Patchwork Blue

Survey of U.S. Rainwater Harvesting Laws

Chris Maxwell-Gaines, P.E.

Collecting Rainwater Now Illegal In Many States As Big Government Claims Ownership Over Our Water

In the United States, we are all under the illusion that we are free, and I am sorry to say that is a lie. Many of the freedoms that we enjoy are quickly eroding away, quickly transforming us into the land of the enslaved.

Many of you might not be aware that in the Western states, including Utah, Washington, and Colorado, have outlawed individuals from collecting rainwater on their own properties. The reason why? They claim that it belongs to someone else.

If You Catch And Use Rainwater In Colorado, You Are A Criminal

NICOLE GENTILE MAR 22, 2016, 6:01 PM

Natural News
The world's top news source on natural health

Oregon man serving prison sentence for collecting rainwater on his own property

Thursday, August 07, 2014 by: Ethan A. Huff, staff writer
Tags: oregon, rainwater collection, big governemnt

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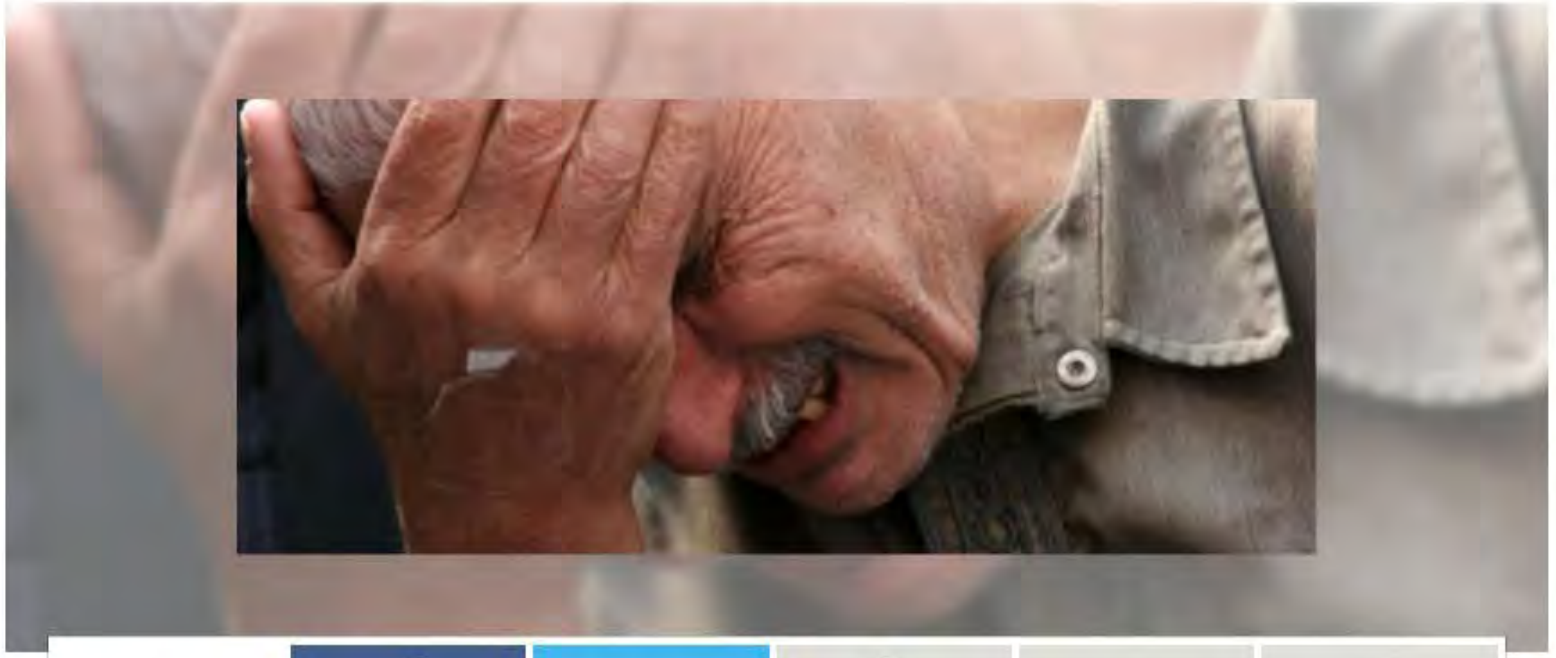
(NaturalNews) An Oregon landowner has been subjected to a 30-day prison sentence for what he says was a simple act of

Rain Trust

An Oregon man was not recently jailed simply for collecting rainwater on his own property.



CLAIM

An Oregon man was jailed for collecting rainwater on his own property. See Example(s)

RATING

MOSTLY FALSE

Guidelines

Standards

Codes

Laws

Regulations

2000 Maryland Stormwater Design Manual Volumes I & II

Prepared By:

Center for Watershed Protection
Ellicott City, Maryland

and the

MDE

Maryland Department of the Environment
Water Management Administration
1800 Washington Blvd., 4th Floor, STE 440 Baltimore, MD 21230-1708
(410) 537-3550 1-800-633-6101 http://www.mde.state.md.us

The Texas Manual on Rainwater Harvesting

Texas Water Development Board

Third Edition

Building Codes Division

Oregon Smart Guide

Rainwater Harvesting

Department of Consumer & Business Services
Building Codes Division

Roof-Reliant Landscaping™

Rainwater Harvesting with Cistern Systems in New Mexico

Nate Downey, Principal Author
Randall D. Schultz, Editor
Ken Wilson, Designer

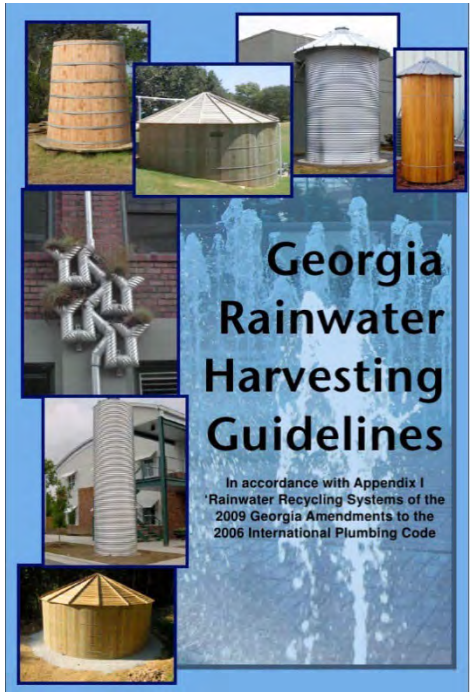
New Mexico Office of the State Engineer
1-800-WATER-NM • www.ose.state.nm.us

