

LADY BIRD JOHNSON WILDFLOWER CENTER

This exhibit honors Lady Bird Johnson (1912-2007), a first lady of the United States and a visionary environmental leader. The Lady Bird Johnson Wildflower Center in Austin, Texas, which she founded with actress Helen Hayes, fulfills her legacy by working on such global challenges as climate change, chemical pollution and water scarcity. By providing native plant information online—and more than 16 unique gardens for 90,000 visitors annually—the Wildflower Center helps educate people about the importance

of native plants. The center also achieves its mission of increasing the sustainable use and conservation of native wildflowers, plants and landscapes by partnering on landscape restoration projects with corporations, parks and governmental units, by collecting thousands of seeds statewide to ensure their survival, and by researching how native plants are critical for maintaining wildlife habitat, water quality and other landscape characteristics that enrich our environmental health and our individual lives.





Lady Bird Johnson plants pansies in Washington as Secretary of Interior Stewart Udall and others look on
LBJ Library photo by Robert Knudsen

SOMETHING THAT WAS BEAUTIFUL

After Lyndon Johnson was elected president in 1964, Lady Bird Johnson focused on conservation and beautification. She wanted to call attention to the nation's natural beauty and succeeded, with lasting contributions in places such as Washington, D.C. She later said she enjoyed doing “something that was beautiful, useful and you could put it on your shield.” Her Committee for a More Beautiful Capital planted pansies on the Mall and azaleas in the Triangle, but Mrs. Johnson was also concerned with pollution, urban decay, recreation, mental health, public transportation and the crime rate. She expanded her efforts to low-income neighborhoods, finding corporate partners and giving neighborhood beautification awards.

THE HIGHWAY—A THREAD OF LIFE AND COMMERCE

Today, perhaps most people think of Lady Bird Johnson as the reason why we see wildflowers blooming along the highways. The Highway Beautification Act of 1965 was one result of her campaign for national beautification. Known as “Lady Bird’s Bill,” the legislation called for restrictions on outdoor advertising, junkyard removal and scenic enhancements along federal highways. It is part of her legacy that the Surface Transportation and Uniform Relocation Assistance Act of 1987 requires that a small percentage of highway landscaping funds be used to plant native wildflowers. Mrs. Johnson said that “the highway—a thread of life and commerce” should be surrounded by “a ribbon of color.”



President Johnson gives his wife the pen he used to sign the Highway Beautification Act of 1965
LBJ Library photo by Frank Wolfe



Lady Bird Johnson enjoys Indian Blankets at the LBJ Ranch in Stonewall, Texas
Wildflower Center photo by Frank Wolfe

PAYING RENT

On her 70th birthday in 1982, Lady Bird Johnson founded the Wildflower Center that was to bear her name, donating \$125,000 and 60 acres of land. She described it as “paying rent for the space I have taken up in this highly interesting world.” She intended that the center would showcase the beauty of native plants and educate and inspire people to use and protect them. She was concerned that the wildflowers she loved were disappearing rapidly, falling victim to urbanization, large-scale agriculture, invasive species and other challenges. Today the 279-acre center in Austin, Texas, carries on her legacy with native plant research, conservation and education. In 2006, the center became a part of The University of Texas at Austin.

DO WHAT YOU CAN

The Lady Bird Johnson Wildflower Center is partnering with the American Society of Landscape Architects and the United States Botanic Garden on the Sustainable Sites Initiative to create national standards and guidelines for sustainable landscapes. Lady Bird Johnson wanted everyone to “do what you can to make your own region a place of joy for you and your descendants,” and this partnership will promote more sustainable backyards, parks and other landscapes. Guidelines will include using appropriate plantings and sustainable measures to improve erosion control, provide cleaner air and water, reduce greenhouse gases and preserve wildlife habitat, so that our national landscape mirrors the environmental ethic at the heart of Lady Bird Johnson’s decades of conservation efforts. www.sustainablesites.org



This Austin, Texas, green roof helps cool the building below and controls storm water runoff.
Wildflower Center photo by Philip Hawkins



First Ladies Water Garden Exhibit

A Clear Vision—The Legacy of Lady Bird Johnson

The Lady Bird Johnson Wildflower Center at the University of Texas at Austin

This exhibit honors first lady Mrs. Lyndon B. Johnson and her “clear vision”. Mrs. Johnson, who died July 11, 2007 at age 94, was an environmental leader ahead of her time as her own words demonstrate. As the signage explains, she expressed her passion for native landscapes through beautification programs in Washington, D.C., and elsewhere, and through her campaign for the Beautification Act of 1965 that brought wildflowers and fewer billboards to national highways. She continued to share her environmental ethic when, at age 70, she helped open the Wildflower Center in Austin that studies and educates others about native plant conservation and sustainable use.

Elements of the Exhibit

Water Spirals—The four brushed stainless steel spirals in the fountain are statements made by Mrs. Johnson that reflect her concern for native plants and the environment.

Benchback Quote—his stainless steel quotation on the long wall explains why Mrs. Johnson’s devoted much of her life to preserving wildflowers and encouraging others to plant native landscapes.

Umbrellas—On the underside of the rust-red umbrellas are facts illustrating how wildflowers and native plants contribute to sustainability.

Native Plants of the United States—Each of the four groupings of container plantings shows native plants from a different region of the country.

Plant Stakes—The plastic plant stakes on each table direct visitors inside to pick up their free wildflower seeds from their part of the country.

Wind Chimes—These chimes use the pentatonic scale, the notes used in both “Amazing Grace” and the University of Texas at Austin song, “The Eyes of Texas”

Wildflower Seeds—The display rack at the Conservatory exit door contains free packets of seeds from six regions of the country as well as rack cards explaining the work of the Wildflower Center.

Lady Bird Wildflower Center Exhibit

First Ladies Water Garden

Resources

Wildflower Seeds: American Meadows
223 Avenue D
Williston VT 05495-7139
www.Americanmeadows.com

Wind Chimes: WindChime.com NetSHopes, Inc.
12720 I Street, Suite 200
Omaha NE 68137
www.windchime.com

Umbrellas: Backyard City
FiberBuilt Umbrellas
P.O. Box 9060
Jacksonville FL 3310-9060
www.Backyardcity.com

Plastic Plant Stakes: Horticultural Marketing and Printing
3210 Innovative Way
Mesquite TX 75149

Water Spirals: Austin Waterjet
8510 Lava Hill Rd
Austin, TX 78744
www.waterjetcutting.com

Display Rack: Displays2Go
55 Broad Common Road
Bristol, RI 02809
www.displays2go.com

Regional Native Plants: **Merrifield Garden Center**
Merrifield, VA
www.merrifieldgardencenter.com

American Plant Nursery
Bethesda MD
www.americanplant.net

Blue Diamond Nursery
Blue Diamond NV
<http://www.cactuscactus.com>

Lady Bird Johnson Wildflower Center

Austin TX

www.wildflower.org

THE SUSTAINABLE SITES INITIATIVE™



AMERICAN SOCIETY OF
LANDSCAPE ARCHITECTS



UNITED STATES
BOTANIC GARDEN

SUCCESS of GREEN BUILDING

The construction market accounts for 14.2% of the \$10 trillion U.S. GDP.

