

# This presentation premiered at WaterSmart Innovations

[watersmartinnovations.com](http://watersmartinnovations.com)





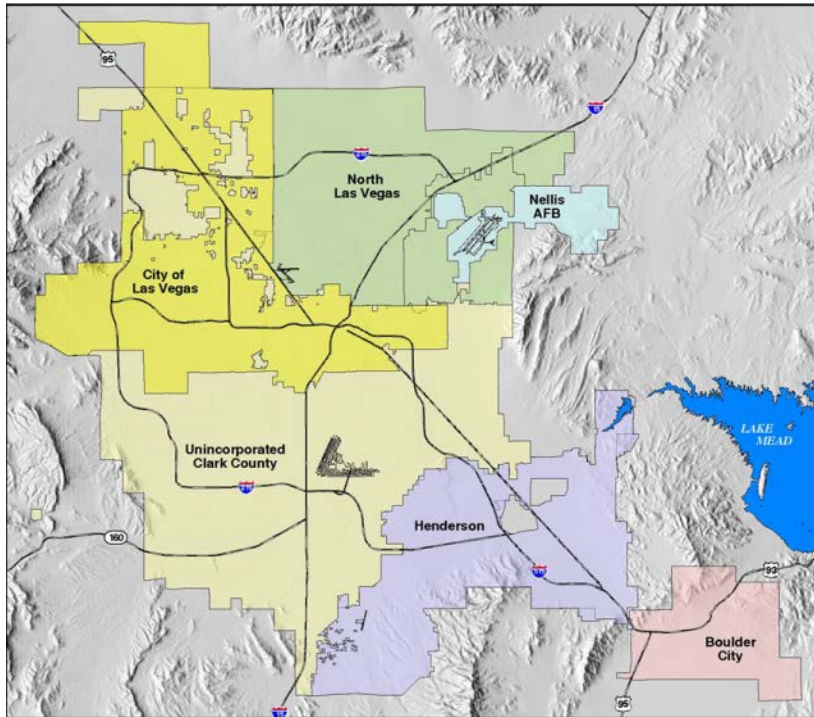
SOUTHERN NEVADA WATER AUTHORITY®

# Using GIS for Large Scale Water Conservation Rebate Programs

**Lou Reinbold**

*Conservation Programs Coordinator, SNWA*

# Southern Nevada Water Authority (SNWA)



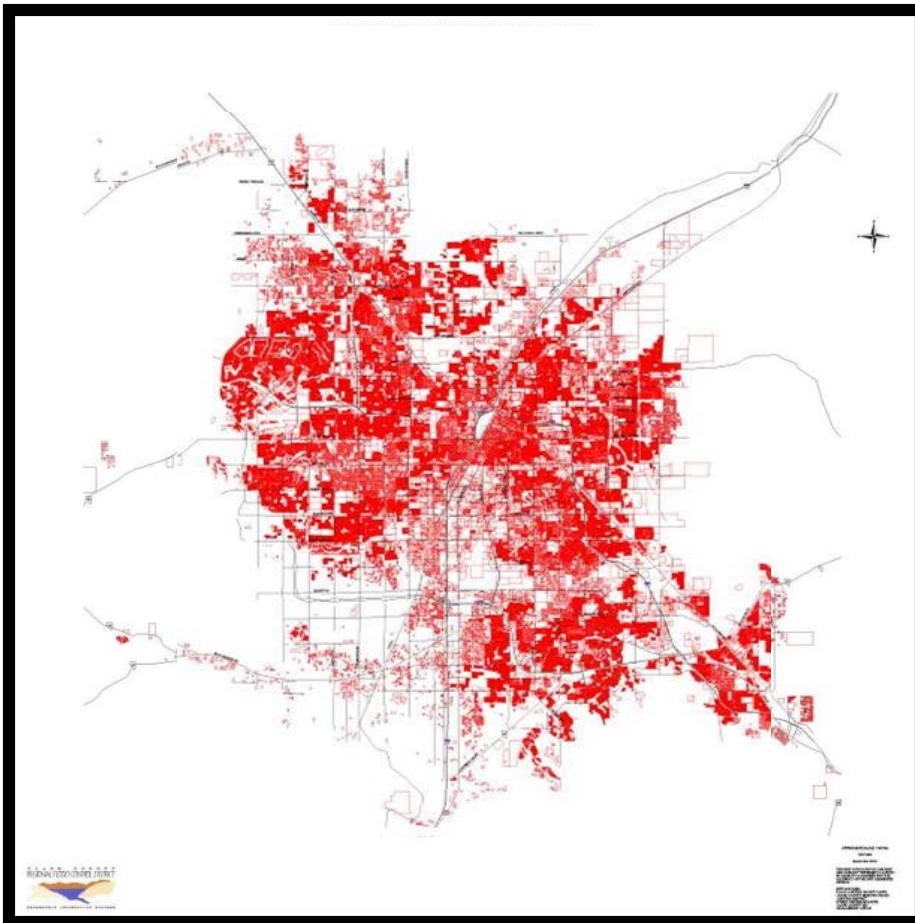
## Member Agencies

- Big Bend Water District
- City of Boulder City
- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County Water Reclamation District
- Las Vegas Valley Water District

# CHALLENGES

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**In the 1990's Southern Nevada hit a crisis point: additional water was needed to meet growing demands.**



## Population

**1950 – 48,000**

**1960 – 127,000**


**1970 – 273,000**

**1980 – 463,000**

**1990 – 800,000**

**2000 – 1,400,000**

**2009 – 2,006,000**

A nighttime photograph of the Paris Las Vegas Eiffel Tower, which is brightly lit with golden lights. The tower stands prominently on the left side of the frame. In the foreground, a wide, multi-lane highway is filled with cars, their headlights and taillights creating a sense of motion. To the right of the highway, there are palm trees and other city buildings, some of which are also lit up. The sky is dark, and the overall scene is a vibrant representation of a busy city at night.

**The Southern Nevada Water Authority meets the water demands of Southern Nevada's 2 million residents and 40 million annual visitors.**

- **\$93 Billion in Gross Domestic Product**
- **71% of Nevada's Total Gross Domestic Product**



# LAS VEGAS AND WATER

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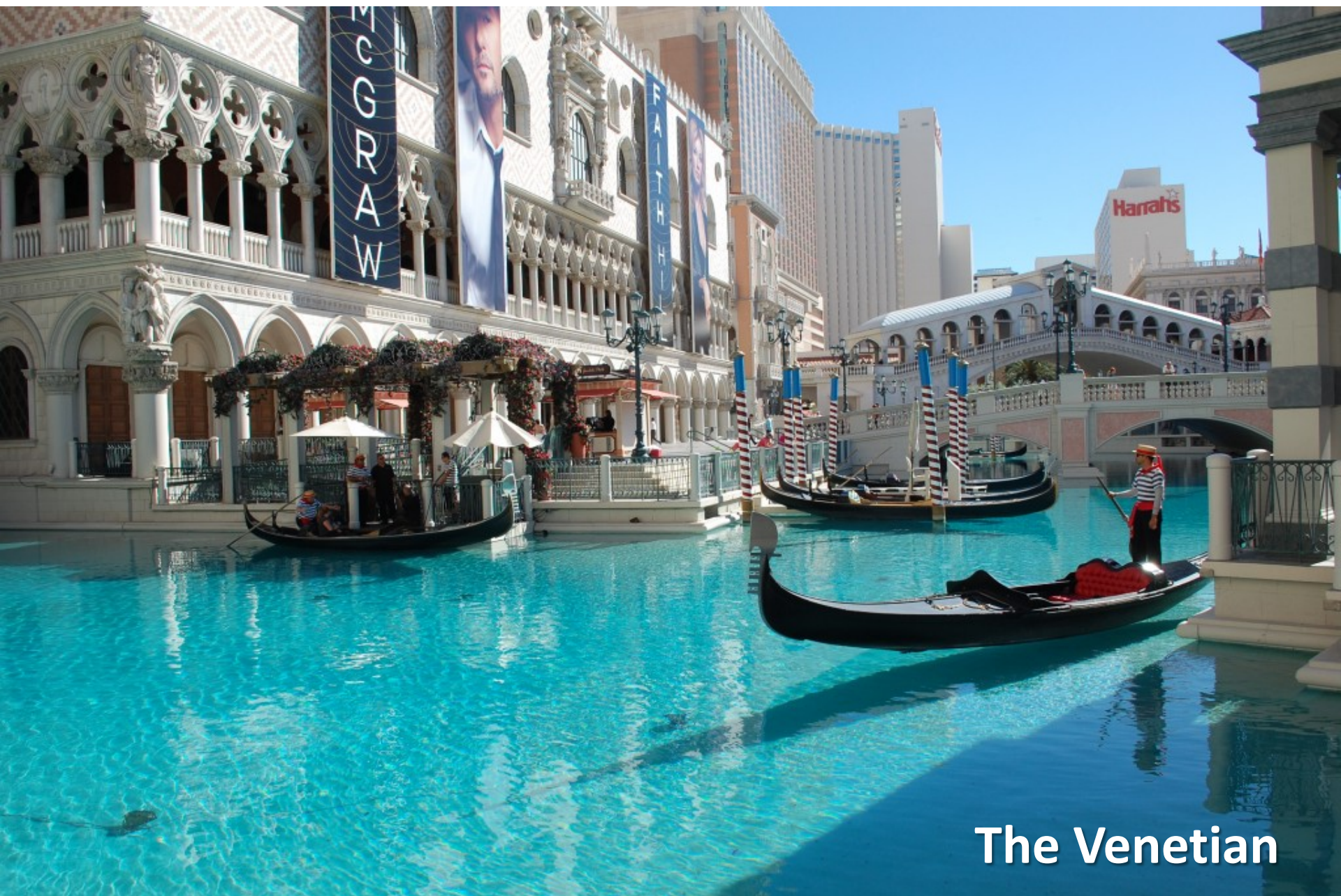


What do you think of?



