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**EMISSIONS INVENTORY
FROM FOREST WILDFIRES,
FOREST MANAGED BURNS,
AND AGRICULTURAL BURNS**



**U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711**

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FROM FOREST WILDFIRES,
FOREST MANAGED BURNS,
AND AGRICULTURAL BURNS**

by

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FOREWORD

This final report has been prepared for the Environmental Protection Agency, under Contract No. 68-02-1389, to describe work performed on IITRI Project No. C6306, "An Inventory of Emissions from Forest Wildfires, Forest Managed Burns, and Agricultural Burns". The work was performed during the period 29 January 1974 to 28 August 1974.


The cooperation, help, and contributions of many federal, state, and industry personnel were invaluable and gratefully acknowledged.

We also appreciate and acknowledge the guidance and help of C. O. Mann, William Vataavuk, Project Officer, and James Southerland, Chief, Emissions Section, National Air Data Branch of the EPA, during the course of the program.

Respectfully submitted,
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AN INVENTORY OF EMISSIONS FROM FOREST WILDFIRES,
FOREST MANAGED BURNS, AND AGRICULTURAL BURNS

SUMMARY

This project was conducted to complete the National Emissions Data System (NEDS) area source inventories on emissions from forest wildfires, forest managed burns, and agricultural burns for each of the 55 states and territories. The objective was to obtain and provide reliable data and information on acreages burned and tons of fuel burned per acre for each of the categories in the approximately 3,100 counties and other jurisdictional entities in the country.

The data and information was obtained from the U.S. Forest Service; Bureau of Land Management; Bureau of Indian Affairs; and the various state forestry, agricultural, and environmental agencies. A limited number of industry (trade associations), academic, and independent personnel were contacted for specific information.

The information retrieved were evaluated and the most reliable selected for use. Where source data values conflicted, adjustments were made. Estimates were derived for states on the basis of land area, forest area, farm and crop area, and verbal descriptions of the fire activity. No estimates were made where no data whatsoever was available.

The pertinent data were entered on area source coding forms provided by the Project Officer and using his data entry guidelines. These completed source coding forms were then

forwarded to the Project Officer for examination, comments, corrections, and final use.

This report summarizes the information on the area source coding forms for 55 states and territories, the information source or sources, and if an estimating and/or proportioning method were utilized. The state forest wildfire information was adjusted to an average 10-year value as calculated from the Federal "Wildfire Statistics" which is published annually by the U.S. Forest Service, Division of Cooperative Forest Fire Control. County breakdowns for the states were either supplied by state personnel or estimated on the basis of verbal or published references to the specific burning practice in that state.

AN INVENTORY OF EMISSIONS FROM FOREST WILDFIRES, FOREST MANAGED BURNS, AND AGRICULTURAL BURNS

INTRODUCTION

The objective of this project was to obtain and provide reliable data and information on acreages burned and tons of fuel burned per acre for each of the approximately 3,100 counties and other jurisdictional entities in the 55 states and territories. This information will then be utilized in conjunction with emission factors developed in a previous program in order to obtain air pollutant emissions information from forest wildfires, forest managed burns, and agricultural burns.

DISCUSSION

BACKGROUND

The National Air Data Branch is charged with the responsibility of collecting, analyzing, and storing air pollutant emissions information on sources located in the 55 states and territories. Area source inventories have been made for each state and territory. Only 11 contain data on emissions from forest wildfires, forest managed burns, and agricultural burns. To complete the area source inventories, reliable data on emissions and their related information (acreages burned and tons of fuel burned per acre) is necessary for each of the approximately 3,100 counties and other jurisdictional entities in the states and territories. This will then supplement and refine the National Emission Data Bank (NEDB) county area source inventories.

OVERVIEW OF METHODOLOGY

The data and information was obtained from the U.S. Forest Service; Bureau of Land Management; Bureau of Indian Affairs; and the various state forestry, agricultural, and environmental agencies. A limited number of trade associations, academic, and independent personnel were contacted for specific fire information. The data and information were obtained as publications, copies of annual and summary reports, copies of survey

reports, state emission reports, and verbal reports.

