The FireMapper2.0 imaging system collects multispectral imagery in 3 thermal infrared bands every 5.6 seconds with a 5.1 meter resolution (Riggan, 2003). When the system is mounted on a very stable platform and flown at a specific speed an height it produces clear very fine resolution imagery. The bands ability to cut out smoke from the image and not get saturated by active flames makes it useful for locating spot fires, flaming fronts, and areas of concern. Figure 1 shows the visible spectrum while Figure 2 shows FireMapper2.0 imagery of the same location at the same time.

This UAS system flew around 60 fires on 14 missions across the western United States in a four year study between 2006 and 2010 (Ambrosia, 2010). These missions provide valuable up to date imagery to incident management teams for analysis. This improves operational safety by better informing decision makers. Figure 1. is the Ikhana UAV which is a converted Predator drone equipped with remote sensing technology. This platform offers the capability of long duration monitoring of a fire which reduces exposure to pilots and crews.

Remote Sensing in Wildland Firefighting Operations

Small Remote Controlled UAS

While large to medium UAS can monitor a fire for an extended period of time there is application for small UAS in the firefighting community (Colomina, 2014). Currently due to issues regarding airspace these sorts of UAS are not operated as to avoid downing other aircraft. The small UAS with the proper sensor can provide cm level resolution in real time to ground crews working on the line. They have demonstrated these UAS can be used to direct retardant drops and bucket work on critical area. Another application is for scouting fire perimeters which is a dangerous job that has taken the lives of many experienced firefighters. There is a lot of potential for the use of small UAS in tactical wildland firefighting operations however improvements to UAS durability and operational time must be further work.

References:


The USFS uses FIS to get remotely sensed imagery from a remote sensor Bar FireMapper on a fixed aircraft flying over a fire to the incident command center for evaluation(s),appt. (2010). The speed at which imagery can be taken and analyzed for distribution is very important when dealing with wildfires. Accurate up to date information is critical for making sound, timely decisions when they count. Analysts must produce static maps deliverable to the IC for briefings that are easy to digest. The implementation of this system improves timeliness and effectiveness of disaster response teams.

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