GARCITAS AND ARENOSA CREEK WATERSHED BASED PLANS

Allen Berthold and Michael Schramm - Texas Water Resources Institute
November 7, 2018

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Introductions

- Name
- Entity/Group – (Agency, Landowner, Citizen, Business Owner, Etc.)

Agenda

- Background on Water Quality Issues and Regulations in Texas
- Approaches to Address Water Quality
- Garcitas and Arenosa Creek Water Quality
- Stakeholder Frameworks and Decision-Making
- Next Steps

INTRO TO WATER QUALITY IN TEXAS

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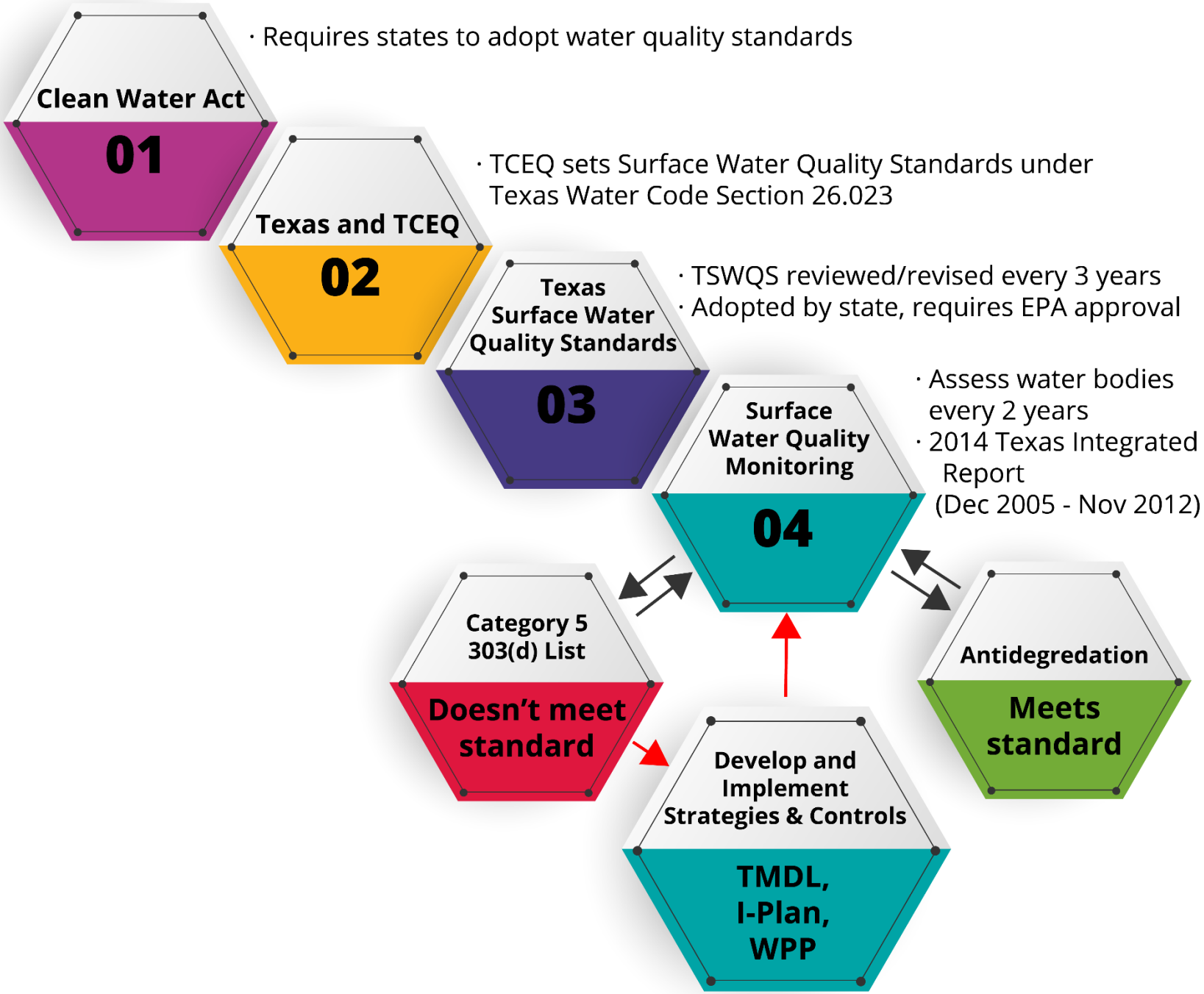

Clean Water Act
01
· Requires states to adopt water quality standards
Texas and TCEQ
02
· TCEQ sets Surface Water Quality Standards under Texas Water Code Section 26.023
Texas Surface Water Quality Standards
03
· TSWQS reviewed/revised every 3 years
· Adopted by state, requires EPA approval
Surface Water Quality Monitoring
04
· Assess water bodies every 2 years
· 2014 Texas Integrated Report (Dec 2005 - Nov 2012)
Category 5 303(d) List
Doesn't meet standard
Antidegredation
Meets standard
Develop and Implement Strategies & Controls
TMDL, I-Plan, WPP

Texas Surface Water Quality Standards

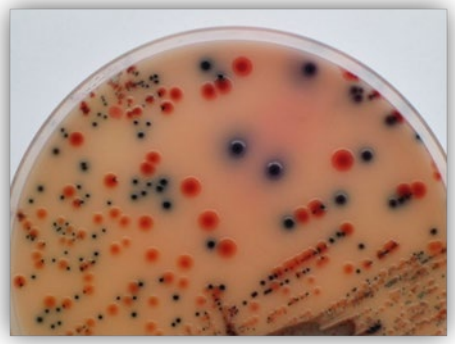
- Two Components:

1) Designated Uses – Waterbodies are assigned a designated use. General Use; Aquatic Life Use; Recreational Uses; and Public Water Supply.
2) Criteria – The numeric or narrative limit used to evaluate if the waterbody meets its designated use.

