



Architecture • Engineering • Construction > INTEGRATED SOLUTIONS

..... **Elmhurst College West Hall | *Sustainable Approaches to Rainwater***

**ILLINOIS LAKES MANAGEMENT ASSOCIATION**

**March 3, 2012**



# Elmhurst College West Hall | *Sustainable Approach*

The "Green" Aspects of West Hall





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The "Green" Aspects of West Hall



 Elmhurst College – West Hall  
First Floor Plan



# The Case for Sustainable Design

## Environmental Impact of Buildings

- 65.2% of total US electricity consumption
- > 36% of total US primary energy use
- 30% of total US greenhouse gas emissions
- 136 million tons of construction & demo waste in the US (~2.8 lbs/person per day)
- 12% of potable water in the US
- 40% of raw materials used globally (3 billion tons annually)



\*Commercial & Residential  
Source: USGBC

## Five Strategic Areas for Sustainable Design

- Sustainable Site Planning
- Energy efficient and renewable energy
- Conservation of materials & resources
- Safeguarding water & water efficiency
- Indoor environmental quality



## Elmhurst College West Hall | *Sustainable Approach*

The “Green” Aspects of West Hall

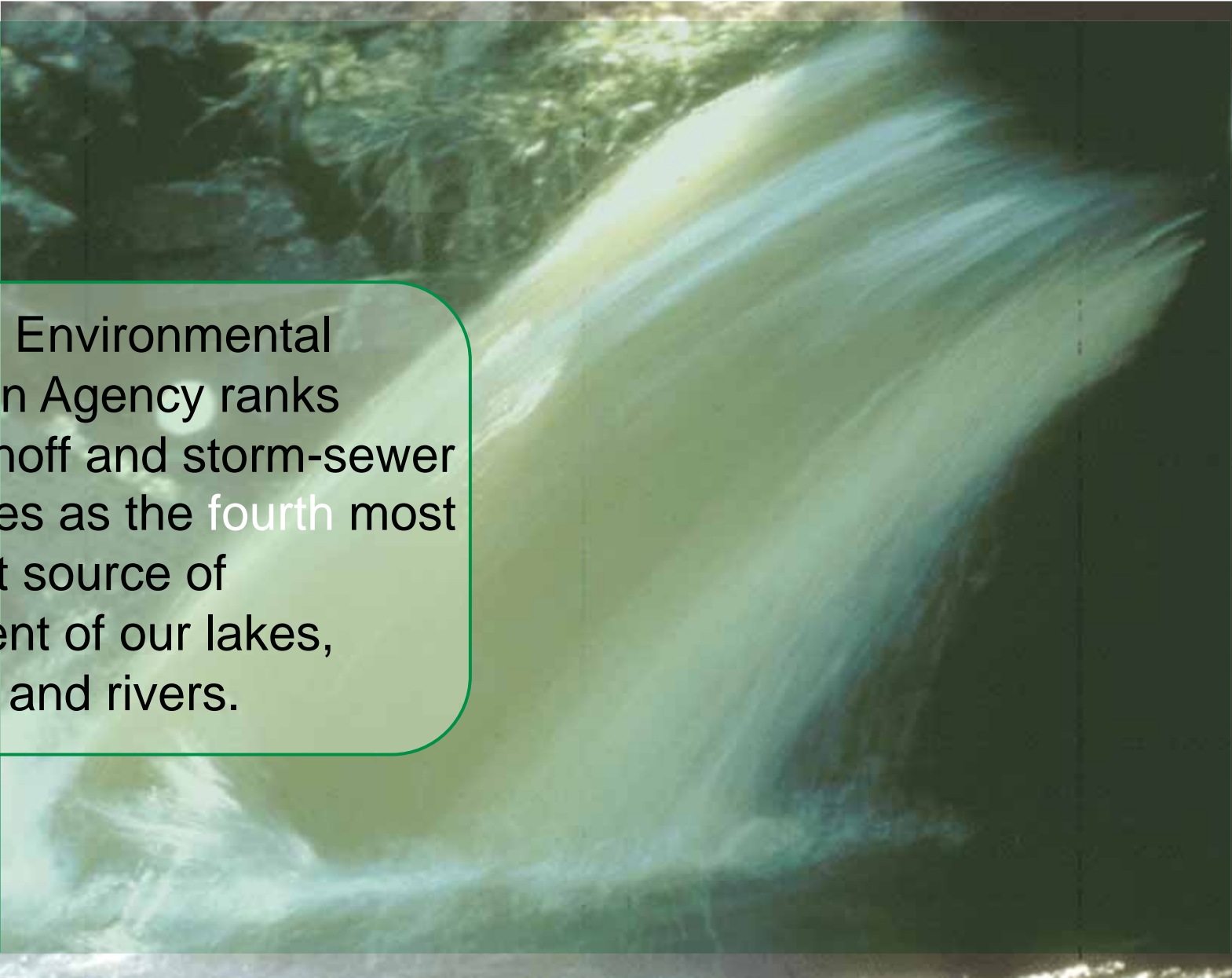


*West Hall*

