Findings

National sales of fresh fruits and vegetables at farmers' markets are estimated to be about $1.2 billion a year (Johnson and others, 1996). Recovery of wholesome, unsold fruits and vegetables from farmers' markets has the potential to provide food donations that can be distributed by nonprofit food recovery and gleaning organizations around the country. Many farmers' markets are already donating to nonprofit food recovery and gleaning organizations. Table 1 presents the total number of farmers' markets and organizations by State. California has the largest number of farmers' markets and food recovery organizations—301 and 51, respectively—followed by New York and Pennsylvania.

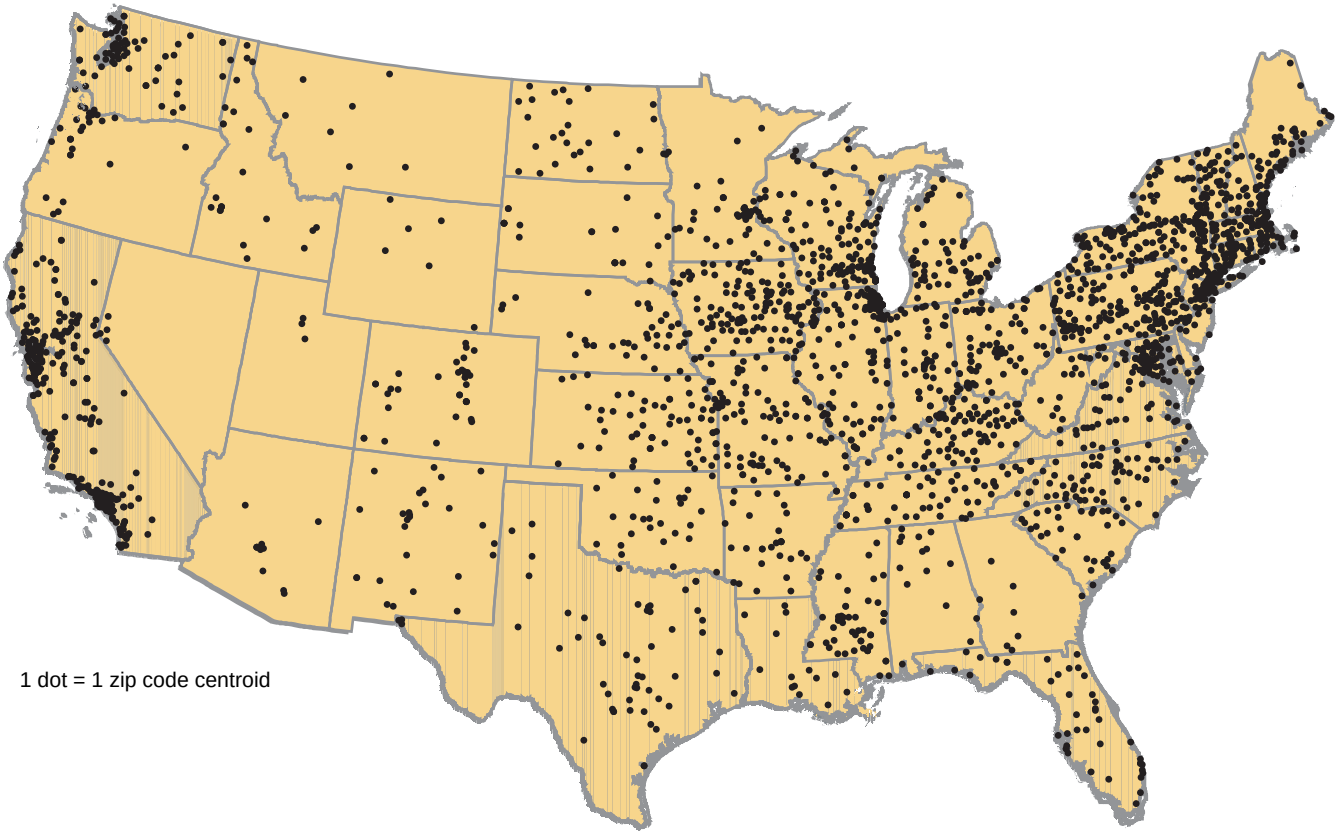
Locations of Farmers' Markets and Food Recovery Organizations

Figures 2 and 3 depict the distribution of farmers' markets and food recovery organizations across the United States. The dots depict zip code centroids containing farmers' markets and nonprofit food recovery and gleaning organizations. The largest densities of matchings are located on the west coast, in the East, and in the Midwest. California has the largest number of combined markets and organizations, followed by New York and then Pennsylvania.

