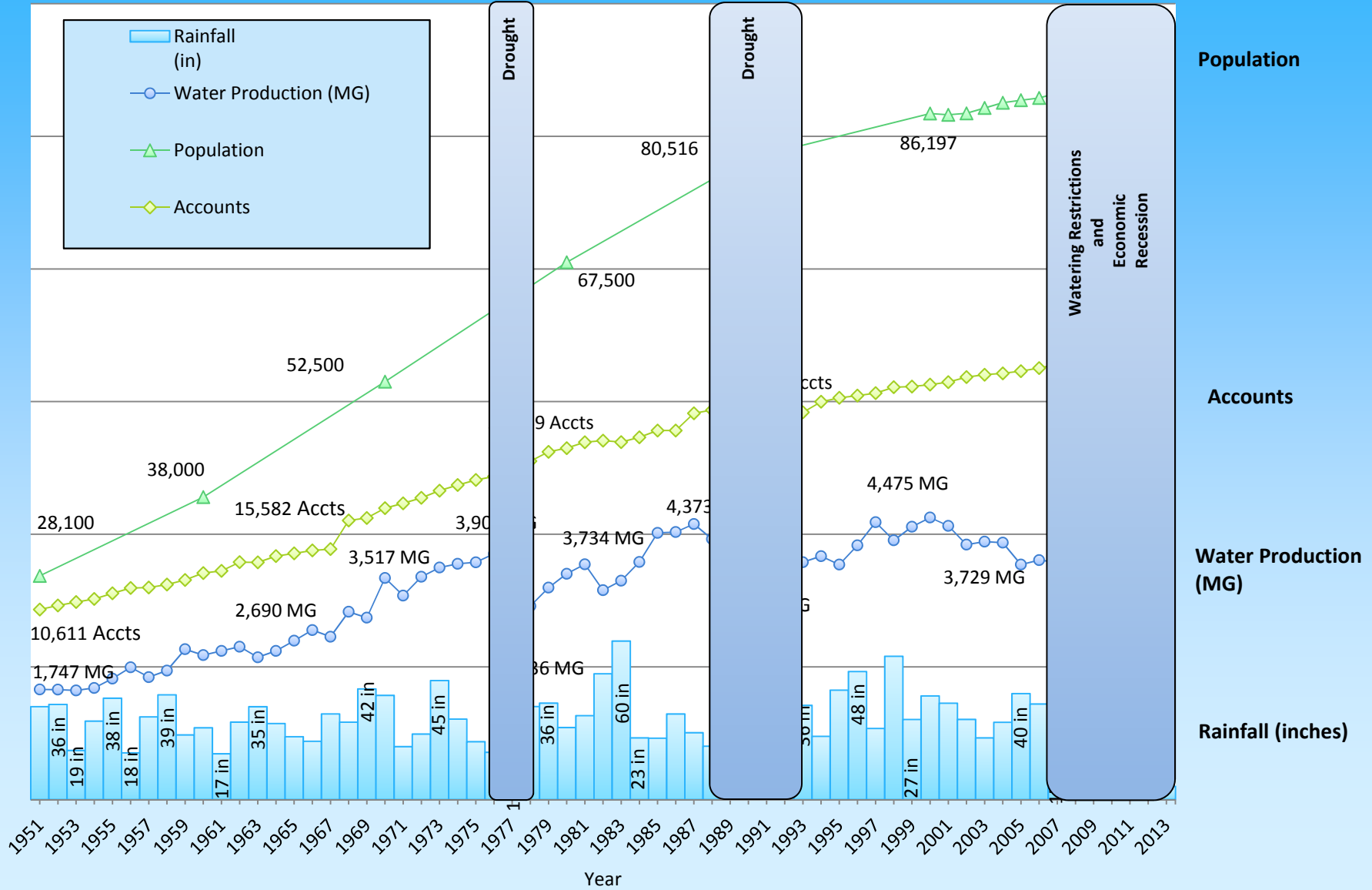


# Forecasting Water Demand

Water Supply Advisory Committee  
October 24, 2014



Population, Accounts, Water Production, and Rainfall  
1951-2013  
City of Santa Cruz



# Regulatory Background

## **Urban Water Management Planning Act**

CA Water Code 10631 e:

- Projected water use
- 5-year increments to 20 years
- By water use sector
- Update every 5 years – due again in 2016

## **SB 610 of 2001**

Coordinate local water supply and land use decisions

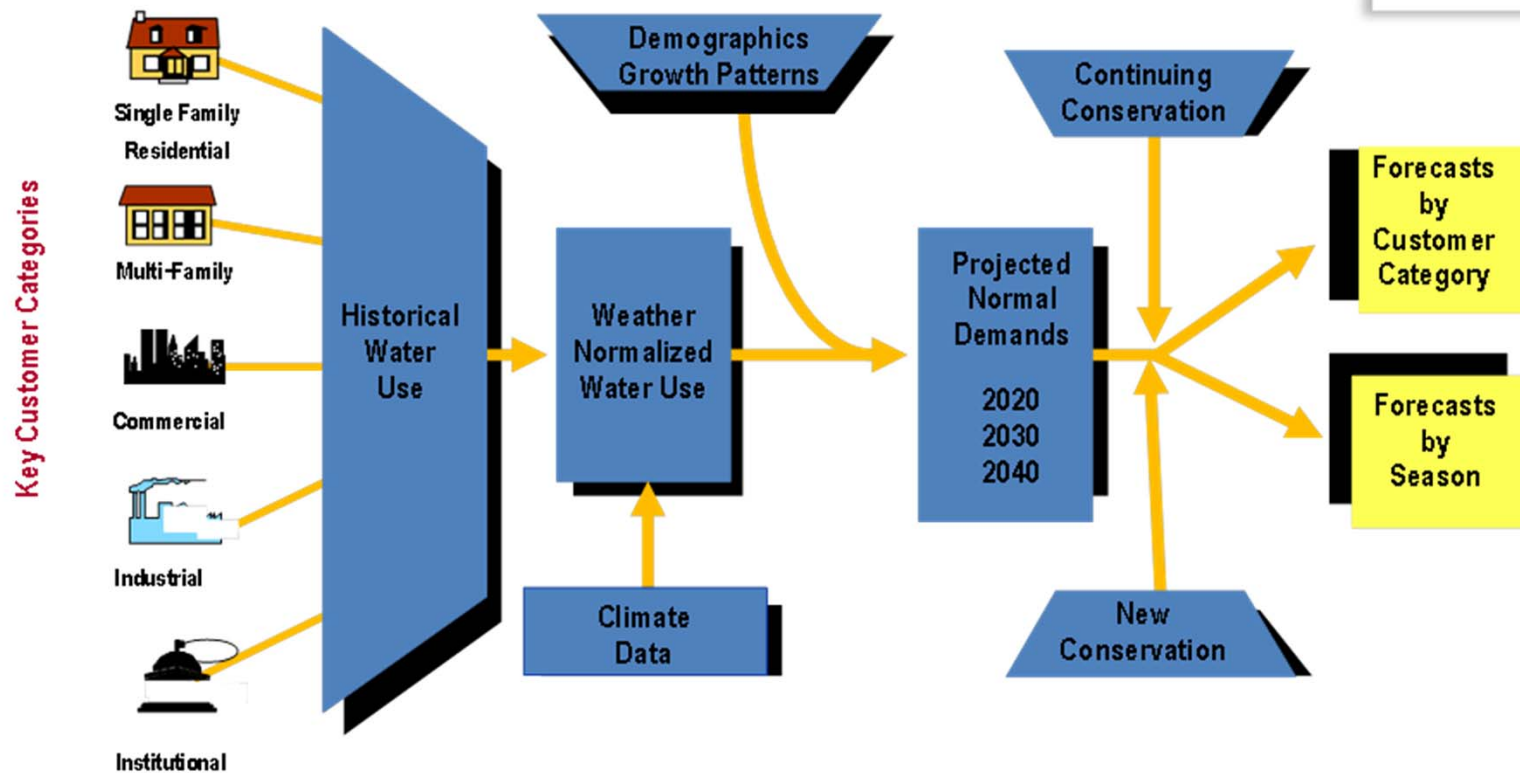
## **Regional Housing Needs Allocation (RHNA)**

# FORECASTING STONE

| FORECAST | CONDITION |
|----------|-----------|
|----------|-----------|

|                  |             |
|------------------|-------------|
| STONE IS WET     | RAINING     |
| STONE IS DRY     | NOT RAINING |
| SHADOW ON GROUND | SUNNY       |
| WHITE ON TOP     | SNOWING     |
| CANT SEE STONE   | FOGGY       |
| SWINGING STONE   | WINDY       |
| STONE GONE       | TORNADO     |

