



Data for Water Use Efficiency and Water Management

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Agenda

- Introduction
- Customer Specific Data and Water Use Efficiency
- Data Uses in Water Supply Planning
- Challenges and Opportunities



EMWD's Service Area

- Established in 1950
- Unique agency, serving:
 - Water/wastewater/recycled
 - Wholesale and retail
- 555 square miles
- Population: 825,000
- Moreno Valley to Temecula
- Seven cities and the unincorporated areas
- One of 26 member agencies of The Metropolitan Water District of Southern California (MWD)



High-growth area that is 38% built-out

EMWD Services

- **Potable Water:** Approx. 144,000 accounts
 - Imported water from the State Water Project and Colorado River
 - Directed treated deliveries from MWD
 - Two Ultra-filtration plants
 - Groundwater wells (adjudicated - managed basin)
 - Brackish desalination
- **Wastewater:** Approx. 239,000 accounts
 - Four regional water reclamation facilities
- **Recycled Water:** Approx. 300 accounts
 - 35,617 acre feet sold in FY 2014/2015
 - Approximately 10,800 acres of agriculture irrigated by recycled water





Customer Specific Data and Water Use Efficiency

Allocation Based Tiered Rate Structure

- Creates a **“Allocation”** or **“Water Budget”** for each customer account based upon reasonable indoor and outdoor needs and efficient use
- Focuses on Equity: Those who need more have a higher budget, those who need less cannot waste
- Uses **Economic Incentives**: Water is priced to customer **lower for use within budget** and much **higher for use over budget**
 - Rewards efficiency
 - Communicates cost of water over-use
- **Identifies Over-use customers**: water bill functions as “report card” – focus staff resources
- Tied to the EMWD’s **Water Shortage Contingency Plan**



Outdoor Irrigation Budget

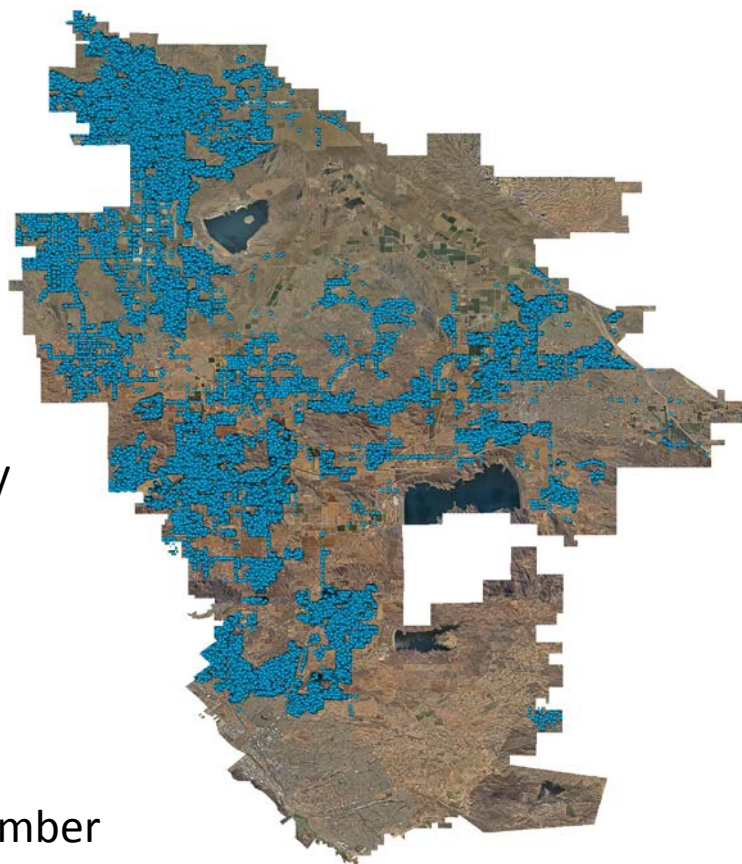
$$\text{Outdoor Budget} = (\text{Annual Evapotranspiration-Eto}) \times (\text{Landscape Area}) \times (\text{Evapotranspiration Adjustment Factor})$$

- Evapotranspiration or Eto
 - A measured weather factor of solar radiation, temperature, humidity, wind - plant transpiration
- Evapotranspiration Adjustment Factor or “ETAF”
 - Level of water use applied based upon landscape type
 - Based on the Model Water Efficient Landscape Ordinance (MWELO) in place at the time



