Transform Your Outdoor Landscapes To Reap Water Savings

APA Colorado State Planning Conference
Keystone, CO
September 8, 2021
Moderator

Christy Wiseman
Land Use and Water Planner,
Community Development Office,
Colorado Department of Local Affairs (DOLA)
Speakers

1) Frank Kinder
Water Efficiency and Sustainability Manager, Northern Water

2) Annie Barrow
Manager of Horticulture Outreach Programs, Denver Botanic Gardens

3) Savanah Benedick-Welch
Project Manager & Planner, Norris Design

4) Don Ireland
Former HOA President, Cherry Creek 3; Owner, Don’s Drones of Denver LLC
Retrofitting your landscape to reap water savings

Frank Kinder
Water Efficiency and Sustainability Manager
Northern Water

What is Northern Water?

Colorado Big Thompson Project

33 Cities
29 Districts
6 Industrial

Conservancy districts: supplemental water source for the region; 600,000 acres of agriculture, 1.5 million acres, > 1 million ppl
Water Efficiency Expansion Motivations

Planning

Sustainability

Partners
Posit: Landscapes add value to life

Proposal: We need to manage them better.
Problem: Systems decay, some don’t make sense, new technology works!

Issues that need to be addressed
Plan - Design
Use - Performance
Waste – Cost
Management - Technology
CONSERVATION CAMPUS AND GARDENS
CONSULTATIONS AND AUDITS
FACT SHEETS AND TOOLS
GRANTS
PARTNERS AND RESOURCES
PLANNING FOR EFFICIENCY
TRAININGS AND EVENTS
WATER WISE LANDSCAPES
WEATHER NETWORK

Northern Water Efficiency Services
Training: Green Industry & City Staff

Irrigation Association:
- Drip Design and Mgmt.
- Alternative Water Sources
- Certified Auditor

Growing Water Smart
- Intensive workshop
- Integrating land use and water efficiency
  - Berthoud
  - Longmont
  - Platteville

May 2021
- Loveland
- Erie

Resilientwest.org
Landscape Consultations for HOA’s, Commercial and Municipalities

Goals
- Understand challenges
- Educate responsible parties
- Equip with tools
- Be objective and trustworthy
- Facilitate efficiency upgrades
- Multiple, mutual benefit

Outcomes
- Create solutions
- Provide direction
- Support the market
- Confidence for investment
- Develop regional examples
- Success, replicated

From passive water users
To active water manager
Irrigation Audits

Contracted with Resource Central and Irrigation Analysis.

Irrigate efficiently
- Heads, pressure, schedule, IE/DU
- Soil type, root depth, visual
- Baseline for conversation
- 12 entities audited
- Right on target to 2x the water!
Collaborative Water-Efficient Landscape GRANTS

WHO
- Public facilities and open spaces
- Businesses
- Schools
- Multi-family complexes
- HOA-managed landscapes

FOCUS
- Water Savings
- Colorado climate-friendly landscape
- Public education

COMMITMENTS
- 50% match
- Water use data
- Long-term maintenance plan
- Contract

REQUIREMENTS
- Consultation with Northern Water staff
- Landscape plan with site map and dimensions
- Plant list
- Cost break-down
- Attaining required permits and city approval from local entities
Landscape Design: Denver Botanic Gardens

- Berthoud
- Evans
- Greeley
- Longmont
- Lyons
- Severance
- St. Vrain
- UNC
Minor Amendment Review process

Water-Efficiency Ordinances

Water use efficiency plans
Timeline of Grant Program & Supporting Services
Now through the 2022 Grant Cycle

- Denver Botanic Gardens Design Services Available (Ending on Aug. 20)

- Irrigation Audits Available (May 3 to Sept. 30)

- Consultations Available (June 15 to Sept. 30)

- 2021 Grant Projects Underway (April 26 to Sept. 30)

- Applications Submitted for 2022 Grants (Oct. 1 to Nov. 19)

- Grant Applications Reviewed (Nov. 19, 2021 to Jan. 21, 2022)

