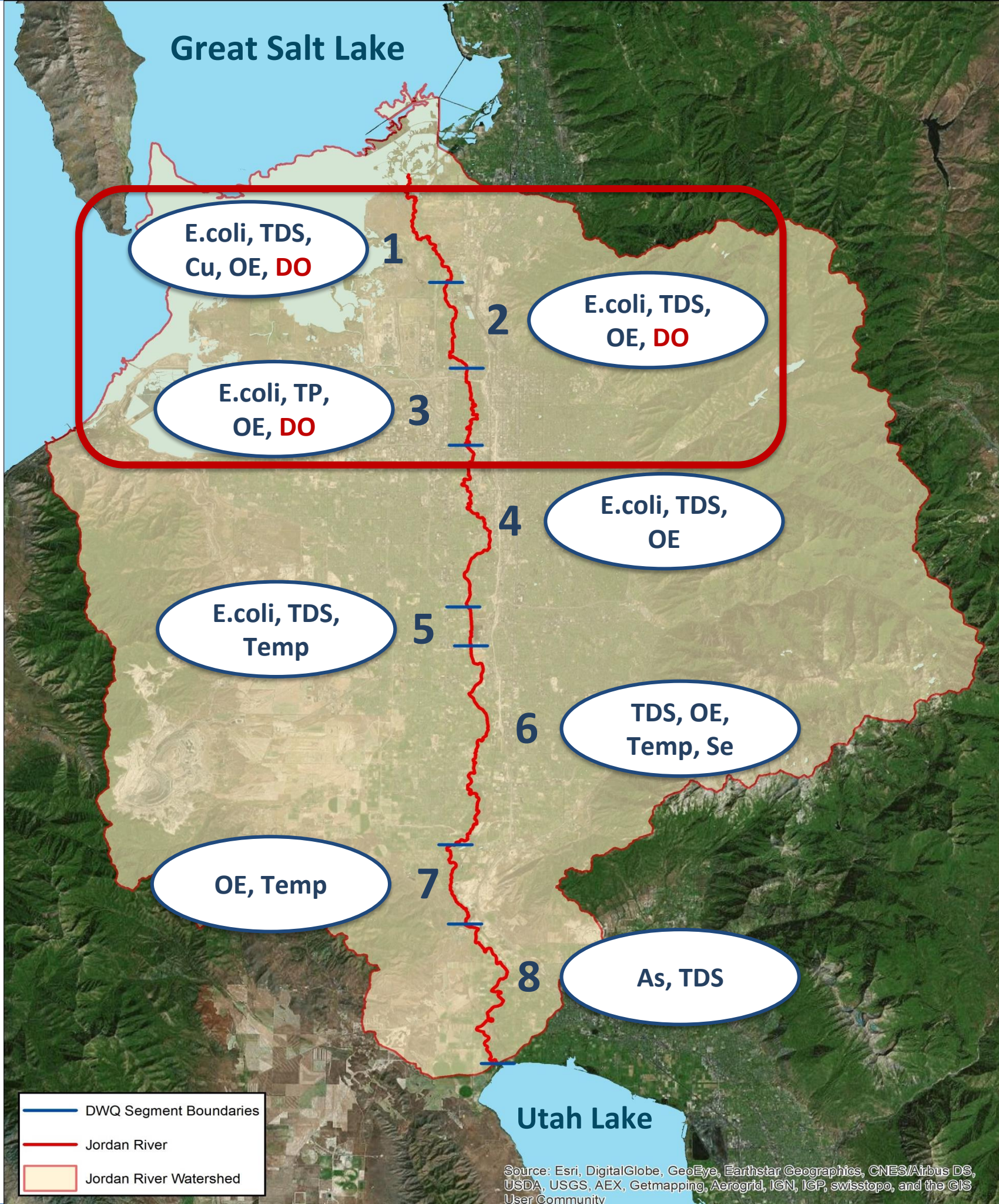




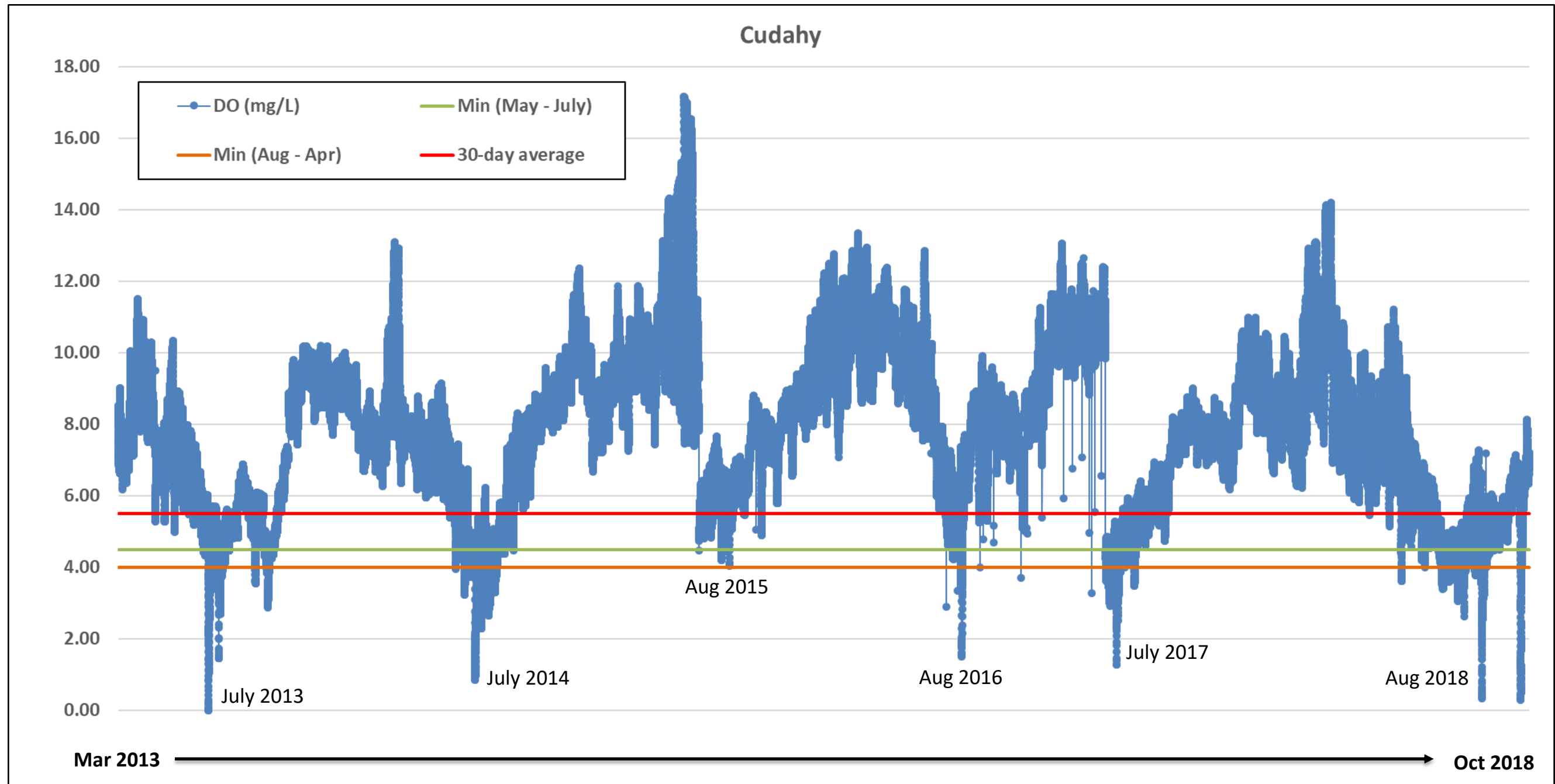
UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
**WATER
QUALITY**

Jordan River Dissolved Oxygen TMDL

August 13, 2020



High Frequency Data



Jordan River DO TMDL Phase 1

- Completed and approved by EPA in June 2013
- 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



Jordan River Total Maximum Daily Load Water Quality Study - Phase 1



Prepared for:

Utah Department of Environmental Quality
Division of Water Quality
195 North 1950 West
Salt Lake City, Utah 84116

Carl Adams- Project Supervisor
Hilary Arens- Project Manager



Prepared by:

