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

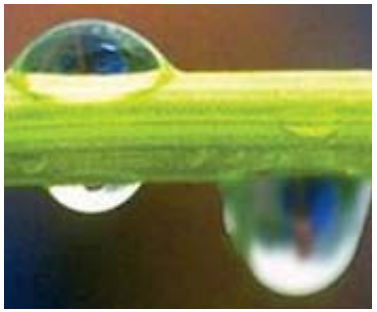
POTENTIAL PROJECTS TYPES

- 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

TECHNICAL SUBCOMMITTEES

Robert Goo
Nonpoint-Source Control Branch, US EPA

William Hunt, Ph.D., P.E.
Urban Stormwater Mgmt., North Carolina State Univ.

Tom Liptan, ASLA
City of Portland Bureau of Environmental Services

James Patchett/ David Yocca
Conservation Design Forum

Nina Bassuk, Ph.D.
Urban Horticulture Institute, Cornell Univ.

Jacob Blue, RLA, ASLA
Applied Ecological Services

Mark Simmons, Ph.D.
Lady Bird Johnson Wildflower Center
Univ. of Texas at Austin

Susan D. Day, Ph.D.
Dept. of Forestry, Virginia Tech

John Peter Thompson
Behnke Nurseries Co.

Kathleen L. Wolf, Ph.D.
College of Forest Resources, University of Wash.

Elaine Ingham, Ph.D
Soil Foodweb, Inc.

James Urban, FASLA
Urban Trees + Soil

Meg Calkins, RLA, ASLA
Dept. of Landscape Architecture, Ball State Univ.

Kimberly Cochran, Ph.D.
Office of Solid Waste, US EPA

Nora Goldstein
BioCycle Magazine

GUIDING PRINCIPLES

Do no harm

Use the precautionary principle

Design with nature and culture

Use a decision-making hierarchy of preservation, conservation and regeneration

Provide regenerative systems as intergenerational equity

Support a living process

Use a systems thinking approach

Use a collaborative and ethical approach

Maintain integrity in leadership and research

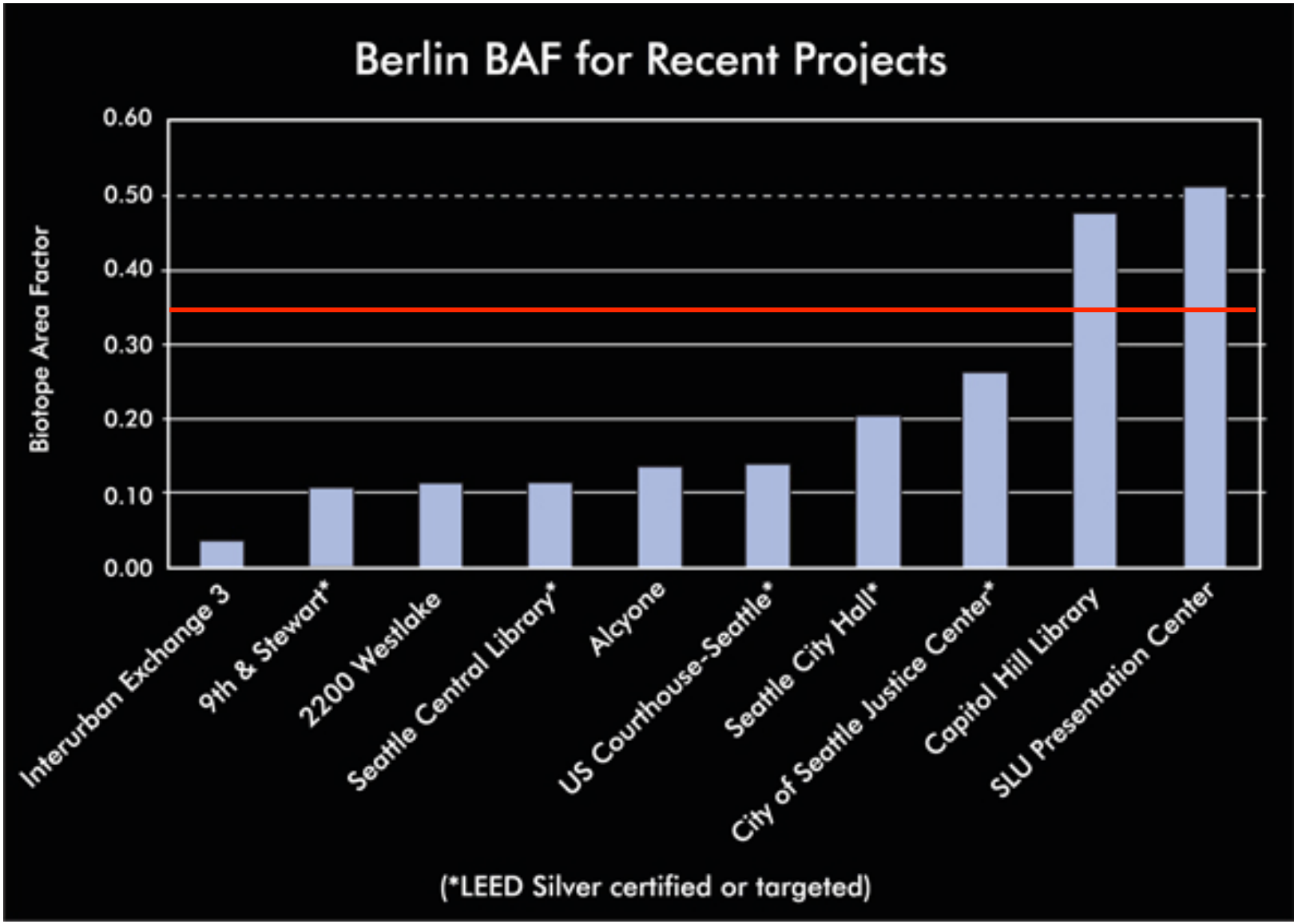
SUCCESS of GREEN BUILDING

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
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)

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…

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%.

