Catch the Hatch

A Community Science Project

by the Left Hand Watershed Center
Community Science Program

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Catch the Hatch

A Community Science Project

Volunteer Training Manual

By:

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~June 2021 ~

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PROJECT OVERVIEW

The Catch the Hatch community science project will track mayfly emergence in Boulder, Left Hand, North St. Vrain, and St Vrain Creeks to help inform watershed health. As you know, mayflies are sensitive to pollution and changing climate. Many scientific organizations sample aquatic insects in streams to inform water resource and land managers on changes in water quality throughout the region. However, so far it has been difficult to track the emergence and adult phase of these insects. It is important for us to capture these life phases as the emergence of mayflies is a critical life stage for reproduction and as a food source for fish.

Thank you for joining us this summer while fishing, recreating and enjoying your watershed as a Catch the Hatch volunteer! Your participation helps inform science! We will provide you with nets and sampling tools to capture and identify emerging mayflies. This year we will be tracking the emergence of the Pale Morning Dun, a mayfly species well known and loved by anglers and fish alike.

What Is Expected of Me?

As a volunteer contributor, you are expected to honor your time commitment and follow data collection and input protocols throughout the project, as well as have all data entered and return gear and samples upon project completion. Throughout the project, your time commitment includes signing up for one or more observation days at sampling locations, visiting the sampling location on those days, and making observations for a minimum of 30 minutes while you recreate on the creek. Data collection expectations include having the appropriate project-provided gear to successfully capture, identify, and collect mayfly observations. Data input expectations include filling out and storing a hard copy datasheet and entering data online on the citsci.org website or using the My Watershed mobile application.

Upon completion of the project, you are expected to return project-provided gear and all stored mayfly samples (labeled and stored in project-provided vials) to the Catch the Hatch team. You will be notified of gear and sample return options by the end of the project.

What Can I expect as a Volunteer from the Catch the Hatch Team

As a volunteer contributor, you can expect updates and information from the Catch the Hatch team throughout the project, as well as updates on how we use your data after project completion (analysis and reporting). Your data will be used to address our annual research questions and contribute to multi-year research questions and long-term data sets. This year's annual research questions will assess the accuracy of volunteer sub adult and adult Pale Morning Dun identification and the frequency and timing of sub adult and/or adult Pale Morning Dun observations during their peak emergence at three different creek locations. Our multi-year research questions compare presence of nymph and adult stages at these creek locations and assess changes in observations during peak emergence in relationship to creek temperature over time. Your data will also help develop and contribute to the National Phenology

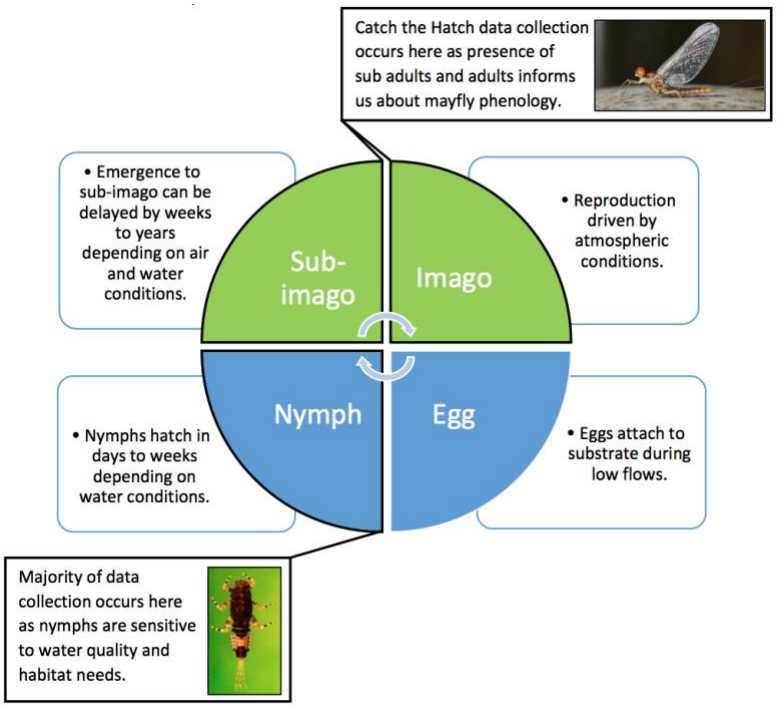
Network's mayfly phenology database, which is a collaborative effort to monitor impacts of climate change in the United States.

Project Timeline

The Catch the Hatch 2020 project will run from June 15 through July 15. Collectively, volunteer contributors will visit each site once a day throughout this project period to record site conditions and observe for sub adult or adult Pale Morning Duns. After July 15, all project materials and gear will be collected and data will be analyzed and reported.

RELEVANCE TO SCIENCE

The life cycle of aquatic insects is complex and spans multiple environments. Throughout the life cycle, aquatic insects occupy both aquatic and terrestrial habitats, and therefore, are sensitive to conditions in both of these environments. However, our scientific understanding of these organisms is heavily focused on aquatic life stages. The instream dwelling larval phase can last for years, while the adult terrestrial phase lasts for a matter of hours to days. Because there are fewer environmental variables for the aquatic larval phase, larval communities are commonly collected and analyzed as indicators of water quality conditions. However, far less is known about the distribution and phenology of adult stages. Tracking the emergence and flight of adult stages is not only critical for understanding population dispersal and reproduction, but also for understanding their sensitivity to changes in watershed conditions and ongoing climate change.



In our Front Range creeks, flow speeds and creek temperature are driven by annual snowpack and melt, which in turn, influence the emergence patterns of aquatic insects. However, these watershed conditions are expected to change as a result of climate change. Our effort to track emergence patterns of sensitive species in relationship to changing flows and temperature over time will be an important indicator of watershed health and ecosystem function, and their sensitivity to climate changes.

Mayflies and Pale Morning Duns

Mayflies are among the most sensitive groups to water quality and hydrologic conditions. Studies have shown that their emergence is correlated to the higher creek temperatures that follow peak flows in spring/early summer. The Pale Morning Dun (PMD) is well-known and easily identifiable species of mayfly that is found in the transition zone of the Front Range. Coupled with the fact that it has a short window of peak emergence compared to others mayfly species, PMDs are expected to be a strong indicator of watershed conditions for our observation sites.

Research Questions

RQ1. Can trained community volunteers accurately identify sub adult and/or adult Pale Morning Duns (*Ephemerella dorothea infrequens*) during their peak emergence from June 15 through July 15?

RQ2. What sampling time frame resulted in more correct observations of sub adult and/or adult Pale Morning Duns?

RQ3. Are Pale Morning Dun adult and nymph life stages present in the same location from year to year?

RQ4. How does presence of sub adults and adult Pale Morning Duns during peak emergence change over time in the transition watershed zone of Boulder, Left Hand, and North St. Vrain Creeks?

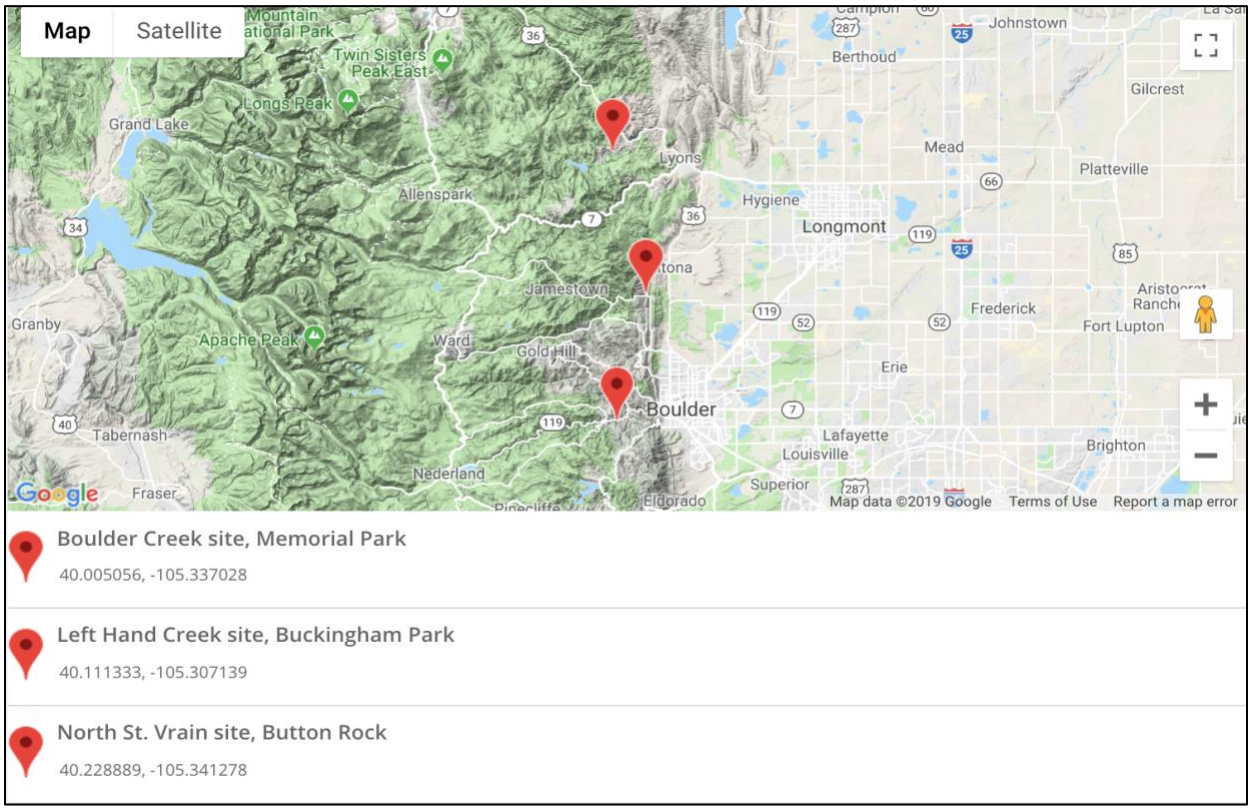
PROJECT LOGISTICS

As a volunteer for Catch the Hatch, you will use the following protocol and project-provided gear to collect observational data and store any samples needed. Here, we provide specific instructions for how to make observations, collect samples, and input data using a datasheet and the citsci.org Catch the Hatch project data portal and/or the My Watershed mobile app. Throughout the project, you will be able to make observations and track all project observations live!
(see: https://www.citsci.org/CWIS438/Browse/Project/Project_Info.php?ProjectID=2341)

Sign Ups

Use the project page to sign up for observation days. You are encouraged to sign up for multiple observations! Simplified instructions on how to sign up for observation days are available on the Catch the Hatch webpage.

