

Connecting Health Agencies with GIS to Track Environmental Health Hazards

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■ Who we are

- The national nonprofit organization representing public health agencies in the United States, the U.S. Territories, and the District of Columbia, and over 100,000 public health professionals these agencies employ.

■ Vision

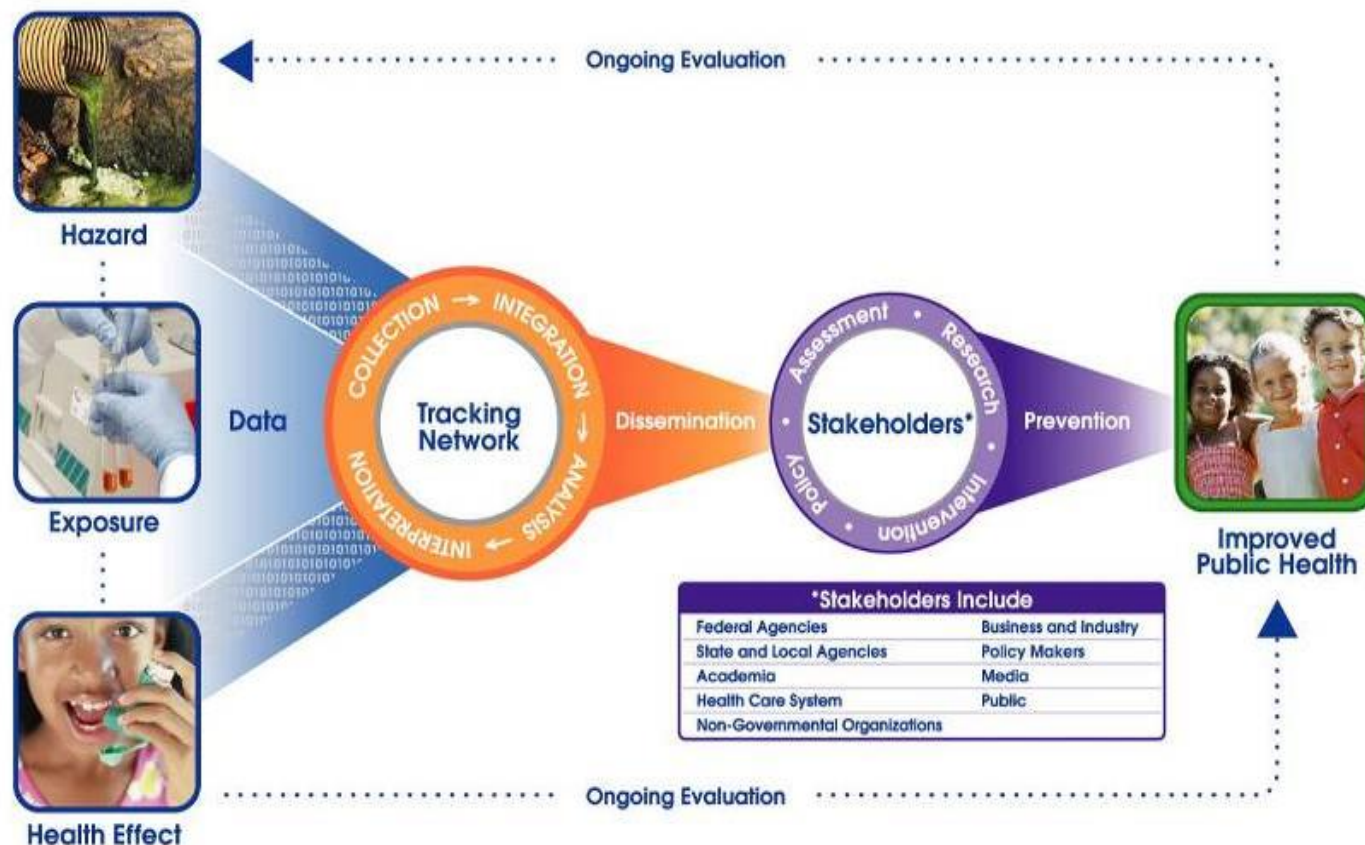
- Healthy people thriving in a nation free of preventable illness and injury

■ Mission

- To transform public health within states and territories to help members dramatically improve health and wellness.



