

# **Securing a Resilient Water Supply for the 21<sup>st</sup> Century: The NAWI Energy-Water Desalination Hub at LBNL**

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# The 20<sup>th</sup> Century Water System is Linear..



In the face of:

- Decreasing freshwater availability
- Increasing standards for wastewater discharges
- Increasing water supply variability due to climate change

**We need to rethink this whole thing...**







Our Region's Trusted Water Leader  
San Diego County Water Authority

POSEIDON WATER

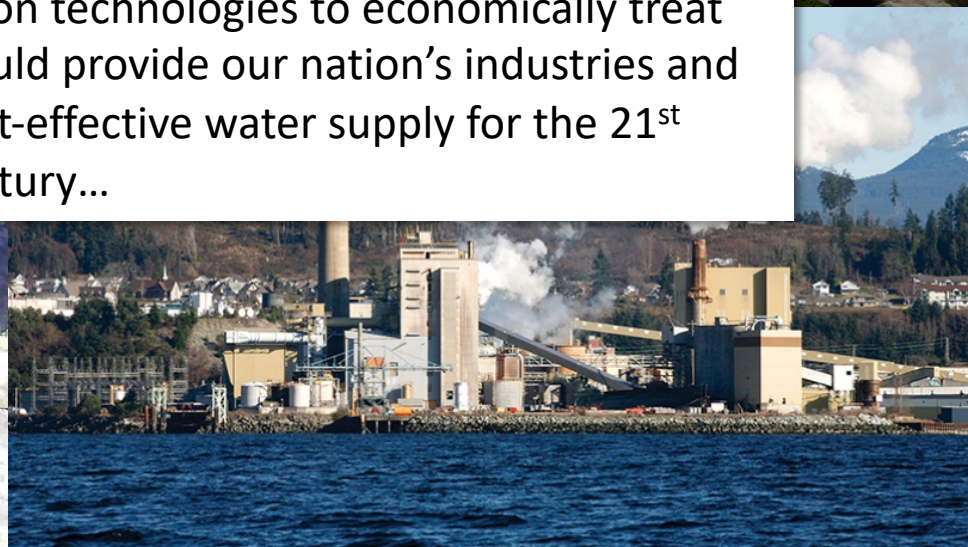
Claude "Bud" Lewis  
**Carlsbad Desalination Plant**



There is a LOT of other water out there that we currently ignore or throw away...



If we could develop new desalination technologies to economically treat these non-traditional waters, we could provide our nation's industries and communities with a resilient, cost-effective water supply for the 21<sup>st</sup> century...



# What does all this mean practically?

- We need to recycle/reuse MOST of the water in our facilities/dwellings
  - There are not a lot of water treatment technologies that are ideally suited to do this (most were designed for large/slow plants)
- We need to treat water to a standard that is \*suitable for its use\*
  - No need to flush poop and rinse floors with drinking water
- The easiest water to treat and reuse is wastewater
  - There is a LOT of it in our various industries