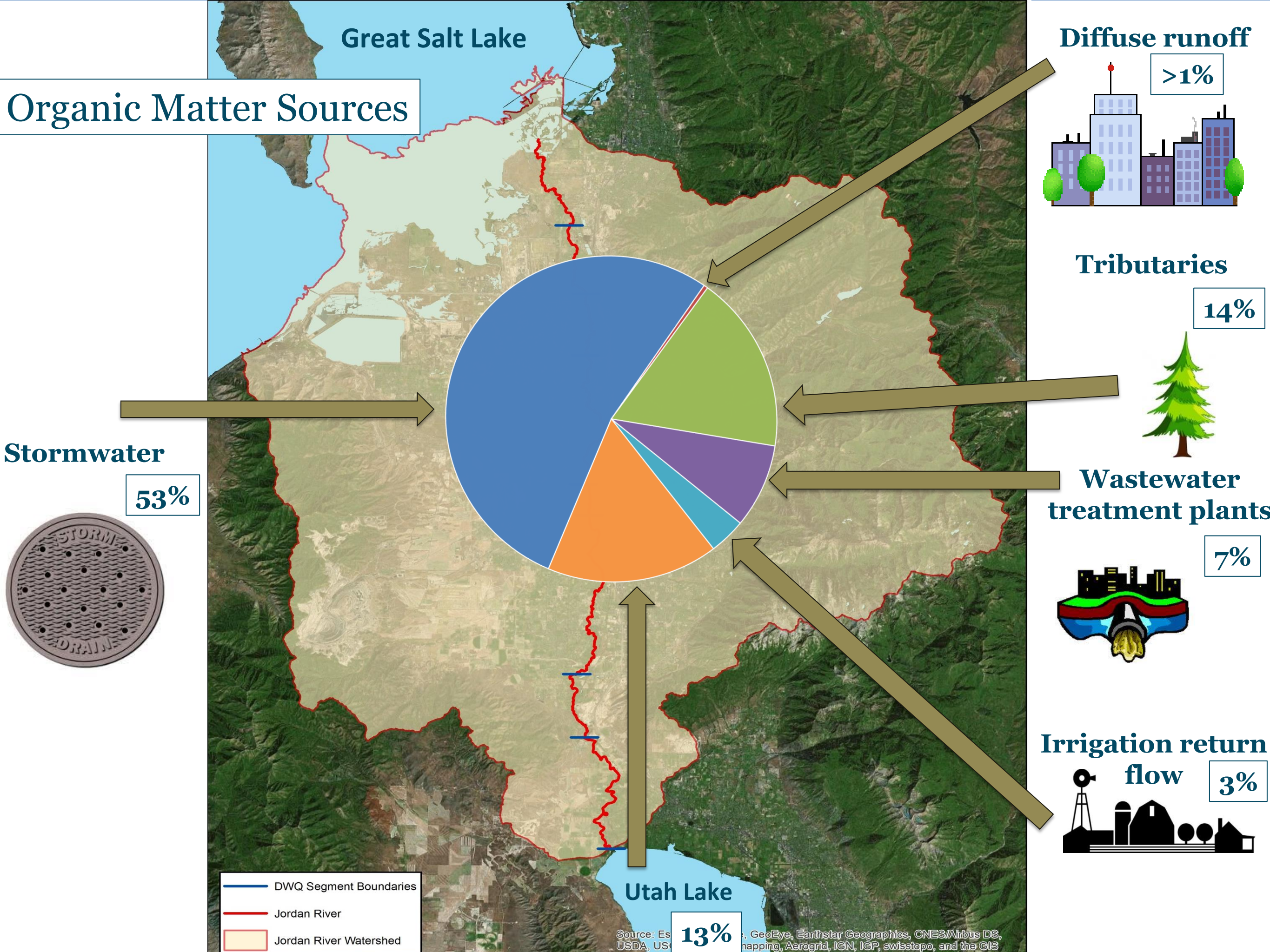
Cirrus Ecological Solutions, LC
965 South 100 West, Suite 200
Logan, Utah 84321

Stantec Consulting Inc.
3995 South 700 East, Suite 300
Salt Lake City, Utah 84107

