This presentation premiered at WaterSmart Innovations

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INNOVATIONS

Rainwater Harvesting Comes of Age

Water is the lifeblood of our bodies, our economy, our nation and our well-being.

Stephen Johnson, EPA Administrator

We are entering into a new era of water management

Consider this:

- We pay to bring water in.
- We pay to get rid of it.
- The water that is free we pay to get rid of it via stormwater fees and infrastructure.

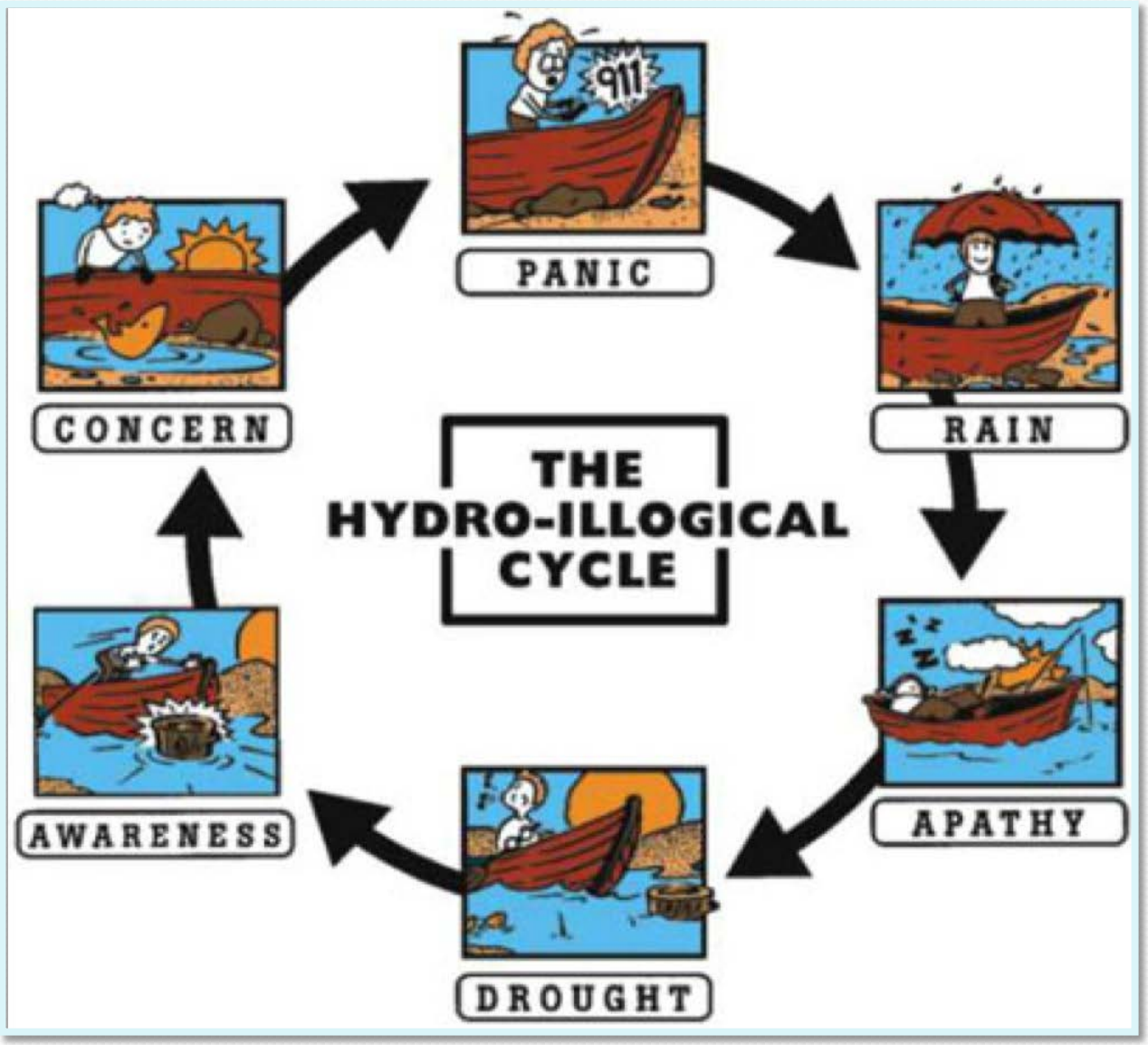
"Irrigation of the land with seawater desalinated by fusion power is ancient. It's called rain. "

Michael McClary

Common Rainwater Myths

- **Myth #1: Rainwater is grey water.**
- **Myth #2 : Water is free and unlimited.**
- **Myth #3: You can't collect rainwater in a drought.**
- **Myth #4: It's raining! We don't need to worry about water.**

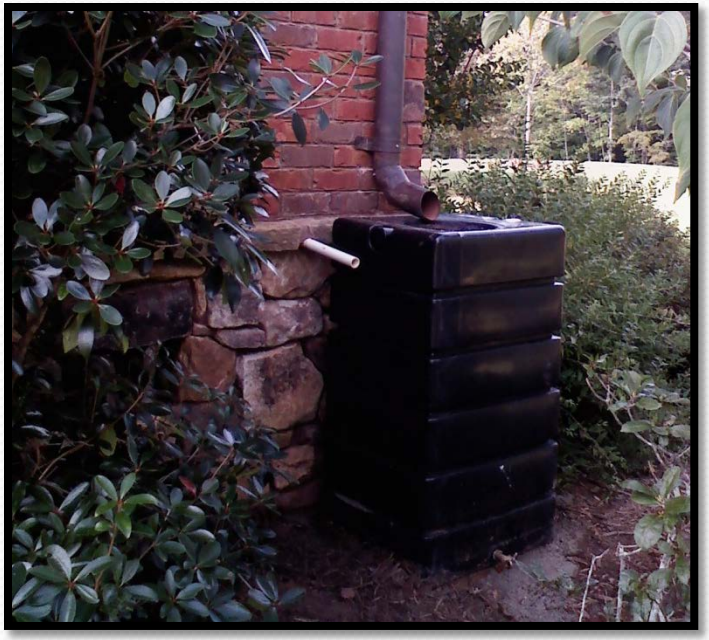




911
PANIC
RAIN
APATHY
DROUGHT
AWARENESS
CONCERN
THE HYDRO-ILLOGICAL CYCLE

Rainwater Harvesting.

