

# Frequently Asked Drifter Questions

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### **How to turn “smartone” transmitter on?**

Look for the word “off” embossed in the plastic near one end of the transmitter. Unscrew the two flat-head screws, flip the end cap 180 degrees, and screw it back on. Look for the word “on” embossed in plastic.

### **How do I get involved with the drifter project?**

Go to the main drifter website at [nefsc.noaa.gov/drifter](http://nefsc.noaa.gov/drifter) and look for the link to:

“To see the process of getting involved with the project, click [here](#). “

Also, we started holding a series of “drifter users meetings” in various places around New England as documented [here](#).

Attending these meetings is the best way to meet all the people involved.

### **What is the cost of a typical drifter deployment including satellite transmissions?**

The costs range about \$800 per drifter :

- a) whether you build the drifter yourself,
- b) you buy all the parts,
- c) how often & how long you want to sample

The typical breakdown for the lowest-cost satellite-tracked drifter goes as follows:

- \$100 parts other than the transmitter at your local hardware
- \$400 transmitter and help with data delivery
- \$300 for satellite fees and 1600 hits

Keep in mind that we do not guarantee that trackers will last. Your tracker may not be refurbishable when it runs out of battery but will check them out for free. If you want us to just refurbish the transmitter with a new battery pack, it cost \$100.

## How do I decide WHERE to deploy my drifter?

If you want to follow your drifter for weeks or months, it is best to get your drifter at least several miles from shore out in what we call the “coastal current”. In New England waters, this is in water depths of a few hundred feet (~100meters). If you are not able to get out that far, it is best not to deploy with a) an incoming tide and/or b) strong easterly winds in the forecast because it may wash ashore the next tide or two. To see the depths of your offshore waters, you can view the on-line NOAA charts [here](#) which is especially important if you plan on deploying a drogue. You may have to shorten your tether if there are shallows in the vicinity. In order to predict where your drifter will go, you can use our on-line drifter prediction routine [here](#) but, as of this writing in July 2016, this routine is only good for 1-2 days into the future and is only as good as the models that drive it.

## How do I get my drifter in the water?

If you do not know anyone yourself to get your drifter well offshore, there is a network of mariners all along the coast who would be happy to deploy your drifter. These include:

- Research vessels are happy to have drifters to mark the water mass under investigation.
  - New England examples, with schedules often listed on the [UNOLS website](#), include:
    - The R/V Endeavor often sails from Narragansett RI
    - The R/V Tioga often sails from Woods Hole,, MA
    - The R/V Challenger often sails from Portsmouth, NH
    - The R/V Auk often sails from Scituate, MA
  - International Research Vessels:
    - schedules are posted [here](#) by Univ. of Delaware folks but do not seem to be up-to-date
    - European RV are listed [here](#)
    - There is an map of where they are currently located are [here](#)
    - For specific country, you can simply google search, for example, “[argentina research vessels](#)”
- Whale watch vessels (most have deployed these before and/or are happy to help):
  - Stellwagen Bank Sanctuary list a set [here](#)
  - Several listed [here](#) off Cape Cod and [here](#) off Gloucester.
- Commercial fishing boats (many along the coast have been happy to help), Contact:

- JiM who has a network of dozens
- Your local harbormaster (listed [here](#): click “nautical links” for your state and scroll down)
- [US Coastguard vessels](#) (have deployed before)
  - cutters
  - small boat patrols
  - search and rescue practice
- [Yacht clubs](#) (often have offshore sailors more than willing to help)
  - [Seakeepers](#), for example, are an organized bunch of sailors who have helped before
- Fishing charter boats (go [here](#) and look for “Nautical Links” for your state)
- Canoe & Kayaking Associations
  - [Paddling.net](#)
  - [Paddle Club](#)

### **Who is responsible for recovering my drifter if it comes ashore?**

You are. You will need to monitor it as it approaches land. Ideally you want to recover it **before** it gets damaged by the surf but, most often, this is not possible. If it lands in a remote location, you may have to ask for help. If you do not know anyone yourself in that area, there is a network of mariners all along the coast who would be happy to help. These include:

- Your local harbormaster (listed [here](#): click “nautical links” for your state and scroll down)
- [US Coastguard vessels](#) (have recovered before)
- [Yacht clubs](#)
  - [Seakeepers](#), for example, are an organized bunch of sailors who have helped before
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  - [Paddle Club](#)

Keep in mind that if your drifter is transmitting at the typical rate while stranded on an island, it is costing a few dollars per day and the batteries are running down so it is best to recover your drifter asap.

