

BUILDING A WORLD OF DIFFERENCE

THE PATH TO WATER SUPPLY RESILIENCE IN AN ERA OF SCARCITY – EXAMPLES OF SUPPLY DIVERSIFICATION

JONATHAN LOVELAND

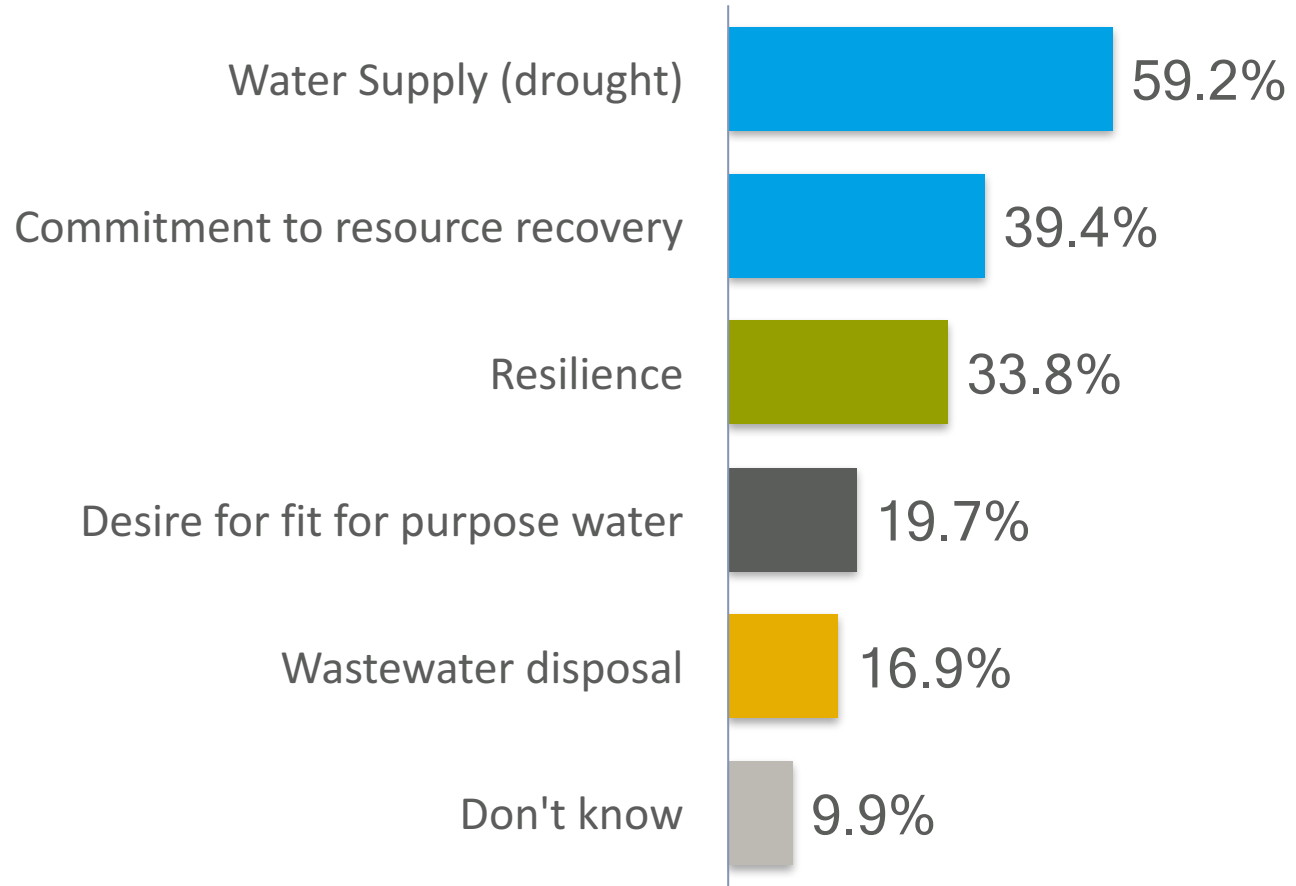
