



United States Department of Agriculture

Considerations for Nested Dashboards

Mike Scanlon, Rocky Mountain
Research Station
and

Chris Ringo, College of Agricultural Sciences,
Oregon State University



Forest Service



Oregon State University
College of Agricultural
Sciences



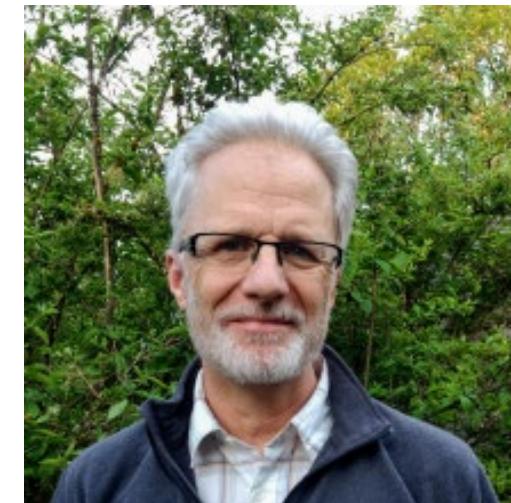
Presenters



Mike Scanlon – Staff
Assistant & Systems Analyst



USDA Forest Service



Chris Ringo – Senior Faculty
Research Assistant



Oregon State University
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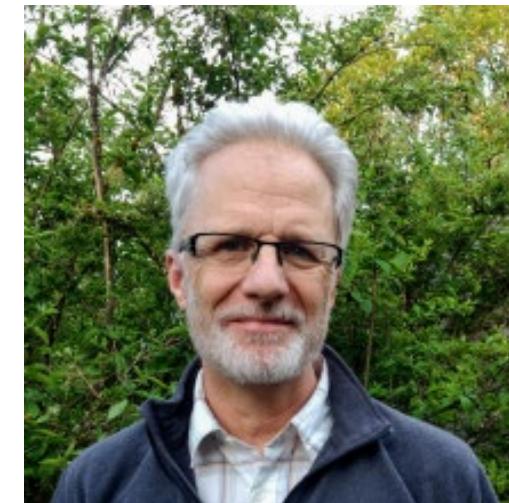
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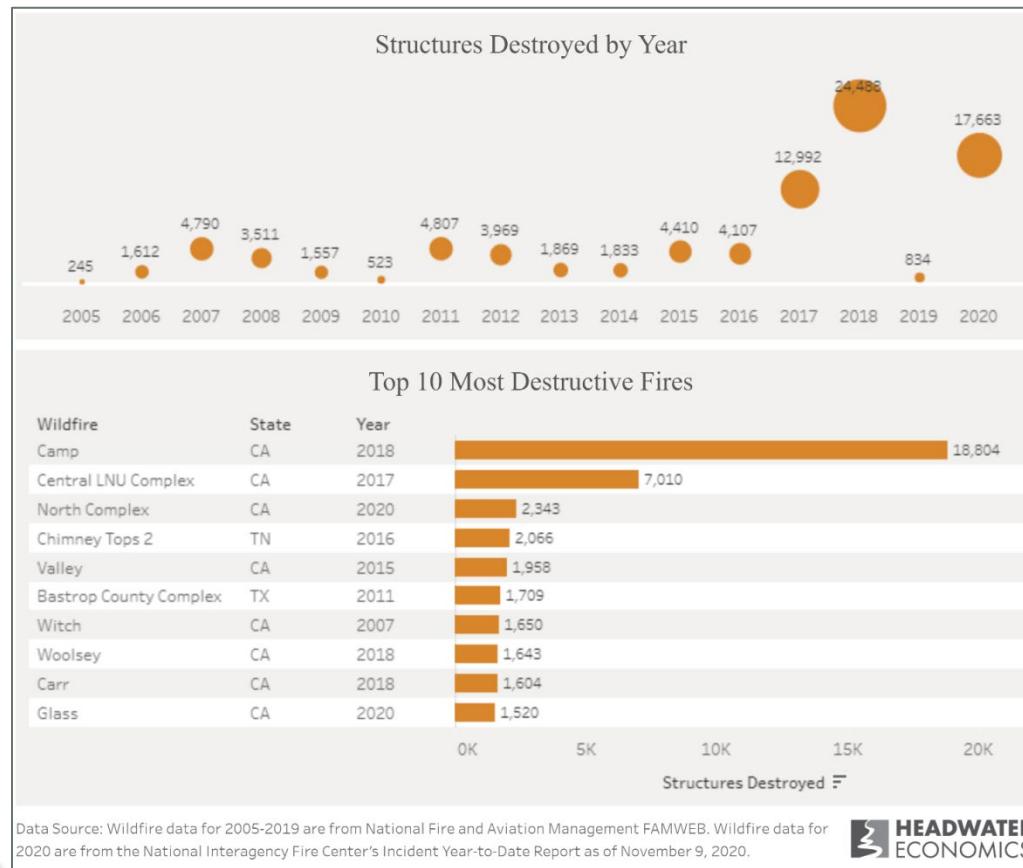
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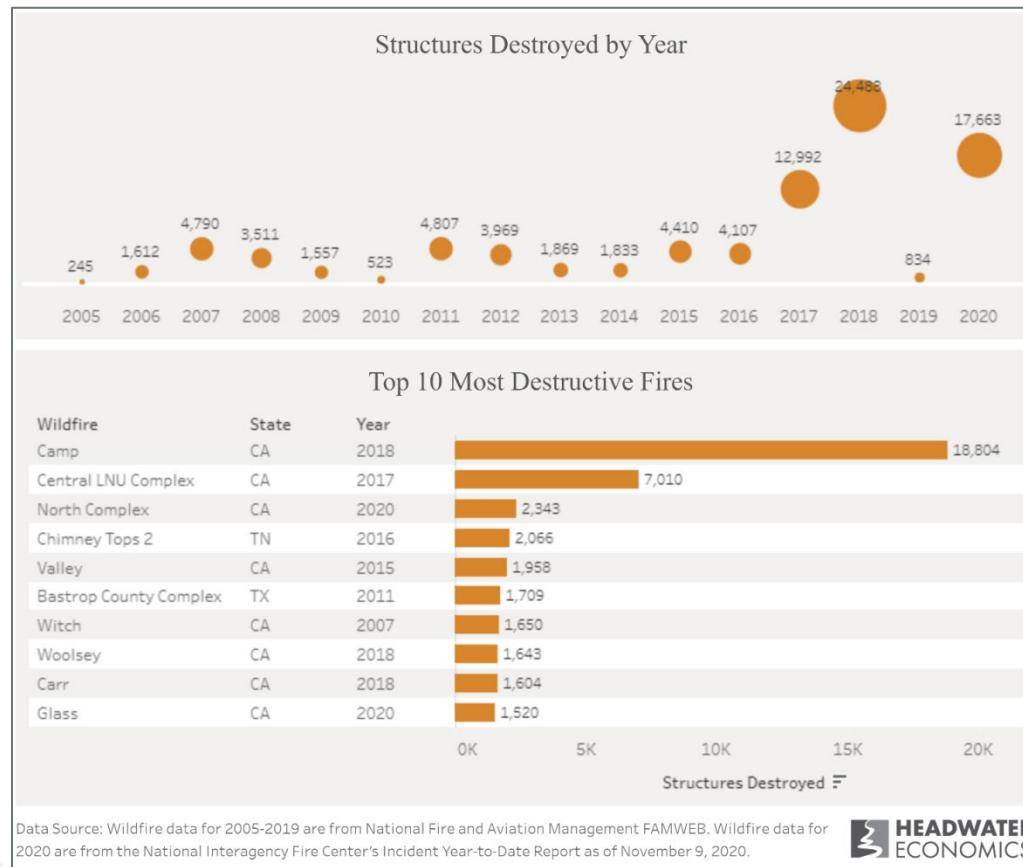
Wildfires are Getting Worse



