Field Demonstration Test Results Report

2025 Dungeness Crab Project

Prepared For Oregon Fish and Wildlife

September 15, 2025

Phase 3 Goals

This season marked the third phase of the Dungeness Crab eLogbook project. We began with a new version of the eLogbook that incorporated user feedback from the previous season. Phase 3 focused on three primary objectives:

1. **Integration of LIME VMS Data**
   Several participating, who also fish in California and Washington, already had Archipelago FishVue LIME VMS units installed on their vessels. These units transmit data to PSMFC in compliance with California and Washington reporting requirements. Harbor Light's goal was to build APIs to allow PSMFC to bulk transfer LIME data to HLS servers.

2. **Improved Pot Haul Detection**
   In Phase 2, the VMS units operated at a one-minute ping rate, which allowed identification of haul locations but made it difficult to determine the exact number of pots pulled. Phase 3 aimed to increase the accuracy of detecting crab pot pulls by refining data capture and analysis at a 10 second ping rate.

3. **User Interface Enhancements**
   We continued refining the eLogbook's interface to better reflect fishing practices. Several captains noted confusion around string disposition options (e.g., *reset partial string*, *reset entire string*, *remove entire string*), and how to use them correctly during a trip. This feedback informed us of a series of usability improvements made throughout the season.

Application Updates (Oct 2024 – Sept 2025)

Key enhancements implemented during this period included:

- Added total number of pots pulled per trip, plus a running season summary of pots/pounds (Home Page).
- Enabled users to email trip summary receipts.
- Introduced manual entry of barged strings at the start of the season via a special code to input lat/long.
- Added a "recheck" button to refresh missing VMS data.
- Automated email notifications to HLS/ODFW staff every 8 hours, flagging vessels with no pings in the past 3.5 hours.
- Simplified error editing with direct navigation from the Summary page.

- Implemented warnings for duplicate fish ticket numbers, duplicate string names, or hauls recorded before set times.
- Enabled submission of multiple fish tickets per trip (up to 10).
- Automatically updated “strings in the water” when internet access became available.
- Removed auto-population of string names.
- Allowed device location to substitute for missing VMS data in map view.
- Added auto-population of bait from the previous trip.
- Support for Washington and California fish tickets.

Screenshots of a few of the features above.

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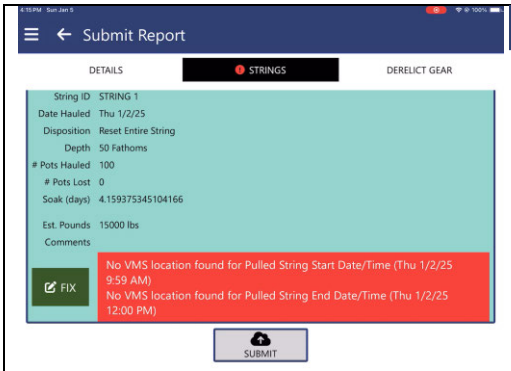
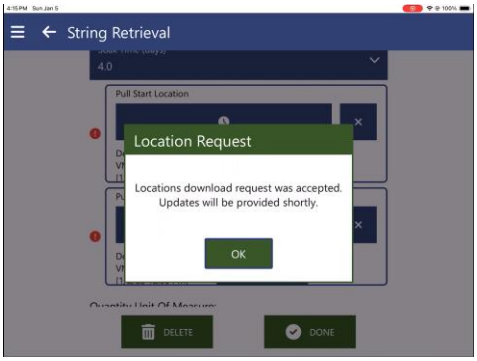
<tr>
<td>


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VMS Recheck button

Users can use the Recheck button to pull down missing VMS locations from the HLS Server

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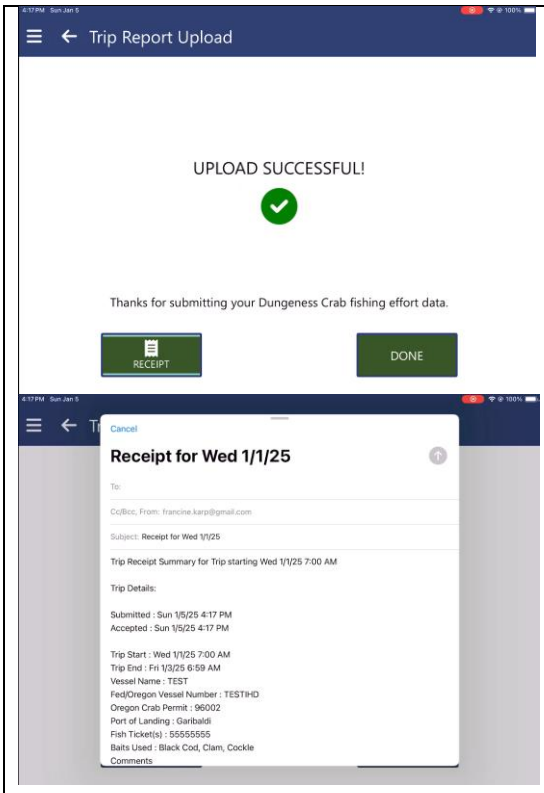
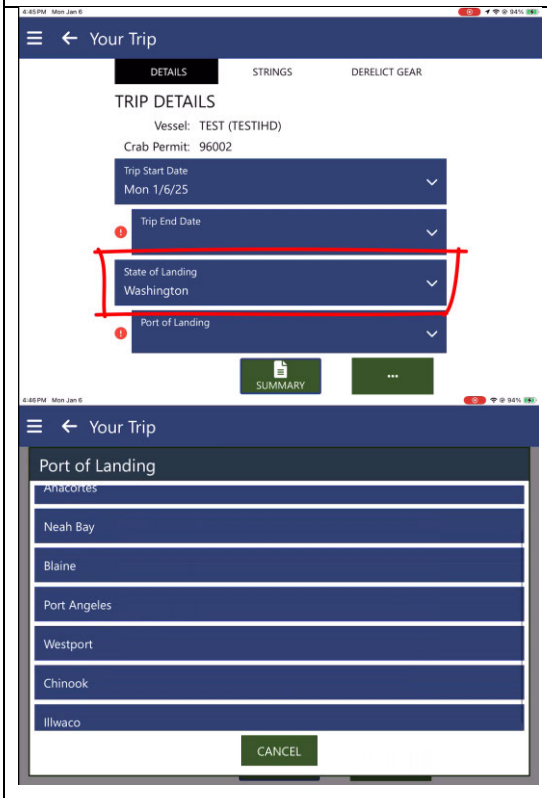
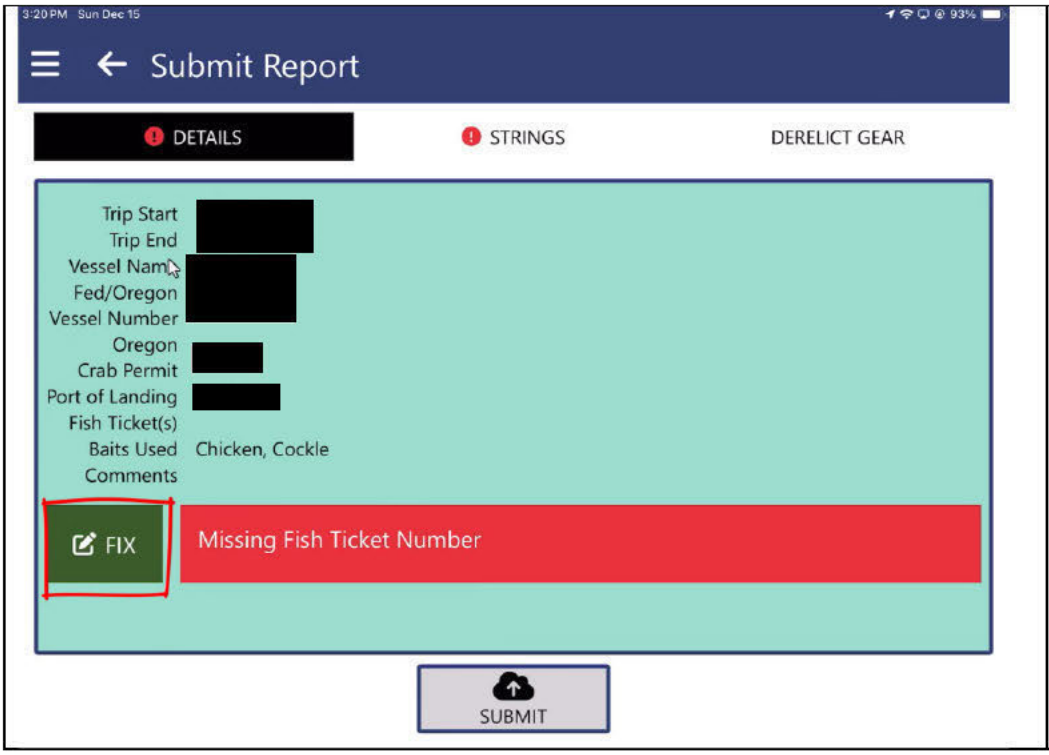
		**Summary Receipt** Users can send receipt of their trip summary via email
		**Support for WA and CA Fish Tickets** Users can select state of landing and now see proper landing ports for each state.



Fix Button

Users can now click on the FIX button and be taken straight to the page with the missing data.

Performance Improvements

A major issue in Phase 2 was app freezing and crashes across platforms. In Phase 3, we worked to resolve these problems, and by the end of the season stability had been achieved on iOS, Android, and Windows devices. As part of testing, [redacted] was provided with an Android tablet late in the season. He reported that the tablet performed well, with no crashes or freezing, and expressed a preference for the Android platform.

TimeZero integration

During Phases 1 and 2, several captains requested integration with TimeZero, a software platform they use to mark pots and strings in the water. We reached out to TimeZero to explore potential integration. After a few initial calls, TimeZero declined to continue discussions and eventually stopped responding.

Streamlined login and VMS Setup

The process of logging in and configuring the software to communicate with the HLS server was further streamlined. Each user login was tied to a specific VMS unit in the HLS database, so once a captain successfully logged in, the app automatically pulled the correct VMS configuration without requiring any additional input. For new users, the only setup needed was to enter the device label and manufacturer under VMS Settings within the app, after which their VMS synced seamlessly with the HLS server.

Captain Participation

A total of 20 captains initially enrolled in the pilot project, including 15 who had also participated in Phase 1, Phase 2, or both. These captains represented ports from Astoria in the north to Brookings in the south.

By the end of the season, 15 captains remained active, though some were only minimally engaged and did not participate at the expected level.

This report provides a comprehensive summary of Phase 3 of the ODFW eLogbook Project, including software development, equipment deployment, data analysis, key findings, and user feedback.

1. Description of installed software and hardware components and their technical specifications.

Software Installed:

Store Icon

The current versions of eLogbook client software as of September 2025, are:

iOS: 2.3.60049
Android: 2.2.60050
Windows: 2.5.60079

These version numbers will change as updates are released into the application stores.

VMS Hardware Installed:

During Phase Three, the CLS Nemo VMS unit was dropped from use. This unit was unable to capture hydraulic data, so there was no need to continue its use in the project. We purchased additional Viatrax Boat Command units in their place.

Viatrax: Boat Command

LINKS:

Viatrax Boat Command website
Link to VMS registration and installation guide

[Link to Viatrax webapp download instructions]

[Overview of Boat Command unit]

<table>
<tr><th colspan="3">VIATRAX BOAT COMMAND</th></tr>
<tr><td colspan="2">   </td><td>  </td></tr>
<tr><td colspan="2">Unit is designed to be tamper proof.
Marine ready, rugged construction.
Measures .5” x 3.5” x 1.59” 8.11 oz</td><td>See links above for specifications, data sheets and installation instructions.</td></tr>
<tr><td colspan="2">Wiring image of connection to sensor
[Full Wiring instructions link]
  </td><td>Hydraulic Sensor Installation Instructions

1. Connect the white wire from the hydraulic sensor to the pink wire of the Boat Command VMS

2. Join the red wire from the sensor to the red wire of the VMS unit and connect it to the positive side of the vessel battery or to an uninterrupted power line.

3. Join the black wire from the sensor to the black wire of the VMS unit and connect it to the negative side of the vessel battery.</td></tr>
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About Viatrax

Viatrax is a technology company specializing in advanced monitoring and tracking systems for the maritime industry. They provide innovative solutions to enhance the efficiency, safety, and compliance of commercial fishing operations. One of their flagship products is

the Boat Command VMS (Vessel Monitoring System) unit. This cutting-edge device offers real-time tracking and monitoring capabilities, ensuring that vessel movements are accurately recorded and reported. The Boat Command VMS unit integrates seamlessly with electronic logbooks, providing a comprehensive solution for managing and documenting fishing activities, thus ensuring regulatory compliance and optimizing operational efficiency. Viatrax also manufactures components for the Faria Beede Sentry 500 devices and provides satellite data transmission connectivity.

This season marked the second year of using the Viatrax VMS Unit, *Boat Command*. During Phase 2 (2023–2024), the units operated at a one-minute ping rate while vessels were outside of port. In Phase 3, the ping rate was increased to every 10 seconds, while the units continued to default to one ping per hour when no movement was detected (e.g., in port).

It is worth noting that Viatrax has since standardized all devices to ping at 10-second intervals, even though payments for these units were originally based on one-minute ping rates.

Overview and Installation:
Five captains successfully installed the Viatrax Boat Command units this year. All reported that the installation process was straightforward and uncomplicated. The only issue encountered was a power cord failure on [redacted] unit, which was promptly replaced by Viatrax.

API Integration:

Viatrax sends all data to HLS servers via HLS webhooks. Data is sent to HLS as it comes into the Viatrax servers.

Deployment/Use and Data Transmission:

During Phase 3, Viatrax units were successfully installed on five vessels. Four additional captains were issued VMS units but did not proceed with installation. Participation challenges varied:

- [redacted] **(**[redacted]**):** Communication proved difficult, and both ultimately declined to participate.
- [redacted] **(**[redacted]**):** Expressed strong interest in joining mid-season, but vessel issues and timing prevented installation.
- [redacted] **(**[redacted]**):** Opted out for reasons unrelated to the project.

The Viatrax Boat Command units that were deployed in the field successfully transmitted location and hydraulic data at a rate of once every 10 seconds. (Note: These units were initially set to transmit every 11 seconds due to a configuration error. We have asked that Viatrax fix this to every 10 seconds)

Throughout the season, we observed occasional gaps in the ping data as well as duplicate records. These issues occurred across all units without a consistent pattern. Viatrax's first corrective action was to reduce the movement threshold required to trigger a ping—from the default value down to 5 meters. This ensured that even minor vessel movement would maintain the 10-second transmission rate, rather than defaulting to one ping per hour when stationery (e.g., in port).

Despite this adjustment, missing ping data continued. Further investigation determined the problem was not with the onboard VMS hardware but rather in the data delivery from Viatrax to Harbor Light Software. Viatrax has acknowledged the issue and committed to implementing a fix. As of this writing, they have requested several additional weeks to complete the resolution. A follow-up update will be provided once the issue is addressed and full data transmission is confirmed. The red rows in the left photo are the missing data points that show on the Viatrax server snapshot on the right.

Data Access:

Vitrax offers a secure web site that manages the Boat Command units. This website is the same website used by Faria Beede units, https://fb-sentrygps.com. Login info: (fkarp+1@harborlightsoftware.com/password)

From this website, a captain can review vessel locations as well as visualizing them on a map. They can also set alerts for items on the vessel that the VMS can monitor such as the bilge pump activity. These alerts can be sent to the captains via email or text.