# Flow of Information



# Basis for Current Projections

## **Two Purposes w/ Shared Planning Horizon – 2030**

1. City's General Plan & EIR
2. 2010 Urban Water Management Plan

## **Two primary components:**

1. Existing Demands as of 2010
2. New Demands expected between 2010 and 2030

## **Breakdown**

1. Inside and Outside City
2. Customer Category

# Existing Water Demand

## **Primary information:**

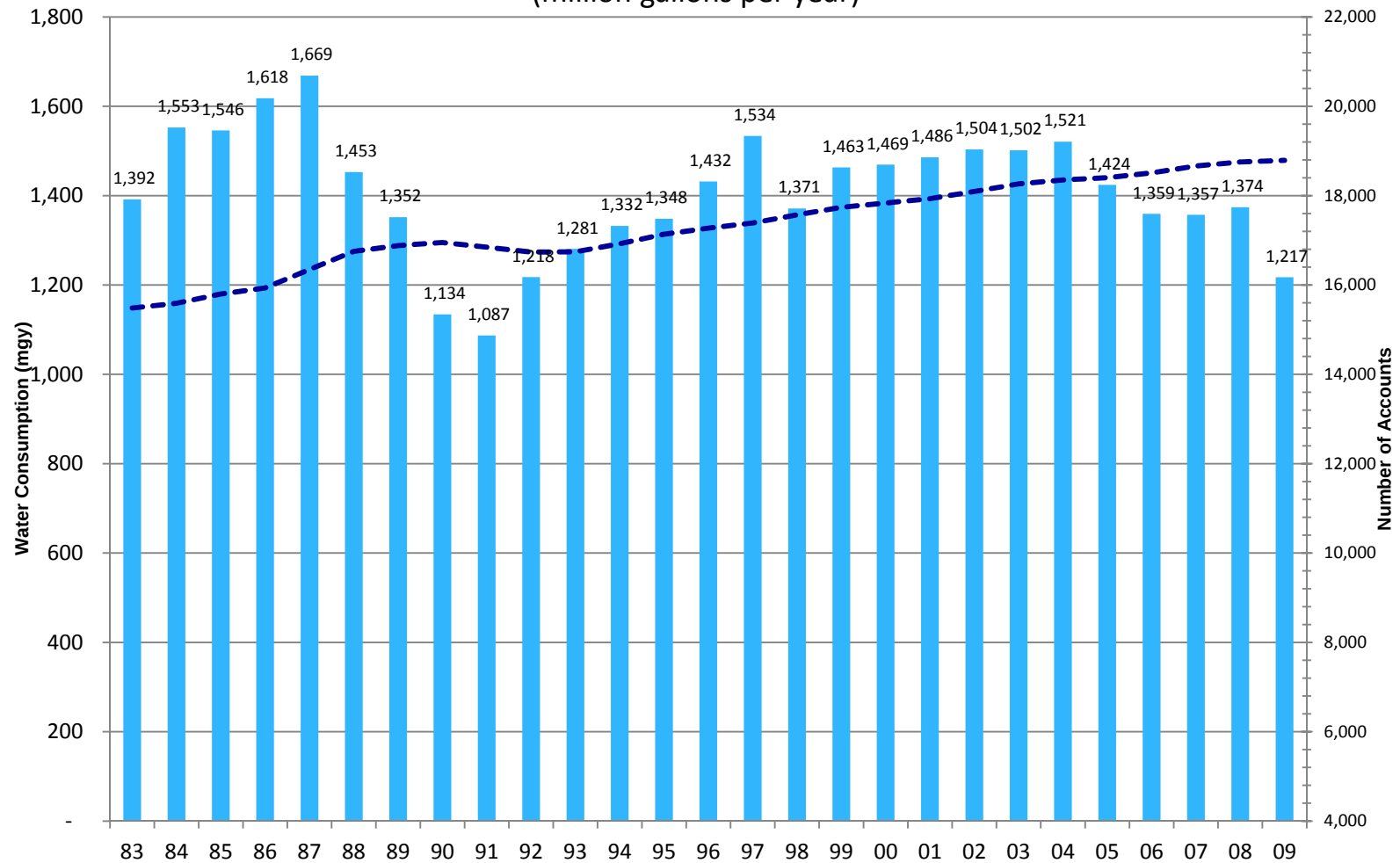
- Number of accounts (utility billing system)
- Average water use per account per day (utility billing system, tracking models)

## **Billing frequency**

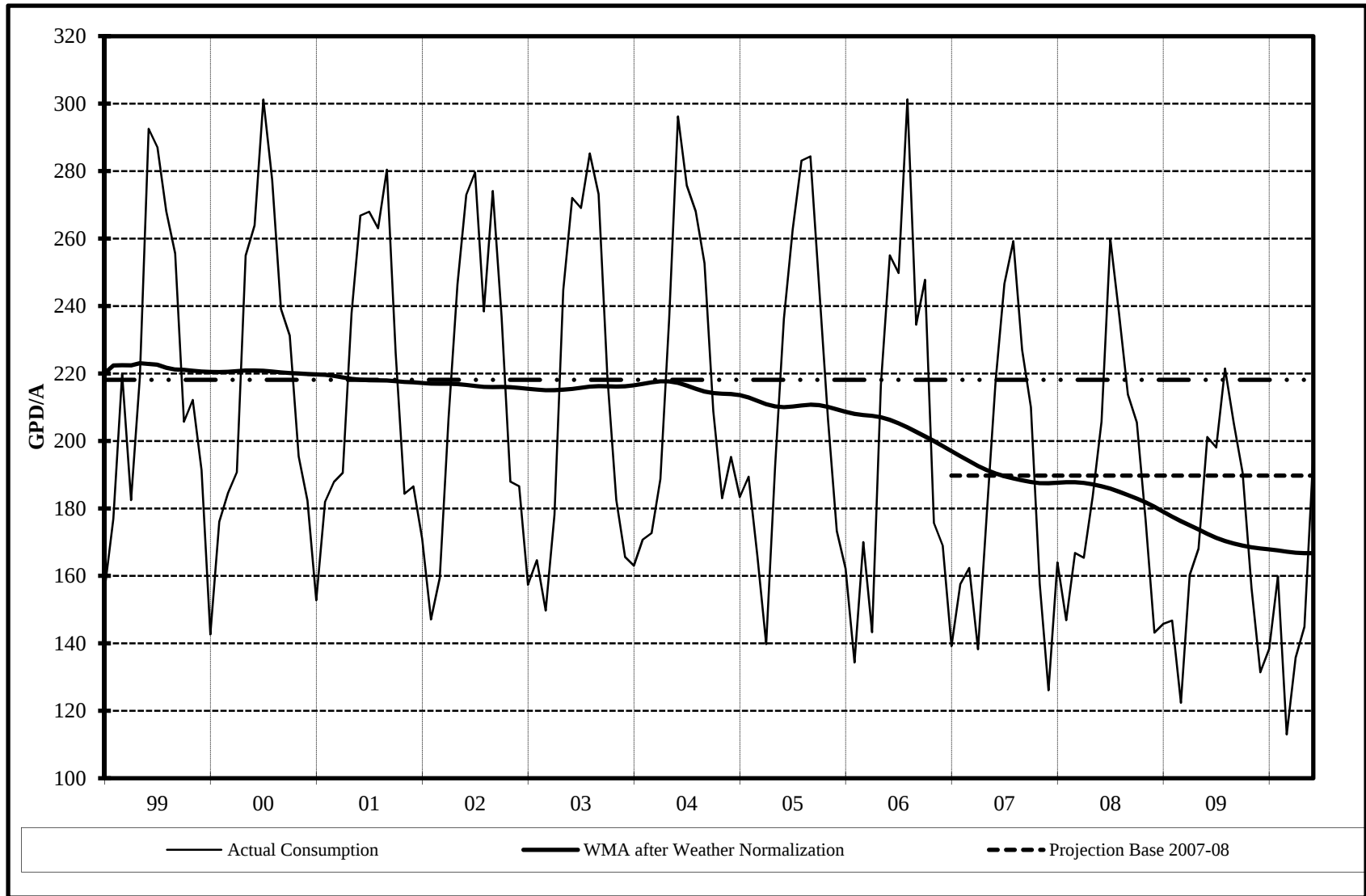
- Inside City - monthly since 2005
- Outside City – bimonthly up to 2014
- → Separate tracking models

# Single Family Residential

Annual Water Consumption, 1983-2009  
Single Family Residential Accounts  
(million gallons per year)



