

Wildfire Hazard Potential for the United States (270-m), version 2020

Metadata:

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- [Distribution Information](#)
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Identification Information:

Citation:

Citation Information:

Originator: Dillon, Gregory K.

Originator: Gilbertson-Day, Julie W.

Publication Date: 2020

Title:

Wildfire Hazard Potential for the United States (270-m), version 2020

Edition: 3rd

Geospatial Data Presentation Form: raster digital data

Publication Information:

Publication Place: Fort Collins, CO

Publisher: Forest Service Research Data Archive

Other Citation Details:

This dataset is the continuous WHP index for the conterminous United States (CONUS).

Online Linkage: <https://doi.org/10.2737/RDS-2015-0047-3>

Description:

Abstract:

This dataset is the continuous wildfire hazard potential (WHP) index for the conterminous United States (CONUS). WHP is an index that quantifies the relative potential for wildfire that may be difficult to control, used as a measure to help prioritize where fuel treatments may be needed.

This 2020 version of WHP was created as part of the Wildfire Risk to Communities project (<https://wildfirerisk.org>) and this dataset is a 270-m resolution companion to the WHP published in Scott et al. (2020). Vegetation and wildland fuels data from LANDFIRE 2014 (version 1.4.0) form the foundation for this version of the WHP. As such, the data presented here reflect landscape conditions as of the end of 2014. National wildfire hazard datasets of annual burn probability and fire intensity were generated from the LANDFIRE 2014 data by the USDA Forest Service, Rocky Mountain Research Station (Short et al. 2020) using the large fire simulation system (FSim). We also used

LANDFIRE 2014 vegetation and fuels data directly in the WHP mapping process, as well as point locations of fire occurrence ca. 1992 - 2015 (Short 2017). With these datasets as inputs, we produced an index of WHP for all of the conterminous United States at 270-m resolution. We present the final WHP map in two forms: 1) continuous integer values, and 2) five WHP classes of very low, low, moderate, high, and very high. On its own, WHP is not an explicit map of wildfire threat or risk, but when paired with spatial data depicting highly valued resources and assets such as structures or powerlines, it can approximate relative wildfire risk to those specific resources and assets. WHP is also not a forecast or wildfire outlook for any particular season, as it does not include any information on current or forecasted weather or fuel moisture conditions. It is instead intended for long-term strategic fuels management.

Purpose:

Federal wildfire managers often want to know, over large landscapes, where wildfires are likely to occur and how intense they may be. To meet this need we developed a map that we call wildfire hazard potential (WHP) - a raster geospatial product that can help to inform evaluations of wildfire risk or prioritization of fuels management needs across very large spatial scales (millions of acres). Our specific objective with the WHP map was to depict the relative potential for wildfire that would be difficult for suppression resources to contain.

Supplemental Information:

This data publication is a third edition. Previous versions of this publication prior to 2014 were known as Wildland Fire Potential (WFP). These new data represent an update to all previous versions of WHP or WFP published by the USDA Forest Service. Previous versions have only covered the conterminous United States. This most recent version includes data for Hawaii and Alaska for the first time, as well as the conterminous United States, and data are provided as both continuous and classified in a single publication.

To check for the latest version of the WHP geospatial data and map graphics, as well as documentation on the mapping process, see: <https://www.firelab.org/project/wildfire-hazard-potential>.

Details about the Wildfire Hazard Potential mapping process can be found in Dillon et al. (2015). Steps described in this paper about weighting for crown fire potential were dropped in the 2018 and 2020 versions due to changes to the FSim modeling products used as the primary inputs to WHP mapping.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 20150101

Currentness_Reference:

Ground condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

Spatial_Domain:

Description_of_Geographic_Extent:

Bounding_Coordinates:

West_Bounding_Coordinate: -127.97220

East_Bounding_Coordinate: -65.26221

North_Bounding_Coordinate: 51.63280

South_Bounding_Coordinate: 22.76568

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: environment

Theme_Keyword: geoscientificInformation

Theme_Keyword: society

Theme_Keyword: structure

Theme:

