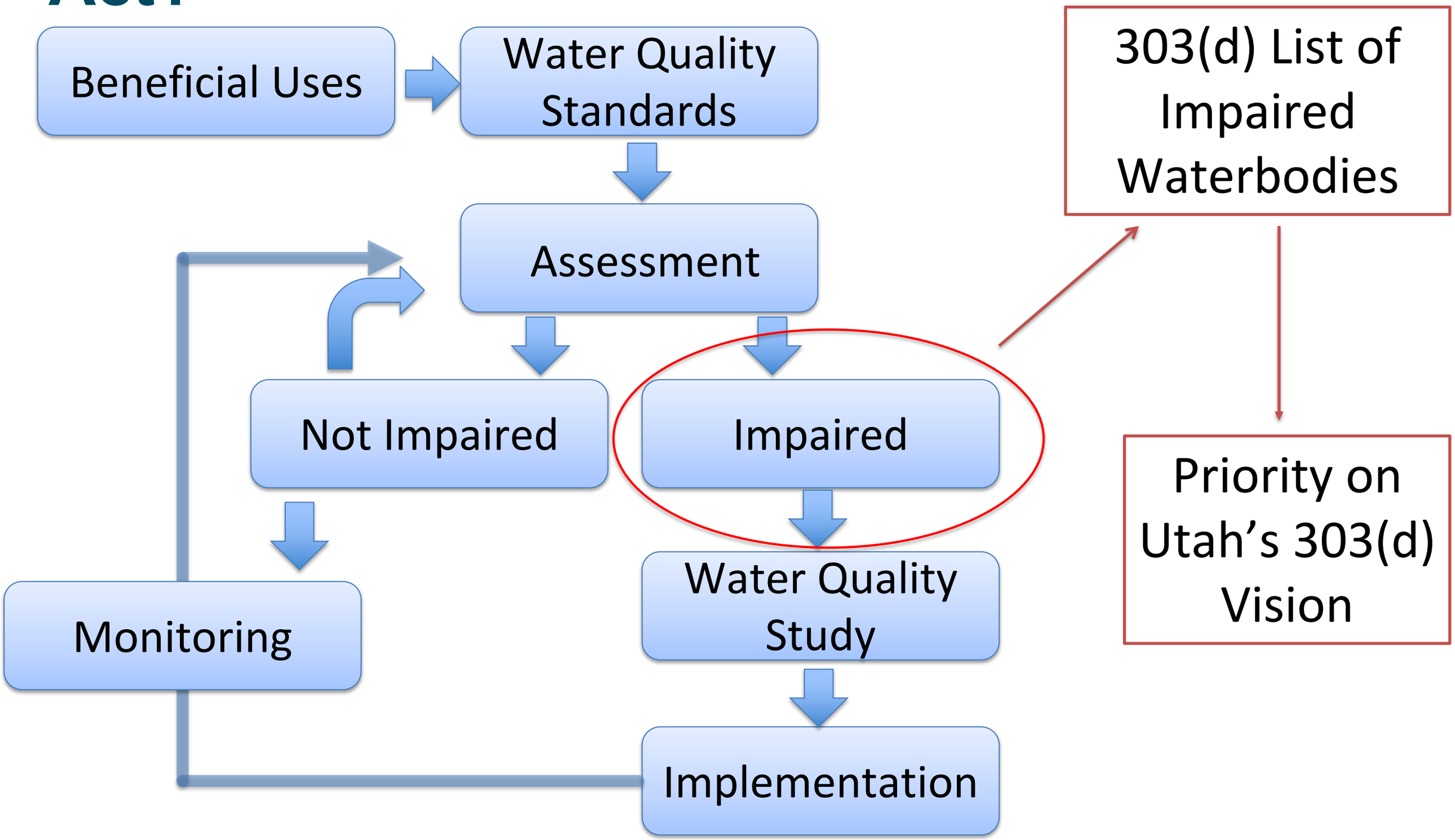
UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
WATER
QUALITY

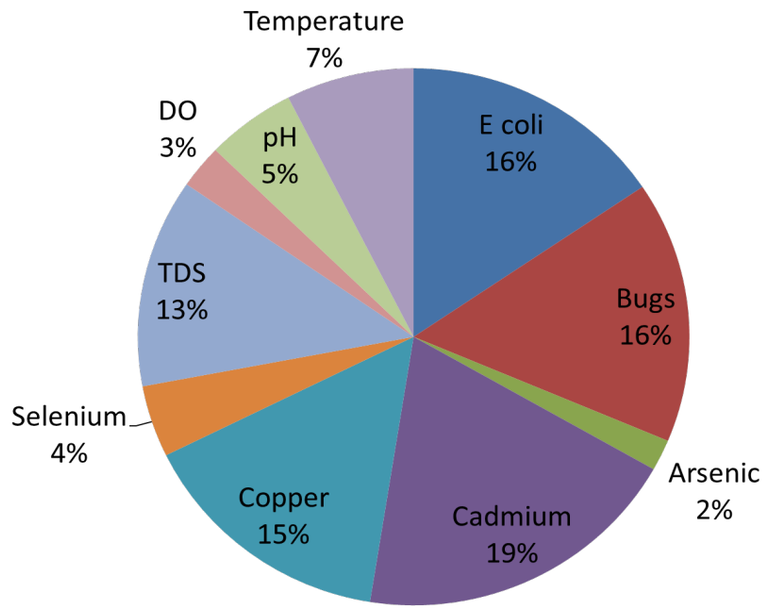
Jordan River Watershed *E. coli* TMDL Studies Introduction

Jordan River Commission – TAC
June 17, 2021
Sandy Wingert & Nick von Stackelberg

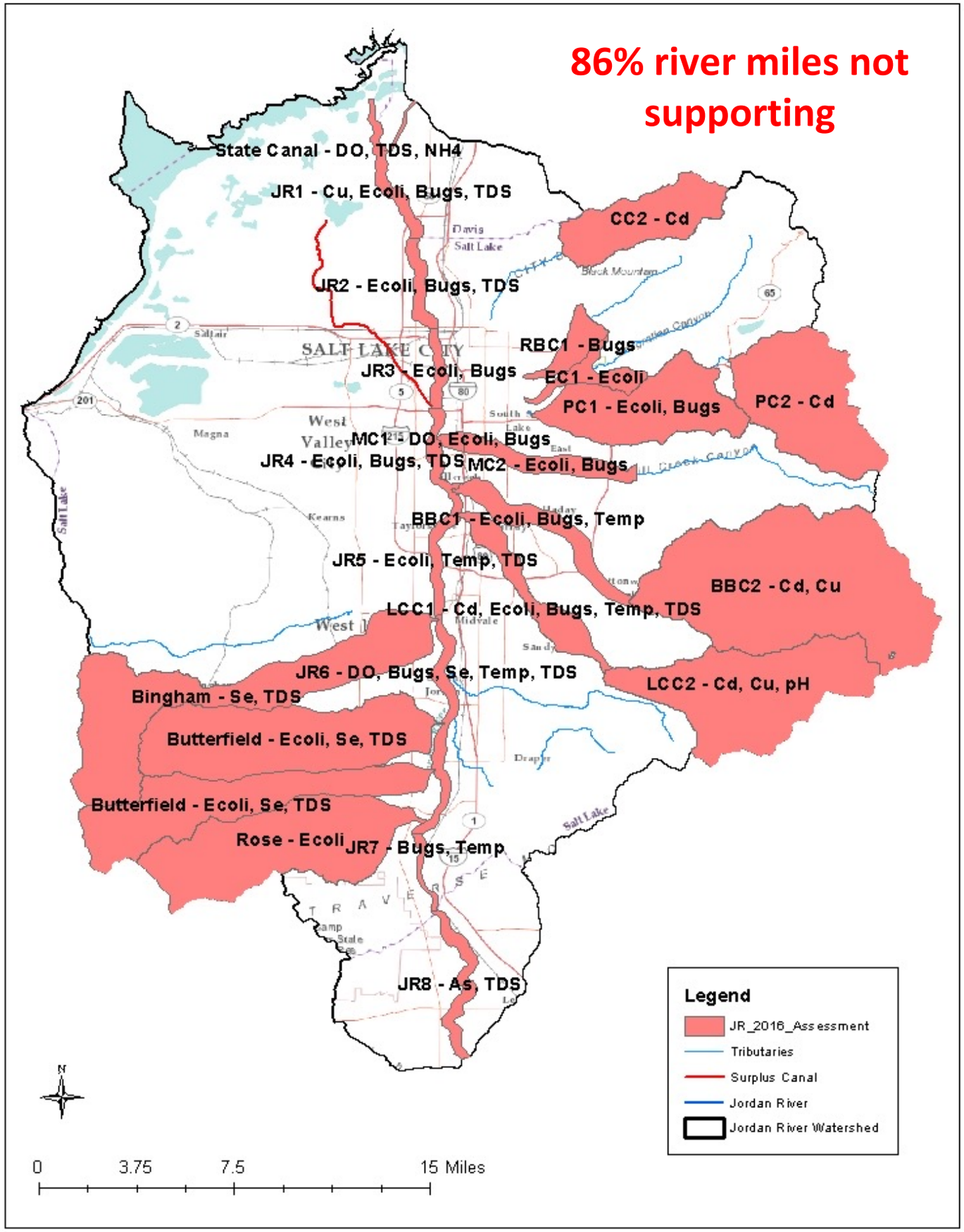
How does Utah implement the Clean Water Act?



