Water Conservation Annual Report 2013

City of Fort Collins Utilities

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Introduction

This is the 22nd Water Conservation Annual Report prepared for the Fort Collins City Council providing accomplishments, partnerships, water use and an update on the provisions of the *Water Conservation Plan.*

The City views the water conservation program as a proactive response to water supply variability and climate change. Reducing indoor demand can be achieved through improved technology, leak reduction and behavior change. Outdoor demands can be reduced through improved watering efficiency and landscape transformation. Lowering water use improves system reliability and resilience to supply variability.

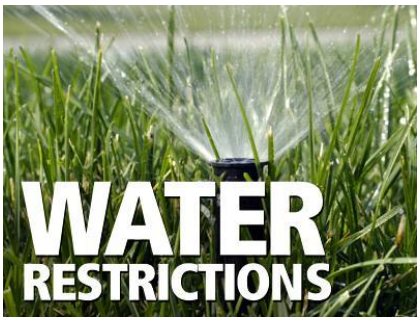
The water conservation program compliments Fort Collins Utilities' strategic sustainability initiative, Utility for the 21st Century, with a mission of "inspiring community leadership by reducing environmental impact while benefiting customers, society and the economy."

Fort Collins Utilities' water conservation programs provide our community with the resources and education necessary to decrease our environmental impact while also reducing long-term costs of water supply while meeting the demands of our customers now and into the future.

Executive Summary

Fort Collins Utilities offers a multi-faceted water conservation program based on public education, incentives, assessments and enforcement. The program is guided by the *Water Conservation Plan* which sets a goal of 140 gallons per capita per day (gpcd) by 2020. The incremental target to reach this goal was 149 gpcd for 2013. The average demand (adjusted for weather) in 2013 was 147 gpcd.

In early 2013, the mountain snowpack was well below average and there were concerns over water quality due to numerous wildfires in 2012, with the High Park Fire being the most significant. As a result, the decision was made to implement water restrictions. However, abundant spring snows brought the snowpack back to near average and the restrictions were only in place from April 1 to June 1. The challenge of implementing restrictions meant additional customer communication and engagement and enforcement duties. For the restriction period, water use was 22 percent below average and 18 percent below expected use.



2013 Highlights

- Provided 2,294 customer rebates for replacing fixtures with high-efficiency models including clothes washers, dishwashers, toilets, urinals and sprinkler equipment.
- Completed 407 sprinkler system audits, identifying system problems and recommending an efficient schedule for homes and homeowner associations.
- Provided retrofits of showerheads, faucet aerators, showertimers and toilets to 275 households in collaboration with the Larimer County Conservation Corps.
- Provided three all-day Poudre Watershed Tours. About 150 community members learned what it takes to provide quality water from the source to the treatment facility.
- Developed a new award program, Water Catchers, to recognize the efforts of residents and businesses to conserve water. Two businesses and one resident received awards.
- Offered customers water and energy conservation kits with a showerhead, faucet aerators, toilet leak detection dye tables, a compact fluorescent light bulb and more.
- Reviewed 73 landscape plans and 49 irrigation plans for compliance with the *Land Use Code's* water conservation standards.
- Participated in the State's stakeholder groups to develop rulemaking for graywater regulations and completed the first year of a two year graywater research project with Colorado State University (CSU).

Our Water Sources

The City receives its water supplies from the Cache la Poudre, Michigan and Colorado River basins. The Poudre River basin sources include senior direct-flow water rights, shares in several local irrigation companies and storage capacity in Joe Wright Reservoir, located high in the basin near Cameron Pass. Water from the Michigan River basin is conveyed into the Poudre basin where it can be stored in Joe Wright Reservoir then released for delivery to the water treatment plant, along with other Poudre sources.

The City also owns units of the Colorado-Big Thompson (C-BT) Project, administered by Northern Water (formerly the Northern Colorado Water Conservancy District). C-BT water is diverted from the upper Colorado River basin and stored in Lake Granby, Carter Lake and Horsetooth Reservoir. The City takes delivery of its C-BT water out of Horsetooth Reservoir.

On average, each source provides about half of the supplies used to meet Utilities' customer treated water demands. Including all sources, the City currently owns water rights that have an average annual yield of approximately 75,000 acre-feet (AF) per year. Per City Council policy, Utilities maintains sufficient water supply to meet an average annual treated water demand of approximately 31,000 AF during a 1-in-50 year drought in the Poudre River basin. During more severe droughts, restrictions may be implemented to reduce demand to match available supplies.

Water Conservation Planning

Water Supply and Demand Management Policy

The original 1992 *Water Demand Management Policy* was updated and combined with the *Water Supply Policy* in 2003. In November 2012, City Council adopted a revised *Water Supply and Demand Management Policy* (WS&DMP).

The WS&DMP provides general criteria for decisions regarding water supply projects, acquisition of water rights and demand management measures. The revised policy sets an annual water use efficiency goal in alignment with the *Water Conservation Plan* of 140 gallons per capita per day (gpcd) by 2020. It also sets a peak daily demand goal of 350 gallons per capita (gpc) by 2020. These are a reduction from the previous 2003 policy which set the goals at 185 gpcd for water demand and 475 gpc for peak daily demand by 2010.

The 2012 WS&DMP sets a water supply planning demand level of 150 gpcd, which is used to determine water supply and facility acquisitions. This planning level provides a value that is higher than the water use goal to address uncertainties inherent in water supply planning.

Water Conservation Plan

In 2010, the *Water Conservation Plan* (WCP) was approved by the Colorado Water Conservation Board to comply with the State's *Water Conservation Act of 2004.* The WCP (*fcgov.com/waterconservationplan*) reflects specific measures related to the demand management criteria outlined in the WS&DMP and sets a demand goal of 140 gpcd by 2020. City Council approved the recommended measures in the 2010 to 2014 budgets.

Programs target all customer classes and indoor and outdoor water use. Attachment 'A' shows the programs and measures in the plan, including the customer class that will be impacted, whether a measure affects indoor or outdoor use and the date of implementation. All but two of the measures are in place. "Online access to water history" and "Water loss program enhancement" will be implemented as data from the deployment of advanced meters becomes available.

The WCP says that a "formal review and revision will be completed five years after adoption," meaning the City's plan would need to be updated by 2015. As work on the revision began, it became clear that not enough data was available to evaluate how the current programs were working. Since new programs were implemented gradually from 2010 to 2013, their impact on water use is only beginning to be realized. With the Water Board's agreement, it was decided to meet the State's schedule of an update within seven years, in 2017. The Budget for Outcomes process in 2014 also influenced the decision to delay the update since program recommendations may impact the budget. With more planning time, recommendations will be prepared in 2016 for the 2017-2018 budgeting process.

Water Use Goals

The Water Conservation Plan sets a goal of 140 gallons per capita per day (gpcd) by 2020. The gpcd calculation is based on the total treated water used by City customers (adjusted for large contractual customers and other sales or exchange arrangements) divided by the estimated population of the City's water service area and 365 days. This calculation is adjusted for weather (normalized) to provide a fair comparison with other years.

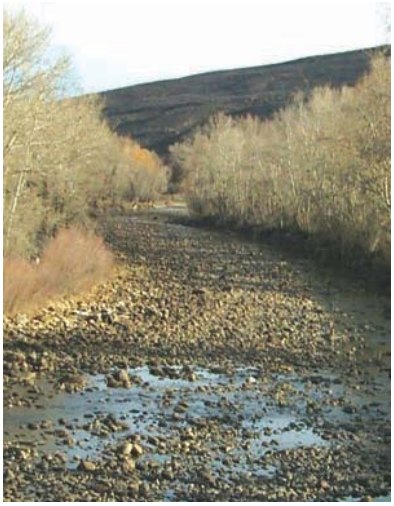
2013 Water Use Savings

In 2013, the normalized average demand was estimated to be 147 gpcd, lower than 152 gpcd in 2012. The table below shows the incremental annual targets for achieving the WCP goal, compared to actual normalized use.