Concentrations of Local Farmers' Markets and Organizations

To better facilitate a successful linkage between farmers' markets and food organizations, both entities must be located in reasonable proximity. Figure 4 shows concentrations of farmers' markets relative to organizations within a 30-mile radius of the food organizations' zip code centroid. The figure shows much higher concentrations in some areas relative to others. The dots (see legend) in figure 4 show the highest concentrations of potential donation sites (farmers' markets). The darkest dots represent high densities (numbers) of farmers' markets. These areas have 69-95 farmers' markets relative to local nonprofit food recovery and gleaning organizations' zip codes. The next level has 39-68 farmers' markets relative to local nonprofit food

Figure 2
Distribution of farmers' markets



recovery and gleaning organizations. We have selected areas depicting the two highest density levels (39-68 and 69-95) to represent areas where the greatest feasibility of strengthening ties exists.

For actual numbers of farmers' markets for each selected area, see appendix tables 2-29. We arbitrarily selected the five intervals (1-9, 10-21, 22-38, 39-68, and 69-95). We were unable to find information or publications defining the relationship between probability of successful recovery and local concentrations of farmers' markets in local areas.

The highest densities of farmers' markets relative to food recovery and gleaning organizations appeared on the west coast and in the Midwest and Northeast. Highest densities tended to be in or around metropolitan areas in these regions (figs. 5, 6, and 7). On the west coast, California, especially Los Angeles, Oakland, Berkeley, Pasadena, Compton, Santa Monica, and Long Beach, had the highest densities (numbers) of farmers' markets within a 30-mile radius of food recovery and gleaning organizations (fig. 5). On the east coast, Washington, DC; Alexandria, VA; Columbia, MD; Annapolis, MD; New York, NY; Mineola, NY; Hillside, NJ; Bronx, NY; Nyack, NY; Millwood, NY; Stamford, CT; Dorchester, MA; and Boston, MA, had the high densities of farmers' markets (fig. 6). In the Midwest, areas with high concentrations of farmers' markets in close proximity included Chicago, IL, and Gary, IN (fig. 7).

Most of these farmers' markets are open-air seasonal. That is, they are located outdoors for a limited time usually during the late spring, summer, and early fall. Most of the year-round farmers' markets were located in California. However, a few were in New York, the Maryland/DC/Virginia area, and Massachusetts.

Appendix table 1 shows the 28 food recovery organizations across the United States that have the highest concentrations (39-95) of farmers' markets within a 30-mile radius. Appendix tables may contain some overlap of farmers' markets because the markets may be in proximity of more than one food organization in a zip code area. These are local areas where high density

