

**WESTERN REGIONAL  
AIR PARTNERSHIP  
EMISSION INVENTORY  
SURVEY REPORT**

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# ACRONYMS AND ABBREVIATIONS

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CARB	California Air Resources Board
CO	carbon monoxide
EF	Emissions Forum
EI	Emission Inventory
EIIP	Emission Inventory Improvement Program
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAQs	Frequently Asked Questions
FTE	full time equivalent
GCVTC	Grand Canyon Visibility Transport Commission
NEI	National Emission Inventory
NH <sub>3</sub>	ammonia
NO <sub>x</sub>	nitrogen oxide
NTI	National Trends Inventory
O <sub>3</sub>	ozone
PM <sub>10</sub>	particulate matter less than or equal to 10 micrometers
PM <sub>2.5</sub>	particulate matter less than or equal to 2.5 micrometers
QA	quality assurance
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SWWYTAF	Southwest Wyoming Technical Air Forum
TIP	Tribal Implementation Plan
TRI	Toxic Release Inventory
TSP	total suspended particulates
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WGA	Western Governor's Association
WRAP	Western Regional Air Partnership

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## EXECUTIVE SUMMARY

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The Grand Canyon Visibility Transport Commission (GCVTC) was created by provisions within the Clean Air Act of 1990. The Commission's task was to report to Congress and the United States Environmental Protection Agency (EPA) by 1995 on measures that could be implemented that could contribute to improved visibility in the Colorado Plateau and principally in and near the Grand Canyon. The Commission prepared a report that developed an emissions inventory, outlined several potential measures and identified areas of investigation to pursue in the future.

The Western Governor's Association (WGA), in conjunction with federal, state, tribal and local entities, has formed a successor organization to the GCVTC know as the Western Regional Air Partnership (WRAP). The purpose of the WRAP is to continue the work of the GCVTC in developing and planning programs that can contribute to reducing emissions and improving the visibility in the intermountain west. The WRAP can recommend regional approaches to improving air quality and reducing regional haze. One element of the WRAP effort to implement Section 309 of the Regional Haze Rule, is the compilation of a regional Emission Inventory (EI) to be used in air quality models as the basis for tracking progress in achieving the visibility goals under the rule. The WRAP EI will contain emissions data from Point, Area, Mobile, and Biogenic/Geogenic source sectors. The WRAP Emissions Forum (EF) is charged with designing a data base system to collect and manage the region's emissions data. One of the foundations of the EF plan is to have state, local and tribal air quality agencies in the region supply locally obtained emission data to the WRAP to fill that regional EI data base.

To determine the capability of these state and local agencies to meet WRAP requirements, the EF conducted a survey on non-tribal air quality agencies to determine the state of preparation and availability of EI data in the WRAP region. The information will be used to identify areas of concern, and to prioritize WRAP resources and efforts in creating the organization's Regional EI system. E.H. Pechan & Associates, Inc. (Pechan) supported the WRAP's efforts by performing an Emissions Inventory Survey of non-tribal air quality agencies to determine the state of preparation and availability of emission inventory data in the WRAP region.

From looking at the survey results, it appears that the state agencies that responded to the questionnaire have greater capabilities at developing and maintaining emission inventory data systems than do local agencies. Greater levels of funding and more staff devoted to emission inventories are probably reasons the state EI data systems are more comprehensive than the local level EI data systems. Emissions inventories appear to be more comprehensive for point and area sources while mobile, biogenic and geogenic source emissions inventories are lacking. This is possibly due to the fact that emission inventory staff are not trained in the methodologies for estimating emissions for these categories.

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# INTRODUCTION

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## BACKGROUND

The GCVTC was created by provisions within the Clean Air Act of 1990. The Commission's task was to report to Congress and EPA by 1995 on measures that could be implemented that could contribute to improved visibility in the Colorado Plateau and principally in and near the Grand Canyon. The Commission prepared a report that developed an emissions inventory, outlined several potential measures and identified areas of investigation to pursue in the future. The Report continues to serve as a basis for the current understanding of the visibility in and near the Colorado Plateau and as the basis for policy decisions that will be required in the future.

The WGA, in conjunction with federal, state, tribal and local entities, has formed a successor organization to the GCVTC know as the WRAP. The purpose of the WRAP is to continue the work of the GCVTC in developing and planning programs that can contribute to reducing emissions and improving the visibility in the intermountain west. The WRAP can recommend regional approaches to improving air quality and reducing regional haze. Ultimately, the responsibility for implementing any or all recommendations of the WRAP lies with individual states, and their legislatures and governors, and tribes.

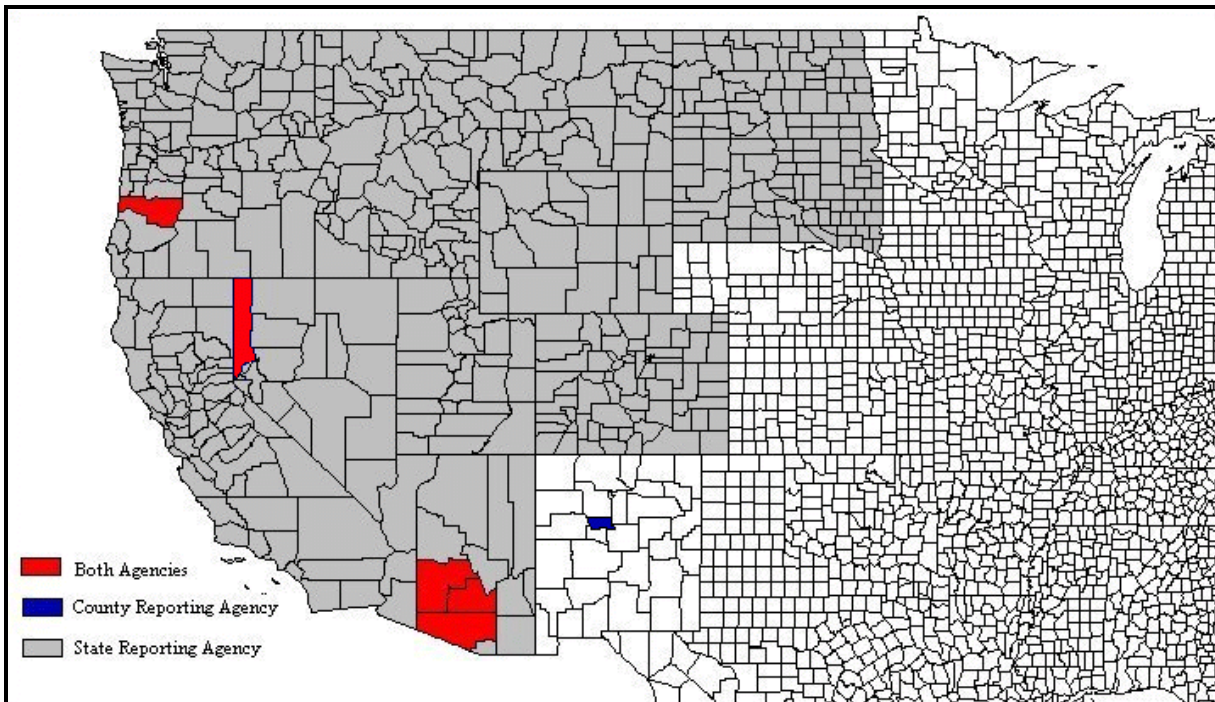
One element of the WRAP effort to implement Section 309 of the Regional Haze Rule, is the compilation of a regional EI to be used in air quality models as the basis for tracking progress in achieving the visibility goals under the rule. The WRAP EI will contain emissions data from Point, Area, Mobile, and Biogenic/Geogenic source sectors. The WRAP EF is charged with designing a data base system to collect and manage the region's emissions data. One of the foundations of the EF plan is to have state, local and tribal air quality agencies in the region supply locally obtained emission data to the WRAP to fill that regional EI data base.

In order for the WRAP to receive the necessary data, the state, local and tribal air quality agencies must have the staff, training and direction to collect and process that local data for ultimate submittal to the WRAP. The Tribal Data Development Working Group of the WRAP has already taken steps to evaluate the availability of emissions data within tribal lands in the WRAP region, but there remains uncertainty as to the status of EI preparation within state and local air quality agencies. To determine the capability of these state and local agencies to meet WRAP requirements, the EF conducted a survey on non-tribal air quality agencies to determine the state of preparation and availability of EI data in the WRAP region. The information will be used to identify areas of concern, and to prioritize WRAP resources and efforts in creating the organization's Regional EI system. Pechan supported the WRAP's efforts by performing an Emissions Inventory Survey of non-tribal air quality agencies to determine the state of preparation and availability of emission inventory data in the WRAP region.

## PARTICIPANTS

Pechan contacted 68 potential survey respondents whose names were provided by the WRAP. A list of these recipients and their phone number, e-mail and mailing addresses can be found in Appendix A. Dennis Goodenow with the California Air Resources Board (CARB) responded with one survey for the entire state of California dropping the total potential survey respondents by over 60%. Pechan received completed surveys from 21 of the 68 potential recipients. A list of the 20 respondents can be found in Appendix B. Of the 21 respondents, state agencies submitted questionnaires referring to their local level

emission inventories as well as county agencies in Arizona, Nevada and Oregon. The map in the figure below represents the geographic areas of responsibility of the respondents.



**Map of Agencies Responding to the Survey**

## **TECHNICAL APPROACH**

The technical approach that Pechan followed in executing the Emission Inventory Survey project is described in this section. Pechan executed the project in a series of discrete, individual tasks. The tasks employed by Pechan are described below:

### **Task 1 – Analysis of Questionnaire**

Pechan collected all of the latest versions of the forms, contacts, questions, and materials to be used in conjunction with the Emissions Inventory Survey from the WGA/WRAP.

After assembling the latest version of the questionnaire, Pechan performed an analysis of the questionnaire itself on several levels including:

- ! Typographical accuracy,
- ! Design of questionnaire tables so that data are easy to tabulate once returned,
- ! Design of questions so that each recipient will complete each question using a similar approach and thought process (which will ultimately make the results of the statistical data processing more meaningful),
- ! Material and content relevance, and
- ! Completeness of questionnaire in meeting the goals of the project.

Pechan attempted to identify additional questions relevant to the end goals of the project. While it was important to determine the current data capabilities of the regulatory agencies in the region, it was also

important to determine the agencies' fiscal and resource capabilities and anticipated timeline for converting to a new/different data system. The questionnaire was designed to gather responses from both technical and authoritative points of view.

Pechan developed a web site with data entry forms for the survey. The web-based data survey forms provide many benefits over the paper forms. The web-based approach required less time for completion by the survey recipients and that likely resulted in a higher response rate. The use of web-based data survey forms would eliminate re-keying of data from the paper survey forms, dramatically reducing second-party data entry errors, and facilitate the overall quality assurance process. Pechan developed a set of instructions for the survey form to attempt to offset the number of potential questions and to ensure consistency in completing the survey by the various recipients. The instructions were placed on the web site to reduce distribution costs. The instructions were updated as questions arose from the various entities completing the questionnaire.