Theme_Keyword_Thesaurus: National Research & Development Taxonomy

Theme_Keyword: Ecology, Ecosystems, & Environment

Theme_Keyword: Fire

Theme_Keyword: Fire detection

Theme_Keyword: Fire ecology

Theme_Keyword: Fire effects on environment

Theme_Keyword: Fire suppression, pre-suppression

Theme_Keyword: Prescribed fire

Theme_Keyword: Environment and People

Theme_Keyword: Forest management

Theme_Keyword: Landscape management

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: burn probability

Theme_Keyword: hazard

Theme_Keyword: fuels management

Theme_Keyword: fire suppression

Theme_Keyword: fire likelihood

Theme_Keyword: fire planning

Theme_Keyword: risk assessment

Theme_Keyword: wildfire hazard potential

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: conterminous United States

Place_Keyword: United States

Place_Keyword: CONUS

Access_Constraints: None

Use_Constraints:

These data were collected using funding from the U.S. Government and can be used without additional permissions or fees. If you use these data in a publication, presentation, or other research product please use the following citation:

Dillon, Gregory K; Gilbertson-Day, Julie W. 2020. Wildfire Hazard Potential for the

United States, version 2020 (270m). 3rd Edition. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2015-0047-3>.

The data presented here are the product of modeling, and as such carry an inherent degree of error and uncertainty. Users are strongly encouraged to read and fully comprehend the metadata and other available documentation prior to data use. No warranty is made by the Originator as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by the Originator. These datasets are intended to provide nationally-consistent information for the purpose of comparing relative wildfire risk among communities nationally or within a state or county. Data included here are not intended to replace locally-calibrated state, regional, or local risk assessments where they exist. It is the responsibility of the user to be familiar with the value, assumptions, and limitations of these national data publications. Managers and planners must evaluate these data according to the scale and requirements specific to their needs. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

Point_of_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Gregory K. Dillon

Contact_Organization: USDA Forest Service, Fire Modeling Institute (FMI)

Contact_Position: Spatial Fire Analyst

Contact_Address:

Address_Type: mailing and physical

Address: Missoula Fire Sciences Laboratory

Address: 5775 US Hwy 10 W

City: Missoula

State_or_Province: MT

Postal_Code: 59808

Country: USA

Contact_Voice_Telephone: 406-829-6783

Contact_Electronic_Mail_Address: greg.dillon@usda.gov

Data_Set_Credit:

Funding for this project provided by USDA Forest Service, Fire and Aviation Management. Funding also provided by USDA Forest Service, Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily completed by Pyrologix, LLC under contract with the USDA Forest Service, Fire Modeling Institute.

Cross_Reference:

Citation_Information:

Originator: Scott, Joe H.

Originator: Gilbertson-Day, Julie W.

Originator: Moran, Christopher

Originator: Dillon, Gregory K.

Originator: Short, Karen C.

Originator: Vogler, Kevin C.

Publication_Date: 2020

Title:

Wildfire Risk to Communities: Spatial datasets of landscape-wide wildfire risk components for the United States

Geospatial_Data_Presentation_Form: raster digital data

Publication_Information:

Publication_Place: Fort Collins, CO

Publisher: Forest Service Research Data Archive

Online_Linkage: <https://doi.org/10.2737/RDS-2020-0016>

Cross_Reference:

Citation_Information:

Originator: Short, Karen C.

Originator: Finney, Mark A.

Originator: Vogler, Kevin C.

Originator: Scott, Joe H.

Originator: Gilbertson-Day, Julie W.

Originator: Grenfell, Isaac C.

Publication_Date: 2020

Title:

Spatial dataset of probabilistic wildfire risk components for the United States (270m)

Edition: 2nd

Geospatial_Data_Presentation_Form: raster digital data

Publication_Information:

Publication_Place: Fort Collins, CO

Publisher: Forest Service Research Data Archive

Online_Linkage: <https://doi.org/10.2737/RDS-2016-0034-2>

Cross_Reference:

Citation_Information:

Originator: Short, Karen C.