### How long will the battery last?

Most transmitters will typically provide at least 2000 fixes before the battery starts to get weak. You can keep track of how many fixes have been transmitted either on the [ComTech website](#) (see *login instructions here*) and on the [“fixcount” website](#) but this is only the number of successful fixes. The battery life depends on the number of **attempts** the transmitter makes. So, if you have the transmitter turned on and it is inside a building, it is still running its batteries trying to transmit. In fact, it will drain quicker hidden from the satellite because it is programmed to try three times per sampling interval.

### What kind of drifter should I make?

There are two basic types of ocean-going drifters:

1. standard surface drifter designed by Russ Davis in the early 1980s
2. standard drogued drifter (with a cylindrical “holey sock” tethered well below the surface)

We make both these types. Although most have been the surface drifters, we encourage you to try both.

As described by separate pull down menus on “studentdrifters.org”, they are both about the same cost and effort to build.

We have been experimenting with a variety of surface drifters in the past decade in order to minimize cost, effort, plastic, and windage. The result is a series of models all with the same shape and size to comply with the standard but they are made from different materials. To see the full list visit the studentdrifters.org “History” tab. In the past few years, we have been suggesting:

- Irina drifter w/aluminum frame
- Tim drifter w/play tunnel drogue

Although, beginning in 2016, we are considering an alternative eco-friendly designs made with cotton and bamboo.

## **Why should I “decommissioned” the drifter if it has been lost at sea or I do not plan on using it in the coming year?**

The ORBCOMM satellite company will keep charging a \$2.45 monthly fee for transmitters even if you are not using them. We can decommission a transmitter to stop that charge but, if you want to use it again, we need to pay \$30 reprovisioning fee. So it is very important you let us know when to decommission. Our rule of thumb is that you should decommission a transmitter if you do not plan on using it within one year.

## **What sample rate should I set my transmitter?**

If you are interested in depicting the big semi-diurnal tidal signal and want to contribute to oceanographers and modelers data archive, we suggest hourly fixes. In this case, the batteries (circa 2015) are good for about three months. If you are deploying more than one drifter and want to see one travel for many more months, you could have one transmit frequently and one just a few times per day.

## **Why did my drifter suddenly stop working?**

It often happens that drifters will not survive as long as you would like. Since we are typically not involved with the actual construction and assembly, we can NOT guarantee they will survive. Here is a list of common problems:

1. transmitter was installed upside down on the drifter (intermittent)
2. lost all flotation (suddenly stops)
3. lost ballast (very intermittent since it is on its side w/transmitter usually half submerged)
4. transmitter flooded (suddenly stops)
5. faulty battery (gradually stops)
6. lost some flotation (intermittent)
7. too much ballast (intermittent from beginning and especially after water logged)
8. accidentally run down by mariner (depends on damage)
9. recovered, hidden, & unreported by mariner (suddenly stops)
10. run down by large marine animal (depends on damage)
11. large waves broke transmitter mount(depends on damage)

## How do I make sure my transmitter is waterproof?

While the transmitters are designed to withstand the weather on the top of trucks on the highway, they are not meant for the ocean. We usually take care of this waterproofing step before mailing transmitters but, just so you know, we have tried a variety of methods to seal the TrackPack transmitters. For most of them in the past we have applied a bead of “5200 Fast-drying Marine Caulking”. While we now do a light sanding of the plastic prior to the application in hopes the caulking will adhere better, it should be noted that this caulking is actually designed for wood and fiberglass surfaces (not plastic) so we are concerned that after some time it may be failing. After all, all it takes is a pin-hole leak in the caulking. When the transmitter gets submerged (as it most definitely will in any kind of seas), a single molecule of seawater will corrode the electronics in no time.

In recent years we have experimented with other methods like:

- more-easy-to-work-with brush-on “liquid electric tape” they sell at ACE Hardware in little bottles
- applied a few wraps of “vulcanizing tape” with (as in all methods) an outer layer of electric tape.
- wrap the entire transmitter in fiberglass cloth. While this is a messy job, it may be the most reliable way to protect the transmitter.
- buy an Otterbox2000 (available online for less the \$20/each) and house the semi-sealed transmitter in that but the transmitters we are using in 2016 do not fit inside this case
- The students at Newburyport Middle School used a 3-d printer to build their own housing.

## What if I want to deploy drifters in a shallow water river or estuary?

In the past we have used 5-gallon plastic bucket drifters for this situation but, in early 2015, devised the “Emily” drifter made entirely of wood. Given scrap paneling from home remodeling projects, sails can be made of  $\frac{1}{4}$  inch wood. These units require more ballast and may be weakened after some period of soak but they will certainly be a) more eco-friendly and b) will probably hold up better than the standard surface drifters. The one unit we deployed only lasted a few winter weeks.

