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# **NMFS' Side-by-side Pilot Testing of NEMO (cVMS) and Historical cELB Units for Gulf Shrimp Vessels**

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## Why are we conducting this evaluation?

3G Cellular transmission used in the current cELB program has ceased.

Given the differences between cELB and NEMO programs, the Council requests that NMFS evaluate and consider draft approval specifications.

Objective here: Because of the potential move to a new GPS system - Compare cELB and NEMO data.

# Who manufactures NEMO Units?

The NEMO provider agreed to deploy units free of charge for testing



3G CDMA cELB

cELB



3G transmission used in cELB has ceased.

# What is the underlying technology?

A **Global Positioning System (GPS) chip** is a microchip that is used in a GPS receiver, which receives signals from four or more of the 27 GPS satellites currently orbiting Earth. A GPS device can calculate its position based on the amount of time it takes to receive a signal from each of the four satellites.

Recording device (SSD card or miniUSB drive) and all devices can be set to record location at any interval.

Cellular device to call home and upload data when in range of port.

NEMO developed both pluggable and solar devices.

# Deployments Previously Examined

Vessel	Location	Faria Beede	Woods Hole	cELB	Other Technology?	Comments
<b>RV Caretta</b>	MS		X	X	FishBit data logger	
<b>Shrimp Vessel</b>	AL		X	X		Did not fish
<b>Shrimp Vessel</b>	AL		X	X		Did not fish
<b>Shrimp Vessel</b>	East Coast			X		Did not fish
<b>Shrimp Vessel</b>	FL	X		X		cVMS did not work
<b>Shrimp Vessel</b>	FL	X		X		cVMS did not work
<b>Shrimp Vessel</b>	FL	X		X		cVMS did not work
<b>4-Recent Vessels</b>	TX		x	x	<u>WindPlot and Others</u>	Working with LGL

Pluggable NEMO cVMS units

NMFS thanks the three industry vessels for volunteering for this project. For additional information contact Farron Wallace [Farron.Wallace@noaa.gov](mailto:Farron.Wallace@noaa.gov).



# Deployments Examined

Vessel	NEMO (WHG)	cELB
Shrimp Vessel I	X	X
Shrimp Vessel II	X	X
Shrimp Vessel III	X	X
Shrimp Vessel IV	X	X
Shrimp Vessel V	X	X