- 2018 Camp Fire
- 18,800 structures lost



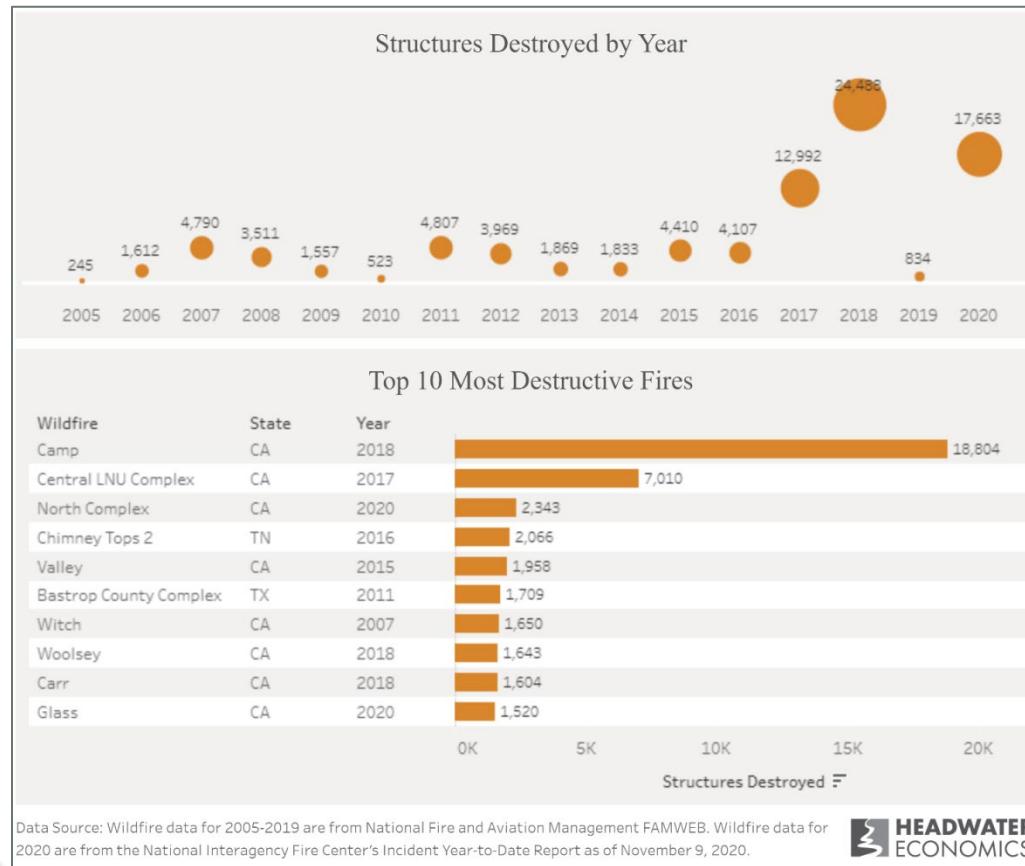
Wildfires are Getting Worse



- 2020 California fires
- 10,000+ structures lost



Wildfires are Getting Worse



- 2020 Oregon fires
- 4,000+ structures lost



Fireshed Registry Project Overview

Research Scientists

- Dr. Alan A. Ager
- Michelle A. Day
- Chris Ringo
- Cody Evers
- Fermin Alcasena
- Rachel Houtman
- Michael Scanlon
- Tania Ellersick

