1) **Title**. Extension of ASGS Operational Awareness Dashboard (OAD) for Real-time Visualization

2) **Principal Investigator**. Brian Blanton (RENCI)

3) **Other Participants/Partners**. Lisa Stillwell (RENCI), Phil Owen (RENCI), Jim McManus (RENCI)

4) **Short Description**. This project will extend the previously developed "operational awareness dashboard" (OAD) that monitors ADCIRC Surge Guidance System (ASGS) prediction activities being conducted across several HPC sites. The dashboard provides a real-time view of ASGS simulations during tropical cyclone events, and is capable of displaying multiple, concurrent ASGS instances on different HPC resources. The OAD has proven to be helpful in keeping ASGS operators more aware of ASGS real-time activities. We will extend the OAD to collect and display more detailed information about ASGS/ADCIRC runtime parameters, including information on where ASGS output is posted and archived for subsequent visualization. The availability of this additional information will enable us to extend the OAD capabilities to include a lightweight, web-based visualization engine. The visualization approach will leverage modern web mapping technologies and use the database developed for the OAD to populate its end-user-interface components.

5) **Abstract**. In CRC Y4-5, RENCI developed a messaging system for ASGS that allows for a broad perspective on ASGS systems operating in real-time. ASGS was instrumented with the RabbitMQ system, and a web-based dashboard was built to allow real-time awareness of the various ASGS instances being run by different operators. This system is called the ASGS Operational Awareness Dashboard (OAD).

The OAD has been extensively tested during the 2019 and 2020 North Atlantic Hurricane seasons, particularly for hurricanes Dorian, Cristobal, and Isaias. During these events, at least 6 ASGS instances were running concurrently at three different HPC sites, and with 5-6 different ADCIRC grids (depending on end-user needs). Feedback from ASGS operators during and after the storm periods was generally positive in terms of the overall usefulness. It was easy to see what/where ASGS instances were running, and the basic state/progress of the main simulation components. Several operators noted that more detailed information would be useful on the OAD, such as specific parameter values being used by the different ASGS configurations, current availability of HPC resources on the systems that host ASGS instances, and links to output products archived by ASGS on THREDDS servers. Additionally, a simplified layout was suggested to make it easier to inter-compare ASGS instances.

In this Y6 project, we will extend the OAD to incorporate more details on ASGS/ADCIRC parameters, reorganize the OAD webpage, and implement a flexible, modern, light-weight visualization add-on that will leverage the existing OAD messaging database, be easily scaled up (or down) to support high-demand periods, and operate "in the cloud."