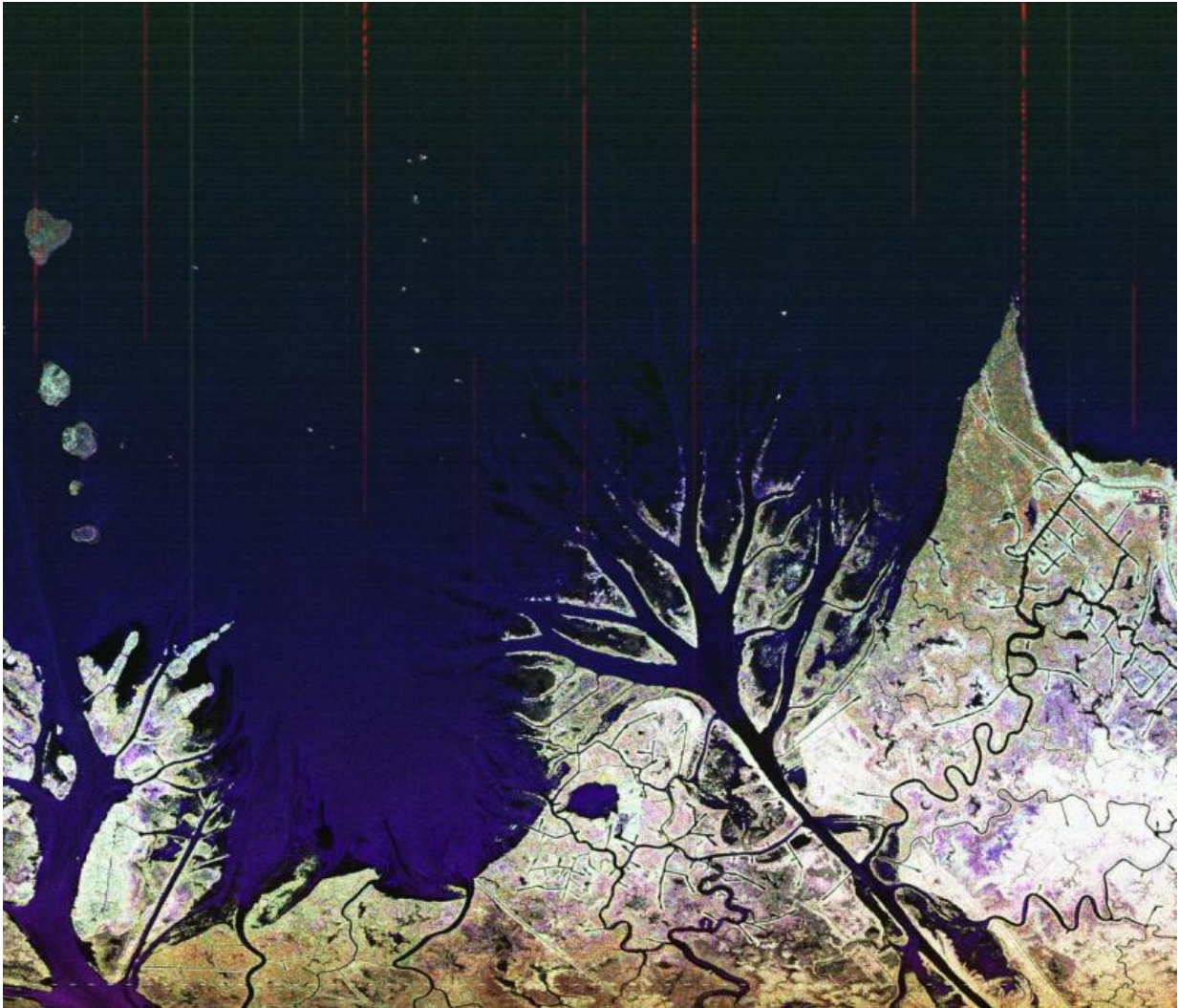


NASA studies Louisiana's changing wetlands

June 17 2015, by Alan Buis



The Mississippi River Delta south of New Orleans, as seen from NASA's C-20A research aircraft. Credit: NASA

NASA recently completed an intensive study of Louisiana Gulf Coast levees and wetlands, making measurements with three advanced imaging instruments on two research aircraft.

NASA instruments fly over the Gulf Coast one to three times per year to keep consistent records of ground subsidence—the gradual sinking of an area of land—which can compromise the integrity of roads, buildings and levee systems. Scientists also closely monitor vegetation changes in the coastal wetlands to better understand how to preserve them. The marshlands not only are home to a delicate ecosystem, but also serve as a natural barrier between land and sea. During storms and hurricanes, the wetlands slow the influx of water into more heavily populated areas. As these wetlands become overly saturated by rising sea levels and the vegetation within them dies, the protection provided by these areas is reduced, jeopardizing the local communities and economy.

"This was a great opportunity to use instruments that work together to create a more complete picture of the changing Louisiana delta," said Randall Friedl, manager of the Earth System Science Formulation Office at NASA's Jet Propulsion Laboratory, Pasadena, California. The instruments were all developed at JPL.

The instruments were:

- The Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) instrument, an imaging radar uniquely designed to measure how Earth locations change between repeat flights over the same path.
- The Next-Generation Airborne Visible/Infrared Imaging Spectrometer (AVIRISng), which observes changes in light reflected from Earth to obtain accurate, quantitative characterizations of the composition and features of Earth's surface.

- The Air Surface Water and Ocean Topography (AirSWOT) instrument, an airborne prototype of a planned spaceborne precision radar instrument that will use a new technique to measure changes in Earth's water surfaces over time.



UAVSAR image of Wax Lake Delta at low tide captured during a flight on May 5, 2015. Research on the delta's growth through natural sedimentation processes can aid future work on restoring deltas worldwide. Image credit: NASA

According to Friedl, the instruments work synergistically together to characterize key wetland properties, such as the extent of flooding, seasonal flooding dynamics and vegetation type.

The goal of the research is to provide data to federal and local agencies, which use the information to determine where to concentrate resources and combat the negative effects of wetland loss and floods. The data will also be used to improve modeling of delta land building and can be applied to help restore deltas worldwide.



The sun rises on NASA's C-20A as it sits at Louis Armstrong New Orleans International Airport before its first science flight. Credit: NASA

UAVSAR flew on a C-20A [research aircraft](#) and the other two instruments flew on a B200 King Air. Both aircraft are based at NASA's Armstrong Flight Research Center facility in Palmdale, California.

An area of particular interest on this mission was the Wax Lake Delta. According to UAVSAR Principal Investigator Cathleen Jones of JPL, the Wax Lake Delta is one of the few deltas in the world that is actually growing through natural sedimentation processes.

"Most deltas are highly engineered, inhabited areas that are in danger from a combination of subsidence and sea level rise. This happens because dams upstream and levees in the delta prevent the natural process of sedimentation from offsetting subsidence," said Jones.



Kean Tam, UAVSAR instrument operator, monitors the C-20A's flight path to ensure that accurate data are collected. Credit: NASA

More information: For more information about NASA's Earth science activities, visit: www.nasa.gov/earth

For more information about NASA's Airborne Science Program, visit: airbornescience.nasa.gov

Provided by Jet Propulsion Laboratory

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