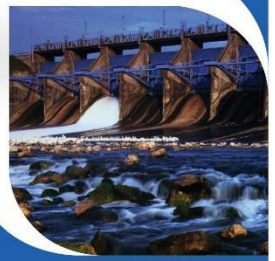
Lake Arlington-Village Creek Watershed Protection Plan Development

Aaron Hoff

Trinity River Authority

December 10, 2015



Trinity River Authority of Texas

Enriching the Trinity basin as a resource for Texans

Meeting Overview

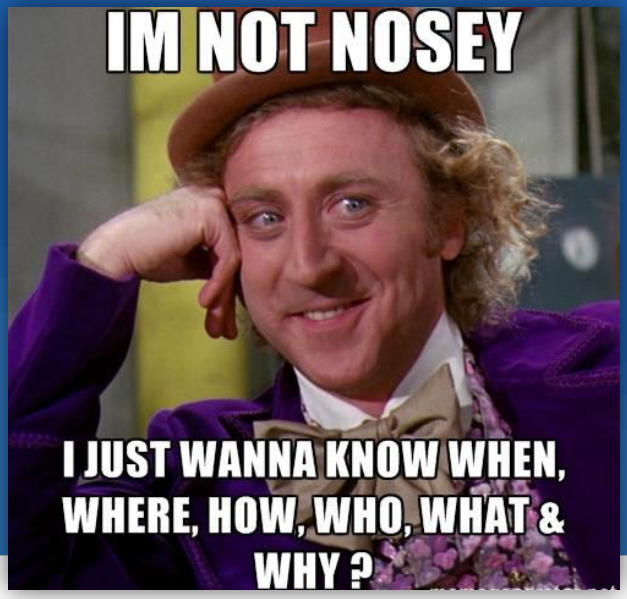
- Evolving into a Watershed Protection Plan
  - Joe Gildersleeve, City of Arlington – Environmental Health Specialist
- Building a Watershed Protection Plan
  - Faith Hambleton, Texas Commission on Environmental Quality - Nonpoint Source Team
- Water Quality in the Lake Arlington/Village Creek Watershed
  - Angela Kilpatrick, Trinity River Authority - Clean Rivers Program

Meeting Overview

- Stakeholder Involvement
  - Aaron Hoff, Trinity River Authority – Watershed Coordinator
- Tentative Monitoring Approach
  - Kelly McKnight, Trinity River Authority – Clean Rivers Program
- Upcoming Events and Path Forward
  - Aaron Hoff, Trinity River Authority – Watershed Coordinator
- Open Discussion and Closing Comments

Introductions

- What's your name?
- Where do you live or work?
- What's your affiliation (landowner, city staff, agency, industry, etc.)?
- What do you expect to get out of the meeting today?



http://www.trinityra.org/lakearlingtonvillagecreek

Basin Planning

Lake Arlington-Village Creek

The Lake Arlington-Village Creek watershed begins at Village Creek's headwaters near the town of Joshua in northern Johnson County, extending approximately 35 miles before emptying into Lake Arlington in southeastern Tarrant County. On its journey, Village Creek passes through a patchwork of urban and rural areas including Burleson, Kennedale, and Fort Worth, while the shores of the Lake itself are shared by Fort Worth and Arlington. Urban areas dominate the northern end of the watershed, with a few industrial and municipal complexes near its center, and trending more towards agricultural use in the southern extent.

Village Creek is currently listed as an impaired water body on the Texas Commission on Environmental Quality (TCEQ) *2010 Texas Integrated Report of Surface Water Quality*, which indicates that Village Creek is not meeting the designated contact recreation use standard due to elevated levels of bacteria. High concentrations of a monitored, non-pathogenic strain of *E. coli* in water bodies like Village Creek may indicate elevated levels of other pathogenic strains that may be a danger to human health. While it is not currently listed as impaired, Lake Arlington was included in the *2012 Integrated Report* for nitrate and chlorophyll-a concerns.

In December 2009, the City of Arlington began putting together a long-term plan that would guide growth and development around the Lake. Under the guidance of this Lake Arlington Master Plan (LAMP), several studies have already been conducted for various water quality constituents, with several best management practices recommended as results. The recommendations of the LAMP are intended to address watershed protection elements that are not addressed by Federal or State regulations, recommendations which will be studied for feasibility through the development of a watershed protection plan (WPP) for the Lake Arlington-Village Creek watershed. This plan will be a stakeholder-driven process that will incorporate water quality data studies with local knowledge and participation to create watershed-specific strategies that will best protect water quality of Lake Arlington and Village Creek while meeting the socio-economic needs of those that live, work, and play in the watershed.

For more information about the watershed protection planning process, see the TCEQ's Nonpoint Source Water Pollution Management website.

Basin Planning
History of Water Quality
Clean Rivers Program
Reports
Region C Water Planning
Lake Arlington-Village Creek

Point of Interest

The segment of the Trinity River between Lake Ray Roberts and Lake Lewisville is well known as an excellent location for canoeing.

Funding Source

Funding provided by the Texas Commission on Environmental Quality through a Clean Water Act Section 319(h) grant from the U.S. Environmental Protection Agency, with match funding from the City of Arlington and in-kind contributions from TRA.

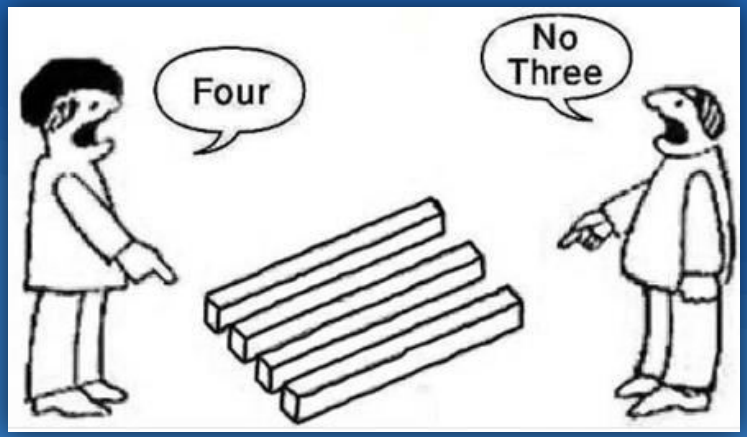
ARLINGTON
THE AMERICAN DREAM CITY

TCEQ

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Ground Rules for Discussion Periods

- Please save questions until after each presentation has been given
- Limit discussion to 5 minutes per person
- Any additional questions may be answered during the open discussion period at the end
- Please be respectful of others' time and points of view



Questions?

http://www.trinityra.org/lakearlingtonvillagecreek

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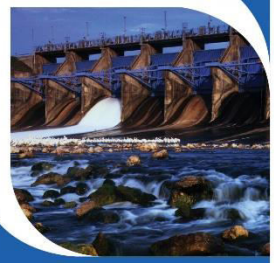
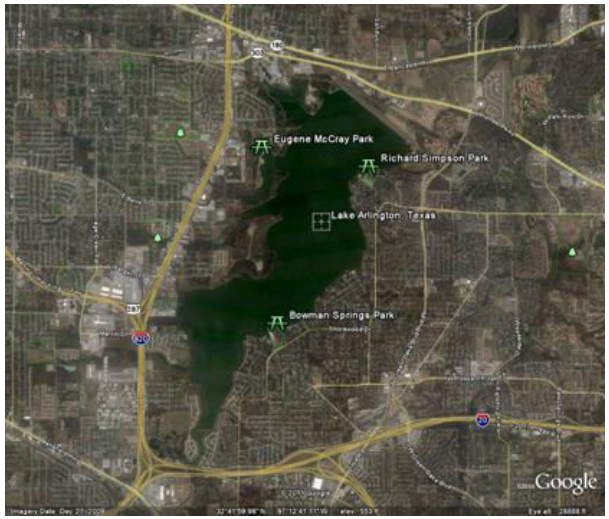


Evolving into a Watershed Protection Plan



Joe Gildersleeve
City of Arlington
Water Resource Services Manager
Office 817-459-5892
joe.gildersleeve@arlingtontx.gov

Lake Arlington Water Supply

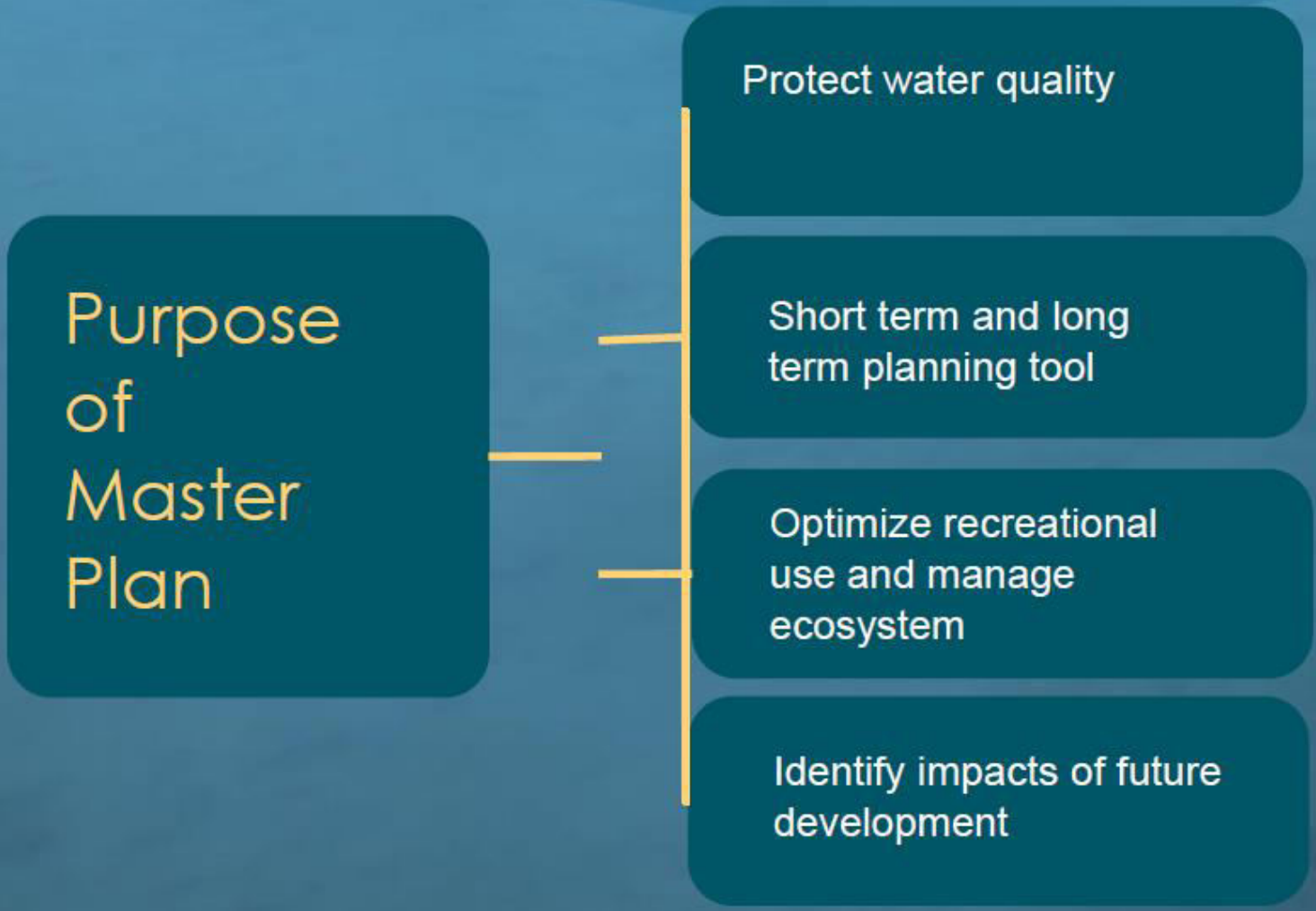
Protect the water resource

Issues and concerns:

- Drinking Water Quality
- Natural Gas Well Drilling
- Lakes capacity to support boating and recreation
- Fishing and Wildlife
- Standards for Docks, Piers
- Dredging
- Increased Water Treatment Cost

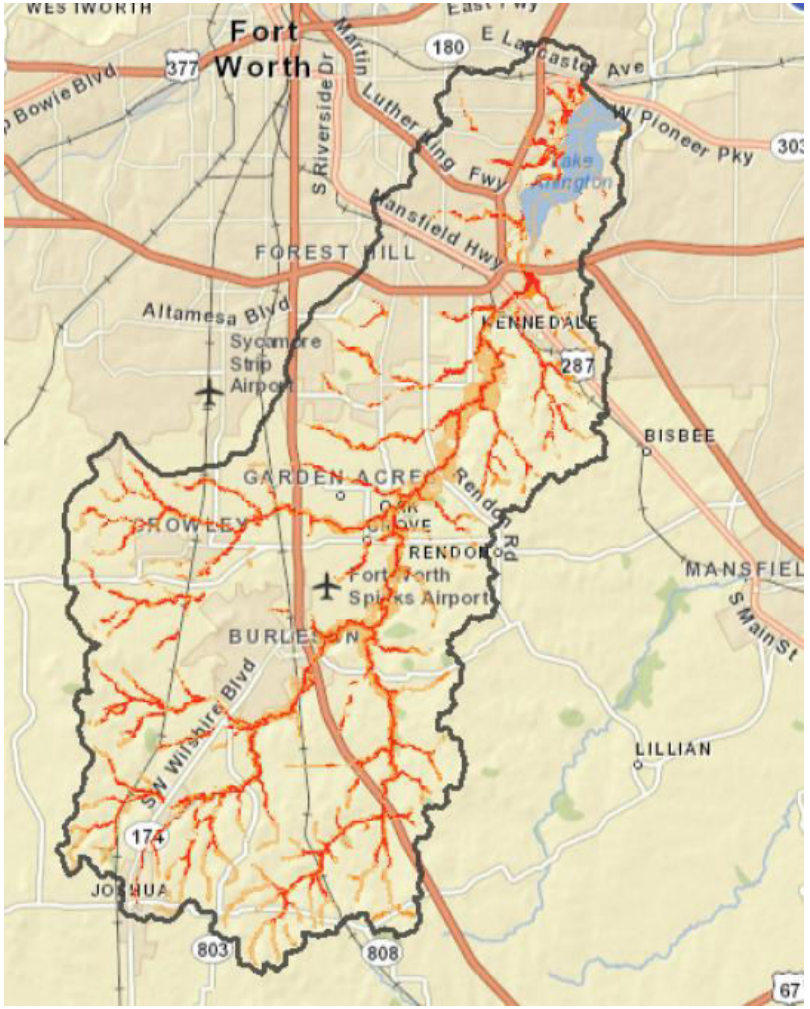
Lake Arlington Master Plan

Purpose of Master Plan



From the Lake to the Watershed

- Protecting the Lake means protecting the Watershed
- Main tributary listed on 303(d) list as impaired for bacteria
- Rapid development within watershed
- Watershed is outside our purview—partnerships are absolutely necessary to our success

