

Pittsburg State University

Pittsburg State University Digital Commons

Faculty Submissions

Communication

2015

Controlling Environmental Crisis Messages in Uncontrollable Media Environments: The 2011 Case of Blue-green Algae on Grand Lake O' the Cherokees, OK

Alicia Mason

Pittsburg State University, amason@pittstate.edu

James Triplett

Pittsburg State University

Follow this and additional works at: https://digitalcommons.pittstate.edu/communication_faculty



Part of the [Environmental Education Commons](#), [Environmental Health and Protection Commons](#), [Environmental Policy Commons](#), [Journalism Studies Commons](#), [Mass Communication Commons](#), [Natural Resources Management and Policy Commons](#), and the [Other Communication Commons](#)

Recommended Citation

Mason, A.M. & Triplett, J. (2015). Controlling environmental crisis messages in uncontrollable media environments: The 2011 case of Blue-green Algae on Grand Lake O' the Cherokees, OK. In (Eds) *Communicating Climate Change and Natural Hazard Risk and Cultivating Resilience*. Springer Publishing.

This Article is brought to you for free and open access by the Communication at Pittsburg State University Digital Commons. It has been accepted for inclusion in Faculty Submissions by an authorized administrator of Pittsburg State University Digital Commons. For more information, please contact digitalcommons@pittstate.edu.

Chapter 11

Controlling Environmental Crisis Messages in Uncontrollable Media Environments: The 2011 Case of Blue-green Algae on Grand Lake O' the Cherokees, OK

Alicia M. Mason¹ and James Triplett

Abstract This chapter documents a content analysis of 62 media reports related to the 2011 blue-green algae (BGA) outbreak on Grand Lake O' the Cherokees, Oklahoma. A three-stage crisis model is used to understand the media framing and crisis communication related to the event. Media reports were categorized according to modality. The data set included: traditional media reports ($n=21$, 33%), online blogs ($n=7$, 11%), and online press releases ($n=34$, 54%). These units of analysis represent both controlled and uncontrolled media representations of the crisis event. The objectives of this analysis are to understand how risk and crisis communication strategies were utilized before, during and after the BGA outbreak. Five strategies and techniques for improving crisis communication effectiveness are detailed. Limitations and implications are provided.

11.1 Introduction

It has been over half of a decade since Cox (2007) framed environmental communication as a *crisis* discipline in the flagship issue of *Environmental Communication: A Journal of Nature and Culture*. He argued that “like perturbations in biological systems, distortions, ineptitudes, and system pathologies occur in our communication[s] about the environment,” (p.10). Today we see flourishing areas of environmental communication scholarship relating to: environmental rhetoric and discourse, media and environmental journalism, environmental conflict resolution, and crisis communication, among others. This case analysis utilizes the summer 2011 blue-green algae (BGA) outbreak in the waters of Grand Lake O' the Cherokees, to narrowly focus on key aspects of environmental journalism and crisis communication.

Scientists argue that climate change will have many effects on freshwater and marine environments. In some cases and for some communities harmful algal blooms (HABs) can create crises. According to the EPA (2014), warmer water temperature due to climate change may favor harmful algae blooms in a number of ways. These blooms are made up of blue-green algae (BGA), which have higher temperature tolerances and float on the surface. This allows them to displace the beneficial green algae. Increased water temperatures prevent mixing and allow the water to stratify, which further favors the blue-green algae.

This case analysis employs a three-stage crisis model in order to understand the media reporting and crisis communication related to this BGA outbreak. Richardson (1994) elaborates

¹ A.M. Mason
Pittsburg State University
Email: amason@pittstate.edu

on the differences in the model components: (1) *pre-crisis phase*: warning signs are present and attempts are made to eliminate risks; (2) *crisis impact phase*: the crisis strikes and communicative and operational support is provided; and (3) *post-crisis or recovery phase*: stakeholder confidence is restored. Following a procession through this crisis cycle organizations can return to pre-crisis planning and preparation efforts.

11.1.1 Overview of the Case and Threat

The Fourth of July is one of the most heavily trafficked and profitable holidays in Northeast Oklahoma's Grand Lake area. Following a harsh winter and tornadic spring, the stage was set for an outbreak of blue-green algae. The Grand River Dam Authority's (GRDA 2011) July 1 announcement "discouraging bodily contact" (para. 1) with the waters of Grand Lake resulted in significant public outrage.

Established in 1935, the GRDA is a quasi-governmental organization, overseen by a Board of Directors, and designated to represent the people of Oklahoma. The GRDA is the managing authority of Grand Lake, which controls access and investigates water quality issues. The lake-based contagion that was present in the water is known scientifically as *cyanobacteria*. These blue-green algae are considered highly undesirable because they are potentially dangerous to human and animal populations (Turner 2011). While appearing harmless, some cyanobacteria develop into harmful algal blooms (HABs), which produce: *neurotoxins* (toxins that affect the nervous system), *hepatoxins* (toxins that affect the liver), and *dermatoxins* (toxins that affect the skin).