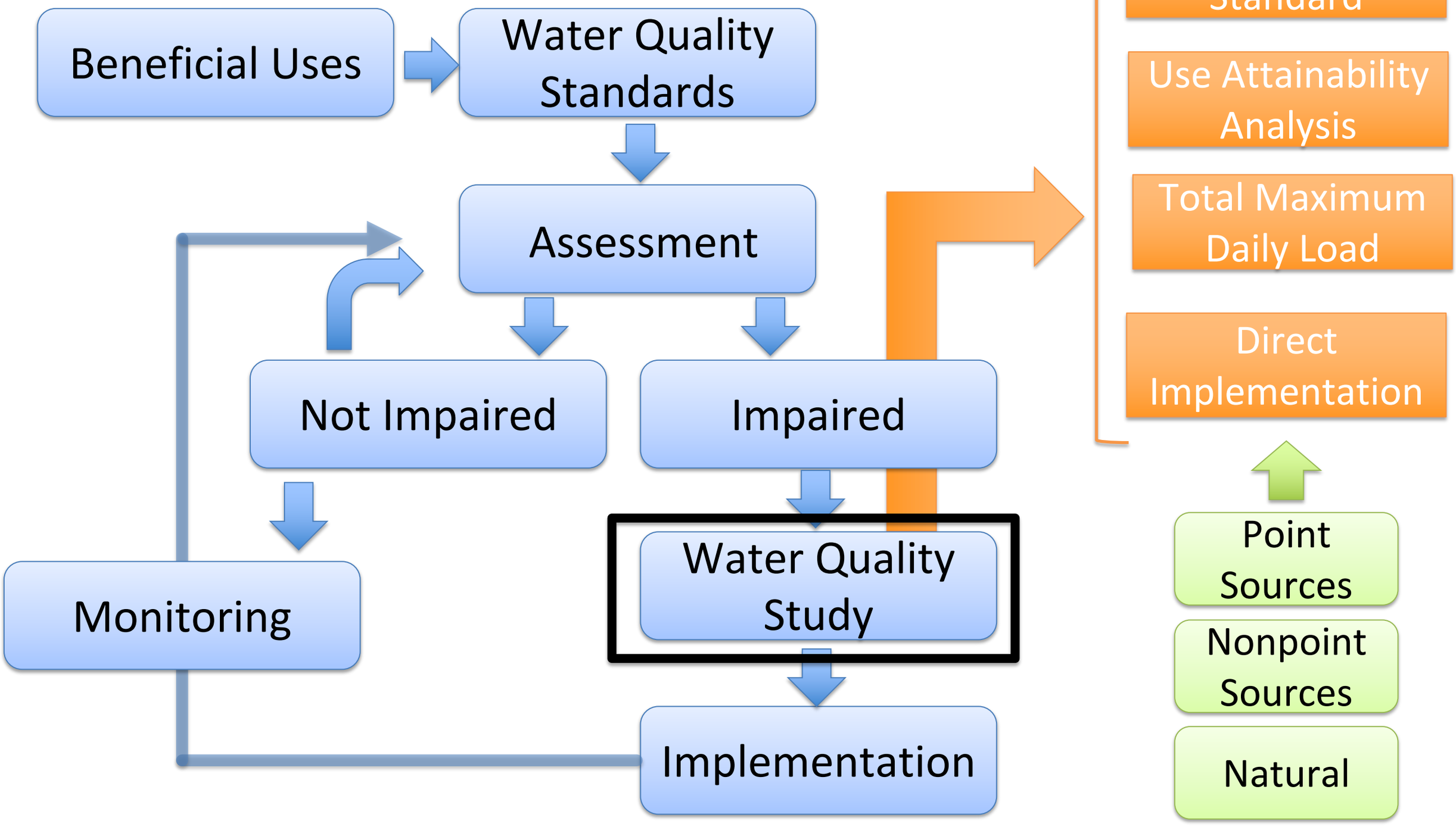
2016 303(d) List of Impaired Waterbodies



Pollutant by Impaired River Miles



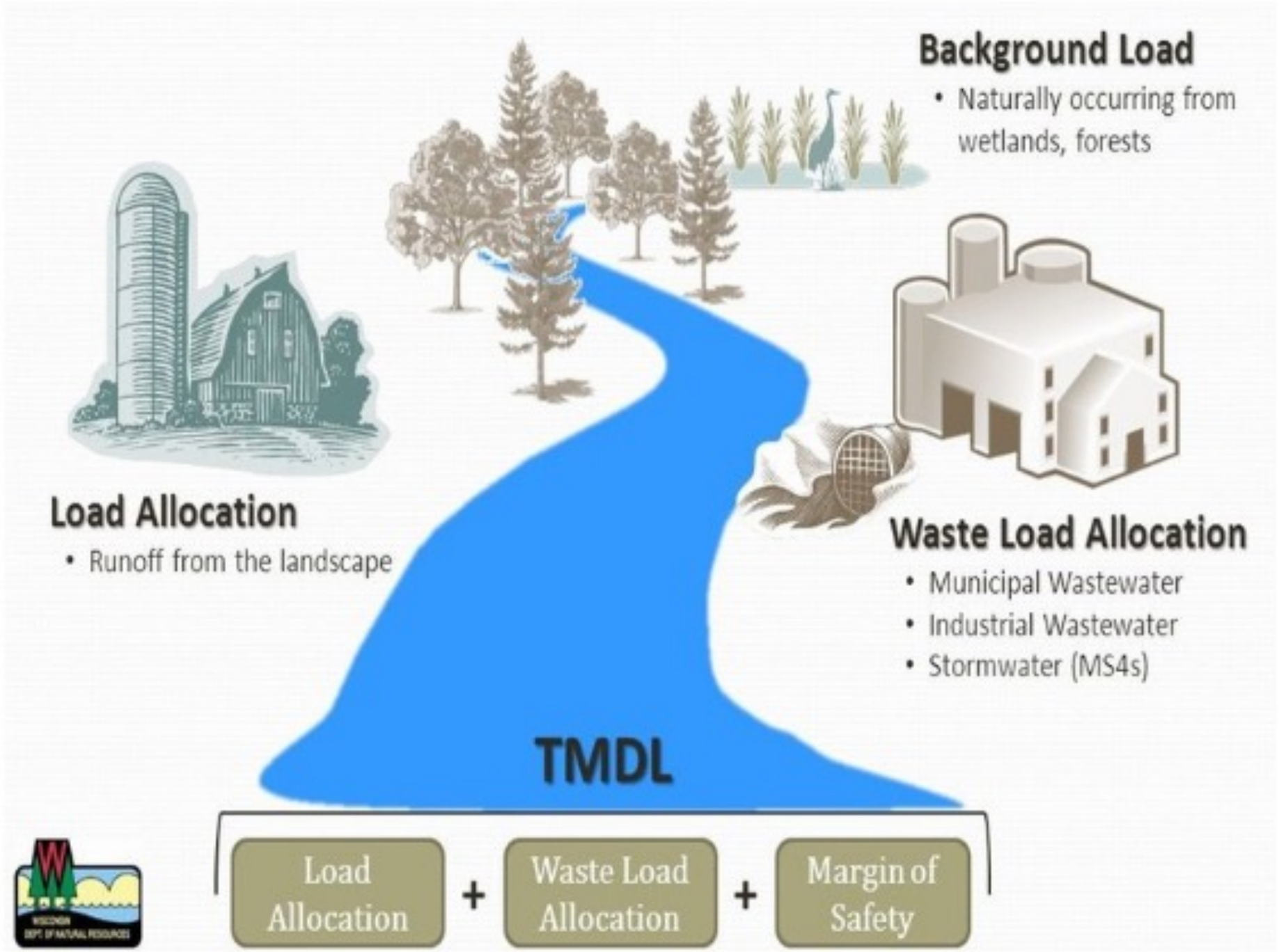
How does Utah implement the Clean Water Act?



Total Maximum Daily Loads (TMDLs)

Total ***M***aximum ***D***aily ***L***oad

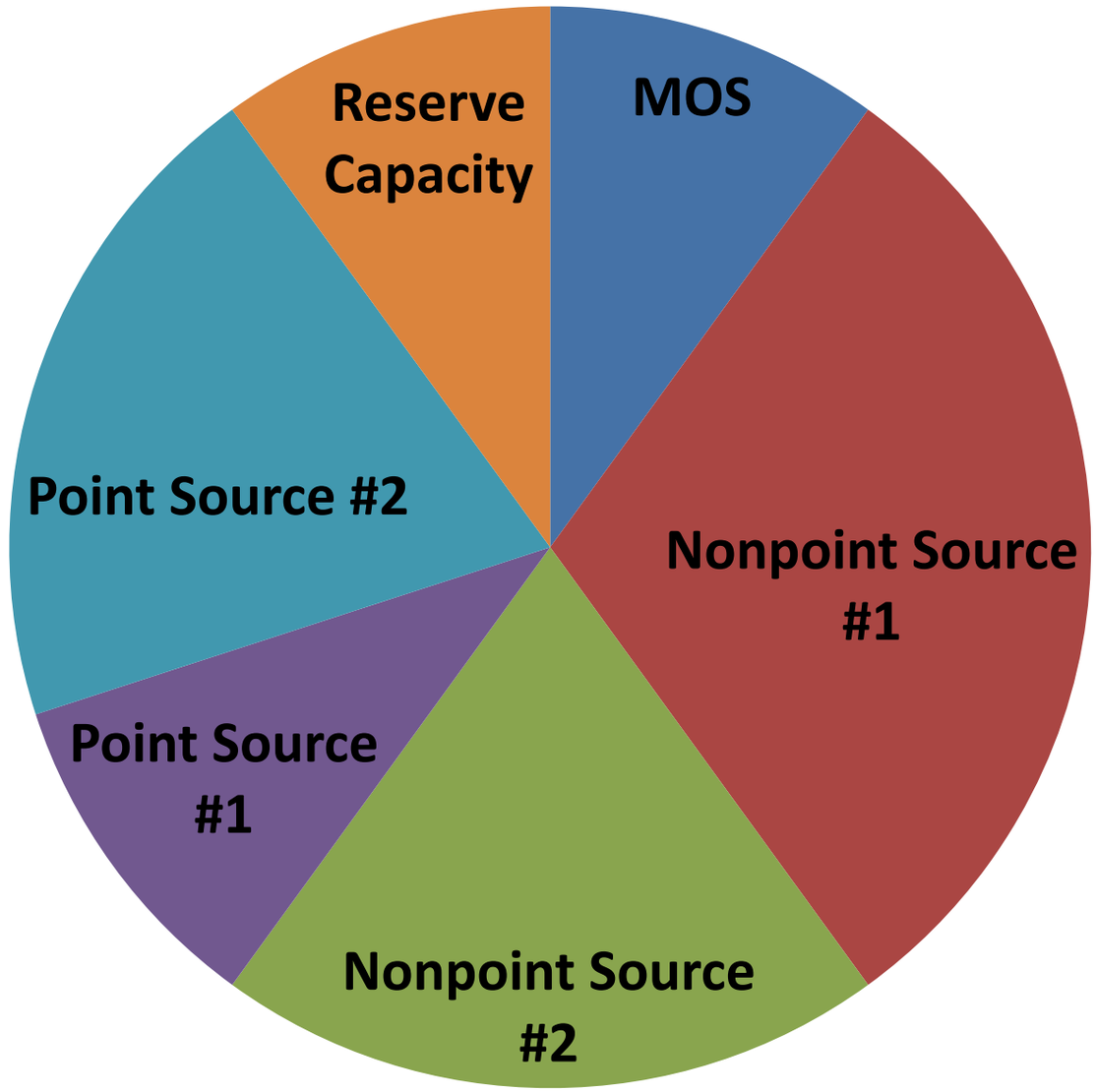
A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still maintain beneficial uses.



