



UTAH DEPARTMENT of ENVIRONMENTAL QUALITY  
**WATER QUALITY**

## Jordan River TMDL Studies

SLCO Stormwater Coalition  
March 17, 2021  
Sandy Wingert

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## Today's Outline....

- Regulatory Requirements & States' Implementation
- Total Maximum Daily Loads (TMDLs) 101
- Jordan River Watershed TMDLs (DO Phase 2 & *E. coli*)
- Stormwater & TMDLs



[jordanrivercommission.com](http://jordanrivercommission.com)



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## Federal & State Requirements



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### Clean Water Act

- 1972
- Restore and maintain the chemical, biological, and physical integrity of the Nation's waters
- National Goal – “Fishable and Swimmable”
- Primarily focused on point sources of pollution
- Amended in 1987 to address nonpoint sources



### Utah Water Quality Act

- 1960's – Utah passed the first water quality regulations in health code
- 1986 – Utah was delegated primacy of the CWA program
- 1991 – Utah Water Quality Act (Title 19-5) passed outlining powers to Water Quality Board and Division of Water Quality's director
- 1990s – Implementing rules



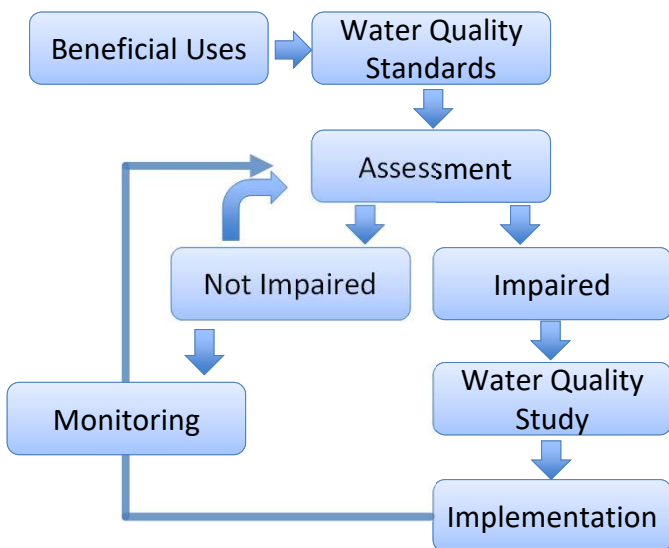
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**Utah Division of Water Quality's Goal:  
To protect, maintain and enhance the quality of  
Utah's surface and underground waters to  
protect beneficial uses and public health.**



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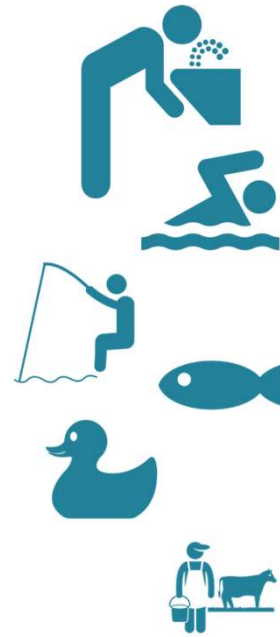
### How does Utah implement the Clean Water Act?



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## Beneficial Uses

Beneficial Use Classification	Use Definition
1C	Drinking water
2A	Primary contact recreation (e.g., swimming, rafting)
2B	Secondary contact recreation (e.g., wading, fishing)
3A	Cold water aquatic life
3B	Warm water aquatic life
3C	Nongame aquatic life
3D	Wildlife (e.g., waterfowl)
4	Agriculture (e.g., irrigation, stock watering)
5	Great Salt Lake



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## Water Quality Standards

- Established criteria to protect beneficial uses
- Reviewed and updated every three years
- All changes approved by Water Quality Board

## Water Quality Assessment

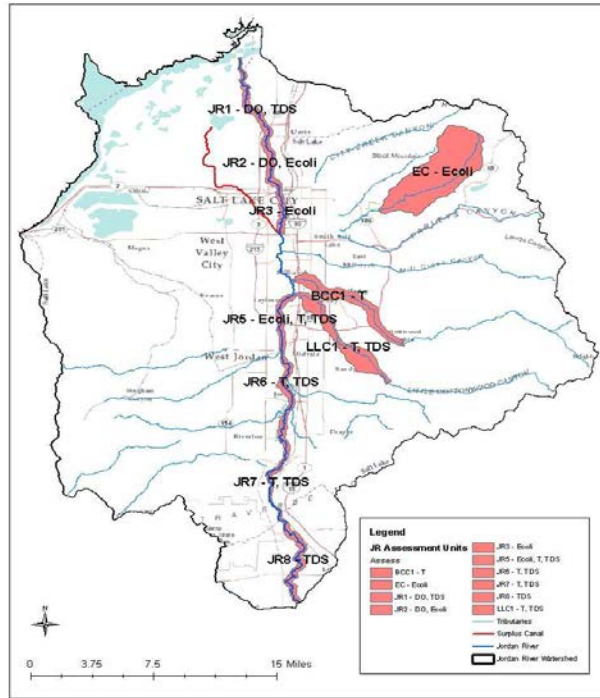
- Required to assess and report to Congress every two years on current water quality conditions
- If waterbody exceeds numeric criteria, it is placed on the list of impaired waterbodies ("303d List")



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2006 303(d) List of Impaired Waterbodies

