

# Impact of Internet media in risk debates: the controversies over the Cassini-Huygens mission and the Anaheim Hills, California, landslide

## Introduction

Media play a crucial role in the social construction of a given hazard. That is, media portrayal of a given hazard or disaster affects individual perceptions and agency reactions to a given situation or event. A common criticism is of the sensationalism that media can bring to hazard stories, which can raise public concern about minimal risks or can hamper efforts to respond to a disaster (Dymon and Boscoe 1996; Elliott 1989; Mazur 1998, 1994; Smith 1992; Stallings 1994). Much more troubling is evidence suggesting systematic bias in media coverage, to the detriment of the poorest and most vulnerable elements in society (Davis 1998; Rodrigue, Rovai, and Place 1997; Singer and Endreny 1994).

For example, during the Northridge earthquake that struck Los Angeles in 1994, the geography of print media attention differed markedly from the actual geography of buildings that had been red-tagged (condemned) and yellow-tagged (marked for limited access to make repairs). This finding emerged in various studies of the earthquake by Eugenie Rovai, Susan Place, and myself, when we did a simple linear regression of place name mentions in the dominant English and Spanish language regional newspapers, the *Los Angeles Times* and *La Opinión*, against damaged buildings inspected by the Los Angeles City Department of Building and Safety (1994). Variation in actual damages by the 36 named communities within the City of Los Angeles accounted for 34 percent of the variation in media coverage, a highly significant ( $\text{prob} = 0.0001$ ) if weak relationship (e.g., Rodrigue, Rovai, and Place 1997).

Concentrating on the 17 communities with large residuals above (8) and below (9) the regression line of expected coverage, we found that the grossly overcovered communities were 61.2 percent non-Hispanic white and had population-weighted *per capita* incomes of US\$26,069; grossly undercovered communities were only 21.7 percent non-Hispanic white and had weighted *per capita* incomes of only US\$14,145 (based

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on data from the 1990 U.S. Census). Furthermore, mental maps of the disaster were elicited from a random sample of 245 people in the region, of whom 52 actually responded to the survey, and they accorded nearly perfectly with the media geography rather than with the actual pattern of damage (the media geography accounted for 95 percent of the variation in residents' mental maps,  $\text{prob} = 0.0000$ ) (Rodrigue, Rovai, and Place 1997).

Most disturbingly, areas that were disproportionately overcovered were recovering at a rate significantly higher than the areas that were disproportionately undercovered. That is, red-tagged buildings were being bulldozed and removed from the database and yellow-tagged buildings were being repaired, re-inspected, and then placed in the green-tagged (safe for routine human occupancy) category much faster (-41.9 percent from 26 April to 12 August) than in the rest of the city and especially faster than in the areas undercovered by the two newspapers (-33.8 percent, the difference having a prob-value of 0.0003). Media skew, then, has serious ramifications for people's understanding of and perceptions of a hazard situation or disastrous event and for the equity of response, recovery, and reconstruction.

A number of media critics have pointed out that media skew can emanate simply from the business orientation of a private corporation, which dictates a need that media capture the largest possible audience for their advertisers. This orientation commonly results in sensationalism, a preference for story hooks that emphasise human conflict rather than issues and scientific content, and stories targeting the interests of the kind of audience the advertisers are trying to reach. Usually, though not always, this desirable market segment is the more prosperous fifth of the population, which

in American society is disproportionately non-Hispanic white. Other sources of skew can include the interests of a parent corporation, which typically includes many other businesses than just a media outlet. This interlocking ownership can lead to pressure to kill stories that show the parent corporation or its other subsidiaries in an unflattering light (Bagdikian 1992; Herman and Chomsky 1988; Lee and Solomon 1991; Stevens 1998). These effects can distort audience perception of many issues of importance to a democratic society, not just hazards and disasters, and there seems little that can be done at present to alter such effects in a hierarchically organised, audience-passive media structure, with its extraordinarily high costs of entry for alternative voices.

My next project took this interest in media and hazard into the arena of technological risks, specifically the controversy over the plutonium on board the Cassini-Huygens spacecraft. Through my subscriptions to various listservers, I began receiving a great deal of email messages on the subject in summer and fall of 1997, as the planned launch of October 1997 approached. I became interested in this controversy, particularly as both sides of that controversy were found in my circle of friends. This project widened my interest in media from the audience-passive traditional print, television, and radio media to the uses of the much more interactive Internet in the controversy. Internet media may compensate for the biasing influence of capital concentration in the print and broadcast media due to the low cost of entry into broad-based communication the Internet affords. The biases of wealth and power are not completely flattened in these new media, however, given that Internet access remains quite uneven socioeconomically, spatially, and along gender lines to the point of common criticisms of 'cybersegregation' (Gates 1999; Rodrigue 1993; Fischer 1999) or the 'digital divide' (e.g. Irwin 2000). While my initial interest in these more interactive media channels concerned the technological risk debate raised around

Cassini, I am presently beginning to examine their use in natural hazards controversies, too, initially a battle over landslides in Anaheim Hills, California, a suburb of Los Angeles.

