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EL NIÑO AND PERCEPTIONS OF THE SOUTHERN CALIFORNIA FLOODS AND MUDSLIDES OF 1998

Christine M. Rodrigue and Eugenie Rovai
Center for Hazards Research
California State University
Chico, CA 95929-0425
Adam Henderson, James Hotchkiss, and Stacy Potter
Department of Geography and Planning
California State University
Chico, CA 95929-0425
Corresponding author: Chrys Rodrigue
E-mail: crodrigue@oavax.csuchico.edu

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ABSTRACT

In early March, 1998, the Center for Hazards Research at California State University, Chico, activated a Quick Response grant. This enabled it to send a five-person field team to the Los Angeles area to investigate the effects of El Niño-attributed storms there in late February and to interview FEMA and Cal OES personnel. In Los Angeles and in Chico, telephone surveys were conducted to elicit residents' mental maps of the most damaged areas. A literature content analysis was later conducted of front-page storm coverage in the *Los Angeles Times*.

The surveys revealed a very heavy concentration of perceived damage in the upscale Malibu and Laguna Beach communities, a concentration quite out of line with *Times* coverage. *Times* coverage was broader spatially, both within the region and throughout the State. Most respondents felt that this rough winter was part of the "normal" extremity of the local weather patterns and cycles, rather than a one-event oddity or part of a trend to worsening climate conditions. When queried about their mitigation behaviors, the great majority of

respondents stated they did maintain an emergency kit. The majority of homeowners, however, did not maintain flood insurance protection. The field study could not resolve whether there were systematic social biases in respondents' mental maps nor whether any such biases derived from media representation.

INTRODUCTION

Media are powerful agents in the social construction of hazards both natural and technological, and their role seems little appreciated in the literature on hazards and risks. Media affect public opinion through "agenda setting," that is, directing public attention to particular issues that their broadcasts or publications make salient. Salience is governed more by the frequency and duration of coverage, rather than the actual content and quality of coverage, since the majority of the time-starved public skim or "channel surf" more than pore over any one story. This fragmentary consciousness makes difficult the conveyance of complicated concepts and debates. The result is a tendency in public perception for technical uncertainties to become polarized into certainty or denial, which can lead to inappropriate behavior in the case of hazardous situations.

An entire body of literature has emerged, which critically examines the factors filtering newsworthy items from the chaos of everyday events (Herman and Chomsky 1988; Bagdikian 1997;and Lee and Solomon 1990; Smith, 1992; Steinem 1990). These filters include the intense capital concentration in the media and its attendant pressure for media subsidiaries to contribute their share to the parent corporations' profitability. This pressure can enhance the media tendency to sensational coverage in efforts to increase circulation. Sensationalism, unfortunately, distorts public perceptions of a given hazard event or risk. Another filter is media dependence on advertising revenue. This dependence encourages coverage of interest to the prosperous target markets of the advertisers. In a hazard event, this bias could lead to an

under-representation of its impacts on the poorer or otherwise more marginalized social groups and geographical areas, with unfortunate effects on disaster response, recovery, and reconstruction. This effect turned up in our earlier work on the Northridge earthquake of 1994 (Rodrigue and Rovai 1995; Rodrigue, Rovai, and Place 1997).

EL NIÑO-ATTRIBUTED FLOODING IN CALIFORNIA

The purpose of the Quick Response grant proposal submitted by the Center for Hazards Research at California State University, Chico, was to evaluate the impact of media coverage of El Niño on residents' perceptions of storm damages and on emergency response agencies in the event of a bad winter in California. Media coverage for much of the half year before we submitted the proposal had been filled with sensational stories about El Niño, its impacts back in 1982-83, predictions that it would hit California even harder this time, and detailing preparation efforts on the part of FEMA, Cal OES, and various other emergency management agencies and organizations. The predicted winter seemed not to arrive as expected in October, November, and December of 1997, however, to the point that El Niño jokes quickly became a staple on comedy talk shows. The humor quickly evaporated as the rains came with a vengeance in January, soaking the State thoroughly in January and February and continuing to generate unusual precipitation levels and mugginess to the present (June 1998).

