UTAH DEPARTMENT OF HEALTH

# Utah Health Status Update:

## *Four Corners States Biomonitoring Consortium*

Special Edition 2

*(December 2016)*

Environmental hazards are present in our everyday life and human exposure can occur from multiple sources, such as food, air, water, and consumer product use. Exposure to some environmental hazards can cause negative health effects illustrated by the consequences of the Flint, Michican lead crisis. Surveillance activities which gather information about environmental hazards, human exposure to those hazards, and resulting health effects, support needed public health programs that are capable of responding to and preventing environmental health crises.

The state health agencies of Arizona, Colorado, New Mexico, and Utah organized the Four Corners States Biomonitoring Consortium (4CSBC) to study environmental hazards common to the four states area. The consortium utilizes a specific surveillance tool called biomonitoring to investigate potential human exposure to environmental hazards. Biomonitoring measures human exposure to environmental hazards by testing for the presence of specific chemicals in the body. For example, if a public health professional wants to know if someone has been exposed to lead, a sample of the subject's blood or urine can be tested. Scientists are then able to draw conclusions about that person's lead exposure based on the results. The result gives scientists a direct measurement of the burden of this toxic chemical in their body. Biomonitoring enables policy makers and public health professionals to better understand how the environment interacts with the human body, enabling them to make informed, science-based decisions about the prevention and control of environmental hazards.

### KEY FINDINGS

- **The Four Corners States Biomonitoring Consortium (4CSBC) utilizes the laboratory and epidemiology capacity of four states (Arizona, Colorado, New Mexico, and Utah) to deliver a cost effective and efficient biomonitoring program.**
- **A needs assessment was conducted to identify the chemicals to be studied which revealed many environmental concerns common to the four states.**
- **Participants are recruited across the four states to participate in one of the specific projects. All participants provide a urine sample. A strength of the program is its ability to share laboratory capacity between the states to test the urine samples.**
- **The 4CSBC will use data collected through this biomonitoring project to ultimately reduce or eliminate exposure to environmental chemicals.**

In the planning stages of the 4CSBC, a needs assessment was conducted to identify the chemicals to be studied.

This assessment revealed many environmental concerns common to the four states and through collaborative processes, the 4CSBC decided to study the following chemicals: 1) exposure to heavy metals through privately owned well water; investigators are interested in this exposure because minimal regulation and monitoring of private wells exists in the four states; 2) exposure to 2,4-D from domestic use of herbicides that contain 2,4-D; 3) exposure to 2,5-DCP from domestic use of pesticides that control moths, molds, or mildew, and exposure to household products such as disinfectants or deodorants; 4) exposure to phthalates from domestic use of products and food containing phthalates; and 5) exposure to pyrethroids from use of pyrethroid-pesticides used for mosquito abatement and other pesticide reduction purposes.