https://www.lakepepinlegacyalliance.org/faq

TMDL: Simply a Pollution Budget

Example: Source Allocation of a TMDL



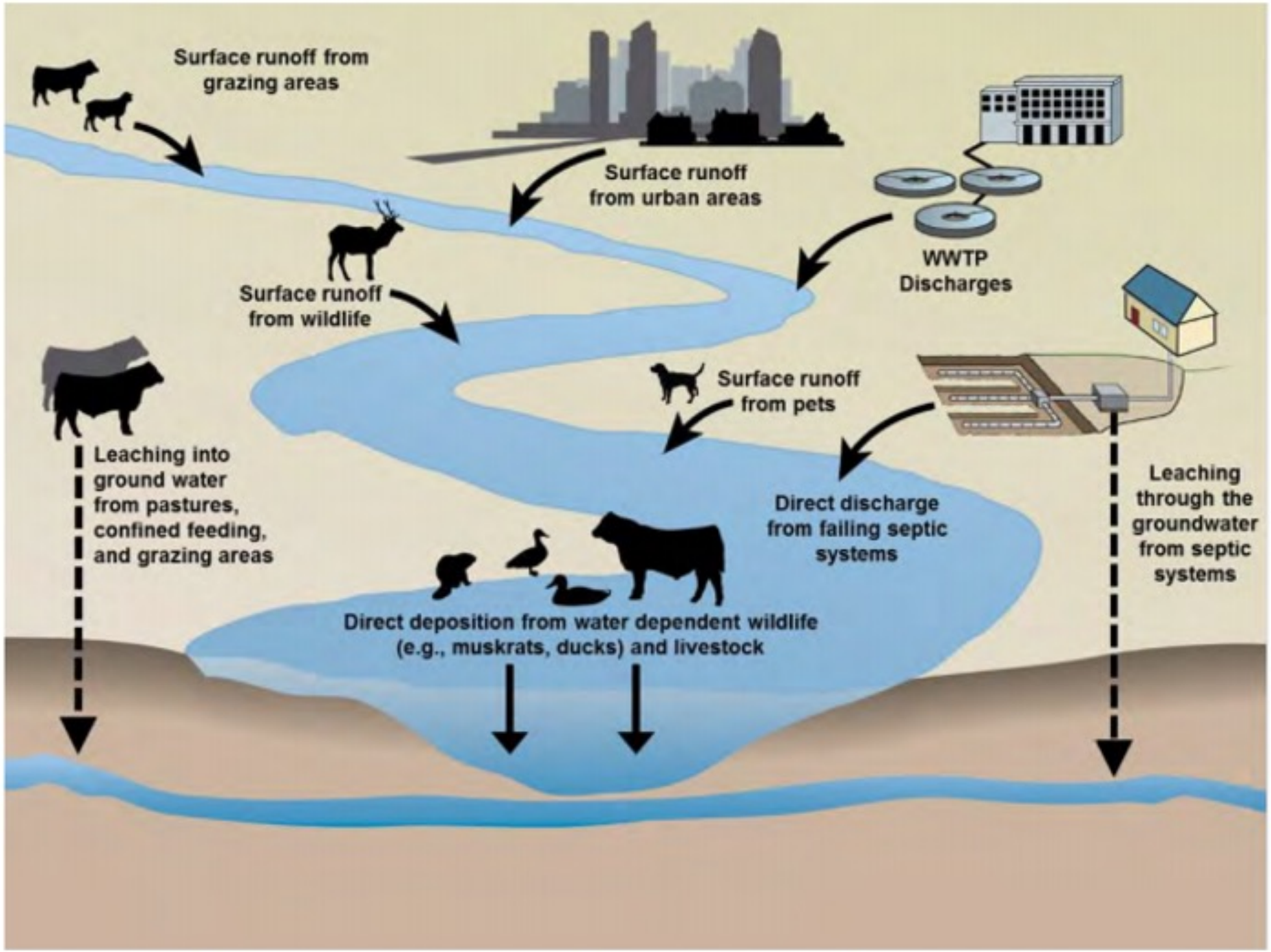
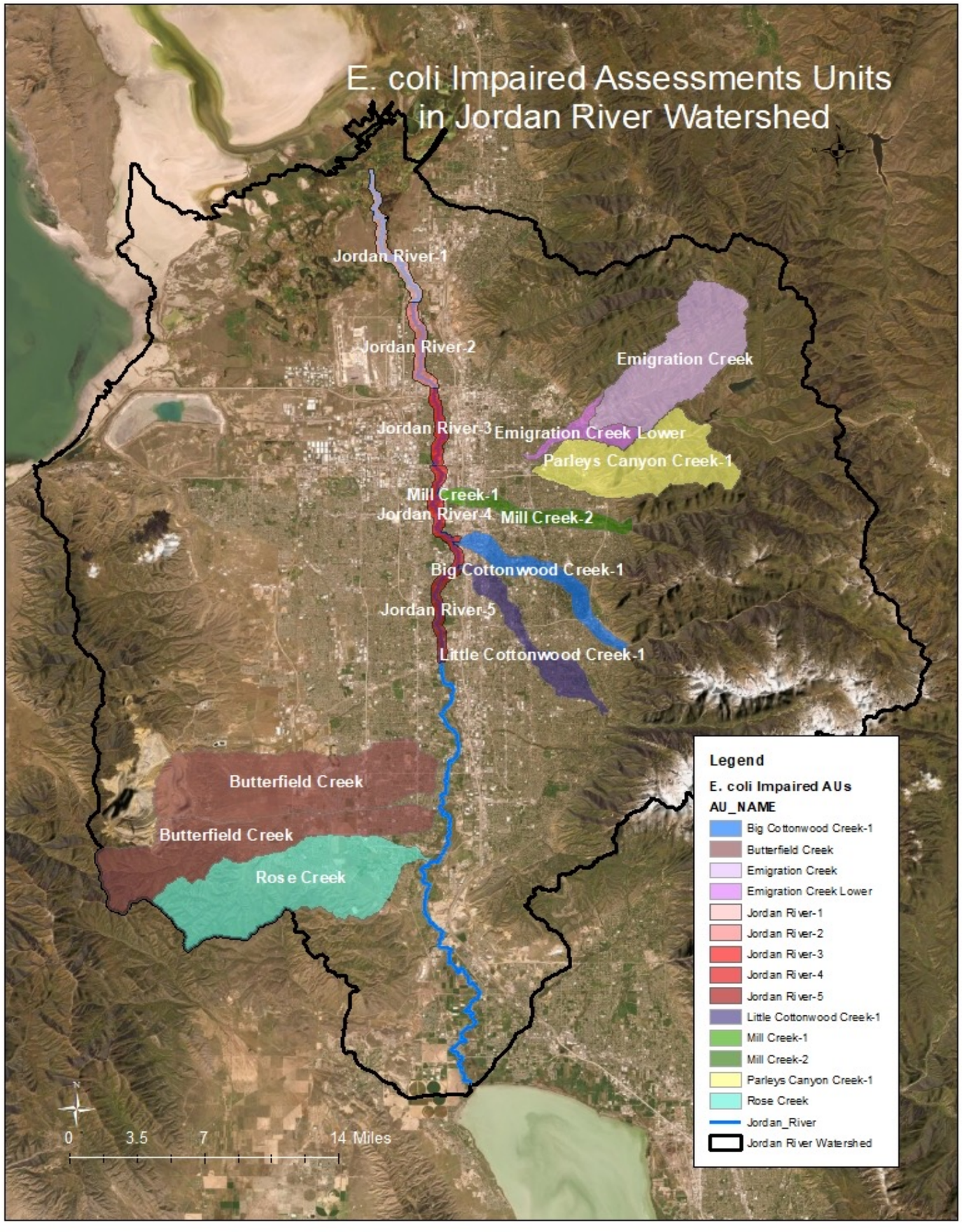


Figure 32. Possible Bacteria Transport Pathways Schematic (WY DEQ, 2018).

