



WETLANDS WATCH

Protecting And Conserving Wetlands

WWW.WETLANDSWATCH.ORG

SEA LEVEL RISE APP BY WETLANDS WATCH / CONCURSIVE

The Sea Level Rise App is designed to crowdsource information about flooding in your community. It has two modes for data collection:

- 1) Trouble – this mode allows the user to indicate locations where flooding occurs, provide some information about the type of flooding (rain, tidal, both), and take photos of the location. Red pins are dropped at flood locations and are displayed along with descriptive information.
- 2) Events – this mode collects information about the extent of flooding during flood events by allowing the approved user to walk the edge of the flooded area and drop blue location pins every few feet, creating an outline of the extent of the flooding.

The app is available to all to view and use in Trouble mode. Data entry in Event mode is only allowed for by users approved by Tide Captains (please see the “Joining a Region” section in this manual). This is done to insure consistent data collection, since some of this information will be used by government agencies and academic researchers to develop flood protection tools in the future.

We developed this app using the IT skills of ConcurSive, which has built similar map-based apps around the world. We wanted to tap the native knowledge of people about their community and where it floods. We also wanted to engage a community of interest in the development of detailed information about the extent and duration of flooding events. We wanted to enhance government and university efforts to address the flooding issues in our communities. We cannot wait for funding and resources to map these events: a single tide gauge costs many thousands of dollars. The concerned community can collect similar data on a volunteer basis, speeding up the development of solutions.

Finally, we wanted to create a virtual community of interest in finding solutions to the problems we face adapting to increased flooding. Our hope is that the users of this app will also join in our efforts to push for meaningful solutions to our flooding/sea level rise problems.

USE INSTRUCTIONS

Download App “Sea Level Rise” from the iOS App Store / Google Play and create an account or log in.

Once you have received approval from your Tide Captain, your status will be elevated and you will be able to enter data in Events mode (please see the “Joining a Region” section in this manual). No approval is necessary to view or use the app in Trouble Mode.

Phone Functions – Before you do any mapping or data entry in the field, make sure that the app has been given permission to access your phone’s camera. This is usually done in the “settings” on your phone, not in the app. This is similar to the permissions needed for Facebook or Instagram to use your camera, so it is not a big deal, but essential for what we are doing.

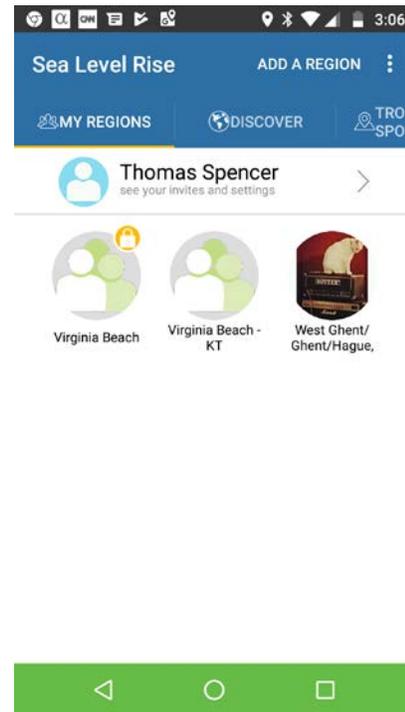
General Navigation – The major functions of the app can be accessed along the bottom ribbon on iPhones or along a ribbon at the top for most Android phones. The functions displayed are:

“My Regions” – this shows which regions you are a member of and can map flooding extent