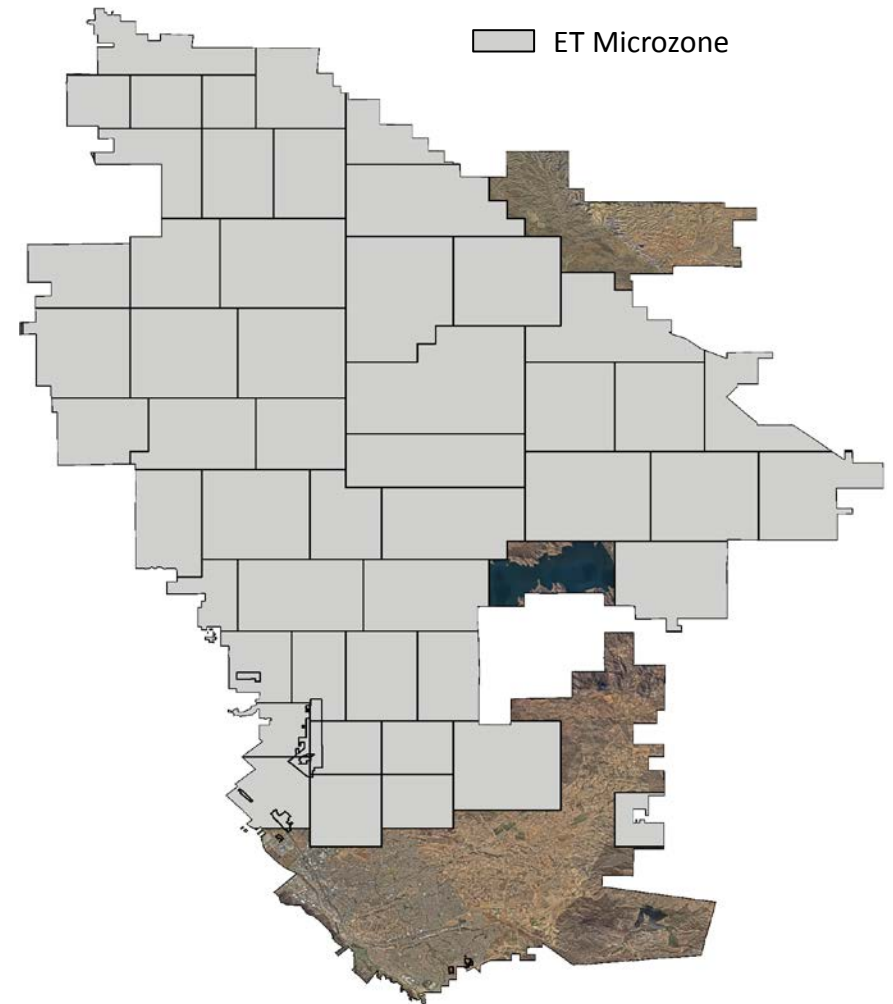
EMWD Billing System

- Each account is geolocated
 - Latitudinal/Longitudinal coordinates
 - Complete service addresses
 - Comments describing exact locations
- Historical data is recorded per account
 - Activation and Inactivation dates
 - Complete consumption and billing history
 - Meter sizes and replacements
 - Historical variance requests
 - Bill payment history
- 1 meter is assigned per account
 - Each meter is assigned a unique serial number
- Residential Dwelling Units (RDU) are recorded for all residential accounts
- Every Customer Service interaction is commented and noted



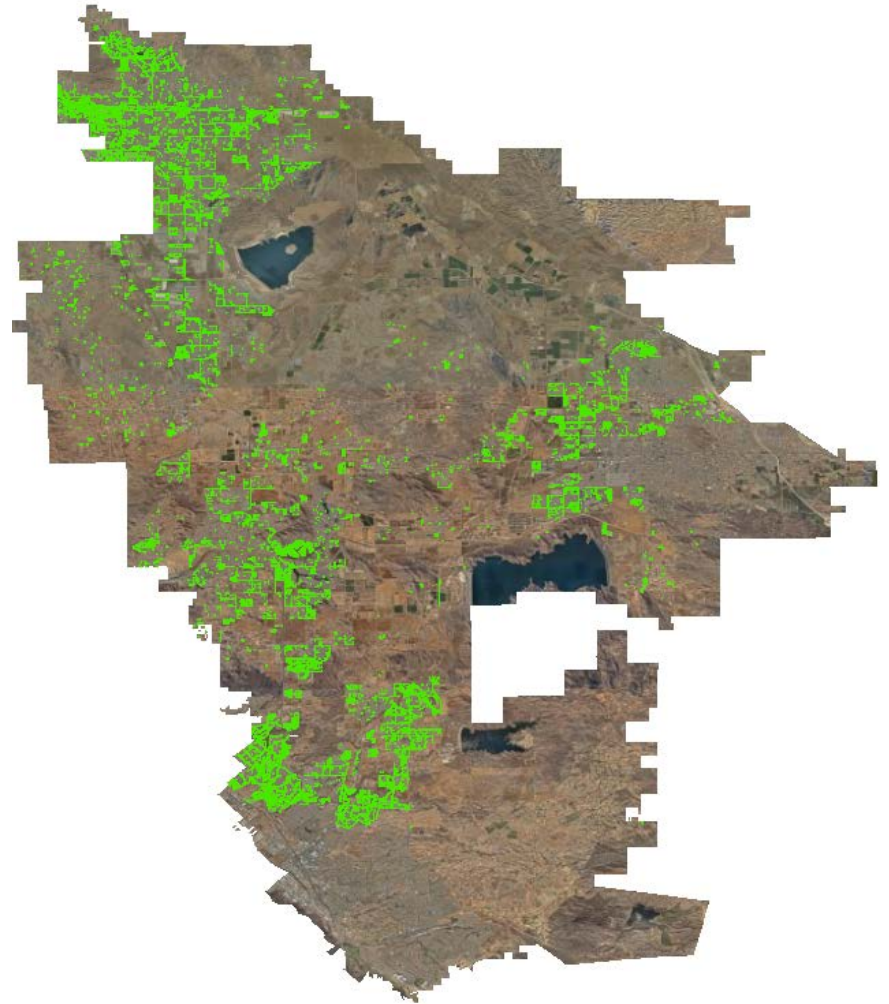
Weather Data

- California Irrigation Management Information System (CIMIS)
 - A program unit managed by the California Department of Water Resources (DWR)
 - Over 145 automated weather stations in California
- Evapotranspiration (ET) Microzones
 - Evapotranspiration data is collected for microzones across the District using spatial CIMIS information and other weather factors



Landscape Measurements

- Conservation Staff measure and track landscapes on residential and commercial properties
 - More accurate outdoor budgets
 - Track progress of installing drought tolerant landscaping
 - Information is used for targeted rebate programs



Rebate Programs

- Rebates are available for Commercial, Multi-Family, and Residential Customers
 - 17 unique rebate programs are currently monitored
 - Participants' water budgets and usage are compared to a control group's to estimate savings and program effectiveness

Residential Water Survey



Program Active Since: **Aug 2013**
 Program Participants: **1009**
 Program Type(s): **Residential**

Summary
Averages (Gal Per Month)

	Predicted Usage	Actual Usage	Savings	% Savings
Participants	19,527	13,070	6,457	33.1%
Control Group	18,075	14,240	3,835	21.2%
Net			2,622	11.9%

Medians (Gal Per Month)

	Predicted Usage	Actual Usage	Savings	% Savings
Participants	14,320	10,210	3,217	22.5%
Control Group	13,840	11,310	1,382	10%
Net			1,835	12.5%

Automated Meter Infrastructure (AMI)

EMWD expects to have its 150,000+ water meters upgraded to AMI by spring 2019

- Cost-Efficient Technology
 - Reduces employee hours dedicated to reading meters
 - Reduces need for vehicle trips
 - Reduces EMWD's environmental footprint
- Real-Time Data Link
 - Hourly meter reads
 - Daily meter reads

Providing Customers Cost-Efficient Technologies

As part of its effort to install automated water meters throughout its service area, EMWD has completed more than 110,000 meter upgrades. EMWD anticipates having all of its more than 150,000 water meters upgraded by spring 2019.

Automated Meter Infrastructure (AMI) is a safe and reliable technology that allows for a real-time data link between the meter and EMWD, allowing for timely customer notifications of potential water leaks and future access to monitor water usage up to the hour.

