

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com



Development of a Standard Cistern Program for Use through Public-Private Partnerships



David Bracciano

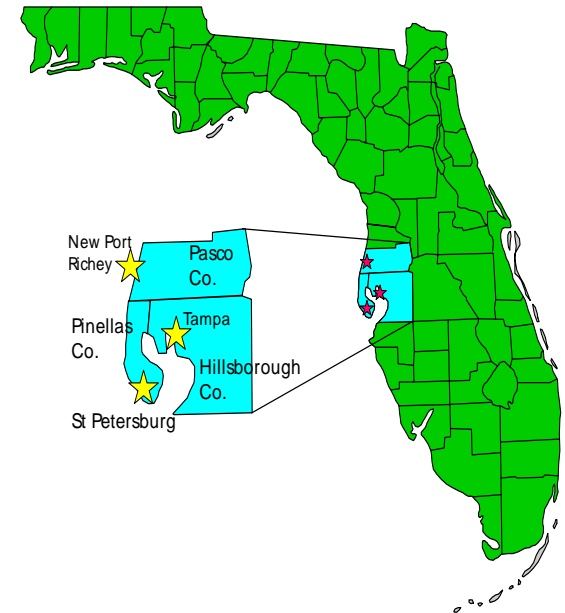
October 7, 2009

Water Smart Innovations Conference

- **Dave Bracciano, Tampa Bay Water**
- **Pacia Hernandez, University of South Florida**
- **Dr. Thomas Ruppert, University of Florida**
- **Skip Wright, Florida Irrigation Society**
- **Dr. Daniel Yeh, University of South Florida**

- **Identify water supply issues**
- **Define the problem**
- **Linking existing programs to presentation materials**
- **Recognize and use of expertise**
- **Creating a mechanism to link public-public agencies-private industry**

- **Regional water wholesaler serving 6 Member Governments in the Tampa Bay region**
- **Population**
 - 2.5 million people served
- **Regional demand**
 - 240 mgd
- **Peak demand >300 mgd**



U.S. Drought Monitor Southeast

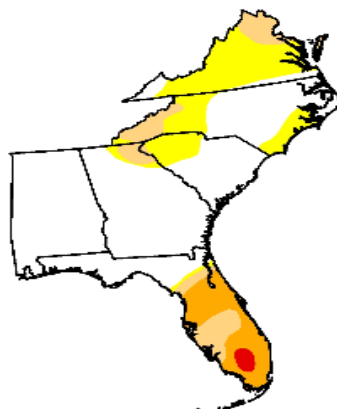
April 14, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.6	36.4	17.9	8.8	0.7	0.0
Last Week (04/07/2009 map)	58.8	41.2	21.4	8.5	0.0	0.0
3 Months Ago (01/20/2009 map)	66.4	33.6	12.4	4.2	1.7	0.0
Start of Calendar Year (01/06/2009 map)	65.3	34.7	15.7	5.3	2.8	0.0
Start of Water Year (10/07/2008 map)	35.2	64.8	41.8	20.8	9.4	1.9
One Year Ago (04/15/2008 map)	29.0	71.0	50.3	29.3	8.9	0.0

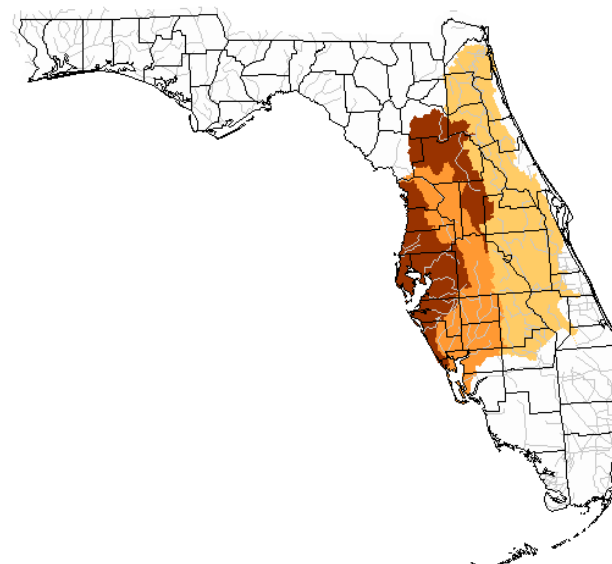
Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



