



# Stormwater Utilities Sustainable Funding



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By Mark Hoskins, P.E.,CFM

# Stormwater Claims - Big costs, localized areas

One of every \$10 spent on goods and services in the U.S. is spent on construction.

19 % of all flood claims  
(since 1979) come from one city  
(New Orleans).

40 % of all flood claims  
come from one state (Louisiana)



Prior to this year, Tennessee flood claims= \$72M

May 2010 Nashville suffered \$2B in damages



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# Stormwater Claims — Perception of needs

The “**Bad Penny**” spent is on stormwater infrastructure

“Every stormwater system functions perfectly,  
as long as it is not raining.” Andy Reese



**Suggestion of a Stormwater Fee:**

**PRE-Flood:** Taken like a proposal to kill the first  
born of every family.

**POST-Flood:** “You knew about the problem and  
did nothing?”



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# Stormwater Funding- Sustained Approach

People are **naïve/foolish** about stormwater management



Everyone's actions, **changes** the watershed

- 1) People need to be educated/informed
- 2) Prevent flood damages
- 3) Protect our water wildlife



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# Stormwater Utility Fee- three aspects

**Stormwater** man reacts to rainfall

a) Three Rainfall Rules

**Utility** is a service provided to a customer, based on use.

a) water, sewer, garbage, natural gas, etc.

**Fee** is a charge.

a) Equitable, regulatory and voluntary



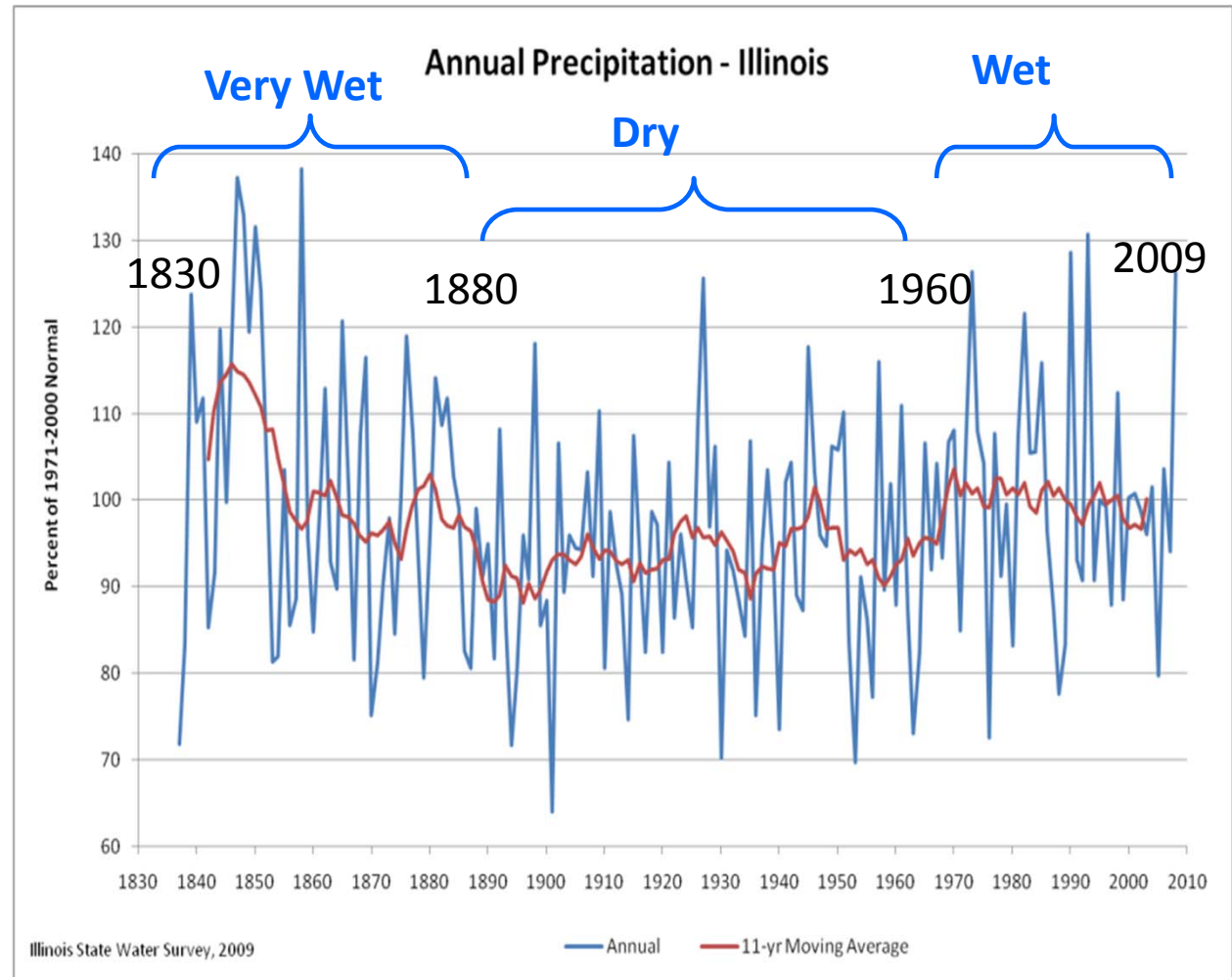
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# Stormwater- Random Climatic Cycles

Jim Angel is the  
Illinois state  
Climatologist for  
Illinois.

