Evaluation and Demonstration of Volume Based Standard Scallop Bags for Enforcement and Dockside Monitoring of Trip Limits or Output Controls to Control Scallop Mortality in the Sea Scallop Fishery

Final Report

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Executive Summary:

Background

This project was primarily meant as a demonstration project to show how the application of a standard bag tag system could benefit enforcement of fishing rules that control sea scallop mortality. Potentially, a standardized bag system does this in two ways: for monitoring compliance with a scallop possession limit and for allowing a transition to output controls where appropriate. Currently, there is no mechanism, other than intense dockside enforcement to ensure full compliance with either approach. With the New England Fishery Management Council (NEFMC) current concern for safety the possible transition to output controls may be a possible management choice for the sea scallop fishery.

One potential problem is that scallops can be easily offloaded illegally and without proper monitoring and can be simply sold to the public in cash sales. Without an adequate enforcement mechanism the benefits of output controls are not a viable option for the NEFMC. This project began to investigate mechanisms of designing and implementing an effective dockside monitoring program to assure the sea scallop landings comply with the mortality objectives (quotas or trip limits) established by a Sea Scallop Fishery Management Plan (FMP).

The goal of this project is to demonstrate to managers an enforcement mechanism to monitor scallop landings that is potentially more effective, less costly and, less time consuming for enforcement agencies. Ultimately we need to demonstrate how standardized scallop bags will greatly reduce the risk of illegal landings. This project also examined how standardized bags potentially maximize the value to the vessels by assuring that vessels will optimize their landings by landing all of their trip or quota allocations. Currently, most vessels are under-catching their trip allocations due to the captain's fear of inadvertently landing in violation a few pounds more than the current trip limits from Closed Areas.

Scallops are difficult to weigh at sea or predict their landed weight due to normal water uptake after shucking. Historically, bag weights have varied due to various manufacturers making different size bags. Currently different sized bags range from 35 to 60 pounds. Additionally, scallops when shucked pick up some weight from the melting ice. This adds difficulty to estimating the projected landed weight while the vessel is at sea. To comply with the possession limits a captain usually overestimates the actual catch and lands much less than the allowable limit. If the rules were quantified in terms of standard size bags and catch limits expressed in a quantity of standard sized bags, rather than pounds, vessels would have more assurance that the actual landings do not exceed the limits and could easily count and land exactly the authorized amount of standard bags.

Amendment #10 of the Sea Scallop FMP establishes rotational management of sea scallops utilizing Scallop Area Access Programs to increase yield from scallops by protecting juvenile scallops and targeting harvest of adult scallops. Amendment #10 considered the use of standard bags for the landing of fresh scallops but this was rejected by the Council since all the issues for the implementation of standard bags as a quota management tool were not completely development in the Amendment process.

Currently Amendment #10 utilizes output controls; pound trip possession limits for the special area access program. The pound trip limit is hard for enforcement to monitor and is frustrating for commercial fishermen to strictly adhere due to the inability to weigh catch at sea. The project investigated the utilization of standardized bags and bag trip limits as a replacement for pound limits for quota/possession limit management. In the future we will need to develop protocols for the manufacture, distribution, record keeping, monitoring and enforcement for the utilization of standardized bags and VMS monitoring.

Introduction: **Project Goals and Objectives:**

The project's goals and objectives are to improve benefits to the fishery and to the nation. At the beginning of the project we had listed a number of issues we were going to investigate to achieve our goals. These issues follow:

1. Specifications for a standard bag (or bag tagging of standardized bags) for the landing of fresh shucked scallop meats.
2. Numbering and printing system so the standardized bags are pre-printed and numbered or tagged.
3. Potential manufacturers of standardized bags/tags.
4. Potential mechanisms of NMFS distributing standardized bags.
5. Feasibility, accuracy and enforcement/management benefit of utilizing standardized bags as a proxy for trip limits in scallop area access programs during the 2005-6 fishing years.
6. Use of Boatracs Macro Reporting System for daily reporting and / or end of trip reporting of standardized bags with notice to NMFS Enforcement prior to offloading.
7. Use of third party Weigh-masters to oversee the offloading of sea scallops would further enhance the enforcement of landings - this was to be developed by outlining options during the Workshops.

Sea Scallop Amendment #10 is a hybrid between input controls (DAS management with limitations on number of crew) and output controls (area quota management). Output control-quotas in the special access areas (currently 18,000 pounds per trip) are in many ways preferable for the commercial fishermen provided the unit of measurement is easy for all parties to employ. When trying to comply using a pound trip limit fishermen are under a significant psychological pressure not to go over their limits, but it is very hard to accurately estimate an 18,000 pound trip limit when you are landing about 360,000 scallops (assuming they average 20 count) with no ability to weigh at sea.

Currently, with pound possession limits there is a tendency for a complying vessel to under catch by a few hundred to more than 1000 pounds by taking a precautionary approach in determining the amount of scallops onboard, trying to insure they are in compliance. Even a good crew trying to catch the limit, may inadvertently land a few hundred pounds above the limit, and thus be forced by the system to "break the law" by inadvertently exceeding the 18,000 lb possession limit. If the landing is unobserved, the extra bags landed are moved over the dock and into a cooler and off of the NMFS reporting system. Once in the cooler the bags can not be traced back to the landing vessel.

Because it is hard to be exact, a pound limit for scallop landings places the crew under unnecessary pressure. In a bag tag or standardized bag system, a crew knows it can land a fixed number of bags (i.e. 360 bags) without fearing an overage since the measurement of the trip limit is gauged in the volume of the standard bags. From an enforcement perspective, the bags are traceable beyond the landing area. A law abiding fishermen can feel safe knowing he will be in compliance and may be more likely to report illegal activity by others.

The economic significance of the crew not knowing exactly how many pounds of scallops are onboard has been totally undervalued by managers. Under-landing by 5% can cost a vessel the value of 900 pounds of scallops; recent prices of as much as $8 per pound means this could be a loss of as much as $7200 profit or, in other words, $600 per crew member for the trip. With the limited number of trips

now allowed, this is significant. More importantly, a recent trip landed 18,300 pounds and had the entire trip seized with devastating economic consequences to the owner and crew members.

Standard Bags and Bag Tags

The need for standardized bags and/or bag tags has arisen with the need to enforce possession limits. Possession limits exist in the scallop fishery in the general category (400 pounds) throughout all areas and in the limited access vessel category (18,000 lbs) as a tool to control removals from special management areas. In addition to the enforcement of area/trip limits a standard pre-numbered bag or the use of a bag tag is also a means to provide accountability and traceability for the scallops after they leave the harvesting vessel until some point of first processing in the marketing stream.

In the January 8, 2002 NMFS Enforcement Guidance there was the recognition that enforcement would be enhanced if fish were accountable and traceable throughout the wholesale process. The scallop industry understands and supports this need, and believes that the accountability and traceability must begin with the harvesting vessel. One method would be to require all bags of scallops to be labeled with a tag that identifies the landing vessel and permit number. Additional tag information could include a landing date, unique identifying number, and the meat count. Kevlar tags are available on the market today for about $50/1000. The primary purpose of the tag would be to maintain accountability after the scallops leave the possession of the harvester until the first point of wholesale processing. Individual bags of scallops, commonly weighing 50 pounds, have a value of about $250.00; a bag of U-10's about $350.00. Another method would be standard pre-marked bags, a possibility in lieu of a separate tag.

A bag tag or pre marked bag system would require a standard bag size to control landings. A common bag used today is made of a piece of linen cloth, measuring about 25 inches by about 34 inches, folded over and stitched on two sides to form an open ended bag that will hold 50 pounds of scallops. The project collected data to determine specifications for standardized bags, their manufacture, tolerances, etc. For example, specifications could be written stating that a bag had to measure no more than 17 x 24 inches between seams with the goal that a standard bag should weigh when filled about 50 pounds. In addition to other issues the project tested how variable the final weights associated with a standard bag.

Assuming our project shows the consistency of weight (within acceptable tolerances) the enforcement protocol of trip limits utilizing standard bags (either preprinted or tagged) should be much easier and less controversial than pound trip limits. Enforcement officials would have to only monitor that the correct number of standardized bags (either preprinted or tagged) were landed for each trip. The standard bag is conceptually similar to the standard cage used by the offshore clam and quahog industry. For that industry, the standard cage has had undeniable utility.

A bag tag system may also require that the tag remain with the scallops until they are re-packaged or consumed. A bag tag system will also have to allow for vessels to land a packaged product that differs from the conventional bag.

The adoption of a standard size pre-numbered scallop bag could provide a simple mechanism of controlling harvest, monitoring catch (through distribution) and facilitate enforcement while reducing psychological pressure upon fishermen. Also similar benefits could accrue if general category scallop vessels were required to land in standard bags, their catches could also be monitored and tracked. This project will demonstrate how such a quota monitoring system using standard pre-numbered (or tagged) bags and advanced VMS tools could be implemented for the benefit of the fishermen and the fishery managers.

One of the key issues with using a volumetric based system to replace a weight based system is understanding what factors affect the relationship between the two systems of measurement. These factors include season, storage time, meat condition, and icing practices (Smolowitz et al, 1989). This project did not have the opportunity to space out the research trips in time or space due to conditions in the fishery. The data collected is primarily from one area over a short time frame.

Project Work Plan:

A project committee was formed and a project workshop was held February 23, 2006 to design the details of the project. Invited to participate on the workshop committee were one scallop offloading / vessel owning company from each of the principal ports (New Bedford, Cape May, and Newport News), active vessel captains, NMFS Office of Law Enforcement,, NMFS RO staff and the NEFMC Scallop Staff. Also invited to the Workshop were manufacturers of scallop bags, and representatives of Vessel Monitoring Systems, and label/tag companies. Appendix A contains a list of workshop attendees.

The workshop participants discussed benefits of standardized bags and tagging to management of the resource, refining the design of the standardized bag, bag markings, bag distribution system, vessel reporting, and dockside monitoring. Suggestions were made on the comparisons to the control group of vessels (vessels not using standard bags) and investigating options for third party Weigh-masters. Weigh masters are not considered essential for this project at this time, but their use was discussed in the workshop for either inclusion in this project or for subsequent follow up depending upon the success of this project.

Recommendations were made to test either bag tags with standardized bags, standardized pre-numbered bags, or a combination of the two. One option was a standardized scallop bag with numbering system or a tag system designed and sufficient bags (tags) produced for testing in closed area trips in 2006. The plan was to test different vessels from different ports, with a goal of testing 12 special area access program trips. For example, twelve different individual vessels would be selected to harvest two of their existing closed area trips utilizing the scallop bags as a proxy for the poundage landing limit. These vessels were to fish their normal closed area trips, except they would be exempt from the 18,000 pound trip limit and instead would have a bag trip limit. As an example, if the standardized bag was determined to be a 50-pound bag each vessel would be provided 360 pre-numbered bags as their trip limit. They would be instructed to land only their 360 standard issued pre-numbered bags. If a NMFS observer was assigned for a trip an additional stock of bags (6 for each day would equal 300 pounds) would also be provided. All trips by different vessels (12 trips) would be compared to see how accurate and variable the pounds per bags were to determine the efficacy of utilizing standardized bags as a proxy for pounds.

Demonstration of Benefits:

The work plan also included collecting from the collaborating companies landing reports of all closed Area trip landings from Vessels' offloaded by their companies not participating in the Standard Bag project. These reports will act as the control for the project. We compared the offloading reports from vessels landing 18,000 pound trip limits from the special access areas to those vessels landing their 18,000 expressed in a bag trip limit. These comparisons will be presented in the results section of this report.

There was an initial plan to test an appropriate VMS reporting protocol for the daily reporting of bags and / or for reporting at the end of the trip. The protocol include requirements for the vessels to

inform the PI and NMFS Enforcement six hours prior to offloading, the port where the vessel will offload, the serial number sequence, and total number of bags to be landed. Ten vessels involved in the project were to be outfitted by Boatracs with WBUI computer links and software to allow for advanced concepts to be tested.

The WBUI interface is a cable link from the ship's onboard computer to the Boatracs' interface. The WBUI interface includes the necessary software program to allow the two systems to communicate together. The benefit of WBUI is that it allows the original Boatracs terminal to remain functional, but it now allows the vessel to handle messaging and communications through an onboard PC. This simplifies emailing and faxing as compared to the OEM keyboard. Among other advantages, the vessel would be able to utilize the address book that comes with email programs. Any messaging would be editable through word processing or database software and be viewable on the PC monitor. In short, WBUI links the practicability of the onboard PC to the wireless communication capabilities of Boatracs. This will allow for wide ranging development of reporting and logging software.

Instead of testing the above concept, we opted to test the new electronic reporting system being developed by the Northeast fisheries Science Center (NEFSC). The results are reported below.

Results:

The Project was approved on November 8, 2005. On November 11, 2005 we formally requested an LOA from the NERO to conduct two collecting trips from CAI, of 19, 597 pounds each, to fund the project. The F/V Jersey Girl returned on December 21, 2005 with the project share settling at $34,030.02 and the F/V Decisive returned on 1/14/06 with the project share settling at $31,877.26 giving the project a total budget of $65,907.28 in available funds.

The first stage of the project was to conduct a workshop to discuss the issues related to the use of standard bags and bag tagging. Interested parties were contacted and the list of those individuals is contained in Appendix A. The workshop was conducted on February 23, 2007 and this report contains the details of the presentations and discussions.

Settlement sheets from several ports have been collected by project personnel and the bag weight data has been entered into a data base. This data includes the bag weights from the landings of 51 day trips and 9 offshore trips that will provide a baseline to the project experiments.

A request for an Experimental Fishing Permit (EFP) was submitted to the NERO on December 8, 2005. The permit was to conduct 24 commercial trips that would be exempt from the 18,000 pound trip possession limit in Special Access Areas. The vessels would be limited to 360 standard bags. The permit was approved; however, closures of the special access areas, due to reaching the yellowtail bycatch TAC, ended our experiment before all the trips could be taken.

A sea-going technician has been hired, Matt Weeks, to oversee data collection. We had purchased two laptop computers, a label printer, labels, bags (from three primary bag sources), interfaces, and other supplies and equipment. Preliminary trials started using the F/V Celtic out of New Bedford. Trip summaries can be found in the Appendix.

Results: Workshop on Standard Bags and Bag Tagging:

Project Workshop Agenda

Hilton Garden Inn February 23, 2006 9 AM to 4 PM

0900: Introductions	Ron Smolowitz
- What are the issues; Goals of the workshop	
0930: Tag and Label Technology	
- Met-Speed label	Bob Reeder
- AMTSystems	Craig Rydingsward
1030: Bag Design	
- VIMS past work	Bob Fisher/Bill Dupaul
- Coastal Forms/Printing	Jim Green
1130: Field Experience	
- Clam Industry	Dave Wallace
- Electronic reporting	Mike Palmer
- Canadian system	Trevor Kenchington

1230: Buffet Lunch

1330: Research Program Design
- data needs
- options

Bag design
- size
- material
- standardizing requirements
- specialty markets (frozen, small fresh packs)
- impacts on product quality

Tag Design
- tag data required
  - vessel identifier
  - date landed
  - count
  - other?
- tag material
- method of attachment
- need for standards

Technology
- tag printing at sea/dockside
- data transmission

Weighmasters

Standard Scallop Bag and Tag Workshop Presentation Notes

Subject #1: Bag Design
Presenters: Bob Fisher – VIMS, Jim Green – Coastal Forms/Printing

Bob Fisher – VIMS
Scallop Bag Research

- Evaluation of the relationships between of scallop bag material, treatment method, and bacterial densities:

Preliminary experiments have shown that shucked and at-sea stowed scallop meats are a good substrate for aerobic psychotropic spoilage bacteria *(Figure 1a.)*. Increases in bacterial densities per unit area of scallop meats touching bag surfaces were associated with increases of surface pH and surface fluorescence *(Figure 1b.)*. Final bacterial densities were similar for a variety of bag types *(Figure 2.)* and on-deck meat treatments prior to stowage *(Figure 3.)*. Lactic acid may hold some promise as a processing agent to reduce these effects and extend product shelf life.

Additional studies are planned to examine the effects of lactic acid and similar compounds on bacterial spoilage. This will entail identifying selected bacterial isolates and attempting to reproduce the yellowing on shucked meats using these cultures.

Fig. 1a. *Yellowing of scallop meats contaminated with aerobic psychotropic spoilage bacteria*

Fig. 1b. *Surface fluorescence of scallop meats contaminated with aerobic psychotropic spoilage bacteria*

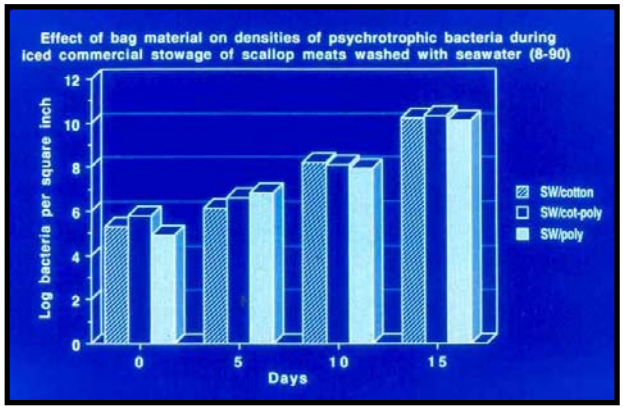


Fig. 2.

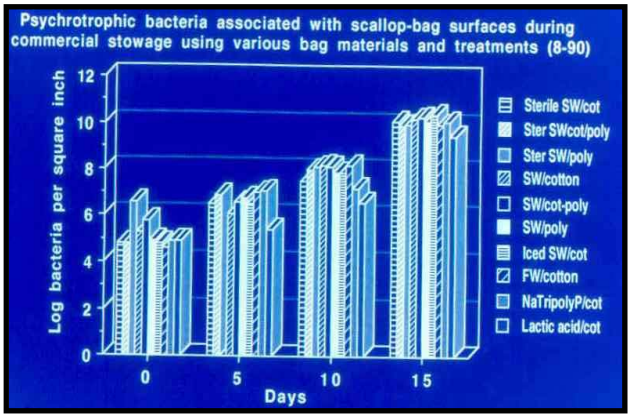


Fig. 3.

• Potential parameters for the standardized scallop bag study:

Test three different bag materials including: 100% cotton, polyester, and a polyester/cotton blend. Use various bag sizes (50 lb., 40 lb., and 25 lb.) and shapes (short/fat or long/skinny) for each of the 3 bag materials. To be consistent, use the same crew member to bag-up at the end of a watch. Also, record the location and duration that each individual bag is stowed.

Collect data that will allow for quantitative analyses such as comparing bag materials by size for weight variation (to establish the standard deviation) and cooling rates (to establish a cooling profile). Also perform for qualitative examinations of the bag integrity/functionality (i.e. rupturing under constant weight and ease of handling/filling/closing/storage) and scallop meat integrity.

Jim Green – Coastal Forms/Printing
Scallop Bag Production

Coastal Forms/Printing has made scallop bags from three different types of materials, including: 100% cotton, minimally processed cotton, and a cotton/polyester blend. Over time each of these bag materials have been used by the scallop industry with the cotton/polyester blend currently being the most successful.

• Scallop bags made of 100% cotton:

The 100% cotton bags swells when wet and restrict the ability of the bag to breathe. This is primarily due to starch added to the cotton during processing. The starch also negatively affects the integrity and appearance of the scallop meats contained in the bag. The 100% cotton bags also have problem of ripping top to bottom and left to right along the grain because of the added starch. Ties tend to slip off the bags and there are unraveling problems due to poor stitching.

• Scallop bags made of minimally processed cotton:

Minimally processed cotton was tried in an attempt to overcome the problems caused by starch added to the 100% processed cotton bags. The minimally processed cotton bags were of a brown color, resulting from the residue retained from the cotton bols. The residue led to a problem of the brown color being transferred to scallop meats touching the surface of the bag. The minimally processed cotton bags also had a problem with poor integrity and restricted breathing.

• Scallop bags made of a cotton/polyester blend:

The solution to the problems incurred with the 100% cotton and the minimally processed cotton bags has been the bag made from a cotton/polyester blend. This material has no added starch thus limited swelling and better breathing. A cross stitch was applied over the ends to avoid the unraveling problems and a folded hem stitch at the top to keep the tie from slipping off. The grain direction allows the bag sizes to be more consistent as opposed to other material types. One problem encountered with the cotton/poly blend bag was that the ammonia bleach used turned the bag a yellow color and caused the scallop meats to have an odor. This has been overcome by substituting the ammonia bleach with hydrogen peroxide bleach. The bags are also distributed in a protective packaging to help prevent from becoming dirty onboard the fishing vessel. The bags are sold 100 per pack and 5 packs per a carton. The selling price is 83 cents per a bag. 18 different bag sizes are produced ranging from 7 – 65 pound filled weight.

Subject #2: Field Experience

Dave Wallace - Wallace Associates
Tagging Systems for Surfclam and Ocean Quahog Fisheries

Currently there are three clam tagging systems used in the US. These include: a federal tagging system for Surfclams and Ocean Quahogs (SCOQ) for states south of Maine, a separate federal system for the Mahogany Ocean Quahog fishery within the state of Maine, and a state system for Surfclams in New Jersey.

- Federal tagging system for areas south of Maine

The federal system for SCOQ fisheries south of Maine is an Individual Transferable Quota System (ITQ) that went into effect January 1, 1990. This system requires that all clams onboard the ship must be placed in a cage with the dimensions of 3' X 4' X 5' (60 ft^3) which can contain up to 32 bushels (1.88 ft^3). Each cage and it contents weights about 3,400 pounds, and is handled with heavy equipment. Every cage, full or not, must have a tag attached before it touches the ground during offloading. There is no fresh market for SCOQ, so all clams go to a processing plant.

Tagging the raw clam in the cage is one of the principle control tools for this federal system. Tags are issued at the beginning of the fishing season with each tag representing 32 bushels of clams. The SCOQ regulations only allow the tags to be used in the year that they were issued. Tags numbered in order are reported only for the first and last numbers. A tag must be used on every cage, even if the cage is not full. Tags lock when attached and cannot be undone requiring them to be cut off after they are used. Tags must be removed from the cages when the clams are dumped out for processing. No empty cage may have tag on it. A tampered with tag that is attached to a cage is considered a violation.

All clams landed must be reported electronically by the vessel weekly and daily by the processor. Information recorded on a vessel report includes: vessel name, official number, permit number, customer, port of landing, species, number of cages, and cage tag numbers. The processors report includes: vessel name, species, number of bushels, cage tag numbers, and their yield. NMFS enforcement then matches the vessel's report to the processor's report. Paper work violations are considered the same as a fishing or cage violation.

- Federal system for the state of Maine

The Maine Mahogany Fishery is a small boat fishery of mostly 40' lobster boats. These vessels are not large enough to carry cages and have no way to unload them if they did.

There are two management systems for the Mahogany quahog fishery operating in the state of Maine. The Maine state waters and federal zone have a 100,000 bushel quota that does not require ITQ tags. Most Maine clams are taken outside of the ITQ tag system under their 100,000 bushel State quota. Federal ITQ system tags may be used for those who own or rent OC quota. These are used once the 100,000 bushel has been taken.

The Maine fishermen have worked out a system with the NMFS enforcement agents to use a box of 60 cubic feet in which the place their small bags of clams in and then place a tag on the box, and cut it off when full. Because these clams are going into the fresh half shell market they require a FDA tag on each bag that replaces the cage tag.

• New Jersey tagging system

The state of New Jersey uses a tagging and reporting system similar to the federal system. The only difference is that the state collects a tax on each bushel which the quota owner must pay to receive their tags.

Mike Palmer - NMFS
Electronic Reporting

The Northeast Fisheries Science Center is currently engaged on a series of projects focusing on the development of electronic reporting initiatives. These projects include: developing an electronic logbook (ELB) with the Groundfish Study Fleet testing out; a pilot project with the Cape Cod Commercial Hook Fisherman's Association (CCCHFA) that is testing an electronic vessel trip reporting system (E-VTR); an Illex Study Fleet working on developing Boatracs macros; and a comparative analysis of the Northeast Region's fisheries dependent reporting systems.

• Benefits of electronically reported data:

Electronically reported data will allow for more, efficient, timely, and accurate data. Reporting data electronically will be both easier and quicker for fishers to complete than the traditional paper reporting methods. All data are transmitted via satellite and internet communication pathways, so no paper processing will be necessary *(Figure 4.)*. The data will be received in a format that can be directly loaded into databases, thus reducing the workload for government agencies. This increased efficiency will allow for FVTR data to be available 29 – 76% faster than the current paper system allows *(Figure 5.)*. The timeliness of this data will facilitate better compliance monitoring and resource monitoring.

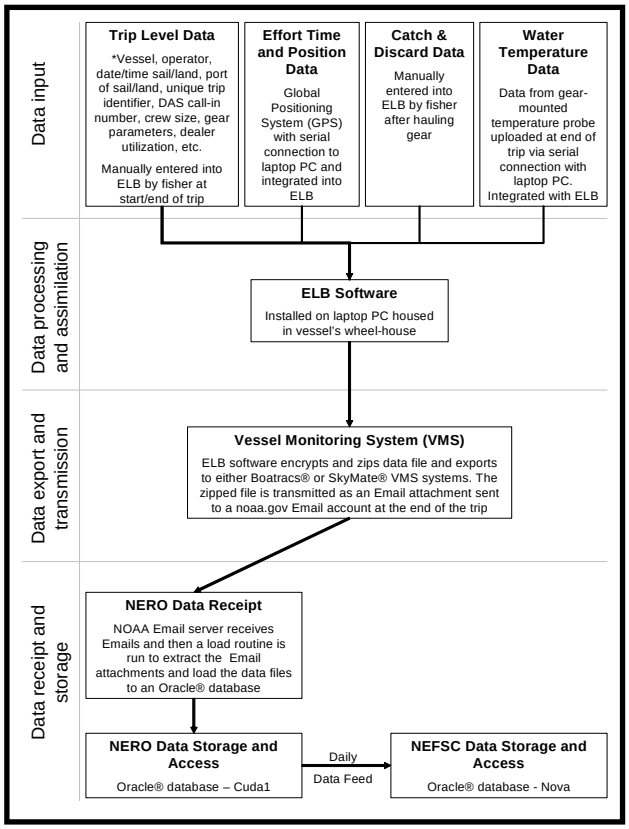


Fig.4. *Schematic model of the Phase II Study Fleet data capture system showing data processing stages and transmission pathways.*

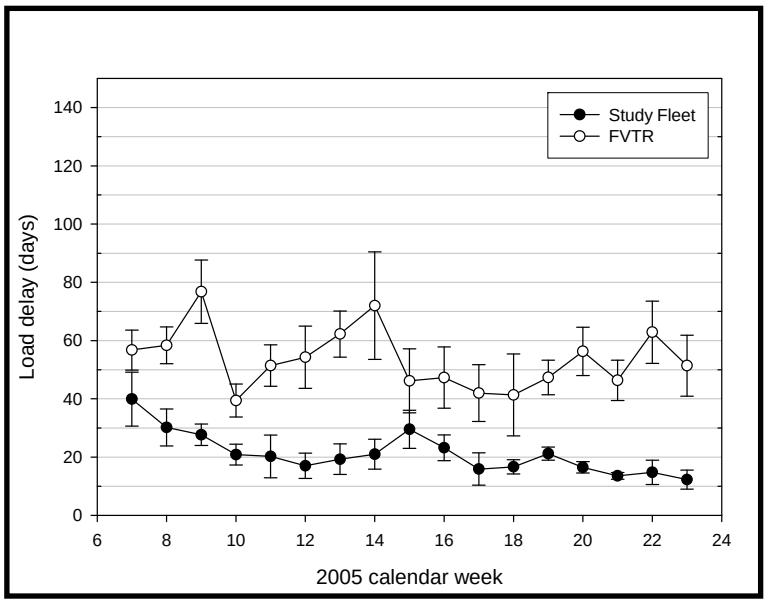


Fig. 5. *Average data load delay for the two vessel-reported data sets used in the Northeast Region; Study Fleet and FVTR. Load delay is defined as the number of days passed from the end of the fishing trip to the data being loaded into Northeast Region's databases and available to end users. Weekly averages and associated standard errors are shown. Only data from fishing trips that ended during 2005 calendar weeks 6 through 23 (February 4 to May 31, 2005) are used in this analysis.*

With these benefits in mind, the NEFSC is currently working on a prototype Electronic Vessel Trip Report (E-VTR). The pilot project is being coordinated among NMFS Northeast Regional Office (NERO), Northeast Fisheries, Science Center (NEFSC) and the Cape Cod Commercial Hook Fisherman's Association (CCCHFA). The project will test the feasibility of using electronic reporting systems for submitting trip reports that fulfill all federal vessel reporting requirements. The goal is to develop the system that will ease the reporting burden of fishermen while allowing the CCCHFA to more efficiently monitor sector landings.

(screen shots from the E-VTR software presented)

• RFIDs and the future of electronic reporting:

The future of electronic report may also involve Radio Frequency Identification (RFID) technology. RFID is an identification method that uses radio frequency to transmit information from a tag. This doesn't require direct contact or line-of-sight scanning. The SpeedPass used to pay tolls on the highway is an example of how RFID technology is currently being applied. RFIDs are gaining widespread use in supply chain management (product tracking). Wal-Mart uses to track goods from suppliers→warehouse→stores. The Japanese tuna fishery is testing a RFID-based traceability system (species, weight, vessel name, etc.). This is done by a RFID tag injected into the tuna prior to flash-freezing. RFID technology could have an application in the scallop industry to track scallop bags *(Figure 6.)*.

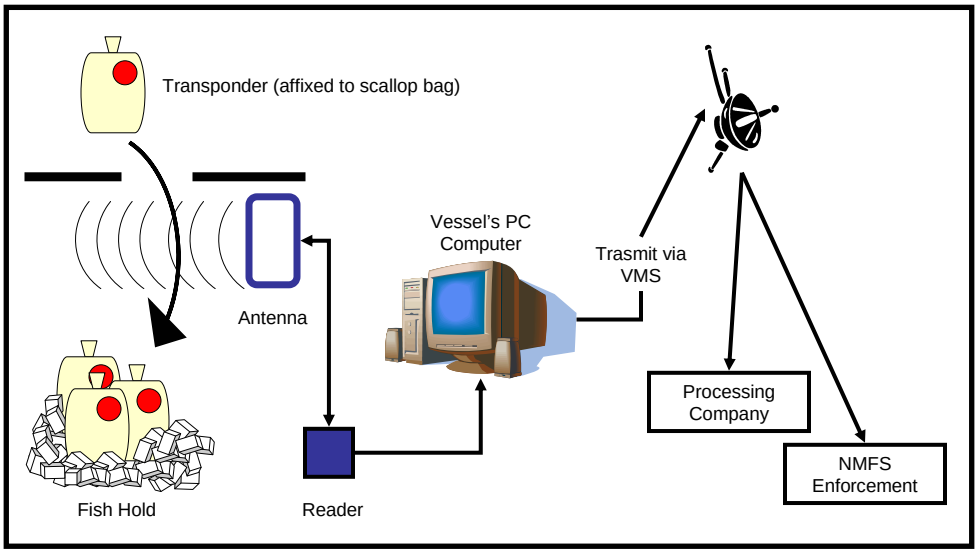


Fig. 6.

The costs involved with implementing RFID system onboard a vessel could include:

- High frequency antennas: $500-$2500
- High Frequency Reader: $100-$2000
- Tracking software costs: free-$10,000
- Transponder: $3.30/tag (360 bags/trip = $1200)

To put these system costs in perspective with potential benefits, consider a vessel under-landing by 900 lb. (5% of 18,000 lb. trip limit) with an estimated scallop price of $8/pound. This would equal to a $7,200 loss to the vessel. On the flip side, if a scallop vessel was seized because of an accidental 2% overage (approx. 300 lb. of 18,000 lb. trip) would result in a $144,000 loss plus fines and sanctions.

Trevor Kenchington - Gadus Associates
Canadian Dockside Monitoring

System developed about 15 years ago, as problems in groundfish management emerged and as smaller vessels came under individual-quota management. It has been refined and strengthened over the years.

Federal government certifies private-sector dockside-monitoring companies, which must meet conflict-of-interest and other performance standards, as well as specific requirements of Department of Fisheries & Oceans (DFO). After certification, companies are routinely audited for compliance with all requirements. Currently six certified companies in Nova Scotia, plus others in the other Atlantic provinces.

Companies hire dockside monitors, who must attend one-week training program and pass a written exam to gain federal-government certification as dockside monitor. Typically, monitors required to have: High-school graduation, experience in fishing industry (but cannot currently hold commercial fishing license, nor be buyer, processor or transporter of fish), certificate of conduct from local police, valid driver's license, satisfactory physical condition, and mature, responsible and reliable behavior. Monitors also required providing own vehicles for travel to wherever fish are landed. They are called out as needed, at any time of day or night. Depending on local fisheries, their work may be steady through year or highly seasonal. There are several hundred dockside monitors spread throughout Atlantic Canada.

Commercial fishermen are required to have catches weighed and monitored at dockside, by conditions placed on fishing licenses. Details vary from fishery to fishery but system is the same for all catch-controlled fisheries. [Lobster fishery is controlled by effort limits (length of season & number of traps) and its landings are not monitored.]

Fishermen required to hail in, to one of monitoring companies, their intention to land a trip or to enter harbor for shelter. Companies maintain 24-hour operations centers to receive hails and dispatch dockside monitors Hailed information includes time and place of offloading, and estimate of amount of fish on board. Hail is required one hour or a number of hours before the time of landing, depending on the fishery (shorter lead times for dayboat fisheries, longer for trip boats). Fishermen have a free choice of which certified monitoring company to call. Fishing companies and fishermen's associations negotiate pricing agreements with particular monitoring companies, which then do all monitoring for those fisheries. The "offshore" scallop fishery (working on Georges) and the "Full Bay" fleet (working the major grounds in the Bay of Fundy) both use Atlantic Catch Data Ltd. ACD is largest dockside monitoring company in Nova Scotia and also operates in Newfoundland.

When monitoring company receives hail, operations centre determines whether to dispatch a monitor. "Offshore" and "Full-Bay" scallop fisheries are required (by license condition) to have 100% monitored weighout, so every hail sees a monitor sent to meet vessel. Small-boat fisheries, including local scallop fisheries, only required to have some trips weighed out (e.g. 25% of all trips). For those fisheries, operations centre makes random selection of which hails to respond to. Fishermen are not told whether monitor will be sent or not. If trip is not selected for weigh-out, hailed weight is entered as landed weight. It is illegal to hail a false weight and the fishermen do not know, until the time of offloading, whether their hailed weight will be checked by a dockside monitor. (DFO allows reasonable latitude for mistakes in estimation of catch weights but does not announce what margin for error they will accept.)

After hailing, a vessel may tie up before its hailed time for offloading but it is illegal to open hatches or begin offloading until that time. If dockside monitor is dispatched, he or she is required to be present by the hailed time. Monitor then observes the offloading, supervises the weighing of entire catch and records weights. Dockside monitors are trained and equipped to check the accuracy of the weigh-scales on the dock. As a routine matter, they check all normal fish stowage areas on vessel, following offloading, to ensure no catch remains on board. (Concealing part of the catch for later, unmonitored offloading remains possible, though vessels can be searched by DFO's fisheries officers.) If monitor's work is obstructed by the fishermen, he or she will refuse to sign off on the landing, which places vessel operator in breach of license conditions. Assuming no problems, monitor provides copy of the landing record to captain and sends another to the operations centre, where the data are entered into a computer and immediately become available to DFO officials. The monitoring companies undertake to forward the data to government in the required formats, thus relieving the fishermen of a paperwork burden.

Costs of system paid 100% by fishermen and fishing companies. Rates charged are highly variable, depending on many factors. However, typical deployment of monitor costs about $50US for up to hour at dockside, plus additional $20US/hr after first hour.

Non-reporting and mis-reporting of catches is thought to be very minor. (The remaining concerns are over what allowances to make for the weight of ice, the weight of scallop bags etc.)

Enforcement focused on evasions of monitoring system, not checking catch weights. All hails entered into real-time database, so fisheries officers can identify vessels approaching land that have not hailed or those approaching landing point other than one declared in hail. Illegal to declare false weight of catch when hailing, while boats remain subject to spot checks by fisheries officers, hence approaching land with amount of fish different from what you intend to land in front of dockside monitor could carry severe penalty. Following collapse of groundfish fisheries in early 1990s, most Canadian fishermen accept the need for monitoring system and are quick to report anyone seen cheating. Meanwhile, the fisheries officers can and do set up surveillance operations leading to heavy penalties.

System seems highly regarded by everyone: fishermen, scientists, government officials and dockside-monitoring companies. When introduced, it was welcomed by fishermen who thought they were paid for an honest weight of their catch for the first time.

Workshop Discussion of Standard Bag and Tagging Systems

Summary Bullets

Approach One

Standard Bag – No Tag
- Regulation: 360 Bags (If standard is 50lb bag, 18,000lb trip)
- How do you certify the bag?
  - Integral to the bag?
- How do you monitor compliance?
  - Specification?
    - Testing protocol?

- What does this accomplish for the:
  - Fisherman
    - Knowing it's a legal trip.
    - Not over/under lbs. / yield
  - Manager
    - Closer to OY
  - Processor
    - None
  - Enforcer
    - Complying fisherman more likely to report violations.
  - Science
    - None
- Problems:
  - Product Quality from Crushing.
    - If stuffed, industry will not pay higher rates.

Approach Two

Standard Bag - Basic Identification
- Permit (Linked to vessel) #
- Landing Date (**Trip Identifier**?)
  - Captured as part of data (when sent) instead of on tag?
- Different tag for limited access vs. day?
- How do you monitor compliance?
  - Specification?
    - Testing protocol?
- What does this accomplish for the:
  - Fisherman
    - Knowing it's a legal trip.
    - Not over/under lbs. / yield
  - Manager
    - Closer to OY
  - Processor
    - None
  - Enforcer
    - Complying fisherman more likely to report violations.
    - Violation could be made out of cooler / Pickup truck.
      - No Mystery bags.

Science
None

Problems
Consumer may not like 14 day old scallops unless trip identifier is used.
Fisherman has to hand-write tags for each bag landed.

Approach Three

Standard Bag - Advanced Identification – Vessel created (dockside?)
Permit (Linked to vessel) #
Linked to Serialized Bags/Tags given to vessel
Landing Date (**Trip Identifier**?)
Captured as part of data (when sent) instead of on tag?
Could be part of Serialized UNIQUE bar code sent to regulatory agency.
UNIQUE Bar Code / Serial number
Can be tracked via computer / Database

Bag size?
50lb
Larger bags require fewer bags/tags
(Variances larger on smaller bags?)
Freezing at sea?
Pre-printed
Placed on bag while put in hold (for testing weights when landing)

Different tag for limited access vs. day?
How do you monitor compliance?
Specification?
Testing protocol?
What does this accomplish for the:
Fisherman
Knowing it's a legal trip.
Not over/under lbs. / yield
Manager
Closer to OY
Processor
None
Enforcer
Complying fisherman more likely to report violations.
Violation could be made out of cooler / Pickup truck.
No Mystery bags.
When offloaded.
Can track off-loaded catch per trip.
Science
None
Problems
Consumer may not like 14 day old scallops unless trip identifier is used.
Fisherman has to hand-write tags for each bag landed.

Results: Field Studies

A total of 21 trips were conducted during this project. The following summary of Trip #1, a short trip to develop protocols, is typical of how the work was conducted on the remaining trips. Details of each trip can be found in Appendix A.

Bag/Tag Summary for Trip #1
F/V Celtic

Ten scallop bags were given to the crew to land 400 lbs. of scallop meats. Bags from three manufactures were correlated, color coded, logged, and labeled from 1 -10. The bags used included: 4 bags from Coastal Forms, 3 from Diamond Marine Supplies, and 3 from TJ Bags. All bags were estimated to hold 50 lbs. of scallop meats.

Haul one of the trip started at 07:18 on 5/20/06 and all ten bags were filled after haul 11 at approximately 22:45 on the same day. The mate filled all bags from the washer using two methods often used by the crew. One method used a five gallon bucket, with holes for water drainage, which is used as a volumetric estimated for 50 lbs. of scallop meats. The crew was asked to randomly select the bags to fill using this method, however all three TJ Bags were filled using the bucket method. The other 6 bags were filled using a regular meat bucket to fill the bags until the mate decided that the bag was full. During the filling process the mate and crew noticed that the Coastal Forms bags were not going to contain 50 lbs. of scallops.

A 9” x 4” tyvek tag was printed, using a label thermal printer in the wheel house, for each bag a few hauls prior to filling. The information on the tag included: project name, primary investigator’s name, trip number, an blank area allowed for attaching the tag, vessel name, permit number, coast guard number, date sailed, date filled, time printed, bag number, statistical area of majority of fishing activity, and an area for the meat count to be filled in dockside.

The meat count was determined by the mate to be 17 meats/pound during the filling process and written onto the label. The bags were secured using 2 wire ties on top of each other, as is normal operations on the vessel, with the bag tag being placed on the bag after the first tie and held in place by the second. Immediately after filling the bag temperature was taken by the captain with an electronic temperature probe several inches deep into the bag. The temperature of each bag was approximately 54 F. After filling the bags were placed in a tote and iced. The bags were stacked consecutively in two columns with one and five being on the bottom; 5 and 10 on the top. The bags remained on the ice in the tote until the vessel docked at 12:37 on 5/21/06. The bags were immediately landed upon docking, weighed, a meat count determined, and a temperature taken for each bag. All the tags remained secured to the bags and were completely legible at the time of landing.

The captain and crew suggested a bag design that was narrower and approximately 4” longer to allow for more efficient and easier storage on the vessel.

Results: Summary of all trips

Three types of trips were studied. The first were open area trip using days at sea (DAS) and no possession limits. The second category was Research Set Aside (RSA) trips into special access areas controlled by a possession limit. The third category was special access area trips controlled by a 360 standard bag limit; the bags designed to approximate 50 pounds. The basic trip information can be found in Table 1.

Table 2 presents the landings summary from the various trips. Trips 3-16 were controlled by the 360 bag limit. There target possession limit would have otherwise have been 18,000 pounds but they were not constrained to approximate that level of landings. Trip 5 had a breakdown and trips 14-16 were terminated early by NMFS due to the access area closing prematurely by a Yellowtail flounder TAC. The remaining ten trips averaged 561 pounds, about 3.1%, over the 18,000 pound possession limit they would have been subject to if they did not have the exemption to use the 360 bags. The highest overage was 6.8%.

We examined the impact of swelling by assuming that the last 10% of the bags packed on a trip did not take up any water weight from ice melt. The special access area 360 bag trips were relatively short in duration and the swelling increased the average weight of the trip by about 1%. Compare this with the four trips that were over 11 days in duration that had weight increases of about 3%.

Table 3 presents the landings data from special access area trips, controlled by the 18,000 pound possession limit, undertaken during the same time period that our standard bag limit trips were made. These trips averaged 17,766 pounds; an average under-landing of 234 pounds per trip. This represents a loss of vessel income of about $1,500 per trip at a scallop price of $6.50 per pound.
Bag Construction

Results: Bag Construction

A number of different bags were used during the project and are described in the Appendix tables. We toured one manufacturer's facility, TJ Bags, and the following section describes these bags.

TJ Bags: The TJ bags used in this project were made out of non-bleached spun cotton. They were constructed using #35 yarn woven 62 x 56 Threads per Inch (TPI). Years of use have defined this mode of construction as the best compromise between strength using a biodegradable fiber and the ability of the bag to drain.

TJ Bags makes many different size bags. The largest measures 17 ½" x 25 ½" and is reported to hold about 62 pounds. Reports from fishermen indicate a TJ bag of the same width but 24" long holds 53 pounds and one 23" long holds about 50 pounds. Interestingly, the impact of increased bag length on bag capacity, based on fishermen's reports, does not seem to be anything close to being linear.

Fig. 7. Bolts of cloth are cut to the desired size.

Fig. 8. The pre-cut cloth is stored ready for sewing

Fig. 9. The cloth is folded and the side and bottom stitched to form the bag by a computer assisted sewing machine.

Fig. 10. Bags of different sizes are stored and ready for sale to vessels.

Bag Failures:

Most trips successfully landed all bags without a bag failure. When bag failure did occur, it tended to be during the deck handling of freshly filled bags or offloading process. No bag failures were observed to have occurred during stowage in the hold. Some bags ripped because of a piece of shell that accidentally got into the bag. However, most bag failures occurred from the separation of the bottom seam. This tended to happen with bags that had loose or uneven stitching. When a bag with defective or loose stitching was placed inside of the basket for transfer in or out of the hold, immediate failure would occur. One particular manufacture's bags were observed to have a higher rate of bag failures, likely due to loose stitching.

Fig. 11a. Example of a bag failure.

Fig. 11b. Seams of a bag full of swollen scallop meats.

Fig. 12a.. Study bags ready to be filled.

Fig. *12b.. Bags being lowered down for stowage after end of watch.*

Bag and Hold temperatures

Bag and hold temperatures taken aboard FV Celtic during trip 19. All bags were Diamond 16x24. Scallops were washed and chilled in ice water before bagging. Temperature logger was inserted into a ziplock bag and put into the middle of bag prior to tying the bag. Each logger was set to record the temperature once every minute. The bags with temperature loggers were chosen to represent the beginning, middle, and end watches of the trip. Where the bag was place in the hold was not recorded. One temperature logger was place just above the ice line in the middle of the hold. This logger polled the ambient hold temperature every 1 minute throughout the course of the trip.

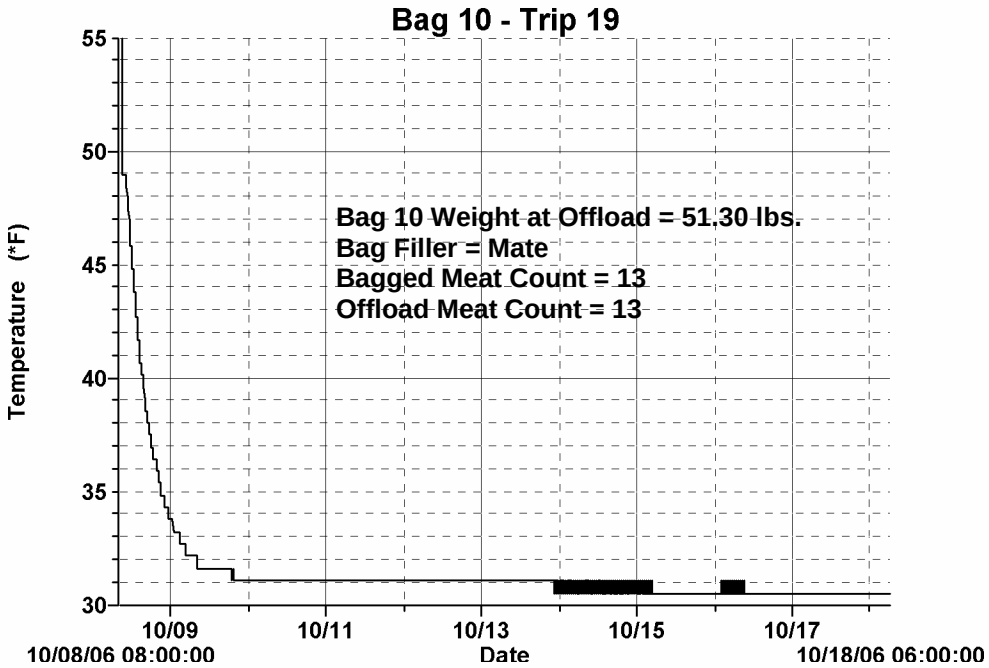


Fig. 13a.

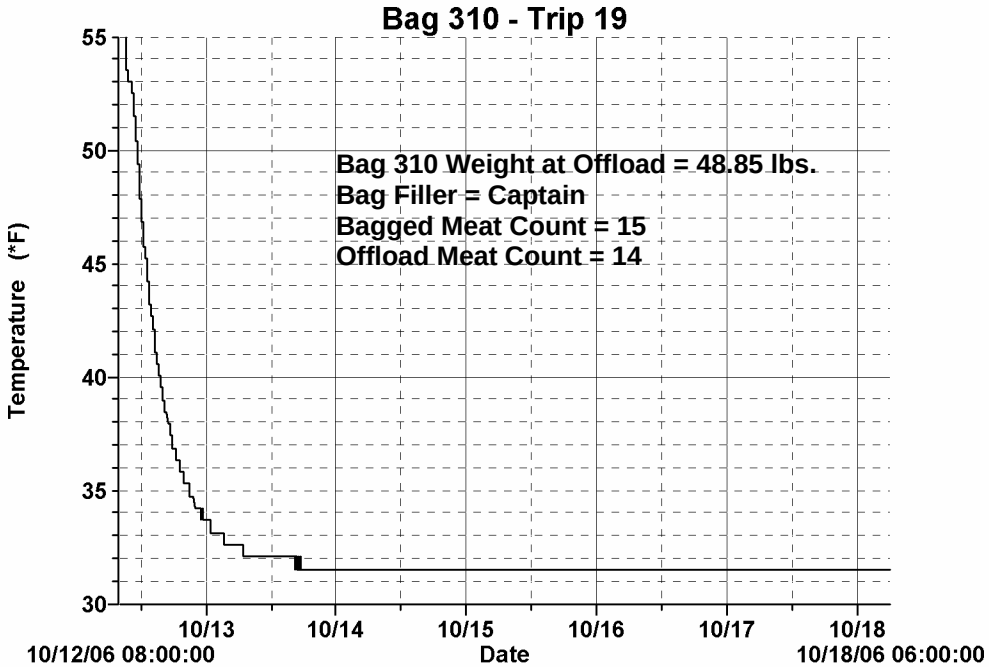


Fig. 13b.

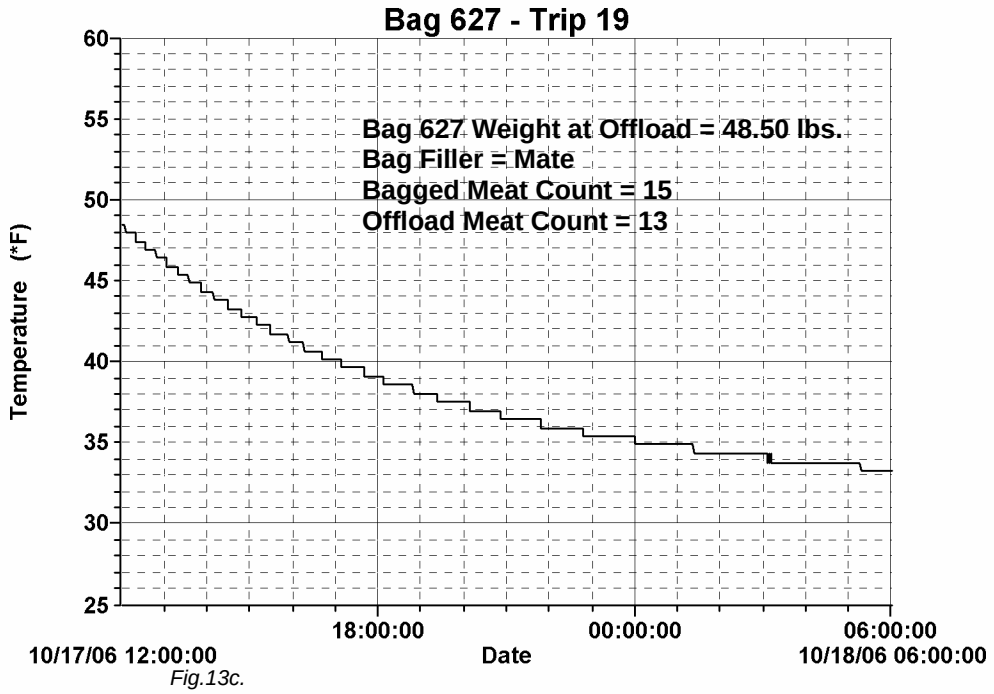


Fig.13c.

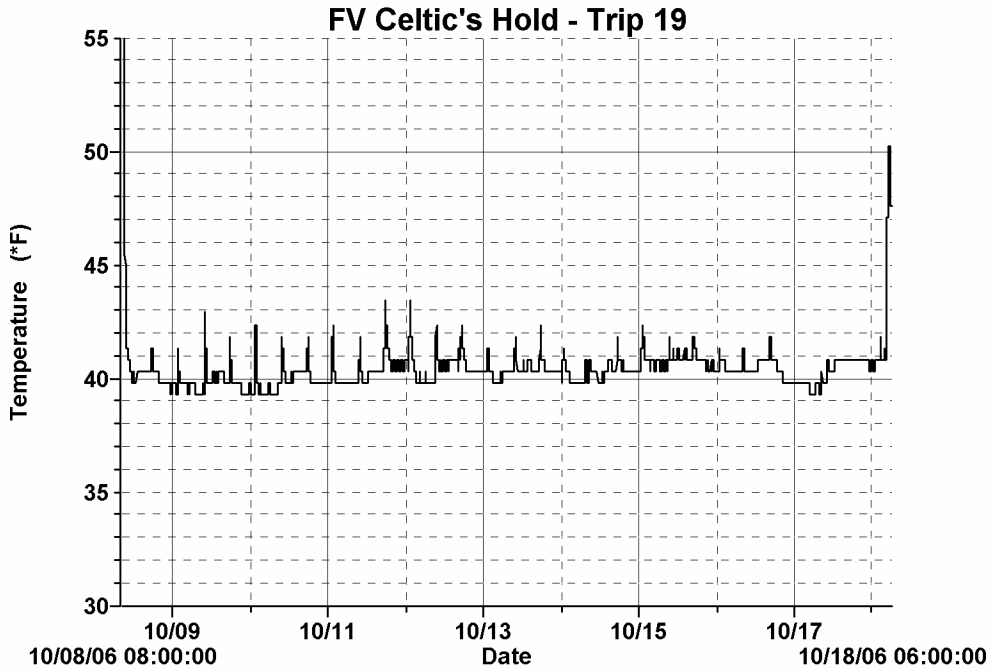


Fig.13d.

Tags

Methods:

Bag tags were applied during trips 1 and 2. Tags were designed using the Datamax BarTender software. Various 3.9” x 9” tag designs were used which included fields such as: project name, trip number, vessel name, USCG number, permit number, statistical area, date sailed, date printed, date bag filled, tag number, bag number, and meat count. Some tags also have a demonstration barcode and a photo indicating the space used to apply the tag. All tags were printed on water proof (insert paper specifications) with (insert ink specifications) using a Datamax DMX E-4203 printer.

Examples of tag designs developed:

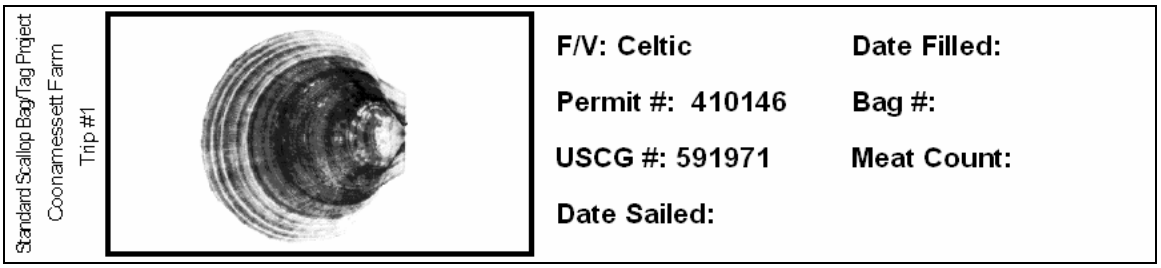


Fig.14a.

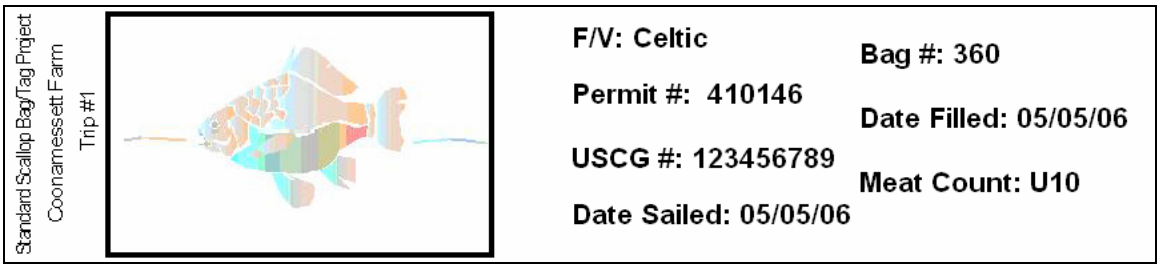


Fig. 14b.

All tags were completed and printed at sea at a computer/printer station set up in the wheelhouse. The NEFSC’s Northeast Electronic Reporting System (NERS) was employed to log information during the trip and could be used to transmit detailed information real-time via the vessel’s VMS.

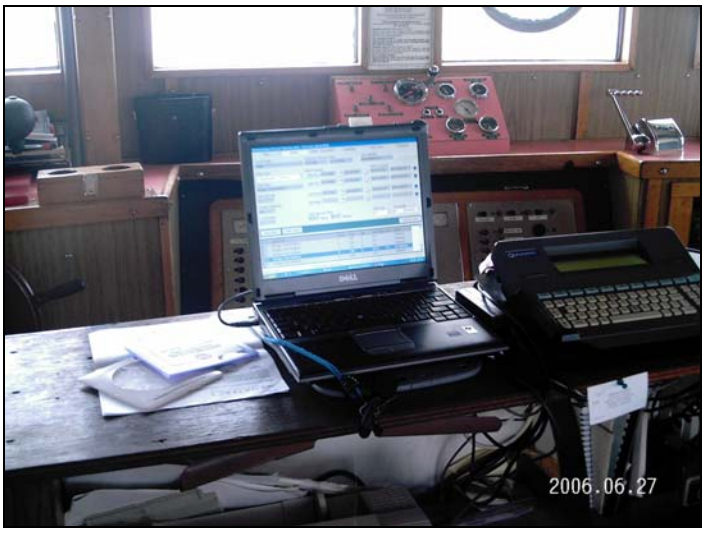


Fig. 15a. Computer station set up in wheelhouse with NERS software running.

Fig. 15b. Printer station set up in wheelhouse actively printing bag tags.

The necessary number of tags were printed by the observer at the end of each watch and attached to the bag by a crew member while filling the bags. Tags were attached to the bag by securing ¼ of the tag with a second bag tie at the designated location on the tag. Tag attachment was by the crew with little hassle or difficultly.

Fig.16. Bags being filled and tag applied by crew.

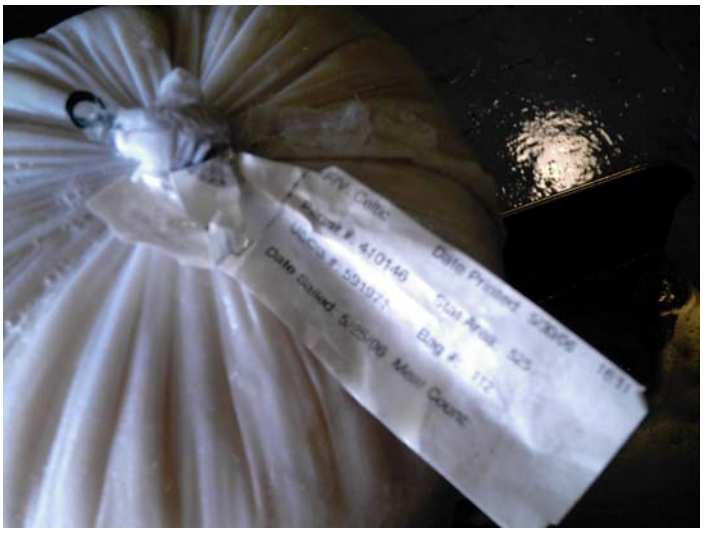


Fig.17. Example of bag tag secured to bag.

