Cheong, S.-M. 2014. The roles of networks, learning, and general resilience in oil spills. *Ecology and Society* **19**(2):65. http://dx.doi.org/10.5751/ES-06636-190265

Guest Editorial, part of a Special Feature on Vulnerability and Adaptation to Oil Spills

The roles of networks, learning, and general resilience in oil spills

So-Min Cheong [1]

Key Words: *adaptation; oil spills; vulnerability*

The occurrence of oil spills is a global problem that requires a complex set of scientists, engineers, governments, corporations, and communities to address. The objective of this special feature is to understand the dynamic process of adaptation in the face of economic and ecological vulnerabilities as related to major oil spills, such as the Deepwater Horizon oil spill in the United States in 2010 and the Hebei Spirit oil spill in Korea in 2007. The special feature originated from a symposium of the same title, Vulnerability and Adaptation to Oil Spills, at the annual meeting of the American Association for the Advancement for Science in 2012. We tackle new issues ranging from citizen science, corporate social responsibility, community adaptation, regulatory change, and an oil spill impact framework, all of which have seldom been addressed in past studies of oil spill consequences.

Three major themes—networks, learning, and general resilience—emerge in this feature as governments, corporations, and communities learn to cope with vulnerabilities and adapt after mega oil spills. Crowdsourcing discussed in McCormick's work reflects the social network that is essential for survival after disasters. Crowdsourcing is a relatively new online tool whereby people can submit community exposure information online. This method of data collection has changed the nature of the networks employed to understand the science of oil spill exposure and impacts. It has also advanced citizen science by broadening the range of participation beyond traditional actors, such as scientists and government agencies, to incorporate locals with weak or nonexistent ties to government agencies, scientists, and even to one another.

Cheong's paper on community adaptation to the Hebei Spirit oil spill emphasizes the significance of communities' dependence on external linkages rather than on self-reliance in times of environmental disasters. She examines the types and effects of external networks by analyzing a range of community responses, including initial responses, early social impact, compensation, and conflicts. Colten et al.'s paper, on the other hand, argues for the inherent resilience that local communities manifest through internal networks. They cite the negative effects of external funding infused into local communities, i.e., generation of complacency and destruction of local networks. The stress on local networks vis-à-vis external entities is also apparent in McCormick's paper, which describes how citizens can exercise some ownership and control of scientific information by collecting their own data.

Colten et al. and McCormick do not necessarily advocate complete local independence and self-reliance. Rather, they advocate more inclusion of local know-how, information, and perceptions in formal oil spill contingency planning, as well as in expert-led, oil-spill impact and exposure mapping. As Cheong's paper notes, the effects of external linkages need to be examined closely in light of the complementarities and power relations between external entities and affected communities. To exploit external networks, a proper assessment of community capacity to absorb resources and information is necessary.

Learning is another major theme that runs through this special feature. Two types of learning—episodic and transformative—occur after disasters (Gunderson 2010). The crowdsourcing discussed in McCormick's paper can generate episodic learning with increased data availability. Transformative learning could potentially follow with inherent resilience as locals accumulate their know-how and knowledge over time and learn after each disaster. Cheong notes that prior learning also plays a significant role. Learning that transfers from one event to a similar event (e.g., from one flood to the next flood) leads to the assumption that this learning transfers to other, different disasters. In the case of coastal Louisiana, prior learning led to confusion and resentment when residents accustomed to frequent hurricanes had to respond and adapt to the Deepwater Horizon oil spill. The top-down command system, different compensation scheme, and the environmental focus that accompanied the spill led to delayed response and duplicated authorities. Thus, not all learning may be necessarily positive, as some learning experience can be a barrier to effective response and recovery after a new disaster.

Resilience, the third theme of the special feature, has become an extremely popular notion in disaster management. What has gained less attention is the notion of general resilience. Instead of fixing one aspect of a system that could make other parts of the system less robust, Walker and Westley (2011) state that building general resilience of a system is the key to sustaining social-ecological resilience in the long term. For example, regulatory change from one act to another was a difficult transition in coastal Louisiana because people were locked into a specific pattern of response and adaptation to hurricanes. Thus, a focused, specific resilience turned into a new vulnerability.

Combining different strategies is one way to expand general resilience and prepare for the unexpected. Frynas recommends hybrid regulations that mix both voluntary regulations (corporate social responsibility) and government regulations in order to prevent oil spills. Hybrid regulations also contribute to raising general environmental sustainability. Corporate social responsibility can offer technological and managerial expertise, faster responses, and more innovation. Government regulations or pressure are necessary to spur voluntary regulations and they can be enforced in every case. Colten et al.'s work also proposes

[1]Associate Professor, Department of Geography, College of Liberal Arts & Sciences, University of Kansas

integrating local adaptation strategies into formal planning in order to raise overall resilience. McCormick's paper on citizen science, in the same vein, calls for the inclusion of citizen science along with expert science in order to create a more powerful and complementary scientific database. Chang et al. wrap up this special issue with their synthesis framework of oil spill consequences, ranging from biophysical, economic, and health impacts. Chang et al. caution us not to readily transfer lessons from one location to another, as they illustrate with their discussion of the potential impacts of an oil spill in Vancouver, Canada.

Responses to this article can be read online at:
http://www.ecologyandsociety.org/issues/responses.php/6636

Acknowledgments:

Special thanks to Lance Gunderson and Jennifer Miner for their helpful reviews and constant assistance. I also thank all the contributing authors to this special issue, and the reviewers of their manuscripts, for their wonderful work. Open access publishing support was partially provided by the Walter and Johanna Kollmorgen fund, University of Kansas Libraries.

LITERATURE CITED

Gunderson, L. 2010. Ecological and human community resilience in response to natural disasters. *Ecology and Society* 15(2):18. [online] URL: http://www.ecologyandsociety.org/vol15/iss2/art18

Walker, B., and F. Westley. 2011. Perspectives on resilience to disasters across sectors and cultures. *Ecology and Society* 16(2):4. [online] URL: http://www.ecologyandsociety.org/vol16/iss2/art4/