GLOBAL PRACTICE LEADER – ALTERNATIVE WATER SUPPLY

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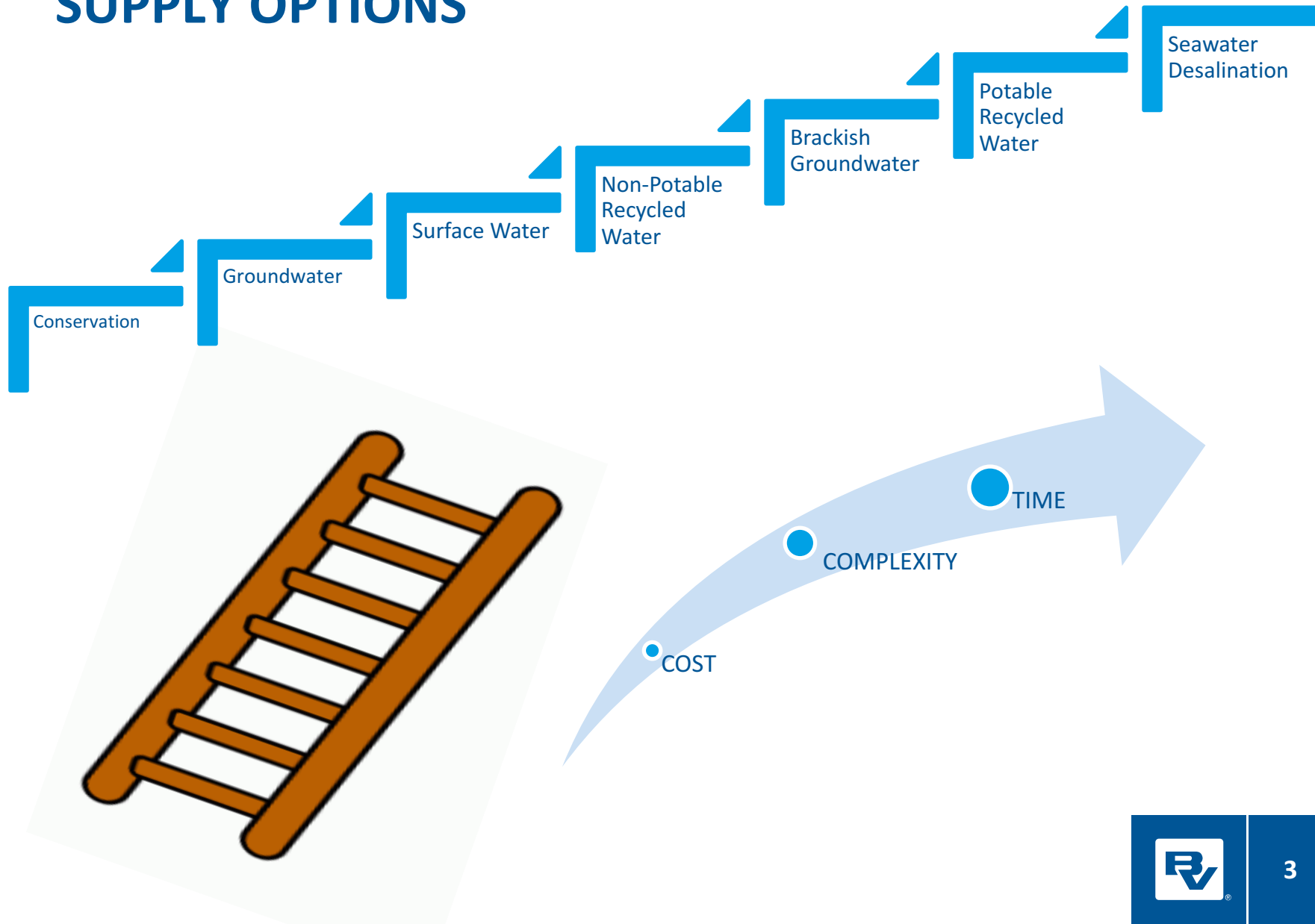
MAIN DRIVERS FOR ALTERNATIVE WATER SUPPLIES