Virginia Rainwater Harvesting Manual

Second Edition 2009

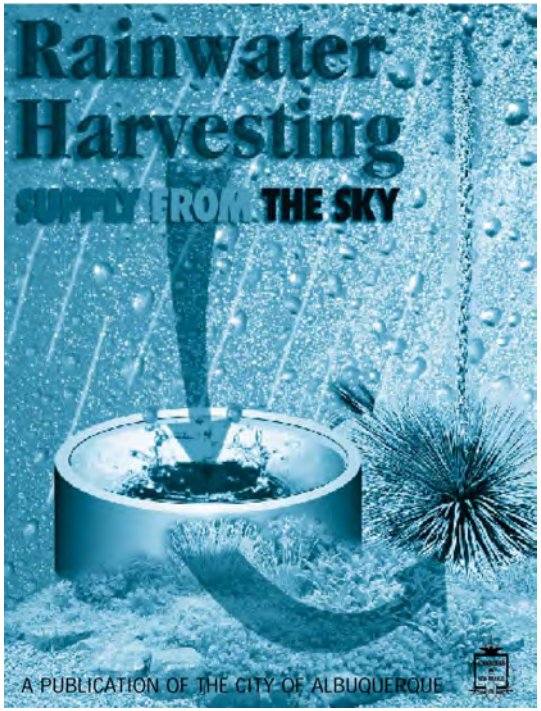
Compiled by The Cabell Brand Center

A comprehensive guide to examining, designing and maintaining rainwater harvesting systems to abate stormwater runoff



Georgia Rainwater Harvesting Guidelines

In accordance with Appendix I 'Rainwater Recycling Systems of the 2009 Georgia Amendments to the 2006 International Plumbing Code



OKLAHOMA COOPERATIVE EXTENSION SERVICE BAE-1757

Design of Rainwater Harvesting Systems in Oklahoma

Ashley Stringer
Graduate Student, Environmental Science

Jason Vogel
Assistant Professor, Stormwater Management
Biosystems and Agricultural Engineering

Jessica Lay
Graduate Student, Biosystems and Agricultural Engineering

Kelly Nash
Undergraduate Research Assistant
Biosystems and Agricultural Engineering

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: http://osufacts.okstate.edu

Introduction

Rainwater harvesting is the process of capturing, channeling, and storing stormwater runoff for later use. Ideas and technologies of harvesting rain date back more than 4,000 years in areas such as Rome, the Middle East, and China. Ancient societies left evidence of agricultural dams and runoff control methods, as well as reservoir or cistern construction in urbanized areas. As of 2004, an estimated 100,000 residential rainwater harvesting systems were in use in the United States and its territories (TWDB 2005).

Rainwater harvesting systems can be easily implemented at the home, commercial, and community levels. The two basic types of rainwater harvesting collection systems, cisterns and rain barrels, essentially differ because of the volume of water to be collected. These methods of collection and storage augment municipal and well water supplies, reduce flooding and erosion, improve water quality, and reduce water bills.

Uses of harvested rainwater include irrigation, washing cars, flushing toilets, and drinking water. Atmospheric contaminants such as, vegetation overhang, infrequent rains, dust accumulation, roof material, and bird and rodent droppings, can be carried into the system by rainwater. Therefore, if used for drinking water or flushing toilets, the water must be treated in accordance with state and federal drinking water regulations. Treatment methods include, but are not limited to, debris filtration and various purification methods such as chlorination or UV treatment to achieve disinfection.

Design and Sizing

The five main components of a rainwater harvesting system are (1) conveyance, (2) storage, (3) overflow, (4) outlet, (5) delivery. In addition, a first-flush diverter can be installed for improved water quality. Before implementing a rainwater harvesting system, it is important to understand and consider the function of these components, as well as familiarizing oneself with local plumbing, building, neighborhood, and environmental codes. The limiting factors in most rainwater harvesting applications are the space available for storage, cost and aesthetics. Several factors must be considered when installing a system including contributing rooftop area, rainfall patterns, and anticipated usage.

Different approaches to rainwater harvesting are taken in different parts of the country. To begin a rainwater harvesting project, consider the following:

- How will the harvested rainfall be used?
- How reliable will you need the system to be?
- What is the size of the catchment area that you have or need?
- Where is the catchment area located relative to the intended use?
- What size and type of storage do you have/need to purchase for the harvested rainfall?

The catchment area should be calculated based on the footprint created by the roof and not by the square footage of the roof surface. Be sure to use roof surfaces as near as possible to the planned cistern location, to shorten pipe runs. Because precipitation and water demand (precipitation for in-home demand) are very uneven during the year, the cistern size is based upon monthly average precipitation and demand. These can be obtained from Table 1 by multiplying your average annual precipitation at your location by the percentage of rain during the identified month desired for using the system. The gallons collected from a particular area per month is calculated by the following:

$$G = 0.6 \times P \times A \times E$$

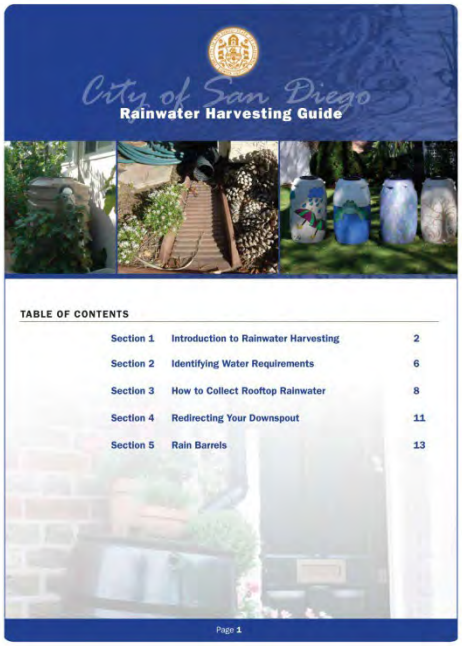
where G is the gallons of water harvested per month, P is the monthly precipitation in inches, A is the roof footprint in square feet, 0.6 is a conversion factor that converts among inches, feet, and gallons, and E is the efficiency of the system (which is assumed to be 0.8, or 90 percent, in the absence of other information). Efficiency is important to include in a system because not all of the water that falls on a rooftop will be captured due to leakage, impact splash, first flush diverters, and evaporation. An excessively steep catchment area or an intense rainfall event may further decrease capture estimates due to gutter overflow.

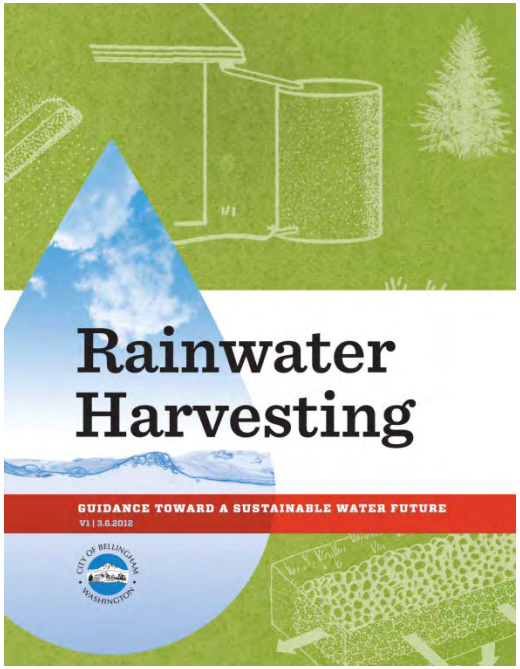
Guidelines for the Design and Construction of Stormwater Management Systems

Developed by the New York City Department of Environmental Protection in consultation with the New York City Department of Buildings

July 2012

NYC Environmental Protection
Michael R. Bloomberg, Mayor
Carter H. Strickland, Jr., Commissioner





International Plumbing Code (IPC)

