THE GREAT ALASKA EARTHQUAKE AND THE DAWN OF U.S. SOCIAL SCIENCE EARTHQUAKE RESEARCH

William A. Anderson¹

ABSTRACT

Earthquake research came considerably later to U.S. social science than to engineering and earth science. It took the 1964 Alaska earthquake to draw the attention of U.S. social scientists to earthquake research, even though systematic studies of other extreme events such as floods, hurricanes, and tornados had been conducted by them starting in the 1940s and 1950s. This changed significantly after the Alaska earthquake struck the 49th state. Part of the explanation for this was the conjunction of the earthquake and the creation of the Disaster Research Center at the Ohio State University in 1963, just ahead of the Alaska earthquake, becoming the first social science research center in the world engaged in disaster studies. The social science research output, along with the even more extensive earth science and earthquake engineering research, made the Alaska earthquake the most documented U.S. earthquake in history. Like the research in the other disciplines, the social science research conducted after the Alaska earthquake had important consequences. It extended the body of knowledge in the field. It also helped set the stage for important policy and programmatic changes in the earthquake community, including the creation of the National Earthquake Hazards Reduction Program and increased multidisciplinary disaster research and international collaboration.

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Introduction

The March 27, 1964 Alaska earthquake caused loss of life, injury and disruption to many communities in the state, from its biggest city, Anchorage, to many of its smaller communities and villages. The tsunami it generated also resulted in loss of life in Crescent City, California.

At the time of the Alaska earthquake, active communities of earthquake specialists existed in the disciplines of earth science and engineering in the United States. This was not the case in the social science field which had little or no history of earthquake research even though other types of hazards and disasters had been investigated by social scientists starting some years earlier [1]. The social science of hazards and disasters had yet to emerge in the U.S. when the 1906 San Francisco earthquake occurred.

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Francisco and 1933 Long Beach earthquakes occurred and furthered advances in earthquake science and earthquake engineering in the U.S.

The first social science disaster study in North America was carried out after the devastating Halifax, Nova Scotia ship explosion in 1917 by Samuel Prince, a Canadian doctoral student at Columbia University [2]. However, it is generally acknowledged that the field of social science disaster research did not essentially emerge until the 1940s and 1950s when disaster and hazard research programs were established at such institutions as the University of Chicago, University of Maryland, University of Oklahoma, and the National Academy of Sciences. Social scientists in these programs systematically studied the social and human dimensions of such extreme events as floods, hurricanes, and tornados, in part because they occurred with greater frequency than earthquakes. Pioneering social scientists from the University of Chicago such as geographer Gilbert White and sociologist Charles Fritz played leading roles in these important early efforts and throughout their long careers [3].

The Alaska earthquake, then, was the first earthquake to significantly grab the attention of social science researchers in the U.S. It could be argued that this was as important for the future of social science disaster research as the 1906 San Francisco and 1933 Long Beach earthquakes were for the development of earthquake science and earthquake engineering in the U.S. While the Alaska earthquake provided the context for the advancement of social science disaster research in the U.S., it was the Disaster Research Center (DRC), established just months before that event, which served as a catalyst for putting earthquakes on the agenda of the social science disaster research community. This development was to have implications beyond the social science disaster research community.

**Disaster Research Center and Alaska Earthquake Conjunction**

It is intriguing that DRC and the Alaska earthquake have nearly overlapping anniversaries. DRC was established at Ohio State University in 1963, just several months ahead of the Alaska earthquake, where it remained until it moved to its present location at the University of Delaware in 1985. It was founded by three upcoming young sociologists, Russell Dynes, Gene Haas, and Henry Quarantelli, who became co-directors, and was the first social science research center in the world engaged in research on the human dimensions of disasters. With a mission of studying group, organizational, and community responses to disasters, its signature approach from the very beginning involved quick-response field work by teams of researchers during the emergency period of disasters. The co-directors quickly recruited and trained a field team which included several graduate students.

By the time of the Alaska earthquake, the field team had already studied several extreme events, including floods, a fire, a dam break and an explosion. Thus when DRC learned of the
earthquake it quickly dispatched its team to the state, which arrived on one of the first commercial flights into Anchorage after the event, to study the organizational and community responses to the crisis. For nearly two years, from the emergency period to the recovery phase, a team comprised of nine members, including the co-directors and graduate students such as me, collected information on the event, including nearly 500 tape recorded interviews as well as many organizational records and reports in every impacted community in south central Alaska, a total of 7 cities and towns and 6 native villages in all. The dawn of social science earthquake research in the U.S. had arrived.

