

## Reported Drought-Related Effects of El Niño for February 1998

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The National Drought Mitigation Center is compiling a list of drought-related effects of the 1997-98 El Niño, as reported to us in news stories from around the world. Our first report “Reported Effects of the 1997-98 El Niño,” released in November 1997, examined the effects of several climatic phenomena related to the current El Niño such as drought, floods, and hurricanes. Because of the great variety of impacts related to El Niño and the number of other researchers dealing with this topic, we have decided to focus more on the drought-related effects of El Niño in subsequent updates (although other related climatic hazards such as flooding may be discussed when they coincide with drought issues).

This report summarizes drought-related El Niño effects reported in stories from 1 February to 28 February 1998. It is important to remember that anomalous weather events happen continually. Because of the interdependence of global circulation patterns, it is often difficult to determine whether El Niño is a direct or indirect cause of certain events, or whether it is a factor at all. It is possible that media attention over the current El Niño has resulted in more effects being attributed to the phenomenon than can be scientifically justified. In addition, reported estimates of damages and other statistics will often vary as new data become available and depending on the methodology used to calculate values.

For more information, please visit the El Niño section of the National Drought Mitigation Center’s web site:

**<http://enso.unl.edu/ndmc/enigma/elnino.html>**

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Where?	Current Impacts	Potential Impacts
<p><b>United States of America</b></p> <p>Alaska</p> <p>California</p> <p>Florida</p> <p>Hawaii</p> <p>Massachusetts</p> <p>Michigan</p> <p>Montana</p> <p>New Jersey</p> <p>North Dakota</p> <p>Oregon</p> <p>Pennsylvania</p> <p>Washington</p> <p>Wisconsin</p>	<p>The northern U.S. winter temperatures have been two to four degrees above normal; warmer weather has reduced heating bills by 10%.</p> <p>Warmer winter; warmer temperatures are allowing skiing and other activities near Anchorage.</p> <p>Coral bleaching off Baja California from warm waters.</p> <p>Coral bleaching in the Florida Keys from warm waters.</p> <p>State of emergency due to drought; 7,500 homes already lack rainwater for bathing and cooking; residents are lining up at county water spigots; residents ordered to cut water use by 10%; some people are paying contractors to deliver domestic water; fines are given for unessential water use (i.e. watering lawns and crops or washing cars); brush fires have threatened 3,000 homes and burned 2,500 acres; outdoor burning is banned; ranchers are shipping cattle to the mainland; tropical flower and ornamental plant growers are working to save their stock; marijuana farmers have postponed planting.</p> <p>Eight inches less snow than normal so far this year; temperatures are seven degrees above normal; El Niño shifted jet stream north drawing warmer air up and rain to New England.</p> <p>Skiing is picking up with new snows (after limited snowfall in December).</p> <p>All snowpack drainages are below normal (most areas have 50% of last year's high snowpack totals); studying the possibility of drought this year.</p> <p>February is 5 degrees above normal; January was 9 degrees above normal.</p> <p>Warm winter; golf courses are opening more than a month early.</p> <p>Last month, the snowpack was 60% of normal but is now 90% of normal and mostly even statewide (except in the Willamette Valley which is 75% of normal).</p> <p>Last fall was dry causing drought in areas, however, January and February rains have revived most areas (except Chester County).</p> <p>Snowpack is slightly below normal; Seattle Water Department will not release as much water this year from its two reservoirs.</p> <p>Lack of snowfall this winter; temperatures are 10 degrees above average; affected snow mobile races, ski events, and other winter activities; lack of ice on bogs this year may expose cranberries to the cold night temperatures; golf courses are opening early.</p>	<p>The Puget Sound regions, Montana, the Great Lakes, the mid-Atlantic and the Ohio Valley may be drier than usual.</p> <p>Warm weather could allow break up and snow melt to occur in April (about a month early).</p> <p>Macadamia nut farmers predict a production drop of more than 25% in 1998.</p> <p>Drier than normal year.</p> <p>Cascade snowpack could be far below normal by late spring, possibly affecting summer water supplies.</p>

<p><b>West Indies</b>  Netherland Antilles  Cayman Islands  Haiti</p>	<p>Coral bleaching from warm waters.  Coral bleaching from warm waters.  Prolonged drought; decreased cereal production; food situation is tight.</p>	
<p><b>Central America</b>   El Salvador   Guatemala   Honduras     Nicaragua   Panama   Yucatan Coast</p>	<p>Drought damaged coffee growing areas and contributed to the spread of pests.  Drought affected the first season cereal crops.  Drought affected the first season cereal crops.  Flooding and droughts; provisional state of emergency; energy use increased per person because of warm, dry weather; rationing of water and electricity to homes nationwide; hydroelectric electric power supplies have decreased because of low dam levels; hundreds of forest fires; damage to 500,000 acres of crops in recent months; government panel has been appointed to coordinate relief efforts.  Drought affected the first season cereal crops.  Coral bleaching on the Pacific Coast from warm waters; drought affected the first season cereal crops.  Coral bleaching from warm waters.</p>	

