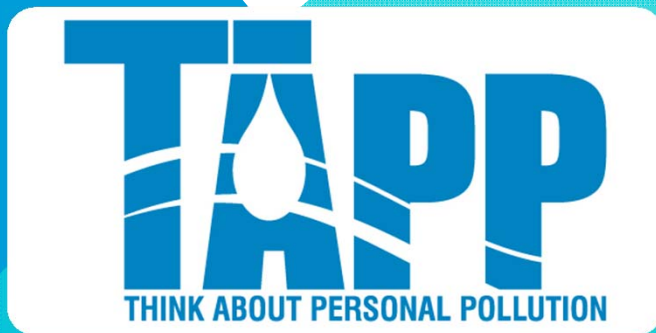


TAPP

Think About Personal Pollution

City of Tallahassee Stormwater Management Group

Florida Stormwater Association
June 8, 2011



OUTLINE OF DISCUSSION

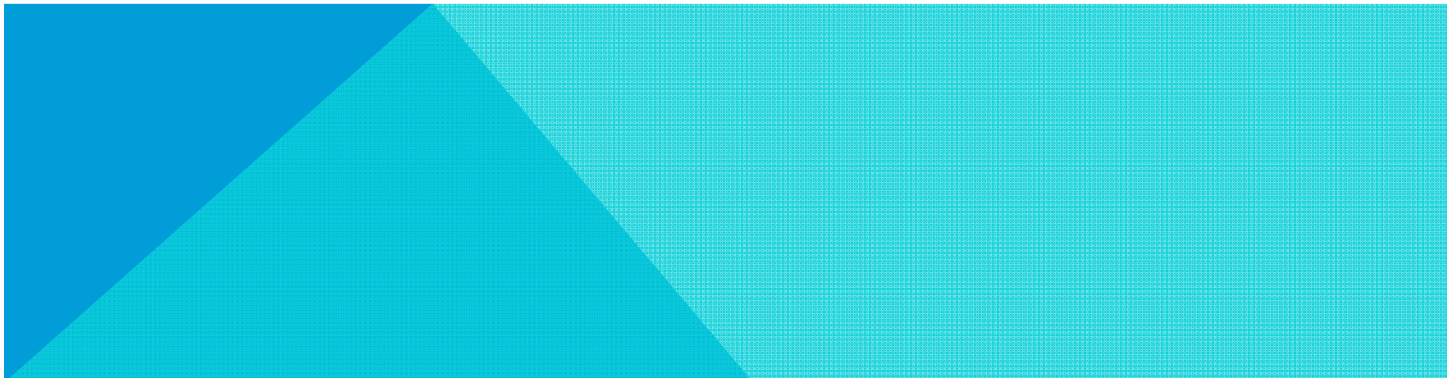
- 💧 *TAPP Historical Background*

Katie Hallas, TAPP Project Coordinator

- 💧 *TAPP Public Service Announcements (PSAs)*

- 💧 *Program Survey Results*

John Cox, Water Quality Planning Chief



WHAT IS THE “VALUE” OF NUTRIENTS?

- 💧 A Florida Department of Environmental Protection (FDEP) study on 23 retrofit projects determined that the **average cost of phosphorus (P) removal was \$13,560 per pound.**
- 💧 P removal/ounce: \$847
- 💧 Gold/ounce: \$1,535

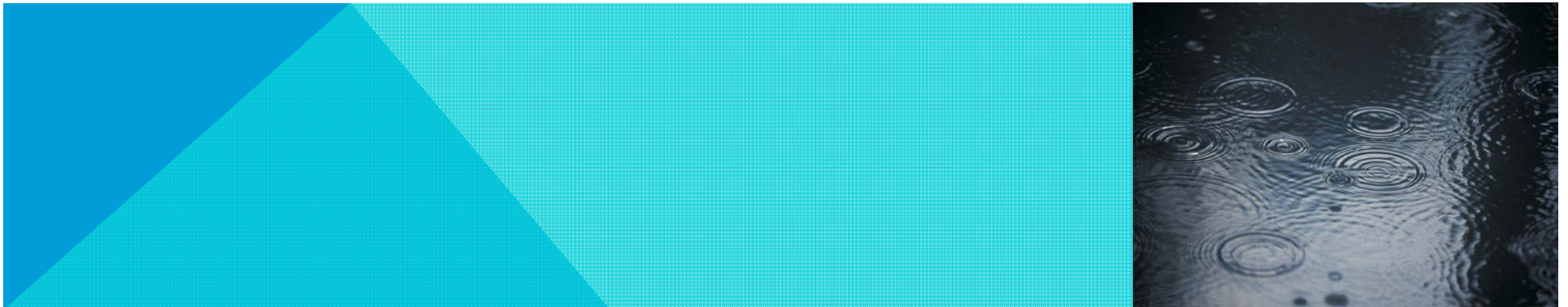


It's far cheaper to prevent pollution than it is to clean it up.

WHAT IS TAPP?

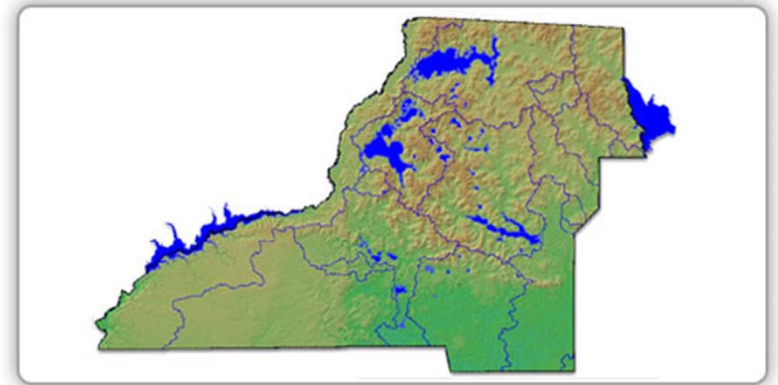
(THINK ABOUT PERSONAL POLLUTION)

- 💧 **TAPP** = multi-media public education campaign
- 💧 **Primary objective:**
 - 💧 To reduce amount of pollution entering lakes & water courses in Tallahassee/Leon County Area.
- 💧 **Main goal:**
 - 💧 To generate awareness & understanding about importance of each person's responsibility to keep our water resources clean.



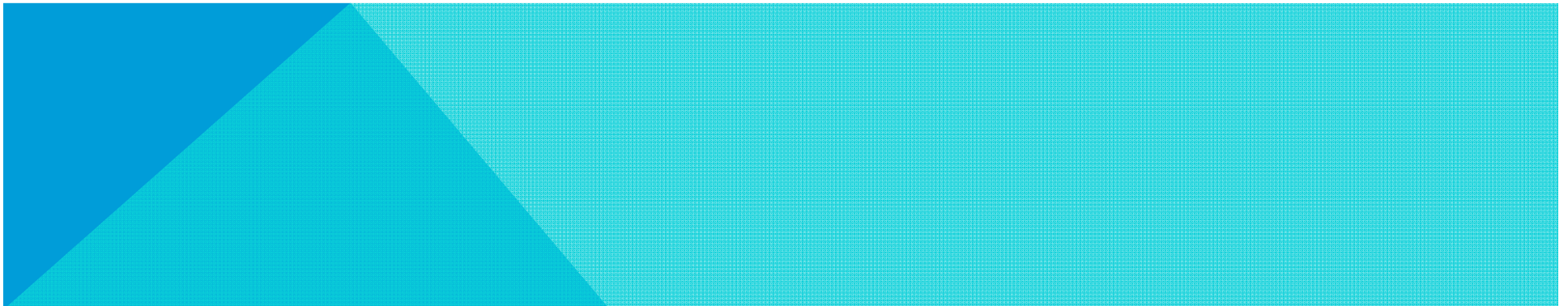
BACKGROUND & HISTORY

💧 The COT was the 1st Florida to create a stormwater utility to provide a funding mechanism to minimize the impacts of flooding & to keep stormwater runoff clean & free of pollutants.



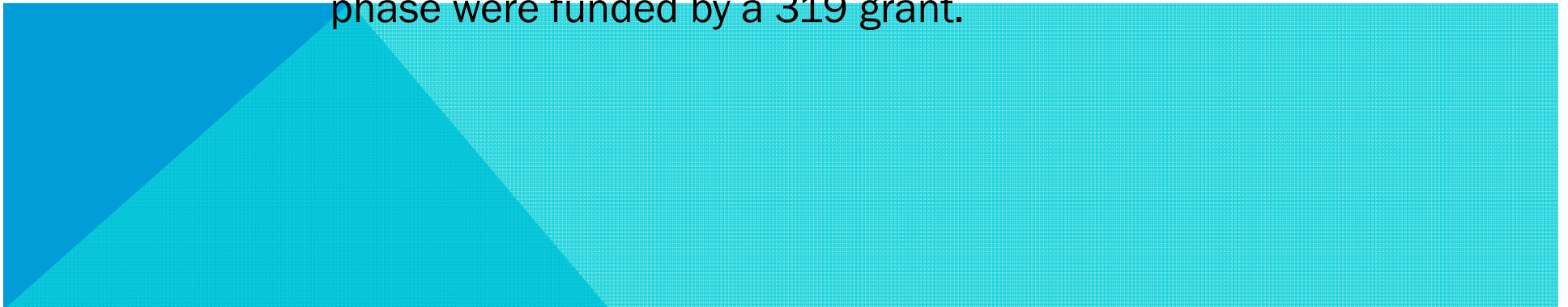
Leon County

💧 The stormwater utility uses structural & non-structural (e.g., TAPP) elements.