Four key environmental conditions must be present to cause harmful algal blooms: sunlight, warm temperatures, phosphorus, and nitrogen. The HABs resemble green scum, foam, or even paint on the surface of the water. Although HABs are not always toxic, scientists have yet to determine what causes the same species of algae to produce toxins during one bloom, and not produce toxins during another (Casaletto 2011). Human poisoning and illness from exposure to BGA is rare, but can be severe. The most widely documented case of human fatalities resulting from BGA occurred in Brazil, where 69 dialysis patients died after direct exposure to toxins in their dialysis fluid (Goering 1997). In the current case, the GRDA estimated the toxicity of the Grand Lake BGA 18 times greater than the World Health Organization's (WHO) acceptable level. The rarity of the event and uncertainty regarding the contagion posed a challenge for GRDA's crisis communication team.

11.1.2 Comparative Case Scenarios

The Grand Lake community is not the first community to be affected by cyanobacterial HABs, but this was the first time they were impacted. In an effort to understand the regional framework concerning water-based environmental threats two incidents: the 2003 BGA outbreak on the Marion Reservoir and the 2009 *Escherichia coli* (*E. coli*) outbreak on Lake of the Ozarks were selected for a comparative analysis. The rationale for selecting these events was based on: (a) the geographic proximity to the Grand Lake region; (b) the similarity in the nature of the threat (water-based bacteria); and (c) the differences related to the crisis communication responses.

The first case, the Marion Reservoir, is a 200 square-mile section of the Grand Lake watershed located near the headwaters of the Cottonwood River in Marion County, Kansas. Completed in 1968, this U.S. Army Corps reservoir is the public water source for three cities Hillsboro, Marion, and Peabody. In June of 2003, Marion Reservoir experienced the first occurrence of heavy concentrations of blue-green algae (BGA). The U.S. Army Corps notified the community water treatment facilities, who then notified state and federal entities managing public health matters. The Corps immediately posted warning signs on the beaches, restricted public access, and provided educational fliers regarding the health risks of exposure to blue-green algae. In addition to this response the water treatment plant added activated carbon to the treatment process to help remove the toxin from filtering into the public water supplies.

Following the outbreak \$1.84 million was invested in the Marion Reservoir water treatment plant. In 2003, the Watershed Restoration and Protection Strategy (WRAPS) program received funding from the US Department of Agriculture EQUIP program and the Kansas Department of Health and Environment Non-point Source program to implement Best Management Practices (BMP) to help local communities improve and maintain high-quality water. Since the initial BGA outbreak over \$1 million in federal, state, and local taxes and donations has been allocated to decrease the amount of nutrient-bearing sediments entering the reservoir, which are known contributors to the development of BGA. In 2007, Marion Reservoir received additional funding to continue studying the watershed in an effort to prevent future BGA outbreaks (Blackman 2009).

In contrast to this approach, during the summer of 2009 the Lake of the Ozarks in Missouri faced a dangerous *E. coli* outbreak. At two of the lake's beaches, 60 water samples were taken on May 26, 2009. Half of samples showed abnormally high levels of the bacteria, *E. coli*, with one sample registering at eight times the maximum allowable level (988.3 *E. coli*). Similar to BGA there are many types of *E. coli* and most are harmless, but exposure to toxic forms can result in several adverse health effects including: urinary tract infections, kidney failure, nausea, vomiting and even death. The Missouri Department of Natural Resources disclosed the high levels of *E. coli* on June 26, one month after initially discovering the contamination (Miller 2010).

Unlike the Marion Reservoir case, DNR officials from Lake of the Ozarks (LOO) did not restrict public access to the water. They instead allowed the public to unknowingly swim in the contaminated water. This strategy is known as *the mum effect*, acting to block the flow of negative or unpleasant information (Tesser and Rosen 1972). It was later determined that the DNR failed to report the high levels of *E. coli* to the public for fear of hurting the lake's economy during the busiest time of the year (Miller 2010). This choice led to a severe public backlash against the DNR. The post-crisis phase included a suspension of the director of the Department of Natural Resources (DNR) for two weeks, a restructuring of the DNR department, and termination of several DNR officials.

These two comparative scenarios gauged the severity, hazard, and potential damage of these water-based environmental toxins differently, and resulted in notably different crisis response strategies. The objectives of this Grand Lake case analysis are to (1) understand how crisis communication strategies were operationalized before, during and after the BGA outbreak, (2) analyze the media framing of the BGA event, and (3) discuss five key communication strategies practitioners and crisis communicators may consider in this context.

11.2 Review of Literature

The belief that general audiences receive most of their information about science from the mass media has been well established (Nelkin 1995; Wilson 1995). The media often play a key role in interpreting scientific findings for the public, in addition to providing key information, selective summaries, and overall assessments of the quality and relevance of the information (Gregory 1989, p. 2–3). There is a general consensus among practitioners that the media provide vital links between individuals, groups, and organizations.