Source: 2006 DOE Buildings Energy Databook

The value of green building construction is expected to exceed \$12 billion in 2007.

Source: McGraw-Hill Construction Analytics

Since 2000, U.S. Green Building Council's membership has increased ten-fold.

Source: U.S. Green Building Council

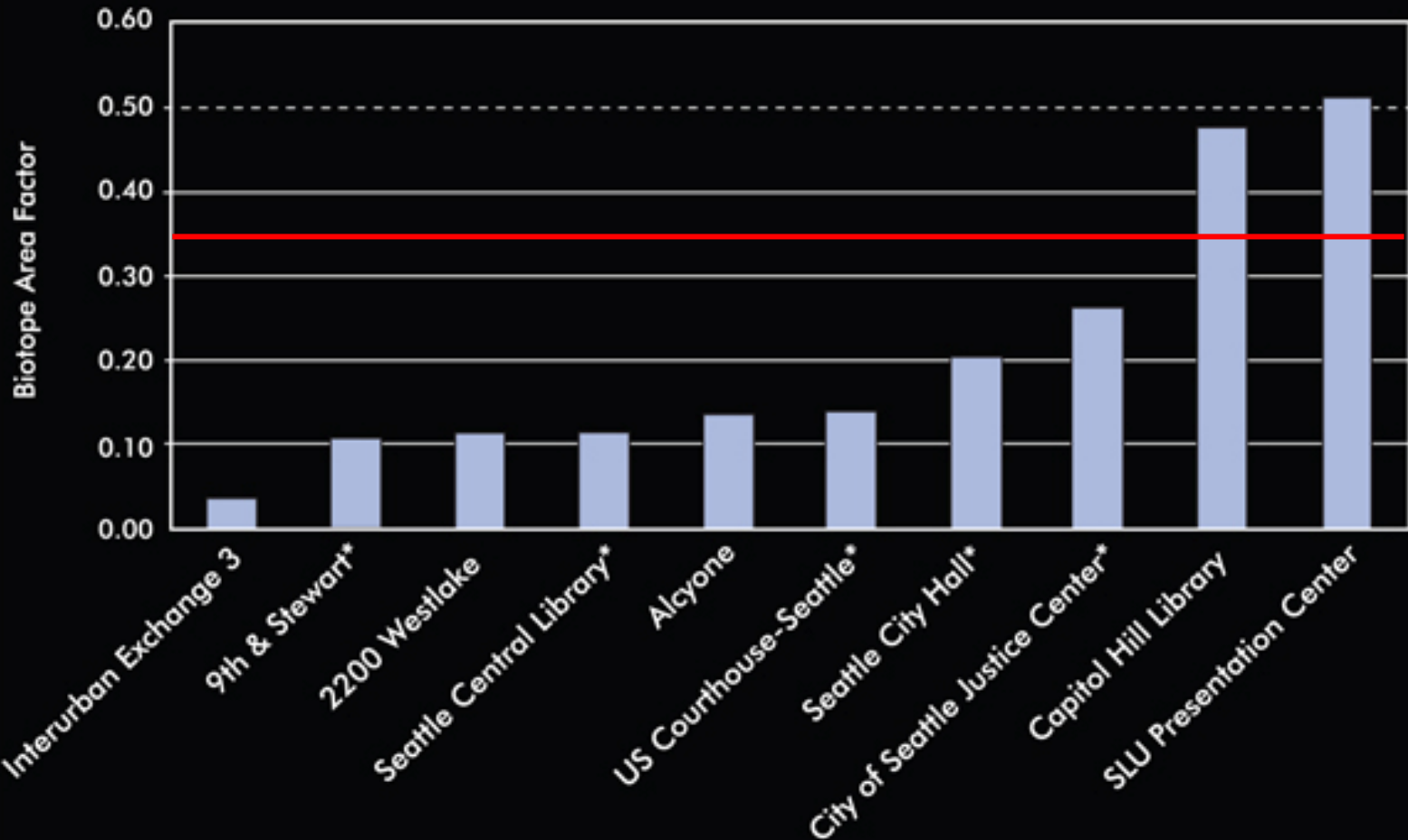
Since 2000, there have been over 1,200 LEED certified buildings and 9,500 registered; and over 45,000 LEED Accredited Professionals.

Source: U.S. Green Building Council





Berlin BAF for Recent Projects



(*LEED Silver certified or targeted)

GREEN DOES NOT EQUAL SUSTAINABLE



LINKING LANDSCAPES TO SUSTAINABILITY...

30% to 65% of water used daily by a family of four is for landscape irrigation.

U.S. Environmental Protection Agency, "Outdoor Water Use in the United States", 2007

Combine sewer overflows result in sewage and large volumes of storm water containing pathogens, solids, debris and toxic pollutants being discharged into surface water.

U.S. Environmental Protection Agency, "Report to Congress on Impacts and Control of Combined Sewer Overflows and Sanitary Sewer Overflows", 2004



LINKING LANDSCAPES TO SUSTAINABILITY...

25 to 50% of electricity used by US cities is consumed by municipal water and wastewater treatment.

Water and Energy Technology Team at Lawrence Berkeley National Laboratory (2007).



LINKING LANDSCAPES TO SUSTAINABILITY...

78 million households in the U.S. use home and garden pesticides.

U.S. Environmental Protection Agency (EPA). 2004.
Pesticides Industry Sales and Usage: 2000 and 2001 Market
Estimates. EPA-733-R-04-001



Soils that are compacted during site preparation and construction lose the ability to absorb storm water and supply plant roots with air and water

Breland and Hansen, 1996



Source: James Urban



LINKING LANDSCAPES TO SUSTAINABILITY...

Disposing of organic materials in Texas landfills costs more than \$150 million a year and consumes more than 15 million cubic yards of space.

TCEQ Yardwise - *Green Guide to Yard Care*

Yard and landscape trimmings contribute approximately 32 million tons to the municipal waste stream, representing over 13 percent of total municipal waste in the U.S.

U.S. EPA, "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2005"



LINKING LANDSCAPES TO SUSTAINABILITY...

