AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS
ASLA Library & Education Advocacy Fund

Climate Change

- Green infrastructure and green building technologies, including green roofs and other innovative stormwater management techniques, are critical for addressing climate change.

- ASLA recommends that landscape practices cover stormwater management, water efficiency, biodiversity, expanded tree canopy coverage, and maintenance practices.

GLACIER CLUB, DURANGO, COLORADO. DESIGN WORKSHOP, DENVER, COLORADO.

- The Society recently released a statement on climate change that outlines its recommendations for addressing and mitigating the effects of climate change.

S.W. 12TH AVENUE GREEN STREET PROJECT, PORTLAND, OREGON. KEVIN R. PERRY, ASLA.

Sustainable Sites Initiative™

- The Sustainable Sites Initiative™ (SSI) is the development of sustainability standards and guidelines for designed landscapes of all types.

- The SSI links research with practice to encourage site development that contributes to the long-term health of communities and the planet.

- This project will drive new levels of environmental quality and community well-being by setting the standard for truly “green” outdoor environments.

AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS
ASLA Library & Education Advocacy Fund

Tradition to Stewardship

- Founded in 1899, stewardship of the land has always been a part of ASLA's core mission.

- ASLA is committed to managing its operations and its headquarters building using sustainable practices.

BROWNFIELD TO GREENFIELD, WELLESLEY, MASSACHUSETTS. MICHAEL VAN VALKENBURGH ASSOCIATES, INC., CAMBRIDGE, MASSACHUSETTS AND NEW YORK, NEW YORK.

- ASLA purchases carbon offsets for leadership and staff air travel, practices "green" meetings management, purchases green/sustainable furnishings and equipment for building renovations, and uses recycled paper and soy-based ink for printing.

ASLA Green Roof

- The ASLA green roof, dedicated in 2006, has reduced the building's energy use, reduced pollution from runoff water, and provides extra green space.

PHOTO COURTESY OF ASLA

- Innovative features of the green roof include two elevated "waves" formed from rigid insulation and covered with a green roof system and an extensive green roof system covered by an aluminum grating walking surface to maximize both usable space and environmental benefits.

- ASLA's green roof website averages 10,000 visitors each month, and over 3,000 individuals have toured the roof and viewed an accompanying presentation.

- ASLA also provides a green roof interactive web-based education program for middle school students.

