THE RECOVER DATA PACKAGE TOOLBOX

This document provides a description and quick tutorial on the use of the tools found in the **RECOVER Data Package Toolbox**. Once you have downloaded and extracted a wildfire Data Package from RECOVER, you will find a toolbox has been included in each data package. Within the toolbox you will find three tools; the **Repair Layer Files Sources** tool, **Percent Distribution within Fire Perimeter** tool, and **Generate Fire Report** tool.

## Using the REPAIR LAYER FILE SOURCES Tool

Layer files (.LYRX file extensions in ArcGIS Pro, .LYR file extensions in ArcMap) do not store relative paths for their sources. When a user adds .LYRX files received via download or another source to a map in an ArcGIS Pro project, the layer in the Contents pane will typically be accompanied by a red exclamation mark ! and will not display in the map. This is because the source is "broken." Repairing .LYRX sources manually can be time consuming, especially if you have to repair many layer files. This tool is designed to assist users of the NASA RECOVER DSS in their analysis of areas affected by wildfires by automatically repairing the .LYRX files found in each data package. You can then dive right in to analysis without needing to painstakingly repair the data sources for each non-webservice-based .LYRX file.

Steps:

1. Open Catalog pane
2. Expand the Toolboxes
3. Locate and expand the toolbox `RECOVERDataPackageTools.atbx`

4. Double-click the script `Repair Layer File Sources` to open it in the Geoprocessing pane.
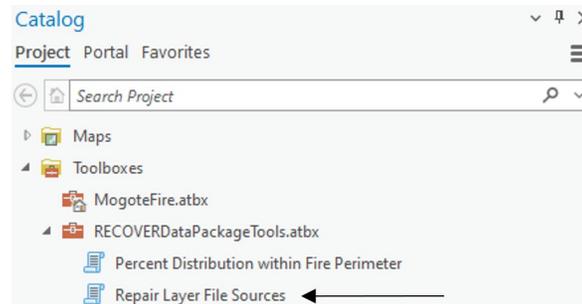
5. Click the file selector to navigate to the previously extracted fire folder, then press "OK".
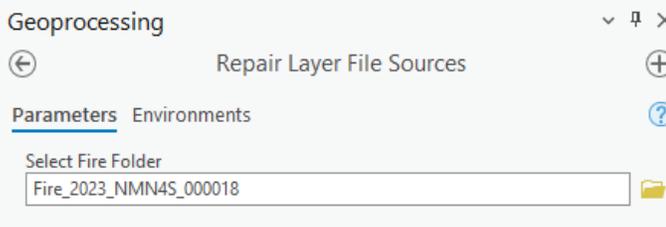
NOTE: the folder name may not be the same as shown above but will be *similar*.

6. Click Run (located in the bottom right corner of the Geoprocessing pane).

The script will fix the source for the "broken" .LYRX files. Once completed, the .LYRX files can be added to your map and the layers will draw with the correct symbology without you needing to deal with those pesky red exclamation points and manually resetting the data source.

Using the PERCENT DISTRIBUTION WITHIN FIRE PERIMETER Tool

Knowing the proportion and distribution of spatial features within a fire area is a common need for users of the NASA RECOVER DSS. For example, you want need to know "how much of a burned area is managed by the Bureau of Land Management?" To answer this, you might use geoprocessing tools to clip, add fields, and calculate new field values. The purpose of the **PERCENT DISTRIBUTION WITHIN FIRE PERIMETER** tool is to perform this processing for you using a single tool where all of these parameters are specified at once. This tool produces a new feature class --clipped to the fire perimeter-- containing a new field called `Distribution within Fire Area`. This field gives the percent distribution within the fire area (e.g., the percentage of land managed by each land management agency).

This tool is compatible with the following feature classes found in the `Fire.gdb` found in each RECOVER data package (more descriptive feature class names in parentheses if applicable):
- SMA (Surface Management Agency)
- Soils_gSSURGO
- Soils_STATSGO
- Geology
- Habitat
- WBD (Watershed Boundary Dataset)
- LandslidePotential
- Wetlands
- Wilderness_Status

NOTE: Earlier versions of the Percent Distribution Within Fire Perimeter tool (lacking semantic version numbers e.g. 1.0.1) use feature classes as clip features which do not respect individual geographic feature (polygon) selections.

