

Evaluation of the NOAA Operational Forecast System in Delaware Bay



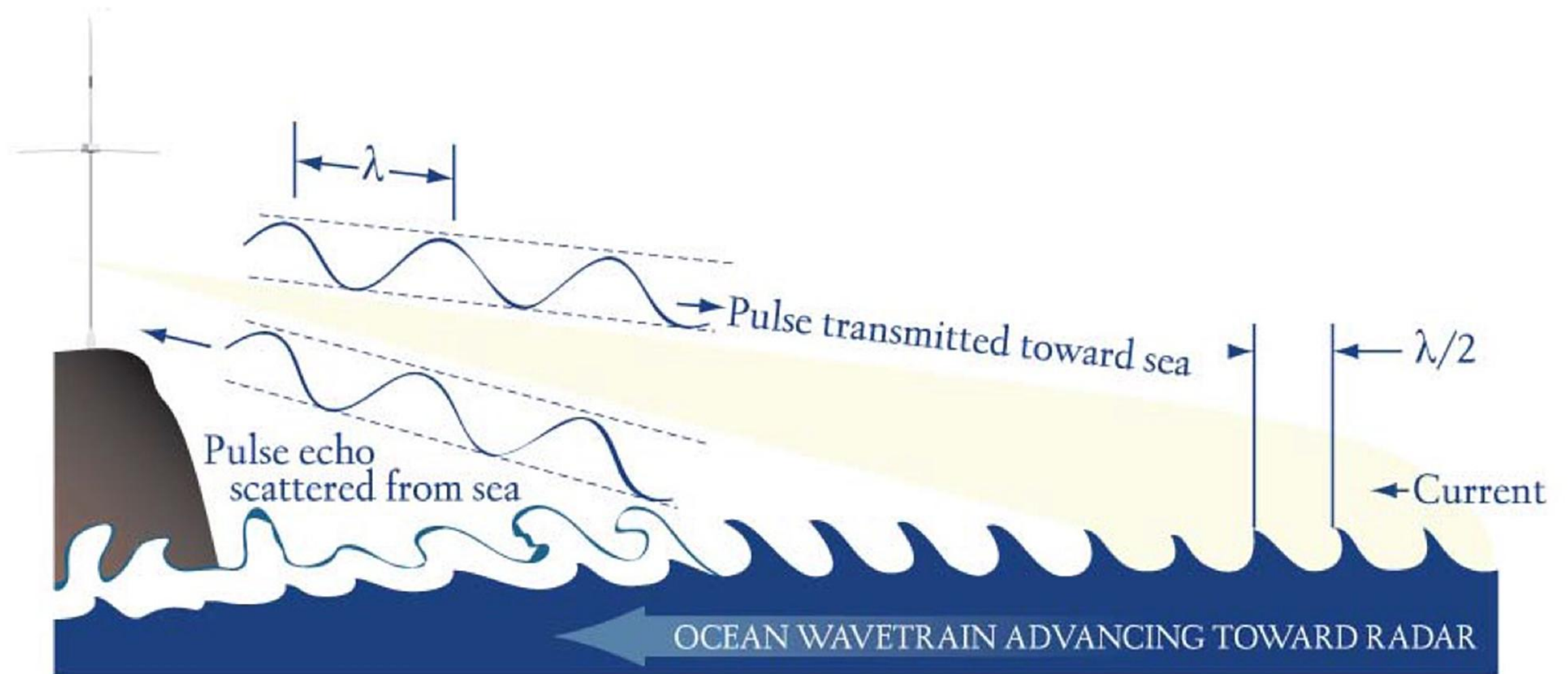
Dr. Hugh Roarty

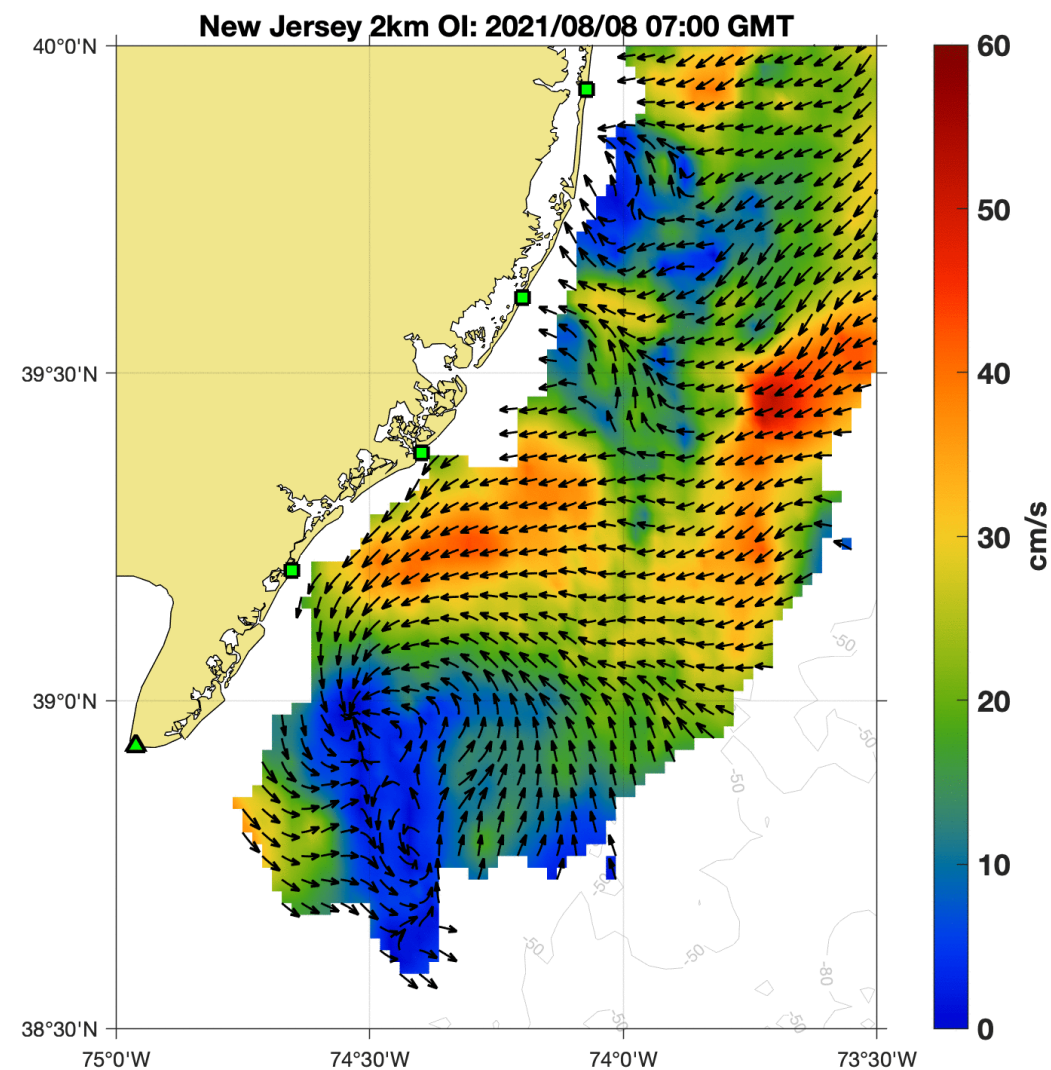
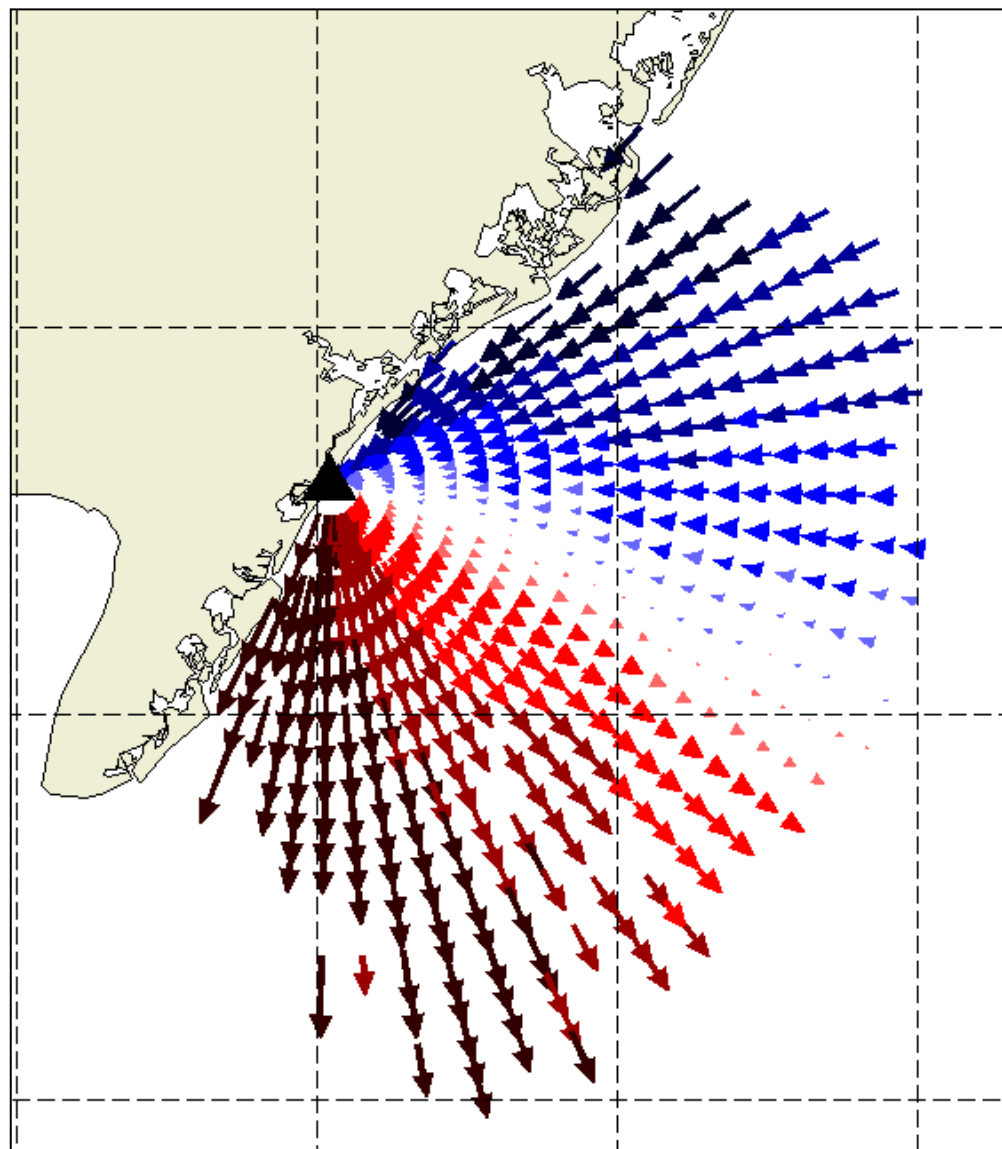