THE SUSTAINABLE SITES INITIATIVE™





AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

Lady Bird Johnson Wildflower center
THE UNIVERSITY OF TEXAS AT AUSTIN

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

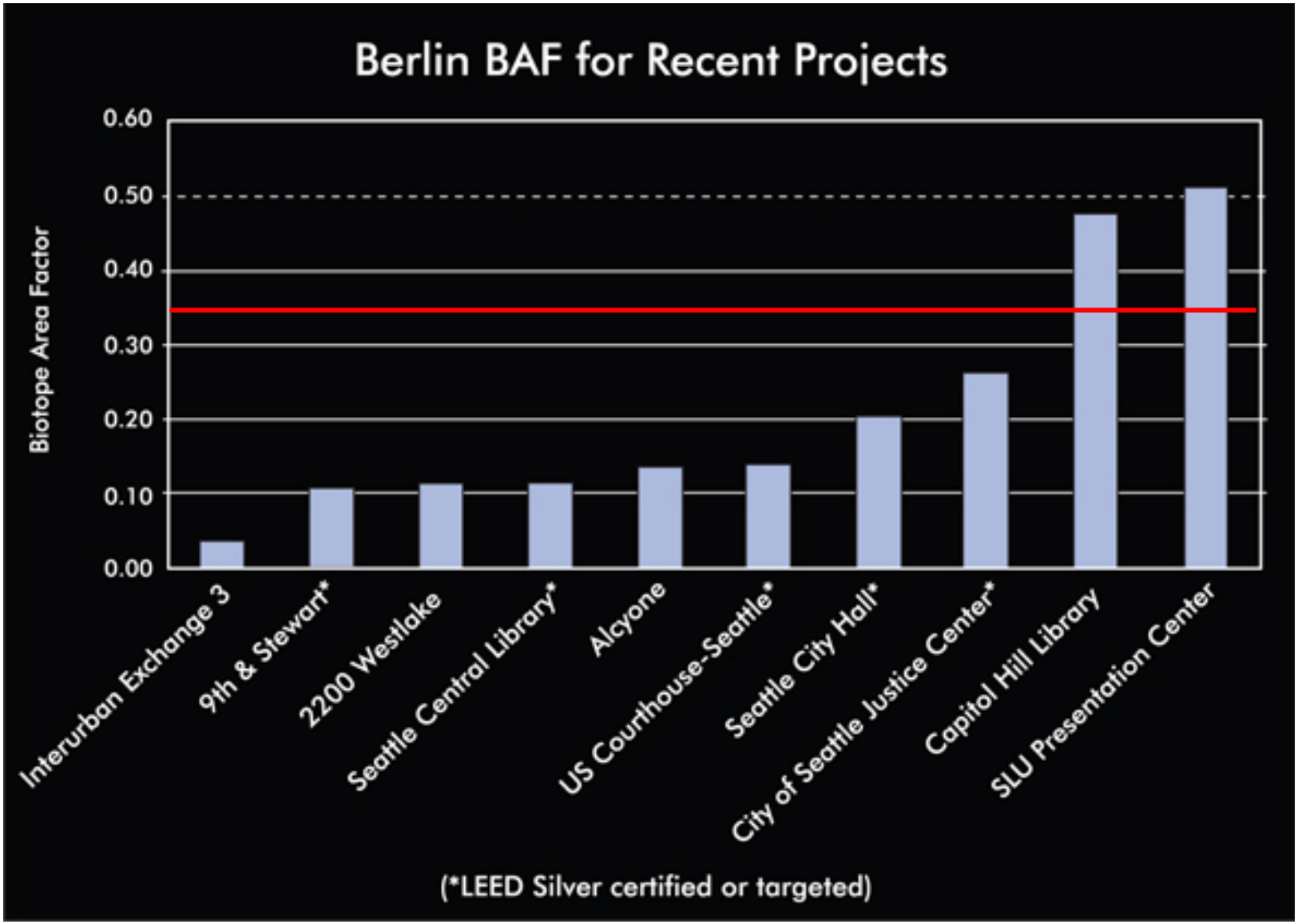
Since 2000, U.S. Green Building Council's membership has increased ten-fold.
Source: U.S. Green Building Council

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


Jefferson Green


Genzyme Center

Oregon Health & Science Center


Berlin BAF for Recent Projects
Biotope Area Factor
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Interurban Exchange 3
9th & Stewart*
2200 Westlake
Seattle Central Library*
Alcyone
US Courthouse-Seattle*
Seattle City Hall*
City of Seattle Justice Center*
Capitol Hill Library
SLU Presentation Center
(*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 Combines 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.

Waterand 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?