The Center assembled a team of faculty and graduate students interested in the field study and began monitoring media reportage throughout much of the State, in order to choose an area of interest to the field team. Team members finally decided to visit coastal Southern California in the wake of particularly intense storms, floods, and mudslides there in late February, which dropped around 14 inches of rain, about what the area receives on average for a year (McCurdy 1998a, 1998b). The team, finally comprised of Chrys Rodrigue and Eugenie Rovai and three

graduate students, Adam Henderson, James Hotchkiss, and Stacy Potter, drove down and worked together from 5 March through 7 March 1998, continuing to collect and process data in Chico throughout the spring.

DATA AND METHODS

Among the goals of the actual field visit were to tour Southern California to view storm damage, to speak with FEMA and Cal OES personnel about particularly hard-hit areas and their own institutions' interactions with the media, and to survey residents of the area about their perceptions of the storms and their connections with El Niño. These perceptions would later be compared with the pattern of print media coverage of the disastrous winter storms.

The Field Tour

The spatially variable nature of storm damage quickly became apparent as the team toured the more urbanized area: There was none easily seen in the San Fernando Valley, San Gabriel Valley, and Los Angeles Basin. The floods were an occasional minor commuting inconvenience for people living in what Rayner Banham (1990) termed the "Plains of Id," the ocean of mostly flat suburbia comprising the bulk of the Greater Los Angeles Area. As one resident put it in a conversation: "It was no big deal -- the media made such a thing out of some water on a couple lanes of the Ventura Freeway" (Swan 1998).

We next turned our attention to Banham's "Surfurbia" and "Foothills" "ecologies." Driving through the Santa Monica Mountains, we would occasionally spot small scale mass wasting. The hazards to humans residing near them was expressed here and there by the sight of tarpaulins and plastic sheeting on hillsides near homes. Once in the beach areas of Oxnard and Ventura, James Hotchkiss, a reservist with the Coast Guard, suggested we stop in at the Coast Guard station at Channel Islands Harbor to ask about particularly hard-hit areas. The staff there directed us farther west, deeper into Ventura County, suggesting

the Mandalay Beach developments near the mouth of the Santa Clarita River and the small, rather countercultural beach community of La Conchita.

On the Mandalay beachfront, we walked a beach that was filled in many places to a couple feet in depth with uprooted bamboo, riparian trees, and parts of a pier. Many of the beachfront homes had been pummelled by this debris and the high seas brought by the February storms, and beach sand covered many of the residential streets.

We proceeded on to La Conchita, a small community on the west end of the "banana belt" of California, a narrow microclimate affording the only opportunity to grow bananas commercially in California. All of the homes (perhaps a few dozen in all) were tagged with warnings that the area is subject to further mudslide activity with no warning. It seems the signs were posted two years ago, when a huge slide buried one home, crushed another, and bent another into a fourth home, with loss of life. Three of the homes are still standing after a fashion, red-tagged, and the community was warned that another movement could occur at any time in this series of El Niño powered storms. The rest of the homes were still actively occupied, despite the looming, unstable slope hanging above them.

Returning back to the City of Los Angeles, this time by Pacific Coast Highway, our way was blocked by signs that yet another slope had blocked the highway east of Malibu Canyon. We returned to our San Fernando Valley base of operations via Malibu Canyon.

Visit to FEMA and Cal OES Field Office in Pasadena

Another day, three of us (Rodrigue, Hotchkiss, and Potter) arranged through James Hotchkiss' personal contacts to tour the FEMA and Cal OES Pasadena field office. The graduate students were astounded at the almost military security measures necessary to enter the office and at the diffidence expressed by the personnel in the office about releasing information that would have been useful to our field survey.

We were particularly interested in the location of the worst slide and flood damage areas, in order to compare them with residents' mental

maps and media coverage patterns. We were shown (but could not have a copy of) a map of Southern California. Hot spots on the map, based on calls to 911 and other police and fire department numbers, included the Ventura County coastline, the L.A. County coastline west of Santa Monica, and coastal areas of southern Orange County, with smaller clusters in other montane areas within and surrounding the conurbation. We expressed our interest in media representation of the damage patterns, and the FEMA people showed us yet another map we could not have a copy of. This one identified places mentioned in media reports. This map brought about a discussion of how media affect FEMA and Cal OES. Both agencies maintained small staffs devoted full time to monitoring media reportage on all aspects of the storms (including stories on the agencies' performance in the disaster). Each day, these staffs compose brief reports on the dominant themes in each related article and then forward the reports to Washington and Sacramento, where the agencies use them to identify areas of particular damage for further investigation. This tour confirmed Rodrigue and Rovai in their concern that emergency response agencies do depend significantly on the media for identifying areas hit hard in a disaster. This dependence may be problematic in light of their earlier finding that media exhibit systematic biases against lower income and minority areas for a variety of reasons (Rodrigue and Rovai 1995).

