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Illinois Wesleyan University

Web story

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June 4, 2008 **Contact:** Rachel Hatch (309) 556-3960

Loss of 'Bio-Guards' Endangering Humans Says Professor

BLOOMINGTON, Ill. – The 2008 Cyclone Nagris in Myanmar, Hurricane Katrina in 2005, the 2004 tsunami in Thailand – all these natural disasters have something in common, they all occurred around vanishing 'bio-guards.' An Illinois Wesleyan University professor believes the planned destruction of these bio-guards is attributing to the catastrophic nature of some coastal storms, and jeapordizing human lives.

"Bio-guards are natural barriers between the water and the coastline," said Given Harper, chair of the biology department at Illinois Wesleyan and an instructor in the University's Environmental Studies Program. Coming in the form of salt-tolerant plants and trees in the mangroves of Myanmar, or barrier islands and coastal marshes along Louisiana's shore, bio-guards can help shield the land and people living there from the ravages of storms. "Scientific studies have shown that bio-guards are important in protecting people from the impact of hurricanes and cyclones," Harper said.

After the cyclone devastated Myanmar in early May, leaving more than 80,000 dead and tens of thousands more missing, the secretary-general of the Association of South-East Asian Nations (ASEAN) said the tragedy was exacerbated by the double punch of people moving into the coastal areas and the loss of coastal bio-guards, such as the mangroves. The United Nations Food and Agriculture Organization (FAO) reported that since 1975 nearly 250,000 acres of Myanmar mangroves have been destroyed in the delta that was worst hit by the recent cyclone, and that vegetation might have provided a much-needed buffer.

According to Harper, the tightly knit roots and trees of mangroves act as a barrier that can deflect wind and some of the energy of a storm surge. "Coastal marshes can offer the same protection," he said. "It has been estimated that 2.7 miles of coastal marsh will reduce storm surge by a foot. They simply absorb the energy from the wave."

The natural barrier of bio-guards is disappearing as human encroach on coastlines for business and pleasure. According to the UN, more than 20 percent of the world's mangroves have been lost over the past 30 years. "For mangroves, it appears that aquaculture – development for fishing and shrimping – and also tourism seem to be major factors in their depletion," he said.

Harper has witnessed the transformation of coastlands firsthand. Throughout the 1990s,

he led several student study abroad trips to Queensland, Australia, during the University's May Term. "There were huge areas of mangroves in places such as Cairns that I have seen removed to make way for development," said Harper. "There are now malls and beachfront property and hotels where mangroves once stood." This loss of bio-guards can also be seen in many areas struck by coastal storms. "There is a definite parallel between loss of mangroves in Myanmar and the region and the loss of coastal marshes along the U.S., particularly along Louisiana," he said.

Since the 1930s, Louisiana has lost a million acres of coastal wetlands, said Harper, who noted the building of levees and canals in Louisiana are not only destroying the natural replenishing of bio-guards, but also endangering freshwater marshes. "Levees hold back the silt that would naturally fortify the marshes," he said. "And canals are being constructed for gas and oil exploration that let saltwater in during a hurricane, killing any freshwater plants."

Clearing away bio-guards is dangerous from an ecological perspective, said Harper. "Bio-guards also perform ecological functions from which humans benefit. Both mangroves and marshes are highly productive ecosystems that are a nursery grounds for a lot of fish and shellfish consumed by humans."

The world is beginning to realize the importance of preserving bio-guards. After the 2004 tsunami in Thailand, studies showed that loss of life was much less severe in areas with intact mangroves, said Harper. The National Rapid Environmental Assessment also noted that the level of devastation depended not just on the slope and elevation of the land, but the presence of natural barriers, such as bio-guards.

"There are mangrove restoration projects in parts of Asia, Thailand in particular," said Harper, who also takes students to Costa Rica, where they hike through mangroves protected in a national park. "In the U.S., there are coastal restoration efforts. Yet, in order to really restore the Louisiana wetlands, it will take millions upon millions of dollars, and unfortunately, money has not been earmarked for that purpose."

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