(see: https://watershed.center/catch-the-hatch/)



As a volunteer, you will choose dates to visit sites on Boulder, Left Hand and North St. Vrain, and St Vrain Creeks. If possible, we request that volunteers commit to more than one observation day from June 15 through July 15 to help cover all possible days for each month. Volunteers should give sign up priority to days with no sign ups, however, multiple sign ups per day is fine. Collectively, our goal is to have one volunteer signed up for each day between June 15 and July 15.

Gear List

The Catch the Hatch Team will provide you with a Gear Kit and a list of items you need to bring. Please keep track of these items, as they will be returned upon project completion.

Gear Kit Contents to bring:

1. Hard Copy Datasheet- found in this packet and provided
2. Catch the Hatch Protocol- found in this packet
3. ID Guide- provided
4. 3-Piece Collapsible Net- provided
5. Pre-filled Sample Vial and Labels- provided
6. Thermometer- provided

What you will need to bring:

1. Timer/watch/phone
2. Camera/phone
3. Pencil
4. Optional: My Watershed installed on your mobile phone

Observation Day Overview

This is a brief summary of an observation day. Please refer to the Catch the Hatch Protocol and Technology and Data Entry instructions for more detail.

1. Prepare

Plan a time when you can visit a designated project site for at least 30 minutes. During this time, plan to fish, recreate, and enjoy your watershed, while also keeping an eye out for mayfly emergence and record observations.

2. Choose a Timeframe (or both!)

Visit a designated project site for at least 30 minutes between 11am and sundown to record observations of Pale Morning Dun (PMD) adults or sub adults. If possible, give priority to observations during the Tier 1 timeframe. **Please remember that observations of "No PMDs Present" are just as important as those finding PMDs!**

- Tier 1: 11am to 2pm. During this time, you will be looking for sub adults that have a characteristic "pale" appearance.
- Tier 2: 2pm to sundown. During this time, you will be looking for sub adult or adult forms. Adults have a darker appearance with clear wings.

An ID guide will be provided to all Data Catchers with images of PMD sub adults, adults, and look-alikes!

3. Collect Data

On-site data collection will include site information and photo, one water temperature measurement, time-stamped observations of sub-adult and/or adult PMDs (if found), and one captured PMD sample (if found) that will be stored in a project-provided vial. Data will be recorded on a hard copy paper datasheet and subsequently entered online on the citsci.org Catch the Hatch project website here.
(see: https://www.citsci.org/CWIS438/Contribute/DataEntryForms/DataEntryForm.php?FormID=2391)

Catch the Hatch Protocol

Step 1. Prepare. Prior to an observation, you should complete some important preparation steps listed below:

1. Register for Catch the Hatch project on citsci.org (see instructions under Technology and Data Entry, Registration Instructions below).
2. Participate a virtual training event (either with instruction or self-directed)
3. Receive a gear kit by coordinating a pickup or delivery with project staff on the Project Page (items listed in Observation Day Overview above)
4. Sign up for the creek site and observation date (see instructions under Sign Ups above)
5. Optional: download My Watershed app on your mobile phone.

Step 2. Choose a Timeframe. During preparation, plan a time when you can visit a designated project site for at least 30 minutes. There are two possible time frames between 11am and sundown to record observations of PMD adults and sub-adults. If possible, give priority to observations during the Tier 1 timeframe.

Remember that observations of "No PMDs Present" are just as important as those finding PMDs!

- **Tier 1: 11am to 2pm.** During this time, you will be looking for sub-adults that have a characteristic "pale" appearance (see ID guide).

  Sub-adults may be emerging from the creek's surface, a time when they are metamorphosing from larvae (nymph) to sub-adult. They are also vulnerable prey to fish- makes good fishing!

  You may also find sub-adults flying from creek shoreline, where they will rest and morph into full adults. Even if you don't see them actively emerging, be sure to check the shoreline substrate and vegetation for resting sub adults or adults.

- **Tier 2: 2pm to sundown.** During this time, you will be looking for sub-adult or adult forms. Adults have a darker appearance with clear wings.

  Sub-adults or adults may be found along substrate or vegetation. You may also find adults flying in the air as they prepare to mate. After mating, females will return to the water's surface to lay their eggs. They will be vulnerable to predators one last time!

Step 3. Navigate to Observation Site. The Catch the Hatch webpage provides coordinates, navigation option, and written out instructions on how to get to each creek location.
(see: https://watershed.center/catch-the-hatch/)

To review: creeks, site names, coordinates, and simple instructions are listed below:

1. **Boulder Creek- Memorial Park**: 40.005056, -105.337028

   From Eben G. Fine Park on Boulder Canyon Drive, continue up Boulder Canyon Drive for 3 miles. After driving through tunnel, turn Left onto pull off. Site location includes entire section of creek accessible from the park pull off. Follow instructions on protocol upon arrival.

2. **Left Hand Creek- Buckingham Park**: 40.111333, -105.307139

   From US-36 W in Altona, turn Left onto Lefthand Canyon Drive for 2.5 miles. Turn right into parking area at Buckingham Park. Site location includes entire section of creek both upstream and downstream of parking lot. Follow instructions on protocol upon arrival.

3. **North St. Vrain Creek- Button Rock**: 40.228889, -105.341278

   From Lyons, head northwest on US-36 W for 4 miles. Turn Left onto Longmont Dam Road for 3 miles. Parking area for Button Rock will be on your left. Site location includes entire section of creek accessible from the parking lot. Follow instructions on protocol upon arrival.

Step 4. Make an Observation and Record Data.

Remember to always use a paper datasheet and store photos on your phone or camera! Then, after returning to your computer or cellular connectivity, enter data to the website and/or My Watershed

A. Record site information. Upon arrival, record the following site information and data:

- Recorder (datasheet only)
- Date
- Site Name: Boulder Creek- Memorial Park, Boulder Creek- Eben. G. Fine, Left Hand Creek- Buckingham Park, North St. Vrain Creek- Button Rock, St. Vrain Creek- Bohn Park
- Arrival Time: date and time
- Weather: clear, hail, wind, rain, overcast, partly cloudy

B. Take a site photo. Take a landscape photo that captures both edges of the creek using your mobile phone. Please take and store all site photos locally to your phone or camera and upload with your data on the website or My Watershed app later.

C. Take a creek temperature and record. During your site visit, take one water temperature measurement. Submerge and leave you thermometer in slower moving water, or a place it will

not wash away. Leave the thermometer submerged for 5-10 minutes. Record temperature reading.

D. Observe for PMDs. While you fish, recreate, and enjoy your watershed, look on the water's surface, vegetation, and substrate for sub-adult and adult PMD. Remember that depending on the time of day, you may see sub-adults or adults emerging, resting, or flying. See Step 2. instructions for further details.

If you see mayflies or any insect you suspect may be a PMD, please use your aerial net and ID guide to capture and identify.

E. Record observations. If you do not observe and/or capture and identify adult or sub-adult PMDs during your site visit, then record 'No' for visual observation data next to both adult and sub-adult life stages and 'No' for sample storage.

If you do observe and/or capture and identify adult or sub-adult PMDs during your site visit, then record 'Yes' for visual observation data and the observation time next to the applicable the life stage, adult or sub-adult. If your PMD was captured and identified, then proceed to Step 5. instructions before you end your observation.

We would like a captured sample for all recorded 'Yes' observations! Try your best to limit 'Yes' observations without capturing, identifying, and storing a sample.

F. End your observation. After you have finished making observations and enjoying your time on the creek, record your time of departure. Your departure time is when you leave the creek site- this can be hours after a PMD observation!

Step 5. Sample storage and photo. If you have captured and identified an adult or sub-adult PMD, then take a photo of the sample and carefully transfer it into a project provided vial for storage until the end of the project. Multiple samples per vial are welcome! You can take a photo before or after placing it in the vial- or both. The citsci.org website and My Watershed app can upload multiple photos.

Using a strip of paper (use post-it note, Rite in the Rain, or card stock; printer paper will degrade) and pencil, label your sample with the site name, date, and time. Place the paper label into your vial and screw your cap on tightly.

Please store your vials in a cool, safe place! They are filled with 80% ethanol solution. We recommend storing vials in the plastic bag for safe keeping in and out of the field.

While making observations, be sure to fill out the datasheet below. Then upload data on the citsci.org website or the My Watershed app. Additional copies of datasheets will be provided depending on your observation needs.

Datasheet

LEFT HAND watershed center

Catch the Hatch Datasheet

Instructions: Please fill out the following information.

Main:

Date: _____

Recorder: _____

Site Name: _____

Comments: _____

_____

Site Data:

Arrival Time: _____

Weather conditions: Clear Hail Wind Rain Overcast Partly cloudy

Creek Temperature (F): _____

Did you see adults? Yes No

If yes, what time? _____

Did you see sub-adults? Yes No

If yes, what time? _____

Did you store a sample? Yes No

Departure Time: _____

Photo: *Please take and upload a site photo and photos of captured adult or sub-adult Pale Morning Duns.*

Technology and Data Entry

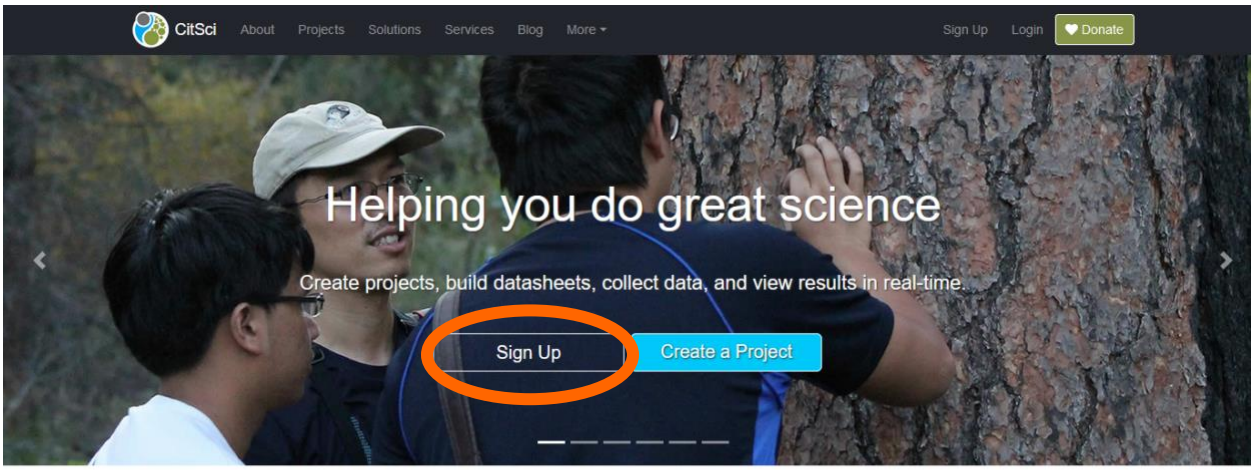
As a volunteer for Catch the Hatch you will use multiple forms of technology to collect and enter data so we can ensure excellent data quality and storage and avoid any accidental data loss. Above all, we ask you use and store a paper datasheet to enter data of your observations each day (the datasheet is provided in this manual and your packet). You may then transfer your hand-written data directly into the online datasheet on the citsci.org website or the My Watershed app that will upload your observation to our project website on citsci.org.

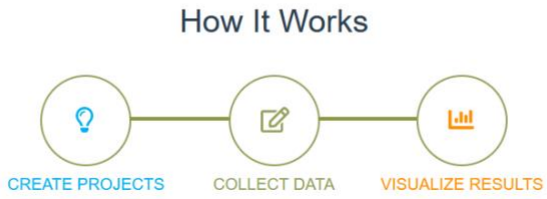
Below are: 1. Website registration instructions (must complete before and observation for either data entry option), 2. data entry instructions using the website after a site visit, and 3. data entry instructions using the My Watershed app (with Android screenshots, iOS are similar).

Website Registration on CitSci.org

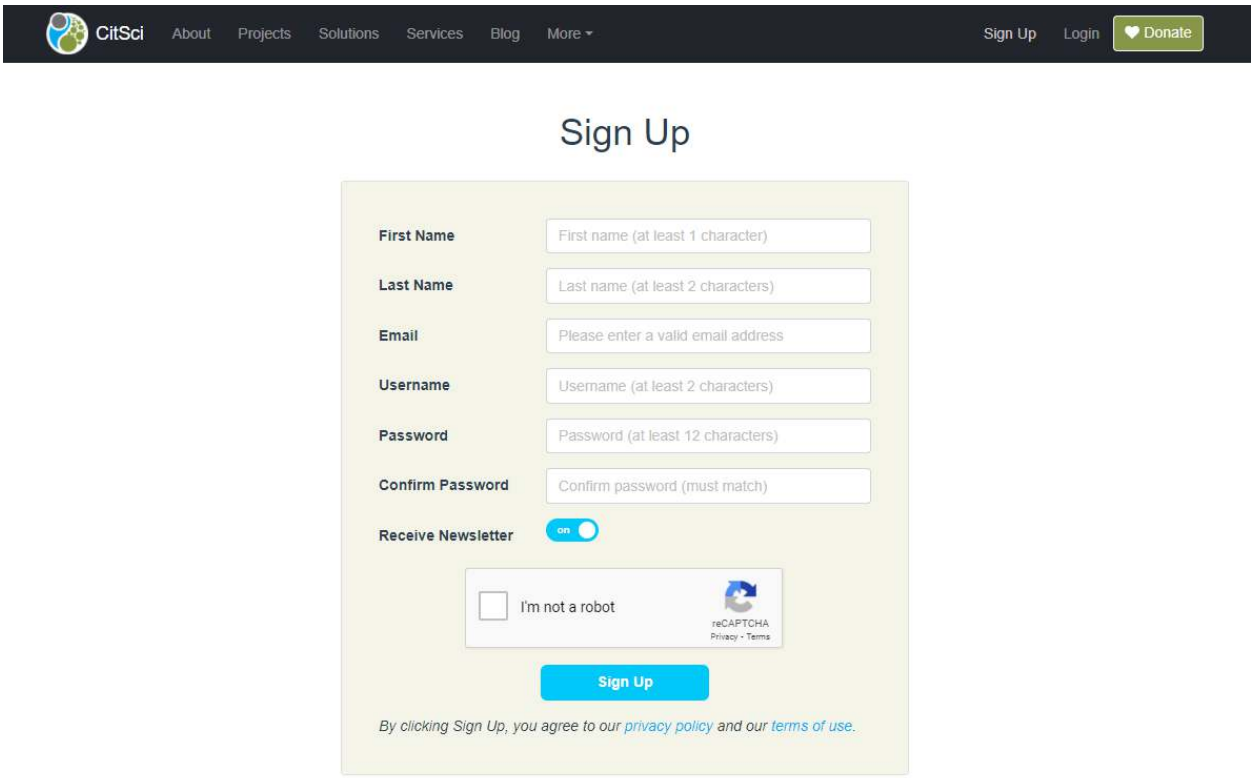
Step 1: Before heading out to make observations, create your account on the website, CitSci.org.

Important 2021 Update: Citsci.org is undergoing a facelift! We anticipate a new website launch June 10-13, 2021. If you are a returning volunteer: you will be asked to create a new password once the launch is complete. If you are a new volunteer: we recommend waiting until AFTER the launch to create your account, otherwise you will also be asked to update your password after the update!





Fill out the registration information and click Submit. You will receive an email with a link that you must click to validate your email.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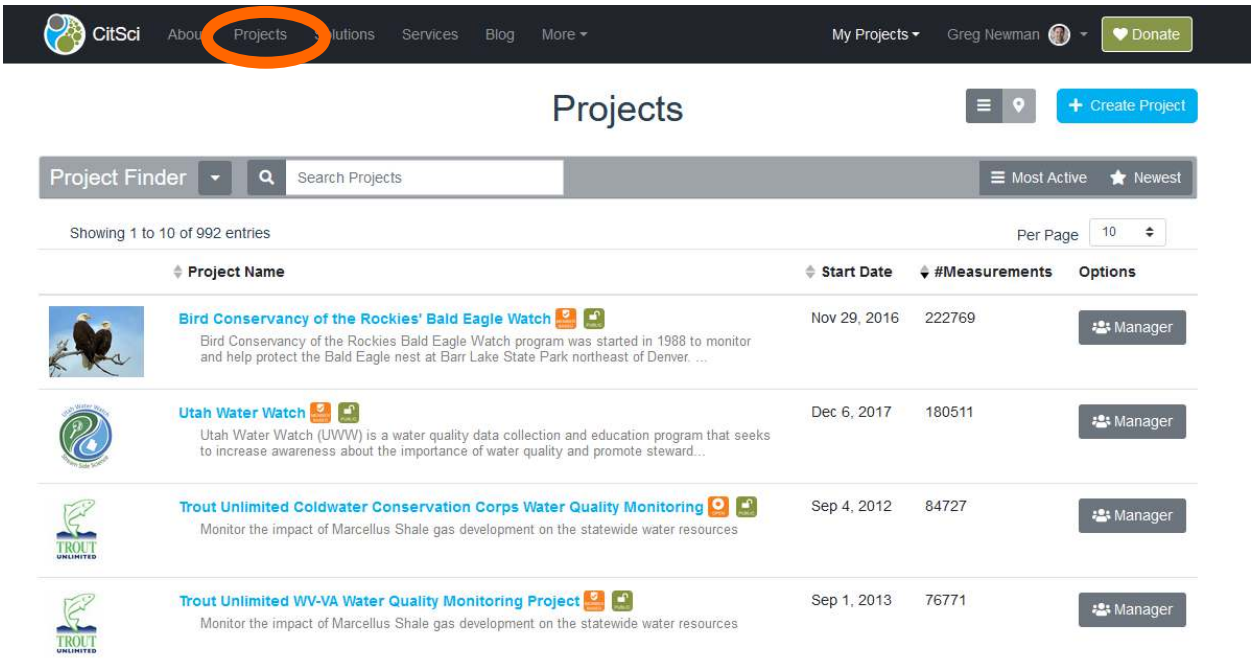
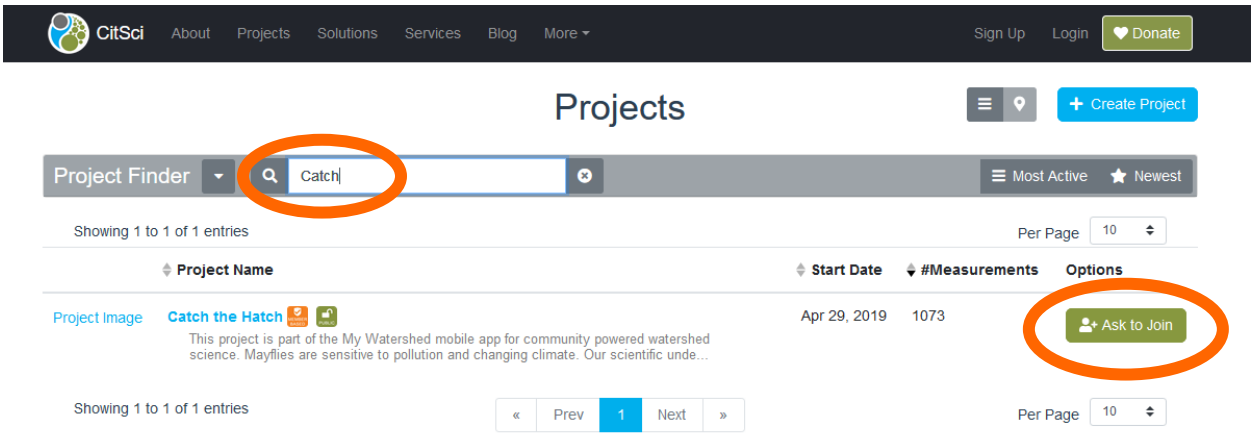
Sign Up
Login
Donate
Sign Up
First Name
First name (at least 1 character)
Last Name
Last name (at least 2 characters)
Email
Please enter a valid email address
Username
Username (at least 2 characters)
Password
Password (at least 12 characters)
Confirm Password
Confirm password (must match)
Receive Newsletter
on
I'm not a robot
reCAPTCHA
Privacy - Terms
Sign Up
By clicking Sign Up, you agree to our privacy policy and our terms of use.

Step 2: Join the “Catch the Hatch” project

Once you’ve validated your email address and logged in, find the “Catch the Hatch” project by clicking on the “Projects” link in the navigation bar.

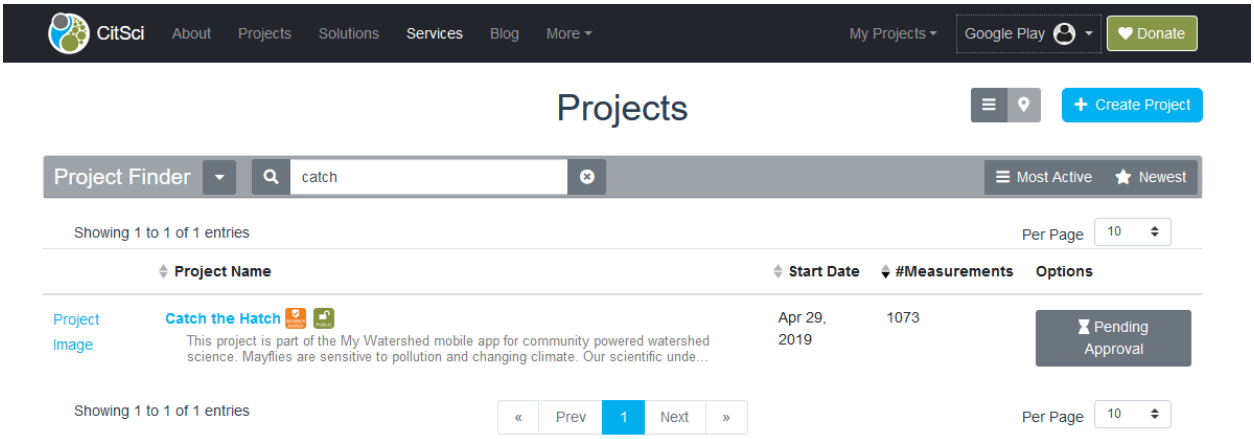


In the search bar, type in “Catch the Hatch”, then click the “Ask to Join”.



Your request to join will be submitted and the button will switch to say “Pending Approval.” An email will be sent to the project manager notifying them of your request. You will also receive an email entitled “Thank you for requesting to join the Catch the Hatch project”. Once the project manager

approves your request, you will receive an email notifying you that your request to join catch the Hatch has been approved.

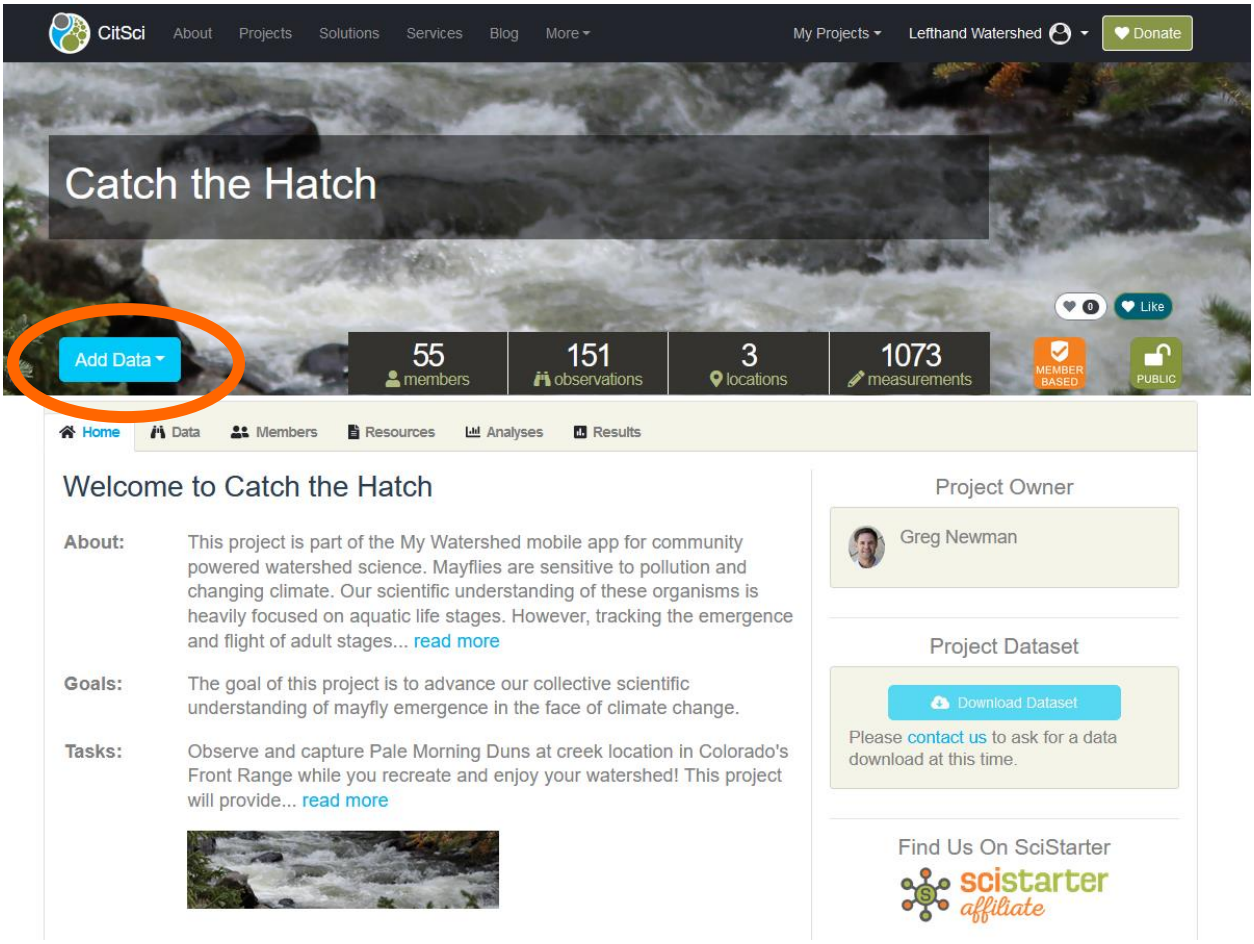


Data Entry Instructions for the Website

Make sure you have completed steps 1 & 2 from the Website Registration Instructions above before entering data with the website.

Step 1: Log in to the website, citsci.org, and go to the Catch the Hatch project page

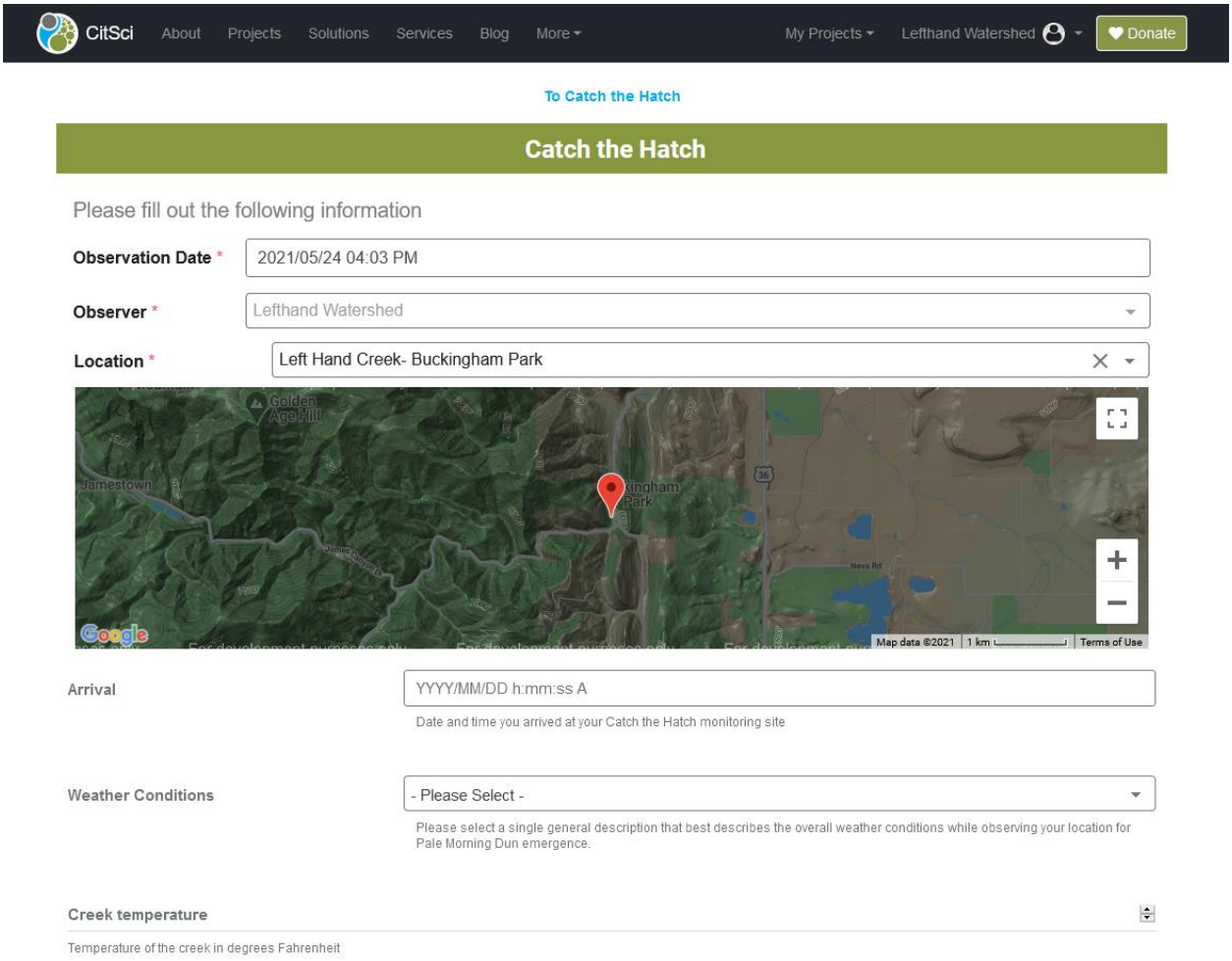
Navigate to https://citsci.org, and log in. Once logged in, click on the "My Projects" dropdown in the upper right corner of the website and select "Catch the Hatch". This will take you to the main project page seen below.