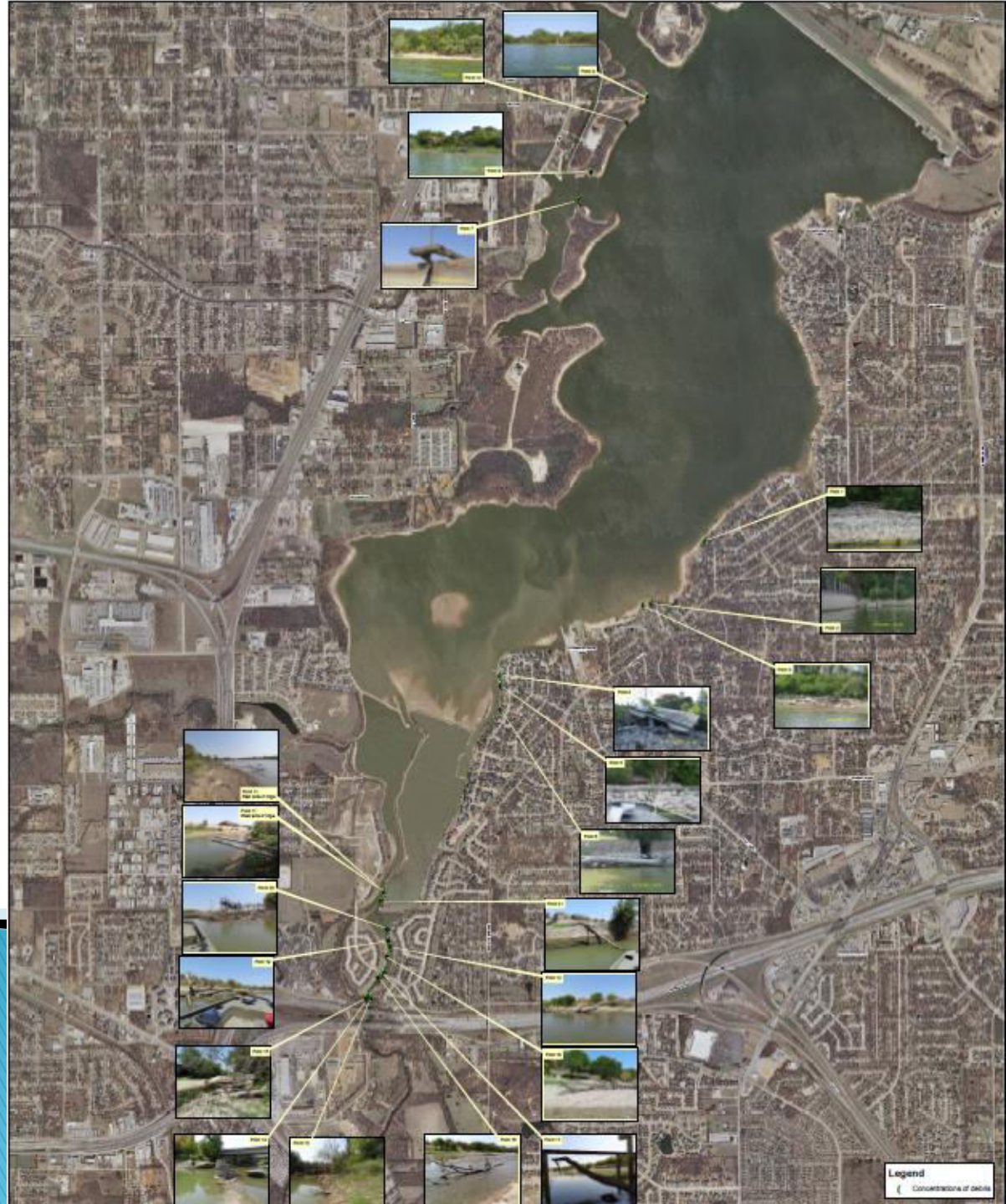


Why not create a watershed protection plan?

- Voluntary, not regulatory
- 319 Grant Funding Available
- **Stakeholder driven decision-making**

Watershed Protection Plan

Opens Grant Funding Opportunities for Actionable Projects?



Building A Watershed Protection Plan

"Restore and Protect Our Waters"

Faith Hambleton
Nonpoint Source Program
Texas Commission on Environmental Quality

NPS Program History

- 1987 Clean Water Act §319(h) NPS Grant Program
- **Purpose** – Implement the State's program for managing NPS pollution
- Prioritize funding for:

  Development and implementation of watershed based plans in impaired waterbodies

NPS Management Program in Texas Funded by CWA §319(h)

- TSSWCB (50% of funds)
  - Silviculture
  - Agriculture

- TCEQ (50% of funds)
  - Urban
    - Work that is not covered in the MS4 management plans
  - Rural
    - Non-silvicultural activities
    - Non-agricultural activities

Project Funding

Solicit projects via Request for Grant Funding

- 60% – Provided by EPA (federal)
  - Through the State NPS Program
- 40% – Must be matched (non-federal)
  - State or local funds
  - In-kind services
  - Salaries, Volunteer hours

NPS Projects Funded

- Proposed projects should:
  - Characterize watershed and water quality
  - Further identify NPS sources of pollution
  - Develop and Implement NPS BMPs
  - Monitor/Quantify BMP effectiveness
  - Provide NPS education & outreach to public
  - Be sustainable
- Set stage for further fundable projects to implement plan

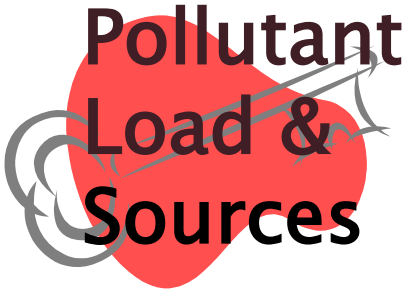
What Is a Watershed-Based Plan ??

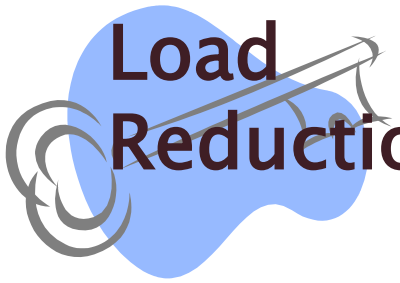
Action plan designed to protect priority waters or restore waters already impaired by pollutants.

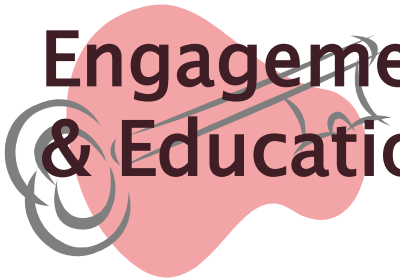
Required by the EPA to have a WBP to be eligible for a large portion of 319 Grant funds.

Specific components (9 Elements) required in WBP's.

Nine Key Elements

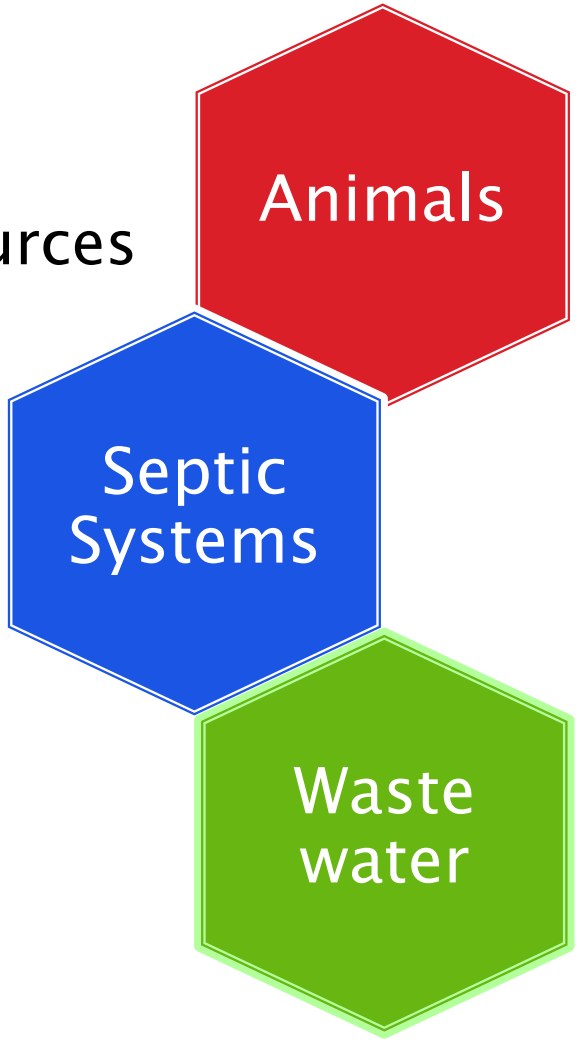






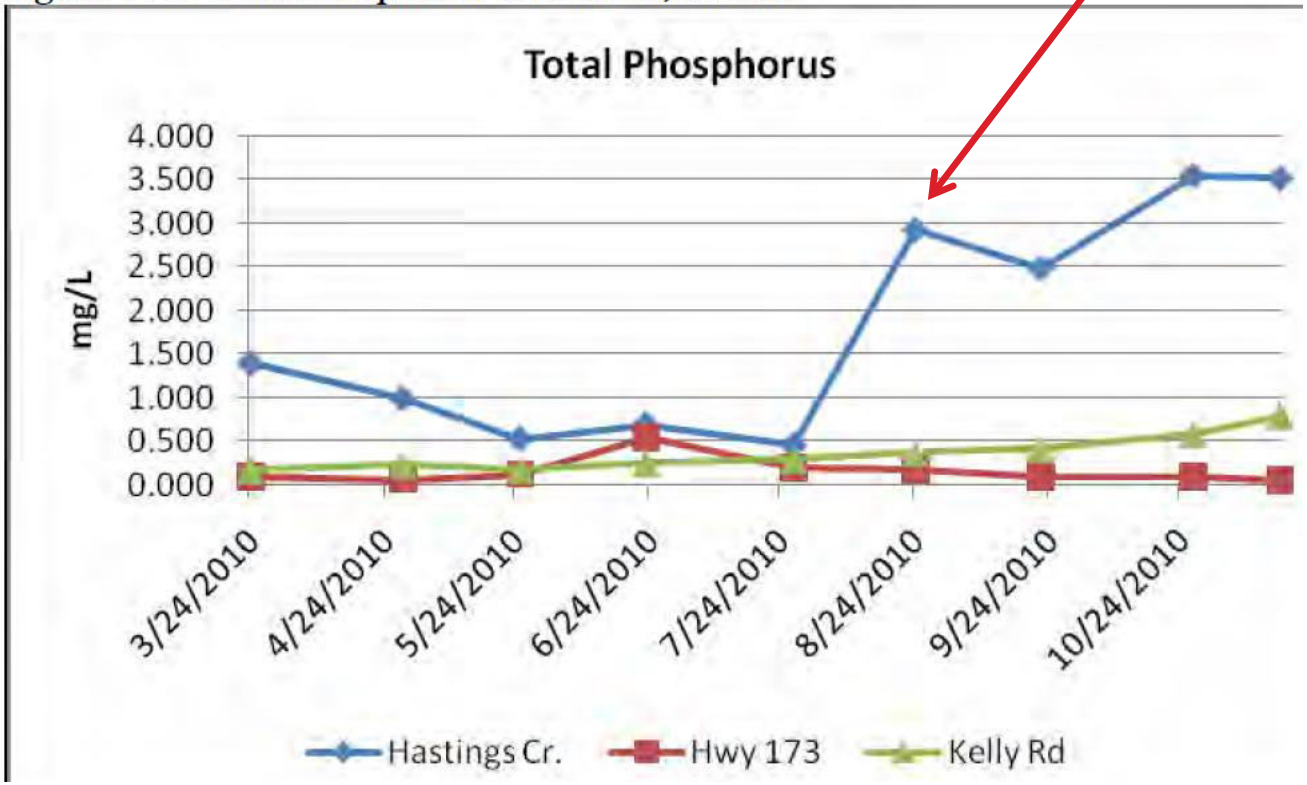
Pollutant Loads/Reduction

- In-stream Pollutant loads
  - Measured in the field
  - Combined pollutant load from all sources
- Watershed Source loads
  - Where is pollution coming from?
  - Determine:
    - Type of source
    - Number of sources
    - Location of sources
    - Pollutant loading per source unit

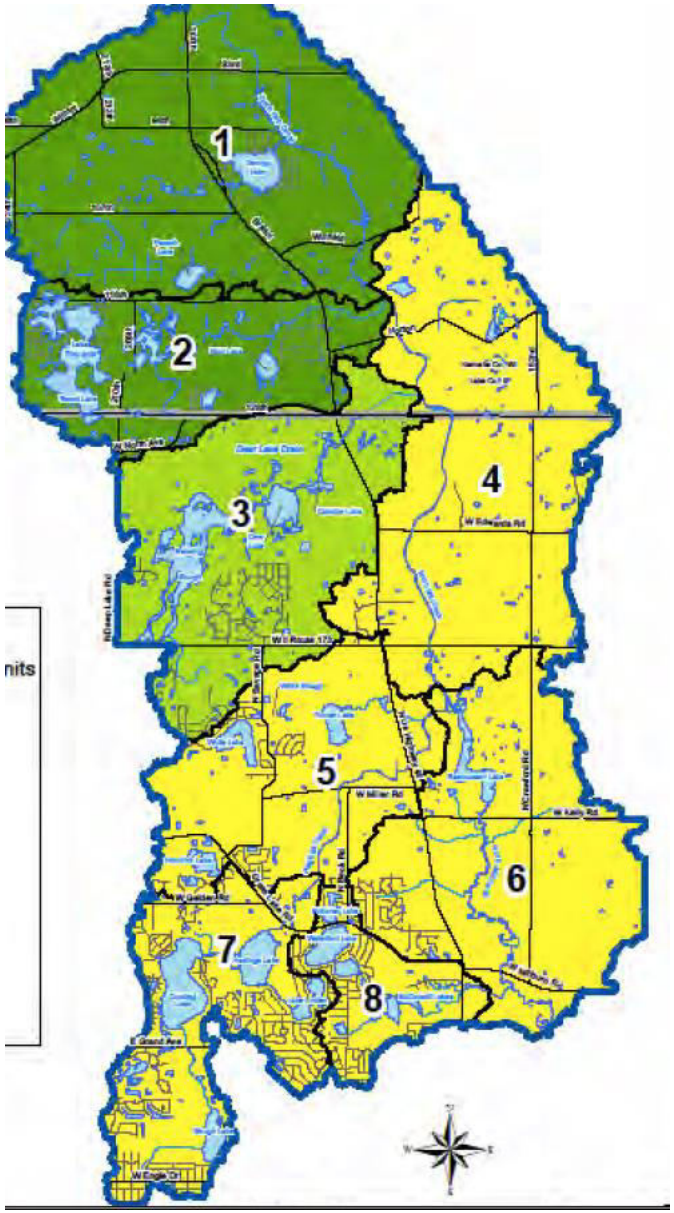


What's happening In stream ??

