Water Efficiency -
The WaterSence Home Program

Instructor: Robbi Currey
Abnormal Weather conditions
Winter temperatures
Snow Pack May 14, 2015

Washington SNOTEL Current Snow Water Equivalent (SWE) % of Normal

May 14, 2015
Current Snow Water Equivalent (SWE)
Basin-wide Percent of 1981-2010 Median

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

* Data unavailable at time of posting or measurement is not representative at this time of year.

Provisional Data Subject to Revision

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day typically 06:00.

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov
Why are water issues important?

Washington’s Growing Demand for Water
In the west, whiskey is for drinking, and water is for fighting over – Mark Twain.
US Per Capita Domestic Water Use

Per Capita Domestic Water Use
In gallons per day (gpd)

United States 147 gpd
Brazil 47 gpd
Germany 41 gpd
United Kingdom 31 gpd
China 20 gpd
Honduras 7 gpd
Somalia 1 gpd

Source: Pacific Institute
www.worldwater.org

Irrigation, 81%
Domestic, 6%
Livestock, 3%
Industrial, 3%
Mining, 1%
Thermoelectric, 3%
Commercial, 1%

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How much water does an average family use indoors?

Household Exercise

Go to:
www.home-water-works.org/calculator

How much water do you use?
How do you compare?
The Price of Water Up 41% Since 2010

THE PRICE OF WATER: 2015
Combined water, sewer and stormwater prices for households in 30 major U.S. cities.

We expect water rates to continue to grow above inflation for some time. We don’t see an end in sight.”
—Andrew Ward, director of U.S. public finance
Fitch Ratings
Sewer Prices Higher Than Water

PRICE OF WATER: 2010-2015
A survey of water prices for households in 30 major U.S. cities.

Since 2010, the price of a monthly water bill for a family of four has increased an average of 41% in 20 of the largest U.S. cities and in 10 regionally representative cities, as chosen by Circle of Blue staff. Over the last year alone, prices climbed an average of 6%, well above any other household staple.

Key
Average Monthly Bill for Family of Four Using:
- 150 Gallons/Person/Day
- 100 Gallons/Person/Day
- 50 Gallons/Person/Day

HIGHEST 2015 WATER BILL*
$153.78: Santa Fe

LOWEST 2015 WATER BILL*
$23.26: Fresno

*Based on 100 gallon-per-person daily use for a family of four.

HIGHEST INCREASES SINCE 2014
31%: Austin is increasing the cost of water for its highest-volume users. The city utility is also charging higher fixed fees so that revenue is stable, even as water use declines.

15%: Chicago is nearing the end of a 5-year plan to double water rates. The new revenue will help the city to double the rate at which it replaces old water pipes.

15%: San Francisco has steadily increased rates to pay for a $US 4.8 billion project to ensure that the city’s water system will be able to deliver water within 24 hours after a major earthquake.

Source: Circle of Blue research, based on utility water rates.
WaterSense® Labeled Homes
WaterSense Labeled New Homes Program

• First national new home labeling program for water efficiency

• Works with other green building programs

• Homes inspected & certified by independent third party to meet EPA criteria

• Units in multifamily buildings can now earn the label

First community of all WaterSense labeled new homes in Issaquah, WA
Acceptance of WaterSense

- The WaterSense label is recognized by other green programs
  - FEMP Designated Products
  - U.S. Green Building Council’s LEED Rating Systems
  - Green Globes’ Green Building Initiative
  - National Association of Home Builders’ National Green Building Standard
  - International Code Council’s International Green Construction Code
  - IAPMO Green Technical Supplement
  - States and Municipalities
WaterSense Labeled New Homes
What Makes a WaterSense Labeled Home?