- 10% recycled content by cost
- 20% energy savings (\$28,000/year)
- Solar/thermal panels
- Energy and water efficient equipment and fixtures
- 95% recycling of construction waste
- Recycling collection system
- Sustainably-harvested woods
- Environmentally friendly indoor environments
- Educational and research aspects

## Five Strategic Areas for Sustainable Design

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A photograph of a waterfall cascading down rocks, with water splashing and creating white foam. The background is slightly blurred, emphasizing the motion of the water. The image is partially overlaid by a green rectangular area on the left and a rounded green box containing text.

The U.S. Environmental Protection Agency ranks urban runoff and storm-sewer discharges as the fourth most prevalent source of impairment of our lakes, streams, and rivers.



The logo for Wight, featuring the word "Wight" in a bold, black, sans-serif font. A yellow square is positioned behind the letter "i".

**Wight**

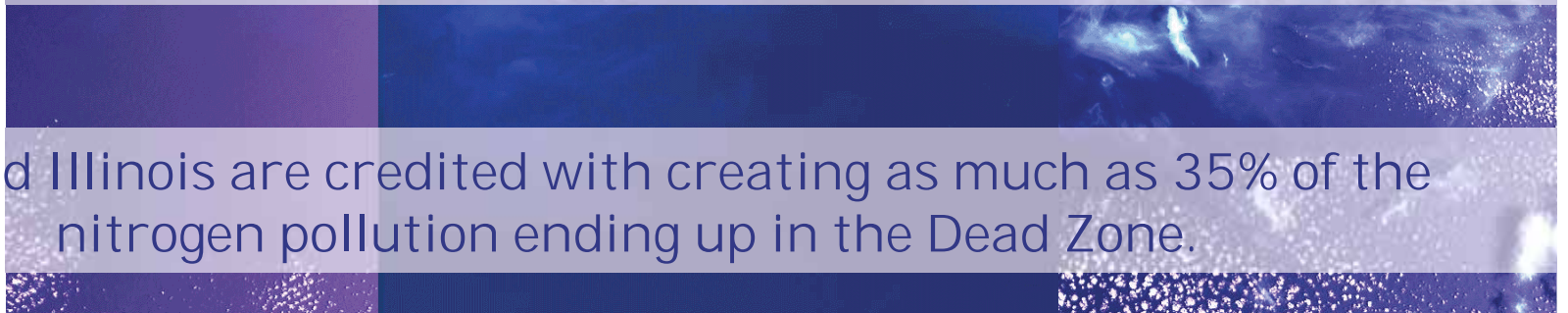


Each spring enormous quantities of dissolved nutrients (nitrogen) are transported from the upper Midwest into the Gulf of Mexico...



Resulting in the Gulf of Mexico Dead Zone.