# NAWI Organizational Structure

## NAWI Alliance

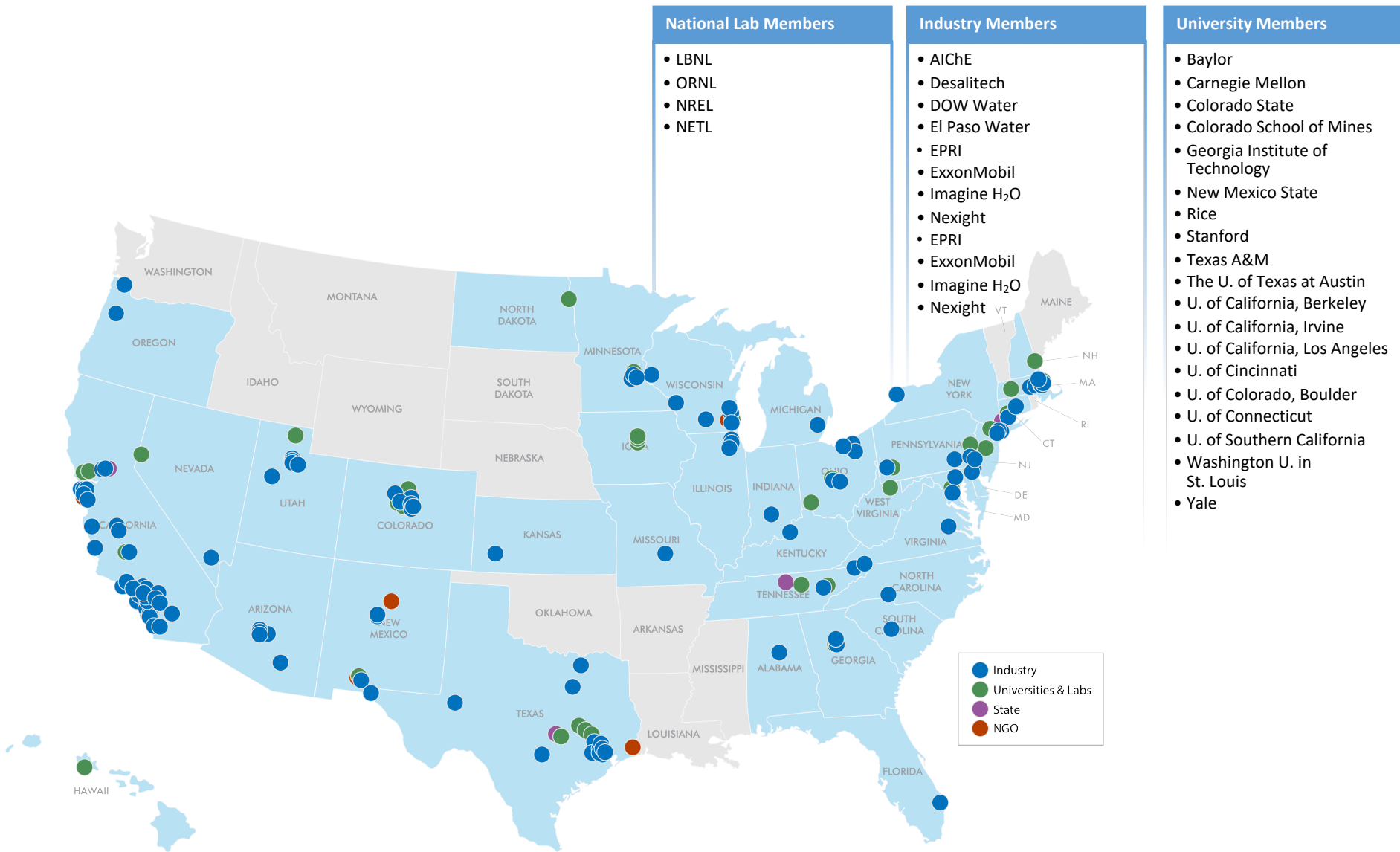
### 180+ U.S. organizations

- Large Companies
- Small Companies
- Universities
- National Labs
- Federal Agencies
- State Agencies
- Water Utilities
- Non-Profit Orgs

## NAWI Research Consortium

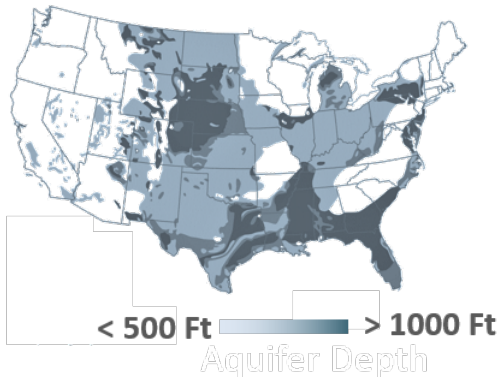
3+ Nat Labs  
15+ Universities  
10+ Industry Partners