Is it really that simple?

It can be as simple as a bucket or a rain barrel…

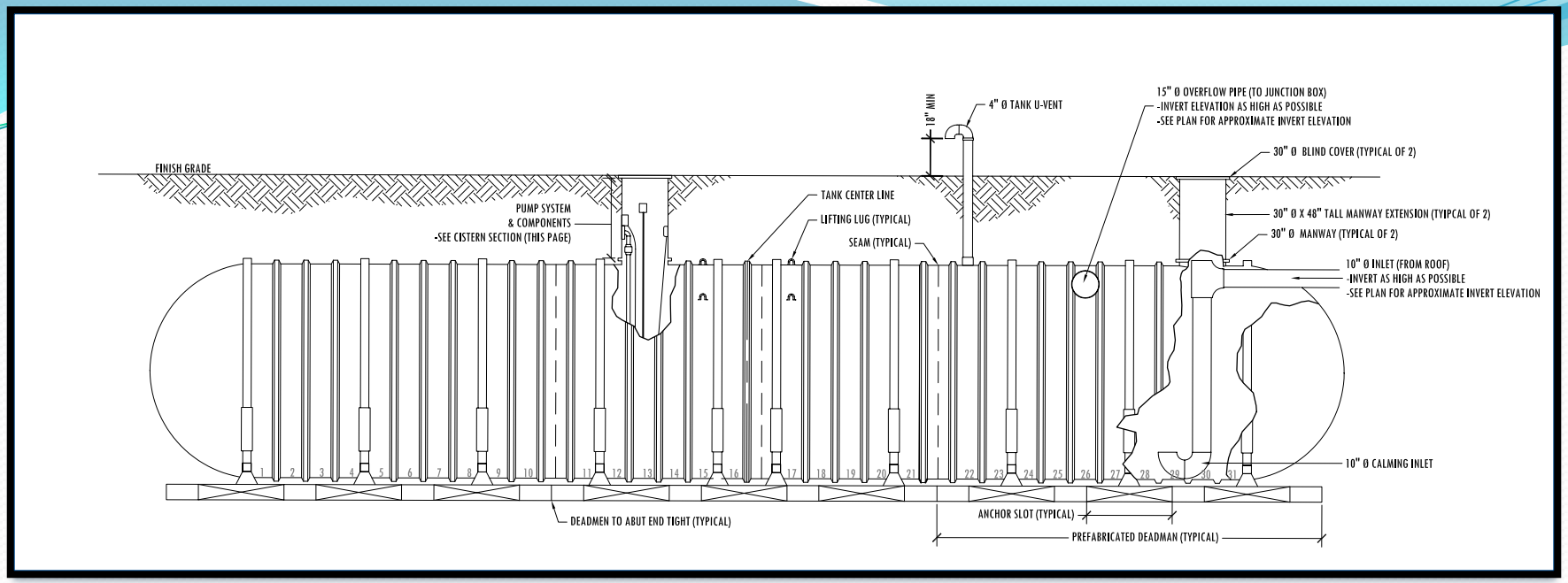


Or could it be more sophisticated?

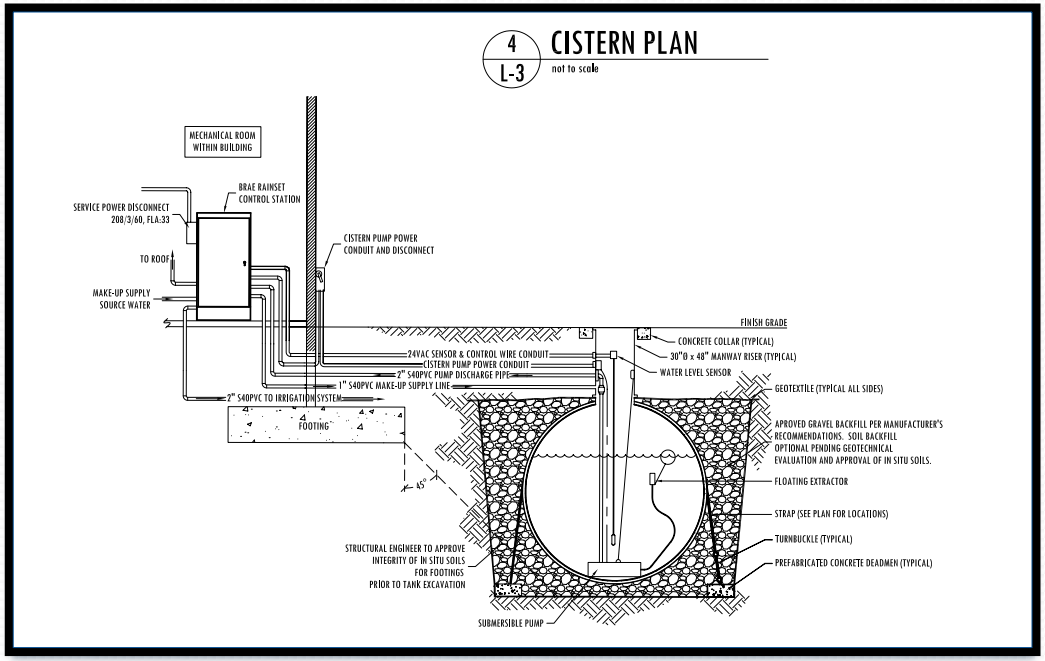
33,000 gallon fiberglass tank

Advance Ed, Alpharetta, GA

AdvancEd Alpharetta GA



AdvancEd Alpharetta GA.