USGS Drought Watch - streamflows

Thursday, April 16, 2009



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>

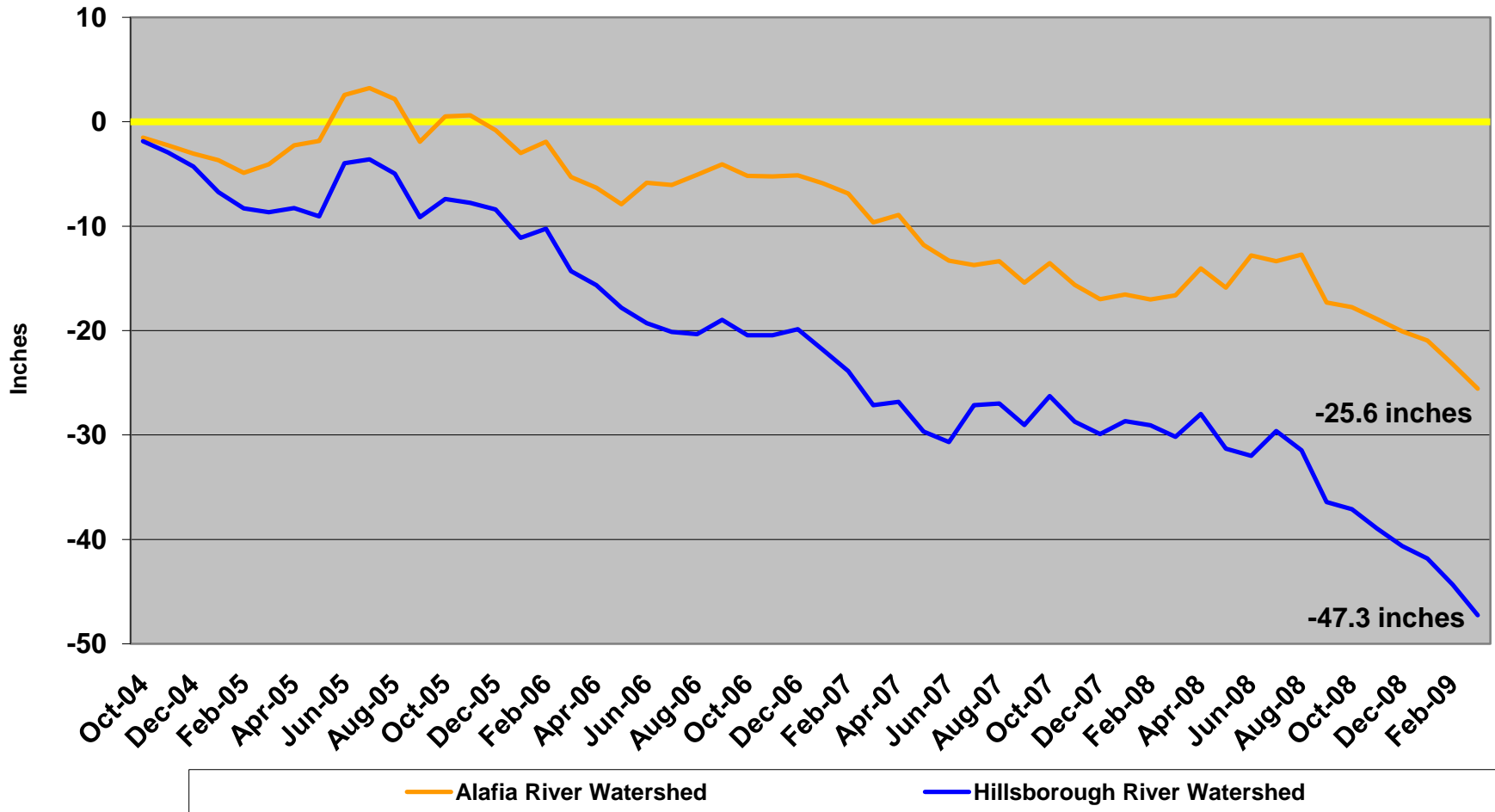


Released Thursday, April 16, 2009
Author: Richard Heim, NOAA/NESDIS/NCDC



Explanation - Percentile classes				
Low	<=5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

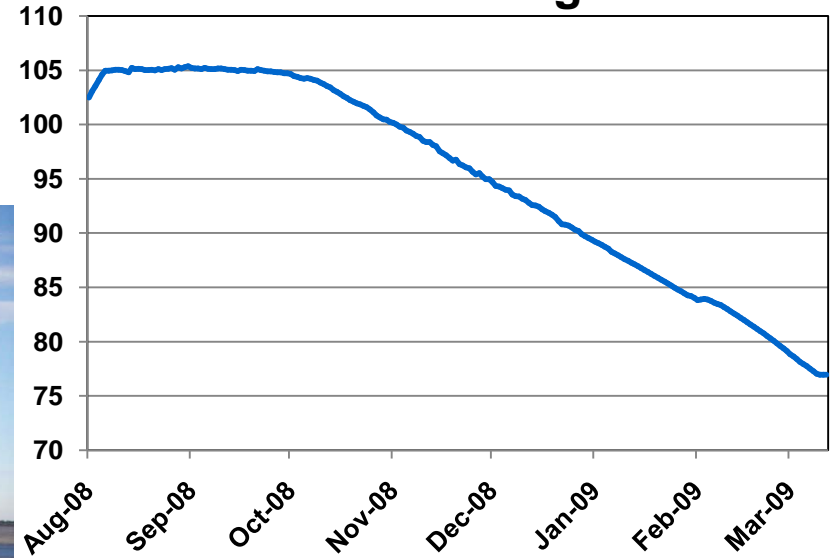
