FIRESHED REGISTRY 2.0

This document discusses the data used in the Fireshed Registry 2.0 Experience Builder application.

Purpose

The purpose of this document is to outline and describe the data used in the updated Fireshed Registry 2.0 ArcGIS Online Experience Builder application. The original Fireshed Registry is an internal ArcGIS Online Dashboard application that "organizes the source of community exposure into hierarchical management containers, and it attributes these containers with information about past, present, and future plans with respect to management and disturbance" (Ager et al. 2021). The updated Fireshed Registry 2.0 is a public-facing ArcGIS Online Experience Builder application where land managers and decision makers can view and map data related to wildfire exposure, completed management actions, and past and predicted wildfires. Forest Service scientists created the Fireshed Registry in response to frequent and wide-ranging questions about forest and fuels management in relation to risk and exposure. The Fireshed Registry is the data backbone for the Scenario Investment Planning Platform, which simulates specific investment scenarios and resulting possible outcomes for reducing wildfire transmission to communities. The Fireshed Registry 2.0 is designed to improve performance and leverage more rapidly refreshed data that is presented to a broader intended audience. Data summaries within this document are organized by section theme and in the same order as the Experience Builder product.

Overview

The Fireshed Registry is a U.S. Forest Service (USFS) application that organizes information about wildfire risk, ecosystem values and community characteristics into geographic landscape containers called firesheds that are used to describe past activity, present conditions, and past and predicted wildfires. The original Fireshed Registry Dashboard application was initially released in 2021 in response to the impacts of the 2020 fire season that prompted wide-ranging policy discussions about the role of active forest management to reduce hazardous fuels on federal and private wildlands (Ager et. al 2021). This revised Fireshed Registry 2.0 application presents updated data and information used in the original Fireshed Registry dashboard, but also utilizes data directly from the Enterprise Data Warehouse (EDW) where authoritative data published by the USFS is stored. The Fireshed Registry 2.0 also incorporates data layers that were compiled to support identification of potential additional landscapes for focused work under the Wildfire Crisis Strategy (WCS). Utilizing authoritative EDW data allows for more rapidly refreshed and up-to-date data to be incorporated, while data compiled to support identification of additional WCS landscapes allows for the visualization of additional ecological and community values to identify exposure and vulnerability.

Contents

Existing Application

The abstract for the existing application describes the following: “The Fireshed Registry was created to advance spatial planning to manage wildfire risk to communities from both national forests and other state, federal and private lands. The registry is a unique geospatial planning framework that stiches together a time window of information – past, present, and future scenarios to describe risk trajectories on lands where destructive wildfires are likely to originate. Prior efforts have focused on in-situ risk with risk assessments, while we have focused on identifying the source of the risk. This approach allowed us to target the problem of prioritizing large areas of wildlands that are the source of fire to developed areas. We also transcended typical risk assessments by describing potential extreme events in each fireshed, rather than average risk metrics. The fireshed planning framework takes a systems approach to the wildfire problem by moving from a descriptive (assessments) to predictive (risk models) to prescriptive (scenario modeling) environment. To date, the agency efforts have focused on the descriptive stage. The all-lands geography of the Fireshed Registry makes it a useful platform for planning cross-boundary, large-scale restoration projects as part of Shared Stewardship and the Collaborative Forest Restoration Program” (Ager et al. 2021).

Methodology for Identifying and Compiling Data Sources

The USFS Wildfire Risk Reduction Infrastructure Team (WRRIT) and the Hazardous Fuels Branch of Fire and Aviation Management (FAM) worked closely with the Geospatial Technology and Applications Center (GTAC) to examine the existing Fireshed Registry dashboard application and data management workflow to develop a design which can utilize more dynamic data and improve the clarity of information presented. The new design was intended to improve application performance and leverage more rapidly refreshed data to display present, past, and future conditions clearly and to a broader audience. In addition to utilizing and updating data that was originally used in the first Fireshed Registry dashboard application, opportunities to utilize authoritative and regularly updated data directly from the Enterprise Data Warehouse (EDW) were identified where possible. The Forest Service has expanded the layers of wildfire exposure that can be compared in this updated version of the Fireshed Registry. These additional datasets identify wildfire risks due to increased wildfire activity to ecosystem and economic values and other assets and highlight the following data themes: at-risk species habitat, carbon, community characteristics, infrastructure, ecological connectivity, and watersheds.

