

MOUNTAIN RESCUE ASSOCIATION

Webinar Series

THE MOUNTAIN RESCUE ASSOCIATION MAPPING PLATFORM

2015 Review, 2016 Preview



PIGEON MOUNTAIN
PMI
INDUSTRIES

sponsored by PMI



Introduction

👤 **Monty Bell,**
Mountain Rescue
Association



👤 **Paul Doherty,**
NAPSG Foundation

<http://www.napsgfoundation.org/>





Introduction

 **Jon Pedder**

**Sierra Madre Search and
Rescue, Esri Disaster
Response Program**



 **Don Ferguson**

**ASRC, MARG, Allegheny
Mountain Rescue**





Discussion

- This is being recorded and slides will be made available
- Q&A at the End
- Email mramapping@gmail.com





MRA Mapping Portal



Each team has a log-in – need yours? mramapping@gmail.com



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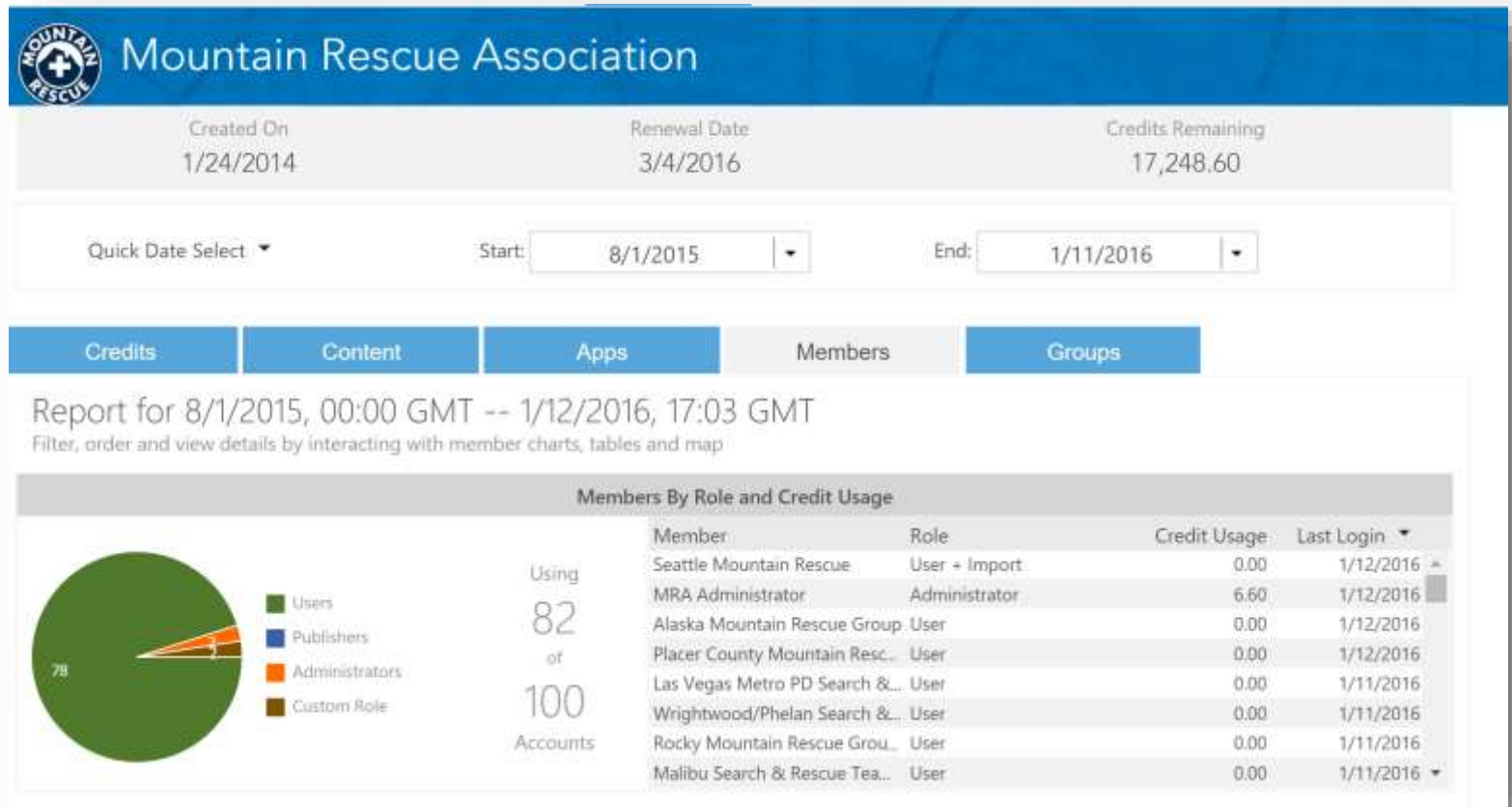
MRA Mapping Portal

- **ArcGIS Online is an online, collaborative web GIS that allows you to use, create, and share maps, scenes, apps, layers, analytics, and data.**

<http://doc.arcgis.com/en/arcgis-online/reference/what-is-agol.htm>



MRA Mapping Portal



Each team has a log-in – need yours? mramapping@gmail.com



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Outline

- 1. Review 2015 Mission Data**
- 2. 2016 Data Collection**
- 3. What Else Can We Do With Maps?**
- 4. Questions and Answers**





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What Did We Learn?

2015 MISSION DATA COLLECTION



2015 Live Data

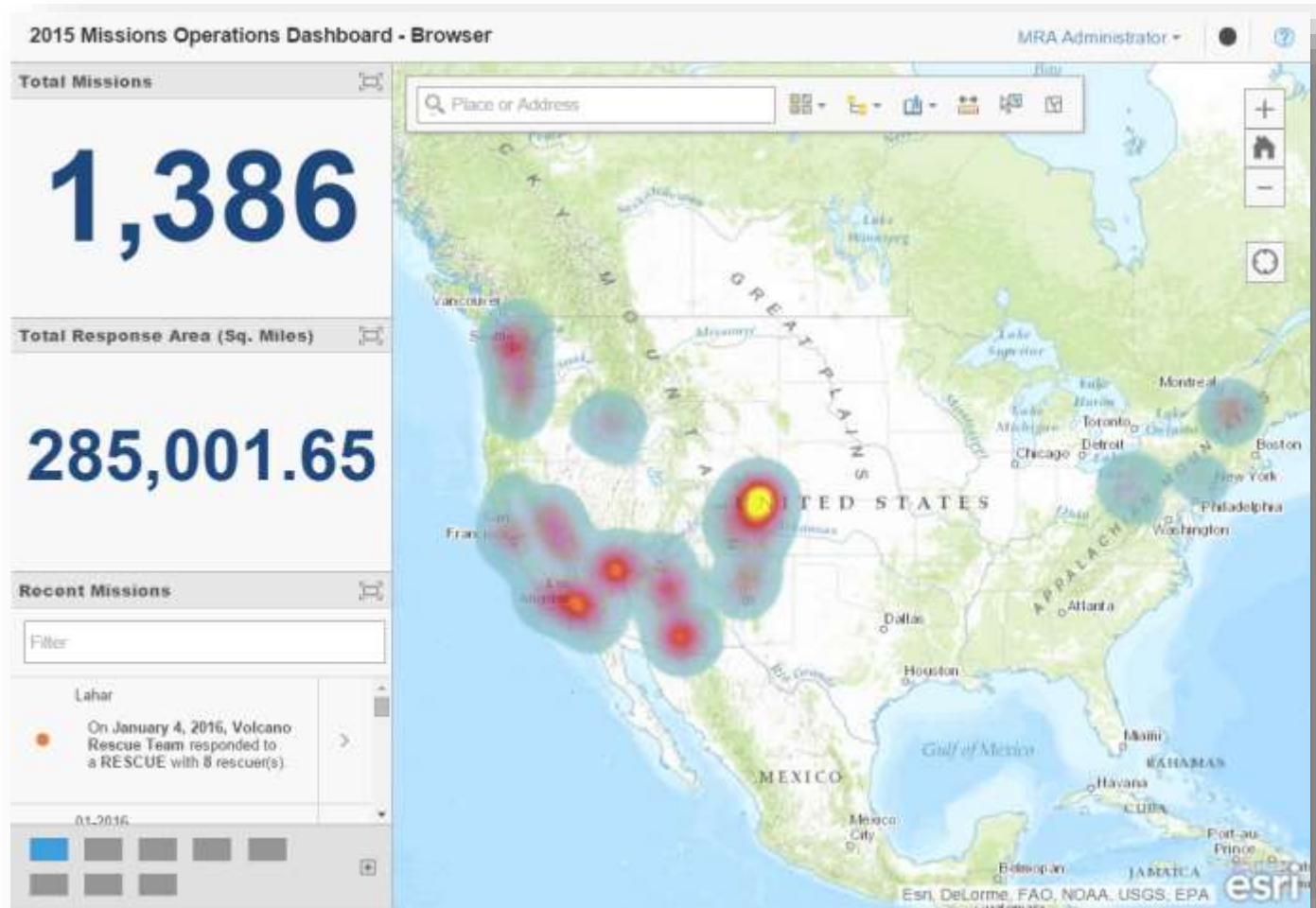
- Number of Incidents and Where
- Types of Missions, Demographics
- Number of People Rescued
- Number of Missions per Team
- Team Response Area
- Other Mission Queries (# Fatalities, Aircraft Used, etc.)





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PMI
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Missions Dashboard



Screenshots 08 January 2016

[Link](#)

Total Missions

1,386

Total Response Area (Sq. Miles)

285,001.65

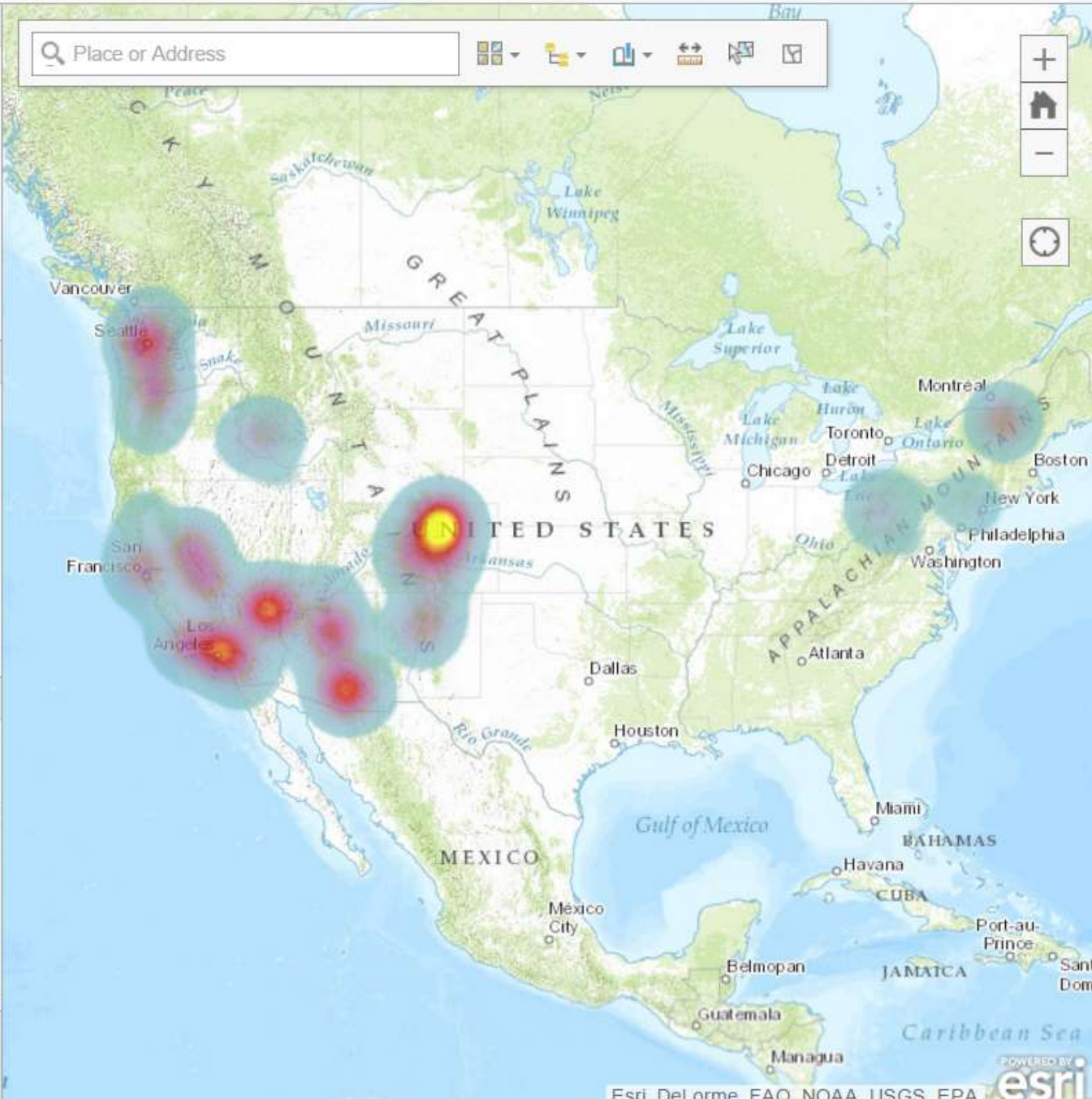
Recent Missions

Filter

Lahar

On January 4, 2016, Volcano Rescue Team responded to a RESCUE with 8 rescuer(s).

