SHOAL CREEK WATERSHED ACTION PLAN
Stakeholder Meeting: January 30, 2019

SHOAL CREEK CONSERVANCY

Welcome & Agenda Overview

Watershed Characterization Report - Update

Status: 2nd draft incorporates stakeholder comments and includes watershed characteristics and current management efforts only

Request: Review and submit comments to joanna@shoalcreekconservancy.org

Copies available today and at:

www.shoalcreekconservancy.org/watershedplan

Draft Goal

What will Shoal Creek be like after the Watershed Action Plan is implemented?

Shoal Creek is a model healthy and resilient urban watershed that benefits people and nature and is supported by a well-informed and engaged community.

SHOAL CREEK WATERSHED PROTECTION PLAN
WATER QUALITY MODELING UPDATE

Tom Hegemier, P.E., D.WRE. CFM

January 30, 2019

Water Quality **Modeling** Purpose

- Quantify pollutant loads
  - Existing and future land use conditions
- Quantify needed load reductions
  - State standards
  - Stakeholder watershed goals
- Evaluate pollutant management measures
- Include in the Watershed Characterization Report
- Supports Watershed Protection Plan development

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Water Quality Constituents

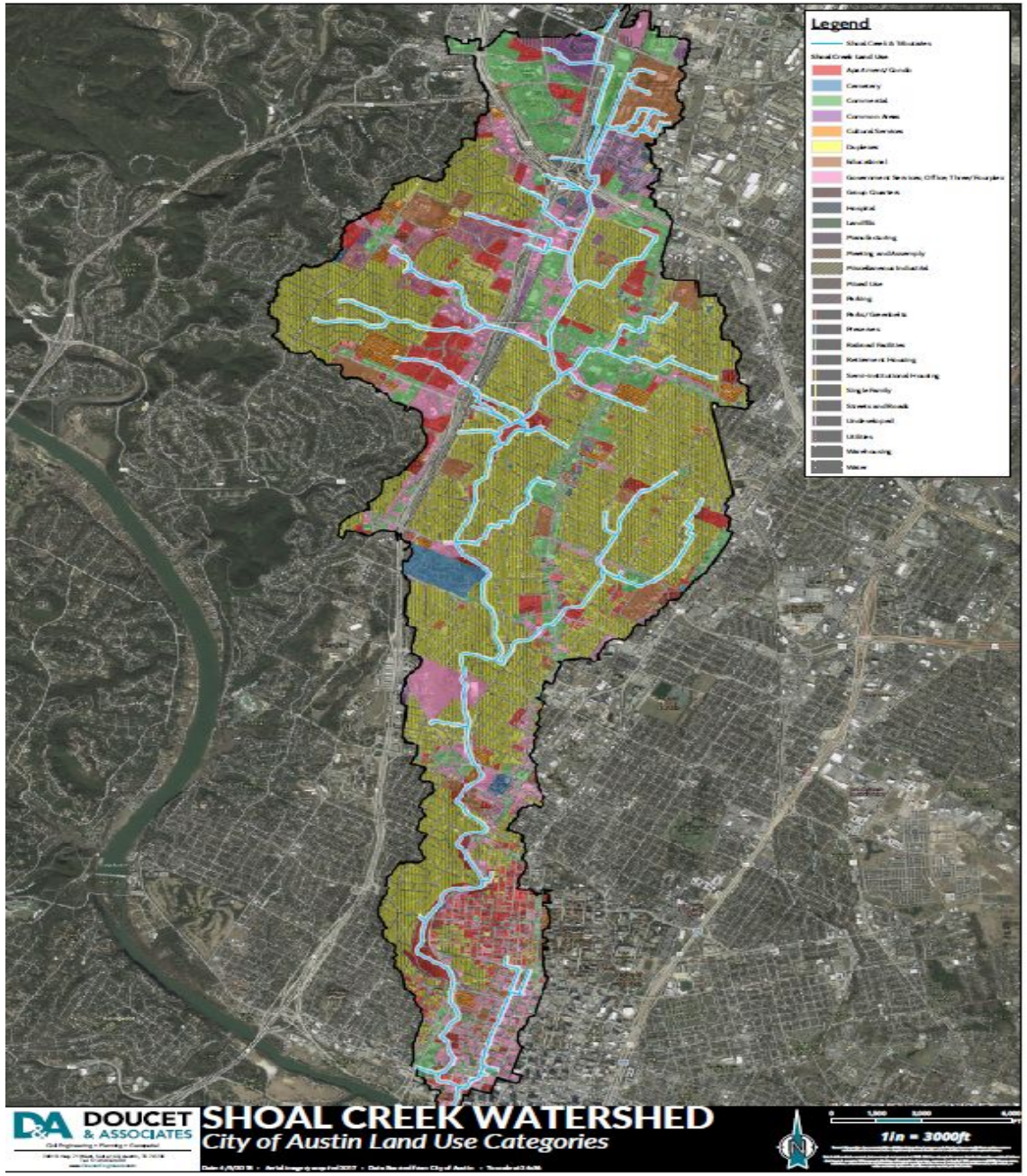
- Modeled pollutants
  - Bacteria
  - Total suspended sediment
  - Total nitrogen
  - Total phosphorus

