

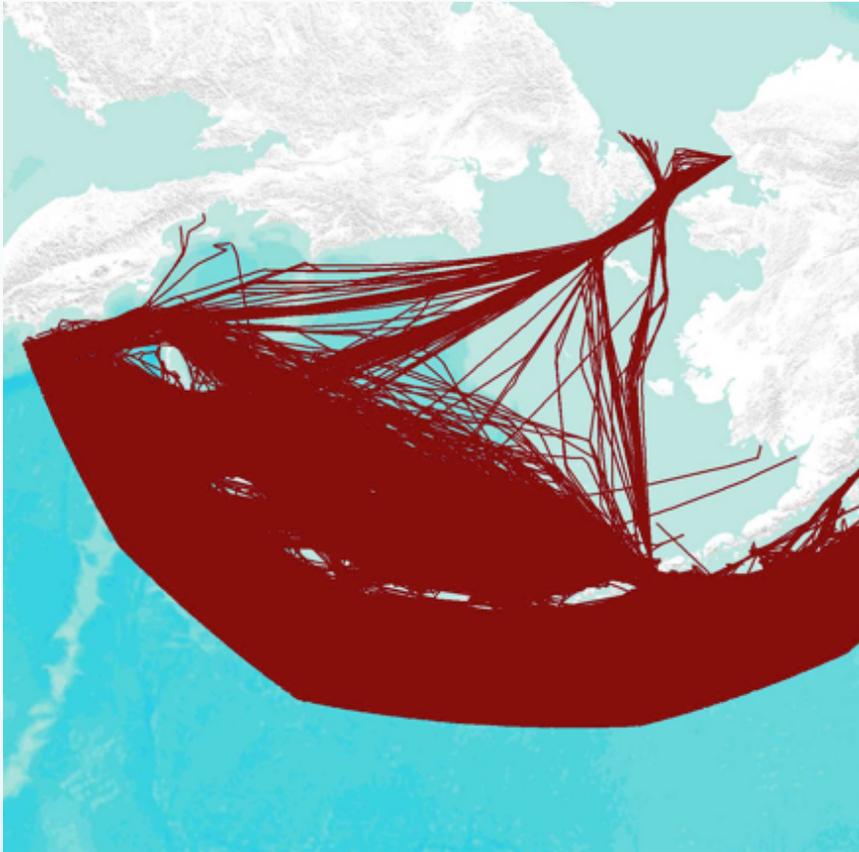
Examination of Vessel Traffic in Bering Strait Region

Preliminary Results of Analysis for Ocean Conservancy

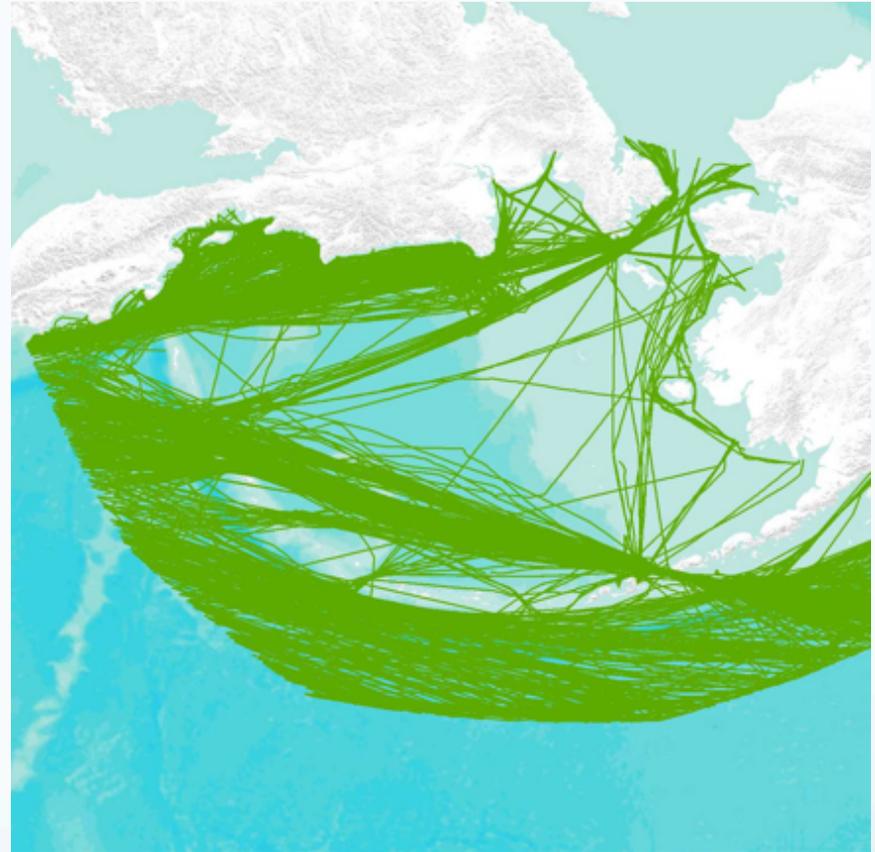
**Sierra Fletcher
Nuka Research and Planning Group, LLC
September 28, 2018**



Bulk Carriers



Tankers

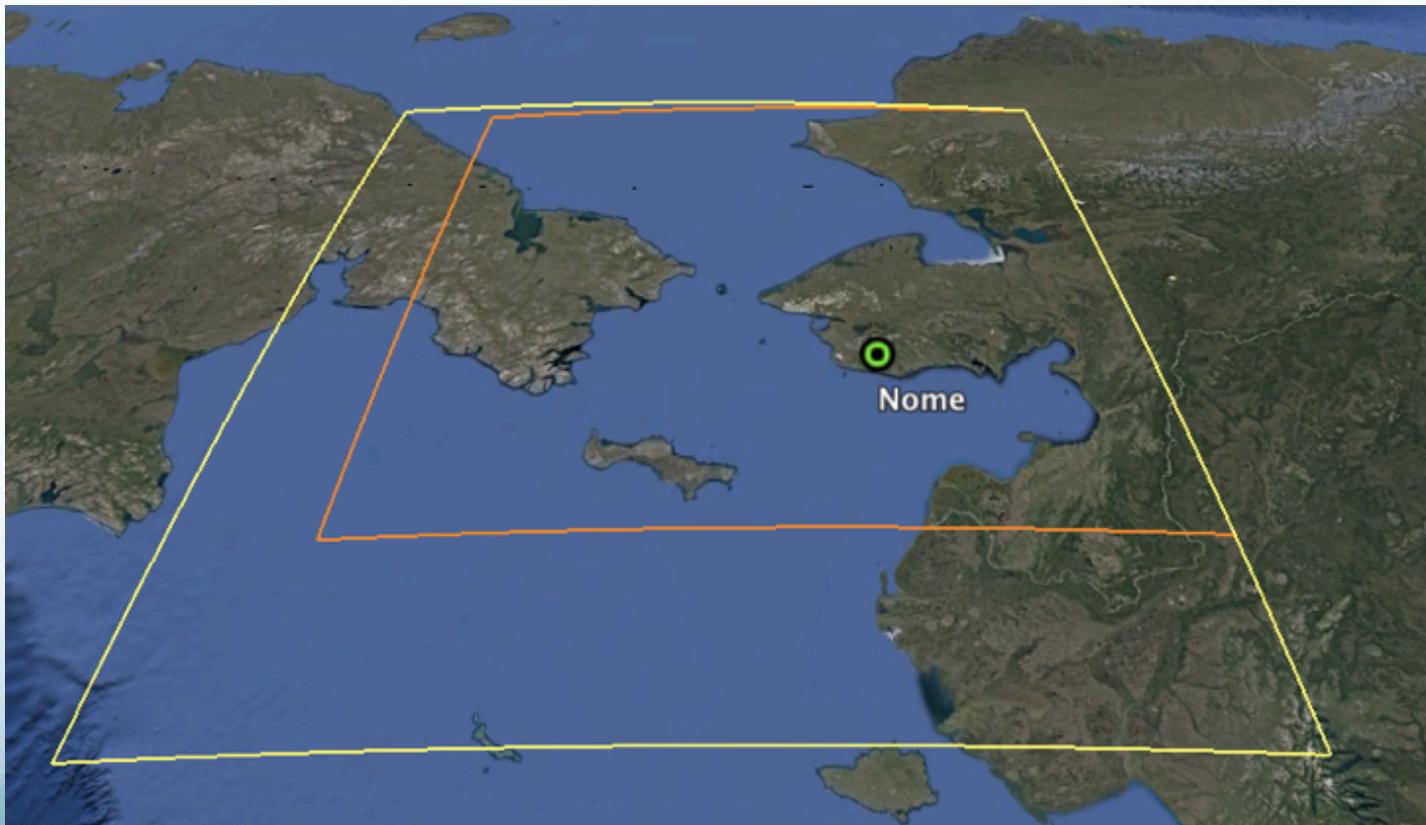


July 2010 - August 2013 satellite AIS data from exactEarth

Credit: Aleutian Islands and Bering Sea LCC, Wildlife Conservation Society, and University of Alaska Fairbanks' SNAP

Methodology

- AIS data NCA (2013-2014) and MXAK (2013-2015)



Methodology, cont.

- Reduced data points that either did not add information or added too much
- Researched vessels remaining
- Removed shallow draft & unknown

Type	Draft				Total
	Deep Draft	Light Draft	Shallow Draft	Unknown	
Barge		7			7
Cargo: Bulk	71	3			74
Cargo: Other	33	73	1		107
Fishing	2	149	2	17	170
Government	2	19	16	2	39
Passenger	1	12		1	14
Tanker	43	13			56
Tug		67	7	3	77
Other	13	31	27	3	74
Unknown		12		3	15
Total	165	386	53	29	633

