Chapter 44
Harnessing the Chaotic:
Using the Participatory Geoweb to Make Sense of Forest Fires

Jon M. Corbett
University of British Columbia Okanagan, Canada

Samantha Brennan
University of British Columbia Okanagan, Canada

Aidan Whitely
University of British Columbia Okanagan, Canada

ABSTRACT

Communities in the Okanagan Valley, Canada are increasingly under threat from forest fires due to climate change and expanding urban development into fire interface zones. The effects of forest fires are not always quantifiable 'hard' impacts. The fluid and chaotic 'soft' impacts can have a profound effect on the collective consciousness of the people living close to the fires. To make sense of these impacts and understand where and when these forest fires have taken place, the authors have developed and implemented a Geoweb tool to support citizen-to-citizen dialogue and tell the stories of these impacts. This article will explore the interlinked 'chaos' that exists between forest fires, GIS and volunteered geographic information, using a Geoweb focused case study from the Okanagan Valley, and argue that the Geoweb offers an unprecedented opportunity for citizen-citizen interaction and combines many types of dissimilar and unstructured data into a unified whole.

INTRODUCTION

While pockets of stability appear, chaos is integral in every facet of the natural and human environment, be it the weather (Lorenz, 1993; Palmer, 1993), ecology (Worster, 1994; Hastings et al, 1993; Rai and Schaffer, 2001) or human system (Loye and Eisler, 1987). The difficulty in predicting natural forces, including fire, is influenced by this inherent chaos. Although certain elements increase the probability of forest fires (drought conditions, densely forested areas, hot weather, and so on), predicting with

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exactitude where and when fires will appear is as uncertain as guessing where lightning will strike or human carelessness will next occur. People continue to be surprised by nature as it acts in ways that defy weather models or resist prediction. But in many ways, humans themselves are as unpredictable as the forces of nature, making the human influence on forest fires equally difficult to calculate. When citizens interact with each other the potential for chaotic behavior increases. The intersection of human and ecological chaos is exemplified during natural disasters. While predictive modeling may be able to forecast the outcome in a controlled environment, the impact on the ground depends upon a multitude of unpredictable factors occurring at the interface of the environment and people (daily conditions, preparedness, time of day, and so on). During disasters such as forest fires there are quantifiable 'hard' impacts—lost resources, burnt homes and associated financial costs—but there are also qualitative 'soft' impacts, psychological, social and familial amongst others, that can have a profound effect on the collective consciousness as well as long term livelihoods of those impacted. The 'soft' impacts are chaotic precisely because of their embedded complexity within the human psyche and the factors that influence our decision-making processes.

Interpersonal communication is becoming progressively more mediated in online environments; allowing spatially disparate individuals and groups to socialize, share experiences and knowledge (Bishop, 2007). This is increasingly made possible through the rapid development of interactive and immersive web technologies, application programming interfaces (APIs) and frameworks. Previous incarnations of the web were built for one-way communication, making mass interaction nearly impossible. New applications and programming languages (Javascript, AJAX), have introduced interactive and inclusive aspects of the web (O'Reilly, 2007). Advances in technology and the ubiquity of open-source software and inexpensive tools has made it possible for many computer users to contribute to (and create) a network of spatial data and information online, this is increasingly referred to as the geospatial web (or geoweb). The geoweb refers to "integrative, discoverable collection of geographically related web services and data" (Lake and Farley, 2007, 7) that increasingly invites a growing number of contributors to share their own spatial experiences (Crampton, 2009; Stephens, 2013). The geoweb "implies the merging of geographic (location-based) information with the abstract information that currently dominates the Internet" (Haklay et al., 2008; Haklay, 2013). Data is 'geotagged', i.e. geographic coordinates are embedded into a document, photograph or other dataset, and thus the information is linked to location (Turner, 2006). Through mass collaboration individuals cooperate through the medium of the geoweb to solve a problem or use their "collective wisdom" (Stephens, 2013) through the process of volunteered geographic information (VGI) (Castelein et al., 2010; Goodchild, 2008; Sui et al., 2014) VGI, a term first used by Michael Goodchild in 2007, is understood as "the widespread engagement of large numbers of private citizens, often with little in the way of formal qualifications, in the creation of geographic information" (Goodchild, 2007b, 212). The geoweb often provides the framework and applications to support the input and sharing of these data, as well as to make online data resources more comprehensive, and in certain instances more accurate (Sui, 2008; Grira and Bédard, 2009), but also create and contribute to maps that are increasingly fleeting and 'of the moment', (Kitchen and Dodge, 2007). By definition, the communicating of human experiences in these unstructured ways has the potential to make these experiences less coherent (Graham et al., 2012) and create spatial products that are liable to be fixed around subjective knowledge claims (Elwood and Leszczynski, 2012) that reflect social position (Crutcher and Zook, 2009) and pluralist ontologies with competing and discordant versions of spatial reality (Warf and Sui, 2010), thus making the geoweb dynamic, divergent and chaotic.