Publication_Date: 2017

Title:

Spatial wildfire occurrence data for the United States, 1992-2015 [FPA_FOD_20170508]

Edition: 4th

Geospatial_Data_Presentation_Form: raster digital data

Publication_Information:

Publication_Place: Fort Collins, CO

Publisher: Forest Service Research Data Archive

Online_Linkage: <https://doi.org/10.2737/RDS-2013-0009.4>

Cross_Reference:

Citation_Information:

Originator: Dillon, Gregory K.

Originator: Menakis, James

Originator: Fay, Frank

Publication_Date: 2015

Title:

Wildland fire potential: A tool for assessing wildfire risk and fuels management needs

Geospatial_Data_Presentation_Form: conference proceedings

Other_Citation_Details:

p. 60-76

Online_Linkage: <https://www.treesearch.fs.fed.us/pubs/49429>

Larger_Work_Citation:

Citation_Information:

Originator: Keane, Robert E.

Originator: Jolly, Matt

Originator: Parsons, Russell

Originator: Riley, Karin

Publication_Date: 2015

Title:

Proceedings of the large wildland fires conference

Geospatial_Data_Presentation_Form: conference proceedings

Series_Information:

Series_Name: Proceedings

Issue_Identification: Proc. RMRS-P-73

Publication_Information:

Publication_Place: Fort Collins, CO

Publisher: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station

Other_Citation_Details:

May 19-23, 2014; Missoula, MT; 345 p.

Online_Linkage: <https://www.treesearch.fs.fed.us/pubs/49166>

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Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

The data described here are derived from wildfire simulation modeling, and their exact accuracy cannot be measured. They are intended to be relative measures of wildfire risk for planning purposes. The FSim datasets of burn probability and intensity used as primary inputs were objectively evaluated and calibrated against historic wildfire occurrence statistics within 136 distinct regions of contemporary wildfire activity (pyromes) across the United States (Short, Grenfell, Riley, and Vogler 2020). See Short et al. (2020) for a more detailed description of FSim calibration. Some LANDFIRE fuels and vegetation data used as inputs have also been evaluated for efficacy and calibrated to meet the objectives of LANDFIRE. More information can be found at: https://www.landfire.gov/lf_evaluation.php.

Short, Karen C.; Grenfell, Isaac C.; Riley, Karin L.; Vogler, Kevin C. 2020. Pyromes of the conterminous United States. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2020-0020>

Short, Karen C.; Finney, Mark A.; Vogler, Kevin C.; Scott, Joe H.; Gilbertson-Day, Julie W.; Grenfell, Isaac C. 2020. Spatial datasets of probabilistic wildfire risk components for

the United States (270m). 2nd Edition. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2016-0034-2>

Quantitative_Attribute_Accuracy_Assessment:

Attribute_Accuracy_Value: Unknown

Attribute_Accuracy_Explanation:

Quantitative accuracy cannot be evaluated.

Logical_Consistency_Report:

Pixel values in the WHP dataset for the United States are theoretically between 0 and 100,000. In practice, the maximum value is 98,085.

Completeness_Report:

All pixels that are part of the land and water of the United States have valid non-negative values.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Short, Karen C.

Originator: Finney, Mark A.

Originator: Vogler, Kevin C.

Originator: Scott, Joe H.

Originator: Gilbertson-Day, Julie W.

Originator: Grenfell, Isaac C.

Publication_Date: 2020

Title:

Spatial dataset of probabilistic wildfire risk components for the United States (270m)

Edition: 2nd

Geospatial_Data_Presentation_Form: raster digital data

Publication_Information:

Publication_Place: Fort Collins, CO

Publisher: Forest Service Research Data Archive

Online_Linkage: <https://doi.org/10.2737/RDS-2016-0034-2>

Type_of_Source_Media: Online

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 20150101

Source_Currentness_Reference:

Ground Condition

Source_Citation_Abbreviation:

FSim BP and FLPs (FLP1, FLP2, FLP3, FLP4, FLP5, FLP6)

Source_Contribution:

Burn probability (BP) and/or flame-length probabilities (FLPs) modeled with FSim were primary spatial inputs to datasets presented here. BP provided information about the overall probability of any 270-meter pixel experiencing a large fire of any intensity. FLPs provided information about the conditional probability of particular fire intensity levels (i.e., likelihood of a particular intensity level, given a fire) for every 270-meter pixel.

