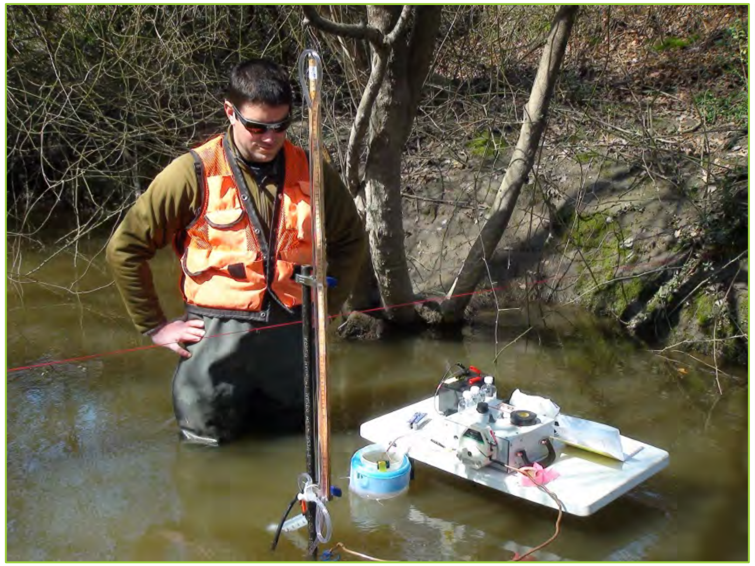
  

Risks to Private Wells

TEAM 2: PRIVATE WELL RISK ASSESSMENT

JACQUELINE MACDONALD GIBSON, DAVID GENEREUX

NC PFAS Testing (PFAST) Network, a research program funded by the NC Policy Collaboratory

Research Objectives

- For GenX and other PFAS, determine current rates of input to the aquifer and output from the aquifer to tributaries of the Cape Fear River.
  - How long will it take to flush PFAS from the aquifer by natural groundwater flow?

- Determine why some wells are contaminated and others are not.
  - What features of the wells, landscape, geology, weather, and geographic location influence risks to wells?

- Develop user-friendly web site with interactive maps to help private well owners assess risks.

Project Will Uncover Causes of Unexplained Variation in GenX and PFAS in Private Wells