Texas Surface Water Quality Standards

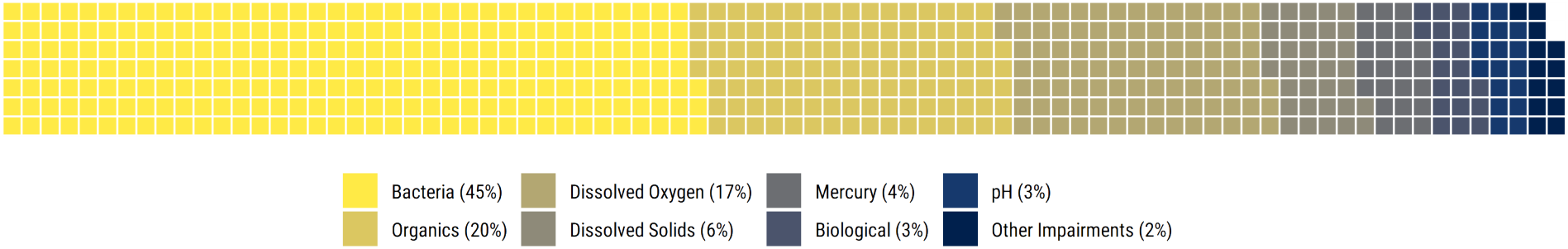
Some Examples:

Designated Use	Criteria	Parameter
Primary Contact Recreation	126 MPN/100 mL (FW) 35 MPN/100 mL (Marine)	*E. coli* Bacteria (FW) Enterococci (Marine)
Secondary Contact Recreation 1	630 MPN/100 mL (FW) 175 MPN/100 mL (Marine)	*E. coli* Bacteria (FW) Enterococci (Marine)
High Aquatic Life Use	5.0 mg/L Average 3.0 mg/L Minimum	Dissolved Oxygen
General Use	6.5 – 9.0	pH



2014 Integrated Report Summary

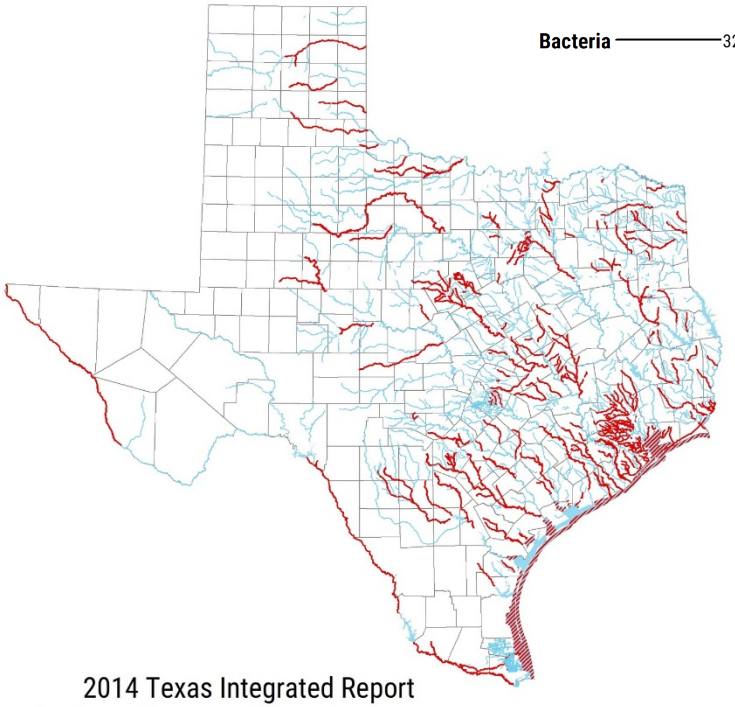
589 total impairments in 1,065 assessed waterbodies



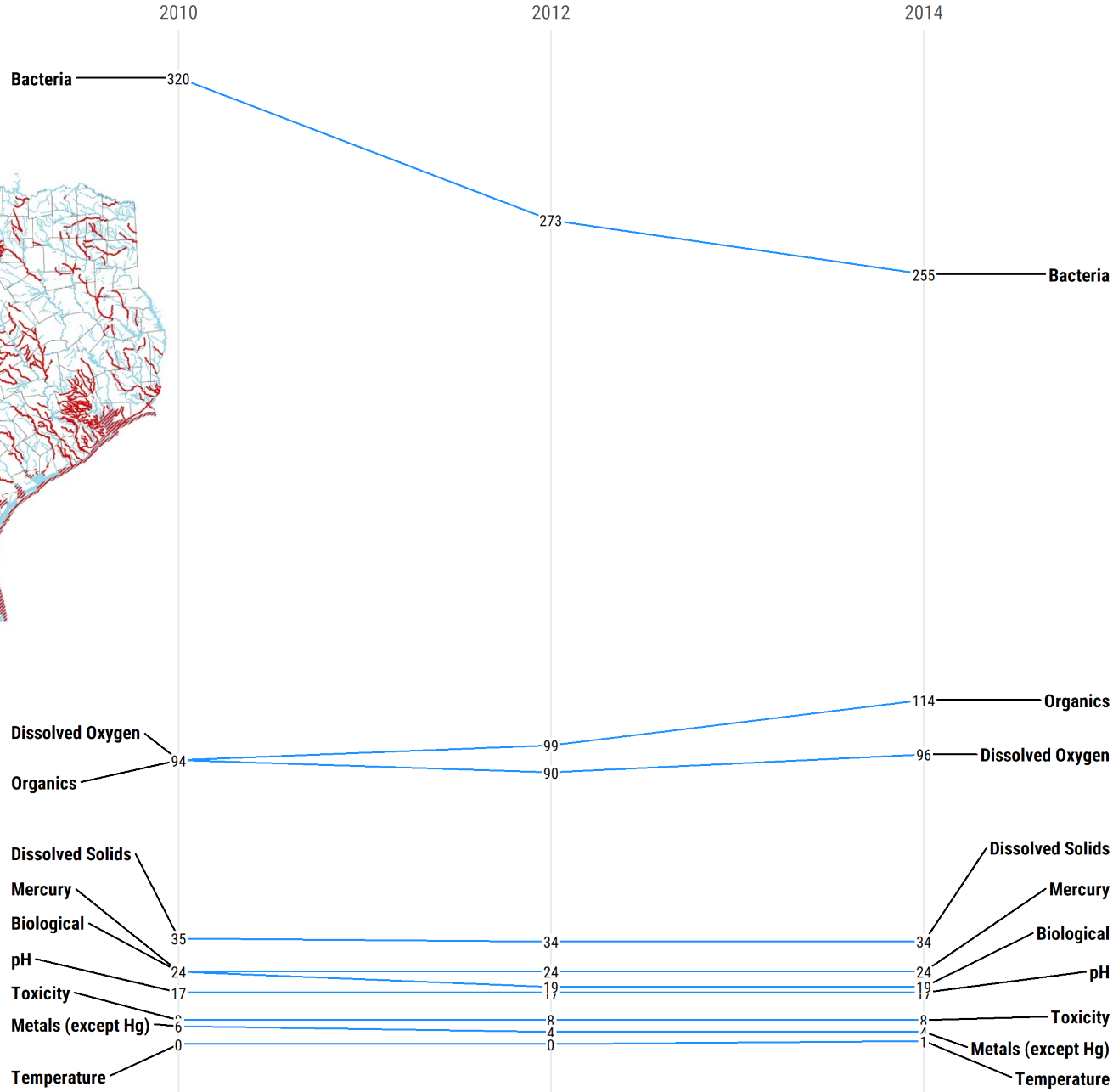
Source: TCEQ (https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_exec_summ.pdf)

