

Excerpts From Report On Warming's Impact

The following are excerpts from "The Regional Impacts of Climate Change: An Assessment of Vulnerability," a new report by Working Group 2 of the Intergovernmental Panel on Climate Change, a panel of scientists advising the United Nations-sponsored talks on greenhouse gases.

Nature of the Issue

CLIMATE models project that the mean annual global surface temperature will increase by 1 to 3.5 degrees Celsius by 2100, that global mean sea level will rise by 15 to 95 centimeters and that changes in the spatial and temporal patterns of precipitation would occur. The average rate of warming probably would be greater than any seen in the past 10,000 years. . . . Whereas many regions are likely to experience adverse effects of climate change — some of which are potentially irreversible — some effects of climate change are likely to be beneficial. . . .

Ecosystems

The primary influence of anthropogenic climate change on ecosystems is expected to be through the rate and magnitude of change in climate means and extremes — climate change is expected to occur at a rapid rate relative to the speed at which ecosystems can adapt and re-establish themselves — and through the direct effects of increased atmosphere CO₂ concentrations, which may increase the productivity and efficiency of water use in some plant species. Secondary effects of climate change involve changes in soil characteristics and disturbance regimes (e.g., fires, pests and diseases), which would favor some species over others. . . .

The species composition of forests is likely to change; in some regions, entire forest types may disappear, while new assemblages of species and hence new ecosystems may be established. . . . In lakes and streams, warming would have the greatest biological effects at high latitudes — where biological productivity would increase and lead to expansion of cool-water species' ranges — and at the low-latitude boundaries of cold- and cool-water species ranges, where extinctions would be greatest. . . .

Hydrology And Water Resources

Currently, 1.3 billion people do not have access to adequate supplies of safe water, and 2 billion people do not have access to

adequate sanitation. . . .

This number is expected to roughly double by 2025, in large part because of increases in demand resulting from economic and population growth. . . .

Changes in climate could exacerbate periodic and chronic shortfalls of water, particularly in arid and semi-arid areas of the world. Developing countries are highly vulnerable to climate change because many are located in arid and semi-arid regions, and most derive their water resources from single-point systems, such as bore holes or isolated reservoirs. . . .

There is evidence that flooding is likely to become a larger problem in many temperate and humid regions, requiring adaptations not only to droughts and chronic water shortages but also to floods and associated damages, raising concerns about dam and levee failures. . . .

Food and Fiber Production

Generally, middle to high latitudes may experience increases in productivity, depending on crop type, growing season, changes in temperature regimes and the seasonality of precipitation. In the tropics and subtropics . . . yields are likely to decrease. The livelihoods of subsistence farmers and pastoral peoples, who make up a large portion of rural populations in some regions, also could be negatively affected. Marine fisheries production is expected to remain about the same.

Coastal Systems

An estimated 46 million people per year currently are at risk of flooding from storm surges. Climate change will exacerbate these problems Large numbers of people also are potentially affected by sea-level rise — for example, tens of millions of people in Bangladesh would be displaced by a one-meter increase.

Human Health

Climate change could affect human health through increases in heat-stress mortality, tropical vector-borne diseases, urban air pollution problems and decreases in cold-related illnesses. Compared with the total burden of ill health, these problems are not likely to be large. In the aggregate, however, the direct and indirect impacts of climate change on human health do constitute a hazard to human population health, especially in the developing countries in the tropics and sub-tropics. . . .