- Criteria
  - State standards for bacteria
  - Screening criteria/stakeholder input to establish thresholds for other pollutants

Water Quality Modeling Approach

- Load Duration Curves
  - Shoal Creek at 12th Street Gage, **insufficient data for other sites**
  - Flow and water quality data
    - (USGS and the City)

- SELECT Model
  - 12 watershed subareas
  - Land use provided by the City
  - Determined loadings for current and future conditions
  - Can evaluate management measures
  - Prioritize sub-watersheds



Pollutant loads based on land use and stormwater runoff

Pollutant concentrations are higher in densely development areas

Watershed impervious cover = 53%

Most of the watershed was developed before City of Austin water quality regulations, 21% IC treated

Healthy watersheds IC typically < 10%

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Water Quality Conditions

- City of Austin Environmental Integrity Index
  - Shoal Creek 6th lowest water quality out of 49 watersheds
  - Poor riparian vegetation
  - Unstable channels
  - Elevated nutrients
  - Fecal contamination
  - Toxins in sediment

Modeling Constraints

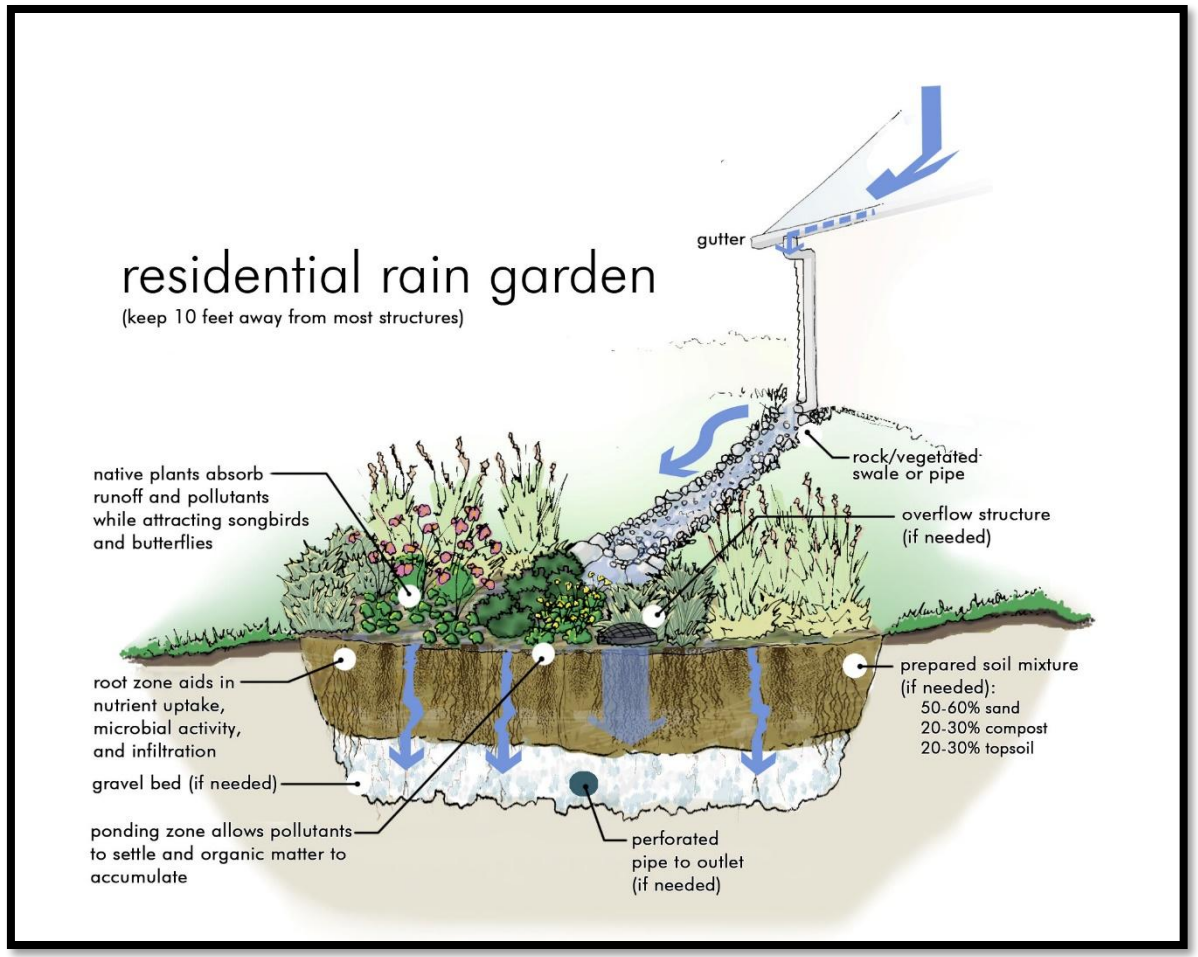
- Data is scarce and dated, uncertainty about loadings and desired reductions
- Creek is intermittent – only flowing directly after rainfall events, dry over half the time, limited baseflow data