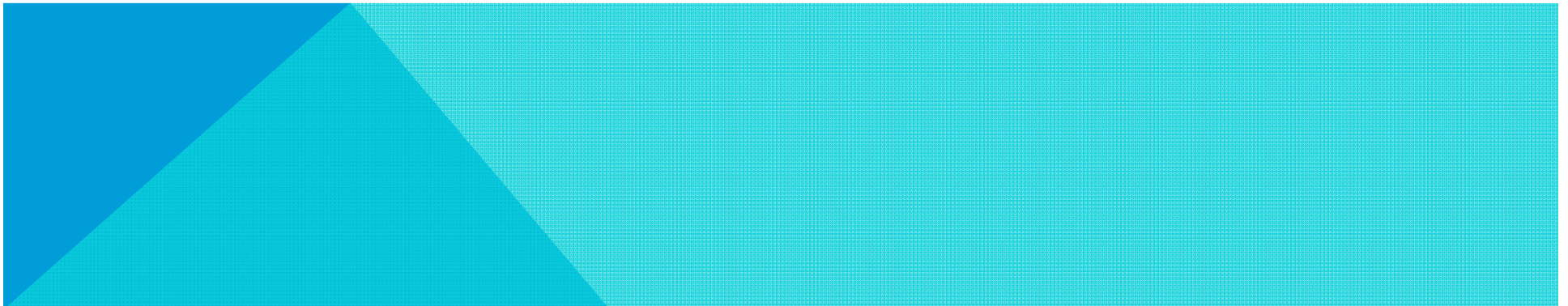
TAPP TIMELINE

- 💧 '02 Ochlockonee River Soil & Water Conservation District (District) received a Section 319 Nonpoint Source Management Program Implementation grant.
- 💧 '03-'05 Phase I of TAPP began in August '03 & ran through September '05.
- 💧 '06-'08 City of Tallahassee (COT) Stormwater Management Division assumed responsibility of grant administration & implementation of Phase II Campaign.
- 💧 '08-'10 Phase III of Campaign took place. The initial years of this phase were funded by a 319 grant.



FUNDING & ADMINISTRATION

- 💧 TAPP Campaign funded by U.S. Environmental Protection Agency (EPA) through 319 grant.
- 💧 Administered by FDEP.
- 💧 Implemented by COT.
- 💧 Significant in-kind funding provided by long-term private sector partners, e.g.:
 - 💧 JSS Enterprises, Inc.
 - 💧 RB Oppenheim Associates, Inc.
 - 💧 Governance, Inc.
 - 💧 Oppenheim Research, Inc.
 - 💧 Maria Balingit Design
 - 💧 Outreach Instructors





Program Set Up & Administration



Television Scripts & Ad Production



Marketing & Public Relations

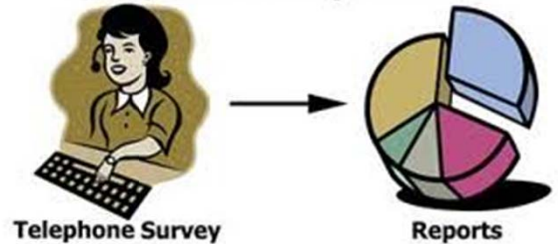


Program Set Up & Administration

TAPP

THINK ABOUT PERSONAL POLLUTION

Telephone Survey Process



Baseline & Post-Campaign Surveys

Citizen Outreach Campaign

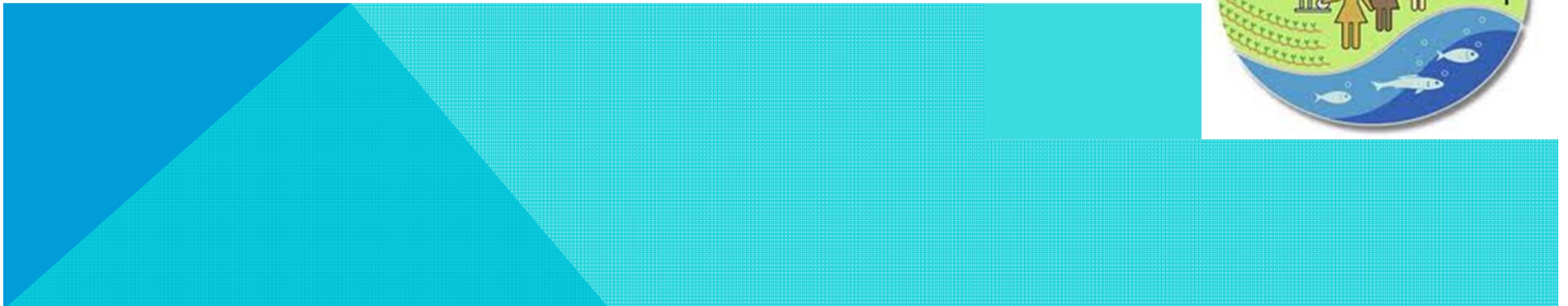


Community Outreach



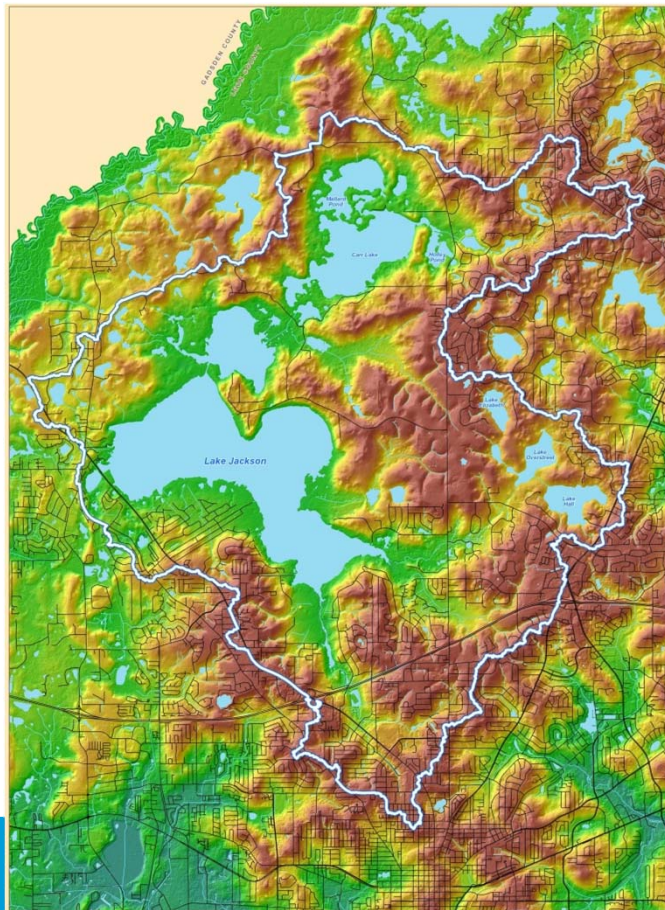
TARGET AUDIENCES

- 💧 Residents, especially homeowners
- 💧 General public
- 💧 Neighborhood/community groups
- 💧 Owners/employees of nursery & landscaping businesses
- 💧 Special emphasis on drainage areas of:
 - 💧 Lake Jackson
 - 💧 Lake Lafayette
 - 💧 Lake Munson



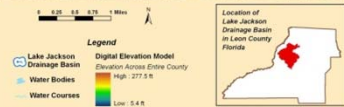
LAKE JACKSON DRAINAGE BASIN

- 💧 27,235 acres
- 💧 Located in Northwest Tallahassee
- 💧 Lake periodically drains into sinkholes
- 💧 Lake Jackson Stormwater Filter & Constructed Wetland Treatment System on Megginnis Arm
 - 💧 One of first stormwater retrofit projects in Florida



The Lake Jackson Drainage Basin

Do you live or work in the Lake Jackson Drainage Basin?



TAPP

TALLAHASSEE

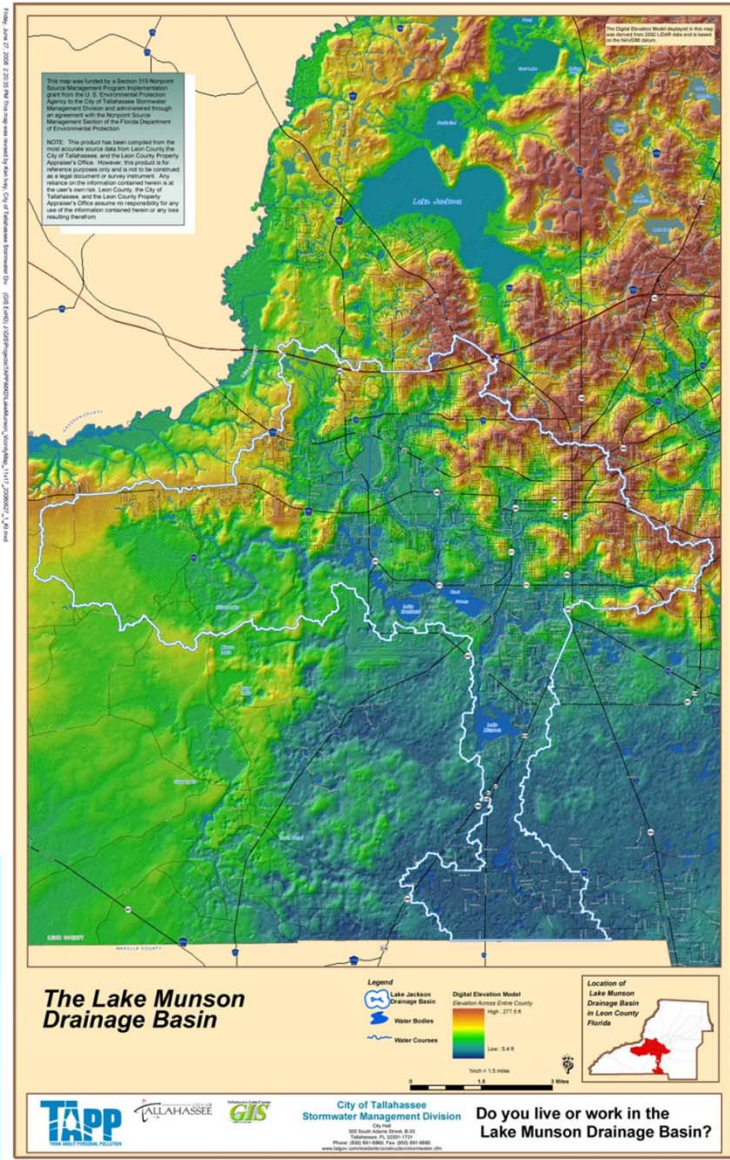
GIS

City of Tallahassee
Stormwater Management Division

This map was prepared by the City of Tallahassee Stormwater Management Division. It is intended for informational purposes only and does not constitute a warranty of any kind. The City of Tallahassee Stormwater Management Division is not responsible for any errors or omissions in this map. For more information, contact the City of Tallahassee Stormwater Management Division at (904) 644-2222.