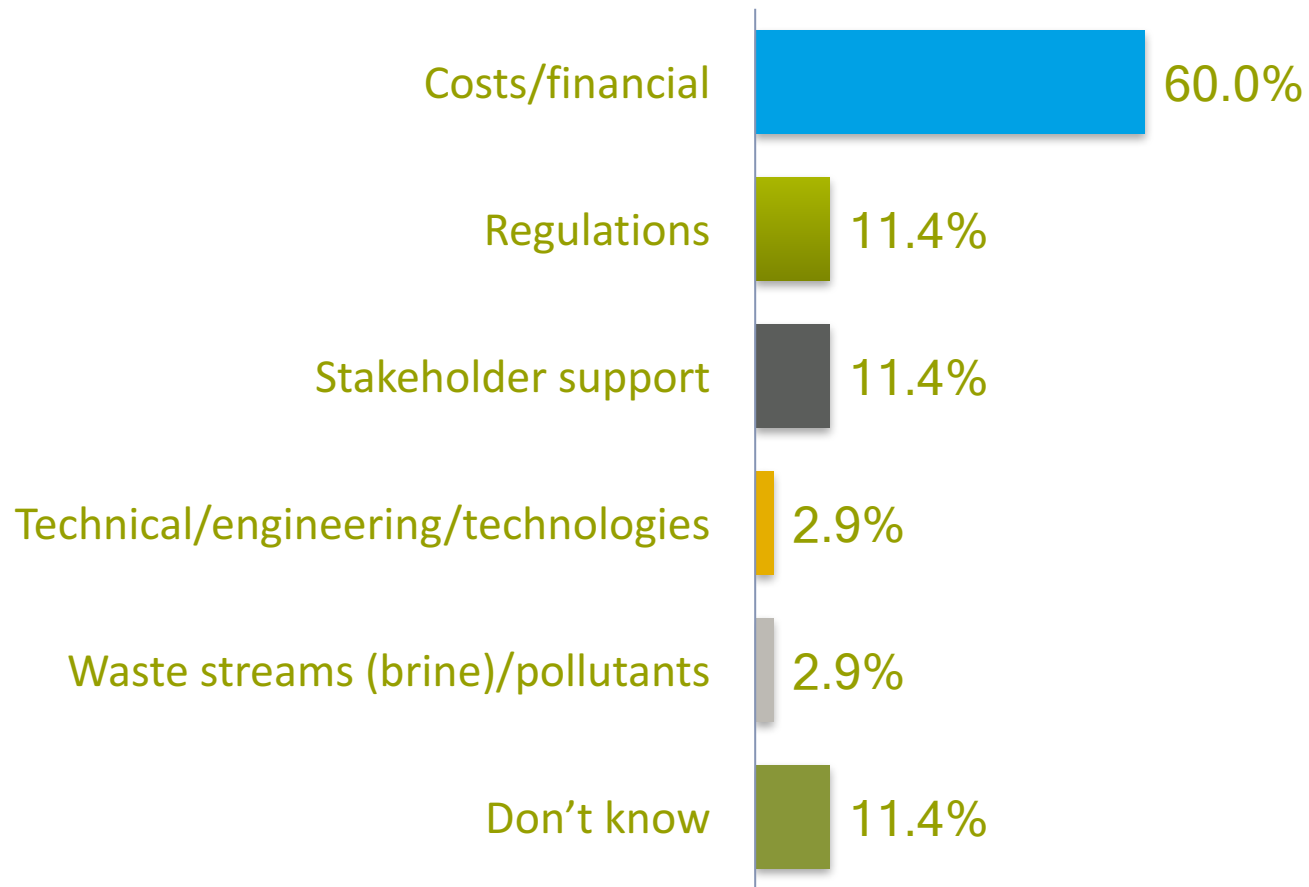
Q28. What are main drivers for Alternative Water Supplies (AWS) in your community? (Select all that apply)
[DRINKING WATER SERVICES]



CLIMBING THE LADDER OF WATER SUPPLY OPTIONS



BIGGEST CHALLENGES IN DEVELOPING ALTERNATIVE WATER SUPPLY PROJECTS



Q29. What is the biggest challenge your organization faces in developing new Alternative Water Supplies (AWS) projects? (Select one choice) [DRINKING WATER SERVICES]



COMPARATIVE TREATMENT COSTS

Type	Treatment	Cost (\$/AF)	Cost (\$/1000gal)
Groundwater	None or Filtration + RO	200 - 500	0.62 – 1.53
Surface Water	Pumping + Aqueduct + Filtration	450 - 1000	1.39 – 3.07
Recycled Water	Filtration + RO + UV + H ₂ O ₂	700 - 1200	2.16 – 3.68
SWRO	Filtration + RO	800 - 1500	2.45 – 4.60