Media gatekeepers determine the newsworthiness of a story based on factors such as the topic's *timeliness, relevance, proximity, prominence, rarity, trendiness, and human interest*. In the context of environmental journalism several studies have concluded that the economic drivers of the news industry commonly result in event-driven, reactionary coverage of environmental issues. Furthermore a considerable amount of research indicates that the balanced reporting of issues such as global warming creates informational biases. Traditional news reports that include both sides of the issue, *balance*, have been found to create more uncertainty among audiences regarding climate-related issues. We should note that these are not one-sided communication failures only on the part of the media to relay environmental information. Extant literature has previously identified failures on behalf of scientists to transmit their high-level expertise to journalists (McComas & Shanahan 1999; Ungar 1992; Zehr 2000). As Schwarze (2007) argues there are risks involved when conveying highly technical, scientific information to lay audiences.

Media are heavily utilized as a channel for transmitting crisis-related messages to groups who may be or are being impacted by environmental crises. Framing theory often serves as a useful theoretical framework for investigating how environmental crises are communicated to audiences. Audience framing involves invoking a “schemata of interpretation” which enables individuals to “locate, perceive, identify and label” information attended to in the environment (Goffman 1974). The original definition posited by Entman (1993) holds that to frame is “to select some aspect of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” for the item described (p. 52) (for a review of framing research, see Levin et al. 2002). In this case we use framing theory to understand how the severity of the BGA outbreak and public susceptibility to the threat was communicated to general audiences.

The realm of uncertainty, which shrouds naturally occurring environmental risks that pose public health threats, is a challenging crisis communication context. In an effort to understand how lay audiences may have encountered information relating to the BGA outbreak from the media the first research question is offered.

RQ1: How did the media frame (a) the severity of BGA's public health threat and (b) the potential public susceptibility?

In order to further understand how the case was presented to audiences we also aimed to understand how media sources, who served as subject matter experts (SME) or opinion leaders, viewed BGA's threat to the community. A key crisis communication tenet is the need for the development of shared perspectives among stakeholders particularly toward the problem definition, the crisis itself. One guideline for evaluating the risks associated with crisis events is through the application of the precautionary principle.

The precautionary principle was formulated to prevent harm to both the environment and human health. The principle originated from within West German environmental law, *Vorsorgeprinzip*, meaning *foresight* (Freestone and Hey 1996; O'Riordan and Jordan 1995).

The precautionary principle posits that when a threat, or *risk*, to human health and/or the environment occurs, precautionary measures must be in place to ethically ensure the safety of the affected publics and regions. Just as some academics have argued the field of environmental communication emerged out of need, the precautionary principle resulted from ongoing systematic and systemic failures of environmental regulations to prevent and protect human health and the environment. Although the principle has been criticized for its subjectivity (Maguire and Ellis 2009) it remains a method for evaluating the decision-making processes when matters of public health and the environment are at stake.

By sharing a perspective, including the evaluation of known risks, crisis communicators, political leaders, and public information officers are more aptly able to speak in one voice. This consistency helps to provide clarity for stakeholders and lay audiences. Stakeholders in this case were defined as groups or individuals with vested interests in the outcomes of the crisis and included: residents, visitors, victims, policymakers, business owners, and the GRDA. We wanted to understand if key opinion leaders were able to speak in one voice; therefore, the second research question was posed.

RQ2: Did key opinion leaders (e.g., policymakers, business owners, and the GRDA) speak in one voice regarding the BGA outbreak?

Heath et al. (2007) argued that in the pre-crisis stage “as people become aware of risks, [a] social amplification of the risk (Kasperson 1992) occurs, during which media coverage and public persuadability [will be] sufficient to motivate mitigation,” (p. 39). Providing the public with instructional and psychologically adjusting information within the amplification period of a crisis is crucial in achieving behavioral outcomes which empower stakeholders to cultivate a sense of agency, self-efficacy, for their personal protection. Coombs (2008) distinguished two key components of crisis messages by defining instructing information as that which “informs stakeholders of what to do to protect themselves [both physically and financially] from the crisis” (p. 108) while, “adjusting information helps stakeholders cope psychologically with the effects of a crisis” (p. 109). Based on these message content considerations, the third research question is posed.

RQ3: Were there differences in the instructional and adjusting message content provided to general audiences over the course of the BGA outbreak?

11.3 Method

In order to answer the research questions, an exploratory content analysis of 62 media reports was conducted using a grounded theory approach. Grounded theory is a qualitative research methodology often used by scholars to analyze communication processes and content. The approach allows for emergent themes to develop from the data, opposed to using a predetermined frame to categorize data (Scott 2009).

The dates of these reports preceded the first confirmed illness resulting from exposure and continued through August 8, three-weeks past the July 13, 2011 date when the public health warning was removed. Media reports surrounding the event were extracted from the LexisNexis database using the search terms *Grand Lake*, *BGA*, and *outbreak*. The reports were categorized according to modality. The data set included: traditional media reports ($n=21$, 33%), online blogs ($n=7$, 11%), and online press releases ($n=34$, 54%). Five reports were omitted due to

duplication. These units of analysis include both controlled and uncontrolled media representations of the crisis event.

11.3.1 Coding Procedures

Reports were coded separately based on their headline and text content. The headline content was coded separately because even if audiences did not read the news article content, they would more than likely be exposed to crisis-related information in the headline (Mason and Wright 2011).

