Operationalizing ScallApp: A tool to engage the fishing industry in tracking scallop health and reproduction

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Executive Summary

Project Title: Operationalizing ScallApp: A tool to engage the fishing industry in tracking scallop health and reproduction

Years Awarded: 2024-2026

RSA Priorities Addressed by this Research: 2023/2024 Scallop RSA Research Priority #2 "Research on Atlantic Sea scallop biology, including studies aimed at understandingrecruitment processes (e.g., reproduction and gonad development, timing of spawning, larval transport, larval and early post-settlement stages, source/sink dynamics, age and growth, and yield) ..."

Industry Partners: Mike Marchetti, F/V Resilient; Adam Puslys, F/V Ava G; Jim Elliot (owner), Mark O Boyle (captain), F/V Vengeance; Jim Gutowski (owner), Corey Karch (captain), F/V Kathy Ann; Jake Wiscott, F/V Susan L; Walter White (owner), Jorge Matos (captain), F/V Chandler Rae; Erik Watermen (owner), Jessy Gilley (captain), F/V Sea Star; Kyle Grant, F/V Grace; Hunter Lees, F/V Seel Jr.; Eric Hansen, F/V Endeavor; Joseph Gilbert, F/V Regulus; Joe Baker, F/V Harvest Moon; Joao DeAlmeida, F/V Paul Michelle; Mark Buron, F/V Nordic Fisheries; Ken Thomas, F/V Grand Larson 3;Chris Benavidez, F/V Miz Alma B, F/V Miz Juanita B, & F/V Miss Stevie B II

Project Narrative: Changing ocean conditions are impacting the biology and physiology of the Atlantic Sea Scallop (*Placopecten magellanicus)* through the emergence of diseases and changes in reproductive dynamics. Scallop health and reproduction are monitored during annual dredge surveys, but these surveys almost exclusively occur from late spring to summer. The need for year-round, area specific information on scallop reproduction and meat quality can be filled by the fishing industry. With this in mind, the Commercial Fisheries Research Foundation (CFRF) created a fishery-dependent smartphone application to collect data that tracks these conditions through space and time.

The smartphone application, coined ScallApp, was designed as a self-guided, quick to use tool, that can be downloaded and operated by members of the scallop fishing community. Through ScallApp, scallopers collect timestamped and geolocated disease and gonad stage data along with images of individual scallops. The data is managed by CFRF, and the images are fed to a data portal that generates interactive maps for use by the broader fishing industry, as well as fisheries scientists, managers, and educators. Additionally, to encourage scallopers to use ScallApp outside the context of Research-Set-Aside quota, the CFRF created "ScallApp Games", a reward-based incentive program designed to further incentivize sampling effort.

Together, these project components provide a comprehensive infrastructure that can be utilized by a broader fleet of participating fishermen to collect images year-round, across the full range of the resource, and contribute to a near real-time understanding of environmental impacts to sea scallop biology. This presentation highlights the development of ScallApp, its successes and challenges as a cooperative research tool, and outlines next steps for expanding its use.

Preliminary Results and Discussion

We successfully achieved our initial goal of collaborating with 10 or more captains during the project's first phase, spanning geographical regions of interest. To further incentivize scallopers to use ScallApp without the prospect of RSA, we have created “ScallApp Games” which includes four prize categories: most sessions submitted, longest consecutive months sampled, most months sampled and a random draw. Monetary prizes will be awarded to first and second place winners, while third-place winners will receive CFRF merchandise, with winners announced three times per year.

ScallApp underwent several times during the project. The first update, released in mid-February added meat quality and enabled users to capture additional scallop images in support of the University of Connecticut’s project “Combining Ocean Models and Historical Shell Archives to Quantify and Project Spatiotemporal Changes in Atlantic Sea Scallop Functional Traits”. A second update improved location settings, ensuring all sessions included geotagged reference images. A third update resolved technical issues in the shell collection component of the app. The final update implemented a single-factor authentication to verify user phone numbers, enhancing security and preparing the app for broader public access.

In total, 220 sessions were submitted in 2025, with the greatest activity occurring during the spring and fall. Data were collected for every month except January, likely because the app was released late in the month. Since the implementation of ScallApp Games, an additional 470 sessions have been submitted in 2026, proving the effectiveness of a reward incentive for citizen science data collection. All data were successfully integrated into the ScallApp data viewer, allowing users to examine gonad status, meat quality, and disease presence. Lastly, the ScallApp Data View was moved from the original R-Shiny app, to our internal CFRF Data Dashboard via OnDeckData. This update featured enhanced functionality and appearance.

Special Comments:

We submitted a proposal to the 2026 RSA program to transition ScallApp from an initial development phase to a sustained, industry-integrated data collection platform. Achieving this transition requires targeted refinements to improve usability, expand participation, and enhance cost-efficiency.

To accomplish this, we will: 1. Sustain and enhance ScallApp data collection by maintaining core functionality and implementing targeted improvements for open use; 2. Optimize industry participation incentives by refining engagement strategies; 3. Deliver actionable insights through communication and outreach by translating ScallApp data into accessible products that inform sea scallop science, management, or industry decision-making. The expected outcome is the establishment of ScallApp as a reliable, day-to-day data collection tool embedded within fishing operations, providing a scalable and cost-effective mechanism to support ongoing research, monitoring, and adaptive management.