- Project Contracting (Jan. 21 to April 22)

- 2022 Grant Projects Underway (April 25 to Sept. 30)

- Irrigation Audits Available (May 2 to Sept. 30)

- Consultations Available (June 21 to Sept. 30)
Town of Severance - Town Hall Project

Savings: 81%
Fairway Ridge HOA

Savings: 57%
Champion Greens
HOA

Savings: 7%
Turf transitions

Fort Collins
20 years
Controllers
Equipment
Grass/Beds
Process

Oakridge Village VII HOA
Savings: 40%
2020 Grants

13 completed

$145,000

4 HOAs

Eaton
Evans
Longmont
Severance

One the Vine Farm - Fort Collins

High Point Metro District - Windsor

St. Vrain Sanitation District - Firestone

Collaborative Water-Efficient Landscape Grant Projects

2020 Summary

Northern Water

5 HOAs • 4 Municipalities
2 Businesses • 2 Districts

13 Projects Funded

$145,000 Awarded

All together, an estimated 500,000 gallons of water saved annually across more than 2 million square feet of landscapes
Grants – over 250k completed – 23 projects

- Public demonstrations
- Accessible/Visible
- Use less water than bluegrass
- Use WaterSense Equipment & WaterSense Professionals – WaterSense Find a Pro
- Matching amount up to $20,000
- Follow city amendment process
- Demonstrate HOA/other approval
- Complete contract/IGA

Participant videos, Grant Summaries, and faqs

Complete by Oct 1 2022
Northern Water views water efficiency as an integral part of its management strategy with long-range planning that encourages people to be good stewards of water resources. The supplemental water that we provide through the Colorado-Big Thompson and Windy Gap projects is diverted from the Colorado River. With known pressures on this river system, it is critically important that we make the best use of this resource and support regional water resilience by promoting water efficient and drought tolerant landscapes.
Denver Botanic Gardens’ horticultural outreach programs include design consultation services for municipalities and community projects.

Sustainable landscape design reduces water consumption, promotes pollinators and improves the aesthetic in areas where the community interacts with the landscape.

We can provide designs for your project, work with your landscape architects and contractors or simply consult on recommended plants for the project.

- **Annie Barrow-** Manager of Horticulture Outreach Programs, Denver Botanic Gardens

- **773.412.3776**

- **annie.barrow@botanicgardens.org**
Traditional landscapes, traditional plants
Western landscape, western plants
HOA Entrance: Turf conversion
HOA Entrance: Turf conversion
HOA Entrance: Turf conversion
Soil & Mulch: Why Squeegee?

- **Wood mulch** absorbs and holds water. Intense aridity causes water to evaporate before reaching plant roots.

