WELCOME!
Monthly EnviroDIY in the DRB User Group Meeting

Online, Thursday April 21, 2022, 2:30-3:30p
*Meeting is being recorded

*Mute unless asking question
These Monthly Meetings

Recordings available at: https://wikiwatershed.org/drwi/
These Monthly Meetings

- Every third Thursday of the month
- 2:30-3:30p
- Zoom link will remain the same: https://us02web.zoom.us/j/81881801310?pwd=eUFmbXZLbmRibVcxa1dtNVhzRmNvZz09
- Reminder email one week prior to each month’s meeting
  - All are welcome, please share
  - And let us know if others should be added
Attendees include:
- Groups working in Delaware River Watershed Initiative (DRWI)
- Groups working in Delaware River Basin (DRB) but not DRWI
- Folks from outside the DRB

Stroud Center support via DRWI and C-SAW
Delaware River Watershed Initiative (DRWI)

https://4states1source.org/

Working across four states to protect one shared source of clean water
C-SAW

https://www.c-saw.info/
Goals for these monthly meetings

- Time to check-in, ask questions, report issues, network, etc.

- **Updates** from the Stroud Center

- **Presentations**
  - **Station Owner/Manager Presentations** – communicate about individual situations, local watershed work
  - **Focus Topic Presentations** – guest presenters talk about technical/ecological/other focus topics

*All of this to support gathering good data and using it purposefully*
Stroud Center project personnel

Stroud Center Facilitators:

David Bressler          Rachel Johnson       Christa Reeves        Shannon Hicks

Project facilitator     Research Engineer Technician     Northern DRB technician and organization collaborator     Research Engineer, Mayfly and EnviroDIY Inventor/Designer
Master Watershed Steward Facilitators:

Carol Armstrong     George Seeds
Stroud Center project personnel

Stroud Center DRWI Leads:

Dr. John Jackson  
Senior Research Scientist

Matt Ehrhart  
Director of Watershed Restoration

Dr. David Arscott  
Executive Director, President Research Scientist
Primary Goal
- Support Station owners, managers, and volunteers
- Use stations for local purposes

Secondary Goal
- Analyze basin-wide data set
- Develop tools to characterize and contextualize watersheds
Today’s Agenda

1. Introduction
2. Stroud Updates
3. Presentations:
   • Winter storm chloride/conductivity rating curves
   • Analysis of DRB continuous data – Diana Oviedo-Vargas, Stroud Water Research Center
4. Discussion
5. Conclusion
● EnviroDIY manual has been updated and has a new searchable format
Stroud Center Updates

https://www.envirodiy.org/knowledge-base/
Stroud Center Updates

- New model of the Hydros 21 CTD sensor by Meter Group is now available

HYDROS 21
Conductivity, Temperature, Depth Sensor
Stroud Center Updates

- Mayfly v1.1 now available on EnviroDIY.org shop and on Amazon
- EnviroDIY cell board now available on EnviroDIY.org shop and on Amazon
Stroud Center Updates

- Reminder to request assistance via the EnviroDIY Service Request Form
  - [https://wikiwatershed.org/drwi/](https://wikiwatershed.org/drwi/)
Stroud Center Updates

- Reminder on resources available at https://wikiwatershed.org/drwi/
- https://wikiwatershed.org

General Resources
- EnviroDIY Field Visit Data
- EnviroDIY Monitoring Station Help Resources
- Salt Monitoring Resources
- Data and Data Visualization Resources
- Volunteer Management Guidance Materials
- WikiWatershed Toolkit
- Project Updates

Meetings, Workshops, and Conferences
- Monthly EnviroDIY:DRWi User Group Meetings
- User Support Workshops and Trainings
- Conference Presentations
- Watershed Ecology Workshops

EnviroDIY Field Visit Data
EnviroDIY Field Visit Data Form (Online)
Any questions before we move on?
Monthly Presentations

- Winter storm chloride/conductivity rating curves
- Analysis of continuous data from across the DRB – Diana Oviedo-Vargas, PhD
Winter storm salt in urban DRB streams

- Selected urban streams targeted for winter storm salt data collection by numerous watershed groups

Grab sample, chloride measurement, and conductivity measurement

Samples being processed but some chloride test strip data currently available – this what we’ll look at today
Winter Storm Grab Sampling and Chloride Test Strip Measurements at EnviroDIY stations

- During spikes, collect grab samples AND use chloride strips.
- During baseflow and dilution, only use chloride strips, no grab samples.
Samples/measurements

- Sample over single and/or multiple events

[Graph showing electrical conductivity measurements over time with notable spikes]

https://monitormywatershed.org/sites/BCGC1S/
### Results – data sheets, conductivity and Cl test strips

