Rachel's Environment & Health News
#301 - Global Warming -- Part 2: Extremes Of Weather Are Increasing
September 01, 1992

Each year more "greenhouse gases" (chiefly carbon dioxide and methane) are building up in the Earth's atmosphere, creating conditions that physicists say must eventually lead to a warmer planet. Global warming will be humanity's greatest challenge because the buildup of gases is continuing year after year but the warming effects are masked by other pollutants (mainly sulfur particles) that have blocked out some sunlight and caused a counter-trend of cooling. (See RHWN #300.) Thus things look and feel normal even though trouble is brewing on a global scale. Eventually the warming trend will overwhelm the cooling trend, and the planet's temperature will rise noticeably. A modest rise is already measurable; the temperature of Earth has climbed 1 degree Fahrenheit (F) since 1880. However, by the time scientists all agree (a decade or two from now, most likely) that the temperature of the Earth has risen BECAUSE OF a buildup of greenhouse gases, it will be too late to achieve easy or gradual solutions.

The global warming problem is not like the depletion of Earth's ozone layer (see RHWN #285). When scientists in 1974 said we should be looking out for evidence of ozone loss in the upper atmosphere, the skeptics sneered. Then in 1985, NASA [the National Aeronautics and Space Administration] measured a gigantic "ozone hole" over the South Pole and from that moment onward the existence of the ozone depletion problem has not been seriously challenged, at least not by scientists.

On the other hand, global warming will be harder to prove because there will be no single "smoking gun" event to galvanize public attention the way discovery of the ozone hole did. The temperature of the planet is creeping upward, but is this definitely caused by greenhouse gases? Maybe, maybe not. While the debate goes on, the buildup of gases inexorably continues.

What evidence could prove the existence of this problem? Many researchers believe that the first real evidence of global warming will be increased variability in the climate--greater swings of high and low temperature; larger hurricanes, typhoons and cyclones; more tornadoes; drier and longer droughts; more and bigger floods. Have weather and climate events of the past decade offered any evidence of extreme variations?

A new study by Douglas Cogan[1] summarizes evidence from the 1980s and 1990s of climatic instabilities in the U.S. and elsewhere. Cogan reports record-breaking cold and warmth; extremes of barometric pressure; record numbers of tornadoes; unprecedented hrricanes and tropical cyclones; record gales; near-record drought and wetness; record-breaking heat in Europe; and miscellaneous strange record- setting events such as snows in places that have never before experienced snow during recorded history.

These events do not "prove" that global warming has begun. But if more such events occur in the next few years, it seems likely that skeptics may begin to agree that global warming is upon us, and that we need to take rapid steps to phase out coal and oil (the main sources of greenhouse gases) and phase in renewable forms of energy that won't leave a legacy of unmanageable wastes and won't heat up the planet-- namely solar power.

Clues to climate-change come in many forms: the oceans are getting warmer. Coral reefs are blanching. The sea level is rising. Average sea level has risen 4 to 8 inches since 1900; now it appears to be rising at the rate of one inch per decade. The extent of polar sea ice has shrunk about 6% globally in the last 15 years. The Rhone Glacier in Switzerland, the Grinnell Glacier in Montana's Glacier National Park, the Mt. Quelccyaya Ice Cap in Peru, and the Speke Glacier in the Ruwenzori Range in Uganda are among dozens of famous glaciers around the world that are receding at record rates. Snow cover throughout the Northern Hemisphere has shrunk 8% since 1973, to its lowest amount in the 19 years such records have been kept. [pg. 22]

During the summer of 1988 a dome of high pressure covered more than half the U.S. and Canada. Inside the dome, temperatures soared 6 to 12 degrees above normal. The jet stream, with its parade of rainstorms, veered around the dome, reducing precipitation beneath the dome to less than 40% of normal. The resulting heat and drought cut the U.S. corn crop by 34%; soybean production fell 21% and the wheat harvest slipped 14%. Congress subsequently approved $4 billion for what the President's Interagency Drought Policy Committee called "the largest disaster relief measure in U.S. history." [pg. 20]

Conditions in Europe have been similar. A localized drought began in the Alps in the mid-1980s, spread to several European nations in 1988, and then encompassed almost the entire continent in 1990. Temperatures ran more than 10o F above normal for weeks at a time. [pg. 21]

December 1989 was the coldest December on record for 15 states east of the Mississippi and the fourth coldest December for the nation as a whole. However the next month, January 1990, was the warmest January on record for the entire country. At the end of 1990 the western states experienced the coldest December ever. Though 1990 was the warmest year ever recorded California's citrus growers lost $750 million in the December deep freeze. [pg. 43]