Water Conservation Plan Annual GPCD Targets

	Target	Actual Normalized	Previous 5-yr. Average
Baseline	155		
2010	153	144	151
2011	152	144	149
2012	150	152	148
2013	149	147	147
2014	147		
2015	146		
2016	144		
2017	143		
2018	142		
2019	140		
2020	139		

2013 Weather and Water Conditions



Mountain snowpack was well below average early in 2013 with only 50 percent of average snowpack on February 1; 62 percent by March 1 and 70 percent by April 1. The low snowpack and water quality concerns due to numerous 2012 wildfires in the Poudre River watershed prompted the decision to implement water restrictions. However, abundant spring snows brought the Poudre Basin snowpack up to 94 percent of average by May 1 and ended the snow season with close to average snowpack. In addition, significant snowpack increases in the C-BT basin provided for additional allocations from that system. Therefore, water restrictions were only in place from April 1 to June 1.

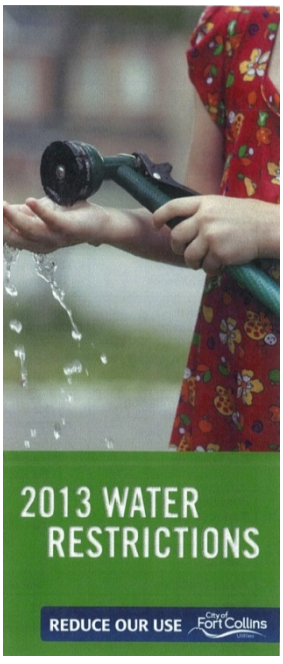
The snowpack conditions caused the native Poudre River flows to be well above average at almost 318,000 AF, compared to an average of 275,000 AF and only 109,300 AF in 2012.

The damp spring was followed by a very dry June, average July and dry August. September was very wet for a week producing about 6 inches of rain in Fort Collins, but up to three times that amount fell in other Front Range communities causing flooding that resulted in tremendous destruction and loss of life.

Temperatures during 2013 were generally warmer than average, with a mean daily temperature of 50.0 degrees Fahrenheit, about 1.7 degrees above average but significantly cooler than 2012 which was 5 degrees above average. Total precipitation for the year was slightly above average at 18.8 inches; however, almost one-third of the year's total precipitation occurred in mid-September.

Total water demand was 23,201 AF, about 91 percent of projected use due to well-timed spring rains and fall flooding. The City's peak day use of 43 million gallons occurred on June 26, which is earlier than the usual peak in early July.

Water Restrictions



Northern Water issued an initial 50 percent quota in November 2012, and despite persistent drought conditions a supplemental quota in April of only 10 percent. Due to low snowpack at the time, it was prudent to maintain storage levels in Lake Granby in case of continuing drought conditions.

Staff began meeting to discuss the water supply situation and the need for restrictions in November 2012. In January 2013, a Water Restrictions Team, made up of water resources and treatment, water conservation, communication and marketing, education and parks staff, came together every two weeks to coordinate all aspects of the restrictions. A comprehensive *Water Shortage Management Action Plan* was written to guide communications, public engagement and violation management.

The *Water Supply Shortage Response Plan* (WSSRP), Ordinance No. 048, 2003, outlines a series of measures to be enacted, including water restrictions, for four levels of water shortage. On March 6, City Manager Darin Atteberry declared Response Level 1 restrictions to be effective on

April 1. The Cache la Poudre River had water quality concerns due to the High Park Fire and low snowpack. The Colorado-Big Thompson Project continued to be affected by persistent drought and low snowpack.

In anticipation of possibly declaring Response Level 2 or higher, Council approved Ordinance No. 047, 2013, adjusting the water rates as recommended in the WSSRP and a few revisions to the plan itself. By May, the weather had made a drastic turnaround with abundant snow and precipitation. With an increase in our water supplies that no longer indicated a shortage, restrictions were lifted effective June 1. All actions and results were captured in the *Water Shortage Management Action Plan* for future reference.

Communication and Public Engagement

Heading into restrictions, the decision was made to take an educational approach to encourage customers' participation. Communications and public engagement plans were prepared with key messages and targeted outreach.

Water restrictions presentation

The communications plan included using the slogan, *Reduce Our Use*, as a call to action. Bill inserts, bus benches, bus shelters, newspaper and magazine articles and ads, social media and the website reflected the need for restrictions and ways to conserve.

A speaker's bureau was established to educate the public about the City's need for restrictions, how to comply with them and other conservation actions. About 75 percent of City staff attended a presentation where they learned about the need for restrictions so they could share a consistent message when talking to the public. Staff also received communication through internal emails and the intranet. Externally, 54 presentations were given to various businesses, organizations and at community events.

Business sectors largely impacted by the water restrictions, such as landscapers, power washers, breweries and homeowner associations (HOA), received targeted outreach. Key account managers communicated often with businesses to share the status of the water supply and restrictions; especially around the potential rate increases for Response Level 2 and higher.

Violation Management

Violation management included issuing permits and responding to complaints of wasting water and violations of the restrictions. There were 179 permits issued and 53 complaints investigated. No citations were issued. To help customers comply with the restrictions, home visits were offered to help re-program their sprinkler controllers.

Permits issued:

New seed and sod: 164
Medical hardship: 4
Religious objections: 5
Large property: 6

Complaints by sector:

Residential: 29
Commercial: 24

Complaints by violation:

Wrong day: 19
Wrong time: 10
Spraying impervious surface: 4
Wasting water: 20

Lifting Restrictions

Due to a dramatic increase in mountain snowpack, the City was fortunate to have significant additional Horsetooth Reservoir supplies which allowed the City to achieve a carryover goal of 7,500 acre-feet and meet remaining 2013 demands. City Manager Darin Atteberry declared the termination of the water restrictions as of June 1.

Water Use

For the restriction period of April 1 to May 31, water use was 22% below average and 18% below expected use (the amount of water that was expected to be used considering the actual weather conditions).

Updates

As the water restrictions were implemented, it became clear that the *Water Supply Shortage Response Plan* and associated Municipal Code provisions needed to be updated. In August, the Water Restrictions Team reconvened to begin working on the revisions to the plan based on identified issues. The proposed changes will be presented to Water Board and City Council in 2014.

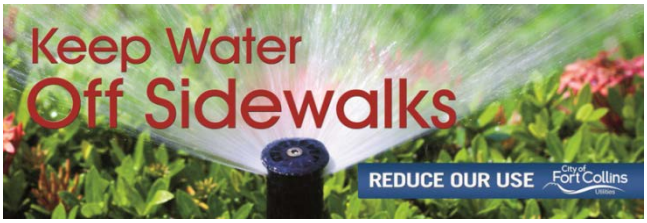
2013 Accomplishments

The *Water Conservation Plan* identifies eight categories of programs and measures. Below is a review of the accomplishments in each category.

1. Education and Public Information

Education and outreach efforts are a strong component of the City's water conservation program to raise awareness about the need for conservation and ways to conserve. These programs reach residents, businesses and youth.

