

Joint Air Toxics Assessment Project (JATAP) for the Maricopa/Pinal Urban Area, Arizona

Presented by:

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To:

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Phoenix Joint Air Toxics Assessment Project (JATAP)

- Joint effort between state, county, tribal and EPA officials to address the risk from air toxics in the greater Phoenix metropolitan area.
- The collaboration is guided by a steering committee
 - Undertakes planning and coordination of joint activities through a consensus based process
 - Logistical and technical support from the Institute for Tribal Environmental Professionals (ITEP)



JATAP Participants

- Agencies with JATAP funded projects:
 - Salt River Pima-Maricopa Indian Community
 - Fort McDowell Yavapai Nation
 - Gila River Indian Community
 - Arizona DEQ
 - ITEP
- Other participating and advisory agencies
 - Maricopa County Air Quality Department
 - Pinal County Air Quality Control District
 - EPA Region 9 Air Division
 - University of Arizona
 - City of Phoenix
 - Sonoma Technology, Inc (sub-contractor)



Key Issues and Challenges

- Complexity of project
- Resource issues
- Quality of monitoring data
- Risk communication
- Data sharing
- Funding

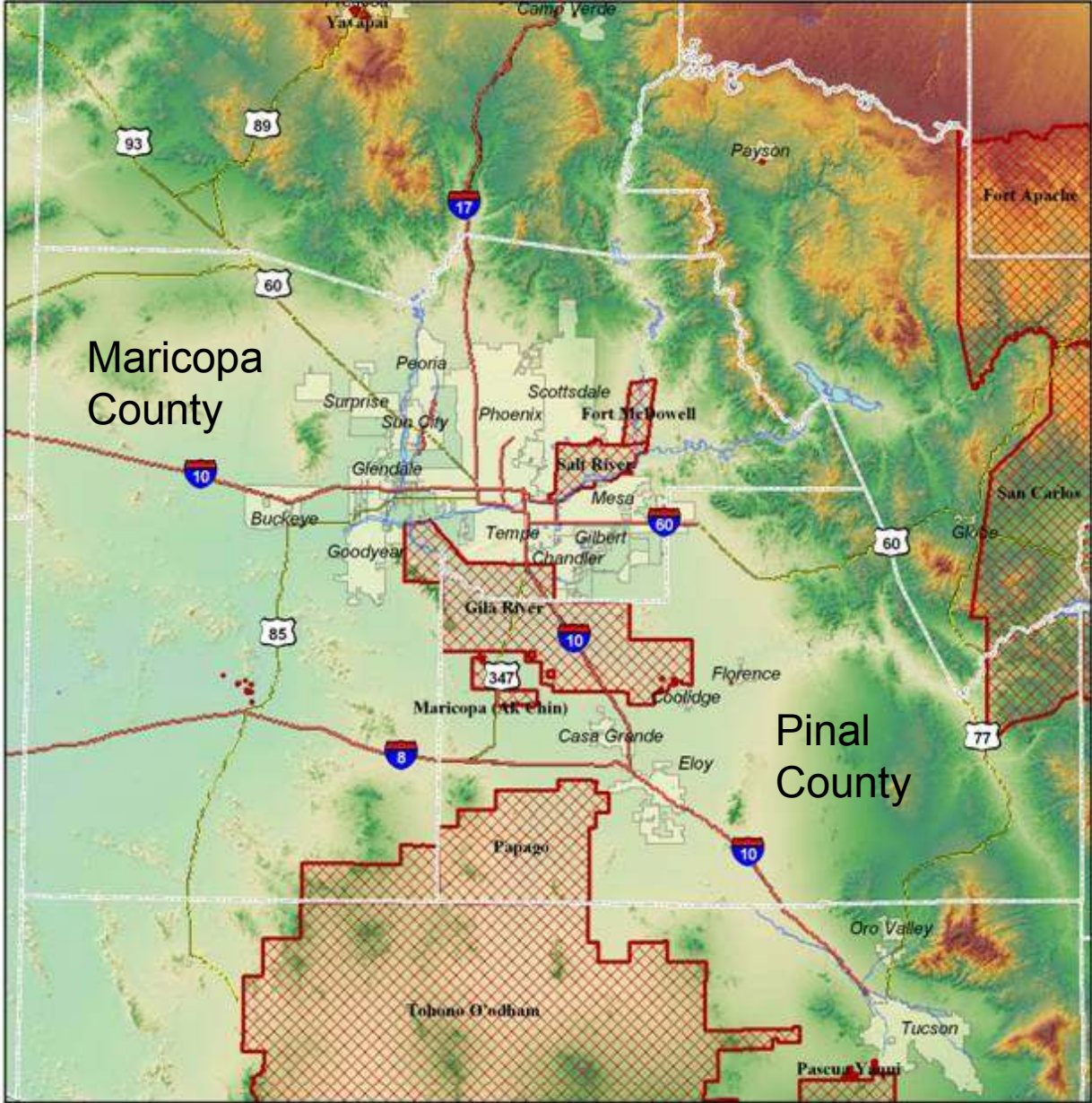


What is the Maricopa/Pinal Urban Area?