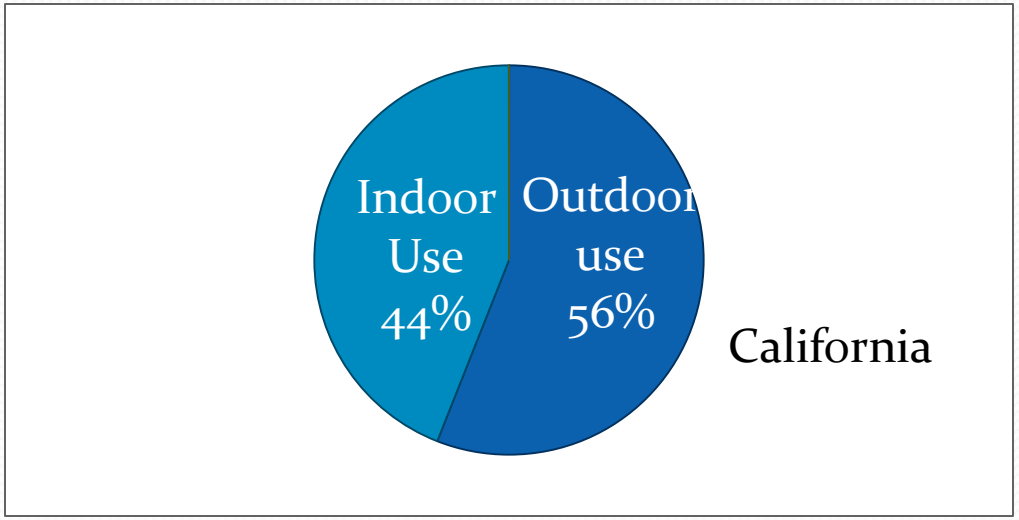
Fowler Dr. Elementary School

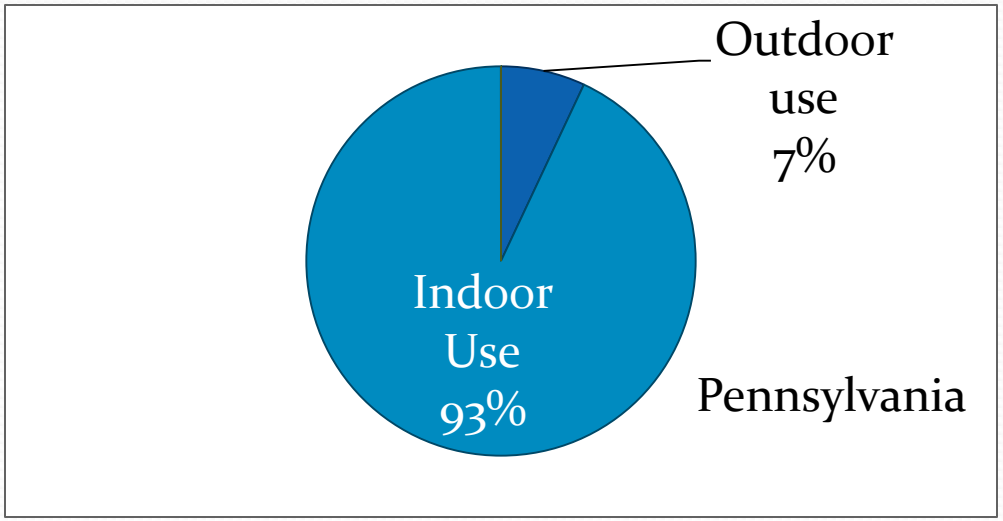
Fowler Dr. Elementary School

U. S. Water Usage

Outdoor vs Indoor

Outdoor residential use varies greatly depending on geographical location and season. Outdoor use in the arid West and Southwest is much greater than that in the East or Midwest.