Public Information Campaign



- Answered customer inquiries and distributed information through brochures, bill inserts and Utilities' website.
- Wrote articles for the *Fort Collins Coloradoan*, *City News* and Colorado WaterWise newsletter.
- Promoted water conservation messages on bus benches, bus shelters and in the local newspaper.
- Staffed displays at events, including Earth Day, Gardens on Spring Creek's Harvest Festival, Northern Water's conservation fair and Colorado WaterWise's workshop.
- Provided staff and materials at spring and fall campaign events at home improvement stores and farmers markets. Offered two $250 sprinkler system upgrades as drawing prizes.
- Promoted Fix a Leak Week in March with a mayoral proclamation, news releases and advertisements to encourage customers to check for and repair leaks.
- Participated in the National Mayor's Challenge for Water Conservation during the month of April. Fort Collins was awarded second place. The 1,200 Fort Collins participants pledged to take actions to save 19.8 million gallons.

Xeriscape Education

- Offered three 2-hour presentations, *Tricks and Tips for Xeriscape*, *Evolving into a Xeriscape Design* and *More Color, Less Water* as part of the 26th annual Residential Environmental Program Series.
- Co-coordinated the 10th annual full-day High Plains Landscape Workshop with a sold-out crowd of nearly 300 people attending presentations on a variety of landscaping topics.
- Co-hosted a xeriscape class at the Gardens on Spring Creek, *Plant Select* (42 attendees).
- Hosted a garden party in July at the City's Xeriscape Demonstration Garden. Master Gardeners provided guided tours, while nurseries, landscape designers and a composter set up displays and answered questions. Refreshments and music were also provided. A *Coloradoan* photographer attended and a photo was printed in the next day's issue.

Irrigation Education

- Provided a daily Lawn Watering Guide on Utilities' website at *fcgov.com/lawnguide* and on the *Coloradoan* weather page. The guide shows how much water a lawn might need if not watered for three, five or seven days.
- Co-hosted two irrigation classes at the Gardens on Spring Creek, *Just Drip It* (42 attendees) in April and *Efficient Sprinklers* (17 attendees) in May.
- Held sprinkler system workshops at local retail stores, irrigation distributors and a nursery.
- Provided 119 customers with consultations regarding sprinkler equipment, performance and maintenance.

Community Water Education

- Provided three all-day Poudre Watershed Tours. A June tour was for key account and other commercial customers, while the July and August tours were open to the public. Approximately 50 people participated each day.

  Participants learned about what it takes to provide quality water from the source to the treatment facility. Stops include a walk along the Michigan Ditch, lunch at Cameron Pass and activities at Gateway Park. Highlights included sights of the High Park Fire and commentary about the fire and its effects on the watershed.

Watershed Tour - August 2013

- Co-hosted the Big Splash Open House with the Poudre Landmarks Foundation in June at the 1882 Water Works building. The event included tours, displays and activities.
- Collaborated with graduate students from the CSU's Public Lands History Center to continue the process of writing an update to the Water Utility's 1982 history book, *From Bucket to Basin*. Publication is expected in 2014.
- Distributed a Watershed Bike Tour brochure that guides riders to water landmarks along the Spring Creek and Poudre bike trails and Centennial Drive at Horsetooth Reservoir. The brochure includes a map and information about each stop.
- Sustainability Services hosted a public showing of *Rivers of Renewal* as part of the Mindful Movies series.

Commercial Education

- The BizEd series offered four programs for businesses related to water: *Water Supply and Conservation*, *Financial Solutions for Efficiency*, *Multi-family Utility Management* and *Sector Success: Efficiency Best Practices*.
- Provided staff and materials about conserving and City programs available at EnvirOvations in April and the Business Innovation Fair in November.

School Programs

- Co-sponsored the 22nd annual Children's Water Festival. This fun event provided water education to over 1,750 Poudre School District third graders. Students spent half a day at Front Range Community College learning all about water through classroom presentations and hands-on exhibits.
- Visited classrooms as Dr. WaterWISE, bringing a water conservation curriculum to schools. Maps, activity books and teachers' handbooks on a variety of water subjects were distributed to teachers for use during their study of water.
- Presented classroom programs to elementary and junior high students about local water history, watershed studies, microbiology and water chemistry.

Water Catchers

- A new award program in 2013, Water Catchers was created to recognize the efforts of residents and businesses to conserve water. Two businesses and a resident received awards. Awards were given to:
  - Resident Joel Shippy installed efficient showerheads and faucet aerators throughout his home, and checked for and repaired leaks, with an estimated water savings of 1,000 gallons per month.
  - Brendle Group, a sustainability consulting firm, won the small business award. With a goal of achieving net zero water by 2020, they expect to reduce water use by 40,000 gallons a year through efficiency measures.
  - Mountain Crest Behavioral Healthcare Center, a part of the University of Colorado Health, was the large business award recipient. By starting the watering season later and updating to more efficient sprinkler equipment, they saved over 650,000 gallons a month, a 60 percent savings over 2012.

Becky Fedak, Brendle Group, accepts Water Catcher award from Michelle Finchum

Conservation Giveaways

- Developed a new water and energy conservation kit with showerheads, faucet aerators, toilet leak detection dye tablets, compact fluorescent light bulb and other energy efficiency items. Shower timers and hose nozzles were also given away.

2. Water Rates and Usage Information

Increasing Block Rate: the three-tiered water rates for single-family and duplex customers increased 4 percent in 2013.

Seasonal Rate: with higher rates from May through September, commercial and multi-family customers experienced an increase of 4 percent in 2013. In addition, commercial water rates also have a second tier based on higher water use.

Online Water Use Calculator: an online tool for customers to help them evaluate their water efficiency. A link to the Alliance for Water Efficiency's Home Water Works site includes the calculator, water saving tips, and information on water-using fixtures and appliances.

3. Indoor Fixtures and Appliances: Residential

Incentive programs provide rebates, loans, services or goods to customers to encourage the purchase of efficient products.

Rebates: offered double rebates for clothes washers, dishwashers, toilets and showerheads during the fall campaign from September 1 to December 31. The double rebate promotion resulted in 187 washer, 142 dishwasher, 212 toilet and 7 showerhead rebates.

2013 Residential Indoor Rebates

Rebates	# Items	# Rebates
ENERGY STAR® clothes washer - $50	971	971
ENERGY STAR dishwasher - $25	648	648
MaP Premium toilet (1.06 gpf) - $75	41	41
WaterSense toilet (1.28 gpf) - $50	610	445
WaterSense showerhead (2 gpm) - $10	25	25
Total	**2,295**	**2,130**

On-bill Financing: offered low-interest loans for energy and water conservation projects. Water loans are available for service line repairs or replacement. No on-bill financing water loans were given in 2013.

Low Income Retrofit Program: participated in Larimer County Conservation Corps' retrofit program by providing 298 showerheads, 584 faucet aerators, 37 toilet tank bags and 57 shower timers for the 275 homes that received retrofits. In addition, 26 WaterSense labeled toilets were installed to replace high water use models. The retrofits are estimated to save about 2 million gallons of water annually.

Home Efficiency Audits: offered an assessment of a home's energy and water use and provided a list of recommended measures to improve efficiency. During 2013, 683 audits were conducted.

4. Outdoor Efficiency: Landscapes and Irrigation

Xeriscape Demonstration Garden: oversaw maintenance of the City's Xeriscape Demonstration Garden with over 160 species of trees, shrubs, perennials and groundcovers. The garden is a Plant Select® demonstration garden. Plant Select, a cooperative program between Denver Botanic Gardens, Colorado State University and local horticulturists, identifies and promotes distribution of plants that are well-suited for our region.

Xeriscape Design Assistance Program: revised the Xeriscape Design Clinics into an ongoing design assistance program at a customer's home. Beginning in 2014, customers will be able to meet one-on-one with a landscape design professional to develop a landscape plan for an area of their yard.

Garden-in-a-Box: partnered with the Center for Resource Conservation to offer the Garden-in-a-Box program, including a $25 discount for City customers. Six pre-planned xeriscape gardens with a design and plants were offered. Fort Collins residents purchased 74 gardens.

