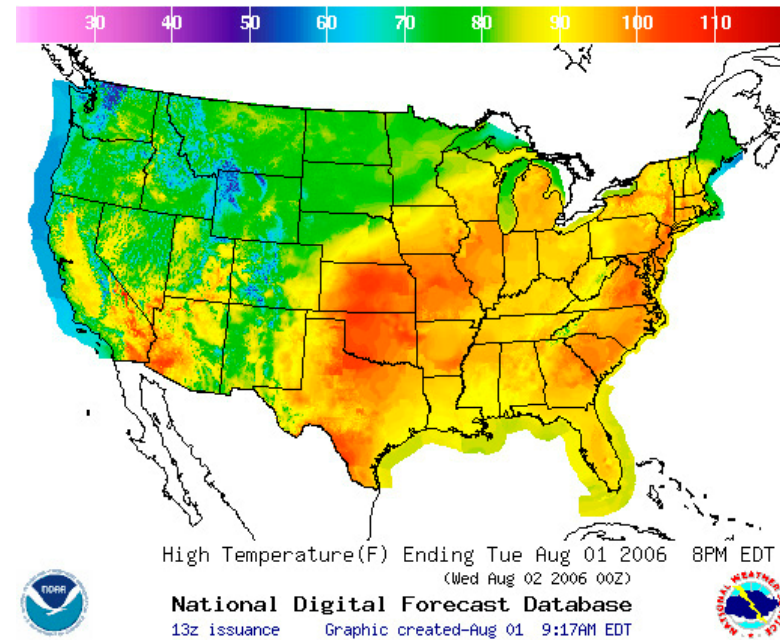


The Long Hot Summer: Records Broken in 2006

Jeff Gaffney
Chief Scientist
GCEP



LONG HOT SUMMER OF 2006



The first six months of this year were the hottest across the nation since the federal government began keeping records in 1890, according to the National Oceanic and Atmospheric Administration. There were 70+ new all-time July records (record highs for all days of the month). There were 50+ new all-time daily maximum temperature records for any month.

California Highlights:

Woodland Hills (outside L.A.) reported a new record of 21 days with maximum temperatures exceeding 100 degrees F (July 6 - 26) [old record was 15 days] Woodland Hills had 24 non-consecutive 100+ days in July (also an all-time record). Woodland Hills set an all-time record of 119 F on 7/22.

Downtown Los Angeles had a record (for July) 15 days (non-consecutive) of 90+ deg days during July.

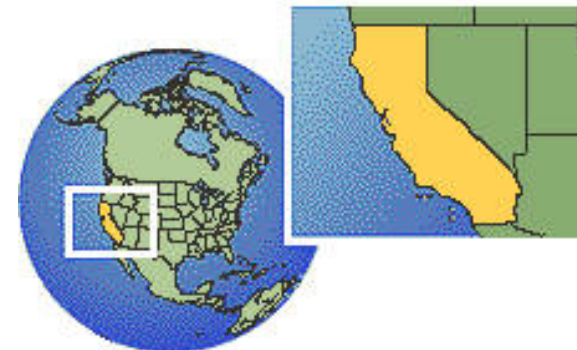
Burbank reported 14 days of July with minimum temperatures above 70 F, breaking the old July record of 5 days (Jul 1954), and the all-time record of 8 days (Aug 92 and Aug 94). Burbank also broke its July record of 108 F (7/15/78) with a 112F reading on 7/22. On the same day Paso Robles Airport did the same with a 114 F reading. Both were 1 degree shy of their all-time records.

On July 22, San Jose reported its warmest minimum temperature ever recorded (since 1893) of 74 F.

On July 23, Redding Airport near Sacramento reported new record for the date of 114 deg F (old record 109 set in 2003).

On July 23, the minimum temperature was just 84 F, setting all-time record warmest minimum temperature record for downtown Sacramento (which was 79 F set the day before, and before that was 78, set on Jun 23, 1909).

On July 23, the maximum temperature at Stockton was 115 F, a new all-time record for warmest maximum temperature for the Stockton airport (114 F in 1972).



August 1-4, 2006 MIDWEST AND EASTERN U.S.

By midafternoon, the temperature in Chicago was 100, Baltimore reached 99 and Washington hit 97, though the humidity made it feel like 107. In New York's Central Park, it was 95; the record for the date was 100, set in 1933. The National Weather Service said the mercury could reach 104 on Wednesday, and Thursday could be bad, too.