**The Bellagio**





**The Venetian**





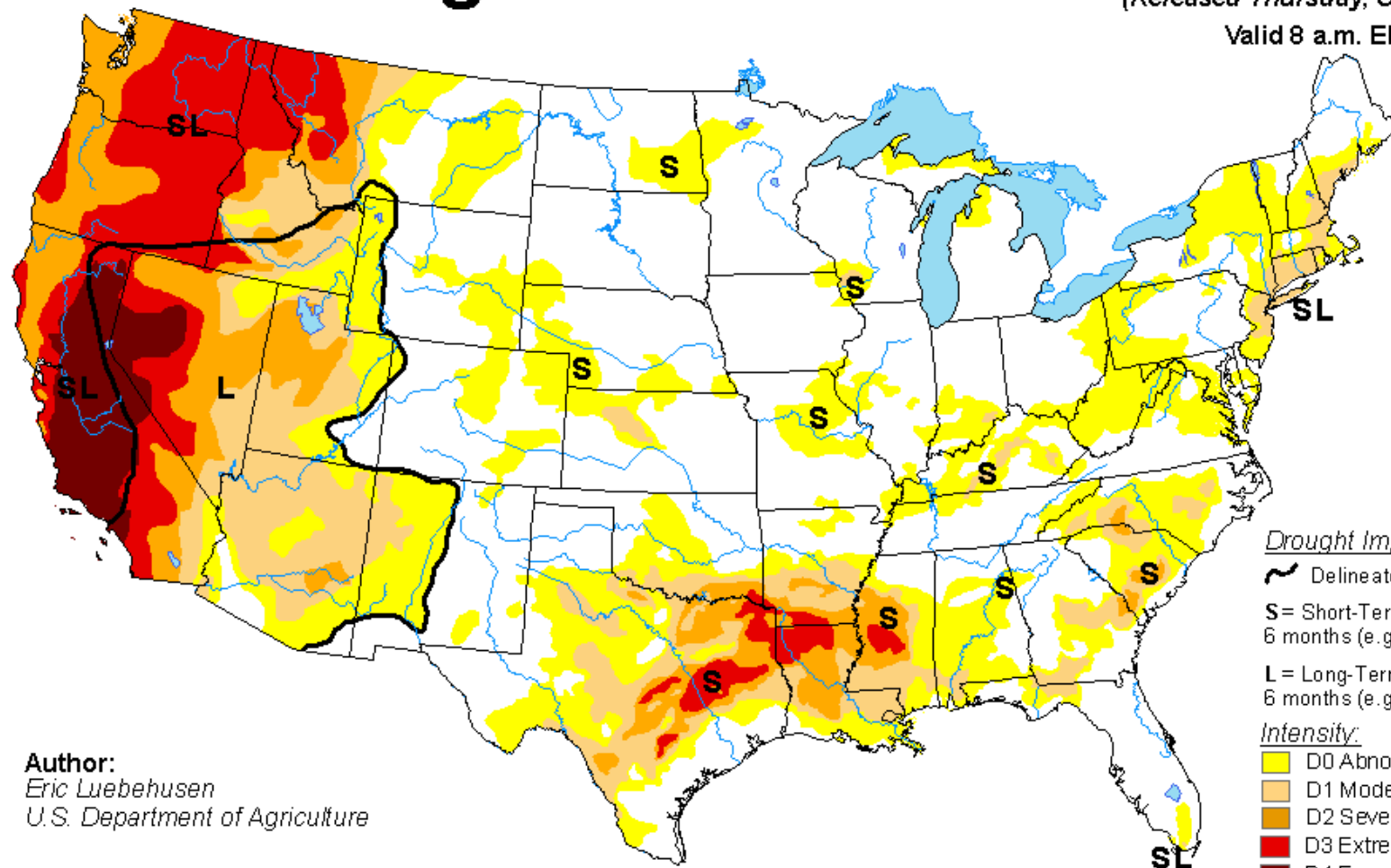
The Colorado River Basin  
is facing one of the worst  
droughts in recorded  
history.

# U.S. Drought Monitor

September 29, 2015

(Released Thursday, Oct. 1, 2015)

Valid 8 a.m. EDT



**Author:**  
Eric Luebbehusen  
U.S. Department of Agriculture

## Drought Impact Types:

~ Delineates dominant impacts

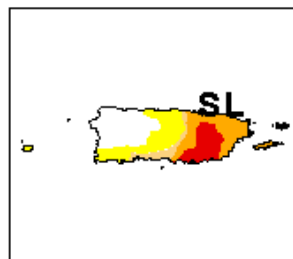
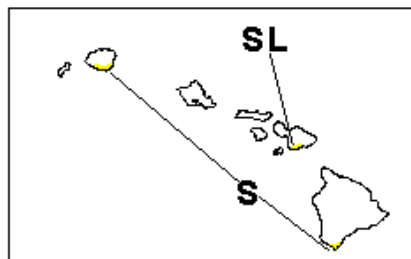
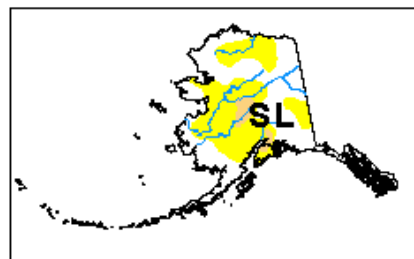
**S** = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

