

The background features a stylized map of the Four Corners region, where the states of Arizona, Colorado, New Mexico, and Utah meet. The map is divided into four colored rectangular areas: a light green area in the northwest, a light blue area in the northeast, a light purple area in the southwest, and a light orange area in the southeast. The text is overlaid on these colored regions.

# **Four Corners States Biomonitoring Program overview**

Presentation at the Biomonitoring California Scientific Guidance  
Panel Meeting, November 2015

Presented by: Utah

Four corners states biomonitoring consortium ( AZ, CO, NM, UT)

# Why?

- Desire and experience
  - Rocky Mountain Biomonitoring Consortium
  - Environmental Public Health Tracking Network
- Efficiency
- Power
  - Total population is 16.9 million people
  - Living in 797 cities, towns or villages
  - With a population range of 24 people to 1,445,632
  - Sitting within 271.7 million acres of land
  - With similar residential, occupational, socio-economic, demographic and environmental concerns
- Similar Regional Problems
  - 35% of land is in agriculture with over 92,500 farms and ranches
  - 33% of land is forested areas
  - 7 shared aquifers
  - 884 active mines, 471 active mine processing plants, and 119,000 abandoned mines
  - 730 CERCLIS sites, 57 NPL sites, and 735 TRI sites

# What?

## Regional Health Concerns

Exposure Concern	Sources of Exposure	Chemical and/or their Metabolite	Public Health Concern
Heavy Metals (As, Cd, Hg, Mn, Se, U)	Private owned (unregulated) drinking water wells	As, Cd, Hg, Mn, Se, U	<ul style="list-style-type: none"> <li>• Cancer</li> <li>• Central &amp; peripheral neuropathy</li> <li>• Cardio-vascular disease</li> <li>• Renal damage</li> <li>• Osteomalacia</li> <li>• Electrolyte imbalance</li> </ul>
Phthalates	Common household products	8-10 metabolites (MEP, MBP, MBzP, MEHP, MEOHP, MEHHP, MECPP, MMP)	<ul style="list-style-type: none"> <li>• Endocrine disruption</li> <li>• Asthma</li> <li>• Obesity</li> <li>• Adverse reproductive outcomes</li> <li>• Maybe linked to breast cancer</li> </ul>
2,4-Dichlorophenoxy acetic acid (2,4-D)	Herbicides used near residential areas	2,4-Dichlorophenol	<ul style="list-style-type: none"> <li>• Adverse birth outcomes</li> <li>• Possibly linked to cancer</li> </ul>
<i>para</i> -Dichlorobenzene ( <i>p</i> -DCB)	Common house hold products	2,5-Dichlorophenol	<ul style="list-style-type: none"> <li>• Weight gain and obesity</li> <li>• Chronic fatigue</li> <li>• Maybe linked to type 2 diabetes and insulin resistance</li> </ul>
Pyrethroids	Insecticides used near residential areas, tick abatement in rural areas of high incidences of RMSF	3-Phenoxy benzoic acid	<ul style="list-style-type: none"> <li>• Neurotoxic for some people</li> <li>• Endocrine disruption</li> <li>• Adverse reproductive health outcomes</li> <li>• Adverse effect on sexual development</li> <li>• Immunosuppression</li> </ul>

# Study Design

Exposure Concern	Likely Exposure Locations	Likely Exposure Time	Recruitment approaches
Metals	Homes with private well water as primary drinking water source	Year Round	Identify areas with a high density of homes using private drinking water wells
Phthalates	Any	Year Round	Over sample for women entering into or of child bearing age
2,4-D	Residential property using 2,4-D containing domestic weed control products. Residential properties near 2,4-D tolerant (e.g., corn, cotton) crops and orchards	Home use spring through fall. Crop pre-emergence and crop pre-harvest seasons	Exposed to use of product in last 24 hours or worked in soils where product was used in last 60 days
<i>p</i> -DCB	Homes or workplaces using <i>p</i> -DCP containing products	Year Round	Anybody
Pyrethroids	Residential or work use insecticides for lawn care or animal flea/tick control. Residential properties near mosquito abatement activities.	Emergence of adult insects	Exposed to use of products in last 24 hours or exposed to soil and water where product used in last 5 days.

# Participant Recruitment



- Arizona: Arizona communities statewide, 6 years and older.
- Colorado: Children 3-13 years of age who are part of an ongoing project in the San Luis Valley.
- New Mexico: New Mexico communities statewide, 18 years and older.
- Utah: Utah communities statewide, 3 years and older.

# Early Successes

- All states:
  - IRB approved
  - Surveillance tools for metals, phthalates developed
  - Data collection and management tool completed
  - Core team workshops
- Arizona:
  - Arizona Biomonitoring Advisory Panel established
  - Successful technology transfer of CDC phthalate metabolite method 6306.04
- Colorado:
  - SLV Community Action Board and the Area Health Education Center to serve as advisory panel
  - Collaboration with Valley Wide Health Systems established for recruitment
  - Community engagement network established

# Early Successes

- New Mexico:
  - NM Private Well Collaborative served as the advisory panel
  - First round of samples taken at Rio Rancho (Sandoval County)
  - Laboratory method validated for metals
- Utah:
  - Risk Assessment Coordinating Committee to serve as the advisory panel
  - First round of samples taken at Mendon (Cache County)

# Lessons Learned

(so far)

- Inter-state contracting complexities
- Use of student interns as staff not advisable
- Value of leveraging combined states staff resources to develop project



# Hopes

- Illumination of the road to more regional collaboration
- Increased capacity, expertise, experience and awareness for both the lab and epi folks
- Reduction in exposures through knowledge that can drive state and regional policies
- A tool-kit for epidemiologists (similar to the APHL tool kit for laboratorians)



**THANK YOU**