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Workflow

4/16/2020 Initial planning web-meeting with project leads and TOT

4/23/2020 Meeting updates to TOT

4/23/2020 Interim Report #1 submitted

4/23/2020 Survey developed by TT and SFE to gain focus for future meetings

5/08/2020 TOT Meeting – Landscape Portal Intro & Scoping Review

5/28/2020 Webinar Meeting #1 (Carl Nordman, NatureServe and Andy Beavers CEMML)

6/30/2020 Webinar Meeting #2 (Todd Hawbaker, USGS/Beth Stys, FFWC and Josh Picotte, USGS)

7/15/2020 Interim Report #2 submitted

8/07/2020 Interim Report #2 Q/A presentation to TOT

10/06/2020 Webinar Meeting #3 presentation of InFORM , IFTDSS and Southern Fire Risk Assessment (Kim Ernstrom, USFS/Andrew Kirsch, NPS/Curt Stripling, SouthWRAP)

10/15/2020 Interim Report #3 submitted

11/05/2020 Modification approved

12/09/2020 MTBS Postfire Tool Demo – Burn Severity Mapping Meeting (Michael Bogle, USFS, Josh Picotte, USGS)

12/09/2020 Fire History/Fire Metrics Discussion (Lou Ballard, Edwin Christopher, Tate Fischer, Jennifer Hincley, Cameron Tongier, Jon Wallace, USFWS; Melanie Vanderhoof, USGS, Todd Hawbaker, USGS)

12/31/2020: SE FireMap Scoping Survey closed

12/27/2020 SE FHM processing completed

01/13/2020 Google Earth Engine SE FHM draft viewer completed

01/15/2020 Interim Report #4 submitted

In Process: QA/QC Draft SE FHM

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## Functionality of the Viewer (<https://esimonson.users.earthengine.app/view/southeast-fhm-viewer>)

- View Different Layers
- Render Boundaries
- Visit Public Lands
- Pixel Inspector

It is important to note that this application is simply a raster viewer and not a computational tool that can be used to perform time series and zonal analysis.

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### View Different Layers

- Use a drop-down list to select from a number of raster layers that represent fire history
  - Layers include: Year Last Burned, Time Since Previous Fire, Longest Fire Free Interval, Fire Frequency, Annual Burned Area (1994-2019), National Land Cover Database (2016)
- Raster layers have a pre-defined classification scheme which is reflected in the map legend
- Users can set layer transparency with the opacity slider

### View Different Layers

Year Last Burned ▾

Legend

■	1994 - 1999
■	2000 - 2005
■	2006 - 2010
■	2011 - 2015
■	2016 - 2019

Opacity  1

### Render Boundaries

Boundaries must be rendered again when a new raster layer is loaded onto the map

Render Southeast Tile Boundary

Render Public Lands Boundaries

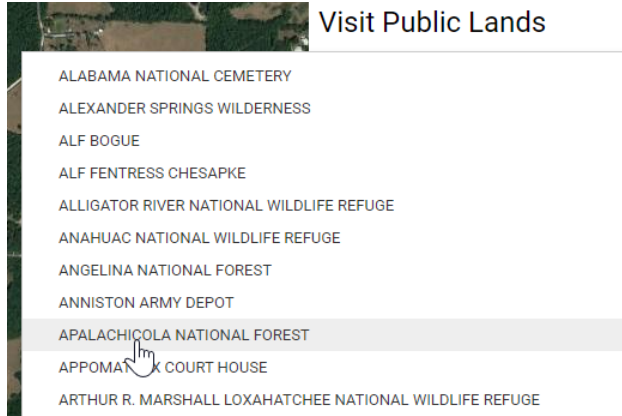
Render LIT Boundaries

### Render Boundaries

- Buttons that can be clicked to render different land boundaries
- Boundaries must be rendered again when a new raster layer is loaded onto the map
- At this time, there is no way to click off these boundaries unless another raster layer is selected
- The following boundaries can be loaded into the map...
  - The extent of the Southeast Fire History data
  - All public lands that exist within the Southeast extent
  - Longleaf Local Implementation Teams boundaries

## Visit Public Lands

- Use a drop-down list to select from all public lands in the Southeast
- The viewer will subsequently zoom to the selected property and add the boundary to the map



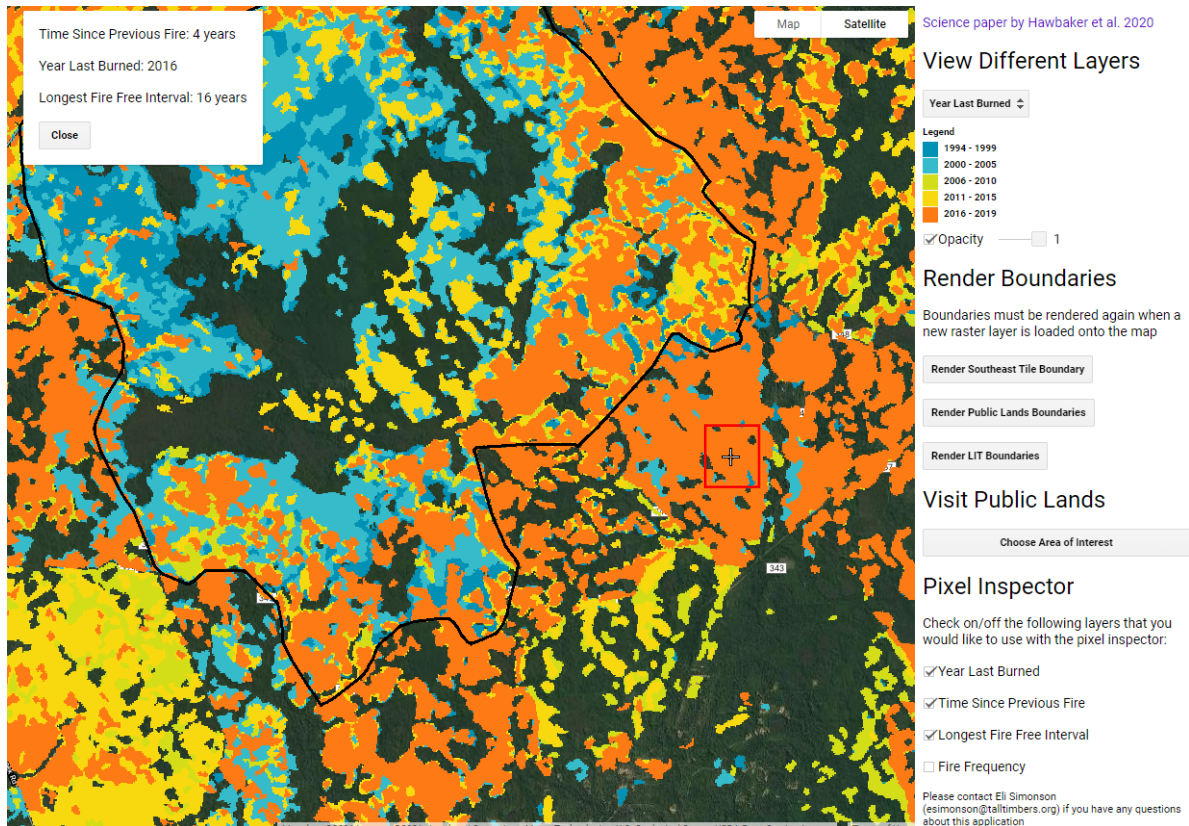
## Pixel Inspector

Check on/off the following layers that you would like to use with the pixel inspector:

- Year Last Burned
- Time Since Previous Fire
- Longest Fire Free Interval
- Fire Frequency

## Pixel Inspector

- Users can zoom into the map and click on individual pixels to see what their value is
- The pixel inspector will print the pixel value for each raster layer that is checked



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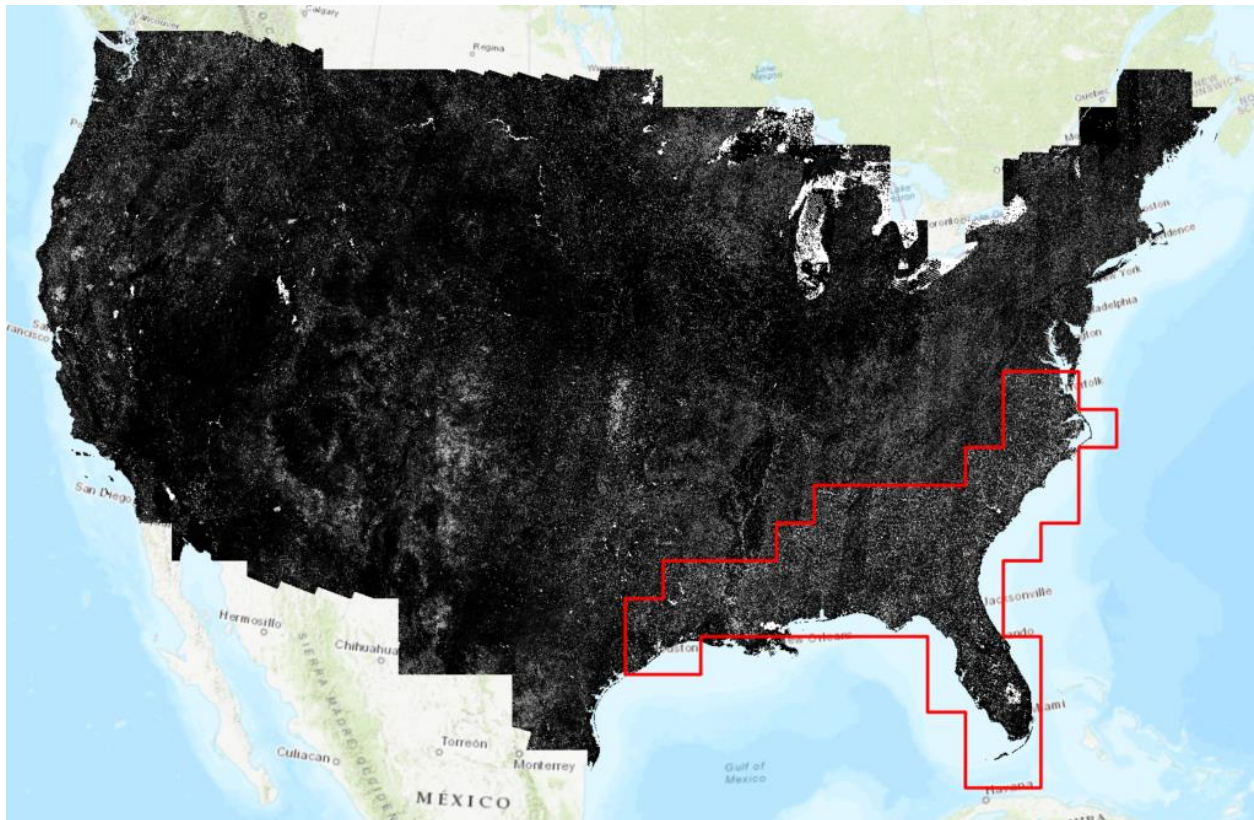
### Processing Workflow