Scientists estimate that strategically planting vegetation reduces cooling energy consumption by up to 25%.

U.S. EPA – Heat Island Effect

A study of street trees in New York City found that the climate moderating benefits provided by trees resulted in annual energy savings of \$27.8 million, or \$47.63 per tree.

Peper, P.J., McPherson, E.G., Simpson, J.R. et al., "New York City, New York: Municipal Forest Resource Analysis," Technical Report, USDA Forest Service Center for Urban Forest Research, Pacific Southwest Research Station (2007).



LINKING LANDSCAPES TO SUSTAINABILITY...

Minneapolis showed savings of \$6.8 million in energy costs and \$9.1 million in stormwater treatment and increased property values by \$7.1 million as a result of street trees.

California study showed a return on investment of \$1.89 for every dollar spent.

McPherson 2005 & 2006



WHAT IS SUSTAINABILITY?



Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.

Brundtland Report, Our Common Future, 1987



ECOSYSTEM SERVICES

Benefits natural systems provide that **support our lives** and are often considered “**free**” and not a part of conventional accounting methods.

\$16 - \$54 trillion per/yr.

Twice the Global GNP

Costanza et al. 1997



THE SUSTAINABLE SITES INITIATIVE™

VISION

All site related design construction operations and maintenance practices ***link natural and built systems*** to achieve balanced environmental, social and economic outcomes to improve the ***quality of life*** and long term ***health*** of communities and the environment



PARTICIPANTS

Lady Bird Johnson Wildflower Center

American Society of Landscape Architects

United States Botanic Garden

U.S. Green Building Council

U.S. Environmental Protection Agency, GreenScapes Program

National Recreation and Park Association

National Association of County and City Health Officials

The Nature Conservancy, Global Invasive Species Team

University of Texas at Austin, Center for Sustainable Development

American Society of Civil Engineers, Environment and Water Resources Institute



POTENTIAL PROJECTS TYPES

- parks, trails, campgrounds
- industrial and office parks
- govt. & medical complexes
- conservation easements
- botanical gardens
- university campuses
- residential sites
- streetscapes & plazas



CURRENT FOCUS OF RESEARCH

HYDROLOGY



VEGETATION



**HUMAN
WELL-BEING**



SOILS



MATERIALS



THE CHALLENGE FOR SITES

Increasing Population

Expanding “Greenfield”
Development

Need for restorative
landscapes providing
additional Ecosystem
Services



POTENTIAL ECOSYSTEM SERVICES PROVIDED BY A SUSTAINABLE SITE

- **Livable atmosphere**
- **Climate regulation (local and global)**
- **Sequester carbon**
- **Detoxify and cleanse air and water**
- **Regulate water supply**
- **Provide habitat**
- **Physical and mental health**
- **Mitigate potential hazards**



MOUNTAIN AND POLAR

Food
Fiber
Fresh water
Erosion control
Climate regulation
Recreation and ecotourism
Aesthetic values
Spiritual values

INLAND WATER Rivers and other wetlands

Fresh water
Food
Pollution control
Flood regulation
Sediment retention
and transport
Disease regulation
Nutrient cycling
Recreation and
ecotourism
Aesthetic values

CULTIVATED

Food
Fiber
Fresh water
Dyes
Timber
Pest regulation
Biofuels
Medicines
Nutrient cycling
Aesthetic values
Cultural heritage

COASTAL

Food
Fiber
Timber
Fuel
Climate regulation
Waste processing
Nutrient cycling
Storm and wave protection
Recreation and ecotourism
Aesthetic values

FOREST AND WOODLANDS

Food
Timber
Fresh water
Fuelwood
Flood regulation
Disease regulation
Carbon sequestration
Local climate regulation
Medicines
Recreation
Aesthetic values
Spiritual values

DRYLANDS

Food
Fiber
Fuelwood
Local climate regulation
Cultural heritage
Recreation and ecotourism
Spiritual values

URBAN Parks and gardens

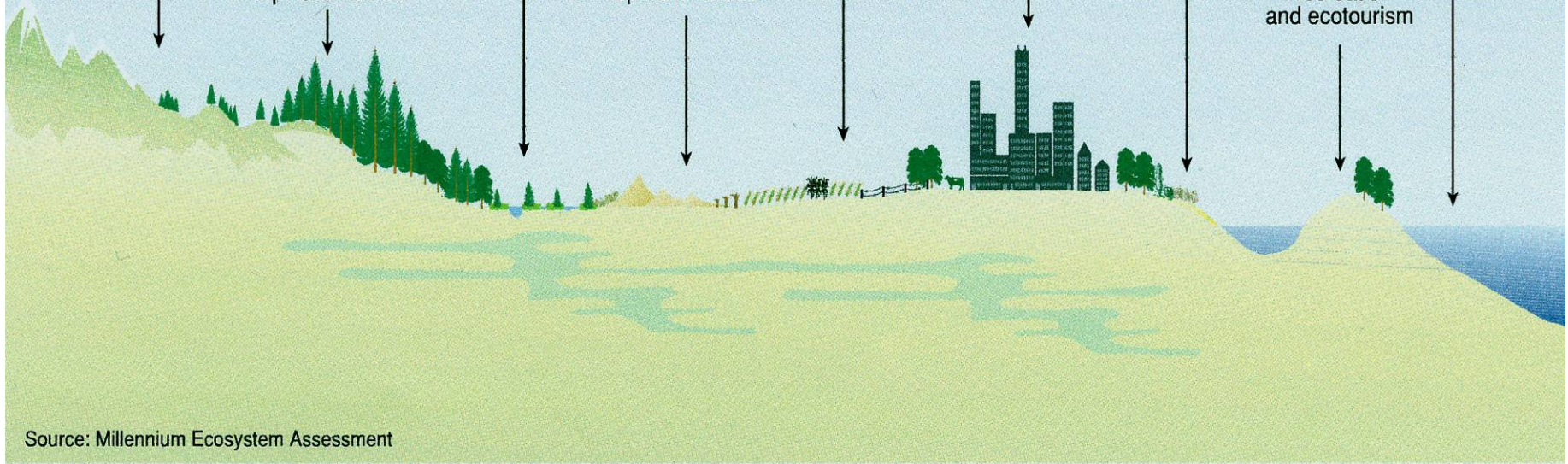
Air quality regulation
Water regulation
Local climate regulation
Cultural heritage
Recreation
Education