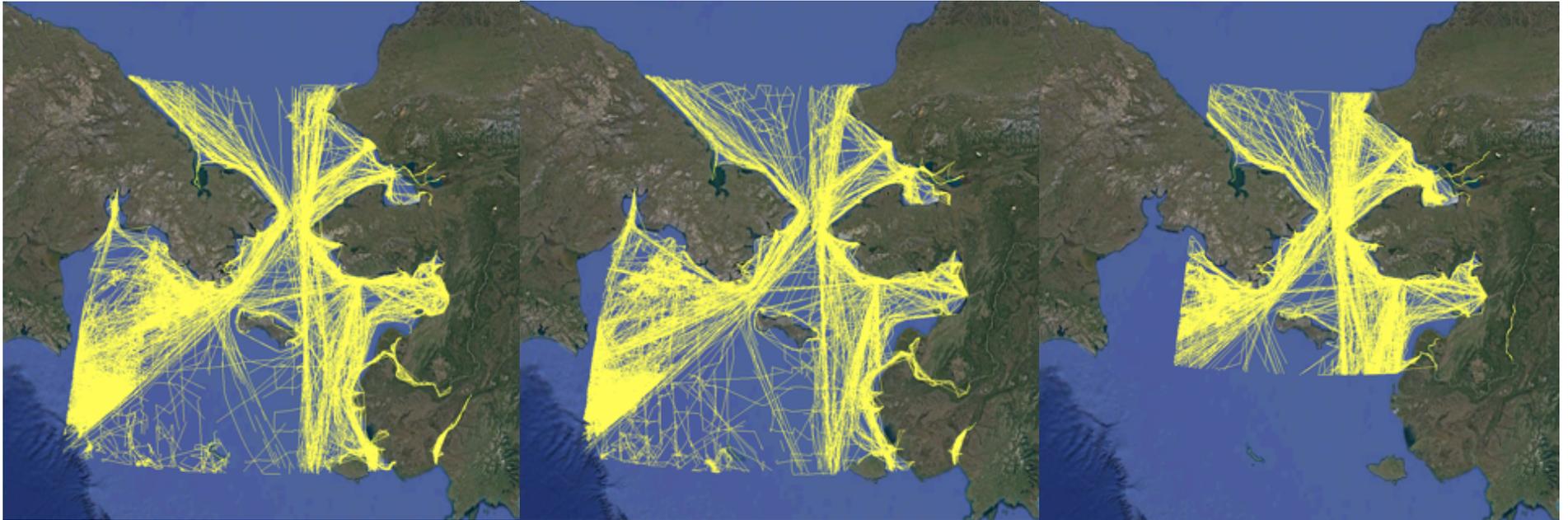
For each vessel:

- Identifier
- Type
- Draft, GT, DWT
- Flag
- Fuel/oil cargo capacity
- Fuel/oil cargo type*
- Time spent in area (operating days)

For each track:

- Vessel
- U.S./Russian “zone”
- Activity
- Distance (operating nautical miles)

Annual differences

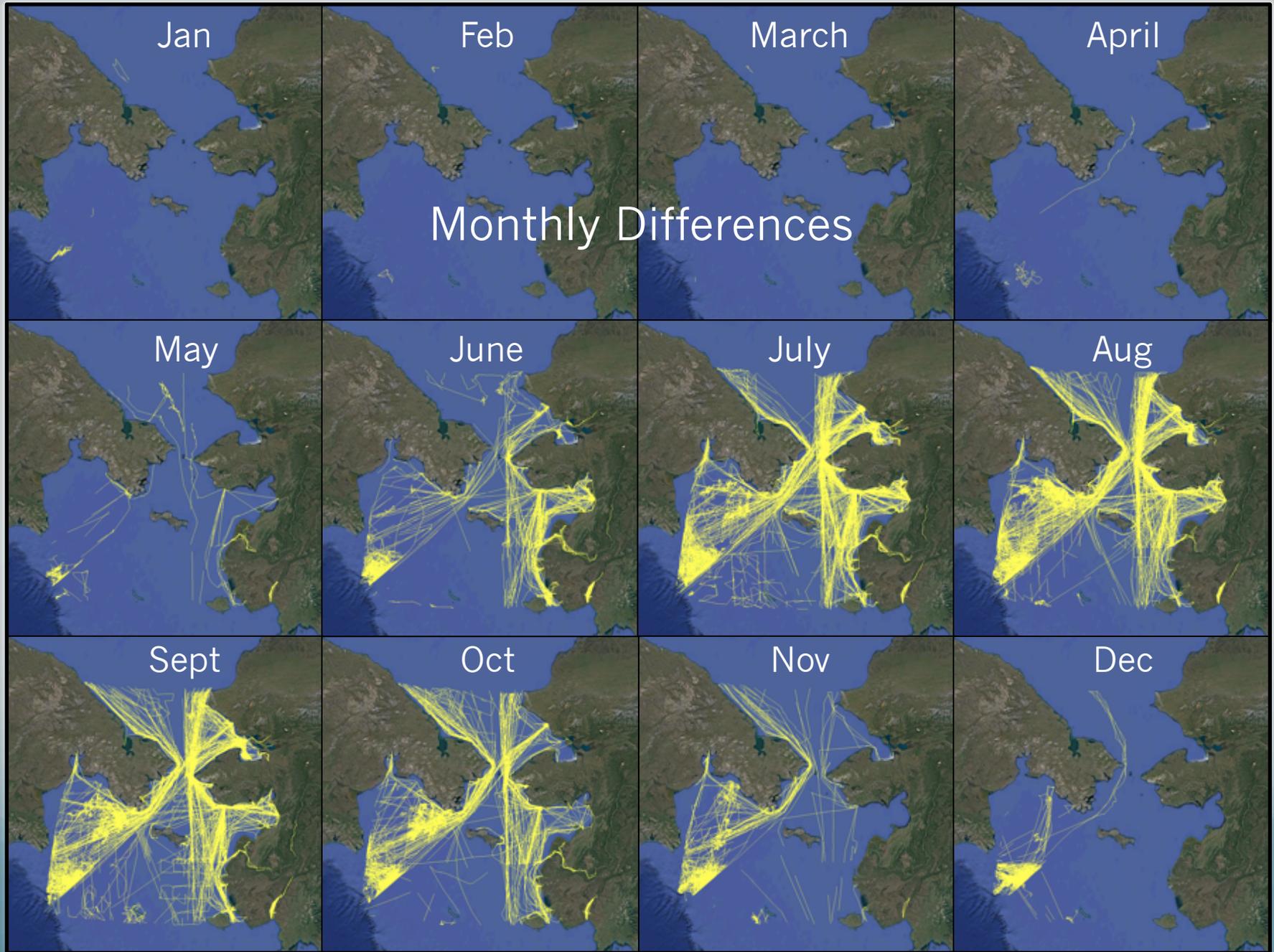


2013

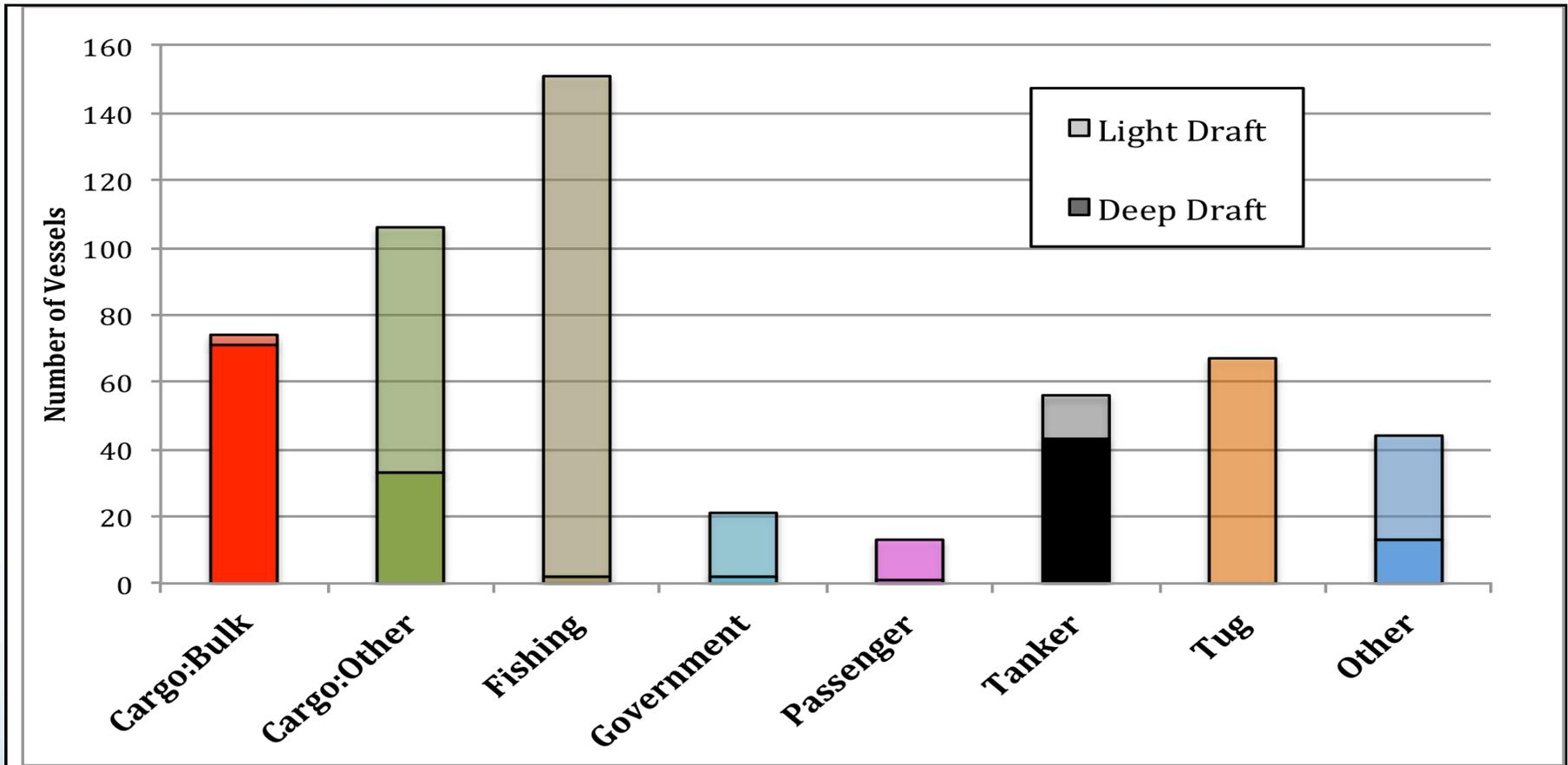
2014

2015

Annual differences are biased by the differences in the geographic scope of the data.