- Set spatial and temporal extent
- Reclassify burn probability (0-100%) to binary (0-1) based on defined threshold
- Smooth and sieve binary raster layers (ENVI)
- Reclassify ENVI outputs to binary raster layers
- Calculate Fire History Metrics
- Burned Area Polygons and Attribution

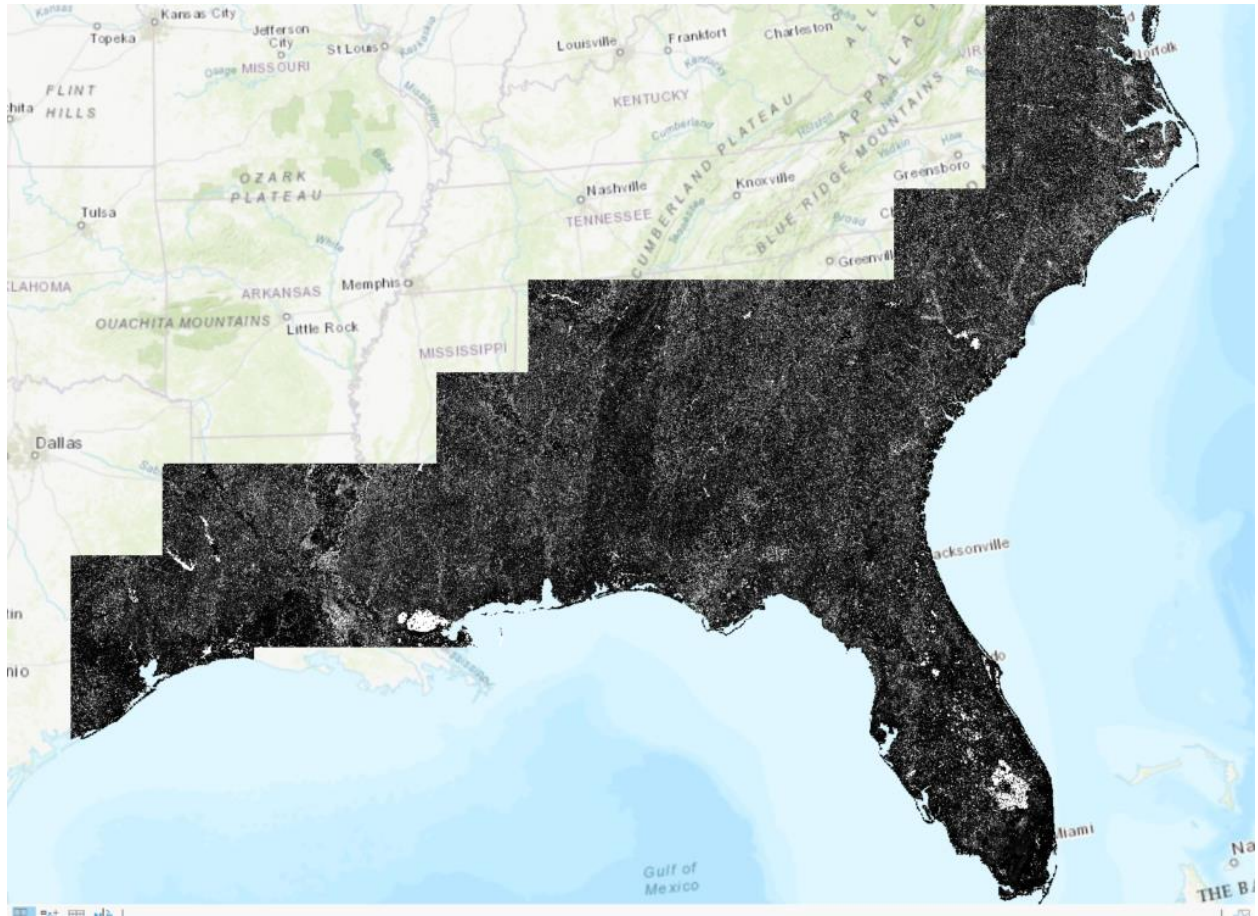
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### Set Spatial and Temporal Extent

- The USGS has provided Tall Timbers Geospatial Center with CONUS wide imagery that represents maximum burn probability each year for the entire Landsat time-series (1984-2019)



- These data were subsequently clipped to the Southeast
- Furthermore, to produce the Southeast Fire History Metrics, only data from 1994-2019 were selected, resulting in a 26year time-series



## Reclassify Burn Probability

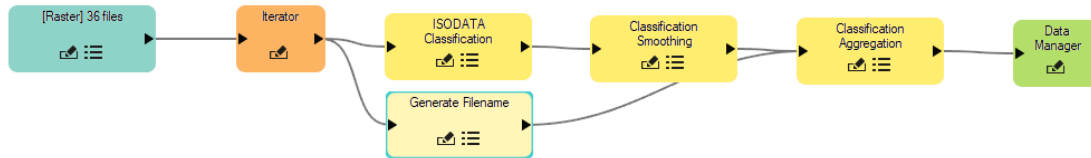
- The continuous burn probability raster layers are first converted into binary burned area presence/absence. Any pixel with burn probability less than 90% is considered a burn absence and classified as a 0. Pixels with a probability of 90% or higher are assigned a 1.
- A python script is directed to the folder with all of the burn probability raster layers and reclassifies each raster with the same specifications. Outputs are written to a new folder.

```
# CREATE A LIST OF THE MOSAIC RASTER LAYERS
rasterList = arcpy.ListRasters("*", "tif")

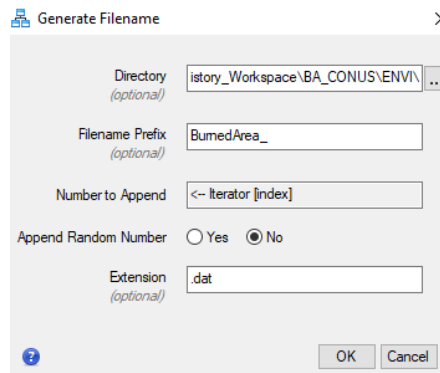
# CREATE LOOP TO RECLASSIFY ALL BP MOSAICS INTO 0s and 1s
for i in rasterList:
    inputRaster = (os.path.join(arcpy.env.workspace, i))
    filename = i[7:-24] + '_90BP_01.tif'
    outname = os.path.join(outws, filename)
    arcpy.gp.Con_sa(inputRaster, "1", outname, "0", '"Value" >=90 AND "Value" <=100')
except arcpy.ExecuteError:
    # Geoprocessor threw an error
    print(arcpy.GetMessages(2))
finally:
    arcpy.CheckInExtension('Spatial')
```

## Smooth and Sieve Raster Layers

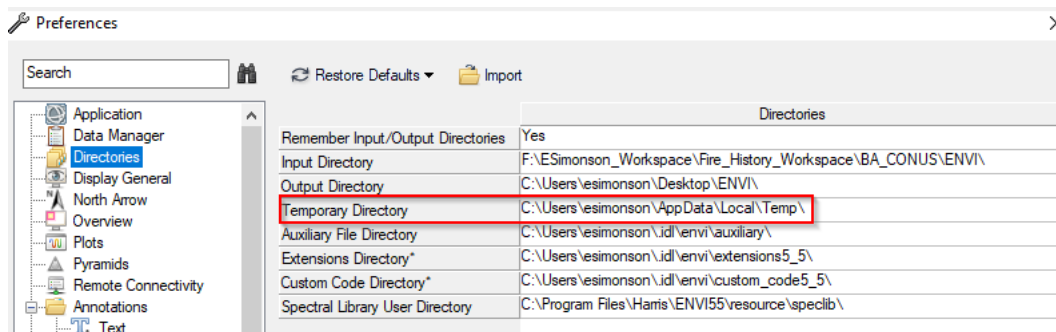
- A module was built in ENVI for post-processing of the binary burned area data. This module creates an ENVI classification image (ISODATA Classification), applies a 3x3 majority filter (Classification Smoothing), and then removes all groups of pixels that are smaller than 10 (Classification Aggregation).



