

P-SEA WINDPLOT PROGRAM AS A REPLACEMENT FOR EXPIRING 3G cELB



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Introduction

- Current problem for monitoring shrimping effort
 - The cELB devices that record and transmit data via the Verizon 3G cellular networks no longer function because Verizon has discontinued this 3G service.
 - Data can still be recorded to the cELB, but there is no mechanism for retrieval.



Industry-led solution for monitoring shrimping effort

- Use existing navigational software
 - Shrimpers routinely use P-Sea WindPlot navigational software to determine their position and record their tow tracks.
 - Could this software be modified to record the two essential data elements for calculating effort (lat/lon and date/time at 10-minute intervals)?
- Southern Shrimp Alliance (SSA) requested LGL Ecological Research Associates explore whether P-Sea WindPlot could be used to record the same information as the cELB in a way that would be compatible with existing NMFS software routines that use those data to calculate shrimping effort.

Industry-led solution for monitoring shrimping effort (continued)

- Over a 4-month period, LGL worked with the P-Sea WindPlot developer to modify the software to record the same information as the existing cELB program (location data at 10-minute intervals) in a way that would be compatible with existing software routines that use that data to calculate shrimping effort.
- This software was designed to be available free of charge to anyone already running P-Sea WindPlot (which LGL determined is likely a very large portion of the offshore fleet).
- LGL also devised a method to pair effort (location) data with landings data for each trip and thus improve matching these values for more robust CPUE estimates.

Industry-led solution for monitoring shrimping effort (continued)

- Every time P-Sea WindPlot is turned on a new ELB file (binary, “.dat” file) is generated in a “hidden” folder within the P-Sea WindPlot folder on the computer’s C: drive.
 - The latitude and longitude and date/time stamp are written to this file every ten minutes. If P-Sea WindPlot is closed for any reason (turned off, power lost, etc.) then the program closes the file, but all previously written data is saved.
 - When P-Sea WindPlot is turned back on, a new file is written, and data is again recorded.
- Upon the completion of a trip, a USB memory stick with a folder titled “ELBprog” can be inserted to the computer and a dialog box will automatically ask to download the files from the ELBprog folder with a “.dat” extension.
 - After these files have been downloaded to the USB memory stick’s ELBprog folder the files in the computer’s C: drive are renamed with the extension “.old”
 - This will allow the location data to be maintained on ship’s computer (as a potential backup) but will keep these files from being downloaded a second time on subsequent trips.

Result of a December 4-18, 2020 trip by "B99986"

- Effort calculated and mapped, trip recorded 7.75 days fishing in 12 coded cells (statistical area (1st two digits of Zone code) and 5 fathom depth increments (last two digits of Zone code)).

Table 1: Table of Detected Trips

	Box	Sdate	Edate	Towdays
1	99986	12/4/2020	12/18/2020	7.75

Table 2: Days Fished by trip end date and NMFS Cell

	Box	Edate	Zone	Towdays
1	99986	12/18/2020	2007	0.92
2	99986	12/18/2020	2012	0.57
3	99986	12/18/2020	2010	0.42
4	99986	12/18/2020	2008	0.42
5	99986	12/18/2020	1911	0.19
6	99986	12/18/2020	1908	0.42
7	99986	12/18/2020	1806	1.69
8	99986	12/18/2020	1807	0.98
9	99986	12/18/2020	1907	1.23
10	99986	12/18/2020	1903	0.31
11	99986	12/18/2020	1902	0.42
12	99986	12/18/2020	1706	0.17

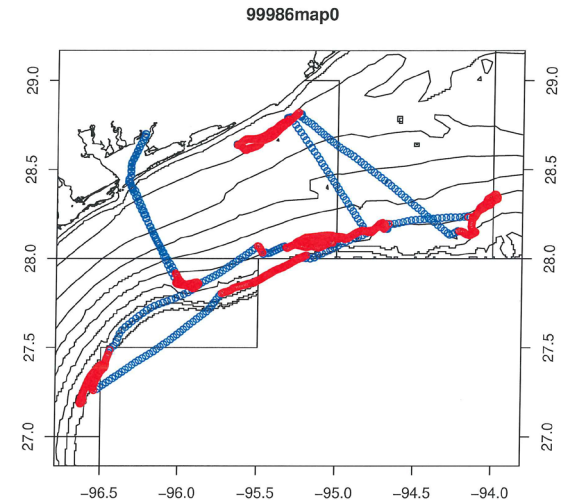


Figure 1: Trip from 12/04/20 to 12/18/20

Conclusions and Path Forward

- The original ELB and subsequent cELB program was jointly developed by industry and NMFS and has been in place for over a decade to support a shrimp fishing effort data collection program for sustainably managing the shrimp fishery.
- There is no individual vessel enforcement dimension to this program, nor has there ever been one in the approved historical programs using ELBs or cELBs.
- The proposed program (and the historical ones) is (are) designed to be a fleetwide, scientific data collection tool and not an individual vessel enforcement tool.

Conclusions and Path Forward (continued)

- Any ELB replacement needs to test and prove efficacy of three major components
 1. ***At sea testing aboard a shrimp vessel for device functionality*** - this ensures the device functions as intended: a) in the geographic location of historical shrimp grounds, b) within the constraints imposed by physical configuration of shrimping vessels and gear, and c) under actual operating conditions for vessels which remain offshore for 30-45 days at a time.
 2. ***Testing of device for data accuracy and compatibility*** - needs to include paired analysis of location data from both a replacement device and an old 3G cELB collected from the same vessel that has been working offshore. Data files from the new device would need to be input into current NMFS shrimp algorithm software and subsequently compared to 3G data collected from the same fishing trip to ensure the new device produces: a) accurate data, b) data that are in a format compatible with current shrimp effort algorithm software, and c) data that are directly comparable to historic shrimp effort data.
 3. ***Testing of transmission mechanism*** - device needs to demonstrate it can transmit recorded data when in range of a tower/transmission signal to a designated server in a secure manner.

Conclusions and Path Forward (continued)

- A simple approach using the vessel's navigation system has been developed and tested at sea for functionality and shown to provide the same effort information produced by the agency-approved and administered cELB system that has been in place for many years. Thus, two out of the three major components have been completed, one component (data transmission) remaining.
- The next step would be to
 1. Work out methods to automatically transmit ELB data and paired trip ticket information to a designated NMFS server and
 2. To initiate installation of the system on a representative subsample of the fleet selected using a random, stratified approach (cost ~\$350 k).