Sprinkler System Audits: offered a sprinkler system audit program for the fifteenth summer. Sprinkler systems were evaluated for watering efficiency, and homeowners received a watering schedule and information about proper watering.

- Five seasonal auditors performed 394 home and 13 HOA audits in 2013.
- Fort Collins-Loveland Water District (94 audits) and East Larimer County Water District (48 audits) contracted with Utilities to perform audits for their customers.
- A self-audit kit is available for homeowners to check out with the equipment needed to do their own sprinkler audit.

Alex Inzer performs a sprinkler audit for a customer

Sprinkler Equipment Rebates: Along with a rebate, a Tech Check consultation was offered to ensure new equipment is correctly installed and programmed. In 2013, seven Tech Checks were completed.

2013 Residential Sprinkler Equipment Rebates

Rebates	# Items	# Rebates
Weather-based controllers - $150	25	25
Weather station add-on: $50	2	2
Soil moisture sensor - $45	2	2
Rain sensor - wired, $15, or wireless, $30	16	16
High efficiency nozzles - $25 (purchases of $50-$99) or $50 (more than $100)	590	45
Pressure-reducing heads - $25 (purchases of $40-$79) or $40 (more than $80)	245	18
Total	**880**	**108**

2013 Commercial Sprinkler Equipment Rebates

Rebates	# Items	# Rebates
Weather-based controllers - 50 percent of purchase price, up to $400	5	5
Weather station add-ons - 50 percent of purchase price, up to $400	1	1
Soil sensor - $45	0	0
Rain sensor - $30	3	3
High efficiency nozzles - $3 per nozzle	1,941	11
Pressure-reducing heads - $35 per zone	314	13
Commercial sprinkler audit - $100	2	2
Total	**2,266**	**35**

5. Indoor Fixtures and Appliances: Commercial

Commercial Facility Assessments: performed 268 facility water and energy assessments for commercial customers, compared to 93 in 2012 and 60 in 2011. They were done in conjunction with ClimateWise and the Business Efficiency Program. Free faucet aerators were provided to businesses at the time of the assessment.

Restaurant Conservation Outreach

- Installed 53 pre-rinse spray nozzles, 365 faucet aerators and information about water efficiency to 70 businesses with commercial kitchens.
- Printed and distributed restaurant *Water Served Upon Request* table-top cards in collaboration with the cities of Loveland and Greeley and Fort Collins-Loveland and ELCO water districts.

Hotel Conservation Materials: printed new water conservation materials for local hotels and motels, including a linen reuse card, a towel reuse hanger and a table-top brochure with information about the Poudre River watershed and importance of conserving water. These will be distributed in 2014.

Commercial Indoor Rebates: offered a variety of rebates to commercial customers for water-efficient appliances and fixtures, including a custom rebate.

- Custom rebates were offered for water-saving equipment that has expected water savings of 20 percent or more as compared to prior equipment. Three rebates were given in 2013; one for 12 showerheads and two for pool filters. Each filter is estimated to save over 796,000 gallons per year.

2013 Commercial Indoor Rebates

Rebates	# Items	# Rebates
Clothes washer – vended: $250, non-vended - $125	1	1
Dishwasher - $250	1	1
MaP Premium tank toilets (1.06 gpf) - $75	2	1
WaterSense tank toilets (1.28 gpf) - $50	63	11
Flushometer toilets (1.28 gpf) - $100	12	3
Urinals (.5 gpf or less) - $100	2	1
Custom: 25% of equipment cost, up to $5,000	14	3
Total	**95**	**21**

6. Water Reuse Systems

Water Treatment Facility: treats the backwash water with ultraviolet disinfection and recycles it to the beginning of the treatment process. In 2013, 199 million gallons were recycled.

Drake Water Reclamation Facility: treated wastewater is reused by being pumped to the Rawhide Power Plant for landscaping and cooling water.

7. Regulatory Measures

The City of Fort Collins has various regulations to encourage efficient water use.

Wasting Water Ordinance: investigated 35 complaints in accordance with the *Municipal Code's* wasting water regulations.

Landscape and Irrigation Standards for Water Conservation: promote efficient water use through proper landscape and irrigation system design and installation.

- Reviewed 73 landscape plans for new developments for compliance with the *Land Use Code* water conservation standards. The plan review is part of the process prior to City approval of new developments.
- Reviewed 49 irrigation plans and completed 34 site inspections of new developments for compliance with the *Land Use Code* water conservation standards. The review is part of construction permitting before a final building permit is issued.

Water Supply Shortage Response Plan: outlines a series of measures to be enacted, including water restrictions for four water shortage response levels. In 2013, water restrictions were in effect from April 1 to June 1.

Restrictive Covenants Ordinance: prohibits homeowner association covenants from banning the use of Xeriscape or requiring that a percentage of the landscape be planted with turf. Although customers asked questions, no enforcement was needed in 2013.

Soil Amendment Ordinance: requires organic matter be added to the soil before planting turf to encourage deep roots and water penetration. In 2013, 605 soil amendment certifications were issued.

Green Building Code: beginning in 2012, the City's building code mandates WaterSense 1.28 gpf toilets as well as low-flow faucets, urinals, and showerheads in residential and commercial facilities. Estimated annual water savings is 20 percent for residential properties and 25 percent for commercial properties.

Streetscape Standards: City Council adopted new Streetscape Standards in 2013. In addition to landscaping requirements for medians and parkways, the standards include curb treatments, sidewalks, railings, planter pots and other features. A demonstration of the new parkway standards was designed and partially installed along Elm Street at the Utilities Service Center. Planting will be completed in 2014, along with signage about the parkway guidelines.

8. Operational Measures

Water Loss Program: Utilities' Leak Detection Program uses sound detection equipment to identify small to moderate leaks so they can be repaired before they become large leaks. During 2013, Utilities surveyed 100 miles of water main to detect leaks. Pinpointing the exact location of the leaks before they surface saves water and reduces excavation and street pavement repair costs.

Advanced Meter Fort Collins (AMFC): In 2013, Utilities completed deployment of almost all mechanical electric and water meters to electronic meters that will enable two-way digital communication, enabling better service to customers through more reliability and increased information about usage. Water use data from the meters is received on an hourly basis, allowing leaks to be identified in a timelier manner than from monthly meter readings.

Customers will have access to a web portal in 2014 for tracking their water and energy consumption and receiving alerts, including a mobile application.

Municipal Government Sustainability Management Plan: The City of Fort Collins has a long history of promoting sustainable practices through a variety of innovative programs and policies. The 2013 Municipal Government Sustainability Management plan outlines goals, objectives and strategies to guide the City organization on a long-term sustainable path. A goal related to water use says, "Reduce municipal operations water irrigation use and increase efficiency per acre. Reduce building water use by 20 percent by 2020." Actions taken in 2013 toward this goal include:

City Buildings

- Performed indoor and outdoor water audits at 215 Mason, 281 N. College and the Senior Center. Toilets were retrofitted and sprinkler efficiency increased by changes in scheduling, and installation of high efficiency nozzles and pressure-reducing heads.
- Replaced turf with xeriscape plantings along the Elm St. parkway strip at the Utilities Service Center.
- City Council mandated that construction of new City-owned buildings achieve Leadership in Energy and Environmental Design (LEED) "Gold" certification to raise the bar for energy efficiency and environmental design, including water conservation credits.

Planting Elm St. Parkway

Parks Department Water Use Efficiency

Water consumption data was collected and analyzed throughout the parks system. Using evapotranspiration (ET) readings, rainfall and water use readings, Parks calculates the landscape area's need for water and the amount of water that was actually applied.

