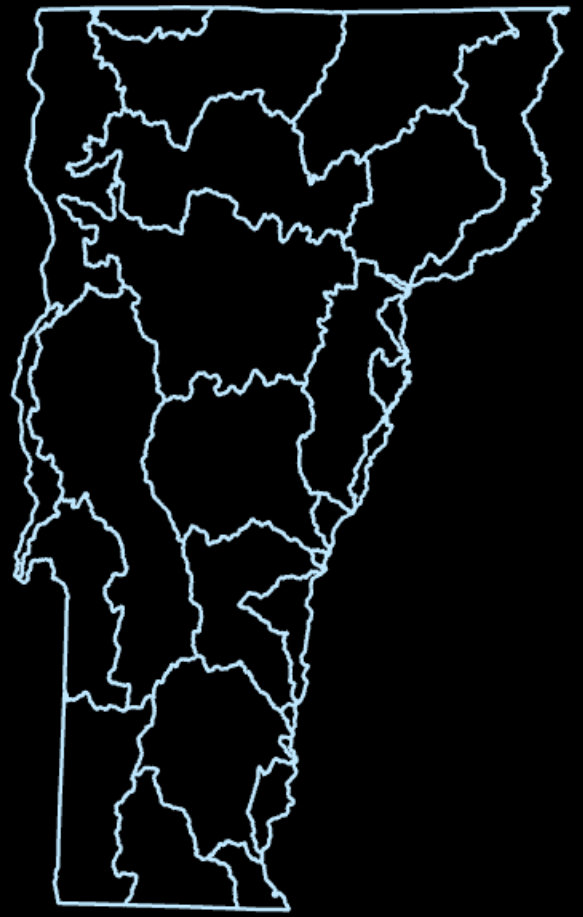
ANNUAL PARTNER TRAINING 2023

LAROSA PARTNERSHIP PROGRAM

VERMONT

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
MONITORING & ASSESSMENT PROGRAM



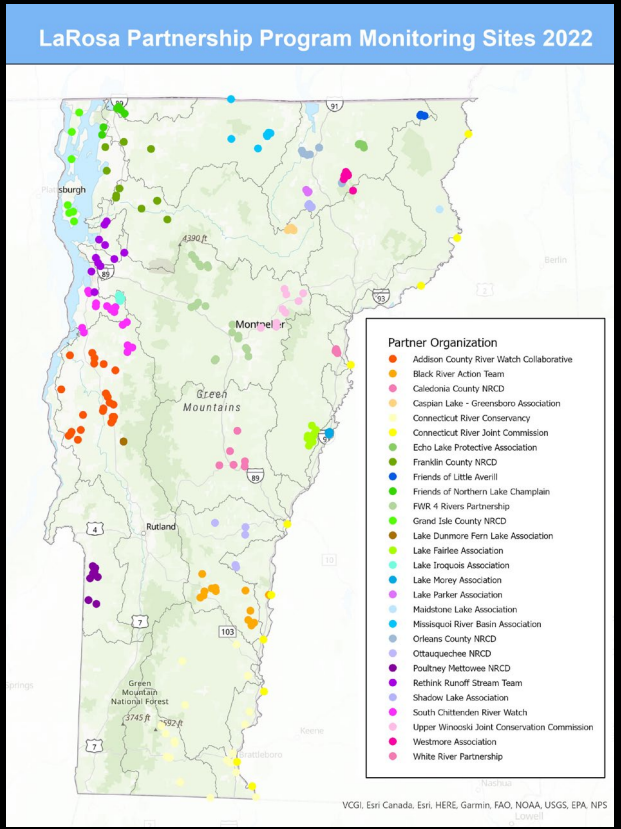
AGENDA

9:00 – 9:10	Welcome & Introductions
9:10 – 9:30	LPP Communications & Updates
9:30 – 9:45	LPP Sample Plan Overview
9:45 – 10:15	Sampling Procedures
10:15 – 10:25	Break
10:25 – 10:55	Flow Observations & Survey123
10:55 – 11:05	Sample Storage & Preservation
11:05 – 11:10	Safety in the Field
11:10 – 11:15	Break
11:15 – 11:30	Accessing Data & Power BI
11:30 – 12:00	Questions/Discussion

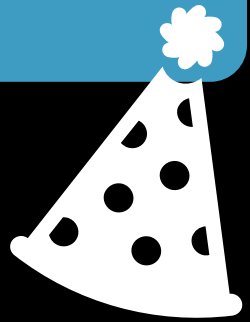
INTRODUCTIONS

In the chat:

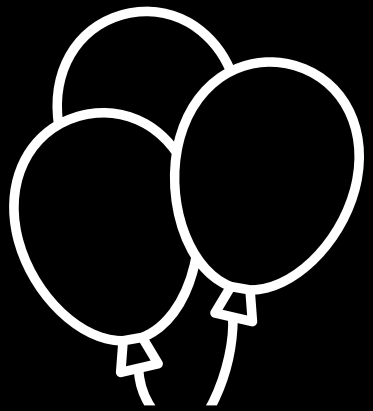
- Name
- Organization
- Watershed or water body



Program Updates & Feedback



LPP's 20th anniversary!



Program Updates & Feedback

20th anniversary facts:

- 53 total partners:
- ACRWC, CRC since ‘03, MRBA, SCRW, PMNRCD since ‘04/’05
- BRAT, FWR, LIA, ORG, OttNRCD, OrNRCD, RRST, WRP over a decade
- 16 new partners in last 3 years
- 113,581 samples collected
- 1,585 sampling sites
- ~550 water bodies monitored in every major watershed in VT

Program Updates & Feedback

- Thinking of doing some social media posts – will ask for your help!
- Would love to spotlight your data/projects conducted through LPP

Program Updates & Feedback

- Site preapproval process – feedback?
- LPP communication/resources – what is the best way to share LPP information & updates, and which resources are the most useful?

https://dec.vermont.gov/watershed/map/monitor/larosa

PROGRAM ANNOUNCEMENTS

- Interactive map of all 2022 LPP water quality monitoring sites
- Interested in participating in LPP? Check out our FAQ Document for some general information about our program.
- For a detailed description of LPP sampling procedures, flow observations, and quality assurance, please review the 2022 LPP Partner Guide.
- To review any incoming 2022 flow data, please view the LPP Flow Data dashboard.
- View LPP's new visual presentation of historic water chemistry data, flow observations, and land use using Power BI.

GET INVOLVED

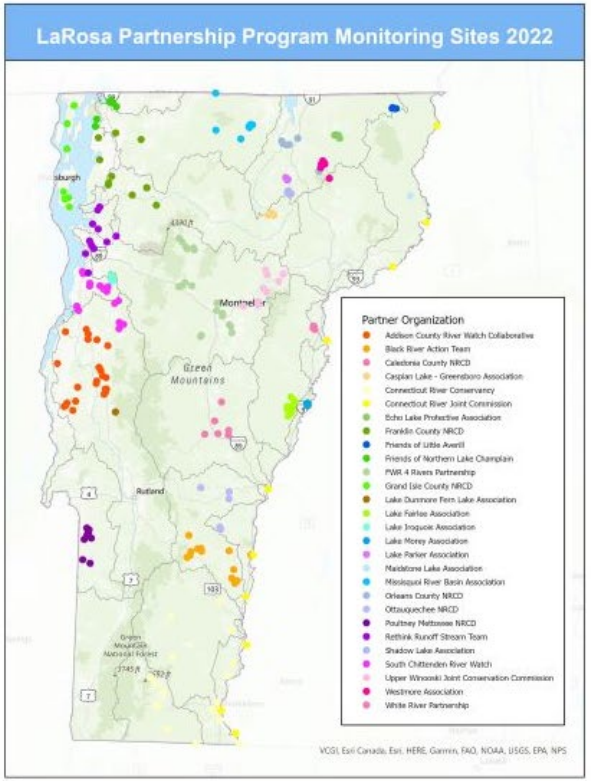
PROGRAM MODEL

TRAINING & EDUCATION

DATA & REPORTS

NEWSLETTERS

VAEL



Poll

Which LPP resources do you find helpful/useful?

Poll

Which LPP resources do you find helpful/useful?

menti.com
8879 5657

Program Updates & Feedback

- WWTF sampling
- Site visits
- No separate high flow sample events – 8 total sampling events **including** 2 high flow (replaces base flow sample for that sample period)
- No lab TP duplicate samples

Sample Plan

- **Eight total biweekly samples**, one sample event per biweekly sample period
- Typically sample on the same day each sample period (groups with multiple teams of volunteers may sample on multiple days)
- Collect first sample after **April 17th**
- Collect last sample before **August 8th/10th**

HIGH FLOW

- Goal to capture the range of nutrient and Cl concentrations impacting the stream under different flow conditions
- Aim for two targeted high flow samples; can collect any day during any biweekly sample period throughout season
- Replaces regularly scheduled sample event – only collect one sample per sample period
- Do your best – we understand this may be difficult to coordinate

When do I collect high flow samples?

- Will likely need to adjust sample day (if possible)
- Typically need about **0.5 to 1 inch of rain**
- Sample during peak flow toward end of rain event
- High flow events more common during spring – don't wait until end of sampling season
- If in doubt, sample during any predicted rain event, you can try again if flows aren't high enough

Reminders

If high flows occur during your regularly scheduled biweekly sampling, it **counts as one of your 8 biweekly samples AND as one of the two high flow samples**.

If rain is predicted outside of your regularly scheduled sample day, do your best to adjust your sampling schedule to capture the high flow event. **It replaces your regular sampling event.**

Reminders

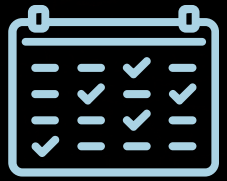
If you already collected samples for a sampling period and a rain event occurs, **no need to collect more samples that sample period.**

Collect all samples even if only some experience high flows – don't skip samples

Safety is a number 1 priority! **Do not sample if dangerous**

ANY QUESTIONS?

SAMPLING SCHEDULE



Dates	Event
Week of April 10th	LPP staff deliver supplies to partners
Monday, April 17th	Sampling season begins
Week of May 1st – Week of August 7th	Biweekly sample pickups: ❖ Tuesday, May 2nd and Thursday, May 4th ❖ Tuesday, May 16th and Thursday, May 18th ❖ Tuesday, May 30th and Thursday, June 1st ❖ Tuesday, June 13th and Thursday, June 15th ❖ Tuesday, June 27th and Thursday, June 29th ❖ Tuesday, July 11th and Thursday, July 13th ❖ Tuesday, July 25th and Thursday, July 27th ❖ Tuesday, August 8th and Thursday, August 10th

SAMPLE PICK UP ROUTES

TUESDAYS - North

St. Alban's (FCNRCD, FNLC)

East Berkshire (MRBA)

Newport (ELPA)

Norton (Little Averill, CRJC)

Location TBD (Maidstone)

Westmore (Willoughby)

West Glover/Glover (Orleans County NRCD, Parker, Shadow, Caspian)

St Johnsbury (CNRCD, CRJC)

Woodsville (Halls?, CRJC)

THURSDAYS - South

Salisbury (Dunmore)

Poultney (PMNRCD)

Bennington (HooRWA, Big Pond?)

Brattleboro (CRC, CRJC)

Springfield (BRAT, CJRC)

VINS (Ottauquechee NRCD)

SAMPLE PICK UP ALTERNATIVES

VAEL DROP OFF/OTHER/TBD

Addison County River Watch - Heather

South Chittenden River Watch - Heather

Fairlee/Morey - TBD

Friends of the Winooski River - TBD

Upper Winooski Joint CC - TBD

Rethink Runoff - TBD

Grand Isle County NRCD - Kelsey

White River Partnership – VAEL

PICK UP WITH LAY MONITORING?

Caspian

Dunmore

Fairlee

Little Averill

Morey

Parker

Maidstone

Shadow

Willoughby

ANY QUESTIONS?

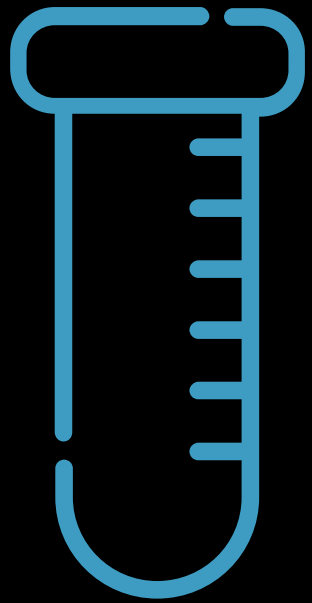
QAQC

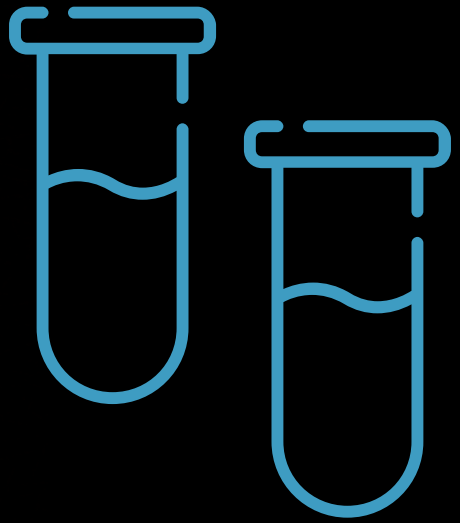
- Field Duplicates
- Site Visits

FIELD BLANKS

Same as last year, not doing regular field blanks

- Sample filled with deionized water using same sampling protocol
- Will collect blanks during site visits
- Tests for contamination



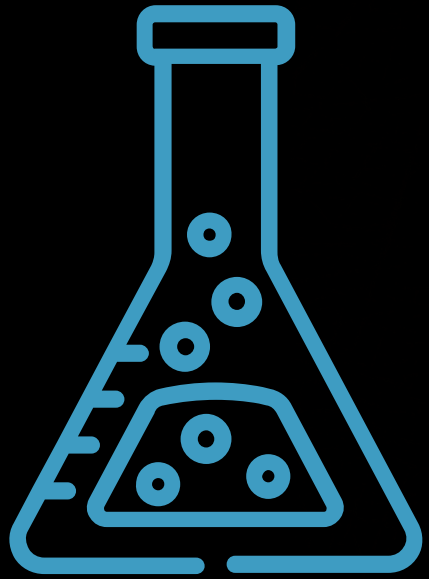


FIELD DUPLICATES

- Used to identify issues with sample collection, including contamination
- For all parameters: TP, TN, and Cl
- 10% of total number of samples collected throughout season
- Sample immediately after regular samples using the same sampling procedure
- Labeled with "-D-" and highlighted on field sheets

LABORATORY DUPLICATES

- Used to determine laboratory precision of results
- **Not doing this year**



SITE VISITS

LPP staff will meet with as many partners as possible to:

- Review sampling protocol, field sheet data recording, flow observations, and sample preservation
- Get to know partners and their sites
- Provide or receive any assistance or feedback if needed
- Take additional samples to provide additional data or quality assurance

Wastewater Treatment Facility Sampling

- Characterizes upstream conditions of wastewater discharge receiving waters
- Used to calculate (along with effluent data) downstream conditions
- Determines if WWTF is meeting water quality standards
- **Very useful for informed WWTF permitting**
- Will collect additional parameters during site visits

ANY QUESTIONS?

