

**Joint Seminar of
Statistical Engineering Division, and
Ionizing Radiation Division**

**Friday November 7, 1997, 1:30 pm
Lecture Room A, Administration Bldg.
NIST
Gaithersburg, MD**

**Statistical Issues in Home Radon Mapping
and Remediation Decisions**

Andrew Gelman

**Department of Statistics
Columbia University**

Home radon exposure is estimated to be the second leading cause of lung cancer in the U.S. This has motivated an EPA-led effort to identify high-radon homes. We describe the hierarchical modeling and model-checking approach we use to combine several sources of information in order to identify the homes that are most likely to have high radon levels. We then discuss some interesting statistical difficulties that arise when using maps to summarize inferences and check the model fit. Finally, we apply decision analysis to the problem of whether you should obtain a radon measurement for your household, and, given that measurement, whether you should remediate your house. When combined with the hierarchical model, the decision analysis allows recommendations to vary geographically. We estimate the aggregate consequences of various decision strategies applied across the entire U.S., and compare to EPA recommendations.

This work is joint with Phillip Price, Energy and Environment Division, Lawrence Berkeley National Laboratory.

Andrew Gelman received his PhD in Statistics from Harvard University under Donald Rubin. He has broad research interests in applied and theoretical Bayesian statistics. His more than 50 publications include the highly regarded textbook *Bayesian Data Analysis* (Chapman and Hall, 1995). Dr. Gelman is a fellow of the Institute of Mathematical Statistics.

[NIST contact: Mark Vangel, 301-975-3208]