Rainfall Deficits Worsen



Regional Reservoir storage exhausted



Reservoir Stage



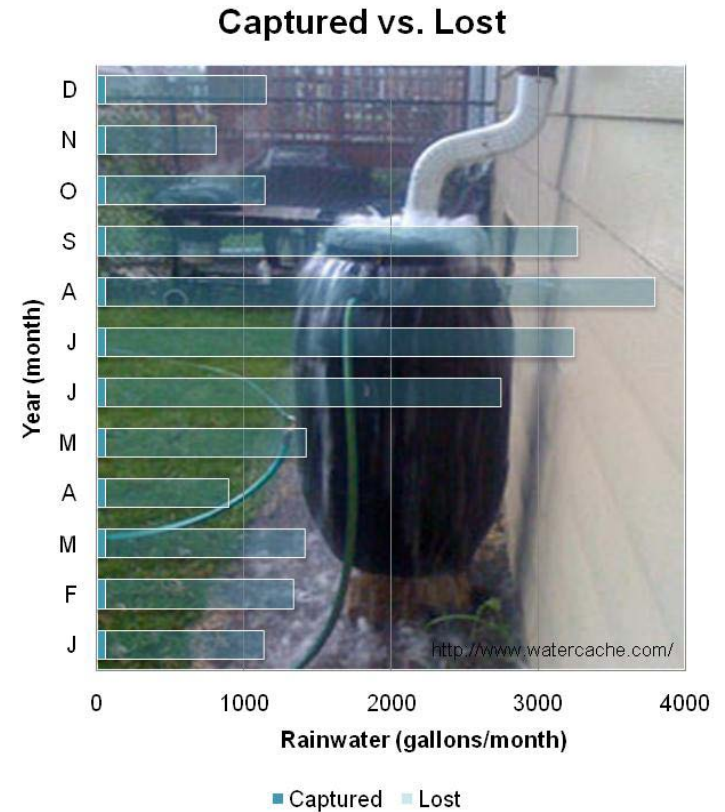
- **Identify technical and legal constraints to implementation**
- **Promote installation and use of cisterns to offset irrigation**
- **Link public with contractors &/or businesses to increase use**
- **Create a standard presentation to offset or augment rain barrel use**