MARINE

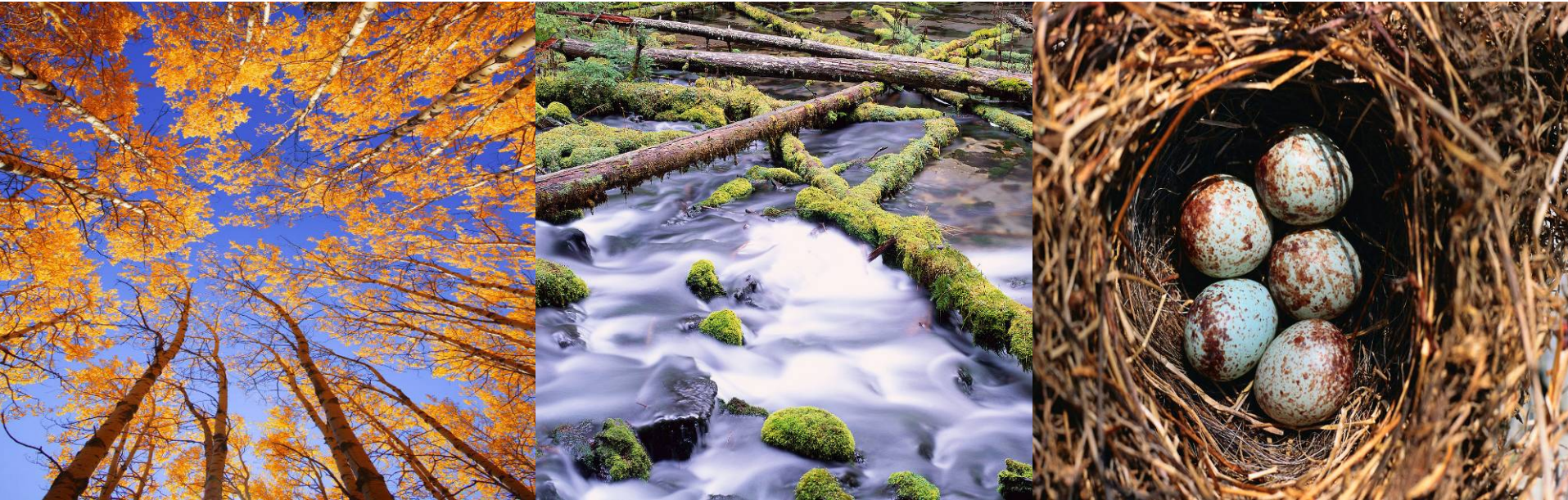
Food
Climate regulation
Nutrient cycling
Recreation