The Telephone Surveys

Returning to Chrys Rodrigue's second home in Reseda, the field team set about to conduct telephone surveys of Los Angelenos. The survey inquired whether respondents were surprised at the flooding this winter or had been expecting it. It asked for the three areas respondents perceived as being hardest-hit by the storms and which news sources respondents relied on to learn about the storms and the damages they created. We asked further whether they perceived this extreme winter as an isolated event, part of a recurring cycle, or part of a global trend towards harsher winters. Additionally, we asked if the respondents were homeowners, and, if so, whether they had flood insurance. If they had

this form of insurance, we asked for how long and what had made them decide to buy it. If they did not have flood insurance, we asked why they decided not to get it. Lastly, we solicited information about one small non-structural mitigation, i.e., whether the respondents' households maintained some sort of emergency kit.

In a mistaken bid to save time in the field, Chrys Rodrigue had developed a random sample of telephone numbers by identifying the local exchanges and appending four randomly chosen digits after each. Los Angeles is remarkable for the number of modems, pagers, and cell phones, as well as the number of other non-residential phones (at least in the prosperous 310 area code to which these calls were first made). After a few days of great frustration, we had to return to Chico. Later, we decided to continue the telephone work back up in Chico. The Chico State library had recent copies of residential telephone directories for the 818 and 714 area codes, respectively, the middle-class ethnically mixed San Fernando Valley and the higher income and largely white Orange County. A proportionally stratified random sample of numbers were taken from these area code directories, and the graduate students made the calls over a week's time in late April and early May, yielding 54 completed surveys. The seven completed surveys from the earlier March calling round, all in the 310 (very prosperous Westside area) are included in this count.

The resulting sample, then, is not statistically representative of the Greater Los Angeles Area. It does, however, include numbers randomly drawn from two of the spatially most extensive area codes in the urban area, with a handful drawn from the prosperous West Side 310 area code. These area codes, however, underrepresent the poorer and most minority-dominated areas of the Greater Los Angeles area. This shortcoming could not be remedied without a second trip to the area, a remedy that would have taken the study far out of its approved budget. Our quick and dirty findings must be read with this caveat in mind, mainly for their heuristic value.

To compare the residents' mental maps of the damages with media, Chrys Rodrigue performed a literature content analysis of all storm-related stories originating on the front pages of the dominant English-

language paper in the region: the *Los Angeles Times*. The issues examined were those in February, 1998, and the first week of March, 1998. This was, then, the five weeks just preceding the arrival of the field team and including the particular storms that motivated the choice of the Los Angeles area for activating the Quick Response study. This analysis consists of place name counts in the articles to generate the pattern of media emphasis.

FINDINGS

In this section, findings for the survey will be presented first. The spatial pattern of media emphasis follows the survey results.

Survey Results

In this section, the survey findings will be broken out by mental maps. These will be presented at the level of specific municipalities, counties, and major intrastate regions mentioned. Following the mental map results, findings about respondents' expectations of a bad winter will be presented. Self- identified sources of information and their mitigation behaviors will be presented afterwards.

Respondents' Mental Maps. -- Far and away the most commonly cited hard-hit communities were Malibu ,a very upscale beach (per capita income $47,320) community in western Los Angeles County and Laguna Beach, another affluent beach town in southern Orange County, southeast of Los Angeles (per capita income $30,646) (U.S. Census 1990). Of the 77 place name mentions in the survey, 21 of the 54 respondents mentioned Malibu and twenty mentioned Laguna Beach. Twenty-six place names were mentioned in the 77, varying from specific municipalities through counties to major regional subdivisions of California (e.g., Northern California, the Southland). Of the other 24 places named, none drew more than six references. Malibu and Laguna Beach, then, were commanding in their salience in residents' mental maps of the storms of 1998.

