

Climate Chaos, Kids and Schools



Bringing children to the forefront of conversations about climate change



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Climate Chaos Impacts Schools

- Focus on return to “normalcy” after a disaster.
- There is no agency that issues alerts on children’s safety **before, during or after** a disaster or that **“clears”** a contaminated facility as safe for reoccupancy by children.

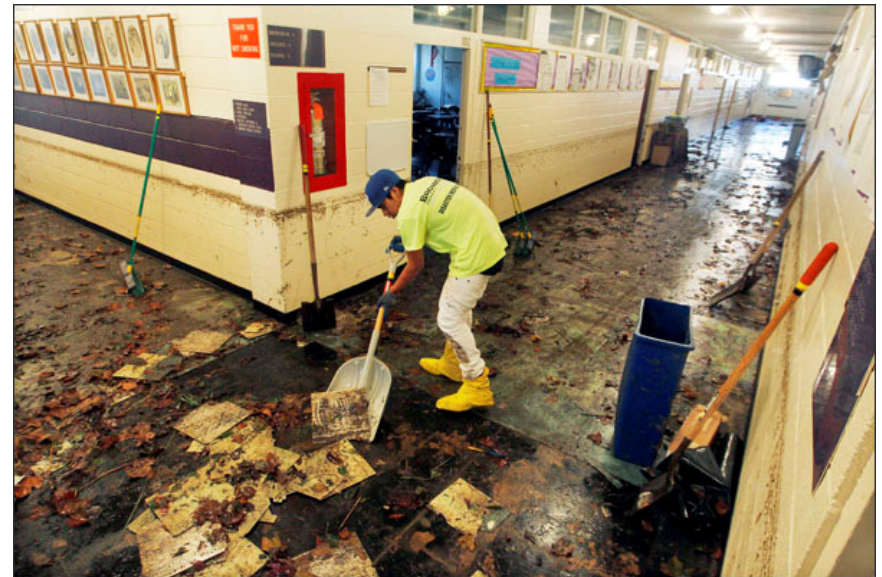


Mud coats the floors of the Windham Ashland Jewett Central School, damaged as a result of Tropical Storm Irene, on Wednesday Aug. 31, 2011, in Windham, NY. Michelle Mattice, treasurer of the school district, walks through the hall. (Philip Kamrass / Times Union)

Climate Chaos on the Rise, Impacts Felt in NY



David Pokress | A recovery crew removes desks and chairs that were damaged during Sandy at East Rockaway Junior-Senior High School. (Nov. 8, 2012)



A worker scrapes up mud and tiles on Sunday from flood-damaged Saint Rose High School in Belmar, N.J., after Hurricane Sandy. —Mel Evans/AP

Climate Chaos on the Rise Around the Country



Charlotte Howell, guidance counselor at Hackleburg Elementary School in Hackleburg, Ala., looks into the hallway of the school on April 30, 2011, days after a tornado swept through the area.

—*Matt McKean/Times Daily/AP*



Colorado Black Forest Fire raging in the background of a high school baseball game.

June 13, 2013,

*By Pete Blackburn,
Nextimpulsesports.com*



A broken ceiling piece hanging above a hallway after a 2,500 square foot section of roof at Capital High School in Olympia, WA collapsed in 2008. Olympia Assistant Fire Chief Greg Wright said the roof appears to have caved in due to the weight of snow, ice and water on top of the building. *(AP Photo/The Olympian, Steve Bloom)*

Children are More Vulnerable to Environmental Hazards

- States compel children to attend school, regardless of the conditions.
- Children's bodies are rapidly developing. They eat more food, drink more water, and breathe more air per pound than adults.
- Children are more susceptible to air pollution
 - When outdoor pollution increases so does indoor pollution
 - Students in classrooms with higher ventilation rates achieve higher test scores

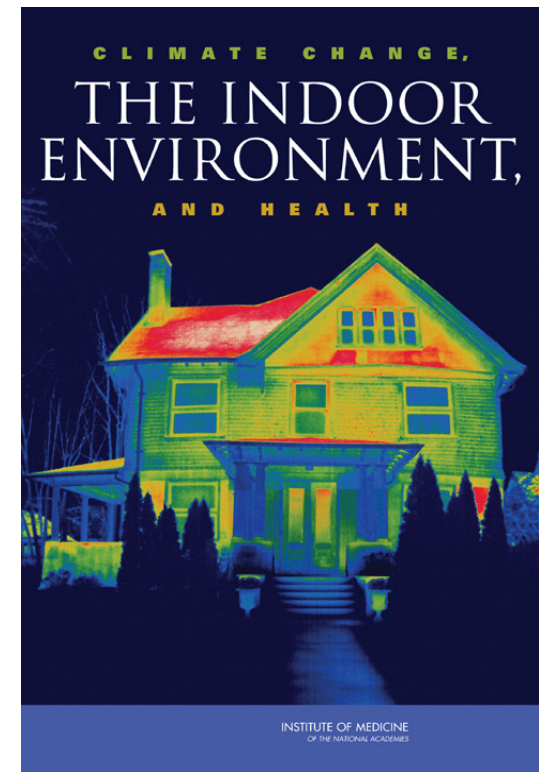


Tornado damaged classroom in the Tower Elementary school in Moore, Oklahoma. An F5 tornado struck the area on May 20th, 2013 causing widespread destruction. (Andrea Booher/FEMA)

Institute of Medicine's *Climate Change, The Indoor Environment and Health*

Three important findings:

- Poor indoor environmental quality is creating health problems today and impairs the ability of occupants to work and learn.
- Climate change may worsen existing indoor environmental problems and introduce new problems.
- There are opportunities to improve public health while mitigating or adapting to alterations in indoor environmental quality induced by climate change.