In this paper, I will focus on the Cassini controversy and introduce the Anaheim Hills one. For each, I'll present a brief background on the risk assessment and risk management policy issues brought up in the debate and then analyse the uses of the Internet in the controversies. For the Cassini case, I'll concentrate on UseNet and, for Anaheim Hills, the web. I'll then wrap up with the dilemma facing politicians with risk management responsibilities when Internet activism generates large-scale constituent queries and protests. Is there some way those of us in the hazards community can apply the lessons of Cassini and Anaheim to create pressure for disaster-resilient communities?

### Cassini

The first case study is the Cassini-Huygens mission. Launched in October of 1997, the Cassini orbiter will spend four years on tour in the Saturn system beginning in 2004 and drop the European Huygens probe onto its largest moon, Titan. This is physically the largest and scientifically the most ambitious mission ever undertaken by the National Aeronautics and Space Administration (NASA) or its European partners, the European Space Agency (ESA) and the Agenzia Spaziale Italiana (ASI) (Spilker 1997).

### Background to the Cassini controversy

The controversy around the mission erupted as a result of NASA's decision to utilise radioisotope thermoelectric generators (RTGs) and thermal units (RHUs) to generate electrical power for the instruments and to keep them at operating temperatures in the deep cold ( $< 10^{\circ}\text{K}$ ) 1.4 billion kilometers from the sun (NASA 1995, 1997). RTGs and RHUs contain ceramicised plutonium-238 dioxide.

Besides the launch of ceramicised plutonium, another related point of controversy was the trajectory getting Cassini from Earth to Saturn. The spacecraft is so immense that no launch vehicle could impart the velocity required for a direct shot to Saturn. So, over its seven year cruise to Saturn, the spacecraft picks up speed through gravitational slingshots by various planets, one of which was Earth (NASA 1995, 1997). Many people became concerned that the RTGs and RHUs could possibly explode or pulverise in the event of a flyby accident and give huge numbers of people a carcinogenic dose of

plutonium as the dust circulated through the planet's atmosphere (e.g., Chong 1997; Grossman 1996; Hoffman 1997a; Kaku 1997).

NASA had had an environmental impact analysis performed for it by a variety of internal and external agencies and researchers. These had reported extremely small probabilities for excess cancer deaths from plutonium releases during launch or swingby. In the 1995 *Final Environmental Impact Statement*, for any of the launch phases, all estimates for expectation and maximum scenarios were below one health effect, i.e., surplus death (NASA 1995, p. 4.56, 4.62). For an inadvertent entry during the Earth swingby, depending on the angle of re-entry, the estimate ranged from 1910 to 3480 excess deaths (calculated without any *de minimis* assumption of an allegedly harmless dose of 0.001 rem) developing over five decades, a level that would not be statistically observable amongst the 1 billion or so deaths normally expected in that time frame (NASA 1995, p. 4.63). These estimates were revised downward in the *Final Supplemental EIS* of 1997 after application of new probabilistic safety analyses and more detailed accident descriptions and environments. For launch accidents, expected surplus deaths again remained below 1, and worst case scenarios resulted in less than 1 percent probabilities of from 0.55 to 1.50 surplus deaths being exceeded, depending on the time of failure (NASA 1997, p. 2.22). For inadvertent entry failures, there was a substantial drop in expected excess deaths, to 120, with a 1 percent probability of 450 surplus deaths being exceeded (NASA 1997, p. 2.22-2.23).

Anti-Cassini activists were skeptical of any risk assessment performed for NASA and came up with their own figures, ranging from over 200,000 (Kaku 1997) through 1 million (attributed to John Gofman by Grossman 1997) to as many as 40,000,000 (attributed to Ernest J. Sternglass by Grossman 1997). The opponents further claimed that NASA was imposing an unnecessary risk, because they argued that solar power would have been an option, even out at Saturn, where incoming solar radiation is 1 percent that at Earth (Turner 1997).

By 1995, a movement began to abort the October 1997 launch of Cassini. The launch went forward, so the movement then focused on aborting the flyby. The movement was unsuccessful in stopping either of these events, but it did generate an enormous amount of controversy and a lot of pressure on Congress. Several

senators and representatives signed a public petition against the mission, and California Senator Barbara Boxer commissioned a study entitled, 'Space exploration — power sources for deep space problems' from the U.S. Government Accounting Office (GAO 1998). State and local government representatives also received pressure to declare their jurisdictions in opposition to the launch or flyby. Several responded, including the Massachusetts House of Representatives, which passed a resolution to abort the launch, as did the Newton, Massachusetts, City Council (Hoffman 1997) and the Santa Cruz, California, City Council (City of Santa Cruz 1997). The movement may not have achieved its original goals, but it did succeed in making RTG and RHU use controversial, which may affect the design, authorisation, and funding of future missions.