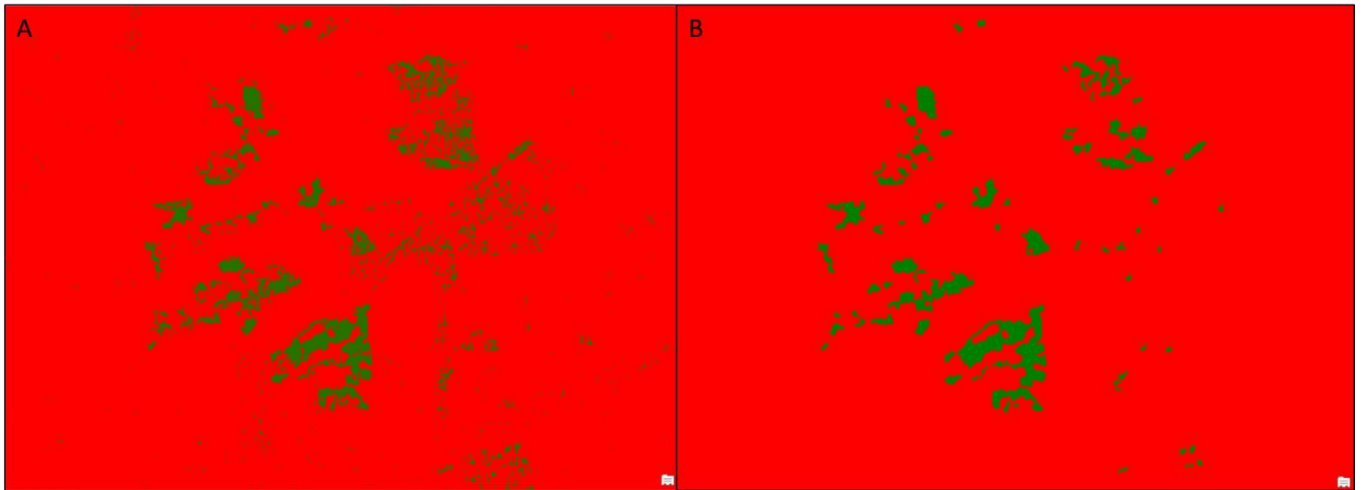
- The iterator ensures that the process runs for every raster in the list provided
- Generate filename is included to automatically generate file names for the outputs
  - Specify the output directory, a prefix, and file extension
  - The iterator number will be appended to the prefix



- Running this module for the Southeast is computationally intensive and can require some environments to be set prior to processing. In ENVI preferences, users can navigate to directories and specify where inputs, outputs, and temporary files are written.
  - Be sure to set your temporary directory to a location with plenty of free storage



- This process results in annual rasters indicating burn presence (with 90-100% probability) for groups of pixels greater than ~2.24 acres (e.g., 10 30m pixels, in any arrangement)
- Below is an image which shows a burn presence raster before (A) and after (B) executing the ENVI module

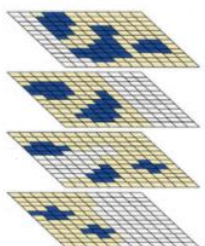


### Reclassify ENVI Outputs

- The binary raster values are not retained in the ENVI outputs; some simple reclassifications can get them ready for calculating fire history metrics
- Reclassify back to binary by running a python script or via ArcGIS GUI
- Create a new set of raster layers that represent the year burned by multiplying each binary raster by their year number
- Scripts can be executed via PyCharm, IDLE, ArcPro python command line, etc.

### Calculate Fire History Metrics

- We now have two sets of binary raster layers that will be used in the calculations
  - Burned Area Presence/Absence (1 / 0)
  - Burned Area Year/Absence (Year Value / 0)
- To generate Fire Frequency (FRQ)
  - First, we direct python code to the folder with all of the presence/absence layers
  - Sum all of these layers together; this shows number of times burned across the time series
  - Create another FRQ layer that has 0 values set to No Data by using the Set Null tool



```
# CREATE A LIST OF ALL RASTER LAYERS FOR USE IN FREQUENCY CALCULATION
rasterList1 = arcpy.ListRasters("*", "tif")
# CALCULATE FIRE FREQUENCY (FRQ) AND THEN REMOVE 0s.. SAVE BOTH LAYERS
outCellStats1 = CellStatistics(rasterList1, "SUM")
outCellStats1.save(r"F:\ESimonson_Workspace\Fire_History_Workspace\BA_CONUS\FHM\FRQ_94to19.tif")
FRQ_Final = SetNull(outCellStats1, outCellStats1, "VALUE = 0")
FRQ_Final.save(r"F:\ESimonson_Workspace\Fire_History_Workspace\BA_CONUS\FHM\FRQ_94to19_BA_Only.tif")
```



- To generate Year Last Burned (YLB)
  - Create a new raster list that is directed to the folder with all of the burned area year layers
  - Calculate the maximum raster value for each pixel in the stack; this will show the last year that a burn was detected in a pixel
  - Create another YLB layer that has 0 values set to No Data by using the Set Null tool

```
# CALCULATE YEAR LAST BURNED (YLB) AND THEN REMOVE 0s.. SAVE BOTH LAYERS
outCellStats = CellStatistics(rasterList1, "MAXIMUM")
outCellStats.save(r"F:\ESimonson_Workspace\Fire_History_Workspace\BA_CONUS\FHM\YLB_94to19.tif")
YLB_Final = SetNull(outCellStats2, outCellStats2, "VALUE = 0")
YLB_Final.save(r"F:\ESimonson_Workspace\Fire_History_Workspace\BA_CONUS\FHM\YLB_94to19_BA_Only.tif")
```

- To generate Time Since Previous Fire (TSPF)
  - Subtract YLB from the current year (in this example it is 2020)

### Burned Area Polygons

- First the presence/absence rasters are processed such that 0 values are set to No Data
- The rasters with only burned pixels are then converted to polygons
  - Polygons are not simplified
- Polygon data are attributed to show burn presence, year of burn, and acreage of burn

OBJECTID *	Shape *	Id	gridcode	Shape_Length	Shape_Area	B2019	FYEAR19	GIS_Ac
1	Polygon	1	1	540	9900	1	2019	2.446345
2	Polygon	2	1	960	36899.999999	1	2019	9.118195
3	Polygon	3	1	1140	54000	1	2019	13.3437
4	Polygon	4	1	480	9900	1	2019	2.446345
5	Polygon	5	1	3060	225000	1	2019	55.59875

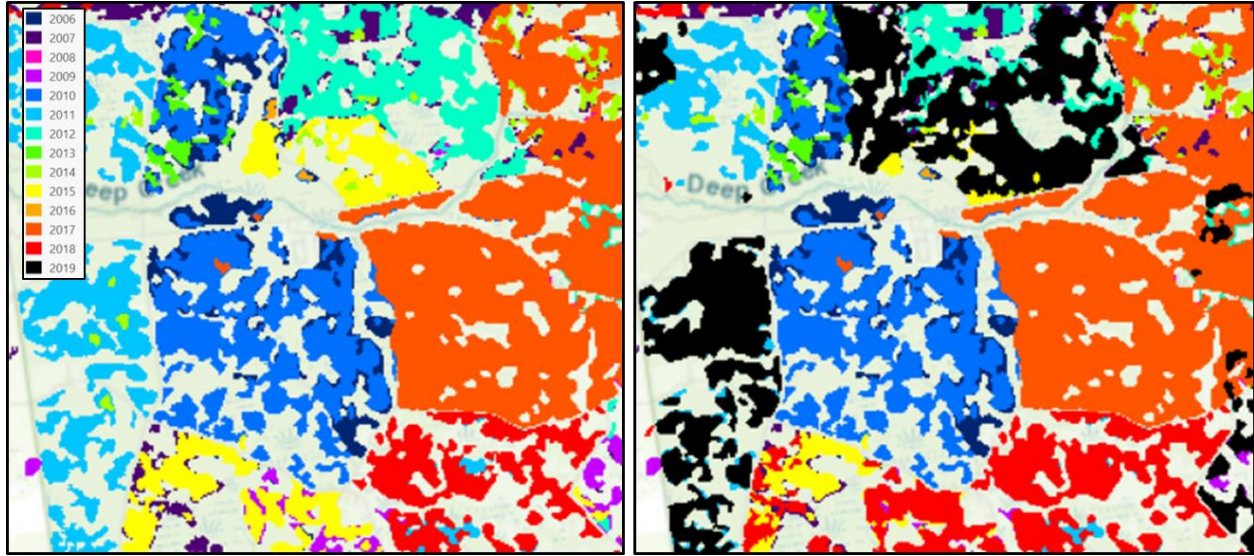
- A union of all burned area polygons results in a singular shape file that represents fire history across the southeast.