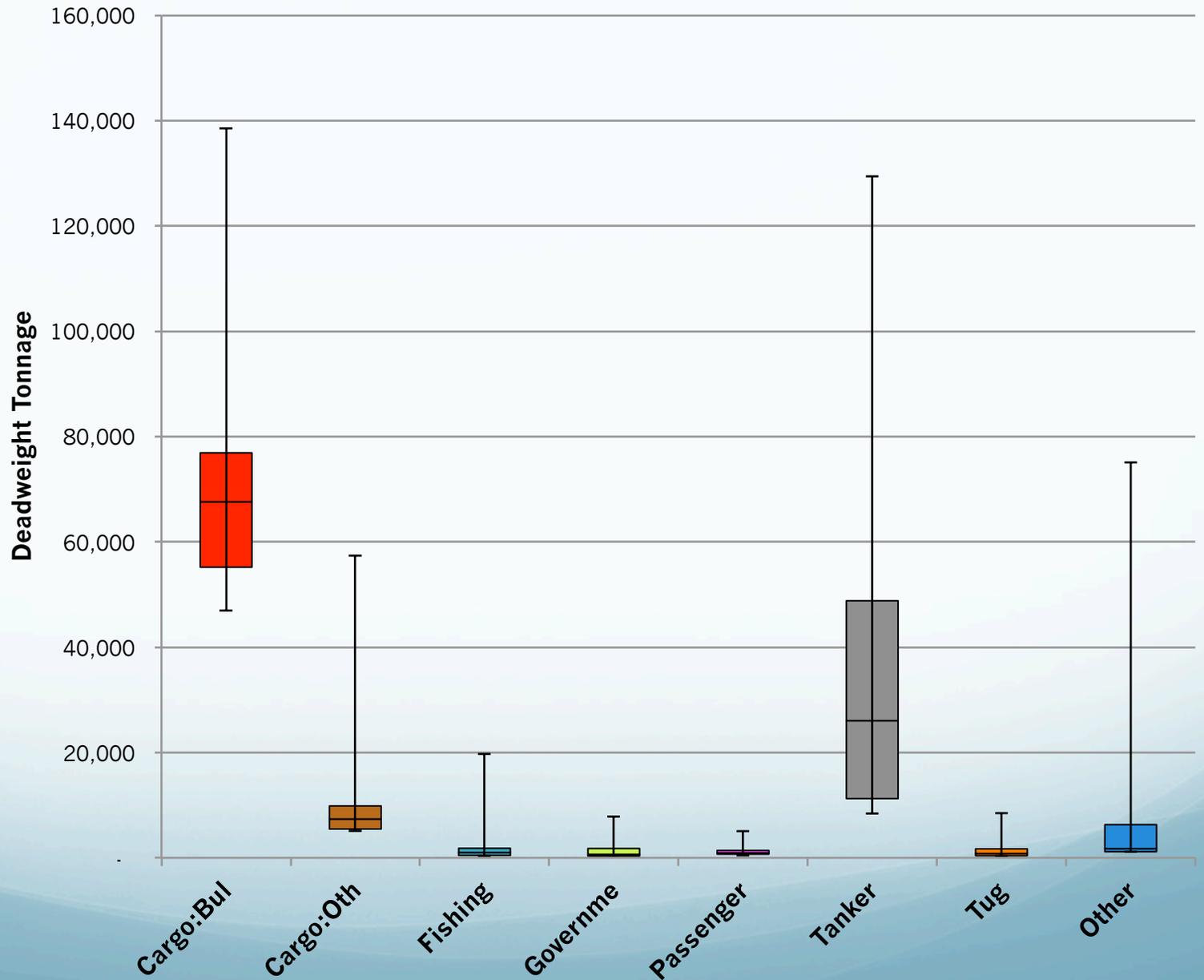


of vessels by type, draft



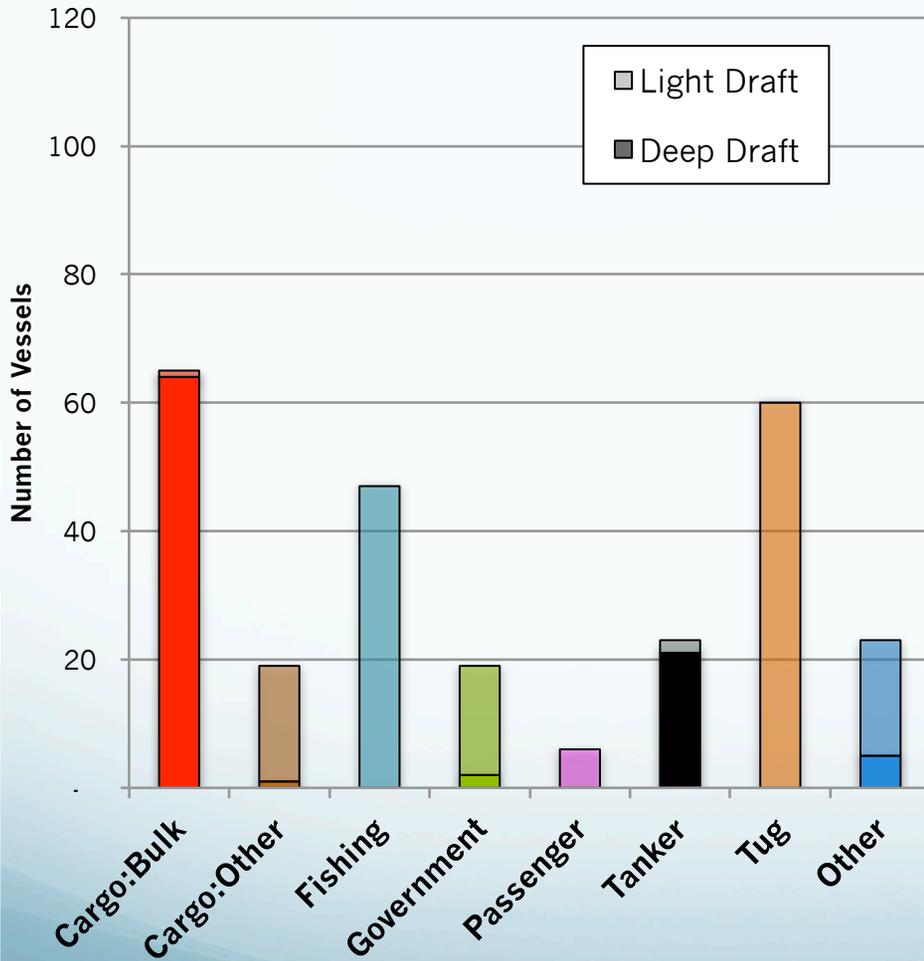
Draft	# of Vessels								
	Cargo: Bulk	Cargo: Other	Fishing	Gov't	Passenger	Tanker	Tug	Other	
Light	3	73	149	19	12	13	67	31	
Deep	71	33	2	2	1	43	13		
Total	74	106	151	21	13	56	67	44	