AMI significantly reduces the need for vehicle trips and employee hours dedicated to reading meters, which reduces costs and limits EMWD's environmental footprint.

The \$12 million AMI program is funded in part by grants from the California Department of Water Resources for programs that increase water conservation and energy savings and reduce carbon emissions.



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Current Uses

- Water loss tracking
 - Helps employees identify and locate leaks on mainlines and on the customer end
 - Improves water loss monitoring and reporting
- Customer Outreach
 - Notify customers about potential water leaks when continuous usage is identified at their meter
 - Develop scorecards – weekly reports comparing a customer’s weekly usage to their budget
 - Estimate indoor and outdoor use
 - Identify inefficient watering practices

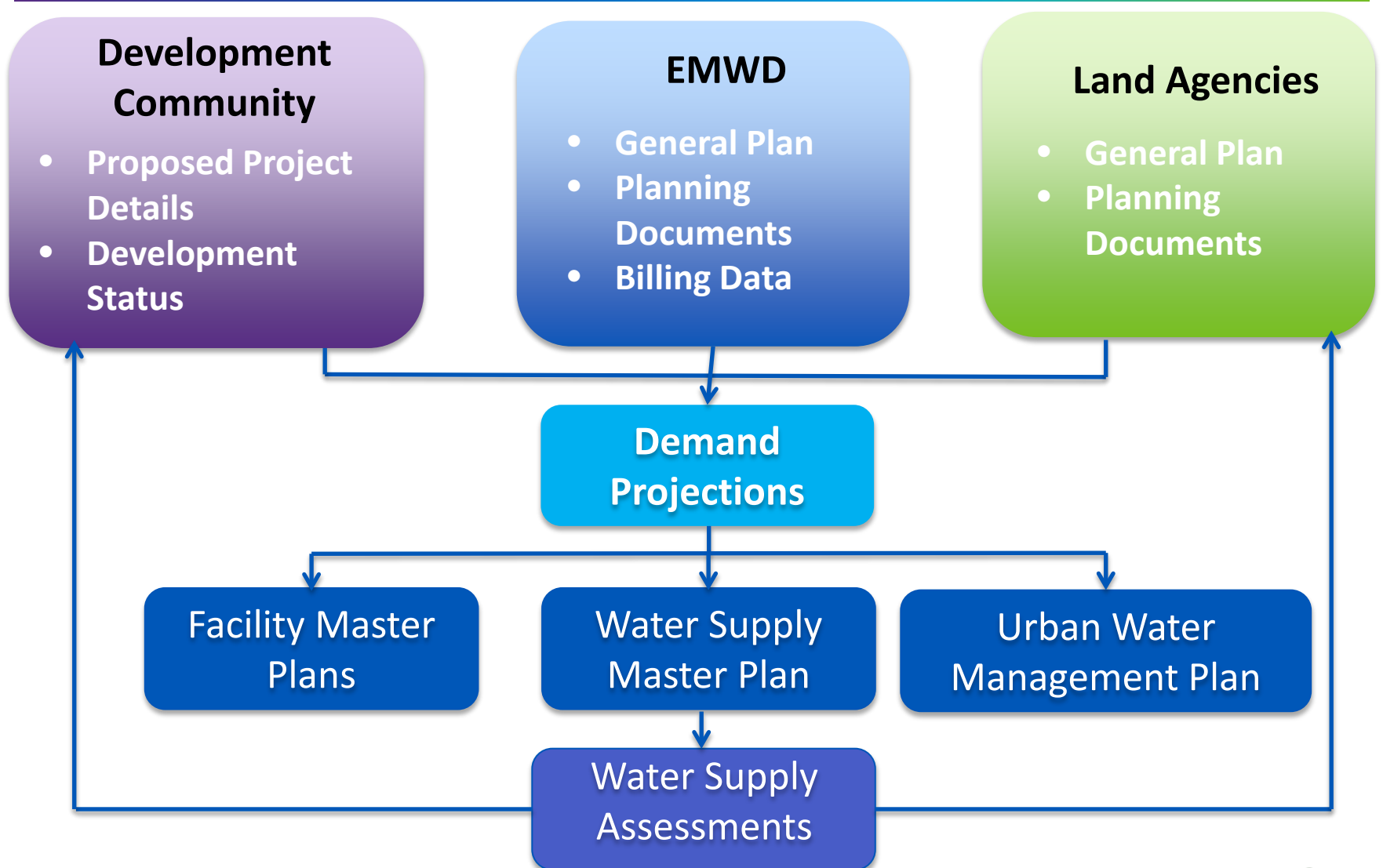




Data Use in Water Supply Planning



Land Use and Water Supply Planning



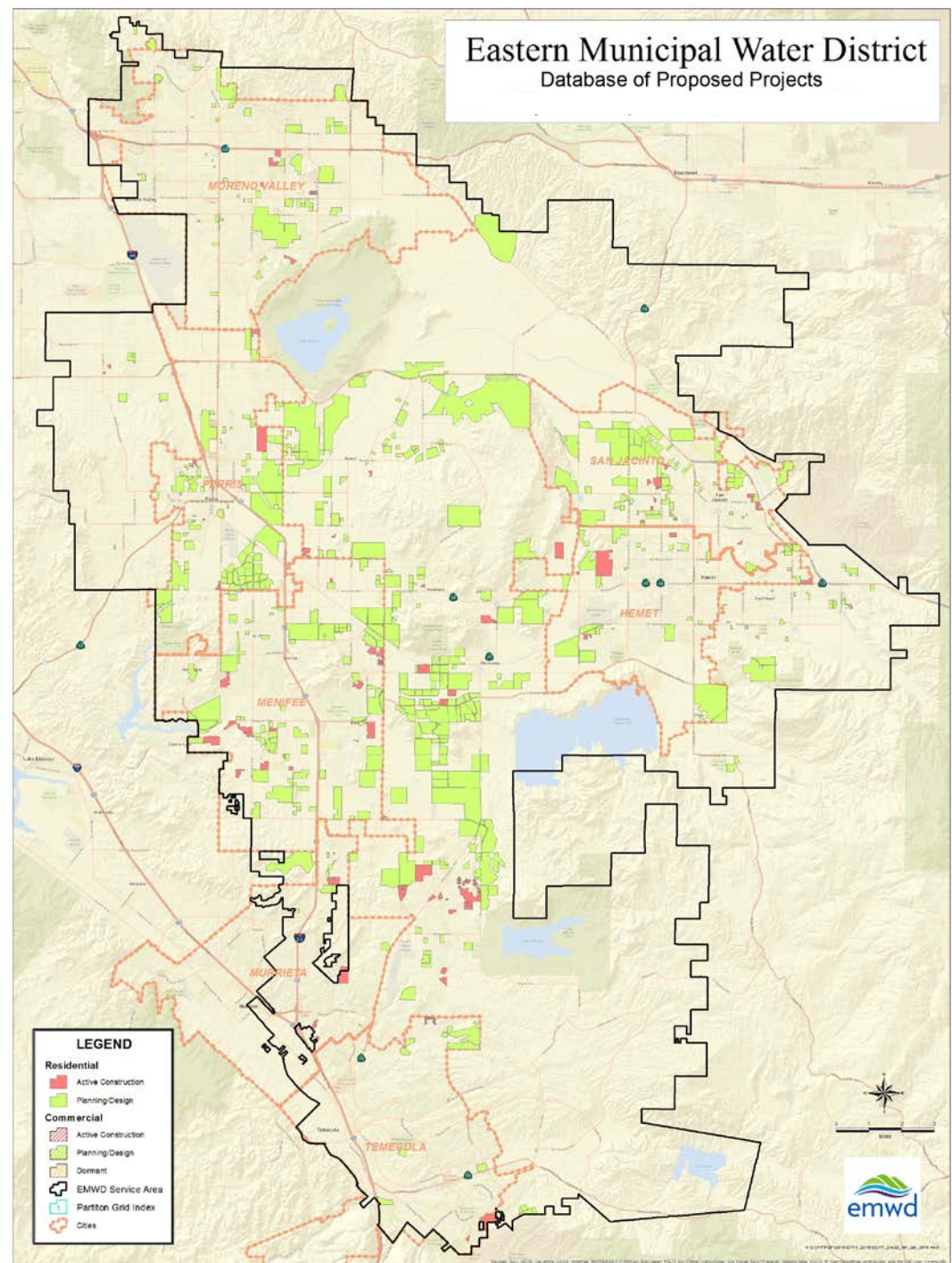
Growth Projections