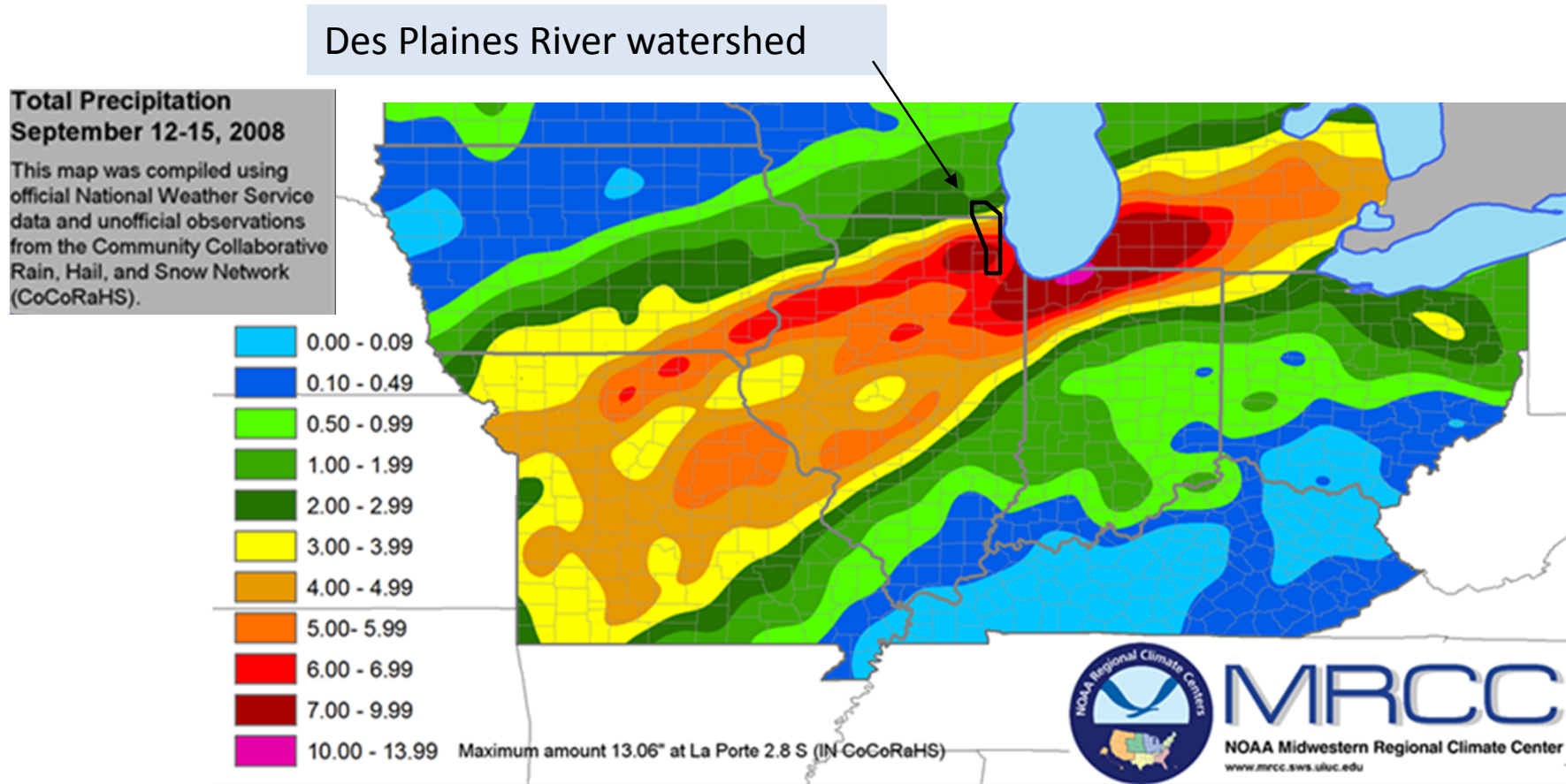
Illinois appears to be  
in a 40 year wet  
cycle as  
compared to  
collected  
observations  
dating back to  
the year 1830.



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# Stormwater - Spatially Variable rainfall

September 12-14, 2008 Storm Event in the Des Plaines Watershed



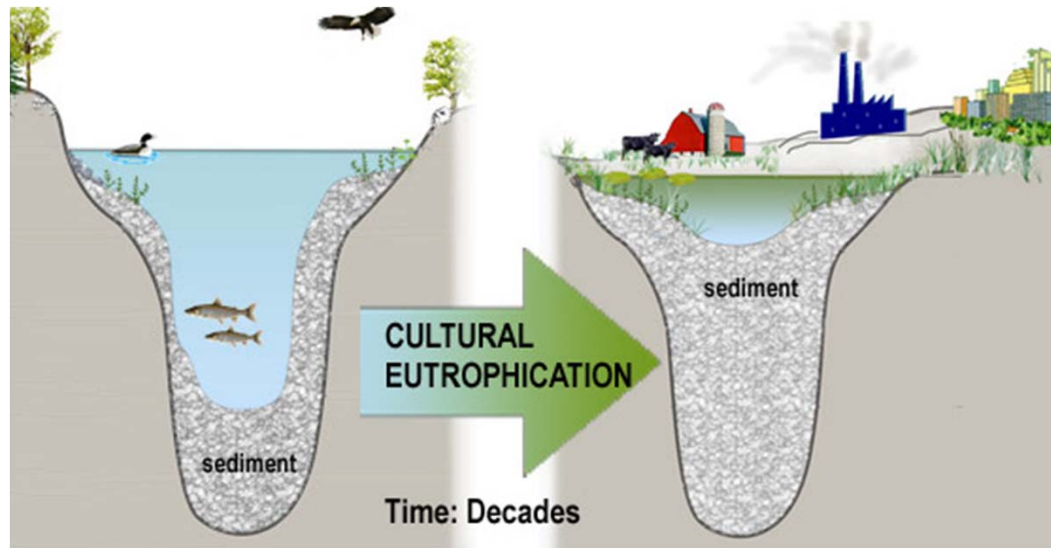
<http://mrcc.isws.illinois.edu/cliwatch/watch.htm#>



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# Stormwater- man accelerates flooding

Natural changes, GRADUAL...



Manmade changes, FAST...

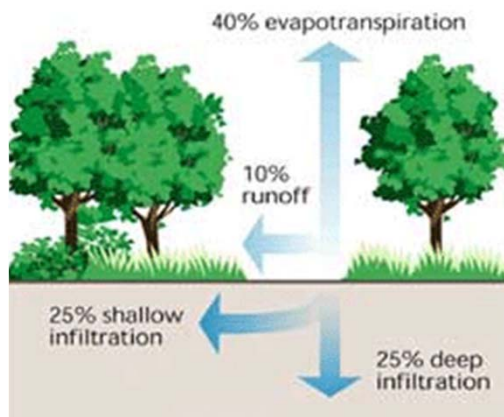


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# Three Rainfall Rules

- 1) Impervious Area increases Runoff: Volume & Velocity
- 2) Debris and Bad-Pipes Backs-up Runoff
- 3) We have to Pay... to Prevent... or Repair... flood damages



**RURAL**  
**10% Runoff**



**URBAN**  
**55% Runoff**

More urbanization slows infiltration, increases runoff, then flooding



Increased runoff speeds erosion, making for dirty stream water.