Media content was examined for distinct attributes including: *quality of instructional/adjusting information, media sources, and quote comments*. Because BGA has been found to be highly toxic in several animal populations, including feline and canine (Peter 2011), and many residents and visitors maintain relationships with their pets, the inclusion of *animal welfare* information was additionally coded. These units were analyzed by groups of coders, with two to three persons per variable. Reliability for these measures was calculated using Scott's Pi, which discounts the level of *observed agreement* by the level of *expected agreement* due to chance and is commonly used for nominal data in communication studies (Potter and Levine-Donnerstein 1999). Categorical descriptions and calculated reliability scores are provided below.

Headline Content Two categories were constructed for analyzing the headlines (e.g., instructional and generalized headlines). Instructional headlines were coded based on the directional information delivered to the general public: *stay out of water, avoid contact, and use caution*. Generalized headlines held no specific instructional information for the audience and were coded as: *warning/threat announced/issued, economic impact, warning/threat removed or other*. Reliability was established at .86.

Instructional/Adjusting Information Based on a grounded theory approach the emerging themes coded were: *generalization of the advisory, minimization of the threat, specific public safety measures, acknowledgment of threat, possible health symptoms, vigilance, and warning removal*. Reliability was established at .92.

Media Sources Media sources were classified as: *business owners, policy makers, local residents, victims, holiday visitors, GRDA spokesperson(s), subject matter experts (SMEs), and others (e.g. eye witnesses)*. Reliability was established at .94.

Quote Content The content of the quotes was coded as: *economic impact, diminishment of threat, fear of threat, confirmation of threat, specific threat location, and warning removal*. Reliability was established at .87.

Additional variables related to *animal welfare* (caution and safety information related to animal safety) and *response measures* (i.e., fliers posted, orange tape around impacted areas of the lake, and warning signs), which were coded separately, if present, in each media source. Reliability ranged from .83–.88.

11.4 Results and Findings

In an effort to answer *RQ1* and *RQ2* and better understand the societal implications of the BGA outbreak, opposed to the ecological, researchers sought to understand how sources were reportedly on-record responding to the BGA outbreak, and whether key subject matter experts (SMEs) were able to speak in one voice therefore a series of Pearson's Chi squares was computed.

We found significant differences $\chi^2 = (35, 51) = 71.2, p < .001$ between the sources and their threat response characteristics (see Table 11.1). For example, policymakers and local business owners accounted for 77% of the responses concerning the economic impact of the BGA outbreak, while policymakers and residents accounted for approximately 90% of the public comments, which diminished the BGA threat. The GRDA accounted for 72% of the publicly available comments concerning the confirmation of the threat in the crisis phase, with a marginal amount (4.9%) additionally resulting from both the residents and others (usually eye witnesses). Outside of the initial report of human illness no voices from victims of the BGA outbreak were noted within the data set. The GRDA accounted for a majority (93.4%) of the threat removal announcements that gave the all clear and demarcated the transition into the post-crisis phase of this event.

RQ3 sought to understand the instructional and psychological adjusting information that was delivered to high-risk populations potentially impacted by this environmental threat. To look at how this information was conveyed over time a Pearson's Chi Square was conducted. Results found significant differences $\chi^2 = (15, 29) = 46.5, p < .001$ between the report date and the form of instructional and psychological adjusting information provided. Results indicate that a majority (64%) of this content was provided to the general audience during the first week of the amplification period, when the GRDA advisory went out. Audiences encountering this information after the Fourth of July would have less of a chance to receive these instructional messages which are meant to facilitate self-efficacy toward protecting their personal health and safety, including identifying possible signs and symptoms. Instructional actions audiences could employ to protect animal populations occurred in only 10% of the analyzed reports.

As the second week of the crisis unfolded over the Fourth of July holiday period, over 60% of the statements discounted or diminished the threat. It was not until the third week following the GRDA warning that instructional information regarding the possible symptoms of BGA re-emerged in the media reports; this was followed shortly by the official announcement lifting the GRDA's BGA warning.

Table 11.1 Crosstabulations for Source Variations Across Threat Response Characteristics

Threat Response Characteristics

Note: Expected frequencies appear in parentheses below observed frequencies.

11.5 Discussion, Implications, and Remedies

A key limitation of this study is the subjectivity in pinpointing the pre-crisis, crisis, and post-crisis stages of the event but this is expected in cases such as this. In order to frame the pragmatic value of the findings, this discussion section will focus on applied crisis communication strategies that can be utilized to achieve strategic message control and produce well-balanced

information outcomes in the future. Five strategies and techniques for bolstering crisis communication effectiveness are detailed below.

11.5.1 Understanding Controlled Versus Uncontrolled Media

Crises increase the need for organizations to control their messages. Traditional media tactics such as media advisories and press releases are often utilized to convey crisis-related messages to media for distribution to audiences so they may become knowledgeable and proactive in limiting and mitigating their personal susceptibility to identified threats. These communication tactics are considered to be *uncontrolled* to organizations because media gatekeepers (e.g., editors, producers) control the timing, distribution, and placement of the content. In contrast, websites, internal memorandums, white papers/position statements and organizational websites are considered to be *controlled* because the organization retains authority in the presentation, content, and the timed release of the information.

