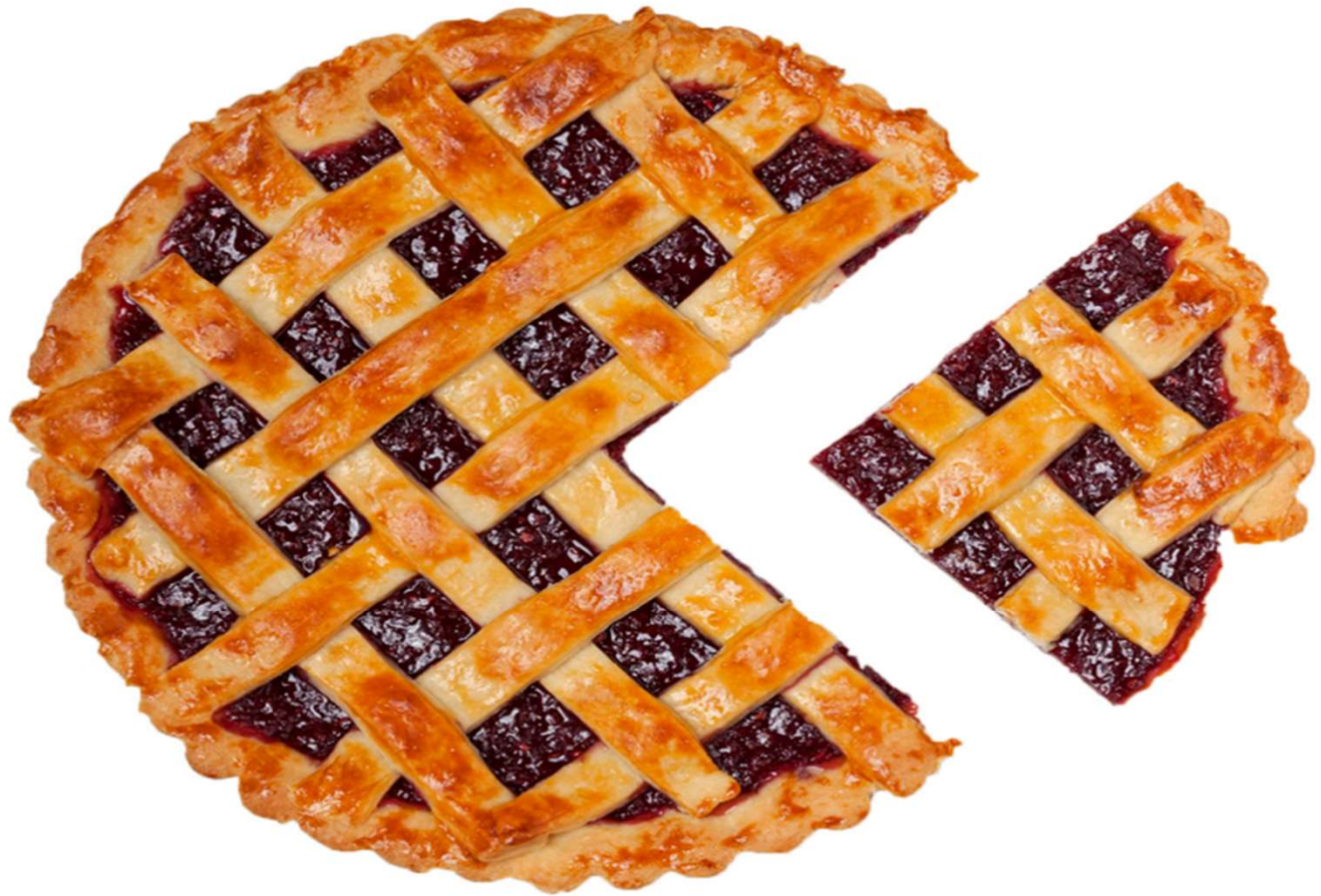


# Water Dispute Dilution

Environmental Professionals of Arizona

**GROW  
THE  
PIE**



Rhett Larson

Arizona State University Sandra Day O'Connor College of Law

Richard Morrison Professor of Water Law

Senior Research Fellow, Kyl Center for Water Policy



## Case Studies for Water Dispute Dilution Project:

1. Augmented Water for Refugee Water Conflict and State Tribal Settlements
2. The Red Sea/Dead Sea Project & its Implications for the Colorado River
3. State General Stream Adjudications & Augmentation Options