A total of 370 bags were tagged and treated as is typical during a scallop trip.

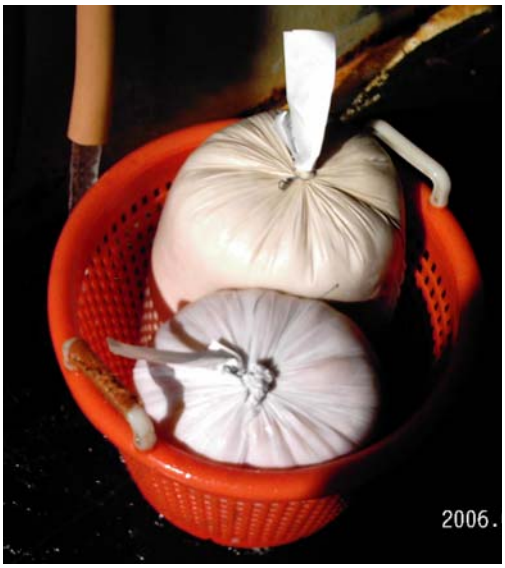


Fig. 18. Bags with tags ready to be stowed.

Fig.19. Example of bag with manually filled out tag.

Discussion

This project collected a large amount of data that may begin to describe the issues that have to be addressed regarding the use of a volumetric measure, a standard bag, as a replacement for a weight based system of monitoring and enforcement. The main questions that needed to be addressed by this data collection include the following:

a) What size bag would be the best choice for standardization?
b) Does bag width versus length choices have an impact?
c) Does the bag material impact standardization?
d) Can bags be over-packed?
e) What role does swelling of the meats play?
f) What is the degree of economic impact between a weight based and a bag based system?
g) How should standard bags be labeled?
h) Would off-the-shelf tag or label printers work at sea?
i) Who are the potential manufacturers of standardized bags/tags?
j) Where do we go next?

Our field sampling program was severely truncated in time and space due to existing management measures. The anticipated closing of the access areas, due to yellowtail bycatch TAC triggers, created a derby style rush into special access area II bunching up our research trips. The closure actually caused three of our trips to terminate early thus limiting the data analysis and associated trip comparisons. The reader needs to keep in perspective that seasonality may play a large role in this issue and this will need to be addressed in future research.

What follows is a discussion of each question in light of the research results to date.

What size bag would be the best choice for standardization?

Discussions with harvesters and buyers lead to different opinions on the best size bag. When scallops are landed the buyers reduce the weight of each bag by one half pound to compensate for the attached ice and wet weight of the bag. On an 18,000 pound trip, if the bags were packed to 40 pounds, the vessel would land 450 bags and would be subject to a 225 pound reduction. At a scallop price of $7.00/pound this would be $3150.00. If the scallops were packed in 60 pound bags there would be 300 bags; a 150 pound reduction costing the vessel $1050 in landed value. The difference of $2100 in trip profit is just due to the bag size. The buyers argue that the smaller bag sizes provide a better quality product however there is no evidence that they will pay a premium for this improved quality.

For the purposes of this project we chose a 50 pound target for our bag size. We thought that bags larger than this size were becoming too heavy to be handled safely by one man.

Does bag width versus length choices have an impact?

We ended up with four different size bags that approximately held the target weight of 50 pounds. The Diamond 16” x 24” and the TJ 16.5” x 22” were very close and the Diamond 16” x 25” and the TJ 17.5” x 24” were capable of being over-stuffed and averaged several pounds higher. Some fishermen suggested that the narrower bags were less likely to be over-stuffed as they were more difficult to close when over-filled. Our data was not collected in a manner to statistically analyze this hypothesis. A longer, narrower bag may have some benefits for product quality as the bag would be less thick and the scallops would chill faster. On the other hand, more of the product would be in contact with the bag material which may be a negative for product quality.

If we had to choose at this time a standard bag size we would suggest the 16” x 24” bag. The good results observed with the TJ 16.5” x 22” bag might have been more a function of the fact that those bags were filled with a standard level bucket.

Does the bag material impact standardization?

There is no doubt that if a standard bag size was initiated, someone would choose a bag material that would stretch when filled. At this stage it would be a simple matter of the government specifying a bag made of 100% natural fiber and require that anyone interested in using another fiber needs to prove that their bag design would not stretch. Bag manufactures may have to label their bags as 100% natural fiber, similar to the way clothing is labeled, to enforce compliance. There is more discussion of this topic in the Workshop section of this report.

Can bags be over-packed?

Our experiment shows that bags can definitely be over-packed. The worst case in this experiment was Trip #12 which landed 1221 pounds over the 18,000 pound target; this amounted to an average of 3.4 pounds per bag or a 6.8% overage. One solution to this problem may be the addition of a marking, possibly by stitching, a full line that the tie has to cover when the bag is sealed.

What role does swelling of the meats play?

The longer the trip, the more water the scallop meats absorb from melting ice while in the hold. In our study the weight gain for the short trips, under one week in duration, was about one percent. The longer trips, of about two weeks, had a three percent increase in scallop weight due to swelling. If a scallop bag is over-stuffed at the beginning of a long trip there is a good chance the bag will burst. One key question is should scallop meat weight gains be considered as part of the target TAC’s. Do we design a bag to hold 50 pounds of fresh shucked scallops or do we design it to hold 50 pounds when landed after an average trip duration?

What is the degree of economic impact between a weight based and a bag based system?

Our study did not show, on average, a large under-catching of the target quota of the 24 vessels recorded. From Table 3 we find that during our limited sampling period the vessels only averaged 234 pounds under the target of 18,000 pounds; a trip loss of about $1,500.00 (@$6.50/lb). While this number is not large it is still a significant loss to the vessel. Three of the vessels lost more than $3000.00 while others landed with almost the exact amount; none were over. The reader must consider what approaches

are available for a vessel to land close to the limit without going over. It is many of these approaches that the standard bag will address.

How should standard bags be labeled?

We labeled each bag during the field work by using a large permanent ink marker to write a consecutive number on the bag. This worked very well. We would suggest that at a minimum, for the purposes of enforcement tracking, each bag should have a vessel permit number and a landing date. The vessel permit number can be pre-written or stamped onto each bag. A trip boat would have to put the landing date on each bag just before or at the time of off-loading. The requirement would that the date has to be on the bag before it leaves the vessel. The reason for this is to enable the tracking of day boat landed scallops under a daily/trip possession limit. If the fishery shifts to individual quotas the concept of government issued numbered bags may need to be considered.

Would off-the-shelf tag or label printers work at sea?

The printing and attachment of tags at sea was accomplished with minimal difficulties. The only reoccurring problem had to do with the paper getting off track and jamming where the tag is dispensed during printing. However, both trips occurred during calm seas and printing would likely be more frustrating during rough conditions. The only major problem had to do with the BarTender software license expiring midway through the second trip. This did not allow the designed tags to be used, so the remainder tags were completed by hand. The tag material held up well with no tags being lost or ripped during either trip. Both the printed and handwritten tag fields were still legible during offloading at the end of the trip. All tags remained securely attached to the bag until opened by the product buyer.

Who are the potential manufacturers of standardized bags/tags?

During our project we located four sources of scallop bags. Only one actually allowed us to tour their facility; a residential one-car garage set up with two sewing machines, work tables, and many stacks of materials and bags. We believe two of the other sources buy in their bags from overseas and the forth does a combination of both.

The one operation that makes their own bags offers 22 sizes. They buy the cloth and then send it out to be cut to size. The cloth is folded by hand and stitched across the bottom and up one side using a hand-operated computer assisted sewing machine. The actual stitching takes about two seconds per bag. Basically, scallop bags can be made in the traditional piece work home setting so the potential is for almost any hard working individual to become a bag manufacturer.

Where do we go next?

There is a need to continue the development of a volume based system of catch monitoring in the sea scallop fishery. We would suggest that continued testing of a standard 16” x 24” 100% cotton bag through all seasons in both the mid-Atlantic and on Georges Bank in special access areas. The best way to accomplish this is to exempt vessels that are willing to participate from any potential unplanned closure risk.

Further work also needs to take place on labeling or tagging the bags. Our testing of a prototype system worked well but it needs to undergo more extensive tests to determine reliability.

Table 1: Trip Summaries

Trip #	Vessel Name	Trip Type	Date Sailed	Date Landed	Approx.DAS	Area Fished	Bag Type Used: Diamond Bags	Bag Type Used: TJ Bags	Bag Type Used: Coastal Forms	Total Bags Weighed	Notes:
1	Celtic	Open Area	5/19/06	5/21/06	2	Mud Hole	16x25	17.5x24	14x23	10	
2	Celtic	Open Area	5/25/06	6/10/06	16	GB SE Parts	16x25	17.5x24	14x23	312	
3	Celtic	Closed Area	7/6/06	7/10/06	4	NLCA	16x25	17.5x24	15x25	345	
4	Celtic	Closed Area	7/12/06	7/16/06	4	NLCA	16x25	16.5x22	15x25	355	
5	Westport	Closed Area	7/31/06	8/6/06	6	CAII	16x25	16.5x22	15x25	264	broken trip
6	Celtic	Closed Area	8/1/06	8/7/06	6	CAII	16x24	16.5x22		360	
7	Tradition	Closed Area	8/4/06	8/10/06	6	CAII	16x25	16.5x22		359	
8	Reflection	Closed Area	8/7/06	8/14/06	7	CAII	16x24	16.5x22		360	
9	Resolution	Closed Area	8/14/06	8/19/06	5	CAII	16x25	16.5x22		360	
10	Ranger	Closed Area	8/7/06	8/14/06	7	CAII	16x25	16.5x22		358	
11	Tradition	Closed Area	8/16/06	8/23/06	7	CAII	16x25	17.5x24	15x25	360	
12	Neskone	Closed Area	8/22/06	8/29/06	7	CAII	16x25	17.5x24		360	
13	Araho	Closed Area	8/30/06	9/6/06	7	CAII	16x25	16.5x22		360	
14	Justice	Closed Area	9/2/06	9/6/06	4	CAII	16x24	16.5x22		192	broken trip
15	Tradition	Closed Area	9/2/06	9/6/06	4	CAII	16x24, 16x25	17.5x24		242	broken trip
16	Generation	Closed Area	8/30/06	9/6/06	7	CAII	16x24, 16x25	17.5x24		341	broken trip
17	Celtic	RSA	9/6/06	9/17/06	11	CAII	16x24, 16x25	17.5x24		347	
18	Westport	RSA	9/14/06	9/26/06	12	CAII	16x24	17.5x24		573	
19	Celtic	RSA	10/6/06	10/18/06	12	CAII	16x24			615	
20	Resolution	RSA	11/7/06	11/10/06	3	NLCA	16x24			102	
21	Resolution	RSA	11/13/06	11/22/06	9	CAII	16x24			368	

Table 2: Trip Landings Data Summary

Trip #	Trip Type	Approx. DAS	Target Weight	Actual Landed Wt.	Landed Wt. Difference from Target	% Difference of Landed Total Wt. from Target	Actual Sum of All Study Bags Weighed	Count of Study Bags Weighed	Avgerage Wt. of Last 10% Filled	Expected Bagged Total Wt. (based on last 10%)	Difference of Bagged Total Wt. from Actual Wt.	% Difference of Bagged Total Wt. from Actual
1	Open Area	2	none	475.0	null	null	475.0	10	null	null	null	null
2	Open Area	16	none	31704.0	null	null	15460.0	312	48.0	14988.2	471.8	3.1%
3	Closed Area	4	18,000	17734.0	-266.0	-1.5%	17407.1	345	49.8	17181.5	225.6	1.3%
4	Closed Area	4	18,000	17978.0	-22.0	-0.1%	17778.7	355	49.7	17650.3	128.4	0.7%
5	Closed Area	6	18,000	13410.9	-4,589.2	-25.5%	13410.9	264	50.7	13384.8	26.0	0.2%
6	Closed Area	6	18,000	18091.2	91.2	0.5%	18091.2	360	49.9	17970.6	120.6	0.7%
7	Closed Area	6	18,000	18655.45	655.5	3.6%	18604.0	359	50.9	18268.5	335.5	1.8%
8	Closed Area	7	18,000	19082.3	1,082.3	6.0%	19082.3	360	52.4	18880.6	201.6	1.1%
9	Closed Area	5	18,000	18576.2	576.2	3.2%	18576.2	360	51.5	18540.0	36.2	0.2%
10	Closed Area	7	18,000	18601	601.0	3.3%	18498.6	358	51.4	18386.9	111.7	0.6%
11	Closed Area	7	18,000	19047.2	1,047.2	5.8%	19047.2	360	51.7	18604.5	442.8	2.3%
12	Closed Area	7	18,000	19221.5	1,221.5	6.8%	19221.5	360	52.5	18902.4	319.1	1.7%
13	Closed Area	7	18,000	18625.4	625.4	3.5%	18625.4	360	51.7	18599.4	26.0	0.1%
14	Closed Area	4	18,000	9210.5	-8,789.5	-48.8%	9210.5	192	46.7	8968.0	242.5	2.6%
15	Closed Area	4	18,000	12706.3	-5,293.7	-29.4%	12706.3	242	51.3	12402.8	303.5	2.4%
16	Closed Area	7	18,000	17909.2	-90.8	-0.5%	17909.2	341	51.8	17669.8	239.4	1.3%
17	RSA	11	22,000	21989.0	-11.0	-0.1%	18142.5	347	50.5	17524.3	618.3	3.4%
18	RSA	12	31,667	31665.9	-1.1	0.0%	29155.0	573	49.4	28280.1	874.9	3.0%
19	RSA	12	31,666	31238	-428.0	-1.4%	30157.9	615	47.7	29323.8	834.2	2.8%
20	RSA	3	5000	4933.6	-66.4	-1.3%	4933.6	102	48.2	4918.7	14.9	0.3%
21	RSA	9	18,244	18146.0	-98.0	-0.5%	17965.4	368	48.0	17648.2	317.2	1.8%

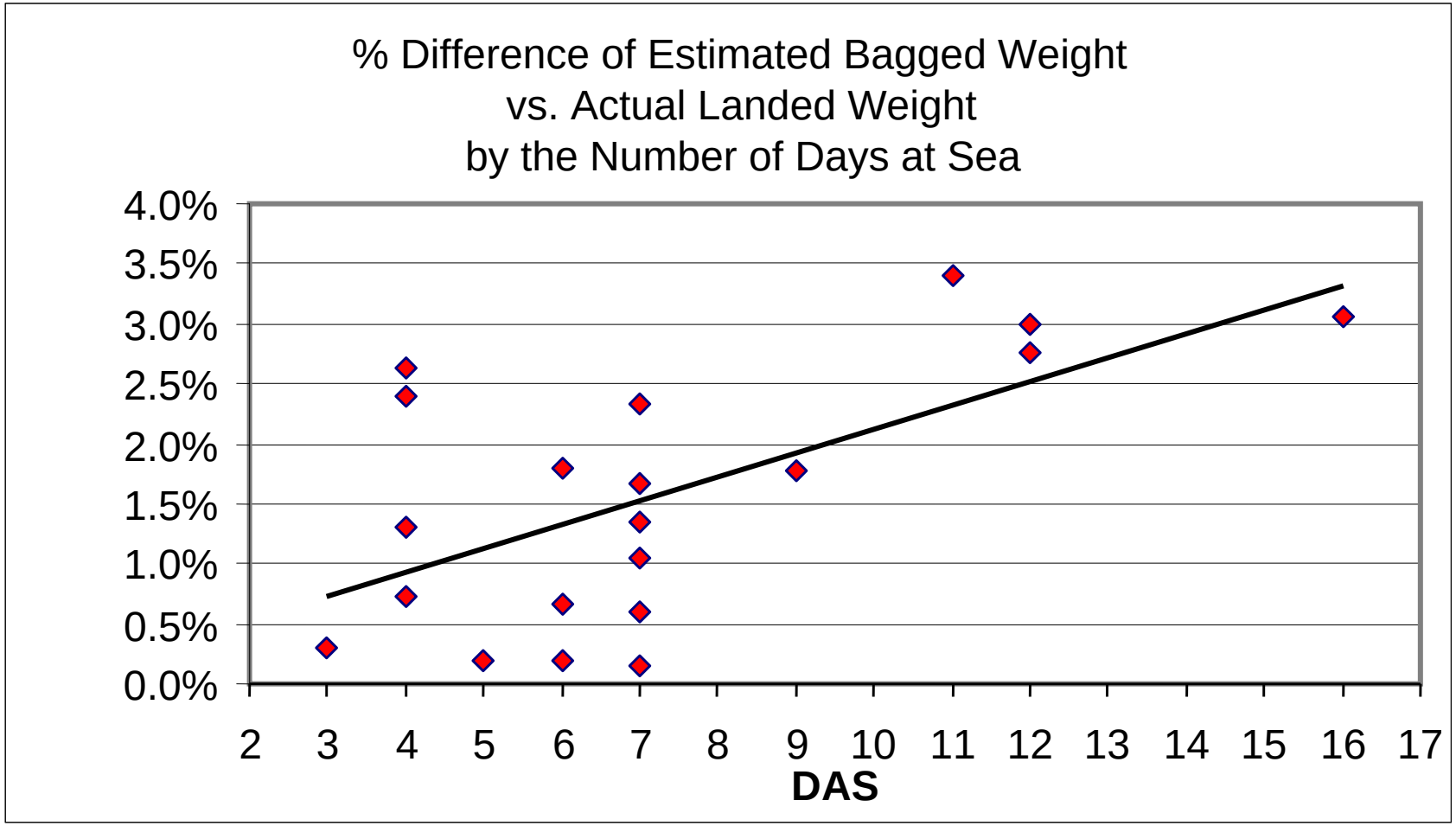

% Difference of Estimated Bagged Weight
vs. Actual Landed Weight
by the Number of Days at Sea
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
DAS

Fig. 20.

Table 3: Landings by vessels fishing under the 18,000 pound possession limit during the study period.

DATE	LANDINGS (lbs)	TARGET (lbs)	Lost Landings		
			lbs	%	$ @ $6.50/lb
8/1/2007	17,811	18,000	189	1.1%	$1,228.50
8/2/2007	17,698	18,000	302	1.7%	$1,963.00
8/7/2007	17,905	18,000	95	0.5%	$617.50
8/7/2007	17,941	18,000	59	0.3%	$383.50
8/7/2007	17,969	18,000	31	0.2%	$201.50
8/9/2007	17,794	18,000	206	1.1%	$1,339.00
8/9/2007	17,959	18,000	41	0.2%	$266.50
8/10/2007	17,439	18,000	561	3.1%	$3,646.50
8/10/2007	17,560	18,000	440	2.4%	$2,860.00
8/11/2007	17,772	18,000	228	1.3%	$1,482.00
8/13/2007	17,914	18,000	86	0.5%	$559.00
8/16/2007	17,803	18,000	197	1.1%	$1,280.50
8/16/2007	17,952	18,000	48	0.3%	$312.00
8/17/2007	17,669	18,000	331	1.8%	$2,151.50
8/20/2007	17,548	18,000	452	2.5%	$2,938.00
8/20/2007	17,815	18,000	185	1.0%	$1,202.50
8/22/2007	17,759	18,000	241	1.3%	$1,566.50
8/22/2007	17,428	18,000	572	3.2%	$3,718.00
8/22/2007	17,920	18,000	80	0.4%	$520.00
8/27/2007	17,504	18,000	496	2.8%	$3,224.00
8/30/2007	17,861	18,000	139	0.8%	$903.50
8/31/2007	17,847	18,000	153	0.9%	$994.50
9/3/2007	17,957	18,000	43	0.2%	$279.50
9/6/2007	17,552	18,000	448	2.5%	$2,912.00

Table 4. Summary of average bag weights by trip number and bag type.