  **SQUEEGEE**

  - Water sinks into the ground rapidly to reach roots
  - Water soaked through to the base of the plant will not evaporate
  - Water will not be held against the plants crown and cause rot
  - Reflects sunlight and heat due to light color
  - Rock mulch does not need to be reapplied yearly, & keeps soil lean for xeric plants
<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Common Name</th>
<th>Water Use</th>
<th>Quantity</th>
<th>Size</th>
<th>Annual Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOT WINGS®</td>
<td>HOT WINGS® Tatarian Maple</td>
<td>moderate to dry</td>
<td>1</td>
<td>1.5”</td>
<td>Every summer trim back any suckers that may occur.</td>
</tr>
<tr>
<td>'Moonshine'</td>
<td>Moonshine Yarrow</td>
<td>moderate to xeric</td>
<td>8</td>
<td>1 quart</td>
<td>Cut back/shear to base every spring</td>
</tr>
<tr>
<td>'Terra Cotta'</td>
<td>Terra Cotta Yarrow</td>
<td>moderate to xeric</td>
<td>13</td>
<td>1 quart</td>
<td>Cut back/shear to base every spring</td>
</tr>
<tr>
<td>'Sinning'</td>
<td>SONORAN SUNSET® Hyssop</td>
<td>moderate to xeric</td>
<td>18</td>
<td>1 quart</td>
<td>Cut back to base/shear down to ground every spring</td>
</tr>
<tr>
<td>Sunset Hyssop</td>
<td></td>
<td>moderate to xeric</td>
<td>7</td>
<td>1 quart</td>
<td>Cut back to base/shear down to ground every spring</td>
</tr>
<tr>
<td>Parry's Agave</td>
<td></td>
<td>dry to xeric</td>
<td>3</td>
<td>1 gallon</td>
<td>None required</td>
</tr>
<tr>
<td>Dwarf Leadplant</td>
<td></td>
<td>dry to xeric</td>
<td>6</td>
<td>1 gallon</td>
<td>None required</td>
</tr>
<tr>
<td>Colorado Desert Blue Star</td>
<td></td>
<td>moderate to xeric</td>
<td>5</td>
<td>1 quart</td>
<td>Cut back/shear to base every spring</td>
</tr>
<tr>
<td>'Chieftain'</td>
<td>Chieftain Manzanita</td>
<td>moderate to xeric</td>
<td>6</td>
<td>1 gallon</td>
<td>Never touch unless there is damage to branches</td>
</tr>
<tr>
<td>'Sea Foam'</td>
<td>Sea Foam Sage</td>
<td>moderate to xeric</td>
<td>8</td>
<td>1 quart</td>
<td>Prune back hard in spring if needed</td>
</tr>
<tr>
<td>'Blonde Ambition'</td>
<td>Blonde Ambition Blue Gram</td>
<td>dry to xeric</td>
<td>5</td>
<td>1 quart</td>
<td>Cut back every early spring.</td>
</tr>
<tr>
<td>Chocolate Flower</td>
<td></td>
<td>dry to xeric</td>
<td>32</td>
<td>1 quart</td>
<td>Hand trim back dead stems in spring.</td>
</tr>
<tr>
<td>Winecups</td>
<td></td>
<td>dry to xeric</td>
<td>13</td>
<td>1 quart</td>
<td>Cut back/shear to base every spring</td>
</tr>
<tr>
<td>Little Leaf Mountain Mahogany</td>
<td>xeric</td>
<td></td>
<td>6</td>
<td>1 gallon</td>
<td>Shear once a year from much tighter growth.</td>
</tr>
<tr>
<td>Fernbush</td>
<td></td>
<td>xeric</td>
<td>23</td>
<td>1 gallon</td>
<td>Shape/Shear 2”-6” off all branch tips every early spring</td>
</tr>
<tr>
<td>Desert Willow</td>
<td></td>
<td>moderate to dry</td>
<td>3</td>
<td>5 gallon</td>
<td>Prune up to a multi-stemmed small tree.</td>
</tr>
<tr>
<td>Mongolian Snowflakes</td>
<td></td>
<td>dry to xeric</td>
<td>11</td>
<td>1 quart</td>
<td>Shear back to the ground every spring to make it bushy</td>
</tr>
<tr>
<td>Lanceleaf Tickseed</td>
<td></td>
<td>moderate to dry</td>
<td>9</td>
<td>1 quart</td>
<td>Cut back/shear to base every spring</td>
</tr>
<tr>
<td>DOG TUFF™</td>
<td>DOG TUFF™ Grass</td>
<td>moderate to xeric</td>
<td>14,000 sq ft</td>
<td>flat</td>
<td>Mow late May through August or do nothing for</td>
</tr>
<tr>
<td>'Carol Mackie'</td>
<td>Carol Mackie Burkwood Daisy</td>
<td>moderate to dry</td>
<td>2</td>
<td>1 gallon</td>
<td>Leave alone or shear to shape after flowering in</td>
</tr>
</tbody>
</table>
Reference Guide


The Front Range along the Colorado Rockies, as well as the Intermountain Western United States, has a unique climate. Successful landscape design in our region demands specific horticultural best practices that are unique to our region.

Sustainable landscaping means conserving water/saving money and ensuring planting success/lower attrition rates/lower replacement costs.