Outline

- Introduction to
 - HF radar
 - NOAA PORTS
 - Delaware Bay Operational Forecast System (DBOFS)
 - US Coast Guard Ports and Waterways Safety Assessment
- Overview of HF radar measurements in Delaware Bay
- Two week evaluation of the NOAA Operational Forecast Model in Delaware Bay using the HFR measurements

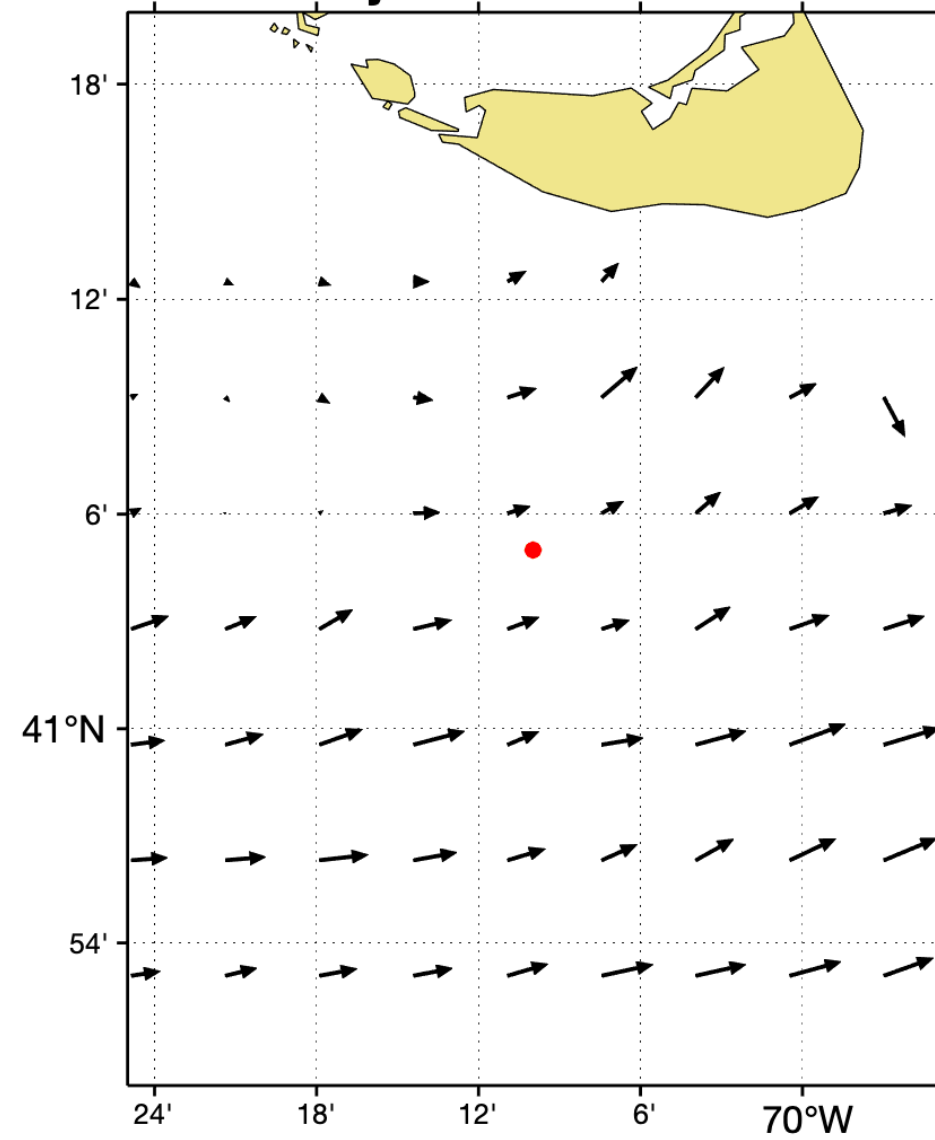
Introduction to HF Radar



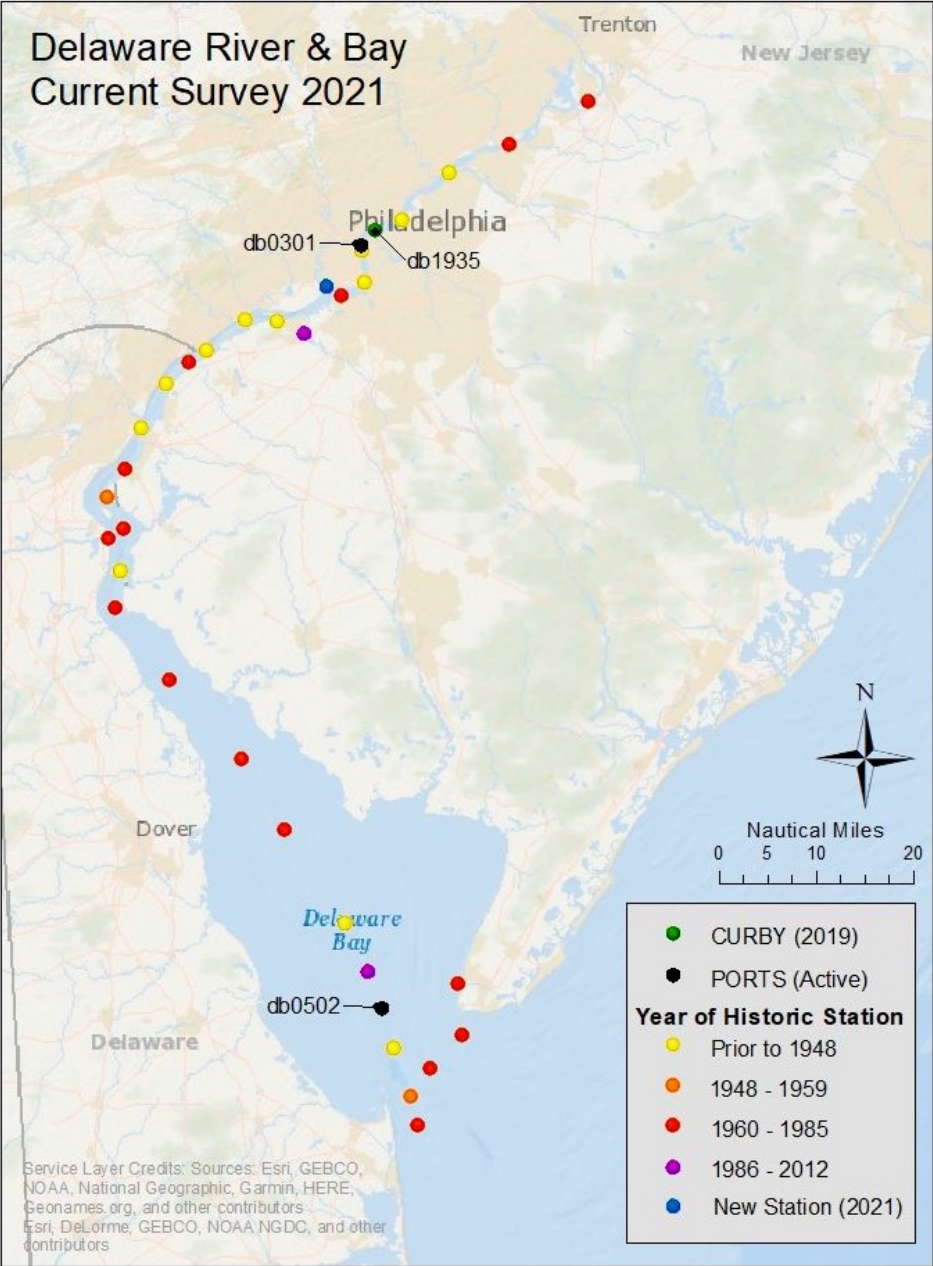
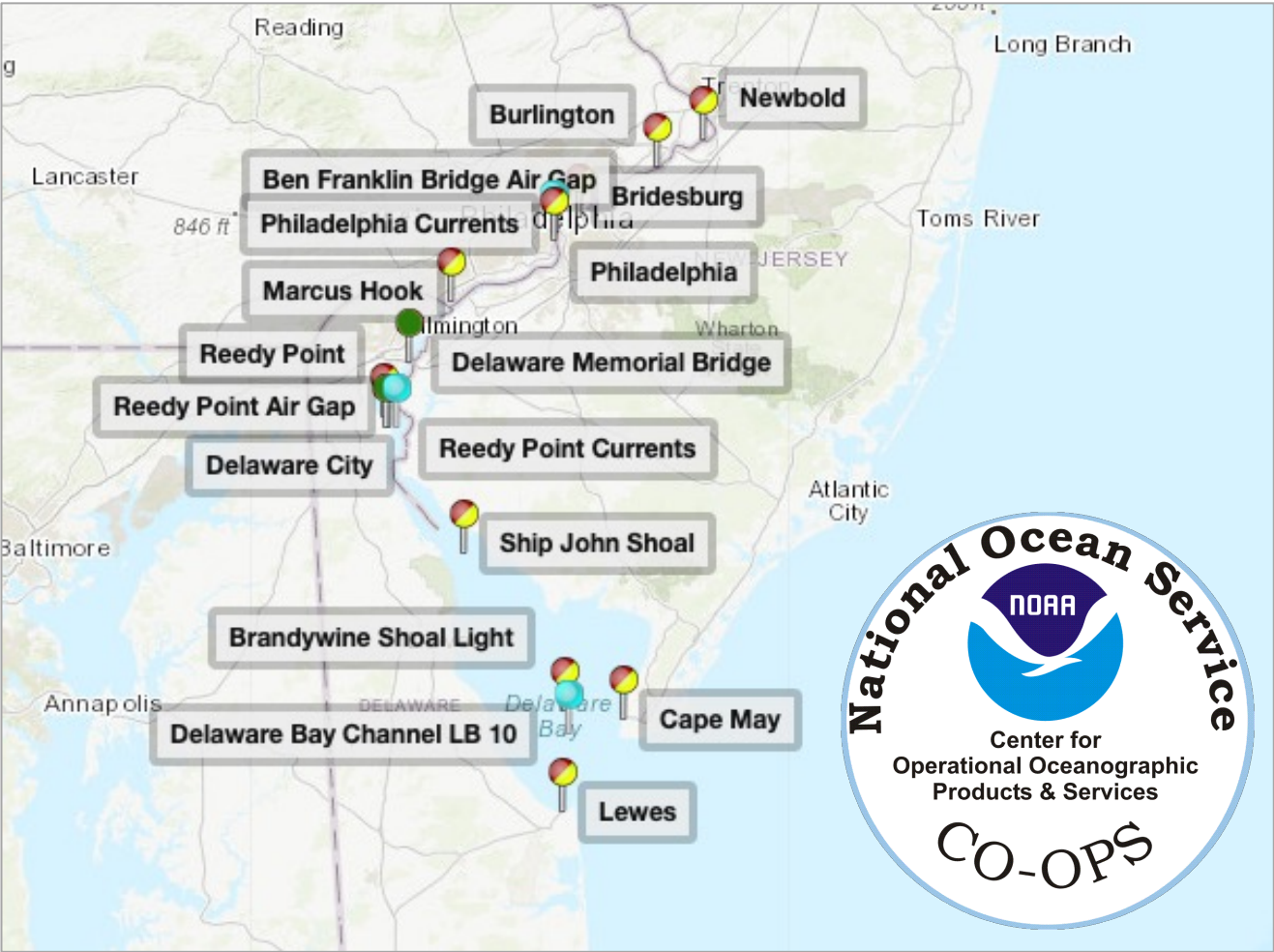


