Prioritizing Restoration of Arizona's Impaired Waters

Arizona Department of Environmental Quality
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ADEQ Arizona Department of Environmental Quality

ADEQ's Mission/Vision

- **To protect and enhance public health and the environment in Arizona.**
- **Through** consistent, science-based environmental regulation; and clear, equitable engagement and communication;
- **With** integrity, respect, and *the highest standards of effectiveness and efficiency*;
- **Because** Arizonans treasure the unique environment of our state and its essential role in sustaining well-being and economic vitality, today and for future generations.

Water Quality Assessment Flow Pathway

- "**Designated Uses**" assigned to all AZ waters

- Associated "**Water Quality Standards"** (WQS)

- **Assessment** of Waters
  - If found to be impaired (not meeting WQS), reaches added to *303d list of impaired waters*
  - 303(d) report lists **164 water quality impairments** in AZ streams, rivers, and lakes that need a plan to reach water quality goals

Watershed Restoration Plan Procedure

- **Total Maximum Daily Load (TMDL)**
  - "*The math and the path*" – to watershed restoration and water quality improvement
  - "*TMDLs are the science that help us better target financial resources*" for watershed restoration

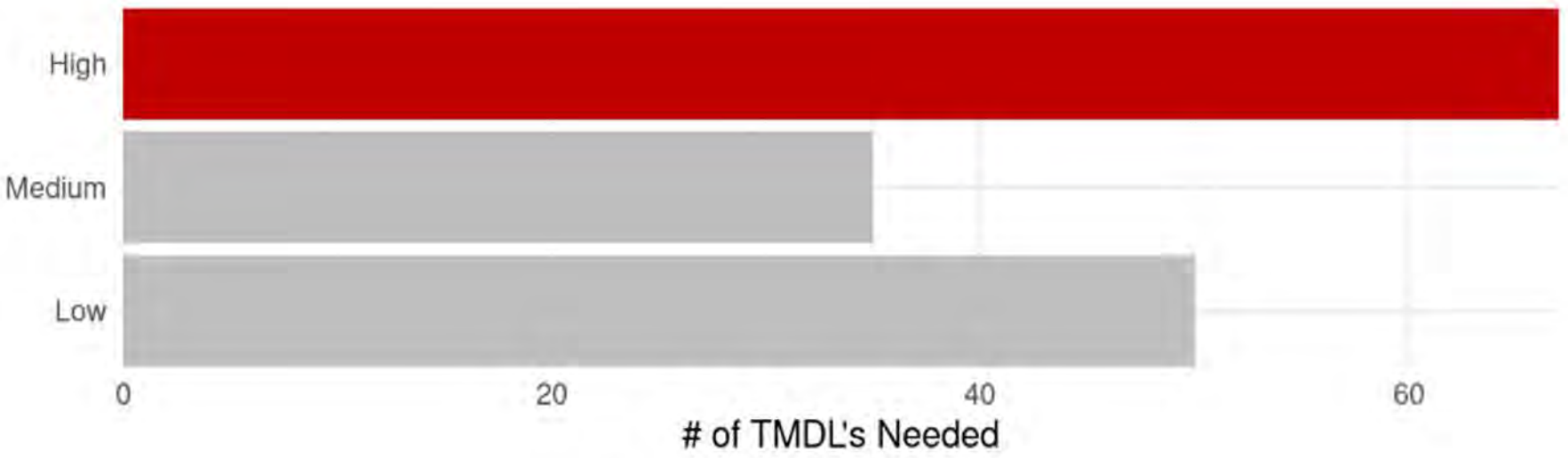
- **Goal** = Achieve WQS => Achieve designated uses

- **Result** = Safer, more ecologically and economically productive resources for wildlife and all Arizonans

TMDL Process

Step	Process Objectives
1	**Project Prioritization**
2	Data Review
3	Sampling and Analysis Plan (SAP)
4	Data Collection
5	Data Analysis and Assessment
6	Draft Report
7	Public Comment
8	Finalize Report
9	TMDL Final Report Approval
	Long-Term/On-going Program Goals