ENVIRONMENTAL PUBLIC HEALTH TRACKING



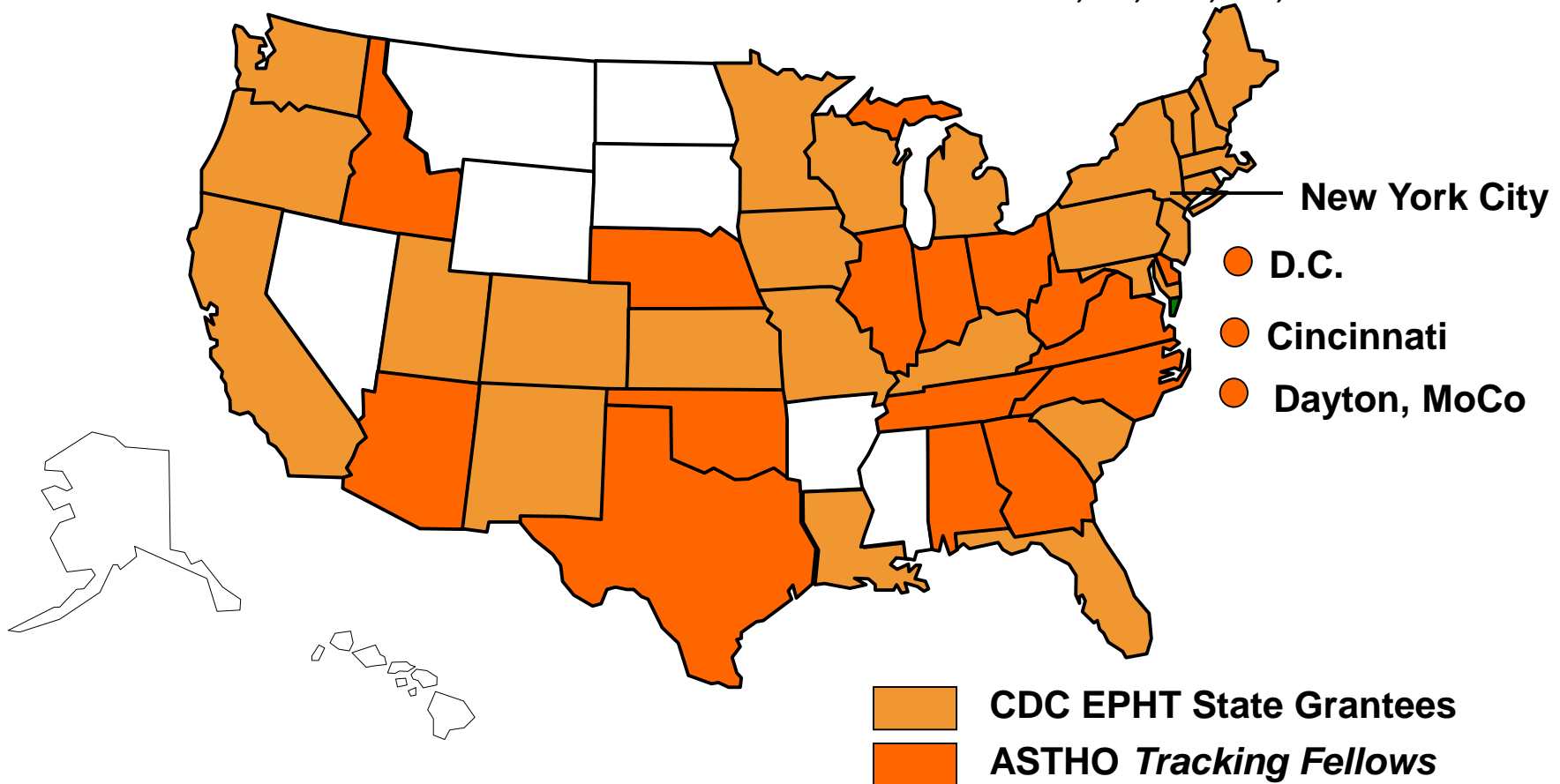
...the ongoing collection, integration, analysis, interpretation, and dissemination of data from environmental hazard monitoring, and from human exposure and health effects surveillance. – CDC. Visit: www.cdc.gov/ephtracking

ASTHO's Tracking Fellowship Program

- Launched in 2009 shortly after the official release of CDC's Tracking Network.
- Offers non-funded S/THA the opportunity to
 - Receive guidance from CDC grantee mentors
 - Become familiar with CDC tracking standards and resources
 - Implement projects to advance tracking in their jurisdictions
- 2009-2013
 - 23 unique special projects implemented
 - Varied in scope and size (from tracking childhood lead poisoning, preventing heat-related deaths, to linking environmental exposures with chronic disease).