**L** = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

## Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

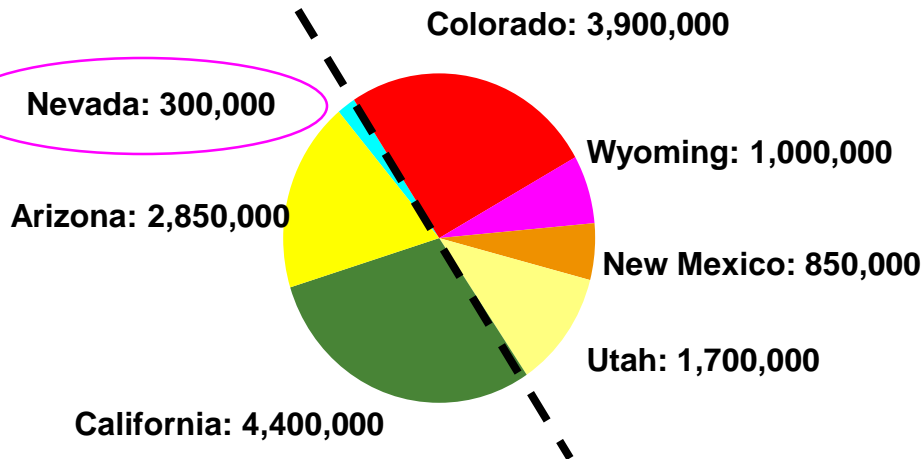


<http://droughtmonitor.unl.edu/>



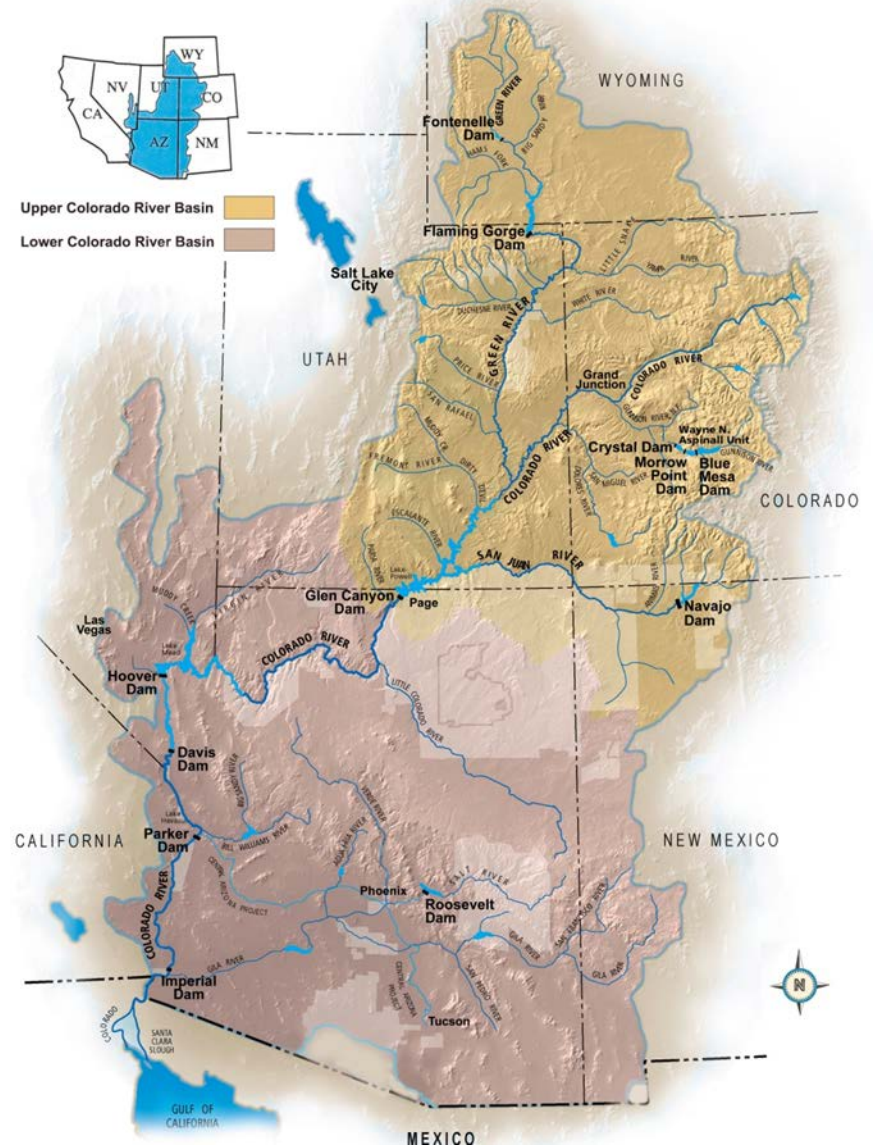
# Colorado River

**UPPER DIVISION**  
**7.5 million afy**



**LOWER DIVISION**  
**7.5 million afy**

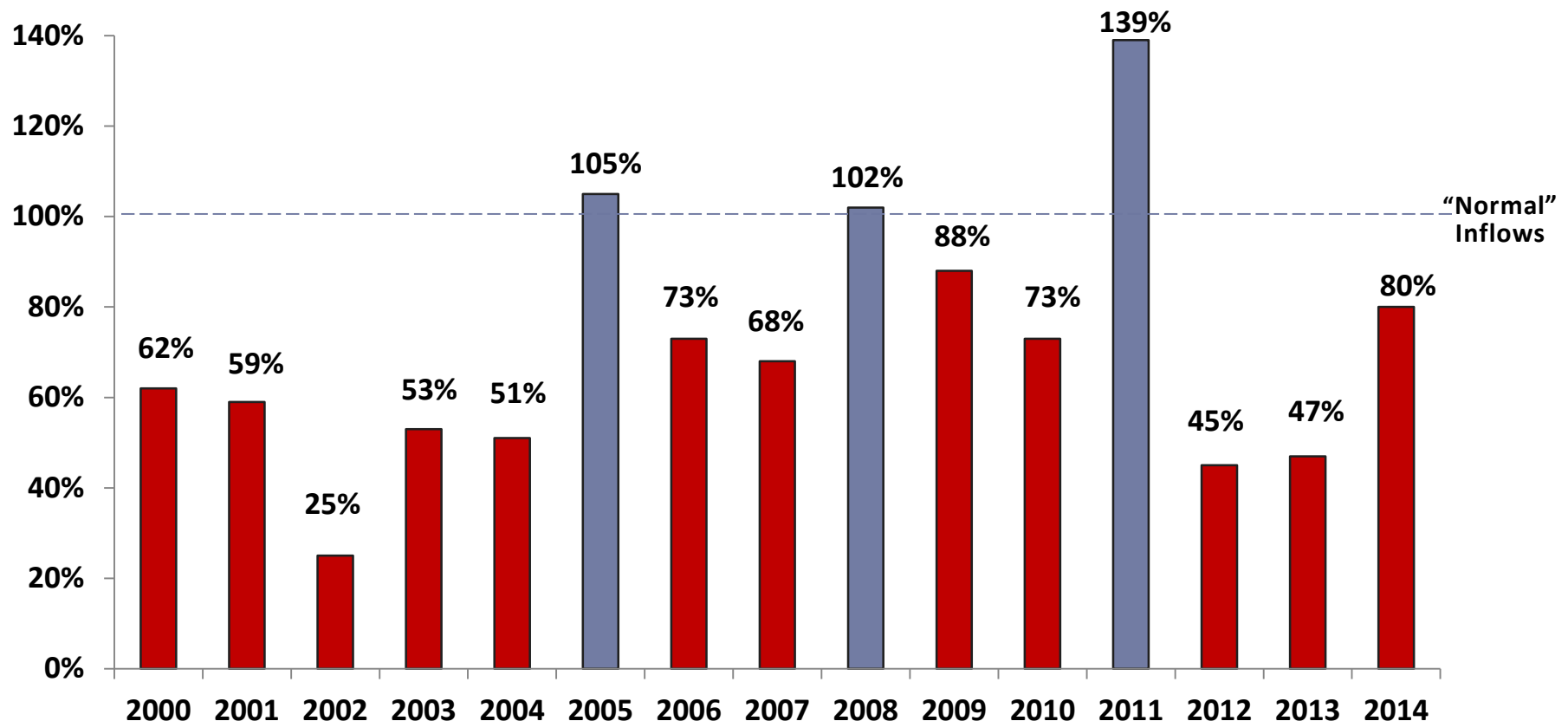
## Colorado River Basin



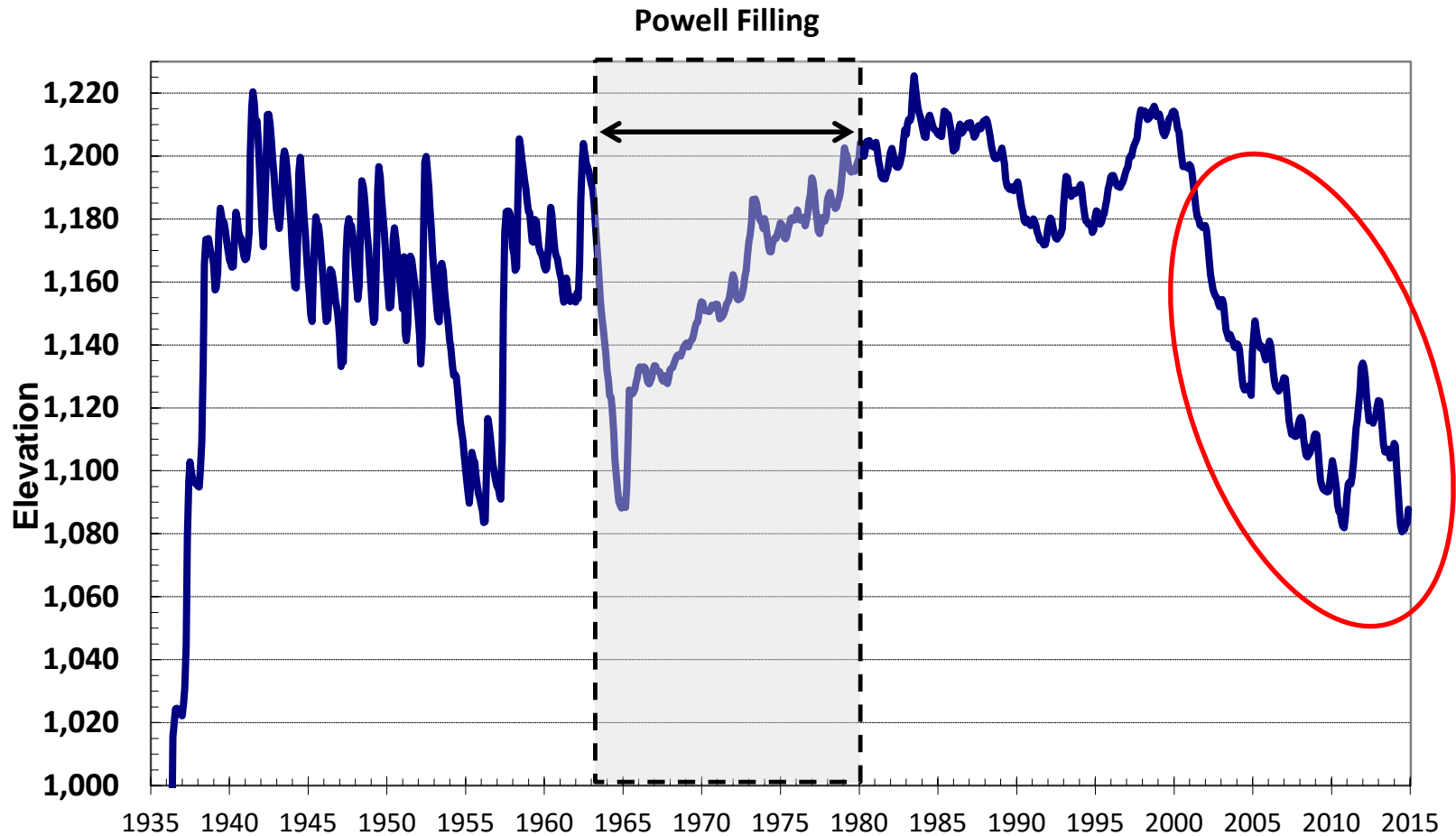


# Current Inflows

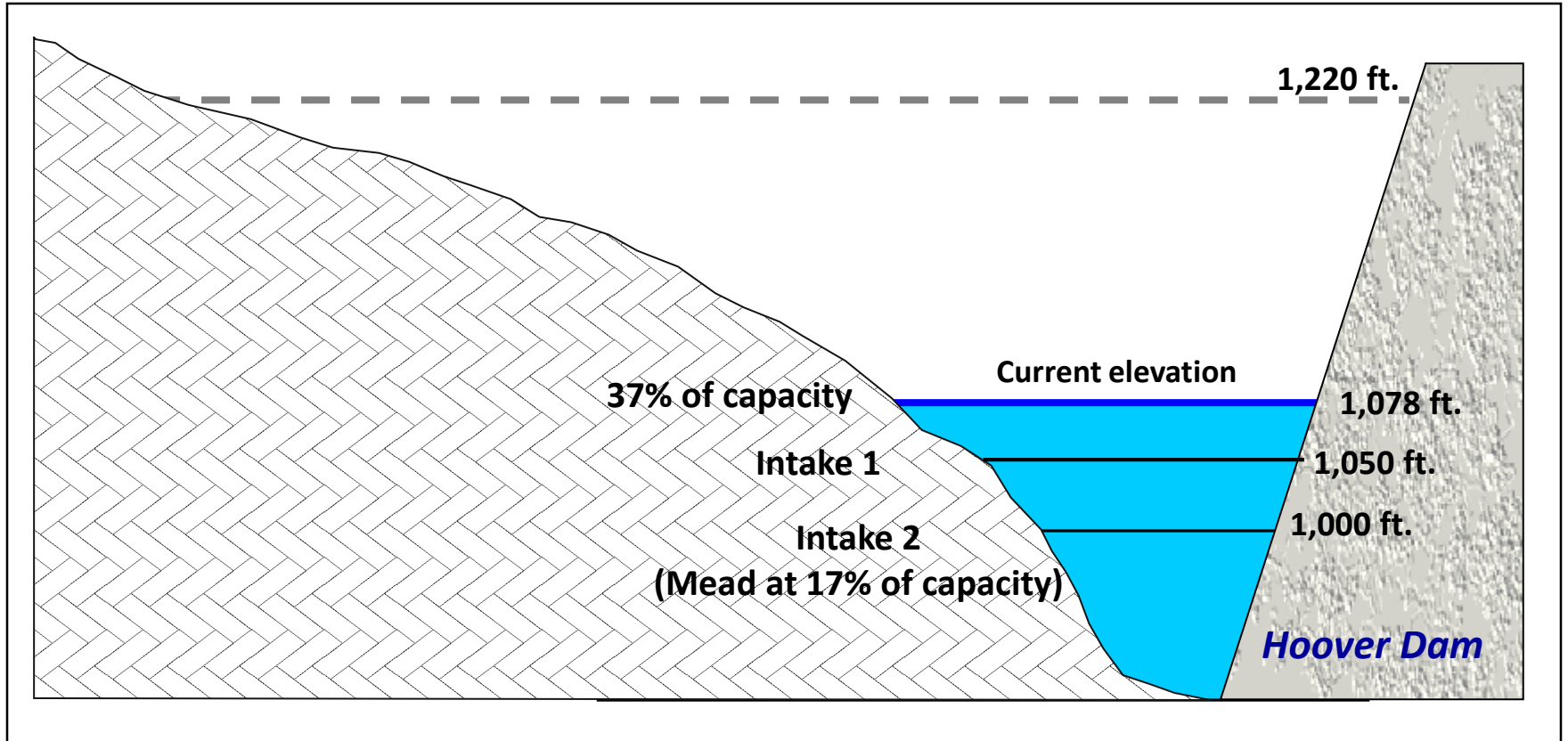
**Lake Powell's annual inflows continue to be below normal.**



**As a result, Lake Mead water elevations have declined more than 100 feet during the past 14 years.**



# LAKE MEAD ELEVATION





# Drought Response: Shortage Sharing

The Basin States developed a framework to manage shortages, utilizing Lake Mead water elevations as triggers.