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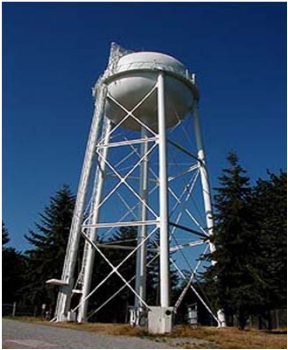
Infrastructure Maintenance Cheaper than Replacement  
Ecosystem repair may not be possible



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# Utility — a fee based on Use

**Many utilities are paid by their use...a Fair Approach**



Water



Gas



Cable



Garbage



Sewer



Electric



# Utility — Funded activities



Infrastructure



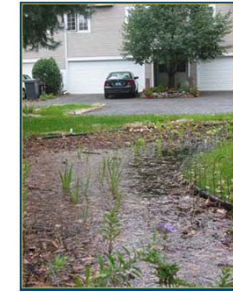
Erosion Control Issues



Capital Improvements



Street Sweeping



Rain Gardens



Inlet Labeling

## SWU Funding



Retain First Flush



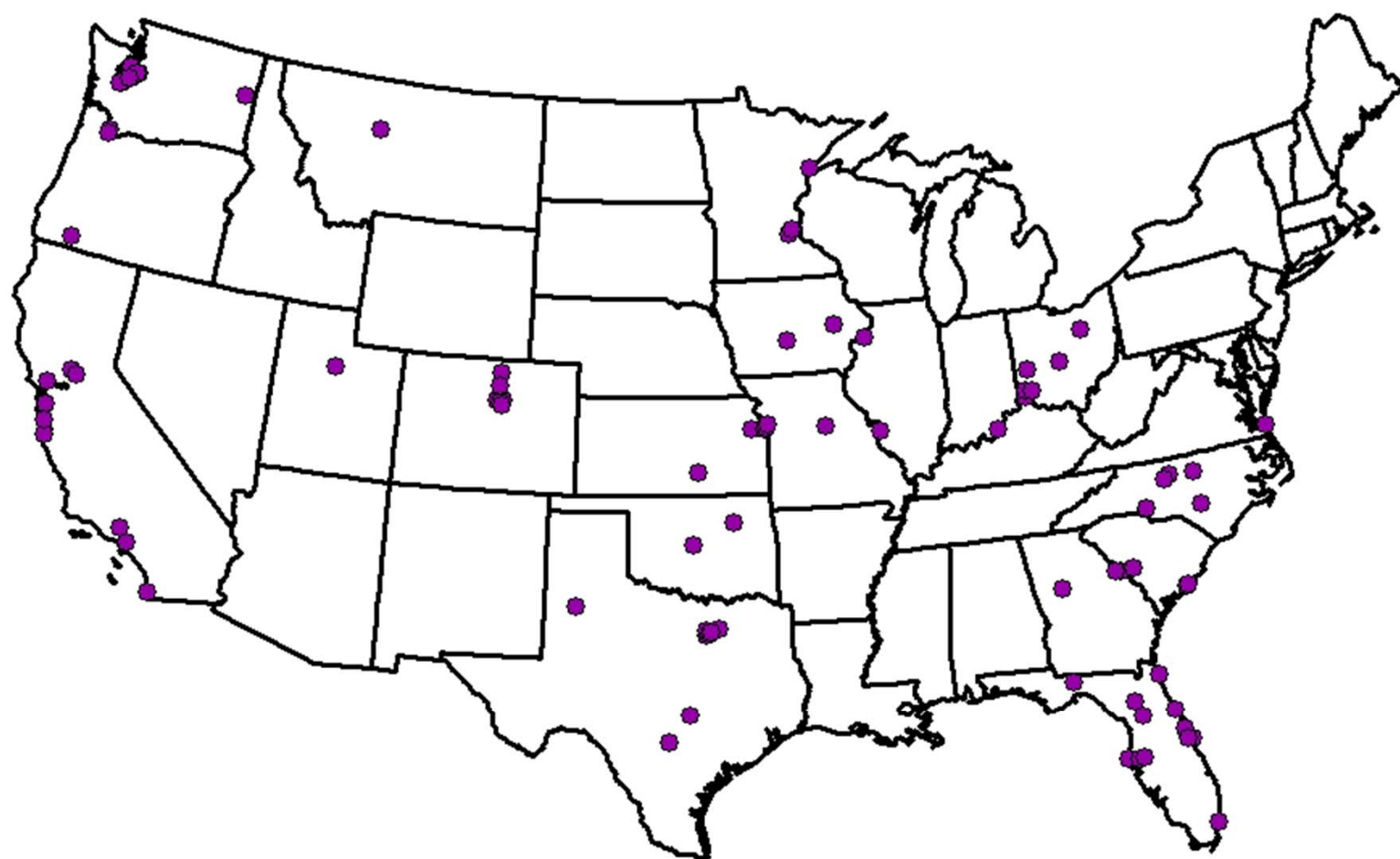
Education Outreach

NPDES Permitting  
Operations and Maintenance  
Engineering Services  
BMPs



Master planning

# Black and Veatch 2005 Stormwater Utility Survey Respondents



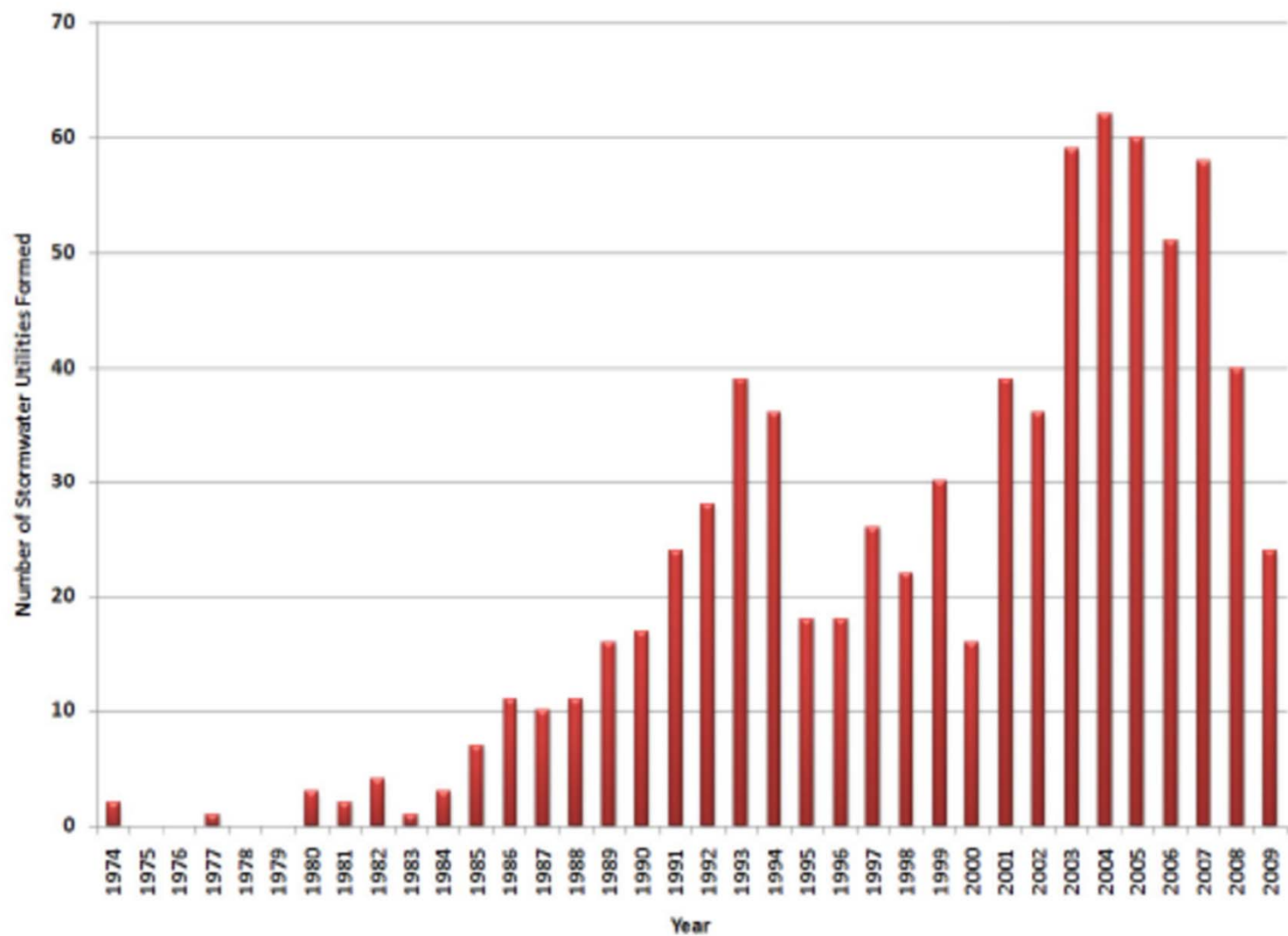
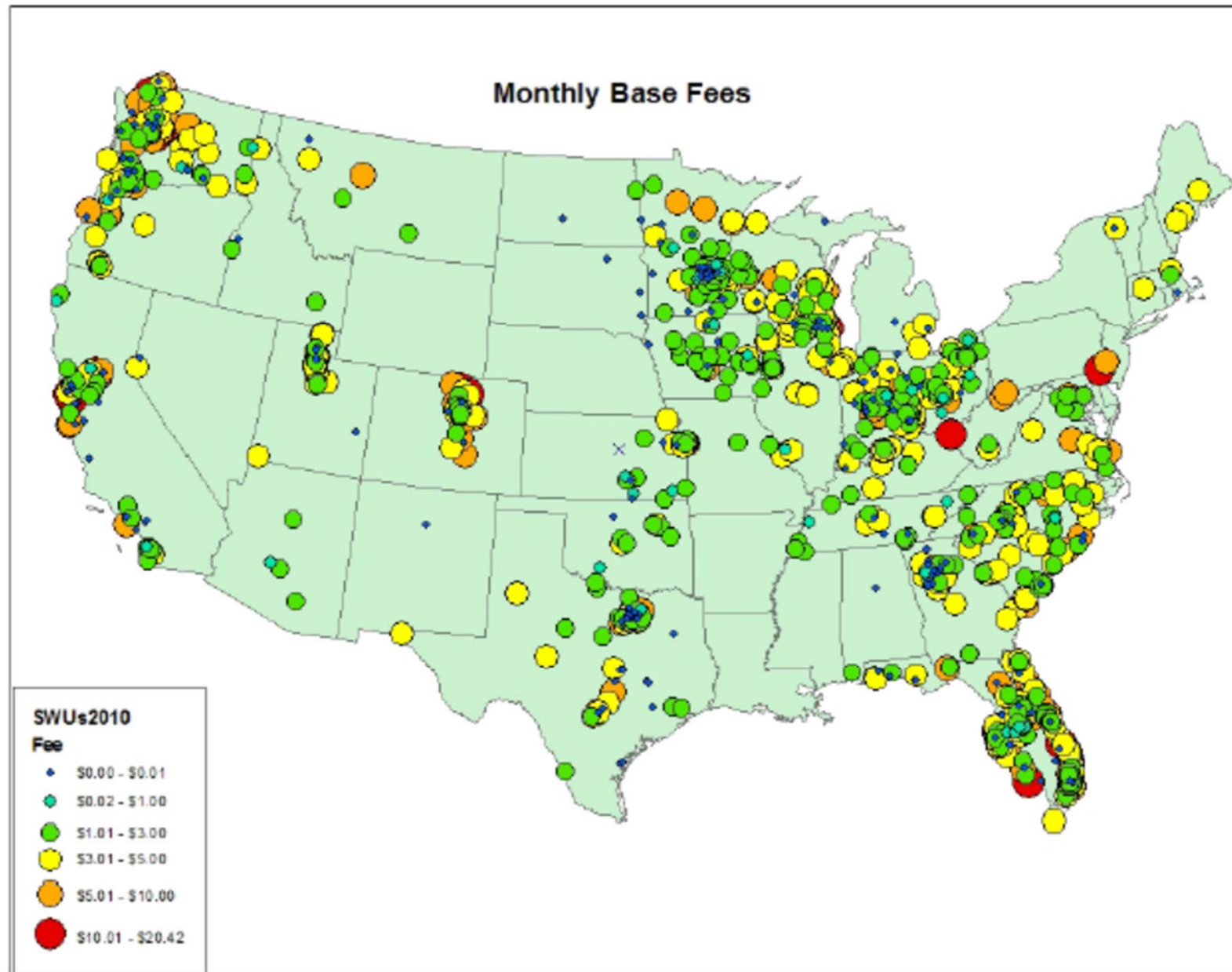