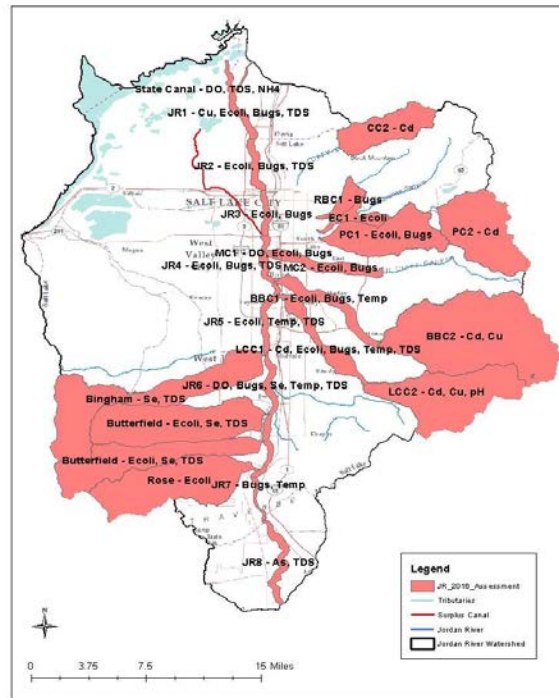
28% river miles not supporting their beneficial uses



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2016 303(d) List of Impaired Waterbodies

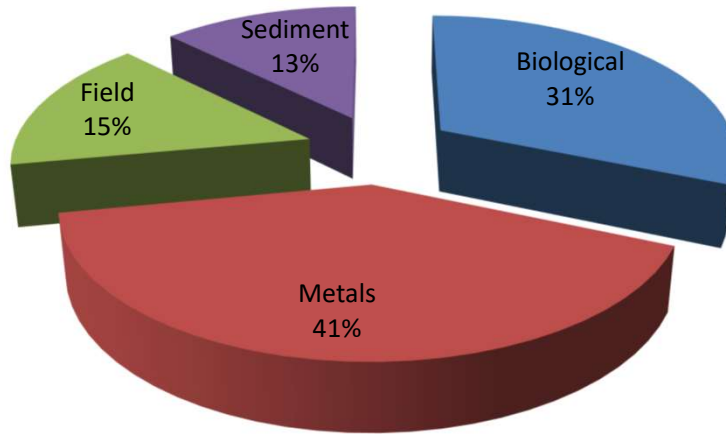
86% river miles not supporting their beneficial uses



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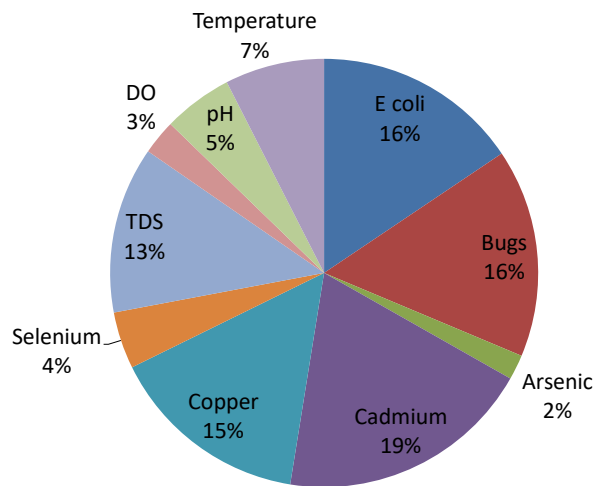
## Impaired by Pollutants (2016)

