



A life cycle hazard assessment (LCHA) framework to address fire hazards at the wildland-urban interface

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The stages of planning for and responding to natural hazards, such as wildfires and related events, are often conducted as discrete (and often not connected) efforts. Disaster response often takes precedence, exhausting agency and stakeholder resources, and the planning stages are conducted by different agencies or entities with different and often competing agendas and jurisdictions. The result is that evaluation after a disaster can be minimal or even non-existent as resources are expended and interest moves on to the next event. Natural disasters and hazards, however, have a tendency to cascade and multiply: wildfires impact the vulnerability of hillslopes, for example, which may result in landslides, flooding and debris flows long after the initial event has occurred. Connecting decisions across multiple events and time scales is ignored, yet these connections could lead to better policy making at all stages of disaster risk reduction. Considering this situation, we present an adapted life cycle analysis (LCA) approach to examine fire-related hazards at the Wildland-Urban Interface in the American West. The LCHA focuses on the temporal integration of : 1) the 'pre-fire' set of physical conditions (e.g. fuel loads) and human conditions (e.g. hazard awareness), 2) the 'fire event', focusing on computational analysis of the communication patterns and responsibility for response to the event, and 3) the 'post-event' analysis of the landscape susceptibility to fire-related debris flows. The approach of the LCHA follows other models used by governmental agencies to prepare for disasters through 1) preparation and prevention, 2) response and 3) recovery. As an overlay are the diverse agencies and policies associated with these stages and their respective resource and management decisions over time. LCAs have evolved from a business-centric consideration of the environmental impact of a specific product over the products life. This approach takes several phases to end up with an assessment of the impact of the product on the environment over time and is being considered beyond the business and logistics communities in such areas as biodiversity and ecosystem impacts. From our perspective, we consider wildfire as the "product" and want to understand how it impacts the environment (spatially, temporally, across the bio-physical and social domains). Through development of this LCHA we adapt the LCA approach with a focus on the inputs (from fire and pre-fire efforts) outputs (from post fire conditions) and how they evolve and are responded to by the responsible agencies and stakeholders responsible. A Life Cycle Hazard Assessment (LCHA) approach extends and integrates the understanding of hazards over much longer periods of time than previously considered. The LCHA also provides an integrated platform for the necessary interdisciplinary approach to understanding decision and environmental change across the life cycle of the fire event. This presentation will discuss our theoretical and empirical framework for developing a longitudinal LCHA and contribute to the overall goals of the NH7.1 session.