United States
Department of
Agriculture

USDA

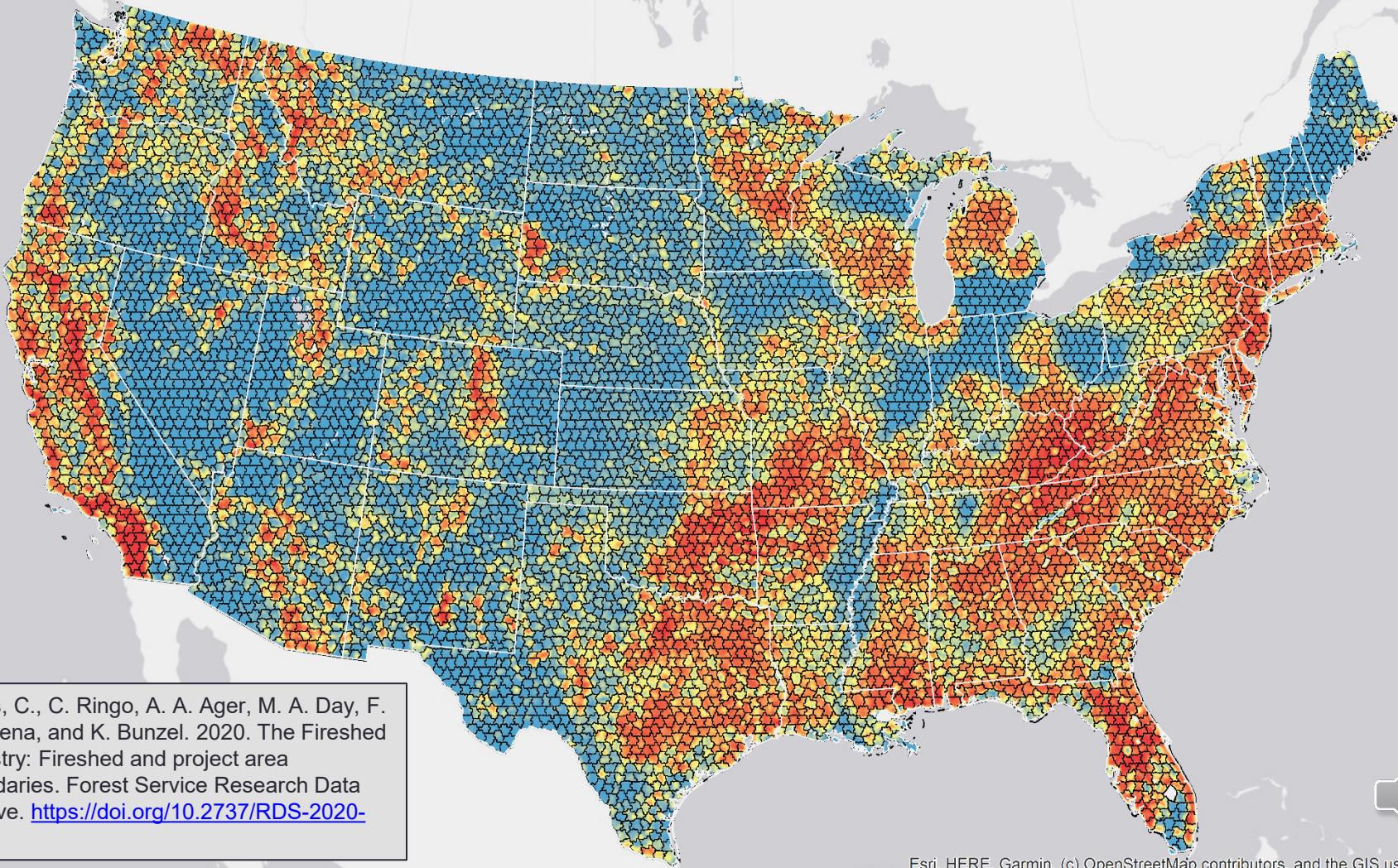
Forest Service

FS-XXX

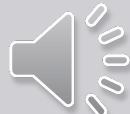
Jan 2021

**Development and
application of the
Fireshed Registry**





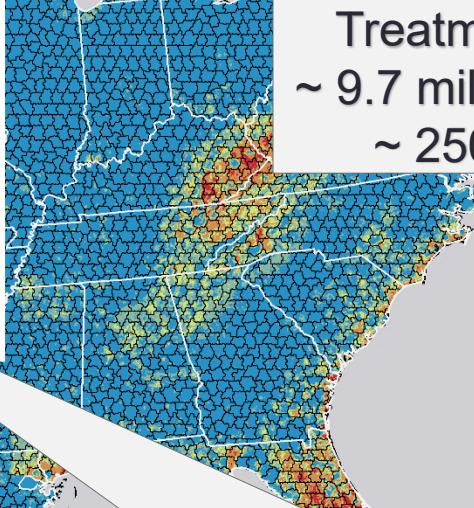
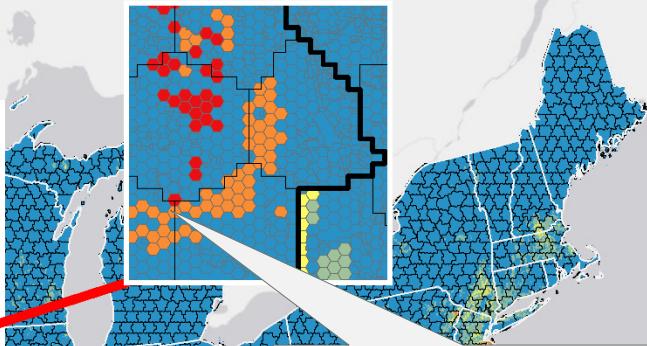
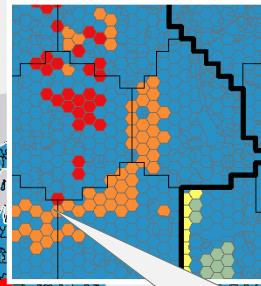
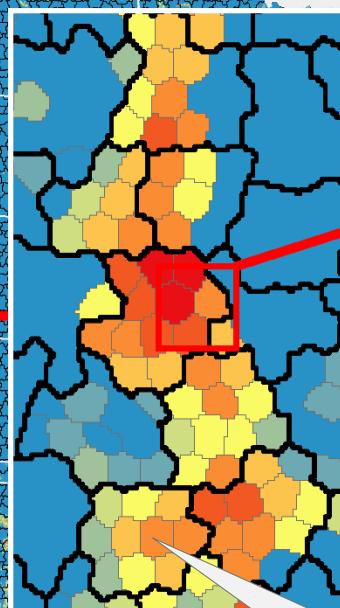
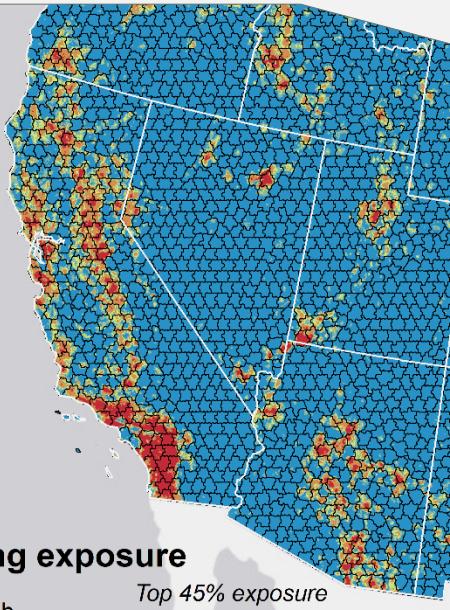
Evers, C., C. Ringo, A. A. Ager, M. A. Day, F. Alcasena, and K. Bunzel. 2020. The Fireshed Registry: Fireshed and project area boundaries. Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2020-0054>.



Scale of exposure assessment

~ 7,700 Firesheds

~ 250,000 Acres

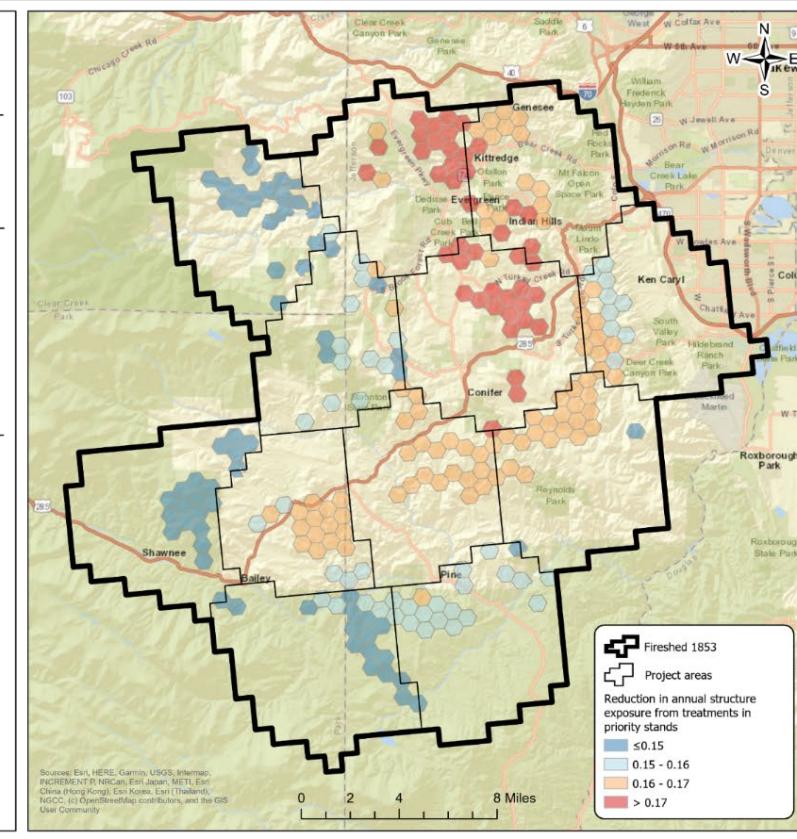
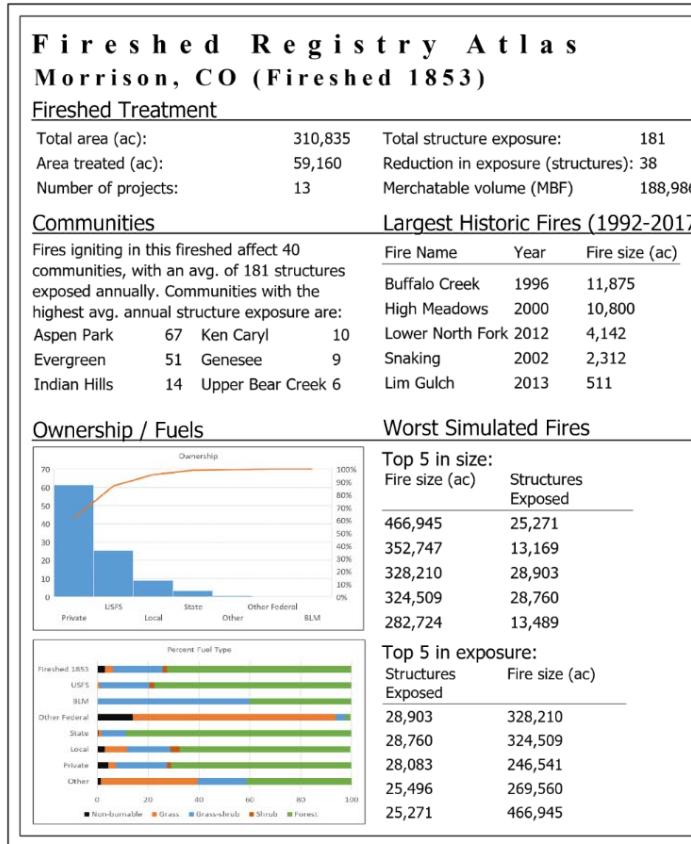