**Example:**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
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<tbody>
<tr>
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<tr>
<td><strong>Conductivity</strong></td>
<td><strong>Chloride</strong></td>
<td><strong>Conductivity method, e.g., continuous data station or handheld meter</strong></td>
<td><strong>Chloride method, e.g., Cl test strips</strong></td>
<td><strong>Date</strong></td>
<td><strong>Time</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Time</td>
<td>Conductivity (μS/cm)</td>
<td>Date</td>
<td>Time</td>
<td>Chloride (mg/l)</td>
<td>Cont. data station</td>
<td>Test strips, low range</td>
<td>Date</td>
<td>Time</td>
<td>Grab Sample</td>
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<td>629.2</td>
<td>12/23/2021</td>
<td>10:00 AM EST</td>
<td>129</td>
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<td>NA-Baseline measurement</td>
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<td></td>
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<tr>
<td>1/2/2022</td>
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<td>333.3</td>
<td>1/2/2022</td>
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<td>NA-Dilution event</td>
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<td>1/7/2022</td>
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<td>2103513</td>
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</table>
Results – conductivity and Cl test strips

Taylor Run, chloride vs conductivity

\[ y = 0.3163x - 52.101 \]

\[ R^2 = 0.9931 \]
Blackhorse Run, chloride vs conductivity

\[ y = 0.3586x - 72.486 \]

\[ R^2 = 0.998 \]
UT to Plum Run, Gordon Natural Area, chloride vs conductivity (high Cl value hit max possible value for test strip - value likely higher)

\[ y = 0.1715x + 500.35 \]

\[ R^2 = 0.9731 \]

*Max Cl strip value ~6000 mg/l

UT to Plum Run, Gordon Natural Area, chloride vs conductivity (high Cl value predicted based on lower five)

\[ y = 0.3519x - 81.818 \]

\[ R^2 = 1 \]
Results – conductivity and Cl test strips

Goose Ck, chloride vs conductivity

\[ y = 0.4275x - 232.9 \]

\[ R^2 = 0.9988 \]
Results – conductivity and Cl test strips

Plum Run at New St, chloride vs conductivity

\[ y = 0.3734x - 289.35 \]

\[ R^2 = 0.9495 \]
Results – conductivity and Cl test strips

- Conductivity and Cl test strips

\[ y = 0.2624x + 92.331 \]

\[ R^2 = 1 \]

Rocky Run (upper), First State NHP, chloride vs conductivity
Results – conductivity and Cl test strips

Hurricane Run, chloride vs conductivity

\[ y = 0.203x + 160.27 \]

\[ R^2 = 1 \]
Results – conductivity and Cl test strips

\[
y = 0.2894x - 23.655
\]

\[R^2 = 0.9983\]
Results – conductivity and Cl test strips

Paulins Kill at Memory Park, chloride vs conductivity

\[ y = 0.3644x - 151.48 \]

\[ R^2 = 0.9995 \]
Paulins Kill at Sussex CCC, chloride vs conductivity

$y = 0.2514x - 13.533$

$R^2 = 0.9792$
Results – conductivity and Cl test strips

Pennypack Ck, chloride vs conductivity

\[ y = 0.3378x - 104.64 \]

\[ R^2 = 0.9611 \]
Results – conductivity and Cl test strips

Shoemaker Run at Abington Club, chloride vs conductivity

\[ y = 0.359x - 656.97 \]

\[ R^2 = 0.9747 \]

Chloride (mg/l) vs Conductivity (uS/cm) graph
Results – conductivity and Cl test strips

Pickering Ck at Montgomery School, chloride vs conductivity

\[ y = 0.3381x - 45.227 \]

\[ R^2 = 0.9815 \]
Results – conductivity and Cl test strips

Pickering Ck at Phoenixville YMCA, chloride vs conductivity

\[ y = 0.1839x - 7.7906 \]

\[ R^2 = 0.7374 \]
- A multifactor index to describe water quality using continuous data in the DRB – Diana Oviedo-Vargas, PhD, Stroud Water Research Center
Future meetings

- May 19, 2022 – water temperature??
Mentors currently available

- Carol Armstrong (MWS), mnem.np@gmail.com, 610-659-7477
- George Seeds (MWS), geoseeds@verizon.net, 484-886-9586
- Rachel Johnson (Stroud Center), rjohnson@stroudcenter.org, 973-557-8995
- Christa Reeves (Stroud Center)(in the north, situational), christa@musconetcong.org, 727-520-5849

*Anyone else interested? If so get in touch with Stroud Center or Carol or George
Next month’s meeting will be on:

Thursday May 19, 2021
2:30-3:30p
Onward!

Stroud Water Research Center, EnviroDIY-DRWI contacts:
- David Bressler, dbressler@stroudcenter.org, 410-456-1071
- Shannon Hicks, shicks@stroudcenter.org, 610-268-2153 x267
- Rachel Johnson, rjohnson@stroudcenter.org, 973-557-8995
- Christa Reeves, christa@musconetcong.org, 908-537-7060

Master Watershed Stewards, EnviroDIY-DRWI contacts:
- Carol Armstrong, mnem.np@gmail.com, 610-659-7477
- George Seeds, geoseeds@verizon.net, 484-886-9586