Maintaining and enhancing ecosystem services

Profitable, competitive and enduring businesses

Healthy individuals participating in stable institutions

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

SOILS

VEGETATION

MATERIALS

HUMAN WELL-BEING

THE CHALLENGE FOR SITES

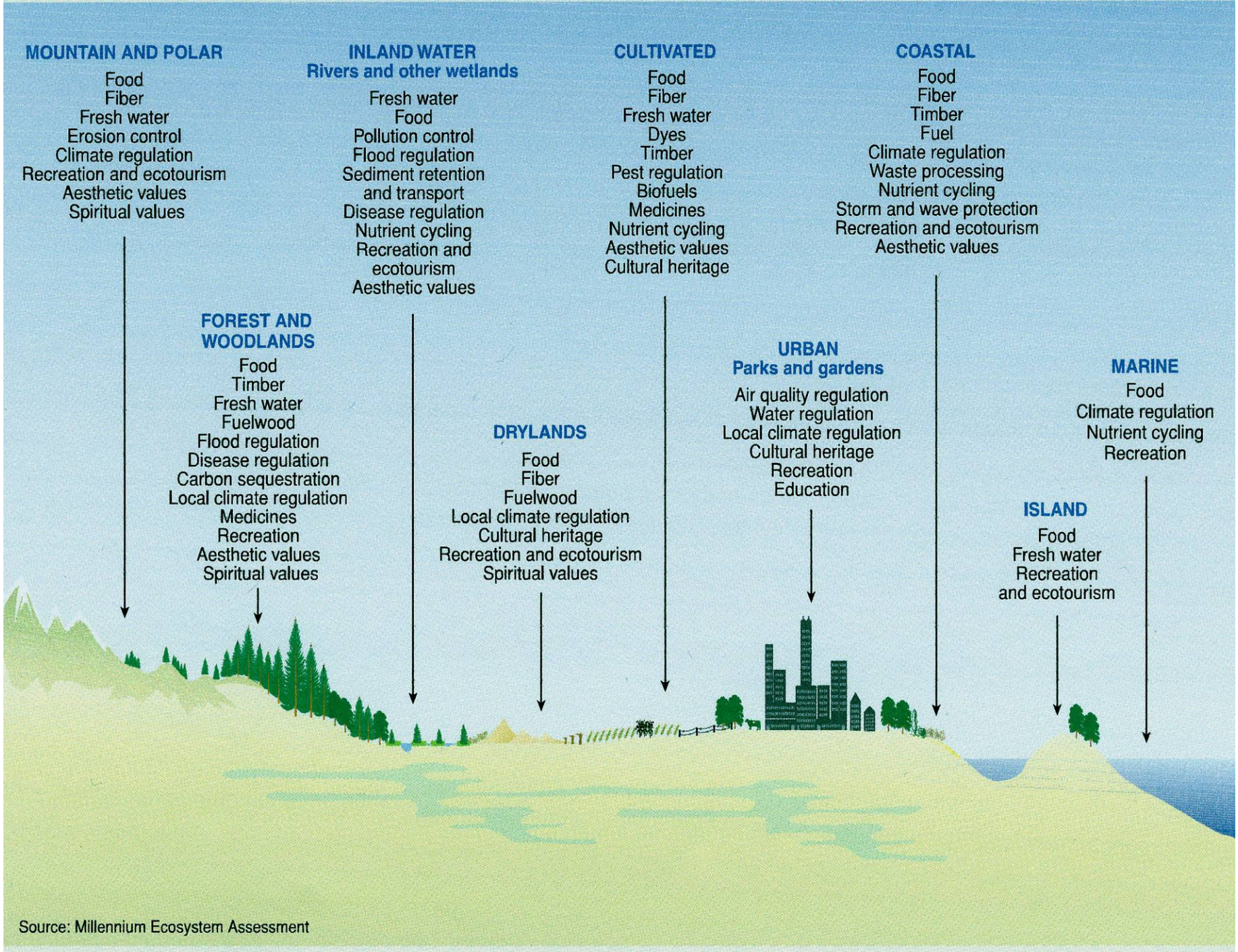
Increasing Population

Expanding “Greenfield” Development

Need for restorative landscapes providing additional Ecosystem Services

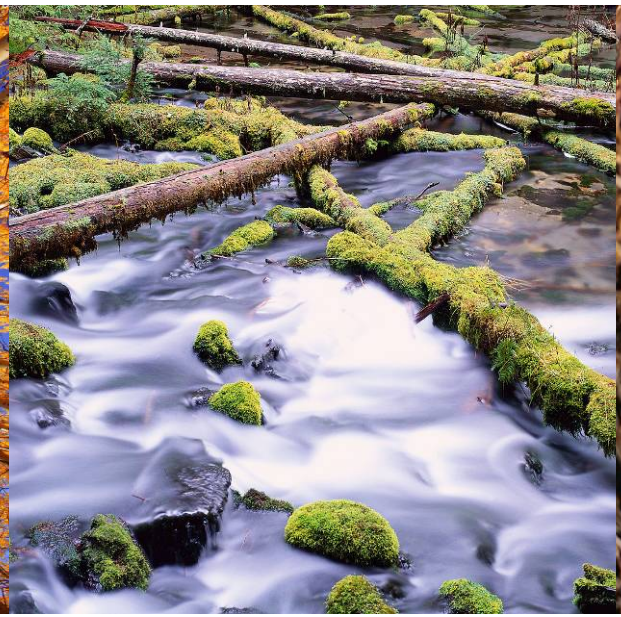
POTENTIAL ECOSYSTEM SERVICES PROVIDED BY A SUSTAINABLE SITE