Forecasts of water and wastewater connections for residential and non-residential developments is updated annually and used to project demand and plan facilities

- Projections are evaluated annually and estimate the:
 - Number of new connections
 - Water demand, wastewater flow and recycled water generation
- Annually, the following data is reviewed:
 - Number of historical connections
 - Changes in planned projects
 - Demand per unit
 - Housing development, sales, foreclosures, and market shifts

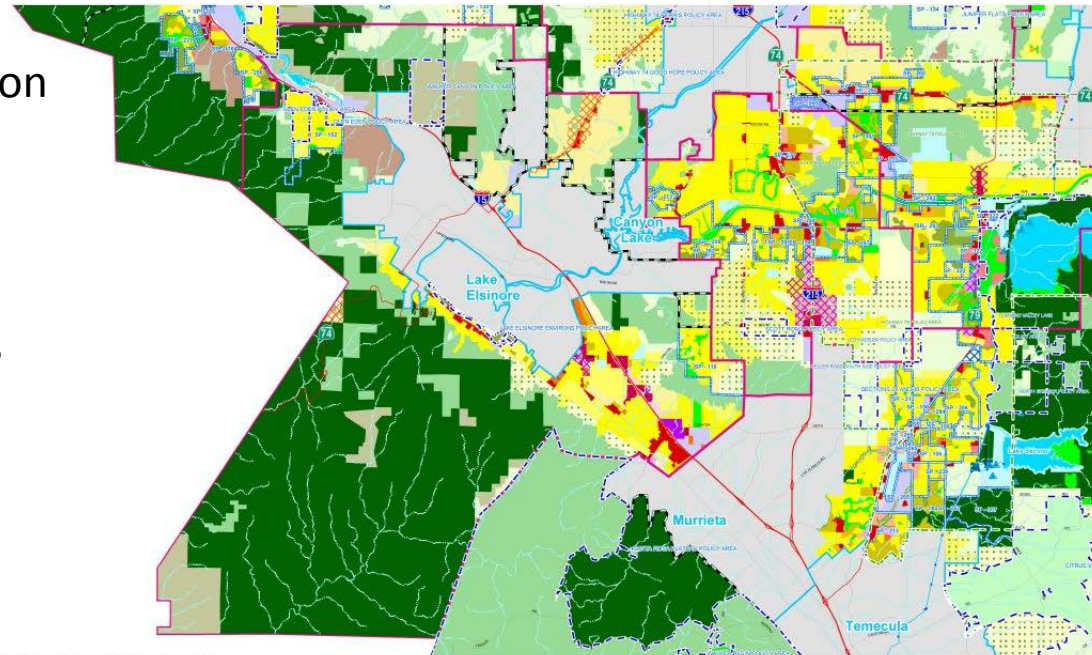
Database of Proposed Projects

- 816 Proposed residential and commercial projects
- 122,550 Proposed new homes
- Tracks from early planning stages to construction
- Input includes information from developers, local land agencies, and new business department
- Used for developing projections needed for supply and facility planning



Ultimate Land Use

- Use General Plan Updates
 - Collect and track information from seven cities and the County of Riverside
- Conservation lands
- Collected and tracked in GIS
- Integrates with DOPP