Through What Mechanism? Florida Yards and Neighborhoods

Florida County Map with Administrative Seats



- **Capacity is limited to about 55 gallons**
- **Mostly residential use**
- **Storage is limited**
- **Workshops popular**



- **FYN/local gov't. liability promoting cistern use**
- **Local health department reaction to cisterns-outdoor irrigation**
- **Review state/local ordinances dealing with cisterns**
- **How should gov't. proceed in allowing private sponsorship of workshops**

- **Background efforts**
 - **Water Quality**
 - **Engineering Design**
 - **Operation and Maintenance**
 - **Economic considerations**
 - **Barriers and incentives**
- **Develop workshop training materials**

- **Assist in determining water use need**
- **Pump sizing**
- **Interaction with irrigation system use**



- **Research=output=draft presentation**
- **Two dry-run workshops**
- **Reviewers**
 - **Local governments**
 - **FYN- local and statewide**
 - **Water Management Districts**
 - **Cistern installers**

Purpose- Receive feedback on type-content of presentation and workshop length.

- **Anatomy of a Rainwater Harvesting System**
 - System components and their function
- **Sizing and Reliability**
 - How cisterns are sized
 - Reliability
 - Potential Issues
 - Resources
- **Break for Vendor Interaction**
- **Q&A for Vendors**

How the Workshops Will Work

- **Workshop materials/background available**
- **FYN will identify tentative schedule/workshop**
- **Contact FIS, ARCOSA, others (FRHI)**
- **Provide recognition of sponsors**
- **Sponsors will likely pay \$50 to \$100**
- **Workshops will have minimum # attendees**