## Nevada/Arizona's share of Colorado River shortages

1,075 ft.

Nevada: 13,000 af / Arizona: 320,000 af

1,050 ft.

Nevada: 17,000 af / Arizona: 400,000 af

1,025 ft.

Nevada: 20,000 af / Arizona: 480,000 af

*Initiate reconsultation for  
shortage below 1,025 ft.*

**Lake Mead**

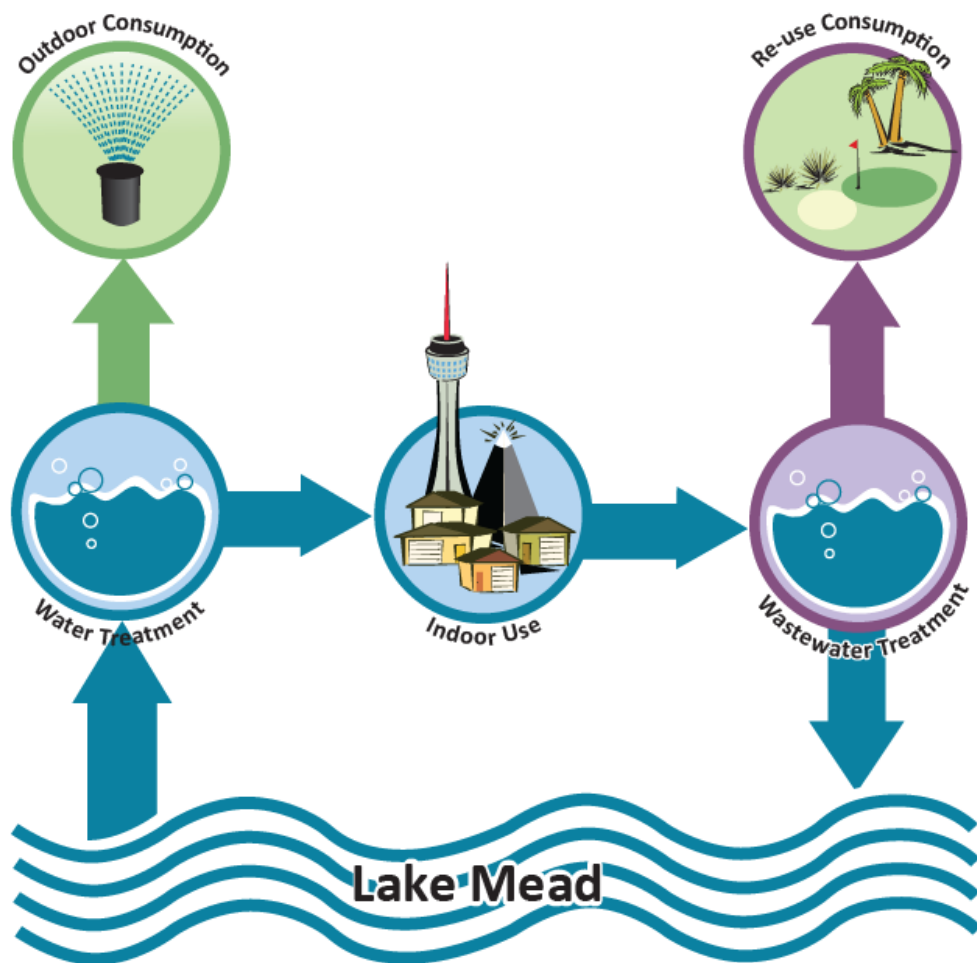
# Inner Las Vegas Bay



**March 7, 2000, elevation 1213 Feet**



**April 11, 2002, elevation 1170 Feet**

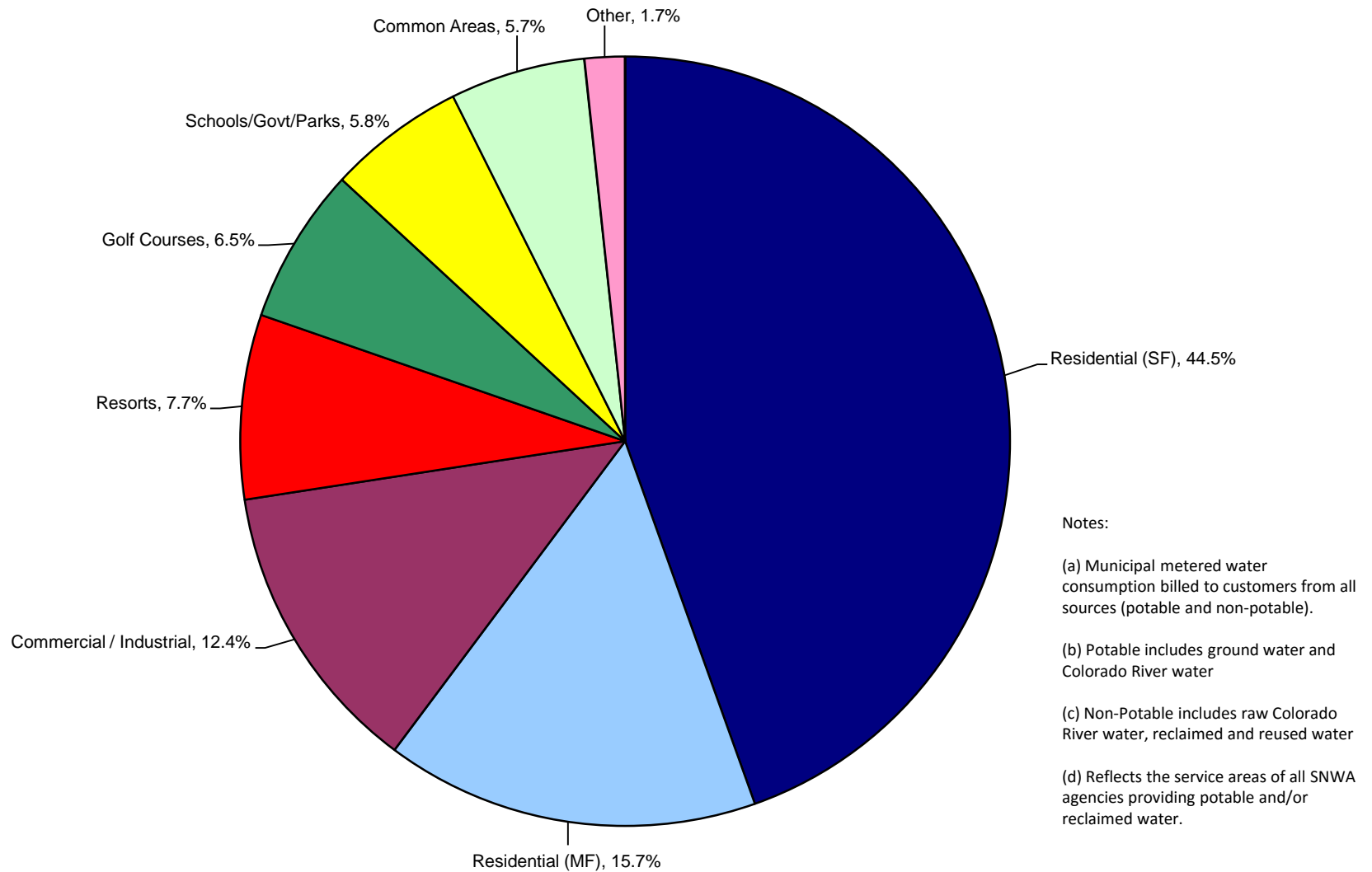


Return-flow credits allow Southern Nevada to reuse 99% of the water used indoors.

Conservation Programs are targeted at the outdoor water use that can't be re-used. Outdoor water use in Southern Nevada makes up 60% of total usage.



# How is Water Used?



# Water Smart Landscapes Program

- Began in 1999. Customers are paid to remove turf from their landscape and replace it with desert landscaping.
- \$1.50 per square foot (up to 5,000 sq ft) then \$1.00 per square foot up to \$300,000 per property per year.
- Irrigation and planting requirements
- Ensure permanent water savings through a Conservation Easement placed on the land.



# Turf Analysis Project (TAP)

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## Technical Details

- Custom ArcGIS Application using an ArcMap add-in
- Utilizes ArcGIS Server and LizardTech
- Numerous Data Layers
- Interfaces with multiple applications

