

Project Title:

Empowering fishermen to collect essential data;
Piloting the Research Fleet approach in the Atlantic sea scallop fishery

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Commercial Fisheries Research Foundation

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N. David Bethoney, Commercial Fisheries Research Foundation

Project Team:

Commercial Fisheries Research Foundation (CFRF):

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Katie Viducic, Research Biologist (project lead after fall 2022)

Carl Huntsberger, Research Biologist (project lead until fall 2022)

Douglas Brander, Research Biologist

Steering Committee:

Jessica Blaylock, Northeast Fisheries Science Center

Dr. Devora Hart, Northeast Fisheries Science Center

Carl Huntsberger, Maine Department of Marine Resources

Dr. David Rudders, Virginia Institute of Marine Science

Dr. Kevin Stokesbury, University of Massachusetts Dartmouth

Vessel Participants:

F/V Yankee Pride, Point Judith, RI

F/V Georges Banks, New Bedford, MA

F/V Clean Sweep, Provincetown, MA

F/V Nemesis, Harwichport, MA

F/V Northern Light, Portland, ME

F/V Glutton, Provincetown, MA

Project Summary:

The goal of this project was to evaluate if the Research Fleet approach could be a viable tool to collect data parameters on individual scallops that would improve our understanding of the spatial-temporal variations in biological condition. The Research Fleet approach engages and utilizes fishermen time by providing them with tools and training to collect data during their regular fishing trips. The data parameters and collection methods are established in consultation with an expert Steering Committee and then refined for practicability through at-sea testing.

Through this project we were able to refine methods and determined a cost and time effective at-sea data collection approach for implementation in a Scallop Research Fleet. CFRF trained six members of the federal scallop fishery to collect location data, shell height, gonad condition, meat quality, tissue weight and meat weight of individual scallops during their normal fishing operations. Participants utilized a modified version of a custom-built android-based application, On Deck Data, to collect data in a standardized reliable manner. The data could then be uploaded to the CFRF once the vessel returns to port for quality control and storage. Overall, participants collected information on nearly 800 scallops over a 6-month period. This sampling established the ability of scallop fishermen to collect data on individual scallops following scientific protocols, eliminated taking individual weights as a path forward, concerns over reproductive staging and highlighted the potential of an image-based approach. Based on this result we are currently working on establishing a Research Fleet of Limited Access General Category vessels with image-based sampling on LAGC vessels.

Project Timeline:

Due to delays in establishing our steering committee, developing the sampling protocol, designing the On Deck Data app and most notably the significant delay with acquiring the motion compensated scales, a one-year extension was granted to allow for sufficient at-sea field testing and sampling by Research Fleet members. The adjusted project timeline was:

Month/Year	Major Activities/Milestones
April-May 2021	Form the scallop research fleet steering committee, including fishermen through open solicitation process; Begin modifications to the On Deck Data Application.
June 2021	Finalize initial sampling protocols and goals for data collection with the steering committee.
July 2021-March 2022	Finalize On Deck Data modifications; Obtain all necessary equipment for Research Fleet data collection
April-May 2022	Equip the pilot vessels with the On Deck Data tablets and other research supplies
May-November 2022	Research Fleet data collection. We will continue to work with the vessels though this time to adjust sampling protocols as necessary and analyze data
December 2022-January 2023	Retrieve equipment from vessels; Finalize data analysis and begin dissemination of the data.
February-March 2023	End of project meeting; Outreach

Project Results:

Participants

The solicitation for pilot fleet participants was sent to our email list serve, posted on the CFRF website, and posted on the CFRF Facebook page. We received applications from 13 vessels and using criteria posted in the announcement we selected 6 vessels to pilot this research fleet (Table 1). The key criteria were the selection of vessels from the limited access (LA) and limited access general category vessels (LACG) with some history of participation in collaborative research. At least two participants that fished in the Northern Gulf of Maine were also sought. Each project participant helped develop the sampling plan, tested it at sea, and then provided feedback summarized later in this report.

Table 1. Pilot Scallop Research Fleet participants.

Vessel	Captain/Owner	Owner	Fleet Category
F/V Georges Banks	Rui Branco	Scott Rapoza	LA
F/V Yankee Pride	Joe Alvernes	Chris Roebuck	LA
F/V Roen Keil	Ben Crocker	Damian Parkington	LAGC-NGOM
F/V Northern Light	Vincent Balzano	Vincent Balzano	LAGC-NGOM
F/V Midnight Our	Jesse Rose	Jesse Rose	LAGC
F/V Glutton	Beau Gribbon	Beau Gribbon	LAGC

A project Steering Committee was also formed. The Steering Committee provided key advice during project initiation and the development of sampling protocols. During the project the Steering Committee was kept informed of progress and results. The initial Steering Committee was comprised of Jessica Blaylock (Fisheries Monitoring Operations, NEFSC), Dr. Devora Hart; Resource Evaluation & Assessment/Population Dynamics NEFSC), Amber Lisi (Scallop Biologist, Maine DMR), Dr. David Rudders (Scallop Biologist VIMS), and Dr. Kevin Stokesbury (Scallop Biologist, SMAST). We recruited each of these members to have representation of biologists involved in similar data collection through fishery-independent scallop surveys, scallop stock assessment team and the NOAA observer program. Towards the end of the project one of our committee members, Amber Lisi left her position with Maine DMR and left the project committee. Carlton Huntsberger, the CFRF lead for much of the project, replaced Lisi at Maine DMR and took her position on this projects Steering Committee.

On Deck Data App Modifications

The CFRF has built a custom android-based data entry application (app), called On Deck Data, to be used for the data collection process in our various research fleets. We modified this app to be tested in the scallop pilot research fleet to follow our sampling protocols. The app collects data on the sampling location, date, depth, total scallop catches, substrate type, as well as the biological data collected for each scallop (Figures 1 and 2). Initial testing of the app was performed by CFRF staff during the South Fork Wind Farm beam trawl survey before full fleet testing was performed. Several minor modifications to streamline the app interface were made based on these initial tests.

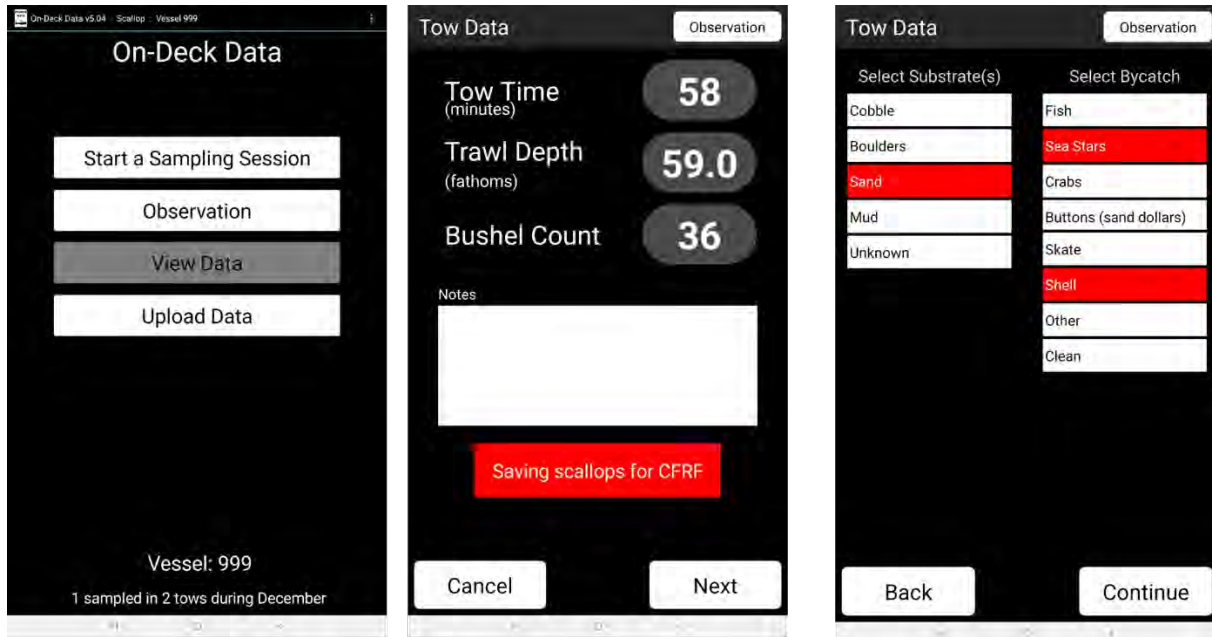


Figure 1. Screen shot of the haul level data being recorded on the On Deck Data app during testing.

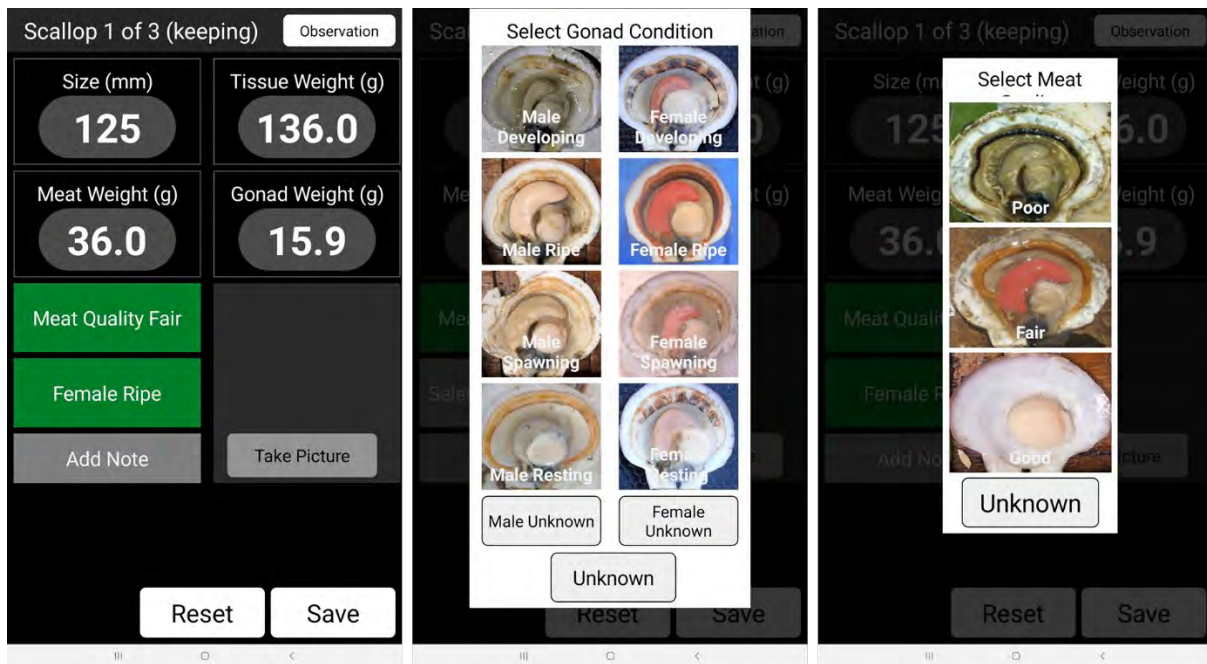


Figure 2. Screen shot of the individual scallop data being recorded on the On Deck Data app during testing.

Sampling Protocols

With the help of the fleet participants and the project steering committee we developed sampling protocols and began testing with the research fleet in May 2022. We asked each LA vessel to complete a minimum of three sampling sessions during each trip occurring in the

sampling period, and the limited access general category vessels LACG to complete a minimum of one sampling session a month during the sampling period. Each vessel was given a training session with CFRF staff. During this session, fleet participants were walked through a demonstration of On Deck Data and provided a binder of project materials including sampling protocols, as well as additional sampling guidelines and supplemental information on scallop anatomy, disease, meat quality, and gonad condition (see Appendix 1 and sections *h* and *i* for detailed sampling protocols).

The overall sampling protocol started with capturing effort information. To initiate a sampling session at the start of a tow the captain pressed the “Start Sampling” button on within On Deck Data to collect the date, time, and position from the built in GPS (Figure 1). The captain entered the depth and once the tow was on deck the captain entered the approximate volume of scallop catch, the dominant bycatch species, and characterize the substrate using the list of approved values (Figure 1). Then 30 scallops larger than 89 mm were randomly selected for individual data collection. Each scallop was processed within one hour of being caught. Each scallop was measured for shell height to the nearest mm using digital calipers then the bottom shell was removed. The first five scallops were imaged using the built-in camera on the tablet on selected trips. The meat quality was then graded into three different established levels of meat quality; white, brown, or gray (Appendix 1). The sex and spawning condition were also recorded using the following categories; resting, developing, ripe, or spawning/partially spent (Appendix 1). When feasible the scallops were then rinsed in sea water and the abductor muscle, gonads, and remaining tissue was separated and weighed to the nearest 0.1 g. The data collection platform also gave the option to then record any unusual observations or note any parasites present.

Due to the problems with recording weights at sea, sampling protocols were adjusted to deemphasize collecting weight data and separation of the gonads for individual gonad weights was removed. Soon into sampling fleet members voiced concerns that the recorded weights at sea were not representative of the true values. The scales (R10 M3) purchased for this project from WPL industries were a major disappointment. There was only one vessel where the scale worked well, this one Limited Access vessel was able to sample 10 scallops each watch with the captain feeling the scale collected accurate weights. Three of the LAGC fleet members collected weights for over 200 samples, however they were concerned that the weights are not representative of the true values. The two remaining fleet members to try these scales did not want to record any weights because they felt the weights were too variable and would constantly change and were not representative of the true weight.

In response, five additional scales were then tested at sea by CFRF staff and fleet members, however, it seemed none of the scales tested were able to produce reliable recordings of weight. One LAGC vessel captain tried a Marel 3 kg scale during their sampling and they were also not pleased with its ability to weigh individual scallop tissues on their boat. The Marel scale readings varied substantially but had a quicker response time. Four alternative non-motion compensated scales were purchased for evaluating their use at sea (Table 2). Prior to testing these scales with the fleet members, they were tested on the CFRF beam trawl survey. Under all conditions tested, two of these scales immediately had various error messages which could not be resolved. The remaining two scales occasionally displayed error messages while powering on

or attempting to zero the scales but did function slightly. Each of these two scales were approximately \$200 and had a 1.5 kg weighing capacity at a resolution of 0.1 g. Accurate measurements of our 50, 100 or 300g known weights were not possible for any of these alternative scales at sea. On land each scale recorded the known weights accurately. Since we were not able to measure accurate weights with these scales, they were not tested with the fleet members.

Table 2. Summary table of the alternative scales tested and performance for at sea measurements during the pilot scallop Research Fleet project.

Brand/Model	Price	Maximum Weight (g)	Resolution (g)	Functioned at sea	Accurate Known Weight
A&D Newton EJ - 1500	\$205.79	1500	0.1	Slightly	No
Ohaus® - SJX1502N/E	\$250.80	1500	0.1	Slightly	No
OMATA - B608 IPX5	\$28.88	5,000	0.1	No	No
Ohaus® - CR221	\$86.71	220	0.1	No	No

Summary of sampling effort

Due to the delays mentioned earlier, the training and subsequent sampling of the research fleet was delayed. Training and delivery of the sampling equipment began the 3rd week in April 2022 and was completed for all vessels by the first week in May. Our goal was to have each vessel sample for six months, however due to quota limitations or vessels not fishing for various other reasons, not all vessels were able to complete the full sampling during this project (Table 3). In response, we asked the fleet members with the remaining quota to continue sampling until the end of 2022, or until they have reached their six months of sampling. Due to personal reasons one fleet member was extended to sample through February 2023, however mounting vessel and personal complications did not allow the vessel to continue to sample.

Table 3. The number of scallops sampled for each month of the Scallop Research Fleet pilot project sampling phase. LA = Limited access, LAGC = limited access general category.

Vessel	May	June	July	Aug	Sep	Oct
LA-1	100	30	Not Scalloping	Not Scalloping	Not Scalloping	Not Scalloping
LA-2	60	60	60	No Samples	50	120
LAGC-3	30	30	Not Scalloping	Not Scalloping	Not Scalloping	Not Scalloping
LAGC-4	45	30	No Samples	Not Scalloping	Not Scalloping	Not Scalloping
LAGC-5	Not Scalloping	Not Scalloping	Not Scalloping	33	30	27
LAGC-6	Not Scalloping	Not Scalloping	Not Scalloping	Not Scalloping	Not Scalloping	85

Summary of participant feedback

The overall goal of this project was to pilot the Research Fleet approach in the Atlantic Sea Scallop fishery by evaluating the feasibility of sampling methods that would produce valuable data. Therefore, assessment of the process by participants was a key outcome of this research. To do this and identify a path forward, a one-on-one interview with each participant was conducted. The summary response to each question were:

Question 1: Was the sampling workload reasonable and how much time did it take?

Vessels sampled between 10-30 scallops per sampling session. One LA vessel (302) collected 10 scallops per session and believed increasing sample size to 15 would be reasonable. One LA vessel (301) and one LAGC vessel (305) sampled 15 scallops and stated that this amount was reasonable and should not increase. Two LAGC (303 and 304) vessels collected 30 scallops per session and found this was a reasonable amount of work but scale issues and difficulty taking images on a moving vessel made sampling challenging at times and the amount of time it took to sample excessive. Only one vessel (304) believed that more than 30 samples a session would be appropriate but only if the weighting and imaging process was more streamlined.

The amount of time taken per sampling session was about 11 minutes for 10 scallops. Vessels that collected 15 scallops reported it generally took less than 30 minutes but sometimes up to 45 minutes to complete a sampling session. When sampling 30 scallops without recording any weights, sampling took about 45 minutes. However, when weights were recorded sampling sessions were about 2 hours long.

Question 2: Did the scales work on your boat and did you feel like the weights from the scale were correct?

Overall, none of the project participants found the scales to collect accurate weights on their vessels. Some participants were able to get the scales to stabilize and collect weight but were not confident in the values recorded. Then there were

participants that were never able get the scales to stabilize to record weight. One participant (302) noted that the scales did seem to work better in calmer seas, however they still were unsure of the accuracy and even took the time to weigh the scallops twice.

Question 3: How user friendly was the App/Data entry?

Most fleet members found the On Deck Data was very user friendly and easy to navigate. However, some crew members that deemed themselves as not very “tech-savvy” needed a little extra guidance at first (302 and 306). There was one crew member aboard vessel 306 that decided they could not navigate the app.

Question 4: Should we change the way data is collected?

Each participant voiced that we should not change the way data is collected and the On Deck Data app worked very well once everyone was able to navigate the app. Two fleet members (303 and 304) voiced concerns over their ability to accurately stage the scallop gonad conditions and suggested some type of verification process, such as collecting individual scallops to bring in or taking images of the scallops for science staff to verify the fishermen’s data.

Question 5: If the fleet decides to continue what is fair compensation?

All fleet members wanted to see RSA pounds continue as the compensation for this type of work. Fleet participant 304 expressed concerns over a reduction in quota soon and believes RSA pounds are good for LAGC.

Question 6: Is there any other information you see as valuable that we’re not collecting?