# Holistic Water Solutions

*This effort is made possible by the support of the American People through the United States Agency for International Development (USAID) and the cooperation of Arizona State University (including the Sandra Day O'Connor College of Law, Walton Sustainability Solutions, Ira A. Fulton School of Engineering, and the Julie Ann Wrigley Global Institute of Sustainability), H2O for Humanity, Zero Mass Water, GreenCo, the René Moawad Foundation, and Mercy Corps. The views and information expressed in this presentation are the sole responsibility of the presenter, and do not necessarily reflect the views of USAID, the United States government, Arizona State University, or the other partners to this project.*



# Holistic Water Solutions



## H2O for Humanity & AquaSafi Systems

- 150 villages in India serving 140,000 people
- Financially Sustainable at \$0.02/liter
- AquaSafi-2000 has 250 cubic meter footprint; produces around 1,300 liters/hour
- AquaSafi-6000 developed specifically for HWSI

**[watersolutions.asu.edu](http://watersolutions.asu.edu)**



# Holistic Water Solutions

## Universal Power Supply: ASU Engineering

Objectives include (1) lead collaboration to complete a full system redesign of the water kiosk (water system, power system) to reduce energy consumption, and (2) provide renewable energy integration and back-up power in the event of grid outage.

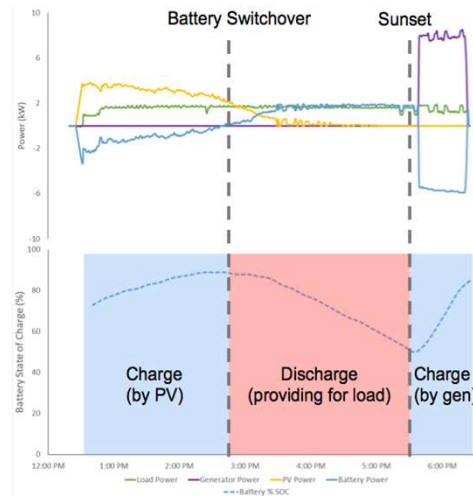
*Example: Containerized microgrids for disaster response*