Fireshed Registry Web Map Layers

The layers below are organized by Fireshed Registry 2.0 application section topics and in the same order of presentation. The layers described are unique to the layer list of the corresponding section’s web map. Most layers are located within the Explore a Fireshed page of the Fireshed Registry 2.0, but some layers are within the Firesheds at Work page and are outlined accordingly. Exceptions to this order are the base layers, reference layers, and data tables, which may be present in multiple web maps or sections. The layers summarized below may not appear in initial web map displays but may be toggled on or off in the expanded layer list to provide additional context for the topic discussed by clicking on the layer list icon.

User Note: Layer lists are uniquely populated for each web map and refresh automatically only while the layer list is collapsed. If the layer list is expanded while scrolling between web maps, users must click on the layer list icon to collapse it, then click the icon again to expand the list and view the uniquely curated reference layers that correspond to the displayed web map.

Base Layers

Base layers are those layers that are used in each map and are not unique to a specific topic or web map.

- **Firesheds-** USFS feature layer containing fireshed polygons, which are approximately 250,000 acre landscape containers that the Forest Service uses to organize information about wildfire risk, ecosystem values, and community characteristics that are used to help plan future wildfire risk reduction strategies (Ager et al. 2021). Link to data
- **Subfiresheds-** USFS feature layer containing polygons of smaller landscape units nested within the larger fireshed boundaries. Subfiresheds are approximately 25,000 acres which is the implementation and prioritization scale National Forests use for project work such as NEPA analysis (Ager et al. 2021). Link to data
- **States-** ESRI feature layer providing generalized boundaries for the 50 States and the District of Columbia. Link to data
- **Counties-** ESRI feature layer containing generalized county boundaries for all 50 states of the United States and the District of Columbia. Link to data
- **US Congressional Districts of the 118th Congress**- Map service containing national and regional extent feature classes and is a generalized spatial representation of the United States Congressional Districts of the 118th Congress. Link to data
- **Administrative Forest Boundaries-** USFS EDW map service containing national and regional extent administrative Forest boundary layers that encompass all the National Forest System lands administered by an administrative unit. Link to data
- **Forest Service Regional Boundaries-** USFS EDW map image layer containing regional and national extent Forest Service regional boundaries that depict all the National Forest System lands administered by a USFS Region. Link to data

Explore a Fireshed tab

These layers are displayed initially in the web maps located under the Explore a Fireshed tab. Widgets within the scrolling panel on the left are otherwise predominantly populated from data tables derived from these spatial layers, unless the spatial layer descriptions below indicate an exception. The user can scroll through these sections and see the layers, turn on more layers, and see the data in the scrolling panel on the left…

Land Ownership

- **Jurisdictional Agencies - Ownership (Public)**- Wildland Fire Decision Support System layer that was created to provide federal fire jurisdictional boundaries on a national scale. The Jurisdictional Agencies dataset is developed as a national land management geospatial layer, focused on

representing wildland fire jurisdictional responsibility, for interagency wildland fire applications. Link to data

Fuel Types

- **Fuel Types**-- USFS imagery layer sourced from LANDFIRE 2022 Remap 40 Scott and Burgan Fire Behavior Fuel Models (FBFM40). The FBFM40 depicts distinct distributions of fuel (vegetation) loading found among surface fuel components (live and dead), size classes, and fuel types (LANDFIRE). Link to data

Wildland Urban Interface

- **Wildland Urban Interface: 2020**- USFS tile layer that depicts the Wildland-Urban Interface (WUI), which is the area where structures and other human development meet or intermingle with undeveloped wildland vegetation. Source data from the U.S. Census and USGS National Land Cover Data were integrated to map the Federal Register definition of WUI (Federal Register 66:751, 2001) for the United States (CONUS) from 1990-2020. This WUI feature class represents a research product that has been consistently measured over more than 30 years (Radeloff et al. 2023). It is different from the authoritative Healthy Forest Restoration Act WUI that is required for administrative decisions. Note: The table data in the left scrolling panel of the Explore a Fireshed WUI section is sourced from SILVIS (Census data for housing units) while the map on the right is showing Microsoft building footprints. Link to data