Fleet members suggested adding to the data collected, such as more environmental parameters and focusing on targeting different depths to better compare scallop health between areas. One fleet participant (301) brought up concerns with the areas sampled and believes there should be dedicated areas so that a better overall picture is developed from revisiting the same locations. Two fleet participants (304 and 305) voiced concerns over scallop shell health, stating that they see variations in the shells between different locations and shell thickness/density should be included in scallop health studies. Fleet member 305, has found scallops with shells that he can crush in his hand, leading to high discard rates in this area. Fleet member 304, also would like to see more investigation of how big currents affect scallop spawning and biomass. Fleet member 304 also believes more environmental data should be recorded by the fleet. Fleet member 303 did not know what other information should be collected but would like to see data that works towards a better understanding of scallop age and growth.

Question 7: Do you have any overall thoughts on the project/Other comments

Half of the participants had no other comments. Vessel 301 would like to see the project move to focus on image collection as images may be able to be used to verify data and that a Research Fleet could be instructed to visit targeted areas. Two other participants shared similar ideas and suggested targeting different depths to better understand scallop health in relation to depth and environment.

Evaluation of the Research Fleet Method and Overall Conclusion

Feedback from participants, coupled with CFRF staff assessment and guidance from the Steering Committee were used to evaluate project results and future direction. The following questions were established at the beginning of the project to determine if a Research Fleet should be established in the scallop fishery.

1. What biological parameters and sample sizes can be easily and reliably measured?

Overall, it seems that the appropriate sample size per session is 15 – 30 scallops. Vessels sampled between 10-30 scallops per sampling session. Tow data entry, shell height measurements, meat quality, and gonad stage were all easy to record. The only parameter fishermen found not easy or reliable to collect was individual scallop weights. All other data was easily collected. However, gonad stage may be difficult for fishermen to classify especially when scallops are transitioning.

Another factor to consider in this approach is the changing of the crew. One of the fleet participants trained a new crew member to collect samples towards the end of the project and misunderstood or misinterpreted the directions passed along. This led to the shell depth being measured and recorded instead of shell height. Though detailed protocols were provided in writing during in person training, there was still some confusion on protocols. This suggests that image-based sampling methods may help to verify protocols are being followed accurately.

2. Can photographs be used as a proxy to determine the timing of spawning events?

Most photographs taken were suitable for staff to determine the gonad condition. Some vessels did not understand directions in the beginning of the project, but once feedback was provided better image quality photos were collected. As not all fishermen were confident in their ability to stage scallops correctly, having photographs to allow scientific staff to review was an essential function of On Deck Data.

3. Is it more feasible (ie. accuracy, precision, effort sampling) to use photographs or gonad weights to determine the timing of spawning events?

Individual weights were not easily or accurately collected. All participants found frustrations with the scales and expressed their concern for accuracy. If the scales were able to stabilize the fishermen still felt the weights were not accurate. One participant (302) weighed scallop meats twice to attempt accuracy but still felt overall the weights recorded are not accurate. Some participants also voiced concerns about staging accuracy and stated that additional photos provided or verification by scientific staff would be beneficial and ensure accuracy. Therefore, we would like to continue to explore the feasibility of using images to collect biological data.

We chose to use the WPL scales for this project because after our experience with the Marel scale we did not think that it would be the ideal scale for this project and the WPL scale was advertised as “*A multirange, high accuracy scale, motion compensated, waterproof and robust, especially developed for scientists and others in need for accurate weighing at sea. A compact light weight scale, ideal for sample weighing. Accuracy, robust construction and ease of use are at the highest importance.*” Additionally, these scales are approximately half the

price of the Marel scales. However, based on our experience and the feedback from project participants these scales are not appropriate for fishermen to record the weights of individual tissues, primarily due to the time required to obtain a given weight and the experience needed to know if the scale has “adapted” to the current environment to provide accurate weights. Switching to a Marel scale did not solve these issues.

4. Are there additional parameters the fleet would be interested in collecting?

Based on the response to Question 6 of the interviews, this is a resounding yes. However, many of the parameters of interest would be difficult to apply to management. Interests could be addressed by focusing on Research Fleet efforts on particular areas of interest such as the Northern Gulf of Maine, access areas, or places with disease concerns. This could allow for year-round monitoring of areas and potentially adding parameters specific to the concerns of these areas.

5. Can an economical benchtop balance scale be used at-sea in place of a motion compensated scale for the appropriate data accuracy needed to answer the biological questions?

No, none of the scales tested showed accurate measurements of weight. Overall, a total of six different scale models were tested across the fleet and aboard CFRF surveys to determine if individual scallop meat, gonad, and tissue weights could be recorded at sea. However, none were able to produce weights that fishermen believed to be accurate measurements.

6. Is it necessary for this fleet to use Bluetooth compatible calipers and scales?

No, they are not seen as a necessity. Sample size and time were adequate without needing to increase efficiency with measurement tools that communicate directly with On Deck Data.

7. What would the appropriate compensation be for data collected?

Participants wanted RSA pounds as compensation for their participation. This is appropriate and generally feasible. This could work especially well for collecting year-round data from the Northern Gulf of Maine which would only be accessible by RSA quota for most of the year.

8. Do answers differ between the LA and LAGC fisheries as well as open or limited access fishing areas?

Answers from participants regarding workflow, sample size, and sampling parameters did not differ. The only answer that differed was when asked if additional parameters should be collected and the LAGC vessels brought up concerns over age and growth, shell composition (thickness/density) as well as environmental data.

9. What is the overall usefulness of the collected data to fisheries management in the context of cost?

The overall potential of data collection seems to warrant the costs of this project. Using RSA pounds as an incentive has been well received by industry members and was found to be the preferred method of compensation over money compensation. Further, utilizing RSA pounds cuts project costs significantly.

The elimination of weight and concerns over gonad staging were the major takeaways from the sampling trials. Participating fishermen were generally comfortable and able to take images of cut scallops following a predetermined routine. Therefore, a focus on developing methods to extract biological data, such as shell height, meat size and quality, and gonad stage from images is a viable path forward. Generally following the NEFSC observer protocols by taking volumes of scallop meat from scallops of known shell sizes could be a way to get shell-height meat-weight information without taking weights at sea and is possible through imagery. The benefits of this continued approach include establishing a system to collect year-round data from specific areas, particularly to improve our understanding of scallop biology in the Northern Gulf of Maine, and to generally support efforts by the NEFSC to collect biological data more broadly from scallop fishermen.

To this end we have been awarded funding through the 2023/2024 Sea Scallop Research Set-Aside program to continue this work and aim to address concerns found during the pilot project. Each vessel will be equipped with a portable sampling station which includes a sampling board with a grid background and a scientific grade camera system. The goal is to devise optimal image-based sampling methods to create an annotated image library for algorithm training that will allow the camera system to automatically record parameters such as shell height, gonad condition, diseases present, meat quality, and combined volume to calculate an estimated mass of scallop meat.

Project Outreach:

The project team has maintained a [project website](#) throughout the project which featured a general overview of the project as well as project updates and results. Communication with fishermen, seafood wholesalers and processors who are both directly involved with the project as well as those with general interest in the project was also maintained throughout all phases of the project. Articles and announcements on the project's progress were featured in the CFRF [July 2021](#), [July 2022](#), and July 2023 newsletters (Appendix 2). The project title and a link to the project website were included in all CFRF newsletters during the project period. CFRF's newsletter reaches over 1,500 individuals involved in the fisheries/seafood system. Two posts about the project were also made on the CFRF Facebook page which has over 1,900 followers.

The project team presented a summary of the project methodology to the [2022 Scallop Research Share Day](#) as well as the [2023 Scallop Research Share Day](#) (Appendix 2). These presentations highlighted the Research Fleet methods used by CFRF and in this project and preliminary findings. The 2023 RSA Share Day presentation also included the project team's "next steps" to continue to explore the Research Fleet approach in the scallop fishery. Both the [2022 Scallop Research Share Day](#) and [2023 Scallop Research Share Day](#) Short Reports were also made available on the CFRF website. A poster entitled "Empowering Atlantic sea scallop harvesters to collect biological data from scallops to inform fisheries management" was presented at the International Council for the Exploration of the Seas annual meeting in

September of 2022 as part of the theme session “Integration of fisher experiential knowledge (FEXK) into marine science and management” (Appendix 2)

Appendix 1:

**CFRF SEA SCALLOP
RESEARCH FLEET**

**VESSEL PARTICIPANT INFORMATION
AND TRAINING MATERIALS**

**F/V
HARVESTER ID #**



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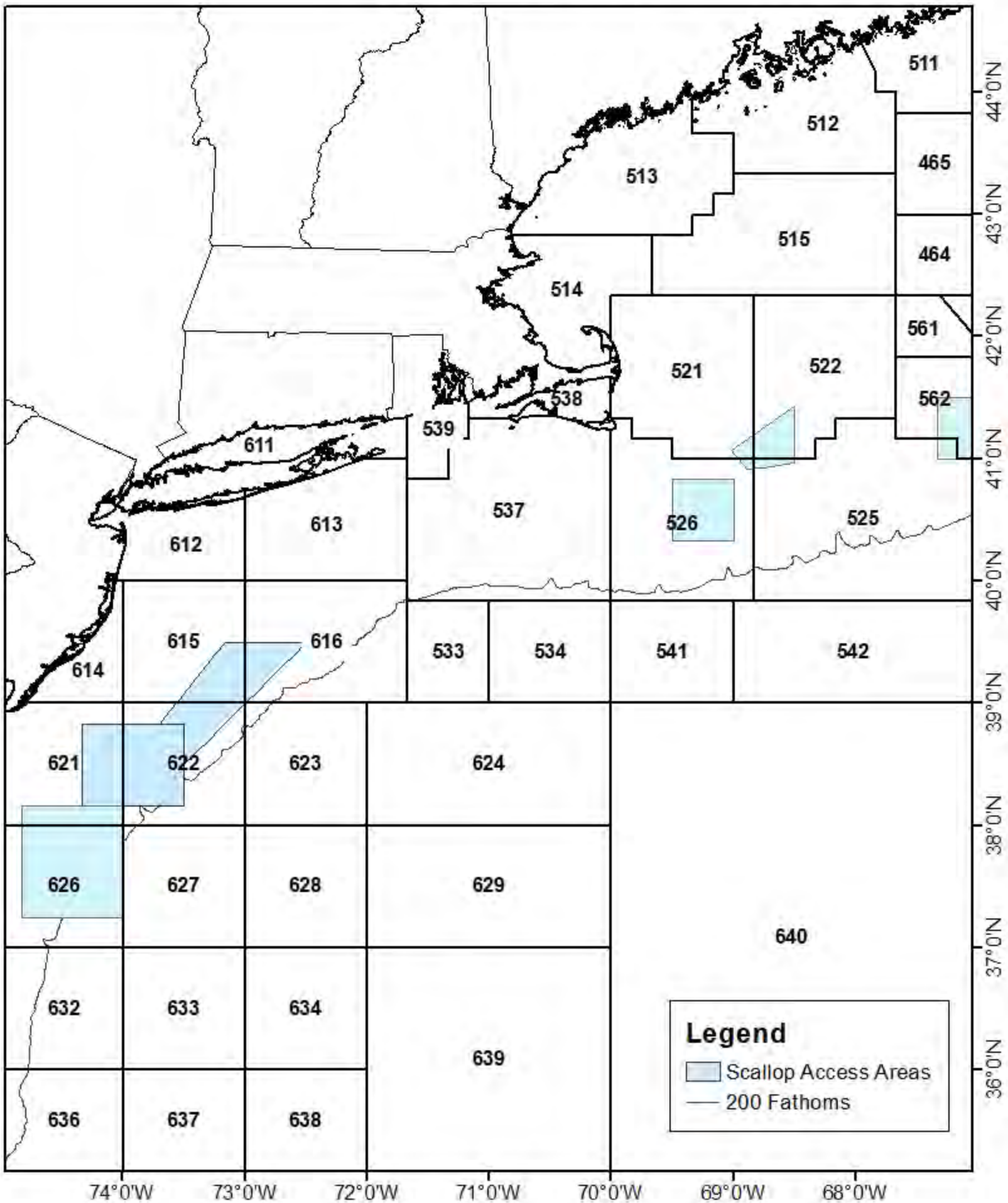
Carl Huntsberger

Research Biologist

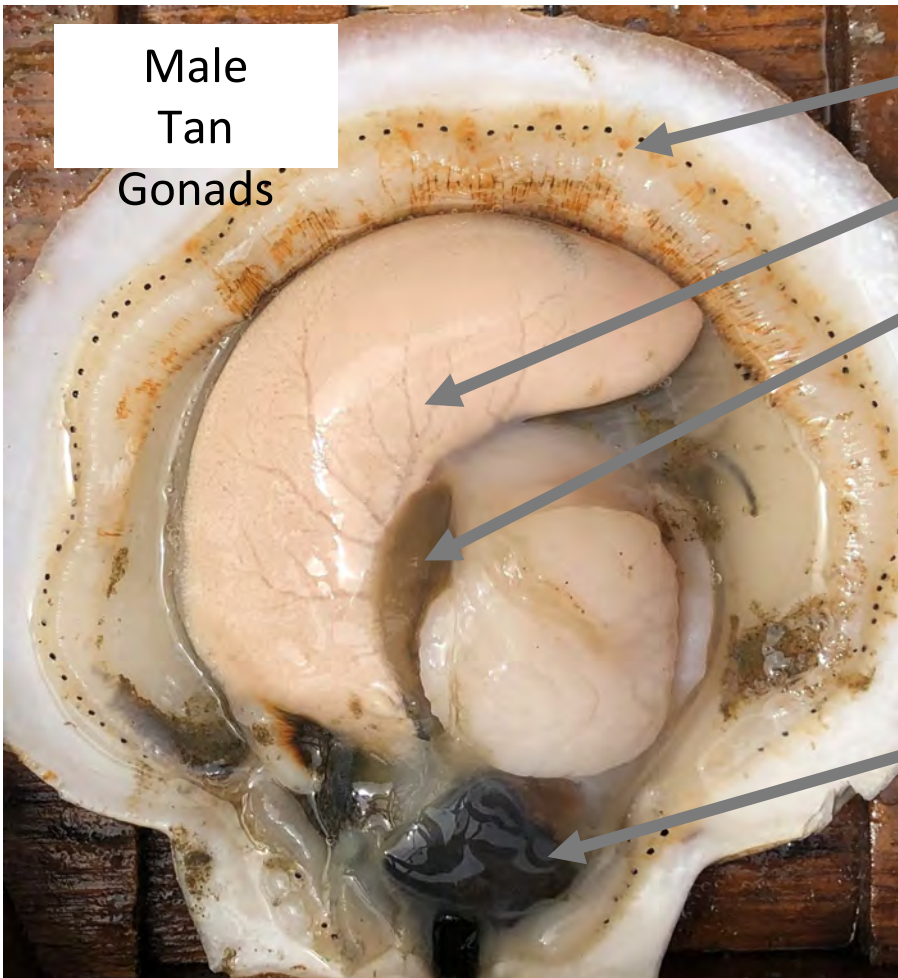
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Email: chuntsberger@cfrfoundation.org

Statistical Areas



Scallop Anatomy



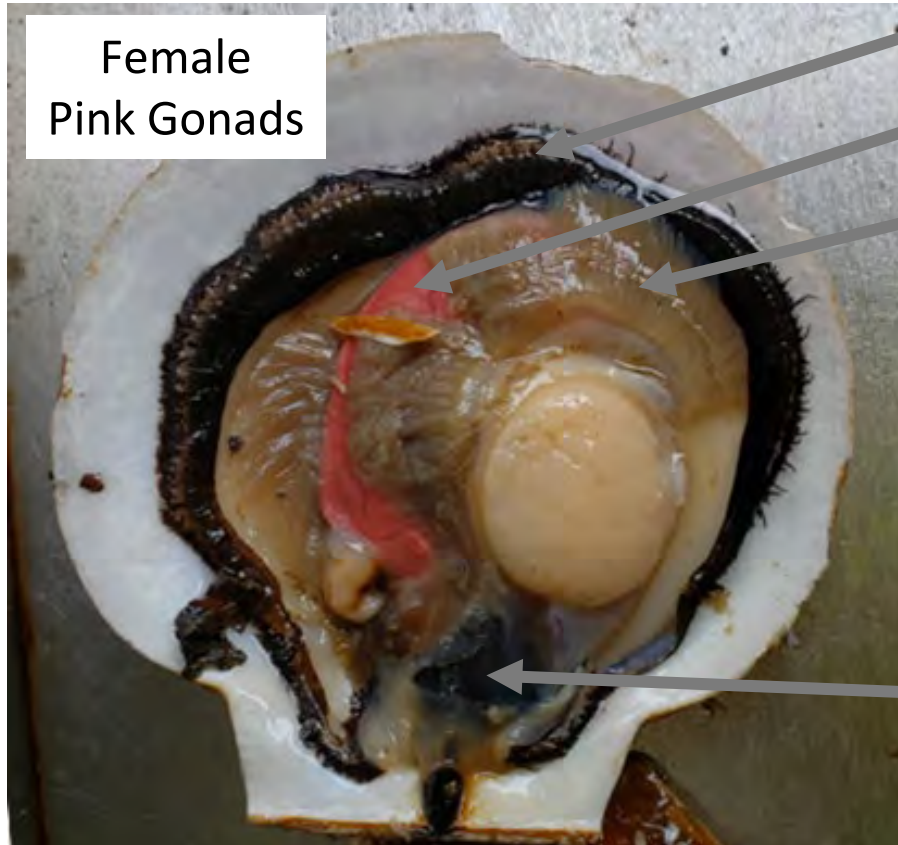
Male
Tan
Gonads

Mantle

Gonad

Gills

Digestive Tissue



Female
Pink
Gonads

Mantle

Gonad

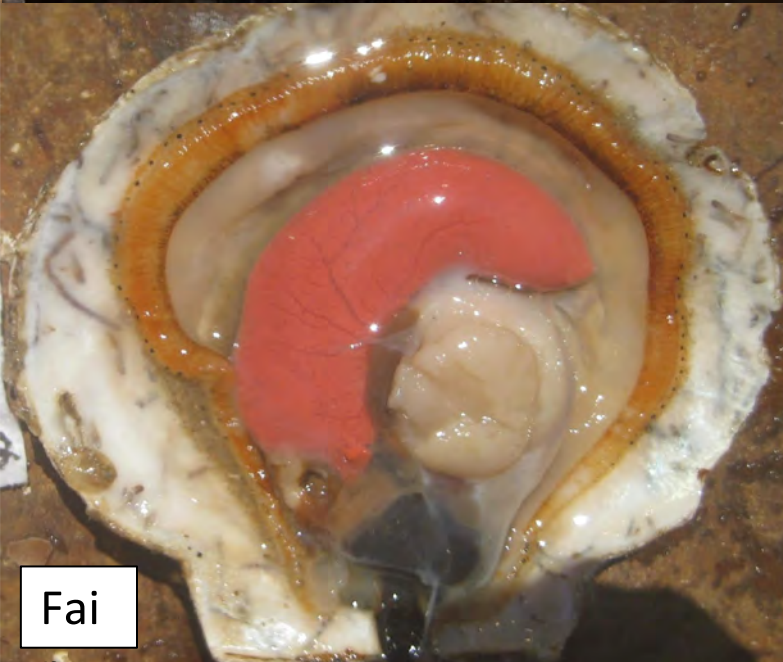
Gills

Digestive Tissue

Meat Quality Guide



Normal, white scallop coloration, firm texture. Scallops with orange meats if firm should be in this category too.



