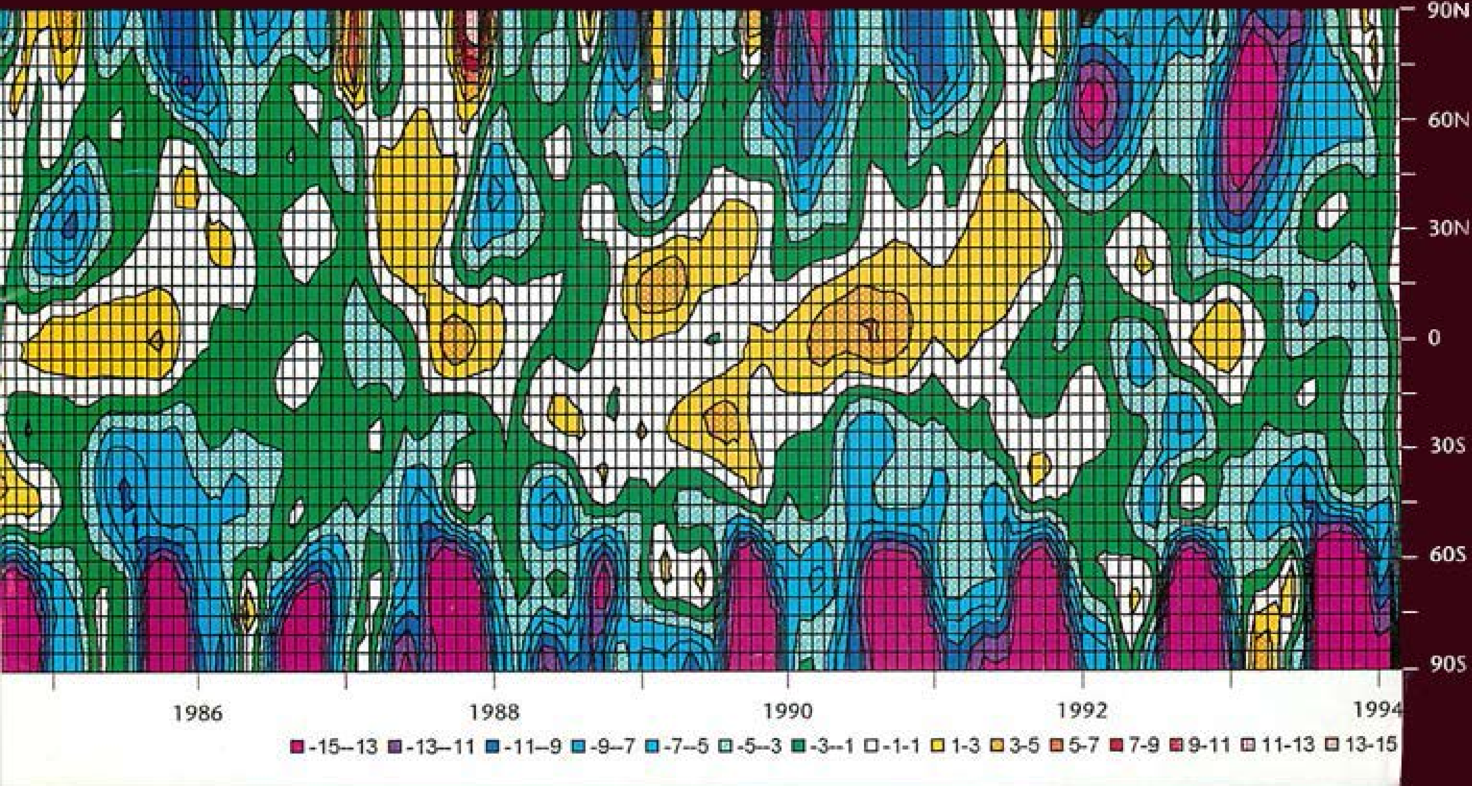
World
Meteorological
Organization

WMO - No. 826

WMO STATEMENT ON THE STATUS OF THE GLOBAL CLIMATE IN 1994



Cover: *Percentage deviation (from the 1964–80 average) of total atmospheric ozone concentrations (averaged along latitudinal bands) as a function of time and geographical latitude, based on surface-observed data from the WMO Global Ozone Observing System with statistical model interpolations. Deviations are shown at intervals of two percent. Values below minus 15% are indicated by the same colour.*

In this north to south pole time cross-section, the Antarctic spring and the northern hemisphere winter-spring ozone declines are especially well demonstrated. Also note the quasi-biennial oscillation in ozone concentrations and the lack of significant changes in ozone concentrations in the equatorial regions.

Source: Bojkov and Fioletev, J. Geophys. Res. 1995

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Geneva - Switzerland
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NOTE

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FOREWORD

In my recent address to the first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, I urged governments to act now and quickly to counter the threat of climate change attributable to human activities. It has long been recognized that the climate system varies naturally on all time scales from hundreds of millions of years to a few years, as revealed by paleo-climatic data and instrumental observations. In recent years, there has been a realization of and a growing concern about the impact of human activities on climate, particularly the effect of steadily increasing concentrations of greenhouse gases in the atmosphere. The latest scientific projections indicate an increase of the global mean temperature of one degree Celsius above 1990 levels by the year 2025 and a 3°C warming by the end of the next century. Such a short-term change in the climate would be unprecedented in the known climate history of the world and could lead to consequential changes in the economic and social well-being of the world's population. It could also seriously hamper efforts to promote and implement sustainable development practices.

The heightened concern about an imminent global warming has engendered a world-wide interest in shorter term year-to-year and even month-to-month fluctuations in the global climate system with the prime interest being the detection of human-induced climate change. Detecting such climate change would not only confirm scientific projections, but it would also accelerate efforts to mitigate and adapt to climate change. Routine monitoring of regional and global climate on shorter time scales has therefore become a preoccupation in many countries of the world.

Much of our knowledge on climate comes from global scientific and technical programmes coordinated by WMO. The Organization's mandate is to coordinate and facilitate world-wide cooperation in making and exchanging standardized and quality-controlled meteorological, hydrological and other geophysical observations as well as their analysis, understanding and interpretation. WMO is also sensitive and responsive to the changing global needs for meteorological and hydrological support to an ever-widening spectrum of human activities.

WMO, working with UNEP, is responsible for the periodic assessments of climate change issued by the Intergovernmental Panel on Climate Change, and for the routine publication of the Climate System Monitoring Monthly Bulletin and the biennial reviews of the Global Climate System. The látter two publications are outputs from the Climate System Monitoring project of the World

Climate Data and Monitoring Programme (WCDMP). In June 1993, the 45th session of the Executive Council of WMO decided to promote WMO's role as a provider of credible scientific information on climate and its variability and requested that arrangements be made for the regular wide distribution, starting in 1994, of WMO statements on the status of the global climate. Following last year's successful introduction of a statement on the status of the global climate in 1993, this is the second annual statement which is provided through the Climate Change Detection project of the WCDMP.

This statement is a summary of the information provided by the Climate Analysis Center (CAC), U.S.A. with inputs from climate centres in Australia, Austria, Belgium, Canada, Germany, Hungary, Iceland, Russian Federation, Spain and the United Kingdom. The contributions were based, to a great extent, on the observational data collected and disseminated by the national Meteorological and Hydrological Services of the WMO Member countries.

G. O. P. Obasi
Secretary-General

Special appreciation is extended to: Dr C. Ropelewski, Chairman of the WMO Commission for Climatology Working Group on Climate Change Detection; other members of the Working Group; and Mr. M. Halpert of the CAC, who helped prepare the statement.

SUMMARY

The 1994 estimated global mean surface temperature over land and marine areas was indisputably warmer than 1992 and 1993, similar to 1988, but not as warm as 1990 and 1991. Warmth in 1994 can be partly attributed to the long-lived *El Niño* event, but also, the cooling influence of the June 1991 eruption of Mount Pinatubo has now waned. Not all regions experienced warmer than normal temperatures. Labrador, Greenland and the northwestern North Atlantic were colder than normal as was the case in 1993 and in other recent years.

Looking at some of the important atmospheric constituents, the overall trend of ozone decline continued during 1994. In the northern hemisphere, the greatest ozone deficiencies were over Siberia and over western and central Europe. In the Antarctic, the ozone in the lower stratosphere was almost annihilated for a period of six weeks during the spring. The upward trend in concentrations of atmospheric carbon dioxide and methane continued in 1994. The increases of these important greenhouse gases can be related to sources directly influenced by human activity.

There were numerous extreme climatic anomalies and weather events in 1994, many very destructive but there is still no scientific evidence that would indicate an increased frequency of such events. Brutally cold Arctic air in January covered most of the east and central regions of North America, with severe icing conditions closing some of the major airports. Hot and dry summers in western North America and in Europe engendered wildfires. Drought conditions plagued agricultural production in Australia, southern Brazil, Indonesia and central China. Some of the severest storms ever affected the tropics, causing death and destruction. In Africa, widespread heavy rains during the wet season resulted in it being the wettest in 30 years accross the western Sahel.