FIELD SAMPLING

Partner Guide
Sampling Procedures
Duplicates
Flow Observations

SAMPLING KITS

BOTTLES & PRE-PRINTED LABELS

SAMPLE RACKS

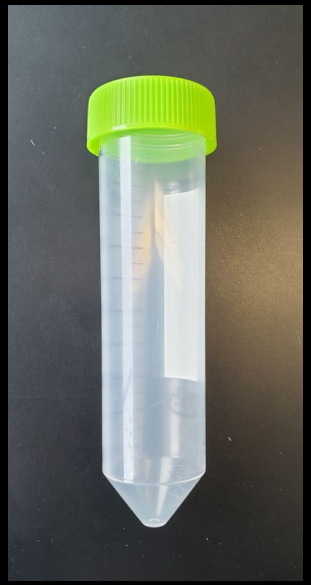
VAEL FIELD SHEETS

TN ACIDIFICATION KITS

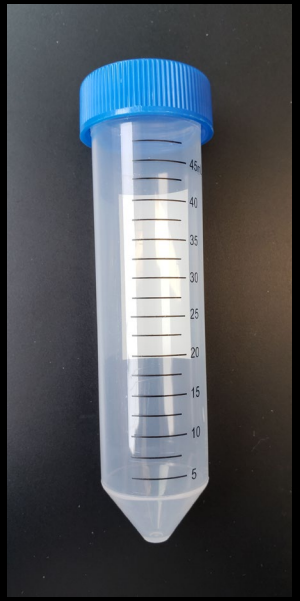
SAMPLING CHECKLIST

RIVER DIPPERS

SAMPLE BOTTLES



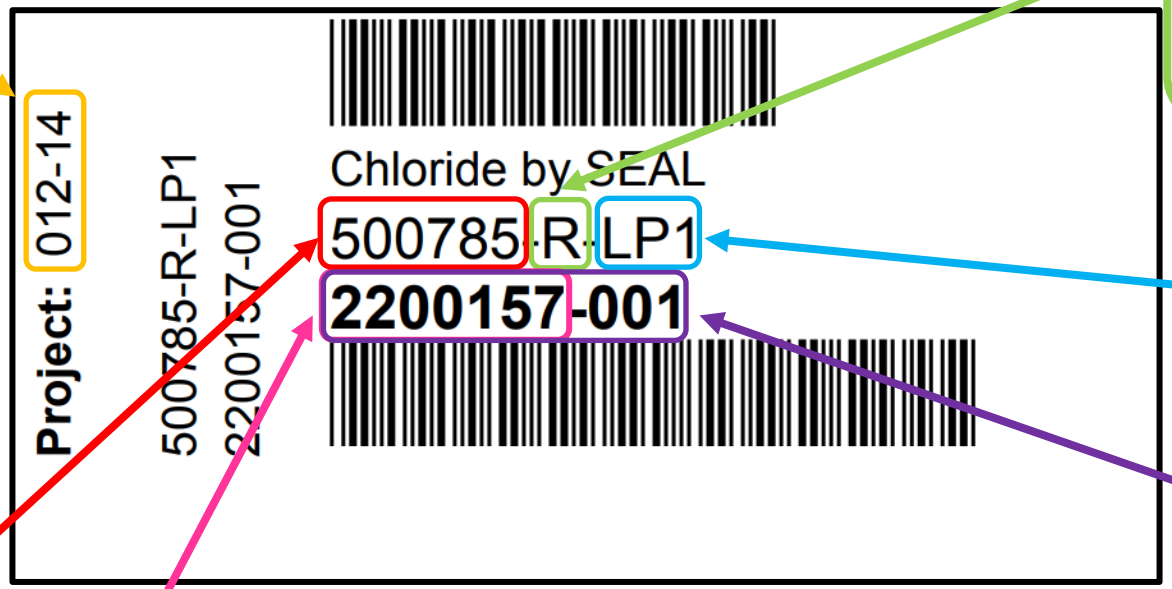
CHLORIDE



NITROGEN

PHOSPHORUS

BOTTLE LABELS



Project ID (012-XX)

QC Code (R = regular, D = duplicate)

LaRosa Site ID

VAEL Lab Sample ID (23XXXXX-XXX)

VT DEC Location ID (5XXXXX)

VAEL Order Number

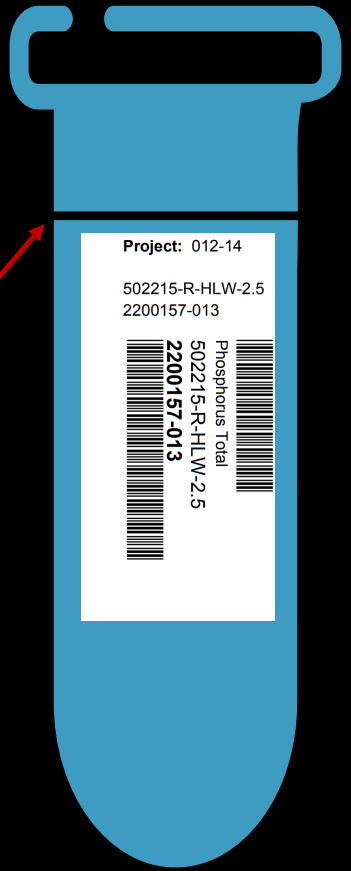
HOW TO - LABEL BOTTLES

Apply all labels before you go out in the field!

Ensure bottles are **dry** before applying.

Place labels **vertically**.

Place TP labels **below black line**.



VAEL FIELD SHEETS

VERMONT
VAEL Vermont Agriculture and Environmental Laboratory

Field Sheet
Order ID: 2200158
Page 1 of 2

VAEL Use Only

Temperature (°C): _____ ☐ On-Ice?

Received By : _____

Date/Time Received: _____ @ _____ AM / PM

VAEL ID: 2200158-001
Project: 012-32-Ticklenaked Pond

Customer Sample #: 508456-R-SB2.5

Date and Time Collected: 4/16/22 12:35pm **Collected By:** Meaghan Hickey

Comments: TP bottle accidentally rinsed

Test	Container	Preservative	Filtered/Acidified?
Nitrogen Total	50 mL Plastic Blue Cap	H2SO4 to pH < 2; Cool 4 °C	Yes / No / NA
Phosphorus Total	60 mL Glass Vial	None	Yes / No / NA

Always fill out date and time!

IF A SITE IS NOT SAMPLED

VERMONT
VAEL Vermont Agriculture and Environmental Laboratory

Field Sheet
Order ID: 2200158
Page 1 of 2

VAEL Use Only

Temperature (°C): _____ ☐ On-Ice?

Received By : _____

Date/Time Received: _____ @ _____ AM / PM

VAEL ID: 2200158-001
Project: 012-32-Ticklenaked Pond
Customer Sample #: 508456-R-SB2.5
Date and Time Collected: **Collected By:**
Comments:

Test	Container	Preservative	Filtered/Acidified?
Nitrogen Total	50 mL Plastic Blue Cap	H2SO4 to pH < 2; Cool 4 °C	Yes / No / NA
Phosphorus Total	60 mL Glass Vial	None	Yes / No / NA

INDIVIDUAL SAMPLE NOT TAKEN?

VERMONT
VAEL Vermont Agriculture and Environmental Laboratory

Field Sheet
Order ID: 2200158
Page 1 of 2

VAEL Use Only

Temperature (°C): _____ ☐ On-Ice?

Received By : _____

Date/Time Received: _____ @ _____ AM / PM

VAEL ID: 2200158-001
Project: 012-32-Ticklenaked Pond

Customer Sample #: 508456-R-SB2.5

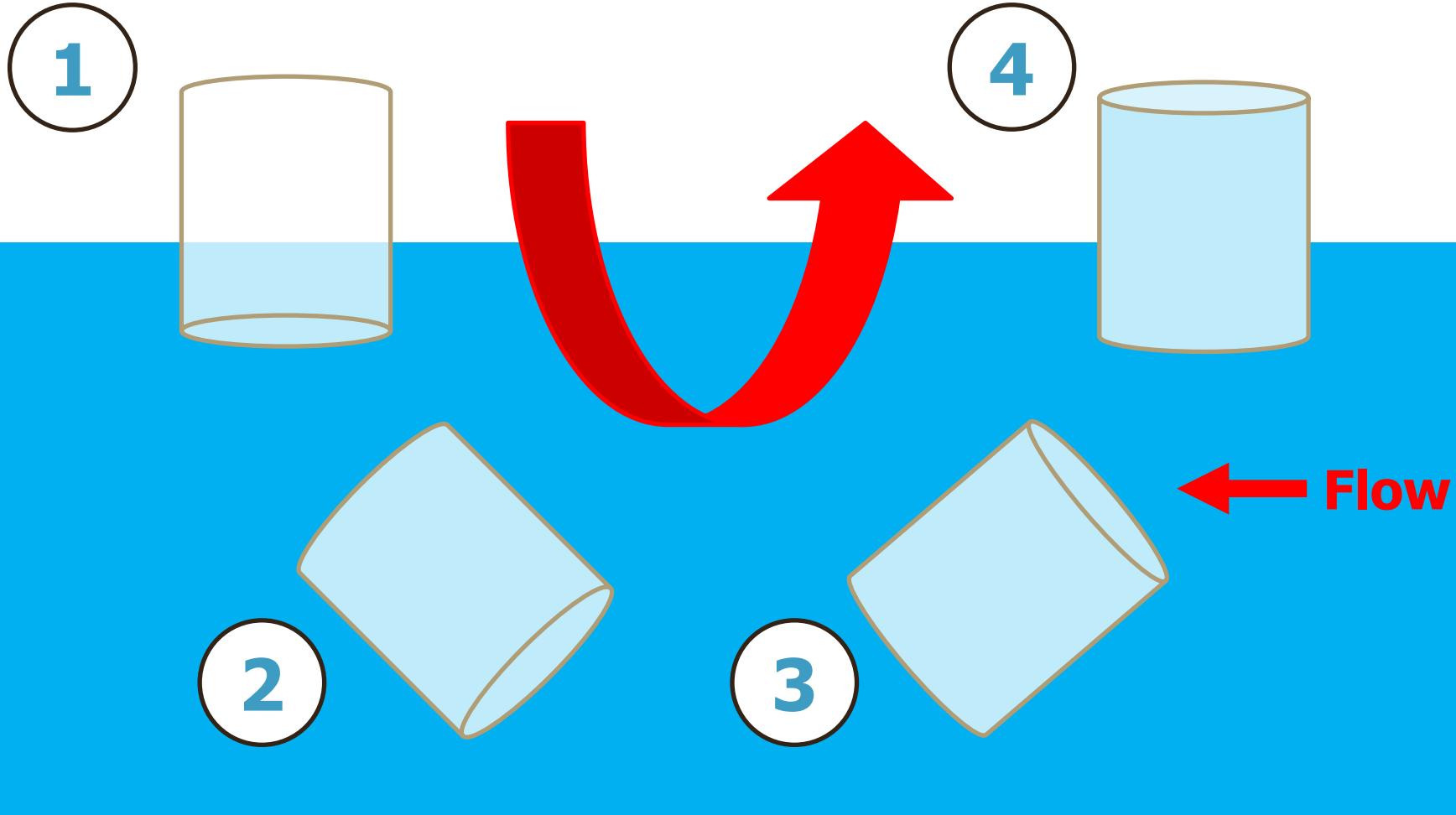
Date and Time Collected: _____ **Collected By:** _____

Comments: TP bottle broken/leaked

Test	Container	Preservative	Filtered/Acidified?
Nitrogen Total	50 mL Plastic Blue Cap	H2SO4 to pH < 2; Cool 4 °I	Yes / No / NA
~~Phosphorus Total~~	~~60 mL Glass Vial~~	~~None~~	~~Yes / No / NA~~

INSTREAM BOTTLE GRAB

1. Wade into the center of the stream's flow.
2. **Do not disturb** bottom sediment (if sediment is disturbed, wait for it to flow downstream)
3. Always **face upstream**.
4. Rinse TN and DCl plastic bottles with stream water **3 times**.
5. **Do not rinse** TP glass bottle.
6. Dip bottles midway between the surface and the bottom in a **U-shaped motion**.


1
4
2
3
Flow

IMPORTANT

Do NOT sample if:

- Water is stagnant puddle (no flow)
- So low you can’t sample without disturbing sediment – need 3-4 inches
- Flows are too swift and/or deep to sample safely (unless you have a river dipper)

IMPORTANT

Rinse TN and Cl bottles
Rinse 3 times each

DO NOT RINSE
TP bottles.

RIVER DIPPER

Store in plastic bag when not in use to avoid contamination

1. Rinse the river dipper bottle **3x** with river water
2. Use the pole to reach out into the center of the stream flow and dip the bottle or cup in the **upstream** direction using the same **U-shaped motion** as grab samples

RIVER DIPPER

3. Use the river water in the river dipper container to **rinse out the sample bottle and cap** (if rinsing is required) **three times**
    a. Remember, **do not rinse** the TP bottle.
    b. Can refill river dipper container as needed
4. Pour water from the river dipper bottle into the sample bottle to the designated fill line

RIVER DIPPER

Only fill a sample bottle if there is enough water remaining in the river dipper container to completely fill the sample bottle to the fill line.

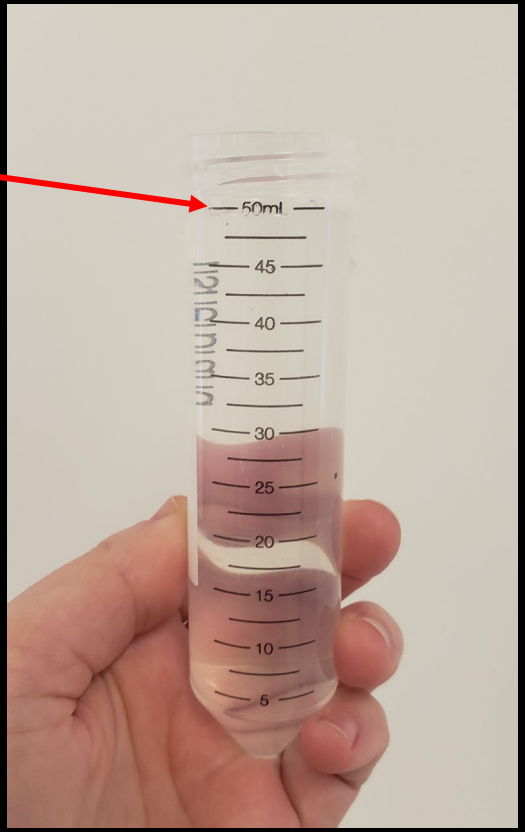
Do not fill part way.

Instead, empty the bottle and collect more water to **completely fill the sample with one river dipper water collection.**

Multiple sample bottles can be rinsed and filled from a single river dipper collection provided there is enough water to completely fill each sample bottle.

- Pour off samples to the required volume before capping.
  - Indicated by the **black line** on TP bottles
- If you fill a sample above the line, carefully flick bottle to remove small amounts of water at a time.
- If you pour off a **TP sample** below the fill line, **do not redo the whole sample!**
  - Fill the cap with sample water to pour into the bottle
  - Can redo for TN/Cl

- Fill TN and Cl **to 50mL line**
- This allows space for addition of acid for TN and for laboratory equipment to insert pipette to withdraw sample without spilling.



ANY QUESTIONS?

REVIEW - TRUE OR FALSE

1. All parameters can be sampled using the same bottles. **FALSE**

2. Always face upstream when sampling. **TRUE**

3. Total phosphorus bottles must be rinsed three times. **FALSE**

REVIEW - TRUE OR FALSE

1. Bottle dippers or buckets must be rinsed three times before sampling. **TRUE**

2. If you pour off a TP sample below the fill line, you must redo the whole sample. **FALSE**

3. If you only have a bit of water left in your bottle dipper or bucket, you should still fill a sample partway. **FALSE**

FIELD DUPLICATES

10% of all samples throughout season

Randomly preassigned to sites by LPP staff

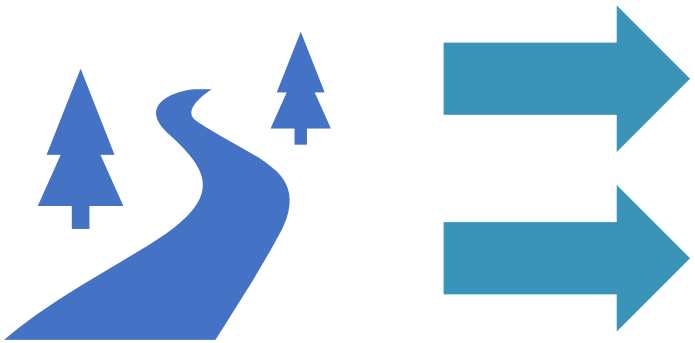
Cannot be skipped

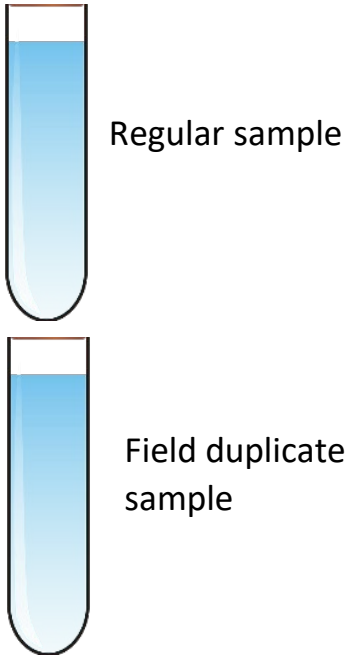
Must be taken at the assigned sites

Collect using the same protocols as regular samples – just do it twice, one after the other

FIELD DUPLICATES

Collect 2 discrete samples
(rinse each bottle 3x if TN/Cl!)





If using a bottle dipper or bucket, the dipper container or bucket should be rinsed three times (for all parameters) in between collecting the regular sample and the field duplicate

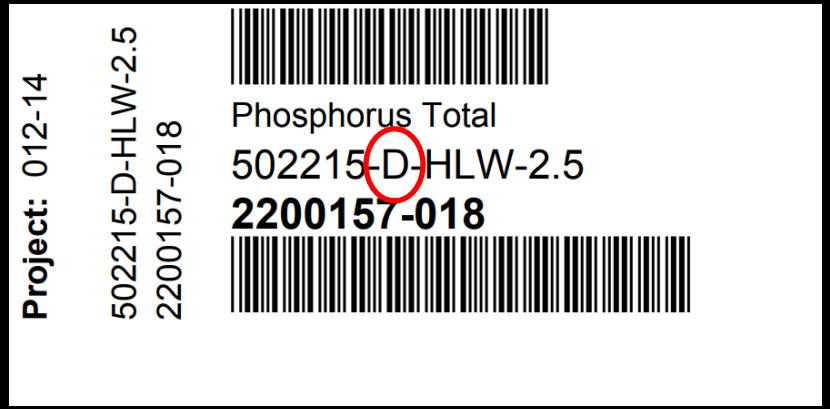
FIELD DUPLICATES

For all three parameters:

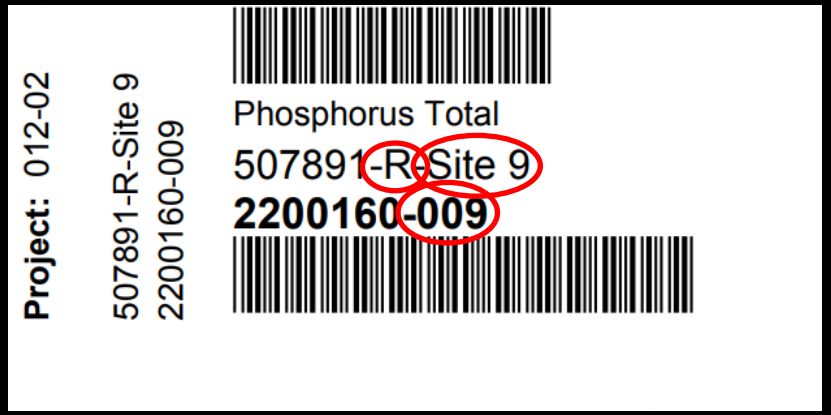
TP, TN, and Cl

Separate sample taken immediately after regular sample, using the same sampling protocol (including rinsing) as regular samples

Labeled with **"D"** instead of "R"



DUPLICATES AND SAMPLE NUMBERS



REGULAR SAMPLE

2300000 – 001

FIELD DUPLICATE

2300000 – 002

Similar to corresponding regular sample but unique final three digits

ANY QUESTIONS?