- Fecal coliform is older proxy for bacteria (e. coli now used), but not enough observed data to use e. coli in analysis
- Observed fecal coliform numbers very high, but many observations from 1980's and 1990's, prior to Austin Clean Water Program, which removed many wastewater lines from creek beds.

Modeling Process

- Use SELECT to quantify pollutant loads
- Use SELECT to assess management measures and load reductions
- Apply findings to the Load Duration Curves to assess benefits and/or compliance with standards/targets

Modeling Hypothetical Example

- **Rain gardens to treat the entire watershed**
- **Sized to retain the runoff from a 0.5 inch storm**



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Preliminary SELECT Output - TSS

Subarea	Drainage Area (acres)	Existing (lbs/yr)	Future (lbs/yr)	Future w/ rain garden ½" ROV (lbs/yr)	BMP Volume (acre-ft)
1	942.95	185,129	206,692	171,599	39.29
2	996.80	156,683	165,332	128,806	41.53
3	959.85	122,716	133,919	98,949	39.99
4	761.56	111,541	121,159	93,256	31.73
5	339.31	51,003	56,497	44,007	14.14
6	300.93	35,660	37,664	26,639	12.54
7	699.58	95,442	100,237	74,656	29.15
8	383.35	36,240	36,255	22,000	15.97
9	1022.38	135,767	139,189	101,961	42.6
10	527.44	75,557	75,681	56,361	21.98
11	432.73	60,314	64,106	48,086	18.03
12	932.26	144,357	157,418	122,771	38.84
Total	8299.14	1,210,409	1,294,149	989,089	345.79

