



Unmanned Aircraft Systems (UAS)

Bridging the Gap Between Earth and Space



As a rapidly emerging technology, Unmanned Aircraft Systems (UAS) are revolutionizing our capability to monitor the global environment. UAS will allow us to detect toxins before we breathe them, discover harmful and costly algal blooms before the fish do, and better observe evolving weather events before they affect local communities.

Remotely operated air vehicles come in a broad range of sizes, from hand-held systems to full-size aircraft. They comprise several components, including the aircraft itself, a ground station from which the aircraft is operated, and a communication system which enables continuous monitoring and control of the aircraft by the pilot(s) and a ground crew.

Around the world, new UAS ideas are being developed by dozens of academic, industry and government groups. UAS have the potential to improve hurricane landfall lead times; save billions of dollars by increasing the accuracy of storm forecasts; and better determine the extent of hurricane evacuations—avoiding costs when evacuations are not

needed. The U.S. National Oceanic and Atmospheric Administration (NOAA) is testing UAS as a platform to improve monitoring over remote areas such as the polar regions, the mid-oceans, expansive wildlands, and also within severe storms. NOAA has selected three UAS "test bed" regions: the Arctic, the Pacific (including Hawaii), and the Gulf/Atlantic regions.

In 2005, NOAA, with the U.S. National Aeronautical and Space Administration (NASA), successfully monitored atmospheric rivers, greenhouse gases and ocean color in the eastern Pacific using a HALE-class UAS (High Altitude Long Endurance). NOAA and NASA used a LALE-class UAS (Low Altitude Long Endurance) during Tropical Storm Ophelia in 2006 and Hurricane Noel in 2007. If routine UAS flights in hurricane strength winds prove successful, LALE-class UAS could become important operational and research tools for obtaining near-surface observations in tropical cyclones at altitudes much lower than traditional aircraft can fly safely. In two demonstrations in the Hawaiian Islands, NOAA used a LALE-class UAS to detect and count humpback whales (2006), and a ship-launched UAS to detect marine debris for future remediation (2007).

<http://uav.noaa.gov/index.html>