REVIEW

1. Field duplicate bottles should be collected _____ regular samples.

a **At the same time as**

b **Immediately after**

REVIEW

2. When sampling field duplicates with a river dipper, the dipper collection container should be rinsed _____ total for both samples.

a **6 times**

b **3 times**

REVIEW

3. Field duplicates can be taken at any site.

a **FALSE**

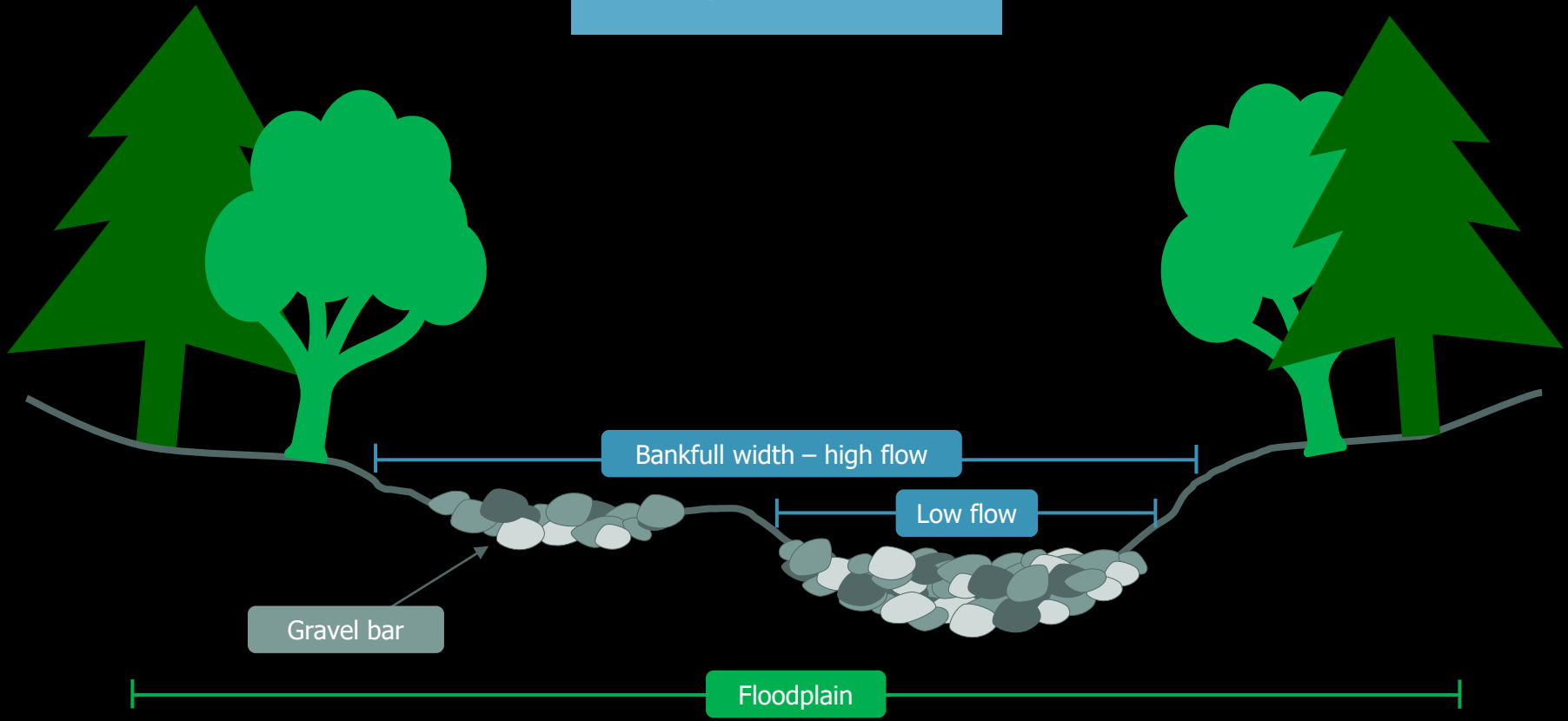
b **TRUE**

BREAK

FLOW OBSERVATIONS

FLOW LEVEL	FLOW TYPE	VISIBLE TURBIDITY
LOW	BASE	YES
MODERATE	FRESHET	NO
HIGH	HYDRO	
FLOOD		

FLOW LEVEL



FLOW LEVEL - LOW

Low - conditions are low relative to the entire range of flows experienced at site

- Generally occur during late winter and summer
- Streambed is typically partially dry with gravel bars exposed.
- It may be possible to walk along the dry edge of the streambed.

FLOW LEVEL - MODERATE

Moderate - at a mid-level or average streamflow conditions; most typical flows experienced in the stream

- Can occur at any time of year
- Majority of the stream bed is under water, but not up to the sharp incline of the stream bank

FLOW LEVEL - HIGH

High - Stream is well above an average level of flow

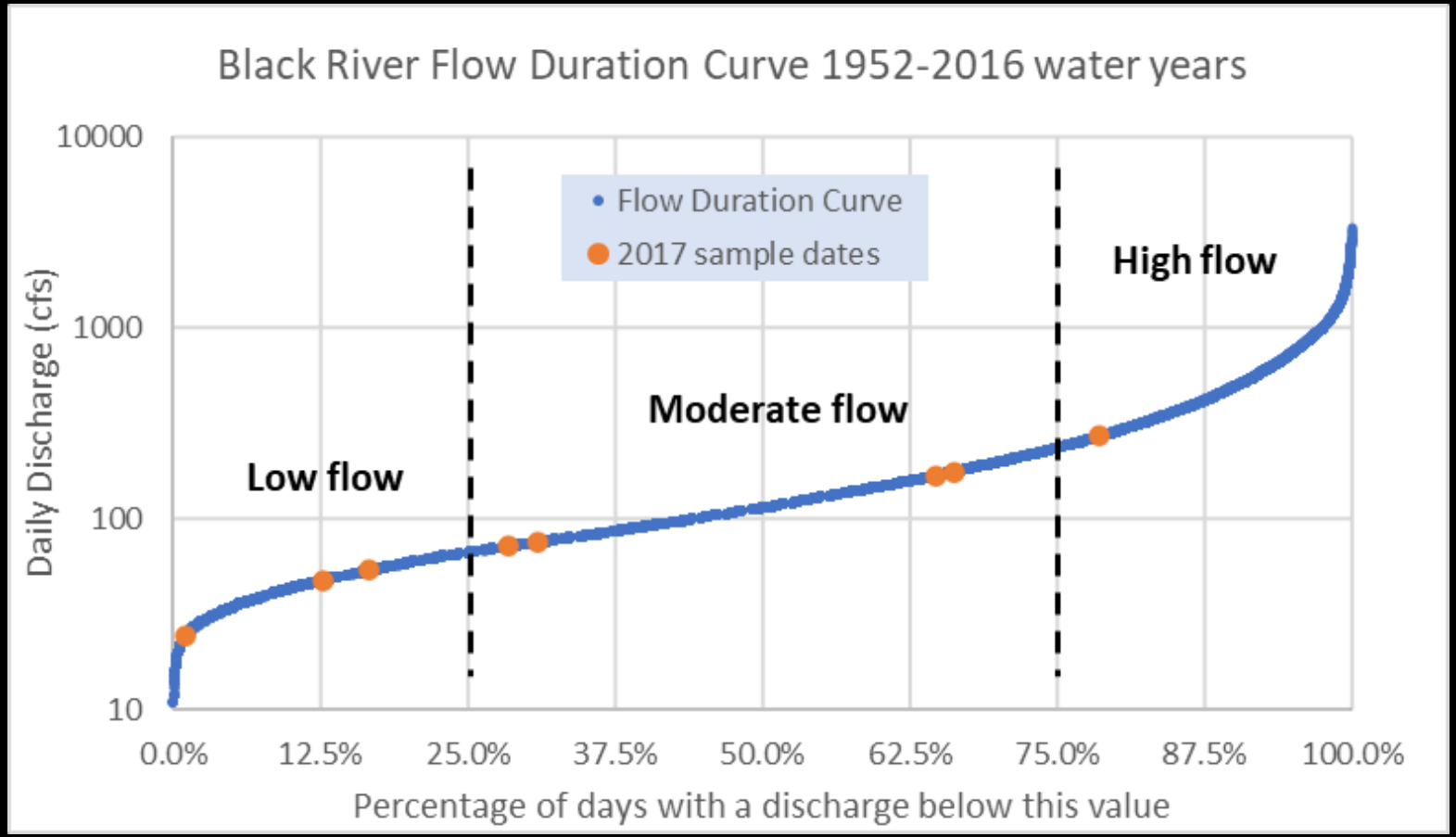
- Generally occur during spring and fall, but can occur due to rainfall any time of year
- Stream is full from bank to bank but not spilling onto floodplain.

FLOW LEVEL - FLOOD

Flood – Stream exceeds bankfull width and accesses the floodplain

- Generally occur less than 5% of time
- Also indicated by submergence or active transport of terrestrial and woody vegetation

Do not sample during flood conditions due to safety concerns


Black River Flow Duration Curve 1952-2016 water years
10000
1000
100
10
Daily Discharge (cfs)
Flow Duration Curve
2017 sample dates
High flow
Moderate flow
Low flow
0.0%
12.5%
25.0%
37.5%
50.0%
62.5%
75.0%
87.5%
100.0%
Percentage of days with a discharge below this value

ANY QUESTIONS?

LOW, MODERATE, HIGH, OR FLOOD?

MODERATE

LOW

LOW, MODERATE, HIGH, OR FLOOD?

HIGH

LOW

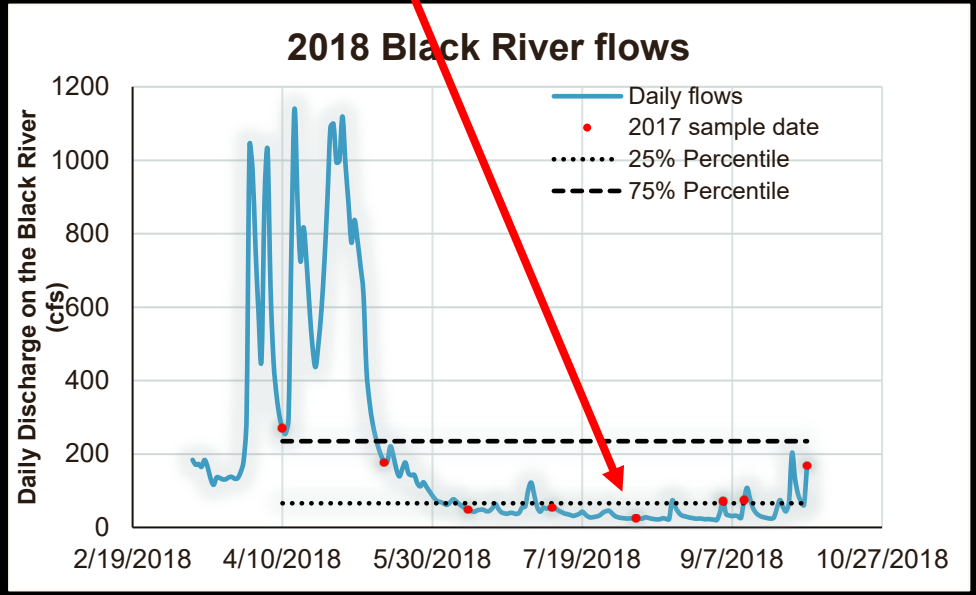
LOW, MODERATE, HIGH, OR FLOOD?

FLOOD

MODERATE

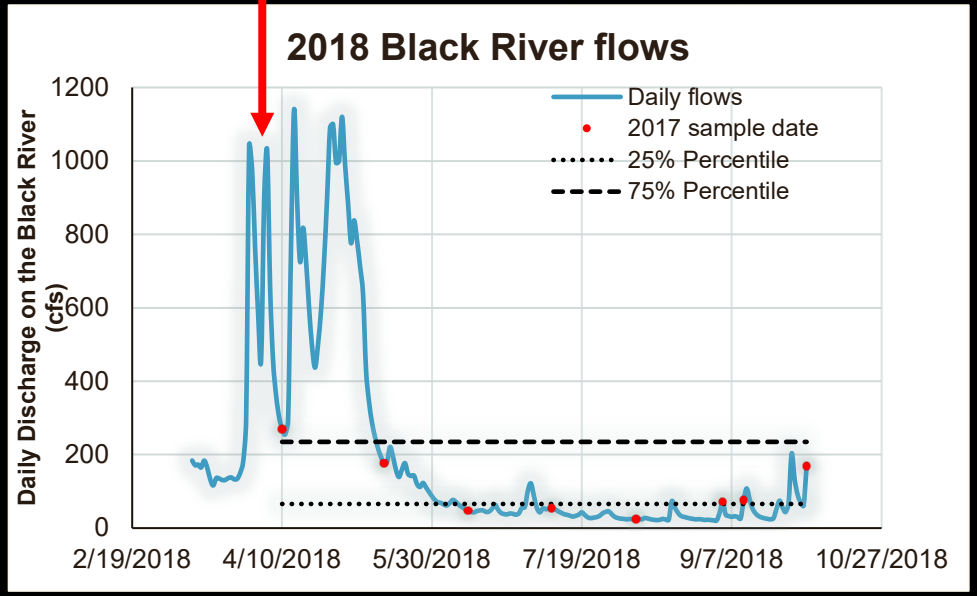
FLOW TYPE – BASE FLOW

- **Water level is relatively constant** and not rising or falling.
- Subsurface flows account for almost all water reaching streams
- Can exist under both low and moderate flow levels, but not under high or flood levels



FLOW TYPE - FRESHET

- Water level is **actively rising or falling in response to a rain event or snowmelt**
- Water can be turbid under these conditions due to stormwater runoff and re-suspension of stream bed sediments
- Can occur with all flow levels



FLOW TYPE - HYDRO

- Water level is rapidly rising or falling solely due to the release of water from an upstream dam
- Indicated by a rise in streamflow with no recent precipitation or snow melt and no similar rises on local stream gauges
- Check the watershed protection layer on the ANR atlas to identify dams and when they are operated for electricity generation

FLOW TYPE – NO FLOW

- Indicates that stream is completely dry or flow levels are so low it is more of a stagnant, mud puddle
- **Do not collect sample** – high likelihood of contamination from sediment
- Fill out Survey123 form for site and **select "no flow"** option for flow type/level
- **Only use "no flow" if did not sample**, not to describe slow flow

TURBIDITY

ANY QUESTIONS?

REVIEW

1. During a freshet, the water level can rise in response to _____ .

a **a rain event**

b **snowmelt**

c **both a and b**

REVIEW

2. You collect your first sample on April 17th. A rain event is predicted on April 30th (your next sample pick up is May 2nd). Should you go out and collect a sample?

a **Yes! Capture that high flow event!**

Yes, but only collect at the sites where flows are high

c **No, you already collected your samples for that sample period**

REVIEW

3. Should you collect a sample if your site looks like this?

a **YES**

b **NO**

REVIEW

4. Should you collect a sample if your site looks like this?

a **YES**

b **NO**

REVIEW

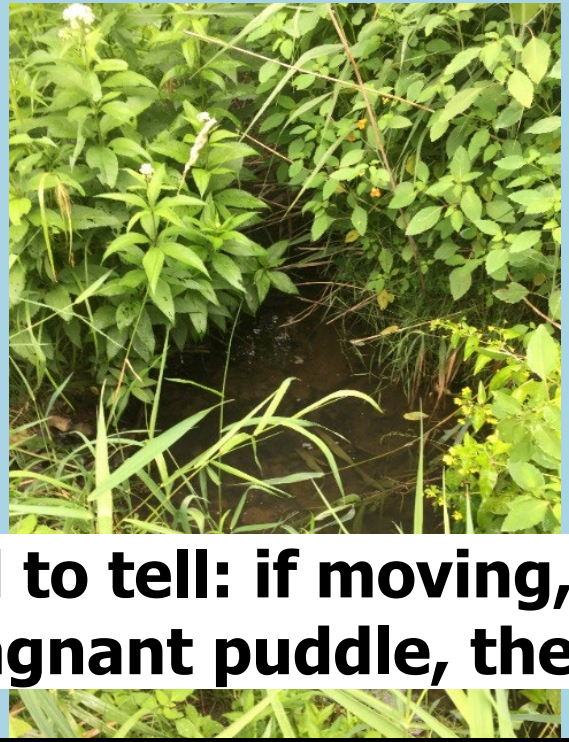
5. Should you collect a sample if your site looks like this?

a **YES**

b **NO**

REVIEW

6. Should you collect a sample if your site looks like this?



a

Hard to tell: if moving, yes.
If stagnant puddle, then no.

NO

REVIEW

7. Should you collect a sample if your site looks like this?

a

Y

Hard to tell: if moving, yes.