# NAWI Alliance



# Brackish groundwater is an untapped resource...

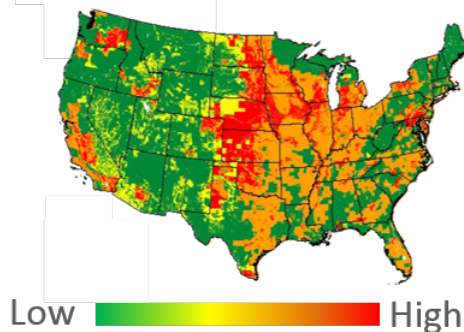
Brackish Groundwater Aquifers



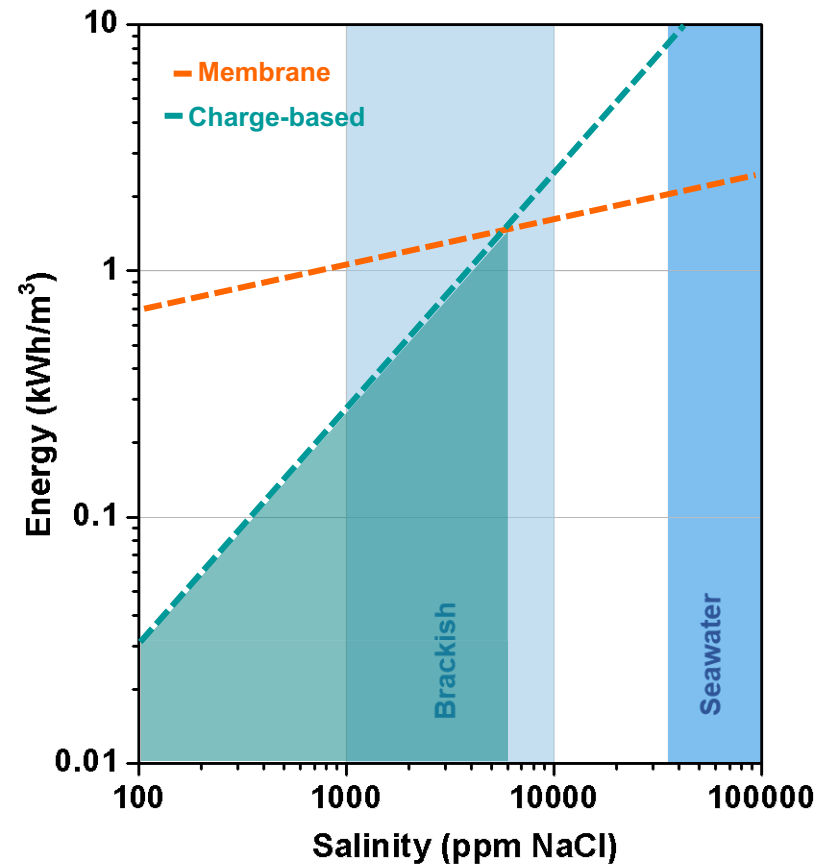
Coastal Salt Water Intrusion