The ET rate during the 2013 irrigation season was 26.72 inches; effective rainfall was calculated at 6.23 inches. Water need was 20.49 inches or 556,406 gallons per acre. The average water use for all park areas was 83 percent of the irrigation water needed.

In 2013, Parks found that:

- 10 parks used over 95 percent of water need
- 34 parks used under 95 percent of water need
- Of the 34 parks, 31 used under 90 percent of water need

Audits are performed at sites when more than 95 percent of the area's water need is used for two consecutive months. During 2013, six sites were audited.

When designing new community and neighborhood parks, water-efficient practices are incorporated, such as low water use turf in low traffic areas. For example, areas of a park that are designated for stormwater flows are ideal for types of grasses that do not need a lot of water, fertilizer or mowing. These areas also provide a different visual aspect to the park, creating unstructured play areas and enhancing the environmental value of the park. High traffic areas use durable, water-efficient varieties of turfgrass. Whenever possible, raw water is used for irrigating turf. Irrigation designers work closely with the park design team to make sure the irrigation system is efficient and uses the latest technology, including high efficiency nozzles, rain sensors and centralized controllers.

Graywater Research and Legislation

Graywater consists of wastewater from indoor activities such as laundry facilities, but excludes wastewater from toilet flushing and other waste streams that may threaten public health and the environment.

On May 15, 2013, Governor Hickenlooper signed House Bill 13-1044, authorizing the use of graywater in Colorado. Before graywater use will be allowed in Fort Collins, the Colorado Department of Health and Environment's Water Quality Control Division must develop regulations to control its use. The rulemaking is expected to be complete in 2015.

Graywater systems vary from simple, low-cost systems to highly complex and costly systems. Sophisticated systems treat graywater prior to disposal using settling tanks and sand filters in order to remove pollutants and pathogens. According to CSU, residential graywater use for toilet flushing and landscape watering could reduce water demand by 30 percent. Some commercial businesses have the potential to saves millions of gallons of treated water annually by implementing projects to reuse effluent and process water.

Graywater Use in Fort Collins

Bill 13-1044 does not require municipalities or counties to implement a graywater program unless they choose to do so. Fort Collins is interested in pursuing graywater use. The City's Building Department will track and oversee installation of systems within the city limits through issuing building permits and performing inspections at the time of installation. Larimer County's Department of Health and Environment will oversee graywater systems outside the city limits.

Graywater Research

In anticipation of the passage of the graywater law, Utilities entered into a two-year agreement with CSU's College of Engineering to continue their graywater research and to perform other tasks to support graywater use. In the months since, staff has collaborated with CSU and participated in stakeholder groups to adopt reasonable regulations that protect public health while promoting the use of graywater systems.

Collaboration and Regional Participation

The water conservation program is enhanced through partnerships with other City departments, local businesses and regional and national organizations.

- Continued the free toilet recycling program in 2013, diverting tons of porcelain from the landfill. The program is a partnership between the Utilities, Environmental Services and Streets departments. The recycling center moved from ReSource (which closed) to Habitat ReStore, 4001 S. Taft Hill Rd. Customers drop off their high water-using toilets and Streets Department crushes them into road base.
- Contributed to Sustainability Services' new Healthy Sustainable Homes program, training volunteers about available water conservation programs and providing materials for assessments.
- Participated in the Water Research Foundation's Commercial End Uses of Water Study. The purpose of the project is to provide water utilities with a better understanding of the amount of water used by their commercial, institutional and industrial (CII) customers by category and by end use. The project is scheduled to be completed in 2015.

- Collaborated with the University of Arizona to plan for a Conserve to Enhance program in Fort Collins. Conserve to Enhance links water savings from conservation projects to environmental restoration by gathering donated funds from water customers and using them for restoration projects. After careful consideration, Utilities decided to not pursue this program as a water conservation project. However, there is some interest in alternate programs to raise funds for river restoration projects.
- Promoted the Environmental Protection Agency's WaterSense program through rebates, articles and events. WaterSense promotes and enhances water-efficient products and services. Utilities is a WaterSense promotional partner.

Organization Participation

- Board member of Colorado WaterWise, a statewide organization with a mission to promote the efficient use of Colorado's water. Sponsored the WaterWise Summit in October.
- Member of the Rocky Mountain Section American Water Works Association's Water Conservation Committee.
- Member of the Alliance for Water Efficiency's Education and Outreach, and WaterSense and Water Efficient Products committees.
- Member of the Smart Water Application Technologies (SWAT) Promotions Working Group. SWAT is a national partnership of water purveyors and irrigation industry representatives to promote state-of-the-art irrigation technologies.
- Member of the International Code Council's Landscape Irrigation Development Panel, charged with setting sprinkler equipment design and performance standards.

Professional Presentations

- Made presentations to various organizations, including, ProGreen, Associated Landscape Contractors of Colorado, CityWorks and Business Innovation Fair.
- Made presentations at conferences:
  - Sustaining Colorado Watersheds (Oct.): *Water Restrictions: An Educational Approach to a Mandate*
  - North American Alliance for Environmental Education (Oct.): *An Educational Approach to a Mandate*
  - Water Smart Innovations (Oct.): *Empowering Customers to Act–Advanced Meter Fort Collins*
  - Irrigation Association (Nov.): *Water Restrictions Can be Positive: An Educational Approach to a Mandate* and *Fort Collins Sprinkler Audit Program*

How Are We Doing?

Total Program Water Savings

Starting in 2013, total water savings has been calculated for measurable water conservation programs, including rebates, sprinkler audits, equipment distribution, retrofits and Building Code regulations. The water savings are calculated based on savings estimates for each type of measure, called "deemed savings." The deemed savings is taken from various water use studies. In 2013, the verifiable water savings from programs was 30.6 million gallons, just over 93 acre feet per year.

Sustainability Information Management System

A Sustainable Information Management System (SIMS) tracks program participation and resulting energy and water savings. The SIMS online tool was used to analyze 2013 water savings from residential water rebate programs and sprinkler audits based on bill analysis of customers that received rebates versus customers that did not. The table below shows savings calculated from the bill analysis.

Water Use Savings by Measure

	Program/Measure	Utility Bill Analysis Savings	
		Avg. Savings (gal/yr)	Median Savings (gal/yr)
Indoor Rebates	WaterSense Toilet	5,550	3,880
	Dishwasher	1,350	970
	Clothes Washer	5,550	3,880
Sprinkler Equipment Rebates	Rain Sensor	9,810	4,520
	Nozzle & Head	2,013	1,385
	Controller	23,470	13,450
	Sprinkler Audit	13,840	8,670

ClimateWise Water Savings

During 2013, ClimateWise grew by 52 businesses, for a total of 352 partners. The partners reduced greenhouse gas emissions by 171,000 metric tons CO2e in 2013. Since 2000, ClimateWise partners have saved 12 billion gallons of water.

