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Global Temperature Report: February 2010

2nd warmest February in 32 years
is fifth 'warmest' month overall

New dataset corrects seasonal cycles

Global climate trend since Nov. 16, 1978: +0.13 C per decade

February temperatures (preliminary)

Global composite temp.: +0.61 C (about 1.1 degrees Fahrenheit) above 20-year average for February.

Northern Hemisphere: +0.72 C (about 1.3 degrees Fahrenheit) above 20-year average for February.

Southern Hemisphere: +0.51 C (about 0.92 degrees Fahrenheit) above 20-year average for February.

January temperatures (revised):

Global Composite: +0.63 C above 20-year average

Northern Hemisphere: +0.81 C above 20-year average

Southern Hemisphere: +0.45 C above 20-year average

(All temperature anomalies are based on a 20-year average (1979-1998) for

the month reported.)

Notes on data released March 8, 2010:

The El Nino Pacific Ocean warming event continues to dominate the global temperature keeping it quite warm, although not so in selected locations where many in the U.S. and Europe experienced colder than usual conditions through February, according to Dr. John Christy, professor of atmospheric science and director of the Earth System Science Center (ESSC) at The University of Alabama in Huntsville.

Globally, February 2010 was the second warmest February in the 32-year temperature record behind February 1998 (+0.75 C). While January 2010 was the warmest January, it was in 4th place overall behind February, April and May 1998. February 2010 was 5th warmest overall, compared to seasonal norms.

"This is the most intense El Nino since the 1997-98 event, when the tropics hit 1.29 C above average in February 1998," Christy said. "Last month the tropics were +0.79 above average, the largest departure for any month in the tropics since 1998."

UAHuntsville introduces satellite dataset v5.3

"We have updated our satellite temperature dataset to account for the mismatch between the average seasonal cycle produced by the older microwave sounding units (MSUs) and the newer advanced MSUs," Christy said. "This affects the value of the individual monthly departures, but does not affect the year to year variations. The overall trend remains the same."

Comparison of v5.2 and v5.3

| Year | Mth | v5.2 | v5.3 |
|------|-----|-------|-------|
| 2009 | 1 | 0.304 | 0.213 |
| 2009 | 2 | 0.347 | 0.220 |
| 2009 | 3 | 0.206 | 0.174 |
| 2009 | 4 | 0.090 | 0.135 |
| 2009 | 5 | 0.045 | 0.102 |
| 2009 | 6 | 0.003 | 0.022 |
| 2009 | 7 | 0.411 | 0.414 |
| 2009 | 8 | 0.229 | 0.245 |

| | | | |
|------|----|-------|-------|
| 2009 | 9 | 0.422 | 0.502 |
| 2009 | 10 | 0.286 | 0.353 |
| 2009 | 11 | 0.497 | 0.504 |
| 2009 | 12 | 0.288 | 0.262 |
| 2010 | 1 | 0.721 | 0.630 |
| 2010 | 2 | 0.740 | 0.613 |

Glb trend +0.132 +0.132
since 11/78

Christy and Dr. Roy Spencer, a principal research scientist in the ESSC, have been looking at making an adjustment to the way the average seasonal cycle is removed from the newer AMSU instruments (since 1998) versus the older MSU instruments that were on satellites before 1998.

"It was brought to our attention that the UAH data tended to have some systematic peculiarities with specific months," Christy said. "February tended to be relatively warmer while September was relatively cooler when compared to other datasets.

"In v5.2 of our dataset we relied considerably on the older MSUs to construct the average seasonal cycle that is used to calculate monthly departures for the AMSU instruments. This created the peculiarities noted above. In v5.3 we have limited this influence.

"The adjustments are minor in terms of climate, as they impact relative departures within the year and not the year-to-year variations," he said. "Since the errors are largest in February (almost 0.13 C), we believe that February is the appropriate month to introduce v5.3 where readers will see the differences most clearly.

"There is no change in the long-term trend, as both v5.2 and v5.3 show warming at the rate of +0.132 C per decade," Christy said. "All that happens is a redistribution of a fraction of the anomalies among the months. Indeed, with v5.3 as with v5.2, January 2010 is still the warmest January and February 2010 is the second warmest February behind February 1998 in the 32-year record."

Additional background information is available in running technical comments from last July:

<http://vortex.nsstc.uah.edu/data/msu/t2lt/readme.05Mar2010>

A more detailed discussion of this issue is available from Dr. Christy at:

christy@nsstc.uah.edu.

Color maps of local temperature anomalies may soon be available on-line at:

<http://climate.uah.edu/>

The processed temperature data is available on-line at:

vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt

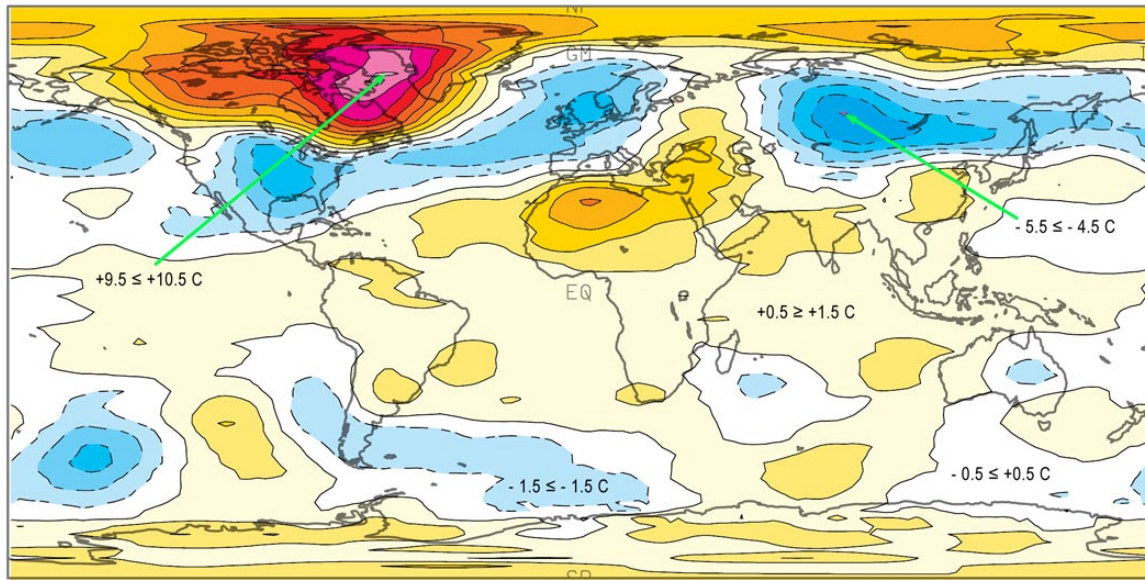
As part of an ongoing joint project between UAHuntsville, NOAA and NASA, Christy and Spencer use data gathered by advanced microwave sounding units on NOAA and NASA satellites to get accurate temperature readings for almost all regions of the Earth. This includes remote desert, ocean and rain forest areas where reliable climate data are not otherwise available.

The satellite-based instruments measure the temperature of the atmosphere from the surface up to an altitude of about eight kilometers above sea level. Once the monthly temperature data is collected and processed, it is placed in a "public" computer file for immediate access by atmospheric scientists in the U.S. and abroad.

Neither Christy nor Spencer receives any research support or funding from oil, coal or industrial companies or organizations, or from any private or special interest groups. All of their climate research funding comes from federal and state grants or contracts.

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FEB 2010
LAYER = LT LOWER TROPOSPHERE



ZERO CONTOUR OFF
CONTOUR FROM -9.5000 TO 9.5000 CONTOUR INTERVAL OF 1.0000 PT(3,3)= 1.4000

Broken lines outlines areas that were cooler than seasonal norms; solid lines outline areas that were warmer than seasonal norms. Each contour represents one degree Celsius, starting at -0.5 and +0.5 degrees C.

