Severe Impacts of Climate Change on Key Ecosystems Worldwide

British scientists have recently assessed the impacts that climate change could have on key ecosystems. The results suggest that rising temperatures are likely to increase the risk of forest fires, droughts and flooding over the next two centuries in many parts of the world, even if greenhouse gas emissions were to cease immediately.

One of the more worrisome aspects of climate change is the potential major impacts on the world’s ecosystems. There is increasing evidence that ecological changes have occurred locally during recent decades as a response to relatively minor climate changes.

A recent British study has quantified the risks of climate induced changes in key ecosystem processes during the 21\textsuperscript{st} century using innovative methods. They gathered results from 52 simulations of future world climate scenarios using 16 different computer models to calculate the probabilities for changes in forest cover, and for severe shifts in the frequency of wildfires and freshwater supplies over the next 100 years.

The results suggest that areas such as Eurasia, eastern China, Canada, Central America and Amazonia could experience important forest loss. The risk of forest losses in some parts of Eurasia, Amazonia and Canada are over 40\% for temperature increases of above 3\textdegree C. The authors also found that most semiarid regions, central Asia, southern Africa and the western US, and much of South America, show a high probability of increasing wildfires, especially for temperature increases above 3\textdegree C.

Furthermore, areas of western Africa, southern Europe, Central America, the eastern United States and the Middle East are at most risk from decreasing freshwater supplies and droughts as a result of rising temperatures.

The authors also highlight that at any temperature increase of more than 3\textdegree C, the amount of carbon that plants absorb is likely to be less than the amount that is released into the atmosphere as carbon dioxide by decomposing dead biomass. This would result in land “carbon sinks” becoming a source of CO\textsubscript{2} as the stored carbon would be released into the atmosphere, exacerbating the problem of global warming.

This research represents an important first step towards quantifying the risks of damaging impacts associated with particular levels of global warming on worldwide ecosystems. An important finding of this study is that small increases in temperature could rapidly result in more pronounced damage to ecosystems.

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