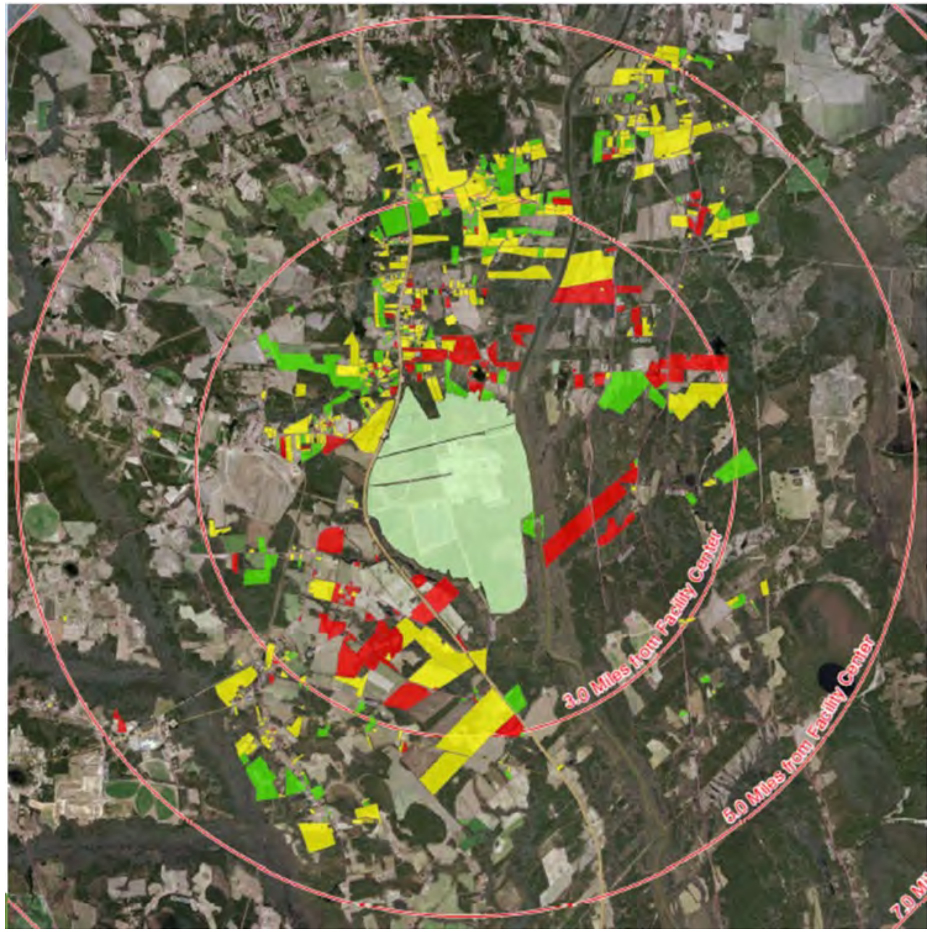
>1,000 wells tested

- 23% > health goal
- 23% non-detect

Map Key

- Red = > 140 ng/L
- Yellow = 0- 140 ng/L
- Green = nondetect

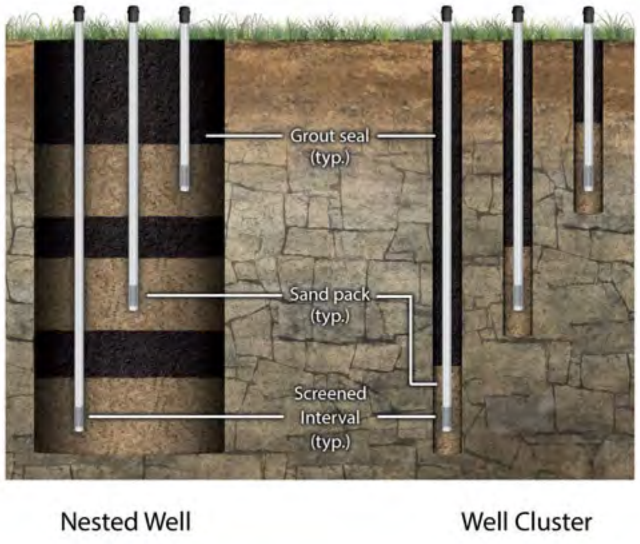
Figure courtesy of DEQ



Hydrogeologic Analysis to Predict Time to Flush PFAS from the Aquifer

Key questions include

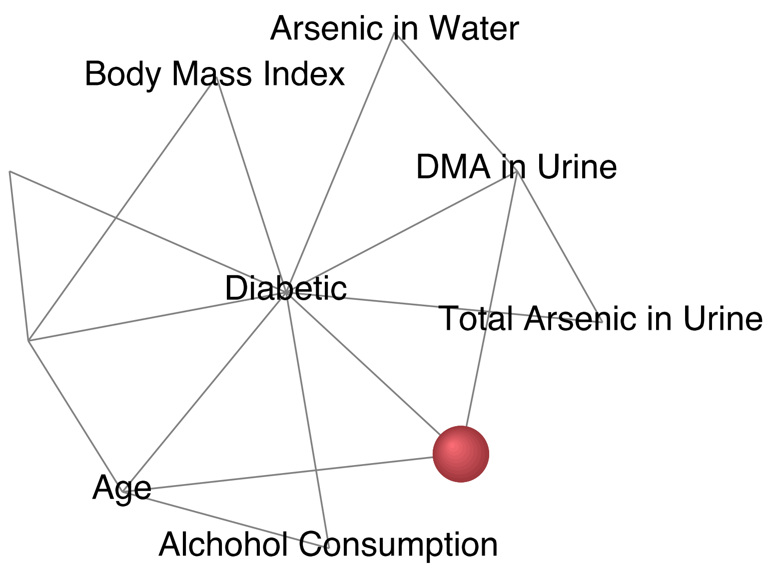
- Current rate of PFAS input to groundwater?
- Rate of PFAS flow from groundwater into streams?
- PFAS in groundwater increasing or decreasing?