2014 Texas Integrated Report Summary

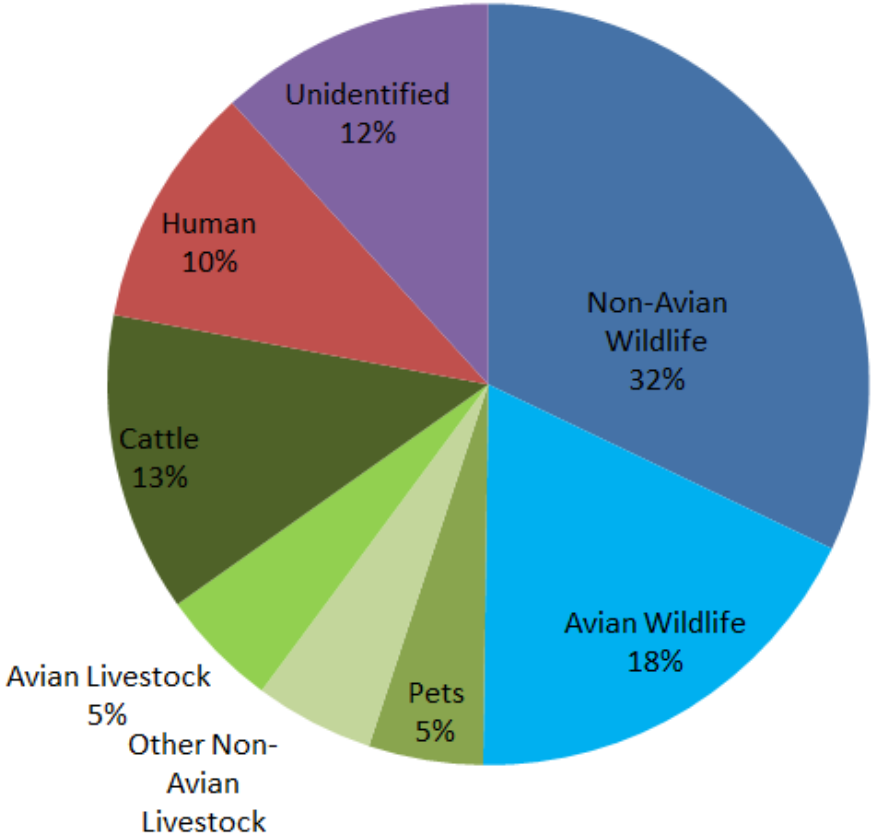
Total number of impairments by parameter



2014 Texas Integrated Report
Waterbodies with Bacteria Impairments



Major Sources of Bacteria (based on prior projects)



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Where Does Fecal Bacteria Come From?

- Direct Deposition:
  - Animals directly deposit fecal matter into water
  - Warm-blooded wildlife, livestock
- Non-Point Sources
  - Stormwater runoff transports bacteria from fecal matter deposited on surfaces
  - Failing septic systems
- Point Sources
  - Improperly treated wastewater
  - Illegal dumping
  - Municipal stormwater

APPROACHES TO ADDRESS WATER QUALITY

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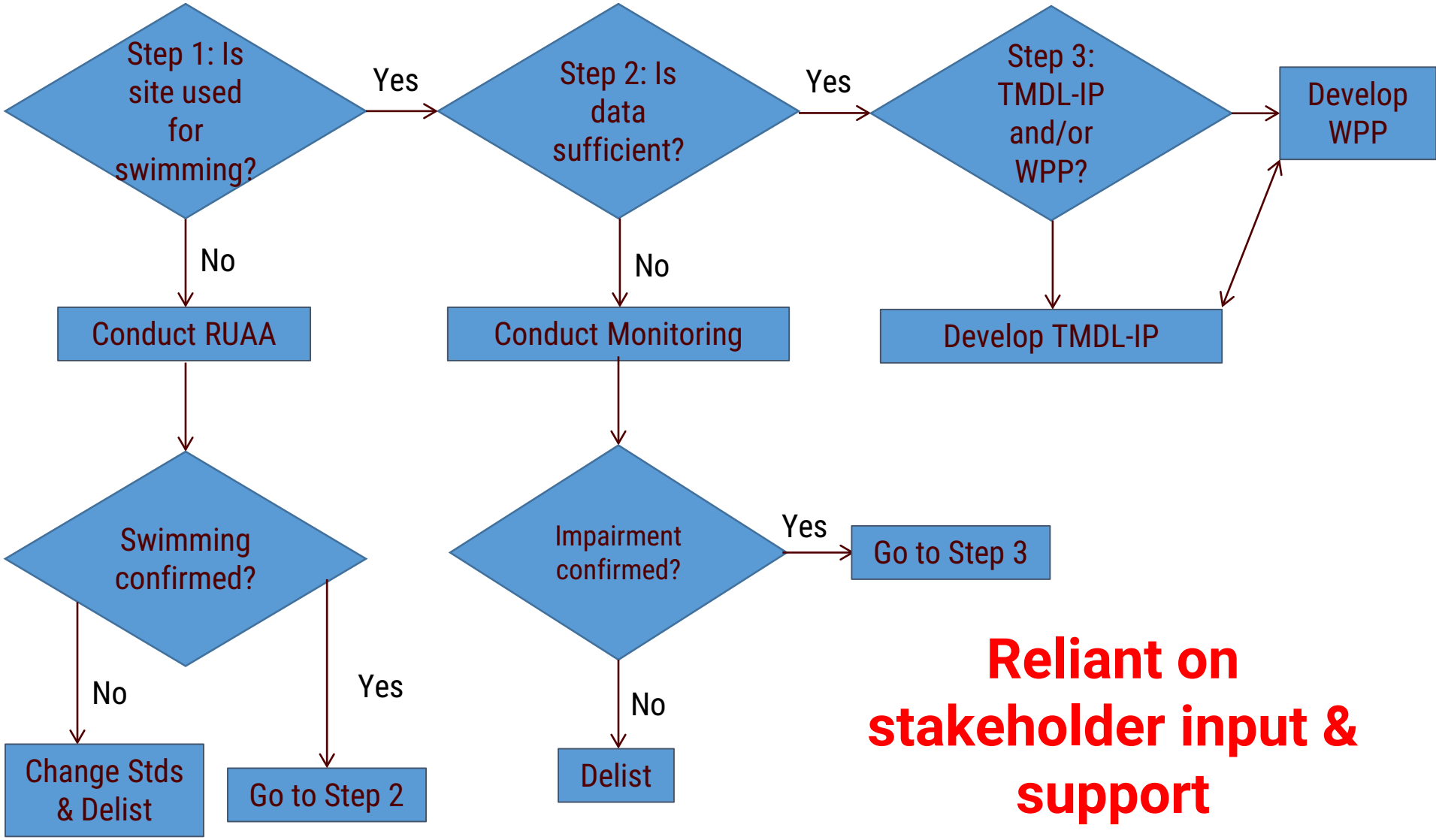
General approach used today



