

FPI Wildfire participates in UnmannedCanada 2016 Systems (UAS) Conference

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Background

FPInnovations was asked to explore the possibility of adding a wildfire section to an Unmanned Aerial Systems (UAS) industry workshop or conference over the winter of 2016. This was the second time 'wildfire' had been included and is seen as an avenue for communicating wildfire realities to the UAS community.

Implementation

Unmanned Systems Canada agreed to include a wildfire component at its 14th Annual UnmannedCanada 2016 Conference held in Edmonton, Alberta, November 1–3, 2016. Jim Thomasson from FPInnovations' Wildfire Operations Research program chaired a wildfire plenary panel discussion and hosted a breakout session, which provided wildfire participants with an opportunity to discuss their needs and operational constraints.

Panel Discussion

The wildfire panel discussion included representatives from various wildfire management agencies in British Columbia, Alberta, and Ontario. These managers are responsible for the use of unmanned aerial vehicles (UAV) within wildfire operations. Each agency gave an overview of their wildfire aviation program and associated costs, and they explained how and where UAVs have been used on wildfire. They discussed the process to be followed by a UAS operator if they had a product to support fire operations and are able to work on fires. Each province was different in their approach to aviation and UAV usage on wildfires.

The take-away points from the panel discussion are:

- "New" uses for UAS are often tasks that have already been performed for years on wildfires by well-established operational practices.
- The airspace on a wildfire is often a complex, dynamic and crowded environment as multiple aircraft can be aloft in a small area.
- UAS operations are more likely to be at the back end of an active fire than at the front of the wildfire timeline.
- The use of UAS operations on wildfires has been very limited in Canada. Most applications have been in trials. There is still a need to identify their niche in terms of overall effectiveness.

Breakout Session

Six speakers participated in the breakout session, covering the following topics:

- Alberta IR scanning program. Jamie Badcock, Alberta Wildfire Management Branch.
 - Jamie gave an overview of the IR scanning program and the certification requirements for operators, and he described the Hinton IR Grid Test.
- British Columbia's wildfire management experience using UAS technology on wildfires (agency perspective). Shawn Lund, BC Wildfire Service.
 - Shawn gave an overview of UAV use on British Columbia wildfires. He believes the most effective UAS use in a wildfire is in supporting fireline operations, for example, in scanning short sections of fireline at night and providing crews with targets for the next day. He sees no need to scan the entire fire with a UAS. Shawn sees this usage of the UAS more as a tactical tool as opposed to a strategic tool.
- Hummingbird drones and wildfire operations in British Columbia. Robert Attwood, president, Hummingbird Wildfire.
 - Robert discussed the challenges of working on a ~30-day mission in northeastern British Columbia. He talked about how data were processed, and gave a demo of his automated hotspot detection software.
- UAS operations in challenging conditions – stories from the Alberta oilfields. Dan Juhlin, Remote Sensing analyst.
 - Dan recounted stories from his days as an UAS operator in the oilfields of Alberta. Muddy roads, rough landings, and equipment damage were all part of normal operations, which would likely be the same on wildfires.
- Economics of scanning winter burn piles. Jim Thomasson, Wildfire Operations researcher, FPIInnovations.
 - Jim discussed an analysis that showed helicopters still have the edge for scanning winter burn piles, but that UAV operations are not far behind. If the UAVs could be more productive, and if missions are carefully selected to suit the capabilities of the UAV, then the scales could tip to increased use of UAVs.
- Characterizing vegetation structure on anthropogenic features in Alberta's Boreal Forest with UAVs. Shijuan Chen, Master of Science student, Department of Geography, University of Calgary.
 - Shijuan discussed her research about using UAVs to characterize the vegetation types and species along transects on a cutline. It was suggested that this process could be used for forest fuel inventories around communities and before prescribed burns.

Media Exposure

The *Edmonton Journal* and CBC interviewed FPIInnovations. The *Journal's* story can be found at:

<http://edmontonjournal.com/news/local-news/alberta-open-to-more-drone-technology-in-battling-and-tracking-wildfires>

Conclusion

The agencies and UAS vendors attending the 2016 UnmannedCanada conference exchanged valuable information. The UAS community learned from agency representatives that wildfire operations take place in a complex and dynamic environment, and that it will be difficult for UAV operations to integrate into wildfire operations without first finding a niche. Approaches to wildfire operations continue to evolve, and wildfire managers want to implement technology that will increase the safety and effectiveness of their fire management operations.