web highlight

Weather Station Data Online

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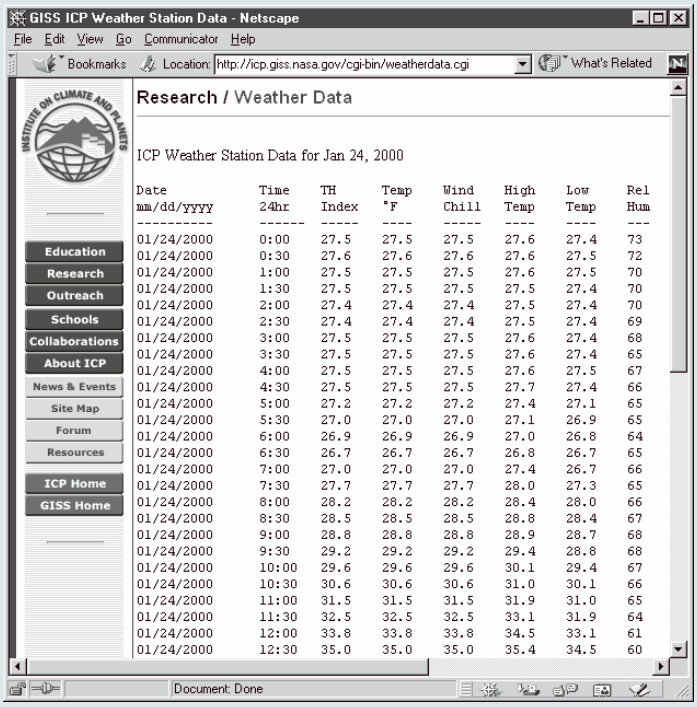
http://icp.giss.nasa.gov/research/data/weather

SINCE SEPTEMBER 14, 1999, A DAVIS INSTRUMENTS WEATHER MONITOR II SITUATED ON THE ROOFTOP OF THE NASA GODDARD INSTITUTE FOR SPACE STUDIES HAS BEEN MEASURING TEMPERATURE, RELATIVE HUMIDITY, WIND SPEED, WIND DIRECTION, PRECIPITATION, AND BAROMETRIC PRESSURE.

Daily data recorded at 30-minute intervals are now available on our website at http://icp.giss.nasa.gov/research/data/weather. The data set also includes calculations, such as high and low temperatures for each archive interval, a temperature-humidity index, dew point, high wind speed, and wind chill.

The GISS weather station joins the primarily school-based Metro Weather Network (METNET) established by City College of New York's Professor Shermane Austin (former ICP Faculty Fellow). METNET spans New York, New Jersey, and Long Island, giving students and educators roles in ongoing scientific investigations to understand their area's microclimate. Their comparison of weather data from urban locations with rural areas provides assessments of temperature trends and contributions of urbanization or large-scale atmospheric forcing such as global warming to these trends.



Date mm/dd/yyyy	Time 24hr	TH Index	Temp °F	Wind Chill	High Temp	Low Temp	Rel Hum
01/24/2000	0:00	27.5	27.5	27.5	27.6	27.4	73
01/24/2000	0:30	27.6	27.6	27.6	27.6	27.5	72
01/24/2000	1:00	27.5	27.5	27.5	27.6	27.5	70
01/24/2000	1:30	27.5	27.5	27.5	27.5	27.4	70
01/24/2000	2:00	27.4	27.4	27.4	27.5	27.4	70
01/24/2000	2:30	27.4	27.4	27.4	27.5	27.4	69
01/24/2000	3:00	27.5	27.5	27.5	27.6	27.4	68
01/24/2000	3:30	27.5	27.5	27.5	27.6	27.4	65
01/24/2000	4:00	27.5	27.5	27.5	27.6	27.5	67
01/24/2000	4:30	27.5	27.5	27.5	27.7	27.4	66
01/24/2000	5:00	27.2	27.2	27.2	27.4	27.1	65
01/24/2000	5:30	27.0	27.0	27.0	27.1	26.9	65
01/24/2000	6:00	26.9	26.9	26.9	27.0	26.8	64
01/24/2000	6:30	26.7	26.7	26.7	26.8	26.7	65
01/24/2000	7:00	27.0	27.0	27.0	27.4	26.7	66
01/24/2000	7:30	27.7	27.7	27.7	28.0	27.3	65
01/24/2000	8:00	28.2	28.2	28.2	28.4	28.0	66
01/24/2000	8:30	28.5	28.5	28.5	28.8	28.4	67
01/24/2000	9:00	28.8	28.8	28.8	28.9	28.7	68
01/24/2000	9:30	29.2	29.2	29.2	29.4	28.8	68
01/24/2000	10:00	29.6	29.6	29.6	30.1	29.4	67
01/24/2000	10:30	30.6	30.6	30.6	31.0	30.1	66
01/24/2000	11:00	31.5	31.5	31.5	31.9	31.0	65
01/24/2000	11:30	32.5	32.5	32.5	33.1	31.9	64
01/24/2000	12:00	33.8	33.8	33.8	34.5	33.1	61
01/24/2000	12:30	35.0	35.0	35.0	35.4	34.5	60

Data from ICP's weather station, a Davis Instruments Weather Monitor II, observing daily temperature, humidity, wind speed/direction, precipitation, and barometric pressure, on the GISS rooftop.

Student Research

New York City is an ideal place to study factors that influence climate, including proximity to oceans, rivers, wetlands and parks, and effects of urbanization. During the 1999 ICP Summer Institute, an experiment was led by High School for Environmental Studies teacher Umit Kenis, to study temperature variability. 12 students took daily temperature measurements with hand-held thermometers out on Broadway and in Riverside Park for 25 days in July.

