MEETING AGENDA: April 12, 2021 1:30-3:30 PM

Join Zoom Meeting

https://ulstercountyny.zoom.us/j/6194032596?pwd=UkJWK0JEK3ZyNURJcmR6UWxrU2l6UT09 Meeting ID: 619 403 2596 Passcode: 077279 Call in- 646-558-8656

The April 12th meeting is a **partner** meeting of the UCWQCC, meaning it is open to members of the UCWQCC and local community partners interested and engaged on this topic. More documents available at: <u>https://ulstercountyny.gov/environment/ulster-county-water-quality-coordinating-committee</u> OR at the google group site ulster-wqcc@googlegroups.com

Agenda

1. Opening, Review of Agenda, Review of notes from February 2021 meetings

2. **Presentation-** Ulster County USGS Gage Network and Data Collection by Guy Foster, Water Quality Networks & Research, Section Chief, US Geologic Survey (USGS)

- 3. Old Business
 - a. List Serve/Google Group ulster-wqcc@googlegroups.com
 - b. Ulster County Stormwater Management Plan (UCSWMP) plan for updates.
 - c. Lower Esopus releases from the Ashokan Reservoir, DEIS technical review
- 4. New Business
- 5. WQCC member updates (e.g. update to group on projects of mutual interest)
- 6. Adjourn

2021 Meeting Schedule

Member Meetings: 2/8, 6/14, 10/18

Partner Meetings: 4/12; 8/9, 12/13

Link to recording: <u>https://drive.google.com/file/d/1YVdLYePsT8BhzvtlVeukGUdyYW0Ou8iZ/view</u> <u>?usp=sharing</u>

Minutes

Attendees: Amanda Lavalle, Guy Foster, Ken Panza, Bill Wegner, Chana Friedenberg, Emily Vail, Grant Jiang, Jared Buono, Mary MacNamara, Max Resnick, Neil Bettez, Robert Ferri, Paul Malmrose, Tim Rose, Adam Doan, Sebastian Pillitteri, Tom Niekrewitz, Scott Cuppett, Andrew Faust, Emilie Hauser, Ben Ganon

2. Presentation Notes-

USGS- Ulster County has 18 surface water Gages, 2 ground water wells

6 Temperature sensors, 4 Specific Conductivity, 11 Turbidity. Many gages are related to sediment monitoring and turbidity. Turbidity sensors are optical, qualitatively measuring clarity. USGS analyzes SSC, not TSS. To calculate sediment load curves USGS performs a particle size analysis looking at fine/sand break, and loss on ignition studies to filter out organics.

Presentation Questions:

-What is the difference between TSS and SSC?

TSS takes aliquot out of sample, SSC uses full sample. The main difference is SSC is more likely to contain data on heavier particles that may not be present in TSS.

When deriving sediment rating curves, the process is filter>dry>burn.

-What information was derived from bathymetry work in Ashokan? This was a onetime survey, but no analysis was done on sedimentation rates.

- -A lot of people are interested in gages- what does it take to add/maintain a stream gage? For USGS to add one, it requires talking with USGS and creating an agreement, some locations are easier than others. Typically, it takes about a year to calculate curves. Cost for partner: less than 20k for stage and discharge (cost varies based on location and matching funds, and types of sensors). USGS is increasing its footprint (offices) to help increase regional resources.
- -Gage on Wallkill in Gardiner is used in NWS Flood predictions, how can they update this model? NWS uses USGS gages to predict flood stage but NWS is independent and doesn't work with USGS on modeling.

-HABs- Are there any sites in Ulster county tracking WQ (phosphate etc)?

USGS is not, primarily in Ulster County USGS is studying turbidity. Dissolved oxygen and pH would be good/low cost indicators. DO will show swings and increases at night, PH would increase. Fluorescent probes would be more expensive (chlorophyll etc) More useful and cost effective would be to install a camera at a site creating a timelapse (game camera)

-Is there a USGS view to look at statewide per parameter?

Here is the <u>link to our new mapper</u>. On the right hand side, expand the "USGS Stations" link to get at all the data types. There are a lot of basemap and overlay options.

-How effective is modeling in measuring sediment transport and sediment settling rates from data collected/measured at gages?

Modeling is very effective at modeling transport, fines (silts and clays) in our area

-A lot of anecdotal sediment is settling- Can you model settling in the bays and slower areas in the lower Esopus?

Can't quantify settling through turbidity probes alone (only 2 on lower Esopus). Modeling would have to be done based on settling rates. One could look at sediment load from Lomontville and Mt Marion, but typically fines stay suspended for a very long time. Settling rates would be of interest to this group.