Figure 3
Distribution of food organizations

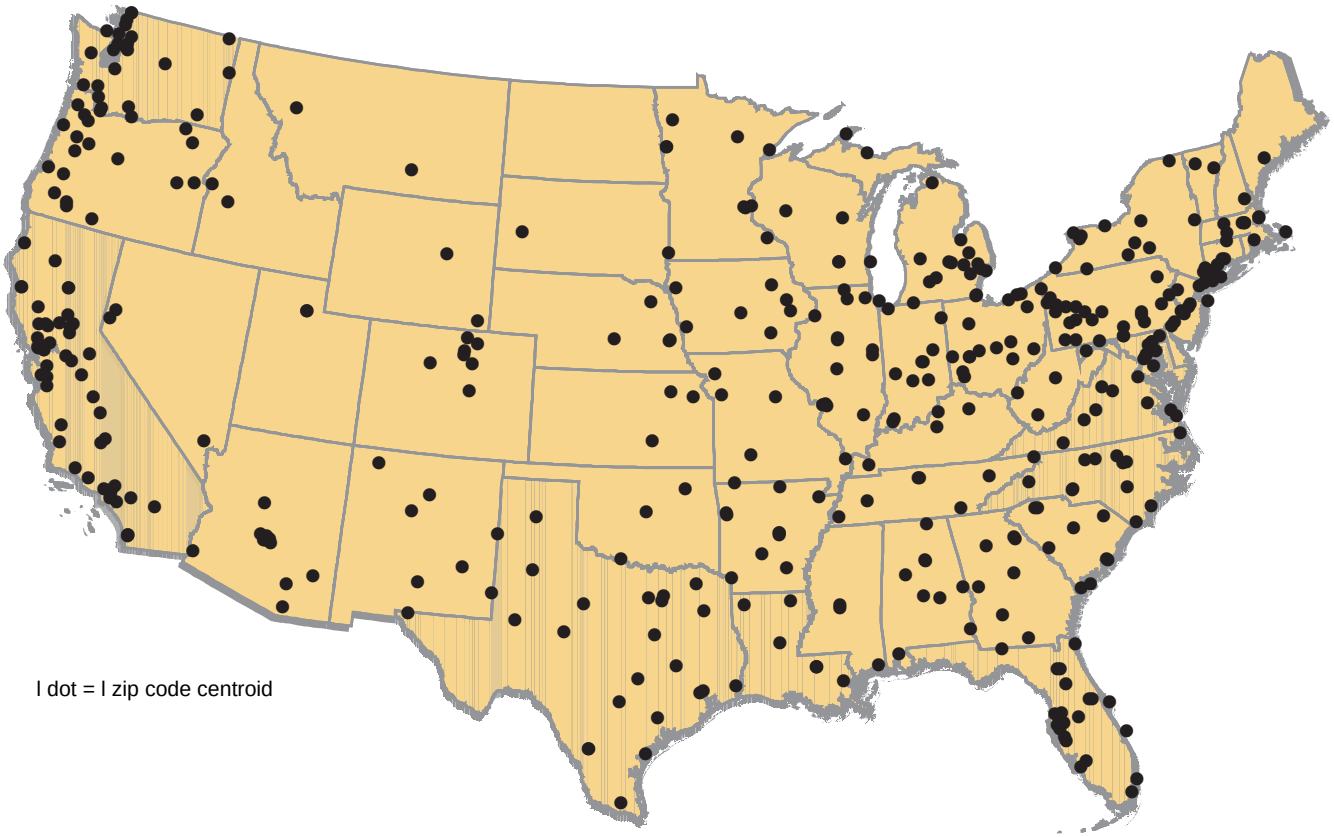


Figure 4

Number of farmers' markets within 30 miles of a food assistance organization

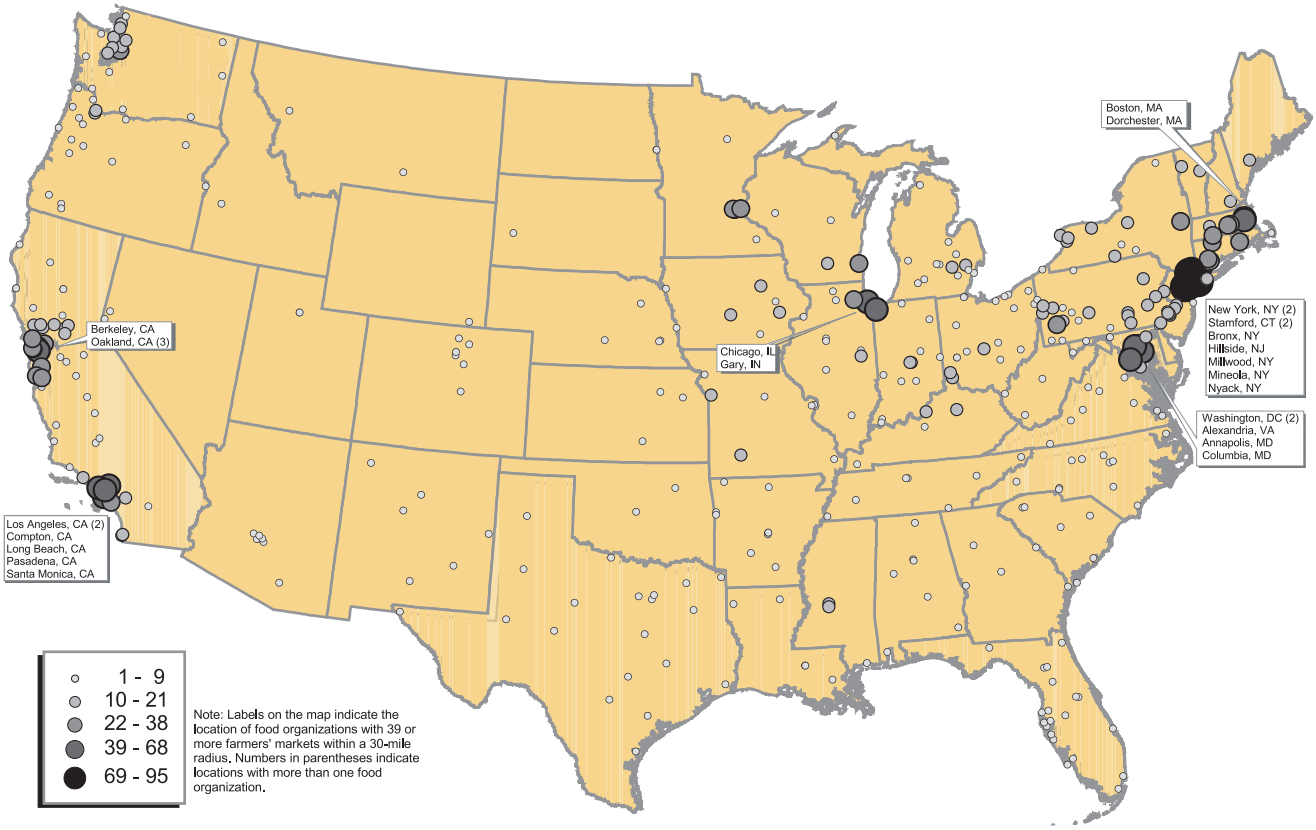


Figure 5