**Packed for shipment**

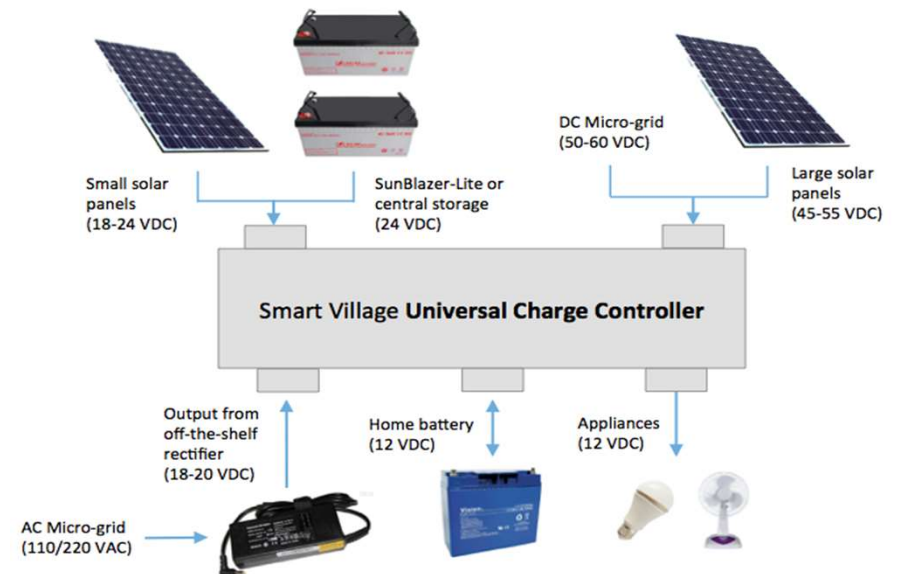


**Unpacked and powering  
20 kW of loads**



**Real-time operation to  
reduce diesel fuel use**

*Example: Universal charge controller for off-grid power*



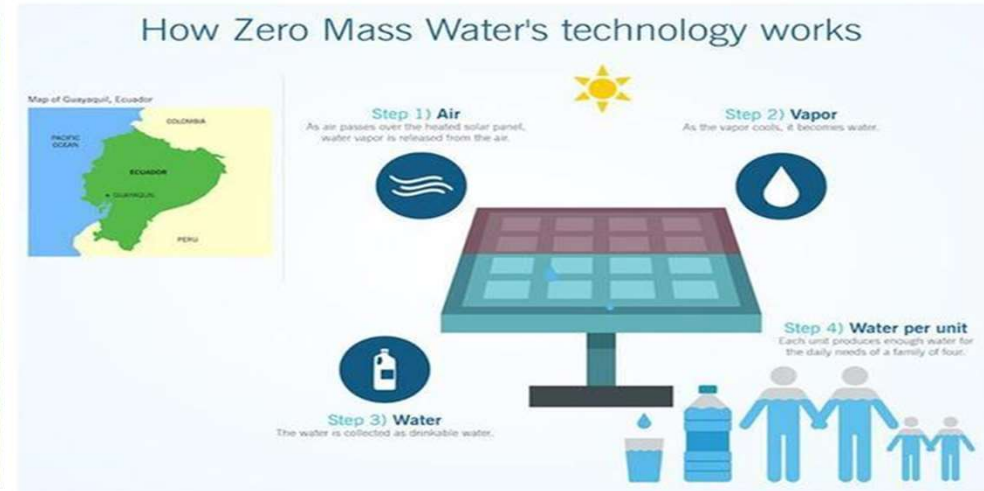
**Seamless integration for connecting solar homes,  
microgrids, and battery charging stations**



