The Value of Citizen Volunteer Data

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Virginia Department of Environmental Quality
DEQ's Volunteer Program

- 1998 DEQ began to solicit citizen volunteer monitoring data
- In 2002, the Virginia General Assembly approved § 62.1-44.19:11
  - Solidified DEQ’s role as a leader of citizen water quality monitoring and technical assistance program
  - DEQ grant recipients must meet certain monitoring requirements
  - Limited how citizen data can be used by Virginia
- The agency developed a three level system to review and use submitted data
The Three Levels and Uses

- **Level 1** - No quality assurance or no WQ Standards
- **Level 2** - Some quality assurance and methods similar to DEQ
- **Level 3** - Follows same methods as DEQ

- Education, pollution red flags, baseline data
- All items above & prioritize areas for DEQ sampling, track improvement
- All items above & assess waters, list or delist waters from 303(d) list
Ways DEQ Does Not Use Citizen Data

• Submitted data is never used by DEQ for enforcement or similar “regulatory” actions
  • Codified in § 62.1-44.19:11

• Data is not assessed if collected from permitted mixing zones or discharge pipes

• Submitted data not used by itself to develop TMDL Implementation Plans
DEQ Citizen Monitoring Support

- 1.5 FTE staff to train and review citizen data
- Annual $88,000 in grants
  - Awards cover coordination, training and monitoring costs
  - Grants typically $1000 - $5,000
  - Data is submitted to DEQ and must meet QA requirements
- ~$2,000 in special grants for 319 (TMDL) based projects
Benefits of Citizen Monitoring to DEQ

- Increase water quality assessment
- Identify pollution “Hot Spots”
- TMDL and BMP performance monitoring
- High return of investment on agency funding and staff time
## Citizen Volunteer Assessment Mileage

<table>
<thead>
<tr>
<th>Assessment Cycle</th>
<th>Monitoring Year</th>
<th>Citizen Sites Submitted</th>
<th>Sample Events</th>
<th>Stream Miles</th>
<th>Estuary Mi²</th>
<th>Lake Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>2001-2006</td>
<td>1,175</td>
<td>15,605</td>
<td>2,372</td>
<td>73.7</td>
<td>9,726</td>
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<tr>
<td>2010</td>
<td>2003-2008</td>
<td>1,485</td>
<td>23,420</td>
<td>3,499</td>
<td>37.5</td>
<td>30,053</td>
</tr>
<tr>
<td>2012</td>
<td>2005-2010</td>
<td>1,774</td>
<td>30,829</td>
<td>4,124</td>
<td>40.2</td>
<td>27,975</td>
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<tr>
<td>2014</td>
<td>2007-2012</td>
<td>1,645</td>
<td>31,871</td>
<td>3,560</td>
<td>34.5</td>
<td>24,860</td>
</tr>
<tr>
<td>2016</td>
<td>2009-2014</td>
<td>1,902</td>
<td>32,859</td>
<td>3,767</td>
<td>89.3</td>
<td>15,478</td>
</tr>
<tr>
<td>2018</td>
<td>2011-2016</td>
<td>1,958</td>
<td>33,133</td>
<td>3,655</td>
<td>41.6</td>
<td>29,891</td>
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</tbody>
</table>
Map of Sample Sites

- Citizen Monitoring Station
- Non-Agency Station
Identify TMDL “Hot Spots”

- Data from Friends of Middle River
- Heavy agriculture watershed
- 3 year E. coli survey using Coliscan Easygel (Level II data)

- <25% violation rate
- 25 to 50%
- 50 to 75%
- >75%
Gauge BMP Effectiveness

**MR4A**
- **Stream Name**: Middle River
- **Descriptive Location**: On private property upstream of bridge on Cattlemans Rd, Rt 876
- **Latitude**: 38.1529831
- **Longitude**: -79.2128408
- **% Violation**: 66.71%
- **% Violation No Rain**: 63.16%
- **% Violation With Rain**: 69.75%

**MR4B**
- **Stream Name**: Middle River
- **Descriptive Location**: On private property downstream of bridge on Cattlemans Rd, Rt 876
- **Latitude**: 38.153
- **Longitude**: -79.199
- **% Violation**: 8.33%
- **% Violation No Rain**: 0.00%
- **% Violation With Rain**: 16.87%
The Monetary Value of Citizen Data

- **2012**: Survey of groups to estimate monitoring costs
  - High level survey with limited detail in cost breakdown
  - Results suggested at least $750,000 in volunteer costs
- **Fall 2018**: Targeted survey to get more details from volunteers and coordinators
  - Received 227 responses from 60 monitoring groups
  - Representing 1,293 volunteers sampling at 867 sites
Monitoring Budget

<table>
<thead>
<tr>
<th>Yearly Budget</th>
<th>Groups</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $1,000 (assume $500)</td>
<td>12</td>
<td>40.00%</td>
</tr>
<tr>
<td>$1,000 - $5,000 ($3,000)</td>
<td>10</td>
<td>33.33%</td>
</tr>
<tr>
<td>$5,000 - $20,000 ($12,500)</td>
<td>4</td>
<td>13.33%</td>
</tr>
<tr>
<td>$20,000 - $50,000 ($35,000)</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>$50,000 - $100,000 ($75000)</td>
<td>3</td>
<td>10.00%</td>
</tr>
<tr>
<td>$100,000 - $500,000 ($300,000)</td>
<td>1</td>
<td>3.33%</td>
</tr>
<tr>
<td>Estimated Monitoring Budget</td>
<td></td>
<td><strong>$611,000</strong></td>
</tr>
</tbody>
</table>

- Majority of responding groups (18 of 30) indicated 50% or more of their budget is due to grants
Paid Staff Costs

- Paid staff used by some groups for coordinating volunteers or in highly technical (e.g. laboratory) tasks
  - 39 paid staff reported in survey
  - Average 43.6 hours/month in volunteer activities
  - Average pay $21.54/hour
  - Yearly total $439,159
Volunteer Expenses

- 454,619 miles were driven by volunteers in 2018
  - $63,647 in mileage costs assuming $0.14/mile
- Average $89.44 per volunteer in annual expenses
  - $115,646 in estimated annual out of pocket expenses
## Value of Volunteer Time

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average hours worked per month by volunteers</td>
<td>5.28</td>
</tr>
<tr>
<td>Total volunteers represented in survey</td>
<td>1,293</td>
</tr>
<tr>
<td>Estimated hours worked per year</td>
<td>81,924.48</td>
</tr>
<tr>
<td>Volunteer in-kind hourly rate (2017 independentsector.org/)</td>
<td>$24.69</td>
</tr>
<tr>
<td>Estimated equivalent wage</td>
<td>$2,022,715</td>
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</table>
## Total Value

<table>
<thead>
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<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring Budget</td>
<td>$611,000</td>
</tr>
<tr>
<td>Paid Staff</td>
<td>$439,159</td>
</tr>
<tr>
<td>Mileage</td>
<td>$63,647</td>
</tr>
<tr>
<td>Out of Pocket Expenses</td>
<td>$115,646</td>
</tr>
<tr>
<td>Volunteer Time (In-Kind)</td>
<td>$2,022,715</td>
</tr>
<tr>
<td><strong>Total Value</strong></td>
<td><strong>$3,252,167</strong></td>
</tr>
</tbody>
</table>

- Average monthly cost per volunteer station $312.59
- $118.71 not factoring in volunteer time
Questions

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Report available at: