

Sargassum Watch - Citizen Science Protocol

Thank you for participating in the citizen science portion of the Sargassum Watch project. Your observations and input mean a lot to us.

The Marine Macroalgae Research Lab at Florida International University (MMRL-FIU) is part of a network in the Caribbean Region dedicated to monitoring the invasions of pelagic Sargassum on Caribbean beaches. While satellite imagery can estimate the abundance of Sargassum influx in the region, local observations are just as valuable in refining the actual scope of the Sargassum landing on Caribbean coasts.

The app needed for the Sargassum Watch is **Epicollect5**. Epicollect5 is a free, open-source citizen science app that is both compatible with Android and IOS. This app was originally developed in Imperial College, London and has since been used on a variety of citizen science projects. The app is used for on-site observations, but can also be used for off-site, previous observation submissions. The app interface follows a “survey” model that asks for questions to be filled out and photos to be uploaded.



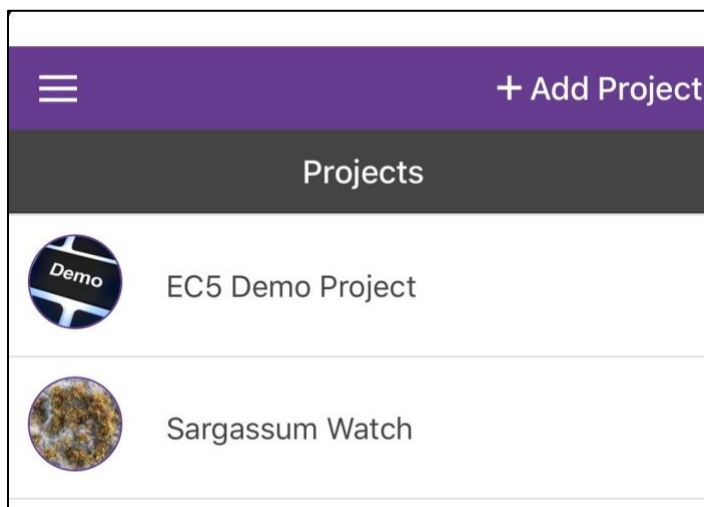
epicollect5

Follow the directions below to record Sargassum in the field:

Step 1: Download the Epicollect5 App onto your smartphone, if you haven't done so already. Open the App.

Step 2: On the top right hand corner, click on "+ Add project."

Step 3: Search for "**Sargassum Watch**". Once found, click on the project name. The *Sargassum Watch* project should be on your main page.



Step 4: Click on the Sargassum Watch Project, and near the top-right corner, click on "+ Add entry".

Step 5: You may receive a message requesting location access while using this app. This is necessary for GPS coordinates. Click on "Allow".

Step 6: Follow the directions as outlined in the Sargassum data sheet. *In situ* observations allow you to automatically record date, time, and GPS coordinates of location.

Step 6.1: The first five pages will ask for date, time, GPS coordinates, site name, and region name. All sections are required. The date, time, and GPS will automatically calculate for your on-site observation.

Sargassum Datasheet

Date of Observation (dd/MM/YYYY)

** This field is required*

Apr 16, 2019

The date selected is: 16/04/2019

Clear Done

January	13	2016
February	14	2017
March	15	2018
April	16	2019
May	17	2020
June	18	2021

Sargassum Datasheet

Time of Observation (HH:mm:ss)

** This field is required*

2:53 PM

The time selected is: 14:53:00

Clear Done

11	50	
12	51	
1	52	AM
2	53	PM
3	54	
4	55	

Step 6.2: Type the site name and region name. Region can be the state, territory, island, country, etc.

Sargassum Datasheet

GPS Coordinates of Site

Update location

Latitude 25.757606

Longitude -80.372996

Accuracy 65

Sargassum Datasheet

Site Name (e.g. Miami Beach)