01-2016



Total Missions

1,386

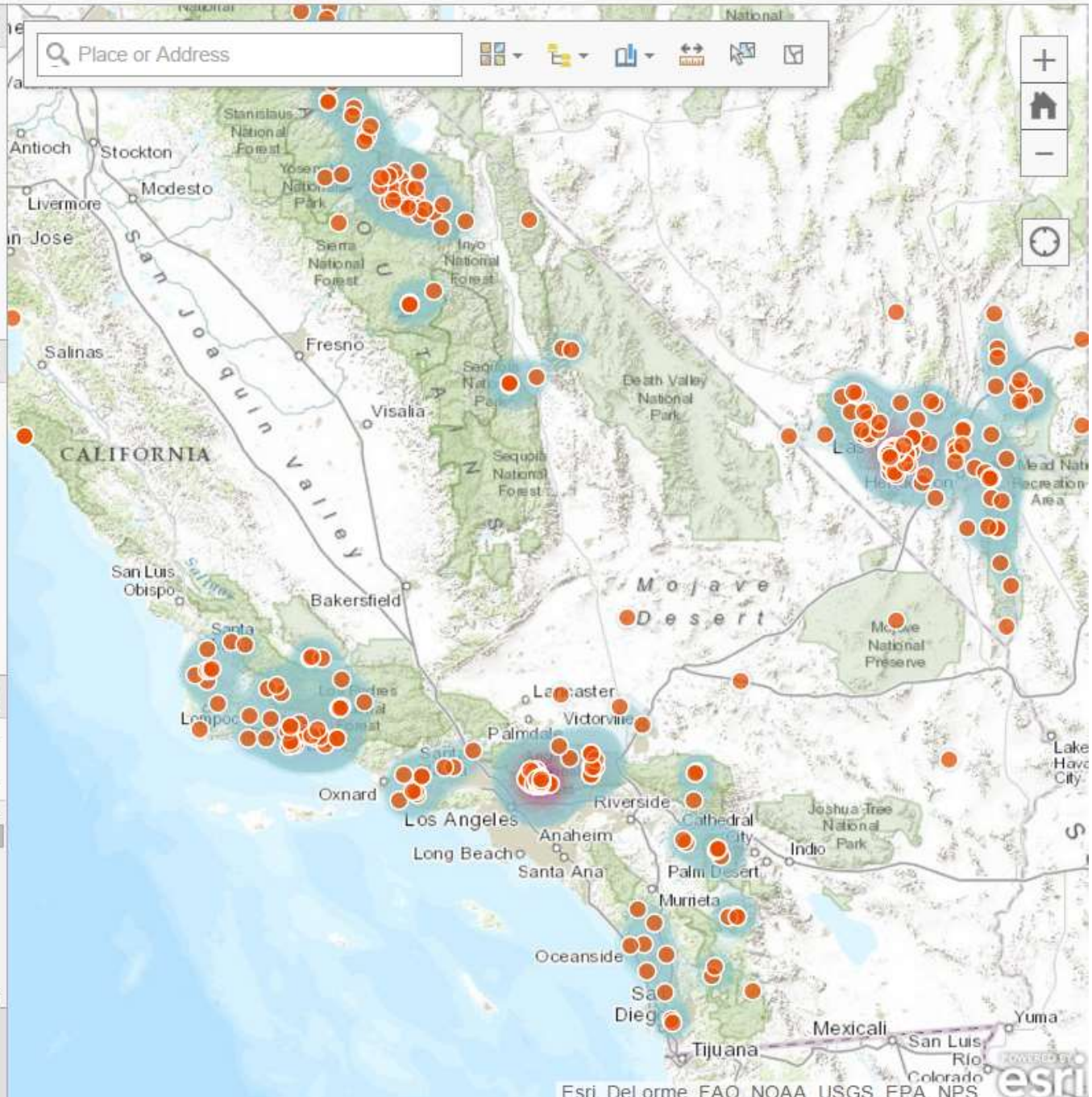
Total Response Area (Sq. Miles)

285,001.65

Recent Missions

Filter

- Lahar
- On January 4, 2016, Volcano Rescue Team responded to a RESCUE with 8 rescuer(s).
- 01-2016



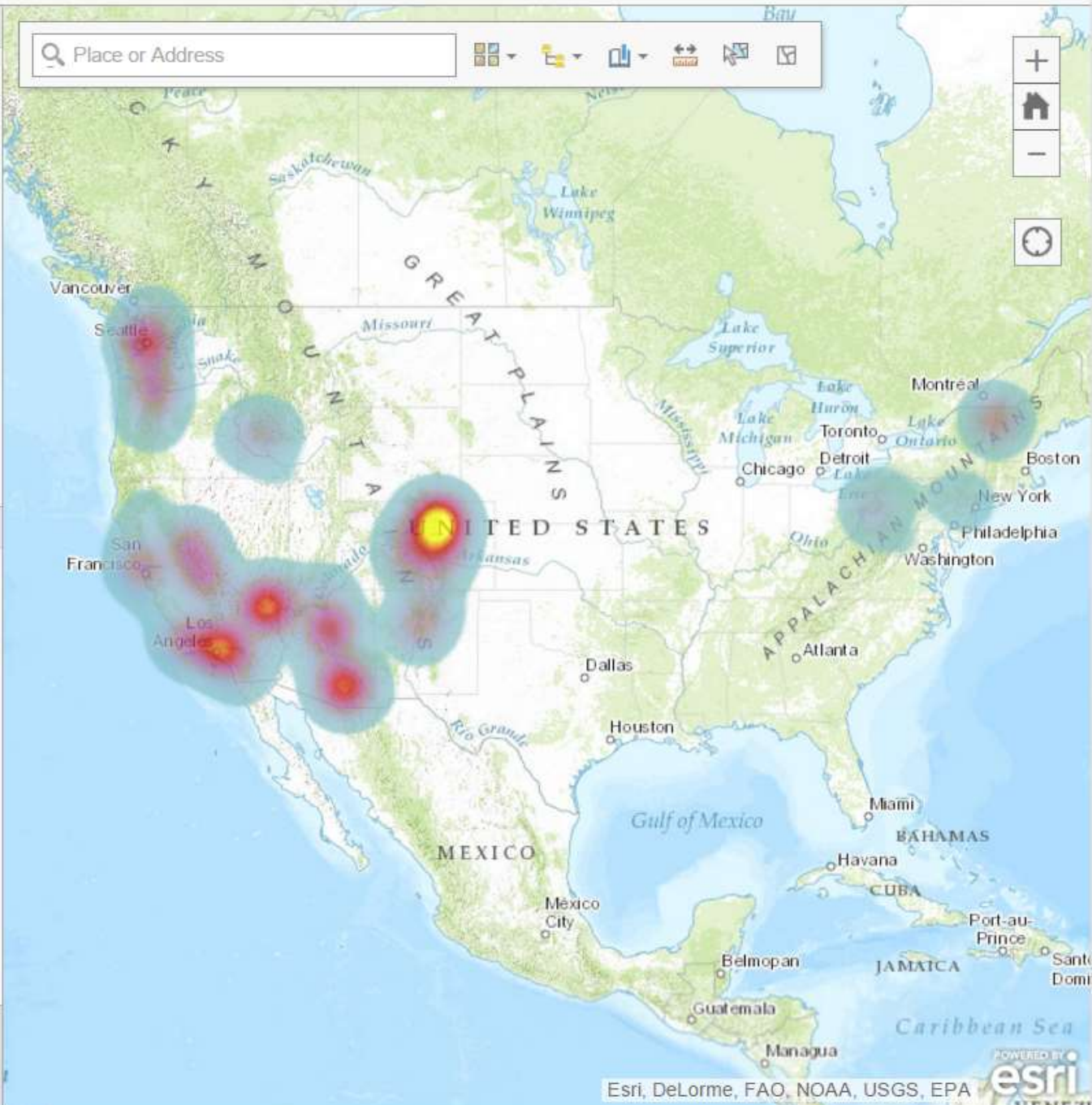
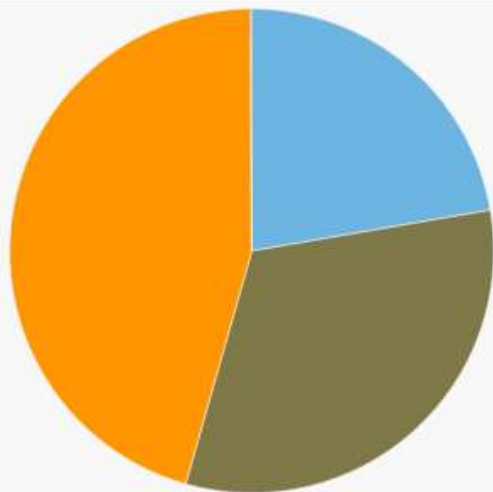


Rescued



1,718

Gender of Rescued





Average # of Personnel / Mission

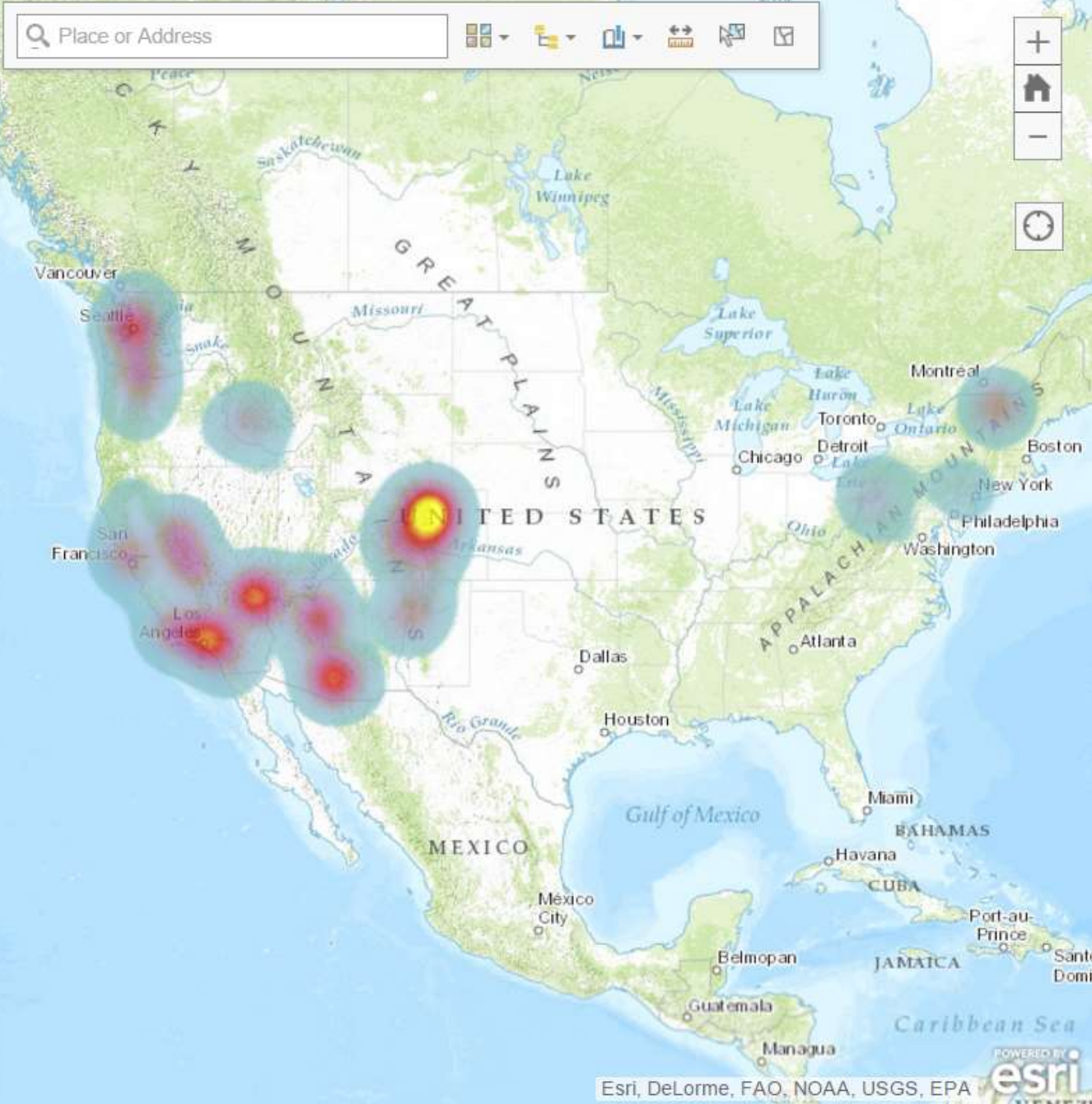


8

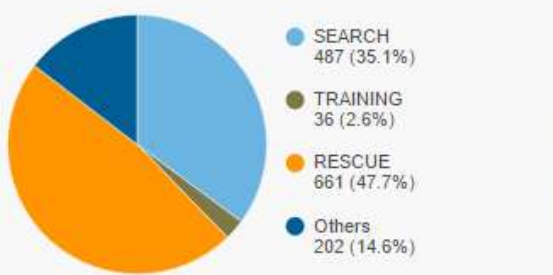
Total Hours (Goal 70,000 Hours)