Muscle starting to degrade, slight brown discoloration, slightly smaller than expected, noticeable change in texture, softer

Fai



Gray meat, muscle is soft and flaccid, and degraded. The meat is shrunken and often difficult to separate from other tissues.

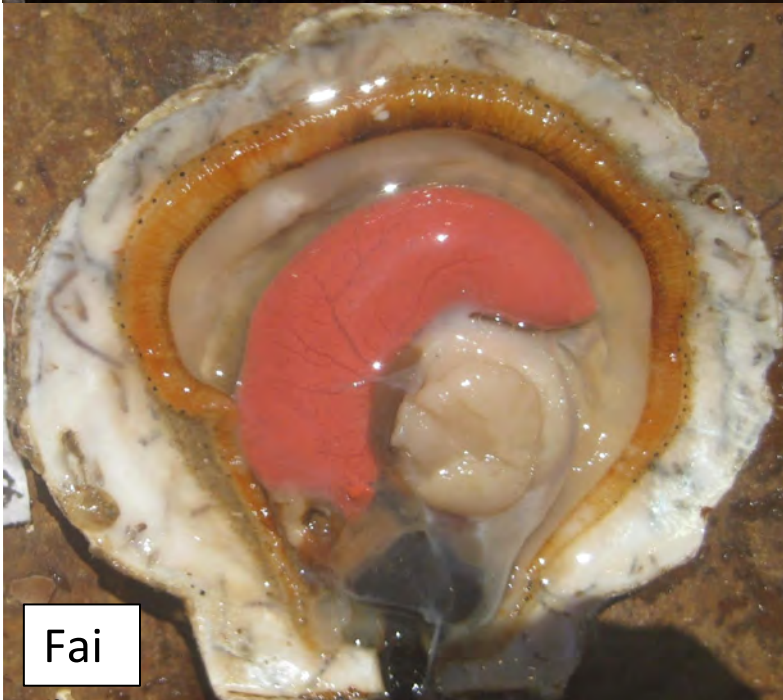
Poor

Meat Quality Guide



Good

Normal, white scallop coloration, firm texture. Scallops with orange meats if firm should be in this category too.



Fair

Muscle starting to degrade, slight brown discoloration, slightly smaller than expected, noticeable change in texture, softer

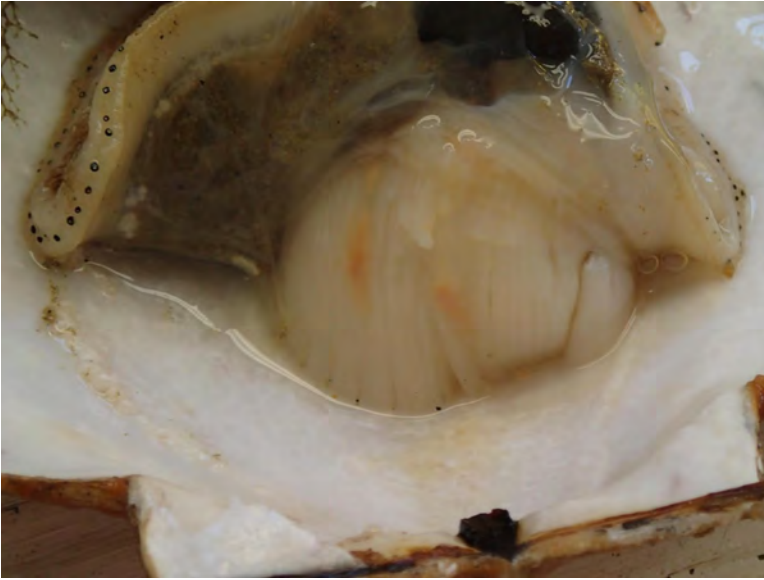


Poor

Gray meat, muscle is soft and flaccid, and degraded. The meat is shrunken and often difficult to separate from other tissues.

Common Parasites

Bacterial Infections
Yellowish orange bubble in the meat filled



Nematode infection
Brown Orange- Pin hole



Photo Credit: Roman

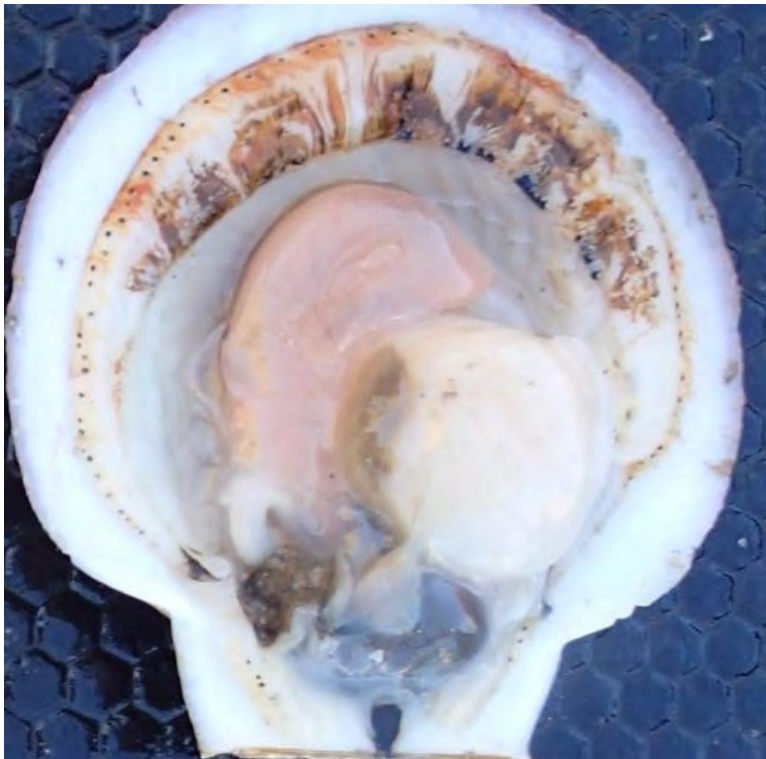
Shell Blister
Pocket against the shell



Photo Credit: Rudders et al

05.12.2013 09:55

Staging Guide: Females



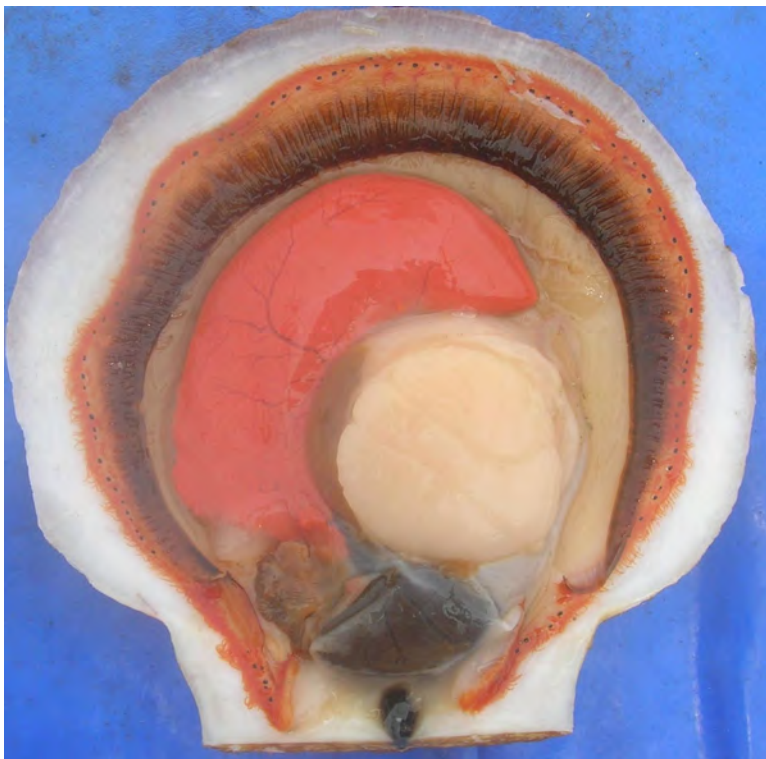
Female: Resting

Nearly Clear, small and flaccid females have a slight pink hue.



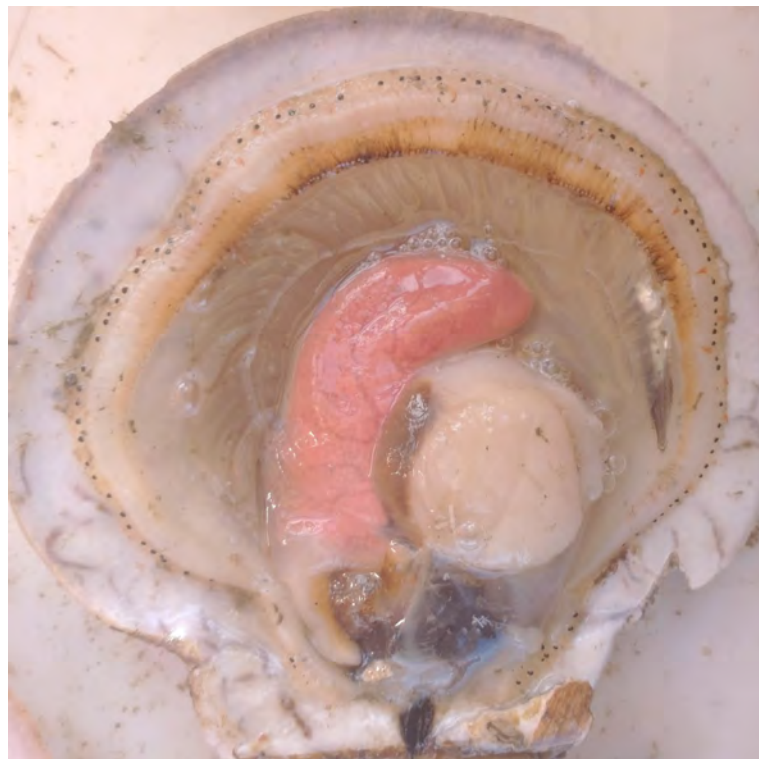
Female: Developing

Pink, eggs beginning to grow, small, Liner is tight to tissue



Female: Ripe

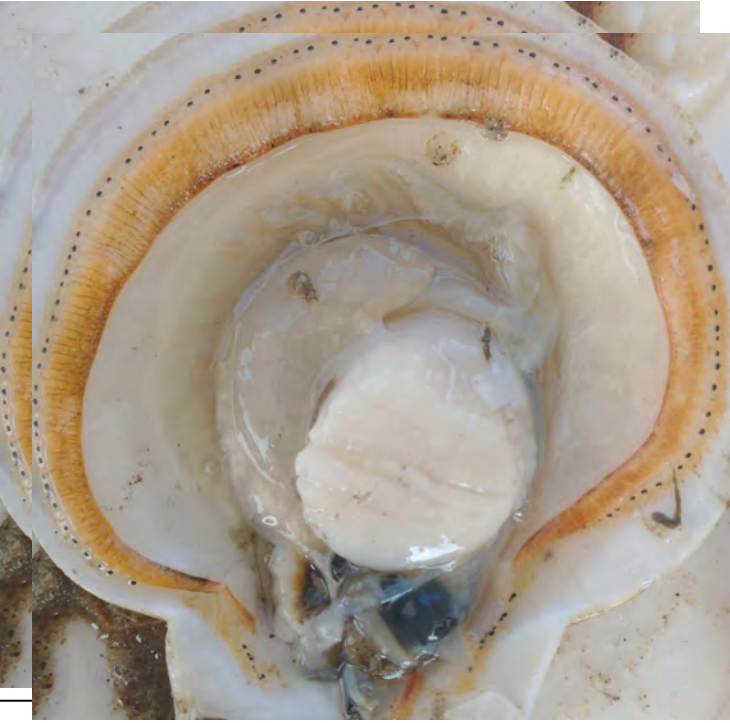
Large and thick, ready to burst, glossy and firm. Brightest color.



Females: Spent

Pink, patchy clear areas, starting to deflate

Staging Guide: Males



Male: Resting

Nearly clear to grey/small patches of tan, small and flaccid, sometimes



Male: Developing

White, beginning to grow, small, Liner is tight to tissue



Male: Ripe

Very Large and thick, ready to burst, glossy and firm. Brightest color.



Males: Spent White, patchy clear areas, looks like it is deflating,

CFRF Scallop Research Fleet Sampling Protocol Overview

General:

- Data will be collected and stored at-sea using the On Deck Data app on tablet devices, and relayed to a central database (at CFRF) via wireless internet once a fishing vessel returns to shore and has access to the internet.

At- Sea Sampling Guidelines:

- The goal for each LA participant is to sample 30 scallops from 3 tows for 1 trip a month.
- The goal for each general category participant is to sample 30 scallops from one tow each month.
- Participants may sample more frequently if possible.
- Participants will aim to collect biological data (size, sex, gonad stage, tissue weight and meat weight and condition) on 30 scallops per sampling session

Notes:

- Participant vessels may choose to sample from any tow, throughout routine fishing practices.
 - Samples must be measured within one hour of being caught

Scallop Sampling Session Data Parameters:

- Date/Time (automatically recorded)
- Location (automatically recorded)
- Depth
- Total catch volume of scallops
- Bottom type
- Dominant bycatch species

Scallop Biological Data Parameters:

- Shell height (mm)
- Sex (Male, Female, Unknown)
- Reproductive Stage (Resting, Developing, Ripe, Spawning)
- Weight of abductor muscle
- Weight of other tissues
- Quality of abductor muscle
- Observations of other parasites/scallop quality issues.

Sampling Protocol

- LAGC Vessels collect data from a minimum of 30 scallops a trip
 - LA Vessels collect data from a minimum of 90 scallops each trip
1. At the start of the tow which will be sampled, press “Start a sampling Session” then press “Start” to start the tow clock.
 2. During Haul back press “stop tow”
 - a. If the tow time needs to be changed enter it in number of minutes
 - b. Enter Depth in Fathoms
 - c. Enter the total bushel count of scallop
 - d. If you’re saving all of the scallop tissues for CFRF press the Grey button “not Saving Scallops for CFRF” and it will turn red saying the scallops will be saved, If you press this button again it will mark the scallops as not being saved for CFRF.
 - e. Enter Stat area
 - f. Press Next
 - g. Select each substrate type in the area.
 - h. Select the type of bycatch species present, if none select clean.
 - i. There is the option to enter other, and type the type of bycatch
 - i. The end position will be automatically be saved from the tablet GPS
 3. Set aside 30 random scallops larger than 3.5 inches (89 mm) for sampling
 - a. If possible store in a tote with flowing water
 4. With-in an hour from conducting the haul the scallops will be processed
 - a. One at a time for each scallop:
 - i. Shell height is measured to the nearest mm with digital calipers and entered into the size box.
 - ii. Bottom shell removed and rinse scallop in sea water
 - iii. Remove the gills and mantle from the bottom shell and place them on the scale.
 - iv. Place the scallop in the photo box and press take picture then press for photo when ready.
 - v. Place all the tissues (gonads, gills, digestive system, and mantel) besides the meat on the scale and record the total weight to the nearest 0.1 gram.
 - vi. Enter the meat quality and gonad state by selecting the matching photo,
 - vii. Weigh all of the scallop muscle to the nearest 0.1 gram.
 - viii. Record anything unusual about the scallop either by adding note or pressing observation at the top to take a picture.

- ix. Press save to move to the next scallop
- x. If less than 30 scallops are saved then press save and okay until the last scallop.



*If scallops are being saved for CFRF place everything from one scallop in a ziplock bag labeled with the scallop sequence number. Then all these scallops into a large ziplock bag labeled with the date, and vessel name.

5. After all the scallops have been entered you will return to the main screen, here you can view the data and add comments about the completed sampling sessions if needed, start a new session, add a observation, or upload the data once connected to WIFI

Recording Observations:

1. Observations can be recorded from the main screen, the tow sampling screen or the scallop sampling screen. These observations are used to record other parasites, potential issues to scallop quality or anything else which may be of interest.
2. Select "Observation" on any screen.
3. Tap the white "Notes" box to enter text.
4. Tap "Take Photo" to take a photo. (Tap "Press for Photo" to take/save a photo)
5. Select "Done" to save the observation record.

To Upload Data to the CFRF Database

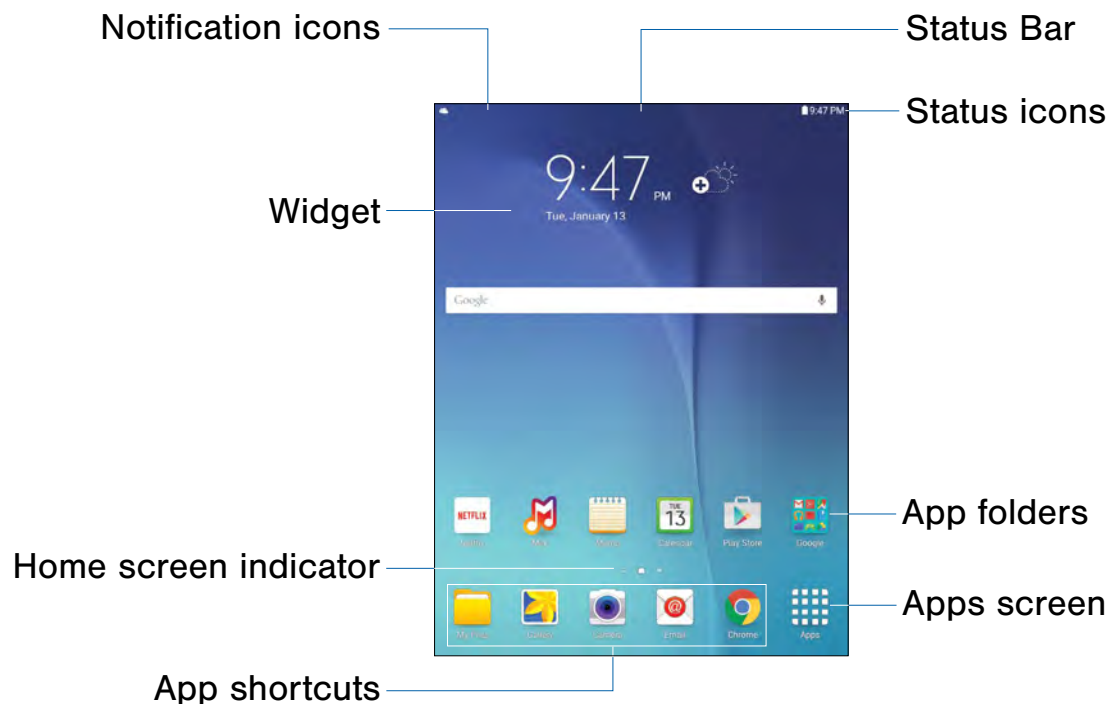
1. Connect tablet to WiFi.
2. Select "Upload Data" on the home screen.
3. Review "Current Data Stats" ready for upload.

4. If accurate, select “Upload” from bottom right corner of screen.
5. A window will pop up showing upload progress.
6. When upload has finished, a window will pop up saying “Upload Complete”. Select “Ok”.
7. On Deck Data will automatically check for updates after data has uploaded, select “Done” when update check is complete.