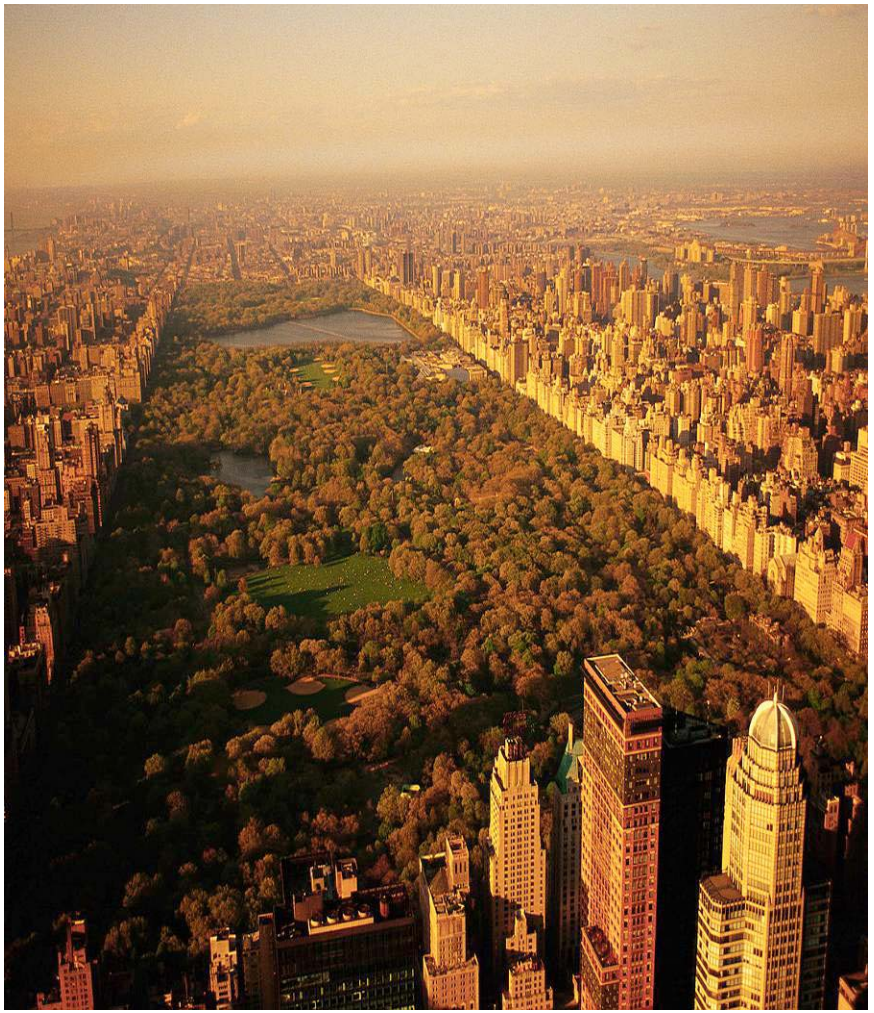
U.S. EPA – Heat Island Effect

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).