Threshold: 75%

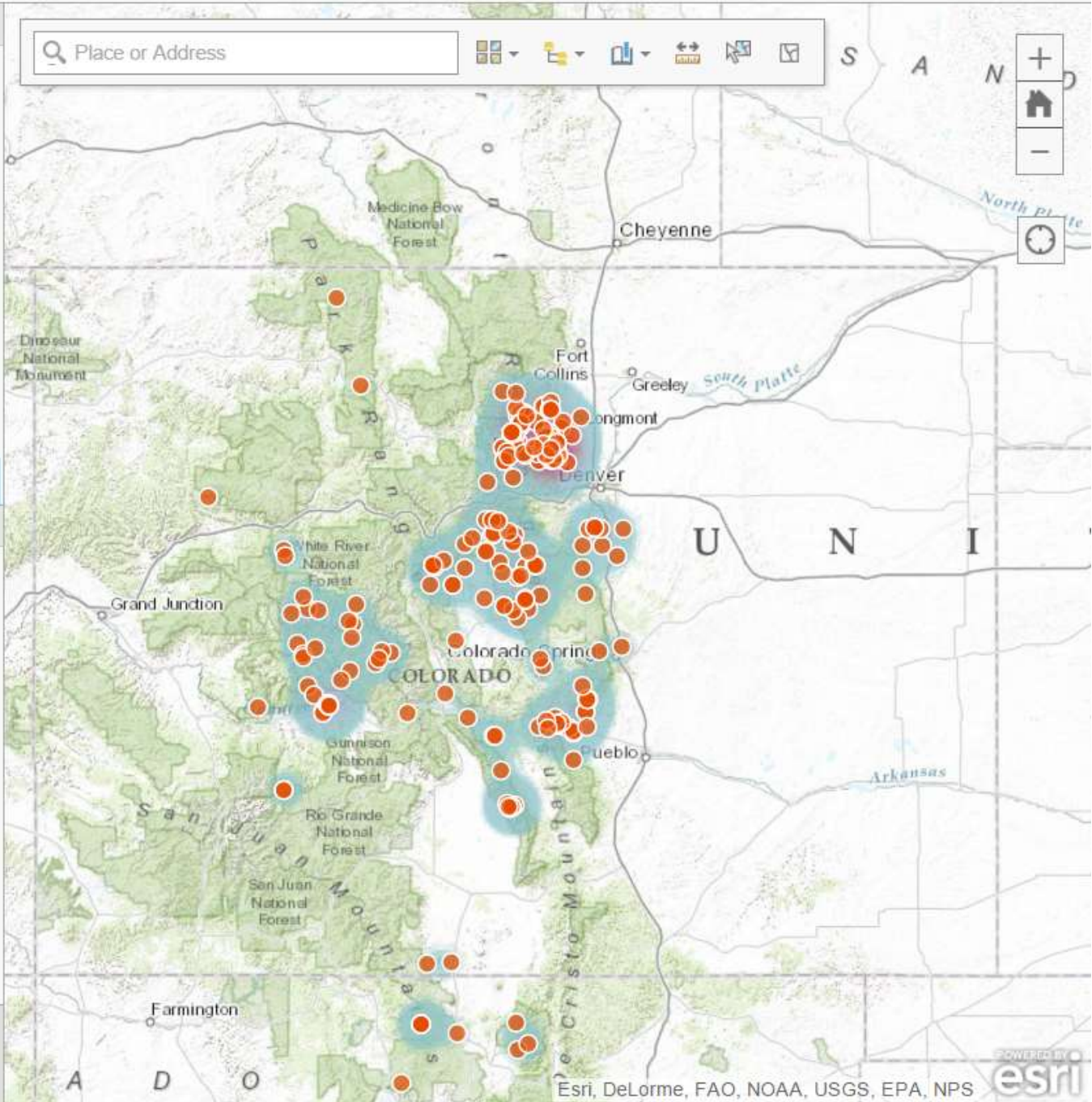


Mission Type (Top 3)

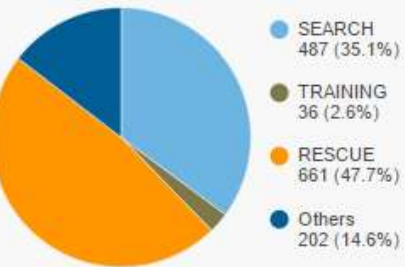


Run Reports

- # Missions with Aircraft
- # Missions Out of County
- # of Missions Subject DOA
- Explore # Missions by Land Ownership
- Explore Fitness of Subject 1
- Explore Experience of Subject 1
- Explore Type of Mission
- Explore # Missions by Team



Mission Type (Top 3)



Run Reports

Results for '# Missions with Aircraft'

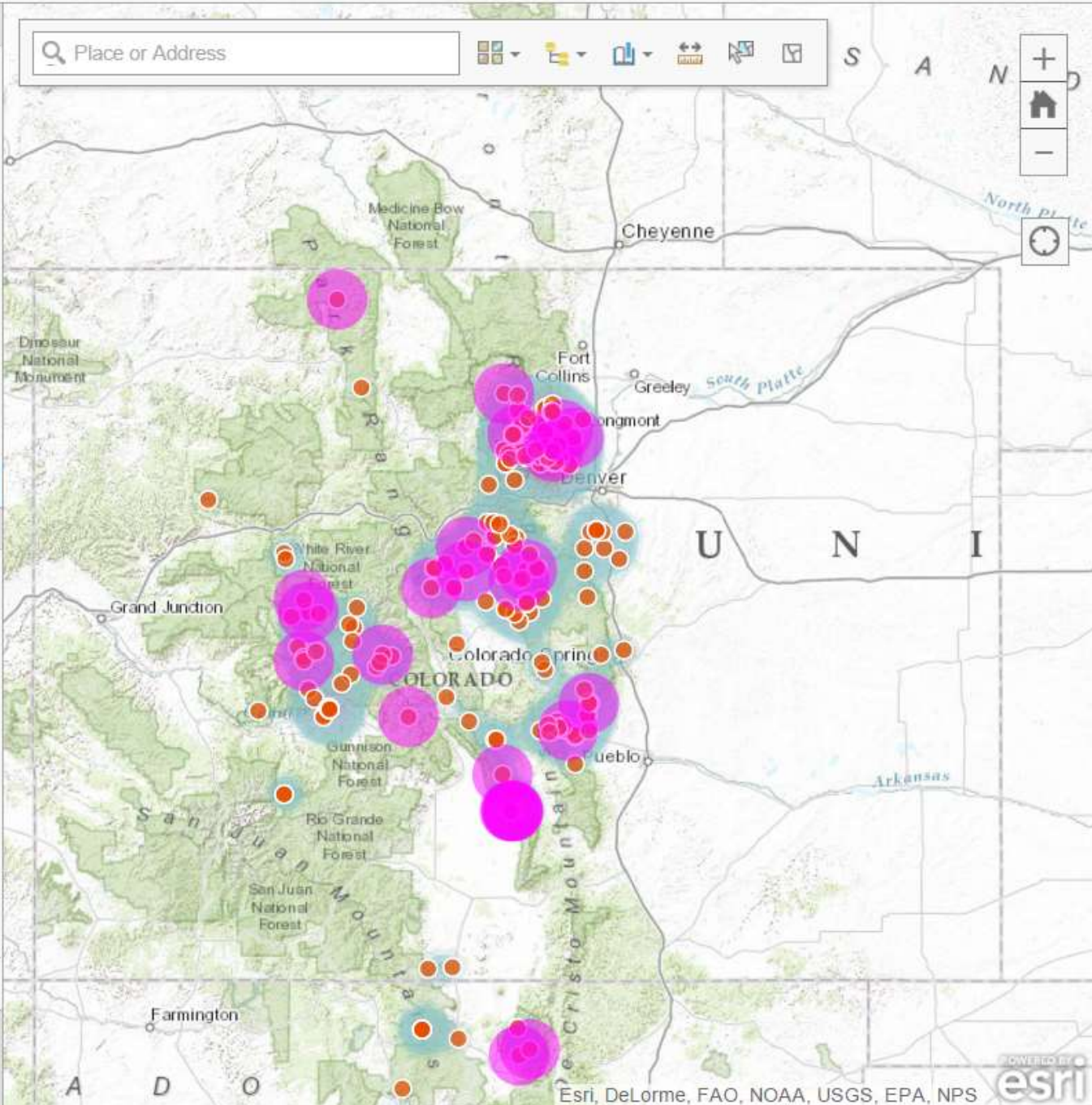
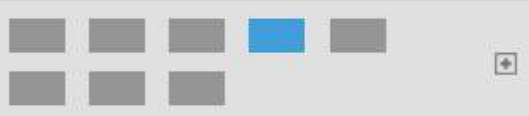
Last executed: Jan 7, 2016, 5:34:54 PM

Number of results: 25

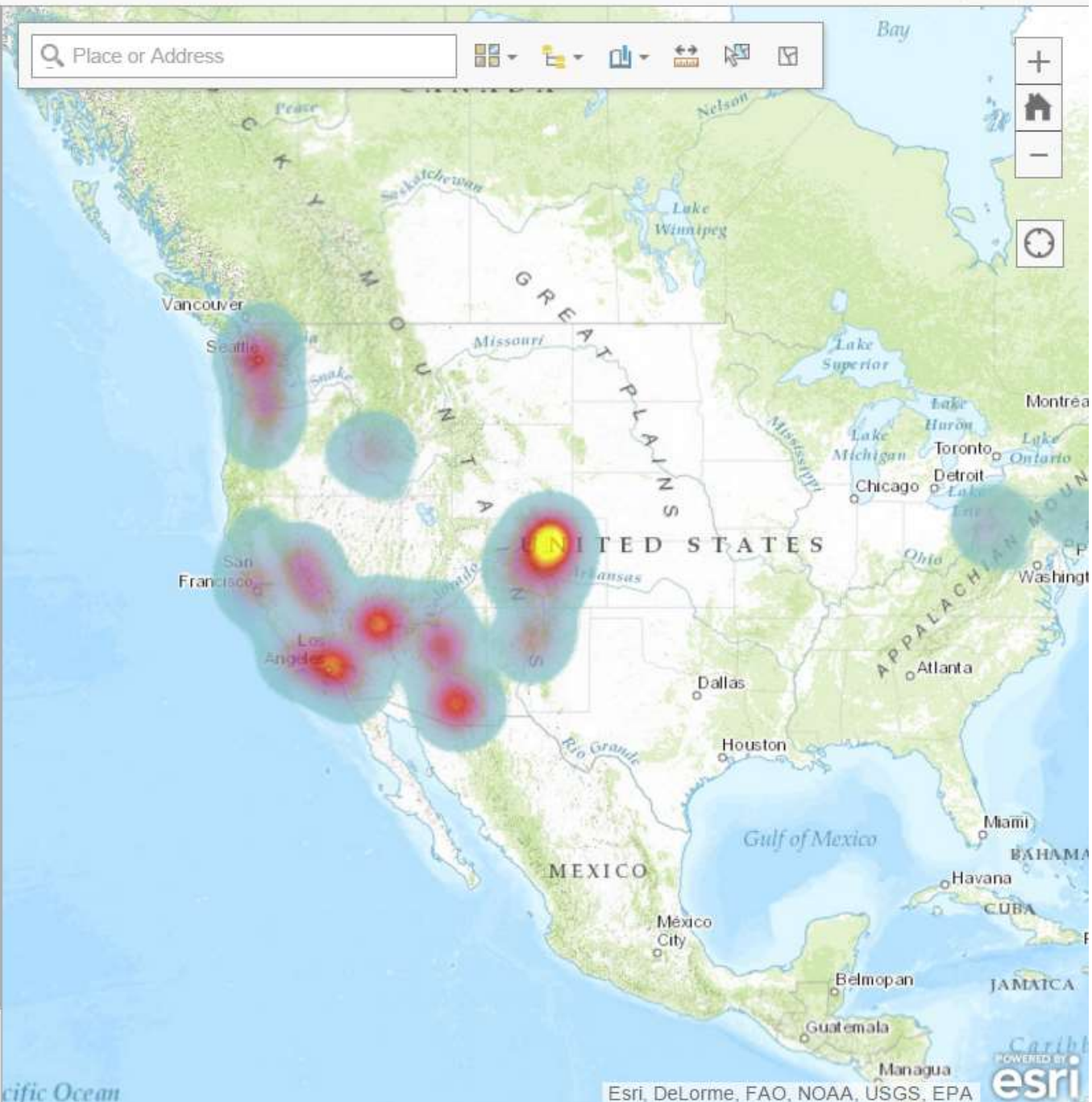
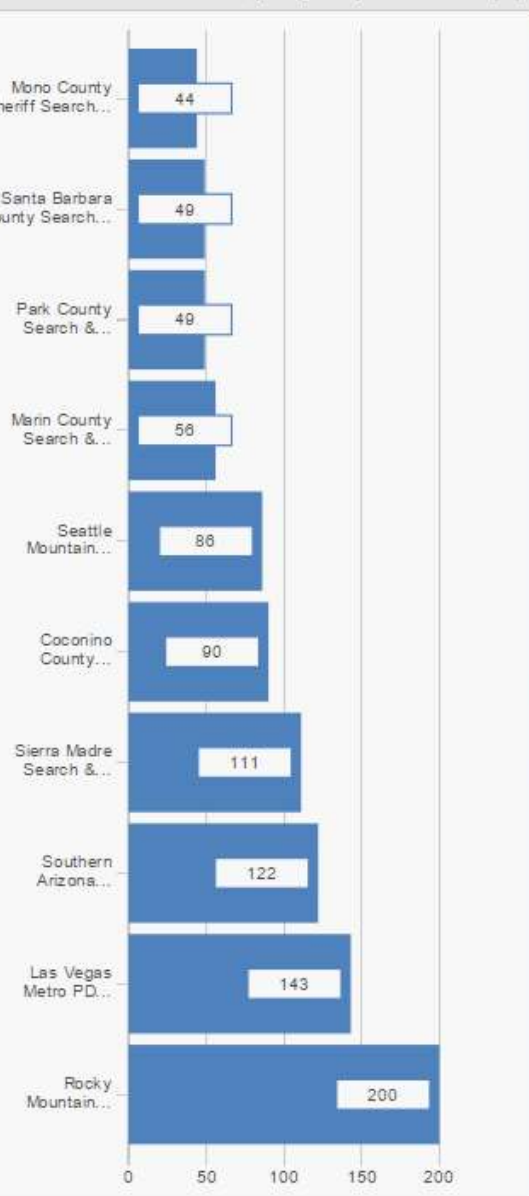
☒ Limit the results to the current map extent

Show Zoom to Select

Done Re-execute



Missions Per Team (Top 10)