Workshop Objectives

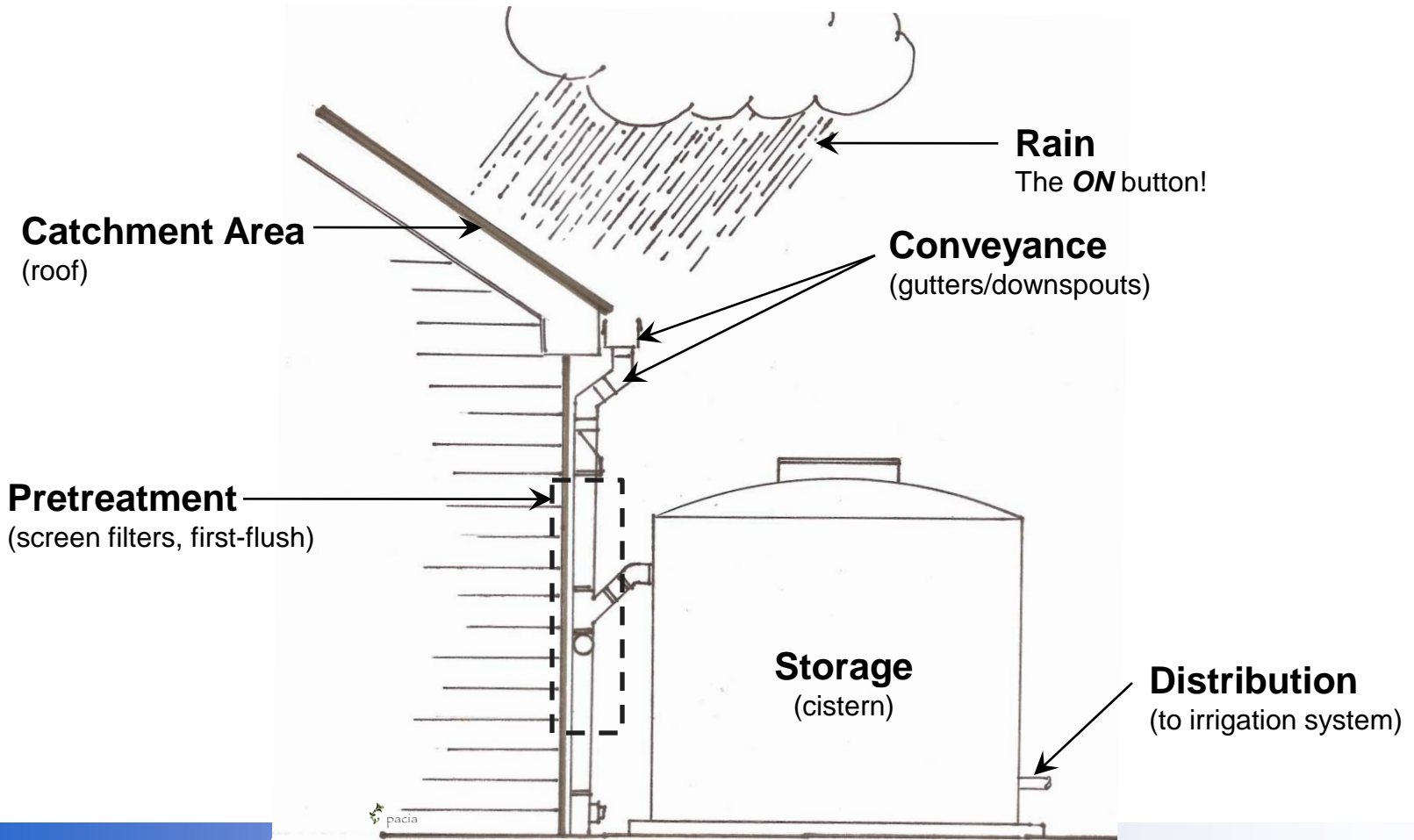
- Promote the installation and use of cisterns throughout Florida in an effort to conserve potable water
- Educate citizens and businesses the **basic principles** of rainwater harvesting
- Explain how to implement these principles
- Motivate attendees to embrace and implement rainwater harvesting principles learned
- Introduce attendees to water harvesting products
- Connect interested parties with rainwater harvesting professionals

What the Attendees Will Learn

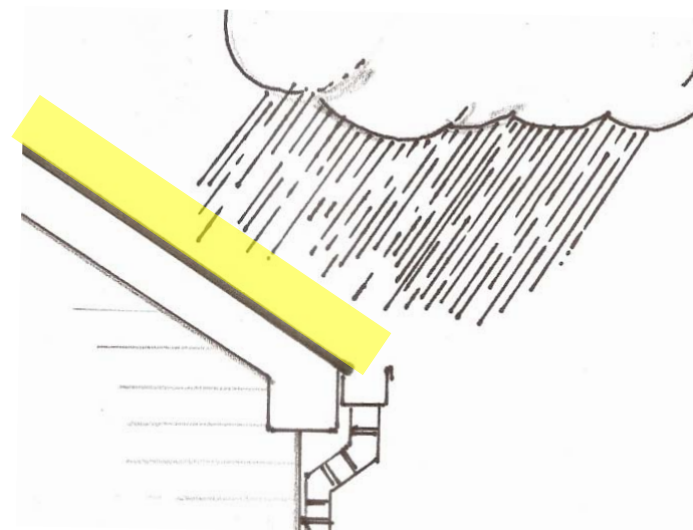
- **Rainwater harvesting: Collecting rain using your roof and a cistern**
- **Learn about system components**
- **How cisterns are sized**
- **Estimate irrigation usage**
- **Passive irrigation: watering your lawn without a hose!**
- **Who and where to go to for answers**