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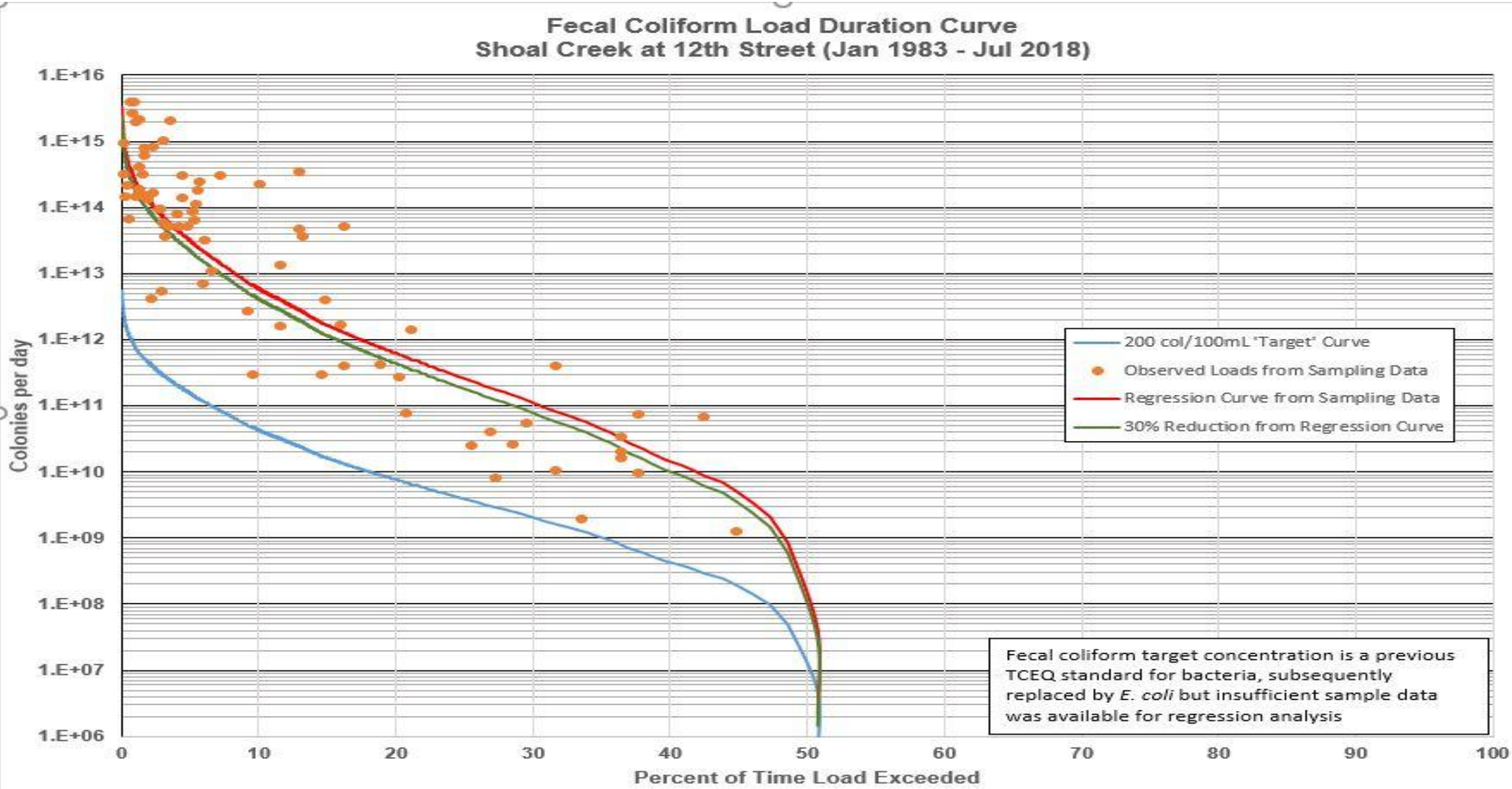
Example Evaluation Summary

- **Total suspended sediment**
  - **Total rain garden volume = 345 acre-feet**
  - **Assuming 1-foot depth, surface area = 345 acres**
  - **Pounds managed per year = 305,000**
  - **Equivalent to about 95 dump trucks per year**