EPA APPROVAL DATE JUNE 5, 2013

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Organic Matter Sources



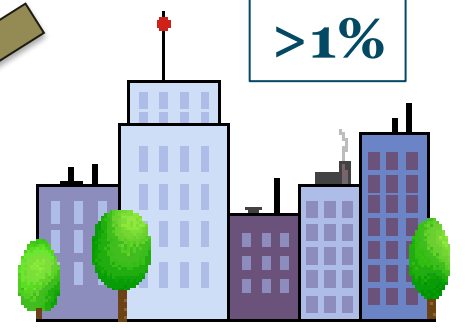
Stormwater

53%



Diffuse runoff

>1%



Tributaries

14%



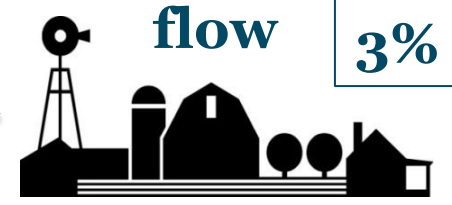
Wastewater treatment plants

7%



Irrigation return flow

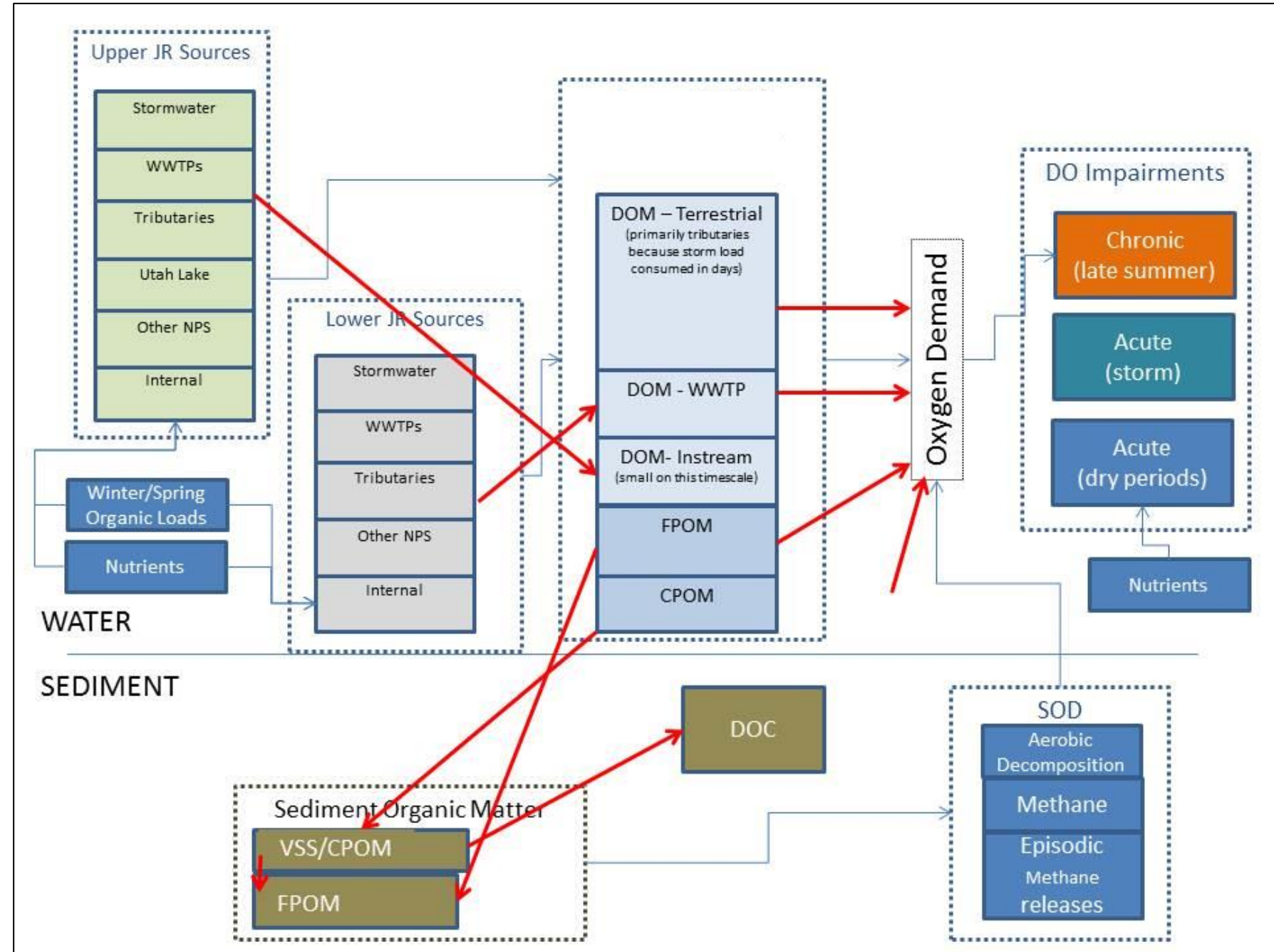
3%



Source: Esri, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community

Since Phase 1 TMDL completion...