<p><b>South America</b> Bolivia</p>	<p>Limited rainfall in most areas. Droughts, floods, and heat; affected 322,000 people (59,238 families by drought and 5,209 families by floods); caused millions of dollars of crop damage in nine departments; lack of rain has “destroyed” peasant farmer’s potato, wheat, oat, barley, quinoa (80% in Potosi), pea, and forage crops in valleys and highlands; in Potosi, crop losses (potato, barley, quinoa, and wheat) total \$12.5 million; rural losses will also mean a gradual food shortage in associated cities; hydroelectric power shortages in the south because of water shortages; distributing water in rural areas; distributing food to drought-affected rural communities; an increase in temperatures for many areas.</p>	<p>Protests could lead to social upheaval; the number of victims will reach “alarming numbers” in the next few weeks; drastic reduction of agricultural and livestock production as of May.</p>
<p>Brazil</p>	<p>Drought in some areas, while others received warm, wet weather; drought in Espiritu Santo caused losses to “robusta” coffee bean crops; warm, wet weather in other coffee areas have increased harvests by 65%.</p>	<p>Water and energy cuts were expected in Bogota this year, though supplies are holding for now.</p>
<p>Columbia</p>	<p>Drought; millions of dollars in crop losses (i.e. coffee); more than 11,000 fires; 10,000 cattle died in the southern region of El Guila; plagues of bugs (broca); government is providing farmer loans worth \$46 million (it will be increased by \$30 million in a few weeks); water shortages in cities, too; two planes have been hired from Canada to fight fires; government is dealing with cholera, dengue and breathing problems from the hot weather.</p>	<p>Very dry weather until May or June; rice production to drop by 10%; water rationing may shorten or modify school hours to accommodate water availability; poor sugar harvest and low rainfall over the next two years; bleaching of coral reefs; shortages of certain foods; 1998 exports may be down 60,000 tons to 300,000 tons.</p>
<p>French Guianas Galapagos Islands Guyana</p>	<p>Drought; gold mining has been affected. Coral bleaching from warm waters. Seven-month dry season; dried up water sources; water rationing in most districts to two or three hours per day; not enough water to irrigate rice; rivers are filling with saltwater from the Atlantic (15 miles or farther inland); farmers are asking for relief; as tourist season begins, hotels and cities are worried about the lack of water affecting tourism; the government has asked for UN experts to advise them; less than 25% of the gold mining industry that works in rivers or on land is working; hundreds of miners laid off; smaller mining operations temporarily closed.</p>	<p>Dry conditions for another four months.</p>
<p>Suriname</p>	<p>Drought; rice production is down; gold mining has been effected.</p>	
<p>Venezuela</p>	<p>Drought and heat; water rationing; loss of hydroelectric power production because of low dam levels; stepped up thermoelectric power generation.</p>	

<p><b>Australia</b></p>	<p>The government has supplied Papua New Guinea with \$19.8 million of drought relief since October of last year (but efforts are being cut back because of better conditions in Papua New Guinea).</p>	<p>High ocean temperatures (29-30 degrees Celsius) off the coast, if persistent, may permanently damage the fragile coral reef ecosystem (bleaching most likely began in the southernmost region of the Great Barrier Reef and appears to be moving toward the north).</p>
<p><b>New Zealand</b></p>	<p>Heat wave on the north island; in Auckland air conditioner use was up, creating fears of power shortages and an increase in power rates (from NZ\$0.3/kWh to NZ\$3.00/kWh); some power stations are having a difficult time meeting environmental regulations in the hot weather (i.e. maintaining river temperatures).</p>	