Jordan River Watershed *E. coli* TMDLs Assessment



Jordan River Watershed Impaired Assessment Units

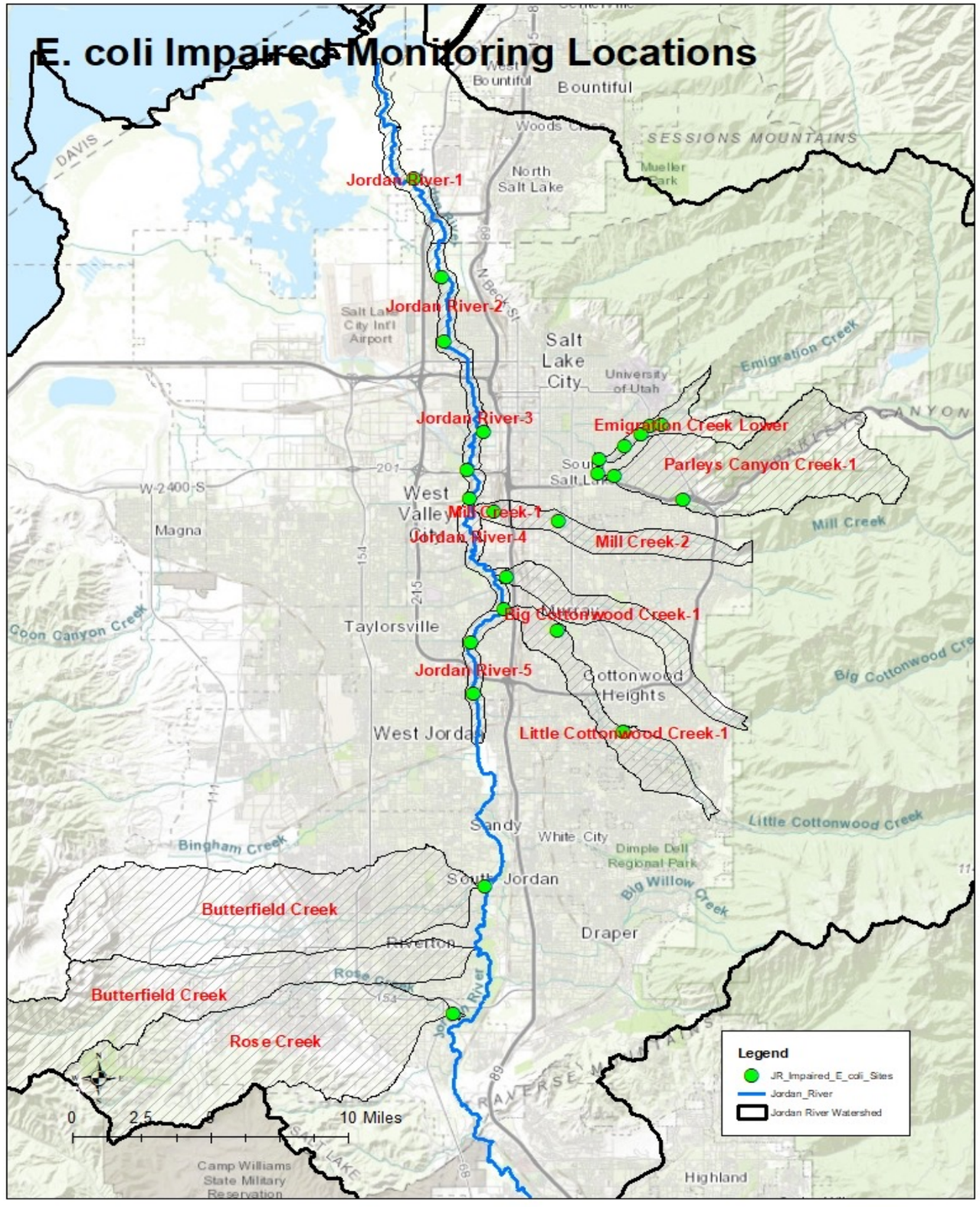
- Jordan River 1-5
- Mill Creek 1 & 2
- Big Cottonwood 1
- Little Cottonwood 1
- Lower Emigration
- Emigration Canyon*
- Parleys Canyon 1
- Butterfield / Midas
- Rose

2022 Priority TMLDs

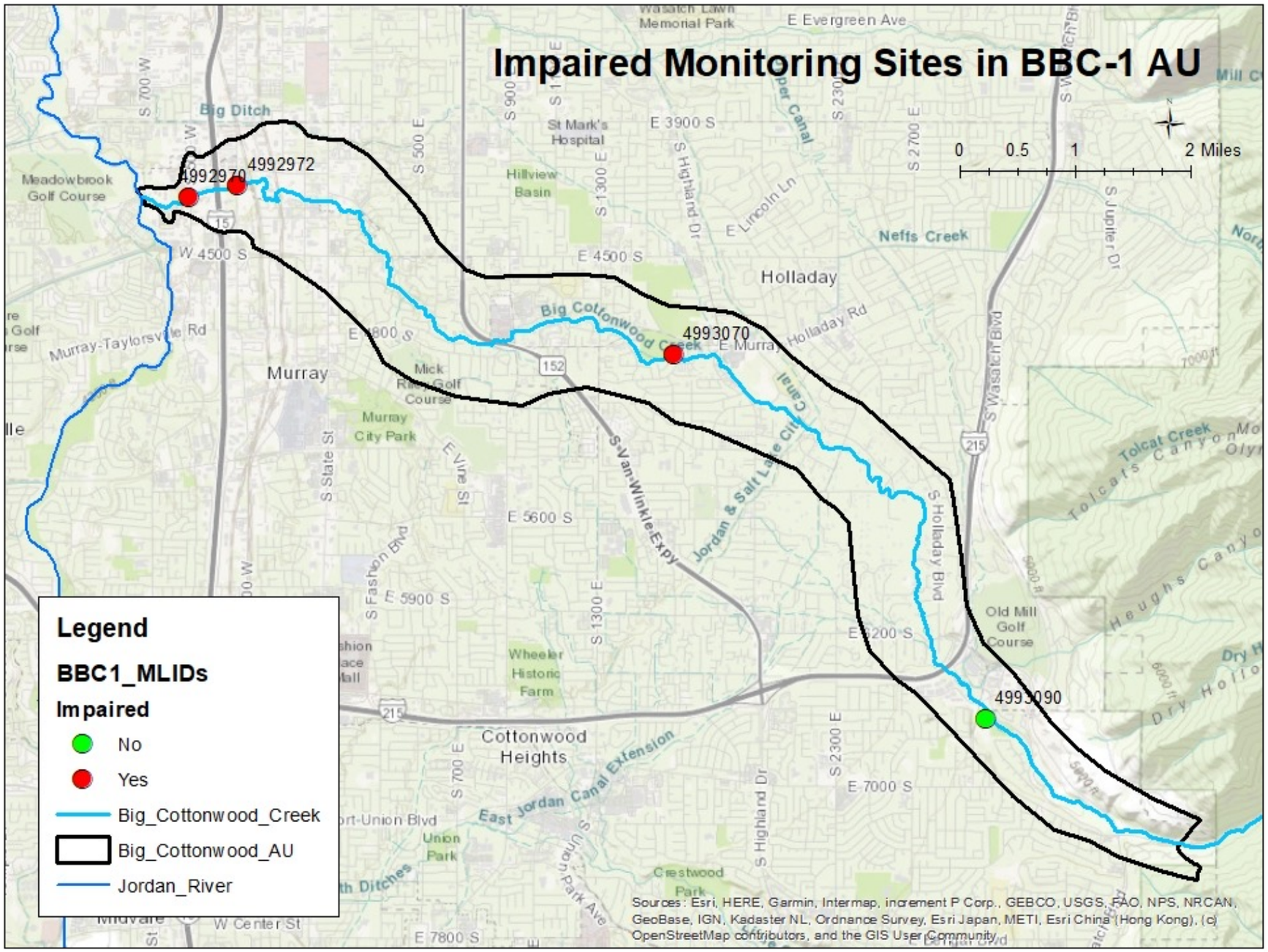
Impaired Monitoring Locations
(2016)

Scenario A – No more than 10% exceedance of the Not to Exceed Criterion (668 MPN/100 mL)

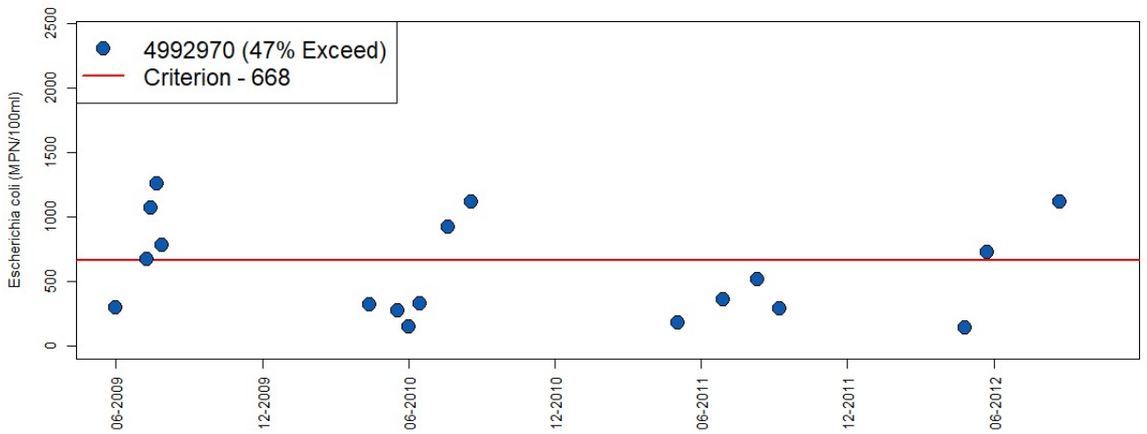
Recreational data only (May – October)



Big Cottonwood Creek-1 Assessment

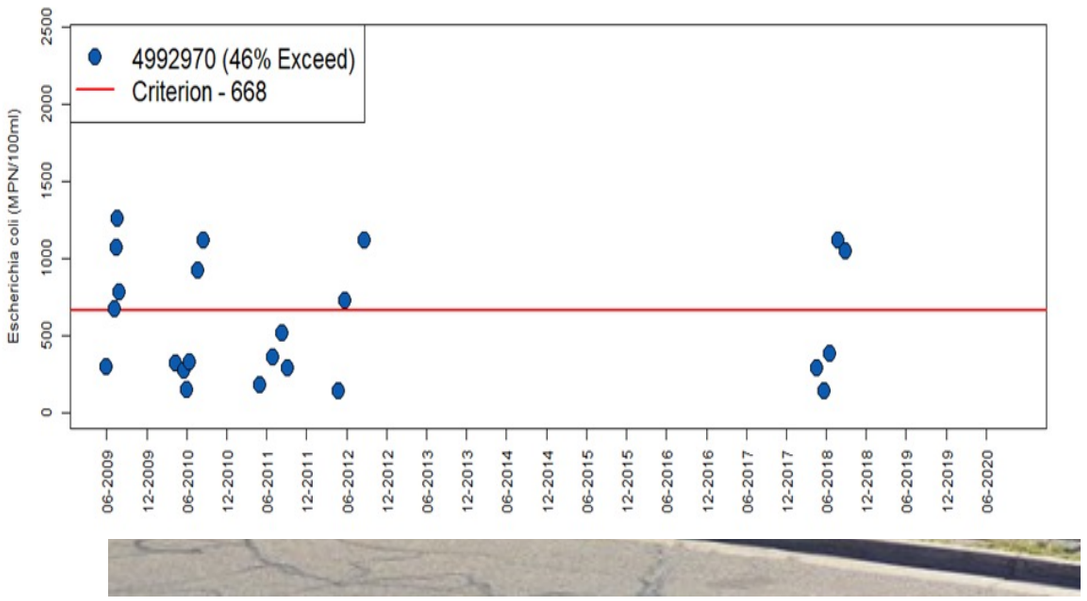


Big Cottonwood Creek @ 500 W (4992970)