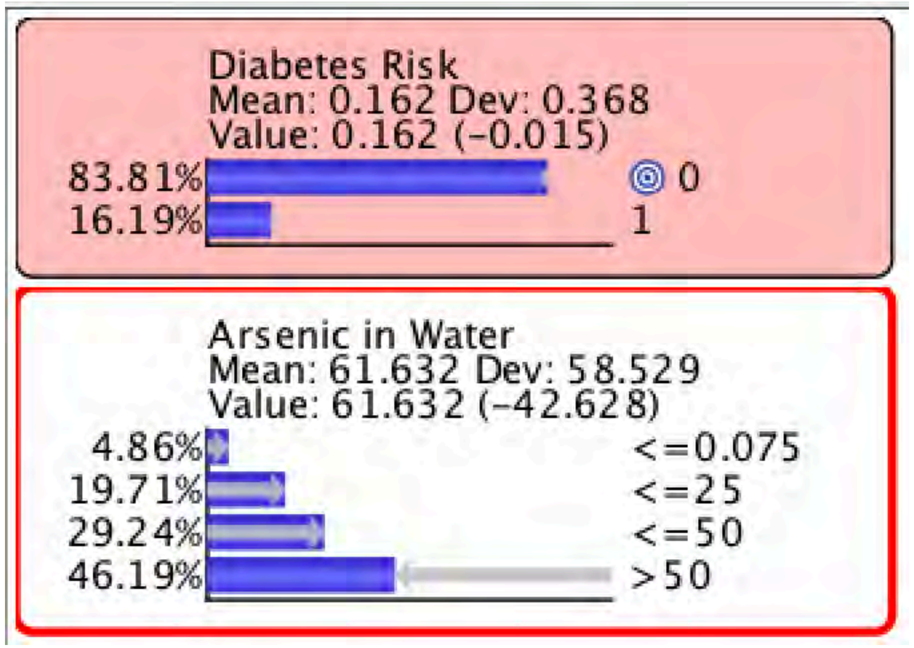
Groundwater sampling from “well nests” (above) and streambeds (title slide photo) can help answer these questions.