- Ongoing high frequency data collection at 8 locations
- 2017 Research Synthesis that summarized research from 2010 – 2015
- University of Utah modeling effort
- Stormwater tracking tool



University of Utah Modeling Effort

1. Confirm organic matter as the primary pollutant of concern
2. Refine pollutant loading estimates
3. Assign WLAs and LAs
4. Explore linkages between nutrient loading and organic matter
5. Link pollutant sources to the DO impairment

Goal

...to develop an improved system-wide quality and quantity model of the Jordan River watershed that can be used by stakeholders to improve planning related to water supply and demand forecasting, TMDL planning and implementation, policy decisions related to urban growth and water projects, and public education and outreach.

DWQ Modeling Effort

- U of U handed over the WASP model to DWQ in January 2020
- Identifying and compiling data to be used for tributary loading
- Validating the model
- Discussions on pairing WASP with a loading model (HSPF or SWMM)
- Next TAC meeting will focus specifically on this effort

2020 Research Synthesis (2015 – 2020)

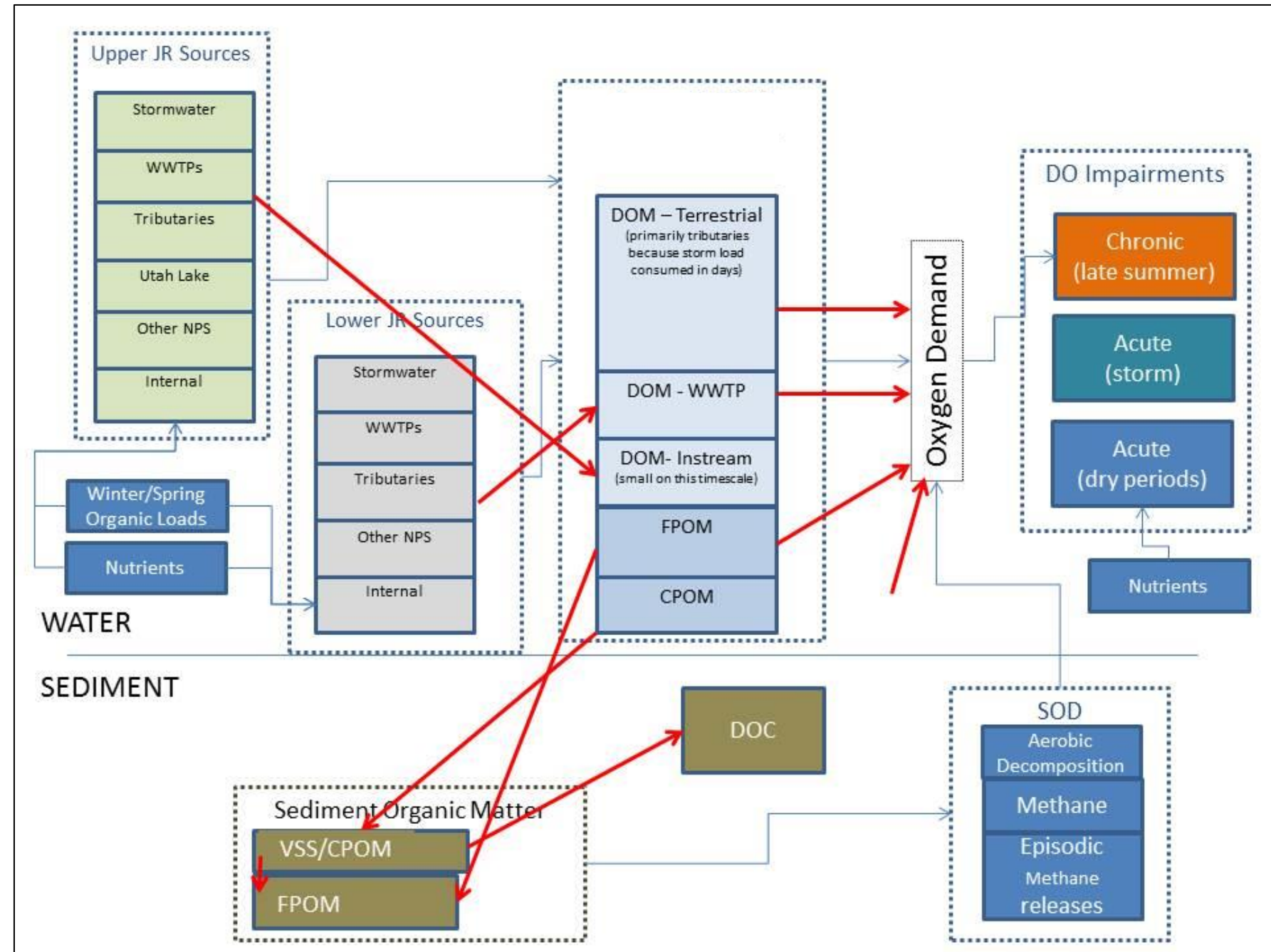
- Over 40 research efforts that deal with some aspect of the Jordan River and contributing watershed area
- We looked specifically for those efforts that:
 - Recommend a parameter of concern that links organic matter (OM), DO, and pollutant sources
 - Recommend options for quantifying differences in lability among OM sources
 - Recommend methods for quantifying relative contributions of OM sources to sediment oxygen demand (SOD).

