Citizen Marine Science Network:

Understanding Change in Coastal Marine Environments

Retrieval and Redeployment Protocols for the SETL Adopt-a-Plate Program, March 2009

Linda McCann, Chela Zabin and Gregory Ruiz, Smithsonian Environmental Research Center
and Sarah Cohen and Verena Wang, Romberg Tiburon Center, San Francisco State University

A checklist of items needed for retrieval and a short version of this protocol to take with you to the field can be found at the end of this document.

Part 1. Timing

Retrieval and deployment of plates is intended to occur quarterly. Plates in the water should be pulled up and new plates deployed as local conditions permit, on March 15, June 15, September 15 and December 15 each year. Please let us know if you are not able to follow this schedule.

Before you go out. Assemble your materials and set up numbered vials.
On a sheet of regular, unlined paper with no ink on it write in pencil a list of numbers from 1-10 (for each vial) leaving space to cut between the numbers to make tags the same size as the printed tags included in your kit. Cut this list into a pile of penciled number tags. Place each pencil tag number in an empty vial.

Part 2. Field protocol

Step 1. Pull plates out of the water slowly and with caution. If there is a lot of sediment lying on top of the brick side, gently swish in water to shake off. Place them on the dock, preferably in a container of seawater, with the plate side up. Use a scissors or knife to cut the plates free of the brick. Deploy clean plates and bricks (see Plate Deployment Protocol). You can re-use the line you already have if it is not too heavily fouled or worn. Retrieve the temperature loggers (ibuttons) and deploy the new ones we have sent you.

Step 2. Fill out the data sheets. Once each retrieval date, fill out a Retrieval/Redeployment Data Sheet with information about the site: specifically, the date, your name and the names of assistants, and if possible, water temperature, salinity and murkiness of water and any additional notes or observations you think are important. In addition, we ask you to fill out a Plate Data Sheet for each plate. On these sheets you should note the presence of Botryllid tunicates (see Introduction to Tunicates and Field ID Cards) and what percent of the surface area of the plate they cover. To supplement the photos, write a description of each morphospecies (each apparently unique type, based on differences in appearance), including color, texture and shape. Example: "flat yellow and orange colonial tunicate, firm to touch." You may write a description for organisms on the plate that are not Botryllid tunicates (i.e., solitary tunicates, mussels, barnacles) but this is not necessary.

Step 3. Photograph the plates. We recommend a camera with at least a 5 megapixel resolution and a macro setting. For each plate, fill out a Plate Photo Card with the relevant information. Use a pencil to fill this out. Place the plate into small clear plastic tub along with its Photo Card and the size bar. Sink the Photo Card and size bar and place along one edge of the plate. Stand over the plate, zooming in or bringing the camera close to the plate so that the plate takes up nearly the entire frame of the view finder. Reduce the glare on the water by setting up in some shade, or creating your own shade with an umbrella or your body. Avoid having the water surface disturbed by wind. Glare and reflections on the water's surface make it hard to see the organisms and can confuse a camera's automatic focus. For this reason, we recommend turning off your flash. You may need to adjust brightness levels on your camera and to shoot several photos to ensure a good shot.

