U.S. Department of the Interior
Unmanned Aircraft Program
Update
FY 2017 Recap

4976 flights
- BLM 56%
- USGS 22%
- USBR 7%
- NPS 6%
- OAS 6%
- FWS 2%
- OSMRE 2%
## FY 2017 By GACC

By GACC:
- Great Basin: 22%
- Northwest: 17%
- Rocky Mtn.: 14%
- AK: 12%
- Southwest: 9%
- Eastern: 8%
- Southern: 8%
- Socal: 5%
- N. Rockies: 4%
- Norcal: 2%

### DOI UAS Flights by Bureau and GACC

<table>
<thead>
<tr>
<th>GACC</th>
<th>BLM #</th>
<th>BLM %</th>
<th>FWS #</th>
<th>FWS %</th>
<th>NPS #</th>
<th>NPS %</th>
<th>OAS #</th>
<th>OAS %</th>
<th>OSMRE #</th>
<th>OSMRE %</th>
<th>USBR #</th>
<th>USBR %</th>
<th>USGS #</th>
<th>USGS %</th>
<th>GACC Tot. #</th>
<th>GACC Tot. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>484</td>
<td>81%</td>
<td>50</td>
<td>8%</td>
<td>64</td>
<td>11%</td>
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<td>0%</td>
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<td>0%</td>
<td>0</td>
<td>0%</td>
<td>3</td>
<td>0%</td>
<td>601</td>
<td>12%</td>
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<tr>
<td>Eastern</td>
<td>20</td>
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<td>0%</td>
<td>268</td>
<td>69%</td>
<td>391</td>
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<tr>
<td>Great Basin</td>
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<td>82%</td>
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<td>62</td>
<td>6%</td>
<td>2</td>
<td>0%</td>
<td>105</td>
<td>9%</td>
<td>10</td>
<td>1%</td>
<td>1118</td>
<td>22%</td>
</tr>
<tr>
<td>Northern California</td>
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<td>63%</td>
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<td>0%</td>
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<td>0%</td>
<td>105</td>
<td>2%</td>
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<tr>
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<td>48</td>
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<td>29</td>
<td>15%</td>
<td>189</td>
<td>4%</td>
<td>189</td>
<td>4%</td>
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<tr>
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<td>26</td>
<td>3%</td>
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<td>17%</td>
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<tr>
<td>Rocky Mountain</td>
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<td>285</td>
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</tr>
<tr>
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<td>45</td>
<td>12%</td>
<td>6</td>
<td>2%</td>
<td>2</td>
<td>1%</td>
<td>0</td>
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<td>7</td>
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<td>311</td>
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</tr>
<tr>
<td>Southern California</td>
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<td>22%</td>
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<td>29</td>
<td>12%</td>
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<td>0%</td>
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<td>15%</td>
<td>250</td>
<td>5%</td>
</tr>
<tr>
<td>Southwest</td>
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<td>0%</td>
<td>149</td>
<td>35%</td>
<td>18</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
<td>53</td>
<td>12%</td>
<td>65</td>
<td>15%</td>
<td>431</td>
<td>9%</td>
</tr>
</tbody>
</table>

**Bureau Totals:**
- DOI Flights (56%): 2774
- BLM Flights (2%): 109
- FWS Flights (6%): 284
- NPS Flights (6%): 307
- OAS Flights (2%): 332
- OSMRE Flights (2%): 1080
- USBR Flights (22%): 4976
Dept. of the Interior - UAS Platforms

**2009-2015**
- AeroVironment – Raven RQ-11A
- Honeywell - T-Hawk
- MLB Super Bat

**PRESENT**
- 3DR Solo (385)
- Firefly Y6S (15)
- Pulse Vapor 55(1)
DOI Remote Pilot Stats

259 DOI Remote Pilots
BLM: 123
USGS: 62
BIA: 2
NPS: 14
OAS: 10
OSMRE: 10
USBR: 19
FWS: 19

Non-DOI = 12

USDA: 1
USFS: 7
State of AK: 3
NOAA: 1

271 TOTAL Current

*Note: DOI Remote pilots have blanket authorization from USFS.
DOI UAS Fleet Numbers

- BLM-147
- USGS-129
- FWS-66
- OAS-20
- NPS-19
- USBR-17
- OSMRE-8
- BIA-8
- Total=419
FY 2017 Training

194 pilots carded in FY 17
13 Basic UAS courses
218 Aircraft Purchased
24 bureau mentors/lead instructors
  • BLM = 8
  • USGS = 7
  • USFWS = 5
  • NPS = 3
  • USBR = 3
  • OSMRE = 0

Lead instructor process
  • Take A-450
  • Nominated by Bureau Program Lead
  • Team Teach A-450
  • Qualified IAT instructor
  • Evaluator Sign off based on competency
Current DOI UAS Fleet Distribution

Cameras & Sensors

Point & Shoot, MILC and DSLR Cameras

High Definition Video

Thermal Sensor

Multispectral Sensor

Courtesy of MicaSense Sample Images
Firefly Payloads

Payloads

- **Sony a6000** 24Mp imager for daytime mapping
- **Sony A7r** 36Mp imager for higher resolution daytime mapping
- **Sony RXIRII** 42Mp imager for higher resolution daytime mapping
- **Slanrange 3P** multispectral camera
- **MicaSense RedEdge** multispectral camera
- **MicaSense RedEdge M** multispectral camera
- **Parrot Sequoia** multispectral camera
- **Gimbaled GoPro Hero 4** HD
- **Gimbaled FLIR Vue Pro R** IR camera
- **Colibri** – EO/IR stabilized gimbaled camera (6X optical zoom)
Remote Sensing Data

- Landsat 8 (30 meter)
- NAIP 2010 (1 meter)
- UAS at 400 ft (5 cm)
- UAS at 200 ft (2.5 cm)
Why Does it Matter?

Arctic Tern (red beak)

Aleutian Tern (black beak)
2017 Fire Missions

- 660+ UAS flights on fires
- 71 Individual fires
- EO/IR payload
- Both quadcopter and fixed wing aircraft
Case Study: Fire Reconnaissance
Case Study: Fire Reconnaissance
Fire Recon
Umpqua North Fire
Current Projects

• Aircraft testing and evaluations (16 in past year)
• Solo Replacement Update
  • DJI
  • DIUX
  • 3DR
• BLM fire CWN contract
• Aerial ignition UAS
• Interagency Fire UAS Subcommittee
• Vertical surface inspection
• Protection of NCI/Icon sites.
• Fire Data Sharing
FY 18 Training

• 13 Basic Operator Courses Planned
• Up to 150 additional remote pilots
• Add-on training for make/model

Sky's the Limit
Since the Interior Department streamlined the process for drone operations in late 2016, flights have drastically increased.

Note: Fiscal year ends in September
Source: Department of the Interior

Source: WSJ
Challenges

- Data Management and cloud processing (FedRAMP)
- Educating the workforce
- Culture
- CWN vs. Exclusive Use
- Full time UAS operators vs. collateral duty
- Acquisition cycle
- System dependability
Future of the DOI UAS Program

• Contracting for UAS services will increase access to data
• Automation and AI will simplify data collection, processing and dissemination
• Move into tactical missions
  • Cargo/water dropping (OPA)
  • ACETA
  • Aerial application
• Much more data available to the public
Discussion?

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