



## Meet an Intern: Ryleigh Moore

**Applied mathematician analyzes storm surge data during summer internship;  
featured on the ORISE Featurecast Podcast**

“The quantification of storm surge is vital for flood hazard assessment in coastal communities affected by coastal storms,” said Ryleigh Moore, recent participant in the National Science Foundation (NSF) [Mathematical Sciences Graduate Internship](#) (MSGI) Research Participation Program.

“The astronomical tide is an integral component of the total still water level needed for accurate storm surge estimates,” she said. “This gives us the ability to predict and better understand the tide which can help with storm warnings and keep people safer from flooding dangers.”

The NSF MSGI Program provides research opportunities for mathematical sciences doctoral students, allowing them to participate in internships at national laboratories, industries, and other facilities. NSF MSGI seeks to provide hands-on experience for the use of mathematics in a nonacademic setting.

Under the mentorship of Marissa J. Torres, research general engineer with the Engineer Research and Development Center ([ERDC](#)) at Cold Regions Research and Engineering Laboratory ([CRREL](#)), Moore spent the summer contributing research focused on improving the tidal height estimates from the Advanced Circulation (ADCIRC) hydrodynamic model.

While ADCIRC is capable of estimating tidal heights nearshore, the model is limited in its ability to resolve more complex components of the tides than actually exist in nature. Moore’s research objective during her internship was to incorporate critical tidal frequencies that affect inter-annual seasonal variability in the tidal signal.

Moore’s analysis of tidal height estimates concluded that the length of predictions analyzed using UTide, a MATLAB function designed specifically to assist in analyzing tidal data, affected the components identified as part of the tidal signal.

She also determined that because the available ADCIRC tidal predictions were only a month long, procuring longer samples by analyzing longer ADCIRC predictions once they are available would be extremely helpful in furthering this study.

[Learn more](#) about her experience and listen to the [podcast](#).