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Title:
UASs Optimization - An evaluation of multiple mode vehicles in monitoring and communication

This presentation will describe the author's experience as Co-I in the NASA/USFS Project: "Strategic Tac Radio and Tac Overwatch (STRATO): Last Mile Communications and Realtime Observation Stratospheric Platforms for wildland fire". This project utilizes an uncrewed Stratospheric (> 70Kft) lighter than air Uninhabited Aerial System (UAS), carries 50 Kg of sensor and communications equipment, and remains on station over a wildfire for up to 30 days. The air vehicle is capable of in excess of 180 days on station, but while the full duration capabilities were not utilized in this project, they could, and would, be used in monitoring a feature like a volcano

In addition to duration, the ability of these Stratospheric Platforms to persistently monitor an area, while carrying "smart" sensors - generating information products, rather than just data - is game changing. Utilizing technologies such as LoRa, the platform can now be the nexus of an ad-hoc sensor web, receiving LoRa based data from low power in-situ sensors in the area being monitored, combining it with high fidelity information gained from on-board sensors, and sending the information product to a remote research facility, using Satellite communication, in real time.

The author will relate the evolution of information collection, derivation and delivery mechanisms in the entire range of NASA's UAS fleet, to today's world, where information products conventionally derived in desk top computational environments, and made available to the Science Community in weeks or months, are now being generated and delivered in near real time.