The Alaska earthquake became the most documented U.S. earthquake in history, with the amount of work carried out by earth scientists and earthquake engineers significantly exceeding the social science research. Nevertheless, the social science research was of great importance too. The DRC conducted the major portion of the empirical social science research on the earthquake, but other researchers from outside the state, such as economist Howard Kunreuther, as well as such Alaska-based social scientists as anthropologist Nancy Davis, urban planner Lidia Selkregg, and economist George Rogers, also made important contributions, including documenting the economic impacts of the earthquake, reconstruction issues, and the role of the church.

In order to learn from the Alaska earthquake and to further its documentation, the White House asked the National Academy of Sciences to establish the Committee on the Alaska Earthquake for that purpose [4]. The committee was created soon after the earthquake and included earth science, engineering, and social science experts. Key aspects of the committee’s charge was to help plan and encourage research on the earthquake and publish major results at the completion of the investigations. Two of the committee members were sociologist Gene Haas, a co-founder of DRC, and Clark University geographer Robert Kates, a protégé of Gilbert White. First Kates and then Haas chaired the committee’s Panel on Geography, which focused on the social, economic, and behavioral dimensions of the earthquake. Serving on the committee and panel together led to later collaboration by the two scholars on pioneering community reconstruction research.

The National Academy of Sciences published an eight volume report on the Alaska earthquake through the Committee on the Alaska Earthquake on the topics of geology, seismology and geodesy, hydrology, biology, oceanography and coastal engineering, engineering, human ecology, and a summary and recommendations volume. The volume *The Great Alaska Earthquake of 1964: Human Ecology* [5] focused on the social science contributions to understanding the impacts of the event and was edited by Kates and Haas on behalf of the Panel on Geography. In addition to publishing the results of some of its work on the earthquake in this report, DRC also published its findings in journals, books, and in its own report and monograph series.
A Watershed Event for the Social Sciences

The Alaska earthquake ushered in an important period for the nascent community of social science disaster researchers. It provided a crucial opportunity for the community to apply in the study of earthquake phenomena concepts and themes that were initially developed in the investigation of other types of disasters and hazards by such pioneers as White and Fritz and to determine their relevance and utility in the earthquake context. It also provided the opportunity to influence both the intellectual and institutional pathways the field would take in the future.

Grounding the Research in Extant Themes and Concepts

At the time of the Alaska earthquake, social science research on extreme events was largely carried out by sociologists and geographers who tended to follow two distinct approaches. Sociologists primarily adhered to the disaster research tradition with its focus on human response during the emergency period of disaster, while geographers followed the hazards research perspective, which historically focused on hazard vulnerability and hazard mitigation [6]. Such domain distinctions would erode in the years ahead as researchers from across the social science disciplines began to collaborate and exchange perspectives. It is not surprising then that at this early stage in the development of the field that major attention was devoted to the emergency period of the Alaska earthquake given the leadership of DRC in the social science research effort on the event. In addition to analyzing the human response to the earthquake in cities, towns, and villages in Alaska, research was also carried out on the response to the tsunami threats generated by the earthquake in Crescent City, California and Hilo, Hawaii, which resulted in loss of life and property damage in the former, but no loss of life and minor damage in the latter.

As reflected in the National Academy of Sciences’ report, DRC’s analysis of human behavior in these locales focused on similar processes in the emergency period that guided many past social science studies of other types of disasters, including disaster warning and emergency communication, emergency coordination, and evacuation. The research suggested that in broad terms the earthquake and resulting tsunami posed similar problems for communities as other types of disasters with regards to these processes, at least in the U.S. A geographic hazard perspective was offered by Kates, including the observation that the range of human adjustments possible for dealing with earthquake vulnerabilities included effective land use planning, site selection for buildings and infrastructure, structural measures, and loss sharing. These were seen as the types of solutions also available to communities endangered by other forms of natural hazards.

Forging New Intellectual Pathways
One of the reasons that the work carried out by researchers on the Alaska earthquake was notable was that it was one of the first times that a team of social scientists focused on the impacts of a single disaster on numerous specific communities and a state as a whole. This required inputs from several social science disciplines. Though outnumbered by the team of sociologists from DRC, as noted previously social scientists from the disciplines of economics, anthropology, and urban planning also contributed important insights on the human dimensions of the earthquake. This anticipated an important future development in the field, the increased involvement of social scientists from disciplines other than sociology and geography. This became a trend especially after the creation of the National Earthquake Hazards Reduction Program in 1977.

A study of the human responses in Crescent City, California and Hilo, Hawaii to the tsunami generated by the Alaska earthquake, including warning and evacuation actions, was also a forerunner. No previous studies of tsunami-threatened communities appear to have been undertaken by U.S. social scientists. This work anticipated future studies that U.S. social science investigators would conduct on such international events as the 2004 Indian Ocean tsunami which struck communities in over a dozen countries [7].

