

# THE CENTER FOR GREEN SCHOOLS



## Fostering Healthy, Sustainable Educational Facilities

Anisa Baldwin Metzger, School District Sustainability  
MACCHE Conference  
September 19, 2014



Center for Green Schools Founding Sponsor

How important is it to improve  
public school buildings in  
America?

How important is it to improve  
public school buildings in  
America?

**90%** } Very or somewhat important

Do you think the United States spends too much, just the right amount, or not enough on buildings and infrastructure in K to 12 schools?

Do you think the United States spends too much, just the right amount, or not enough on buildings and infrastructure in K to 12 schools?

55% } Not enough

**THE CENTER**  
**FOR GREEN SCHOOLS**



**K 2013**

**STATE OF OUR**  
**SCHOOLS**  
**REPORT**

**\$542**

**BILLION**  
**WOULD BE REQUIRED**  
**OVER THE NEXT**

**10 YEARS**  
*to*

**MODERNIZE**  
**OUR PRE-K**  
**THROUGH 12TH GRADE**  
**EDUCATIONAL**  
**INFRASTRUCTURE**





# THE CENTER FOR GREEN SCHOOLS



## FELLOWSHIP PROGRAM

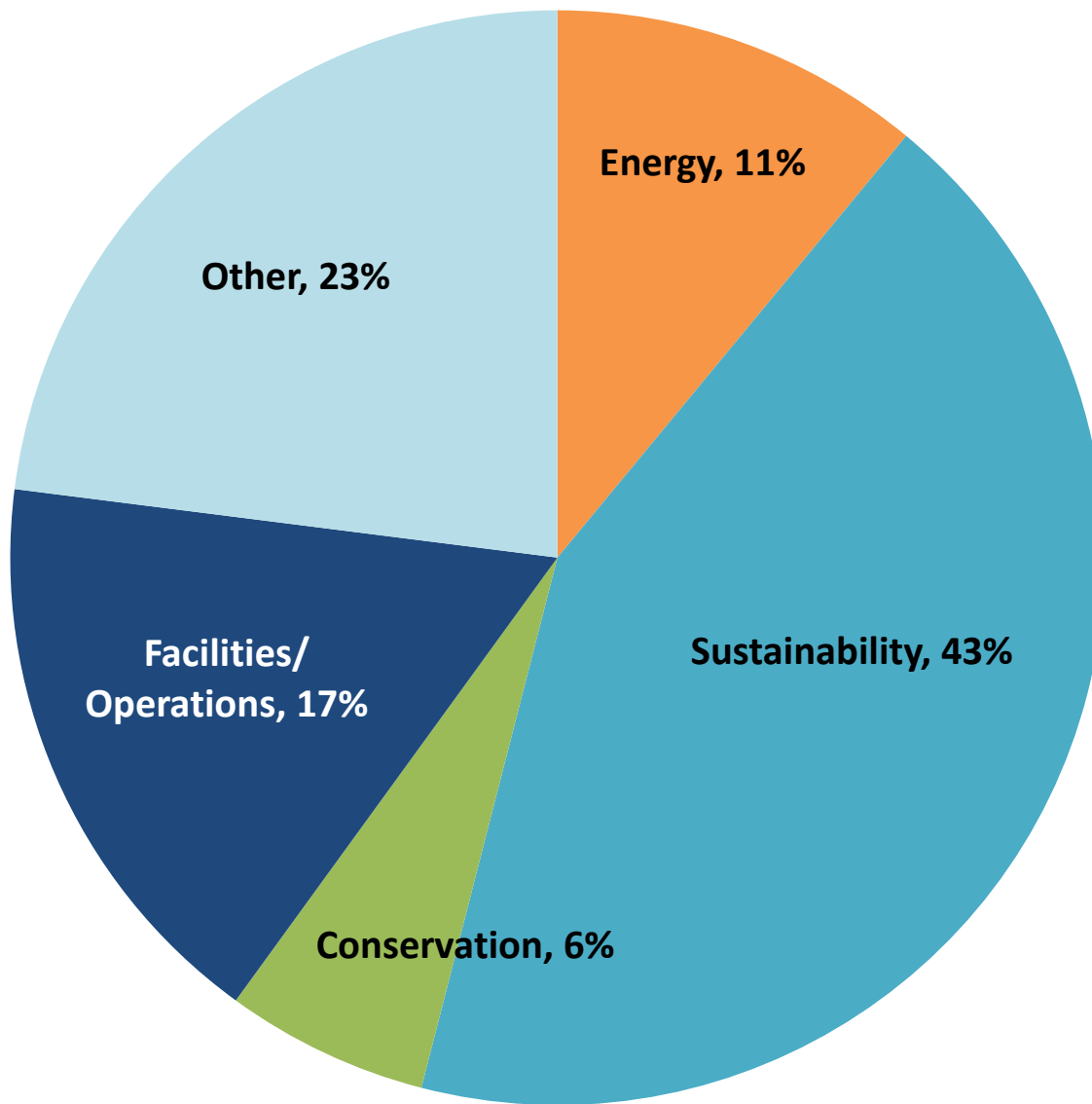




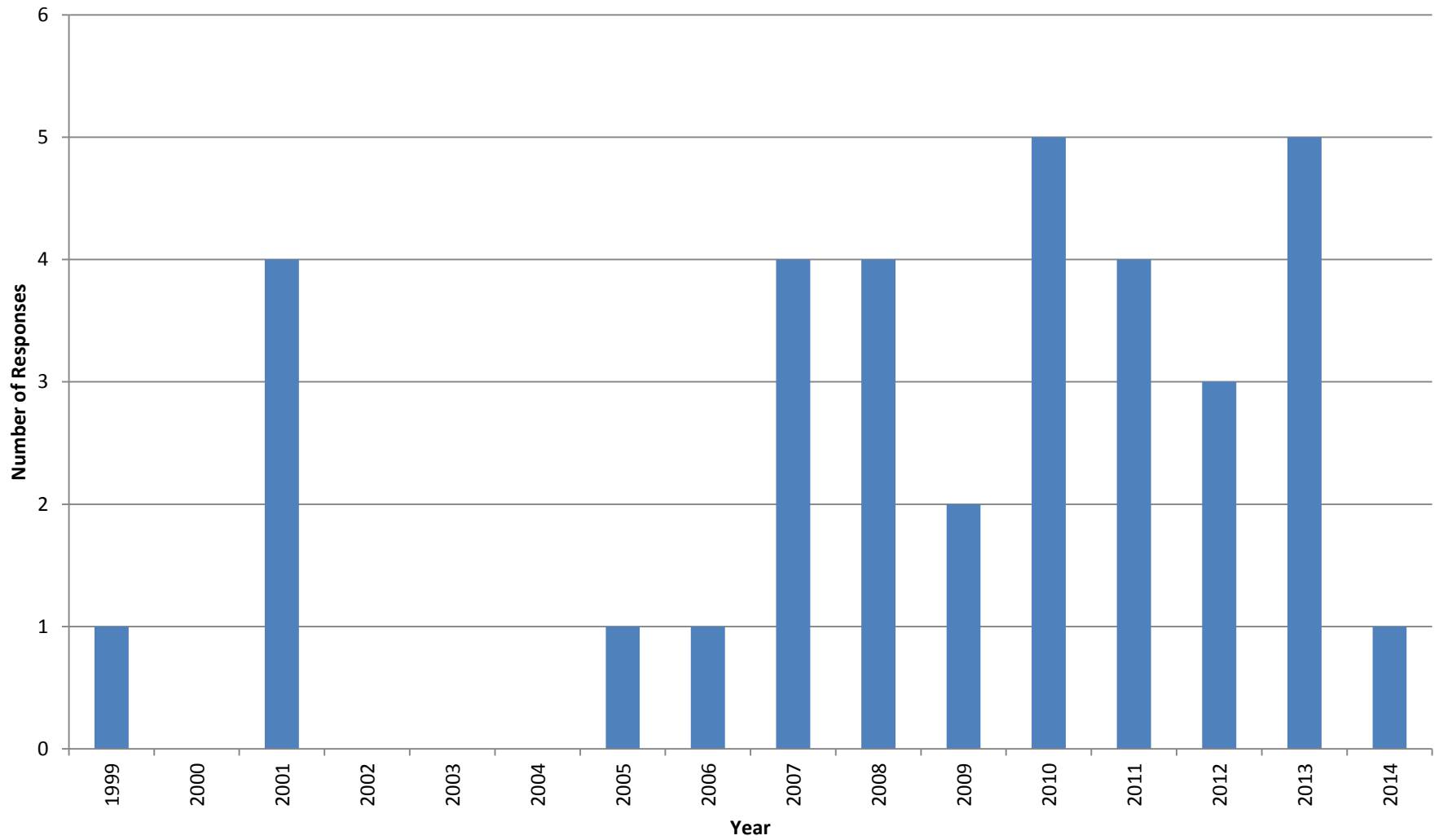




## Job Title Themes



## Initial Hire Date





U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools

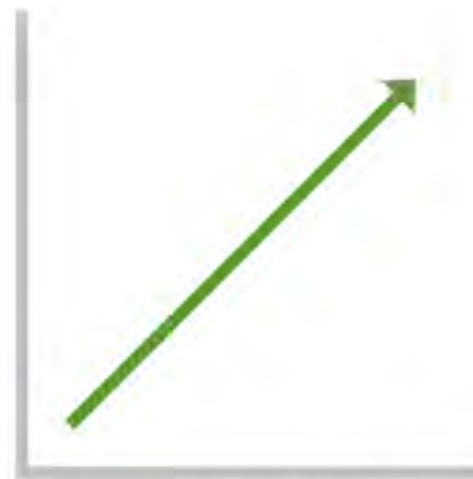




Net impact  
(waste, water, energy, CO<sub>2</sub>)



