**NASA DEVELOP National Program**

****NASA Langley Research Center

**Summer 2015**

**Short Title: North Carolina Ecological Forecasting**

**Updated Abstract**

As a result of their sensitivity to sea level rise, wetlands are considered one of the most vulnerable ecosystems to climate change. In addition, wetland extents have diminished over time due to population increases and associated land change patterns. This project, partnered with the Albemarle-Pamlico National Estuary Partnership (APNEP), sought to delimitate wetland extent within the Albemarle-Pamlico watershed from 2000 to 2015 using NASA’s Landsat 5 Thematic mapper(TM), 7 Enhanced Thematic mapper(ETM+), and 8 Operational Land Imager(OLI). Four images (representing spring, summer, fall, and winter) were collected for each year from 2000 to 2015. Multiple images were used for each year to account for tidal changes and to minimize the noise produced by cloudy imagery. After pre-processing the images, indices that measure water extent and wetland health were calculated for each image. From these indices’ wetland extent and relative health were measured more rapidly than contemporary classification methods. A tutorial was provided to APNEP to support the organization in implementing policies toward wetland monitoring, protection, and restoration.