Figure 4-7b: Total Phosphorus 2010 levels, streams



Determine types of landcover and uses in the watershed.

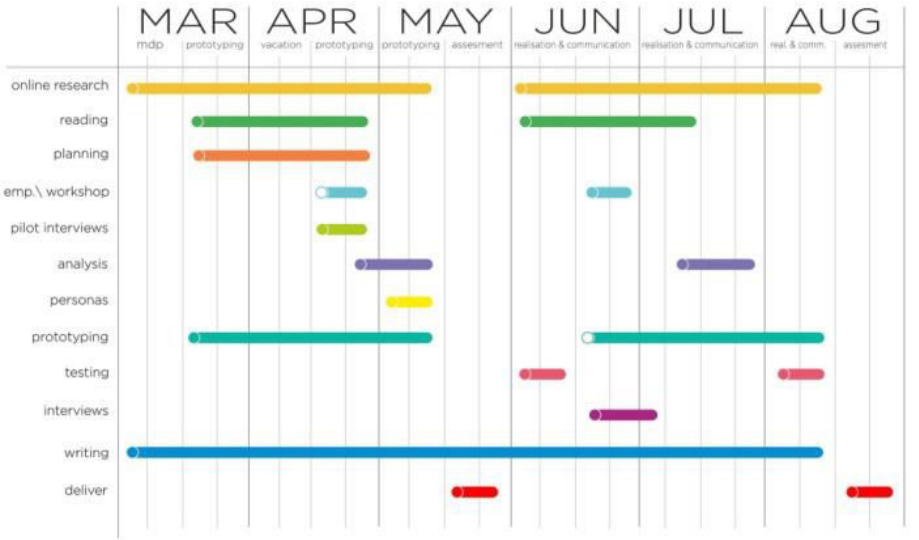


Best Management Practices

- Actions that reduce pollution
- Tested practices with quantifiable results
- No overlap with MS4 activities allowed

Schedule for Implementation

- Basic timeline
- Responsible party
- Take into account when $ will be available

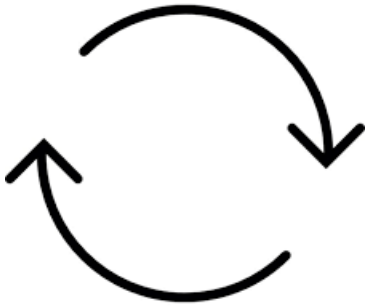


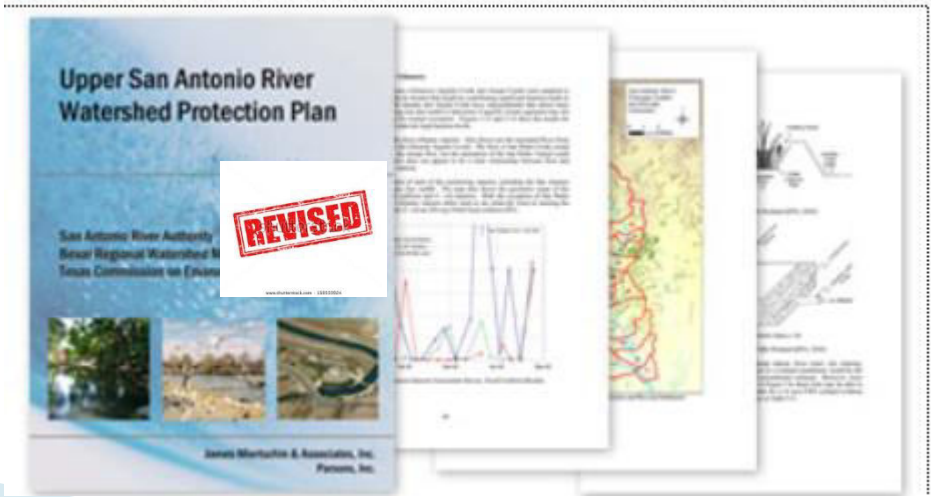
Monitor Progress

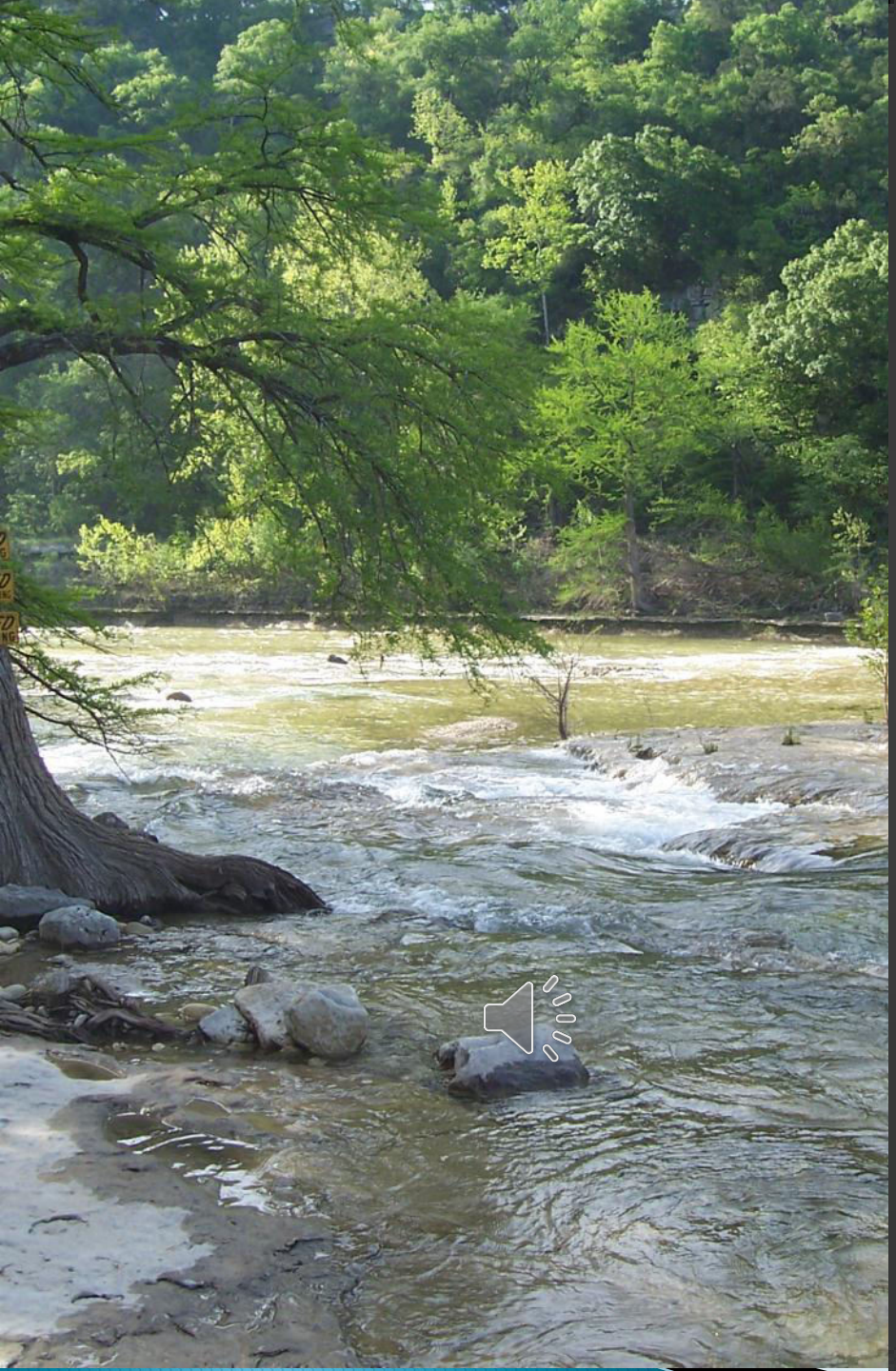
- Ambient conditions (concentrations at index sites)
- Structural BMP performance can be estimated or determined via targeted monitoring
- Education/outreach – successful?
- Milestones achieved

Adaptive Management

- Sustainable group to implement plan
- Reconvene stakeholders; check progress
- Apply for funding
- Revise WBP strategies, modify plan







Faith Hambleton

Nonpoint Source Program

nps@tceq.texas.gov

512-239-1764

Take Care of Texas

TakeCareOfTexas.org

A. Pollutant sources needing control – as a fraction of all sources, quantified

B. Load reduction estimates by BMP type

C. BMP (management measure) descriptions

D. Resources needed to implement plan

E. Information/education component (stakeholder leadership as well as education)

F. Schedule for implementing measures (BMPs) identified

G. Interim implementation milestones

H. Criteria for determining load reduction success and for determining need for revision of plan if not successful

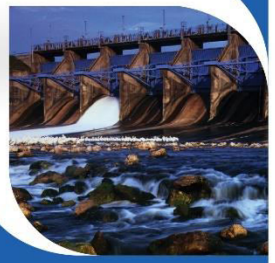
I. Monitoring component to test success

Water Quality in the Lake Arlington/Village Creek Watershed

Angela Kilpatrick

Trinity River Authority

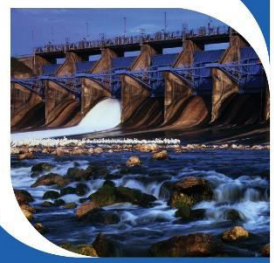
December 10, 2015



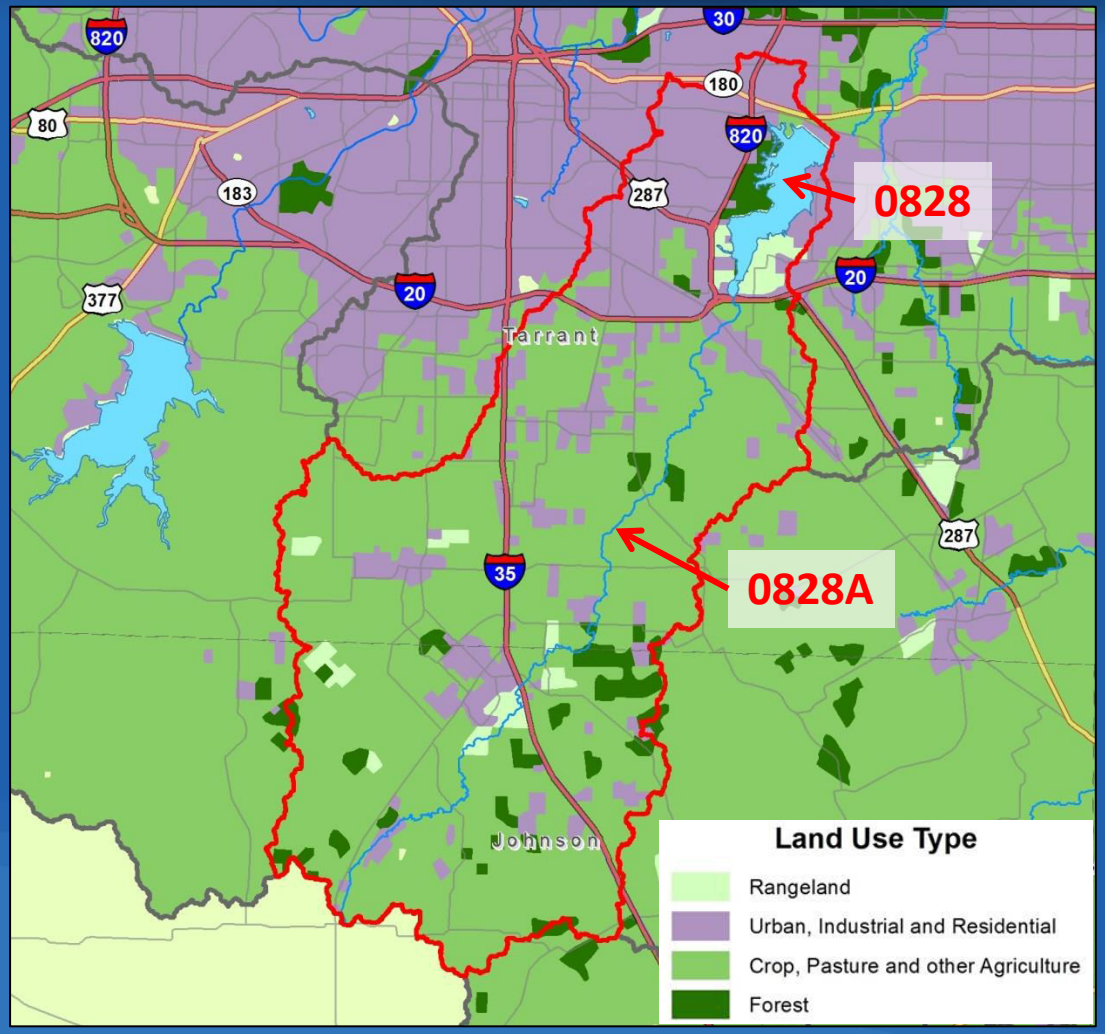
Trinity River Authority of Texas

Enriching the Trinity basin as a resource for Texans

Watershed Overview



Village Creek Watershed

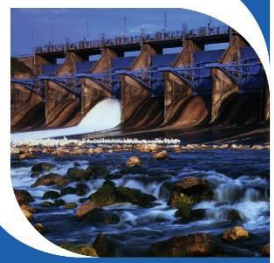


- 28 river miles
- 143 square miles
- Supplies water to City of Arlington, portions of Tarrant County
- Imports from Cedar Creek and Richland-Chambers Reservoirs