Legend







- Tribal Land
- Limited Access Highway
- Highway
- Major Water
- Urban Boundary
- County Boundary

Elevation (m)

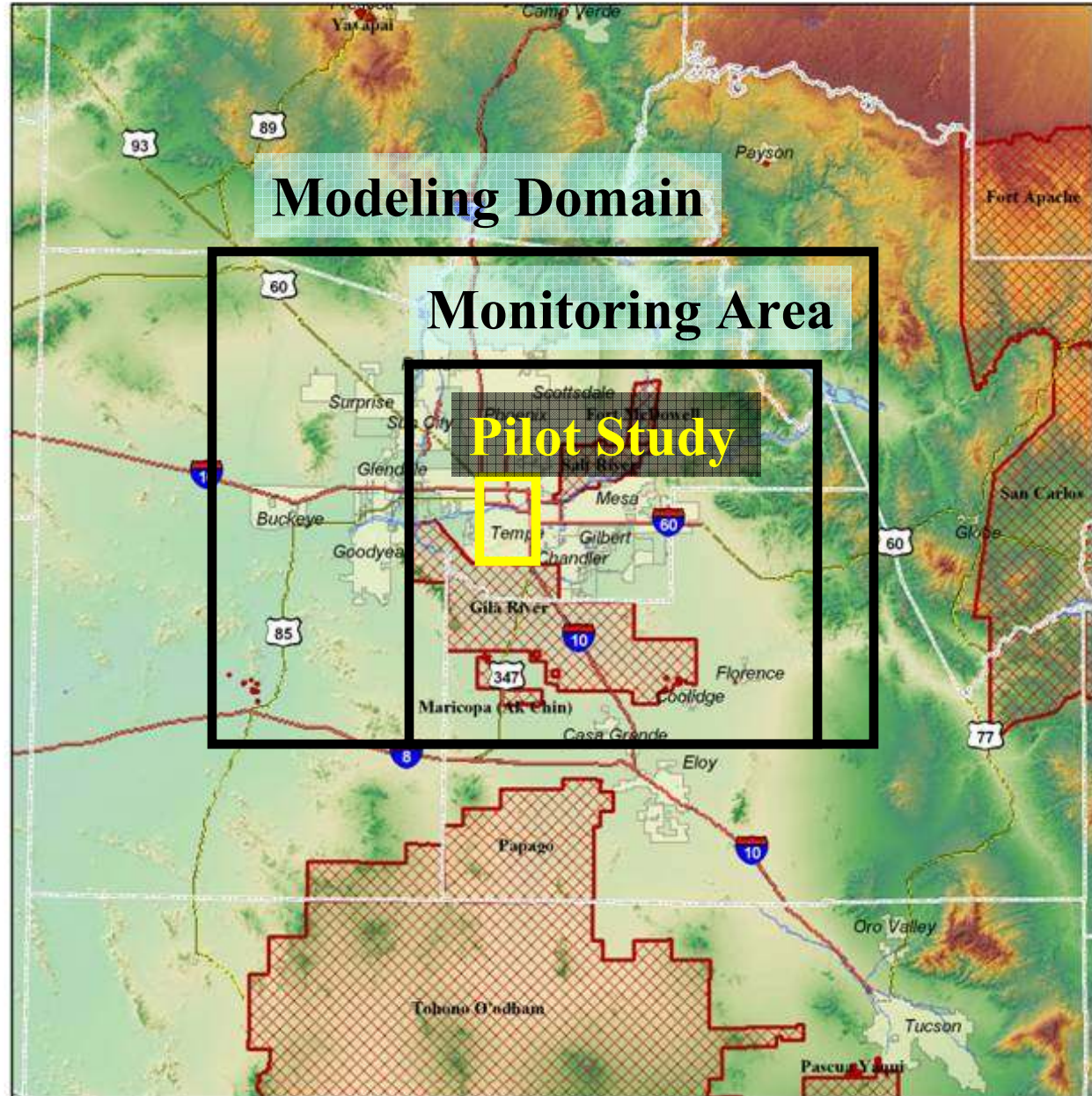


JATAP Project Area

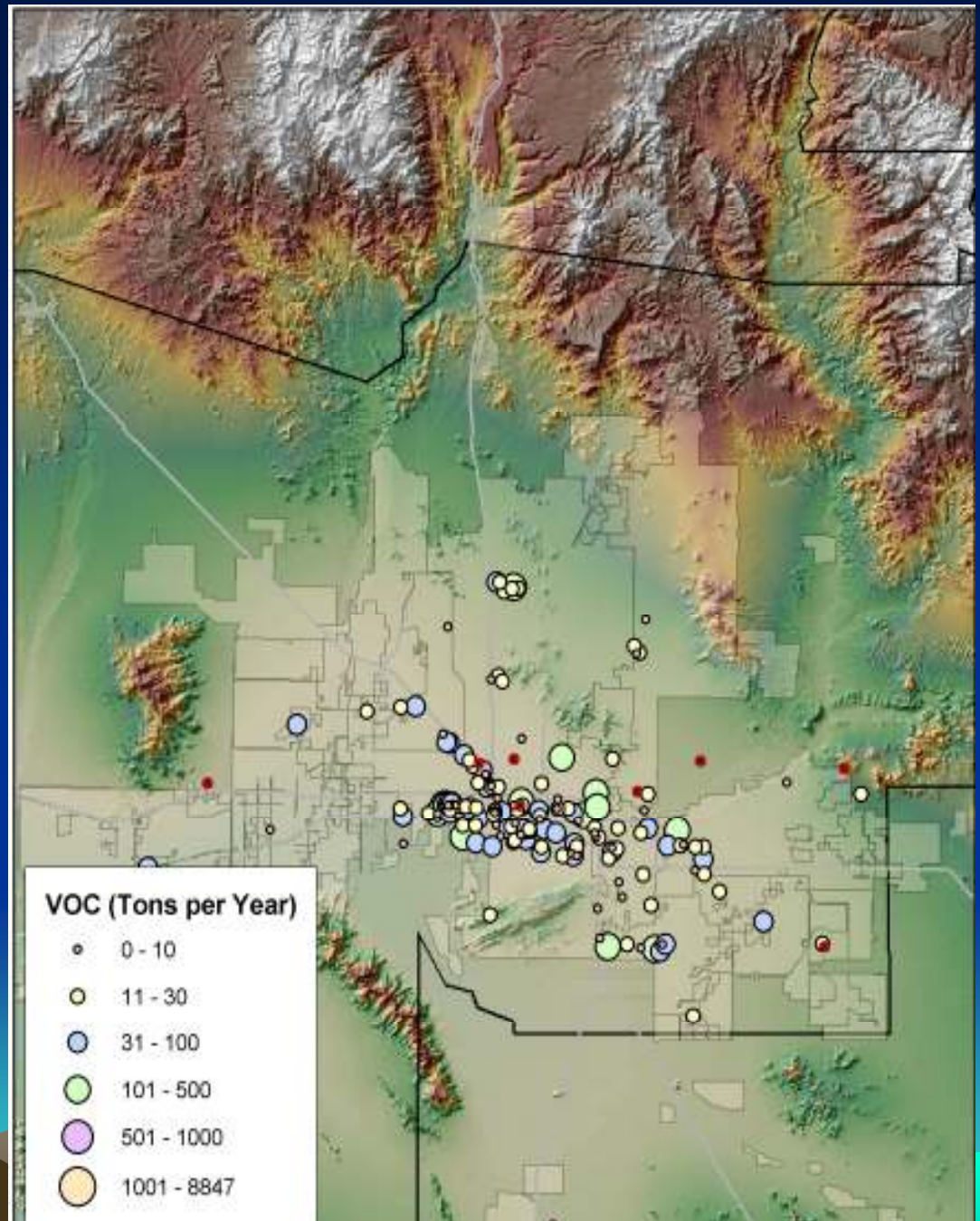
Legend

-  Tribal Land
-  Limited Access Highway
-  Highway
-  Major Water
-  Urban Boundary
-  County Boundary

Elevation (m)



VOC Point Sources



Annual Average Daily Traffic Volume (vehicles per day)