CDC Tracking Network Grantees and ASTHO Fellows

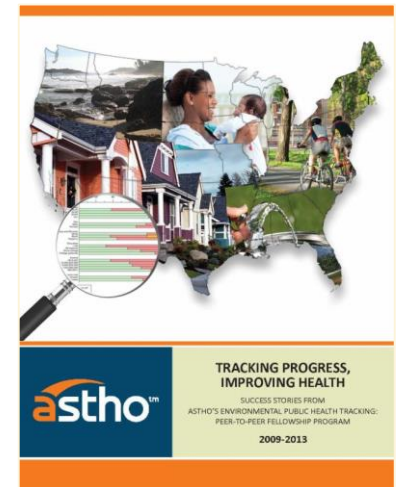
- ASTHO Tracking Fellows:
 - 2009: *LA, *MI, DC
 - 2010: NC, GA, *KY, DE, WV
 - 2011: AZ, IN, OH, VA, and Cincinnati



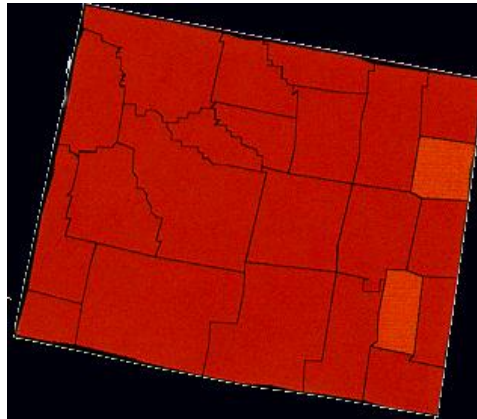
- 2012: AL, Fairfax County, ID, NE, OK
- 2013: IL, TN, TX, WY, Dayton Montgomery County, Ohio

Connecting Health Agencies with GIS to Track Environmental Health Hazards: 2013 Fellowship Mapping Projects

- In 2013, ASTHO welcomed support of Esri to, for the first time, offer GIS tools, training, and ArcGIS Online Community, as part of its fellowship program.
- In pilot year, supported a higher number of mapping projects and enabled states to see their data in action.
- Participating health agencies:
 - Illinois: West Nile Virus and Weather Related Tracking
 - Tennessee: Lead Poisoning and Social Vulnerability Index
 - Texas: Environmental Health Indicators at Texas-Mexico Border
 - Wyoming: Radon Level Distribution across 23 Counties
 - Dayton Montgomery County, Ohio: Infant Mortality Risk Factors
- For more information, visit: www.astho.org
- Download ASTHO Tracking Fellowship Five-Year Report



Wyoming Radon GIS Mapping Project



Steven M. Melia, MSPH
Manager, Environmental and
Occupational Health Program

INTRODUCTION

- The Wyoming Radon Program has been working with Air Chek laboratories since the program's inception in 1990.

To date, there have been approximately 35,000 short-term radon tests from Wyoming that have been analyzed by Air Chek Laboratories, Inc.

15,120 have been in the .02 to 3.9 pCi/L range
9,946 test results have been in the 4.0 pCi/L and above range.

Though all test results have address, city, county and zip code data, none of these test results have ever been geo-mapped to illustrate a more precise radon map for Wyoming than the current EPA zone map.