Global surface temperature rises again

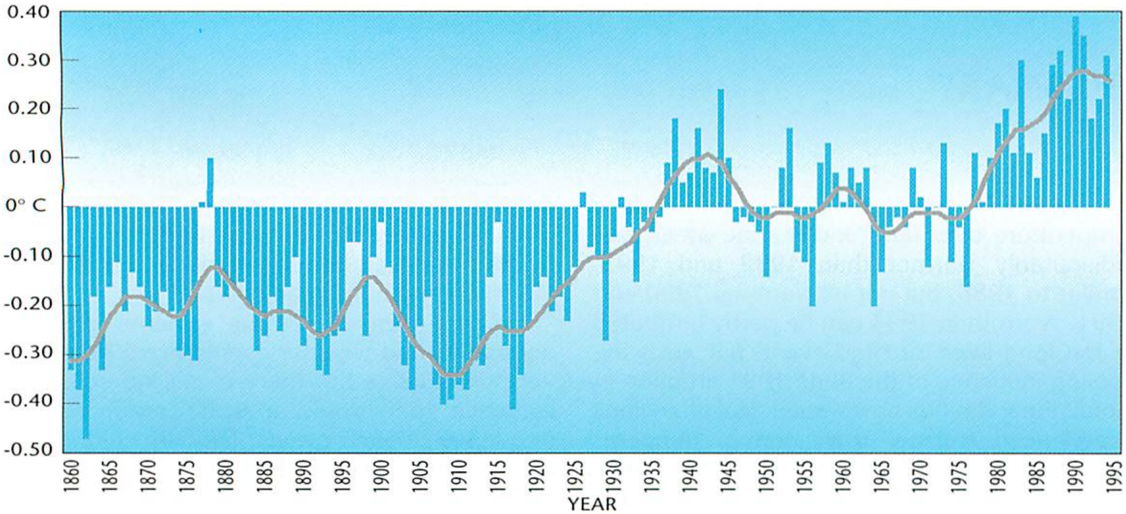


Figure 1
Global land air and sea surface temperature anomalies (°C) are computed departures from the 1951-1980 base-period means. The graph is a revised update from the one used in 1992 IPCC Supplement. The fitted curve is a 21-point binomial filter.
Source: Hadley Centre, Meteorological Office, U.K.

Figure 3
Surface temperature anomalies (°C) for January-December 1994. Anomalies are departures from the 1951-1980 base-period means.
Source: Environment Canada

The 1994 estimated global mean surface temperature anomaly (departure from normal calculated relative to the 1951–1980 base period) for land and marine areas, was +0.31°C +/-0.03°C (Figure 1). The uncertainty in this estimate results mainly from data sparsity, especially in the southern hemisphere oceans and parts of the tropics, and lack of data from Antarctica. As a result, different *analysis* techniques yield recent global mean anomalies that vary by a few hundredths of a degree. All estimates for 1994 rely heavily on land surface air temperature data from about 1 400 surface stations, mostly distributed as WMO monthly CLIMAT messages, and on oceanic surface temperatures based on approximately two million measurements from ships and buoys. Most of these data were exchanged over the Global Telecommunication System.

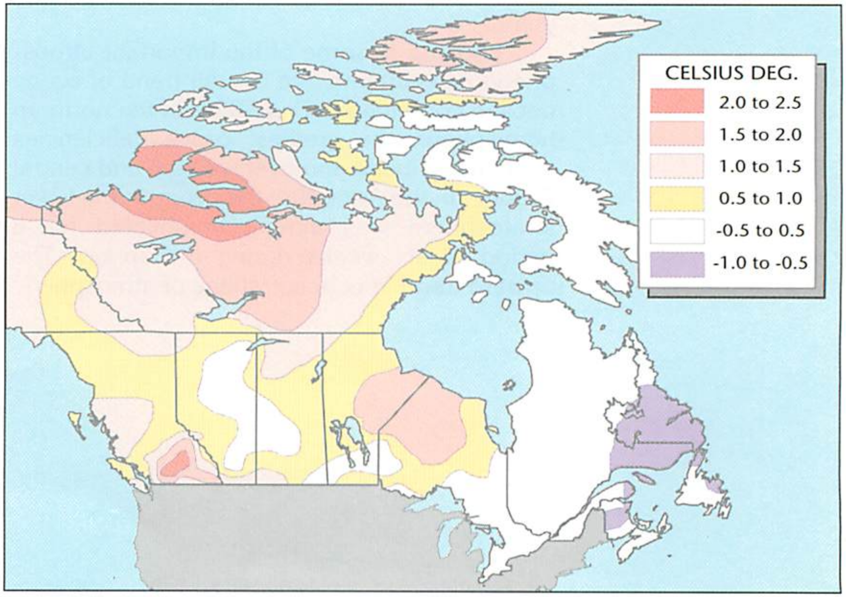
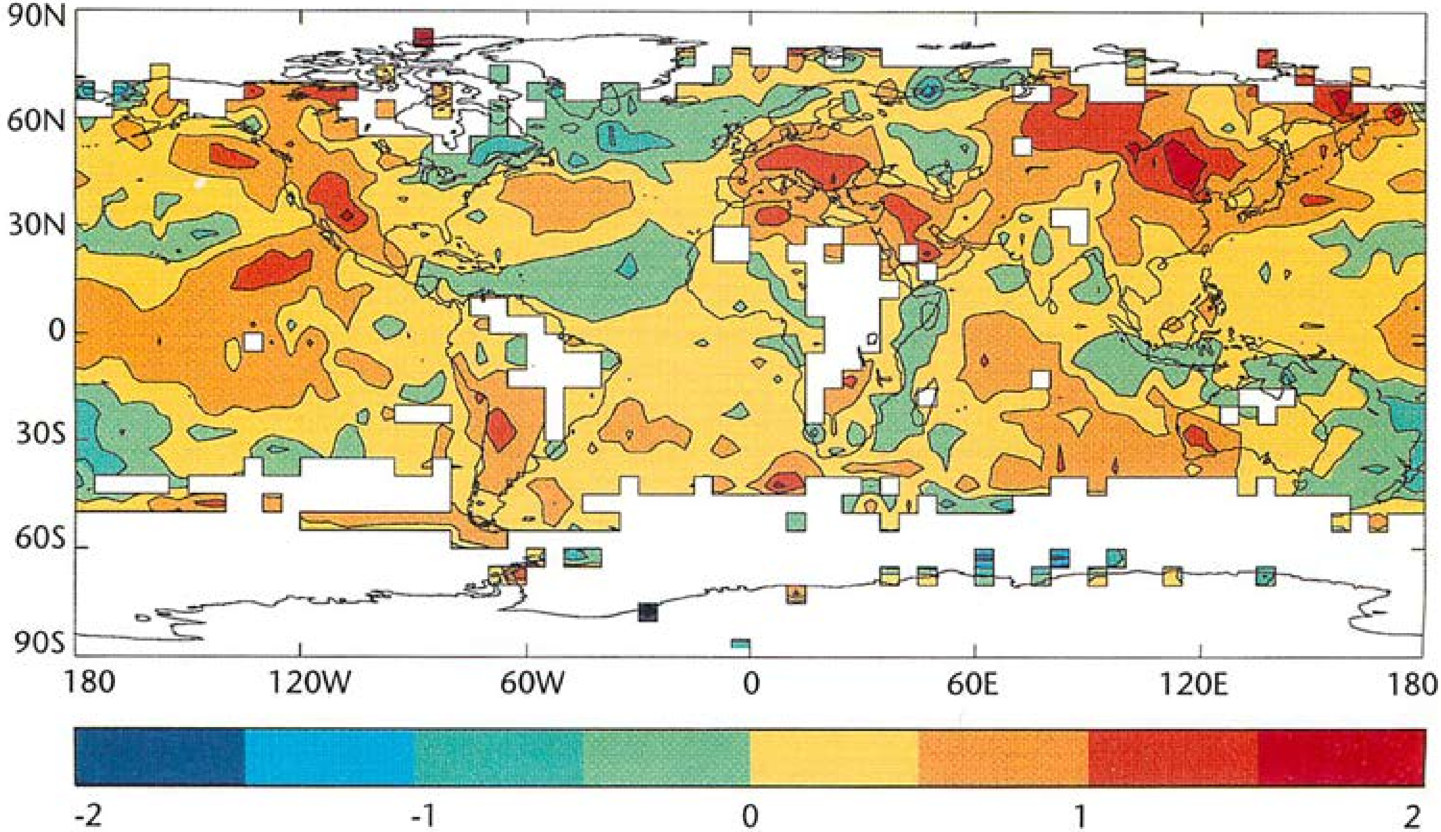


Figure 2
Surface temperature anomalies (°C) for January-December 1994. Analysis is based on at least 8 months of data. Areas with insufficient data are blank. Anomalies are computed departures from the 1951-1980 base-period.
Source: Hadley Centre, Meteorological Office, U.K.

Figure 1 shows that 1994 was indisputably warmer than 1992 and 1993, similar to 1988, but not as warm as 1990 and 1991. Figure 1 also places 1994 in a longer-term context by showing global temperatures since 1861: a similar analysis is expected to appear in the 1995 IPCC Scientific Assessment. The mean global temperature has increased approximately 0.6°C over the past 135 years. Much of this increase has occurred during two periods, a thirty-year period from approximately 1910 to 1940, and over the most recent 15 years. During 1994, most of the warmth occurred after February. In addition, the past year witnessed individual monthly positive temperature anomaly records for the mean global temperature in April, September, and December.

