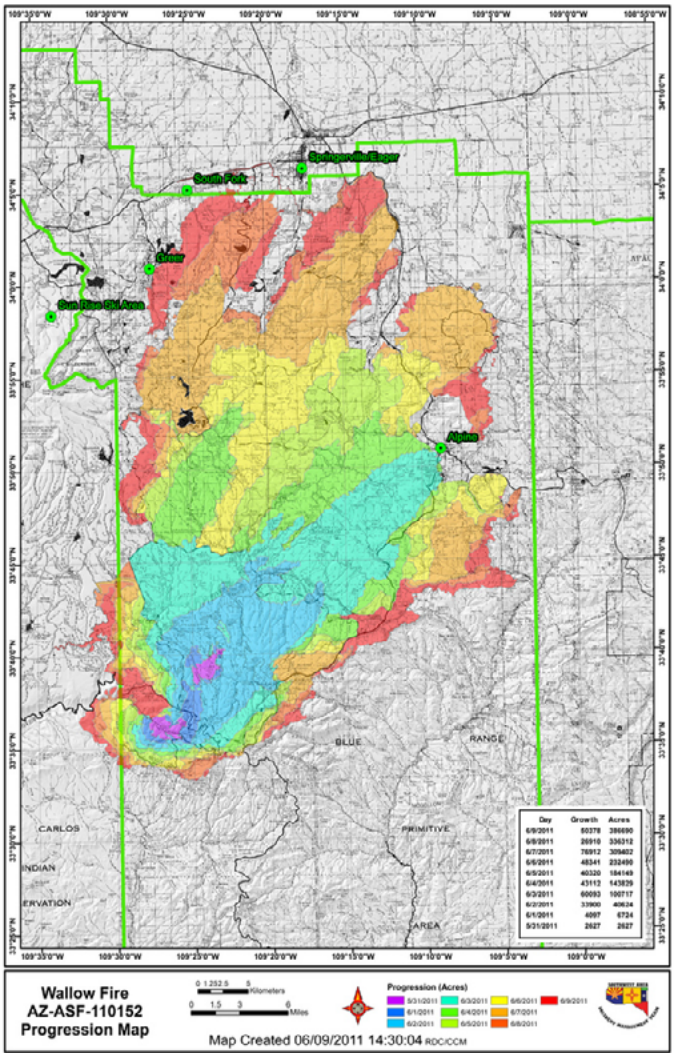
FireWatch: A Citizen's Guide to Wildfire Suppression Monitoring

Part One: A Guide to Online Wildfire Information Gathering



by
Michael Beasley and Timothy Ingalsbee

Firefighters United for Safety, Ethics, & Ecology
July 2018

FUSEE

www.fusee.org

ABOUT THE AUTHORS: Michael Beasley is a founding Board Member of FUSEE. He had a 30 year career in wildland fire, performing a variety of roles and duties in the National Park Service and U.S. Forest Service. His fire career began on the Yellowstone Fires of 1988 as a firefighter with the NPS. Mike then served on a NPS Hotshot crew, was a crewboss of one of the first Fire Use Modules, and served eight years as the fuels management officer at Yosemite National Park. Mike then worked in the USFS where he served as a District Fire Management Officer, Deputy Forest Fire Management Officer, and Interagency Fire Chief for the USFS and BLM at his last post in Bishop, California, from which he retired at the end of 2016.

Timothy Ingalsbee, Ph.D. is the Executive Director of Firefighters United for Safety, Ethics and Ecology (FUSEE), and is a former wildland firefighter for the U.S. Forest Service and National Park Service. Ingalsbee is a certified senior wildland fire ecologist who founded and directed the Cascadia Fire Ecology Education Project, and the Western Fire Ecology Center. Tim served as Secretary of the Board of Directors for the Association for Fire Ecology for six years, and then became its Executive Co-Director for another eight years. Tim is also a Research Associate and Adjunct Professor at the University of Oregon.

ABOUT FIREFIGHTERS UNITED FOR SAFETY, ETHICS, and ECOLOGY (FUSEE): FUSEE (pronounced FEW-zee) is a national nonprofit organization founded in 2004 that conducts public education and policy advocacy to promote safe, ethical, ecological fire management. FUSEE members include current and former wildland firefighters, fire management managers and scientists, fire educators and students, forest conservationists, rural homeowners and other interested citizens.

Inspired by the great Aldo Leopold's "Land Ethic," FUSEE promotes a new Fire Ethic in fire management policies and practices:

> *"A thing is right when it contributes to the safety of firefighters and the public, ethical public service and use of taxpayer dollars, environmental protection of fire-affected landscapes, and ecological restoration of fire-dependent ecosystems. It is wrong when it tends otherwise."*

FUSEE informs, inspires and empowers firefighters and their citizen supporters to become torchbearers for the new paradigm of Ecological Fire Management.

For more information or to receive printed copies of
FireWatch: A Citizen's Guide to Wildfire Suppression Monitoring:

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Website: www.fusee.org

FUSEE

Cover photo: A fire progression map of the 2011 Wallow Fire that started in the Bear Wallow Wilderness Area on the Apache National Forest in Arizona. The fire spread across 538,049 acres, becoming the largest wildfire in Arizona State history.

The FireWatch Guides *have been produced and distributed with the generous support of the Leonardo DiCaprio Foundation, the Weeden Foundation, the Fund for Wild Nature, and other private donors.*

FireWatch: A Citizen's Guide to Wildfire Suppression Monitoring

A Guide to Online Wildfire Information Gathering

Table of Contents

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INTRODUCTION

Along with an upsurge in wildfire activity across the U.S. has been a rapid escalation in risks to firefighters, costs to taxpayers, and environmental impacts on public lands from fire suppression activities. Climate change, suburban sprawl, and excess fuel loads resulting from past fire exclusion have all changed the fire environment in ways that make conventional suppression tools and techniques less effective. Risks to firefighters have increased, yet opportunities to reduce future risk are often ignored. America has long since passed the point of diminishing returns: spending more and more money on fire suppression is resulting in less effective protection of homes and communities from wildfire damage.

The mounting risks, costs, and impacts of suppression actions are, paradoxically, a result of society's misguided combative relationship with wildland fire. The dominance of fire management by suppression, and its militaristic framing as fire fighting, accounts for much of the problem. Wildfire suppression operations on public lands are developed without informed public involvement or environmental analysis, and decisions to fully and aggressively suppress wildfires often run afoul of the best available fire ecology science and economic rationality. Indeed, most citizens are silent spectators during wildfire incidents, and what little they learn about suppression actions are what they read or watch in the news media, which too often glorifies firefighting and uncritically relays the official spin of agency spokespersons. Consequently, firefighting actions often escape critical analysis or external oversight, leading to a systemic lack of agency transparency and accountability. That must change.

For many reasons, agencies must become more selective and strategic with their use of suppression resources, so that protection efforts are concentrated on homes and communities, where fire is absolutely unwanted. Use of fire to meet ecological objectives should be emphasized in uninhabited wildlands, where more fire is desperately needed. Concerned citizens and rural communities must get more actively involved in monitoring fire suppression operations not just to prevent bad things from happening, but also to help promote best practices in land stewardship. The new paradigm of Ecological Fire Management strives to maximize the ecological benefits of burning while mitigating the risks to firefighters, minimizing the costs to taxpayers, and avoiding the environmental damage caused by aggressive suppression actions. Informed citizens and local communities should be able to communicate with agencies, share their knowledge of local values-at-risk, and collaborate with managers in setting priorities for suppression efforts.

Wildland firefighters need your support

Wildland firefighters always seek to optimize their "situational awareness." This applies to citizen watchdogs, as well. When they learn how to gain access to unmediated sources of wildfire suppression information and documents, critically analyze the data, and communicate their concerns to agency officials, they can become assets in helping fire managers make better decisions in wildfire responses. Wildland firefighters and the public they serve stand to benefit from increased public understanding and involvement in wildfire management, and will gain much from greater agency transparency and accountability of suppression operations on public lands. Firefighters United for Safety, Ethics and Ecology (FUSEE) offers *FireWatch: A Citizen's Guide to Wildfire Suppression Monitoring* to help environmental reporters, forest conservation groups, taxpayer watchdogs, and other concerned citizens learn how to monitor wildfire events and suppression operations occurring on public lands. The *FireWatch Guide* will provide people with step-by-step instructions and advice needed to access documents and analyze data on suppression operations.

The *FireWatch Guide* is divided into three parts. *FireWatch Guide Part One* will detail how to access web-based information sources in order to learn where wildfires are located, where they might be spreading, and what kinds of suppression resources have been dispatched to manage the fires. Reporters and local citizens can access these information sources on their own in real-time, and thus avoid being dependent on agency spokespersons to disclose information or being dependent on the news media, which often involves delays between when events are happening and the time that news stories get printed or broadcast.

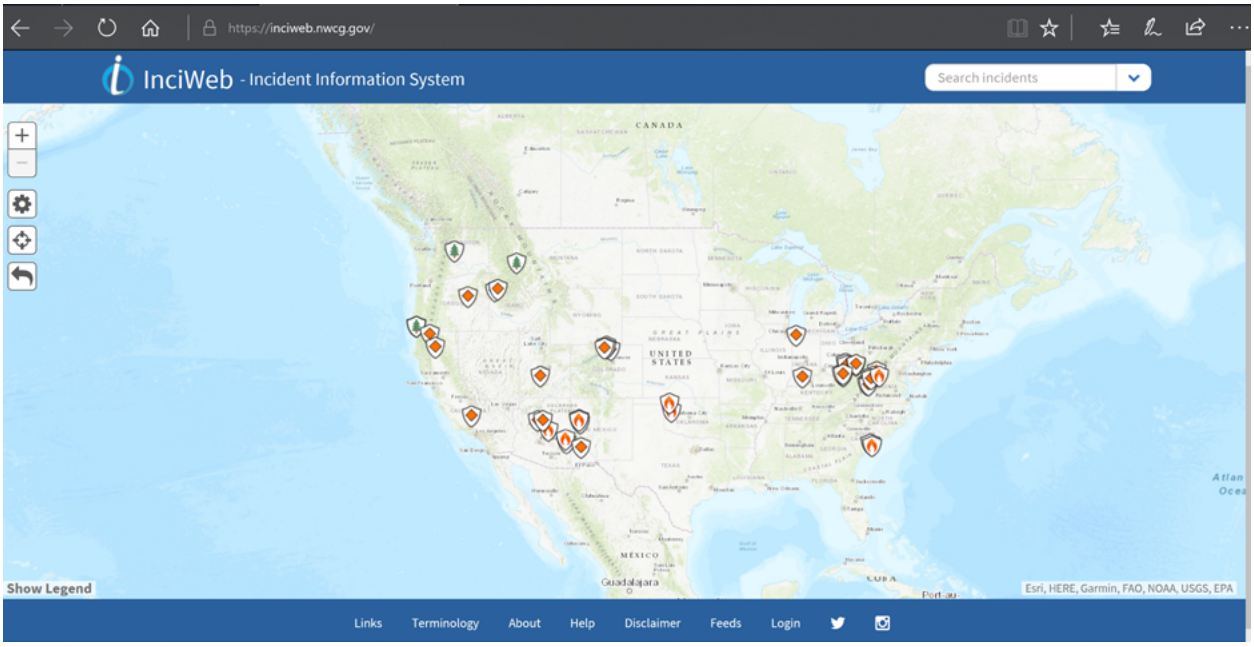
FireWatch Guide Part Two will discuss how to access hardcopy suppression documents and analyze the data in them to understand suppression operations on recent past fires. In some cases, these documents will require a Freedom of Information Act (FOIA) request, so tips on how to navigate the FOIA process will also be provided. *FireWatch Guide Part Three* will provide tips for citizens and groups to communicate their concerns with agency officials and fire managers. The ideal time to do this is well before a wildfire ignites by establishing collaborative relationships of knowledge-sharing that will be mutually-beneficial if and when a wildfire ignites in a given area. Together, the series of three *FireWatch Guides* will educate and empower people to become citizen "fire watchers" providing vital citizen input and public oversight to the agencies to help wildland firefighters do their jobs more safely, ethically, and ecologically.

FireWatch: A Citizen's Guide to Wildfire Suppression Monitoring

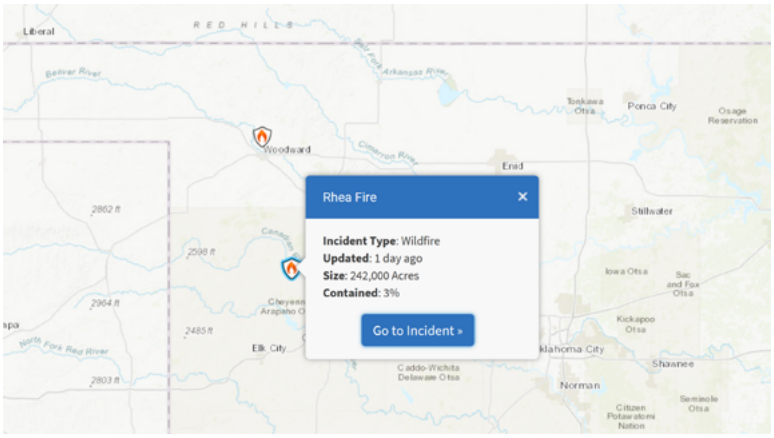
A Guide to Online Wildfire Information Gathering

Inciweb/Sit Report

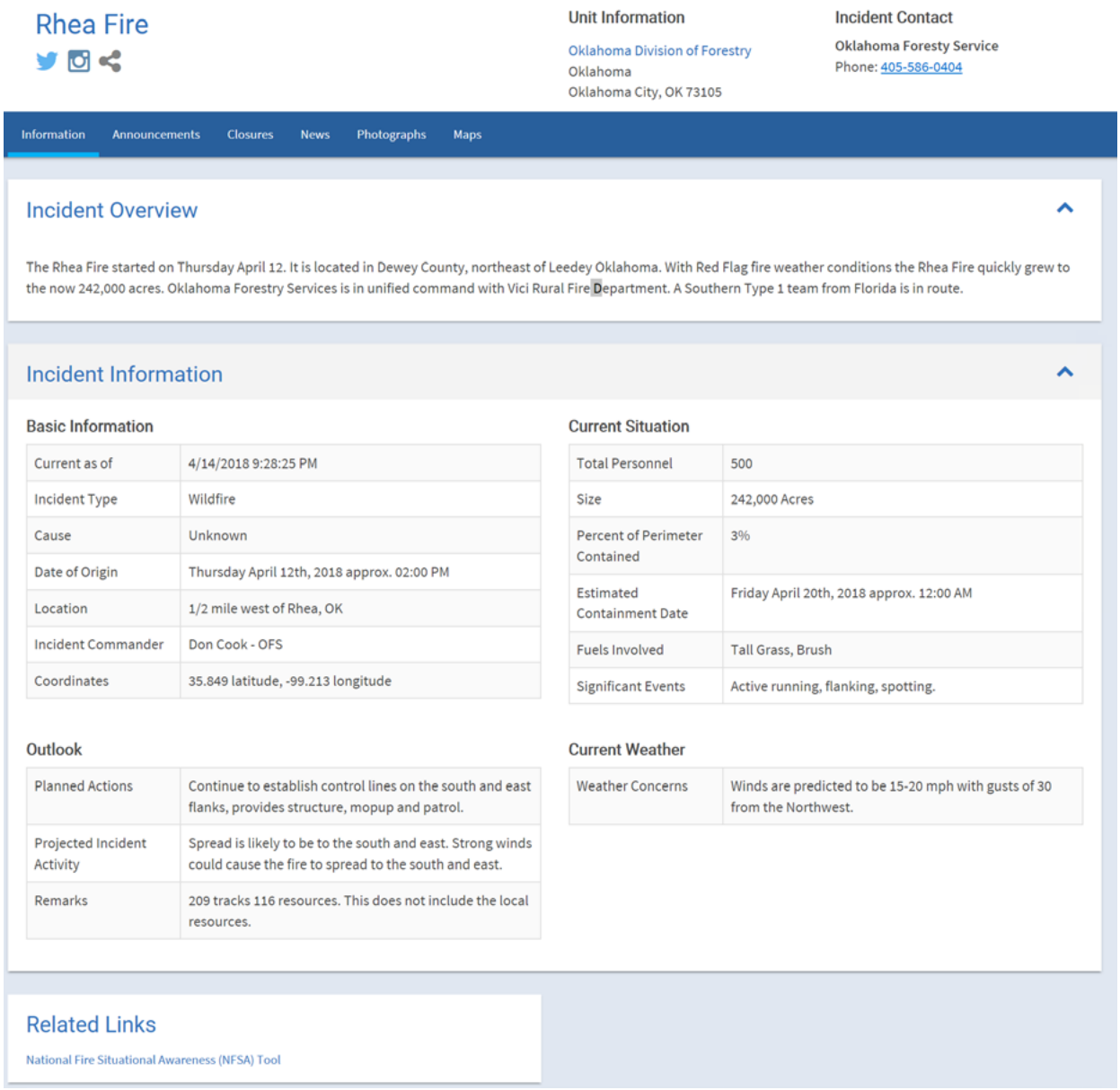
No guide to wildire information gathering would be complete without an initial discussion of InciWeb (https://inciweb.nwcg.gov/), the venerable platform utilized by the official spokespersons of the agency units who have the dubious honor of hosting a large fire within their boundary. Inciweb has a new look with a easy-to-use map server on the opening page. By zooming in and panning back and forth the user can focus in on the incident they wish to research. The image below shows incidents across the country on the morning of April 16, 2018.



