Eagle Mountain Watershed Protection Planning & Texas Watershed Stewards Workshop

Thursday, November 7th, 2019
Decatur, Texas

9:00am Sign In

- *Coffee & light breakfast snacks provided by TRWD*

Introduction

- *Why We Are Here – Sarah Grella, TRWD*
- *Welcome – JD Clark, Wise County Judge*

The Eagle Mountain Watershed Protection Plan (WPP)

- *Overview of current WPP & Implemented Activities - Sarah Grella, TRWD*
- *State and Federal Roles in the WPP*
  - *Mike Bira, EPA, Robin Pugh, TCEQ, Mitch Conine, TSSWCB*

Review of the TCEQ Integrated Report within the Eagle Mountain Watershed

- *2010 versus 2016 – Darrel Andrews, TRWD*

Survey Participation and Break (10min)

Review of the Eagle Mountain WPP EPA Comments

- *Darrel Andrews, TRWD*

Request for Stakeholder Comment and Input

- *Sarah Grella, TRWD*

11:30 Lunch *provided by TRWD*

12:30pm Texas Watershed Steward Workshop

- *More detail is provided on back*

4:30pm Adjourn

trwd Tarrant Regional Water District
watershed protection
Texas A&M AgriLife Extension
Texas Watershed Steward

TEXAS WATERSHED STEWARD WORKSHOP: AGENDA

THURSDAY– NOVEMBER 7, 2019
EAGLE MOUNTAIN LAKE WATERSHED
DECATUR, TX

CLICK HERE for digital handbook

Sign-In/Register/Coffee
Pre-test

Introductions (of speakers and participants)
Module 1: Program Introduction

Module 2: Overview of Watershed Systems
What is a Watershed?
Watersheds in Texas
How do Texans Use Watersheds?
Principles of Watershed Hydrology
Natural Watershed Features
Natural Watershed Functions

Module 3: Overview of Watershed Impairments
Water Quantity and Quality

BREAK

Module 3: Overview of Watershed Impairments
Point and Nonpoint Sources of Pollution
Consequences of Impaired Water Quality
Water Quality Law and Policy in Texas
Water Quality Testing, Monitoring and Regulation

Module 4: Managing to Improve Watershed Function
Using a Watershed Approach
Water Quality Improvement Projects
Agricultural Best Management Practices
Water Quality Stewardship on Small Acreages
Management of Non-domestic Animals and Wildlife
Urban Best Management Practices
Protecting Water Quality Around the Home

Module 5: Community-Driven Watershed Protection and Management
Importance of Local Watershed Involvement
Forming and Sustaining Community Watershed Organizations and Partnerships

Questions, Discussions, Conclusions

Post-Test

Eagle Mountain Lake Watershed Protection Planning

Sarah Grella
TRWD Watershed Coordinator

Stakeholder Meeting, Decatur, Tx
November 7, 2019

Your input!

Thank you for sharing your ideas for future meetings:

Timelines

1. Quarterly x 8
2. Semi annual x 4
3. Biannual x 3
4. Annual
5. Bimonthly
6. Every 2 months

Topics

1. Urban Stormwater Mgmt. x 10
2. Feral Hog Mgmt. x 6
3. Impairment/Concern Communication x 4
4. Fertilizer use and alternatives x 3
5. Riparian Mgmt. x 3
6. Agriculture BMPs x 3 (cover crops, brush, burning)
7. Funding Programs x 2
8. (USDA, EQUIP, GRIP)
9. Septic Systems x 2
10. Soil Sampling & Improvement x 2
11. Water Infiltration x 2
12. Fish Quality
13. Lake Bridgeport Lake Discharge Mgmt. (pollutant loading to EM)
14. Native Prairie Mgmt.
15. Water Capture
16. Water Quality Improvement

Locations

1. Decatur x 7
2. Azel x 5
3. Bowie x 2
4. Bridgeport x 2
5. Areas of highest development
6. Decatur Country Club
7. Fort Worth
8. Fort Worth Boat Club
9. Locations of Bacteria Concerns
10. Rotation throughout watershed
11. Springtown

Is your property located in or near primary hog habitat?

(Forested land within 100 ft of a stream or wetland)

Place a star in the box under your answer:

Yes	No
7	6

Have you seen feral hogs on or near your property in the last 12 months?

Place a star in the box under your answer:

Yes	No
5	8

Have you seen fewer or greater number of hogs than previous years?

Place a star in the box under your answer:

Greater Number	Fewer Number
2	6

What is the MOST significant challenge to implementing feral hog control on your property?

Place a star in the box under your answer:
(One answer only)

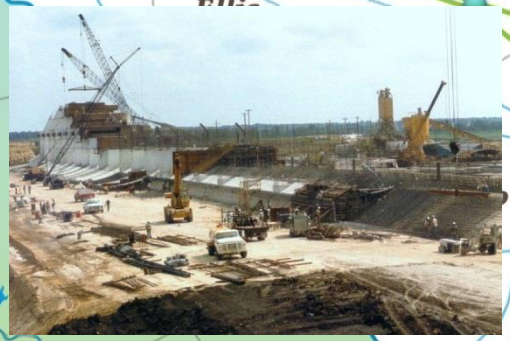
Lack of			
Time	Money	Information	Other
1	0	3	2

TRWD Water Supply System

1931

1932

1964



1987

Wise
Hunt
West Fork
EAGLE MOUNTAIN LAKE
Tarrant
Dallas
Rockwall
TRINITY RIVER
Parker
Lake Arlington
Lake Benbrook
Erath
Johnson
Somervell
CEDAR CREEK RESERVOIR
Henderson
Anderson
RICHLAND-CHAMBERS RESERVOIR
Freestone