## **Task 2 – Distribution**

Pechan verified the contact information of the intended recipients of the Emissions Inventory Survey as provided by the WGA. Pechan staff attempted to contact each Emission Inventory Survey recipient (maximum two attempts each) to verify their e-mail and postal address information. The survey was then prepared and an e-mail notification was distributed to each potential respondent that the survey was available along with the survey's web address (URL) and the end date of the survey. Pechan was prepared to provide a paper version of the survey to requesting participants via the United States Postal Service. Five working days before the completion of the survey, a Pechan team member attempted to pro-actively contact each potential respondent (maximum two attempts each) that had not submitted a survey to ensure that the survey would be completed and that the information will be returned in a timely manner.

Pechan set up a specific web site and e-mail account for questions about the survey to be forwarded. Pechan staff checked the e-mail once per day and respond to the questions, incorporating the answers on the web site's Frequently Asked Questions (FAQ) area.

## **Task 3 – Summarization**

Pechan built a data base to store the information from the Emission Inventory Survey questionnaires. When the questionnaires were submitted to the website, the Pechan project team transferred the information into the data base. Once the data from the Emission Inventory Survey questionnaires were in the data base, Pechan developed statistics on the data. The statistics generated included information to assist in answering the 10 questions suggested by the EF for judging the state of EI preparation in the WRAP region. The analysis of these questions, along with graphs of the data, where appropriate, can be found in the Findings section of this report.

## **Task 4 – Report Generation**

Pechan developed this report of the survey results and analysis for the emissions forum. Pechan made recommendations based on the qualifications of the statistical results from Task 3. Pechan also included broad-brush recommendations for a regional emission inventory design based on the results of the surveys.

Paper copies and an electronic copies of the report will be provided to the EF. The report will be presented by Steve Boone, the Pechan project manager, at the first WGA Emissions Forum meeting scheduled after the conclusion of the project.

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# FINDINGS

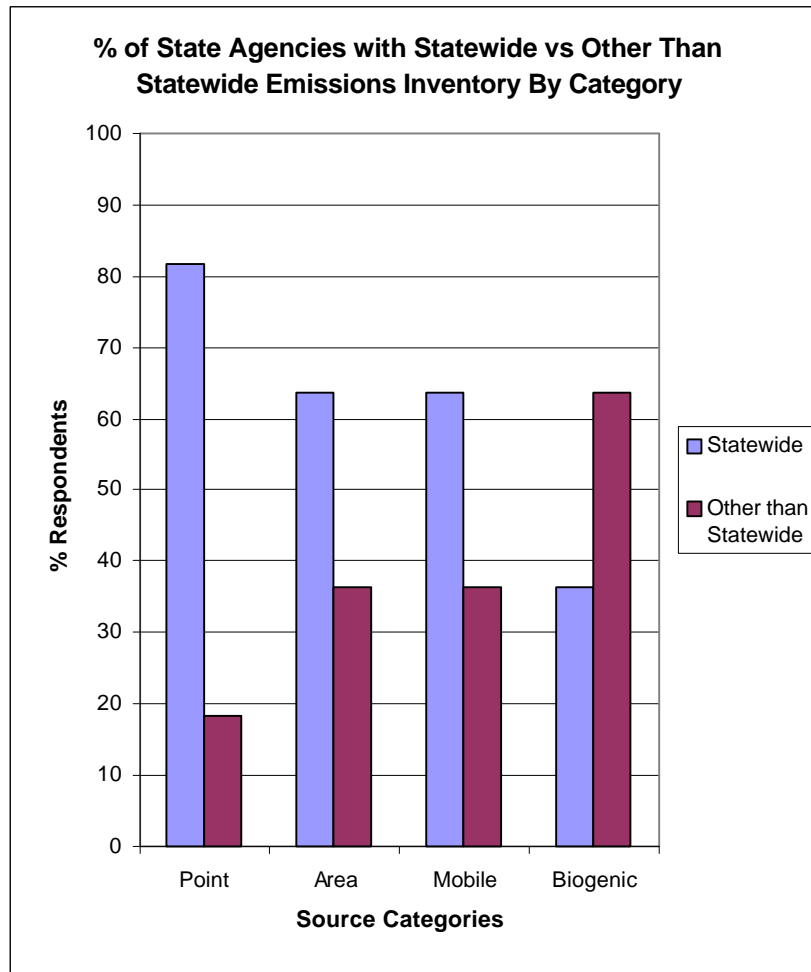
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The questions suggested by the Emissions Forum for judging the state of emission inventory preparation in the WRAP region along with an analysis of each question can be found in this section. Graphs were used, whenever possible, to show the data collected. The raw data tables used in the analysis can be downloaded from [www.pechan.com/eisurvey/WRAPEISurvey.ZIP](http://www.pechan.com/eisurvey/WRAPEISurvey.ZIP). The .ZIP file contains an Access data base of the survey results. This report also contains a discussion of trends found in the surveys submitted.

## RFP QUESTIONS

1. *Are emission data collected statewide, or through local agencies?*

The graph below shows a breakdown of geographic coverage of the emission inventory data collection by state agencies.



Collection of emissions for Point, Area, and Mobile source categories are done at a state level for Colorado, Idaho, Oregon, South Dakota, Utah and Washington. Biogenic source category data is also collected at a state level for Arizona, Idaho, Oregon, Utah and Washington. Except for Point sources, all other source categories emission data are collected mainly at other than the state level. One of the respondents did not answer this question. After the survey was completed, Washington clarified that point source data are compiled at the state level, but are supplied by local agencies. The local agencies that responded to the survey did not have statewide data in any category.

2. *What are the major gaps in data availability (i.e., pollutants, source information, activity data)?*

The responses to the major gaps in data availability tended to be uniform throughout the region and centered around emission factors. Half of the respondents said that there needed to be more uniform and up-to-date emission factors. A need for more complete and accurate particulate matter less than or equal to 2.5 micrometers (PM<sub>2.5</sub>) and precursor emission factors was mentioned by a number of respondents. One county agency respondent from Arizona suggested that there should be research on emission factors that are specific to the Southwest.

The availability of pollutants in the inventories throughout the region are summarized in the following table, where each category is displayed in its own respective row and the pollutant columns indicate the percent of respondents that cover that pollutant in their inventories for that category. The only category/pollutant combination with 100% availability is Major Point Sources/Carbon Monoxide. The geogenic and biogenic sources have sparsely completed inventories of all pollutants in the region's inventories.

**Table of Respondent Percentage of Pollutants by Source Category**

Category	CO	NH3	NOX	PM10	PM25	SO2	TSP	VOC
Area Sources - Adhesives	5	0	5	0	0	5	5	45
Area Sources - Agricultural Burning	25	0	20	30	5	10	5	20
Area Sources - Agricultural Tilling	0	0	0	25	15	0	10	0
Area Sources - Agricultural/Animal Feed Lots	5	15	10	20	5	5	15	5
Area Sources - Asphalt Paving	15	5	20	25	5	10	5	55
Area Sources - Asphalt Roofing	0	0	5	10	0	5	5	25
Area Sources - Bulk Terminals/Plants	10	0	10	10	0	5	0	55
Area Sources - Construction Sites	0	0	0	20	10	0	10	0
Area Sources - Consumer/Commercial Solvents	0	0	0	0	0	0	0	45
Area Sources - Dry Cleaning	0	0	5	0	0	0	0	60
Area Sources - Fertilizer Application	0	20	5	0	0	0	0	5
Area Sources - Gasoline Service Stations	0	0	0	0	0	0	0	60
Area Sources - Graphic Arts	0	0	0	0	0	0	0	60
Area Sources - Incineration	30	5	30	35	15	20	10	35
Area Sources - Industrial Waste Water	5	5	5	5	0	5	0	20
Area Sources - Landfills	25	10	25	25	5	25	10	50
Area Sources - Livestock Waste	5	25	5	5	0	5	5	5
Area Sources - Non-Residential Fuel Combustion	60	10	50	50	5	25	15	50
Area Sources - Other Open Burning	35	0	30	35	10	15	10	30
Area Sources - Other Residential Fuel Combustion	60	10	45	50	10	25	10	50
Area Sources - Paved Road Dust	0	0	0	40	15	0	15	0
Area Sources - Pesticides/Insecticides	0	0	0	0	0	0	0	40
Area Sources - POTWs	30	15	25	20	5	15	10	50
Area Sources - Prescribed Burning	35	0	30	40	15	20	10	30
Area Sources - Petroleum Transport	5	0	5	5	0	0	0	50
Area Sources - Residential Wood Stoves/Fireplaces	60	0	45	55	20	25	15	55
Area Sources - Restaurant Grills	20	0	20	25	5	10	10	20

Category	CO	NH3	NOX	PM10	PM25	SO2	TSP	VOC
Area Sources - Structure Fires	40	0	35	40	10	15	10	35
Area Sources - Surface Cleaning	0	0	5	10	0	0	5	65
Area Sources - Surface Coating/Painting	0	0	5	10	0	0	0	65
Area Sources - TSDFs	5	5	5	10	0	5	0	15
Area Sources - Unpaved Road Dust	0	0	0	40	15	0	10	0
Area Sources - Wind Erosion/Blowing Dust	0	0	0	30	15	0	10	0
Biogenic Sources - Non-Domestic Animals	0	5	0	0	0	0	0	5
Biogenic Sources - Other Biogenic	0	5	0	0	0	0	0	10
Biogenic Sources - Soil Ammonia	0	10	5	0	0	0	0	0
Biogenic Sources - Vegetation	5	0	10	0	0	0	0	30
Geogenic Sources - Lightning	0	0	0	0	0	0	0	0
Geogenic Sources - Oil & Gas Seeps	0	0	0	0	0	0	0	10
Geogenic Sources - Other Geogenic	0	0	0	0	0	0	0	0
Geogenic Sources - Sea Salts	0	0	0	0	0	0	0	0
Geogenic Sources - Volcanic/Geothermal Activity	0	0	0	5	0	0	0	0
Geogenic Sources - Wildfires	25	0	25	25	10	15	10	30
Mobile Sources - Aircraft	35	10	40	25	10	10	5	40
Mobile Sources - All On-Road	45	10	35	40	25	25	10	40
Mobile Sources - Non-Road Diesel Vehicles	50	10	40	40	20	25	5	45
Mobile Sources - Non-Road Gasoline Vehicles	50	10	40	40	20	25	10	45
Mobile Sources - Other Non-Road Equipment	40	10	35	30	15	15	5	40
Mobile Sources - Recreational Boats	40	10	40	30	20	20	10	45
Mobile Sources - Ships	20	5	20	20	10	15	10	25
Mobile Sources - Trains	45	10	40	35	15	20	5	40
Point Sources - Major	100	20	95	95	25	90	45	95
Point Sources - Minor	95	20	90	90	20	80	40	90

The following table illustrates the methodologies used for each inventory category throughout the region by percent of respondents. Based on the findings, agencies tend to rely heavily on the EPA/EIIP methodologies for the point sources. The area sources range from 15 to 60 percent dependence on the EPA./EIIP methodologies. The lower numbers for biogenic and geogenic sources reflect the low availability of inventory data for those categories. The Activity Sources column indicates where activity data were used to calculate emissions for the respective source category.