UAHuntsville Satellite Temperature Dataset, v. 5.3

| YEAR | MTH | GL | NH | SH | TRPC | YEAR | MTH | GL | NH | SH | TRPC |
|------|-----|--------|--------|--------|--------|------|-----|--------|--------|--------|--------|
| 1978 | 12 | -0.198 | -0.165 | -0.231 | -0.166 | 1982 | 2 | -0.108 | -0.223 | 0.007 | -0.170 |
| 1979 | 1 | -0.146 | -0.279 | -0.012 | -0.081 | 1982 | 3 | -0.248 | -0.385 | -0.110 | -0.109 |
| 1979 | 2 | -0.153 | -0.226 | -0.080 | 0.032 | 1982 | 4 | -0.134 | -0.043 | -0.226 | -0.165 |
| 1979 | 3 | -0.147 | -0.147 | -0.147 | -0.103 | 1982 | 5 | -0.156 | -0.292 | -0.020 | -0.101 |
| 1979 | 4 | -0.167 | -0.184 | -0.149 | -0.042 | 1982 | 6 | -0.113 | -0.248 | 0.023 | -0.002 |
| 1979 | 5 | -0.165 | -0.245 | -0.084 | -0.108 | 1982 | 7 | -0.258 | -0.237 | -0.279 | -0.113 |
| 1979 | 6 | -0.151 | -0.187 | -0.114 | -0.062 | 1982 | 8 | -0.192 | -0.284 | -0.101 | -0.136 |
| 1979 | 7 | -0.052 | 0.071 | -0.175 | 0.052 | 1982 | 9 | -0.147 | -0.247 | -0.048 | -0.107 |
| 1979 | 8 | -0.163 | -0.097 | -0.229 | 0.020 | 1982 | 10 | -0.230 | -0.348 | -0.111 | -0.252 |
| 1979 | 9 | 0.025 | 0.001 | 0.049 | 0.066 | 1982 | 11 | -0.132 | -0.432 | 0.167 | 0.025 |
| 1979 | 10 | 0.133 | 0.082 | 0.183 | 0.176 | 1982 | 12 | -0.013 | -0.073 | 0.047 | 0.169 |
| 1979 | 11 | 0.007 | 0.046 | -0.032 | 0.240 | 1983 | 1 | 0.128 | 0.125 | 0.131 | 0.568 |
| 1979 | 12 | 0.106 | 0.115 | 0.097 | 0.033 | 1983 | 2 | -0.026 | -0.180 | 0.128 | 0.534 |
| 1980 | 1 | 0.030 | -0.134 | 0.194 | 0.146 | 1983 | 3 | 0.245 | 0.167 | 0.323 | 0.568 |
| 1980 | 2 | 0.107 | 0.014 | 0.199 | 0.152 | 1983 | 4 | 0.167 | -0.004 | 0.337 | 0.453 |
| 1980 | 3 | 0.003 | -0.218 | 0.224 | 0.090 | 1983 | 5 | 0.186 | -0.018 | 0.389 | 0.381 |
| 1980 | 4 | 0.145 | -0.032 | 0.322 | 0.195 | 1983 | 6 | -0.082 | -0.180 | 0.016 | 0.209 |
| 1980 | 5 | 0.159 | 0.041 | 0.278 | 0.260 | 1983 | 7 | 0.118 | 0.136 | 0.100 | 0.386 |
| 1980 | 6 | 0.097 | 0.037 | 0.157 | 0.263 | 1983 | 8 | 0.059 | 0.089 | 0.028 | 0.157 |
| 1980 | 7 | 0.068 | 0.032 | 0.104 | 0.085 | 1983 | 9 | 0.080 | 0.034 | 0.126 | 0.093 |
| 1980 | 8 | 0.123 | 0.030 | 0.217 | 0.013 | 1983 | 10 | -0.094 | -0.167 | -0.021 | -0.098 |
| 1980 | 9 | 0.193 | 0.053 | 0.332 | 0.127 | 1983 | 11 | -0.041 | 0.019 | -0.101 | -0.077 |
| 1980 | 10 | 0.085 | 0.135 | 0.035 | 0.089 | 1983 | 12 | -0.312 | -0.336 | -0.288 | -0.330 |
| 1980 | 11 | 0.111 | 0.110 | 0.112 | 0.026 | 1984 | 1 | -0.315 | -0.376 | -0.255 | -0.421 |
| 1980 | 12 | -0.070 | -0.118 | -0.023 | -0.015 | 1984 | 2 | -0.203 | -0.335 | -0.070 | -0.252 |
| 1981 | 1 | 0.127 | 0.111 | 0.143 | -0.125 | 1984 | 3 | -0.126 | -0.341 | 0.090 | -0.102 |
| 1981 | 2 | 0.160 | 0.047 | 0.273 | -0.158 | 1984 | 4 | -0.218 | -0.324 | -0.112 | -0.170 |
| 1981 | 3 | 0.124 | 0.119 | 0.130 | -0.085 | 1984 | 5 | -0.044 | -0.216 | 0.127 | -0.259 |
| 1981 | 4 | 0.001 | 0.077 | -0.076 | -0.056 | 1984 | 6 | -0.231 | -0.177 | -0.286 | -0.338 |
| 1981 | 5 | 0.045 | 0.083 | 0.008 | -0.012 | 1984 | 7 | -0.266 | -0.296 | -0.235 | -0.443 |
| 1981 | 6 | -0.031 | 0.024 | -0.086 | -0.080 | 1984 | 8 | -0.206 | -0.174 | -0.237 | -0.270 |
| 1981 | 7 | 0.039 | 0.023 | 0.055 | -0.122 | 1984 | 9 | -0.487 | -0.460 | -0.514 | -0.550 |
| 1981 | 8 | 0.051 | 0.088 | 0.014 | -0.174 | 1984 | 10 | -0.194 | -0.254 | -0.133 | -0.337 |
| 1981 | 9 | 0.025 | -0.017 | 0.067 | -0.029 | 1984 | 11 | -0.417 | -0.587 | -0.247 | -0.494 |
| 1981 | 10 | -0.016 | 0.028 | -0.060 | 0.047 | 1984 | 12 | -0.391 | -0.605 | -0.177 | -0.388 |
| 1981 | 11 | -0.017 | -0.021 | -0.013 | 0.029 | 1985 | 1 | -0.157 | -0.217 | -0.098 | -0.251 |
| 1981 | 12 | 0.123 | 0.080 | 0.166 | 0.053 | 1985 | 2 | -0.224 | -0.159 | -0.288 | -0.241 |
| 1982 | 1 | -0.103 | -0.236 | 0.030 | -0.082 | 1985 | 3 | -0.129 | -0.317 | 0.059 | -0.222 |