Groundwater Contamination

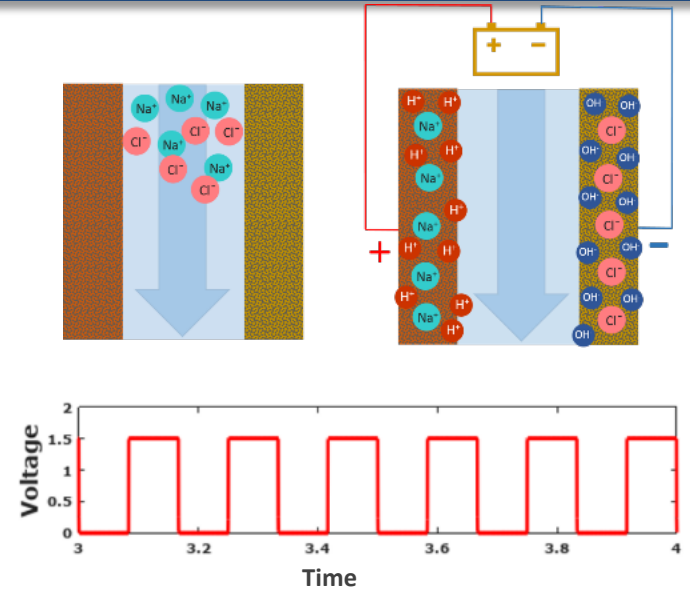
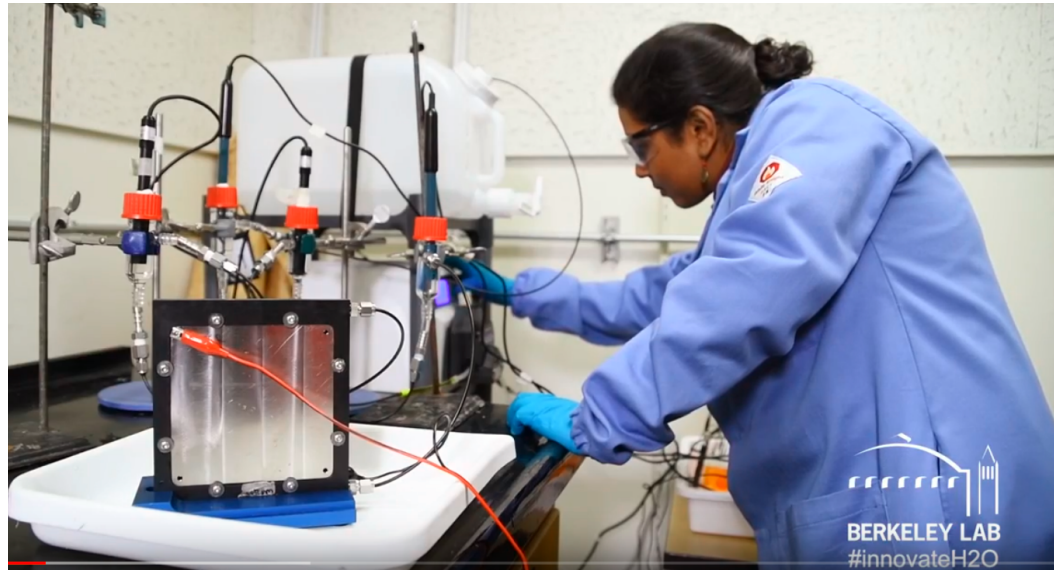


Charge-based salt separation is more energy-efficient for low salinity brackish water sources