CASE STUDY – LOUDOUN WATER

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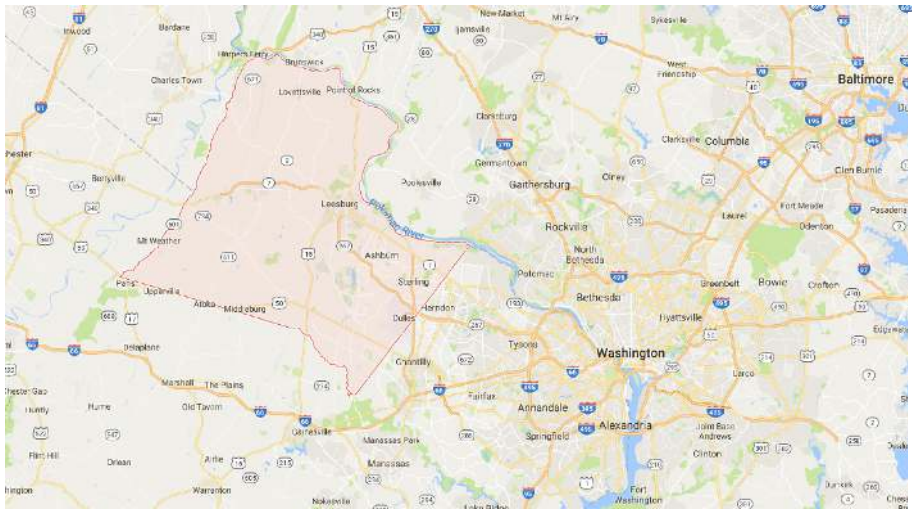
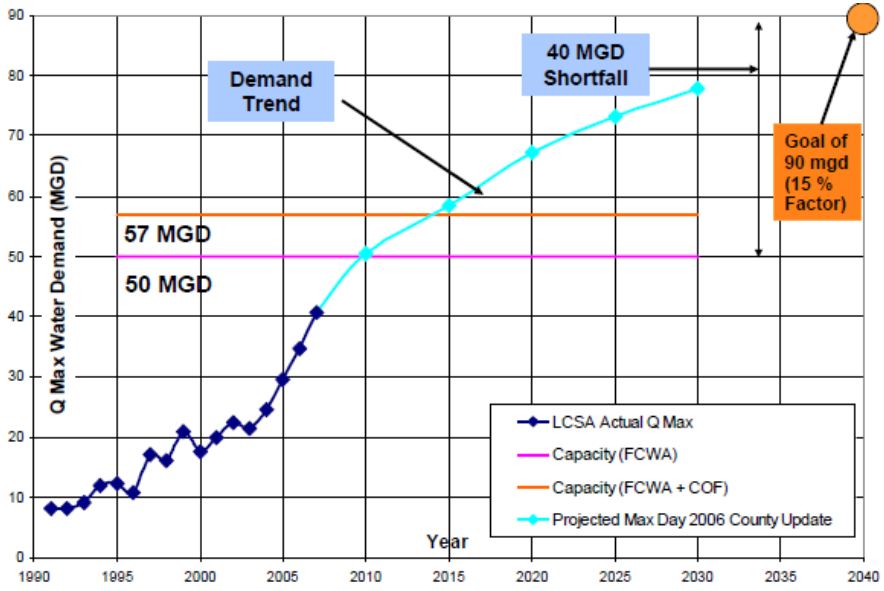
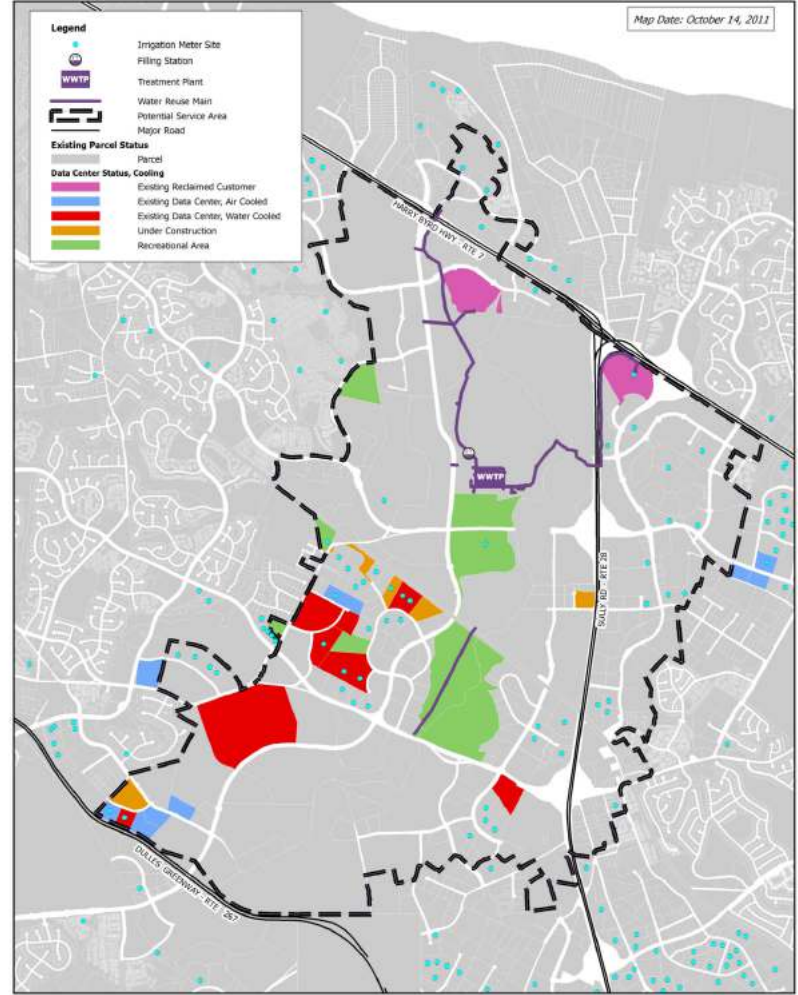
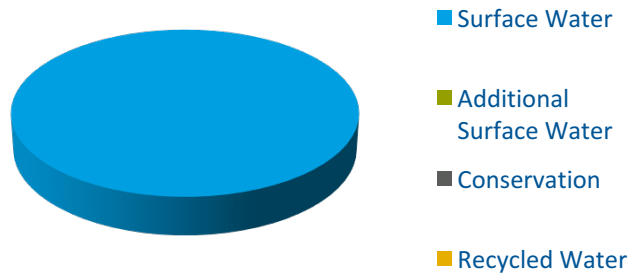


