

YEARS SINCE LAST FIRE IN WESTERN UNITED STATES

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SUMMARY

There are many areas in the western US where no fire has burned since 1980. That's 46 years without a fire. In contrast, there are other areas that have burned up to 11 times over the same time period. Identifying fire-prone areas and areas where a fuel stockpile may exist is useful information for land managers. The geoprocessing workflow described below identifies these areas and produces an output layer describing years since last fire.

DATA

Using the Historic Fires Database (HFD)¹, download the raster data for fire years 1980-current (NOTE: The raster data contains layers from 1950 to current, but we are going to look at the year 1980 onwards). Each raster layer displays 0 for pixels that did not burn in that year and one (1) for pixels where a fire occurred in that year. There is one raster layer for each year. Please also have the data downloaded for Raster Folder Stats tool box.

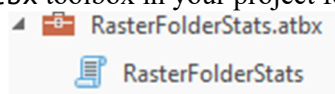
TIMES

Using the Times tool multiply each raster layer by the year designated for that layer. For example, for the 2025 layer, the output raster will display 0 for pixels that did not burn in that year and 2025 for pixels where a fire did occur in that year (1×2025). The completed geoprocessing parameters will be similar to that shown below. Do this for each year.



RASTER FOLDER STATS

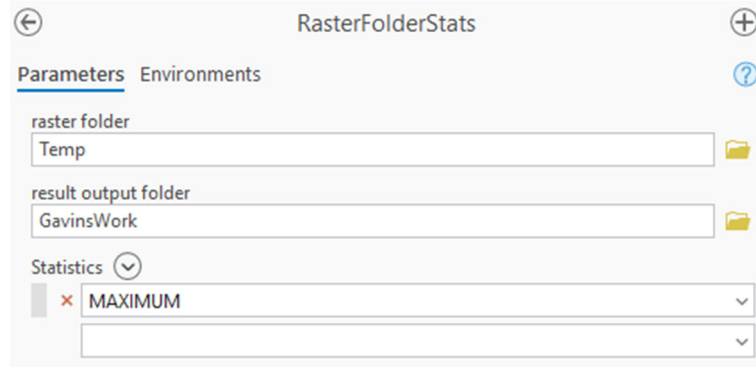
The RasterFolderStats toolbox was created at ISU's GIS TREC by Dr. Di Wu as part of the NASA RECOVER project². This python script tool calculates selected statistics for all raster files found in a specified input folder. The output is a single raster layer containing the resulting/selected statistics. Locate the RasterFolderStats.atbx toolbox in your project folder using the Catalog pane.



¹ Cf. <https://giscenter.isu.edu/research/Techpg/HFD/index.htm>

² Cf. https://giscenter.isu.edu/research/Techpg/nasa_RECOVER2/index.htm

- Expand the toolbox
- Double-click the RasterFolderStats tool to open it.
- The input folder is the folder containing the Years1980-Years2025 individual raster layers
- Select an output folder where the results will be written
- Choose Maximum for the statistics selection. This setting will produce an output where the most recent fire (i.e., pixels with the maximum value as 2025 is a larger number than 2024) is recorded. Places where no fire has been documented will retain the value zero (0).



- Rename the output raster to LastBurnYear.tif

MINUS

As of this writing it is currently 2026 and fires that burned in 2025 occurred one year ago. In other words, there has been one year since the last fire for that that specific area. To create a layer showing years since last fire, we will use the Minus geoprocessing tool and the following parameters:

- Type the number 2026 (or use the current year) as the Constant value 1
- Select LastBurnYear.tif as the Input raster or constant value 2.
- Name the Output Raster YearSinceLastFire.tif



RECLASSIFY

Reviewing the results, you will see the current year (e.g., 2026) is the pixel value for all areas that have not experienced a wildfire. This indicates there have been 2,026 years since the last fire. That may be true but most likely it is not correct. We will use the Reclassify tool to fix this.

1. Open the Reclassify tool
2. Select YearsSinceLastBurn.tif as the Input raster
3. Set the Reclass field to Value
4. Click the Unique button to see all values.
5. Select all rows that do not need to be changed and press DEL from your keyboard.
6. Change the erroneous value in the NEW column to a more correct value. We recommend using 46 or the value of [current year] – 1980.

7. Name the output raster using the following convention:

YearsSinceLastFire_current yearBase1980.tif

In this example, the output raster was named: YearsSinceLastFire_2026Base1980.tif

We have provided a layer file using a recommended symbology for this layer. This raster layer and layer file can be downloaded from the ISU GIS TREC spatial library at https://giscenter-sl.isu.edu/AOC/AOC_Research/SPARC/

END