Service Area
Pipelines
Pump Stations
TRWD Offices

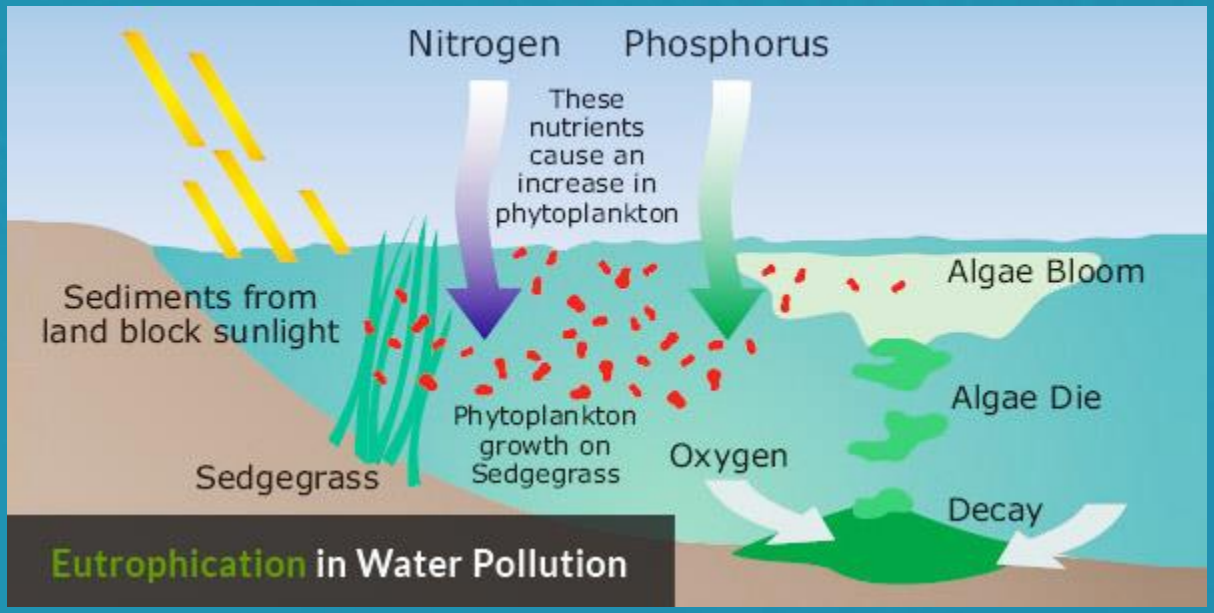
N
W
E
S

THREATS TO DRINKING WATER SUPPLIES

Threats

Water Quality - Eutrophication

- Nutrients - typically nitrogen or phosphorus
- Promotes excessive plant growth and decay
- Causes water quality problems
  - Algae blooms
  - Taste & odor problems
  - Low dissolved oxygen



Threats

Water Quantity - Sedimentation

- Result of excessive erosion in watershed
- Sheet & rill, gully, channel
- Transports nutrients downstream
- Decreases storage

WATERSHED PLANNING APPROACH

Planning Approach

Watershed Protection Plans

- Stakeholder-driven
- EPA 9-Element Framework
- TRWD's Role as Facilitator vs Stakeholder
- Partnership with TAMU AgriLife Research

TEXAS A&M AGRILIFE RESEARCH | EXTENSION

Why We're Here

- Trend of increasing Chlorophyll a levels in north central Texas reservoirs
- Concerns and Impairments identified by TCEQ
- Proactive approach to solving water quality issues opposed to regulatory action through a TMDL (Total Maximum Daily Load)

Project Funding

Plan Development (FY03-FY09)

- Environmental Protection Agency
- Natural Resources Conservation Service
- Tarrant Regional Water District

Plan Implementation

- Texas State Soil and Water Conservation Board
- Texas Water Development Board
- Texas Commission on Environmental Quality

Participating Partners

- Tarrant Regional Water District
- Texas AgriLife Research
- Texas AgriLife Extension Service
- Texas Water Resources Institute
- Spatial Sciences Laboratory, TAMU
- Alan Plummer Associates, Inc.
- Espey Consultants, Inc.
- Baylor University – Peter Allen, John Dunbar
- University of Texas – George Ward, Neal Armstrong
- Texas Water Development Board

CHARACTERIZING SOURCES

Characterizing Sources

Human Impacts

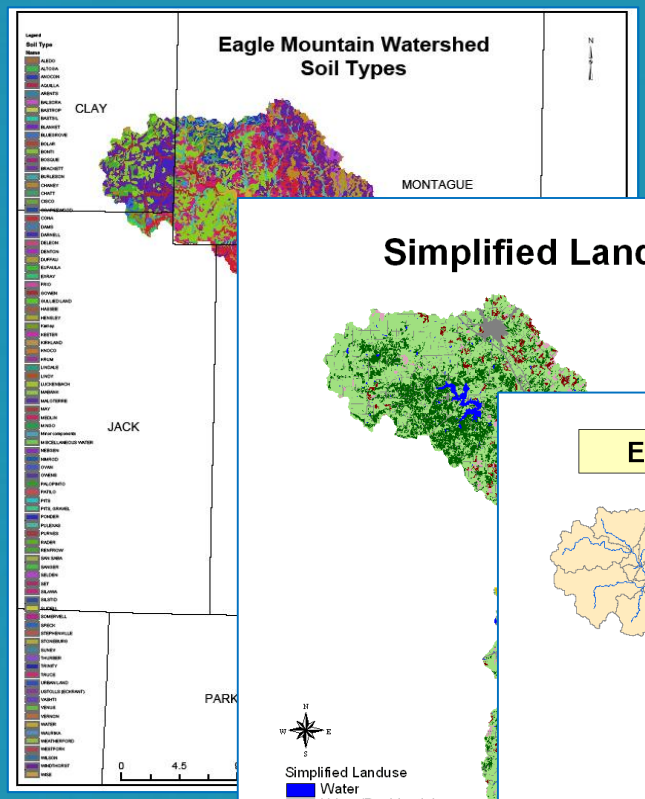
Point Source Pollution

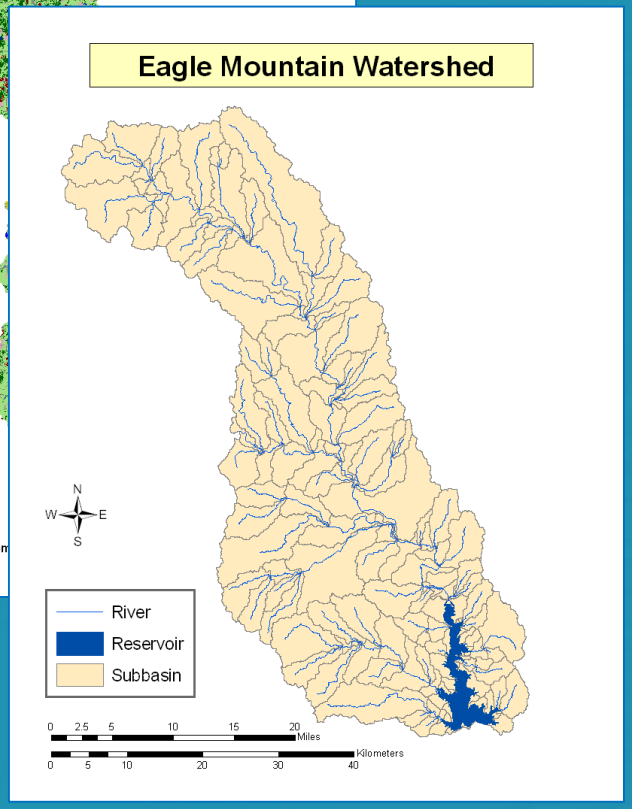
discharged from a clearly defined, fixed point such as a pipe, ditch, channel, sewer or tunnel