Trip	Diamond 16x25	Diamond 16x24	TJ 17.5x24	TJ 16.5x22	Coastal Forms 14x23	Coastal Forms 15x25	Trip Comments
1	50.13		50.65		43.41		exploratory, used full level bucket
2	50.11		54.09		44.27		exploratory, some using full level bucket
3	50.06			50.60		50.70	NLCA, bags filled using full level bucket
4	49.75			50.01		50.47	NLCA, bags filled using full level bucket
5	51.77			50.79		52.23	CAII, used full level bucket, trip ended early
6	50.21		50.30				CAII, used full level bucket
7	52.39		51.25				CAII
8	54.38		51.92				CAII
9	50.95		52.25				CAII
10	51.75		51.60				CAII, used full level bucket
11	53.74		51.46			53.67	CAII
12	53.23		53.56				CAII
13	52.56			50.91			CAII
14		47.55		48.40			CAII, trip ended early
15	53.35	50.12	52.26				CAII, trip ended early
16	53.05	49.47	52.68				CAII, trip ended early
17	52.74	49.69	52.07				exploratory
18		49.22	52.57				exploratory
19		49.04					exploratory
20		48.37					exploratory
21		48.82					exploratory

Table 5. Summary of Standard Deviations of Average Bags Weights by trip number and bag type.

Trip	Diamond 16x25	Diamond 16x24	TJ 17.5x24	TJ 16.5x22	Coastal Forms 14x23	Coastal Forms 15x25	Trip Comments
1	0.38		1.08		0.38		exploratory, used full level bucket
2	1.51		1.73		1.59		exploratory, some using full level bucket
3	1.03			0.93		1.02	NLCA, bags filled using full level bucket
4	0.99			0.79		1.01	NLCA, bags filled using full level bucket
5	1.41			1.08		1.32	CAII, used full level bucket, trip ended early
6	1.32		1.45				CAII, used full level bucket
7	1.34		1.40				CAII
8	0.95		1.04				CAII
9	1.28		1.29				CAII
10	1.24		0.99				CAII, used full level bucket
11	1.56		1.31			1.79	CAII
12	1.44		1.66				CAII
13	1.57			1.72			CAII
14		1.20		1.26			CAII, trip ended early
15	1.31	1.22	1.61				CAII, trip ended early
16	1.32	1.31	1.42				CAII, trip ended early
17	1.49	1.39	2.40				exploratory
18		1.26	1.07				exploratory
19		1.31					exploratory
20		1.41					exploratory
21		1.31					exploratory

Table 6a. Bag Measurement Samples for Diamond 16x25

Diamond 16x25	Length Seam	Length Fold	Average	Width Top	Width Middle	Width Bottom	Average	Square Inches	STDEV
1	25.00	25.00	25.00	15.75	15.75	15.75	15.75	393.75	3.07
2	25.00	25.00	25.00	15.75	15.75	15.75	15.75	393.75	
3	25.25	25.00	25.13	16.00	15.75	16.00	15.92	399.91	AVG
4	25.00	25.00	25.00	15.75	15.75	15.75	15.75	393.75	396.82
5	25.00	25.00	25.00	16.00	16.00	16.00	16.00	400.00	
6	25.00	25.25	25.13	16.00	16.00	16.00	16.00	402.00	
7	25.00	25.00	25.00	15.75	15.75	16.00	15.83	395.83	
8	25.50	25.25	25.38	15.75	15.75	15.75	15.75	399.66	
9	25.00	25.00	25.00	15.75	15.75	16.00	15.83	395.83	
10	25.00	25.00	25.00	15.75	15.50	16.00	15.75	393.75	

Table 6b. Bag Measurement Samples for Diamond 16x24

Data from Trip 21

Diamond 16x24	Length Seam	Length Fold	Average	Width Top	Width Middle	Width Bottom	Average	Square Inches	STDEV	Offload Wt.	Pounds per Square Inch
103	23.75	23.80	23.78	16.00	16.00	16.00	16.00	380.40	2.40	47.95	0.13
104	23.70	23.80	23.75	15.80	15.80	15.90	15.83	376.04		48.55	0.13
105	23.70	23.80	23.75	15.80	15.90	16.00	15.90	377.63		49.05	0.13
106	23.75	23.80	23.78	15.80	15.80	16.00	15.87	377.23		48.45	0.13
107	23.70	23.80	23.75	15.90	15.90	16.00	15.93	378.42		47.30	0.12
108	23.60	23.75	23.68	16.00	15.80	15.90	15.90	376.43		48.55	0.13
109	23.70	23.75	23.73	15.90	15.90	15.90	15.90	377.23		48.95	0.13
110	23.60	23.80	23.70	15.80	16.00	16.10	15.97	378.41		48.80	0.13
111	24.00	23.90	23.95	16.00	16.00	16.20	16.07	384.80		49.25	0.13
112	23.75	23.75	23.75	15.90	15.90	16.00	15.93	378.42		47.55	0.13
Overall Averages:			23.76	378.50			15.93	378.50		48.44	0.13

Table 6c. Bag Measurement Samples for TJ 17.5x24

TJ 17.5x24	Length Seam	Length Fold	Average	Width Top	Width Middle	Width Bottom	Average	Square Inches	STDEV
1	24.00	24.50	24.25	16.50	17.75	17.00	17.08	414.27	4.93
2	23.75	25.00	24.38	16.50	16.75	17.00	16.75	408.28	
3	23.50	23.75	23.63	16.50	17.00	17.00	16.83	397.69	AVG
4	23.75	23.75	23.75	16.75	16.75	17.00	16.83	399.79	403.74
5	23.75	24.00	23.88	16.50	16.50	17.00	16.67	397.92	
6	24.00	24.00	24.00	17.00	17.00	17.00	17.00	408.00	
7	24.00	23.75	23.88	17.00	16.75	17.00	16.92	403.89	
8	23.75	24.00	23.88	16.75	16.75	17.00	16.83	401.90	
9	23.75	23.75	23.75	17.00	17.00	17.00	17.00	403.75	
10	24.00	23.75	23.88	16.75	16.75	17.00	16.83	401.90	

Table 6d. Bag Measurement Samples for TJ 16.5x22

TJ 16.5x22	Length Seam	Length Fold	Average	Width Top	Width Middle	Width Bottom	Average	Square Inches	STDEV
1	22.25	22.50	22.38	16.75	16.75	17.00	16.83	376.65	4.52
2	22.25	22.50	22.38	16.75	17.00	17.00	16.92	378.51	
3	22.25	22.50	22.38	16.50	17.00	17.00	16.83	376.65	AVG
4	22.00	22.50	22.25	16.75	16.75	17.00	16.83	374.54	372.79
5	22.50	22.50	22.50	16.50	16.50	17.00	16.67	375.00	
6	22.00	22.25	22.13	16.50	16.50	16.75	16.58	366.91	
7	22.50	22.50	22.50	16.50	16.50	17.00	16.67	375.00	
8	22.25	22.25	22.25	16.50	16.75	17.00	16.75	372.69	
9	22.00	22.25	22.13	16.00	16.50	17.00	16.50	365.06	
10	21.75	22.50	22.13	16.50	16.50	16.75	16.58	366.91	

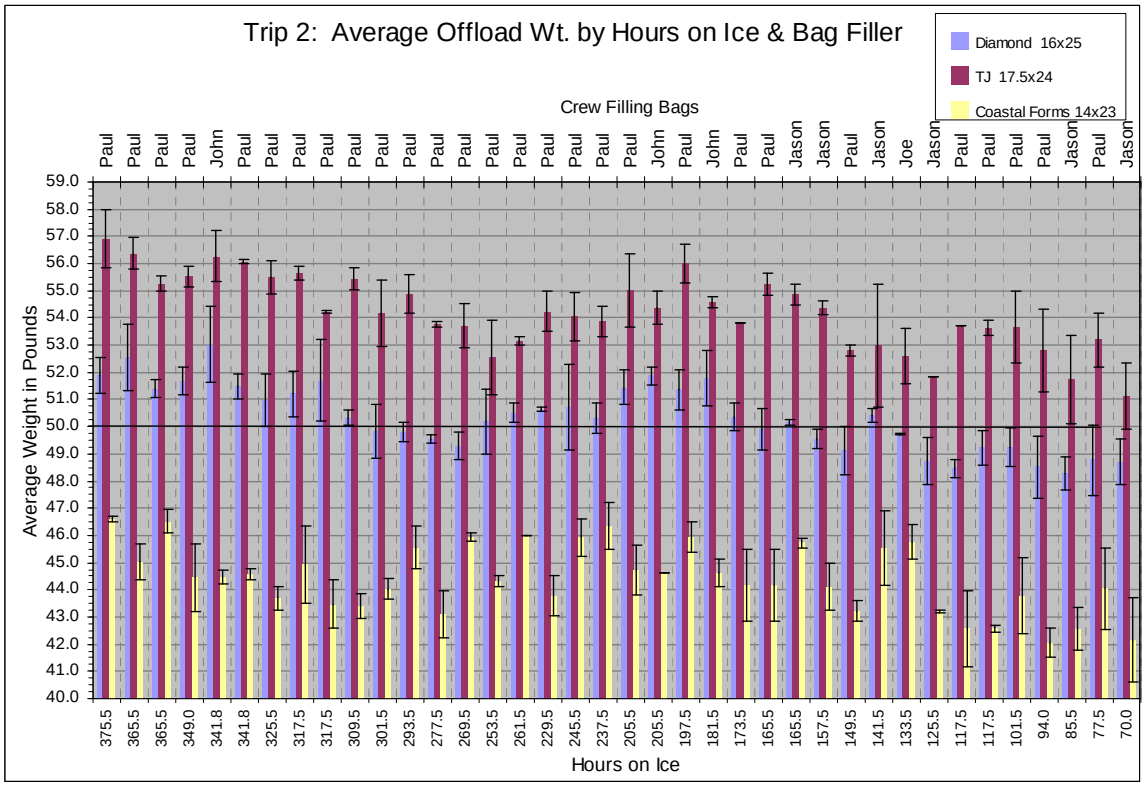
Table 6e. Bag Measurement Samples for Coastal Forms 14x23

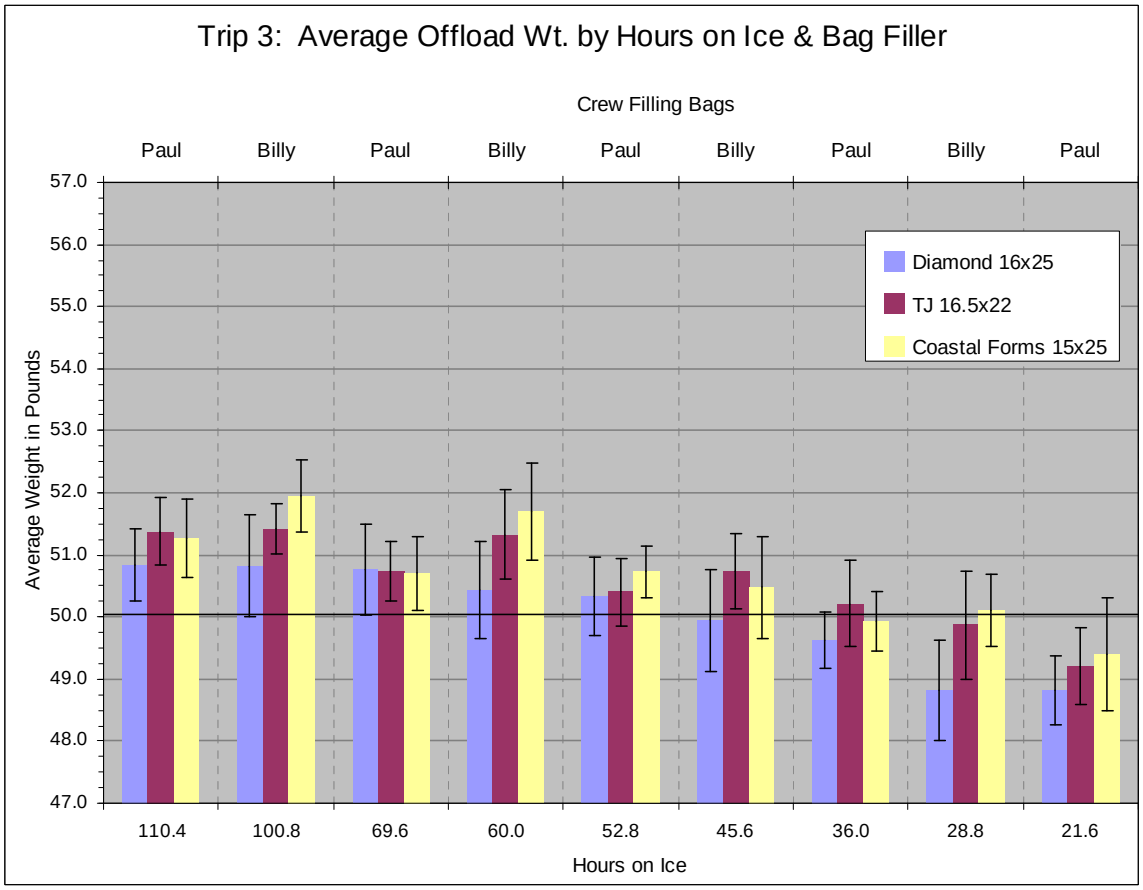
Coastal 14x23	Length Seam	Length Fold	Average	Width Top	Width Middle	Width Bottom	Average	Square Inches	STDEV
1	22.50	23.50	23.00	14.00	14.50	14.00	14.17	325.83	7.99
2	23.00	23.25	23.13	14.50	14.75	14.00	14.42	333.39	
3	22.00	23.25	22.63	15.00	14.75	14.00	14.58	329.95	AVG
4	22.50	24.00	23.25	14.50	14.75	14.00	14.42	335.19	332.41
5	24.00	24.00	24.00	14.50	14.50	14.50	14.50	348.00	
6	22.50	23.25	22.88	14.50	14.50	14.00	14.33	327.88	
7	21.75	23.50	22.63	14.00	14.50	14.00	14.17	320.52	
8	23.25	23.25	23.25	14.50	14.75	14.50	14.58	339.06	
9	22.75	25.00	23.88	14.25	14.50	14.00	14.25	340.22	
10	22.25	23.50	22.88	14.00	14.50	14.00	14.17	324.06	

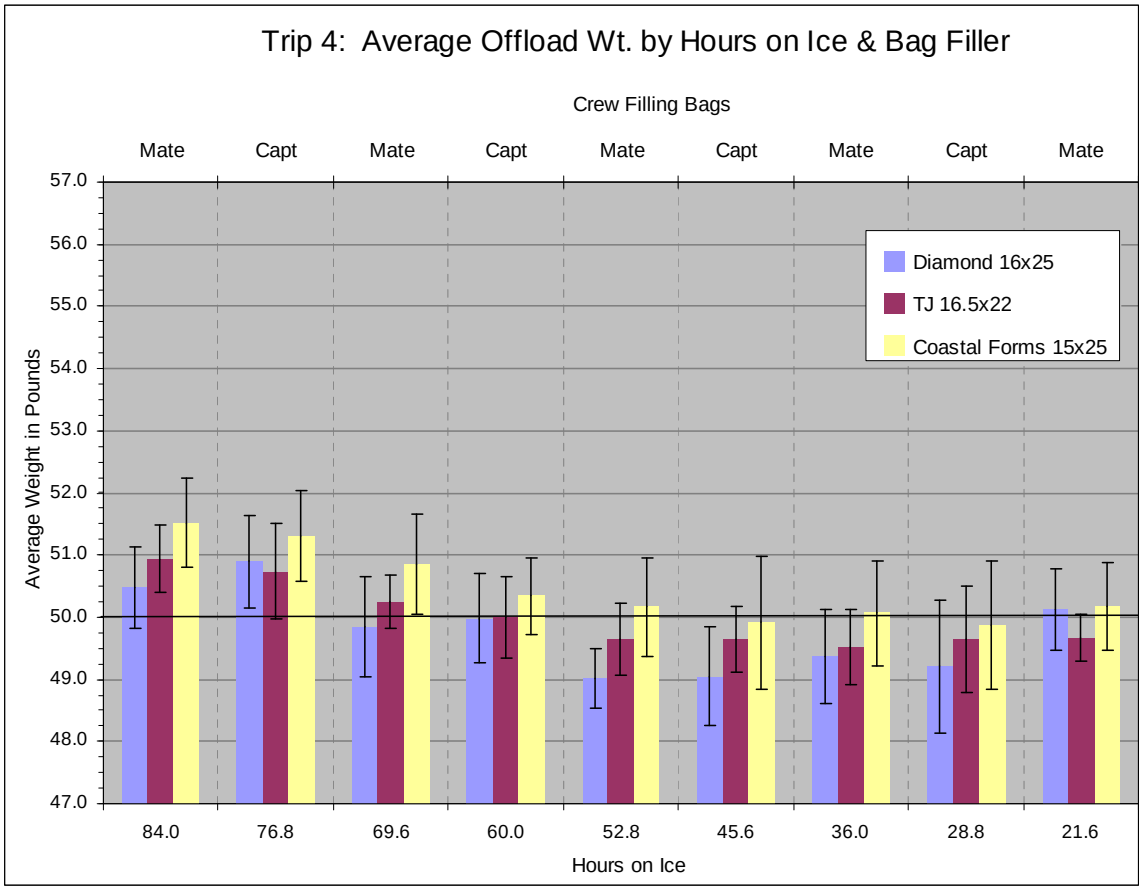
Table 6f. Bag Measurement Samples for Coastal Forms 15x25

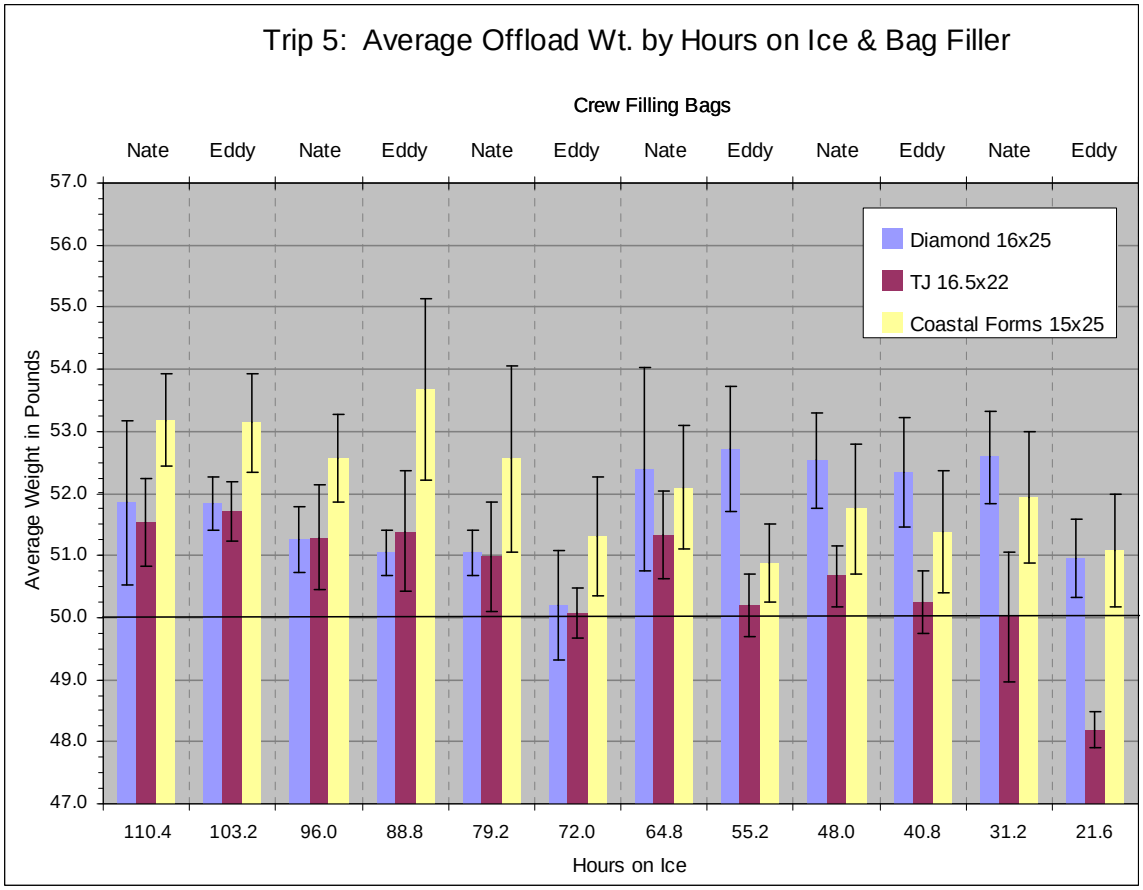
Coastal 15x25	Length Seam	Length Fold	Average	Width Top	Width Middle	Width Bottom	Average	Square Inches	STDEV
1	24.00	25.00	24.50	15.00	15.00	13.00	14.33	351.17	6.05
2	24.00	25.00	24.50	15.00	15.00	13.00	14.33	351.17	
3	24.00	25.00	24.50	15.25	15.00	13.50	14.58	357.29	AVG
4	24.25	25.50	24.88	15.00	15.25	14.00	14.75	366.91	361.85
5	24.00	25.25	24.63	15.00	15.25	14.00	14.75	363.22	
6	24.00	25.25	24.63	15.25	15.25	14.00	14.83	365.27	
7	24.50	25.25	24.88	15.00	15.25	14.00	14.75	366.91	
8	24.50	25.25	24.88	15.00	15.25	14.00	14.75	366.91	
9	24.75	25.00	24.88	15.00	15.25	14.00	14.75	366.91	
10	24.50	25.25	24.88	15.00	15.00	13.75	14.58	362.76	