The data were evaluated and the most reliable selected for use. When necessary, adjustments and proportions were utilized to equate federal and state values. In many states where agriculture is economically important and/or geographically distant from urban centers, there was a distinct lack of knowledge or information on forestry or agriculturally related burning practices. Many state environmental agencies were unaware of agricultural or forest burning practices in their state. Where possible, estimates were made where information was not available but some base could be obtained to make an estimate.

The pertinent data were entered on area source coding forms. The area coding forms, background coding information, and data entry guidelines were provided by the Project Officer. The completed source coding forms were forwarded to the Project Officer for examination, comments, and final use.

This report summarizes information on the area source coding forms, the information source or sources, and if an estimating and/or proportioning method was utilized. The state forest wildfire information was directly related to an average 10-year value as calculated from the Federal "Wildfire Statistics" which is published annually by the U.S. Forest Service, Division of Cooperative Forest Fire Control. County breakdown for the states were either supplied by state personnel or estimated on the basis of verbal or published references of the burning practices in that state.

INFORMATION AND DATA SEARCH

The information search was initiated in several directions. The literature sources were reviewed for information on forest wildfires, forest managed burning, and especially agricultural burning activities. Letters requesting information were sent to distant areas (non-contiguous United States) where telephone contact would be difficult. Telephone calls were made to contacts established in a previous program for further information, referrals, and new sources of information. When necessary, various state environmental, forestry, and agricultural agencies were contacted in order to obtain additional needed information.

Personal interviews were limited when it was discovered that no single source had enough available information to warrant the travel expenditure. It was estimated that a minimum of two or three on-site personal interviews were necessary for each state in order to obtain the desired information. There was also no way of being assured that the information, if present, would be available or given freely. Therefore, the bulk of the information requests were made over the telephone with a follow-up letter when requested or suggested.

DATA RETRIEVAL AND EVALUATION

If possible, the acres burned and tons of fuel burned per acre in each of the three categories of forest wildfires, forest managed burns, and agricultural burns were obtained for each of the counties or fire districts in the state. If data was available, a five-year or 10-year summary was made in order to average the variable burning behavior; otherwise, data for

an average year (typical) or a record of a recent year was used. A study of a state's vegetation-topography-fire record was helpful.

A working summary sheet was prepared for each of the 55 states and territories plus a cumulative state total tally. The data were evaluated on the basis of number of years record, county or district breakdown, type of vegetation, and completeness of state coverage. If the fire record was for a number of years, the average was taken. In the wildfire category, this average was apportioned over the state or proportioned to equal the federal 10-year average for the state.

Many states do not have records on agricultural burning activities or forest managed burns. Some states have very poor records on wildfire activities. Lastly, fuel consumption in a fire (tons of fuel burned per acre) is an unknown data for most of the states in all three categories. Regional results of a previous study were utilized to obtain county and state values for these unknowns.

In states exempting agricultural burning from air quality regulations in addition to states where officials were unaware of burning activity as part of a standard cultural practice, no numerical value or estimates were made and the corresponding appropriate spaces in the area coding forms were left blank.

RESULTS

Area source coding forms were filled out for all 55 states and territories; with the exceptions of Arizona, Nevada, and Oregon. Results from these three states had been placed in the National Emission Data Bank (NEDB) country area source inventories previous to the start of this program by other contractors.

The following is a brief reference to the major information sources in the respective states and territories. Table 1 summarizes the data which was collected.

ALABAMA

The Alabama Forestry Commission provided a five-year (1969-73) data for wildfire acreage burned by country. The average was calculated and then proportioned to equal the 10-year average Federal Wildfire Statistic for Alabama. The prescribed burning and the agricultural burn data were estimates of these burning activities obtain in several surveys made by the U.S. Forest Service, Southeastern Area, State and Private Forestry. County breakdowns were estimated on the basis of forestry and agricultural activities in the state. Fuel loadings in all three categories were estimates prepared in an earlier study.

