DEMOGRAPHIC EFFECTS OF NATURAL DISASTERS: A CASE STUDY OF HURRICANE ANDREW

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Many studies have considered the economic, social, and psychological effects of hurricanes, earthquakes, floods, tornadoes, and other natural disasters, but few have considered their demographic effects. In this paper we describe and evaluate a method for measuring the effects of Hurricane Andrew on the housing stock and population distribution in Dade County, Florida. Using information collected through sample surveys and from other data sources, we investigate the extent of housing damages, the number of people forced out of their homes, where they went, how long they stayed, and whether they returned to their prehurricane residences. We conclude that more than half the housing units in Dade County were damaged by Hurricane Andrew, that more than 353,000 people were forced to leave their homes, at least temporarily, and that almost 40,000 people left the county permanently as a direct result of the hurricane. We believe that this study will provide methodological guidance to analysts studying the demographic effects of other large-scale natural disasters

Hurricanes, earthquakes, floods, tornadoes, and other natural disasters strike with alarming frequency, often leaving death and destruction in their wake. These events have profound social, economic, and psychological effects on the stricken individuals and communities. Although there is little evidence that the frequency of natural disasters has increased in recent years, their social and economic impact has increased because of population growth and economic development in particularly hazardous areas (e.g., Drabek 1986; Friedman 1984; Haas, Kates, and Bowden 1977; Shah 1983).[1]

There is a substantial social science literature on natural disasters, covering topics as diverse as the effects of disasters on income, employment, tax revenue, and other economic variables (e.g., Chang 1983; Ellson, Milliman, and Roberts 1984; Gillespie 1991, Kimball and Bolton 1994; West and Lenze 1994); institutional and organizational responses to disasters (e.g , Oliver-Smith 1993; Stallings 1987); recovery and restoration following disasters (e.g., Bates and Peacock 1987; Haas et al. 1977), mental, emotional, and behavioral responses to disasters (e.g., Church 1974; Perry and Lindell 1978); and the effects of disasters on crime rates, divorce rates, and other social variables (e.g., Friesema et al 1979; Geipel 1989).

Very few studies, however, have considered the demographic effects of natural disasters, mainly because of the scarcity of timely, accurate, and comprehensive data Data on damages from natural disasters are often little more than "a congeries of rumors, clippings from old newspaper stories, and guesses, more or less educated" (Wright and Rossi 1981:156). Estimates of changes in population size and of the underlying mortality, fertility, and migration rates are also incomplete and unreliable (e g., Adugna 1989, Clarke 1989; Friesema et al. 1979). The literature offers very little guidance for answering even the most basic demographic questions, such as how to measure the extent of housing damages, the number of persons forced out of their homes, where they went, how long they stayed, and whether they returned to their predisaster residences.

In this study we develop a method for answering these questions, and test that method using Hurricane Andrew and its demographic impact on the population of Dade County, Florida as a case study. In the following section we briefly describe Hurricane Andrew and the prehurricane population of Dade County. Next we discuss the strengths and weaknesses of potential sources of data for estimating housing damages and population redistribution following a natural disaster. Then we describe a sample survey designed to collect data not found elsewhere, and analyze the survey results. Finally we offer several conclusions regarding the applicability of this method in other circumstances. The frequency and magnitude of recent earthquakes, hurricanes, and floods in the United States illustrate the importance of finding ways to measure the demographic consequences of natural disasters and developing appropriate plans and policies for dealing with those consequences.

HURRICANE ANDREW

With winds gusting up to 175 miles per hour, Hurricane Andrew ripped through the southern tip of Florida on August 24, 1992. Before crossing the state and exiting into the Gulf of Mexico, the storm took at least 15 lives, destroyed or dam-

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1. We define natural disasters as sudden meteorological or geophysical events that produce high levels of damage and destruction (e.g., hurricanes, earthquakes, and tornadoes). We do not include long-lasting natural events (e.g., droughts) or the effects of human activities (e.g , chemical spills), although the methods described here may be applicable in those circumstances as well