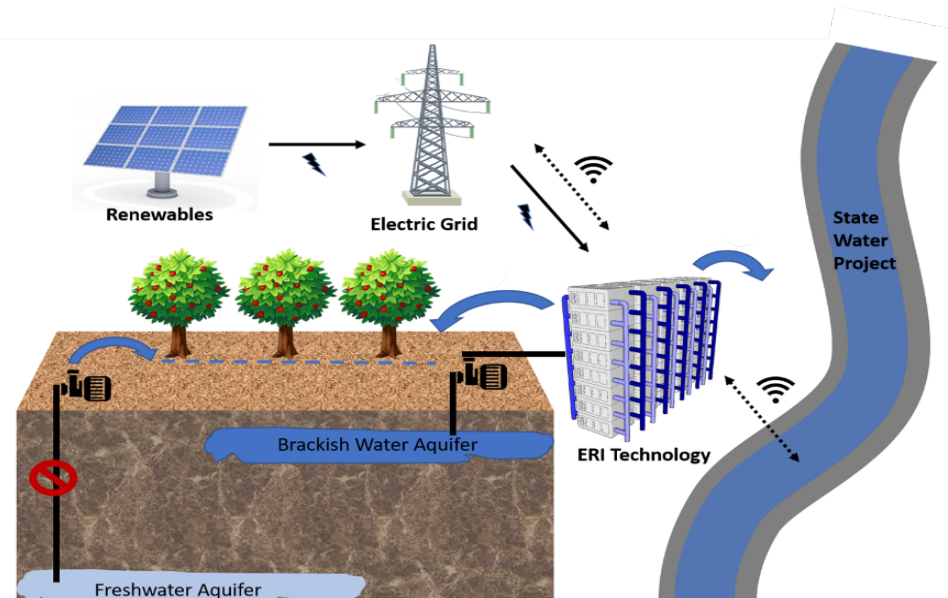




# Electrically-Recharged Ion Exchange (ERI) -



**Distributed, solar or grid-powered desalination – the ultimate grid stabilizer**

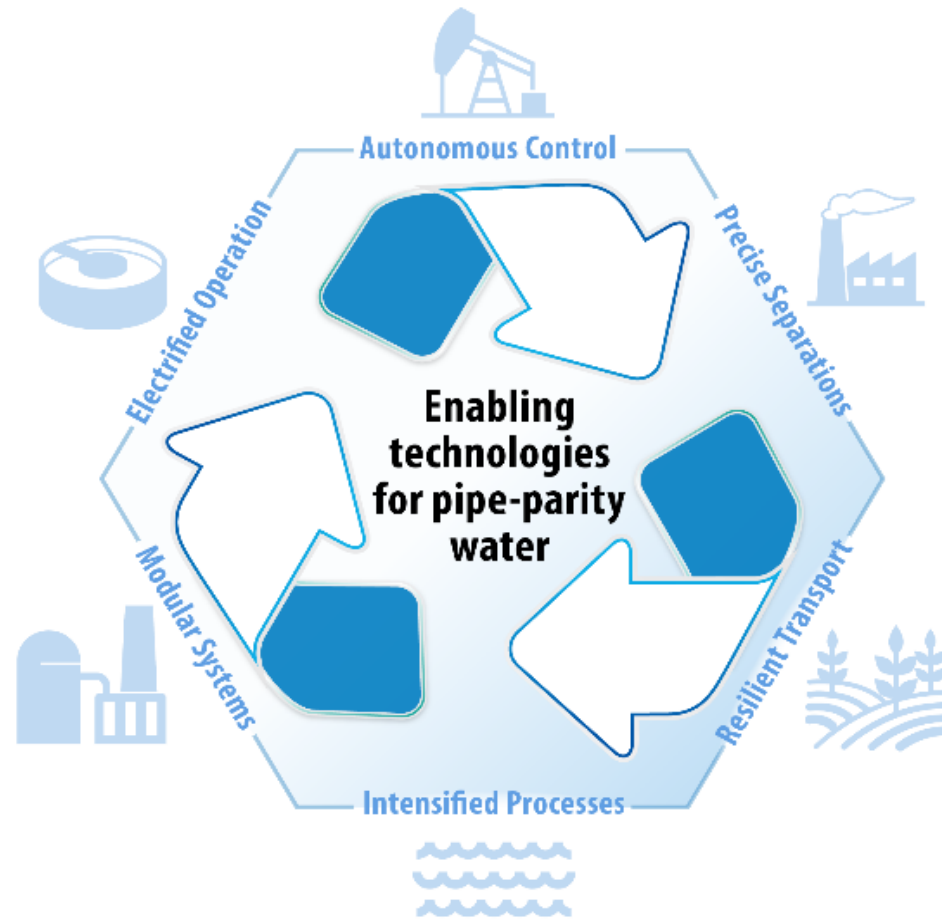


# The 20<sup>th</sup> Century Water System is Linear..



“The Solution to Pollution is Dilution”

# The 21<sup>th</sup> Century Water System must become Circular...



The Solution to Pollution is Revolution



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