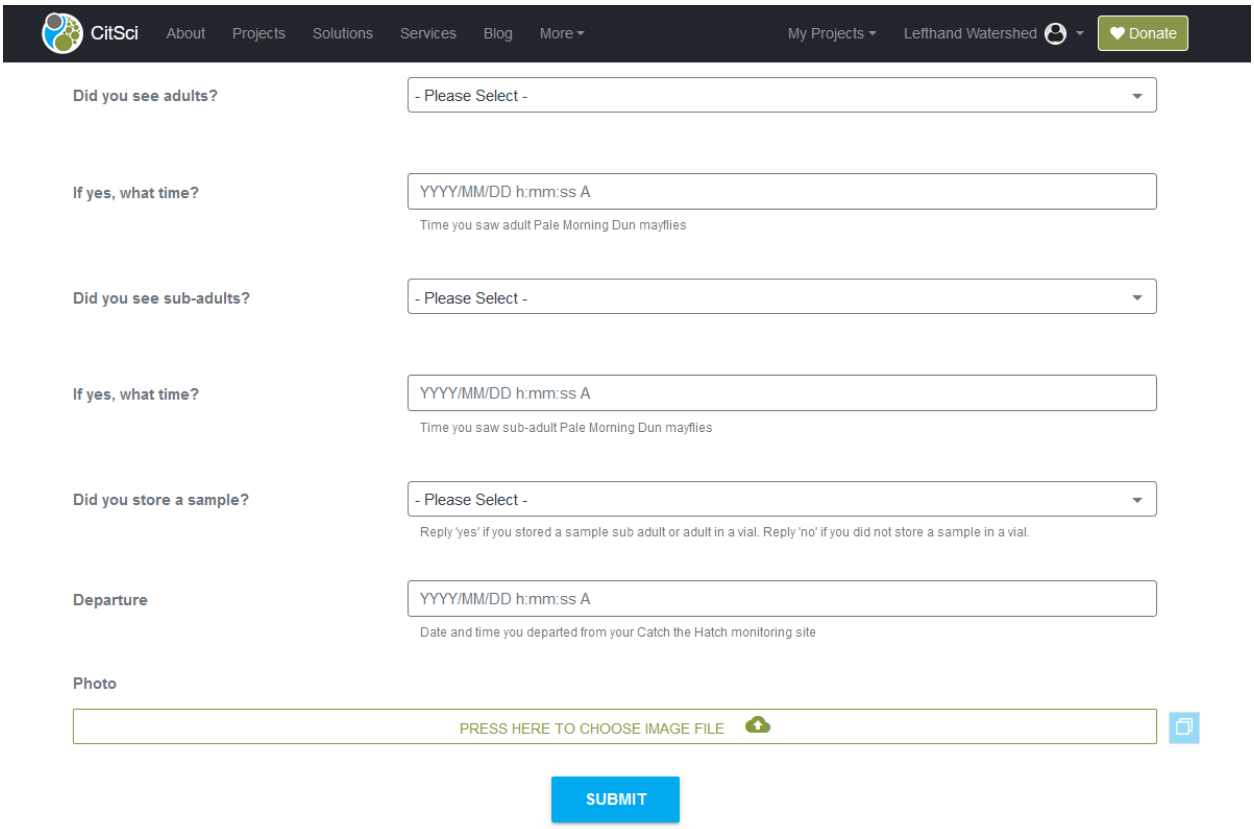


Step 3: Access the Catch the Hatch datasheet and enter data

Click on the “Add Data” button to go directly to the form to submit data. Enter the following data:

- Date of Observation: Date of observation, Recorder (should show your name).
- Location Information: select your observation location from drop down menu.
- Enter Arrival Time, Weather Conditions, Creek Temperature, Adult and Sub-Adult observations and times (if observed), whether you stored a PMD sample or not, and Departure Time.
- Photos: upload all observation photos including site photo and photos of captured adult or Sub-Adult PMDs.

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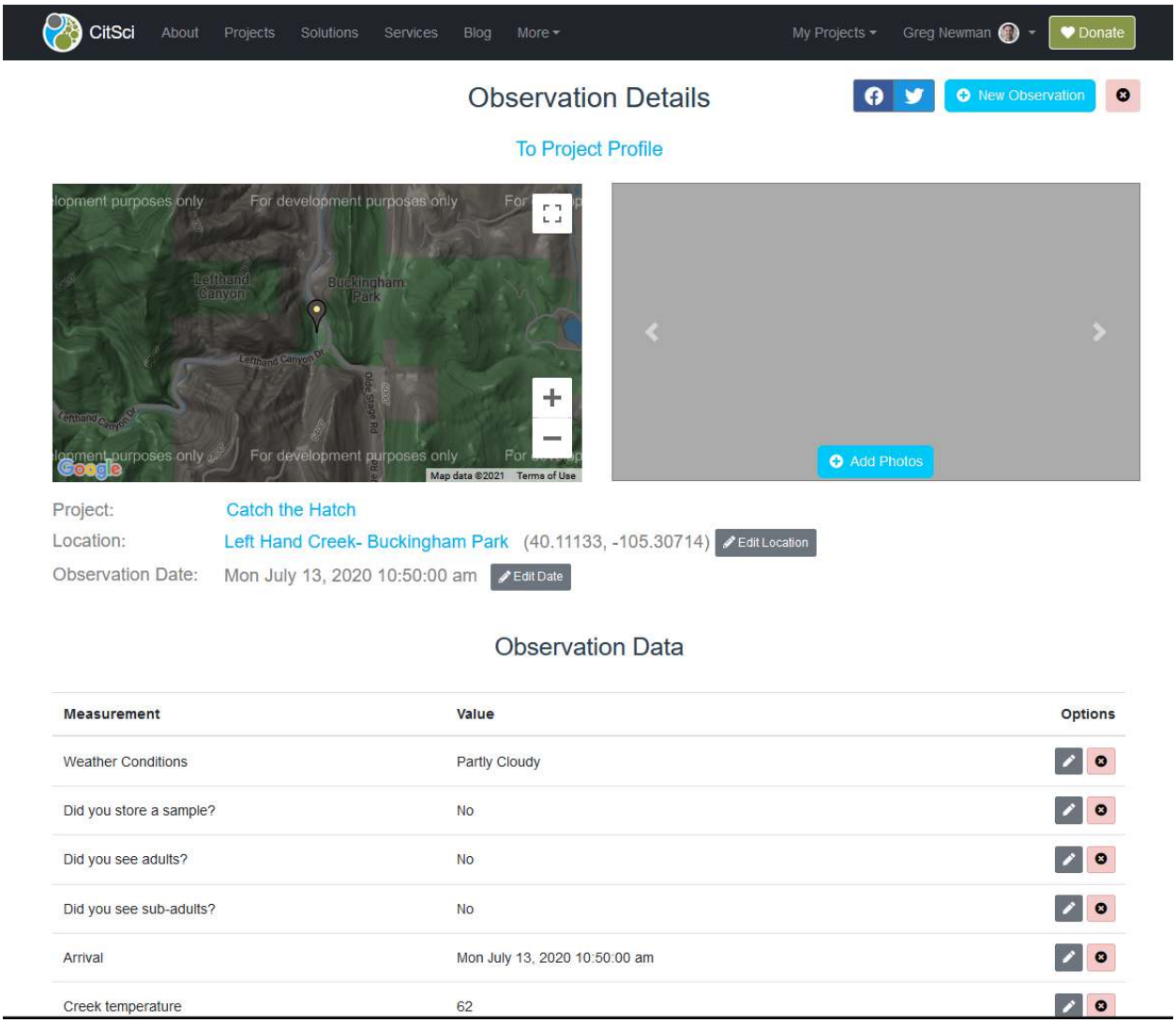
Lefthand Watershed
Donate
Did you see adults?
- Please Select -
If yes, what time?
YYYY/MM/DD h:mm:ss A
Time you saw adult Pale Morning Dun mayflies
Did you see sub-adults?
- Please Select -
If yes, what time?
YYYY/MM/DD h:mm:ss A
Time you saw sub-adult Pale Morning Dun mayflies
Did you store a sample?
- Please Select -
Reply 'yes' if you stored a sample sub adult or adult in a vial. Reply 'no' if you did not store a sample in a vial.
Departure
YYYY/MM/DD h:mm:ss A
Date and time you departed from your Catch the Hatch monitoring site
Photo
PRESS HERE TO CHOOSE IMAGE FILE
SUBMIT