YEAR12	B2013	FYEAR13	B2014	FYEAR14	B2015	FYEAR15	B2016	FYEAR16	B2017	FYEAR17	B2018	FYEAR18	B2019	FYEAR19
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	1	2019
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	1	2019
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	1	2019
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	1	2019
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	0	0
2012	1	2013	1	2014	1	2015	1	2016	0	0	1	2018	1	2019
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	1	2019
2012	1	2013	1	2014	1	2015	1	2016	1	2017	1	2018	1	2019

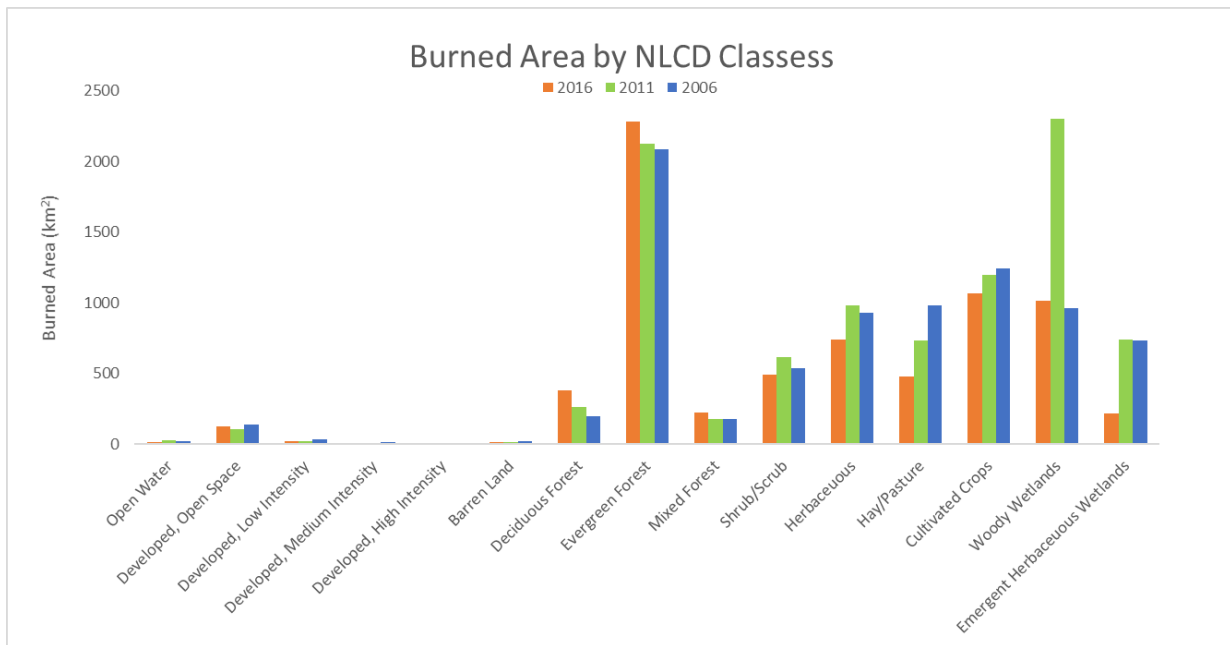
- The annual attributes can be used to recalculate FRQ, YLB, and TSPF
  - FRQ – Sum of B1994 to B2019
  - YLB – Max of FYEAR94 to FYEAR 19
  - TSPF – 2020 Minus YLB
- To Calculate LFFI
  - The polygon data table is exported from ArcGIS and imported into R
  - A script is used to calculate the longest consecutive sequence of 0s for each polygon by searching B1994 to B2019
  - These values are appended to the data table and ultimately joined back to the shape file

## QA/QC

- A previous version of the fire history metrics (2006-2018), which served as a deliverable on an FWC grant, was compared against the new Southeast FHM product
- The image below shows the original FHM (left) and the Southeast FHM (right)
  - Years 1994-2005 have been masked from the right image for comparison purposes
  - In black, 2019 data is evident in the Southeast FHM
  - 2018 imagery was also updated and showed an increase in burned area
  - The products are identical aside from the data updates mentioned above



## Summary Statistics



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This dataset is derived from the USGS Burned Area Products (Hawbaker *et al.* 2017). We used Burned Area (BA) version 2 products (USGS 2020). We evaluated the Landsat Burn Probability (BP) datasets –which are raster datasets – for evidence of burns. The annual datasets span an entire calendar year (*e.g.*, Jan 1 through Dec 31) and indicate the maximum BP within the year (0-100%). For each year between 1994 and 2019, we combined the annual datasets of interest within individual ARD Tiles into a single annual raster dataset (*i.e.*, we mosaicked the tiles) for further processing. We performed all additional processing steps on the annual mosaicked datasets as this provided statewide consistency. We identified pixels as burned or unburned according to their probability value; initially, we retained all pixels with an annual BP between 85-100% based on Hawbaker *et al.* (2017). Values between 90-100% were then converted to presence/absence rasters and we used image processing methods to remove ‘speckling’ (*e.g.*, fill in small holes within a burned area and remove groups of pixels less than a specified size/amount). This process resulted in annual rasters and vectors indicating burn presence (with 90-100% probability) for groups of pixels greater than ~2.24 acres (*e.g.*, 10 30m pixels, in any arrangement). Fire regime metrics such as number of times burned, year last burned, and time since previous fire (as measured from 2020) are included in the dataset, and were derived using these annual presence/absence rasters and vectors.

**References:**

Hawbaker, T.J.; Vanderhoof, M.K.; Beal, Y.-J.; Takacs, J.D.; Schmidt, G.; Falgout, J.; Brunner, N.; Caldwell, M.; Dwyer, J. 2017. An automated approach to identify burned areas in LANDSAT images. *Remote Sens. Environ.*, 198, 504–522.

Hawbaker, T.J., Vanderhoof, M.K., Schmidt, G.L., Beal, Y.J., Picotte, J.J., Takacs, J.D., Falgout, J.T. and Dwyer, J.L., 2020. The Landsat Burned Area algorithm and products for the conterminous United States. *Remote Sensing of Environment*, 244, p.111801.

United States Geological Survey [USGS]. 2019. Landsat Level-3 Burned Area Science Product. <[https://www.usgs.gov/centers/eros/science/usgs-eros-archive-landsat-landsat-level-3-burned-area-ba-science-product?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/eros/science/usgs-eros-archive-landsat-landsat-level-3-burned-area-ba-science-product?qt-science_center_objects=0#qt-science_center_objects)>. Digital Object Identification: [doi.org/10.5066/F77W6BDJ](https://doi.org/10.5066/F77W6BDJ)

Vanderhoof, M. K.; N. Fairaux; Y-J. G. Beal; T.J. Hawbaker. 2017. Validation of the USGS LANDSAT Burned Area Essential Climate Variable (BAECV) across the conterminous United States. *Remote Sens. Environ.*, 198, pp. 393-406.

**Contact:**

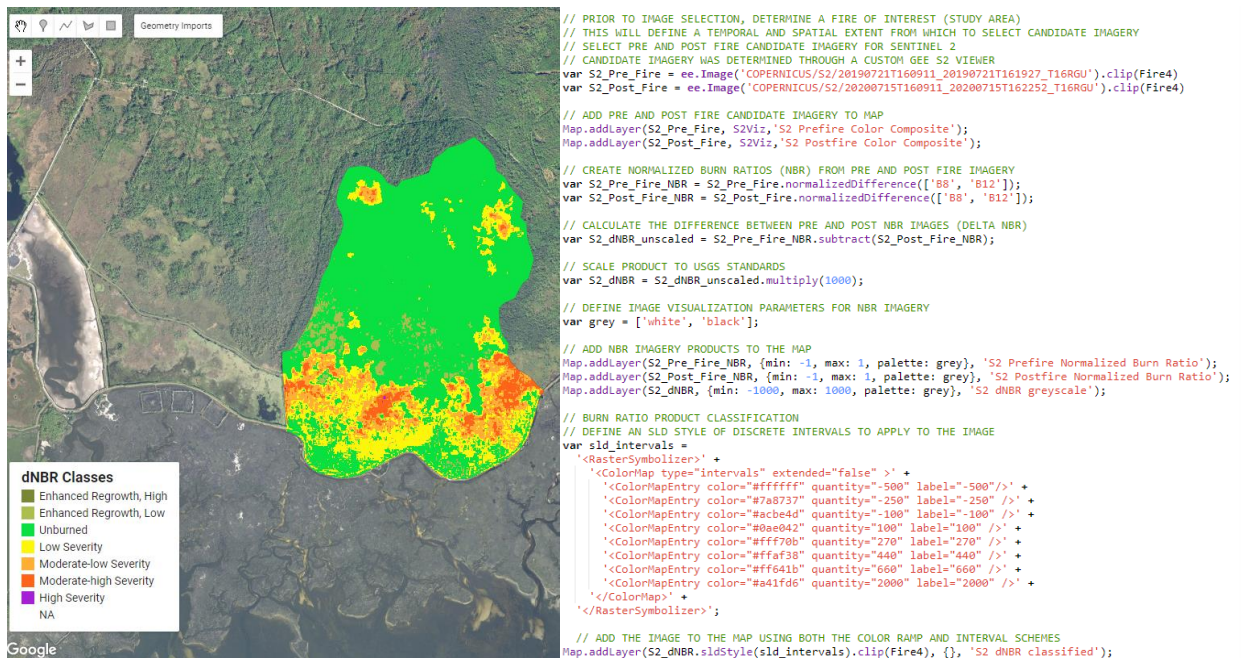
Eli Simonson ([esimonson@talltimbers.org](mailto:esimonson@talltimbers.org)) or Joe Noble ([jnoble@talltimbers.org](mailto:jnoble@talltimbers.org)) for more information.