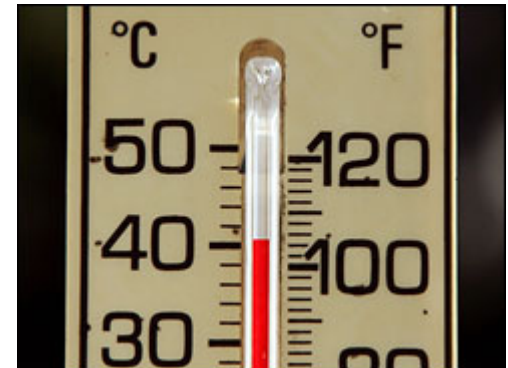
Fish kill in New Jersey

In New Jersey, soaring temperatures were suspected in a huge fish kill at a Piscataway lake, and beachgoers were on the sand and in the water before most people had arrived at work.

In Queens, N.Y., many residents found themselves in the dark again after recovering from a 10-day outage in late July. That included Ali, the grocer, who said he had to throw out \$17,000 worth of produce last time.



North Carolina

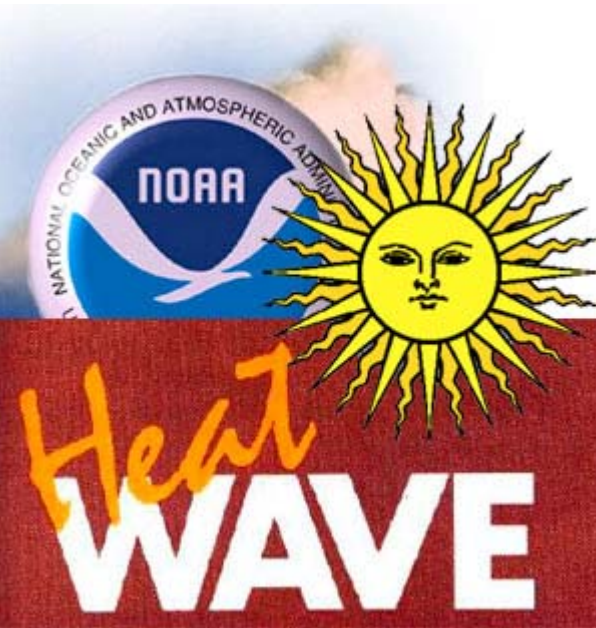


Des Plaines, IL

HEAT – THE NUMBER ONE NON-SEVERE WEATHER RELATED KILLER IN THE UNITED STATES

Heat Index (Apparent Temperature) Chart

The **Heat Index** (HI) is the temperature the body feels when heat and humidity are combined. The chart below shows the HI that corresponds to the actual air temperature and relative humidity. (NOTE: This chart is based upon shady, light wind conditions. **Exposure to direct sunlight can increase the HI by up to 15°F.**) (Due to the nature of the heat index calculation, the values in the tables below have an error of +/- 1.3F.)



Heat Index	General Effect of Heat Index on People in Higher Risk Groups
80 to 89° - Caution	Fatigue possible with prolonged exposure and/or physical activity.
90 to 104° - Extreme Caution	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
105 to 129° - Danger	Sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
130° or higher - Extreme Danger	Heat/sunstroke highly likely with continued exposure.

		Relative Humidity (in percent)																					
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
Air Temp (in F)	140	125																					
	135	120	128																				
	130	117	122	131																			
	125	111	116	123	131	141																	
	120	107	111	116	123	130	139	148															
	115	103	107	111	115	120	127	135	143	151													
	110	99	102	105	108	112	117	123	130	137	143	150											
	105	95	97	100	102	105	109	113	118	123	129	135	142	149									
	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144							
	95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136					
	90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122			
	85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108	
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91		
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80		
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	71	72	

HEAT INDEX/HEAT DISORDERS

Possible Heat Disorders for People in Higher Risk Group:

Heat Index of 130 degrees F or Higher:

Heatstroke/sunstroke highly likely with continued exposure.

Heat Index of 105 degrees F - 130 degrees F: Sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.

Heat Index of 90 degrees F - 105 degrees F: Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.

Heat Index of 80 degrees F - 90 degrees F: Fatigue possible with prolonged exposure and/or physical activity

HIGH RISK GROUP: Elderly persons, small children, chronic invalids, those on certain medications or drugs (including tranquilizers and anticholinergics) and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails

KNOW THESE HEAT DISORDER SYMPTOMS

SUNBURN: Redness and pain. In severe cases swelling of skin, blisters, fever and headaches. First Aid: Ointments for mild cases if blisters appear and do not break. If breaking occurs, apply dry sterile dressing. Serious, extensive cases should be seen by a physician.

