

# ICS-209-PLUS: An All-hazards dataset mined from the US National Incident Management System 1999-2020

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## ABSTRACT

The dataset mined from the public archive (1999 to 2020)<sup>1</sup> of the U.S. National Incident Management System/Incident Command System (NIMS/ICS) Incident Status Summary Forms contains a total of 185,956 reports for 35,174 incidents, including 34,418 wildfires. This system captures detailed information on incident management costs, personnel, hazard characteristics, values at risk, fatalities, and structural damage. Most (98.4%) are fire-related, followed in decreasing order by Hurricane, hazardous materials, flood, tornado, search and rescue, civil unrest, and winter storms. The dataset is linked with multiple wildfire products including the Fire Occurrence Database (FOD)<sup>2</sup>, Manufacturing Trends in Burn Severity (MTBS)<sup>3</sup>, and the Fire Events Delineated database (FIRED)<sup>4</sup>. Key variables are aggregated spatially at the county, tract, and block group levels for spatial analysis.

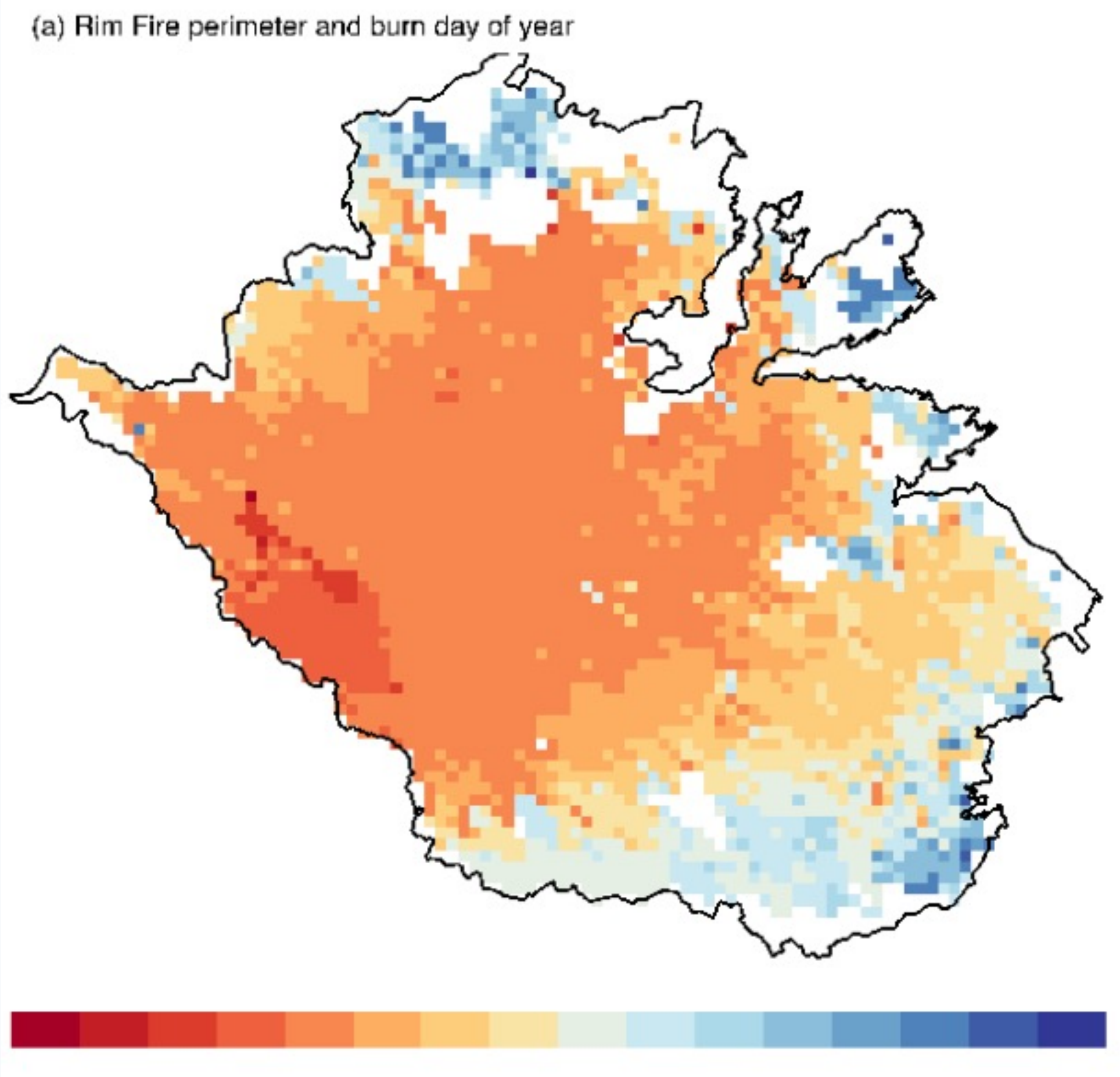
## What is an ICS-209 Incident Status Report?

The ICS-209 Form is used for reporting and supports decision-making at all levels above the incident. It captures detailed information for each operational period or when information becomes outdated.

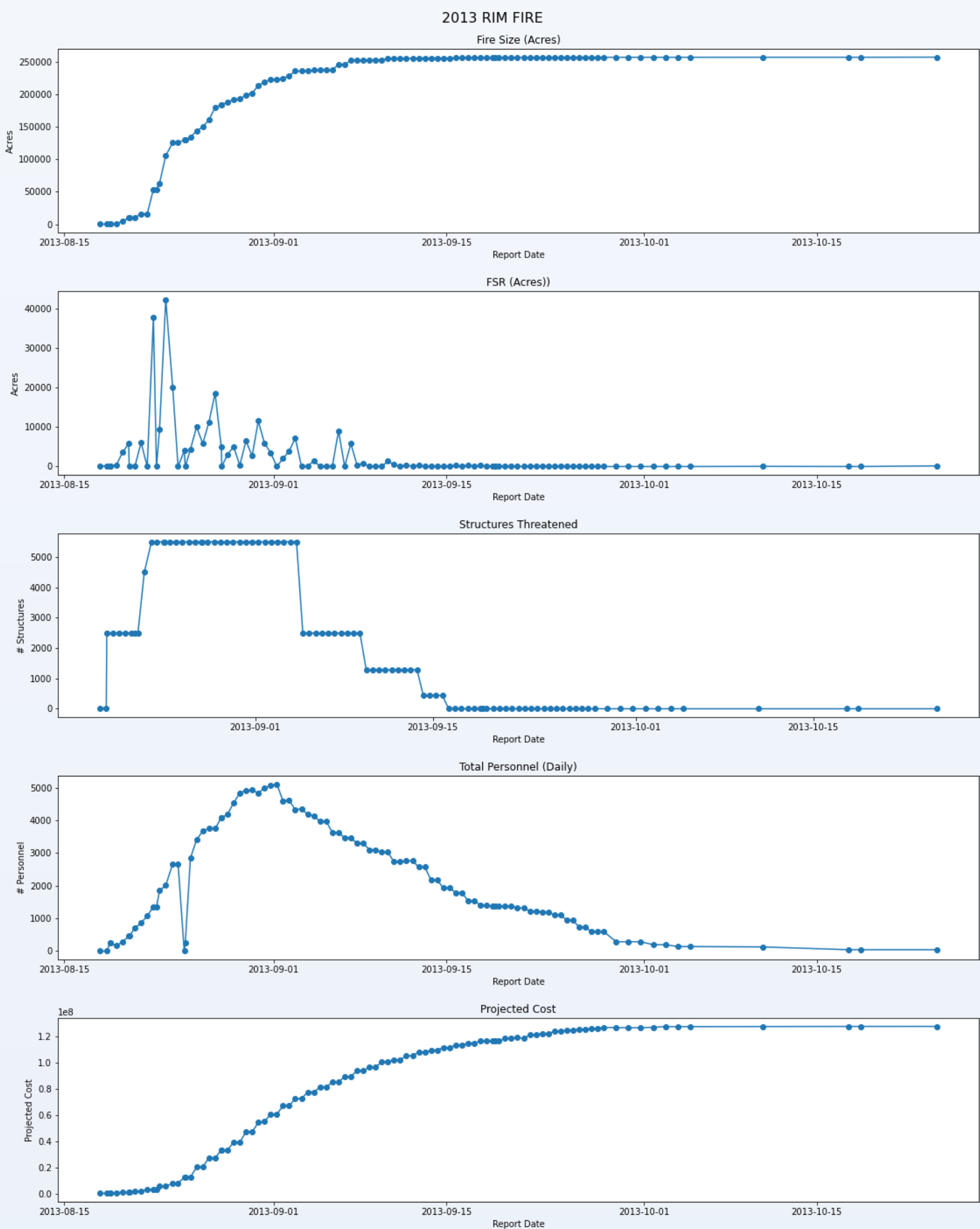
1. Incident Name 2. Incident Number 3. Incident Type 4. Incident Location 5. Incident Status 6. Incident Date 7. Incident Time 8. Incident Location 9. Incident Location 10. Incident Location 11. Incident Location 12. Incident Location 13. Incident Location 14. Incident Location 15. Incident Location 16. Incident Location 17. Incident Location 18. Incident Location 19. Incident Location 20. Incident Location 21. Incident Location 22. Incident Location 23. Incident Location 24. Incident Location 25. Incident Location 26. Incident Location 27. Incident Location 28. Incident Location 29. Incident Location 30. Incident Location 31. Incident Location 32. Incident Location 33. Incident Location 34. Incident Location 35. Incident Location 36. Incident Location 37. Incident Location 38. Incident Location 39. Incident Location 40. Incident Location 41. Incident Location 42. Incident Location 43. Incident Location 44. Incident Location 45. Incident Location 46. Incident Location 47. Incident Location 48. Incident Location 49. Incident Location 50. Incident Location 51. Incident Location 52. Incident Location 53. Incident Location 54. Incident Location 55. Incident Location 56. Incident Location 57. Incident Location 58. Incident Location 59. Incident Location 60. Incident Location 61. Incident Location 62. Incident Location 63. Incident Location 64. Incident Location 65. Incident Location 66. Incident Location 67. Incident Location 68. Incident Location 69. Incident Location 70. Incident Location 71. Incident Location 72. Incident Location 73. Incident Location 74. Incident Location 75. Incident Location 76. Incident Location 77. Incident Location 78. Incident Location 79. Incident Location 80. Incident Location 81. Incident Location 82. Incident Location 83. Incident Location 84. Incident Location 85. Incident Location 86. Incident Location 87. Incident Location 88. Incident Location 89. Incident Location 90. Incident Location 91. Incident Location 92. Incident Location 93. Incident Location 94. Incident Location 95. Incident Location 96. Incident Location 97. Incident Location 98. Incident Location 99. Incident Location 100. Incident Location		30: Observed Weather for Current Operational Period Peak Gusts (mph): <b>30+</b> Max. Temperature: <b>100</b> Wind Direction: <b>SW &gt; E</b> Min. Relative Humidity: <b>11</b> 31: Fuels/Materials Involved: <b>4 Chaparral (6 Feet) Grass</b> 32: Today's observed fire behavior (leave blank for non-fire events): <b>Aggressive fire behavior due to Thunderstorm outflows. Flame lengths in excess of 25 feet</b> 33: Significant events today (closures, evacuations, significant progress made, etc.): <b>Evacuations, 19 fatalities</b> 34: Forecasted Weather for next Operational Period Wind Speed (mph): <b>5</b> Temperature: <b>92-102</b> Wind Direction: <b>SW</b> Relative Humidity: <b>14-19</b> 35: Estimated Control Date and Time:	
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## Why Does this Dataset Matter?