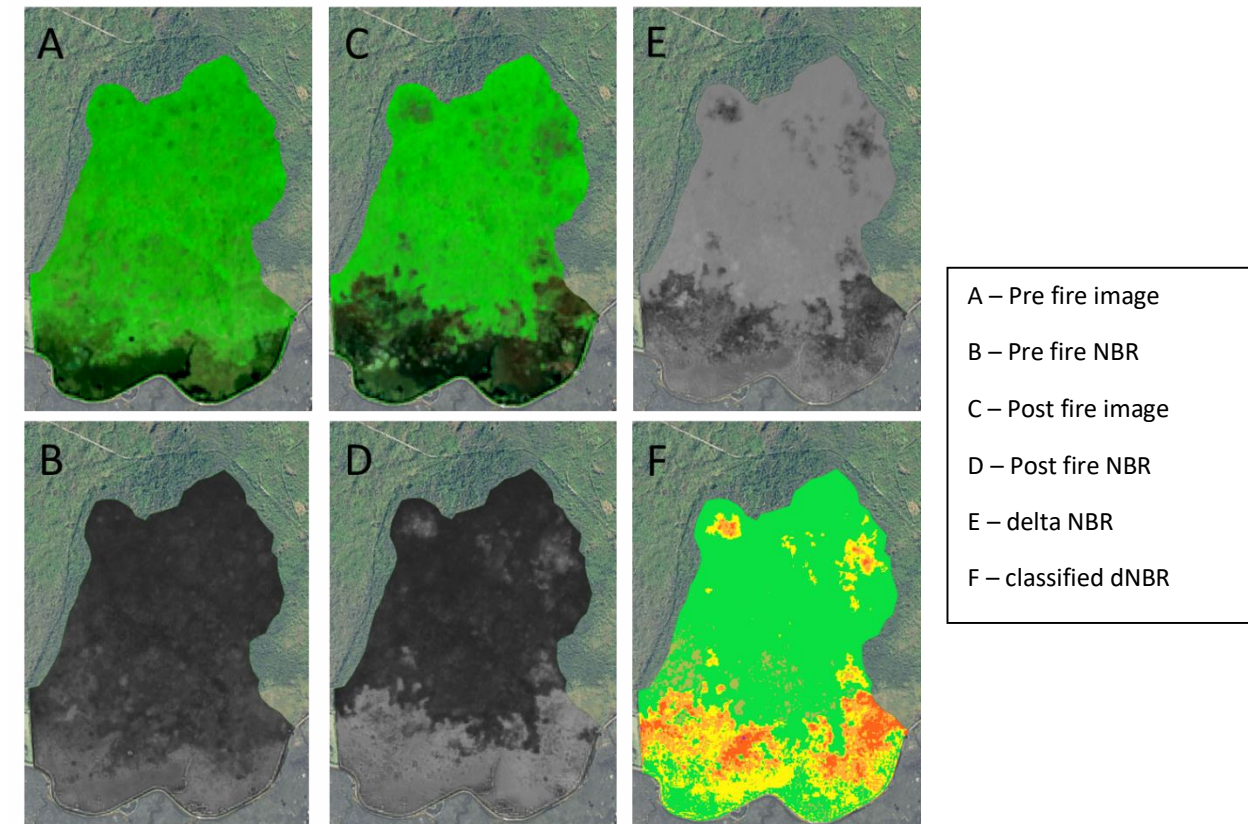
## What is Google Earth Engine?

- Google Earth Engine (GEE) is a powerful web-platform for cloud-based processing of remote sensing data on large scales.
- One of GEE's tools, the Earth Engine Code Editor, is a web-based integrated development environment which facilitates developing complex geospatial workflows.
- Google Earth Engine is free of charge. To use the Code Editor, however, one needs to [register](#) with a valid Google account.
- Using the Code Editor, one can perform many remote sensing exercises such as flood mapping, forest fire detection, land cover classification, and much more.

## Workflow: Rapid Burn Severity Mapping and Classification

- Assess candidate pre and post fire sentinel-2 imagery using the Sentinel-2 image viewer app (<https://esimonson.users.earthengine.app/view/sentinel-2-image-viewer>)
- Within the GEE code editor, you can call in pre/post fire candidate imagery, calculate normalized burn ratio products, and apply a standardized classification scheme with just a few lines of code
- Due to the limited availability of cloudless imagery over burned areas during optimal imagery capture windows (before green-up), some cloud masking techniques may have been applied. All masked pixels are removed from the final products.
- Method is easily replicable for other fires with varying spatial and temporal extents





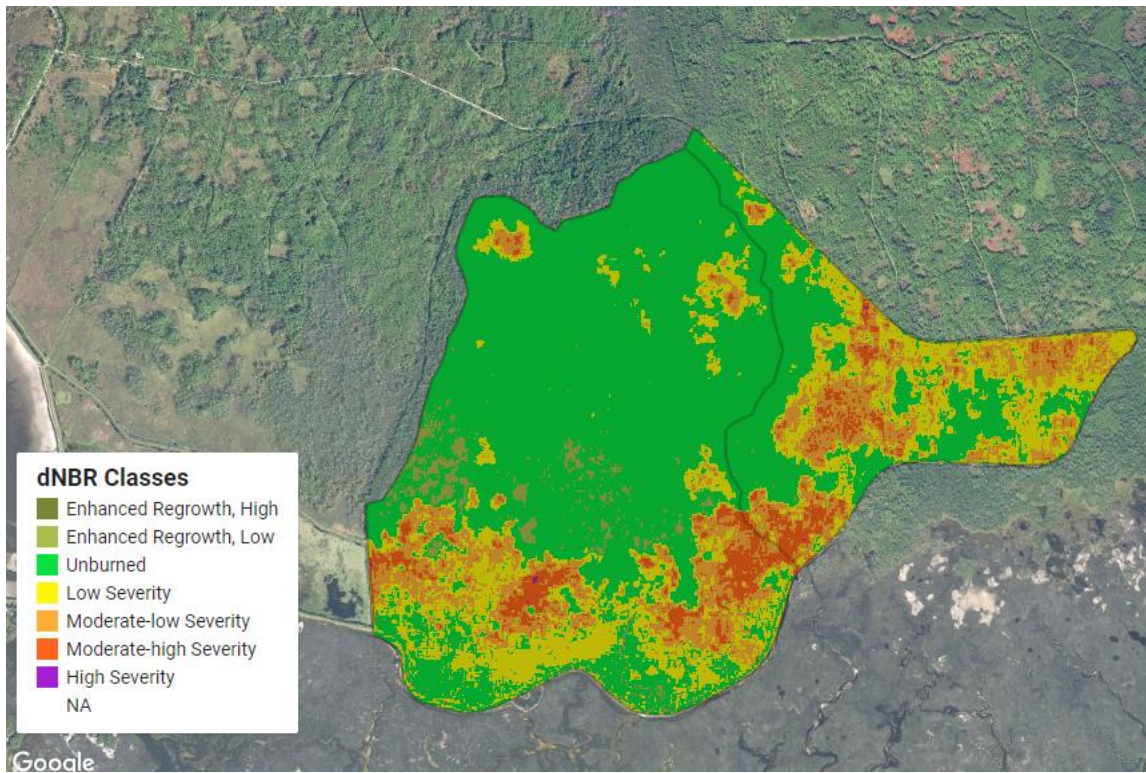
### Normalized Burn Ratio (NBR) Products

- The Normalized Burn Ratio (NBR) is an index designed to highlight burnt areas in large fire zones. The formula is similar to NDVI, except that the formula combines the use of both [near infrared](#) (NIR) and shortwave infrared (SWIR) wavelengths.
- The difference between the pre-fire and post-fire NBR obtained from the images is used to calculate the *delta* NBR (dNBR or  $\Delta$ NBR), which then can be used to estimate the burn severity. A higher value of dNBR indicates more severe damage, while areas with negative dNBR values may indicate regrowth following a fire.
- While observed fire severity and their respective dNBR values differ from fire to fire, the United States Geological Survey (USGS) proposed a classification table to interpret the burn severity, which can be seen below.
- For our methods, we calculate a dNBR from the pre and post fire candidate imagery, and then we apply the classification scheme suggested by the USGS to obtain classified burn severity products.