CLS Woodshole VMS: Sentry 500

Faria Beede Sentry 500

During Phase 1 of the project, CLS purchased the rights to the Faria Beede Sentry 500 VMS units. CLS Woodshole is now the point of contact for service and support of the VMS units.

About the Sentry 500

The Sentry 500 module used in this study is a compact, ruggedized, and GPS/cellular boat tracking and monitoring system utilizing a dual-mode Iridium Satellite and GPS/GPRS platform. The Faria Beede units are designed to be installed on the dash of the vessel and require a 12-24v power supply. During Phase 3, vessel tracking positions were collected at a ping rate of one minute due to service agreement payments, but the device is capable of ten second pings. These units can optionally interface with multiple shipboard systems such as bilge pumps, security systems, high water alarms, batteries, and shore power.

Overview and Installation:

All six captains from Phase 1 or Phase 2 retained their VMS units for Phase 3, eliminating the need for reinstallation or new setup. The only exception was Captain [redacted], who encountered a device failure on December 4, 2024. A replacement was shipped promptly, but that unit also malfunctioned later in the season. Although another replacement was provided, [redacted] did not install it since his fishing season had already

ended. As a result, two of his trips—December 28, 2024, and January 5–10, 2025—were submitted without VMS locations from the HLS server.

It was also confirmed that units supplied by Faria Beede are not always new; some refurbished devices resold as new.

API Integration:

Faria Beede uses the same API configuration as Viatrax, sending all data to HLS servers via HLS webhooks. Data is sent to HLS as it comes into the Viatrax servers.

Deployment/Use and Data Transmission:

In Phase 3, Faria Beede units were deployed on six vessels operated by captains who had also participated in Phase 2, so no new installations were required. The units were configured to transmit at one-minute intervals, consistent with the purchased data plan, although the devices are capable of pinging as frequently as every 10 seconds.

Data Access:

Faria Beede uses the same website as Viatrax to access their systems. https://fb-sentrygps.com (Sign on info: fkarp@harborlightsoftware.com/VMS2023)

Archipelago

Fishview LIME

About LIME

FishVue LIME (Lite Integrated Monitoring Equipment) is a low-cost data collection platform that enables fleet managers, fisheries managers, and enforcement personnel to monitor and access critical fisheries activity in real time. Designed to fit a wide range of vessels, its compact footprint makes it particularly well-suited for smaller boats that lack the space for a full-scale EM system, or for fisheries where the frequency or intensity of fishing makes full-scale monitoring cost prohibitive.

Overview and Installation

For Phase 3 of the project, the LIME VMS devices were already installed on vessels as part of the California and Washington Crab Project. The participating captains—[redacted]—were able to use these existing devices and their associated hydraulic sensors. No additional installation work was required for their participation in the ODFW project.

API Integration:

Archipelago opted not to transmit data directly to Harbor Light Software (HLS) servers for this project. Instead, HLS collaborated with the Pacific States Marine Fisheries Commission (PSMFC), which already receives VMS data from Archipelago. HLS developed an API to allow PSMFC to bulk transfer data for each unit. Data is sent from PSMFC to HLS once per hour on the half-hour. Because Archipelago first sends data to PSMFC, and PSMFC then relays it to HLS, the resulting transmission is delayed by approximately three hours.

Deployment/Use and Data Transmission:

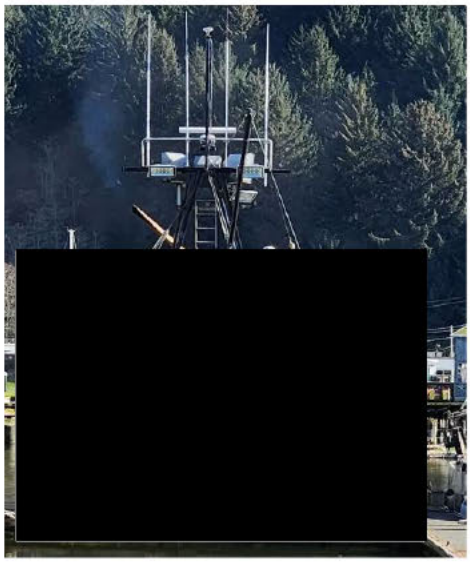
Since the LIME units were already onboard prior to Phase 3, no additional setup was required. All units operated as expected throughout the season. During data review, however, we identified significant gaps—often several hours long—in the transmissions received from PSMFC. Archipelago worked directly with PSMFC to resolve this issue, after which data was received without interruption. Once corrected, the system reliably transmitted 10-second ping locations along with vessel speed and hydraulic sensor data, with no missing points.

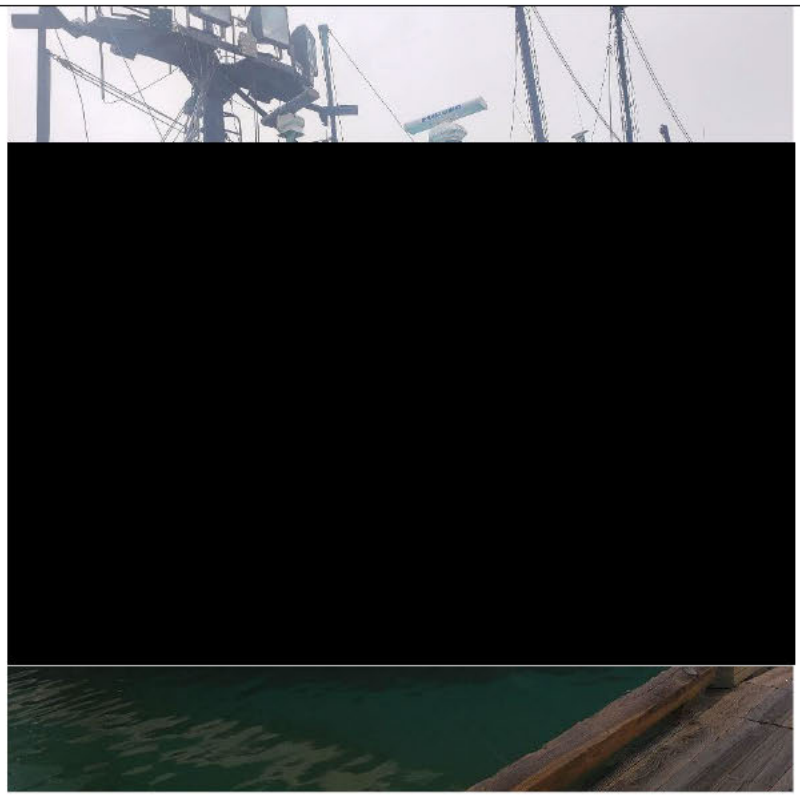
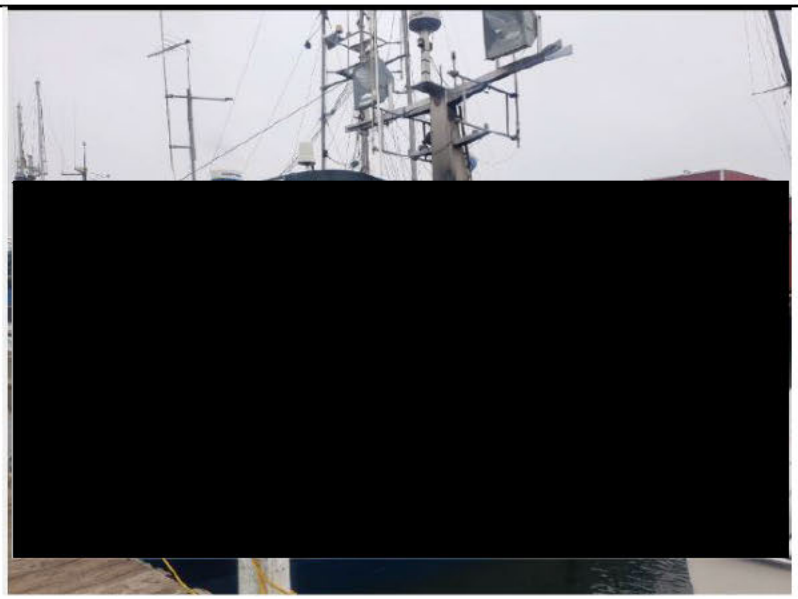
Data Access:

It remains unclear whether LIME provides a user-facing website or platform for captains to monitor their devices, review data, or receive system alerts.

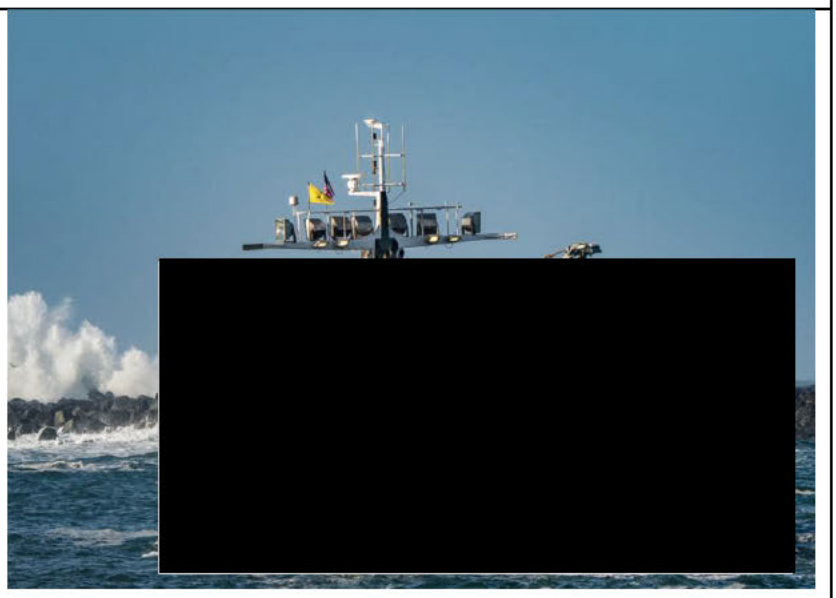
2. Vessels and Captains involved in Phase Two of the Project:

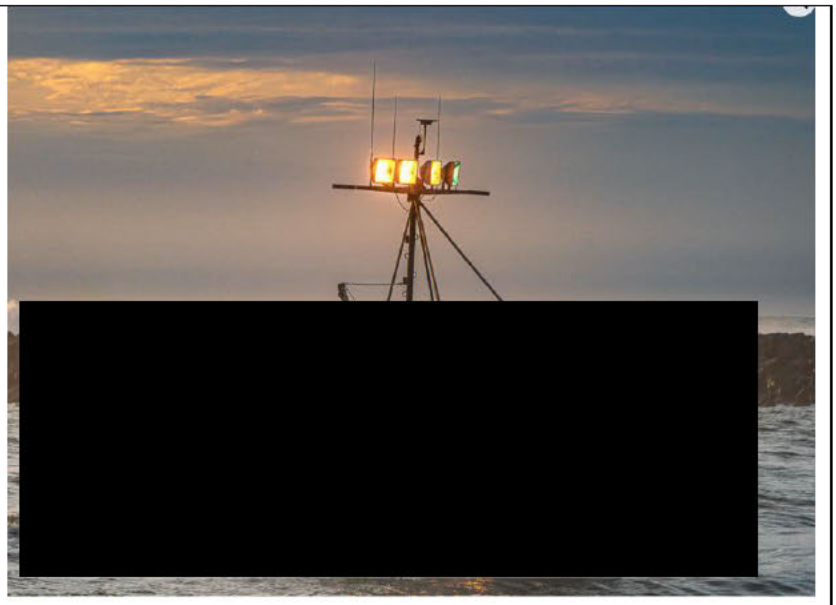
NOTE: USERS WITH AN * NEXT TO THEIR NAME PARTICIPATED IN PHASE ONE and/or PHASE TWO

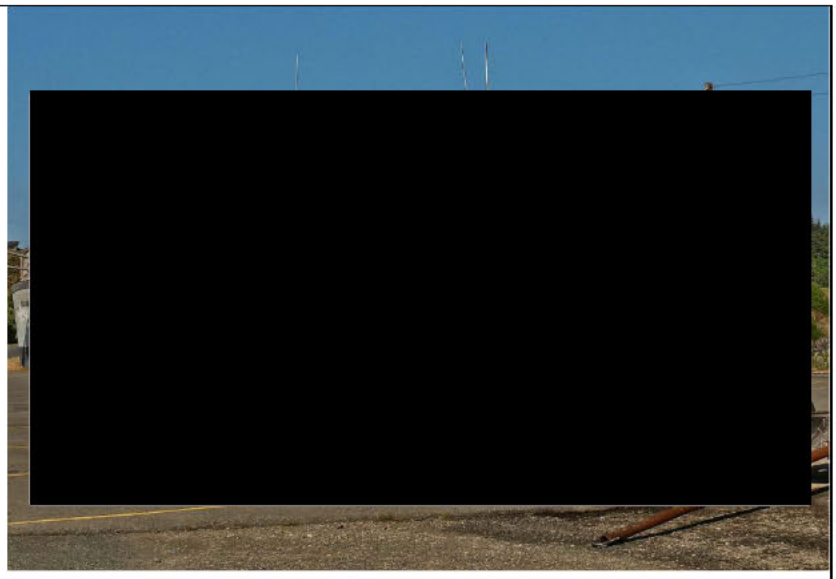
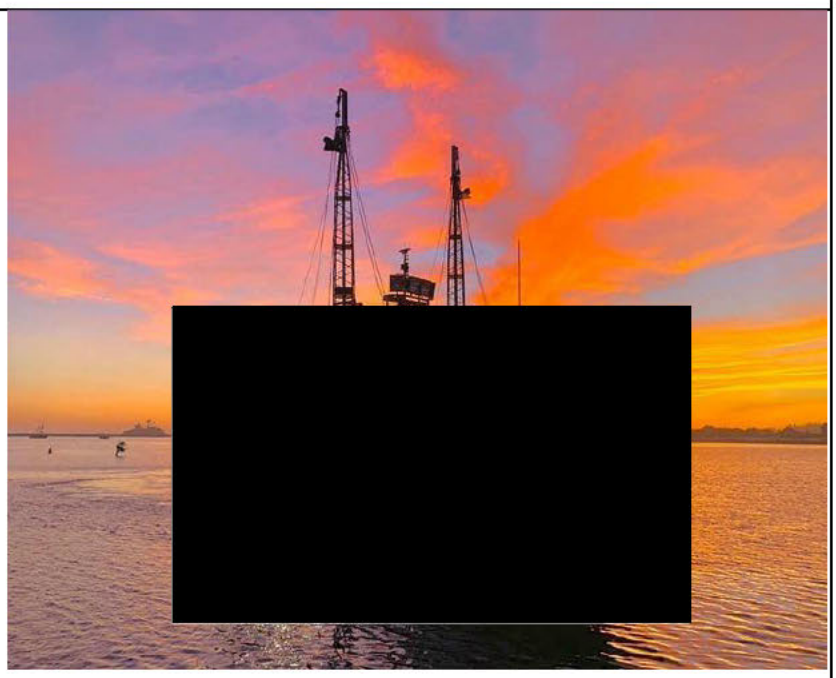
[redacted] *(Phase 1&2)* VMS: LIME Sensor: MSP300 Device used: iPad Mini [redacted] Home Ports: [redacted]	
[redacted] VMS: Viatrax [redacted] Sensor: M5241 Device used: iPad Mini Vessel Name: [redacted] Home Ports: [redacted]	