This dataset captures daily "snapshots" of the observed characteristics of a wildfire, response variables, societal impacts and values at risk – supporting new research for a *critical* population of wildfire in the US. These fires while only accounting for 1% of wildfire in the US, account for roughly 85% of suppression costs and 95% of acreage burned each year.



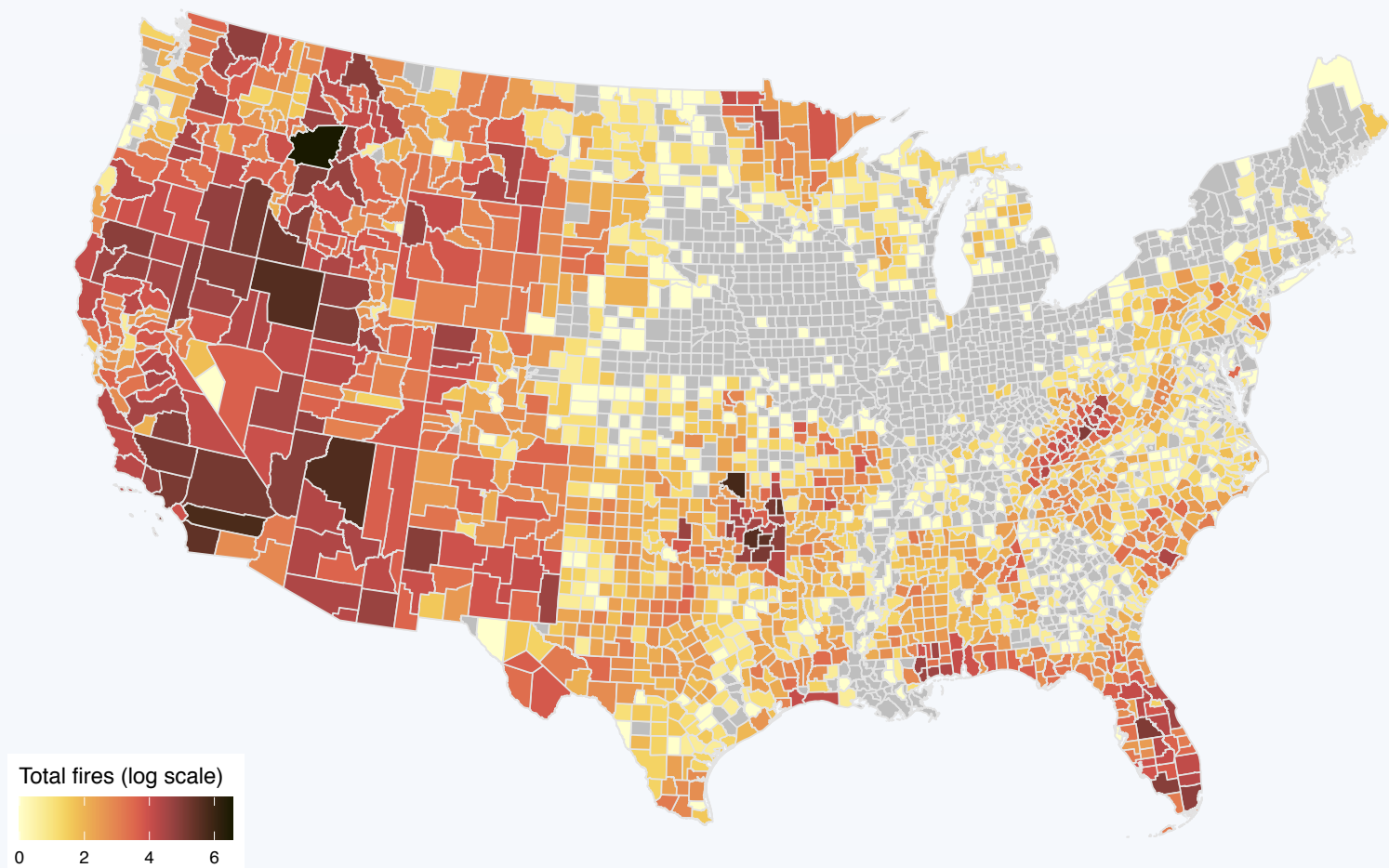
2013 Rim Fire: MTBS Perimeter (in black) and FIRED Daily Perimeters (in Color) shown above, Daily Statistics summarized below.