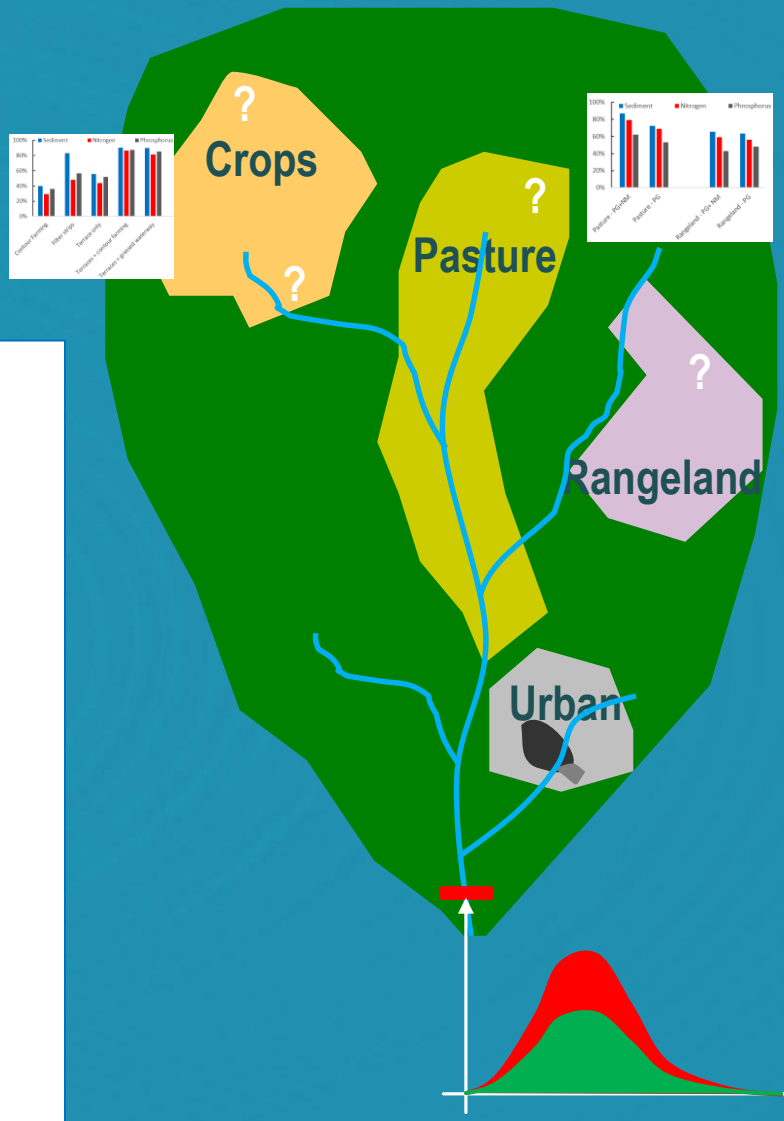
Non-Point Source Pollution

originates from many different places across the landscape, most of which cannot be readily identified.

Characterizing Sources







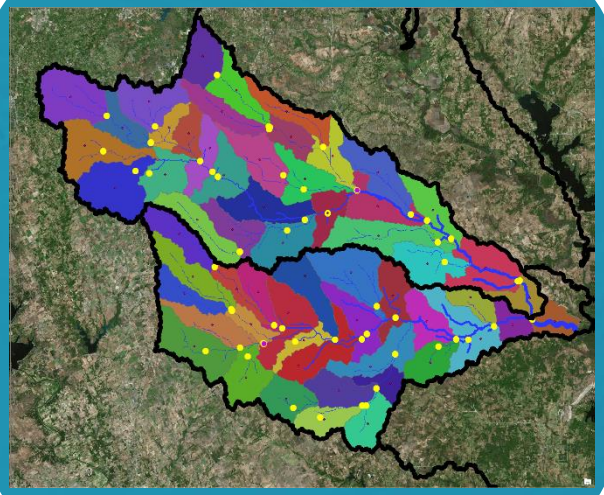
Characterizing Sources

Soil & Water Assessment Tool

Input

- Topography
- Land Use
- Soil
- Observations
- …

SWAT



Output

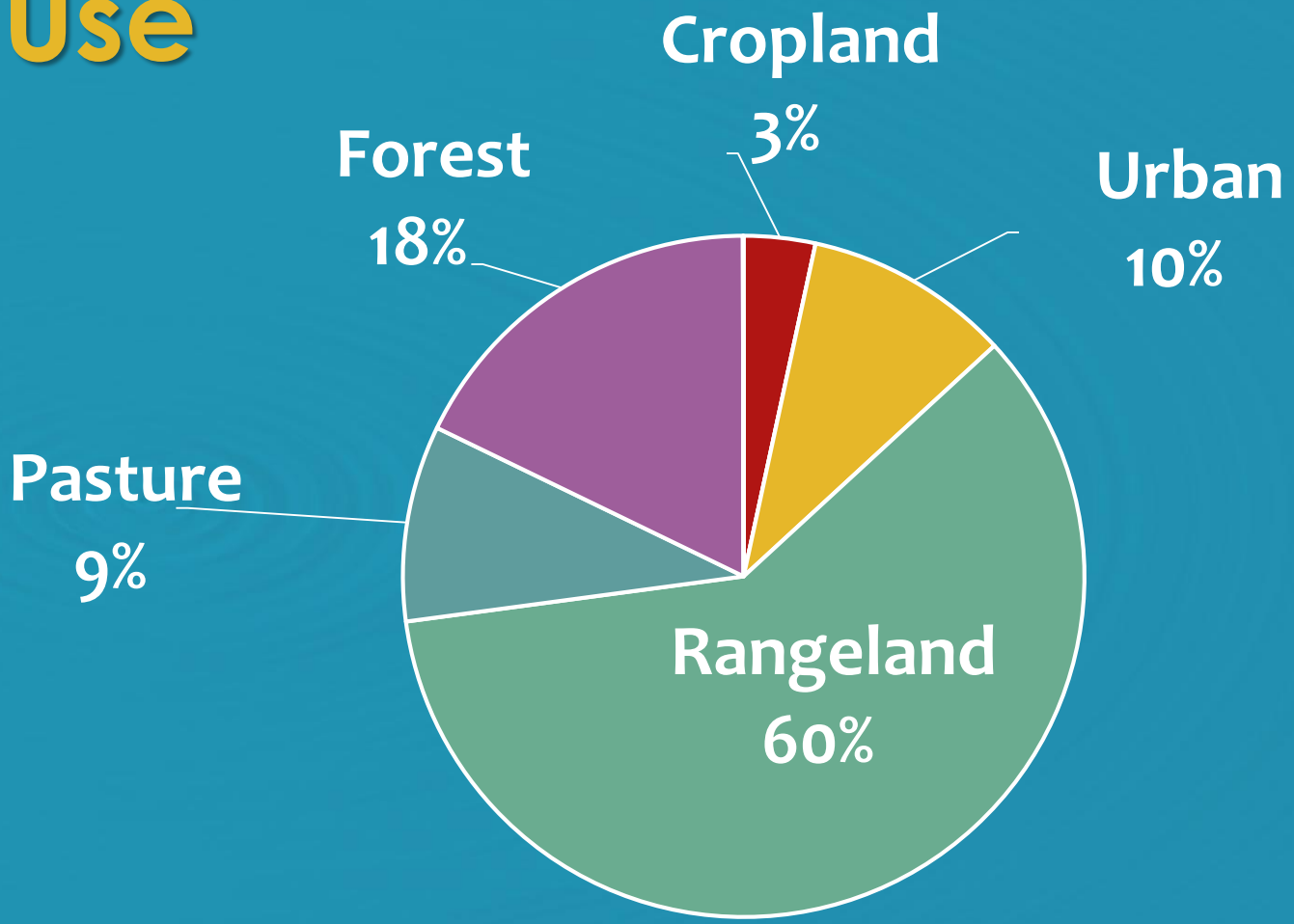
- Runoff/Sediment /Nutrient for HRU
- Runoff/Sediment /Nutrient for WS
- Runoff/Sediment /Nutrient for Rch

