EVS-3 Delta-X

Start Date:	**April 8, 2019**
Confirmation:	**September 20, 2019 (scheduled)**
End Date:	**April 7l, 2024**
Airborne Platform:	**B200 King Air (AFRC), Gulfstream III (AFRC or JSC), B200 King Air (Dynamic Aviation)**
Data Center:	**not assigned**
Principal Investigator:	**Marc Simard (JPL)**
Investigation Manager:	**Ian McCubbin (JPL)**
Deputy PI	**Cathleen Jones (JPL)**
Program Executive:	**Bruce Tagg (HQ)**
Program Scientist:	**Hank Margolis (HQ)**
ESSP Mission Manager:	**Jennifer Olson (LaRC)**
Project Cost Cap:	**$15.0M over five years (2019-2024)**

Summary: Understanding and mitigating the impact of relative sea-level rise (RSLR) on coastal deltas is urgent, as half a billion people live in these low-lying coastal regions. Current models do not account for portions of deltas that can maintain and build land by trapping mineral sediment carried by the water channel network, and by accumulating organic soils produced as plants grow. The science goal of Delta-X is to quantify these mesoscale patterns of soil accretion that control land loss and gain, and predict the resilience of deltaic floodplains under projected RSLR. This study will collect data at the spatial and temporal scales required to understand these dynamic systems. Delta-X makes breakthrough advances in the study of deltaic evolution, moving beyond coarse areal averaging of delta mass balance, to resolve mesoscale features using remote-sensing and in situ measurements.

Implementation: Delta-X will investigate the temperate Mississippi River Delta, obtaining data during high discharge (March) and low discharge (October) in 2020. The deployments will characterize the spatial and temporal variations in water-flow, vegetation-structure, and sediment-load using observations made from state-of-the-art airborne remote sensing interferometric synthetic aperture radar and imaging spectroscopy methods. The airborne measurements will be supplemented by extensive in situ field observations. These data will then be used to calibrate the open-source hydraulic, sediment transport, and land-evolution Delft3D model and ecogeomorphic numerical soil accretion models.

NASA Earth Science Relevance: Delta-X advances NASA's goal to detect and predict changes in Earth's ecosystems and biogeochemical cycles, including land cover, biodiversity, and the global carbon cycle (NASA SMD 2014 Plan: Carbon Cycle and Ecosystems, CC&E). Specifically, it will answer the question: *What are the\consequences of climate change and increased human activities for coastal regions?*