# Single Family Residential - Inside City



# Example: SFR Inside City

12,121 Accounts inside City

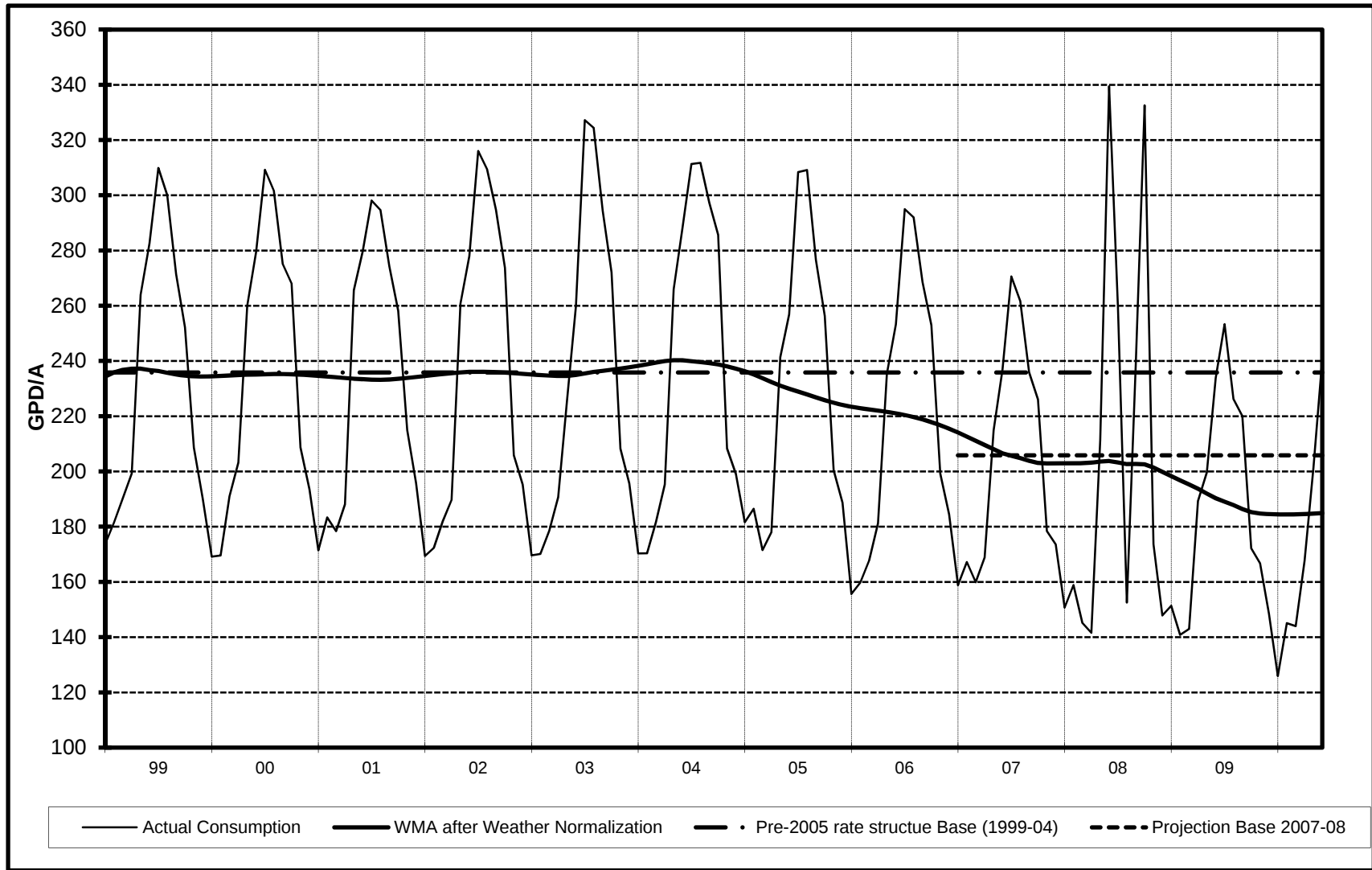
x 189.7 Gallons per account per day

x 365 Days/year

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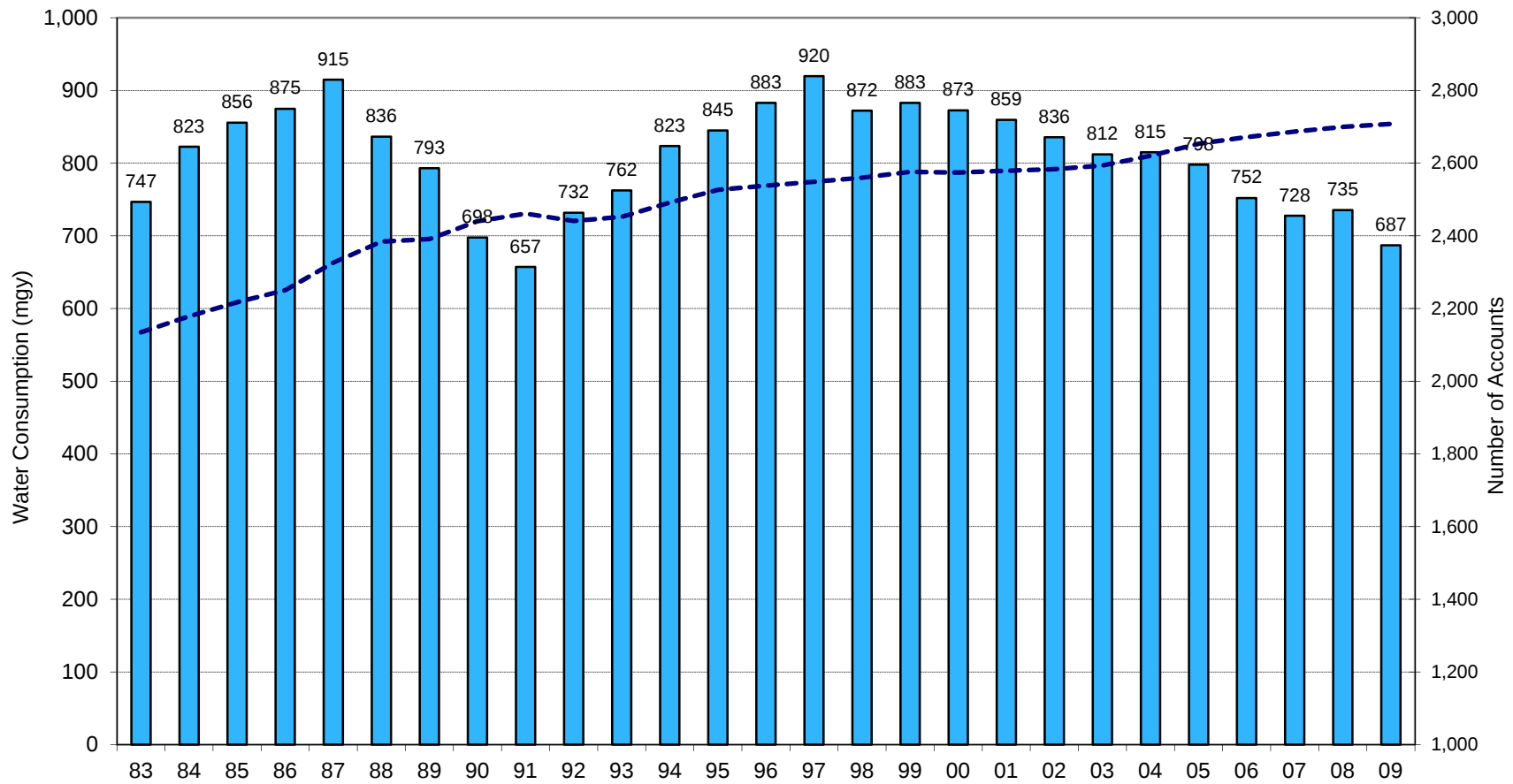
= 839 Million gallons per year