01/12/22 vector_plot_hourly_curly_13MHz_v2.m

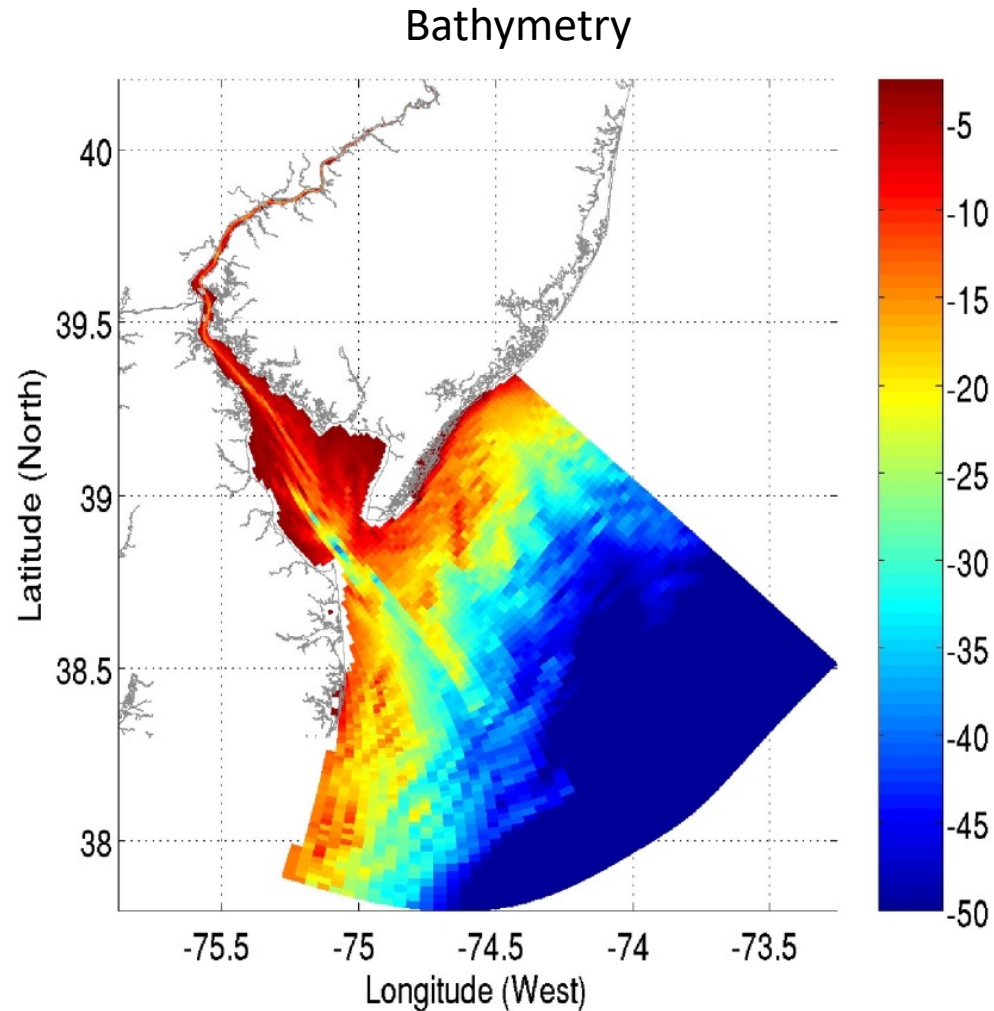
MARA Particle Trajectories: 2020/04/18 00:00 GMT