Reliant on stakeholder input & support

Strategies For Improving Water Quality

- **Total Maximum Daily Load (TMDL)** – Driven by federal Clean Water Act requirements
- **Total Maximum Daily Load Implementation Plan (I-Plan)** – Stakeholder driven plan that outlines how the TMDL will be achieved
- **Watershed Protection Plan (WPP)** – Stakeholder driven plan that holistically addresses all impairments and concerns in a watershed.

TMDL

- The TMDL is also a document submitted to the EPA to fulfill requirements of the Clean Water Act. TMDLs identifies the pollutant of concern, potential sources, and allocates the allowable load.

I-Plan

- The TMDL Implementation Plan (I-Plan) is a document outlining steps and schedules for reducing a pollutant load in the waterbody covered by the TMDL.
- The management measures and control actions identified in the I-Plan are developed by local stakeholders.
- I-Plans address the pollutant of concern in the TMDL.

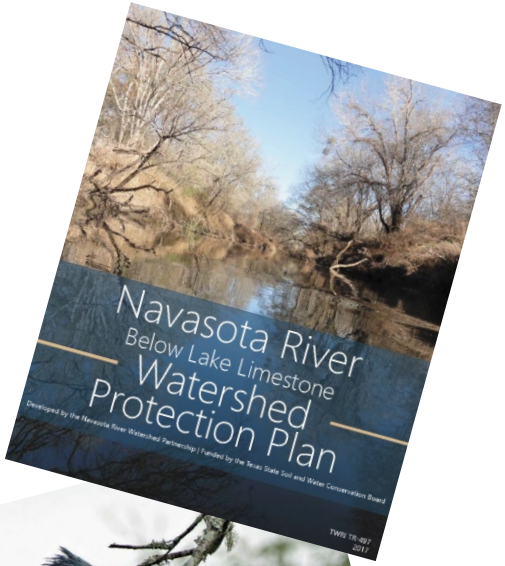
Watershed Protection Plan

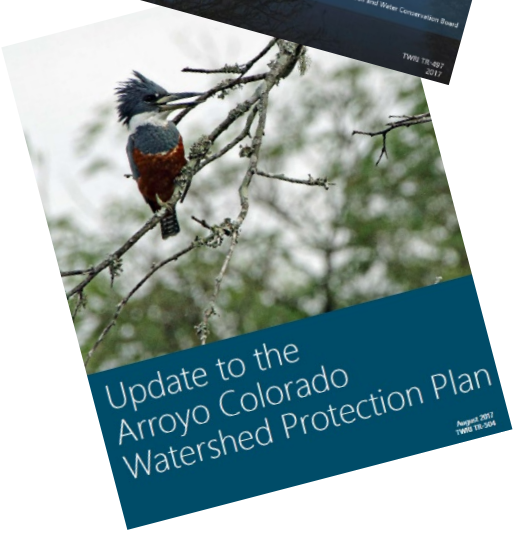
- A holistic stakeholder driven plan that addresses water quality in a watershed rather than political subdivisions
- Addresses all impairments in a watershed
- A mechanism for voluntarily addressing complex water quality problems that cross multiple jurisdictions
- Provides a framework for coordinated implementation of prioritized and integrated protection and restoration strategies
- Integrates ongoing activities, prioritizes implementation projects based on technical merit and benefits to the community

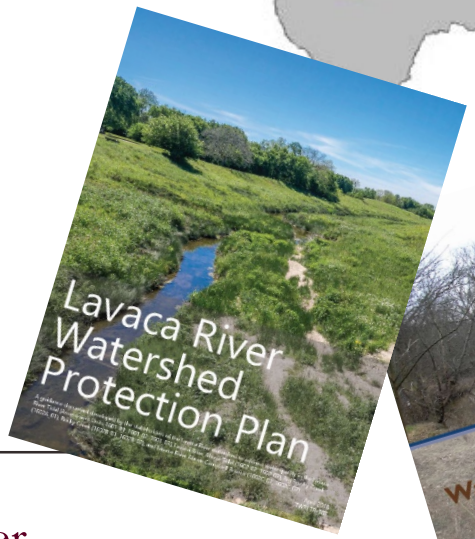
9 Elements of Successful Watershed Protection Plans