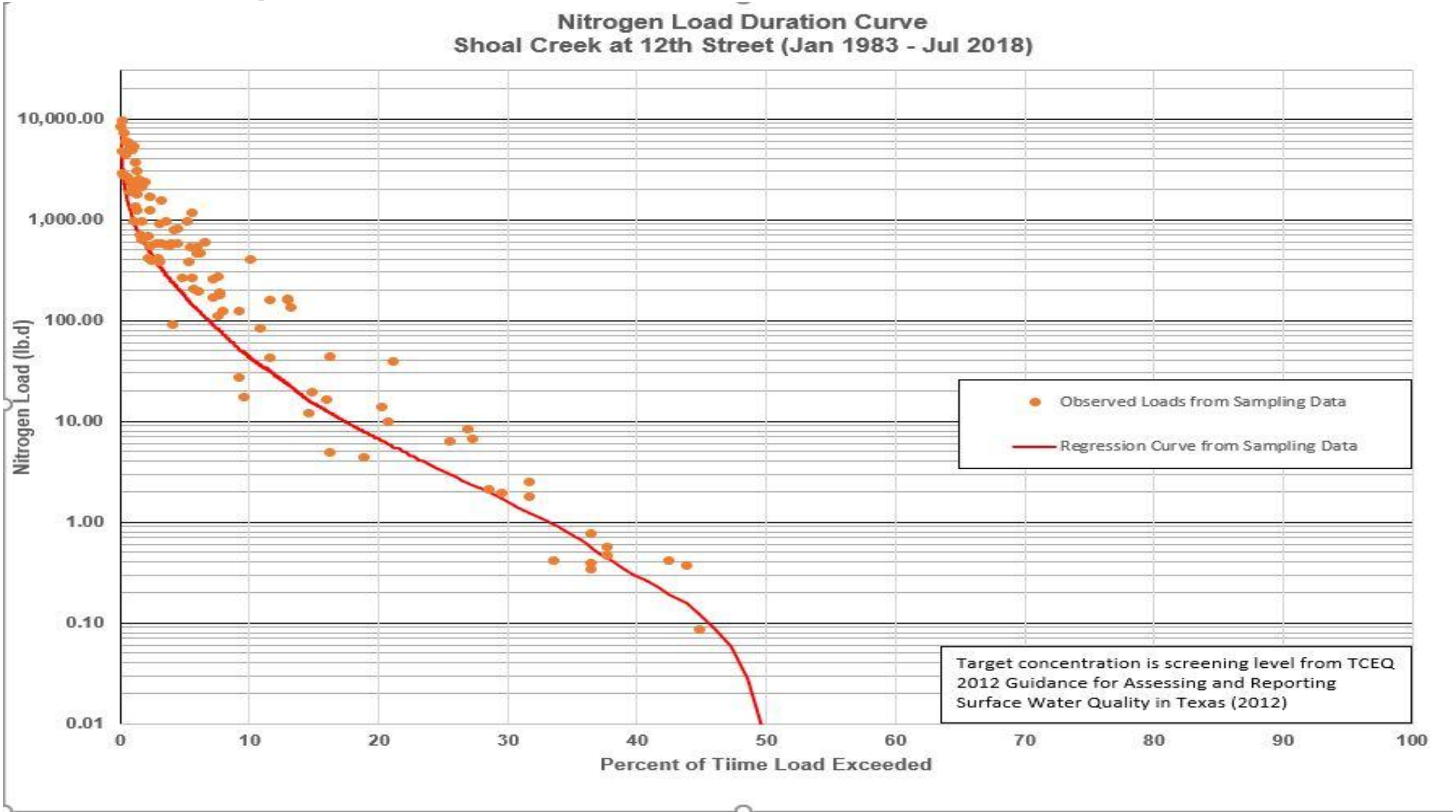
Priority watersheds – Upper watershed commercial areas