**Table of Respondent Percentage of Methodologies by Source Category**

Category	EPA/EIIP	Other	Activity Sources
Area Sources - Adhesives	45	35	35
Area Sources - Agricultural Burning	30	35	40
Area Sources - Agricultural Tilling	25	25	30
Area Sources - Agricultural/Animal Feed Lots	30	25	35
Area Sources - Asphalt Paving	55	30	55
Area Sources - Asphalt Roofing	25	30	25
Area Sources - Bulk Terminals/Plants	50	35	50
Area Sources - Construction Sites	20	25	30
Area Sources - Consumer/Commercial Solvents	50	30	45
Area Sources - Dry Cleaning	60	40	60
Area Sources - Fertilizer Application	25	30	30
Area Sources - Gasoline Service Stations	55	30	60
Area Sources - Graphic Arts	60	35	55
Area Sources - Incineration	40	30	45
Area Sources - Industrial Waste Water	20	25	15
Area Sources - Landfills	40	35	45

Category	EPA/EIIP	Other	Activity Sources
Area Sources - Livestock Waste	25	30	30
Area Sources - Non-Residential Fuel Combustion	55	25	60
Area Sources - Other Open Burning	35	25	40
Area Sources - Other Residential Fuel Combustion	35	30	60
Area Sources - Paved Road Dust	35	40	40
Area Sources - Pesticides/Insecticides	40	35	45
Area Sources - Petroleum Transport	50	35	45
Area Sources - POTWs	50	30	50
Area Sources - Prescribed Burning	35	40	45
Area Sources - Residential Wood Stoves/Fireplaces	45	45	60
Area Sources - Restaurant Grills	25	25	20
Area Sources - Structure Fires	40	25	50
Area Sources - Surface Cleaning	60	30	60
Area Sources - Surface Coating/Painting	60	35	60
Area Sources - TSDFs	15	20	20
Area Sources - Unpaved Road Dust	35	30	40
Area Sources - Wind Erosion/Blowing Dust	30	30	35
Biogenic Sources - Non-Domestic Animals	5	25	5
Biogenic Sources - Other Biogenic	10	25	10
Biogenic Sources - Soil Ammonia	15	30	20
Biogenic Sources - Vegetation	30	40	20
Geogenic Sources - Lightning	0	25	5
Geogenic Sources - Oil & Gas Seeps	10	30	10
Geogenic Sources - Other Geogenic	0	20	0
Geogenic Sources - Sea Salts	5	25	5
Geogenic Sources - Volcanic/Geothermal Activity	5	25	5
Geogenic Sources - Wildfires	25	40	30
Mobile Sources - Aircraft	40	40	45
Mobile Sources - All On-Road	40	40	50
Mobile Sources - Non-Road Diesel Vehicles	45	35	55
Mobile Sources - Non-Road Gasoline Vehicles	45	35	55
Mobile Sources - Other Non-Road Equipment	40	35	40
Mobile Sources - Recreational Boats	45	35	45
Mobile Sources - Ships	20	40	25
Mobile Sources - Trains	40	35	50
Point Sources - Major	90	45	85
Point Sources - Minor	80	50	85

The table below indicates where spatial surrogates were used in the inventory and the spatial resolutions of the inventory by percent of respondents. From the table, it appears that most inventory data are available at the county level. Numbers totaling less than 100 across a row (not including spatial surrogate) are because of the lack of respondents answering the questions and those rows totaling greater than 100 are because the respondents selected more than one category for the answer.

**Table of Respondent Percentage of Spatial Resolution by Source Category**

Category	Spatial Surrogate	State	County	NAA	CMSA	MS A	Other
Area Sources - Adhesives	30	5	35	15	0	0	10
Area Sources - Agricultural Burning	20	0	35	5	0	0	5
Area Sources - Agricultural Tilling	25	5	20	10	0	0	5
Area Sources - Agricultural/Animal Feed Lots	25	5	25	10	0	0	15

Category	Spatial Surrogate	State	County	NAA	CMSA	MS A	Other
Area Sources - Asphalt Paving	30	0	40	15	0	0	10
Area Sources - Asphalt Roofing	20	0	15	5	0	0	10
Area Sources - Bulk Terminals/Plants	30	5	40	15	0	0	15
Area Sources - Construction Sites	20	0	15	5	0	0	5
Area Sources - Consumer/Commercial Solvents	40	5	45	15	0	0	10
Area Sources - Dry Cleaning	40	5	55	15	0	0	10
Area Sources - Fertilizer Application	20	5	20	5	0	0	5
Area Sources - Gasoline Service Stations	40	5	55	15	0	0	10
Area Sources - Graphic Arts	40	5	50	15	0	0	10
Area Sources - Incineration	20	5	30	15	0	0	10
Area Sources - Industrial Waste Water	10	0	10	10	0	0	10
Area Sources - Landfills	25	5	30	10	0	0	20
Area Sources - Livestock Waste	25	5	20	5	0	0	5
Area Sources - Non-Residential Fuel Combustion	35	0	45	20	0	0	10
Area Sources - Other Open Burning	20	5	35	15	0	0	5
Area Sources - Other Residential Fuel Combustion	30	0	45	20	0	0	5
Area Sources - Paved Road Dust	35	5	30	20	0	0	5
Area Sources - Pesticides/Insecticides	35	5	35	15	0	0	5
Area Sources - Petroleum Transport	35	5	45	10	0	0	5
Area Sources - POTWs	30	0	40	15	0	0	15
Area Sources - Prescribed Burning	25	10	30	15	0	0	15
Area Sources - Residential Wood Stoves/Fireplaces	45	5	55	20	0	0	5
Area Sources - Restaurant Grills	15	0	15	10	0	0	10
Area Sources - Structure Fires	30	5	40	15	0	0	5
Area Sources - Surface Cleaning	40	5	55	15	0	0	10
Area Sources - Surface Coating/Painting	45	5	60	15	0	0	5
Area Sources - TSDFs	10	0	15	5	0	0	0
Area Sources - Unpaved Road Dust	30	5	30	15	0	0	5
Area Sources - Wind Erosion/Blowing Dust	25	5	25	15	0	0	5
Biogenic Sources - Non-Domestic Animals	5	0	10	0	0	0	0
Biogenic Sources - Other Biogenic	10	0	10	0	0	0	5
Biogenic Sources - Soil Ammonia	10	5	15	5	0	0	0
Biogenic Sources - Vegetation	20	5	30	10	0	0	0
Geogenic Sources - Lightning	0	0	5	0	0	0	0
Geogenic Sources - Oil & Gas Seeps	0	5	5	0	0	0	5
Geogenic Sources - Other Geogenic	0	0	5	0	0	0	0
Geogenic Sources - Sea Salts	5	5	5	0	0	0	0
Geogenic Sources - Volcanic/Geothermal Activity	0	5	5	0	0	0	0
Geogenic Sources - Wildfires	15	5	20	10	0	0	5
Mobile Sources - Aircraft	35	0	35	15	0	0	10
Mobile Sources - All On-Road	35	5	40	20	0	0	5
Mobile Sources - Non-Road Diesel Vehicles	40	5	45	20	0	0	5
Mobile Sources - Non-Road Gasoline Vehicles	40	5	45	15	0	0	5
Mobile Sources - Other Non-Road Equipment	30	0	40	5	0	0	5
Mobile Sources - Recreational Boats	35	10	35	10	0	0	5
Mobile Sources - Ships	20	15	15	5	0	0	5
Mobile Sources - Trains	20	5	30	20	0	0	5
Point Sources - Major	40	20	75	20	0	0	25
Point Sources - Minor	45	15	70	15	0	0	25

The temporal resolution of the inventory data is shown in the table below by percent of respondents. From looking at the table, inventory data are mostly available on an annual timeslice. Some inventory data in the region are available in a seasonal timeslice and to a lesser extent, daily inventory data are also available. Hourly data is the least available temporal category in the WRAP area.

**Table of Respondent Percentage of Temporal Resolution by Source Category**

Category	Annual	Seasonal	Daily	Hourly
Area Sources - Adhesives	45	15	15	5
Area Sources - Agricultural Burning	30	20	15	5
Area Sources - Agricultural Tilling	25	15	10	5
Area Sources - Agricultural/Animal Feed Lots	30	15	10	5
Area Sources - Asphalt Paving	55	15	15	10
Area Sources - Asphalt Roofing	25	10	15	5
Area Sources - Bulk Terminals/Plants	50	15	15	5
Area Sources - Construction Sites	20	10	10	5
Area Sources - Consumer/Commercial Solvents	50	15	15	5
Area Sources - Dry Cleaning	60	15	15	10
Area Sources - Fertilizer Application	25	15	10	5
Area Sources - Gasoline Service Stations	55	15	15	5
Area Sources - Graphic Arts	60	15	15	10
Area Sources - Incineration	40	10	10	5
Area Sources - Industrial Waste Water	20	10	5	0
Area Sources - Landfills	40	20	10	5
Area Sources - Livestock Waste	25	15	10	5
Area Sources - Non-Residential Fuel Combustion	55	25	15	5
Area Sources - Other Open Burning	35	20	15	5
Area Sources - Other Residential Fuel Combustion	35	40	15	5
Area Sources - Paved Road Dust	35	20	15	5
Area Sources - Pesticides/Insecticides	40	15	10	10
Area Sources - Petroleum Transport	50	15	15	5
Area Sources - POTWs	50	20	15	5
Area Sources - Prescribed Burning	35	25	20	5
Area Sources - Residential Wood Stoves/Fireplaces	45	40	15	5
Area Sources - Restaurant Grills	25	10	10	5
Area Sources - Structure Fires	40	20	15	5
Area Sources - Surface Cleaning	60	15	10	10
Area Sources - Surface Coating/Painting	60	15	15	10
Area Sources - TSDFs	15	5	5	0
Area Sources - Unpaved Road Dust	35	20	10	5
Area Sources - Wind Erosion/Blowing Dust	30	15	10	5
Biogenic Sources - Non-Domestic Animals	5	0	0	0
Biogenic Sources - Other Biogenic	10	0	0	0
Biogenic Sources - Soil Ammonia	15	10	5	0
Biogenic Sources - Vegetation	30	10	0	0
Geogenic Sources - Lightning	0	0	0	0
Geogenic Sources - Oil & Gas Seeps	10	5	5	5
Geogenic Sources - Other Geogenic	0	0	0	0
Geogenic Sources - Sea Salts	5	0	0	0
Geogenic Sources - Volcanic/Geothermal Activity	5	0	0	0
Geogenic Sources - Wildfires	25	15	10	5
Mobile Sources - Aircraft	40	20	15	10
Mobile Sources - All On-Road	40	30	15	10
Mobile Sources - Non-Road Diesel Vehicles	45	25	15	5

Category	Annual	Seasonal	Daily	Hourly
Mobile Sources - Non-Road Gasoline Vehicles	45	25	15	5
Mobile Sources - Other Non-Road Equipment	40	15	15	5
Mobile Sources - Recreational Boats	45	20	10	5
Mobile Sources - Ships	20	10	10	5
Mobile Sources - Trains	40	25	15	5
Point Sources - Major	90	25	20	15
Point Sources - Minor	80	20	15	15

### 3. *What is the variability of the EI approach or data used throughout the region?*

The variability for the emission inventory approach and/or data used throughout the region can be looked at from many different perspectives. Below, the variability of the emission inventory data is considered by Update Period, Data Currency, Models Used, Quality Assurance, Bordering Countries and the different emission inventory major categories. The data presented represents the percent of agencies that selected the various options. In most cases, multiple answers could be selected from the survey, for example, when it is reported that 40% of the respondents selected a particular option it will be implied that 60% of the respondents did not select that specific option, however it must be noted that the respondents not selecting that particular option may or may not have selected other options. Also keep in mind that respondents in the initial 40% could also have selected other options as well. In totaling option responses across a category, the percentages either may not total 100% or could exceed 100%.