Figure 3.2 – Potential Customers with Existing Uses

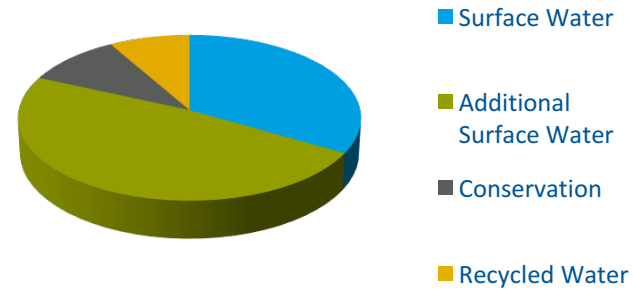


LOUDOUN WATER – SUPPLY DIVERSIFICATION

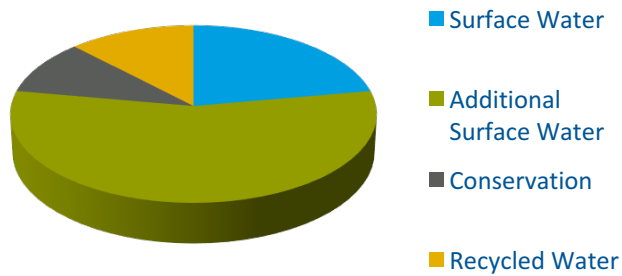
2000: 20 MGD



2015: 49 MGD



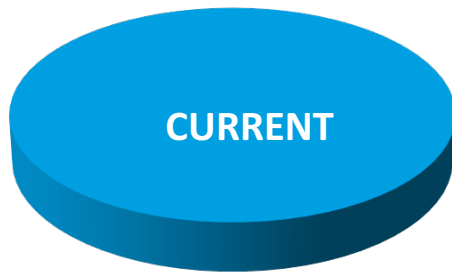
2030: 70 MGD



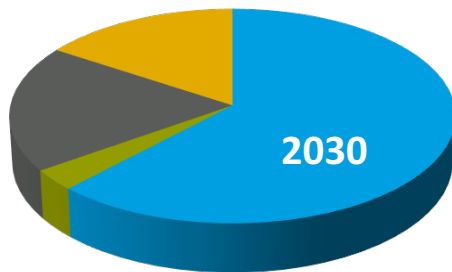
- Have access to surface water
- Unanticipated growth in data centers
- Cooled with recycled water

CENTRAL FLORIDA INITIATIVE

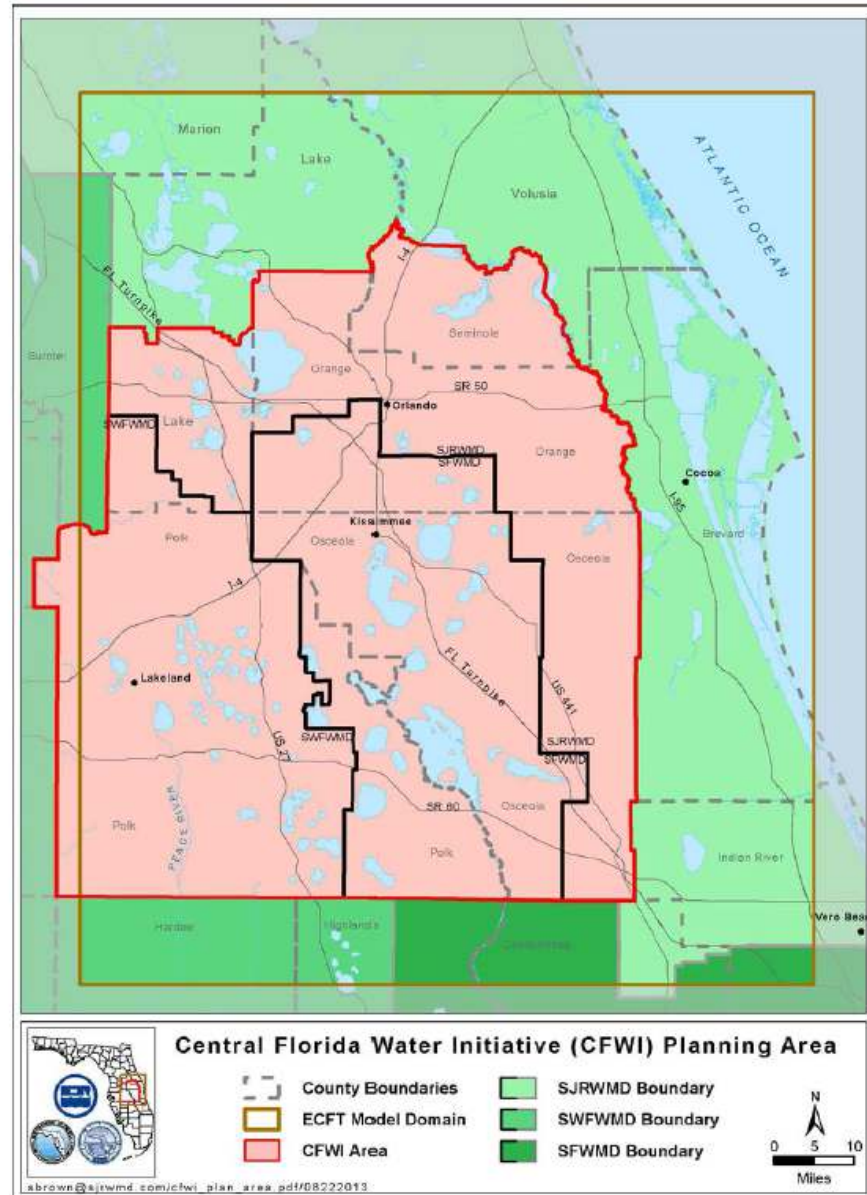
- Historically a groundwater system
- Permitted withdrawals
- Limited surface water
- Projected 50% population growth



