

# The New Hampshire Expanded Biomonitoring Program – Opportunities for Collaboration

Presented at the  
Annual APHL Meeting Indianapolis, IN  
05.19.2015

Julianne Nassif, MS  
NH Public Health Laboratories  
29 Hazen Drive Concord, NH  
[julianne.nassif@dhhs.state.nh.us](mailto:julianne.nassif@dhhs.state.nh.us)



# Two Phases of the NH Program

---

- Targeted Biomonitoring
  - Area of known contamination
  - Limited analytes
  
- Surveillance Program
  - Statewide
  - Broader analyte list
  - Gather baseline data, NH specific ranges



# Biomarker Selection Targeted Program

---

- ❑ Awareness of drinking water contamination
- ❑ Recognized health effects associated with consumption of contaminated water
- ❑ Non-invasive specimen collection
- ❑ Accepted biomonitoring methods
- ❑ Viable treatment options for highly exposed
- ❑ National Exposure Report
- ❑ Preliminary NH data indicating cause for concern



# Potential for Arsenic and Uranium Exposure

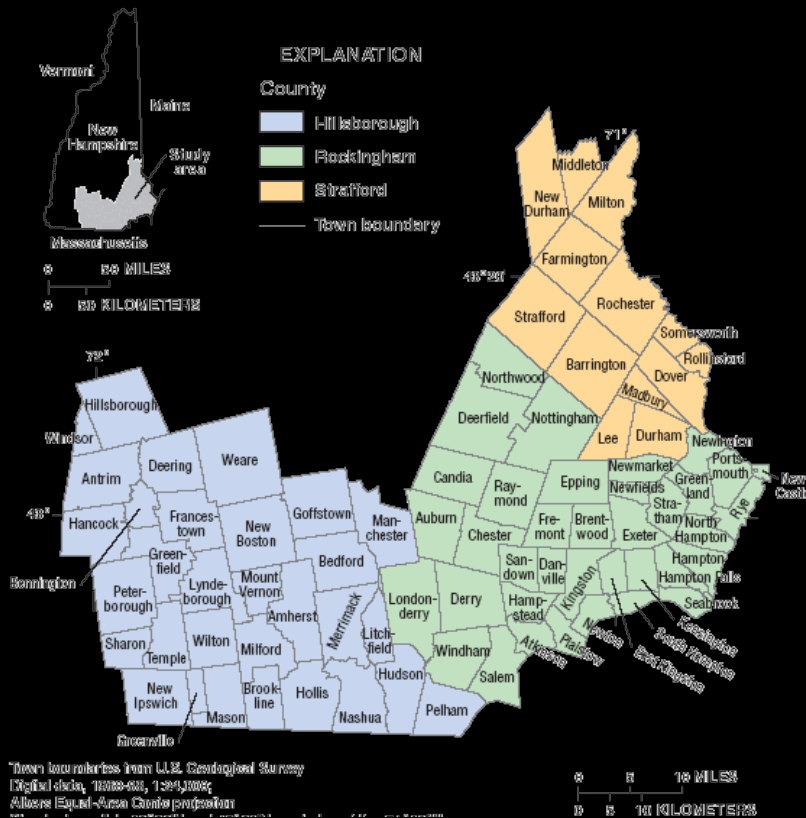
---

- ❑ Forty-six percent of the state population is reliant on bedrock wells for drinking water
- ❑ Geologic formations, past land use practices provide opportunities for exposure
- ❑ NPHL data (2005-2006) 31% of 121 samples collected in southern NH exceeded MCL
- ❑ Significant correlation between elevated drinking water arsenic and higher than average total urinary arsenic