### UseNet Activism over Cassini

I became interested in how the Internet was being used to build both opposition to Cassini and support for Cassini. Besides a number of print media and television pieces on the controversy, most of the day-to-day activism took place on email and listservers, the web, and on UseNet. I was interested in the immediacy of communication amongst individuals enabled by the Internet, so I was more interested in email and UseNet. UseNet became my focus, because all UseNet discussions have been archived in a searchable site by Déja.com since the beginning of the controversy, back in 1995.

**Hypotheses:** I went through these postings to evaluate several hypotheses that follow from hazards literature in general and technological risk literature in particular. Based on this literature, I expected UseNet comments to focus on perceived control over hazard exposure, because people often will tolerate high levels of risk if they are the ones making the choice but will become very upset over even vanishingly small risks if they feel the exposure is imposed on them (Fischhoff 1994; Shrader-Frechette 1990). I also expected discussion of fairness and equity in the allocation of the mission's costs and benefits, as this has emerged as a theme affecting people's acceptance of risk (Margolis 1996). A central expectation was that dread would dominate the discussion because of the nuclear issues involved (Covello 1991; Slovic 1991). Another expected theme was mistrust of public institutions in protecting the public (Douglas and Wildavsky 1982; Margolis

1996). I also expected different takes on the issue amongst different demographic segments of the population, as there seem to be gender, ethnic, age, and other demographic differences in hazard perception, attitudes, and behaviour (Blanchard-Boehm 1997; Mulilis 1999). Lastly, I expected opponents to dominate discussion, because their motivations (particularly dread) are emotionally more compelling than those of mission proponents, e.g. the romance of space exploration and curiosity about Saturn and Titan (Douglas and Wildavsky 1982; Margolis 1996).

**Data and Methods:** Using Déja.com's search engine, I searched through the population of 19,853 messages posted on 'Cassini' from April 1995 through March 1999. I sampled the discussion by going through the top 250 messages month by month, working backwards. This yielded comments by 937 authors who had, amongst them, posted 8020 messages. The authors were classified by stance (based on their most recent postings), central concerns they raised, gender, and whether their messages were original compositions or largely forwards from someone else.

**Findings:** I was rather surprised to learn that the great majority of UseNet authors were supportive of the mission: 60 percent were supporters; 21 percent were opponents; and 19 percent were neutral (Table 1).

The only demographic difference I could pick out amongst the authors was gender (Table 2). This debate was overwhelmingly a male preserve: Fewer than 5 percent of authors were female, and they contributed only 3 percent of the posts. Both genders were likelier to support Cassini than to oppose it, but there is a gender-gap. Only 45 percent of the women were mission-supporters, versus 63% of the men; 38 percent of the women were opponents, while only 18 percent of the men were. Had the genders been equally represented amongst the authors, the proponents would still have been in the majority, but the disparity would not have been so extreme.

I examined the specific concerns of authors in all three positions to understand what activated them to contribute to the social debate over Cassini (Table 3). Opponents were dominated by three subtypes:

- 24 percent simply passed on messages originating from about half a dozen people or organisations, often without comment
- another 24 percent wrote independent

Stance	Gender	Individuals		Posts	
		#	%	#	%
Neutral 19.0% of 13.3% of	female	7	3.9	10	0.9
	male	139	78.1	930	87.5
	organisation	4	2.2	14	1.3
	unknown	28	15.7	109	10.3
	authors posts	178	100.0	1063	100.0
Opponent 20.7% of authors 31.3% of posts	female	16	8.2	103	4.1
	male	132	68.0	2067	82.4
	organisation	6	3.1	121	4.8
	unknown	40	20.6	217	8.7
		194	100.0	2508	100.0
Proponent 60.3% of authors 55.5% of posts	female	19	3.4	154	3.5
	male	468	82.8	3946	88.7
	organisation	3	0.5	24	0.5
	unknown	75	13.3	325	7.3
		565	100.0	4449	100.0
937 = n (authors)					
8020 = n (posts made by these authors)					

Table 1: Stance by gender

Gender	Stance	Individuals		Posts	
		#	%	#	%
Female 4.5% of authors 3.3% of posts	neutral	7	16.7	10	3.7
	opponent	16	38.1	103	38.6
	proponent	19	45.2	154	57.7
		42	100.0	267	100.0
Male 78.0% of authors 86.6% of posts	neutral	139	18.8	930	13.4
	opponent	132	17.9	2067	29.8
	proponent	468	63.3	3946	56.8
		739	100.0	6943	100.0
Organisation 1.5% of authors 2.0% of posts	neutral	4	30.8	14	8.8
	opponent	6	46.2	121	76.1
	proponent	3	23.1	24	15.1
		13	100.0	159	100.0
Unknown 16.0% of authors 8.1% of posts	neutral	28	19.6	109	16.7
	opponent	40	28.0	217	33.3
	proponent	75	52.4	325	49.9
		143	100.0	651	100.0
937 = n (authors)					
8020 = n (posts made by these authors)					