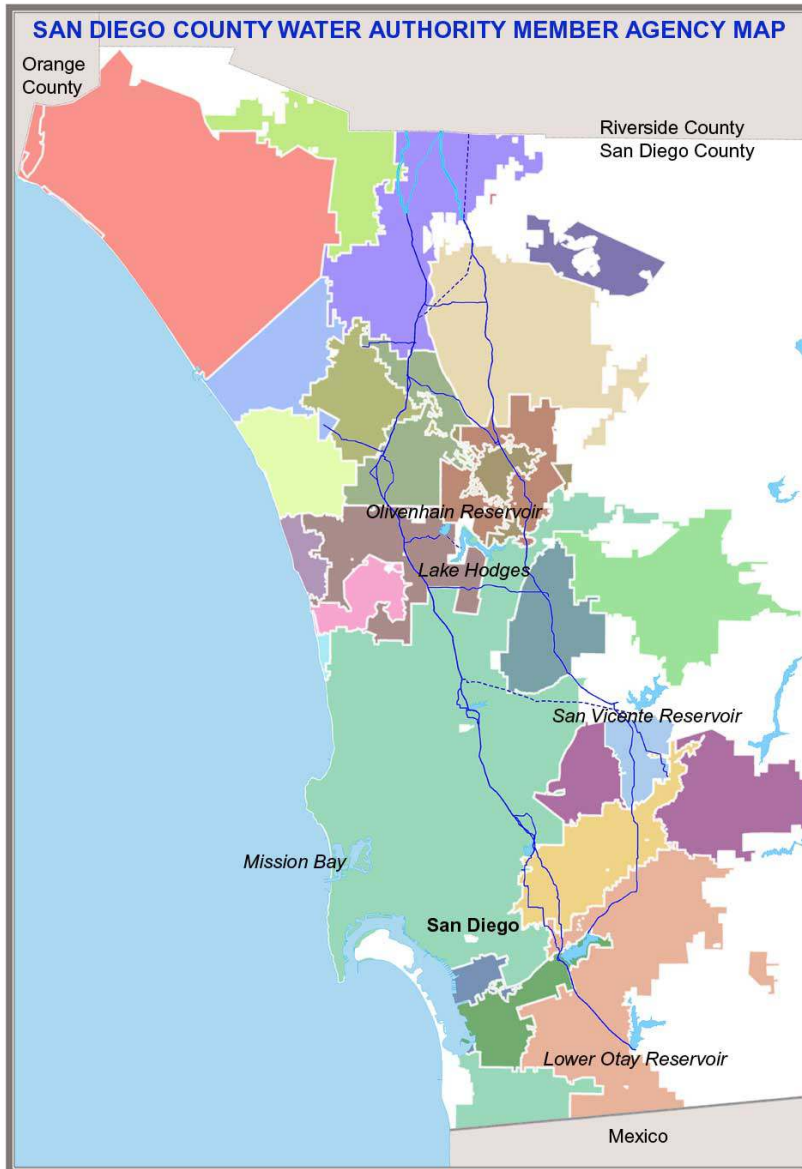
- Groundwater
- Surface Water
- Conservation
- Recycled Water



- Groundwater
- Surface Water
- Conservation
- Recycled Water



CASE STUDY – SAN DIEGO COUNTY



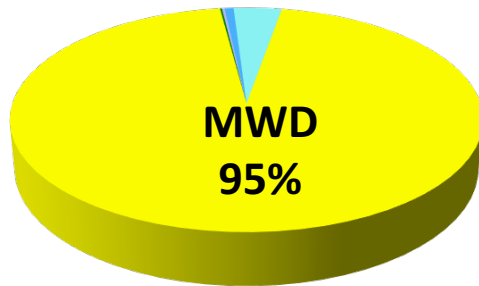
- Wholesale water agency created by State Legislature in 1944
 - 24 member agencies
 - 36-member board of directors
 - 3 million people
 - \$188 billion economy
- Mission is to provide safe and reliable water supply to member agencies
- Service area
 - 950,000 acres
 - 97% county's population