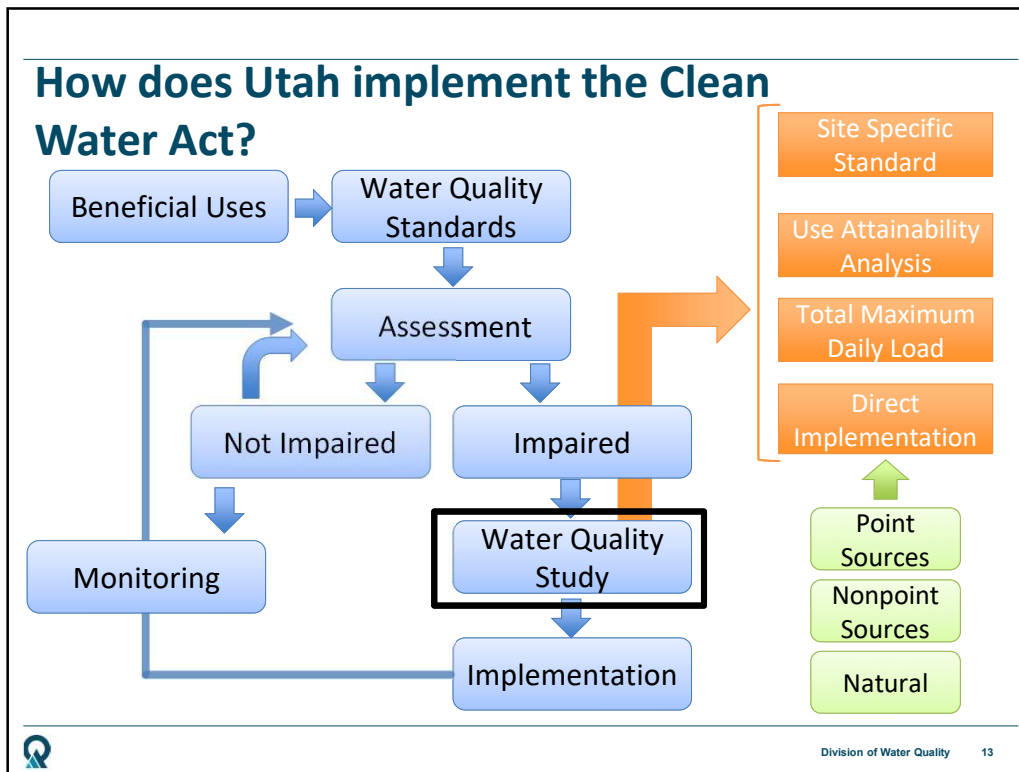
Pollutant by Impaired River Miles



## Impaired by Pollutants (2016)

Pollutant by Impaired River Miles





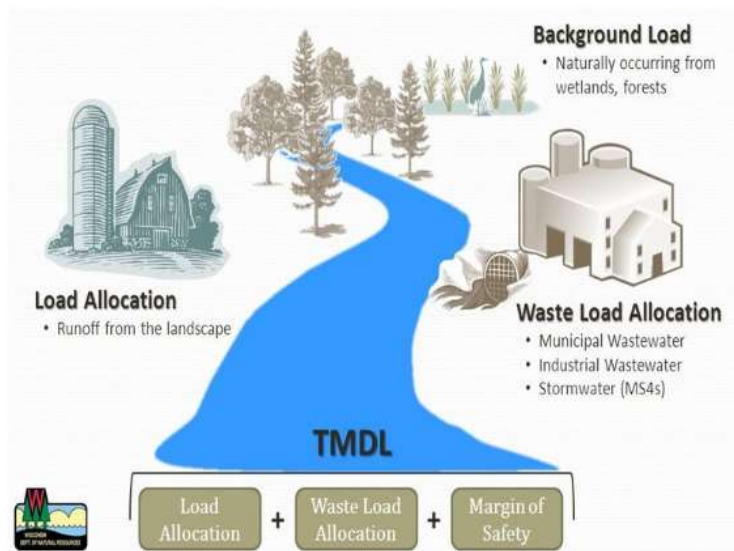
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**Total Maximum Daily Loads 101**  
(TMDLs)

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## Total Maximum Daily Load

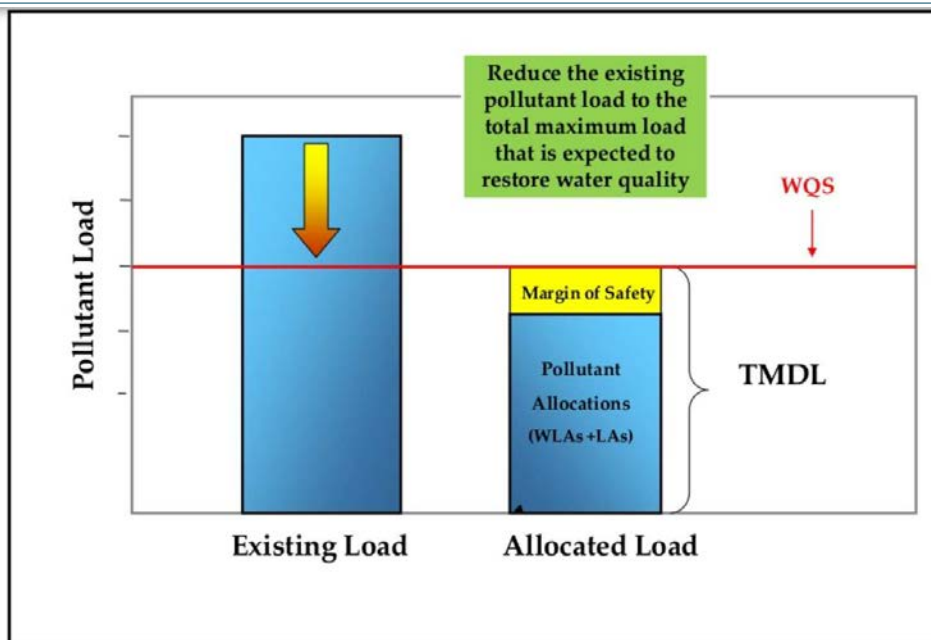
A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still maintain beneficial uses.



<https://www.lakepepinlegacyalliance.org/faq>



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<https://www.slideshare.net/fairfaxcounty/draft-tmdl-action-plans-for-sediment-bacteria-and-pcbs-public-meeting>