By zooming in to Oklahoma, one can see the very large fires burning in Eastern Oklahoma – the Rhea Fire and the 34 Complex just to the north. By clicking on the larger Rhea Fire, one gets the option to view the incident data.



When one clicks on *go to incident*, one arrives at the more familiar incident information page with important links in the blue bar below the jurisdictional information. (Of note in this case, this huge off-season fire is surely catching a poorly funded agency with poor morale amid a statewide teaching strike that has threatened to extend into the ranks of other Oklahoma State employees.)



Rhea Fire

Unit Information

Oklahoma Division of Forestry
Oklahoma
Oklahoma City, OK 73105

Incident Contact

Oklahoma Foresty Service
Phone: 405-586-0404

Information | Announcements | Closures | News | Photographs | Maps

Incident Overview

The Rhea Fire started on Thursday April 12. It is located in Dewey County, northeast of Leedey Oklahoma. With Red Flag fire weather conditions the Rhea Fire quickly grew to the now 242,000 acres. Oklahoma Forestry Services is in unified command with Vici Rural Fire Department. A Southern Type 1 team from Florida is in route.

Incident Information

Basic Information

Current as of	4/14/2018 9:28:25 PM
Incident Type	Wildfire
Cause	Unknown
Date of Origin	Thursday April 12th, 2018 approx. 02:00 PM
Location	1/2 mile west of Rhea, OK
Incident Commander	Don Cook - OFS
Coordinates	35.849 latitude, -99.213 longitude

Current Situation

Total Personnel	500
Size	242,000 Acres
Percent of Perimeter Contained	3%
Estimated Containment Date	Friday April 20th, 2018 approx. 12:00 AM
Fuels Involved	Tall Grass, Brush
Significant Events	Active running, flanking, spotting.

Outlook

Planned Actions	Continue to establish control lines on the south and east flanks, provides structure, mopup and patrol.
Projected Incident Activity	Spread is likely to be to the south and east. Strong winds could cause the fire to spread to the south and east.
Remarks	209 tracks 116 resources. This does not include the local resources.

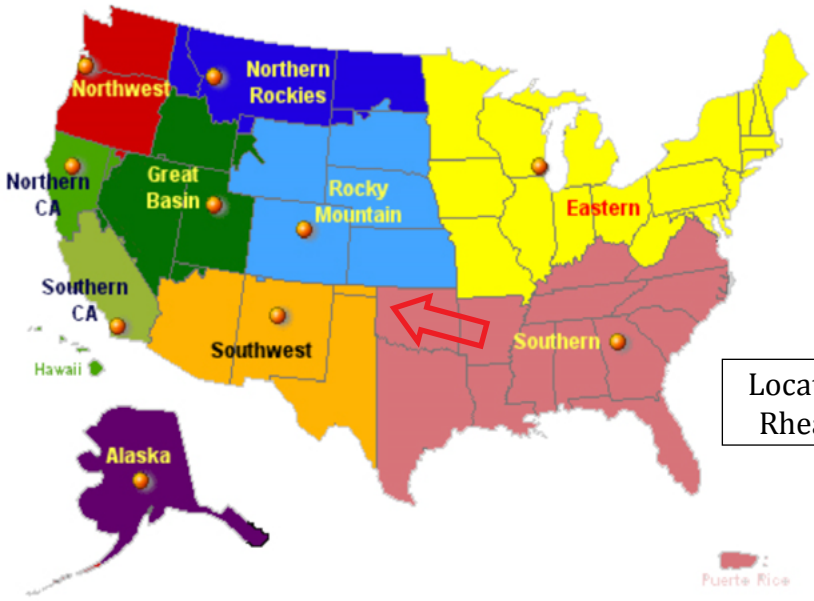
Current Weather

Weather Concerns	Winds are predicted to be 15-20 mph with gusts of 30 from the Northwest.

Related Links

National Fire Situational Awareness (NFSA) Tool

The Rhea Fire is also located right on the boundary between two Geographic Area Coordination Centers (GACCs). If this fire was in the Oklahoma Panhandle, it would be within the Southwestern GACC, instead it is in the Southern Area GACC, meaning that all suppression resource orders are going through Atlanta. “Closest Forces Dispatching” guidelines dictates that Southern Area suppression resources will have to be depleted before the Southern Area GACC can request resources through the National Interagency Coordination Center (NICC) in Boise, the equivalent of the Pentagon for wildfire operations.



Location of Rhea Fire

At that nexus of 'the Pentagon of Fire,' all of the fire information is rolled up daily and placed in the "Sit Report" (https://www.nifc.gov/). Like InciWeb the Daily Sit Report is a go-to information resource for a daily roundup of National fire activity. Note the nearly half million acre figure in the acres-to-date column for the Southern Area GACC. [pg.4]

National Interagency Coordination Center
Incident Management Situation Report
Monday, April 16, 2018 – 0800 MT
National Preparedness Level 2

National Fire Activity

Initial attack activity:	Light (72) new fires
New large incidents:	4
Large fires contained:	5
Uncontained large fires:**	20
Area Command teams committed:	0
NIMOs committed:	0
Type 1 IMTs committed:	2
Type 2 IMTs committed:	2

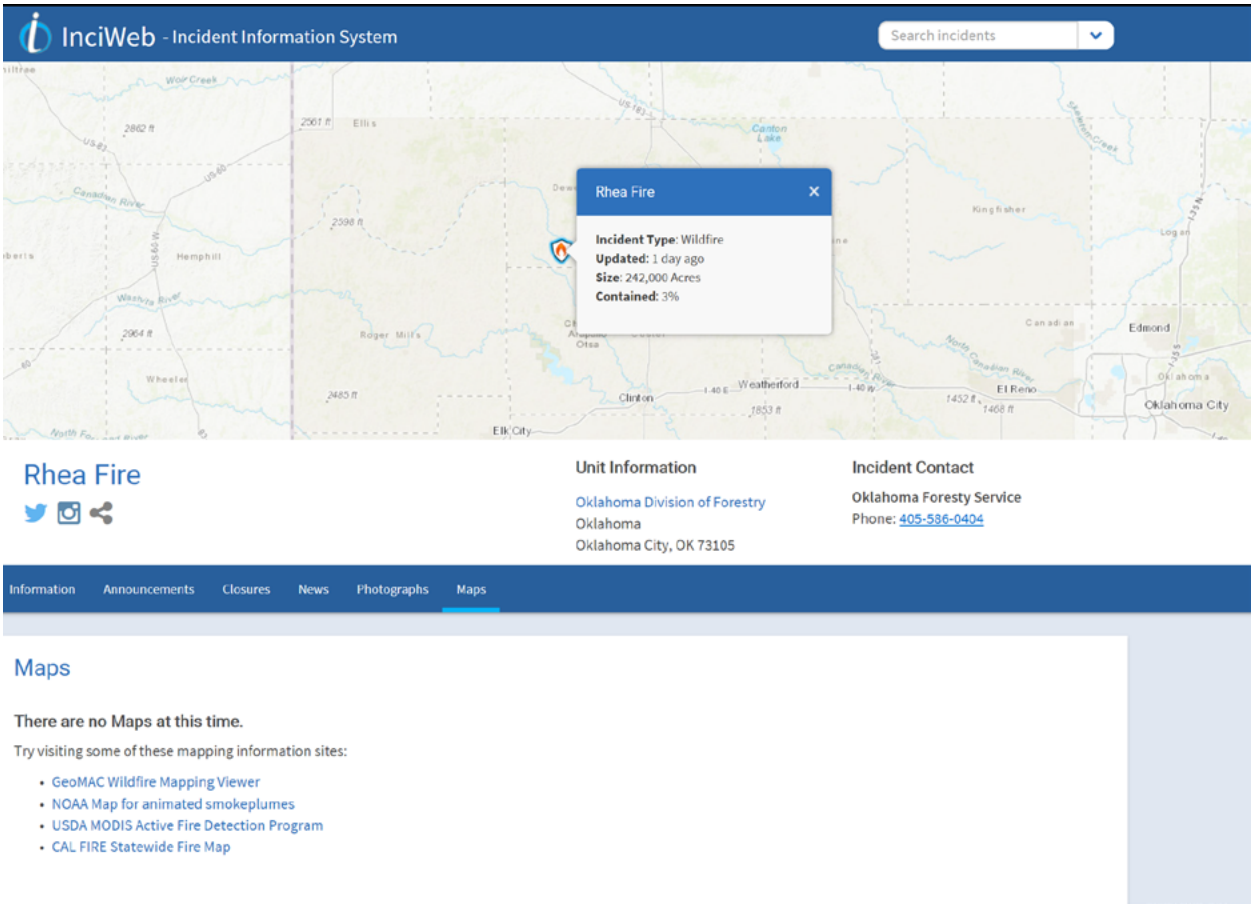
**Uncontained large fires include only fires being managed under a full suppression strategy.
Link to Geographic Area daily reports.

Active Incident Resource Summary

GACC	Incidents	Cumulative Acres	Crews	Engines	Helicopters	Total Personnel
AICC	0	0	0	0	0	0
NWCC	0	0	0	0	0	0
ONCC	0	0	0	0	0	0
OSCC	1	258	0	1	0	9
NRCC	0	0	0	0	0	0
GBCC	0	0	0	0	0	0
SWCC	6	59,416	21	40	7	819
RMCC	0	0	0	0	0	0
EACC	4	5,791	3	9	2	136
SACC	43	412,282	12	219	8	830
Total	**54**	**477,747**	**36**	**269**	**17**	**1,794**

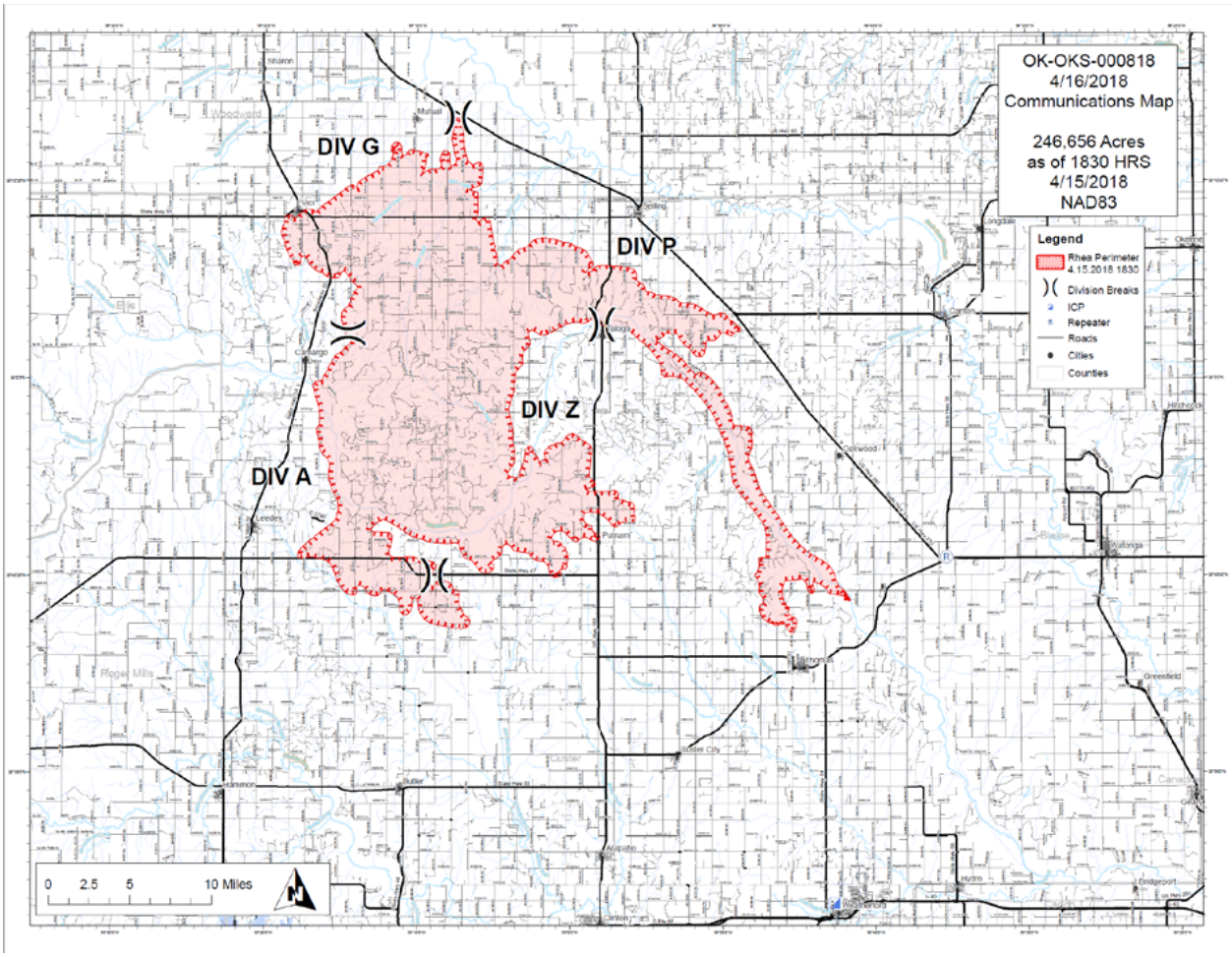
You can leaf through the daily Sit Report, like thousands of firefighters across the country do each morning, and get a good feeling about where our next assignment may take us. Which remote wilderness area or suburban nightmare will our crew, fire engine, helicopter or air tanker find themselves at as the afternoon heats up and the lightning pops? Looking at the individual fires in the Sit Report, with respect to cost, one can see a cost-to-date taken from the last ICS-209 turned in by the incident. But we are getting ahead of ourselves. Lets go back to Inciweb for a moment, remembering that this is the "official" portal for incident information vetted through an agency Public Affairs or Fire Information Officer. What was once restricted to terse news releases is now a very robust, but still tightly controlled, series of tweets, Facebook posts, and press releases managed by an official 'spin doctor' whose aim is to cast the agency in as favorable a light as possible. These are the folks you already have in your rolodex for the alphabet soup of acronyms for agencies that manage wildfires. As a reporter, these are your 'reliable sources' with whom you likely have a fairly close relationship within your area of coverage.