Prioritization and implementation

~ 77,000 Planning Areas

~ 25,000 Acres

Example Fireshed Registry Atlas Page: top priority Fireshed for treatment in the western US



First Dashboard Attempt

Fireshed Registry Dashboard

Modeled treatments

Fireshed: Morrison, Colorado (1,853)
 Fireshed area (ac): 309,840.52
 Treatment area (ac): 59,160.35
 Total annual structure exposure: 180,69
 Western US Rank (of 1860): 11
 Reduction in annual exposure: 37.75
 Western US Rank (of 1860): 1
 Merchantable volume (MBF): 188,985.76

Project List

Project ID: 18,587
 Project Area (ac): 29,687.05
 Treatment Area (ac): 4,938.6
 Reduction in Exposure (# structure): 3,44
 Merchantable Timber (MBF): 15,266.86

Project ID: 18,586
 Project Area (ac): 24,787.24
 Treatment Area (ac): 4,928.35
 Reduction in Exposure (# structure): 3,43
 Merchantable Timber (MBF): 14,752.16

Project ID: 18,585
 Project Area (ac): 24,787.24
 Treatment Area (ac): 4,899.92
 Reduction in Exposure (# structure): 3,35
 Merchantable Timber (MBF): 11,684.73

Project ID: 18,591
 Project Area (ac): 27,381.26
 Treatment Area (ac): 4,925.81
 Reduction in Exposure (# structure): 3,34
 Merchantable Timber (MBF): 19,856.11

Project ID: 18,590
 Project Area (ac): 25,075.47
 Treatment Area (ac): 4,941
 Reduction in Exposure (# structure): 3,31
 Merchantable Timber (MBF): 17,310.58

Project ID: 18,593
 Project Area (ac): 21,040.33
 Treatment Area (ac): 4,942.1
 Reduction in Exposure (# structure): 3,22
 Merchantable Timber (MBF): 11,674.72

Project ID: 18,588
 Project Area (ac): 25,651.91
 Treatment Area (ac): 4,942.11
 Reduction in Exposure (# structure): 3,22
 Merchantable Timber (MBF): 22,038.92

Map Legend

- Fireshed boundaries
- Project Areas
- MTBS Fire Perimeters
- Optimized treatment locations
- HUSUM_STND
 - > 0.05 - 0.65
 - > 0.001 - 0.05
 - > 0.0005 - 0.001
 - > 0.0001 - 0.0005
 - 0 - 0.0001
- US States
- States - Regional Extent

Ownership

Ownership Type	Percentage
Private	62%
USFS	25%
State	3%
Local	9%
Other	1%

Fireshed Fuel Types

Fuel Type	Percent of Fireshed
Forest	~75%
Shrub	~5%
GrassShrub	~15%
Grass	~5%
Non-burnable	~5%

Modeled Exposure (Top 5 Communities)

Community	Annual Structures exposed
Aspen Park	67
Evergreen	51
Indian Hills	14
Ken Caryl	10
Genesee	9

Top 5 Historic Fires

Fire Name	Year	Size (ac)
BUFFALO CREEK	1,996	11,875
HIGH MEADOWS	2,000	10,800
LOWER NORTH FORK	2,012	4,142
SNAKING	2,002	2,312
LIME GULCH	2,013	511

Historic Fires **Simulated Fires**



Dashboards

Dashboard Settings

Home ▾  Fireshed

 Fireshed Registry

 Configure

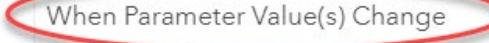
309,834 ac

External links

Nested dashboards

Add URL Parameter ▾

 URL Parameters

 When Parameter Value(s) Change

Feature Parameter

Name: fireshed

Layer: Firesheds Change

Unique ID Field: Fireshed_ID

Add Action ▾

Add Target ▾

Filter: 99! Selected Fireshed

Method: Fields Spatial



Cascading Selections

- Embedded Content – URL
 - https://...arcgis.com/...?p1={Fireshed_ID}
- Dashboard link with parameters
 - Dashboard actions work
 - Actions do not “cascade”
 - Map or Feature actions within are not executed
- Most charts sum acres from a feature selection ☹
- Parent – Child actions only
- Strings and numbers don't mix



Dashboard Organization

Dashboards

1. Master
2. Current & Historic Conditions
3. Charts
4. Historic Fires & Treatments
5. Community Exposure
6. Planned Treatments
7. Scenario Planning
8. Community Explorer

Currently Published Dashboard

Fireshed Registry Master Page: <https://www.arcgis.com/apps/opsdashboard/index.html#/8df414f92af944c5a6167b9e9b85f8a2?mode=edit>

Current & Historical Conditions (Tab 1) <https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/d01e63f0bed4ec6ae6842d494285aac?mode=edit>

Rich Text Title (Fireshed Name and Number)
UST (Column Headers in HTML)

Percent_Ownership_and_Fuel_Types_Chart_Only
<https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/31f7bda061547af9cc69cb14de6efab?mode=edit>

Tab 1: Percent Ownership
Chart: Layer: Fireshed_OwnerPct – Change State color to pink, check label size

Tab2: Percent Fuel Types
Chart: Layer: Fireshed_FuelTypes

Maps
Tab 1 – “Ownership Map”
Name – “Fireshed Registry Map (Ownership)”
Review multiple Map and Layer Actions

Tab 2 – “Fire and Treatment History”
Name – “Fireshed Registry Map (History) v2”
Map Action – Respond to Extent Changes only

Tab 3 – “Exposure Profile”
Name – “Fireshed Registry Map (Exposure) v2”
Map Action – Respond to Extent Changes only

Rich Text Title (“Fire & Treatment History”)

Historical_Treatments_and_Historical_Fires_Charts_Only
<https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/3e9bbf814e7d455291b5dbc330fa221?mode=edit>

Rich Text: Largest Historical Fires, 1992-2015
Data List: Layer: Fireshed_HistoricFires_Top5
Fire Name, Fire Year, Fire Size

Tab 1 “Historical Treatments” Data List: Layer: Fireshed_FiresAndMgmtHistory_v3
List Title: “Fire & treatment Totals, 2010-2015”
Prescribed Fire: Mechanical: Mastication:

Tab2 “Historical Fires”
Data List: Layer: Fireshed_FireAndMgmtHistory
List Title: Fires & Treatments, 2010-2015
Area Burned: Number of Fires

Rich Text Title (“Community & Exposure Profile”)