- In-depth look at 16 studies



2020 Research Synthesis (2015 – 2020)

- Document organized according to processes and sources
- Section 2: Oxygen demand by water and sediment
- Section 3: Organic matter sources
- Section 4: WASP modeling report
- Section 5: Data gaps and conclusions

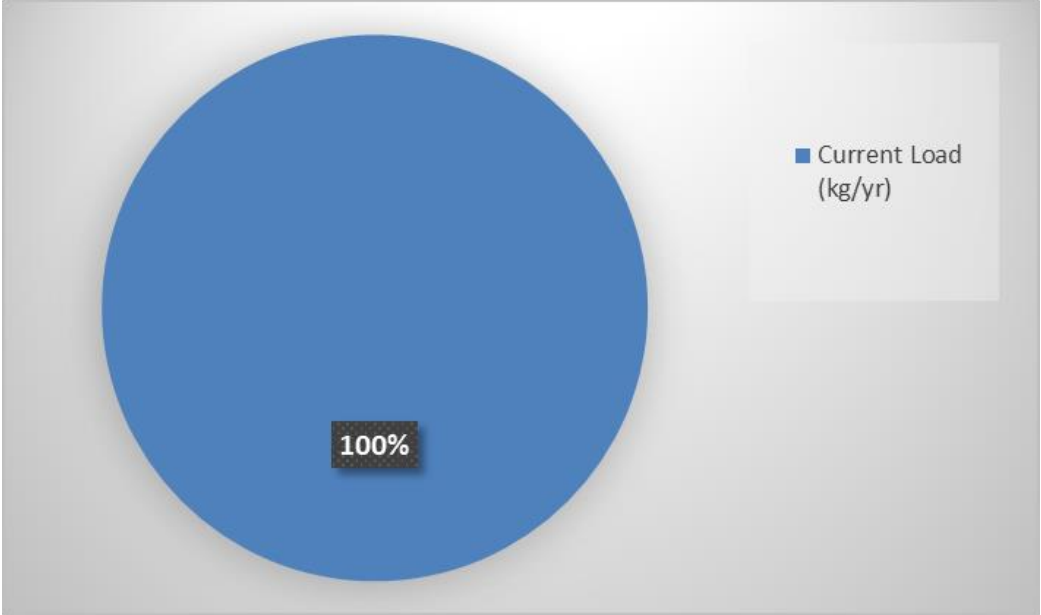


Extra slides

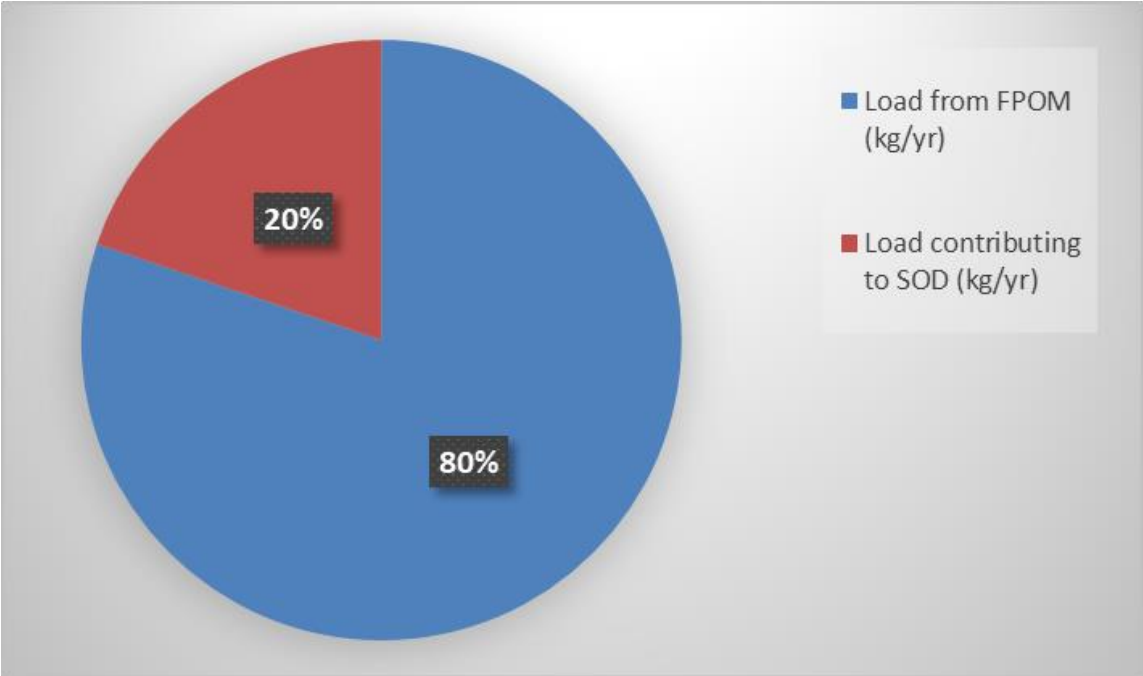
Phase 1 Jordan River DO TMDL Summary

Located at: https://deq.utah.gov/legacy/programs/water-quality/watersheds/docs/2013/09Sep/JordanRiverTMDL_Final_20130905.pdf