Legend

● AQ Monitoring Sites

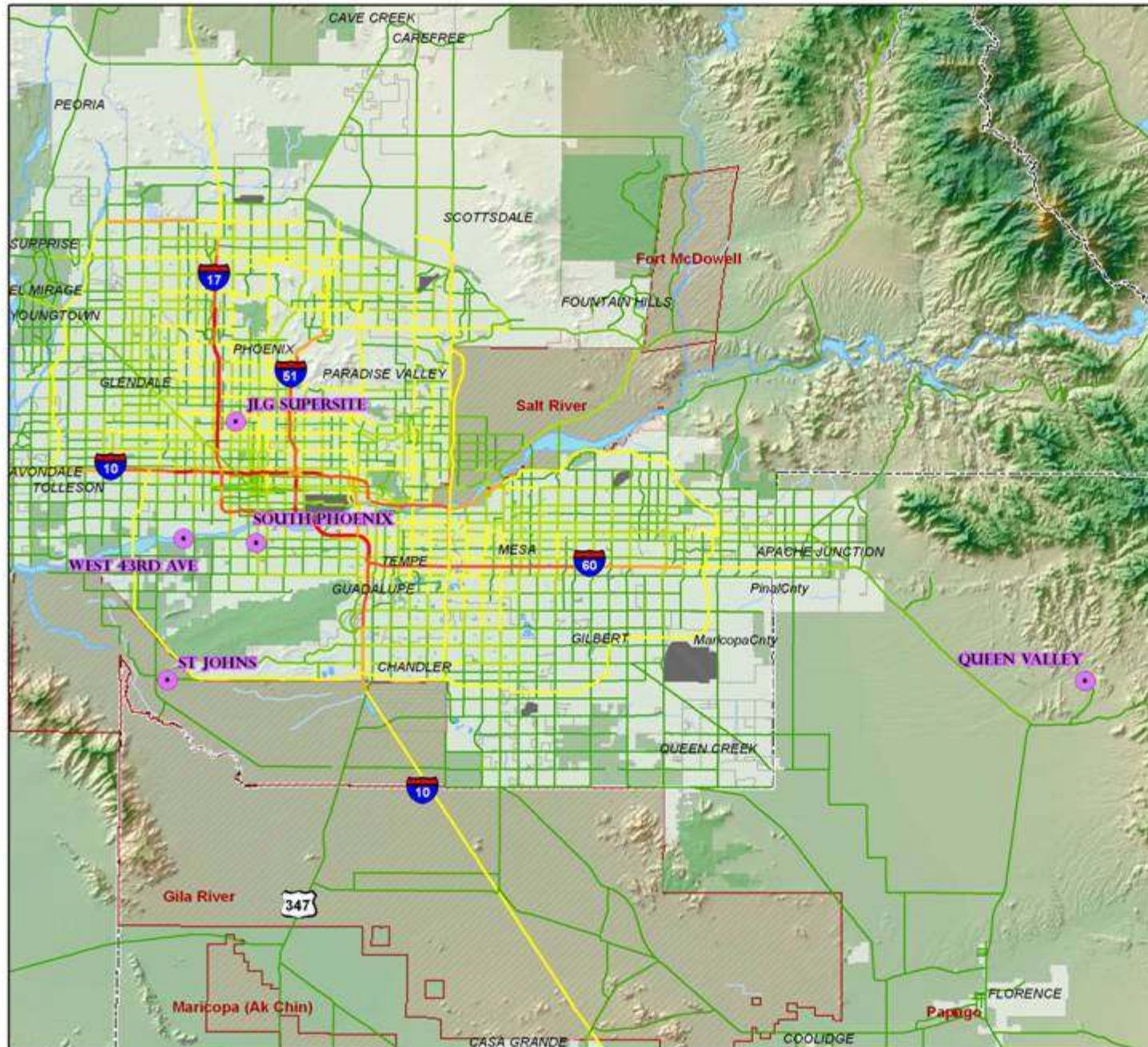
AADT

- 0 - 10,000
- 10,001 - 20,000
- 20,001 - 35,000
- 35,001 - 75,000
- 75,001 - 125,000
- 125,001 - 200,000
- 200,001 - 266,000

- Park
- Airport
- Tribal Land Boundary
- City Boundary
- County Boundary



0 2.5 5 10 15 Kilometers



1999 National Scale Air Toxics Assessment (NATA)

- Best national assessment, 1999 results released Feb. 2006.
- Limitations:
 - Diesel particulate matter not included in cancer risk assessment
 - Uncertainty in cancer risk potency for formaldehyde (1999 NATA used much lower number)
 - Only as good as National Emission Inventory data
- Data available at <http://www.epa.gov/ttn/atw/nata1999>