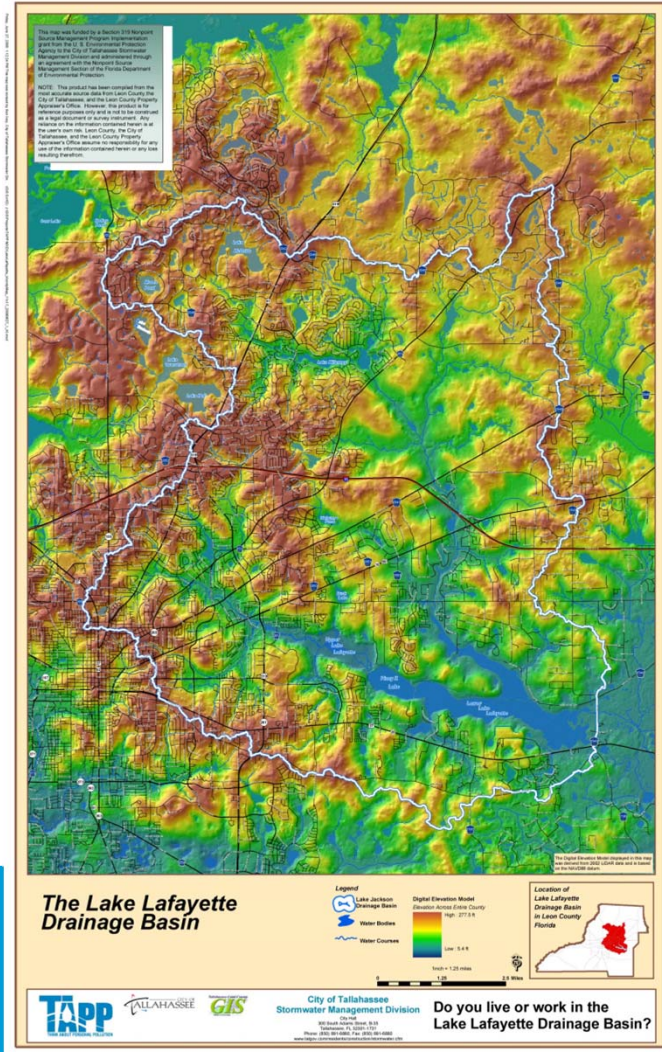
LAKE MUNSON DRAINAGE BASIN

- 💧 40,256 acres
- 💧 Located in southwest Tallahassee
- 💧 Heavily impacted by pollutants



LAKE LAFAYETTE DRAINAGE BASIN

- 💧 51,000 acres
- 💧 Located in east Tallahassee
- 💧 Lake Lafayette broken into series of smaller lakes w/earthen dikes in 1940s:
 - 💧 Upper Lafayette
 - 💧 Piney Z
 - 💧 Lower Lafayette
 - 💧 Alford Arm



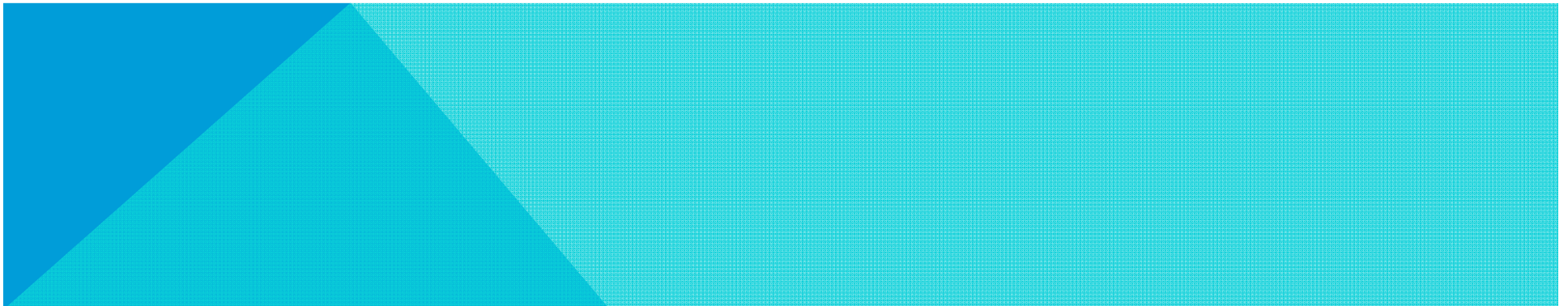
TAPP IMPLEMENTATION

💧 Phase I (2003-2005, District)

- 💧 *First 4 TV & 4 radio ads*
- 💧 *Educational materials*
- 💧 *Garnered 59% match value to 41% 319 funds*

💧 Phases II-III (2006-2010, COT)

- 💧 *Billboards*
- 💧 *Rain Garden Grant Program*
- 💧 *Rain gauges & ducks*
- 💧 *Rain garden posters for nurseries*
- 💧 *Displays in garden centers & public places*



2009-2010 TAPP CAMPAIGN

- 💧 2009-2010 Campaign aimed to motivate residents [to act](#) by changing personal behaviors that lead to water pollution.
- 💧 **Main messages:**
 - 💧 Switch to non-P fertilizers
 - 💧 Pick up pet waste





START-UP DECISIONS

- 💧 Chose project name, logo, & slogans.
 - 💧 *Slow the Flow!*
 - 💧 *Every drop you lose, nature finds.*

- 💧 Reviewed available literature – especially *The Toolbox*.



- 💧 Organized **TAPP** team to develop key themes, audiences, & specific messages.

- 💧 Aimed for major emphasis during gardening seasons.

Lesson: Allow several months for organizational work.

AD DEVELOPMENT

- 💧 **Numerous decisions:** Campaign name, logo & slogans, key themes, message development, & target audiences.
- 💧 Ten 30-second video ads to date.
- 💧 The media outlets liked the TAPP ads due to their appealing quality. As a result, ads were run extensively.
- 💧 TAPP Campaign PSAs have won **ten** national, state, & local awards, including an Emmy in 2009 for grant partners.

Lesson: Partner with proven professionals & trust your professional advisors.

VIDEO AD MESSAGES (2008-2009 CAMPAIGN)

It is never too early to think about personal pollution.



Prevent erosion.



It all adds up: the cumulative effect of personal pollution.

If runoff looked like this,

it would be cute.



Slow the flow with a rain garden or rain barrel.

Campaign Partner: RB Oppenheim Associates

MEDIA & PUBLIC RELATIONS


- 💧 Timing - Spring gardening
- 💧 Press releases & events
- 💧 Ads placed w/media
- 💧 Programming on WCOT
- 💧 Informative articles
 - 💧 Zing!s
 - 💧 Newspaper articles
 - 💧 Community newsletters
- 💧 Billboards



Lesson: Partner w/a good local ad agency, & let them lead.

Campaign Partner: Summit Outdoor


TAPP 2006-2008 BILLBOARDS




*It's never too early to think
about personal pollution.*

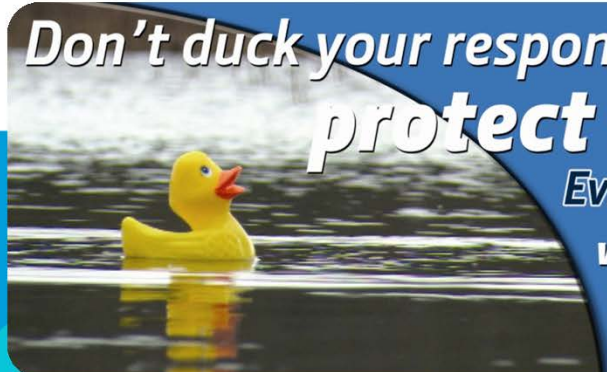
EVERY DROP YOU LOSE, NATURE FINDS.

www.TAPPwater.org

 CITY OF
ALLAHASSEE
STORMWATER MANAGEMENT

 TAPP
THINK ABOUT PERSONAL POLLUTION


- A billboard in each of the three targeted lakes basins w/one in-kind billboard.
- Signs to run for six months total during gardening season.




*Don't duck your responsibility...
protect our groundwater.*

EVERY DROP YOU LOSE, NATURE FINDS.

www.TAPPwater.org

 CITY OF
ALLAHASSEE
STORMWATER MANAGEMENT

 TAPP
THINK ABOUT PERSONAL POLLUTION

TAPP 2009-2010 BILLBOARDS



Poop Isn't Cute.
Pick It Up.
Protect Our Waters.



Every drop you lose, Nature Finds. | www.TAPPwater.org

Made possible by funding from the U.S. Environmental Protection Agency and Florida Department of Environmental Protection



Look for
the **ZERO**.
Just as green and
keeps our water clean.



Every drop you lose, Nature Finds. | www.TAPPwater.org

Made possible by funding from the U.S. Environmental Protection Agency and Florida Department of Environmental Protection

💧 A billboard in each of the three targeted lakes basins w/one in-kind billboard.

💧 Signs to run for six months total during gardening season.



What's The Problem?

Community Outreach

Our Lakes and Rivers

What Can I Do?

Rain Gardens

Rain Barrels

Not My Pet

Slow The Flow

Save Your Topsoil

Fertilizers and Pesticides

Septic Systems

Contact Us

Helpful Links

What is TAPP?

The TAPP - Think About Personal Pollution Campaign helps educate individuals on ways that small personal changes in home and yard practices can help keep local lakes, sinks and streams cleaner. The campaign is here to help you understand your impact on water quality and to encourage you to take action by adopting some slightly different approaches to things you do every day.

TAPP offers educational materials and seminars that provide information on this program to local neighborhood and civic groups. To schedule a seminar, or request information, call (850) 891-6806. **Think About Personal Pollution**

Latest News & Events

Survey Shows Residents TAPPING into Water Quality
Tallahassee, Fla. Tallahassee area residents may have seen humorous TV ads and billboards in recent months that promoted picking up dog waste and p...(more)

Media Advisory

The TAPP campaign survey was designed to obtain feedback on the levels of public understanding of water pollution sources; gauge respondents adverti...(more)

TAPP INTERACTIVE



View Interactive Slideshow



Visit TAPP's Facebook Page



View Rain Garden Animation



View TAPP's Interactive Map

What You Can Do!