NO

REVIEW

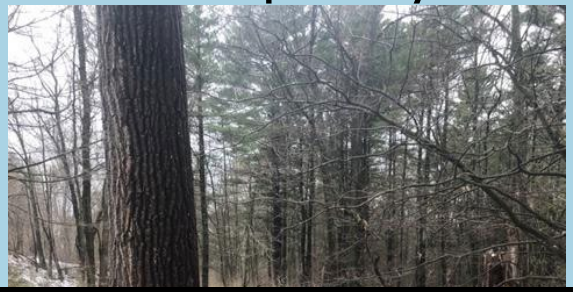
8. Should you collect a sample if your site looks like this?

a **YES**

b **NO**

REVIEW

9. Should you collect a sample if your site looks like this?



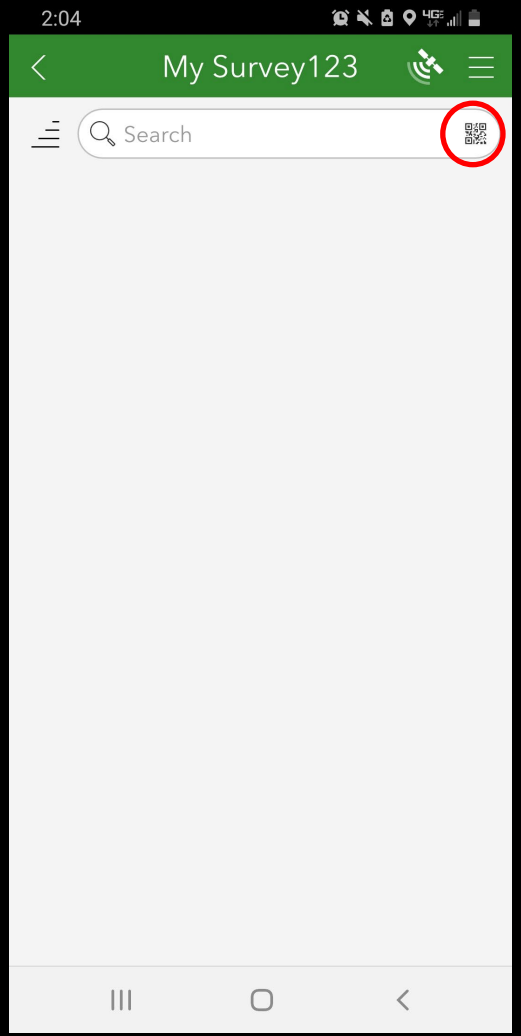
Do not sample or use extra caution during flood conditions

a **YES**

b **NO**

HOW TO – INSTALL LPP SURVEY

1. Download/open Survey 123 app
2. Click **“Continue without signing in”**
3. Click the QR code symbol next to search bar
4. Align QR code with camera
5. Click **“Open in Survey123 field app”**

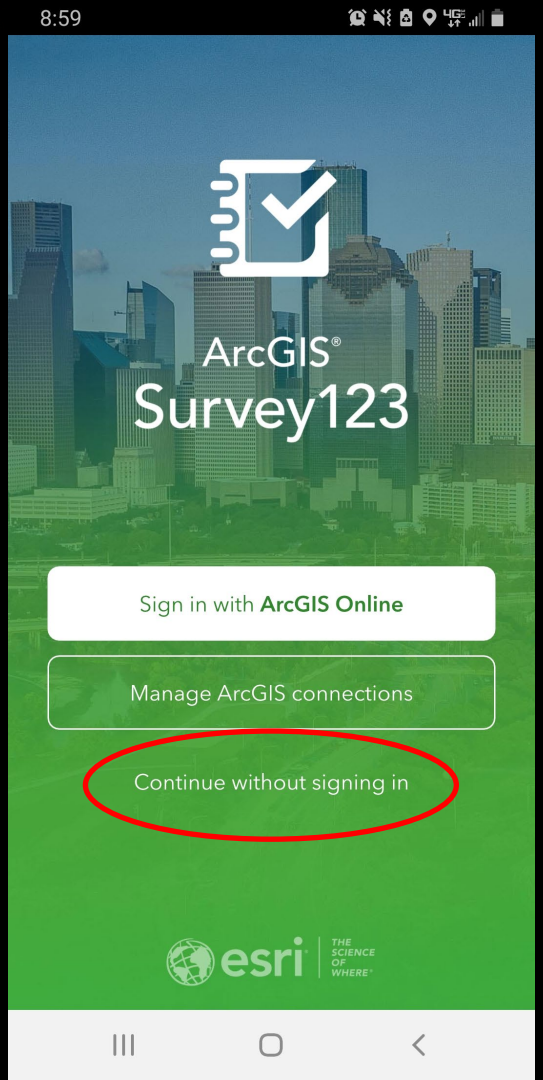


SURVEY123 APP

https://arcg.is/1PXuTe0

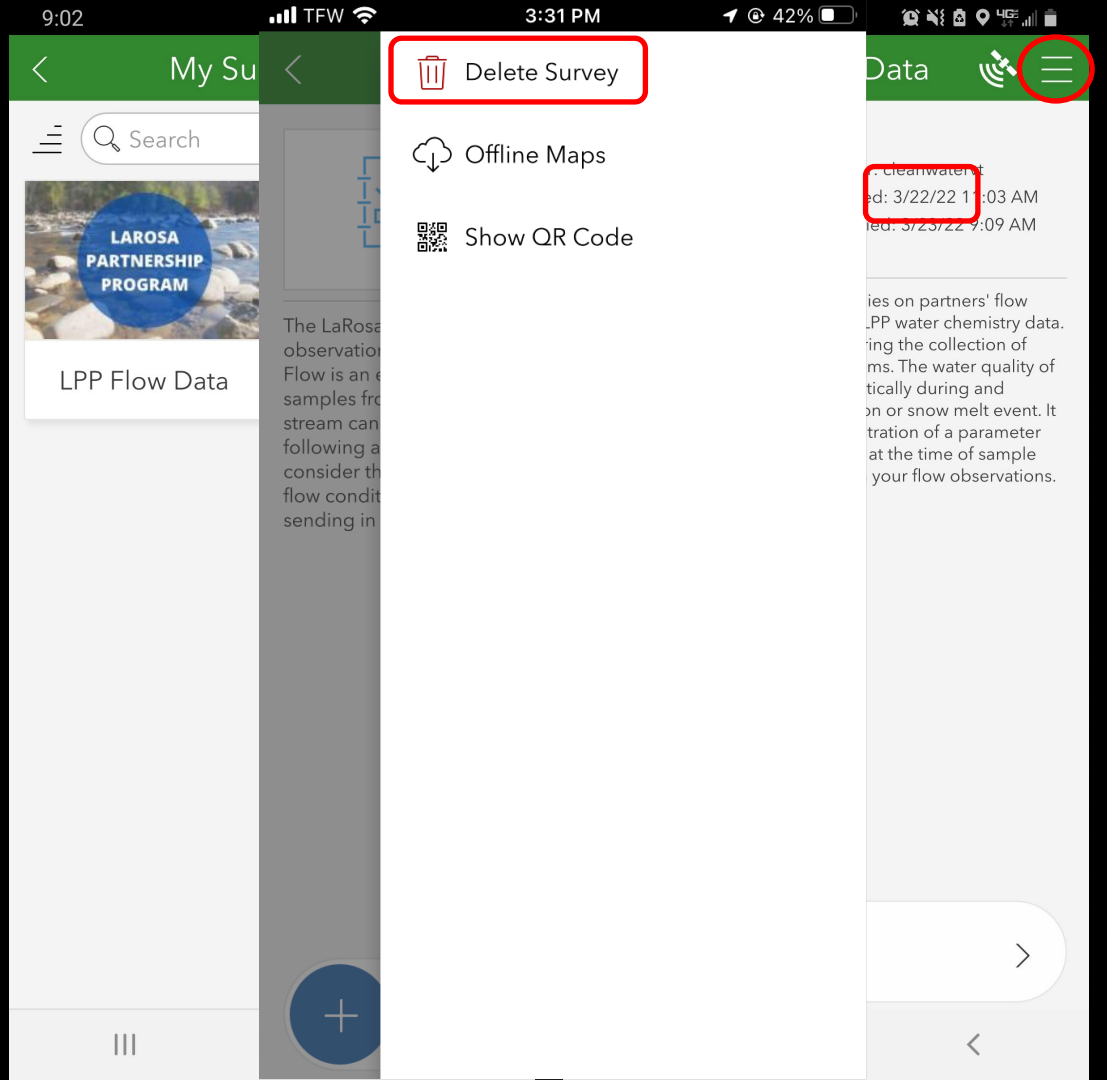
HOW TO – SUBMIT SURVEY

1. Open Survey 123 app
2. Click **“Continue without signing in”**



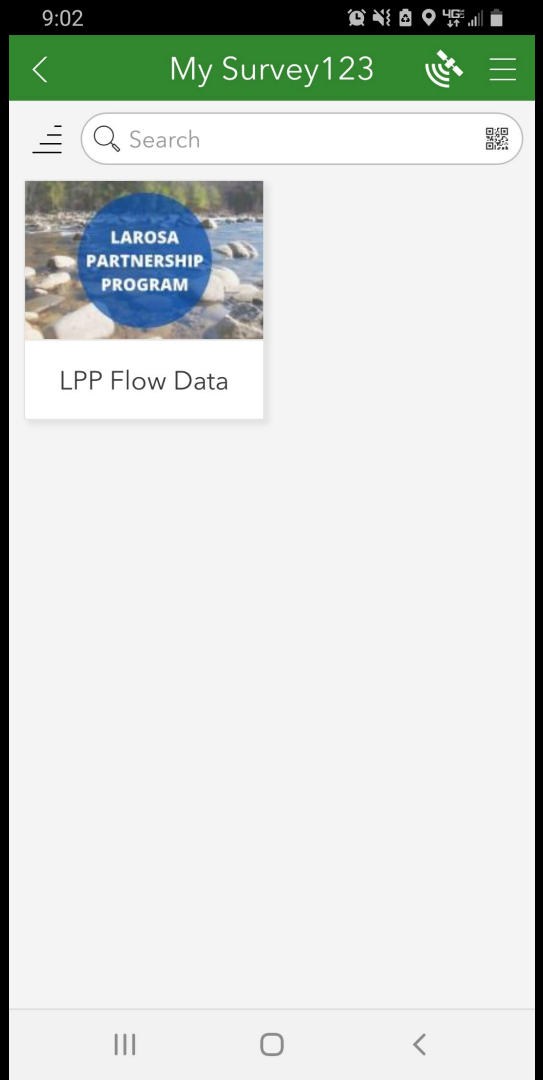
HOW TO - DELETE 2022 SURVEY

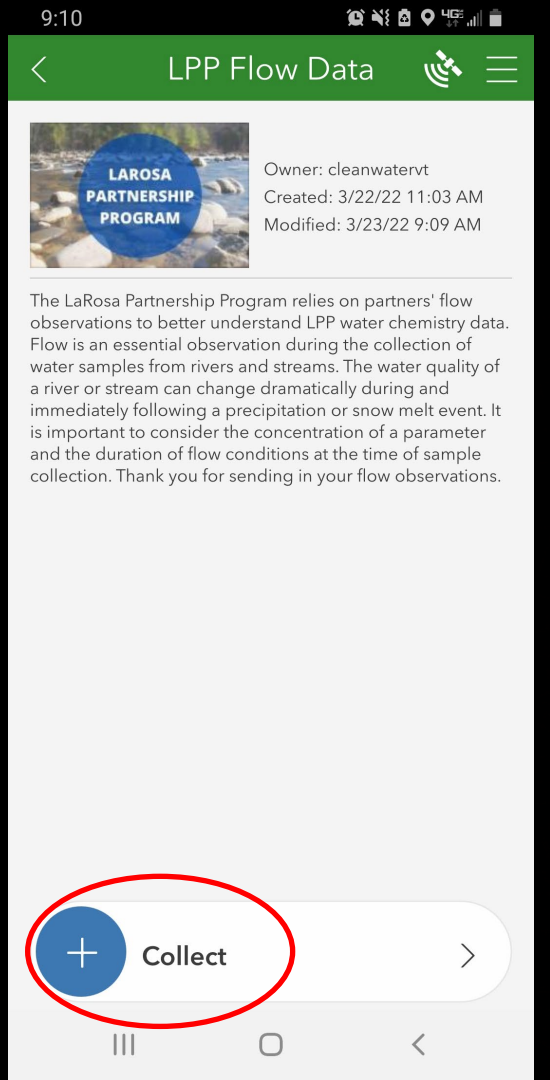
3. Click **“LPP Flow Data”**
4. Click **Menu icon**



HOW TO – SUBMIT SURVEY

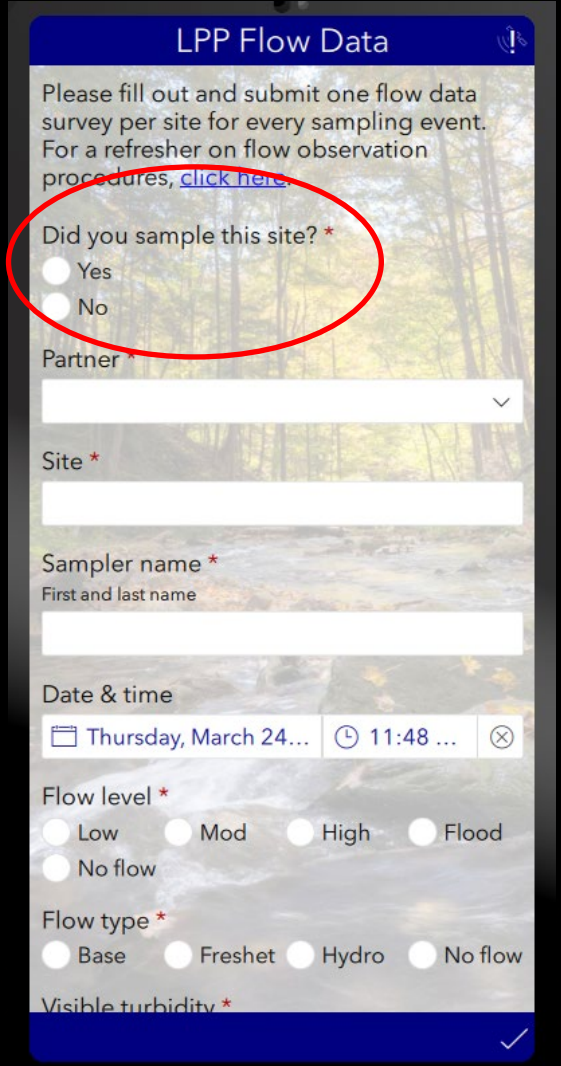
3. Click **“LPP Flow Data”**
4. Click **“Collect”**





HOW TO – SUBMIT SURVEY

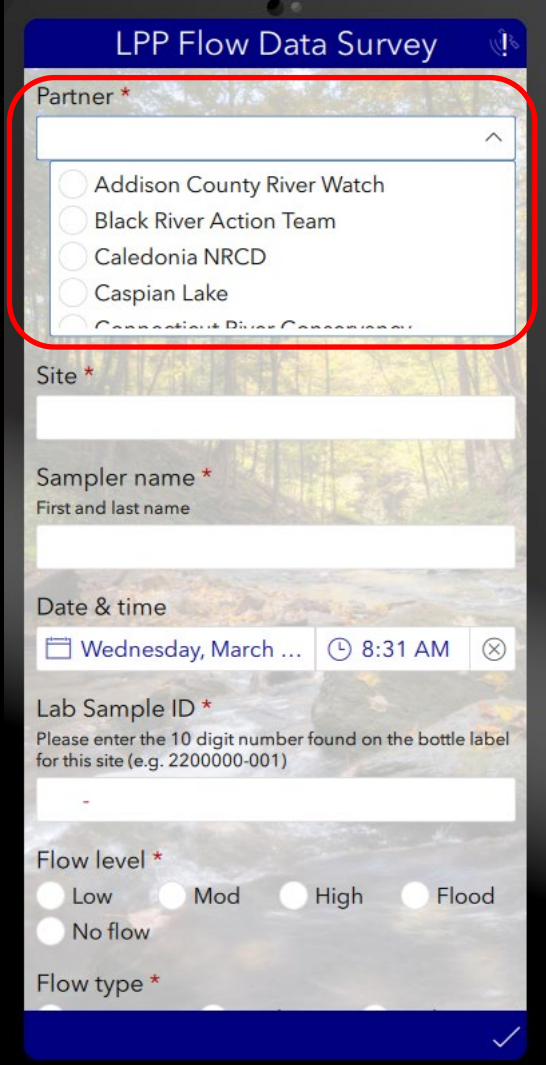
Please fill out the survey once per site for every sampling event, regardless of whether the site was sampled.

