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Understanding the Sources of Illicit Drug Bale Wash-up

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Understanding the Sources of Illicit Drug-Bale Wash-up



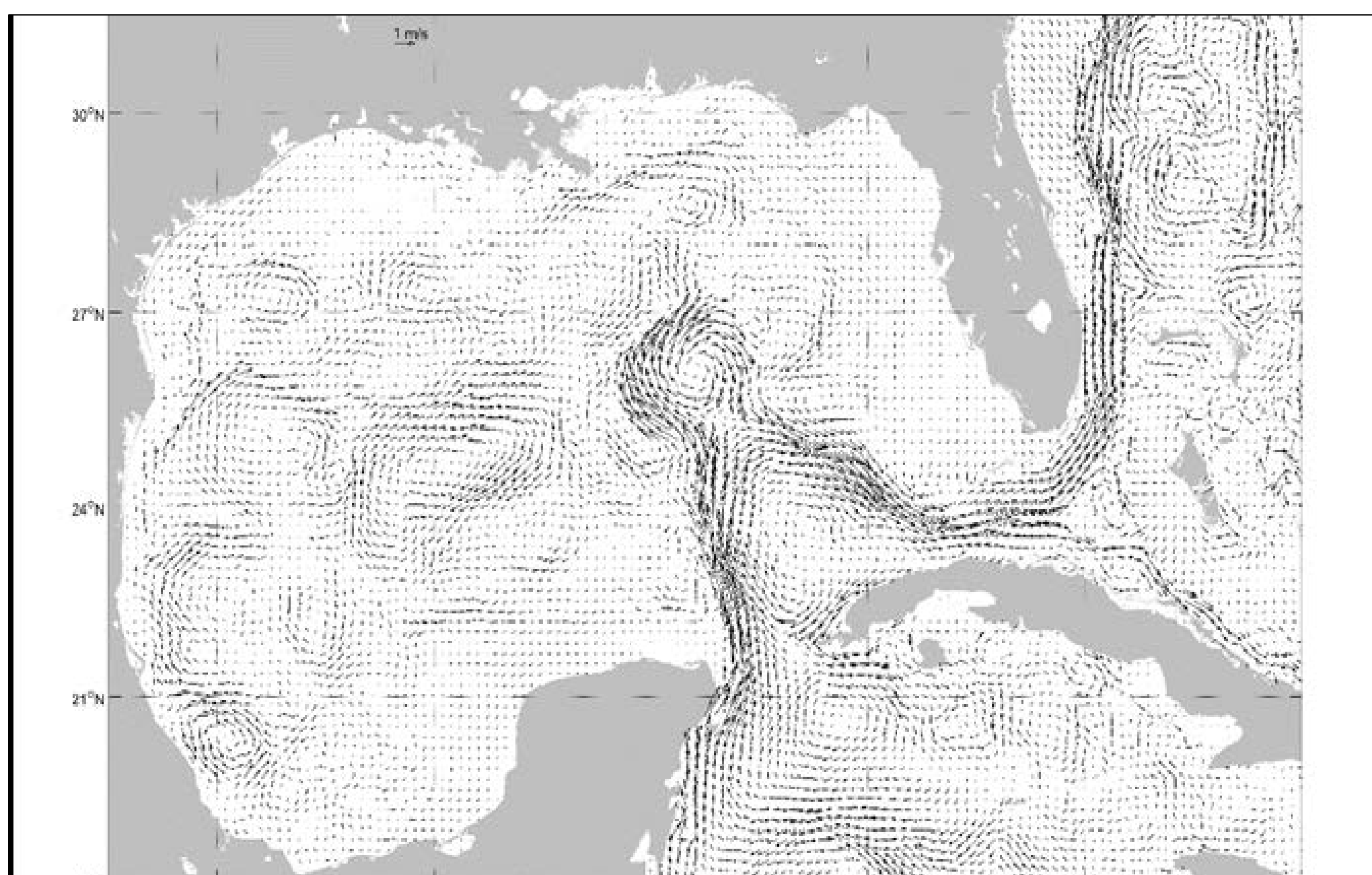
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Postgraduate
School

Background

Counter-drug agencies have encountered many illicit bales of drugs washed-up on shore of beaches around the Gulf of Mexico region, yet it is not clear where the packages originated or how long the packages had been drifting. This study uses ocean modeling to provide a physics-based solution that narrows the likely origins of the drifting drug bales and shed light on their “patterns of life.” Integration of intel collected by drug enforcement agencies to help guide and constrain the model to produce statistically significant, realistic output.