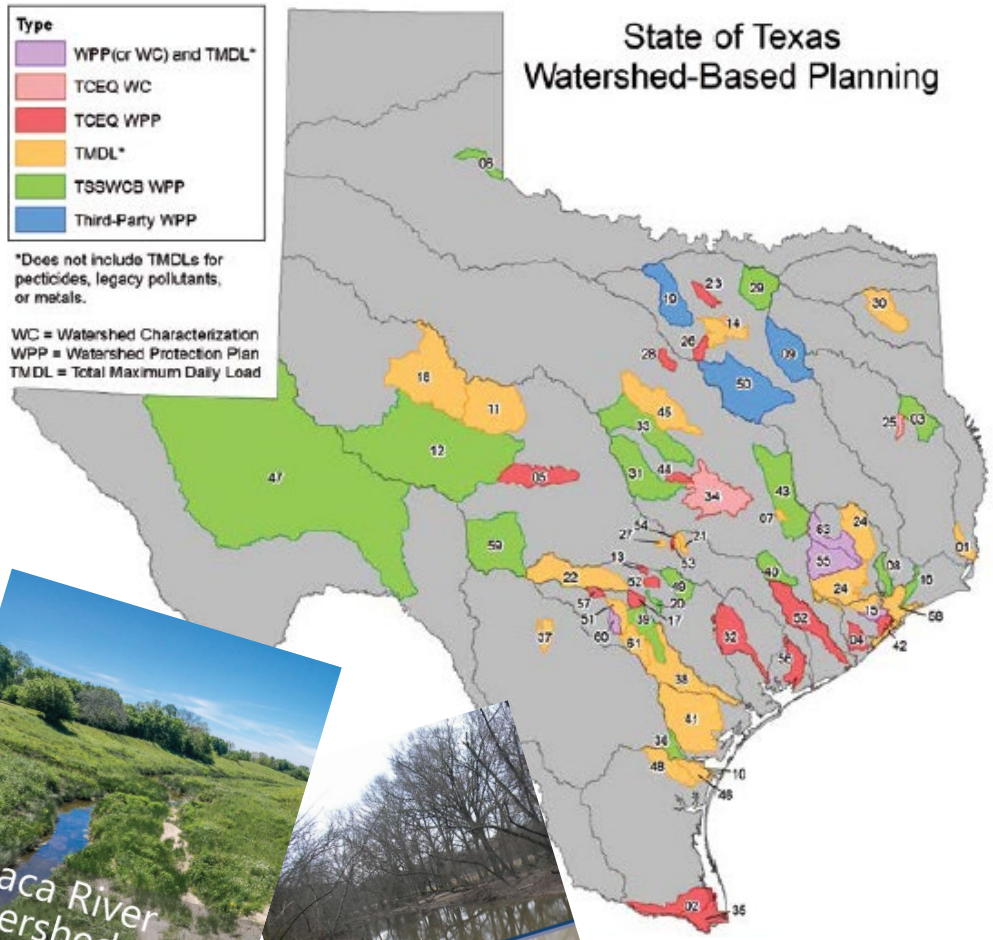
1. Identify causes and sources of pollution
2. Estimate needed reductions
3. Describe management measures
4. Include education and outreach
5. Design implementation schedule
6. Provide measurable milestones
7. Estimate costs and document sources of financial assistance
8. Progress indicators and adaptive management
9. Monitoring to evaluate effectiveness

Watershed-Based Plans Across Texas









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GARCITAS AND ARENOSA CREEK WATER QUALITY

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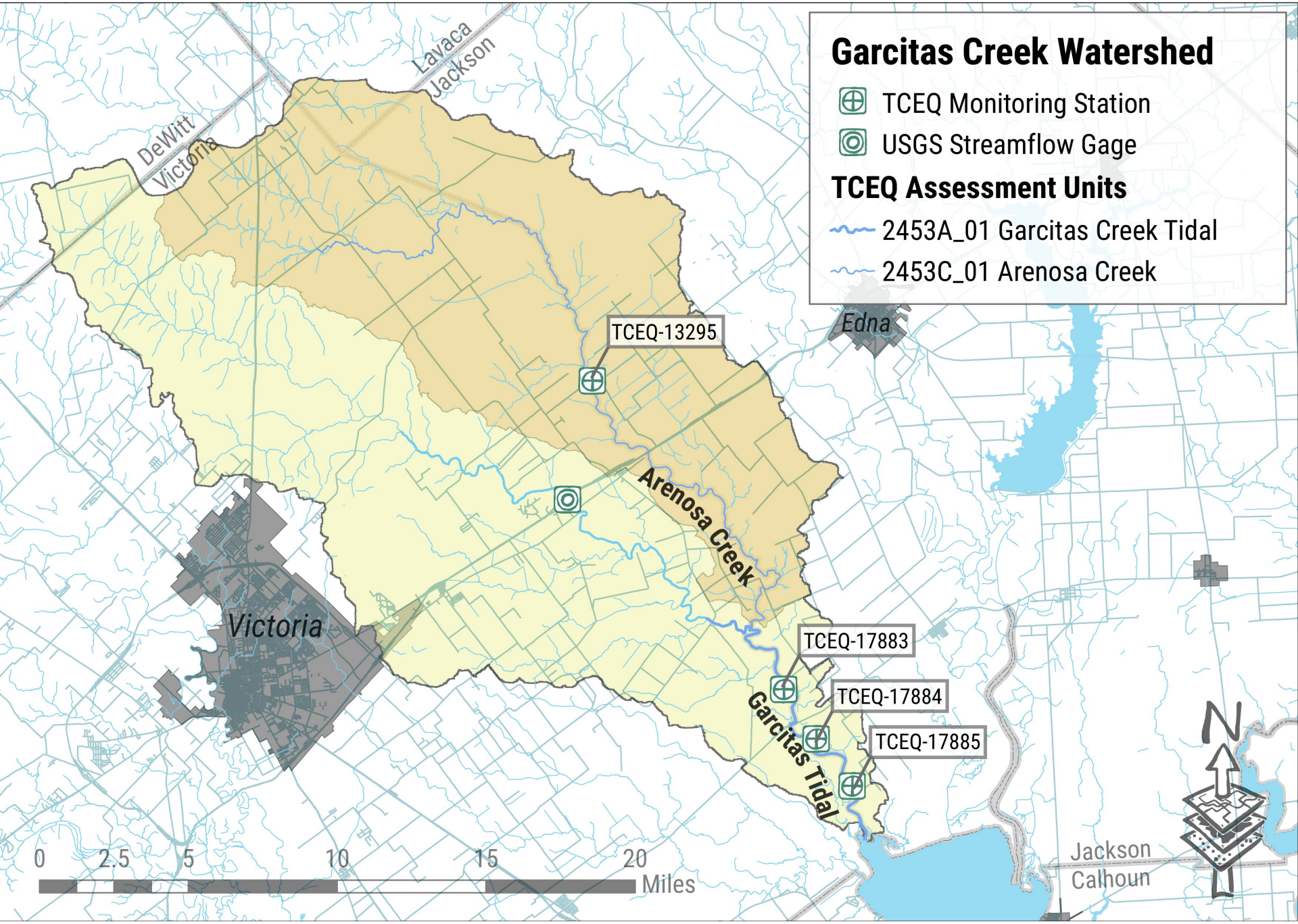

Garcitas Creek Watershed
TCEQ Monitoring Station
USGS Streamflow Gage
TCEQ Assessment Units
2453A_01 Garcitas Creek Tidal
2453C_01 Arenosa Creek
Lavaca
Jackson
DeWitt
Victoria
Edna
TCEQ-13295
Arenosa Creek
Victoria
TCEQ-17883
TCEQ-17884
TCEQ-17885
Garcitas Tidal
Jackson
Calhoun
0
2.5
5
10
15
20
Miles
N