The cooling influence of the June 1991 eruption of Mount Pinatubo has now waned. Warmth in 1994 has partly resulted from the long-lived *El Niño* event, which is evident in the geographical patterns of temperature anomalies for 1994 shown in Figure 2. Note especially the warmth in the central equatorial Pacific and along the west coast of North America, warmth in the central Indian Ocean, and cold areas centred near Hawaii and to the



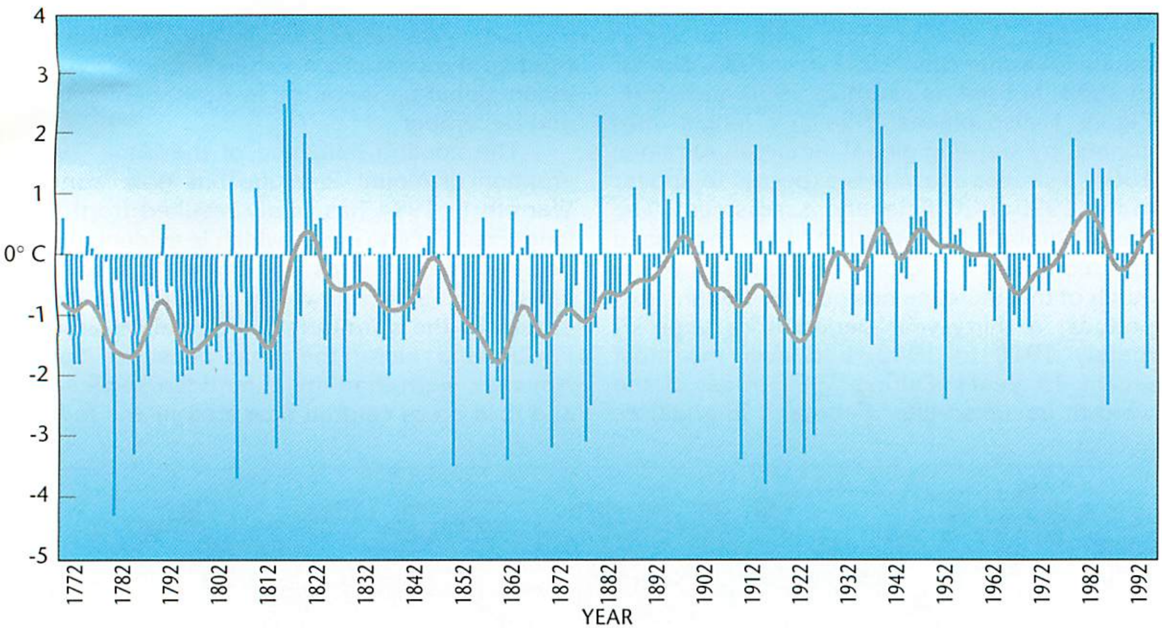


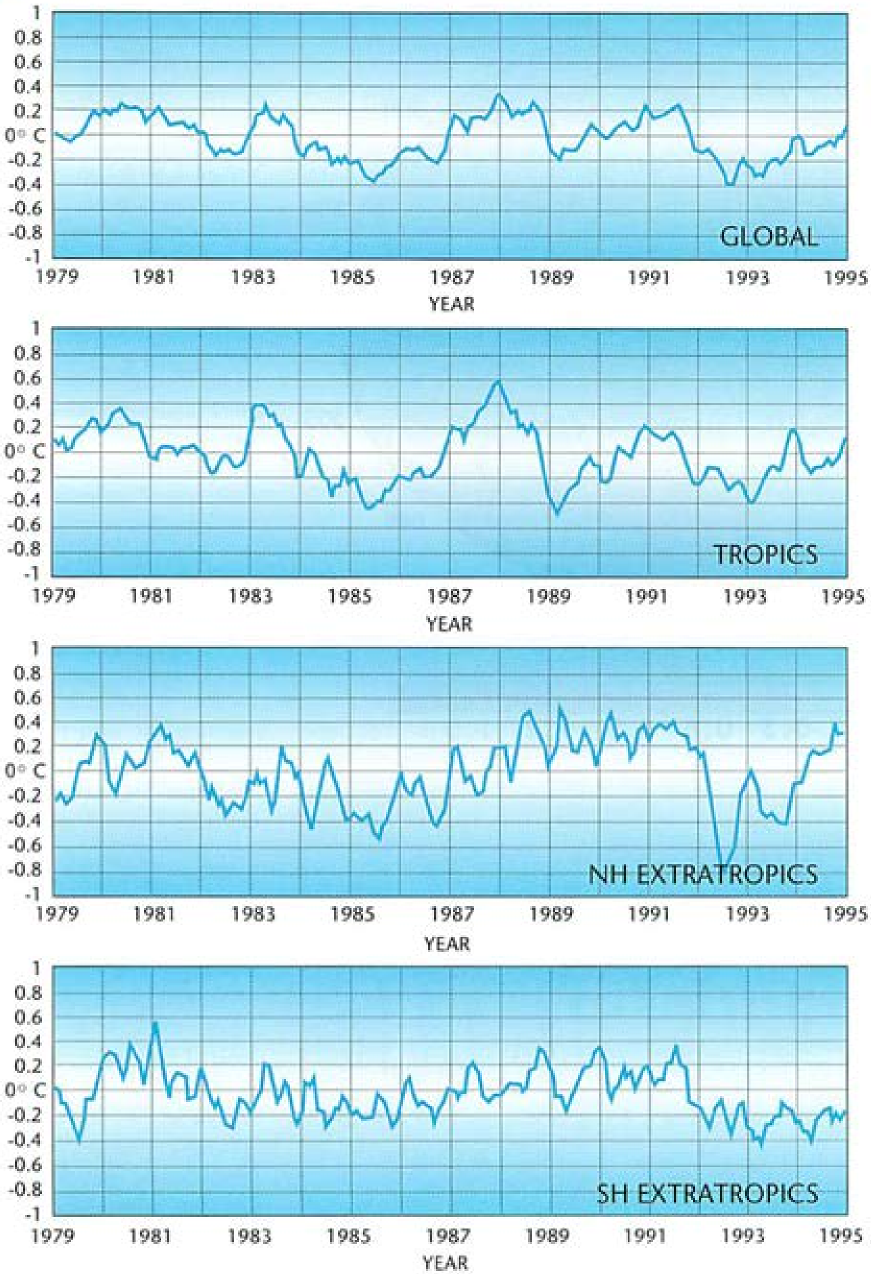
Figure 4
November surface temperature anomalies (°C) for central England with the departures from the 1951-1980 base-period.
Source:

Figure 5 ➢
Mean annual tropospheric temperature anomalies (°C) from the Microwave Sounding Unit (MSU) channel 2R for the a) globe (85°S–85°N), b) tropics (30°N–30°S), c) northern hemisphere extratropics (30°N–85°N) and d) southern hemisphere extratropics (30°S–85°S). Anomalies are departures from the 1982–1991 base-period means.
Source: CAC (data provided by the University of Alabama at Huntsville.)

Figure 7 (far right)
Global temperature anomalies (°C) in three vertically adjoining layers of the atmosphere based on atmoshphere sounding data from January 1993 to December 1994 with departures computed from the base period January 1961 through December 1975.
Source: Russia Research Institute of Hydrometeorological

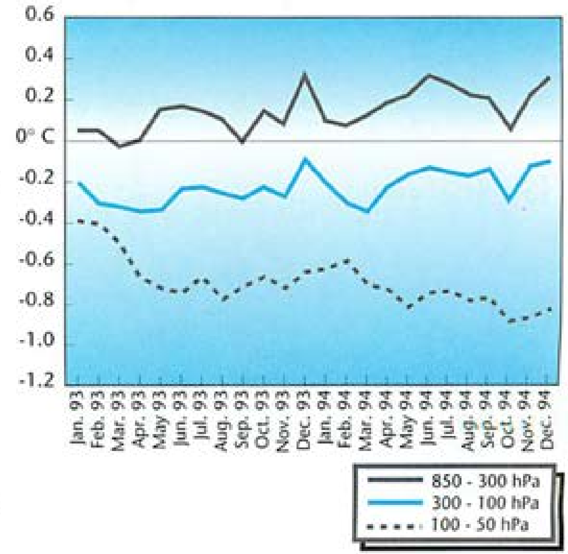
northeast of, and over, New Zealand. Other noteworthy annual anomalies, exceeding 1°C, were warmth over central and eastern Europe (where the summer was exceptionally hot) and the Levant, and warmth over Mongolia. Labrador (see Figure 3), Greenland and the northwestern North Atlantic were cold, as in 1993 and many other recent years. Warmth in northwestern Canada (Figure 3) also mirrored recent years, but the warm anomaly over Mongolia was further south than the Siberian warm anomaly typical of the past 15 years or so (e.g. Figure 3 of 1993 WMO Statement). Positive temperature anomalies in the Baikal region were the most significant in Russia and were a continuation of the intensive warming of the last two decades.

An unusual regional feature was exceptional warmth in November in parts of northwestern Europe, in sharp contrast with November 1993 (see Figure 15 of 1993 WMO Statement). In Central England, November 1994 was the warmest November in the 336-year record, by a margin of 0.5°C (Figure 4, which only shows the more reliable data), and was more than 5°C warmer than November 1993. The warmth resulted from a combination of an unusual frequency of southerly and southwesterly winds originating from the subtropics, about 1°C warmer than normal upstream surface ocean waters in the Mediterranean and from Gibraltar to the Azores, and persistent cloud cover preventing nocturnal cooling. Although Figure 4 shows no tendency to greater extremes in recent years, nor any systematic warming trend in recent decades, the average November temperature in Central England was almost 1°C lower before 1925, with anomalies of –3°C or lower occurring on average almost once per decade. These have been absent since 1926.



Tropospheric warming and continued cooling in the stratosphere

Satellite-derived estimates of lower troposphere temperature showed a rise of global temperature anomalies to clearly positive values for the first time since the Mt. Pinatubo volcanic eruption of June 1991 (Figure 5). Stratospheric temperatures continued to be colder than normal with the negative departures from normal being the greatest in 15 years of the satellite record. Figure 6 shows that most regions experienced colder than normal stratospheric temperatures in 1994. Similar variability is shown in time series analyses of various layers of the atmosphere based on traditional upper air balloon ascents as shown in Figure 7. These temperature trends in the atmosphere above the earth's surface are consistent with scientific model projections of global warming related to increasing concentrations of greenhouse gases.