	A	B	C	D	E	F	G	H	I	J
1	Kit Number	Result	Start Date	Stop Date	Name	Address	City	County	State	Zip
2	6301496	0	1/5/2013	1/12/2013			Buffalo	Johnson	WY	82834
3	5501614	0	11/29/2008	12/4/2008			Casper	Natrona	WY	82609
4	3632323	0	1/18/2009	1/22/2009			Casper	Natrona	WY	82604
5	5254071	0	2/17/2009	2/24/2009			Casper	Natrona	WY	82604
6	5355168	0	3/12/2009	3/18/2009			Casper	Natrona	WY	82609
7	5472339	0	12/8/2008	12/11/2008			Cheyenne	Laramie	WY	82007
8	5501691	0	1/13/2009	1/17/2009			Cheyenne	Laramie	WY	82009
9	5533312	0	1/21/2009	1/25/2009			Cheyenne	Laramie	WY	82007
10	5533340	0	1/22/2009	1/26/2009			Cheyenne	Laramie	WY	82009
11	5555020	0	7/31/2009	8/3/2009			Cheyenne	Laramie	WY	82001
12	5254691	0	1/15/2011	1/21/2011			Cheyenne	Laramie	WY	82001
13	5952987	0	1/31/2011	2/4/2011			Cheyenne	Laramie	WY	82009
14	5729539	0	3/25/2011	4/1/2011			Cheyenne	Laramie	WY	82009-1807
15	5729541	0	3/25/2011	4/1/2011			Cheyenne	Laramie	WY	82009-1807
16	5747881	0	6/25/2011	6/30/2011			Cheyenne	Laramie	WY	82009
17	5254674	0	6/27/2011	7/4/2011			Cheyenne	Laramie	WY	82003
18	6139065	0	3/16/2012	3/22/2012			Cheyenne	Laramie	WY	82009
19	6139062	0	3/17/2012	3/22/2012			Cheyenne	Laramie	WY	82001
20	6139042	0	3/19/2012	3/23/2012			Cheyenne	Laramie	WY	82009
21	6136095	0	4/12/2012	4/17/2012			Cheyenne	Laramie	WY	82009
22	4410766	0	8/17/2011	8/19/2011			Cody	Park	WY	82414-4027
23	4410773	0	8/17/2011	8/19/2011			Cody	Park	WY	82414-4027
24	5966723	0	3/24/2011	3/27/2011			Evanston	Uinta	WY	82930
25	5946723	0	3/25/2011	3/27/2011			Evanston	Uinta	WY	82930
26	5966737	0	3/22/2011	3/28/2011			Evanston	Uinta	WY	82930
27	5966707	0	3/25/2011	3/28/2011			Evanston	Uinta	WY	82930
28	5946716	0	3/27/2011	3/30/2011			Evanston	Uinta	WY	82931
29	5966715	0	3/28/2011	3/31/2011			Evanston	Uinta	WY	82931
30	5946736	0	3/28/2011	4/1/2011			Evanston	Uinta	WY	82931
31	5966764	0	3/29/2011	4/1/2011			Evanston	Uinta	WY	82930
32	6020146	0	8/9/2011	8/13/2011			Gillette	Campbell	WY	82716
33	6020131	0	8/8/2011	8/15/2011			Gillette	Campbell	WY	82718
34	5501631	0	12/12/2008	12/17/2008			Green River	Sweetwater	WY	82935
35	5518863	0	12/19/2008	12/23/2008			Greybull	Big Horn	WY	82426
36	5987559	0	5/2/2011	5/6/2011			Grover	Lincoln	WY	83122
37	5987566	0	5/2/2011	5/6/2011			Grover	Lincoln	WY	83122
38	5356599	0	12/21/2008	1/10/2009			Jackson	Teton	WY	83001
39	5952952	0	4/26/2011	5/2/2011			Jackson	Teton	WY	83002
40	5655134	0	4/19/2011	4/22/2011			Kemmerer	Lincoln	WY	83101
41	5501646	0	2/27/2009	3/3/2009			Lander	Fremont	WY	82520
42	5735232	0	3/26/2011	4/1/2011			Lander	Fremont	WY	82520-9789
43	4281558	0	5/29/2011	5/24/2011			Lander	Fremont	WY	82520
44	4281560	0	7/15/2011	7/19/2011			Lander	Fremont	WY	82520
45	5254003	0	8/5/2011	8/10/2011			Lander	Fremont	WY	82520
46	6301372	0	1/26/2013	1/30/2013			Lusk	Niobrara	WY	82225
47	5379413	0	3/28/2009	11/30/1999			Lyman	Uinta	WY	82937
48	5379484	0	2/17/2009	2/25/2009			Lyman	Uinta	WY	82937
49	5655261	0	5/1/2011	5/4/2011			Lyman	Uinta	WY	82937
50	5655300	0	7/22/2011	7/25/2011			Lyman	Uinta	WY	82937
51	5254021	0	5/17/2009	5/21/2009			Mills	Natrona	WY	82644
52	5655218	0	3/19/2012	3/22/2012			Mountain View	Uinta	WY	82939
53	5472386	0	3/13/2009	3/16/2009			Powell	Park	WY	82435