This phenomena grows to approximately  
7000 square miles each spring...



Iowa and Illinois are credited with creating as much as 35% of the nitrogen pollution ending up in the Dead Zone.

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**Wight**



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Stormwater Management to Educational Teaching Tool





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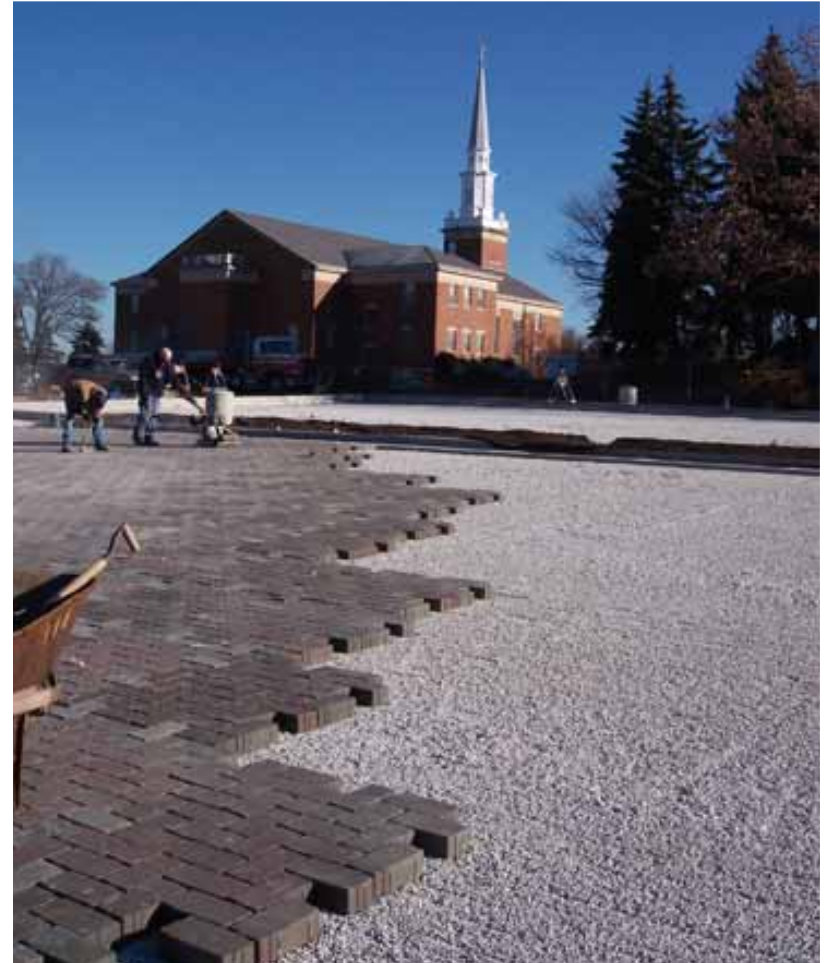
## The “Rain Water” Aspect of West Hall



- 100% Permeable Paver Parking Lot
- Bioswales in Parking Lots
- Rain Gardens Around Building
- Rain Water Harvesting and Recycling for Irrigation
- High Efficiency Irrigation System
- Native Landscapes
- Monitoring Equipment to Quantify Rain Water Run-off



