

## **Tracking Hepatitis B Outbreaks on Long Island, Bahamas**

During the summer of 2006 I was given a great opportunity to work for Dr. Kathleen Sullivan-Sealey in her Coastal Ecology of the Bahamas lab at UM. Over the past two years of working in this lab I have enjoyed hands on experience with scientific conservation efforts to determine the anthropogenic impacts of development on small islands in the Bahamian archipelago. However, it is not only human development that threatens the fragile ecosystems of these islands. Global climate change is also playing a key role in altering the natural environment, which in turn is affecting the lives of thousands of people who call the Bahamas home.

The Bahamas is considered a Small Island Developing State (SIDS), and is linked with other nations in the tropics that face issues of flooding due to severe tropical storms and seasonal rainfall. Flooding poses a direct human threat by exposing people to contaminated water caused by overflow of on-site sewage disposal through cess pits or pit latrines. The spread of many communicable diseases after flood episodes has caused a public health crisis on these small islands. Although preventable by vaccination, Hepatitis B has quickly become one of the next major health crises in the Bahamas because of its ease of transmission. This virus is typically spread through sexual/blood contact; however, on these small islands it can spread via contaminated floodwaters.

My proposed research project will help to address the lack of information about the spread of Hepatitis B on the Family Islands, or those less densely populated islands outside of New Providence. This research will focus on central Long Island, including Deadman's Cay, and will occur from June 17 - July 17 to coincide with Dr. Sealey's field season on this island, thus allowing me to access her knowledge and resources about the

terrain and customs necessary for a project of this magnitude. Long Island received over 17 inches of rain during Tropical Storm Noel in November 2007 and remained flooded for several weeks, which exposed many of the 4,000 occupants of the area to contaminated floodwaters.

The overall goal of the project is to determine the correlation between exposure to the contaminated floodwaters and a recent outbreak of Hepatitis B in the community. In the first phase of the project all major flood areas, including homes and septic tanks affected, will be mapped thoroughly. I will use GPS and GIS technologies to collect many data points and then create maps to determine the extent of the area affected by the floodwaters. Since I will be surveying during the wet season it is possible that recurrent flooding may occur, which would allow for mapping of flooded areas similar to those affected by the past storms. The next phase will involve community surveys, which will be reviewed and in line with UM's IRB standards, to determine the levels of exposure by residents of the community to the post storm flooding.

Once all of the data is collected and analyzed, an interactive digital map will be created to outline the high risk areas affected by the last episodes of flooding. Ideally computer modeling will be used in conjunction with this map to determine a possible origin of contaminated waste, therefore allowing for prediction of future contamination. At the completion of the project I will review all data and maps with my contacts in the local Red Cross and Ministry of Health. I am confident that this will help them determine which residents may need to be tested for Hepatitis B in order to contain further spread in the community, and the modeling may give them a clue as how to prevent outbreaks following future flooding episodes.