ISLAND

Food
Fresh water
Recreation
and ecotourism

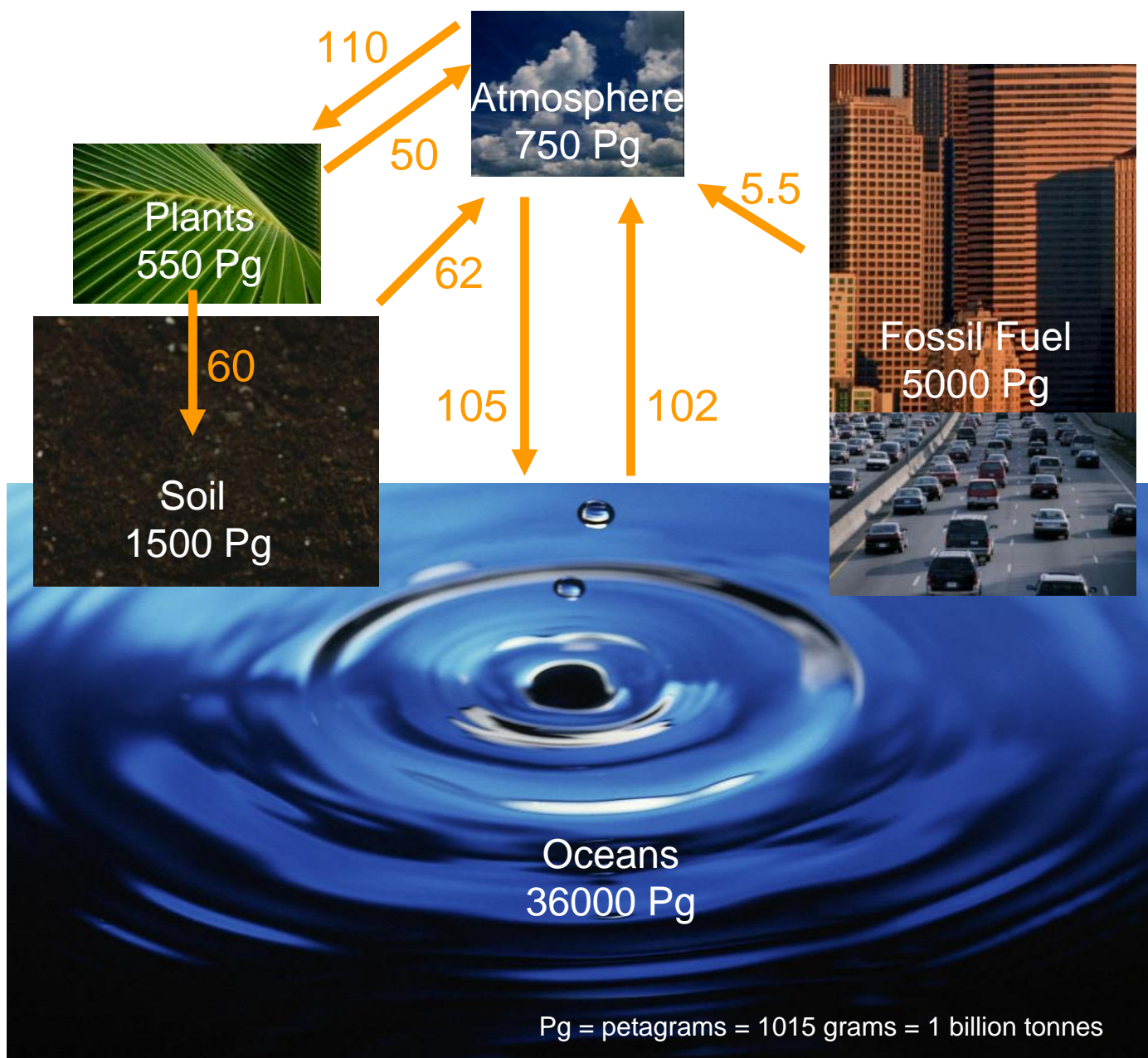


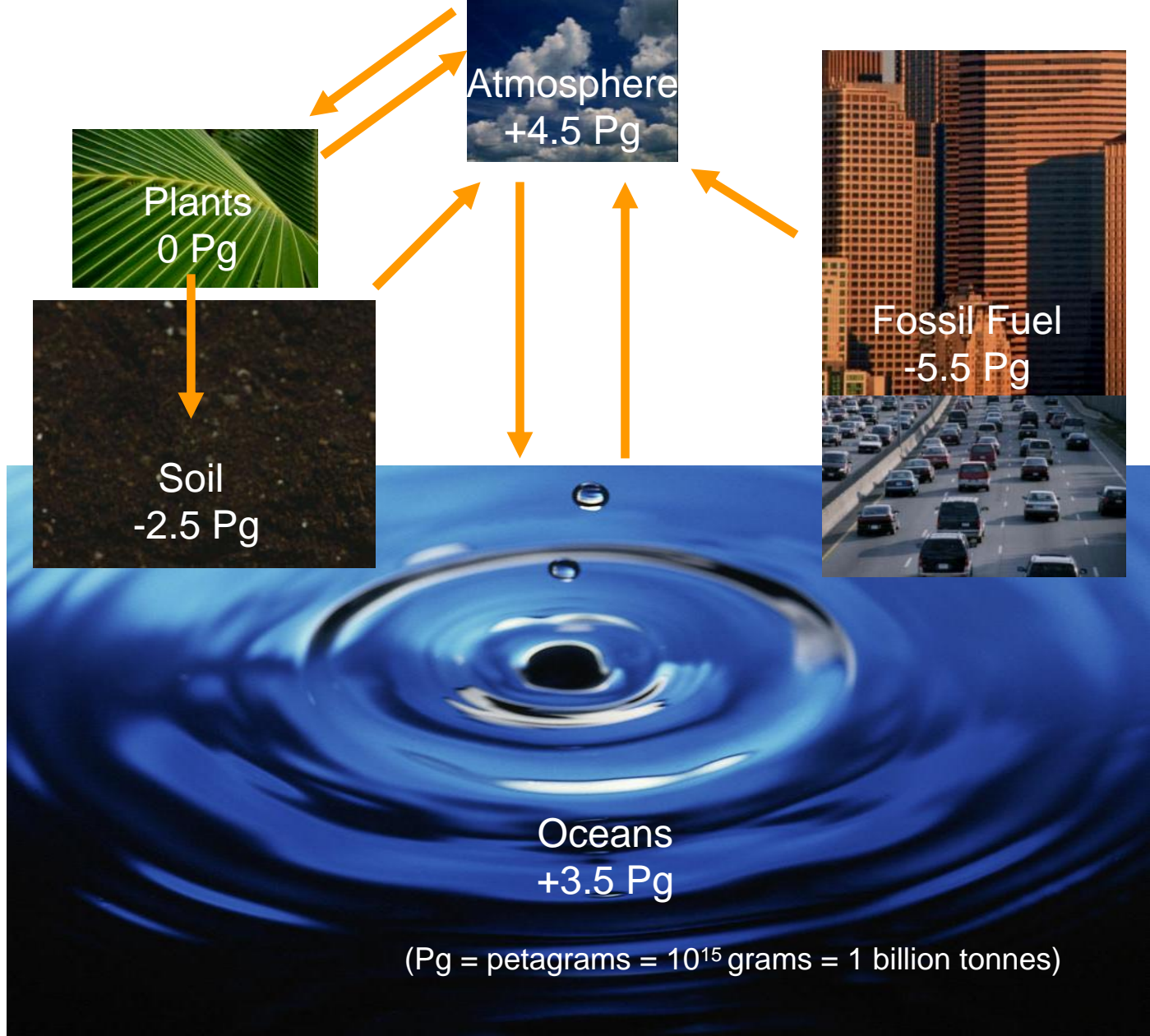
How can a site protect or enhance ecosystems services?



CARBON STORAGE

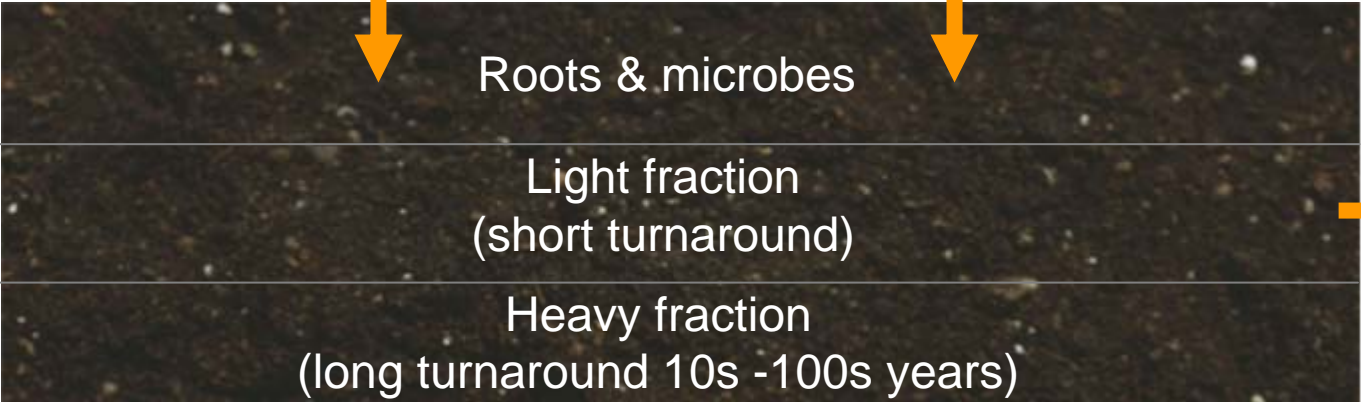








Photosynthesis



Roots & microbes

Light fraction
(short turnaround)

