Dataset Information

Title: NCCOS Assessment: Prescribed Fire in Coastal Alabama and Mississippi, 1992-01-01 to 2022-12-31

Project Page URL:
https://coastalscience.noaa.gov/project/initiation-of-programmatic-approach-to-valuation-of-ecosystem-services-and-management-outcomes/

Primary Point of Contact:

- Sarah Gonyo, sarah.gonyo@noaa.gov
- NCCOS Data Manager, nccos.data@noaa.gov, US DOC; NOAA; NOS; NCCOS

Dataset Author(s):

- Katherine Auerswald[1], 0009-0001-7938-1146

[1]CSS, Inc. Under contract to NOAA National Ocean Service, National Centers for Coastal Ocean Science

Description:

> This dataset includes smoke counts, prescribed fire density, and population density from the National Centers for Coastal Ocean Science (NCCOS) Social Science team's Prescribed Fire project. The project was conducted in partnership with land managers at the Grand Bay National Estuarine Research Reserve and the Weeks Bay National Estuarine Research Reserve in coastal counties of Alabama and Mississippi. This dataset was created to visualize prescribed fire distribution and potential impacts in the study area of Jackson County, MS and Mobile and Baldwin Counties, AL, and for use in an educational infographic for public outreach.

Methods:

> Secondary fire data was used from the Fire Program Analysis (FPA) Fire-Occurrence Database (FOD). This point data from 1992-2020 was downloaded and filtered to only include human caused fires for debris and open burning. It was then converted to a raster format using the Kernel Density tool in ArcGIS Pro, weighing fire size as a population input based on partner requests. The resulting raster displays prescribed fire density weighted by final fire size. Pixels with higher values indicate areas that have more fires and larger fires (via acres burned).
>
> Secondary smoke data from NOAA's Hazard Mapping System was summarized within block groups in the study area to understand how smoke distribution may or may not align with actual locations of prescribed fires, and how visual smoke may impact public perceptions of prescribed fire. Smoke shapefiles from 2017-2022 were filtered to only include visible smoke originating within the study area.

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:

- Gulf of America (formerly Gulf of Mexico), Grand Bay NERR, Weeks Bay NERR

Discovery Theme Keywords

- Prescribed Fire
- Prescribed Burns
- Controlled Fire
- Mississippi
- Alabama
- Geospatial

NCCOS Keywords:

- NCCOS Research Priority > Coastal Change: Vulnerability, Mitigation, and Restoration, Social Science
- NCCOS Research Topic > Ecosystem Valuation
- NCCOS Research Location > Region > Gulf of America, National Estuarine Research Reserves
- NCCOS Research Location > U.S. States and Territories > Mississippi, Alabama
- NCCOS Research Data Type > Geospatial

Related Publication(s):

- Auerswald, K. C., Fobia, A. C., and Gonyo, S. B. (2025). Methods Report for Prescribed Fire in the Gulf: A Spatial Analysis in Coastal Alabama and Mississippi. National Oceanic and Atmospheric Administration, National Ocean Service, National Centers for Coastal Ocean Science. https://doi.org/10.25923/33bh-pe16

Notes: Prescribed fire is any controlled, planned fire used as a tool for land management. Most prescribed burns are conducted to remove dead and overgrown vegetation in a timely and cost effective manner. Beneficial outcomes of prescribed fire include wildfire prevention, more biodiverse plant communities, wildlife abundance, accessible forests, increased human recreation, and invasive species reduction. Prescribed fire is highly regulated. Before a burn, a series of environmental and climatic conditions must be met so that fire behavior remains controlled and smoke disperses. Unlike from wildfire and other human caused fire, smoke from prescribed burns is monitored and regulated in order to minimize and disperse plumes as quickly as possible. This works to reduce potential impacts to respiratory health and air quality. Prescribed burns are conducted with warnings to potentially impacted local community members and under supervision by trained, permitted individuals. Training and permits are granted by local officials.