UAHuntsville Satellite Temperature Dataset, v. 5.3

| YEAR | MTH | GL | NH | SH | TRPC | YEAR | MTH | GL | NH | SH | TRPC |
|------|-----|--------|--------|--------|--------|------|-----|--------|--------|--------|--------|
| 1985 | 4 | -0.200 | -0.307 | -0.093 | -0.506 | 1988 | 6 | 0.090 | 0.132 | 0.049 | -0.068 |
| 1985 | 5 | -0.247 | -0.211 | -0.283 | -0.346 | 1988 | 7 | 0.187 | 0.264 | 0.110 | 0.037 |
| 1985 | 6 | -0.247 | -0.349 | -0.145 | -0.410 | 1988 | 8 | 0.158 | 0.290 | 0.026 | 0.051 |
| 1985 | 7 | -0.377 | -0.541 | -0.213 | -0.584 | 1988 | 9 | 0.284 | 0.311 | 0.258 | 0.050 |
| 1985 | 8 | -0.200 | -0.370 | -0.030 | -0.339 | 1988 | 10 | 0.124 | 0.179 | 0.068 | -0.050 |
| 1985 | 9 | -0.199 | -0.335 | -0.063 | -0.325 | 1988 | 11 | -0.076 | -0.133 | -0.020 | -0.392 |
| 1985 | 10 | -0.291 | -0.311 | -0.271 | -0.243 | 1988 | 12 | -0.131 | -0.148 | -0.115 | -0.621 |
| 1985 | 11 | -0.148 | -0.130 | -0.167 | -0.258 | 1989 | 1 | -0.326 | -0.356 | -0.295 | -0.491 |
| 1985 | 12 | -0.139 | -0.084 | -0.193 | -0.200 | 1989 | 2 | -0.191 | -0.168 | -0.215 | -0.627 |
| 1986 | 1 | -0.028 | -0.005 | -0.051 | -0.093 | 1989 | 3 | -0.201 | -0.100 | -0.302 | -0.733 |
| 1986 | 2 | -0.177 | -0.335 | -0.018 | -0.355 | 1989 | 4 | -0.107 | 0.027 | -0.240 | -0.472 |
| 1986 | 3 | -0.153 | -0.174 | -0.132 | -0.323 | 1989 | 5 | -0.223 | -0.130 | -0.315 | -0.482 |
| 1986 | 4 | -0.024 | -0.078 | 0.031 | -0.168 | 1989 | 6 | -0.217 | -0.144 | -0.290 | -0.471 |
| 1986 | 5 | -0.046 | -0.106 | 0.015 | -0.158 | 1989 | 7 | -0.102 | -0.038 | -0.165 | -0.296 |
| 1986 | 6 | -0.152 | -0.126 | -0.178 | -0.209 | 1989 | 8 | -0.062 | -0.065 | -0.060 | -0.239 |
| 1986 | 7 | -0.189 | -0.257 | -0.121 | -0.295 | 1989 | 9 | 0.063 | 0.101 | 0.025 | -0.175 |
| 1986 | 8 | -0.231 | -0.282 | -0.179 | -0.126 | 1989 | 10 | 0.046 | 0.050 | 0.041 | -0.126 |
| 1986 | 9 | -0.259 | -0.342 | -0.176 | -0.184 | 1989 | 11 | -0.065 | -0.190 | 0.060 | -0.001 |
| 1986 | 10 | -0.259 | -0.263 | -0.254 | -0.117 | 1989 | 12 | 0.067 | 0.004 | 0.129 | -0.202 |
| 1986 | 11 | -0.114 | -0.223 | -0.004 | -0.081 | 1990 | 1 | -0.003 | -0.042 | 0.037 | -0.155 |
| 1986 | 12 | -0.135 | -0.233 | -0.036 | -0.024 | 1990 | 2 | -0.146 | -0.049 | -0.243 | -0.318 |
| 1987 | 1 | 0.147 | 0.245 | 0.049 | 0.173 | 1990 | 3 | 0.101 | 0.323 | -0.121 | -0.182 |
| 1987 | 2 | 0.184 | 0.258 | 0.111 | 0.180 | 1990 | 4 | 0.011 | 0.078 | -0.057 | -0.011 |
| 1987 | 3 | -0.080 | -0.024 | -0.136 | 0.111 | 1990 | 5 | 0.095 | 0.171 | 0.020 | 0.009 |
| 1987 | 4 | 0.114 | 0.055 | 0.174 | 0.253 | 1990 | 6 | 0.090 | 0.246 | -0.066 | 0.030 |
| 1987 | 5 | -0.048 | -0.117 | 0.021 | 0.027 | 1990 | 7 | 0.042 | 0.004 | 0.080 | -0.129 |
| 1987 | 6 | 0.144 | 0.047 | 0.242 | 0.333 | 1990 | 8 | 0.023 | 0.051 | -0.006 | 0.001 |
| 1987 | 7 | 0.114 | 0.115 | 0.113 | 0.409 | 1990 | 9 | 0.000 | 0.056 | -0.056 | -0.022 |
| 1987 | 8 | 0.032 | -0.011 | 0.076 | 0.344 | 1990 | 10 | 0.134 | 0.144 | 0.123 | 0.114 |
| 1987 | 9 | 0.051 | 0.124 | -0.023 | 0.409 | 1990 | 11 | 0.319 | 0.298 | 0.339 | 0.210 |
| 1987 | 10 | 0.209 | 0.219 | 0.200 | 0.511 | 1990 | 12 | 0.217 | 0.239 | 0.194 | 0.149 |
| 1987 | 11 | 0.096 | 0.071 | 0.121 | 0.500 | 1991 | 1 | 0.133 | 0.172 | 0.093 | 0.205 |
| 1987 | 12 | 0.359 | 0.517 | 0.202 | 0.621 | 1991 | 2 | 0.157 | 0.184 | 0.129 | 0.176 |
| 1988 | 1 | 0.275 | 0.349 | 0.201 | 0.421 | 1991 | 3 | 0.284 | 0.430 | 0.138 | 0.159 |
| 1988 | 2 | 0.017 | 0.029 | 0.004 | 0.252 | 1991 | 4 | 0.134 | 0.240 | 0.028 | 0.005 |
| 1988 | 3 | 0.223 | 0.192 | 0.254 | 0.440 | 1991 | 5 | 0.166 | 0.329 | 0.003 | 0.152 |
| 1988 | 4 | 0.062 | -0.033 | 0.157 | 0.099 | 1991 | 6 | 0.331 | 0.318 | 0.344 | 0.286 |
| 1988 | 5 | 0.089 | 0.202 | -0.024 | 0.162 | 1991 | 7 | 0.188 | 0.217 | 0.158 | 0.122 |

