

NEFSC Scallop Survey

Introduction for Volunteer Scientists



History of the scallop survey

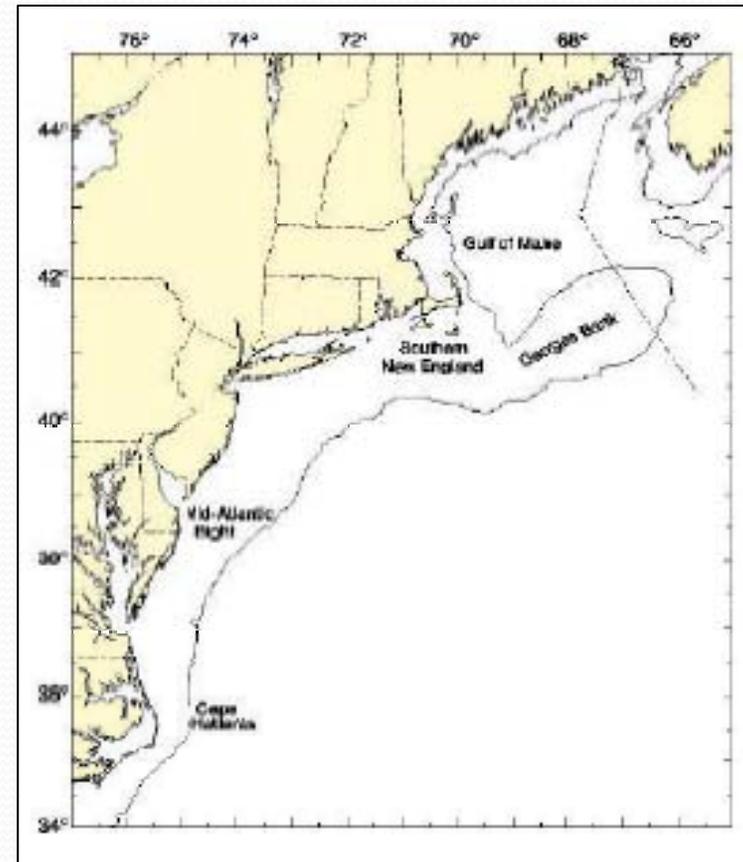
- The Northeast Fisheries Science Center (NEFSC) has annually surveyed the Atlantic sea scallop population since 1979
- The main objective of the survey is to determine the distribution and relative abundance of sea scallops (*Placopecten magellanicus*) and associated fauna
- In 2011, the survey began to incorporate an underwater habitat camera (HabCam) to collect further data without the use of bottom contact gear
- Since 2008, it has been conducted aboard the *Hugh R. Sharp*, which is a 146-foot UNOLS research vessel owned by the University of Delaware
- The survey had previously been conducted aboard the 187-foot NOAA Ship *Albatross IV*, which has since been decommissioned