Original Assessment

- June 2009 – Sept 2012
- Sample size = 18
- 47% exceedance maximum criterion

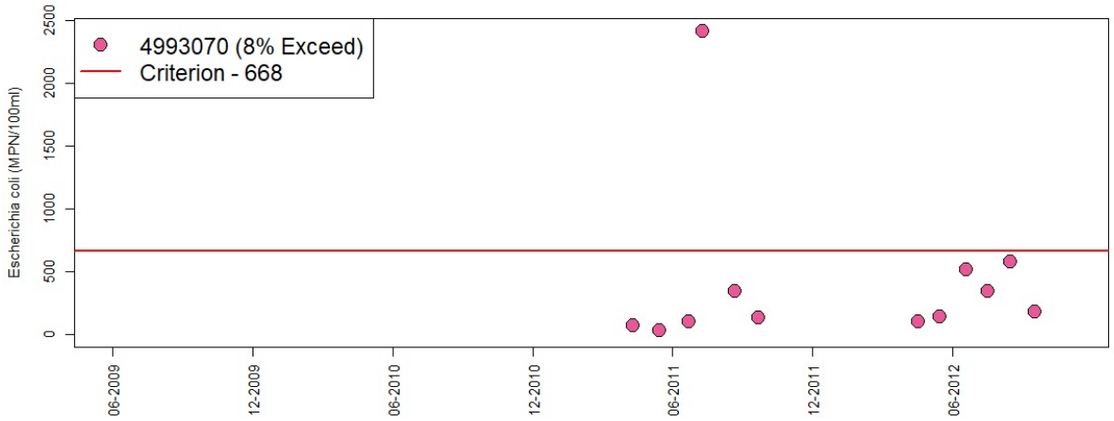


Current Assessment

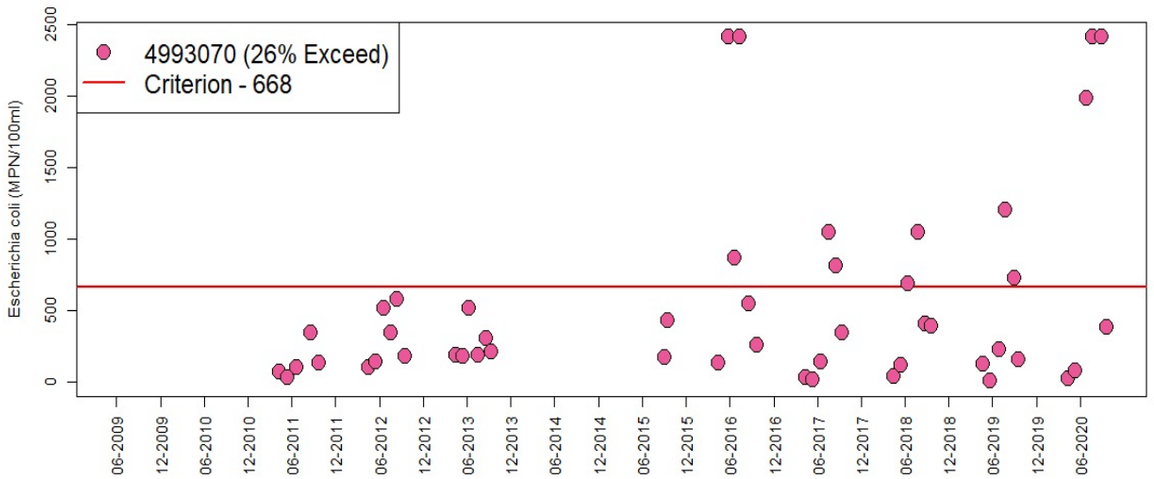
- June 2009 – Sept 2018
- Sample size = 23
- 46% exceedance maximum criterion

Big Cottonwood Creek above Creekside Park (4993070)

2012/2014 IR – no impairment

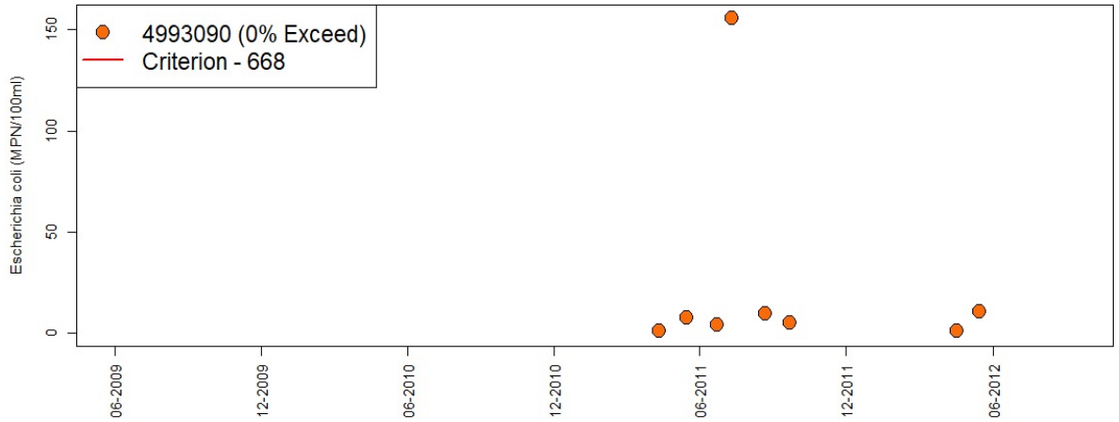


Current– 26% exceedance

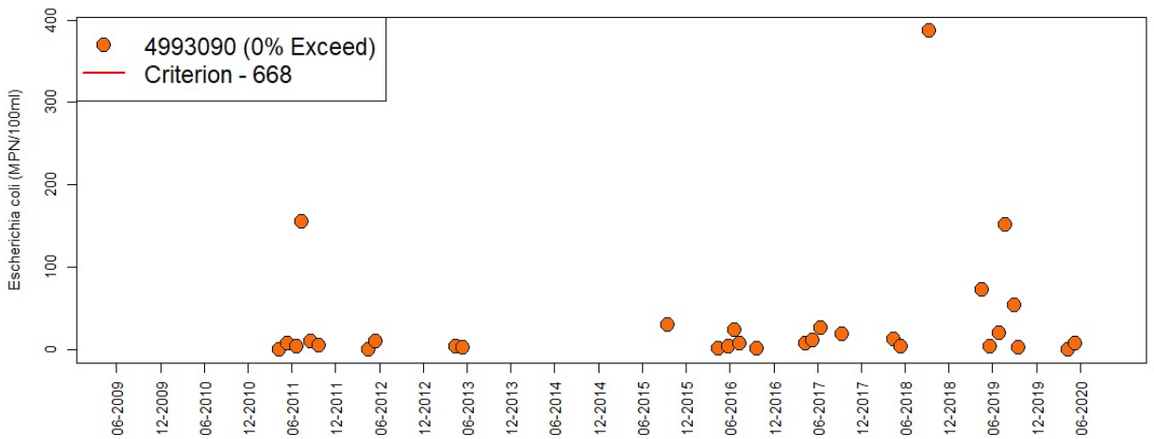


Big Cottonwood Creek below Old Mill (4993090)