Historical_Treatments_and_Historical_Fires_Charts_Only
<https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/65202a7978754e93b53633a61d03f894?mode=edit>

Tab 1 – “Model Exposure” Data List:
Layer: Fireshed_CommunityStats (text)
DataList: Layer: Fireshed_ExposedCommunities
Community Name, Average Exposure, Maximum Exposure

Tab2 – “Worst Simulated Fire”
Rich Text: Blank (on left side)
Data List: Layer: SimulatedFires_by_Fireshed_Top5
Structures Exposed, Fire Size (ac)

Planned/Proposed Treatments (Tab 2) <https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/c532b70567b14f0f9f4fe822e6d79aae?mode=edit>

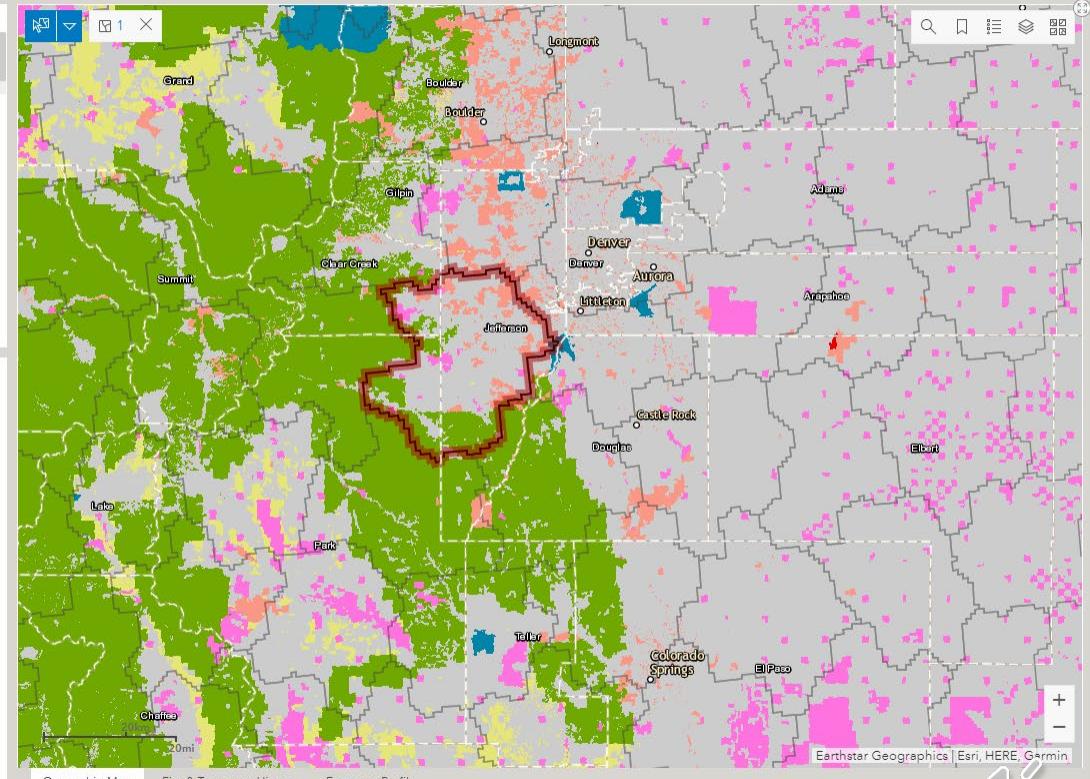
Fireshed Dashboard_Treatment Analysis_Optimized
Fireshed Dashboard_Treatment Analysis_Planned

Load Scenario Planning Outputs (Tab 3)
<https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/0151ba5d07aa47999ef9257d445cd89d?mode=edit>
ForSys Outputs Map

Community Explorer (Tab 4)
<https://usfs.maps.arcgis.com/apps/opsdashboard/index.html#/f9ba7194df024ae4933e3554b0f4e721?mode=edit>
Fireshed Registry Map (Communities)



1



Morrison, Colorado (Fireshed 1853)

Fireshed Area
309,834 acWUI Area
167,495 ac
(54% of Fireshed)WUI Structures
35,946# Communities
37

3

FIRE & TREATMENT HISTORY

COMMUNITY & EXPOSURE PROFILE

4

5

2

6

7

8

Current & Historical

Planned

Treatment

Load Scenario

Outputs

Community



Current & Historical Conditions (Fireshed Registry)

Morrison, Colorado (Fireshed 1853)

PERCENT OWNERSHIP

Fireshed Area: 309,834 ac WUI Area: 167,495 ac WUI Structures: 35,946 # Communities: 37 (54% of Fireshed)

Fire & Treatment History

LARGEST HISTORICAL FIRES, 1992-2013

Fire Name	Year	Size (ac)
BUFFALO	1996	11,875
HIGH	2000	10,800
LOWER	2012	4,142
SNAKING	2002	2,312
LIME GULCH	2013	511

FIRE & TREATMENT TOTALS, 2010-

Prescribed Fires: Mechanical: 2,171.68 ac. 2,962.20 ac. 602.24 ac.

Community &

Simulated fires that ignited in this fireshed and burned into one or more communities exposed an average of 3,171.14 ac of structures to fires burned into specific communities, they exposed on average the following:

Community Name	Average Exposure	Maximum Exposure
Arvada	146.25	281.86
Aspen Park	498.68	10,842.53
Black Hawk	48.89	178.52
Castle Pines	1.45	2.87
Castle Pines	389.18	389.18

Percent Fuel Type

Ownership Map **Fire & Treatment History** **Exposure Profile**

Planned/Proposed Treatment

Morrison, Colorado (Fireshed 1853)

FIRESHED TREATMENTS

Total Area (ac):	309,841	Total Structure Exposure:	181
Area Treated (ac):	59,160	Reduction in Exposure (structure):	38
Number of Projects:	12	Merchantable Volume (MBF):	188,986

Project Area TREATMENTS

Project Area ID 18,587
Total Area (ac): 29,487.05
Area Treated (ac): 4,938.6
Reduction in Exposure (structure): 3.44
Merchantable Volume: 15,266.86

Project Area ID 18,586
Total Area (ac): 24,791.24
Area Treated (ac): 4,928.35
Reduction in Exposure (structure): 3.43
Merchantable Volume: 14,752.16

Project Area ID 18,585
Total Area (ac): 24,787.24
Area Treated (ac): 4,899.92
Reduction in Exposure (structure): 3.35
Merchantable Volume: 11,684.73

Project Area ID 18,591
Prioritized treatments
•Based on reducing wildfire exposure to structures
•Maximum 5000 acres treated per project area
•Minimum of 200 MBF per stand must be merchantable
•Stands must be manageable (based on PAD)
•Projects prioritized within each Fireshed for western US only
•12,890 firesheds; ca. 30,000 projects

Prioritized Treatment Locations **Planned Treatments**

Load Scenario Planning Outputs

Morrison, Colorado (Fireshed 1853)

Percent Ownership

Community Exposure (Fireshed Registry)

Morrison, CO

Community Area (ac):	Total # of Structures (Avg):	Acres Burned (Annual Avg):	Structures Exposed (Annual Avg):
11,073	10	10.15	7.71

Percent Ownership

Community Ownership **Percent Fuel Type**

Top 5 Worst Simulated Fires (Highest Structure Exposure)

Community Structures	Community Acres Burned
596	7,092
596	7,092
596	7,092
596	7,092
596	7,092

Community Exposure (Fireshed Registry)

Morrison, CO

Community Area (ac):	Total # of Structures (Avg):	Acres Burned (Annual Avg):	Structures Exposed (Annual Avg):
11,073	10	10.15	7.71

Percent Ownership

Community Ownership **Percent Fuel Type**

Top 5 Worst Simulated Fires (Highest Structure Exposure)

Community Structures	Community Acres Burned
596	7,092
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596	7,092

Planned Treatments

Project Area TREATMENTS

Project Area ID 18,587
Total Area (ac): 29,487.05
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Nested Dashboard Advantage

Stacked Tables and Charts

FIRE & TREATMENT HISTORY

LARGEST HISTORICAL FIRES, 1992-2015

Fire Name	Year	Size (ac)
BUFFALO CREEK	1996	11,875
HIGH	2000	10,800
LOWER NORTH	2012	4,142
SNAKING	2002	2,312
LIME GULCH	2013	511

FIRE & TREATMENT TOTALS, 2010-2015

Prescribed Fire:	Mechanical:	Mastication:
2,171.68 ac.	2,906.25 ac.	602.24 ac.