BACKGROUND

1. Application
 - a. Discussed with supervisor and Deputy Administrator.
 - b. Application made – accepted.
2. Registered for GIS class at local community college.
Cancelled – no other students.
3. Arranged for an SME site visit for tutoring.
4. Wyoming radon data has never been geo-mapped
 - a. The current EPA Zone Map for the country is too broad-brushed to give specific location data regarding areas of radon levels on a more specific range.
 - b. Geo-mapping the state with the 25,000+ test results will create a more accurate radon map of Wyoming.
5. Participated in conference calls.

Site Visit #1



**BKS Environmental
Associates, Inc.**

Providing consulting services to the energy industries
throughout the Western United States since 1981.

Two site visits were scheduled:

- April 2013 Cheyenne, BKS Environmental Associates, Inc.

Session 1:

- Navigating the ArcGIS Desktop Platform.
- Navigating ArcGIS Desktop Tools.
- Using ArcGIS Desktop Tools Introduction.
- Navigating and using ArcCatalog Basics.

Session 2:

- Excel and ArcGIS Basics.
- Geo-database Management Basics.
- Cartography Basics.
- Q&A Time.

Site Visit #2



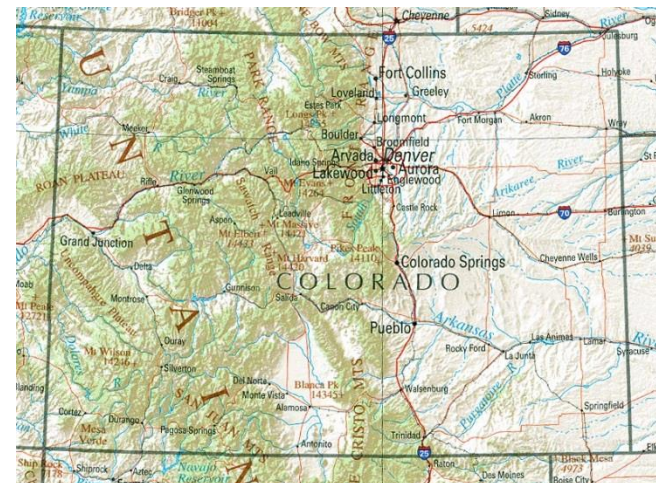
➤ Second site visit (May 2013)

Site visit to Colorado Department of Public Health Environment
Colorado CDPHE tracking team.

- Web Portal
- Communication / Outreach
- Partnership on Data & Data Sharing
- GIS, Mapping Applications
- EPHT Technology
- Developing Radon Data on the Colorado Portal
- Developing Wyoming Data and GIS Display
- Developed two Wyoming GIS Radon Maps

Three GIS maps were discussed, two were developed:

- Radon distribution by zip code
- Radon distribution by county
- Discussed Radon distribution by census track – not accomplished



Research Design

- The WRP began with approximately 35,000 test kit results from Air Chek laboratory.
- These 35,000 test kits needed to be purged of duplicate tests, Post Office Box addresses, test kit results from other states, test kits with ERROR messages and other abnormalities that negated the use of certain test kits in the database.
- 19,334 test result were developed after purging.
- After purging the database, the data was arranged by county and zip code according to the level of radon in those areas.
- The data consisted of the test kit address, city, county, zip code and level of radon.
- These were divided into groups by county, with a maximum of 1,000 lines of code per group.
 - Used GPS Visualizer for geo-coding <http://www.gpsvisualizer.com/geocoder/>