Water Quality Standards

RECREATIONAL USES

Water Quality Standards

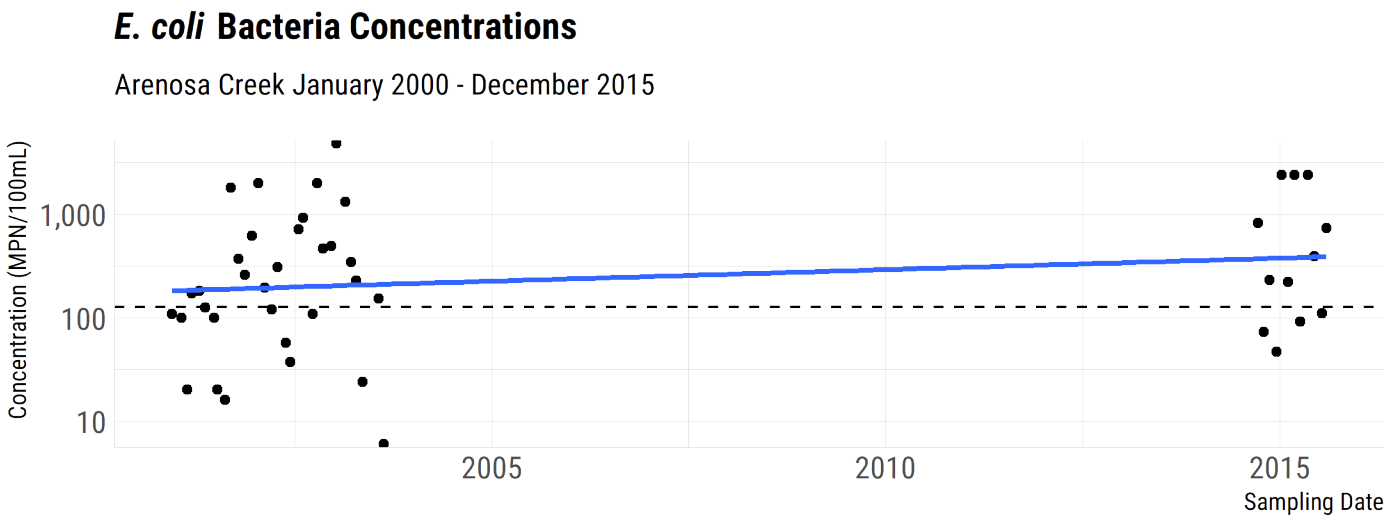
- **Primary Contact Recreation:**
- 126 MPN/100 mL *E. coli* bacteria
- 35 MPN/100mL Enterococcus bacteria

- Equates to an estimated risk of 36 per 1,000 individuals engaged in contact recreation (swimming, diving, and other activities with increased risk of water ingestion) contracting a gastrointestinal illness [1]

[1] EPA Office of Water. 2012. Recreational Water Quality Criteria. URL: https://www.epa.gov/sites/production/files/2015-10/documents/rwqc2012.pdf

Arenosa Creek

- **Indicator Bacteria**
- Inadequate samples for recent assessments. Current listing is based on data collected 2001-2003.[3]
- **2001-2003 Data** = 198 MPN/100mL



Source: TCEQ CRP Data Tool
Solid Blue Line == Line of Best Fit,
Dotted Line == Water Quality Standard (126 MPN/100mL).

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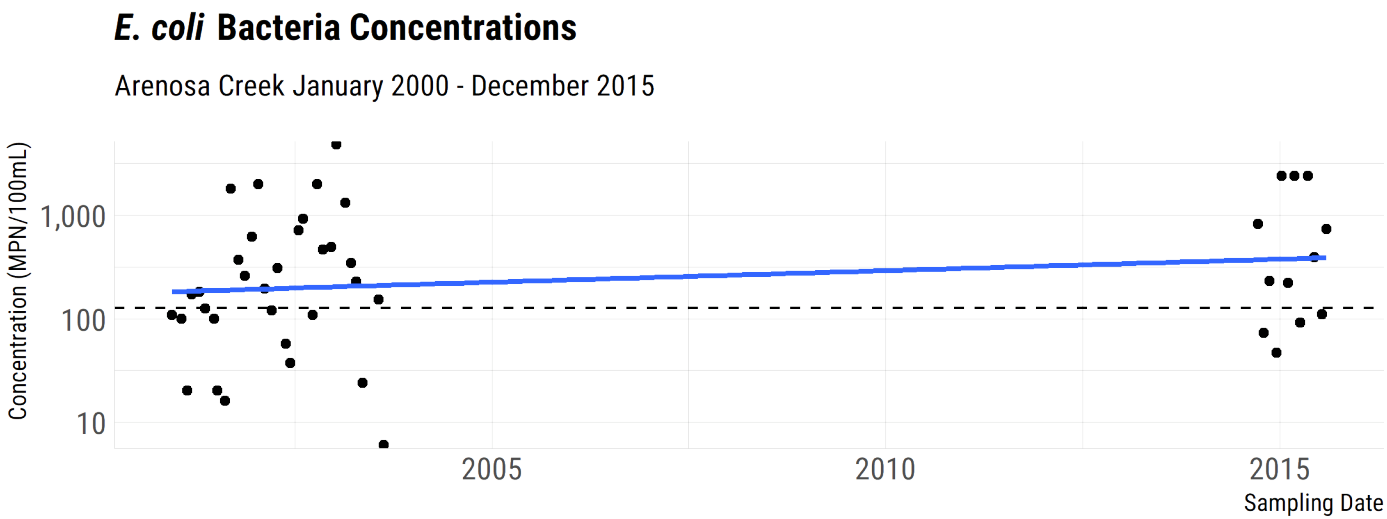
[3] TCEQ. 2011. 2010 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d) . URL: https://www.tceq.texas.gov/waterquality/assessment/10twqi

Arenosa Creek

- **Indicator Bacteria**
- TWRI conducted supplemental monitoring 2014-2015 (not used for assessment purposes).[4]
- **2014-2015 Data** = 364 MPN/100mL



Source: TCEQ CRP Data Tool
Solid Blue Line == Line of Best Fit,
Dotted Line == Water Quality Standard (126 MPN/100mL).