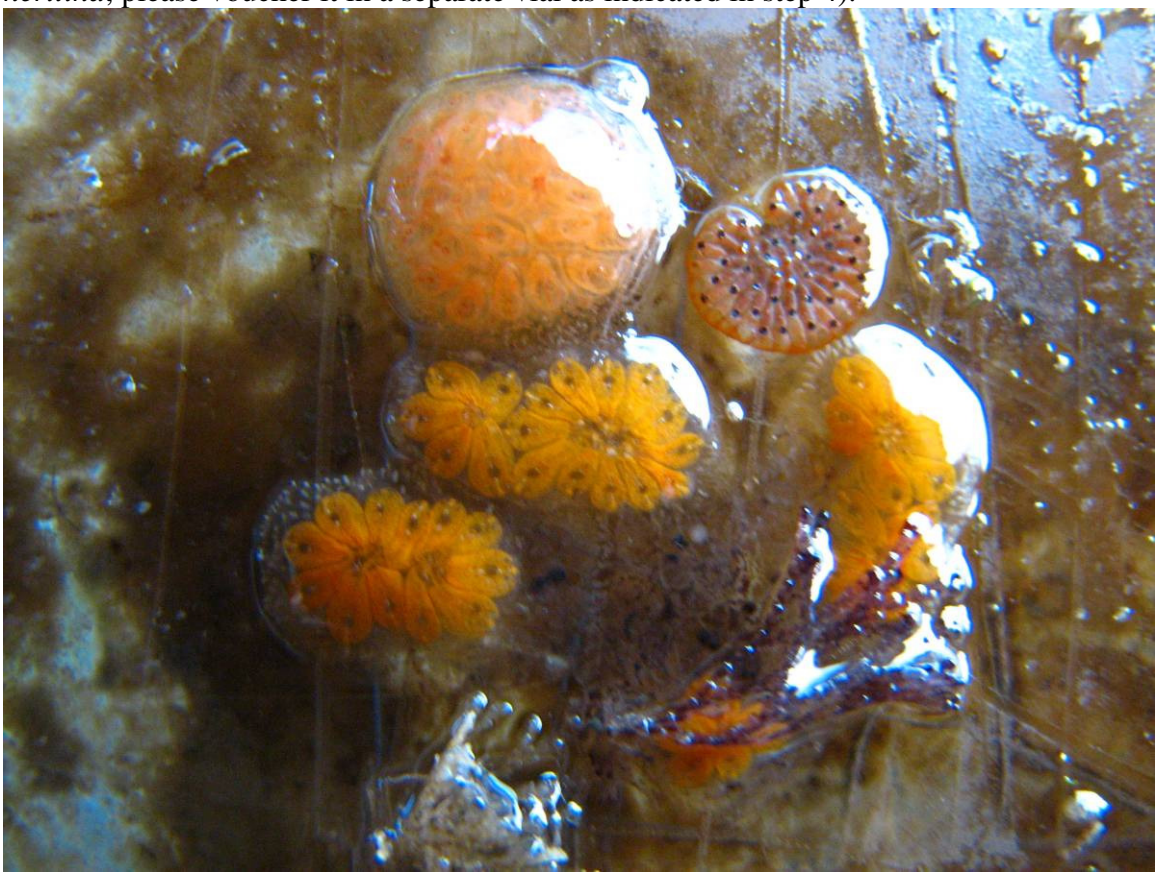
After you have shot the entire plate, take a **close-up** photo of the Botryllid tunicates on the plate. Use the small printed photo labels for these, one number per tunicate. Sink these and the scale bar next to the specimen or otherwise ensure that they are visible in your close-up shots. Then record this number on the plate data sheet. This allows us to keep track of which close-up shots go with each plate and to be able to calculate the size of the organism. A super macro setting may work best for these shots. If you have this feature on your camera, play back the photo and zoom in to check for sharp edges on the organism you have photographed. Below is a photo of a fouling plate, showing a photo label. If the camera has trouble focusing on the colonial tunicate, or you cannot tell if it is in focus, instead focus on the scale and number.

Ciona – collect me too if you see me!

Picture of a plate out of water (not recommended) showing light growth and many small to medium-sized botryllid colonies.

Below, an example of a close up of individual species on the plate.

Below, a plate photographed (out of water and without a tag—not recommended protocol) to show appearance of smaller colonies. In this photo, you can see *Botryllus* (bottom 3 colonies) and *Botrylloides* (top) which should both be collected (note the other encrusting organisms, including *Watersipora* sp. on the top right. If you were at the workshop in Alaska this fall and can readily identify this bryozoans or the red *Bugula neritina*, please voucher it in a separate vial as indicated in step 4).



Step 4. Preserve specimens. Collect a sample of each colonial tunicate for preservation. Place all the samples from a single plate into one vial so that you use a single vial per plate. The specimens should be preserved in 95 percent non-denatured ethanol or Everclear if you cannot get the ethanol. The specimens should be well covered in the alcohol. Labels in vials should only be written in pencil. In at least one of your vials, write an additional tag in pencil that has your location name, your name, and the date of collection. Cut the parafilm into squares along the dashed lines. Wrap the container tops with parafilm by stretching as you wrap around the vial several times to secure the parafilm. If you don't have parafilm, duct tape works very well also.

NOTE: If you are unable to complete steps 2-4 in the field, you can transport the plates in buckets/tubs of seawater, but make sure the plates do not jostle one another, which can knock off or damage the attached organisms, and label plates so you can remember their position on the dock. Make sure you are able to finish processing plates within 3 hours.

Heat will stress and kill organisms on the plates, so don't leave these in bright sunlight or in a locked car for long.