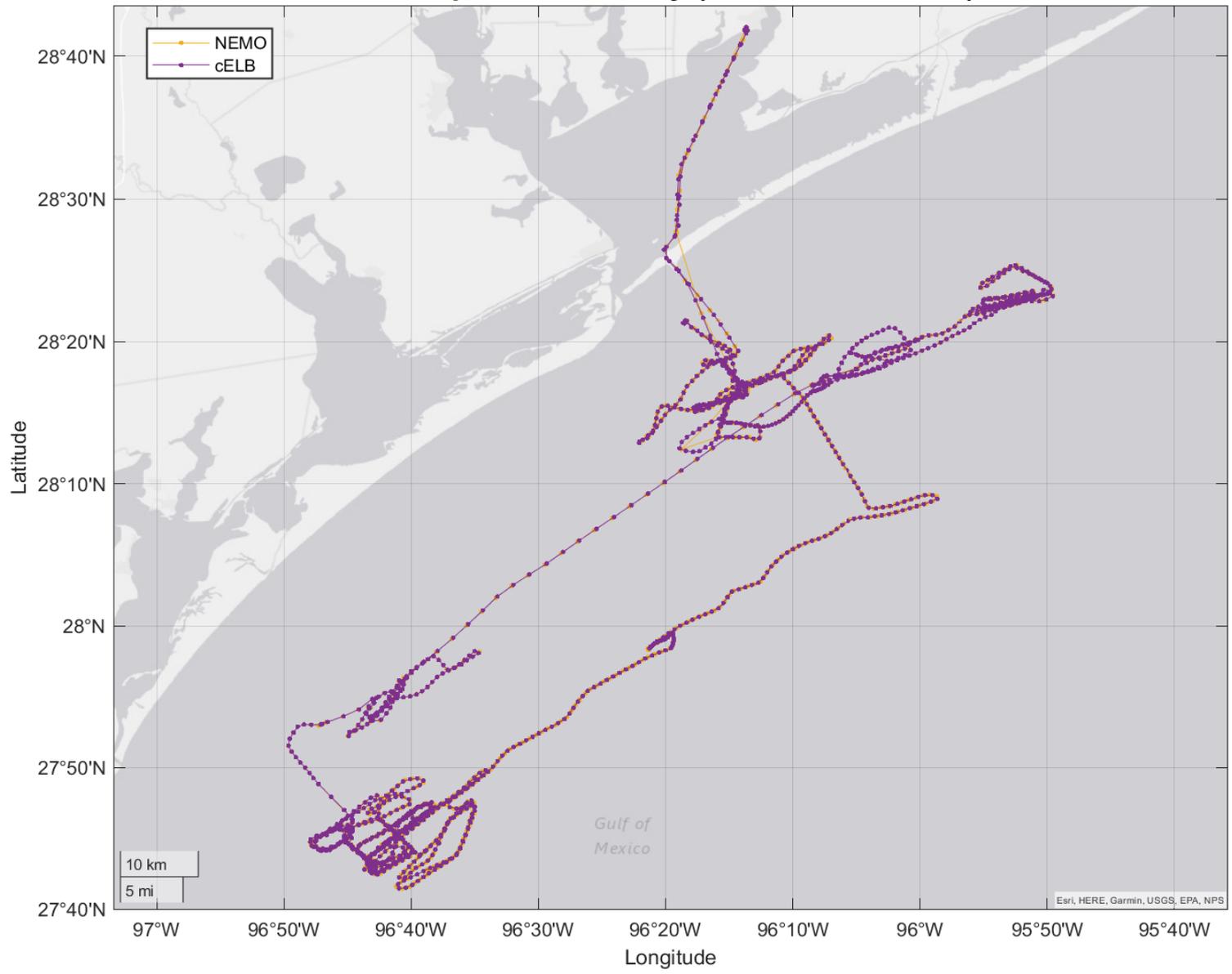
Solar NEMO cVMS units

NMFS thanks the five industry vessels for volunteering for this project. For additional information contact Farron Wallace [Farron.Wallace@noaa.gov](mailto:Farron.Wallace@noaa.gov).

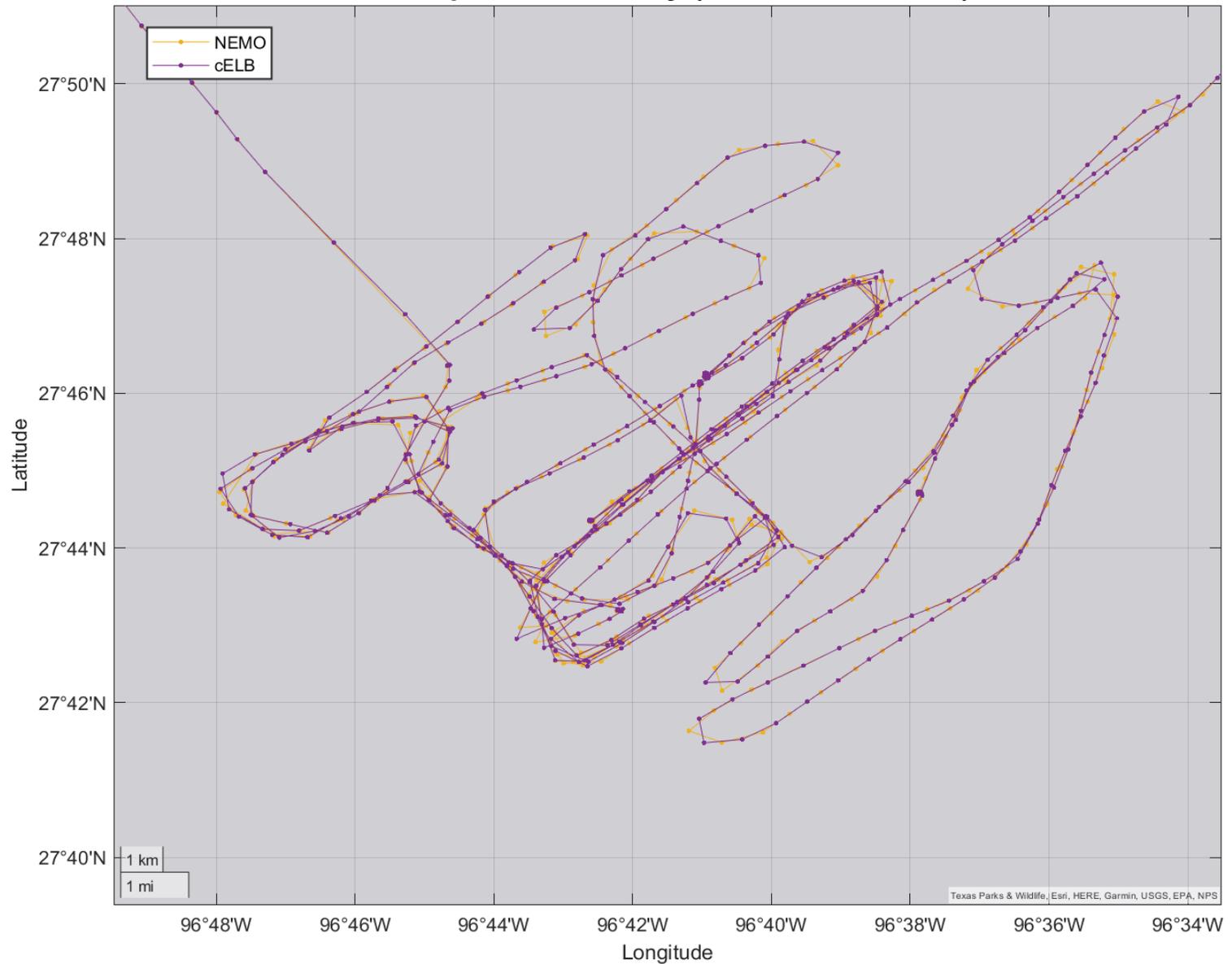
# Securing and processing data

- NEMO data were checked/corrected for ping rate issues during collection in the first two weeks and then left to operate without interference.
- NEMO data were retrieved from Woods Hole Group's Thoriumweb.com password protected web service.
- cELB data were retrieved via miniUSB drives from the devices themselves by LGL Associates.
- Data were cleaned by eliminating observation rows containing out of range coordinate/time stamp data and processed using the same codes for the Caretta study.