Grouping the responses by county (for easier comparison with the media geography), unsurprisingly, Orange County and Los Angeles County dominate the mental maps, with 29 and 27 references, respectively (Table 1). There is awareness of storm impacts in other areas, in that seven other counties are mentioned: Ventura County (six mentions), Santa Barbara County (six), Riverside County (three), San Diego County (three), and one mention each of San Luis Obispo, Santa Cruz, and San Francisco counties. Grouping further, nearly all the respondents' mental maps focused on their own region (Table 2): Southern California, with 74 mentions out of the 77 places cited (96 percent).

Respondents' Expectations of a Bad Winter. -- In light of media attention to the unusually large El Niño developing in 1997, the survey elicited respondents' expectations of a particularly bad winter (Table 3). Of the 54, 35 (65 percent) said they expected the winter to be this bad and were not surprised when the full vehemence of the storm season hit. Another 15 (28 percent) expressed some degree of surprise at the force of the winter. Some apparently did not believe what they termed the media "hype" of El Niño and so were completely taken by surprise; others said the media campaign led them to expect a bad winter but that the winter far exceeded their worst expectations. Only 4, or 7 percent, could not answer the question one way or the other. These findings must be tempered by the suspicion that some respondents, in light of the ferocity of this winter, may have chosen to report they knew it all along, even if they did not ahead of time.

There was much apprehension in the disaster management community in 1997 about the unprecedented media interest in El Niño. Since the relationship between El Niño and heavy precipitation in specific places in the American West is not statistically clear (Ingersoll 1997), there was concern about future disaster situations should the media predictions of an epic winter fall flat. In fact, there was evidence of growing public skepticism toward the El Niño media campaign by December of 1997, when Southern California was still enjoying a mild and pleasant winter. On the other hand, the media campaign was seen as useful in other professional quadrants in the sense that it could elicit mitigation behavior and receptiveness to hazard education in the crucial months

before the possible disaster. In hindsight, the media campaign clearly did heighten public expectation of usually bad weather and its attendant hazards. Two thirds of the respondents were expecting a bad winter and several of the people in the surprised third stated that they did expect a bad winter but just not one quite this bad.

Related to these expectations was information collected on respondents' understanding of the genesis of such bad winters (Table 4). Forty-one or 76 percent of the respondents characterized the winter flooding as a cyclical and recurring event. Only one person claimed it was just an isolated event, and one declined to answer. Ten respondents or 19 percent interpreted this winter as part of a global trend toward harsher winters. One respondent cited both the normalcy of extreme winters and the possibility of a trend toward more extreme winters. So, most people in the survey understand that extreme winters can be a normal part of the weather regime in Southern California, while a small minority connect this event with global change. The survey did not explore whether those who saw this winter as expressing a trend interpreted the trend in terms of scientific concerns about human-induced global warming or in terms of millenial religious or quasi-religious expectations.

Respondents' Sources of Information. -- Respondents identified from 1 through 4 sources of information, with a mean of 1.9 (Table 5). These were, in order of mention, local television (with 40 respondents mentioning it, or 74 percent), newspaper (24 mentions, or 44 percent), national television (18 mentions, or 33 percent), and radio (17 mentions, or 31 percent). In addition to these four sources provided on the survey, some people volunteered other sources: three people (6 percent) mentioned the Internet, and one soul had but one source of information and that was other people.

Among the 24 respondents mentioning newspapers, there were 26 paper identifications (two people identified two papers). The majority specified the *Los Angeles Times* (16), with the *Orange County Register* picking up 7 mentions and the *Daily News* in the San Fernando Valley garnering only 3 mentions. The dominance of the *Times* both in geographical coverage and in citation by respondents led Chrys Rodrigue to choose the paper for the literature content analysis.

Breaking out respondents' mental maps by the salience of Malibu and Laguna Beach in respondents' images of the disaster, it turns out that there are differences among the media of choice in respondents' tendency to emphasize these two communities (Table 6). Half of all paper readers (12 of 24) mentioned Malibu, Laguna, or both. Twenty-three of the 40 local television watchers or 58 percent cited one or both of these communities. Only 39 percent (7 of 19) of national television viewers mentioned one or both, while fully 82 percent (14 of 17) of radio listeners cited one or both places.

Respondents' Mitigation Behaviors. -- An ongoing theme in hazards literature is the effort to overcome residents' patterns of disaster denial and get them to mitigate some of their risk to disaster (e.g., Palm 1995). Data on self-reported mitigations are here provided by way of monitoring the success of these efforts.