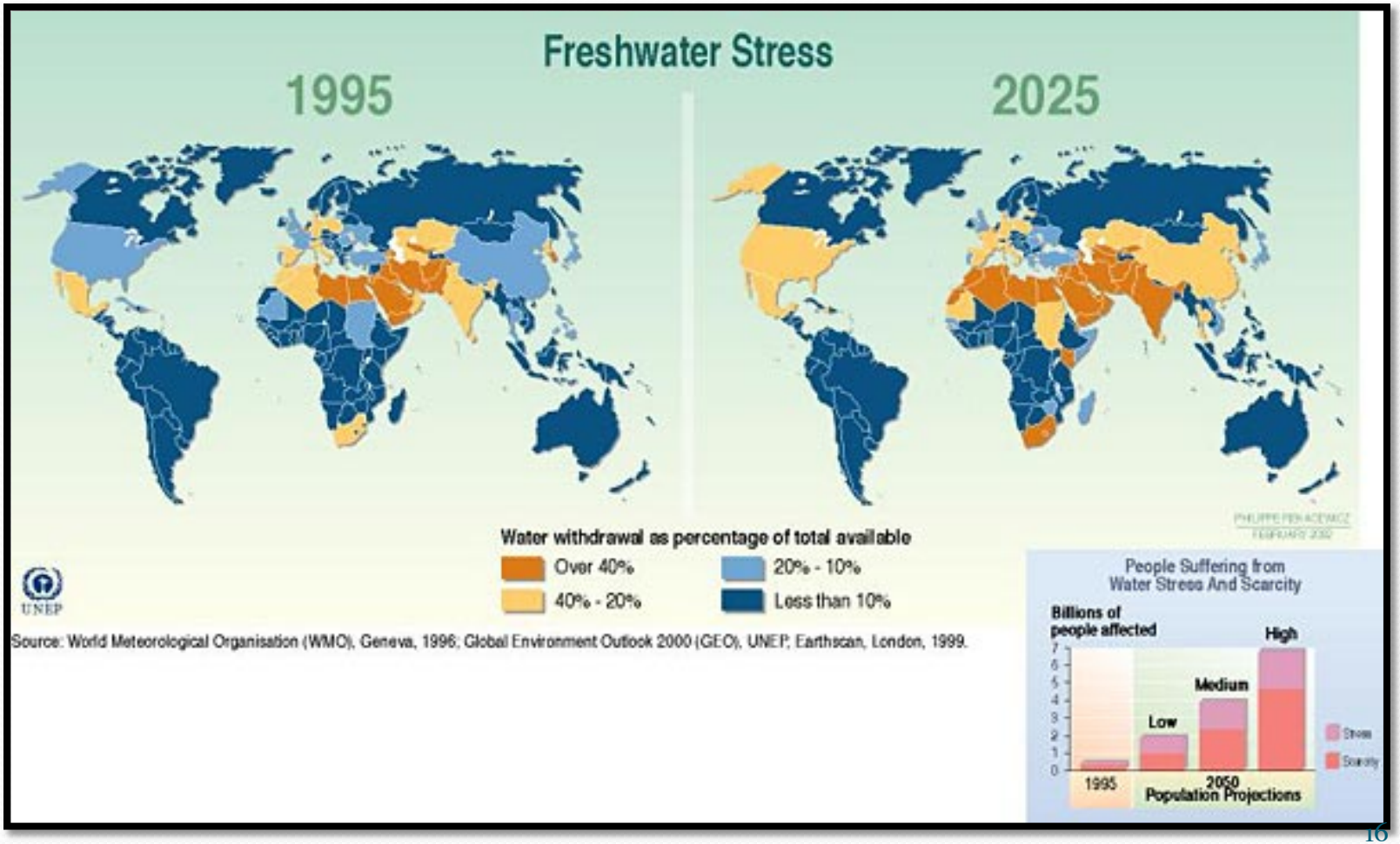


Source: U.S. EPA >Water>How we use water in the United States

Indoor Home Use

Source: U.S. EPA >Water>How we use water in the United States

If all the world's water were fit into a gallon jug, the fresh water available for us to use would equal only about one tablespoon. http://www.lenntech.com/water-trivia-facts



Using Harvested Rainwater

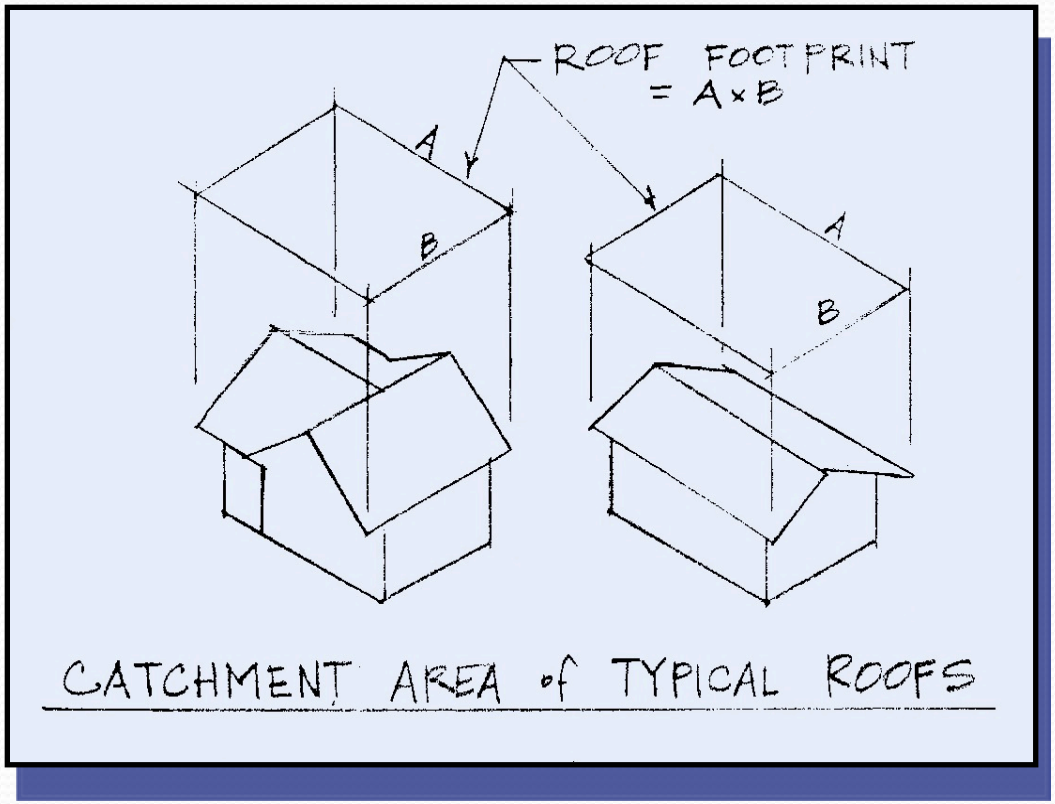
- Landscape
- Livestock and Pets
- Wildlife
- Home
- Commercial and Industrial
- Groundwater recharge

How much water can be collected?