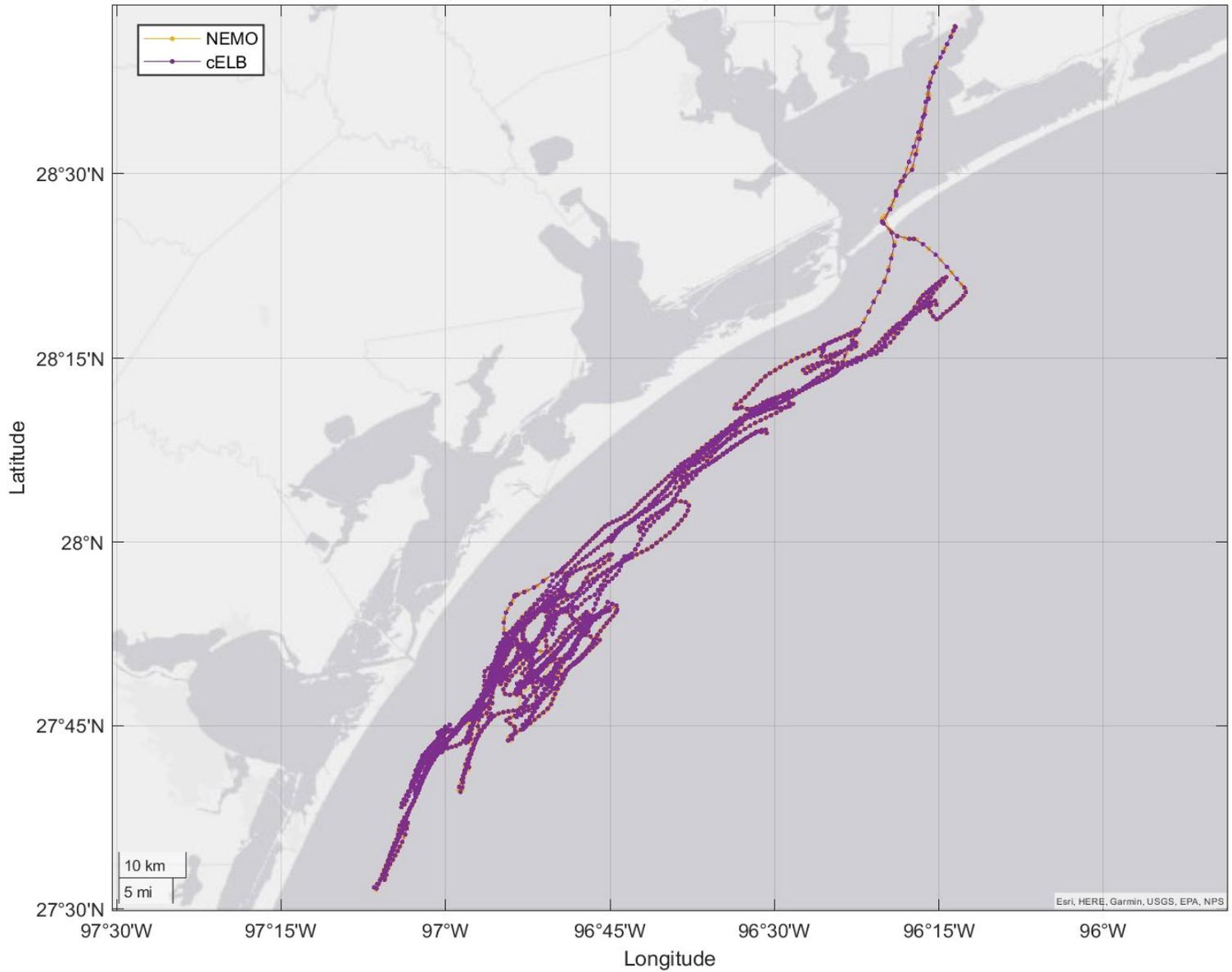
# Shrimp Vessel I Study (All Data - Cleaned)