Permitted Dischargers

County	Cooling Water	Domestic Sewage <1 mgd	Mining	Stormwater	Wastewater >1 mgd	CAFO	Total Dischargers
Johnson		5					5
Tarrant		1			1		2
Total		**6**			**1**		**7**

TCEQ Integrated Report



TCEQ Integrated Report

- "Describes the status of Texas' natural waters based on historical data"
- Lake Arlington
  - Primary contact recreation use – swimmable
  - High aquatic life use – fishable
  - Public water supply use – finished drinking water
- Standards
  - Numeric criteria approved by EPA
- Screening levels
  - Numeric criteria for water quality concerns
  - Numeric criteria that support narrative criteria
  - chlorophyll-a and nutrients
  - 85th percentile of historic data

0828A-Village Creek

- Intermittent with pools
- Limited use designation based on flow type

Use	Level of Support
Contact Recreation	**Not Supporting[1]**
Fish Consumption	Fully Supporting
Aquatic Life	Fully Supporting
General	No Concern

1. 25 samples – 302.36 geomean. 5c-Additional data and information will be collected before a TMDL is scheduled.

0828-Lake Arlington

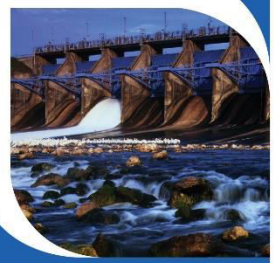
- Reservoir
- High use designation based on TWQS Appendix A

Use	Level of Support
Contact Recreation	Fully Supporting[1]
Fish Consumption	Not Assessed-Inadequate Data
Public Water Supply	Fully Supporting
Aquatic Life	Fully Supporting
General	**Screening Level Concern[2]**

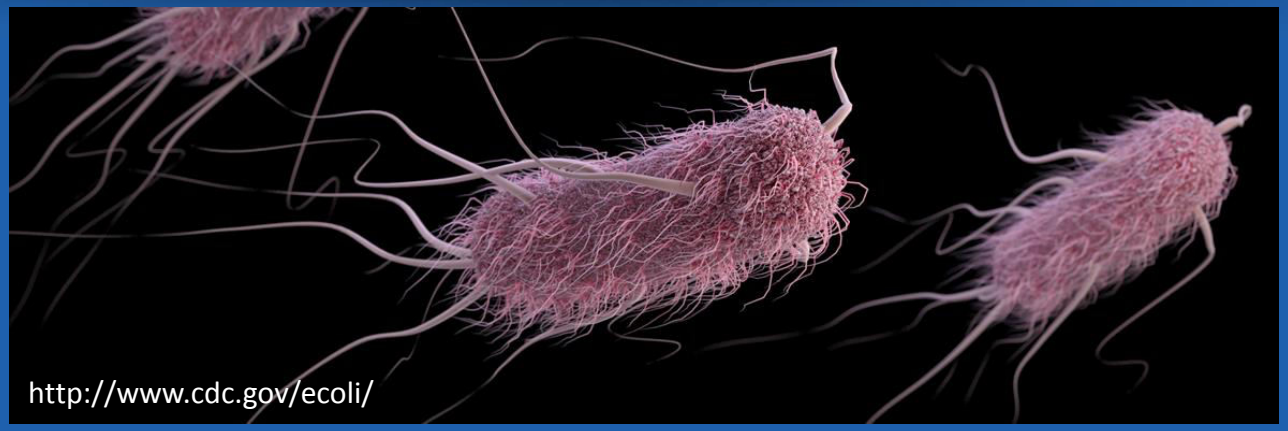
1. Contact Recreation
- 0828_07 – Uppermost portion of lake – 24 samples – 108.2 geomean
- 0828_06 – Eastern half of upper portion of lake – 33 samples – 8.0 geomean
- 0828_05 – Western half of upper portion of lake – 23 samples – 17.1 geomean
- 0828_02 – Lowermost portion of lake along eastern half of dam – 58 samples – 5.2 geomean

2. General
- 0828_06 – Eastern half of upper portion of lake – chlorophyll-a – 31 samples & 19 exceedances
- 0828_05 – Western half of upper portion of lake – chlorophyll-a – 14 samples & 10 exceedances
- 0828_02 – Lowermost portion of lake along eastern half of dam – chlorophyll-a – 30 samples & 19 exceedances
- 0828_07 – Uppermost portion of lake – nitrate– 20 samples & 9 exceedances

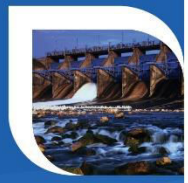
Data Review



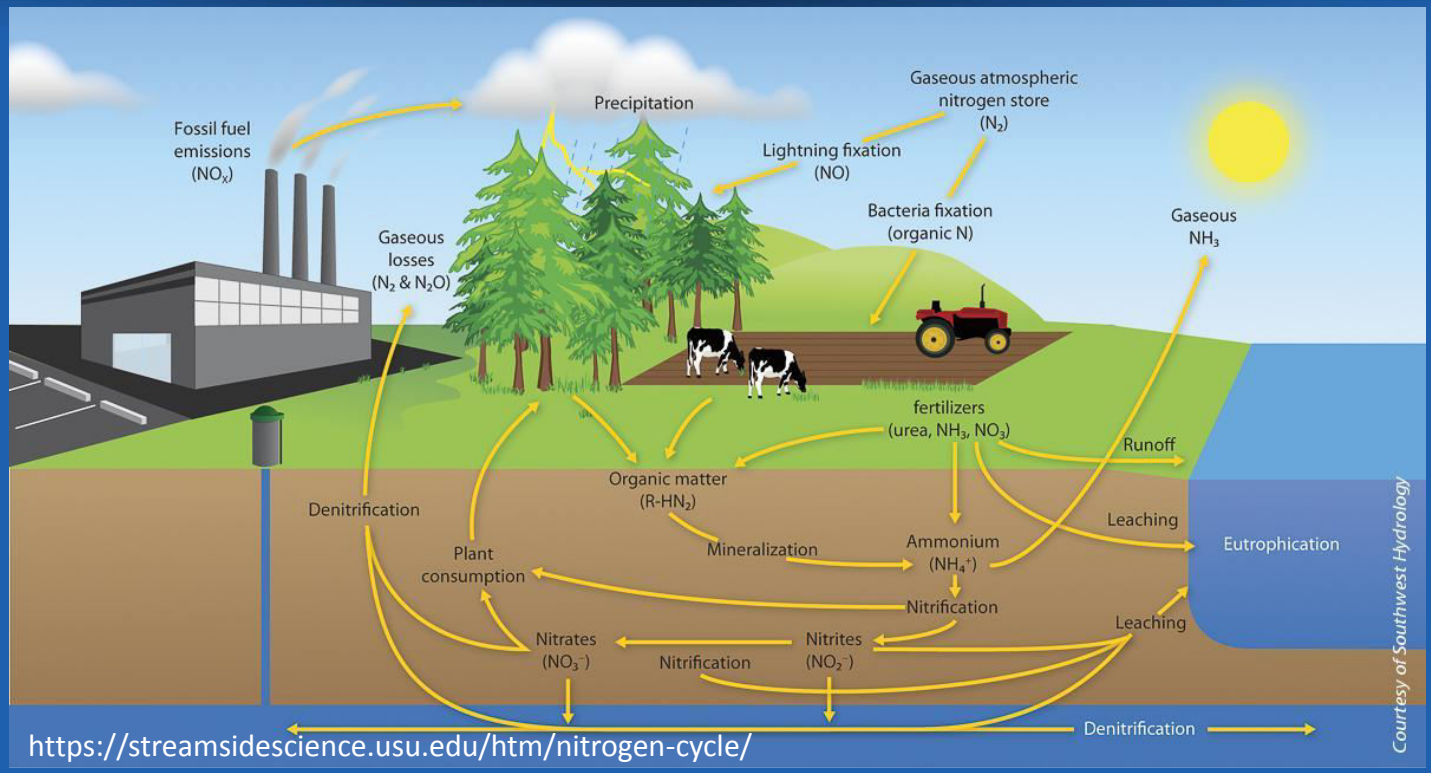
Escherichia coli (E. coli)



- Found in intestines of warm-blooded animals.
- Most strains are harmless.
- Used as indicator bacteria.

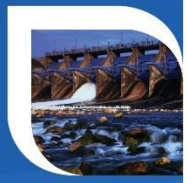


Nitrate

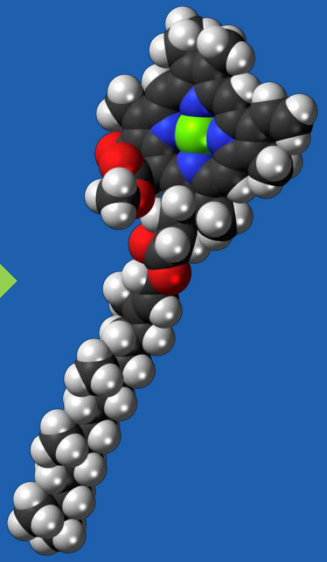


https://streamsidescience.usu.edu/htm/nitrogen-cycle/

- Common source - fertilizers.
- Oxidation of Ammonium to Nitrite and Nitrite to Nitrate by ammonia-oxidizing bacteria.
- Can cause health issues in **finished drinking water**.

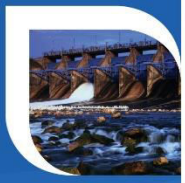


Chlorophyll-a

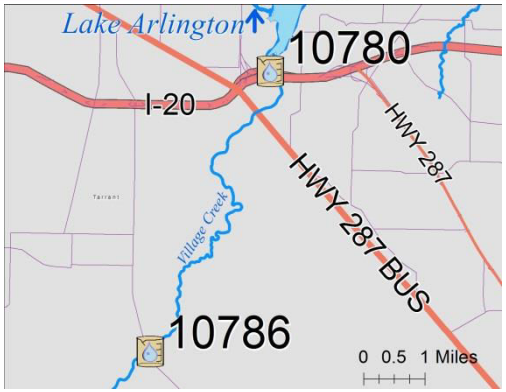


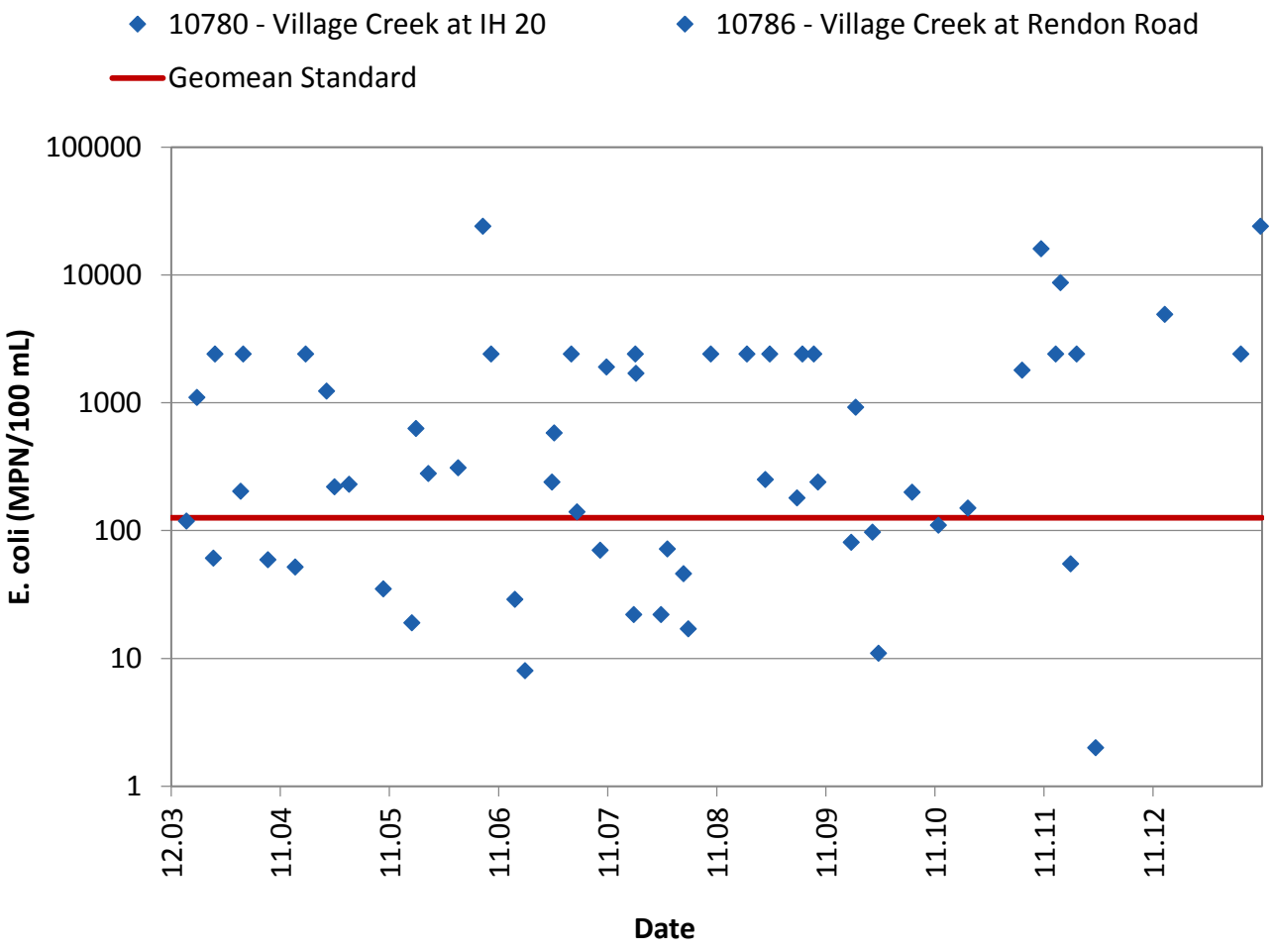
https://en.wikipedia.org/wiki/Chlorophyll_a

- Photosynthetic molecule in most algae and plants.
- Surrogate for algal growth.
- Algal blooms can cause water quality issues.