** This field is required*

Miami Beach

Sargassum Datasheet

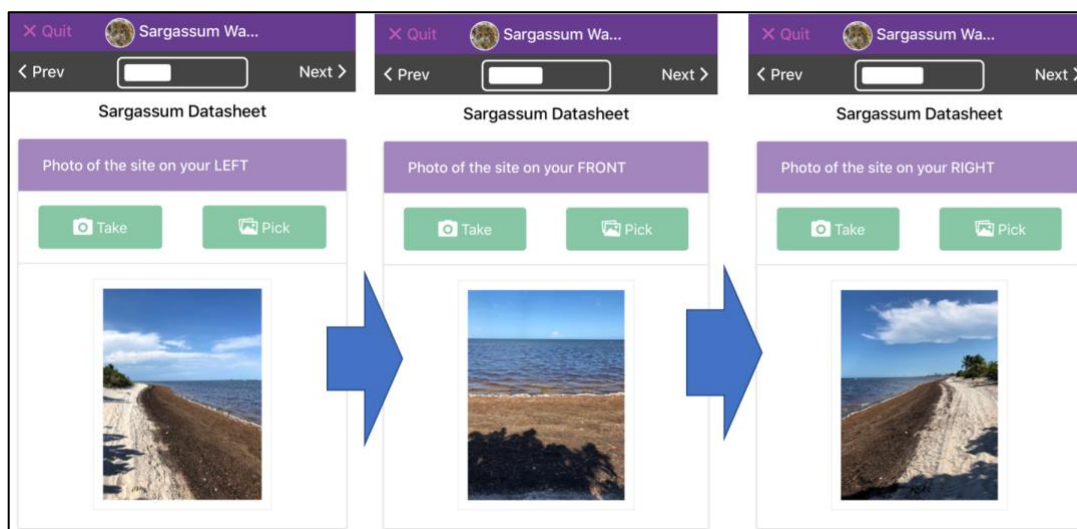
Region Name (state, territory, country, etc.)

** This field is required*

Florida

Step 6.3: The next three pages will ask you to take photos of the site at different angles. For on-site observations, click on “Take.” The screen should change to a camera to take

the photo. Examples of these results are shown below:



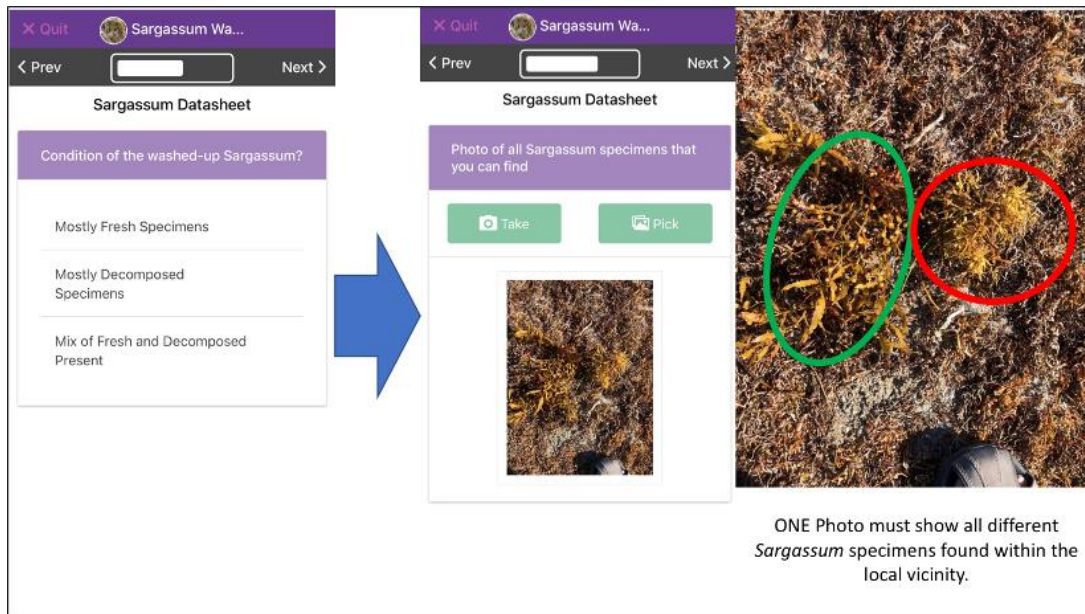
Step 6.4: The next two pages will ask you for evidence of site cleanup. Click on the response if there is evidence. The next page will ask for you to select all evidence found at your site. Click on all applicable evidence that you find. Skip the next page if you answered “no” or “not applicable” on page 9.

 The image shows two sequential screenshots of the 'Sargassum Datasheet' app. Both have the same purple header and navigation bar as the previous images. The first screenshot asks 'Evidence of recent site cleanup? (Machines, tire tracks, grinded Sargassum incorporated into sand, etc.)' with three radio button options: 'Yes', 'No', and 'Not Applicable'. A large blue arrow points to the second screenshot, which asks '(If you answer "yes") Check all evidences of site cleanup found (skip if "no")'. This screen has five radio button options: 'Large tire tracks', 'Trucks or tractors', 'People raking Sargassum', 'Sargassum buried in sand', and 'Other (specify in "additional observations")'.

Step 6.5: The next two pages will ask you for the Sargassum specimens. First, determine whether the Sargassum is fresh, decomposing, or a mix. The next page will ask for one “photo of all Sargassum specimens that you can find.”

It is preferred that you find fresh specimens of different types that you can distinguish. You also need to have the specimens distinct from each other and fit inside one photo.

Example submissions and labeled quality are shown below:



ONE Photo must show all different *Sargassum* specimens found within the local vicinity.