NOAA PORTS

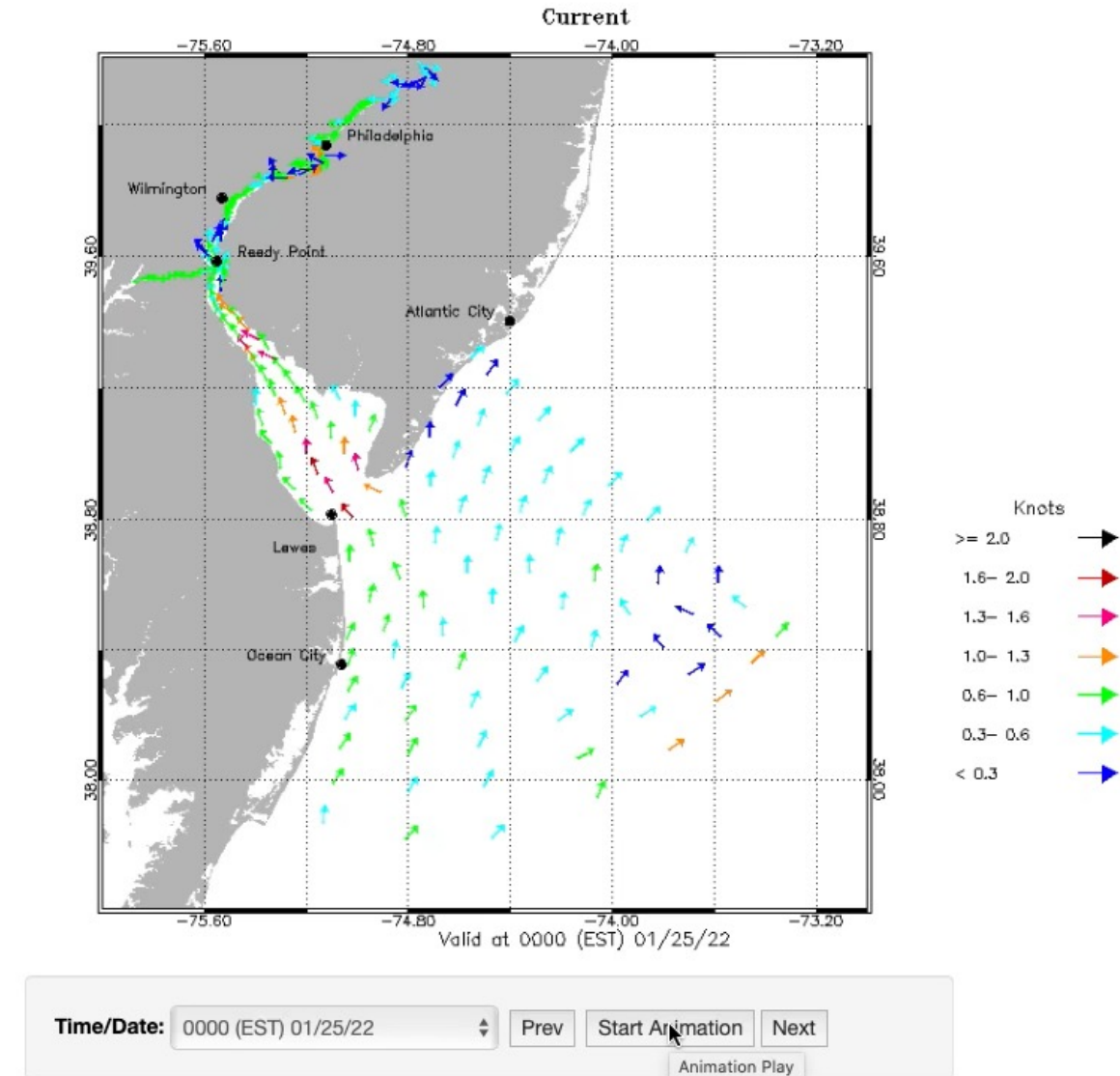


Delaware Bay Operational Forecast System

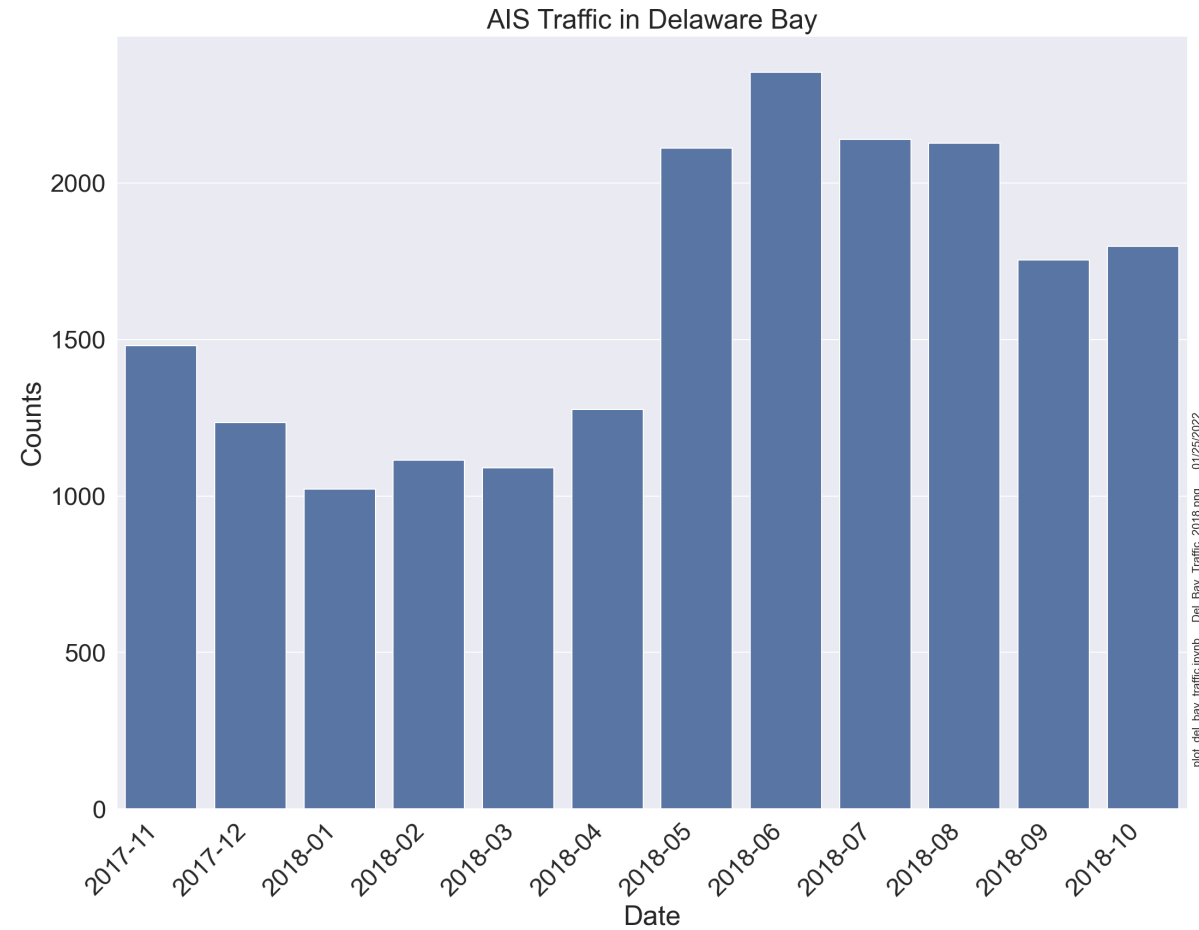
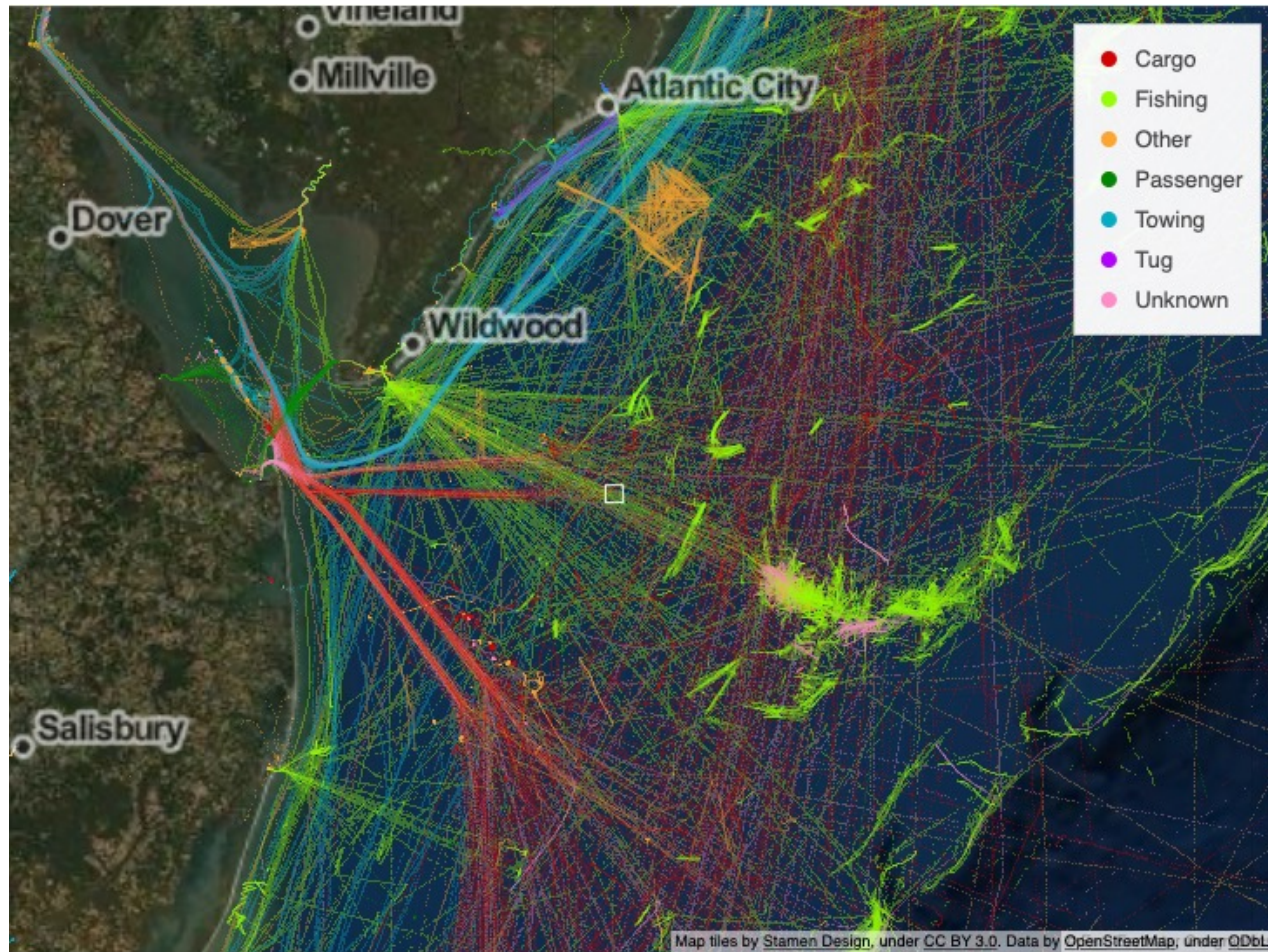


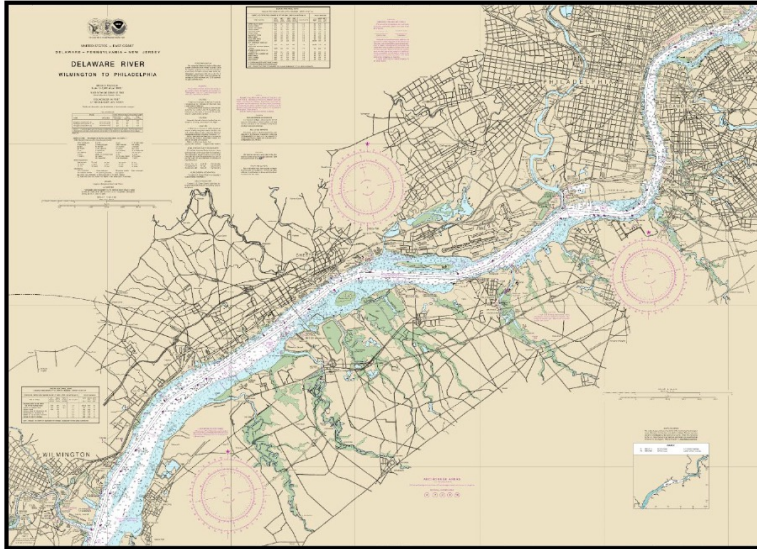
Delaware Bay OFS Currents Nowcast

All model nowcast and forecast information is based on a hydrodynamic model and should be considered as computer-generated nowcast and forecast guidance.