Quartile plot of DWT by type

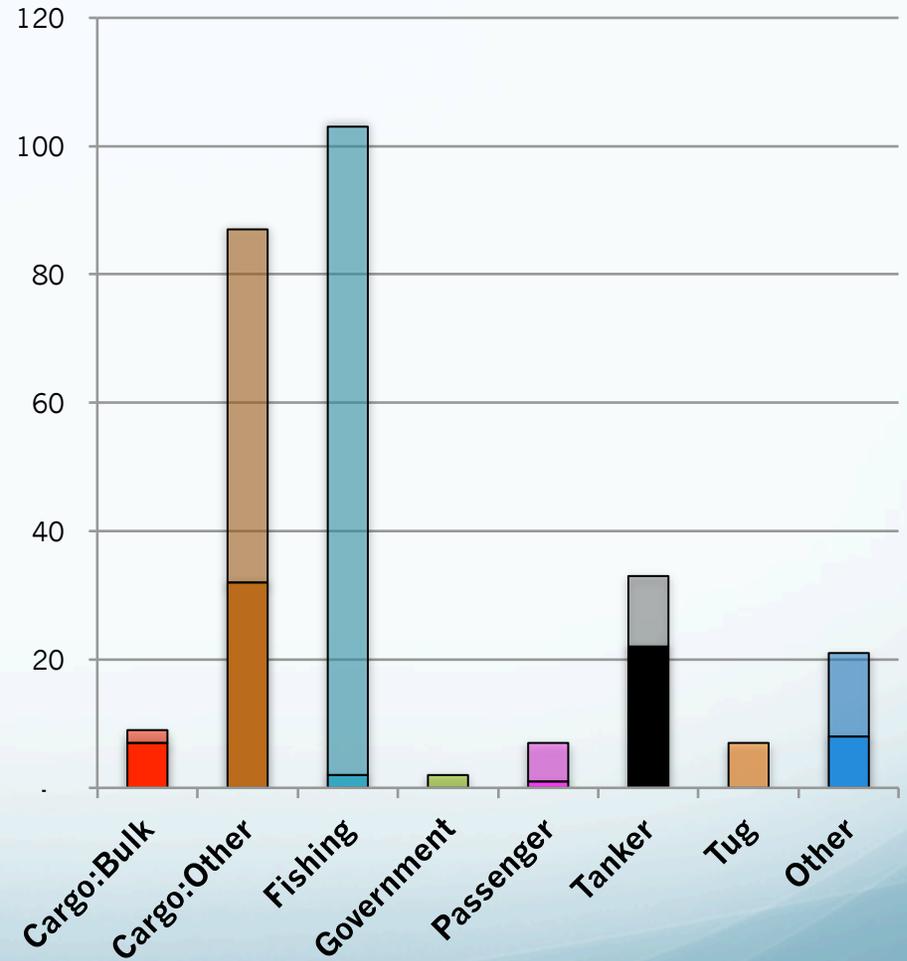


of vessels by type, draft, zone

U.S. Zone

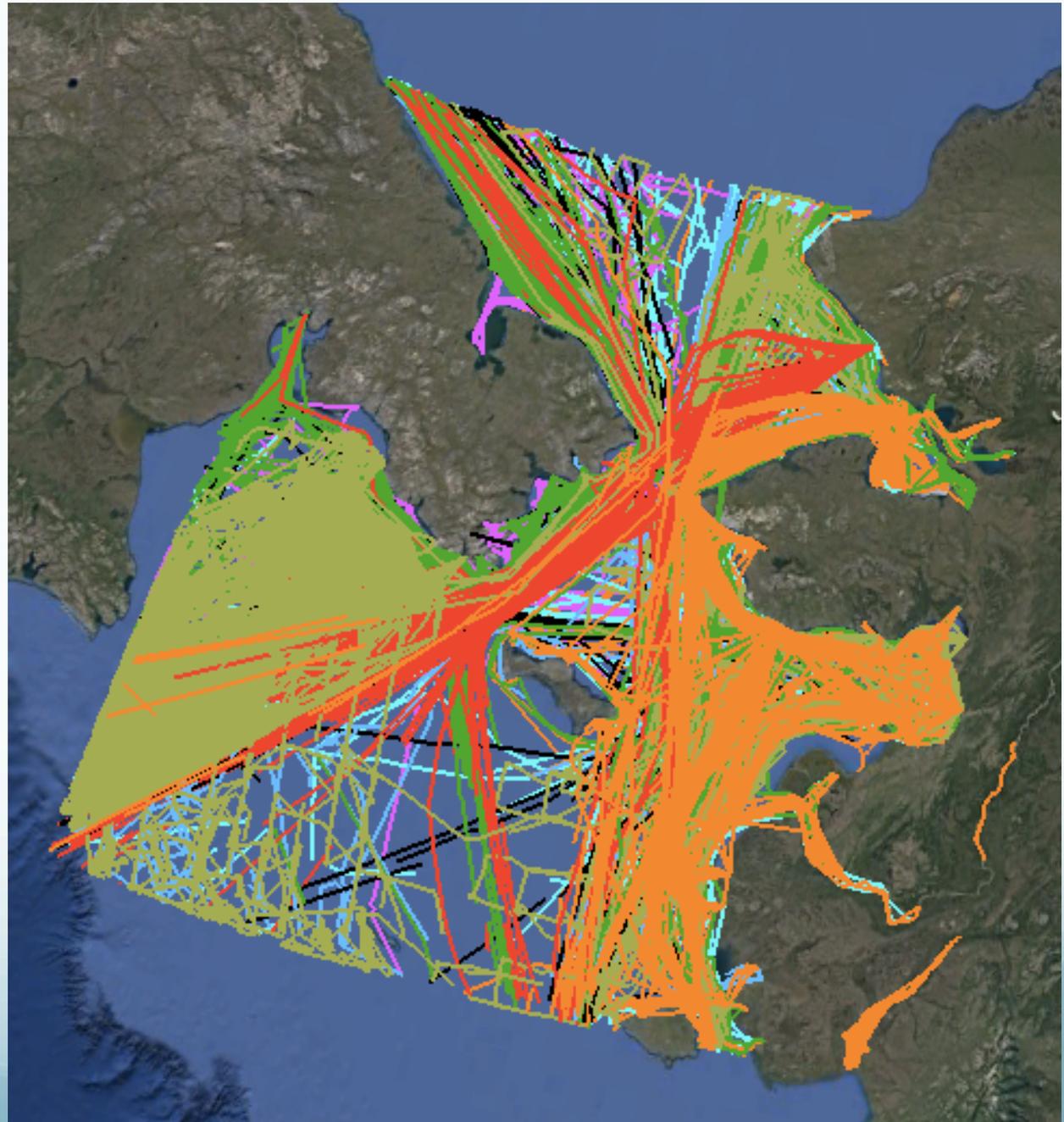


Russian Zone

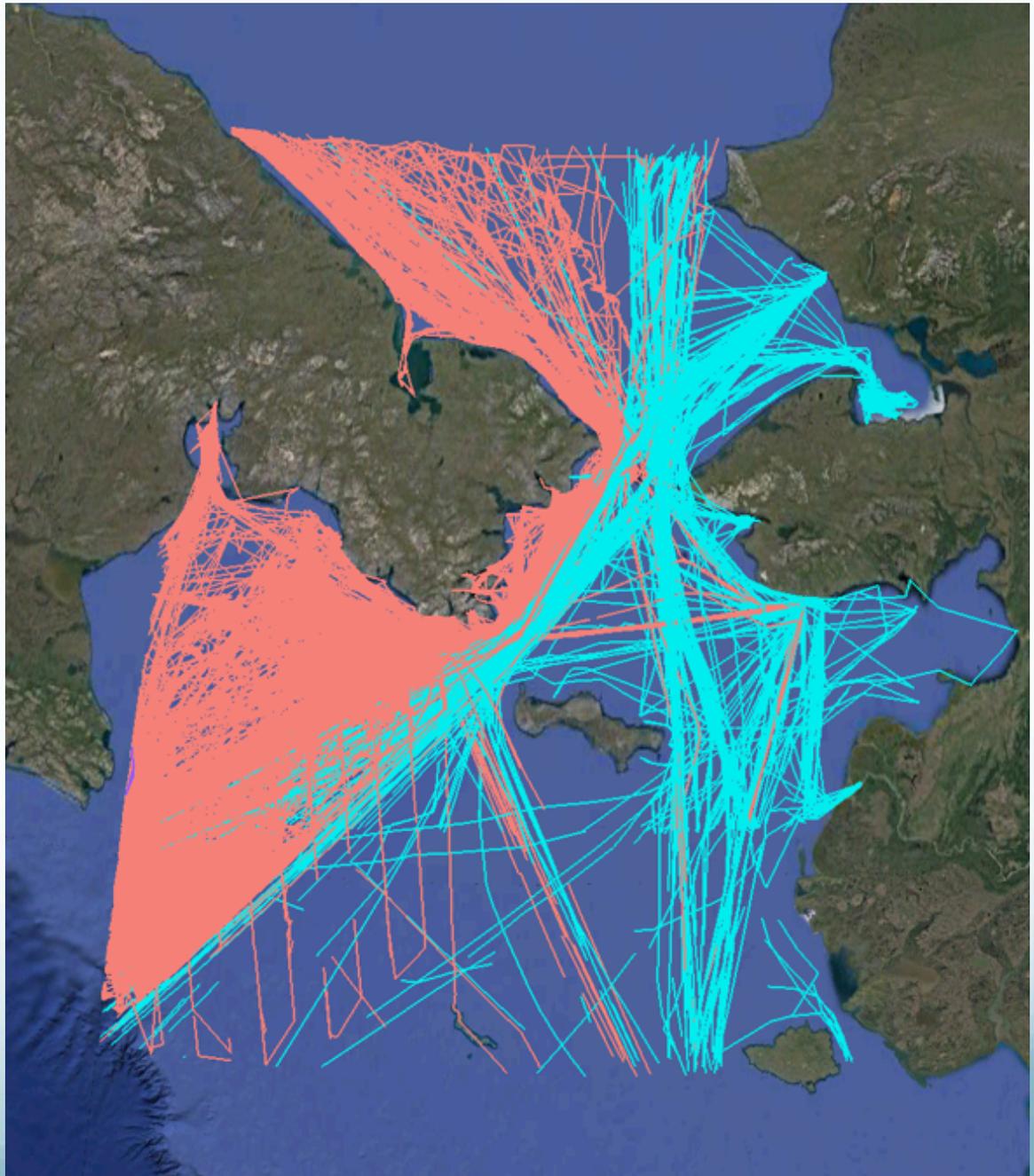


**All vessels in
dataset**