Tips for taking photos

- Place the scallop in the center of the milk create in the hole created
- Try to find a place where there are limited shadows on the scallop and as much light as possible
- Have the tablet in position before opening up the camera

Home Screen



- **Apps Folder:** For your convenience, there are several applications that are grouped into a folder on the main Home screen.
- **App shortcuts:** Shortcuts to your favorite applications.
- **Apps screen:** Allows quick access to all of your applications.
- **Home screen indicator:** Indicates which Home screen is presently displayed.
- **Notification icons:** Display new messages and emails, notifications, available software updates, and so on.
- **Status Bar:** Displays device status icons (right) and notification icons (left).
- **Status icons:** Display information about the device, such as the network signal strength, battery level, the time, and so on.
- **Widget:** Self-contained application that runs on the Home screen (not a shortcut).

Status Bar

The Status Bar at the top of the Home screen provides device information (such as network status, battery charge, and time) on the right side and notification alerts on the left.

Status Icons



Battery is fully charged.



Battery is low.



Battery is charging.



Vibrate mode is enabled.



Mute mode is enabled.



Wi-Fi is active.

Notification Icons



New email has arrived.



New Gmail has arrived.



Download of a file or app is in progress.



File is being uploaded or sent.



Location service (GPS) is active.



App updates are available from the Google Play Store.



App installation or updates are complete.



Keyboard is in use.

Navigation, Motions, and Gestures

Touchscreen Navigation

Tap

Lightly tap items to select or launch them.

- Tap the onscreen keyboard to enter characters or text.
- Tap an item to select it.
- Tap an app icon to launch the application.

Touch and Hold

Activate onscreen items by a touch and hold gesture. For example:

- Touch and hold a widget on a Home screen to move it.
- Touch and hold a field to display a pop-up menu of options.

Swipe or Slide

To swipe, lightly drag your finger vertically or horizontally across the screen.

- Swipe the screen to unlock the device.
- Swipe the screen to scroll through the Home screens or menu options.

Drag

To drag, touch and hold on an item, and then move it to a new location.

- Drag an app shortcut to add it to a Home screen.
- Drag a widget to place it in a new location on a Home screen.

Pinch and Spread



Pinch the screen using your thumb and forefinger or spread by moving your fingers apart.

- Pinch or spread the screen to zoom in or out while viewing a picture or a web page.
- Pinch or spread the screen to zoom in or out while taking a picture.

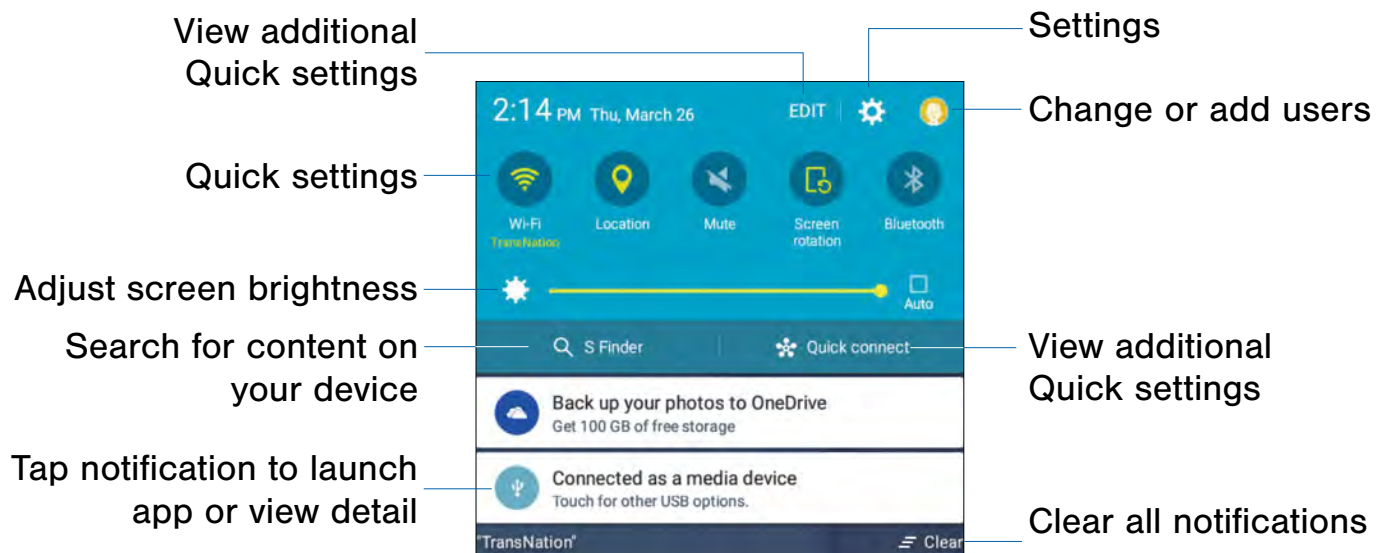
Motions and Gestures

Control your device by making specific gestures with your hand above the device's screen.

Enable Motions and Gestures



1. From a Home screen, tap  **Apps** >  **Settings** > **Motions and gestures**.
2. Tap **ON/OFF** to enable each feature:
For details, see [Motions and Gestures](#).

Notification Panel



Notification icons on the Status Bar display calendar events, device status, and more. For details, open the Notification Panel.

View the Notification Panel

1. Swipe down on the Status Bar to display the Notification Panel.
2. Scroll down the list to see notification details.
 - Tap an item to open it.
 - To clear a single notification, drag the notification left or right. Tap  **Clear** to clear all notifications.
3. To close the Notification Panel, swipe upward from the bottom of the screen or tap  **Back**.

Quick Settings

In addition to notifications, the Notification Panel also provides quick access to device functions such as Wi-Fi, allowing you to quickly turn them on or off.

To view additional Quick settings:

- ▶ Swipe left or right across the visible icons.

To customize the Quick settings that appear:



- ▶ Tap **EDIT**.

Wi-Fi Settings



Wi-Fi is a term used for certain types of Wireless Local Area Networks (WLAN). Wi-Fi communication requires access to a Wireless Access Point (WAP).

Turn Wi-Fi On or Off

Turning Wi-Fi on makes your device able to discover and connect to compatible in-range WAPs.

1. From a Home screen, tap  Apps >  Settings.
2. Tap Wi-Fi, and then tap ON/OFF to turn Wi-Fi on or off.

Scan and Connect to a Wi-Fi Network



1. From a Home screen, tap  Apps >  Settings.
2. Tap Wi-Fi, and then tap ON/OFF to turn Wi-Fi on.

When Wi-Fi is first turned on, your device will automatically scan for available networks and display them.

3. Tap the network you want to connect to.

When you select an open network, you are automatically connected to the network. Otherwise, enter a password to connect.

Manually Connect to a Wi-Fi Network

1. From a Home screen, tap  Apps >  Settings.
2. Tap Wi-Fi, and then tap ON/OFF to turn Wi-Fi on.
3. Tap MORE > Add network.
4. Enter information about the Wi-Fi network:
 - **Network name:** Enter the name of the Wi-Fi network.
 - **Security:** Select a security option and enter your password.
 - **Show advanced options:** Tap if you need to add advanced options such as Proxy settings, IP settings, or Key management.
5. Tap CONNECT to store the new information and connect to your target WAP.

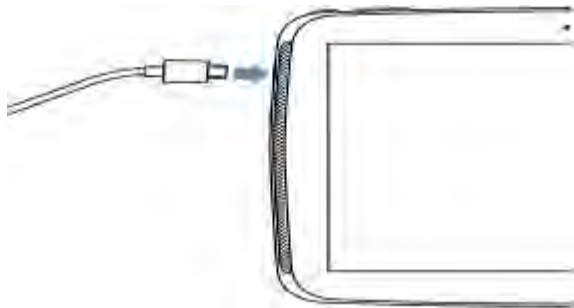
Taking Care of the Galaxy A Tablet

Tablet Care:

1. Always keep tablet in case.
2. Use scratch-free cloth to remove finger prints and smudges from the screen.
3. Never leave your tablet in direct sunlight.
4. Minimize contact with water as much as possible, especially around seams in case, keep a towel readily available to dry off as soon as possible.

Charging the tablet:

Connect the small end of the Micro USB cable to the Micro USB port in the center of the bottom edge of the tablet, when viewed from the front (must open rubber tab to access charging port). Then connect the other end to the charging unit, and the charging unit to a power outlet.



- Use only the charging unit and Micro USB cable that comes with your Galaxy A. Using a different charging unit or cable may damage your tablet.
- The tablet charges faster when you're not using it.
- The input voltage range between the wall outlet and this charging unit is AC 100V–240V, and the charging unit's output voltage is DC 5V, 2A.
- The Galaxy A's battery can't be removed. Don't attempt to open the tablet.

Taking Care of the Scale

Scale Care:

- Do not drop
- Rinse/wipe down with fresh water after use
- Store Dry
- When using only battery on deck keep the plug in a zip lock bag

Basic Use:

1. Make sure the scale is charged before using
2. Turn on with the power button located under the bottom right front corner
3. It takes about 30 seconds for the self check do not have anything on the weighing tray or move it around while doing this
4. It will be ready to use once it reads 0.0
 - a. If the initial weight is more than 0.5 g away from 0 then reset it to zero using the Zero button, if that does not work press the tare button
 - b. If you get into the menu options or it is not displaying zero the easiest fix is to turn it off using the power button (under the right front corner) then turn it back on and wait for it to cycle through the start up
5. This scale is only set to weight in grams, the maximum weight is 300g if at one point the total tissue weight is higher than 300 weigh it in two parts and write the second weight in the comments
6. No need to press any buttons besides zero or tare
7. The scale will shut off after a couple minutes if only on battery power
 - a. If this happens press any button to wake it up

Detailed Scale Use:



Location of the power button, under the front right, press once if nothing happens charge the scale



If the scale is off of 0 by ~1 gram press this button

If the scale is off of 0 of more than a few grams use this button

No need to press other buttons

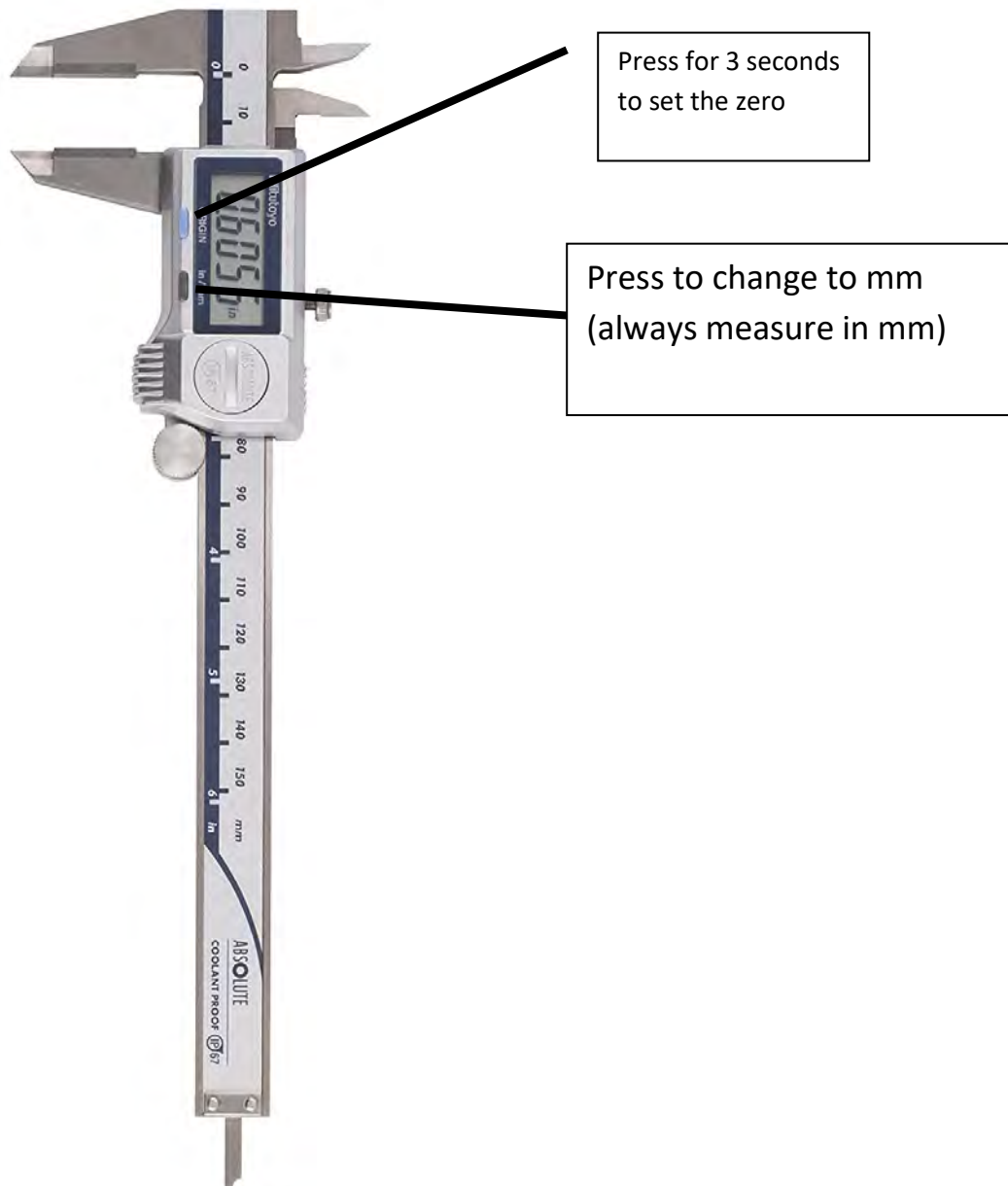


COMMERCIAL FISHERIES RESEARCH FOUNDATION

P.O. Box 278, Saunderstown, RI 02874
Phone: (401) 515-4892 | Fax: (401) 515-3537
www.cfrfoundation.org

Caliper instructions

- Rise with fresh water at end of the day
- Keep slightly open so they don't rust close
- Turn on by moving the slide, turns off automatically





Scallop Research Set-Aside (RSA) Program Reporting Requirements

This summary provides a broad overview of restrictions and requirements; the regulations summarized here may be found at 50 CFR 648. Please contact the Sustainable Fisheries Division at (978) 281-9315 for more information.

When harvesting scallop RSA quota, you are subject to reporting requirements in addition to those already required by the scallop fishery. Grant recipients and partnering vessel owners and operators must adhere to compensation fishing permit and exempted fishing permit terms and conditions. Failure to do so may result in the revocation of RSA compensation fishing and exempted fishing privileges for the remainder of the project period.

Vessel Monitoring System (VMS)

Your scallop permit requires you to have a VMS unit on board, which therefore requires you to declare your scallop RSA trips on your VMS unit. When declaring a scallop RSA trip on your VMS, first select the appropriate general category or limited access area declaration, then also declare your intent to harvest scallop RSA quota. In addition to declaring an RSA trip, you must also complete and submit the 'RSA and EFP Trip Start Hail' prior to leaving port and the 'RSA and EFP Trip End Hail' at least 6 hours before returning to port. If fishing ends less than 6 hours before returning to port, send the report immediately upon leaving the fishing grounds. When completing the trip end hail, you will be required to report pounds of species kept and discarded and your anticipated time port and time of landing.

How to Declare a Research Set-Aside and Commercial Allocation Combination Trip Prior to Leaving Port:

1. Properly declare a scallop RSA trip as laid out in the reporting instructions
2. Send in the RSA start hail with appropriate project code*

Prior to Arriving at Port:

1. Send in the Scallop Prelanding Report with total pounds on board the vessel. This will be the total number of pounds landed under the commercial allocation and under each RSA project code.
2. Send in the RSA End Hail with the total number of RSA only pounds landed for each project code and remember to mark 'Yes' that both commercial and RSA allocations will be landed.*
3. VTR filled out with all lbs recorded. Captains can record commercial and RSA allocations as separate line items on the VTR to help as a double check mechanism, but it is not required.

Example: The vessel is landing 18,000 lbs of commercial allocation and 10,000 lbs of RSA allocation landed under two project codes

1. Trip Preland would have 28,000 lbs recorded
2. RSA End Hail for project code 1 has 6,000 lb recorded, commercial and RSA allocation marked 'Yes'
3. RSA End Hail for project code 1 has 4,000 lb recorded, commercial and RSA allocation marked 'Yes'
4. VTR will have all 28,000 lbs recorded

***Note:** If fishing under multiple Scallop RSA project codes, an RSA start and end hail **must** be sent in for each project code. For example, if you will be landing RSA pounds under two project codes, then two RSA start and end hails must be sent in. In addition, each RSA end hail must have the appropriate amount of pounds being landed under each individual project code.

Northeast Fishery Observer Program (NEFOP)

There are no observer requirements for scallop RSA trips, including trip notification requirements. Therefore, if you are harvesting scallop RSA compensation on your fishing trip, you do not need to contact NEFOP prior to sailing.

Vessel Trip Report (VTR)

All VTR submission requirements apply to vessels participating in the Scallop RSA Program. Please visit https://www.greateratlantic.fisheries.noaa.gov/aps/evtr/vtr_inst.pdf for more information on VTRs.

Research Report

The principal investigator of this project must submit a copy of the final report to us within 6 months of project completion.

Contacts

Scallop RSA Program questions – (978) 281-9315

VMS questions and technical difficulties – (978) 281-9213

VTR questions – (978) 281-9246

Scallop RSA Vessel Monitoring System (VMS) Reporting Worksheet

This worksheet outlines the information needed to declare a trip in VMS and to submit RSA catch reports. The 'RSA and EFP Trip Start Hail' must be completed prior to leaving port and the 'RSA and EFP Trip End Hail' must be completed at the same time as the trip pre-land. The hail forms can be located on your VMS unit at the locations below. This sheet may be copied and used as a personal record and does not need to be submitted.