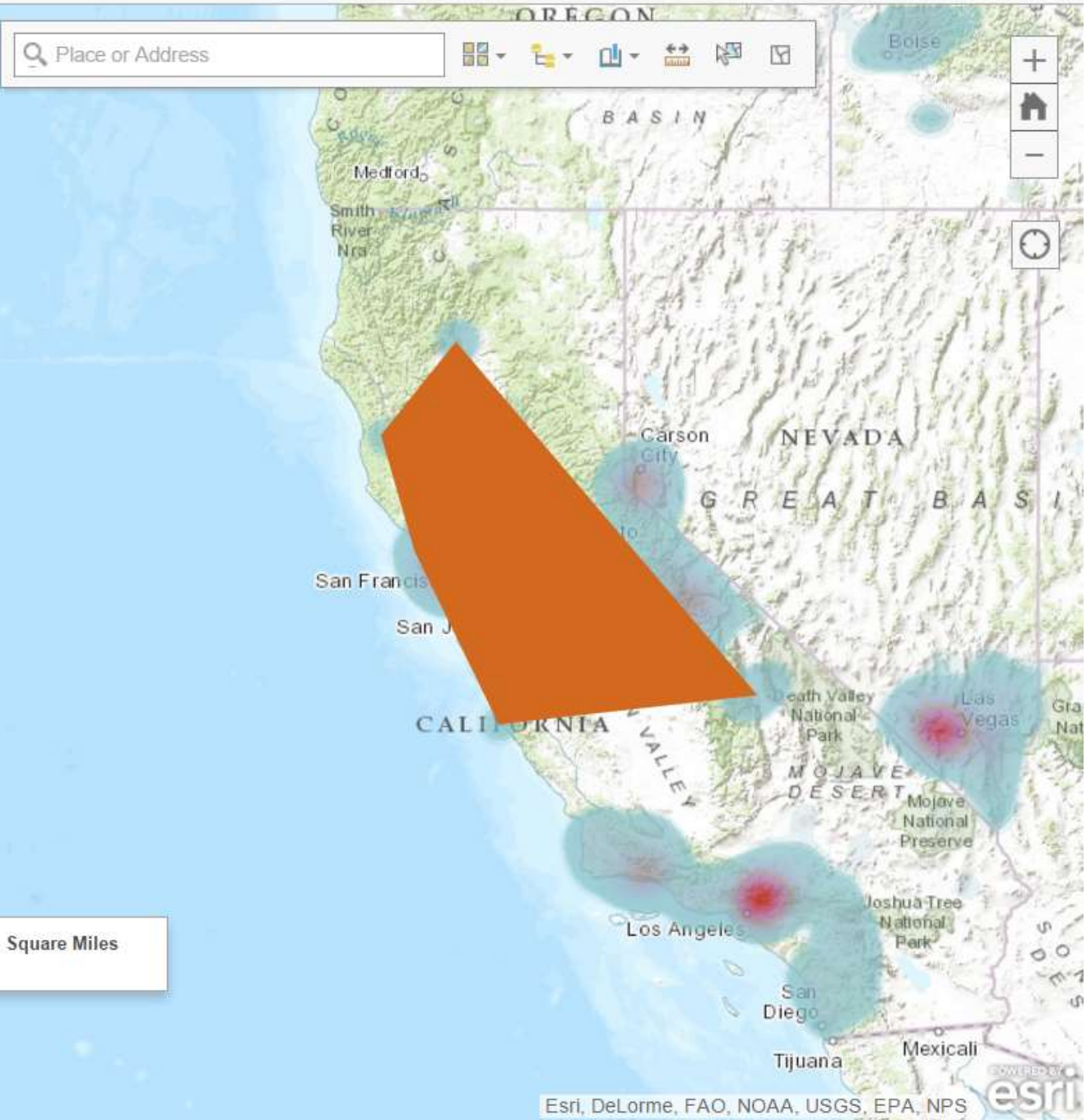


Team Service Areas (Top 10)



Marin County Search & Rescue, Square Miles
41,624

Units are Square Miles





Demographics

Esri Tapestry Segmentation

We are a nation of ZIP Codes and neighborhoods. This is how the next generation of Tapestry describes itself.

What is Tapestry?

Tapestry helps you understand your customers' lifestyle. Tapestry classifies US residential neighborhoods by socioeconomic characteristics. That's how you get more targeted marketing. And you also get higher response rates.

Tapestry lifestyle data is available across the ArcGIS and data enrichment. To access Tapestry, you need to sign up for a free 30-day ArcGIS Online trial subscription.

LifeMode Group: Affluent Estates

Top Tier

Households: 2,052,000
Average Household Size: 2.82
Median Age: 46.2
Median Household Income: \$157,000

WHO ARE WE?

The residents of the wealthiest Tapestry market, Top Tier, earn more than three times the US household income. They have the purchasing power to indulge any choice, but what do they really desire? Aside from the obvious expenses for the upkeep of their lush homes, consumers select upscale salons, spas, and fitness centers for their personal well-being and shop at high-end retailers for their personal effects. Whether short or long, domestic or foreign, their frequent vacations spare no expense. Residents fill their weekends and evenings with opera, classical music concerts, charity dinners, and shopping. These highly educated professionals have reached their corporate career goals. With an accumulated average net worth of over 1.5 million dollars and income from a strong investment portfolio, many of these older residents have moved into consulting roles or operate their own businesses.

OUR NEIGHBORHOOD

- Married couples without children or married couples with older children dominate this market.
- Housing units are owner occupied with the highest home value and above average use of mortgages.
- Neighborhoods are older and located in the suburban periphery of the largest metropolitan areas, especially along the coasts.

SOCIOECONOMIC TRAITS

- Top Tier is a highly educated, successful consumer more than one in three residents has a postgraduate degree.
- Annually, they earn more than three times the US household income, primarily from wages and salary and employment income (Index 175) and investments.
- These are the nation's wealthiest consumers. They have achieved to manage their diverse investment portfolio across a range of current financial trends and product categories.
- Socially responsible consumers who are for a better lifestyle, they are goal oriented and hardworking but time for their kids or grandkids and maintain a close group of friends.
- These busy consumers seek variety in life. They take in the fine arts, read to expand their knowledge, and the Internet, radio, and newspapers as key media sources.
- They regularly cook their meals at home, attention to good nutrition and fresh organic foods.

TAPESTRY SEGMENTATION
www.esri.com/tapestry

<http://www.esri.com/landing-pages/tapestry>

 Details

 Add ▾

 Edit

 Basemap

 Analysis













Find address or place



Legend

\$ on Sportswear / Person

Total Spending divided by 2015 Total Population

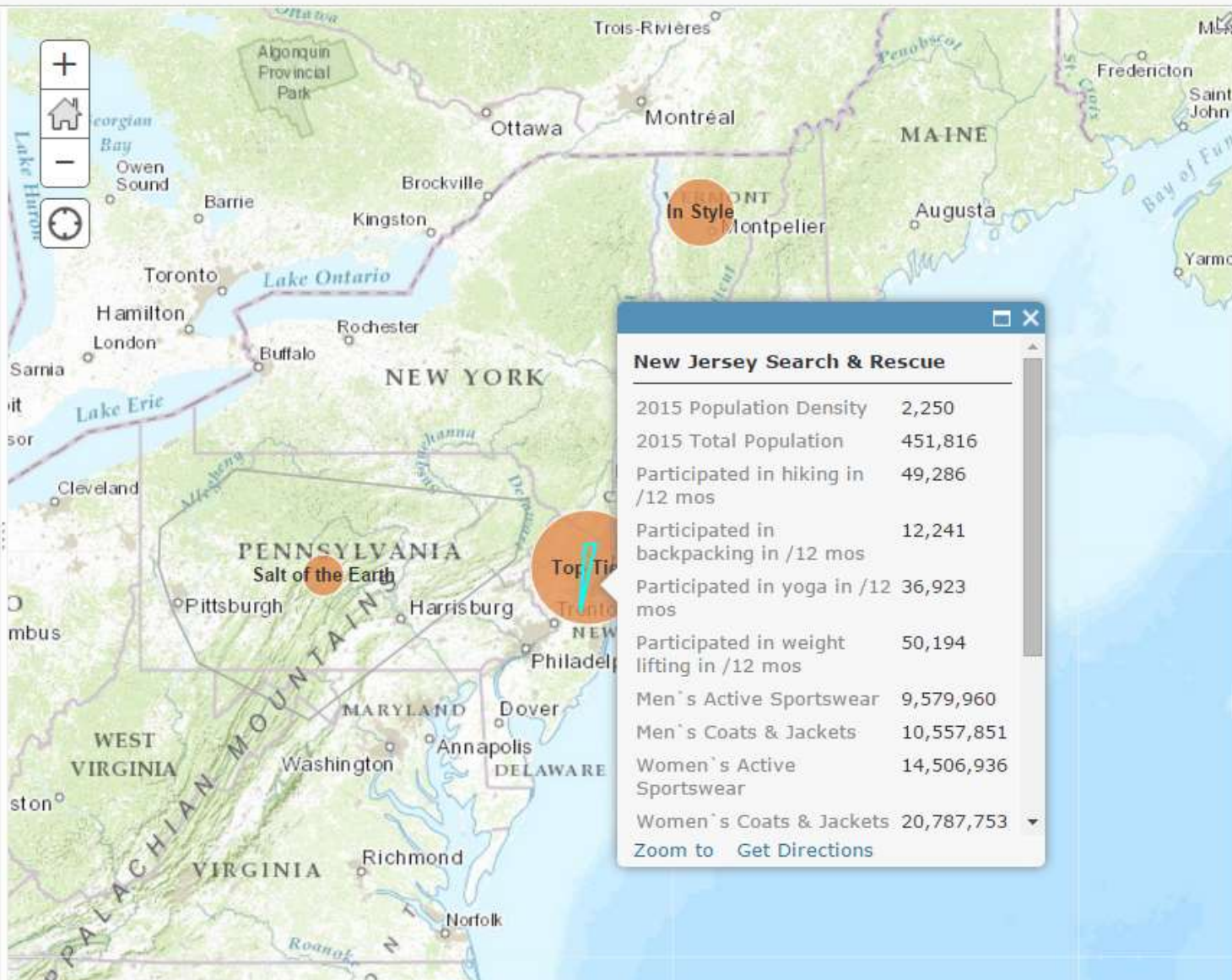
 > 146

 120

 100

 80

 < 54



New Jersey Search & Rescue

2015 Population Density	2,250
2015 Total Population	451,816
Participated in hiking in /12 mos	49,286
Participated in backpacking in /12 mos	12,241
Participated in yoga in /12 mos	36,923
Participated in weight lifting in /12 mos	50,194
Men`s Active Sportswear	9,579,960
Men`s Coats & Jackets	10,557,851
Women`s Active Sportswear	14,506,936
Women`s Coats & Jackets	20,787,753

Zoom to

Get Directions

Details
Add ▾
Basemap
Analysis
Share
Find address or place

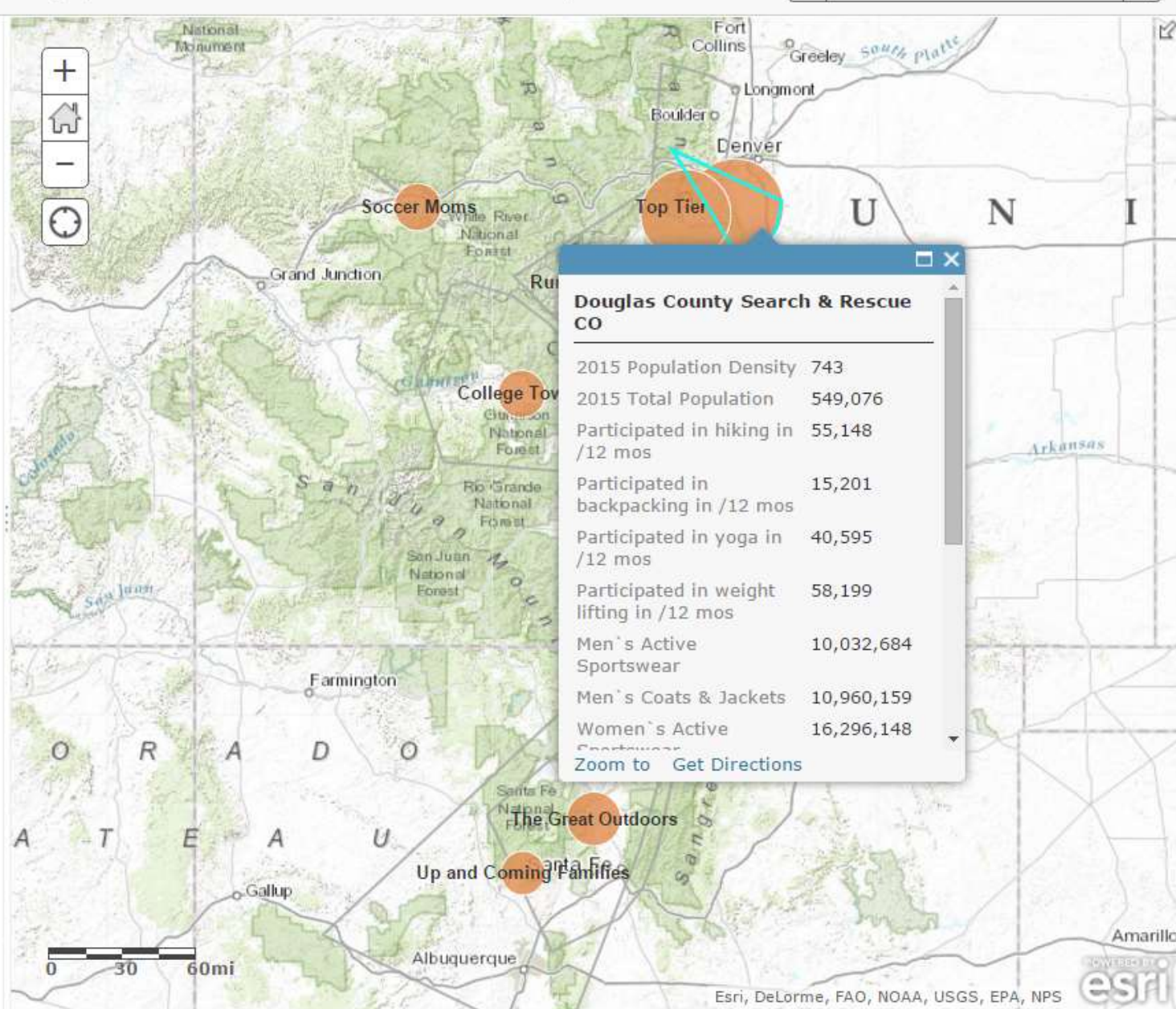
Legend

\$ on Sportswear / Person

Total Spending divided by 2015 Total Population

- > 146
- 120
- 100
- 80
- < 54

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What is New? How Do I Get Started?