West Coast: Number of farmers' market within 30 miles of a food assistance organization

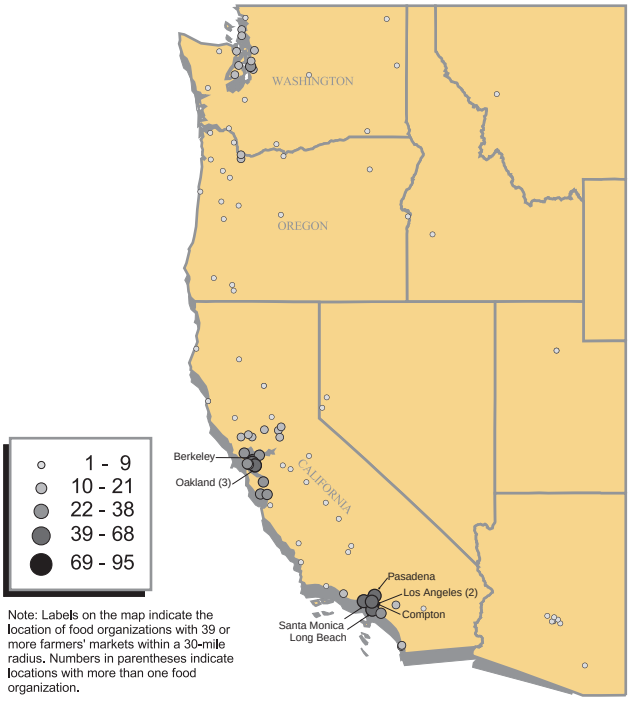


Figure 6

Northeast: Number of farmers' markets within 30 miles of a food assistance organization