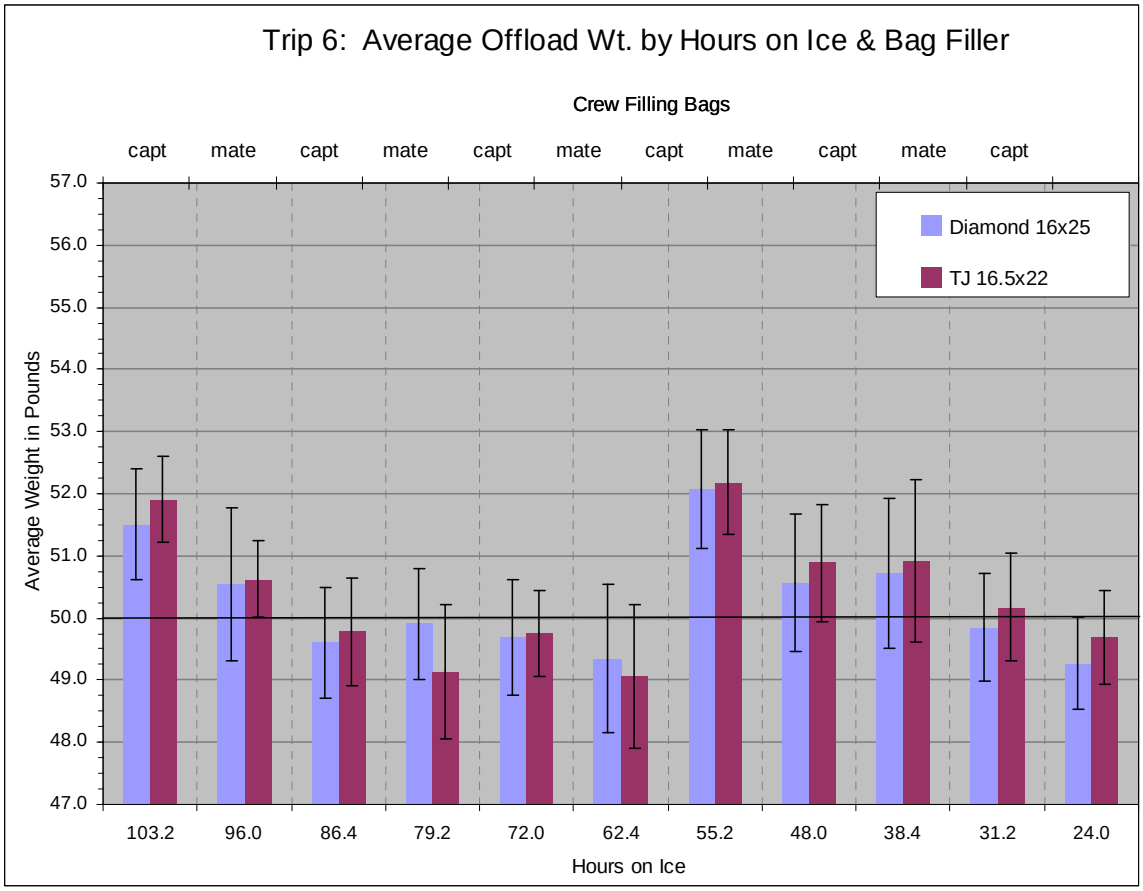
Appendix A: Average Bag Weights by Bag Type, Hours on Ice, and Bag Filler

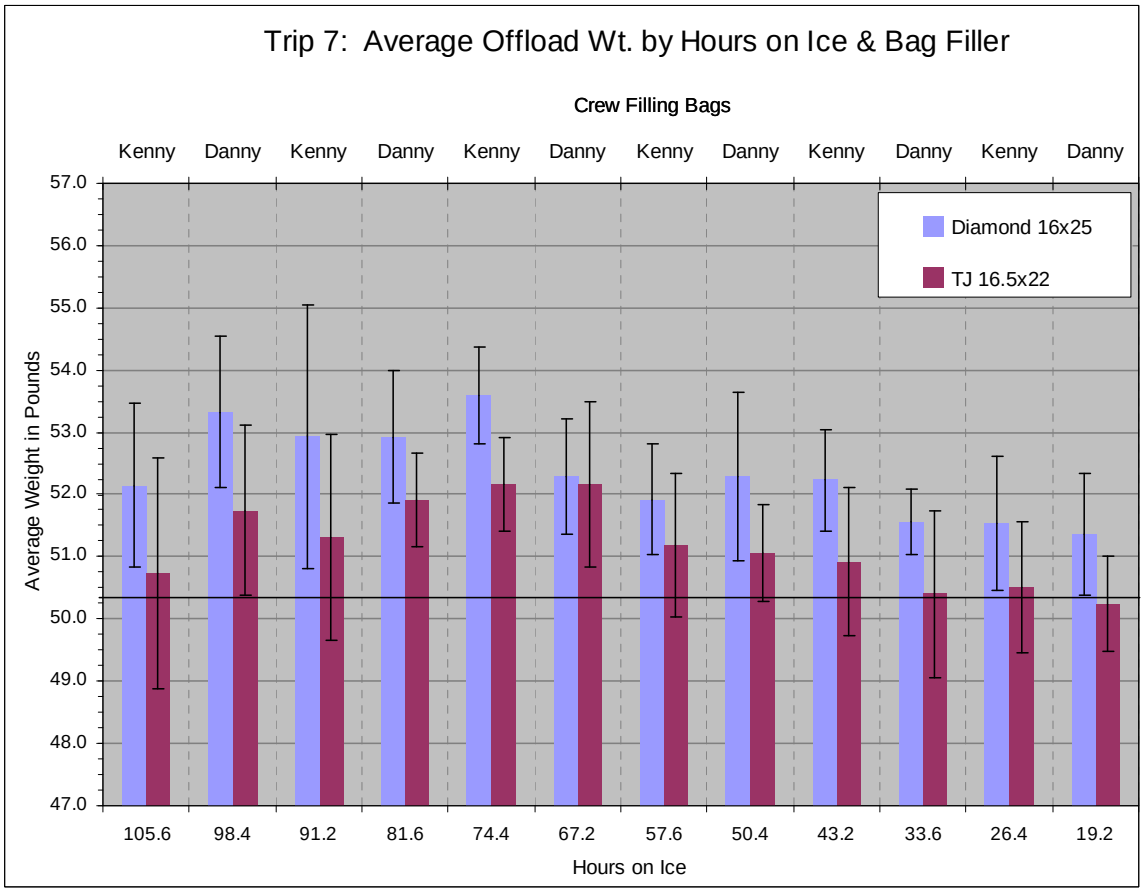


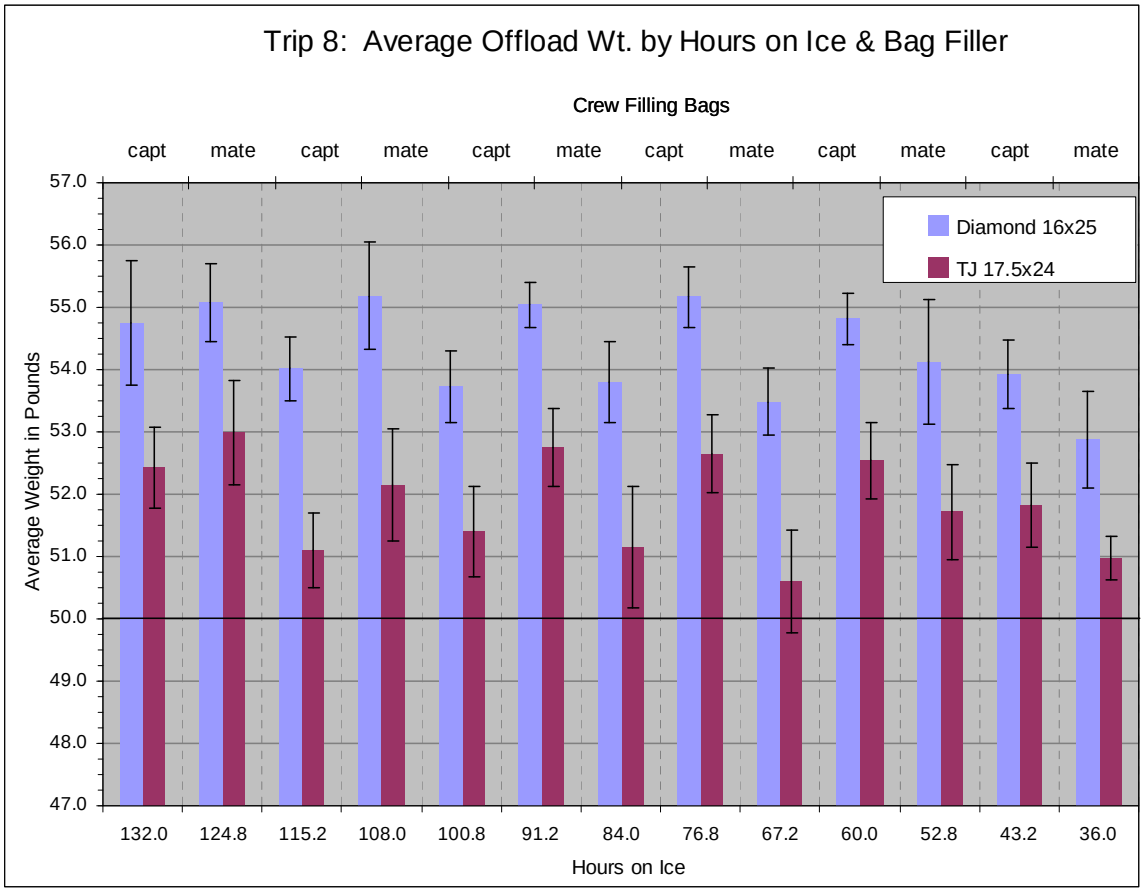


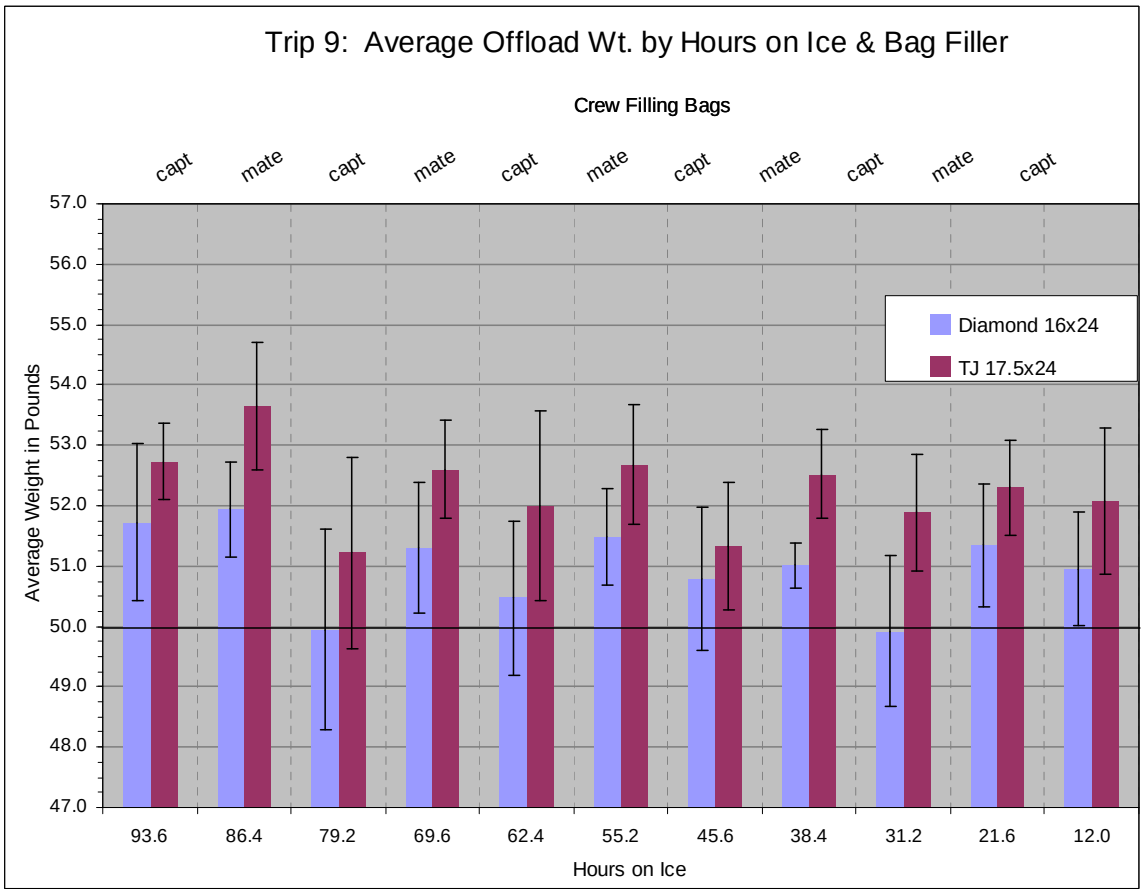

Trip 4: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
Mate
Capt
Mate
Capt
Mate
Capt
Mate
Capt
Mate
Average Weight in Pounds
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
Diamond 16x25
TJ 16.5x22
Coastal Forms 15x25
84.0
76.8
69.6
60.0
52.8
45.6
36.0
28.8
21.6
Hours on Ice

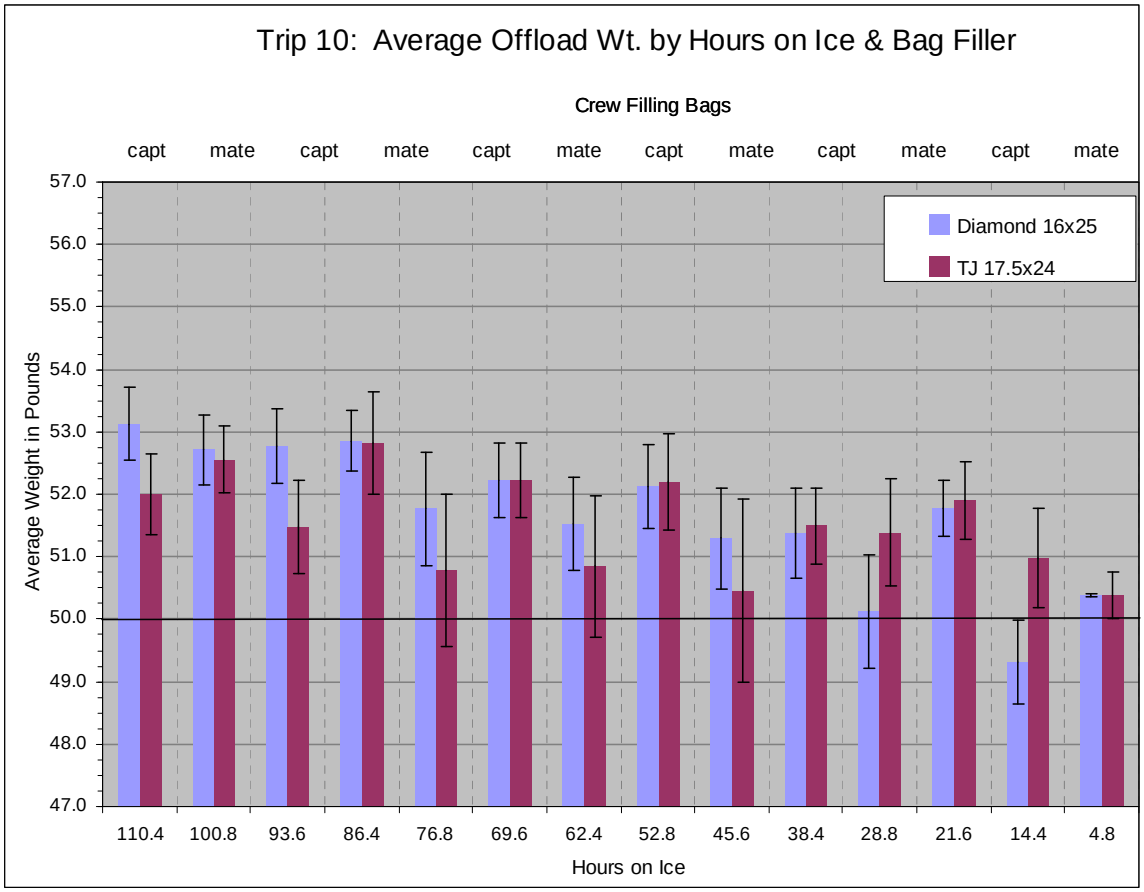

Trip 5: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
Nate
Eddy
Nate
Eddy
Nate
Eddy
Nate
Eddy
Nate
Eddy
Nate
Eddy
Average Weight in Pounds
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
Diamond 16x25
TJ 16.5x22
Coastal Forms 15x25
110.4
103.2
96.0
88.8
79.2
72.0
64.8
55.2
48.0
40.8
31.2
21.6
Hours on Ice