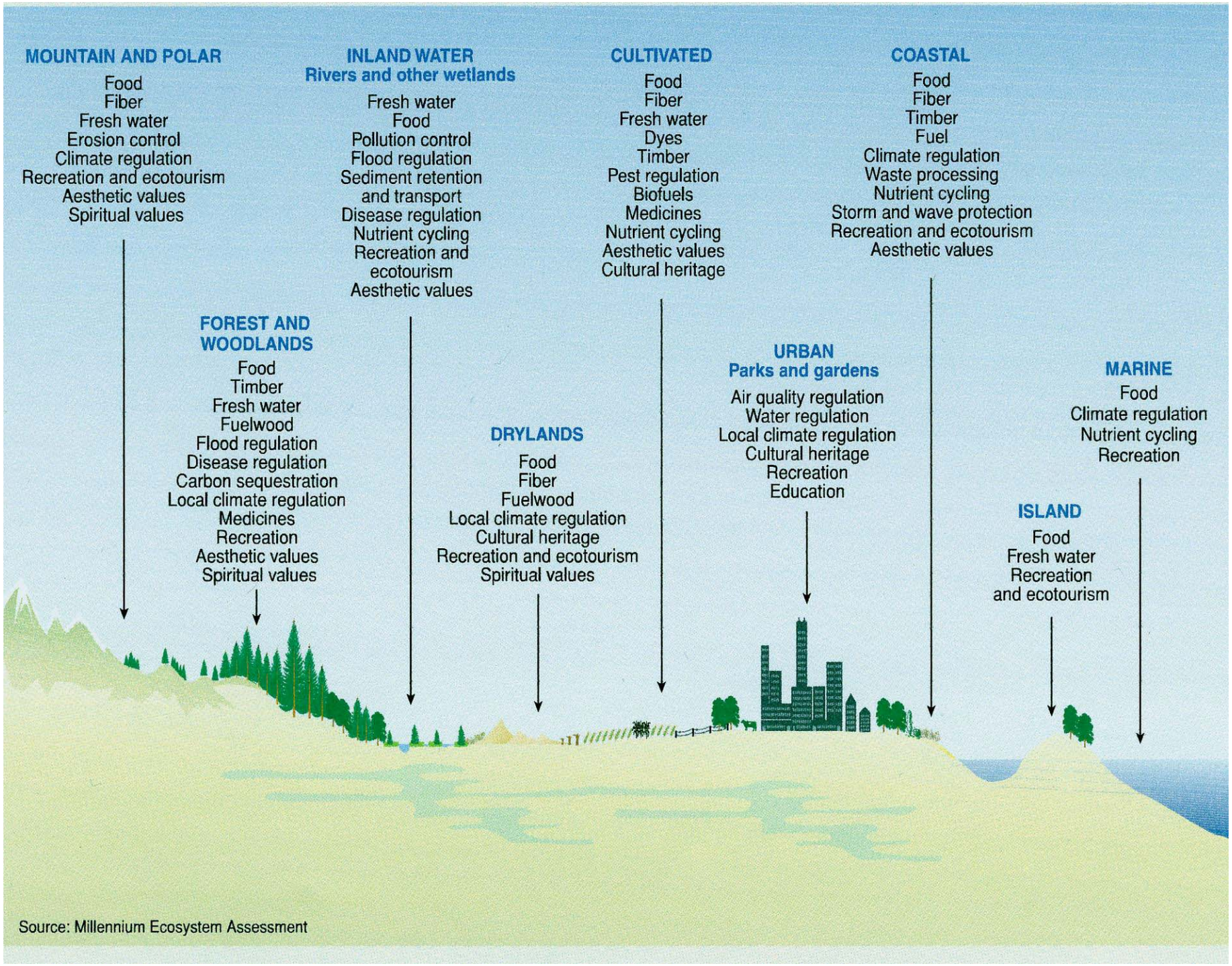
ECOSYSTEM SERVICES

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

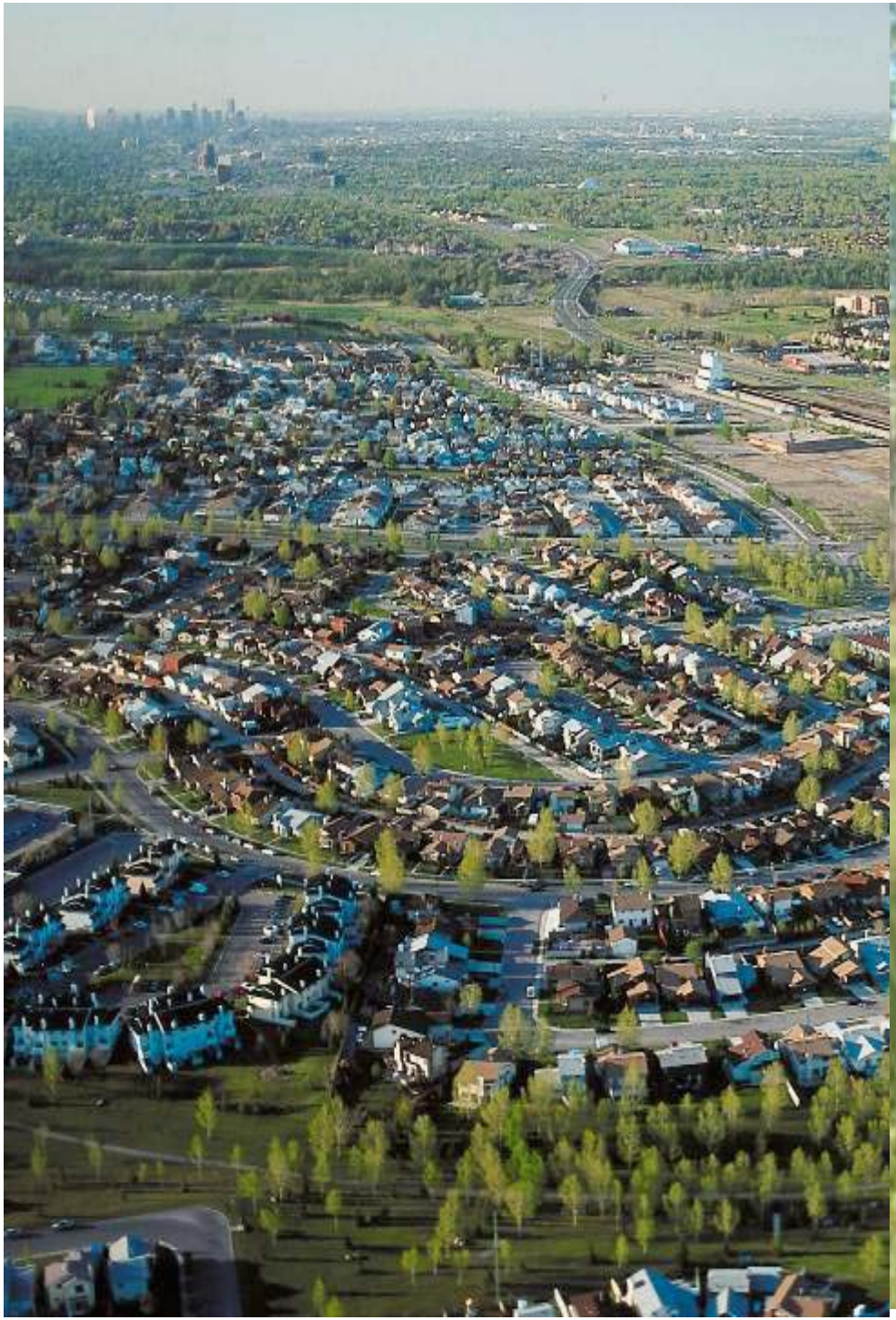


$16 - $54 trillion per/yr.