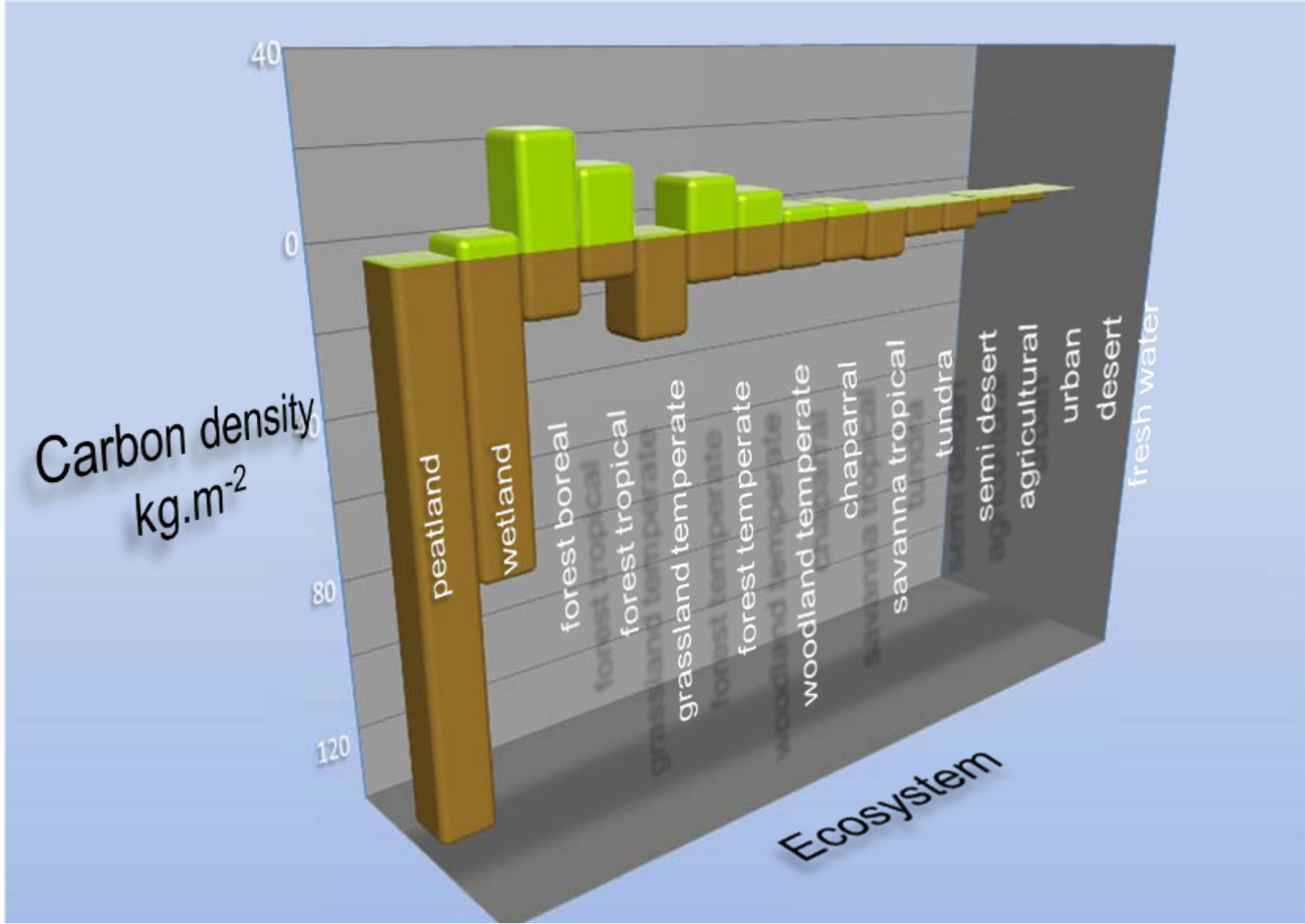
Heavy fraction
(long turnaround 10s -100s years)