2016 MISSION DATA COLLECTION



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MRA Mapping Portal



<http://msar.maps.arcgis.com/home/>



2016 Mission Data Portal

2016 MRA Mission Data Portal

No issues detected [Edit](#) [Return to MRA Mapping Portal](#)

[Enter A New Mission \(Short Form\)](#) [Enter a New Mission \(Long Form\)](#) [Edit Missions \(Web Map App\)](#) [2015 Dashboard \(2016 Coming Soon\)](#)

 MOUNTAIN
RESCUE
ASSOCIATION

Enter Missions (SHORT FORM)

As soon as you are done with a mission (i.e. not at the end of the year) - enter new mission data and confirm the location of the incident using this form. For complex incidents or recording missing person search operation statistics - please see the "[Long Form](#)".

1. Enter Incident Information
2. Enter the Location of the Mission (best available location)
3. Complete Form

Data can be reviewed and edited later using the Edit Mission Web App if needed. If you have questions or need help, please send an email to mramapping@gmail.com.

1. Enter Information

Mission # or Name (required)

<http://bit.ly/MRA2016Data>



Bookmark this link



Missing Subject: Part I

Steve Clark was scheduled to meet his companions at Vogelsang High Sierra Camp in Yosemite National Park last night at 8 pm but never arrived. Today, at 0700h, they reported him missing. His companions said his travel plans were to hike from Sunrise to Merced Lake High Sierra Camp and stay overnight, and to then hike the following day to Vogelsang High Sierra Camp and stay the night.

EXERCISE ONLY



Missing Subject: Part I

- Age: 62
- Height: 6' 2"
- Weight: 170 lbs
- Hair: Silver
- Clothing: Blue jeans, long sleeved shirt, hiking boots, carrying an overnight pack

EXERCISE ONLY



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Missing Subject: Part I

Initial Planning Point (IPP)

Last Seen at Sunrise High Sierra Camp

- **NAD 1983**
- **UTM Zone 11**
- **Easting: 285811**
- **Northing: 4185893**

EXERCISE ONLY



Enter Data



Use the GeoForm

- Short Form = simple incident
- Long Form = complex incident, search operations (both the IPP and Found)





Enter Data

2016 MRA Mission Data Portal

For Issues Detected | Edit | Return to MRA Mapping Portal

Enter a New Mission (Short Form) | Enter a New Mission (Long Form) | Edit Missions (Web Map App) | 2015 Dashboard (2016 Coming Soon)

 MOUNTAIN RESCUE ASSOCIATION

Enter Missions (SHORT FORM)

As soon as you are done with a mission (i.e. not at the end of the year) - enter new mission data and confirm the location of the incident using this form. For complex incidents or recording missing person search operation statistics - please see the "Long Form".

1. Enter Incident Information
2. Enter the Location of the Mission (best available location)
3. Complete Form

Data can be reviewed and edited later using the Edit Mission Web App if needed. If you have questions or need help, please send an email to mramapping@gmail.com.

1. Enter Information

Mission # or Name (required)

Please enter the mission number or short name your team uses.

Team (required)

Select...

Select team or select from the dropdown

Short Form

Fill out to the best of your ability!



Enter Data

2016 MRA Mission Data Portal

No users detected [Log In](#) [Return to MRA Mapping Portal](#)

[Enter A New Mission \(Short Form\)](#) [Enter a New Mission \(Long Form\)](#) [Edit Missions \(Web Map App\)](#) [2015 Dashboard \(2016 Coming Soon\)](#)

Enter Mission (LONG FORM)

Enter new mission data and confirm the location of the incident using this form. This "Long Form" is for complex missions (multiple subjects) or missing person search operations. Once the subject is found please use the "Found" drop-down below.

Use the "Short Form" for simple missions or if you are not participating in missing person search statistics research.

If you have questions or need help, please send an email to mramapping@gmail.com.

[Short Form \(Mission or Found\)](#)

[Long Form \(Mission or Found\)](#)

Location (the best initial planning point available - the point last seen or last known point in most cases)

1. Select Form

Found

2. Enter Information

Mission # (required)

Long Form

Search Operations, MCI, etc.



Enter Data

- ❖ No special characters (/,#,\$,&, etc.)
- ❖ Add attachments if needed
- ❖ You can always go back and enter more information or edit data...





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Edit Data

Use the WebApp

- Go back and edit / review data
- For example:
 - Out of County Response
 - 12 Rescuers
 - 3 Operational Periods (30 hours)
 - $30 \times 12 = 360$ hours



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Edit Data

2016 MRA Mission Data Portal

No issues detected | Edit | Return to MRA Mapping Portal

Enter A New Mission (Short Form) | Enter a New Mission (Long Form) | **Edit Missions (Web Map App)** | 2015 Dashboard (2016 Coming Soon)

Edit Missions (2016) | Place (lat, degree, UTM)

Web Map App

Select a template to create features

- MRA Missions 2016 - Mission
- New Feature
- MRA Missions 2016 - Recent Locations
- New Feature

12.793 -90.022 Degrees

800m

esri

The screenshot shows the '2016 MRA Mission Data Portal' interface. At the top, there's a navigation bar with buttons for 'Enter A New Mission (Short Form)', 'Enter a New Mission (Long Form)', 'Edit Missions (Web Map App)', and '2015 Dashboard (2016 Coming Soon)'. The 'Edit Missions (Web Map App)' button is highlighted with a red box and a red arrow. Below the navigation bar, there's a map of North America. On the left side of the map, there's a sidebar with a search bar and a list of templates to create features: 'MRA Missions 2016 - Mission', 'New Feature', 'MRA Missions 2016 - Recent Locations', and 'New Feature'. The map shows the United States, Canada, and Mexico, with various cities and geographical features labeled. The bottom of the map shows a scale bar and the text '12.793 -90.022 Degrees' and '800m'. The Esri logo is visible in the bottom right corner.



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Edit Data

Read Me (click the x to close --->)



Below is a brief explanation of tools in the WebApp, click the help links to learn more about each tool. The Edit tool is open by default, so you can 1) click on one of your missions on the map and 2) edit the information or move the location by dragging the point.



Edit mission locations. [Help](#)



Open a table to see all missions [Help](#)



Print a copy of your screen. [Help](#)



Turn **Layers** on / off (download). [Help](#)



Change the **Basemap** (imagery, USGS Topo, etc). [Help](#)



See a **Map Legend**. [Help](#)

[Read More](#)

This [WebApp](#) can be customized for your team. For more information please send an email to mramapping@gmail.com.



Edit Data

2016 MRA Mission Data Portal

Enter A New Mission (Short Form) | Enter A New Mission (Long Form) | Edit Missions (Web Map App) | 2015 Dashboard (2016 Coming Soon)

Edit Missions (2016) | Place, date, degree, USNG

View Table

Export to .csv

Filter by Map Extent | Zoom In | X Clear Selection | Refresh

Comments	Type of Mission	Date Mission Started	Mission In County?	Number of Personnel	Total Volunteer Hours	Number of Subjects	Subject Gender	Subject Age	Subject Fitness Level	Subject Experience Level	Subject Category	Mission Area Type	Land Ownership	Subject Mental Factor	Subject Mental Rating	How Subject Was Found
	RESCUE	1/4/2016, 2:30 PM	YES	7	14	2	MALE	35	FAIR	POOR	SNOWMOBILE					
	RESCUE	1/10/2016, 10:50 AM	YES	8	77	2	FEMALE	36	GOOD	GOOD	HIKING					



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What Else Can We Do?

DOING MORE WITH MAPS



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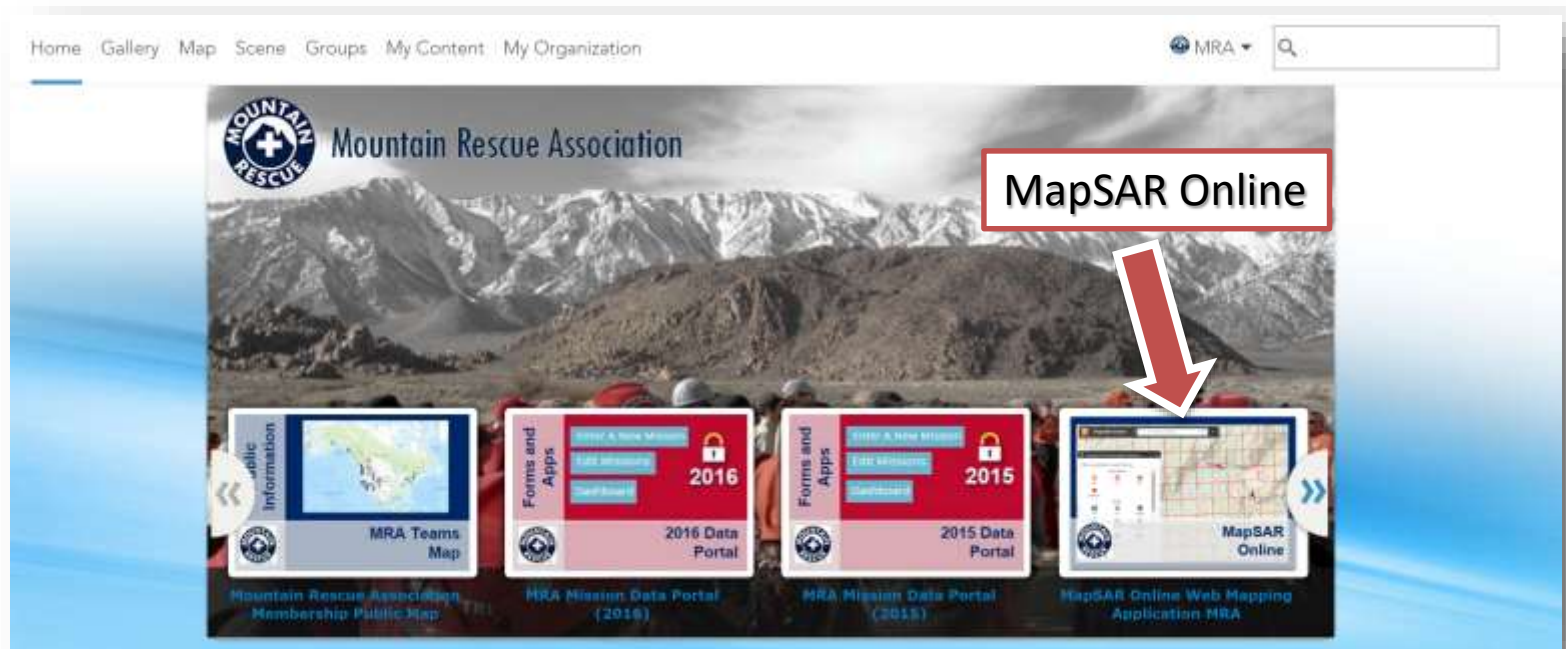
Missing Subject: Part II

- Plot the Incident Command Post at Tuolumne Meadows SAR Cache
- Hasty Assignment from the IPP to Merced Lake High Sierra Camp
- Trail blocks at nearby Trailheads