Above: UNOLS vessel *Hugh R. Sharp*

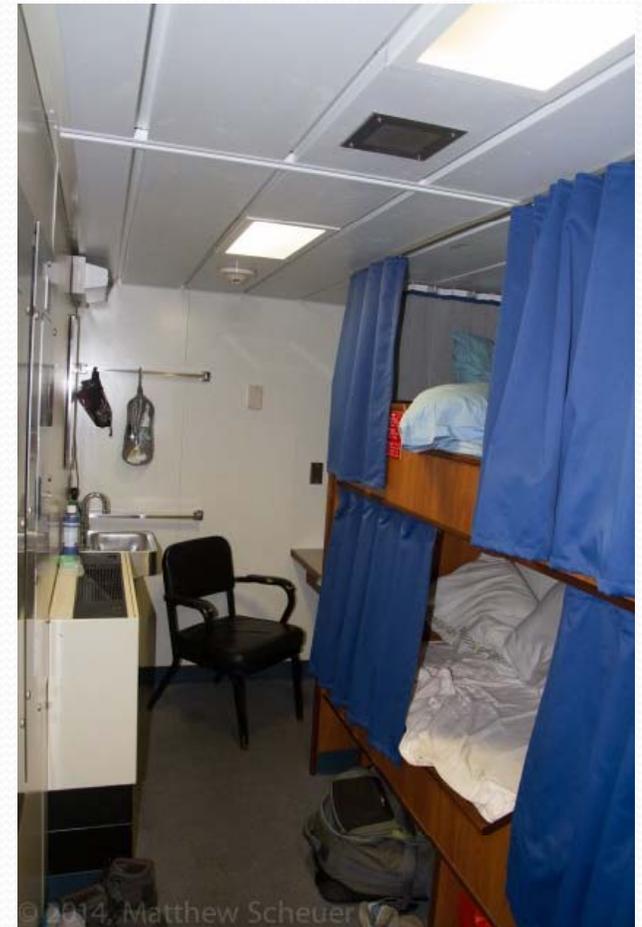
About the survey

- The survey utilizes a stratified random sampling method
- The area surveyed includes the Mid-Atlantic Bight, the northern and southern flanks of Georges Bank, and occasionally areas within Canadian waters
- This survey takes place during summer months in order to assess the age, distribution, and reproductive ability of sea scallops



Life onboard

- Each arriving scientist will be given a gender specific room. These rooms accommodate two to four personnel. Each person will likely share the room with no more than one other person during off-shifts. All rooms are equipped with a private bed, a sink, and a desk. Bathrooms are shared between multiple rooms
- Wake ups occur approximately one hour before shift changes. Although shifts break at noon and midnight, scientists are expected to give a 10-15 minute buffer by showing up slightly earlier
- While on shift, scientists are discouraged from reentering staterooms. It is beneficial to bring a small backpack of personal essentials (such as clothing layers, books, medications, etc) that you might need during your shift
- Very limited internet access is available for basic emailing. Downloads, Facebook access, photos, and video streaming of any kind will not be available.
- The ship will provide linens, pillows, and towels. The galley is fully stocked with toiletries and essentials if necessary, though scientists are expected to bring their own toiletries.
- A suggested packing list is available on our website:
http://www.nefsc.noaa.gov/femad/ecosurvey/mainpage/welcome_ aboard.html



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Life onboard

- Three meals per day are provided in the galley and are prepared by the ship's cook. Snacks are available around the clock in the galley cupboards
- During meals, the crew will be served first. The cook will post meal times specific to the science crew.
- The *Sharp* is not an open ship. However scientists are allowed to visit the bridge and explore the ship, so long as they check in with Watch Chiefs and ship personnel. Learn more about the *Sharp* and take a virtual tour **requires flash player**:
<http://www.ceoe.udel.edu/schools-departments/school-of-marine-science-and-policy/marine-operations/r-v-hugh-r-sharp/tour-the-r-v-hugh-r-sharp>



What to expect: Dredge work

Shifts are typically 12 hours long and deck work can be very physically strenuous. Scientists may be standing or carrying heavy objects for up to 8-12 hours. Individual jobs on deck and in the labs will be delegated by Watch Chiefs. Time will always be allotted for meals.



What to expect: Dredge work

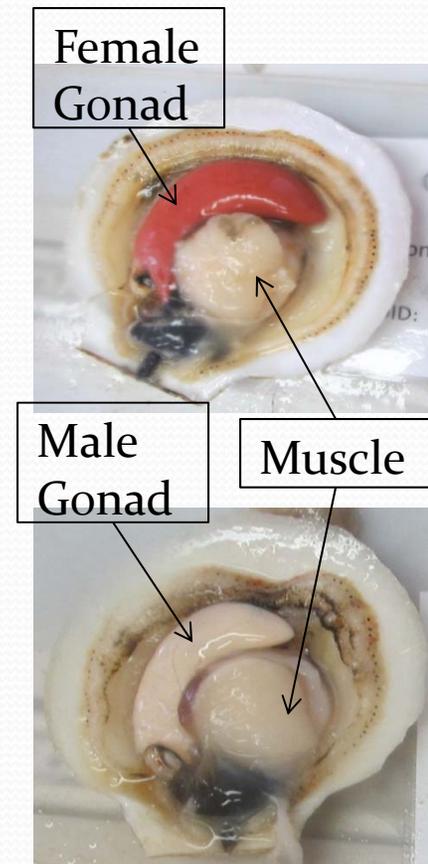


- All dredge station information is plotted and monitored by Nobletec navigation software and displayed in the dry lab
- For every dredge station, a small sensor called a star oddi will be inserted into the dredge to collect information on temperature, depth, tilt, flip, manifold pressure, and ambient pressure. This information is downloaded after each station
- All dredges are towed for 15 minutes, after which the catches are dumped onto the sorting table
- After sorting the catch by species, all species are electronically entered into our database, weighed, and counted
- The science crew then measure scallops and certain fish species using electronic measuring boards called Icthysticks
- Special samples are taken on a subset of the scallop catch. These may include gonad, meat weights, and sex information
- Personnel will be trained to use all software and hardware

