

Future of Fire: Modelling Fires of Unusual Size

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- Fahrenheit (EPA).
- with a significant increase starting in the 2000s (NIFC).
- effects to predict wildfires.
- scenario.

- level 3 ecoregions of the continental U.S.?



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Model	Predicted Total Burn Area	Predicted Total # of Fires
CanESM2	226,242,751 (min:138,877,319; max: 543,397,052)	22,861 (min:15,702; max: 35,938)
CNRM_CM5	238,296,183 (min:151,698,454; max: 415,443,732)	22,333 (min:16,772; max: 34,043)
CSIRO	249,272,222 (min:168,281,042; max: 425,696,465)	24,201 (min:17,292; max: 39,593)
Had_CC	261,160,775 (min: 175,794,707; max: 392,785,962	26,421 (min:19,801; max: 38,099)
Had_ES	308,602,550 (min: 183,396,8001; max: 555,709,520)	29,508 (min:21,063; max: 44,647)
IPSL_MR	103,298,987 (min:6,578,3004; max: 290,167,381)	12,014 (min:8850; max: 29,964)
MIROC	232,486,171 (min:156,777,770; max (370,013,462)	24,304 (min:18,292; max: 33,974)
MRI	164,601,570 (min: 117,002,758; max: 548,737,948)	16,562 (min:12,576; max: 24,270)
Average	222,995,151	22,275
MTBS 1984-2019	117,050,395	12,217

Table 1. Median predicted total burned area (ha) and total number of fires from 2020-2060 for Contiguous US from 2000 iterations per model.

- 2060.
- times more fires than the IPSL.
- https://www.nifc.gov/fire-information/statistics/wildfires • Joseph, M.B., Rossi, M.W., Mietkiewicz, N.P., Mahood, A.L., Cattau, M.E., St. Denis, L.A., Nagy, R.C., Iglesias, V.,
- maxima. Ecological Applications, 29(6), p.e01898.
- GRIDMET Data: www.climatologylab.org/gridmet.html
- MACA Data: www.climatologylab.org/maca.html
- MTBS Data: mtbs.gov
- EPA Ecoregions: https://www.epa.gov/eco-research/ecoregions



Figure 3. Slope for the burned area of the largest fire for each level 3 ecoregion across 2020-2060 for all 8 model runs.

Conclusions

Top 3 ecoregions ranked by predicted total number of fires: Central Basin and Range, Northwestern Great Plains, and Northern Basin and Range.

• Northwestern Great Plains had the highest slope of the 3 top ecoregions. The Canadian Rockies have the largest slope in fire size across models, with the second largest occurring in the Northern Cascades.

Across models, the ecoregions with the largest slope in maximum burned area, due to having the largest projected burned area from a single event, are the Arizona/New Mexico Mountains & Central Basin and Range.

Doubling of number of fire events and total burned area across continental U.S. by

The IPSL and MRI models predicted significantly fewer fires than the other models for the continental U.S., with the Had_ES model predicting approximately 2.5

References

https://www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature

Abatzoglou, J.T. and Balch, J.K., 2019. Spatiotemporal prediction of wildfire size extremes with Bayesian finite sample

ICLUS Data: https://www.epa.gov/gcx/iclus-fourth-national-climate-assessment