EXERCISE ONLY

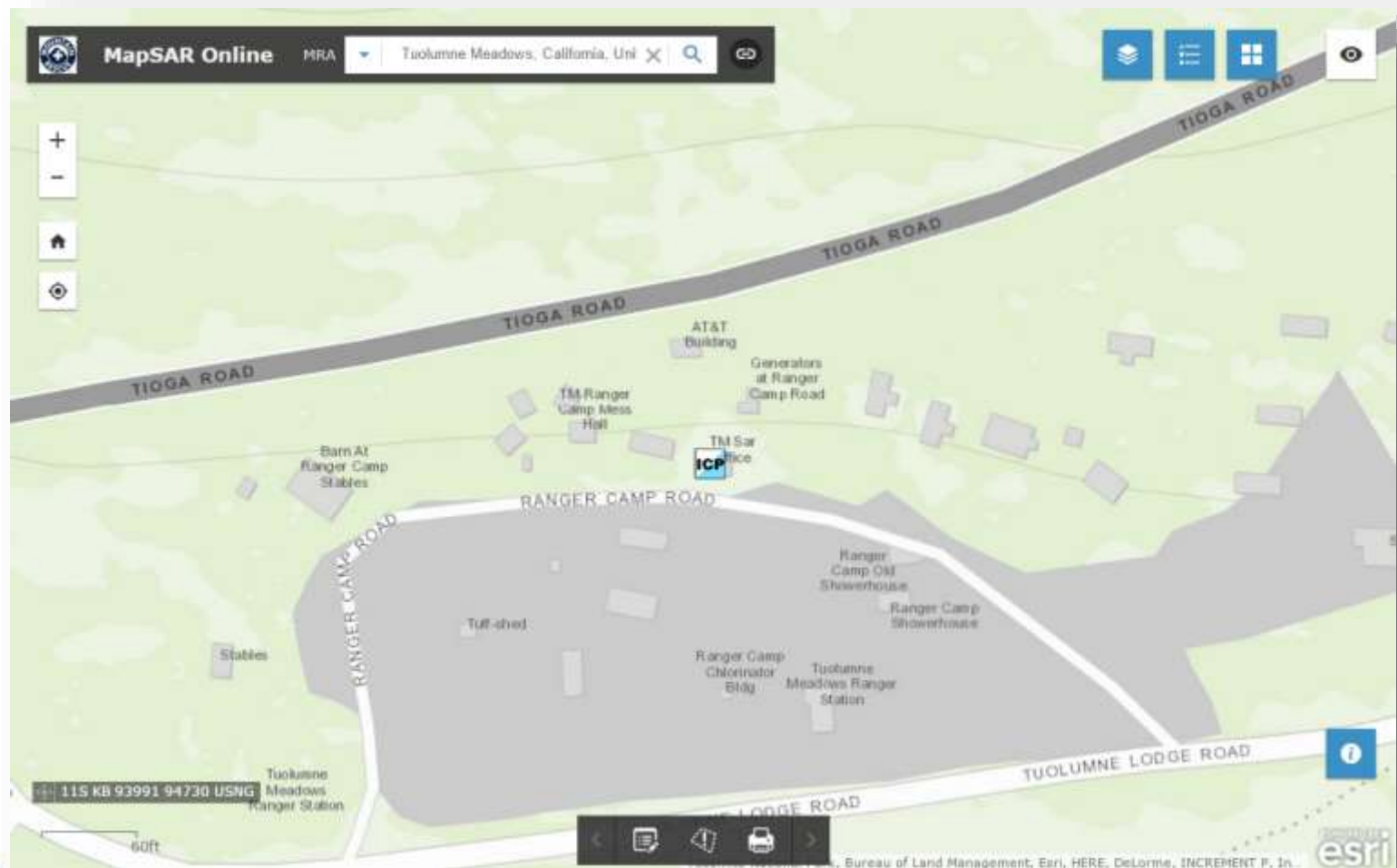


MapSAR Online



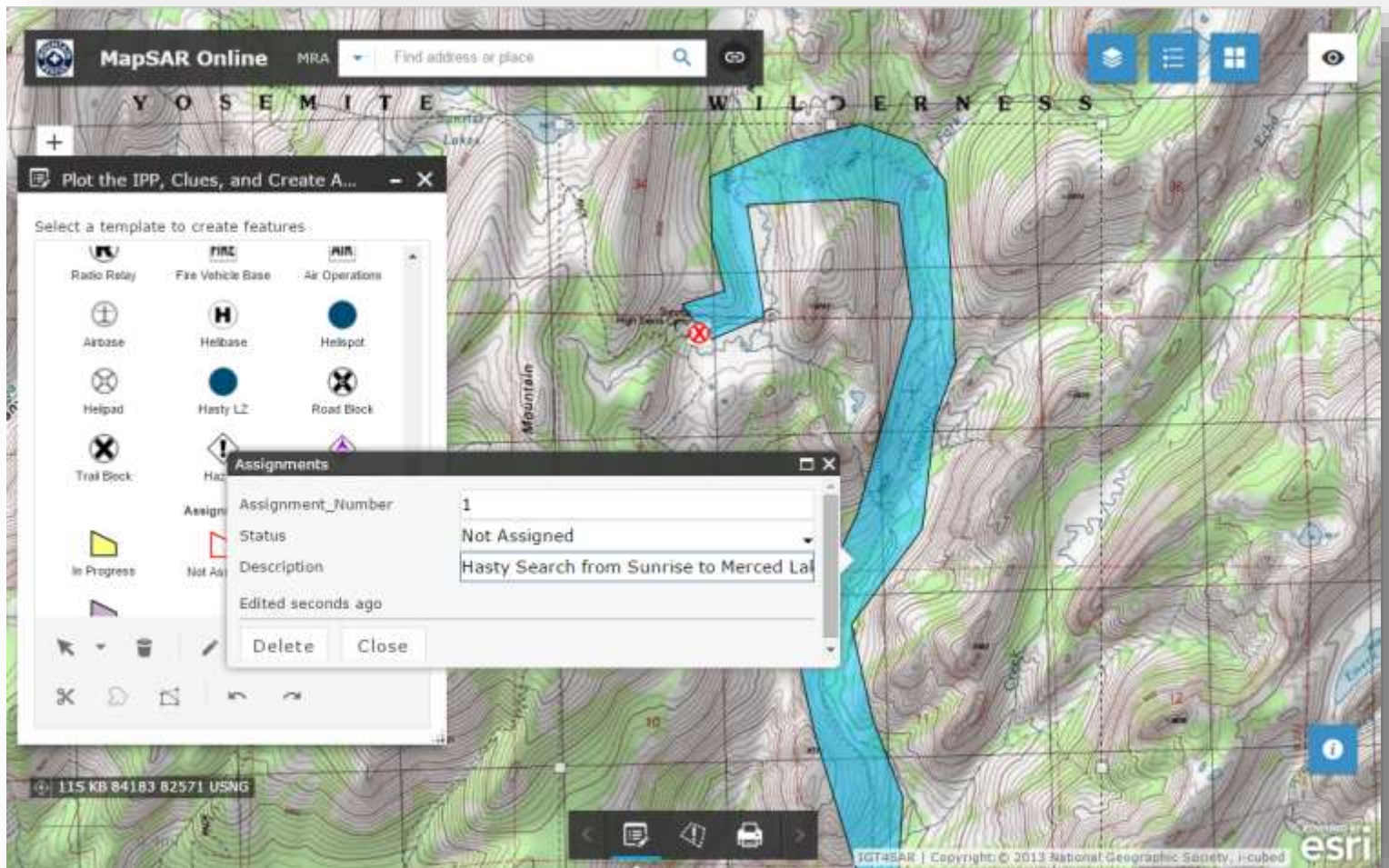


MapSAR Online



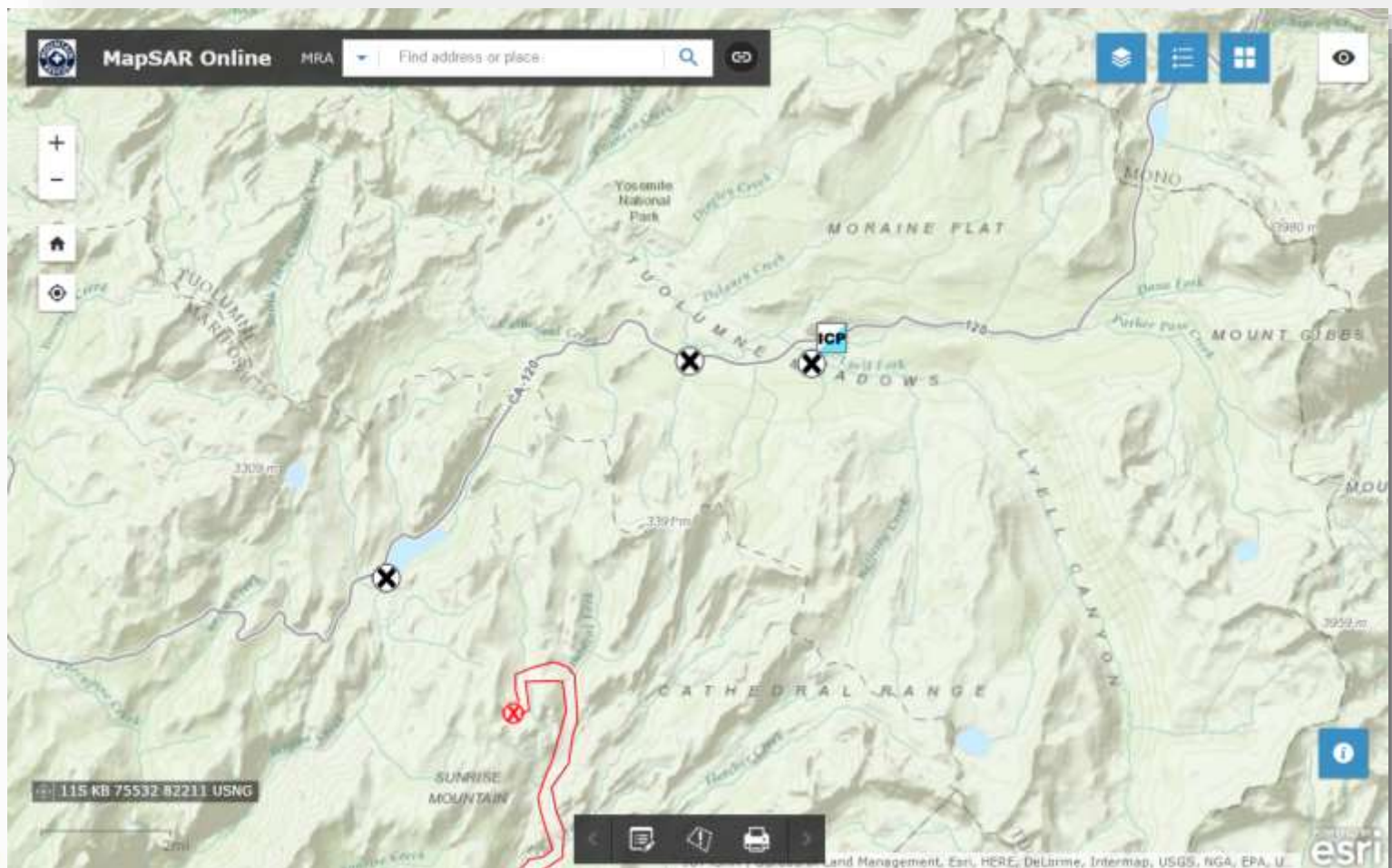


MapSAR Online





MapSAR Online





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GIS

- Use the Portal to Collaborate
- Connect with Regional GIS Specialists
 - Pre-planning (maps, data, training)
 - Incident support (Assignment maps, GPS processing, etc.)
 - Spatial Analysis (POA, Cell Phone, etc).
 - Regional Leadership Teams

<http://www.napsgfoundation.org/about/regional-leadership-teams/>



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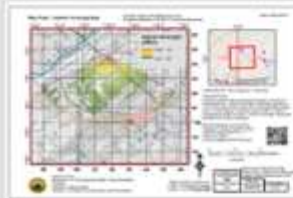
SARGIS Map Products

This is a group of maps presented as examples of what can be produced by a Search and Rescue GIS Specialist.

Search maps



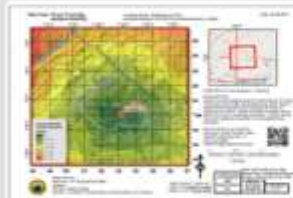
Sort by Date Title Type Ratings Avg. Rating Comments Views



Analysis: Cellular Data

PDF by pdoherly_napsg. Last Modified Nov 19, 2015.

Cellular coverage map provides an estimate of cellphone signal strength based on parameters available from service provider as obtained through Exigent Circumstances.



Analysis: Theoretical Search Area / Travel Time

PDF by pdoherly_napsg. Last Modified Nov 19, 2015.

Travel time – Cost Model calculates the influence of the environment and available travel aides of the subject's nominal walking speed. The influence of weather is incorporated through reduced nominal walking speed.



Analysis: Watersheds / Ridgelines

PDF by pdoherly_napsg. Last Modified Nov 20, 2015.

Watershed Offset provides values for SAME, ADJACENT or DISTANT watershed from the IPP in which subjects of a similar category have been found.



This gallery is designed to give SAR Managers a "Menu" to order from. It shows examples of maps and apps that can be requested from a trained SARGIS specialist. For more information on how these maps are made, please see the following resources:

Map Products Group ([Link](#))

Minimum Essential Datasets ([Link](#))

Using GIS in Wildland Search and Rescue ([Link](#))

MapSAR for ArcGIS Desktop ([Link](#))

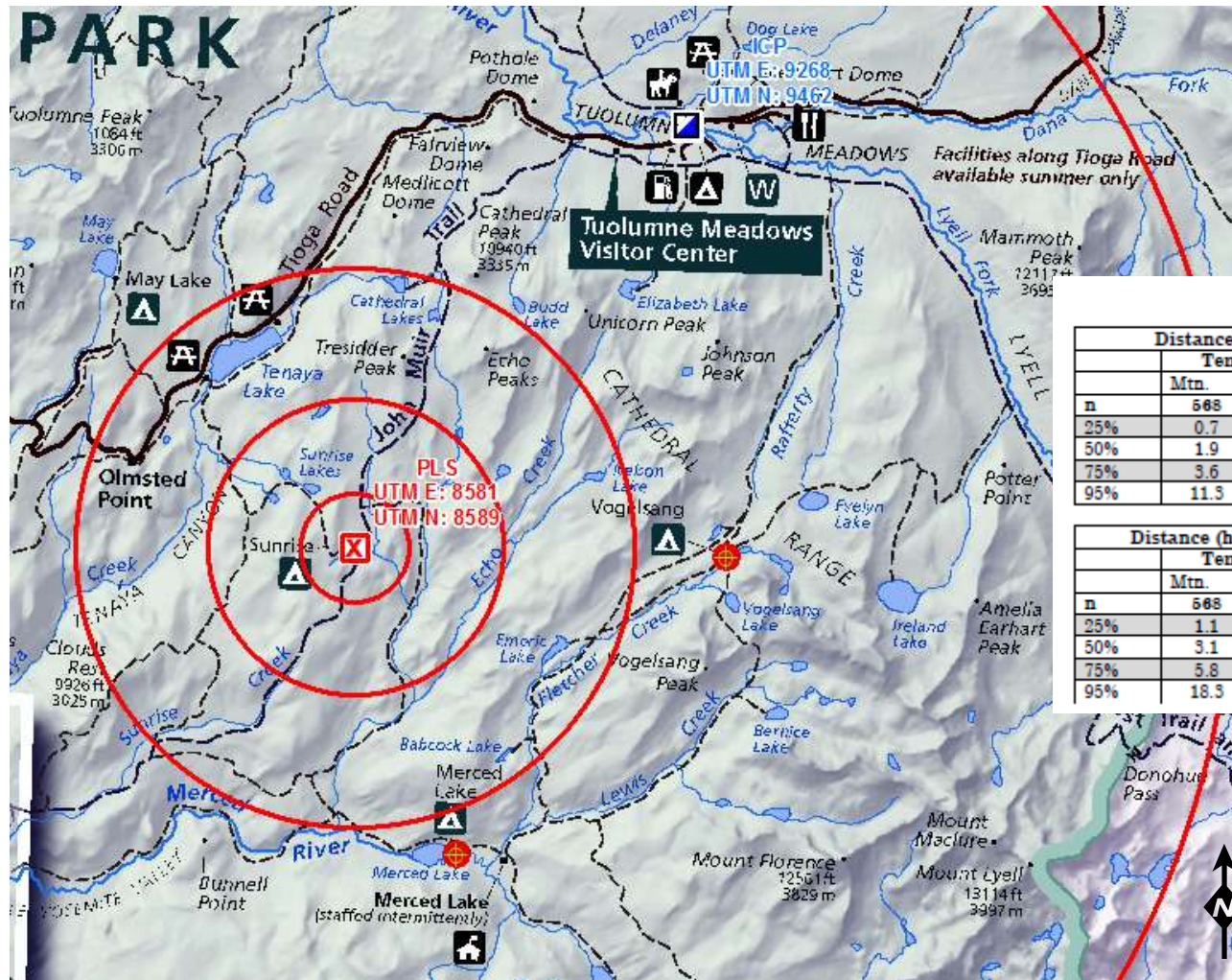
Integrated Spatial Tools For SAR for ArcGIS Desktop ([Link](#))