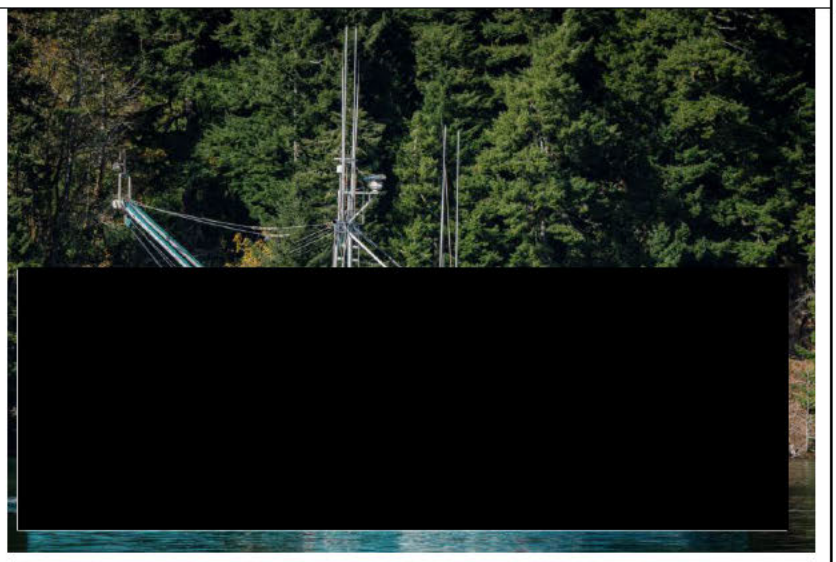
[redacted] *(Phase 1&2)* VMS: LIME Unit Sensor: MSP300 Device Used: iPad Mini Vessel Name: [redacted] Home Ports: [redacted]	
[redacted] *(Phase 1&2)* VMS: Faria Beede Sentry SENSOR: AshCroft Device Used: iPad Vessel Name: [redacted] Home Port: [redacted]	

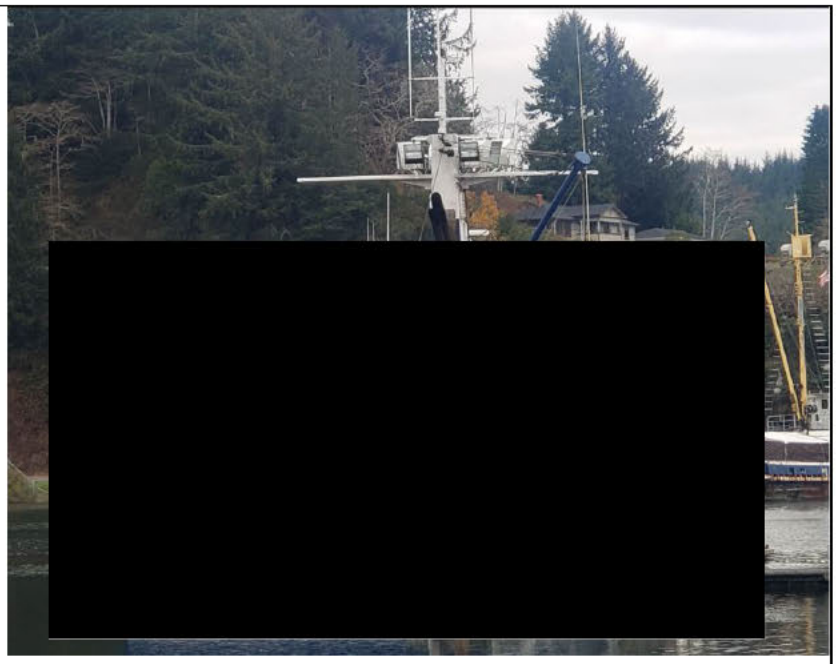
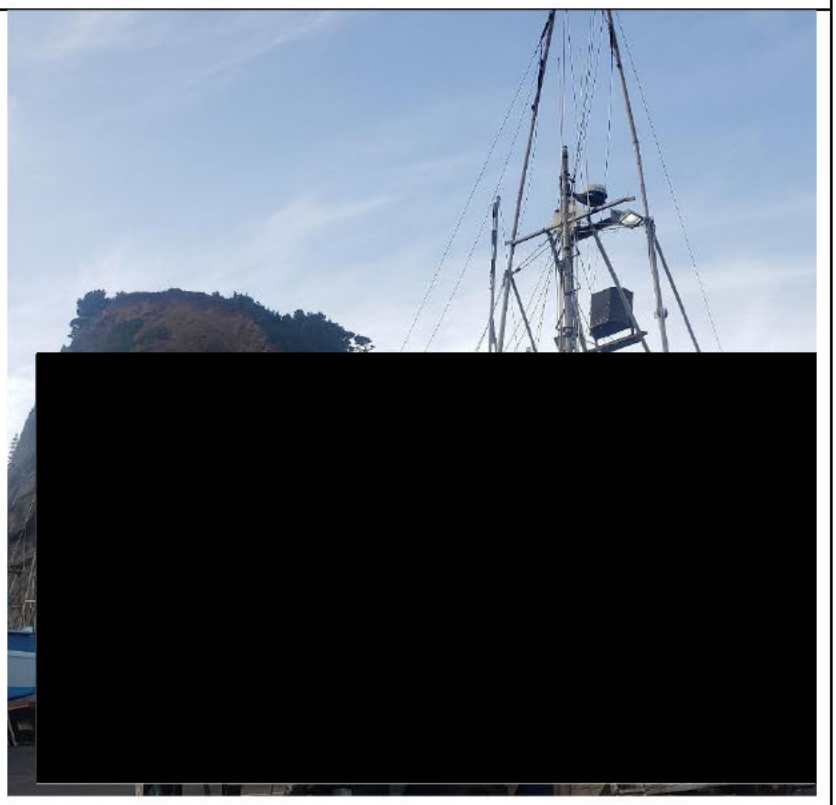
[redacted] [redacted] *(Phase 1 & 2)* [redacted] VMS: Faria Beede Sentry Sensor: Ashcroft Device Used: iPad Mini Vessel name: [redacted] [redacted] Home Port: [redacted]	
[redacted] *(Phase 1 participant, Phase 2 non-user, provided feedback)* VMS: LIME Sensor: MSP300 Device Used: iPad Mini Vessel name: [redacted] Home Port: [redacted]	

[redacted] *(Phase 2)* VMS: Faria Beede Sentry [redacted] Sensor: Ashcroft Device Used: iPad Mini Vessel Name: [redacted] Homeport: [redacted]	
[redacted] *(Phase 1 & 2)* [redacted] VMS: Viatrax Boat Command [redacted] Sensor: M5241 Device Used: iPad Mini Vessel name: [redacted] Home Port: [redacted]	

[redacted] *(Phase 2)* VMS: LIME [redacted] Sensor: MSP300 Device Used: iPad Mini Vessel name: [redacted] Home Port: [redacted]	
[redacted] *(Phase 2)* VMS: Viatrax Boat Command [redacted] Sensor: M5241 Device Used: iPad Mini Vessel name: [redacted] Home Port: [redacted]	

[redacted] VMS: Viatrax Sensor: Ashcroft Device Issued: Ipad Vessel Name: [redacted] Home Port: [redacted]	
[redacted] *(Phase 2)* VMS: Faria Beede Sentry [redacted] Sensor: Ashcroft Device Used: iPad Mini Vessel name: [redacted] [redacted] Home Port: [redacted]	

[redacted] *(Phase 2)* VMS: Faria Beede Sentry [redacted] Sensor: Ashcroft Device Used: iPad Mini Vessel name: [redacted] Home Port: [redacted]	
[redacted] *(Phase 2)* VMS: Viatrax Boat Command Sensor: [redacted] Device Used: iPad Mini Vessel Name: [redacted] Home Port: [redacted]	

[redacted] *(Phase 1&2)* [redacted] VMS: Faria Beede Sentry [redacted] Sensor: Ashcroft Vessel Name: [redacted] Home Port: [redacted] [redacted]	
[redacted] *(Phase 2)* VMS: Viatrax Boat Command [redacted] Sensor: M5241 Vessel Name: [redacted] Home Port: [redacted]	

3. *For each system requirement, identification of how successfully the requirement was met during field testing and any workarounds of system modifications needed to meet the requirement. Include screenshots, photos, or examples as appropriate.*

REQUIREMENTS:

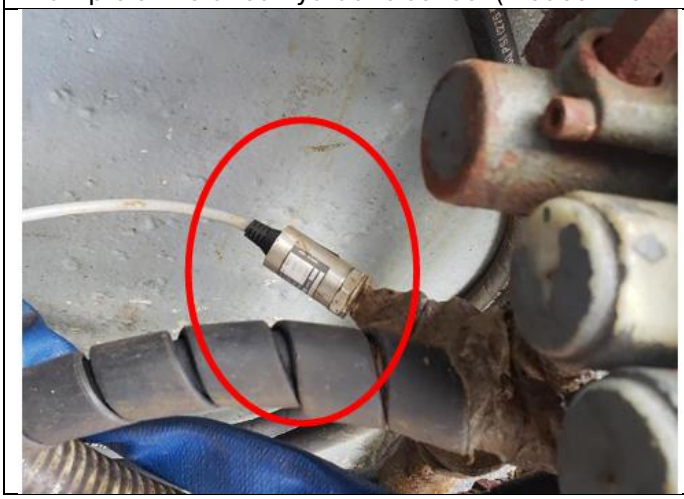
a. **VMS installed. 100%**
   All project vessels had either a Faria Beede Sentry, Viatrax Boat Command or LIME device installed at the start of the season. The installation was done by the captains. Each captain reported that the VMS was easy to install.
b. **Hydraulic sensors installed 100%**
   All vessels participating in Phase 3 had pressure sensors installed by their captains. Three models were used—the Mouser Electronics M5241, the Ashcroft G2 Transducer, and the TE Connectivity MSP300. Overall, the sensors performed well, with pressure readings appearing consistent across models.
   One exception occurred when [redacted] Ashcroft G2 unit caught fire and melted; this was promptly replaced with a spare. In another case, [redacted] hydraulic sensor produced readings outside the expected range. Although he reported installing the unit in the same manner as his brothers, the data remained inconsistent. [redacted] noted that his vessel also operates a TrapMaster system, but it is unclear whether that system interfered with the hydraulic sensor's performance.

   Links to datasheets for each hydraulic device:
   MOUSER ELECTRONICS, Model M5241
   Used with the Viatrax Boat Command VMS system Cost: $156 + shipping.

   ASHCROFT, G2 Transducer used with the Faria Beede Sentry VMS system
   Cost ~ $200

   TE Connectivity MSP 300 used with the Achipelago LIME VMS System
   Cost unknown

Example of installed hydraulic sensor (Mouser M5241)



c. **Each device of the captains can connect via the API of each VMS vendor. 100%**
All captains were able to receive data from the HLS server without issue. Those that were connected to WiFi during their trips were able to receive data from the HLS API in near real time. LIME users were able to receive data to their devices after approximately 3 hours when in WiFi range.

d. **ODFW Dungeness Crab software installed on each device of the captains. 100%**
Captains started the season with a new version of the software released into the Apple iOS store on 12/12/2024. All captains were able to set up their iPads and log in without issue.

e. **Captains able to submit reports to the Harbor Light Host. ~80%**
This season recorded the highest number of reports to date, 122. Overall, many of the obstacles encountered were not related to the application itself but rather to limited effort, lack of communication with HLS during the season, and in some cases, hardware challenges.

Captains who were fully engaged with the project were able to submit trips without issue. A few captains did not fully participate, most notably [redacted]. Both have historically shown limited commitment to using the system. [redacted] disconnected his hydraulic sensor for most of the season while working on his vessel, and both he and [redacted] proved difficult to reach. Although [redacted] initially assured us he was "all set" at the start of the season, communication ceased once it became clear his trips were not being entered.

[redacted] experienced persistent tablet problems; his iPad was slow and unreliable, causing significant frustration. When we visited [redacted] at the very end of

the season, we noticed that his iPad would not update to the latest iOS version even though the specs of the iPad showed it was capable of a new operating system. We transitioned [redacted] to an Android device, which resolved the performance issues. [redacted] entered his last two trips as a single combined submission, which we did not upload. He approached the project with enthusiasm but struggled with confidence and technology challenges. Refresher training in Phase 4 would likely improve his performance.

On the [redacted] began the season with [redacted] listed as captain, but [redacted] chose to step away from fishing and did not submit reports. [redacted] stepped in mid-season and submitted five trips. [redacted] second vessel, the [redacted], was run by [redacted], who submitted three trips. [redacted] did have difficulty with slowness in the app at the beginning of the season. He did not go back to the app once the performance improvements were made because he was done fishing for the season.

Captain	# of Trips Submitted
[redacted]	13
[redacted]	5
[redacted]	0
[redacted]	7
[redacted]	0
[redacted]	11
[redacted]	33
[redacted]	11
[redacted]	9
[redacted]	11
[redacted]	7
[redacted]	7
[redacted]	3
[redacted]	5
[redacted]	0

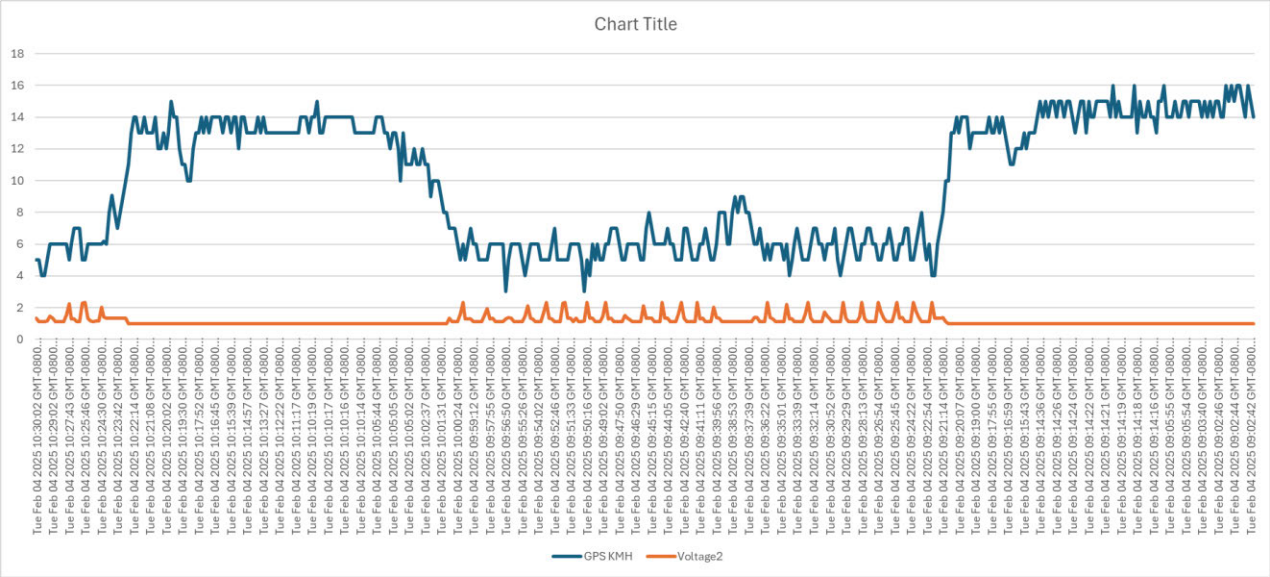
f. Hydraulic sensor can properly detect pots being hauled out of water. 100% Hydraulic sensor can accurately count the number of pots being pulled < 80%

One of our primary goals in this phase was to improve the accuracy of counting pot hauls on each string. In practice, this proved difficult and somewhat elusive. Identifying where strings were being pulled was relatively straightforward—the haul patterns stood out clearly in the data, even when VMS points were missing from the vendor (Faria Beede). Early in the season, we used data from the [redacted] to test whether pot hauls could be

reliably identified from raw data alone. In two cases, [redacted] was unable to recall the number of pots hauled on his strings, so we analyzed his trip data and converted it into the graphics shown below to illustrate how pot hauls could be visualized. Using this estimation of pots, we were able to sent this information to [redacted] and he was able to complete his reports and send them in. He stated that our estimate seemed correct, but he could not be certain.