The *FireWatch Guide* will dive deeper into the pool of digital and hard copy data that is available, if you know where to look. It is worth pointing out that Inciweb has chosen not to show cost-to-date from the latest ICS-209 on the incident information page. Doubtless, that was an intentional decision by the InciWeb development team In fact, when one clicks on the Maps selection on the blue toolbar, this is what was shown:



What? No maps at this time for a quarter-million acre wildfire so near a major metro area like Oklahoma City?! OK, so they have better systems for dealing with tornados, but climate change means more of both – tornadoes and wildfires. This query was at 8:00am PDT three days after this fire started and remained void of any map information by 3:30pm PDT. By that time, one could retrieve a detailed .pdf format maps of both the 34 Complex and Rhea Fires from the NIFC FTP site. In fact, at 8:00 am there was a map from the 34 Complex and still nothing from the huge Rhea Fire. But by that afternoon, someone on the assigned incident management team (IMT) finally uploaded all three days of maps. This is one of the public online data sources explored in the next few pages.

As you look at the map on the next page, remember the shape of the fire when we examine the Active Fire Mapping program products in the next section.

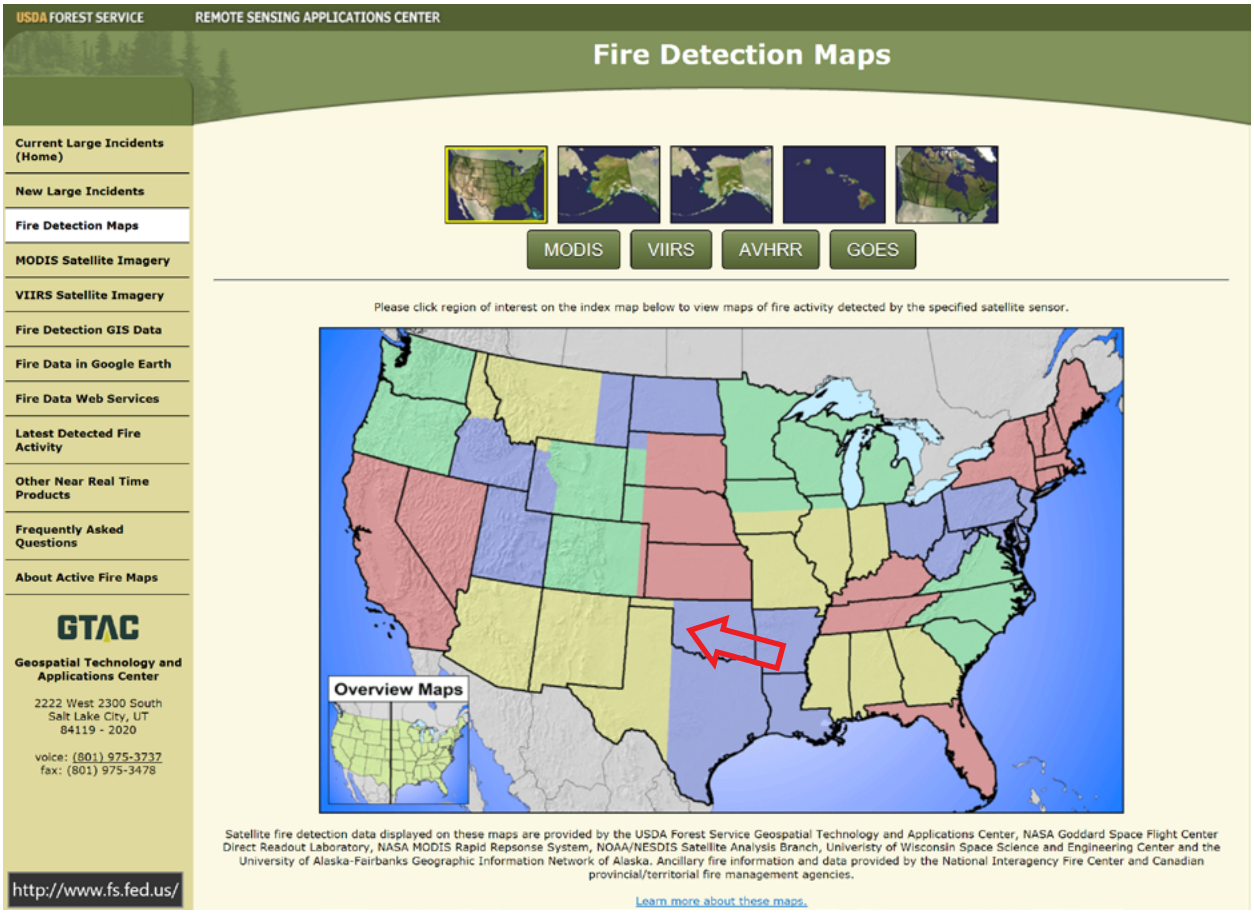


The purpose of this illustration is the significant lag time that often occurs, especially in the early and often chaotic period of a wildfire, for the posting of relevant information. Since the gatekeepers of InciWeb are the official agency spokespeople, these folks are usually buried in the early days of an incident and are not able to get good content posted in a timely fashion. This is especially true in the case of a more poorly funded agency, for instance a state forestry organization in a deep red state. The purpose of this *FireWatch Guide* will be to give insight on some of the other primary sources available online for your investigation. Many of these searchable databases require special permission, but some are publicly accessible. We will explore these public sites with step-by-step instructions on obtaining the data you need.

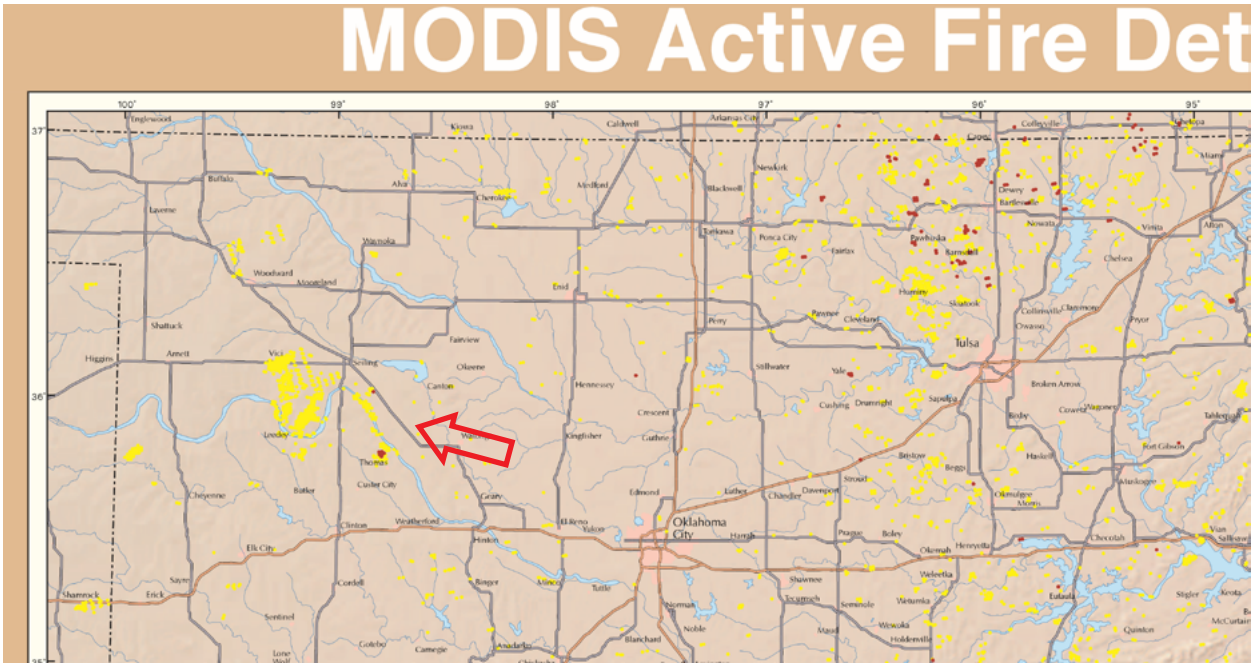
Active Fire Mapping (MODIS VIIRS, etc.)

Staying with the broad overview theme for a moment more, one should be familiar with the U.S. Forest Service-led Active Fire Mapping Program and the remote sensed products they provide. While these products are available online as either .jpeg or .pdf file maps, one of the most useful geovisualizations is using the data available for viewing within Google Earth. The screen capture on the next page shows the Active Fire Mapping homepage at https://fsapps.nwcg.gov/

By clicking on the Fire Detection Maps bar on the left, one can bring up the nationwide map of selectable .jpeg or .pdf fire detection maps generated by satellite observation. By clicking on the blue area representing Arkansas and most of Oklahoma outside of the Panhandle, one comes to the screen offering a selection of file types to download.



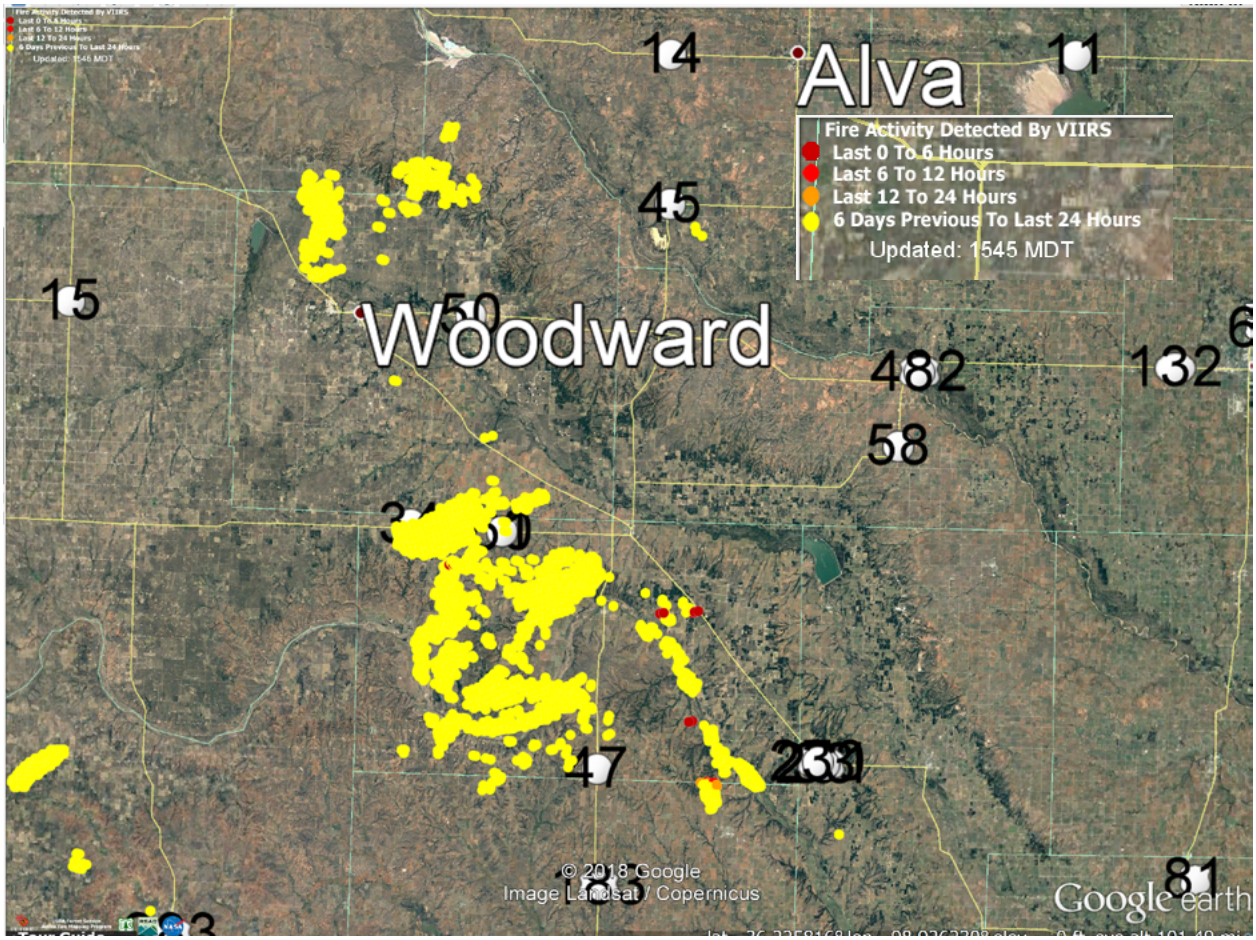
MODIS is the default satellite system for viewing. Note also at the top of the screen the ability to select another system like VIIRS, GOES, etc. Select either file type with a right-button click to save or left to view onscreen. After selecting the .pdf file and zooming into the Rhea Fire area, one can immediately determine that large-scale spread for this fire is largely over, with only a few recent heat signatures showing up in red and the remainder of the fire painted in the historic yellow hue. The shape of the fire is immediately recognizable from the incident map downloaded from the NIFC ftp server. More on that in the next section.



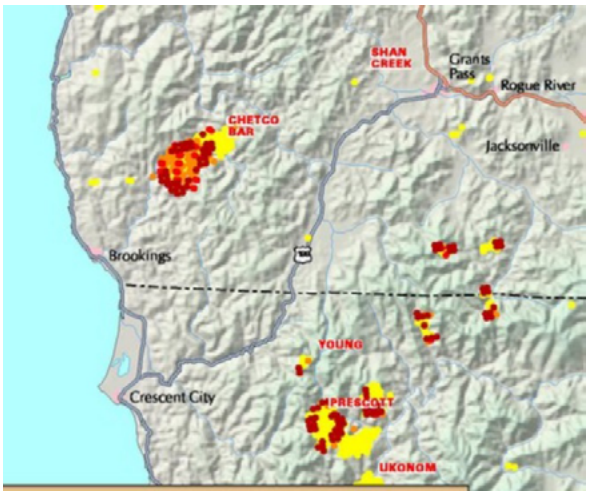
If one goes back to the bars on the lefthand side of the page and selects the Google Earth data, one can see all the heat signatures painted on the Google Earth landscape, with all the customizations, addition of other layers and zooming features inherent to this user-friendly Google product. In this case, we selected VIIRS. VIIRS is a newer system that offers better resolution than MODIS (375 and 750m vs. 1km).

By selecting a different satellite system, the selections in the white box change. In this case, the finest resolution current Google Earth coverage from the most recent satellite pass was selected. Animations and historical images are also available here.

One can then either save the file or open it immediately in Google Earth. The legend below has been enlarged to show how the Fire Mapping Program products capture the previous six days of heat signatures in showing the total fire footprint (in yellow). Rangeland fires, like this one in Oklahoma, burn mostly fine fuels. These go out quickly with little residual burn-down, so the heat signatures are fleeting.