Table 1. SUMMARY OF DATA

Code	States and Territories	Forest Wildfires		Managed Burning		Agricultural Burning	
		Acres Burned	Tons/Acre Burned	Acres Burned	Tons/Acre Burned	Acres Burned	Tons/Acre Burned
01	Alabama	151,150	9	208,505	3	89,000	2
02	Alaska	783,994	11	*	-	0	0
03	Arizona	38,051	10	**	-	**	-
04	Arkansas	139,970	9	54,736	3	**	-
05	California	162,070	18	12,104	70	762,862	3
06	Colorado	11,106	30	**	-	**	-
07	Connecticut	1,982	7	0	0	0	0
08	Delaware	307	2	950	2	210	10
09	District of Columbia	1,000	2	0	0	0	0
10	Florida	703,490	6	718,877	4	265,000	7
11	Georgia	61,123	9	724,616	3	974,406	1
12	Hawaii	11,015	4	0	0	108,000	12
13	Idaho	120,892	60	27,906	65	11,849	2
14	Illinois	13,881	11	*	-	*	-
15	Indiana	10,812	11	0	0	*	-
16	Iowa	4,200	6	0	0	*	-
17	Kansas	292,279	3	0	0	600,000	1
18	Kentucky	75,750	11	*	-	**	-
19	Louisiana	108,107	9	220,791	3	350,000	6
20	Maine	3,696	9	0	0	36,400	1
21	Maryland	2,699	7	0	0	1,500	5
22	Massachusetts	10,184	11	0	0	**	-
23	Michigan	9,314	11	3,831	3	**	-
24	Minnesota	37,347	11	**	-	**	-
25	Mississippi	116,479	9	168,890	3	340,170	2
26	Missouri	319,530	5	**	-	**	-
27	Montana	27,102	49	47,000	45	**	-
28	Nebraska	88,911	3	0	0	**	-
29	Nevada	24,643	8	**	-	1,950	3
30	New Hampshire	760	8	0	0	0	0
31	New Jersey	31,325	10	20,000	3	0	0
32	New Mexico	26,483	10	**	-	**	-
33	New York	7,331	11	0	0	0	0
34	North Carolina	111,209	9	117,175	3	341,185	2
35	North Dakota	2,096	3	1,998	2	**	-
36	Ohio	6,247	11	0	0	**	-
37	Oklahoma	514,772	3	**	-	**	-
38	Oregon	43,658	60	26,125	33	264,170	2
39	Pennsylvania	15,609	11	0	0	**	-
40	Puerto Rico	0	0	0	0	78,791	8
41	Rhode Island	1,311	7	0	0	0	0
42	South Carolina	64,645	9	388,704	3	**	-
43	South Dakota	15,891	4	**	-	**	-
44	Tennessee	41,003	9	**	-	**	-
45	Texas	42,485	6	83,255	3	*	-
46	Utah	16,707	8	*	-	*	-
47	Vermont	366	8	0	0	100	3
48	Virginia	14,910	5	30,964	5	**	-
49	Washington	35,917	61	66,777	34	140,801	2
50	West Virginia	82,475	12	0	0	0	0
51	Wisconsin	8,322	11	**	-	**	-
52	Wyoming	18,538	6	0	0	**	-
53	American Samoa	*	-	*	-	*	-
54	Guam	0	0	0	0	0	0
55	U.S. Virgin Islands	0	0	0	0	0	0
	Total U.S.A.	4,433,144	(10.4)	2,923,204	(5.8)	4,366,394	(2.8)

* Negligible

** No Data Available

ALASKA

Alaska's wildfire statistics were apportioned on the basis of a literature study. The basic publication used was: Barney, Richard J., "Interior Alaska Wildfires, 1956-1965", U.S. Dept. of Agriculture, 1969.

Prescribed fire activity is now being experimentally carried out in the Interior using the Australian Bushfire system. No agricultural burning activity was noted. Fuel loadings were estimates obtained in an earlier study.

ARIZONA

Arizona state personnel reported that their data was already in NEDS and no further up-date has been made.

ARKANSAS

The Arkansas Forestry Commission provided wildfire statistics for five years (1969-73) for their administrative districts. A map was provided to indicate the counties contained within each district. An apportionment was made for each county in each administrative district. This estimate was then proportioned to equal the 10-year average of the Federal Wildfire Statistics. Prescribed burning data were estimates from a survey made by the U.S. Forest Service, Southeastern Area, State and Private Forestry. No agricultural burning estimates were obtained. Fuel loadings were estimates prepared from an earlier study.

