National CWA 106/319 Conference

Developing an Annual Water Quality Assessment Report
CWA 106 Program Requirements

1. Monitoring Strategy

2. Electronic copies of surface water quality data for nine basic parameters (submitted in a STORET-compatible format)

3. Annual Water Quality Assessment Report
Why Report?

- Provides foundation for assessing water quality for reservation waters
- Allows for the comparison of water quality data over time in order to make informed decisions about your program’s future
- Allows EPA to assess national results associated with CWA Section 106 Tribal Program
What to Report?
Minimum Reported Water Quality Indicators for Baseline Monitoring Programs

**Fundamental**
- Dissolved Oxygen
- pH
- Temperature
- Turbidity

**Intermediate**
- Total Phosphorus
- Total Nitrogen

**Mature**
- Macroinvertebrates
- *E. coli* or enterococci
- Basic Habitat Information
Reporting Requirements for Annual Assessment Reports

1. Description of monitoring strategy

2. Water quality assessment

3. Surface water quality monitoring data
   - For the nine required reporting parameters
   - Electronic, STORET-compatible format
   - Include metadata
Description of Monitoring Strategy

- Include a description of your existing monitoring strategy in your assessment report
- The description can vary in length as long as you adequately describe a program that:
  - Meets your current data and information needs
  - Considers future needs
Water Quality Assessment

- Summary of water quality
- Key components
  1. Atlas of tribal water resources
  2. Description of tribal water quality monitoring program and assessment methods
  3. Results of water quality monitoring
  4. Summary of issues of tribal concern (e.g., sources of impairments)
- Content and level of detail will vary based on tribal program’s sophistication
## Atlas of Tribal Waters

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total stream miles</td>
<td>95</td>
</tr>
<tr>
<td>Total lake acres</td>
<td>250</td>
</tr>
<tr>
<td>Total of wetland acres</td>
<td>140</td>
</tr>
<tr>
<td>Total estuarine square miles</td>
<td>10</td>
</tr>
</tbody>
</table>
Description of Water Quality Monitoring Program

(Water Quality Assessment #2)

- Purpose of the monitoring program
  - For example: Identify problem areas, track trends over time, identify NPS impacts, address public health concerns, etc.
- Number of stream miles, lake or wetland acres, and estuary square miles monitored
- Parameters monitored
- Monitoring frequency
- Discussion of applicable WQIs, tribal goals and objectives, or standards
- Coordination or collaboration with other organizations
- Lab support (if any)
- How data are interpreted and managed
Description of Assessment Methods

(\textit{Water Quality Assessment #2})

- Methodology for analyzing data and interpreting results

- Each of the nine parameters should be analyzed
  - Calculation of mean/median values
  - Range of measured concentrations
  - Comparison of data against a threshold (e.g., WQS)

- Include summary of number of sampling locations (or stream miles, lake acres, etc.) for which samples are above or below (as appropriate) the threshold value
Description of Assessment Methods (cont.)

(Water Quality Assessment #2)

• For tribes with EPA-approved or tribally-adopted WQS and designated uses, include a summary of the number of stream miles, lake acres, etc. that are:
  ■ Meeting designated uses
  ■ Not meeting designated uses (i.e., impaired waters)
  ■ Unassessed

• This information will be helpful for measuring success towards water quality improvements in tribal waters
### Example Summary Tables

#### Making Assessment Decisions

<table>
<thead>
<tr>
<th>Designated Use or Tribal Goal</th>
<th>Parameter(s) to be Measured to Determine Support of Use or Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact recreation / swimming / cultural uses</td>
<td><em>E. coli</em> or <em>enterococci</em>, nitrogen, phosphorus</td>
</tr>
<tr>
<td>Aquatic life and wildlife</td>
<td>Dissolved oxygen, temperature, pH, turbidity, macroinvertebrates, habitat, nitrogen, phosphorus</td>
</tr>
<tr>
<td>Drinking water</td>
<td><em>E. coli</em> or <em>enterococci</em>, nitrates, turbidity</td>
</tr>
<tr>
<td>Shellfish / fish consumption</td>
<td><em>E. coli</em> or <em>enterococci</em>,</td>
</tr>
</tbody>
</table>
## Example Summary Tables

### Use / Goal Support

<table>
<thead>
<tr>
<th>Designated Use or Tribal Goal</th>
<th># of Stream Miles Monitored / Assessed</th>
<th># of Stream Miles Fully Supporting Use or Goal</th>
<th># of Stream Miles Threatened*</th>
<th># of Stream Miles Not Supporting Use or Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swimming</td>
<td>50</td>
<td>40</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Aquatic Life</td>
<td>45</td>
<td>20</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Cultural</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