Prioritization Approach



- Priority ranking based on Arizona State Statute requirements
- There are **67 impairments** (out of 164) that rank as **high priority**

How the Prioritization Application works…

1 – Sources

World Wide Web
1-Wild and Scenic Rivers

Water Quality Database
2-Outstanding Arizona Waters
3-Priority Uses/Flow Regime
5-Watershed Area

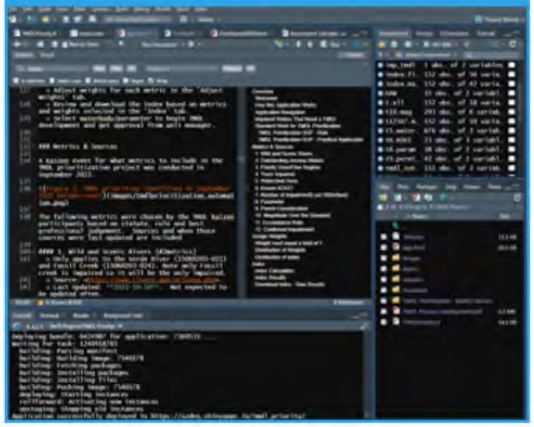
Google Sheets
4-Years Impaired
8-Parameter

Excel
6-KOUI

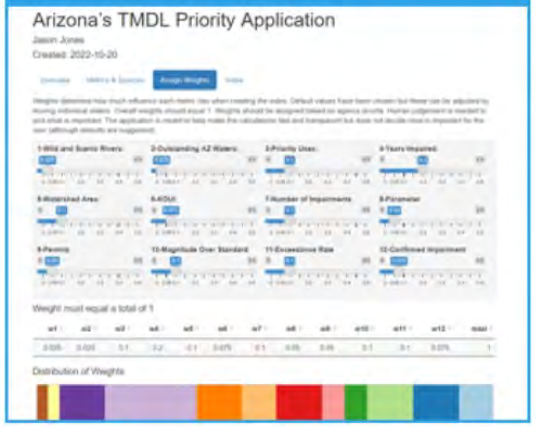
R Tools
7-# Impairments

GIS
9-Permits

2 – R Code



3 – Shiny App

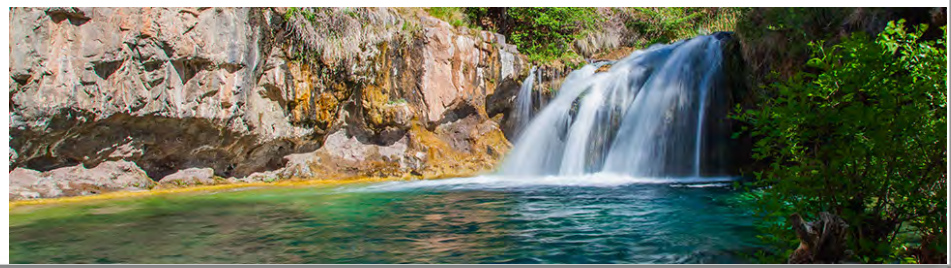


- Ranks impaired waters using weighted factors
  - Sorted using R code and ranked/prioritized
  - Coding credit to our own Jason Jones!

- Located here: *azdeq.shinyapps.io/tmdl_priority/*

Prioritization Factors Include:

1. Wilderness Areas and Outstanding Waters
2. Environmental Justice
3. Priority Uses/Flow Regime
4. Years Impaired
5. Watershed Area
6. KOUI Watershed? (Known Ongoing Unauthorized Impacts)
7. Number of Impairments per Waterbody
8. Parameter
9. Permit Consideration
10. Magnitude Over the Standard
11. Exceedance Rate
12. Confirmed Impairment