Figure 7. Stormwater utilities by year



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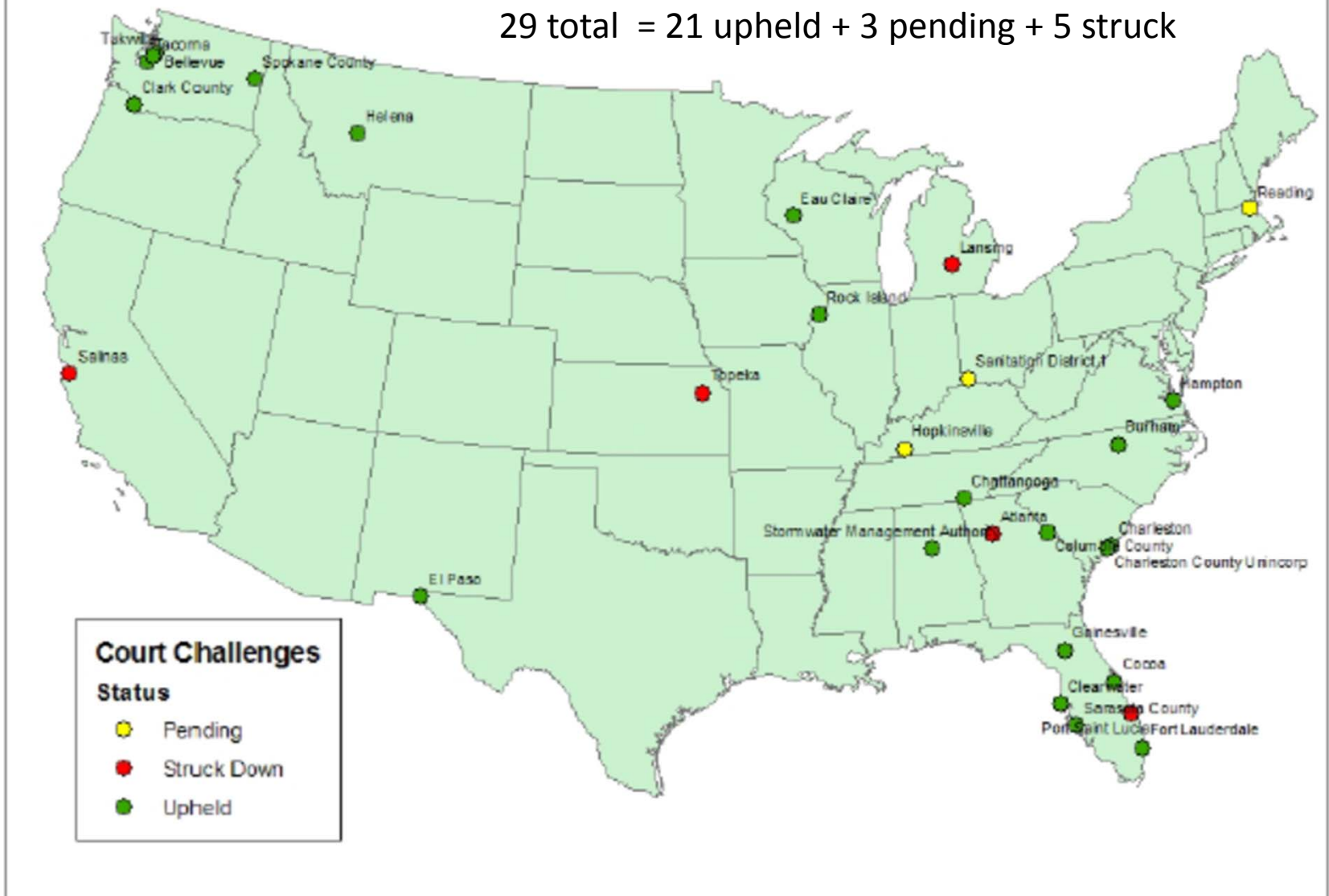