Based on the media reports analyzed in this case, the GRDA (2011) spent more time clarifying their initial, abstract warning “discouraging bodily contact with the water” (para. 2) during the amplification period of the crisis rather than explicitly and concisely providing instructional and adjusting information as the crisis unfolded. The GRDA’s reliance on uncontrolled media as the primary mechanism for the release of risk information during the pre-crisis phase resulted in increased uncertainty. Some audiences received information that specified known HAB locations, while others received information on how to avoid contact with BGA, and others received information on BGA’s threat to animal populations. Reporters and editors controlled presentation of BGA-related information in traditional media, where the GRDA’s warning was diluted. The media pattern that emerged from this BGA outbreak is consistent with An and Gower’s (2009) findings that the most common crisis frames media employ to convey crisis narratives are: *responsibility, economic, conflict, human interest, and moral*. Policymakers at the local level (e.g., State Representatives) and state-level (e.g., Oklahoma Governor), along with local business owners repeatedly endorsed and framed this crisis as one of economic impact, opposed to an actual public health risk. In doing so they undermined the scientifically based warning information the GRDA was attempting to provide.

Millner et al. (2011) label third party sources of critical information during crises as *proxy communicators*. “Although proxy communicators can fill the void created when an organization in crisis chooses to remain mute, this substitution is not without problems,” (Ulmer et al. 2014, pg. 157). Proxy communicators in this case undermined the communication efforts meant to limit or mitigate public harm. For example, Grove’s State Representative was quoted in the *Tulsa World* on July 2, 2011 stating, “I’m more concerned about the urine level than I am the blue-green algae level” (Morgan, 2011, para. 12).

The issuance of the GRDA public health warning was characterized by the publisher of The Chronicle of Grand Lake as “sensationalized journalism... an irresponsible act of passive terrorism,” who further alleged that “not one single case at any medical facility in the Grand Lake area related to BGA,” and additionally advocated for the public support of Rep- Doug Cox, M.D., a local policymaker (Ruth, 2011, p. 1). These diminishing and deceptive statements occurred during the crisis, and despite initial media reports, which featured the first-known victim of BGA in the Grand Lake area on June 24, 2011 (Andes 2011).

This attitude toward threat diminishment by arguably highly credible sources was also shared among business owners within the Grand Lake Community. The president of Arrowhead Investment and Development Co. stated “This has been a major overreaction, in my opinion,...It’s very damaging economically,” (Morgan 2011, para. 7). The aversion to accepting the risk BGA posed by a variety of proxy communicators, including policymakers and business owners, was problematic. Researchers found that not only were these voices integrated into the framing of the threat, but also the severity of the risk.

It is notable that within the 62 articles included in this sample, at no time did any business entity or policy maker associated with Grand Lake mention or reference the health and welfare of the current residents or holiday visitors prior to their own economic interests. Instead, the media frames that incorporated these voices focused almost solely on the economic impact opposed to the public health threat or environmental risk.

Controlling the statements of proxy communicators in crisis events is a difficult if not impossible task; however, one method for controlling crisis-related information is through the development of ghost sites. Ghost sites are a particularly effective strategy that can be strategically designed in pre-crisis stages with collaborative efforts from management and computer technology personnel. Ghost sites are web pages that can mask the front page of an organization’s website but remain in the dark, or in a ghost state, unseen by public eyes until the time a crisis occurs. Once activated the strategy allows organizations to convey reliable and timely information to mass audiences throughout the crisis life cycle. This strategy is a formal, controlled means of communication and can often serve as a valuable information resource center for media.

11.5.2 Controlling the “Image” of a Crisis

Attempting to control environmental crisis messages in uncontrolled media environments is a daunting task. Just as the media frame information for audiences, scientists and organizations have a role in creating an interpretative framework of environmental crises for the media. Online media environments contain both text-laden information (e.g., blogosphere) and image-laden information (e.g., imagesphere), which creates the need for crisis communicators to control more than words. Current social media users are posting more than 300 million photos per day to Facebook, and 70% of all actions on social media involve images (Lisbonne 2012). The rise of the social media site Pinterest[®] is just one example of the growing emphasis on images in our contemporary visual culture. Pinterest, a site completely composed of images, hit 10 million monthly unique visitors faster than any independent website in history, yet most crisis management plans do not include a process of gathering, clearing, and disseminating *official* images during crisis events. In the Grand Lake case the media incorporated a variety of outdated stock imagery and environmental pictures that were not native to the Grand Lake region (Scripps Media 2011). One publication staged a photo op featuring the Oklahoma Governor standing alongside the president of Arrowhead Investment and Development Co, a local business, overlooking the calm, non-green waters of Grand Lake and juxtaposed with a story encouraging people not to cancel their travel plans to the Grand Lake area (Canfield 2011). Strategic communication efforts to provide and disseminate relevant and appropriate crisis-related imagery can be achieved by developing a portfolio of imagery as well as policies and processes for

collecting, selecting, and distributing that imagery. Digital media kits are often created to store and package the imagery in preparation for future distribution.