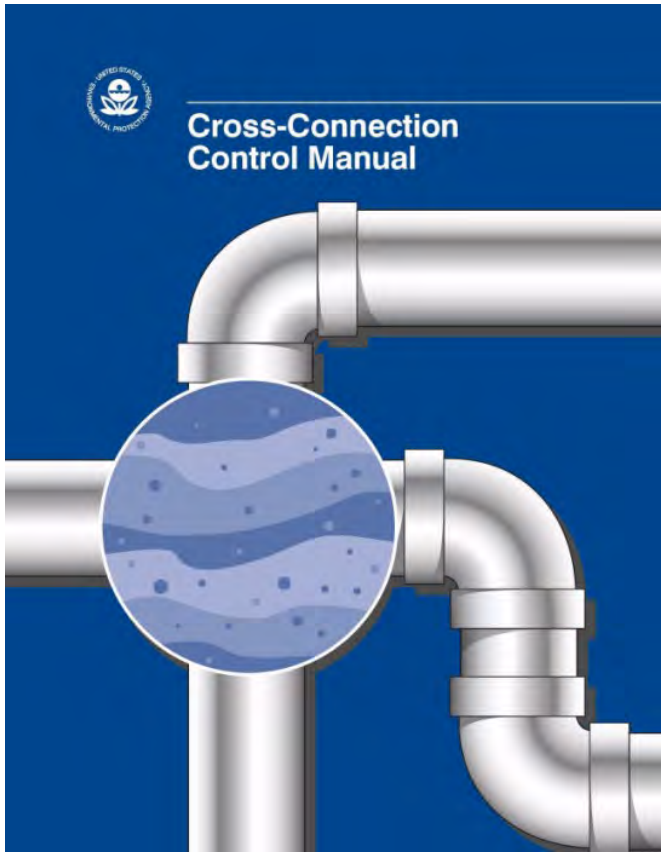
- International Code Council
- Developed International Green Construction Code (IgCC) as a supplement in 2012 with a section dedicated to water efficiency and conservation
- IgCC became part of main code in 2015

Universal Plumbing Code (UPC)

- International Association of Plumbing and Mechanical Officials (IAPMO)
- Developed Green Plumbing & Mechanical Code Supplement in 2010

Backflow Prevention Regulations

- Based on “Degree of Hazard”
- No formal regulation at national level
- Safe Water Drinking Water Act
- State, County, and Municipality regulations vary greatly
- States develop rules but give them over to municipalities to administer
- EPA published Cross-Connection Control Manual



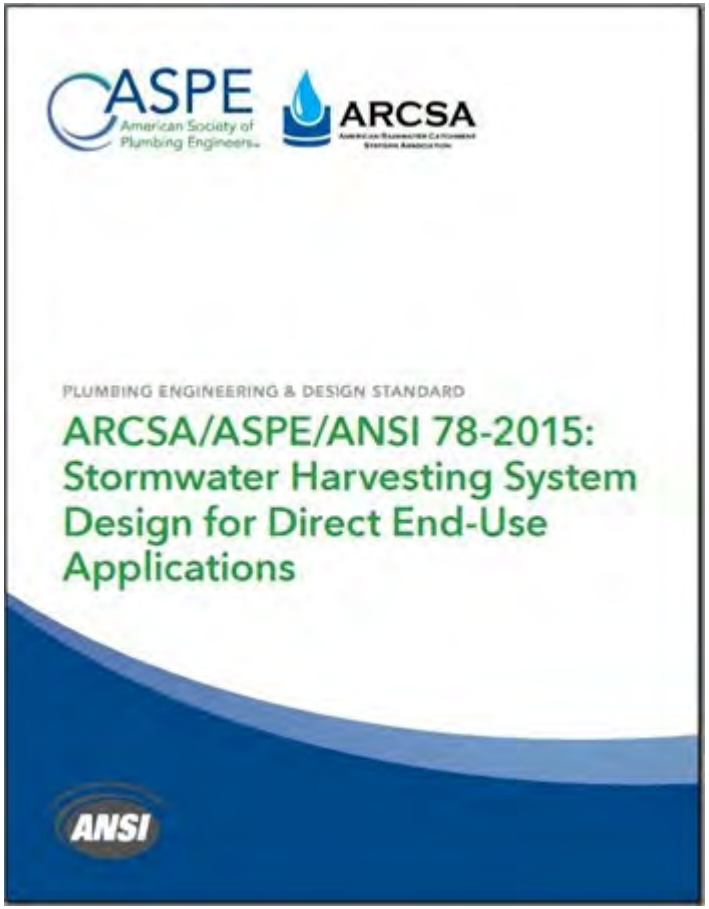
NSF/ANSI Standards

- **NSF P151**: Certification of Rainwater Catchment System Components
- **NSF/ANSI Standard 61** - Drinking Water System Components Health Effects
- **NSF/ANSI Standard 53-2007a** - Drinking Water Treatment Units - Health Effects
- **NSF/ANSI Standard 55** - Ultraviolet Microbiological Water Treatment Systems
- **NSF/ANSI Standard 60** - Drinking Water System Chemicals Health Effects

ARCSA/ASPE/ANSI 63-2013: *Rainwater Catchment Systems*

- Approved on November 14, 2013
- Jointly developed by ASPE and ARCSA
- Co-sponsored by IAPMO and NSF International
- Assist engineers, designers, plumbers, builders/developers, local government officials, and end users in safely implementing a rainwater catchment system using precipitation from rooftops

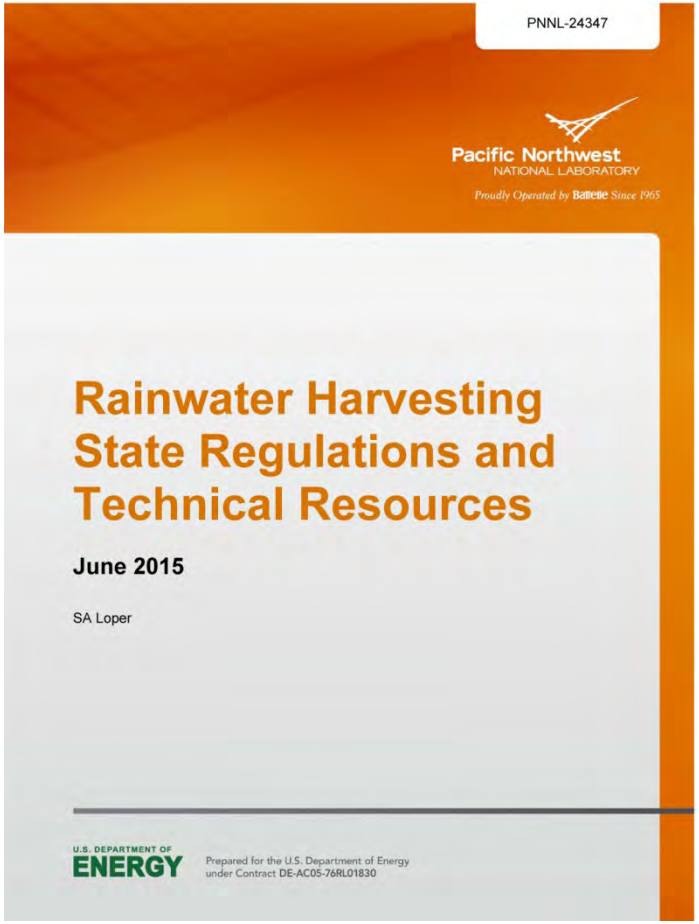
ARCSA/ASPE/ANSI 78-2015: *Stormwater Harvesting System Design*