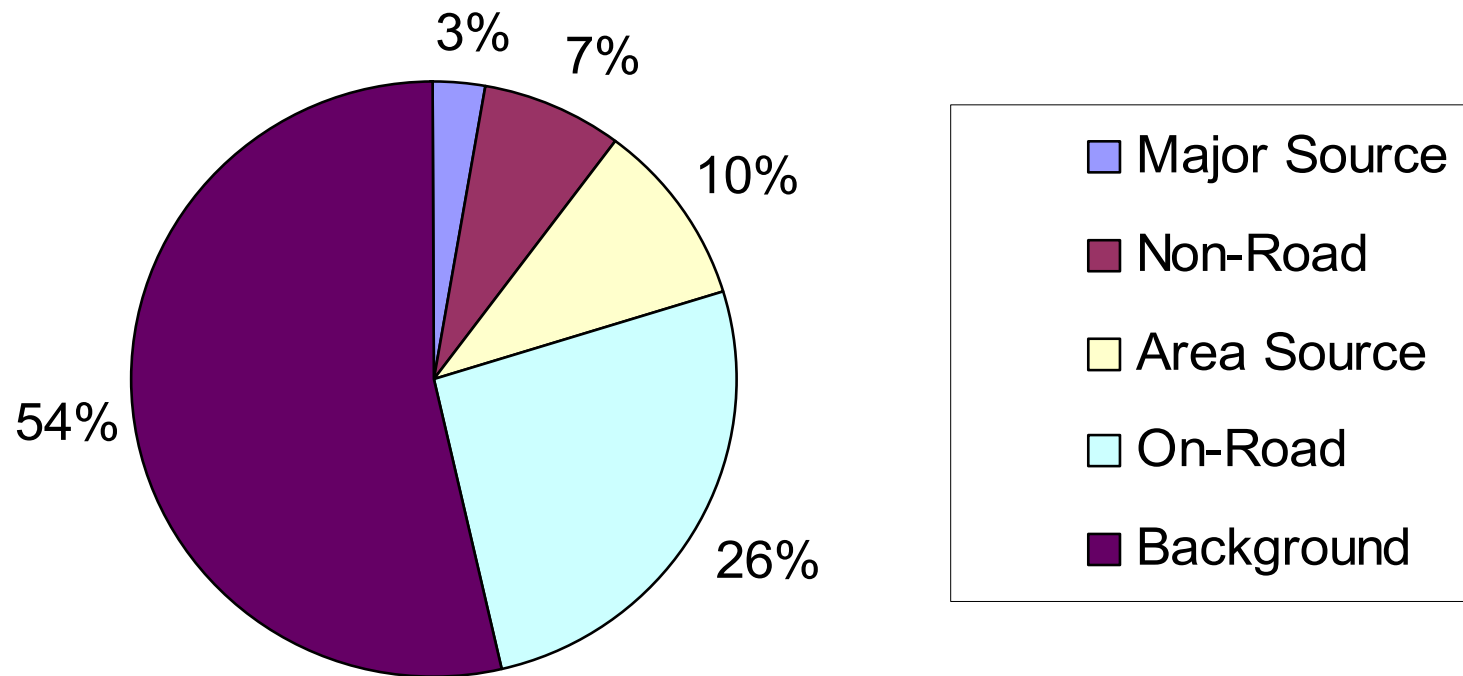


1999 NATA Results

- 694 census tracts are all or partly in JATAP study area
- Total 2000 census population in these tracts: 3.25 million
- Population weighted lifetime excess inhalation cancer risk: 43.8 per million inhabitants



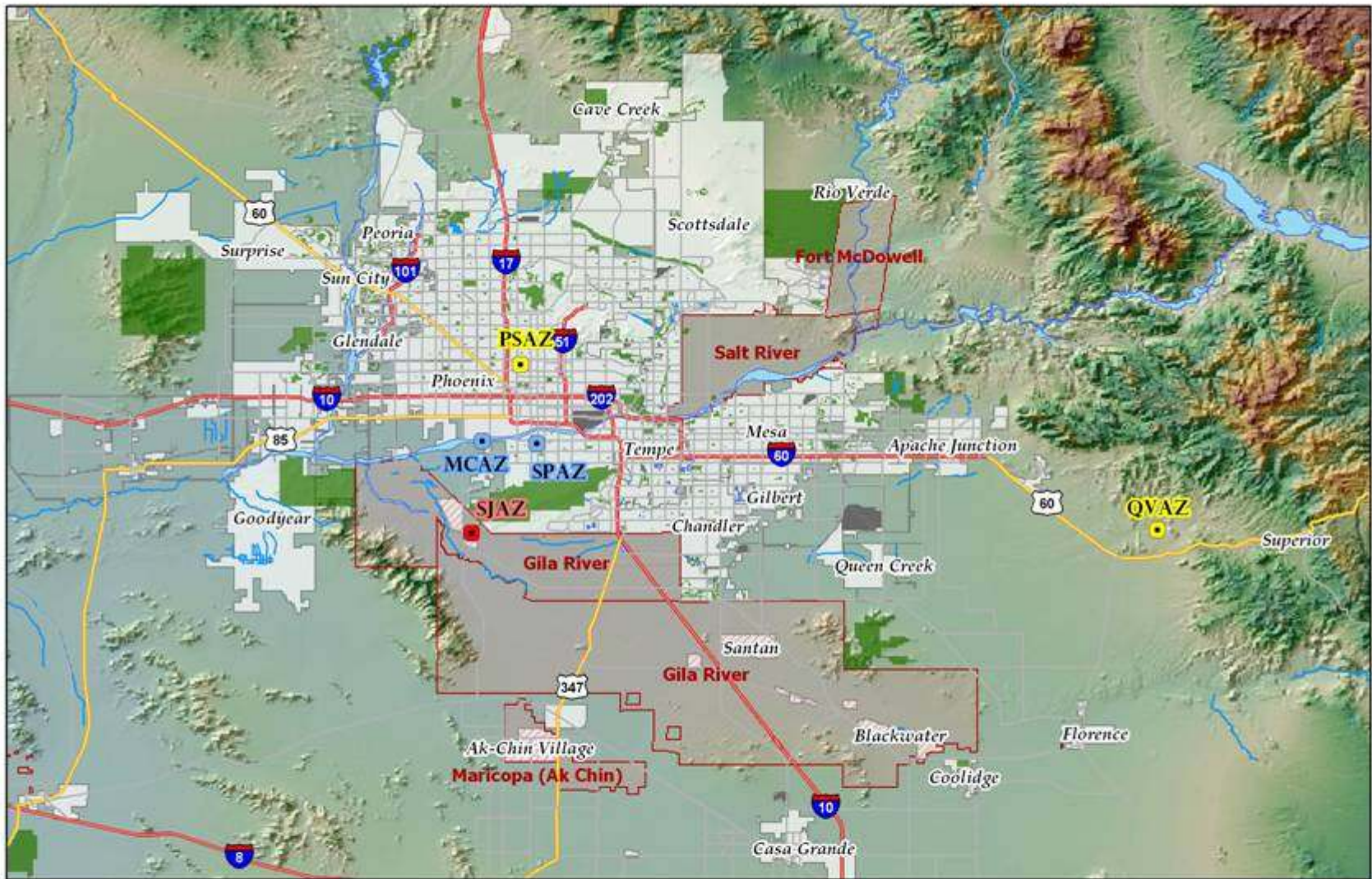
Relative Contribution to Excess Cancer Inhalation Risk, 1999 Modeling Domain for the JATAP Area