CALIFORNIA

California provided a three inch stack of computer printout on their burning activities. Their data were complete and

covered all aspects of burning for 1973. However, their wildfire data was adjusted proportionately to equal the 10-year average for California as obtained from the Federal Wildfire Statistics.

COLORADO

Colorado is now in a period of adjustment in that they are compiling their state information. Wildfire statistics, prescribed burning, and agricultural burning take place but no agency or group is aware of the extent of burning or has responsibility over it. The wildfire statistics for the state were estimated on the basis of verbal descriptions, land acreages, and the forested acreages. Fuel loadings were estimates prepared in an earlier study.

CONNECTICUT

The State of Connecticut, Department of Environmental Protection, provided data on 1972 wildfire acres burned per town per county. These were proportioned to the 10-year average burn which took place all on state and private lands. Prescribed burning and agricultural burning were prohibited in Connecticut.

DELAWARE

The 10-year average wildfire acres burned were obtained from the Federal Wildfire Statistics. State breakdown of the various categories were provided by the Department of Natural Resources and Environmental Control. Their categories of forest fires, marsh fires, and prescribed forestry burning were stated to be fairly reliable whereas educated guesses were used for agricultural burning. Their fuel consumptions were used

in the coding form.

DISTRICT OF COLUMBIA

Data was verbally provided by the Fire Prevention Division of Washington, D.C. Most of the wildfires were small acreages in trees, brushes, and grass along the highways and in the parks. Managed burning and agricultural burning were prohibited.

FLORIDA

The Division of Forestry, Florida Department of Agriculture and Consumer Services, provided extensive data on wildfire and forestry burning. Data processing equipment will provide more information later in the year on all open burning that the Division has jurisdiction over especially agricultural burning. At present, only the cane fires were reported here since other agricultural burning data were not available.

GEORGIA

The Georgia Forestry Commission provided information on open burning in forest and agricultural land. Their district data was apportioned over the counties. The wildfire statistics were proportioned to equal the Federal Wildfire Statistics. The prescribed burning statistic was proportioned to equal the average of three surveys taken by the U.S. Forest Service, Southeastern Area, State and Private Forestry. Fuel loadings from an earlier study were utilized for this report.

HAWAII

Hawaii's wildfire statistics were obtained by apportioning the 10-year average from the Federal Wildfire Statistics to the various county land acreages. No prescribed burning activity

took place. Agricultural burning takes place with the burning of sugar cane in all four counties and the burning of pineapple plant residues in Honolulu and Maui counties. Agricultural fuel loadings were obtained verbally from cane industry personnel, the Hawaii State Department of Health, and cultural practices.

IDAHO

Idaho statistics were obtained by estimates and proportioning of data obtained from the Project Officer. The wildfire statistics were proportioned to equal the 10-year average Federal Wildfire Statistics. The forest managed burning and the agricultural burning were apportioned from a combined managed burning total on the basis of fuel loading.

ILLINOIS

Illinois wildfire statistics were obtained by apportioning the 10-year average Federal Wildfire Statistics over the forested area of the state. Forest managed burning is nil for the state. Agricultural burning is exempt from regulation but does not take place as a standard cultural practice.

INDIANA

Indiana wildfire statistics were obtained by apportioning the 10-year average Federal Wildfire Statistics over the forested area of the state. No forest managed burning takes place. Agricultural burning is exempt from regulation.

IOWA

The State Conservation Commission provided information on the wildfire history for the period 1966-1973 in the counties of Iowa. Forest managed burning is not a practice. Agricultural

burns for stubble removal and fence row clearing is diminishing, but no estimates were available.

KANSAS

The wildfire, forest managed, and agricultural burn statistics for the state were prepared and apportioned on the basis of verbal descriptions of its extent and locations. Personnel in Air Quality and Conservation as well as Kansas State University provided the verbal descriptions.

KENTUCKY

The Division of Forestry, Department of Natural Resources and Environmental Protection, provided wildfire data covering the five-year period 1969-73. Forest managed burning is nil and no estimates were available for agricultural burning since it is not prohibited. Fuel loadings were estimates from an earlier study.