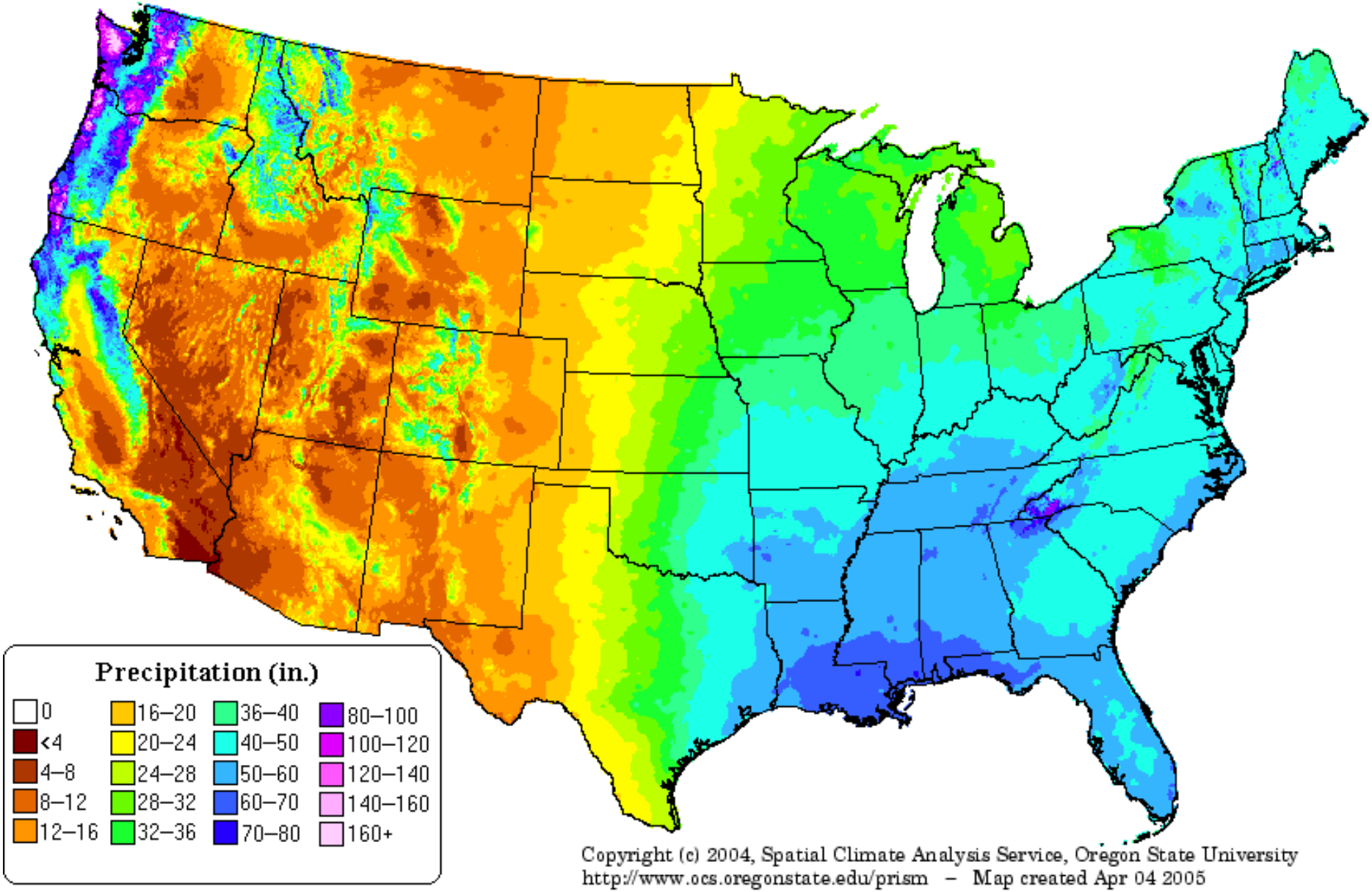
- Approved on August 3, 2015
- Jointly developed by ASPE and ARCSA
- Co-sponsored by IAPMO and NSF International
- Provides guidance on how to install and maintain a safe alternative to utility-provided water and to optimize stormwater utilization to reduce dependence on municipal potable water systems

Literature Review

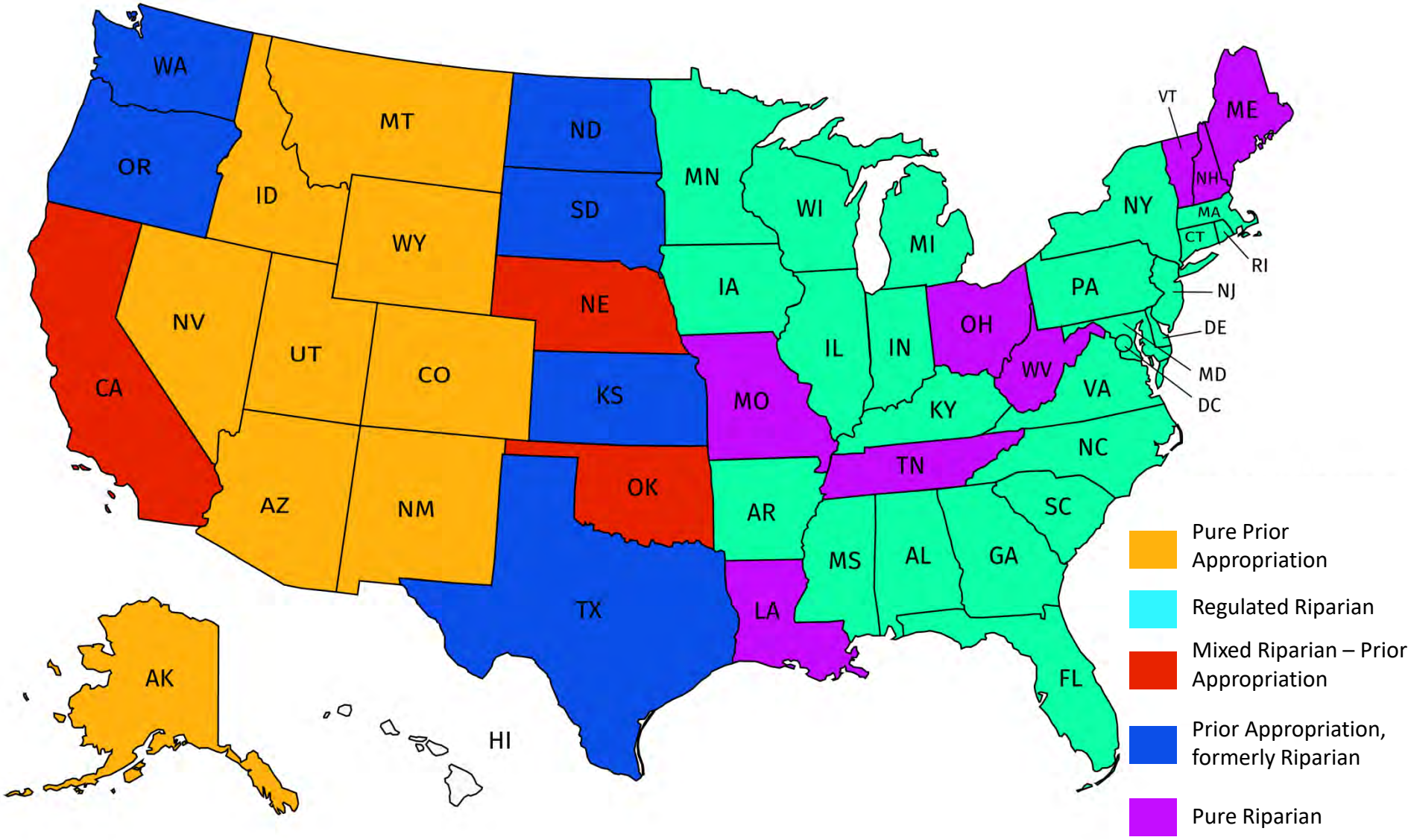
- ✓ Rainwater Harvesting State Regulations and Technical Resources
  - SA Loper, Pacific Northwest National Laboratory, June 2015
  - Produced for U.S. Federal Energy Management Program
- ✓ State Rainwater Harvesting Laws and Legislation
  - National Conference of State Legislatures
- ✓ Laws, Rules & Codes webpage
  - ARSCA
- ✓ Regulations & Statutes webpage
  - HarvestH2o.com