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[4] Jonescu, B., Gregory, L., Berthold, A., Wagner, K. 2015. Arenosa Creek Monitoring Report. Texas Water Resources Institute. TR-482. URL: http://twri.tamu.edu/media/615040/tr-482.pdf

Water Quality Standards

AQUATIC LIFE USES

Water Quality Standards

- **Aquatic Life Use[2]:**
- Freshwater High Aquatic Life Use
- 5.0 mg/L Dissolved Oxygen Average
- 3.0 mg/L Dissolved Oxygen Minimum

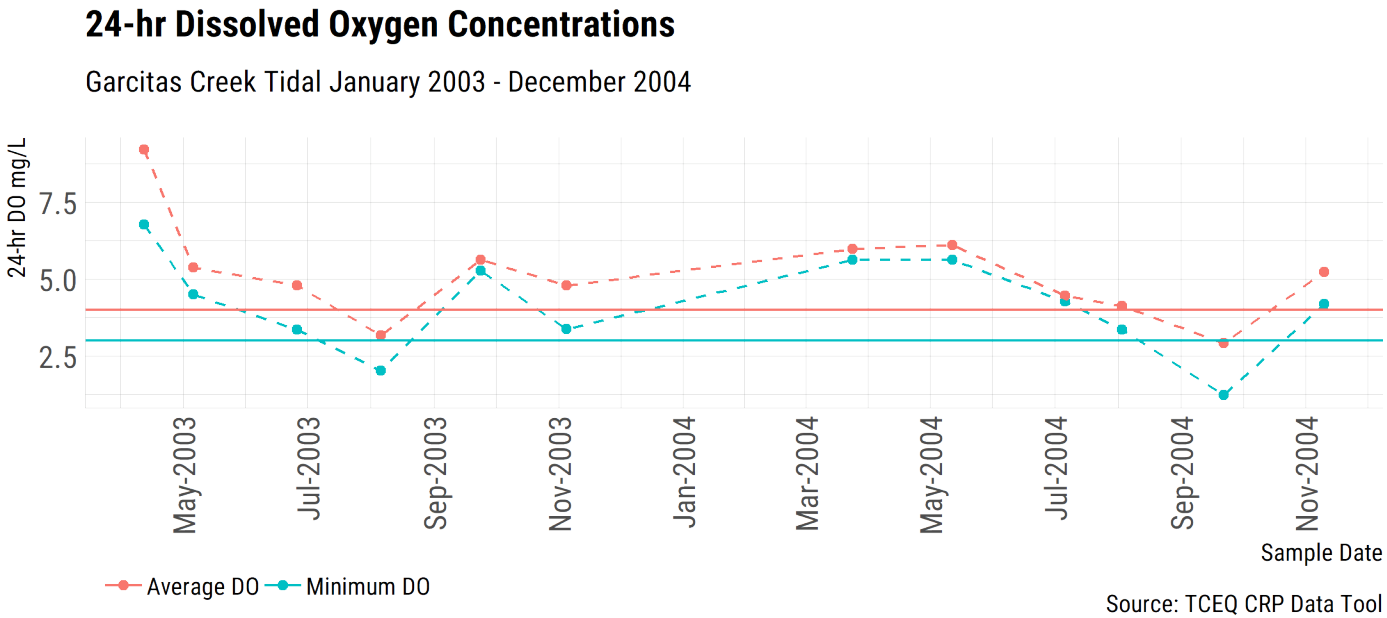
- Saltwater High Aquatic Life Use
- 4.0 mg/L Dissolved Oxygen Average
- 3.0 mg/L Dissolved Oxygen Minimum

ALU	Habitat Characteristics	Species Assemblage	Sensitive Species	Diversity	Species Richness	Trophic Structure
High	Highly Diverse	Usual association of expected species	Present	High	High	Balanced to slightly imbalanced

[2] TCEQ. 2014. Texas Surface Water Quality Standards. URL: https://www.tceq.texas.gov/waterquality/standards/2014standards.html

Garcitas Creek Tidal

- 24-hr Dissolved Oxygen Monitoring conducted 2003 – 2004
- Impairment listing triggered:
  - 25% of 24-hr Average Dissolved Oxygen Samples fell below 4 mg/L (10% exceedance allowed as determined by binomial statistical test)



Recap

- Arenosa Creek is impaired due to elevated indicator bacteria. Recent sampling by TWRI verified likelihood of this impairment.
- Garcitas Creek Tidal is impaired due to depressed dissolved oxygen. There is no recent data to confirm this listing.

STAKEHOLDER ORGANIZATIONAL FRAMEWORKS AND DECISION-MAKING PROCESSES

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What is a stakeholder?

- A group or individual who:
  - Has the responsibility for implementing a decision
  - Is affected by the decision
  - Assists with problem identification
  - Promotes awareness, education, and action
  - Facilitates implementation of solutions

Types of stakeholders

- Stakeholders can belong to the following entities:
  - Landowners
  - County or regional representatives
  - Local municipal representatives
  - State and federal agencies
  - Business and industry representatives
  - Citizen groups
  - Community service and Religious organizations
  - Universities, colleges, and schools
  - Environmental and conservation groups
  - Soil and water conservation districts

Major Tasks for Stakeholders

- Provide guidance and input on potential sources of bacteria and estimated pollutant loads
- Set goals and objectives
- Guide identification of measures that could be implemented to address bacteria
- Identify level of implementation that's reasonable
- Identify outreach and education that is needed
- Oversee development of an implementation plan & schedule

Goals for today

- Initiate discussions on how best to organize stakeholders to maximize local input
- Possible frameworks
- Possible members (if needed)
- Possible processes for decision making

Stakeholder Organizational Frameworks and Decision-Making Processes

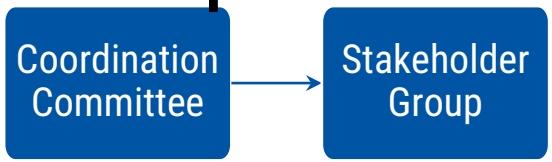
STAKEHOLDER GROUP FRAMEWORKS

Key Definitions

- **Stakeholder Group** – The general body of individuals who participate in public meetings
- **Coordination Committee** – A decision making body made up of stakeholders from diverse interest/backgrounds
- **Workgroup** – Groups made up of stakeholders of a similar interest/background

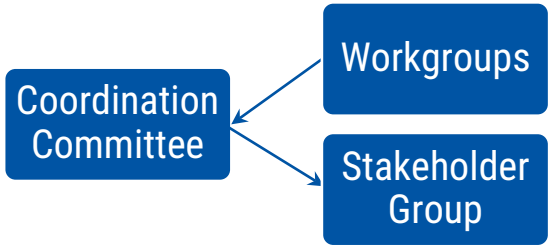
Possible Stakeholder Organization Frameworks

Option 1

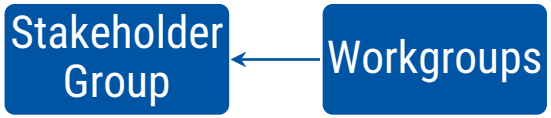


Option 3

Option 2



Option 4



Carancahua Bay Example

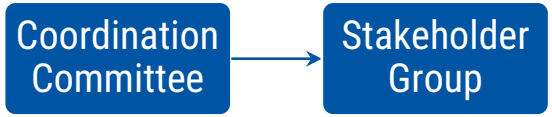
- Watershed Characteristics
  - Almost entirely rural
  - Very limited human influence with low population
- Structure
  - Stakeholder Group
- Typical Attendees
  - Texas AgriLife Extension Agent
  - Landowners
  - TPWD
  - SWCD Board Members
  - County Commissioners
  - Other Citizens

