Presentation Overview

- History of GWMA
- Overview of AZ Approach
- Lessons Learned
- Challenges
- Discussion
Colorado River Basin States | Water Supplies by Source 2010

Percentage Colorado River (approximate)

- AZ – 40%
- CA – 10%
- NV – 15%
- CO – 15%
1973 Water Adequacy Statute

1980 Groundwater Management Act
- Established the Arizona Department of Water Resources (ADWR)
- Established Active Management Areas (AMAs) & Irrigation Non-Expansion Areas (INAs)
- Established Assured and Adequate Water Supply Programs

1994 – Underground Water Storage, Savings and Replenishment Management Act

1996 – Arizona Water Banking Authority

2007 – SB1575 – Mandatory Adequacy
Arizona Water Management Policy

Evolution Shaped By

• Resource Availability

• Economics of Acquiring, Treating & Distributing

• Cultural Foundations for Resource Use

• Legal Framework of Ownership & Management

• Politics of Area & Major Players
### Arizona Groundwater Management Act

**Drivers**

- Groundwater Overdraft
- Secure CAP Authorization
- Legal Conflicts over Water Rights (FICO)

**Goals**

- Control severe overdraft occurring in certain parts of Arizona.
- Allocate limited groundwater resources to meet changing needs
- Augment Arizona’s groundwater supplies.
Arizona’s Management Framework:

- Regulatory Approach
- Management Areas vs Statewide
- State vs Regional/Local Control
- Groundwater / Surface Water Dichotomy
- Rights System with Grandfathering

............... & Consequences
Arizona Water Management

Management Structure

State-Wide Provisions
Irrigation Non-Expansion Areas; and
Active Management Areas
Arizona Water Management

Statewide Water Management Programs

• Well Drilling (NOI) & Construction
• Adequate Water Supply Provisions & SB 1575
• Growing Smarter – Water Adequacy Element
• Water Measurement & Planning – HB 2277
• Groundwater Transfer Restrictions
• Surface Water Rights Administration
• Arizona Water Protection Fund
• Rural Watershed Initiatives
Water Management Areas

Prescott AMA goal: safe-yield by 2025

Joseph City INA: No new irrigated lands

Phoenix AMA goal: safe-yield by 2025

Pinal AMA goals:
- allow development of non-irrigation uses
- preserve agriculture as long as feasible

Tucson AMA goal: safe-yield by 2025

Santa Cruz AMA goal:
- maintain safe-yield
- prevent decline of water table

Douglas INA: No new irrigated lands

Harquahala INA: No new irrigated lands
Active Management Areas

- Withdrawal Authorities
- Demand Management: Conservation Requirements & Use Restrictions
- Supply Management: Conversion to Renewable Water Supplies
ARIZONA’S WATER MANAGEMENT TOOLS - AMAs

CONSERVATION REQUIREMENTS

FOR:

→ **AGRICULTURE**

→ **MUNICIPAL** - Cities, Towns, Private Water Companies, and Irrigation districts

→ **INDUSTRIAL**
  - Turf Facilities
  - Power Generation
  - Large Landscaping
  - Mining
  - Dairies/Feedlots
  - Large Cooling
  - Sand & Gravel

Mining
ARIZONA’S WATER MANAGEMENT TOOLS - AMAs

• CONVERSION TO RENEWABLE SUPPLIES

• Incentives for use of Renewable Supplies

• Underground Storage / Recovery Permits

• Assured Water Supply Requirements for New Subdivisions
Recharge & Recovery

Arizona Water Banking Authority

- Established **1996**
- Stores unused Colorado River water, to be used in times of shortage
- Bank stored **3.4 Million** acre-feet **1,100 Billion** gallons
  - Total stored statewide: **9 Million acre-feet** or **3,000 Billion gallons**
ARIZONA’S WATER MANAGEMENT TOOLS - AMAs

CONVERSION TO RENEWABLE SUPPLIES

Assured Water Supply Rules

– Must demonstrate AWS to subdivide land
– Requires 100 year supply
– Must be consistent with AMA Goal
  • e.g. safe yield
– Meet water quality standards
– Prove Financial capability
Water Management