Sustainable landscape design provides a “sense of place” by using the design principle “right plant, right place”. Sustainable design does not mean “zero-scape” or desert-like plantings. Waterwise plantings can be lush, colorful & full of texture.

<table>
<thead>
<tr>
<th>Watering Guide</th>
<th>Irrigation Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Designation</strong></td>
<td><strong>Establishment Period</strong></td>
</tr>
<tr>
<td>Moderate</td>
<td>2&quot; per month</td>
</tr>
<tr>
<td>Dry</td>
<td>1&quot; per month</td>
</tr>
<tr>
<td>Xeric</td>
<td>1&quot; per month</td>
</tr>
</tbody>
</table>

*Drip irrigation is not recommended during establishment periods but can be used post establishment. Trees will benefit from long term irrigation.*

**Recommended plant sizes at installation**

<table>
<thead>
<tr>
<th>Plants</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perennials</td>
<td>1 quart</td>
</tr>
<tr>
<td>Shrubs</td>
<td>1 gallon</td>
</tr>
<tr>
<td>Trees</td>
<td>Maximum of 1.5” caliper</td>
</tr>
</tbody>
</table>

**Horticulture Best Practices for the Western US: Reduce installation size**

It is important to reduce stress to plants as less stress leads to higher success rates in establishment. We cannot control environmental stress - aridity, temperature, UV, etc., but we can control plant installation size.

1. Small plants allow roots to establish quickly and therein can significantly improve plant survival. Plants that establish strong root systems will promptly establish new growth in the form of shoots, spread and coverage.
2. Large plants will stress more, i.e. lose water due to our arid climate and the sun’s UV intensity. The shoots and leaves wilt and suffer because the roots are not able to quickly establish to support existing photosynthesizing materials.
3. When B&B plants are harvested, a portion of the roots are left behind. Smaller caliper trees lose less roots during harvesting which can result in better survival rates. Remove as much burlap as possible and cut away the wise basket.

**Soil**
RETROFITTING LANDSCAPES TO REAP WATER SAVINGS
A PLANNERS GUIDE
WHY PLANNERS CARE

- Reduction of water consumption and dependency
- Assists with conformance of State Water Plan
- Cost savings for neighborhoods, developers and water users
- Longterm environmental benefits of reduced water consumption

WAYS TO PROMOTE

- Include Water Department in the review process from the start
- Flyers provided to developers at Concept or Pre-app meetings
- Encourage applicants to apply for the Northern Water Grant Program and/or find out if there is a local monetary incentive
MINOR AMENDMENT
CITY OF LOVELAND

Primarily provided for HOAs, commercial properties, and non-profits.

QUESTIONS:
1. Is retrofit in better alignment with Code requirements?

2. What type of retrofit is proposed?
   - Simple turf replacement
   - Plant/tree removal replacement
   - Redesign
   - Grading work

3. Where is retrofit occurring?
   - Detention area
   - Common area
   - Parkway

4. Who needs to review?
   - Planning
   - Water Department
   - Stormwater Department
   - Other utilities (if affected/applicable)
MINOR AMENDMENT

PROCESS

IMPORTANT ELEMENTS TO ASK FOR

Request letter - retrofit exhibit, current and proposed changes, and a maintenance plan.

Exhibit of changes - site plan or concept visually illustrating the proposed changes - current and proposed. Include new plant palette.

Documentation for HOA and neighbor notification.

Conformance with adopted covenants.

If within a detention area/drainage way: indication that retrofit meets stormwater/drainage requirements.
ADDITIONAL ELEMENTS TO CONSIDER

**Timeframe** - level of review and whether others are involved - can take up to a month.

**Fees** - consider reduced fee or no fee if review is very minor.

**Allow/Encourage Hydrozones** - landscape design that clusters plantings based on water usage. Typically low to very low water use plants are used.