- 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

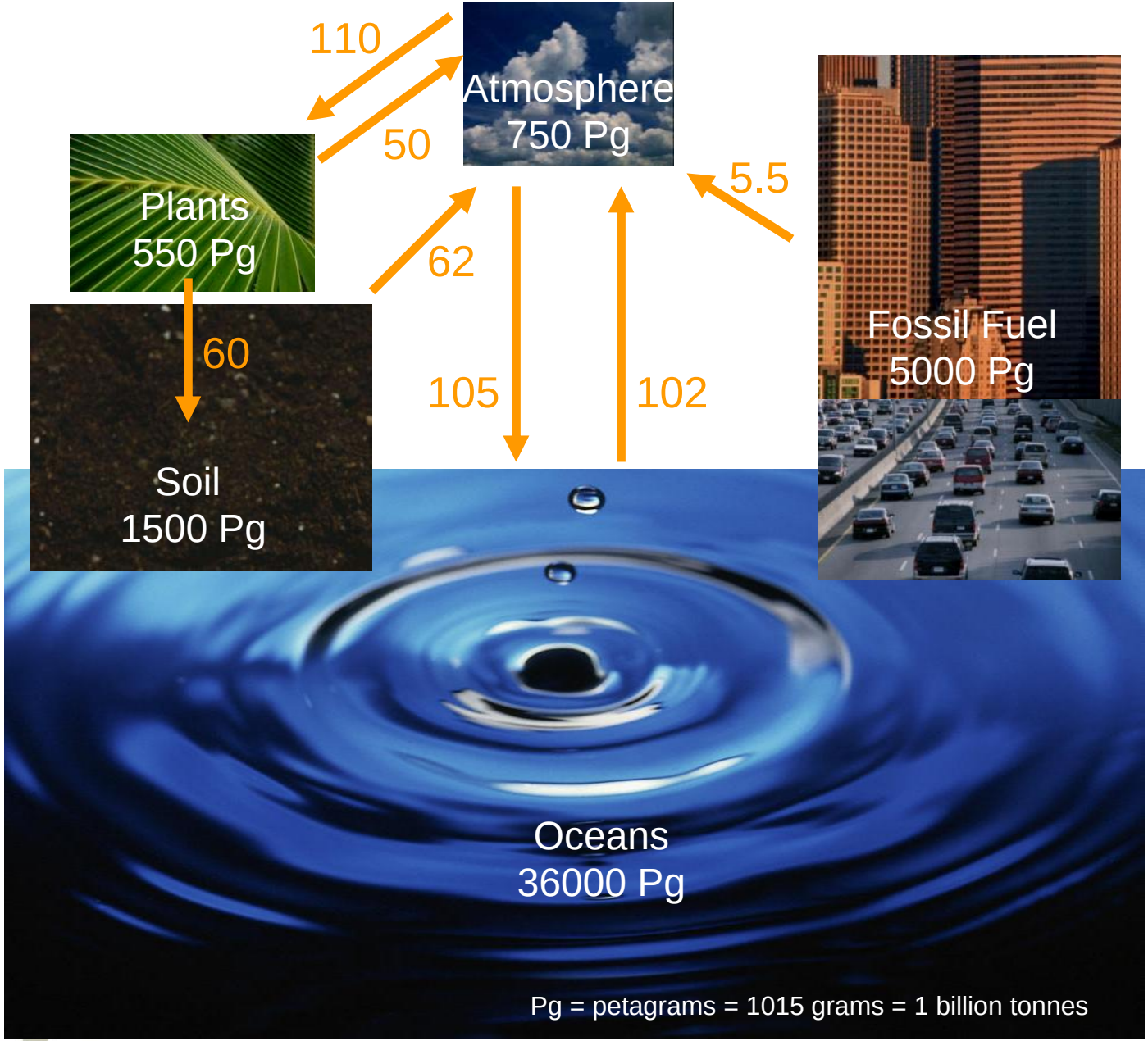


Source: Millennium Ecosystem Assessment

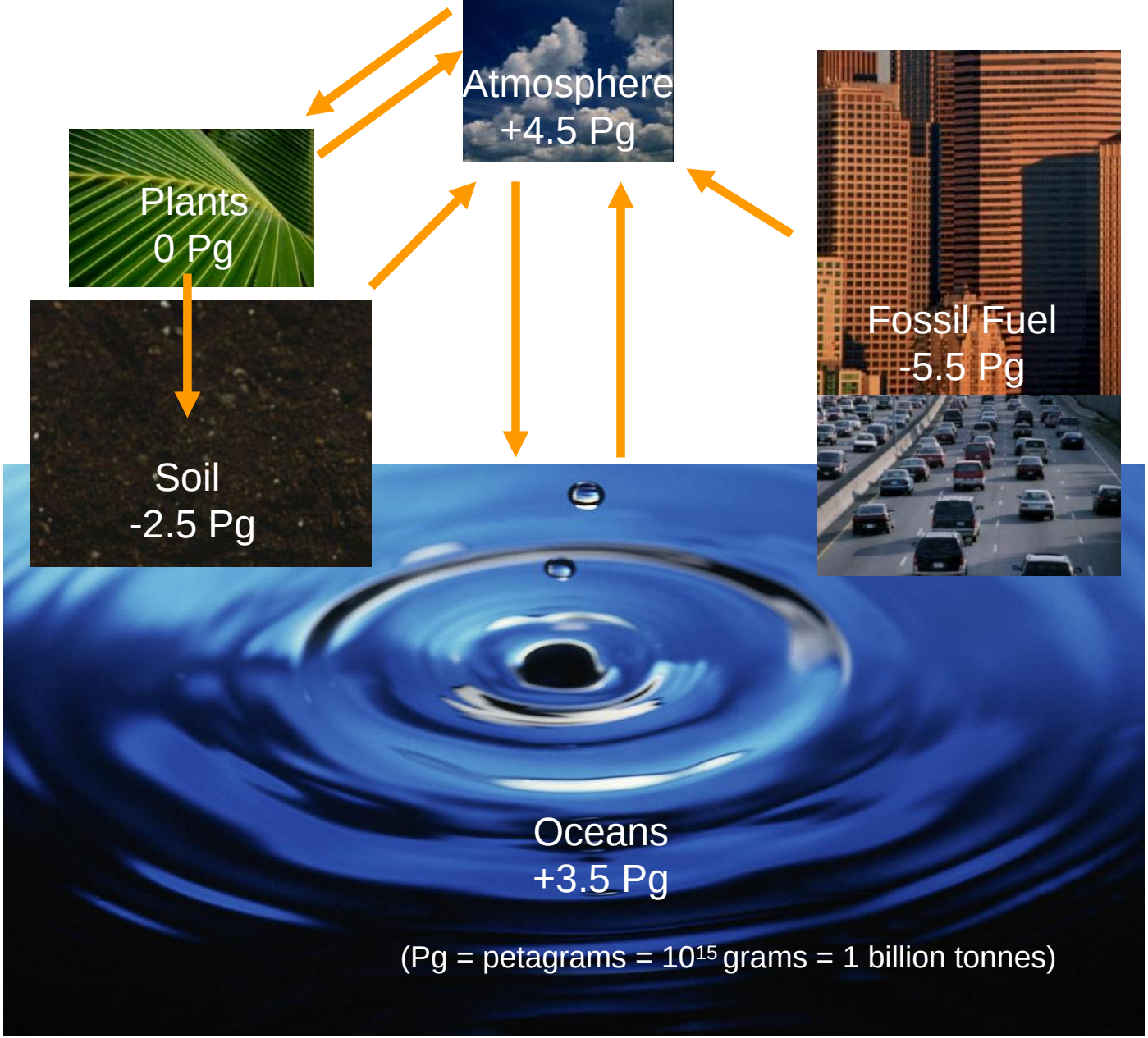
How can a site protect or enhance ecosystems services?