SAN DIEGO SUPPLY DIVERSIFICATION

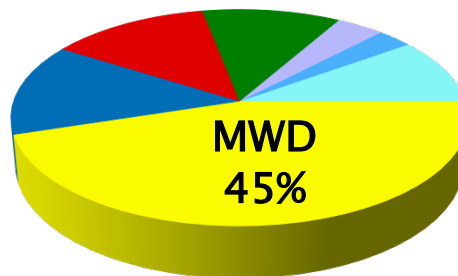
Resource Strategies to Manage Shortages

Strategy	1991	2012	2017
Long-term Conservation	875	69,680	~100,000
Recycled Water	1,170	24,010	24,010
Brackish Groundwater	0	6,280	6,280
Colorado River Transfers	0	165,000	165,000
Seawater Desalination	0	0	56,000
TOTAL (Acre-Feet)	2,045	264,970	350,000

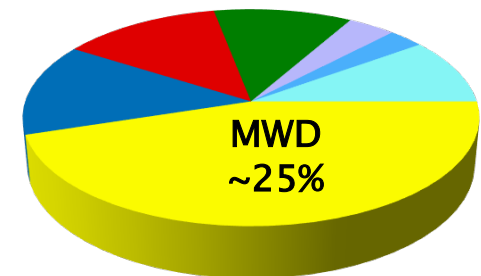
1991 Supply Portfolio



2012 Supply Portfolio

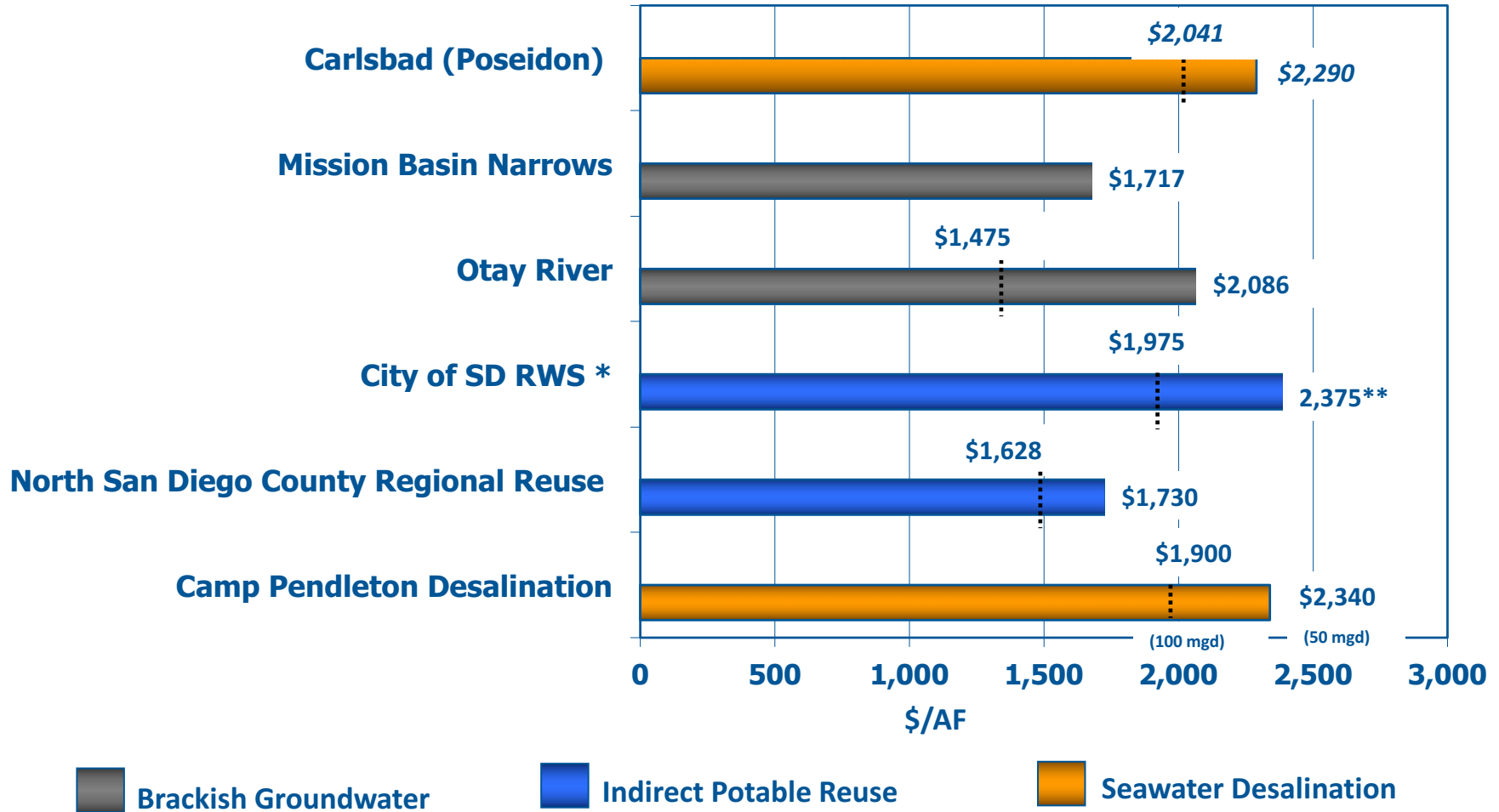


2017 Supply Portfolio

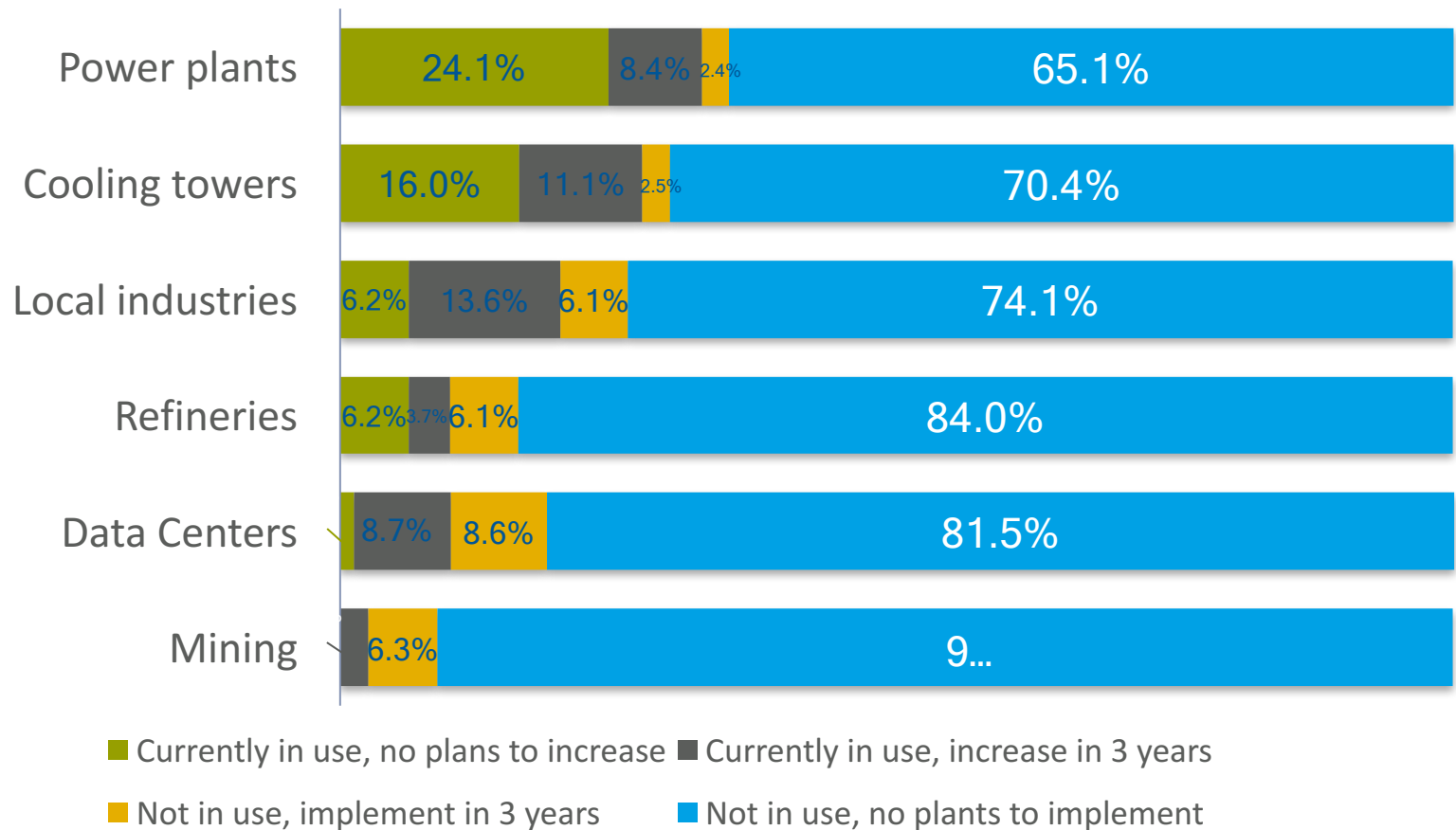


COST OF SAN DIEGO ALTERNATIVES

COST OF SAN DIEGO ALTERNATIVES



CURRENT AND FUTURE USE OF NON-POTABLE INDUSTRIAL REUSE



- 26. What is your organization's current level of usage and future plans for the following types of non-potable industrial reuse? (Select one choice per row) [Answer choices shown: Currently in use (no future plans) (2) Currently in use, plan to increase within 3 years (3) Not in use – plan to implement in 3 years, (4) Not in use, no plants to implement/I don't know] [DRINKING WATER SERVICES]

BENEFITS OF DIVERSIFICATION

- Enables continued growth
- Usually a local supply
- Hedge against supply limitation
- Improves reliability/system resilience
- Does come at a premium
- Economic benefit

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