HEAT CRAMPS: Painful spasms usually in muscles of legs and abdomen possible. Heavy sweating. First Aid: Firm pressure on cramping muscles, or gentle massage to relieve spasm. Give sips of water. If nausea occurs, discontinue use.

HEAT EXHAUSTION: Heavy sweating, weakness, skin cold, pale and clammy. Pulse thready. Normal temperature possible. Fainting and vomiting. First Aid: Get victim out of sun. Lay down and loosen clothing. Apply cool, wet cloths. Fan or move victim to air conditioned room. Sips of water. If nausea occurs, discontinue use. If vomiting continues, seek immediate medical attention.

HEAT STROKE (or sunstroke): High body temperature (106° F. or higher). Hot dry skin. Rapid and strong pulse. Possible unconsciousness. First Aid: **HEAT STROKE IS A SEVERE MEDICAL EMERGENCY. SUMMON EMERGENCY MEDICAL ASSISTANCE OR GET THE VICTIM TO A HOSPITAL IMMEDIATELY. DELAY CAN BE FATAL.** Move the victim to a cooler environment. Reduce body temperature with cold bath or sponging. Use extreme caution. Remove clothing, use fans and air conditioners. If temperature rises again, repeat process. Do not give fluids. Persons on salt restrictive diets should consult a physician before increasing their salt intake.

Produced as a cooperative effort of NOAA's National Weather Service, the Federal Emergency Management Agency, and the American Red Cross. NOAA/PA 85001

NOT JUST U.S. – Some Headlines from Europe.....

Temperatures across Europe were expected to smash records this week as the current heat wave showed no signs of abating. While some enjoyed the sun, deaths and forest fires marred the increasingly tropical summer.



**SETTING THE RECORD STRAIGHT:
More than 52,000 Europeans Died from Heat in Summer 2003**

Heat Wave is Drying Up Europe's Water Resources

The record temperatures in July have had a dramatic effect on Europe's water resources. Many lakes and rivers are at record lows, aggravating problems already caused by bad water management



In Freiburg, you can walk through the Dreisam river bed these days

LONDON, England (Reuters) -- European governments scrambled to save lives in record high temperatures on Wednesday to avoid a repeat of the catastrophic heatwave of 2003 that killed 15,000 people in France and 2,000 in Britain.

In Britain, temperatures hit an all-time high for the month of July, touching 36.3 degrees Centigrade (97.34 Fahrenheit) south of London to edge out the previous record set in 1911.

Germany's national meteorological service said July was on the way to being the hottest since records began in many parts of the country.

The searing heat and expected storms later in the week threatened to damage northern Europe's wheat crop just days before the harvest, especially hitting Germany and France.

Electricity grids were straining. In Britain the national grid warned that blackouts could be possible because of increased demand from air conditioners.

France's main electricity provider EDF said it had to buy power abroad. Not only did demand rise, but the company had to curtail production to maintain safety at nuclear power plants cooled by river water.

FEEDBACKS....

HEAT – URBAN HEAT ISLANDS INCREASE HEAT

MORE AIR CONDITIONING DEMAND

MORE ENERGY DEMAND ---- MORE WATER DEMAND

CROPS – MORE WATER

LIVESTOCK – MORE WATER

PEOPLE – MORE WATER

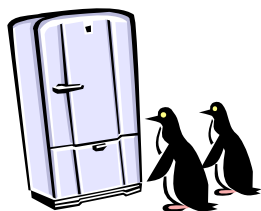
HEAT WAVES – DROUGHT – INCREASED FIRE RISK...

WATER..

WATER SHORTAGES KEY ISSUES

NEED TO START MANAGING OUR RESOURCES IF WE ARE TO SUCCESSFULLY ADAPT TO GLOBAL CHANGE...

Newspapers tried to help people cool off. Germany's biggest-selling daily Bild published a list of the coolest places in Berlin, including the fish counter at the Karstadt department store and the penguin house at the zoo.