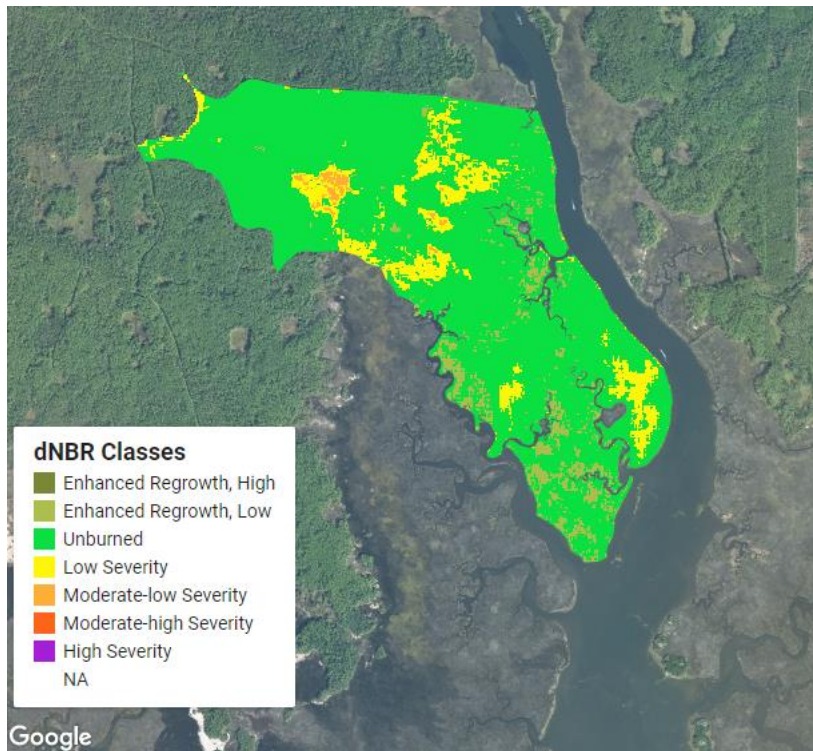
<https://un-spider.org/advisory-support/recommended-practices/recommended-practice-burn-severity/in-detail/normalized-burn-ratio>

Severity Level	dNBR Range (scaled by 10 <sup>3</sup> )	dNBR Range (not scaled)
Enhanced Regrowth, high (post-fire)	-500 to -251	-0.500 to -0.251
Enhanced Regrowth, low (post-fire)	-250 to -101	-0.250 to -0.101
Unburned	-100 to +99	-0.100 to +0.99
Low Severity	+100 to +269	+0.100 to +0.269
Moderate-low Severity	+270 to +439	+0.270 to +0.439
Moderate-high Severity	+440 to +659	+0.440 to +0.659
High Severity	+660 to +1300	+0.660 to +1.300

Examples of classified outputs from selected fires



Fire(s) recorded – 07/10/20, Pre-Fire Image – 07/21/19, Post-Fire Image – 07/15/20



Fire recorded – 07/09/20, Pre-Fire Image – 07/16/19, Post-Fire Image – 07/15/20

### Exporting Imagery Products

- A small line of coded is added to the bottom of the script that allows any/all imagery products to be exported to a Google Drive account in GeoTIFF format.

```
// Export the image, specifying scale and region.
Export.image.toDrive({
  image: dNBR,
  description: 'Sentinel 2 dNBR for Fire',
  folder: 'GEE_Downloads',
  scale: 30,
  region: Fire3
});
```

- Users must specify the image to export (image), pixel resolution in meters (scale), spatial extent (region), and where to download the data (folder).
- We can arrange it such that classified (categorical) and unclassified (continuous) dNBR imagery is available for export.

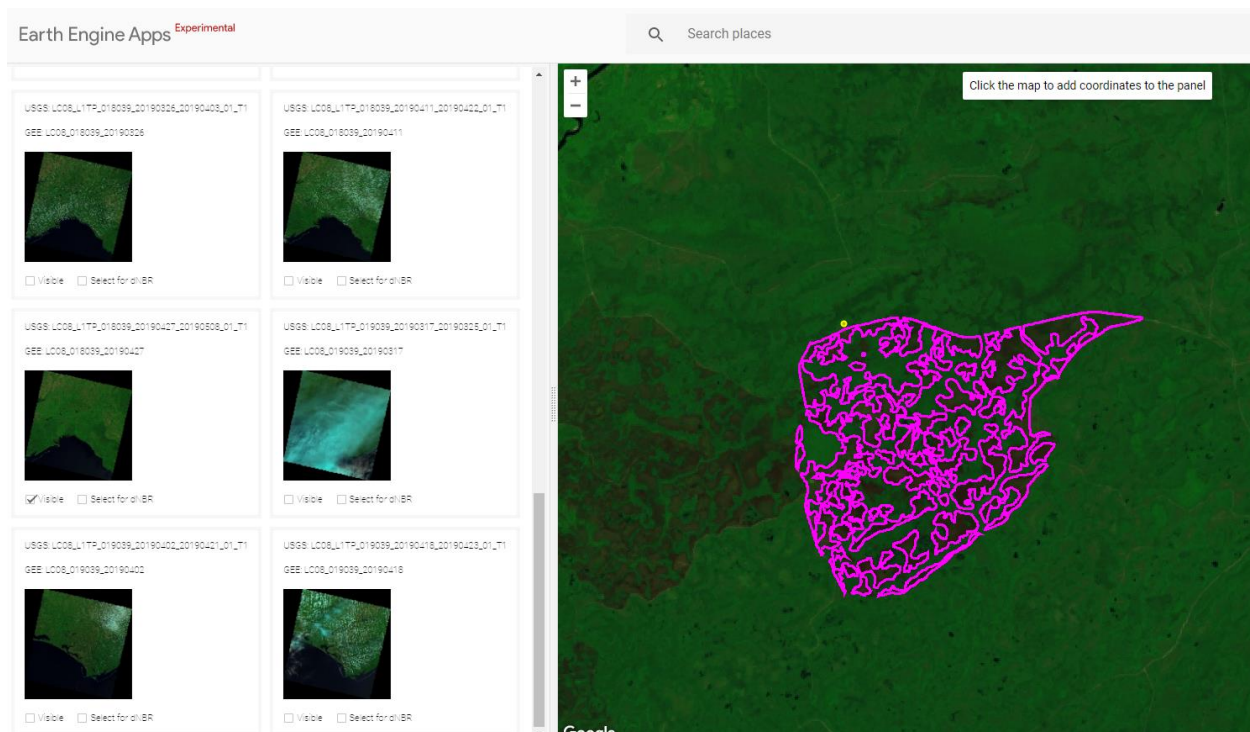


## GTAC GEE Burn Severity Mapping

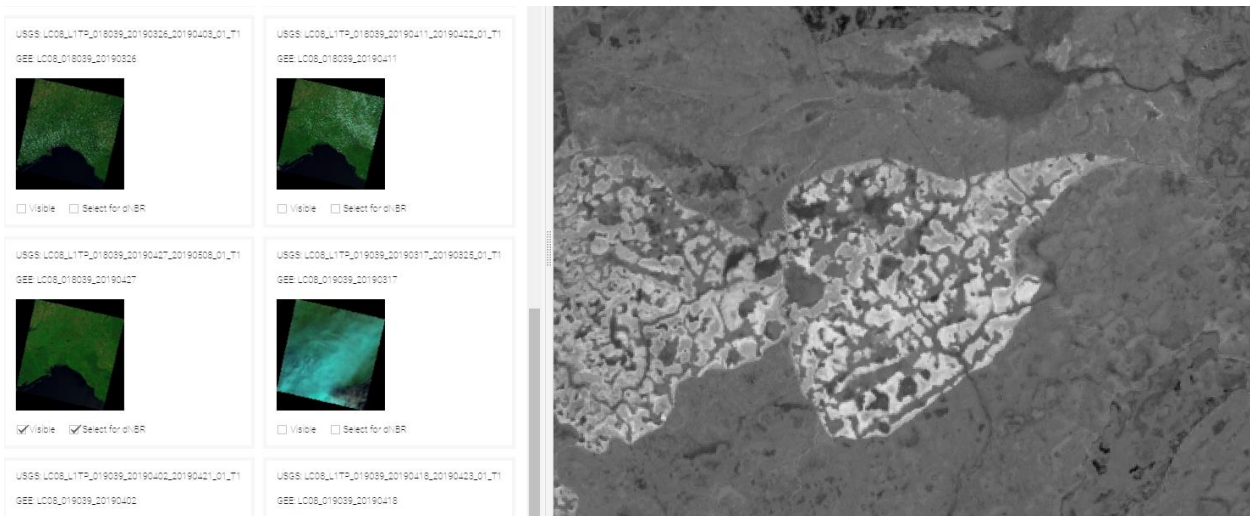
- In December 2020, Tall Timbers Geospatial Center met with Joshua Picotte and Michael Bogle to learn about tools that USFS GTAC have developed in GEE for mapping burn severity.
- We were introduced to two tools that can be used sequentially.

## Landsat and Sentinel Viewer for Burned Area Detection

- Users can select imagery from Landsat 5/7/8 and Sentinel 2 A/B
- Users can select from a list of pre-defined image visualization parameters including natural color, false color, NBR, and NDVI and change these parameters on the fly
- Users can also upload a fire polygon boundary from their GEE assets to assist in the image selection process



- A list of imagery is loaded on the left-side panel based on the image filters that have been specified (geographic coordinates, temporal range of pre/post fire, cloud cover %)
- GEE and USGS image IDs are included for each image. These IDs can be used if a specific image needs to be called from GEE or downloaded from USGS servers.
- If a pre and post fire image are each selected in the imagery panel, there is also an option (Select for dNBR) to render a dNBR on the fly for the image pair. This is an extra step to ensure that the image pair is a good match for detecting the burned area.



- The ultimate goal of this tool is to find a satisfactory image pair for mapping a burned area. Once the analyst is satisfied, the image pair can be carried over to the second tool to map burn severity.
- Link to application → <https://esimonson.users.earthengine.app/view/landsat--sentinel-viewer-for-burned-area-detection>

### Burn Severity Product Generator

- This tool requires two inputs
  - Users import a fire perimeter from their GEE assets into the left-side panel by specifying the asset ID
  - Pre and Post fire GEE image IDs can be copied directly from the Landsat & Sentinel Viewer application
- There are options to create a dNBR offset polygon and adjust classification thresholds as the analyst sees fit
- This tool also has the functionality to produce CBI (Composite Burn Index) outputs
  - dNBR values from the imagery are integrated into CBI regression equations for different vegetation types.
  - Josh Picotte recently shared a comprehensive list of CBI equations which includes equations specific to...
    - East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland
    - East Gulf Coastal Plain Near-Coast Pine Flatwoods
    - Gulf and Atlantic Coastal Plain Swamp Systems
- All imagery products rendered in this tool can be subsequently exported to Google Drive from the Tasks tab at the top left of the code editor

Google Earth Engine Search places and datasets...