SAR Explorer ([Link](#))

ArcGIS Online SAR

<http://bit.ly/SARGISgallery>

Lost Person Behavior (IPP Distance)



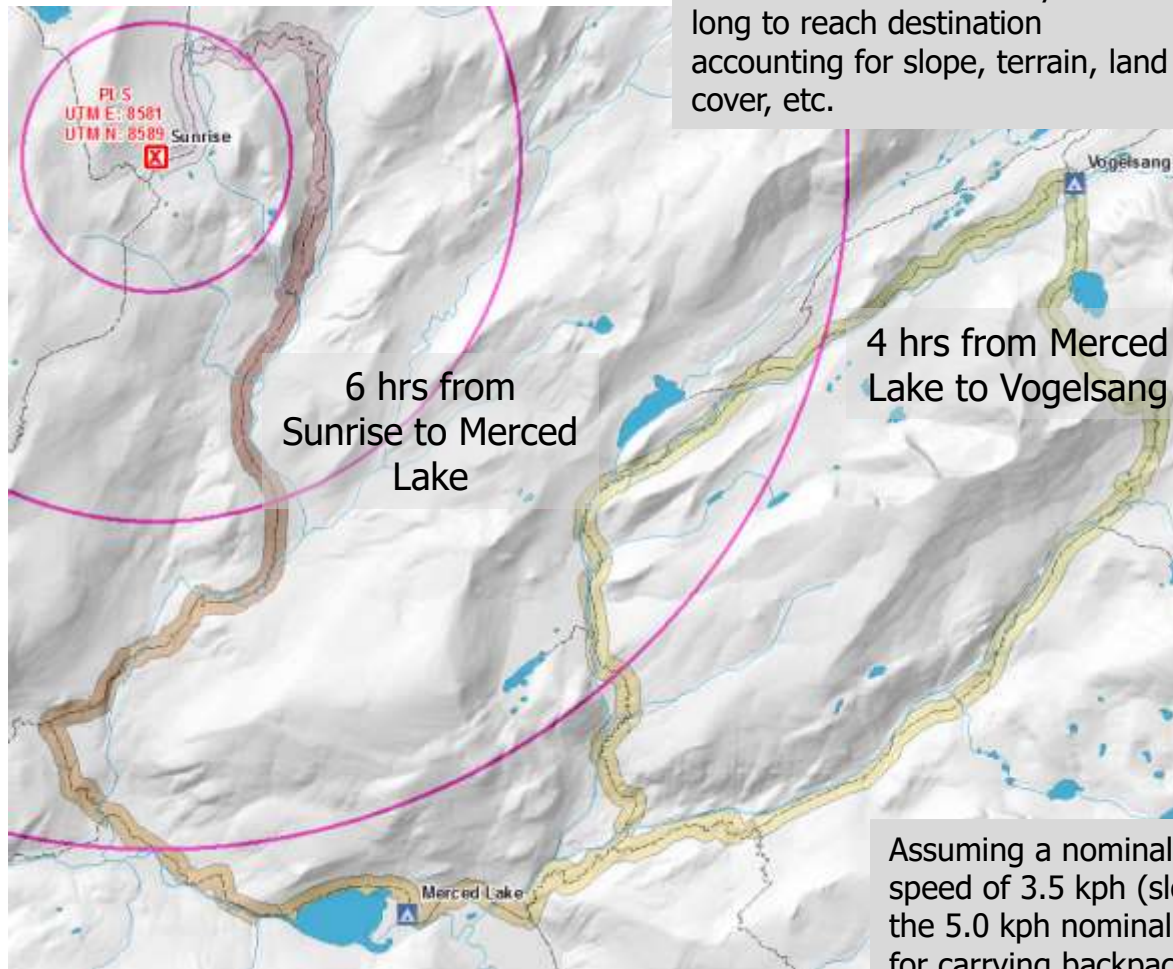
Hiker

Distance (horizontal) from the IPP (miles)					
	Temperate		Dry		Urban
	Mtn	Flat	Mtn	Flat	
n	568	274	221	68	8
25%	0.7	0.4	1.0	0.8	
50%	1.9	1.1	2.0	1.3	1.6
75%	3.6	2.0	4.0	4.1	
95%	11.3	6.1	11.9	8.1	

Distance (horizontal) from the IPP (kilometers)					
	Temperate		Dry		Urban
	Mtn	Flat	Mtn	Flat	
n	568	274	221	68	8
25%	1.1	0.6	1.6	1.3	
50%	3.1	1.8	3.2	2.1	2.6
75%	5.8	3.2	6.5	6.6	
95%	18.3	9.9	19.3	13.1	



Terrain Analysis (Mobility-corridor)

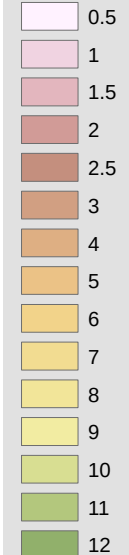


	Mobility (hours)	
	Temperate	Dry
n	232	112
25%	0	4
50%	3	8
75%	6	12
95%	14	26

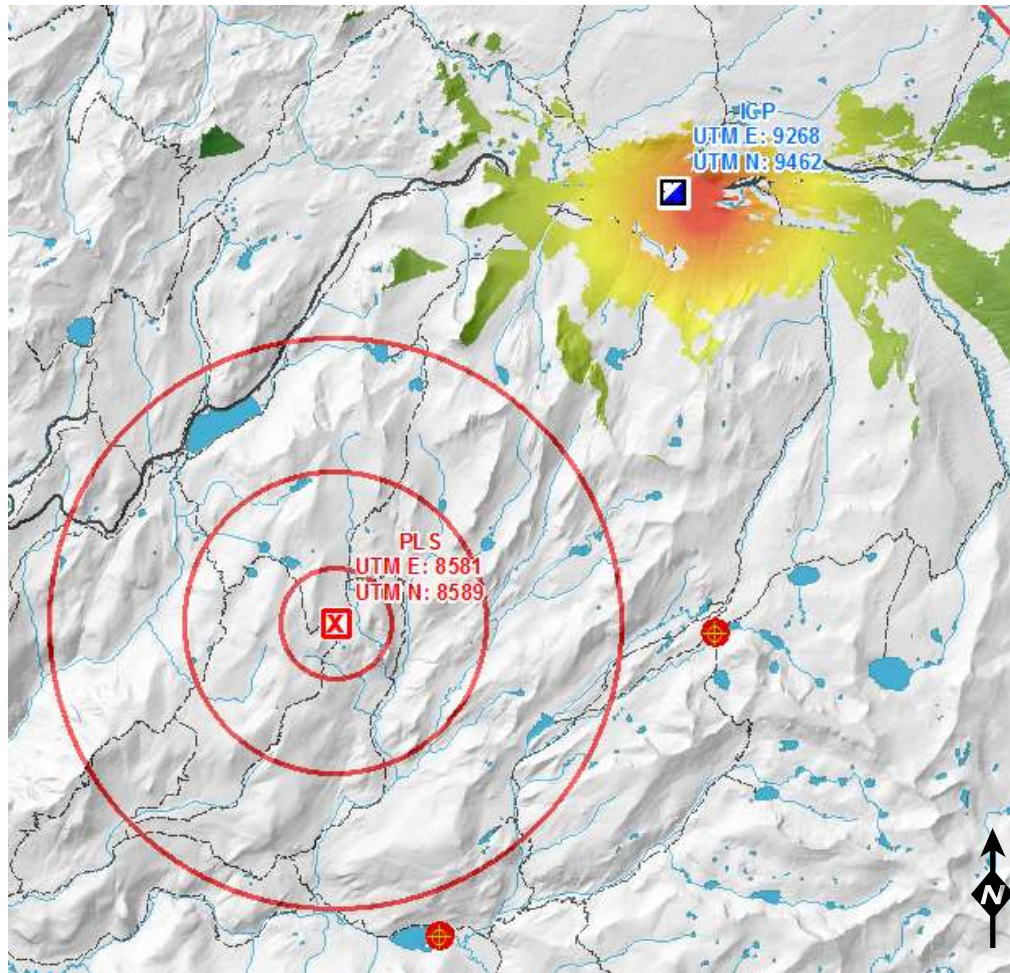
Legend

Statistical Area

General Mobility (hrs)



Could the Subject Have Contacted Friends Using Cellphone?



Does the celltower at Tuolumne Meadows provide coverage within the search area?

Unlikely subject would have cell phone coverage.

Legend

 Statistical Area

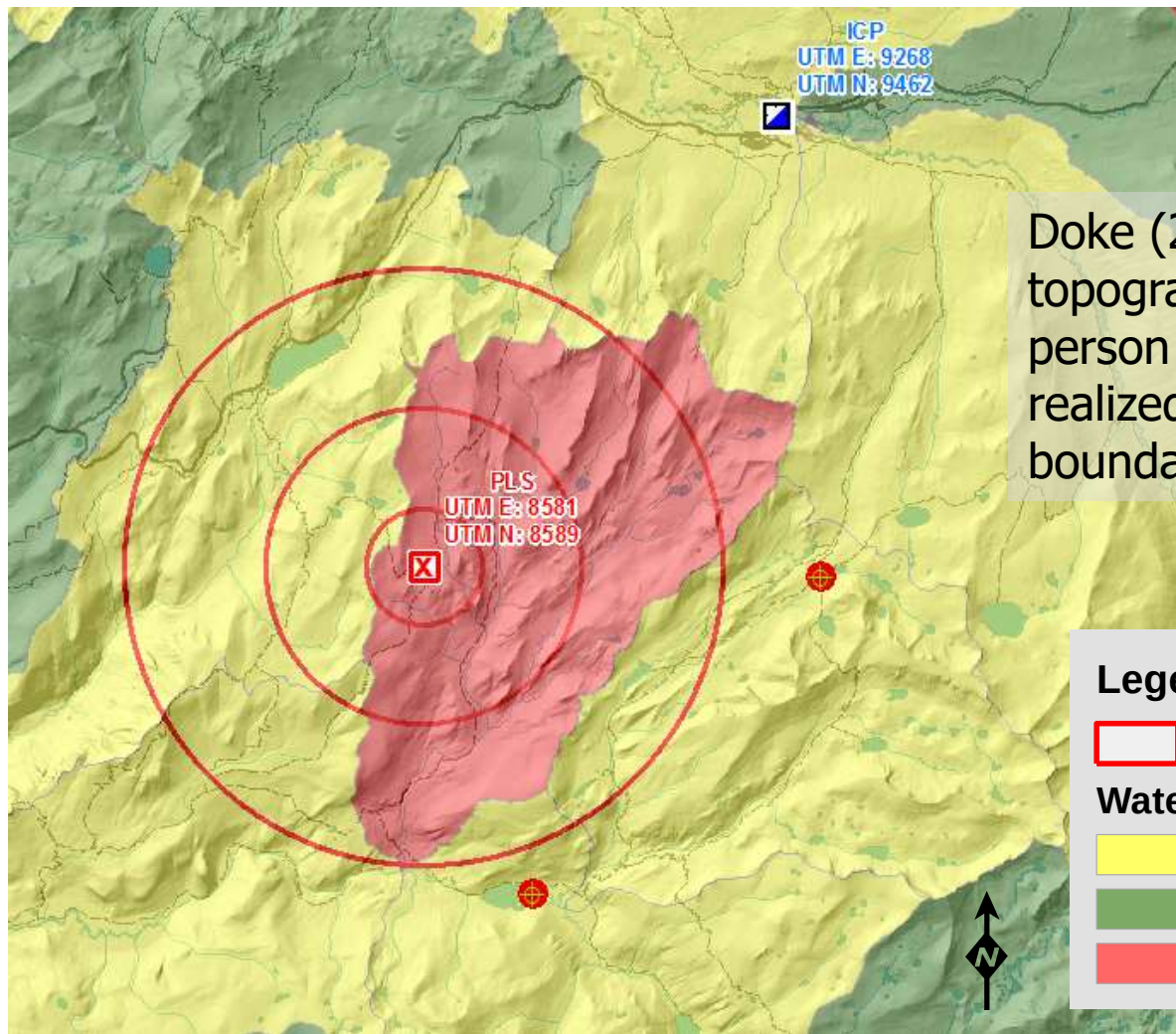
Signal Strength (dBm)

 High : -33.7

 Low : -94.0



Lost Person Behavior (Watershed)



Doke (2012) speculated that topographic affects on lost person behavior may be realized through watershed boundaries.