# Holistic Water Solutions



**GreenCo Water**



**Zero Mass Water**





# Holistic Water Solutions

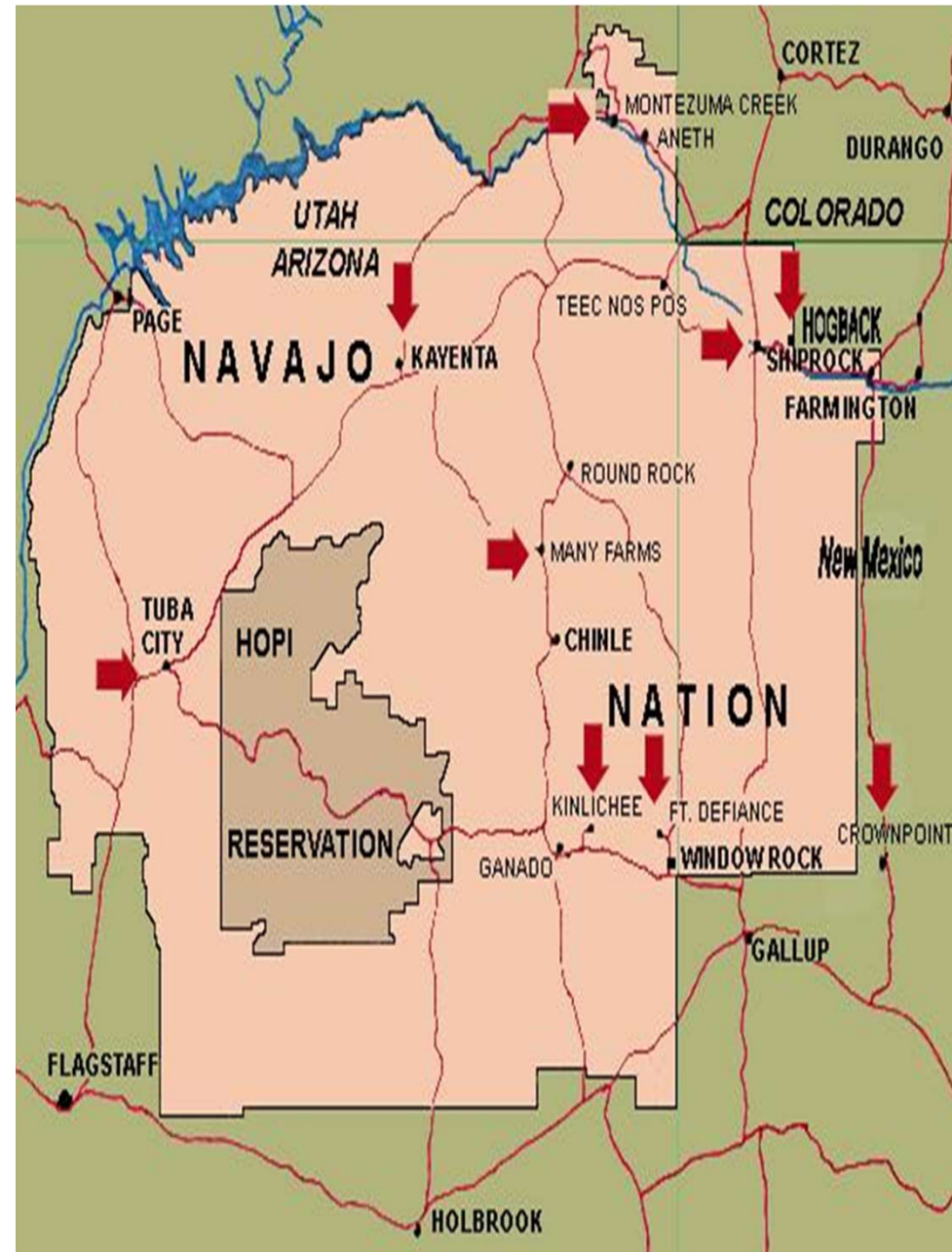
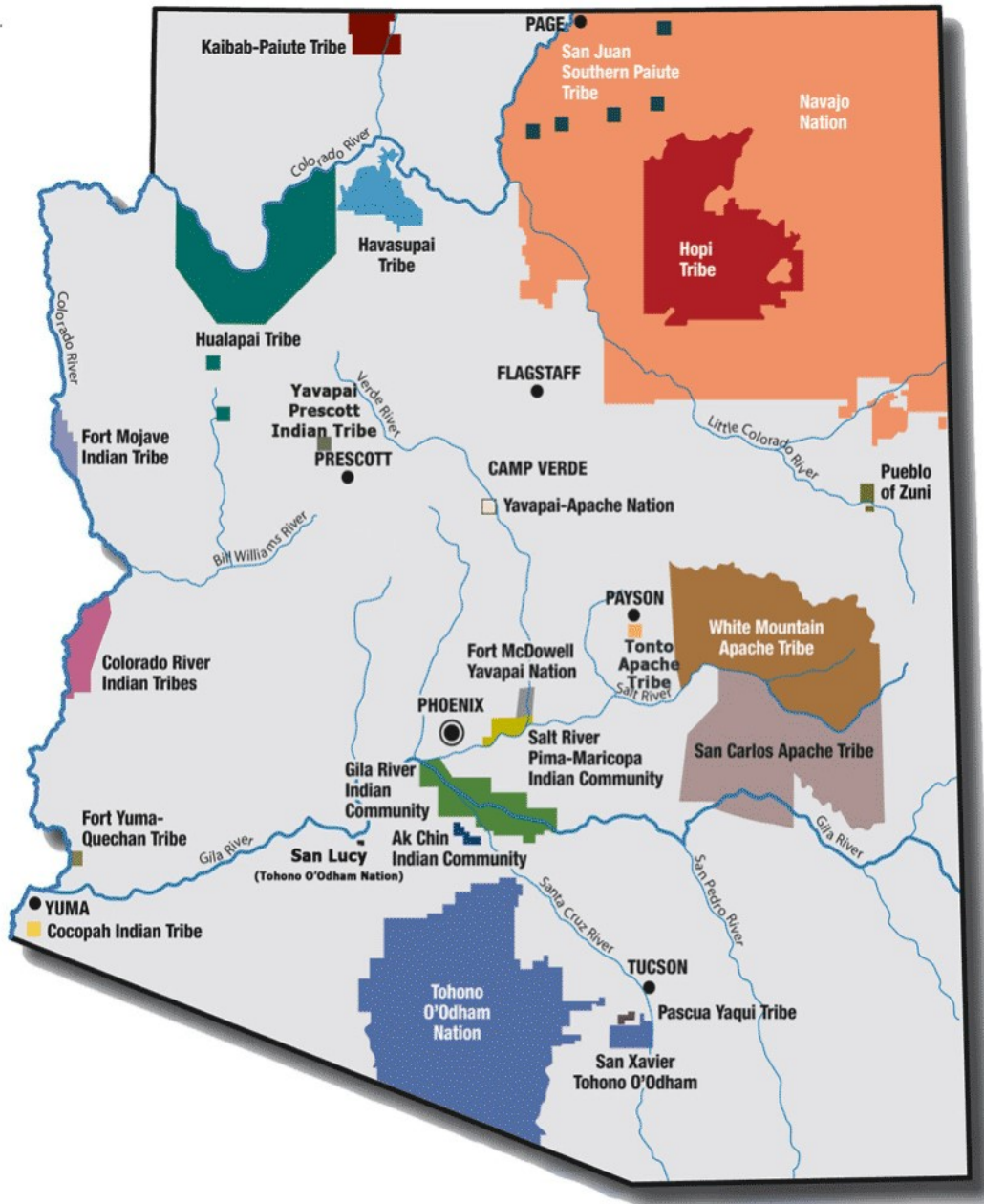


Initially, we proposed to serve 36,500 people in 18 refugee host communities in Lebanon and Jordan for \$2 million in 2 years. We are now serving over 185,000 people in 29 communities, on time and on budget.