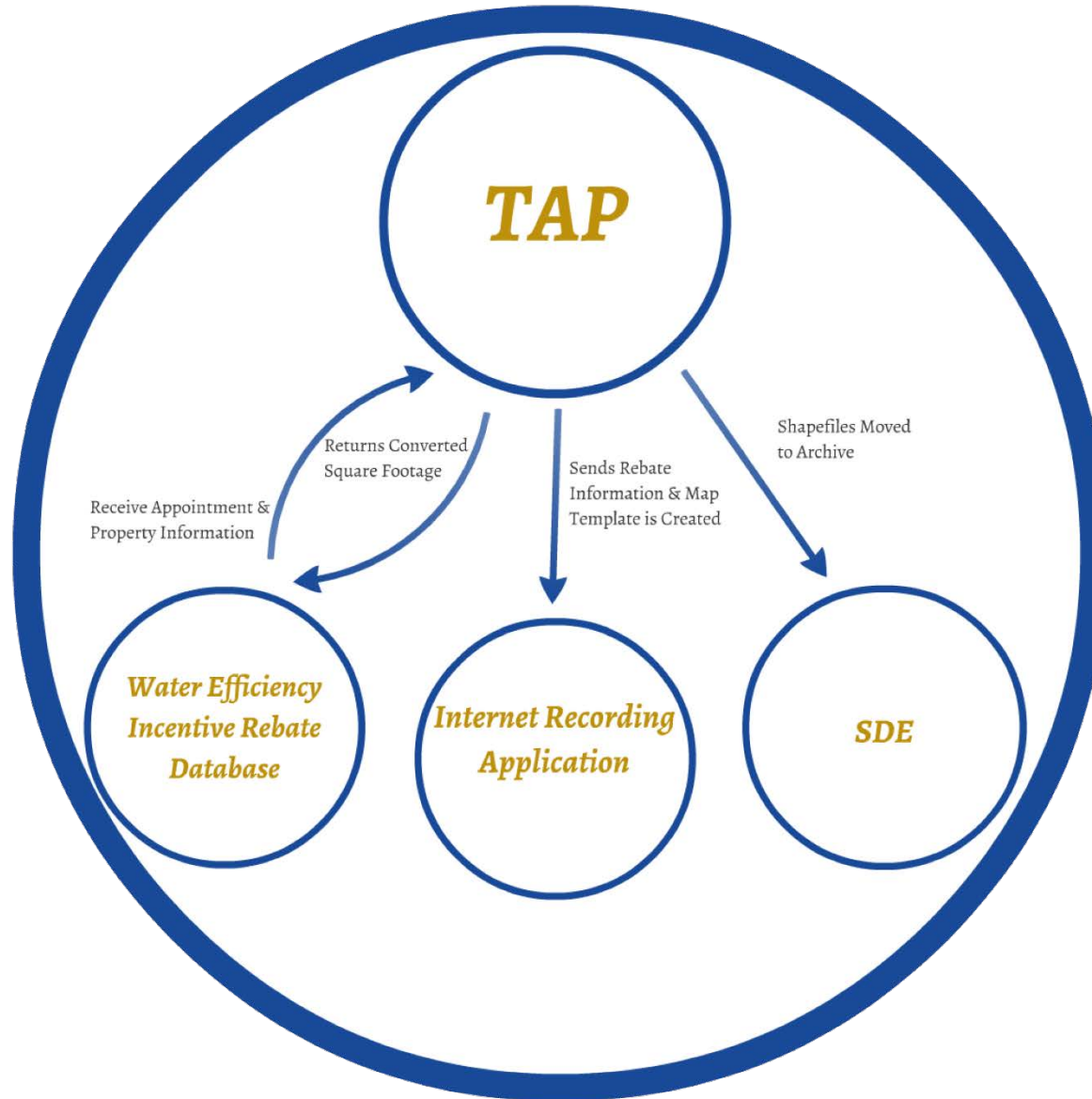
## Vital to the creation of Conservation Easement Legal Documents

On Average 8,000 maps per year are created using TAP

- 2,000 Pre Conversion Maps
- 3,000 Post Conversion Maps
- 3,000 Exhibit C Maps



# TAP Diagram



# Appointment Screen

Appointments

Previous 7/7/2014 - 7/13/2014 Next

Date Select: Mon, 7/ 7/2014

Date	Name	Type
07/07/2014	CRASSAS, MICHAEL N & TONI M	PRE
07/07/2014	Uzell, Edward & Betty	PRE
07/07/2014	Fong, Lawrence & Judy	FOL
07/07/2014	BURKHART, CHRISTINE D	PRE
07/07/2014	NOVAK, MERCEDEH	PRE
07/07/2014	Goutsaliouk, Vladimir & Elena	PRE
07/07/2014	KATZ, BARBARA E	PRE
07/07/2014	BARISH, HOWARD & RANDI	PRE
07/07/2014	BLACKINGTON, BURT & FRED JR	PRE
07/07/2014	Lianos-Rodriguez, Edy Margot	PRE
07/07/2014	PARKER GARY A & ILLY A	PRE

Cancel Schedule View: ☐ Daily ☒ Weekly Go To Parcel

List of Users

Select a User: Ainsworth, Sean

Notes:

- User is automatically selected based on network login information.

# Parcel Information / Application Overview

The screenshot displays the ArcMap application interface. The main map area shows an aerial view of a residential neighborhood with blue-outlined parcel boundaries. A 'Parcel Information' window is open in the center, displaying the following details:

**Parcel Information**

Parcel Number: **17806613001**  
Address: **3100 TRUENO RD**  
Owner's Name: **CRASSAS MICHAEL N & TONI M**  
Zip Code: 890143618  
Lots Size (sq ft):  
Land Use: 110000  
Constructed Year: 1978  
Sale Price: \$120,000.00  
Sale Date: 8/27/1998  
Sub Name: MISSION\_VALLEY\_UNIT\_2

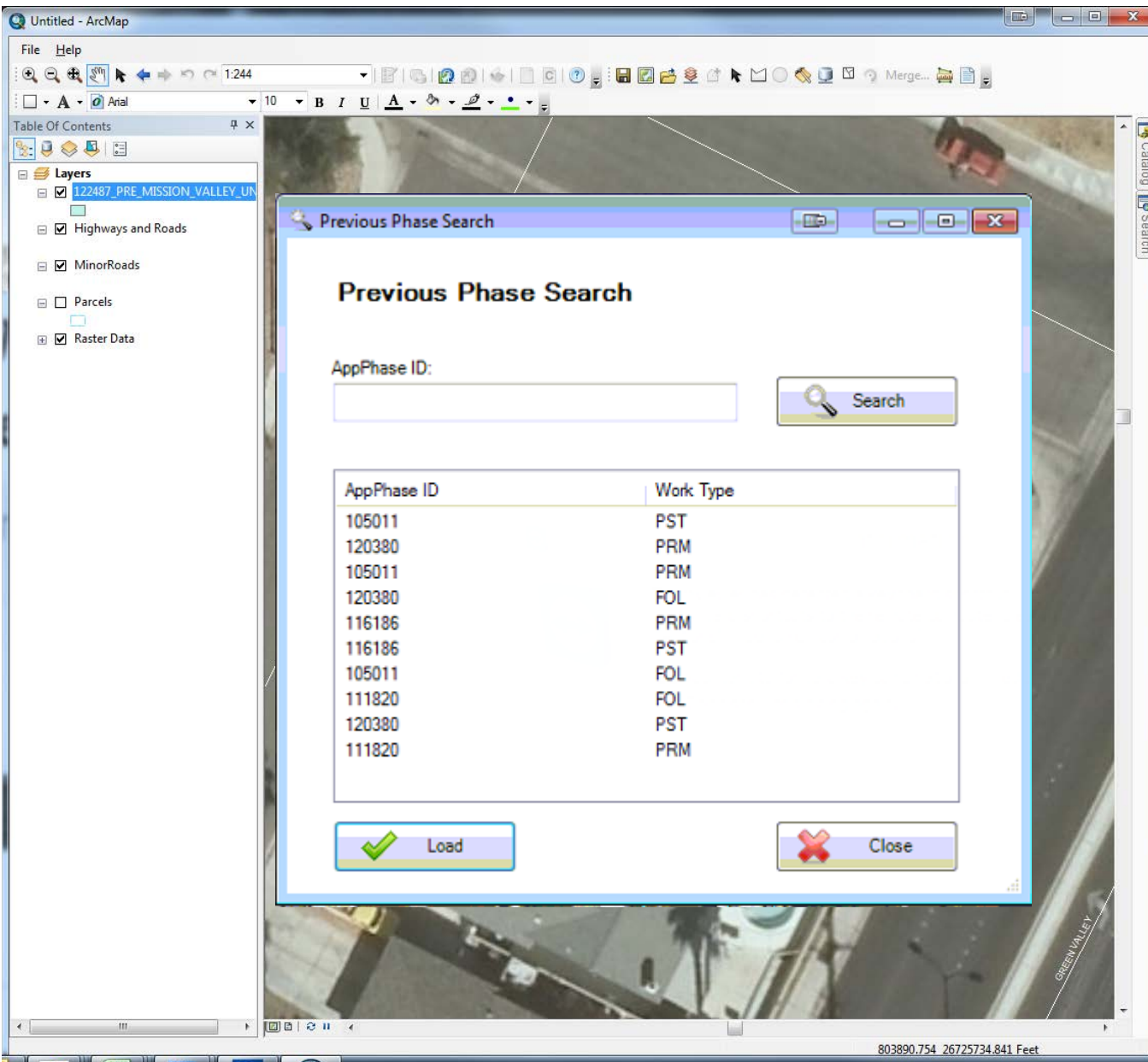
A 'Close' button with a red 'X' icon is located at the bottom of the window. The background map includes labels for streets such as EL TRUENO, LA MESA, GREEN VALLEY, and BELVEDERE. The left sidebar shows the 'Table Of Contents' with layers for 'Highways and Roads', 'Minor Roads', 'Parcels', and 'Raster Data'. The top toolbar includes standard GIS navigation and editing tools.



# Shapefile Creation & Drawing Toolbar

## Notes:

- Shapefiles are automatically created based on property & work order attributes.
- Custom Toolbars created with program necessary buttons.
- Some buttons are greyed out unless a user is in a specific user class.
- Historical shapefile archive for all properties.