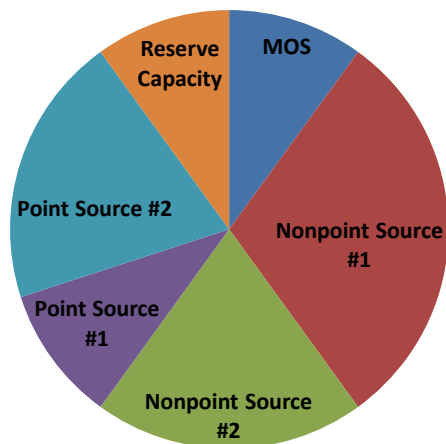


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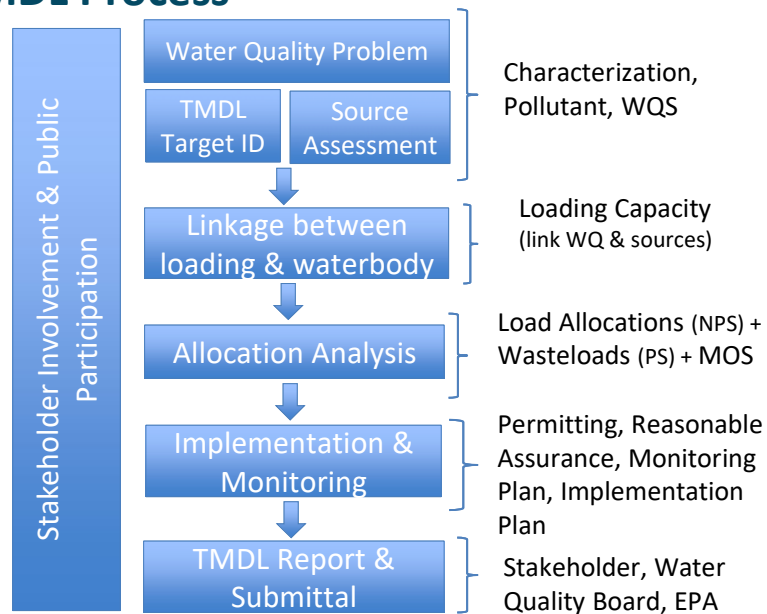
## TMDL: Simply a Pollution Budget

Example: Source Allocation of a TMDL



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## Typical TMDL Process



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## Jordan River Watershed TMDLs: Dissolved Oxygen Phase 2

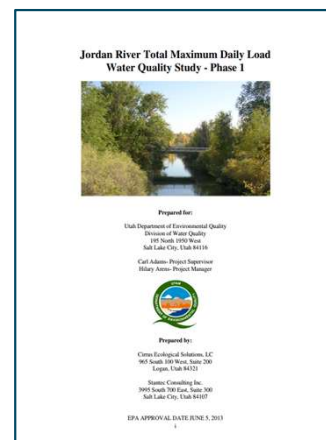
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### Lower Jordan River DO TMDL Phase 1

- 2004 303(d ) List for failing to protect its warm-water aquatic life due to low dissolved oxygen
- Excessive Organic Matter (OM) loads causing low DO
- TMDL approved in 2013 and requires 35% reduction from NPS and 41% from PS