Health & performance



Environmental literacy



## The Impact of School Buildings on Childhood Health and Learning

Convened in Boston  
October 2011



# The Impact of School Buildings on Student Health and Performance

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February 27, 2012

[www.mcgraw-hillresearchfoundation.org](http://www.mcgraw-hillresearchfoundation.org)

McGraw-Hill  
Research Foundation

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# HOW STUDENTS... SEE



## Classroom lighting and visual experience

Research on lighting and classrooms has been conducted for over a century, but attention in recent years has focused on the importance of natural light, after a departure from natural lighting for two decades in the 1970s and 1980s. Part of the issue has been understanding more precisely why natural light seems to have good results in schools. Intuitively, it makes sense that daylight would enhance the learning environment, but, because school districts are asked to justify facilities decisions using quantifiable means, researchers have attempted to show more conclusively that daylight is objectively positive for schools. This research includes seeking objective information about specific daylight design strategies (like skylights, clerestories, frosted glass, etc.) to ascertain whether certain strategies are more beneficial than others in terms of student health and learning.

The visual qualities of a learning environment are some of the most crucial building aspects to design properly since children depend heavily on sight in the learning process. In the early days of lighting research in schools, the focus was purely on quantity—in how much light to provide for given tasks. Quantity of light is largely agreed upon today. Less understood are issues of how light quality impacts student health. The question that follows, then, is how to ensure that we achieve a truly high-performing visual environment through design.

## What do we know today?

The impact of daylight on student health and learning has been thoroughly studied. Up until the 1970s, it was widely appreciated that natural daylight was necessary for healthy learning environments. But when the energy crisis hit in the early 1970s, designers began building schools with no windows to save energy. They conducted research at this time to test how the change impacted students and found no discernable impact on test scores. Researchers did find that teachers and students were very dissatisfied, but they did not believe that these attitudes could impact student performance and, thus, did not deem the dissatisfaction critical (Baker, 2011).

School building professionals have learned from experience, and we have begun to understand the biology of this phenomenon. For example, one study found that students without access to natural light showed a delay in seasonal cortisol production, a hormone that is positively associated with concentration abilities (Küller & Lindbom, 1992). More recently, Figueiro and Rea showed that dim light melatonin onset (DLMO) is delayed significantly (by 30 minutes) after a five-day intervention in which a group of 8th graders wore glasses that kept out all short-wave (solar) light exposure while they were at school. DLMO helps entrain the circadian system, and thus, this study showed that an absence of short-wave light (daylight) can contribute to sleep problems in adolescents.

Regarding academic impacts, one well-known study showed that students in daylight classrooms had greater improvement over the course of one school year in math and reading standardized tests than students in windowless classrooms (Heschong Mahone Group, 1999). The numbers

“...one study found that students without access to natural light showed a delay in seasonal cortisol production, a hormone that is positively associated with concentration abilities.”

















# air that is unfit to breathe

**AFT's 2008 Building Minds Minding**

**Building report cites a GAO study showing  
15,000 U.S. schools suffer from indoor air  
that is unfit to breathe.**

**15**  
**THOUSAND**

# GREEN CLASSROOM PROFESSIONAL

[centerforgreenschools.org/greenclassroom](http://centerforgreenschools.org/greenclassroom)





01



02



03



04



05



06



07



08



09



10



11



12



The logo features the words "GREEN" and "APPLE" in a bold, yellow-green sans-serif font. A stylized green leaf is positioned between them. Below "GREEN" is the word "DAY" in the same font, followed by "OF" in a smaller, lighter font, and then "SERVICE" in the large, bold font. The background is white with several small, dark green cloud icons scattered around the text.

# GREEN APPLE DAY OF SERVICE

A stylized illustration of a community. At the top is a green building with a clock tower. Below it are two green trees. A large, multi-colored rainbow arches across the middle. On the left and right sides of the rainbow, there are silhouettes of people of various ages and genders walking. The background is white with several small, dark green cloud icons.

SAVE THE DATE:

SEPTEMBER 27, 2014

[mygreenapple.org](http://mygreenapple.org)

@mygreenschools











# centerforgreenschools.org/resources

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