# Single Family Residential - Outside City

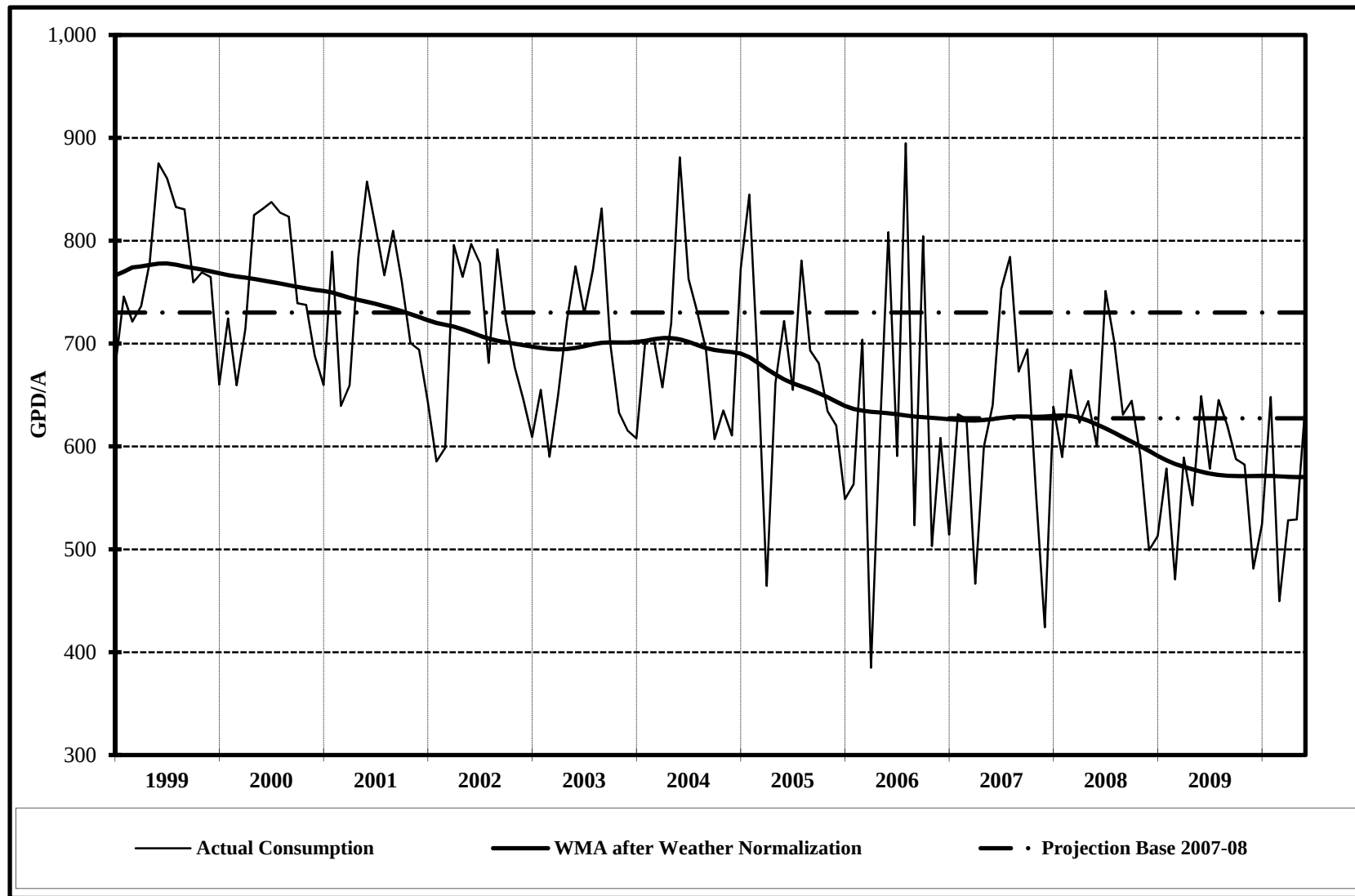


# Multi-family Residential

Annual Water Consumption, 1983-2009  
Multifamily Residential Accounts  
(million gallons per year)