Daily
Monthly
Yearly

Characterizing Sources

Land Use vs Load Contribution

Land Use

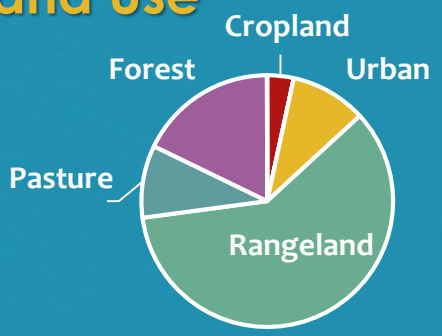


From Narasimhan, et al. 2010.

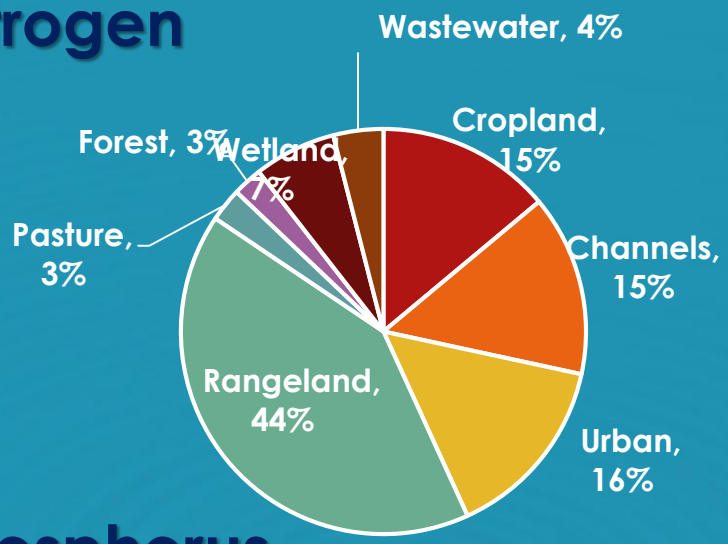
Characterizing Sources

Land Use vs Load Contribution

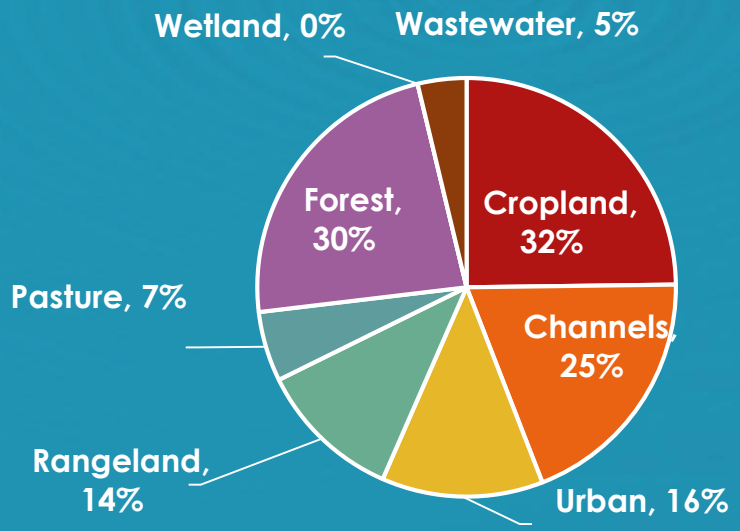
Land Use



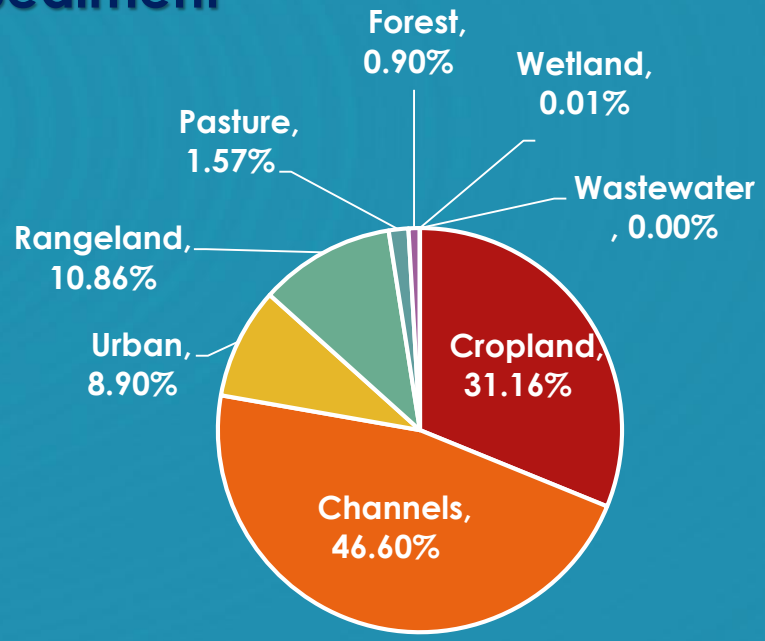
Nitrogen



Phosphorus



Sediment



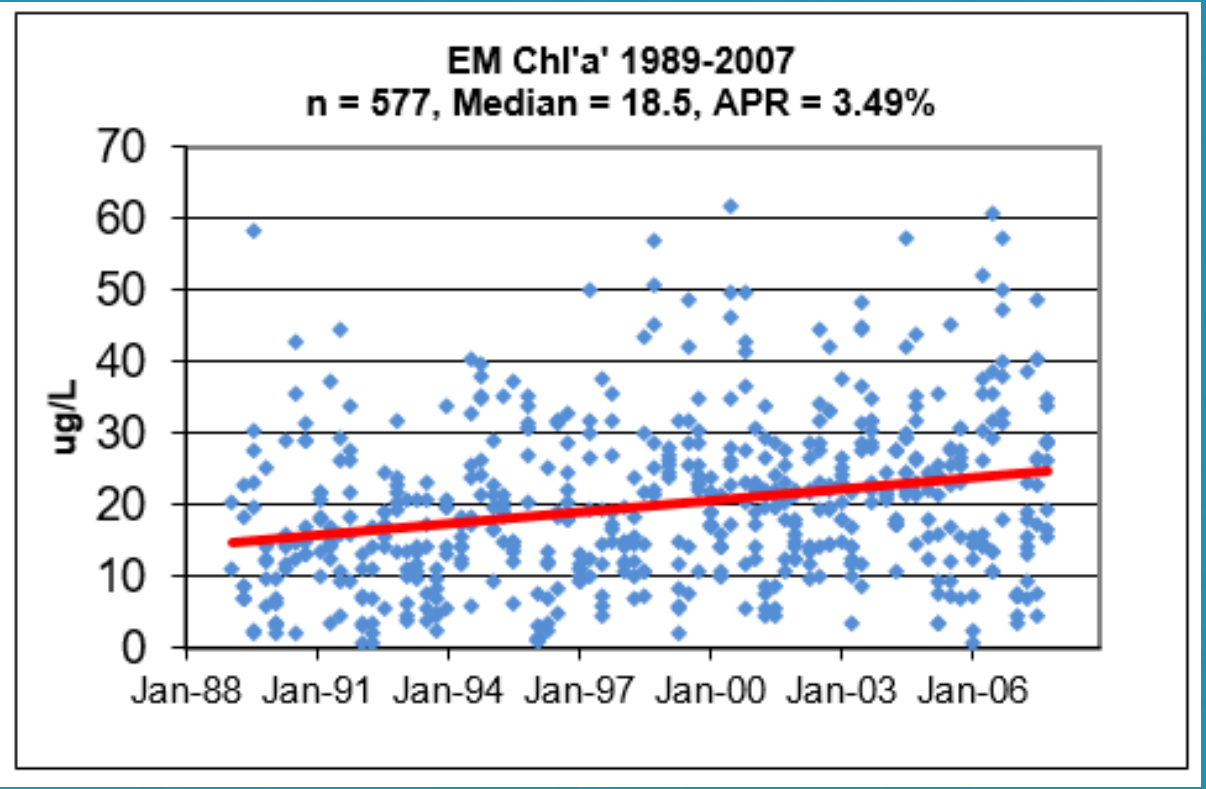
From Narasimhan, et al. 2010.

SETTING WATERSHED GOALS

Watershed Goals

- **Goal Statement**

To reduce increasing chlorophyll-a concentration in Eagle Mountain Lake by achieving a 30% reduction in total phosphorus loads.