Steps:
1. Add the fire perimeter feature class to a map in ArcGIS Pro. (NOTE: Fire perimeter feature classes contain fire perimeters at different points in time, indicated by the various date fields in their attribute tables. It is recommended to select one of the fire shapes (example below) to get percent distribution for that fire at that specific point in time. Otherwise, this tool will calculate the percent distribution for the total area of the fire at every point in time.)
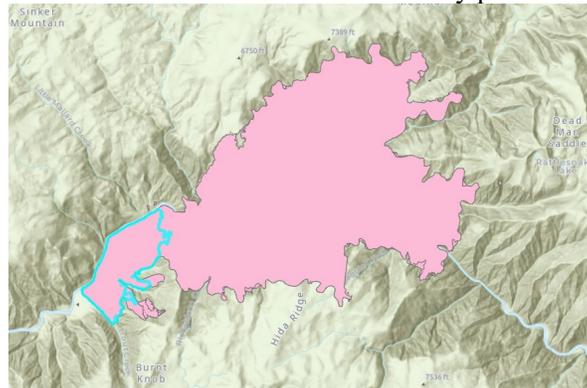
2. Open the Catalog pane.
   a. Expand Toolboxes.
   b. Expand the Toolbox titled `RECOVERDataPackageTools.atbx`

RECOVERDataPackageTools.atbx
　　📜 Percent Distribution within Fire Perimeter 1.0.1
　　📜 Repair Layer File Sources
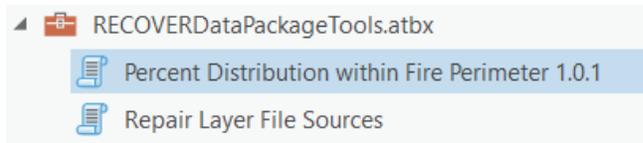
3. Double-click the script `Percent Distribution within Fire Perimeter 1.0.1` to open the tool in the Geoprocessing pane.
4. Complete the input dialog as follows:
    a. Click Browse 📁 to navigate to the `Fire.gdb` geodatabase within the fire folder.
    b. Select the geodatabase and click OK.
    c. Click Browse 📁 to navigate to the feature class you wish to clip (NOTE: this feature class must be located within the same Fire geodatabase)
    d. Click OK.
    e. For the Fire Perimeter (clip feature), click the dropdown button and select the fire perimeter feature layer from your map's layers.
    f. Click OK.
    g. The completed tool dialog will look *similar* to that shown below.
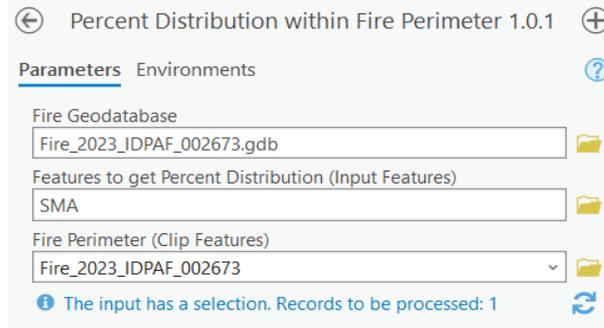
In the example shown above, the `SMA` (surface management agency) feature class is being clipped to the selected polygon (the most current polygon) within the `Fire_2023_IDPAF_002673` feature layer.

    h. Click the Run button located in the bottom right corner of the Geoprocessing pane.