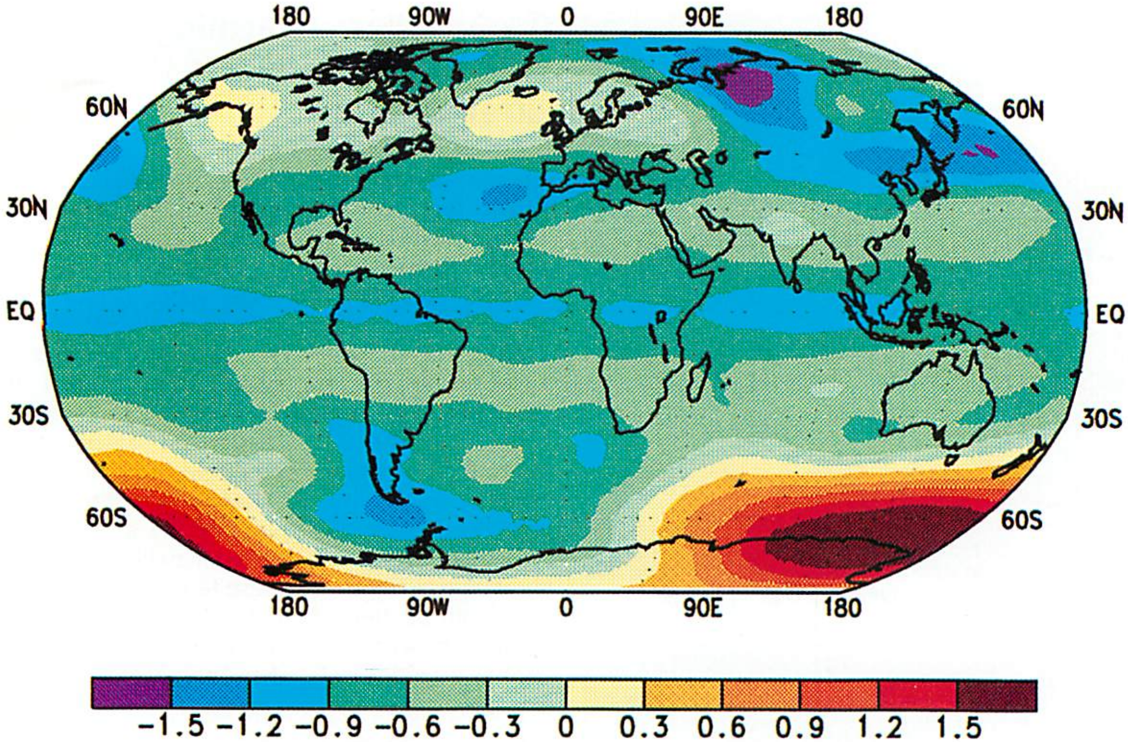


Figure 6
Mean annual tropospheric temperature anomalies (C°) for 1994 derived from the Microwave Sounding Unit (MSU) on the NOAA polar-orbiting satellite. Anomalies are departures from the 1982–1991 base-period means.
Source: CAC (Data provided by the University of Alabama at Huntsville.)

Figure 8 ➢
Satellite-derived rainfall estimates in mm per month. Anomalies are departures from the 1986–1993 base-period means.
Source: CAC

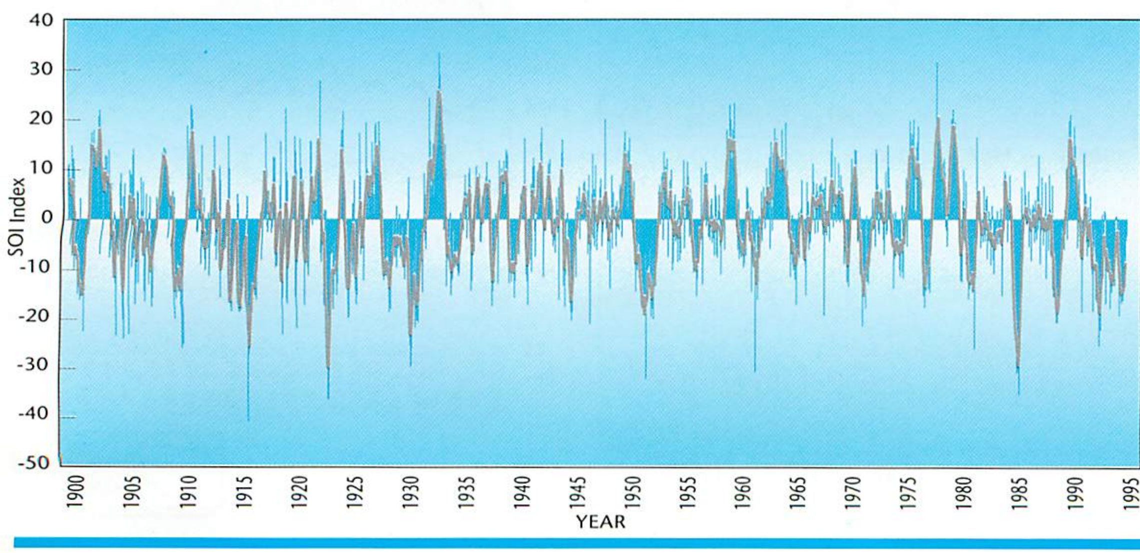
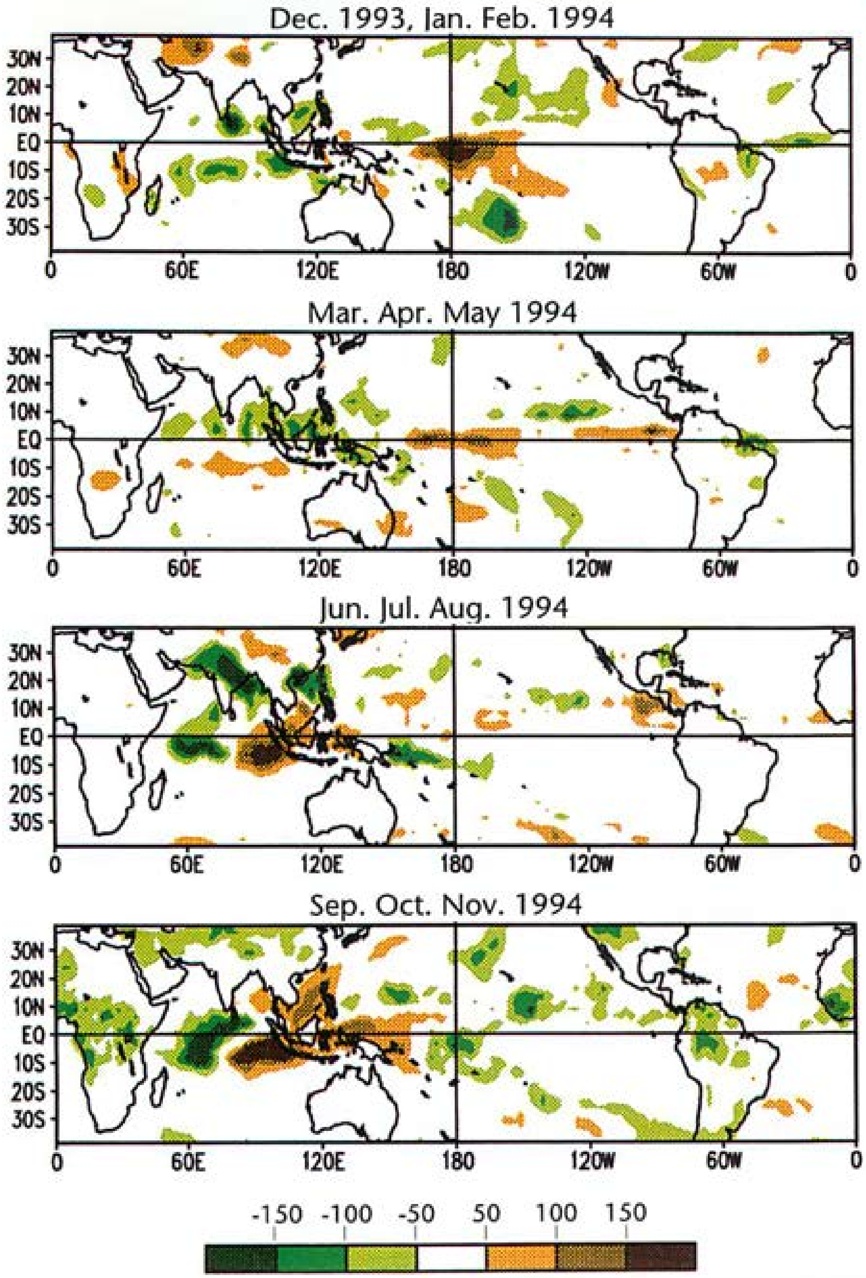


Figure 9
Monthly values of the Southern Oscillation Index (SOI — difference between sea level pressure anomalies at Tahiti and Darwin, standardized with respect to mean monthly standard deviation). Solid curve is a 5-month running mean. Note that for some months between 1906 and 1932, Tahiti pressure values were estimated by an interpolation scheme.
Source: Bureau of Meteorology, Australia

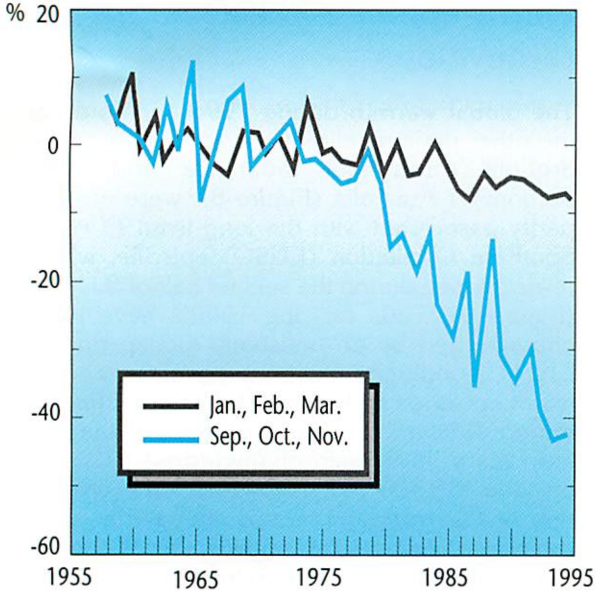


Warm-episode ENSO re-develops

The global warmth during 1994 and some of the other unusual climatic events such as the drought throughout Indonesia and large portions of Australia (Figure 8), were at least partly associated with the long-lived *El Niño*/ Southern Oscillation (ENSO) episode, which re-developed during the second half of the year (Figure 9). Thus far, the 1990's have been characterized by an unusually long period of ENSO conditions. The re-development of warm episode conditions in the tropical Pacific during 1994 means that three out of the last four years have been characterized as warm episode (ENSO) years. However, an examination of the historical record shows that such prolonged periods of above normal ocean temperatures are not entirely unprecedented. For example, the period 1911–1915 appears most similar to the present period. One can speculate that conditions during 1992–1993 are similar those observed during 1911–1912 (see Figure 9) and that recent developments may be similar to what occurred during 1914.