Assigning Metric Weights

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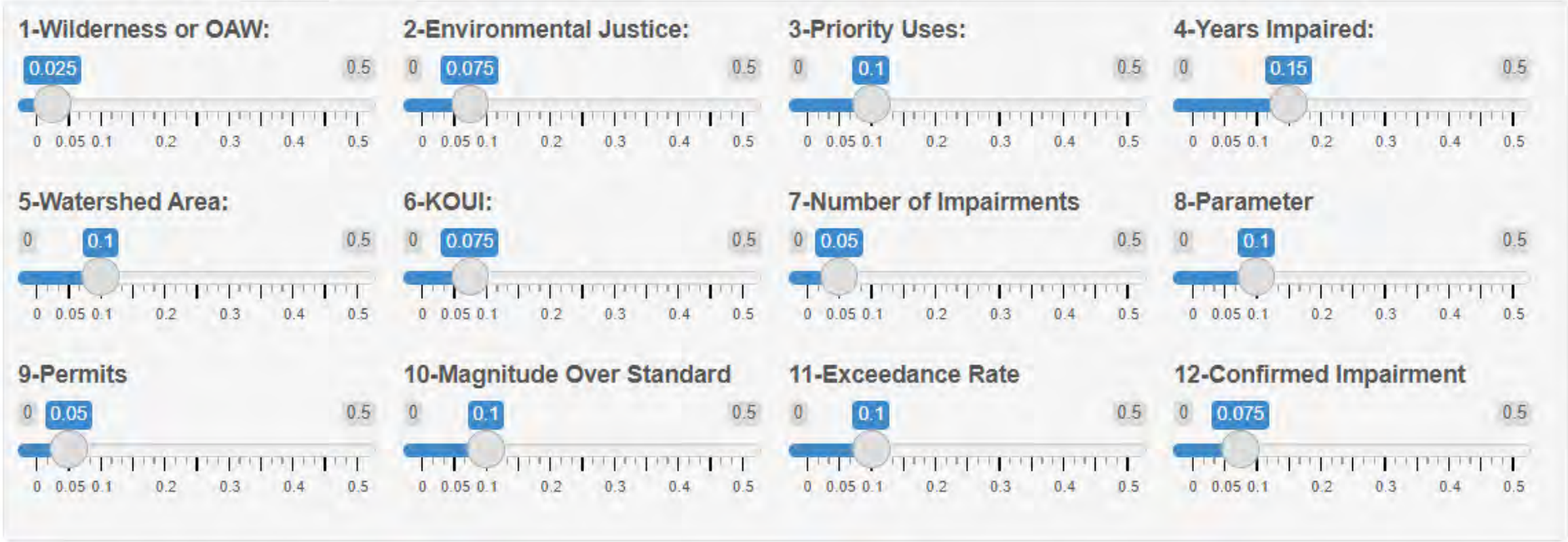
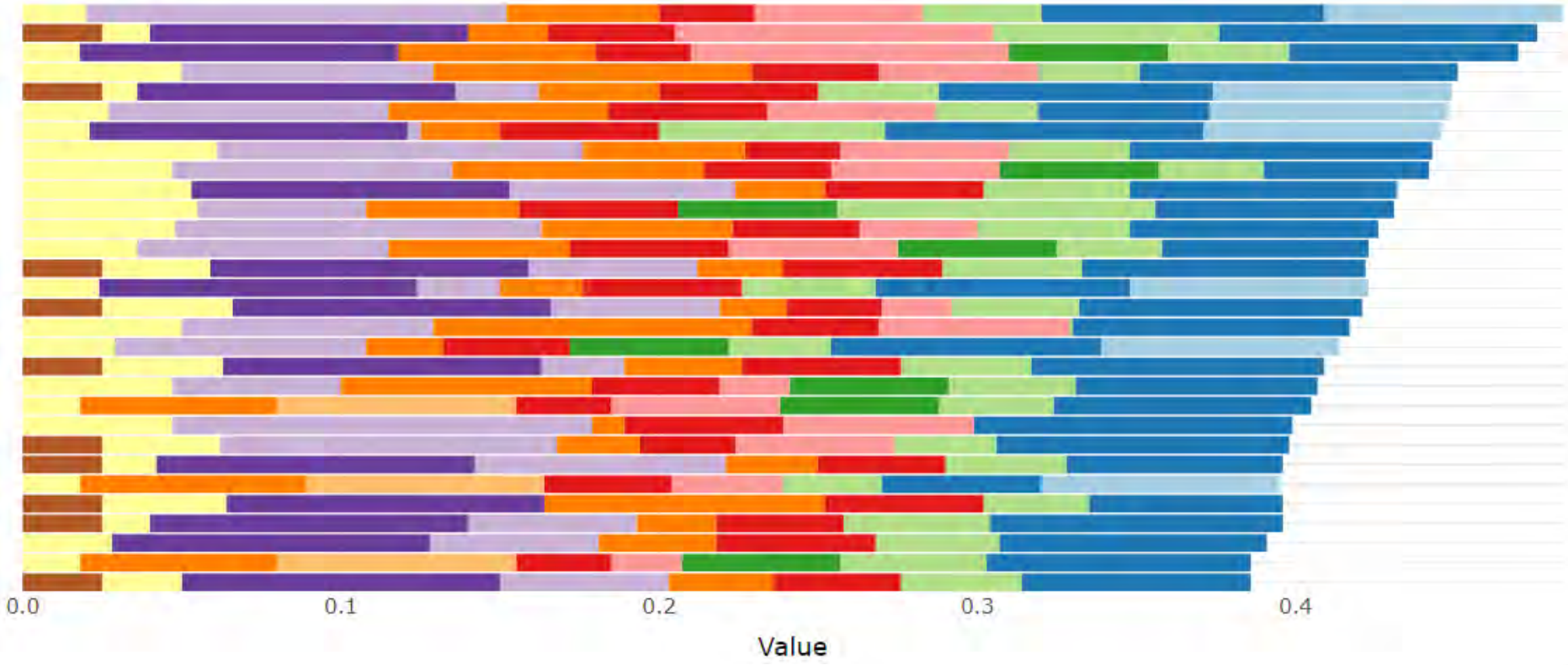
Overview | Metrics & Sources | **Assign Weights** | Index