Twice the Global GNP

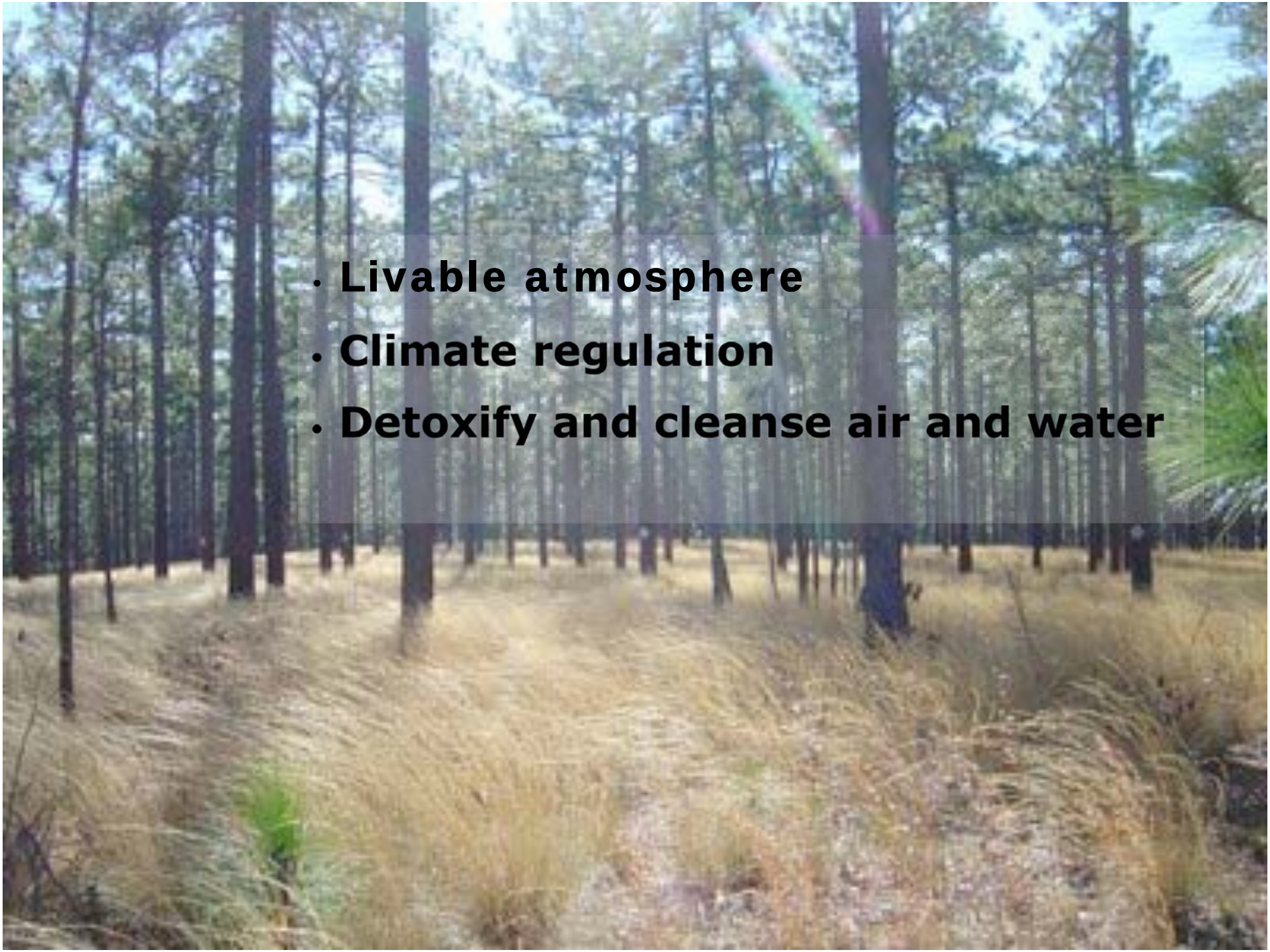


Source: Millennium Ecosystem Assessment




· Livable atmosphere


• Livable atmosphere
• Climate regulation


• Livable atmosphere
• Climate regulation
• Detoxify and cleanse air and water


• Livable atmosphere
• Climate regulation
• Detoxify and cleanse air and water
• Regulate water supply


• Livable atmosphere
• Climate regulation
• Detoxify and cleanse air and water
• Regulate water supply
• Provide habitat