<u>SkyMate:</u>	
<u>Trip Declaration:</u>	<u>EFP/RSA Forms:</u>
<ol style="list-style-type: none"> 1.) From the main screen select "Activity NE" 2.) Then select "More" 3.) Then select "Scallop" 4.) Select area you will fish for appropriate permit category 5.) Select "Yes" for question "Will scallop RSA quota be harvested on this trip?" 6.) Select "Yes" or "No" for question "Will you fish under a scallop Exempted Fishing Permit?" 	<ol style="list-style-type: none"> 1.) From the main screen select "Forms NE" 2.) Then select "More" 3.) Then select "RSA/EFP" 4.) Then Select either "RSA/EFP TS" or "RSA/EFP TE"
<u>Woods Hole Group:</u>	
<u>Trip Declaration:</u>	<u>EFP/RSA Forms:</u>
<ol style="list-style-type: none"> 1.) From the homepage select "Forms" 2.) Then select "NE Declarations" 3.) Then select "Scallop Plan" 4.) Select appropriate permit category area to be fished, and gear if an LAGC trip 5.) Select "Yes" "Will scallop RSA quota be harvested on this trip?" 6.) Select "Yes" or "No" for question "Will you fish under a scallop Exempted Fishing Permit?" 	<ol style="list-style-type: none"> 1.) From the homepage select "Forms" 2.) Then select "NE Other – Forms" 3.) Then select either "RSA and EFP Trip Start Hail" or "RSA and EFP Trip Start Hail"

RSA and EFP Trip Start Hail

Operator's Permit Number*							

Assigned Project Code				

*Number from operator ID, not vessel permit #

VTR Serial #													

Landing Port Code		

Landing State	

Estimated Arrival				
MM	DD	YY	HR	MI

RSA and EFP Trip End Hail

Operator's Permit Number*							

Assigned Project Code				

*Number from operator ID, not vessel permit #

VTR Serial #													

Estimated Arrival				
MM	DD	YY	HR	MI

Estimated Offload				
MM	DD	YY	HR	MI

Landing Port Code		

Landing State	

RSA/EFP Product Kept/Discarded		
IVR Species Code	Kept (lbs)	Discarded (lbs)

Will Both Commercial and RSA Allocation be Landed	
Yes	No

IVR Species Codes							
Summer flounder/fluke	01	Atlantic mackerel	02	Scup	03	Illex squid	04
Longfin squid	05	Butterfish	06	Black sea bass	07	Spiny dogfish	08
Bluefish	09	Cod	10	Cod, gulf of maine	11	Cod, georges bank	12
Haddock	13	Red hake	14	Whiting	15	Ocean pout	16
Sea scallop	17	Monkfish	18	Monkfish tails	19	Monkfish livers	20
Pollock	21	Windowpane/sand dab	22	Atlantic sturgeon	23	Short-nose sturgeon	24
Golden tilefish	25	Hagfish	26	Redfish / ocean perch	27	Atlantic herring	28
American plaice	29	Witch flounder	30	Surf clam	31	Ocean quahog	32
Horseshoe crab	33	Jonah crab	34	Red crab	35	Lobster	36
Yellowtail flounder	37	Southern flounder	38	Fourspot flounder	39	Loggerhead sea turtle	40
Leatherback sea turtle	41	Kemps ridley	42	Green sea turtle	43	Hawksbill turtle	44
Unidentified sea turtle	45	Little skate	46	Little skate wings	47	Winter skate	48
Winter skate wings	49	Little or winter skate	50	Little or winter skate wings	51	Rosette skate	52
Rosette skate wings	53	Barndoor skate	54	Winter flounder/blackback	55	Smooth skate	56
Smooth skate wings	57	Thorny skate	58	Thorny skate wings	59	Clearnose skate	60
Clearnose skate wings	61	Unclassified skate	62	Unclassified skate wings	63	Small skates (discards)	64
Wolfish / ocean catfish	65	Striped bass	66	White hake	67	Atlantic halibut	68
Female red crab	69	Greenland halibut	70	Barndoor skate wings	71	Cusk	72

Port Codes							
Barnegat Light	406	Belford	418	Block Island	549	Center Moriches	468
Chatham	472	Chincoteague	483	Fairhaven	541	Fall River	543
Gloucester	244	Hampton	257	Hampton (Compact)	258	Hampton Bays	259
Islip	287	Little Compton	310	Montauk	351	New Bedford	366
New Harbor	371	New Shoreham	377	New London	375	Newport	385
Ocean City Harbor	109	Plymouth	144	Point Judith	146	Point Pleasant	148
Portland	157	Portsmouth	160	Rye	194	Stonington	11
Tiverton	31	Wanchese	46	Waretown	48	Wesport	66

More port codes are available at <http://www.greateratlantic.fisheries.noaa.gov/vms/regs/ivrcodes.pdf>



CFRF NEWSLETTER

July 2021

ISSUE 15

COMMERCIAL FISHERIES RESEARCH FOUNDATION

The Commercial Fisheries Research Foundation is a non-profit, private research foundation founded and directed by members of the commercial fishing industry. The CFRF's primary mission is to conduct collaborative research and education projects that assist in the achievement of sustainable fisheries and vibrant fishing communities.

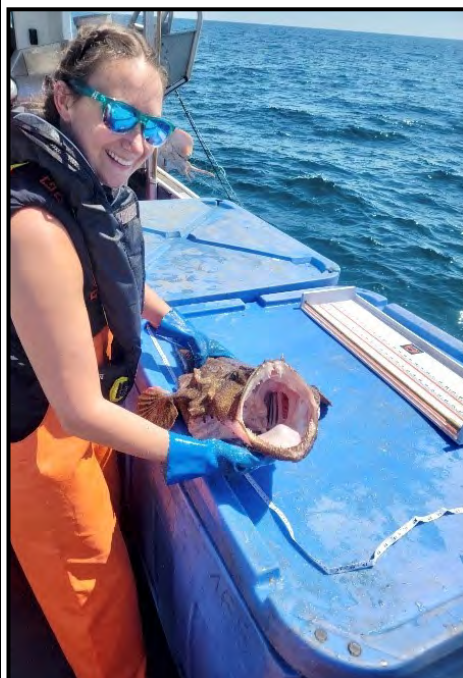
MESSAGE CORNER:

Our summer and research are in full swing, especially the 4 surveys (Beam Trawl, Gillnet, Ventless Trap & Fish Pot) in the essential habitat area of Cox Ledge, which are assessing the status of fish stocks as part of the South Fork Fisheries Monitoring Plan. The CFRF staff is working with RI fishermen from Point Judith, Newport and Sakonnet to conduct this significant research, which is critical to measuring impacts during and prior to construction and installation of wind turbines. The research is essential; however, the safety standards, documentation and requirements of Ørsted are imposing and excessive. They have created additional anguish for the CFRF staff and the fishing vessel captains and crews, and they unwarrantedly exceed United States Coast Guard fishing vessel regulations in US territorial waters. We are striving to establish some common ground with the offshore wind developers to standardize the safety regulations. We will succeed in time. I wish you ALL a productive, healthy and safe summer season.

Fred Mattera, CFRF President

NEW PROJECT: SOUTH FORK WIND FARM FISHERIES MONITORING—GILLNET SURVEY

This past May and June, we partnered with local fishermen (F/V Cailyn and Maren of Little Compton, RI and F/V More Misery of Newport, RI) to conduct a spring pre-construction fishery monitoring gillnet survey of the South Fork Wind Farm near Cox Ledge off the coast of Rhode Island. The South Fork Wind Farm is an offshore wind energy project located in federal waters and includes up to 15 wind turbine generators, submarine cables between turbines and an offshore substation. Five gillnet strings of 12-inch mesh and tie-downs are hauled in the development area, and two reference areas to the east and west of the development area. The survey



was conducted twice per month to document the abundance, distribution, and size of monkfish and winter skate in each area prior to construction. In addition, we are investigating prey composition for these species through stomach content analysis.

The top five commercial species caught in our spring survey were winter skate, monkfish, little skate, barndoor skate and summer flounder. Catch rates steadily increased throughout May and June. The proposed wind farm area had the highest number of winter skates, followed by the western reference area. Monkfish rates were highest in the

proposed wind farm area, with an almost even distribution of monkfish caught in the two reference areas. These results will be used in conjunction with future surveys to help determine if changes occur after the wind farm is constructed. Stay tuned to see what our fall survey will bring, starting October 2021! Please visit the CFRF South Fork Wind Farm Fisheries Monitoring [website](#) to stay up to date on all the surveys and the [gillnet survey webpage](#) for this project. Funding for this monitoring is provided by South Fork Wind LLC.



Learn more about CFRF at www.cfrfoundation.org



Follow us on Facebook!

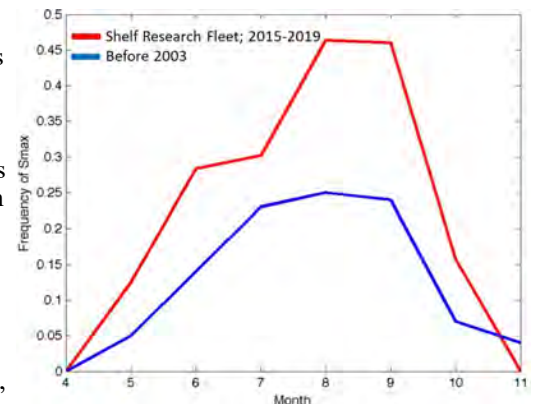
PROJECT UPDATE: LOBSTER AND JONAH CRAB RESEARCH FLEET

Over the last four months, the Lobster and Jonah Crab Research Fleet continued to sample biological and environmental data from over 4,500 lobsters and 3,900 Jonah crabs. This sampling effort brings the total number sampled by the Research Fleet since June 2013 to almost 169,000 lobsters and over 100,000 Jonah crabs! Thank you to all our current and past members for their involvement. We are excited to announce the Research Fleet has welcomed two new vessels: F/V Anna Mary out of Montauk, NY and F/V Rachel Leah out of Newington, NH. The addition of these two new vessels is an important step in expanding the Research Fleet to areas of significant importance offshore (eastern Georges Bank, and offshore Southern New England). This May, with funding from the Atlantic States Marine Fisheries Commission, we released a new version of our sampling app to improve biological data collection and our understanding of female lobster reproductive dynamics and seasonal cycles. Fishermen can now record their gear type (lobster or crab), lobster egg stage, and lobster shell hardness. At the beginning of July, we started a collaboration with the Rhode Island Department of Environmental Management (RI DEM) to leverage ongoing efforts by the Research Fleet to increase our understanding of Jonah crab growth. Crabs are being collected by members of the fleet, and monitored for molting over a 30-day period at the RI DEM laboratory in Jamestown. So far, over 150 Jonah crabs from two inshore and two offshore boats have been collected. Please visit our project [webpage](#) to find more information about this project and the Lobster and Jonah Crab Research Fleet.



PROJECT UPDATE: SALINITY MAXIMUM INTRUSIONS

We are working with partners from several institutions to better understand influxes of warm, salty water (salinity maximum intrusions) from the continental shelf to waters closer to shore. These intrusions generally occur from May to October. The Shelf Research Fleet data was used to investigate the occurrence of these intrusions over the past few years. By comparing conductivity, temperature, and depth profiles collected by the Shelf Research Fleet from 2015-2019 to data before 2003, the team found a nearly 70% increase in these events (see pictured graph). A research cruise, in June, to find and collect data on salinity maximum intrusions was successfully completed. During the cruise numerous intrusions were tracked. Several locations had profiles with multiple intrusions occurring simultaneously at different depths. New techniques, including the use of autonomous underwater vehicles, to track these intrusions were developed. Initial observations of squid on the trip occurred only where these intrusions were present, fueling speculation that squid are “riding” these intrusions inshore. A follow up cruise is planned for September when a fishing vessel, following the research vessel, will tow within intrusions. Before that, CFRF will hold an informational session for those interested in learning more about this trip. Check out the [blog](#) and our [website](#) for more information and stay tuned for the meeting announcement.



PROJECT RESULTS/NEW PROJECT: PILOTING A N-VIRO DREDGE IN THE SCALLOP FISHERY

CFRF staff and participating vessels (F/V Brooke C, F/V Harvest Moon, F/V Karen Elizabeth, and F/V Mister G) completed all research trips for the project between February–September 2020. The at-sea trials consisted of 120 paired tows with the N-Viro dredge (pictured) and New Bedford style dredges on Limited Access General Category (LAGC) vessels around Cox Ledge and 80 paired tows on a Limited Access (LA) vessel in open bottom around Cox Ledge as well as the Nantucket Lightship Access Areas. Final results from both LAGC and LA vessel data show improved fuel efficiency and reduced bycatch rates for the N-Viro dredge compared to New Bedford style dredges, but reduced scallop catch rates were also observed for the N-Viro dredge. This low scallop catch rate offsets the other gains, but provided evidence for a niche use of the N-Viro dredge. In areas with high densities of small (<4") scallops, the N-Viro dredge catch rate was much lower than the New Bedford style dredge, but in areas with lower densities of large (>5") scallops, the N-Viro dredge catch rate was much closer to the catch rate of the New Bedford style dredge. These areas of low densities of large scallops also had high densities of sand dollars, and the N-Viro dredge was much more efficient at reducing their catch compared to the New Bedford style dredge. This suggests the N-Viro dredge could be used to extract large scallops from areas with high densities of both large and small scallops. Based on these results, the project team has received a second Sea Scallop Research Set-Aside award for 2021. We will have the opportunity to conduct Phase II field trials in the coming year. The second round of field trials will involve LAGC vessels to test modifications to the N-Viro dredge and a LA research trip that will apply the best modifications to the N-Viro dredge and specifically target areas of mixed scallop year classes. To follow along with the N-Viro dredge project and read the Phase I project report, visit the CFRF [website](#).



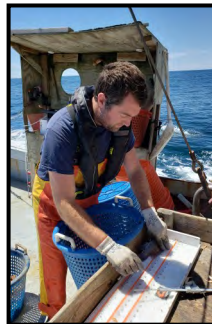
NEW PROJECT: SEA SCALLOP RESEARCH FLEET

Development of a Sea Scallop Research Fleet is underway! The main goal of this pilot Research Fleet is to develop and test methods of collecting individual weights and spawning condition of scallop during normal fishing operations. Despite being a well surveyed stock, there remain uncertainties surrounding the seasonal and spatial changes to scallop meat quality and the timing of spawning across the region. If practical methods are found, the Research Fleet could provide data to support fisheries management and stock assessment. This project is funded through the Sea Scallop Research Set-Aside Program and would not be possible without support from the industry. We would like to thank all the vessels who applied to be a part of this Research Fleet. Due to the scope of the project, we were limited to working with 6 vessels representing different sectors of the fishery; F/Vs Georges Banks and Yankee Pride (Limited Access), F/Vs Glutton and Midnight Our (Limited Access General Category), and F/Vs Clean Sweep and Northern Light (Northern Gulf of Maine). We're excited to work with these vessels, and the project steering committee. The steering committee is comprised of five members from the management and scientific communities to help us develop a sampling technique that is practical and has scientific integrity. An initial meeting with the steering committee gave us great leads to less burdensome sampling approaches, such as extracting data onshore from standardized photographs of freshly cut scallops (see picture). Our goal is to have the Sea Scallop Research Fleet begin testing the data collection methods in January. For more information and project updates visit the [webpage](#).



NEW PROJECT: SOUTH FORK WIND FARM FISHERIES MONITORING— FISH POT SURVEY

The fourth, and final, South Fork Wind Farm fishery monitoring survey kicked off in June with the commencement of the fish pot survey. The fish pot survey will be in operation for the next two years from June through December of each year. We will be working with the F/V Harvest Moon out of Point Judith, RI to complete the fish pot survey. The survey is designed to investigate the impact the wind turbines will have on fish in the immediate area around the installation. Eight trawls of 18 ventless fish pots have been deployed with the first pot of each trawl near the location of a potential turbine. The goal is to monitor structure-associated fin fish species such as black sea bass and scup to see if the turbines have the potential to create artificial reefs which may alter the abundance, distribution, or size-structure at increasing distances from the turbines. Throughout the first two months of survey activities the area seems to be predominately occupied by crabs, both Jonah and rock crabs, with the most abundant fish species being cunner, black sea bass, conger eels, and red hake. Stay tuned to the [project webpage](#) for survey updates and catch summaries! Funding for this monitoring is provided by South Fork Wind LLC.



NEW PROJECT: SOUTH FORK WIND FARM FISHERIES MONITORING — VENTLESS TRAP SURVEY

The South Fork Wind Farm Ventless Trap Survey commenced in May 2021. The survey is conducted in partnership with the F/V Amelia Anne, F/V Ashley Ann II, and F/V Erica Knight of Point Judith, RI and Dr. Jeremy Collie's lab of the University of Rhode Island. This survey is designed to assess the seasonal abundance, distribution, movement, and habitat use of lobster and Jonah crab in the South Fork Wind Farm area and two reference areas to the east and west of Cox Ledge for two years prior to the construction of the South Fork Wind Farm. Sampling will happen twice per month from May–November of 2021 and 2022 at 30 survey stations with trawls consisting of 10 traps (6 ventless traps and 4 standard traps). Biological data is collected for lobsters, Jonah crabs, and all bycatch species, and 3,000 lobsters will be tagged with green T-bar tags throughout the course of the two-year survey. The first three months of the survey have been completed and catches have increased as the survey progresses into summer. The South Fork Wind Farm area and western control area catches have been a mix of lobsters, Jonah crab, and rock crab, while the eastern control area was dominated by rock crab. To find out more about the survey, visit the [webpage](#). Funding is provided by South Fork Wind LLC.



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MORE ON-GOING PROJECTS:

- **A Pro-Seafood Climate Action Agenda:** A group of RI and MA fishing organizations initiated a process to craft a narrative on climate solutions that places wild seafood production at its core. Contact Sarah Schumann (schumannsarah@gmail.com) for more information.
- **Assessing the Vulnerability of the Atlantic Sea Scallop Social-Ecological System:** This project looks at how vulnerable sea scallop fishing communities are to ocean acidification and warming water temperatures, and develops recommendations on how to build resiliency to these changes. Visit our [website](#) for more information on this project and stay tuned to learn about the upcoming workshops.
- **Black Sea Bass Research Fleet:** In partnership with RI DEM, the Black Sea Bass Research Fleet produces year-round estimates of black sea bass catch, bycatch, and biological data for seven different gear types in the Southern New England and Mid-Atlantic regions. More information can be found on our black sea bass project [webpage](#).
- **Catalyzing the Restoration of the Bay Scallop:** This project seeks to help develop a restoration plan for bay scallops in Rhode Island. Information on this project can be found [here](#).
- **Development of a Marketable Seafood Product from Scup:** This project is developing a frozen scup fillet product that meets consumer, fisherman, fish processor, and chef needs. More information can be found at the project [webpage](#).
- **Mapping Hotspots and Piloting Underwater Video Technology:** The goal of this project is to create a map of ghost gear “hot spots” within Narragansett Bay and test a drop camera-grapple approach to target and remove ghost gear. Visit the [website](#) to learn more about the project.
- **Piloting a Low-Bycatch Automatic Squid Jig Fishery in SNE:** In partnership with The Town Dock, this project pilots the use of automatic jigging gear as a low bycatch method to harvest squid. More information on this project can be found on our [website](#).
- **Shelf Research Fleet:** In partnership with Woods Hole Oceanographic Institution the Shelf Research Fleet collects oceanographic data along the continental shelf. More information can be found on the shelf research fleet [webpage](#).
- **South Fork Wind Farm Fisheries Monitoring—Beam Trawl Survey:** The South Fork Wind Farm beam trawl survey collects data on the benthic communities of the South Fork windfarm development area and two nearby reference areas. More information on this project can be found [here](#).

EDUCATION AND OUTREACH:

- In May, Joshua Nooij from Northeastern University joined CFRF as the student intern for our Bay Scallop project. Joshua is playing a key role in the research and writing for this project. The internship will fulfill Joshua’s co-op requirement for his Master of Science degree.
- In June, Jessica Ruggieri from the University of Rhode Island joined CFRF as the Campbell Foundation supported summer intern. She spent the month of June learning about our research and is now working on a project that supports our wind farm surveys. The project will count towards her Graduate Certificate in Fisheries Science.
- David Bethoney served as one of several mentors to the student comprised “Team SCUPPERS” as they competed in the BlueGreen Innovation Challenge. In June, it was announced they had won first place for their idea of *Shellfish Aquaculture on Offshore Wind Farms!* Congratulations to the team and watch their pitch [here](#).
- Michael Long presented “Piloting the fuel efficient, low bycatch, and habitat friendly N-Viro dredge in the Southern New England Sea Scallop Fishery” to share project results at the results from the N-Viro project Sea Scallop Research Set-Aside Program Share Day in May.
- Aubrey Ellertson presented “Size at Maturity of Female American Lobsters from Offshore Southern New England and Eastern Georges Bank” to the Southern New England Chapter of the American Fisheries Society in June.