Legend

 StatisticalArea

Watershed_LPB

 ADJACENT

 DISTANT

 SAME





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Missing Subject: Part III

- Subject Found Alive!
- Steve Clark was found cold but healthy below Vogelsang Peak
- Location: 11S KB 91694 81455

EXERCISE ONLY





Enter Data

2016 MRA Mission Data Portal

[No Issues Detected](#) [Edit](#) [Return to MRA Mapping Portal](#)

[Enter A New Mission \(Short Form\)](#) [Enter a New Mission \(Long Form\)](#) [Edit Missions \(Web Map App\)](#) [2015 Dashboard \(2016 Coming Soon\)](#)

1. SELECT FORM

Found

Enter Information

Number or short name your team uses (NOTE: the mission number or name must be the same as the one entered in the Initial Mission Form)

Number of Subjects

Found Location (required)

Found Date (required)

Comments

Long Form



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MRA Mapping Portal

- Build A Custom Web Map App for Data Entry
- Make a Public Information Map to Show Where Your Team was Active in 2015
- Plan a Training Exercise





MRA Mapping Portal





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MRA Mapping Portal

Home ▾ My Map New Map MRA ▾

[Details](#) [Add ▾](#) [Basemap](#) [Analysis](#) [Save](#) [Share](#) [Print](#) [Directions](#) [Measure](#) [Bookmarks](#)

[About](#) [Content](#) [Legend](#)

Guided tours to quickly get you started

Pick a tour to learn more about using the map viewer.

- Learn to make a map**
[START TOUR >](#)
- Learn to style a map**
[START TOUR >](#)
- Learn to explore Living Atlas Layers**
[START TOUR >](#)

Take A Tour!

A map of the United States showing state boundaries and major cities. The map is displayed in a web browser interface with various navigation and tool icons. A red arrow points from the "Take A Tour!" text to the "Learn to make a map" tour option.

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MRA Mapping Portal

Home Gallery Map Scene Groups My Content My Organization

MRA

My Groups

CREATE A GROUP

Show

You are a member of 16 groups

All My Groups
Owned by Me
Owned by Others
With New Membership Requests

2014 Graham Search Virginia
This is a Group to help coordinate efforts on the Graham Search.
owned by MRA_Admin on September 19, 2014

2014 SARGIS6
This is an inter-organizational account to support the SARCON2014 and SARGIS6 Field exercises.
owned by pdoherlySAR on May 1, 2014

Active Operations - Mountain Rescue Association
This is the group for coordinating active search and rescue operations.
owned by MRA_Admin on January 27, 2014

Find...
The organization's groups
The organization's groups that are public
The organization's groups that are designated as Open Data

Featured Groups
National Maps for USA
Esri Maps and Data
Community Basemaps

Groups allow for Public and Private Sharing



PASADENA MOUNTAIN
INDUSTRIAL
PMI

MRA Mapping Portal

Home ▾ My Map

Details Add Basemap Analysis Save Share Print Directions Measure Bookmarks

Search for Layers

Find: Washington Trails
In: ArcGIS Online
☒ Within map area

34 Results Found

- Thurston_BikeMap by ambrogim Add
- Collector_Test by jhdm490 Add
- USGS Protected Areas Database of the United States (PAD) by URS_C40 Add
- USGS Protect Areas Database of the United States (PADUS) by URS_C40 Add
- Thurston_Parks by TRPC.Maps Add
- CascadeCrest by khutchins_jsapi Add
- WATrails_Federal by WAGeoservices Remove
- WATrails_State by WAGeoservices Add

Find Layers

The screenshot shows the MRA Mapping Portal interface. On the left, there's a search bar labeled "Search for Layers" with the text "Washington Trails" entered. Below the search bar, it says "34 Results Found" and lists several layers with "Add" or "Remove" buttons. A red arrow points from the "Find Layers" text box to the search bar. The main part of the screen shows a map of Washington state with green lines representing trails. Cities like Vancouver, Victoria, Seattle, Olympia, and Spokane are labeled. The bottom left corner of the slide features a blue rope knot graphic.

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MRA Mapping Portal

The screenshot shows the 'Mountain Rescue Association Membership Map' interface. On the left, there is a legend titled 'MRA Teams USA' with categories: Regular (blue square), Associate (white square), Ex-Officio (green square), and Other (grey circle). The main area displays a map of the United States with team locations marked by colored squares. A 'Share' dialog box is open in the center, showing options to share the map via social media, a map link, or an embed code. The 'Embed Map' section is highlighted by a red arrow and a red box labeled 'Embed in Website'. The embed code is as follows:

```
<iframe width="100%" height="640px"
src="http://msar-maps.arcgis.com/apps/PublicInformation/index.html?
appid=4e51f27ce6374f98af633ed18a845bd2"
>
```

The size is set to 100% x 640px.



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QUESTIONS AND ANSWERS





Common Q&A

1. Do I have to answer all of the questions?
2. What if I already collect data?
3. Can I export the data?
4. When should I fill out the form?
5. How do I estimate mission hours?
6. Where do I get help?

mramapping@gmail.com





Common Q&A

1. Do I have to answer all of the questions?

Short-Form = Yes

Long-Form = Please





Common Q&A

2. What if I already collect data?

We will do our best to develop a data import plan with you

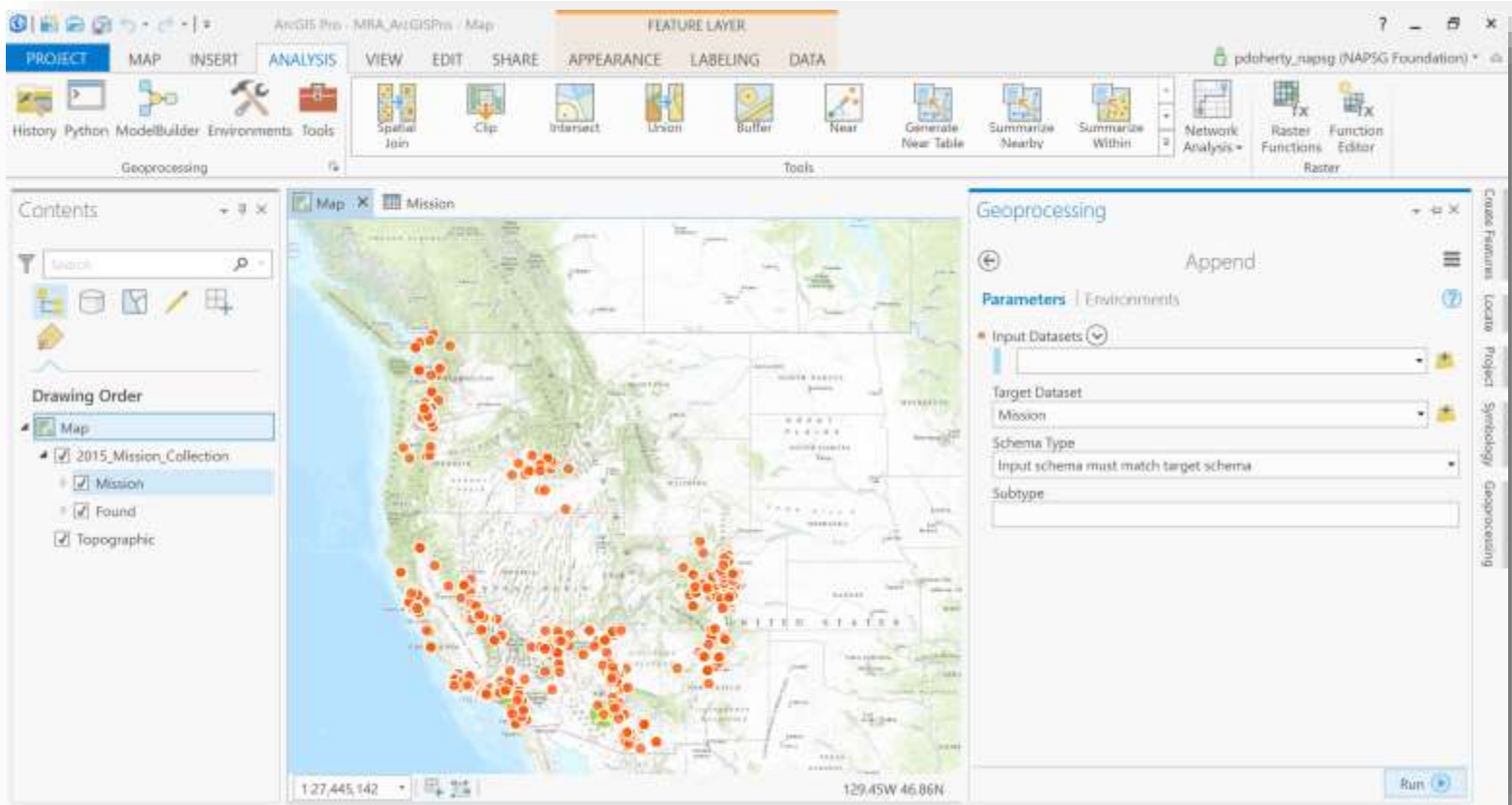
mramapping@gmail.com

Please consider that this is a volunteer run system and you must follow instructions closely.





Common Q&A



ArcGIS Pro



Common Q&A

3. Can I export the data?

Yes

The data is downloadable and has an API for .csv, .kml, .shp, .gdb, and services





Common Q&A

4. When Should I Fill Out the Form?

As soon as possible after an incident is over. You can always go back and edit the data.

Waiting until the end of the year may be counterproductive and inefficient.





Common Q&A

5. How do I estimate mission hours?

of rescuers x duration of the incident

Complex multi-operational period
incident? Do your best.





Common Q&A

6. Where do I get help?

mramapping@gmail.com





Common Q&A

6. Where do I get help?

MRA Mapping Hangouts

2nd Tuesday of each month

1100h Mountain Time

Details TBA





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Resources

Free Mapping Training

- ArcGIS Online Help Documentation

<http://bit.ly/AGOLHelp>

- Getting Started With GIS

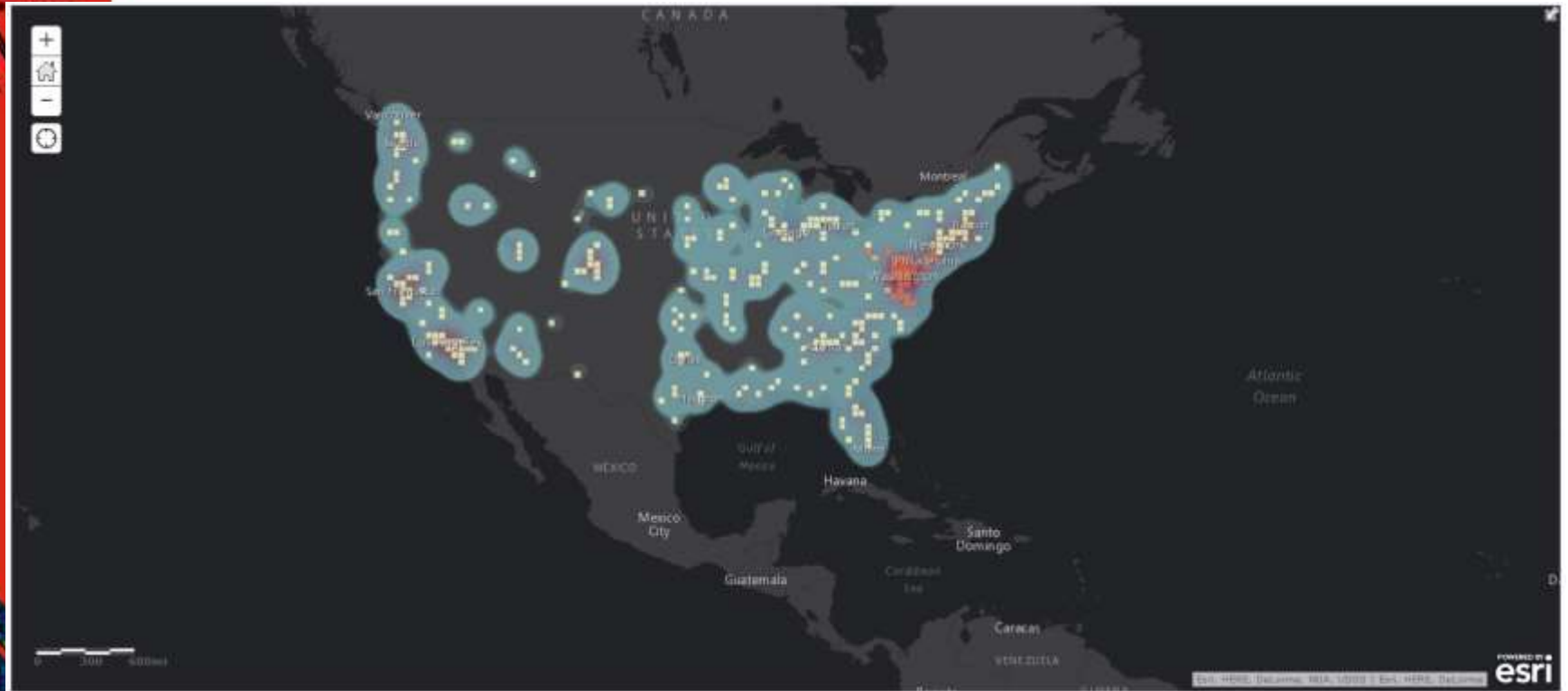
<http://bit.ly/StartGIS>

- NAPSG Resources

<http://bit.ly/NAPSGresources>



Public Safety GIS Community



<http://www.napsgfoundation.org/about/regional-leadership-teams/>



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Thank You

- **MRA Member feedback!**
- **Mark Johnson from USC GIS**
- **MRA Mapping Volunteers**
- **Esri Non-Profit Organization Program**