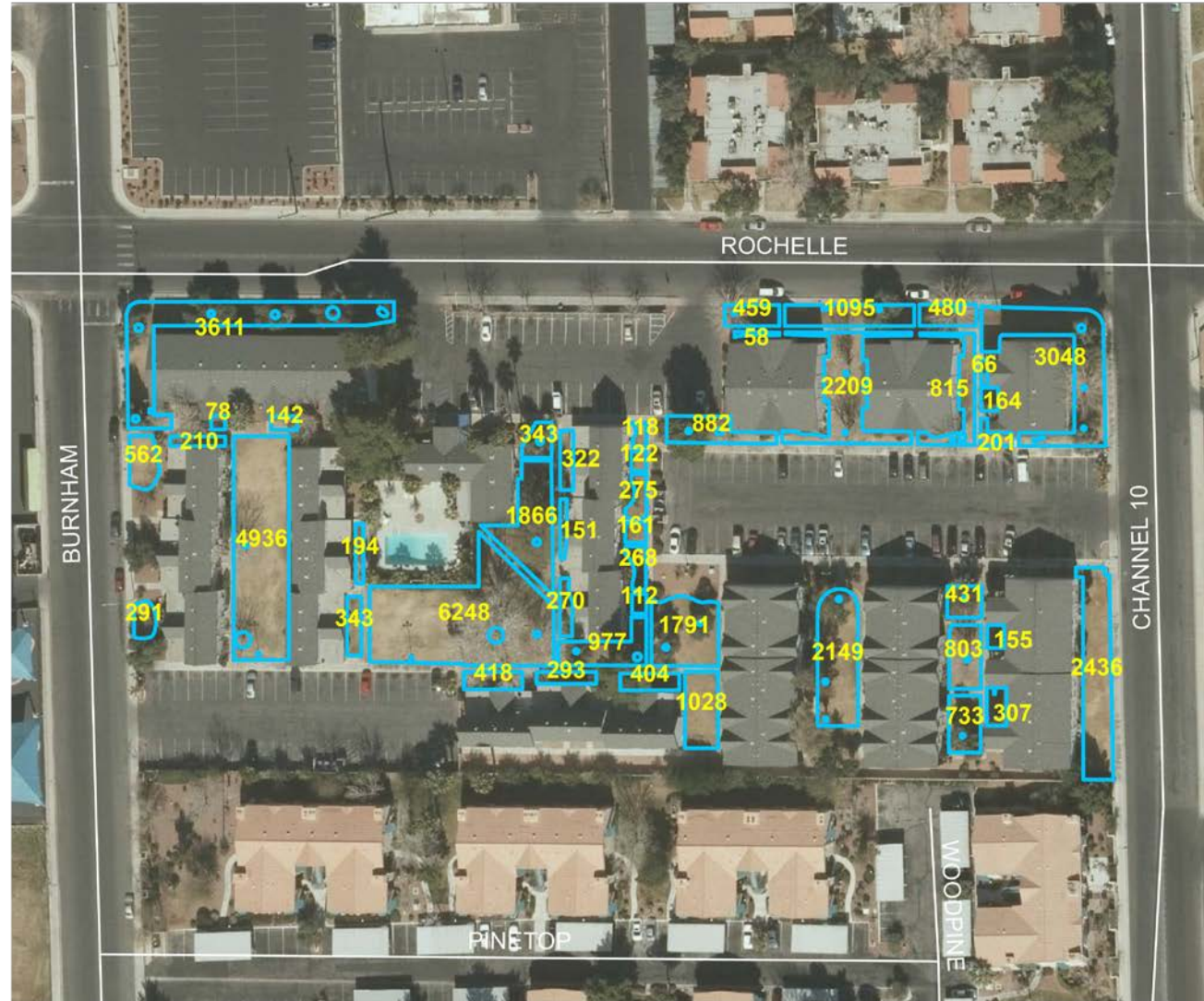


# Map Creation

## NOTTINGHAM GARDENS L L C

2165 E ROCHELLE AVE

*Pre-Measure Sq Ft= 42,025*



5/1/2014  
niidab  
Parcel Number: 16223603001  
Photo Taken: Spring 2013

Source:  
Clark County GIS Management Office  
Southern Nevada Water Authority

WSL Rebate Calculations are conducted by the Conservation Department of SNWA and are approximate figures. All other data on the map is for display purposes only, and no liability is assumed to the accuracy of that data delineated herein.

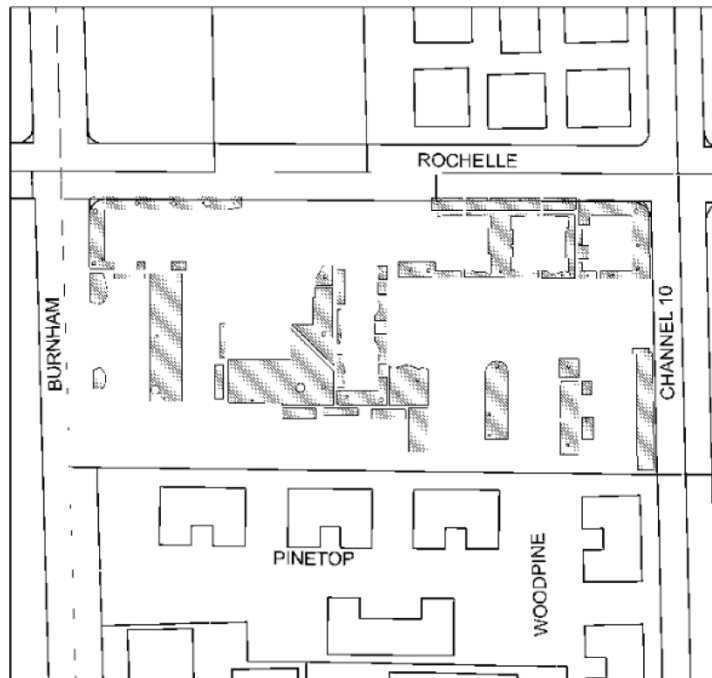
# Map Creation – Legal Templates

Dynamic  
Fields

1

Parcel Number:  
16223603001

Exhibit C



2

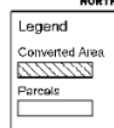
Total Sq. Ft.  
42025  
Incentive Amount  
44525

0 45 90 180 270 360 Feet



3

Legal Description  
GOV LOT 34  
SEC 23TWP 21RNG 61



Dynamic Fields

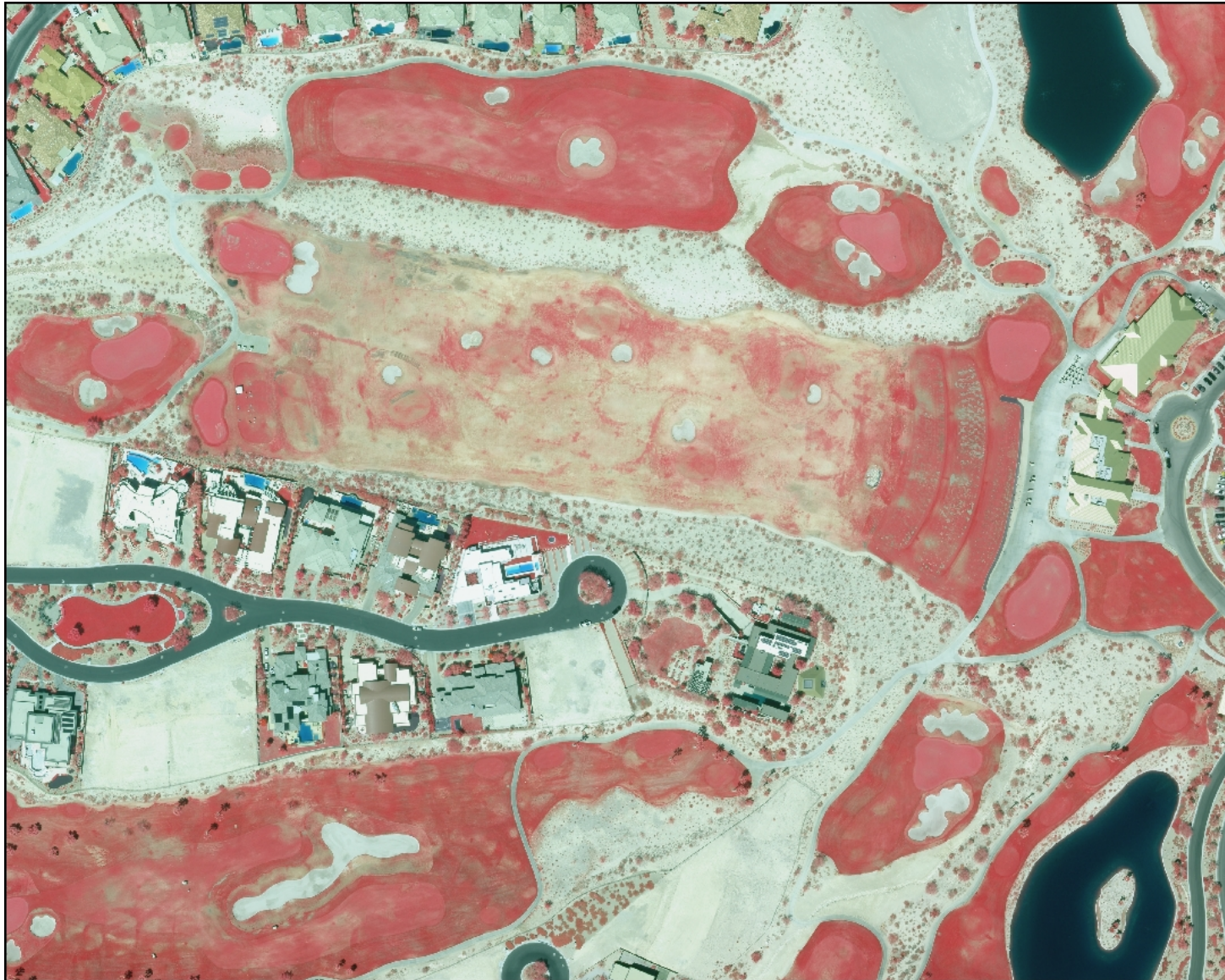
1. Parcel Number
2. Total Square Footage and Rebate Amount
3. Legal Description

Notes:

- Exhibit C map is a requirement for the creation of the Conservation Easement.
- Map format is automated. Format is fixed to comply with PRIA standards.
- User simply verifies data and saves the map.



# What's Out There?





# What's Out There?





[illegible]