GENERAL PLAN FOUNDATION COMPONENTS AND LAND USE DESIGNATIONS

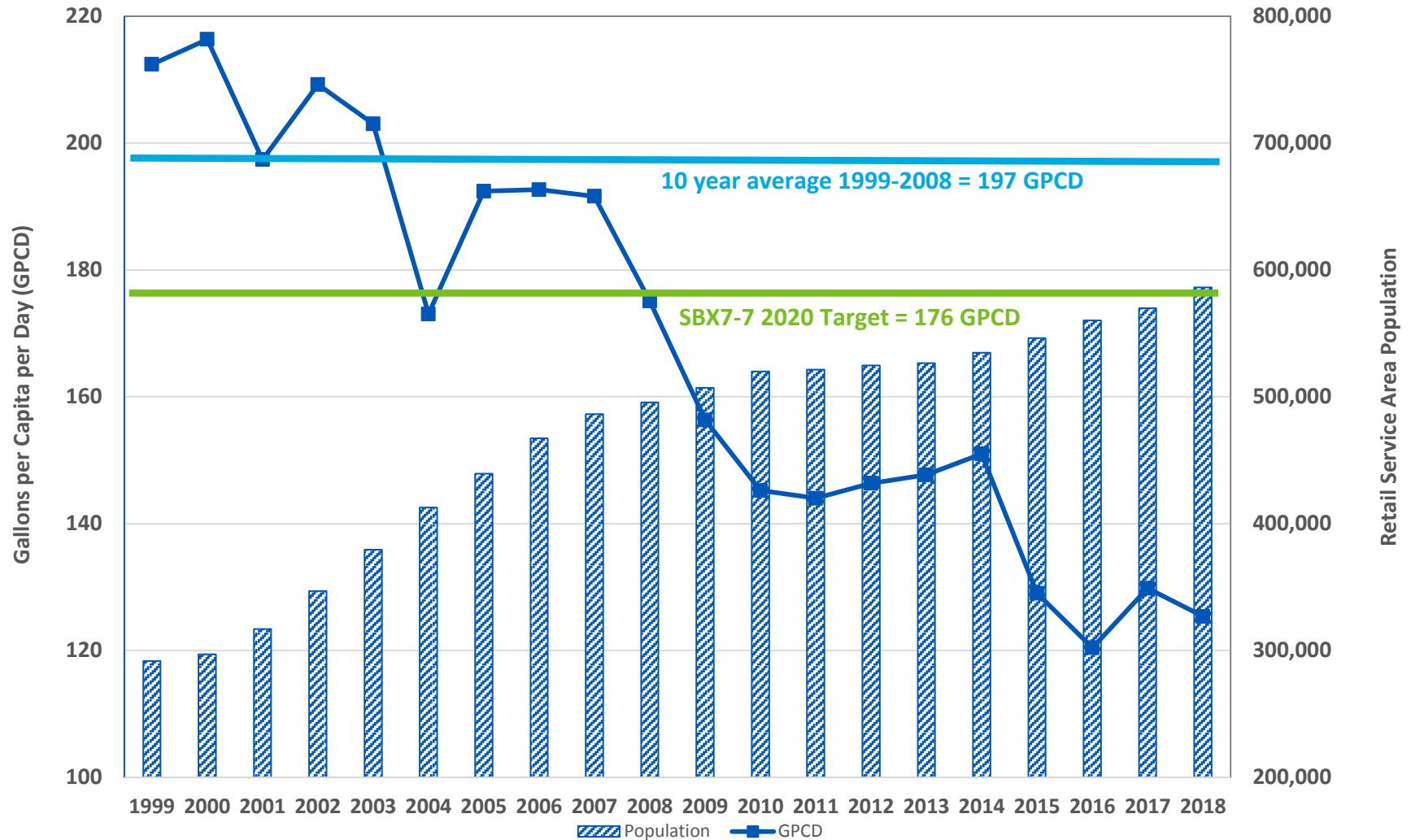
COMMUNITY DEVELOPMENT	COMMUNITY DEVELOPMENT (CONT.)	RURAL CONSISTENCY	AGRICULTURE	OVERLAYS
<ul style="list-style-type: none"> Low Density Residential (LDR) Medium Density Residential (MDR) High Density Residential (HDR) Office Community Center Public Facilities Other 	<ul style="list-style-type: none"> Commercial Office Community Center Light Industrial High Industrial Research and Development Public Facilities Other 	<ul style="list-style-type: none"> Low Density Residential (LDR) Medium Density Residential (MDR) High Density Residential (HDR) Office Community Center Public Facilities Other 	<ul style="list-style-type: none"> Agiculture Conservation Open Space - Forest Open Space - Shrub Open Space - Grass Open Space - Mixed Open Space - Wetland 	<ul style="list-style-type: none"> Historic District Community Development Conservation Special Use District Village Park Area Historic Open Space - Wetland Open Space - Wetland Open Space - Wetland

Source: Information Council. This draft land use plan is prepared for the County of Riverside Planning Department. It is subject to change without notice. This map is not a warranty, representation, or endorsement by any agency of the accuracy, reliability, or completeness of the information presented. This map is not a warranty, representation, or endorsement by any agency of the accuracy, reliability, or completeness of the information presented.



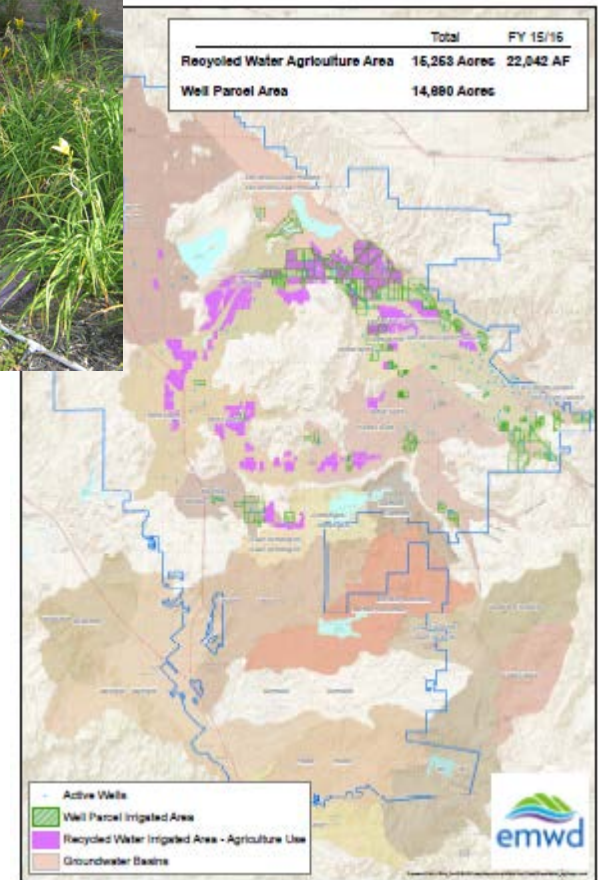
Figure 3.5
FINAL DRAFT ELSINORE AREA
LAND USE PLAN