2012/2014 IR – no impairment

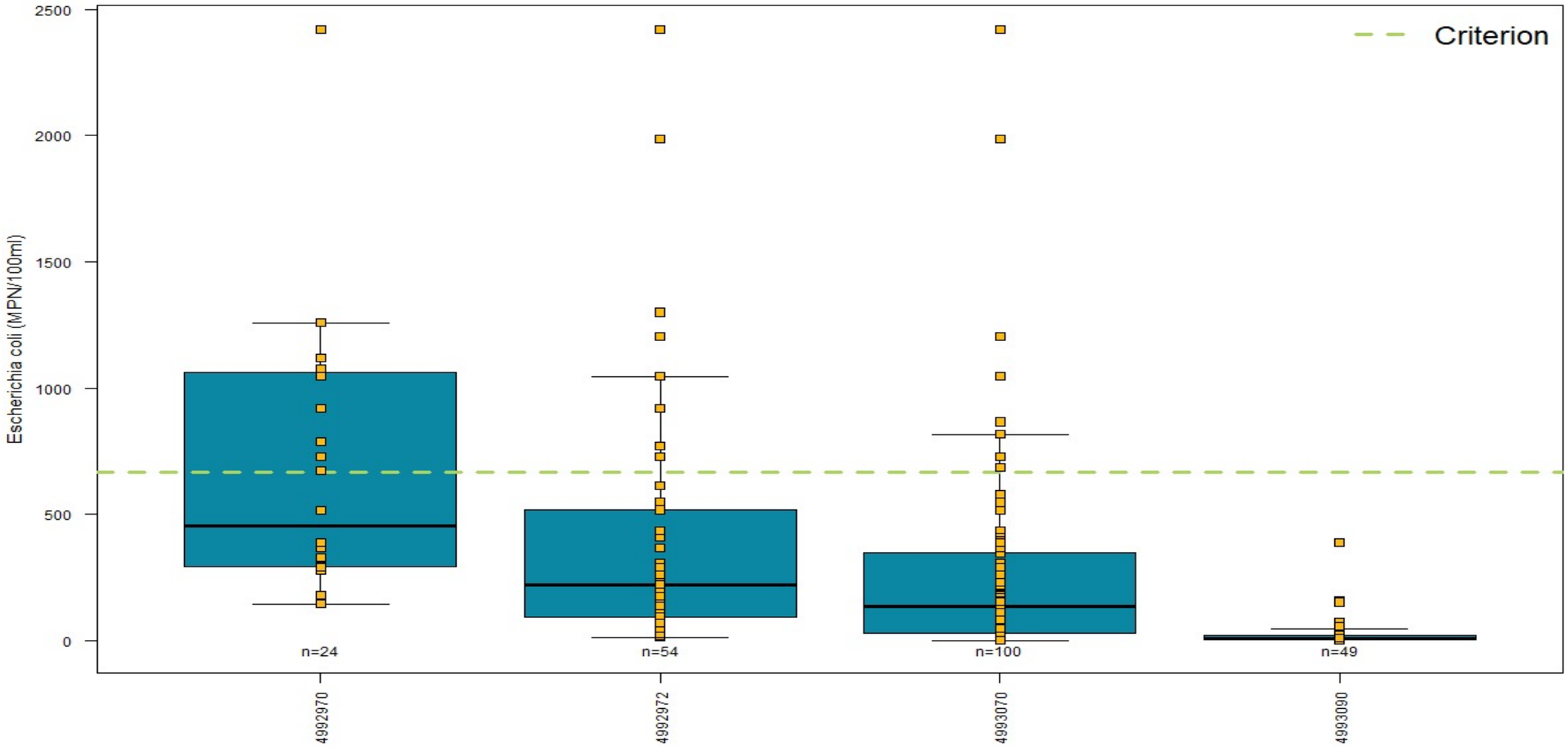


Current– no impairment



[E. coli] Downstream to Upstream

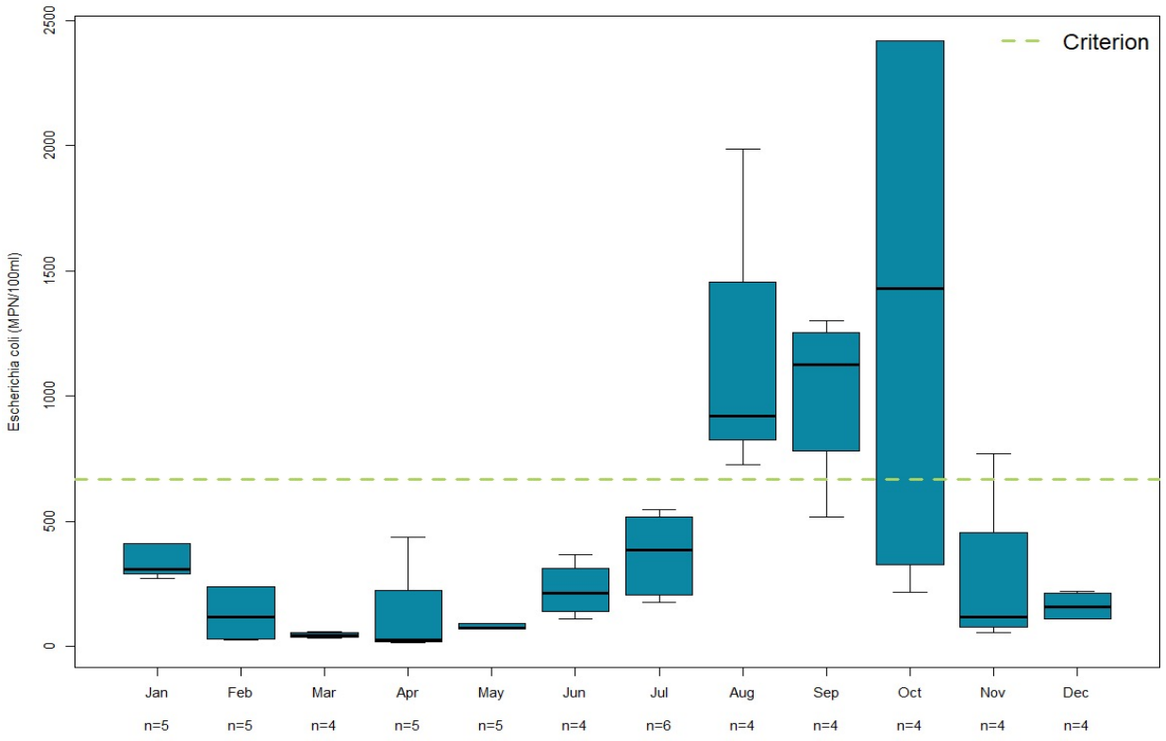
Jordan River



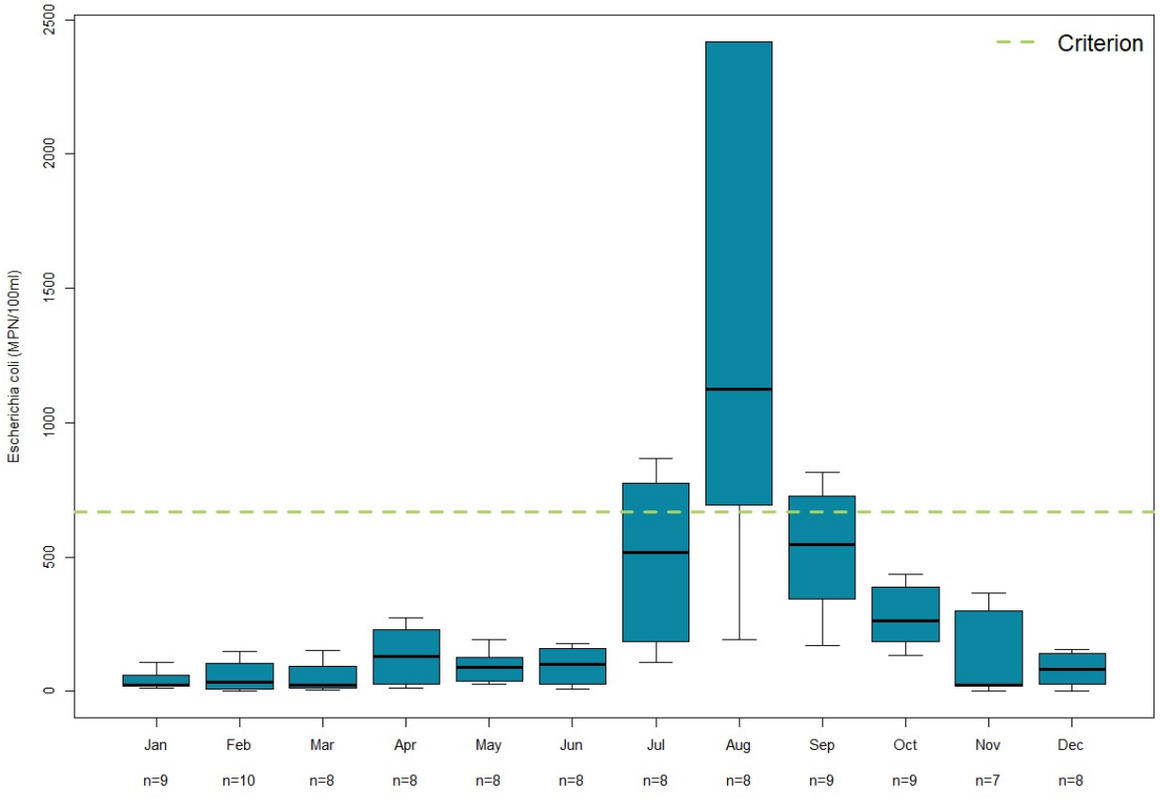
Canyon

Monthly Concentrations – Strong Seasonality

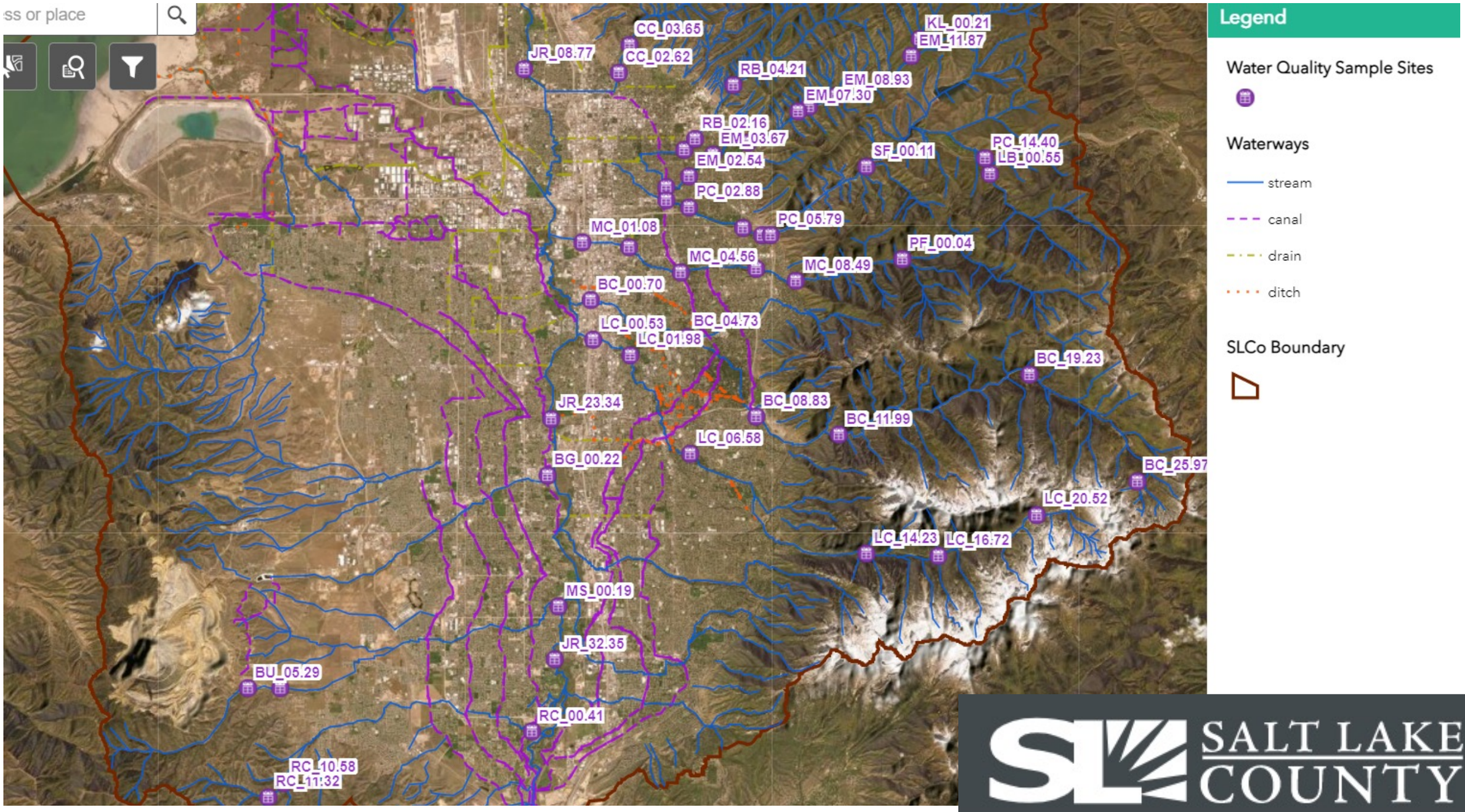
BCC @ 300 W (4992972)