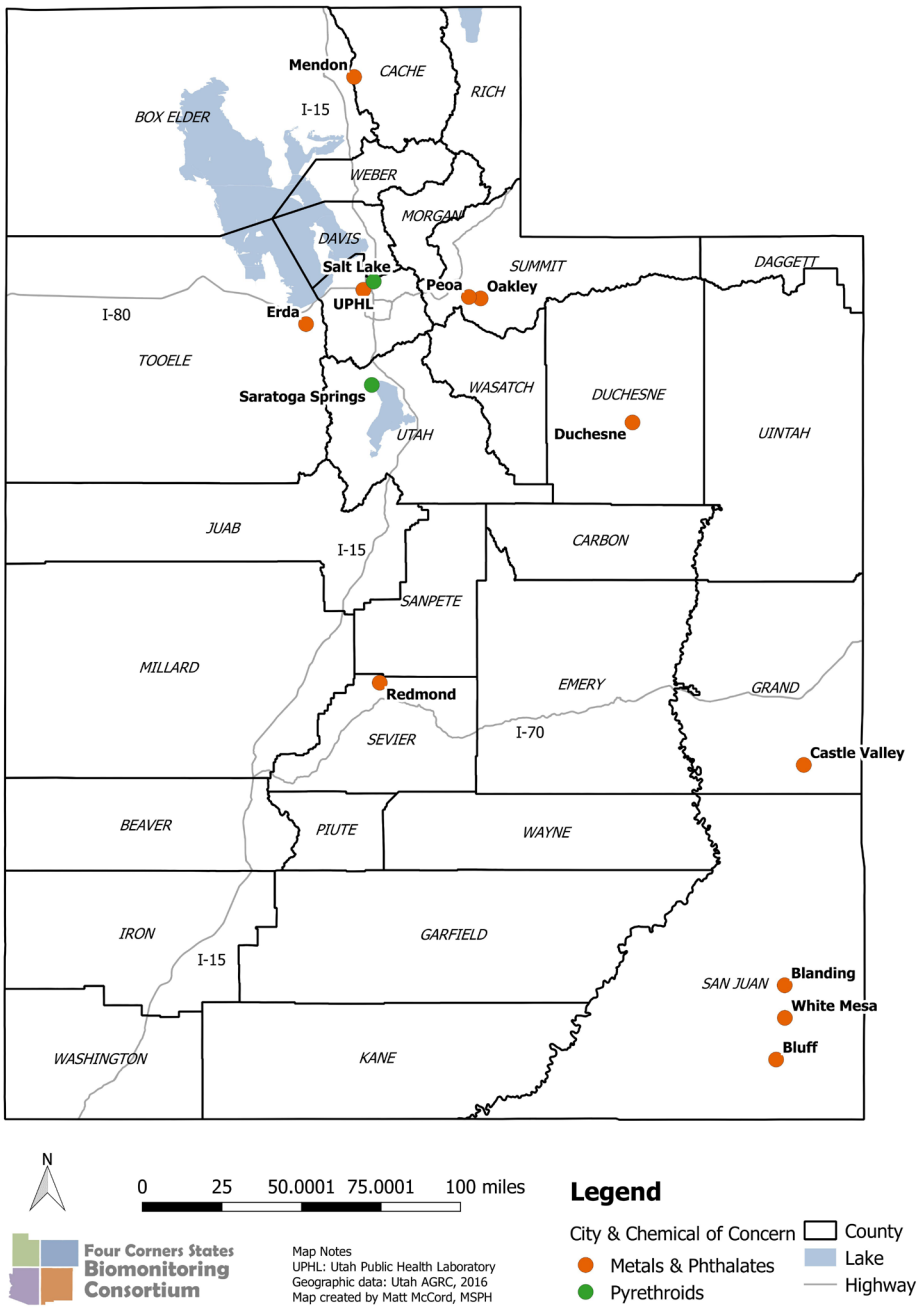
The 4CSBC biomonitoring program is funded by the U.S. Centers for Disease Control and Prevention for five years and is currently entering its third year. The 4CSBC has tested hundreds of people across the four states for heavy metal exposure, phthalate exposure, and some states have started testing for pyrethroid exposure.

All participants in the study provide a urine sample. The laboratory tests metabolites in the urine for the presence of the chemical of concern. Investigators also conduct surveys to assist in determining where potential exposure may be coming from. Tobacco use, for instance, is a potential way people can be exposed to heavy metals. Individuals who are tested for heavy metals also provide a sample of their well water. The laboratory tests the water for the presence of heavy metals.

After samples have been collected, laboratories report tests as they are available. Epidemiologists review the reported results and send participants their results. High levels of arsenic and uranium were found in multiple urine samples in Utah. The Utah biomonitoring team communicated these findings and sent supporting documents to the participants. The documents included a listing of the levels of metals found in the urine sample with corresponding reference values; fact sheets about each metal of concern and possible health effects; resources for medical concerns and mitigation options; and where to find more information. Figure 1 shows sampling locations in Utah to date.

## Utah Collection Sites for Chemicals

*Figure 1.* Map of 12 communities tested for heavy metals/phthalates and pyrethroids by the Four Corners States Biomonitoring Consortium




The 4CSBC will use data collected to 1) develop and enhance regional collaboration between the states' laboratories and environmental epidemiologists to identify and implement biomonitoring activities relevant to state and regional needs; 2) develop increased capability and capacity to conduct biomonitoring and risk and exposure assessment through the shared regional capacity, experience, and knowledge; 3) develop science-based knowledge about environmental exposure that can be used to respond to public health concerns common to the region; 4) empower communities, policy makers, and state legislatures to develop appropriate and science-based public health policy and programs to lessen health concerns; and 5) ultimately reduce or eliminate exposure to environmental chemicals.

Effective and efficient collaboration is instrumental in the success of the program between both laboratory and epidemiology programs in individual states and across the four states. Additionally, all states rely on their partners to help achieve the goals of the program. Some of these partners include the Public Health Emergency Preparedness (Chem-Threat) program, the Environmental Public Health Tracking Network, local health departments, and many other state and local programs.

For more information, visit www.4csbc.org or contact Carrie Butler at cbutler@utah.gov.

### UDOH ANNOUNCEMENT:

The Utah Parkinson's Disease (PD) Registry has collected 1,800 case reports since it went live in May 2015. Providers who care for patients with PD are encouraged to report to this easy-to-use website: http://updr.org/. Data from the PD registry will be used to better understand the impact this disease of aging is having on the Utah population.

For additional information about this topic, contact Carrie Butler, Utah Department of Health, (801) 965-2400, email: cbutler@utah.gov or the Office of Public Health Assessment, Utah Department of Health, (801) 538-9191, email: chdata@utah.gov.