    The new feature class will be automatically added to the geodatabase and to your map with `_Distribution` added to the end of its name (e.g., `SMA_Distribution`).
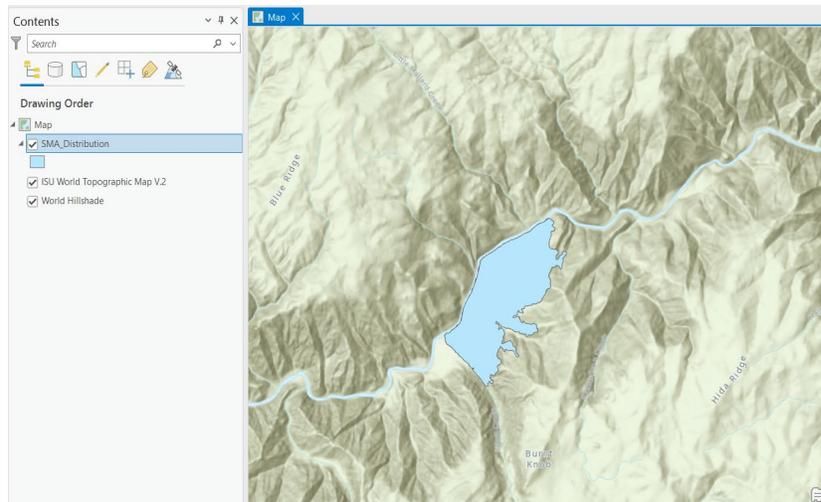
MGMT_AGNCY	Shape_Length	Shape_Area	Distribution within Fire Area
USFS	21588.920279	8695196.34408	99.850099
UND	3697.838191	13053.785366	0.149901

Notice the SMA feature class has been clipped to the shape of the selection of the `FirePerimeter_2023_NMN4S_000018` feature layer and contains the new `Distribution within Fire Area` field showing the percent of each Surface Management Agency present within the perimeter (NOTE: you may wish to change the symbology to show the location of various land management areas).

You can use this tool to calculate other distributions within the fire perimeter as well.

Using the GENERATE FIRE REPORT Tool

Quickly gathering relevant information about the area affected by a fire is important for making post-wildfire management decisions. Gathering statistics, figures, and tables about a fire area's affected population, topography, surface management agencies, soil composition, and vegetation is a time-consuming but necessary process. The aim of the **GENERATE FIRE REPORT** tool is to quickly provide much of this information using a single parameter, the fire folder location, specified by the user. This tool produces a HTML document which can be exported or printed to PDF.

This tool uses a number of resources bundled with every RECOVER Data Package:
- `Fire.gdb`:
    - Fire feature class
    - SMA (Surface Management Agency)
    - Soils_gSSURGO
    - Population_CensusBlocks2020
- Topography Rasters:
    - `TopographyAspect_WesternUS.tif`
    - `TopographyElevation_WesternUS_bepf.tif`
    - `TopographySlopeDegree_WesternUS.tif`
- Vegetation Raster:
    - `EVT.tif`
- `FireReportBoilerplate.html`. This document contains the report structure with placeholders for figures, tables, and statistics. Do NOT delete or modify this file.

- `AspectCompassRose.png` An image file used as a figure in the final report. Do NOT delete or modify this file.

NOTE: All the above resources are needed to allow the **GENERATE FIRE REPORT** tool to run properly. Do not edit or delete any of the files listed above.

To run the **GENERATE FIRE REPORT** tool:
1. Open the Catalog pane in ArcGIS Pro
2. Expand Toolboxes.
3. Expand the Toolbox titled `RECOVERDataPackageTools.atbx`
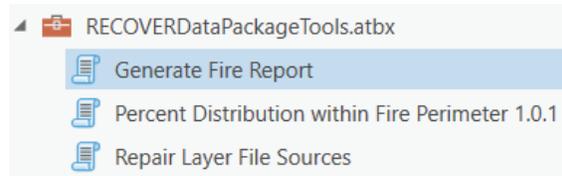
4. Double-click the script `Generate Fire Report` to open it in the Geoprocessing pane.
5. Complete the input dialog as follows:
   a. Click Browse 📁 to navigate to the RECOVER fire data package folder.
   b. Select the folder and click OK.
   c. The completed tool dialog will look *similar* to that shown below.

6. Click the Run button located in the bottom right corner of the Geoprocessing pane.

In a short while, a fire report HTML document will be written to the fire data package folder (highlighted in yellow in the figure below). There will be some additional PNG files created also. These files are highlighted in blue and are part of normal processing.

To view the Fire Summary Report:

7. Using Windows file manager, navigate into the fire folder (e.g., `Fire_2023_COSJF_001184`).
8. Double-click the HTML report file
9. We recommend saving/printing this report as a PDF file for future reference. Once the PDF file has been saved, you can move it to another location on your computer or share it with others etc. as all figures and tables are embedded within that document.

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