*Note: Threatened miles are those that are not fully supporting the use or goal
Description of Water Quality Monitoring Results
(Water Quality Assessment # 3)

- An interpretation and summary of the findings of monitoring activities
  - Including probable causes and sources of impairments
  - Summarize using narrative, tables, and charts / graphs

- Consider conducting a watershed survey to learn about potential sources of impairment
  - EPA’s Volunteer Stream Monitoring Manual contains more information (including field sheets) on conducting watershed surveys
    http://www.epa.gov/volunteer/stream/stream.pdf
Presenting Data Results
(Water Quality Assessment #3)

• Include statistical summaries of your data in tables

• Summarize data using scatter plot graphs, line graphs, bar charts, etc.
  ■ Summarize/graph data on a site-by-site basis instead of aggregating data
  ■ Identify the number of samples used to create each graph or chart (i.e., n = 10)
### Field Data Collected at Station RIV-1

<table>
<thead>
<tr>
<th>Statistic</th>
<th>DO (mg/L)</th>
<th>Temp (°C)</th>
<th>Conductivity (μmhos/cm)</th>
<th>pH</th>
<th>Turbidity (NTU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Value</td>
<td>15.67</td>
<td>29.0</td>
<td>2190</td>
<td>9.43</td>
<td>2000</td>
</tr>
<tr>
<td>Min Value</td>
<td>1.25</td>
<td>6.0</td>
<td>534</td>
<td>8.29</td>
<td>4</td>
</tr>
<tr>
<td>Median</td>
<td>9.89</td>
<td>23.0</td>
<td>1475</td>
<td>9.05</td>
<td>36</td>
</tr>
<tr>
<td>Mean</td>
<td>9.53</td>
<td>21.4</td>
<td>1473</td>
<td>8.97</td>
<td>64</td>
</tr>
<tr>
<td># of Samples</td>
<td>12</td>
<td>17</td>
<td>19</td>
<td>18</td>
<td>5</td>
</tr>
</tbody>
</table>
## Example Summary Tables

### Lab Data for Station RIV-1

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Total Phosphorus (mg/L)</th>
<th>Copper (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Value</td>
<td>0.075</td>
<td>0.00030</td>
</tr>
<tr>
<td>Min Value</td>
<td>0.28</td>
<td>0.00020</td>
</tr>
<tr>
<td>Median</td>
<td>0.205</td>
<td>0.00025</td>
</tr>
<tr>
<td>Mean</td>
<td>0.196</td>
<td>0.00025</td>
</tr>
<tr>
<td># of Samples</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>
Example Bar Chart

Total Phosphorus Data for Station RIV-1

TP (mg/L)

Mar  Apr  May  June  July  Aug  Sept  Oct

Total Phosphorus Standard
Dissolved Oxygen Data for the RIV Stations

Example Line Graph

Dissolved Oxygen (DO) (mg/L)

April May June July

RIV-1
RIV-2
RIV-3
RIV-4
RIV-5
WQS
Summary of Issues of Tribal Concern
(Water Quality Assessment #4)

• Brief description of any issues of tribal concern

• Examples:
  ■ Outbreaks of waterborne disease
  ■ Fish kills
  ■ Fishing or shellfishing advisories
  ■ Restrictions on surface water supplies of drinking water
  ■ Restrictions on swimming
## Causes of Impairment

<table>
<thead>
<tr>
<th>Parameter</th>
<th># of Stream Miles Monitored or Assessed</th>
<th># of Stream Miles Not Supporting Use or Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em></td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>Turbidity</td>
<td>45</td>
<td>20</td>
</tr>
<tr>
<td>Habitat Degradation</td>
<td>45</td>
<td>25</td>
</tr>
</tbody>
</table>
## Example Summary Tables

### Sources of Impairment

<table>
<thead>
<tr>
<th>Source of Impairment</th>
<th># of Stream Miles Monitored or Assessed</th>
<th># of Stream Miles Not Supporting Use or Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrologic modification</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>Agriculture (livestock grazing)</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Stormwater runoff</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Unregulated septic systems</td>
<td>50</td>
<td>25</td>
</tr>
</tbody>
</table>
Example Sources of Impairment
Environmental Results

• Support Tribal Water Quality Programs:
  ■ Identifying water quality priorities in Indian Country
    • Maintain the natural habitat for wildlife, native plants, and for those in your community
    • Support the designated uses of that waterbody (fishable, swimmable, etc)
    • Protect and maintain the cultural significance
    • Protect drinking water (health concern)
  ■ Supporting future funding needs for CWA § 106, 319

• Provide R9 with information on status of tribal water quality:
  ■ For EPA management (e.g., IPPC)
  ■ Information for Accomplishments Report, Success Stories, etc.
Questions??