Placopecten magellanicus- Atlantic Sea Scallops



- The Atlantic sea scallop is a commercially important filter feeder bivalve native to the western Atlantic Ocean
- The most productive areas for sea scallops are in the mid-Atlantic Bight and Georges Banks, though they can be found from the Gulf of St. Lawrence southward to Cape Hatteras
- The shells are relatively smoother and flatter than most other scallop species
- Shells vary in color, with the top shell light pink to reddish-brown and the underside (flatter) white or cream, though a small percentage are all-white



What to expect: HabCam



Above: HabCam images of skate (top) and dolphin (bottom)

- HabCam is an advanced stereo-optic towed camera array that captures 6 paired images per second. It is towed behind the vessel in lieu of dredging
- Our version of HabCam, the V4, was built by the Woods Hole Oceanographic Institution
- At sea, the HabCam can be towed continuously for several days, and can cover over 100nm per 24hr period. Scientists should expect that they could spend several 12-hr shifts driving or annotating indoors
- Training will be provided by experienced staff onboard
- Images captured are later made available to on-board scientists for analysis.

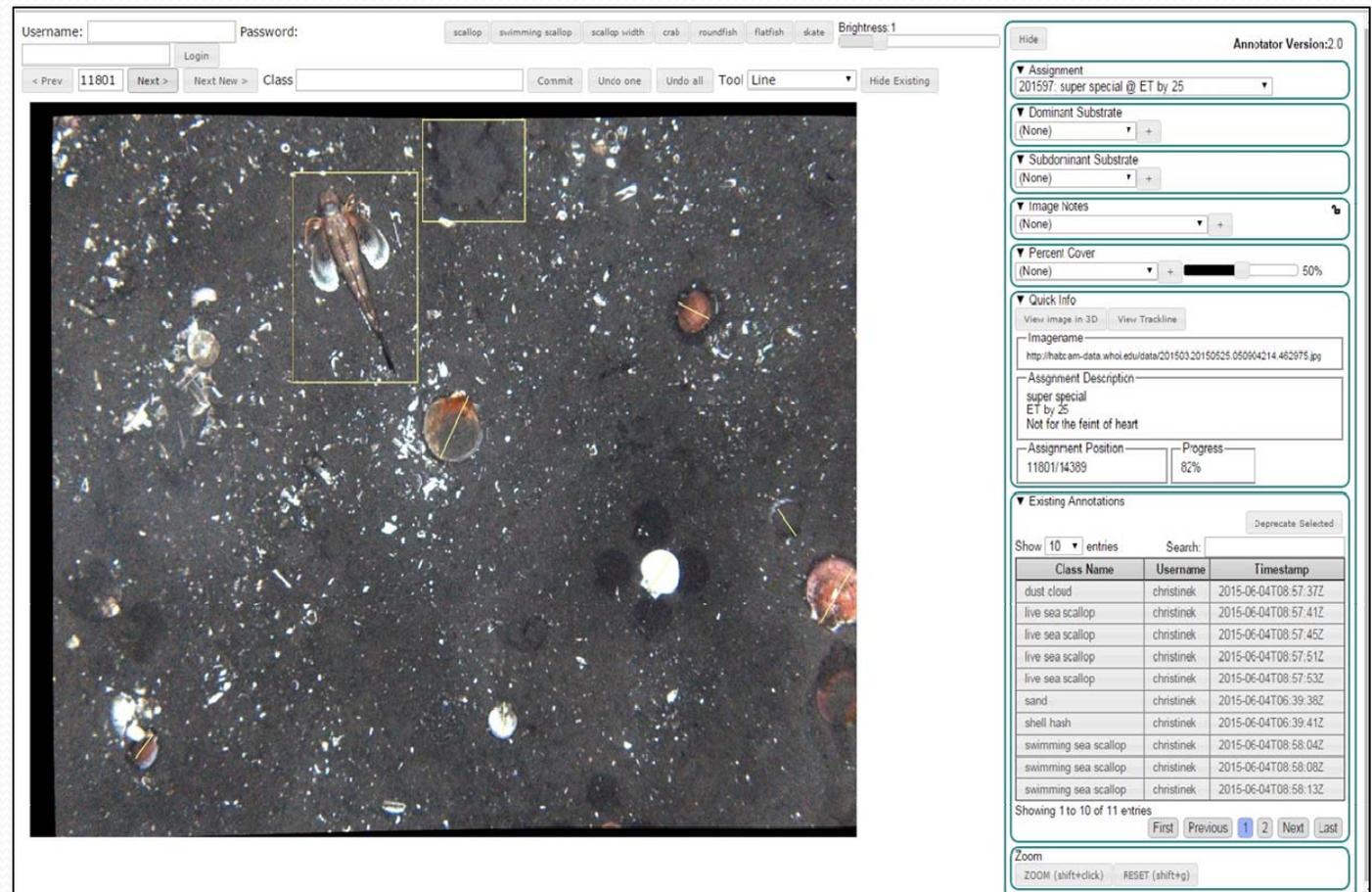


Above: HabCam on deck
Below: the dry lab where scientists drive HabCam and annotate



What to expect: Annotations

This is a screen shot of the online Graphical User Interface used to annotate HabCam images. Each member of the science party will be assigned a username and taught annotation basics and rules onboard. All annotators are given a test set of images to practice with before annotating images collected on the current survey.



