"Well OF COURSE there are greenhouse gasses in here. It's a freakin' GREENHOUSE!"
Changes in Temperature
2 to 5° F by 2050
Changes in Seasonality
Warmer winters earlier springs
Snowpack
Reduced levels at low elevations
Extra-local Water Influences
Lake Mead Water Level

Vertical Axis Units: Feet above Mean Sea Level

- Maximum (1220 feet)
- Average (1173 feet)
- Drought (1125 feet)

Lowest level since 1937
Changes in Natural Vegetation

Change in Vegetation Cover, 2070–2099

Decreasing Forest Yields, 2070–2099
Increased Wild Fires
Frost Days

Winter Freeze Line - Dec, Jan, Feb
Comparing Minimum Temperatures Between 1920 and 1993*

*1920 data is the average between 1900-1940; 1993 data is the average between 1980-2006
Agriculture in the San Joaquin Valley

Simulated Change in Crop Yields

Grapes table

Cherries

[Graphs showing simulated change in crop yields for grapes and cherries over time]
Relative surface area of crops in California for 2006
Heat Deaths Increasing

The New York Times

U.S.

For Californians, Deadly Heat Cut a Broad Swath

LOS ANGELES — With temperatures expected to be well above 100 degrees again Sunday, California officials were appealing to residents to turn down their air conditioners and hold off on using major appliances until after dark.

The blistering heat wave blanketing California continued to place tremendous strain on the power grid, as some 2,600 homes and businesses in Los Angeles remained without power Saturday after overloaded circuits knocked out power to thousands last week.

Around the state, dozens of cooling centers have been opened in parks, libraries, senior centers and county fairgrounds.

The heat wave wasn’t the only extreme weather causing havoc in the state. The misery was being compounded by humidity as moisture moves in from the south, causing concerns about sudden thunderstorms. Flash-flood warnings have been issued for many valley, mountain and desert areas. A funnel cloud touched down in the Antelope Valley desert, but no one was hurt.
# Heat Waves

## Table

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<td>1961-1990</td>
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<td>Heat-wave Days</td>
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Data from (Dreschler et al., 2005)
Public Health Consequences of Climate Change

Climate Change

- Temperature
  - Heat Waves
    - Increased air pollution
- Precipitation
  - Greater Intensity
  - Increased Drought
- Extreme Weather
  - Flooding/Drought
    - Decreased Water Quality
- Ecosystem Change
  - Greater Wildfires
    - Increased Disease Vectors

Greater Mortality, Hospitalizations, Injuries, Health Issues
Public Health Effects of Climate Change

Heat
- Heat Stroke
- Cardiovascular failure

Severe Weather
- Injuries, Fatalities

Allergies
- Poison Ivy
- Respiratory Allergies

Disease Vectors
- Malaria, Dengue, Encephalitis, Hantavirus, Nile Valley Fever
- Cholera, Cryptosporidiosis

Water-Borne Diseases
- Campylobacter Leptospirosis

Water-Food Supply
- Heat Stroke
- Cardiovascular failure

Mental Health
- Anxiety, Despair, Depression, Post-traumatic Stress

Environmental Refugees
- Forced Migration
- Civil Unrest

Air Pollution
- Asthma, Cardiovascular disease

Archaeology
- Injuries, Fatalities

Prehistoric Conditions
- Malaria, Dengue, Encephalitis, Hantavirus, Nile Valley Fever
- Cholera, Cryptosporidiosis

Water-Borne Diseases
- Campylobacter Leptospirosis

Environmental Refugees
- Forced Migration
- Civil Unrest

Prehistoric Conditions
- Injuries, Fatalities
Air Quality
Bad and probably getting worse
Allergies and Disease
Increasing pollen numbers and allergy

Spread of new diseases
Mosquito-Borne
Rodent-Borne
Water-Borne
www.csufresno.edu/icoa/projects/fresnoclimate

Available as a PDF
Chambers said the fire's behavior was the result of low humidity, a temperature that topped out at 103 degrees, and a fire-induced wind from the Northwest. Residents said that because of water restrictions and the cost of city water, many had stopped watering their lawns.
Carbon Dioxide (CO₂)

Reconstructed Atmospheric CO₂

Historic Atmospheric CO₂ Concentrations

Calendar Years B.P.
Recent CO$_2$ Changes
Carbon Dioxide
Differential Change across the Globe

September 21, 2005
**Arctic Sea Ice**

*Arctic sea ice loss compared to IPCC models*

Arctic ice extent loss to September 2007 compared to IPCC modelled changes using the SRES A2 CO2 scenario (IPCC high CO2 scenario). September loss data from satellite observations. Data smoothed with a 4th order polynomial to smooth out the year-to-year variability. Chart courtesy Dr Asger Sorteberg, Bjøknes Centre for Climate Research and University Center at Svalbard, Norway. Data: 23 September 2007 www.carboncopy.info/images/seaxs07.jpg