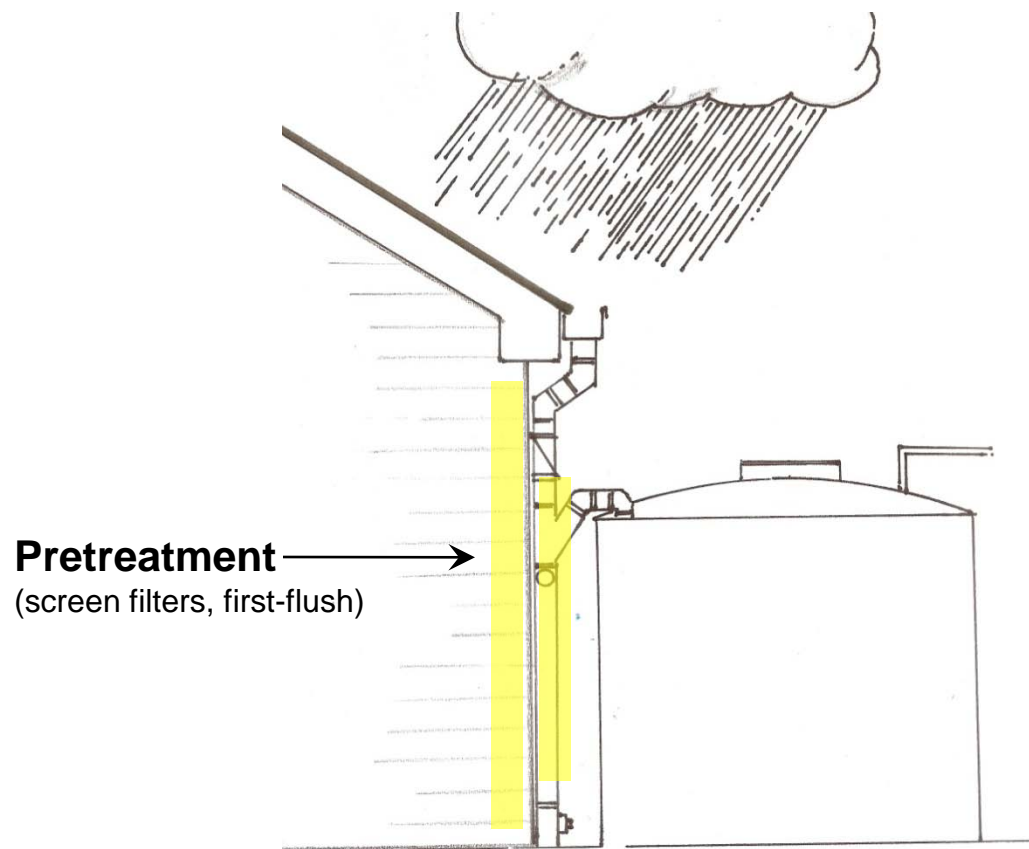
- **Part I: Anatomy of a Rain Water Harvest System**
- **Objectives:**
 - **Identify major parts of a rainwater harvesting system**
 - **Become familiar with the function of each**
 - **Understand what components may be necessary for irrigation purposes**

Parts of the System



- **Roof acts as the catchment area**
- **Size**
 - **Determines harvesting potential**
- **Surface material**
 - **Determines quality**





- **Roof surface debris**
 - Twigs and leaves
 - Dust
 - Bird droppings
 - Particle release (asphalt shingles)