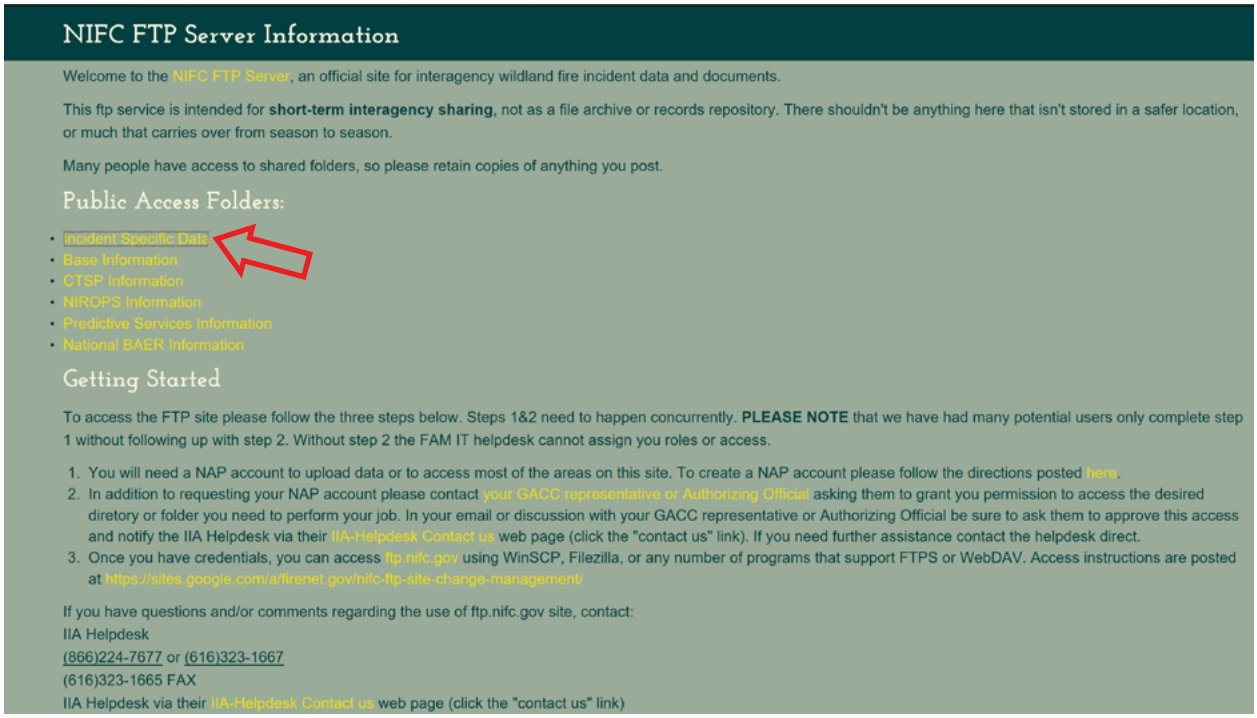


The striking thing about these products is the image of a fast-moving fire in forest fuels, which can really express a lot about the direction of spread. In this MODIS imagery (at right) showing the Chetco Bar Fire from last August, the strong downslope spread within the Chetco River drainage is easily recognizable with these strong remote sensed returns. Considering the 1km resolution for each pixel, one can only imagine the the flaming front, likely a crown fire in timber.



NIFC FTP Server

File transfer protocol (or FTP) websites are a common place for large file sharing between parties and serve in a similar function to sites like Dropbox. The NIFC FTP site portal (https://ftp.nifc.gov/) is the gateway to the NIFC FTP Server. While postings to this site are not mandatory for all the standard folders in each incident folder, it is a great place to find the most recent infrared mapping from aircraft overflights, fire spread modeling, and uploaded daily GIS databases including perimeters and a host of other geospatial data).



NIFC FTP Server Information

Welcome to the NIFC FTP Server, an official site for interagency wildland fire incident data and documents.

This ftp service is intended for **short-term interagency sharing**, not as a file archive or records repository. There shouldn't be anything here that isn't stored in a safer location, or much that carries over from season to season.

Many people have access to shared folders, so please retain copies of anything you post.

Public Access Folders:

- Incident Specific Data
- Base Information
- CTSP Information
- NIROPS Information
- Predictive Services Information
- National BAER Information

Getting Started

To access the FTP site please follow the three steps below. Steps 1&2 need to happen concurrently. **PLEASE NOTE** that we have had many potential users only complete step 1 without following up with step 2. Without step 2 the FAM IT helpdesk cannot assign you roles or access.

1. You will need a NAP account to upload data or to access most of the areas on this site. To create a NAP account please follow the directions posted here.
2. In addition to requesting your NAP account please contact your GACC representative or Authorizing Official asking them to grant you permission to access the desired diretory or folder you need to perform your job. In your email or discussion with your GACC representative or Authorizing Official be sure to ask them to approve this access and notify the IIA Helpdesk via their IIA-Helpdesk Contact us web page (click the "contact us" link). If you need further assistance contact the helpdesk direct.
3. Once you have credentials, you can access ftp.nifc.gov using WinSCP, Filezilla, or any number of programs that support FTPS or WebDAV. Access instructions are posted at https://sites.google.com/a/firenet.gov/nifc-ftp-site-change-management/

If you have questions and/or comments regarding the use of ftp.nifc.gov site, contact:
IIA Helpdesk
(866)224-7677 or (616)323-1667
(616)323-1665 FAX
IIA Helpdesk via their IIA-Helpdesk Contact us web page (click the "contact us" link)

Left click on incident specific data, and then go to the GACC folder for the area the fire is located. In this instance, the Northern California GACC is selected.

Index of /public/incident_specific_data

Name	Last modified	Size	Description
Parent Directory		-	
!!NorthMill.lnk	30-Jul-2017 11:08	609	
20160831_2224_Rev_CALPF2809_FIMT10011.gdb.zip	07-Mar-2017 17:09	235K	
AvCheckDB.bak	03-Mar-2016 18:19	3.5M	
Fuels/	17-Mar-2018 16:22	-	
alaska/	24-Feb-2018 14:45	-	
calif_n/	10-Jan-2018 16:55	-	
calif_s/	05-Mar-2018 11:45	-	
california_statewide/	15-Jun-2017 08:45	-	
eastern/	08-Mar-2018 15:01	-	
great_basin/	21-Mar-2018 09:43	-	
n_rockies/	30-Oct-2017 10:30	-	
nw_pio_map_products/	16-Sep-2017 09:41	-	
pacific_nw/	07-Mar-2018 18:54	-	
rocky_mtn/	01-Mar-2018 10:11	-	
southern/	07-Feb-2017 13:44	-	
southwest/	07-Feb-2017 13:44	-	
training/	11-Apr-2018 15:22	-	

Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

Next, 2017 wildfire incidents within Federal jurisdiction were selected.

Index of /public/incident_specific_data/calif_n

Name	Last modified	Size	Description
Parent Directory		-	
!2017 FEDERAL_Incidents/	02-Mar-2018 13:03	-	
!CALFIRE/	12-Jul-2017 16:09	-	
2012 FEDERAL_Incidents/	10-Jun-2015 00:10	-	
2012_Incident_Aviation/	10-Jun-2015 00:16	-	
2013 FEDERAL_Incidents/	10-Jun-2015 00:00	-	
2014_FEDERAL_Incidents/	02-Dec-2015 11:00	-	
2015 FEDERAL_Incidents/	29-Oct-2015 17:42	-	
2016_FEDERAL_Incidents/	27-Sep-2016 09:51	-	
CA-xxx-xxx_incident name1/	03-Sep-2017 23:35	-	
DODAircraft/	31-Jul-2016 14:58	-	
FIMT_9204_setup.exe	02-Apr-2009 12:17	7.5M	
FTP.NIFC.GOV FIRE SEASON 2009 GACC CONTACT UPDATE.pdf	21-Jul-2009 20:29	42K	
FTP.NIFC.GOV GACC_Support Folder Instructions_2009.pdf	21-Jul-2009 20:30	320K	
Historic/	13-Jul-2016 16:43	-	
Maps_DPA for North Ops/	24-May-2016 16:47	-	
nicc/	15-Jun-2017 15:13	-	
post_fire_imagery/	27-Aug-2015 14:15	-	
z2010_archive/	10-Jun-2015 00:27	-	
zCA_Fire_Siege_Report/	10-Jun-2015 00:27	-	
zCA_Fire_Siege_Report_Review/	10-Jun-2015 00:30	-	
zFIRE_DIRECTORY_EXAMPLE/	12-Jul-2017 21:32	-	
z_Aviation/	25-Aug-2017 18:18	-	

Now, all of the large fires from last year in the Northern California GACC are shown, and the Eclipse Complex on the Klamath National Forest was selected.

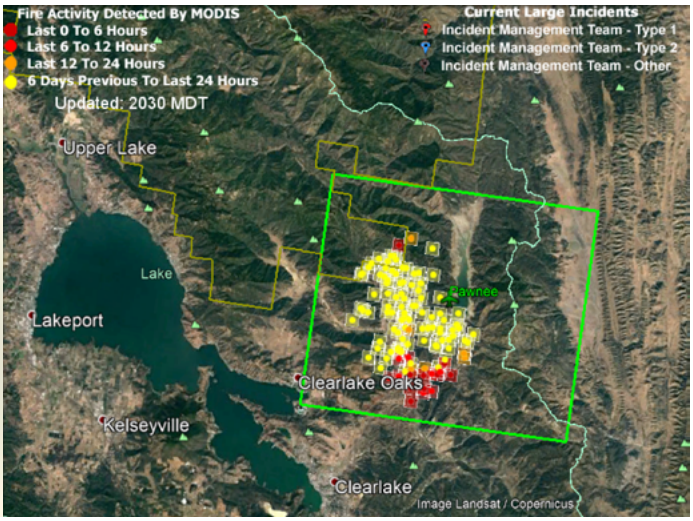
Index of /public/incident_specific_data/calif_n/!2017 FEDERAL_Incidents

Name	Last modified	Size	Description
Parent Directory		-	
CA-ENF-026677_Table/	11-Oct-2017 18:11	-	
CA-ENF-030114_Ice/	11-Oct-2017 18:10	-	
CA-KNF-004540_Island/	15-Jun-2017 08:37	-	
CA-KNF-005502_Clear/	01-Aug-2017 09:33	-	
CA-KNF-006081_Salmon_August_Complex/	10-Sep-2017 09:03	-	
CA-KNF-6098_Eclipse_Complex/	10-Sep-2017 17:44	-	
CA-MDF-000671_Modoc_July_Comp[illegible]	15-Jun-2017 08:37	-	
CA-MDF-000862_Parker2/	15-Jun-2017 08:38	-	
CA-NOD-005180_R-4_PARSNIP/	31-Aug-2017 23:06	-	
CA-PNF-001272-Toll/	15-Aug-2017 14:05	-	
CA-PNF-1043_Minerva/	15-Jun-2017 08:38	-	
CA-SHF-001755_Bradley/	15-Jun-2017 08:41	-	
CA-SHF-001770_Helena/	05-Oct-2017 16:59	-	
CA-SHF-001850_Buck/	24-Sep-2017 09:25	-	
CA-SRF-000703_Marble/	15-Jun-2017 08:37	-	
CA-SRF-000726_Dillon/	28-Jul-2017 23:45	-	
CA-SRF-000741_Orleans/	16-Aug-2017 18:33	-	
CA-SRF-000863_Youngs/	20-Aug-2017 22:37	-	
CA-SRF-000897_RuthComplex/	16-Aug-2017 18:43	-	
Delegation_of_Authority/	15-Jun-2017 08:39	-	
MMA_Support_2017/	06-Sep-2017 21:25	-	

Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

At that point, the standard folder format for each fire on the FTP site is revealed. While there are folders for the

daily Incident Action Plan (IAP), Delegation of Authority from the responsible Agency Administrator to the Incident Commander (IC), and so on, don't be surprised if you find a lot of empty folders. This site is used most extensively for geospatial data, including a daily dump of the working geodatabase (.gdb) in the GIS folder and any overnight infrared detection data in the IR folder. In fact, many incidents will only have a GIS and IR folder. To get an idea about where the fixed-wing IR platforms are being ordered for the upcoming evening, you can check the National Infrared Operations (NIROPS) website at https://fsapps.nwcg.gov/nirops/. By clicking on the Google Earth coverage, you can start to get some insight on which incident folders may get populated overnight.



As of this writing on June 26th the Google Earth NIROPS coverage shows a fire called the Pawnee Fire in central California near Clear Lake. The green box is requested area for the evening's flight; barring cloud cover, mechanical problems, or the fire extending too far south beyond the requested coverage. The aircrew can adjust this on the fly, so active fire areas are usually included, but sometimes "cold" parts of the fire are accidently missed.

Sometimes one may also find fire spread modeling information on the FTP site, as well as maps of values-at-risk and other items in the WFDSS folder. All of this information is native to the Wildland Fire Decision Support System (WFDSS) and must be transferred to the FTP site for public sharing. Since that information already exists on a separate system, it is often not uploaded to the FTP site. Data from unmanned aerial vehicles may be placed here, as well, and with emerging technologies coming online all the time, you never know what might appear. And don't forget to browse through the daily GIS coverages, if you have access to ArcGIS. Many sources of data, like daily data gathered by field observers and resource advisors from handheld GPS devices usually appear in that database.

Index of /public/incident_specific_data/calif_n/!2017 FEDERAL_Incidents/CA-KNF-6098_Eclipse_Complex

Name	Last modified	Size	Description
Parent Directory		-	
Complexity_Analysis/	16-Aug-2017 11:33	-	
Delegation_of_Authority/	16-Aug-2017 11:33	-	
Demob_Plan/	16-Aug-2017 11:33	-	
Final_Incident_Narrative/	16-Aug-2017 11:33	-	
GIS/	23-Sep-2017 22:35	-	
IAP/	28-Aug-2017 11:46	-	
IR/	13-Oct-2017 05:18	-	
IR_VETS/	11-Sep-2017 14:10	-	
WFDSS/	09-Sep-2017 11:48	-	

Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

In this case, we look at the IR folder for the Eclipse Fire and data from August 21st is selected. On this particular incident, a vendor called Veteran's Emergency Technical Services (VETS) flying infrared detection from a rotor wing platform created their own folder for their data.

Index of /public/incident_sp
6098_Eclipse_Complex/IR

Name	Last modified	Size	Description
Parent Directory		-	
20170817/	17-Aug-2017 11:19	-	
20170820/	20-Aug-2017 11:23	-	
20170821/	21-Aug-2017 15:53	-	
20170822/	22-Aug-2017 06:23	-	
20170823/	23-Aug-2017 02:23	-	
20170824/	24-Aug-2017 07:19	-	
20170825/	25-Aug-2017 02:21	-	

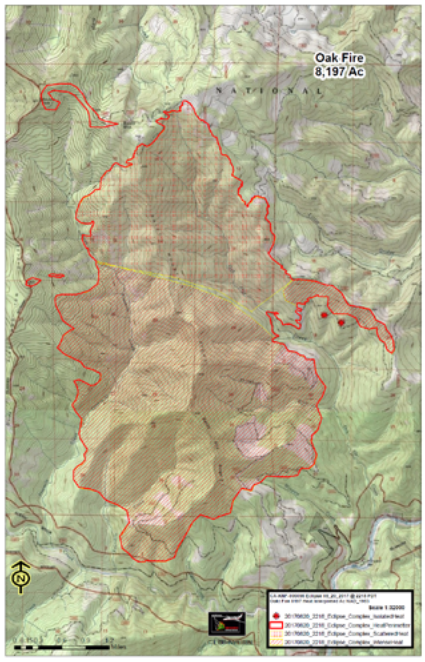
The standard daily infrared detection, if it is requested for the incident, there are no mechanical issues, and the weather (including cloud cover) cooperates, includes the following files: There are raw GIS files in the .zip file, detection maps in a .pdf format, and a Google Earth coverage (.kmz file).