RECENT RELEASES, PUBLICATIONS, AWARDS AND UPCOMING EVENTS:

- An informational brochure for the Salinity Maximum Intrusions project was distributed and can be viewed [here](#).
- The Assessing the Vulnerability of the Atlantic Sea Scallop Social-Ecological System project was featured in the NOAA Fisheries Navigator, “Scientists Seek Input From Scallop Industry for Study on Ocean Acidification Impacts” The article and other CFRF press releases can be viewed from [here](#).

COMMERCIAL FISHERIES RESEARCH FOUNDATION

The Commercial Fisheries Research Foundation is a non-profit, private research foundation founded and directed by members of the commercial fishing industry. The CFRF's primary mission is to conduct collaborative research and education projects that assist in the achievement of sustainable fisheries and vibrant fishing communities.

MESSAGE CORNER:

A special thanks to David Spencer, CFRF's first and formidable President, as he resigns from CFRF's Board. David was instrumental in launching CFRF as a research foundation with funds appropriated by Senator Reed in 2007. With David's guidance and these funds, CFRF then hired a small staff and drafted an initial request for proposals on significant topics relative to fisheries needs. David influenced CFRF's industry and academia partnerships by providing strategic counsel and fisheries data to augment scientific decision making for a sustainable future in fisheries. He was influential in developing the successful Lobster and Jonah Crab Research Fleet using tablets at sea to record data. This program now generates the largest source of Lobster and Jonah crab scientific data beyond state boundaries. David's mission was to make a positive difference in the livelihood of our fishing community. David motivated and inspired the dream of utilizing industry's independent research to create an impact and cause a reality. His impressive leadership in fisheries research and for the fishing industry itself, personifies his devoted commitment. We thank you!

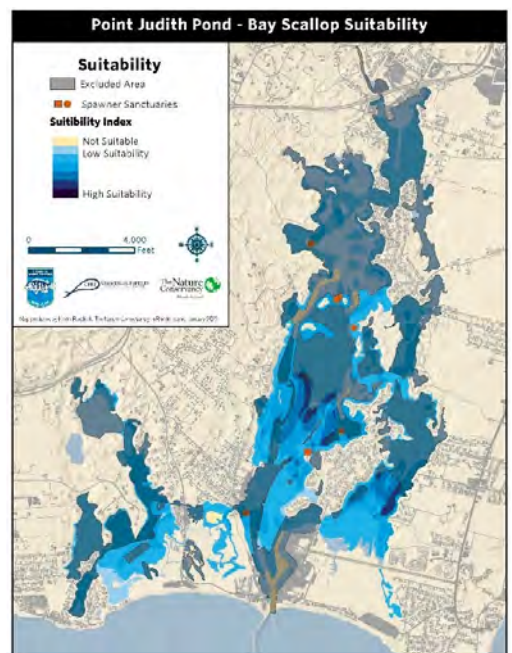
Fred Mattera, CFRF President

PROJECT RESULTS: CATALYZING THE RESTORATION AND CONSERVATION OF THE BAY SCALLOP

We completed our work with the Rhode Island Department of Environmental Management and The Nature Conservancy to conduct a study that will help catalyze the restoration of the bay scallop in Rhode Island. Bay scallops once supported significant fisheries along the United States east coast, but mass population declines in the 1900s led to a nearly total loss of the fishery. In some places, intensive, long-term restoration efforts have allowed bay scallop fisheries to return and persist. However, bay scallops are environmentally sensitive, so careful planning is needed to ensure the greatest chance that such efforts will be successful. Point Judith Pond was once the epicenter of the bay scallop fishery in Rhode Island. To support the development of an upcoming Rhode



Island Shellfish Restoration Plan, we set out to determine which locations in Point Judith Pond are most likely to support bay scallops in the present day. We did this by creating a habitat suitability index that ranks sites throughout the pond based on several factors that are known to influence bay scallop growth and survival. For example, bay scallops have a strong association with eelgrass habitats, which provide juveniles with protection from predators such as crabs and sea stars, so this factor is extremely important when evaluating whether locations are suitable for bay scallops. On the other hand, bay scallops are not likely to grow and survive well in areas with fluid, silty bottoms, so these areas are probably best avoided when it comes to restoration efforts. The ranked index suggests there are a range of sites throughout the pond that are likely to provide adequate habitat once again for bay scallops. These results can be used as a guide to help identify where to focus renewed restoration efforts in Point Judith Pond and can be a foundational piece of the bay scallop section of the Rhode Island Shellfish Restoration Plan. A manuscript on this project has been accepted for publication in the August issue of Journal of Shellfish Research. Reach out to us next month if you'd like to read more! Thanks to the Sarah K. de Coizart Perpetual Charitable Trust for funding this project. Information on this project can be found [here](#).



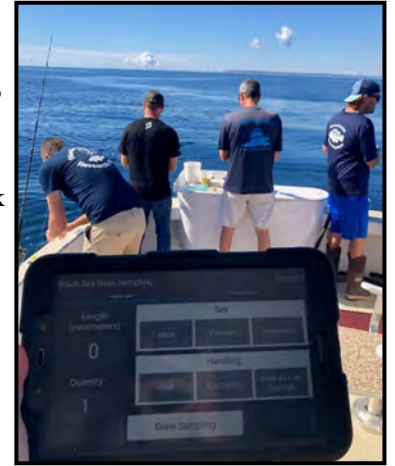
Learn more about CFRF at www.cfrfoundation.org



Follow us on Facebook!

PROJECT UPDATE: BLACK SEA BASS RESEARCH FLEET

The Black Sea Bass Research Fleet has officially surpassed the 5-year mark of data collection, with over 42,600 fish sampled! Sampling was slow through the winter, as usual, but is starting to pick up for the summer season, and over 1,600 fish have been sampled so far in 2022. A Research Track Stock Assessment is currently underway for northern black sea bass, so we have been working hard to ensure that the data is included in the current assessment efforts. The Black Sea Bass Research Fleet represents the first application of the Research Fleet model to a fish species, and we are excited to illustrate the value of collaborative research with the fishing industry in the assessment and sustainable management of finfish. The Research Fleet will continue data collection at least through 2023 with support from the Atlantic Coastal Cooperative Statistics Program. We are grateful to our industry collaborators for participating in this project! More information can be found [here](#).



PROJECT UPDATE: ELECTRONIC GEAR LOCATION MARKING APPLICATION

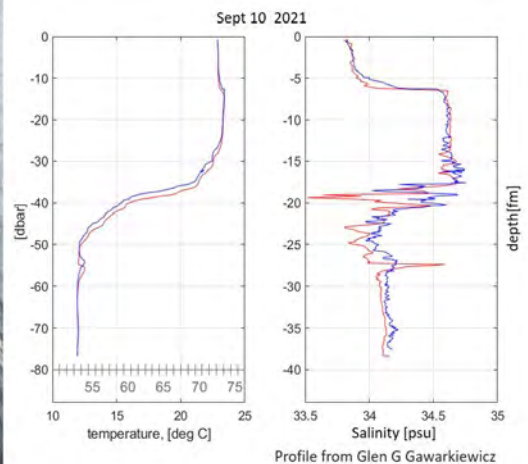


Our new project to test an electronic gear location marking application (app) is officially underway! We have begun using the Trap Tracker app to record the location of the gillnet, fish pot, and ventless lobster trap gear that we are using for our South Fork Wind Farm fisheries monitoring surveys. Our goal is to determine how accurately the app shows the location of fixed fishing gear, whether it is feasible for the app to be used at-large within the fishing industry, and whether it could be used to help reduce gear conflicts between mobile and fixed gear fisheries. We are still recruiting mobile gear fishermen to test the app during their regular fishing activities; participants will receive significant compensation for testing as well as a free cell service signal booster. If you fish in or regularly transit through the area shown in the picture and are interested in participating or learning more about the project, please email Katie at kviducic@cfrfoundation.org. This project is support by the National Fish

and Wildlife Foundation. Stay tuned for project updates [here](#)!

PROJECT UPDATE: SALINITY MAXIMUM INTRUSIONS

This project seeks to map intrusions of warm, salty water that may influence fish distributions off the coast of southern New England. The research cruise for this year's salinity maximum investigation is scheduled for August 30 - September 7th. We are again looking for help from the Shelf Research Fleet to record locations of any high salinity or warm water intrusions to help direct the research cruise. The cruise will take place on the R/V Endeavor and this year will be supplemented with a 2-day biological survey, August 31-September 1, through one of the salinity intrusions. The survey will be conducted by the F/V Darana R and will document the species composition within the salinity intrusion. CFRF personnel Noelle



Olsen and Susan Inglis intend to participate in the survey. Be sure to check out the publication section to read a new manuscript by Dr. Glen Gawarkiewicz and colleagues, including CFRF's Aubrey Ellertson, about these intrusions. This project is funded by the National Science Foundation. Check out the [blog](#) and our [project page](#) for more information.

PROJECT UPDATE: SCALLOP RESEARCH FLEET

The Scallop Research Fleet has started sampling! After two months, data for over 300 scallops has been uploaded to us! As expected, this trial period has had some challenges and successes. The major challenge is that the at-sea scales purchased have not performed well on all vessels, making the measurements of individual scallops difficult. Three of the vessels so far have stopped collecting weights and switched to recording images of the whole scallop. As the Research Fleet continues sampling, we are looking at the practicality of continuing with recording the weights or whether it is more beneficial, and more accurate, to record images or aggregate weights. In the future we will explore options for automated data analysis of these images and the potential to extract the estimated volume of each tissue, color of the meat (indicating the quality), and determine the reproductive stage. Stay tuned as the Research Fleet completes the six-month trial sampling period. This project is funded by the Scallop Research Set Aside program. For updates visit the project page [here](#).



PROJECT UPDATE: SHELF RESEARCH FLEET

Participants in the Shelf Research Fleet take salinity, temperature, and depth profiles while they're out fishing to help us understand changes in the ocean environment. Fishermen have collected nearly 800 profiles since the project started, and this summer, the Shelf Research Fleet is welcoming back Jim Violet and his crew of the F/V Excalibur. Recently, Shelf Research Fleet data was used by Dr. Ke Chen and colleagues in a manuscript describing a marine heat wave on the Northeast US shelf. The data is also being used in the preparation for the upcoming Salinity Maximum Intrusions project cruise at the end of the summer. Thanks to efforts of Woods Hole Oceanographic Institution (WHOI) project lead Dr. Glen Gawarkiewicz, we are happy to announce the Shelf Research Fleet will remain active through the next year with funding from WHOI. We are thankful for the previous financial supporters of the Shelf Research Fleet, the Van Beuren and the MacArthur Foundations. More information can be found on the Shelf Research Fleet [here](#).



NEW PROJECT: METHODS TO ASSESS SEA SCALLOP CONDITION IN RELATION TO WIND FARM DEVELOPMENT

The most economically important species surveyed by our South Fork Wind Farm beam trawl pre-construction survey is the sea scallop. However, the low number of scallops caught in the wind farm area of the survey caused concern that the data would not be sufficient to evaluate any potential impacts on the scallops. Local scallopers knew areas of high scallop abundance within the South Fork construction area but outside the area that the beam trawl survey operates. Funding from the Scallop Research Set Aside program allowed us to supplement the scallop sampling during this survey by supporting an additional tow in these areas of higher scallop density during each month of the existing survey. For the first two months of this project, the single additional tow each survey has more than doubled the scallop catch in the South Fork area, allowing more data to be collected on the baseline condition of this species. As part of this project, we are also collecting additional biological information on scallops with the hopes that these methods will be incorporated in future windfarm surveys. More information can be found on the [project page](#).



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Noelle Olsen
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Hannah Verkamp
Research Biologist

Katie Viducic
Research Biologist

MORE ON-GOING PROJECTS:

- **A Pro-Seafood Climate Action Agenda:** A group of RI and MA fishing organizations initiated a process to craft a narrative on climate solutions that places wild seafood production at its core. Contact Sarah Schumann (schumannsarah@gmail.com) for more information.
- **Assessing the Vulnerability of the Atlantic Sea Scallop Social-Ecological System:** This project looks at how vulnerable sea scallop fishing communities are to ocean acidification and warming water temperatures and develops recommendations on how to build resiliency to these changes. For more information on this project visit [here](#).
- **Ghost Gear Removal Plan:** This project will develop a removal program for abandoned and derelict fishing gear for Rhode Island. See our [project webpage](#) for workshop, public meeting announcements and outreach materials.
- **Lobster Research Fleet:** This Research Fleet provides year-round biological data and environmental data from lobster and Jonah crab traps. More information can be found [here](#).
- **Phase II Piloting a N-Viro Dredge in the Scallop Fishery:** This project builds on previous work to utilize this dredge to reduce bycatch, including small scallops, in the sea scallop fishery. To follow along with the N-Viro dredge project and read the Phase I project report, visit the CFRF project webpage [here](#).
- **Piloting a Low-Bycatch Automatic Squid Jig Fishery:** This project investigates the feasibility of automatic squid jigging machinery, used in other large-scale squid fisheries worldwide, in the southern New England Longfin squid fishery. Check out the project [here](#) for more information and updates.
- **South Fork Wind Farm Fisheries Monitoring—Beam Trawl:** This survey is designed to help determine potential impacts of wind farm development on bottom dwelling animals. More information can be found [here](#).
- **South Fork Wind Farm Fisheries Monitoring—Fish Pot Survey:** This survey is designed to determine the spatial scale of potential impacts on the abundance and distribution of structure associated finfish in the immediate area around the wind farm installation. More information on this project can be found on the [project webpage](#).
- **South Fork Wind Farm Fisheries Monitoring—Gillnet Survey:** This survey is designed to assess the seasonal abundance and distribution of monkfish and winter skate in the South Fork Wind area and two reference control areas to the east and west. More information on this project can be found [here](#).
- **South Fork Wind Farm Fisheries Monitoring—Ventless Trap Survey:** The goal of the survey is to assess the seasonal abundance, distribution, movement, and habitat use of lobster and Jonah crab in the South Fork Wind Farm area and two reference areas to the east and west. More information can be found at [here](#).
- **Whelk Research Fleet:** In partnership with RI DEM, this project seeks to fill data gaps in the combined Knobbed and Channeled Whelk fishery across southern New England through fishermen collected data. Please visit the webpage for more information [here](#).

EDUCATION AND OUTREACH:

- In July, Mike Long attended the ICES PICES Early Career Scientist Conference and presented “*Establishing Baseline American Lobster and Jonah Crab Demographics for Assessment of Marine National Monument Impacts*”
- In June, Aubrey Ellertson and Carl Huntsberger presented data from the Lobster and Jonah Crab Research Fleet at to the Jonah Crab Benchmark Stock Assessment Data Workshop.
- In June, Carl Huntsberger presented “*Fishery-dependent data informs American lobster (*Homarus americanus*) stock structure and commercial fleet heterogeneity*” and Hannah Verkamp presented “*Scoping Bay Scallop Restoration in Rhode Island*” at the AFS southern New England chapter summer meeting.
- In April, Carl Huntsberger attended the annual Benthic Ecology Meeting and presented “*Fishery-dependent data informs American lobster (*Homarus americanus*) stock structure and commercial fleet heterogeneity*”

RECENT RELEASES, PUBLICATIONS, AWARDS AND UPCOMING EVENTS:

- **Recent Publication:** “[Increasing Frequency of Mid-Depth Salinity Maximum Intrusions in the Middle Atlantic Bight](#).” (Gawarkiewicz et al. 2022)

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Project Update:
Empowering fishermen to collect essential data;
Piloting the Research Fleet approach in the
Atlantic sea scallop fishery

RSA Share Day: May 6th 2022

Carl Huntsberger, CFRF Research Biologist
N. David Bethoney, CFRF Executive Director



Project Goal

Assess the potential of the research fleet approach to increase biological data collection in the Atlantic sea scallop (*Placopecten magellanicus*) fishery

Priority #3 “*Scallop Biology: Research on scallop biology, including studies aimed at understanding recruitment processes...*”. The proposed project will develop a data platform to enable the industry to collect biological data.



Our model of the research fleet

- Industry collected data to fill data gaps in management
- Steering committee: scientist, managers, and industry
- Two-way street developing trust in the data and results



CFRF Database						

Examples of Our Research Fleets

- Lobster and Jonah Crab Fleet
 - 31 Vessels sampling > 181,000 lobsters & > 107,000 crabs since 2013
- Shelf Research Fleet
 - 6 Vessels Sampling- Bi-Weekly oceanographic profiles since 2014
- Black Sea Bass Research Fleet
 - 20 Vessels sampling + 40,000 fish sampled since 2016
- Whelk Research Fleet
 - Starting Fall 2022



Project Plan

- 1) Develop a research fleet steering committee**
- 2) Develop data goals and a trial sampling protocol**
- 3) Modify CFRF's On Deck Data application for scallop data collection**
- 4) Collect fishery-dependent biological data from LA and LAGC vessels
- 5) Evaluate the data collection methods for practicality and accuracy
- 6) Outreach and education activities to share findings.