Courtesy: ARCSA

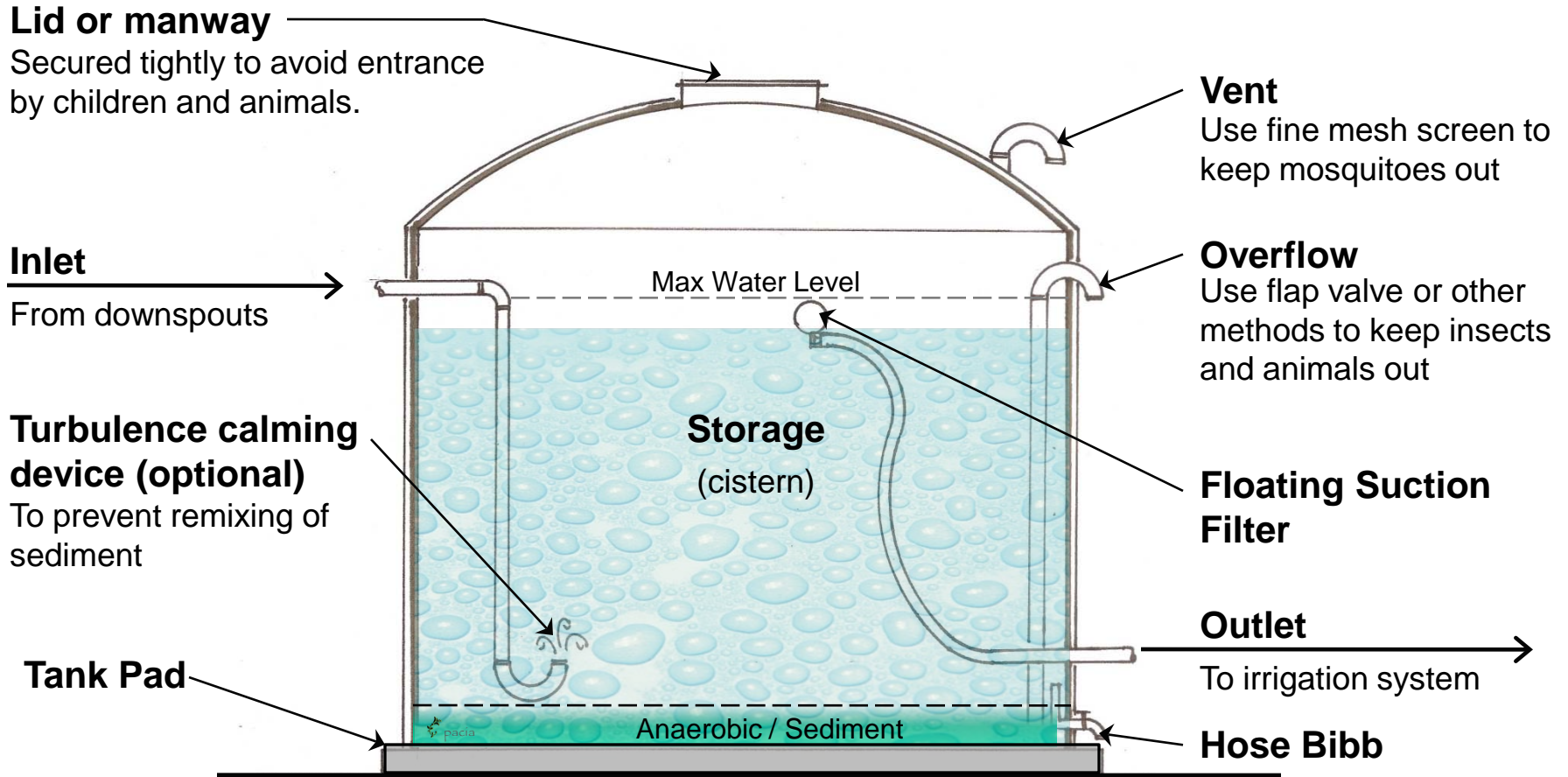


Q: How do we keep debris from entering the cistern?

A: First step: Pretreatment screens.



Cistern Anatomy



Q1:

What are the 5 main components of a rainwater harvesting system?

A1:

Catchment Area (roof), Conveyance (gutters/downspouts), Pretreatment, Storage (cistern), Distribution

Q2:

How are debris and/or contaminants kept from entering the storage tank (cistern)?