Third Party Certification

WaterSense Labeled Products

Hot Water Distribution

Leak Prevention & Service Pressure

Smart Landscaping & Irrigation
WaterSense® Labeled New Homes

Indoor Criteria

• **Required items:**
  - Water service pressure maximum 60 psi
  - Leak prevention measures
  - WaterSense labeled plumbing fixtures
  - Efficient hot water distribution system

- **Other items must meet efficiency criteria, if installed:**
  - ENERGY STAR qualified dishwasher or clothes washer (if appliances installed)
  - Evaporative air conditioners
  - Water softeners
  - Drinking water treatment systems
WaterSense® Labeled New Homes

Outdoor Criteria

• Be designed using the WaterSense Water Budget Tool

• Irrigation system *(if installed)*
  – Designed or installed by a WaterSense irrigation partner
  – Audited by a WaterSense irrigation partner

• Other water features *(if installed)*
  – Pools/spas - require covers
  – Ornamental water features

Healthy, beautiful landscapes that allow the homeowner to save water
Benefits of a WaterSense Labeled Home

• **Inside**: a family of four could save big in a WaterSense labeled new home
  – 50,000 gallons of water - equal to 2,000 loads of laundry
  – More than $600 per year on water, sewer, and energy bills

• **Outside**: water-efficient landscapes are adaptable to local watering restrictions
  – Easily maintained
  – Offer long term curb appeal
Website & Resources

- Easy to find on the WaterSense homepage
  - Look for the “New Homes” tab
  - [www.epa.gov/watersense/new_homes](http://www.epa.gov/watersense/new_homes)

- Inspection video

- Resources for plumbers

- Technical documents
  - [http://www.epa.gov/watersense/new_homes/homes_final.html](http://www.epa.gov/watersense/new_homes/homes_final.html)

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Who’s Building In Your State?

WaterSense labeled new homes are popping up all across the country. Saving water, energy, and money makes sense wherever you might live—whether your region has recently experienced a drought or is flush with lakes and streams. Find a WaterSense builder partner in your state. And check out a few of the homes below that have been built to date:

- Chapel Hill, NC (Vanguard)
- Hendersonville, NC (Napier Homes)
- Colorado Springs, CO (GJ Gardner)
- Revere, CA (KB Home)
This home is certified to meet the U.S. Environmental Protection Agency’s criteria for water-efficient new homes and has earned the WaterSense® label.

[Address of labeled home]

This WaterSense labeled home was built by

[Name of builder]

[Name of Inspector]

[Date]

Efficiency Home Inspector

[Name of License Certification Provider]

[Title]

Licensed Certification Provider

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Who are local WaterSense® Builders?

- Sage Homes NW
- Habitat for Humanity Seattle-King County
- Dwell Development
- Ichijo USA
- RD Construction
- Creative Home Partners
Who are local Raters?

Pam Worner, Green Dog Enterprises
(206) 883-6688
Tadashi Shiga, Evergreen State Energy
(206) 491-7111
Tom Balderston, Balderston & Associates
(206) 715-6865

To become a WaterSense partner, visit:
www.epa.gov/WaterSense/partners/become_a_watersense_partner.html
Questions/Contact

• WaterSense Information
  – Web site: www.epa.gov/watersense
• For questions:
  – Helpline: watersense@epa.gov
  – Toll-free: (866) WTR-SENS
• And online:
  www.facebook.com/epawatersense
  www.twitter.com/epawatersense

Jonah Schein
schein.jonah@epa.gov
202.564.2720

Bevin Horn
horn.bevin@epa.gov
206.553.1566
## Certification: Built Green

<table>
<thead>
<tr>
<th>Site &amp; Water</th>
<th>required</th>
<th>No zinc galvanized ridge caps, copper flashing or copper wires for moss prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site &amp; Water</td>
<td>required</td>
<td>Landscape with plants appropriate for site topography and soil types, emphasizing use of plants with low watering requirements [drought tolerant]</td>
</tr>
<tr>
<td>Site &amp; Water</td>
<td>required</td>
<td>Use the most efficient aerator available for kitchen faucets, lavatory faucets and showerheads</td>
</tr>
</tbody>
</table>
## Certification: LEED for Homes