Ozone depletion continues

The overall trend of ozone decline continued during 1994 (see cover). After record low ozone concentrations were observed over the northern middle latitudes during early 1993, the 1994 ozone deficiencies were smaller, being still 5 per cent below the long-term average. In the northern hemisphere, during the spring, the regions with the greatest ozone deficiencies were over Siberia and over western and central Europe which coincided with regions of high concentrations of chlorine oxide, a bi-product of CFCs. This coincidence supports chemical ozone destruction as a cause of the deficiency.

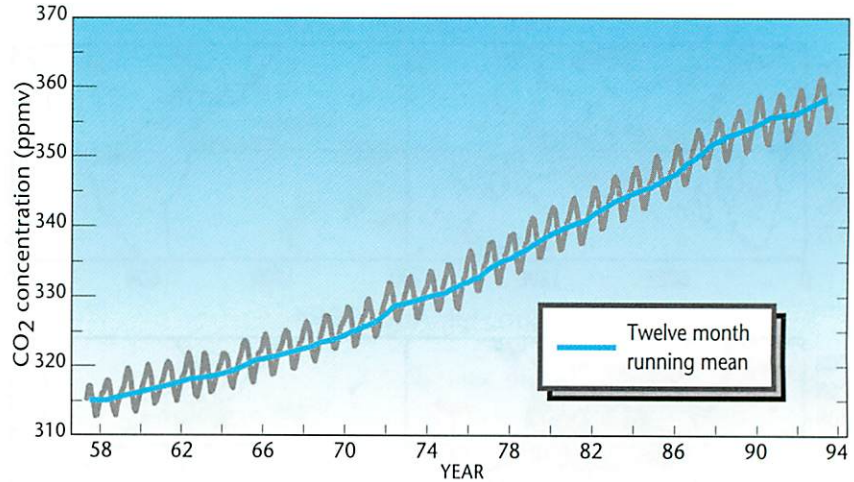


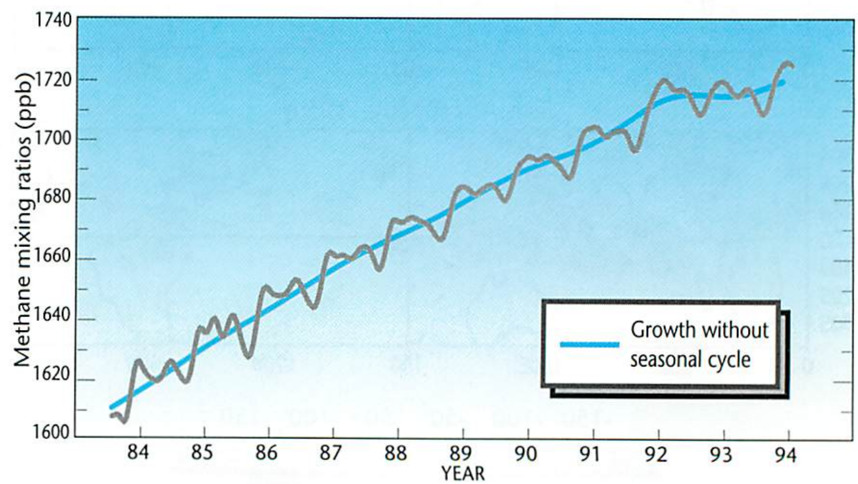
≺ Figure 10
Total ozone seasonal deviations from pre-ozone hole averages (1957-1978) in the Antarctic. Summary of data from stations Faraday, Syowa, Halley Bay, South Pole
Source: Bojkov, WMO Bulletin 43 (2) 1994

Severe ozone depletion has been observed every spring in the Antarctic since the early 1980's (Figure 10). In the spring of 1994, the ozone decline reached another record low value for the September averages. For nearly six weeks, the ozone in the lower stratosphere was almost annihilated. It should be noted that all these extremes in 1994 occurred even though volcanic aerosols from the 1991 Pinatubo eruption had completely disappeared. This supports scientific model predictions that volcanic aerosols contributed only a small fraction of the observed ozone depletion in recent years.

Continued increases in carbon dioxide and methane

The upward trend in concentrations of atmospheric carbon dioxide and methane continued in 1994 (Figures 11 and 12), although the rate of increase of methane over the past few years has slowed somewhat. The increases can be related to sources directly influenced by human activity. It is certain that continued increases in both of these important "greenhouse" gases will alter the earth's radiation balance and, according to scientific models, should lead to an increase of the global surface temperature. The





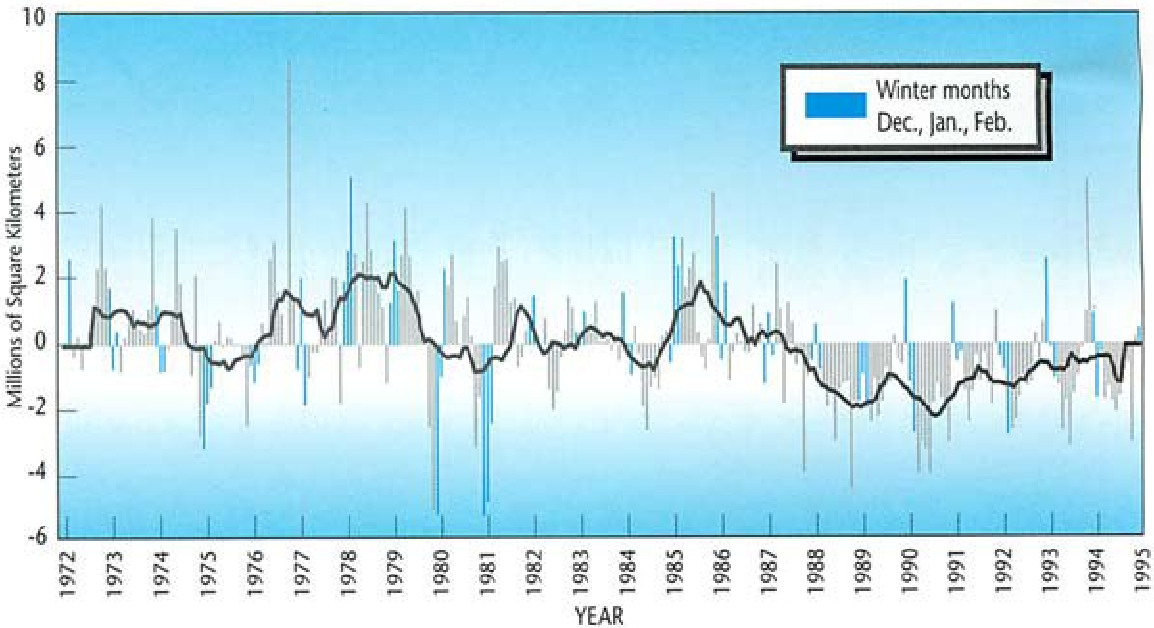


Figure 13 ➢ Anomalies of monthly snow cover extent over the northern hemisphere (including Greenland) between January 1972 and December 1994. Smoothed curve is a twelve-month running mean. Anomalies are departures from the 1972–1994 base-period means.
Source: CAC (Data provided by Rutgers University)

≺ Figure 11 Monthly mean carbon dioxide concentrations (ppm) measured at Mauna Loa, Hawaii, 1958–1994. The data through 1973 are from C. D. Keeling at Scripps Institute of Oceanography.
Source: CAC (Data provided by the Climate Monitoring and Diagnostics Laboratory)