## Burn Severity Product Generator

This tool allows the user to generate Post-fire burn severity products using a feature dataset (Asset), a pre-fire reflectance image, and a post-fire reflectance image.

- 1) Input the required parameters and click the Generate dNBR button to produce a suite of products for the desired study area. IDs for the reflectance images are obtained from the separate Landsat & Sentinel-2 Viewer app. Boundary Buffer Value is initially set to 3000 meters, which is a default for the MTBS program.
- 2a) To create RdNBR, enter an offset value or use Draw Offset Polygon option to draw a polygon over the dNBR layer to calculate one.
- 2b) CBI layers may also be generated by using the Add CBI Layers button.
- 3) The Inspect dNBR button will allow the user to display dNBR values, for a clicked location on the map. Once suitable thresholds are entered, click the Generate dNBR (6-Class) button to create the final burn severity product. The moderate value will auto-calculate if left empty. Exports for each step of the analysis will appear in the Tasks tab. Links to a jpeg version of each product, along with any relevant histograms will print to the console tab.

**1) Create dNBR:**

Fire Name:

Drive Folder:

Class (Acreage)		
0	Background	33546.8
1	Unburned to Low	224.6
2	Low	210.8
3	Moderate	479.0
4	High	1653.7
5	Increased Greenness	0.1

Google Earth Engine Search places and datasets...

**2a) Create RdNBR:**

dNBR Offset:

**2b) Add CBI:**

**3) Create dNBR (6-Class):**

Low Threshold:

Moderate Threshold (Optional)  None

Class (Acreage)		
0	Background	33546.8
1	Unburned to Low	224.6
2	Low	210.8
3	Moderate	479.0
4	High	1653.7
5	Increased Greenness	0.1

- Link to application → <https://code.earthengine.google.com/fc4c408cb312be070421dacda5dd4bbf>
- If there are any issues or questions about using these applications, please contact Eli Simonson (esimonson@talltimbers.org)



SIGN UP FREE



# SE FireMap Scoping Survey

Survey Responses

QUESTION SUMMARIES

DATA TRENDS

INDIVIDUAL RESPONSES

Q1

## Contact Information

Answered: 33 Skipped: 0

ANSWER CHOICES	RESPONSES	
Name	Responses	100.00% 33
Company	Responses	0.00% 0
Address	Responses	0.00% 0
Address 2	Responses	0.00% 0
City/Town	Responses	0.00% 0
State/Province	Responses	0.00% 0
ZIP/Postal Code	Responses	0.00% 0
Country	Responses	0.00% 0
Email Address	Responses	100.00% 33
Phone Number	Responses	0.00% 0

Q2

## What agency/organization/stakeholder group do you represent?

Answered: 33 Skipped: 0

DOI-National Park service

12/29/2020 7:09 PM

USFS

12/29/2020 6:53 PM

The Nature Conservancy

12/17/2020 1:58 PM

The Longleaf Alliance

12/11/2020 9:25 AM

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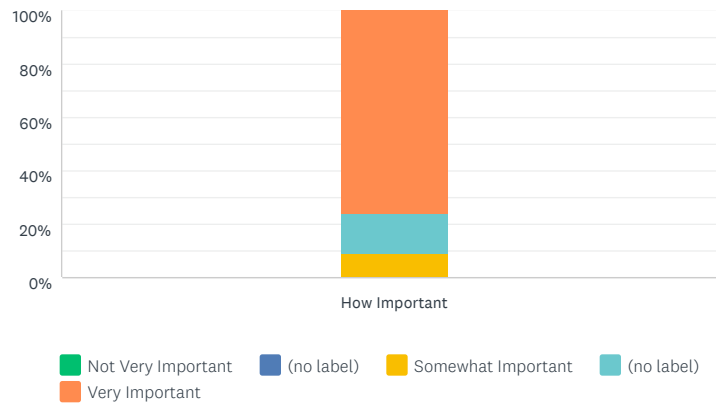


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### How important will it be for the SE FireMap to include fire history in the mapping product?

Answered: 33 Skipped: 0

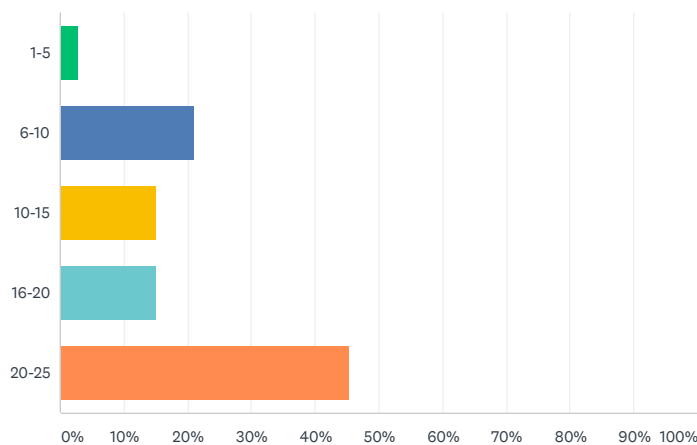


	NOT VERY IMPORTANT	(NO LABEL)	SOMEWHAT IMPORTANT	(NO LABEL)	VERY IMPORTANT	TOTAL	WEIGHTED AVERAGE
How Important	0.00% 0	0.00% 0	9.09% 3	15.15% 5	75.76% 25	33	4.67

### Q4

### If important, how many consecutive years of fire history data would be needed to assist with critical management decisions?

Answered: 33 Skipped: 0



ANSWER CHOICES	RESPONSES	
1-5	3.03%	1
6-10	21.21%	7
10-15	15.15%	5
16-20	15.15%	5
20-25	45.45%	15
<b>TOTAL</b>		<b>33</b>

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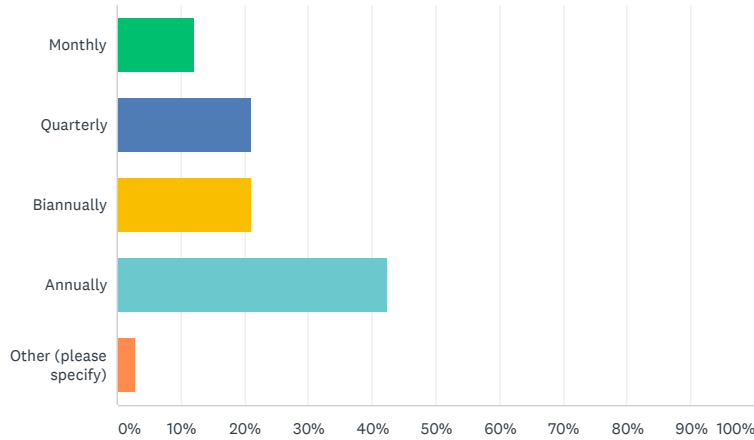


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What temporal resolution would you prefer the SE FireMap support? (How often the data need to be updated to address your questions)

Answered: 33 Skipped: 0



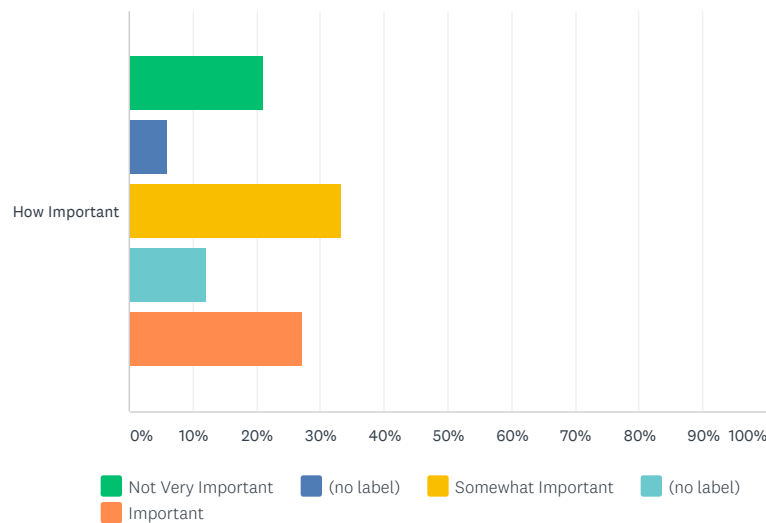
ANSWER CHOICES	RESPONSES	
Monthly	12.12%	4
Quarterly	21.21%	7
Biannually	21.21%	7
Annually	42.42%	14
Other (please specify)	<a href="#">Responses</a> 3.03%	1
<b>TOTAL</b>		<b>33</b>

Q6



How important will it be for the SE FireMap to incorporate active fire detection?