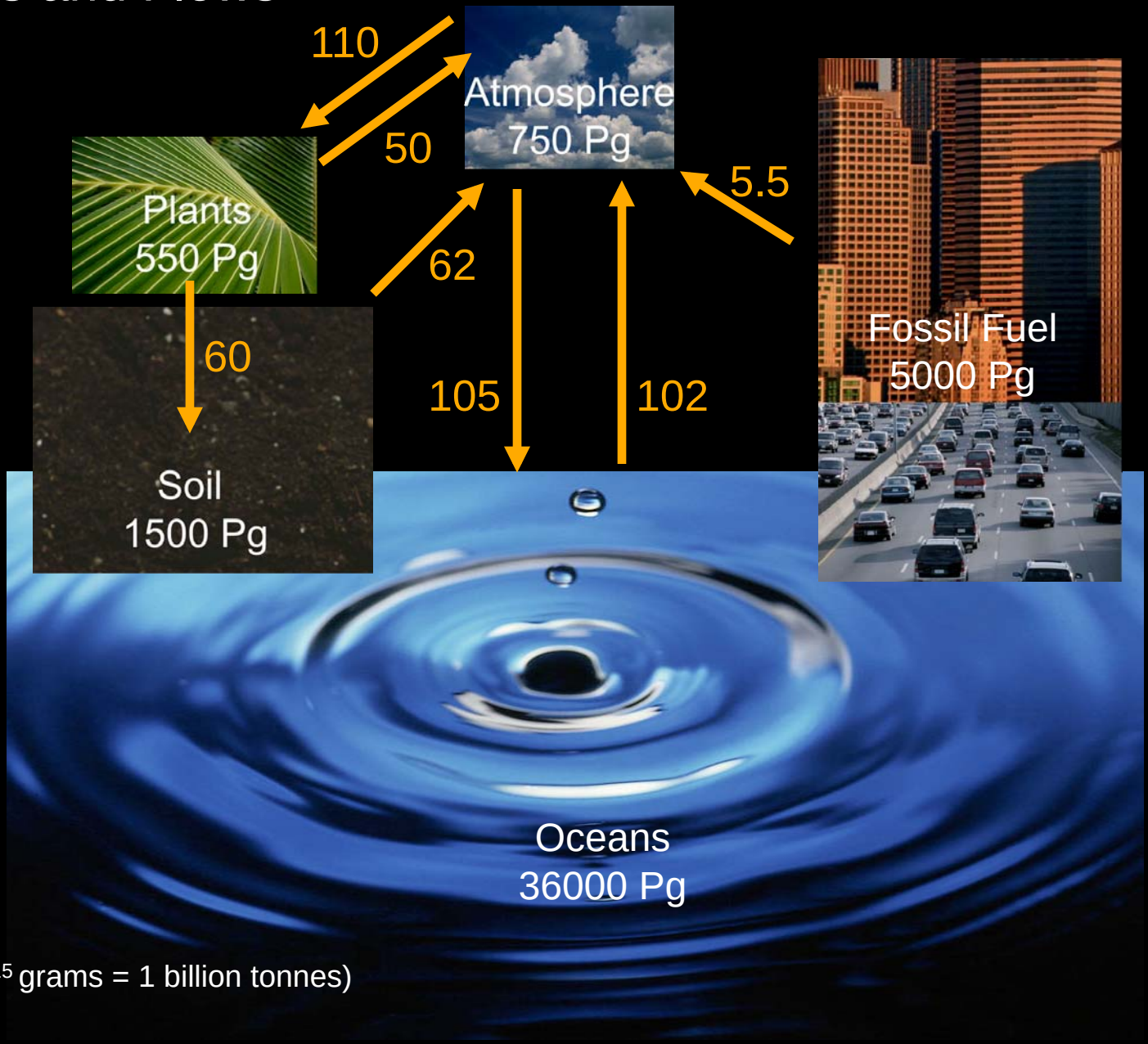

• Livable atmosphere
• Climate regulation
• Detoxify and cleanse air and water
• Regulate water supply
• Provide habitat
• Sequester carbon


• Livable atmosphere
• Climate regulation
• Detoxify and cleanse air and water
• Regulate water supply
• Provide habitat
• Sequester carbon
• Physical and mental health


• Livable atmosphere
• Climate regulation
• Detoxify and cleanse air and water
• Regulate water supply
• Provide habitat
• Sequester carbon
• Physical and mental health
• Other


by far the most terrifying film
you will ever see.
an inconvenient truth
A GLOBAL WARNING
An Inconvenient Truth on DVD
November 21

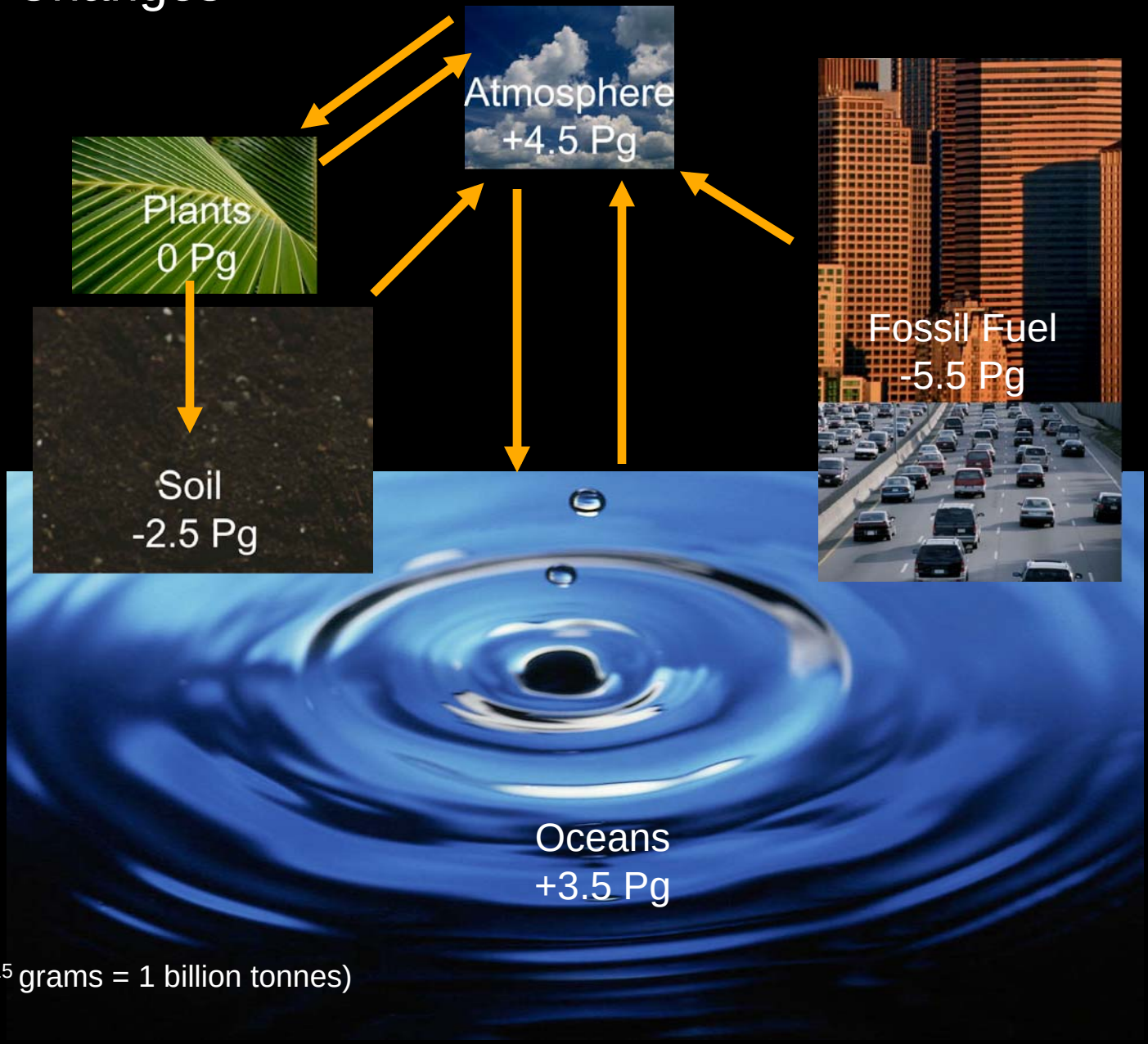
Carbon Pools and Flows



(Pg = petagrams = 10^{15} grams = 1 billion tonnes)