The great majority of respondents claim to maintain some sort of emergency kit (Table 7). Thirty-eight of the 54, or 70 percent, said they did have an emergency kit, while only 16 or 30 percent admitted they did not. It is impossible to guess the veracity of these claims, as people often do not want to admit something that would make them feel a bit sheepish. One person qualified her claim to an emergency kit, saying it was just a bunch of Band-Aids and gauze. It is interesting even so that not having an emergency kit could induce fibbing or exaggeration. Whether 70 percent of the respondents actually have some sort of emergency kit or whether some of these would say they did out of embarrassment bespeaks a high awareness of this element of preparedness.

Of the 54 respondents, exactly half were homeowners and half were not Table 8). Of the 27 homeowners, only seven had flood insurance. All seven offered explanations for their decision to purchase flood insura nce. Three of these stated that flood insurance was a lender requirement, whether for a mortgage or a home-equity line of credit. The others cited various reasons for being cautious: having a cautious personality, living in a canyon area, concern about the storms, and "always had it."

FEMA notes three reasons often cited for not purchasing flood insurance (1998):

1 Disaster assistance will be available if my home (or business) is flooded. I don't need to buy flood insurance!
2 It's too expensive!
3 My home isn't going to be flooded--we've never been flooded before!

Sixteen of the twenty homeowners without flood insurance offered some explanation as to why they did not. Their responses most classically support the third reason enumerated by FEMA, and one respondent cites the second. None of them mentioned government assistance.

Above all was a belief that their particular place of residence was not at risk to flooding: this was cited by fourteen. Only one of these had looked into it and found out s/he was out of FEMA's AR zone. Six others fall into an almost amusingly contradictory pair of camps: three thought they lived up too high to be at risk (including one person in West Van Nuys, which is in a low-lying part of the San Fernando Valley); while another three thought they were too low to be at risk (the idea probably being that floods and mudslides are dangers peculiar to hillside communities). Yet another seven flatly denied they were at risk. Of the remaining two respondents, one simply stated they did not know why they did not have flood insurance, while another stated it was too expensive.

Chrys Rodrigue confesses a certain red-faced sympathy with the homeowners eschewing flood insurance, having passed on it for one of her two homes. Her own decision-making process was driven by cost, risk assessment at the two places, and personal experience. She is insuring two homes, one in Reseda in the San Fernando Valley and the other in Chico in the North State. When her earthquake premiums shot up 235 percent in 1997 following approval and implementation of the California Earthquake Authority in December, 1996, she found it difficult to manage both earthquake and flood insurance at both places, in addition to ordinary homeowners' policies. Trying to navigate between the Scylla of risk and the Charybdis of fiscal limitations, she looked into the risk of each hazard at both places, using various FEMA, USGS, and California Department of Conservation sites. She decided to drop earthquake coverage at the Chico home to subsidize the purchase of flood insurance, vividly remembering water coming up on her porches

there last year. In Reseda, she kept only the earthquake coverage, which was a priority after having experienced the Northridge earthquake and the benefits of earthquake coverage then. She decided to take a gamble on Chico's lower seismic rating and Reseda's lower flood rating (and her never experiencing the slightest flooding in the Reseda home during her 45 years there, even in the epic 1994-95 winter there). It is possible that those survey respondents who opted against insurance might have followed a similar line of argument.

Los Angeles Times Content Analysis Results

The floods and mudslides of winter 1998 never became as prominent in the *Times*' front page coverage as the earthquake of 1994, perhaps reflecting the much lower level of regional damage in this disaster. In the February issues of the *Times,* the storms and the damages they caused never commanded more than one front page article out of the seven to ten that the *Times* normally begins on the front page (and there were none the first week of March). In the first several weeks after the earthquake, there would often be several quake-related articles on the front page.

Of the 310 place name references in the *Times*' front page articles on these storms, 136 different places were mentioned. As with the survey respondents, the *Times*' references ranged from specific locales (232) through counties (25) and major regions in California (46) to the State as a whole (5) or places outside the State (27). Of the 232 mentions of specific communities in California, San Francisco garnered the most references (11) Camarillo picked up 8, Malibu received 7, and Laguna Beach had 6 (as did Los Angeles and Cazadero). At 3.0 and 2.6 percent each, references to Malibu and Laguna Beach are vastly below the references made by the survey respondents (27 and 26 percent of the survey place mentions, respectively).