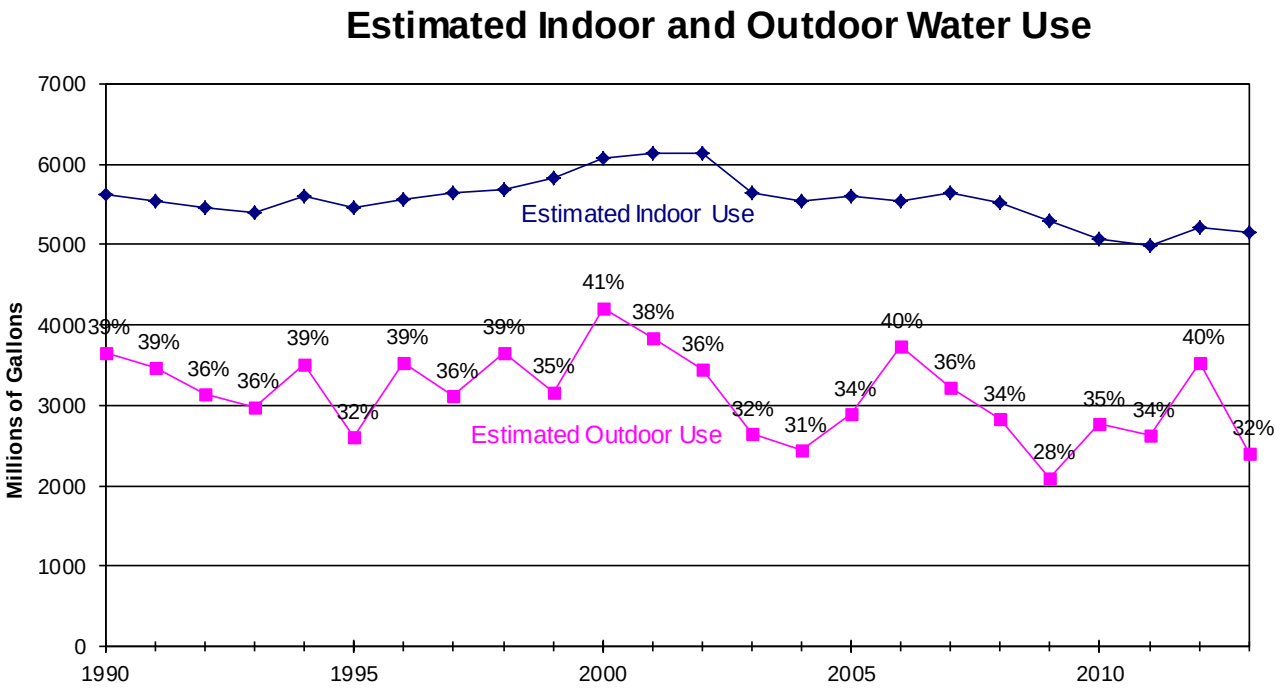
Two ClimateWise partners stood out with their water conservation projects. Arapaho and Roosevelt National Forests and Pawnee National Grasslands worked with their building's property manager to adjust the irrigation schedule and controls, resulting in a savings of almost 1.4 million gallons of water, a 68 percent reduction in outdoor use. Faith Evangelical-Free Church replaced 36 toilets with 1.28 gpf models and expects to save over 13,000 gallons annually.

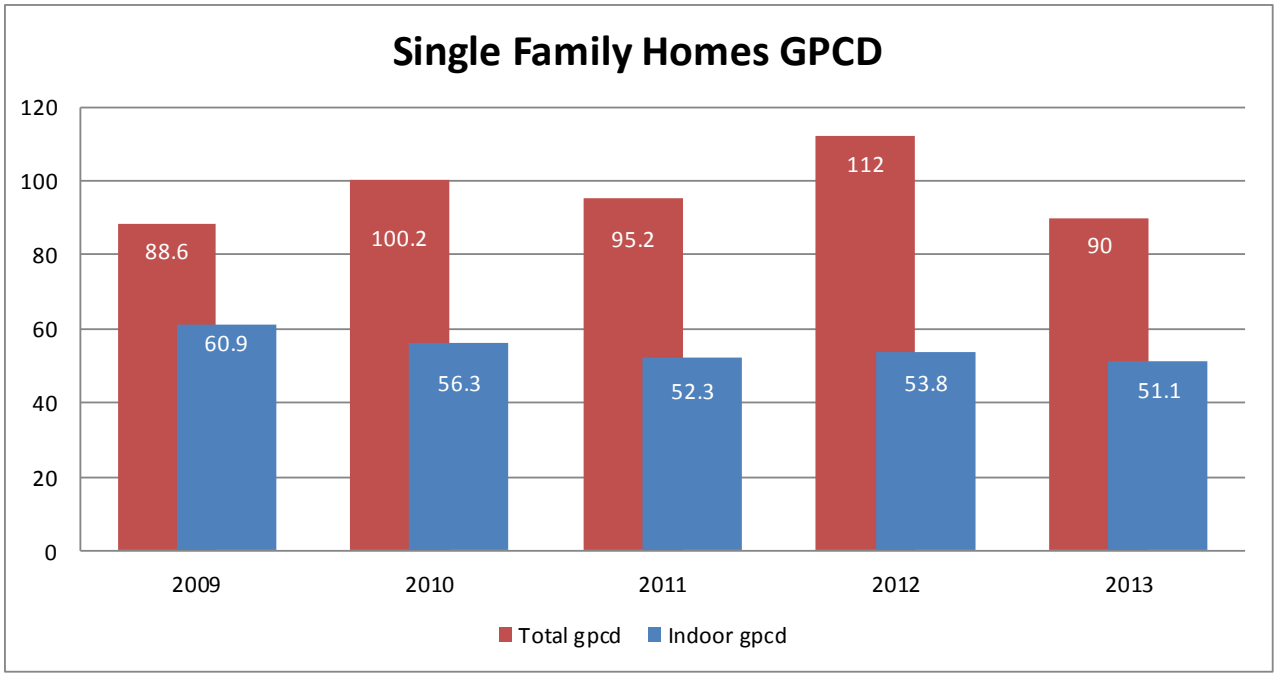
ClimateWise
Business Smart.

Evaluating Water Use

The water use trend continues to be significantly lower than pre-2002 drought (1993-2001) demands. Tiered and seasonal water rates, and water conservation efforts, contribute to this trend. How much of the lower usage can be attributed to the City's water conservation measures is difficult to analyze. For almost 20 years, low-flow plumbing standards and metered water taps have contributed to the reduction of per capita water use.

Per capita water use can vary for many reasons; population is not the sole determinant of water use. Changes in weather, season, household size and income can also contribute. Precipitation levels and daily temperatures during the watering season cause water use to vary considerably from year to year. For Fort Collins, the first graph on the next page shows the percentage of water used indoors versus outdoors by year for all water use. Indoor water use remains fairly consistent while outdoor water use fluctuates. In 2013, outdoor water use was 32 percent of total use, compared with 40 percent in 2012. The second graph compares indoor and total water use for single family homes.


Estimated Indoor and Outdoor Water Use
Millions of Gallons
7000
6000
5000
4000
3000
2000
1000
0
1990
1995
2000
2005
2010
Estimated Indoor Use
Estimated Outdoor Use
39%
39%
36%
36%
39%
32%
39%
36%
39%
35%
41%
38%
36%
32%
31%
34%
40%
36%
34%
28%
35%
34%
40%
32%


Single Family Homes GPCD
120
100
80
60
40
20
0
88.6
60.9
100.2
56.3
95.2
52.3
112
53.8
90
51.1
2009
2010
2011
2012
2013
Total gpcd
Indoor gpcd

Historic Water Use Per Person[1]

Year	Actual Use (gpcd)	Normalized Average Use[2] (gpcd)	Actual Peak Day Use (gpc)	1 in 50 Normalized Peak Day Use[3] (gpc)
2002	183	189	378	411
2003	154	157	346	383
2004	146	150	307	327
2005	155	155	365	363
2006	172	156	353	350
2007	162	156	342	356
2008	153	153	321	333
2009	135	147	265	304
2010	146	144	295	323
2011	141	144	285	289
2012	165	152	342	315
2013	141	147	312	303

Notes:
1. Values do not include large contractual water use.
2. Normalized values represent average expected use for 1930-1995 weather conditions.
3. 1 in 50 peak use is expected to occur once in 50 years.

