Utilizing GIS in Wildland Firefighting

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Overview

• Background

• Use Cases

• Dashboard

• Conclusion
Background
Background: Wildland Fire GIS

1964 National Infrared Operations
1970s Incident Command Structure
2001 USGS GeoMAC
2004 Specialized Esri Tools
2010 NWCG – GISS Training
2011 Efforts to use Web GIS
2013 Web GIS: Silver Fire
2014 Collector: Boles Fire

United States Forest Service
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Splintered efforts to use Web GIS begin to co-evolve across several agencies.
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Overview | Background | Web Map | Collector | VGI | Dashboard | Summary
Web Map: Silver Fire 2013

Banning, California
Web Map: Silver Fire 2013

Official fire perimeter
Aug 7th PM
Web Map: Silver Fire 2013

MODIS thermal data combined with official fire perimeter
Web Map: Silver Fire 2013

Updated perimeter given to Incident Commander
Prior to arrival, the Incident Management Team knew fire acreage had increased overnight from 6,000 acres to 11,000 acres.
ArcGIS Collector: Boles Fire 2014

Weed, California
157 Homes – 120 Minutes
ArcGIS Collector: Boles Fire 2014
ArcGIS Collector: Boles Fire 2014
ArcGIS Collector: Boles Fire 2014

Real time updates in ArcGIS Operations Dashboard
What is next in Fire GIS?

Volunteered Geographic Information (VGI)
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Volunteered Geographic Information (VGI)

Quality

Users can contribute false or incorrect data intentionally or inadvertently

“Data provided by those with experience or technical knowledge in the field of interest have been found to have high quality.”

- Michael Goodchild, 2007
Volunteered Geographic Information

Neophyte
- Interested

Interested Amateur
- Read about subject

Expert Amateur
- Knowledge of subject

Expert Professional
- Works in the field

Expert Authority
- Studied subject
- Well known

Coleman, Georgiadou, Labonte (2009)
VGI: Expert Sourced

- Forum for active and retired firefighters
- Verification required for registration and contribution
Volunteered Geographic Information (VGI)

<table>
<thead>
<tr>
<th>CA-BDF-Lake</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location:</strong> Barton Flats area off Jenks Lake Rd. @ Camp Debenelle</td>
</tr>
<tr>
<td><strong>Acres:</strong> 1</td>
</tr>
<tr>
<td><strong>ROS:</strong> Moderate</td>
</tr>
<tr>
<td><strong>ROC:</strong> Immediate structure threat, several camp grounds threatened. Extensive bug kill of trees and other vegetation. Felled trees</td>
</tr>
<tr>
<td><strong>Structures:</strong> are threatened</td>
</tr>
<tr>
<td><strong>Special Hazards:</strong> limited ground access, fire burning in heavy brush, lack of water</td>
</tr>
<tr>
<td><strong>Resources:</strong> Second alarm en-route along with 1 Type 3 strike team, total of 5 AT's. Type 2 team managing the fire</td>
</tr>
<tr>
<td><strong>Radio Frequencies:</strong></td>
</tr>
<tr>
<td><strong>Weather Info:</strong> Converse Raws: <a href="http://raws.wh.noaa.gov/rom.....gi?stn=CVEC1">http://raws.wh.noaa.gov/rom.....gi?stn=CVEC1</a></td>
</tr>
<tr>
<td>Big Bear Raws: <a href="http://fam.nwgc.gov/roman/cgi-bin/ed...8C66FAGMT">http://fam.nwgc.gov/roman/cgi-bin/ed...8C66FAGMT</a></td>
</tr>
<tr>
<td><strong>Other Comments:</strong> Lake AA has permission to use the retardant in San Gorgonio wilderness area.</td>
</tr>
</tbody>
</table>

**Internet Links ----------**

- **Maps:** [http://arcg.is/1GuuCOV](http://arcg.is/1GuuCOV)
- **Progression:** [http://arcg.is/1GxaR7h](http://arcg.is/1GxaR7h)
- **Historic Fire Map:** [http://arcg.is/1G8gMPT](http://arcg.is/1G8gMPT)
- **Agency Website:** [http://inciweb.nwgc.gov/incident/4302/](http://inciweb.nwgc.gov/incident/4302/)
- **Live Video:** [http://ktla.com/2015/06/18/lake-fire...ions-ordered](http://ktla.com/2015/06/18/lake-fire...ions-ordered/)
  - [http://www.nbclosangeles.com/news/lo...lowTwt_LABrand](http://www.nbclosangeles.com/news/lo...lowTwt_LABrand)
- **Web Cam:** [http://bensweather.com/webcams/cam_2...65479309057204](http://bensweather.com/webcams/cam_2...65479309057204)
  - [http://hpren.ucsd.edu/cameras/L/tp-n-mobo-c.jpg](http://hpren.ucsd.edu/cameras/L/tp-n-mobo-c.jpg)
  - [http://www.RNTL.net/lakefire.htm](http://www.RNTL.net/lakefire.htm)
- **Big Bear City/Shay Meadow Cam:** [http://www.bensweather.com/benscamshay.php](http://www.bensweather.com/benscamshay.php)
How to display?

- Web Based
- Visually Appealing
- Publicly Accessible
- GIS
- Sensor Data
- Official Data
- VGI
Dashboard
Dashboard

- Wildfire data organized spatially
- Combine official data with expert-sourced data
Dashboard

- Authoritative Data
- Expert-Sourced VGI
Summary
Thank You

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