### NGA Water-Energy Nexus Learning Lab Agricultural Sector Water Use Efficiency

Clint Chandler Deputy Director Arizona Department of Water Resources September 2, 2020



Arizona's Water Future

# If there's one thing Arizona is the best in the nation at – it's water.

GOVERNOR DOUG DUCEY THE STATE OF THE STATE ADDRESS (1.11.16)

### **ARIZONA'S WATER MANAGEMENT SUCCESS**









#### Yuma Agriculture Efficiency

Agribusiness in Yuma has adapted to changing technologies and markets to evolve into a world class venture that is a model for efficiently using water to maximize agricultural production and economic value. It is a driving force for the financial strength of the community in Yuma and is a key component of Arizona's vibrant economy.

> DIRECTOR TOM BUSCHATZKE "A CASE STUDY IN EFFICIENCY – AGRICULTURE AND WATER USE IN THE YUMA, ARIZONA AREA, FEBRUARY 2015"

# Yuma Agriculture Efficiency

- There have been numerous changes within the Yuma districts to improve water use efficiency. They include:
  - Modifications of conveyance systems and turnouts to allow high volume deliveries
  - Implementation of improved scheduling
  - Delivery practices including the use of Supervisory 12 Control and Data Acquisition (SCADA) systems for gate control and the use of electronic metering devices.





# 1980 Groundwater Management Code

Issue: Severe groundwater depletion

**Approach:** Collaborate among different sectors and stakeholders **Goals:** 

- Control severe groundwater depletion
- Improve groundwater supplies through conservation and development of additional water supplies
- Provide the means for allocating Arizona's limited groundwater resources

Solution: Groundwater Management Code



Former Arizona Governor and Interior Secretary Bruce Babbitt signing the GMA

# Groundwater Management Active Management Areas

# Active Management Areas (AMAs)

- Phoenix
- Pinal
- Prescott
- Santa Cruz
- Tucson

# Irrigation Non-Expansion Areas (INAs)

- Joseph City INA
- Harquahala INA
- Douglas INA



# **Active Management Area Goals**

#### **Phoenix AMA**

To achieve safe-yield by the year 2025

#### **Pinal AMA**

• To preserve agricultural economy for as long as feasible, while considering the need to preserve groundwater for future non-irrigation uses

#### **Prescott AMA**

• To achieve safe-yield by the year 2025

#### **Tucson AMA**

To achieve safe-yield by the year 2025

#### Santa Cruz AMA

 To maintain a safe-yield condition in the active management area and to prevent local water tables from experiencing long term declines

# **Groundwater Regulatory Structure**

**Statewide** 

INA

- Registration of all wells
- Adequate Water Supply
- Community Water Systems Documentation

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- Expansion of irrigated acres is prohibited
- Monitoring and Reporting

#### +

- Assured Water Supply
- Groundwater Withdrawal Fees
- Management Goals, Plans & Conservation Programs

AMA

# **Agricultural Base Program**

Each irrigation groundwater right is assigned a maximum annual groundwater allotment based on the water duty and water duty acres associated with the land, while allowing for some flexibility.

#### **Components of the Base Program**

- Water Duty The amount of water that is reasonable to apply to irrigated land
- Water duty acres The highest number of acres irrigated between 1975 1980
- Flexibility account allows right holders to accrue credits or debits based on annual water use to accommodate for varying climatic and market conditions

# **Best Management Practices Program**

#### A.R.S. § 45-568.02 (G)

The BMP Program shall be designed to achieve conservation that is at least equivalent to that required under the Base Program

- Farm operator agrees to implement approved BMPs on their farm relating to water conveyance, irrigation systems, and efficient water & soil management practices.
- Must implement and report on practices annually, in addition to adhering to water use reporting requirements, under BMP farm unit number.
- No annual allotment to adhere to, therefore the water duty and flexibility account provisions are irrelevant to IGFRs while enrolled in the BMP Program.

#### Category 1:

#### Water Conveyance System Improvements

Participants may earn points based on the percentage of the farm's acreage that is served by an approved conveyance system.

- Concrete lined ditch
- Pipelines
- Drainback system





#### Category 2:

#### Farm Irrigation Systems

Participants may earn BMP points based on the types of irrigation systems used. More efficient types of irrigation systems are granted more points.

- Slope Systems
- Sprinkler Systems
- Drip Systems







#### Category 3:

#### **Irrigation Water Management Practices**

Participants may earn BMP points by implementing practices that will increase a farm's overall efficiency of water application in a growing season.

- Field management such as laser touch-up or furrow checks
- Irrigation management such as surge, temporary sprinklers, or scheduling services
- Continuing education



#### Category 4:

#### **Agronomic Management Practices**

Participants may earn BMP points by implementing combinations of plant and soil management practices to conserve water over the length of growing season.

- Crop management: rotation, use of transplants, residue management, etc.
- Other agronomic practices: surface conditioning, using plastic mulch, planting in the bottom of furrows, etc.









# **Agricultural Data – Reporting Entities**

# Water use data reported to ADWR comes from:

- Irrigation rights greater than 10 irrigation acres
- BMP Farm Units
  - Can be made up of multiple Irrigation Rights, but only submit one report
- Irrigation Districts
  - Some districts report on behalf of their right holders



# **Agriculture Water-Use by Source**



Agricultural groundwater use has declined ~37% since 1985 in response to the introduction of CAP water to the AMAs

#### Arizona's Water Future

As Arizona transitions to a drier future, we must continue to promote a culture of conservation - one that enables the unbeatable quality of life and boundless opportunity we enjoy.

> GOVERNOR DOUG DUCEY SIGNS ARIZONA DCP LEGISLATION (1.31.19)



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PROTECTING ARIZONA'S WATER SUPPLIES for ITS NEXT CENTURY