Step 4: Review the observation data you've entered

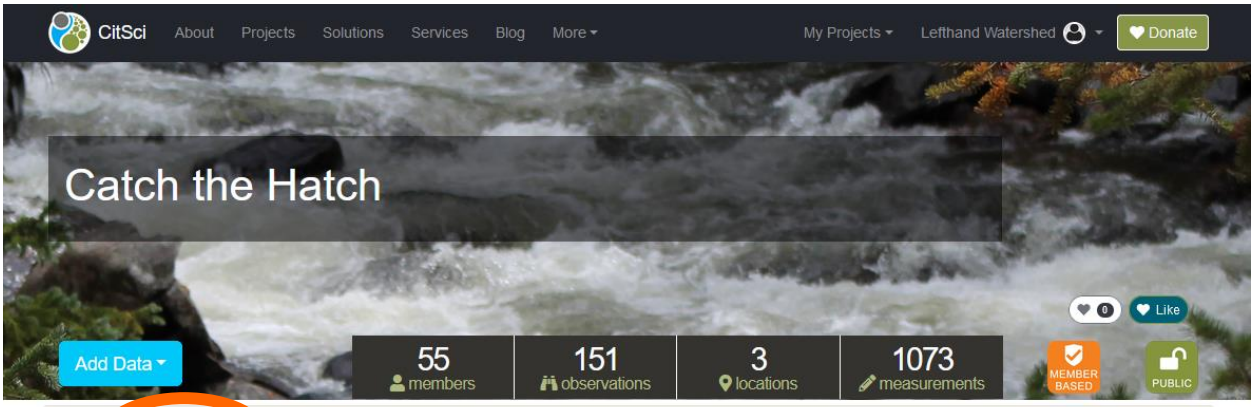
Check all entered data points. Then, click on the "Submit" button at the bottom of your datasheet. Once you submit and observation, you will be taken to the "Observation Details" page below, where you will have the ability to review or edit your submitted data.

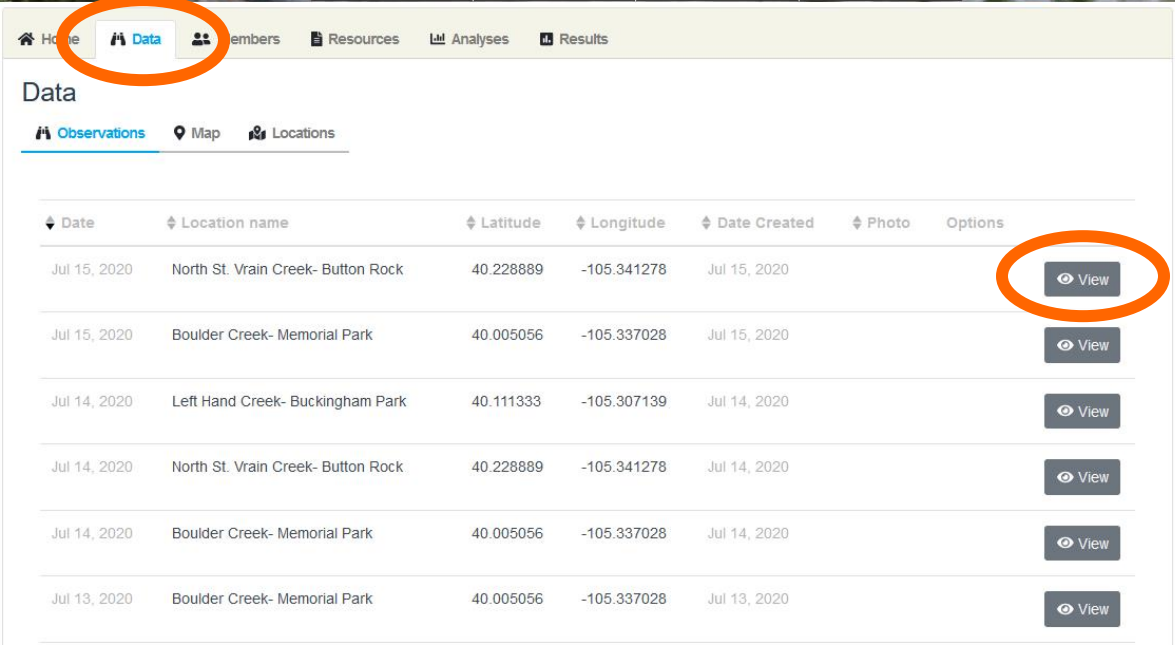


Step 5: View the project's main profile page on the website to confirm your data has been submitted properly or view all data submitted to the project

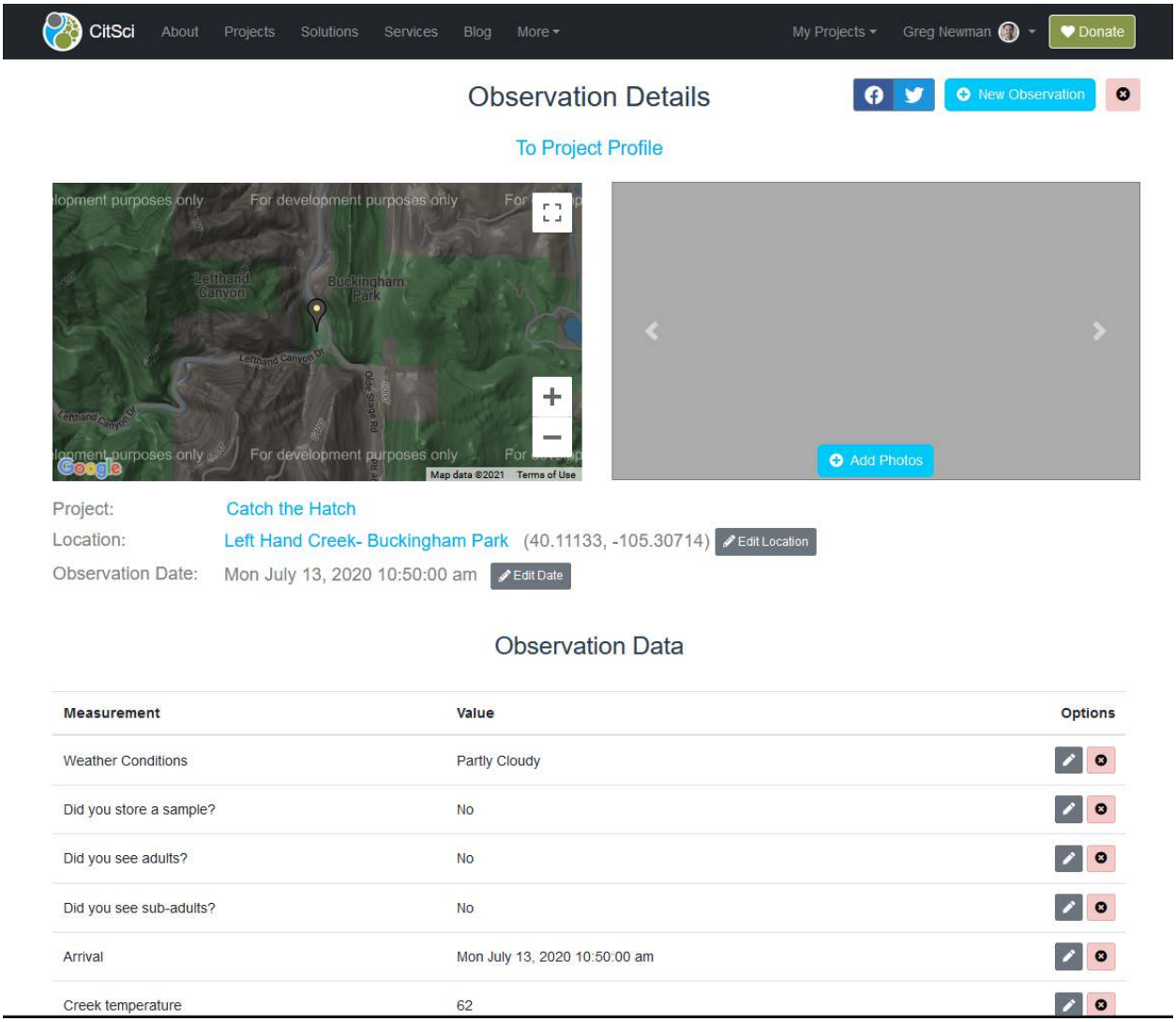
Navigate to "https://citsci.org", and log in. Once logged in, click on the "My Projects" dropdown in the upper right corner of the website and select "Catch the Hatch". This will take you to the main project page seen below.

Click on the "Data" tab to view a list of all observations submitted to the project. You should see your observation at the top of the table (first row) because it will be the most recent observation submitted. Click the "View" button at right corresponding to your observation.





After clicking on the observation's "View" button, this will take you to the same "Observation Details" page you saw before, displaying the data you entered. Here, you will be able to view your observation on a map and have the ability to edit or delete any of the data you've entered.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My Projects
Greg Newman
Donate
Observation Details
New Observation
To Project Profile
For development purposes only
Lefthand Canyon
Buckingham Park
Lefthand Canyon Dr
Old Stage Rd
Map data ©2021
Terms of Use
Add Photos
Project: Catch the Hatch
Location: Left Hand Creek- Buckingham Park (40.11133, -105.30714) Edit Location
Observation Date: Mon July 13, 2020 10:50:00 am Edit Date
Observation Data
Measurement
Value
Options
Weather Conditions
Partly Cloudy
Did you store a sample?
No
Did you see adults?
No
Did you see sub-adults?
No
Arrival
Mon July 13, 2020 10:50:00 am
Creek temperature
62

Data Entry Instructions for My Watershed app

Make sure you have completed steps 1 & 2 from the Website Registration Instructions above before entering data on the My Watershed app.