Table 2: Gender by stance

expressions of concern about the risks of plutonium in general or during the launch and flyby phases of this mission in particular

- 21 percent were people interested in Nostradamus and astrology, who expressed great fear that Cassini was the 'King of Terror' that Nostradamus had

Neutral Issues	#	%
Technical questions/answers	72	40.4
Asking/providing basic information	20	11.2
Passing on others' messages	14	7.9
Nostradamus fan asking basic question	13	7.3
Risk question	12	6.7
Flames	7	3.9
Costs, taxes	6	3.4
Politics/bureaucratisation	5	2.8
Privatisation of space	4	2.2
Vulnerability of big mission	2	1.1
Other	23	12.9
sum	178	100.0
Opponent issues	#	%
Passing on others' msgs	46	23.7
Risk	46	23.7
Nostradamus/astrology/666 fears	41	21.1
Calls to action	11	5.7
Costs, scale, opportunity costs	9	4.6
Censorship by media	7	3.6
Conspiracy/militarisation of space	6	3.1
Flames	4	2.1
Privatisation of space better than NASA	3	1.5
Other	21	10.8
sum	194	100.0
Proponent issues	#	%
Opponents a small # unqualified Luddites	95	16.8
Risk overstated, disproportionate	91	16.1
Enthusiasm for the mission and space	73	12.9
Flames	59	10.4
Orbit/trajectory aimed to be safe	36	6.4
Passing on others's messages	36	6.4
Past nuke/RTG failures didn't kill life on Earth	27	4.8
Solar not feasible	22	3.9
Big missions=big results	20	3.5
Nostradamus critiques	23	4.1
Cass budget doesn't allow for cruise science	16	2.8
Opportunity costs of opponent activism	11	1.9
Media censorship/bias against science	9	1.6
Calls to action	8	1.4
Privatisation critique for large-scale missions	4	0.7
Other	35	6.2
sum	565	100.0

937 = n (authors)

Table 3: Central concerns raised by stance

predicted would come from the skies and destroy Earth in summer of 1999 (the Earth flyby took place in August 1999).

Proponents, given their much larger numbers, discussed a wider range of issues and concerns, with no one issue commanding as many as a fifth of the authors. The most common statement (17 percent) was that the opposition was very small if very vocal and unqualified to

comment. Sixteen percent opined that the risk of the mission or of RTGs was being grossly overstated. Thirteen percent simply enthused about the mission and its goals. Another 10 percent engaged in rather nasty 'flaming' of the opponents. Only 6 percent forwarded on other people's or organisations' messages, usually something from a NASA publicity office.

Contrary to the expectations of hazards

literature, there was no concern expressed over the issue of control over the plutonium exposure, not even amongst the opponents. Fairness questions are often raised as an explanation for public activism over technological risk, but only 2 percent of authors raised the issue of fairness and that in a manner tangential to the risk of plutonium exposure (most of these complained about how NASA's monopoly over the space enterprise was unfair to the private sector). There was also a gender gap, which has occasionally emerged in other hazards perception studies (Blanchard-Boehm 1997; Mulilis 1999). The gap is statistically significant with a *Chi-square* prob-value of 0.005 but extremely weak with a Cramér's *V* of 0.117.

Perfectly in accordance with prior literature, however, dread is the central axis in this hazards debate. Two thirds of opponents expressed dread of nuclear contamination, and the Nostradamus discussants were terrified that Cassini would bring about the predicted end of the world. Over a quarter of the proponents addressed the dread factor, too, mainly by trivialising the probability of an accident and the consequences of an accident should one occur.

Another factor mentioned in hazards literature is mistrust of public institutions, and it shows up in this debate. Six opponents say that there is a NASA conspiracy to militarise space and the plutonium on Cassini is the camel's nose in the tent, and another 7 stated that the media were censoring the plutonium risks of Cassini. Both of these arguments are often cited in the 46 messages forwarded by opponents. Even a few proponents (9) said they thought the media were biased towards the opponents and were not letting NASA have a chance to defend the mission and its goals. So, mistrust of national government and of media is common in this debate and, in the case of the media, is shared by both sides.

This sample may not be a representative sample of all those on the Internet with an opinion on Cassini: It is more than likely that people who bestir themselves to contribute to the debate are in some way self-interested in its outcome. These may be employees of NASA, the ESA, the ASI, or employees of their subcontractors or, conversely, committed and activism-prone members of opposition organisations.