iPhone

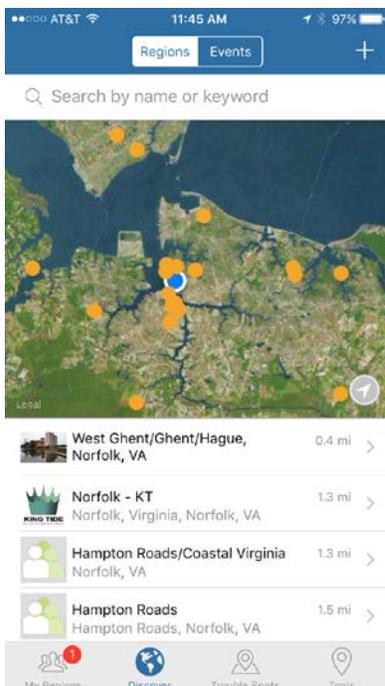


Android

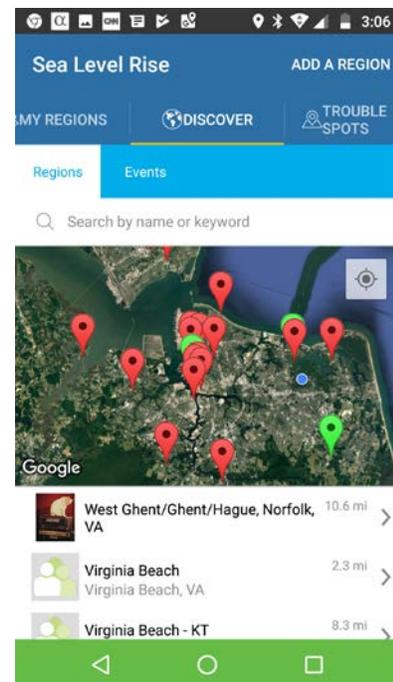


“Discover” – a globe logo shows all the nearby regions for mapping. More regions will show up as you move the map image to new areas. On Android, the regions you have joined are in green.

iPhone



Android

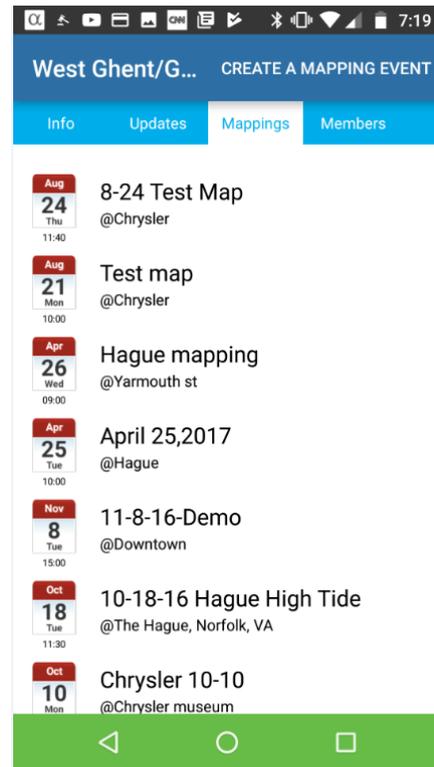


When you hit the “Events” tab, all of the mapping events the app has conducted are listed by date, from newest to oldest. (More information on this function appears below.)

iPhone



Android



“Trouble Spots” – a pointer logo takes you to a screen that displays all the trouble spots around where you are standing. (More information on this function appears below).

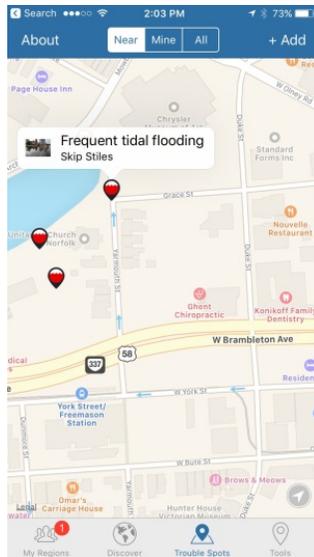
“Tools” – this pointer logo takes you to the screen that allows you to map the extent of the flooding during an event, like the King Tide Event. For some Android phones, you’ll have to swipe left on the function ribbon to display the tool logo.