#### Update Period

For most of the categories, respondents selected the “other (explain)” option, especially for the questions pertaining to their current emissions inventory. 40% (8 out of 20) responded to the question about how often they update their emissions inventory. Four out of the eight said that they update point sources annually and three respondents said that area, mobile and biogenic sources are updated every three years. One state, Colorado, said that they update their emissions inventory every five years when stationary sources report, unless a significant increase occurs, which in turn shortens their update cycle. Pinal County in Arizona said that at this time they do not have an emissions inventory.

#### Data Currency

Answers varied about the currency of the emission inventories. 55% of the respondents said that their emissions inventories were different than the choices provided. Eleven of the respondents said that their current emissions inventory year is 1996. This is generally for area and mobile sources and the pollutants carbon monoxide (CO) and ozone (O<sub>3</sub>). The same eleven also said that 1996 is their latest base year for emissions. Seven of the respondents said that their emissions inventories are current as of 1998 or 1999, mostly for point sources. The respondent from the state of California said that their emissions inventory is current as of 2000. Wyoming does not yet have a statewide emissions inventory, instead they use a Southwest Wyoming Technical Air Forum (SWWYTAF) Inventory which was completed in 1998-99 using actual 1995 data from a special modeling project in southwest Wyoming. Responses to the latest emissions base year question ranged from 1977 for point sources in Oregon to 2000 for the state of California.

#### Models Used

MOBILE 5/6 and NONROAD Models were the most selected by respondents when asked what point, area, mobile, or biogenic emissions models they use or they would use. Some of the models that respondents wrote in that they used are SMOKE, GLOBEIS, EMFAC2000, and ISC III. Only one state,

Idaho, did not select any models, because they are currently in the process of determining the extent of their capabilities.

### Quality Assurance

When it comes to quality assurance (QA), calculation checks, reasonableness checks and peer review are the practices most employed by the agencies. All respondents selected more than one QA practice, except for respondents from the states of Arizona and Wyoming, where none of the available QA practices were selected.

### Bordering Countries

Three states responded to the question of whether or not emissions information is available in their inventories from other countries. In order to complete modeling efforts, data is requested by Washington, Montana and Arizona and is supplied on a voluntary basis by Canada and Mexico, respectively.

In Part 2 of the questionnaire, respondents were asked to provide specifics about their emission inventories, including pollutants inventoried, emissions estimation methods and source of activity data. These answers varied greatly over each of the specific source categories.

### Point Sources

For point sources, over 80% of the respondents said that they inventory volatile organic compounds (VOCs), CO, nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and particulate matter less than or equal to 10 micrometers (PM<sub>10</sub>), while the remaining 20% had different combinations of the same pollutants. 85% said that they use EPA/Emission Inventory Improvement Program (EIIP) guidance to estimate emissions while 45% of the respondents also used other methodologies as well. Source of activity data varied among the respondents. Sources include permits, industrial source operators, facility questionnaires, source surveys and facility data reports. Respondents were asked to provide, if applicable, spatial surrogate data, which is data that is used to distribute activity data or emissions to a smaller geographic area, such as using population data to go from state-level emissions to county-level emissions. Spatial surrogates mentioned include land use, population, employment, production and location. Spatial resolution is the degree to which the location of a source can be pinpointed geographically within an inventory area. 70% of those responding said that the spatial resolution of their current emission inventory is by county, while state, non-attainment area and "other" spatial resolutions were also available in the region to a lesser extent. In terms of temporal resolution, 80% of those responding said that their emissions are at least annual while to a much lesser extent (approximately 20%) data are available for shorter time periods (seasonal, daily and hourly).

### Area Sources

For area sources, the pollutants most inventoried are VOC, CO, NO<sub>x</sub> and PM<sub>10</sub>. An average of 35% of the respondents said that they use "other" methods to estimate area source emissions. Some of the additional methods mentioned are community surveys, 1996 National Trends Inventory (NTI), CARB and individual Air Pollution Control District methods. Source of activity data for area sources also varied among the respondents. Sources include permit data, state energy reports, surveys, population data, agricultural data, EPA National Emission Inventory (NEI) data and CARB data. Some of the spatial surrogate data mentioned include location, population, land use, employment and vehicle miles traveled (VMT). An average of 34% of those responding said that the spatial resolution of their current area source emission inventory data is delineated by county, which had the highest occurrence. In terms of temporal resolution, an average of 39% of those responding for all area source categories said that their emissions are annual, which had the highest occurrence.

## Mobile Sources

For mobile sources, over 40% of the respondents said that the pollutants they inventory are VOC, CO, NO<sub>x</sub> and PM<sub>10</sub>. Just under half of the respondents said that they use EPA/EIIP guidance as a method in estimating emissions. Some of the other methods mentioned are CARB methods, NONROAD Model and surveys. The sources of activity data for mobile sources include CARB, surveys, EPA Nonroad inventory, Federal Aviation Administration (FAA) and railroad companies. Spatial surrogate data used in emission inventories include airport land use, VMT, population, employment and location. 45% of those responding said that the spatial resolution of their current emission inventory by county is available, which was the highest occurrence. In an average of the area source categories, 49% of those responding said that their emissions are available in an annual timeslice.

## Biogenic Sources

For biogenic sources, some of the other pollutants included in emission inventories are VOC CO, NO<sub>x</sub> and ammonia (NH<sub>3</sub>), depending on the specific category. Across the biogenic categories, an average of 18% of the respondents said that they use EPA/EIIP guidance as a methodology in estimating emissions and 38% use non-EPA/EIIP methodologies in determining biogenic emissions. Some of the other methods mentioned are CARB methods and the PCBEIS model. The sources of activity data for biogenic sources include local meteorological data, land use and vegetative species data. Spatial surrogate data used in the emission inventories include land use, vegetative species distribution data, geography and location. An average of 20% of those responding said that the spatial resolution of their current emission inventory is by county. An average of 19% of those responding said that their emissions are annual, which was the highest occurrence of temporal selections among the biogenic categories.

## Geogenic Sources

For geogenic sources, less than an average of 10% of the respondents said that the pollutants they inventory are VOCs, CO, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and total suspended particulates (TSP), depending on the category. An average of 9% of the respondents said that they use EPA/EIIP guidance as a methodology in estimating emissions. An average of 34% of the respondents use other methodologies including CARB methods and state and federal forest fire data. The sources of activity data for geogenic sources include state and federal forest fire data, surveys and CARB. Spatial surrogate data used in the geogenic emission inventories include geography, vegetative land cover, land use and vegetative species distribution. An average of 9% of those responding said that their current emission inventory can be delineated by county. An average of 9% of those responding said that their emissions are annual across the various geogenic categories.

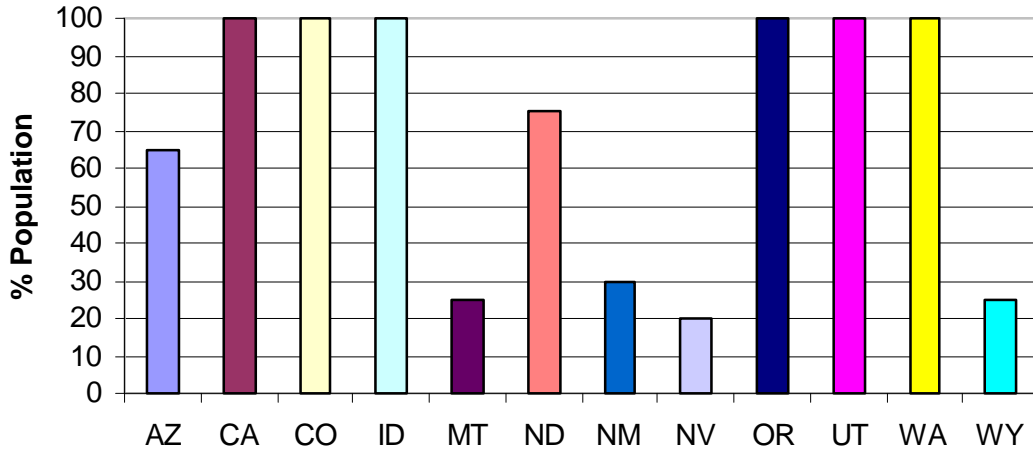
Data for the individual source categories can be found in an Access data base located at [www.pechan.com/eisurvey/WRAPEISurvey.ZIP](http://www.pechan.com/eisurvey/WRAPEISurvey.ZIP) for further analyzing the emissions data collected for specific source categories in the WRAP region.

### 4. *What proportion of the state population is covered by EI efforts?*

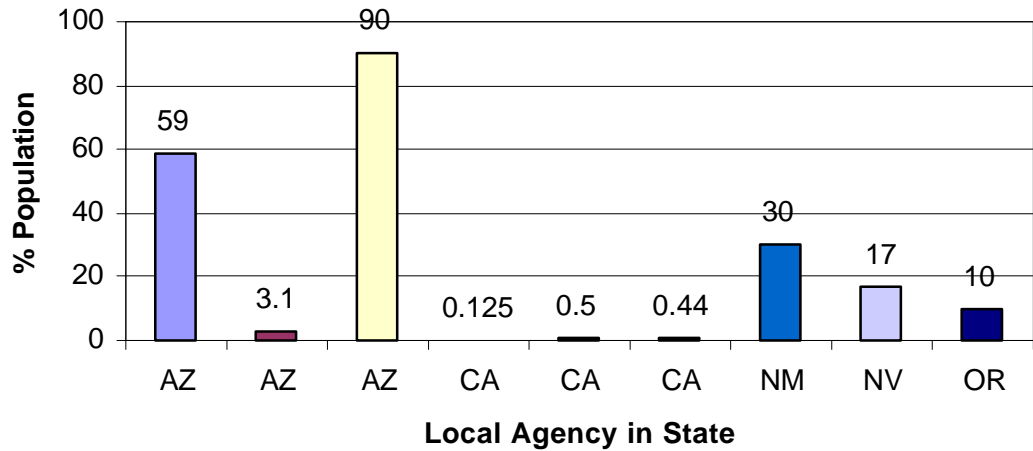
The graphs below show state agencies and local agencies that responded to the questionnaire and the percentage of the population covered in their emission inventories, respectively.

Of the 12 states that responded to this question, half (6 out of the 12) of the states said that 100% of the state population is represented in their emission inventories. These states are California, Colorado, Idaho, Oregon, Utah and Washington. County agencies from Arizona, California and Oregon provided percentages of county population represented in their emission inventories. South Dakota did not respond to this question.