<p><b>Southeast Asia</b></p> <p>Indonesia</p> <p>Sumatra</p> <p>Kalimantan</p> <p>East Java</p> <p>Ujung Pandang</p> <p>Lombok island</p> <p>Loa Janan Ilir</p> <p>Malaysia</p> <p>Sarawak</p>	<p>Smog from forest fires caused more than \$1.3 billion in damage to SE Asia in 1997. Drought and depreciation of the rupiah has caused widespread environmental and economic problems; January rains have continued into February in some areas while other areas are becoming dry; in 1997, more than one million acres of paddy were reported to be damaged by heat and drought, dropping 1997 forecasts by 1.3 million tons; five deaths so far related to food riots; coffee and corn belts have receive some rain while cocoa plantations remain dry; early arrival of the dry season would hit the flow of latex because rubber trees were still in their "adjustment period" after last year's drought; military has stepped up operations against hoarders of basic commodities; last year 413 million acres were burned; \$1 billion in smog damage (90% for short-term health costs).</p> <p>Rains fell in January but have decreased in February; southern Sumatra is receiving rain but north Sumatra is dry (where palm oil and rubber is produced ); coffee, cocoa, and corn belts remain dry; last year 1.5 million ha (3.7 million acres) of land burned in southern Sumatra, Kalimantan and Java, afflicting nearly 50 million people with respiratory problems; coffee plantations of Bengkulu, Lampung, and South Sumatra all remain dry (area accounts for 70% of the country's coffee production); fires in the coastal peat forest were creating more smog for Singapore.</p> <p>Smoke has cut visibility and airport operations in several areas; 1,000 forest fires burning in East Kalimantan; cloud seeding is scheduled to put out the fires.</p> <p>Riots over high food prices (some over 300% higher); people started to plant in December, but they pulled their crops back because of a lack of rains; corn areas are receiving sporadic rains; some corn crops have been completely lost.</p> <p>Between 4,000 and 5,000 tons of cocoa arrived from growing areas compared to 6,000 to 7,000 tons last year; many cocoa farmers have arrived to look for work.</p> <p>Food riots killed two people; Chinese businesses have been accused of hoarding.</p> <p>Fires destroyed nearly 180 homes and left 1,400 people homeless.</p> <p>Urging the public to conserve water and farmers to use all possible sources for irrigation; smog caused \$300 million in losses (mainly from industrial production and tourism losses) in 1997.</p> <p>Urging residents not to clear land by burning.</p>	<p>Drought over the next few months until heavy rains in October; reduced cocoa production because of dry conditions last year; a drop in coffee output in 1998 to 300,000 to 325,000 tons from normal levels of 430,000 to 450,000 tons; a drop in February cocoa harvest to between 3,000 to 4,000 tons from 4,000 to 5,000 tons last February; as fires continue, more orangutans will be driven from the forest.</p> <p>Rainfall to decrease by 20 to 50% from now until June.</p>
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<p><b>Southeast Asia (cont.)</b></p>		
<p>Philippines</p>	<p>Rice paddy production dropped by 327,000 tons.</p>	
<p>Vietnam</p>	<p>Very little rainfall since early January except Jan. 18-19 in parts of Quang Ngai and Binh Dinh Provinces (60-100 mm); modifying and completing irrigation works and water management plans for winter-spring crops in case of drought; reservoirs have already released water for irrigation this year; 9,600 ha of winter-spring rice in Quang Nam Province's northern districts are suffering drought; drought and salt water encroachment is threatening the winter-spring crop in the Mekong River delta paddies; 10,000 ha on the western bank of the Hau River in Ken Qiang Province are affected by salt water intrusion; redirecting streams for desalinization.</p>	
<p>Thailand</p>	<p>Worst drought in over 90 years; more than six million people in 46 provinces are facing a drought (northeastern provinces are hardest hit); building 865 village water pipelines, 1,000 artesian wells; and 99 water tanks (\$44 million U.S.) for rural residents; setting aside \$156 million U.S. for assistance to residents in 56 potential drought-affected provinces; asked mobile medical units to be on standby and provide free medication to residents; set up special centers nationwide for relief efforts (receive complaints; survey water sources; prepare logistics and equipment for managing irrigation water).</p>	<p>The drought may last until May; reservoirs are low from below-normal 1997 rainfall; almost a quarter of the villages will be affected by drought; 6.4 million acres of corn and rice in six northern provinces could be effected; thousands of acres of lychee and longan orchard and soybean farms could be effected by the drought.</p>
<p>Papua New Guinea</p>	<p>Worst drought in 100 years, frosts, and forest fires; 260,000 people are without food or foraging; 980,000 have inadequate amount of food; 75 confirmed people (though thousands have also been reported) have died from the drought (malaria, typhoid, dysentery, and exhaustion); Australia has cut back its relief efforts from 70,000 to 54,000 people; Australia is conducting a third needs assessment for PNG; Australia has flown about 150 aid missions; foreign governments have donated about \$24 million U.S. for relief efforts; Ok Tedi copper/gold mine had been halted since August costing about \$20 U.S. million per month in lost revenues; recent rains have revived some areas.</p>	<p>Ok Tedi copper/gold mine will resume operation in weeks; Australia's relief operation may end by the end of April; despite recent rain, coffee output is expected to drop 20% (60,000 bags) from an average of 1 million bags.</p>
<p>Singapore</p>	<p>Smog caused losses of \$60 million (mainly from tourism losses) in 1997.</p>	