Historic Wildfires

- **MTBS Burned Area Boundaries (2014 to 2022)**- Authoritative USFS feature layer sourced from the Monitoring Trends in Burn Severity (MTBS) Area Boundaries dataset that assesses the frequency, extent, and magnitude (size and severity) of all large wildland fires (including wildfire, wildland fire use, and prescribed fire). All fires reported as greater than 1,000 acres in the western U.S. and greater than 500 acres in the eastern U.S. are mapped across all ownerships. Also serves as the source data for largest MTBS wildfires that have occurred within the last 10 years list under the Historic Wildfires section. Link to data
- **WFIGS Current Interagency Fire Perimeters (Recent and Ongoing)-** Authoritative feature layer from the Wildland Fire Interagency Geospatial Services (WFIGS) that contains perimeters for recent and ongoing wildland and prescribed fires (that meet certain criteria) in the United States. Fires from previous calendar years are excluded. A filter is applied to only show fires greater than 100 acres. Link to data
- **WFIGS Interagency Fire Perimeters (2023 to Current; Including Recent and Ongoing)-** Authoritative Wildland Fire Interagency Geospatial Services (WFIGS) feature layer that contains wildland and prescribed fire incident perimeters that meet the following criteria: are categorized as a wildfire or prescribed fire, is valid, and attribution of the source polygon is set to public, approved, and is visible. A filter for the Fireshed Registry application shows fires discovered after 1/3/2023 to current to include fires not currently updated and available in the MTBS Burned Area Boundaries feature layer. Another filter is applied to only show fires greater than 100 acres. Also serves as source data for the list that contains the largest WFIGS wildfires that have occurred from 2023-present time, located under the Historic Wildfires section. Link to data

Previous Fuel Reduction Treatments

- **RX Burn & Wildfire in Planned Treatment (2014 to Current) -** USFS authoritative feature layer contains historic prescribed fuel treatments data completed within the fireshed from 2014 to the current date. Data sourced from FACTS which is the agency standard for managing activities related to fire/fuels, silviculture, and invasive species. Link to data
- **Mechanical (2014 to Current)-** USFS authoritative feature layer that contains historical data pertaining to thinning, cuts, and fuel removal treatments completed within the fireshed from 2014 to the current date. Data sourced from FACTS which is the agency standard for managing activities related to fire/fuels, silviculture, and invasive species. Link to data
- **Other (2014 to Current)-** USFS authoritative feature layer that contains other historical treatments completed within the fireshed from 2014 to the current date. Data sourced from FACTS which is the agency standard for managing activities related to fire/fuels, silviculture, and invasive species. Link to data

Potential Worst Case Scenarios with Simulated Fires

- **Top Five Simulated Fires by Fireshed**- USFS feature layer that represents the top 5 simulated fires (by number of buildings exposed) by fireshed and contains information pertaining to size (acres), burn days and structures exposed. Sourced from FSim (Short et al. 2020) and Microsoft Building Footprints data. These data were used in the original Fireshed Registry dashboard and use FSim simulated fires that include ignition locations and perimeters for each simulation, and a burn probability raster in conjunction with the Microsoft Building Footprints data to determine the number of buildings exposed within the fire perimeter, given a simulated ignition (Ager et al. 2021). Also serves as the data sources for the table that lists the top five simulated fires igniting in the fireshed, located under the Potential Worst Case Scenarios with Simulated Fires section. Link to data
- **Community Zones-** USFS feature layer that delineates U.S. Census populated places in the United States (CONUS U.S., Alaska, Hawaii, and Puerto Rico) and their associated wildland urban interface (WUI) as part of assessments to quantify wildfire transmission to communities (Bunzel et al. 2021). Link to data

Wildfire Exposure

- **CONUS Structure Exposure Index-** USFS tile layer that depicts an interpolated/smoothed building exposure index utilizing 2014 vegetation conditions and 2020 building locations. This layer depicts annual building exposure from simulated wildfire ignitions within each 90m pixel, where each cell represents the number of buildings affected by fires igniting in the pixel annually. Link to data

Expanded Fireshed Exposure Data

The following layers for the Western U.S. are accessible in the Exposure to Wildfire section web map's Layer List as well as in the Fireshed Overview page and serve to provide additional context for the topic addressed. These layers were compiled to support identification of potential additional landscapes for focused work under the Wildfire Crisis Strategy (WCS). These additional datasets were aggregated at the fireshed scale and grouped into the following data themes: at-risk

species habitat, carbon storage, community characteristics, ecological connectivity, infrastructure, and watershed. Layers can be turned on and off to visualize proximity and overlap. More information about how datasets were derived can be found in the Expanded Fireshed Exposure Map – Data Summary document.