Historic Annual Water Use

Year	Service Area Population	Annual Precipitation (inches)	Annual Water Use (MG)	Average Day Use (MGD)	Peak Day Use (MGD)
2002	123,700	9.3	9,599	26.2	51.4
2003	125,500	18.2	8,280	22.6	46.9
2004	125,800	18.1	7,984	21.8	42.3
2005	126,900	16.2	8,497	23.3	50.1
2006	127,800	11.2	9,268	25.4	48.9
2007	128,400	13.7	8,860	24.2	47.5
2008	128,700	13.8	8,352	22.8	44.3
2009	128,900	21.9	7,391	20.2	37.1
2010	129,000	14.1	7,830	21.4	40.8
2011	129,100	17.8	7,621	20.8	39.7
2012	129,200	10.8	8,757	23.9	46.8
2013	129,300	18.8	7,560	20.7	43.0

Number of Accounts by Customer Class

	2009	2010	2011	2012	2013
Single-Family	26,658	26,627	26,588	26,605	26,654
Duplex	1,165	1,175	1,191	1,205	1,217
Multi-Family	2,146	2,154	2,165	2,180	2,204
Commercial	2,162	2,184	2,186	2,192	2,174
City Government	214	208	208	212	213
West Fort Collins WD	1	1	1	1	1
Outside City Customers	1,423	1,414	1,415	1,419	1,427
Total	33,769	33,762	33,754	33,814	33,889

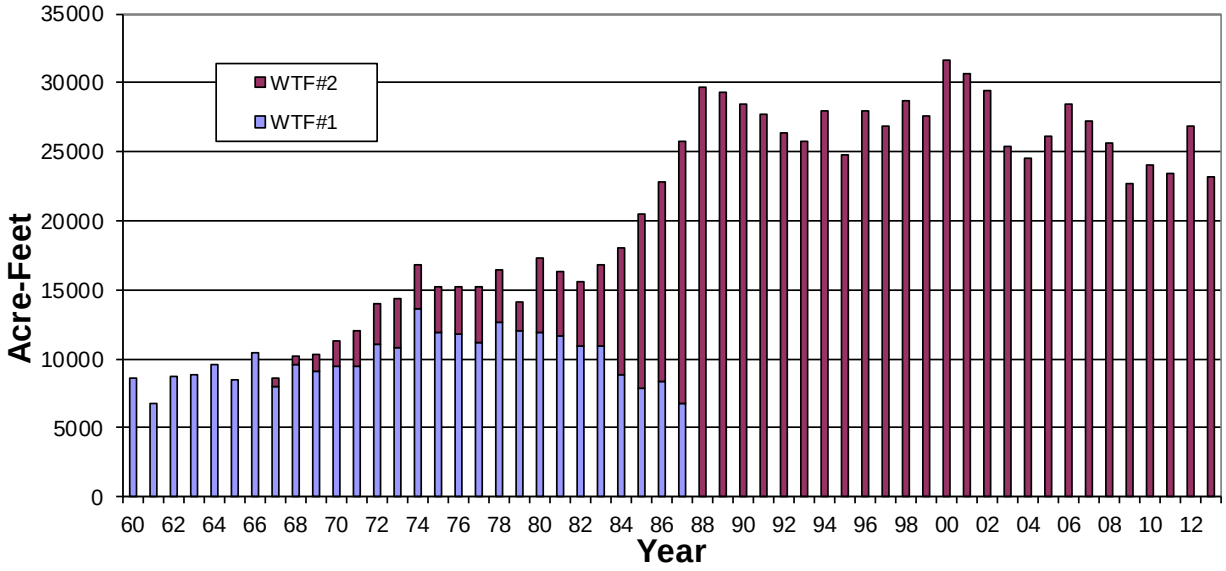
Water Use by Customer Class
(Million Gallons)

	2009	2010	2011	2012	2013
Single-Family	2,318.1	2,619.1	2,475.3	2,915.8	2,347
Duplex	119.0	134.0	130.9	146.4	127.8
Multi-Family	914.1	1,000.2	980.2	1,048.2	1,096.6
Commercial	3,023.4	3,095.3	3,057.8	3,330.5	2,924.6
City Government	87.3	122.8	108.0	148.1	100.4
West Fort Collins WD	142.2	168.3	146.9	169.9	154.1
Outside City Customers	238.9	263.8	259.5	303.4	274.7
System Losses	548.2	426.5	462.1	695.1	534.9
Total	7,391.1	7,830.1	7,620.7	8,757.4	7,560.1

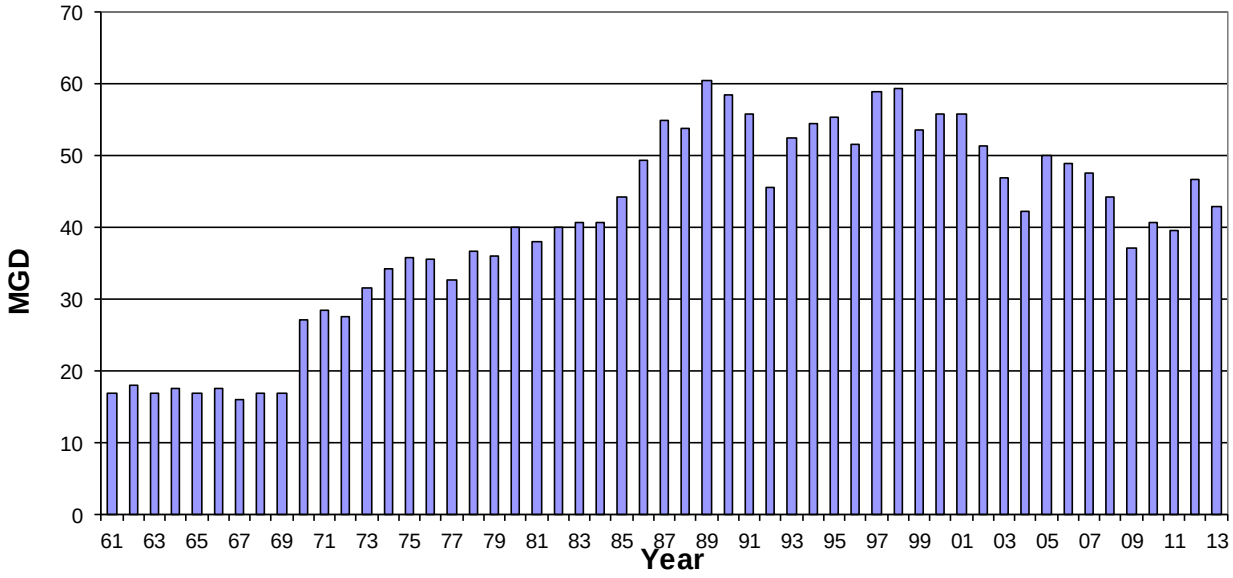
Water Use per Account by Customer Class
(Gallons per Year)

	2009	2010	2011	2012	2013
Single-Family	86,957	98,363	93,097	109,594	88,056
Duplex	102,105	114,085	109,886	121,518	104,999
Multi-Family	426,000	464,338	452,038	480,866	497,632
Commercial	1,398,439	1,417,338	1,397,962	1,519,134	1,345,089
City Government	407,309	591,785	519,674	699,082	472,134
Outside City Customers	167,827	186,599	183,365	213,772	192,547

