



25-SIDP

(Released August 2024)

**UNITED STATES DEPARTMENT OF AGRICULTURE
FEDERAL CROP INSURANCE CORPORATION
FIRE INSURANCE PROTECTION - SMOKE INDEX DATA PROVISIONS (SIDP)
2025 AND SUCCEEDING CROP YEARS**

These provisions document the procedures for determining the counties where a loss is triggered for the Fire Insurance Protection - Smoke Index (FIP-SI) Endorsement. Smoke Events are determined using data obtained from the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Census Bureau. The data may be modified in the Special Provisions of Insurance.

1. Data

FIP-SI uses two external datasets to determine a loss trigger: NOAA's Hazard Mapping System's (HMS) smoke density dataset and the U.S. Census Bureau's geometry of counties TIGER/Line Shapefile. All times for all datasets are Universal Time Coordinated (UTC).

Table 1: Smoke Data Provisions External Data Sources

Data Set	Data Location (or successor website)
NOAA HMS Smoke	www.ospo.noaa.gov/Products/land/hms.html ; Also available at: satepsanone.nesdis.noaa.gov/pub/FIRE/web/HMS/Smoke_Polygons/Shapefile/
US County Shapefile	www.census.gov/cgi-bin/geo/shapefiles/index.php
EPA AirNow	aqs.epa.gov/aqsweb/airdata/download_files.html

NOAA HMS Smoke Data

NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) Satellite Analysis Branch monitors active fire and smoke information over North America using near real-time polar and geostationary satellite observations and expert image analysis and quality control. Smoke density is analyzed during daylight hours for all locations. Expert image analysts draw polygons around smoke plumes and identify them as heavy, medium, and light density. NOAA HMS posts smoke data daily, including holidays, and FIP-SI will use the date identified by NOAA HMS and utilized in the daily file name.

It is possible that cloud coverage may interfere with smoke density identification. The Federal Crop Insurance Corporation (FCIC) does not interpolate or interpret smoke plume images, text, or other data in such a scenario. FCIC only uses the heavy density smoke polygons as reported by NOAA HMS for the day.

County Data

The county boundary shapefile (TIGER/Line) from the U.S. Census Bureau is used to determine precise county boundaries. Due to the timing of the contract change date, the county shapefile will have a two-year lag from the current crop year. Census county boundaries may be modified by the Special Provisions.

2. Determining Smoke Events

Each daily HMS smoke file is filtered to only heavy smoke density polygons. There may be more than one polygon per day. FCIC uses all heavy smoke density polygons released for each day. Each heavy smoke density polygon is spatially intersected with the County Data using a common projection of NAD83 (EPSG: 4269). If any part of a heavy smoke density polygon intersects a county, then the day is considered to have a Smoke Event for that specific intersected county. A maximum of one Smoke Event per county per day is allowed.

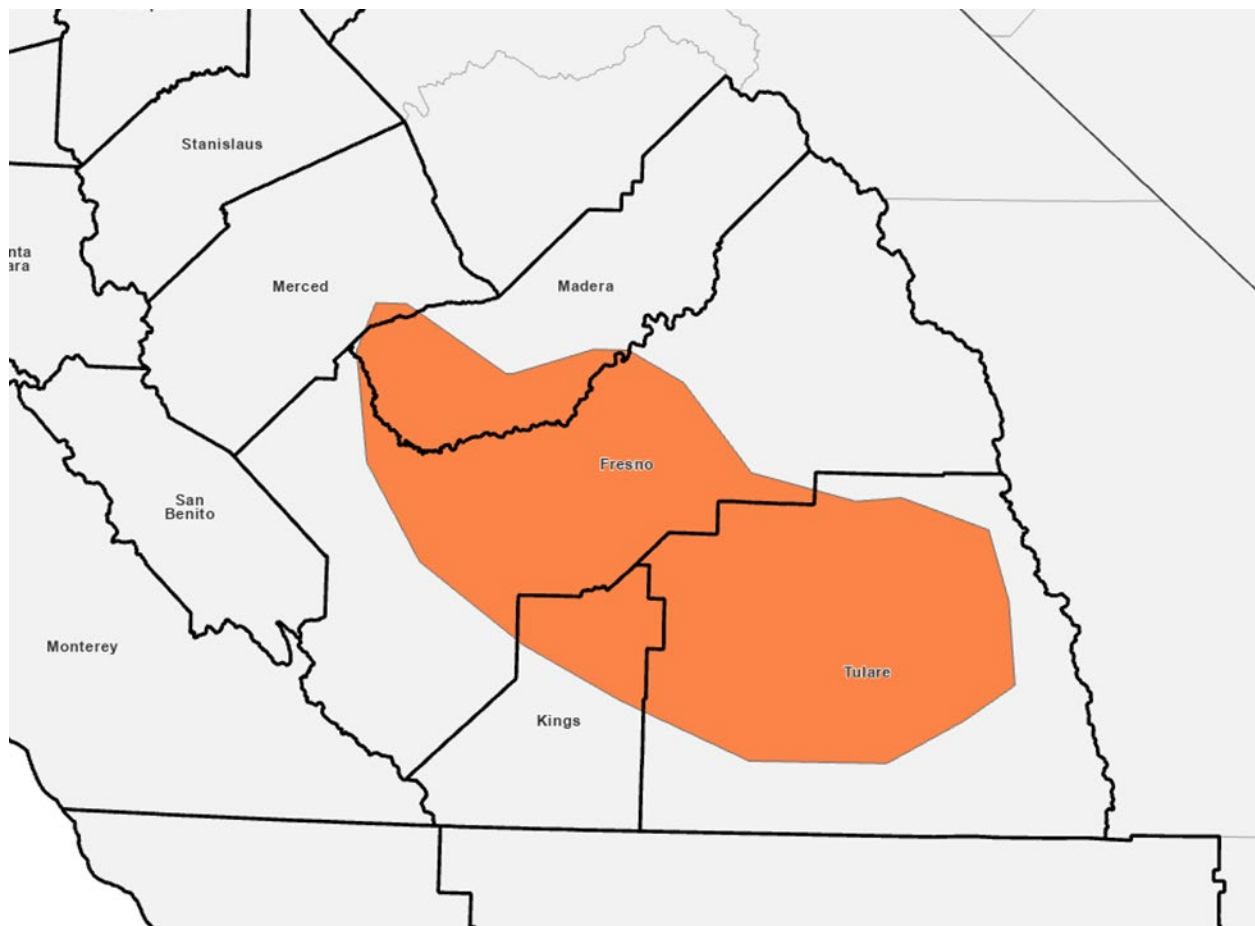
Figure 1 shows an example of how a Smoke Event is determined by county. In this example, there are five insurable counties: Fresno, Kings, Madera, Merced, and Tulare. In Figure 1, the heavy smoke density polygon is shown as an orange-colored polygon. The heavy smoke density polygon is overlaid on top of the County Data.