The *Times* mentioned 23 counties or places that could be grouped within those counties, for a total of 232 citations (Table 1). The most commonly mentioned county was Los Angeles, at 77 citations or 33 percent. The second most commonly mentioned county was Ventura,

with 51 or 22 percent of the references. The third and fourth most frequently cited counties were Sonoma and Orange, with 18 (7.8 percent) and 17 references (7.3 percent), respectively. Grouping all local, county, and regional references (278) into Southern California and Northern/Central California, Southern California unsurprisingly dominated the *Times*' coverage, with 198 citations or 71 percent of the total. Northern and Central California captured 80 references, or 29 percent (Table 2).

DISCUSSION

In this section, the implications of the findings are drawn out and the results of the survey and of the *Times*' coverage analysis are related to one another. First, the mental maps of the respondents overwhelmingly emphasize Malibu and Laguna Beach to a level far beyond the *Times*' coverage. The disparity (and the fact that only 30 percent of respondents read that paper) is enough to dismiss the *Times* as the primary source of concern about these two communities. It is unfortunate that a review of local television and radio coverage is beyond the scope of this Quick Response study, as there appeared a suggestive tendency for radio listeners to cite one or both of the two places much more often than users of the other media.

Second, when comparing the two geographies at the county level, there is substantial overlap between respondents and the *Times* in the most frequently emphasized four counties. The top four counties in the *Times* coverage were, in order, Los Angeles, Ventura, Sonoma, and Orange. For respondents, the top four were Orange, Los Angeles, Ventura, and Santa Barbara.

Third, at the broad regional level, respondents had a more local emphasis, 96 percent of their citations being to places in Southern California (and 100 percent of their top four counties). The *Times* also emphasized local events, with 71 percent of the places mentioned being in Southern California (and 75 percent of the *Times*' top four counties),

but that leaves a substantial minority of references focused in Northern or Central California: 29 percent. The *Times* truly is a regional paper and maintains its own staff all over the world and throughout the State, so its sensitivity to the harshly hit Northern California communities is not surprising. Respondents, however, draw their information more widely than from a single newspaper, relying on local television and radio, as well as their own difficulties in a disaster. These other sources seem to impart a more localized flavor to their mental maps.

Fourth, the media's sensational emphasis on El Niño did certainly raise local expectations of a bad winter. Nearly two thirds of respondents expected a rough time and many of those caught by surprise stated that they did expect a bad winter but were just surprised at just how bad bad could be. In this sense, media attention served the public good by raising awareness of the possible consequences of El Niño, especially since the predictions happened to have been fulfilled this year and in this region.

Fifth, perhaps the atmosphere of heightened awareness did encourage at least some mitigation behavior. Seventy percent of respondents claim to maintain an emergency kit. Unfortunately, this tendency did not extend all the way to purchasing flood insurance. Validly or invalidly in particular cases, many homeowners perceive that the risk of flood damage to their homes was too little to bother with flood insurance or felt that they could not afford the premiums. The lesson to be drawn from this is the value of education efforts on those mitigations that are affordable in cost and time. People will make cheap mitigations, such as getting an emergency kit together, if they learn how to do so and how important it is to do so. FEMA, Cal OES, and the State Department of Conservation should, then, continue their efforts at educating the public on how specifically to prepare for locally relevant hazards and, better, provide enough information on risks by place that some people might be motivated to undertake more costly mitigations in higher risk areas. On-line publication of FIRMs could be a useful step, in the spirit of the seismic hazards maps put out by the Department of Conservation (Cal DC 1998).

CONCLUSIONS

The Quick Response study entailed a field visit to the Greater Los Angeles Area in the wake of the El Niño attributed storms of late February, 1998. During the field study, a tour of storm damages was conducted of the western San Fernando Valley, San Gabriel Valley, Conejo Valley, Oxnard Plain, several Ventura County beach communities, and the coastline of western Los Angeles County (until we were prevented from further progress by a slide blocking Pacific Coast Highway). We also visited the FEMA and Cal OES field office in Pasadena to discuss with its staff the extent of damages and their use of and impressions of media coverage.