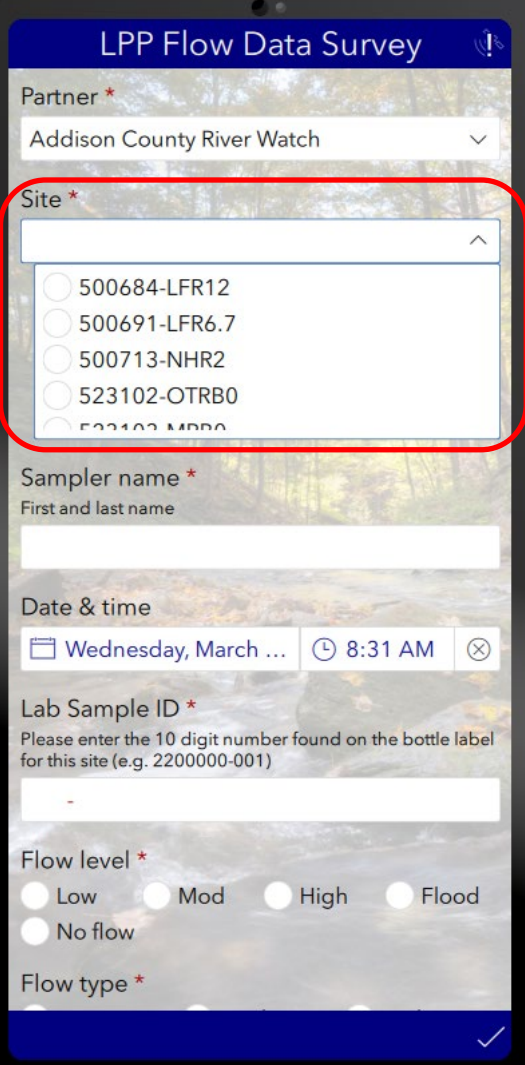


HOW TO – SUBMIT SURVEY

5. Choose partner name.
6. Choose site name.

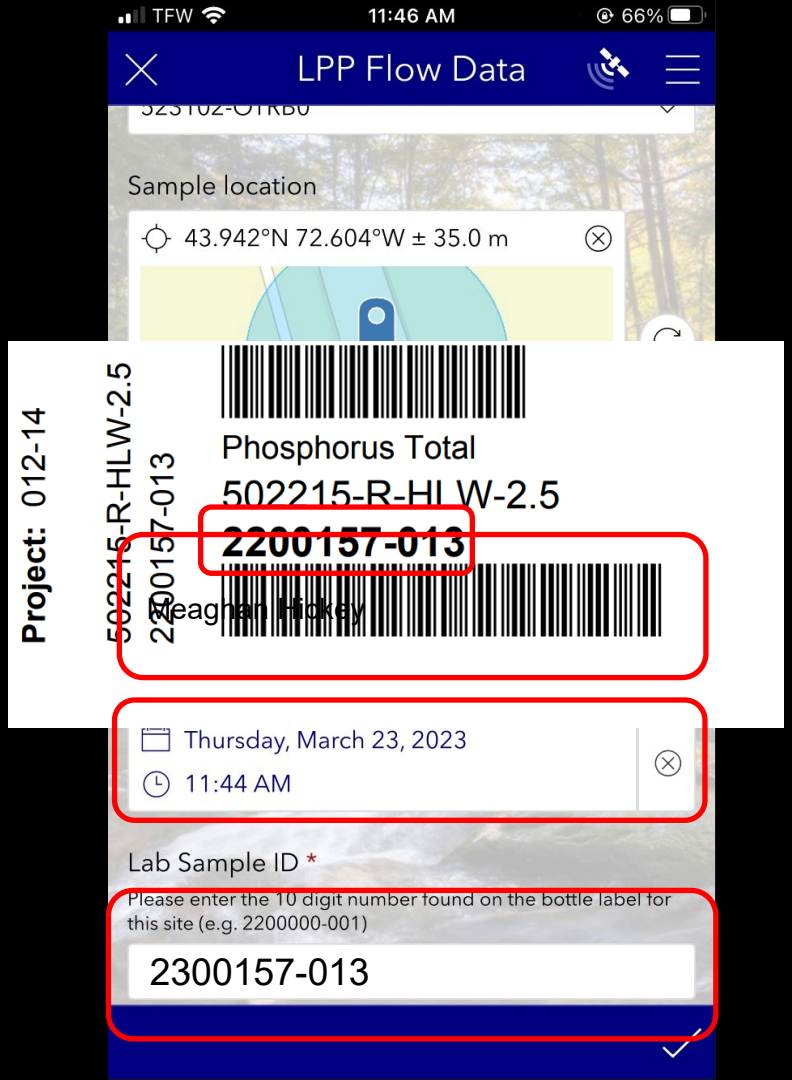
Site names for your specific organization will be prepopulated based on the chosen partner name.





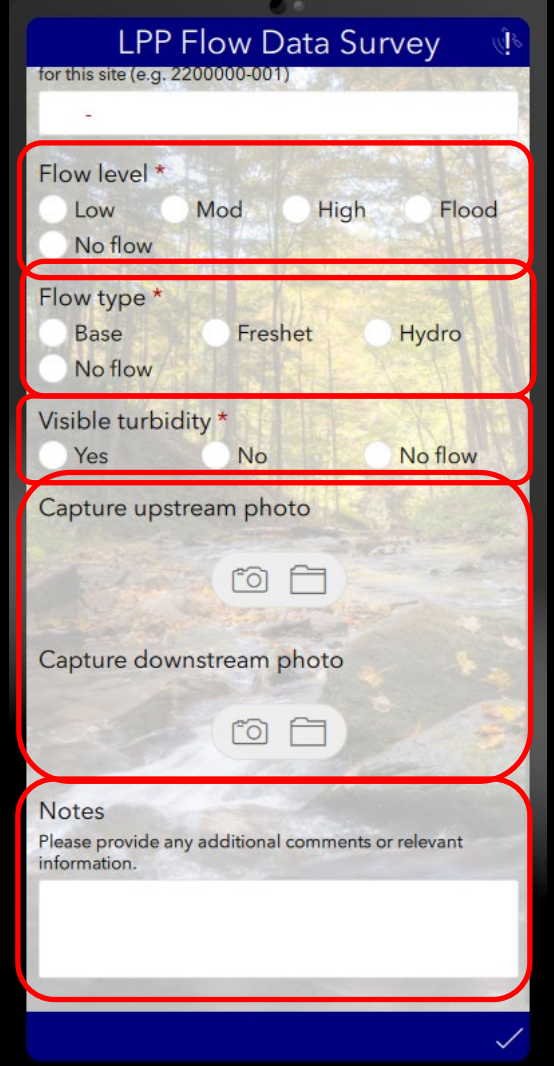
HOW TO – SUBMIT SURVEY

7. Type first and last name of sampler.
8. Date and time prepopulate automatically.
9. Type Lab Sample ID (seven numbers – three numbers, **23XXXXX-XXX**).



HOW TO – SUBMIT SURVEY

10. Choose flow observations.
11. Take upstream photo.
12. Take downstream photo.
13. Note anything new or unusual.



SUBMIT FLOW SURVEY

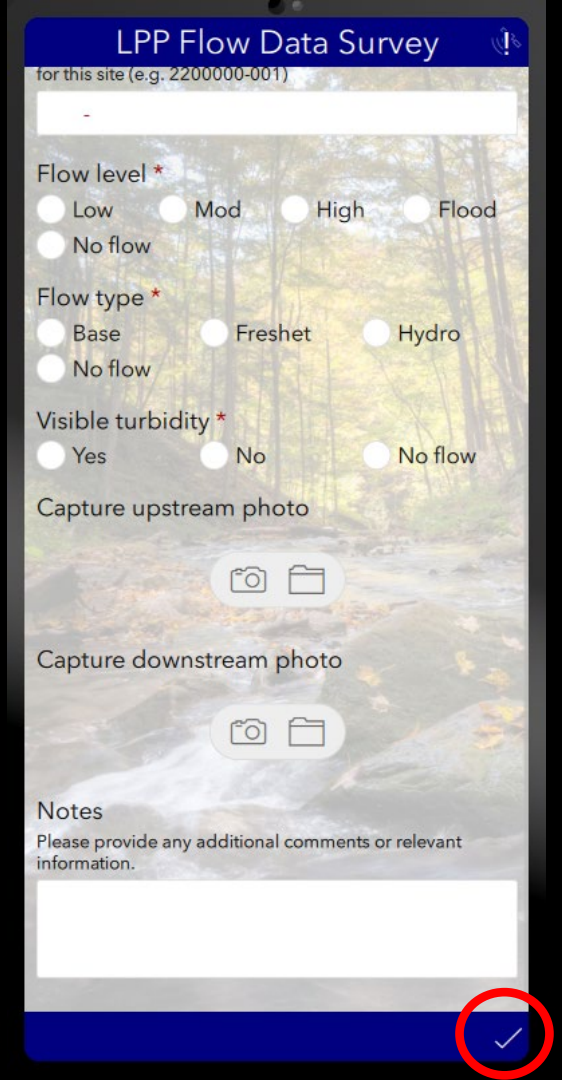
Finished?

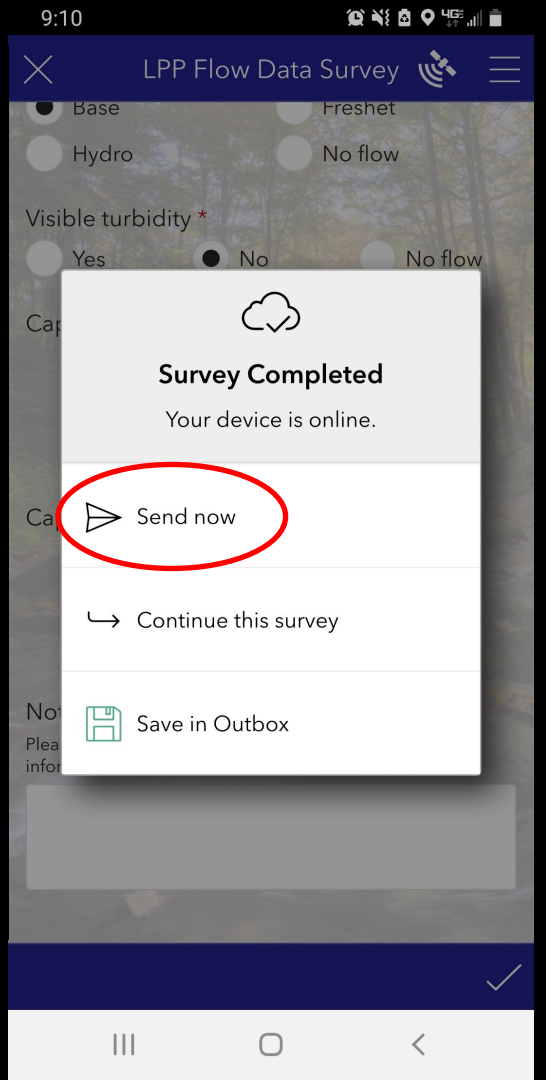
14. Click ✓ at bottom right

(Keyboard may hide ✓

press **“done” or “return”**)

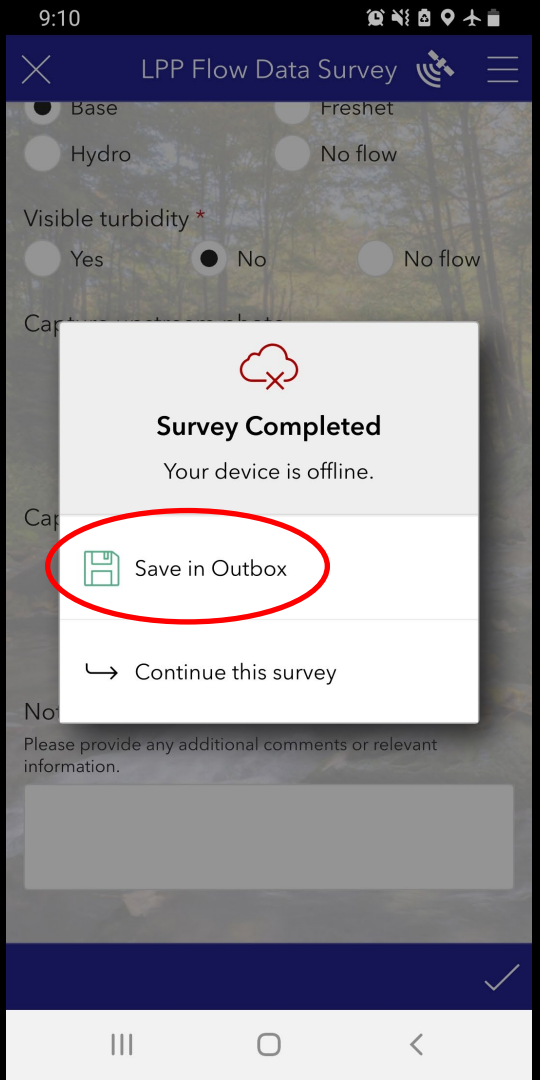
15. If online, click **“Send now”**





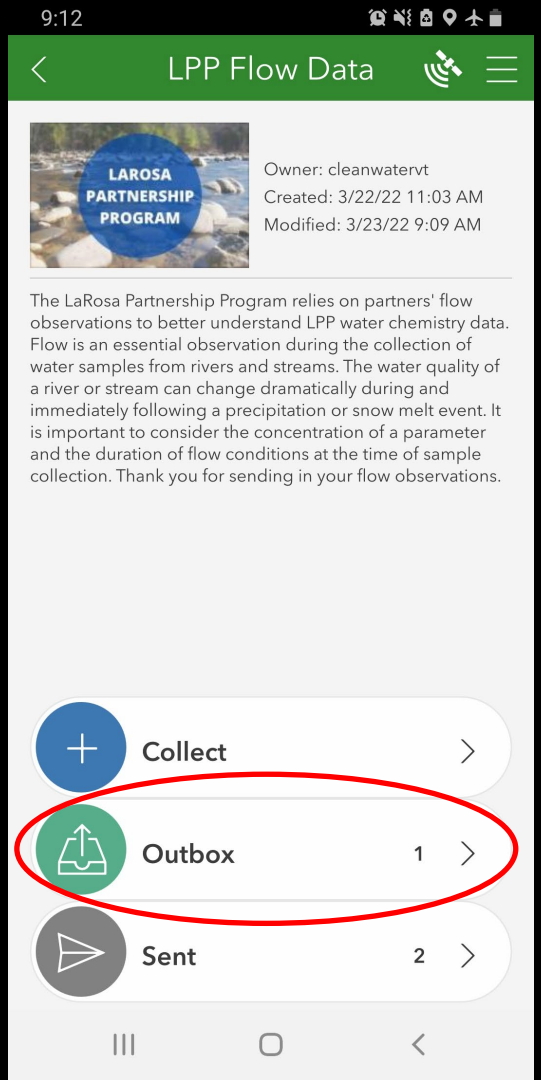
SUBMIT FLOW SURVEY

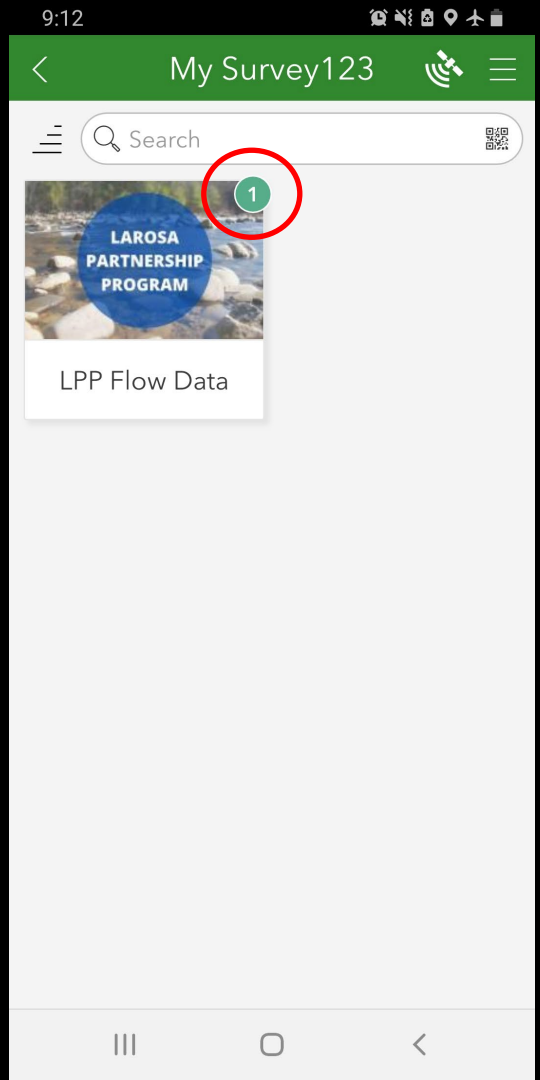
16. If offline, click **“Save in Outbox”**



SUBMIT FLOW SURVEY

Always remember to check your outbox after returning from the field!

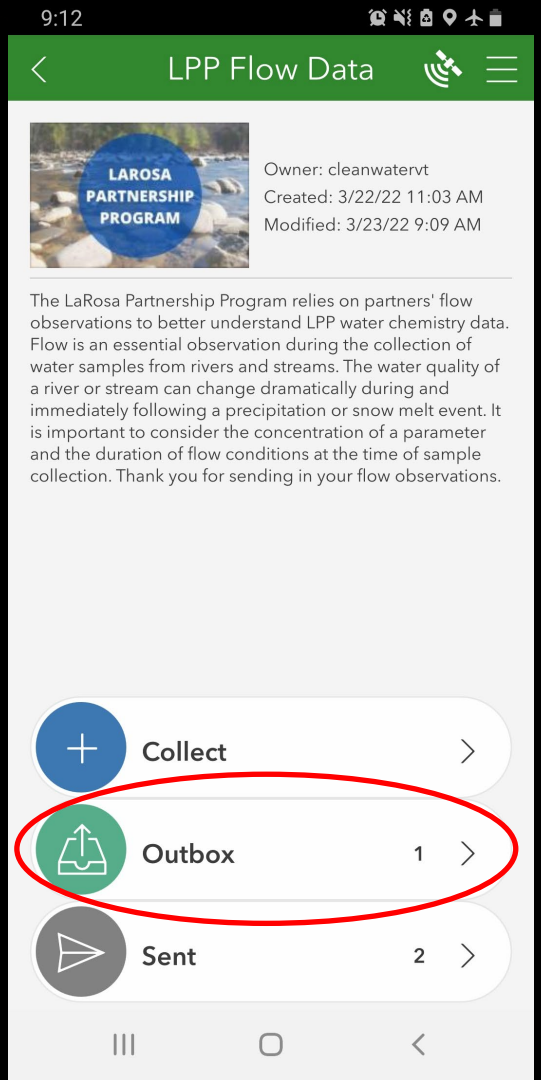


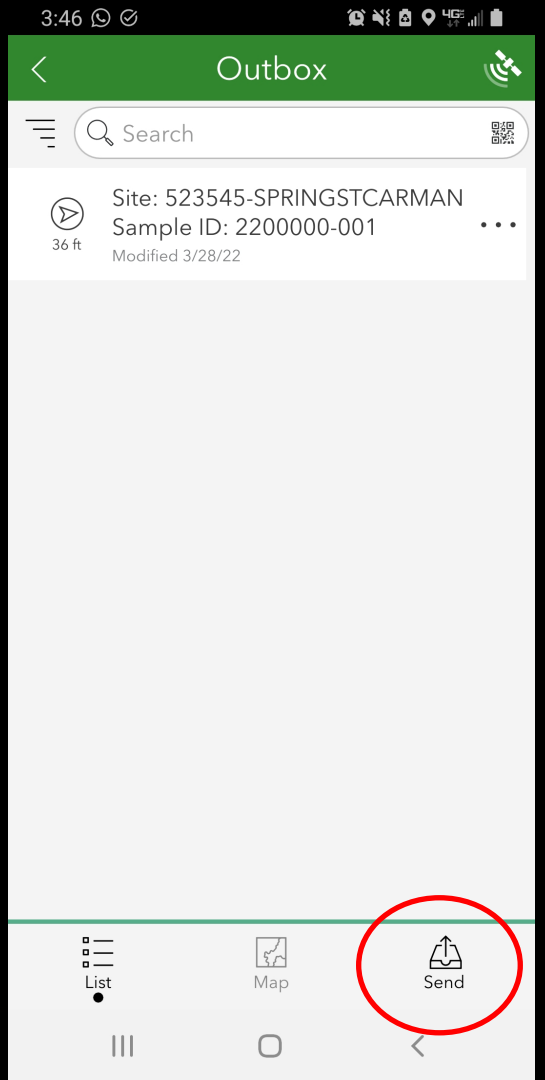


SUBMIT FLOW SURVEY

Click on Outbox.