COMMUNITY CHARACTERISTICS

- **CDC Social Vulnerability Index Tracts 2020-** Feature layer that identifies 2020 US Census Tracts identified as socially vulnerable by the Centers for Disease Control and Prevention's Social Vulnerability Index. This layer uses 16 U.S. census variables to help local official identify communities that may need support before, during, or after disasters. Link to data
- **American Indian and Alaska Native Lands**- feature layer derived from the US Census Bureau's American Indian/Alaska Native/Native Hawaiian Areas dataset. The data includes the following legal entities: federally recognized American Indian reservations and off-reservation trust land areas, state-recognized American Indian reservations, and Hawaiian home lands (HHLs) Link to data
- **USDA ERS Persistent Poverty Census Tracts 2022-** feature layer that provides poverty area measures for counties across 50 state and Washington D.C. Includes indicators of high poverty areas, persistent poverty areas, and enduring poverty areas for Decennial Census years 1960-2000 and for the American Community Survey 5-year periods spanning both 2007-2011 and 2015-2019. Link to data

WATERSHED

- **Source Watershed Exposure by Fireshed-** USFS feature layer that uses FSim simulation library data (Short et al. 2020) combined with EPA Source Water Protection area data and Forests to Faucets 2.0 data to develop a composite index characterizing each HUC12 sub-watershed's relative wildfire exposure to surface water supply. Link to data
- **NFS HUC12 Supply Watershed Exposure-** USFS feature layer that utilizes FSim simulation library data (Short et al. 2020), which consists of ignition locations and perimeters for hypothetical fire seasons to estimate fire transmission by HUC12 watersheds. This information was with Forests to Faucets 2.0 and EPA Source Water Protection area data to develop a composite index characterizing each HUC12 sub-watershed's relative wildfire exposure to surface water supply. Depicts expected surface water exposure in annual area burned from simulated wildfire ignitions within each HUC12 waters. Link to data
- **Water Condition Framework: Priority Watersheds-** USFS map service depicting Watershed Condition on Forest Service lands in HUC12 watersheds (from the USGS Watershed Boundary Dataset). Watersheds identified in this feature class contain more than 5% USFS ownership. The feature class also includes data on high priority watersheds identified in the Watershed Condition Framework (WCF) process. The WCF data identifies priority watersheds, rationale for their designation as such, and information on Watershed Restoration Action Plans. The data are compiled from the NRM (Natural Resource Manager: a suite of applications, each of which collects, stores, and reports data for various Forest

Service business areas) and the Watershed Condition Assessment and Tracking Tool (WCATT) application. Link to data

- **NFS Municipal Supply Watersheds**- USFS feature layer that identifies HUC12 watersheds that could be characterized as a municipal supply watershed, information on public water dependence, and municipal surface water supplies originating on NFS land units and other forested lands (as of June 2022). The data allows viewers to identify communities most dependent on USFS Municipal Supply Watersheds for surface drinking water. Link to data

INFRASTRUCTURE

- **Infrastructure-** group layer that contains various infrastructure assets for reference. Derived from HVRA_NWRA geodatabase- Highly Valued Resources and Asset (HVRA) and National Wildfire Risk Assessment (NWRA). Data include: communication sites, dams, emergency services, Federal campgrounds, heritage (historic buildings), hospitals, power plants, substations, major roads, natural gas pipelines, and transmission lines (NWRA Documentation. Link to data