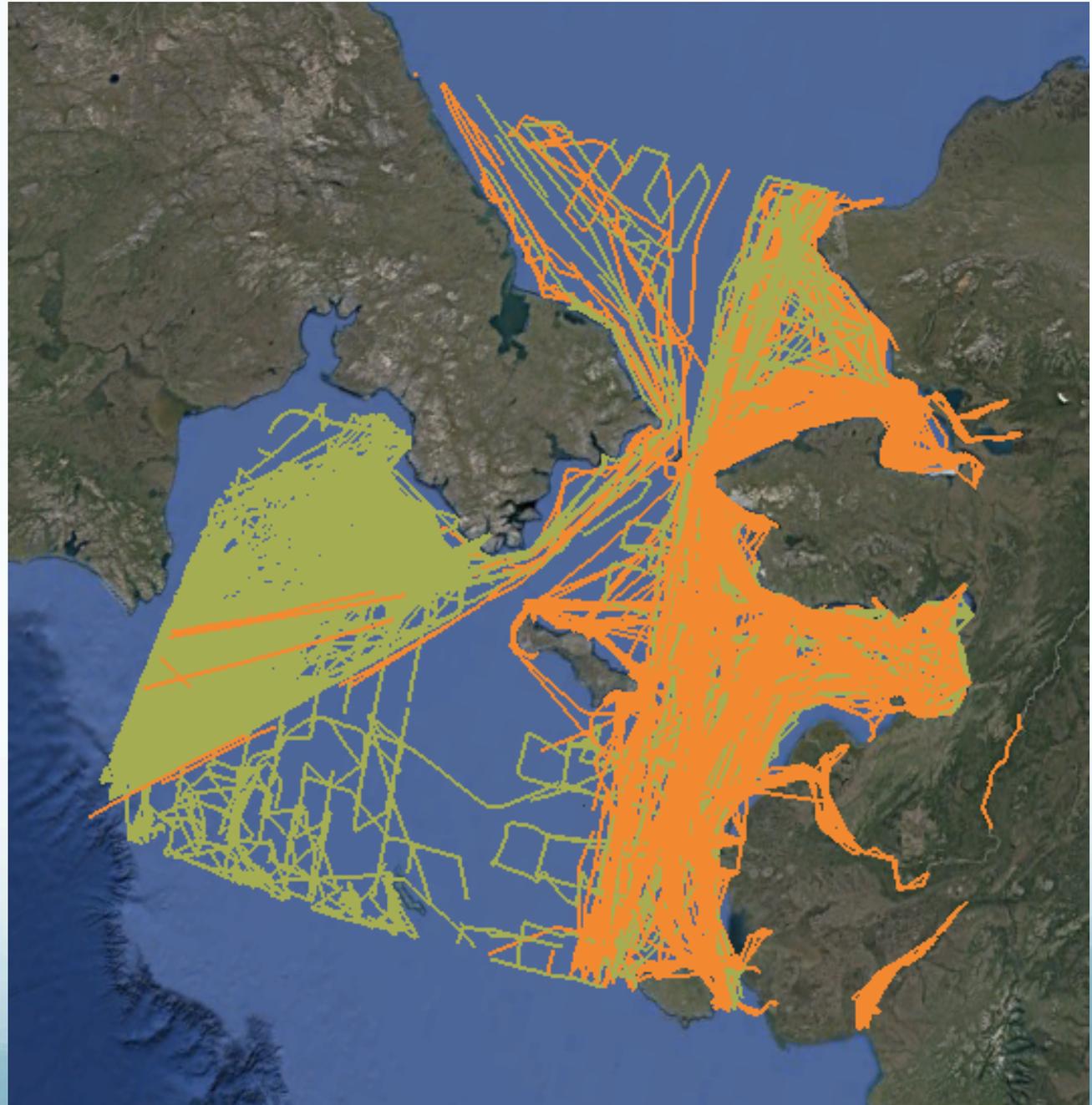
2013-2015



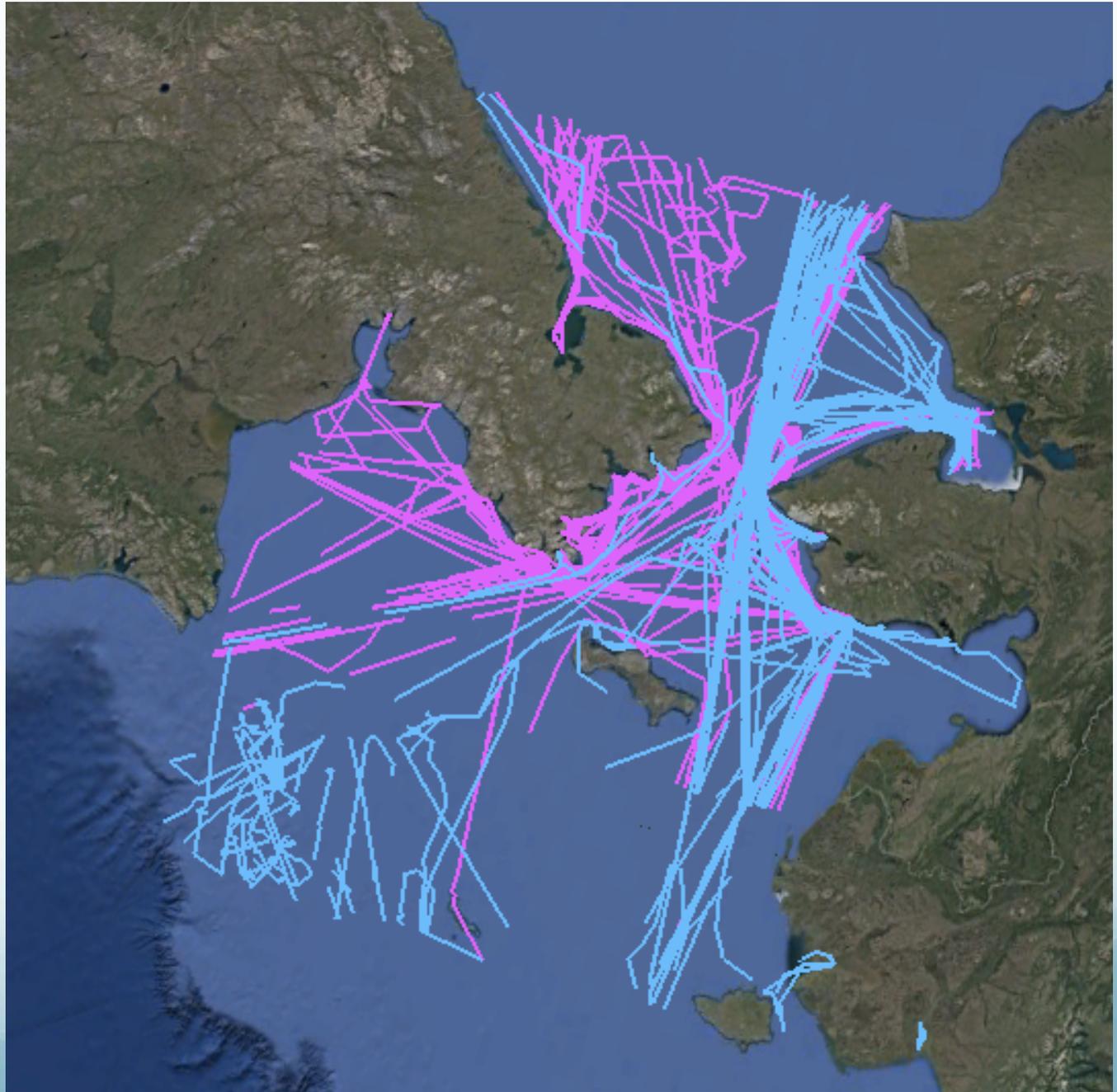
Russian Zone (red)
U.S. Zone (blue)



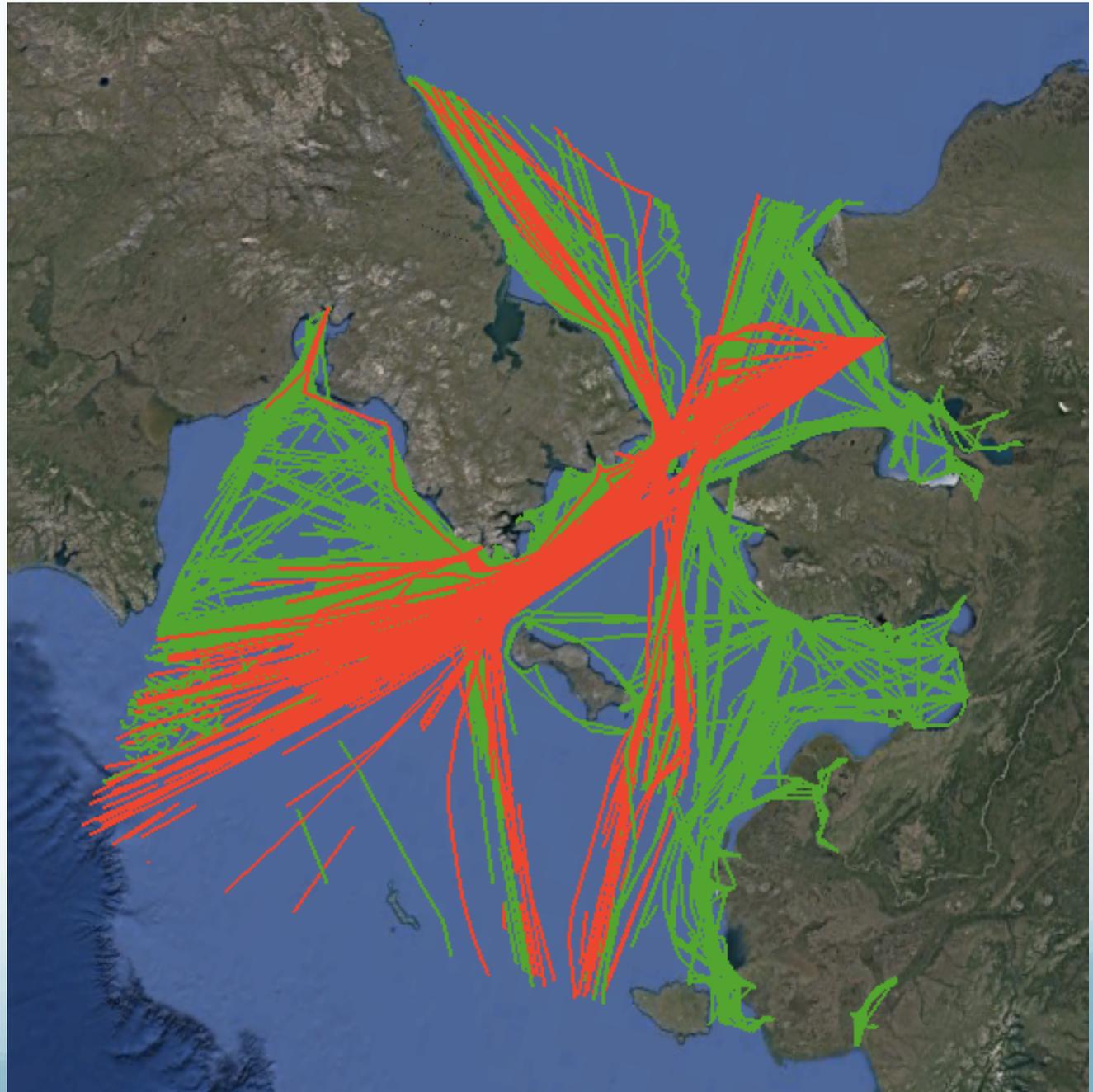
Fishing (green)
Tugs (orange)



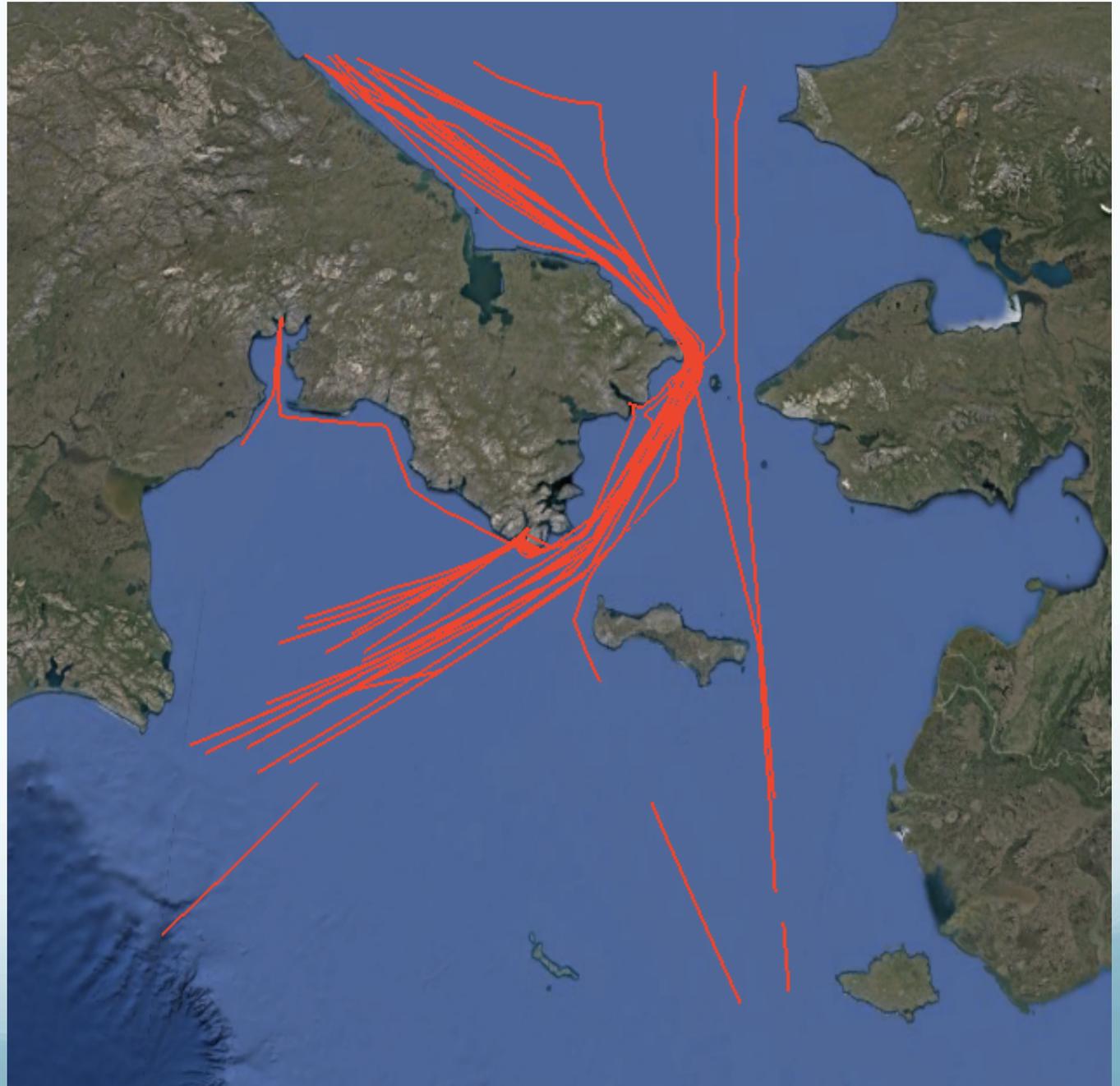
Passenger (pink)
Gov't (blue)