Marijuana bales washed up on a Florida Beach



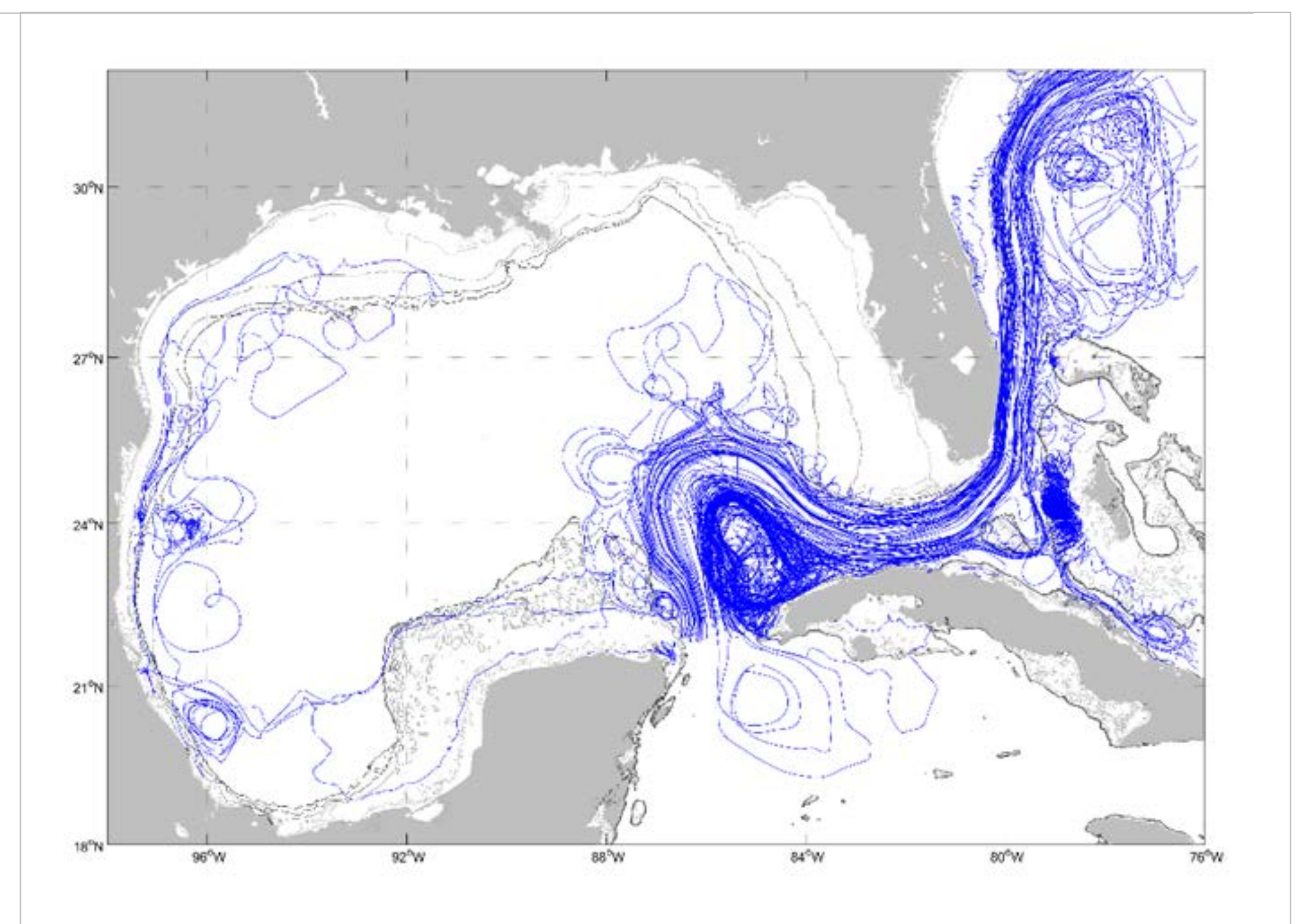
Currents from high-resolution RNCOM ocean model

Modeling

- RNCOM 3-km spatial resolution covering the full domain of interest
- Includes currents, tides and wind stress
- Historical analyses of readily available to drive the model over extended periods
- Combining intel from counter-drug agencies to tune and constrain the model to realistic scenarios

Results

- Modeled circulation at 3km resolution allows estimation of mechanisms that move drug containers, including the influence of tides
- Model suggests a basic mechanism for beaching parcels on the Florida coast outside of Gulf Stream is the classical tides
- Numerical experiments show that accounting for the container shape will result in higher degree of level of freedom and the container motions may change.



Trajectories for parcels launched in Yucatan Channel between eastern Mexico and western Cuba

Recommendations for Future Work

- Validate model performance with tracking of actual or simulated bales in real ocean
- Tune the model to handle various types of drug-bale packages commonly found in the region
- Incorporate more intel from counter-drug agencies to constrain model to realistic scenarios
- Conduct sensitivity analysis to help determine which information is critical fields



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