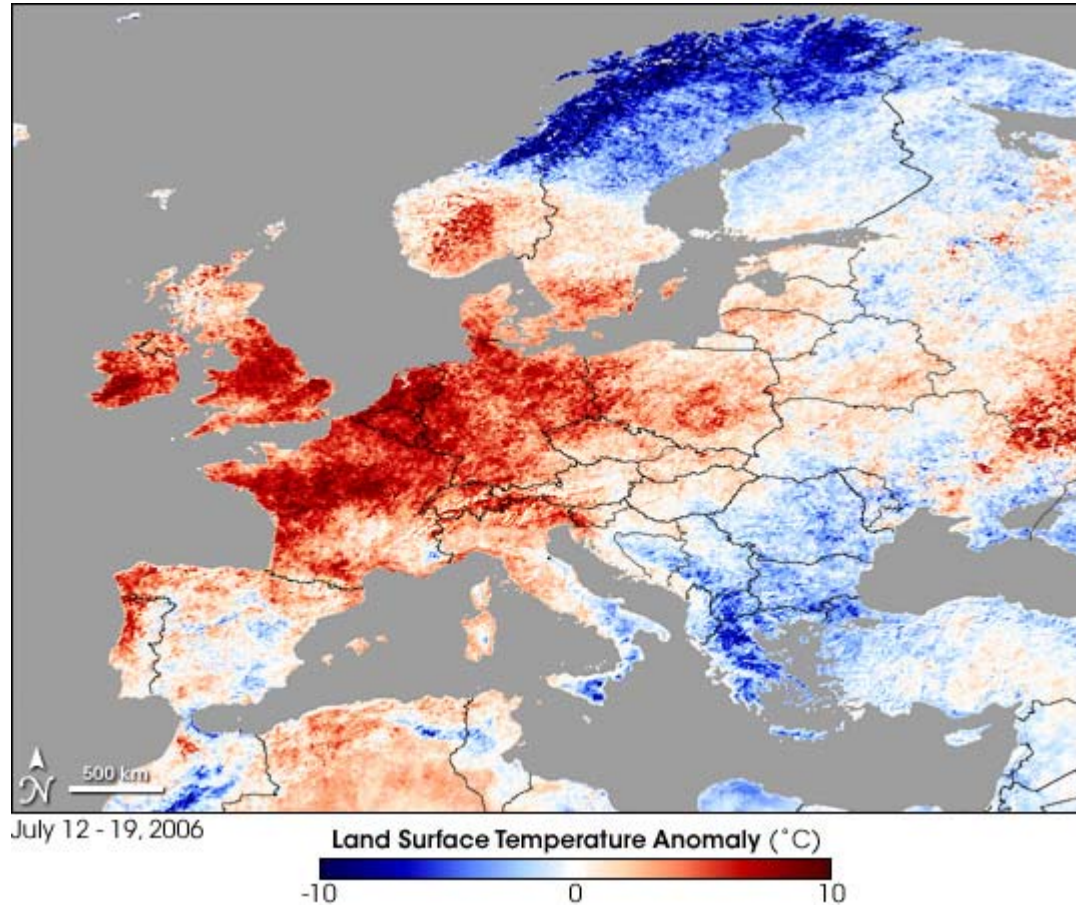
USA TODAY – AUGUST 9, 2006

A preview of the future — much hotter decades on a warming planet — has been delivered today by the continent-spanning heat wave, climate experts say.

"Heat wave projections all agree. They are going to intensify in length and frequency" in this century, says climate scientist Claudia Tebaldi of the National Center for Atmospheric Research in Boulder, Colo.

MODIS Satellite Data...GLOBAL CHANGE NOT A HOMOGENEOUS PROCESS

WHILE SOME PLACES BAKED.. OTHERS WERE COOLER



CLIMATE MODELS PREDICT STABLER HIGH PRESSURE DOMES – THAT LEAD TO THIS TYPE OF HEAT WAVE SITUATION....

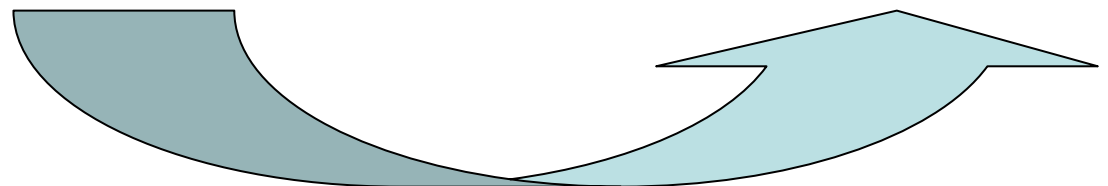


The Edison Electric Institute reported "significant strain" on the power grid Monday. It said last week that electricity demand in the U.S. had set a weekly record.



