

# Extreme Weather now More Frequent

*Trend will continue, IPCC finds*

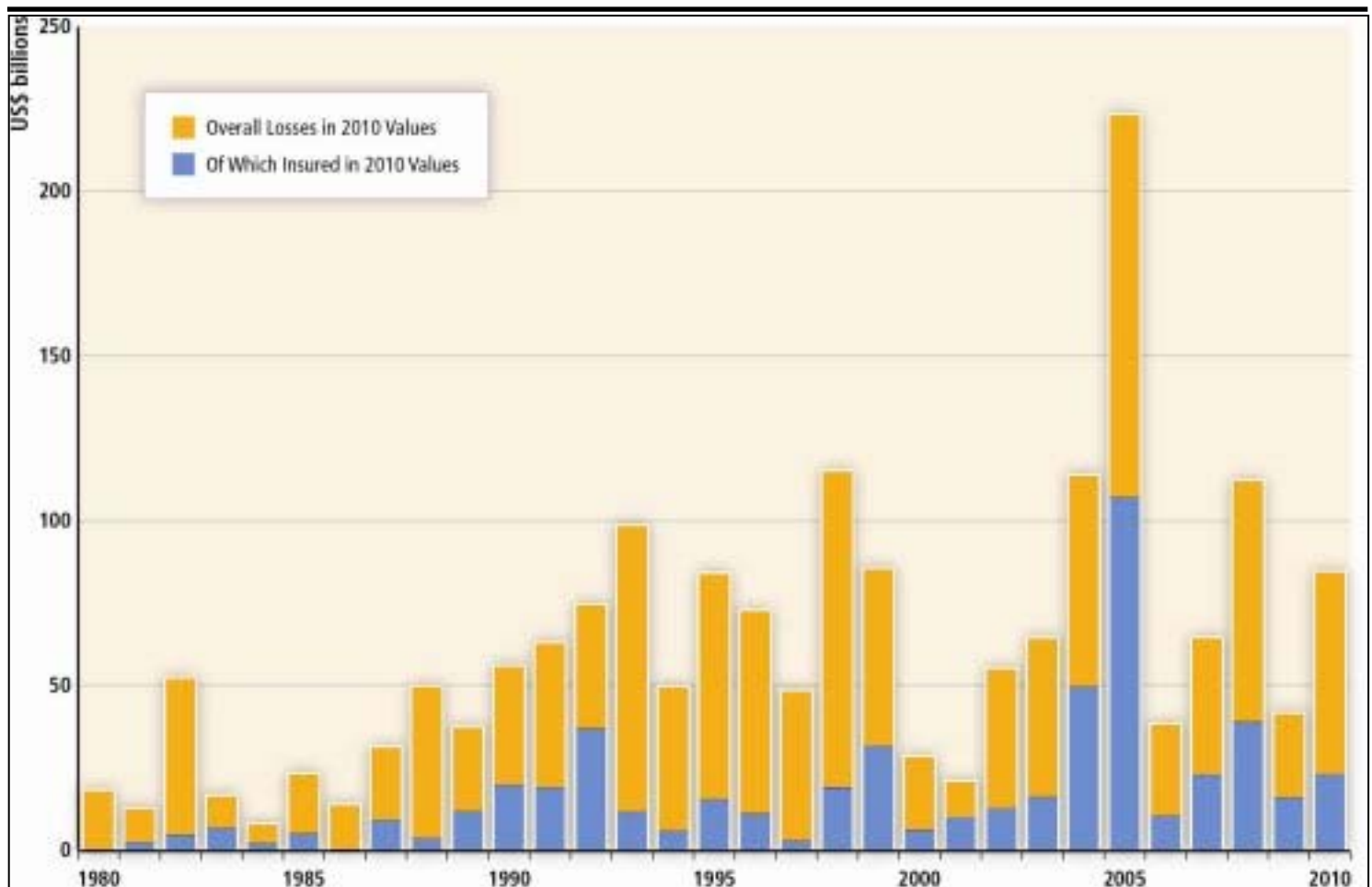
Extreme heat, intense rainfall and drought have clearly become more frequent in the last 60 years in many regions, the United Nations climate-change body reported [in a summary](#)<sup>1</sup> just released. The Intergovernmental Panel on Climate Change (IPCC) looked at how often extreme weather and climate events now occur, and whether economic losses related to disasters are now more frequent than before. They also projected trends through the 21st century, based on expected increases in greenhouse gases.

Economic losses from weather and climate disasters have grown in the developed nations of the world, whether the losses were insured or not (see Figure, below). Losses vary tremendously from year to year, as the figure shows well, and vary greatly from one region to another. But in less developed nations, the rate of human fatali-

ties from weather disasters is much higher (95% of such deaths are in developing nations). And economic losses in the poorer countries are taking a larger percentage of their Gross Domestic Product (GDP).