- Slow the Flow
- Clean Up After Pets
- Manage Soil to Minimize Erosion
- Minimize the Use of Fertilizers
- Install a Rain Barrel
- Plant a Rain Garden
- Save Your Soil
- Maintain Septic Systems
- Lawn Mulching Tips



View Rain Gardens

Click Here

Apply For Rain Garden Grant

Click Here

Find My Lake Basin
& Order Bumper Sticker

Click Here

View TAPP TV Spots

Click Here

TAPP WEB SITE (WWW.TAPPWATER.ORG)

- 💧 Original concept did not envision the major part the web site would ultimately play.
- 💧 Web site activated in March 2004 & w/continual upgrades.



Lessons:

1. Web site offers a *reference point* to which all program elements can refer.
2. Allot enough time for web site set-up / design.
3. Adequately fund set-up, design, & maintenance.

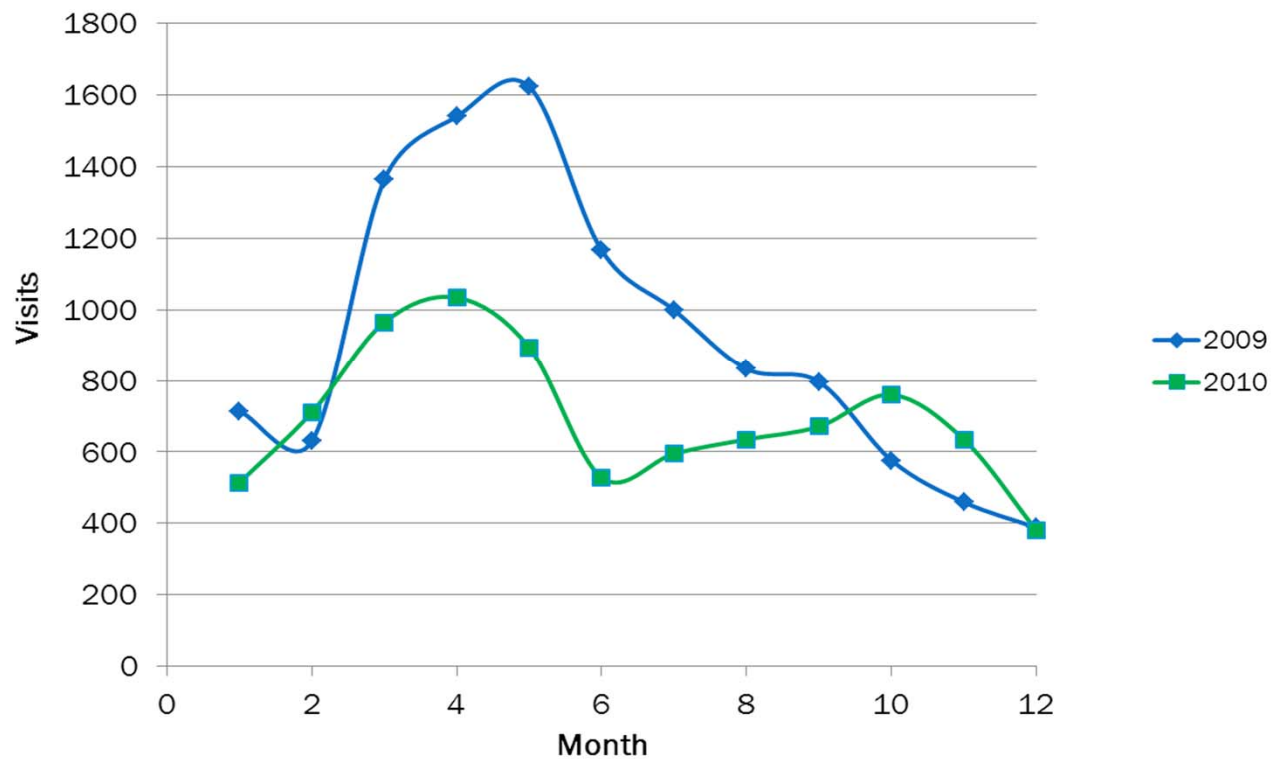
TAPP WEB SITE (WWW.TAPPWATER.ORG)



- Regional distribution of TAPP messages.
- February – June 2009 web site traffic doubled compared to same period in 2008.
- Web site hits from 77 countries.

TAPP WEB SITE (WWW.TAPPWATER.ORG)

TAPP Web Site Visitation (2009-2010)

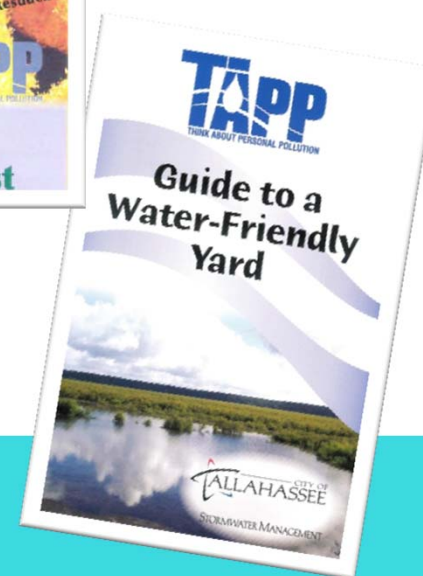
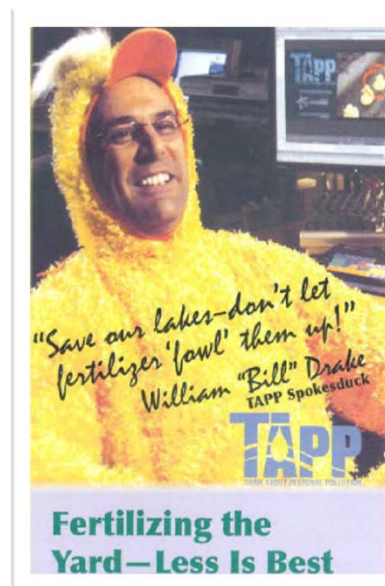


Source: JSS Enterprises, Inc.

TAPP OUTREACH

💧 *Key Themes*

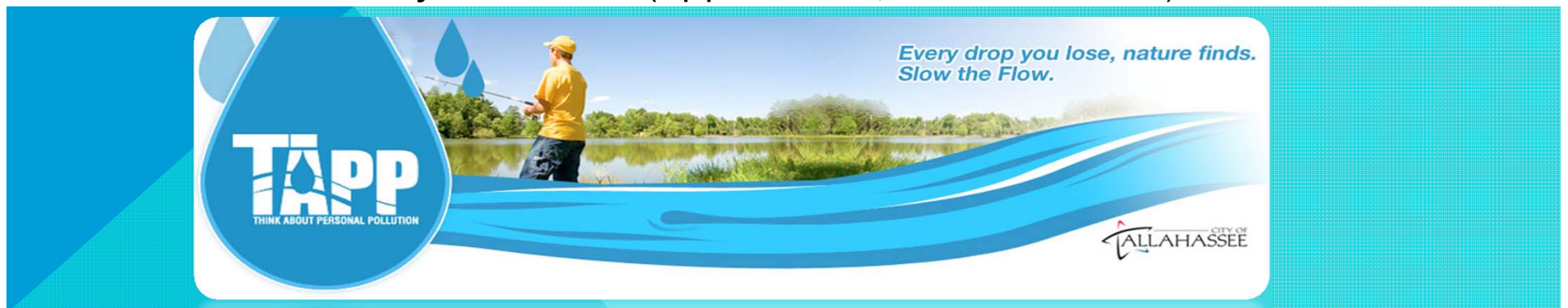
- 💧 Problem identification
- 💧 Individual responsibility
- 💧 Slow the Flow / rain gardens
- 💧 Proper fertilization



TAPP OUTREACH

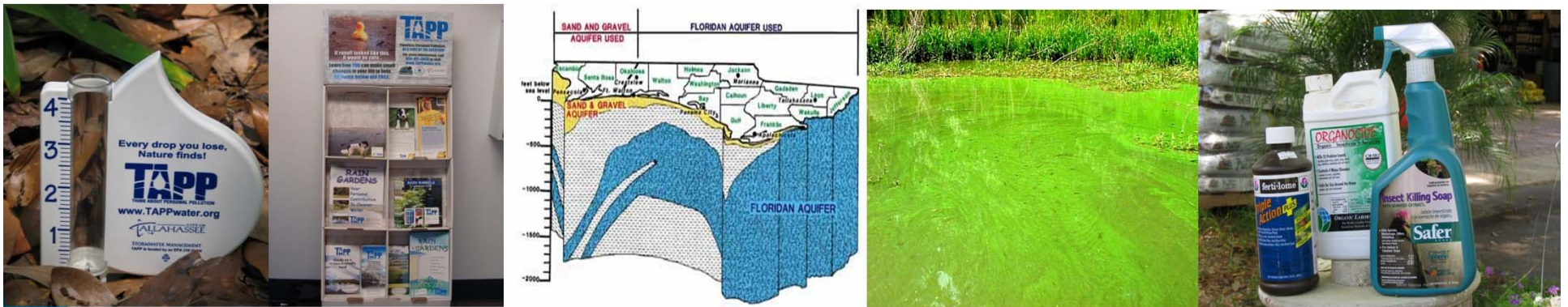
Methods of Communication

- 💧 Presentations to community, neighborhood, & business groups
- 💧 Educational materials development & distribution
- 💧 Rain Garden Grant Program
- 💧 Displays in garden centers & nurseries
- 💧 Booths at community events, programs, & festivals
- 💧 Contacts with developers, nurseries, & fertilizer retailers
- 💧 Articles in neighborhood & community group newsletters
- 💧 Tallahassee utility bill inserts (approx. 105,000 customers)



OUTREACH PRESENTATION MESSAGES

- 💧 Uniqueness of Tallahassee geology
- 💧 Why your yard matters
- 💧 What you can do

