Joint Air Toxics Assessment Project (JATAP)

Presented by:
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On Detail to the
American Indian Policy Institute, ASU Tempe, AZ

To:
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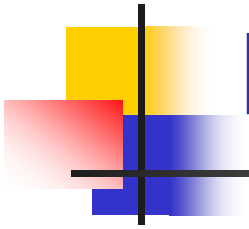


Presentation

- Introduction
- Overview of JATAP project
- Brief discussion of monitoring results
- Current Activities

JATAP

- A partnership of federal, state, local, and tribal air pollution control officials which include:
  - US Environmental Protection Agency (EPA) Region 9
  - EPA Office of Air Quality, Planning, and Standards (OAQPS)
  - Arizona Department of Environmental Quality
  - Gila River Indian Community (GRIC)
  - Salt River–Pima Maricopa Indian Community (SRPMIC)
  - Maricopa County Air Quality Control Department
  - Pinal County Air Quality Control District
  - Institute for Tribal Environmental Professionals at NAU
  - Inter Tribal Council of Arizona, Inc (ITCA)
  - Fort McDowell Yavapai Nation

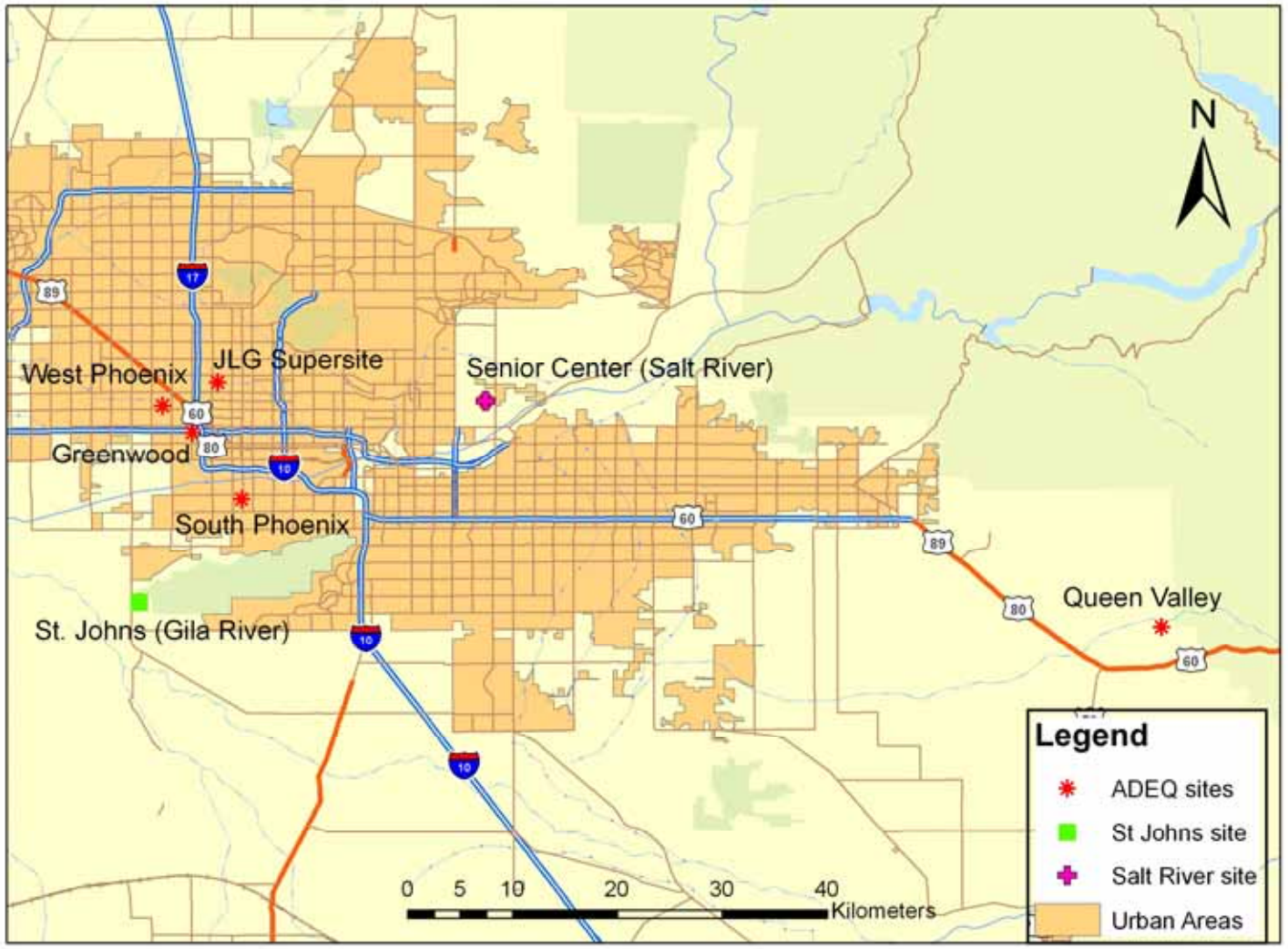
JATAP cont.

