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Tropical Rainfall Measuring Mission

Climate and Disease

When we think about changes in the weather, we automatically think about heat waves, cold snaps, rain and drought, etc. When any of these changes become extreme, we turn up the air conditioner, turn up the furnace, water the lawn or do whatever is necessary to cope with the current weather conditions. But for those who make their livelihood as farmers or fishermen, these extremes can yield serious damage as droughts destroy crops and the fish supply dwindles.

Most of us are aware of the effects that the weather phenomena called El Niño can have on global weather, producing droughts in some areas, flooding in others, and completely devastating the fishing industry in certain areas of the world. Now, research is beginning to show the correlation between these weather changes and disease. Some secondary effects associated with the 1982-83 El Niño were:

- an outbreak of encephalitis caused by a warm, wet spring along the east coast of the United States
- an increase in snake bites in Montana as the hot, dry weather drove mice from higher elevations in search of food and water; the rattlesnakes followed
- an increase in shark attacks off the Oregon coast due to unseasonably warm ocean temperatures
- an increase in cholera in Bangladesh
- an increase in typhoid, shigellosis, and hepatitis in South America
- an increase in viral encephalitis in Australia.

In Egypt, near the Nile River Delta, there is concern about a devastating parasite-borne disease called schistosomiasis. It seems that the places that have the most soil moisture are most likely to harbor the parasites. These parasites use snails as their host, and the wetter the area, the more likely it is that the snails will survive and increase the risk of infection in humans. There is a similar problem with locust infestations in moist regions of Africa.

The Tropical Rainfall Measuring Mission (TRMM) is designed specifically to measure rainfall in the tropics and subtropics, and provide information concerning the levels in the atmosphere where heating and cooling associated with the rain are taking place. As the

satellite orbits the Earth, it will locate areas where rain is falling, and give monthly reports on total rainfall that has fallen in those areas. This information will allow epidemiologists to focus on areas where disease is most likely to spread. They can then take steps to control the spread and be prepared to provide therapy to those who become ill.

TRMM's information will feed into global climate models which can then be used to make predictions concerning when and where climate changes are likely to occur, what changes can be expected, and how long they will last. This information will provide scientists the information necessary to improve their models so they can more accurately detect the conditions leading up to an El Niño episode and other disturbances in the atmosphere. TRMM will be one of several spacecraft tracking the 1997-98 El Niño as it unfolds and will help determine when the episode will end. A National Research Council Committee composed of disease experts and climate scientists is being formed, and it will be co-chaired by the TRMM Project Scientist. They will use the TRMM data to come to a better understanding of the correlation between climate and disease.

Visit the TRMM Homepage at
http://trmm.gsfc.nasa.gov