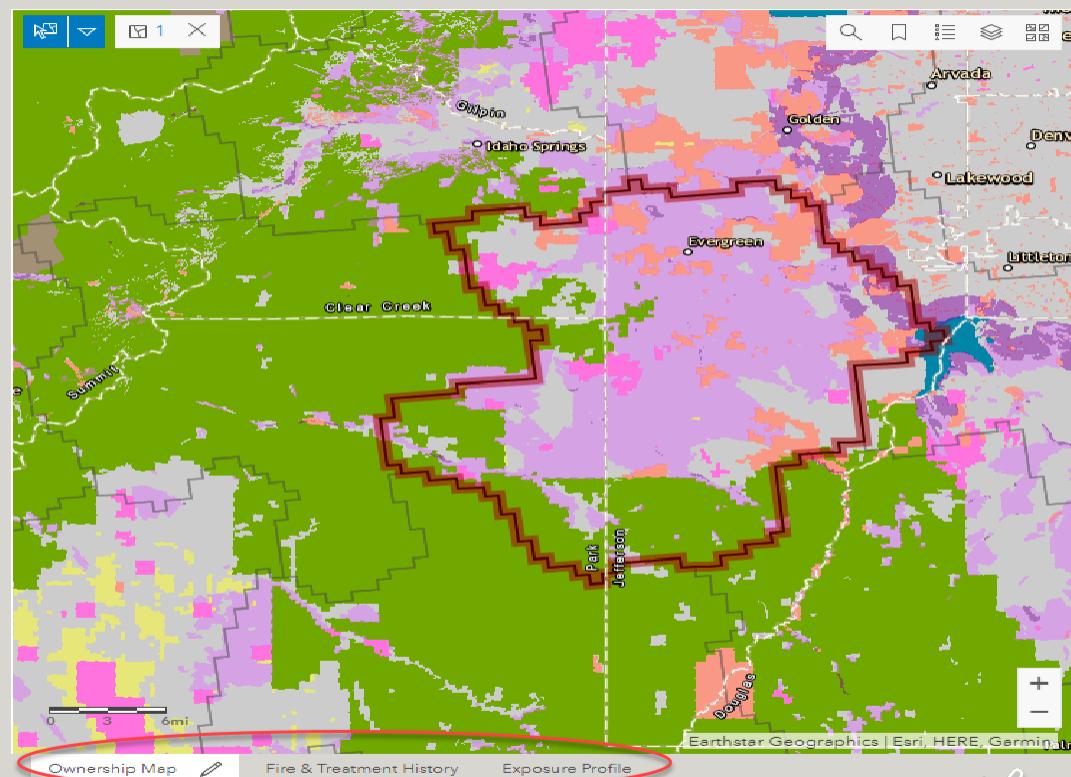
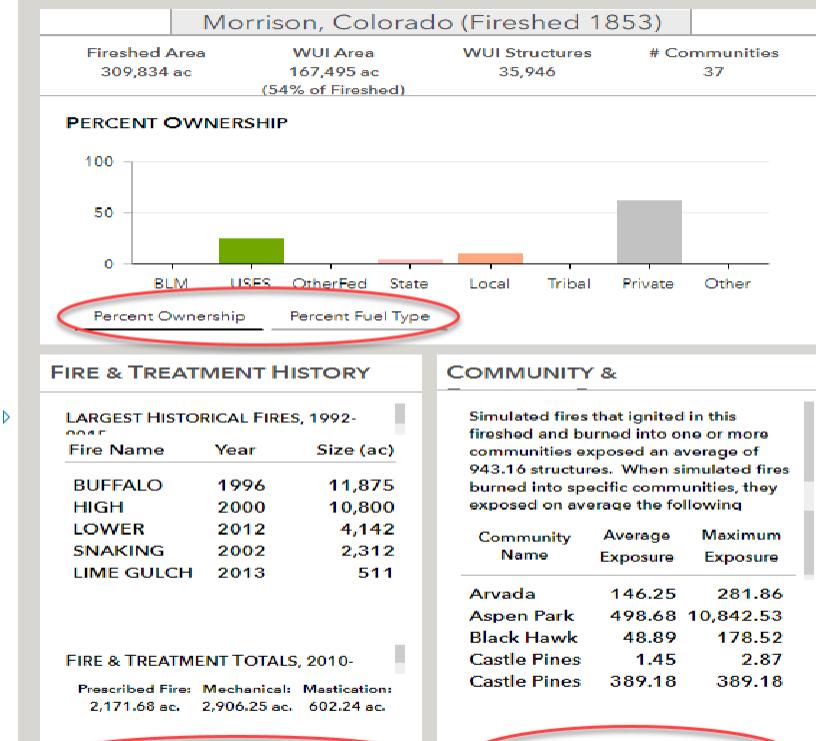
Historical Treatments Historical Fires

COMMUNITY & EXPOSURE PROFILE

Simulated fires that ignited in this fireshed and burned into one or more communities exposed an average of 943.16 structures. When simulated fires burned into specific communities, they exposed on average the following number of structures:

Community Name	Average Exposure	Maximum Exposure
Arvada	146.25	281.86
Aspen Park	498.68	10,842.53
Black Hawk	48.89	178.52
Castle Pines	1.45	2.87
Castle Pines North	389.18	389.18

Modeled Exposure Worst Simulated Fires



Integrated Single Dashboard

Slack | general | USFS Scenario Pl. | BEST 28 UML Tools in 2021 | Content | Firedesh Registry (v2) | Firedesh Registry | Current & Historical Conditions | Historical_Treatments_and_Histo... | +

usfs.maps.arcgis.com/apps/opsdashboard/index.html#/81d50aaa4c349fc83452c7f8ff0bf97?mode=edit

Apps ConnectHR ArcGIS Online DEMO APP (NRM C... DevTest Citrix Google Maps Learn more about C... NRM Compass NRM Prod Citrix OSU TeamForge Imported From IE Research Projects

Home Firedesh Registry (v2) Mike

Firedesh Registry Dashboard

Firedesh Registry

The **Firedesh Registry** is a geospatial dashboard built to organize information about wildfire transmission to communities and monitor progress towards risk reduction from management investments. The Registry is a unique approach to bring together a time window of information - past, present, and predicted future, to describe risk trajectories on lands where destructive wildfires are likely to originate. The dashboard provides an interactive system to view information on:

1. Context (Ownership, Fuels, and Buildings),
2. History (Fires and Treatments),
3. Projected wildfire risk (Simulated Fires),
4. Planned future treatments (5-year action plans), and
5. Prioritized treatment
6. Community zones and exposure

The proposed treatments are the results of one possible strategy, based on the scenario investment planning model. Panels with a yellow background have clickable records that will allow you to filter the features shown on the map.