Considering Conservation



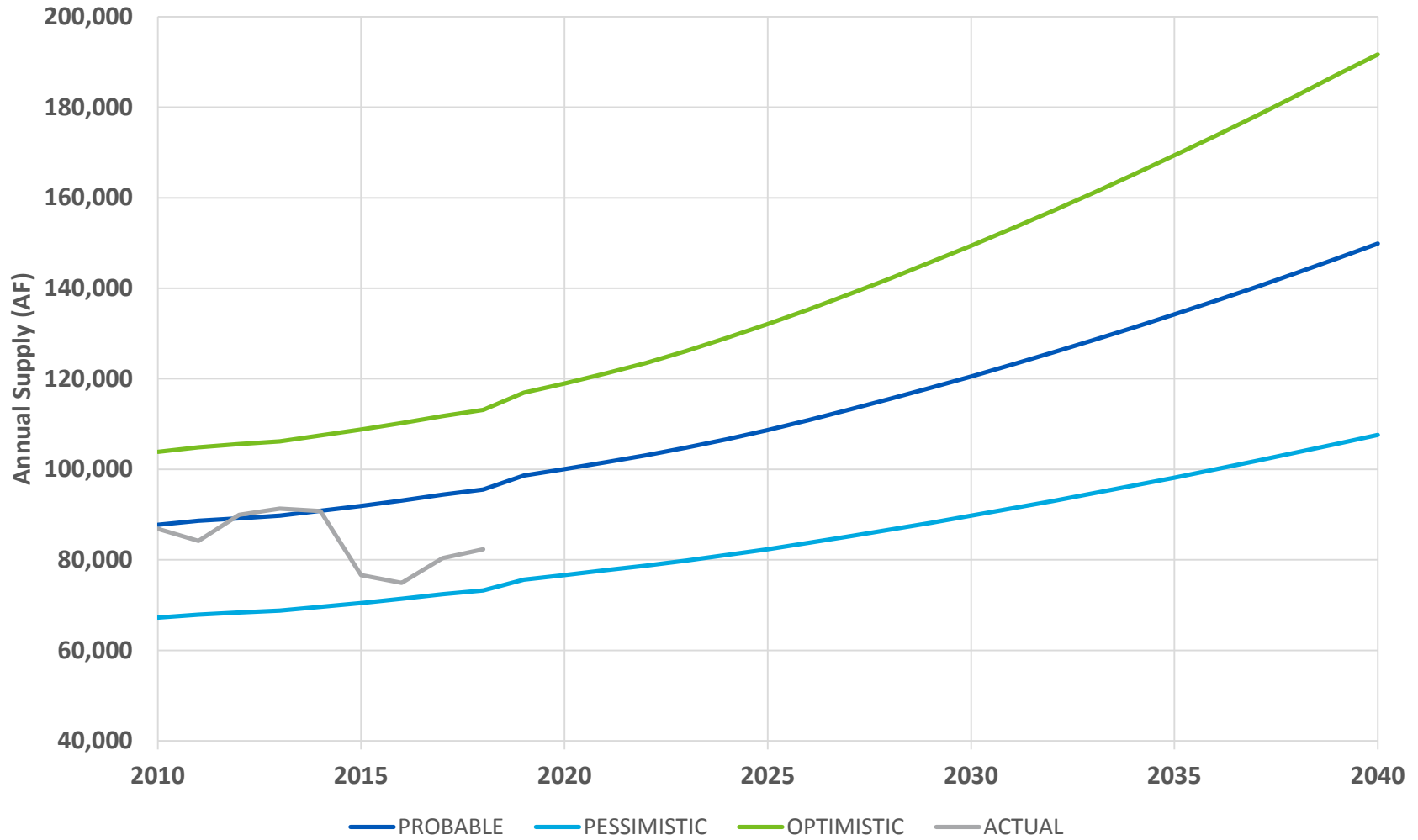
Recycled Water

- 37% of EMWD's Water Supply
- Offsets potable water use
- Agricultural and Urban Water Use
- Increases in urban land use result in an increase in supply of recycled water
- Decreases in available agricultural land can result in decrease in demand