To examine self-selection bias, I removed all people with emails originating from the space agencies, companies doing contract work for them, and academic institutions with sizable grants with them,



as well as those who posted from activist organisation addresses. It remains possible that such individuals also maintain private email accounts not associated with their work affiliations and, so, would not be culled in this manner. The easily identifiable affiliates made up 18 percent of the authors. Suggestively, they contributed 26 percent of the messages, a disproportion suggestive of their passion on the subject (*Table 4*).

By removing them, the database dropped to 765 individuals and 5912 messages originating with people having no discernible ties with Cassini and the organisations that oppose it. Of the remaining authors, 20 percent are neutral, trivially more than was the case with the full database. They posted 16 percent of messages, however, a somewhat greater percentage than did the neutrals in the original database. Twenty-three percent of the authors in the reduced database are opponents, a slightly greater percentage than in the original, but they posted fully 39 percent of the messages, which is quite a bit higher than was seen in the full database. The public left in the database who oppose the mission emerge as more likely to communicate their feelings. The percentage of proponents in the revised database dropped slightly, from 60 percent to 57 percent, but these are less passionate about their sentiments than was the case when identifiable employees of NASA and related institutions were left in. That is, the percentage of posts from non-self-interested proponents dropped to 46 percent from the 56 percent seen in the original database.

In all, the public left in the database were basically indistinguishable from the full database in terms of the proportions of individuals adhering to the three positions. Those individuals left in the database who oppose the mission, however, are more passionately communicative about their views, which offers some support to the expectation that the emotional basis of opposition, dread of nuclear contamination, is more compelling than that of support for the mission. Indeed, though supporters left in the database dominated as individuals, their support was considerably more tepid emotionally than when identifiably self-interested persons remained in the database, at least as judged from the number of posts they offered on the subject.

**Discussion:** The Cassini controversy demonstrates the empowerment the Internet offers to political activists. A handful of people can alert others to gravely concerning issues and enlist them

Stance	Individuals		Posts	
	#	%	#	%
Neutral	156	20.4	968	16.4
Opponent	174	22.7	2233	37.8
Proponent	435	56.9	2711	45.6
765 = n (authors)				
5912 = n (posts made by these authors)				

*Table 4:* Stance with self-interested persons omitted

to spread the news. The population notified of the issue expands exponentially and, if even a small number of those exposed to the idea respond politically, the result can be tremendous political pressure. Potentially very empowering to ordinary citizens, the Internet offers a counterweight to the political power of great corporations and wealthy individuals. This counterweight function does, however, remain tempered by the continuing underrepresentation of the voices of the poor, of minorities, and of women in cyberspace.

This kind of Internet activism reflects some of the work done by John-Paul Mulilis and Shelley Duval on person-relative-to-event approaches in hazard perception and reaction (1995). Their model is built on the relationship between perceived magnitude of threatening events and perceived resources to do something about them. The originating half dozen or so activists often stress the dire consequences of exposure to plutonium and claim that the danger of exposure from Cassini is drastically greater than NASA admits, messages that constitute negative threat appeals in the field of social psychology. The Internet makes activism through the forward button so easy that it raises readers' appraisal of their resources for coping with the threat. The predicted outcome of this conjunction of high-magnitude negative threat appeals and high-coping resources is a high level of the problem-focused coping behaviour represented by Internet activism.

The demagogic use of the Internet, however, remains the shadow of empowerment. Appeals to conspiracies, *ad hominem* attacks, exaggeration, and other emotionally-manipulative devices are the hallmark of demagoguery, and they are abundant in this debate, particularly amongst the opponents but also amongst flame-prone proponents. As pointed out by Henry W. Fischer, there is a '...greater likelihood of the diffusion of inap-

propriate disaster relevant information ... The inherent advantage of democratisation provided by the Internet through the levelling of hierarchies also creates at least one unintended consequence. Those who are truly expert may appear equal to those who have no background in the field' (1999 p. 63). The complex nature of Cassini and of many other both technological and natural hazard controversies makes them inaccessible to the average citizen, who yet must decide whether to act politically about this or similar situations or, worse, for a democratic society, remain uninformed and apathetic. This is a dilemma we all face as citizens: We must make judgments, and there is no way any of us can spend the time to look into issues far from our training.

So, we have shortcuts to opinions—we tend to defer to the opinions of people and organisations we trust, our reference groups (Johnson 1993; Margolis 1996; Slovic 1991). The problem with this is that it is possible for a handful of people to hijack this mechanism of trust and, through the ease and exponential expansion of activism-by-the-forward button, mobilise a lot of us into a politically potent movement, deflecting our energies from other causes that would normally attract our attention. In this case, attention to a relatively trivial hazard may result in inattention to a more significant hazard well within our powers to do something about.