BCC @ Creekside Park (4993070)



Current *E. coli* TMDL Monitoring Sites



https://slco.maps.arcgis.com/apps/webappviewer/index.html?id=f7872466d6e5463f94b9f63ec6df3a9f

Jordan River Watershed *E. coli* TMDLs

Technical Approach

Different options for TMDL development

Simple ⟷ Complex

- mass balance
- load duration curves
- mechanistic modeling

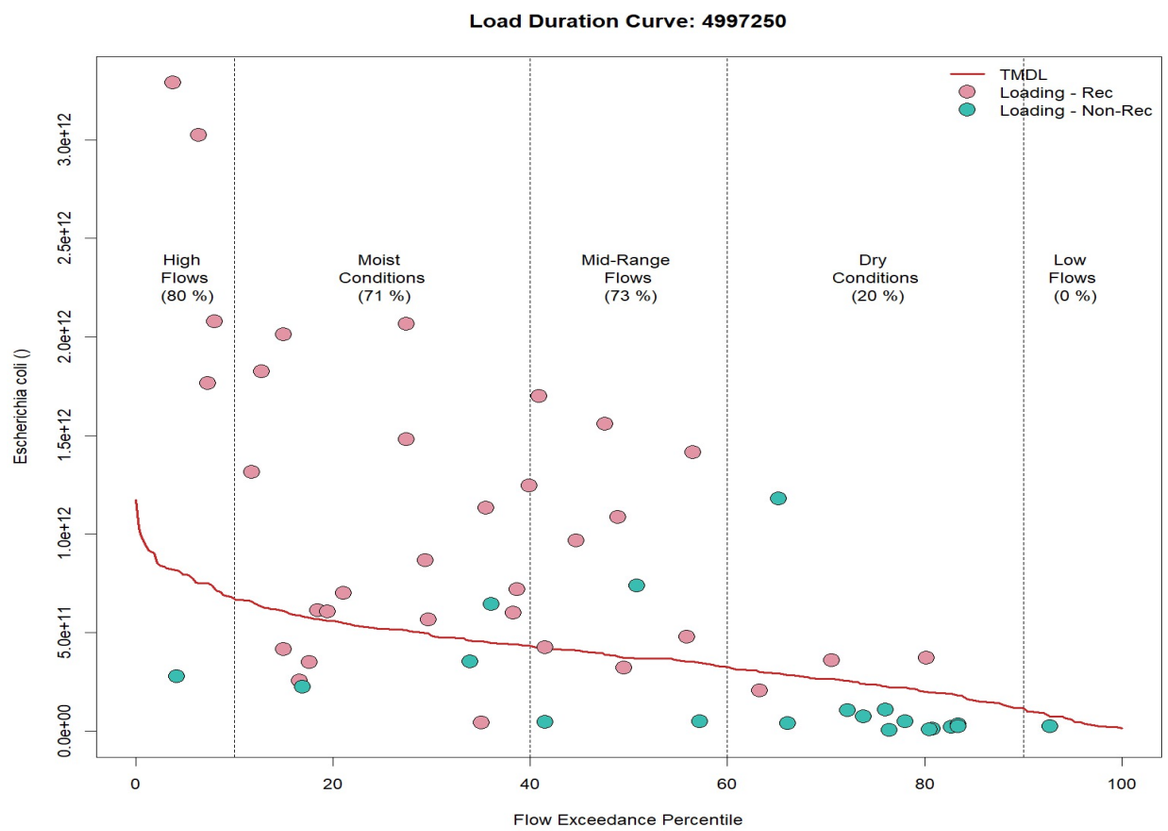
Degree of analysis depends on:

Waterbody type

Complexity of flow conditions

Pollutant

Sources

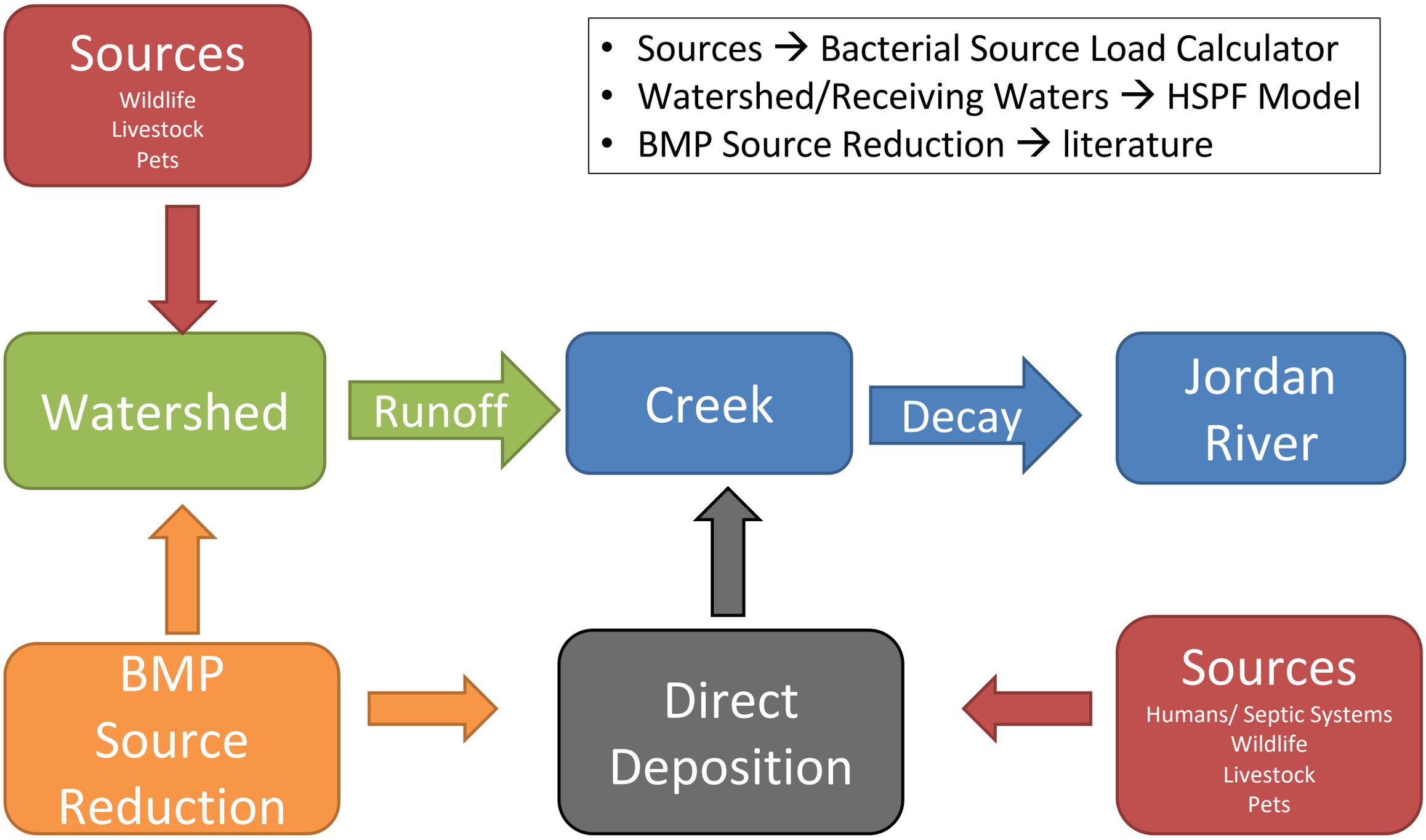


Mechanistic Modeling for TMDLs

- Decision support tool for regulatory actions
- Is a mechanistic model required?
  - Significant cost implications to implementing TMDL
  - Complex interactions between variables and processes
  - Scenario evaluation and optimization of TMDL
  - Verify that preferred scenario meets the in-stream criterion
- General modeling approach
  - Keep it as simple as possible – complex model is not necessarily better model
  - Develop QAPP for model development with acceptance criteria
  - Calibrate/validate model to build confidence
  - Run TMDL scenarios that meet water quality standards

Proposed Modeling Framework for *E. coli*

- Sources → Bacterial Source Load Calculator
- Watershed/Receiving Waters → HSPF Model
- BMP Source Reduction → literature