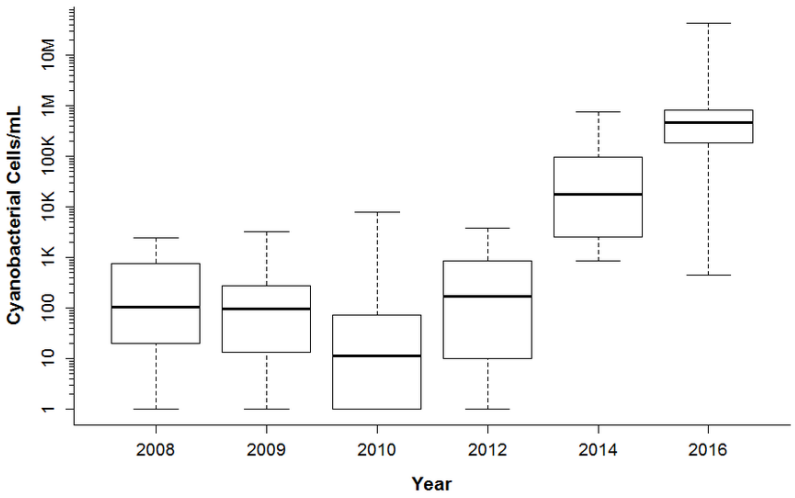
## Breaking News, Special Edition 2 (December 2016)

### Harmful Algal Blooms

A harmful algal bloom, or HAB, is a rapid growth of blue-green algae in water that can harm people, animals, and the local ecosystem. Blue-green algae are not true algae, but instead are an assortment of photosynthetic bacteria called cyanobacteria. Harmful algal blooms can last from days to months, and the situation can change quickly. When conditions are right, blooms can form large visible masses or scums that may look like pea soup or spilled paint.

The primary risks from HABs arise from liver and nervous system toxins that cyanobacteria may produce. While people are typically exposed during recreational activities like swimming and water skiing, drinking water systems can also be affected. Symptoms vary depending on the toxin and exposure, and include skin and eye irritation, headache, sore throat, vomiting, diarrhea, abdominal pain, and neurologic effects. It is not possible to determine a bloom's toxicity without laboratory analysis of the water.

**Utah Lake Harmful Algal Blooms, 2008–2016**




Cyanobacterial cell count data collected at Utah Lake from 2008 through 2016. Note that the Y-axis is on a log scale. Each box displays five statistics for that year's data: the top line is the maximum value, the top of the box is the 75th percentile, the bold middle line is the median, the bottom of the box is the 25th percentile, and the bottom-most line is the minimum value.

Source: Utah Division of Water Quality

Algal blooms are promoted by high nutrient levels, plentiful sunlight, warm temperatures, and stagnant water. In the summer of 2016, these conditions were common at Utah Lake, resulting in an HAB of unprecedented size, scope, and duration that forced a two-week closure of the lake. Utah also experienced blooms in a number of other areas, including Scofield Reservoir, Mantua Reservoir, Big East Lake, Box Lake, and McClellan Lake.

For more information about harmful algal blooms, visit http://health.utah.gov/enviroepi/appletree/HAB/.

## Community Health Spotlight, Special Edition 2 (December 2016)

### Pregnancy Intention – Survey Response Options

In most maternal and infant health studies, pregnancies are characterized as either "intended" or "unintended." Intended pregnancies are those wanted at, or sooner than, the time they occurred. Unintended pregnancies include unwanted and mistimed pregnancies.

Subject matter experts have raised concerns that this dichotomous measure may be too broad for investigating the impact of childbearing intentions on maternal behaviors and infant health.[1] To address this issue, an additional response option was added to the Pregnancy Risk Assessment Monitoring System (PRAMS) survey beginning in 2012. The survey question asks: *Thinking back to just before you got pregnant with your new baby, how did you feel about becoming pregnant? Check ONE answer:*

*I wanted to be pregnant later*
*I wanted to be pregnant sooner*
*I wanted to be pregnant then*
*I didn't want to be pregnant then or at any time in the future*
*I wasn't sure what I wanted**

The accompanying table demonstrates the decrease in the percentage of unintended pregnancies after the new category was added, suggesting that reported unintended pregnancy rates may have been overestimated with previous measures. A better understanding of the spectrum of pregnancy intention will lead to a more precise assessment of pregnancy outcomes among Utah women.

**Intendedness of Pregnancy, Utah PRAMS**

| | 2010-2011 | 2012-2013 |
|---|---|---|
| Intended | 67.9% | 64.9% |
| Unintended | 32.1% | 23.8% |
| Wasn't Sure* | — | 11.4% |

*New response option added in 2012

1. Kost, Kathryn and Lindberg, Laura. "Pregnancy Intentions, Maternal Behaviors, and Infant Health: Investigating Relationships with New Measures and Propensity Score Analysis". Demography vol. 52, no.1, 2015, pp. 83-111.