The winter of 1991-92 was the warmest winter on record with temperatures 4o F above normal nationwide and 11o F above normal in the upper midwest. There was almost no snowfall outside the mountainous region of the country. But a freak storm in May provided northern Georgia with its largest snowfall ever recorded. Other parts of the world that rarely get snow had plenty of it during 1991-92: Jerusalem received 2 feet of snow; Shanghai had a rare snow shortly after Christmas; it snowed on Cyprus for the first time in 40 years, in Beirut for the first time in 55 years and in Eliat, Israel for the first time in recorded history. [pgs. 44-45]

Normally barometric pressure rises and falls within a narrow band between 29 and 31 inches of mercury. Cold, dense air pushes the barometer up; warm, moist air drives it down. During a five-month period between late 1988 and early 1989, both records--the all-time high and the all-time low barometric pressure for North America--were broken. [pg. 45]

In the U.S. in 1990, the National Weather Service reported a record number of tornadoes (1115 twisters occurring in 44 states); the previous record was 1102 in 1973. The next year, 1991, set another new record (1141 tornadoes), though improved detection may account for part of the increase. The severity of tornadoes also appears to be increasing, with 14 tornadoes in 1990 reaching F4 and F5 on the Fujita scale, 3 of them with winds reaching 260 mph.

Hurricanes draw their strength from the heated surface layers of the sea. The warmer the sea, and the deeper the heated layer, the more powerful the storm will be. Hurricane Gilbert (1988) was the strongest hurricane ever recorded in the Atlantic. Hurricane Hugo in 1989 set a new record for sustained wind speeds (more than 200 miles per hour). Hurricane Andrew in 1992 was "one of the century's most powerful hurricanes." (NY TIMES August 26, pg. A1.) A tropical cyclone that struck Bangladesh in 1991 was the most powerful storm ever to ply the Bay of Bengal. Known only as Cyclone 2B, it reached sustained winds of up to 200 mph shortly before it struck land. A 20-foot tidal crest ushered the storm ashore where it killed 140,000 people. [pg. 46]

Seven typhoons struck Japan in 1991, including Mireille, which killed 50 people and caused more damage to insured property than any other storm in that nation's history. The '90s do seem to be shaping up as a time of unparalleled storms.

Three successive gales struck Great Britain and the European continent in late January and early February 1990, with sustained winds of 100 mph. These storms were unprecedented in European memory. During that same period, the jet stream accelerated to 230

mph over the north Atlantic--as fast as it has ever been measured there. [pg. 46]

Before these gales struck, the concern in Europe and the U.K. had been drought. The water table as measured at West Sussex, England--the longest continuous observation site in the world--was within an inch or two of the lowest level ever recorded as of mid-December 1989. But the winter of 1989-90 was the wettest winter in 70 years. February, 1990, was the wettest February ever. The water table in West Sussex rose 125 feet in just 8 weeks, an unprecedented rise in the 150-year history of the site. Despite the wet February, 1990 turned out to be the second- driest year of record in England, though in Scotland 1990 was the wettest year ever recorded. March through September was the driest spring and summer period for England and Wales in a rainfall series dating back 220 years. "[T]here is no modern parallel to the remarkable swings in water resources recently experienced," two researchers wrote in WEATHER, the journal of the Royal Meteorological Society.

Heat has also set records in England in recent years. Three consecutive winters, starting in 1987-88, constitute the warmest "triplet" of winters in 332 years of record-keeping. Almost every month during 1989 and 1990 was warmer than normal, making it the warmest two-year period in a record dating back to 1659.

Cogan offers considerably more evidence of recent chaotic weather, which we haven't space to report here. We merely note that the dollar cost of extreme weather is already great and is evidently growing. Witness the $15 to $30 BILLION estimate for repairs following hurricane Andrew in Florida and Louisiana in 1992.

Carbon dioxide, the main greenhouse gas, remains in the atmosphere for a long time. CO2 released today will destabilize the atmosphere for our grandchildren. Each day of delay makes needed solutions more drastic, more expensive and more difficult to implement.

THE RESPONSIBLE PARTIES ARE COAL AND OIL EXECUTIVES WHO STEADFASTLY OPPOSE CHANGE. THE SOLUTION IS SOLAR TECHNOLOGIES, WHICH ARE ALREADY AVAILABLE. THE LEAST-COST TIME TO BEGIN THE TRANSITION IS NOW

Douglas Cogan, THE GREENHOUSE GAMBIT: BUSINESS AND INVESTMENT RESPONSES TO CLIMATE CHANGE (Washington, D.C.: Investor Responsibility Research Center [IRRC], 1992). Available for $45 from IRRC, 1755 Massachusetts Avenue, N.W., Washington, DC [20036;] phone (202) 234-7500.

--Peter Montague

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Descriptor terms: global warming; greenhouse gases; methane; climate; interagency drought policy committee; carbon dioxide;