Total Organic Matter Load to the Jordan River = 2,225,523 kg/yr

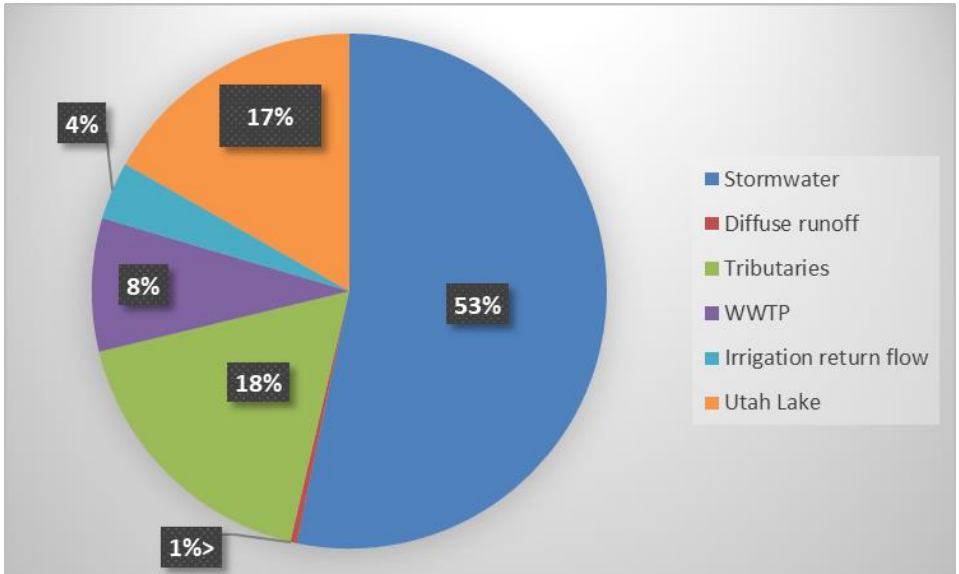


Load from FPOM = 1,784,500 kg/yr
Load contributing to SOD = 441,023 kg/yr



Load from FPOM = 1,784,500 kg/yr broken down by source

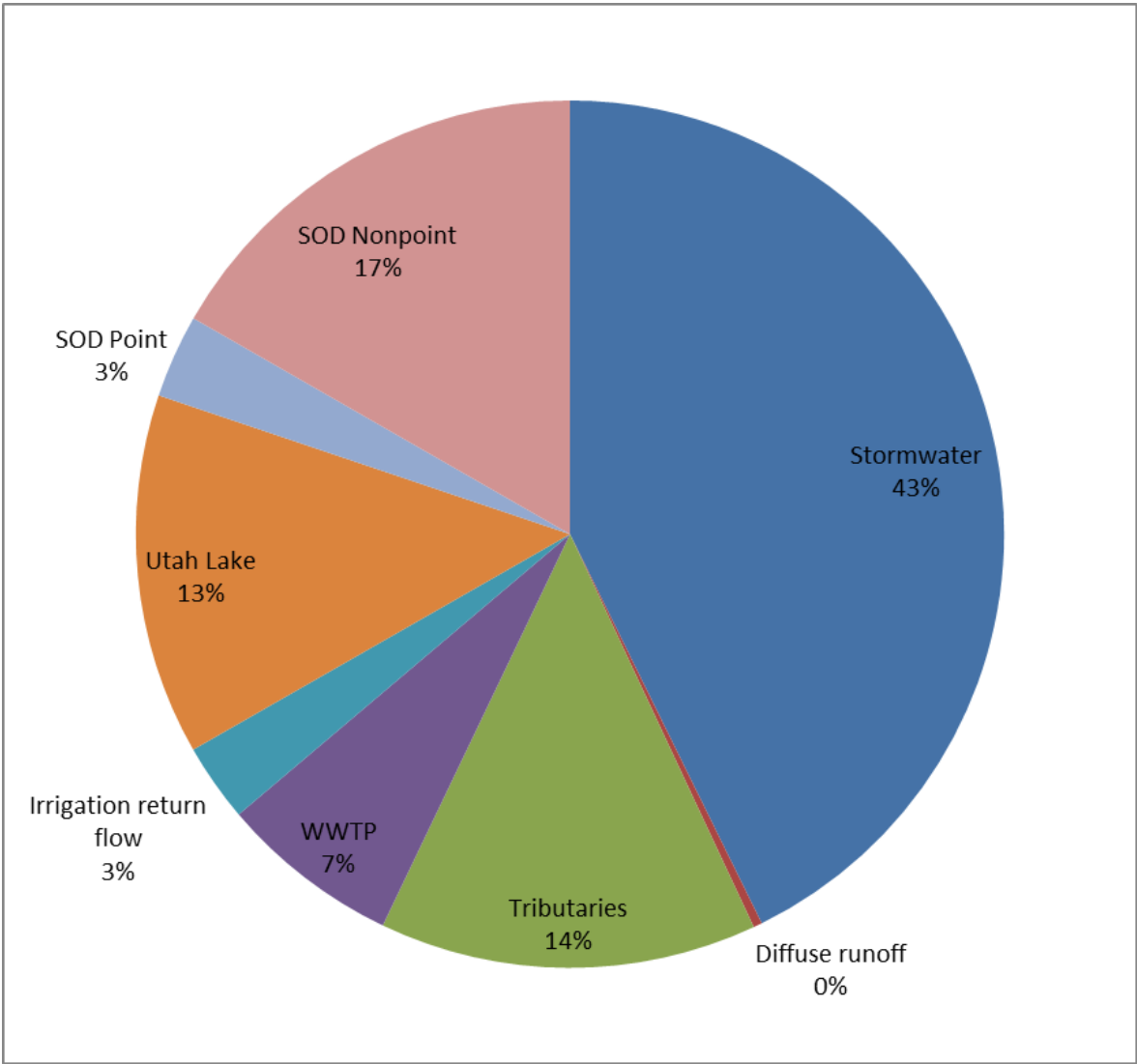
	FPOM (kg/yr)
Stormwater	950,691
Diffuse runoff	7,190
Tributaries	312,849
WWTP	149,500
Irrigation return flow	64,765
Utah Lake	299,505
Total	1,784,500



Phase 1 Jordan River DO TMDL Summary continued...

OM load broken down by source that includes contribution to SOD

FPOM (kg/yr)	
Stormwater	950,691
Diffuse runoff	7,190
Tributaries	312,849
WWTP	149,500
Irrigation return flow	64,765
Utah Lake	299,505
	1,784,500
Contributing to SOD (kg/yr)	
SOD Point source	69,155
SOD Nonpoint source	371,867
	441,022
Total	2,225,522



It may be that the discrepancy in % contribution from stormwater that you were referring to was a matter of whether or not sediment oxygen demand (SOD) was included in the pie chart numbers. If we include it, then stormwater contributes 43%, if we do not, then stormwater contributes 53%. Keep in mind that stormwater is likely contributing to some portion of SOD, but we do not know how much at this time. That is something we will hopefully address in the next phase.

Total *Maximum Daily Load*

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

- WLA – wasteload allocation for point sources
- LA – load allocation for nonpoint sources
- MOS – margin of safety – incorporated into the load calculations