Delaware Bay Traffic





United States Coast Guard
Marine Transportation Systems Directorate



Providing Navigation Safety Information
for America's Waterways Users

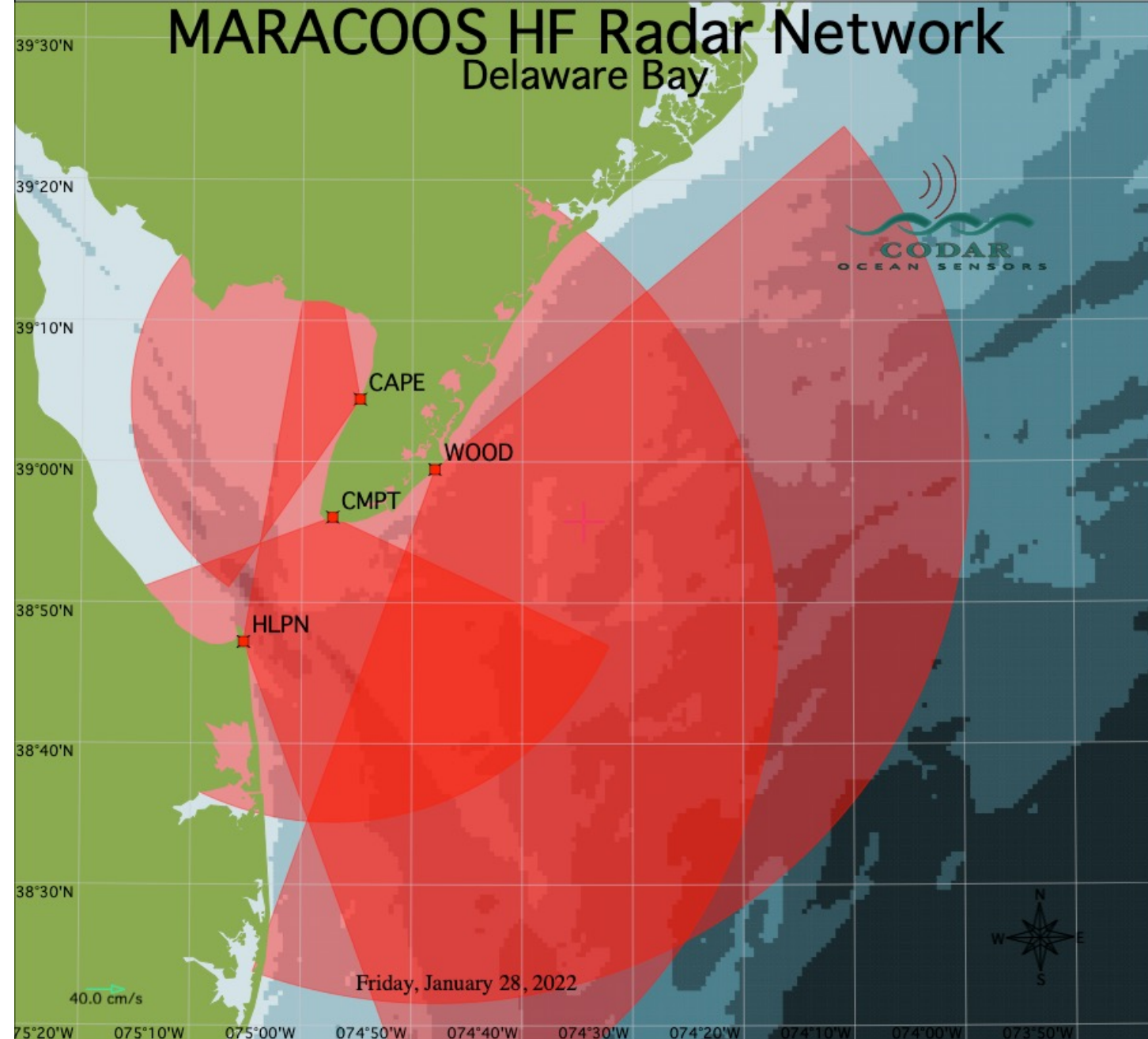
2018

Ports and Waterways Safety Assessment

Waterway Risk Model					
Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Deep Draft Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personnel Injuries	Health and Safety
Shallow Draft Vessel Quality	Volume of Small Craft Traffic	Water Movement	Dimensions	Petroleum Discharge	Environmental
Commercial Fishing Vessel Quality	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Materials Release	Aquatic Resources
Small Craft Quality	Congestion	Obstructions	Configuration	Mobility	Economic