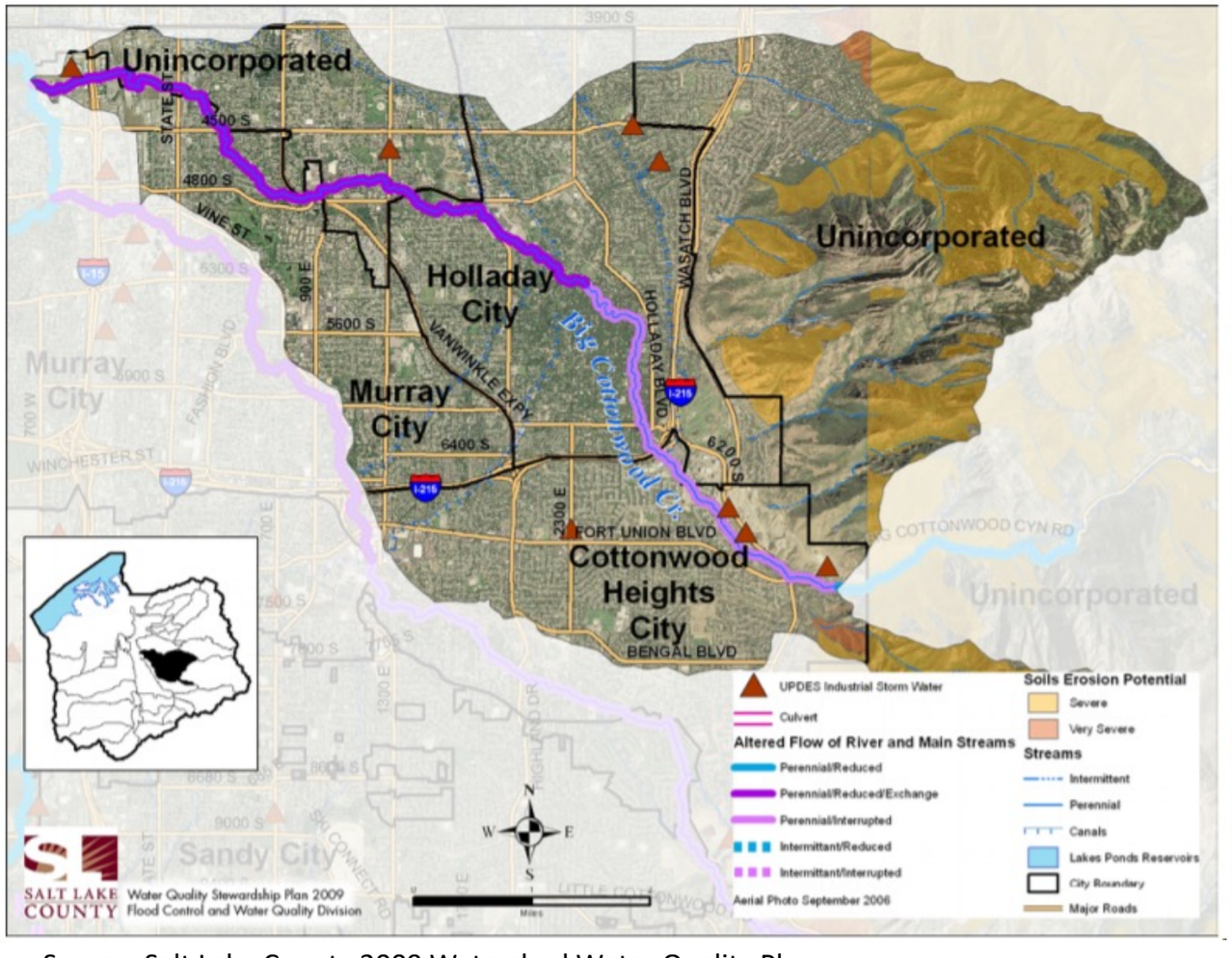


Modeling Tasks for Jordan River *E. coli* TMDLs

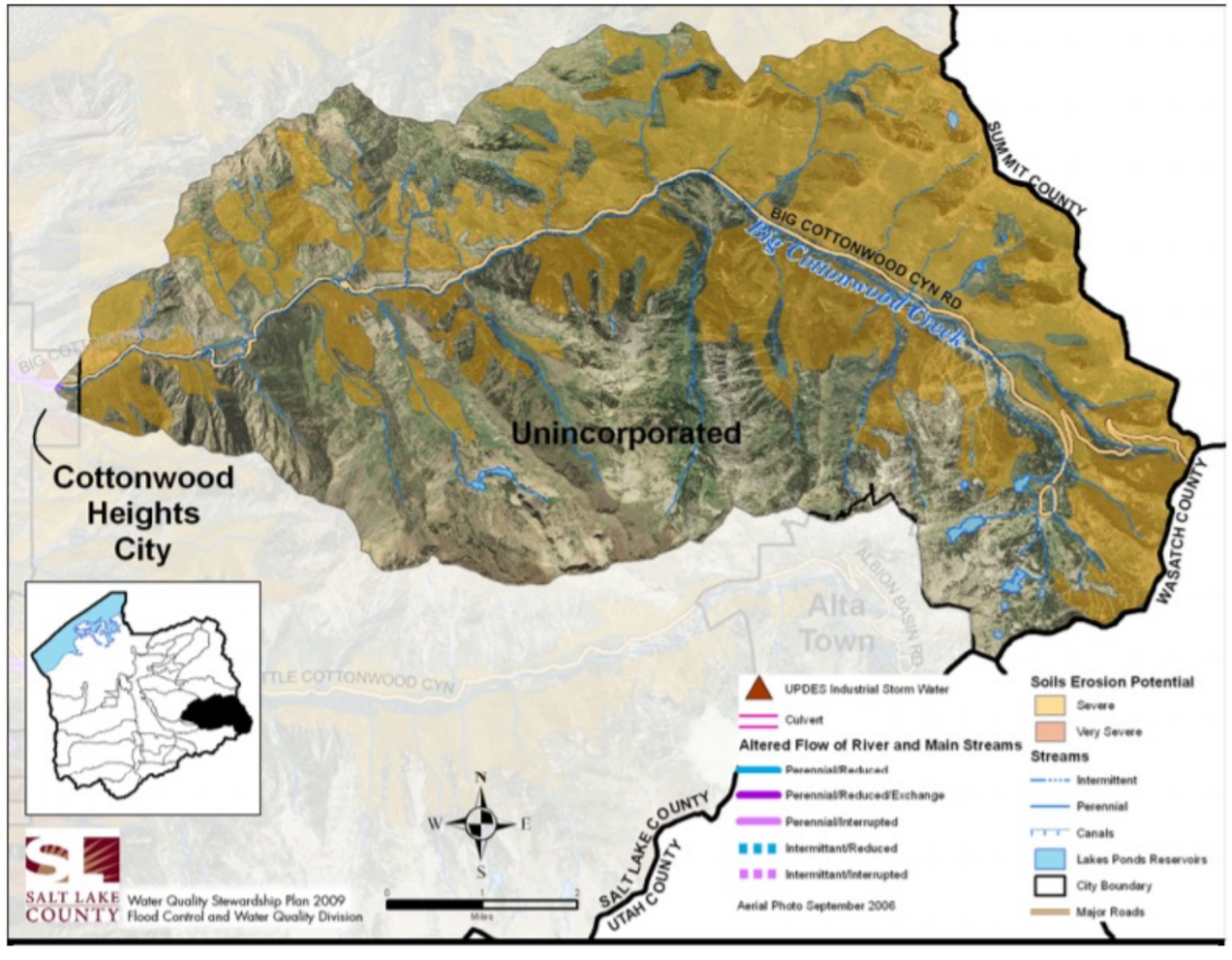
1. Update existing Salt Lake County Watershed HSFP model
   a. Big Cottonwood Creek as a pilot subwatershed
   b. Add *E. coli* as state variable
   c. Update to recent time period using observed *E. coli* data for model calibration
   d. Determine source loading utilizing Bacteria Source Load Calculator
2. Model calibration
   a. Hydrology
   b. Water temperature
   c. Sediment
   d. E. coli
3. TMDL scenario implementation
4. Support optimal BMP selection for load allocation

Big Cottonwood Creek Subwatershed Pilot Model

Valley



Canyon

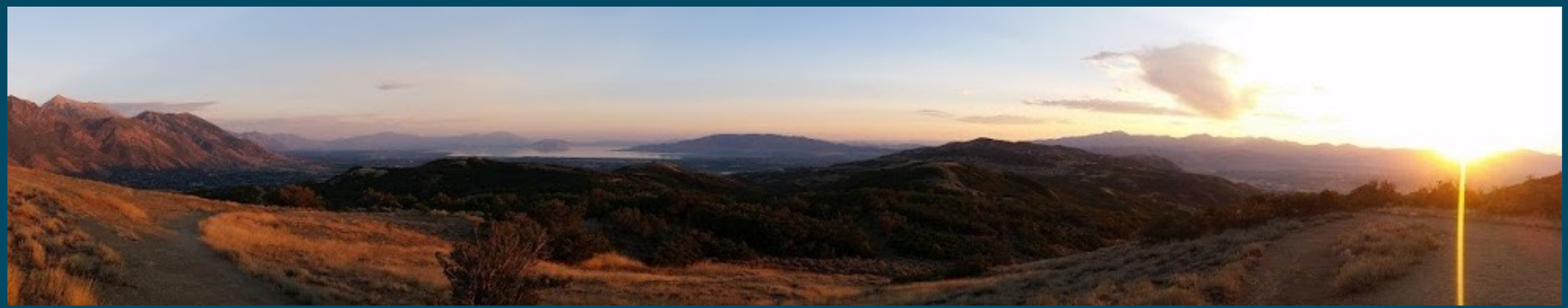


Source: Salt Lake County 2009 Watershed Water Quality Plan

Timeline

Date	Schedule
February 5, 2019	Kickoff Stakeholder Meeting (Jordan River Watershed Council)
March 21, 2021	Salt Lake County Stormwater Coalition: TMDL Update
April 21, 2021	Salt Lake County Stormwater Coalition: TMDL Tracking Tool
May 26, 2021	Water Quality Board Introduction
June 2021	Jordan River Commission Technical Advisory Council: TMDL and Technical Approach
Summer 2021	Technical Analysis Approach Finalized
Fall 2021	Technical Analysis (Calibration/Validation/Scenarios if necessary); Report Writing
Winter 2021	Model Report (if necessary), Report Writing, Stakeholder Meeting
1st Quarter 2022	Internal Draft Report
2nd Quarter 2022	Stakeholder Meeting & Stakeholder Draft Report
June 2022	Water Quality Board preliminary approval & initiate rule-making
July 2022	30-day rulemaking process
August 2022	Address public comments
September 2022	Water Quality Board request for formal adoption into rule
	Submit to EPA for final approval

Questions



Jodi Gardberg
Manager
801-536-4372
jgardberg@utah.gov

Nick von Stackelberg
Model Lead
801-536-4374
nvonstackelberg@utah.gov

Sandy Wingert
TMDL Coordinator
801-536-4338
swingert@utah.gov