UPPER/MIDDLE ANACOSTIA CITIZEN SCIENCE WATER QUALITY MONITORING

Olivia Anderson, Project Coordinator and Development Lead
9/1/2020
Welcome!

- Programs Background
- Importance of Water Quality Testing
- Parameters
- Upper Anacostia Results
- How to get involved
- Q & A
Anacostia Riverkeeper’s Monitoring Programs

- DC Sampling, started in 2019
- 22 sites in all 3 watersheds, weekly
- Water and air temperature, pH, turbidity, bacteria

- Upper/Mid Anacostia Tributaries, started in 2020
- 7 sites in MD/DC, biweekly
- Same parameters and dissolved oxygen (DO), specific conductivity
Importance of WQ Monitoring

- Share data with the public
- Help enforcement/watershed management
- Inform policy decisions
- Overall watershed health
Parameters

- Air and water temperature
- pH (acidity)
Parameters

- Turbidity (cloudiness)
- Bacteria (E. coli)
Parameters (Upper Anacostia)

- Dissolved Oxygen (DO % and mg/L)
- Specific Conductivity ($\mu$S/cm)

<table>
<thead>
<tr>
<th>Source</th>
<th>Dissolved Oxygen (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distilled Water</td>
<td>0.5 - 3</td>
</tr>
<tr>
<td>Melted Snow</td>
<td>2 - 42</td>
</tr>
<tr>
<td>Tap Water</td>
<td>50 - 800</td>
</tr>
<tr>
<td>Potable Water in the US</td>
<td>30 - 1500</td>
</tr>
<tr>
<td>Freshwater Streams</td>
<td>100 - 2000</td>
</tr>
<tr>
<td>Industrial Wastewater</td>
<td>10000</td>
</tr>
<tr>
<td>Seawater</td>
<td>55000</td>
</tr>
</tbody>
</table>

**RANGE OF TOLERANCE FOR DISSOLVED OXYGEN IN FISH**

- **< 3.0 PPM** too low for fish populations
- **3.0 - 5.0 PPM** 12-24 hour range of tolerance / stressful conditions
- **6.0 PPM** supports spawning
- **7.0 - 9.0 PPM** supports fish populations
- **> 9.0 PPM** supports abundant fish populations

**OXYGEN REQUIREMENTS mg/L**

- 14
- 13
- 12
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1
## Summer 2020 Results

<table>
<thead>
<tr>
<th></th>
<th>SC-1</th>
<th>SC-2</th>
<th>NWB-1</th>
<th>NEB-1</th>
<th>BWP-1</th>
<th>LBC-1</th>
<th>WB-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg E. coli level</td>
<td>2195.9</td>
<td>1585.3</td>
<td>1476.7</td>
<td>1154.2</td>
<td>1692.9</td>
<td>1389.2</td>
<td>1434.0</td>
</tr>
<tr>
<td>Avg DO%</td>
<td>91.0</td>
<td>96.5</td>
<td>86.9</td>
<td>90.8</td>
<td>72.9</td>
<td>78.9</td>
<td>94.5</td>
</tr>
<tr>
<td>Avg DO mg/L</td>
<td>7.9</td>
<td>8.4</td>
<td>7.5</td>
<td>7.8</td>
<td>6.1</td>
<td>6.7</td>
<td>8.1</td>
</tr>
<tr>
<td>Avg Spec. Conductivity</td>
<td>412.2</td>
<td>443.2</td>
<td>310.5</td>
<td>267.4</td>
<td>261.2</td>
<td>343.1</td>
<td>304.0</td>
</tr>
</tbody>
</table>

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![Map of sampling locations](image-url)
Bacteria Trends

- Heavy precipitation = bacteria off the charts
- Stay at home order, lower bacteria
  - Less traffic, cars, people, etc.
- SC-1 and 2, hot outfall
  - Just north of SC-1 (Wayne Avenue)
- 7/22 – 8/19 extremely high across the board
  - Why?
    - 3+ inches of rain 7/8 and 8/5

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Upper Anacostia *E. coli* Results 5/27 - 8/19

- SC-1: Sligo at Fleetwood Terrace
- SC-2: Sligo Creek at Maple Avenue
- NWB-1: Northwest Branch
- NEB-1: Northeast Branch
- BWP-1: Bladensburg Waterfront Park
- LBC-1: Lowerbeaverdam Creek
- WB-1: Watts Branch

<table>
<thead>
<tr>
<th>Date</th>
<th>SC-1</th>
<th>SC-2</th>
<th>NWB-1</th>
<th>NEB-1</th>
<th>BWP-1</th>
<th>LBC-1</th>
<th>WB-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/27/2020</td>
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<td>6/10/2020</td>
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<tr>
<td>7/8/2020</td>
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<tr>
<td>7/22/2020</td>
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<td>8/5/2020</td>
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</tr>
</tbody>
</table>

- Avg *E. coli* level
- Passing Single Sample *E. coli*
Specific Conductivity and Dissolved Oxygen

Specific Conductivity Average 5/27-8/19/2020

SC-1: Sligo at Fleetwood Terrace
SC-2: Sligo Creek at Maple Avenue
NWB-1: Northwest Branch
NEB-1: Northeast Branch

Dissolved Oxygen (mg/L) Average 5/27-8/19/2020

BWP-1: Bladensburg Waterfront Park
LBC-1: Lowerbeaverdam Creek
WB-1: Watts Branch

SC-1
SC-2
NWB-1
NEB-1
BWP-1
LBC-1
WB-1

Specific Conductivity (µs/cm)

Dissolved Oxygen (mg/L)

Avg SPC
Specific Conductivity Impairment
Avg DO mg/L
DO Minimum for Fish
Where to find weekly data

- [https://www.anacostiariverkeeper.org/md-water-quality/](https://www.anacostiariverkeeper.org/md-water-quality/)
- Maps are embedded in ARK website and reports the results for that week as well as stores past data
- Swim Guide shows P/F and Water Report shows P/F and quantitative results
Where to find weekly data

- CMC can be found at https://cmc.vims.edu/ (left map)
- ARK maps can be found on social media as well (along with Swim Guide and Water Reporter maps)
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Become a citizen science water quality monitor</td>
<td>Report unusual smell or look of the water</td>
</tr>
<tr>
<td>Write your local councilmembers about issues</td>
<td>Rain gardens, rain barrels, decrease impervious pavement</td>
</tr>
<tr>
<td>Be aware!</td>
<td>Stay updated on the results</td>
</tr>
</tbody>
</table>
Thank you for joining!

<table>
<thead>
<tr>
<th>Go</th>
<th>Go to our website</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="http://www.anacostiariverkeeper.org/md-water-quality">www.anacostiariverkeeper.org/md-water-quality</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Follow</th>
<th>Follow us on social media</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facebook - Instagram - Twitter</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Email</th>
<th>Email us for updates or to become a Citizen Science Water Quality Monitor:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="mailto:monitor@anacostiariverkeeper.org">monitor@anacostiariverkeeper.org</a>, <a href="mailto:olivia@anacostiariverkeeper.org">olivia@anacostiariverkeeper.org</a></td>
</tr>
</tbody>
</table>
Resources

- https://www.anacostiariverkeeper.org/water-quality/
- https://www.chesapeakebay.net/discover/ecosystem/dissolved_oxygen
- https://www.epa.gov/national-aquatic-resource-surveys/indicators-conductivity