Annual Precipitation Averages

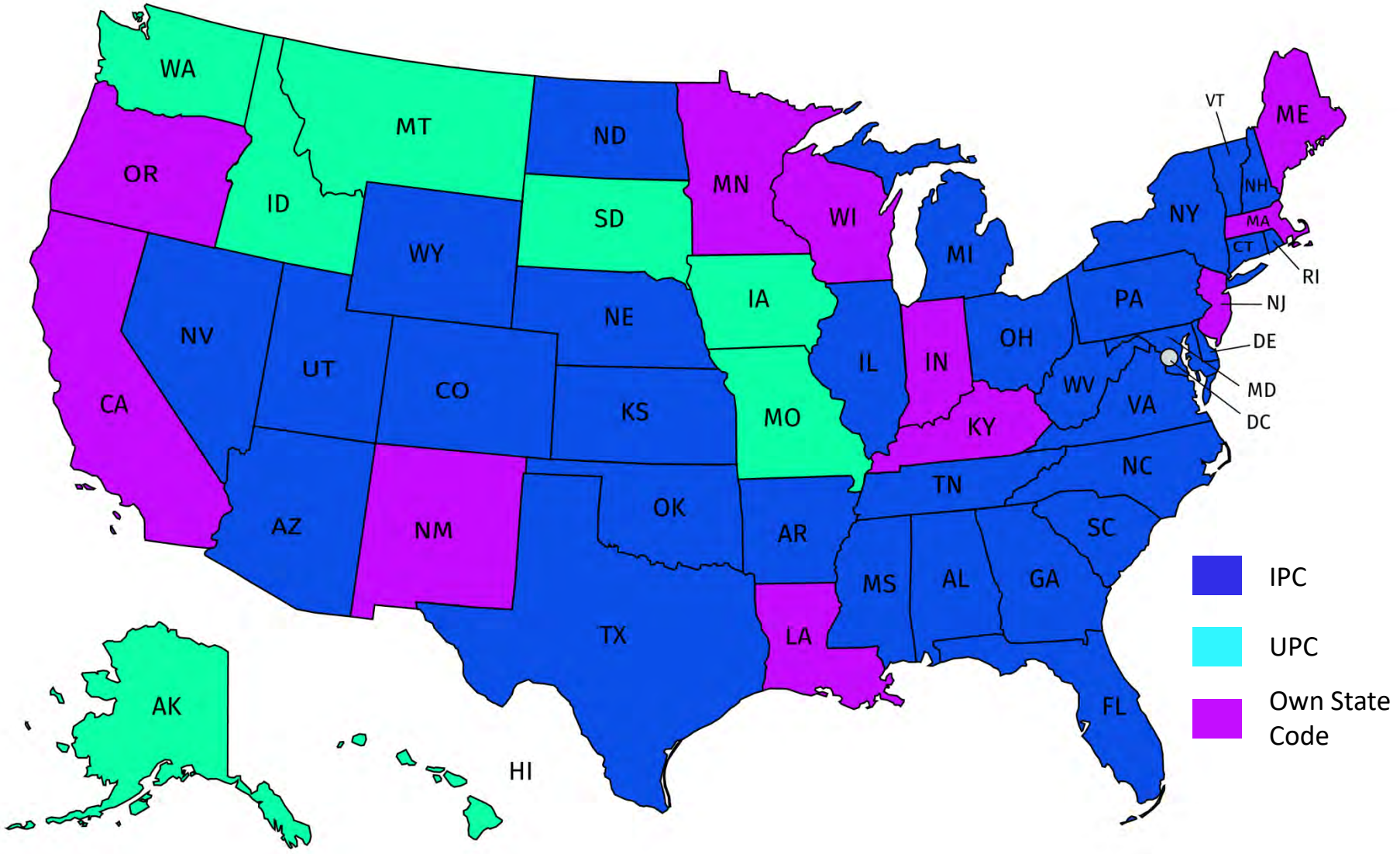


Surface Water Appropriations



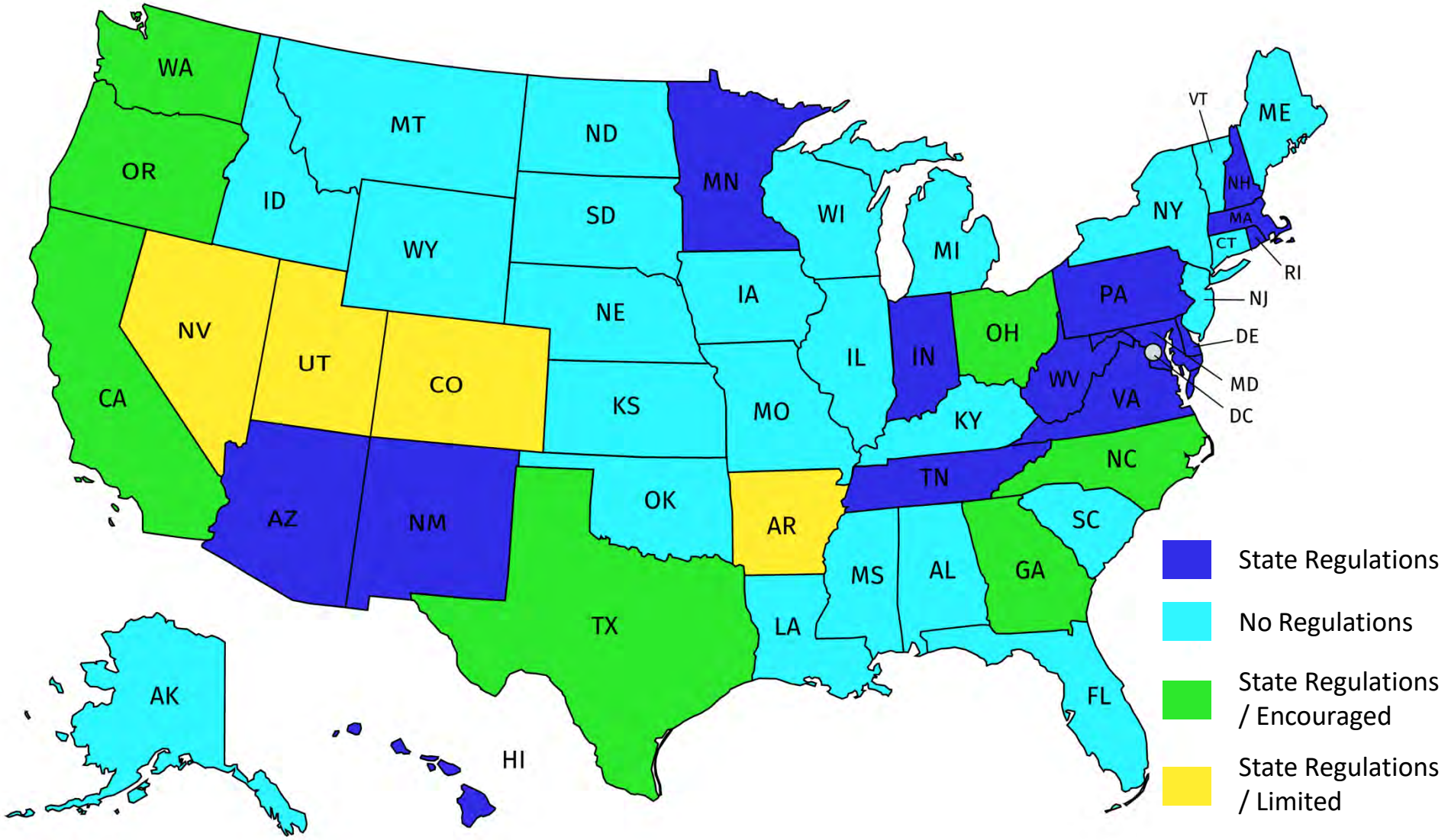
Source: Gleick and Christian-Smith 2012

Plumbing Codes, by State

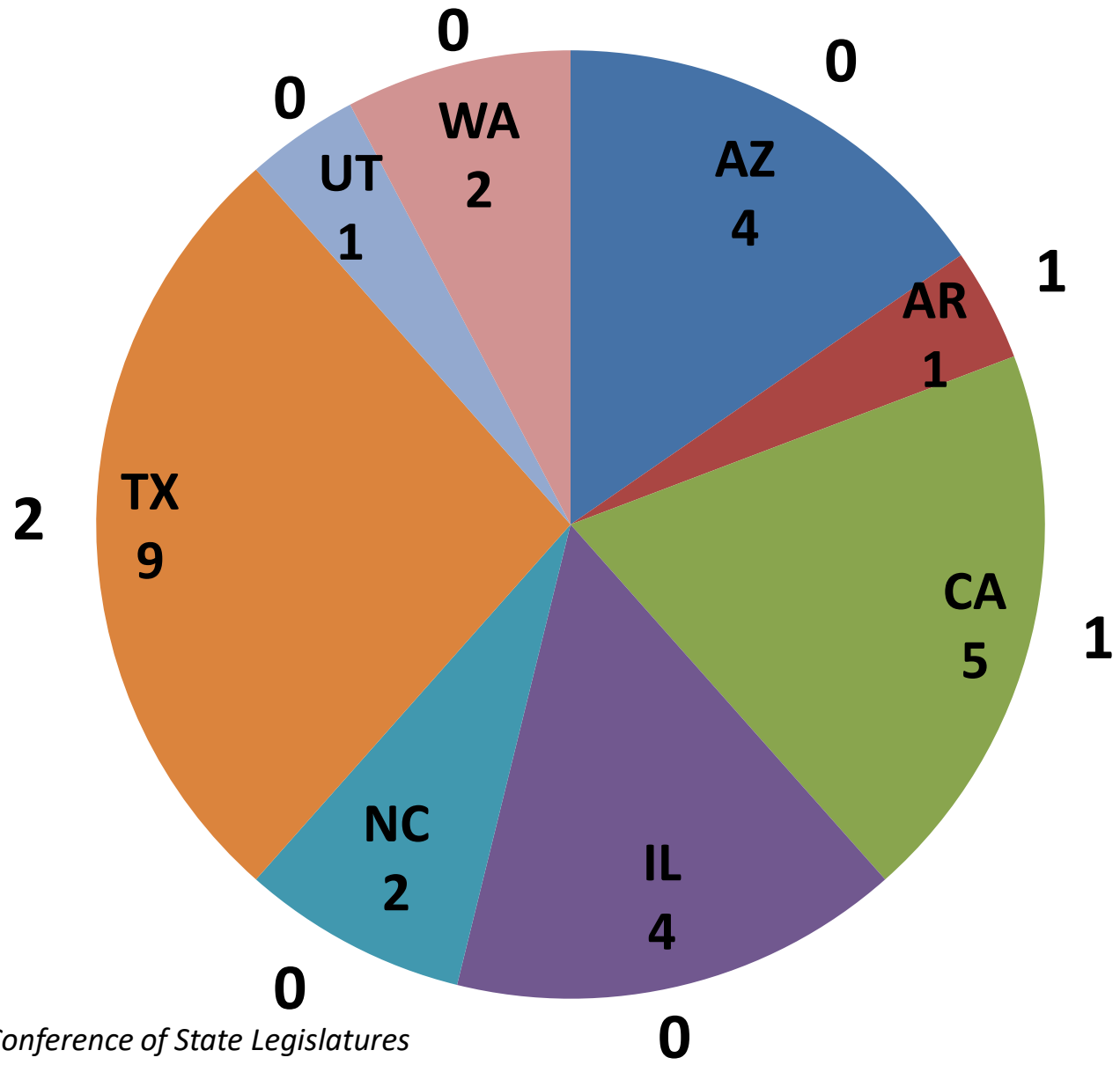


Source: State Plumbing Codes, Tests.com

Rainwater Regulations



RWH Bills Filed Since 2008



Source: National Conference of State Legislatures

Types of Rainwater Harvesting Bills

- Rainwater harvesting licensure (TX)
- Prohibition of homeowner associations from preventing the practice (IL)
- Expand definition of plumbing (IL, TX)
- Tax credit for rainwater harvesting (NC)
- Defining need for permit (**AR**, CA, UT, WA)
- Exemption from ad valorem taxation (TX)

Unpassed RWH Tax Credit Bills

- North Carolina HB 1385 (2009)
  - Tax credit for the construction of cisterns on residential and commercial properties
  - Credit equal to 35% of an eligible cistern cost, including modifications to existing plumbing systems necessary for operation of the system
- New Mexico SB 16 (2014)
  - “Water harvesting income tax credit” to provide incentive for homeowners and businesses to use harvested water
  - Credit equal to 20% of the purchase and installation costs of the system, up to $5,000. Earmark max annual aggregate of $2,000,000/year
- Arizona HB 2330 (2017)
  - Tax credit for installing a residential “water augmentation system”
  - Credit equal to 25% of the cost of the system not to exceed $1,000

Why Regulations are Necessary?