Machine Learning to Predict Wells at Risk and Identify Key Influences

EXAMPLE: PREDICTING RISKS FROM ARSENIC IN DRINKING WATER

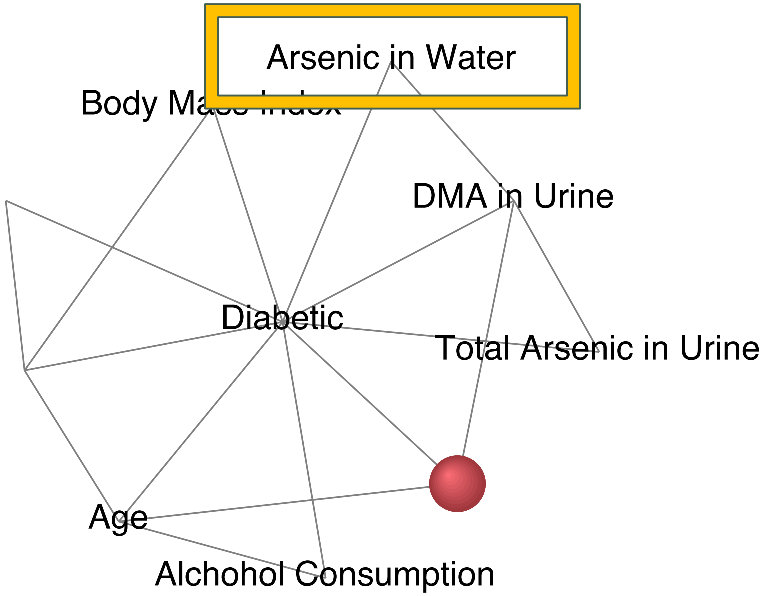


BASELINE DIABETES RISK IS 16%

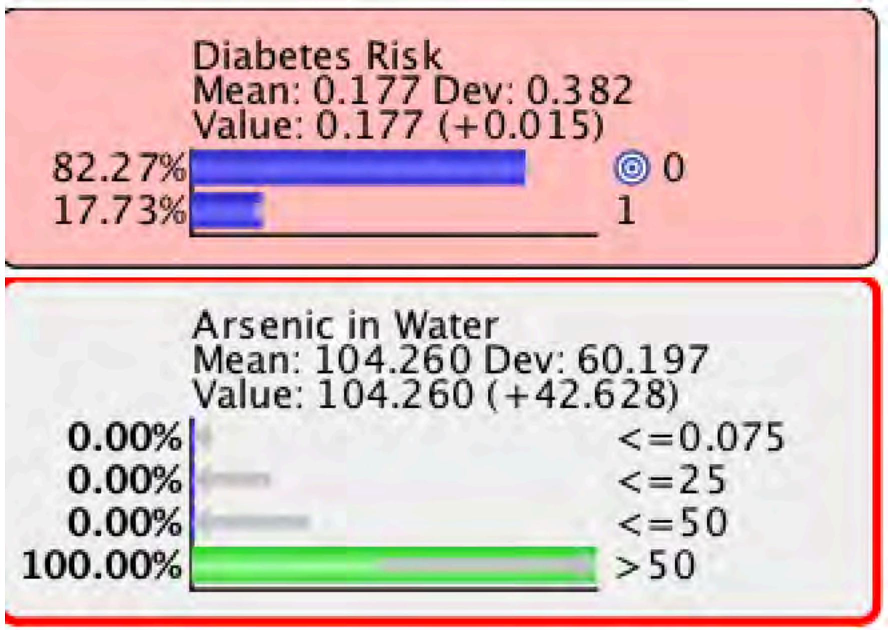


Machine Learning to Predict Wells at Risk and Identify Key Influences

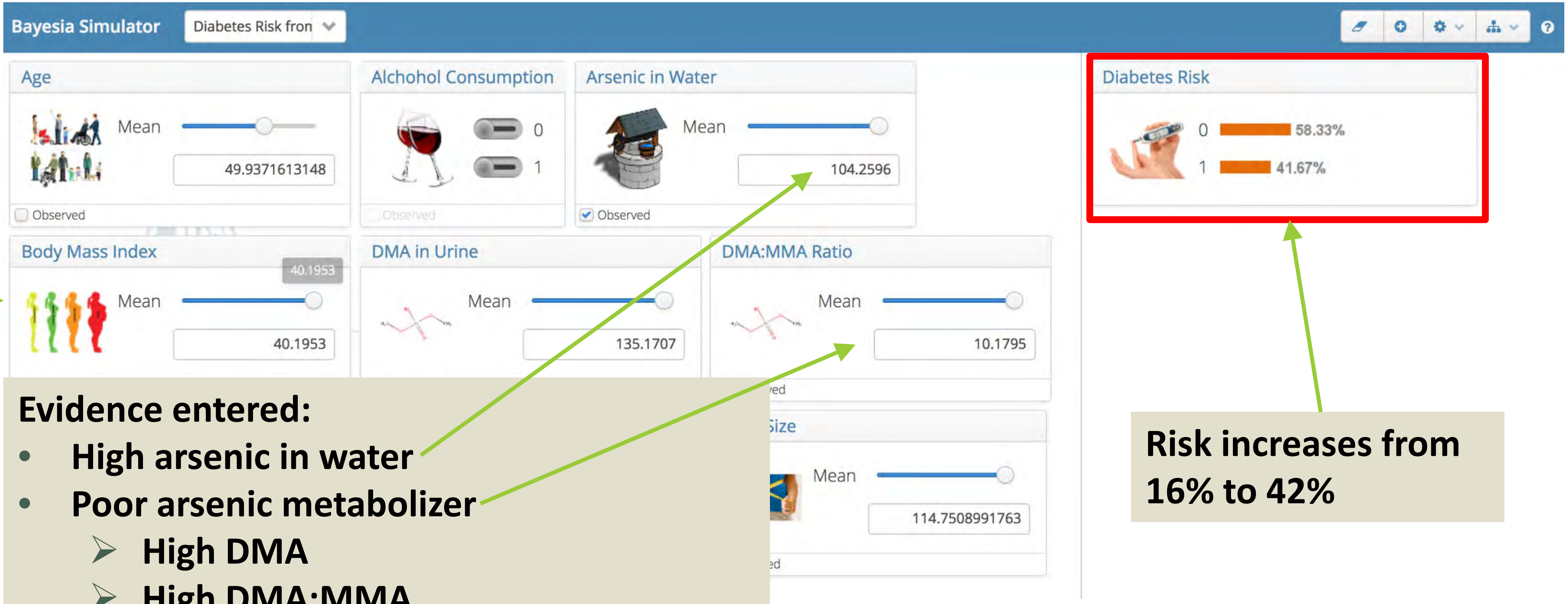
EXAMPLE: PREDICTING RISKS FROM ARSENIC IN DRINKING WATER



INCREASING ARSENIC INCREASES DIABETES RISK TO NEARLY 18%



User-Friendly Version Allows Consumers to Assess Their Own Risks



Evidence entered:

- **High arsenic in water**
- **Poor arsenic metabolizer**
  - ➢ **High DMA**
  - ➢ **High DMA:MMA**
- **Obese**

Risk increases from 16% to 42%