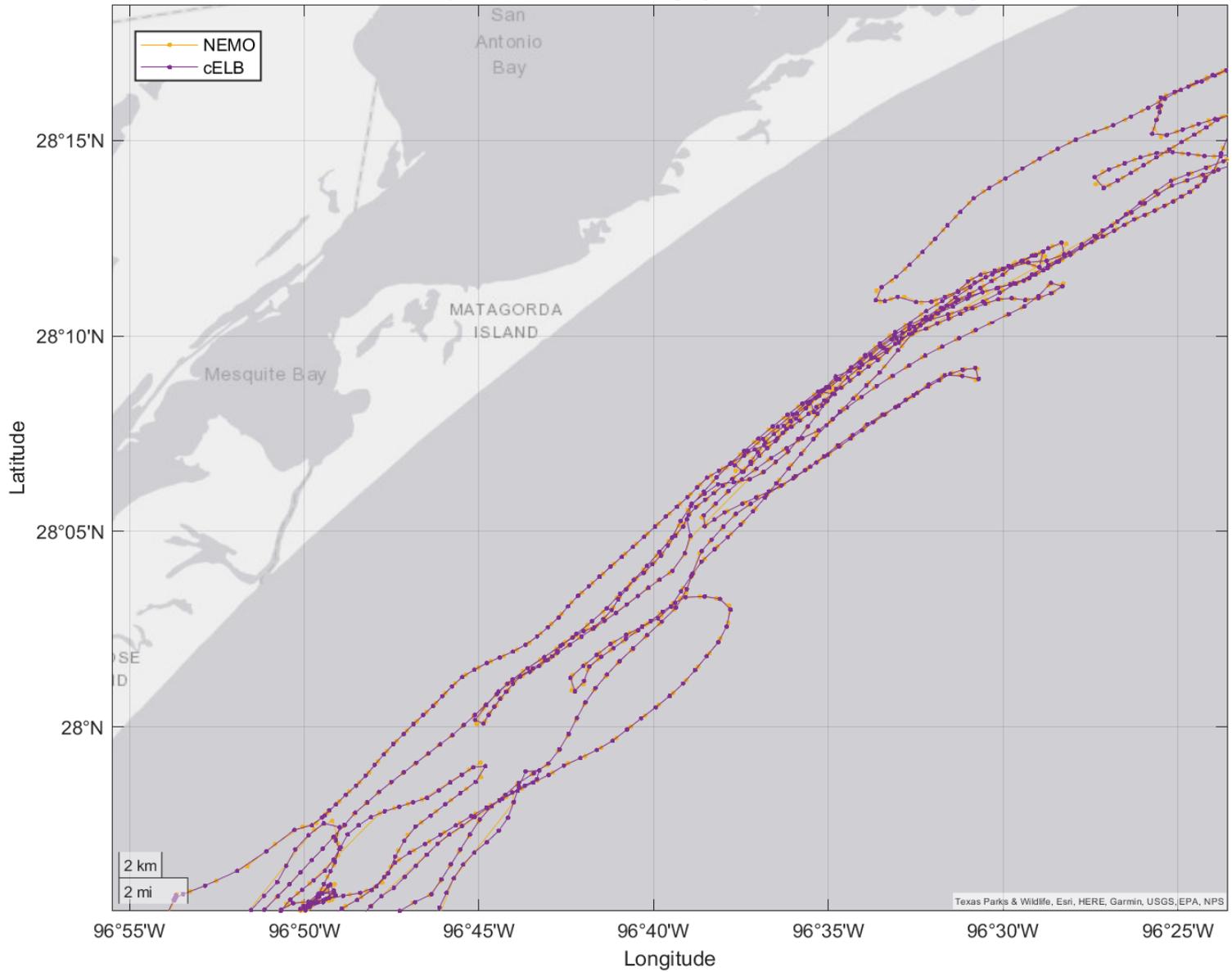
# Shrimp Vessel I Study (All Data - Cleaned)



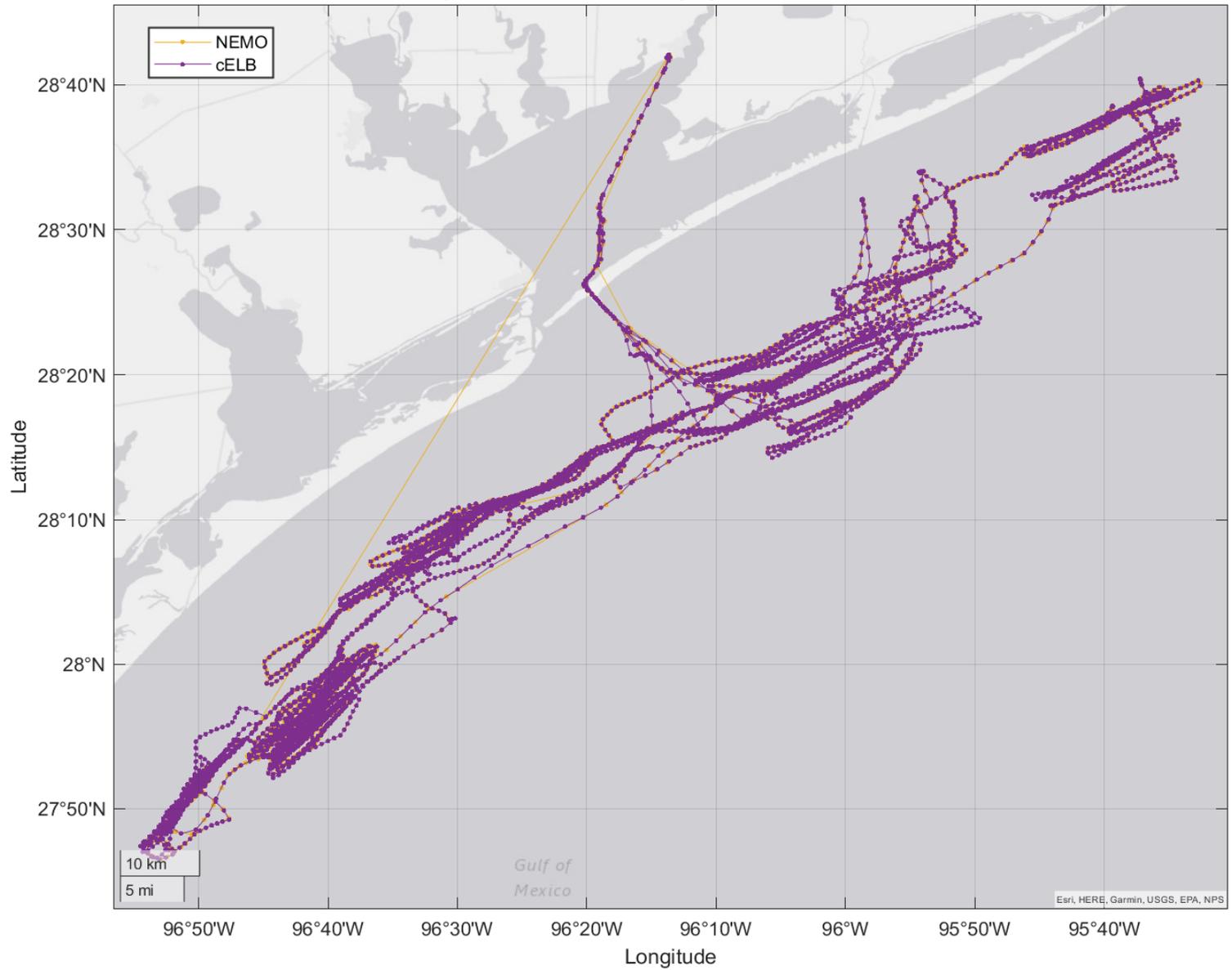
# Shrimp Vessel II Study (All Data - Cleaned)