The major cause of increasing economic losses from weather disasters is the increasing exposure of people and their assets to weather risks—not so much the global changes in weather or climate, although that too is important. “*Exposure*” is the presence of people, infrastructure, assets, etc. in places that could be adversely affected. More people now live on the Atlantic coastline of the US where they are exposed to landfalling hurricanes, for example; and more homes have been built on the coastline, along rivers and in flood plains than before. In addition to their greater exposure, certain groups of people have also become more vulnerable to the risks from weather-related disasters.

*(Continued on page 2, Col. 1)*



**Figure: Dollar cost** of weather- and climate-related disaster losses over the last 30 years, in billion US\$. Insured values in blue, non-insured values in yellow, converted to values in 2010. Source: [Generic presentation, Special Report on Extremes, IPCC](#). [[http://www.ipcc-wg2.gov/SREX/images/uploads/IPCC\\_SREX\\_slide\\_deck.pdf](http://www.ipcc-wg2.gov/SREX/images/uploads/IPCC_SREX_slide_deck.pdf)]

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### **Heat and drought**

Most land areas are seeing more warm days and warm nights than in the past; this is more than 90% probable for any location. The length and number of heat waves or warm spells have increased for many locations, but not all. The authors have medium confidence that some regions, notably southern Europe and West Africa, are experiencing longer and more intense droughts than before.

It is "virtually certain" that record-warm daily high temperatures will become more frequent through the 21st century; record-cold daily low temperatures will become less frequent. By "virtually certain," the IPCC means "from 99% to 100% probable." It is also very likely that heat waves will be longer, more frequent, and more intense.

To make this trend clear, a hot day that is now expected once in 20 years, will likely recur once every two years by the year 2100. In the northern Arctic, such a day would recur once every 5 years.

There is evidence that drought will intensify around the Mediterranean Sea, in central Europe, the middle of North America, Mexico, Central America, and southern Africa and northeast Brazil, as this century goes on. Confidence in this prediction is also "medium." The trend is a good example of what climate scientists now expect: that wet regions will get wetter, and dry regions dryer, as the hydrological cycle of Earth speeds up.

### **Rainfall and floods**

Up to the present, the number of "heavy precipitation" events per year has increased significantly in many regions, while a few regions see fewer heavy rain events. More regions are seeing an increase than a decrease.

Precipitation now considered heavy in any given region will likely recur more frequently over the 21st century, in many places. The proportion of rainfall from heavy storms will likely increase, too, in the tropics, the polar regions, and in northern temperate latitudes in the winter (but not the summer).

In some regions where precipitation is expected to decrease, heavy rainfalls are expected to increase. There is medium confidence in this prediction.

These forecasts imply that flooding should become more problematic, but confidence in the trend

of river-related flooding is low. The evidence for it is limited, and the causes of floods are very complex.

But along sea coasts the predictions are quite clear. Coastal high water levels are very likely, as sea level continues to rise everywhere, and wind speeds and waves increase over the temperate zone oceans (*Climate Science Forum*, summer 2011)<sup>2</sup>.

Hurricanes and typhoons have been headline news in the last ten years. It may surprise many that this report did not find any trend in tropical cyclone activity over the last 40 years or more. They were compelled to this conclusion after noting that modern observing systems (especially satellites) detect tropical cyclones in remote oceans much better than pre-1960 technology did. Their prediction for the 21st century is nuanced: that the global frequency of tropical cyclones will either remain the same or will decrease, while the top wind speed of such cyclones will likely increase. ("Likely" means from 66% to 100% probable.)

There is medium confidence that the number of cyclones (low-pressure systems) in the temperate and polar latitudes will decrease. This implies that storms will be less frequent, although in storms that do occur, heavy rain will be more frequent.

### **Reducing the Risks**

Many risk-reduction measures make sense under a wide range of future climates. These are called "low-regrets" measures, and include systems to warn people of disasters; to provide better water supplies and drainage; to enforce better building codes; to manage land and ecosystems sustainably.

Reconstruction after a disaster provides an opportunity to "do it better" for the next disaster. But short-term fixes that protect people from immediate risk (such as a levee) may increase future risks (if more people move into a flood plain and develop the low-lying land, for example). Measures that dissuade people from building on low-lying, flood-prone land would make economic sense in the long term.

Managing risks works best when tailored to local circumstances. Communities can reduce their risk and adapt to climate change if they combine local knowledge with scientific expertise that is tailored to their community.

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**Citations**

1. Intergovernmental Panel on Climate Change (IPCC), 2011: [\*Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, special report\*](#), Summary for Policymakers, 18 Nov. 2011, 29 p., Geneva.
2. "[\*Winds Grew in Power over much of the Oceans\*](#)" - *Climate Science Forum*, summer 2011, p. 1.

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