Arroyo Colorado Example

- Watershed Characteristics
  - Diverse issues and many parties involved
  - Significant Growth
  - Multiple Environmental Concerns
- Structure
  - Coordination Committee and Workgroups
    - Habitat, Agriculture, Wastewater, Education & Outreach
  - Coordination Committee oversees watershed activities
- Coordination Committee
  - RGV UT-Brownsville; CCA; Resident; TDA; Nueces River Authority; TSSWCB; City of Harligen; TWDB; LRGV SW Task Force; Harligen Irrigation District; Texas State Bank; LRGV Dev. Council; Sierra Club; TAMUK; USFS; TPWD; Arroyo Property Owner; Cameron Co. DD#5; City of McAllen; Texas Citrus Mutual; Coalition to Save the Acl Sea Grant Marine Advisory Council; Military High WSC; Cotton Growers Assn; Valley Land Fund; Suger Growers; Port of Harligen

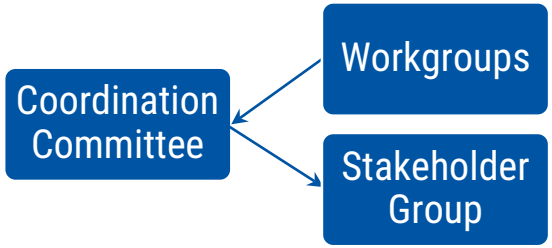
Preferred Framework?

Option 1

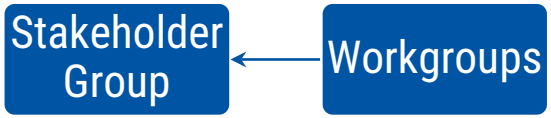


Option 3

Option 2



Option 4



Committee Members – If Needed

- Local property owner
- County Extension Agent
- County Health Inspector
- County Judge or Commissioner
- Soil and Water Conservation District Board Member
- Subdivision or Homeowners Association Member
- TPWD
- USDA – NRCS
- Texas Sea Grant
- TSSWCB
- River Authority
- Others?

Possible Work Groups – If Needed

- Work Groups Used in Other Watersheds
  - Agriculture
  - Education & Outreach
  - Habitat
  - Septic Systems
  - Ordinance & Planning
  - Science & Monitoring
  - Urban Stormwater
  - Wastewater Infrastructure
  - Wildlife
- Work Groups to Consider for Garcitas Creek
  - Agriculture
  - Wildlife
  - Septic

Stakeholder Organizational Frameworks and Decision-Making Processes

DECISION-MAKING PROCESSES

Possible Decision Making Processes

- Formal –
  - Established bylaws that govern the actions of the committee
  - Adhere to Open Meeting Act Requirements
- Informal –
  - Develop a set of ground rules that will be used to govern the group
  - Committee members approve ground rules and their use
- Consensus Based in Public Meetings

Bylaws Example

Lake Granbury Watershed Protection Plan

STAKEHOLDERS GROUP

BYLAWS

Adopted
March 24, 2006
Amended
February 13, 2007

- Outlines:
  - Organization
  - Voting Membership
  - Selection of Additional Groups/Members
  - Designated Alternates
  - Decision Making
  - Adoption and Amendments of Bylaws

Ground Rules Examples

- Geronimo Creek
  - Goals
  - Powers
  - Timeframe
  - Membership Selection
  - Steering Committee
  - Workgroup
  - Technical Advisory
  - Replacement/Additions
  - Alternates
  - Decision Making
  - Quorum
  - Facilitators

Ground Rules Examples

- Tres Palacios Creek– (Informal Ground Rules)
  - Consensus Based Decisions

Preferred Decision-Making Process?

- Formal –
  - Bylaws
  - Open Meeting Act Requirements
- Informal –
  - Ground Rules Developed to Govern the Group
  - Committee Members approve Ground Rules and Their Use.
- Consensus Based in Public Meetings

Next Meeting Or Today?

- Decide On:
  - Stakeholder Framework
    - Initial Stakeholder Group Membership
  - Decision-Making Process
    - Formal
    - Informal
  - Consensus Based

NEXT STEPS AND TIMELINE

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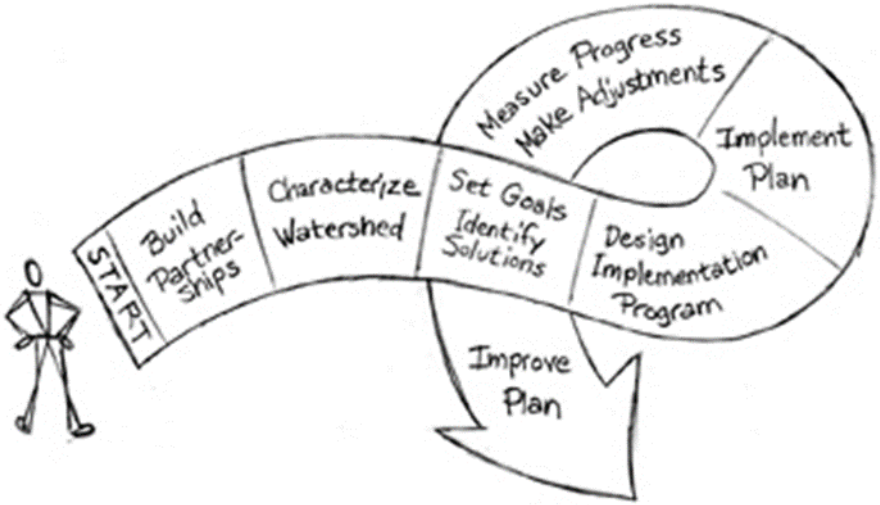
Next Steps – Near Term

- Continue Building Partnerships
- Initiate Work on Characterizing the Watershed
- Finalize Stakeholder Structure (if needed)



Next Meeting

- Recap Meeting 1
- Finalize Partnership (if needed)
- Form Workgroups (if needed)
- Discuss Example Watershed-Based Plans
- Discuss Next Steps

Overall Timeline

- August 2018 – June 2019:
  - Five to Seven Stakeholder Meetings and Plan Development
- July 2019:
  - Submit Plans to TCEQ for Review
- August 2019 – August 2020:
  - Agency Review, Additional Meetings if Needed
- September 2020:
  - Begin Implementation

Thank You!

Questions or Concerns?

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