Risk management decision-makers, particularly politicians, would be well-reminded that they are hearing from an unrepresentative selection of their voting and contributing constituents in technological risk debates, as in most other issues. This sample may be responding to self-interest, demagoguery, or the rational consideration of risks and benefits: The source of political pressure may not be too apparent when decision-makers consider policy to manage a hazard. 'The outcome? Information may be incorporated into public policy, which leads to

ineffective or inappropriate disaster mitigation or response activities' (Fischer 1999, p. 63). While one would hope they rely on risk assessment science in framing their responses, they must navigate a sea of political risk and uncertainty, with its own Type I and Type II statistical hazards to their own careers! Do they assume the volume of pressure they receive represents the feelings of their constituents and then help enact risk management policy that would gall the bulk of their constituents (Scylla)? or do they assume the pressure is not representative and blithely neglect an issue that proves to be important to voting constituents (Charibdis)?

### Anaheim Hills landslide

The second case study, one I am just beginning to analyse, involves the use of the web by one deeply angry victim of a landslide in the Anaheim Hills area of Orange County, one of the suburbs to the southeast of Los Angeles proper. This individual took to the Internet after the slump occurred, so the character of his activism is *ex-post facto*, unlike the anti-Cassini activists' work. Rather than a single focus on stopping a specific event perceived as hazardous, this site has several foci. The author, Gerald M. Steiner, wishes to expose the prior knowledge of landslide hazard on the part of elected city government officials and, therefore, their culpability in what he characterises as failure to disclose. He seeks to educate others on the nature of landslide hazards in the region and provide them with one-stop access to United States Geological Survey (USGS), Federal Emergency Management Agency (FEMA), and California Division of Mines and Geology information and maps they can peruse before making purchase offers on homes in Orange County. Another purpose is to provide a forum for other victims of the slides to share their stories and to stay abreast of current developments in their legal actions against the City of Anaheim.

### Background to the Anaheim Hills controversy

This case involves the slump of a 25-acre (62 hectare) hillslope from the 16th to the 17th of January 1993 in a neighbourhood of luxury homes on view sites in the Anaheim Hills (Woo and Powell 1993). This development was started in 1973 on known ancient landslides that had experienced some sliding in the early 1960s, and the slide may have been activated by leakage from polyethylene plastic water conduits the City had adopted as its specification before this development, in 1967. In the wake of the slide, a few dozen

families were evacuated and more than 200 affected by other symptoms of ground slippage, so eventually about 250 households sued the City of Anaheim (Spencer 1993). The legal firm they engaged had won a similar suit elsewhere in Southern California, and the residents expected to be made whole for the loss of their homes or the costs of structural repairs and mitigations. The situation exposed a loophole in real-estate disclosure laws in California, which allowed sellers and realtors to disclose as mitigated areas of significant landslide hazard, even when the efficacy of the mitigation implemented is contested.

The mitigation chosen by the City here entailed dewatering wells, which did not work here. Rather than pay the claims and perform structural mitigations, the City instead spent nearly 9 million dollars in legal fees (Schrader 1998), claiming that the residents helped create the slide by overwatering their lawns and because of leaky backyard swimming pools (Pepper 1998). The legal firm representing the homeowners worked out a settlement yielding approximately US\$32,000-36,000 per household and forcing them into a Geological Hazard Abatement District (GHAD) to self-fund the maintenance of 150 pumps and wells (Clark and McLarty 1999).

On the basis of extrapolation from another GHAD in a geologically similar landslide situation (the Big Rock slide area in Malibu, Los Angeles County), the Anaheim Hills GHAD is estimated to require US\$5,000 per year per household after the City's initial donation of US\$3.5 million runs out in a few years (Steiner 2000). Gerald M. Steiner and Sandra J. Steiner, affected homeowners, sued their attorneys for failure of fiduciary responsibility (Steiner and Steiner v. Pillsbury Madison & Sutro, LLP 1999). In this morass of conflicting claims and accusations and lawsuits, Gerald Steiner built an absolutely amazing website: <http://anaheim-landslide.com>

### Anaheim Hills victim activism on the Web

This website contains hundreds of pages and links. Some of these are the author's sarcastic commentaries on the process and the politicians and lawyers involved. Others are maps from the USGS or California Division of Mines and Geology, showing hazard-prone areas. Still others are geological reports and environmental impact statements and news reports from the *Orange County Register*, the local newspaper. The site includes a timeline of

the history of Anaheim Hills and its landslides, copies of the legal actions and depositions, myriad photographs of the damages, videos of politicians and lawyers making contradictory statements, and two dozen letters Steiner has received from other victims of the disaster, documenting their suffering and their support for his efforts, as well as queries from people wanting to know if they should buy a particular home in the area. Much attention is devoted to *caveat emptor*.

