.)
- France – Veolia/Suez were expending \$76MM (USD) in 2004

# Water Research Funding in U.S.

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- \$700MM/year (NRC report)
- NSF -- ~25% of total
- EPA -- ~\$50MM
- Bureau of Reclamation -- \$15MM
- Sandia National Laboratories -- \$3.7MM
- USDA/DOD/DOE -- ???
- Water Research Foundation, WERF, WaterReuse Foundation -- ~\$21MM
- Water Reuse/Desalination Funding = \$0.08/pp/yr.



# ***Water Policy***

# Water Policy Studies

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- National Water Commission Report -- 1973
- Intergovernmental Water Policy Task Force Reports -- 1979-80
- *Fragile Foundations* – NCPWI Report in 1987
- SWAQ – Confronting the Nation's Water Problems -- 2004
- SWAQ – Strategy for Federal S&T to Support Water Availability and Quality in...U.S. --2007

# Vision: Roadmap to Resolution

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- Enact H.R. 135 – Would Create a National Water Commission
- Create Department of Water – Use E.O. as did R.M. Nixon on December 2, 1970
- Enact “National Water Management Act”
- Create Series of Centers of Research Excellence (e.g., Desalination, Water Reuse, Advanced Water Treatment Technologies)

# Conclusions on Water Policy

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- Various Members of Congress Have Introduced Water Legislation, but...
- Linder's Bill is Only One that Proposes Overarching National Policy Action
- Since Domenici, No Real Champion for National Water Policy
- As a National Priority, Water Ranks far Behind Health Care, Energy, Deficit, Jobs, etc.

# Conclusions

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- Nation Needs a National Water Policy
- Water Needs to be Assigned a Higher Priority by Congress and Administration
- A Champion Needs to Emerge
- Funding Research at Elevated Levels is Essential

# Thank you



[www.WateReuse.org](http://www.WateReuse.org)



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