**Pollinators** - consider low water use plants that are also pollinators to encourage ecosystem health and bio-diversity.
WATER-WISE RETROFITS - FRONT RANGE

Arapahoe County - Minor Administrative Amendment
Cheaper and faster process for SP retrofits. City is also updating landscape codes and considering streamlined approach for drought-tolerant landscapes.

City of Littleton - Median renovation demo project
City of Littleton and Denver Botanic Gardens working together to re-design city medians to show that xeric plantings are visually pleasing.

City of Greeley - Life After Lawn Program
Local incentive program to provide rebates for landscape and lawn retrofits - available to homeowners, HOAs, commercial properties, churches, non-profits
THANK YOU!
Cherry Creek 3:
Changing for the future
Terrible news in the West...

Drought, wildfires, mudslides, etc.
Our water supply is in jeopardy!

Photo: KLAS-TV, Las Vegas, NV
Colorado:
“Where the whiskey is for drinking…and the water is for fighting.”
“The state faces a 163 billion gallon projected water shortfall by 2050 that, as today’s population of 5.3 million grows to 10 million and industry expands, threatens to leave 2.5 million people parched.”  — Colorado Water Plan
According to Denver Water:

Roughly HALF of all water used by a single-family household is used outdoors each year.

(Half of that is wasted to over-water plants.)
Saving water is possible!

• In 2008-09 Fiscal Year (Oct. 1 to Sept. 30), Cherry Creek 3 used 36.7 million gallons of water.
• For the 2018-19 Fiscal Year, the HOA used 20.41 million gallons.
• **Difference: 16.3 million gallons.**
The Community Associations Institute (CAI) estimates there are between 345,000 and 347,000 in the US.

There’s an estimated 9,000 Common Interest Communities (CICs), or HOAs, in Colorado.

An estimated 1.9 million people in Colorado (population 5.7 million) live in an HOA. (1/3 of pop.)
What wise planning looks like today in Colorado
My HOA: Cherry Creek 3, Denver
Basic information
Third Cherry Creek Townhomes
(a.k.a. Cherry Creek 3)

* Situated in the southeastern section of the City of Denver, bordering I-225 and near the Denver Tech Center.
*Opened in 1966 (55 years ago) as one of the first three HOAs in the City of Denver. The square-block site includes 251 side-by-side condo-style townhomes in 39 buildings. (The # of units per building varies.)
Design of that era, resulting in 21st century issues

* One looping water system installed without individual meters at each home or building.
* Irrigation system pulled from main water lines (no accurate ability to measure outside demand).
* Original sprinkler system not designed to accommodate different types of planting zones.
Methodology and reasoning in CC3 (1965)

* Cheaper to build without installing individual meters.
* The cost of water and sewage was comparatively cheap.
* “It’s an HOA, where we split the costs among everyone!”
Antiquated water system owned by HOA is aging.

It will cost millions to replace. (We don’t have the money.)

Water and sewage costs rise annually. The two have accounted as the largest-single budget item for years.
What existing HOAs can do in 2021

- Outdoor – use newer technologies for irrigation controllers and sprinkler heads.
- Offer rebates to individual owners who install new, water-saving devices indoors.
- Determine whether Flume or similar water-saving technologies and help monitor water consumption.
- Communicate regularly with residents of the desire to save money, water and the environment.
Partnerships & Technology

* Dual-measuring meters.
* Flume monitoring devices.
* Some water providers offer cash-for-turf rebates to promote low-water plantings.
* Water providers may offer lower tap connection fees when a low-water yard is planned vs. a regular turf lawn.
When people are informed about water, they reduce their usage by 7.8%.

Colorado’s Water Plan predicts a shortage of water by 2050, due to growth and availability of water.