CARBON

- **Aboveground Carbon (average tons per acre)-** USFS feature layer that utilizes 2016 USFS TreeMap data and contains aboveground tree and coarse woody material in tons per acre by Western NFS firesheds (Riley et al. 2022, Riley et al. 2021). Link to data
- **Carbon Density 2020 Metric Tons Per Forested Acre-** USFS feature layer that displays 2020 baseline carbon estimates and projects by county, as provided by the USFS Inventory and Analysis (Domke et al. 2022). Link to data
- **Expected Annual Carbon Emissions from Wildfire by Fireshed-** USFS Research & Development feature layer that estimates the expected annual carbon emissions from simulated wildfires as a percent of the total carbon within a fireshed. Link to data
- **Exposure of Carbon to Wildfire-** The Nature Conservancy feature layer that quantifies where the highest wildfire hazard overlaps with the most total aboveground carbon (Peeler et al. 2023). Link to data
- **Opportunities Hot Spots to Help Carbon Persist After Wildfire-** The Nature Conservancy feature layer that estimates whether land managers could use prescribed fire to proactively reduce vulnerability and help carbon persist after wildfire in the US West while considering ecological, legal, and operational constraints for applying prescribed fire and mechanical thinning (Peeler et al. 2023). Link to data
- **Carbon Recovery After Wildfire-** The Nature Conservancy feature layer that estimates the likelihood of tree regeneration after wildfire under contemporary climate scenarios (Peeler et al. 2023). Link to data

ECOLOGICAL CONNECTIVITY

- **Ecological Connectivity-** USFS dataset that includes layers for 9 selected species: Canada Lynx, Elk, Greater Sage-Grouse, Grizzley Bear, Lesser Prairie Chicken, Mexican Spotted Owl, Mule Deer, Pronghorn, Wolverine. The Ecological Connectivity Team conducted a literature

search to identify datasets that represent types of ecological connectivity at a large landscape scale. Link to data

AT-RISK SPECIES HABITAT

- **At-Risk Species Habitat-** USFS feature layer that represents a compilation of various data sources for approximately 60 species, subspecies, or distinct population segments whose habitat could be negatively impacted by fire, and who are of management importance in one or more Western USFS Regions. Link to data

Firesheds at Work tab

These layers show in the Firesheds at Work tab and apply at a national level…

- **Wildfire Crisis Strategy Landscapes-** USFS feature layer that documents the official boundary of the landscapes selected for fuels treatment activity in the Wildfire Crisis Strategy. The Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA) included significant funding to execute fuels mitigation projects. Regions submitted proposed project boundaries designed to address community exposure to wildfire. The Executive Leadership Team of the Forest Service selected "Landscapes" for investment in Fiscal Years 2022 and 2023. Additional landscapes may be selected for future action. Link to data
- **High Risk Firesheds-** USFS feature layer that identifies firesheds under the Wildfire Crisis Strategy considered high risk. High-risk firesheds are areas where fires can start and have the potential to threaten a relatively large number of buildings if they spread, and where there are treatable lands where focused work could reduce that threat. Link to data
- **FS/NRCS Joint Chiefs' Landscape Restoration Partnership Projects-** A USFS public map service depicting activities completed under the Forest Service/Natural Resources Conservations Service (NRCS) Joint Chiefs' Landscape Restoration Partnership (LRP) program. This program invests in FS and NRCS projects that mitigate wildfire risk, improve water quality, and restore forest ecosystems. Displays areas in which Activities associated with Forest Service/Natural Resources Conservation Service funding may occur. Link to data
- **Collaborative Forest Landscape Restoration Program**- A USFS map service depicting Collaborative Forest Landscape Restoration Program (CFLRP) and High Priority Restoration (HPR) project accomplishments. These are ten-year projects designed to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes. Sublayers for CFLRP data may also be displayed by activity points, lines, and polygons that are organized by fiscal year or activity type. These data are sourced from FACTS. Please note that these data do not contain all activities that are part of the CFLRP since spatial reporting is not required and is self-reported by U.S. Forest Service units. Link to data

Reference Layers

These are layers that can be turned on and off within maps in the Fireshed Registry 2.0 Experience Builder product that are used to provide additional context and reference within web maps. These reference layers may be present in more than one web map.

