Prioritizing Restoration of Arizona’s Impaired Waters

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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.
“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
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
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<th>Step</th>
<th>Process Objectives</th>
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<td></td>
<td>Long-Term/On-going Program Goals</td>
</tr>
</tbody>
</table>
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...

- 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

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).

1-Wilderness or OAW: 0.025
5-Watershed Area: 0.1
9-Permits: 0.05

2-Environmental Justice: 0.075
6-KOUI: 0.075
10-Magnitude Over Standard: 0.1

3-Priority Uses: 0.1
7-Number of Impairments: 0.05
11-Exceedance Rate: 0.1

4-Years Impaired: 0.15
8-Parameter: 0.1
12-Confirmed Impairment: 0.075
Output From Prioritization Application

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

See the [Download Index - Raw Results](#) to see the math behind how the index was calculated.

<table>
<thead>
<tr>
<th>WBID</th>
<th>WaterbodyName</th>
<th>CharacteristicName</th>
<th>TMDLPriorityRule</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>15050100-012B</td>
<td>MINERAL CREEK (MIN)</td>
<td>COPPER</td>
<td>High</td>
<td>1.00</td>
</tr>
<tr>
<td>15060103-004</td>
<td>SALT RIVER</td>
<td>ARSENIC</td>
<td>High</td>
<td>0.97</td>
</tr>
<tr>
<td>15060202-016</td>
<td>OAK CREEK</td>
<td>ESCHERICHIAcoli</td>
<td>High</td>
<td>0.89</td>
</tr>
<tr>
<td>15060106B-0410</td>
<td>CORTEZ PARK LAKE</td>
<td>PH</td>
<td>High</td>
<td>0.89</td>
</tr>
<tr>
<td>15080301-090A</td>
<td>MULE GULCH</td>
<td>COPPER</td>
<td>High</td>
<td>0.88</td>
</tr>
<tr>
<td>15050100-014A</td>
<td>QUEEN CREEK</td>
<td>COPPER</td>
<td>High</td>
<td>0.86</td>
</tr>
<tr>
<td>15050301-011</td>
<td>NOGALES WASH</td>
<td>COPPER</td>
<td>High</td>
<td>0.86</td>
</tr>
<tr>
<td>15040004B-003</td>
<td>SAN FRANCISCO RIVER</td>
<td>ESCHERICHIAcoli</td>
<td>High</td>
<td>0.83</td>
</tr>
<tr>
<td>15050301-500B</td>
<td>POTRERO CREEK</td>
<td>CHLORINE</td>
<td>High</td>
<td>0.83</td>
</tr>
<tr>
<td>15050301-1070</td>
<td>PENNA BLANCA LAKE</td>
<td>MERCURY</td>
<td>High</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Showing 1 to 10 of 152 entries
Current and Future TMDLs

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

- 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
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