USING THE PHONE TO MAP

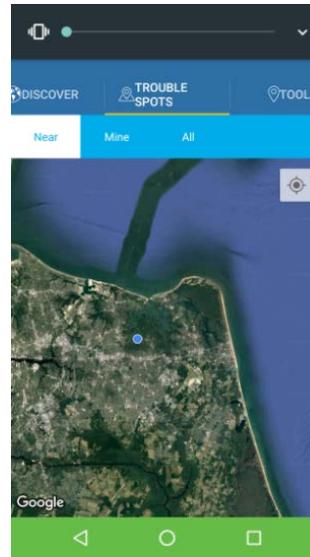
TROUBLE FUNCTION

From any screen, find the “Trouble Spot” icon on the bottom ribbon (iPhone)/top command ribbon (Android) and that will take you to the right screen. After you tap the icon, you should see a screen like this:

iPhone



Android



This is the data entry screen for “Trouble Spots.” These are spots that you know flood frequently – either with rain, during tidal events, or both. Once you are logged on, the blue “+ Add” will be in the upper right corner for iPhones and a circle target is displayed on Android. (If “+ Add” or circle target is not present, log off and on again and/or get in touch with the administrator.)

Go to a spot that you know floods, stand as near the center of the flooding area, and hit the blue “+ Add” in the upper right corner (iPhone) or the target logo (Android) to mark the spot. Then you’ll get a screen that lets you make optional comments. In that frame, enter a standard description for the trouble spot: Rain Flood, Tide Flood, Both Rain and Tide Flood, etc. If you can indicate how often it floods in the notes that would also be useful. For example, if the spot floods when it rains heavily, put “Floods Frequently – Rain” (see Appendix 1 on page 9 for app terminology). Once entered you’ll be able to also upload a photo of the spot (remember to allow the app to access your camera). A red data pin will show up on the map.

These data points are useful for identifying locations for future activity, such as flood mapping during events. These locations also start to give a picture of where to avoid during rain events when you are driving around.

JOINING A REGION

The app users assemble into “Regions” to organize mappings. A region can be as big as a city or as small as a neighborhood. (Usually, the smaller the region the better for managing the app.) When you hit the “Discover” logo, you will be taken to a map that displays the regions that have been set up around you for mapping.

The regions around your location will be displayed on the map and in the information below the map. If you click on the dot or the region name below the map, the mapping region will pop up on the map. When you touch the map popup, you’ll be taken to a page with an option, “+ ask to follow.” If you touch that phrase, a request to join will be sent to the manager of the region, or “Tide Captain,” who will allow you to join the region and will also approve you for mapping (in order to collect GPS flood data points and have them appear on the map, your status has to be elevated from simple “member” to “champion.” Only the Tide Captain can make that approval.)

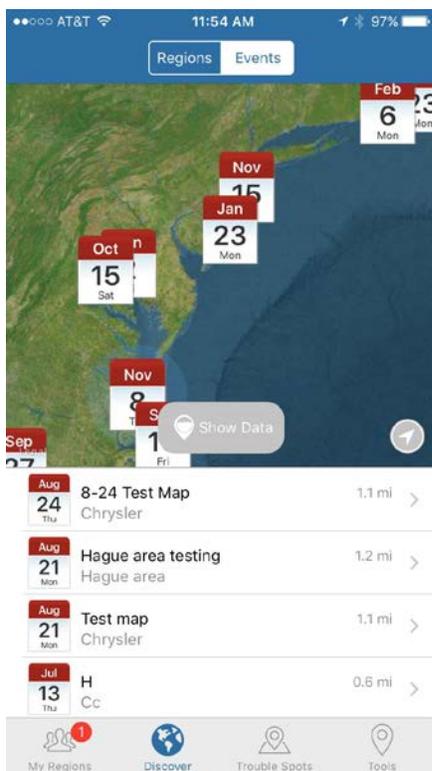


For the King Tide 2017 Event, the mapping regions are designated with a crown symbol:  Pick a region in which you want to map and ask to join the region. The Tide Captain will approve in advance of the mapping day. Don't be concerned if you only see one King Tide (KT) region in your area. Go ahead and ask to follow it. On the day of the King Tide 2017 Event, there will be additional King Tide mapping events set up within each region – e.g., the Virginia Beach KT region will include several mapping events, such as Pleasure House Point-KT 8:30-10:00, Baylake Beach-KT 8:30-10:00, etc. Tide Captains will be in touch with their teams prior to the event to provide additional details.