The Alaska earthquake experience was also a precursor in another way. Post-earthquake community reconstruction issues received some attention from social scientists investigating the event, particularly in connection with the city of Anchorage. However, it was to remain an understudied topic for years to come. Among the key observations made by Kates and Haas in the National Academy of Sciences’ report on the earthquake was that “…..research is needed to determine the most common problems that prevent the optimal readjustment and reconstruction of a community following a full-scale disaster” [8]. With this still in mind some years later, Kates and Haas teamed up again and brought in other colleagues on a new project that focused on reconstruction and recovery following disaster. Using Anchorage as one of four case studies in this NSF-funded project, the team collected additional data on reconstruction and recovery in the city after the 1964 event. The 1906 San Francisco earthquake, the 1972 Rapid City, South Dakota flood, and the 1972 Managua, Nicaragua earthquake were the other cases included in the study [9].

In recent years more studies on recovery have been completed on earthquakes and other disasters in the U.S. and elsewhere, emphasizing its social, economic, institutional and physical dimensions, with attempts also at constructing models and theories of recovery and reconstruction [10]. The newer studies owe an intellectual debt to the groundbreaking work of Kates, Haas and Bowden, which at a minimum provided hypotheses for testing and a theoretical model to challenge. Recent research breaks new ground by showing how recovery is much more complicated than a linear model can explain, whether the reconstruction takes place in the U.S., China, or Japan, and offers innovative ways to study the recovery process. Recovery is now less
of an understudied area than it once was, even though many fundamental questions still need to be addressed.

An important conceptual breakthrough was another outcome of the Alaska earthquake that is worth mentioning. The DRC team was struck by the rich variety of groups and organizations that participated in the emergency response to the earthquake, both with regards to their structure, the nature of the tasks they undertook, and the reasons for doing so. What particularly caught team members’ attention following the Alaska earthquake was the emergence of new and self-organizing groups, informal entities that did not exist before the event but developed to handle needs, such as search and rescue and emergency first aid and transport, perceived as not being met by existing formal groups and organizations. Such observations growing out of the Alaska earthquake and later DRC research experiences eventually resulted in the now widely known and useful DRC typology of disaster-activated groups and organizations: established, expanding, extending, and emergent groups and organizations, distinguished by their structural and functional properties [11]. This typology has helped guide research and explain complicated group and organizational behavior following various types of disasters in the U.S. and abroad. For example, it underscores that what is sometimes taken as undisciplined and chaotic behavior following disasters is in reality the emergence of new and previously unseen groups that have a vital role to play in disaster response and therefore in many cases should be integrated into the actions of more recognized groups and organizations rather than discouraged. The study of emergent and innovative group actions, especially during the emergency period of disaster, is now a cornerstone of disaster research [12].

Finally, with its Alaska earthquake research, DRC began its own long-term campaign to debunk popular myths about human behavior in disaster, separating fact from fiction, an effort that Quarantelli had initially begun while in graduate school [13]. Such myths greatly exaggerate the extent to which such antisocial behavior as panic and looting occur in disasters, see a society gone amuck during such crises, and can seriously interfere with needed fact-based emergency preparedness planning. The need to document and correct such myths when they are encountered is now one of the basic tenets of social science disaster research because they are so persistent and potentially harmful to effective disaster planning, preparedness and response.

**New Connections, Role, and Institutions**

The Alaska earthquake and the 1964 Niigata and 1971 San Fernando earthquakes that soon followed, with political scientist Robert Olson being one of the key investigators of the latter [14], helped expand the involvement and role of U.S. social scientists in the disaster field. These early investigations increased their visibility among other important actors in the field, including researchers from other disciplines and policy makers.
The June 16, 1964 Niigata earthquake occurred on the heels of the Alaska earthquake. Flush from their experience studying the Alaska earthquake with other DRC team members, the three co-directors traveled to Japan to investigate this latest event, focusing, as in the case of the Alaska earthquake, on group and organizational responses during the emergency period of the disaster. This study enabled them to learn how Japan, a country with a long history of facing damaging earthquakes, responds to such events in comparison with the U.S. Additionally, the work in Japan set the stage for DRC establishing important relationships with Japanese social scientists which later resulted in the center hosting a major NSF-funded U.S.-Japan disaster conference at Ohio State University and cooperative disaster research between U.S. and Japanese counterparts. This helped start a trend of U.S. social scientists assuming a leading role in international cooperative efforts in the field. An example of this was DRC’s leadership in launching the International Sociological Association’s Research Committee on Disasters, which publishes the *International Journal of Mass Emergencies and Disasters* and organizes international meetings and other activities.