- Project had three goals
  - To develop a lasting relationship among the various partner agencies
  - To obtain a metropolitan area-wide understanding of exposures and risks
    - Particularly important for Tribal lands that border the metropolitan Phoenix area
  - To provide a dynamic model that could have application in other communities

Scope of JATAP Project

- Monitoring
- Risk assessment
- Communicating Results and Emission Reduction Strategies

Monitoring: Sites



Monitoring: List of Air Toxics (AT)

- Mobile source AT
  - 1,3-butadiene, acetaldehyde, formaldehyde, benzene, ethylbenzene, toluene
- Stationary source AT
  - Chloroform, methylene chloride, trichloroethylene, tetrachloroethylene, styrene, o,m,p-xylenes, hexachlorobutadiene, vinyl chloride
- Background AT
  - Carbon tetrachloride
- Air toxics metals (speciated $PM_{2.5um}$)

Monitoring: Results

- AT sampled for 1 year at all 7 sites
- 24 hour average samples taken every 6th day
- The maximum number of air toxics sampled was 17
  - 10 are identified as carcinogens (OAQPS)
    - 5 mobile source AT: benzene, 1,3-butadiene, acetaldehyde, formaldehyde, ethylbenzene
    - 5 industrial source AT: dichloromethane, hexachlorobutadiene, tetrachloroethylene, trichloroethylene, vinyl chloride
  - 6 are non-carcinogens only (OAQPS)
    - 5 industrial source AT: chloroform, m,o,p-xylene, styrene
    - 1 mobile source AT: toluene
  - 1 background source carcinogen (carbon tetrachloride)

Monitoring: Results

- $PM_{2.5}$ samples collected at 4 sites:
  - SRPMIC
  - GRIC
  - West Phoenix monitor
  - Supersite monitor
- Samples have been speciated
- Need numerical and interpretive analyses
  - In particular, for air toxics metals which have been shown to be of concern, (i.e., arsenic, cadmium, chromium, nickel, cobalt, manganese)

Monitoring: Results

avg. conc. (ug/m3)