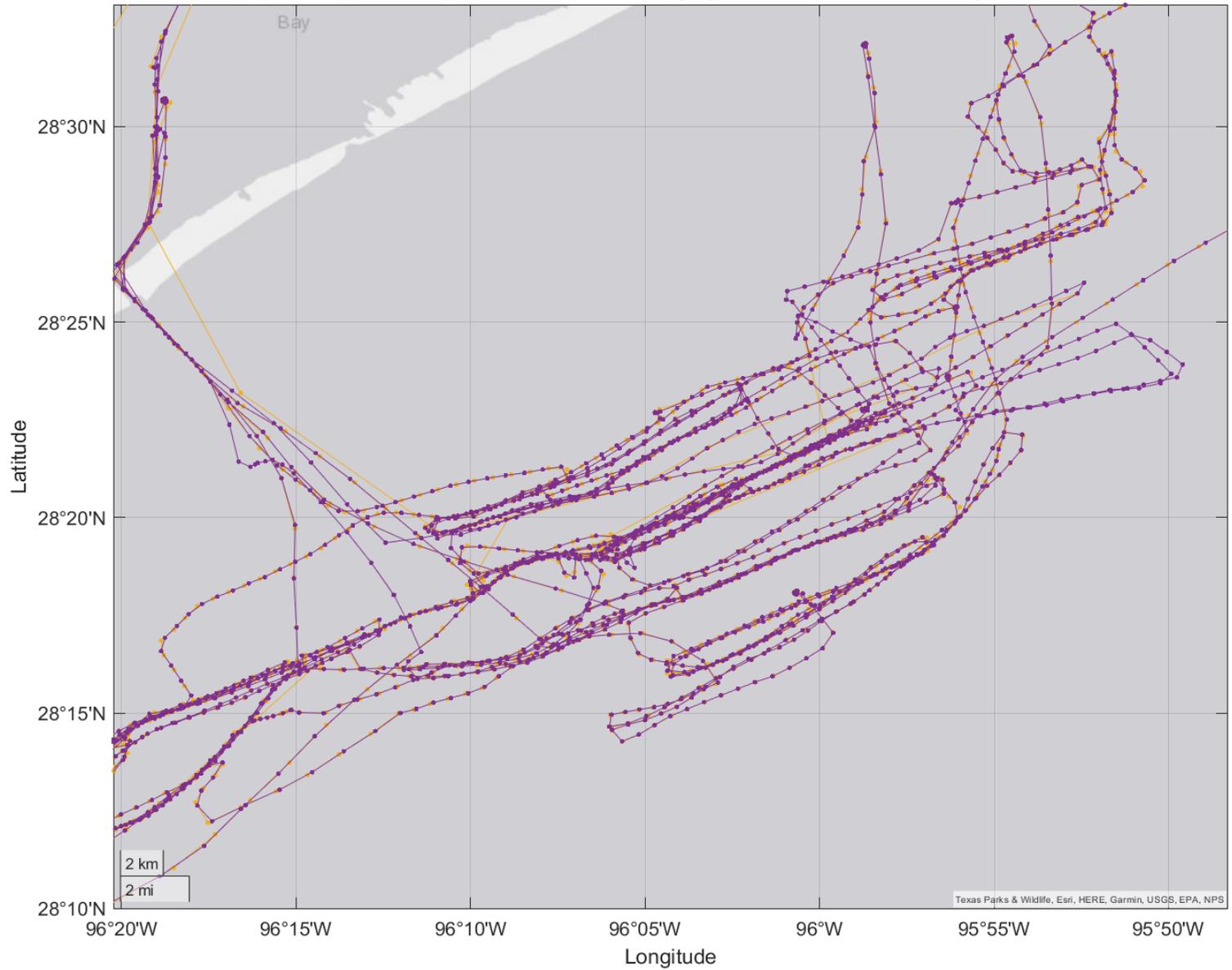
# Shrimp Vessel II Study (All Data - Cleaned)