Project Members

Scientists and Managers

- Jessica Blaylock-NEFOP
- Deborah Hart- NEFSC
- Amber Lisi- ME DMR
- David Rudders- VIMS
- Kevin Stokesbury- SMAST



Participating Fleet Members

- Chris Roebuck- LA- Point Judith, RI
- Rui Branco- LA- New Bedford, MA
- Vince Balzano- LAGC- Portland, ME
- Damian Parkington-LAGC-Provincetown
- Jesse Rose- LAGC-Harwich port, MA
- Beau Gribbin-LAGC-Provincetown, MA



Scallop Research Fleet Data Goals

- Improve our understanding for spatial temporal variability in biological parameters
- Improve data collection in data poor areas (NGOM)
- Baseline of biological parameters/meat quality pre windfarms



Initial Sampling Plan

Using the customized On Deck Data app

- Collect Location Data
 - Position, Date, Depth, Substrate, Bycatch
- Collect Individual biological data for:
 - 30 Scallops/Month- LAGC
 - 90 Scallops/Trip- LA
- Evaluate/Modify the sampling protocol



Biological Data

- Shell Height
- Tissue Weight
- Meat Weight
- Gonad Weight
- Meat Quality Fair
- Gonad Condition Female Ripe
- Meat Quality
- Presence of parasites
- Standardized Photos

Scallop 1 of 3 (keeping) Observation

Size (mm)	Tissue Weight (g)
125	136.0
Meat Weight (g)	Gonad Weight (g)
36.0	15.9
Meat Quality Fair	
Female Ripe	
Add Note	Take Picture
Reset	Save



Biological Data

- Shell Height
- Tissue Weight
- Meat Weight
- Gonad Weight
- Gonad Condition
- Meat Quality
- Presence of parasites
- Standardized Photos

Scallop 1 of 3 (keeping) Observation

Size (mm)	Tissue Weight (g)
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Female Ripe	
Add Note	Take Picture
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Select Gonad Condition

Male Developing	Female Developing
Male Ripe	Female Ripe
Male Spawning	Female Spawning
Male Resting	Female Resting
Male Unknown	Female Unknown
Unknown	

Select Meat

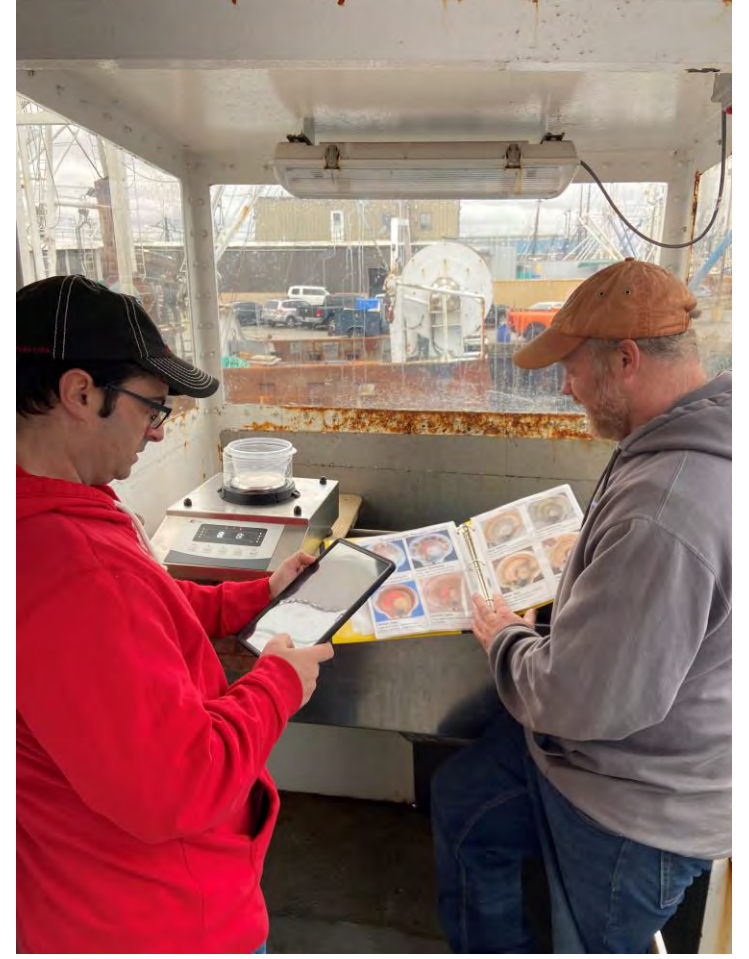
Poor
Fair
Good
Unknown

Project Delays

- Longer than expected to establish and schedule meetings with the steering committee
- Late development of protocols delayed app development
- Ordered the sampling equipment in August 2021-
 - No issues with the tablets or calipers however
 - The scales did not arrive until March 11th: Not in working order
- Troubleshooting the scales until Mid April
- Started training fleet members April 20th



Current Status-Fleet Testing Phase



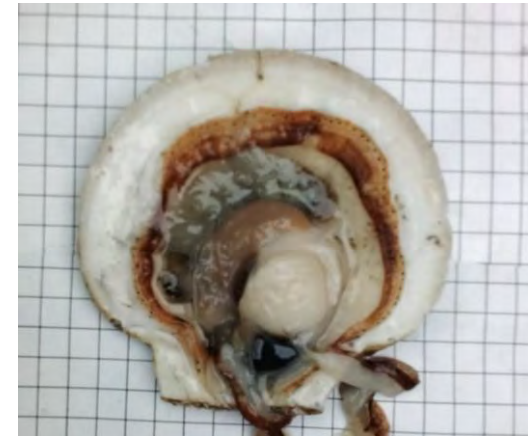
Next Steps

Now-Nov

- Continue working with the fleet members as they collect data, explore the option of collecting individual gonad weights
- Collecting standardized photos to be used for analysis

Dec-March

- Evaluate the potential of this method for the scallop industry
- Apply for additional funding/other sources
- Prepare the final report and outreach events



Any Questions?



Thanks to everyone involved!

<http://www.cfrfoundation.org/sea-scallop-research-fleet-pilot-project>



Project Update:
Empowering fishermen to collect essential data;
Piloting the Research Fleet approach in the
Atlantic sea scallop fishery

RSA Share Day: May 10^h 2023

Katie Viducic, CFRF Research Biologist

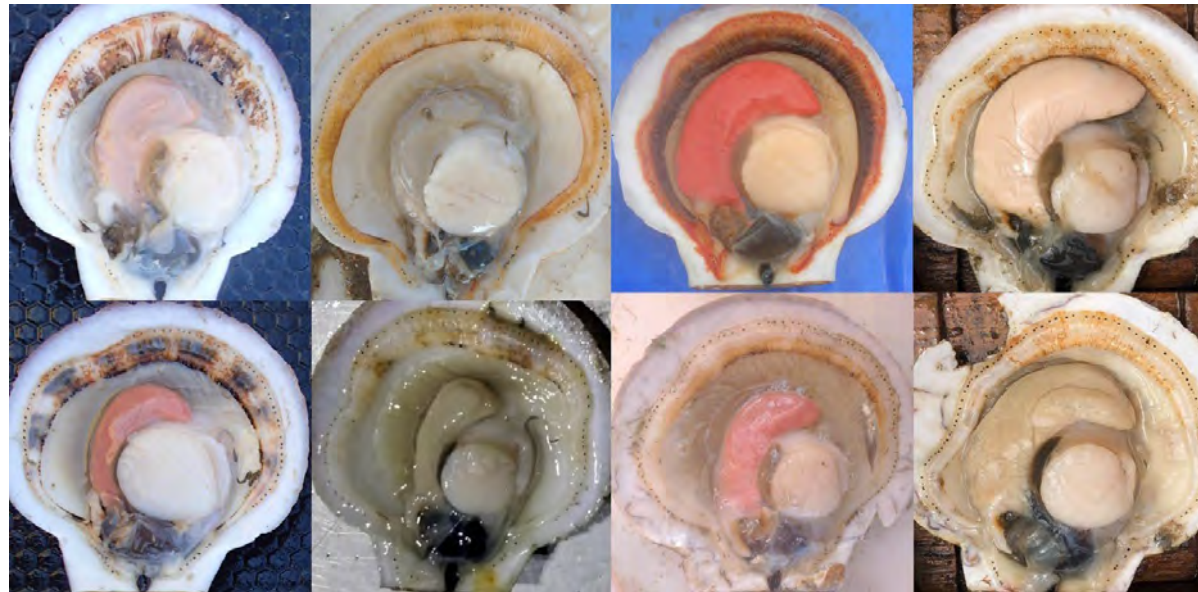
N. David Bethoney, CFRF Executive Director



Project Goal

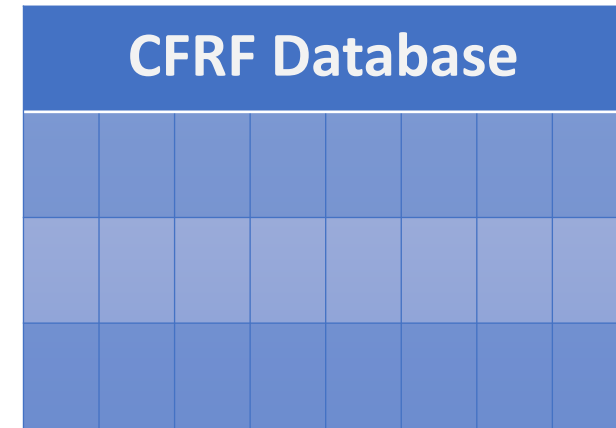
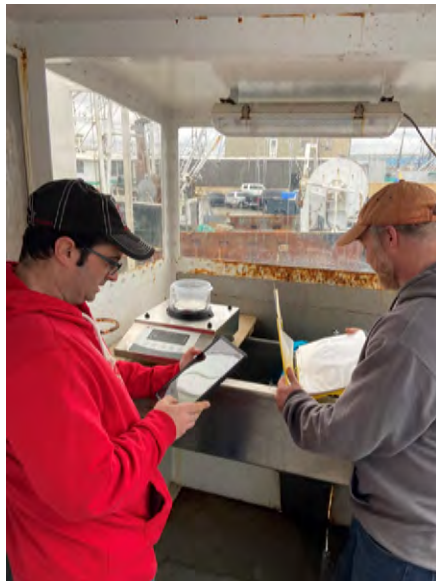
Assess the potential of the research fleet approach to increase biological data collection in the Atlantic sea scallop (*Placopecten magellanicus*) fishery

Priority #3 “Scallop Biology: Research on scallop biology, including studies aimed at understanding recruitment processes...”.



Our Model of the Research Fleet

- Steering Committee: scientist, managers, and industry
- On Deck Data: Tailored tablet application
- Industry collected data to fill data gaps in management



Examples of Our Research Fleets

- Lobster and Jonah Crab Fleet
 - 31 Vessels sampling > 204,000 lobsters & > 107,000 crabs since 2013
- Shelf Research Fleet
 - 6 Vessels Sampling- Bi-Weekly oceanographic profiles since 2014
- Black Sea Bass Research Fleet
 - 20 Vessels sampling > 53,000 fish sampled since 2016
- Whelk Research Fleet
 - 7 Vessels Sampling > 4,000 whelk since 2022



Project Plan

- 1) Develop a Research Fleet Steering Committee
- 2) Recruit a Research Fleet
- 3) Develop Sampling Protocols
- 4) Modify CFRF's On Deck Data application for scallop data collection
- 5) Collect fishery-dependent biological data from LA and LAGC vessels
- 6) Evaluate the data collection methods for practicality and accuracy
- 7) Outreach and education activities to share findings.

Project Members

Steering Committee

- Jessica Blaylock-NEFOP
- Deborah Hart- NEFSC
- Carl Huntsberger – ME DMR
- David Rudders- VIMS
- Kevin Stokesbury- SMAST

Participating Fleet Members

- Chris Roebuck- LA- Point Judith, RI
- Rui Branco- LA- New Bedford, MA
- Vince Balzano- LAGC- Portland, ME
- Damian Parkington-LAGC-Provincetown, MA
- Jesse Rose- LAGC-Harwich Port, MA
- Beau Gribbin-LAGC-Provincetown, MA



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On Deck Data

Tow Data Observation

Tow Time (minutes) 0	Depth (fathoms) 0.0
Stat Area 0	Bushel Count 0

Notes:

Not saving scallops for CFRF

Cancel Next

Tow Data

- Location
- Date/Time
- Tow Time
- Depth
- Stat Area
- Bushel Count
- Substrate
- Bycatch
- Additional Observations

Tow Data Observation

Select Substrate(s)	Select Bycatch
Cobble	Fish
Boulders	Sea Stars
Sand	Crabs
Mud	Buttons (sand dollars)
Unknown	Skate
	Shell
	Other
	Clean

Back Continue

On Deck Data

- Shell Height
- Tissue Weight
- Meat Weight
- Gonad Weight
- Gonad Condition
- Meat Quality
- Standardized Photos
- Additional Observations (Presence of parasites)

Scallop 1 of 3 (keeping) Observation

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Select Meat

Poor
Fair
Good
Unknown

Initial Sampling Plan

Using the customized On Deck Data app

- Collect Individual biological data for:
 - 30 Scallops/Month- LAGC
 - 90 Scallops/Trip- LA
- Modify the sampling protocol



Biological Data









- Shell Height
- Tissue Weight
- Meat Weight
- Gonad Weight
- Gonad Condition
- Meat Quality
- Standardized Photos
- Additional Observations

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Preliminary Results

Fleet Interviews

1. Was the sampling workload reasonable? How much time did it take?
2. Did the scales work on your boat? Did you feel like the weights from the scale were correct?
3. How user friendly was the App/Data entry?
4. Should we change the way data is collected?

Preliminary Results

Fleet Interviews

5. If the fleet decides to continue what is fair compensation?
6. Is there any other information you see as valuable that we're not collecting?
7. Do you have any overall thoughts on the project/Other comments


Next Steps

Awarded funding to continue to establish the Research Fleet approach

2023/2024 Sea Scallop Research Set-Aside Program

Project Goal: Develop image-based sampling methods to collect biological data on individual scallops





Thank you!
Questions?

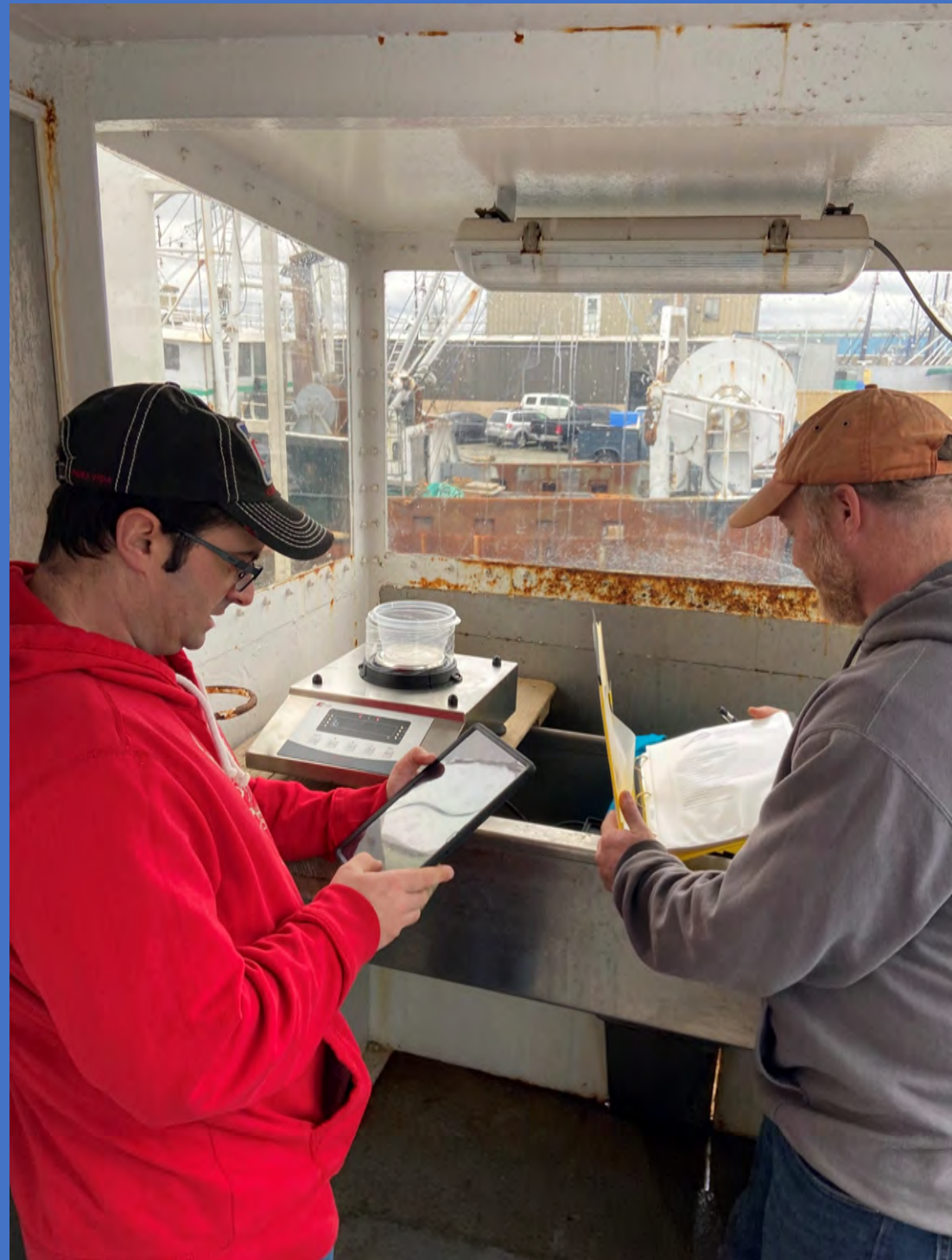


Empowering Atlantic sea scallop harvesters to collect biological data from scallops to inform fisheries management

Carl Huntsberger*, N. David Bethoney

Commercial Fisheries Research Foundation, RI, U.S.A.

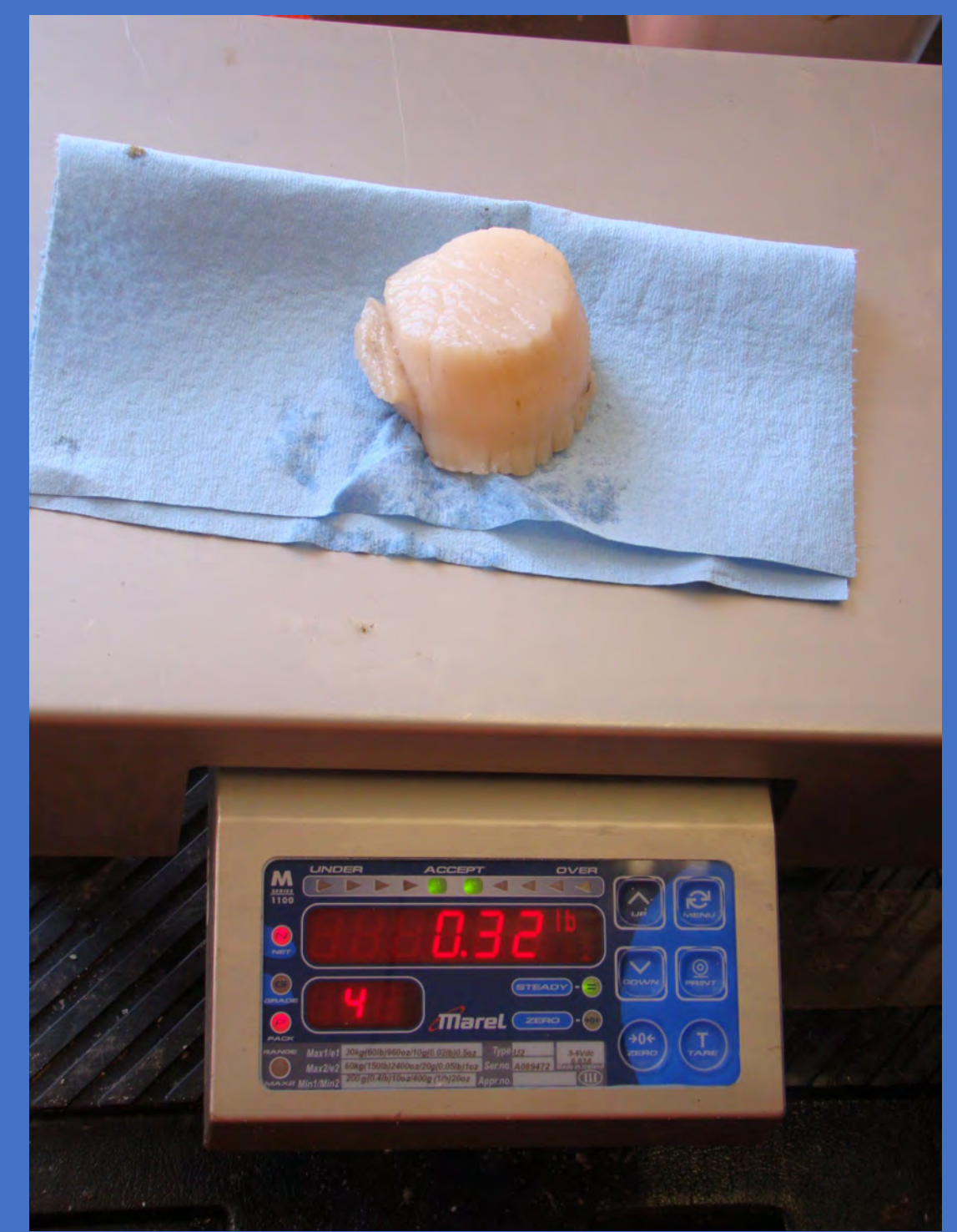
chuntsberger@cfrfoundation.org



Project Goal:

Testing the Research Fleet Approach with Atlantic Scallops

- Develop methods to engage scallopers to collect biological data on individual scallops year-round while commercial fishing.
- Long term goal: To support fisheries management and stock assessment as a fishery dependent data collection tool.