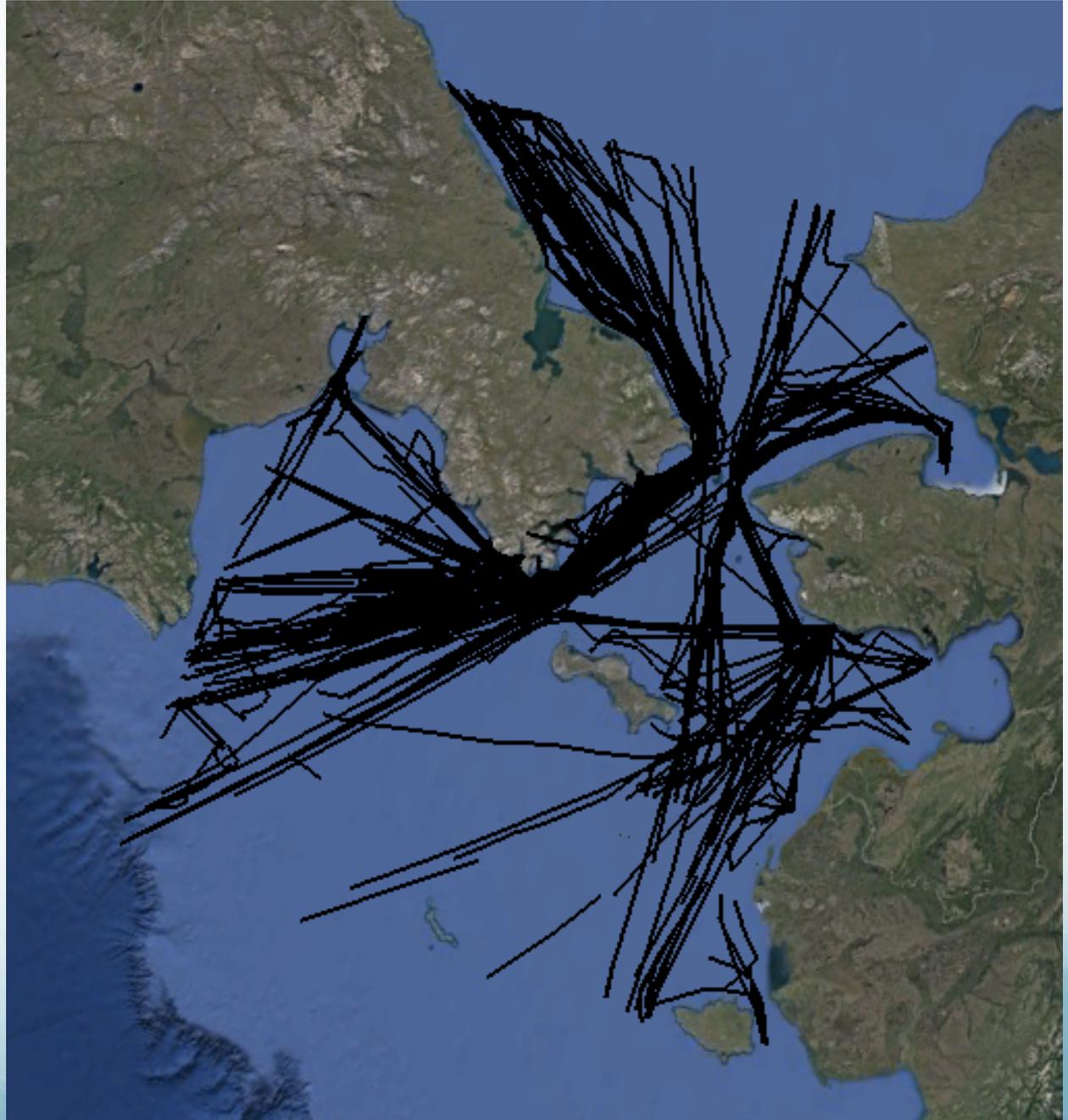
Bulk Carriers (red)
Other Cargo (green)



Bulk Carriers
Red Dog Excluded



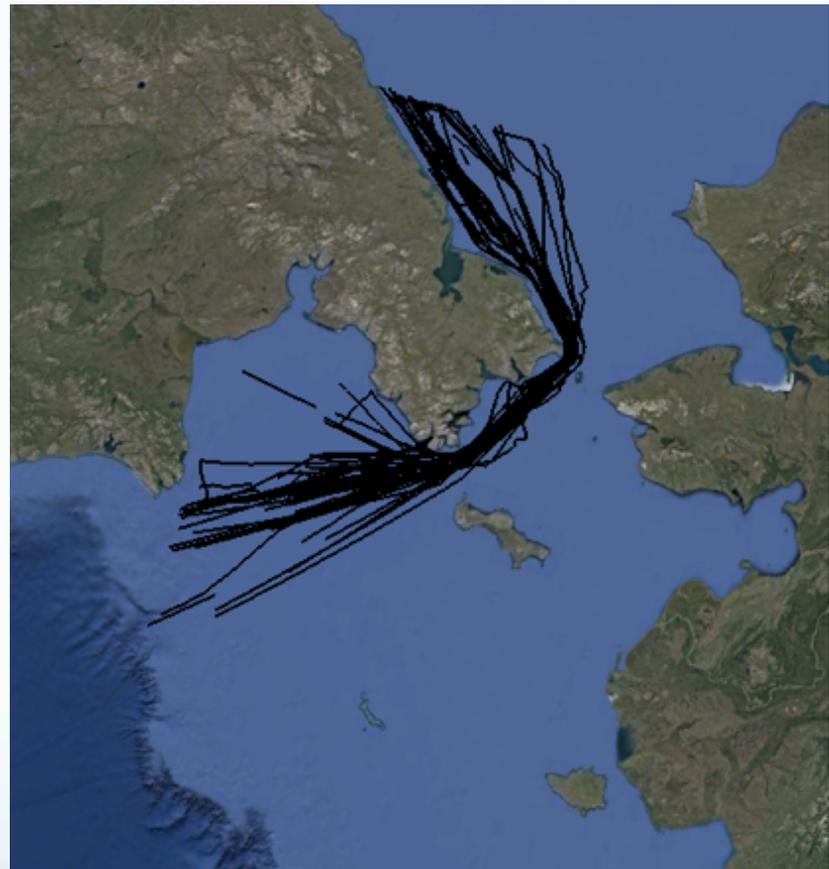
Tankers



Tankers

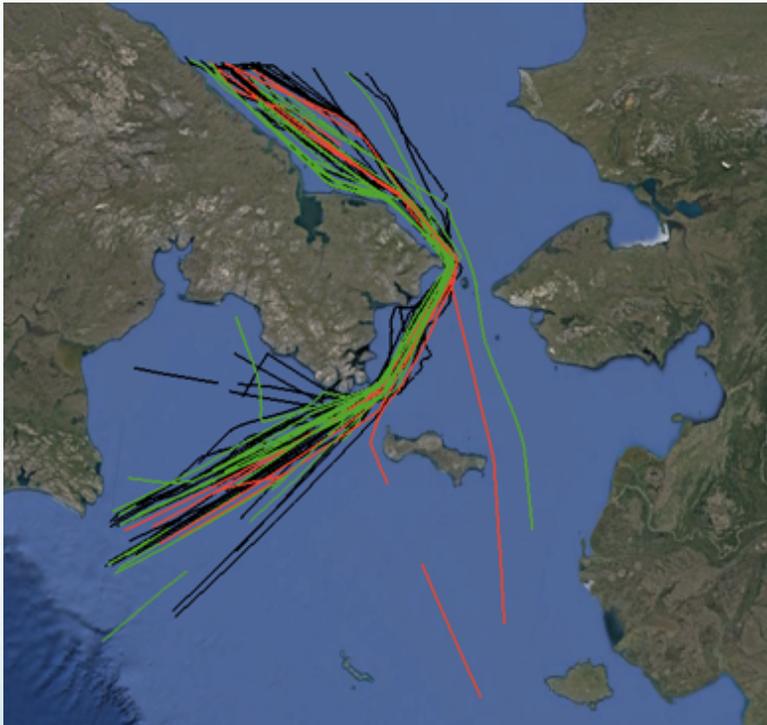


All Tankers

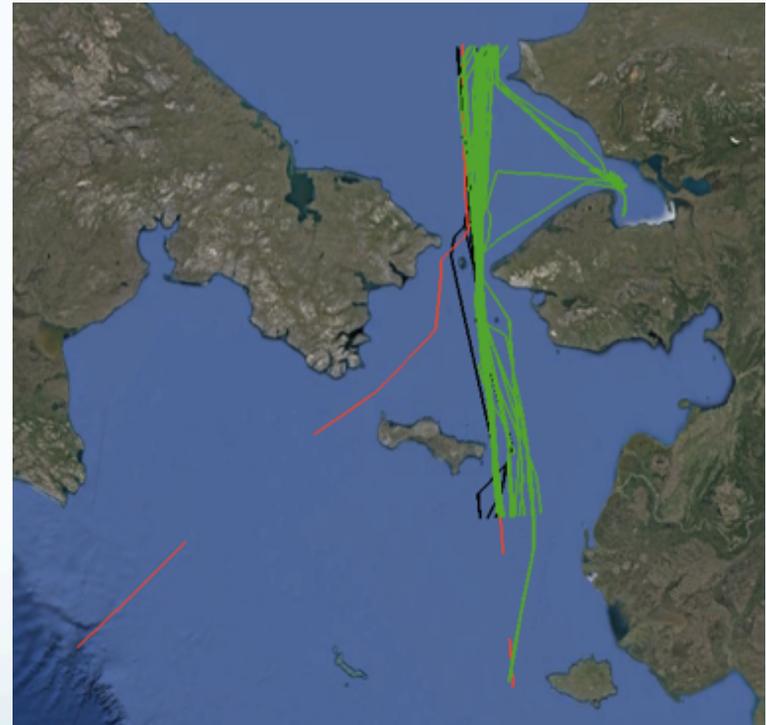


Russian Transits

Russia Transits

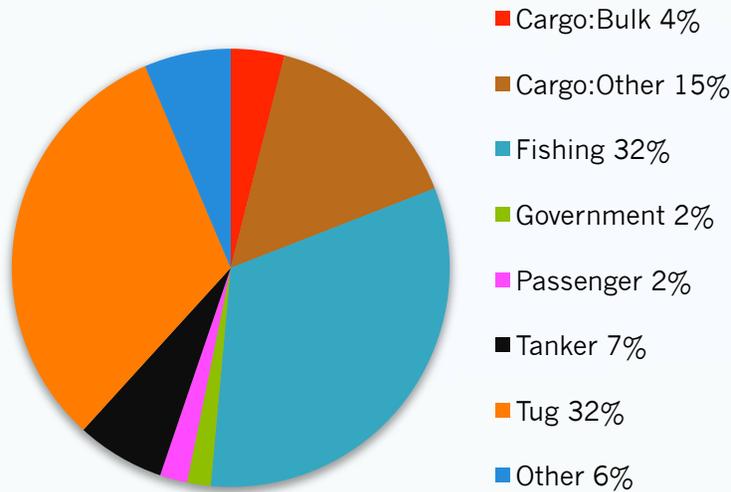


U.S. Transits

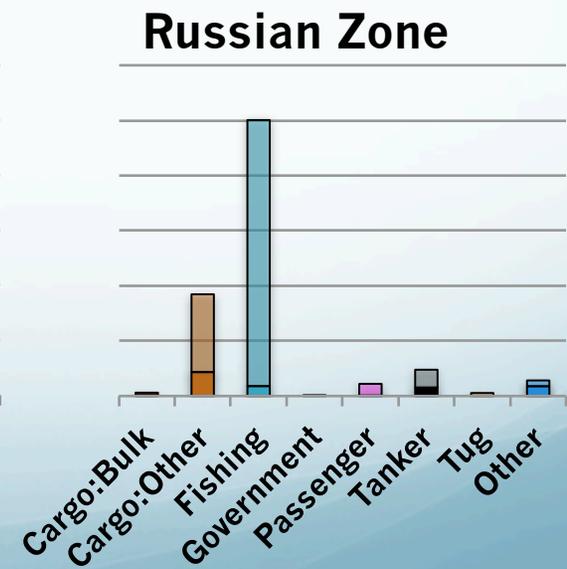
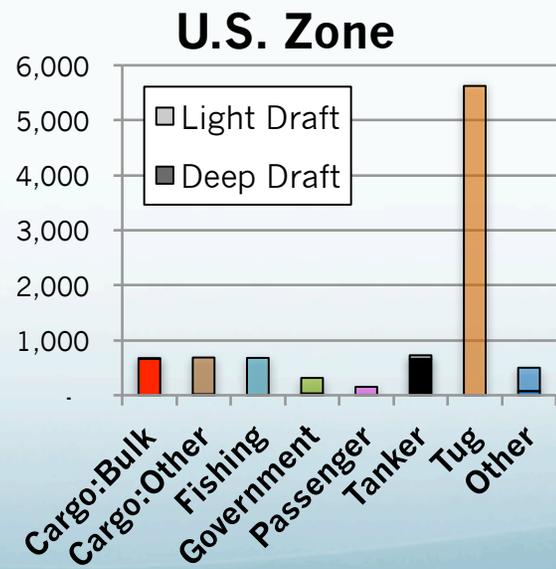