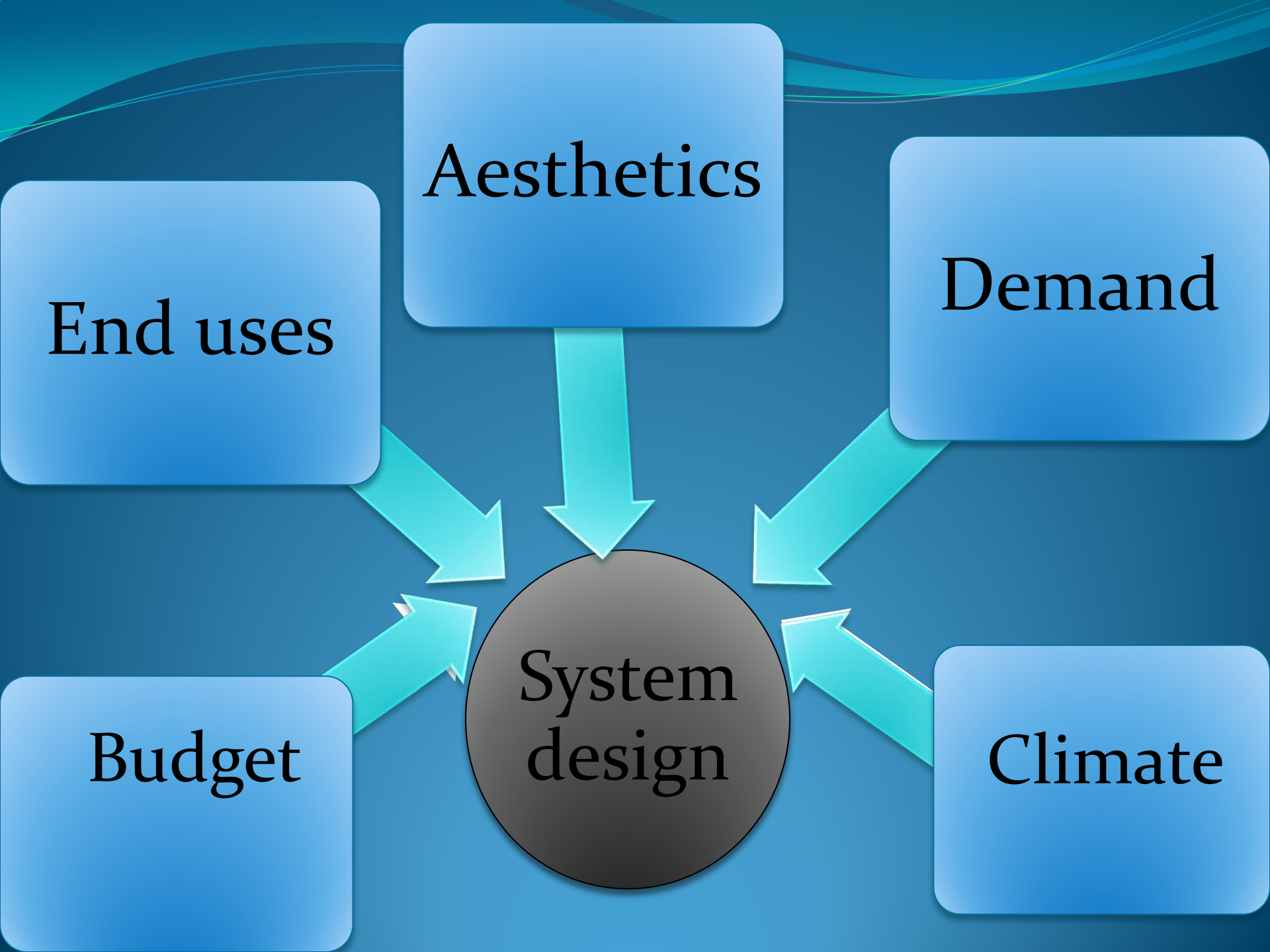
Harvested Water (gal) =
catchment area (sq.ft.) X depth (in.) X 0.623 (conversion factor)

2,000 sq.ft. roof receiving 1 inch of rain equals 1,246 gallons of collected rainwater.

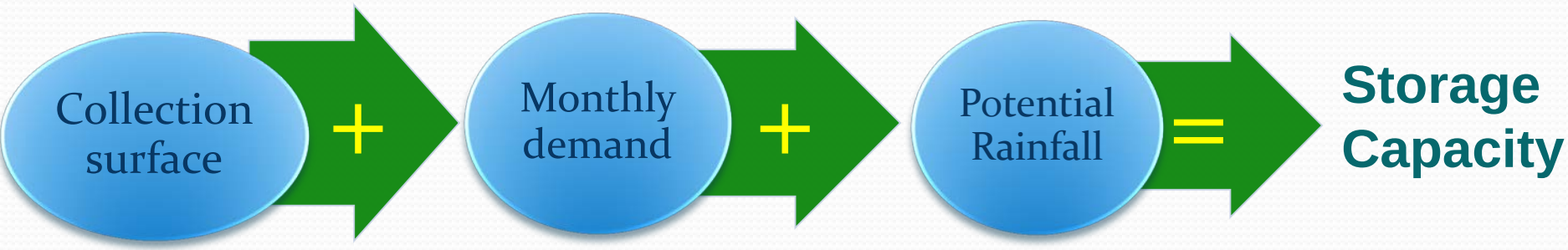
Catchment area



Regardless of the pitch, the shape, or the complexity of the roof surface, the overall footprint of the building determines the collection area.


Aesthetics
End uses
Demand
System design
Budget
Climate

System Sizing Water Balancing



Economic return Current Paradigm

Cost of RWH system

VS

Cost of Municipal Water Over Time

=

ROI

Where is the ROI on Stormwater Infrastructure?

- Stormwater infrastuture is compulsory.
- Designed to prevent loss of life and property resulting from impervious surfaces.

We do not require stormwater infrastructure to provide a return on the investment.

Why should you be concerned about runoff?

- Increased surface runoff
  - Stream bank erosion
- Increased soil erosion
  - Disturbed soil/lack of vegetation
- Impaired water quality
  - Nutrients
  - sediment

Consider this paradox.