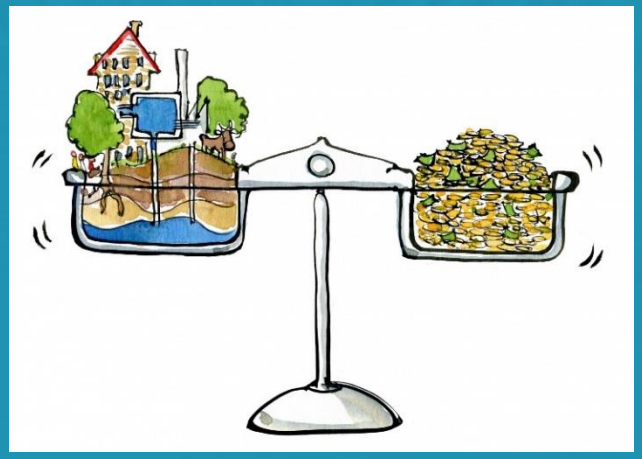


Chlorophyll-a concentrations (TRWD 2011)

IDENTIFYING ECONOMICALLY FEASIBLE MANAGEMENT MEASURES

Management Measures

- Related to sources identified in previous steps
- Identify critical areas
- Economically feasible



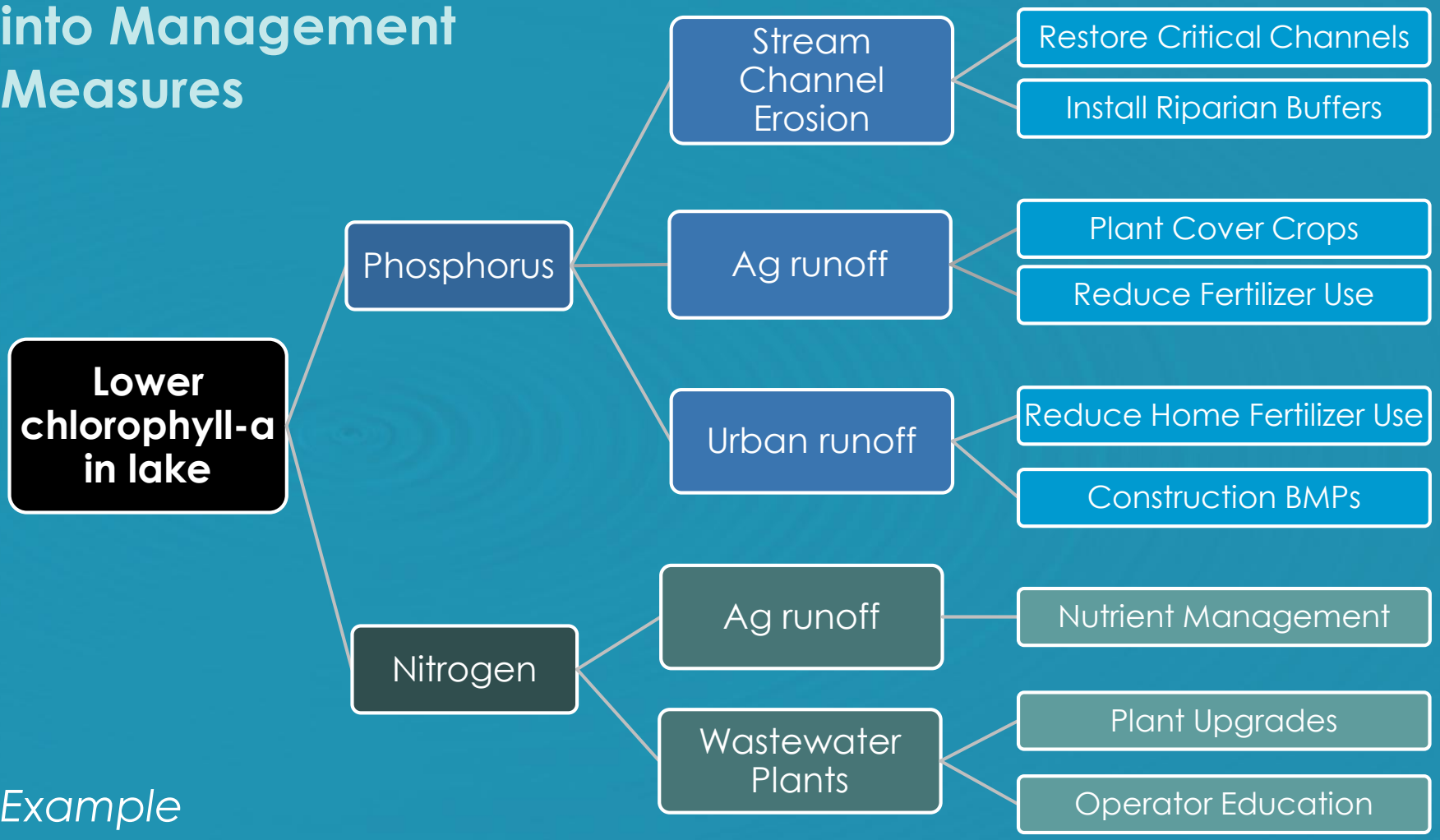
Management Measures

Identification of Cost-Effective Solutions

- Historic Use of Effective BMPs in Watershed
- Estimation of Current, Potential and Most Likely Adoption Rates
- Creation of Budgets for Individual BMPs
- Ranking of BMPs - least cost for load reduction
- Identification of suite of BMPs to reach project goal
- Establish Cost Estimates for Least-Cost Solution