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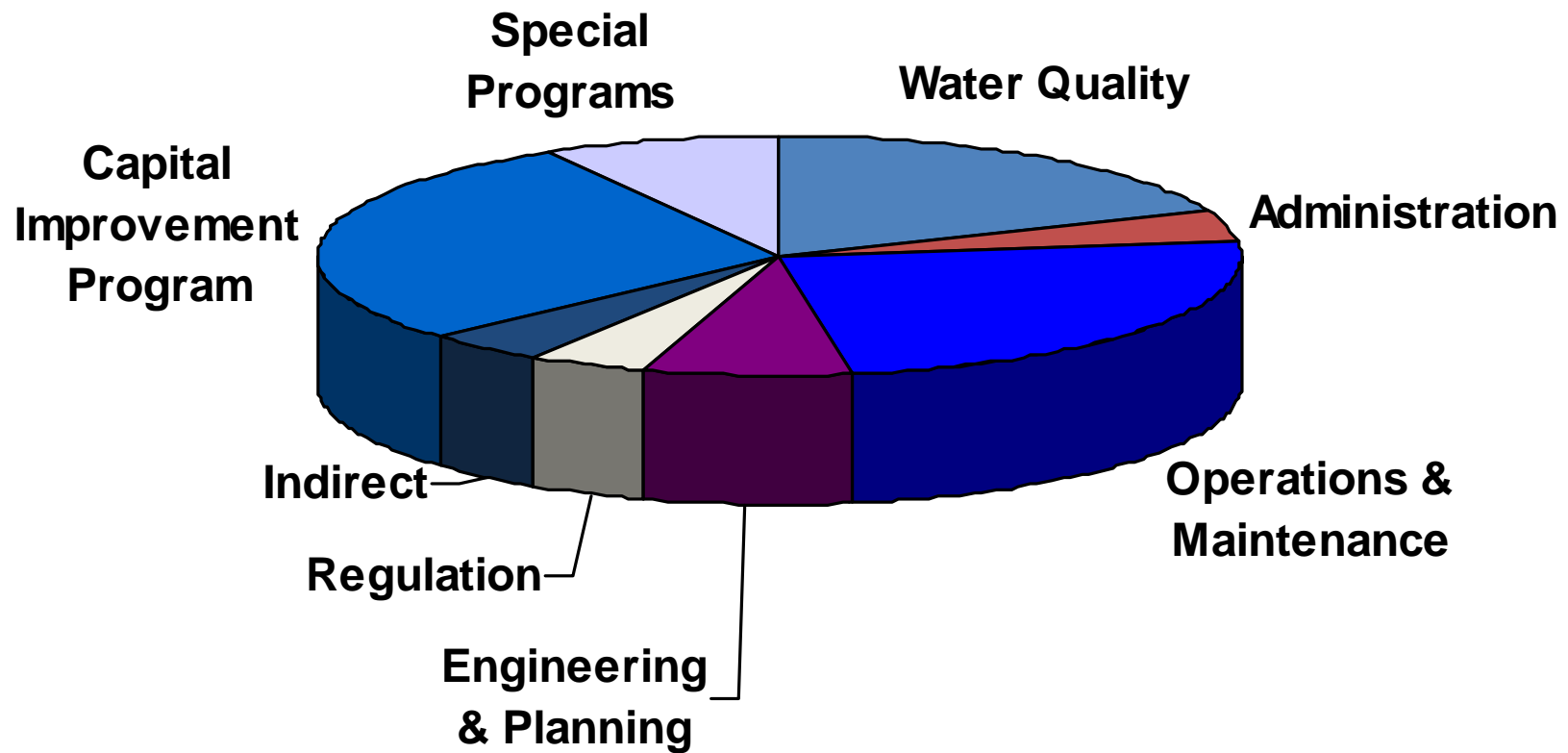
## Court Challenges

29 total = 21 upheld + 3 pending + 5 struck



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# Fee — Typical Programs Funded



# Fee- Typical Expenses

	Existing Expenditures	Proposed (Not including your input!)
Detention/Retention Ponds	\$12,750	\$18,350
Creek System	\$722,500	\$756,800
Inlets/ Catch Basins/ Manholes	\$345,000	\$385,000
Pipelines/ Ditches	\$476,000	\$559,750
Debt Service	\$1,010,000	\$1,010,000