To get started with this interface, **highlight the selection tool** in the top-left corner of this map, zoom in, and then click on your area of interest. If more than one "firedesh" is selected, please re-select just a single firedesh.

The **Scenario Investment Planning Platform** provides more information on the development of Firedeshs and the data shown here.

"Wildfire transmission to communities" occurs when fires start on public lands and grow into private lands where structures are exposed to wildfire risk.

Start Here Highlight the selection tool, zoom in, and pick a single firedesh to explore.

45 Actions based on one feature selection

National forest Non-source area / Source area Exposed area / Non-exposed area

Community

Navigator Overview Ownership & Fuels Historic Fires & Treatments Simulated Fires Planned/Proposed - Treatments Communities

8:59 AM

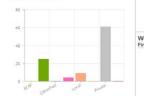
Fireshed Registry Dashboard

Summary for:
Morrison, Colorado (Fireshed 1853)

Fireshed Conditions

Total Protected Area (acres): 209,812
Potential Projects: 193,320
Building exposure (per year): 2,089Communities: Five fireshed in this fireshed
expose buildings in these communities:Community: Arg. Forest
Farmstead
Gardens
Aspen Park
Castle Pines North

PERCENT OWNERSHIP



Navigator Overview Ownership & Fuels Hazardous Fires & Treatments Simulated Fires Planned/Prescribed Treatments Communities

Fire & Treatment Dashboard

FIRE & TREATMENT HISTORY

Fire Name: BUFFALO CREEK

Year: 1996

Size (ac): 9,792

Fire Name: HIGH MEADOWS

Year: 2000

Size (ac): 9,607

Fire Name: LOWER NORTH FORK

Year: 2002

Size (ac): 2,089

Source: MTBS

FIRE & TREATMENT TOTALS: 2010-2019

Measure: Prescribed Fire

Total Prescribed: 2,317 ac.

Avg. Presc. 1,515 ac.

Percent: 1%

Pct. Area: 0%

Hazardous Fire: 2,472 ac.

Avg. Hazard. 785 ac/yr.

Non-Hazardous: 735 ac/yr.

Avg. Non-Hazard.

Non-Hazardous:



SIMULATED FIRES (Highest Exposure)

Reference #	Acres	Buildings Exposed
9607	479,874	34,646
9752	550,975	30,514
9740	418,032	26,322
9764	263,814	25,496
9692	459,770	25,271
9755	265,436	23,255
9688	231,065	23,250
9594	175,528	23,109
9640	276,568	23,079
9705	670,786	21,032
9753	175,906	20,286
9686	261,526	19,333
9737	380,239	18,364
9785	229,966	17,985
9802	191,560	17,147

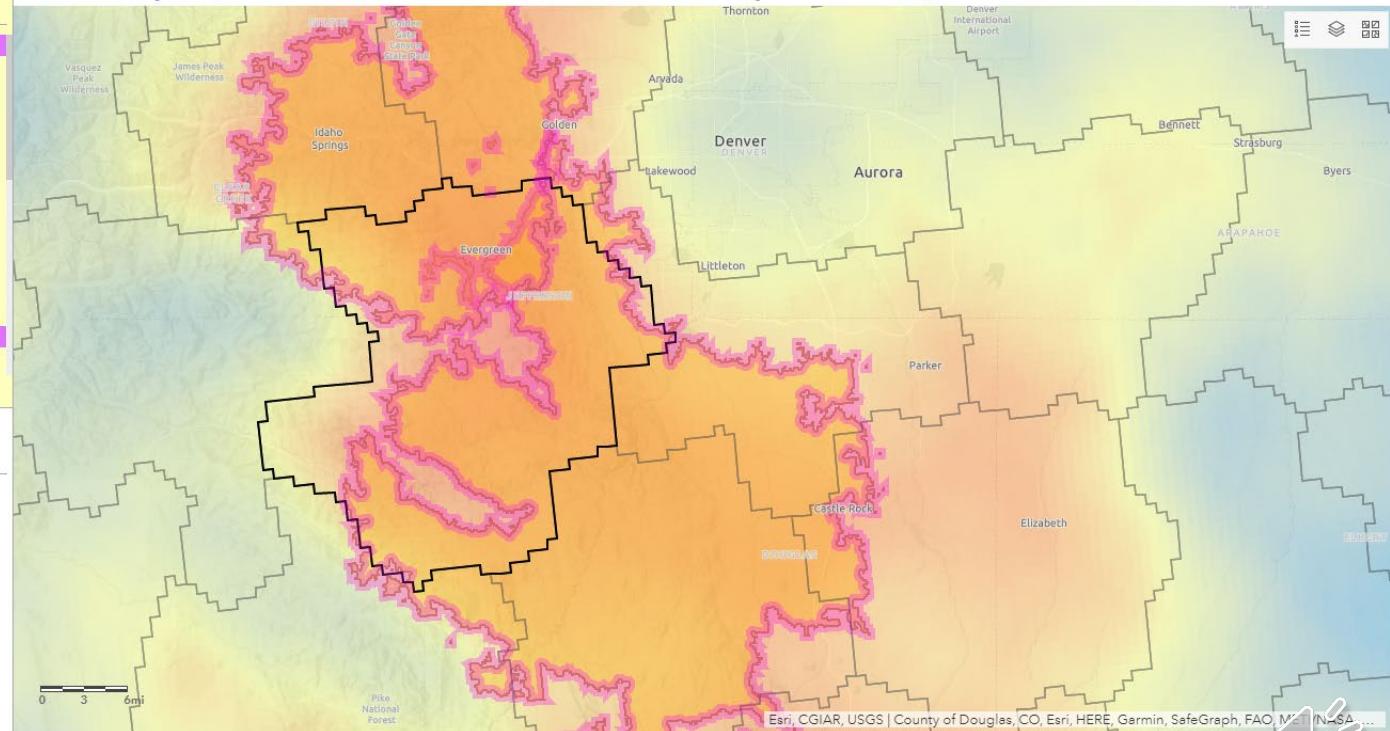
Description: Simulated fires are generated by [FSim](#).

AFFECTED COMMUNITIES

Community	Exposed Buildings (Average & Max)
Evergreen	998.6 18,913
Fairmount	540.34 1,509
Genesee	510.84 2,709
Aspen Park	498.68 10,843
Castle Pines	389.18 389
Indian Hills	374.14 2,999
Dakota Ridge	365.23 1,529
Ken Caryl	286.01 2,650
Roxborough	260.47 3,545
Kittredge	246.21 1,652

"Average" exposure only includes simulation years that had some exposure.

What is a plausible extreme fire event for this landscape across 10,000 fire seasons?



In the table to the left, click on one or more fires to see individual fire perimeter(s) on the map.

"Average" structure exposure is based on exposure in years with fire. All years are not included.