Contributor:

- Angela Underwood, Scott Phipps, Sarah Johnston, Johanna Gertsch, Eric Brunden, Cory Powell, Will Underwood; Alabama DCNR; Related Persons
- Jonathan Pitchford, Eric Sparks; Mississippi State University; Related Persons
- Chris Ellis; NOAA Office for Coastal Management (OCM); Related Person

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- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, National Centers for Coastal Ocean Science
    - Identifier: https://ror.org/05ba43f71

Date of Collection
Start Date: [2024-04-08]
End Date: [2025-03-20]

Geospatial Metadata
Geographic Coverage: United States, Jackson County, Mississippi, Mobile and Baldwin Counties, Alabama
Geographic Unit: Census Block Group, 30 x 30 meter raster, 1 x 1 kilometer raster, 10 mile grid

Geographic Bounding Box:
Northern Boundary: 31.3190169997348
Southern Boundary: 30.1444250002136
Western Boundary: -88.8845360003361
Eastern Boundary: -87.366590999575

File Information
Data Type: Geospatial

Data Sources:
- NOAA Hazard Mapping System. (n.d.). *Fire and Smoke Product*. Retrieved July 2024, from https://origin-east-01-www-ospo.woc.noaa.gov/products/land/hms.html#data
- Short, Karen C. 2022. *Spatial wildfire occurrence data for the United States, 1992-2020 [FPA_FOD_20221014]*. 6th Edition. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2013-0009.6
- U.S. Census Bureau. (2022). *TIGER/Line with selected demographic and economic data*. Retrieved from https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-data.html
- WorldPop (www.worldpop.org - School of Geography and Environmental Science, University of Southampton; Department of Geography and Geosciences, University of Louisville; Departement de Geographie, Universite de Namur) and Center for International Earth Science Information Network (CIESIN), Columbia University (2018). Global High Resolution Population Denominators Project - Funded by The Bill and Melinda Gates Foundation. Accessed from https://worldpop.arcgis.com/arcgis/rest/services/WorldPop_Population_Density_1km/ImageServer, which was acquired from https://www.worldpop.org/doi/10.5258/SOTON/WP00674 on 15 Sep, 2021.

Total File Size: 0.093146 GB total, 116 files, 0.057011 GB (zipped)

Data File Format(s):

- ShapeFile .SHP (and ancillary files .CPG, .DBF, .PRJ, .SBN, .SBX, .SHX)
- GeoTiff .TIF (and ancillary files .TFW, .AUX, .OVR, .XML)]
- Geodatabase .gdb

Data File Compression: zip
Data File Resolution: 30x30 meters, 1x1km, 10 mile grid, block group
GIS Projection: NAD 1983 UTM Zone 16N, ArcGIS Pro version 3.4.0

Data Files:

- ArchivedGDB_PrescribedFire_Coastal_AL_MS.gdb

Documentation Files:

- Prescribed_Fire_Archive_Package_2025.pdf
- Visible_Smoke_Results_2025.xlsx

Data Types (Parameter Information)

List of major parameters included in this accession:

- Prescribed fire origin point density and severity
- Smoke
- Population density

Parameter Description:
Parameters: Prescribed fire origin points and severity
Property Type: calculated
Units: 30 x 30 meter raster
Observation Category: modeled
Sampling Instrument: Secondary data analysis
Sampling and Analyzing Method:

Secondary fire data was used from the Fire Program Analysis (FPA) Fire-Occurrence Database (FOD). This point data from 1992-2020 was downloaded and filtered to only include human caused fires for debris and open burning. It was then converted to a raster format using the Kernel Density tool in ArcGIS Pro, weighing fire size as a population input based on partner requests.

Data Quality Method:
Secondary fire data was used from the Fire Program Analysis (FPA) Fire-Occurrence Database (FOD). This point data from 1992-2020 was downloaded and filtered to only include human caused fires for debris and open burning. It was then converted to a raster format using the Kernel Density tool in ArcGIS Pro, weighing fire size as a population input based on partner

requests. The resulting raster displays prescribed fire density weighted by final fire size. Pixels with higher values indicate areas that have more fires and larger fires (via acres burned).

Parameter Description:
Parameters: Smoke density
Property Type: calculated
Units: block groups
Observation Category: modeled
Sampling Instrument: Secondary data analysis
Sampling and Analyzing Method:

Secondary smoke data from NOAA's Hazard Mapping System was summarized within block groups.