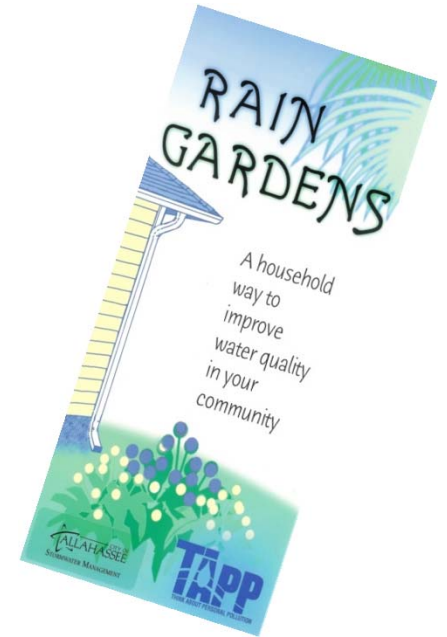
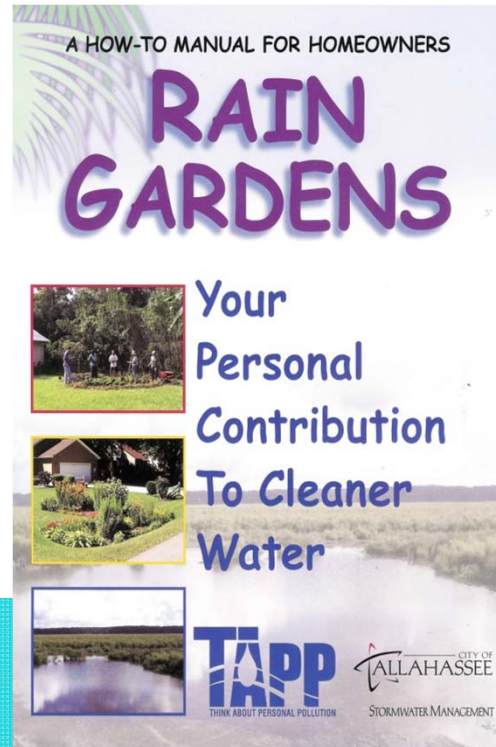
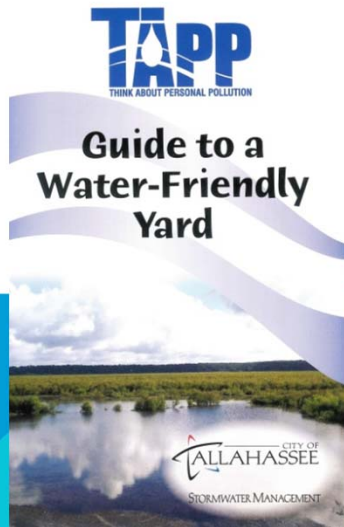
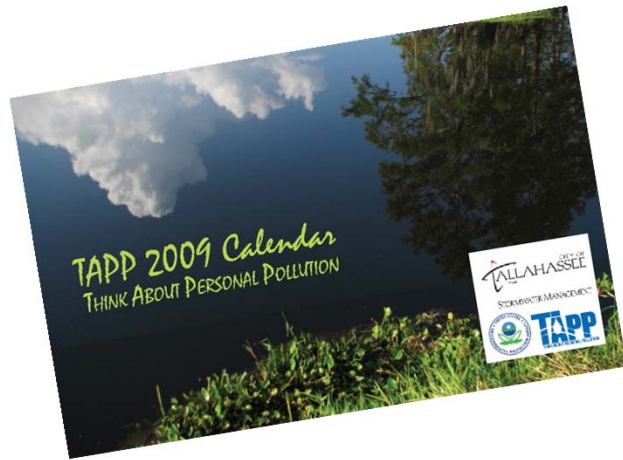


Lessons:

1. Master Gardener participation lends credibility.
2. Instructor training should emphasize that TAPP is centered on water resource protection & stormwater pollution reduction.

Campaign Partner: Maria Balingit Design

TAPP EDUCATIONAL MATERIALS



Lesson: Allocate adequate \$\$ for reprinting.

PRE- & POST-CAMPAIGN SURVEYS

- 💧 4 surveys & 4 focus groups to date:
 - 💧 1st baseline survey in January 2004.
- 💧 **Post-campaign survey in September 2004**
 - 💧 7% increase in number who acknowledge personal responsibility.
 - 💧 Various ads had recognition rates of 18% - 47%.
- 💧 **2nd baseline survey in November, 2006**
 - 💧 35% of respondents said they had heard or seen TAPP ad.
 - 💧 54% of respondents w/yards believe they can make a difference.

Lesson: Time post campaign survey about one month prior to expected end date of campaign activities.

2009 SURVEY & RESULTS

- 💧 89.7% of those surveyed believed that personal habits contribute to water pollution.
- 💧 88.6% found the TAPP TV ads to be very or somewhat informative.
- 💧 67% heard, saw, or read the slogan, “Every drop you lose, nature finds.”
- 💧 39.7% indicated that TAPP ads and information prompted them to make changes.
- 💧 18.4% switched to non-P fertilizer.



2009 SURVEY & RESULTS

💧 59.7% of respondents with dogs pick up all the time when they walk their dogs, and 15.5% report that they pick up most of the time

💧 30% of these dog owners indicated that they began picking up this spring

💧 To achieve equivalent results through conventional treatment methods would require a minimum cost of \$2.5 M/year.



My pet can't be part of a water pollution problem! My pet is a member of the family. He watches TV with me on the sofa. He sleeps in my lap.

Of course, it's not your pet alone, and sure, you keep your pet clean. The pollution results when we add all of our pets together. Research by the American Pet Products Manufacturers' Association shows that 40 percent of U.S. households have at least one dog. Based on public information survey results and the fact that many area residents have more than one dog, our stormwater experts estimate that there are approximately 70,000-75,000 dogs in Tallahassee.

This isn't just a problem in our community. Water pollution from pet waste isn't just a Tallahassee problem. It inevitably occurs when we concentrate ourselves—and our pets—into cities. **There is no sewage treatment for pet waste.** The U.S. Environmental Protection Agency (EPA) has been studying the problem of water pollution from pet waste for several years. The EPA reports that two to three days of pet waste from just 100 dogs in a 20 square mile watershed can contribute enough bacteria to temporarily close a bay to swimming and shell fishing (U.S. EPA, 1993). Pet waste also contributes to nutrient pollution in our local waterways.

TALLAHASSEE
SEWER
TAPP
SOLID WASTE MANAGEMENT



💧 Lesson: Time post-campaign survey ~one month after expected end date of media campaign activities.

TAPP Performance Monitoring Methods and Results

June 8, 2011

**John Cox,
Chief of SW Quality
Enhancement Program-
SPRP**

**(850) 891-6867,
John.Cox@talgov.com**

PUBLIC EDUCATION WORKS

- 💧 With TAPP We Changed Behavior BUT
- 💧 How Did TAPP Translate to Improved Instream Water Quality??



\$64 K Dollar Question!

That is What I'm Here to Discuss.

OUTLINE OF DISCUSSION

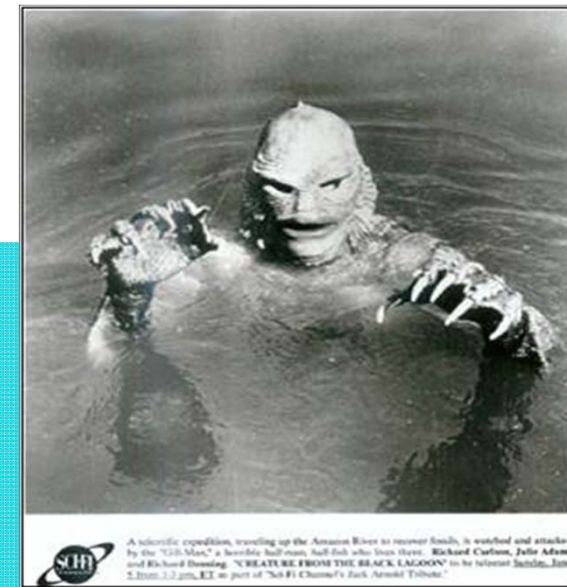
- 💧 How TAPP Monitored Performance, the Approach We Used & Why
- 💧 Results (Nutrients & Bacteria)
- 💧 Rain Garden Performance

Cost Savings



TAPP 2009 – FOCUS WAS PET WASTE AND FERTILIZER (WHY?)

- Nearly all Tallahassee Ditches Impaired for Fecal Coliform.
- Numerous Lakes & Ditches Impaired for Nutrients
- NO₃ in Groundwater Rising
- Protection of Wakulla Springs & Drinking Water a Priority.



TAPP 2009 – NEW ELEMENTS

- **Shifted Emphasis to Motivate Residents to Take Action.
(2 new PSAs)**
- **Improved Web Site.**
- **Developed New Outreach Info (Palm Cards, Rain Garden Manual, etc)**

Document Performance-Water Quality Benefits

A FEW WORDS ABOUT MONITORING

- 💧 Monitoring Should NOT be an Afterthought.
- 💧 DO NOT Discuss with Your Spouse.