Tip #1 - Dashboard Reference with Context



Fireshed Morrison, Colorado (Fireshed #1,853) ▾



Post-Treatment Conditions

Fireshed area treated (ac.):

63,436

Number of projects implemented:

12

Exposure Treated (per year):

40,4728

Portion of fireshed treated:

20.5%

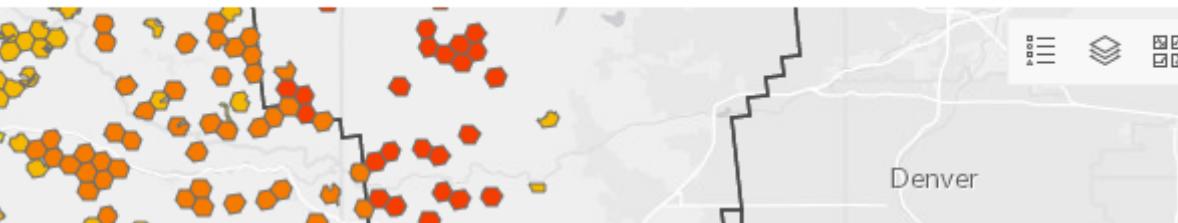
Harvest volume:

Not Available

The [Fireshed Investment Portal](#) shows projects prioritized by fireshed and project area for each Region or State. Projects are ranked by their ability to treat exposure from USFS fires.

40
12
20

Treatments suggested by the Scenario Planning model to treat wildfire



PROJECT AREA TREATMENTS

Project Area ID 18586

Total Area (ac.): 24,787

Area Treated (ac.): 6,425

Reduction in Exposure (buildings): 4.38292

Treated Volume: Not Available

Project Area ID 18587

Total Area (ac.): 29,687



List

Data

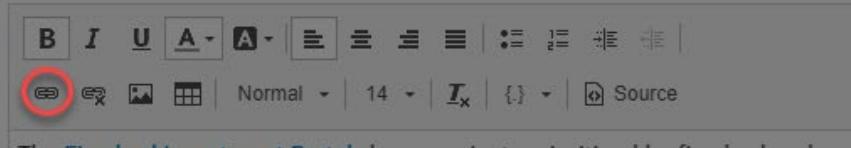
List

General

Actions

List Options

Line Item Text



The [Fireshed Investment Portal](#) shows projects prioritized by fireshed and project area for each Region or State. Projects are ranked by their ability to treat exposure from USFS fires.

```
div p span span strong a
```

Line Item Icon

None

The [Fireshed Investment Portal](#) shows projects prioritized by fireshed and project area for each Region or State. Projects are ranked by their ability to treat exposure from USFS fires.

Link

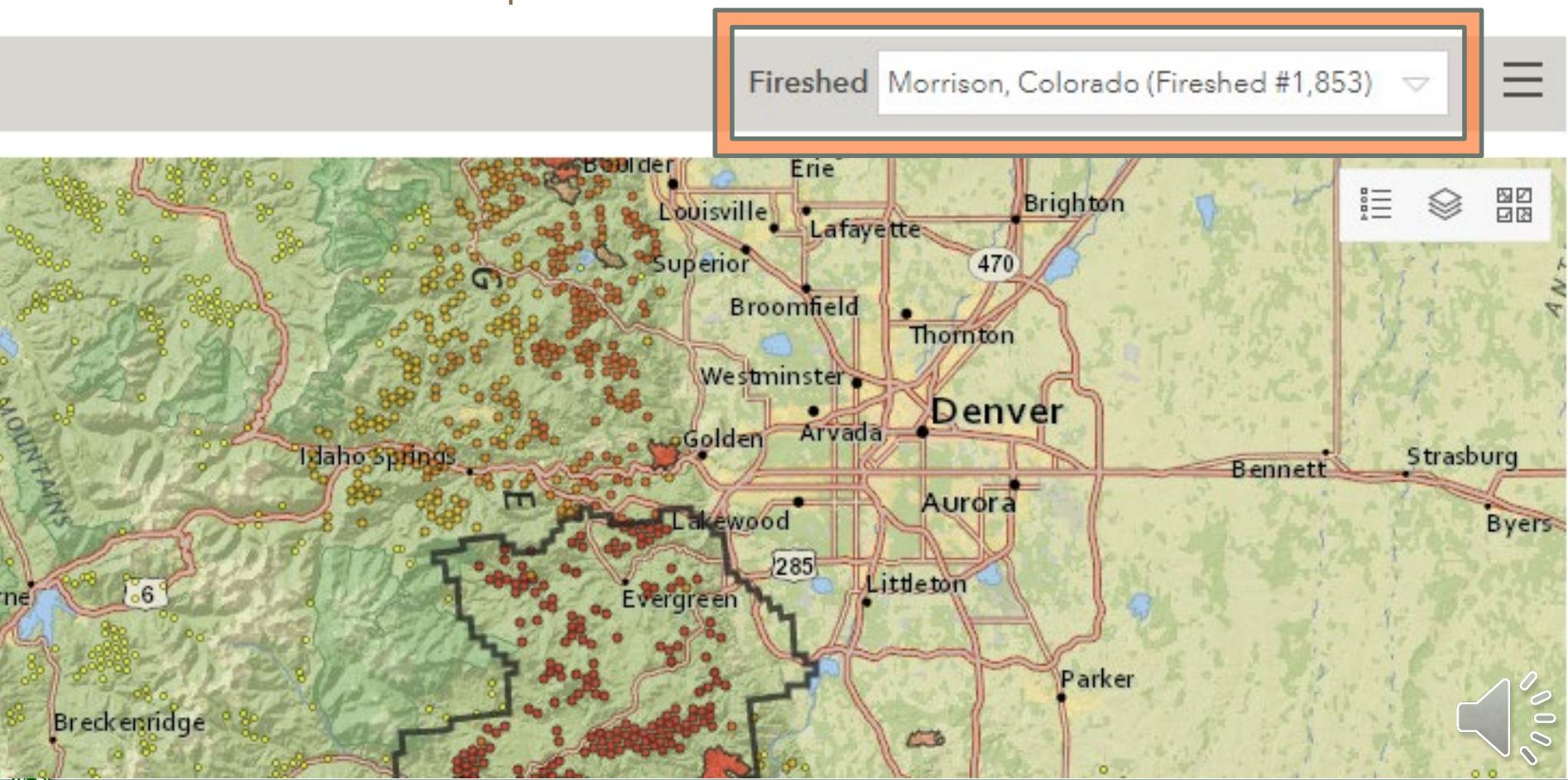
Display Text

Link Type

Protocol

URL

Tip #2 Feature Classes not Data Tables



Recap

Nested Design

- Multiple stacked windows
- Embedded content with URL parameters
- Reduced bandwidth

Integrated Design

- One window for stacked panels
- Call all actions from one map selection
- Components can continue to interact



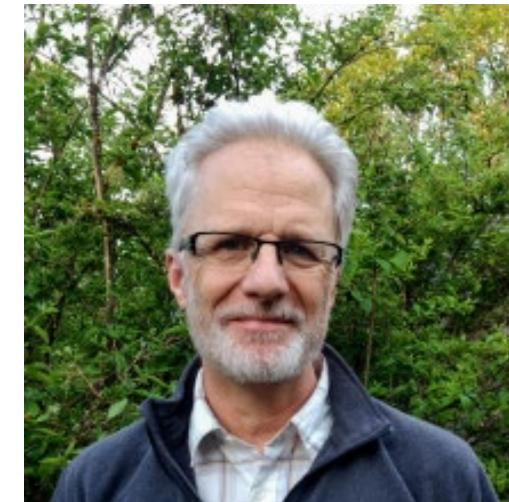
Questions?



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