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Masters of Science
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ESTIMATING THE IMPACT OF 21st CENTURY CLIMATE CHANGE ON WILDFIRE RISK POTENTIAL

About Meghna: Meghna has earned her MS in Environmental Studies, at San Jose State University, CA (May 2006) and an MS in Analytical Chemistry from the University of San Francisco, CA (May 2003). Her experience includes: Associate faculty, Collin County Community College District, Plano, Aug 2006- Present. Associate Faculty with the Department of Geology and Environmental Studies teaching Introduction to Environmental Science (lecture and lab) Part-time faculty of Department of Environmental Studies, CSUEB, Hayward, June-Aug 2006. Teaching Undergraduate level course " Introduction to Environmental Studies Consultant, Union of Concerned Scientist, Berkeley, CA, Jul 2005 – Sep 2005. Acted as a Consultant and contributed to the UCS database on the projected impacts of climate change in California. Research was conducted to estimate the impact of climate change on wildfire risk potential for Sequoia and Kings Canyon National Park. Research Assistant, Center for Environmental Science and Policy, Stanford Institute for International Studies, Stanford University, Jun 2005 – Jul 2005. As a research assistant, I created global long-term ecological databases on migration phenology, egg-laying, and range distributions to assess ecological change over long time periods. Literature search for recent articles on global phenology change. Intern, SOMA Corporation, Emeryville, CA, Summer 2004. Received training in HHRA and ERA methodology based on California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) and U.S. EPA guidance. Learned U.S. EPA's ProUCL software to estimate the 95 percent upper confidence limit of the arithmetic mean (95UCL) concentrations of environmental data. Conducted sensitivity tests on parameters of the Johnson and Ettinger Model for vapor intrusion into indoor air. The results of the sensitivity tests were incorporated into a presentation delivered by SOMA Corporation at a Groundwater Resources Association conference. Fellow, Conservation Science Institute, Santa Cruz, CA, Dec 2004 – present Write articles on Global warming/global climate change for the monthly newsletter. Research Assistant, Laxminarayan Institute of Technology, India, July -Dec 99 Worked in the area of "Anti-fouling and Eco-friendly Coatings" a joint project of the Department of Oil and Paint Technology and Department of Microbiology, funded by Jotun A/s Norway. Performed formulation and preparation of paints and monitored their effect on the marine ecosystem. Studied synthetic and natural anti-fouling agents. Chemist, Enviro Techno Consultants, India, Summer 97.Carried out physico- chemical analysis of wastewater samples from industrial effluent treatment plants using standard

protocols including COD and BOD and detecting toxic metals like iron and magnesium in water

Abstract: Fire occurrence in forests is driven by levels of fuel moisture content and, as such, is highly sensitive to changes in climate. Under current climate change projections, wildfire risk potential can be expected to increase significantly. Increased evaporation due to the increase in temperatures, will lead to more severe and longer-lasting droughts in some areas. Drought is an important indicator of fire in that it affects the amount of available fuel. Because of their low moisture content fuel becomes available during periods of drought, resulting in more intense fire. When studying the role of climate on the area of forest burned, several meteorological parameters like temperature, precipitation, and drought indexes such as the Keetch-Byram Drought Index (KBDI) have been used to study the relationship between climate and area burned by forest fires. This study will provide useful insights into the interconnections between 21st century climate change, drought, and forest fire for Sierra Nevada forests like Sequoia and Kings Canyon National Park based on the Keetch/Byram Drought Index. We explore this wildfire risk potential based on the highest and lowest intergovernmental Panel on Climate Change emission pathways. The results indicate more days exceeding "drought conditions," and a contrast between higher and lower emissions scenarios. It is important to understand and predict the potential of large fires to track the large-scale build up of forest fuels, and to develop warning systems and mitigation measures to protect and conserve the forest ecosystem. If climate change increases the future wildfire risk potential, we can expect changes in the behavior and response of plant and animal species, loss of habitat, and range shifts. Understanding ecosystem responses to climate change can help in predicting the ecological consequences of current and future climate change, in order to plan conservation strategies for warmer climates.