- Regulations of RWH is interpreted through other regulations:
  - Water well and private water systems
  - Stormwater management and green infrastructure
  - Reclaimed water
  - Cistern or tank construction standards
- Clarify authority of review
- Prevent misinformed implementation

Goals of RWH Regulations

- Define RWH as legal practice
- Promote the use of rainwater while safeguarding public health
- Make permitting predictive
- Avoid restrictive policies
- Define the requirements of RWH in relation to existing code
- Make it easy for the public to understand and implement
- Standardize and streamline application processes

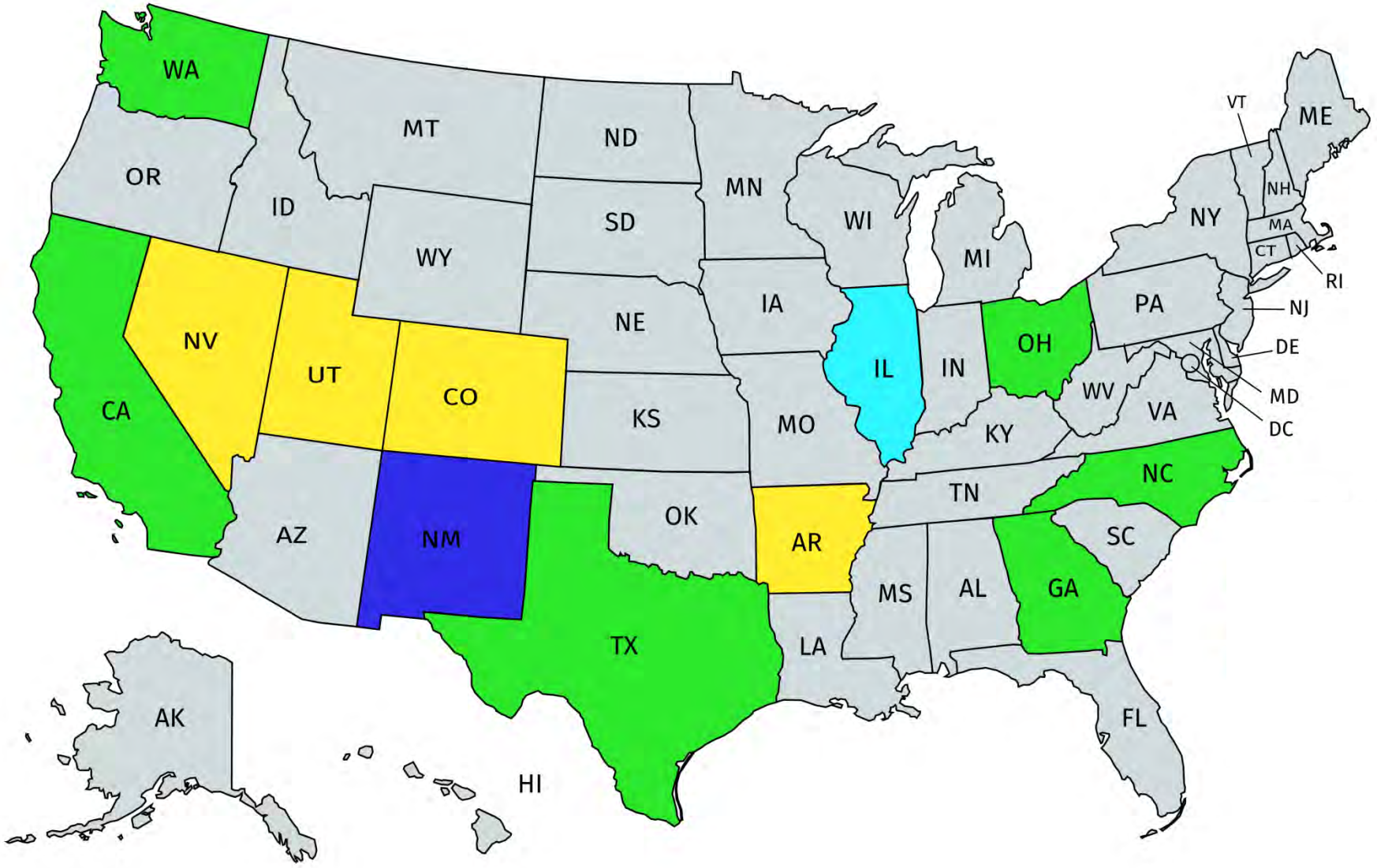
Rainwater Regulation Hurdles

- Political
  - Codes and Standards
- Water Rights
  - Prior appropriation issues
- Economics
  - Conflicts with purpose of water utility districts
- Health Concerns
  - Backflow / Cross-connection
  - Mosquito breeding

Nice Effort, but…

- Unfunded or “forgotten” mandates to promote RWH
- Typically it goes like this…
- *The Department shall develop by [DATE], guidelines regarding the use of rainwater. The guidelines shall describe the conditions under which rainwater may appropriately be used and for what purposes.*
- *The Department shall promote the use of rainwater as means to reduce fresh water consumption, ease demands on public treatment works and water supply systems, and promote conservation.*
- Texas, Virginia, Oklahoma, Arizona, Nevada, Illinois

Let's Take a Closer Look



Nevada Laws and Regulations

AB 138 (2017)

- Provides that the de minimus collection of precipitation from the rooftop of a **single-family dwelling for non-potable domestic use** is exempted from the requirements of chapter 533 of NRS and thus may be collected without a water right or permit to appropriate water
- Larger rainwater harvesting systems would need to apply for a permit to the Division of Water Resources

Utah Laws and Regulations

SB 32 (2010)

- Allows the collection and use of precipitation without obtaining a water right
  - If an underground storage container is used, then the maximum capacity is **2,500 gallons**. The system must be registered at state engineer's office.
  - If a covered storage container is used, then the maximum capacity is **two containers, with 100 gallons** being the maximum capacity of any one container.

Colorado Laws and Regulations

SB 09-080 (2009)

- Allows limited collection and use of precipitation for landowners, only if:
  - Residential property uses a well for the water supply that is permitted for domestic uses, and there is no water supply available in the area from a municipality, and
  - The rainwater is collected only from the roof, and used only for those uses that are allowed by, and identified on, the well permit.

HB 16-1005 (2016)

- Allows the collection of precipitation from a residential rooftop if:
  - Maximum of **2 rain barrels** with a combined storage capacity of **110 gallons** or less are used;
  - Precipitation is collected from a single-family residence or a multi-family residence with 4 or fewer units;
  - The collected precipitation is used on the residential property only for outdoor purposes

Arkansas Laws and Regulations

SB 401 (2009)

- The State Board of Health shall allow the use of a harvested rainwater system used for a **non-potable** purpose if the harvested rainwater system:
  1. Is designed by a professional engineer licensed in Arkansas;
  2. Is designed with appropriate cross-connection safeguards; and
  3. Complies with the Arkansas Plumbing Code.

New Mexico Laws and Regulations

The NM Office of the State Engineer encourages the harvesting, collection and use of rainwater from residential and commercial roof surfaces for on-site landscape irrigation and other on-site domestic uses.