- Downtown area

Bacteria Load Duration Curve



Nitrogen Load Duration Curve



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Next Steps

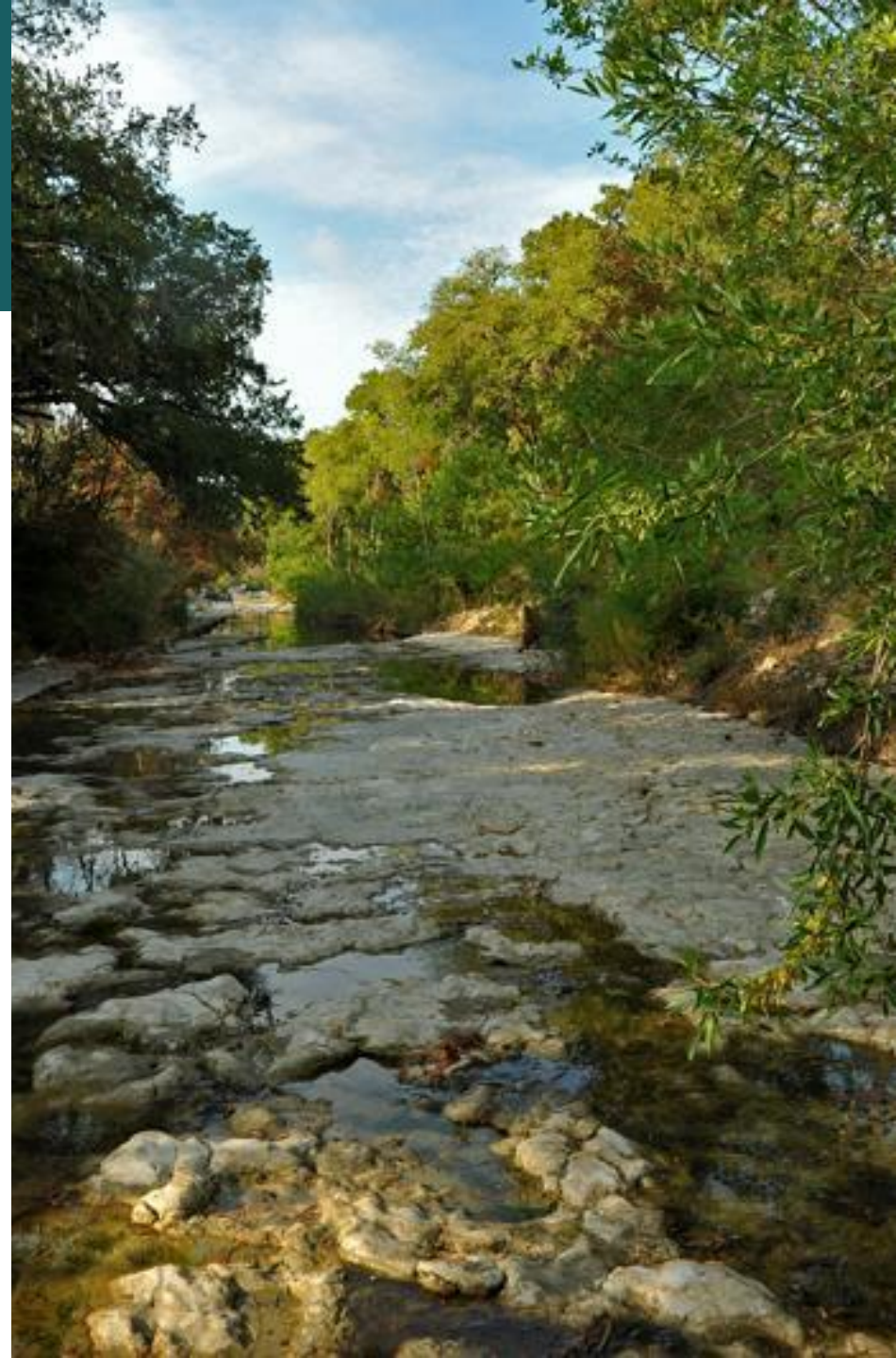
- Finalize draft modeling report by the end of February
- Respond to TCEQ and stakeholder comments
- Use models in the watershed planning process, establish target criteria
- Compare with City of Austin Environmental Integrity Index to provide context
- Intensive targeted monitoring program would help establish a better “baseline” to assess desired pollutant reductions
  - Not included in the project scope

