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An Overview of Nepal with an Emphasis on Hydrogeology

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Abstract: Nepal is a fascinating place to visit but also presents a series of contrasts: beautiful scenery vs widespread air & water pollution; friendly people vs strange semi-exotic society; tremendous potential vs widespread poverty; an ancient civilization vs globalization. Nepal sits on the southern side of the Himalayas and shares 8 of the 10 highest peaks in the world with its northern neighbor China (Tibet). As such it serves as kind of a buffer zone between that country and India and therefore is of strategic interest to the US and others. The Himalayas, obviously the main feature of the area, were created by the collision of the sub-continent of India with the underbelly of Asia proper over the past 50 Ma or so. Most of the bedrock in the main mass of the mountains is made of thrust-faulted, foliated metamorphic rocks intruded by granitic plutons all covered with a thin veneer of Quaternary (?) alluvium and colluvium. At the southern edge of the orogen is a relatively thin series of tilted, uplifted sedimentary rocks, the "Churia Range", which merges with the flatter Indo-Gangetic plain in the "Terai" to the south that continues on into India. Most of the country outside of the capital Kathmandu functions as what is called a "mixed agricultural system" in which autonomous family units raise a variety of crops and animals. Small villages and individual houses sit amidst dwindling forests and terraced fields of rice, corn, vegetables, ginger, etc., with chickens, goats, and usually a cow and/or water buffalo. The monsoon season brings abundant precipitation, and water for crops, from June through September but for the rest of the year most areas away from major streams depend upon springs. Therein lie the challenges of providing an adequate supply of clean water, and hence food, for a growing population in light of changing regional conditions. Rainfall, and concomitant runoff, appears to be declining over the past decade or two; most glaciers in the country are receding; many springs are declining. Potential solutions to these concerns are complex and difficult to apply especially in light of natural disasters like earthquakes, landslides, and floods. Results of our studies show that surface-water quality is variable but especially of concern in regard to phosphorous and fecal coliform bacteria. In one area about 85% of springs have diminished flow or have dried up completely in the last 10 to 20 years. Many other socio-economic conditions also need to be addressed.

Biography: Tim Duex is currently an Associate Professor of Geology in the School of Geosciences at The University of Louisiana at Lafayette where he has served since 1984. He received a B.S. from the University of Wisconsin-Oshkosh and entered the graduate program at Rice University in Houston. After two years there, in the midst of the Viet Nam conflict, he was awarded an all-expense-paid trip to Germany courtesy of the US Army. While there he finished his Master's degree and tour of duty in the military and spent the next few years traveling around Europe teaching Geology to the military. While doing so he became enlightened and realized that teaching was easier than a real job and so he enrolled in a Ph. D. program at The University of Texas at Austin. He finished the Ph. D. in 1983 and held a few one year appointments at several schools until he arrived in Lafayette and his present position. He has taught a variety of courses from introductory Geology through Mineralogy and Petrology to Hydrogeology and Field Camp to name a few. His research is likewise quite esoteric and includes Hydrogeology, Environmental Geology, and Igneous Petrology. Although not confirmed by factual data,

he is probably one of the top ten volcanologists in southwest Louisiana. The talk today presents some of the results of recent research, travels, and (mis)-adventures in Nepal thanks in large part to the work of my colleague and native Nepali, Dr. Durga Poudel and people he has brought together. Tim is a member of Lafayette Geological Society, GSA, and AAPG where he serves as the Gulf Coast regional representative for the Division of Environmental Geosciences. He has also been UL's representative on the (Ground) Water Advisory Task Force since 2001 and serves as the Mineral curator for the UL Geology Museum which is housed in the Lafayette Science Museum.