An important opportunity that emerged for Alaska earthquake research veterans and other social scientists in the early 1970s was Charles Thiel’s rise as a major champion of multidisciplinary earthquake research, inclusive of the social sciences, in NSF’s Research Applied to National Needs program (RANN). Thiel was familiar with the work of such Alaska earthquake research veterans as Kates, Haas, Dynes and Quarantelli who received research support from RANN. As a rising star in the science policy community in Washington, DC at the time, Thiel played a leading role in the creation of the multiagency National Earthquake Hazards Reduction Program (NEHRP) when director of the engineering division that would eventually house the engineering and social science components of NEHRP when it was established in 1977. And Thiel and Robert Hamilton, his counterpart at the U.S. Geological Survey (USGS), made sure that there were social scientists involved in planning efforts leading up to the implementation of NEHRP [15]. This was crucial because it enabled social scientists to provide input to this national program which has helped shape earthquake research and policy in the U.S. for almost 40 years.

Thiel went even further in his efforts to provide a place for the social sciences in the mix of disciplines that would contribute to NEHRP when he informed such veterans of Alaska earthquake research as Dynes and Quarantelli that he was interested in developing a new program in his division at NSF to fund social science research on earthquakes and would like suggestions of possible candidates to lead it. Thiel saw social science research as necessary for providing a basis for understanding human decision making and actions related to hazard reduction, emergency preparedness, and disaster response and recovery. The program was established in 1976 and I was selected as its first director, in part because of my earlier involvement in Alaska earthquake research.
This was a critical turning point for the social sciences, which probably would not have occurred had it not been for the Alaska and San Fernando earthquakes reminding policy makers of the earthquake threat in the U.S. Though it has always received less funding than most other elements in the multiagency NEHRP activity comprised of the National Institute of Standards and Technology, NSF, USGS, and the Federal Emergency Management Agency, the NSF program, which is now called Infrastructure Management and Extreme Events and directed by sociologist Dennis Wenger, has for nearly 40 years been the principal supporter of social science research on earthquakes and other hazards and training for the next generation of researchers. The program also made it possible for leading social scientists to work in close collaboration with engineering colleagues in such notable NSF-funded research programs as the earthquake engineering research centers.

Conclusions

In many respects the Alaska earthquake provided a glimpse into the future of social science disaster research when much progress would be made even with its many challenges, a principal one being garnering needed research funding. What was once unique then seems routine now. For example, whereas DRC, currently directed by geographer James Kendra, was the only social science-focused disaster research center at the time of the Alaska earthquake, several now exist, including the Natural Hazards Center at the University of Colorado, directed by sociologist and former DRC director Kathleen Tierney; the Hazard Reduction and Recovery Center at Texas A&M University, directed by sociologist Walter Peacock; and the Hazard and Vulnerability Research Institute at the University of South Carolina directed by geographer Susan Cutter. Also, even though the Alaska earthquake experience offered hints of important developments to come, still no one could have anticipated how common studies of earthquakes and other disasters by social scientists would become. This was furthered by the development of NEHRP and other advances in the research infrastructure, by the ties forged with international colleagues, and by the frequency and scale of earthquakes and other disasters that impacted the U.S. and other vulnerable societies after the Alaska earthquake which social scientists, like other researchers, have been drawn to investigate. To mention only some, such events in the U.S. have included the 1989 Loma Prieta and 1994 Northridge earthquakes, the 2001 terrorist attacks, and Hurricane Katrina in 2005 and Hurricane Sandy in 2012; and abroad they have included the 1995 Kobe, Japan earthquake, the 1999 Chi-Chi earthquake in Taiwan, the 2004 Indian Ocean tsunami in multiple countries, the 2009 Sichuan, China earthquake, the 2010 Haiti earthquake, and the 2011 Tohoku, Japan earthquake and tsunami.

Clearly the important role of the social sciences in earthquake and disaster research more broadly is more fully recognized than it was at the time of the Alaska earthquake. One reflection of this is that cross disciplinary ties between social scientists and engineers in particular are more common. For example, engineer Sue McNeil has served as director of DRC, and other
engineering researchers at the University of Delaware are now associated with the once exclusively social science enterprise. Also, former DRC director and current core faculty member Joanne Nigg became the first social scientist elected president of the Earthquake Engineering Research Institute. And Kathleen Tierney currently serves on the Institute’s board of directors, which is now not unusual for a social scientist with her outstanding accomplishments.

Even though these and other developments that have taken place since the Alaska earthquake a half century ago could not have been predicted, that experience nevertheless helped set the course for them, along with other factors, enabling the social science community in the U.S. to become a world leader in the field. Thus the present status of social science disaster research is linked to its Alaska past.

References


Today, the great Alaska earthquake was the biggest earthquake to ever hit North America. John Mooallem, author of the book *This Is Chance!* on the story of that disaster and the voice that held the state together. It’s Friday, May 22. John mooallem. Sunday, February 23, 1964, a month before the earthquake. Just before 1:00 PM. And I knew we had no power by the fact that the traffic lights went out. But I knew that our very ingenious engineers would have us on the air very shortly. And not realize.