The screenshot displays the online Graphical User Interface for annotating HabCam images. The interface is divided into several sections:

- Top Navigation:** Includes fields for Username and Password, a Login button, and a Class dropdown menu. There are also navigation buttons for < Prev, 11801, Next >, and Next New >. A Commit button and Undo options (Undo one, Undo all) are present, along with a Tool Line dropdown and a Hide Existing button.
- Central Image Viewer:** Shows a dark image of a scallop on a seabed. A yellow box highlights the scallop, and a red box highlights a specific part of it. A red arrow points to another object in the image.
- Right Sidebar:** Contains various annotation controls and information.
 - Assignment:** 201597: super special @ ET by 25
 - Dominant Substrate:** (None)
 - Subdominant Substrate:** (None)
 - Image Notes:** (None)
 - Percent Cover:** (None) with a progress bar at 50%.
 - Quick Info:** Includes a View image in 3D button, a View Trackline button, the Imagername (http://habcam-data.whoi.edu/data/20150320150525_050904214_462975.jpg), the Assignment Description (super special ET by 25, Not for the faint of heart), the Assignment Position (11801/14389), and the Progress (82%).
 - Existing Annotations:** A table showing a list of annotations with columns for Class Name, Username, and Timestamp. The table is filtered to show 10 entries.
- Bottom Right:** Includes a Zoom section with a ZOOM (shift+click) button and a RESET (shift+g) button.

HabCam Rules to Remember

All scallops with >50% visible in image should be counted regardless of position.

For counting scallops with 50% visible in image, use “L” rule. Scallops along the “L” of the image (left side and bottom) should **NOT** be counted.