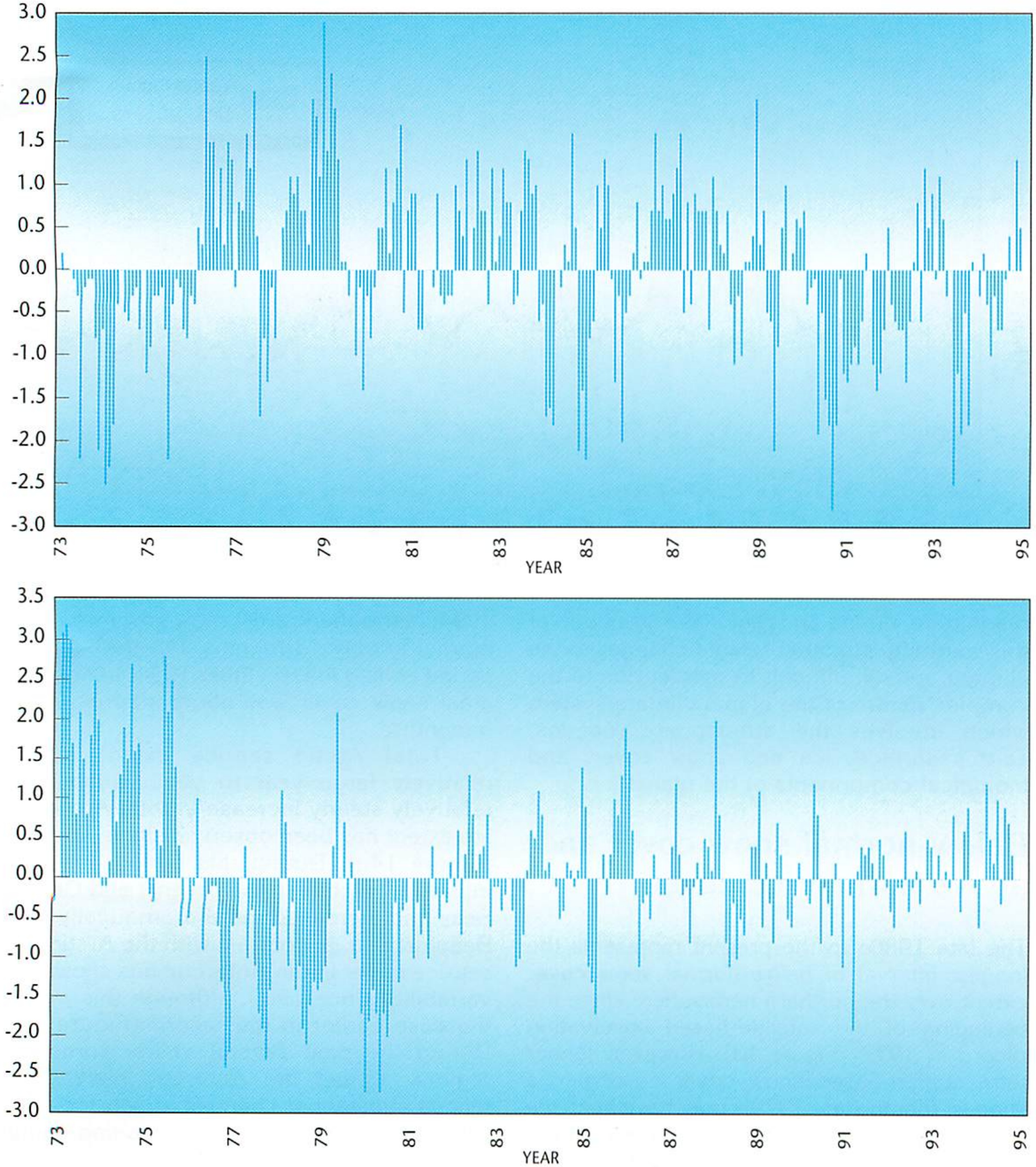
≺ Figure 12 Globally-averaged, biweekly methane mixing ratios (ppb) by volume determined from the NOAA/CMDL Carbon Cycle Group co-operative air sampling network. Solid red line shows the growth with the seasonal cycle removed.
Source: CAC (Data provided by the Climate Monitoring and Diagnostics Laboratory)

magnitude, timing and regional distribution of this warming and other related changes to the climate are still difficult to predict due to the complex nature of the global climate system which involves the atmosphere, oceans, earth's surface, ice and snow cover, and biological components of the planet

Below-normal snow cover and above-normal ice cover

The late 1980s to the present represents the longest interval of below-normal snow cover extent over the northern hemisphere since the beginning of the satellite-based observation record in 1972 (Figure 13). However, longer term station-based snow cover observations suggest that the late 1970's may have been the snowiest period since the turn of the century. For the eight-year period ending December 1994, hemispheric areal snow cover was above normal in only 13 months. For the 16-month period ending in December 1994, hemispheric areal snow cover was above normal in only 5 months.

Total Arctic sea-ice extent exhibits relatively large year to year variability. A relatively steady increase in total Arctic sea-ice extent has been observed since July 1993 (Figure 14*a*). During this period, ice cover increased slightly in the Barents and Okhotsk Seas and increased more dramatically in the Beaufort Sea. In contrast with the Arctic, total sea-ice cover in the Antarctic has shown little variability since 1989, although this was not the case earlier in the record (Figure 14*b*). During the past several years, some sub-regions around the Antarctic have experienced substantial changes in sea-ice extent with the overall net ice cover being slightly above normal.



Figures 14(a) and 14(b) Standardized sea-ice area anomalies for the a) total Arctic and b) total Antarctic. Values are standardized by the standard deviation for the 1973–1994 period.
Source: CAC

REGIONALLY...

Extreme events cause havoc in many countries

While in 1994 extreme climatic anomalies and weather events (Figure 15) remained as numerous and as destructive as they ever were, there is still no scientific evidence that would indicate an increased frequency of such events. Any increases in the number of fatalities, injuries and amount of damage and destruction caused by extreme events can often be related to population increases, especially in those regions most susceptible to climate variability.

Rains in Africa

Widespread heavy rains soaked much of the Sahel region from late July through mid-October. By August, well above normal precipitation also covered the Sudan and Ethiopia, and the wet season as a whole (May–September) was the wettest in 30 years across the western Sahel (Figure 16).

Five tropical systems made landfall on Madagascar during the first three months of the year. Cyclone Geralda (early February) traversed the southern and central portions of the island. As much as 400 mm of rain and winds gusting to 215 km/h lashed the island as Geralda destroyed numerous buildings and

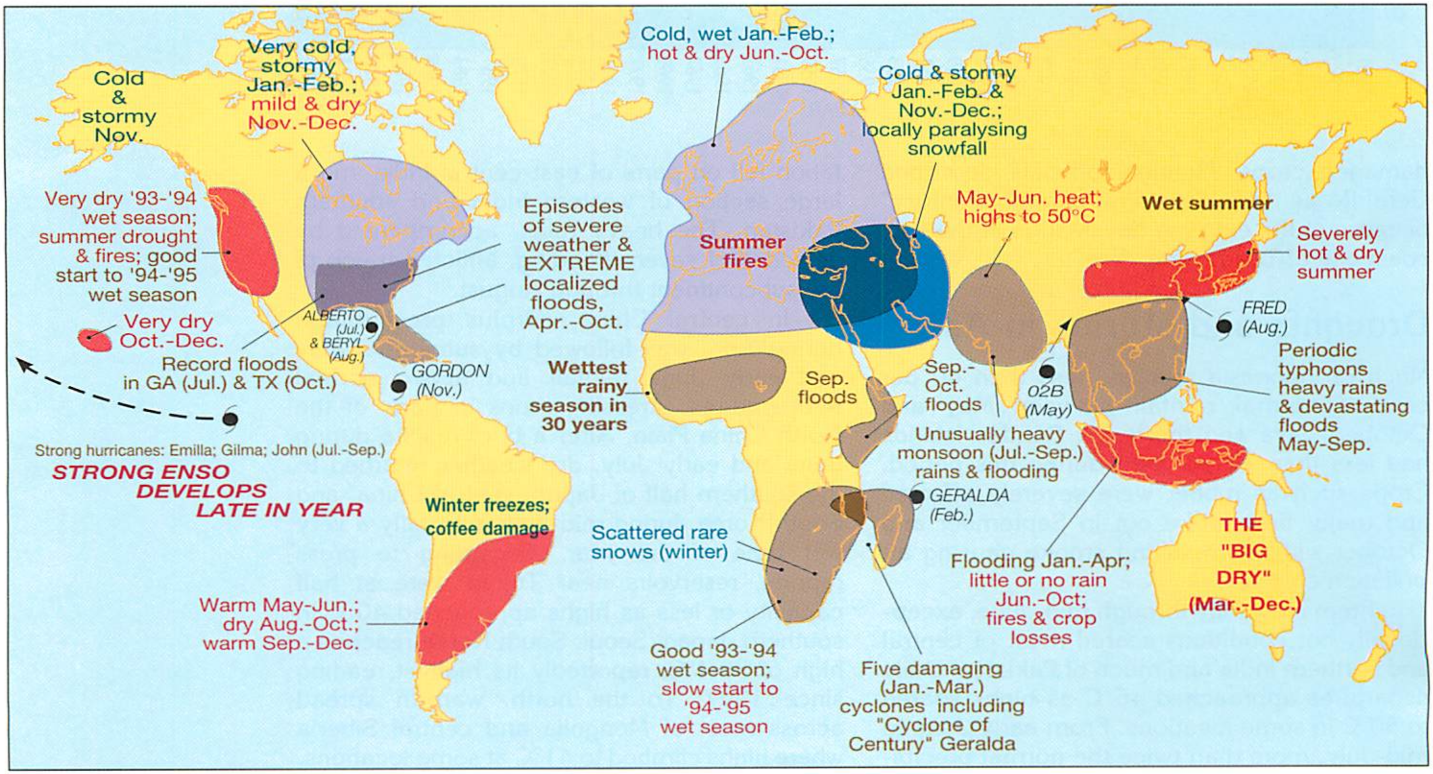


Figure 15
Significant climate anomalies and episodic events during 1994.
Source: CAC