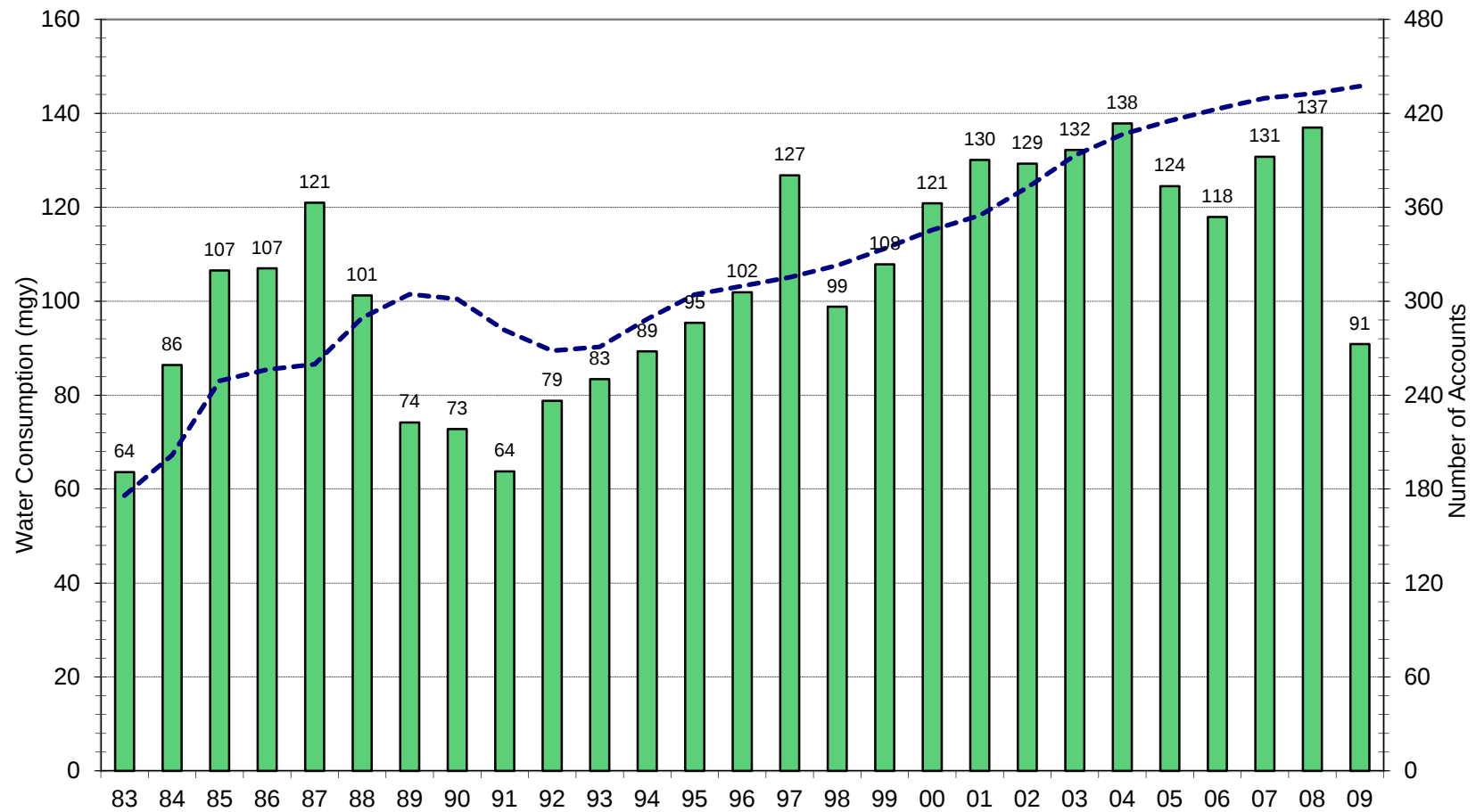


# Multifamily Residential – inside City

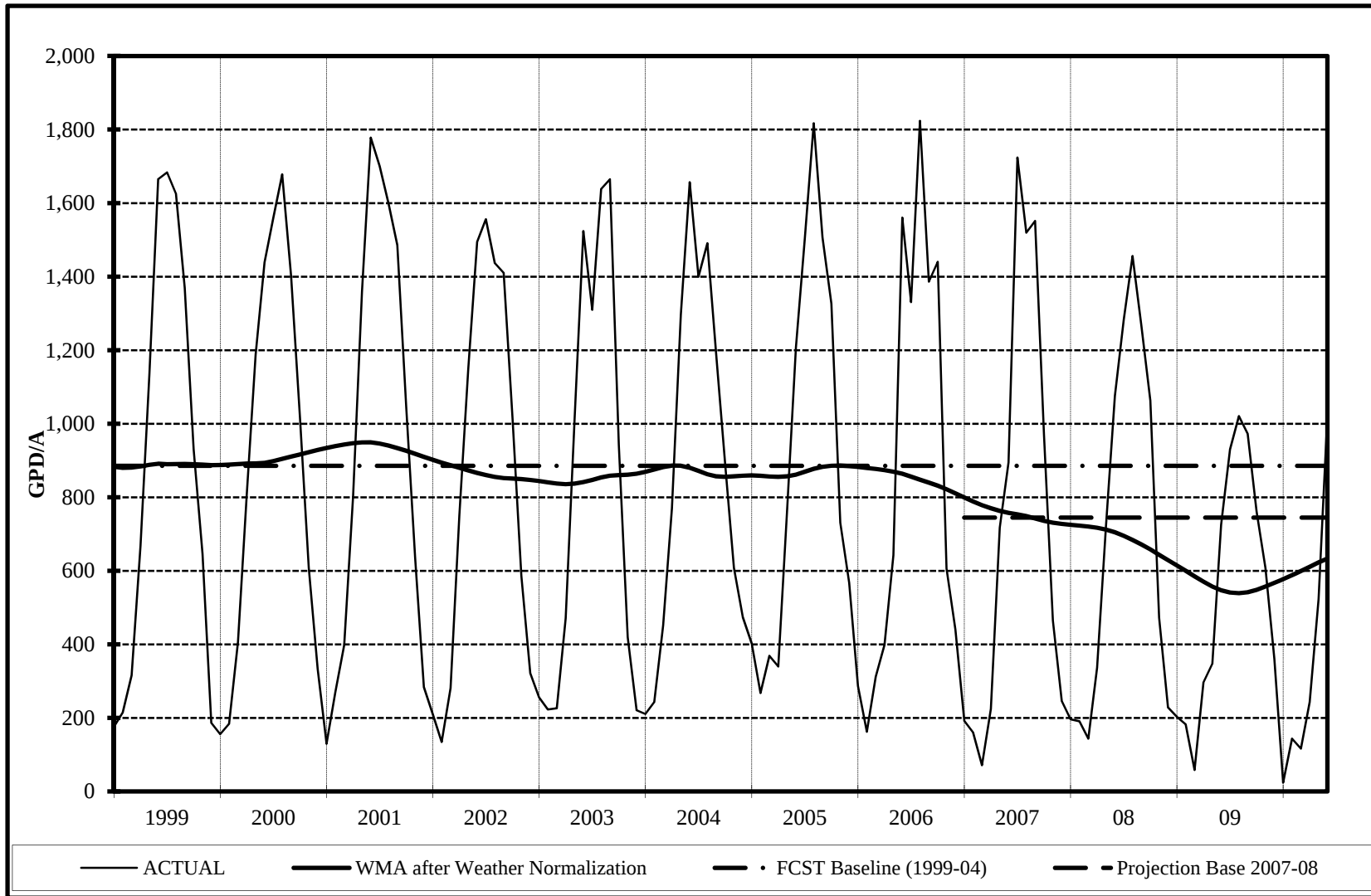


# Dedicated Irrigation Accounts

Annual Water Consumption, 1983-2009  
Irrigation Accounts  
(million gallons per year)



# Irrigation – Inside City



# New Demands to 2030

- Inside the City: Estimated General Plan 2030 Buildout (DC&E, 2009)

**General Plan 2030 Water Demand**

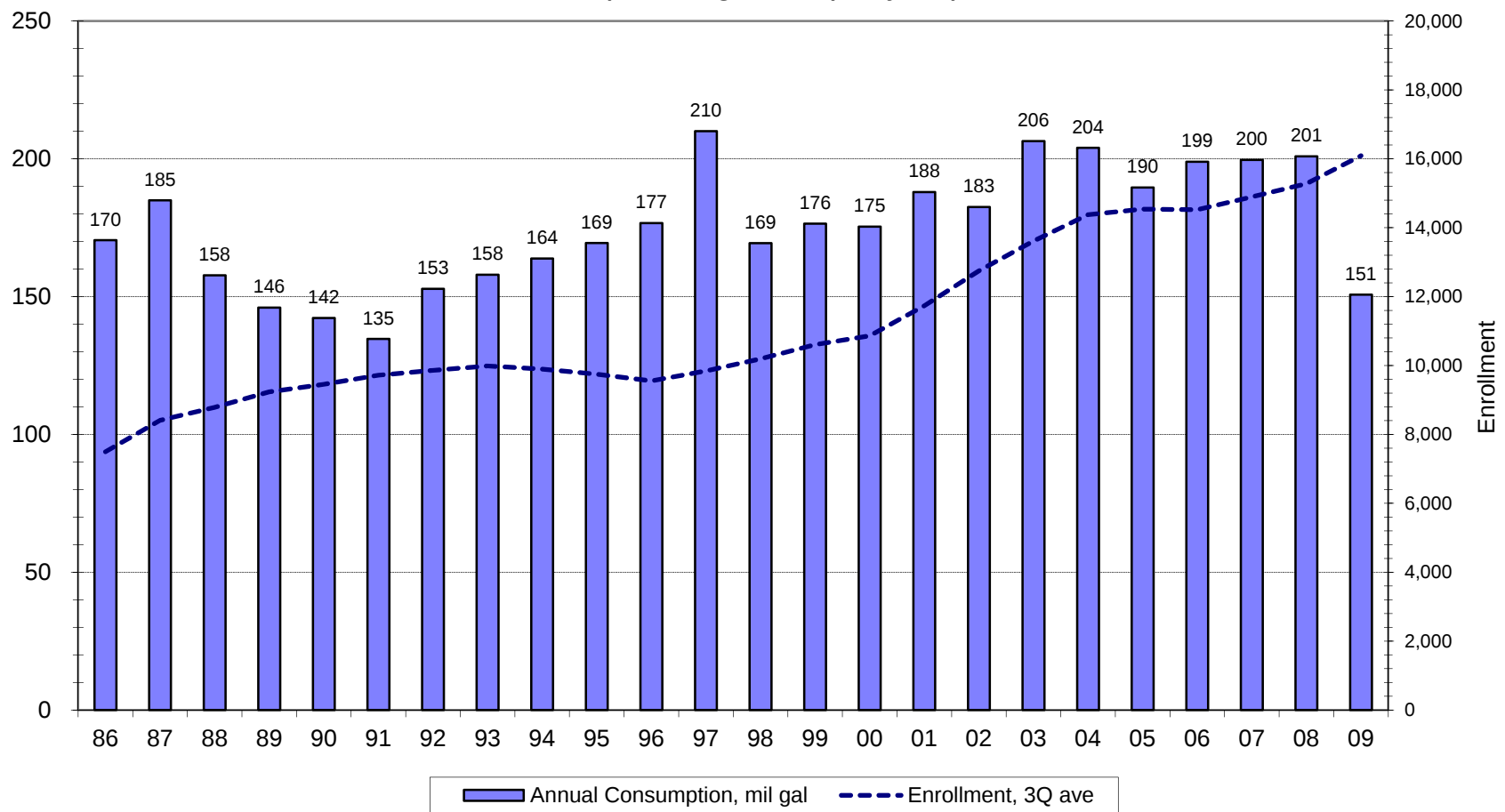
|                                 | <b>Buildout Projections (a)</b> | <b>Water Factor</b>           | <b>Water Demand (mgy)</b> |
|---------------------------------|---------------------------------|-------------------------------|---------------------------|
| <b>Single Residential (b)</b>   | 840                             | 194 gal/unit/day              | 59.6                      |
| <b>Multiple Residential (b)</b> | 2,510                           | 70 gal/unit/day               | 64.3                      |
| <b>Business/Industry:</b>       |                                 |                               |                           |
| - Commercial Sq Ft              | 1,087,983                       | 66 gals/ft <sup>2</sup> /year | 71.8                      |
| - Hotel Rooms                   | 311                             | 93 gal/room/day               | 10.6                      |
| - Office Sq Ft                  | 1,273,913                       | 18 gal/ ft <sup>2</sup> /year | 22.9                      |
| - Industrial Sq Ft              | 776,926                         | 12 gal/ ft <sup>2</sup> /year | 9.3                       |
| <b>Total</b>                    |                                 |                               | <b>238.5</b>              |

# New Demands to 2030

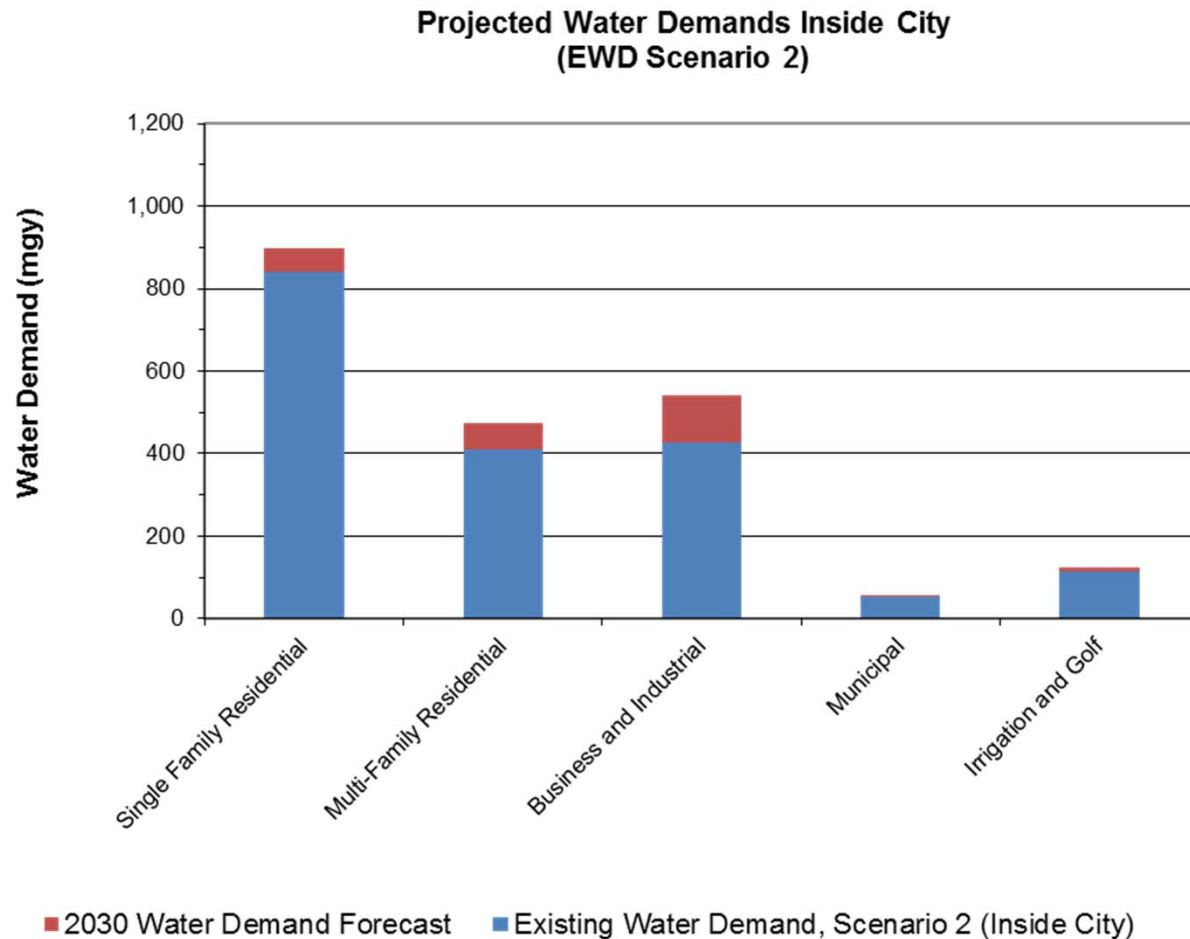
- **Outside the City:**
  - Scaled up residential and business sectors by 8% in accordance with AMBAG population projections
- **University of California**
  - Existing demand 212 mgy (200 mgy main campus)
  - Additional demand 2020: 126 mgy per its water supply assessment
  - Additional 10 mgy from 2020 to 2030

