

# ALASKA FIRE SCIENCE CONSORTIUM

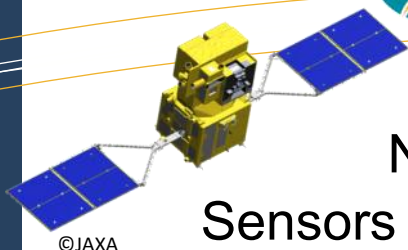


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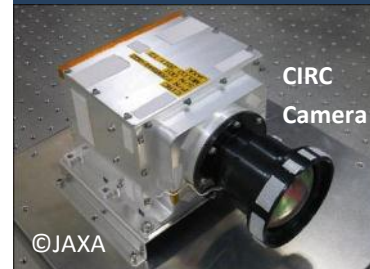
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AFSC Research Brief  
2014-2 May 1, 2014



## New Satellite Sensors For Wildfire Mapping and Monitoring

By Randi Jandt & Koji Nakau



### Highlights:

- ◆ Low-cost microsattellites may supplement fire detection/mapping
- ◆ Collectively, new satellites should provide daily observations of fires world-wide

Hokkaido University (HU) is one of the world leaders in developing new earth-observing space technology. Dr. Koji Nakau leads their **wildfire remote sensing applications team**. He's working with various partners—including UAF—on new satellite-derived products delivered to wildland fire managers in Alaska and around the world.

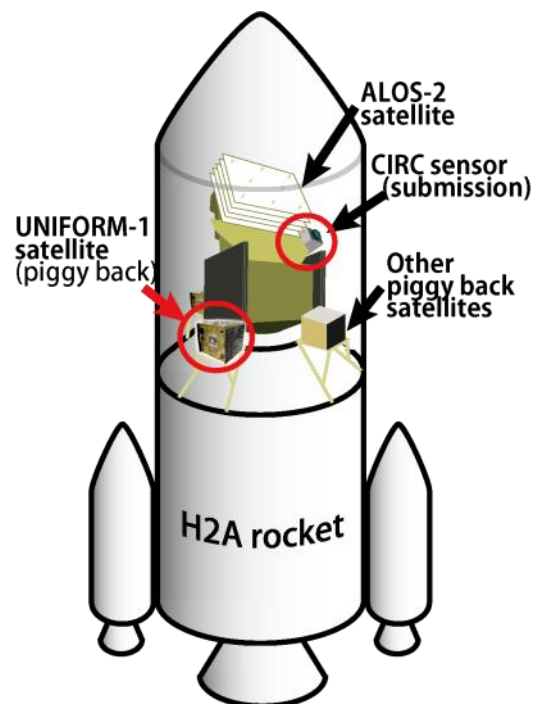
satellites” piggy-backed on the rocket (below).

### Microsatellites & Uncooled Cameras

Advances in microsatellite technology have opened the door for new sensors to detect open-burning fires as well as smoldering combustion in peat layers. The microsattellites weigh just a few

### Countdown to Launch!

May 24, 2014 is the scheduled launch of a rocket called HIIA-F24 from Japan's Tanegashima Space Center. The rocket launch by the Japanese Aerospace Exploration Agency (JAXA) will carry the Advanced Land Observing Satellite (ALOS-2) used for environmental monitoring and four microsattellites. HU will see two of it's new fire-sensing thermal infrared sensors launched into orbit with that mission. A Compact Infrared Camera (CIRC, above right) is attached to the ALOS-2 satellite. Also, UNIFORM-1—with an infrared sensor called BOL developed by HU specifically for fire sensing—is one of several “micro-



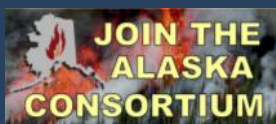
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### Abbreviations

#### UNIFORM-1:

UNIversity FORmation Mission 1

**BOL:** microBOLometer camera



**ALOS-2:** <<[LINK](#)>> to Rocket & satellite package info

**JAXA** is the Japanese Aerospace eXploration Agency: <http://www.jaxa.jp>

The UNIFORM “micro-satellite” (below) was developed by Hokkaido University specifically for fire monitoring.

hundred pounds and cost a fraction of the large satellite/sensor arrays we use today such as MODIS. In addition, HU’s new CIRC and BOL cameras require much less power because they don’t rely on special semiconductors that require continuous cooling. Uncooled sensors are somewhat less sensitive than the large cooled sensors like MODIS, but with higher resolution imagery (150-m vs. 1-km pixels) they may yield similar or improved results for hotspot detection and fire mapping.

Dr. Nakau and his team will be busy testing data and working out algorithms that hopefully will lead to advances in improving real-time operational support for wildfire propagation modeling, smoke transport, fuels inventory, and post-fire vegetation change.

Satellite	ALOS-2	UNIFORM
Developer	JAXA	HU
Camera	CIRC	BOL
Satellite	2 tons	110 lbs.
Wavelength	8-12 $\mu$ m	8-12 $\mu$ m
Resolution	200m	150m



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Information on Dr. Nakau’s work with sensor testing and calibration is available at: <http://www.census.hokudai.ac.jp/html/JSTJICA/index.html>

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