3. Old Business

a. List Serve/Google Group <u>ulster-wqcc@googlegroups.com</u>

This could be very useful for members and partners but needs guidelines to be concise. Perhaps surveying the group could be helpful.

b. Ulster County Stormwater Management Plan (UCSWMP) plan for updates.

There is interest in forming a County storm water coalition through intermunicipal agreement. To follow up with a call with Saugerties, Town of New Paltz (Niel) Rob Ferri, Chana Friedenberg (HVRC), Ulster County. Explore funding opportunities.

c. Lower Esopus releases from the Ashokan Reservoir, DEIS technical review

High turbid releases impact the lower Esopus and the Hudson River. DEIS comments fall into three main buckets. 1. Alternatives analysis. 2. Impacts to lower Esopus. 3. Potential impacts to the Hudson River and Hudson 7 water supply. The goal of comments is to ensure clean water releases to the lower Esopus

There is a technical group that will make comments, other groups will also make comments. Can share draft comment document with partners to ensure comments from different organizations are compatible.

4. New Business

5. WQCC member updates (e.g. update to group on projects of mutual interest)

Andrew Faust (Rondout Creek Watershed Alliance) RCWA completed brochure, available on website Working on basic watershed awareness/literacy for the public. Also looking at stream buffers and

agroforestry through a proposed planting on the lower Esopus with Ulster County. <u>https://rondoutcreekwatershedalliance.org/download-our-brochure/</u>

Rob Ferri (WRWA) Would be interested in assisting municipalities and the County with MS4. WRWAsymposium in May, working on grant to sponsor boat launches.

Neil Bettez (NP supervisor) Used to be watershed bio-geo-chemist. Stormwater management should be watershed or county based and he'd be happy to help with exploring a county wide stormwater coalition.

Paul Malmrose- Hudson 7. Challenging Champlain power transmission lane under Hudson Estuary. This project would mean a hydro-jet trench passing 5 drinking water intakes which will stir up bed sediment/pollutants, thus impacting drinking water supply. Also just started working on lower Esopus-Significant increase in turbidity readings at intakes correlating with releases from Ashokan. This causes increased costs and use of chemicals. Would like to see Ulster County more involved in Hudson 7.

Jared Buono (UC-CCE) CCE is busy trying to get back to in person programming while still meeting needs online. A lot of recent time has been spent on DEIS and pump storage.

Adam Doan (UCSWCD) AWSMP has bids open for 2 stream restoration projects in upper Esopus. Working on project on Tongore Brook to address farm run-off to lower Esopus. Also SWCD has a project going out to bid later on Stony Clove Creek. Gearing up for field season.

-What are your funding sources outside of DEP watershed- two sources: Part B State funding for SWCDs, and Part C grants

Maps of stream restoration work:

- 1. https://catskillstreams.org/
- 2. <u>https://www.arcgis.com/apps/MapSeries/index.html?appid=e243993d888d42e0818878ba3aec69e</u> <u>8</u>
- 3. https://ashokanstreams.org/

UC-SWCD averages about 1000-1500 linear restoration feet annually on larger projects. Current contract with DEP is a five-year agreement- 7.5 million for turbidity reduction improvements/projects. A lot of focus has been on the tributaries to Esopus for sediment reductions and these projects are based on the stream feature inventories (SFI) which assess stream reaches, erosion, geology and water quality data.

Grant Jiang (NYSDOH source water protection) Involved in drinking water source protection program. DWSP2 announcement will be soon.

Sebastian Pilliterri - Riverkeeper- Starting water sampling days (May to October) and will post data every few days to Riverkeeper website

Rondout/Wallkill	July 6
May 11	August 10
June 8	September 7

October 12

Esopus/Catskill May 13 June 10 July 8 August 12 September 9 October 14

Bill Wegner (Riverkeeper) Well underway on DEIS review

Emilie Hauser- EMC, Kingston CAC -Kingston CAC exploring law to ensure house septic is working correctly

Tom Neikrewicz- HREP, works on Hudson Estuary and Tribs, feel free to reach out. thomas.niekrewicz@dec.ny.gov

Tim Rose (UCDOH)- Looking into being more involved in Hudson 7

Chana Friedenberg (HVRC) - working with New Paltz on source water protection, have gotten framework and now working on protection strategies, then will put together an implementation timeline and stakeholders to oversee.

Mary MacNamara- Lower Esopus Watershed & Saugerties- Thank you to the County and Riverkeeper for all efforts. Lots of green business opportunities for water quality and alternative wastewater technologies being pursued.

Amanda - If WQIP opens for funding WQCC will try to get a presentation.