### % of State Population Accounted for in State Level Emission Inventories



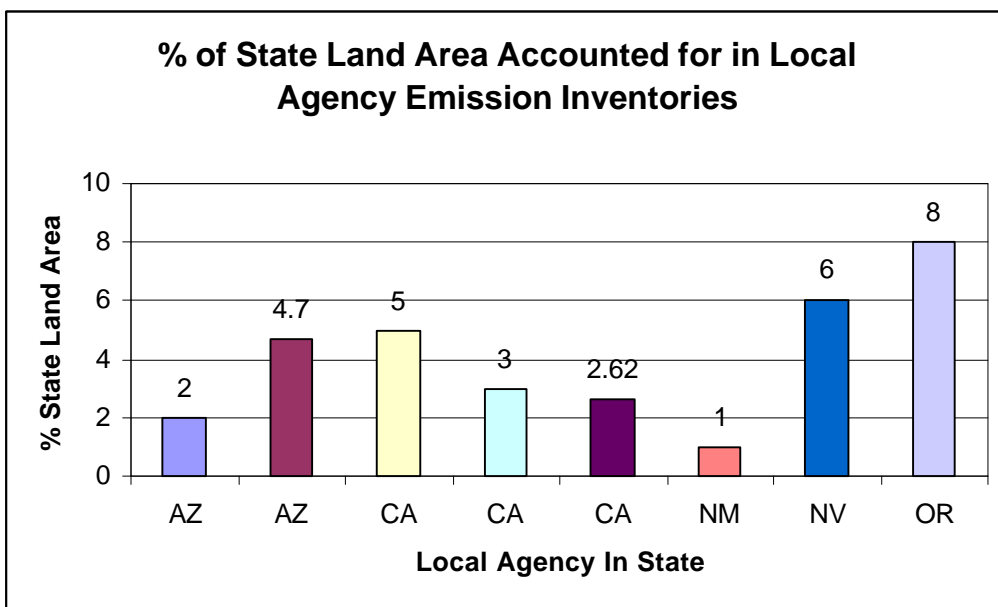
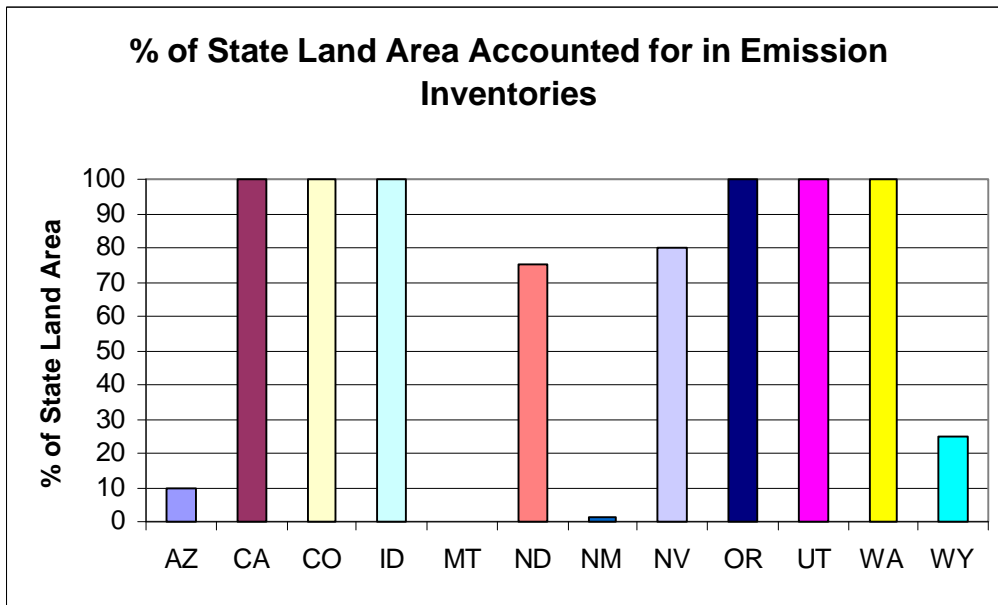
### % of State Population Accounted for in Local Agency Emission Inventories



5. *What proportion of state land area is represented in EI efforts?*

The graph below shows state agencies that responded to the questionnaire and the percentage of state land area covered in their emission inventories.

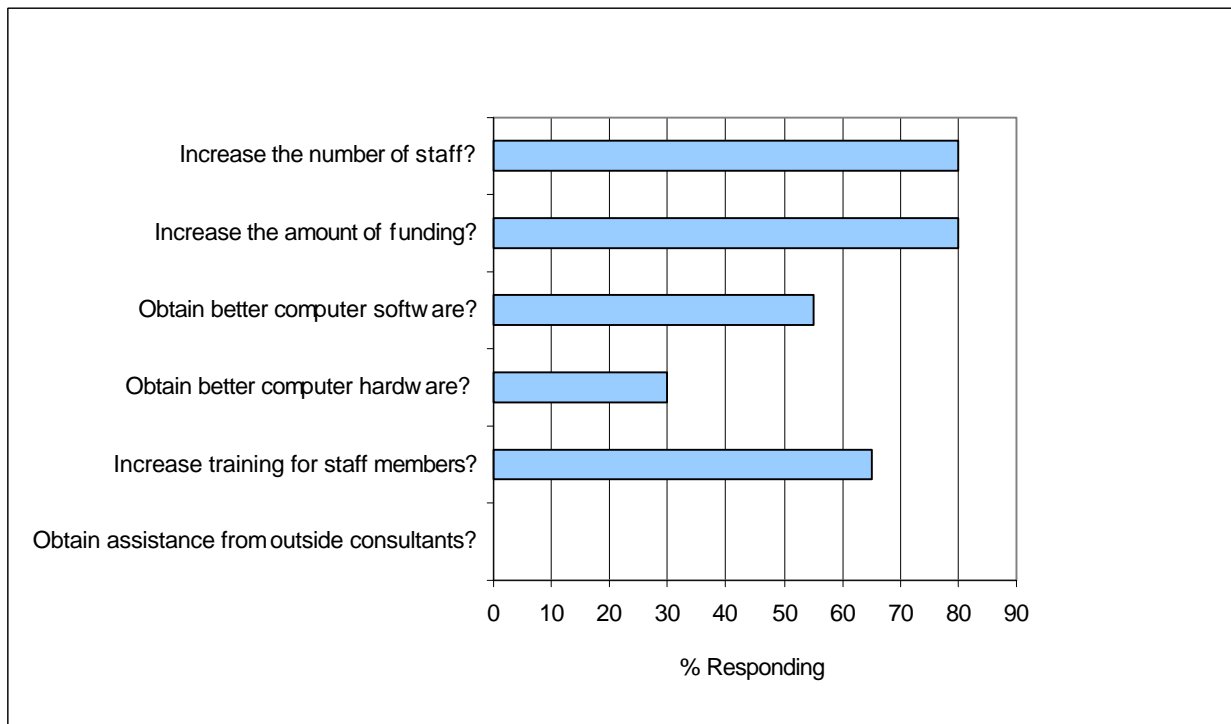
Of the 12 states that responded to this question, half (6 out of the 12) of the states said that 100% of the state land area is represented in their emission inventories. These states are California, Colorado, Idaho, Oregon, Utah and Washington. County agencies from Arizona, California and Oregon provided percentages of county land area represented in their emission inventories. South Dakota did not respond to this question.



6. *What are the recommendations for budget priorities for filling gaps in EI data systems?*

There are six key areas the respondents said they would need assistance with to fill in the gaps in EI data systems. Of those responding, 90% (18 out of 20) felt that if assistance was available, their level of effort would increase. The graph below shows these key areas and the percentage of those responding to the questionnaire who believe that assistance is necessary.

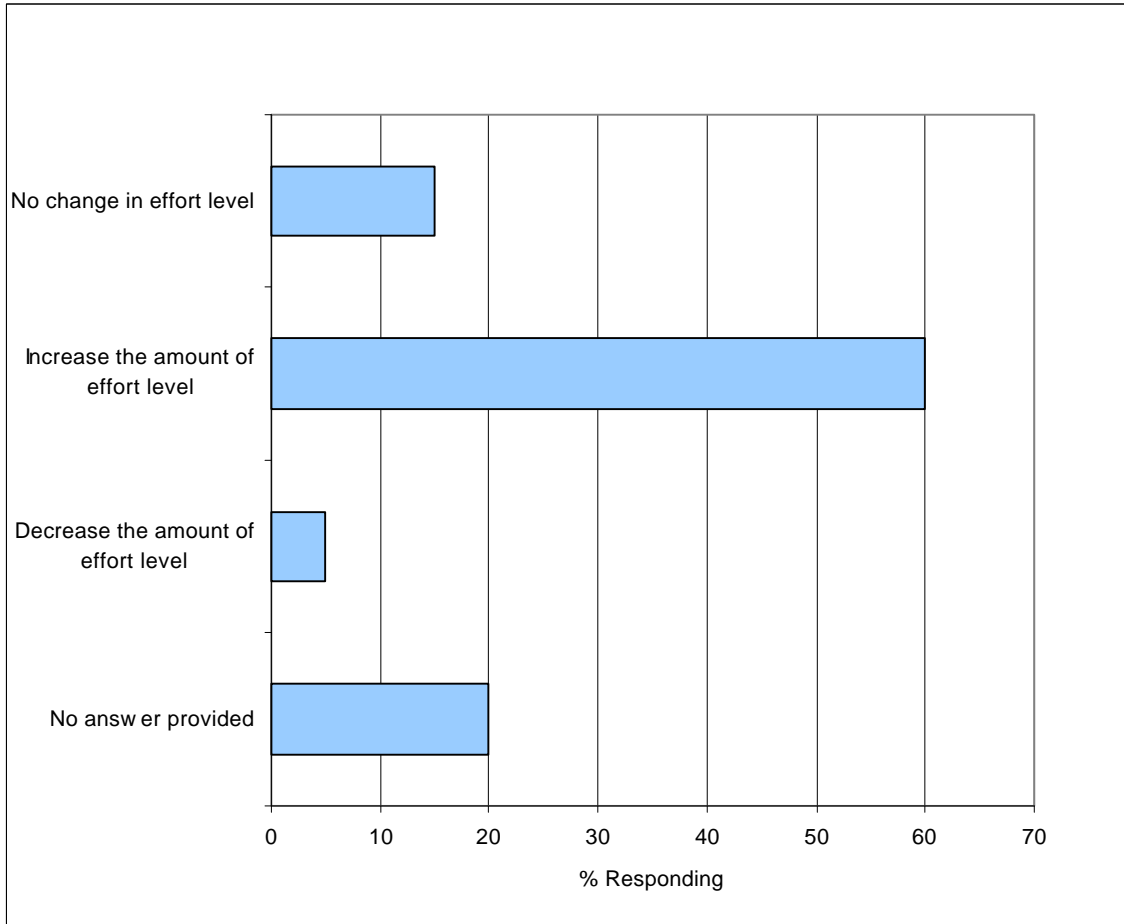
Increases in staffing and funding were the two areas most often selected as areas where assistance would be necessary. 80% (16 out of 20) of those responding selected either staffing or funding and 75% (15 out of 20) selected both. None of the respondents said that assistance would be necessary from outside consultants.



**Recommendations of Areas of Needed Assistance**

7. *What are the anticipated changes in level of effort/or quality of future inventories?*

The graph below shows the percentage of those responding to the question of whether or not they expect any anticipated changes in their level of effort to expend on emission inventories within the next year.