Send remaining submissions.





For coordinators and volunteers uncomfortable with using smartphones in the field, flow data can be submitted after sampling on a computer via the Survey123 webform.

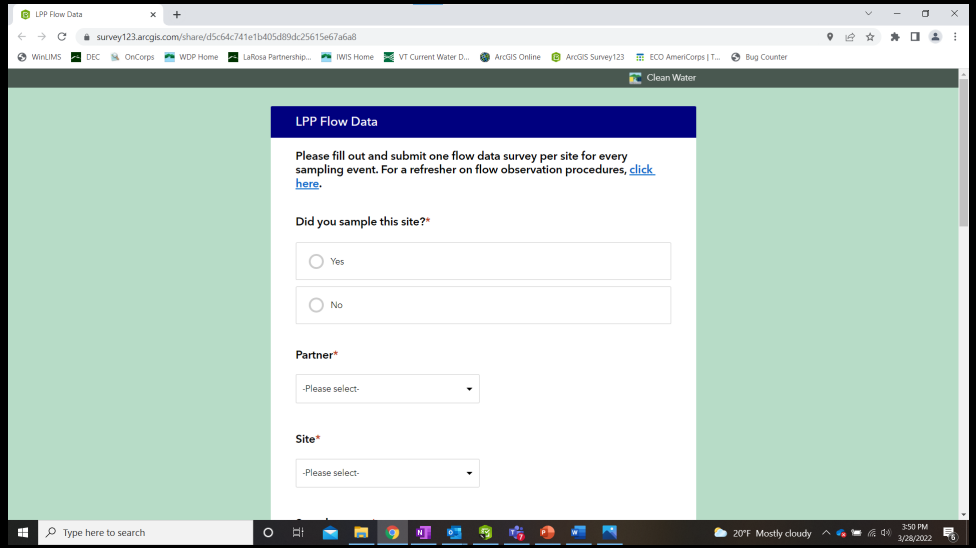
Volunteers and/or project coordinators **must record flow observations in the field** using field sheets.

After returning from the field, follow the same directions in the previous slides.

Transfer flow observations from field sheets to Survey123 webform.

Always correct the date and time.

Upstream and downstream photos are **not required**.

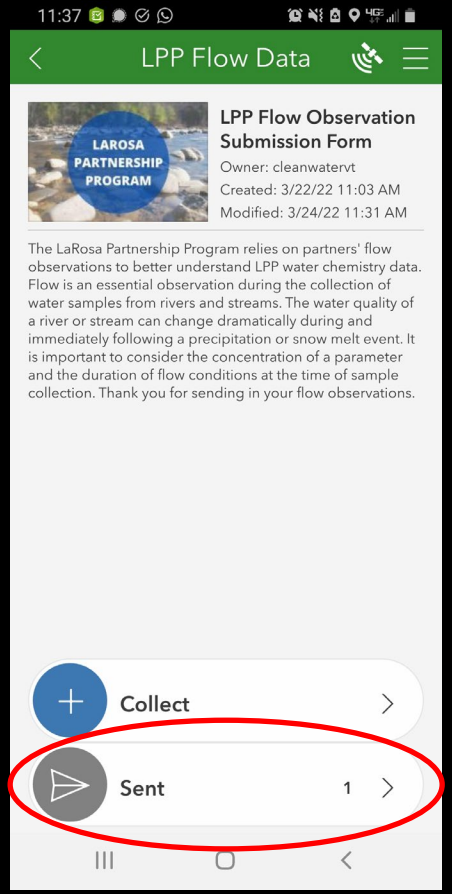


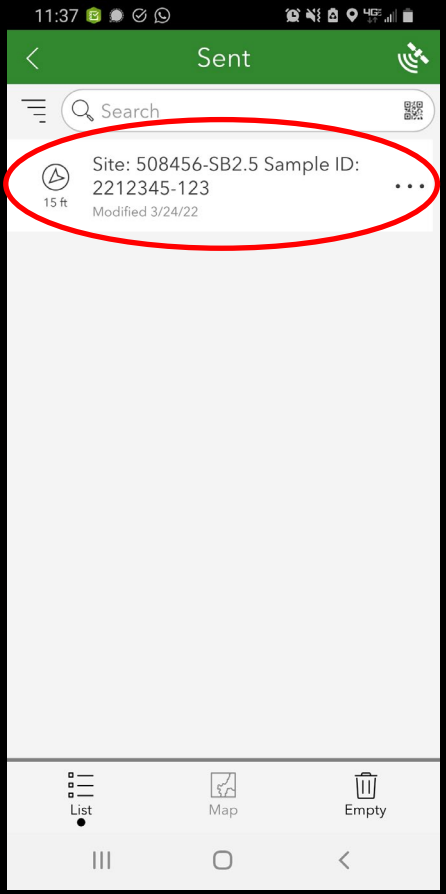
https://arcg.is/8TP9b

Oh no! I made a mistake but already submitted my survey…

HOW TO – EDIT SUBMISSIONS

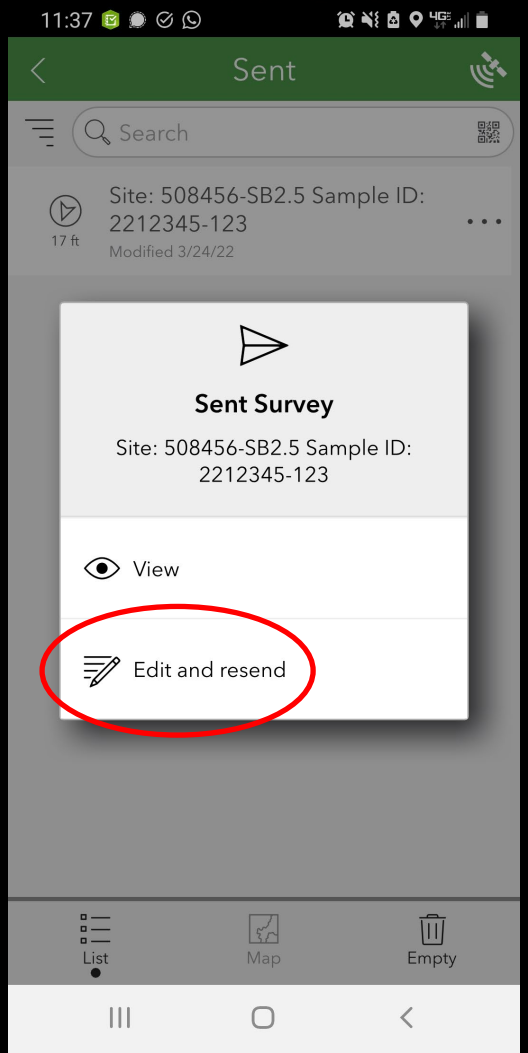
1. Click on **"Sent"** folder.
2. Click on the submission you would like to edit.





HOW TO – EDIT SUBMISSIONS

3. Click on **“Edit and resend”**.
4. Edit the survey and resubmit.



LPP Flow Data

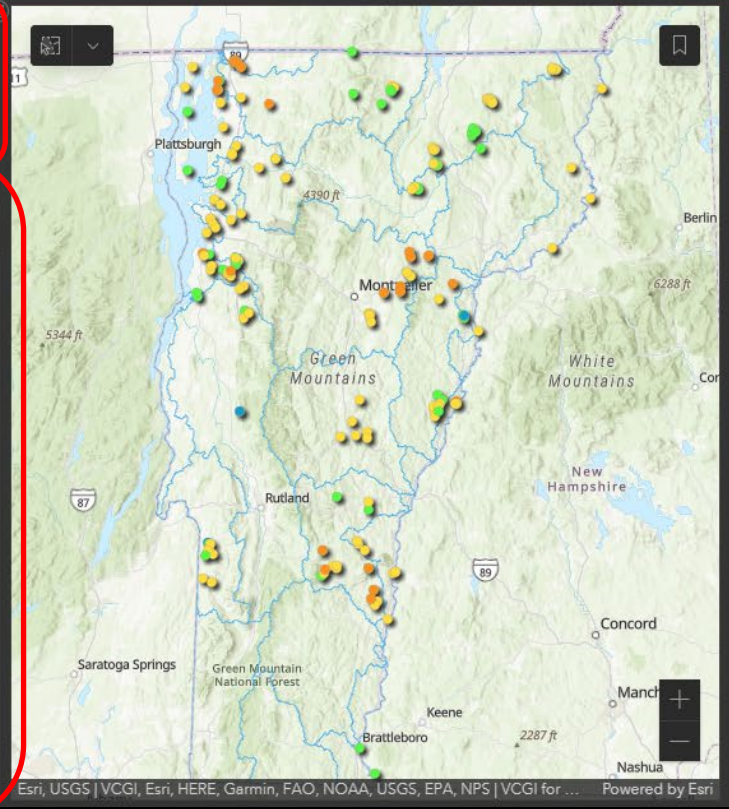
Partner Organization
None selected

Sampling Period
Event 4: 5/27 - 6/9

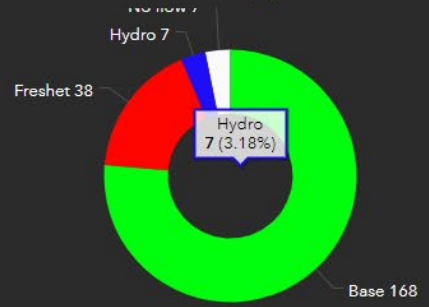
Sites Observed

190

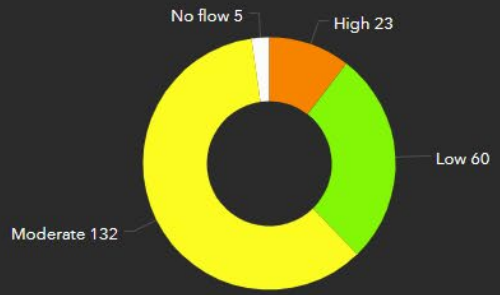
Sites	Total...
500665-Jewett Brook-Lower Norton	1
500680-LCHLW1.0	1
500785-LP1	1
500786-LP10	1
500789-LP2	1
500796-LP9	1
500806-MH1	1
500807-MH2	1
500809-PB1	1
500827-METT03	1
501033-Munroe 20	1
501118-JUB 1.3	2
501129-WIN 83.8	2



Flow Type



Flow Level



[LPP Flow Data Dashboard]

ANY QUESTIONS?

SAMPLE PRESERVATION

All samples have hold times of **28 days**.

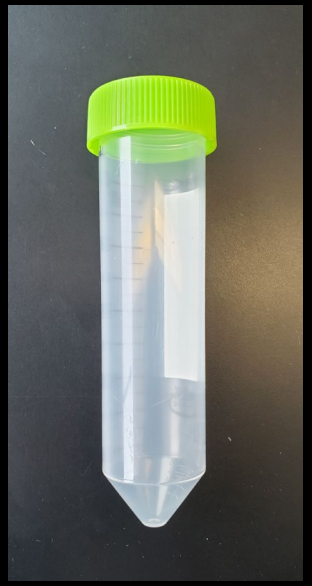
Store upright in a safe place.

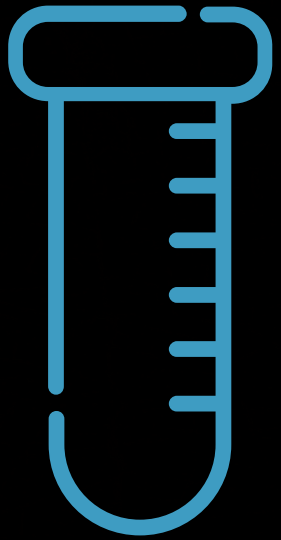
TOTAL NITROGEN

- Store TN samples **on ice or refrigerated** after collecting
- Acidify TN samples within **24 hours**

TP and Cl

Do not need to be kept cold or acidified





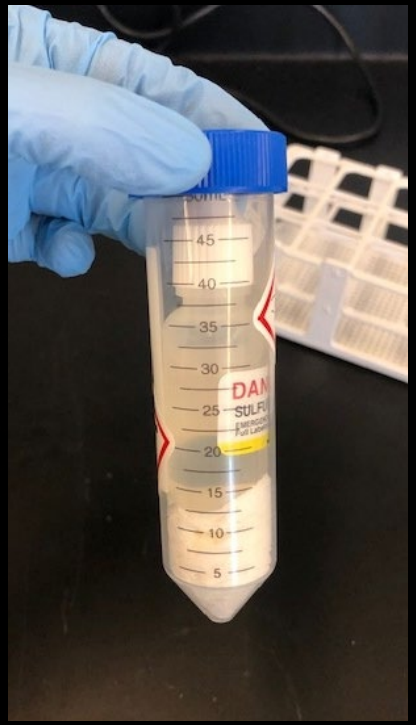
NITROGEN ACIDIFICATION

- Read Safety Data Sheet & sign safety agreement.
- Always wear provided disposable gloves and safety glasses when handling acid.
- Do NOT put gloved hands near eyes or mouth.
- DO NOT acidify in the field. Choose a safe location near sink.
- If you spill the acid, absorb with paper towel and dispose in plastic bag.
- If you spill acid on skin or clothes, **rinse thoroughly with water.**

Acidification should only be performed by project coordinators or volunteers that have been approved and trained by LPP staff.

ACIDIFICATION PROCEDURE

1. Put on safety goggles and gloves.
2. Choose a location near a sink.
3. Secure the sample in test tube rack to facilitate easy and safe dispensing of acid.
4. Dispense 2 drops of 98% sulfuric acid.
5. Immediately recap the acid dropper and replace in secondary container.
6. Cap the acidified samples and gently invert 5 times to mix.
7. Carefully remove gloves so as not to touch exterior side of glove with bare hands and dispose in a safe container.



ANY QUESTIONS?

REVIEW

1. Nitrogen must be acidified within _____ hours of sample collection.

a 48

b 24

REVIEW

2. TP, TN, and Cl have hold times of

_____ .

a 28 days

b 18 days

REVIEW

3. All volunteers can perform nitrogen acidification.

a **True**

b **False**

REVIEW

4. How many drops of sulfuric acid are required to acidify one nitrogen sample?

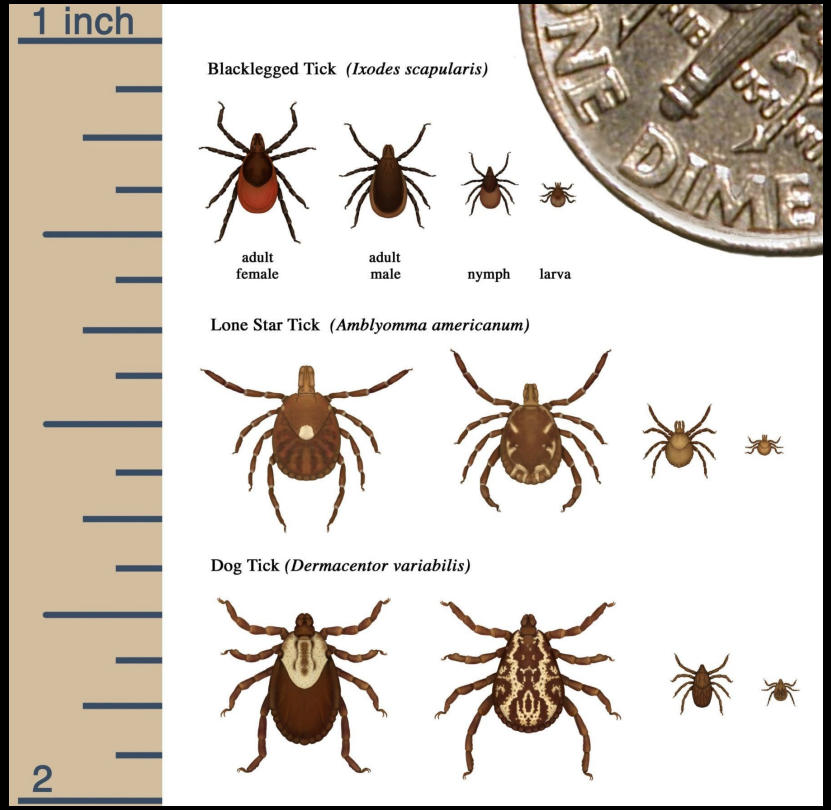
a **One**

b **Two**

SAFETY IN THE FIELD

- Carry a cell phone, sample with a partner, and let someone know where you are, when you intend to return, and what to do if you do not return on time.
- Honor private property rights. **Never cross a landowner's property without permission.**
- Never wade in swift or high water. Do not wade if depth is greater than knee-deep. **Do not monitor if the stream is at flood stage.**
- If possible, have a **first aid kit** and medical form for each volunteer.
- Be aware of the nearest hospital and how to get there.
- Listen to weather reports. **Never monitor if severe weather is predicted.**
- Do not walk on unstable stream banks.
- Be aware of wildlife, insects, and skin irritating plants.