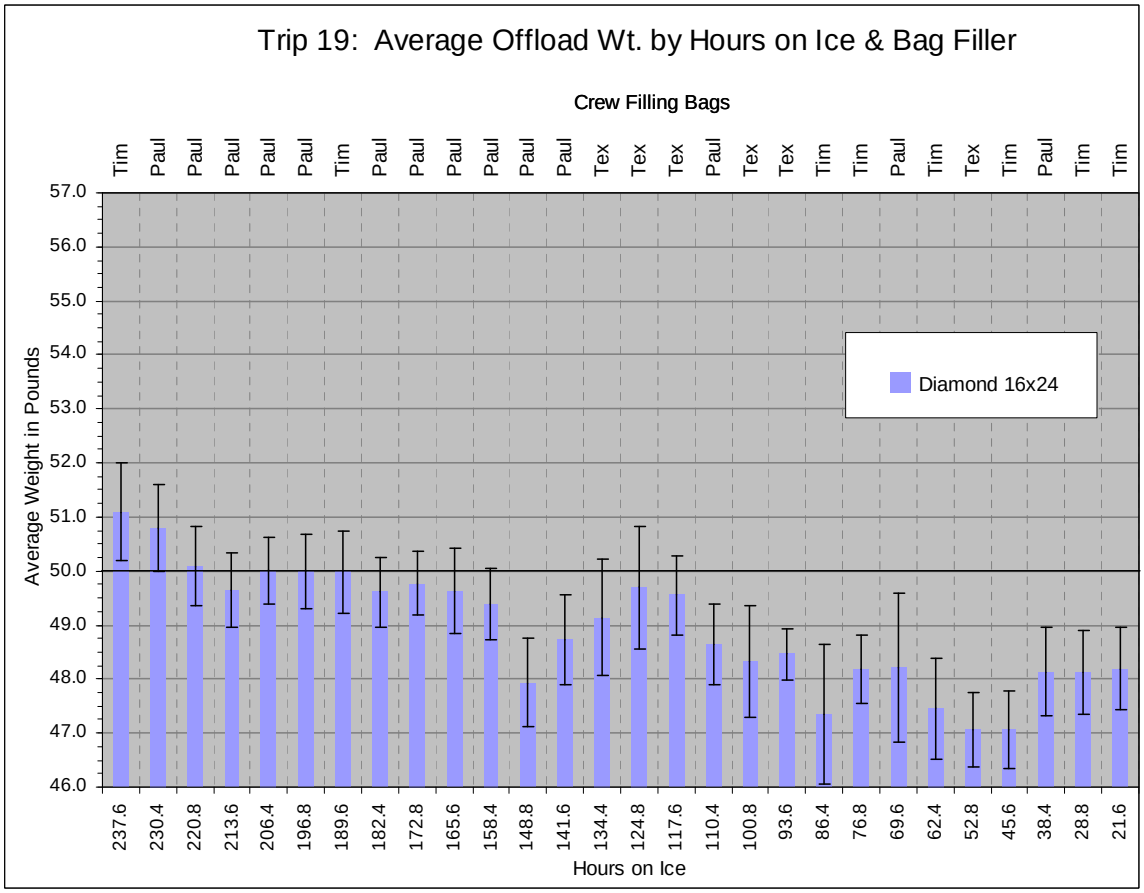

Trip 6: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
capt mate capt mate capt mate capt mate capt mate capt
Average Weight in Pounds
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
Diamond 16x25
TJ 16.5x22
103.2 96.0 86.4 79.2 72.0 62.4 55.2 48.0 38.4 31.2 24.0
Hours on Ice

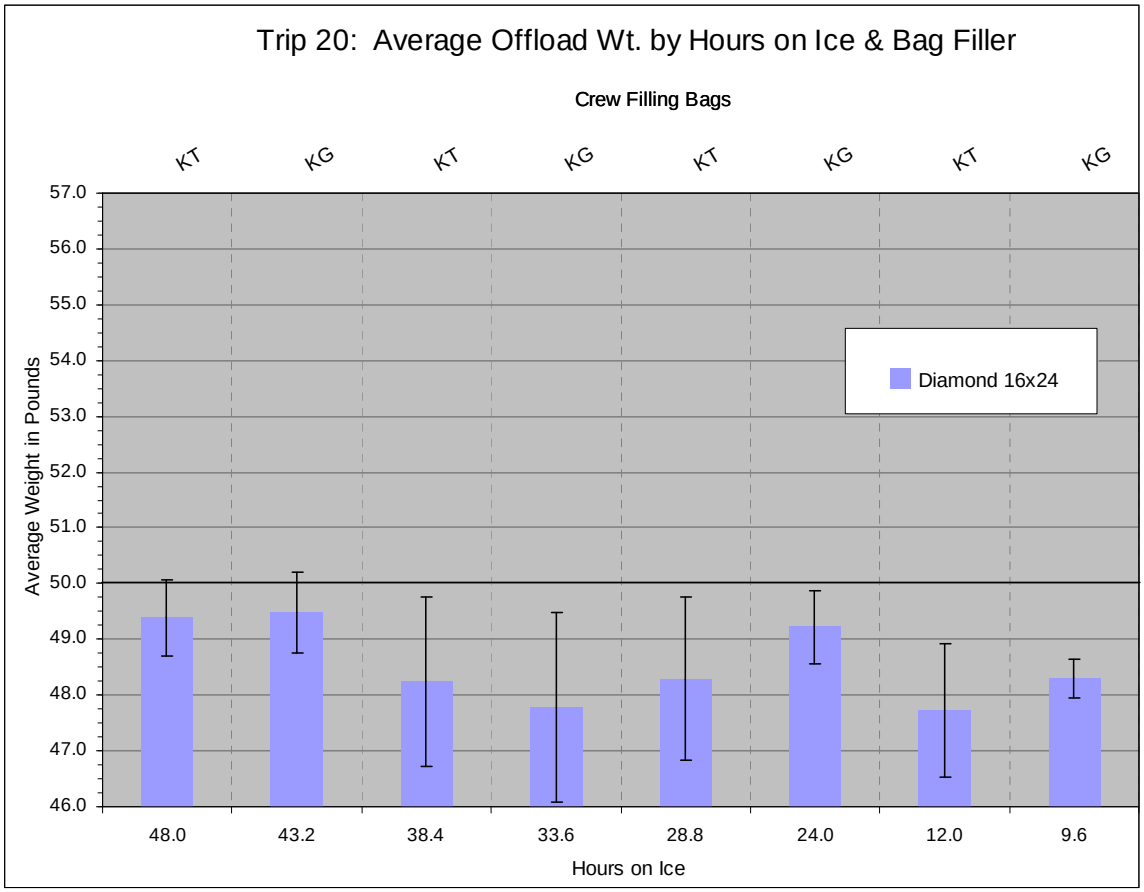

Trip 7: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
Kenny Danny Kenny Danny Kenny Danny Kenny Danny Kenny Danny Kenny Danny
Average Weight in Pounds
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
Diamond 16x25
TJ 16.5x22
105.6 98.4 91.2 81.6 74.4 67.2 57.6 50.4 43.2 33.6 26.4 19.2
Hours on Ice


Trip 8: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
capt
mate
Diamond 16x25
TJ 17.5x24
Average Weight in Pounds
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
132.0
124.8
115.2
108.0
100.8
91.2
84.0
76.8
67.2
60.0
52.8
43.2
36.0
Hours on Ice


Trip 9: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
capt
mate
Diamond 16x24
TJ 17.5x24
Average Weight in Pounds
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
93.6
86.4
79.2
69.6
62.4
55.2
45.6
38.4
31.2
21.6
12.0
Hours on Ice


Trip 10: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
capt mate capt mate capt mate capt mate capt mate capt mate
Average Weight in Pounds
57.0 56.0 55.0 54.0 53.0 52.0 51.0 50.0 49.0 48.0 47.0
Diamond 16x25
TJ 17.5x24
110.4 100.8 93.6 86.4 76.8 69.6 62.4 52.8 45.6 38.4 28.8 21.6 14.4 4.8
Hours on Ice


Trip 19: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
Tim Paul Paul Paul Paul Paul Tim Paul Paul Paul Paul Paul Paul Tex Tex Tex Paul Tex Tex Tim Tim Paul Tim Tex Tim Paul Tim Tim
Average Weight in Pounds
57.0 56.0 55.0 54.0 53.0 52.0 51.0 50.0 49.0 48.0 47.0 46.0
Diamond 16x24
237.6 230.4 220.8 213.6 206.4 196.8 189.6 182.4 172.8 165.6 158.4 148.8 141.6 134.4 124.8 117.6 110.4 100.8 93.6 86.4 76.8 69.6 62.4 52.8 45.6 38.4 28.8 21.6
Hours on Ice


Trip 20: Average Offload Wt. by Hours on Ice & Bag Filler
Crew Filling Bags
KT
KG
KT
KG
KT
KG
KT
KG
57.0
56.0
55.0
54.0
53.0
52.0
51.0
50.0
49.0
48.0
47.0
46.0
Average Weight in Pounds
Diamond 16x24
48.0
43.2
38.4
33.6
28.8
24.0
12.0
9.6
Hours on Ice

Appendix B: Bag Tag Project Participants

Name	W	Organization	Phone	email	Address
Ronald Smolowitz	Y	Fisheries Survival Fund	508-563-2560	cfarm@capecod.net	277 Hatchville Rd, East Falmouth, MA 02536
Danny Cohen	Y	Atlantic Capes Fisheries	609-425-1044	PO Box 555	Cape May, NJ 08204
Peter Hughes	N	Atlantic Capes Fisheries	609-884-0115 609-425-3220 (c)	phughes@atlanticcapes.com	PO Box 555 Cape May, NJ 08204
Roy Enoksen	N	Eastern Fisheries	508-991-5300	roy@easternfisheries.com	14 Hervey Tichon Ave New Bedford, MA 02740
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James Kendall	Y	NB Seafood Consulting	508-997-0013 508-287-2010 (c)	nbsc@comcast.net	19 Weaver Street New Bedford, MA 02740
William Dupaul	Y	VIMS	804-684-7163	dupaul@vims.edu	PO Box 1346 Gloucester Point, VA 23062
David Rudders	Y	VIMS	804-684-7531	rudders@vims.edu	PO Box 1346 Gloucester Point, VA 23062
Robert Fisher	Y	VIMS	804-684-7168	rfisher@vims.edu	PO Box 1346 Gloucester Point, VA 23062
Mike Palmer	Y	NEFSC	508-495-2041	michael.palmer@noaa.gov	166 Water Street Woods Hole, MA 02543
Richard Canastra	N	Whaling City Auction	508-990-0799 508-294-6903	richie@whalingcityauction.com	62 Hassey St New Bedford, MA 02740

Bag Tag Project Participants

Name	W	Organization	Phone	email	Address
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Peter Christopher	Y	NMFS, NERO	978-281-9288	peter.christopher@noaa.gov	One Blackburn Drive Gloucester, MA 01930
Ryan Silva	Y	NMFS, NERO	978-281-9326	ryan.silva@noaa.gov	One Blackburn Drive Gloucester, MA 01930
Paul Rago	N	NMFS, NEFSC	508-495-2341	Paul.rago@noaa.gov	166 Water Street Woods Hole, MA 02543
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Andrew Applegate	N	NEFMC	978-465-0492	aapplegate@nefmc.org	50 Water Street Newburyport, MA 01950
Chris Kellogg	N	NEFMC	978-465-0492	ckellogg@nefmc.org	50 Water Street Newburyport, MA 01950
Deidre Boelke Y		NEFMC	978-465-0492	dboelke@nefmc.org	50 Water Street Newburyport, MA 01950
Thomas Hill	N	NEFMC	978-283-7006	thomas.r.hill@verizon.net	27 Ferry Street Gloucester, MA 01930
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Louis Jachimczyk	N	NMFS, OLE	508-992-7711	Louis.j.jachimczyk@noaa.gov	
Kevin Flanagan	Y	NMFS, OLE	508-992-7711	Kevin.g.flanagan@noaa.gov	
Christopher Mccarron	N	NMFS, OLE	508-992-7711	Christopher.mccarron@noaa.gov	
Peter Hanlon	N	Mass DEP	508-367-9951	pjcran@prodigy.net	

Bag Tag Project Participants

Name	W	Organization	Phone	email	Address
Jim Austin	N	AMT Systems		JimA@amtsystems.com	
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Harriot Ditriksen	N	NB Ship Supply	508-509-7208 (c) 508-994-2961	wbss.nbship@verizon.net	
Andreia Dias	Y	TJ Bags	508-999-1870 508-596-1752 (c)		
Laurie Botelho	Y	Diamond Marine Supply	978-869-2664	scallopbags@comcast.net	PO Box 8380 New Bedford, MA 02724
Charlie Quinn	Y	F/V Celtic	508-509-6620		
Chris Wright	N	F/V Harvester	508-958-6202		
Richard Taylor	Y	Seascallop.com	978-853-5999	rtaylor@cove.com	
Edward WelchY		F/V Westport	508-993-3218		
Ron Marley	N	Wise Tag & Label	877-853-0598		PO Box 15056 Clearwater, FL 33766
Bob Eaves	N	Wise Tag & Label		Rbe@wisetaglabel.com	
Greg DiDomenico	N	Garden State Seafood	609-898-1100	gregdi@voicenet.com	
Erik Orman	N	Tempest Fisheries	508-294-7611	tempest01@rcn.com	
Danny Eilertsen	N	Nordic, Inc	508-341-9255		

Bag Tag Project Participants

Name	W	Organization	Phone	email	Address
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Jim Gutowski	Y	Viking Village	609-494-0113 609-548-5020 (c)	jim@vikingvillage.net	PO Box 458 Barnegate Light, NJ 08006
Dave Wallace	Y	Wallace Associates	410-376-3200	dhwallace@aol.com	1142 Hudson Road Cambridge, MD 21613
Matt Weeks	Y	Coonamessett Farm	802-535-4333 (c)	mattvweeks@usa.net	
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Bob Reeder	Y	Met-Speed label	888-886-0638 610-496-1810 (c)	bob@metspeedlabel.com	187 Washington Ave Nutley, NJ 07110
Arne Isiksen	N	Isiksen Fishing Corp	508-999-1028		
Gabe Miranda	N	F/V Friendship		Captgabe41@aol.com	
Ronnie Shrader	Y	F/V Tradition	508-951-2771	Captrsshredder@aol.com	
Barbara Bragdon	Y	BTG Fisheries	508-398-6162	bragnet@comcast.net	Box 789 Dennisport, MA 02639
Jim Green	Y	Coastal Forms/Printing	800-241-4067 757-810-1500 (c)	jgreen@coastalforms.com	720 Thimble Shoals Blvd Newport News, VA 23606
SuAnn Brown	N	Coastal Forms/Printing	757-873-8806	sbrown@coastalforms.com	
Bruce Breeger N		Coastal Forms/Printing	757-873-8806	bbreeger@coastalforms.com	
Keith Larsen	Y	F/V Elizabeth	609-494-6950 609-548-5025 (c)	bigeye101@alo.com	PO Box 695 Barnegate Light, NJ 08006

Bag Tag Project Participants

Name	W	Organization	Phone	email	Address
John Mahoney	Y	NMFS	508-984-0063	john.b.mahoney@noaa.gov	
Mark Buron	Y	Eastern Fisheries	508-993-6730	markb@easternfisheries.com	
Geoffrey Day	Y	Seafood research Assoc.		Gday@cx.com	
Chris Biegel	Y	NMFS	978-281-9112	christopher.biegel@noaa.gov	
Bob Keese	Y	Gen Cat Fisherman	508-945-2216	bobkeese@hotmail.com	
Andy Keese	Y	Gen Cat Fisherman	774-263-6385	missrockville@adelphia.net	

Appendix C: Trip Summaries and Descriptive Statistics of Average Bag Weights by Type

Bag Trip #:	1
Vessel:	Celtic
Date Sailed:	5/19/2006
Date Landed:	5/21/2006
Time Landed:	12:45
Area:	Mud Hole
CAS Trip:	No
EFP:	none, declared out of fishery, only landed 400 lbs.
Total Wt. Landed:	400
Approx DAS:	3
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Charlie Quinn
Mate:	Paul
Bag Fillers:	Paul
Deck Handling:	put straight into washer then bagged
Notes:	-first exploratory with study bags, bags filled using bucket
Total # of study bags:	10
Total # of study bags weighed:	10

Diamond 16x25	Trip 1
COUNT:	3
AVG:	50.13
STDEV:	0.38
MIN:	49.81
MAX:	50.67
MEDIAN:	49.91

TJ 17.5x24	Trip 1
COUNT:	3
AVG:	50.65
STDEV:	1.08
MIN:	49.68
MAX:	52.15
MEDIAN:	50.11

Coastal Forms 14x23	Trip 1
COUNT:	4
AVG:	43.41
STDEV:	0.38
MIN:	43.05
MAX:	43.94
MEDIAN:	43.33

Bag Trip #:	2
Vessel:	Celtic
Date Sailed:	5/25/2006
Date Landed:	6/10/2006
Time Landed:	23:30
Area:	GB Southeast Parts
CAS Trip:	No
EFP:	No
Date Offloaded:	6/11/2006
Time Offloaded:	6:00
Approx DAS:	16
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Paul D.
Mate:	Billy
Bag Fillers:	Paul D., Jason, John, Joe
Deck Handling:	chilled, ~30 min to bag and put in hold

Notes:	-2nd exploratory trip with study bags
	-Seams on Coastal Forms bags are too loose. They pop when put down into basket
	-Label maker software stopped working on 6/16/06 because trail version expired. All tags form bag 135 on were hand written.
	-Starting on 6/5/06, bags were filled using a 5 gallon bucket with holes as the crew usually does
Total # of study bags:	335
Total # of study bags weighed:	312

Diamond
16x25

COUNT:	109
Ripped:	0
AVG:	50.11
STDEV:	1.51
MIN:	47.15
MAX:	54.90
MEDIAN:	50.00

TJ 17.5x24

COUNT:	103
Ripped:	1
AVG:	54.09
STDEV:	1.73
MIN:	56.65
MAX:	58.40
MEDIAN:	54.30

COASTAL FORMS
14x23

COUNT:	100
Ripped:	6
AVG:	44.27
STDEV:	1.59
MIN:	40.25
MAX:	47.20
MEDIAN:	44.38

Bag Trip #:	3
Vessel:	Celtic
Date Sailed:	7/6/2006
Date Landed:	7/10/2006
Time Landed:	20:00
Area:	NLCA
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	7/11/2006
Time Offloaded:	5:00
Total Wt. Landed:	17734, with bags/ice; 17558 without bags/ice
Approx DAS:	4
Port Sailed:	New Bedford
Dealer:	Eastern Seafood
Captain:	Paul
Mate:	Billy
Bag Fillers:	Paul, Billy
Deck Handling:	chilled, washed, bagged at end of watch
Notes:	New batch of TJ bags that are supposed to be closer to 50 lbs
	New batch of Coastal Forms bags that are supposed to be closer to 50 lbs
	crew recorded bag offload weights
	8 bag weights missed, 7 bags MIA
	Was a NLCA trip
	used 5 gallon ring bucket with holes to fill all bags
Total # of study bags:	360
Total # of study bags weighed:	345

Diamond
16x25

COUNT:	114
Ripped:	0
AVG:	50.06
STDEV:	1.03
MIN:	47.25
MAX:	52.30
MEDIAN:	50.15

TJ
16.5x24

COUNT:	115
Ripped:	1
AVG:	50.60
STDEV:	0.93
MIN:	47.90
MAX:	52.70
MEDIAN:	50.60

Coastal Forms
15x25

COUNT:	116
Ripped:	0
AVG:	50.70
STDEV:	1.02
MIN:	48.45
MAX:	53.40
MEDIAN:	50.68

Bag Trip #:	4
Vessel:	Celtic
Date Sailed:	7/12/2006
Date Landed:	7/16/2006
Time Landed:	17:00
Area:	NLCA
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	7/17/2006
Time Offloaded:	5:00
Total Wt. Landed:	17978 (without bag/ice wt.)
Approx DAS:	4
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Paul D.
Mate:	Billy D.
Bag Fillers:	Paul D., Billy
Deck Handling:	chilled
Notes:	all bags filled using a link bucket level to the top
	4 bag weights missed
	1 bag got grease on it and was not used
Total # of study bags weighed:	355

DIAMOND
16x25

COUNT:	116
Ripped:	0
AVG:	49.75
STDEV:	0.99
MIN:	47.65
MAX:	51.60
MEDIAN:	49.73

TJ
16.5x22

COUNT:	119
Ripped:	0
AVG:	50.01
STDEV:	0.79
MIN:	48.20
MAX:	51.85
MEDIAN:	49.85

Coastal Forms
15x25

COUNT:	120
Ripped:	0
AVG:	50.47
STDEV:	1.01
MIN:	47.35
MAX:	53.00
MEDIAN:	50.55

Bag Trip #:	5
Vessel:	Westport
Date Sailed:	7/31/2006
Date Landed:	8/6/2006
Time Landed:	16:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	8/6/2006
Time Offloaded:	16:00
Approx DAS:	7
Port Sailed:	New Bedford
Dealer:	Whaling City Seafood Auction
Captain:	Eddy Welch
Mate:	Nate
Bag Fillers:	Eddy, Nate
Deck Handling:	chilled
Notes:	used 5 gallon bucket with holes to fill all bags
	trip was cut short due to winch problem, not all bags used
Total # of study bags:	264
Total # of study bags weighed:	259