### Baseline water consumption of fixtures and fittings

<table>
<thead>
<tr>
<th>Fixtures, Fittings, and Appliances</th>
<th>Current Baseline (IP Units)</th>
<th>Current Baseline (SI units)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water closets (toilets)</strong>*</td>
<td>1.6 gallons per flush (gpf)</td>
<td>6 liters per flush (lpf)</td>
</tr>
<tr>
<td><strong>Private lavatory faucet</strong>*</td>
<td>2.2 gpm at 60 psi</td>
<td>8.3 lpm at 415 kPa</td>
</tr>
<tr>
<td><strong>Kitchen faucet</strong></td>
<td>2.2 gpm at 60 psi</td>
<td>8.3 lpm at 415 kPa</td>
</tr>
<tr>
<td><strong>Showerhead</strong>*</td>
<td>2.5 gpm at 80 psi per shower stall</td>
<td>9.5 lpm at 550 kPa per shower stall</td>
</tr>
</tbody>
</table>
Valuing the benefits

LOW IMPACT DEVELOPMENT CASE STUDY
Shamrock Heights
The site had documented flooding issues which Triad Associates then corrected with grading and restoration of the pre-existing wetland.
Rain Channels

CamWest “buyers are looking for more privacy”

Windermere “people were very jazzed by the LID features”
Camwest “significant cost reductions only come when the streets can be designed at narrower widths”
## Original Paired Sales Analyses 2007-2009

### Original Premium for Green Amenities:
$7.50-$12.50 per sq.ft.
zHomes Case Study

DOMESTIC WATER USE AND CONSERVATION
zHomes (Issaquah) WaterSense Case Study

Target: 40% Overall Water Use Reduction

Photo Credit: King County Solid Waste Division
What Happened?

- Av. zHome resident used 16.07 gpd – over a 70% reduction
- Exceeds Net Zero benchmark
## Fixtures and Appliances

<table>
<thead>
<tr>
<th>Q1</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The toilet works well.</td>
<td>☑️☑️☑️☑️</td>
<td>☑️☑️</td>
<td>☑️☑️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The bathroom faucets work well.</td>
<td>☑️☑️☑️☑️</td>
<td>☑️☑️☑️</td>
<td>☑️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The showerhead works well.</td>
<td>☑️☑️☑️☑️☑️</td>
<td>☑️☑️☑️</td>
<td>☑️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The clothes washer works well.</td>
<td>☑️☑️☑️</td>
<td>☑️☑️☑️</td>
<td>☑️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The dishwasher works well.</td>
<td>☑️☑️☑️☑️☑️</td>
<td>☑️☑️</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Positive Responses = 87%
## Rainwater Harvesting

<table>
<thead>
<tr>
<th>Q6</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cistern that supplies the toilet and clothes washer works well.</td>
<td>√√√</td>
<td>√√√√</td>
<td>√√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q7</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The rainwater that comes from the cistern is relatively clean and odorless.</td>
<td>√√√√√√</td>
<td></td>
<td>√√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Q8</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>The cistern’s water supply lasts through the summer.</td>
<td>√√√</td>
<td>√√</td>
<td>√</td>
<td>√√</td>
<td></td>
</tr>
</tbody>
</table>

Positive Responses = 69%
## Landscaping

<table>
<thead>
<tr>
<th>Q9</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t miss having a traditional grass lawn.</td>
<td>✔️ ✔️ ✔️ ✔️ ✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q10</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy the native landscaping.</td>
<td>✔️ ✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q11</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The rain gardens absorb and manage storm water runoff effectively.</td>
<td>✔️ ✔️ ✔️ ✔️ ✔️</td>
<td>✔️ ✔️</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Positive Responses = 92%
### Values

<table>
<thead>
<tr>
<th>Q12</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserving water is important to me.</td>
<td>√√√√√</td>
<td>√√√</td>
<td>□</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Q13</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>Knowing that my zHome uses less water, less energy, and was built with low toxicity/green building materials is important to me.</td>
<td>√√√√√</td>
<td>√√√√√</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q14</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>I enjoy living in my zHome.</td>
<td>√√√√√√√√</td>
<td>√√√</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Positive Responses = 96%
All Units - GPD