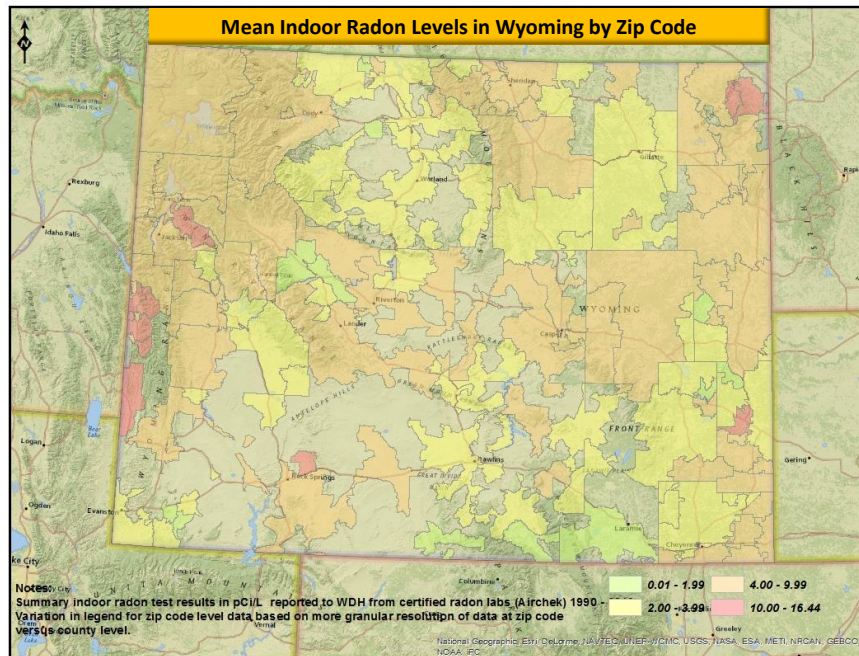
Wyoming Radon Mapping Project

- The specific aim of the Wyoming Radon GIS mapping project was intended to provide radon data in a GIS map format for the benefit of radon professionals, real estate agents, contractors, building code officials, physicians, general public, and Region 8 US EPA in Denver, CO.
- The GPS Visualizer (<http://www.gpsvisualizer.com/geocoder/>) was used to acquire the latitude and longitude of each address.
- When completed, the coordinates, by county, were placed onto the ArcGIS map in three groups with an assigned color:
 - 0.0 pCi/L to 1.9 pCi/L (Green),
 - 2.0 to 3.9 (Yellow) and
 - 4.0 pCi/L and above (Red).
- This completed the first map of setting the radon level points.
- The second task was accomplished at CDPHE with the county map and the zip code map.

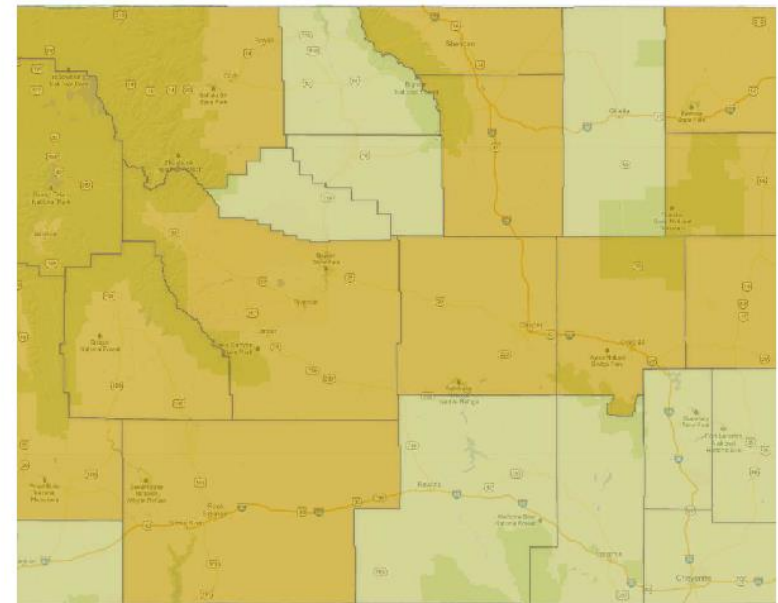
Wyoming Radon Mapping Project

- With the assistance of ASTHO, ESRI and CDPHE, two maps have been produced; one showing the average radon level by county and the second showing the average radon level by zip code.