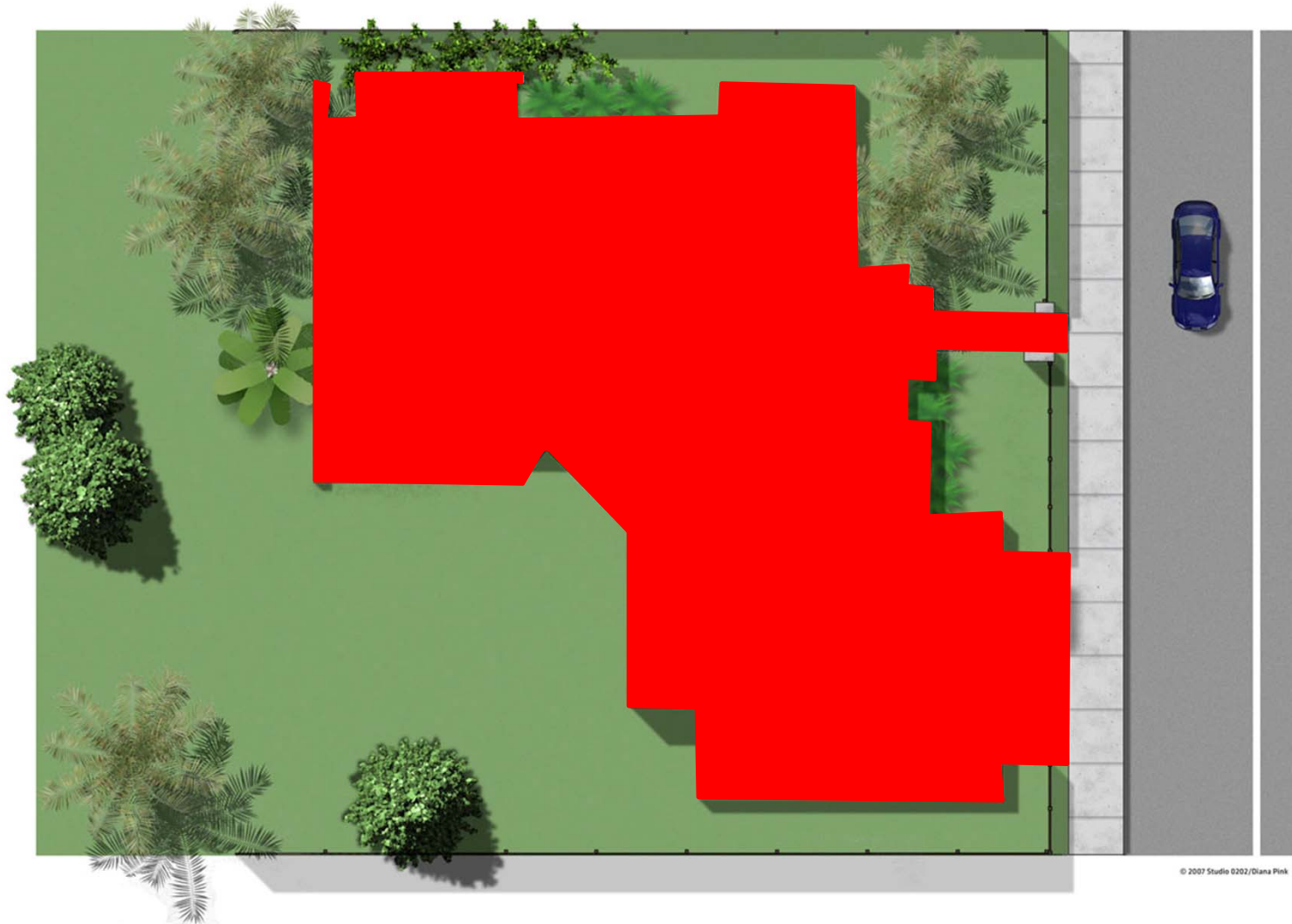


Over the next 5 years the Preliminary  
Total Expenditures average \$2.6 Million



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# Fee — What is an ERU?





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Equivalent Residential Unit (ERU) – community's **average impervious area** on a single family residential lot (sq. ft.)

All developed single family residential parcels usually **pay a single fee**

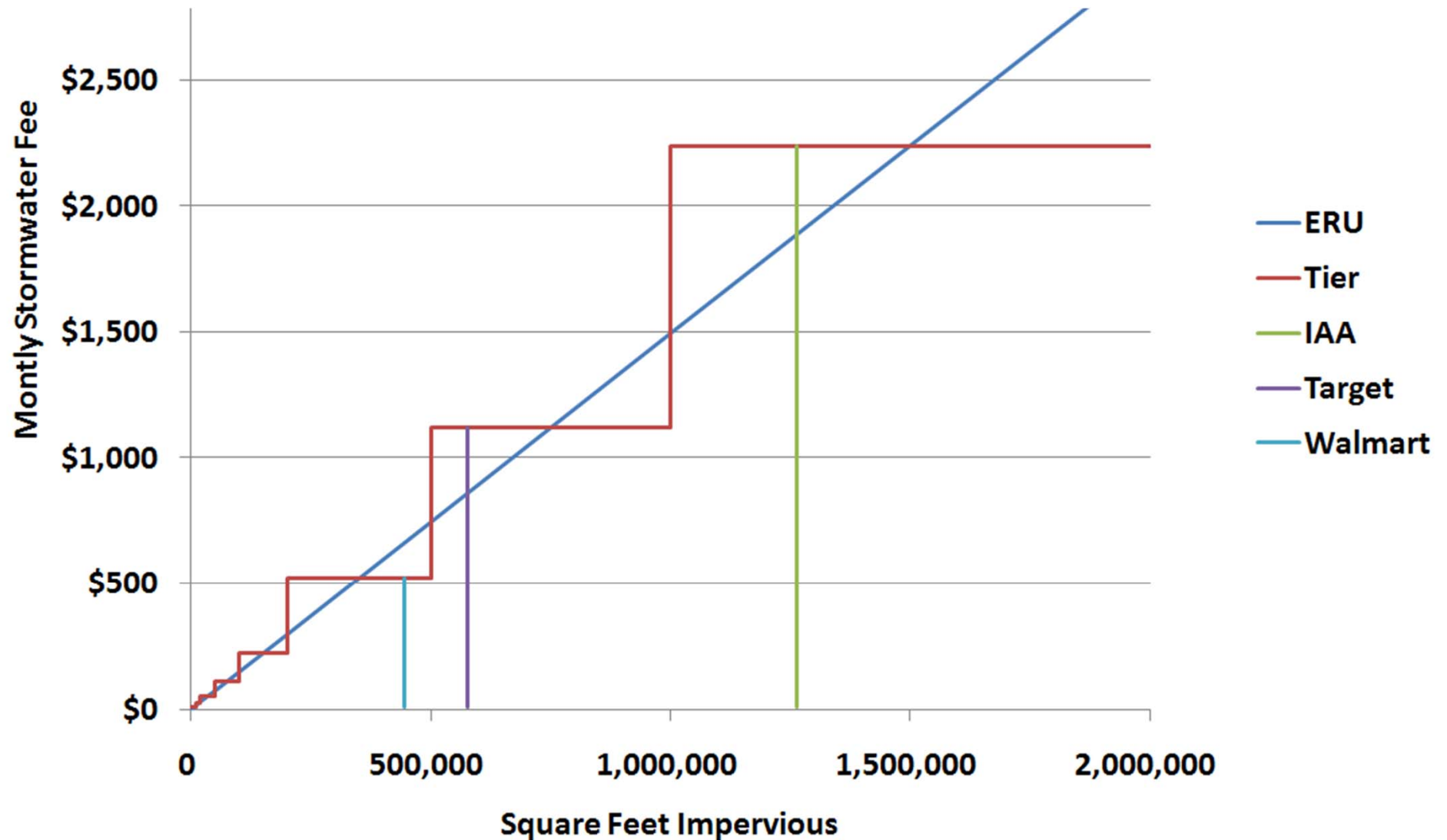
Average U.S. ERU = 3,000 sq. ft. impervious

ERU usually **determined using GIS** and is estimated from a random sample of single family residential properties