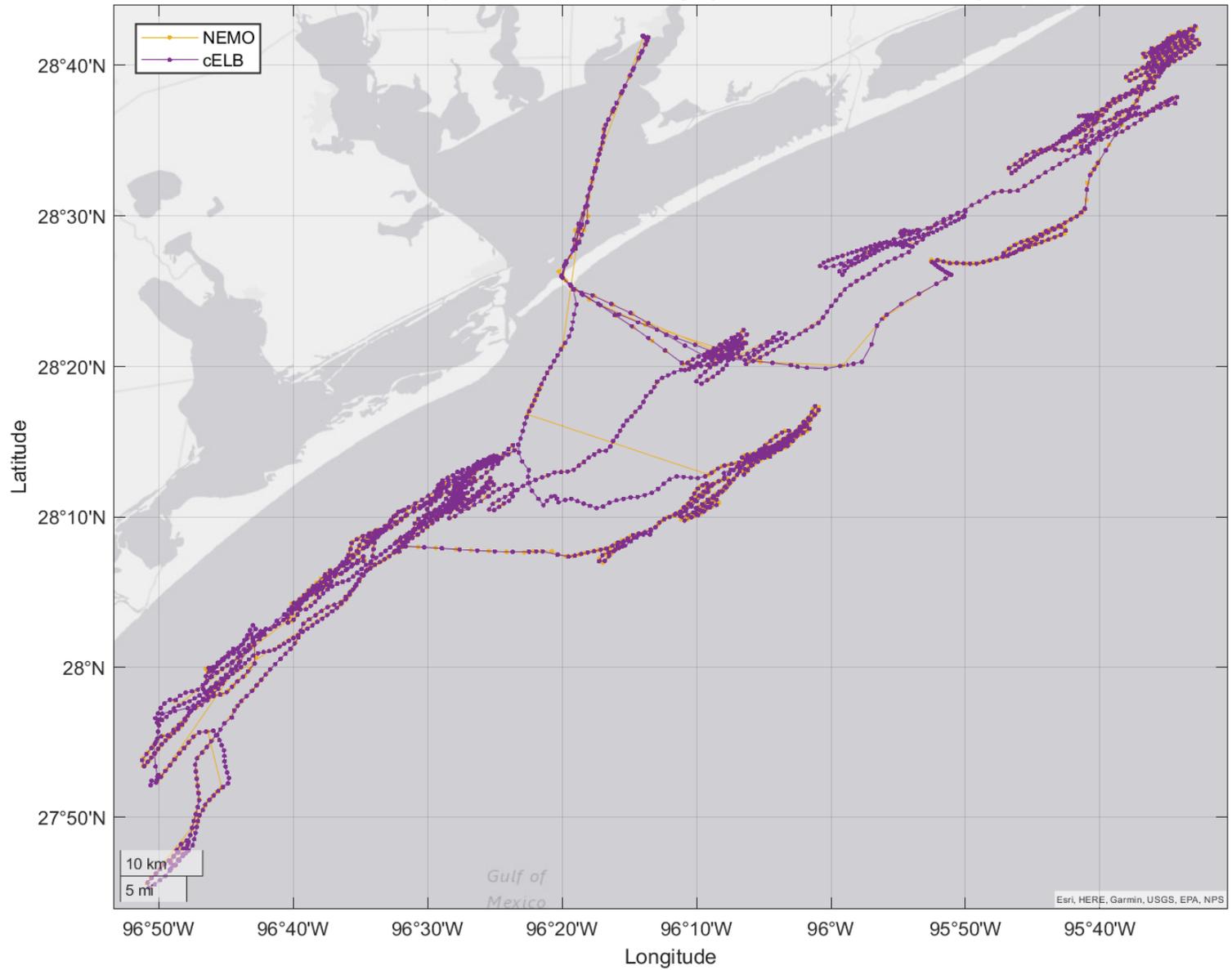
# Shrimp Vessel III Study (All Data - Cleaned)