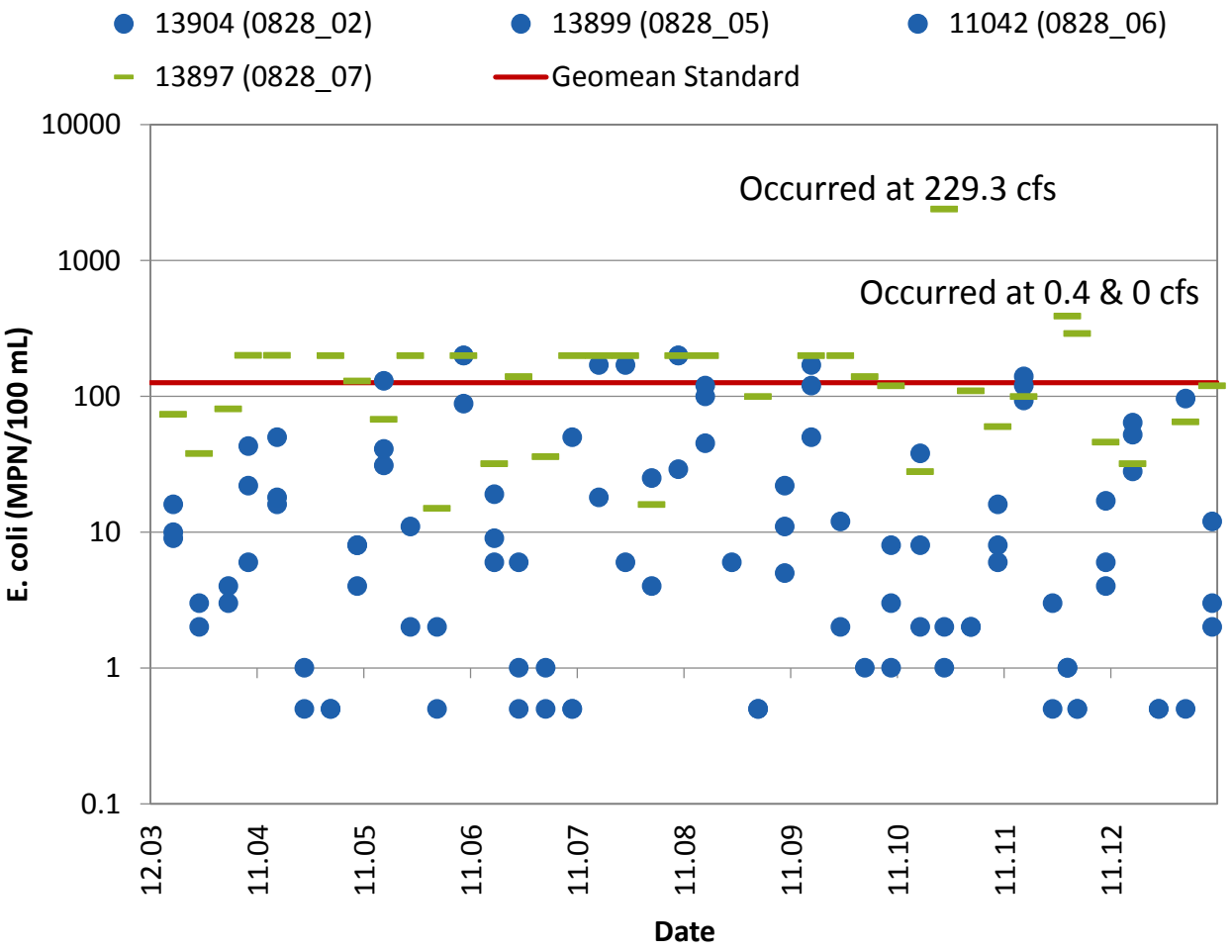


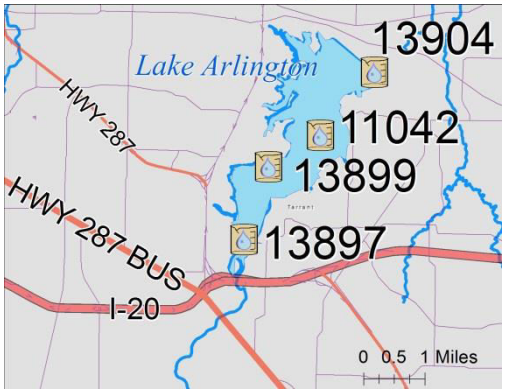
0828A Village Creek *E. coli*





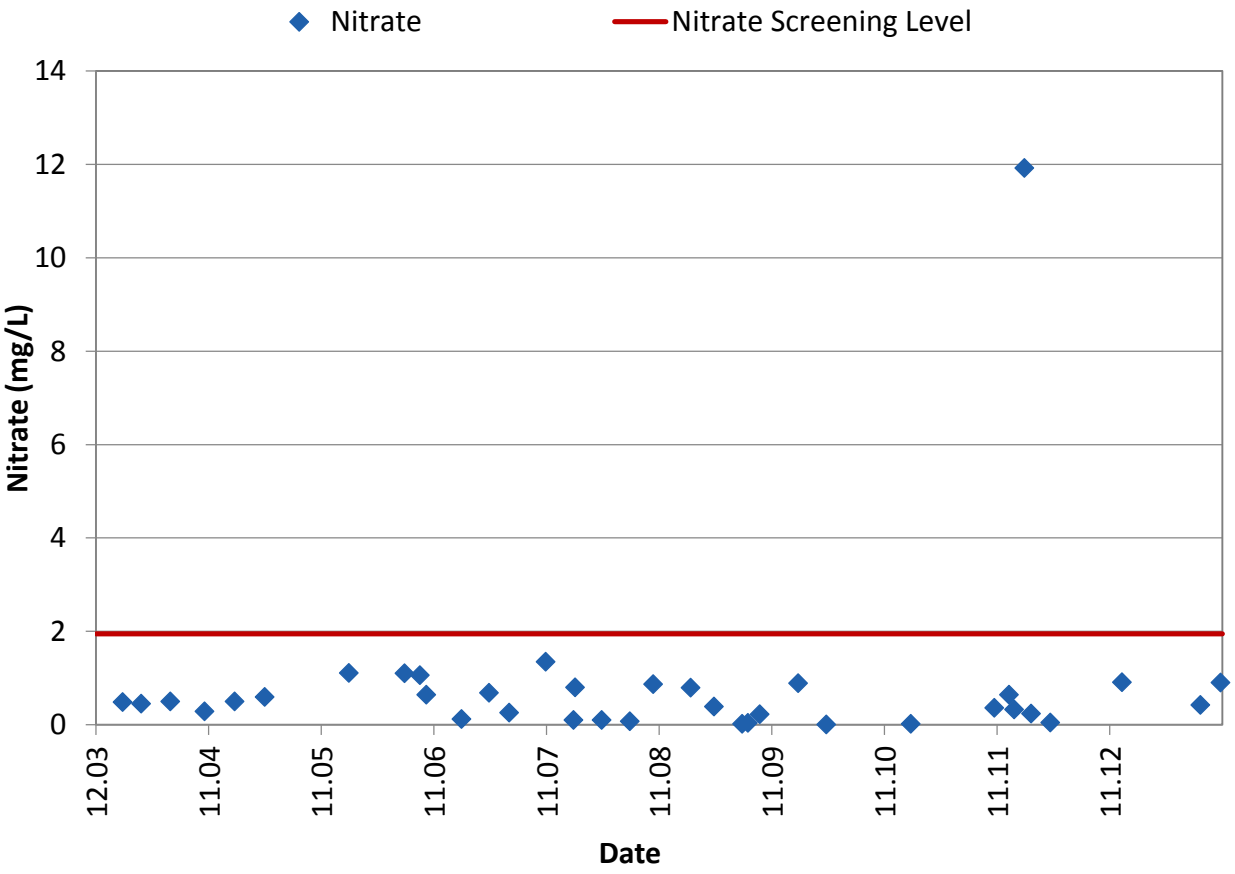
0828 Lake Arlington *E. coli*

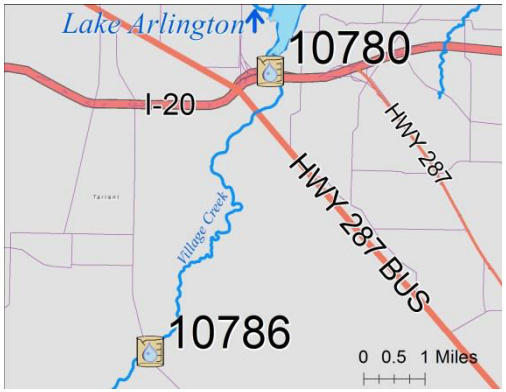




0828A Village Creek Nitrate

- Screening level = 1.95 mg/L

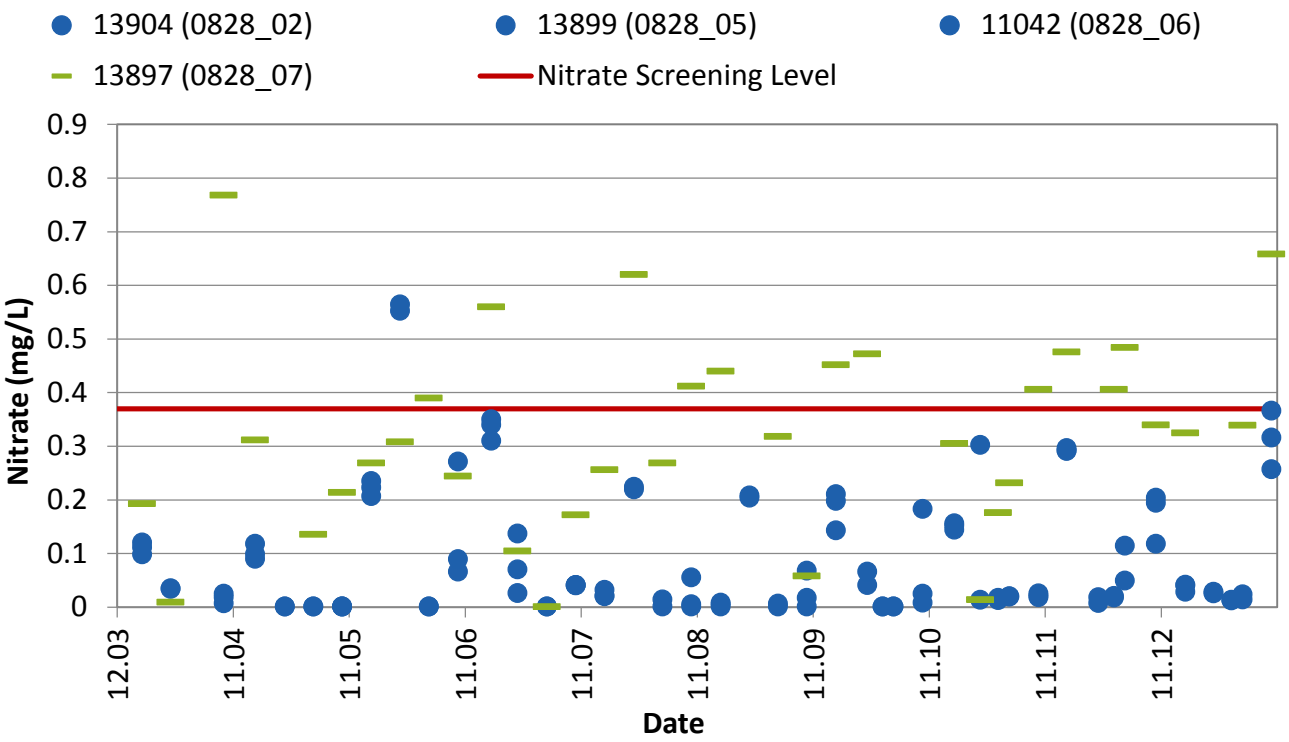


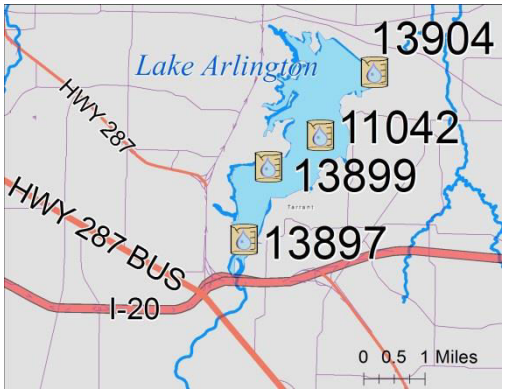


- Average = 0.81 mg/L

0828 Lake Arlington Nitrate

- Screening Level = 0.37 mg/L

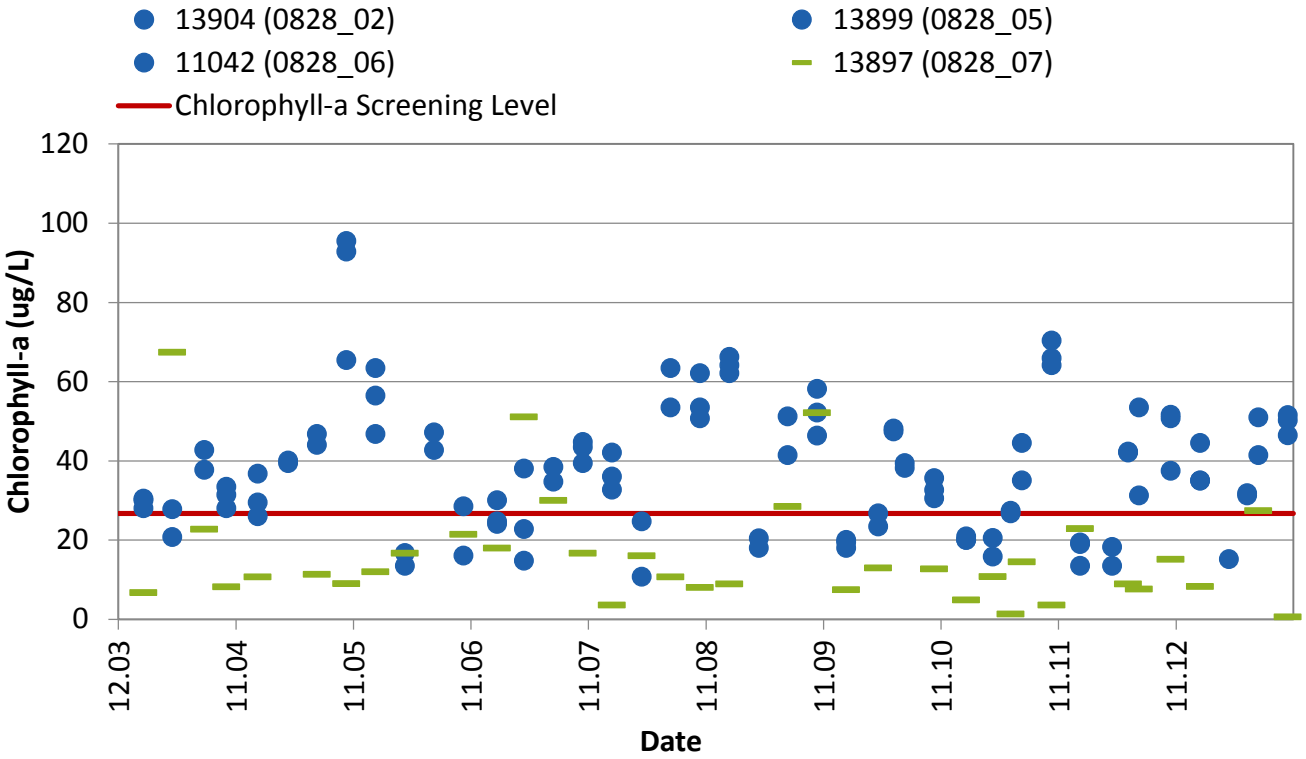


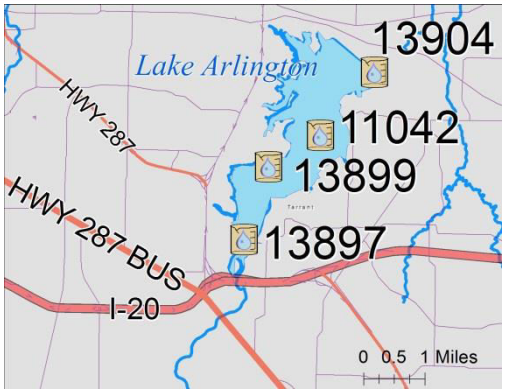


- Averages
  - 13904 = 0.09 mg/L
  - 13899 = 0.11 mg/L
  - 11042 = 0.09 mg/L
  - 13897 = 0.32 mg/L

0828 Lake Arlington Chlorophyll-a

- Screening Level = 26.7 ug/L

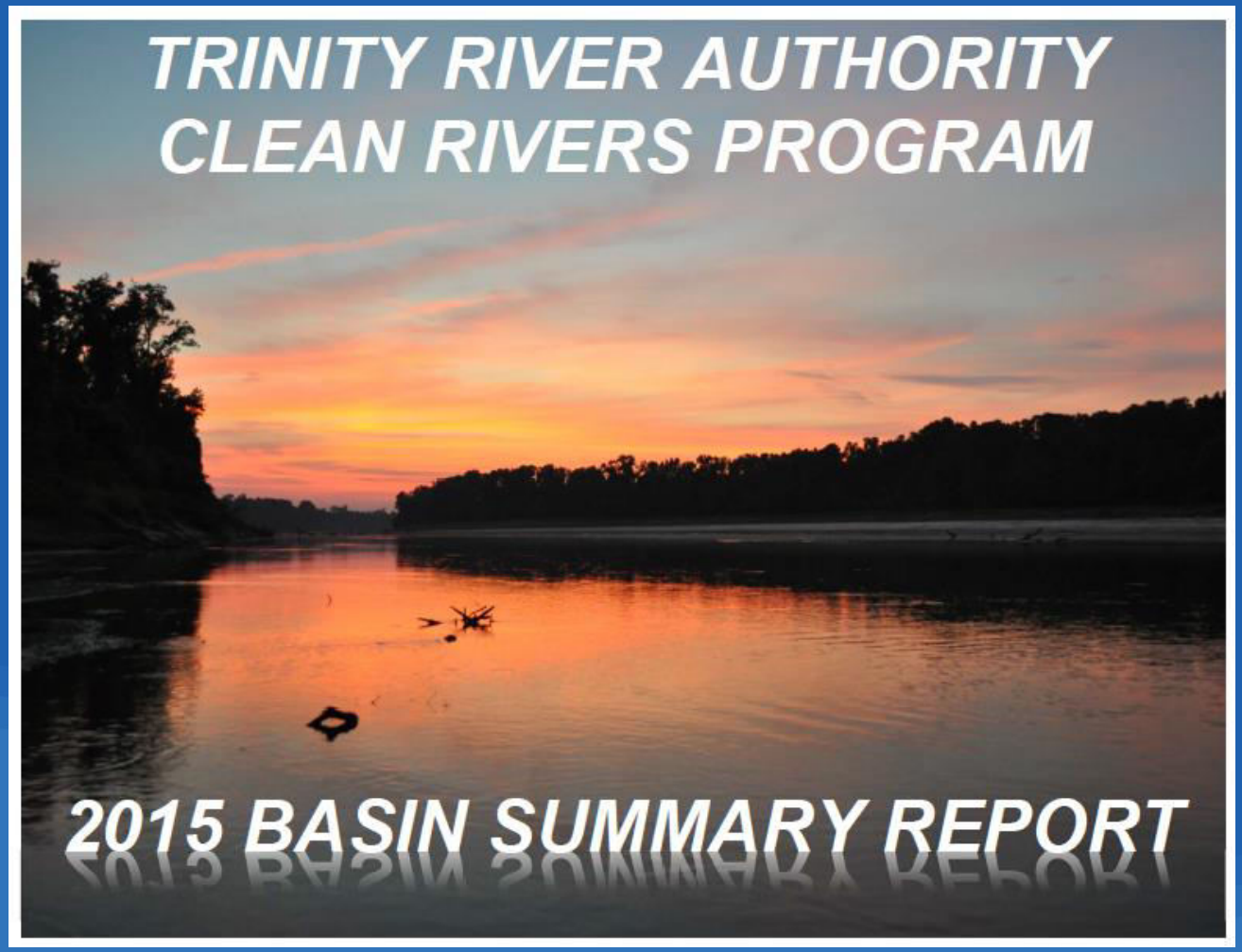




- Averages
  - 13904 = 36 ug/L
  - 13899 = 41.5 ug/L
  - 11042 = 38.1 ug/L
  - 13897 = 16.4 ug/L

2015 Basin Summary Report

http://serv.trinityra.org/reports/BasinSummaryReports/Final2015TRABSR.pdf



Questions

Angela Kilpatrick
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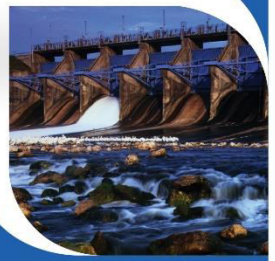
Lake Arlington-Village Creek Watershed Partnership

Aaron Hoff
Trinity River Authority
December 10, 2015



Trinity River Authority of Texas
Enriching the Trinity basin as a resource for Texans

Who is a stakeholder?

- A stakeholder is anyone who:
  - Makes and implements decisions
  - Is affected by those decisions
  - Participates in the planning process
    - Assisting with implementation
    - Impeding the process
  - **Don't have to live here to be a stakeholder!**

Who is a stakeholder?

- Citizens/citizen groups
- Community/religious organizations
- Local businesses & industries
- Landowners
- Local government staff & officials
- Academia
- NGOs
- Environmental/conservation groups

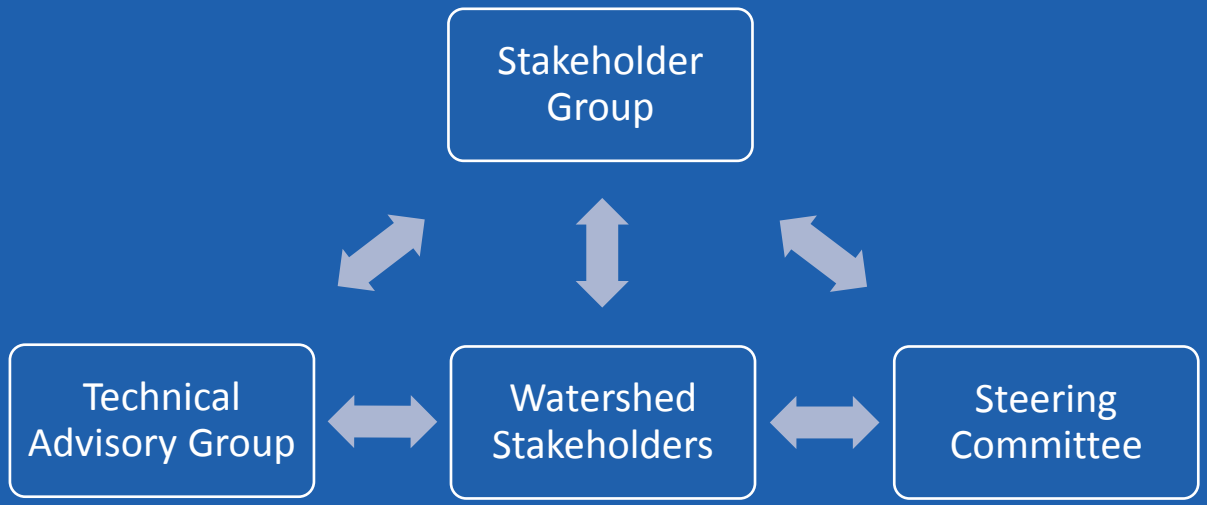
Why is stakeholder involvement important?

- It's the key to developing an effective WPP
- Stakeholder representation must be well-distributed
  - Amongst multiple users with varying needs
  - Throughout the entire watershed
- Local knowledge
  - Know the watershed
  - Know what works, what doesn't

Building the Stakeholder Group

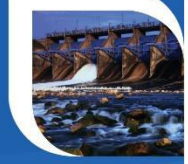
- Increase awareness of the watershed, issues, and planning process
  - Start off with informational meetings
  - Provide informative outreach materials
- Encourage participation
