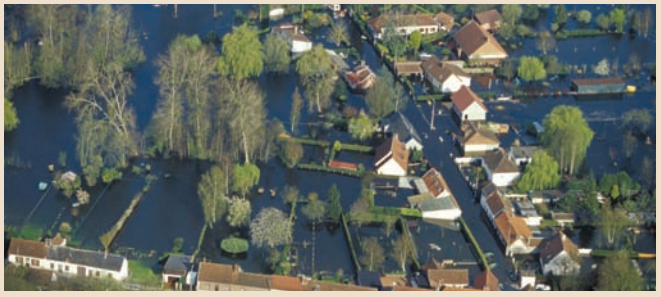
BOX 1.1 | The role of biodiversity in mitigating the impacts of natural disasters

The year 2005 witnessed the largest financial losses ever recorded as a result of natural disasters, with preliminary estimates of total economic losses reaching over US$ 200 billion. Many experts have suggested that better management of natural ecosystems could lessen the loss of human lives and damage to property caused by such disasters, as explored in the four examples presented here, compiled from various sources.

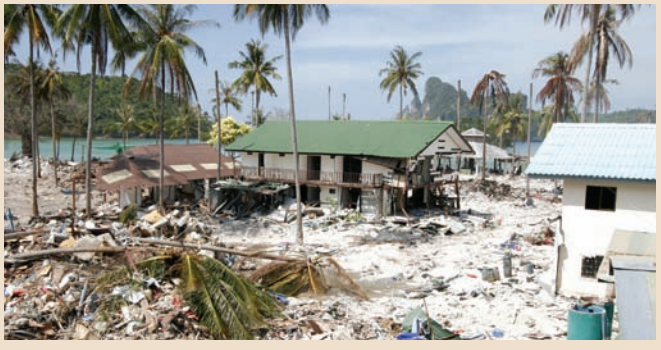


Aerial view of inundations of the Somme river, Picardie, France
Cyrill Ruoso/BIOS/Alpha Presse

ALTERED FLOODPLAINS AND THE FLOODS OF CENTRAL EUROPE: Heavy rains in August 2002 and 2005 triggered catastrophic floods across Central Europe. Most of the natural, meandering stream and river systems in the region have been dyked, straightened and deepened over the past century, altering the flow of water accordingly. The natural ability of the land to retain and store water has also been reduced by the loss of once extensive marshlands and floodplain forests, and by the use of intensive farming methods. Large fields encourage runoff and erosion, and heavy machinery compacts the soil, limiting the land's capacity to absorb excess water. Options for improved river basin management to reduce risks from floods are being explored.

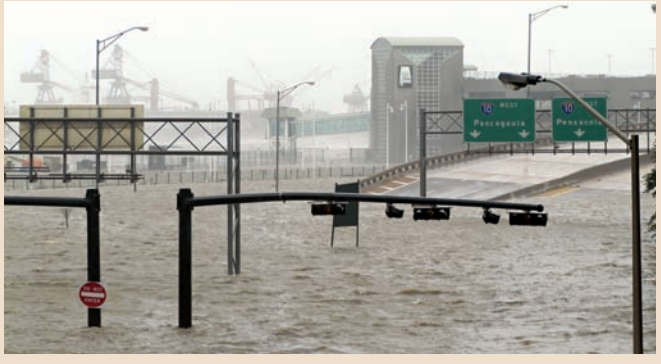
Deforestation in the countryside, Haiti
Julio Etchart/Alpha Presse

DEFORESTATION AND TROPICAL STORMS IN THE CARIBBEAN: In 2004, tropical storm Jeanne hit the island of Hispaniola, killing close to 3,000 people in Haiti, but only 18 people across the border in the Dominican Republic. This difference in human suffering has been linked to extensive deforestation in Haiti, where political turmoil and extreme poverty have led to the destruction of all but some 2% of the country's original forest cover. Restoring forest ecosystems in Haiti would help to delay and reduce peak floodwater flows at local scales, making communities safe from the water torrents that now follow even normal rainfalls.



Destruction caused by tsunami, Koh Phi Phi (Loh Dalam Bay), Thailand
Hartmut Schwarzbach/Alpha Presse

MANGROVES AND THE ASIAN TSUNAMI: Mangrove forests have been rapidly disappearing from Southeast Asian coastlines in recent decades to make way for vast shrimp farms and tourist resorts. The tsunami that hit Asia in December 2004 revealed the devastating consequences of this loss. Although coastal vegetation could not have protected against catastrophic destruction in areas of maximum tsunami intensity, analysis of satellite images revealed that areas with mangrove or tree cover were significantly less likely to have experienced major damage. This underlines the protective role of coastal forests in reducing damage, including from regular storms, such as the typhoons that batter the Philippines every year. Efforts to replant mangroves are underway, but face challenges from coastal developers.



Hurricane Katrina overflowed Mobile Bay and downtown Mobile, Alabama with 3–5 metres of storm surge. August 29th, 2005
Weatherstock/Alpha Presse

COASTAL WETLANDS AND HURRICANE KATRINA IN THE UNITED STATES: Hurricane Katrina touched down on a coastal region of the United States that has been under environmental pressure for over a century. Re-engineering of the Mississippi River, accomplished through a system of canals and levees, has diverted natural sedimentation flows and steadily eroded coastal wetlands; Louisiana alone loses more than 65 km^2 of coastal wetlands every year. Development has also destroyed barrier islands and oyster reefs that buffered the coast. During the hurricane, the tidal surge was able to travel unimpeded up shipping canals and burst over the levees surrounding New Orleans. Although damage from the storm would have been considerable in any case, breaches occurred more often in areas where wetlands had been destroyed and levees were exposed to wave action.