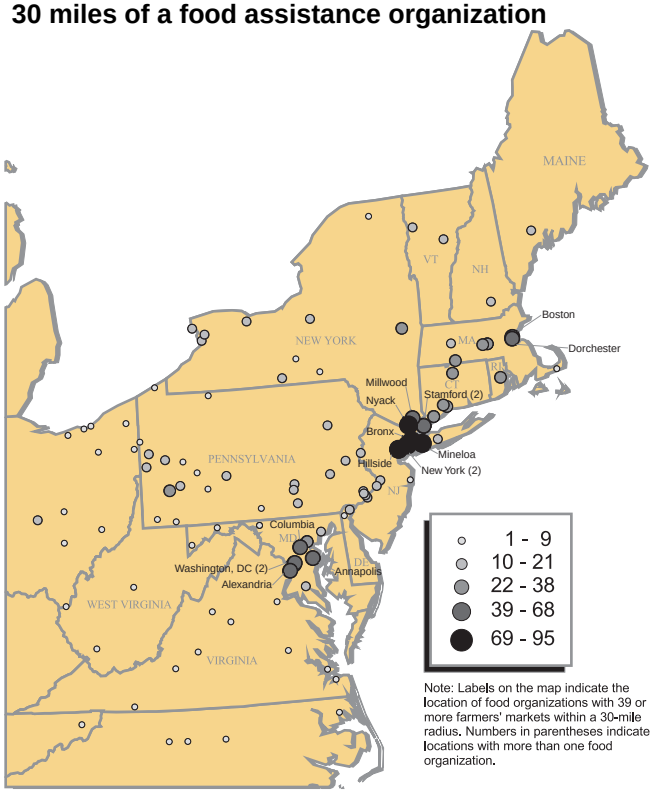
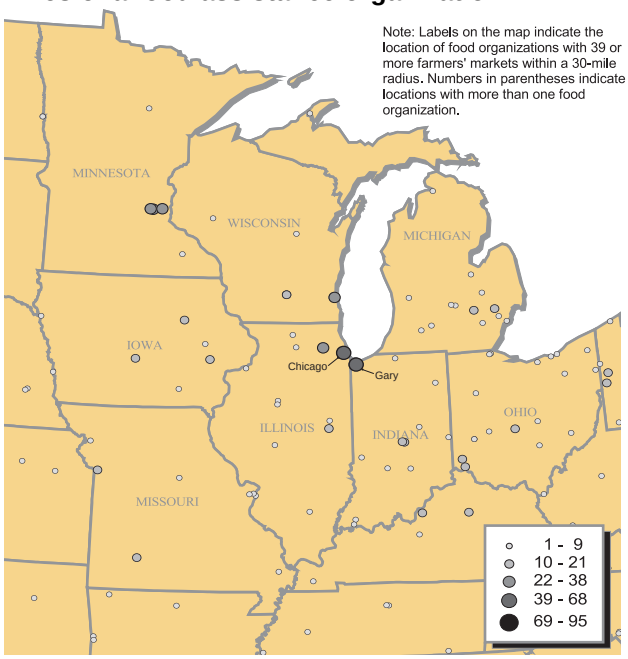


Figure 7

Midwest: Number of farmers' markets within 30 miles of a food assistance organization



(numbers) may keep collection costs to a minimum. These costs are important to organizations because most pick up the majority of their local donations.

Appendix tables 2-29 show a detailed list of farmers' markets within a 30-mile radius of the 28 food recovery and gleaning organizations. Other pertinent information is given, such as the address of the market, telephone number, contact person, and type of market, to enable successful communication between farmers' markets and food organization personnel.

Among the zip codes reflecting the 28 selected food recovery and gleaning organizations, the zip code centroid (geographic center) containing the most farmers' markets was located in New York City, which had 95 farmers' markets.

Limitations of the Study

The GIS analysis identifies several zip code centroids and metropolitan areas that have high concentrations of farmers' markets relative to local food assistance organizations. We present these results as areas with a strong feasibility of linking farmers' markets and nonprofit food recovery and gleaning organizations. However, the depictions shown in this report reflect numbers and locations (markets and organizations) based only on the centers of zip codes. The results are based solely on numbers of farmers' markets, not actual quantities sold at these markets, nor the actual amounts of unsold fruits and vegetables that would be donated. Data on actual quantities would further enhance the feasibility analysis. Also, actual locations (specific addresses for farmers' markets) were not used in the analysis. Therefore, the corresponding street and road infrastructure could not be included in the analysis. Lack of actual address data precluded us from further examining the routing and transport costs associated with pickup.

Future Research

The information presented in this analysis reflects a first step toward a definitive analysis of potential food recovery from farmers' markets. Further study should focus on case studies of potential and actual linkages. Case studies of the high-feasibility communities shown in this analysis would provide better information about quantities sold and potential donations from local farmers' markets. Organizations could also be surveyed to determine their use of fruits and vegetables in their programs. Individual organizations interested in starting or increasing food donations from farmers' markets could also conduct their own local feasibility studies. Phone numbers and addresses contained in this publication provide enough information in high-feasibility areas to initiate a feasibility study in these local communities.