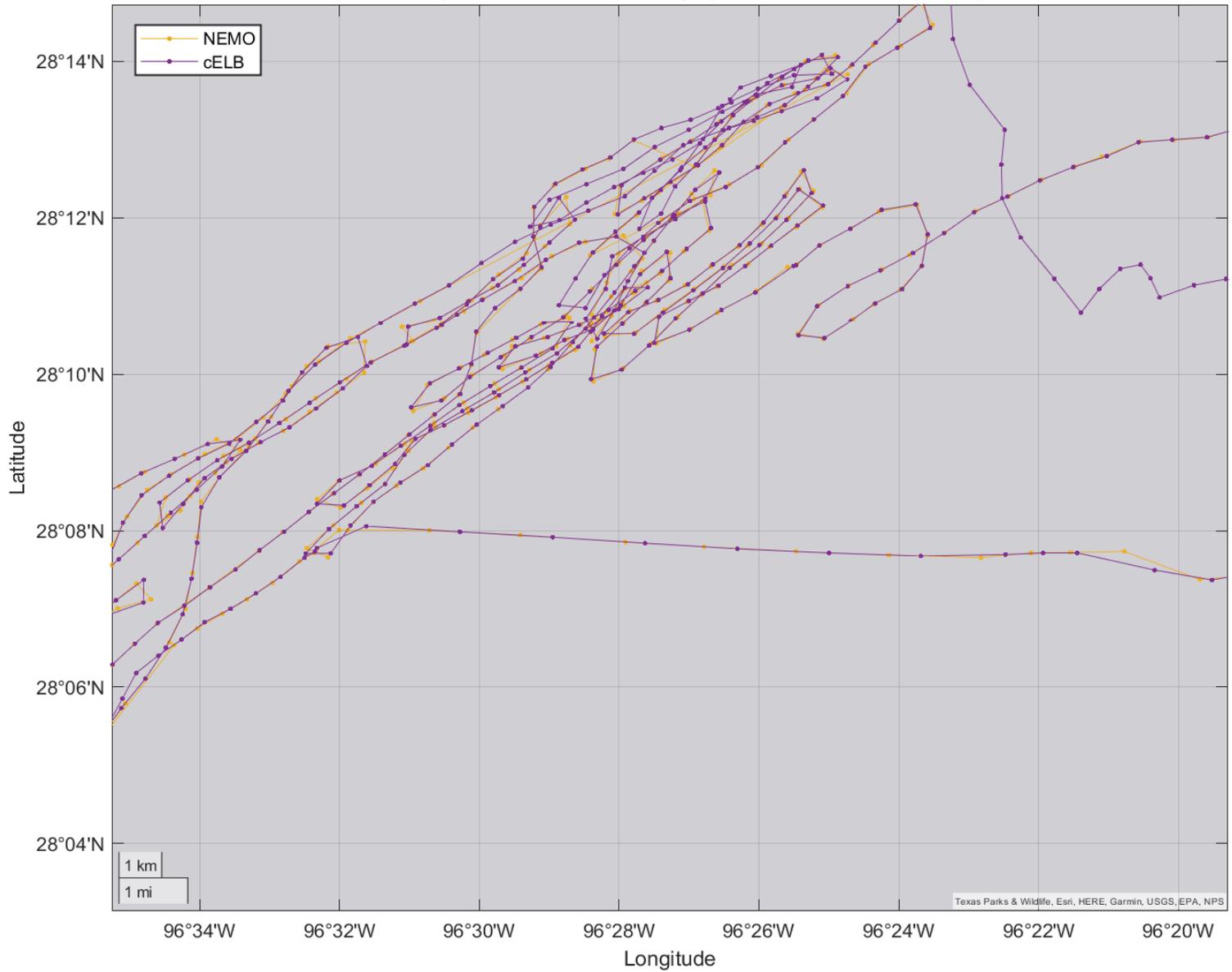
# Shrimp Vessel III Study (All Data - Cleaned)



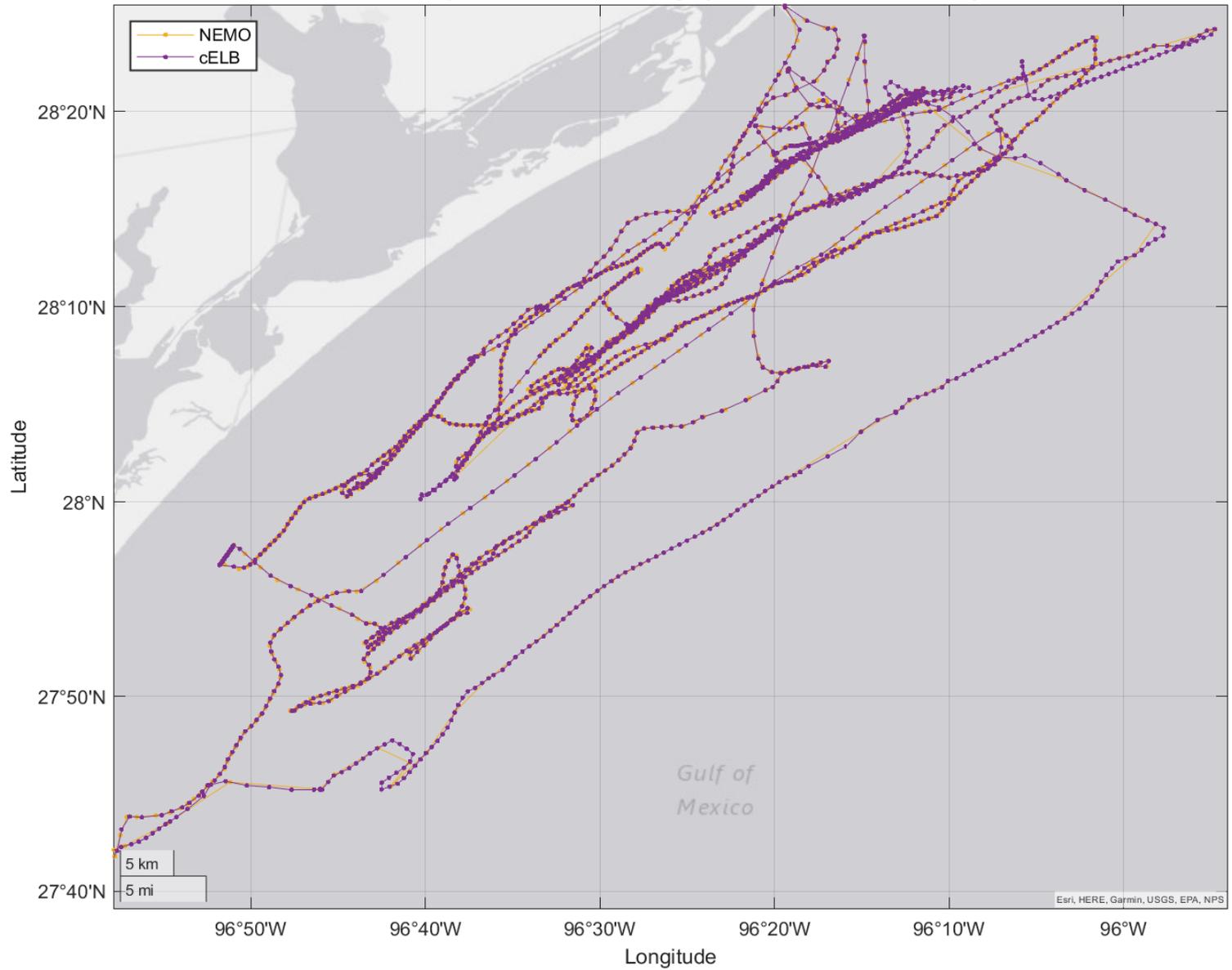
# Shrimp Vessel IV Study (All Data - Cleaned)