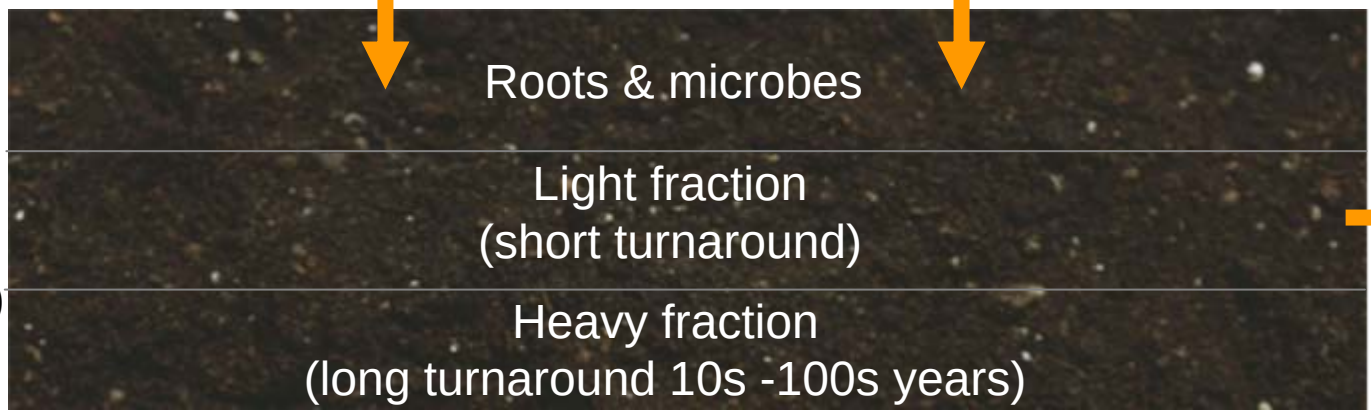
CARBON STORAGE



Source Brady and Weil 1996



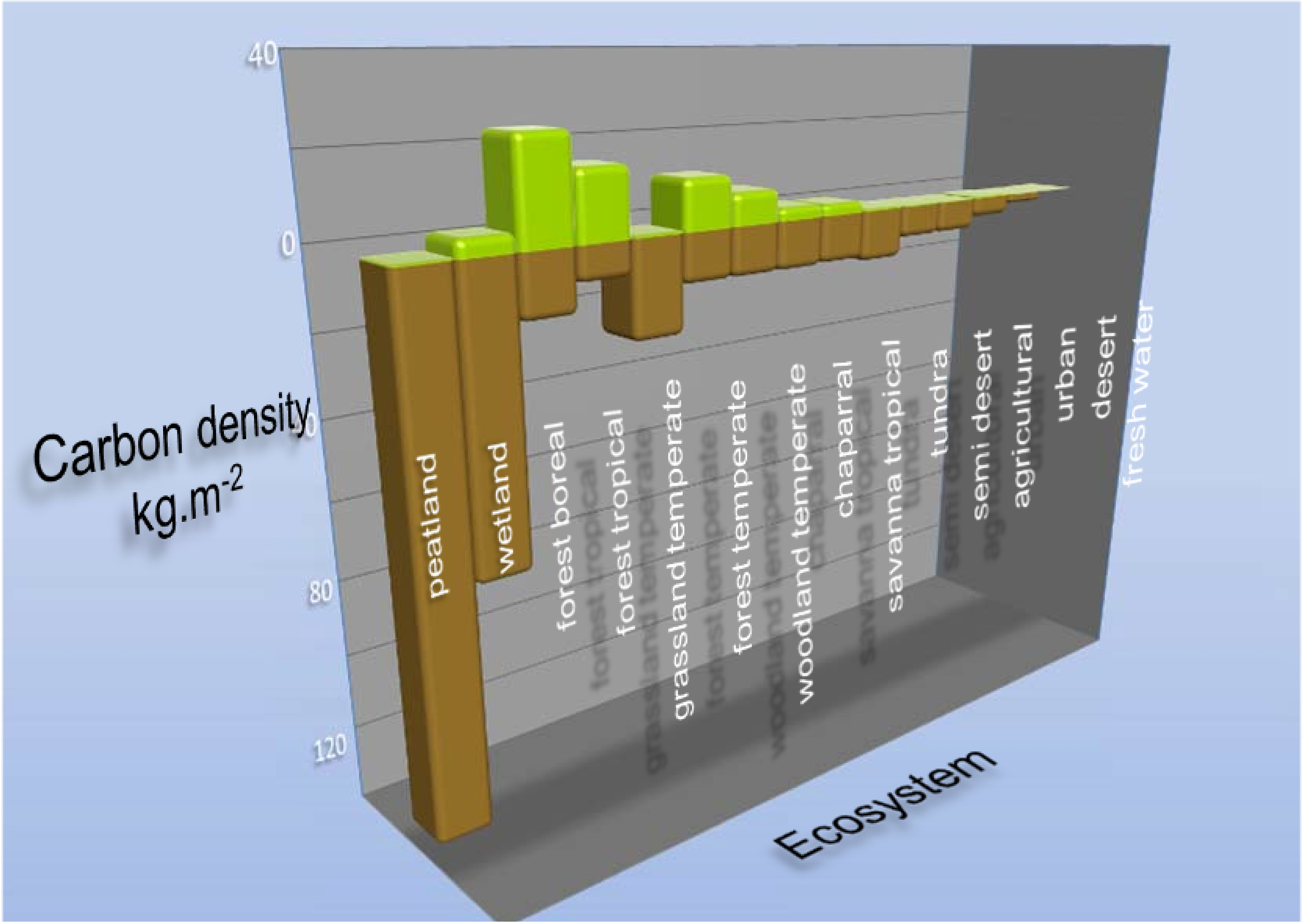