Natural gas, oil prices jump amid heat wave

**CO₂,
etc....**

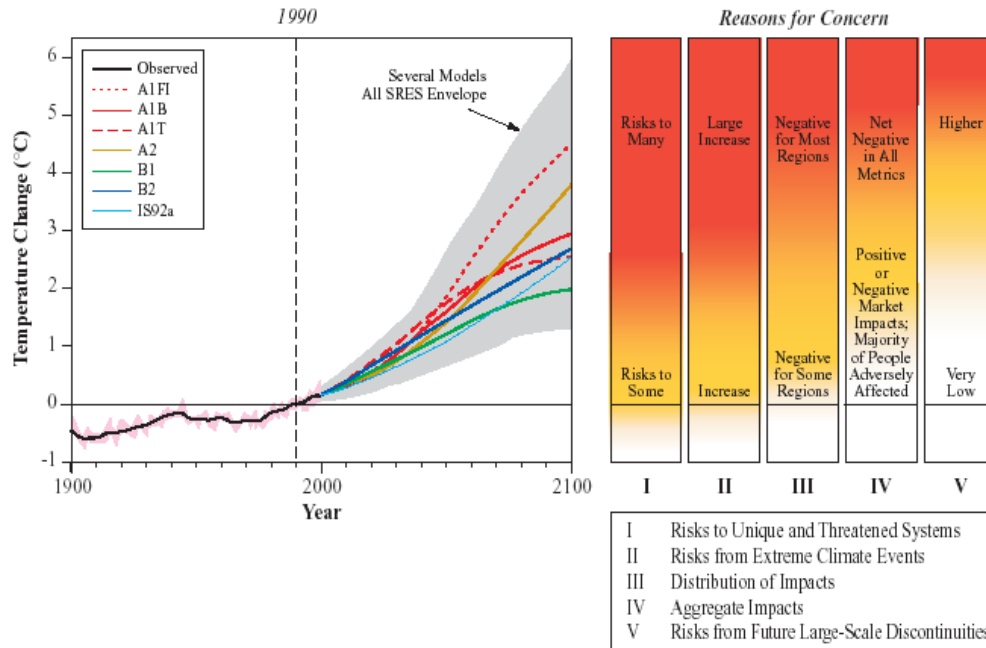


SHORT TERM GAIN....

The energy sector was one of the bigger gainers on the TSX Monday, up 1.3 per cent. Major gas and oil companies, including EnCana and Canadian Natural Resources, saw their stock prices rise.

VS.. LONG TERM CONSEQUENCES AND IMPACTS...

Reasons for Concern About Climate Change Impacts.



IPCC

Some Other Consequences of HEAT WAVES...

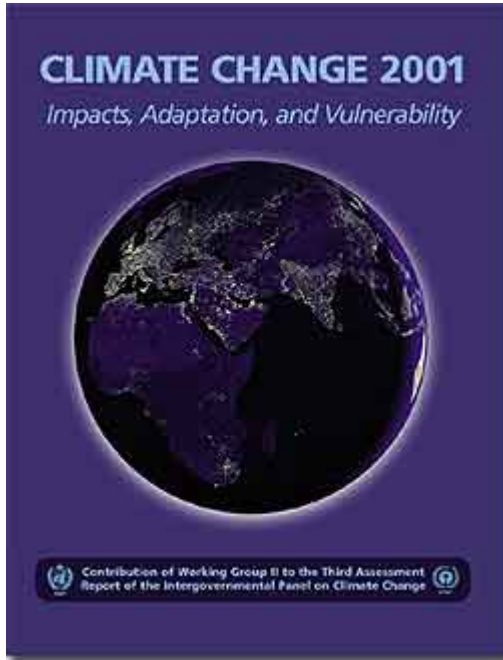


off the mark by Mark Parisi
www.offthemark.com



CLIMATE CHANGE AND IMPACTS ARE VERY LIKELY..

RESOURCE MANAGEMENT KEY



SUCCESSFUL ADAPTATION AND SUSTAINABILITY
WILL WORK IF WE UNDERSTAND THE GLOBAL
SYSTEMS AND PROCESSES

YOU'RE THE FUTURE.. AND OUR HOPE...

CHANGE IS INEVITABLE

PEOPLE DON'T LIKE CHANGE

CHANGE REQUIRES EFFORT TO ADAPT.... LOTS TO DO

NEVER GIVE UP... NEVER SURRENDER.. Galaxy Quest