# University of California

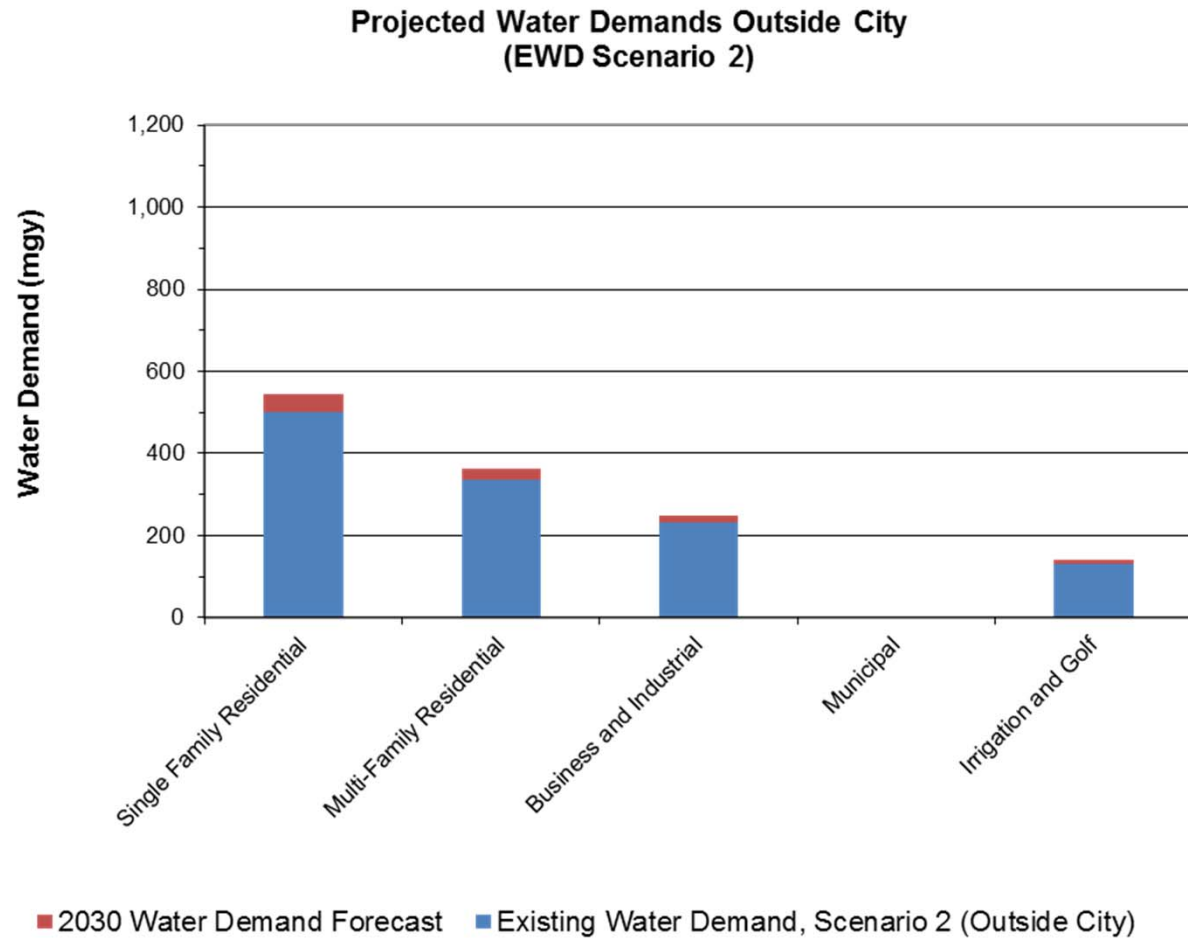
Annual Water Consumption, 1986-2009  
Univeristy of California, Santa Cruz (main campus only)  
(million gallons per year)