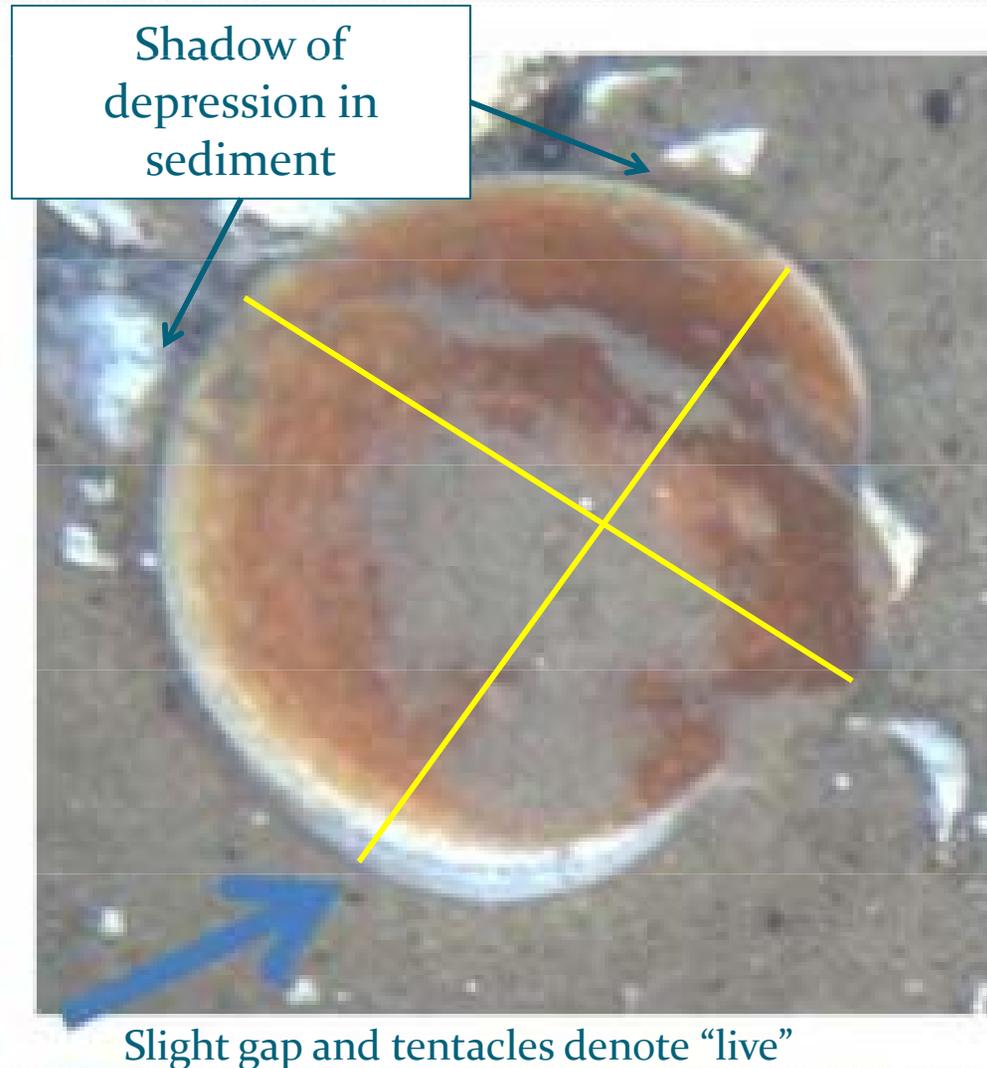


HabCam Rules to Remember

Scallops with 50% along the right and top sides should be counted.
This method reduces the chances of overestimating the population.



HabCam Rules to Remember



- Live scallop lengths should start at the umbo and extend to the end of the shell.
- Width may be taken if unable to determine shell height.
- Seed scallops may be marked with point due to size.

HabCam Rules to Remember

Fish categories may include: unidentified fish, flatfish, roundfish, snake eel, or skate and should be contained in a bounding box

Dust cloud - when there is a poof of sediment visible- use bounding box

Highlights (good examples, rare species, unusual phenomenon, interesting image) are in the image notes- may be 1-3 stars. It is useful to highlight photos of predation events (see below), manmade objects, or interesting interactions.



These are two examples of predation events. On the left, a horde of asterias sea stars attempt to pry a scallop open. On the right, dozens of hagfish flock to prey on a scallop.