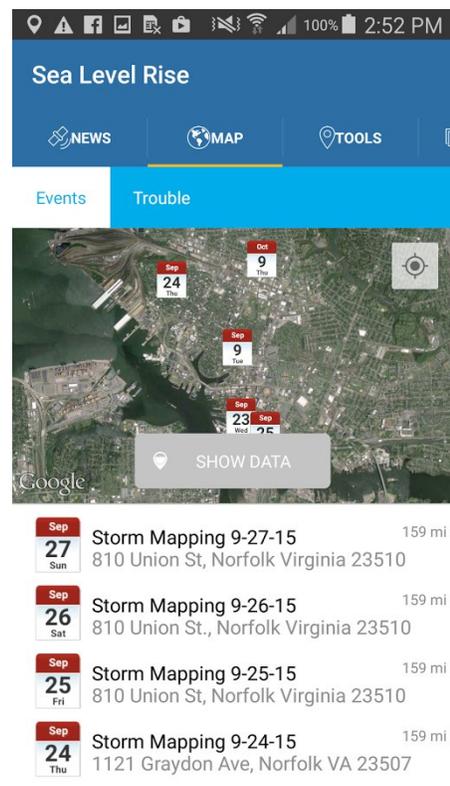
EVENTS FUNCTION

Within each geographic region, there are specific mapping events scheduled for certain places and times. To find these events, tap the “Discover” logo and then tap the “Events” square at the top of the screen (iPhone) or near the middle (Android) and you'll get this view:

iPhone



Android

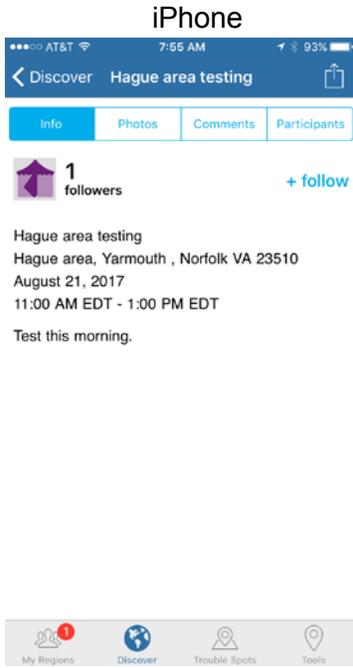


This is the page we use for mapping events with the app. If you click on one of the listed events, such as “Oct 9, '14 Tidal Mapping” it will take you to the calendar page on the map for that event. Tap the “Show Data” grey button in the center bottom of the screen and the blue data points will show up. Zoom in on those points and you'll see they are actually a series of points outlining the extent of flooding at those locations during a past mapping event.

These are the data sets we are working on for the King Tide 2017 Event. We are trying to get good, accurate outlines of the extent of the flooding so that those data points can be exported and given to researchers to test their models and develop predictions for future flood events. These outlines can also be used by local government after a flooding event to determine the extent of flooding when applying for assistance funding.

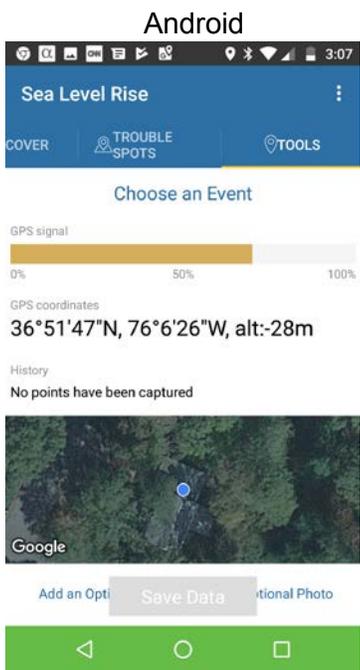
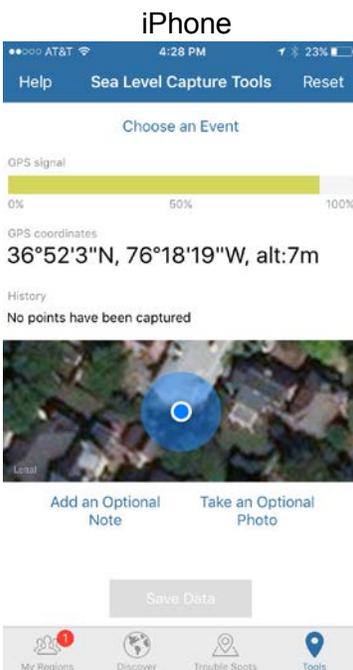
MAPPING EVENTS