JATAP Pilot Study

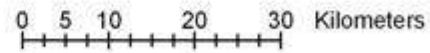
- As part of JATAP, air toxics data were collected between March 2003-March 2004 at three sites:
 - West 43rd (MCAZ)
 - South Phoenix (SPAZ)
 - St John's (Gila River Indian Community) (SJAZ)
- Other ADEQ sites for comparison include:
 - Phoenix Supersite (PSAZ)
 - Queen Valley (QVAZ)





Legend

- | | | | | | |
|--|------------|--|--------------------|--|---------------|
| | ADEQ Site | | Interstate/Freeway | | Tribal Land |
| | JATAP Site | | Highway | | Airport |
| | Gila Site | | Major Arterial | | City Boundary |
| | | | Parks | | |



Some Conclusions from Pilot Study

- For a number of key air toxics the detection limits for our analysis techniques were too high to allow risk assessment at these sites.
- Annual average concentrations of formaldehyde, acetaldehyde, benzene and 1,3 butadiene were on the high end of the range reported in EPA funded assessments of other US cities.



2005 Monitoring Project

- Funded through a combination of
 - Community Air Toxics Monitoring Grants to ADEQ, Salt River and Gila River
 - Ongoing National Air Toxics Trend Sites (NATTS) funding
 - Particulate Speciation Trends Network (STN) funding
 - Photochemical Air Monitoring Stations (PAMS) funding
 - Additional support from EPA Region 9 lab
- This supported a network of eight monitoring sites
 - Monitoring effort ranged from 1 in 12 day sampling for VOCs alone at one site to a comprehensive effort at the NATTS site

