



Partnership for Research to Open Markets for an
Emerging Technology: Helping to Expand Unmanned
Systems (PROMETHEUS) in Nevada

Quarterly Progress Report

Reporting Period: 1 October to 31 December 2015
December 31, 2015

Project Purpose

This project's purposes include developing new technologies and applications as they relate to fire science research and fire management; assessing the commercial potential of fire-UAS applications and assisting Nevada companies in targeting relevant markets; building capacity and conducting outreach to promote fire-related UAS business for our Nevada partners in the field of fire science and fire management; and seeking opportunities to conduct demonstrations, operations, and relevant supporting research.

Section I: Proposal Progress

With considerable activity and time in Q4 devoted to initiating the Knowledge-Fund supported cloud-seeding project, activities on this project were somewhat more limited this quarter. However, highlights included the following activities:

- work to develop commercial opportunities for a new industry-academic partnership
- involvement with UBCO business students to conduct market and commercialization research
- development of business models for UAS in fire
- advising UNR engineering students involved in a new startup

Additionally, proposal activity related to this project continued, with a number of significant funding proposals submitted or under development. These include the following:

1. NASA-EPSCoR preproposal, "Satellite and UAS Sensing of Wildland Fire Processes and Effects Supporting Fire Science and Management." This ~\$1 million preproposal was selected to be Nevada's entry in the national NASA EPSCoR competition.
2. Joint Fire Science Program, "Tools to Guide Treatments for Future Climates in Sagebrush Ecosystems." This \$267,000 proposal was submitted in November, and if funded will both benefit from and contribute to the activities conducted in the course of the PROMETHEUS project.
3. National Science Foundation Major Research Infrastructure proposal focused on UAS for fire and ice research, also expected to be ~\$1 million. This proposal is currently under development with submission expected in Q1 2016.
4. NSF EPSCoR preproposal: This 5-year, ~\$20 million program will be pursued by a collaborative team consisting of DRI, UNR, UNLV, and a number of commercial partners, with DRI expected to play a significant leadership role. The preproposal our team submits will be tailored to the theme of UAS and wildland fire, and we will be developing this proposal throughout 2016. We will continue to provide updates and will ultimately request letters of support from GOED, since the activities accomplished by our team will have huge positive impacts on the commercial UAS sector in Nevada, workforce development and educational capacity building, and STEM capacity building throughout NSHE.

In all four cases the capacity built by and activities conducted for this project have improved our ability to submit highly competitive proposals, and we will continue this trend.

1. Commercialization / Partnering

During Q4 2015 we explored commercial partnerships with two Canada-based companies whose interests include fire-UAS applications. Their advantages include established presence beyond local markets, and current income streams derived from UAS operations. Their needs include UAS manufacturing and expertise such as DRI and one of our Nevada commercial partners, Drone America, provide. We will continue to develop opportunities based on the capacity of Drone America to provide UAS manufacturing and integration services.

2. Intellectual Property

None to report this quarter.

3. Programmatic & Project Changes

[Section is reserved and will be used only if needed. Summary of material changes to project scope and mission, e.g. addition or removal of job roles, any unforeseen needs, changes in budget, or other material changes in direction]

4. Looking Forward

Annual federal expenditures on wildland fire averaged over \$3.3 billion during the past five fiscal years. These large sums are only a portion of spending on wildfire response, however, as State and local jurisdictions bear large responsibilities for control and suppression as well. Aviation resources for observation comprise a substantial portion of wildfire costs, and present a market opportunity for capable UAS platforms that will become available to a global market immediately upon access to the National Airspace System (NAS). Additional opportunities will emerge as UAS are developed to deliver supplies, and to engage in high-risk backfiring operations by serving as aerial ignition platforms. We will continue to pursue proposal opportunities related to the broad area of fire science and management as they relate to UAS and commercial opportunities, and report on these efforts in future quarters.

Section II: Performance

Table 2: Progress Toward Metrics

Primary Categories	Q4 2015
Companies Moved to NV	0
Start-up companies	0
Jobs Created	12
IP Licenses	0
IP Revenue	0
Grants Received/Affiliated	0/0
Sponsored Research (Contracts/\$)	1/\$2,000,000
Secondary Categories	
Patents (Filed/Awarded)	0
Students placed with Companies	0
Impact Faculty Hired	0
Gifts/Donations to KF Projects	0
Student Internships	0

Start-up Companies:

None this quarter, although discussions with our partners have included starting a company based in Nevada to serve as headquarters for our team efforts.

Jobs Created:

Consulting with Murdoch University led directly to a contract for Drone America that has resulted in the creation of 12 jobs for our industry partner.

Intellectual Property Licenses:

None this quarter.

Intellectual Property Revenue:

None this quarter.

Grants received:

The aforementioned contract to Drone America has an estimated value of \$2 million, and DRI played an instrumental role in convincing Murdoch to place its order with Drone America.

Sponsored research:

None this quarter.

Impact Faculty hired:

None this quarter.

Student Internships:

None this quarter.

Section III: Budget

The budget of the PROMETHEUS project supported some salary time and travel for PI Watts in Q4 2015, with one hire expected to occur in Q1-2 2016.

Section IV: Monthly Logs of AIC Activities for Reporting Quarter

October 2015
<ul style="list-style-type: none">• Consulting with DroneAmerica and Murdoch University (Perth, Australia) yielded an order for 50 units that resulted in the creation of 12 DA jobs and an estimated impact of over \$2 million.
<ul style="list-style-type: none">• Conversations with industry partners in Nevada and Canada to discuss teaming opportunities.
<ul style="list-style-type: none">• Participation in Remote Sensing for Wildfires workshop that resulted in submission of one funding proposal and potential NASA collaboration that strengthened NASA EPSCoR preproposal.
November 2015
<ul style="list-style-type: none">• Business prospects trip to BC to discuss partnership opportunities with UBCO, fire consulting company, and UAS startup
<ul style="list-style-type: none">• Advised AboveNV, a Reno UAS startup, on fire-UAS work
<ul style="list-style-type: none">• Attended the International Fire Congress to present and discuss commercialization work and UAS-fire business prospects with potential clients and collaborators
<ul style="list-style-type: none">• Advised student group at UNR on creation of startup company in the area of fire and UAS, potentially resulting in creation of 4-5 jobs
December 2015
<ul style="list-style-type: none">• Advised student group at UNR on creation of startup company in the area of fire and UAS (continuing activity)
<ul style="list-style-type: none">• Attended the American Geophysical Union Fall Meeting to present and discuss commercialization work and UAS-fire business prospects with potential clients and collaborators
<ul style="list-style-type: none">• Advised UBCO business students concerning market and commercialization study of UAS for fire operations (continuing work throughout the quarter)

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| <ul style="list-style-type: none">• Meeting with Van Scoyoc to discuss Congressional outreach activities that may occur in Q1 2016 to potentially benefit UAS industry in Nevada. |
| <ul style="list-style-type: none">• UAS-Fire business model development with commercial partners |

Section V: Appendix

No appendices this quarter.