Management Measures

Translating Goals into Management Measures



Example

Total Eligible Acreage for an Individual BMP

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

% of Acreage Currently Implemented

% of Acreage Likely to Implement

% of Acreage Unlikely to Implement

Management Measures

Initial Estimates – Ranking by Cost

BMP Description	Annual $ per kg of Total Phosphorus reduced
Establish Filter Strips	$6.39
Establish Grassed Waterways	$9.65
Grade Stabilization – gully plugs	$14.92
Herbicide Application – Riparian Corridor	$15.37
Required Urban Nutrient Mgt.	$27.06
Terracing	$53.39
Conversion of Cropland to Grass/Hay	$55.31
…	…
Critical Pasture Planting – shaping	$1,005.37
WWTP – Level I to Level III	$1,153.13
Riparian Buffer Strips – Med. Erosion Areas	$1,431.70

Management Measures

Effectiveness – Ranking by Reduction

BMP Description	Cumulative P Reduction %
Establish Filter Strips	3.9%
Establish Grassed Waterways	5.7%
Grade Stabilization - gully plugs	7.8%
Herbicide Application - Riparian corridor	8.5%
Required Urban Nutrient Mgt.	12.3%
Terracing	14.0%
Conversion of Cropland to Grass/Hay	20.5%
Prescribed Burning	21.3%
P Inactivation with Alum	24.6%
Flood Protect Sites - Big Sandy/Salt Creek	28.8%
Pasture Planting – reseeding	29.1%
Prescribed Grazing	29.1%
Brush Management	29.4%
Voluntary Urban Nutrient Mgt.	29.9%
30% Reduction Target **TOTALS**	**29.9%**

TARGETED IMPLEMENTATION AND PARTNERSHIPS

Targeted Implementation

30% Total Phosphorus *Reduction Target*

Cropland
- Grassed Waterways
- Cropland Conversion
- Terracing
- Nutrient Management
- Filter Strips

Pasture
- Prescribed Grazing
- Pasture Planting
- Critical Area Planting
- Grade Stabilization
- Prescribed Burning
- Brush Management

Watershed
- Flood Protection Structures

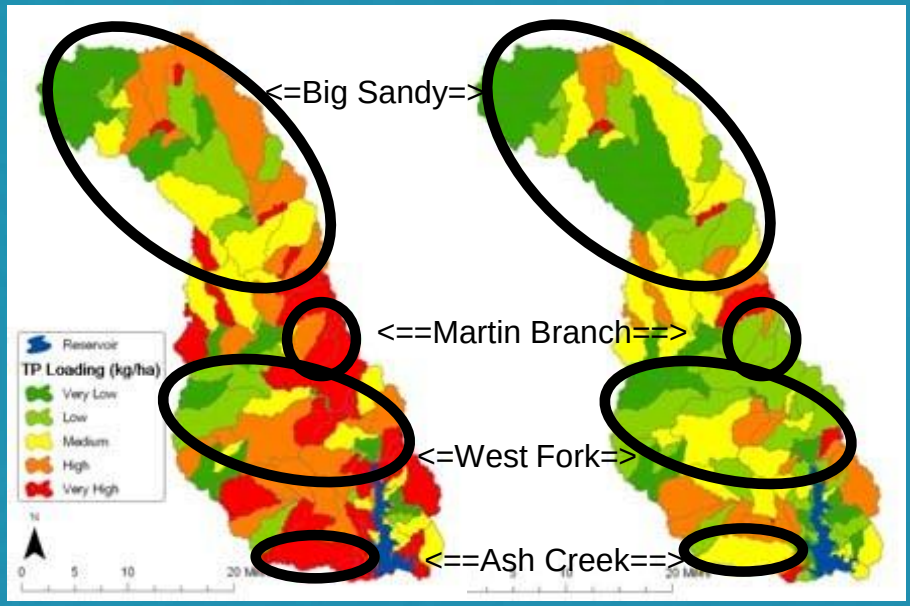
Urban
- Phase II Storm Water Control Measures
- Urban Nutrient Management
- Wastewater Treatment Plant Upgrade

Riparian
- Brush Management
- Wetland Development
- Buffer Strips

In-Lake
- Hypolimnetic Aeration
- P-Inactivation

Total Phosphorus Reductions by Subwatersheds

Pre- and Post-Implementation



Partnerships

Eagle Mountain Lake Conservation Initiative

A partnership between

- Wise Soil and Water Conservation District
- USDA-Natural Resources Conservation Service
- Wise County Water Control & Impr Dist#1
- Wise County Commissioners Court
- Tarrant Regional Water District

Purpose

*The coordination of partners to **provide technical assistance** to agricultural producers to plan and implement **conservation treatment** to reduce the high levels of **nutrients and sediment loadings** into Eagle Mountain Lake*

Partnerships

Eagle Mountain Lake Conservation Initiative

Goals

- 150 conservation plans per year
- Focused implementation
  - Walnut, Blue and Salt Creeks
- Financial assistance through EQIP & local match

Accomplishments (FY12 – FY18)

- 585 plans written on 108,327 ac
- 412 EQIP contracts on 62,135 ac

Education & Outreach

2014 - 2019

9,426

Parker County Erosion Day
Pesticide Applicator Workshop
Eagle Mountain Lake Clean Up
Pecan Management Workshop
Water Well Screening Workshop
Pasture Management Workshop
Grade School Demonstrations