For the King Tide 2017 Event, organizers will schedule events for mapping within each of the designated regions. Those events will be for the specific mapping dates and times and will also be focused on specific locations where mapping teams will be working. Individuals on these mapping teams will need to find the event they want to join (hit “Discover” and then touch “Events” to see a list of the events). Once the desired event is found, you need to tap the event in the list which will cause a popup in the map screen. Touch the map popup and you’ll find a screen like this:



Hit the “+ ask to follow” phrase to ask to join the event and the Tide Captain will put you in the mapping event and give you permission to map.

On the date and time for the mapping, you’ll go to the designated area to map and touch the “Tools” icon in the icon ribbon at the bottom (iPhone) or in the icon ribbon on top (Android – you may have to swipe left on the function ribbon to display the tool logo). You’ll get a screen that looks like this:



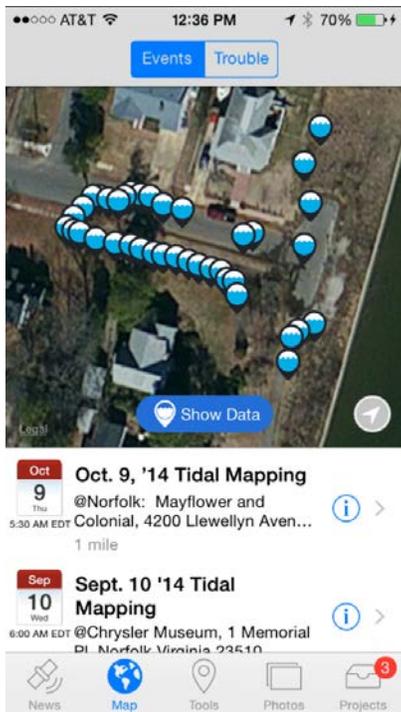
The screen will show the strength of the GPS signal (the color bar), will show your location on the map, and will ask you to "Choose an Event." Touch the "Choose an Event" and a list of events will show up. Choose the one you are participating in. Once you have associated your phone/pad with an event, the gray rectangle at the bottom will turn green and show "Save Data."

Now you're ready to map.

Look at the inundated area you want to map and figure out a way to walk around the edge of it. (You should by now have determined you'll need your boat boots, kayak shoes, or Wellingtons to do this work. If the water looks like it will go higher than your boot tops, best to leave the mapping to others!) Don't worry about mapping the water-ward edge as that will be assumed to be wet. If you can, bring a yard/meter stick to use to measure water depth for a site photo.

Pick a starting point and hit the "Save Data" button every few steps/seconds as you move around the inundation area (more about spacing in a moment). This will drop a blue pin where you are standing. As you walk around the wet area, you will see the shape of the inundation area show up. You will need to see how the points are laying out as there may be some wobble in the points as you go along that you need to adjust your location. Just try a few approaches to see what works best for your walking pace and mobile device.

ABOUT DATA SPACING



In urban areas, you'll need close spacing like the lower edge of the outline at left – dropping a pin every five feet/five seconds or so – especially where there is a lot of intervening hard infrastructure (curbs, berms, structures, etc.). In open areas and rural areas without infrastructure affecting the outline of the inundation area, we do not need spacing this close, just close enough to where you can “connect the dots” to show where the water has gone. If there is a dune, hill, mound, etc. that changes the inundation outline, place the data points closer to show that outline change. Check the screen to see how fast the data points are dropping (weak signal = slow upload/extended buffering) and pace the data point collection accordingly, slowing down if the points are uploading slowly.