11.5.3 Engaging New Media

It is important to note that no formal responsive engagement from the GRDA or DEQ was found within the data set representing the blogosphere. This silence allowed streams of patently deceptive information from unreliable sources to flow freely, thus creating a reputational threat to the very subject matter experts (e.g., scientists, public health officials, GRDA) who sought to serve public interest. As mentioned earlier, the provision for clear, concrete instructional information and psychological adjusting information for general audiences was virtually absent in the GRDA's warning strategy. Audiences were left questioning the need for precautionary measures as to the protection of their personal safety and animal welfare, and this opened the door of scrutiny from unregulated new-media bloggers who emerged as dominant voices related to this issue. The lack of a coordinated online public notification strategy addressing the threat's severity, and the public's susceptibility was problematic. Unfortunately this is not all that uncommon and frequently results from a lack of professional training as to the value of strategic online crisis communication, and the need for monitoring and managing of new media communication systems for both process and evaluative feedback.

As in the Grand Lake case, informal online communication can undermine formal attempts to deliver proactive public health and environmental information. Environmental organizations cannot rely on the media to handle their reputation management in crisis situations. Software technology systems such as Social Mention[®], Radian6[®], and Sysomos[®] can assist with media analysis, issues management, reputation monitoring, and social networking engagement during environmental crisis situations. These platforms are valuable in selecting which non-traditional media channels are best to reach stakeholders with timely, reliable, and instant information or refute false, unverified, and unreliable information.

11.5.4 Post-Crisis Communication-Emphasis on Learning, Recovery, and Renewal

One of the cardinal tenets in post-crisis management is the need for organizations to deliver post-crisis messages of renewal and recovery that inform and educate members on the steps being taken to ensure the crisis does not reemerge, or, if it does, the steps that are being taken to reduce or mitigate the damage. In this case, no follow-up post-crisis communication related to the event was noted. Only four of the media reports included in this analysis provided any post-crisis response. All were general announcements concerning the removal of threat warnings, and none specifically reported measures meant to prevent or curb the development of future HABs. This finding may have occurred because the data set only extended three weeks past the warning removal date, and a longer time period may have yielded different results. Still, to this date, we have not seen proactive steps, similar to what was deployed in the Marion Reservoir case, to prevent reoccurrence by addressing nutrient loadings, or additional state-level grant funding to support the preservation and protection of water quality.

More information has been learned since the spotlight of the media dissipated. In August 2011 sales tax numbers indicated the BGA outbreak had minimal economic impact on the Grand

Lake business community (Young 2011). In the post-crisis stage we have also learned the severity of the public health impact (PHI) resulting from the Grand Lake BGA outbreak. According to the Acute Disease Service (ADS) August 22, 2011 report, the PHI was much larger than anticipated. The ADS conducted phone interviews with 49 out of 54 possible BGA exposures occurring between June 5 and August 20, 2011. Of the 37 cases reported in Oklahoma, 20 were directly and negatively impacted by harmful algae blooms (HABs) on Grand Lake. The most common documented symptoms by the ADS were upper respiratory (coughing, shortness of breath, wheezing), gastrointestinal (nausea, vomiting, diarrhea), dermatological (itchiness, rash, blisters), and neurological (numbness, vertigo, vision disturbance). No fatalities were reported.

In May 2012 policymakers enacted Oklahoma Senate Bill 259, which stripped the GRDA's authority to notify the general public about BGA risks. The legislation transferred the authority instead to Oklahoma's Department of Tourism and Recreation, the state agency that promotes the use of state lakes and rivers. SB 259 prohibits *any* Oklahoma state agency or *any* county in Oklahoma from posting BGA advisories or warnings.

In addition to the change in agency duties, the law established a new public disclosure threshold for blue-green algae blooms, eliminating the previous threshold of 20,000 cells per milliliter of water to a new, higher standard of 100,000 cells per milliliter. World Health Organization (WHO) guidelines indicate a moderate probability of adverse health effects from exposure to water containing between 20,000 to 100,000 cyanobacteria cells. That level increases to a high probability of adverse health effects when the cells per milliliter go beyond the 100,000 mark (Carter 2012).

Beyond just increasing the amount of BGA that has to be present in the water, the legislation also requires the microcystin, or toxicity, of that BGA to be equal to or greater than 20 parts per billion (ppb) prior to any public warning. Because of this inclusion, Oklahoma's SB 259 is the most stringent piece of environmental legislation restricting public notification of BGA outbreaks in the United States today. In this case there was no stakeholder mobilization, no advocacy groups, no investigative media coverage, and no public outcry prior to the implementation of the law.

11.5.5 Crisis Planning and Preparation

Most generally, stakeholders who collectively face environmental risks share an interest in environmental quality and public health; therefore, these forms of environmental crisis events provide opportunities to motivate community involvement from stakeholders with a wide variety of backgrounds and interests. Bandura (1997) defined this concept *collective efficacy* as a "group's shared belief in its combined ability to undertake courses of action to achieve a goal" (p. 291). Sampson et al. (1997) alternatively defined collective efficacy as the "level of social cohesion among neighbors, and their willingness to take collective action for common good," (p.