Goal: Safe, Efficient and Commercially Viable

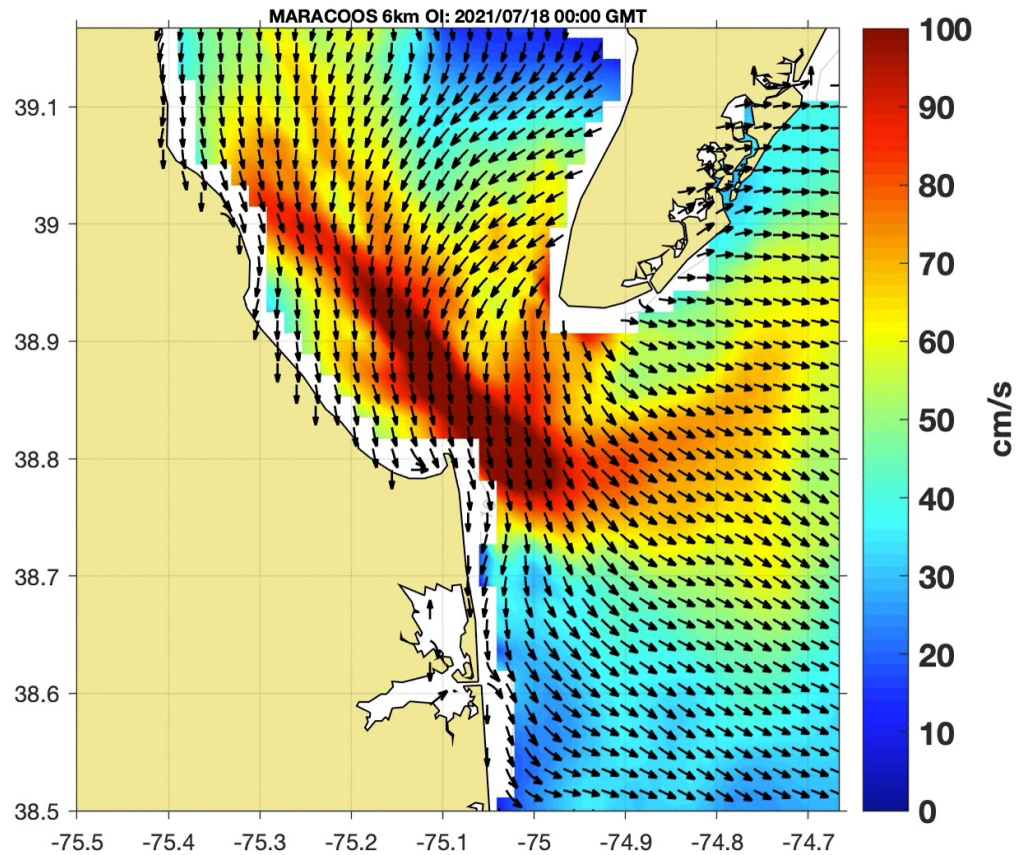
HF Radar Coverage



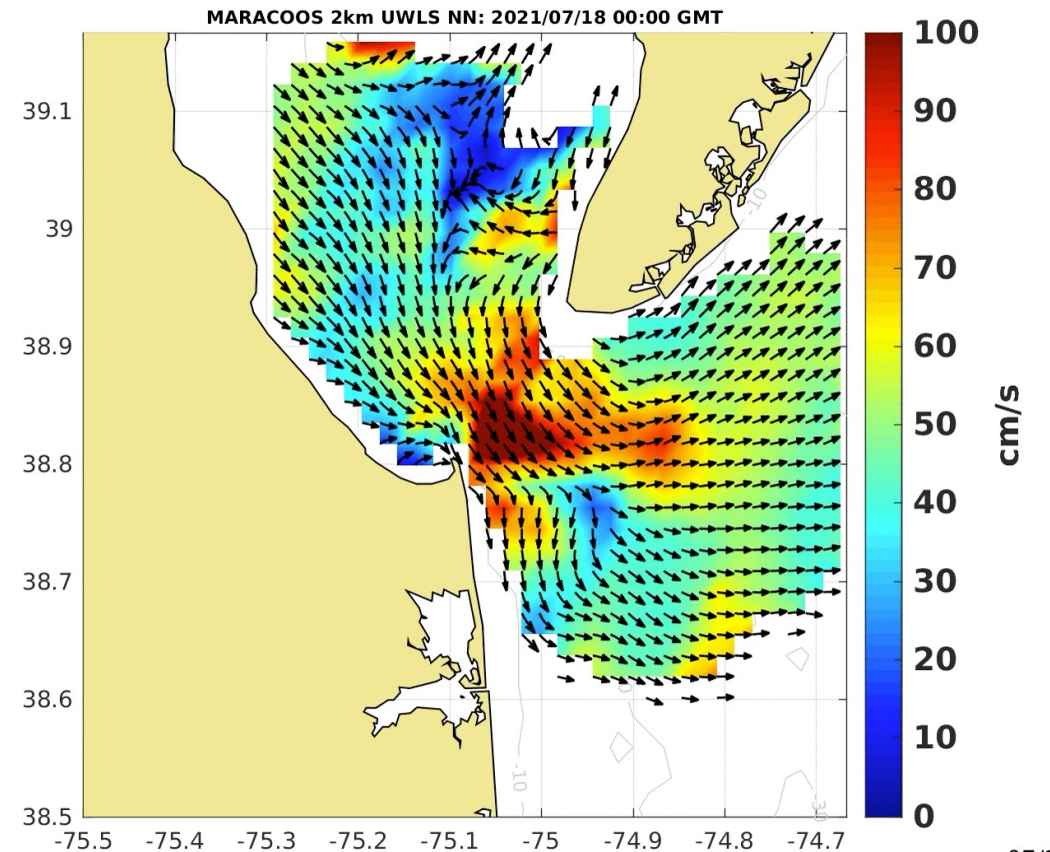
Lewes HFR Installation



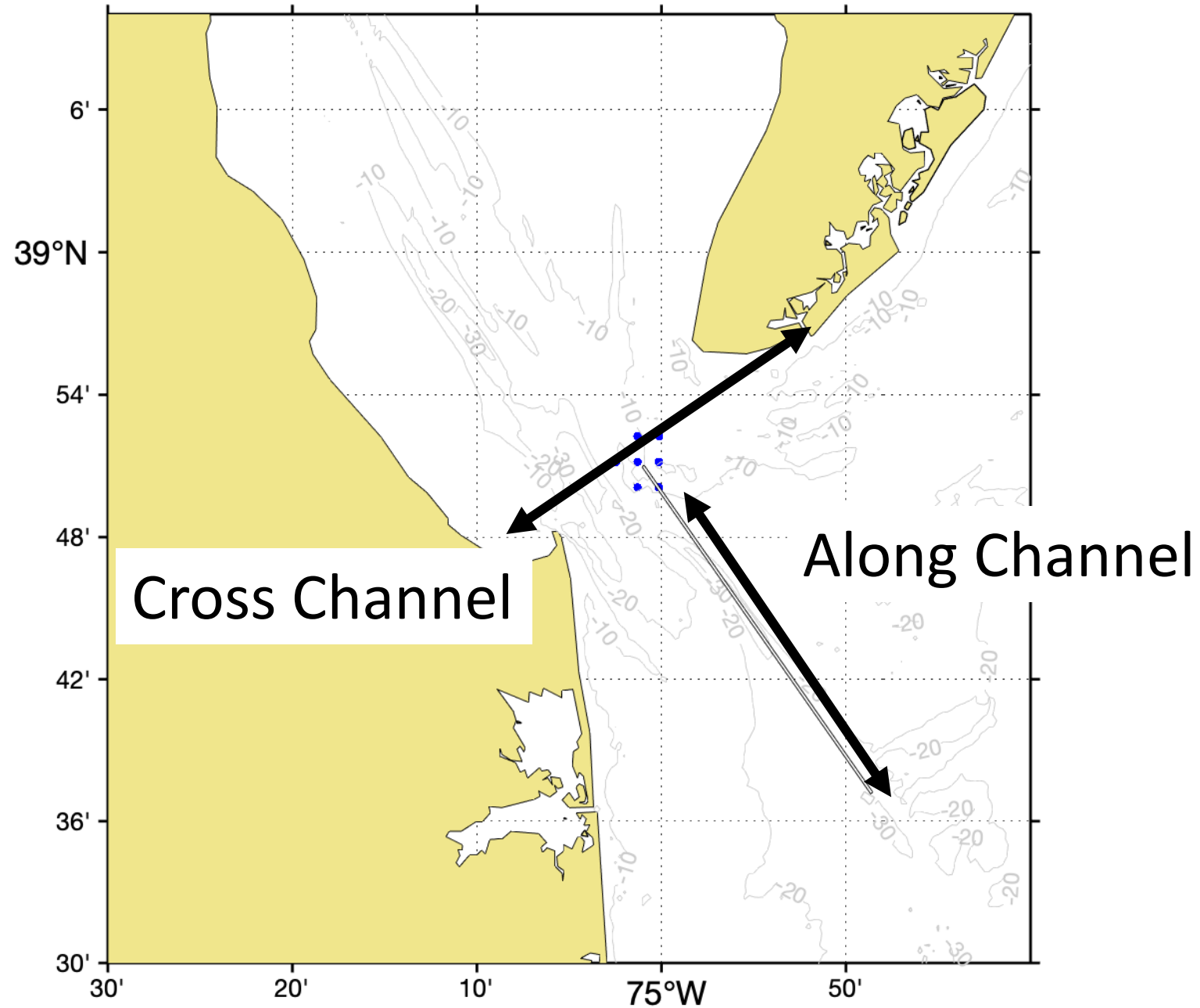
DBOFS vs HFR