Cargo: Bulk, **Cargo: Other**, Tankers

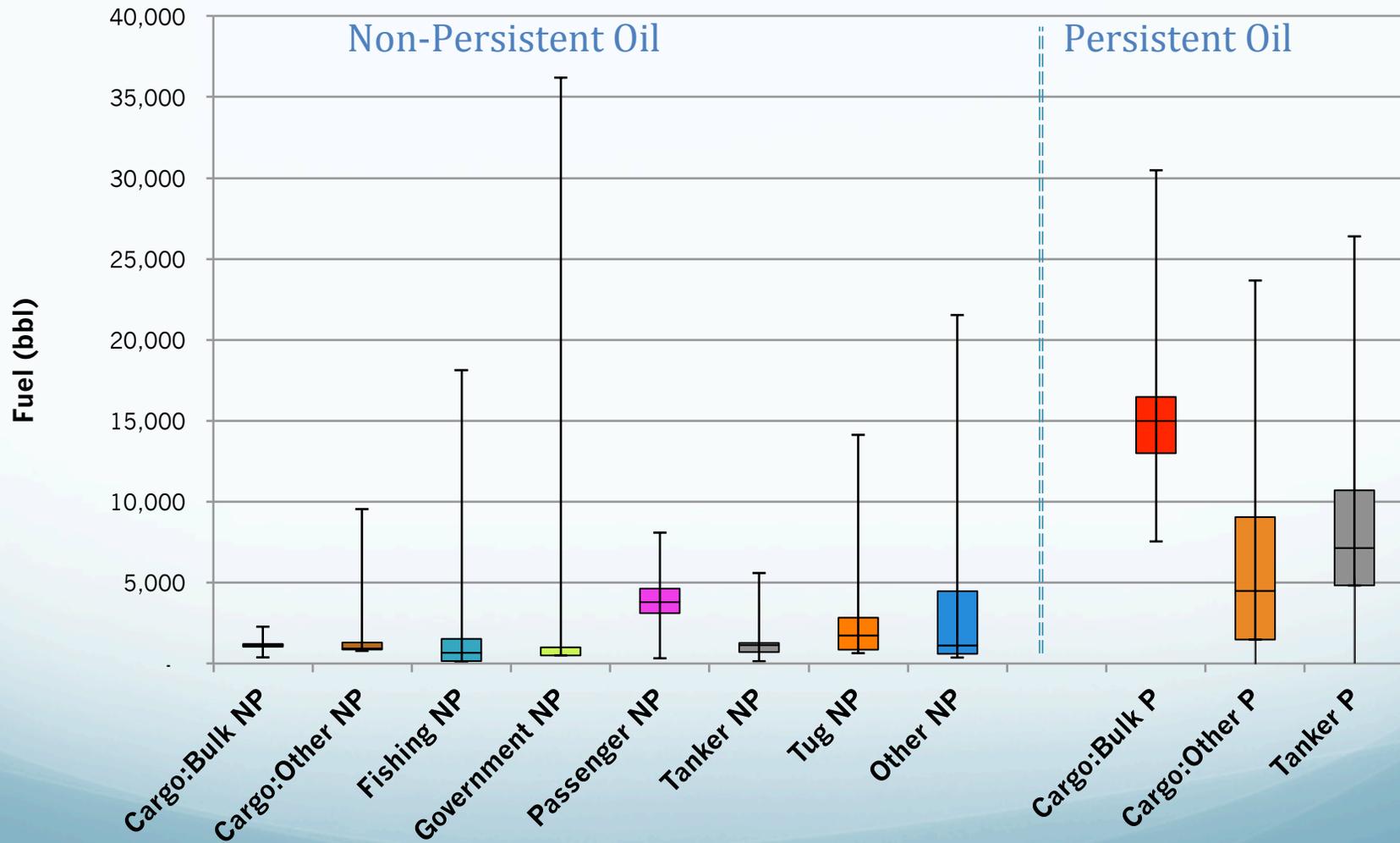
% Operating Days by Vessel Type

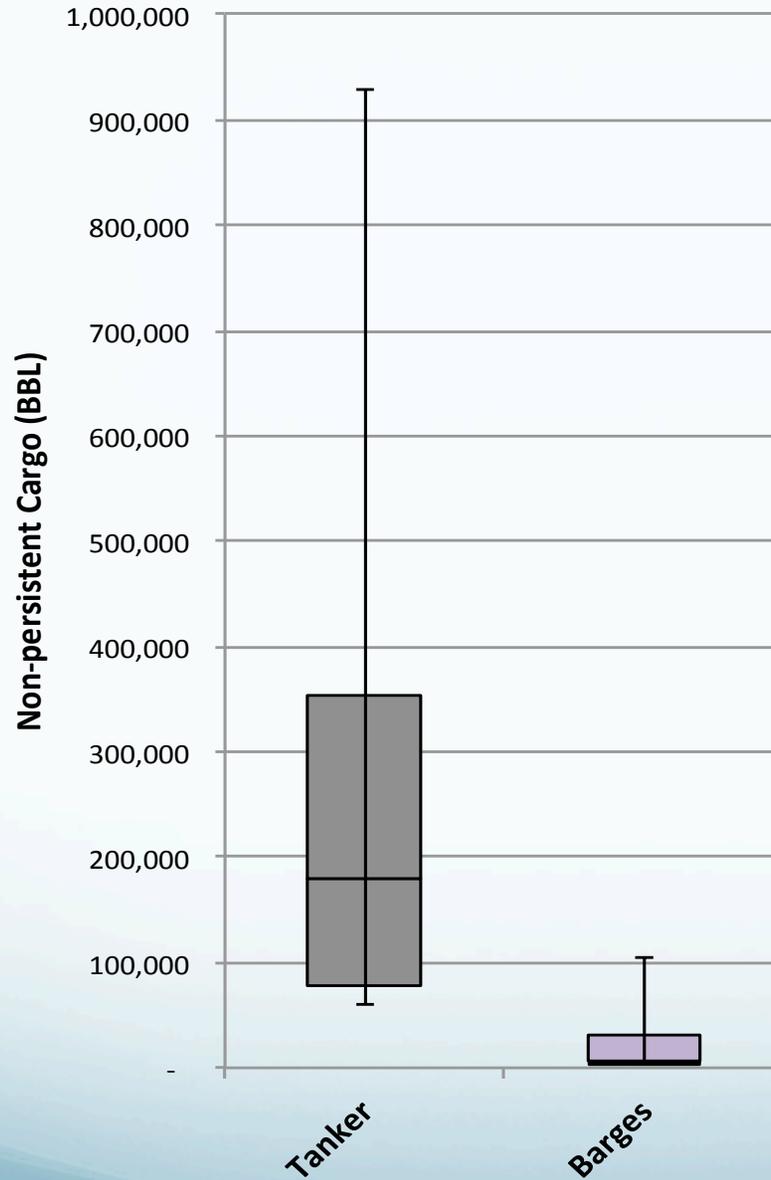


Operating Days by Zone



Fuel capacity & type





Petroleum Cargo Capacity

*barges not included in overall oil exposure estimates

Estimates

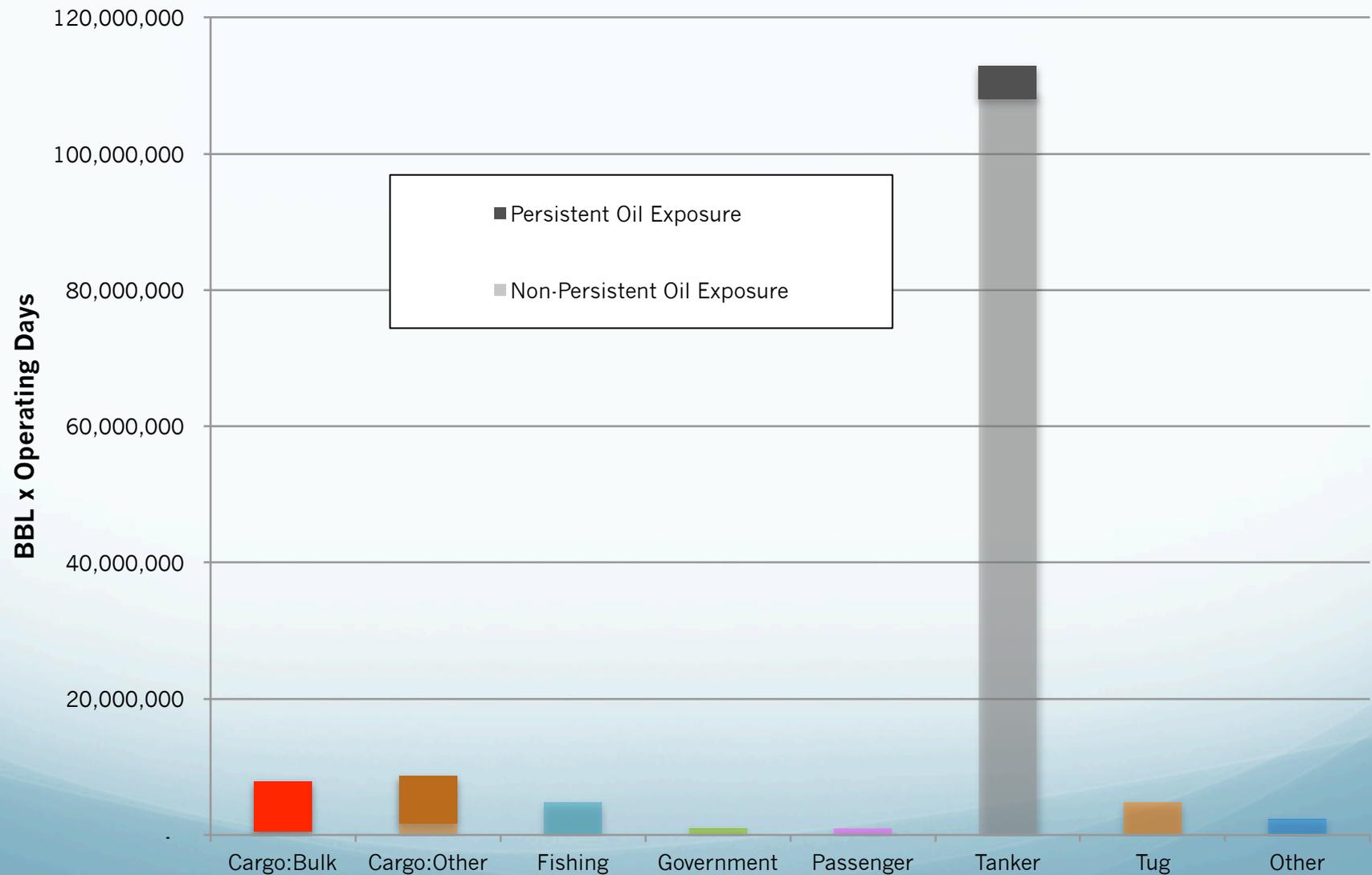
- **Persistent Oil Exposure** = 70% of Persistent Fuel Capacity (BBL) x Track duration (days)
- **Non-persistent Oil Exposure** = (70% of Non-persistent Fuel Capacity (BBL) + 50% of Tanker Cargo Capacity (BBL) x Track duration (days)