292). Depending on the issue, forms of collective efficacy and mobilization may range from letter-writing campaigns, educational outreach, public meetings, protests, and demands on public officials to formulate grassroots efforts.

Through strategic collaboration in post-crisis states, community leaders possess the capacity to foster community involvement from key stakeholders who are likely to be affected in the future. These stakeholders should be involved in the prevention thinking processes. A proactive approach can help foment community-based goals and objectives to aid in bolstering the quality of future crisis communication efforts. This process of collaborative engagement is vital to facilitating the community-building processes that result in collective efficacy.

11.6 Conclusion

The Grand Lake Watershed Alliance Foundation (GLWAF), a non-profit organization dedicated to preserving, protecting, and improving water quality within the 4-state watershed, contends the threat BGA poses remains, as it began raising a red flag in 2004, publishing tests showing elevated nutrient levels polluting the Grand Lake Watershed, but it wasn't until July 1, 2011 that "it made headline news," (Turner 2011, para. 6). Unlike the Marion Reservoir case that limited public access to contaminated water and the mum effect demonstrated by the Lake of the Ozarks DNR, the GRDA issued a notice that allowed residents and holiday visitors to make a personal choice based on known information at the time. Researchers hold that the Oklahoma GRDA used a conservative interpretation of the precautionary principle, which was in accord with public interest; however, beyond just relying on uncontrolled media channels there was a subsequent failure to provide ongoing instructional and psychological adjusting information as to how key stakeholder groups (e.g., residents, holiday visitors, businesses) could still have fun *at* Grand Lake opposed to *in* Grand Lake, and this in turn increased public outrage.

This analysis found there was an utter failure for government agencies and political officials to speak in one voice in the interest of the environment and public health. Long-term accountability for the policymakers, business owners, and media outlets which placed a priority on economic impact, rather than the public health of their consumers, audiences, and voting base is beyond the scope of this case analysis. It is clear that SB 259, the resulting legislation, was designed to substantially reduce the ability of those agencies responsible for health and safety to protect the public in order to manage future potential economic impacts.

Environmental crises are opportunities—opportunities to engage, recover, learn, grow, and renew. Naturally occurring environmental threats will not change unless the environmental conditions that contribute to their emergence change; however, the manner in which key stakeholders respond to crisis events can be augmented. This is where we can use crises, such as this, as case-based exemplars to inform community-based crisis management planning and preparation efforts, as well as improve future crisis communications.

References

- An SK, Gower KK (2009) How do the news media frame crises? A content analysis of crisis news coverage. *Public Relations Review* 35:107–112
- Andes N (2011, June 24) Bacteria warning for lake swimmers. *KTUL.com*.

- <http://www.fox23.com/news/local/story/Blue-Green-Algae-Scare-Impacts-Grand-Lake-Business/PRXKhpmJvE6sqeMKUdizzg.csp>. Accessed October 4, 2011
- Bandura A (1997) *Self-efficacy: The exercise of control*. Freeman, New York
- Blackman P (2009, December 15) The Marion Reservoir story. Grand Lake Watershed Alliance Foundation. <http://glwaf.org/?p=223>. Accessed November 3, 2011
- Canfield K (2011, July 2) Despite advisory, Fallin spending holiday weekend at Grand Lake. Tulsa World. http://www.tulsaworld.com/news/article.aspx?subjectid=12&articledid=20110702_12_0_KE. Accessed October 4, 2011
- Carter S (2012) Expert: New law for monitoring blue-green algae inadequate for public protection in Okla. The J Record. <http://www.questia.com/newspaper/1P2-33093760/expert-new-law-for-monitoring-blue-> Accessed 12 Mar 2014
- Casaletto, D. (2011, July 11). We strongly discourage any body contact with the water at this point. Ozarks Water Watch. archive.constantcontact.com/fs075/1102224436468/archive/1106483306152.html. Accessed 4 Oct 2011
- Ruth B (2011, July 7) The Chronicle of Grand Lake. <http://www.grand-chronicle.com>. Accessed 10 Aug 2011
- Coombs WT (2008) Conceptualizing crisis communication. In Heath R, O’Hair D (eds) *Handbook of Risk and Crisis Comm*, p 99–118
- Cox R (2007) Nature’s “crisis disciplines”: Does environmental communication have an ethical duty. *Environmental Comm: A J of Nature and Culture* 1:5–20
- Entman, RM (1993). Framing: Towards clarification of a fractured paradigm. *J of Comm* 43(4):51–58
- EPA (2014) Climate change and harmful algal blooms. <http://www2.epa.gov/nutrientpollution/climate-change-and-harmful-algal-blooms>. Accessed May 14, 2014
- Freestone D, Hey E (1996) Origins and development of the precautionary principle. In Freestone D, Hey E (eds) *The Precautionary Principle and International Law*, p 3–15. The Hague: Kluwer Law International
- Goering L (1997, December 7) Death by pond scum: Blue-green neurotoxin -- algae killed 69 people in Brazil, and the problem could spread. The Chicago Tribune. <http://community.seattletimes.nwsources.com/archive/?date=19971207&slug=2576812>. Accessed 1 Jun 2014
- Goffman E (1974) *Frame analysis: An essay on the organization of experience*. Harper & Row, New York
- GRDA (2011, July, 30) GRDA discouraging swimming in Grand Lake. <http://www.grda.com/grda-discouraging-swimming-in-grand-lake/>. Accessed 4 Oct 2011
- Gregory R (1989) Improving risk communications: Questions of content and intent. In Leiss W (ed) *Prospects and problems in risk communication*. University of Waterloo Press, Waterloo, Canada p 98–132
- Heath RL, Palenchar MJ, Proutreau S, Hocke T (2007) Nature, crisis, risk, science, and society: What is our ethical responsibility. *Environmental Comm* 1:34–38
- Kasperson RE (1992) The social amplification of risk: Progress in developing an integrative