- **Watershed Boundaries-** A map service depicting comprehensive aggregated collection of hydrologic unit data consistent with the national criteria for delineation and resolution. It defines the areal extent of surface water drainage to a point except in coastal or lake front areas where there could be multiple outlets as stated by the Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD). Reference watershed boundary feature layers are provided at the Region (HUC2), Subregion (HUC4), Basins (HUC6), Subbasins (HUC8), Watersheds (HUC10), and Subwatersheds (HUC12) scales. Link to data
- **Microsoft Building Footprints- Features**- Microsoft feature layer that displays 125 million building footprints in the United States. Serves as a reference layer only to visualize building locations regarding other wildfire risk and exposure layers. Link to data

Derived Data Tables

These data tables are derived from data layers within the web map of the Fireshed Registry 2.0 Experience Builder product or may be the output of "join" or "relate" geospatial processes that establish a link between data tables and/or spatial layers. These tables are used to populate tables, lists, and charts within the scrolling panel on the left side of the Fireshed Registry.

- **Fireshed Landowner Percent-** Derived table containing the percentage of Jurisdictional landowners within each fireshed, sourced from the Jurisdictional Agencies dataset developed by the Wildland Fire Management, Research, Development, and Application (WFM RD&A) program. This is the source data for the pie chart under Land Ownership section. Related 1-1 to the Firesheds base layer via FIRESHED_ID field. Link to data
- **Fireshed Fuel Types Percent-** Derived table sourced from LANDFIRE's 2020 Scott and Burgan Fire Behavior Fuel Model 40 (FBFM40) spatial imagery layer that represents distinct distributions of fuel loadings found among surface fuel components (live and dead), size classes, and fuel types (Scott and Burgan 2005). This data table contains calculations for the percentage of fireshed within major fuel types, aggregated by fireshed, to populate the pie chart located under the Fuel Types section. Related by Fireshed ID with the Fireshed base layer. Link to data
- **Fireshed WUI Communities-** Derived data table sourced from the SILVIS WUI 2020, which depicts the Wildland-Urban Interface (WUI), defined as areas where buildings meet or intermingle with undeveloped wildland vegetation. Data was aggregated by fireshed and serves as the source data for the acres and percent of the fireshed that meet the Interface and Intermix definitions of WUI table located under the Wildland Urban Interface section. Related 1-1 by the FIRESHED_ID field with the Fireshed base layer. Link to data
- **Fireshed Fire and Management History-** Derived table that contains the acres and percentage of previous fuel treatments, historic wildfires, and non-burnable area within each fireshed. History is defined as the last 10 years for treatments. Larger fires should be displayed for all available years but limited to the last 10 years for tabular summary. Wildfire perimeter data sourced from MTBS (up to 2022) and WFIGS (2023 to current). Historical treatments sourced from USFS FACTS (2014-2024). Source data for the treatments, acres treated, and percent of the fireshed treated in the last ten years table located under the Previous Fuel Reduction Treatments section. Link to data

- **Fireshed Exposed Communities-** Derived table containing communities affected by simulated fires originating in the fireshed, ordered by number of buildings exposed. Sourced from FSim: LF2014b (Short et al. 2020) and Microsoft Building Footprints. Related 1-1 by Fireshed ID to the Fireshed base layer. Source data for the communities affected by simulated fires originating in the fireshed table located under the Potential Worst Case Scenarios with Simulated Fires section. Link to data

Fireshed Overview Tab

The Fireshed Overview tab contains an ArcGIS Online embedded Dashboard that summarizes the same data presented throughout the sections in the Explore a Fireshed page, with the following exceptions:

- **Fireshed Mean Fire Return Interval**- this data table was used in the original Fireshed Registry Dashboard and was used to populate the Distribution of Fire Return Intervals (%) bar chart located in the Fireshed Overview Page (Ager et al. 2021). Sourced from LANDFIRE 2020 data utilizing the FRI_ALLFIR attribute field which "quantifies the average period between fires under the presumed historical fire regime" (LANDFIRE Biophysical Settings Attribute Data Dictionary). Link to data
- **Firesheds with NFS Lands in the West Public View**- this layer was used to populate the "FIRESHED CONTAINS", FIRESHED RISK", and "FIRESHED EXPOSURE" text boxes located on the right side of the Fireshed Overview page. The information in the three text boxes referenced above are derived from index values that were calculated utilizing the layers identified and outlined under the Exposure to Wildfire section of this document. Index values improve the ability to distill complex spatial relationships between the layers into simplified and meaningful information. Detailed information, including sources, methodology, limitations, findings, and recommendations about each dataset consolidated in the referenced layer is available in the Expanded Fireshed Exposure Map – Data Summary and the Expanded Fireshed Exposure – Composite Indices Methodology documents. Link to data