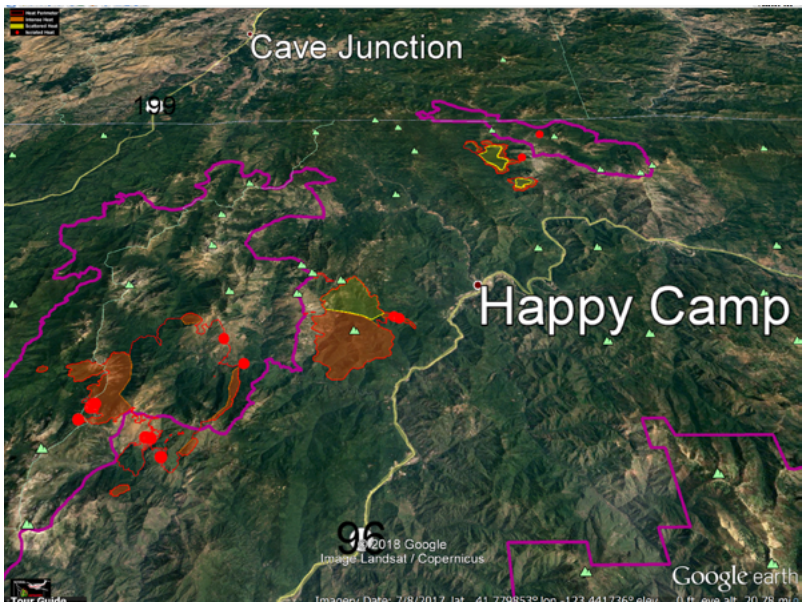
Index of /public/incident_specific_data/calif_n/!2017 FEDE
6098_Eclipse_Complex/IR/20170821

Name	Last modified	Size	Description
Parent Directory		-	
20170820_2218_Eclipse_Complex_Gis.zip	21-Aug-2017 02:42	82K	
20170820_2218_Eclipse_Complex_IR_map_11x17_Cedar_Four_MileTopo.pdf	21-Aug-2017 02:30	5.7M	
20170820_2218_Eclipse_Complex_IR_map_11x17_OakTopo.pdf	21-Aug-2017 02:31	5.5M	
20170820_Eclipse_IR_Log.docx	21-Aug-2017 02:41	19K	
20170820_Eclipse_KMZ.kmz	21-Aug-2017 02:41	185K	
Updated_20170820_2218_Eclipse_Complex_IR_map_11x17_PrescottTopo.pdf	21-Aug-2017 15:53	6.0M	

Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

The .pdf file is shown on the left below for the Oak Fire, one of several fires in the Eclipse Complex. The Google Earth coverage is shown on the right.





Next, we will look at the Sobranes Fire in the Southern California GACC in 2016. In the opening menu the Southern California GACC and CalFire incidents from 2016 were selected.

Index of /public/incident_specific_data/calif_s

Name	Last modified	Size	Description
Parent Directory		-	
!2017_Incidents/	26-Feb-2018 12:16	-	
!CALFIRE/	10-Jan-2018 19:53	-	
2006a/	10-Jun-2015 00:34	-	
2007/	10-Jun-2015 00:34	-	
2010_Fires/	10-Jun-2015 00:35	-	
2011_Incidents/	24-Aug-2016 13:10	-	
2012_Incidents/	10-Jun-2015 00:35	-	
2013_Incidents/	10-Jun-2015 00:37	-	
2013_r5_dispatchers_workshop/	10-Jun-2015 00:37	-	
2014_Incidents/	10-Jun-2015 00:40	-	
2015_Incidents/	28-Dec-2015 18:38	-	
2016_Incidents/	26-Feb-2018 23:02	-	

Index of /public/incident_specific_data/calif_s/!CALFIRE

Name	Last modified	Size	Description
Parent Directory		-	
2009_Incidents/	10-Jun-2015 00:40	-	
2010_Incidents/	10-Jun-2015 00:40	-	
2011_Incidents/	10-Jun-2015 00:40	-	
2012_Incidents/	10-Jun-2015 00:40	-	
2013_Incidents/	10-Jun-2015 00:40	-	
2014_Incidents/	10-Jun-2015 00:41	-	
2015_Incidents/	13-Oct-2015 00:19	-	
2016_Incidents/	27-Sep-2016 11:38	-	
2017_Incidents/	08-Dec-2017 17:20	-	
2018_Incidents/	19-Feb-2018 06:57	-	

Index of /public/incident_specific_data/calif_s/!CALFIRE/2016_Incidents

Name	Last modified	Size	Description
Parent Directory		-	
CA-BEU-003422_Soberanes/	18-Oct-2016 00:14	-	
CA-FKU-009100_Curry/	13-Jul-2016 17:30	-	
CA-FKU-010852_Goose/	01-Aug-2016 01:31	-	
CA-FKU-011358_Mineral/	11-Aug-2016 02:24	-	
CA-KRN-024109_Deer/	02-May-2016 17:58	-	
CA-MVU-014498_Border3/	24-Jun-2016 13:17	-	
CA-RRU-105125_Bogart/	02-May-2016 17:59	-	
CA-SCU-006912_Loma-moved to cal_s/	28-Sep-2016 01:27	-	
CA-SLU-008948_Chimney/	15-Aug-2016 14:47	-	
CA-TCU-009339_Willow/	29-Aug-2016 05:50	-	
CA-TCU-10403_Marshes/	02-May-2016 17:59	-	
CA-xxx-xxx_incident name13/	02-May-2016 17:59	-	
CA-xxx-xxx_incident name14/	02-May-2016 17:59	-	
CA-xxx-xxx_incident name15/	02-May-2016 17:59	-	
CA-xxx-xxx_incident name16/	02-May-2016 17:59	-	
CA-xxx-xxx_incident name17/	02-May-2016 17:59	-	
Sobranes 206 9-19-2016 Day.docx	19-Sep-2016 14:37	31K	

Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

Index of /public/incident_specific_data/c
003422_Soberanes

Name	Last modified	Size	Description
Parent Directory		-	
Complexity_Analysis/	02-May-2016 17:58	-	
DailyUpdates/	25-Oct-2016 02:12	-	
Delegation_of_Authority/	02-May-2016 17:58	-	
Demob_Plan/	02-May-2016 17:58	-	
Final_Incident_Narrative/	27-Sep-2016 08:21	-	
GIS/	26-Aug-2016 17:02	-	
IAP/	23-Oct-2016 23:56	-	
IMET_[illegible]N/	21-Sep-2016 12:48	-	
IR/	21-Oct-2016 02:35	-	
Operations Map/	27-Sep-2016 19:32	-	
SPP_Pre-Attack/	21-Sep-2016 19:17	-	
WFDSS/	02-May-2016 17:58	-	

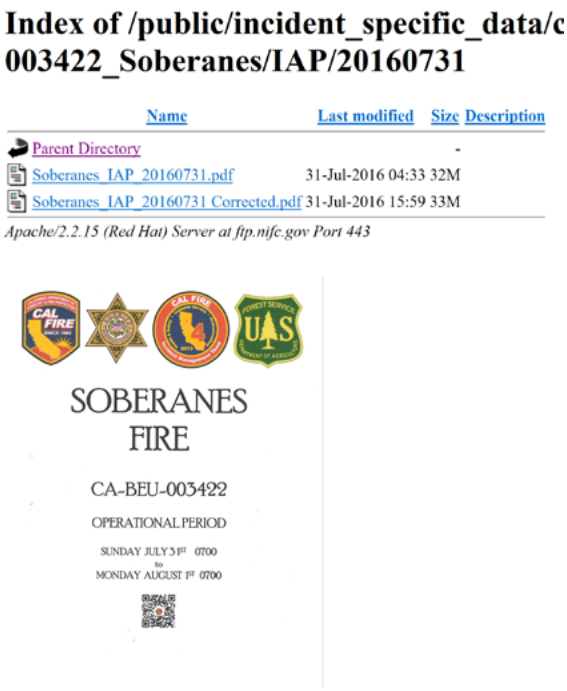
Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

When one clicks on the IAP folder, each day has its own folder, just like IR and GIS data. In this case, July 31st is selected.

Index of /public/incident_specific_data
003422_Soberanes/IAP

Name	Last modified	Size	Description
Parent Directory		-	
20160724/	25-Jul-2016 17:10	-	
20160725/	25-Jul-2016 15:26	-	
20160726/	26-Jul-2016 16:26	-	
20160727/	27-Jul-2016 17:45	-	
20160729/	29-Jul-2016 04:17	-	
20160730/	30-Jul-2016 03:52	-	
20160731/	31-Jul-2016 15:33	-	
20160801/	01-Aug-2016 17:15	-	
20160802/	02-Aug-2016 16:33	-	
20160803/	03-Aug-2016 16:05	-	
20160804/	04-Aug-2016 15:32	-	

The large .pdf file for the day's IAP is shown and can be downloaded. Most, if not all, Federal jurisdiction fires do not post daily IAPs on the FTP site, due to privacy and security concerns outlined in the 10-year old NMAC memo found in Appendix A.



Index of /public/incident_specific_data/c
003422_Soberanes/IAP/20160731

Name	Last modified	Size	Description
Parent Directory		-	
Soberanes_IAP_20160731.pdf	31-Jul-2016 04:33	32M	
Soberanes_IAP_20160731 Corrected.pdf	31-Jul-2016 15:59	33M	

Apache/2.2.15 (Red Hat) Server at ftp.nifc.gov Port 443

SOBERANES
FIRE

CA-BEU-003422

OPERATIONAL PERIOD

SUNDAY JULY 31ST 0700
to
MONDAY AUGUST 1ST 0700

July 31, 2016 Soberanes IAP

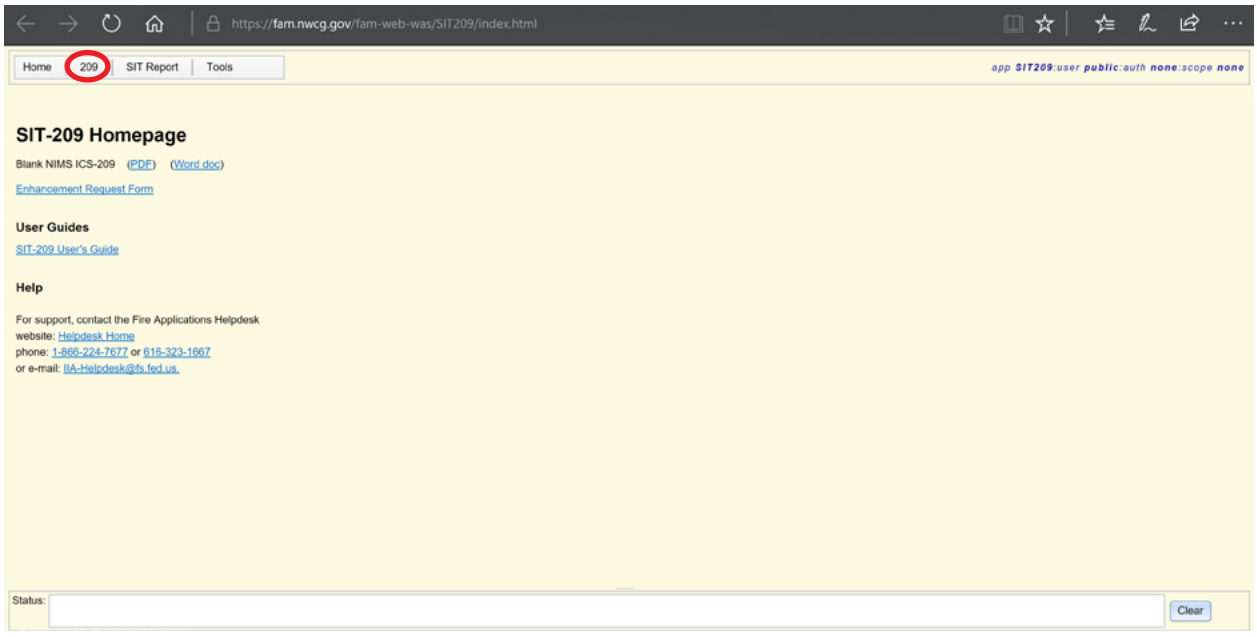
ICS-209

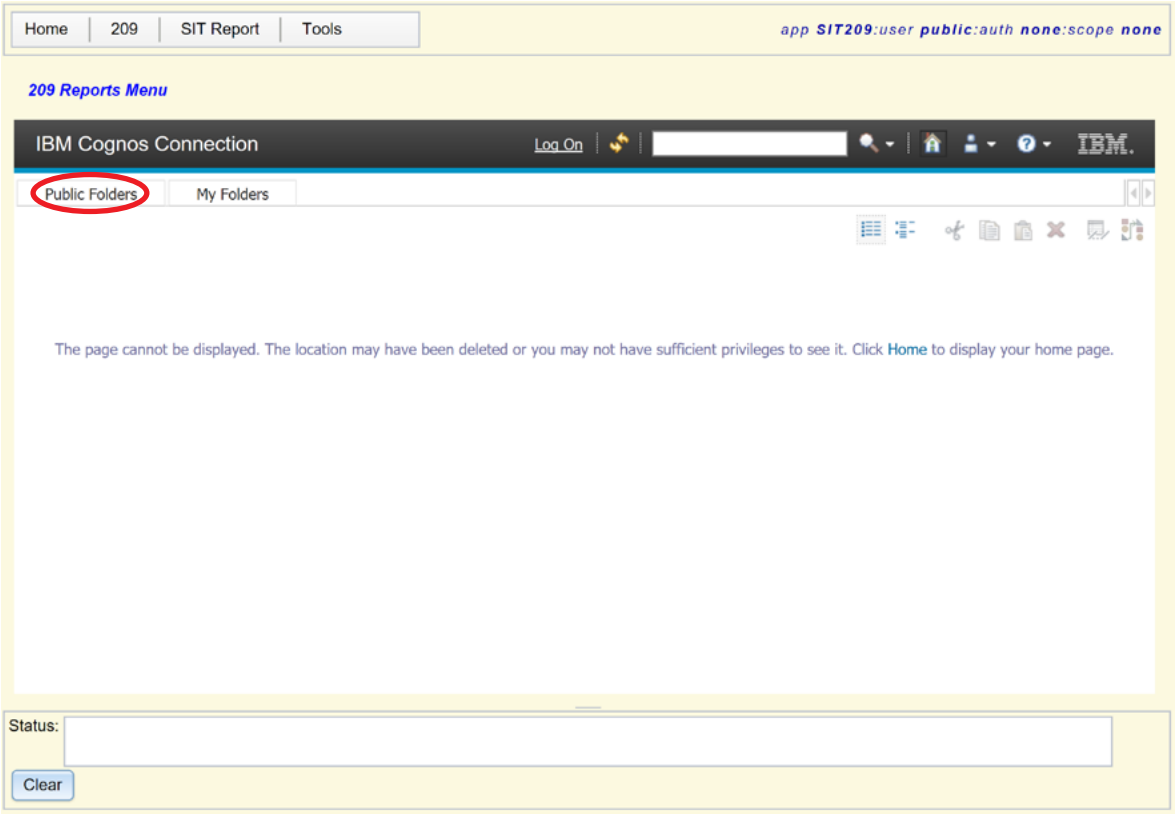
The ICS-209 is the most well-known document for wildland fire suppression data, as it is usually a daily or twice-daily exercise of accumulating incident information that is fed upward though the dispatching system. It gives a running total estimated cost of the incident to-date. There are often several updates of the ICS-209 on an incident, and these are archived for only seven years following a fire. The final ICS-209 with the final fire cost is kept permanently. Each ICS-209 is approved by the Incident Commander (IC), who works for the jurisdictional Agency Line Officer (e.g. District Ranger, Forest Supervisor, Park Superintendent, or Regional Forester, depending on the fire's location and complexity). Thresholds for requiring an ICS-209 are 100 acres in timber and 300 acres in grass/brush, but a smaller fire being simply monitored for resource benefits may be required to submit a routine ICS-209 to the servicing GACC to ensure that the fire, being uncontained and possibly unstaffed, remains on the GACC and Multi-Agency Coordinating (MAC) Group's (if in place) radar. It is the Geographic Area Command Centers (GACCs) that dictate which fires should be submitting ICS-209 updates and on what frequency. Large fires in the mobilization phase will be required to submit two ICS-209s per day – one in the early morning and one in the evening. If a fire size and staffing stabilize, a single ICS-209 per day may be negotiated with the GACC. Aside from running cost data, this information is used by higher level deciding officials, dispatch centers, and other coordinating bodies like Multi-Agency Coordinating (MAC) Groups to anticipate and arrange for resource availability.