LOUISIANA

The Louisiana Forestry Commission provided the 10-year wildfire statistics (1964-73) and the forest managed burning information (1970). The agricultural burning information was obtained from the American Sugar Cane League in New Orleans.

MAINE

The Bureau of Forestry, Department of Conservation, provided the wildfire statistics for a 10-year period (1964-73). Forest managed burning is not practiced in this state. The agricultural burn information was verbally received from the Department of Agriculture.

MARYLAND

Data and information were obtained from the Bureau of Air Quality and the Forest Service of the Maryland Department of Natural Resources. Verbal estimates of fuel loading were obtained with references to Delaware (6 tons/acre) and to West Virginia (9 tons/acre). A calculated state average of 7.1 tons per acre were obtained for the state. Forest managed burning is not practiced in the state. Marsh grass is burned annually for muskrats in one county.

MASSACHUSETTS

Forest wildfire data for a representative year (1972-73) by fire protection districts were provided by the Bureau of Forest Fire Control, Department of Natural Resources. The statistics were proportioned for the counties and equated to the federal statistics. Forest managed burning is not practiced and no estimate was possible for agricultural burning activity. Fuel loading was an estimate obtained in an earlier study.

MICHIGAN

Wildfire (1972) and forest managed burn (1973) statistics were provided by the Forest Fire Division, Department of Natural Resources. The wildfire data closely represents the last five-year average and were equated to the federal statistics. Managed burn data were initiated in 1973. No estimate was possible for agricultural burning activity. Fuel loadings were verbal assents to estimates prepared in an earlier study.

MINNESOTA

Minnesota is also undergoing adjustment in compiling state information. The wildfire statistics for the state were apportioned on the basis of verbal descriptions of its extent and locations in the state. No estimates were obtained of the extent of forest managed or agricultural burning. Fuel loadings were estimates prepared in an earlier study.

MISSISSIPPI

The Mississippi Forestry Commission provided county data for five years (1969-73) for wildfires, a statewide estimate for prescribed forestry burning, and a fire protection district map of the state. Agricultural burning statistics were estimates from the U.S. Forest Service, Southeastern Area, State and Private Forestry. Wildfire data was proportioned to equal the federal statistics whereas forest managed burns and agricultural burns were estimated on the basis of forestry and agricultural activities in the state. Fuel loadings in all three categories were estimates prepared in an earlier study.

MISSOURI

The Department of Conservation provided data and information for a six-year period (1967-72) for wildfires. Their fire statistics are based on protection districts and covers only half of Missouri. Averages were apportioned to counties in each district. No estimates were possible for forest managed and agricultural burns since minimum restrictions are placed on these activities.

MONTANA

Estimates of wildfire and forest managed burns were made on the basis of verbal information and literature sources. Much of the information is not divulged, especially by the large land owners. Apportionment of values were made on the basis of land, forest, and farm acreages. References were made to the personnel at the University of Montana having access to but do not have available records of slash burning activity. No estimates could be made on agricultural burn activity because less was known of this practice.

NEBRASKA

The Federal Wildfire Statistics for the state was apportioned on the basis of land acreage and verbal descriptions of its extent and locations in the state. Fuel loading was estimated from a verbal description of the fuel type in the state. No forest managed burns were reported. No estimates were available for agricultural burning activity.

NEVADA

Nevada reported that their data was collected by another contractor and placed in NEDS. Up-dating of information has not taken place since that time.

NEW HAMPSHIRE

The Division of Resources Development of the Department of Resources and Economic Development provided data and information on wildfires. Since data was on a fire district basis, the values were apportioned to the various counties. Forest managed and agricultural burning, although permitted, was nil.

NEW JERSEY

The Federal Wildfire Statistics for the state and the state estimate of forest managed burns were apportioned to the counties on the basis of land area and verbal descriptions of its extent and location. Fuel loadings varied from the Piedmont region in the north to the Coastal Plains by the ocean. No agricultural burning was reported.