## Elmhurst College West Hall | *Sustainable Approach* Stormwater Management to Educational Teaching Tool

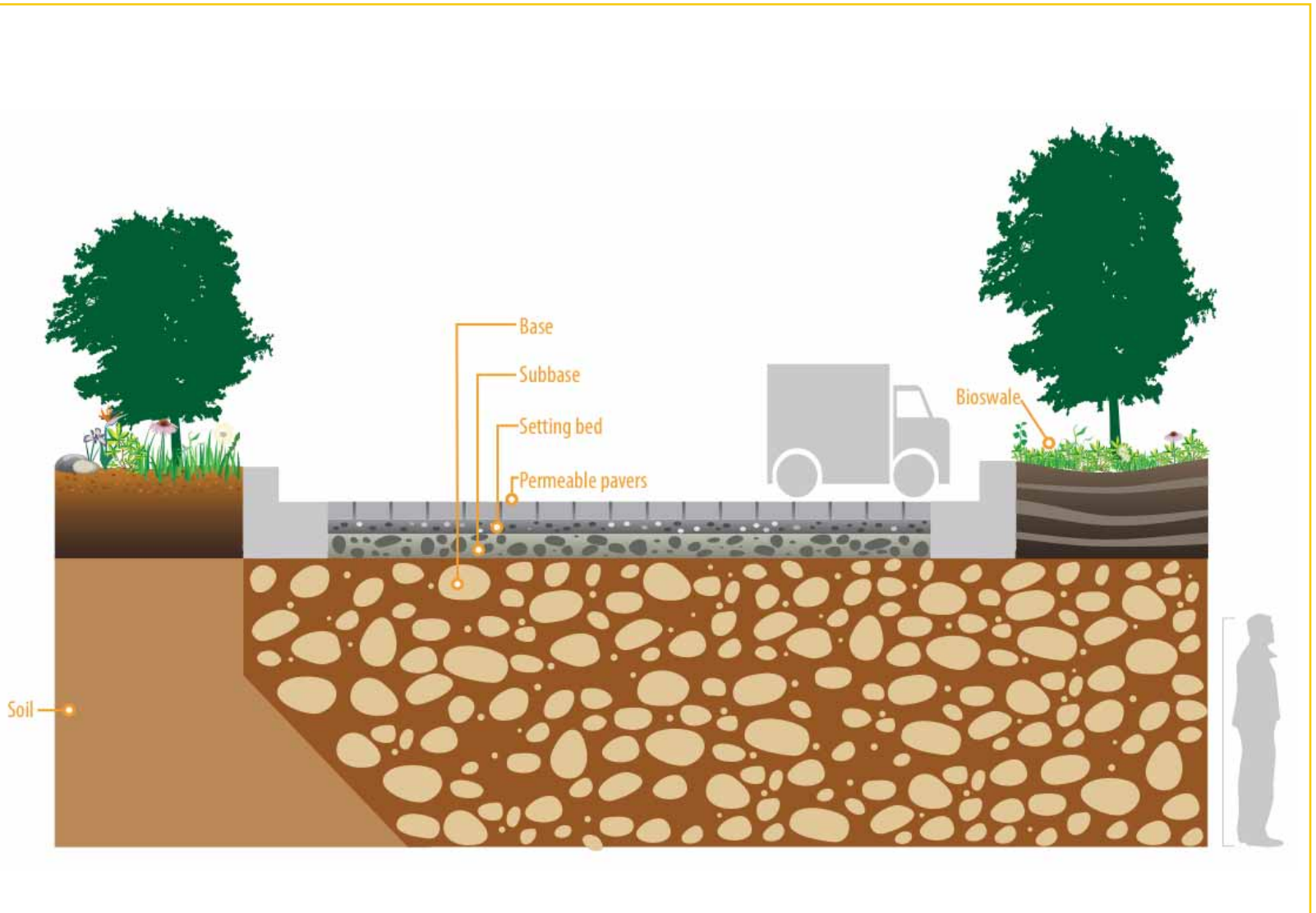


**100% Permeable Paver Parking Lot - this is the detention basin at West Hall**



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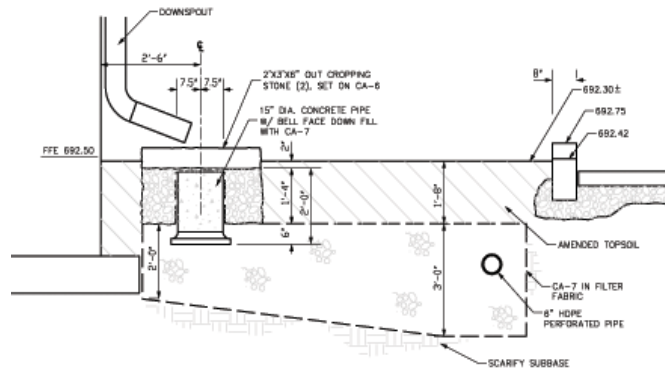