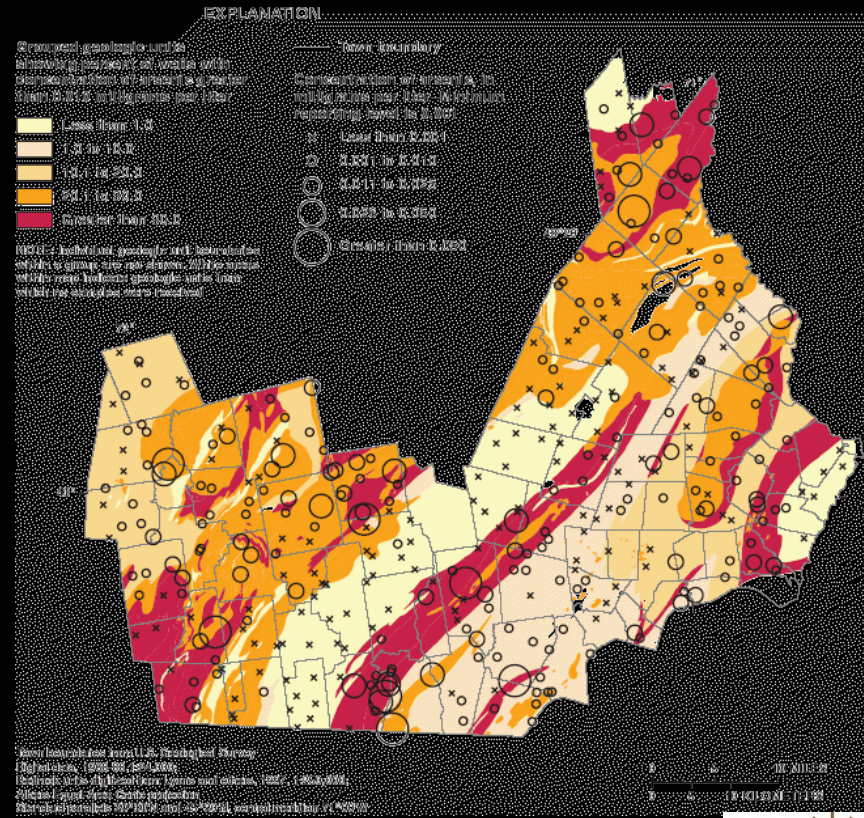


# Proposed Study Area Targeted Biomonitoring

## Affected Communities



## Arsenic Contaminated Wells



# Project Implementation

---

- ❑ Outreach to Prospective Communities
- ❑ Hiring of Project Staff
- ❑ Purchase of Equipment & Supplies
- ❑ Project Advisory Committee
  - Technical
  - Community
- ❑ Communication & Messaging



# “Study Design”

---

- Recruit from High Risk Areas
  - Age, race, gender, sensitive sub-populations
  - Control population
  - Sample size
- Questionnaire
  - Residential, occupational & recreational histories
  - Food diary and drinking water patterns
  - Demographic, educational, socioeconomic status
  - Behavioral risk factors
  - Health status? Other indicators?
- Collect & Analyze
  - Drinking water - total As, U, ICP/MS
  - Urine - total As, U, creatinine - ICP/MS
    - Speciated arsenic - HPLC-ICP/MS



# Potential Collaborations

---

## □ Massachusetts

- Comparability of data
- Questionnaire development?
- Risk messaging
- Release of results?

## □ Dartmouth College

- NIEHS Center of Excellence
- Specimen sharing
- Collaboration with researchers conducting epigenetics work



# Other Potential Collaborations

---

- Training
- Mentoring
- Recruitment strategies
- Reporting practices

# Surveillance Biomonitoring Project

---

- ❑ Baseline information, NH specific ranges
- ❑ Statewide recruitment
  - Challenging
    - ❑ Incentives
  - Opportunistic recruitment
    - ❑ Blood donation centers
    - ❑ College campuses
    - ❑ State employee complex
  - Clinical collaborators
  - Academic partners



# Surveillance Biomonitoring Project

---

- ❑ Baseline information, NH specific ranges
- ❑ Statewide recruitment
  - Challenging
    - ❑ Incentives?
  - Opportunistic recruitment?
    - ❑ Blood donation centers
    - ❑ College campuses
    - ❑ State employee complex
  - Clinical collaborators
  - Academic partners



# Biomarker Selection Surveillance Program

---

- ❑ Refine list with guidance from TAC and CDC
- ❑ Metals
- ❑ Pesticides
  - Organophosphate
  - Pyrethroid
- ❑ Environmental tobacco smoke
  - Cotinine
- ❑ Industrial chemicals
  - PFCs



# Study Design

---

- ❑ Recruit Statewide
- ❑ Age, race, gender, sensitive sub-populations
  - Sample size
  - Target/oversample sensitive populations
- ❑ Questionnaire
  - Residential, occupational & recreational histories
  - Food diary and drinking water patterns
  - Demographic, educational, socioeconomic status
  - Behavioral risk factors
  - Health status? Other indicators?
- ❑ Collect & Analyze
  - Urine – metals, pesticide metabolites
  - Whole blood – metals
  - Serum - cotinine, PFCs