- framework. In Krinsky S, Golding D (eds) *Social theories of risk*, Praeger, Westport, CT, US p153–178
- Levin IP, Gaeth GJ, Schreiber J, Lauriola M (2002) A new look at framing effects: Distribution of effect sizes, individual differences, and independence of types of effects. *Organizational Behavior and Human Decision Processes* 88(1):411–429
- Lisbonne S (2012, September 8) Just picture it: The imagesphere. <http://techcrunch.com/2012/09/08/just-picture-it-the-imagesphere/>. Accessed 2 May 2013
- Maguire S, Ellis J (2009) The precautionary principle and risk communication. In Heath RL, O’Hair D (eds) *Handbook of risk and crisis communication*, Erlbaum, Mahwah, NJ p 119–137
- Mason A, Wright KB (2011) Framing medical tourism: An examination of appeal, risk, convalescence, accreditation, and interactivity in medical tourism websites. *J of Health Comm* 16:163–177
- McComas K, Shanahan J (1999) Telling stories about global climate change: Measuring the impact of narratives on issue cycles. *Comm Research* 26(1):30–57
- Miller A (2010, May 13) E. coli at the Lake of the Ozarks: one year later. *Vox Magazine*. <http://www.voxmagazine.com/stories/2010/05/13/e-coli->. Accessed 9 Nov 2011
- Millner AG, Veil SR, Sellnow TL (2011) Proxy communication in crisis response. *Public Relations Review* 37(1):74–76
- Morgan R (2011, July 2) Lakegoers urged to stay out of Grand. *The Tulsa World*. http://www.tulsaworld.com/news/state/lakegoers-urged-to-stay-out-of-grand/article_d6f06b31-6d9b-55b9-9393-ffe2cf967dcc.html. Accessed 1 Nov 2011
- Nelkin D (1995) *Selling science: How the press covers science and technology*. WH Freeman, New York
- O’Riordan T, Jordan A (1995) The precautionary principle in contemporary environmental politics. *Environmental Values* 4(3):191–312
- Peter ML (2011) BGA poses threat to animals and humans. <http://www.petandkennelsupply.com/blue-green-algae>. Accessed 10 Mar 2012
- Potter W, Levine-Donnerstein D (1999) Rethinking validity and reliability in content analysis. *J of Applied Comm Research* 27:258–284
- Richardson B (1994) Socio-technical disasters: Profile and prevalence. *Disaster Prevention and Management* 3(4):41–69
- Sampson RJ, Raudenbush SW, Earls F (1997) Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science* 277:918–924
- Schwarze S (2007) Environmental communication as a discipline of crisis. *Environmental Comm: A J of Nature and Culture* 1:87–98
- Scripps Media (2011, July, 1) Blue green algae found on Grand Lake in northeast Oklahoma. *Tulsa, Oklahoma. KJRH-TV*. http://www.kjrh.com/dpp/news/local_news/blue-green-algae-found-on-grand-lake-in. Accessed 4 Oct 2011
- Scott C (2009) Grounded theory. In S Littlejohn, K Foss (eds) *Encyclopedia of communication theory*. (pp 448–451) Sage, Thousand Oaks, CA. doi:<http://dx.doi.org/10.4135/9781412959384.n166>
- Tesser A, Rosen S (1972) Similarity of objective fate as a determinant of the reluctance

- to transmit unpleasant information: The MUM effect. *J Of Personality And Society Psychology*, 23(1), 46–53. doi:10.1037/h0032881
- Turner B (2011, August 9) BGA outbreak brings awareness of lake population. *GTR Newspaper*. <http://gtrnews.com/greater-tulsa-reporter>. Accessed 4 Oct 2011
- Ulmer RR, Sellnow TL, Seeger MW (2014) *Effective crisis communication: Moving from crisis to opportunity*. Sage, Thousand Oaks, CA
- Ungar S (1992) The rise and (relative) decline of global warming as a social problem. *The Sociological Q* 33(4):483–501
- Wilson KM (1995) Mass media as sources of global warming knowledge. *Mass Comm Review* 22:75–89
- Young C (2011, August 29) Sales tax numbers show algae had little effect on Grand Lake revenue. *Tulsa World*. <http://www.tulsaworld.com/news/state/sales-tax>. Accessed 2 Jan 2012
- Zehr SC (2000) Public representations of scientific uncertainty about global climate change. *Public Understanding Science* 9:85–103