- Approximately 37.5” of precipitation falls on every acre of the Midwest
- That’s equal to nearly **1,000,000** gallons of water per acre per year
- For Elmhurst College that is roughly 30,000,000 gallons



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## Stormwater Management to Educational Teaching Tool



*The rain garden.*



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# Elmhurst College West Hall | *Sustainable Approach*

The Prairie Gardens



Prairie blazing star  
Compass plant



Prairie rose



Wild Onion



# Elmhurst College West Hall | *Sustainable Approach*

The Prairie Gardens







# Elmhurst College West Hall | *Sustainable Approach*

The Prairie Gardens





# Elmhurst College West Hall | *Sustainable Approach*

The Prairie Gardens



The Woodland Gardens



# Elmhurst College West Hall | *Sustainable Approach*

The Prairie Gardens





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## Educational Signs by Bluestones & Associates

### Where Does the Rain Go?

**West Hall courtyard system**

**1•Building Places for Water**

Each time a building needs to parking lot, it's important, there is less green space left to absorb incoming and draining storm, and water runoff collects debris, oil, antifreeze, salt, and heat. This polluted water drains into storm sewers and then into our streams and lakes. Storm water retention is a requirement for all new developments in Elmhurst, and with our new construction we have taken this several steps further.

We have built a system to hold, filter, and use the excess water by creating three water-shed areas: places for the rain to drain and accumulate—Inland West Hall parking lot, Rain Garden, and courtyard.

**2•Parking lot**

Instead of asphalt, which soaks off the soil, we have used permeable porous, which allows rain to soak into the earth. Under the porous, the ground has been excavated to 1 to 2 feet and filled with a layer of composted mulch, covered with a layer of crushed gravel, and topped with fine gravel directly under the porous, to slowly absorb water from the parking lot.

The parking lot is gently sloped toward a water treatment, where any filtered rain will not drain to collect runoff, and is slowly used above the water.

**3•Rain Garden**

On the south side of West Hall, developers carry rain from the roof into a catch basin surrounded by a deep bed of composted mulch where it is stored, and used to irrigate the Rain Garden.

... If retention exceeds the 10,000 gallon capacity of the catch basin system, it will drain into the parking lot storm drain.

... Stored water feeds an automatic drip irrigation system to water West Hall gardens during the weeks.

**3•Courtyard**

Storms pour over in the flat roofed area, a combination of gutters, downspouts and pipes under West Hall's courtyard. Downspouts from the concrete roof of the building drain into two catch basins. As these basins fill, water drains into a storm pipe, four feet across and over 40 feet long.

**ELMHURST COLLEGE**

### Building Green: Details Count

**A Living Textbook**

As people of the natural world around us, it's more important today. We built West Hall with a commitment to reducing energy consumption from the ground up.

The U.S. Green Building Council's a non-profit group, operates a program called LEED (Leadership in Energy and Environmental Design), to set standards on energy, water, materials, waste, construction. With every element of our construction, we are striving toward LEED certification—and in LEED's checklist we know how to do it.

West Hall, which includes an asphalt parking lot, has been designed to have a sustainable work environment.

**Use Renewable Materials**

Every small product choice can affect whether or not a forest survives. Builders at West Hall are made from rapidly renewable rubber was harvested from rubber tree bark, not forests. Before the technique of tapping was developed, rubber trees were cut down to collect latex.

Interior wood doors throughout the building are made with wood certified as sustainable by the Forest Stewardship Council.

**Don't Toss It; Use It Again**

Recycling glass, masonry, plastics, and rubber waste recycled.