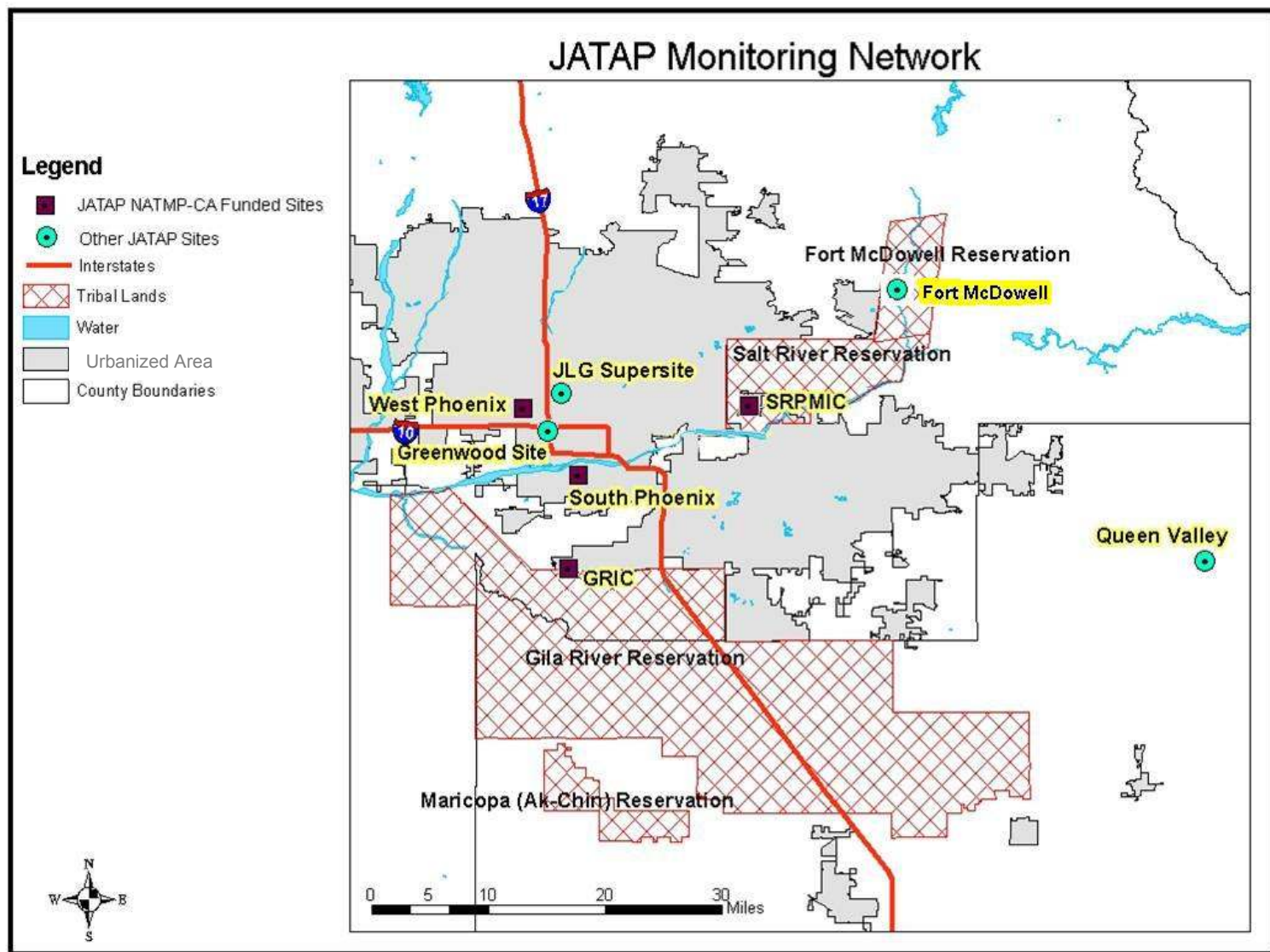


Objectives for Monitoring

- NATA results indicate that, overall, VOCs and carbonyls are the biggest risk drivers
 - Particulate metals significant in some areas
- Additional monitoring needed to compare with model results
 - Annual average concentrations of key HAPs