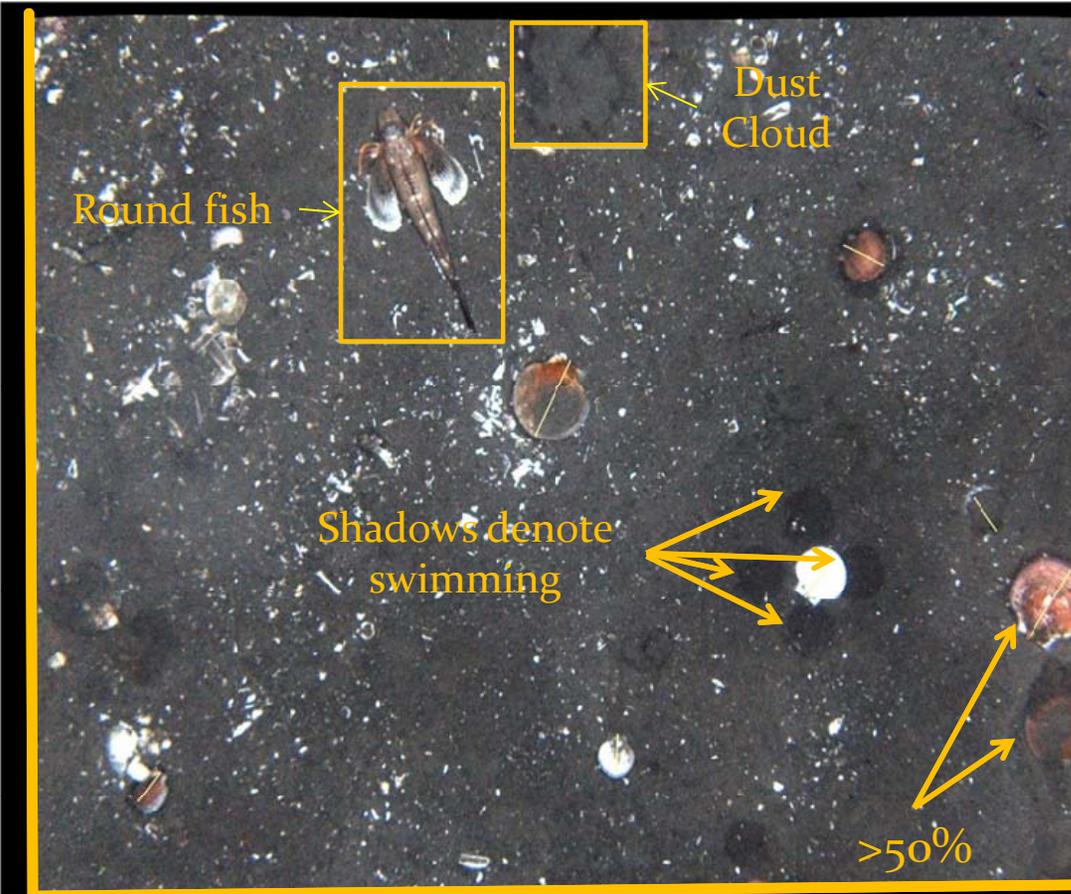


HabCam Rules to Remember

Username: Password:

scallop swimming scallop scallop width crab roundfish flatfish skate Brightness 1

< Prev 11801 Next > Next New > Class Tool Line



Round fish →

Dust Cloud

Shadows denote swimming

>50%

Hide Annotator Version: 2.0

Assignment: 201597: super special @ ET by 25

Dominant Substrate: (None)

Subdominant Substrate: (None)

Image Notes: (None)

Percent Cover: (None) 50%

Quick Info

View images in 3D View Trackline

Imagename: http://habcam-data.whoi.edu/data/20150320150525050904214.462975.pg

Assignment Description: super special ET by 25 Not for the feint of heart

Assignment Position: 11801/14389 Progress: 82%

Existing Annotations

Deprecate Selected

Show 10 entries Search:

Class Name	Username	Timestamp
dust cloud	christinek	2015-06-04T08:57:37Z
live sea scallop	christinek	2015-06-04T08:57:41Z
live sea scallop	christinek	2015-06-04T08:57:45Z
live sea scallop	christinek	2015-06-04T08:57:51Z
live sea scallop	christinek	2015-06-04T08:57:53Z
sand	christinek	2015-06-04T06:39:33Z
shell hash	christinek	2015-06-04T06:39:41Z
swimming sea scallop	christinek	2015-06-04T08:58:04Z
swimming sea scallop	christinek	2015-06-04T08:58:03Z
swimming sea scallop	christinek	2015-06-04T08:58:13Z

Showing 1 to 10 of 11 entries

First Previous 1 2 Next Last

Zoom

ZOOM (shift+click) RESET (shift+g)