A family of four in the following cities, using 100 gallons of water, per person, per day will pay per month:

Phoenix AR	Boston MS	Las Vegas NV	Atlanta GA
$34.29	$65.47	$32.93	$72.95

Source: **The Price of Water: A Comparison of Water Rates, Usage in 30 U.S. Cities**
MONDAY, 26 APRIL 2010

RWH has a dual purpose :

- Provides additional water supply.

- Manage stormwater runoff.

A better ROI formula on RWH would be:

Cost of RWH system

VS

Cost of Municipal water

+

Environmental Costs

+

Stormwater fees/infrastructure

+

Pollution to rivers

+

Infrastructure Impacts

=

ROI

RWH provides many benefits:

- Reduce velocity and volume of pollutant laden stormwater
- Offset of peak demands
- Increase resiliency against droughts
- Mitigates impacts of impervious surfaces (ground water recharge)
- Extends the life of existing water supply lines and delayed upgrades

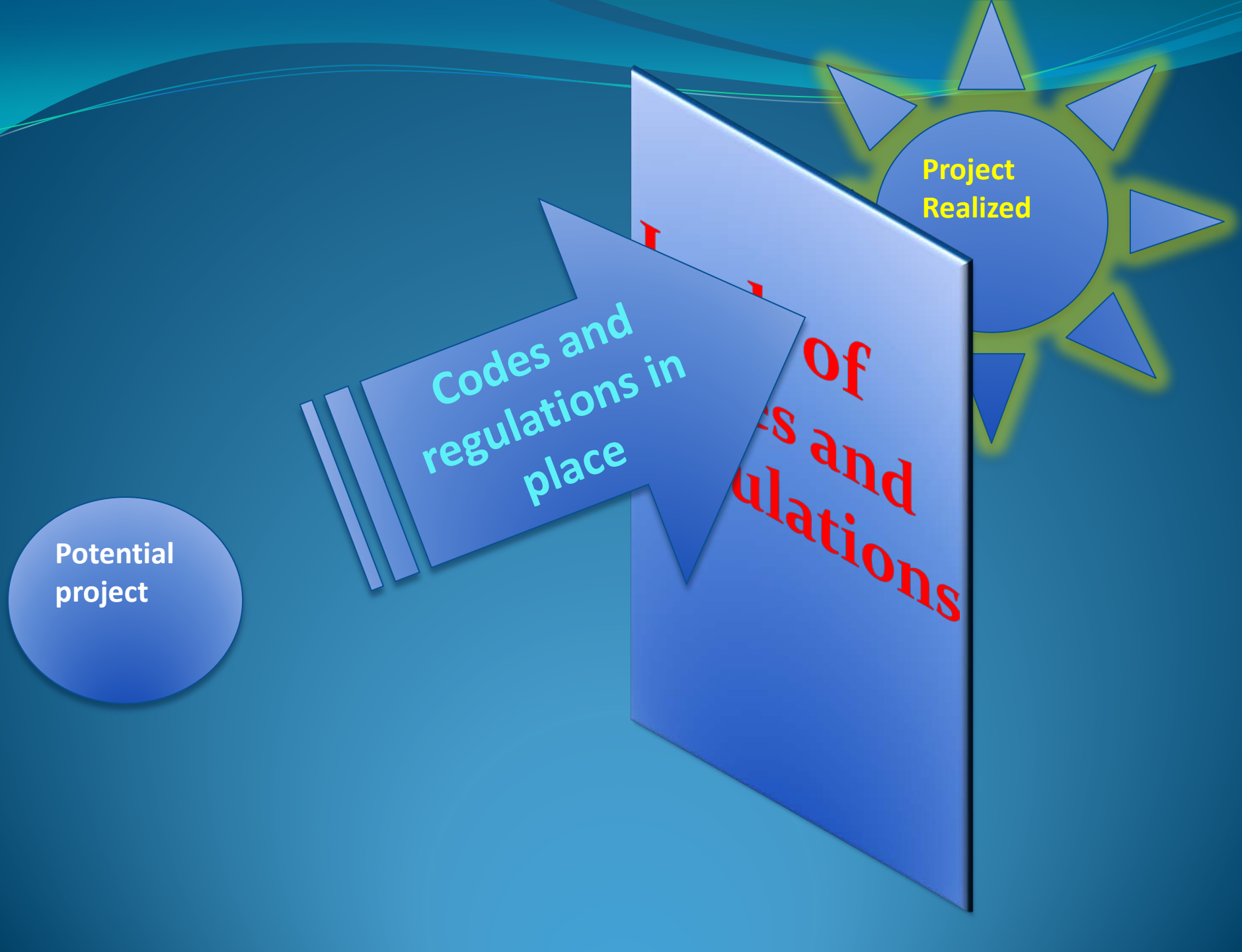
Strengths and weaknesses of a Federalized regulatory community as it relates to Building and Plumbing codes

- Allows individual states to have codes that are particular to their climate, culture and geography.

- Inherently has redundancies in personal and review policies.