<p><b>East Asia</b> China North China</p> <p>North Korea</p>	<p>Prolonged drought. Farmers and livestock have had problems finding enough drinking water; precipitation in winter-crop areas of Northwest and Northeast China is down from 2 to 9% of normal; drought has damaged winter wheat in areas; recent rain and snow in North China has helped ease the drought.</p> <p>Prolonged drought along with previous flooding and storms; UN appeal for \$415.6 million U.S. for humanitarian efforts (food aid for 7,470,000 people including 5,520,000 children, and support in health services to prevent child malnutrition).</p>	<p>In November, it was predicted that up to one million tonnes of food aid would be needed this year because of the small harvest and limited ability to buy food.</p>
<p><b>Southern Asia</b> Sri Lanka</p> <p>India</p> <p>Bangladesh</p>	<p>Drought and pests; 83 farmers (mostly young or middle-aged small land holders) have committed suicide in the last 3 months (drought from June to August and pests afterwards destroyed crops for which many farmers had borrowed high-interest money); crops destroyed (i.e. cotton) and thousands of small farmers ruined.</p> <p>Lack of rain last October affecting the flowering Aman paddy which may drop production 500,000 tons to 8.5 million tons this year; reduced rice import surcharges to increase stocks; rice prices have risen 30% over the last couple of months (from production shortfalls and devaluation of the local currency [taka]); government is selling coarser rice to poorer people at lower prices to reduce unrest and lower prices; government has secured contracts for 150,000 tons of wheat from the Netherlands and the U.S. for shipment by March 15th.</p>	<p>Island wide drought this year, but high productivity and prices may offset crop losses (i.e. tea crops in low-lying countryside and the central district of Uva).</p> <p>Food deficit of up to 2.5 million tons in fiscal 1997/98 (June-July) from local production declines from bad weather; increased food prices; import 1.5 million tons of rice (from 1 million in 1996/97).</p>
<p><b>Middle East</b> Cyprus</p> <p>Red Sea</p>	<p>Three-year drought; seeking divine intervention to end the drought; a Turkish-Norwegian project plans to tug balloons that can hold 10,000 cubic meters of water to northern Cyprus.</p> <p>Warm ocean water has bleached some Red Sea reefs in the last year.</p>	

<p><b>Africa</b> <b>Northeast Africa</b> Sudan</p>	<p>Drought and fighting; UN appealed for \$109.4 million to relief assistance for war- and drought-affected Sudanese (and for re-establishing communities and social networks); increased crop failure and insecurity in parts of Bahr El Ghazal, Equatoria, and Jonglei in the south were causing migrations from grazing and fishing grounds and a significant increase in staple food prices (out of reach for some people).</p>	
<p><b>West Africa</b> Ghana</p>	<p>50% hydroelectric power generation cut since January because of low rainfall in the latter half of last year; since early February, domestic power supply has been cut every 24 hours; industries in Tema have been running at half capacity or lower for most of February.</p>	<p>Continued power rationing until at least June or July if rainfall doesn't return to normal by April.</p>
<p><b>Central Africa</b> Seychelles</p>	<p>Warm ocean water has bleached some reefs in the Seychelles last year.</p>	
<p><b>Southern Africa</b></p>	<p>Seeing first major dry spell in the interior, especially across Namibia, Botswana, the Limpopo Valley and most of the northern and central portions of South Africa; the dry spell is sending crop prices "spinning"; thus far, El Niño impact has not been significant; no widespread drought as predicted; some farmers who planted in low-lying areas (as recommended during drought) have lost crops from flooding; some farmers did not plant at all for fear of drought which will lower production.</p>	<p>Western part of southern Africa may be seriously affected by drought.</p>
<p>South Africa</p>	<p>Threat of major drought reduced by normal rains that fell until January; temperatures are an average of 4 degrees above average; a third of the maize is coming into the pollination phase (pollen virility may be effected by high temps) so maize production could be affected.</p>	<p>Warm and dry conditions are likely to continue; 50-60% chance of below normal rainfall from Jan-March of 1998 and the same percentage for above normal temperatures; maize crops in the interior are at risk; maize futures may rise.</p>
<p>Nespruit</p>	<p>Below normal rainfall in December and January; high water table from good rains over the last two years; crops still green.</p>	
<p>Zambia</p>	<p>Crops have been replanted up to 5 times because of inadequate rainfall and rodents; hunger is present in areas.</p>	<p>Hunger may continue this year since maize in the fields has dried up or is severely stunted from lack of rain.</p>