

NASA's unmanned aerial systems (UAS) have been utilized in many science missions, going all the way back to 1993. Some of these missions have targeted imagery (fire, vegetation) and surface measurements, but many have been applied to atmospheric research, both physical (dynamics, weather, etc.) and chemical (e.g., composition). NASA's largest UAS, the Global Hawk, has been used to study atmospheric composition at the tropical tropopause in the Airborne Tropical Tropopause Experiment (ATTREX) mission, where the benefit of the UAS was long range and especially duration of up to 24 hours. Two Global Hawks were used in the Hurricane and Severe Storm Sentinel (HS3) mission to observe hurricane development. Again, long duration at altitude was the significant feature of the UAS. At the smallest scale, NASA has flown DragonEye UAS to measure volcanic gas emissions in both Costa Rica and Hawaii. The small DragonEye could sample gases in hazardous locations where manned aircraft could not fly. At mid-size, the NASA SIERRA UAS has flown imaging payloads and chemical remote sensing instruments in local and international settings. These experiences provide direction for best use of UAS in atmospheric science, which will be presented.

Session Selection:

Use of Unmanned Aerial Systems in Atmospheric Science

Abstract Title:

NASA Experience with Large and Small UAS for Atmospheric Science

Requested Presentation Type:

Assigned by Program Committee (oral, panel, poster, or lightning poster talk)

Presenting Author

Susan Schoenung

Primary Email: susan.schoenung@gmail.com

Affiliation(s):

Longitude 122 West Inc.

Menlo Park CA 94025 (United States)

Second Author

Matthew M Fladeland

Primary Email: matthew.fladeland@nasa.gov

Phone: 6506043325

Affiliation(s):

NASA Ames Research Center

Moffett Field CA (United States)