UAHuntsville Satellite Temperature Dataset, v. 5.3

| YEAR | MTH | GL | NH | SH | TRPC | YEAR | MTH | GL | NH | SH | TRPC |
|------|-----|--------|--------|--------|--------|------|-----|--------|--------|--------|--------|
| 1991 | 8 | 0.215 | 0.215 | 0.215 | 0.041 | 1994 | 10 | -0.125 | 0.079 | -0.328 | -0.152 |
| 1991 | 9 | 0.071 | 0.159 | -0.017 | 0.093 | 1994 | 11 | 0.141 | 0.260 | 0.021 | 0.069 |
| 1991 | 10 | -0.043 | 0.017 | -0.102 | -0.306 | 1994 | 12 | 0.117 | 0.135 | 0.100 | 0.255 |
| 1991 | 11 | -0.101 | 0.005 | -0.208 | -0.175 | 1995 | 1 | 0.135 | 0.389 | -0.119 | 0.184 |
| 1991 | 12 | -0.124 | -0.144 | -0.103 | -0.095 | 1995 | 2 | 0.075 | 0.311 | -0.161 | 0.028 |
| 1992 | 1 | -0.025 | 0.015 | -0.064 | -0.132 | 1995 | 3 | -0.018 | 0.029 | -0.065 | 0.036 |
| 1992 | 2 | -0.133 | -0.036 | -0.230 | 0.003 | 1995 | 4 | 0.211 | 0.360 | 0.062 | 0.167 |
| 1992 | 3 | -0.011 | -0.031 | 0.008 | 0.107 | 1995 | 5 | 0.064 | 0.211 | -0.082 | 0.059 |
| 1992 | 4 | -0.175 | -0.265 | -0.084 | 0.087 | 1995 | 6 | 0.121 | 0.280 | -0.038 | 0.240 |
| 1992 | 5 | -0.187 | -0.405 | 0.031 | -0.036 | 1995 | 7 | 0.095 | 0.093 | 0.097 | 0.142 |
| 1992 | 6 | -0.196 | -0.384 | -0.009 | 0.010 | 1995 | 8 | 0.279 | 0.332 | 0.225 | 0.305 |
| 1992 | 7 | -0.335 | -0.556 | -0.115 | -0.268 | 1995 | 9 | 0.229 | 0.300 | 0.158 | 0.209 |
| 1992 | 8 | -0.391 | -0.446 | -0.335 | -0.239 | 1995 | 10 | 0.107 | 0.082 | 0.131 | 0.100 |
| 1992 | 9 | -0.344 | -0.306 | -0.382 | -0.292 | 1995 | 11 | 0.153 | 0.380 | -0.074 | 0.026 |
| 1992 | 10 | -0.130 | -0.178 | -0.082 | -0.161 | 1995 | 12 | -0.123 | -0.248 | 0.002 | -0.170 |
| 1992 | 11 | -0.151 | -0.098 | -0.203 | -0.302 | 1996 | 1 | -0.081 | 0.004 | -0.167 | -0.194 |
| 1992 | 12 | -0.220 | -0.117 | -0.322 | -0.222 | 1996 | 2 | 0.096 | 0.130 | 0.061 | -0.034 |
| 1993 | 1 | -0.231 | -0.180 | -0.283 | -0.287 | 1996 | 3 | 0.076 | 0.043 | 0.110 | 0.004 |
| 1993 | 2 | -0.195 | -0.094 | -0.296 | -0.425 | 1996 | 4 | -0.050 | -0.247 | 0.147 | -0.102 |
| 1993 | 3 | -0.347 | -0.282 | -0.412 | -0.346 | 1996 | 5 | -0.114 | -0.074 | -0.155 | -0.083 |
| 1993 | 4 | -0.217 | -0.263 | -0.171 | -0.123 | 1996 | 6 | -0.129 | -0.109 | -0.148 | -0.065 |
| 1993 | 5 | -0.177 | -0.151 | -0.203 | -0.067 | 1996 | 7 | -0.016 | -0.040 | 0.009 | 0.048 |
| 1993 | 6 | -0.064 | -0.108 | -0.019 | 0.027 | 1996 | 8 | 0.116 | -0.089 | 0.321 | -0.026 |
| 1993 | 7 | -0.045 | -0.099 | 0.009 | 0.034 | 1996 | 9 | 0.152 | 0.009 | 0.296 | 0.084 |
| 1993 | 8 | -0.178 | -0.202 | -0.154 | -0.164 | 1996 | 10 | 0.083 | 0.048 | 0.118 | 0.021 |
| 1993 | 9 | -0.289 | -0.351 | -0.227 | -0.187 | 1996 | 11 | 0.117 | 0.312 | -0.077 | -0.099 |
| 1993 | 10 | -0.063 | -0.144 | 0.018 | 0.092 | 1996 | 12 | 0.008 | 0.132 | -0.115 | -0.148 |
| 1993 | 11 | -0.062 | -0.125 | 0.001 | 0.204 | 1997 | 1 | -0.065 | -0.149 | 0.020 | -0.295 |
| 1993 | 12 | 0.082 | 0.133 | 0.032 | 0.312 | 1997 | 2 | 0.006 | 0.053 | -0.041 | -0.235 |
| 1994 | 1 | 0.014 | 0.130 | -0.102 | 0.093 | 1997 | 3 | -0.031 | 0.042 | -0.104 | -0.289 |
| 1994 | 2 | -0.141 | -0.111 | -0.172 | -0.022 | 1997 | 4 | -0.203 | -0.134 | -0.272 | -0.413 |
| 1994 | 3 | -0.131 | -0.022 | -0.239 | -0.158 | 1997 | 5 | -0.055 | -0.042 | -0.068 | -0.174 |
| 1994 | 4 | -0.050 | 0.094 | -0.193 | -0.117 | 1997 | 6 | -0.006 | 0.033 | -0.045 | -0.065 |
| 1994 | 5 | -0.060 | 0.143 | -0.263 | -0.078 | 1997 | 7 | 0.085 | 0.156 | 0.014 | 0.402 |
| 1994 | 6 | 0.050 | 0.103 | -0.004 | -0.146 | 1997 | 8 | 0.099 | 0.220 | -0.023 | 0.341 |
| 1994 | 7 | 0.037 | 0.123 | -0.048 | -0.063 | 1997 | 9 | 0.094 | 0.275 | -0.087 | 0.395 |
| 1994 | 8 | -0.058 | 0.024 | -0.141 | -0.078 | 1997 | 10 | 0.138 | 0.178 | 0.097 | 0.304 |
| 1994 | 9 | 0.063 | 0.136 | -0.010 | 0.040 | 1997 | 11 | 0.195 | 0.107 | 0.283 | 0.409 |