Data Quality Method:

Smoke shapefiles from 2017-2022 were filtered to only include visible smoke originating within the study area.

Parameter Description:
Parameters: Population density
Property Type: calculated
Units: 1 x 1 kilometer raster
Observation Category: modeled
Sampling Instrument: Secondary data
Sampling and Analyzing Method:

The WorldPop data was imported and clipped to the study area.

Data Quality Method:
Secondary smoke data from NOAA's Hazard Mapping System was summarized within block groups in the study area to understand how smoke distribution may or may not align with actual locations of prescribed fires, and how visual smoke may impact public perceptions of prescribed fire. Smoke shapefiles from 2017-2022 were filtered to only include visible smoke originating within the study area.

Table 1: Data Dictionary for VisibleSmoke_CoastalALMS

Column	Variable	Field Name	Definition	Units	Range
1	FID	FID	Object ID	n/a	Object ID
2	Shape	Shape	Geometry	n/a	Geometry

Column	Variable	Field Name	Definition	Units	Range
3	State	STATEFP	State Identifier (U.S. Census)	n/a	text
4	County	COUNTYFP	County Identifier (U.S. Census)	n/a	text
5	Tract	TRACTCE	Tract Identifier (U.S. Census)	n/a	text
6	Block Group	BLKGRPCE	Block Group Identifier (U.S. Census)	n/a	text
7	GEOID	GEOID	Geographic Identifier (U.S. Census)	n/a	text
8	Long Name	NAMELSAD	Geographic Identifier (U.S. Census)	n/a	text
9	GEOID Long	GEOID_Data	Geographic Identifier (U.S. Census)	n/a	text
10	Number of Smoke Clouds	Smoke_Count	Count of smoke clouds by block group aggregated from NOAA's HMS.	Count of polygons	long
11	Shape Length	Shape_Length	Geometry	meter	double
12	Shape Area	Shape_Area	Geometry	meter	double

Table 2: Data Dictionary for VisibleSmoke_CoastalALMS_10miGrid

Column	Variable	Field Name	Definition	Units	Range
1	Object ID	OBJECTID	Object ID	n/a	ObjectID
2	Shape	Shape	Geometry	n/a	Geometry
3	ID	GRID_ID	Grid Identifier		Text
4	Area (miles)	sum_Area_SQUAREMILES	Area		Double

Column	Variable	Field Name	Definition	Units	Range
5	Smoke Count	Smoke_Count	Count of smoke clouds by block group aggregated from NOAA's HMS.	Count of polygons	long
6	Shape Length	Shape_Length	Geometry	meter	double
7	Shape Area	Shape_Area	Geometry	meter	double

Table 3: Data Dictionary for VisibleSmoke_CoastalALMS_NotAggregated

Column	Variable	Field Name	Definition	Units	Range
1	Object ID	OBJECTID	Object ID	n/a	ObjectID
2	Shape	Shape	Geometry	n/a	Geometry
3	Satellite	Satellite	Satellite from which polygons were digitized	n/a	Text
4	Start	Start	Reference NOAA HMS	n/a	Text
5	End	End	Reference NOAA HMS	n/a	Text
6	Density	Density	Smoke cloud density (light/medium)	n/a	Text
7	Date	Date	Date of smoke cloud detection	(mm/dd/yyyy)	Date
8	Shape Length	Shape_Length	Geometry	meter	double
9	Shape Area	Shape_Area	Geometry	meter	double

Table 4: Data Dictionary for Prescribed Fire Density

Variable	Filename	Definition	Units	Range	Resolution
Density and Severity of of Prescribed Fire	PrescribedFireDensity_CoastalALMS.tiff	Secondary fire data was used from the Fire Program Analysis (FPA) Fire-Occurrence Database (FOD) displaying prescribed fire density weighted by final fire size. Pixels with higher values indicate areas that have more fires and larger fires.	Normalized values/continuous raster	0-1	30m
Population Density	WorldPop_PopulationDensity_CoastalALMS.tiff	Population density data between 2000-2020 from WorldPop at the 1 kilometer resolution (WorldPop 2021) clipped to the study area.	Continuous raster	0-2309.53	1km