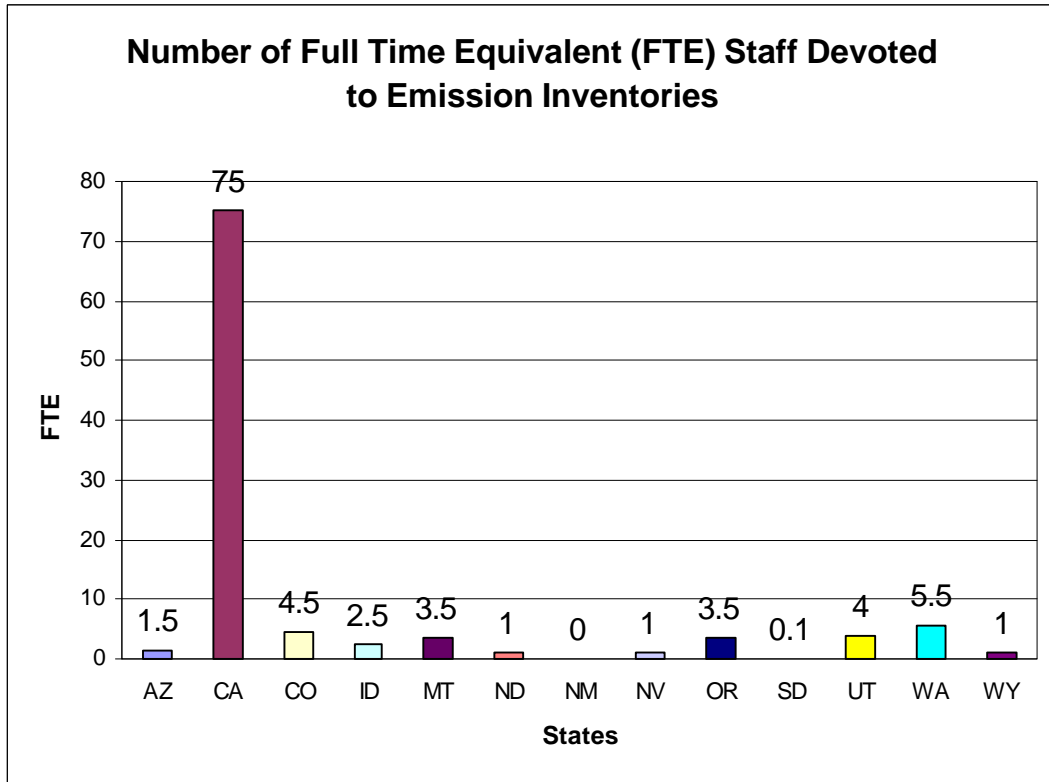


**Anticipated Changes in Level of Effort**

Of the 20 respondents, 60% said that their level of effort would increase within the next year, given that staffing and funding are available. Only 5% said that their level of effort would decrease. Four of the respondents did not answer this question.

8. What is the number of EI staff and/or contractors that are involved in EI efforts in the region?

The figure below shows how many full time equivalent (FTE) staff and/or contractors are involved in EI efforts in the states that responded to the questionnaire. For the purposes of this data analysis, county agency data from Arizona, California and Oregon was not included since state level data was provided.



When looking at the range of responses from the states, there is a great deal of variability in the number of FTE staff devoted to emission inventories in the WRAP region. For example, South Dakota said that 0.1 FTE staff ( which may be a typographical error) are involved in emission inventories, whereas California said that there are 75 FTE staff involved in their state. New Mexico was the only state with no FTE staff devoted to emission inventories. About 70% (9 out of 13) of the states said that they have between 1 to 5 FTE staff involved in emission inventories in their state. Except for New Mexico and South Dakota, all other states have at least 1 FTE staff member working on emission inventories.

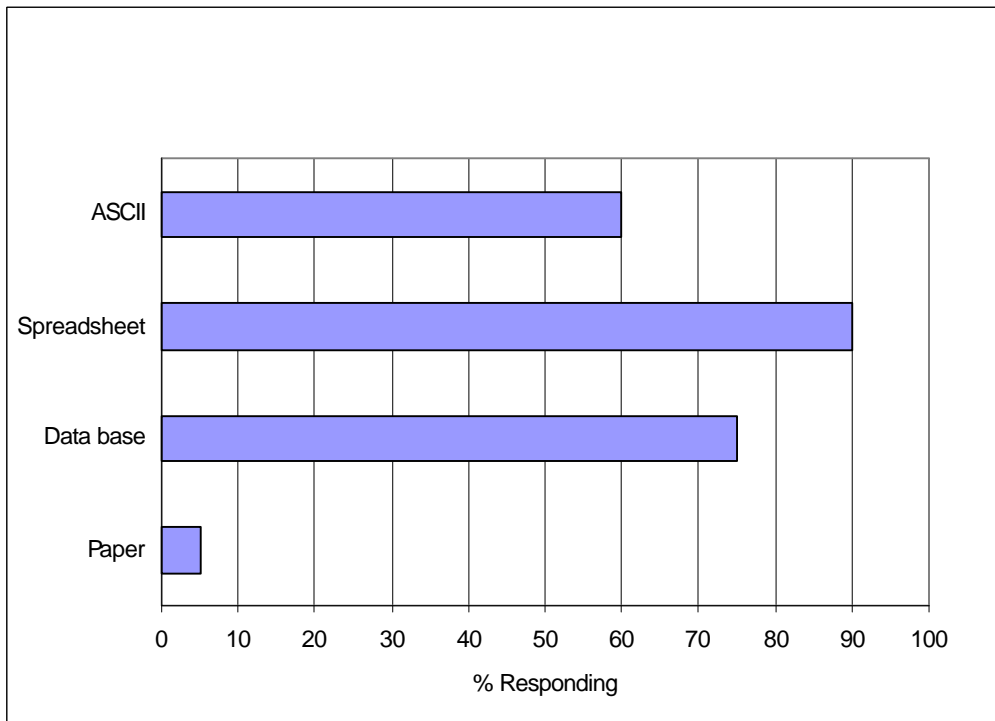
Oregon amended their original entry of 35 FTE to 3.5. Washington was unclear in its initial response to this question. The estimate given was only for state staff. The local agency FTEs should have been included in the estimate and were not. The actual FTE count in the state (including state and local staff) would be closer to 5.5.

9. *How comprehensive are EI data collection systems in the region (i.e., do they have complete point, area, mobile and biogenic/geogenic source category capabilities)?*

The survey did not have a specific question or set of questions to directly provide an appropriate response to this topic. The survey did however touch on the fringes of this topic and inquired about data storage capabilities in the next question, Question 10. Part 2 of the survey inquired about the availability of data by category throughout the region as discussed in Question 3. The survey was geared to retrieve information about the availability of data by specific source categories and in general about the formats which it is kept at each agency and did not have any questions that matched up EI systems capability by emission inventory category.

10. *What EI data formats can be supported by agencies throughout the region?*

The graph below shows the four emission inventory data formats and the percentage of respondents that use them. Included in this analysis is the data submitted by the county agencies in Arizona, California and Oregon.



**Emission Inventory Data Formats Supported by Agencies**

Only one state (Washington) uses all four of the data formats to do emission inventories. Nine of the respondents (45%) said that they use ASCII, spreadsheets and data base data formats to manage their emission inventories. 25% (5) of the respondents only use spreadsheets and data base formats to prepare emission inventories.

## **DATA TRENDS**

It appears from looking at the findings discussed in the previous section, the state agencies that responded to the questionnaire have greater capabilities at developing and maintaining emission inventory data systems than do the local agencies. Greater levels of funding and more staff devoted to emission

inventories are two reasons the state EI data systems are more comprehensive than the local level EI data systems.

When looking at the answers provided in Part 2 of the questionnaire, it appears that emissions inventories are more comprehensive for point and area sources while mobile, biogenic and geogenic source emissions inventories are more disparate. This is possibly due to the emission inventory staff not having the proper training in implementing the available methodologies to collect/compile information for those source categories.

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# CONCLUSION

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## DATA

Overall, more attention needs to be placed on compiling mobile, biogenic, and geogenic source category emission inventories across the region. Based on the survey results, not all states have an inventory of these source categories. Funding is also an issue with the agencies, and each stated that with more funding they could potentially allocate more staff to compiling more comprehensive inventories. Many agencies only apply funding to required tasks driven by regulations that apply to their business operations.

## SYSTEM

General recommendations about a data base management system to house emissions inventory data for the WRAP can be made from the results of this survey. This survey pointed out the level, types and detail of emission inventory data across the region, but did not go into the data level specifics such as what data items are collected and what QA procedures are applied to individual items. The system should be able to house point, area, mobile, nonroad, biogenic and geogenic emissions with the following general data storage capabilities:

At a minimum contain the emission inventory specific inputs to the desired regional models to be used for air quality/emissions analysis.

- State
- County
- Grid coordinates
- Geographic coordinates
- Zip Code
- Source ids (where applicable)
- Stack identifier and parameters (where applicable)
- Stack exit gas attributes (where applicable)
- Building dimensions (where applicable)
- Local terrain type
- Distance to fenceline (where applicable)
- Source Classifications (SIC and SCC)
- Operational/emission throughput percentages
- Type of emission (annual, seasonal, daily, etc...)
- Time of emissions (begin and end dates, begin and end times)
- Emissions
- Emissions units
- Emissions methodology
- Date of data collection
- Date of entry/update
- Entity and individual that last updated the data
- Control Equipment
- Control Efficiency
- Applicable Regulation(s)

While there are many data base management systems and data formats available for use, the WRAP will need to select on that meets several critical needs:

- Data be supplied in a consistent format
- Data be supplied be of similar timeframe, level of detail and spatial resolution
- All data be available at the same time for analysis and modeling runs

The entities that are to supply the WRAP with data must have the capability to create data formats consistent with the WRAP's needs or the WRAP must supply the resources to convert data into their formats from the specific agencies or decide to use a different source for the data altogether. Since all states are required to submit data to the EPA in NEI Input format, the WRAP system should be able to read NEI formatted data. If agencies cannot supply data to the WRAP, then the WRAP will need to seek other sources for the data, such as EPA NEI or Toxic Release Inventory (TRI) data bases. For categories where data are not supplied, the WRAP will have to estimate the data using methodologies appropriate for the particular source category where data are to be derived.

The WRAP should also consider the amount of data to be processed in selecting a system to house emission inventory data for the region. Pechan estimates that the WRAP regional database will contain about one-quarter to one-third of the data that is contained in the NEI. The NEI data comprises about 2 gigabytes of data per year of emission inventory data for the entire country. If the WRAP is to process multiple years of data for the region, several gigabytes of data will require processing. It is recommended that a SQL back-end data base such as Oracle be used to house the data to facilitate analysis and data retrievals.

In conclusion, if data are to be compiled for the region, the WRAP needs to take into consideration, the applicability of file formats for accepting data, available resources at the agency level, available data types, time for importing, generating and repairing data, data storage capacities and data processing time and accessibility of the data to/by various sources.