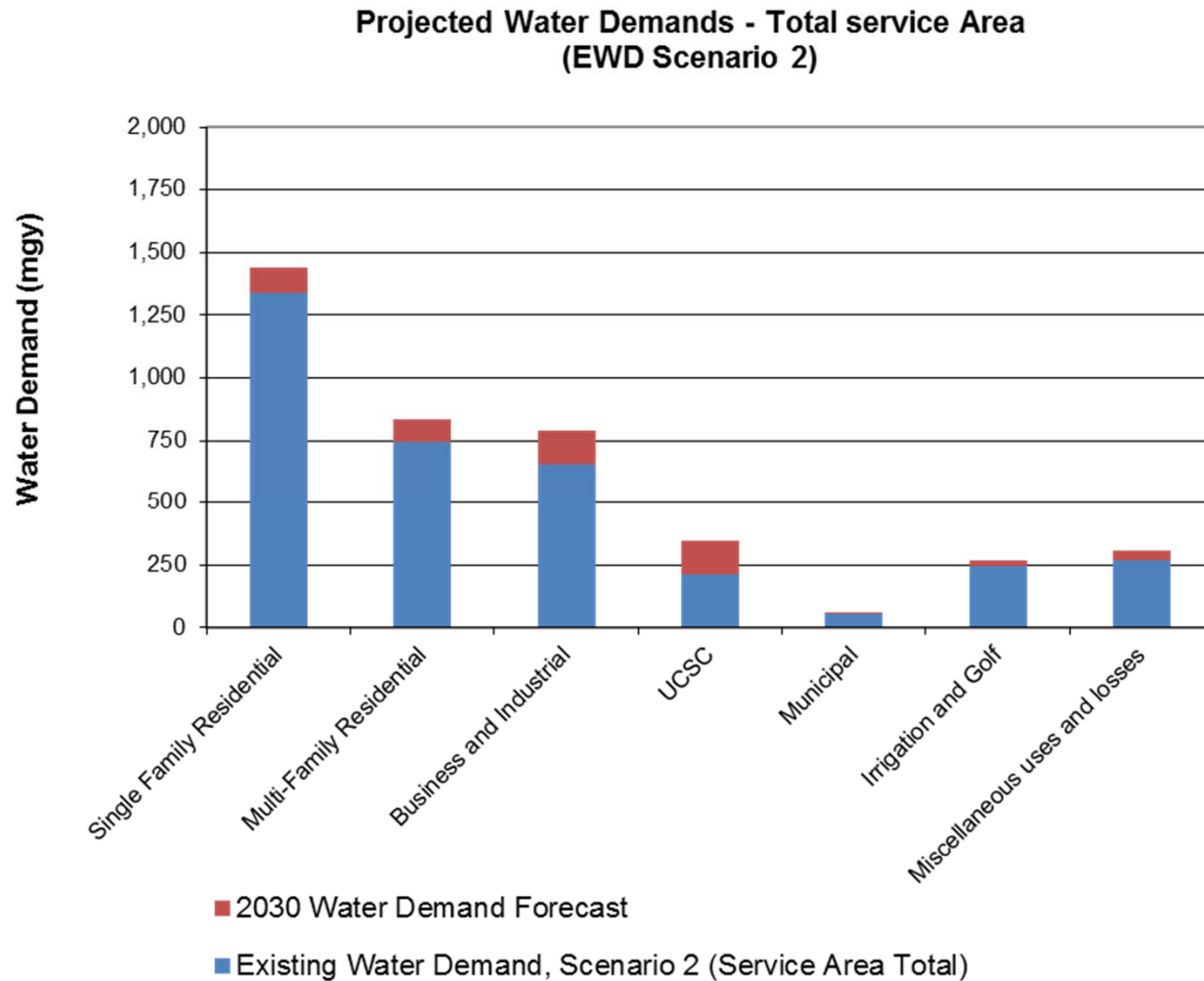
# 2030 Water Demand – Inside City



# 2030 Water Demand – Outside City



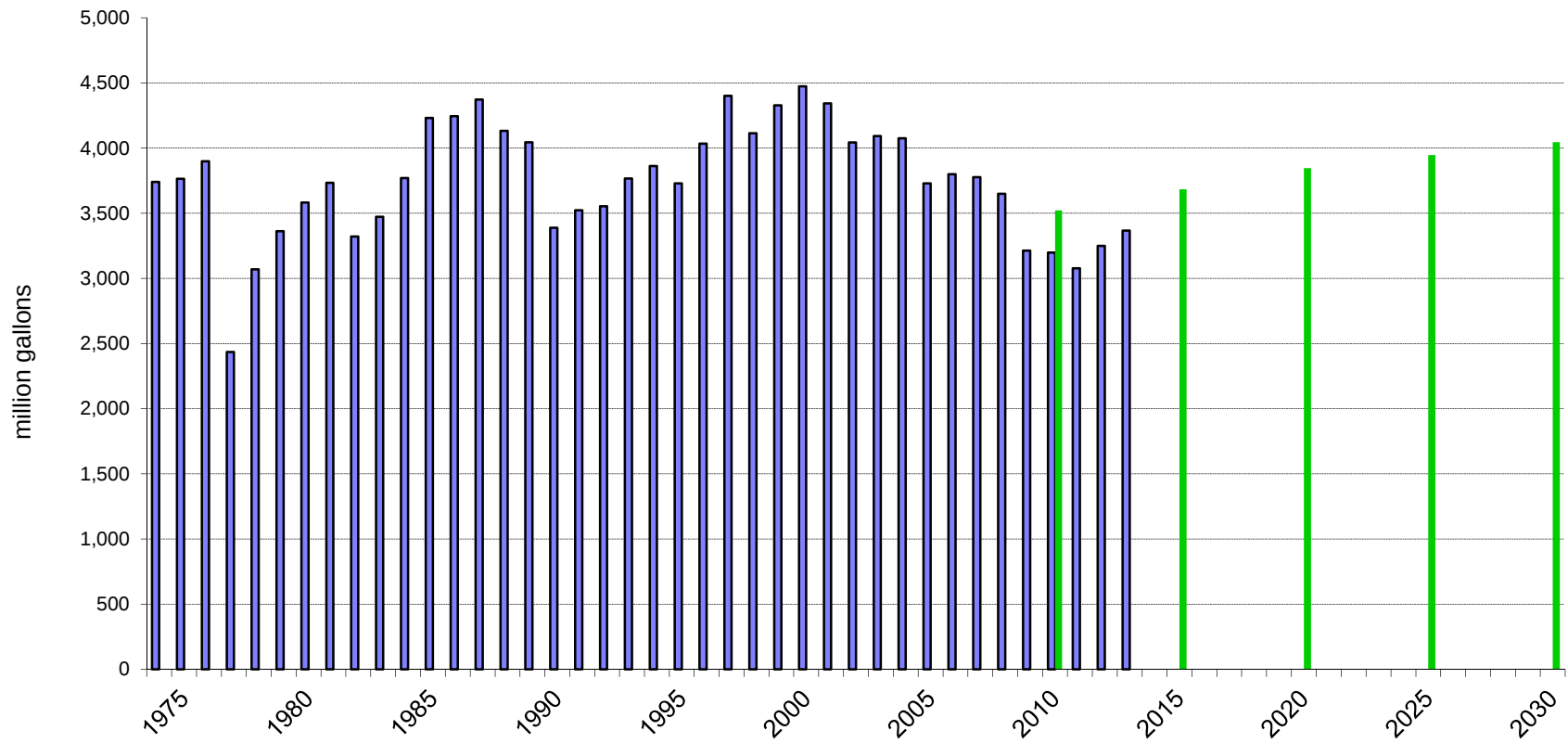
# 2030 Water Demand – Total



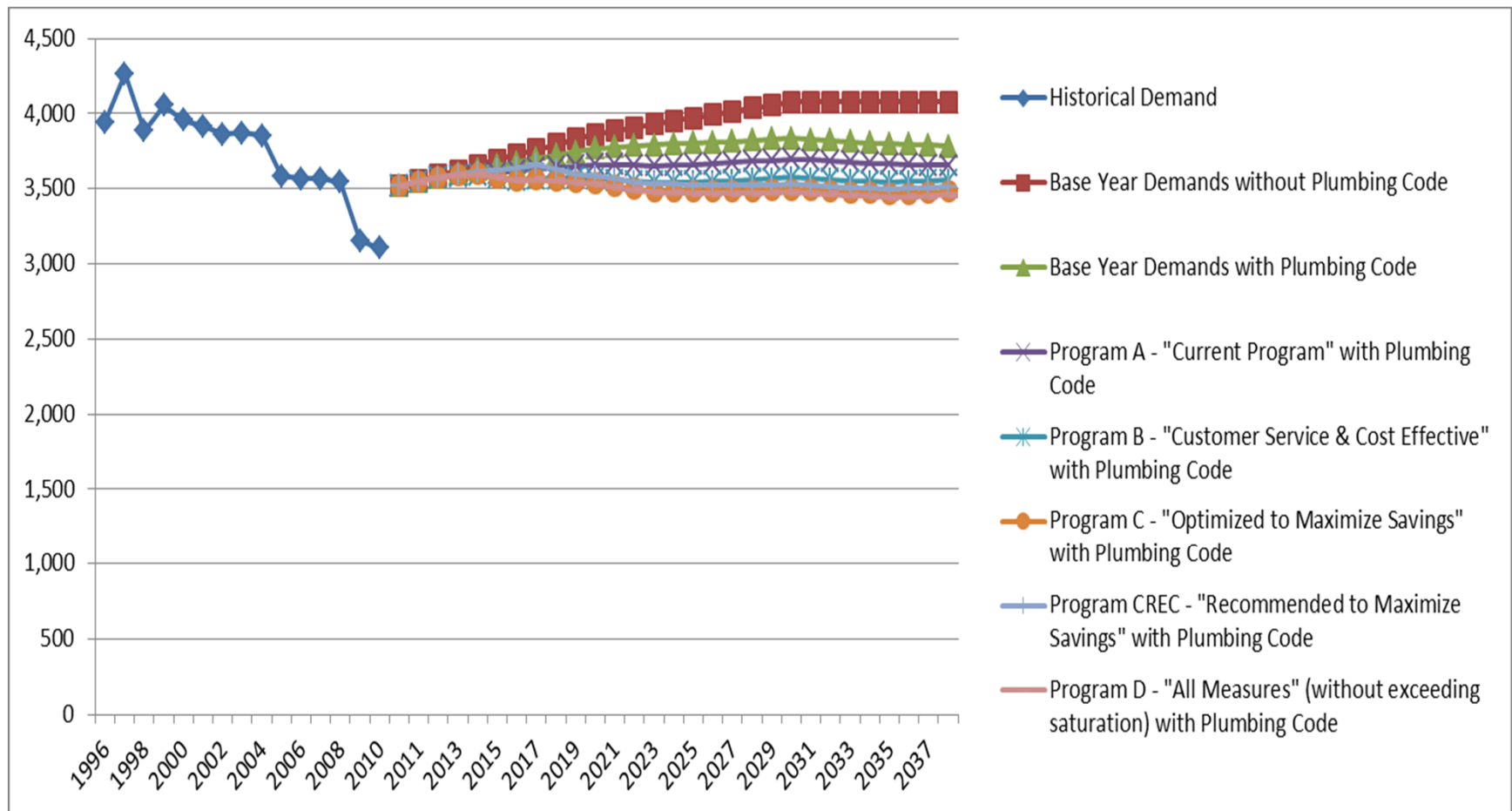
# Total System Demand

| Location:                                                                  | Customer Class       | 2010         | 2015         | 2020         | 2025         | 2030         |
|----------------------------------------------------------------------------|----------------------|--------------|--------------|--------------|--------------|--------------|
| City of Santa Cruz                                                         | Single Residential   | 839          | 854          | 869          | 884          | 899          |
|                                                                            | Multiple Residential | 408          | 424          | 440          | 456          | 472          |
|                                                                            | Business/Industry    | 425          | 454          | 483          | 511          | 540          |
|                                                                            | Municipal            | 54           | 54           | 55           | 55           | 56           |
|                                                                            | Irrigation/Golf      | 115          | 118          | 120          | 122          | 125          |
|                                                                            | UC Santa Cruz        | 212          | 276          | 339          | 344          | 349          |
| <b>Inside City Subtotal</b>                                                |                      | <b>2,055</b> | <b>2,180</b> | <b>2,306</b> | <b>2,373</b> | <b>2,441</b> |
| Outside City:<br><i>County, Capitola, &amp;<br/>North Coast Irrigation</i> | Single Residential   | 502          | 513          | 523          | 533          | 543          |
|                                                                            | Multiple Residential | 336          | 343          | 350          | 357          | 364          |
|                                                                            | Business/Industry    | 231          | 236          | 240          | 245          | 250          |
|                                                                            | Municipal            | -            | -            | -            | -            | -            |