Michigan State/National Science Foundation says 36% of US households may not be able to afford to pay their monthly water bills with the next few years.
Why outdoor planning matters

In the past, developers focused mostly on the buildings, leaving landscapes as an afterthought. (“roll out sod and stick in some bushes.”)
Changing the landscape...
Change the mindset, too!
Kentucky Blue Grass isn’t native to our state.
It requires a lot of water and maintenance. Up to 50% of a homeowner’s individual annual water bill is used outdoors.
Native plants, including those recommended by Plant Select ©, are proven to survive our difficult, quick climate changes and use much less water.
We need to break the century-old thought process: “The guy with the meanest, greenest lawn wins.”
Blue grass should only be used where people or pets walk or play. The mentality needs to become: “Kiss your grass goodbye!
Eliminating Blue Grass
Turf alternatives

Dog Tuff Grass: Little supplemental water. Mow once or twice a season.
How we changed indoors:

* Ran a toilet-replacement program with Denver Water, offering residents High-Efficiency Toilets that used less water. Owners paid only $15 to have each toilet replaced, including installation. (over 400 switched.)

* HOA later offered its own self-funded cash rebates for owners who later replaced old water devices with water-saving models, including laundry machines, dishwashers and additional toilets.
How we changed outdoors:

* Developed a plan to replace all 251 small, front-yard planting beds with low-water plants recommended by Plant Select ©. The program took five years to complete, spreading out the costs.
* Traditional sprinkler heads were switched to water-saving MP rotary heads.
* Irrigation controller clocks were placed with modern ones that have rain shutoff sensors and are programmed to operate based on ET information.
* Many non-used turf areas were replaced with water-saving and pollinator-attracting plants.
How we changed outdoors:

* Cherry Creek 3 benefitted from a Denver Water outdoor water reduction program (no longer available.) Received more than $43,000.
* Received $17,000 refund from Denver Wastewater after proving our water consumption was slashed.
* Spent approximately $200,000 (spread over 5 years) to finance landscaping overhaul. That included above-mentioned rebates. In the end, the result was a more attractive community and water/sewer savings benefitted other HOA budget categories.
From this... sprinklered lawn area
Volunteer operated Community Garden for edibles. Hand-watered by gardeners (10\textsuperscript{th} year, 2021).
From this in 2009
To a Habitat Hero award in 2014

(First Colorado HOA to win an Audubon Rockies Habit Hero Award)
Water = Money.

If you pay a water bill, you also likely pay a sewage bill.

If you save on water, you also save on sewage costs.

"DO YOU WANT TO SAVE MONEY?"
More than 100 million gallons saved by CC3 during the past decade...
A Step by Step plan for HOAs...

- Establish a budget line for water efficiency and landscape retrofitting. Conduct over several years to make costs manageable.
- Explain to residents what you’re doing... and why.
- Seek their participation. (Cherry Creek 3 has offered rebates beyond what our water supplier offers.)
- Replace irrigation clocks & sprinkler heads, stick to recommended watering times for turf areas.
Despite additional surcharges and regular rate increases, Cherry Creek’s water-saving efforts resulted in the HOA paying less for water in 2019 than it did a decade earlier.
During the pandemic (stay-at-home orders), Cherry Creek 3’s water consumption increased to 22.03 million gallons, a 1.62 million-gallon spike. (That didn’t include the swimming pool, which didn’t open due to city regulations.)

Current FY trending toward 21.5 million gallons.
During the past few years, the City of Denver’s sewage charges have greatly increased. The HOA now pays at least $20,000 more annually for sewage than it does for water. (Ponder what it would be like if no water-conservation practices had occurred.)
Save water, save money, get noticed!
It’s not a one-time thing for us!

- Regularly remind residents of the importance of being water-efficient.
- Use newsletters & website as reminders. Link relevant videos to the web site.
- We have offered our own HOA “Efficiency Rewards” cash rebates, in addition to what Denver Water may offer.
- We have participated in the annual “Imagine a Day without Water” national event for years. (This year’s date is Oct. 21: will you participate and show you care?)
Do it for $$$, for those who follow and do it because “it’s the right thing for everyone!”
1) Frank Kinder  
Water Efficiency and Sustainability Manager,  
Northern Water

2) Annie Barrow  
Manager of Horticulture Outreach Programs,  
Denver Botanic Gardens

3) Savanah Benedick-Welch  
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