

## **HEALTH AND EARTH MEDICAL GEOLOGY BUILDING A SAFER ENVIRONMENT**

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Emerging diseases commonly present the medical community with many difficult problems. In addition, emerging disciplines may offer the medical community new opportunities to address a range of health problems. One such emerging discipline is Medical Geology.1-4 Medical Geology can be considered as a complement of environmental medicine dealing with the impacts of the natural geologic materials and processes (that is, the natural environment) on the incidence and spatial/temporal distributions of human (and other animal) diseases. As one of the selected topics highlighted during the International Year of Planet Earth (2007-2009), medical geology is aimed at improving interdisciplinary interactions among earth and public health scientists, providing the basis for innovative and exciting research that can lead to new discoveries and greater knowledge. Among the environmental health problems that medical scientists are working with the geosciences community are: exposure to toxic levels of trace elements such as arsenic, cadmium, mercury and uranium; trace element deficiencies; exposure to natural dusts and to radioactivity, and naturally occurring organic compounds in drinking water. Analytical characterization of naturally-occurring trace elements and toxic organic compounds in ground water is helping to explain patterns of diseases such as arseniasis, fluorosis, and Balkan Endemic Nephropathy – a condition leading to end-stage kidney failure. Satellites and geographic information systems are being used to monitor the movement of large dust clouds moving across oceans carrying toxic metals and pathogenic microbes that may kill coral and may cause asthma. Regionally, dust exposure can affect broad regions such as the dust stirred up by earthquakes in the arid regions of the southwestern U.S. and northern Mexico. This dust carries spores of a fungus (*Coccidioides immitis*) that cause Valley Fever, a potentially fatal respiratory condition. Although the consequences of this type of exposure are not fully understood, modern medical and environmental techniques offer promise of developing innovative solutions to prevent or minimize exposure to potentially deleterious natural environmental pollutants and processes. In this presentation, we provide an overview and examples of some of the health problems being addressed by medical geologists dealing with exposure to natural materials and environmental processes.

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