Zip Code

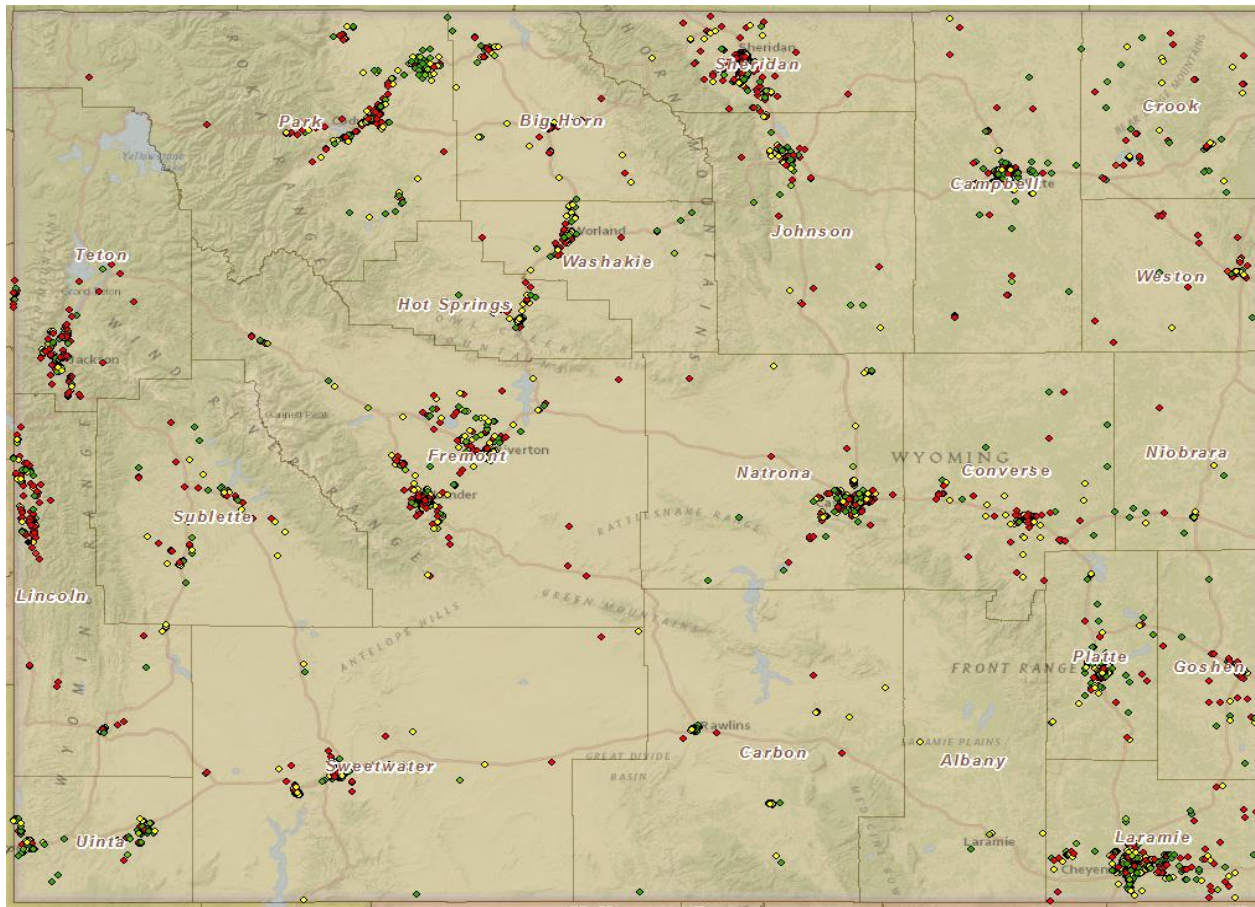


County



Wyoming Radon Mapping Project

A third map was produced back in Wyoming of all 19K+ points in the state



Legend in pCi/L

Radon Concentration Range (pCi/L)	Color
.1 – 1.9	Green
2.0 – 3.9	Yellow
4.0 – 99.9	Red
100+	Black

Conclusion

- The Wyoming ArcGIS Radon mapping project is off to a good start, but it needs to develop more in the way of training for the personnel involved, more data input and more data analysis.
- The Wyoming EPHT still has some distance to go before it is ready to be placed on the web.

**Environmental Public Health Tracking
ASTHO Fellowship Program Pilot Project**

***LEAD POISONING AND SOCIAL
VULNERABILITY INDEX (SVI) DATA
IN TENNESSEE***

Sutapa Mukhopadhyay, Ph.D.
Tennessee Department of Health
4 November, 2014

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