A2:

With the use of screens, filters and first flush devices.

Q3:

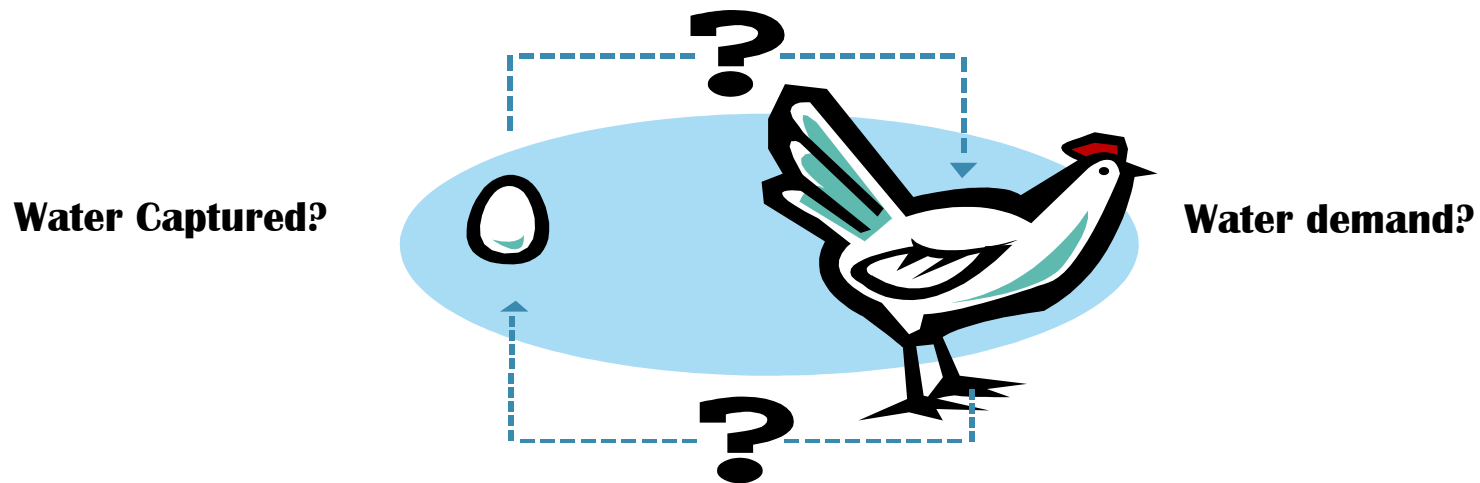
What type of catchment surface is necessary to harvest rain intended for landscape irrigation?

A3:

Any roof surface is acceptable.

- **Part II: Sizing and Reliability**
- **Objectives:**
 - **How to calculate rainfall capture potential**
 - **Determining water use demand (irrigation)**
 - **Passive irrigation**
 - **How to insure the right water quality in your tank**
 - **Determining if the water supply is reliable**
 - **Resources for further investigation**

Q: What dictates size of storage?



A: In this case, demand dictates storage capacity

- **How much can be collected?**
 - **Variables & Formula**

$$A \times R = G$$

A = Catchment **Area** of building (square feet)

R = **Rainfall** (inches)

G = Total amount of Collected Rainwater (**Gallons**)



- **Visit demonstration sites**
- **Visit these websites**
 - www.arcsa.org/resources.html
 - www.harvestingrainwater.com/
 - www.harvesth2o.com
- **Speak to vendors**



florida

Rainwater Harvesting Initiative



AMERICAN RAINWATER CATCHMENT
SYSTEMS ASSOCIATION

- **Does not replace technical CEU based education**
- **Focus on irrigation water use only**
- **Control of presentation materials**
- **Control/accept changes and suggestions**

- **Government must provide solutions**
- **Link with the private sector**
- **Know the limitations of presenters**
- **Optimize partnerships**
- **Eliminate duplication**
- **Focus on standards**

Questions?

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www.tampabaywater.org