Part 3 Managing/Sending Data

Download the photos and burn them to a CD. This CD is for you to keep any additional photos and to use as a back up for the data you will post on the website. If you use a writeable CD, you can have folders for each retrieval on the same CD. Next you will enter the data and download the photos to the SETL website. Log onto http://platewatch.nisbase.org/ and if you haven't already registered, do so using your name in your ID so that we can tell who has posted the data. Click on the 'new event' line and enter the data requested. Add any important observations or notes in the 'Notes' field. Next, click on 'add site'. This will give you a map where you can enter your location. You must enter Latitude as a positive number (example: 59.441) and Longitude as a negative number (example: -151.721). Enter the specific location under name, state under state etc. Once you have a site entered, a Plate section should appear at the bottom with 'Create New' on the right. Click on 'Create New' and upload your photos along with any notes, and voucher information. Make sure to include the voucher numbers if you have vouchers. To get to 'new event' at anytime you can click on the 'my events' header. If you want to see all of the entries, click on the header 'all events'. Send me the temperature logger (ibutton) you retrieved in the postage-paid packet. If you have vouchers, email Linda McCann at mccannl@si.edu to determine whether the voucher will be held or sent out for ID. For now, tunicates will be sent out for identification only if they are found at a new site or location.

Part 4. Finishing up.

Clean the plates and bricks. Remove remaining organisms with a paint scraper, rinse them down with freshwater and scrub with wire brush and/or sandpaper. Soak these in a 30 percent solution of household bleach solution. Now the plates are ready for reuse.

Items to take to the field for retrieval/redeployment

10 plate and brick combos, ready to be redeployed

<u>From the box we sent you</u>

Photo Card (large ones to be filled out for each plate)
Small, numbered photo cards (to be used to close-up or macro shots)
Size bar
Paper clips for holding photo labels
Vials for specimen collection
Parafilm
2 ibutton temperature loggers
Cable ties

Handheld thermometer

Printed versions of the following items we have sent you electronically
Field ID Cards (We suggest that you print these and laminate or place in plastic protectors.)
Retrieval/Redeployment Data Sheet (1 per site)
Plate Data Sheets (1 for each plate)

You will need to supply

Scissors or knife for cutting cable ties
Large tub(s) for holding plates
Small clear plastic tub for photographing plates
Bucket on a rope or other means for getting seawater for holding plates
Digital camera
Umbrella (depending on your site, for providing shade for photos)
Clipboard, pencils, plain white paper
Single-edged razor, tweezers, small paint scraper for removing specimens from plates
Tools and hardware as needed for tying off bricks and cutting line
GPS unit (optional)
YSI or other device for measuring water temp, salinity (optional)
Secchi disk or other device for measuring turbidity (optional)
Other field guides for your area (optional)
Non-denatured ethanol or Everclear for preserving specimens

Field checklist for retrieval

1. Fill out the RETRIEVAL/REDEPLOYMENT DATA SHEET for each dock where you have plates. Measure water temperature and salinity and turbidity if you have the equipment to do so.

2. Pull plates out of the water slowly and gently. Cut the plate off the brick and place the plate, facing up, into a tub of water.

3. Fill out a PLATE DATA SHEET for each plate. If you see Botryllid tunicates, describe how they look and how much of the plate (what percent) each colony covers. You may also describe other animals and algae on your plate if you want to and record how much of the plate they cover.

4. Fill out a PLATE PHOTO CARD. Photograph the entire plate along with the plate photo card. It may take a few shots to make sure the plate photo and the plate are in focus. Hold the plate photo card down with paper clips or other weights if it floats.

5. If you find Botryllid tunicates, take a close-up or macro shot of each colony. Make sure to place one of the SMALL, NUMBERED PHOTO CARDS and the size bar next to the colony for inclusion in the photo. Use one number per colony. On your plate data sheet note that you have taken a photo and write down the photo card number.

6. Collect Botryllid tunicates into the vials. Each vial should have a piece of paper with a number written in pencil inside. All Botryllid tunicates from Plate 1 go into the vial with the number 1, all from Plate 2 into the vial with the number 2, etc. Preserve them with ethanol or Everclear. Close the lids and seal them by stretching the parafilm tightly over them, like you would with plastic wrap.

7. Deploy the next set of plates.

8. Retrieve the ibuttons and deploy the new ones we have sent you.