Analysis of their record showed two main results. First, the traffic-heavy street with buildings on both sides was consistently warmer than the park surrounded by vegetation only four blocks away bordering Hudson (see figure 1 on next page).

Second, the temperature difference between the two sites varied daily, ranging from 0.1°C on July 7 to 3.6°C on July 30 (see figure 2). Even within this small observation period, we see two outliers (3.6°C on July 30 and 2.3°C on July 26), the causes of which are unknown. The deviations could be due to human error (measurement in sun vs. shade), instrument error, or local effects—the park being closer to the Hudson river (though less likely to cause this large a difference). Whatever the reason, the lesson learned is that accurate, frequent, regular measurement of weather conditions in many locations is required to study long-term global climate variability and change.

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Measuring temperature. From left to right: David Sarma, New York University; Ingrid Gonzalez, DeWitt Clinton High School; Rashele Cross, Townsend Harris High School; Andre Cassell, Bronx High School of Science; Susane Colasanti, Teacher at Hostos-Lincoln Academy of Science; Jessica Morales, High School for Environmental Studies; Jenny Solis, DeWitt Clinton High School.

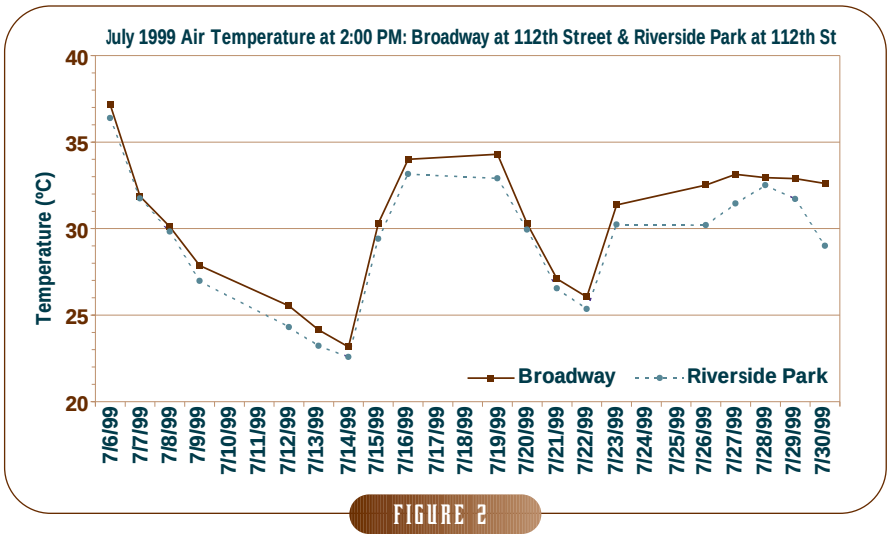

FIGURE 2

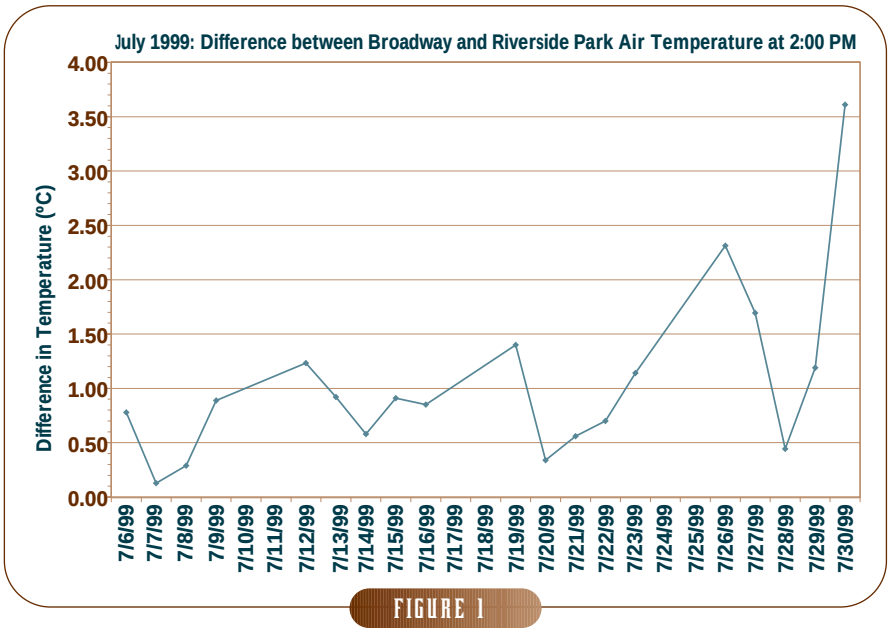

FIGURE 1

Back at School

As a continuation of his summer curriculum development project, Mr. Kenis has implemented research and lessons that focus on the urban heat island effect in his Earth Science Course and after-school research program.

At the Bronx High School of Science, Mitch Fox leads his Geoscience students in identifying and studying weather trends using time series graphs of temperature, pressure, and humidity. They learn that although there is an overall global trend for warming, this is not always evident on a daily, local basis (weather) and that average temperatures for even a month (climate) can be misleading.

For example, temperature plummeted from a high of 63°F on January 3 to a low of 3°F on January 18. Using overlay plots of temperature, pressure, dew point, and precipitation, students see the rapid downward trend in both temperature and water content, as measured by dew point, as a cold air mass enters the area. They also learn that temperature and dew point are related in terms of their influence on precipitation.

These kinds of studies contribute to NASA's Earth Science Enterprise research objectives for learning about microclimate and enhancing climate-modeling capabilities. In addition to contributing to climate research, weather station data provides a useful resource for students to learn about physical phenomena and processes.

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