UAHuntsville Satellite Temperature Dataset, v. 5.3

| YEAR | MTH | GL | NH | SH | TRPC | YEAR | MTH | GL | NH | SH | TRPC |
|------|-----|--------|--------|--------|--------|------|-----|-------|--------|--------|--------|
| 1997 | 12 | 0.308 | 0.273 | 0.342 | 0.725 | 2001 | 2 | 0.144 | 0.090 | 0.197 | -0.086 |
| 1998 | 1 | 0.582 | 0.612 | 0.552 | 1.097 | 2001 | 3 | 0.139 | 0.347 | -0.070 | -0.232 |
| 1998 | 2 | 0.753 | 0.857 | 0.649 | 1.291 | 2001 | 4 | 0.286 | 0.405 | 0.168 | 0.026 |
| 1998 | 3 | 0.528 | 0.655 | 0.401 | 1.025 | 2001 | 5 | 0.269 | 0.432 | 0.106 | -0.008 |
| 1998 | 4 | 0.770 | 1.014 | 0.525 | 1.059 | 2001 | 6 | 0.042 | 0.071 | 0.014 | -0.197 |
| 1998 | 5 | 0.645 | 0.685 | 0.606 | 0.885 | 2001 | 7 | 0.132 | 0.191 | 0.072 | 0.016 |
| 1998 | 6 | 0.562 | 0.635 | 0.490 | 0.536 | 2001 | 8 | 0.323 | 0.453 | 0.192 | 0.229 |
| 1998 | 7 | 0.510 | 0.659 | 0.362 | 0.442 | 2001 | 9 | 0.215 | 0.247 | 0.183 | 0.008 |
| 1998 | 8 | 0.518 | 0.544 | 0.492 | 0.447 | 2001 | 10 | 0.306 | 0.252 | 0.359 | 0.202 |
| 1998 | 9 | 0.458 | 0.571 | 0.345 | 0.312 | 2001 | 11 | 0.283 | 0.383 | 0.183 | 0.181 |
| 1998 | 10 | 0.416 | 0.519 | 0.312 | 0.339 | 2001 | 12 | 0.254 | 0.333 | 0.175 | 0.234 |
| 1998 | 11 | 0.192 | 0.272 | 0.113 | 0.130 | 2002 | 1 | 0.307 | 0.529 | 0.086 | 0.057 |
| 1998 | 12 | 0.277 | 0.416 | 0.138 | 0.073 | 2002 | 2 | 0.282 | 0.469 | 0.095 | 0.097 |
| 1999 | 1 | 0.132 | 0.361 | -0.098 | -0.174 | 2002 | 3 | 0.344 | 0.542 | 0.146 | 0.123 |
| 1999 | 2 | 0.233 | 0.435 | 0.030 | -0.229 | 2002 | 4 | 0.345 | 0.433 | 0.257 | 0.077 |
| 1999 | 3 | -0.001 | 0.144 | -0.146 | -0.228 | 2002 | 5 | 0.388 | 0.383 | 0.393 | 0.278 |
| 1999 | 4 | 0.082 | 0.436 | -0.271 | -0.265 | 2002 | 6 | 0.365 | 0.292 | 0.437 | 0.186 |
| 1999 | 5 | 0.016 | 0.175 | -0.143 | -0.365 | 2002 | 7 | 0.292 | 0.382 | 0.202 | 0.375 |
| 1999 | 6 | -0.127 | 0.057 | -0.310 | -0.367 | 2002 | 8 | 0.250 | 0.148 | 0.351 | 0.194 |
| 1999 | 7 | -0.005 | 0.045 | -0.055 | -0.245 | 2002 | 9 | 0.365 | 0.285 | 0.444 | 0.196 |
| 1999 | 8 | -0.054 | 0.004 | -0.112 | -0.227 | 2002 | 10 | 0.242 | -0.010 | 0.494 | 0.198 |
| 1999 | 9 | 0.133 | 0.217 | 0.049 | -0.246 | 2002 | 11 | 0.357 | 0.345 | 0.370 | 0.263 |
| 1999 | 10 | 0.069 | 0.050 | 0.089 | -0.238 | 2002 | 12 | 0.224 | 0.151 | 0.297 | 0.419 |
| 1999 | 11 | 0.025 | 0.241 | -0.192 | -0.226 | 2003 | 1 | 0.391 | 0.611 | 0.170 | 0.401 |
| 1999 | 12 | 0.000 | 0.271 | -0.270 | -0.228 | 2003 | 2 | 0.265 | 0.277 | 0.253 | 0.385 |
| 2000 | 1 | -0.229 | -0.067 | -0.392 | -0.285 | 2003 | 3 | 0.188 | 0.270 | 0.105 | 0.165 |
| 2000 | 2 | 0.004 | 0.150 | -0.141 | -0.374 | 2003 | 4 | 0.247 | 0.473 | 0.022 | 0.145 |
| 2000 | 3 | 0.045 | 0.138 | -0.049 | -0.394 | 2003 | 5 | 0.296 | 0.483 | 0.108 | 0.172 |
| 2000 | 4 | 0.141 | 0.367 | -0.086 | -0.248 | 2003 | 6 | 0.076 | 0.148 | 0.005 | -0.054 |
| 2000 | 5 | 0.125 | 0.181 | 0.069 | -0.152 | 2003 | 7 | 0.177 | 0.163 | 0.190 | 0.180 |
| 2000 | 6 | 0.048 | 0.019 | 0.078 | -0.270 | 2003 | 8 | 0.185 | 0.298 | 0.071 | 0.109 |
| 2000 | 7 | -0.017 | 0.005 | -0.038 | -0.248 | 2003 | 9 | 0.312 | 0.405 | 0.219 | 0.144 |
| 2000 | 8 | -0.046 | 0.107 | -0.199 | -0.114 | 2003 | 10 | 0.413 | 0.544 | 0.281 | 0.293 |
| 2000 | 9 | 0.125 | 0.194 | 0.057 | -0.121 | 2003 | 11 | 0.327 | 0.431 | 0.223 | 0.278 |
| 2000 | 10 | 0.096 | 0.088 | 0.103 | 0.003 | 2003 | 12 | 0.445 | 0.616 | 0.273 | 0.280 |
| 2000 | 11 | 0.101 | 0.114 | 0.088 | 0.098 | 2004 | 1 | 0.287 | 0.363 | 0.211 | 0.241 |
| 2000 | 12 | 0.039 | 0.139 | -0.062 | 0.066 | 2004 | 2 | 0.301 | 0.610 | -0.009 | 0.176 |
| 2001 | 1 | 0.057 | 0.195 | -0.080 | -0.164 | 2004 | 3 | 0.420 | 0.682 | 0.158 | 0.224 |