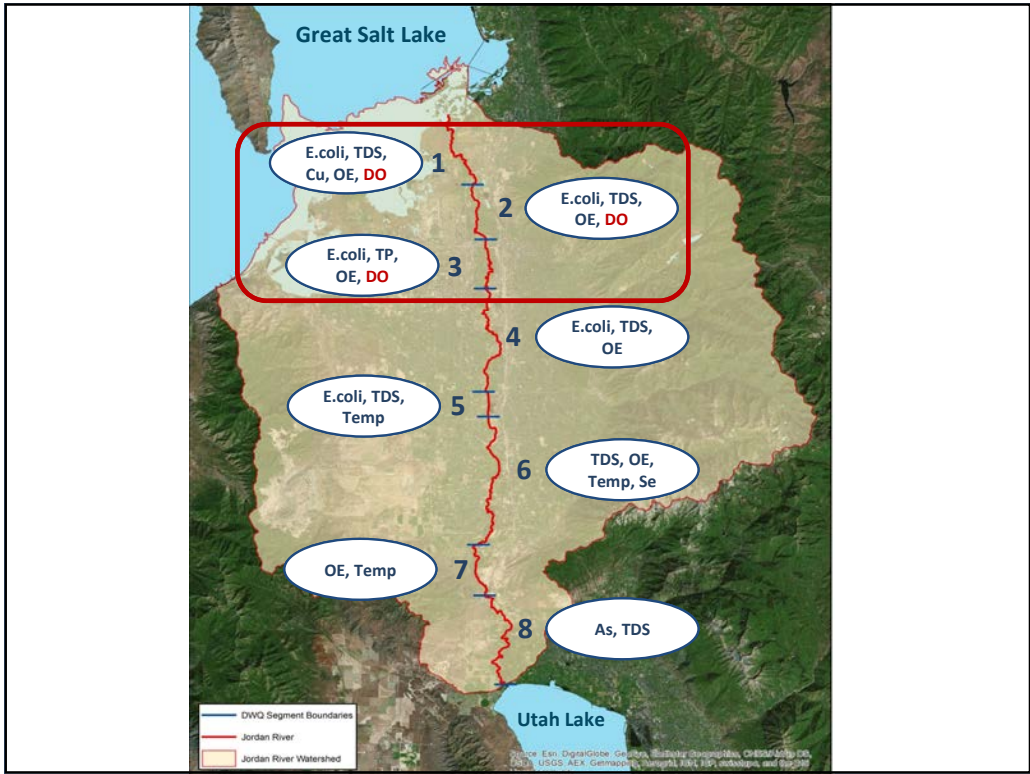
#### Implementation

- Jordan River TMDL TAC
- Phase approached
- Adaptive implementation

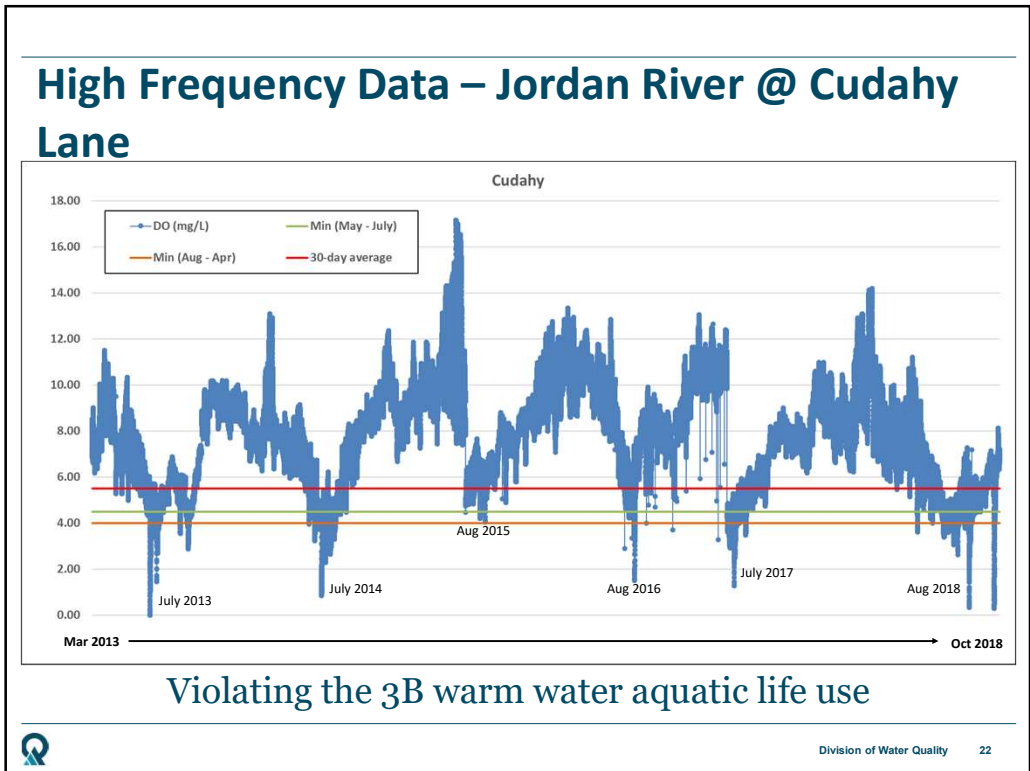


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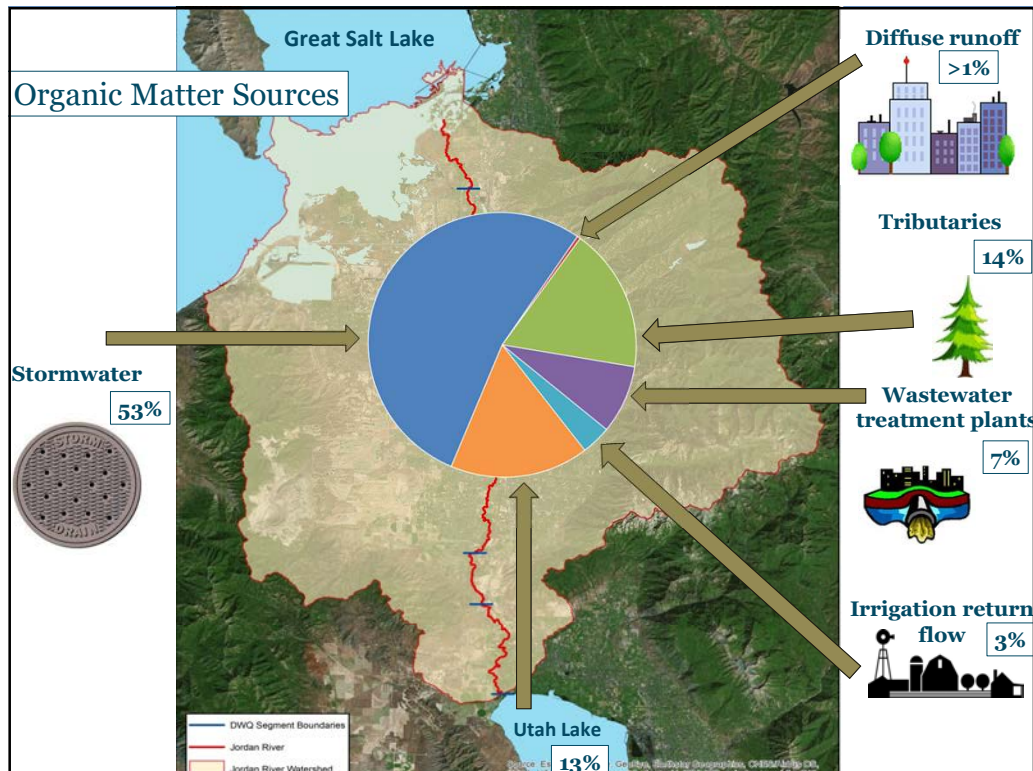
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## Lower Jordan River DO TMDL Phase 1

- Why a phased TMDL?
  - Available data allowed only for an *estimate* of load reductions
  - Uncertainty regarding the sources of impairment
  - Dynamic environment that requires an adaptive management approach
- DO concentrations primarily impacted by organic matter loading