 - Spatial gradients
 - Potential hot spots (near freeway environments)
 - Diurnal variability
 - Source identification through fingerprinting
 - Which HAPs contribute most to the risk?



JATAP HAP Monitoring Network, 2005



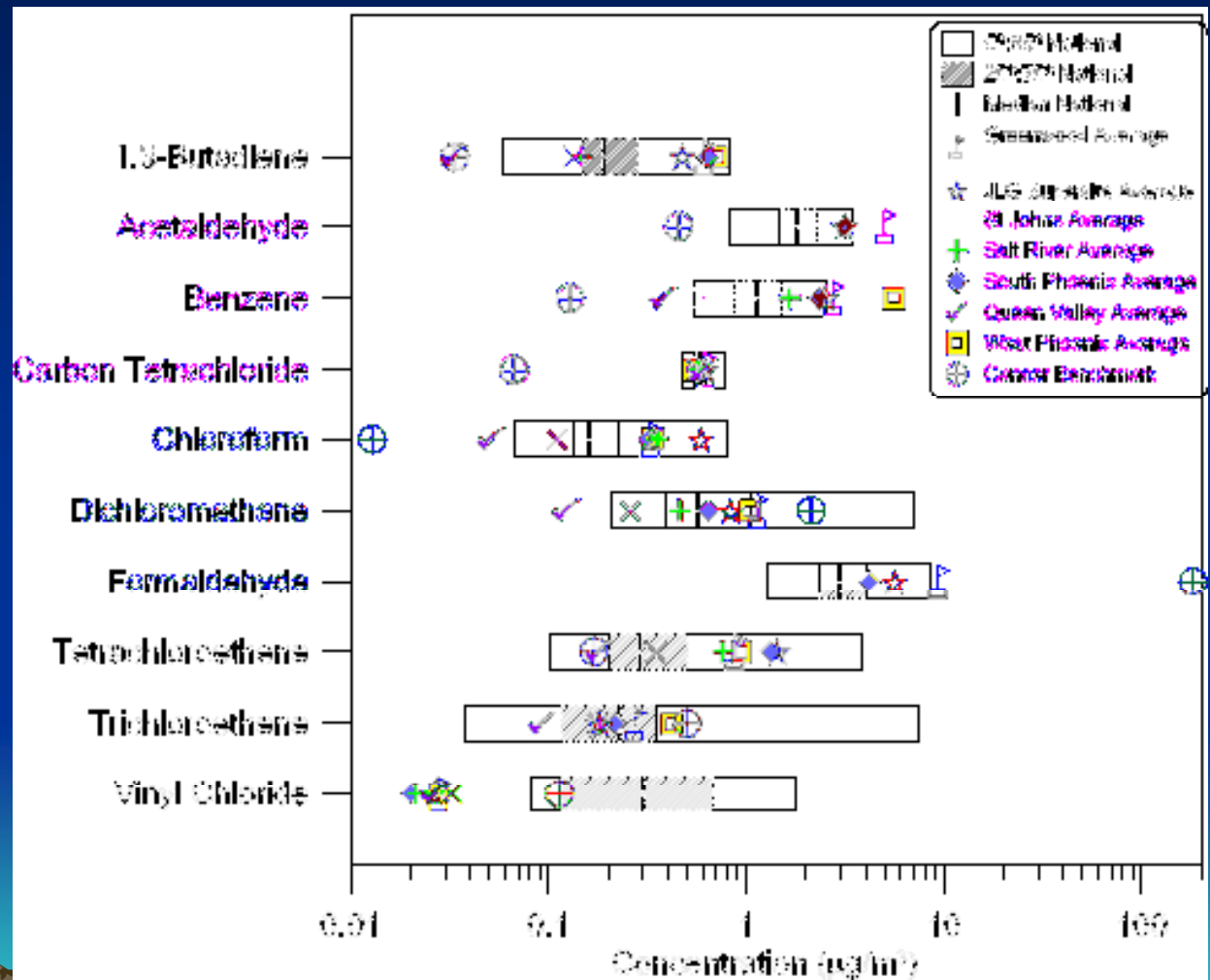
Key Features of JATAP Monitoring and Analysis