# Golf Course Play Areas







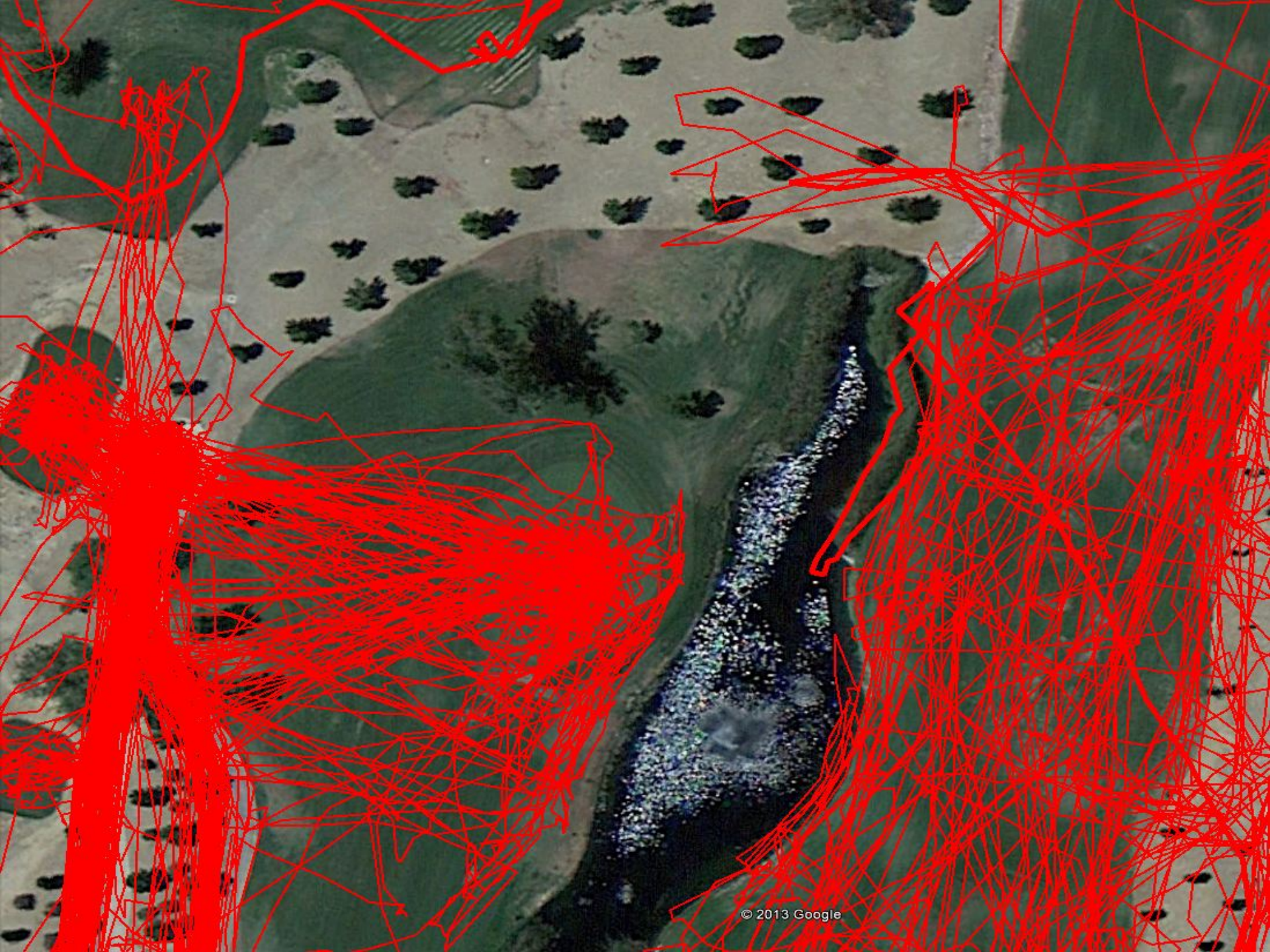
Green Valley North

© 2013 Google











# WSL Program to Date

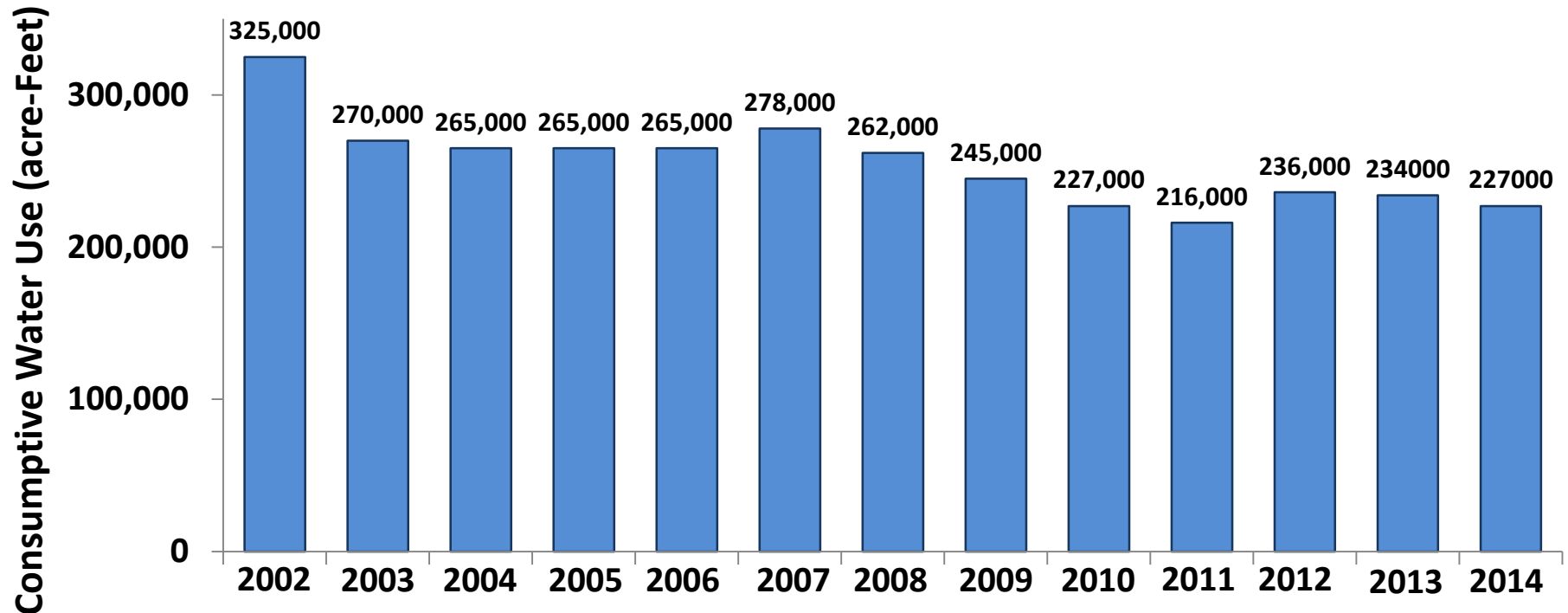
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- Converted of 170,000,000 Sq Ft of turf
- Conversions have resulted in a savings of over 78,000,000,000 gallons of water!
- New water savings of approximately 9.6 Billion gallons per year
- 3,000 landscape conversion annually
- All properties are measured by Conservation field staff



# Conservation Achievements

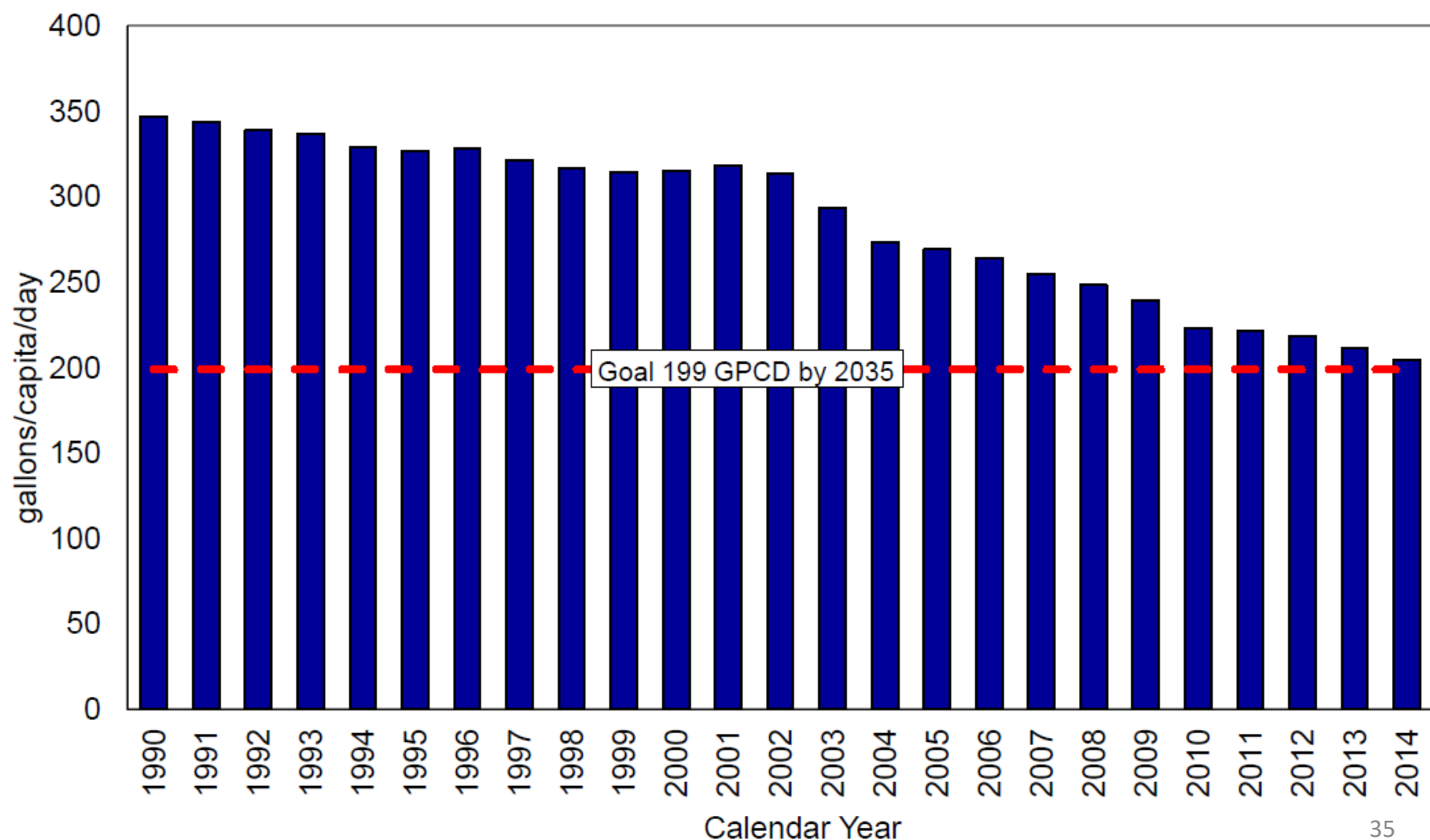
**Our community has made significant conservation achievements.**



**Southern Nevada uses over 90,000 fewer acre-feet of water than it did just over ten years ago, despite an annual population increase of nearly 500,000 residents and millions of annual visitors.**