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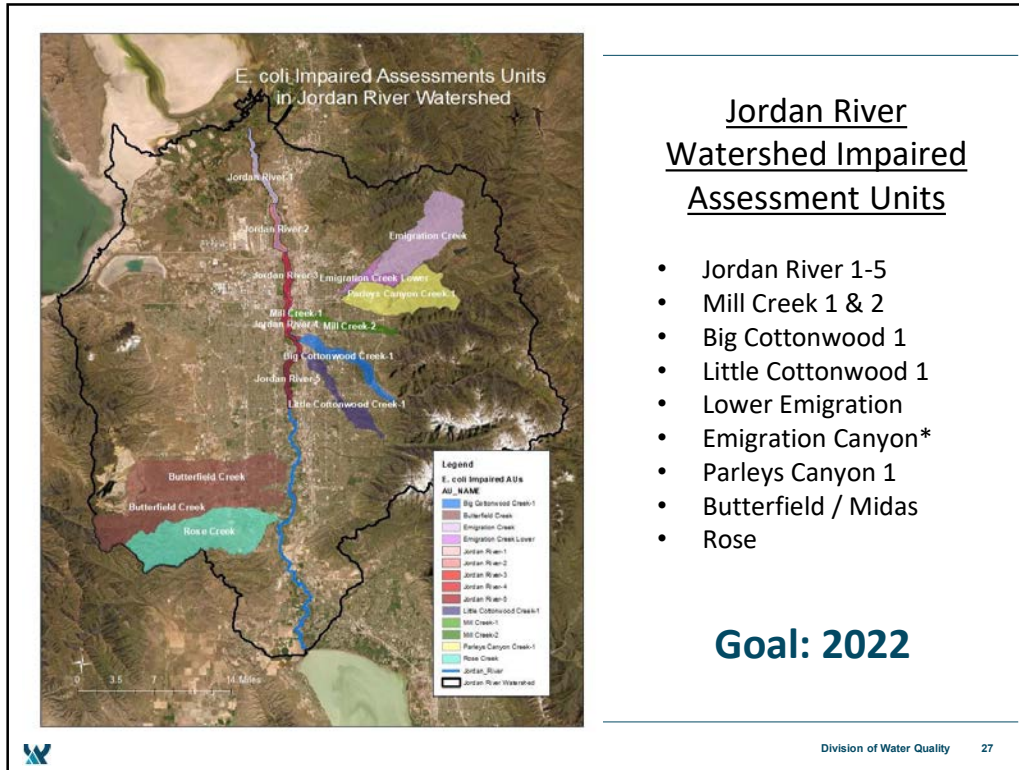
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## Jordan River DO Phase 2 - Update

- University of Utah handed over a water quality model (WASP) to DWQ in January 2020
- Model will be used to:
  - Confirm pollutants of concern (e.g., organic matter and possibly others)
  - Refine pollutant loading estimates
  - Link pollutant sources to the DO impairment
  - Develop wasteload allocations/load allocations for point/nonpoint sources
- DWQ currently working to:
  - Identify and compile data to be used in the model
  - Validate the model
  - Complete a model validation report to be submitted and reviewed by stakeholders



## Jordan River Watershed TMDLs: *E. coli*



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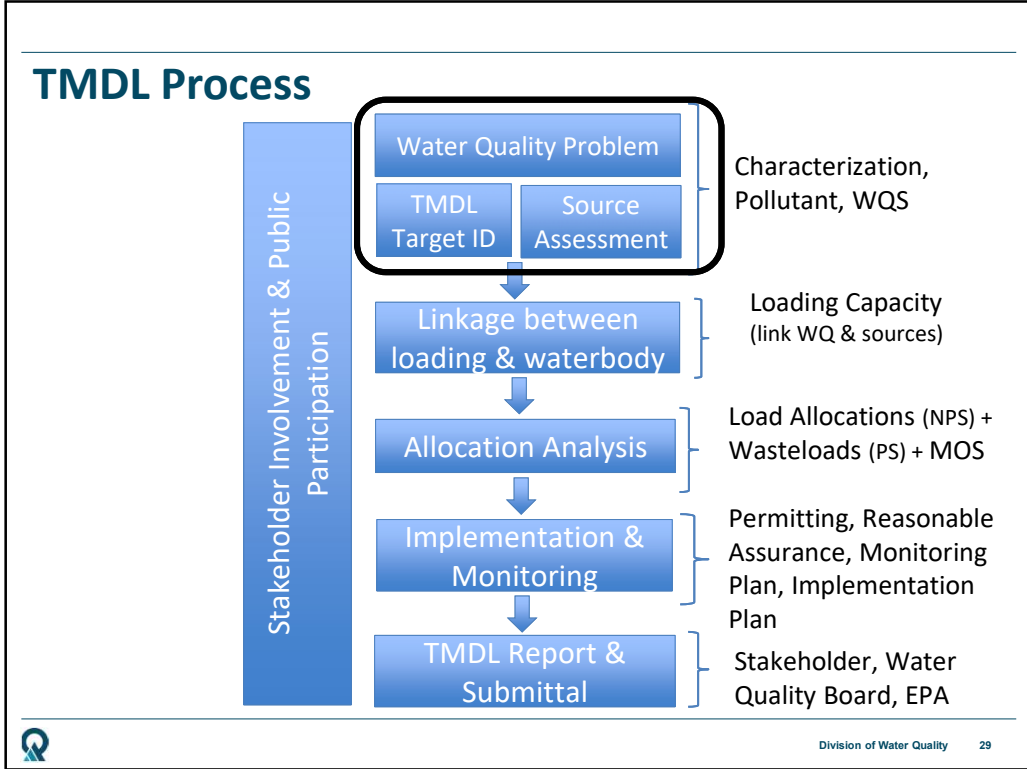
### E. coli Impaired Assessment Units