- Lowered detection limits for VOC species to support risk assessment; included sample-specific MDLs.
- Sampled at a range of urban, rural, and tribal sites.
- Data validation and analysis were built into the program including strong QA program (collocated measurements, inter-laboratory comparison).
- Results of this study will be put in National context.



Current Status of Data Analysis

- Data validation is complete
- Analyses to be completed by end of year



Accomplishments of JATAP (2000-2006)

- Continuous involvement of all agencies during the project
- Bridged data gap to include tribal lands
- Leveraged existing monitoring resources
- Encouraged data sharing
- Enhanced tribal capacity
- Collected *quality* air toxics data
- Completed a detailed review of existing knowledge of Phoenix HAPs
- Developed a blueprint for a multi-year comprehensive study of HAPs in the Maricopa/Pinal Urban area



Future Use of JATAP Monitoring Data

- Critical for future risk assessment effort
 - Detailed emission inventory
 - Dispersion modeling
 - Human exposure modeling
 - Quantification of cancer and non-cancer risk due to inhalation exposure
- Monitor data provides key comparison for dispersion model output
 - Increased confidence in outcome of assessment



Continuing JATAP Monitoring Collaboration

- In September 2006, ADEQ and Salt River Pima Maricopa Indian Community installed a Differential Optical Absorption Spectrometer (DOAS) for continuous measurements of key VOC and carbonyl species
- Complete data analyses by January 2007
- Identify funding sources to continue efforts



For More Information

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Location	Measurements	Sampling Frequency	Objective
Phoenix - JLG Supersite	VOCs, PAHs, carbonyls, continuous black carbon, continuous elemental/organic carbon, continuous NMHC, particulate metals	1 - 24 Hour Sample Every 6 Days	Population Exposure
	Collocated VOCs, carbonyls, particulate metals	1 - 24 Hour Sample, Schedule Varies by Sample Type	QA
West Phoenix	VOCs, particulate metals	1 - 24 Hour Sample Every 6 Days	Population Exposure
South Phoenix	VOCs, carbonyls, particulate metals	1 - 24 Hour Sample Every 6 Days	Population Exposure
Gila River Indian Community, St. Johns	VOCs, particulate metals	Sampling Every 6 Days, Alternate 2 - 12 Hour Samples and 1 - 24 Hour Sample	Transport/ Gradient
Salt River Pima-Maricopa Indian Community, Senior Center	VOCs, particulate metals	Sampling Every 6 Days, Alternate 2 - 12 Hour Samples and 1 - 24 Hour Sample	Transport/ Gradient
Fort McDowell Yavapai Nation	VOCs	1 - 24 Hour Sample Every 12 Days	Transport/ Gradient
Greenwood, SW Corner of I-10/I-17	VOCs, carbonyls, particulate metals	1 - 24 Hour Sample Every 6 Days	Maximum Concentration
Queen Valley	VOCs, elemental carbon, particulate metals	1 - 24 Hour Sample Every 6 Days	Background