Annual Treated Water Use
1960-2013



Peak Day Use
1961-2013



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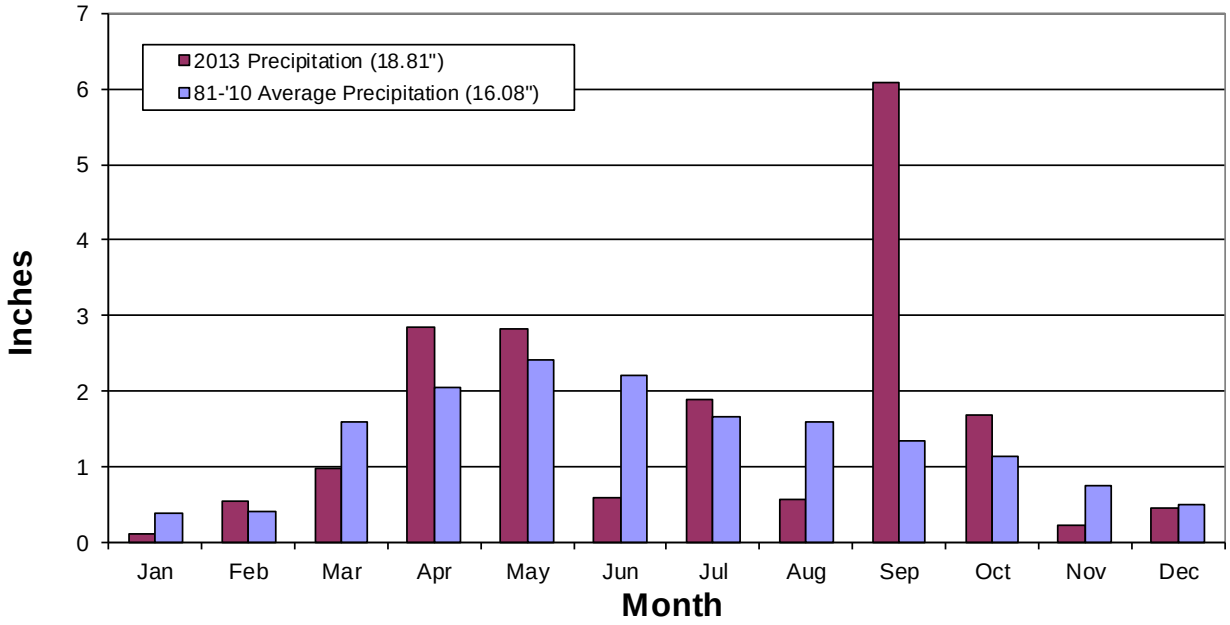
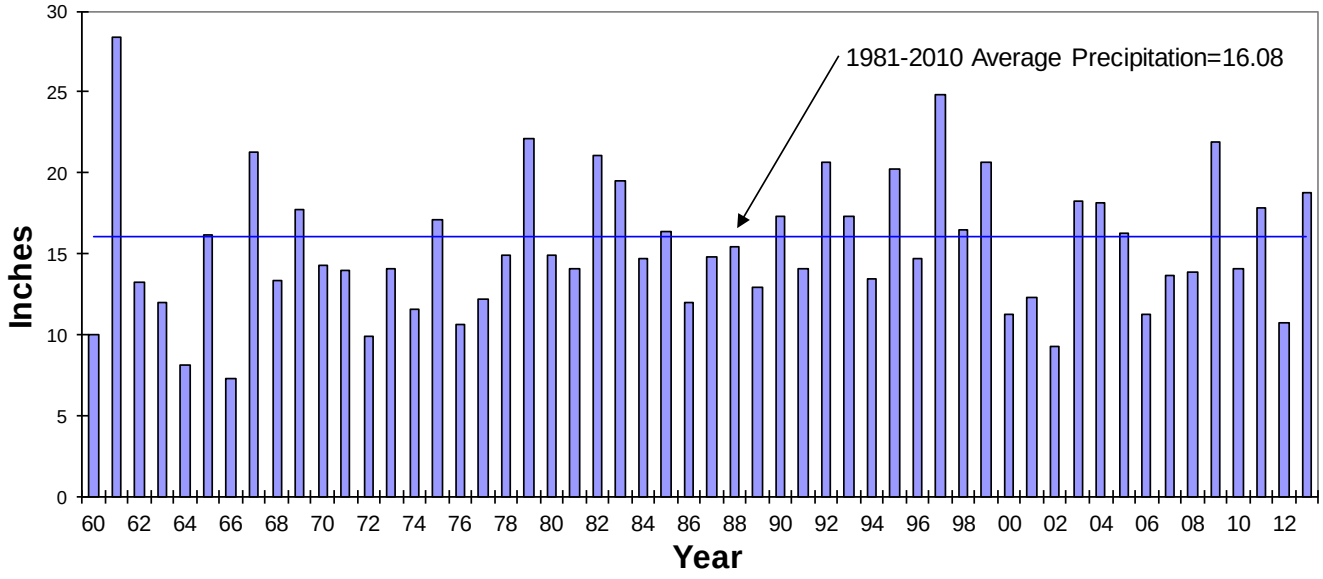
2013 Precipitation



Historic Annual Precipitation Fort Collins 1960-2013



Attachment 'A'

Fort Collins Utilities Water Conservation Plan: Recommended Measures

Measure	Customers				Water Use		Date
	RSF	RMF	CII	City	Indoor	Outdoor	Started
Education and Public Information							
Conservation public information campaign	X	X	X	X	X	X	1977
Adult education programs	X	X			X	X	1977
Business environmental programs		X	X		X	X	2004
School education programs	X	X			X	X	1977
Conservation giveaways	X	X			X	X	1990
Water conservation awards	X	X	X	X	X	X	2013
Water Rates and Usage Information							
Increasing block rate – Res.	X				X	X	2003
Seasonal rates – Comm. & multi-family		X	X	X	X	X	2003
Online access to water history	X	X	X		X	X	Future
Online water use calculator	X				X	X	2012
Indoor Fixtures and Appliances - Residential							
Residential clothes washer rebates	X	X			X		2003
High efficiency toilet rebates	X	X			X		2010
Dishwasher rebates	X	X			X		2007
Low income retrofit program	X	X			X		2007
On-bill financing	X				X		1994
Research: Water end use study	X				X	X	2011
Outdoor Efficiency - Landscapes and Irrigation							
Sprinkler system audits	X	X					1999
Xeriscape Demonstration Garden	X	X	X	X		X	1986
Xeriscape design clinics	X	X				X	2009
Irrigation technology rebates	X	X	X			X	2010
Raw water for irrigation at parks, cemeteries and golf courses				X		X	1900
Research: Determine irrigated area for lots	X	X	X	X		X	2012
Indoor Fixtures and Appliances - Comm., Indust., Institutional (CII)							
CII facility audits			X		X	X	2004
Commercial clothes washer rebates			X		X		2011
Commercial toilet and urinal rebates			X		X		2011
Financial incentives for commercial water-saving upgrades			X		X	X	2011
Hotel and restaurant conservation materials			X		X		2003
Restaurant pre-rinse spray valve distribution			X		X		2011

Measure	Customers				Water Use		Date
	RSF	RMF	CII	City	Indoor	Outdoor	Started
Water Reuse Systems							
Large customer reuse			X	X	X	X	1980
Backwash recycling at water treatment facility				X			2003
Regulatory Measures							
Wasting water ordinance	X	X	X	X	X	X	1964
Restrictive covenants ordinance		X				X	2003
Soil amendment ordinance	X	X	X	X		X	2003
Water Shortage Response Plan	X	X	X	X	X	X	2003
Landscape & irrigation standards for new development		X	X	X		X	1994
Operational Measures							
Utility water loss program				X			1993
Water loss program enhancement				X			Future
Water conservation upgrades at City LEED buildings				X	X	X	2006
Water conservation upgrades at City facilities				X	X	X	2010

Key:
RSF – Residential Single Family
RMF – Residential Multi-family
CII – Commercial, Industrial, Institutional
City – City government
Indoor – affects indoor water use
Outdoor – affects outdoor water use
Future – future measure