MY MONITORING PLANNING APPROACH

Consult w/ Sidekicks



Get Input



Do It Yourself

TAPP MONITORING METHODS CONSIDERED

Performance Monitoring Approaches

Paired Watersheds
Direct WQ Comparison
but

**Upstream Downstream
(New MS4 Approach)**
Direct WQ Comparison
but

**Public Info Survey
(Traditional Approach)**
No Direct WQ Comparison
but

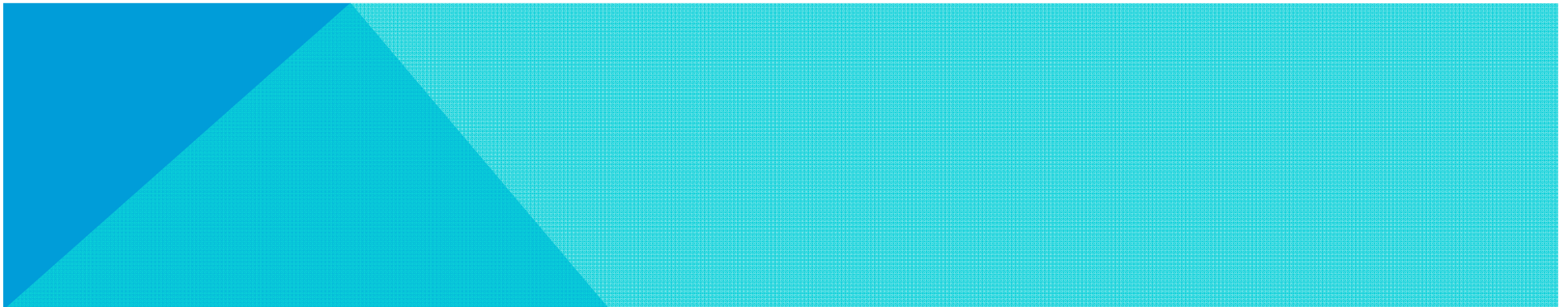
**High Cost,
Takes Time (1 yr)**
Limited to Small WS
Not for Mass Media

**Very High Cost,
Takes Time (5 yr)**
Limited to Medium WS
Not for Mass Media

**Low Cost,
Short Time (1 mon)**
Regional Application
Perfect for Mass Media

TAPP MONITORING METHODS CONSIDERED

- 1. Paired Watersheds**
- 2. Upstream Downstream
(New MS4 Approach)**
- 3. Public Information Surveys**



PAIRED WATERSHED MONITORING



UPSTREAM/DOWNSTREAM MONITORING

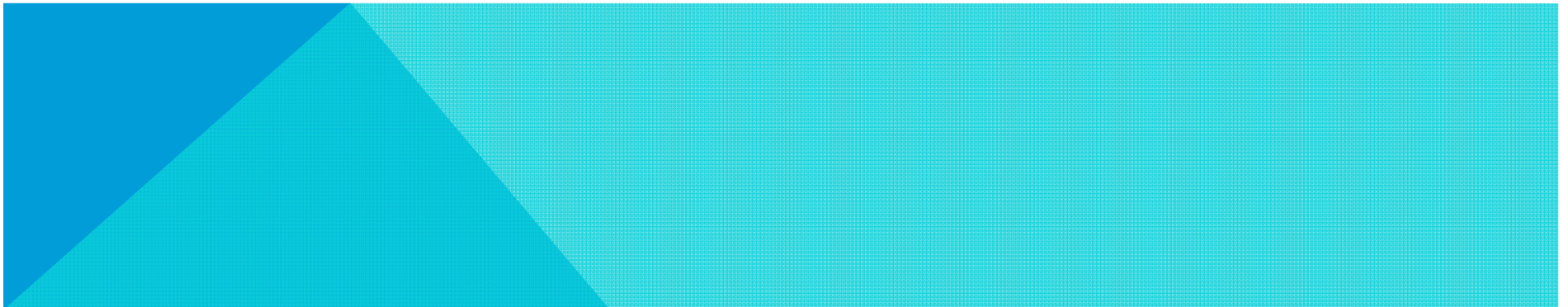


PUBLIC INFO SURVEY



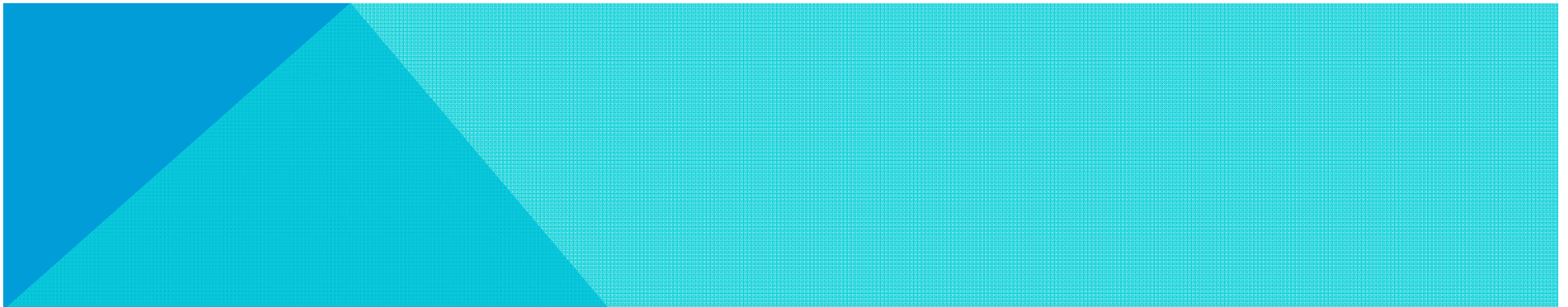
MONITORING VIA PUBLIC SURVEYS

- 💧 Have an Assessment Approach In Mind & Be Aware of Your Information Needs.
- 💧 Ask Questions Specific to Your Information Needs.
- 💧 Do Not ask About Pets When You Really Want Dog Stats.



WHY WE CHOSE THE PUBLIC SURVEY APPROACH

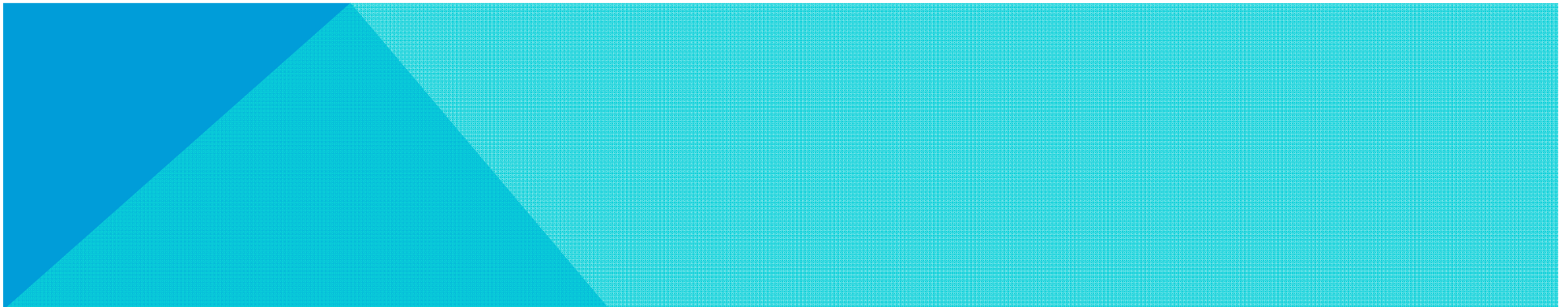
- 💧 Paired Watershed & Upstream/Downstream Approaches
 - 💧 Not able to limit outreach & media effort to specific watershed
 - 💧 Variability in Event Monitoring an Issue
- 💧 Public Survey approach
 - 💧 Covered the entire region
 - 💧 High percent confidence in results
 - 💧 Focus on specific issues & actions



DISADVANTAGE OF PUBLIC SURVEY APPROACH

Missing a direct link with water quality

**.....But we worked with our research partner to
construct survey questions that would give us the
information we needed to quantify load
reductions**



SURVEY RESULTS – IN GENERAL

(N=669)

- 💧 **Nearly 40 Percent of Tallahassee Households (HHs) Reported Changes Due to TAPP**
- 💧 **[39.7% or 31,281 (HHs)]**



MONITORING RESULTS

DOGS

- 💧 Percent Tallahassee Households (HHs) with Dogs = 36.5 % (Similar to National Average)
- 💧 1.55 per Household w/ dogs
- 💧 Percent HHs w/Dogs that started to pick up & dispose of waste in past 6 months = 30%

Well Exceeded Expectations!



PET WASTE ASSESSMENT INPUT DATA

INPUT	DATA	SOURCE
FC Conc. in Feces (Count/gr)	23,000,000	1
% Nitrogen	0.70%	2
% Phosphorus (P205)	0.25%	2
No. Households	78793	3
% Households w/dogs	35.60%	4
Dogs/Household	1.55	4
Dog Population	43,578	4

References:

1. Van der Wel, 1995
2. R.E. Hall, 1999, University of Minnesota
3. American Communities Survey 2005-2007, US Census Bureau
4. Oppenheim Research & Associates, TAPP 2009 Survey

ASSESSMENT RESULTS

DOG



- 💧 Tallahassee has Approximately 43,600 dogs
- 💧 Dogs Generate 16 Tons/day of Fecal Waste
- 💧 TAPP Achieved a 30% Reduction
- 💧 Translates to a 6% Improvement in WQ over the City

That is Equal to Treating 4700 acres w/
Treatment Ponds @ an 85 % Removal Rate.

SURVEY RESULTS (FERTILIZER USE)

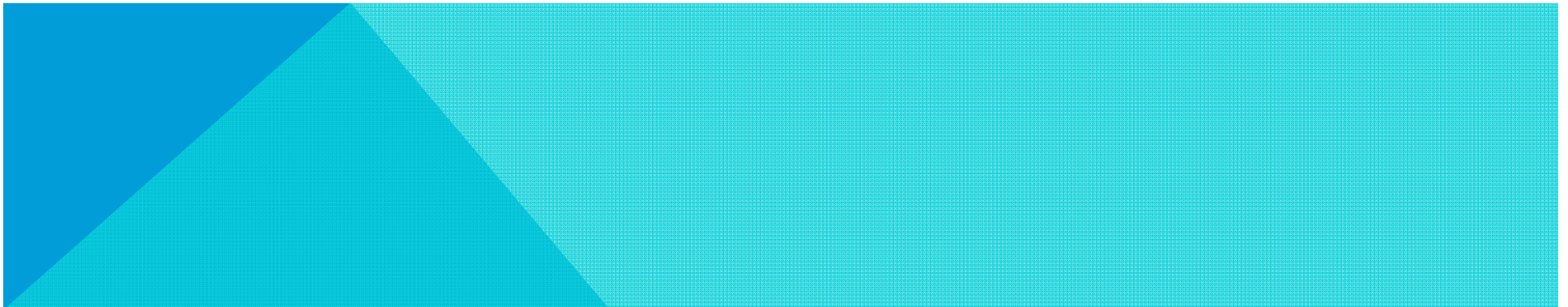


- 💧 TAPP Achieved a 10.8% decrease in households that apply fertilizer.
- 💧 (37.3 % in 2007 vs 26.5% in 2009)
- 💧 That is actually a 29% decrease in the number that applied from 2007 to 2009.
- 💧 45% of those that applied, used 0% P.