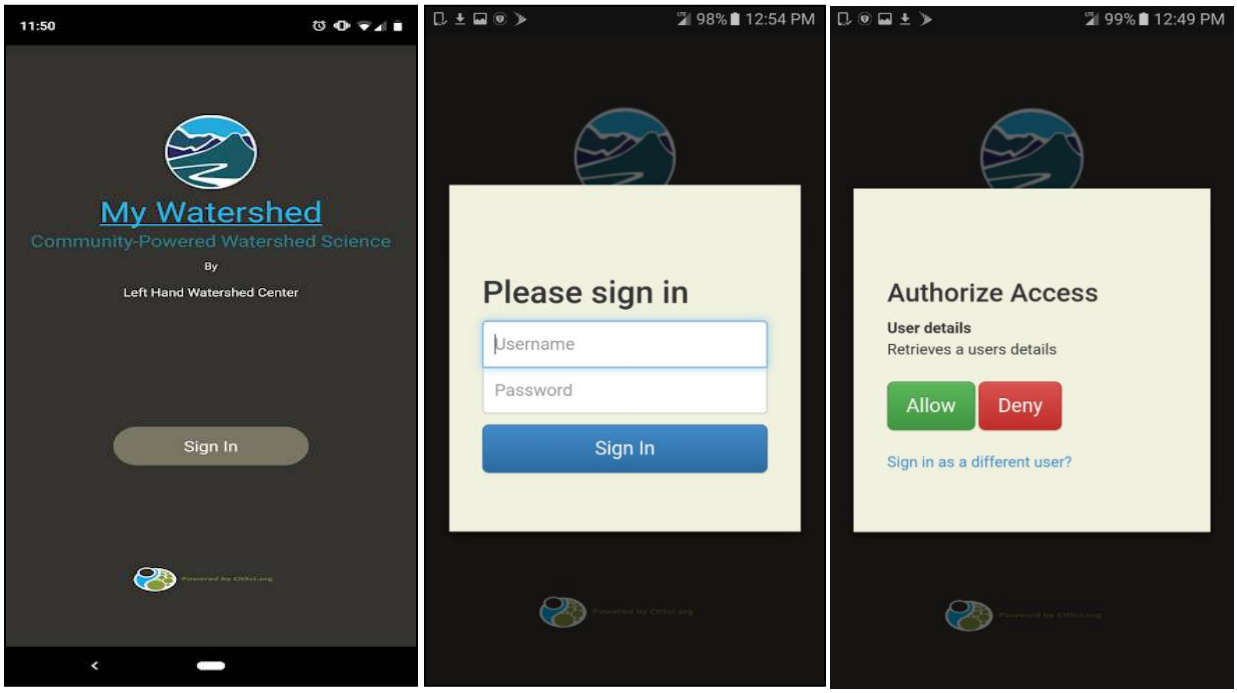
Due to some glitches (that are currently being worked on), please fill out a paper datasheet and store photos locally to your phone while in the field. Then, when you return to connectivity, you can upload data and photos to the app's datasheet.

Step 1: Download and install the My Watershed mobile app

Before heading to the field, search for and install the My Watershed mobile app from the Google Play or Apple app store.

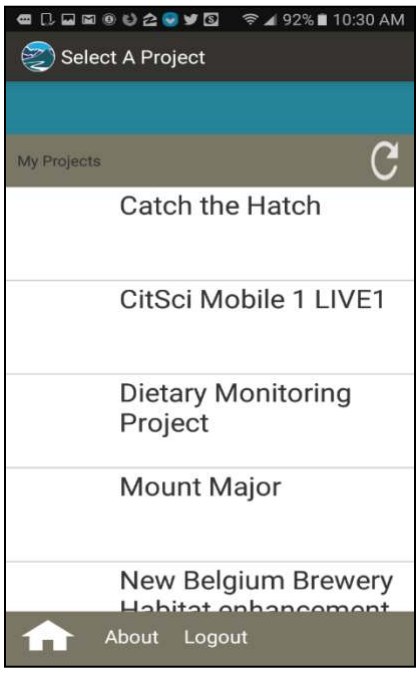
Step 2: Sign in to the app and let it automatically sync projects & datasheets

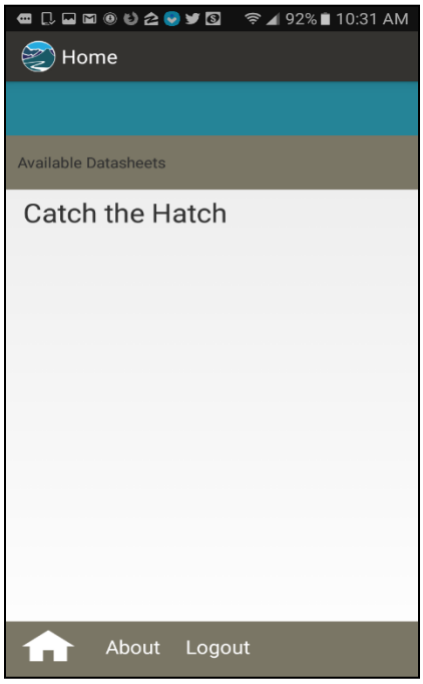
Use your registration credentials from citsci.org to log in. The app will ask you to "Authorize Access" - click "Allow".



You must always log in to the My Watershed app before use. If you fail to log in before uploading data, you may incur an upload error or be asked to log in before an observation upload.

Step 3: Select “Catch the Hatch” project from the project list and “Catch the Hatch” datasheet from the datasheet list





Step 4: Select “Catch the Hatch” datasheet, upload data and photos, save the observation, and submit/upload it to the website.

Once you’ve selected your project and datasheet on the mobile app home screen, click on the “Add Observation” button to take you to the datasheet. You will see 3 tabs on the datasheet labeled “Main”, “Species”, and “Site Data”. NOTE: you will not be entering any data in the “Species” tab.

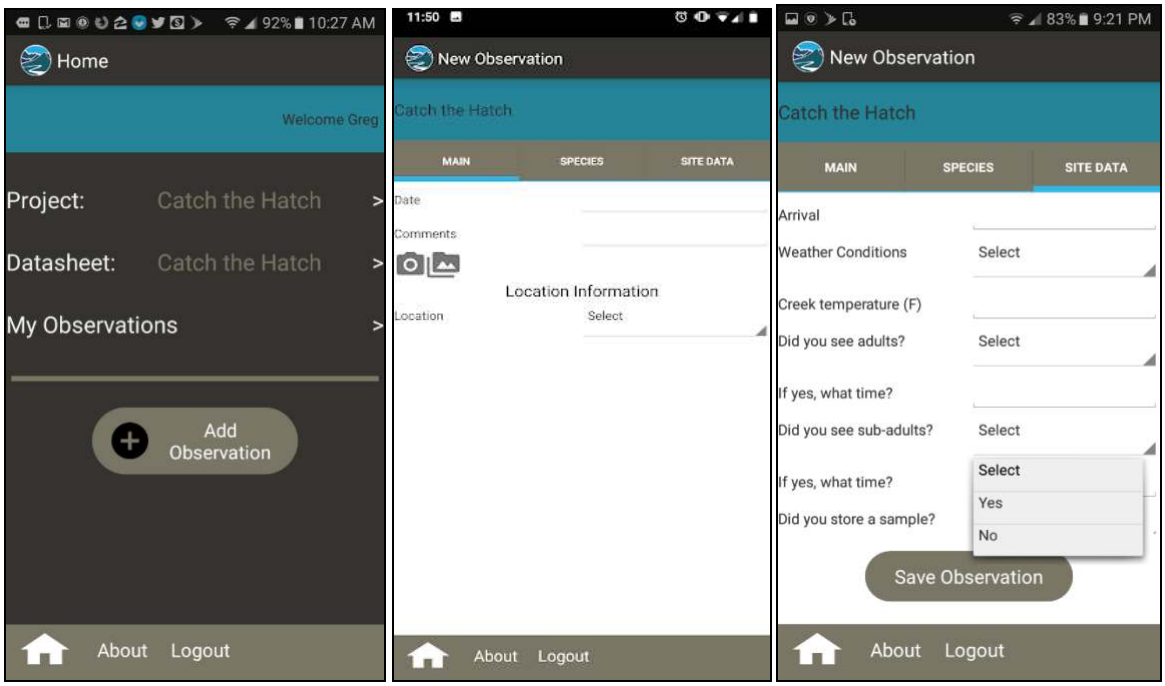
Under the “Main” tab, you will need to fill out the following data:

- Date of observation
- Comments (if applicable)
- Photo: upload site photo(s) and a photo of sampled PMDs in your net or vial (if applicable)
- Location Information: select your observation location from drop down menu

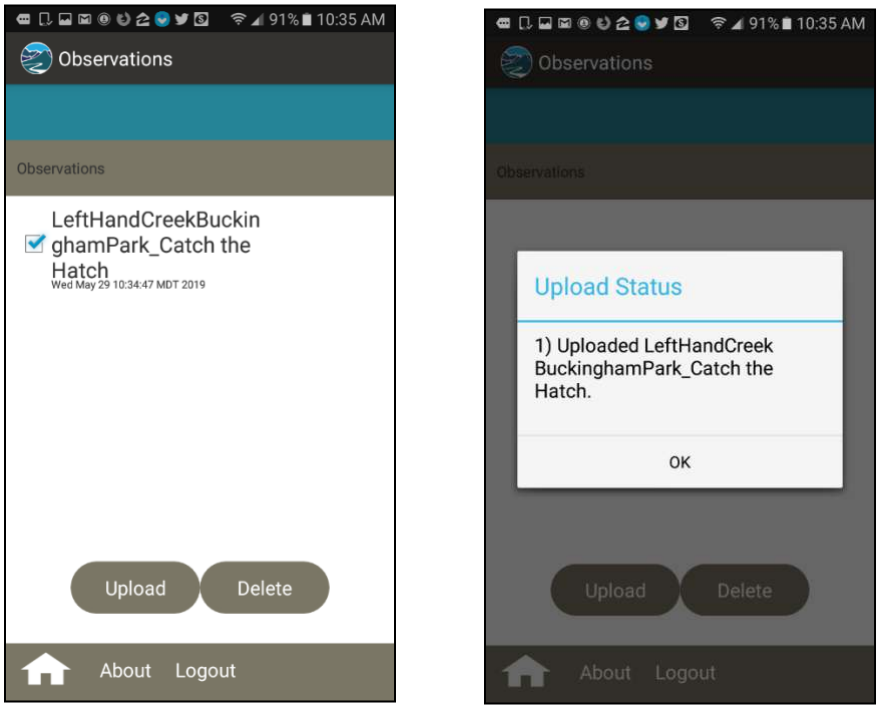
Under the “Site Data” tab you will fill out the following data:

- Arrival Time, Weather Conditions, Creek Temperature, Adult and Sub-Adult observations and times (if observed), whether you stored a PMD sample or not, and Departure Time

Once all data are filled out and all photos are uploaded, click the “Save Observation” button. Clicking this button will save the observation to your phone, but will not yet submit the observation to the website.