Get the full that the slanted on the sloped roof of West Hall are made of recycled plastic. Many parts of West Hall's exterior had natural materials—brick, stone, and concrete—natural recycled materials, and when we walk into the building, all the carpets have and walk do, too.

**Look for a Local Source**

Finding local sources for building materials saves fuel.

Cypress board, acoustic ceiling tiles, concrete block, exterior field brick, pressure-treated, concrete floor plates, and wood interior doors used in West Hall came directly from businesses in our region.

... Consider how best a material is recycled, and a top filter collect the water from the roof gutter collected to produce clean water and light.

**ELMHURST COLLEGE**





# Elmhurst College West Hall | Sustainable Approach

Educational Signs by Bluestones & Associates

## Elmhurst College: Past and Present

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### Our Early History

Elmhurst College began as the Geneva Evangelical Protestantism in 1871.

In the midst of a strict academic schedule, a portion of each day was devoted to cultivation of the land around the school. Students were assigned chores which included tending farm animals, working in the school's vegetable garden, corn, oat, and wheat fields—and working in the school's laboratory—all for their own maintenance.

In 1925, Geneva Evangelical Protestantism (it only became Elmhurst College, and in 1930, women students were admitted for the first time.



### Our Trees

In 1965, Herbert Lohr, a landscape architect, donated a collection of trees to the college, and the campus was given Arbor Day status by the U.S. Department of Agriculture.

These trees have been nurtured by our remarkable land stewardship program, which has increased the number of species from 45 to 750, (including specimens donated by students, faculty, staff, and friends), before retiring in 2010.

Now, it's a living memorial to the past. Some 100 trees stand as silent witnesses to the future.

### Today's Campus

Continuing our long-standing belief in the link between education and the world around us, our campus plan includes a firm pledge to construction that respects nature's impact on the natural environment. Complementing our trees, prairie and woodland gardens, walkways and parking lots, to foster exploration and protection of our natural history.

An explicit commitment to Green initiatives, we plan to bring classroom to park campus grounds and reflect the college's vision.

Background: Elmhurst College campus plan in 1970



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## Returning to the Native Landscape

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### Land Formed by Glaciers

Over thousands of years ago, huge glaciers up to a mile thick, scraped their way over the land where Elmhurst College now stands.

The glaciers began to melt 11,000 years ago, leaving behind a landscape of hills and valleys in gravel and silt. For thousands of years, great prairie covered these hills in a vast expanse of the Midwest.



Elmhurst College is located in the heart of the Midwest.

### Disappearing Prairies

Most of the prairie in the early 1900s, in 1907, the U.S. Census estimated the remaining prairie at only 25 million acres. Today, only 1% of that remains. The prairie has been largely removed—and only recently have we begun to discover what we have lost.

A prairie is a unique ecosystem that provides habitat for a wide variety of animals and plants. A prairie is healthy and well-managed by fire, with lightning, drought, and fire.



### Prairie to Woodland to Forest

When cleared, the prairie became a woodland. As the forest grew, it made the prairie plants less viable, making way for a succession of plants adapted to the new environment of shade. These plants were well-suited to the cool, shaded woodland. As trees grew taller and denser, they created a woodland forest.

### The Role of Fire

Elmhurst has been getting nature to do her thing, long term.

It was common practice for prairie fires to burn in the fall, before the growing season. The fire was used to clear the land of brush and weeds, to prepare the soil for the next year's planting. The fire also helped to clear the land of brush and weeds, to prepare the soil for the next year's planting.

For long-term prairie restoration, it is important to have a fire every 10-15 years. This helps to clear the land of brush and weeds, to prepare the soil for the next year's planting. The fire also helps to clear the land of brush and weeds, to prepare the soil for the next year's planting.



Elmhurst has a diverse species of native prairie and woodland plants.

Some 100 trees stand as silent witnesses to the future. Some 100 trees stand as silent witnesses to the future.



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A partnership with nature...

Healing the earth in concert with human activities...