Success was Equivalent to Pet Waste

ASSUMPTIONS

- 💧 **Households that fertilized in 2009 applied at the 2007 rate for Nitrogen**
- 💧 **Households that fertilized w/P did so at 2007 rate**
- 💧 **No growth in the number of households**
- 💧 **Delivery of N = 12% of Applied, P = 20%**



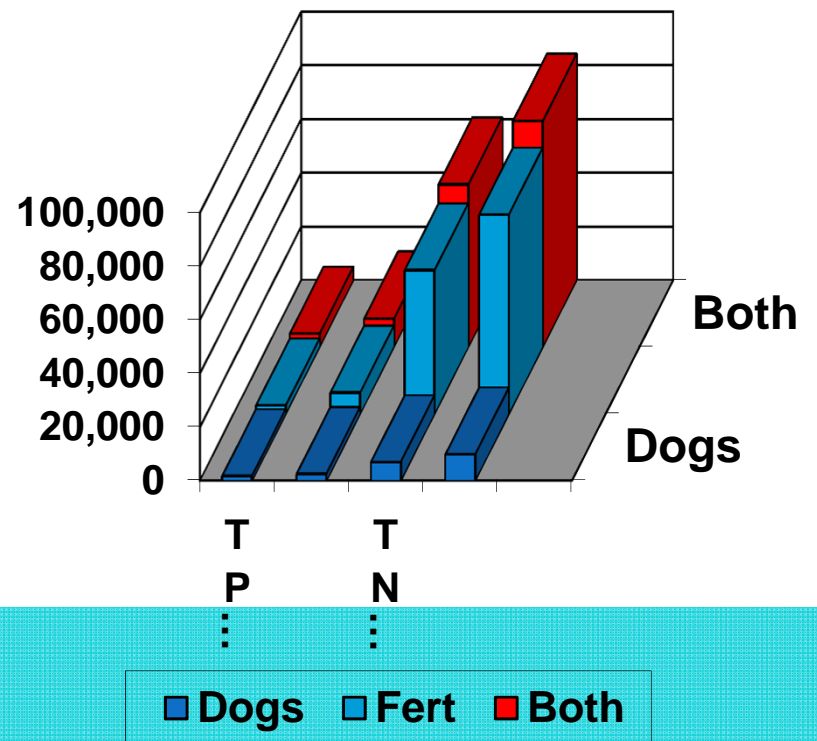
ASSESSMENT RESULTS (NUTRIENTS)

💧 TAPP Addressed both Fertilizer and Dog Feces

💧 Therefore; % Load Reduced Exceeded FC

💧 Nitrogen Load to Waters Reduced by 28%

💧 P Load to Waters Reduced by 53%



PRE VS POST NUTRIENT LOAD SUMMARY

Pre-Project

	TN (mg/L)	TP mg/L
Measured (FDEP)	1.104	0.205
Dogs & Fertilizer	0.377	0.047

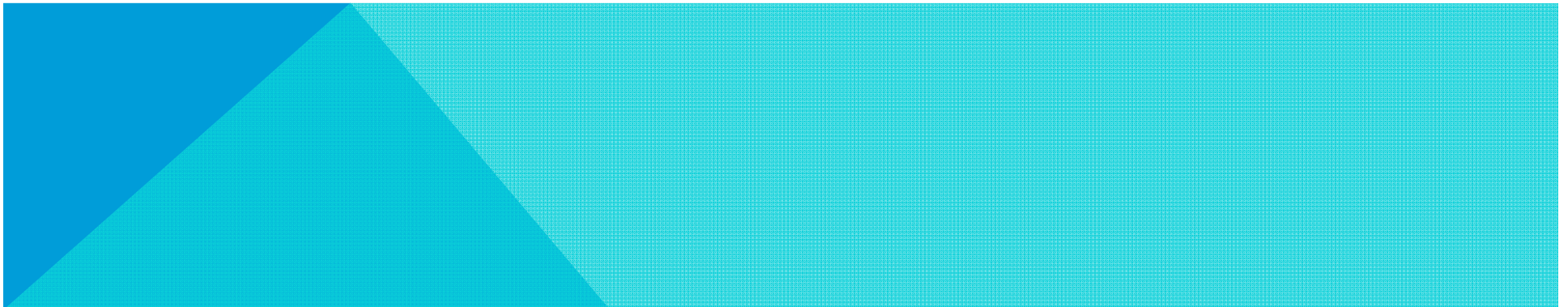
Post-Project

Dogs & Fertilizer	0.271	0.022
Other Sources	0.727	0.158
Post Project Total	0.998	0.180

Reduction Instream (10% TN & 12% TP)

RAIN GARDENS & PERFORMANCE

- 💧 **Value Added Benefits (Provides Quality Time Opportunity for Families & Organizations, Save Water, Reduce Lawn Chemicals, Wildlife Habitat, & Enhanced Aesthetics)**
- 💧 **Slow the Flow**
- 💧 **Can Be Constructed w/ Light Equipment**
- 💧 **People Want to Save the Planet & Be a Part of the Solution**



COT ANIMAL SERVICES CENTER



TAPP RESULTS (CONT.)

RAIN GARDEN GRANT PROGRAM

- 💧 City Pays \$175.00 toward Plants, Mulch, or Compost.**
- 💧 30 Residential and 1-2 Institutional RGs/Year.**
- 💧 Average Size (10 ft by 20 ft) or 200 ft²**
- 💧 Treatment Volume = 100 ft³**
- 💧 That is 22% of the first ½ inch of runoff from a typical quarter acre residential lot**

Equivalent to a 17%/Yr Load Reduction per HH.

TAPP ALSO MOTIVATED OTHER NON-STRUCTURAL CONTROLS

- 💧 Pet Waste & Better Control of Fertilizer
- 💧 Passed new Pet Waste Ordinance (June 2008)
- 💧 Expanded in 2010 to include All Public Places
- 💧 Passed new Fertilizer Applicator Ordinance (January 2009)

Certified 278 Fertilizer Applicators since 2009.

Lastly, Lets Talk \$\$\$\$

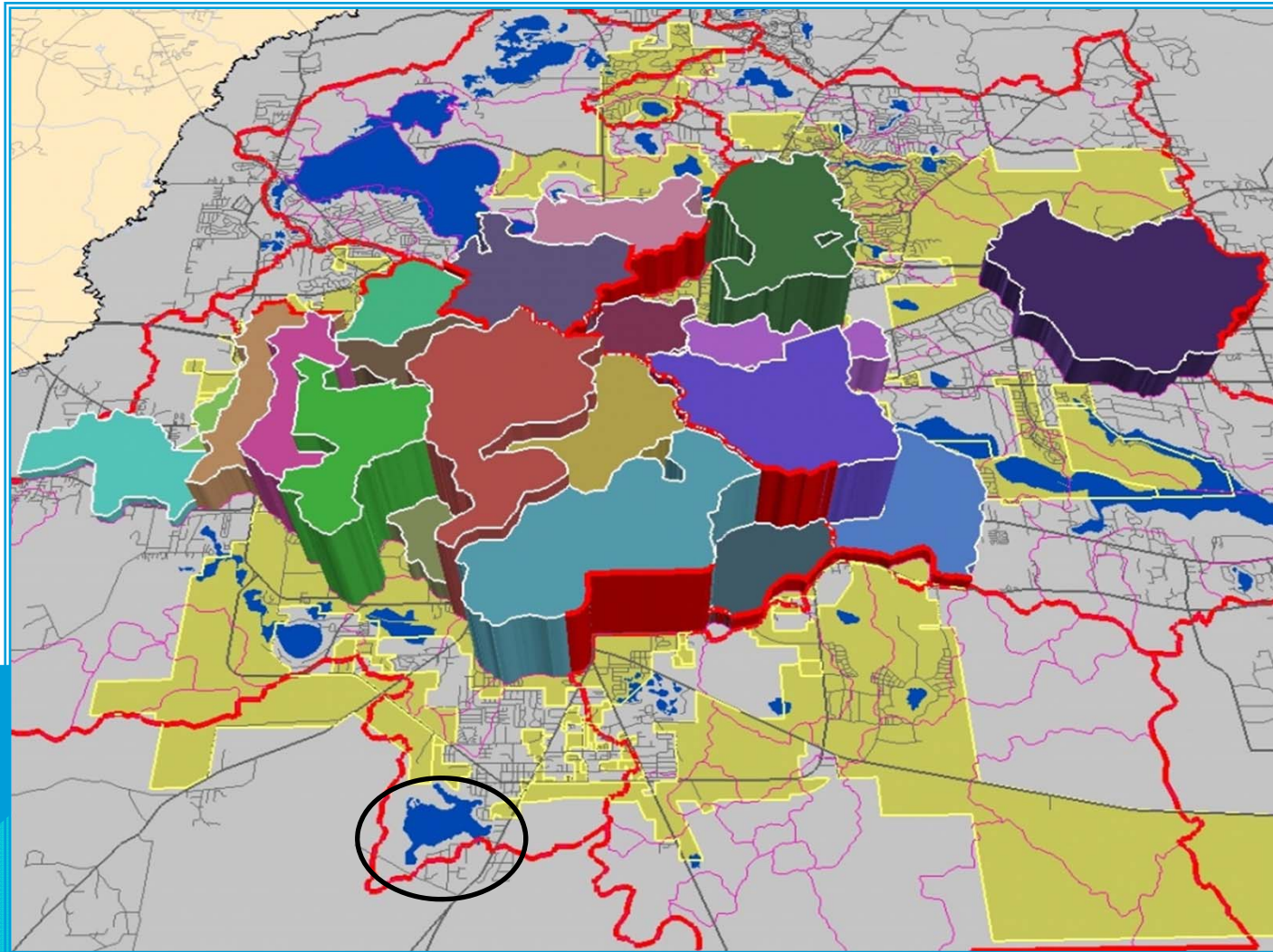


Tallahassee's Stormwater Utility Ranks among the highest in FL & USA @ \$7.95/ERU