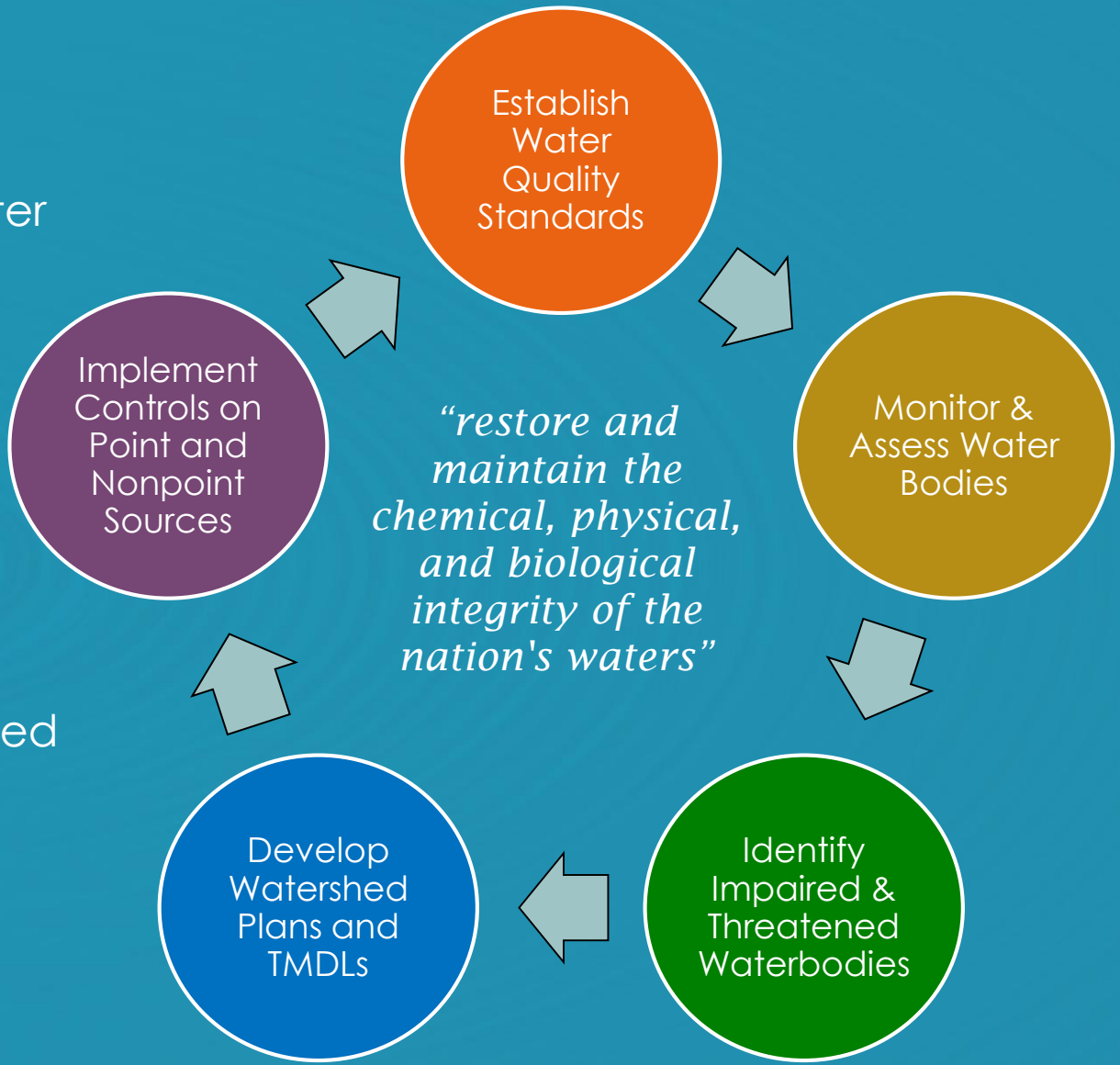
Ag Days
Career Days
Science Fairs
Youth Camps
Riparian Workshop
Teacher Workshops
Ranchers Gathering

Eagle Mountain Watershed Water Quality

Water Quality Management

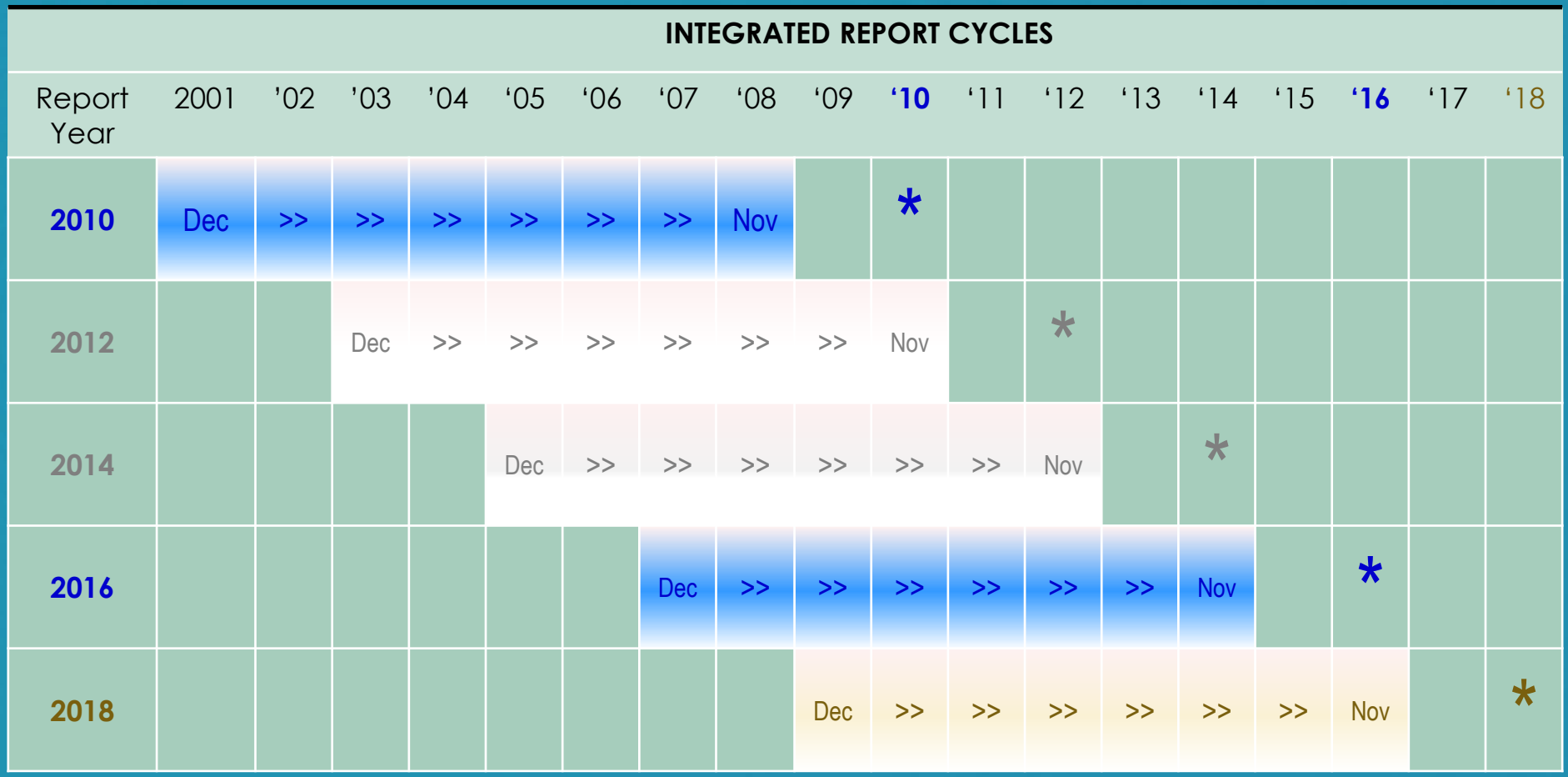
Clean Water Act

- Applies to surface water
- Uses regulatory and non-regulatory tools
- reduce pollutant discharges (PS),
- manage polluted runoff (NPS)
- Many water quality programs are delegated to states