Assessment Unit	Description	Impaired Beneficial Use	Year Listed
Jordan R-1	Jordan River from Farmington Bay upstream contiguous with the Davis County line	2B	2010
Jordan R-2	Jordan River from Davis County line upstream to North Temple Street	2B	2006
Jordan R-3	Jordan River from North Temple to 2100 South	2B	2006
Jordan R-4	Jordan River from 2100 South to the confluence with Little Cottonwood Creek	2B	2014
Jordan R-5	Jordan River from the confluence with Little Cottonwood Creek to 7800 South	2B	2006
Mill Creek-1	Mill Creek from confluence with Jordan River to Interstate 15 crossing	2B	2014
Mill Creek-2	Mill Creek and tributaries from Interstate 15 to USFS Boundary	2B	2008 (FC)
Little Cottonwood -1	Little Cottonwood Creek and tributaries from Jordan River confluence to Metropolitan WTP	2B	2014
Big Cottonwood-1	Big Cottonwood Creek and tributaries from Jordan River to Big Cottonwood WTP	2B	2014
Lower Emigration	Emigration Creek and tributaries from below Westminster College) to stream gage at Rotary Glen Park	2B	2014
Parley's-1	Parleys Canyon Creek and tributaries from 1300 East to Mountain Dell Reservoir	1C/2B	2010
Rose	Rose Creek and tributaries from confluence with Jordan River to headwaters	2B	2014
Butterfield/Midas	Butterfield Creek and tributaries from confluence with Jordan River to headwaters	2B	2014

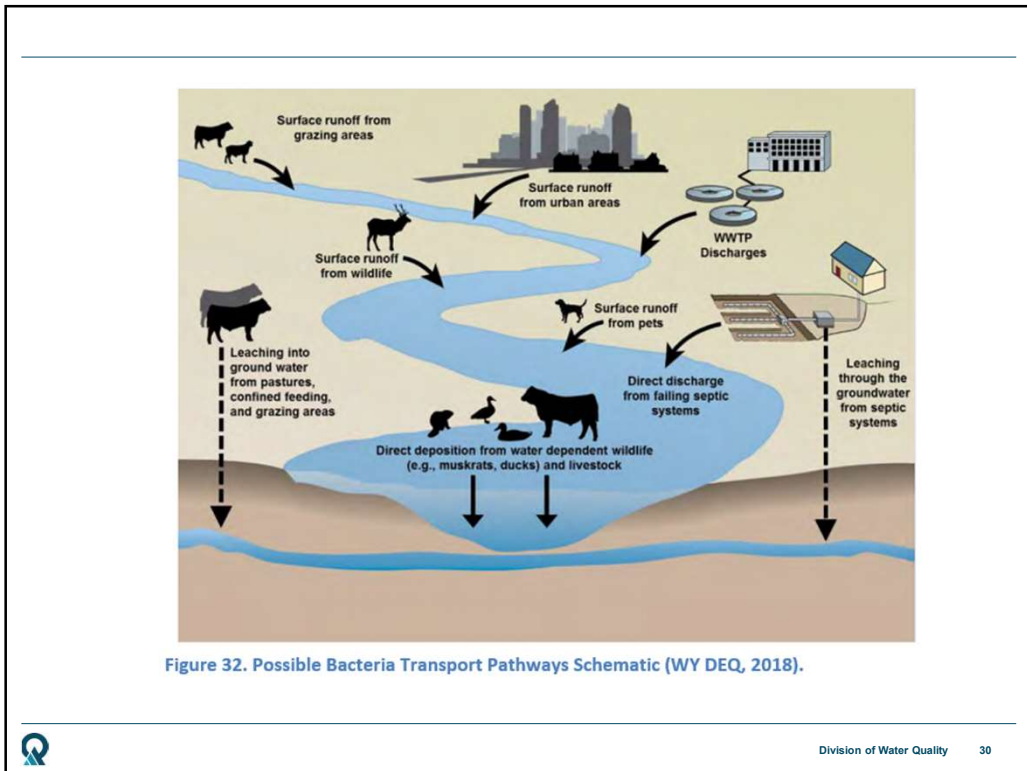
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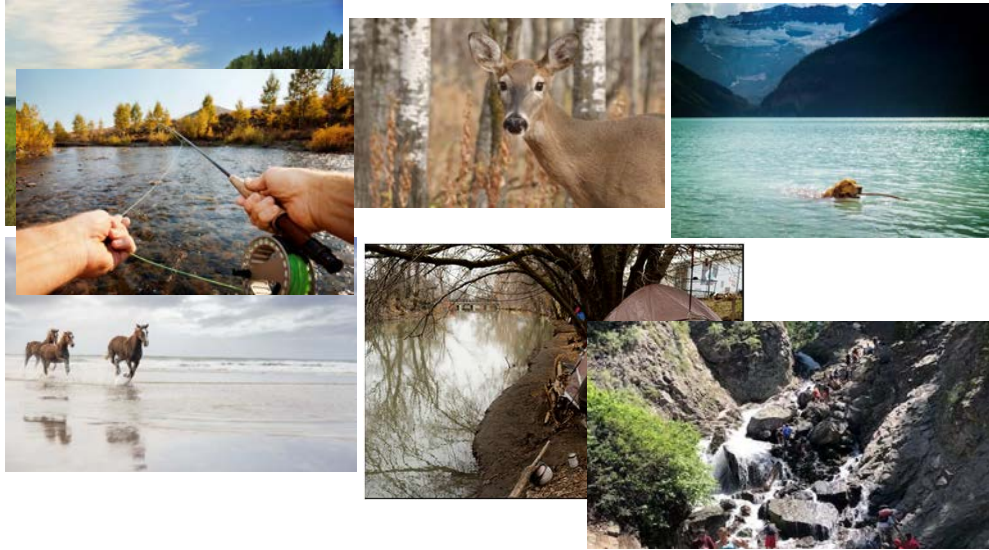


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### Potential sources include.....



