Abstract

The population of the State of Washington is growing rapidly, especially in areas surrounding Seattle and Tacoma. The population in 2010 was reported as 6.7 million and is projected to be 9.9 million by 2060, an anticipated growth rate of approximately 50%. This population growth leads to increased development in the suburbs of major cities and towns, causing urban sprawl. Washington State is also home to seven active volcanoes, all within 100 miles of major cities. As urban sprawl occurs, development extends into areas adjacent to volcanoes. Due to these trends it is important to understand the location and size of future development of the region for decision-making and hazard mitigation. This study focused on the region surrounding Mount Rainier, as it is the volcano closest to Seattle and Tacoma. A land use change analysis must be performed to assess how urban development could be impacted by volcanic hazards. This study uses the Land Use Conflict Identification Strategy (LUCIS) model created by Carr and Zwick (2007) to visualize potential land use in conflict with volcanic hazards. Potential future allocation of conservation, agriculture, and urban land use was determined using economic, transportation, physical geography, agricultural, and biological data. Results show that urban land is most suitable in areas near existing urban areas in the western portion of the study area. Agriculture lands are most suitable through the central portion of the study area and conservation land is suitable in the majority of the study area. Future land allocated to urban land exceeds the number of acres required to sustain the future population, by pushing into the agriculture land while conserving more lands suitable for conservation. Urban cells affected by a volcanic eruption of Mount Rainier have the potential to double with new development. This study creates a visualization of where developers can plan for the future while limiting the impact of volcanic hazards on humans and their property.