

Using Geographic Information Systems to Establish Who is "Hard to Reach"

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One of the goals of California utilities' Residential Contractor Program (RCP) is to expand the market for contractor services. As in most energy efficiency efforts there is great speculation that certain groups of utility customers are not being adequately enrolled in the RCP program. The authors of this paper have developed a geographic information system (GIS) to determine the coverage of contractors across the service territories and to measure the distribution of benefits across different ethnic, income, and population density characteristics. This poster session reports on the distribution of benefits across the four utilities' service areas.

A detailed analysis was made of the distribution of vouchers across the three service territories. To accomplish this analysis, a geographic information system (GIS) was constructed that was able to merge data on the location of each participant with the 1990 US Census data. The GIS software, ArcView is able to locate the exact coordinates of more than 95 percent of the program participants by matching their street address to the underlying street data contained in the year 2000 TIGER data set. The remaining households were placed at a point that represented the centroid of their zip code.

Once the exact location of each site is determined, the GIS assigns to that location the underlying census tract information on the population's racial composition, median income, and housing type. These overlays use the 1990 census information.

For each of the three utility service territories, an analysis of the vouchers received is compared to the median income of the census tract, the percentage of population that is white, and the percentage of population that is Hispanic. In each case, correlation statistics measure the strength of the relationship between the voucher amount per household and each of the other variables. In the 1990 Census, the designation of race was a separate question from whether or not a household was of Hispanic origin. A household could be white and Hispanic, white and non-Hispanic, non-white and Hispanic, or non-white and non-Hispanic. The data are not reported in a way that produces a combined category that develops the percentage of households that are either non-white or Hispanic.

An examination of the characteristics of the RCP participant households reveals that participants are much more likely to be white, non-Hispanic, rural/suburban living, and higher income participants. The graphs and maps presented in the poster session will show clear differences in participation across these population characteristics. For each utility, the census tracts that have a higher-than-average percentage of the population that is Hispanic are more likely to have lower-than-average voucher amounts per household. Similarly, the lower the median income, or the higher the population density, the lower the average voucher amounts received per household. We present the results in two ways: as a correlation of vouchers versus other variables and as maps showing the spatial distribution of the vouchers overlaying census tract median income and the percentage of population that is white. It is important to remember that voucher amounts are presented as voucher amounts per household. This statistic eliminates the bias that would be expected in that larger census tracts could be expected to have higher total voucher amounts. By expressing all activity on a per household basis, the issue of absolute size of the tract is eliminated.