TICK SAFETY



POISON PARSNIP
POISON IVY

BREAK

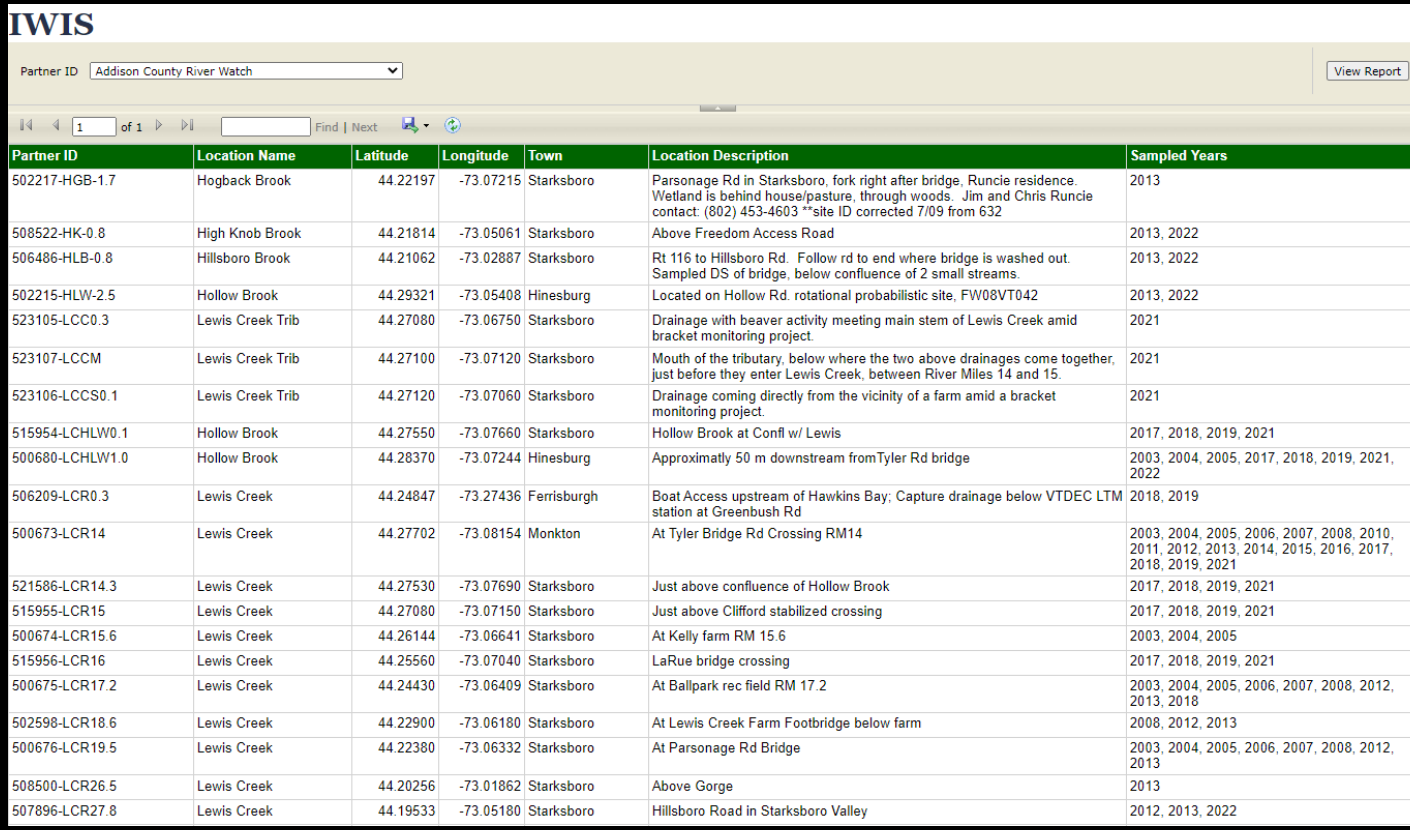
ACCESSING DATA

Partners will be emailed PDF copies of raw data from VAEL once samples have been analyzed. **This data has not gone through the full QAQC process and should not be shared with the public.**

All finalized and reviewed historic data is available via the **Water Chemistry Data Report** linked on the LPP website. Please use data directly from this report rather than the raw data from VAEL or the QC excel sheets.

2023 data will undergo review in Fall 2023. Our goal is to have data finalized by the end of winter.

MONITORING SITE DETAILS REPORT



IWIS

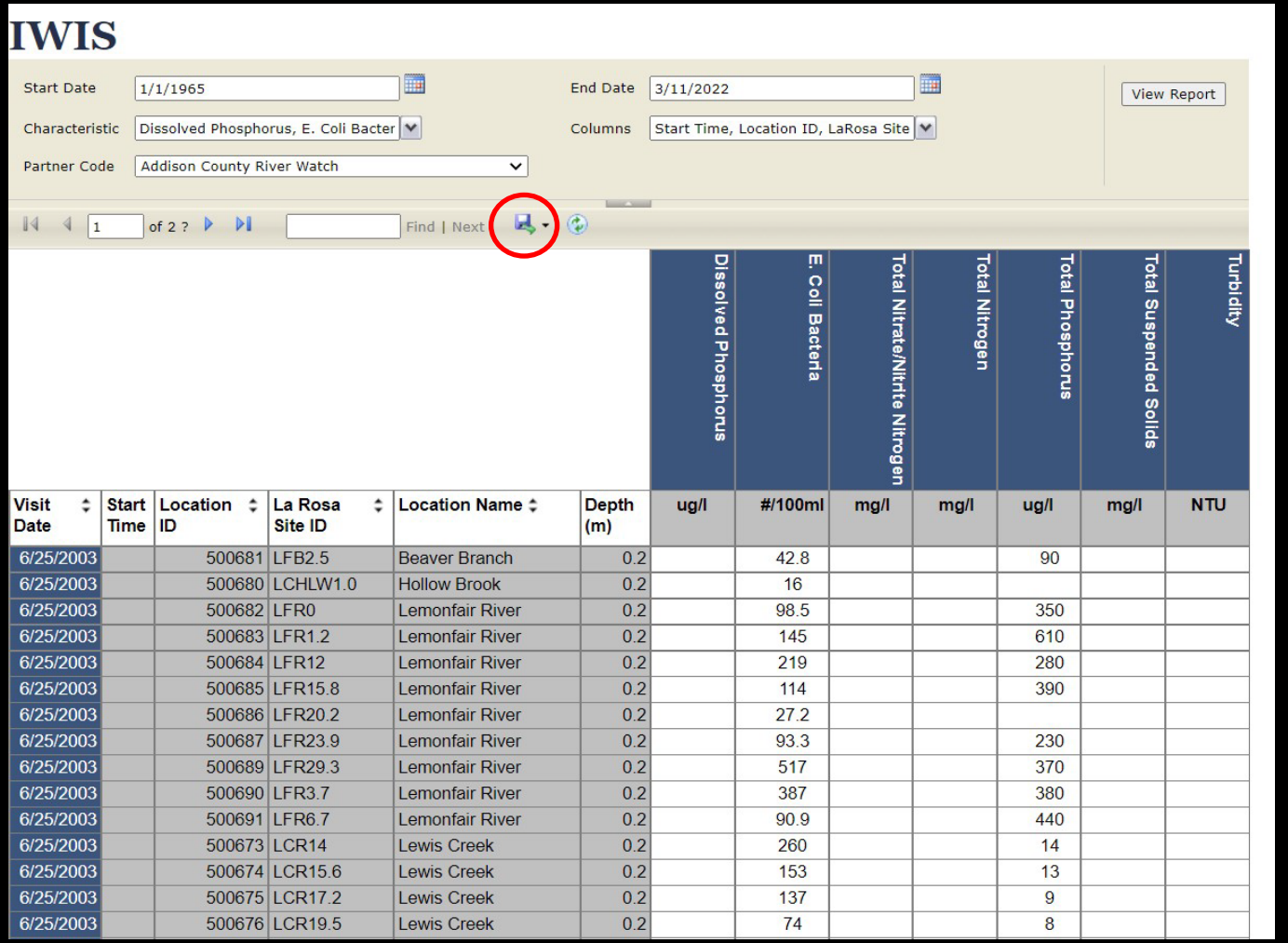
Partner ID: Addison County River Watch

View Report

1 of 1 Find | Next

Partner ID	Location Name	Latitude	Longitude	Town	Location Description	Sampled Years
502217-HGB-1.7	Hogback Brook	44.22197	-73.07215	Starksboro	Parsonage Rd in Starksboro, fork right after bridge, Runcie residence. Wetland is behind house/pasture, through woods. Jim and Chris Runcie contact: (802) 453-4603 **site ID corrected 7/09 from 632	2013
508522-HK-0.8	High Knob Brook	44.21814	-73.05061	Starksboro	Above Freedom Access Road	2013, 2022
506486-HLB-0.8	Hillsboro Brook	44.21062	-73.02887	Starksboro	Rt 116 to Hillsboro Rd. Follow rd to end where bridge is washed out. Sampled DS of bridge, below confluence of 2 small streams.	2013, 2022
502215-HLW-2.5	Hollow Brook	44.29321	-73.05408	Hinesburg	Located on Hollow Rd. rotational probabilistic site, FW08VT042	2013, 2022
523105-LCC0.3	Lewis Creek Trib	44.27080	-73.06750	Starksboro	Drainage with beaver activity meeting main stem of Lewis Creek amid bracket monitoring project.	2021
523107-LCCM	Lewis Creek Trib	44.27100	-73.07120	Starksboro	Mouth of the tributary, below where the two above drainages come together, just before they enter Lewis Creek, between River Miles 14 and 15.	2021
523106-LCCS0.1	Lewis Creek Trib	44.27120	-73.07060	Starksboro	Drainage coming directly from the vicinity of a farm amid a bracket monitoring project.	2021
515954-LCHLW0.1	Hollow Brook	44.27550	-73.07660	Starksboro	Hollow Brook at Confl w/ Lewis	2017, 2018, 2019, 2021
500680-LCHLW1.0	Hollow Brook	44.28370	-73.07244	Hinesburg	Approximatly 50 m downstream fromTyler Rd bridge	2003, 2004, 2005, 2017, 2018, 2019, 2021, 2022
506209-LCR0.3	Lewis Creek	44.24847	-73.27436	Ferrisburgh	Boat Access upstream of Hawkins Bay; Capture drainage below VTDEC LTM station at Greenbush Rd	2018, 2019
500673-LCR14	Lewis Creek	44.27702	-73.08154	Monkton	At Tyler Bridge Rd Crossing RM14	2003, 2004, 2005, 2006, 2007, 2008, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2021
521586-LCR14.3	Lewis Creek	44.27530	-73.07690	Starksboro	Just above confluence of Hollow Brook	2017, 2018, 2019, 2021
515955-LCR15	Lewis Creek	44.27080	-73.07150	Starksboro	Just above Clifford stabilized crossing	2017, 2018, 2019, 2021
500674-LCR15.6	Lewis Creek	44.26144	-73.06641	Starksboro	At Kelly farm RM 15.6	2003, 2004, 2005
515956-LCR16	Lewis Creek	44.25560	-73.07040	Starksboro	LaRue bridge crossing	2017, 2018, 2019, 2021
500675-LCR17.2	Lewis Creek	44.24430	-73.06409	Starksboro	At Ballpark rec field RM 17.2	2003, 2004, 2005, 2006, 2007, 2008, 2012, 2013, 2018
502598-LCR18.6	Lewis Creek	44.22900	-73.06180	Starksboro	At Lewis Creek Farm Footbridge below farm	2008, 2012, 2013
500676-LCR19.5	Lewis Creek	44.22380	-73.06332	Starksboro	At Parsonage Rd Bridge	2003, 2004, 2005, 2006, 2007, 2008, 2012, 2013
508500-LCR26.5	Lewis Creek	44.20256	-73.01862	Starksboro	Above Gorge	2013
507896-LCR27.8	Lewis Creek	44.19533	-73.05180	Starksboro	Hillsboro Road in Starksboro Valley	2012, 2013, 2022

WATER CHEMISTRY DATA REPORT



IWIS

Start Date 1/1/1965 End Date 3/11/2022 View Report

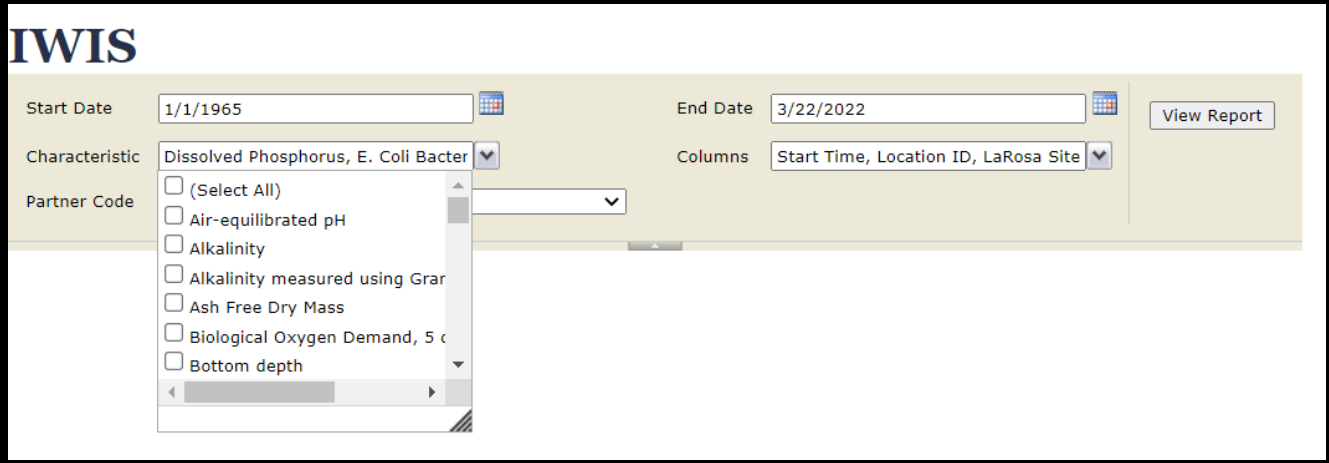
Characteristic Dissolved Phosphorus, E. Coli Bacter Columns Start Time, Location ID, LaRosa Site

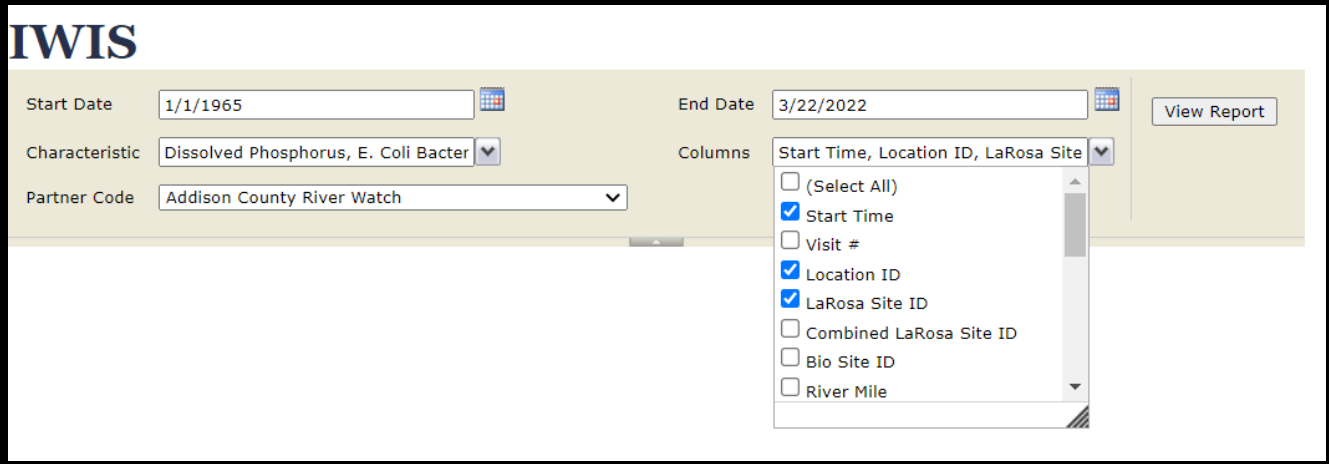
Partner Code Addison County River Watch

1 of 2 ? Find | Next

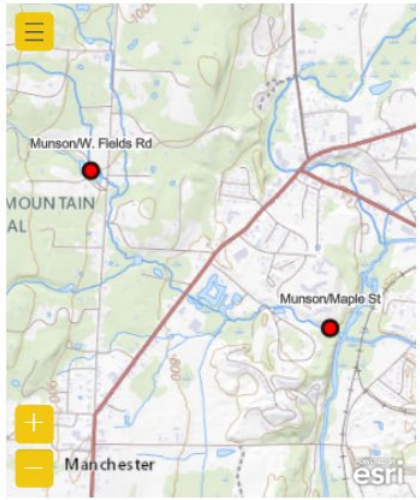
Visit Date	Start Time	Location ID	La Rosa Site ID	Location Name	Depth (m)	Dissolved Phosphorus ug/l	E. Coli Bacteria #/100ml	Total Nitrate/Nitrite Nitrogen mg/l	Total Nitrogen mg/l	Total Phosphorus ug/l	Total Suspended Solids mg/l	Turbidity NTU
6/25/2003		500681	LFB2.5	Beaver Branch	0.2		42.8			90		
6/25/2003		500680	LCHLW1.0	Hollow Brook	0.2		16					
6/25/2003		500682	LFR0	Lemonfair River	0.2		98.5			350		
6/25/2003		500683	LFR1.2	Lemonfair River	0.2		145			610		
6/25/2003		500684	LFR12	Lemonfair River	0.2		219			280		
6/25/2003		500685	LFR15.8	Lemonfair River	0.2		114			390		
6/25/2003		500686	LFR20.2	Lemonfair River	0.2		27.2					
6/25/2003		500687	LFR23.9	Lemonfair River	0.2		93.3			230		
6/25/2003		500689	LFR29.3	Lemonfair River	0.2		517			370		
6/25/2003		500690	LFR3.7	Lemonfair River	0.2		387			380		
6/25/2003		500691	LFR6.7	Lemonfair River	0.2		90.9			440		
6/25/2003		500673	LCR14	Lewis Creek	0.2		260			14		
6/25/2003		500674	LCR15.6	Lewis Creek	0.2		153			13		
6/25/2003		500675	LCR17.2	Lewis Creek	0.2		137			9		
6/25/2003		500676	LCR19.5	Lewis Creek	0.2		74			8		