At the local predetermined frequency – in California, it's twice daily at 0600 and 1800 hrs. – The Incident Commander (IC) must approve for transmittal an ICS-209 update that is input into a database, becoming visible to the local, regional and national dispatch centers. Likely the most important content is the resource needs and values-at-risk used for priority setting. The running incident cost-to-date is another input, along with an accounting of the number, type and agency of each resource on the fire.

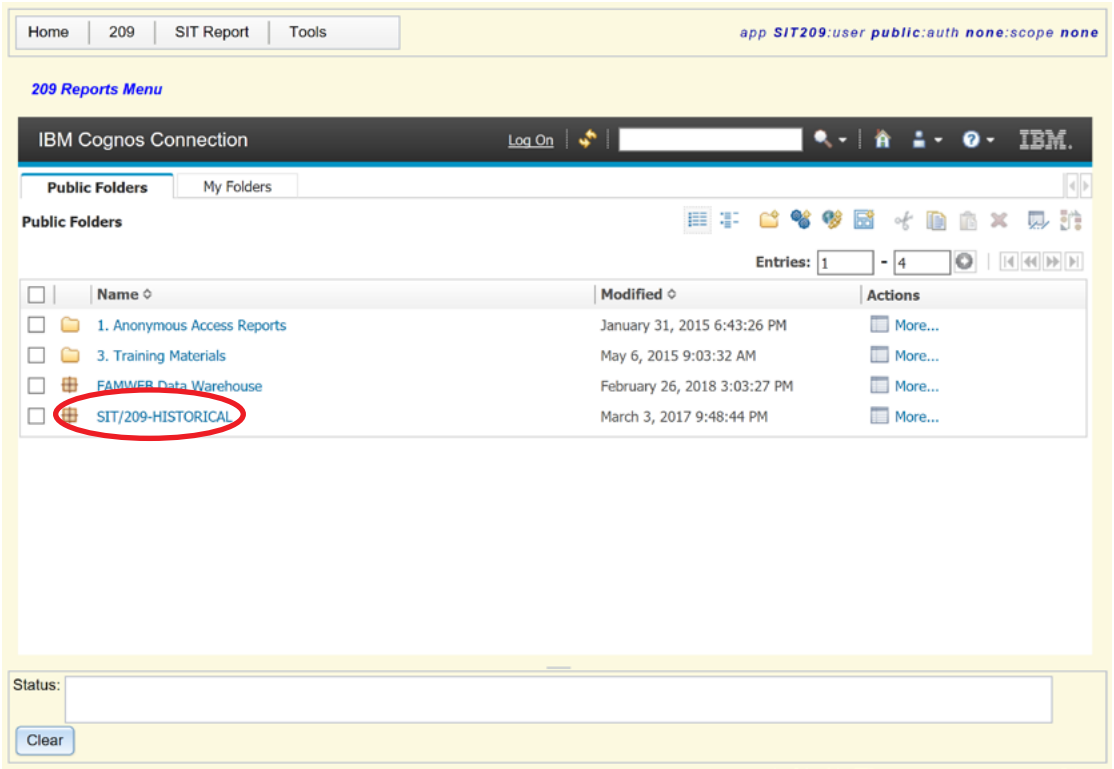
The initial (I), update (U) and final (F) ICS-209s are archived in the SIT-209 application, accessed through the Fire and Aviation Management Web Application (https://fam.nwcg.gov/fam-web/). Currently, only the past four years of ICS-209s are archived and available to the public on this database. To access the current year ICS-209s for ongoing fires, one needs a logon and password, as well as permission from the local dispatch center for posting from the incident. First, left click on the SIT-209 link on the lefthand side of the FAMWEB site.

Then click on the 209 button at the top of the page.

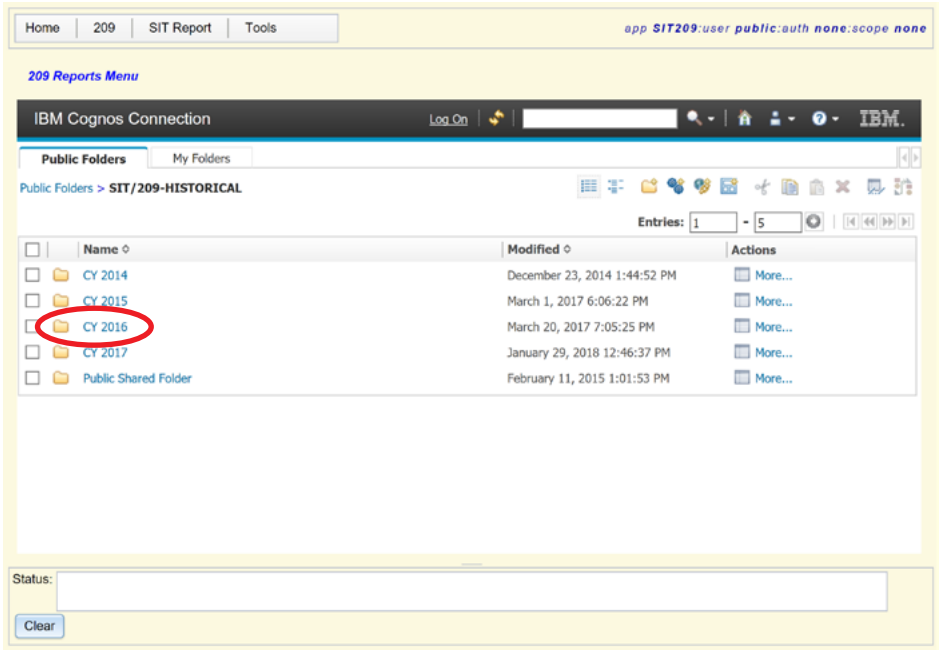




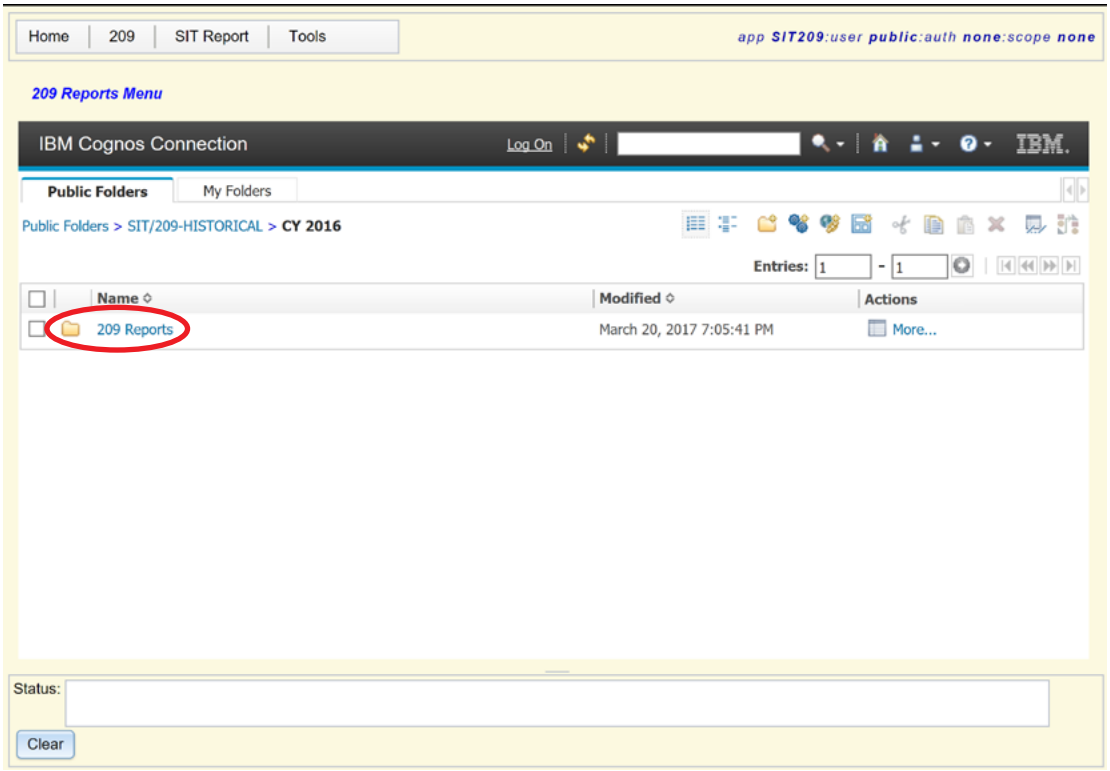
When the IBM Cognos Connection box appears, left click on *Public Folders* tab.



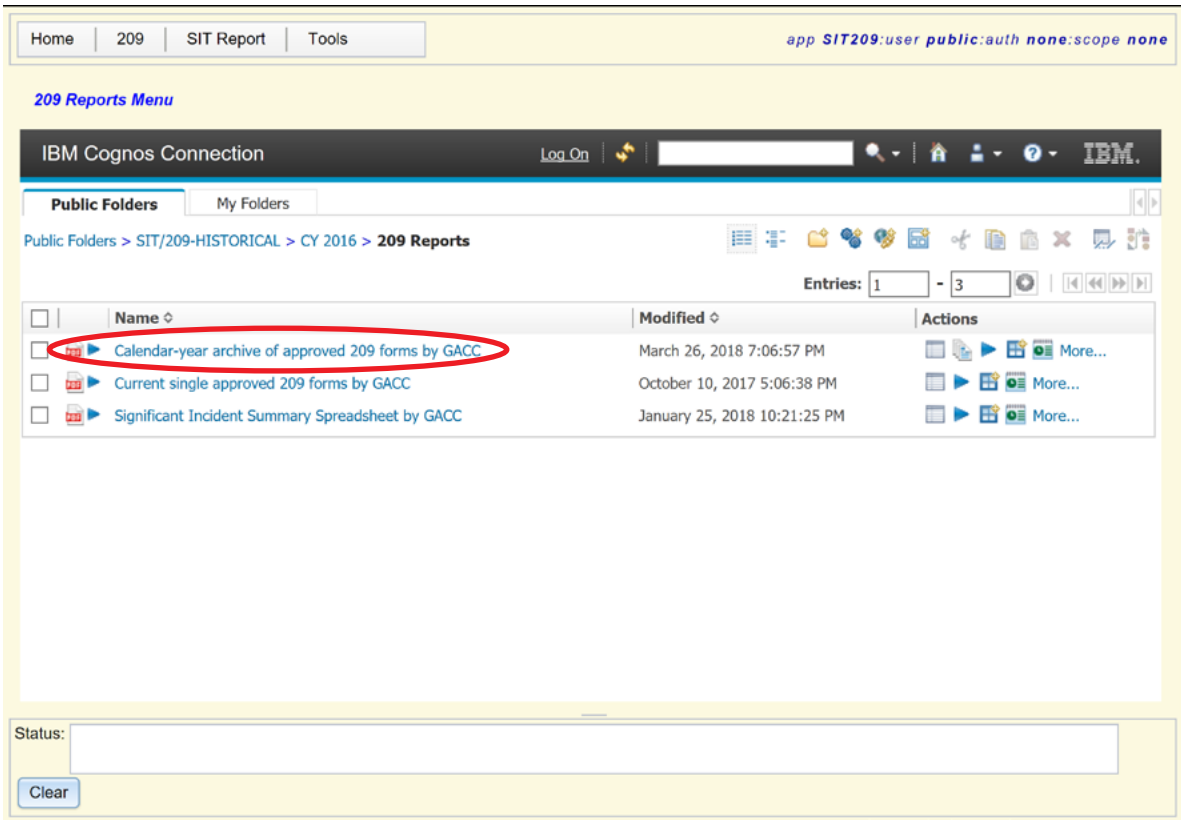
Click on SIT/209-HISTORICAL then click on the desired year of the fire. In this case, we are searching for the Soberanes Fire from 2016.



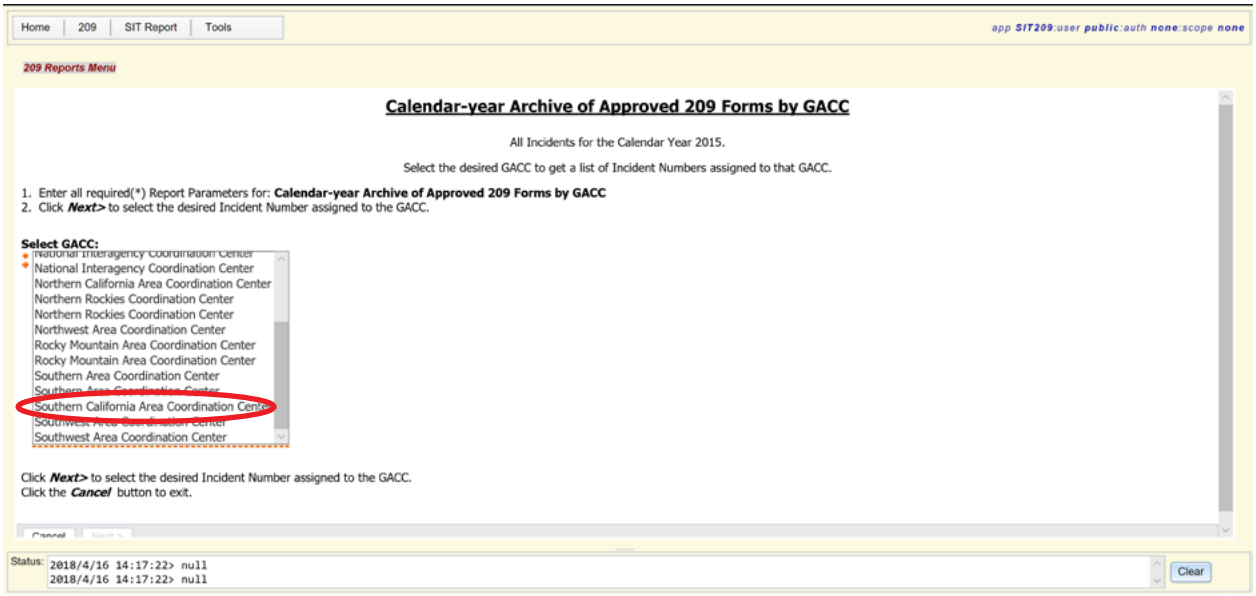
Click on *209 Reports*.