Source_Information:

Source_Citation:

Citation_Information:

Originator: LANDFIRE, U.S. Department of the Interior, Geological Survey

Publication_Date: 2017

Title:

LANDFIRE 1.4.0 40 Scott and Burgan Fire Behavior Fuel Models layer

Edition: 1.4.0

Geospatial_Data_Presentation_Form: raster digital data

Other_Citation_Details:

Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p. <https://doi.org/10.2737/rmrs-gtr-153>

Online_Linkage: <https://landfire.cr.usgs.gov/viewer/>

Online_Linkage: <https://www.landfire.gov/fuel.php>

Type_of_Source_Media: Online

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 20150101

Source_Currentness_Reference:

Ground Condition

Source_Citation_Abbreviation:

LANDFIRE FBFM40

Source_Contribution:

The LANDFIRE Fire Behavior Fuel Models layer was a primary input to the FSim BP and FIL datasets.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Short, Karen C.

Publication_Date: 2017

Title:

Spatial wildfire occurrence data for the United States, 1992-2015 [FPA_FOD_20170508]

Edition: 4th

Geospatial_Data_Presentation_Form: vector digital data

Publication_Information:

Publication_Place: Fort Collins, CO

Publisher: Forest Service Research Data Archive

Other_Citation_Details:

Spatial wildfire occurrence Additional information is available in: Short, Karen C. 2014. A spatial database of wildfires in the United States, 1992-2011. Earth Systems Science Data 6:1-27. <https://doi.org/10.5194/essd-6-1-2014>

Online_Linkage: <https://doi.org/10.2737/RDS-2013-0009.4>

Type_of_Source_Media: Online

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19920101

Ending_Date: 20151231

Source_Currentness_Reference:

Observed

Source_Citation_Abbreviation:

FPA FOD

Source_Contribution:

The FPA point fire occurrence database (FPA FOD) was used in the process of creating the burn probability (BP) and fire intensity level (FIL) rasters.

Source_Information:

Source_Citation:

Citation_Information:

Originator: LANDFIRE, U.S. Department of the Interior, Geological Survey

Publication_Date: 2017

Title:

LANDFIRE 1.4.0 Existing Vegetation Type layer

Edition: 1.4.0

Geospatial_Data_Presentation_Form: raster digital data

Other_Citation_Details:

Rollins, Matthew G. 2009. LANDFIRE: a nationally consistent vegetation, wildland fire, and fuel assessment. International Journal of Wildland Fire 18:235-249.

<https://doi.org/10.1071/wf08088>

Online_Linkage: <https://www.landfire.gov/vegetation.php>

Online_Linkage: <https://landfire.cr.usgs.gov/viewer/>

Type_of_Source_Media: Online

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 20150101

Source_Currentness_Reference:

Ground Condition

Source_Citation_Abbreviation:

LANDFIRE EVT

Source_Contribution:

The LANDFIRE EVT layer was used to spatially apply resistance to control weights to create the final WHP.

Process_Step:

Process_Description:

1. Using the nationally-available 270-m FSim BP and FLP data, multiply BP by each FLP to get the actual probabilities of fire occurrence in each flame length class.

Source_Used_Citation_Abbreviation:

FSim BP and FLPs

Process_Date: 201912

Process_Step:

Process_Description:

2. Weight the probabilities in each flame length class by the potential hazard they represent and sum them to derive a measure of large wildfire potential. Weights used were: FLP1 and FLP2 - 1; FLP3 and FLP4 - 8; FLP5 - 25; FLP6 - 75.

Process_Date: 201912

Process_Step:

Process_Description:

3. Create a separate surface of small wildfire potential based on ignition locations for fires smaller than 300 acres (generally not accounted for in FSim).

Source_Used_Citation_Abbreviation:

FPA FOD

Process_Date: 201912

Process_Step:

Process_Description:

4. Integrate the large wildfire potential created in process steps 1-2 with the small wildfire potential created in process step 3. This was done by weighting each according to its relative contribution to total wildfire potential, then adding the weighted values.