  - Group meetings
  - Steering committees
  - Public feedback
- **GOAL – develop a plan that will drive implementation**
  - Locally-driven and stakeholder supported
  - Improve water quality in Village Creek
  - Protect water quality in Lake Arlington

Proposed Group Structure



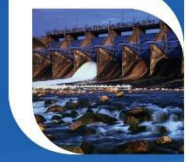
Proposed Group Structure

- Watershed Stakeholders
  - Anyone that is part of the group, regardless of activity level
- Steering Committee
  - Decision makers and voting body
  - Will need to establish a consensus set of ground rules
- Technical Advisory Group
  - State/Federal Agency staff that provide technical guidance, information, and funding opportunities



How can I get involved?

- Attend and participate at public meetings
- Provide feedback during the WPP's public comment period
- Serve as Steering Committee member
  - Vote on important watershed issues
  - Vote on WPP components



The Steering Committee

- Decides what is included in the plan
  - What solutions go into the WPP
  - What components are most likely to achieve those solutions
- Will be asked to agree to and abide by a set of ground rules
- **GOAL – develop a plan that will drive implementation**

Obligations

- Group meetings will be held quarterly
  - Schedule set by the group
- Steering Committee will meet more frequently than Group
  - Schedule will be set by Committee after it has been selected and established
  - Participation is expected for all meetings throughout project duration, planned for August 2018

Steering Committee Formation

- Will be formed during the next Group meeting
- Surveys will be used to solicit participation in the steering committee
- Initial meeting will be held to set ground rules, assess membership and determine if additional participation is required

Stakeholder Feedback

- Please fill out survey provided and turn it in prior to leaving today OR return it to the address provided at the bottom of the survey
- Survey will help us identify key watershed stakeholders to engage for steering committee participation
- Take additional copies to hand out to friends/neighbors that may be interested in protecting the watershed

Questions?

http://www.trinityra.org/lakearlingtonvillagecreek

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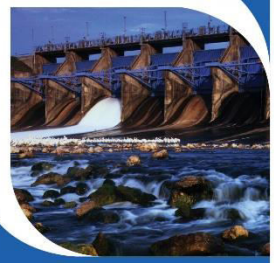
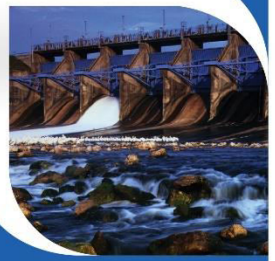