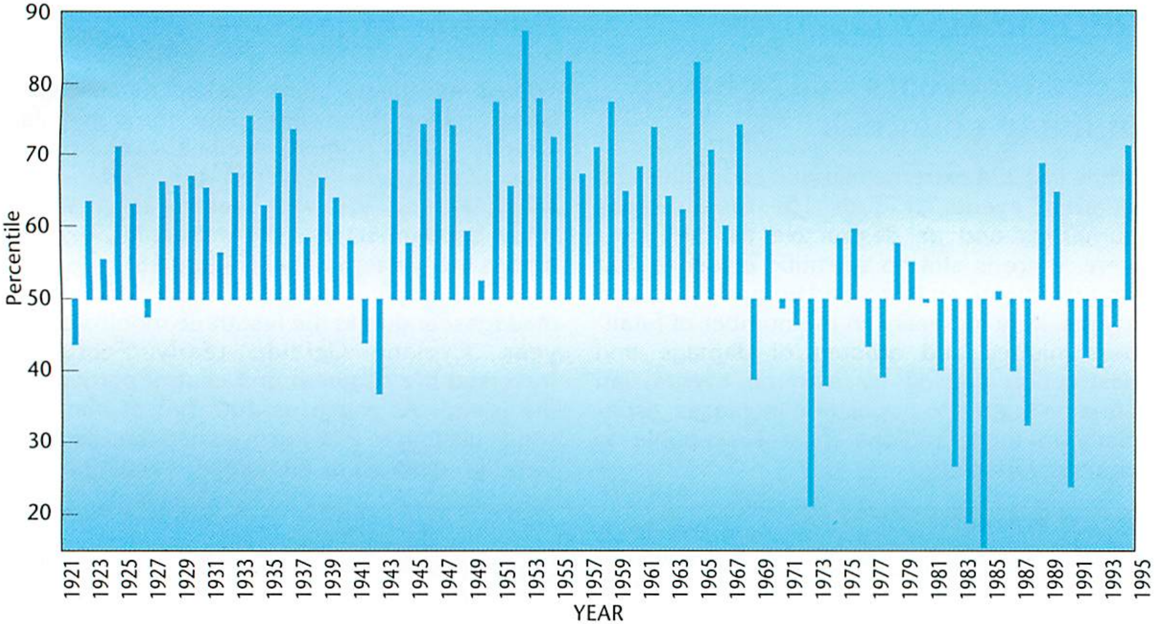


Figure 16
Precipitation index (average gamma percentiles of station precipitation within the region) for the western Sahel for August - September normalized by the 1961–1990 base period.
Source: CAC

damaged crops. National officials described Geralda as the "Cyclone of the Century" because of the extreme devastation in the east coast city of Toamasina.

Droughts and storms in Asia

Much of Indonesia received less than 40 per cent of normal rainfall between May and October. Java and the lesser Sundas Islands had less than 10 per cent during this period. Crops such as rubber were severely affected and major fires broke out in September and October with the resulting smoke causing air pollution episodes.

From early May through mid-June, exceptionally hot conditions seared most of central and northern India and much of Pakistan. Daily departures approached +6°C as highs soared to 50°C in some locations. From early June to mid-July, more than twice the normal precipitation fell on parts of east-central India and a large section of western India and southern Pakistan. The heavy rains, accompanied by episodes of severe flooding, afflicted much of the subcontinent through August.

In central China, surplus precipitation during April was followed by subnormal May and early June rainfall and above normal temperatures, stressing crops in parts of the North China Plain. After a brief respite during June and early July, dry weather returned to the southern half of Japan, central China, and South Korea during mid-July, normally a very wet time of the year. According to press reports, reservoirs near Tokyo were at half capacity or less as highs approached 40°C in southern Japan. Seoul, South Korea reached a high of 38.4°C, reportedly its highest reading since 1907. To the north, warmth spread across most of Mongolia and central Siberia where highs climbed to 41°C at some locations.

A total of 12 tropical cyclones struck China in 1994 which was the highest number in more than 40 years. In late August, Typhoon Fred slowly moved into southern Zhejiang province of east-central China, accompanied by 100 to 225 mm of rain, wind gusts of up to 205 km/h, and a large storm surge. Fred's landfall coincided with an unusually high astronomical tide, resulting in coastal floods. According to the statistics, the death toll was over 1 000 and economic loses reached 17.7 billion Chinese Yuan (about US$ 2 billion).

In early May, powerful tropical cyclone 02B, with estimated winds of 250 km/h, slammed into southeastern Bangladesh causing many deaths and much destruction. However, advance warnings, cyclone shelters, and the absence of a large tidal surge kept casualties to a minimum compared to the devastating 1991 cyclone.

Hot and dry in central South America

In late May, unusually mild conditions developed across Paraguay, Uruguay, northern Argentina, and southern Brazil, with weekly temperature departures approaching +6°C at some locations. The abnormally warm weather presisted through the first half of June, with weekly departures reaching +9°C at many locations during mid-month. However, in late June and early July, a brief cold outbreak brought freezing temperatures as far north as Brazil's northern Parana state, damaging part of Brazil's coffee crop.

During August, unusually dry weather developed across much of southern Brazil, Paraguay, and northeastern Argentina. By mid-September, 100 to 150 mm of rain brought relief to eastern Paraguay, and adjacent areas of Argentina. However, unseasonably hot weather (>40°C) in late September aggravated dry conditions in some locations. The hot and dry weather spread throughout central South America during the first half of October, but widespread moderate to heavy rains during the second half of the month ended the dry spell. However, above-normal temperatures persisted through the end of the year, with only brief respites during November and December.

Unusual winter conditions in North America

In North America, two outbreaks of brutally cold Arctic air in January covered most of the east and central regions, establishing at least 18 new all-time record low temperatures through the Ohio Valley and central Appalachians around mid-month. Most of Ontario and the Canadian Maritimes experienced their coldest January since 1920, and southern Quebec endured its coldest January ever.

Hot and dry conditions in the summer combined to create an unusually severe wildfire season across the western U.S.A. and British Columbia. According to the National Interagency Fire Center, nearly 10 120 km^2 were consumed by wildfires in the United States by mid-July 1994, which was 31 per cent more than the 1989–1993 average for the January to mid-July period. Winter arrived early in the western Cordillera with exceptionally heavy snowfalls. New November snowfall records were established at Alta, UT (480 cm), Prince Rupert/Terrace, B.C. (182.5 cm), and Salt Lake City, UT (80 cm).

The Caribbean was not severely affected by hurricanes in 1994, however, in November, a rare late-season tropical storm, Gordon, formed in the western Caribbean and took an erratic path that brought gusty winds and flooding rains to portions of Jamaica, Cuba, and Haiti before the system veered towards Florida where it generated up to 300 mm of rain.

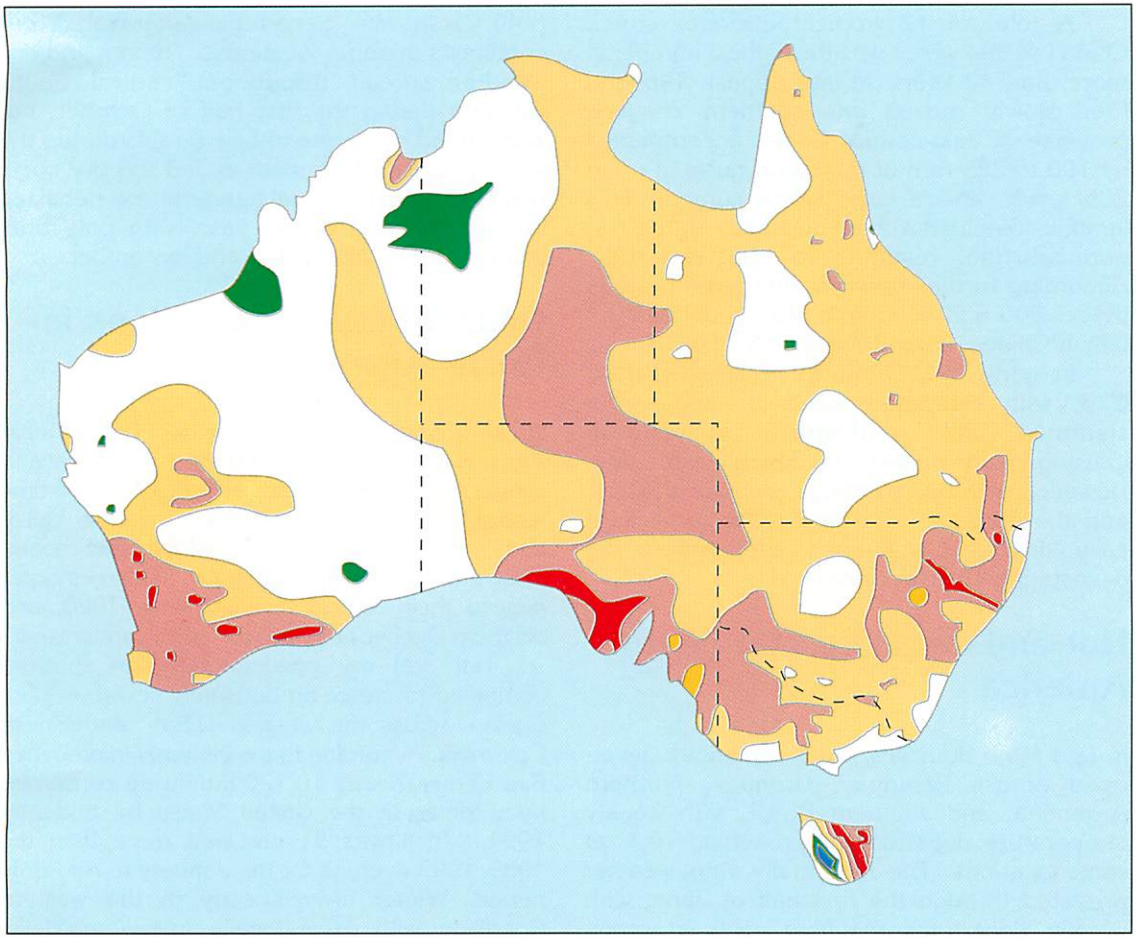


Figure 17
Distribution of annual rainfall in Australia.
Source: Bureau of Meteorology, Australia

Effects of ENSO in the Pacific

Abnormally warm waters, associated with the ENSO, across a vast expanse of the tropical central Pacific contributed to the development of hurricanes with immense strength. In July, Hurricanes Emilia and Gilma shattered records for the most intense storms ever observed. Then in August, Hurricane John intensified into the strongest storm ever recorded in the central Pacific as it passed south of Hawaii. Fortunately, the storm never affected any inhabited areas as its estimated sustained winds reached 275 km/h, with gusts to 330 km/h.