Both in Los Angeles and back in Chico, 54 telephone surveys of residents in the 818, 714, and 310 area codes were completed. This unrepresentative sample turned up nearly an obsessive focus on Malibu and Laguna Beach in respondents' mental maps of the damages, a corresponding concentration on Los Angeles and Orange counties, and an overwhelming concern with the Southern California region, when the whole State was being hit hard by this battery of storms.

The source of this concentration on the two prosperous beach communities is unclear from our field and survey work and analysis of the *Los Angeles Times*. *Times* coverage was broader than residents' mental maps, giving about a quarter of its emphasis to Northern California and covering a much wider array of communities in Southern California. The *Times* coverage did emphasize the three coastal counties of the Los Angeles area and, at the county level, widely overlapped the local residents' perceptions. Some of the variations in respondents' mental maps do suggest that future work on the role of news radio might be especially helpful in understanding the mental maps of disaster on the part of residents in a conurbation large enough to support 24 hour news stations with extensive commuting information.

A field study of this nature cannot provide information on any systematic social bias in media or residents' mental maps. Does the emphasis on the upscale Malibu and Laguna Beach communities reflect

a bias toward the better-off or does it reflect the objective geography of slide and flood damage? As with chaparral fire hazard in the region and hurricane damage in Eastern and Southern amenity coasts, is this a situation in which the well-off select residential locations of extraordinary risk (and beauty) and expect to socialize their vulnerability to other strata via insurance and government mechanisms (Rodrigue 1993)?

The media hype could have created greater denial toward future disasters had the rains not come as predicted. Evidence of this kind of backlash was rampant in the spate of El Niño jokes making the rounds as late as December, 1997, and early January, 1998. The media hype may, nevertheless, in this instance, have provided an improved awareness of a hazardous situation and what to do about it. Most respondents stated that they did maintain emergency kits. This preparedness, however, did not extend all the way to widespread adoption of flood insurance in the area. Further research remains necessary on the factors causing people to eschew such financial mitigation, while adopting some other non-structural risk mitigations (such as emergency kits). It should be noted that lending institutions seem to exert a salutary influence on homeowners' decision-making processes in this regard.

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STF3Bfor Malibu Zip Code 90265 and Laguna Beach Zip Codes 92651, 92653, 92655, 92656, and 92657.

TABLES

Table 1: Places mentioned in the *Los Angeles Times* and by survey respondents, grouped by county

Places Grouped by County	L.A. *Times* # Mentn	L.A. *Times* % Mentn	survey # Mentn	survey % Mentn
Alameda	1	.4		
Calaveras	1	.4		
Lake	3	1.3		
Los Angeles	77	33.2		
			27	35.1
Marin	1	.4		
Merced	4	1.7		
Mono	1	.4		
Monterey	2	.9		
Orange	17	7.3		
			29	37.7
Riverside	1	.4		
			3	3.9
San Bernardino	16	6.9		
San Diego	6	2.6		
			3	3.9
San Francisco	11	4.7		
			1	1.3
San Joaquin County	3	1.3		
San Luis Obispo	1	.4		
			1	1.3
San Mateo	4	1.7		
Santa Barbara	8	3.4		
			6	7.8
Santa Clara	2	.9		
Santa Cruz	1	.4		
			1	1.3
Sonoma	18	7.8		
Tehama	2	.9		
Tulare	1	.4		
Ventura	51	22.0		
			6	7.8

	232	*99.8		
77	*100.1			

23 counties cited in *Times*
9 counties cited by respondents

*numbers do not add up to 100.0% because of rounding errors

C.M. Rodrigue, from content analysis by C.M. Rodrigue, and survey data
collected by Adam Henderson, James Hotchkiss, and Stacy Potter

Table 2: Places mentioned in the *Los Angeles Times* and by survey respondents, grouped into Southern California and Northern (including Central) California

	L.A. *Times*		**survey respondents**	
Places Grouped by Region	**# Mentn**	**% Mentn**	**# Mentn**	**% Mentn**
Southern California	198	71.2	74	96.1
Northern/Central California	80	28.8	3	3.9
	278	100.0	77	100.0

Source: C.M. Rodrigue, from content analysis

Table 3: Survey responses on expectations of a

bad winter

Were you surprised by the flooding over the last couple of months or did you expect an extreme winter?		
Surprised	15	27.8%
Expected extreme winter	35	64.8%
Declined to answer	4	7.4%
	54	100.0%