Source Brady and Weil 1996

Carbon Pool Changes

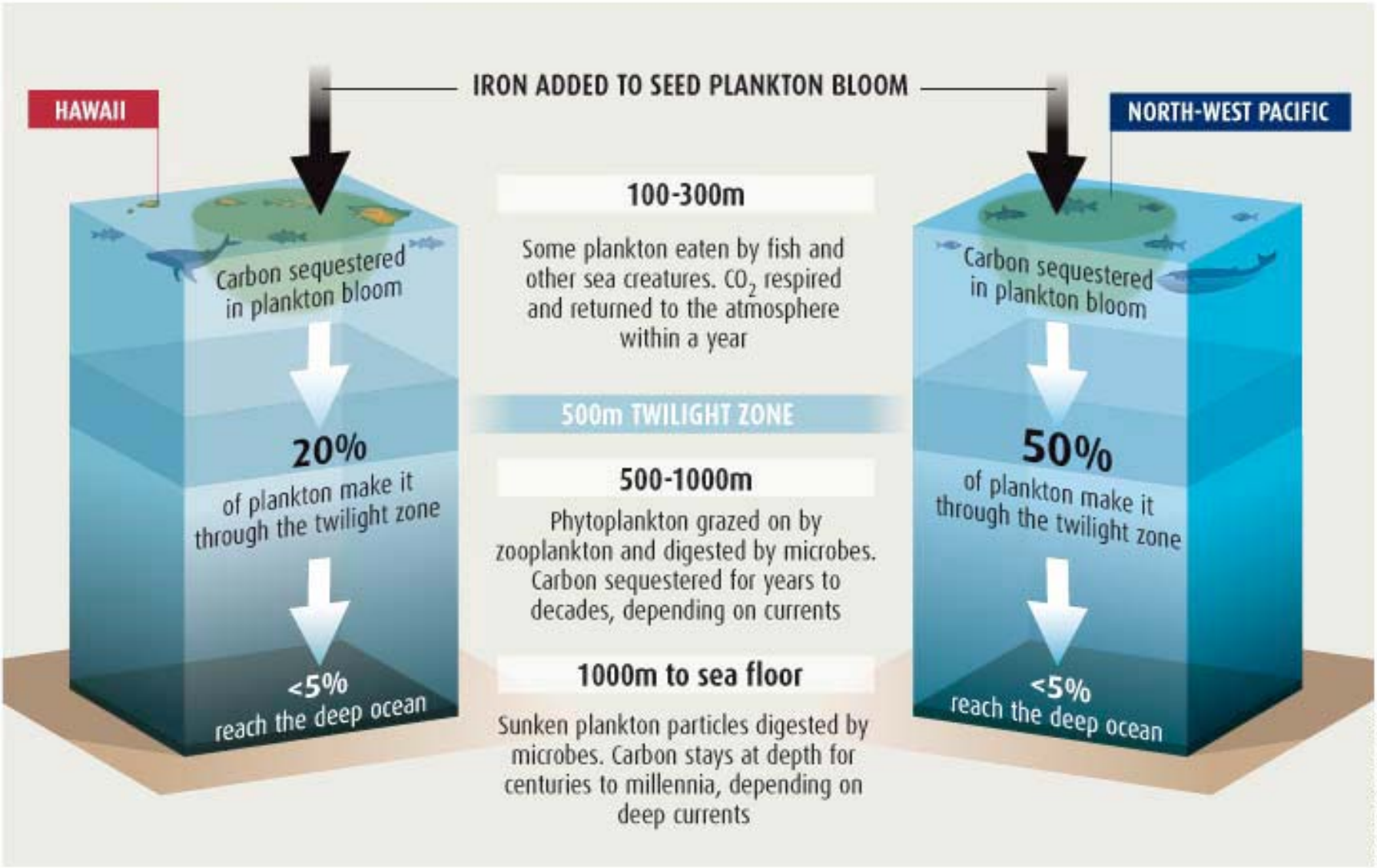


(Pg = petagrams = 10^{15} grams = 1 billion tonnes)

Source Brady and Weil 1996

CARBON LOCKED UP FOR GOOD?

Ocean seeding sequesters carbon in phytoplankton, but for how long? In field experiments, the amount of plankton sinking through the ocean was different in different areas