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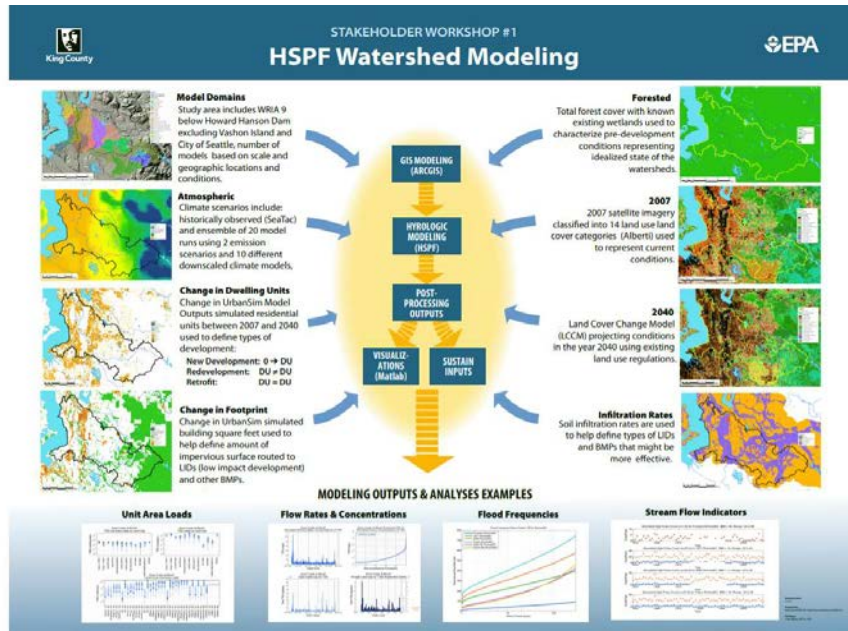
<https://www.utahcleanwater.org/what-is-nonpoint-source-pollution.html>

[https://en.wikipedia.org/wiki/Sewage\\_treatment](https://en.wikipedia.org/wiki/Sewage_treatment)





# Hydrological Simulation Program – FOTRAN (HSPF)

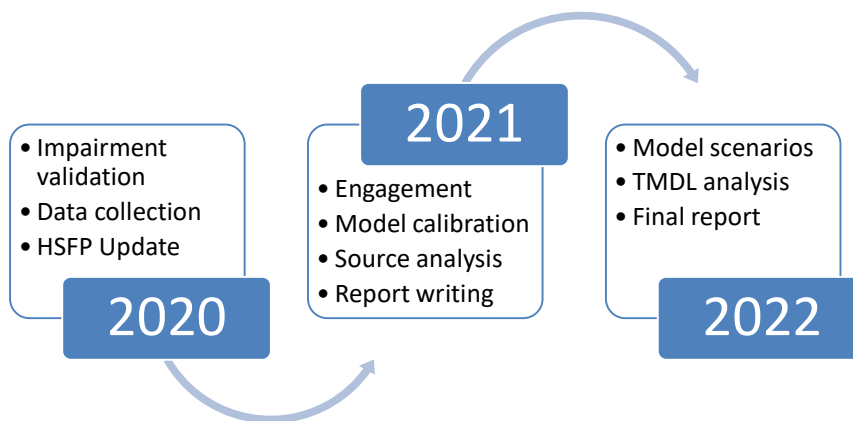


<https://your.kingcounty.gov/dnrplibrary/water-and-land/watersheds/green-duwamish/stormwater-retrofit-project/2011-posters/1104-SWRws-HSPF-11x17.pdf>



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## Timeline



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## Stormwater & TMDLs



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### How does stormwater fit into the TMDL process?

- During the source assessment, TMDLs consider all possible sources including stormwater.
- What are the characteristics of this stormwater runoff? What is the source?
- Conveyance system or farmer's field?
- How the stormwater runoff is addressed in a TMDL depends on its pathway/conveyance.
- TMDLs are implemented to control point sources through a permit (UPDES) process.
- Nonpoint sources of pollution are addressed on a cooperative, voluntary approach using grant-based programs.
- Both are managed in a stormwater management plan (SWMP).



<https://www.farmanddairy.com/columns/understanding-stormwater-runoff/439371.html>



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## Merging TMDL & Stormwater Programs

### Challenges:

- Time: CWA 303(d) List of Impaired Waterbodies/ priority TMDLs development and permit cycles are not also aligned.
- Geography: TMDLs are waterbody specific where general permits can be State-wide. Regulatory and watershed boundaries do not overlap.
- Requirements: TMDLs are defined in quantitative terms while stormwater permits are defined by BMPs to be implemented.

### Address challenges:

- Flexible and realistic approach to develop waste load allocations
- Reconcile spatial boundaries of impaired waterbodies with boundaries of permitted stormwater sources
- TMDL implementation plan includes suggested BMPs (structural & nonstructural) to meet load allocations
- Incorporate monitoring, tracking & adaptive management requirements in waste load allocations & stormwater permits



## Relevance for Stormwater Sources

- How much is stormwater contributing to the dissolved oxygen and *E. coli* impairments?
  - Estimates from Phase 1 of the DO TMDL & revised during Phase 2 (with modeling)
  - Unknown for *E. coli* currently
- How much do we need to reduce the stormwater load in order to meet the TMDLs?
- How will we reduce the stormwater load?
  - Implementation plan - identify ways to reduce the stormwater load through both structural and non-structural BMPs
- How will reduction strategies be implemented in the permit? What will the permit require at the end of the TMDL process?
  - Approach to meeting the load allocations will vary based on what we find during the TMDL process
  - Flexibility



## Questions ?



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