Scallop Fishery Background

- ~50 million pounds/year of *Placopecten magellanicus* abductor muscle harvested in recent years.
- Top 5 most valuable U.S.A. fishery.
- Complex management model, high data input:
 - Spatio-temporal variations in the meat quality and spawning are not well accounted for.
- These seemingly small changes can be magnified across the fishery resulting in significant effects.

Our Model of a Research Fleet

- Leverage the harvesters time and experience on the water to collect biological data to fill data gaps.
- Engage fisheries managers, scientists and the harvesters at all stages.
- Effect two-way communication with clear ownership of data, and periodic data updates.
- Fleet collected data creates a sense of pride and trust in the data and results produced.



How we Integrate Harvester's Knowledge into Designing Sampling Protocols to Acquire Biological Data



Important Planning Steps

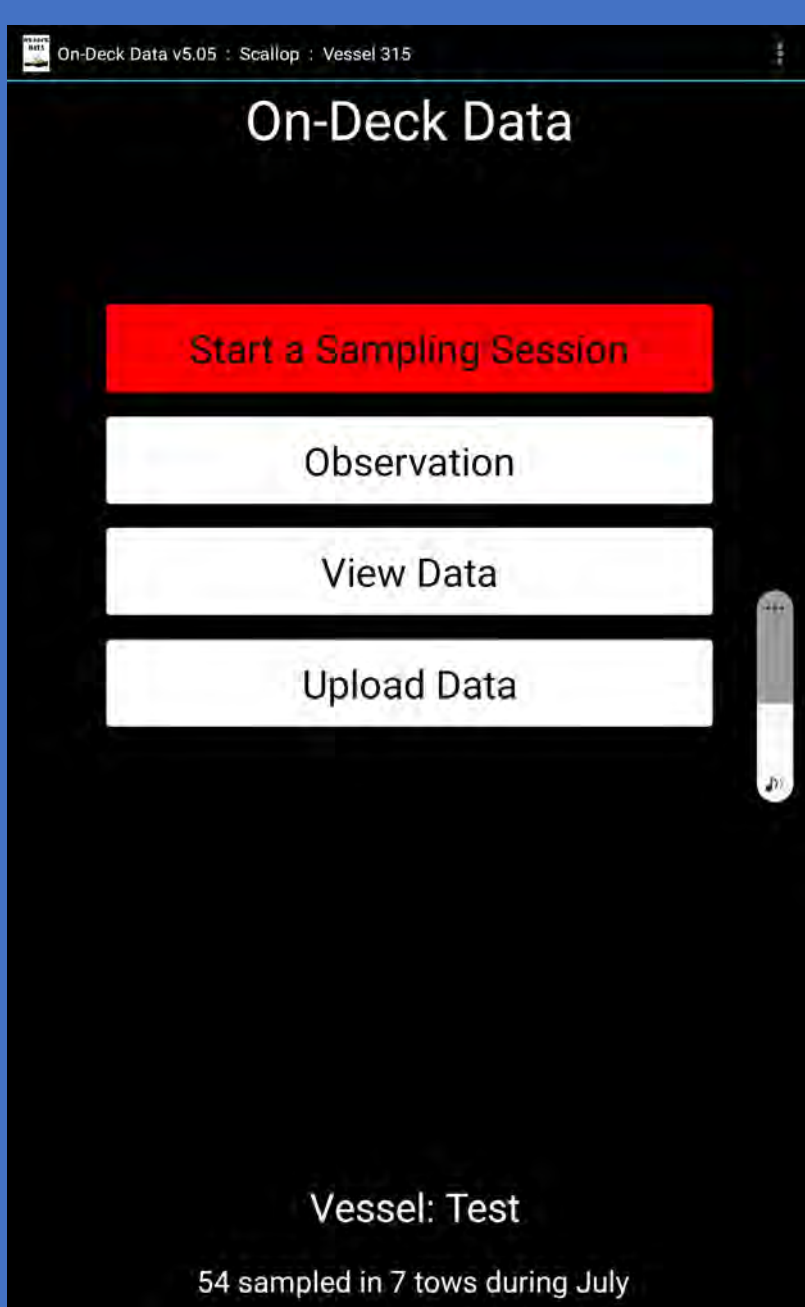
- Understand operations at sea
- Identify data gaps
- Can gaps be filled?
- Build on trust

Training and Testing Sampling

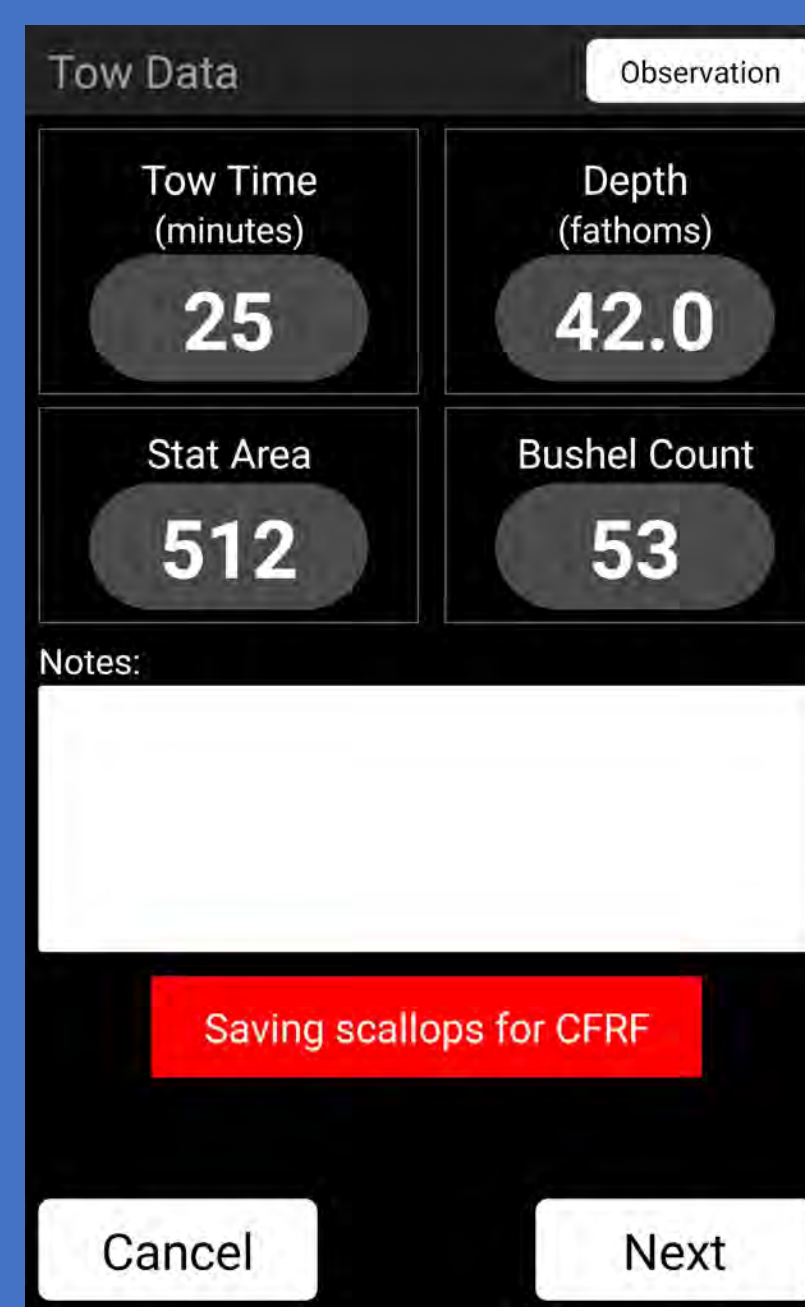
- Simple protocols
- Understand fleet lingo
- Clear, relevant data goals
- Incorporate fleet feedback

Assuring Quality Data

- Share data updates
- Design to reduce bias
- Understand data collection process, and its limitations



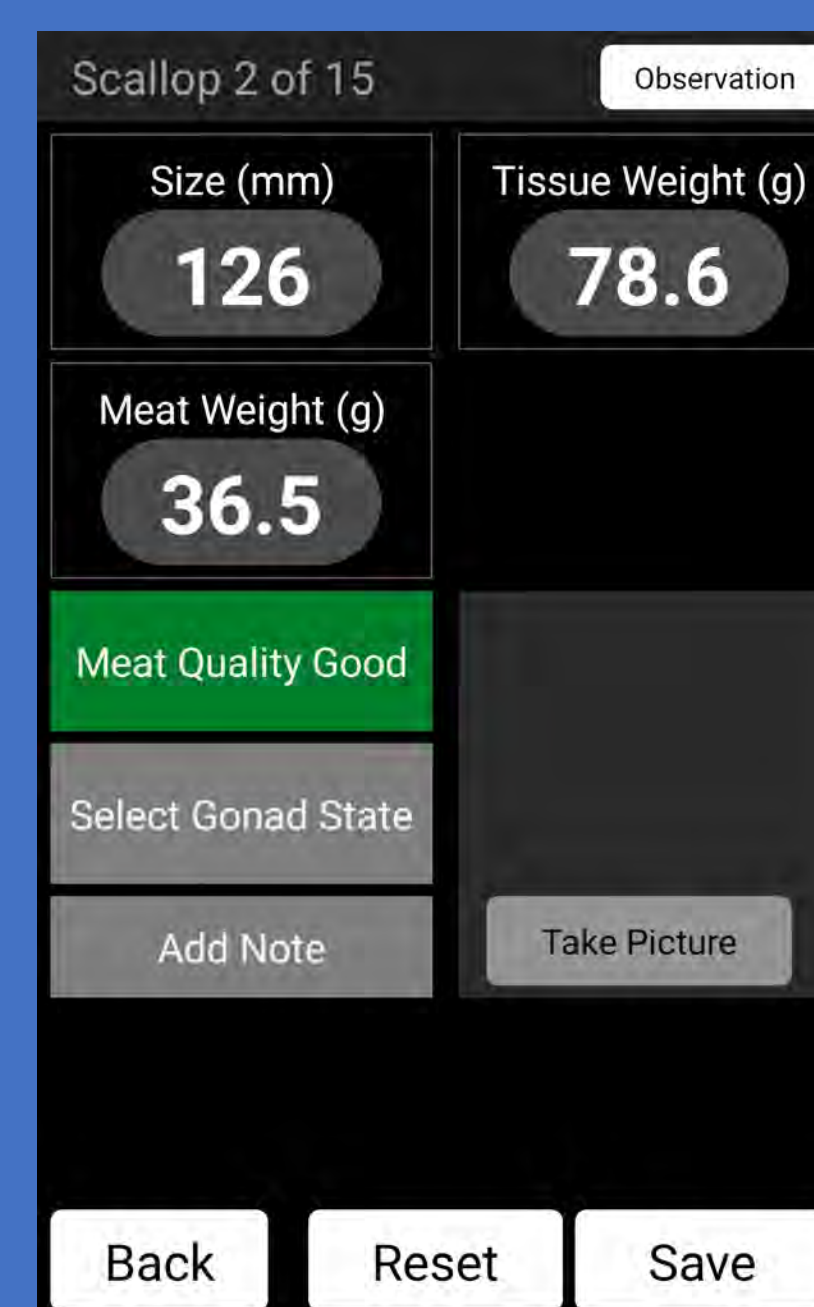
Simple labels



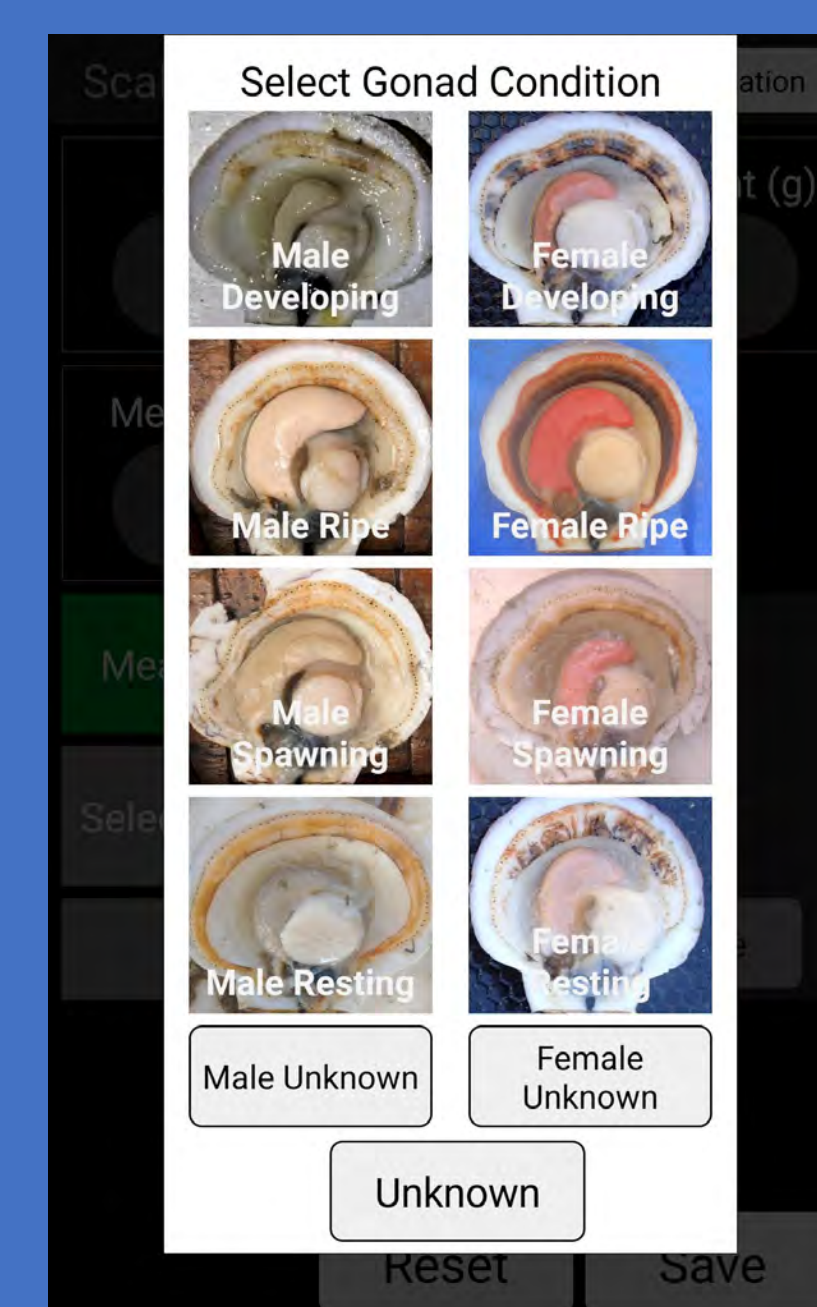
Large text



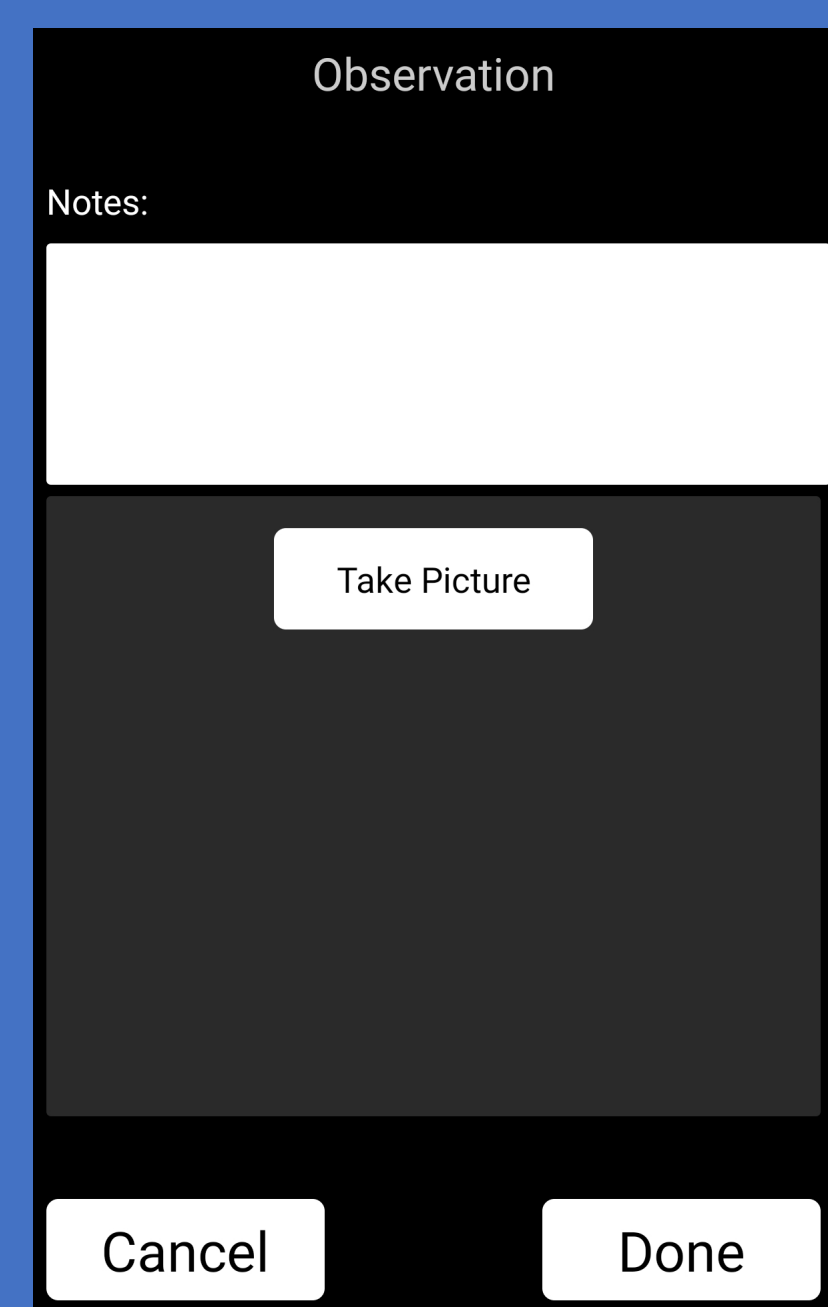
Limit data options



Logical flow



Built in images



Options for notes

Successes and Failures

- Sampling design and time requirements satisfactory, however...
- Scales not always practical: Difficult to verify weights
- Staging of gonads difficult: Accuracy concerns
- Optimism for the data potential from this fleet

Next Steps

- Evaluate the data to understand accuracy and appropriate sample sizes.
- Explore the option of automated image processing to estimate volume of tissues, meat/gonad condition.
- What level of compensation is fair for collecting data?