Any insurable county with one or more points in common with the heavy smoke density polygon for that day would qualify for one Smoke Event. All five insurable counties in Figure 1 qualify for a Smoke Event.

The number of Smoke Events is summed for each county across the insurance period (June 1 to November 10). FCIC will determine the cumulative Smoke Events for each county for the insurance period.

The County Loss Trigger is identified as the minimum number of cumulative Smoke Events that must occur during the Insurance Period to trigger an indemnity payment. In addition, indemnity payments may increase as the cumulative number of Smoke Events exceed the County Loss Trigger. The Payment Factor is used to calculate the indemnity payment due to the insured. The County Loss Trigger and Payment Factor are identified in the actuarial documents. The FIP-SI policy also provides examples showing how the Payment Factor is determined.

Figure 1: Example of Heavy Smoke Density Polygon Intersecting with County Data



 Heavy Smoke Polygon

Text description for Figure 1: The heavy smoke density polygon is shown in orange. The heavy smoke density polygons are overlaid on top of the County Data. Five insurable counties (Fresno, Kings, Madera, Merced, and Tulare) qualify for a Smoke Event in this figure.

If the HMS smoke density data file is not available, FCIC will coordinate with NOAA to fill in the missing data. If NOAA is not able to provide the missing data, FCIC will do the following:

- If there are 7 or fewer consecutive days missing, FCIC will consider each county’s smoke density data to be that of the nearest available day. (This may include dates outside the insurance period.) In the event of a tie (i.e., the same number of calendar days between the date of a missing dataset and the dates the dataset is available before and after that missing date), FCIC will, on a county by county basis, assign the missing dataset date a Smoke Event if either of the available days before or after has a Smoke Event in that specific county. An example follows in Figure 2.

Figure 2: Example of How Missing Data Will Be Determined When There Are Seven or Fewer Days Missing

July 1	July 2	July 3	July 4	July 5	July 6	July 7
Available	Not Available – use July 1	Not Available – use July 1	Not Available – use either July 1 or July 7 if one of these two dates has a Smoke Event	Not Available – use July 7	Not Available – use July 7	Available

Text description for Figure 2: There are seven days from July 1 through July 7. July 1 and July 7 have HMS smoke density data. July 2 through July 6 do not have HMS smoke density data. For July 2 and July 3, FIP-SI would use available smoke density data from July 1. For July 5 and July 6, FCIC will use available smoke density data from July 7. For July 4, which is an example of an “event of a tie,” FCIC will, on a county by county basis, assign July 4 a Smoke Event if either July 1 or July 7 has a Smoke Event in that specific county.

- If there are more than seven consecutive days missing, FCIC will review air quality measurements from the Environmental Protection Agency (EPA) AirNow to determine if a Smoke Event occurred in each county daily. A reading of PM_{2.5} above 22 µg/m³ (at least one hourly reading of the 88101 dataset, using the GMT date) corresponds to heavy density smoke. (Please note that there is no difference between UTC and GMT date.) FCIC will use regulatory sensors in determining the PM_{2.5} threshold. In the alternative, if there are no regulatory sensor data available for the day or no regulatory sensors within the county, FCIC will use regulatory sensors from an adjacent county or use non-regulatory sensors.

Once the number of Smoke Events are published by FCIC, the results and data are final and are a matter of general applicability, presumed to be accurate, and will not be changed.