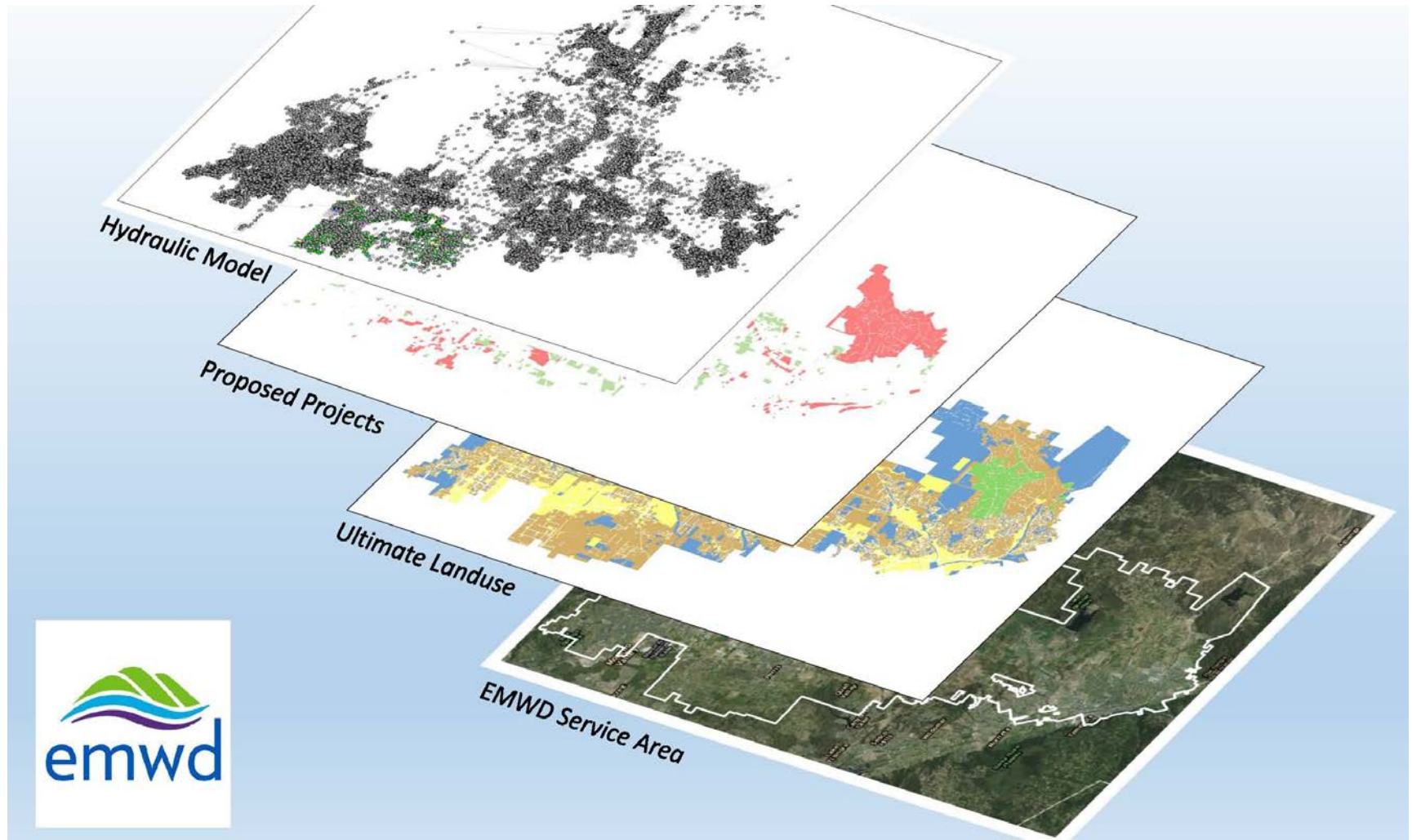


Changes in land use impact both supply and demand

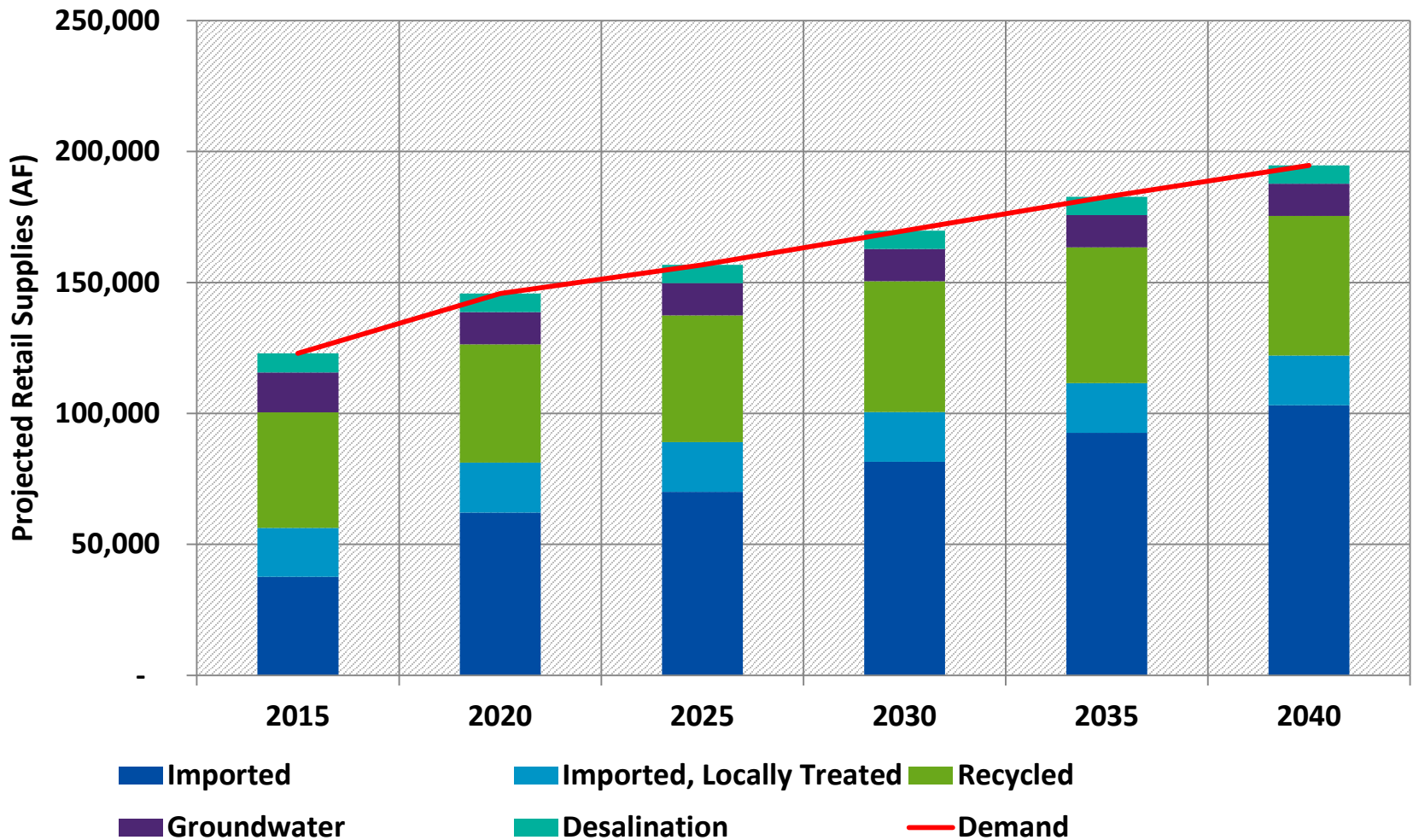
Projected Annual Demands – Potable/Raw Service



Water Supply Planning



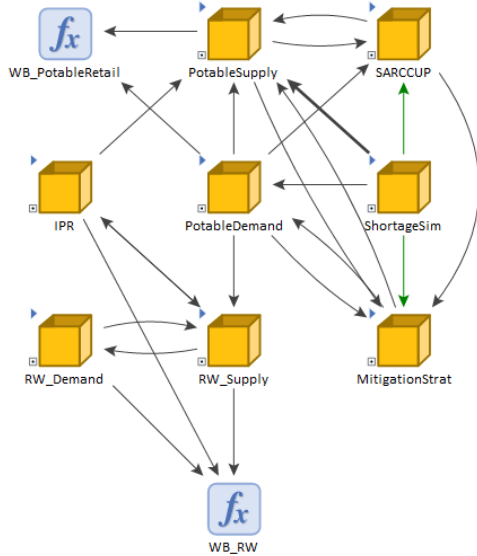
EMWD Projected Retail Supplies (2020-2040)