[redacted]

[redacted]

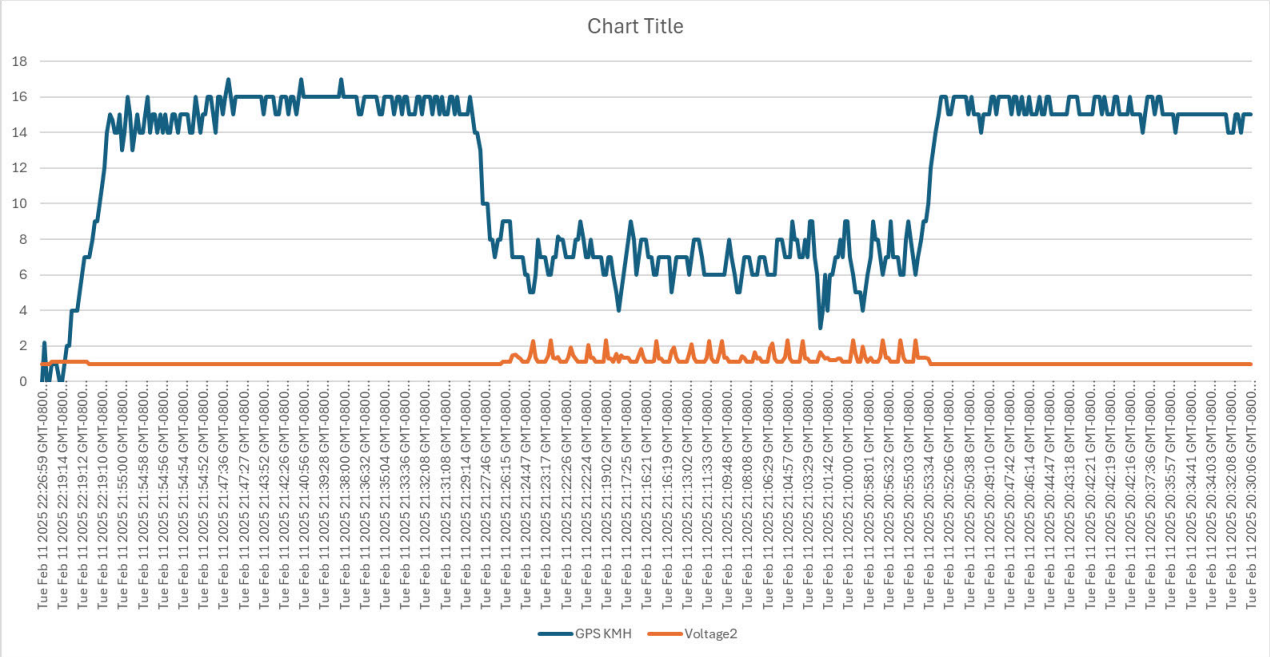


String33

02/11/2025 20:54 PST

02/11/2025 21:26 PST

[redacted]



The graphic illustrates a consistent relationship between vessel speed and hydraulic activity during pot hauling. When the vessel slows down, the hydraulic system engages, and voltage spikes are recorded. These spikes generally correspond with the pulling of pots, with each spike often indicating an individual haul.

However, the data is not always this straightforward. In some instances, multiple pots may be pulled in quick succession, producing overlapping or clustered spikes that are difficult to distinguish as discrete hauls. In other cases, a single pot may require multiple pulls—for example, if it becomes lodged in a strong current or tangled on the seafloor—resulting in multiple spikes for a single pot. Vessel speed also plays an important role: sharp reductions in speed align with hauling activity, but gradual fluctuations may introduce noise into the dataset.

We then took the logbook data from [redacted] last two string pulls of the season and compared it to his [redacted]. Looking at the data, we were able to see that there were still missing data points that we know will be addressed by Viatrax. Besides this, it was still difficult to determine his exact number of pots pulled. Using the information from the captains on their approximate speeds when hauling, we said that speeds of 3.5 mph to 4.0 mph were average. The “off” for this hydraulic device is 1.003. Given these parameters, we used 4 mph as our top haul speed with a hydraulic voltage of 1.124 or higher. We were able to match up the first string of 5 pots.

In the example below, the GREEN marks the MPH of the vessel under 4 mph. The YELLOW marks the hydraulic at 1.124 as pulling of a pot. This matched up 100%

Tue Aug 12 2025 14:58:15 GMT-0400 (Eastern Daylight Time)	0	1.003	Start Haul per logbook.
Tue Aug 12 2025 14:58:32 GMT-0400 (Eastern Daylight Time)	0	1.003	Captain reported 5 pots hauled
Tue Aug 12 2025 14:58:46 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 14:59:07 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 14:59:18 GMT-0400 (Eastern Daylight Time)	1.86	1.094	
Tue Aug 12 2025 14:59:29 GMT-0400 (Eastern Daylight Time)	2.49	1.094	
Tue Aug 12 2025 14:59:40 GMT-0400 (Eastern Daylight Time)	3.11	1.094	
Tue Aug 12 2025 14:59:51 GMT-0400 (Eastern Daylight Time)	4.35	1.094	
Tue Aug 12 2025 15:00:02 GMT-0400 (Eastern Daylight Time)	3.11	1.124	
Tue Aug 12 2025 15:00:13 GMT-0400 (Eastern Daylight Time)	1.86	1.094	
Tue Aug 12 2025 15:00:24 GMT-0400 (Eastern Daylight Time)	0.62	1.094	
Tue Aug 12 2025 15:00:35 GMT-0400 (Eastern Daylight Time)	1.24	1.094	
Tue Aug 12 2025 15:00:51 GMT-0400 (Eastern Daylight Time)	0	1.064	
Tue Aug 12 2025 15:01:06 GMT-0400 (Eastern Daylight Time)	0	1.003	
Tue Aug 12 2025 15:01:26 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 15:01:47 GMT-0400 (Eastern Daylight Time)	0	1.003	
Tue Aug 12 2025 15:02:02 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 15:02:18 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 15:02:34 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 15:02:48 GMT-0400 (Eastern Daylight Time)	0	1.003	
Tue Aug 12 2025 15:02:59 GMT-0400 (Eastern Daylight Time)	3.11	1.003	
Tue Aug 12 2025 15:03:10 GMT-0400 (Eastern Daylight Time)	2.49	1.124	

Tue Aug 12 2025 15:03:21 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 15:03:32 GMT-0400 (Eastern Daylight Time)	6.21	1.124
Tue Aug 12 2025 15:03:43 GMT-0400 (Eastern Daylight Time)	6.84	1.124
Tue Aug 12 2025 15:03:54 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 15:04:05 GMT-0400 (Eastern Daylight Time)	6.21	1.124
Tue Aug 12 2025 15:04:16 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 15:04:41 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 15:05:29 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:06:00 GMT-0400 (Eastern Daylight Time)	1.24	1.003
Tue Aug 12 2025 15:06:11 GMT-0400 (Eastern Daylight Time)	3.11	1.003
Tue Aug 12 2025 15:06:22 GMT-0400 (Eastern Daylight Time)	4.35	1.033
Tue Aug 12 2025 15:06:33 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 15:06:44 GMT-0400 (Eastern Daylight Time)	5.59	1.155
Tue Aug 12 2025 15:06:55 GMT-0400 (Eastern Daylight Time)	6.21	1.124
Tue Aug 12 2025 15:07:06 GMT-0400 (Eastern Daylight Time)	6.21	1.155
Tue Aug 12 2025 15:07:17 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 15:07:28 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 15:07:39 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 15:07:50 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 15:08:01 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 15:08:16 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:08:45 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:09:08 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:09:19 GMT-0400 (Eastern Daylight Time)	2.49	1.033

Tue Aug 12 2025 15:09:30 GMT-0400 (Eastern Daylight Time)	3.73	1.064
Tue Aug 12 2025 15:09:41 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 15:09:52 GMT-0400 (Eastern Daylight Time)	3.73	1.094
Tue Aug 12 2025 15:10:03 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 15:10:14 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 15:10:25 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 15:10:36 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 15:10:47 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:10:58 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:11:12 GMT-0400 (Eastern Daylight Time)	0	1.003
Tue Aug 12 2025 15:11:36 GMT-0400 (Eastern Daylight Time)	1.24	1.003
Tue Aug 12 2025 15:11:47 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 15:11:58 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 15:12:09 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 15:12:20 GMT-0400 (Eastern Daylight Time)	2.49	1.124
Tue Aug 12 2025 15:12:31 GMT-0400 (Eastern Daylight Time)	1.86	1.124
Tue Aug 12 2025 15:12:42 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 15:12:53 GMT-0400 (Eastern Daylight Time)	0	1.124
Tue Aug 12 2025 15:13:06 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:13:30 GMT-0400 (Eastern Daylight Time)	0	1.033
Tue Aug 12 2025 15:14:00 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 15:14:17 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 15:14:28 GMT-0400 (Eastern Daylight Time)	2.49	1.033
Tue Aug 12 2025 15:14:39 GMT-0400 (Eastern Daylight Time)	4.97	1.033

Tue Aug 12 2025 15:14:50 GMT-0400 (Eastern Daylight Time)	6.21	1.033	
Tue Aug 12 2025 15:15:01 GMT-0400 (Eastern Daylight Time)	7.46	1.003	
Tue Aug 12 2025 15:15:12 GMT-0400 (Eastern Daylight Time)	6.21	1.033	
Tue Aug 12 2025 15:15:23 GMT-0400 (Eastern Daylight Time)	6.84	1.003	End Haul per logbook

On the next string, [redacted] reported hauling 16 pots. Using the same parameters as above, we count 20 pots.

Tue Aug 12 2025 13:35:11 GMT-0400 (Eastern Daylight Time)	0	1.003	Start haul by captain reported 16 pots
Tue Aug 12 2025 13:35:27 GMT-0400 (Eastern Daylight Time)	0	1.003	
Tue Aug 12 2025 13:35:42 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:36:00 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:36:17 GMT-0400 (Eastern Daylight Time)	1.24	1.003	
Tue Aug 12 2025 13:36:28 GMT-0400 (Eastern Daylight Time)	2.49	1.003	
Tue Aug 12 2025 13:36:39 GMT-0400 (Eastern Daylight Time)	1.24	1.033	
Tue Aug 12 2025 13:36:50 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:37:02 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:38:52 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:39:09 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:39:28 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:39:40 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:39:52 GMT-0400 (Eastern Daylight Time)	0	1.003	
Tue Aug 12 2025 13:40:08 GMT-0400 (Eastern Daylight Time)	0	1.003	
Tue Aug 12 2025 13:40:23 GMT-0400 (Eastern Daylight Time)	0.62	1.003	
Tue Aug 12 2025 13:40:38 GMT-0400 (Eastern Daylight Time)	1.86	1.003	

Tue Aug 12 2025 13:40:54 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 13:41:08 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 13:41:18 GMT-0400 (Eastern Daylight Time)	2.49	1.003
Tue Aug 12 2025 13:41:29 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 13:41:40 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 13:41:51 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 13:42:02 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 13:42:13 GMT-0400 (Eastern Daylight Time)	3.73	1.094
Tue Aug 12 2025 13:42:24 GMT-0400 (Eastern Daylight Time)	2.49	1.124
Tue Aug 12 2025 13:42:35 GMT-0400 (Eastern Daylight Time)	1.24	1.124
Tue Aug 12 2025 13:42:46 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 13:42:57 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 13:43:08 GMT-0400 (Eastern Daylight Time)	0	1.094
Tue Aug 12 2025 13:43:27 GMT-0400 (Eastern Daylight Time)	0	1.064
Tue Aug 12 2025 13:44:07 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 13:44:54 GMT-0400 (Eastern Daylight Time)	0	1.033
Tue Aug 12 2025 13:45:05 GMT-0400 (Eastern Daylight Time)	1.86	1.033
Tue Aug 12 2025 13:45:16 GMT-0400 (Eastern Daylight Time)	1.86	1.033
Tue Aug 12 2025 13:45:27 GMT-0400 (Eastern Daylight Time)	4.97	1.033
Tue Aug 12 2025 13:45:38 GMT-0400 (Eastern Daylight Time)	4.97	1.033
Tue Aug 12 2025 13:45:49 GMT-0400 (Eastern Daylight Time)	4.35	1.033
Tue Aug 12 2025 13:46:00 GMT-0400 (Eastern Daylight Time)	4.35	1.033
Tue Aug 12 2025 13:46:11 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 13:46:22 GMT-0400 (Eastern Daylight Time)	4.35	1.124

Tue Aug 12 2025 13:46:33 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 13:46:44 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 13:46:55 GMT-0400 (Eastern Daylight Time)	1.86	1.124
Tue Aug 12 2025 13:47:06 GMT-0400 (Eastern Daylight Time)	0.62	1.124
Tue Aug 12 2025 13:47:17 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 13:47:28 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 13:47:41 GMT-0400 (Eastern Daylight Time)	1.24	1.064
Tue Aug 12 2025 13:47:52 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 13:48:03 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 13:48:14 GMT-0400 (Eastern Daylight Time)	0	1.003
Tue Aug 12 2025 13:48:39 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 13:48:50 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 13:49:01 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 13:49:12 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 13:49:23 GMT-0400 (Eastern Daylight Time)	4.97	1.094
Tue Aug 12 2025 13:49:34 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 13:49:45 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 13:49:56 GMT-0400 (Eastern Daylight Time)	1.24	1.124
Tue Aug 12 2025 13:50:07 GMT-0400 (Eastern Daylight Time)	0.62	1.124
Tue Aug 12 2025 13:50:22 GMT-0400 (Eastern Daylight Time)	1.24	1.124
Tue Aug 12 2025 13:50:46 GMT-0400 (Eastern Daylight Time)	0	1.064
Tue Aug 12 2025 13:51:02 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 13:51:21 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 13:51:37 GMT-0400 (Eastern Daylight Time)	0.62	1.033

Tue Aug 12 2025 13:51:48 GMT-0400 (Eastern Daylight Time)	3.11	1.033
Tue Aug 12 2025 13:51:59 GMT-0400 (Eastern Daylight Time)	2.49	1.033
Tue Aug 12 2025 13:52:10 GMT-0400 (Eastern Daylight Time)	3.11	1.033
Tue Aug 12 2025 13:52:21 GMT-0400 (Eastern Daylight Time)	4.97	1.033
Tue Aug 12 2025 13:52:32 GMT-0400 (Eastern Daylight Time)	4.97	1.033
Tue Aug 12 2025 13:52:43 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 13:52:54 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 13:53:05 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 13:53:16 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 13:53:27 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 13:53:38 GMT-0400 (Eastern Daylight Time)	1.24	1.155
Tue Aug 12 2025 13:53:49 GMT-0400 (Eastern Daylight Time)	0	1.155
Tue Aug 12 2025 13:54:03 GMT-0400 (Eastern Daylight Time)	0	1.124
Tue Aug 12 2025 13:54:27 GMT-0400 (Eastern Daylight Time)	0.62	1.064
Tue Aug 12 2025 13:55:09 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 13:55:23 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 13:55:35 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 13:55:46 GMT-0400 (Eastern Daylight Time)	3.11	1.003
Tue Aug 12 2025 13:55:57 GMT-0400 (Eastern Daylight Time)	4.35	1.003
Tue Aug 12 2025 13:56:08 GMT-0400 (Eastern Daylight Time)	4.97	1.003
Tue Aug 12 2025 13:56:19 GMT-0400 (Eastern Daylight Time)	5.59	1.003
Tue Aug 12 2025 13:56:30 GMT-0400 (Eastern Daylight Time)	5.59	1.003
Tue Aug 12 2025 13:56:41 GMT-0400 (Eastern Daylight Time)	5.59	1.003
Tue Aug 12 2025 13:56:52 GMT-0400 (Eastern Daylight Time)	4.97	1.003

