

Climate concerns

—by Ilse Genovese

The debate is no longer whether climate change is imminent, but when it will no longer be reversible. Scientists remain uncertain when such a point might occur, but calls for policy makers to cut global carbon dioxide emissions in half over the next 50 years are intensifying.

Three specific events are especially worrisome as they could trigger climate changes that would be irreversible. Widespread coral bleaching is one of them, predicted to seriously damage the world's fisheries within three decades.

Glacier meltdown is accelerating, already causing a troubling rise in the sea level. By the end of the century, the seas are likely to be still higher, flooding lowlands such as the Florida Keys and Bangladesh. And, a shutdown of the Atlantic "conveyor belt" current which moderates temperatures in northern Europe and along our East Cost, may happen within 200 years.

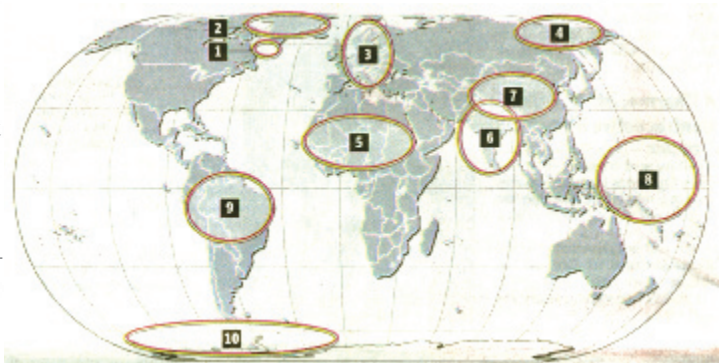
Scientists warn that a reversal of these trends might take tens of thousands of years and would require significant changes in economic behavior.

Recently, reports came out which suggest that the Earth is warming much faster than previously suspected. NASA's Goddard Institute of Space Studies recently confirmed that 2005 was the warmest year on record, surpassing the unusually warm year of 1998.

The average temperature on Earth has risen nearly one degree Fahrenheit over the past 30 years, and if it should increase by as little as four degrees over the next century, the planet Earth would not be the planet we know today.

Perhaps the greatest danger lies in the disintegration of the Greenland or the West Antarctic ice sheets, which together hold about twenty percent of the fresh water on the planet. Scientists warn that if either of the two melts away, sea level could rise nearly 20 feet in the course of a couple of centuries, swamping the southern third of Florida and Manhattan up to the middle of Greenwich Village.

While both the Greenland and the Antarctic ice sheets are gaining some mass in their cold interiors because of increasing snowfall, they are losing ice along their peripheries, which ultimately leads to its disintegration. The meltdown of both ice

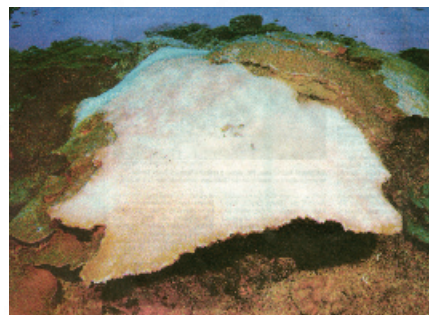


Richard Furno—The Washington Post

1. Collapse of Atlantic "conveyor belt" current
2. Disintegration of Greenland ice sheet
3. Climatic-change-induced ozone hole
4. Massive methane release from beneath tundra
5. Transformation of Saharan vegetation
6. Disruption of Indian monsoon
7. Erosion of Tibetan plateau snow cover
8. Major shift in El Niño weather pattern
9. Collapse of Amazonian rain forest
10. Disintegration of West Antarctic ice sheet

sheets would be well within the range of climate change projected for this century, if average temperatures rise by more than five Fahrenheit.

One of the more obvious effects of higher temperatures (apart from unusually mild winters and excessive heat during summers) is the stress on coral reefs, which are the nurseries of fish and other maritime life. A temperature rise of just 1.8 degrees Fahrenheit is likely to lead to extensive coral bleaching, concludes a report of a British government-sponsored symposium on "Avoiding Dangerous Climate Change."



Bleached coral off the Texas–Louisiana coast, fall 2005
[Texas Parks and Wildlife Department]

Warmer-than-usual temperatures cause corals to expel symbiotic micro-algae that live in their tissues and provide them with nutrients. The loss of algae drains the color out of coral tissue, causing them to appear bleached. No coral can sustain long periods of bleaching, and many die after suffering algae deprivation for about a week.

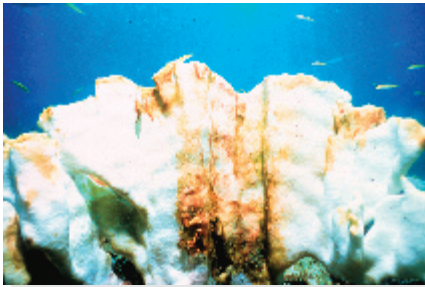
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Weather, from p. 31

Widespread bleaching was reported last fall from Texas to Trinidad, killing broad swathes of corals. Ocean temperature of two degrees Fahrenheit above the average monthly maximums was partly to be blamed.

This February, NOAA released a project brief (www.noaanews.noaa.gov/stories2006) which reports that the coral reefs at NOAA's Flower Garden Banks National Marine Sanctuary off the coast of Texas and Louisiana have begun to recover from what was thought to be a deadly coral bleaching.

Last fall, surveys found 42 to 46 percent of all coral to be showing signs of bleaching. This January, only 4 to 10 percent of the coral were showing signs of bleaching.



Flower Garden Banks coral, January 2006 (www.noaa.gov)

The coral reefs in the Flower Garden Banks sanctuary appear to be more resilient to degradation than most other reefs. More research is needed, according to the sanctuary's manager, to determine what allows the coral reefs at this location to be resilient.

Although bleaching is a problem at Flower Garden Banks, some of the coral colonies have also exhibited "white plague," a disease that often follows bleaching events throughout the Caribbean. Marine biologists maintain that it is the cumulative impact of a number of seemingly small injuries that appear to be causing the overall degradation of many coral reefs.

Many scientists are also worried about a possible collapse of the Atlantic thermohaline circulation, a current that brings warm surface water to northern Europe and returns cold, deep-ocean water south. According to some studies this conveyor belt is already slower than it was thirty years ago.

So, while we cannot say that we have reached a tipping point, signs are there suggesting that the climate has shifted abruptly in the past on a scale that could prove disastrous. [Reference: NOAA, *The Washington Post*, Jan. 29, 2006]