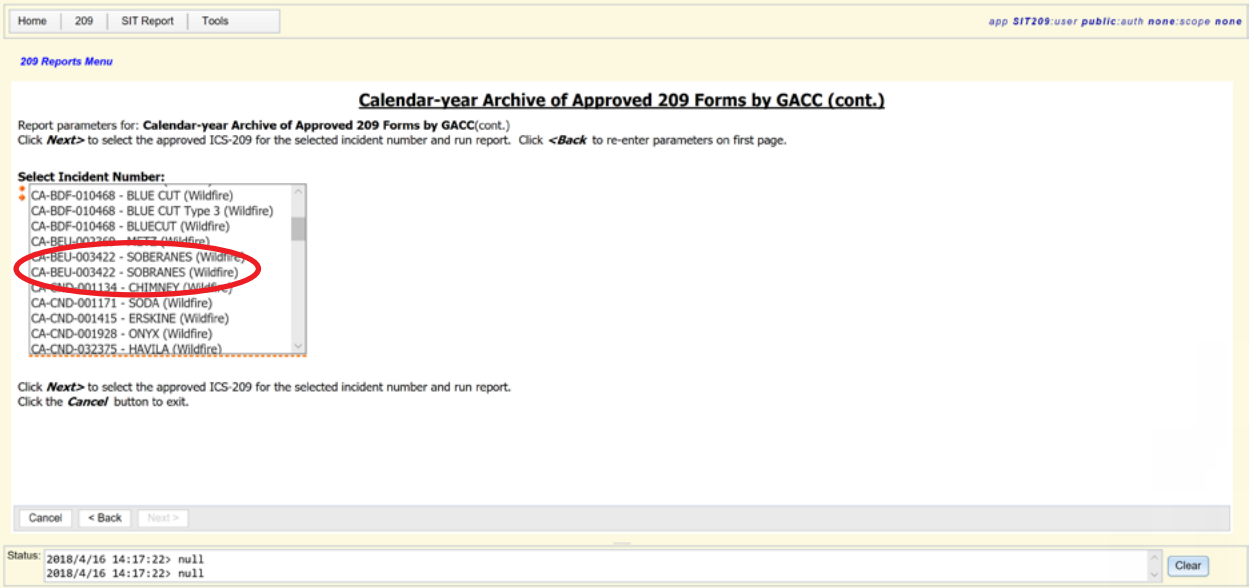
Next, click on *Calendar-year archive of approved 209 forms by GACC*.



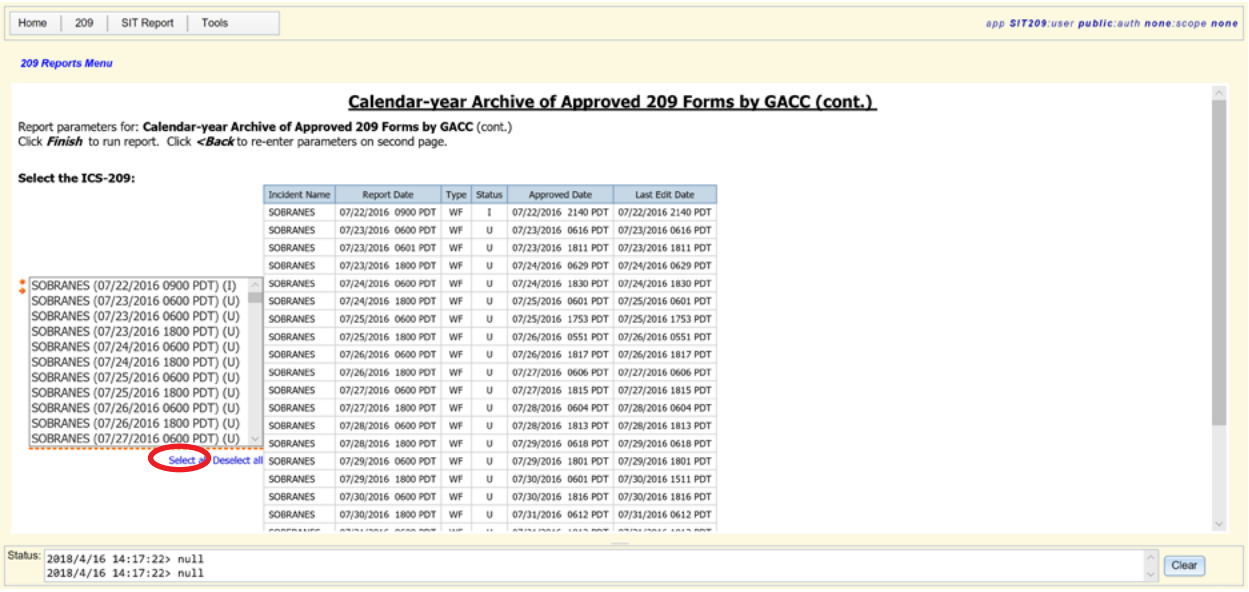
In this case, the Southern California GACC is selected.



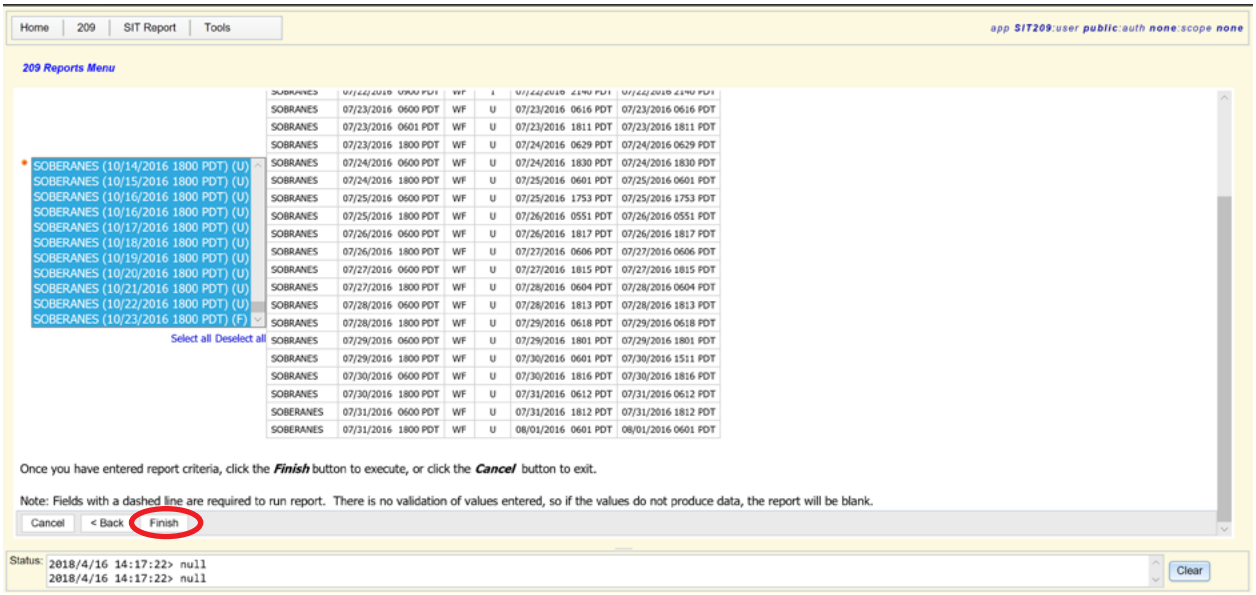
At that point, one sees a list of all the fires for that GACC that submitted ICS-209s in 2016. As can be seen, the Soberanes Fire was entered with two different spellings, but the fire number is consistent between the two, so it should pose no problem.



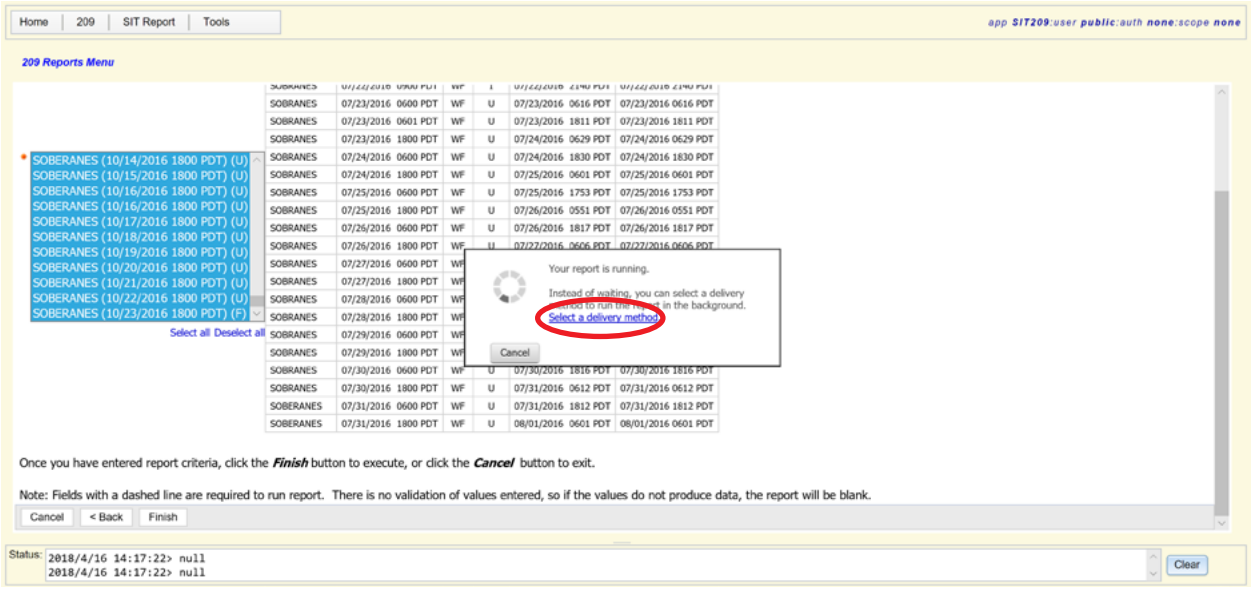
All the approved ICS-209s are then shown. One may then select an individual ICS-209 or elect to receive the whole batch, by choosing *select all*.



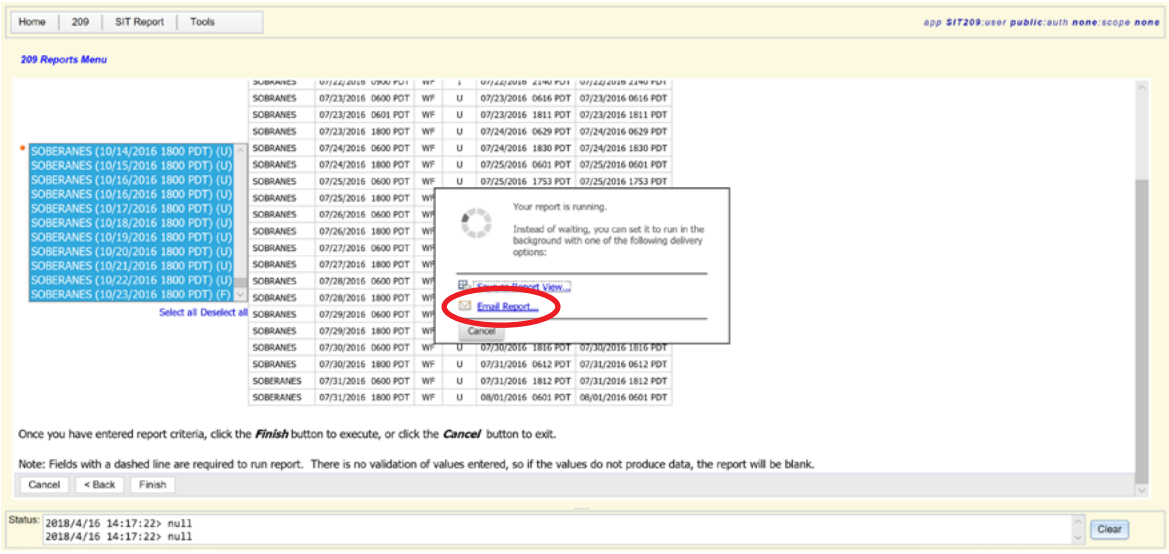
This selects all the documents, so they are now highlighted.



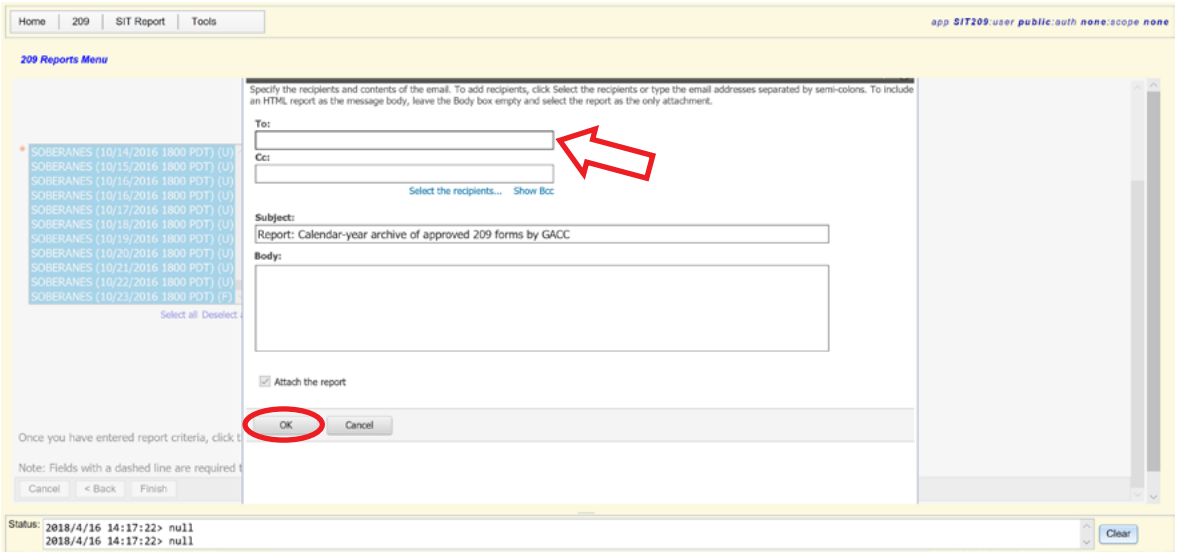
Finally, click on *finish* at the bottom of the page (remember to use the scroll bar on the right). One may either wait for the information to appear on the screen (this will take a long time for multiple documents), or one may elect to have the documents emailed by clicking on *select a delivery method*.



Click on *email report*, and you will get a screen allowing you to specify one or more email addresses, a subject line and a text body to accompany the attached report.



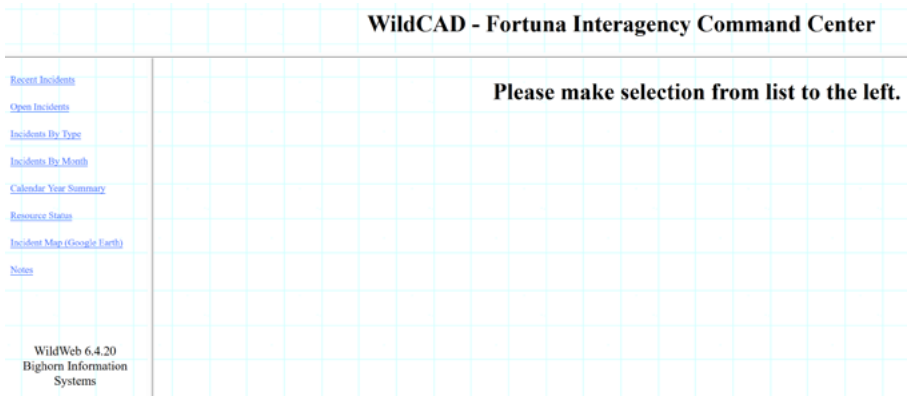
Input at least one email address and click on *OK*. The documents will appear in your email inbox a short time later.