**Steiner's Purpose:** Steiner has said that his site helps level the public-opinion playing field between the neighbors and the city, with its team of top attorneys. 'I think in future, political action will be a basic part of the Internet' (quoted in Pepper 1998). The City has tried to close down the web site, saying that the site is full of misinformation (Pepper 1998). The site is obviously one-sided, but it also brings together a tremendous amount of landslide and earthquake hazard information and maps, about which it would normally never occur to a home-buyer to ask. As such, it is extremely informative, the more so since its controversial character makes the site popular and entertaining. It casts light on a loophole in the disclosure process that contributed to a faulty hazard perception on the part of residents and potential residents. It also yields an informative if jaundiced perspective on the dialogue between geological risk assessment and the very political process of risk management decision-making in local governmental bodies, a process that exposed a lot of people unawares to a potentially lethal and financially devastating hazard.

**Discussion:** As with the UseNet discussions of Cassini, this one-person web campaign stirs up a good deal of anti-government sentiment and draws on popular suspicion of government and risk management planners, this time at the local level. It, too, draws on dread, in this case the horror of waking up in the middle of the night hearing your home creaking and having the local police forcibly evict you from your disintegrating home. Steiner details the impacts of these events on his neighbors and himself—divorces, medical interventions for suicidal actions, bankruptcies, weight loss, and drug problems—with a 'this could be you if you buy in the hills of Orange County' tone.

Unlike the Cassini debate, this site is all about fairness and control. Steiner feels that local government and realtors did not disclose enough information for potential homebuyers to understand the risk they

were assuming moving into the hillsides of Southern California. Without the disclosure necessary for informed consent in risk assumption, Steiner feels that homeowners needlessly lost control over their risk exposure. This is bound up with fairness and equity issues, in that the City's actions and the settlement imposed on the affected homeowners, in Steiner's view, leaves them holding a bag they never knew was being handed to them.

There is an interesting fairness and equity dimension to this controversy that escapes Mr. Steiner's notice. These people are like hazards victims everywhere in the degree and poignancy of their individual sufferings. Unlike victims of, say, mudslides in Central American villages and shantytowns or in the poverty-stricken Appalachians of the eastern United States, however, they have been able to publicise their own stories through the access of one of their own to web-authoring skills and domain-hosting resources. The appalling losses of these at least originally very prosperous households are out there online, due to easy access to the requisite financial and technological resources by middle class and professional people. Others like them, also with access to the Internet, can learn from their tragedies and begin to insulate themselves from the potential devastation of landslides. Other more marginalised victims suffer silently, uninformed of their risk exposure, stricken by disaster, unable to get their own stories out, and overlooked by society — Herman's and Chomsky's 'unworthy' victims (1988).

So far, this tacit fairness issue affects all social organising on the Internet. The Cassini activists, too, are middle and professional class people (professors of journalism and of physics, physicians, and the owner of a software company). At this point in time, interactive civic action offers tremendous empowerment to individuals already relatively privileged in this society: Cybersegregation still divides those with access to this medium and those without, those comfortable with it and those still awkward around it. The potential of democratic oversight of risk assessment and risk management awaits the effective arrival of the poor, of minorities, of working class people, and, at least in the case of Cassini, of women. The empowerment of these now marginal voices in these dialogues can only make interactive media a fascinating channel for the hazards community to watch.

### In closing

In the meanwhile, those of us in the

hazards community might want to learn from Mr. Steiner and his do-it-yourself hazards education program and from the various participants in the Cassini controversy. They remind us of the obstacles and limits posed by the traditional print and broadcast media and model possible ways around them.

Emergency managers and disaster planners face difficulties with the conventional media both in the predisaster phase and in the various post-disaster phases (emergency response, restoration, and reconstruction). Before a disaster, the need to get hazard information into the hands of the public may be stymied by the fact that hazards education does not generally have a news 'hook': it is not 'newsworthy',

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unless some event occurs that can 'peg' the story (e.g. the anniversary of the Newcastle earthquake). Of the many potential hook events, though, getting media attention may depend on the existence of sensational human drama and conflict in the story, as expressed in the adage, 'if it bleeds, it leads'. In short, disaster planners are at a disadvantage in trying to get their messages across to the populations for which they are responsible: they do not control the media, and the concerns of the media do not ordinarily dovetail with those of disaster planners.

Activists share this disadvantage. They, too, do not control the media. Unlike disaster planners, however, they are better able to generate the kinds of hook events that might snag coverage: they can stage demonstrations or create fanfare over allegations of risk coverups. This relative advantage can be squandered, however, if reporters are summoned over much and begin to think of a group as on the fringe and 'crying wolf'.

The situation is little better for emergency managers in the wake of a disastrous event. Again, they generally enjoy little

control over media activities and representations. In a disaster, media will search out the sensational or picturesque. People in deep need may be overlooked, due to social bias in media. Media can propagate myths about disasters that can compound the work of emergency managers and cause them to squander resources needed elsewhere. Perhaps worst of all, media attention spans are quite short, so enduring needs to communicate information during recovery and reconstruction phases may not be met by media. About all that can be done to control the flow of information is to establish media contact offices during a disaster during the brief windows of opportunity created by journalists' attempts to learn about an event before they settle on a 'spin'.