WATER CHEMISTRY DATA REPORT





PAGE 1: WATER CHEMISTRY PLOTS



ProjectName

Bennington County Conservation District

LocationName

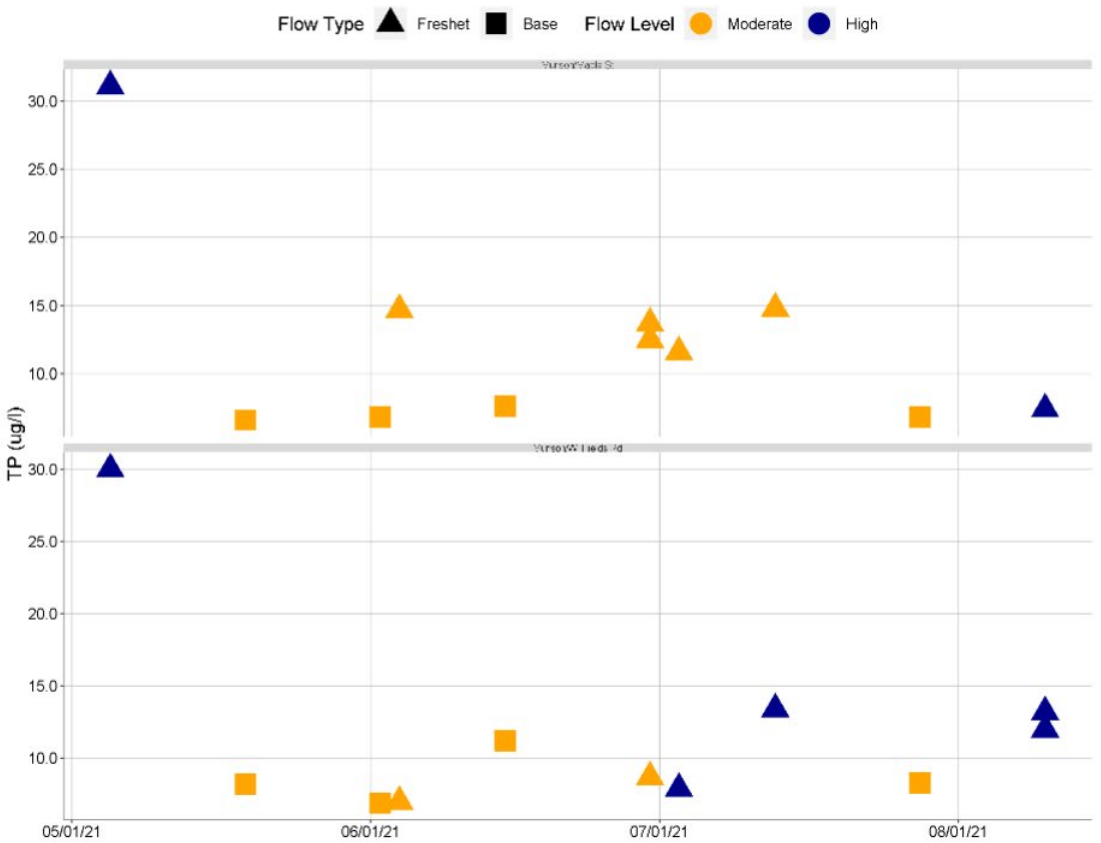
Munson Brook

CharacteristicID

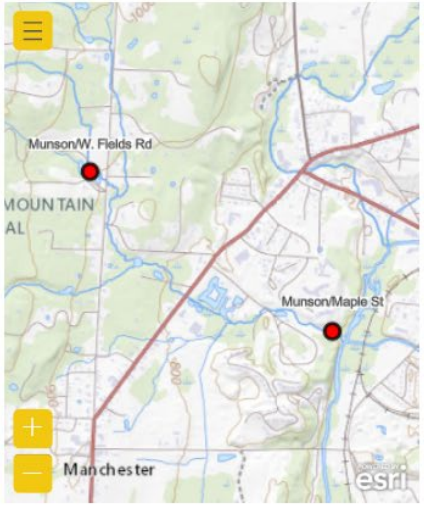
TP (ug/l)

Year

Multiple selections



PAGE 2: WATER CHEMISTRY BOX PLOTS



ProjectName

Bennington County Conservation District

LocationName

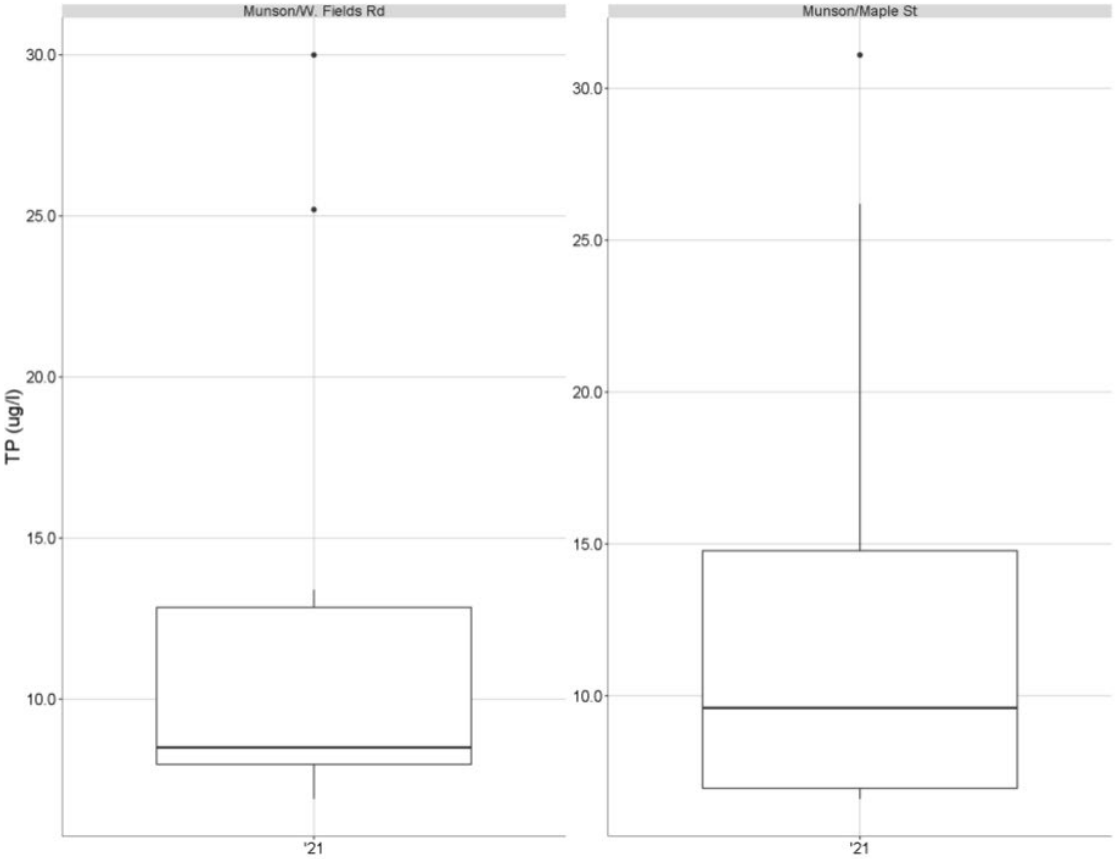
Munson Brook

CharacteristicID

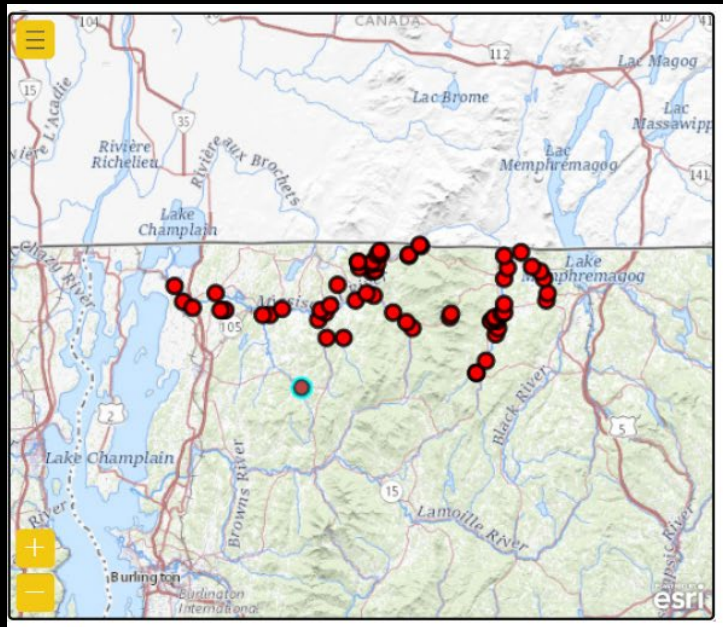
TP (ug/l)

Year

2021

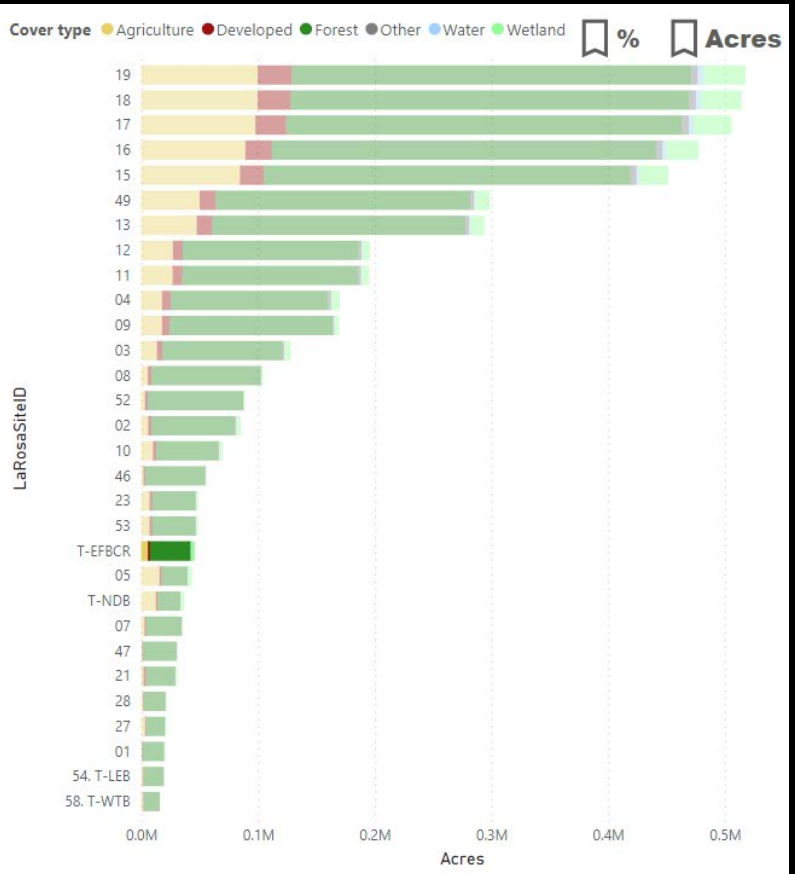


PAGE 3: LAND USE BAR CHARTS

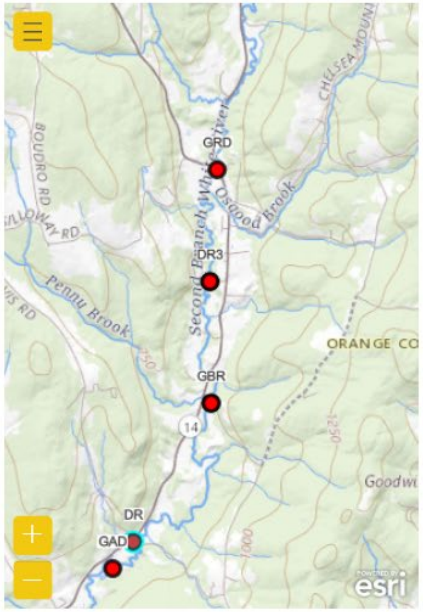


ProjectName
- Lake Rescue Association
- Lake St. Catherine - Green Mtn College
- Lake Willoughby-Westmore Association
- Missisquoi River Basin Association

LocationName
- Beetle Brook
- Black Creek
- Burgess Branch
- Coburn Brook



PAGE 4: FLOW LEVEL BOX PLOTS



ProjectName

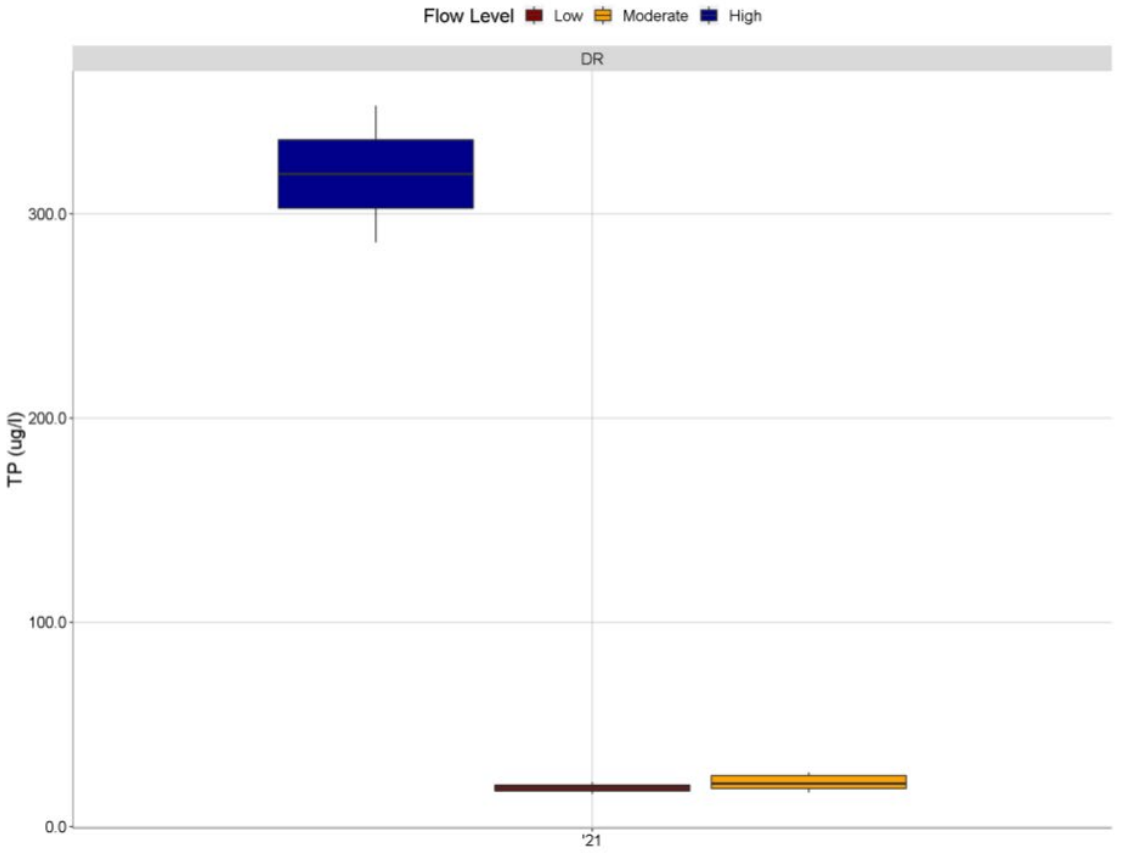
White River Partnership

LocationName

Second Branch White River

CharacteristicID

TP (ug/l)



ANY QUESTIONS?

Discussion on diversity, equity, & environmental justice in water monitoring

Ideas or thoughts on incorporating DEIJ principles in:

- Sampling site selection
- Outreach/education
- Data/information access
- Volunteer recruitment
- Building community partnerships