Five Climate-Induced Indoor Environmental Problems, IOM

1. Indoor air quality
2. Dampness, moisture, and flooding
3. Infectious agents and pests
4. Thermal Stress
5. Building ventilation, weatherization, and energy use



A school damaged by Hurricane Katrina. (Flickr, Paul Baker)

Climate Chaos Adaptations and Health Risks

- **Sealed Buildings:** to reducing heating/cooling costs
 - Lowers ventilation, increased humidity, VOC off-gassing
- **Reduced use of mechanical ventilation:** to reduce energy use
 - Lowers ventilation, increases CO2 levels
- **Increased use of Air Conditioning**
 - Improperly maintained systems subject to microbial growth, dampness problems
- **Increased Building Insulation:** reduce energy use
 - Insulation may contain harmful chemicals, buildings more susceptible to infestations
- **Building Renovations and Presence of “Legacy” Hazards**
 - Renovations in older buildings may disturb hazardous building materials like lead paint or asbestos

Green Buildings and Green Products Not Enough

- IOM report observed that conventional *green* buildings and products do not take health into account.
- Some *green cleaning* products contain fragrances that react with ozone to produce secondary indoor air pollutants.

INDOOR ENVIRONMENTAL QUALITY		AWARDED: 4 / 19
EQc1	Outdoor air delivery monitoring	0 / 1
EQc10	Mold prevention	0 / 1
EQc2	Increased ventilation	0 / 1
EQc3.1	Construction IAQ Mgmt plan: during construction	1 / 1
EQc3.2	Construction IAQ Mgmt plan: before occupancy	0 / 1
EQc4	Low-emitting materials	1 / 4
EQc5	Indoor chemical & pollutant source control	0 / 1
EQc6.1	Lighting system design & controllability	0 / 1
EQc6.2	Thermal comfort controllability	1 / 1
EQc7.1	Thermal comfort: design	0 / 1
EQc7.2	Thermal comfort: verification	0 / 1
EQc8.1	Daylight & views: daylight 75% of spaces	0 / 3
EQc8.2	Daylight & views: views for 90% of spaces	1 / 1
EQc9	Enhanced acoustical performance	0 / 1

Even a LEED certified school building does not have to earn important credits for indoor environmental quality. (*LEED scorecard from LEED Certified School, IPS 79- Carl Wilde, Indianapolis, IN*)

Stages of Disaster

- Within the phases of emergency management children receive little protection from environmental hazards.
- These phases include:
 - Preparedness
 - Response
 - Recovery



The Blue Cell, LLC Colorado based planning company tabletop planning exercise.

DRAFT Recommendations

1. As weather related disasters become more common the US EPA, advised by CDC and Education, should develop facility guidance for schools to improve indoor environmental quality while addressing energy efficiency, retrofits and resiliency.
2. EPA should develop certification for weatherization/indoor environmental quality contractors for schools.
3. CDC should develop and issue Public Health Advisories for children during disasters and have the capacity to directly reach local K-12 schools and childcare centers with these advisories.
4. EPA, advised by CDC, should issue new federal child-safe environmental health guidelines for re-occupancy of damaged schools after a disaster.

Additional Climate Chaos Events and Impacts on Schools, Sept 2013

- **Southern Vermont Suffers Power Outages from Storm:**
 - September 12, 2013: "...schools have been closed in parts of Orange, Rutland, Washington and Windsor counties"
<http://www.rutlandherald.com/article/20130912/THISJUSTIN/130919969>
- **MA schools close after slippery floors cause 22 falls in a single day:**
 - September 12, 2013: "All six schools in the Amherst-Pelham Regional School District are shut because the hot weather has made the newly waxed floors too slippery." <http://www.ablxboston.com/national/16196-massachusetts-schools-close-after-slippery-floors-cause-22-falls-in-a-single-day.html>
- **Closures: CU, Naropa, Boulder Valley, St. Vrain schools shut down due to flooding:**
 - September 12, 2013: "UC and Naropa University have closed their Boulder campuses and the Boulder Valley and St. Vrain Valley school districts each have cancelled all classes today due to the widespread overnight flooding across the county." http://www.denverpost.com/breakingnews/ci_24077093/cu-boulder-valley-st-vrain-schools-all-closed?source=rss

Recommendations or Comments?

- Have we missed something?
- Have another recommendation?
- Other questions or comments?

E-mail us at:

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- Heavy Weather: How Climate Destruction Harms Middle- and Lower-Income Americans. Americanprogress.org, Daniel J. Weiss, Jackie Weidman, and Mackenzie Bronson, November 2012.