Source: C.M. Rodrigue, from surveys administered by Adam Henderson, James Hotchkiss, and Stacy Potter

Table 4: Survey responses on the genesis of this extreme winter

Do you think the flooding this year is the result of:		
A) An isolated event?	1	1.9%
B) A cyclical/recurring event that happens every so often?	41	75.9%
C) A global trend towards harsher winters (things are getting worse)?	10	18.5%
Both B and C	1	1.9%
Declined to answer	1	

1.9%

54

100.1%

Source: C.M. Rodrigue, from surveys administered by Adam Henderson, James Hotchkiss, and Stacy Potter

Table 5: Survey responses on their sources of information

Where have you gotten most of your information about the storms and the
damages they have created?

Newspaper:	24	44.4%	(*Los Angeles Times*=14)
			(*Orange County Register*=6)
			(*Daily News*, San Fernando Valley=2)
			(*Times* and *Register*=1)
			(*Times* and *Daily News*=1)
Local TV:	40	74.1%	
National TV:	18	33.3%	
Radio:	17	31.5%	
Internet:	3	5.6%	
Other people:	1	1.9%	

Total sources mentioned: 103

Number of respondents: 54

Mean number of sources: 1.9

Source: C.M. Rodrigue, from surveys administered by Adam Henderson, James Hotchkiss, and Stacy Potter

Table 6: Survey responses by dominance of Malibu and Laguna Beach by sources of information

	Respondents' sources of informaton			
	paper	**local TV**	**nat'l TV**	**radio**
Places mentioned				
Neither Malibu nor Laguna Beach	12	17	11	3
Malibu	2	7	3	5
Laguna Beach	4	5	1	4
Both Malibu and Laguna Beach	6	11	4	5

Mentioning Malibu and/or 12 23
7 14
Laguna Beach 50.0% 57.5%
38.9% 82.4%

Source: C.M. Rodrigue, from surveys administered by Adam Henderson, James
Hotchkiss, and Stacy Potter

Table 7: Survey responses concerning maintenance of an emergency kit

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Do you maintain an emergency kit for disaster situations?

Yes 38 70.4%

No 16 29.6%

54 100.0%

Source: C.M. Rodrigue, from surveys administered by Adam Henderson, James Hotchkiss, and Stacy Potter

Table 8: Homeowners and flood insurance

Not homeowners 27
50.0%

Homeowners without flood insurance 20

37.0%

Homeowners with flood insurance 7
13.0%

Homeowners with insurance, reasons why:
1940 -- canyon area (Glendale, foothills of Verdugos and San Gabriels)
1985 -- necessity to protect mortgage (Huntington Beach, L.A. Coastal Plain
1995 -- refinanced home, flood insurance came with it (Westminster, L.A. Coastal Plain)
1988 -- always had it (Tustin, L.A. Basin)
1996 -- cautious (Tustin, L.A. Basin)
n.d. -- home credit line lender requirement (Santa Ana, L.A. Basin)
n.d. -- storm, recommended (Newport Beach, L.A. Coastal Plain)

Homeowners without insurance, reasons why not:
no flooding (Manhattan Beach, L.A. Coastal Plain)
not risk (North Hills, San Fernando Valley)
no flooding in a long time (Burbank, San Fernando Valley)
not in a flood-prone zone (Fullerton, foothills of Santa Ana Mountains)
not in floodplain (North Hollywood, in San Fernando Valley)
out of flood-plain (Santa Ana, L.A. Basin)
doesn't pose a problem where we live (Buena Park, L.A. Basin border)
not in Zone AR (Anaheim, L.A. Basin)
Valley floor, raised foundation, no risk (Winnetka, San Fernando Valley)
high up, elevated (West Van Nuys, on floor of San Fernando Valley)
high ground (Yorba Linda, foothills of Santa Ana Mountains)
live on top of hill (Pasadena, foothills of San Gabriel Mountains)
flat land (Irvine, Irvine Valley)

flat area, no history (Costa Mesa, L.A. Coastal Plain)
expensive! (Santa Ana, L.A. Basin)
don't know why not (Los Angeles, east of Chavez Ravine)

Source: C.M. Rodrigue, from surveys administered by Adam Henderson, James Hotchkiss, and Stacy Potter

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hazctr@colorado.edu