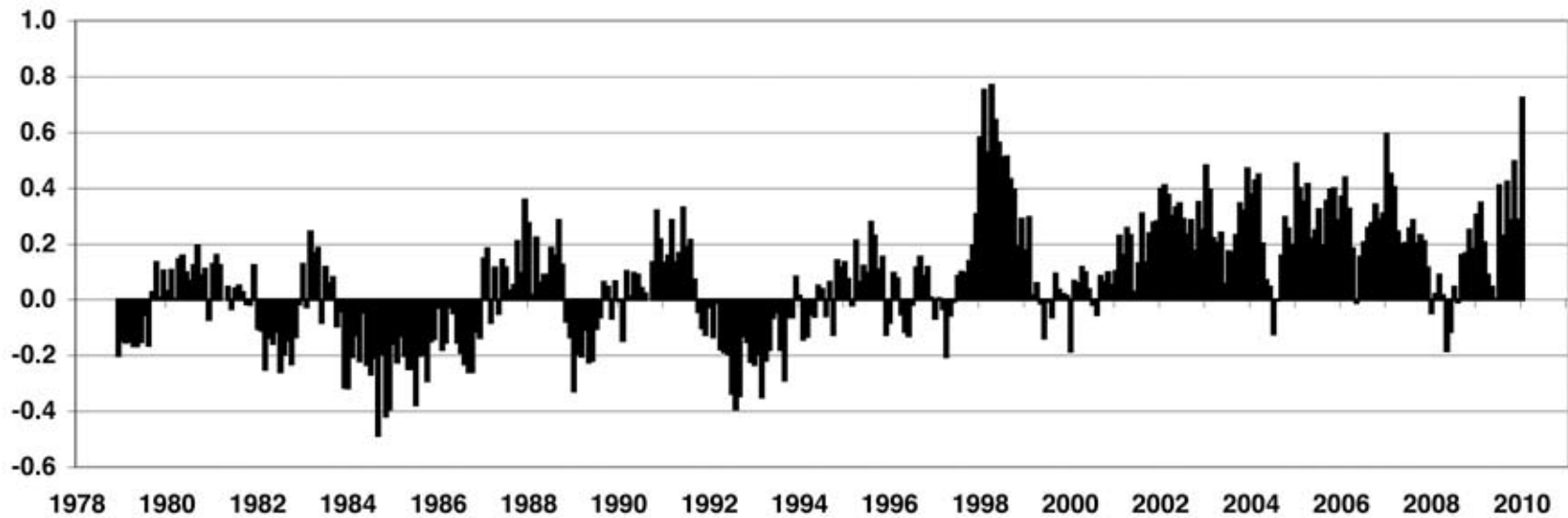
UAHuntsville Satellite Temperature Dataset, v. 5.3