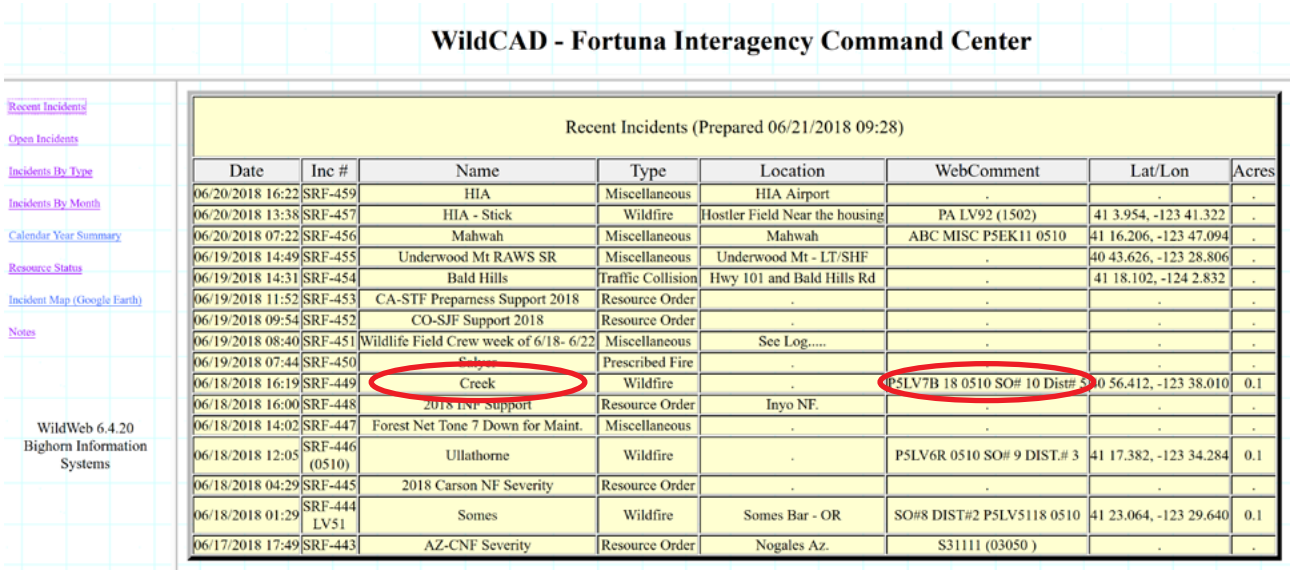
WildWeb

WildWeb is the public access handle and web portal for all those dispatch centers utilizing WildCad, the software and routing package that facilitates the operation of an interagency incident management dispatch center. Most dispatch centers in California use WildCad, the industry standard in dispatching software. While many law enforcement applications require special credentials, background checks, and terminals for access, strict wildland fire dispatching is largely open source, in that you would have to have had a pretty rough start not to get a password. WildCad manages the consoles through which dispatchers manage incidents, both law enforcement, wildland fire, and everything else.

Find your local or center of interest. In this case, say the Fortuna Interagency Command Center (FICC) in Eureka, California. By navigating to the dispatch center of interest, we find that they dispatch for both the Six Rivers National Forest (SRF), the Humboldt-Del Norte Unit of Calfire (HUU), and the Hoopa Nation (HIA).



The menu system on the lefthand side of the page is largely self-explanatory and worth exploration, however clicking on the recent incidents link reveals the most recent fire called the Creek Fire. We'll use that as an example. The Creek Fire was discovered (1st dispatch entry) at 4:19 pm (16:19 in military time). The fire number is CA-SRF-449 and the associated fiscal account number, or "P-Code" is P5LV7B. Both of these numbers are very important for finding information from theses fires, after the fact. The administrative and fiscal codes figure prominently in all successive paperwork.



WildCAD - Fortuna Interagency Command Center

Recent Incidents
Open Incidents
Incidents By Type
Incidents By Month
Calendar Year Summary
Resource Status
Incident Map (Google Earth)
Notes

WildWeb 6.4.20
Bighorn Information
Systems

Recent Incidents (Prepared 06/21/2018 09:28)

Date	Inc #	Name	Type	Location	WebComment	Lat/Lon	Acres
06/20/2018 16:22	SRF-459	HIA	Miscellaneous	HIA Airport	.	.	.
06/20/2018 13:38	SRF-457	HIA - Stick	Wildfire	Hostler Field Near the housing	PA LV92 (1502)	41 3.954, -123 41.322	.
06/20/2018 07:22	SRF-456	Mahwah	Miscellaneous	Mahwah	ABC MISC P5EK11 0510	41 16.206, -123 47.094	.
06/19/2018 14:49	SRF-455	Underwood Mt RAWS SR	Miscellaneous	Underwood Mt - LT/SHF	.	40 43.626, -123 28.806	.
06/19/2018 14:31	SRF-454	Bald Hills	Traffic Collision	Hwy 101 and Bald Hills Rd	.	41 18.102, -124 2.832	.
06/19/2018 11:52	SRF-453	CA-STF Preparness Support 2018	Resource Order	.	.	.	.
06/19/2018 09:54	SRF-452	CO-SJF Support 2018	Resource Order	.	.	.	.
06/19/2018 08:40	SRF-451	Wildlife Field Crew week of 6/18- 6/22	Miscellaneous	See Log.....	.	.	.
06/19/2018 07:44	SRF-450	Salyer	Prescribed Fire	.	.	.	.
06/18/2018 16:19	SRF-449	Creek	Wildfire	.	P5LV7B 18 0510 SO# 10 Dist# 5	0 56.412, -123 38.010	0.1
06/18/2018 16:00	SRF-448	2018 INF Support	Resource Order	Inyo NF.	.	.	.
06/18/2018 14:02	SRF-447	Forest Net Tone 7 Down for Maint.	Miscellaneous	.	.	.	.
06/18/2018 12:05	SRF-446 (0510)	Ullathorne	Wildfire	.	P5LV6R 0510 SO# 9 DIST.# 3	41 17.382, -123 34.284	0.1
06/18/2018 04:29	SRF-445	2018 Carson NF Severity	Resource Order	.	.	.	.
06/18/2018 01:29	SRF-444 LV51	Somes	Wildfire	Somes Bar - OR	SO#8 DIST#2 P5LV5118 0510	41 23.064, -123 29.640	0.1
06/17/2018 17:49	SRF-443	AZ-CNF Severity	Resource Order	Nogales Az.	S31111 (03050)	.	.

0510 is the code for the Six Rivers. There are Forest-level and District-level codes assigned in the WebComment column, but beyond that, you need to FOIA the dispatch log for that fire and fire number to get the running log of the entire incident from beginning to end. It's easy, based on the incident number, and takes the staff a couple of keystrokes to get the entire log of communications between the dispatch center and firefighters on the ground giving updates and requesting additional resources. WildCad outputs an easy .pdf file of the entire incident, as experienced by the dispatch center.

WFDSS, E-ISuite and Hard Copy Documents

WFDSS is an online repository of all the relevant Agency Administrator decisions and guidance to the IMT for an ongoing wildfire suppression incident. E-ISuite is a database that contains all of the accumulated expenditures on the fire, providing a detailed day-by-day breakdown of suppression costs by category. Both of these online databases are password protected and are accessible only by authorized agency employees, however, FUSEE will continue to seek access to the high-resolution data these programs gather, related to risk assessment, costs and incident decision-making. As we gather more information, expect further guides on accessing and interpreting that information.

The Future

This document represents the first of three separate *FireWatch Guides. FireWatch Guide Part One* offers instructions for accessing basic online information for a single fire or a group of wildland fires. Anyone wishing to gain situational awareness of an emerging wildfire incident or ongoing fires should start with these tools, gaining basic information quickly from online sources. We have also included as Appendix B a list of links compiled by NASA that contains some of the links already discussed in this Guide, but also includes additional links that are more focused on remote sensing data that NASA generates. This includes important information regarding air quality, fire activity--both past and present--as well as post-fire flood risk. It is included to further help in the initial fact-finding search to learn more about an incident. Reporters using these online tools can often gain information ahead of the official releases by agency spokespersons, and citizens can gain information ahead of print or broadcast stories releases by the newsmedia.

FireWatch Guide Part Two will focus on fire suppression operations documents and data that are recorded and archived in hardcopy format, and are accessible through Freedom of Information Act (FOIA) requests. Much fire documentation is only produced as a hard copy and ends up in the many file boxes constituting the Incident History File (IHF) that gets stored in an agency office or warehouse. A detailed list of key hardcopy documents to FOIA, especially those containing important information about suppression actions, effects, and costs, will be a part of the *Firewatch Guide Part Two*. As well, that Guide will provide a more detailed guide to WFDSS Decision Documents – what's important and incident-specific versus what's auto-generated boilerplate language--and what specific reports should be FOIA requested from the E-ISuite database. Tips on writing FOIA request letters along with the procedures, potential wait times and costs, and a list of specific documents to request will be provided. For instance, requesting a .pdf dispatch log generated by WildCad for a specific wildfire incident is a great example of a smart, focused FOIA request. It takes seconds for the agency to generate, and contains crucial information about suppression operations with time and date stamps. Knowing what to ask for and how to ask for it are crucial requirements for any citizen wildfire monitor. Some information found in FOIA requests might be withheld or redacted, but FUSEE will continue to work with agencies to advocate full access to this information as part of a citizen's right to know. We need more transparency in suppression operations, not less.

Finally, *FireWatch Guide Part Three* will dive into becoming a real partner with IMT decisionmakers, building trust, and conducting direct monitoring in-person on the fireline, as the incident unfolds. Guide III will introduce the team Public or Fire Information Officer, describe their role, as well as that of Liaison Officer, and look at the various means IMTs use to reach out to the community (e.g. public meetings, social media, etc.) to provide fire information. We will describe existing successful community liaison programs, the role of Fire Safe Councils, and provide tips for other local NGOs who wish not only to monitor suppression operations in real-time, but to weigh in on pre-fire planning and the whole breadth of fire management issues that greatly affect public lands. Finally, we'll examine resources available to communities, like the Nature Conservancy's Fire Learning Network. Stay tuned to FUSEE's website for more *FireWatch Guides* to help citizens monitor wildfires as suppression operations continue to become ever more risky, costly, and damaging in the foreseeable future.

Appendix A

National Interagency Fire Center
3838 S. Development Avenue
Boise, Idaho 83705

August 14, 2007

To: Geographic Area Coordination Group Chairs

From: National Multi Agency Coordinating Group

Subject: Posting of IAPs on Public FTP Sites

There have been recent concerns expressed regarding the posting of Incident Action Plans (IAPs) on public ftp sites such as ftp.nifc.gov. In particular, some ICS forms in the IAP such as Radio Communications (ICS205) and Air Operations (ICS 220) may contain sensitive information. We understand IAPs contain important incident data and are used to share incident information with various audiences. However, there have been concerns raised about specific operational information that is included in an IAP being used by someone outside our organization in an inappropriate manner. Although there may be a local need to post IAPs to a public ftp site, the National Multi Agency Coordinating Group (NMAC) does not require IAPs to be posted to any of these Web sites.

The recommendation from NMAC, at this time, to address this specific issue is that if IAPs are to be posted on a public ftp site they should be password protected. An option to secure this information is to use software such as WinZip to zip the file or files and secure the zip file with an appropriate password which can then be shared with the appropriate audience that needs this information. Directions to create a password protected zip file are located at http://ftpinfo.nifc.gov. Another alternative is to use a secure ftp site.

This issue requires further review and discussion following fire season to determine efficient ways to share important incident and operational information that is intended for internal and/or external use.

/s/ Tom Boatner
Chair, NMAC

Appendix B

Where to Access Fire Information

(courtesy of the National Aeronautics and Space Administration)

One can check for fire updates on: https://disasters.nasa.gov/

The following sections are organized as: Basic General fire information; Satellite viewing and data products; ESRI site access: Air Quality; and Others.

Basic information:

USDA Forest Service (USFS): The former Remote Sensing Applications Center (RSAC) is now Geospatial Service and Technology Center (GSTC) serves Active Fire Data from numerous satellite sensor systems (MODIS, VIIRS, Landsat) for the U.S. https://www.fs.fed.us/gstc/

https://fsapps.nwcg.gov/

National lnteragency Fire Center (NIFC):

The NIFC server is intended as a short-term interagency sharing, not as a file archive or records repository (e.g., access to incidents, base information NIROPS. BAER, Predictive Services).

https://ftp.nifc.gov/

CAL FIRE:

http://www.fire.ca.gov/

Portal to geographic regions and fire weather information:

https://gacc.nifc.gov/

Information about individual fires:

Incident Information System https:/inciweb.nwcg.gov/

For viewing Earth, active fire and aerosol data:

This site provides an excellent view of what is happening daily

[zoom to area of interest and day, add layers, Fires, Fires and Thermal Anomalies, Aqua and Terra (VIIRS too next), click data and night, close "X" search] https://worldview.earthdata.nasa.gov/

Active-Fire data:

NASA active fire data (easy to use)

One can use these data to see the daily/hourly evolution and movement of fire hot spots.

These data include ancillary information [e.g., Brightness Temperature, Fire Radiative Power (proxy for

intensity)"

Available in text (ASCII) or shape files https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms

Forest Service (easy to use) - one can view or download. These are often satellite based data.

https://fsapps.nwcg.gov/afm/gisdata.php

https://maps.nwcg.gov/

NOAA Hazard Mapping System Fire and Smoke Product

http://www.ospo.noaa.gov/Products/land/hms.html

Burned area, severity, debris-flow modeling (NASA Applied Sciences Wildland Fire program)

For post-fire analysis, one could use Landsat data (16-day return interval). https://earthexplorer.usgs.gov/

RECOVER was designed as a Wildland Fire Decision-Support-System tool, however this system has been used for active-fire response toprovide relevant data layers.

Keith Weber would be very happy for you to use RECOVER to assist with the California wildfires.

To request a fire web map:

Send an email to Keith Weber (webekeit@isu.edu)

1. Include a fire name (even "Fire01" will work)
2. Include some form of map data describing the area to be included in this RECOVER web map. Sending a shapefile works great.

RECOVER can generate the web map for you (the requester) and send you the link ASAP.

You can learn more about RECOVER by visiting http://giscenter.isu.edu/research/Techpg/nasa_RECOVER/index.htm

The USGS has predictions of debris flow for many Western fires already online: https://landslides.usgs.gov/hazards/postfire_debrisflow/

You can also request they model fires that are not already posted!

Rapid Response Erosion Database:

Mary Ellen Miller (memiller@mtu.eduailto) has a database for creating hydrological modeling inputs for predicting post-fire erosion and run-off and could help you learn the modeling if you want.

http://rred.mtri.org/rred/

ESRI ArcMap information:

This map shows accidents, traffic jams, road closures and fires (updated in minutes)
http://www.arcgis.com/apps/webappviewer/index.tm?id=e49945fbd463437f9a0724f2cf56dc83&extent=-14020668.1233,4452496.2876,-13091193.8594,4995504.9365,102100

https://www.arcgis.com/home/webmap/viewer.html?webmap=f404beeda3354da2b65cd968b11222e2

Air Quality:

https://www.airnow.gov

NASA Health and Air Quality Applied Sciences Team (HAQAST):

https://haqast.org/nasa-tools/

Other:

https://earthdata.nasa.gov/fires-in-northern-california-usa

https://earthobservatory.nasa.gov/IOTD/view.php?id=91111

Live FMV on DAART for Fires

Need to gain access https://daart.us/Event/Details/84023

Specific to Northern CA fires:

https://api.mapbox.com/styles/v1/robinkraft/cj8nn4lvp7yoq2ro1klhjltw8.html?title=true&access_token=pk.eyJ1Ijoicm9iaW5rcmFmdCIsImEiOiJQLUp2RU9NIn0.B20c6fiHx0NCgfSOE3HYbw#16/38.477614/-122.701165