Tue Aug 12 2025 13:57:03 GMT-0400 (Eastern Daylight Time)	4.35	1.003
Tue Aug 12 2025 13:57:14 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 13:57:25 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 13:57:36 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 13:57:47 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 13:58:01 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 13:58:48 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 13:59:24 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 13:59:35 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 13:59:46 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 13:59:57 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:00:08 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:00:19 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:00:30 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:00:41 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:00:52 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:01:03 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:01:14 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:01:25 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 14:01:36 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:01:47 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:02:04 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 14:02:26 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 14:02:49 GMT-0400 (Eastern Daylight Time)	0	1.033

Tue Aug 12 2025 14:03:08 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:03:30 GMT-0400 (Eastern Daylight Time)	0	1.033
Tue Aug 12 2025 14:03:49 GMT-0400 (Eastern Daylight Time)	0	1.064
Tue Aug 12 2025 14:04:07 GMT-0400 (Eastern Daylight Time)	0.62	1.064
Tue Aug 12 2025 14:04:18 GMT-0400 (Eastern Daylight Time)	1.86	1.064
Tue Aug 12 2025 14:04:29 GMT-0400 (Eastern Daylight Time)	1.86	1.064
Tue Aug 12 2025 14:04:40 GMT-0400 (Eastern Daylight Time)	3.11	1.064
Tue Aug 12 2025 14:04:51 GMT-0400 (Eastern Daylight Time)	3.11	1.064
Tue Aug 12 2025 14:05:02 GMT-0400 (Eastern Daylight Time)	4.97	1.094
Tue Aug 12 2025 14:05:13 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:05:24 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:05:35 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:05:46 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:05:57 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:06:08 GMT-0400 (Eastern Daylight Time)	1.24	1.124
Tue Aug 12 2025 14:06:19 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:06:30 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:06:41 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 14:07:42 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 14:08:11 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 14:08:22 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:08:33 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:08:44 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:08:55 GMT-0400 (Eastern Daylight Time)	5.59	1.094

Tue Aug 12 2025 14:09:06 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:09:17 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 14:09:28 GMT-0400 (Eastern Daylight Time)	1.24	1.124
Tue Aug 12 2025 14:09:39 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:09:50 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:10:01 GMT-0400 (Eastern Daylight Time)	0	1.124
Tue Aug 12 2025 14:10:17 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:11:09 GMT-0400 (Eastern Daylight Time)	2.49	1.003
Tue Aug 12 2025 14:11:20 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 14:11:31 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:11:42 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:11:53 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:12:04 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:12:15 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:12:26 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:12:37 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 14:12:48 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:12:59 GMT-0400 (Eastern Daylight Time)	0.62	1.124
Tue Aug 12 2025 14:13:28 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:13:45 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:14:06 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:14:26 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:14:38 GMT-0400 (Eastern Daylight Time)	2.49	1.033
Tue Aug 12 2025 14:14:49 GMT-0400 (Eastern Daylight Time)	3.73	1.124

Tue Aug 12 2025 14:15:00 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 14:15:11 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:15:22 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:15:33 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:15:44 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:15:55 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:16:06 GMT-0400 (Eastern Daylight Time)	6.21	1.094
Tue Aug 12 2025 14:16:17 GMT-0400 (Eastern Daylight Time)	3.11	1.124
Tue Aug 12 2025 14:16:28 GMT-0400 (Eastern Daylight Time)	1.86	1.124
Tue Aug 12 2025 14:16:39 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:16:50 GMT-0400 (Eastern Daylight Time)	0	1.033
Tue Aug 12 2025 14:17:01 GMT-0400 (Eastern Daylight Time)	0.62	1.064
Tue Aug 12 2025 14:17:13 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 14:17:24 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:17:40 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 14:18:05 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:18:21 GMT-0400 (Eastern Daylight Time)	1.24	1.033
Tue Aug 12 2025 14:18:32 GMT-0400 (Eastern Daylight Time)	2.49	1.124
Tue Aug 12 2025 14:18:43 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:18:54 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:19:05 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:19:16 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:19:27 GMT-0400 (Eastern Daylight Time)	2.49	1.124
Tue Aug 12 2025 14:19:38 GMT-0400 (Eastern Daylight Time)	1.86	1.124

Tue Aug 12 2025 14:19:49 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:20:00 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 14:20:11 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:20:22 GMT-0400 (Eastern Daylight Time)	0	1.094
Tue Aug 12 2025 14:20:33 GMT-0400 (Eastern Daylight Time)	0	1.064
Tue Aug 12 2025 14:20:55 GMT-0400 (Eastern Daylight Time)	0	1.003
Tue Aug 12 2025 14:21:55 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:22:06 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 14:22:17 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:22:28 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:22:39 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:22:50 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:23:01 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:23:12 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 14:23:23 GMT-0400 (Eastern Daylight Time)	1.86	1.094
Tue Aug 12 2025 14:23:34 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:23:45 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:24:06 GMT-0400 (Eastern Daylight Time)	0	1.033
Tue Aug 12 2025 14:24:25 GMT-0400 (Eastern Daylight Time)	1.86	1.003
Tue Aug 12 2025 14:24:44 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 14:25:03 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 14:25:14 GMT-0400 (Eastern Daylight Time)	1.86	1.003
Tue Aug 12 2025 14:25:25 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 14:25:36 GMT-0400 (Eastern Daylight Time)	3.73	1.094

Tue Aug 12 2025 14:25:47 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:25:58 GMT-0400 (Eastern Daylight Time)	4.97	1.094
Tue Aug 12 2025 14:26:09 GMT-0400 (Eastern Daylight Time)	5.59	1.124
Tue Aug 12 2025 14:26:20 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:26:31 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:26:42 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:26:53 GMT-0400 (Eastern Daylight Time)	6.21	1.094
Tue Aug 12 2025 14:27:04 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:27:15 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 14:27:26 GMT-0400 (Eastern Daylight Time)	2.49	1.124
Tue Aug 12 2025 14:27:37 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:27:48 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:27:59 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:28:28 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:28:45 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:29:03 GMT-0400 (Eastern Daylight Time)	0.62	1.033
Tue Aug 12 2025 14:29:17 GMT-0400 (Eastern Daylight Time)	1.24	1.064
Tue Aug 12 2025 14:29:32 GMT-0400 (Eastern Daylight Time)	0	1.064
Tue Aug 12 2025 14:29:43 GMT-0400 (Eastern Daylight Time)	1.86	1.064
Tue Aug 12 2025 14:29:54 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 14:30:05 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 14:30:16 GMT-0400 (Eastern Daylight Time)	6.21	1.094
Tue Aug 12 2025 14:30:27 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:30:38 GMT-0400 (Eastern Daylight Time)	5.59	1.124

Tue Aug 12 2025 14:30:49 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 14:31:00 GMT-0400 (Eastern Daylight Time)	3.73	1.124
Tue Aug 12 2025 14:31:11 GMT-0400 (Eastern Daylight Time)	1.86	1.124
Tue Aug 12 2025 14:31:22 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:31:33 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:31:45 GMT-0400 (Eastern Daylight Time)	0	1.033
Tue Aug 12 2025 14:32:25 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 14:32:49 GMT-0400 (Eastern Daylight Time)	1.86	1.033
Tue Aug 12 2025 14:33:00 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 14:33:11 GMT-0400 (Eastern Daylight Time)	3.73	1.094
Tue Aug 12 2025 14:33:22 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:33:33 GMT-0400 (Eastern Daylight Time)	5.59	1.094
Tue Aug 12 2025 14:33:44 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:33:55 GMT-0400 (Eastern Daylight Time)	4.35	1.094
Tue Aug 12 2025 14:34:06 GMT-0400 (Eastern Daylight Time)	2.49	1.094
Tue Aug 12 2025 14:34:17 GMT-0400 (Eastern Daylight Time)	0.62	1.094
Tue Aug 12 2025 14:34:28 GMT-0400 (Eastern Daylight Time)	1.24	1.094
Tue Aug 12 2025 14:34:39 GMT-0400 (Eastern Daylight Time)	0	1.094
Tue Aug 12 2025 14:35:01 GMT-0400 (Eastern Daylight Time)	0.62	1.003
Tue Aug 12 2025 14:36:01 GMT-0400 (Eastern Daylight Time)	3.11	1.094
Tue Aug 12 2025 14:36:12 GMT-0400 (Eastern Daylight Time)	4.35	1.124
Tue Aug 12 2025 14:36:23 GMT-0400 (Eastern Daylight Time)	4.97	1.094
Tue Aug 12 2025 14:36:34 GMT-0400 (Eastern Daylight Time)	4.97	1.124
Tue Aug 12 2025 14:36:45 GMT-0400 (Eastern Daylight Time)	4.35	1.124

Tue Aug 12 2025 14:36:56 GMT-0400 (Eastern Daylight Time)	2.49	1.124	
Tue Aug 12 2025 14:37:07 GMT-0400 (Eastern Daylight Time)	0.62	1.124	
Tue Aug 12 2025 14:37:18 GMT-0400 (Eastern Daylight Time)	1.24	1.124	
Tue Aug 12 2025 14:37:29 GMT-0400 (Eastern Daylight Time)	0	1.094	
Tue Aug 12 2025 14:37:51 GMT-0400 (Eastern Daylight Time)	0	1.033	
Tue Aug 12 2025 14:38:43 GMT-0400 (Eastern Daylight Time)	0.62	1.033	
Tue Aug 12 2025 14:39:12 GMT-0400 (Eastern Daylight Time)	0	1.033	
Tue Aug 12 2025 14:39:30 GMT-0400 (Eastern Daylight Time)	1.24	1.033	
Tue Aug 12 2025 14:39:46 GMT-0400 (Eastern Daylight Time)	1.24	1.033	
Tue Aug 12 2025 14:40:00 GMT-0400 (Eastern Daylight Time)	0.62	1.033	
Tue Aug 12 2025 14:40:13 GMT-0400 (Eastern Daylight Time)	1.24	1.033	
Tue Aug 12 2025 14:40:32 GMT-0400 (Eastern Daylight Time)	0	1.033	
Tue Aug 12 2025 14:40:53 GMT-0400 (Eastern Daylight Time)	0	1.033	
Tue Aug 12 2025 14:41:08 GMT-0400 (Eastern Daylight Time)	0.62	1.033	
Tue Aug 12 2025 14:41:21 GMT-0400 (Eastern Daylight Time)	0.62	1.033	
Tue Aug 12 2025 14:41:37 GMT-0400 (Eastern Daylight Time)	0.62	1.033	
Tue Aug 12 2025 14:41:48 GMT-0400 (Eastern Daylight Time)	3.73	1.033	
Tue Aug 12 2025 14:41:59 GMT-0400 (Eastern Daylight Time)	6.21	1.033	END of Haul 16 pots reported by captain

It is important to note that the accuracy of identifying exact pot pulls may never be fully precise. Captains explained that hydraulic sensors can register additional activity unrelated to hauling, such as when the bait chopper is running simultaneously. These overlapping signals make it difficult to isolate true pot pulls from other hydraulic operations, adding another layer of complexity to achieving exact counts.

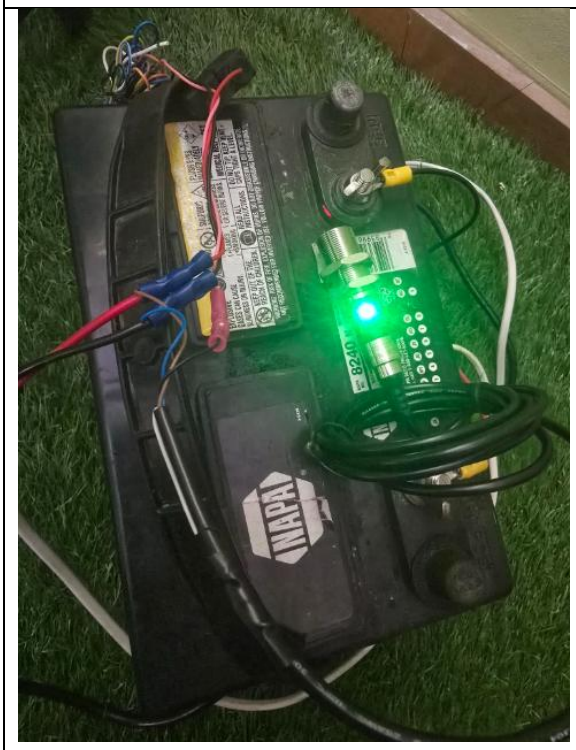
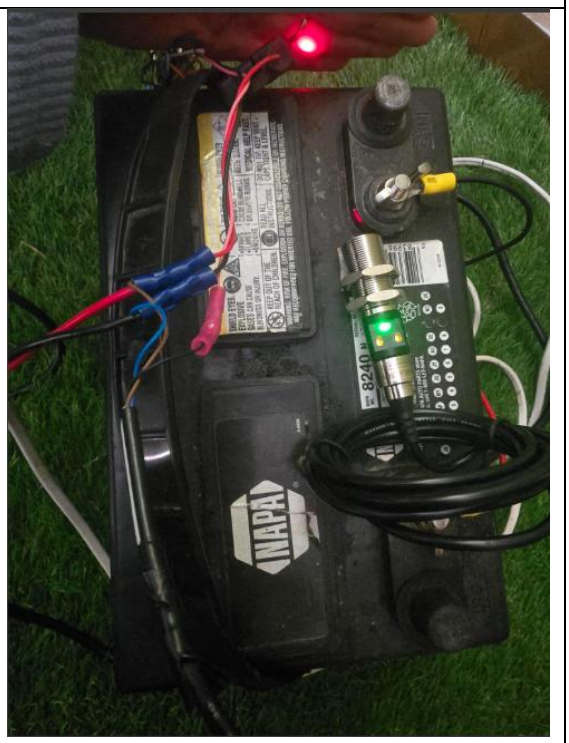
Additional Sensor Tested

Infrared Pot Hauler Sensor

[Banner M1804 data sheet]

This season, we elected to test an infrared sensor to evaluate whether it could more accurately detect pot hauls. A Banner M18-4 unit (approximately $150) was purchased and sent to [redacted], who coordinated with Viatrax for installation. [redacted] confirmed that the unit appeared to function correctly on his vessel; when the pot hauler davit engaged, the receiver's red light visibly triggered to indicate a "pull."

Despite this, no corresponding pull signals were captured in the Viatrax data throughout the season. Toward the end of the season, the sensor still had not been integrated successfully. To troubleshoot further, we purchased an additional unit and configured it independently with a car battery, allowing for portable testing. Because the VMS unit must ping every 10 seconds to log a pull signal, movement of the VMS unit was critical. During setup, we determined that the wiring needed to be modified for the sensor to communicate with the VMS unit. Once this adjustment was made, the system began transmitting valid pull signals.