Municipal Water (gallons)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Water (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20.8</td>
</tr>
<tr>
<td>2</td>
<td>14.2</td>
</tr>
<tr>
<td>3</td>
<td>24.2</td>
</tr>
<tr>
<td>4</td>
<td>9.35</td>
</tr>
<tr>
<td>5</td>
<td>14.2</td>
</tr>
<tr>
<td>6</td>
<td>20.1</td>
</tr>
<tr>
<td>7</td>
<td>19.7</td>
</tr>
<tr>
<td>8</td>
<td>8.8</td>
</tr>
<tr>
<td>9</td>
<td>30.4</td>
</tr>
</tbody>
</table>

Average = 16.07
Review of Strategies

- Peter’s Creek retirement home using old, inefficient fixtures
- Cascade Water Alliance provided WaterSense toilets, showerheads and faucet aerators

OUTCOME:
- Sustained decrease in water use of about 40%
Water Usage & Rates

WATER VALUATION
Appraisal Practices Board

Voluntary Guidance on Recognized Valuation Methods and Techniques:

Valuation of Green and High Performance Property:

1-to-4-Unit Residential

This communication is for the purpose of issuing voluntary guidance on recognized valuation methods and techniques.
3.2 Water Efficiency

Water efficiency relates to how efficiently a property manages, uses and disposes of water. Virtually every property makes efforts to control water. For example, when a property has indoor plumbing, it typically has pipes to control where the water goes, a controlled water heating mechanism, drains and even water storage devices. Efforts are also typically made to control how water is collected, disposed of (or recycled) and consumed. It would, for example, be highly unusual for a property to have a continually running hot-water faucet. In that regard, every property with indoor plumbing has some level of water efficiency. The task, then, is not to recognize all forms of water efficiency; rather, it is to recognize when special effort has been made (or when not enough effort has been made) to impact water efficiency. Questions to consider might include:

- How is water managed in the home? Is this normal for the area?
- Do the market participants appreciate or value special water efficiency features?
- Is the water efficiency too efficient (i.e., no indoor plumbing, gray water recycling systems in an area where they are not expected, having to collect all available water via rain barrels)?

If special efforts – or too few efforts – are made to manage water efficiency, proceed to research how the market values these particular features (if at all). Additionally, if certain features meet the expectation of a market segment, and those features are common and noted in every home, then a detailed documentation of those features is likely unnecessary.
## Bellevue Single Family Variable Water Cost Example*

<table>
<thead>
<tr>
<th>Two-Month Billing Period</th>
<th>0 - 20 CCF</th>
<th>21-30 CCF</th>
<th>31-100 CCF</th>
<th>Over 100 CFF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$3.57</td>
<td>$4.93</td>
<td>$</td>
<td>$9.40</td>
</tr>
<tr>
<td></td>
<td>$6.31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Older home using 83 CCF or about 620 gallons per day Family of Four = $523.73 (used av. US consumption of 157 gpd)

2. Newer home using 44 CCF or about 332 gallons per day Family of Four = $277.64 (used WA av. of 83 gpd)

3. WaterSense labeled home using 35 CCF or about 265 gallons per day Family of Four = $220.85

* Does not include connection (meter) charge
Capitalization of Energy & Water Savings

Subject Property
ENERGY STAR home with anticipated $513 annual energy & water savings

Energy Savings Identified
- $250 divided by 6.55% = $3,817

Water Savings Identified
- $263 divided by 5.9% = $4,458

8.3.1 DCF Analysis
A discounted cash flow analysis provides an indication of present value of future income. Energy cost savings can be capitalized using a reasonable capitalization rate (such as a local utility cap rate or a current mortgage interest rate).
Review

- Which room typically accounts for the largest % of household water usage indoors?
- Which area accounts for the largest % per capita of household water usage in the US?
What % of water savings can a family of four expect with WaterSense?

How much water does the average person in WA use per day?

For a family of four, on average, how much water is saved annually living in a WaterSense certified home?
QUESTIONS?

To learn more or to register for one of our other courses go to:

WWW.SEECSOLUTIONS.COM

SEEC LLC School of Green Real Estate

Instructor: Robbi Currey

P: 1.360.894.6817

E: robbi@seecolutions.com