Tentative Monitoring Approach for Lake Arlington and Village Creek

Kelly McKnight

Trinity River Authority

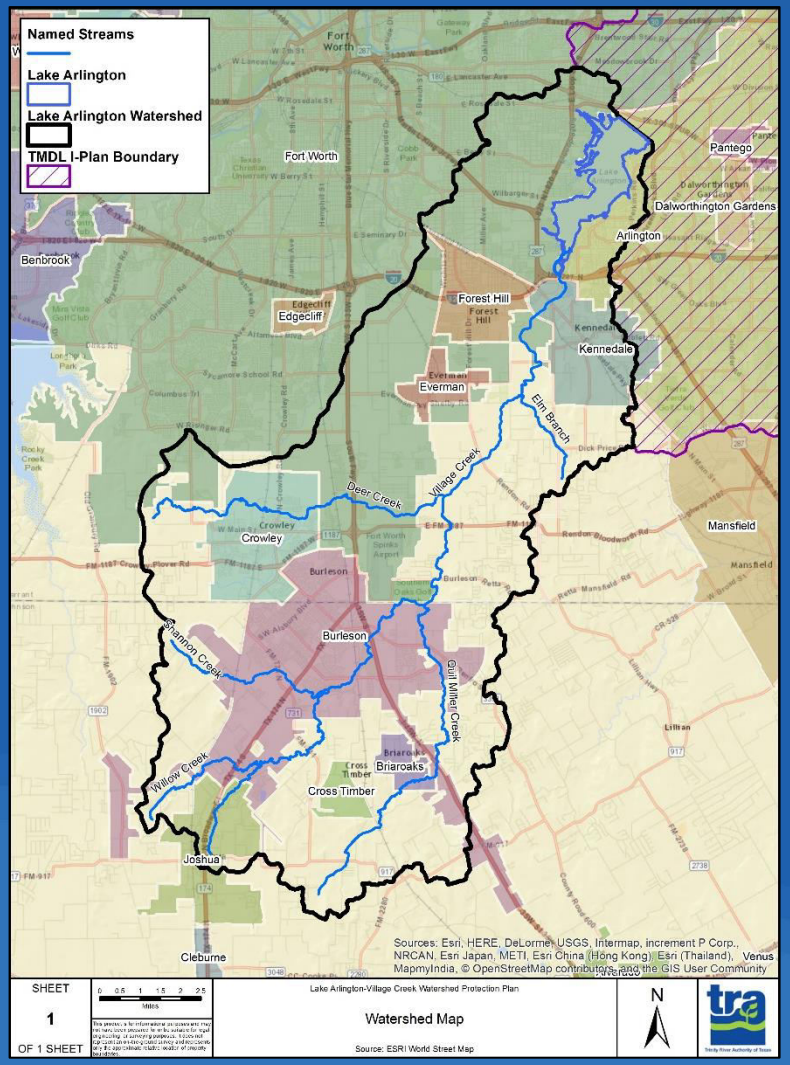
December 10, 2015



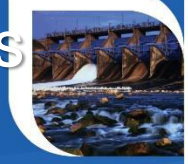
Trinity River Authority of Texas

Enriching the Trinity basin as a resource for Texans

What's in the watershed?



- 91,400 acres
- Village Creek drains to Lake Arlington
- Counties
  - Johnson • Tarrant
- Towns and Cities
  - Joshua • Cross Timber
  - Briaroaks • Burleson
  - Crowley • Everman
  - Forest Hill • Kennedale
  - Arlington • Ft. Worth
- Soil and Water Conservation Districts
  - Dalworth • Johnson



Who’s collecting the samples?

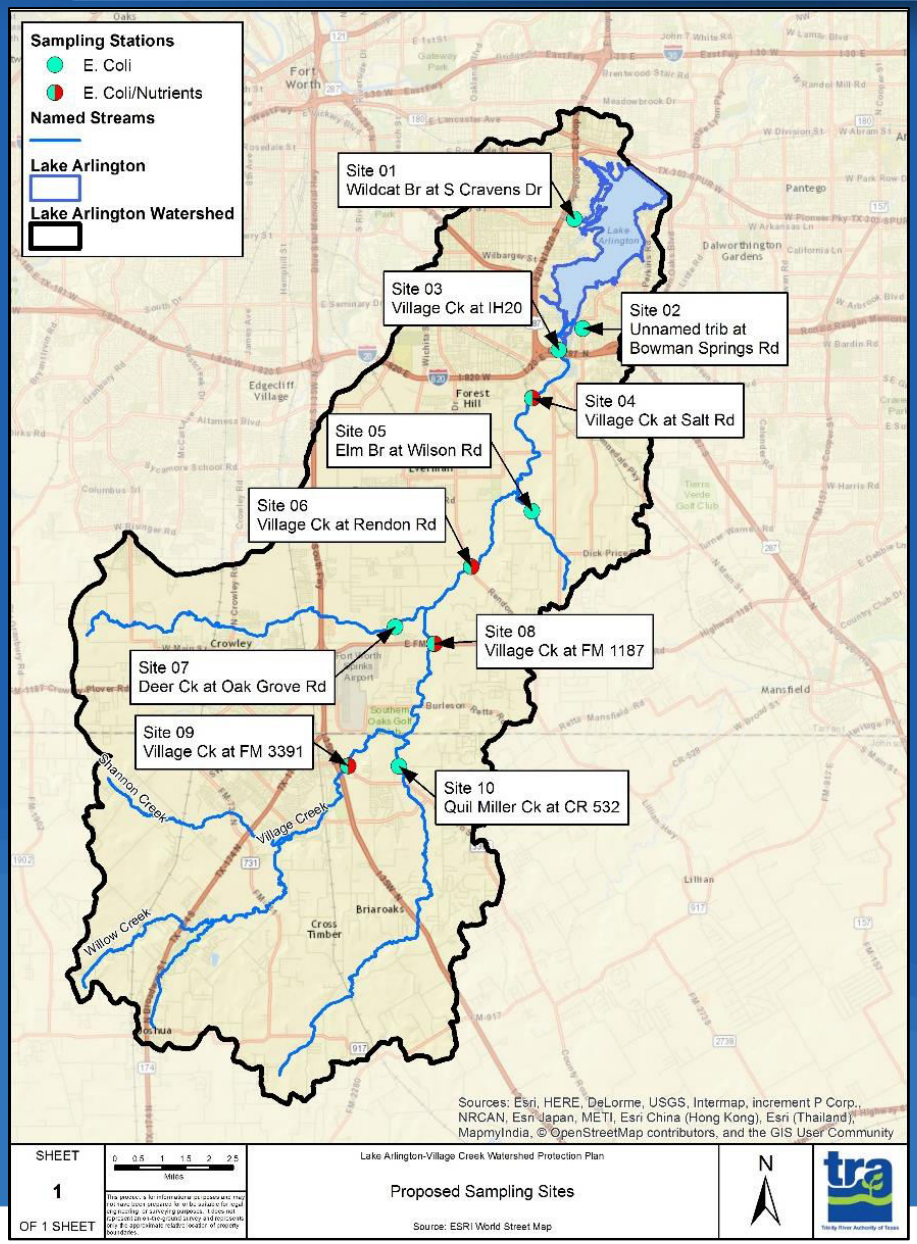
What are we looking for?

- Loadings!
- How do we get them?
  - Collecting flow and water quality samples
    - Parameter concentration x Flow = Loading
- What are the parameters?
  - Bacteria (*E. coli)*
  - Total Suspended Solids (TSS)
  - Volatile Suspended Solids (VSS)
  - Total Dissolved Solids (TDS)
  - Nitrite/Nitrate (NO_2/NO_3)
  - Total Kjeldahl Nitrogen (TKN)
  - Total Phosphorus (TP)
  - Dissolved Orthophosphate (OP)
  - Chlorophyll-a

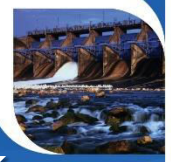
When are we sampling?

- Begin sampling in May 2016
- One year of routine monthly sampling, regardless of flow
- Maximum of four additional flow-biased samples
  - Two high-flow
  - Two low-flow
- 10 sites monitored for bacteria only
- 4 sites monitored for bacteria and nutrients

Where are we sampling?



- One site west of Lake Arlington
- One Site east of Lake Arlington
- Five sites on the main stem of Village Creek
- Three sites on Village Creek Tributaries
  - Deer Creek
  - Elm Branch
  - Quil Miller Creek



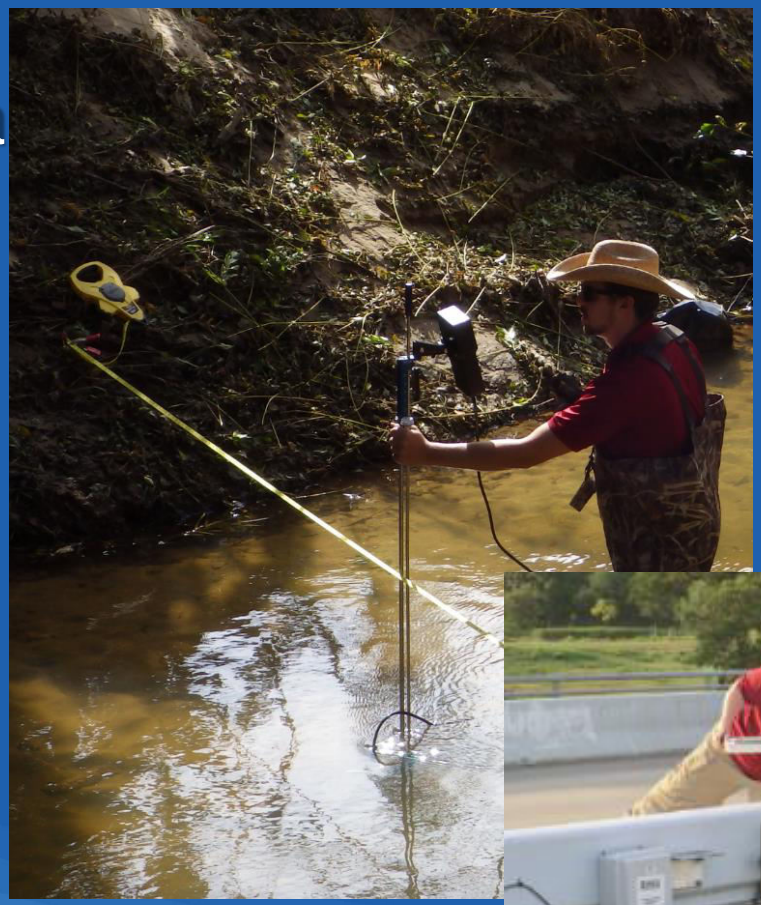
Sampling Site Details

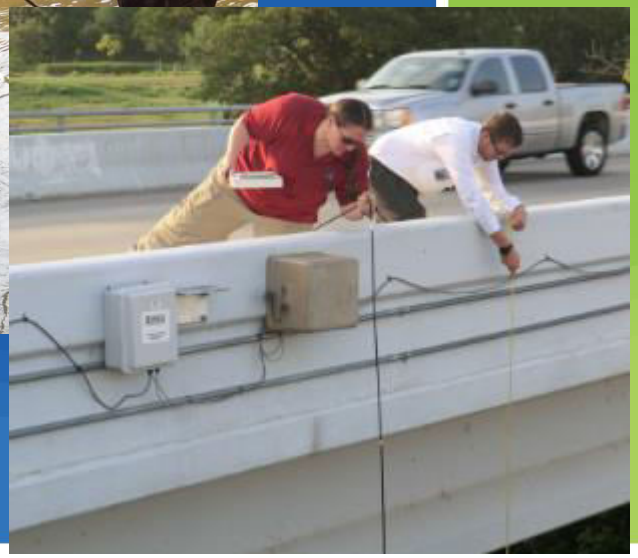
Station Number	Station Description	Station ID	Monitoring Type	Latitude (Decimal)	Longitude (Decimal)
01	Wildcat Branch at S Cravens Road	TBD	E. coli	32.709733	-97.225706
02	Unnamed Tributary at Bowman Springs Road	TBD	E. coli	32.676067	-97.223204
03	Village Creek at IH 20	10780	E. coli	32.669540	-97.231941
04	Village Creek at Salt Road	TBD	E. coli/nutrients	32.654876	-97.241869
05	Elm Branch at Wilson Road	TBD	E. coli	32.620093	-97.242383
06	Village Creek at Rendon Road	10786	E. coli/nutrients	32.603279	-97.264702
07	Deer Creek at Oak Grove Road	TBD	E. coli	32.585014	-97.292665
08	Village Creek at FM 1187	TBD	E. coli/nutrients	32.579726	-97.278467
09	Village Creek at FM 3391	TBD	E. coli/nutrients	32.542439	-97.310278
10	Quil Miller Creek at CR 532	TBD	E. coli	32.542249	-97.291880

TBD will be replaced with a Station Location (SLOC) ID after site receives TCEQ approval.

Why did we pick these sites?