# SNWA Total System GPCD 1990 to 2014

2014 SNWA per capita water use – 205 GPCD

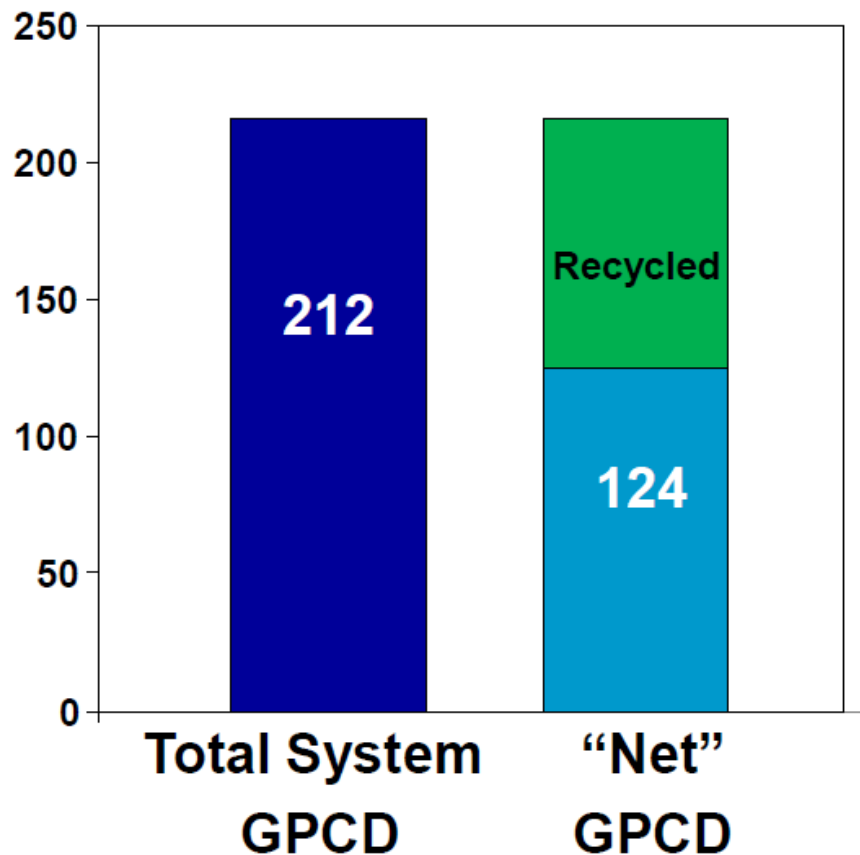




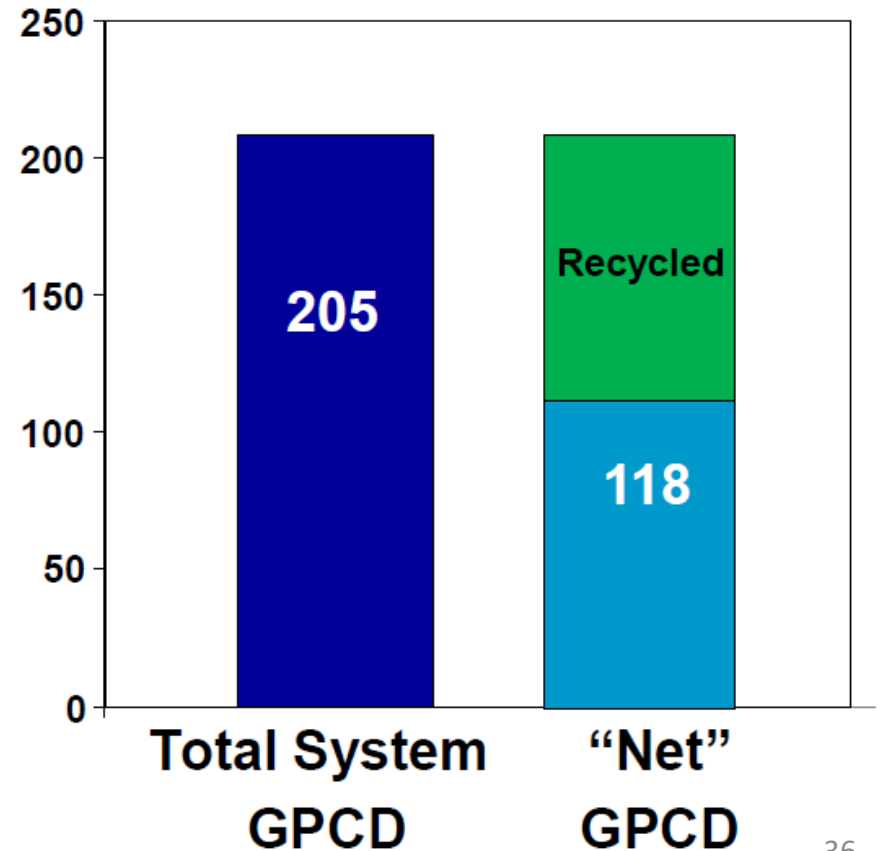
## Components of SNWA 2014 GPCD

Because of Direct and Indirect Recycling, total amount of water “net of recycling” is far less than the actual amount of water used.

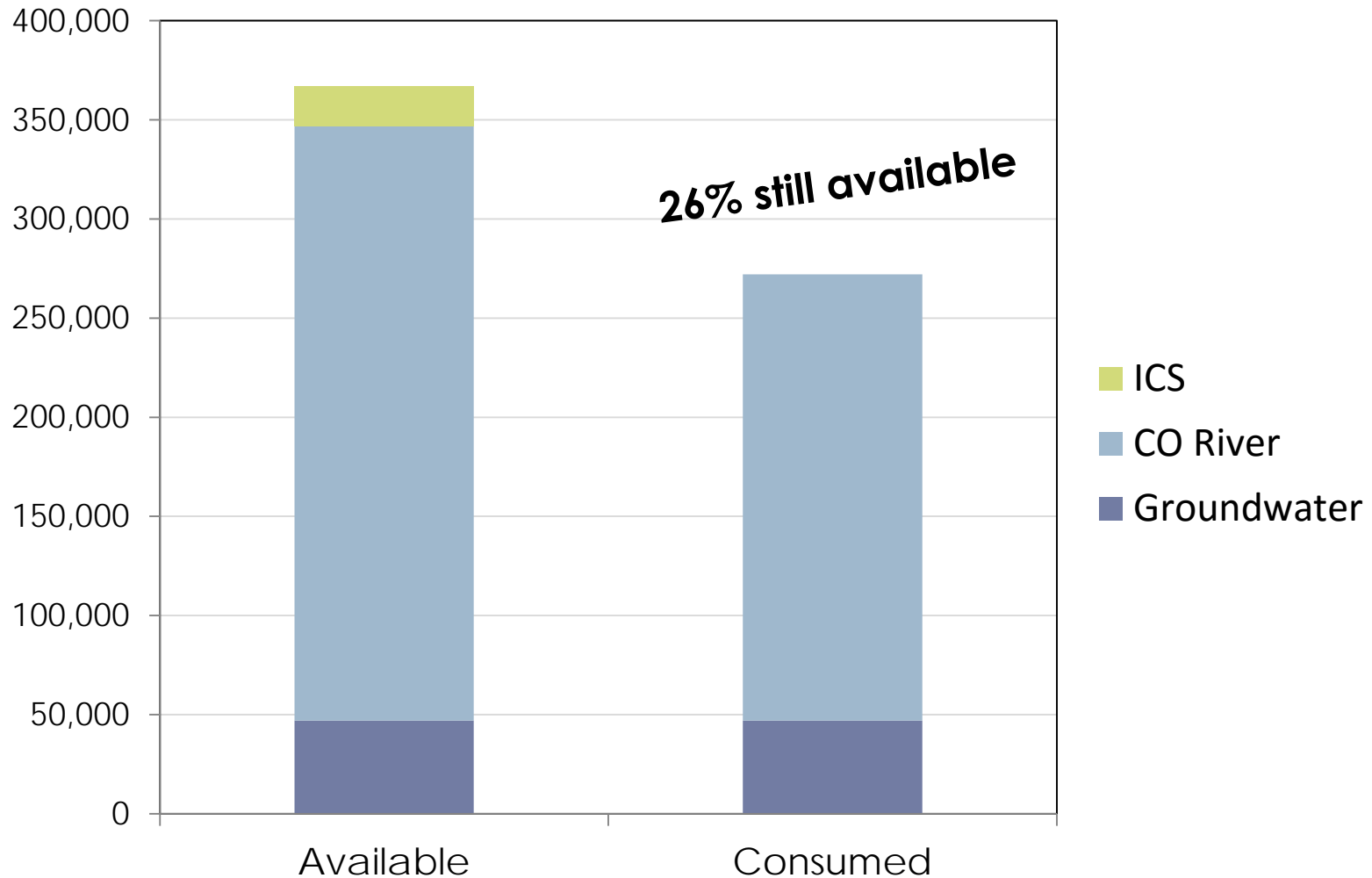
2013



2014



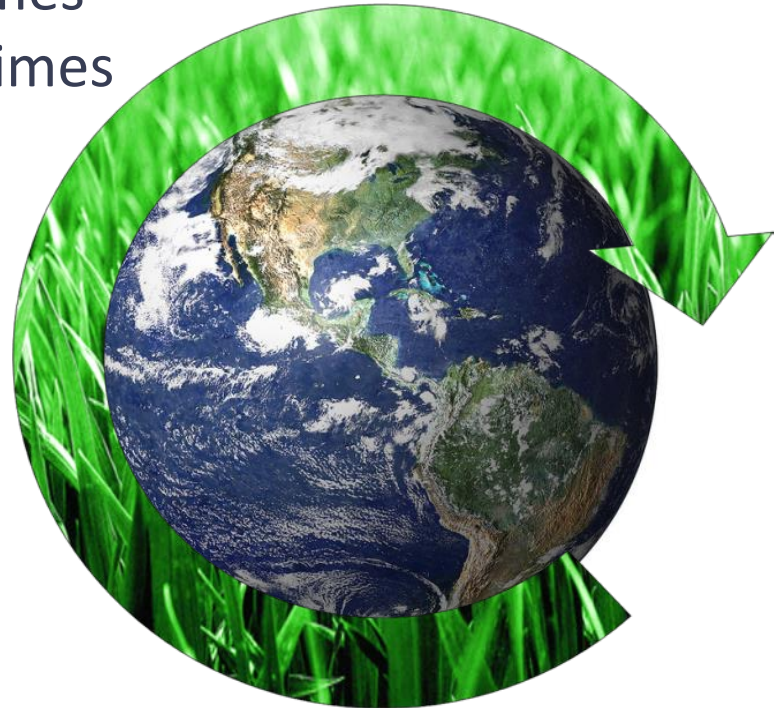
# One-fourth of Southern Nevada's permanent, consumptive use resources are not being consumed.



# Fun Facts

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- Southern Nevada has removed enough grass for a roll of sod to extend 87% of earth's circumference!
- Enough water has been saved to:
  - Fill 882,000 Olympic Swimming Pools
  - Fill the Luxor Hotel Pyramid 217 times
  - Fill the Empire State Building 283 times
- Saved 240,234 acre feet of water.
- Entire years' worth of water saved!





# Questions?

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To learn more please visit

[snwa.com](http://snwa.com)

[watersmartinnovations.com](http://watersmartinnovations.com)

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