NASA GSFC Activities at UMES

Geoff Bland
610.W/5-11-17
NASA Earth Science
Capturing The Global View from Space
NASA Airborne Science Program
A Detailed Perspective

goff.bland@nasa.gov  5-10-17
Operation Ice Bridge
Airborne Topographic Mapping (ATM)

Images Courtesy of 2017 Operation Ice Bridge/NASA ATM Team
Images Courtesy of 2017 Operation Ice Bridge/NASA ATM Team
**Surface Imaging System (SIS)**

for **CARbon Atmosphere Flux Experiment (CARAFE, Kawa, et al)**

C-23 (N430NA), September 2016, May 2017

* Nikon DSLR (D7000) color camera
  * Flir Thermal Imager (AS325sc) with computer
  * Micasense multiband camera
Pressure Ports for Wind Vector System

Rack with Position and Attitude System

Images Courtesy of J. Moisan/NASA
Surface Imaging System (SIS)

CARAFE 3-Camera System Example
Color, Thermal Infrared, Multispectral (Red, Near-Infrared shown)

Images Courtesy of NASA ATM Team
S/S Color & Thermal Infrared Images

Images Courtesy of NASA ATM Team
**S/S Multispectral Images**

<table>
<thead>
<tr>
<th>Image Number</th>
<th>MicaSense Band</th>
<th>Central Wavelength</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blue</td>
<td>475 nm</td>
<td>20 nm</td>
</tr>
<tr>
<td>2</td>
<td>Green</td>
<td>560 nm</td>
<td>20 nm</td>
</tr>
<tr>
<td>3</td>
<td>Red</td>
<td>668 nm</td>
<td>10 nm</td>
</tr>
<tr>
<td>4</td>
<td>Near IR</td>
<td>840 nm</td>
<td>40 nm</td>
</tr>
<tr>
<td>5</td>
<td>Red Edge</td>
<td>717 nm</td>
<td>10 nm</td>
</tr>
</tbody>
</table>

Images Courtesy of NASA ATM Team
Vanilla Aircraft VA001 Multispectral Composite

LandSat False color technique to enhance chlorophyll
Near IR band = red
Red band = green
Green band = blue

MicaSense (adjusted)*
Near IR (4) = red
Red band (3) = green
Green band (2) = blue

*Not identical bands to LandSat and color balance adjusted for visual match to LandSat images

Images Courtesy of NASA ATM Team; Vanilla Aircraft, LLC
MiniSniffer UAVs with Gasoline & Hydrazine Propulsion
NASA DFRC (c.1975)
VEREX
Volcanic Retrievals Emissions Experiment
D. Pieri, et al – February, 2017
VEREX
Volcanic Retrievals Emissions Experiment
VEREX
Volcanic Retrievals Emissions Experiment
VEREX
Volcanic Retrievals Emissions Experiment
Arenal & Turrialba Volcanoes
w/ David Pieri/JPL, Andres Diaz/Univ. Costa Rica
AEROKATS and ROVER Education Network

AREN

Typical NASA Mission Model

AREN Model

geoff.bland@nasa.gov  5-10-17
Undergraduate Multidisciplinary Earth Science Airborne Instrumentation Research

UMES-AIR

Collaboration with the University of Maryland Eastern Shore
**TwinCam**

- Low-Cost Video Cameras: Color and Near-Infrared for Normalized Difference Vegetative Index (NDVI)
- With UMES Natural Sciences & Engineering and Aviation Sciences Departments
1912 *Picavet Alternative - The Aeropod*
ThermoPod
UMES/Boseman Field - Thermal Imager

goff.bland@nasa.gov

06/28/12
16:49:26

CEN: 33.3

27.9

47.1°C
Profiler
Boundary Layer Studies

![Graph showing temperature, humidity, and wind speed profiles](image)

- **Temperature (deg F)**
- **Humidity (%)**
- **Wind Speed (mph)**

geoff.bland@nasa.gov 5-10-17
MicroSpectrometer on MSC Barge
Jeff Sumey, et al – California Univ. of Pennsylvania
Schmidt Ocean Institute R/V Falcor

Images Captured by S. Uz, et al/NASA
Dare to Dream
This Stuff is Hard

**Communicate** - Everyone Has Something Valuable To Say

**Plan** - Understand The Possibilities

**Be Safe** - Have Fun!

geoff.bland@nasa.gov  5-10-17