

Utilization of remotely-piloted aircraft systems for operations and research—RxCADRE 2012

Thomas J. Zajkowski^{A,F}, Matthew B. Dickinson^B, J. Kevin Hiers^{C,G}, William Holley^D, Brett W. Williams^C, Alexander Paxton^D, Otto Martinez^D, Gregory W. Walker^E

^AUS Forest Service, Remote Sensing Applications Center, 2222 W. 2300 South Salt Lake City, UT 84119, USA.

^BUS Forest Service, Northern Research Station, 359 Main Road, Delaware, OH 43015, USA.

^CAir Force Wildland Fire Center, Jackson Guard, Eglin Air Force Base, 107 HWY 85 North, Niceville, FL 32578, USA.

^DUS Air Force, 96th Test Wing, Eglin Air Force Base, Niceville, FL 32542, USA

^EAlaska Center for Unmanned Aircraft Systems Integration, University of Alaska Fairbanks, Fairbanks, AK 99775, USA.

^FCurrent address: Institute for Transportation Research and Education, North Carolina State University, Centennial Campus, Box 8601, Raleigh, NC 27695, USA.

^GCurrent address The University of the South, 735 University Avenue, Sewanee, TN 37383, USA

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ABSTRACT:

Small remotely-piloted aircraft systems (RPAS), also known as unmanned aircraft systems (UAS), are expected to have important contributions to wildland fire operations and research, but their evaluation and use have been limited. Our objectives were to leverage US Air Force (USAF) controlled airspace to (1) deploy RPAS in support of the 2012 Prescribed Fire Combustion and Atmospheric Dynamics Research (RxCADRE) objectives including fire progression at multiple scales, and (2) assess tactical deployment of multiple RPAS with manned flights in support of incident management. We report here on planning for the missions, including the logistics of integrating RPAS into a complex operations environment, specifications of the aircraft and their measurements, execution of the missions, and considerations for future missions. RPAS measurements included visible and longwave infrared (LWIR) imagery, black carbon, air temperature, relative humidity, and three-dimensional wind speed and direction. The RPAS flew over 50 sorties and provided real-time situational awareness to incident staff without major mishap. Despite this success the missions showed that improvements RPAS technology, platform, sensors and image processing is necessary to maximize their effectiveness. This presentation will describe the results of RxCADRE 2012 as well as current and anticipated research.