

Fahrenheit 451

In the summer, schoolyards are unnaturally hot and impair kids' ability to learn.

By Luisa D'Amato

According to research done at the University of Waterloo, schoolyards are not only "awful places for children" in hot weather; they also radiate enough heat to contribute to global warming.

The schoolyards are unnaturally hot because of a combination of asphalt parking lots, mowed playing fields and paved playgrounds, which absorb the sun's heat.

That, combined with a lack of shade, makes them both unpleasant on hot days and also warm enough to radiate unwanted heat to the surrounding community.

The research, done by four engineering students under the supervision of a renowned U.S. environmental scientist, used satellite data to measure the temperature on the ground at 15 Waterloo schools.

The one-day snapshot of temperatures was taken on September 3, 1999 at 10:20 am. The air temperature was only about 27°C, but the schoolyards ranged from 48.4°C at Centennial Public School to a high of 55°C at Holy Rosary School.

At those temperatures, the environment is "too hostile to allow (children) to do what they're supposed to do" in a playground, which is play, said Carol Moogk-Soulis, one of the four students.

Moogk-Soulis is an occupational therapist who also has a degree in engineering, and decided for interest's sake to take the University of Waterloo course on urban design with visiting American scientist Jeffrey Luvall from NASA's Marshall Space Flight Center's Global Hydrology and Climate Center.

She persuaded Luvall and the three other students to use schoolyards for their research because, as a mother of two school-aged boys, she knows first-hand the problem of hot, inhospitable schoolyards.

She still remembers 12 years ago spending the day with her grade 1 son and coming out for recess to see the heat waves rising off the ground.

The kids were drooping and there wasn't any shade. None of us wanted to do anything," she said.

The heat makes students less able to return refreshed to classes and raises the cost of air-conditioning the school buildings, she said. Also, higher temperatures are associated with lower air-quality, which in turn can lead to drowsiness and headaches.

Playground Temperatures

10:20 am, September 3, 2000

City Air Temperature 26.9°C

Centennial	48.4°C
MacGregor	50.3°C
Westvale	50.5°C
Cedarbrae	51°C
Brighton	51.2°C
Keatsway	51.2°C
Bluevale	52°C
Laurelwood	52.1°C
Harold Wagner	52.3°C
Mary Johnstons	52.8°C
Sandowne	52.8°C
Northdale	53°C
Northlake Woods	53.1°C
WCI	53.4°C
Holy Rosary	55°C

(Individual differences can be explained by differences in the playgrounds, or whether the school is near a cool, wooded area or in a dry, built-up subdivision.)

Since her experience with her son, Moogk-Soulis has become involved as a volunteer: planting trees, wildflowers and shrubs in schoolyards to help cool them, but she says it isn't enough. Schoolyard designs have to change.

The University of Waterloo satellite images of last September show clearly that not only are schoolyards unnaturally hot, but also they radiate heat up to 150 meters beyond the school boundaries, affecting the surrounding neighbourhood. "You can see you're heating up the city," she said.

If trees were planted to provide shade to these areas, the temperature of the ground could drop by 20°C. If the ground temperature of schoolyards could drop to reflect the city average, the temperature of the entire city would drop by 0.1°C.

The research done by Moogk-Soulis and the other three students will be continued by investigating if there's a connection between the temperature and levels of absenteeism or behaviour problems among the children, said Moogk-Soulis.

She also plans to visit the two Waterloo Region school boards and urge them to make shaded playgrounds a priority when new schools are being designed.

That could include considering not only planting a certain number of trees, but also where to plant them so that the shade falls in the right place at the right time, and even thinking about which way the building will face. The most effective thing to do is provide shade," she said.

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