For vessels other than tankers, Tanker Cargo Capacity = zero.

- **Weighted Oil Exposure** = (Persistent Oil Exposure x 1.64¹) + Non-persistent Oil Exposure

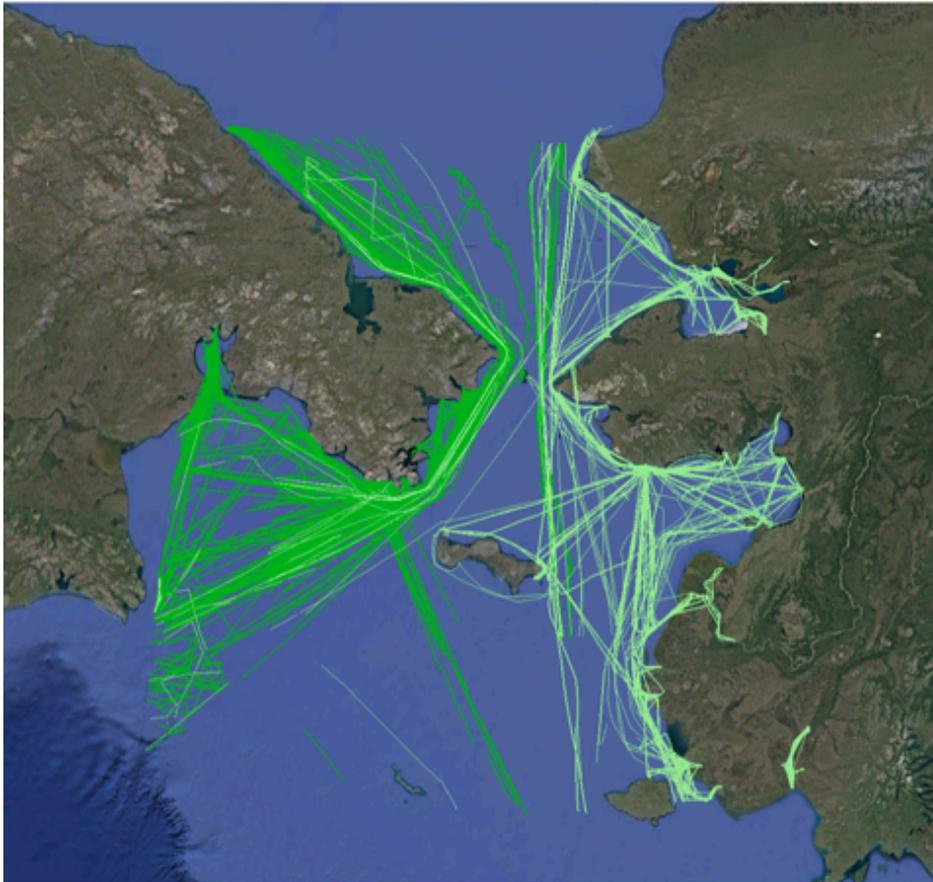
¹Reich et al., 2014

Estimated oil exposure by type



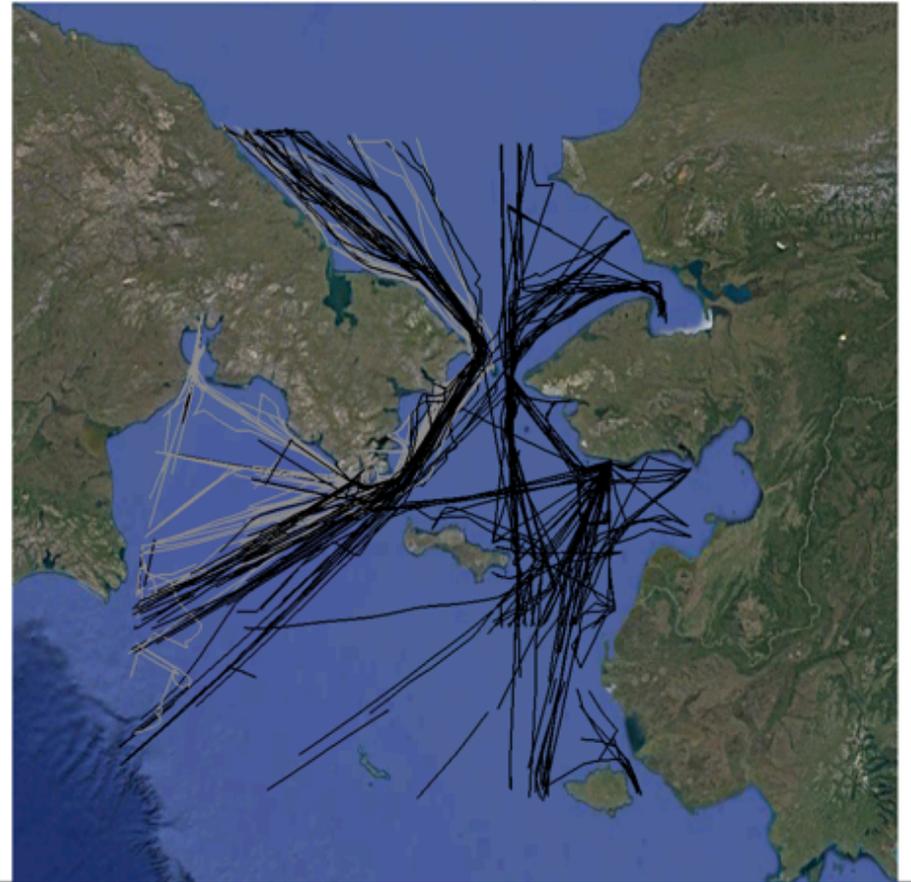
Cargo: Other tracks observed in 2013-2015

light green = vessels with non-persistent oil only
dark green = vessels with persistent oil

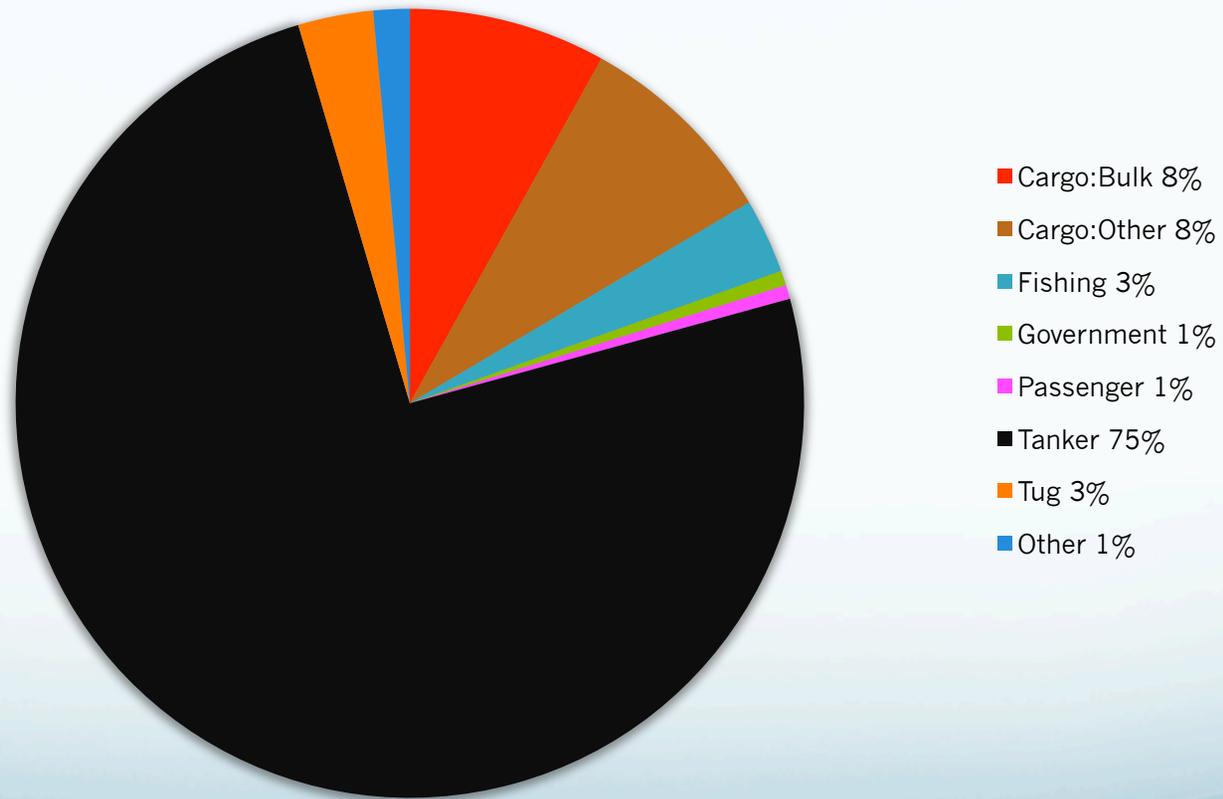


Tanker tracks observed in 2013-2015

grey = vessels with non-persistent oil only
black = vessels with persistent oil



Weighted Oil Exposure = % by type





Thank you

Sierra Fletcher

sierra@nukaresearch.com

(207) 841 0604