Unit is in the "OFF" position	Placing something within 8" of the sensor will trigger it to turn "ON" Notice the two yellow dots under the green light to indicate an "ON".
	

We found these “ON” signals to be steadily accurate when testing in a vehicle. The testing was accomplished by driving the VMS unit and the infrared sensor around town and using the clock in the vehicle to mark the approximate times I put the sensor into an “ON” or “OFF” status by placing an object in the path of the sensor to signal an “ON” or “pull”.

In the testing, I used the clock in my vehicle to mark sensor “ON” times. For example, in the first YELLOW group below, I marked that the sensor was on from 16:01-16:03 according to my vehicle clock. Since my clock was not exactly accurate and given the fact that I was driving at the same time, I expected that the sensor timings would be slightly off from my clock in my car. The YELLOW indicates when I wrote down that the sensor should be “ON”, the GREEN indicates when the sensor showed “ON” per the VMS Unit. As you can see, the sensor was very accurate in this testing, with a very distinct “ON” at .699 and an “OFF” at .364/.365

Sun Aug 17 2025 16:04:07	-71.4406771	41.6118533	0.364
Sun Aug 17 2025 16:03:56	-71.440372	41.6107565	0.364
Sun Aug 17 2025 16:03:45	-71.4401035	41.6097593	0.364
Sun Aug 17 2025 16:03:34	-71.4407215	41.6094713	0.395
Sun Aug 17 2025 16:03:23	-71.4424065	41.609464	0.364
Sun Aug 17 2025 16:03:12	-71.4440691	41.6090108	0.699
Sun Aug 17 2025 16:03:01	-71.4457765	41.6084641	0.699
Sun Aug 17 2025 16:02:50	-71.4476536	41.6082858	0.699
Sun Aug 17 2025 16:02:39	-71.4495485	41.6081573	0.699
Sun Aug 17 2025 16:02:28	-71.4514068	41.6078283	0.699
Sun Aug 17 2025 16:02:17	-71.4531643	41.6075746	0.699
Sun Aug 17 2025 16:02:06	-71.454826	41.607346	0.699
Sun Aug 17 2025 16:01:55	-71.4555956	41.6070303	0.699
Sun Aug 17 2025 16:01:44	-71.455535	41.6068675	0.699
Sun Aug 17 2025 16:01:33	-71.4553611	41.6063691	0.699
Sun Aug 17 2025 16:01:22	-71.4549521	41.6053995	0.699
Sun Aug 17 2025 16:01:11	-71.4540311	41.605386	0.699
Sun Aug 17 2025 16:01:00	-71.4524516	41.6055655	0.699
Sun Aug 17 2025 16:00:49	-71.4508723	41.6057818	0.699
Sun Aug 17 2025 16:00:39	-71.4498643	41.6057401	0.699
Sun Aug 17 2025 16:00:23	-71.4498181	41.6056886	0.395
Sun Aug 17 2025 16:00:12	-71.4491746	41.6049703	0.364
Sun Aug 17 2025 16:00:01	-71.4482795	41.6039023	0.395
Sun Aug 17 2025 15:59:50	-71.4469623	41.6029426	0.395
Sun Aug 17 2025 15:59:39	-71.4452858	41.6019756	0.395
Sun Aug 17 2025 15:59:28	-71.4440211	41.6006638	0.364
Sun Aug 17 2025 15:59:17	-71.4431231	41.5991268	0.364
Sun Aug 17 2025 15:59:06	-71.4419776	41.5978541	0.699
Sun Aug 17 2025 15:58:55	-71.4403128	41.5968988	0.699
Sun Aug 17 2025 15:58:44	-71.4385151	41.5961113	0.699

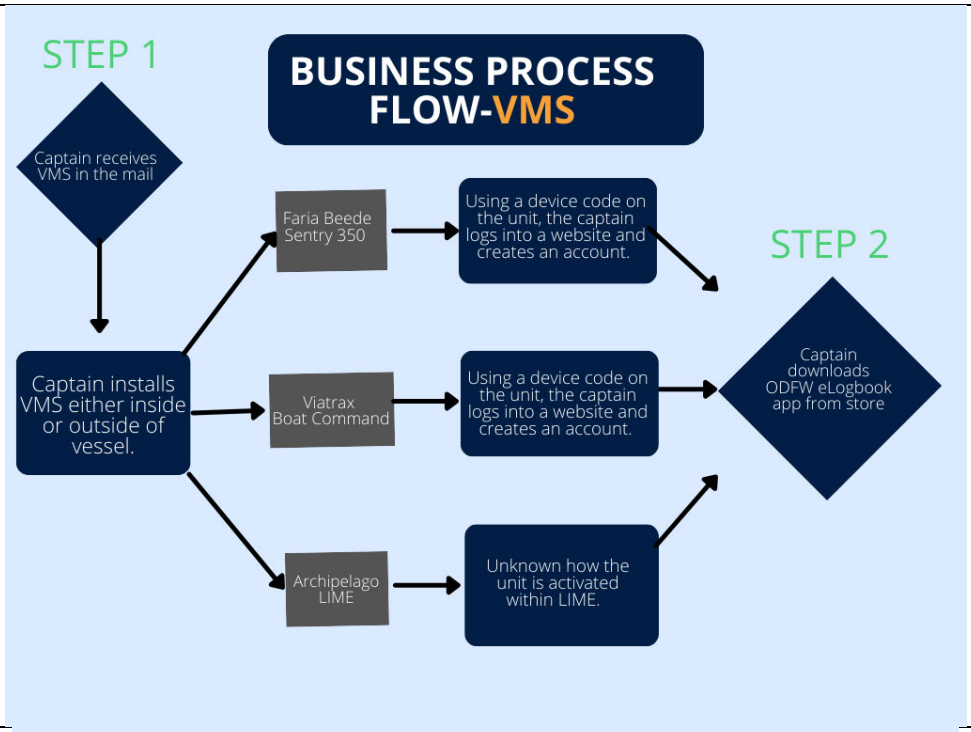
Sun Aug 17 2025 15:58:33	-71.4367596	41.5953376	0.699
Sun Aug 17 2025 15:58:22	-71.4348768	41.5945445	0.699
Sun Aug 17 2025 15:58:11	-71.4329896	41.5937441	0.699
Sun Aug 17 2025 15:58:00	-71.4322918	41.5931406	0.699
Sun Aug 17 2025 15:57:41	-71.4323341	41.5930945	0.699
Sun Aug 17 2025 15:57:30	-71.432895	41.5922721	0.699
Sun Aug 17 2025 15:57:19	-71.4328763	41.5911913	0.699
Sun Aug 17 2025 15:57:08	-71.4326026	41.5901378	0.699
Sun Aug 17 2025 15:56:57	-71.4327425	41.5892038	0.395
Sun Aug 17 2025 15:56:46	-71.4327831	41.5883628	0.699
Sun Aug 17 2025 15:56:35	-71.4323468	41.5877195	0.395
Sun Aug 17 2025 15:56:24	-71.4317018	41.5873898	0.364
Sun Aug 17 2025 15:56:13	-71.4309903	41.5872763	0.395
Sun Aug 17 2025 15:56:02	-71.4303405	41.5873645	0.395
Sun Aug 17 2025 15:55:51	-71.4298328	41.5874368	0.395
Sun Aug 17 2025 15:55:40	-71.4296381	41.5870458	0.395
Sun Aug 17 2025 15:55:29	-71.429275	41.586349	0.699
Sun Aug 17 2025 15:55:18	-71.4289801	41.5858615	0.699
Sun Aug 17 2025 15:55:07	-71.429121	41.5857703	0.699
Sun Aug 17 2025 15:54:56	-71.4293761	41.5864655	0.699
Sun Aug 17 2025 15:54:45	-71.4297805	41.5872946	0.699
Sun Aug 17 2025 15:54:34	-71.4303313	41.5873563	0.699
Sun Aug 17 2025 15:54:23	-71.4308956	41.5872601	0.395
Sun Aug 17 2025 15:54:12	-71.4315758	41.5873391	0.395
Sun Aug 17 2025 15:54:01	-71.4325048	41.5878495	0.364
Sun Aug 17 2025 15:53:50	-71.4328348	41.5887733	0.395
Sun Aug 17 2025 15:53:39	-71.4326615	41.5898153	0.364
Sun Aug 17 2025 15:53:28	-71.4327565	41.5907561	0.364
Sun Aug 17 2025 15:53:17	-71.4329991	41.5915361	0.364
Sun Aug 17 2025 15:53:06	-71.432918	41.5923005	0.364
Sun Aug 17 2025 15:52:55	-71.4324066	41.5930595	0.395
Sun Aug 17 2025 15:52:44	-71.4316448	41.5931203	0.395
Sun Aug 17 2025 15:52:33	-71.4306571	41.5928648	0.364
Sun Aug 17 2025 15:52:22	-71.4301528	41.5937421	0.364
Sun Aug 17 2025 15:52:11	-71.4297871	41.595006	0.395
Sun Aug 17 2025 15:52:00	-71.4293955	41.5963406	0.699
Sun Aug 17 2025 15:51:49	-71.4288376	41.5972866	0.699
Sun Aug 17 2025 15:51:38	-71.4275643	41.5977373	0.699
Sun Aug 17 2025 15:51:27	-71.4270653	41.598427	0.699
Sun Aug 17 2025 15:51:16	-71.4269513	41.5992623	0.699
Sun Aug 17 2025 15:48:15	-71.4282583	41.6070155	0.395
Sun Aug 17 2025 14:48:14	-71.4464115	41.6117211	0

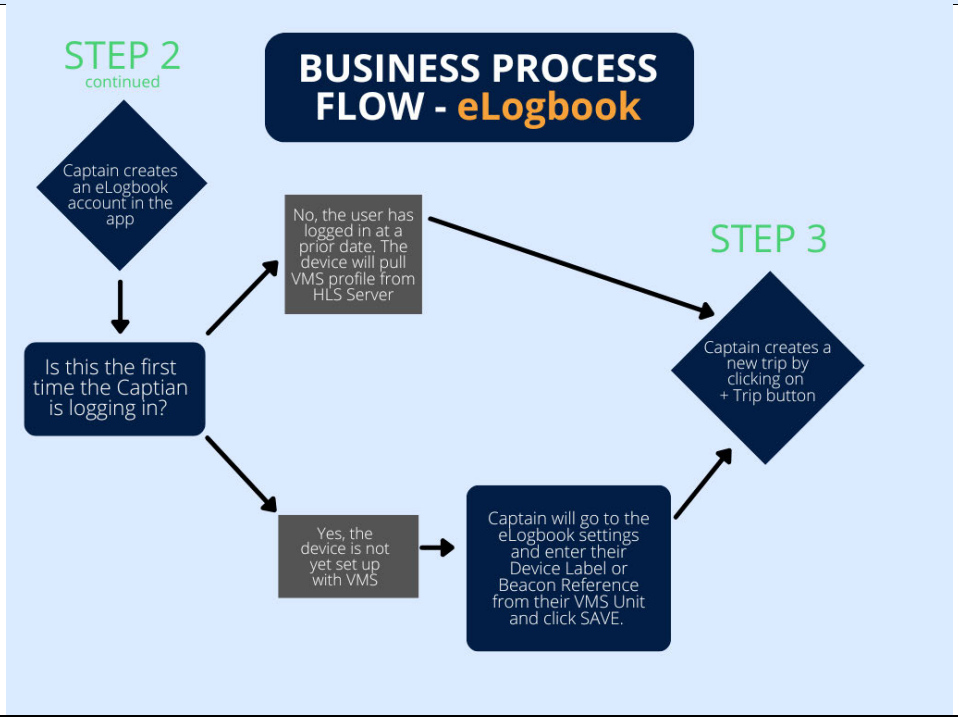
	**Correct wiring for the sensor:** Black wire from the VMS harness goes to the blue wire from the IR Sensor Red wire from the VMS harness goes to the brown wire from the IR Sensor Pink wire from the VMS harness goes to the black wire from the IR Sensor
	[redacted] infrared sensor set up**.** As the davit moves upwards as the pot is being pulled, the infrared sensor should detect this movement and register a pot pull. See video of sensor in action here: Video.mov

Further testing with Viatrax confirmed that the infrared sensor produces a voltage signal, similar to the hydraulic sensors. Because the VMS unit can only process one voltage input at a time, it cannot run both a hydraulic sensor and this infrared sensor simultaneously. To address this limitation, Viatrax is now testing a revised infrared sensor that does not rely on

voltage. The expectation is that this new design will operate alongside a hydraulic sensor without conflict.

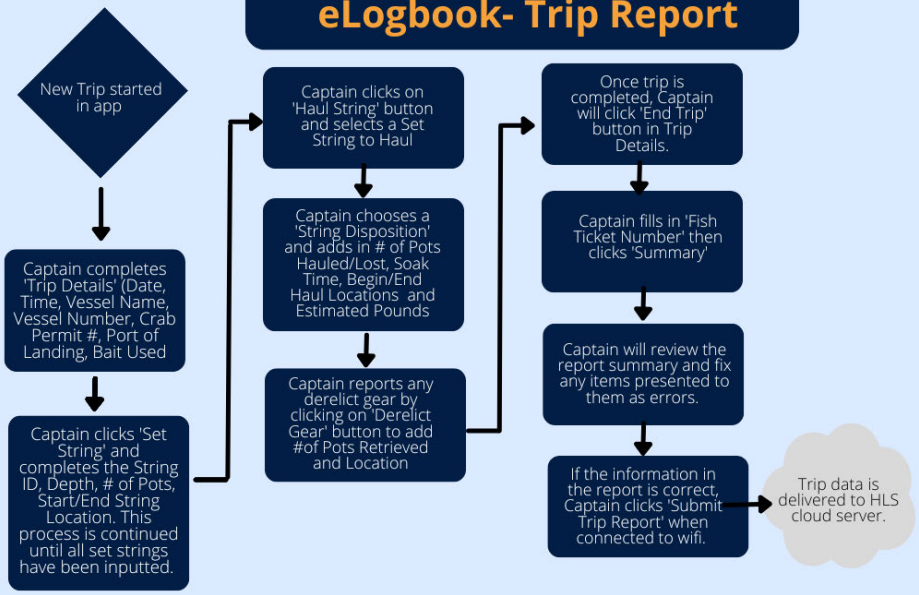
4. Business Process workflow diagram(s) demonstrating how System use integrated with vessel's crabbing activities.