Potential project

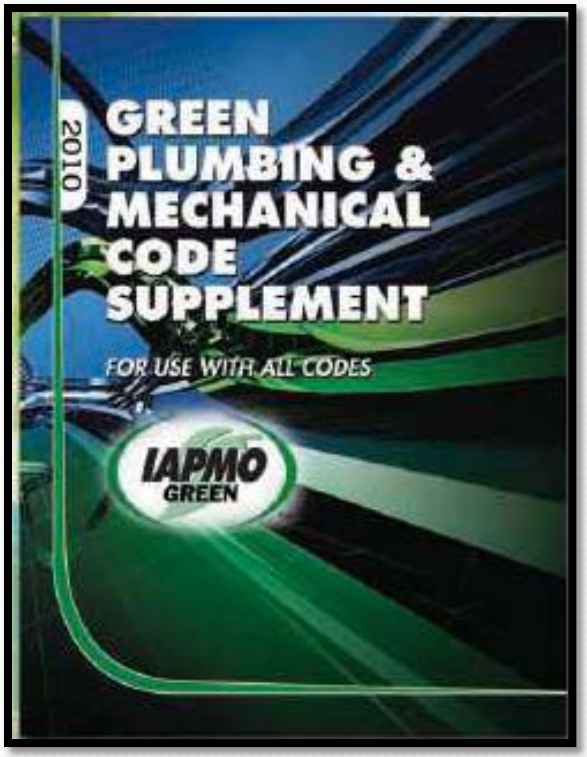
Lack of codes and regulations

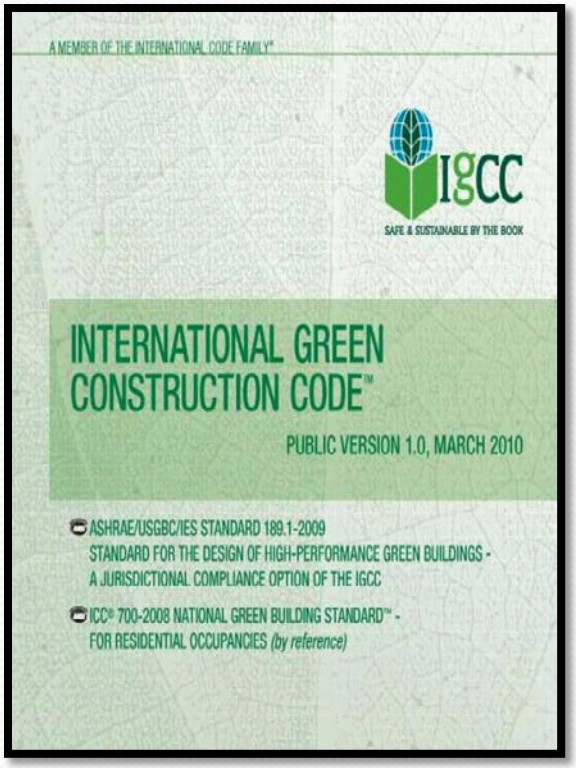

Project Realized
Codes and regulations in place
of
s and
ulations
Potential project

How do we remove these obstacles?

Changing codes is a meticulous process.

You need to understand the codes in order to promote the idea





Step one: Identify stake holders

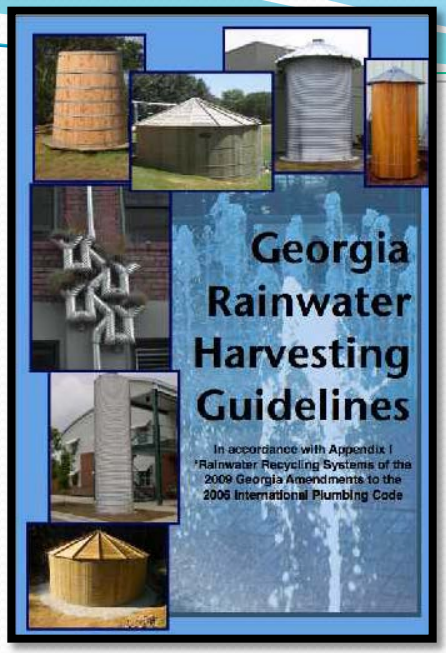
Step two: Form work group

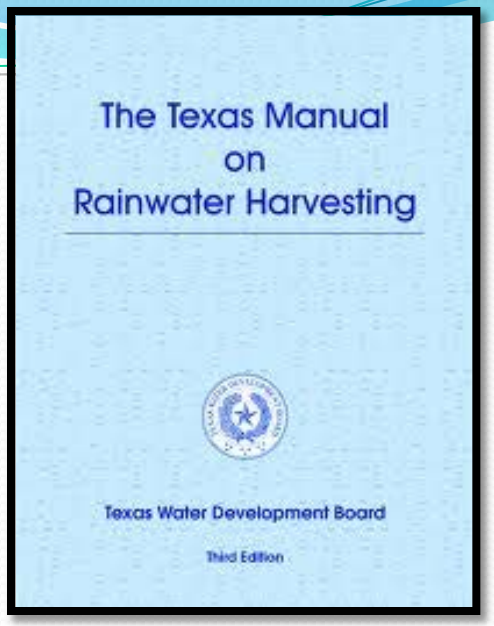
Step Three: Inform work groups with:

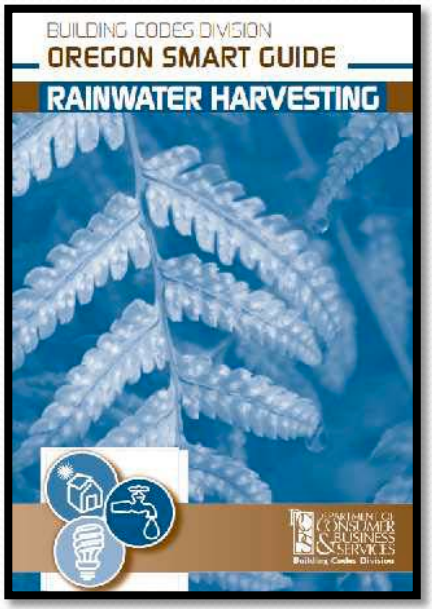
- Case Studies
- Test Results
- Data from Usage, while continuing to outline benefits

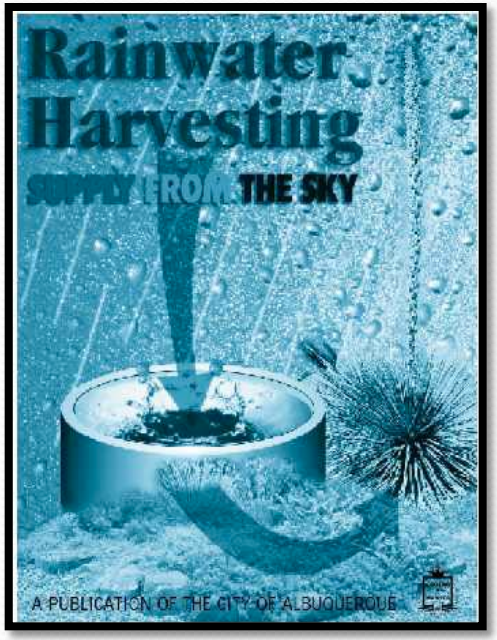
Final Step: Push to develop guidelines for best practices. Why?