Air Toxic/Monitor	Supersite	Greenwood	S.Phoenix	W.Phoenix	SRPMIC	GRIC	Queen Valley
1,3-butadiene	0.47	0.62	0.64	0.71	0.15	0.13	0.03
Acetaldehyde	3.13	5.07	3.15				
Benzene	2.5	2.79	2.33	2.43	1.65	0.61	0.38
Formaldehyde	5.61	9.81	4.2				
Ethylbenzene	1.61	2.06	1.12	2.38	0.71	0.37	0.82
Dichoromethane	0.83	1.15	0.64	1.04	0.46	0.26	0.12
Tetrachloroethylene	1.43	0.89	1.32	0.94	0.76	0.35	0.18
Trichloroethylene	0.18	0.27	0.22	0.42	0.18	0.18	0.09
Carbon Tetrachloride	0.62	0.63	0.6	0.54	0.57	0.56	0.61
Chloroform	0.59	0.33	0.32	0.34	0.35	0.11	0.05
m,p-Xylene	4.32	5.43	3.46	4.84	1.83	0.88	0.82
o-Xylene	0.78	2.08	1.2	1.67	0.79	0.36	0.38
Styrene	0.76	1.71	0.4	0.82	1.96	0.35	0.11
Toluene	7.18	8.82	6.86	12.87	7.23	2.51	0.59
Vinyl Chloride	0.03	0.03	0.03	0.02	0.02	0.03	0.03
Hexachlorobutadiene	0.12	0.11	2.49	2.91	1.91	2.26	0.11

Monitoring: Results

	Average Measured Concentration Normalized to 1 in a Million Risk						
Air Toxic/Monitor	**Supersite**	**Greenwood**	**S.Phoenix**	**W.Phoenix**	**SRPMIC**	**GRIC**	**Queen Valley**
1,3-butadiene	**16**	**21**	**21**	**24**	**5**	**4**	**1**
Benzene	**19**	**21**	**18**	**19**	**13**	**5**	**3**
Ethylbenzene	**4**	**5**	**3**	**6**	**2**	**1**	**2**
Acetaldehyde	**6**	**10**	**6**	**ns**	**ns**	**ns**	**ns**
Formaldehyde				**ns**	**ns**	**ns**	**ns**
Dichoromethane		**1**		**1**			
Tetrachloroethylene	**8**	**5**	**8**	**6**	**4**	**2**	**1**
Trichloroethylene		**1**		**1**			
Carbon Tetrachloride	**9**	**9**	**9**	**8**	**8**	**8**	**9**
Chloroform	**nc**						
m,p-Xylene	**nc**						
o-Xylene	**nc**						
Styrene	**nc**						
Toluene	**nc**						
Vinyl Chloride							
Hexachlorobutadiene	**2**	**2**	**50**	**58**	**38**	**45**	**2**
nc = non-carcinogen							
ns = Not Sampled							

Risk Assessment : Scope of Work

- Intended to complement the monitoring results
- Will be used to compare modeled to monitored concentrations
  - Identify sources contributing to monitored values
- Identify sources and/or AT needing emission reduction strategies
- Consider inhalation exposures only

Risk Assessment : Scope of Work

- To be implemented in 3 steps
  - Stationary source dispersion and exposure modeling using HEM-AERMOD model
    - Developed emissions inventory for Maricopa County containing over 4000+ emission point entries
  - Urban area-wide mobile source modeling using CAMx model
    - Will develop emissions inventory for Maricopa county
      - Will include diesel PM
  - Mobile source dispersion modeling to identify near-roadway concentrations and exposures
    - Highest mobile source concentrations are known to occur within 250m of major highway and drop off after about 500m

Communicating Results and Emission Reduction Strategies

- Partners, especially Tribal partners, will communicate results to their respective community leaders
  - Address questions such as;
    - Why was monitor placed where it was?
    - Who does the monitor represent?
    - What are their exposures?
    - How may these exposures be reduced if necessary?

Communicating Results and Emission Reduction Strategies

- Answers to these questions will lead to discussion of what are we doing or what can be done to reduce community exposures
  - Are there specific source reduction measures that can be developed
  - Are there personal/behavioral activities that would reduce exposures

Summary of JATAP

- JATAP:
  - Has been a successful collaborative effort among different governmental agencies
    - This allowed for:
      - The leveraging of existing monitoring sources
      - The sharing of data
      - The on-going interaction among staff
  - Will provide useful data to their respective communities
  - May be a model project that has application to other communities

For Further Information

- Contact:

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JATAP Forum – June 19th at ADEQ offices in Phoenix