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**APPENDIX A  
SURVEY MAILING LIST**

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**Emission Inventory Survey Mailing List (Rev. October 11, 2000)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
Arizona	Arizona Department of Environmental Quality, Air Quality Division	Nancy Wrona, Director * (602) 207-2308 wrona.nancy@ev.state.az.us Mike George, Emission Inventory Contact (602) 207-2274 MG1@ev.state.az.us	3033 North Central Avenue Phoenix, Arizona 85012
Arizona	Maricopa County Bureau of Air Pollution Control	Jo Crumbaker, Emission Inventory Contact (602) 506-6705 jcrumbak@mail.maricopa.gov	1001 North Central Avenue Suite 100 Phoenix, Arizona 85004
Arizona	Pima County Department of Environmental Quality	Ursula Kramer, Director (520) 740-3340 ukramer@deq.co.pima.az.us	130 West Congress, Third Floor Tucson, Arizona 85701-1317
Arizona	Pinal County Air Quality Control District	Donald Gabrielson, Director (520) 868-6929 don.gabrielson@co.pinal.az.us	P.O. Box 987 Florence, Arizona 85232
Colorado	Colorado Department of Health, Air Pollution Control Division	Margie Perkins, Division Director * (303) 692-3100 margie.perkins@state.co.us Roy Doyle, Emission Inventory Contact (303) 692-3159 roy.doyle@state.co.us	4300 Cherry Creek Drive South Denver, Colorado 80246-1530
Idaho	Idaho Department of Environmental Quality, Air Quality Division	Orville Green, Program Administrator * (208) 373-0502 ogreen@deq.state.id.us Matt Stoll, Air Quality Assessments Manager (208) 373-0249 mstoll@deq.state.id.us	1410 North Hilton Street Boise, Idaho 83706

**Emission Inventory Survey Mailing List (Rev. October 11, 2000) (continued)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
Montana	Montana Department of Environmental Quality, Air Quality Program	Bob Raisch, Chief * (406) 444-3658 braisch@state.mt.us	2209 Phoenix Avenue Helena, Montana 59620
		John Coefield, Emission Inventory Contact (406) 444-5272 jcoefield@state.mt.us	
Nevada	Nevada Division of Environmental Protection, Bureau of Air Quality	Colleen Cripps, Director (775) 687-4670 ccripps@ndep.carson-city.nv.us	333 W. Nye Lane Carson City, Nevada 89706-0851
Nevada	Clark County Health District, Air Pollution Control Division	Michael Naylor, Director (702) 383-1276 mnaylor@cchd.org or naylor@cchd.co.clark.nv.us	P.O. Box 3902 Las Vegas, Nevada 89127
Nevada	Washoe County District Health Department, Air Quality Management Division	Andrew Goodrich, Director * (775) 784-7200 agoodric@mail.co.washoe.nv.us	401 Ryland Street, Suite 331 Reno, Nevada 89502
		Linda O'Brien, Emission Inventory Contact (775) 784-7206 lobrien@mail.co.washoe.nv.us	
New Mexico	New Mexico Environmental Department, Air Quality Bureau	George Llewellyn, Manager * (505) 827-1494 ext.1470 george_llewellyn@nmenv.state.nm.us	2048 Galisteo Street Santa Fe, New Mexico 87505
		Genevieve Grant (505) 955-8070 genevieve_grant@nmenv.state.nm.us	
New Mexico	Albuquerque Environmental Health Department, Air Pollution Control Division	Dan Warren, Planning Supervisor (505) 768-2637 dwarren@cabq.gov	P.O. Box 1293 Albuquerque, New Mexico 87103
North Dakota	Division of Air Quality, North Dakota Department of Health	Chuck McDonald, Environmental Engineer (701) 328-5188 cmcdonal@state.nd.us	1200 Missouri Avenue, #304 Bismark, North Dakota 58506-5520

**Emission Inventory Survey Mailing List (Rev. October 11, 2000) (continued)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
Oregon	Oregon Department of Environmental Quality, Air Quality Division	Andy Ginsburg, Administrator * (503) 229-5397 ginsburg.andy@deq.state.or.us	811 S.W. Sixth Avenue Portland, Oregon 97204-1390
		Steve Aalbers, Emission Inventory Specialist (503) 229-6798 aalbers.steven@deq.state.or.us	
Oregon	Lane Regional Air Pollution Authority	Ralph Johnston, Emission Inventory Supervisor (541) 726-2514 ext. 213 metman@lrapa.org	1010 Main Street Springfield, Oregon 97477
South Dakota	S.D. Dept. of Environment & Natural Resources, Air Quality Program	Jeanne Goodman, Administrator * (605) 773-3151 jeanne.goodman@state.sd.us	Joe Foss Building, 523 Capitol Pierre, South Dakota 57501
		Jay Fenenga, Emission Inventory Contact (605) 773-3151 jay.fenenga@state.sd.us	
Utah	Utah Department of Environmental Quality, Division of Air Quality	Rick Sprott, Director * (801) 536-4022 rsprott@deq.state.ut.us	P.O. Box 144820 Salt Lake City, Utah 84114-4820
		Dave McNeill, Emission Inventory Contact (801) 536-4037 dmcneill@deq.state.ut.us	
Washington	Washington State Department of Ecology, Air Quality Program	Mary Burg, Manager * (360) 407-6880 mbur461@ecy.wa.gov	P.O. Box 47600 Olympia, Washington 98504-7600
		Sally Otterson, Emission Inventory Contact (360) 407-6806 sott461@ecy.wa.gov	

**Emission Inventory Survey Mailing List (Rev. October 11, 2000) (continued)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
Wyoming	Wyoming Department of Environmental Quality, Air Quality Division	Dan Olson, Administrator (307) 777-7391 dolson@state.wy.us	Herschler Building 122 West 25 <sup>th</sup> Street Cheyenne, Wyoming 82002
		Lee Gribovicz, Regional Impacts/E.I. Coordinator (307) 332-6755 lgribo@state.wy.us	250 Lincoln Street Lander, Wyoming 82520
California	California Air Resources Board	Mike Kenney, Executive Officer * (916) 445-4383 mkenny@arb.ca.gov	P.O. Box 2815 Sacramento, California 95812
		Andy Alexis, Emission Inventory Contact (916) 445-8699 aalexis@arb.ca.gov	
California	Amador County Air Pollution Control District	Karen Huss, Air Pollution Control Officer (209) 223-6406 khuss@co.amador.ca.us	500 Argonaut Lane Jackson, California 95642-2310
California	Antelope Valley Air Pollution Control District	Charles L. Fryxell, Air Pollution Control Officer (661) 723-8070 cfryxell@mdaqmd.ca.gov	14306 Park Avenue Victorville, California 92392-2310
California	Bay Area Air Pollution Control District	Ellen Garvey, Air Pollution Control Officer (415) 749-4970 egarvey@baaqmd.gov	939 Ellis Street San Francisco, California 94109-7799
California	Butte County Air Pollution Control District	Larry Odle, Air Pollution Control Officer (530) 891-2882 apco@butteair.dcsi.net	2525 Dominic Drive, Suite J Chico, California 95928-7184
California	Calaveras County Air Pollution Control District	Jerry Howard, Air Pollution Control Officer (209) 754-6504 jhoward@co.calaveras.ca.us	Department of Agriculture 891 Mountain Ranch Road San Andreas, California 95249-9709
California	Colusa County Air Pollution Control District	Harry Krug, Air Pollution Control Officer (530) 458-0590 hak@mako.com	100 Sunrise Blvd. #F Colusa, California 95932-3246
California	El Dorado County, Environmental Management Department	Jon Morgan, Air Pollution Control Officer (530) 621-6662 jmorgan@co.el-dorado.ca.us	2850 Fairlane Court Placerville, California 95667-4100

**Emission Inventory Survey Mailing List (Rev. October 11, 2000) (continued)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
California	Feather River Air Pollution Control District	Steven A. Speckert, Air Pollution Control Officer (530) 634-7659 apco@yuba.org	938 14th Street Marysville, California 95901-4149
California	Glenn County Air Pollution Control District	Ed Romano, Air Pollution Control Officer (530) 934-6500 gcairag@maxinet.com	P.O. Box 351 Willows, California 95988-0351
California	Great Basin Unified Air Pollution Control District	Brian Lamb, Air Pollution Control Officer (760) 872-8211 greatbasin@qnet.com	157 Short Street Bishop, California 93514-3537
California	Imperial County Air Pollution Control District	Stephen Birdsall, Air Pollution Control Officer (760) 339-4314 agcom@imperialcounty.net	150 South 9th Street El Centro, California 92243-2801
California	Kern County Air Pollution Control District	Thomas Paxson, Air Pollution Control Officer (661) 862-5250 kcapcd@co.kern.ca.us	2700 "M" Street, Suite 302 Bakersfield, California 93301-2370
California	Lake County Air Pollution Control District	Robert Reynolds, Air Pollution Control Officer (707) 263-7000 bobr@pacific.net	885 Lakeport Boulevard. Lakeport, California 95453-5405
California	Lassen County Air Pollution Control District <b>**SEND HARD COPY OF SURVEY**</b>	Kenneth R. Smith, Air Pollution Control Officer (530) 251-8110 lassenag@psln.com	175 Russell Avenue Susanville, California 96130-4215
California	Mariposa County Air Pollution Control District	David Conway, REHS (209) 966-2220 air@yosemite.net	P.O. Box 5 Mariposa, California 95338
California	Mendocino County Air Pollution Control District	Dean Wolbach, Sr. Air Quality Specialist (707) 463-4354 mcaqmd@co.mendocino.ca.us	306 E. Gobbi Street Ukiah, California 95482-5511
California	Modoc County Air Pollution Control District	Joe Moreo, Air Pollution Control Officer (530) 233-6419 modocag@hdo.net	202 West 4th Street Alturas, California 96101-3915
California	Mojave Desert Air Pollution Control District	Charles L. Fryxell, Air Pollution Control Officer (760) 245-1661 cfryxell@mdaqmd.ca.gov	14306 Park Avenue Victorville, California 92392-2310

**Emission Inventory Survey Mailing List (Rev. October 11, 2000) (continued)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
California	Monterey Bay Unified Air Pollution Control District	Doug Quetin, Air Pollution Control Officer (831) 647-9411 dquetin@mbuapcd.org	24580 Silver Cloud Court Monterey, California 93940-6536
California	North Coast Unified Air Pollution Control District	Wayne Morgan, Air Pollution Control Officer (707) 443-3093 ncuaqmd@northcoast.com	2300 Myrtle Avenue Eureka, California 95501-3327
California	Northern Sierra Air Pollution Control District	Rod Hill, Air Pollution Control Officer (530) 274-9360 nsaqmd@nccn.net	P.O. Box 2509 Grass Valley, California 95945-2509
California	Northern Sonoma County Air Pollution Control District	Barbara Lee, Air Pollution Control Officer (707) 433-5911 nsc@sonic.net	150 Matheson Street Healdsburg, California 95448-4908
California	Placer County Air Pollution Control District	Todd Nishikawa, Air Pollution Control Officer (530) 889-7135 placeraqmd@foothill.net	DeWitt Center 11464 "B" Avenue Auburn, California 95603-2603
California	Sacramento Metro Air Pollution Control District	Norman D. Covell, Air Pollution Control Officer (916) 874-4802 ncovell@airquality.org	777 12th Street, Third Floor Sacramento, California 95814-1908
California	San Diego Air Pollution Control District	Richard Sommerville, Air Pollution Control Ofcr. (858) 650-4500 rsommeha@co.san-diego.ca.us	9150 Chesapeake Drive San Diego, California 92123-1096
California	San Joaquin Valley Air Pollution Control District	David L. Crow, Air Pollution Control Officer (559) 230-6036 david.crow@valleyair.org	1990 E. Gettysburg Avenue Fresno, California 93726-0244
California	San Luis Obispo County Air Pollution Control District	Robert W. Carr, Air Pollution Control Officer (805) 781-5912 bcarr_apcd@co.slo.ca.us	3433 Roberto Court San Luis Obispo, California 93401-7126
California	Santa Barbara County Air Pollution Control District	Doug Allard, Air Pollution Control Officer (805) 961-8853 allardd@sbcapcd.org	26 Castilian Drive, Suite B-23 Goleta, California 93117-3027
California	Shasta County Air Pollution Control District	Michael Kussow, Air Pollution Control Officer (530) 225-5674 mkussow@co.shasta.ca.us	1855 Placer Street, Suite 101 Redding, California 96001-1759