NEW MEXICO

The Federal Wildfire Statistic for the state was apportioned to the counties on the basis of land area, forested area, and verbal descriptions. No estimates were obtained for forest managed burns or agricultural burns. Fuel loading estimates were from an earlier study.

NEW YORK

The Department of Environmental Conservation provided data on wildfires in the various counties. The fuel loading was an estimate from an earlier study. Forest managed and agricultural burns were nil for the state.

NORTH CAROLINA

The Federal Wildfire Statistics was apportioned to the counties on the basis of data and information provided by the Department of Natural and Economic Resources (Forest Service) for an 11-year period (1963-73). The forest managed and agricultural burn data were estimates obtained in several surveys made by the U.S. Forest Service, Southeastern Area, State and Private Forestry. The apportionment was based on census values, land area, forest area, and verbal descriptions. Fuel

loadings were estimates derived in an earlier study.

NORTH DAKOTA

The Division of Environmental Engineering, Department of Health, and the Bureau of Indian Affairs provided information on burning activities in the state. The wildfire and managed burning statistics were apportioned on the basis of land area, forested area, and verbal descriptions. Fuel loadings were estimates based on verbal description of the fuel cover types. No estimates were obtained for agricultural burning activity.

OHIO

The Division of Forests and Preserves of the Department of Natural Resources provided data and information on forest wildfires for the period 1960-73. The average acres burned for this period was apportioned to equal the federal 10-year average. Fuel loading was an estimate obtained in an earlier study. Forest managed burning is nil in the state. No estimate was possible for agricultural burning activity.

OKLAHOMA

The Forestry Division of the Department of Agriculture provided information on fuel models and wildfire acreage burned for the period 1970-73. The data was apportioned to each county on the basis of land area, forested area, and verbal descriptions of fire activity. No estimate was possible for forest managed and agricultural burns.

OREGON

Oregon's data was reported in NEDS. Up-dating of information was not required.

PENNSYLVANIA

The Federal Wildfire Statistics for the state was apportioned to the counties on the basis of land area, forested area, and verbal descriptions. Forest managed burns were not conducted in this state. No estimates were possible for agricultural burning activity. The fuel loading was an estimate from an earlier study.

PUERTO RICO

Information on fire activity in Puerto Rico was provided by the Environmental Quality Board. Forest wildfires and managed burns were rare due to the small acreage and location in the humid zones. Agricultural burns, especially sugar cane, is dominant. A breakdown of sugar cane burning activity on the basis of sugar mill location and U.S. Census Bureau publications were used in apportioning agricultural burns. Fuel loading was estimated on the basis of tonnage of cane harvested per acre and type of harvesting practice (field).

RHODE ISLAND

The Federal Wildfire Statistics for the state was apportioned on the basis of a verbal description of its extent and location. Approximately two-thirds of the fires occur in Kent and Washington Counties. Fuel loadings in the state range from 4-10 tons per acre (7 tons/acre average). Forest managed and agricultural burns are prohibited.

SOUTH CAROLINA

The State Commission of Forestry provided data on wildfires and forest managed fires for the five-year period 1969-73.

The forest type and terrain is similar to North Carolina's. No estimate was available on the extent of agricultural burning. Fuel loadings were estimates prepared in an earlier study.

SOUTH DAKOTA

The Federal Wildfire Statistics for the state was apportioned on the basis of verbal descriptions of its extent and locations. The Black Hills region accounts for 85% of the acreage burned. No estimates were obtained on the extent of forest managed or agricultural burning since these activities are permitted. Comments were received that not much of these activities do take place.

TENNESSEE

The Division of Forestry, Department of Conservation, provided data on forest wildfires for the period 1960-73. The data was apportioned to equal the 10-year federal wildfire average for acres burned. No estimates were available for forest managed and agricultural burns. The wildfire fuel loading was an estimate derived in an earlier study.

TEXAS

The Texas Forest Service provided data on various fire activities in the state. The wildfire data were proportioned to each county in the district on the basis of acreage and equated to the federal statistics. The forest managed burns were similarly equated to the survey estimates of the U.S. Forest Service, Southeastern Area, State and Private Forestry. Agricultural burns are prohibited except for variances granted to the flax and sugar cane industries. However, these

year-to-year variances were scheduled to end. Fuel loadings were estimates from forestry personnel and related to an earlier study.