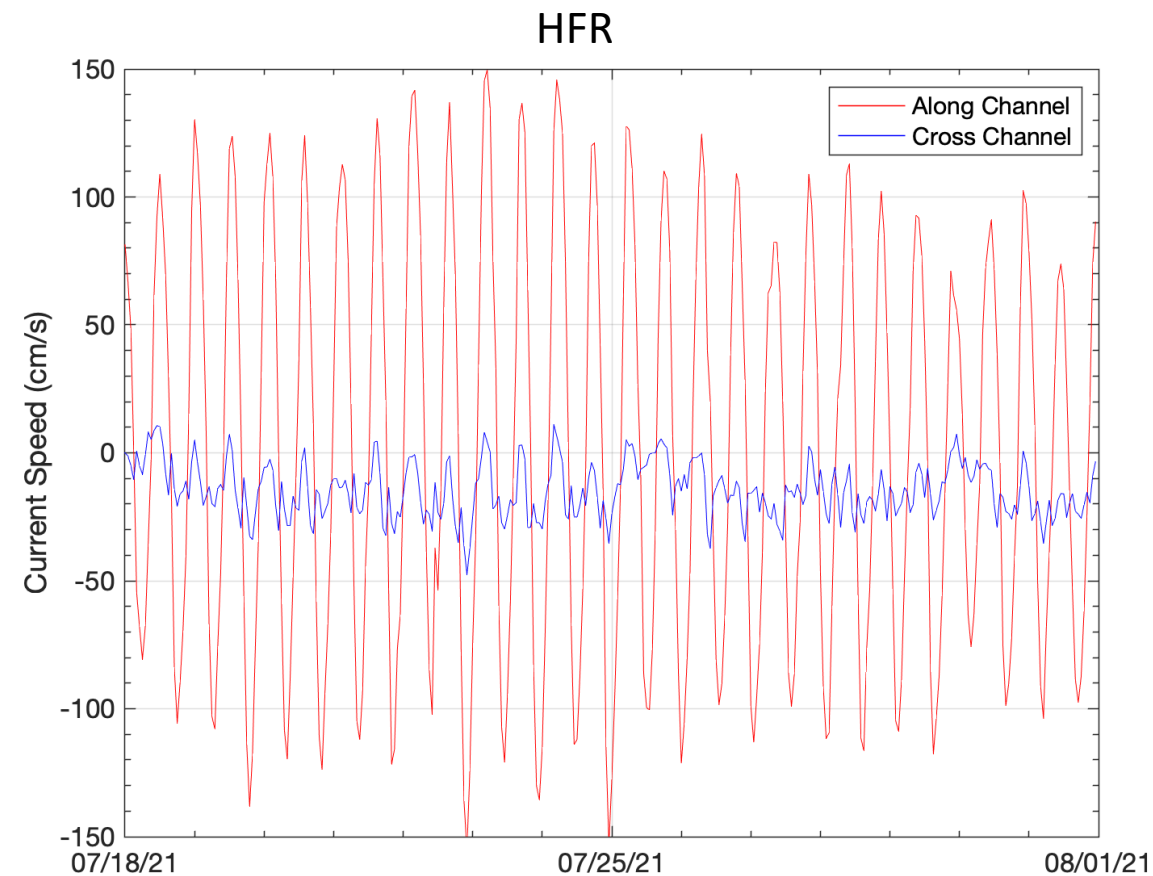
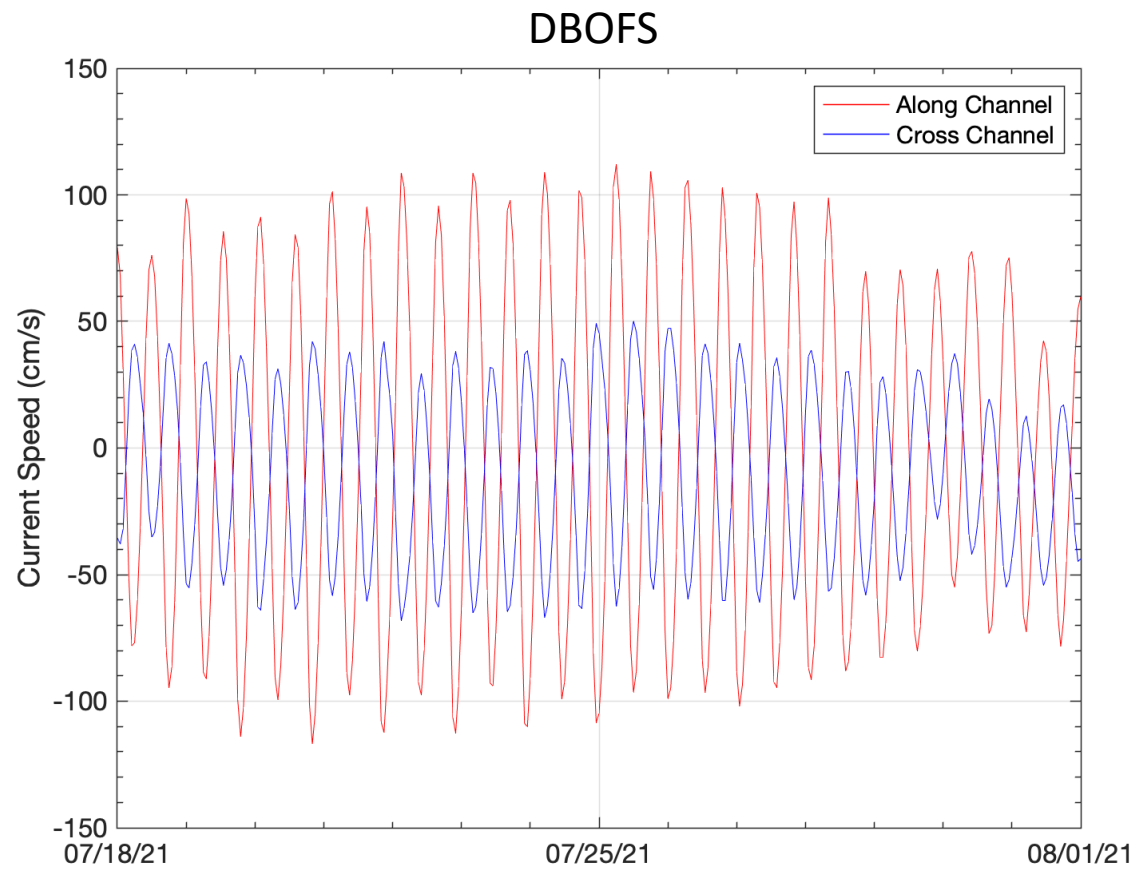
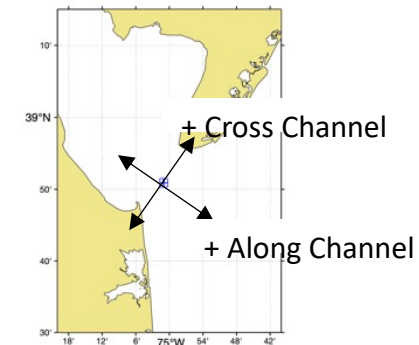
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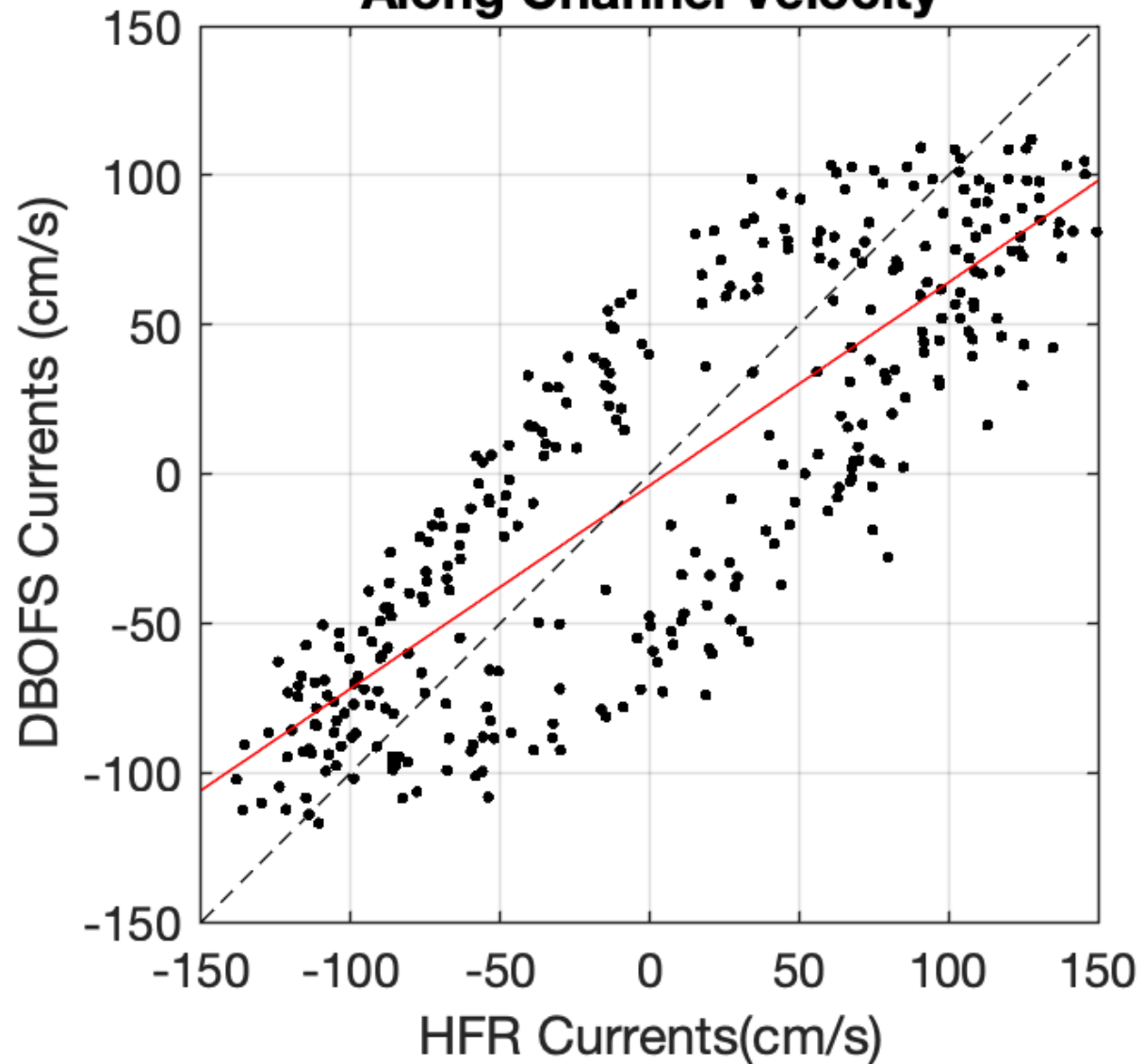
07/19/21
vector_plot_hourly_NN_curly_v2.m