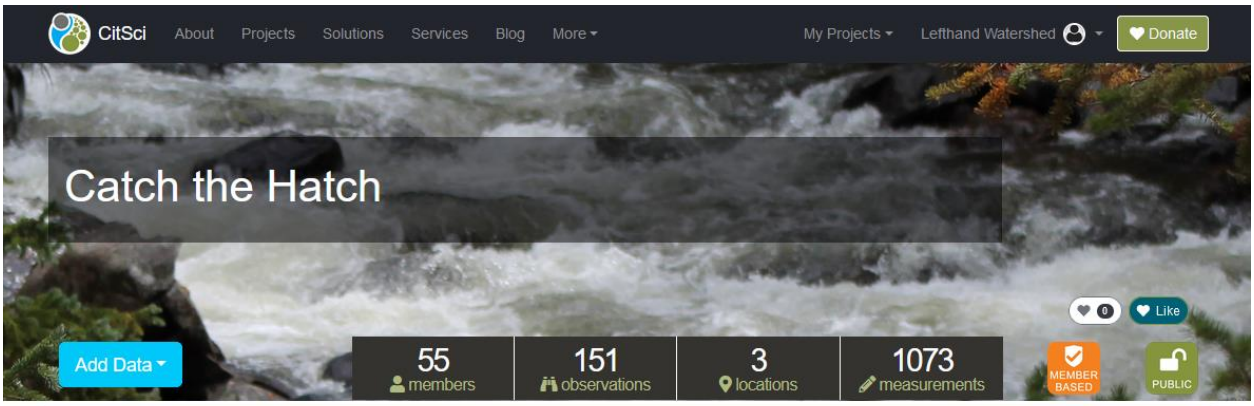
After you save your observations you will return to the "Catch the Hatch project page. You may then click on "My Observations", highlight the observation you would like up upload to the website, click upload (on iOS, please upload one at a time).

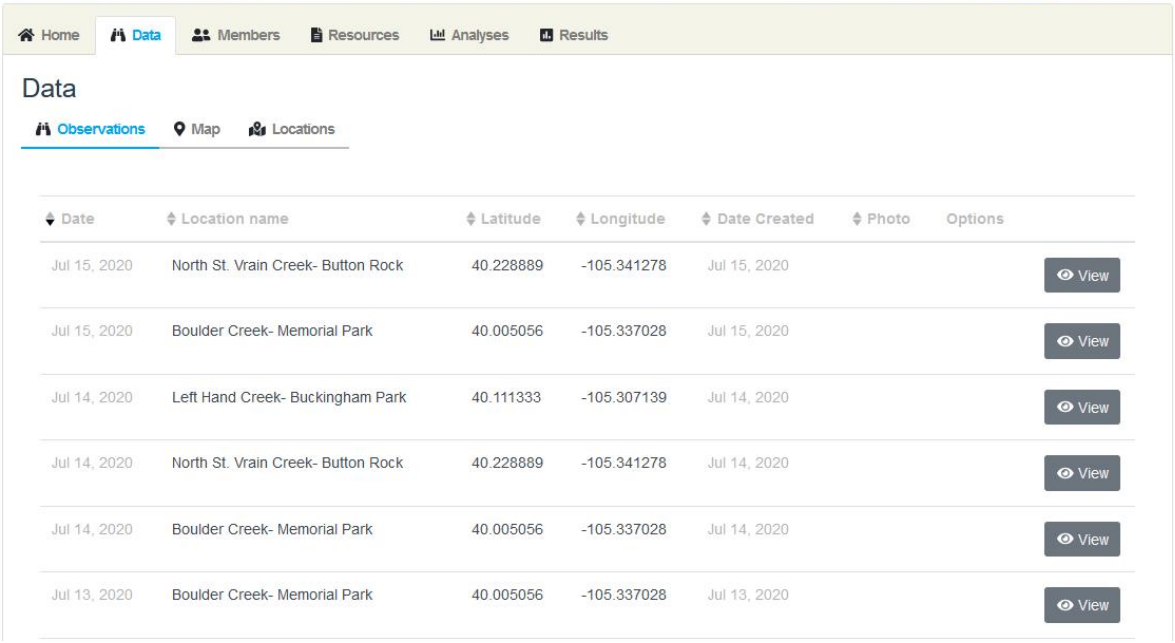


Step 5: View the project's profile page on the website to confirm your data has been submitted properly or view all data submitted to the project

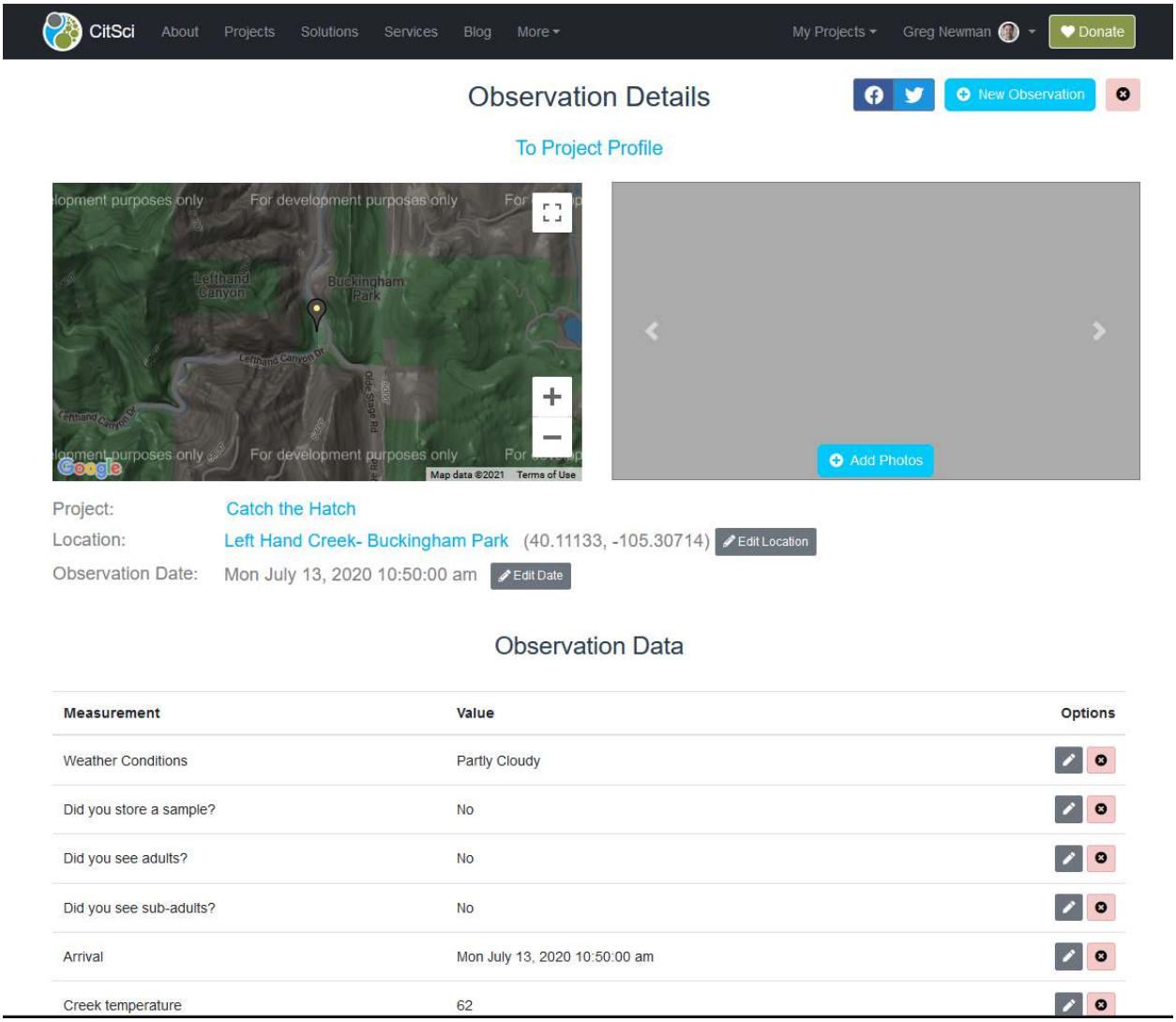
Navigate to https://citsci.org, and log in. Once logged in, click on the "My Projects" dropdown in the upper right corner of the website and select "Catch the Hatch". This will take you to the main project page seen below.

Click on the "View Data" tab to view a list of all observations submitted to the project. Then click the "View" button corresponding to your observation.





After clicking on the observation's "View" button, this will take you to the "Observation Details" page, displaying the data you entered. Here, you will be able to view your observation on a map and have the ability to edit or delete any of the data you've entered.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For development purposes only
Lefthand Canyon
Buckingham Park
Lefthand Canyon Dr
Old Stage Rd
Map data ©2021
Terms of Use
Add Photos
Project:
Catch the Hatch
Location:
Left Hand Creek- Buckingham Park
(40.11133, -105.30714)
Edit Location
Observation Date:
Mon July 13, 2020 10:50:00 am
Edit Date
Observation Data
Measurement
Value
Options
Weather Conditions
Partly Cloudy
Did you store a sample?
No
Did you see adults?
No
Did you see sub-adults?
No
Arrival
Mon July 13, 2020 10:50:00 am
Creek temperature
62