Good example

Specimens collected are fresh, separate from the accumulated piles, and morphological characteristics are clear to observe



Okay example

Specimen collected is decomposed, but some characteristics are still distinguishable



Bad example

Specimens are decomposed and/or not separated from the accumulated piles. Photo is also blurry, making it difficult to distinguish *Sargassum* species

Example submissions of Sargassum specimens collected.

Step 6.6: The next four sections ask for environmental characteristics:

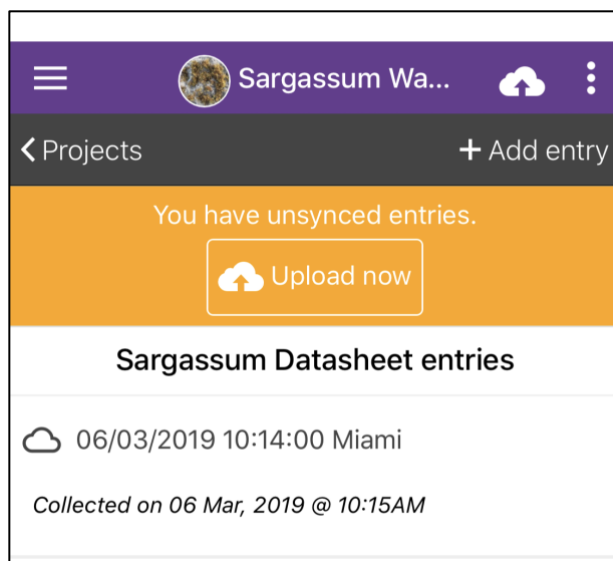
- Water color: Describe the water color close to shore.
- Smell: Does the site really smell of decomposing Sargassum?
- Wind: Is the site windy?
- Additional observations

The image shows three sequential screenshots of a mobile app titled 'Sargassum Datasheet'. Each screenshot has a purple header with a 'Quit' button and a site icon. The first screenshot asks 'Does the site smell of Sargassum?' with 'Yes' and 'No' options. A blue arrow points to the second screenshot, which asks 'Color of the water?' with options: 'Unchanged (blue and/or green)', 'Slightly brown', 'Very Brown', and 'Not applicable'. Another blue arrow points to the third screenshot, which asks 'Is the site windy?' with 'Yes' and 'No' options.

Step 6.7: The last page will prompt you to click on “save entry.”

The image shows two sequential screenshots of the 'Sargassum Datasheet' app. The first screenshot, labeled 'Step 6 page 14', shows the 'Additional Observations' section with a text input field containing 'This is a test observation'. A blue arrow points to the second screenshot, which shows the 'Save entry' button. The second screenshot is labeled 'Step 6 page 15'.

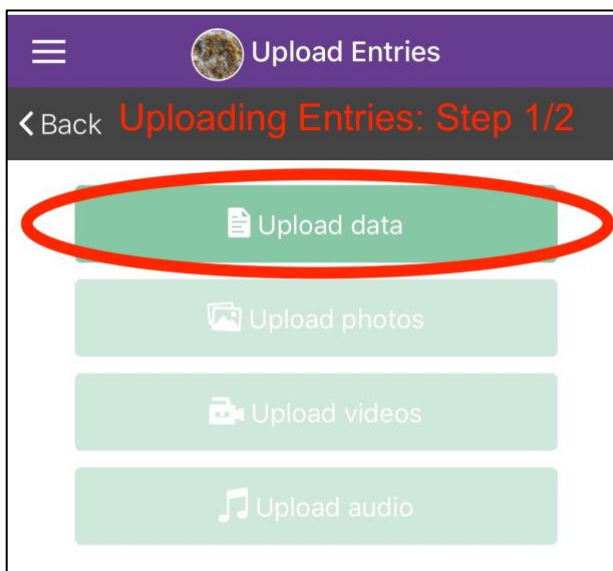
Step 7: Once you click on “save entry,” you will be lead back to the project screen with an additional orange window “You have unsynced entries” shown.

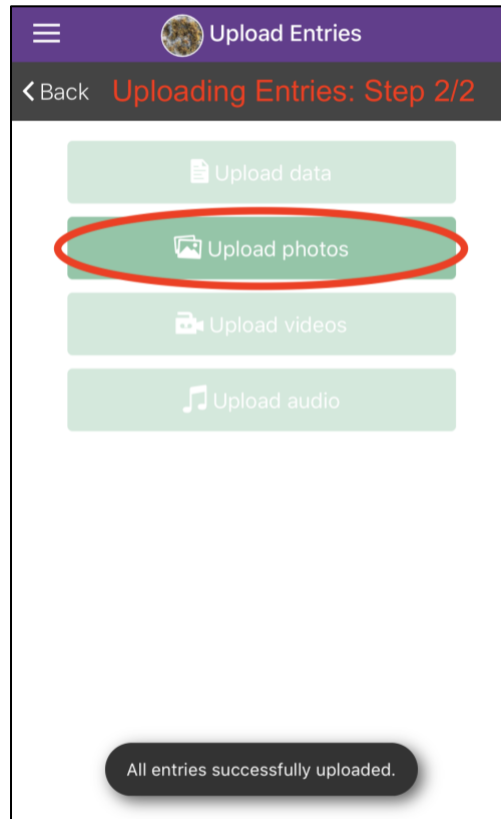


Step 8. You can save as many entries as you want. When you are ready to upload, click on “Upload Now” in the orange box.

