

Site Selection, Well Installation, and Monitoring

The 29 sampling sites were selected in residential and commercial areas developed between 1970 and 1990 and underlain by unconsolidated surficial deposits (fig. 2). The older, densely populated areas of Boston and its neighboring cities and towns were excluded because urban land uses in these areas pre-date 1970. Industrial areas were not sampled because these areas contain numerous point sources of contaminants and known contaminated sites (Flanagan and others, 1999). Finally, areas developed after 1990 were not included in this investigation because of the inadequate time necessary for new construction to affect ground-water quality (Squillace and Price, 1996).

Sites were randomly chosen on the basis of the above criteria using a computer program developed for the NAWQA program (Scott, 1990). Final well locations were based on the randomly chosen sites and landowner permissions. The USGS wells were installed during 1998-99 according to NAWQA protocols (Lapham and others, 1995). Seventy-nine percent of the wells were installed in residential areas. The remaining wells were in areas that included a mix of light commercial, residential, and undeveloped land.

Water samples were collected from these wells during the summer of 1999, and analyzed for major ions, nutrients, trace elements, radon gas, radionuclides, chlorofluorocarbons, 48 different pesticide compounds, and 86 different volatile organic compounds (VOCs) (Coakley and others, 1999; and Socolow and others, 2000). Sampling protocols were followed to obtain and evaluate accurate water-quality data (Koterba and others, 1995). Water samples were processed in the field and then shipped to the USGS National Water Quality Laboratory (NWQL) for analysis.

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Drilling a shallow well in an urban area in the Boston metropolitan study area.

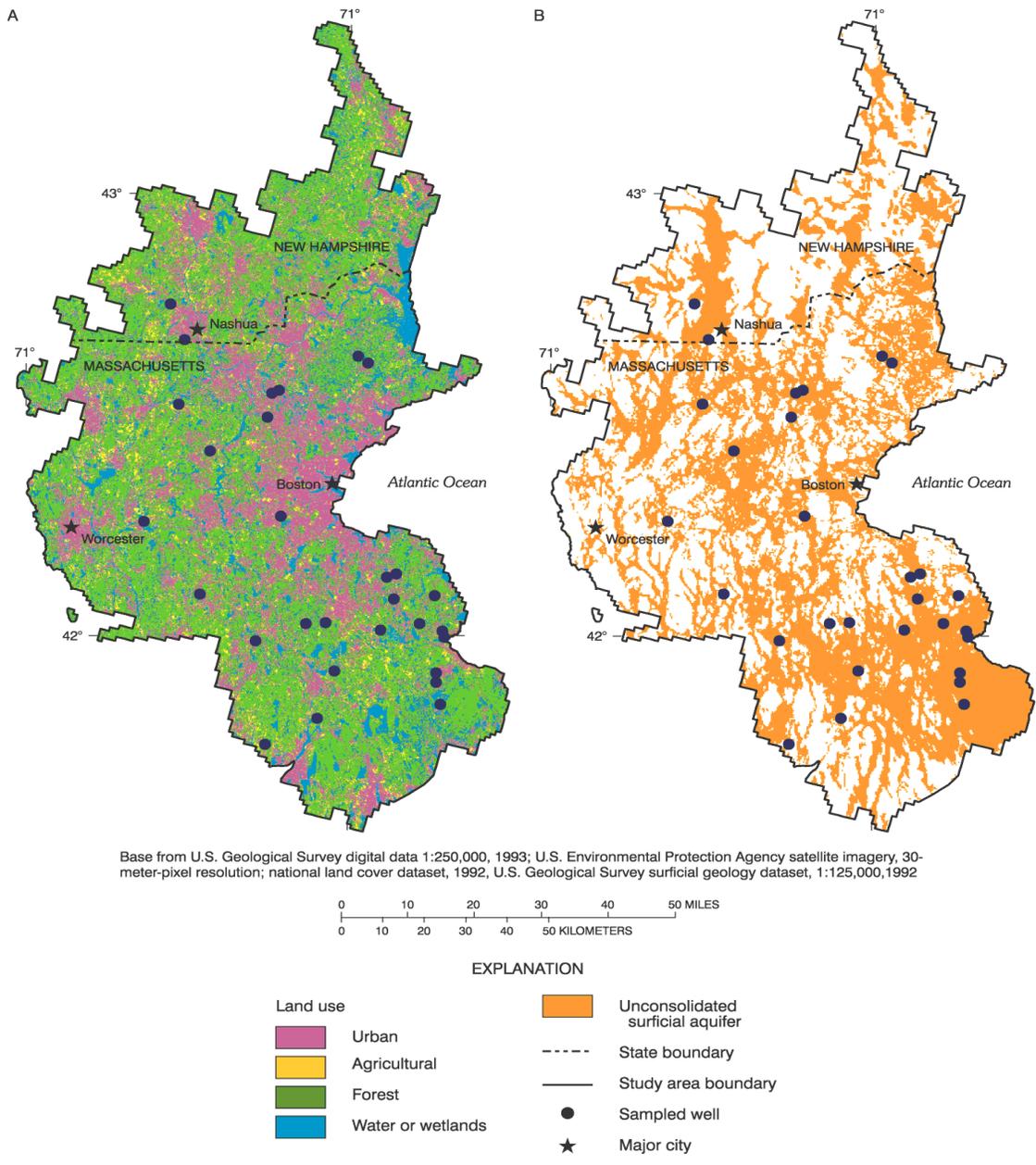


Figure 2. Land uses (A), unconsolidated surficial aquifers (B), and sampled wells in the Boston metropolitan area.