TCEQ Water Quality Reports

Period of Data Collected for TCEQ Integrated Report Cycles



Water Quality

***2010 Integrated Report**: Dec 2001 – Nov 2008*

Water Body	Chlorophyl-a	Oxygen	Ammonia	Bacteria
West Fork Trinity below BP *(lower)*				**Impaired**
Big Sandy Creek *(lower)*				**Impaired**
Martin Branch				**Impaired**
Garrett Creek				**Impaired**
Salt Creek				**Impaired**
Eagle Mountain Lake				
01 East end of dam	Concern	Concern		
03 Ash Creek cove	Concern		Concern	
05 Walnut Creek cove	Concern			
08 near Cole subdivision	Concern			
09 Indian Creek cove	Concern			
10 Upper Indian Crk cove	Concern			
12 near Newark Beach	Concern			
14 mid-lake	Concern			

Water Quality

2016 Report: *Dec 2007 – Nov 2014*

Water Body	Chlorophyl-a	Oxygen	Ammonia	Bacteria	Nitrate	Phosphorus
West Fork Trinity below BP *(lower)*				**Impaired**		
Big Sandy Creek *(lower)*				**Impaired**		
Martin Branch				**Impaired**		
Garrett Creek *(WQS changed)*				~~Impaired~~		
Salt Creek *(WQS changed)*				~~Impaired~~		
Walnut Creek				Concern		
Ash Creek				***Impaired***	Concern	Concern
Derrett Creek				Concern		
Little Dosier Creek				Concern		
Eagle Mountain Lake						
01 East end of dam	~~Concern~~	Concern				
03 Ash Creek cove	~~Concern~~		~~Concern~~			
05 Walnut Creek cove	~~Concern~~					
08 near Cole subdivision	~~Concern~~					
09 Indian Creek cove	~~Concern~~					
10 Upper Indian Crk cove	~~Concern~~					
12 near Newark Beach	~~Concern~~					
14 mid-lake	~~Concern~~					

TCEQ Water Quality Reports

2010

2016

Eagle Mountain Watershed

Summary

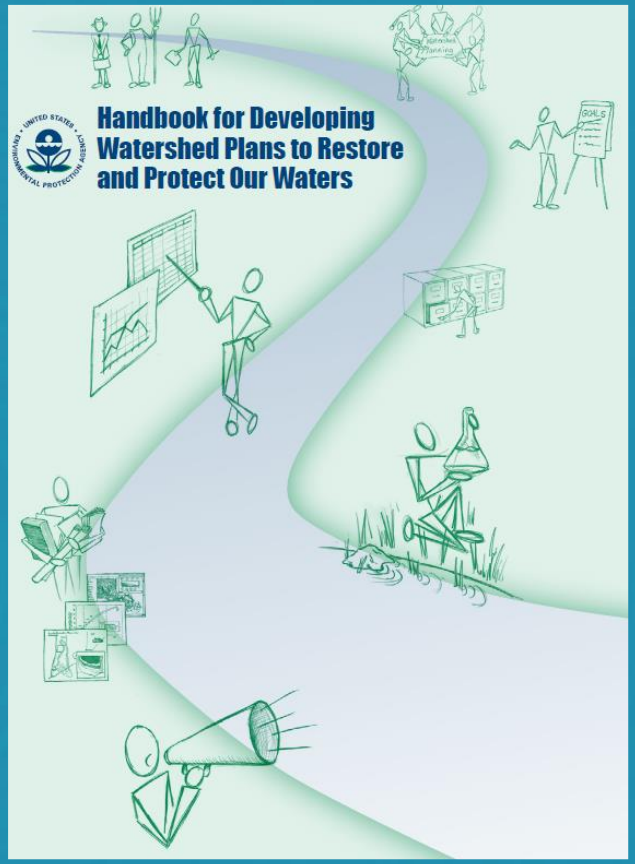
- **Changes in assessment results since 2010 report.**
  - ***Concerns/Impairments removed due to less stringent Water Quality Criteria (Garrett, Salt) and change in indicators (EM Lake)***
  - ***Concerns/Impairments added with new tributary segments - bacteria, nutrients (Ash, Dosier, Derrett)***
  - ***Concern added for bacteria (Walnut)***

Agency Comments on the 2016 Watershed Protection Plan

Potential Revisions to Address EPA and TCEQ Comments

Watershed Protection Plans

A. Identify problem & sources
B. Reductions needed to reach goals
C. Identify measures needed to achieve reductions
D. Assistance needed
E. Education & outreach plan
F. Schedule
G. Milestones
H. Criteria for measuring progress
I. Monitoring Plan



Agency Comments

Element A: Watershed Characterization and Pollutant Sources

Major Agency Comments	Potential for Revision to WPP
More current water quality and land use data should be used.	*More recent WQ data are available. More recent land use data may be available.*
Impairments in tributaries should be included in the WPP.	*Include all impairments and concerns identified in the 2016 Integrated Report*

Potential Sources of Bacteria

Element A:
Pollutant Sources

- Septic Systems
- Pets - Dogs
- Livestock
  Cattle, horses, goats, sheep
- Wildlife - Deer
- Non-natives - Feral Hogs

Agency Comments

Element B: Goals and Pollutant Reductions

Major Agency Comments	Potential for Revision to WPP
Load reduction targets should be tied to meeting water quality standards, according to TCEQ assessment methods.	*Other analyses are available to more explicitly tie load reductions to water quality standards and assessment methods.*

Agency Comments

Element H: Load Reduction Evaluation Criteria

Major Agency Comments	Potential for Revision to WPP
More detail should be provided on how load reductions will be tracked through time and when additional effort may be needed.	*Additional details can be added, as determined by stakeholders.*

Agency Comments

Element I: Water Quality Monitoring

Major Agency Comments	Potential for Revision to WPP
Additional tributary monitoring stations are needed to detect changes in water quality.	*Data from additional (existing) TCEQ monitoring sites are available for inclusion.*

Agency Comments

Summary

- Identify and include additional WQ data.
- Update land use data, as available.
- Update estimated pollutant loads & target reductions 2016 Integrated Report priorities.
- Include more detail on processes to identify progress.
- Include additional details about stakeholder outreach, implementation activities, and urban stormwater management.
- Several other comments may be addressed with clarifying language and more detail.

watershed protection

Tina Hendon
Program Manager

Sarah Grella
Watershed Coordinator

Michelle Wood-Ramirez
Watershed Coordinator