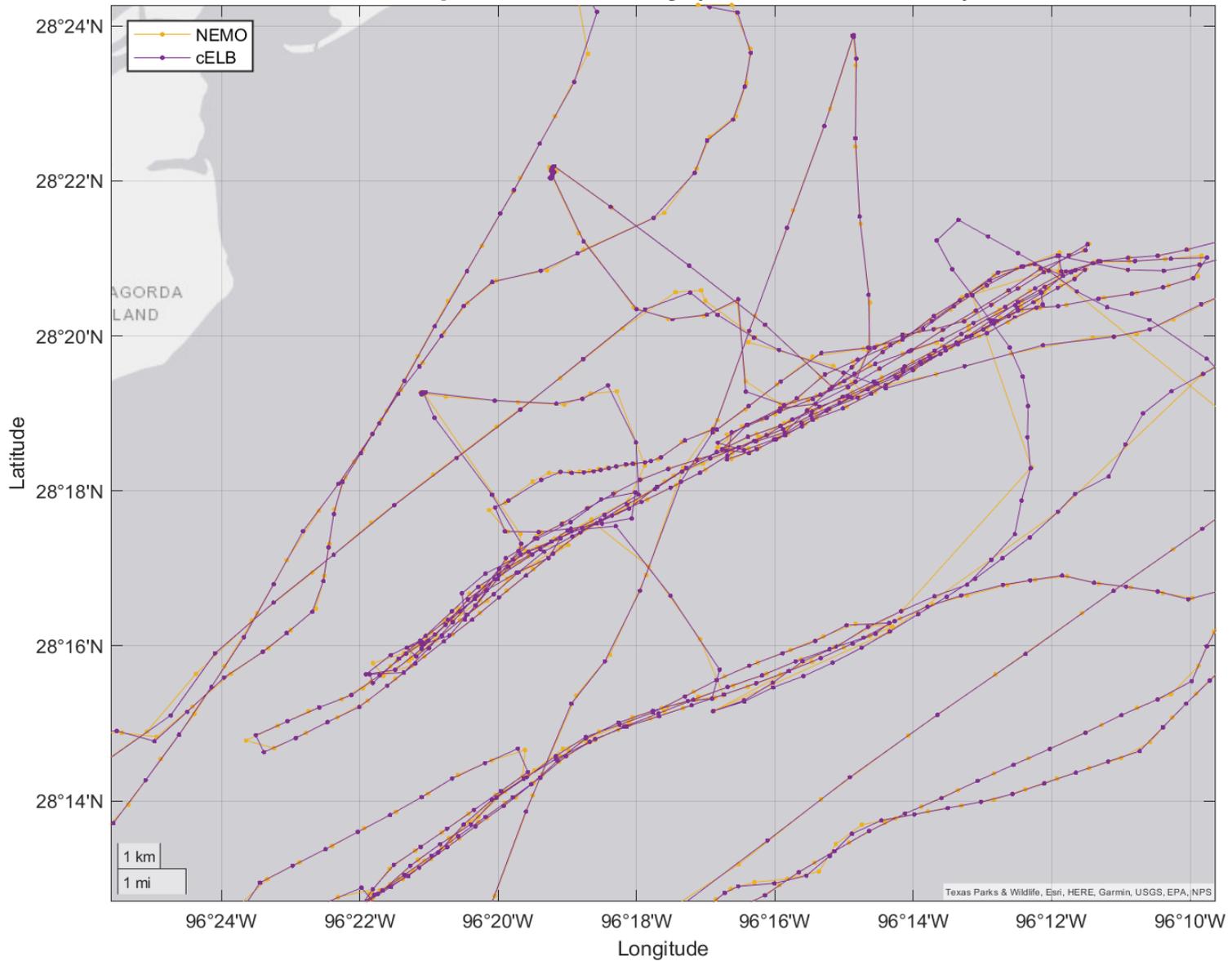
# Shrimp Vessel IV Study (All Data - Cleaned)



# Shrimp Vessel V Study (All Data - Cleaned)



# Shrimp Vessel V Study (All Data - Cleaned)



# Conclusions

- Good overlap between NEMO and cELB tracks/tows
- Solar powered NEMO had intermittent issues with ping rate making it very difficult to evaluate
- cELB data for Vessel 3 had section of bad data in the middle of the record that was removed.
- Pluggable cVMS unit deployed on the Caretta was consistent cELB

# Trip Statistics from Caretta deployment

- Pluggable cVMS Unit

	<b>Distance Swept</b>	<b>TimeSwept</b>
<b>cVMS</b>	96.5730 nm	35.1619 hrs
<b>cELB</b>	98.0740 nm	37.0703 hr
<b>Diff</b>	1.5010 hrs	1.8683 hrs
<b>%-Diff</b>	1.5305	1.9050



- Thanks to the Captains and crews of the five F/Vs that participated in this work.