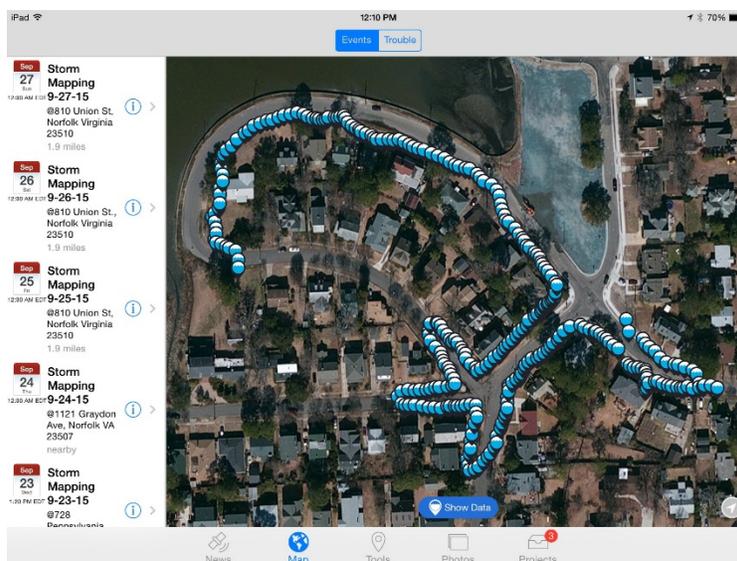
In the mapping on the screen to the left, you can see a good spacing for part of the work along the lower edge but some hard to define outlines on the upper edge. The upper edge was deeper water and harder to map, but needed some attention to spacing.

Once you finish one area, you can add a note or photo and drop one more pin to record it. Also, you can take your meter/yard stick, wade out to the deepest part of the impoundment, and take a shot across the measurement stick to show the depth – again, watching out for water that is too deep/moving.

When you have finished one puddle or site, hit “Reset” (blue word on top right of screen in iPhone, or in stack of buttons at top right of screen on Android).

Then move to another area, choose the event again, and map again.

In the screen shot below, you can see the clear outline of the flooded area in this neighborhood. In retrospect, the spacing on these data points did not have to be so close along the long stretches of the flooded areas, only at the turns in direction and sharp curves.



APPENDIX 1 – APP TERMINOLOGY FOR “TROUBLE SPOT” REPORTING

Floods Frequently – Tidal

These are the chronic areas that flood when we get a spring tide on a new or full moon or a little more. Does not require a wind event/rain event, it does it on its own. Floods more than a few times a year – street or curbs often wet, salt cake on ground, discolored sidewalks (rusty colored), grass and trees dying/gone.

Floods Frequently – Rain

These are areas that flood when we get those big rainstorms during the summer, 1 or 2 inches in an hour or two and intersections are flooded. Does not need a high tide to do this. Happens more than a few times a year.

Floods Frequently – Rain/Tide

These are areas that flood when we get wind/tide/rain at the same time, flooding more than a few times a year or flooding more frequently over time.

Floods Occasionally – Tidal

These are areas that take a higher than usual event to flood – maybe flood on its own only a few times a year during those higher high tide events in the fall, etc.

Floods Occasionally – Rain

Flood from rainfall, but not more than a few times a year.

Floods Occasionally – Rain/Tide

A few times a year, with high tides and a rain event, these areas flood, but only one cause will not put it under water.

Storm Water Problem

These are areas that flood when water runs UP storm water lines and flows out from storm water drains and curb cuts – often some distance from the shoreline.

Wetlands Instead of Lawns

These are areas where wetlands plants are starting to pop up – where there should be lawns and dry land shrubs and plants. In notes be sure to explain if this is something that has been noticed as happening only recently.

Broken Bulkhead or Barrier

If the barriers to storm surge are failing – breaks in walls, water undercutting bulkheads, etc.

Adaptation Examples

Show where homes and businesses have taken steps to prevent flooding. Note in text what they have done that is special – build berms around their homes, installed flood walls, etc.