Wildfire Hazard Potential (WHP) for the conterminous United States (270-m GRID), version 2018 continuous

Identification_Information:

Citation:

Originator: Dillon, Gregory K.
Publication_Date: 2018
Title: Wildfire Hazard Potential (WHP) for the conterminous United States (270-m GRID), version 2018 continuous
Edition: 2nd
Geospatial_Data_Presentation_Form: raster digital data
Publication_Information:

PublicationPlace: Fort Collins, CO
Publisher: Forest Service Research Data Archive

Online_Linkage: https://doi.org/10.2737/RDS-2015-0047-2

Description:

Abstract:

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. To create the 2018 version, we built upon spatial estimates of wildfire likelihood and intensity generated in 2016 with the Large Fire Simulation system (FSim), as well as spatial fuels and vegetation data from LANDFIRE 2012 and point locations of fire occurrence from FPA (ca. 1992 – 2013). With these datasets as inputs, we produced an index of WHP for all of the conterminous United States at 270 meter resolution. We present the final WHP map as continuous integer values. 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...
Purpose:
This dataset is the continuous wildfire hazard potential (WHP). It is intended for use in strategic wildland fuels and land management planning at mostly regional to national scales.

Supplemental Information:
This data publication is a second edition. The first edition (https://doi.org/10.2737/RDS-2015-0047) represents WHP mapped in 2014, depicting landscape conditions as of 2010. This second edition is the 2018 version, and depicts landscape conditions as of 2012. (See \\Supplements\WHP2014_to_2018_ChangeSummary.pdf for a summary of the changes between the first and second editions of these data.)

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/wildland-fire-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 have been dropped in the 2018 version due to changes to the FSim modeling products used as the primary inputs to WHP mapping.

The FSim products used to create the 2018 version of WHP can be found here in Short et al. 2016.


Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2012

Currentness_Reference:
Ground condition

Status:

Progress: Complete
Maintenance_and_Update_Frequency: As needed

Spatial_Domain:

Description_of_Geographic_Extent:
conterminous United States

Bounding_Coordinates:

West_BoundingCoordinate: -127.972202
East_BoundingCoordinate: -65.258792
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:


Please note: This dataset is the product of modeling, and as such carries an inherent degree of error and...
uncertainty. Users must read and fully comprehend the metadata and other available documentation prior to data use. Users should acknowledge the Originator when using this dataset as a source. Users should share data products developed using the source dataset with the Originator. No warranty is made by the Fire Modeling Institute (FMI) or USDA Forest Service 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 FMI. Inputs to the WHP map, and therefore the WHP map as well, are intended to support 1) national (all states) strategic planning, 2) regional (single large states or groups of smaller states) planning, and 3) strategic and possibly tactical planning for large sub-regional landscapes (including significant portions of states or multiple federal administrative entities). The applicability of the WHP map to support fire and land management planning on smaller areas will vary by location and specific intended use. Further investigation by local and regional experts should be conducted to inform decisions regarding local applicability. It is the sole responsibility of the local user, using product metadata and local knowledge, to determine if and/or how the WHP map can be used for particular areas of interest. The WHP map is not intended to replace local products where they exist, but rather serve as a back-up by providing wall-to-wall cross-boundary data coverage. It is the responsibility of the user to be familiar with the value, assumptions, and limitations of WHP map. Managers and planners must evaluate the WHP map 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 Organization Primary:**

**Contact Organization:** USDA Forest Service, Fire Modeling Institute (FMI)

**Contact Address:**

- **Address Type:** mailing and physical
- **Address:** Missoula Fire Sciences Laboratory
- **Address:** 5775 US Hwy 10 W
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- **State or Province:** MT
- **Postal Code:** 59808
- **Country:** USA

**Contact Voice Telephone:** 406-329-4800

**Contact Electronic Mail Address:** fmi@fs.fed.us

**Contact Instructions:** https://www.firelab.org/fmi

**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’s Fire, Fuel and Smoke Science Program.

**Native Data Set Environment:**

Version 6.2 (Build 9200) ; Esri ArcGIS 10.5.1.7333

**Cross Reference:**

**Citation Information:**

**Originator:** Dillon, Gregory K.

**Publication Date:** 2015

**Title:**

Wildland Fire Potential (WFP) for the conterminous United States (270-m GRID), version 2012

continuous
Cross_Reference:

Citation_Information:

Originator: Dillon, Gregory K.
Publication_Date: 2015
Title: Wildfire Hazard Potential (WHP) for the conterminous United States (270-m GRID), version 2014 continuous
Edition: 1st
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-2015-0045

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:
Attribute_Accuracy:

Attribute_Accuracy_Report:
WHP, by its nature, is an abstract index of fire potential. Its accuracy, therefore, cannot be quantitatively measured. It is intended to be a relative measure of wildfire hazard potential. The FSim burn probability (BP) used as a primary input to the WHP map was objectively evaluated and calibrated within 128 distinct regions of contemporary wildfire activity (pyromes) across CONUS, using historic reference data on fire size distributions and annual area burned. More information on the FSim modeling outputs can be found in Short et al. 2016 (https://doi.org/10.2737/RDS-2016-0034). 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.

Quantitative_Attribute_Accuracy_Assessment:

Attribute_Accuracy_Explanation:
Quantitative accuracy cannot be evaluated.

Logical_Consistency_Report:
Pixel values in this grid should be within the range of 0 to 100,000. Values in this grid were used to create the classified version of 2018 WHP, using the following class breaks: very low <= 61; low >61 and <= 178; moderate > 178 and <= 489; high > 489 and <= 1986; very high > 1986. The continuous and classified WHP products should be logically consistent with each other.

Completeness_Report:
All pixels that are part of the land and water of the conterminous United States have valid non-negative values. Zero values are valid and typically represent non-burnable land cover (water, snow/ice, developed, agriculture).

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Short, Karen C.
Originator: Finney, Mark A.
Originator: Scott, Joe H.
Originator: Gilbertson-Day, Julie W.
Burn probability modeled with FSim was a primary spatial input to calculating the large wildfire potential. This layer provided information about the overall probability of any 270 meter pixel experiencing a large fire of any intensity.
Conditional flame lengths modeled with FSim were a primary spatial input to calculating the large wildfire potential. This set of layers 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.
The FPA point fire occurrence database (FPA FOD) was used to create a surface of small wildland fire potential. It was also used in the process of creating the burn probability (BP) and fire intensity level (FIL) rasters.

The LANDFIRE Fire Behavior Fuel Models layer was a primary input to the FSim BP and FIL datasets. It was used as an input at various points in the WHP mapping process, including spatially applying resistance to control weights and bringing in non-burnable and water.
Process Step:

Process Description:
Step 1: Multiply overall burn probability for each flame length to get actual probabilities for each flame length class.

Source Used Citation Abbreviation:
FSim FILs ([fil1_20160830], fil2_20160830], fil3_20160830], fil4_20160830], fil5_20160830], fil6_20160830])

Source Used Citation Abbreviation:
FSim Burn Probability (BP) [bp_20160830]

Process Date: 20180606

Process Step:

Process Description:
Step 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.

Process Date: 20180606
**Process_Description:**
Step 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:** 20180606

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**Process_Description:**
Step 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:** 20180606

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

**Source_Used_Citation_Abbreviation:**
LANDFIRE EVT

**Source_Used_Citation_Abbreviation:**
LANDFIRE FBFM40

**Process_Date:** 20180606

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**Process_Description:**
Step 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:** 20180606

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**Spatial_Data_Organization_Information:**

**Direct_Spatial_Reference_Method:** Raster

**Raster_Object_Information:**

**Raster_Object_Type:** Grid Cell

**Row_Count:** 10803

**Column_Count:** 17133

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**Spatial_Reference_Information:**

**HorizontalCoordinateSystemDefinition:**

**Planar:**

**Map_Projection:**

**Map_Projection_Name:** NAD 1983 Albers
**Albers Conical Equal Area:**

- Standard Parallel: 29.5
- Standard Parallel: 45.5
- Longitude of Central Meridian: -96.0
- Latitude of Projection Origin: 23.0
- False Easting: 0.0
- False Northing: 0.0

**Planar Coordinate Information:**

- **Planar Coordinate Encoding Method:** coordinate pair
- **Coordinate Representation:**
  - Abscissa Resolution: 0.0000000037527980722984474
  - Ordinate Resolution: 0.0000000037527980722984474