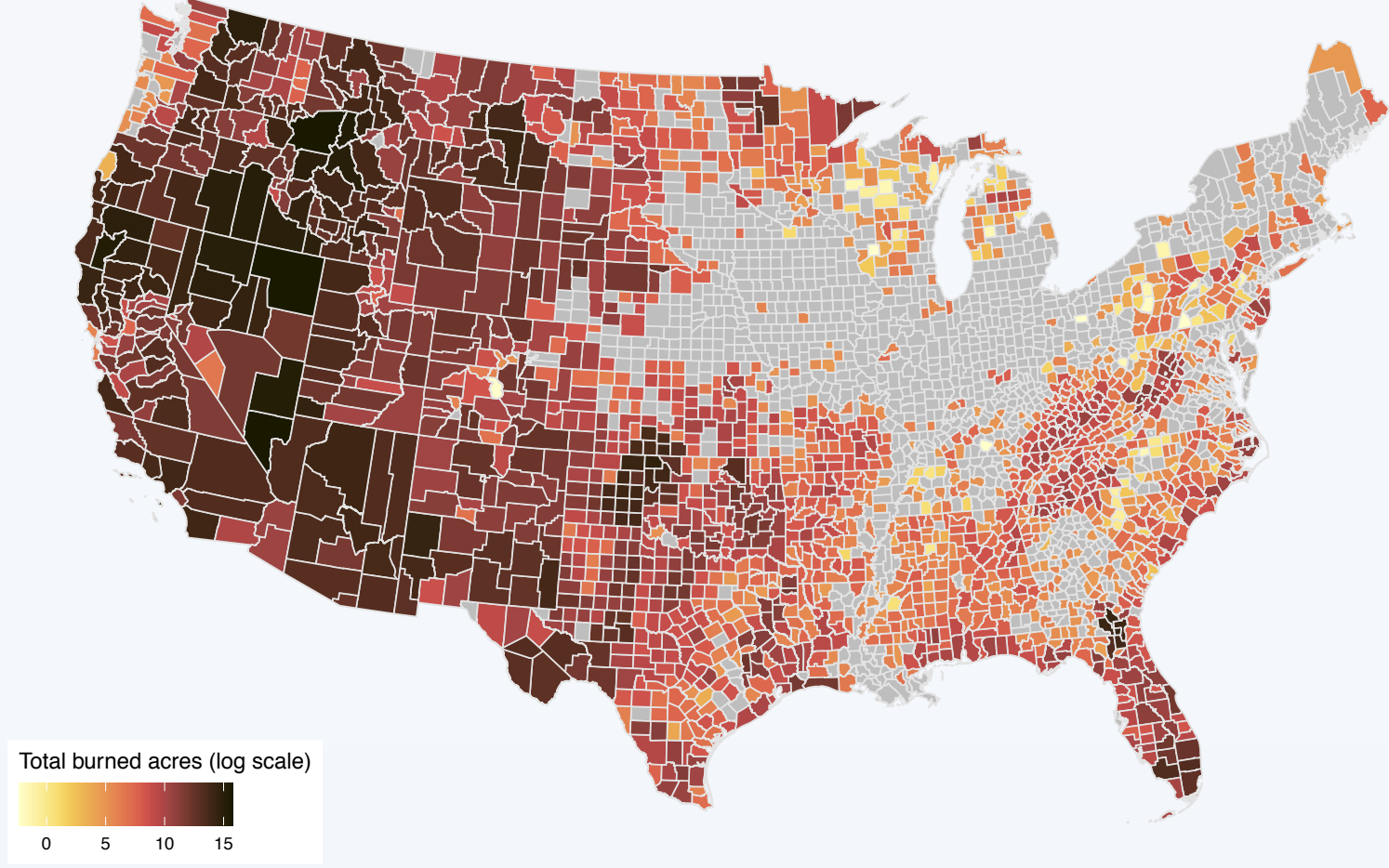
## ICS-209-PLUS-SPATIAL

The ICS-209-PLUS-Spatial dataset aggregates information at the county, tract, and block group level for analysis. These maps describe distribution of wildfires and key characteristics of wildfire impacts in the US/CONUS.