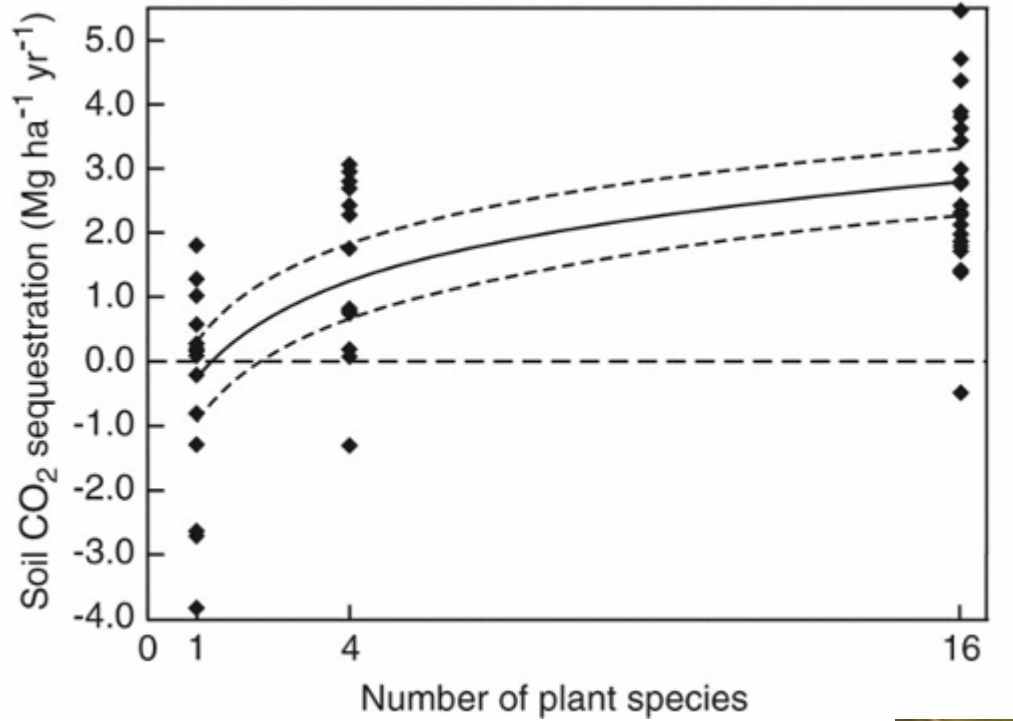
erosion

leaching

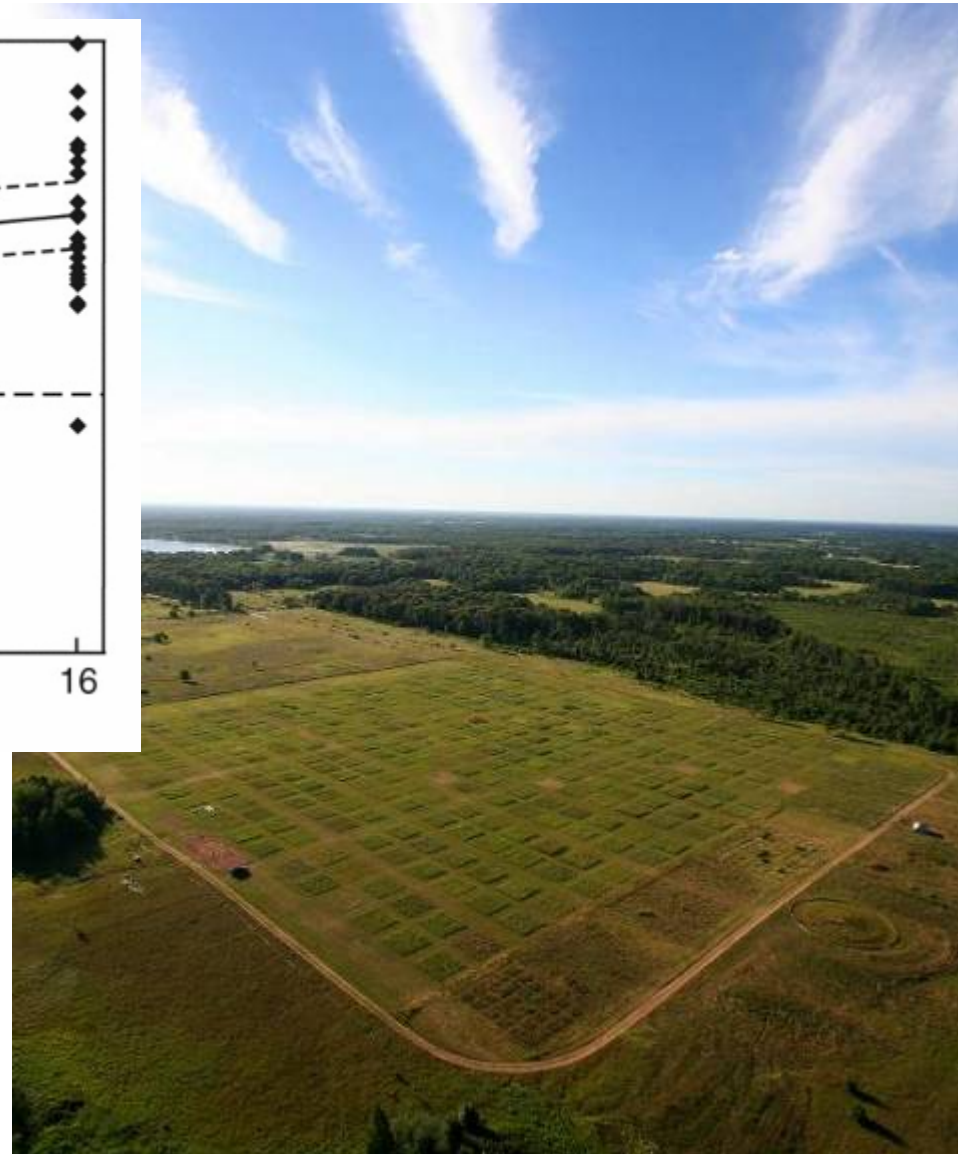
Oxidation
(respiration)







Source Tilman, Hill and Lehman. Science (2006)
 Photo: Cedar Creek LTER Site



Construction Carbon Calculator | BuildCarbonNeutral.org - A CO2 calculator for your whole built - Windows Internet Explorer

http://buildcarbonneutral.org/

Links » Google build carbon neutral Go Bookmarks 250 blocked Check AutoLink AutoFill Send to build carbon neutral Settings File Print FedEx Kinko's

File Edit View Favorites Tools Help

Construction Carbon Calculator | BuildCarbonNeutral...

Home Feeds (1) Print Page

buildcarbonneutral beta

Estimate the embodied CO₂ of a whole construction project.

The Construction Carbon Calculator helps developers, builders, architects and land planners approximate the net embodied carbon of a project's structures and site.

1:reduce 2:renew 3:offset

Constructing new buildings and sites with the least possible environmental impact involves three important steps: [reduce](#), [renew](#) and [offset](#). Offsetting means calculating the project's carbon footprint so it can be balanced by funding resources or activities like renewable energy and land protection – resources that benefit and protect the planet.

This tool estimates the embodied energy and subsequent carbon amounts released during construction. The measurements account for building materials, processes and carbon released due to ecosystem degradation or sequestered through landscape installation or restoration.

Learn more about this calculator: [why it exists](#), [how it works](#) and [why you should use it!](#)

Construction Carbon Calculator

Building Size

Total Square Feet:

Stories Above Ground:

Stories Below Ground:

Primary Structural System Above Ground

Wood

Concrete

Steel

Mixed

Site

Ecoregion: [\(view map\)](#)

Predominant Existing Vegetation:

Predominant Installed Vegetation:

Landscape (SF) Disturbed:

Landscape (SF) Installed:

I have read and agree to the [terms of use](#).

Calculator version 0.03.5. Last updated 2007.10.11.

[reduce & renew](#) | [calculate](#) | [offset](#) | [about the calculator](#) | [assumptions](#) | [faq](#) | [send feedback](#)

Source: The Lady Bird Johnson Wildflower Center and Mithun

EMBODIED CARBON NEUTRALITY?