| YEAR | MTH | GL | NH | SH | TRPC | YEAR | MTH | GL | NH | SH | TRPC |
|------|-----|--------|--------|--------|--------|-------|-----|--------|--------|--------|--------|
| 2004 | 4 | 0.250 | 0.365 | 0.134 | 0.056 | 2007 | 6 | 0.223 | 0.306 | 0.139 | 0.056 |
| 2004 | 5 | 0.123 | 0.268 | -0.021 | 0.048 | 2007 | 7 | 0.257 | 0.292 | 0.223 | 0.126 |
| 2004 | 6 | 0.067 | -0.054 | 0.188 | -0.081 | 2007 | 8 | 0.301 | 0.285 | 0.317 | 0.080 |
| 2004 | 7 | -0.121 | -0.123 | -0.118 | -0.140 | 2007 | 9 | 0.282 | 0.262 | 0.301 | 0.161 |
| 2004 | 8 | 0.016 | 0.097 | -0.064 | 0.109 | 2007 | 10 | 0.298 | 0.262 | 0.334 | -0.081 |
| 2004 | 9 | 0.239 | 0.257 | 0.221 | 0.000 | 2007 | 11 | 0.217 | 0.186 | 0.247 | -0.065 |
| 2004 | 10 | 0.359 | 0.328 | 0.390 | 0.189 | 2007 | 12 | 0.088 | 0.151 | 0.024 | -0.207 |
| 2004 | 11 | 0.262 | 0.431 | 0.092 | 0.256 | 2008 | 1 | -0.137 | -0.140 | -0.134 | -0.295 |
| 2004 | 12 | 0.167 | 0.241 | 0.092 | 0.304 | 2008 | 2 | -0.107 | 0.128 | -0.341 | -0.465 |
| 2005 | 1 | 0.397 | 0.565 | 0.229 | 0.304 | 2008 | 3 | 0.061 | 0.455 | -0.334 | -0.535 |
| 2005 | 2 | 0.272 | 0.334 | 0.211 | 0.504 | 2008 | 4 | 0.062 | 0.336 | -0.212 | -0.530 |
| 2005 | 3 | 0.319 | 0.576 | 0.063 | 0.448 | 2008 | 5 | -0.130 | 0.004 | -0.263 | -0.525 |
| 2005 | 4 | 0.459 | 0.747 | 0.170 | 0.363 | 2008 | 6 | -0.093 | -0.062 | -0.123 | -0.256 |
| 2005 | 5 | 0.276 | 0.267 | 0.285 | 0.155 | 2008 | 7 | 0.048 | 0.069 | 0.026 | -0.068 |
| 2005 | 6 | 0.267 | 0.350 | 0.185 | 0.241 | 2008 | 8 | 0.010 | 0.134 | -0.113 | -0.119 |
| 2005 | 7 | 0.326 | 0.399 | 0.253 | 0.343 | 2008 | 9 | 0.243 | 0.241 | 0.246 | 0.079 |
| 2005 | 8 | 0.208 | 0.268 | 0.148 | 0.215 | 2008 | 10 | 0.230 | 0.279 | 0.182 | 0.127 |
| 2005 | 9 | 0.436 | 0.452 | 0.419 | 0.317 | 2008 | 11 | 0.258 | 0.363 | 0.153 | 0.103 |
| 2005 | 10 | 0.459 | 0.477 | 0.441 | 0.143 | 2008 | 12 | 0.153 | 0.409 | -0.102 | -0.025 |
| 2005 | 11 | 0.407 | 0.495 | 0.318 | 0.229 | 2009 | 1 | 0.213 | 0.418 | 0.009 | -0.119 |
| 2005 | 12 | 0.260 | 0.400 | 0.119 | 0.143 | 2009 | 2 | 0.220 | 0.557 | -0.117 | -0.091 |
| 2006 | 1 | 0.277 | 0.419 | 0.135 | 0.061 | 2009 | 3 | 0.174 | 0.335 | 0.013 | -0.198 |
| 2006 | 2 | 0.311 | 0.632 | -0.011 | 0.164 | 2009 | 4 | 0.135 | 0.290 | -0.020 | -0.013 |
| 2006 | 3 | 0.293 | 0.466 | 0.119 | -0.063 | 2009 | 5 | 0.102 | 0.109 | 0.094 | -0.112 |
| 2006 | 4 | 0.227 | 0.373 | 0.082 | -0.116 | 2009 | 6 | 0.022 | -0.039 | 0.084 | 0.074 |
| 2006 | 5 | 0.046 | 0.269 | -0.177 | -0.194 | 2009 | 7 | 0.414 | 0.188 | 0.640 | 0.479 |
| 2006 | 6 | 0.173 | 0.280 | 0.067 | 0.040 | 2009 | 8 | 0.245 | 0.243 | 0.247 | 0.426 |
| 2006 | 7 | 0.208 | 0.296 | 0.120 | 0.267 | 2009 | 9 | 0.502 | 0.571 | 0.433 | 0.596 |
| 2006 | 8 | 0.271 | 0.238 | 0.305 | 0.201 | 2009 | 10 | 0.353 | 0.295 | 0.410 | 0.374 |
| 2006 | 9 | 0.354 | 0.411 | 0.297 | 0.135 | 2009 | 11 | 0.504 | 0.443 | 0.565 | 0.482 |
| 2006 | 10 | 0.408 | 0.360 | 0.456 | 0.295 | 2009 | 12 | 0.262 | 0.331 | 0.193 | 0.482 |
| 2006 | 11 | 0.295 | 0.336 | 0.253 | 0.152 | 2010 | 1 | 0.630 | 0.809 | 0.451 | 0.677 |
| 2006 | 12 | 0.282 | 0.542 | 0.022 | 0.388 | 2010 | 2 | 0.613 | 0.720 | 0.506 | 0.789 |
| 2007 | 1 | 0.503 | 0.736 | 0.269 | 0.499 | | | | | | |
| 2007 | 2 | 0.323 | 0.623 | 0.024 | 0.260 | Trend | | 0.13 | 0.19 | 0.07 | 0.07 |
| 2007 | 3 | 0.371 | 0.637 | 0.105 | 0.104 | | | | | | |
| 2007 | 4 | 0.289 | 0.510 | 0.067 | 0.010 | | | | | | |
| 2007 | 5 | 0.256 | 0.297 | 0.215 | 0.055 | | | | | | |

(Degrees Celsius per decade since 12/1978)

<http://vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt>

Global Lower Troposphere, v. 5.2



Global Lower Troposphere v5.3