In general, we discourage these shallow deployments. We have found that shallow water tracks are too short. They take a lot of logistics, time, and effort in recovering units, refurbishing them, and redeploying them. It is hard to do statistics on shallow water drifters. Since we can not always determine exactly when the drifter is aground, you are not able to accurately calculate the average speeds and directions. We suggest Vitalii’s current meters in shallow water studies.

## How do I get funding for my drifters?

We have been collaborating with multiple labs and applying for various grants through:

- NOAA
  - Environmental Literacy
  - Marine Debris
- EPA Environmental Education
- NSF
  - Environmental Education
  - Innovative Technology Experiences for Students and Teachers (ITEST)
- Sea Grant
  - multiple options around New England (MIT, NH, ME, etc)
- Foundations
- Crowdsourcing
- Corporations

If you come across any other grant opportunity and need help with drafting and submitting the proposal, we can help. We have lots of proposals and letters of support already written that can be used over and over. In a few cases, teachers have gone to their local banks for mini-grants. We also suggest you join your local chapter of the National Marine Educators Associations, go to their meetings, and network with other groups in order to submit big proposals.

## What can I do with the data in the classroom?

We have started posting various lesson plans at [studentdrifters.org](http://studentdrifters.org) where there is a drop down menu with options for various levels (middle school through undergrad) and there are some resources on the [NERACOOS drifters page](#). We also have drafted a [googledoc on this topic](#) which we will share with you on request. It has a variety of cookbook steps to do some coding and visualize the drifter data. The most recent additions, for example, is some notes on how to view your data using ArcGIS OnLine or CODAP.

## How do I track my drifter?

If you visit the drifter site [here](#) and click on “Tracking units on the web”, you will be directed to a couple different options but the easiest is to go to the [main drifter site](#), scroll down the page to find your school/lab, and click on the status of your drifter. It is either “underway” or “done”. A googlemap should appear and, if you substitute “dat” in the url of this googlemap where it says ‘html’ you should see your data.

## Do the drifters have drogues? If so - at what depth?

Most of these drifters are standard Davis-style surface drifters denoted w// 1-meter depth but some do have subsurface drogues (typically 13m), some are "bucket" drifters very near surface (0.5m), and some are not really drifters at all but unmanned sailboats (0.1m). We have a [separate googledoc](#) on the subject of designing and building eco-friendly drogues.

## Do the drifters have any sensors onboard?

We are actively working on low-cost ways to do this but, as of this writing, the science gained is probably not worth the added expense. It is however an excellent educational exercise in electronics and engineering. In the Fall of 2015, two of the students in the drifter lab took a course in how to use an Arduino microcomputer to interface multiple sensors and relay that data through our transmitters to either GLOBALSTAR and/or IRIDIUM satellite. We have an extensive [googledoc](#) on this topic. A few drifters have had temperature sensors in the past but the accuracy of those sensors was not good enough to do real science. We are working on adding more accurate sensor packages in unmanned sailboats and then will move this to drifters. There was a special session on this topic at the annual NMEA meeting in 2016. If you are interested in this aspect, we can share the googledoc with our up-to-date notes.

## Is the data public?

Yes, the raw data is served via csv files and the processed data is served via ERDDAP.

## Is there any “data use policy” of any sort?

Not officially but an email to me is suggested so that I can be sure you access the necessary metadata (drogue depths, for example)

## **Are the trajectories (latitude-longitude values) made available to the public as data files through other websites?**

This is a “distributed” data set so there is no need to post the data at more than one site.

## **Do the drifters have WMO numbers?**

Since we put out at least 100 drifters every year, getting distinct WMO numbers is not an easy task. However, we want to do this and will pursue it in the future.

## **Do your trajectories go out over the Global Telecommunications System (GTS)?**

Not yet.

## **What is our primary motivation in deploying drifters?**

To help validate models.

## **What is all this lingo about “provisioning”, “decommissioning” etc?**

TO:

- "program" a unit is to connect to the transmitter in the office (via cable or bluetooth) and set its sample rate
- "provision" a unit is to go on the Orbcomm website and register the unit with the satellite folks (\$30)
- "decommission" a unit is to go on the Orbcomm website and tell the satellite folks to ignore transmission from it so they can't charge anymore
- "reprovision" a unit is to go on the Orbcomm website and tell the satellite folks to start paying attention to it again (another \$30)
- "command" an Iridium unit is to go on the AssetLink site and, for example, change the sample rate