= 240 metric tons CO₂



40,000 ft² building
On a brownfield

Source: The Lady Bird Johnson Wildflower Center and Mithun



= 220 metric tons CO₂



-20 tons



= 205 metric tons CO₂



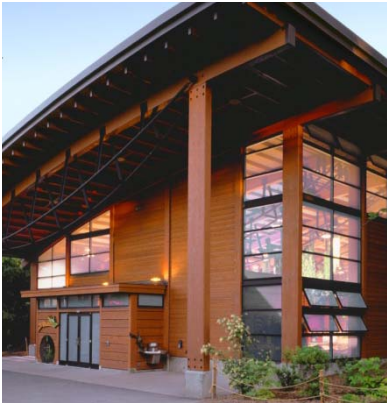
-20 tons



-15 tons



= 190 metric tons CO₂



-20 tons



-15 tons



-15 tons



= -10 metric tons CO2



-20 tons



-15 tons



-15 tons



-200 tons



= -15 metric tons CO2



+240 tons



-20 tons



-15 tons



-15 tons

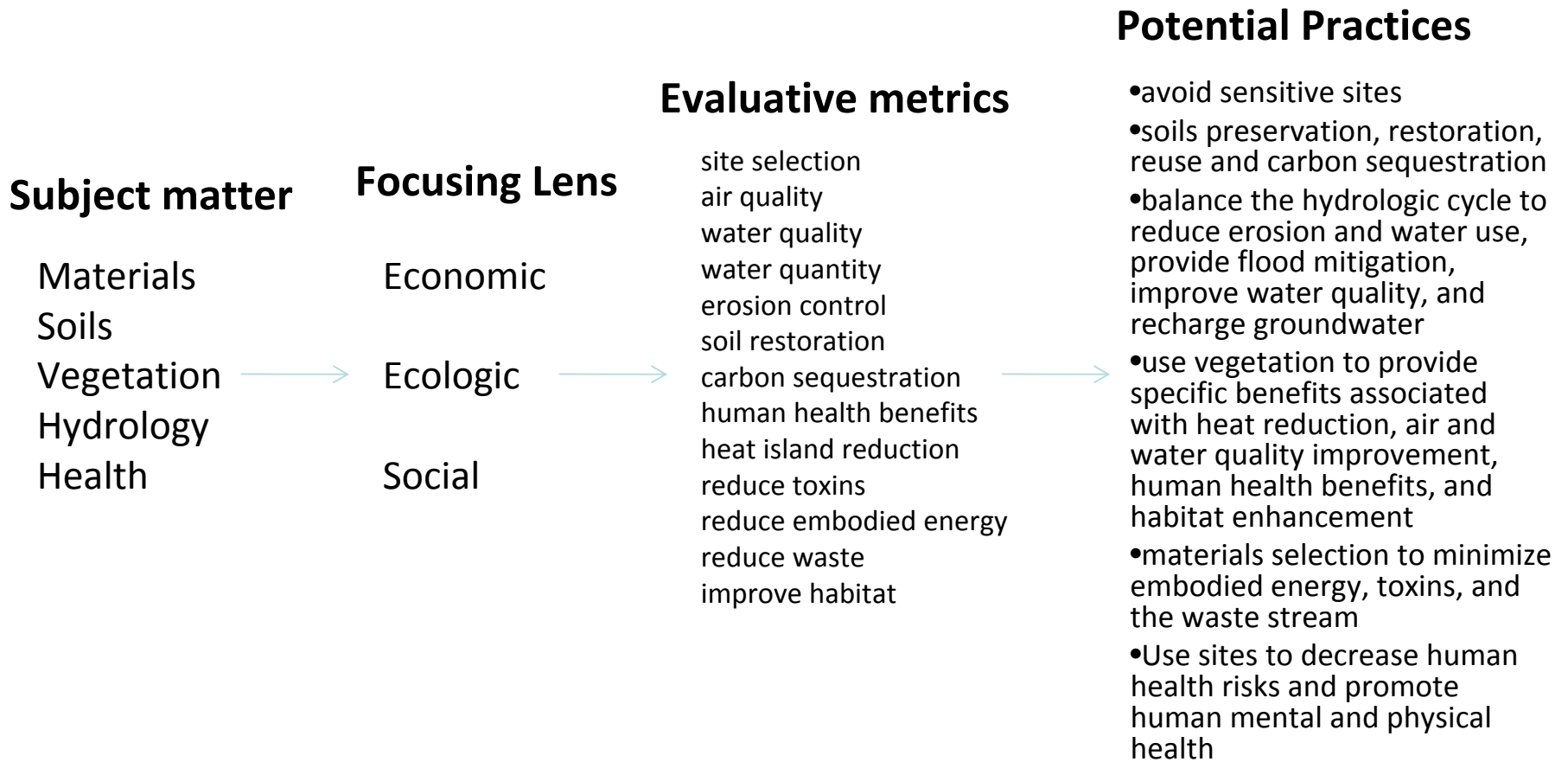


-200 tons



-5 tons





* Slide content for illustration only. Metrics and practices are neither exclusive nor complete.



HYDROLOGY

measures of success

- **Balance hydrologic cycle**
- **Not net export of pollutants above background levels**
- **Treatment of 90% of average annual rainfall**
- **Eliminate or significantly reduce potable water use**
- **Increase high quality vegetation within the floodplain**



HYDROLOGY

potential strategies

- Restore impacted wetlands, streams and habitat features
- Harvest rainwater and reuse graywater
- Use soil and plant based treatment systems to maintain infiltration and transpiration of rainfall
- Vegetated roofs and walls



SOILS

measures of success

- **Appropriate bulk densities within root zone for soil type**
- **Appropriate soil volume for target plant species**
- **Appropriate organic matter content for soil type**
- **Appropriate soil organism biomass**
- **Soil Organic Carbon (SOC)**



SOILS

potential strategies

- Develop soil management plan
- Limit soil disturbance
- Require IPM for site maintenance
- Increase organic matter in soils
- Manage soils to store nutrients that contribute to GHG (CO₂;CH₄;N₂O)



VEGETATION measures of success

- **Optimize Leaf Area Index (LAI) for site conditions and ecosystem services**
- **Document carbon footprint of plant material**
- **No use of invasive plant species**
- **50% of site shaded by vegetation after 5 years**



VEGETATION potential strategies

- Use plants to filter pollutants and sequester carbon
- Select and locate plants based on information gathered during a detailed site assessment
- Develop short and long term sustainable maintenance plans
- Use native or regionally appropriate adapted vegetation



MATERIALS

measures of success

- **Percent of materials used with recycled content**
- **Provide for the collection of recyclables**
- **Percent organic matter recycled**
- **Minimize landscape electricity & use sustainable sources**
- **Track embodied energy of materials**



MATERIALS

potential strategies

- Reuse or renovation of existing site elements
- Specify durable materials that require less maintenance and replacement
- Use local materials
- Specify recycled content material
- Use sustainably certified products



& Rebuy



HUMAN HEALTH & WELL-BEING measures of success

- Provide access and views of green spaces
- Percent of landscape that serves other functions which is also accessible and safe (multi-use)
- Engaging community in design



HUMAN HEALTH & WELL-BEING potential strategies

- Provide both visual and physical access to greenspace
- Provide opportunities to interact with nature
- Offer places for rest and reflection
- Provide community gathering areas



PARADIGM CHANGE



Water

1. Conserve
 2. Reuse
 3. Balance
- = Regenerate



Energy

1. Reduce
 2. Renew
 3. Offset
- = Produce



Habitat

1. Preserve
 2. Protect
 3. Restore
- = Regenerate



Materials

1. Reduce
 2. Reuse
 3. Recycle
- = Upcycle

from **CONSERVATION** to **REGENERATION**



UPCOMING REPORTS

- Preliminary Draft *Standards and Guidelines* **released November 2007**
(at www.sustainablesites.org)
- Updated Draft *Standards and Guidelines* **to be released November 2008**
 - Goals and Strategies
 - Suggested tools
 - Quantitative evaluation
 - Measurement of site performance in a variety of site and regional contexts
- Final draft of the *Standards and Guidelines* **to be released summer 2009**



THE SUSTAINABLE SITES INITIATIVE™

SCHEDULE

(tentative to project funding)



SUPPORT PROVIDED BY

American Society for Landscape Architects

The Lady Bird Johnson Wildflower Center

United States Botanic Garden

The Meadows Foundation

U.S. Environmental Protection Agency

Texas Commission on Environmental Quality

The Horticultural Research Institute

U.S. Forest Service

The Nature Conservancy

American Society of Civil Engineers

General Services Administration

U.S. Green Building Council

National Recreation and Parks Association

National Association of County and City Health Officials



THE SUSTAINABLE SITES INITIATIVE™

FOR MORE INFORMATION or TO GET INVOLVED:

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