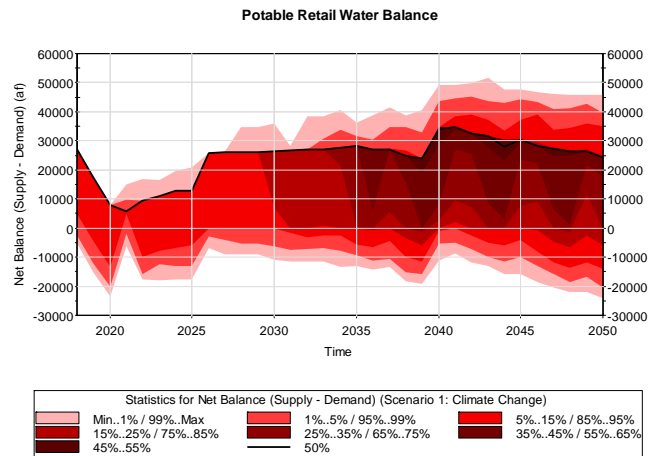
Scenario Planning

- Evaluated the resilience of EMWD's planned water supply portfolio.
- Design test scenarios to evaluate the reliability of EMWD's water supply portfolio under various conditions:
 - Prolonged drought
 - Disruption of both imported and local supplies
 - A severe regulatory environment
- Use a probabilistic model to calculate an water balance annually over the next twenty years while being stressed by the identified uncertainties.
- Data is obtained from:
 - Urban Water Management Plan (UWMP)
 - Water Supply Strategic Plan
 - Recycled Water Strategic/Master Plan
 - MWD's 2015 Integrated Water Resources Plan (IRP)
 - EMWD Billing System
 - California Irrigation Management Information System (CIMIS)

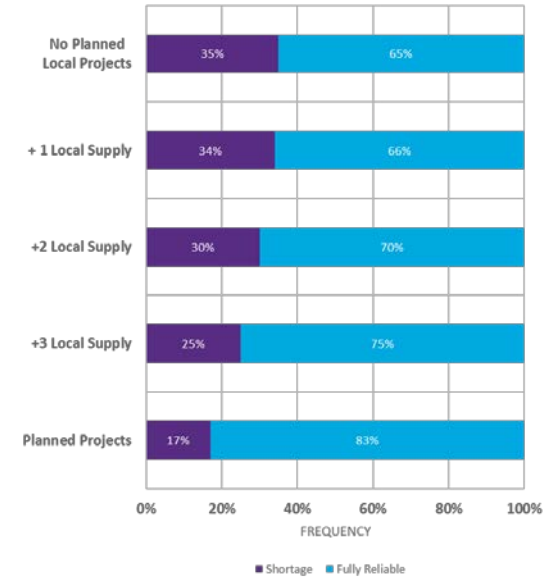
Scenario Planning



Model Inputs



Model Outputs



Presentation Summary



Challenges and Opportunities



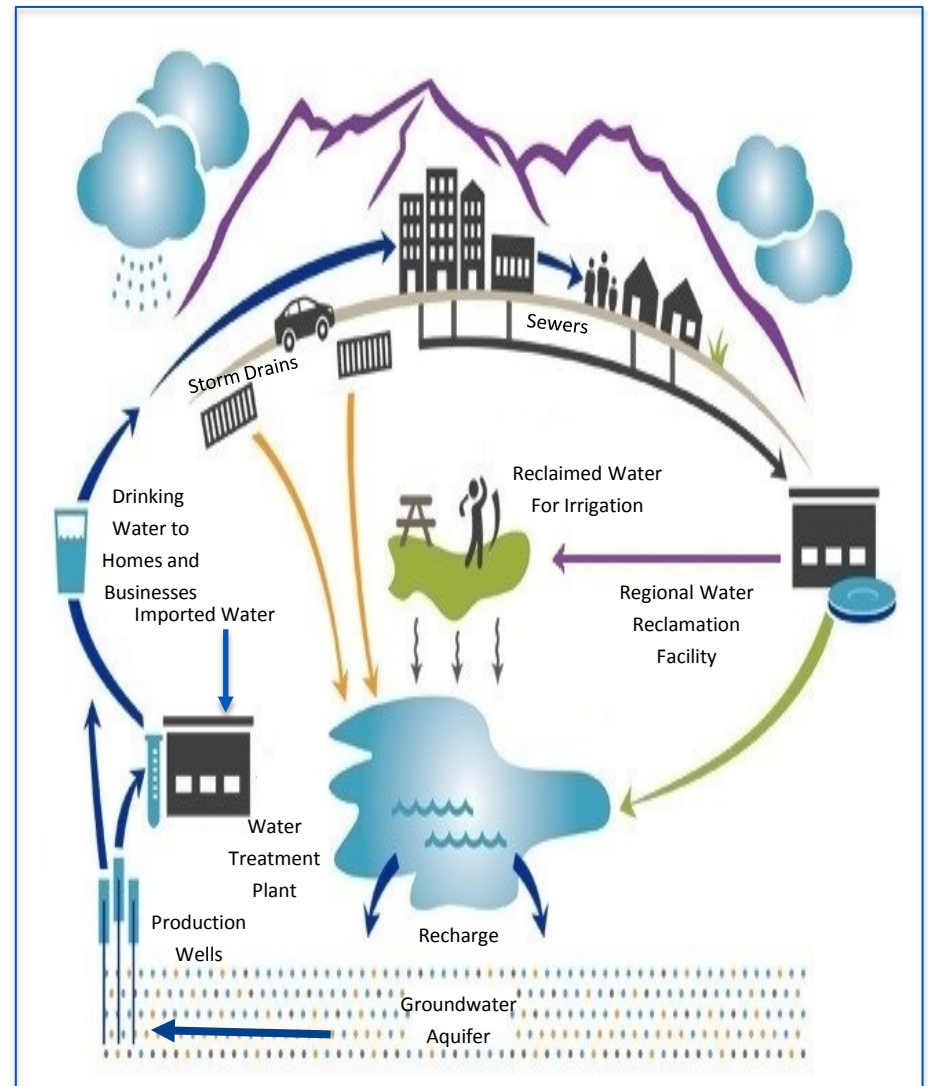
Challenges

- Data Overload
 - Storage space
 - Data Management
 - Equipment limitations
 - Organization
- Proficiency
 - Data collection and analytical skills
 - Organization and presentation
- Security
 - Protect customer information



Opportunities

- Increased accuracy and frequency of data collection
- Better decision making:
 - Water resource managers – balancing supply and demand
 - Consumer – changing behaviors and increasing supply reliability
 - Regulators – influencing actions and responses to changing conditions
- More comprehensive understanding of behaviors and actions
- Targeted actions
- Transparency
- **Safe and reliable service**





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