- Two existing sites with historical data for comparison
- Public road crossings
- Even representation of land uses
- Includes main channel and tributaries



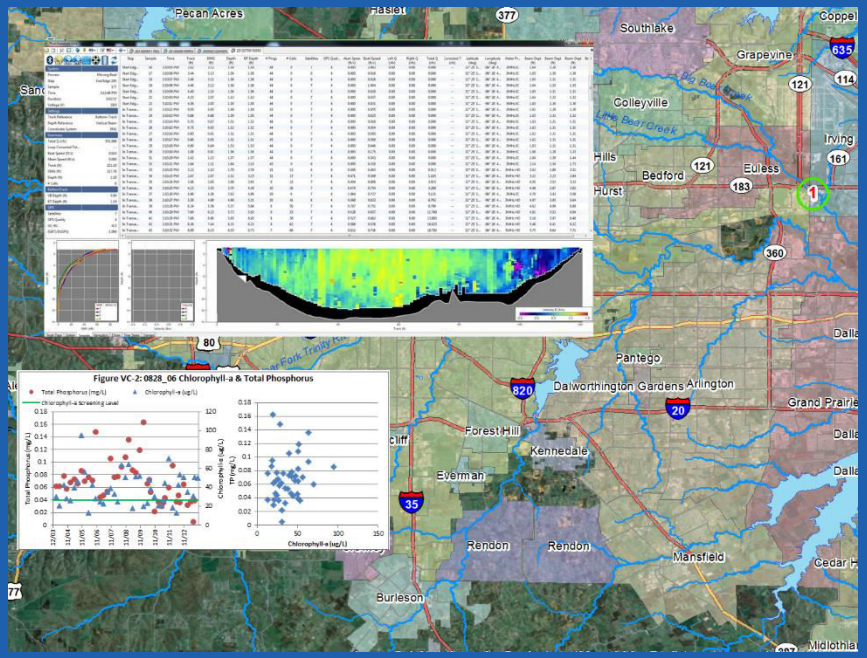


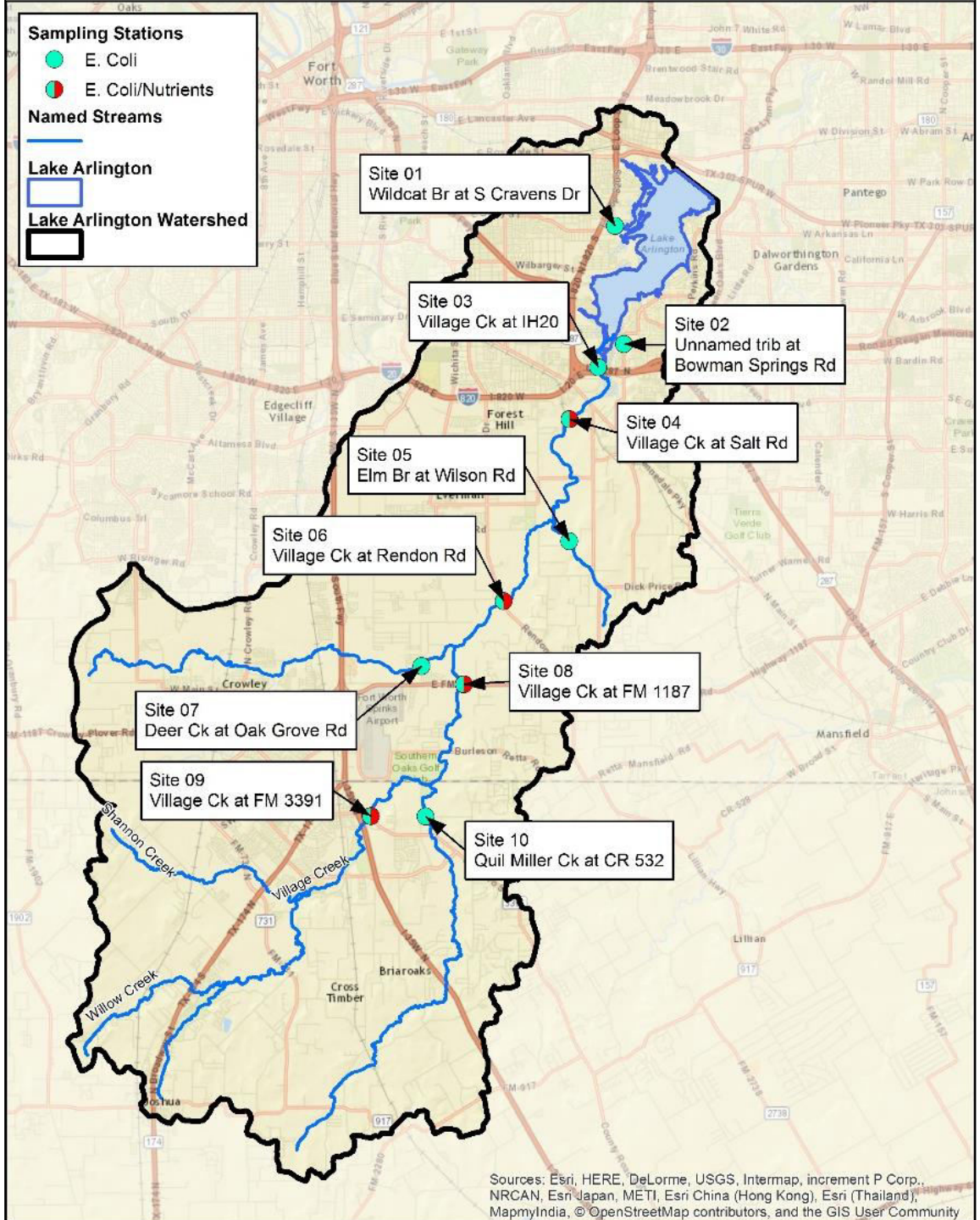
What will we learn from the data?

- Establishes baseline knowledge
- Monitoring results can show changes over time
  - Are there any trends?
  - Does the time of year matter?
- Data can show potential areas of concern
  - Is land use a major factor?
  - Are parameters highest in a particular tributary?

How will we use the data?

- Promotes group discussion and provides basis for informed decisions
- Denotes focus areas for specific BMPs
- Ultimately drives decisions that will become part of the WPP




Sampling Stations
E. Coli
E. Coli/Nutrients
Named Streams
Lake Arlington
Lake Arlington Watershed
Site 01
Wildcat Br at S Cravens Dr
Site 02
Unnamed trib at
Bowman Springs Rd
Site 03
Village Ck at IH20
Site 04
Village Ck at Salt Rd
Site 05
Elm Br at Wilson Rd
Site 06
Village Ck at Rendon Rd
Site 07
Deer Ck at Oak Grove Rd
Site 08
Village Ck at FM 1187
Site 09
Village Ck at FM 3391
Site 10
Quil Miller Ck at CR 532
Shannon Creek
Village Creek
Willow Creek
Fort Worth
Pantego
Dalworthington Gardens
Forest Hill
Edgecliff Village
Crowley
Burleson
Mansfield
Briaroaks
Cross Timber
Lillian
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Questions?

http://www.trinityra.org/lakearlingtonvillagecreek

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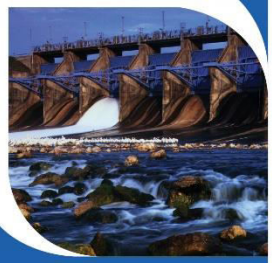
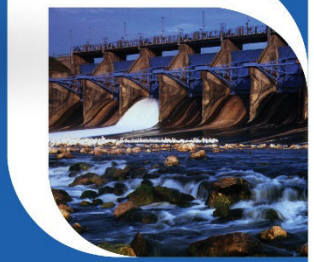


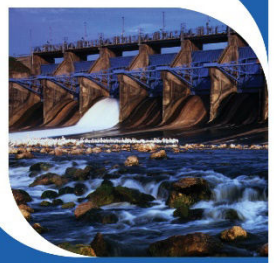
Upcoming Events and Path Forward

Aaron Hoff
Trinity River Authority
December 10, 2015



Trinity River Authority of Texas
Enriching the Trinity basin as a resource for Texans

Texas Watershed Steward Program

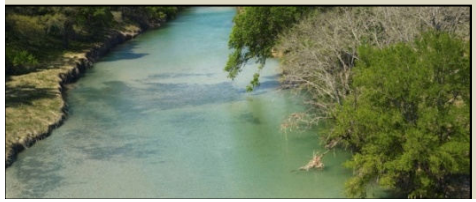


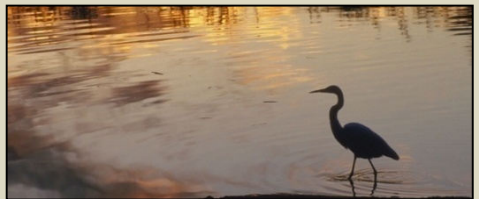
TEXAS WATERSHED STEWARD PROGRAM

- No-cost introductory training in the fundamentals of watersheds and watershed management.
- Target audience: individuals representing all stakeholder groups…
  - **Agriculture**
  - **Urban**
  - **Business/industry**
  - **City/county officials and personnel**
  - **Landowners, homeowners**

TEXAS A&M AGRILIFE EXTENSION

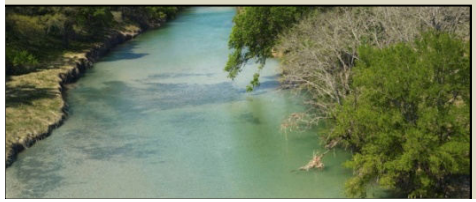
TEXAS Watershed Steward

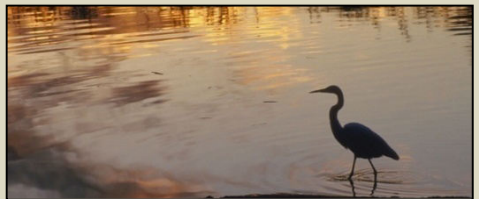





TWS Program Goals

1. Increase citizen awareness, understanding, and knowledge of the nature and function of watersheds, potential impairments, and watershed protection strategies.
2. Empower and inspire individuals to take leadership roles involving community water issues.
3. Enhance stakeholder involvement in local watershed protection planning initiatives (WPP/TMDL).

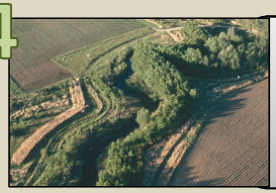





TWS Program Curriculum

5 

Community-Driven Watershed Protection and Management

4 

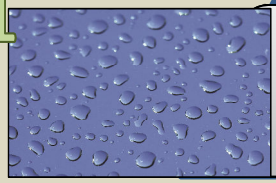
Managing To Improve Watershed Function

3 

An Overview of Watershed Impairments

2 

An Overview of Watershed Functions

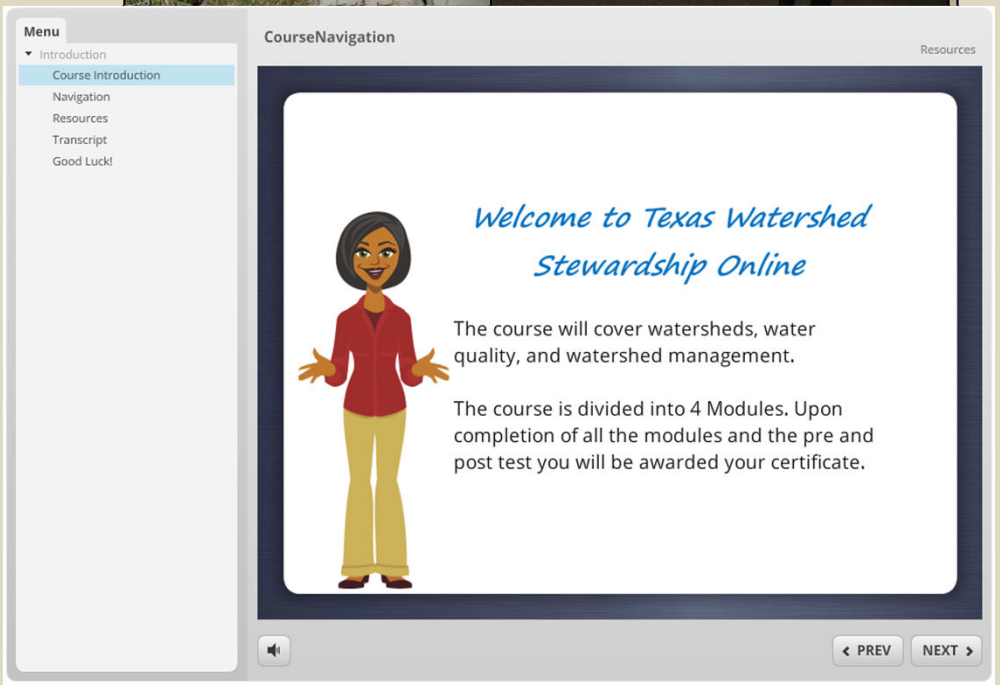
1 

Program Introduction

TWS Educational Training

- Full day (8 hour) and half day (4 hour) programs available
  - **Reach a broader audience**
  - **Stimulate interest & involvement**
  - **Earn continuing education credits (ex: P.E., P.G., CCA, TCEQ, Certified Planner, etc.)**

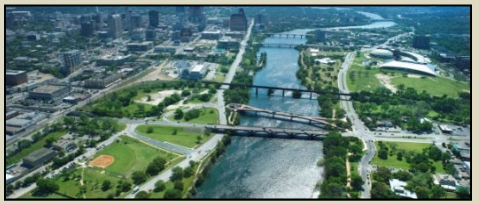
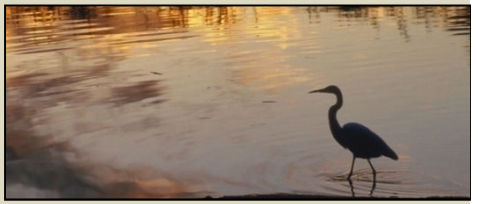
- Online version of TWS **http://tws.tamu.edu**



The Texas Watershed Steward Program

http://tws.tamu.edu



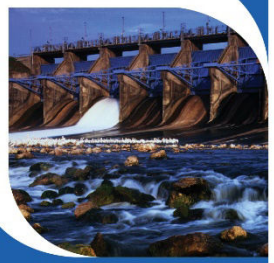
Michael Kuitu
Texas A&M AgriLife Extension Service

Tel: 979-862-4457
mkuitu@tamu.edu

Texas A&M AgriLife Extension

Texas Watershed Steward

Let’s make some decisions!



How do we want to present ourselves?

- Focus on the watershed?
  - Lake Arlington-Village Creek
  - Village Creek and Lake Arlington
  - Add watershed to the end or leave it off?
- Focus on the effort?
  - Watershed Protection
- Focus on the group?
  - LAVC Watershed Partnership
  - Lake Arlington-Village Creek “Friends of the Watershed”

Watershed Logo Designs

1

2

3

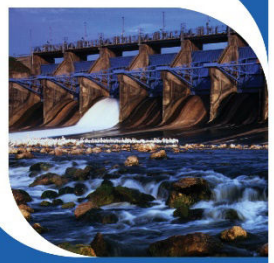
4

5

6

Credit for logo design goes to Sarah Bar with the City of Arlington.

Future Meetings and General Timeline



Where do we go from here?

- Texas Watershed Stewards Workshop
  - Tentative Date: March 8, 2016, 1:00 pm
- Next Group Meeting
  - Tentative for mid-February 2016
- First Steering Committee Meeting
  - Tentative for Early March 2016
- Approve Monitoring Plan
  - Finalize by mid-March 2016
- Begin sampling in May 2016
  - Duration = 1 year
- Load Calculations & BMP evaluation
  - Baseline data retrieval underway
  - Analysis completed by mid-2017


PREPARE YOURSELF
IT'S TIME FOR A GROUP DISCUSSION

Open Comment Period

If you have additional concerns or comments, please send them to:

Aaron Hoff
Trinity River Authority
hoffa@trinityra.org
817.493.5581