Process_Date: 201912

Process_Step:

Process_Description:

5. Apply a set of resistance to control weights based on fireline construction rates in different fuel types.

Source_Used_Citation_Abbreviation:

LANDFIRE FBFM40

LANDFIRE EVT

Process_Date: 201912

Process_Step:

Process_Description:

6. Convert WHP values to integers by multiplying by 10,000 and rounding to the nearest whole number (preserves four decimal places of precision).

Process_Date: 201912

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Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Pixel

Row_Count: 10803

Column_Count: 17132

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Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: Albers Conical Equal Area

Albers_Conical_Equal_Area:

Standard_Parallel: 29.5
Standard_Parallel: 45.5
Longitude_of_Central_Meridian: -96
Latitude_of_Projection_Origin: 23
False_Easting: 0
False_Northing: 0
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: Row and Column
Coordinate_Representation:
Abscissa_Resolution: 30
Ordinate_Resolution: 30.00
Planar_Distance_Units: Meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.0000
Denominator_of_Flattening_Ratio: 298.25722210

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Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

Continuous integer values of the Wildfire Hazard Potential index. Values for the United States are between 0 and 98,085.

Entity_and_Attribute_Detail_Citation:

Dillon, Gregory K.; Menakis, James; Fay, Frank. 2015. Wildland fire potential: A tool for assessing wildfire risk and fuels management needs. In: Keane, Robert E.; Jolly, Matt; Parsons, Russell; Riley, Karin. Proceedings of the large wildland fires conference; May 19-23, 2014; Missoula, MT. Proc. RMRS-P-73. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 60-76.
<https://www.fs.usda.gov/treesearch/pubs/49429>

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Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: USDA Forest Service, Research and Development

Contact_Position: Research Data Archivist

Contact_Address:

Address_Type: mailing and physical

Address: 240 West Prospect Road

City: Fort Collins

State_or_Province: CO

Postal_Code: 80526

Country: USA

Contact_Voice_Telephone: see Contact Instructions

Contact Instructions: This contact information was current as of November 2020. For current information see Contact Us page on: <https://doi.org/10.2737/RDS>.

Resource_Description: RDS-2015-0047-3

Distribution_Liability:

Metadata documents have been reviewed for accuracy and completeness. Unless otherwise stated, all data and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. However, neither the author, the Archive, nor any part of the federal government can assure the reliability or suitability of these data for a particular purpose. The act of distribution shall not constitute any such warranty, and no responsibility is assumed for a user's application of these data or related materials.

The metadata, data, or related materials may be updated without notification. If a user believes errors are present in the metadata, data or related materials, please use the information in (1) Identification Information: Point of Contact, (2) Metadata Reference: Metadata Contact, or (3) Distribution Information: Distributor to notify the author or the Archive of the issues.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: TIFF

Format_Version_Number: 2020

Format_Information_Content:

32 Bit signed integer; LZW compression

File-Decompression_Technique: Files zipped using 7-Zip version 19.00

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: <https://doi.org/10.2737/RDS-2015-0047-3>

Digital_Form:

Digital_Transfer_Information:

Format_Name: GDB

Format_Version_Number: 2020

Format_Information_Content:

32 Bit signed integer; LZ77 compression

File-Decompression_Technique: Files zipped with 7-Zip version 19.00

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: <https://doi.org/10.2737/RDS-2015-0047-3>

Fees: None

Custom_Order_Process:

Because of the large file size of 30 m resolution raster data, we deliver the data here as zip files by U.S. state. Users requiring the entire United States can request the complete dataset as national mosaics through the point of contact listed in this metadata document.

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Metadata_Reference_Information:

Metadata_Date: 20201118

Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Gregory K. Dillon

Contact_Organization: USDA Forest Service, Fire Modeling Institute (FMI)

Contact_Position: Spatial Fire Analyst

Contact_Address:

Address_Type: mailing and physical

Address: Missoula Fire Sciences Laboratory

Address: 5775 US Hwy 10 W

City: Missoula

State_or_Province: MT

Postal_Code: 59808

Country: USA

Contact_Voice_Telephone: 406-829-6783

Contact_Electronic_Mail_Address: greg.dillon@usda.gov

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001.1-1999

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