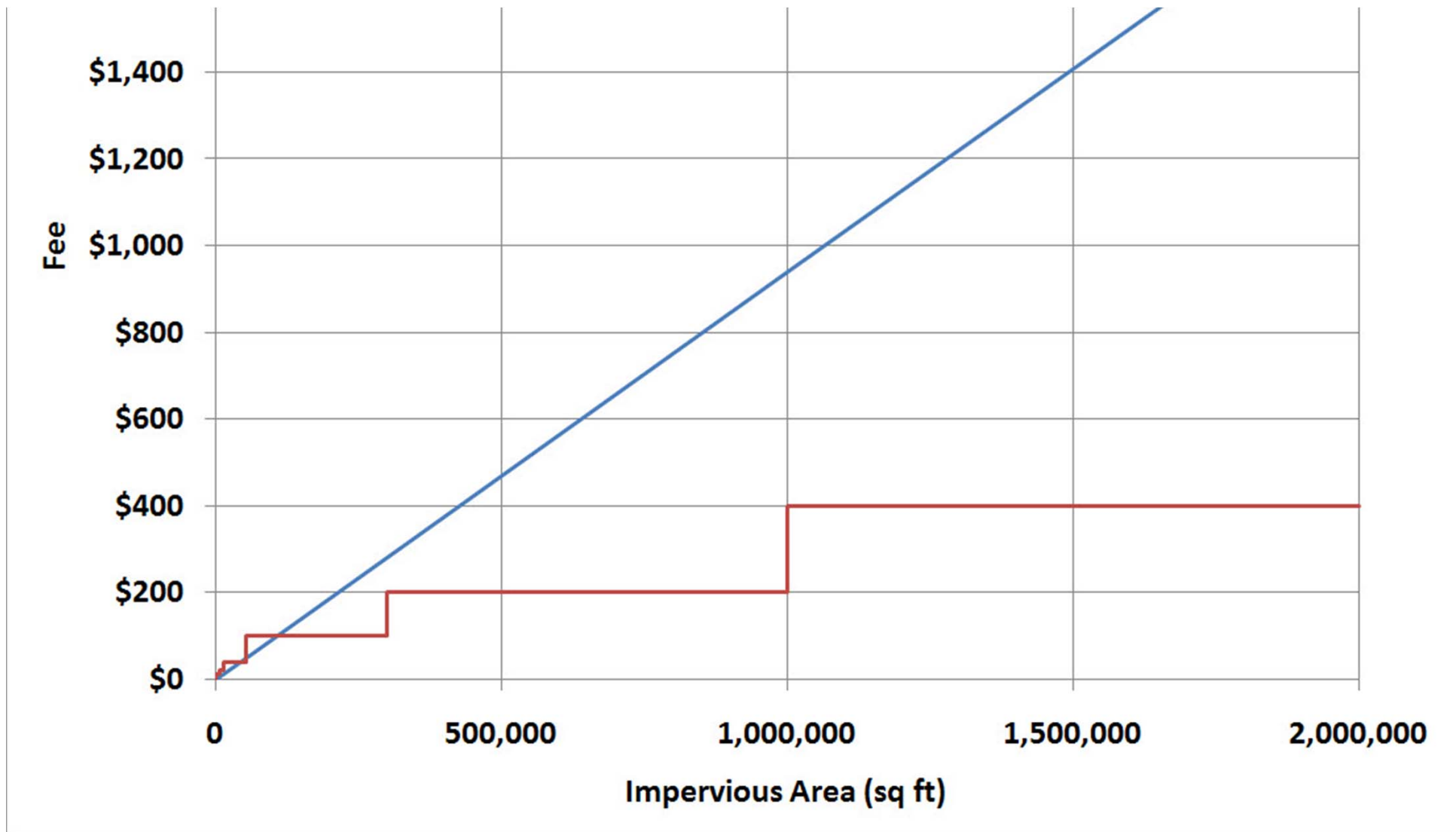


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# Fee — ERU fair tiered “stepped” rate vs. single rate



# Fee — ERU that is overcharging smaller tiers



# Fee — How do you set up a Stormwater Utility?

1. **5 Year Masterplan-** Determine problems, needs goals
2. Develop a public outreach program
3. Enlist Significant Political Support

1. **Feasibility Study-** Determine level of service to be provided
2. Determine a rate methodology and rate base
3. Outreach to Major Stakeholders

1. **Implement the SWU Program**
2. Create master account file and supporting tools
3. Begin the billing

1. **Report the results** to residents (every 6 months)
2. Consider early construction



# Outreach is the Key

Marketing Plan: Web-based and Event-based

**Public Service Announcements** Car Care, Fertilizer, Pet Waste

**Educational Programs** EPA Toolbox

**Adopt a Reach** Organizations hold clean-up days, install signs

**Stencil Inlets** Public Works Day, Web Calendar, Advertising, Fair Event

**Resident Volume Volunteers** Rain Gardens, Rain Barrels



Rain barrel



Rain gardens Infiltrating



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# Go Blue and "Be Prepared"

**Involve Community based Organizations**

## **Enlist Conservation groups:**

Conservation Foundation, Fermi Lab

Arboretums

Engineering Groups - IAFSM, ASCE, ISPE

Boy Scouts - Eagle rank Projects

## **Plan Events at:**

Local Museums, Libraries

Parks for Rain Garden Lectures

State Fairs or County Fairs



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## Fee — Outreach could be at a State Fair



Manhard 2007 Rain Day Team  
Chris Ide    Lillian Prince    Mark Hoskins



Rain Day Tent Entrance – Information Booth



USACE Tulsa District Joe Remondini



USACE Floodplain Management Model



### Minnow Race Participants



### Hurricane Foot Wash



IEPA Steve Kolsto and Kristi Morris-Richards



## Demonstrating the ENVIROSCAPE Model



### Water table with Legos



## Water Table Experts



NOAA CoCoRaHS Steve Hilberg



MWRDGC Deep Tunnel Lou Storino



# Fee — What is Outreach?

**Consider Outreach to School Districts early on...**

**Adults will listen to their children** when they can't spare a minute for a stormwater professional

Most adults are **basically ignorant** of floodplain issues  
Block swales with privacy fences and flower beds  
Place lawn debris in gutter  
Unprepared for the big one



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# Involve Schools as Outreach

## Kid quotes after a Stormwater Class

"I learned that if we throw the things in the storm drain  
**the fishes will die.**"

Sincerely, Daniel A., age 8



"Thank you for helping the water and fish keep clean because the dirty water kills animals. I learned not to throw dirty trash on the floor...water is the fish's home because **fish like to be happy.**"

Sincerely, Yajqera B., age 8

"Thank you for coming to our class. I promise not to throw stuff away that **can hurt any kind of animal.** This way we can go to the beach and so that all the animals will live and not die very fast."

Sincerely, Martin G., age 9



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# Questions?



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