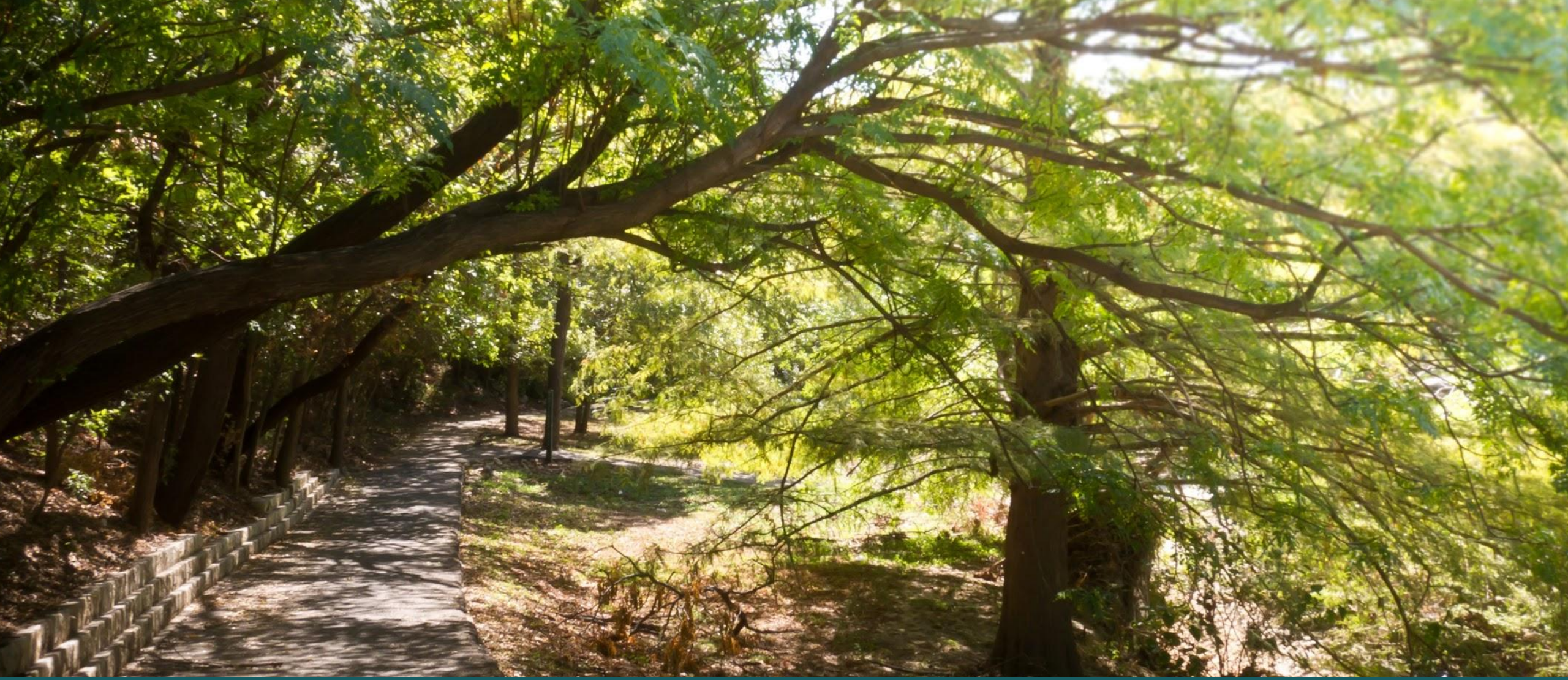
Part 2: Working Groups

Groups:

- Water *(Leader: Jennifer Walker)*
- Land Stewardship *(Leader: Ranleigh Hirsh)*
- Education & Outreach *(Leader: Ryan Spencer)*
- Implementation *(Leader: Joanna Wolaver)*

Today: 2nd meeting of groups, identify objectives related to the purpose of your working group





Wrap-Up & Public Comments

Partners

SHOAL CREEK CONSERVANCY

THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT
TEXAS STATE UNIVERSITY

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CITY OF AUSTIN FOUNDED 1839

And Shoal Creek Stakeholders

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