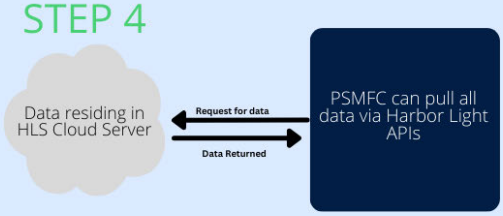
STEP 3
continued

BUSINESS PROCESS FLOW
eLogbook- Trip Report

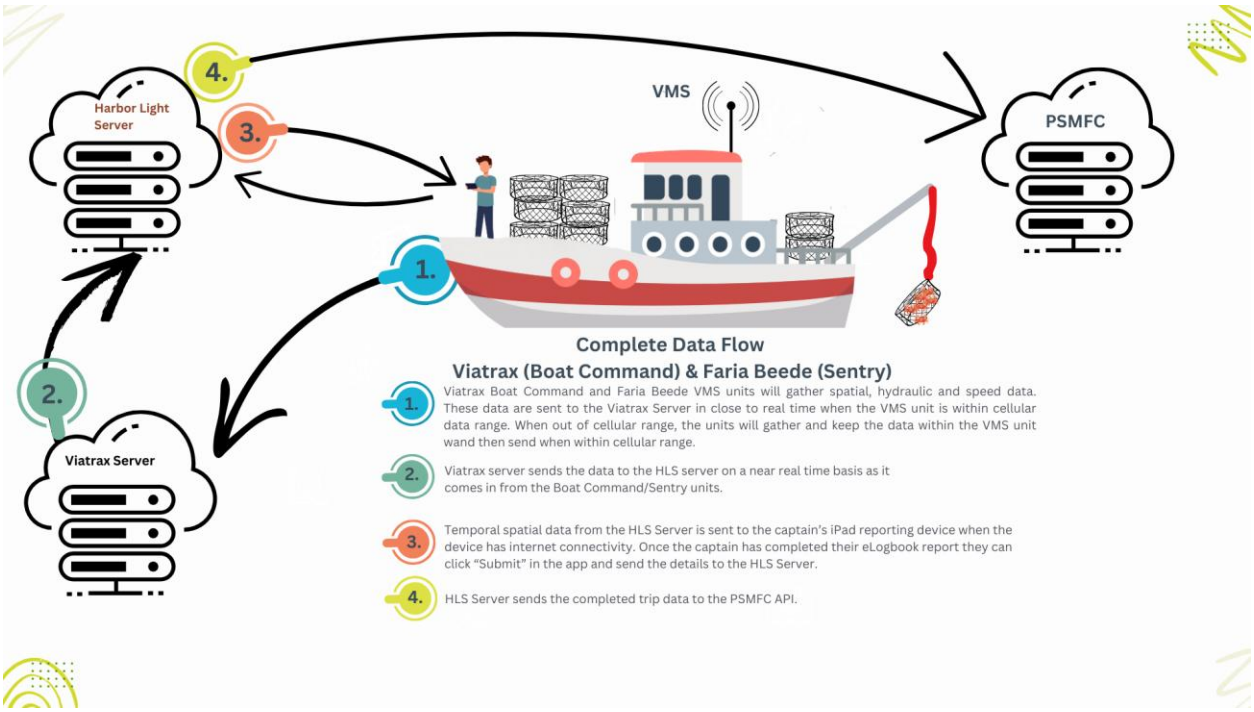


BUSINESS PROCESS FLOW
Delivery of data to ODFW

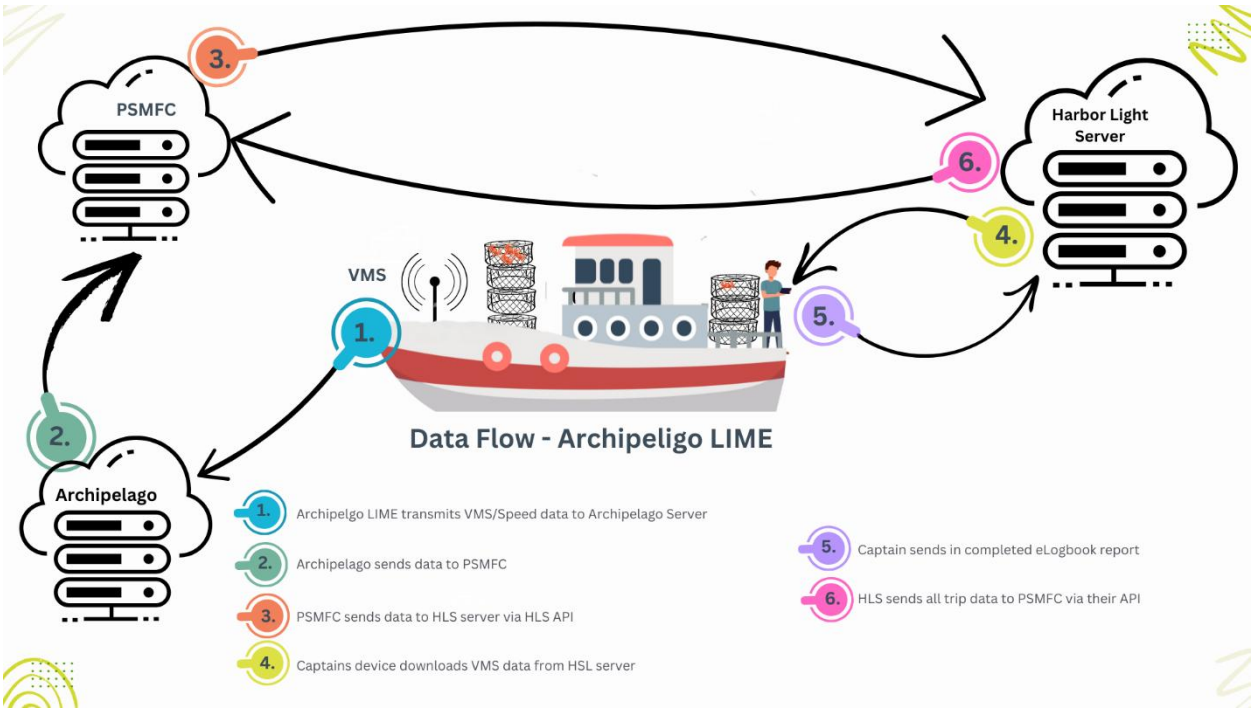
STEP 4



Hydraulic and Infrared Sensor Data Flow Viatrax and Faria Beede



Hydraulic Sensor Data Flow Archipelago LIME



5. Detailed metrics on the % of fishery and vessel tracking data that was recorded as well as any data gaps or erroneous data that occurred and apparent reason for it.

This season saw an increase in the number of trips submitted with complete data, a result of several key enhancements to the app:

- **Improved stability** – Captains were able to move through the app more smoothly, without freezing or crashing.
- **Error resolution** – The Summary Page now includes direct links to individual errors, allowing captains to quickly correct issues and submit clean data to the HLS servers.
- **Recheck VMS feature** – If a trip submission was missing VMS data points for a string set or haul, captains could use the new *Refresh VMS* button to query the HLS server and retrieve any missing data.

The *Recheck* feature proved especially valuable for vessels equipped with LIME units, which initially experienced data gaps caused by delays between Archipelago and PSMFC. Early in the season, many LIME users were unable to submit reports because of missing VMS locations. Once Archipelago and PSMFC resolved the issue, captains were able to use the *Recheck* function in the app to backfill the missing VMS data and successfully complete their reports.

[redacted] had two VMS unit failures which resulted in two trips at the end of his season that did not have VMS data points. These trips were uploaded without the VMS data.

By the end of the season, LIME vessel tracking data was consistently transmitted from all VMS devices to PSMFC and then to the HLS server. While both Viatrax and Faria Beede units continued to drop a small number of data points, these gaps did not prevent reports from being successfully submitted. Viatrax continues to work on the issue.

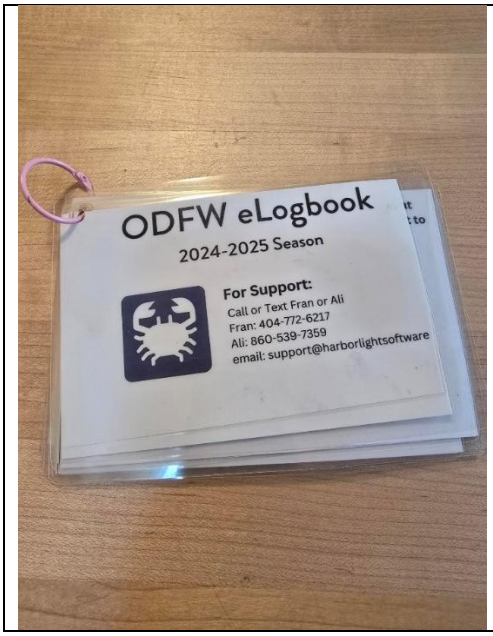
6. Lessons learned from field demonstration test that address changes to system requirements, implementation approach or other considerations for future fleet wide implementation.

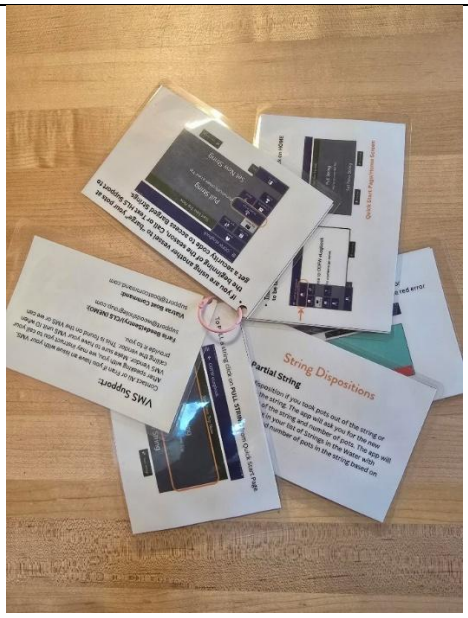
Training and Outreach

During Phase 3, we adjusted our approach to delivering training materials. We found that captains rarely check email while preparing their vessels or during the busy crabbing season. Instead of emailing training video links, we sent them via text message. Captains confirmed that this method was more effective, as they were able to watch the short videos directly on their phones. Keeping the videos only a few minutes long held their attention and allowed them to absorb information in smaller, more manageable segments—a marked improvement over Phase 2. We will continue to use this method of sending training videos to captains.

Links to training videos:
2025 Season 3 Profile Setup
Setting a string
Hauling and Sending in a Trip Report
VMS Recheck and State Ports

Flip Chart
In addition to training videos, we developed laminated "Flip Charts" attached to key rings, which captains could keep on their vessels. These provided a quick reference for frequently asked questions and definitions of string dispositions, giving captains an easy, durable tool to use while on the water.





String Dispositions

Captains reported confusion with the existing "string dispositions" options, such as moving an entire string or resetting part of one. They explained that these choices required them to stop and think about what was happening with the string while it was being pulled—something that could even change mid-haul. Several captains emphasized that, in practice, their work boils down to three simple actions: starting a string pull, stopping a string pull, and stacking pots from the string. Midway through the season, we began exploring this simplified approach, referred to as *Start/Stop/Stack*. We held multiple meetings with captains, who generously shared their time to walk us through real-world scenarios. Moving forward, this concept will be a primary focus as we work to streamline workflow and reduce unnecessary complexity for captains.

VMS "down" emails

Utilizing the "VMS down emails" each day will help us identify VMS issues quickly so that arrangements for new units or for captains to check their units can be timelier.

Outreach is KEY

As we approach our fourth year of this project, we will continue to encourage fishermen to reach out to us early and often. Consistent training and interaction with the fishermen will continue to bring better results in the next phase. Meeting with the captains a minimum of twice per season should continue. These meetings allow us to see and test their equipment, exchange ideas, and build a relationship with the captains so that they feel comfortable with reaching out to us at any hour of the day.

Post Project User Feedback Report

At the end of each phase, captains are encouraged to provide feedback on their season, suggesting improvements and highlighting successful aspects we should continue into the next season.

Here is a recap of their post-project feedback from meetings between Feb 24 through March 4, 2025.

[redacted]

[redacted] has been unable to send in two trips. One trip has a hauled string that is missing VMS data. He states the string lost date and time of haul. Another string was missing VMS data for two strings. We later found the issue was the VMS data was missing from the LIME data sent to PSMFC. This issue is being worked on between LIME and PSMFC. *NOTE: This issue was resolved later in the season after LIME corrected their issues with PSMFC.* [redacted] *was able to submit all of his trips this season.*

[redacted] reported that the app performed much better this year, noting significant improvements over both Phase 1 and Phase 2. He uses TimeZero software and suggested that an integration with the app would be extremely valuable. Within TimeZero, he color-codes his strings—green for active strings and orange for hauled strings—which he felt greatly improves usability. [redacted] also observed that the app crashed more often when the iPad was connected to Wi-Fi, but rarely when using his hotspot. *These crashing issues were resolved by the end of the season*.

[redacted] also shared broader perspectives, commenting that too much energy is devoted to one species—specifically whales—and expressing concern that they will become more of a nuisance than a priority for future management. Despite these concerns, he was enthusiastic about the project and expressed interest in continuing to use the app in the coming year.

Beyond his contributions to testing and feedback, [redacted] *left a strong personal impression on all of us. He enjoyed talking about visiting* [redacted]*, where his wife is from, and had a fascination with Tibetan coffee. The loss of Captain* [redacted] *was deeply felt by our team. Over the past three years, we came to know him well as a standout participant who gave generously of his time and ideas to strengthen the project. As the work continues, we will carry* [redacted] *insights forward, knowing he would have been eager to see the final product being realized*.

[redacted]

[redacted] experienced issues early in the season with the app freezing and, as a result, did not use it extensively. His hydraulic sensor was disconnected and remained unfixed even at the time of our meeting, though he indicated he planned to reconnect it before his next trip. [redacted] also did not have internet access on his vessel this year and instead had to bring the iPad home to retrieve VMS data. He stated he would be installing Starlink for next season.

During our meeting, [redacted] committed to trying harder in the second half of the season. He explained that the recent storm had scattered his gear and that he intended to reset all of his strings the following day. A subsequent check confirmed that he had set two strings, but our follow-up texts about his activity went unanswered. Although we continued to check in throughout the season, communication remained minimal.

This marks the second consecutive year with little engagement or effort from Captain [redacted]. Based on this track record, we recommend that he not be included in future phases of the project.

[redacted]

[redacted] completed four trips this season, all of which were recorded in his logbook. He reported having few issues with the app. However, upon reviewing his trip database, it became clear that while trip dates were entered, several strings were saved without dispositions. Because of this, the strings remained in his open list indefinitely rather than being cleared. In effect, he was able to set a string and haul it multiple times without ever recording a disposition.

When asked, [redacted] could not provide the start or end times of his trips. Without speed or hydraulic data from LIME in the current dataset, we were unable to reconstruct his activity.

Based on this feedback, we worked to gray out save button until a disposition is picked.

[redacted] is a difficult captain to assess. While he appears enthusiastic about participating, he is often hard to reach before and during the season. He does not reach out for assistance but expressed confidence that he was using the app correctly.

[redacted]

[redacted] reported that he started the season using the app successfully. When resetting long, straight strings, the workflow was smooth and he found it easy to use, especially with the ability to see his total pot count. However, as the season progressed, he felt the app became glitchy and used it less frequently. He experienced problems when breaking strings into smaller segments and when trying to stop one haul and immediately begin another.

Although he experimented with the list view and labels, [redacted] ultimately relied on the Map View. With Starlink running continuously, he noted that having VMS data return to the tablet quickly was a major improvement over the previous year, when he lacked internet access and was forced to depend on list view alone. This year, the ability to simply select his strings from the map made the process much easier.

[redacted]

[redacted] plans to continue fishing through August and has been consistently using the app on every trip, successfully submitting all of his reports electronically. He connects his iPad to his phone hotspot while hauling so he can use Map View, which he relies on since he does not use TimeZero software. Although he experienced some app crashes, he was able to work around them. At times, strings appeared in the list but not on the map; this was due to VMS data not yet being received. This issue should be resolved by enabling the iPad's GPS as a fallback (User Story 9932, current Sprint).

[redacted] emphasized the need for functionality to add pots to a string. He explained that he occasionally resets a string and then adds four or five pots, which the current system cannot capture—only pot removals are supported. After reviewing the Start/Stop/Stack methodology with him, he agreed that it would better reflect real-world fishing, particularly since he often stops strings mid-haul.