- **Planar Distance Units:** meter

**Geodetic Model:**

- **Horizontal Datum Name:** D North American 1983
- **Ellipsoid Name:** GRS 1980
- **Semi-major Axis:** 6378137.0
- **Denominator of Flattening Ratio:** 298.257222101

**Entity and Attribute Information:**

- **Detailed Description:**
  - **Entity Type:**
    - **Entity Type Label:** whp2018_cnt.vat
    - **Entity Type Definition:**
      Continuous values of Wildfire Hazard Potential
  - **Entity Type Definition Source:** None

- **Attribute:**
  - **Attribute Label:** Rowid
    - **Attribute Definition:**
      Internal feature number
    - **Attribute Definition Source:** ESRI
    - **Unrepresentable Domain:**
      Sequential unique whole numbers that are automatically generated.

- **Attribute:**
  - **Attribute Label:** VALUE
    - **Attribute Definition:**
Continuous integer WHP index values (0=low, 100,000=high)

Attribute Definition Source:
None

Attribute Domain Values:

Range Domain:

Range Domain Minimum: 0
Range Domain Maximum: 98762
Attribute Units of Measure: unitless
Attribute Measurement Resolution: 1

Attribute:

Attribute Label: COUNT
Attribute Definition:
Number of pixels in each WHP value.
Attribute Definition Source:
ESRI
Attribute Domain Values:

Unrepresentable Domain:
Number of pixels in each WHP value.

Overview Description:

Entity and Attribute Overview:
This dataset represents wildfire hazard potential (WHP) as continuous integer values on a scale from 0 (low) to 100,000 (high).

Also included in the download are the following files:

\Supplements\whp_2018_continuous_lettersize.jpg: JPEG image file containing a letter sized map of continuous wildfire hazard potential (WHP) plus non-burnable lands and water. (Resolution: 300 dots per inch [DPI] at 8.5x11 inches)

\Supplements\whp_2018_continuous_midsize.jpg: JPEG image file containing a letter sized map of continuous wildfire hazard potential (WHP) plus non-burnable lands and water. (Resolution: 96 DPI at 44x34 inches, scales well for printing anything smaller than poster size)

\Supplements\whp_2018_continuous_postersize.jpg: JPEG image file containing a letter sized map of continuous wildfire hazard potential (WHP) plus non-burnable lands and water. (Resolution: 200 DPI at 44x34 inches)

\Supplements\WHP2014_to_2018_ChangeSummary.pdf: Adobe Acrobat PDF/a file containing a summary of the changes between the 2014 and 2018 Wildfire Hazard Potential (WHP) data publications.

Entity and Attribute Detail Citation:
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 October 2018. For current information see Contact Us page on: https://doi.org/10.2737/RDS.

Resource Description: RDS-2015-0047-2

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: GRID
Format Version Number: see Format Specification
Format Specification:
ESRI ArcGIS 10.5.1 digital raster file
File Decompression Technique: Files zipped using 7-Zip 18.01

Digital Transfer Option:

Online Option:
Computer_Contact_Information:

Network_Address:

Network_Resource_Name: https://doi.org/10.2737/RDS-2015-0047-2

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: https://www.firelab.org/project/wildfire-hazard-potential

Digital_Form:

Digital_Transfer_Information:

Format_Name: JPG
Format_Version_Number: see Format Specification
Format_Specification:
  JPG image file
File_Decompression_Technique: Files zipped using 7-Zip 18.01

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: https://doi.org/10.2737/RDS-2015-0047-2

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: https://www.firelab.org/project/wildfire-hazard-potential

Fees: None

Metadata_Reference_Information:

Metadata_Date: 20181010
Metadata_Contact:
Contact Information:

Contact Organization Primary:

Contact Organization: USDA Forest Service, Fire Modeling Institute (FMI)
Contact Person: Greg Dillon

Contact Position: Spatial Fire Analyst

Contact Address:

Address Type: mailing and physical
Address: Missoula Fire Sciences Laboratory
City: Missoula
State or Province: MT
Postal Code: 59808
Country: USA

Contact Voice Telephone: 406-329-4800
Contact Electronic Mail Address: fmi@fs.fed.us
Contact Instructions: https://www.firelab.org/fmi

Metadata Standard Name: FGDC Content Standard for Digital Geospatial Metadata
Metadata Time Convention: local time