Open Grant Programs:

HREP grants are open https://www.dec.ny.gov/lands/5091.html

HRVG grants are open https://hudsongreenway.ny.gov/grants-funding





Ulster County USGS Gage Network and Data Collection

Guy M. Foster

Water Quality Networks and Research Section Chief New York Water Science Center

Ulster County Water Quality Coordinating Committee April 12, 2021

U.S. Department of the Interior U.S. Geological Survey

USGS

- Who we are: Created by an act of Congress in 1879, USGS has evolved over the decades matching its talent and knowledge to the progress of science and technology. USGS is the sole science agency for the Department of the Interior. It is sought out by thousands of partners and customers for its natural science expertise and its vast earth and biological data holdings.
- What we do: As the Nation's largest water, earth, and biological science and civilian mapping agency, USGS collects, monitors, analyzes, and provides science about natural resource conditions, issues, and problems. Our diverse expertise enables us to carry out large-scale, multidisciplinary investigations and provide impartial scientific information to resource managers, planners, and other customers.



USGS









Department of the Interior

Mission Areas

Wate

Core Science Systems Ecosystems Energy and Minerals Environmental Health Land Resources Natural Hazards

Regions

Region 1: North Atlantic-Appalachian

Region 2: South Atlantic-Gulf (Includes Puerto Rico and the U.S. Virgin Islands) Region 3: Great Lakes Region 4: Mississippi Basin Region 5: Missouri Basin Region 6: Arkansas-Rio Grande-Texas-Gulf Region 7: Upper Colorado Basin Region 8: Lower Colorado Basin Region 8: Lower Colorado Basin Region 9: Columbia-Pacific Northwest Region 10: California-Great Basin Region 11: Alaska Region 12: Pacific Islands

USGS Mission

We provide the science to:



Minimize loss of life and property as a result of water-related natural hazards, such as floods, droughts, and land movement.



Effectively manage groundwater and surface-water resources for domestic, agricultural, commercial, industrial, recreational, and ecological uses.



Protect and enhance water resources for human health, aquatic health, and environmental quality.



Contribute to the wise **physical and economic development** of resources for the benefit of present and future generations.





- Non-regulatory
- Uniquely funded through a combination of federal appropriations & stakeholder funding agreements









Streamgaging Network



https://dashboard.waterdata.usgs.gov/app/nwd/?region =lower48&aoi=default







Streamgaging Network – Ulster County

- 18 Surface Water Gages
- Water Quality
 - 6 Temp, 4 Specific Conductance, 11 Turbidity
 - Turbidity Gages Related to Sediment Monitoring
- 2 Groundwater Wells

Ulster County, I	New York
<u>0136219503</u>	ESOPUS CREEK BELOW LOST CLOVE RD AT BIG INDIAN NY
<u>013621955</u>	BIRCH CREEK AT BIG INDIAN NY
<u>01362200</u>	ESOPUS CREEK AT ALLABEN NY
<u>01362230</u>	DIVERSION FROM SCHOHARIE RESERVOIR NY
<u>0136230002</u>	WOODLAND CREEK ABOVE MOUTH AT PHOENICIA NY
01362357	WARNER CREEK NEAR CHICHESTER NY
01362368	2~OX CLOVE NEAR MOUTH AT CHICHESTER NY
<u>01362370</u>	STONY CLOVE CREEK BLW OX CLOVE AT CHICHESTER NY
01362487	BEAVER KILL AT MOUNT TREMPER NY
01362497	LITTLE BEAVER KILL AT BEECHFORD NEAR MT TREMPER NY
<u>01362500</u>	ESOPUS CREEK AT COLDBROOK NY
	[backup from orifice]
<u>01363382</u>	BUSH KILL BLW MALTBY HOLLOW BK AT WEST SHOKAN NY
<u>01363556</u>	ESOPUS CREEK NEAR LOMONTVILLE NY
	[GOES Data Feed]
	[Modem Data Feed]
01363999	2~DUMMY 29 - ASHOKAN - waste channel + waste spill
	[EAST basin]
	[WEST basin]
<u>01364500</u>	ESOPUS CREEK AT MOUNT MARION NY
01366999	2~DUMMY 30 - RONDOUT - spillway + blowoff
<u>01367500</u>	RONDOUT CREEK AT ROSENDALE NY
	[GOES Data Feed]
	[Modem Data Feed]
<u>01371500</u>	WALLKILL RIVER AT GARDINER NY
	[GOES Data Feed]
	[Modem Data Feed]
<u>0143400680</u>	E BR NEVERSINK R NORTHEAST OF DENNING NY
01434017	EAST BRANCH NEVERSINK RIVER NEAR CLARYVILLE NY
<u>01434021</u>	W BR NEVERSINK R AT WINNISOOK L NR FROST VALLEY NY
<u>01434025</u>	BISCUIT BK ABOVE PIGEON BK AT FROST VALLEY NY
	[AT500 Data Feed]
	[Backup Data Feed]
414728074154301	2~U1691

https://waterdata.usgs.gov/nwis/



Streamgaging Network









Monitoring location 01363556 is associated with a STREAM in ULSTER COUNTY, NEW YORK. Current conditions of DISCHARGE, GAGE HEIGHT, and TURBIDITY are available. Water data back to 2013 are available online.