Source Brady and Weil 1996



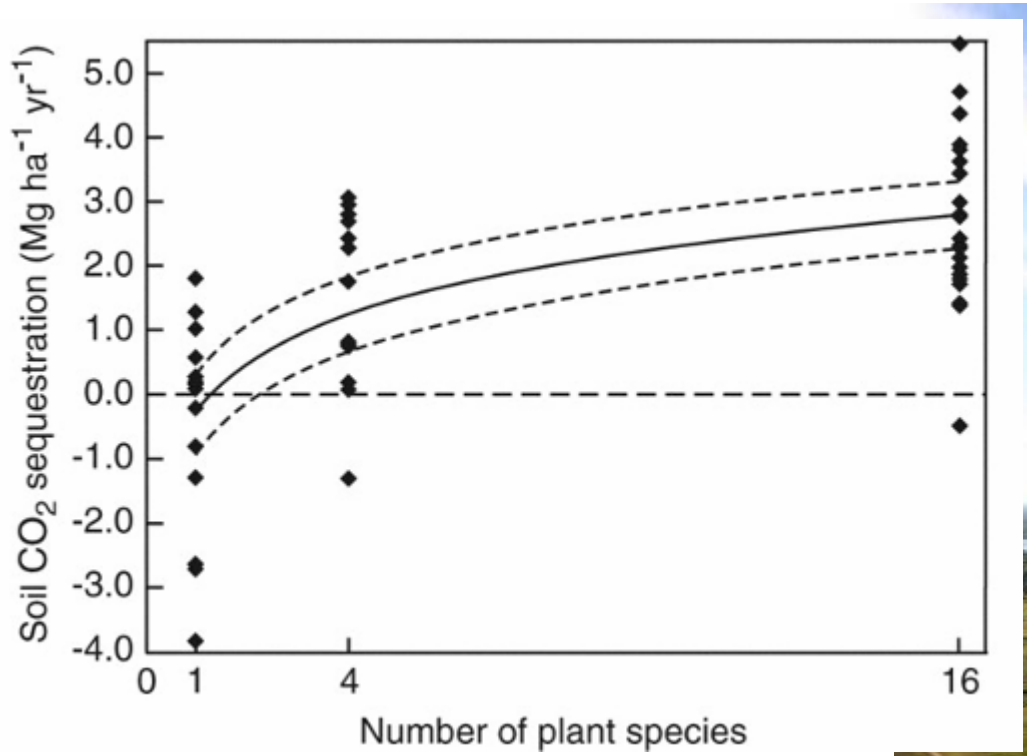
Oxidation
(respiration)