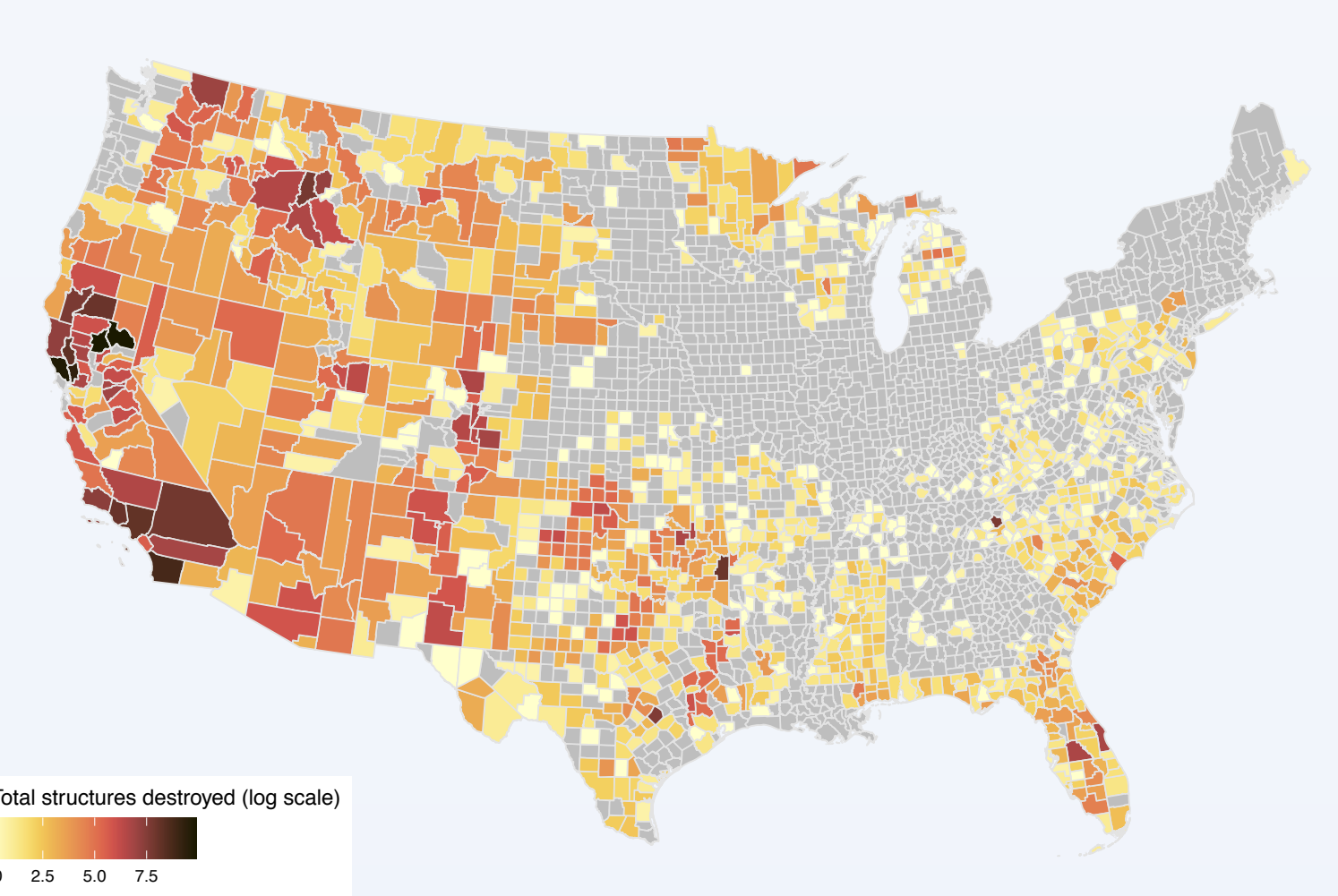
### Total Fires



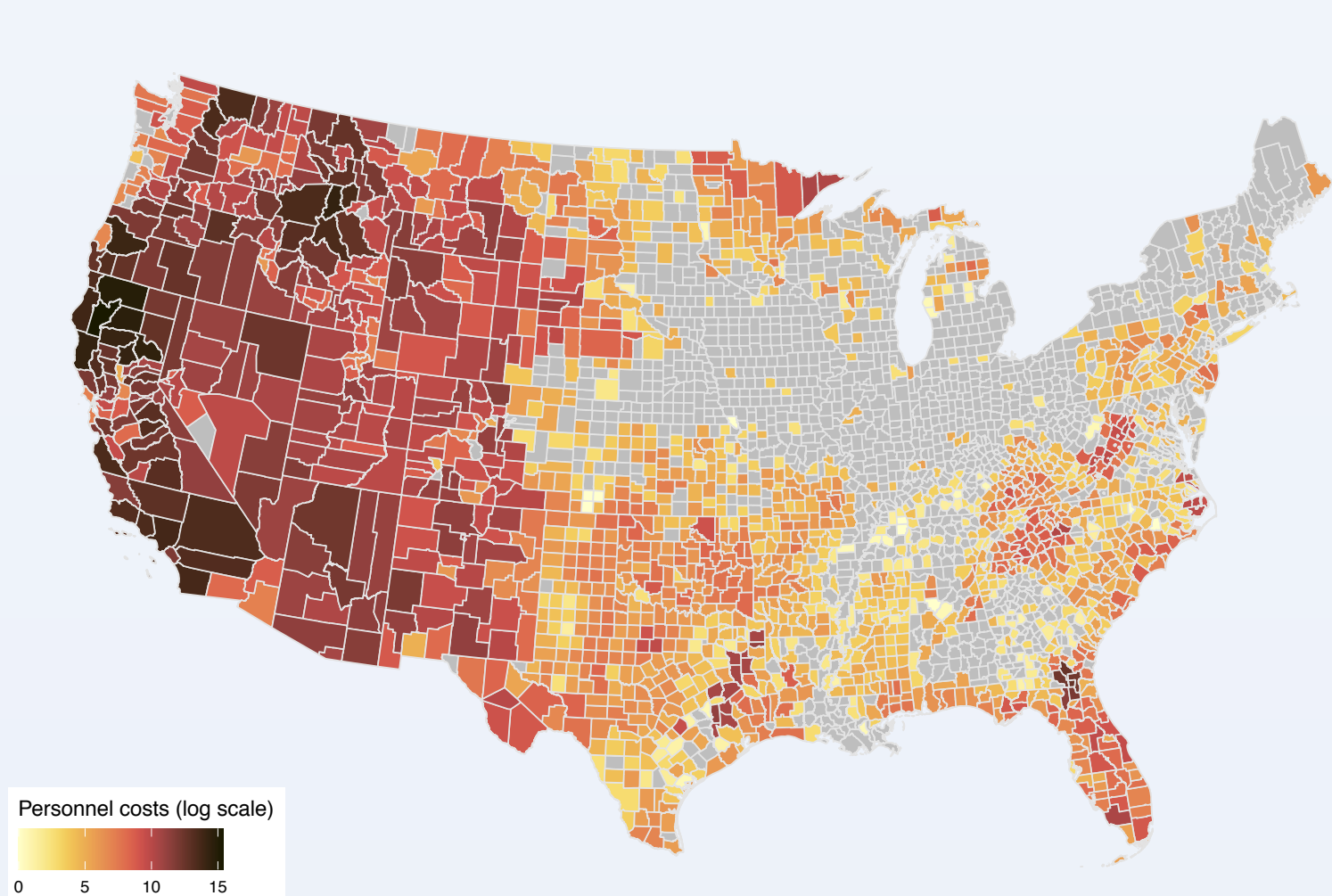
### Burned Area



### Structures Destroyed

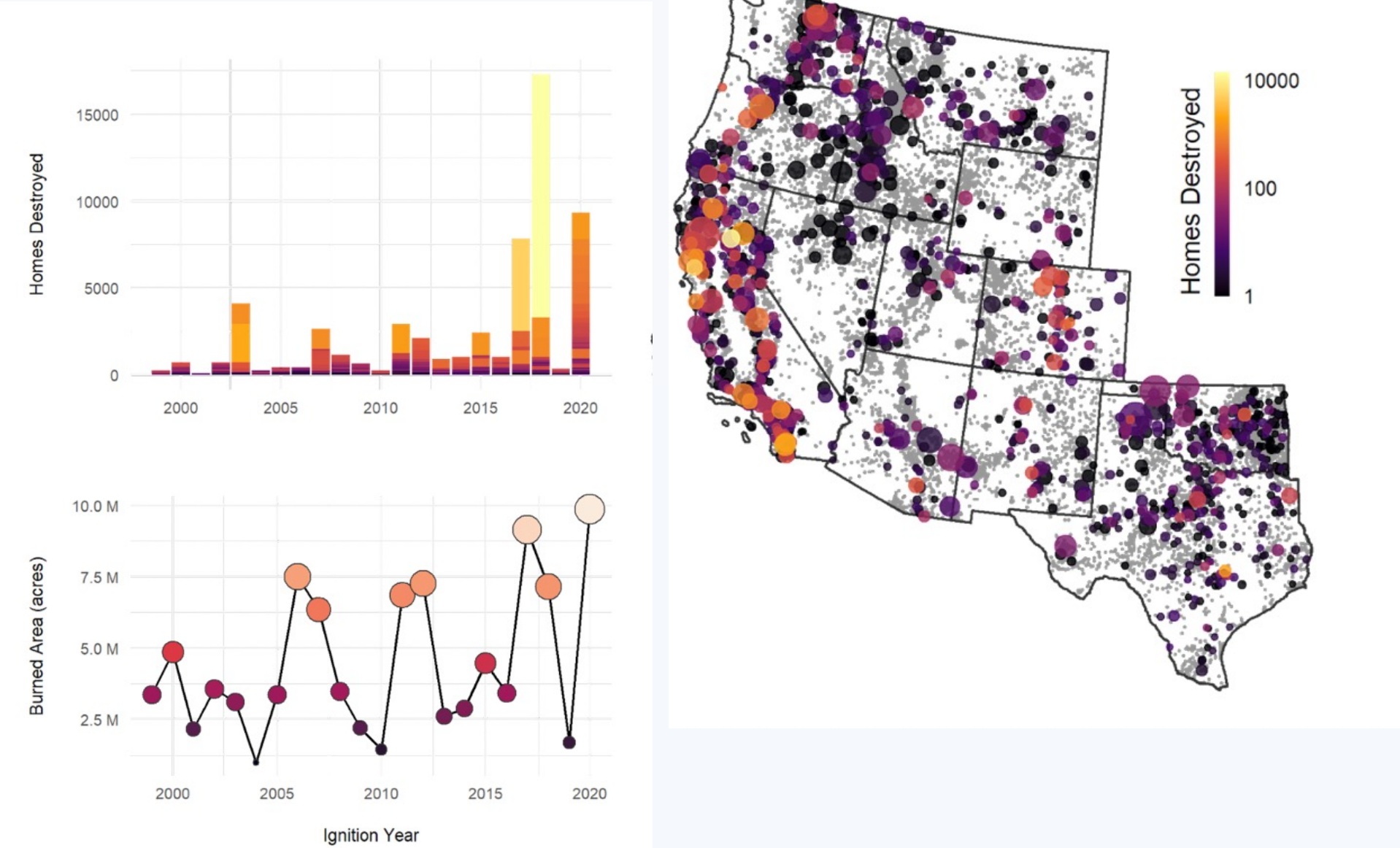


### Total Personnel

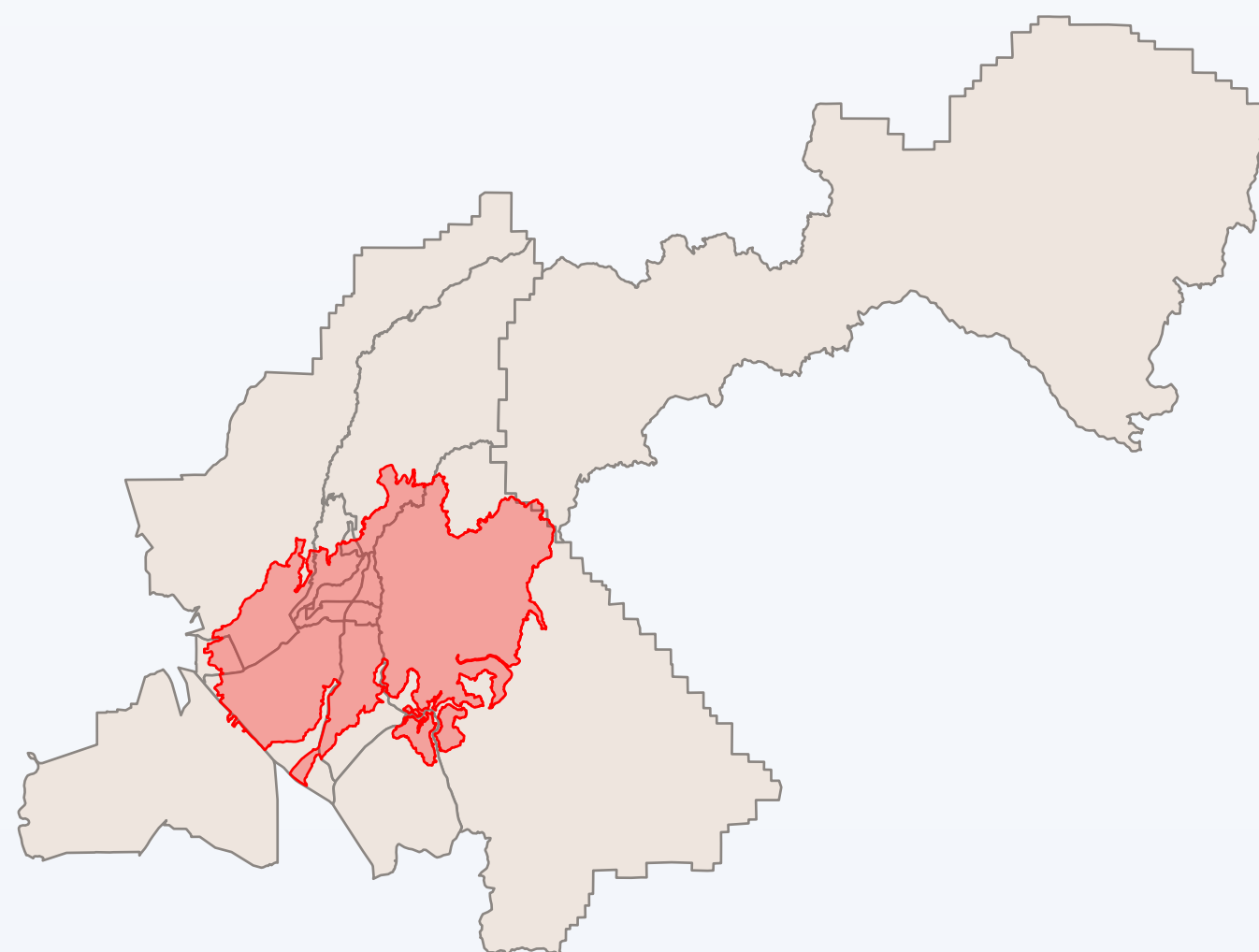


## APPLICATIONS

*Spatial and Temporal Distribution of Wildfire-Related Home Loss and Burned Area Across the Western U.S.*



*Effects of Wildfire Destruction on Migration*



## REFERENCES

St Denis, Lise A., et al. "All-hazards dataset mined from the US National Incident Management System 1999–2014." *Scientific data* 7.1 (2020): 1-18.

Short, Karen C. 2021. Spatial wildfire occurrence data for the United States, 1992-2018 [FPA\_FOD\_20210617]. 5th Edition. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2013-0009.5>

Eidenshink, Jeff, et al. "A project for monitoring trends in burn severity." *Fire ecology* 3.1 (2007): 3-21.

Balch, Jennifer K., et al. "Fired (Fire events delineation): An open, flexible algorithm and database of us fire events derived from the modis burned area product (2001–2019)." *Remote Sensing* 12.21 (2020): 3498.

Cook, Maxwell Cody. *Drivers of Wildfire-Related Home Loss Across the Western United States 2001-2018*. Diss. University of Colorado at Boulder, 2021.

McConnell, Kathryn, et al. "Effects of Wildfire Destruction on Migration, Consumer Credit, and Financial Distress." (2021).

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