In short, traditional print and broadcast media wring out the sensation and drama in a disastrous event and then move on to other, more 'newsworthy' stories, leaving information needs unmet. Such media are out of the control of emergency managers and disaster planners. Activists are only marginally more capable of hooking coverage.

One way to slip information past the control of traditional media decision-makers is to take to the Internet. The Internet requires a vanishingly small price of entry compared with that required in the highly oligopolistic conventional media. It is also growing explosively, if unevenly, into a densely interacting global community. There are different facets of the Internet that offer different channels to the public. The World Wide Web functions in much the way that a newspaper, magazine, journal, radio show, television show, performance, or art work would: material is posted and waits passively for an audience to find its way to it. It competes with other material similarly posted for audience attention. Unlike newspaper stories and broadcasts, however, web pages are more enduring and easier to find.

Like these other traditional venues, though, increasing audience exposure requires advertisement. For the world wide web (www), advertisement can consist of purchasing banner advertisements on other, related web pages or arranging a reciprocal and *gratis* exchange of banner advertisements or links. Too, a web address (URL) can be registered with search engines at their web sites, so that active searchers for particular types of information can find a site. Related to search engine registration, it is also possible to include 'meta-tags' in the header portion of a web document to offer



lists of keywords that search engine 'spiders' can use to classify and prioritise sites they find on their own as they 'crawl' through the web. Also, frequent changes to a web site make it more attractive to search engines.

Another way to advertise a web page is through the Internet equivalent of direct mail campaigns: announcements through email address books or on listservers. Probably most disaster planners and emergency managers are familiar with email and maintain their own address books to exchange information among colleagues (and, at home, to swap bad jokes with friends and family!). This activity can be used to notify others of a web page or any other sort of information, but most personal email lists are too limited to be of use—at first. The thing to remember is that email can be used like a chain letter, requesting the direct recipients to forward the information on to anyone who they think might be interested. This introduces the exponential expansion of a pyramid scheme or chain letter and was widely exploited by many of the Cassini activists.

Listservers are automatic email lists of people who take the initiative to subscribe to a list of interest to them. To email everyone on the list, one need not maintain one's own address book or manually enter the address of every individual: one simply sends a message to the list name (often merely by hitting the 'reply' or 'respond' button), just as though to write a single person. The listserver software (e.g. Listserv, Listproc, and Majordomo) then automatically routes the message to all on the list. Each list may have anywhere from a dozen to several thousand subscribers. Getting information out on a listserver and requesting that the message be sent to anyone the recipients think might be interested dramatically increases the compounding power of chain letter mathematics. This was one of the principal avenues utilised by the Cassini activists to get their messages out and propagating exponentially.

Still another channel that might be explored to get information past the controls of traditional media is UseNet. UseNet is the Internet equivalent of a bulletin board. Unlike listservers, UseNet postings may be read by anyone curious enough to visit a news board, search for a subject on the Déja.com UseNet search engine or, increasingly, through any search engine. Like listservers, however, people must subscribe to a board to have posting privileges. UseNet boards can have mil-

lions of readers and thousands of subscribers, each of whom can forward information to their email and listserver circles (and other UseNet news boards). Much of the early activism around Cassini was conducted on UseNet, and my suspicion is that UseNet provided the initial exponential ripple in cyberspace that produced very effective political pressure on elected risk management decision-makers. The anti-Cassini movement traces back, on UseNet, at least, to approximately six individuals!

To be sure, there is now much hazards information online by responsible agencies and institutions (and a fair amount of misinformation by less moderate elements). Disaster planners, especially, and emergency managers might want to explore having their staff follow UseNet bulletin boards to identify appropriate places for postings. The Déja.com search engine ([www.deja.com/home\\_ps.shtml](http://www.deja.com/home_ps.shtml)) can provide access to these. Staff could also be encouraged to post messages from an agency on relevant community or subject boards and ask readers to forward them to anyone who might be interested in the information. Similarly, staff might be encouraged to identify and subscribe to appropriate listservers and post similar messages from time to time. Appropriate lists might be found at CataList (<http://www.lsoft.com/catalist.html>), Liszt (<http://www.liszt.com/>), or PAML (<http://paml.net/>). Web page development is a necessary anchor for such information dissemination, and web pages should be modified fairly frequently to maintain search engine revisits—and serve as occasions for communicating through listservers and UseNet.

To be sure, such transparent communication might backfire. NASA's publicity offices utilise the web, UseNet, and listservers—and may thereby have made themselves a target for anti-nuclear activism. Even so, communication of information beyond the controls and interests of conventional media serve the democratic purpose of creating an informed citizenry and, hopefully, a proactive and coöperative one with the information necessary to prepare for disaster and cope with it afterwards.

*I know no safe depository of the ultimate powers of society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion (Jefferson 1821).*

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