The collection of water harvested in this manner should not reduce the amount of runoff that would have occurred from the site in its natural, pre-development state. Harvested rainwater may not be appropriated for any other uses.

California Laws and Regulations

AB 1750 (2012)

- "Rainwater Capture Act of 2012"
- Provides that use of rainwater collected from rooftops does not require a water right permit from the State Water Resources Control Board
- Authorizes landscape contractors to install rainwater capture systems for outdoor uses

North Carolina Laws and Regulations

HB 749 (2009)

- Authorizes the State Building Code to permit the use of cisterns to provide water for flushing toilets and for outdoor irrigation in the construction or renovation of residential or commercial buildings or structures
- Prohibits any state, county, or local building code or regulation from prohibiting the use of cisterns for these uses

Washington Laws and Regulations

On October 12, 2009, the Department of Ecology issued an Interpretive Policy Statement clarifying that a water right is not required for rooftop rainwater harvesting.

If and when the department determines that rooftop or guzzler rainwater harvesting systems are likely to negatively affect instream values or existing water rights, local restrictions may be set in place to govern subsequent new systems.

However, Ecology generally does not expect the collection of harvested rainwater to cause problems or reduce the amount of runoff that would have occurred from the site in its natural, pre-development state.

Ohio Laws and Regulations

Ohio Revised Code §3701.344

- Defines “Private water systems” which are regulated by the Ohio Department of Health
- "Private water system" includes any well, spring, **cistern**, pond, hauled water, or recycled water and any equipment for the collection, transportation, filtration, disinfection, treatment, or storage of such water extending from and including the source of the water to the point of discharge

Texas Laws and Regulations

SB 2 (2001)

- Sales tax exemption / Ad valorem tax exemption

HB 645 (2003)

- HOA can't restrict installation

HB 2430 (2005)

- TWDB shall establish a Rainwater Harvesting Evaluation Committee and provide report (*raincat.ch/RWReport)*

HB 4 / SB 3 (2007)

- Restricts the use of rainwater indoors to nonpotable use if connected to PWS / Backflow required

Texas Laws and Regulations

HB 3391 (2011)

- New state buildings shall have rainwater harvesting systems

SB 1073 / HB 3372 (2011)

- Allows rainwater to be used for potable indoor use if connected to PWS / Must be plumber with water supply protection specialist endorsement to install these

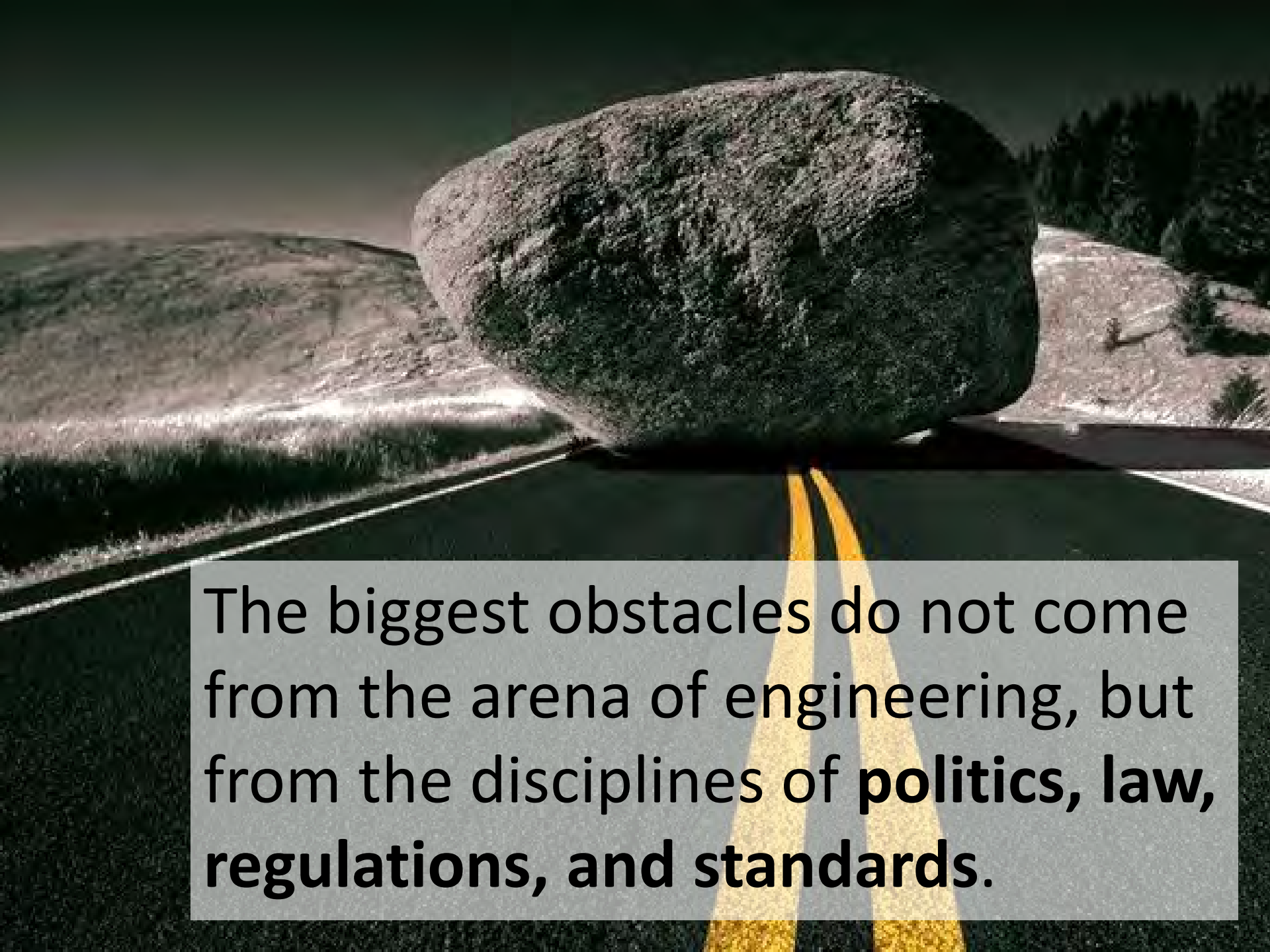
HB 1902 (2015)

- Defined rainwater as an “alternative onsite water”

Illinois Laws and Regulations

SB 38 (2011)

- Amends the Illinois Plumbing License Law to include rainwater harvesting in the definition of “plumbing”
- Requires the Illinois Department of Public Health to adopt and publish a minimum code of standards for rainwater harvesting systems by 1/1/2012
- Requires rainwater harvesting systems and rainwater harvesting distribution systems to be (A) used only for non-potable uses and (B) constructed in accordance with the Illinois Plumbing Code
- **Did not pass as introduced**



The biggest obstacles do not come from the arena of engineering, but from the disciplines of **politics, law, regulations, and standards**.

What's Next for ARCSA?

- Work with state legislators to develop consistent RWH regulations that fits their ultimate goal, whether it is conservation or stormwater management
- Sponsor research to show that RWH doesn't diminish a "prior user's" water supply
- Promote the idea of RWH "systems" to state governments and consumers, not just "rain barrels"
- Develop RWH regulation database on website

Thank you very much!!

Want a copy of my presentation or the regulation database, email me at:

chris@watercache.com