Weights determine how much influence each metric has when creating the index. Default values have been chosen but these can be adjusted by moving individual sliders. Overall weights should equal 1. Weights should be assigned based on agency priority. Human judgement is needed to pick what is important. The application is meant to help make the calculations fast and transparent but does not decide what is important for the user (although defaults are suggested).



Output From Prioritization Application

- Example showing the top 30 priority waters
- Colors indicate influence of each factor on total score & rank



Index Ranking Priority Waters

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Index Results

See the Download Index - Raw Results to see the math behind how the index was calculated.

Show 10 entries

Search:

WBID	WaterbodyName	CharacteristicName	TMDLPriorityRule	Index
All	All	All	All	All
15050100-012B	MINERAL CREEK (MIN)	COPPER	High	1
15060103-004	SALT RIVER	ARSENIC	High	0.97
15060202-016	OAK CREEK	ESCHERICHIA COLI	High	0.89
15060106B-0410	CORTEZ PARK LAKE	PH	High	0.89
15080301-090A	MULE GULCH	COPPER	High	0.88
15050100-014A	QUEEN CREEK	COPPER	High	0.86
15050301-011	NOGALES WASH	COPPER	High	0.86
15040004-003	SAN FRANCISCO RIVER	ESCHERICHIA COLI	High	0.83
15050301-500B	POTRERO CREEK	CHLORINE	High	0.83
15050301-1070	PENA BLANCA LAKE	MERCURY	High	0.81

Showing 1 to 10 of 152 entries

Previous 1 2 3 4 5 … 16 Next

Current and Future TMDLs

- Taking a watershed based approach, contributing reaches and related impairments will be completed in grouped TMDLs

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- Queen Creek for dissolved Cu and Pb impairments
  - 6 impaired reaches
  - Impacting aquatic wildlife designated use
- Oak Creek for *E. coli* impairment
  - 7 impaired reaches
  - Impacting recreational contact designated use
- Mercury in fish tissue impairment
  - 25 impaired water bodies
  - Impacting fish consumption designated use

Questions?

- We value your feedback!
- Review current plans and provide comments to:

TMDL@azdeq.gov

weinkam.grant@azdeq.gov

Prioritization Application Link

- azdeq.shinyapps.io/tmdl_priority/
- azdeq.gov/watershed-plans-and-tmdls