**Emission Inventory Survey Mailing List (Rev. October 11, 2000) (continued)**

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
California	Siskiyou County Air Pollution Control District	William J. Stephans, Air Pollution Control Officer (530) 841-4029 wstephans@siskiyou.co.ca.us	525 South Foothill Drive Yreka, California 96097-3036
California	South Coast Air Quality Management District	Dr. Barry Wallerstein, Executive Officer (909) 396-2100 bwallerstein@aqmd.gov Mike Nazemi, Planning Manager of the Emission Inventory Branch (909) 396-3187 mnazemi@aqmd.gov	21865 East Copley Drive Diamond Bar, California 91765-4182
California	Tehama County Air Pollution Control District	Gary Bovee, Assistant Air Pollution Control Officer (530) 527-3717 tehapcd@snowcrest.net	1750 Walnut Street P.O. Box 38 Red Bluff, California 96080-0038
California	Tuolumne County Air Pollution Control District	Gerald Benincasa, Air Pollution Control Officer (209) 533-5693 tuolapcd@mlode.com	2 South Green Street Sonora, California 95370-4618
California	Ventura County Air Pollution Control District	Genie McGaugh, Supervising Air Quality Specialist (805) 645-1425 genie@vcapcd.org	669 County Square Dr., 2nd Fl. Ventura, California 93003-5417
California	Yolo-Solano Air Pollution Control District	Larry Greene, Air Pollution Control Officer (530) 757-3656 lgreene@ysaqmd.org	1947 Galileo Court, Suite 103 Davis, California 95616-4882

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**APPENDIX B**  
**SURVEY RESPONDENTS**

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### Emission Inventory Survey Respondent List

<b>State</b>	<b>Agency</b>	<b>Contact Name / Phone Number / E-Mail</b>	<b>Mailing Address</b>
Arizona	Arizona Department of Environmental Quality, Air Quality Division	Randy Sedlacek, Special Applications Unit Manager (602) 207-2352 rfs@ev.state.az.us	3033 North Central Avenue Phoenix, Arizona 85012
Arizona	Maricopa County Environmental Services Department	Bob Downing, Emission Inventory Unit Manager (602) 506-6883 bdowning@mail.maricopa.gov	1001 North Central Avenue Suite 100 Phoenix, Arizona 85004
Arizona	Pima County Department of Environmental Quality	Richard Grimaldi, Deputy Director (520) 740-3332 rgrimald@deq.co.pima.az.us	130 West Congress, Third Floor Tucson, Arizona 85701-1317
Arizona	Pinal County Air Quality Control District	Robert Farrell, Environmental Engineer II (520) 868-6949 bob.farrell@co.pinal.az.us	P.O. Box 987 Florence, Arizona 85232
Colorado	Colorado Department of Health, Air Pollution Control Division	Roy Doyle, Environmental Protection Specialist (303) 692-3159 roy.doyle@state.co.us	4300 Cherry Creek Drive South Denver, Colorado 80246-1530
Idaho	Idaho Department of Environmental Quality, Air Quality Division	Matt Stoll, Air Quality Assessments Manager (208) 373-0249 mstoll@deq.state.id.us	1410 North Hilton Street Boise, Idaho 83706
Montana	Montana Department of Environmental Quality, Air Quality Program	John Coefield, Air Program Manager (406) 444-5272 jcoefield@state.mt.us	2209 Phoenix Avenue Helena, Montana 59620
Nevada	Washoe County District Health Department, Air Quality Management Division	Linda O'Brien, Environmental Engineer (775) 784-7206 lobrien@mail.co.washoe.nv.us	401 Ryland Street, Suite 331 Reno, Nevada 89502
New Mexico	Albuquerque Environmental Health Department, Air Pollution Control Division	Dan Warren, Planning Supervisor (505) 768-2637 dwarren@cabq.gov	P.O. Box 1293 Albuquerque, New Mexico 87103
Nevada	Nevada Division of Environmental Protection, Bureau of Air Quality	Greg Remer, Staff Engineer for Colleen Cripps, Director (775) 687-4670 gremer / ccripps@ndep.carson-city.nv.us	333 W. Nye Lane Carson City, Nevada 89706-0851
North Dakota	Division of Air Quality, North Dakota Department of Health	Chuck McDonald, Environmental Engineer (701) 328-5188 cmcdonal@state.nd.us	1200 Missouri Avenue, #304 Bismark, North Dakota 58506-5520

### Emission Inventory Survey Respondent List (continued)

State	Agency	Contact Name / Phone Number / E-Mail	Mailing Address
Oregon	Oregon Department of Environmental Quality, Air Quality Division	Steve Aalbers, Emission Inventory Specialist (503) 229-6798 aalbers.steven@deq.state.or.us	811 S.W. Sixth Avenue Portland, Oregon 97204-1390
Oregon	Lane Regional Air Pollution Authority	Brett Jacobs, Environmental Specialist (541) 7736-1056 eiguy@lrpa.org	1010 Main Street Springfield, Oregon 97477
South Dakota	S.D. Dept. of Environment & Natural Resources, Air Quality Program	Jay Fenenga, Natural Resources Engineer (605) 773-3151 jay.fenenga@state.sd.us	Joe Foss Building, 523 Capitol Pierre, South Dakota 57501
Utah	Utah Department of Environmental Quality, Division of Air Quality	Carol Nielsen, Inventory Coordinator (801) 536-4073 CNielsen@deq.state.ut.us	P.O. Box 144820 Salt Lake City, Utah 84114-4820
Washington	Washington State Department of Ecology, Air Quality Program	Sally Otterson, Environmental Specialist (360) 407-6806 sott461@ecy.wa.gov	P.O. Box 47600 Olympia, Washington 98504-7600
Wyoming	Wyoming Department of Environmental Quality, Air Quality Division	Lee Gribovicz, Regional Impacts/E.I. Coordinator (307) 332-6755 lgribo@state.wy.us	250 Lincoln Street Lander, Wyoming 82520
California	California Air Resources Board	Dennis Goodenow, Sr. Air Pollution Specialist * (916) 445-4292 dgoodeno@arb.ca.gov	P.O. Box 2815 Sacramento, California 95812
California	Mendocino County Air Pollution Control District	Dean Wolbach, Sr. Air Quality Specialist (707) 463-4354 mcaqmd@co.mendocino.ca.us	306 E. Gobbi Street Ukiah, California 95482-5511
California	San Luis Obispo County Air Pollution Control District	Tom Roemer, Compliance Engineer (805) 781-5912 troemer_apcd@co.slo.dst.ca.us	3433 Roberto Court San Luis Obispo, California 93401-7126
California	Siskiyou County Air Pollution Control District	William J. Stephans, Air Pollution Control Officer (530) 841-4029 wstephan@co.siskiyou.ca.us	525 South Foothill Drive Yreka, California 96097-3036

\* Mr. Goodenow responded for the whole state of California.

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**APPENDIX C  
SURVEY**

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The survey can be found on-line at [www.pechan.com/eisurvey](http://www.pechan.com/eisurvey).

## **EMISSION INVENTORY SURVEY**

### **Background**

The Western Regional Air Partnership (WRAP) Emissions Forum is developing a consistent regional tracking system to meet requirements for State Implementation Plan (SIP) and Tribal Implementation Plan (TIP) development and periodic review and updates. A central regional emission inventory data base is needed to facilitate regional modeling, to enable states and tribes to obtain information needed for SIPs and TIPs and to provide public information. The WRAP emission inventory will contain emission data from point, area, mobile and biogenic/geogenic sources. The WRAP Emission Forum is charged with designing a database system to collect and manage the region's data. One of the foundations of the Emissions Forum plan is to have state, local and tribal air quality agencies in the region supply locally obtained emission data to the WRAP to fill that regional emission inventory database.

In order for the WRAP emission inventory system to receive the necessary data, the state, local and tribal air quality agencies must have the staff, training and direction to collect and process the local data for ultimate submittal to the WRAP. To determine the capability of the state and local agencies to meet WRAP requirements, the Emissions Forum will collect and analyze data from this survey to determine the state of preparation and availability of emission inventory data in the WRAP region. The information will be used to identify areas of concern and to prioritize WRAP resources and efforts in creating the organizations regional emission inventory system.

### **Survey**

There are three (3) parts to the survey, please complete all portions. If a survey section is submitted more than once, only the first submittal will be retained unless we are otherwise notified.

## WRAP EMISSION INVENTORY SURVEY - FREQUENTLY ASKED QUESTIONS

**1. *What is the purpose of the survey?***

The survey's purpose is to poll the agencies in the western portion of the United States about the nature, status and general data content of their emission inventories. The Western Regional Air Partnership (WRAP) will use the information resulting from the analysis of the survey to determine how to collect, integrate and manage emission inventory data from all agencies so that regional modeling and other programs can be executed efficiently.

**2. *Will I have to submit emission inventory data as part of the survey?***

The collection of emission inventory data is not part of the survey.

**3. *How long will the survey take?***

The survey should take about 1 to 2 hours to complete, provided you have the information available to complete the questions. We advise that each survey respondent read over the entire survey before beginning, in order to familiarize themselves with and make available the information necessary to complete the survey.

**4. *How long will the survey be on-line?***

The survey will be available until December 1, 2000. Please try to complete the survey before December 1, 2000 to ensure that your responses will be included in the resulting analysis.

**5. *How is the table in Part One regarding the current emissions inventory to be completed if the current inventory is only for one county?***

Answer no for statewide inventory, and in the section (Other) explain that the inventory is only for one county.

**6. *Does temporal resolution refer to how the final emissions are expressed in the inventory?***

Yes.

**7. *If I am working on a newer than 1996 inventory (but 1996 is the current complete inventory), should the questions answered based on the 1996 inventory or the newer inventory?***

The survey responses should be based on the information contained in the 1996 inventory and note that a newer (indicate year) inventory is being compiled.

**8. *If I plan to use the NONROAD model in the future, but have not yet used it for any emissions inventory, do I include it in my survey responses?***

Please check all the models that are currently being used and also include ones that are planned to be used in the future.