Diamond 16x25

COUNT:	87
Ripped:	1
AVG:	51.77
STDEV:	1.41
MIN:	45.00
MAX:	54.25
MEDIAN:	51.75

TJ 16.5x22

COUNT:	85
Ripped:	1
AVG:	50.79
STDEV:	1.08
MIN:	47.85
MAX:	53.50
MEDIAN:	50.90

COASTAL FORMS 15x25

COUNT:	87
Ripped:	1
AVG:	52.23
STDEV:	1.32
MIN:	49.85
MAX:	55.05
MEDIAN:	52.15

Bag Trip #:	6
Vessel:	Celtic
Date Sailed:	8/1/2006
Date Landed:	8/7/2006
Time Landed:	5:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	8/7/2006
Time Offloaded:	5:00
Approx DAS:	6
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Paul D.
Bag Fillers:	Paul D., Mate
Deck Handling:	chilled
Crew Size:	7
# of Watches	11
Watch Length:	8
Notes:	no coastal bags used
Total # of study bags:	360
Total # of study bags weighed:	360

Diamond16x25

COUNT:	180
Ripped:	0
AVG:	50.21
STDEV:	1.32
MIN:	47.40
MAX:	54.25
MEDIAN:	50.00

TJ
17.5x22

COUNT:	180
Ripped:	0
AVG:	50.30
STDEV:	1.45
MIN:	47.05
MAX:	54.10
MEDIAN:	50.20

Bag Trip #:	7
Vessel:	Tradition
Date Sailed:	8/4/2006
Date Landed:	8/10/2006
Time Landed:	10:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	8/10/2006
Time Offloaded:	10:00
Approx DAS:	6
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Ronnie Shrader
Bag Fillers:	Kenny T, Danny C.
Deck Handling:	
Crew Size:	7
# of Watches	12
Watch Length:	8
Wheelhouse Recorder:	Ronnie Shrader
Offload Recorder:	Ronnie Shrader
Total # of study bags:	360
Total # of study bags weighed:	359

Diamond
16x25

COUNT:	180
Ripped:	0
AVG:	52.39
STDEV:	1.34
MIN:	48.15
MAX:	55.45
MEDIAN:	52.30

TJ
17.5x22

COUNT:	179
Ripped:	0
AVG:	51.25
STDEV:	1.40
MIN:	47.25
MAX:	55.65
MEDIAN:	51.30

Bag Trip #:	8
Vessel:	Reflection
Date Sailed:	8/7/2006
Date Landed:	8/14/2006
Time Landed:	5:00
Area:	CAII
CAS Trip:	YES
EFP:	YES
Date Offloaded:	8/14/2006
Time Offloaded:	5:00
Approx DAS:	7
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Sakeforth
Bag Fillers:	Capt, Mate
Deck Handling:	not chilled, straight into washer
Bags prepared by:	Ron
Wheelhouse Recorder:	Sakeforth
Offload Recorder:	Buck
Data Entry:	Matt Weeks
Notes:	captain does not chill meats before bagging, they go straight into washer
Total # of study bags:	360
Total # of study bags weighed:	359

Diamond 16x25	
COUNT:	180
Ripped:	0
AVG:	54.38
STDEV:	0.95
MIN:	51.05
MAX:	56.80
MEDIAN:	54.45

TJ 17.5x24	
COUNT:	179
Ripped:	1
AVG:	51.92
STDEV:	1.04
MIN:	48.95
MAX:	54.15
MEDIAN:	51.95

Bag Trip #:	9
Vessel:	Resolution
Date Sailed:	8/14/2006
Date Landed:	8/19/206
Time Landed:	14:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	8/19/2006
Time Offloaded:	14:00
Approx DAS:	5
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Leo F. Curran
Bag Fillers:	capt, mate
# of Watches	11
Bags prepared by:	Ron
Wheelhouse Recorder:	Leo F. Curran
Offload Recorder:	Eric Matzen
Data Entry:	Matt Weeks
Total # of study bags:	360
Total # of study bags weighed:	360

Diamond 16x25

COUNT:	180
Ripped:	2
AVG:	50.95
STDEV:	1.28
MIN:	46.65
MAX:	54.35
MEDIAN:	51.05

TJ 17.5x24

COUNT:	180
Ripped:	0
AVG:	52.25
STDEV:	1.29
MIN:	48.35
MAX:	55.95
MEDIAN:	52.35

Bag Trip #:	10
Vessel:	Ranger
Date Sailed:	8/16/2006
Date Landed:	8/22/2006
Time Landed:	5:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	8/22/2006
Time Offloaded:	5:00
Total Wt. Landed:	1230
Approx DAS:	8
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	AJ
Bag Fillers:	AJ, mate
Deck Handling:	not chilled
Crew Size:	7
# of Watches	14
Watch Length:	8
Bags prepared by:	Ron
Wheelhouse Recorder:	AJ
Offload Recorder:	Matt Weeks
Data Entry:	Matt Weeks
Notes:	capt does not chill
	meats go into tumbler, then into bags, not soaked or chilled
	used 5 gallon bucket with holes to fill all bags
	usually est 51 lbs/bag, brings in 348 or 350
	Robert bland observer on trip, had extra bags for obs
Total # of study bags:	360
Total # of study bags weighed:	358

Diamond 16x25

COUNT:	179
AVG:	51.75
STDEV:	1.24
MIN:	47.75
MAX:	54.10
MEDIAN:	52.05

TJ 17.5x24

COUNT:	179
AVG:	51.60
STDEV:	0.99
MIN:	48.60
MAX:	54.10
MEDIAN:	51.65

Bag Trip #:	11
Vessel:	Tradition
Date Sailed:	
Date Landed:	8/23/2006
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	8/23/2006
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Kenny
Bag Fillers:	Kenny
Bags prepared by:	Ron
Wheelhouse Recorder:	Kenny
Offload Recorder:	Kenny
Data Entry:	Matt Weeks
Notes:	Ripped bags were saved.
Total # of study bags:	360
Total # of study bags weighed:	360

Diamond 16x25

COUNT:	120
AVG:	53.74
STDEV:	1.56
MIN:	50.00
MAX:	56.90
MEDIAN:	53.98

TJ 17.5x24

COUNT:	128
AVG:	51.46
STDEV:	1.31
MIN:	46.90
MAX:	55.75
MEDIAN:	51.55

Coastal Forms 15x25

COUNT:	112
AVG:	53.67
STDEV:	1.79
MIN:	48.65
MAX:	58.15
MEDIAN:	53.63

Bag Trip #:	12
Vessel:	Neskone
Date Sailed:	38951
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Kevin McMullen
Bag Fillers:	MD, MT, KM
# of Watches	14
Bags prepared by:	Ron
Wheelhouse Recorder:	Kevin McMullen
Offload Recorder:	Kevin McMullen
Data Entry:	Matthew Weeks
Notes:	Then white material bags are very slippery and hard to bag. TJ bags have 55# bags that bag easy and you would not need so many 323.
	This would eliminate handling 30 bags down and 30 bags up.
Total # of study bags:	360
Total # of study bags weighed:	360

Diamond 16x25

COUNT:	180
AVG:	53.23
STDEV:	1.44
MIN:	49.35
MAX:	56.95
MEDIAN:	53.20

TJ
17.5x24

COUNT:	180
AVG:	53.56
STDEV:	1.66
MIN:	48.55
MAX:	56.90
MEDIAN:	53.88

Bag Trip #:	13
Vessel:	Araho
Date Sailed:	8/30/2006
Date Landed:	9/6/2006
Time Landed:	5:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	9/6/2006
Time Offloaded:	5:00
Total Wt. Landed:	18622 with bag
Approx DAS:	4
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Frankie Adams
Bag Fillers:	Captain, Mate
Deck Handling:	not chilled, straight into washer
# of Watches	14
Wheelhouse Recorder:	Frankie Adams
Offload Recorder:	Matt Weeks
Data Entry:	Matt Weeks
Notes:	No ripped bags
	Blue bags a little larger; No rips during trip
	White bags seem easier to work with less slippery
	Not chilled, straight into water
Total # of study bags:	360
Total # of study bags weighed:	360

Diamond 16x25

COUNT:	180
AVG:	52.56
STDEV:	1.57
MIN:	48.50
MAX:	55.65
MEDIAN:	52.75

TJ 16.5x22

COUNT:	180
AVG:	50.91
STDEV:	1.72
MIN:	44.40
MAX:	54.85
MEDIAN:	51.00

Bag Trip #:	14
Vessel:	Justice
Date Sailed:	9/2/2006
Date Landed:	9/6/2006
Time Landed:	18:15
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	9/6/2006
Time Offloaded:	18:15
Total Wt. Landed:	9080 total wt
Approx DAS:	4
Port Sailed:	New Bedford
Dealer:	Whaling City Seafood Auction
Captain:	Tom Nicholas
Bag Fillers:	Capt, mate
# of Watches	13
Bags prepared by:	Matt Weeks
Wheelhouse Recorder:	Tom Nicholas
Offload Recorder:	Matt Weeks
Data Entry:	Matt Weeks
Notes:	trip ended early bc CA II shut down
	9080 total wt
Total # of study bags:	360
Total # of study bags weighed:	192

Diamond 16x24

COUNT:	96
AVG:	47.55
STDEV:	1.20
MIN:	44.50
MAX:	51.00
MEDIAN:	47.50

TJ 16.5x22

COUNT:	96
AVG:	48.40
STDEV:	1.26
MIN:	45.50
MAX:	53.00
MEDIAN:	48.25

Bag Trip #:	15
Vessel:	Tradition
Date Sailed:	8/30/2006
Date Landed:	9/2/2006
Time Landed:	19:00
Area:	CAII
CAS Trip:	Yes
EFP:	Yes
Date Offloaded:	9/2/2006
Time Offloaded:	19:00
Total Wt. Landed:	12710
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Ronnie Shrader
Bag Fillers:	Kenny T., Ronnie S.
Bags prepared by:	Ron
Wheelhouse Recorder:	Ronnie Shrader
Offload Recorder:	Buck Denton
Data Entry:	Matt Weeks
Notes:	trip ended early because CA II shut down
	12710 lb total wt from f/v Tradition
	Trip ended CAII closed. 242 in the hold and 2 broken bags, no: 11
	and 233. Those bags with 245-360 in shopping bag.
Total # of study bags:	360
Total # of study bags weighed:	242

Diamond 16x24

COUNT:	23
AVG:	50.12
STDEV:	1.22
MIN:	48.15
MAX:	52.55
MEDIAN:	50.5

Diamond 16x25

COUNT:	98
AVG:	53.35
STDEV:	1.31
MIN:	50.40
MAX:	55.75
MEDIAN:	53.65

TJ 17.5x24

COUNT:	120
AVG:	52.26
STDEV:	1.61
MIN:	45.20
MAX:	55.50
MEDIAN:	52.48

Bag Trip #:	16
Vessel:	Generation
Date Sailed:	8/30/2006
Date Landed:	9/6/2006
Time Landed:	21:15
Area:	CAII
CAS Trip:	CAII
EFP:	Yes
Date Offloaded:	9/6/2006
Time Offloaded:	21:15
Total Wt. Landed:	17909
Approx DAS:	9
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	John J. Simpson
Mate:	Adam
Bag Fillers:	Capt, mate
# of Watches	17
Bags prepared by:	Matt Weeks
Wheelhouse Recorder:	John J. Simpson
Offload Recorder:	Buck Denton
Data Entry:	Matt Weeks
Notes:	trip ended early bc CAII shut down
	#285 and 297 has some rips and cuts, color red
	replaced and renumbered the two bags
	bag #307 ripped replaced bag no number
Total # of study bags:	360
Total # of study bags weighed:	341

Diamond 16x24

COUNT:	33
AVG:	49.47
STDEV:	1.31
MIN:	46.85
MAX:	53.25
MEDIAN:	49.65

Diamond 16x25

COUNT:	136
AVG:	53.05
STDEV:	1.32
MIN:	48.10
MAX:	56.20
MEDIAN:	53.05

TJ 17.5x24

COUNT:	172
AVG:	52.68
STDEV:	1.42
MIN:	43.70
MAX:	55.80
MEDIAN:	52.80

Bag Trip #:	17
Vessel:	Celtic
Date Sailed:	9/6/2006
Area:	CAII
CAS Trip:	No, RSA trip
EFP:	No, RSA trip
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Paul
Mate:	Tim
Bag Fillers:	Capt, Mate
Deck Handling:	chilled
Bags prepared by:	Matt Weeks
Wheelhouse Recorder:	Paul
Offload Recorder:	Paul
Data Entry:	Matt Weeks
Notes:	all were filled with bucket
Total # of study bags:	360
Total # of study bags weighed:	347

Diamond 16 x24

COUNT:	32
AVG:	49.69
STDEV:	1.39
MIN:	46.65
MAX:	52.30
MEDIAN:	49.60

Diamond 16 x25

COUNT:	143
AVG:	52.74
STDEV:	1.49
MIN:	47.75
MAX:	55.50
MEDIAN:	52.90

TJ 17.5x24

COUNT:	174
AVG:	52.07
STDEV:	2.40
MIN:	46.15
MAX:	58.10
MEDIAN:	52.03

Bag Trip #:	18
Vessel:	Westport
Date Sailed:	9/14/2006
Date Landed:	9/26/2006
Time Landed:	4:00 AM
Area:	Closed Area II RSA collection trip
CAS Trip:	No
EFP:	No
Date Offloaded:	9/26/2006
Time Offloaded:	4:00 AM
Approx DAS:	13
Port Sailed:	New Bedford
Dealer:	Whaling City Seafood Auction
Captain:	Eddy Welch
Mate:	Nate
Bag Fillers:	Eddy, Nate
Deck Handling:	chilled
Crew Size:	8
# of Watches	30
Bag Batch:	Diamond 16x24, TJ 52 lbs. from Captain
Bags prepared by:	Matt Weeks
Wheelhouse Recorder:	Matt Weeks
Offload Recorder:	Matt Weeks
Data Entry:	Matt Weeks
Notes:	RSA collection trip
	Diamond bags don't hold full bucket used to fill the TJ bags. Capt says a full bucket is 50 lbs.
	Meats throughout trip seem to be used up
	Bag one filled at 3:30 am
	several TJ bags ripped
	Several bags were lost by the mate
	Red marker bled through onto scallops by end of trip, also bled onto other bags
Total # of study bags:	573
Total # of study bags weighed:	573

Diamond 16x24

COUNT:	289
AVG:	49.22
STDEV:	1.26
MIN:	45.70
MAX:	52.95
MEDIAN:	49.30

TJ 17.5x24

COUNT:	284
AVG:	52.57
STDEV:	1.07
MIN:	49.30
MAX:	55.15
MEDIAN:	52.60

Bag Trip #:	19
Vessel:	Celtic
Date Sailed:	10/6/2006
Date Landed:	10/18/2006
Time Landed:	5:30 AM
Area:	CAII
CAS Trip:	No, RSA collection trip
EFP:	No
Date Offloaded:	10/18/2006
Time Offloaded:	5:30 AM
Total Wt. Landed:	31238
Approx DAS:	12
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Paul
Mate:	Tim
Bag Fillers:	Paul, Tim, Tex
Deck Handling:	chilled
Crew Size:	9
# of Watches	29
Watch Length:	8 hours
Bag Batch:	Ron's 16x24 white diamonds, Paul's 16x24 tan diamond
Tag Type:	none
Labels Used:	black
Bags prepared by:	Matt Weeks
Wheelhouse Recorder:	Matt Weeks
Offload Recorder:	Matt Weeks
Data Entry:	Matt Weeks
Notes:	bag 10=temp logger
	261 busted seam
	68 busted
	228 busted
Total # of study bags:	615
Total # of study bags weighed:	615

Diamond 16x24

COUNT:	615
Ripped:	11
AVG:	49.04
STDEV:	1.31
MIN:	43.35
MAX:	52.40
MEDIAN:	49.10

Bag Trip #:	20
Vessel:	Resolution
Date Sailed:	11/7/2006
Date Landed:	11/10/2006
Time Landed:	0:00
Area:	Nantucket Lightship
CAS Trip:	No, RSA collection trip
EFP:	No, RSA collection trip
Date Offloaded:	11/10/2006
Time Offloaded:	0:00
Approx DAS:	3
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Ken Thuestad
Mate:	KG
Bag Fillers:	KG, KT
Bags prepared by:	Ron Smolowitz
Wheelhouse Recorder:	Ron Smolowitz
Offload Recorder:	Ron Smolowitz
Total # of study bags:	102
Total # of study bags weighed:	102

Diamond 16x24

COUNT:	102
AVG:	48.37
STDEV:	1.41
MIN:	41.65
MAX:	50.55
MEDIAN:	48.40

Bag Trip #:	21
Vessel:	Resolution
Date Sailed:	11/13/2006
Date Landed:	11/22/2006
Time Landed:	0:00
Area:	CAII
CAS Trip:	No, RSA collection trip
EFP:	No, RSA collection trip
Date Offloaded:	11/22/2006
Time Offloaded:	0:00
Port Sailed:	New Bedford
Dealer:	Eastern Seafoods
Captain:	Ken Thuestad
Mate:	KG
Bag Fillers:	KT, KG
Bags prepared by:	Patrick
Wheelhouse Recorder:	Patrick
Offload Recorder:	Patrick
Data Entry:	Patrick

Diamond 16x24

COUNT:	368
AVG:	48.82
STDEV:	1.31
MIN:	45.15
MAX:	52.25
MEDIAN:	48.85

Appendix D: Examples of Data Logs Used

Scallop Bag Watch Log

Trip #:	_____	Date Sailed:	_____	Date Landed:	_____	Batch #:	_____
Vessel:	_____	Port Sailed:	_____	Time Landed:	_____	Bag Size:	_____
Captain:	_____	Date Entered:	_____	Dealer:	_____	EFP/Area:	
Bag Manufactures:				Labeling Scheme:			

Bag #	Bag Label:	Date Filled:	Time Filled:	Meat Count:	Crew Filling:	Notes (ie, deck methods used, how bag ripped):
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
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36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						

Comments for bags 1-50 *(ripped bags, lost bags, tag problems….)*

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Scallop Bag Offload Log

#	Bag #	Wt.	Circle Type	Count/Notes
1		.	Red / Blue / Black	
2		.	Red / Blue / Black	
3		.	Red / Blue / Black	
4		.	Red / Blue / Black	
5		.	Red / Blue / Black	
6		.	Red / Blue / Black	
7		.	Red / Blue / Black	
8		.	Red / Blue / Black	
9		.	Red / Blue / Black	
10		.	Red / Blue / Black	
11		.	Red / Blue / Black	
12		.	Red / Blue / Black	
13		.	Red / Blue / Black	
14		.	Red / Blue / Black	
15		.	Red / Blue / Black	
16		.	Red / Blue / Black	
17		.	Red / Blue / Black	
18		.	Red / Blue / Black	
19		.	Red / Blue / Black	
20		.	Red / Blue / Black	
21		.	Red / Blue / Black	
22		.	Red / Blue / Black	
23		.	Red / Blue / Black	
24		.	Red / Blue / Black	
25		.	Red / Blue / Black	
26		.	Red / Blue / Black	
27		.	Red / Blue / Black	
28		.	Red / Blue / Black	
29		.	Red / Blue / Black	
30		.	Red / Blue / Black	
31		.	Red / Blue / Black	
32		.	Red / Blue / Black	
33		.	Red / Blue / Black	
34		.	Red / Blue / Black	
35		.	Red / Blue / Black	
36		.	Red / Blue / Black	
37		.	Red / Blue / Black	
38		.	Red / Blue / Black	
39		.	Red / Blue / Black	
40		.	Red / Blue / Black	
41		.	Red / Blue / Black	
42		.	Red / Blue / Black	
43		.	Red / Blue / Black	
44		.	Red / Blue / Black	
45		.	Red / Blue / Black	
46		.	Red / Blue / Black	
47		.	Red / Blue / Black	
48		.	Red / Blue / Black	
49		.	Red / Blue / Black	
50		.	Red / Blue / Black	

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