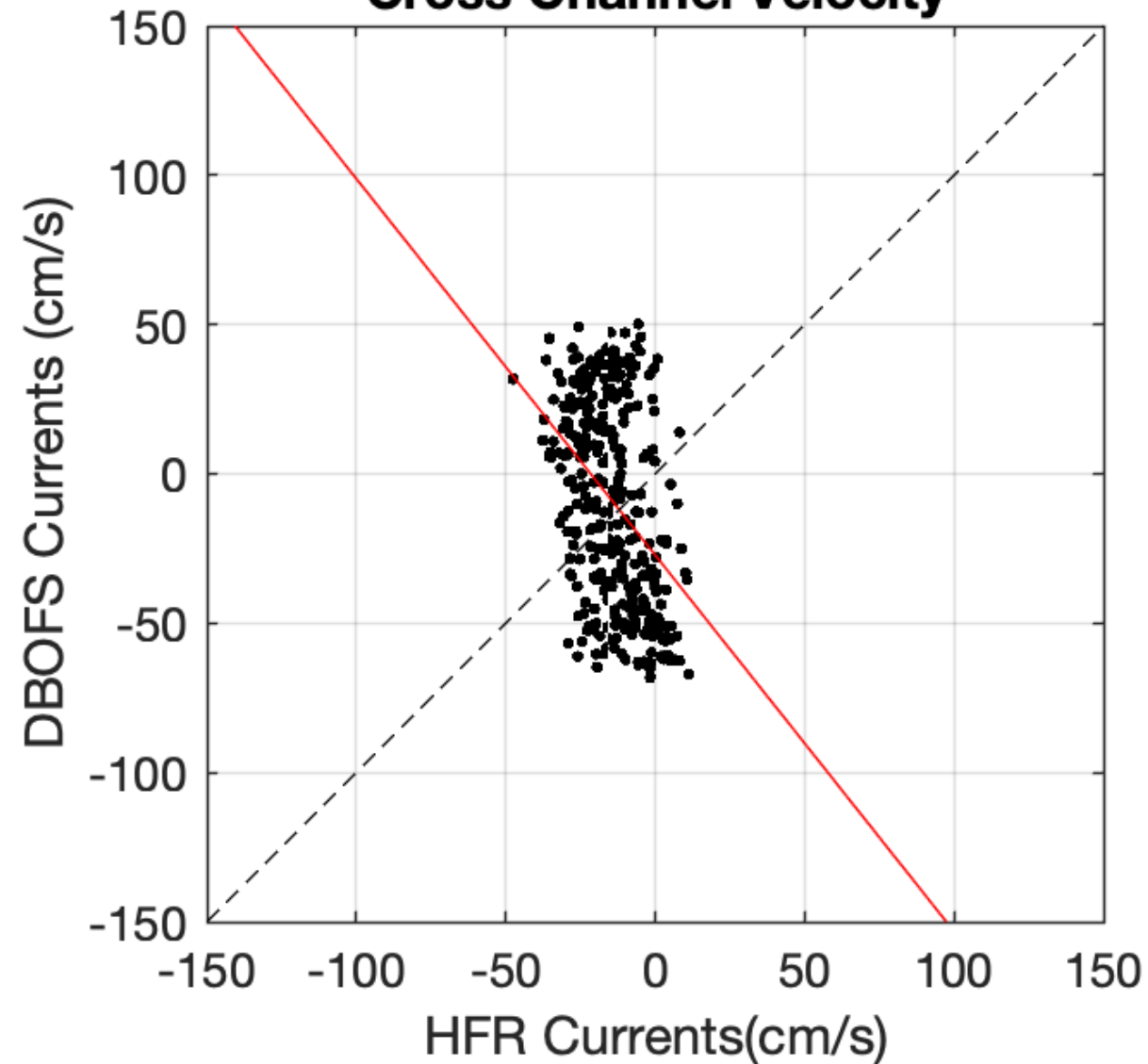
Time series – July 18-Aug 1, 2021



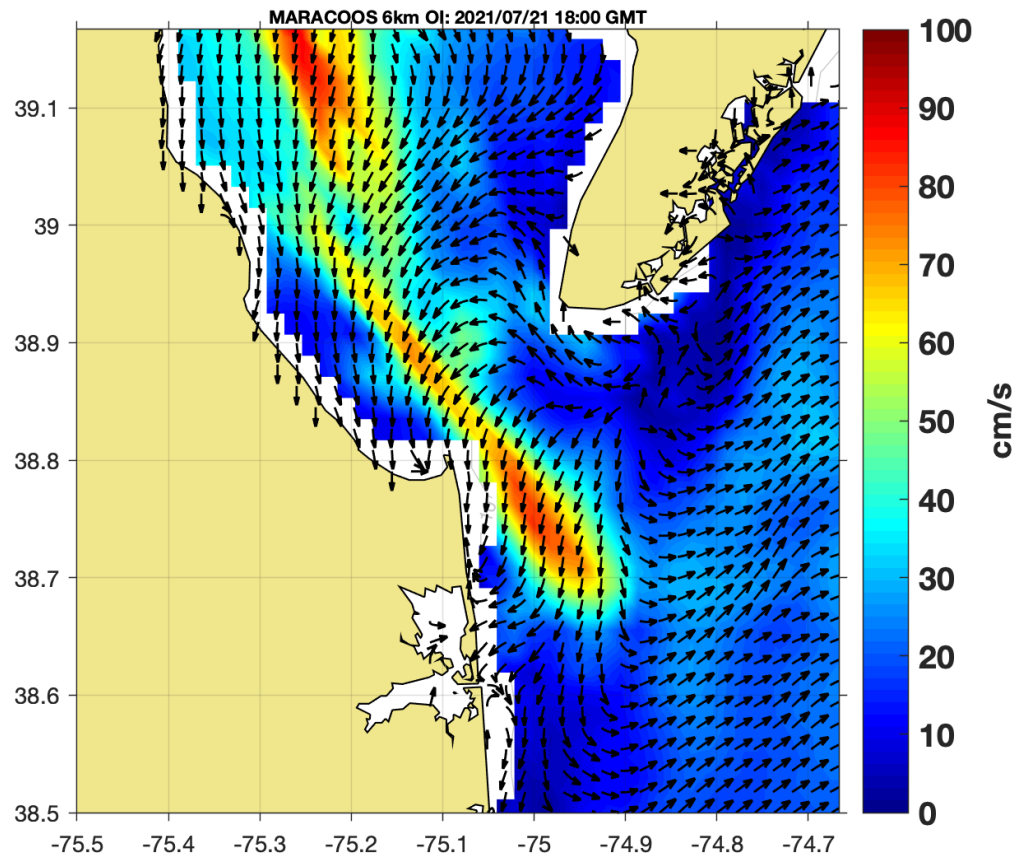
Along Channel Velocity



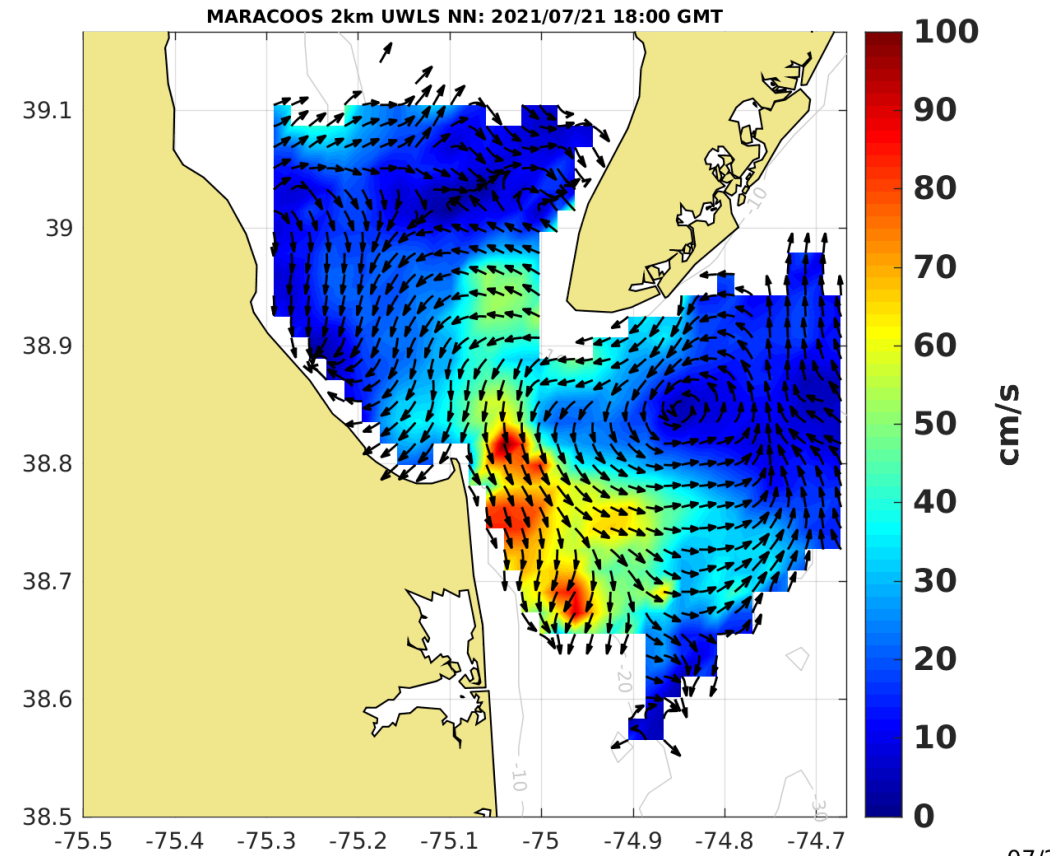
Cross Channel Velocity



Spatial comparison

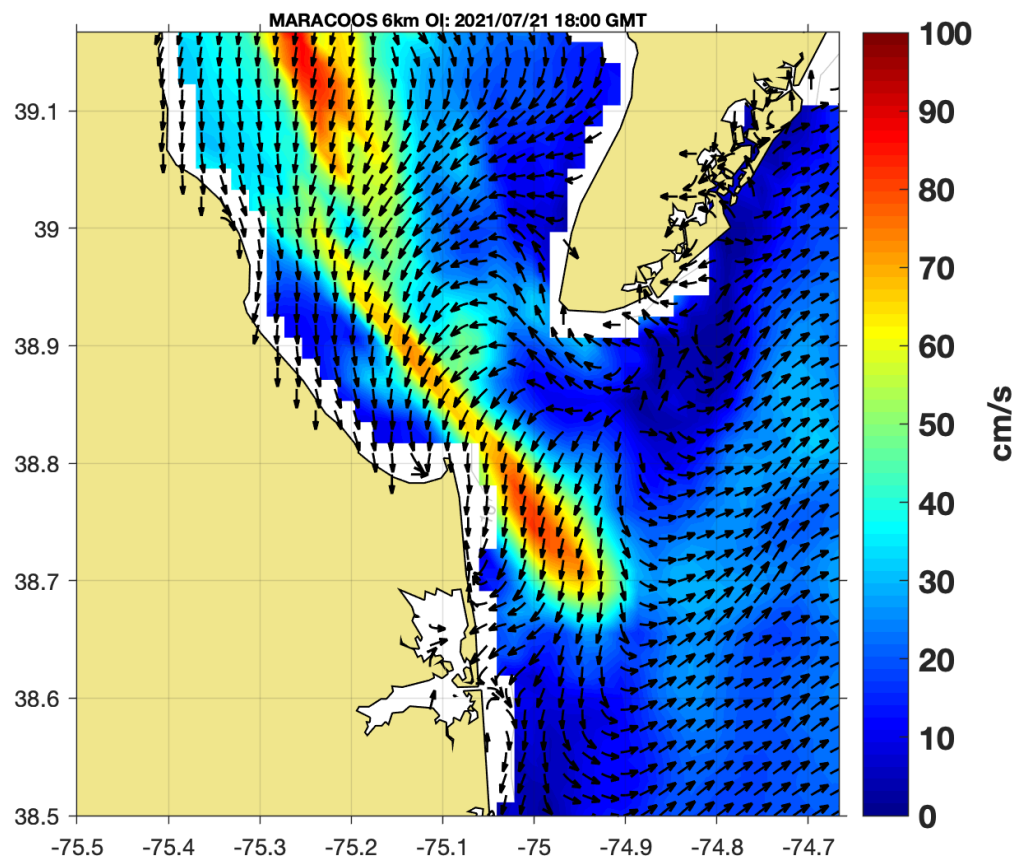


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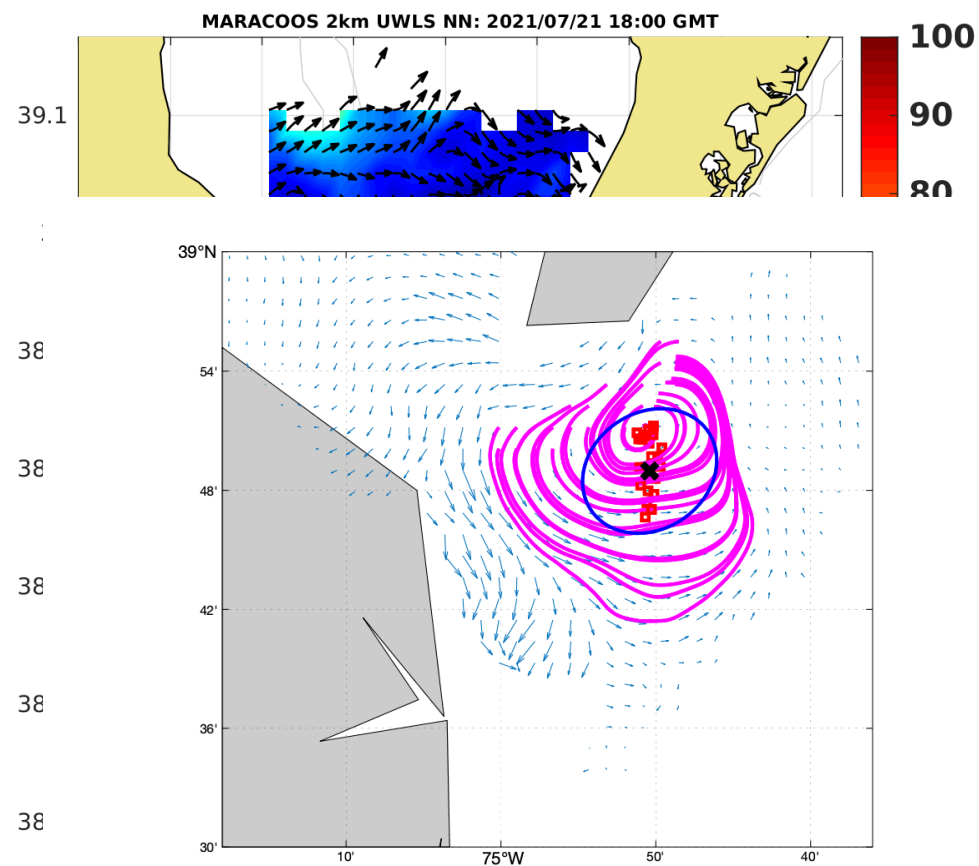


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Spatial comparison



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ly_v2.m

Conclusions

- HFR measurements and model forecasted currents are available in Delaware Bay for use by the maritime community
- The model is underestimating the currents in the along channel direction and shows no skill in the cross channel
- The HFR measurements are capturing cyclonic eddies on a daily basis that are not seen in the model

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Thank You