Answered: 33 Skipped: 0



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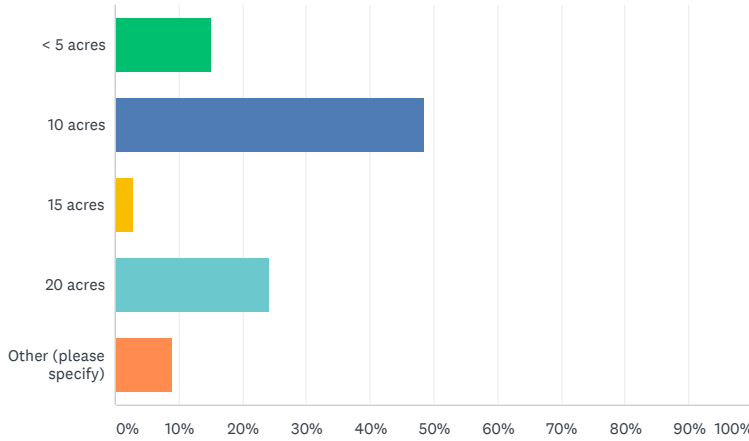


Q7



Considering the SE FireMap will be a remotely sensed product, what detection threshold do you consider an appropriate target to meet your needs? (minimum size of fire detected in product)

Answered: 33 Skipped: 0



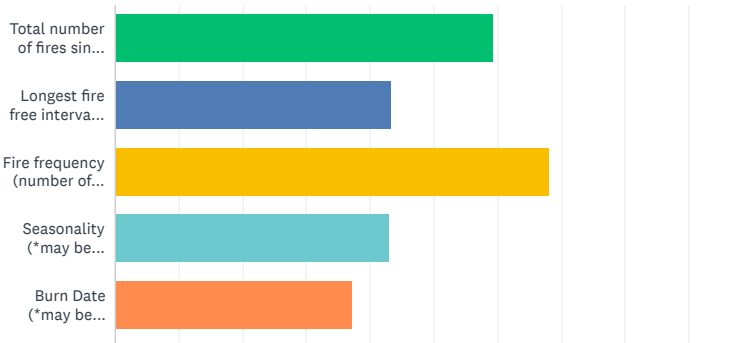
ANSWER CHOICES	RESPONSES	
< 5 acres	15.15%	5
10 acres	48.48%	16
15 acres	3.03%	1
20 acres	24.24%	8
Other (please specify)	<a href="#">Responses</a> 9.09%	3
<b>TOTAL</b>		<b>33</b>

Q8



The SE FireMap will consist of more than just a map. Thinking ahead to a decision support tool, what are the standard queries you would consider most important to support? Please Rank in order of importance.

Answered: 33 Skipped: 0



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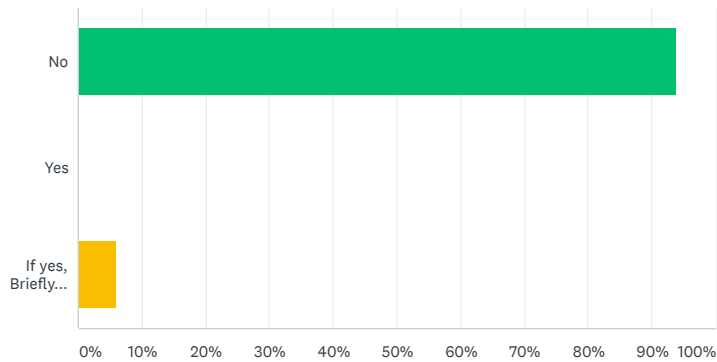


	1	2	3	4	5	6	7	8	TOTAL	SCORE
Total number of fires since specified date	27.27% 9	27.27% 9	18.18% 6	3.03% 1	3.03% 1	6.06% 2	15.15% 5	0.00% 0	33	5.9
Longest fire free interval within a specified range of dates	3.03% 1	18.18% 6	9.09% 3	18.18% 6	21.21% 7	9.09% 3	3.03% 1	18.18% 6	33	4.3
Fire frequency (number of times burned in specified range of dates)	48.48% 16	18.18% 6	15.15% 5	12.12% 4	3.03% 1	0.00% 0	0.00% 0	3.03% 1	33	6.8
Seasonality (*may be limited by capability of RS mapping product)	6.06% 2	9.09% 3	18.18% 6	18.18% 6	9.09% 3	15.15% 5	12.12% 4	12.12% 4	33	4.3
Burn Date (*may be limited by capability of RS mapping product)	6.06% 2	6.06% 2	3.03% 1	12.12% 4	24.24% 8	24.24% 8	9.09% 3	15.15% 5	33	3.7
Intersection with habitat/species models	0.00% 0	9.09% 3	12.12% 4	9.09% 3	6.06% 2	24.24% 8	30.30% 10	9.09% 3	33	3.4
Landcover/Stewardship	3.03% 1	3.03% 1	18.18% 6	12.12% 4	15.15% 5	15.15% 5	18.18% 6	15.15% 5	33	3.7
Ownership	6.06% 2	9.09% 3	6.06% 2	15.15% 5	18.18% 6	6.06% 2	12.12% 4	27.27% 9	33	3.6

Q9

Were any reporting elements you see as critical not listed above?

Answered: 33 Skipped: 0



ANSWER CHOICES	RESPONSES	
No	93.94%	31
Yes	0.00%	0
If yes, Briefly describe the missing reporting element:	Responses 6.06%	2
<b>TOTAL</b>		<b>33</b>

Q10

The scale of the SE FireMap is not a good match for...

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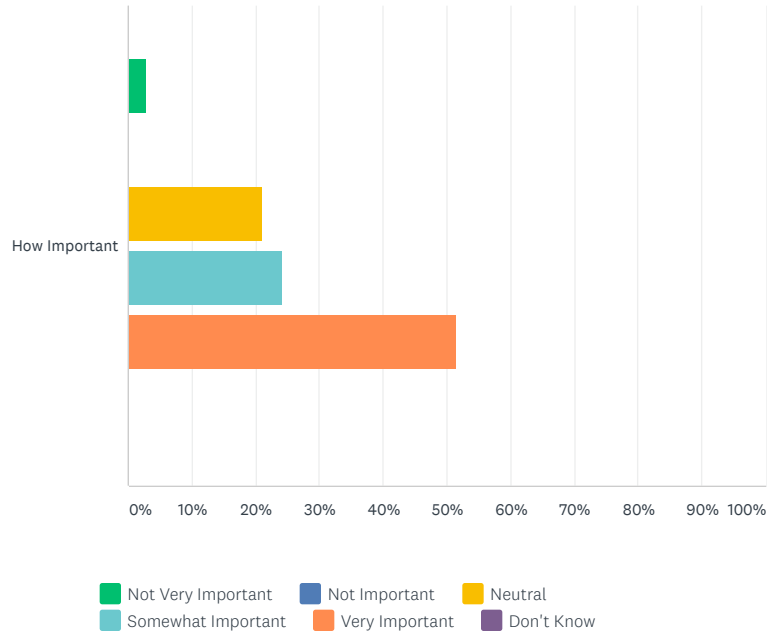




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Answered: 33 Skipped: 0



	NOT VERY IMPORTANT	NOT IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	DON'T KNOW	TOTAL	WEIGHTED AVERAGE
How Important	3.03%	0.00%	21.21%	24.24%	51.52%	0.00%	33	4.21
	1	0	7	8	17	0		

Q11

If important, what current fire tracking system do you believe should be prioritized for crosswalking? (Example: common attribution; compatible database structure, etc.) Current systems might include LANDFIRE, MTBS, InFORM, WFDSS, State Permitting Systems, or others.

Answered: 19 Skipped: 14

- Wfdss

12/29/2020 7:09 PM
- A compromise between habitat modeling for fire regimes, T & E species, and ownership - whatever that looks like. Do we have the perfect database? How do we prioritize the habitats and desired future condition? Departure from DFC? What would it take to achieve DFC across XXX acres?

12/29/2020 6:53 PM
- systems listed above would be key, include EPA needs?

12/17/2020 1:58 PM
- I'd be interested in the intersection of State Permitting Systems to assess accuracy, but not critical since it is replacing some of these systems.

12/11/2020 9:25 AM

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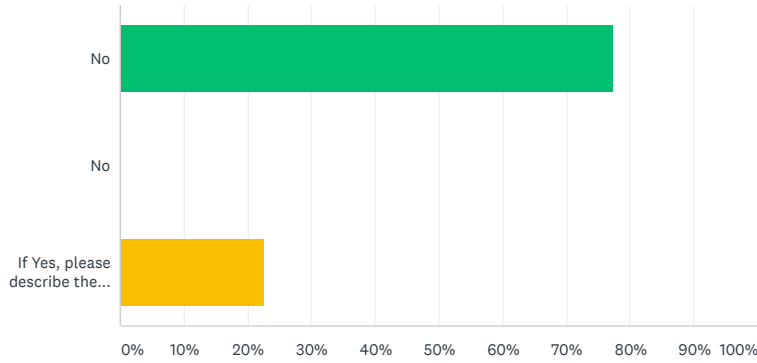


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Are you familiar with any emerging mapping technology/system we should consider during the current SE FireMap scoping effort?

Answered: 31 Skipped: 2



ANSWER CHOICES	RESPONSES
No	77.42% 24
No	0.00% 0
If Yes, please describe the emerging fire mapping technology/system you feel would be critical to review during the scoping phase.	<a href="#">Responses</a> 22.58% 7
<b>TOTAL</b>	<b>31</b>

Q13

If you familiar with any emerging mapping technology/system, please list a best point of contact for the mapping technology/system.

Answered: 10 Skipped: 23

- N/A  
12/11/2020 9:33 AM
- Jon Wallace, USFWS and Kevin Heirs, Tall Timbers.  
12/7/2020 10:24 AM
- NIFC  
11/20/2020 10:18 AM
- NA  
11/17/2020 2:11 PM

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