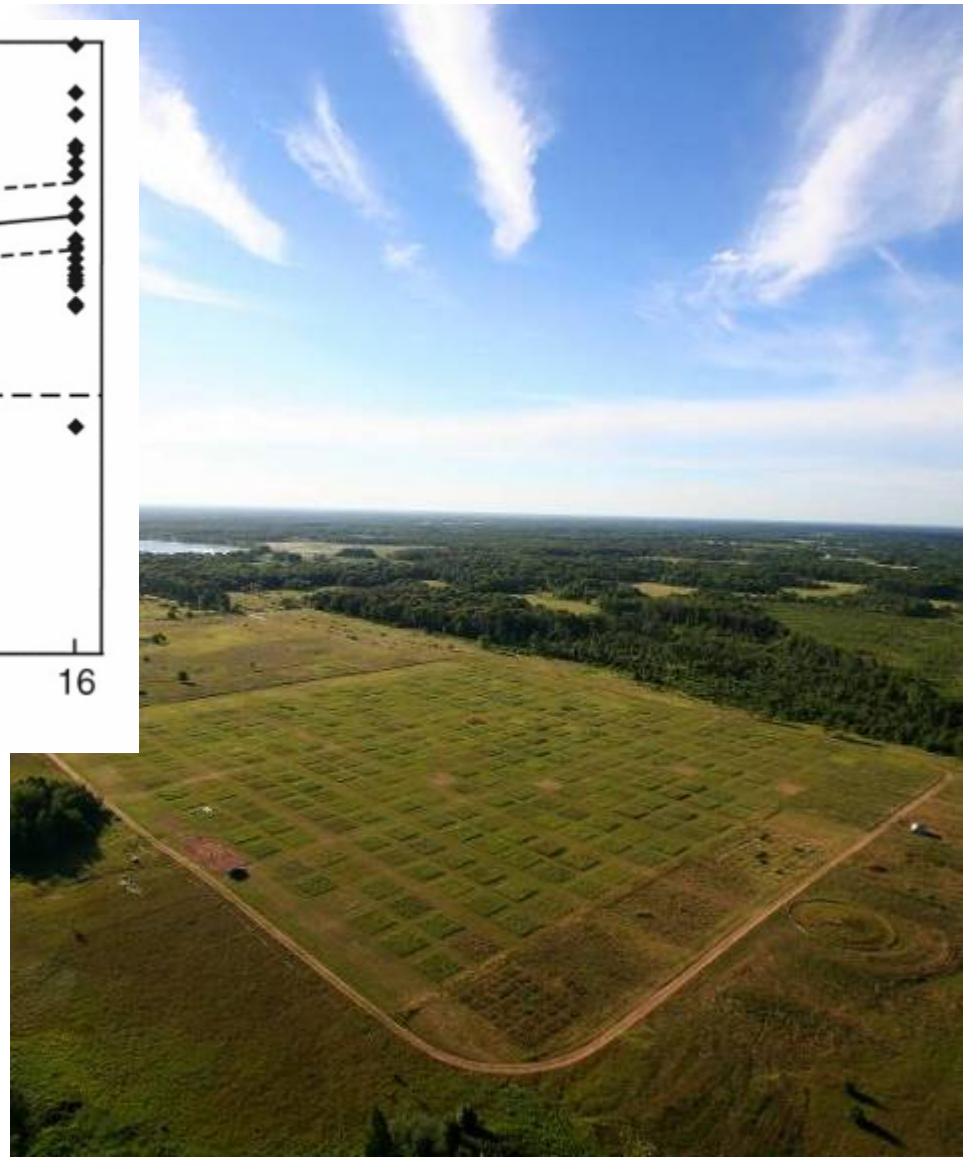
erosion

leaching



Carbon density
kg.m-2
40
0
40
80
120
peatland
wetland
forest boreal
forest tropical
grassland temperate
forest temperate
woodland temperate
chaparral
savanna tropical
tundra
semi desert
agricultural
urban
desert
fresh water
Ecosystem





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

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

Subject matter

Materials
Soils
Vegetation
Hydrology
Health

Focusing Lens

Economic

Ecologic

Social

Evaluative metrics

site selection
air quality
water quality
water quantity
erosion control
soil restoration
carbon sequestration
human health benefits
heat island reduction
reduce toxins
reduce embodied energy
reduce waste
improve habitat

Potential Practices

- avoid sensitive sites
- soils preservation, restoration, reuse and carbon sequestration
- balance the hydrologic cycle to reduce erosion and water use, provide flood mitigation, improve water quality, and recharge groundwater
- use vegetation to provide specific benefits associated with heat reduction, air and water quality improvement, human health benefits, and habitat enhancement
- materials selection to minimize embodied energy, toxins, and the waste stream
- Use sites to decrease human health risks and promote human mental and physical health

* 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 o 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**

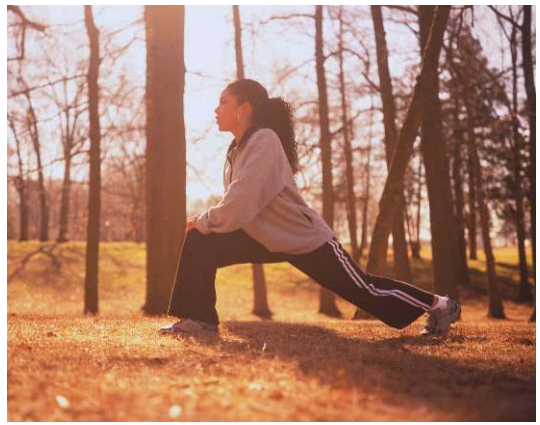
& Rebuy

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

1. Conserve
2. Reuse
3. Balance

= Regenerate

1. Reduce
2. Renew
3. Offset

= Produce

1. Preserve
2. Protect
3. Restore

= Regenerate

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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info@sustainablesites.org

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