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What does it mean if a site is offline?

- Sites are prone to a multitude of potential breakdowns – physical, electronic, etc.
- Each site has an assigned USGS staff member who is responsible for its maintenance and record.





Water Quality

Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Station Operation, Record Computation, and Data Reporting



Like Streamflow, **Nationally Consistent Data Based on Peer Reviewed** and **Published Methods** Wide Range of **Parameters Collected Routinely**



Turbidity

- Turbidity is a qualitative measure of the optical clarity of water and is an indicator of the environmental health of water bodies.
- Different makes and models of sensors are not directly comparable.
- Different calibration standards labeled as the same value can produce different results on the same make and model turbidity sensors.

Foster and others, 2021, Technical Note – Relative Variability of Selected Turbidity Standards and Sensors in Use by the U.S. Geological Survey, *in press*.









What's that hydrograph doing?!?

- Parameters like turbidity are not always "steady."
- Sometimes anti-fouling measures fail.





Suspended-sediment sampling



Figure 36. Equal-width-increment sampling technique



Figure 37. Equal-width-increment vertical transit rate relative to sample volume, which is proporti water discharge at each vertical.





Techniques of Water-Resources Investigations of the U.S. Geological Survey

Book 3, Applications of Hydraulics

Chapter C2

Field Methods for Measurement of Fluvial Sediment

By Thomas K. Edwards and G. Douglas Glysson

https://pubs.usgs.gov/twri/twri3-c2/pdf/TWRI_3-C2.pdf

This manual is a revision of "Field Methods for Measurement of Fluvial Sediment," by Harold P. Guy and Vernon W. Norman, U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter C2, published in 1970.

Suspended-sediment analysis

- Suspended Sediment Concentration (SSC)
- Sand/Fine Break
- Full Grain Size Analysis
- Volatile-On-Ignition



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• Suspended Sediment Concentration The concentration of samples collected from streams is determined and the results reported in mg/L. Filtration is the preferred analysis removing all dissolved solids during the analysis.



https://pubs.usgs.gov/twri/twri5c1/

Bringing it all together

Lomontville Turbidity-SSC Model

Mount Marion Turbidity-SSC Model



All data (167 samples) from November 2013 to May 2020. SSC samples ranged from 2 mg/L to 389 mg/L; in contrast the turbidity ranged from <1 FNU to > 1,600 FNU.

All data (198 samples) from November 2013 to May 2020. SSC samples ranged 1 mg/L to 1,970 mg/L; turbidity ranged from 1 FNU to 1,350 FNU.

Guidelines and Procedures for Computing Time-Series Suspended-Sediment Concentrations and Loads from In-Stream Turbidity-Sensor and Streamflow Data



Techniques and Methods 3-C4 https://pubs.usgs.gov/tm/tm3c4/pdf/TM3C4.pdf

Preliminary Information-Subject to Revision. Not for Citation or Distribution.

Ashokan Reservoir Bathymetry

Prepared in cooperation with the New York City Department of Environmental Protection

Bathymetry of Ashokan, Cannonsville, Neversink, Pepacton, Rondout, and Schoharie Reservoirs, New, York, 2013–15





Nystrom, E.A., 2018, Bathymetry of Ashokan, Cannonsville, Neversink, Pepacton, Rondout, and Schoharie Reservoirs, New York, 2013–15 (ver. 1.2, November 2018): U.S. Geological Survey Scientific Investigations Report 2017–5064, 29 p., https://doi.org/10.3133/sir20175064.

Questions?





gfoster@usgs.gov 785-393-7746 https://www.usgs.gov/centers/ny-water

Turbidity: FNU vs NTU

Formazin Nephelometric Unit (FNU)

 Measured with an infrared light source according to the ISO 7027 method.

Nephelometric Turbidity Unit (NTU)

 Measured with a white light according to EPA method 180.1.

In general:

 Both (FNU and NTU methods) measure scattered light at 90 degrees from the incident light beam.





