Technical Report

How the Sample Was Selected

The NH & Piscataqua Region Water and Watersheds Survey was a telephone survey of randomly selected adults in the state of New Hampshire with an oversample of towns in New Hampshire and Maine that fall within the Piscataqua Watershed. This survey was conducted using a procedure called Random Digit Dialing (RDD), of both landline and cellular telephone.

The Maine towns included in the oversample are: *Acton, Berwick, Eliot, Kittery, Lebanon, North Berwick, Sanford, South Berwick, Wells, and York.*

The New Hampshire towns included in the oversample are: *Barrington, Brentwood, Brookfield, Candia, Chester, Danville, Deerfield, Dover, Durham, East Kingston, Epping, Exeter, Farmington, Fremont, Greenland, Hampton, Hampton Falls, Kensington, Kingston, Lee, Madbury, Middleton, Milton, New Castle, New Durham, Newfields, Newington, Newmarket, North Hampton, Northwood, Nottingham, Portsmouth, Raymond, Rochester, Rollinsford, Rye, Sandown, Seabrook, Somersworth, Strafford, Stratham, Wakefield.*

A sample of households in the area was selected by a procedure known as random digit dialing. The way this works is as follows. First, with the aid of a computer, one of the three digit telephone exchanges that are currently used in the state (e.g., 772) is randomly selected. The computer then randomly selects one of the "working blocks"--the first two of the last four numbers in a telephone number (e.g., 64)--and attaches it to the randomly selected exchange. Finally, the computer program then generates a two digit random number between 00 and 99 (e.g., 57) which is attached to the previously selected prefix (772), and the previously selected working block (64) resulting in a complete telephone number, i.e., 772 6457. This procedure is then repeated numerous times by the computer to generate more random numbers, so that we have a sufficient quantity to conduct the survey. The end result is that each household in the area in which there is a telephone has an equally likely chance of being selected into the sample. This procedures is done for both land line and cellular exchanges.

The random sample used in the NH & Piscataqua Region Water and Watersheds Survey was purchased from Scientific Telephone Samples (STS), Foothill Ranch, CA. STS screens each selected telephone number to eliminate non-working numbers, disconnected numbers, and business numbers to improve the efficiency of the sample, reducing the amount of time interviewers spend calling non-usable numbers.

Each of these randomly generated telephone numbers is called by one of our interviewers from a centrally supervised facility at the UNH Survey Center. If the number called is found not to be a residential one, it is discarded and another random number is called. (Approximately forty-five percent of the numbers

were discarded because they are found to be businesses, institutions, or not assigned.) If it is a residential number, the interviewer then randomly selects a member of the household by asking to speak with the adult currently living in the household who has had the most recent birthday. This selection process ensures that every adult (18 years of age or older) in the household has an equally likely chance of being included in the survey. No substitutions are allowed. If, for example, the randomly selected adult is not at home when the household is first contacted, the interviewer cannot substitute by selecting someone else who just happens to be there at the time. Instead, he or she must make an appointment to call back when the randomly selected adult is at home. In this way, respondent selection bias is minimized.

When the Interviewing Was Done

Adult respondents in the NH & Piscataqua Region Water and Watersheds Survey were interviewed between September 20 and September 29, 2013. Each selected respondent was called by a professional UNH Survey Center interviewer from a centrally supervised facility at the UNH Survey Center. Telephone calls during the field period were made between 9:00 AM and 9:00 PM.

Response Rates

For the statewide survey, interviews were completed with 406 randomly selected adults in New Hampshire from a sample of 2,453 randomly selected telephone numbers. For the oversample survey, interviews were completed with 210 randomly selected adults in the Piscataqua Region of New Hampshire and Maine from a sample of 1,479 randomly selected telephone numbers. Using American Association for Public Opinion (AAPOR) Response Rate 4, the response rate for the NH & Piscataqua Region Water and Watersheds Statewide Survey was 31% percent and 25% for the oversample.

The formula to calculate standard AAPOR response rate is:

$$\frac{I + P}{(I + P) + (R + NC + O) + e(UH + UO)}$$

I=Complete Interviews, **P**=Partial Interviews, **R**=Refusal and break off, **NC**=Non-Contact, **O**=Other, **e**=estimated portion of cases of unknown eligibility that are eligible, **UH**=Unknown household, **UO**=Unknown other.

Weighting of Data

The data have been weighted to account for known biases of telephone surveys. The data in the NH & Piscataqua Region Water and Watersheds Survey are weighted by the number of adults and telephone lines within households to equalize the chances that any one adult would be selected for inclusion. The data are also weighted by respondent sex, age and region of the state (statewide) or state of residence (oversample).

Sampling Error

The NH & Piscataqua Region Water and Watersheds Survey, like all surveys, is subject to sampling error due to the fact that all residents in the area were not interviewed. For those questions asked of five hundred (500) or so respondents, the error is +/-4.4%. For those questions where fewer than 500 persons responded, the sampling error can be calculated as follows:

$$Sampling\ Error = \pm 1.96\sqrt{\frac{P(1-P)}{N}}$$

Where P is the percentage of responses in the answer category being evaluated and N is the total number of persons answering the particular question.

For example, suppose you had the following distribution of answers to the question, "Should the state spend more money on road repair even if that means higher taxes?" Assume 1,000 respondents answered the question as follows:

YES	47%
NO	48%
DON'T KNOW	5%

The sampling error for the "YES" percentage of 47% would be

$$\pm 1.96\sqrt{\frac{47(53)}{1000}} = \pm 3.1\%$$

for the "NO" percentage of 48% it would be

$$\pm 1.96\sqrt{\frac{48(52)}{1000}} = \pm 3.1\%$$

and for the "DON'T KNOW" percentage of 5% it would be

$$\pm 1.96\sqrt{\frac{5(95)}{1000}} = \pm 1.4\%$$

In this case we would expect the true population figures to be within the following ranges:

YES	43.9% - 50.1% (i.e., 47% ±3.1%)
NO	44.9% - 51.1% (i.e., 48% ±3.1%)
DON'T KNOW	3.6% - 6.4% (i.e., 5% ±1.4%)