UTAH

The Federal Wildfire Statistics for the state was apportioned on the basis of land area, forest area, and verbal descriptions of its extent and location. Fuel loading was an estimate derived in an earlier study. No estimate was possible of forest managed and agricultural burns. These activities were quoted to be limited in scope.

VERMONT

The Federal Wildfire Statistics for the state was apportioned on the basis of verbal descriptions of its extent and location. Fuel loading was an estimate derived from an earlier study as it related to fuel models for the area. Forest managed burns are nil and only a small amount of agricultural burning takes place in Addison County.

VIRGINIA

The Division of Forestry, Department of Conservation and Economic Development provided data and information on forest wildfires (five-year average) and on forest managed burns (1972). Estimates of the tons of fuel consumed per acre were supplied for each type of burn activity. No estimates were available for agricultural burn activity.

WASHINGTON

The Department of Ecology and the Department of Natural Resources provided emission and burning data for the state of

Washington. Supplemental information was obtained from another contractor working for Region X. Fuel loadings were estimates from data received and from a previous study.

WEST VIRGINIA

The Department of Natural Resources provided their wildfire statistics for the period 1951-73. Their data was proportioned to equate to the federal 10-year wildfire average. The fuel loadings varied from 9 to 15 tons per acre, westward, and averaged 12 tons per acre for the state. Forest managed and agricultural burns were nil for the state.

WISCONSIN

The Department of Natural Resources provided wildfire data by county for the period 1964-73. The 10-year average was then adjusted slightly to equal the federal 10-year average for the state. The fuel loading was an estimate obtained in an earlier study without undue oral objection. No estimates were made of forest managed and agricultural burns since these occur without documentation or as a standard cultural practice. Efforts are being made to centralize record-keeping.

WYOMING

The Federal Wildfire Statistics for the state was apportioned on the basis of land area, forest area, and verbal descriptions of its extent and location. Forest managed burning is nil on state and private lands whereas the National Park Service has a "let burn policy" in the area. No estimate was available for agricultural burning activity.

AMERICAN SAMOA

No estimates were possible, although the climatic conditions, geographic location, and vegetation types leads one to presume that burning activity is nil in this area.

GUAM

Written communication was received that these burning activities do not take place with any degree of concern.

VIRGIN ISLANDS

Verbal communication and literature references indicate that with the phasing out of the sugar cane industry, these burning activities are nil in this area.

CONCLUSIONS

The project goals of obtaining the best available data and information on emissions related statistics on forest wild-fires, forest managed burns, and agricultural burns were accomplished.

The results of the information search and retrieval were evaluated and the most reliable selected for use. Where possible, estimates were prepared for geographical areas presenting some indication of these burning activities. These estimates were based on land area, forested area, farm and crop areas, and some verbal description of the extent and location of the burning practice. No estimates were possible for areas where no available data, reference, or information were present to connect or relate to a burning activity.

The values reported in the area coding forms and sent to the Project Officer are presently the best available and most reliable.

RECOMMENDATIONS FOR FUTURE WORK

Since the statistics are present-day values of past activities, periodic review and up-dating of information are recommended. This periodic activity will also extend the information base to cover geographic areas where no estimates are presently available. Additional costs in time and money will be required for on-site surveys for some states where information is scattered, not kept, nor recorded.

Another recommended area of study is the use of present statistics to extrapolate future burning activity; as a guide to control and modification of some burning practices; and finally to aid state and local authorities to understand these air pollutant sources.

ABSTRACT

This project was conducted to complete the area source inventories on emissions from forest wildfires, forest managed burns, and agricultural burns for each of the 55 states and territories. Reliable data and information on acreages burned and tons of fuel burned per acre were obtained for each of the approximately 3,100 counties and jurisdictional entities in the country. Literature searches, letters, telephone calls, and personal contacts were used in obtaining the results. The most reliable data was selected and entered on NEDS area source coding forms under the guidelines of the Project Officer for inclusion in the NEDB. Presently, the values obtained are the best and most reliable for these burning activities. No estimates were recorded for locations that had no available data or information.

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