Step 8.5: If you need to delete an entry that has not been uploaded yet (noted with a white cloud to the left), click on the entry. On the top right corner, click on “delete entry,” and confirm with “ok.” The entry should be deleted.

Step 9: Once you click on “Upload now,” you should see a page with a highlighted button asking to upload your data and photos. Click on “**Upload data**”.





Step 10: Once the data is uploaded, the app will give you a message “all entries successfully uploaded.” The button asking to “Upload Photos” should also be highlighted. Click on “**Upload photos.**” **This is required for your data entries to be complete.**

Step 11: All entries (including photos) should have been uploaded. Enjoy the rest of your day under the sun. ☺

Frequently Asked Questions and Troubleshooting

“I don’t see any Sargassum. Should I still upload an observation?”

Yes! Absence of Sargassum is still data, and seeing how the site changes over time is essential, especially should Sargassum make landfall one day.

“I am returning to the same site and seeing the same observation. Should I still upload an observation?”

Yes! Seeing how the same site changes over time is valuable information.

“Where can I observe mats of Sargassum?”

Most areas would be coastal, such as public beaches or state/federal parks. Other areas can include piers, bridges, marinas, or anywhere where the area has contact with the ocean. Sargassum is a pelagic, floating species that eventually washes onto shore, and can occur anywhere there is connection to the ocean.

“What species of Sargassum should I look for?”

The two species of Sargassum are *Sargassum fluitans* (*S. fluitans*) and *Sargassum natans* (*S. natans*). Within these two species however, are morphotypes, which are still the same species but can look vastly different from each other. The top 3 morphotypes of the two Sargassum species are shown below in the figure by Schell et al. (2015).



Do note that while these are the three most common species/forms of *Sargassum*, we have found other species or forms in common abundance in the past. If you see any unusual specimen in abundance, take a picture of it anyway. These findings can still be useful for monitoring of previously rare forms.

“I am intimidated with using this app. How do I know what buttons on the datasheet to push?”

Once you install the app, there is a “EC5 Demo Project” on the project homepage. The demo is optional, but it is good for getting acquainted with the types of questions and inputs to expect in the app. The layout for the Sargassum Watch project is the same as any other Epicollect5 project, including the demo. The breakdown of step 6 also follows the data sheet step-by-step.

“What questions does the data sheet in the project consist of?”

The first part of the data sheet will ask you for general information, such as your name, date, time, and location. The following questions will ask you to take photos of your observed site at different angles and the Sargassum specimens. Getting photos of the Sargassum specimens requires **picking up a few pieces of Sargassum** and taking **one photo** of all specimens simultaneously. The data sheet wraps up with three other questions asking for water color, smell of the site, and wind activity.

“I have a previous observation of Sargassum. How could I record that?”

You can still use the app to upload your observations, photos included. The only additional steps to take is to adjust the date and time of the observation manually, as the app can only automatically record today's date and time. GPS Coordinates should also be skipped. The remaining steps to follow are the same.

“The app is not connecting. How could I upload the entry.”

The app requires internet connection and may not upload immediately. Saving the entry will keep it on your entry page, and you can upload it on a later time when you have more stable internet connection.

“I still cannot upload the entry and I have internet connection.”

You can email the photos, with all observation details to this email: Sargassum.fiu@gmail.com. We will confirm to you once we receive your observation.

“Do you have a website that shows the project itself?”

Yes! Follow this website link: <https://five.epicollect.net/project/sargassum-watch>. This website is automatically generated from the app. You can even see the data collected by clicking on “View data.”

“Do you have this app/project in _____ (language other than English)?”

We have a Spanish-translated version of this project “Monitoreo de Sargassum” also in the Epicollect5 project search. The steps to follow are identical to the English version. We also plan in the future to have the app in French and Dutch for specific Caribbean countries with those dominant languages.

“How can I contact you for any other questions?”

You can email the Ph.D Candidate, Lowell Iporac at lipor001@fiu.edu.

References used:

Schell, J., Goodwin, D. & Siuda, A. 2015. Recent Sargassum Inundation Events in the Caribbean: Shipboard Observations Reveal Dominance of a Previously Rare Form. *Oceanography*. 28:8–10.