- To incorporate cultural influences.
- To incorporate climatological differences.









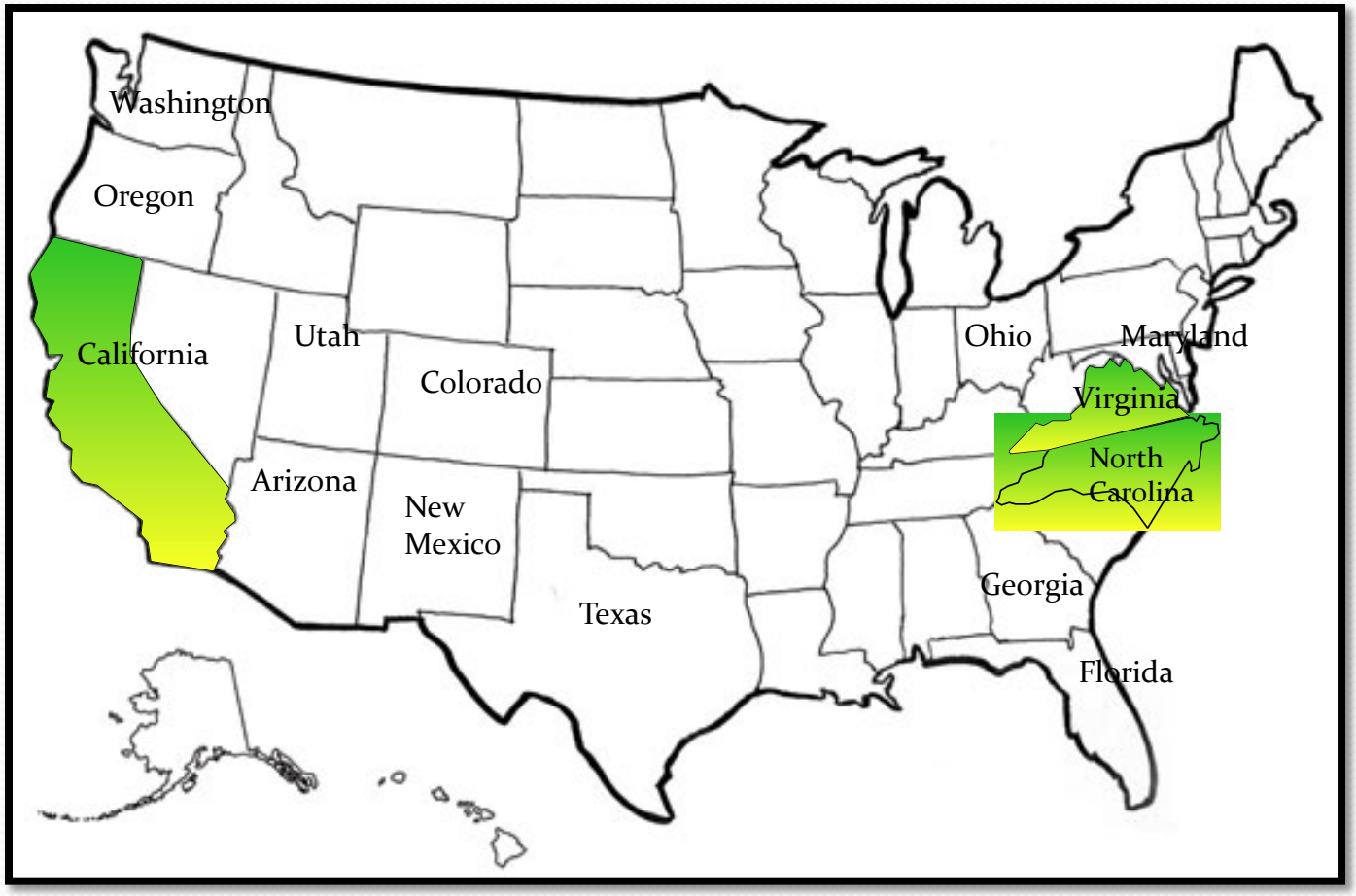
All of this is done to address health and safety concerns that affect the general public

The Future?

Potential widespread uses of rainwater, graywater and stormwater in the future:

Type of water	Garden sub surface irrigation	Garden Surface Irrigation	Toilet	Laundry	Hot Water	Cold water to Shower	Kitchen drinking & cooking
Rainwater	✓	✓	✓	✓	✓	✓	✓
Treated Greywater	✓	✓	✓	✓			
Untreated Greywater	✓						
Treated Stormwater	✓	✓	✓				

States active in RWH and/or with policies or codes at state or municipal level



State RWH Policies and Programs

State								
	x							
exas								
Utah								

Athens Clarke Co Solid Waste

- 5,100 gallon capacity.
- Toilet flushing and outdoor irrigation

Athens Clarke Co Solid Waste Facility

Grand Bay Coastal Reserve

Pascagoula MS

Grand Bay Coastal Reserve

- 12,000 gallon capacity
- Toilet flushing and hose bibs

Grand Bay Coastal Reserve

Thank you.

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