Arizona’s Water Management Success


<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Total Water Use (in million acre-feet)</th>
<th>Population (in millions)</th>
<th>Gross Domestic Income (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1957</td>
<td>7.1 maf</td>
<td>1.1</td>
<td>$13.4</td>
</tr>
<tr>
<td>2015</td>
<td>6.9 maf</td>
<td>6.8</td>
<td>$243.1</td>
</tr>
<tr>
<td>Change from 1957-2015</td>
<td>-3%</td>
<td>504%</td>
<td>1,716%</td>
</tr>
</tbody>
</table>

Source: ADWR, 2015
ARIZONA’S MUNICIPAL WATER MANAGEMENT INVESTMENTS

1980 - 2000 AMWUA – 8 cities

(million dollars)

• Capital Cost for Renewable Supply $1,253
  o Surface water treatment & delivery
  o Acquisition of renewable supplies
  o Water reclamation
  o Development of recharge projects

• Water Conservation Programs 33

Total $1,286
ARIZONA WATER MANAGEMENT - Evolution of Focus

• 1980’s – Demand Side / Conservation
  o Develop & Implement Conservation Requirements & Models
  o Quantify Water Rights
  o Focus on Compliance

• 1990’s – Supply Side
  o Assured Water Supply & Recharge
  o Groundwater Replenishment District

• 2000’s – Banking & Statewide Planning

• 2010’s – Rest of State & Shortage Concerns
  o Rural area challenges – region’s left out of AMA’s
  o Need for localizes approaches & mechanisms
  o Colorado River management and shortage concerns
ARIZONA WATER MANAGEMENT POLICY

Institutional Changes Supporting Transition

• Recharge Program 86 & 94
• Assured Water Supply Rules – 95 … Adequacy - 07
• Central AZ Groundwater Replenishment Dist.- 94
• AZ Water Banking Authority – 96
• Indian Water Rights Settlements
• Planning Requirements - Ongoing Adjustments
• Colorado River Management – Ongoing Adjustments
ARIZONA’S WATER MANAGEMENT TOOLS - AMAs

Evolution of Programs

- Target/Allocation Tied to Conservation Potential
- Prescriptive Program Options Added
- Increased Flexibility & Complexity
- Regulation of Additional Sectors
- De-regulation of Small Rights
- Increased Emphasis on Supply Source
- Increased Potential for Tech Assistance
Water Management Policy

Additional Observations On Key Lessons

- Allowing Programs to Evolve Over Time
- Flexibility to Deal With Fluctuations in Use
- Reporting of Water Use & Maintaining Data
- Importance of Enforcement Authority
  ($10,000 per day, $200/af)
- Quantifying & Grandfathering Rights to Facilitate Conservation
- Certainty over Rights to Facilitate Investments
- Relationships are Critical – Recognize Long Term Nature
Water Management Policy

Governance Questions & Challenges

• Appropriate Level of Government for Different Activities
  o Assured Supply – need state mandates
  o Conservation – closer to end user the better

• Policy Approach – Politics Linkage
  o Regulate vs Partner vs Incentivize
  o Beware of Unintended Consequences (Youngs Farm)
  o Keep Water Policy Isolated from Broader Political Dynamics

• Capitalize on Opportunity & Crisis
Emerging Challenges

• Demand UP .... Supply DOWN
• The Structural Deficit plus Climate Impacts
• Impact of Reduced Supply on GW Mgmt Programs
• Future of Agriculture
• Pressure for Water Transfers
• Rural vs Urban Water Uses
• GW Mgmt Approaches for Rural Areas
• Environmental / Habitat Uses
• Multi-Jurisdictional – Tribal - Bi-National Coordination and Conflict
• Governance – Need More or Less Engagement
• Increasing Uncertainty
• Land is a Key
Jim Howay, Director
Babbitt Center for Land and Water Policy
jholway@lincolninst.edu
602.393.4305