# Water Security for the Hopi and the Navajo Nation







# Sharing the Colorado River in the U.S.

# The Structural Deficit

## Interstate Water Law

# Supreme Court Equitable Apportionment

# Congressional Apportionment

# Compact Apportionment

# The Law of the River

# Colorado River Compact Boulder Canyon Project Act

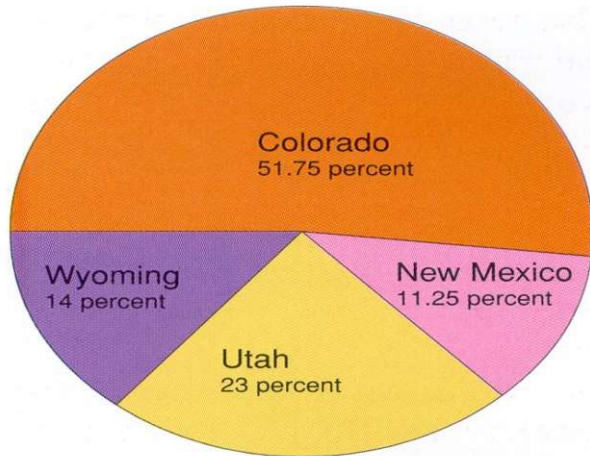
# Arizona v. California

## Dept of Interior Guidelines

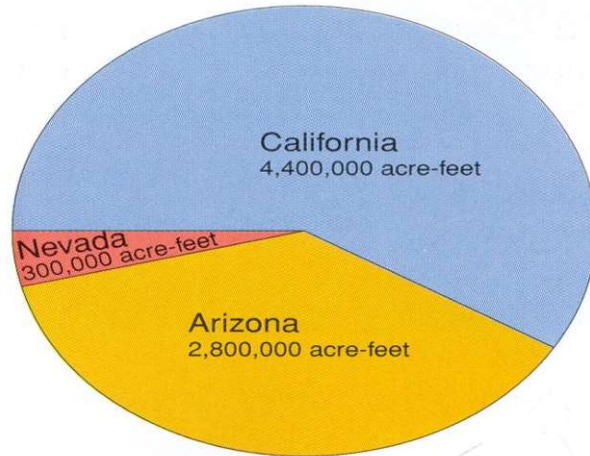


# Colorado River Inter-State Allocation

7.5 maf to Upper; 7.5 maf to Lower;  
1.5 maf to Mexico



The upper basin states  
water division.



The lower basin states water division.





# Lake Mead

## 2007 Shortage Sharing Guidelines

Jan 1st elevation	Arizona reduction	Nevada reduction	Mexico reduction
1075'	320,000 AF	13,000 AF	50,000 AF
1050'	400,000 AF	17,000 AF	70,000 AF
1025'	480,000 AF	20,000 AF	125,000 AF

No reductions to California

In Minute 319 & 323, Mexico agreed to voluntary reductions







# The Drought Contingency Plan



# LBDCP Water Use Reductions

Lake Mead Elevation	AZ [2007]	AZ [Plan]	AZ TOTAL	NV [2007]	NV [Plan]	NV TOTAL	CA [2007]	CA [Plan]	CA TOTAL	BOR	TOTAL
1090-1075	0	192K	192K	0	8K	8K	0	0	0	100k	300k
1075-1050	320K	192K	512K	13K	8K	21K	0	0	0	100k	633k
1050-1045	400K	192K	592K	17K	8K	25K	0	0	0	100k	717k
1045-1040	400K	240K	640K	17K	10K	27K	0	200K	200K	100k	967k
1040-1035	400K	240K	640K	17K	10K	27K	0	250K	250K	100k	1,017k
1035-1030	400K	240K	640K	17K	10K	27K	0	300K	300K	100k	1,067k
1030-1025	400K	240K	640K	17K	10K	27K	0	350K	350K	100k	1,117k
<1025	480K	240K	720K	20K	10K	30K	0	350K	350K	100k	1,200k





# The Red/Dead Project







Colorado River Drought  
Contingency Plan & the  
Salton Sea





# Los Angeles Wildfires & Water





# Prior Appropriation

JUNIOR USER 1970 water right →

First-in-time, First-in-right  
Beneficial Use Without Waste  
Forfeiture – use it, or lose it  
Diligence & “Relation-Back”  
Call on the River &  
the Futile Call Doctrine  
General Stream Adjudications

← SENIOR USER  
1910 water right



# Resolving Water Rights Uncertainties

## Major Obstacles to Resolution

- **Institutional Competency**
- **Transaction Costs**
- **Subflow**
- **Forest Management**
- **Water Transfer Basins**
- **Expand Bartlett Dam**