In Australia, hot, dry, and windy weather at the beginning of 1994 engendered the rapid spread of wildfires, many started by arsonists, which claimed several lives, forced thousands from their homes, and destroyed hundreds of buildings near Sydney. Australia experienced

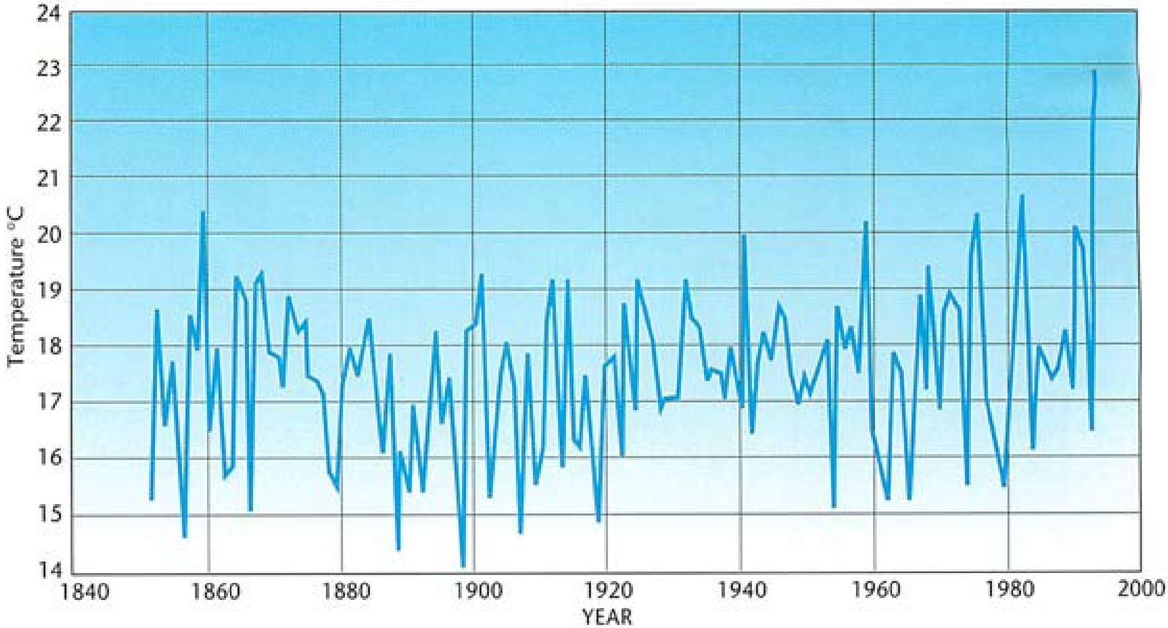


Figure 18
Monthly means of temperature (°C) for July in Hamburg, Germany between 1851 and 1994
Source: Deutscher Wetterdienst, Germany

the driest March–September period (as averaged across the continent below 20°S) since 1902. Figure 17 shows the national extent of dryness in 1994. Fires, abetted by tinder-dry conditions, spread through parts of eastern Australia, especially in New South Wales, where dozens of people were forced from their homes. As the year ended, the 1994–1995 wet season had yet to become well established. According to government and media sources, the continuing drought was severely impacting the country, causing millions of dollars damage to crops, forests and pastures. Dryness across northern and eastern Australia is consistent with conditions typically observed during an *El Niño.*

In New Zealand, there were record amounts of sunshine in Auckland and eastern North Island while in the far south it was much wetter than normal. A cold outbreak in the spring killed many thousands of newborn lambs.

After a cold start, record heat engulfs much of Europe

In Europe, subnormal temperatures prevailed across much of Scandinavia during late January as bitterly cold air enveloped the region. Several Winter Olympic events were nearly postponed because of the extremely cold conditions. Farther south, a bitterly cold Arctic outbreak at the end of January penetrated as far south as southern Italy and the Balkans. Subfreezing lows were widespread across the continent, and readings plummeted to –50°C in northern Russia, –28°C in Romania, and –12°C in Italy. Heavy snows downed power lines in southern France, while blizzard conditions isolated villages in Turkey. In Iceland, an avalanche near the town of Isafjordur, on April 5, killed one person and damaged skiing facilities and 35 summer cottages.

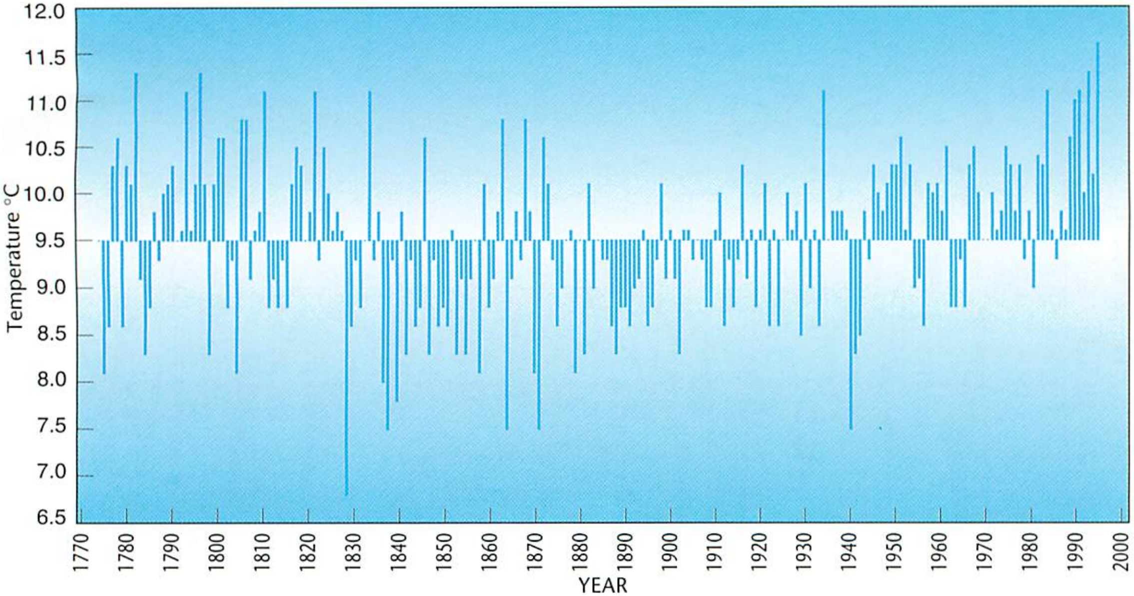
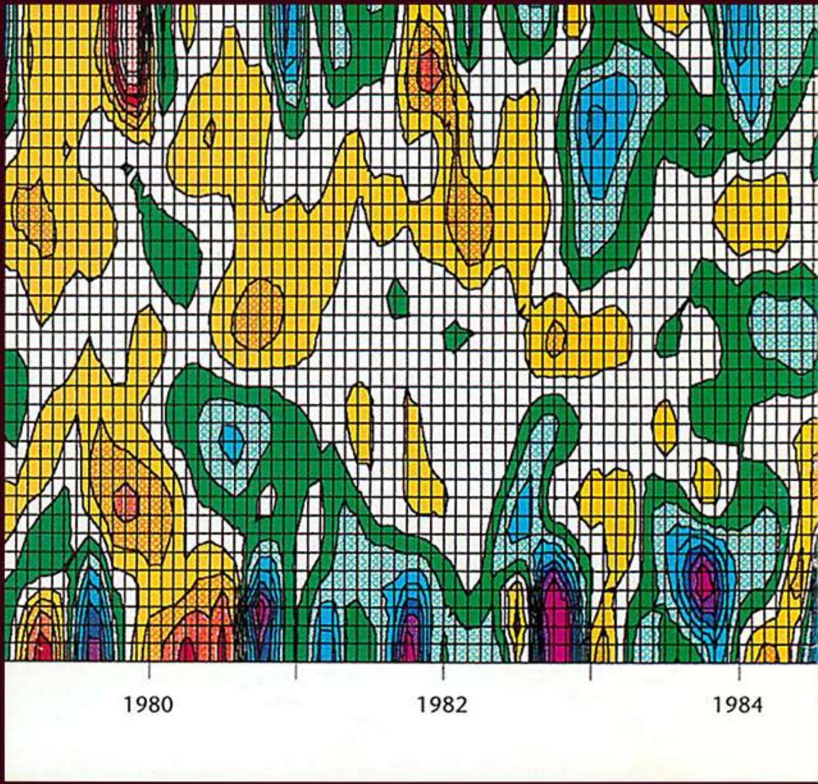


Figure 19
Annual mean air temperatures (°C) at Vienna, Austria 1775 — 1994 (220-year average = 9.5°C).
Source: CELOCLIM-DATA-BANK, Austria

In the summer, record breaking heat waves prevailed over much of Europe along with a shortage of rainfall, especially on the Iberian Peninsula, Poland, the Baltics and western Russia. July 1994 was the warmest at Brussels, Belgium since records began in 1833 and also at Hamburg (Figure 18). In Hungary, maximum temperatures exceeded 35°C on 11 days during July and on only four days did not reach 30°C. In Spain, prolonged dryness, aggravated by high temperatures (up to 46°C at Murcia), engendered wildfires and water shortages gripped parts of the Iberian Peninsula affecting agricultural production in some areas. In Vienna, Austria, 1994 was the warmest year on record, which extends back 220 years (Figure 19)

A series of storms moved across the Middle East in mid and late November, forcing the closure of some Egyptian harbours and delaying convoys in the Suez Canal. Reports indicated that blizzards isolated villages in eastern Turkey while torrential rains caused death and destruction in Iran.


1980
1982
1984