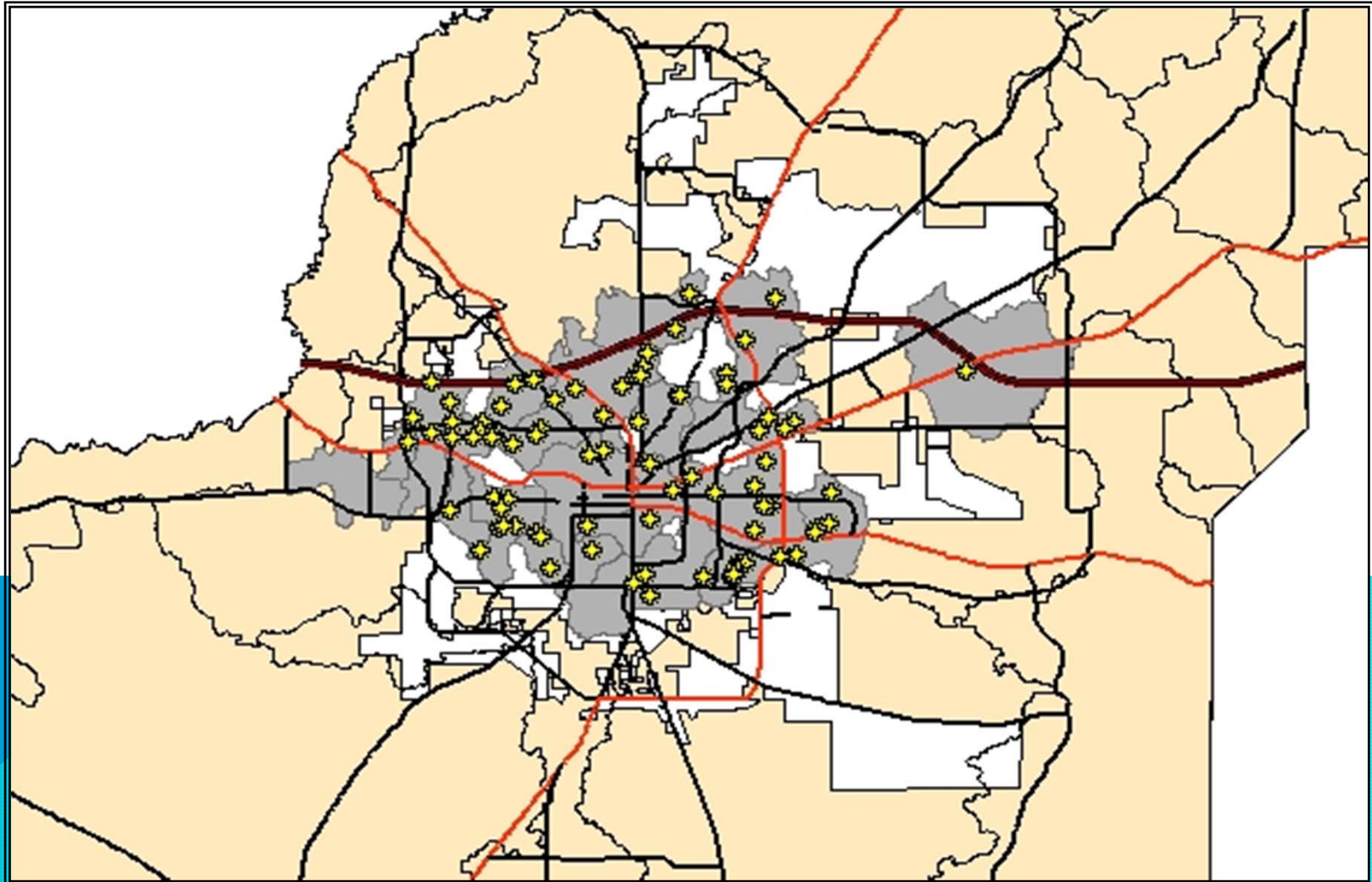


A \$1.70 approved in 2005, phased over five years (2010) generates \$60 million over 20 years to improve stormwater quality

TALLAHASSEE TOP 20 PRIORITY WATERSHEDS



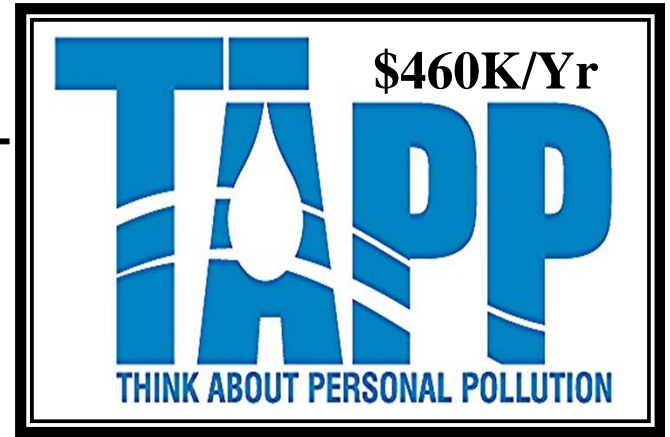
CAPITAL PROJECTS (PROPOSED PONDS \$60 MILLION)





**Abbiegail Pond
146 Acres**

**Capital Improvement
Projects (Structural & Non-
Structural)**



**4700 Equivalent
Treatment Acres**



**Bond Pond
64 Acres**

**Last 10 years City-wide
\$74 Million, 45 Projects**



**FSU-RSF
400 Acres**

DESPITE PROGRESSIVE SW PROGRAM

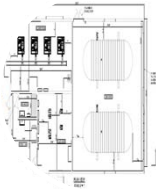
- 💧 \$\$\$\$\$ Needed Exceed \$ Available, Given the Load Reductions Required
- 💧 Economies of Scale Limited by “Thou Shall Not Treat in Waters” Policy. Best Locations are Off-Limits
- 💧 Shift to High Performance BMPs

~~ALUM?~~

Tallahassee can NOT Meet Proposed TMDLs

ALUM (CONT)

CAPITAL COST PLUS LIFETIME O&M



**\$5 Million
Capital
Const. Cost**



**\$210,000/YR
60 Alum
Deliveries/YR**



**Treats 80% avg.
Yearly Volume @
90% Removal**



**Expect a
72% TP
Reduction**

10,000 ac. Watershed

COST SAVINGS

TAPP

vs.

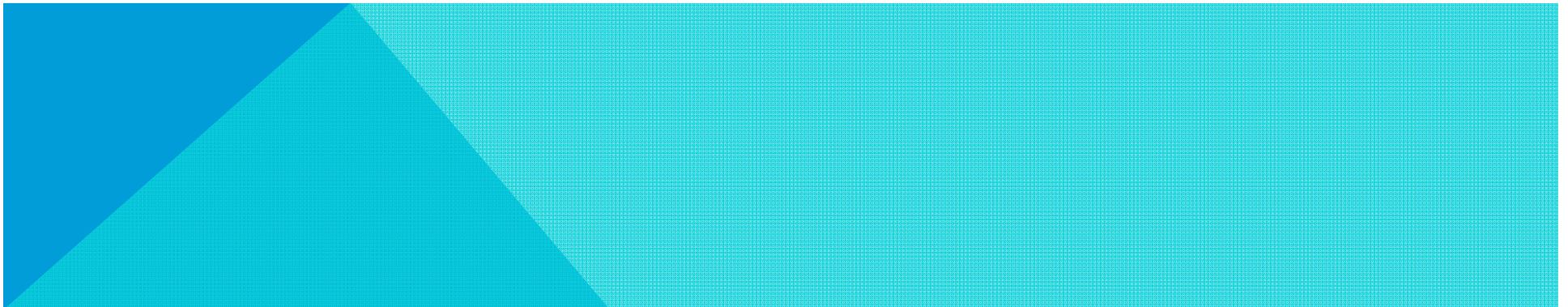
Stormwater Ponds



\$450 K vs \$2.5M /YR

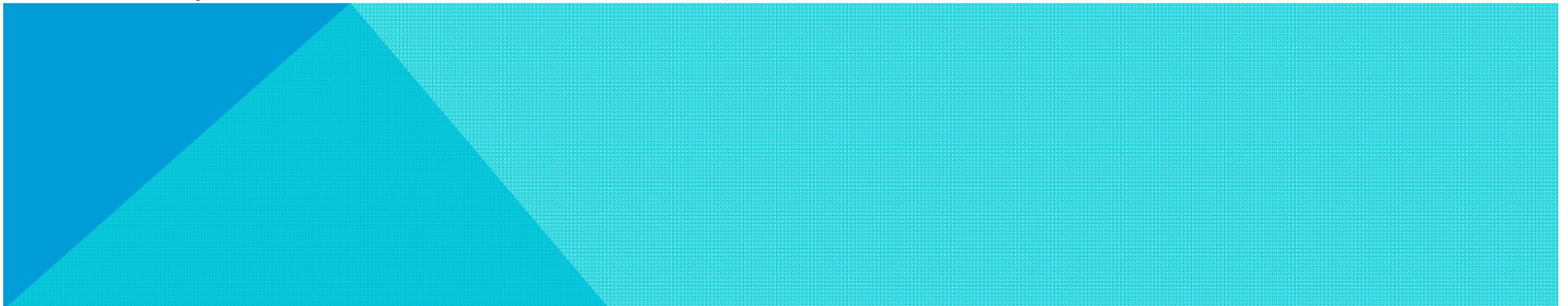
WRAP UP – TAPP EXCEEDED ALL EXPECTATIONS!

- 💧 Public Education and Outreach Programs can be a very Cost Effective Alternatives to Structural BMPs .
- 💧 Residents Want to Help (Consider Rain Gardens etc>).
- 💧 Success can Motivate Other Options (Ordinances etc.).
- 💧 Performance Monitoring is Essential to Demonstrate Effect on WQ & \$\$\$ Saved .



THE TAPP TEAM

- 💧 Cynthia Barber COT Environmental Policy & Energy Resources
- 💧 John Buss COT Water Resources Engineering
- 💧 John Cox COT TAPP Project Manager
- 💧 Michelle Bono COT Communications
- 💧 Katie Hallas TAPP Project Coordinator
- 💧 Koren Taylor COT Environmental Policy & Energy Resources
- 💧 Ken Ivey COT Stormwater GIS
- 💧 Rick Oppenheim RB Oppenheim Associates
- 💧 Gary Yordon The Zachary Group/Governance, Inc.
- 💧 Anneliese Oppenheim Oppenheim Research, Inc.
- 💧 Steve Shafer JSS Enterprises
- 💧 Maria Balingit Maria Balingit Designs
- 💧 Nancy Miller COT Commissioner





Questions