|                                                                            | Irrigation/Golf      | 130          | 133          | 135          | 138          | 141          |
| <b>Outside City Subtotal</b>                                               |                      | <b>1,199</b> | <b>1,224</b> | <b>1,248</b> | <b>1,273</b> | <b>1,297</b> |
| Other miscellaneous uses including water losses                            |                      | 268          | 280          | 292          | 300          | 307          |
| <b>Total System Water Demand</b>                                           |                      | <b>3,522</b> | <b>3,684</b> | <b>3,847</b> | <b>3,946</b> | <b>4,046</b> |

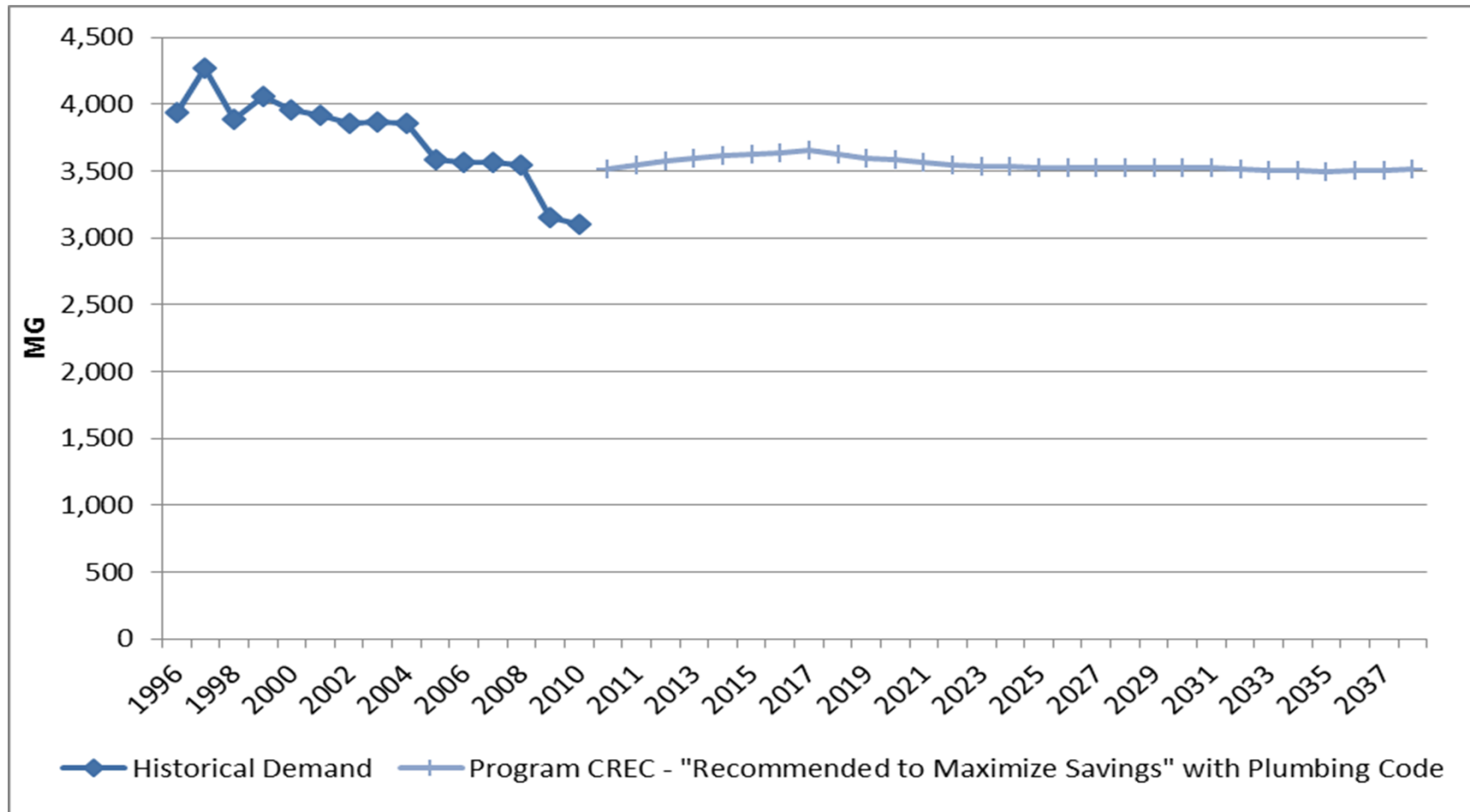
# Historic and Projected Water Demand



# Water Conservation Master Plan



# Program C-REC



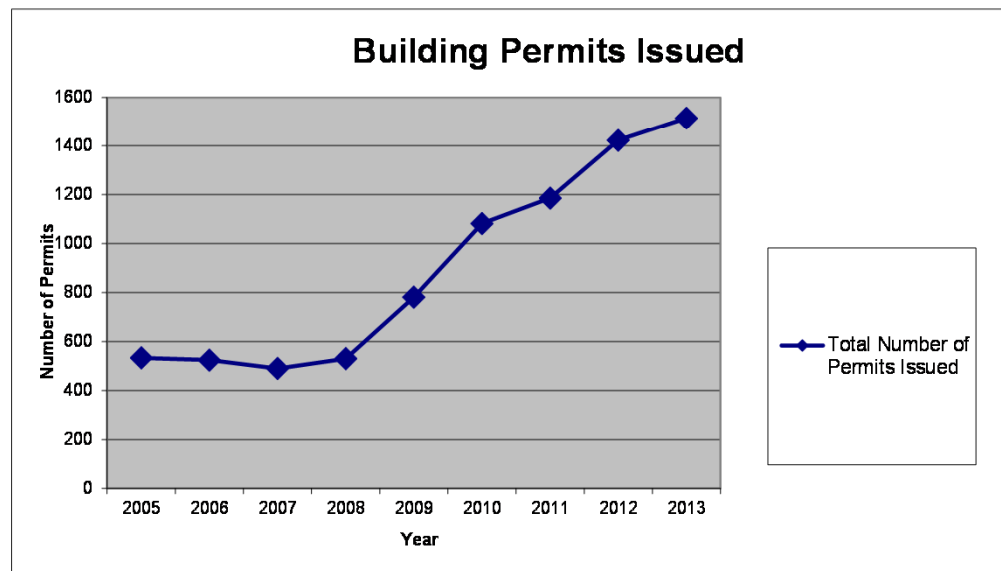
# Follow-up To Report on Historic Water Demand Related to Growth

| Year        | New Accounts |
|-------------|--------------|
| 2005        | 126          |
| 2006        | 166          |
| 2007        | 125          |
| 2008        | 81           |
| 2009        | 67           |
| 2010        | 69           |
| 2011        | 27           |
| 2012        | 64           |
| 2013        | 32           |
| 2014 (part) | 66           |

# Planning Data

**Planning and Community Development- Building Permit Trend**

|                                       | 2005 | 2006 | 2007 | 2008 | 2009 | 2010  | 2011  | 2012  | 2013  |
|---------------------------------------|------|------|------|------|------|-------|-------|-------|-------|
| <b>Total Number of Permits Issued</b> | 533  | 524  | 490  | 530  | 781  | 1,082 | 1,186 | 1,423 | 1,515 |
| <b>Commercial Permits</b>             | 122  | 124  | 121  | 184  | 201  | 260   | 297   | 412   | 439   |
| <b>Residential Permits</b>            | 411  | 400  | 368  | 346  | 580  | 818   | 886   | 1,009 | 1,076 |
| <b>Other</b>                          | 0    |      |      |      |      |       |       | 2     |       |



# Planning Data

**Planning and Community Development- Project Valuation Trend**

|           | 2005       | 2006       | 2007        | 2008       | 2009       | 2010       | 2011       | 2012       | 2013       |
|-----------|------------|------------|-------------|------------|------------|------------|------------|------------|------------|
| Valuation | 36,737,011 | 64,850,591 | 112,534,245 | 71,881,385 | 29,954,214 | 63,999,327 | 42,094,296 | 81,294,880 | 76,520,656 |