[redacted] has been a highly engaged participant, completing all 34 of his trips this season. He also tested an Android tablet provided later in the season and reported that, by the end, the app no longer crashed and performed smoothly. He expressed his support for electronic reporting, summing it up simply: *"I like not having to screw with paper."*

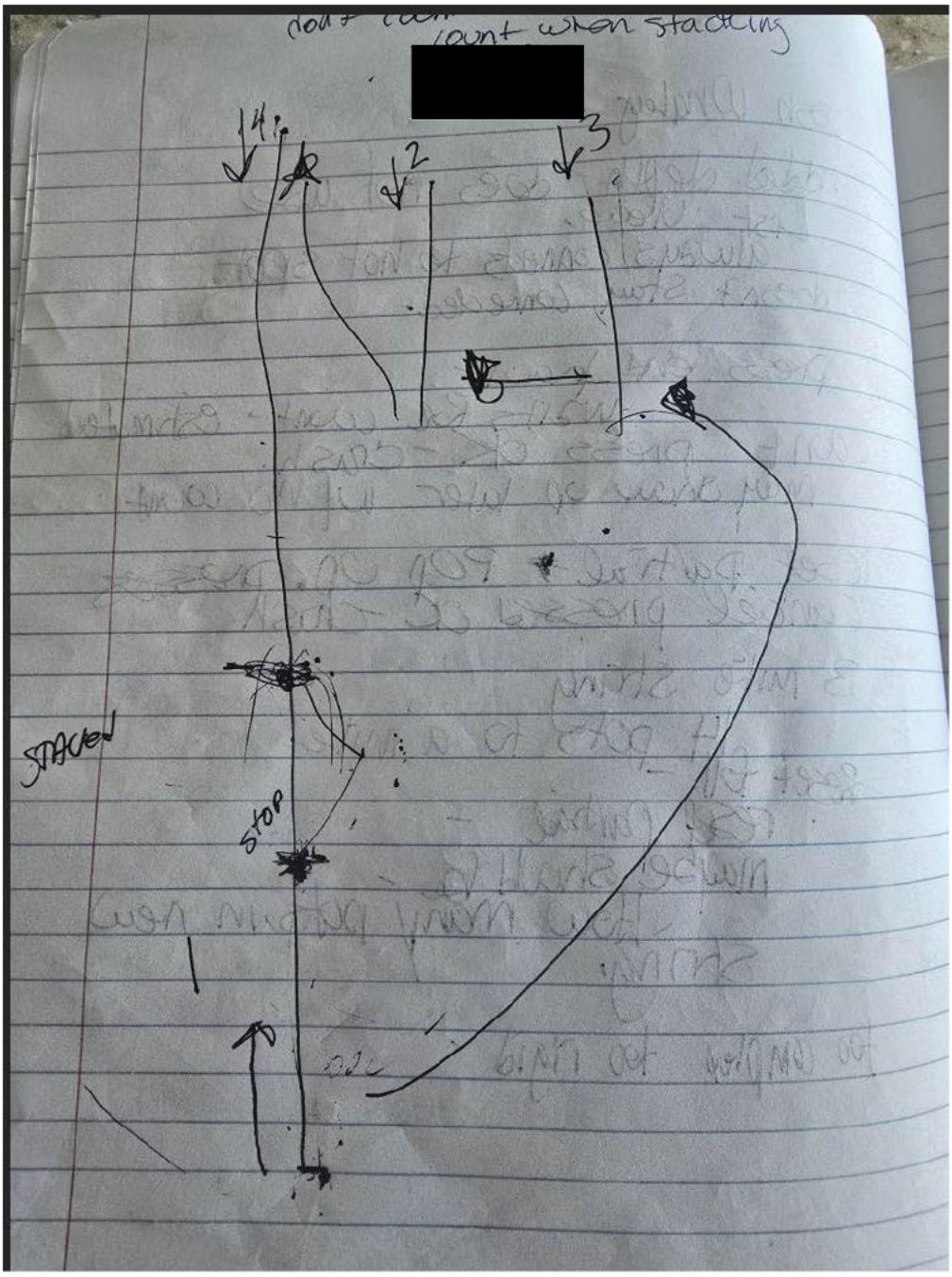
[redacted]

[redacted] performed well with the app, recording seven trips on his iPad. Four were completed and submitted successfully, while three showed missing VMS data. For the trips with missing locations, some of the data was later found in our database (logged under Bug #10062 for development review).

With the most recent app update, [redacted] can now use the *Recheck* button to retrieve VMS data that was initially missing on two trips (01/20 and 02/03). One additional trip (02/10–02/13) is still missing VMS locations from Pacific States/LIME. We reached out to [redacted] by text, asking him to update to the latest release and use the *Recheck* function to pull in the missing data from our server. He agreed to try this and report back.

[redacted] feels that the current platform is too rigid. He feels that allowing the user to input their locations by hand would be ok since we have the data to "back it up." [redacted] is always connected to a hot spot, but he often drops that hot spot when on a trip so that he goes back and forth with internet. He would like to see the LIME data come through quicker like the other vendors. [redacted] agreed that the app needs to be able to ADD pots to a string. Currently you can delete but not add. [redacted] is a captain who really THINKS HARD about making the program better. He is outspoken, but in a great way. Per [redacted] loves this kind of stuff because he used to work with computers and is excited about the project.

This diagram is what we used to walk through many different situations.



[redacted] suggested giving users the option to manually input locations when needed, noting that the system has the underlying data to validate entries. Although he is always connected to a hotspot, he often drops the connection during trips, causing him to switch between being online and offline. He would like to see LIME data transmitted more quickly, similar to other vendors, and emphasized the importance of adding functionality to add pots to a string. At present, the system only allows pots to be removed, not added.

[redacted] stands out as a captain who thinks carefully about how to improve the program. He is outspoken but constructive, offering thoughtful feedback grounded in his own experience. As [redacted] observed, [redacted] enjoys engaging with the technical side of the project—drawing on his background working with computers—and is genuinely excited about contributing to its success.

[redacted]

[redacted] participated in the first season of the electronic logbook project but opted out in the second, preferring to rely solely on his LIME unit rather than installing another VMS device. He was pleased that we were able to incorporate his LIME data this season. [redacted] expressed a strong belief that fishermen should "own" their data, and that if a captain authorizes real-time transmission from LIME, it should occur without additional barriers. While he understands the current data connection setup, he feels it is overly complicated and results in delays in getting data to his iPad.

He noted that the newest version of the app is far superior to the original release, describing it as "heads and tails over the first version." Having participated in several reporting projects, [redacted] commented that this one has made the most progress and that he is pleased with its overall direction. At the same time, he emphasized that fishing requires his full attention and that reporting is always secondary while at sea.

[redacted] successfully entered all of his trips this season, though we found a few "blank" strings in his logbook. These appeared to be caused by crashes, after which he reentered the data. Interestingly, [redacted] mentioned that he does not count pots while hauling, only when stacking, and instead labels his strings with simple state codes such as O5 or W11. During our vessel visit, we worked with him to correct missing crab counts and delete incomplete hauls caused by earlier crashes. After these edits, he was able to submit all five of his reports. Importantly, his reporting was not affected by the Pacific States/LIME transmission issues seen elsewhere.

[redacted]

[redacted] typically fishes until May, but switches to salmon if crab landings decline. At the start of the season, he was running an outdated iPad operating system and an older version of the software. We updated both and showed him how to check for future updates. He used the app early in the season but gradually trailed off. Limited internet access at his port made it difficult for him to view his strings on the map, so he relied on the list view and stressed that carefully naming strings was essential to his workflow.

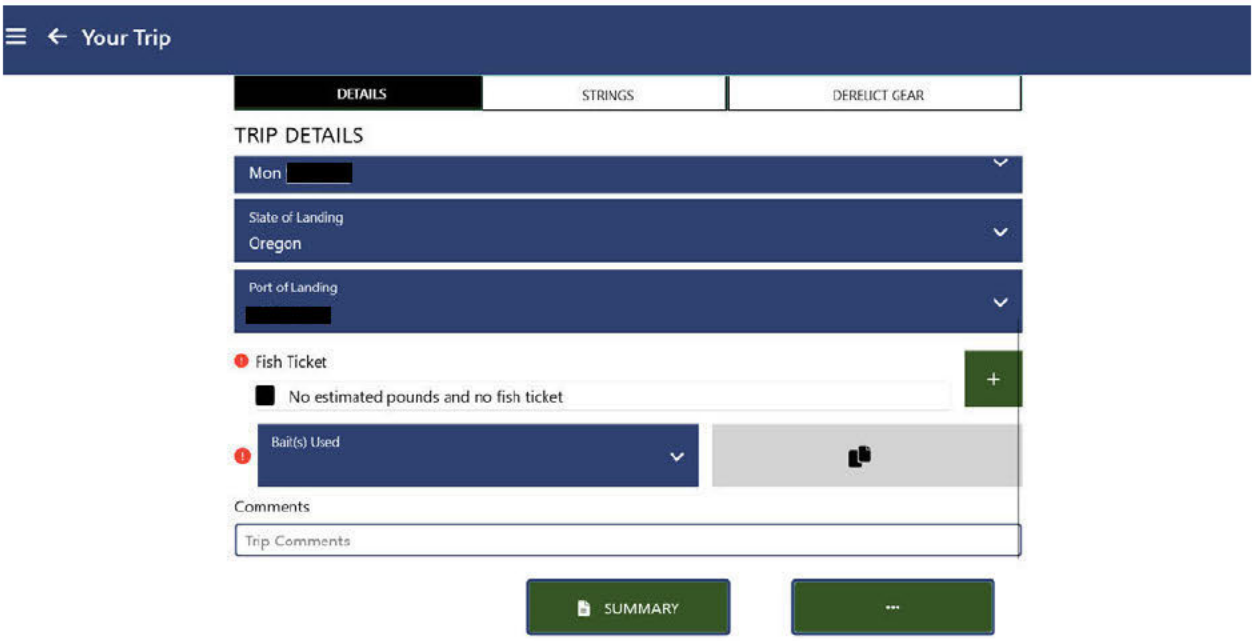
[redacted] that incorporating a Pause or Start/Stop/Stack feature would be important, emphasizing the need to balance data collection with ease of use. He indicated that he

would be willing to participate again next year. To address ongoing performance issues, we reset his tablet mid-season, then later replaced his iPad with an Android device, which ran much more smoothly for him for his last two trips of the season, but these trips were not sent in because he put both trips together under one trip and decided paper reporting was the way to go for this season. He is excited to participate next season with his new tablet.

[redacted]

[redacted] was the captain of the [redacted] for the first two trips of the season as [redacted] decided to pursue an alternative career choice. [redacted] was not ready to run the app, so he opted for paper reporting on some trips. [redacted] stepped in to run the vessel midway through the season. He stated he did not have too much of an issue with the app. He did experience some crashes but was able to work through it. We helped [redacted] determine an approximate number of pots pulled in two strings that he had forgotten to record that detail. [redacted] was able to submit 5 reports using the app.

[redacted] last trip of the season did not have any crab caught or sold. He does not have a fish ticket - so he could not submit his trip. Due to this, we later added in the ability to report "no catch" within the app.



[redacted]

[redacted] successfully submitted 13 trips this season, his first year participating in the project. He reported no major issues. His vessel is always connected to Starlink, and he uses a newer iPad model without a home button. The only minor problem he noted was that the app occasionally logged him out if left idle for an extended period.

[redacted] admitted some confusion when leaving one string to begin hauling another and then returning to the original string. He does not use the map view, instead relying on carefully naming his strings. He uses TimeZero software, while his crew member, [redacted], uses OLEC. Both responded positively to the idea of replacing dispositions with the Start/Stop/Stack approach.

One concern [redacted] raised was enforcement-related: his lines are sometimes set within 400 yards of another vessel's, and he wants to ensure enforcement understands that close proximity could cause his hauls to appear as if he were pulling another fisherman's gear, depending on positional accuracy.

[redacted]

[redacted] has been a strong advocate for the app, stating that he "loves it" and finds it far more reliable than in previous seasons. While he did experience some crashes, he was able to work through them and appreciated that the app now "kept its place," which he identified as a major improvement over last year. [redacted] does not connect to the internet while fishing and does not use TimeZero.

He described one challenge where he accidentally pulled the wrong string and was unsure how to correct it. Instead, he simply selected the correct string on the next haul—"two wrongs made a right," as he put it. Overall, he emphasized that the app is straightforward if users pay attention, though he acknowledged there will always be some complaints. In his words, *"the average crab guy would want to use it instead of paper."*

At the close of the season, a few of [redacted] trips were all able to be submitted using the app.

[redacted]

[redacted] has completed his crabbing season, which he described as difficult, remarking, "I zigged where I should have zagged." He is now looking ahead to shrimping. [redacted] explained that he tried to make his data as accurate as possible but encountered challenges when editing strings. He noted difficulty both in removing pots from a string and in needing the ability to add pots, admitting that his strings were not always perfect. He also reported that the app occasionally crashed in the middle of hectic hauls, at which point data entry became his lowest priority.

[redacted] uses TimeZero and relies on his Starlink connection, primarily for weather updates. He acknowledged that he often does not know the exact number of pots in the water, instead making his best estimate. Despite these challenges, he stated he would be willing to participate in the project again next year if asked.

[redacted] successfully submitted all of his trips for the season. He did experienc a number of app crashes, including one incident where the newest version crashed repeatedly while he was navigating between trips to view fish tickets.

Captains who were out of town or could not meet with us:

[redacted] (on vacation)
[redacted] (last minute issue- couldn't meet)
[redacted] (Vacation)

[redacted] have emerged as some of the app's strongest supporters. Both [redacted] were vocal in saying they never want to return to paper reporting and have even urged us to develop similar applications for other fisheries. Despite experiencing significant equipment setbacks—[redacted] with a melted hydraulic line and [redacted] with two faulty VMS units—they remained enthusiastic and unwavering in their praise for the app.

The feature allowing them to track ongoing crab counts within the app was described as a true "game changer." It not only streamlined their reporting but also introduced a new level of engagement, turning the process into friendly competition among [redacted]. They compared results, monitored their progress, and treated the app as more than just a compliance tool—it became part of their fishing experience.

Their feedback underscores how, when the technology works reliably, it can add real value beyond reporting requirements, fostering buy-in and even excitement among captains who have traditionally resisted electronic systems.

[redacted]

[redacted] was to participate midway through the season. He had all of his equipment ready to install when he found that his vessel [redacted]. Due to this, he could not fish this season and had to concentrate on fixing his vessel. He is planning on participating in this upcoming season.

Conclusion

Phase 3 of the electronic logbook project demonstrated continued progress in both technology performance and captain engagement. Many participants reported that the app has improved significantly over previous years, with features such as ongoing crab counts, map-based string tracking, and the transition toward a simplified *Start/Stop/Stack* workflow being especially well received. Captains like [redacted], [redacted] showed that when the system functions reliably, it not only streamlines reporting but also adds value to their day-to-day operations.

At the same time, the season revealed ongoing challenges. Technical issues such as outdated tablets, intermittent crashes, and incomplete VMS data from vendors created barriers to consistent reporting. In other cases, limited captain engagement or lack of precise trip data made it difficult to validate haul counts or reconstruct trips. Efforts to use sensor data to identify exact pot pulls showed promise but underscored the complexity of separating true haul events from other hydraulic activity, reinforcing the need for continued testing of sensors.

Moving forward into Phase 4, the project will focus on three key areas: strengthening training and communication so captains feel comfortable reaching out early and often; continuing technical improvements such as the Start/Stop/Stack workflow, add-pot functionality, and device performance stabilization; and refining the integration of sensor data to improve accuracy. We look forward to another crab season and working with these terrific captains.