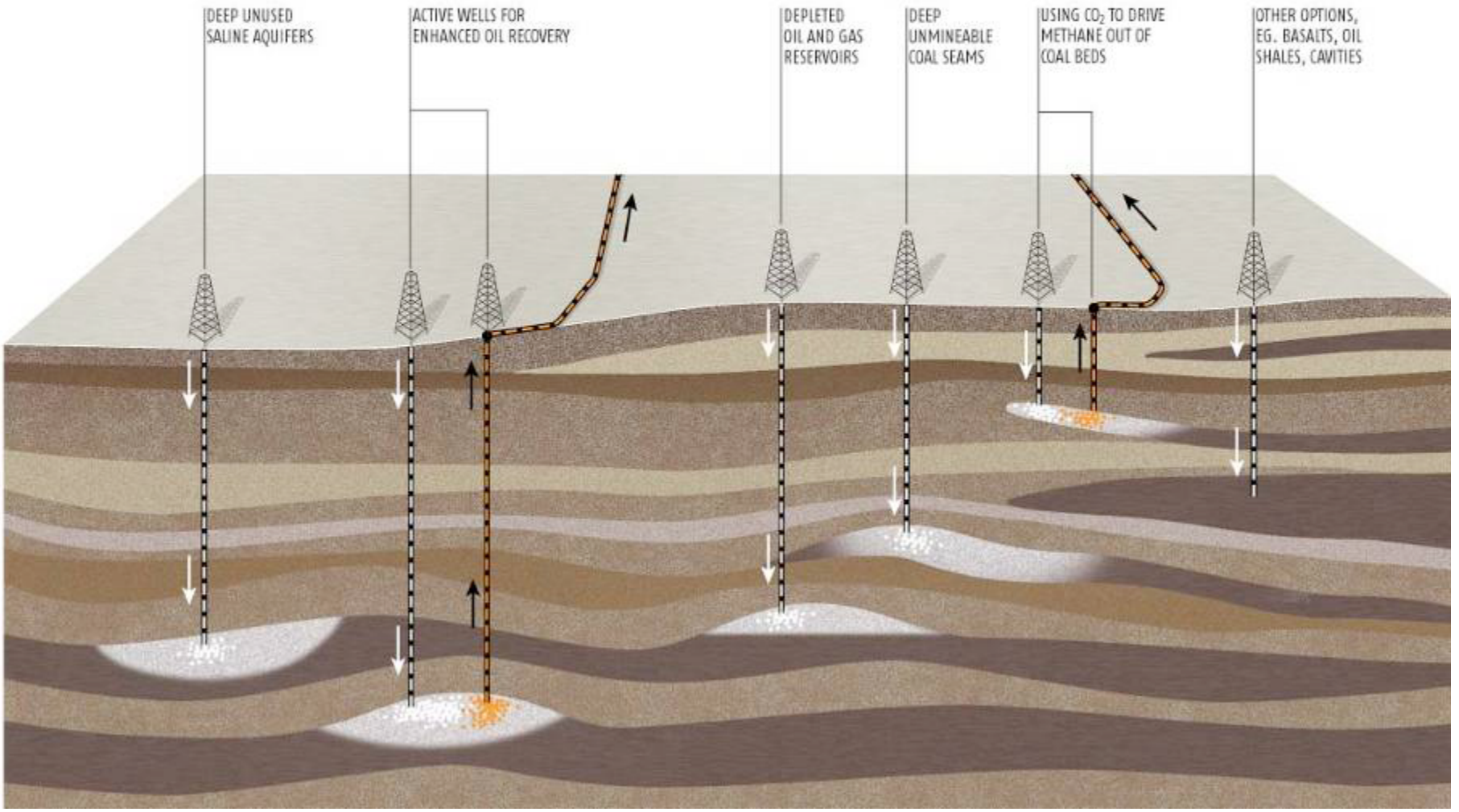


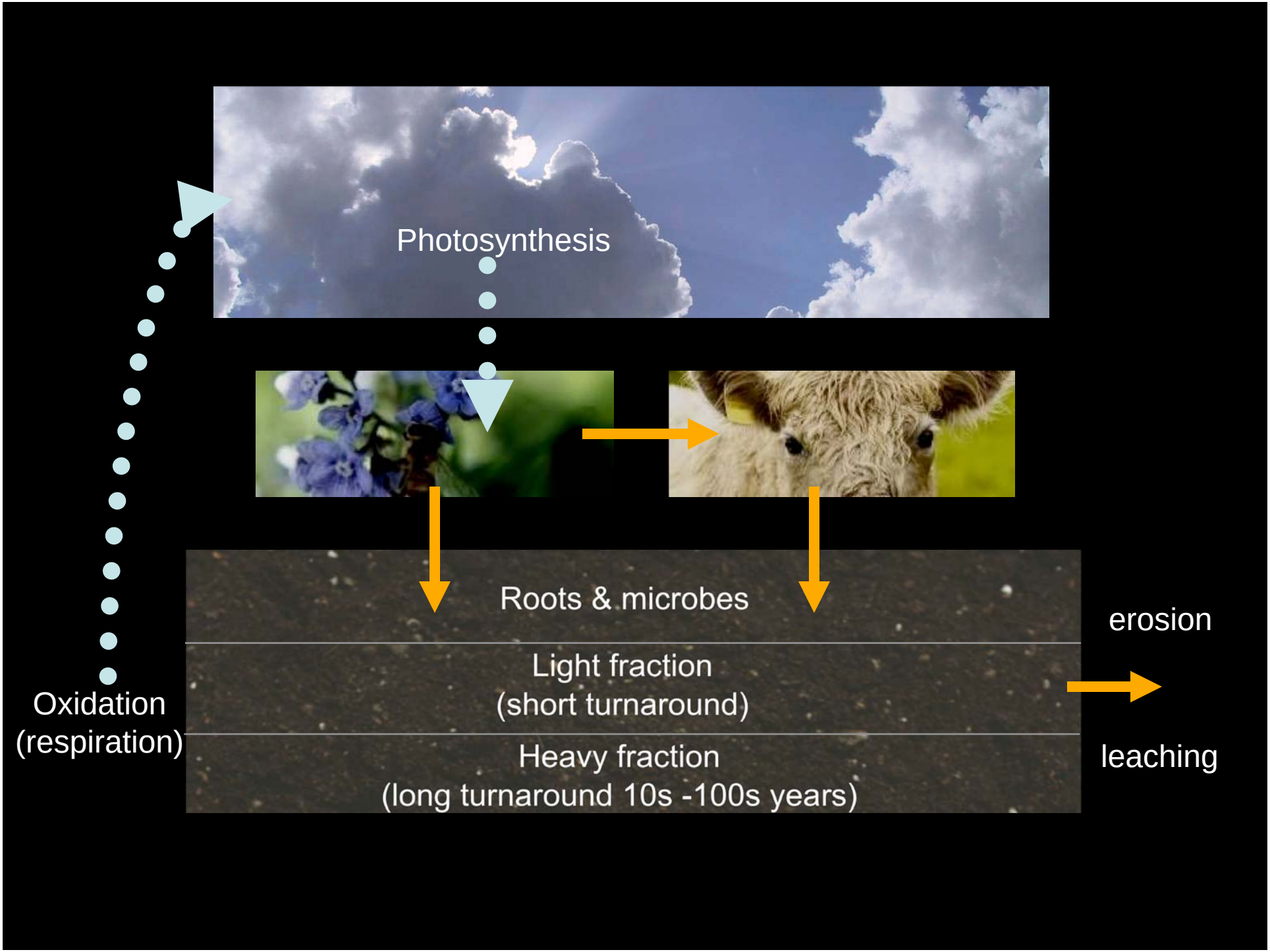
SCIENCE, VOL 316, P 567

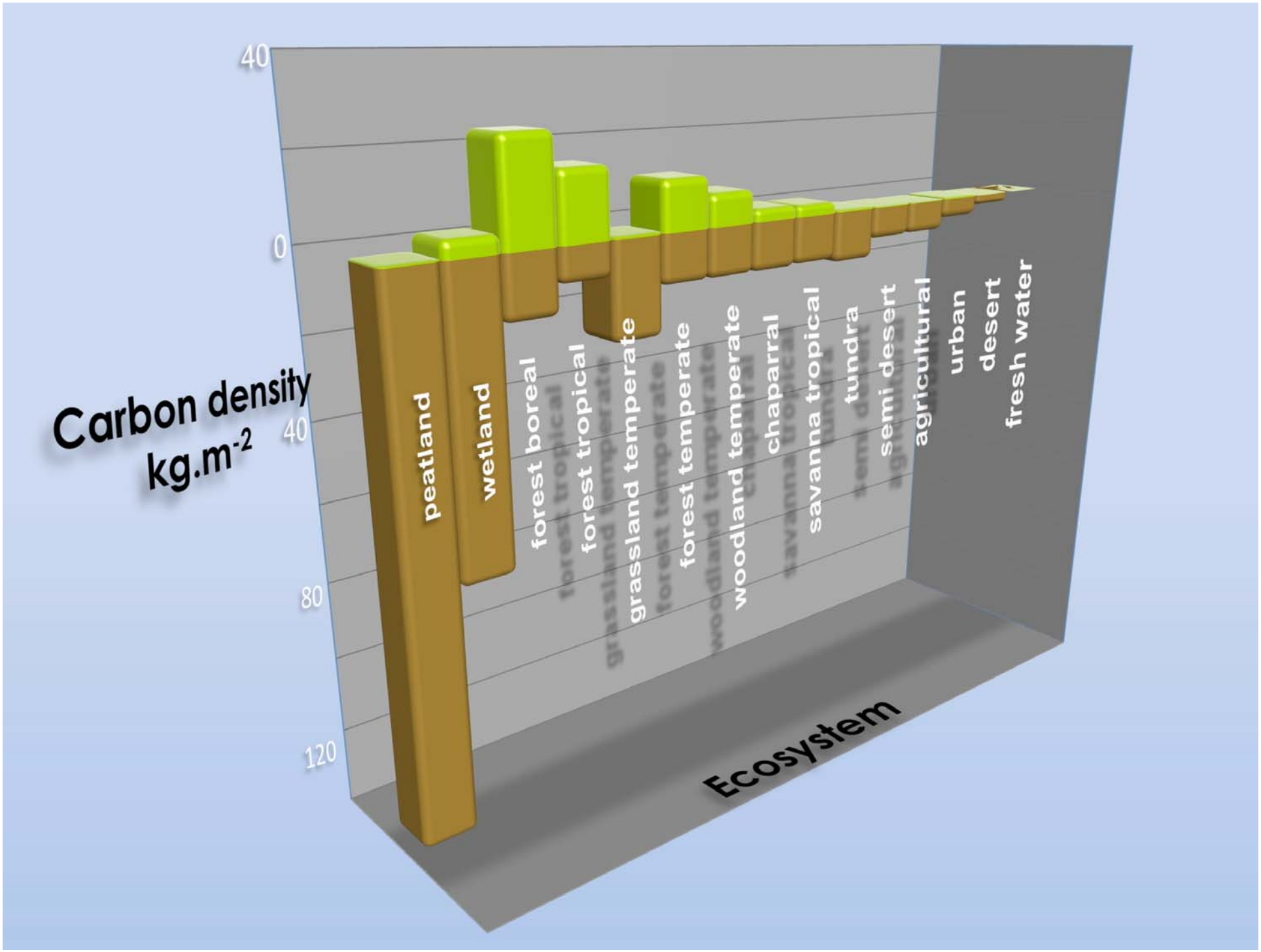
BURYING THE PROBLEM

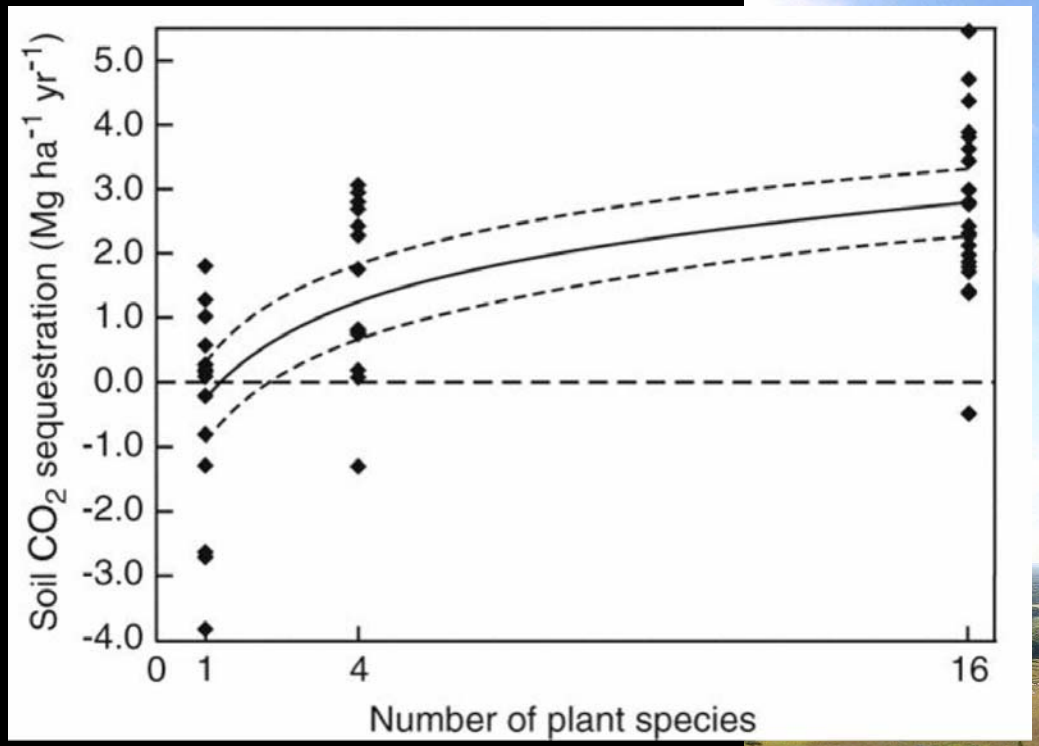
Storing CO_2 underground could help to solve the problem of global warming. But doing it cheaply and safely are huge challenges

CO_2 in Oil or gas out Stored CO_2




Photosynthesis
Roots & microbes
Light fraction
(short turnaround)
Heavy fraction
(long turnaround 10s -100s years)
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)

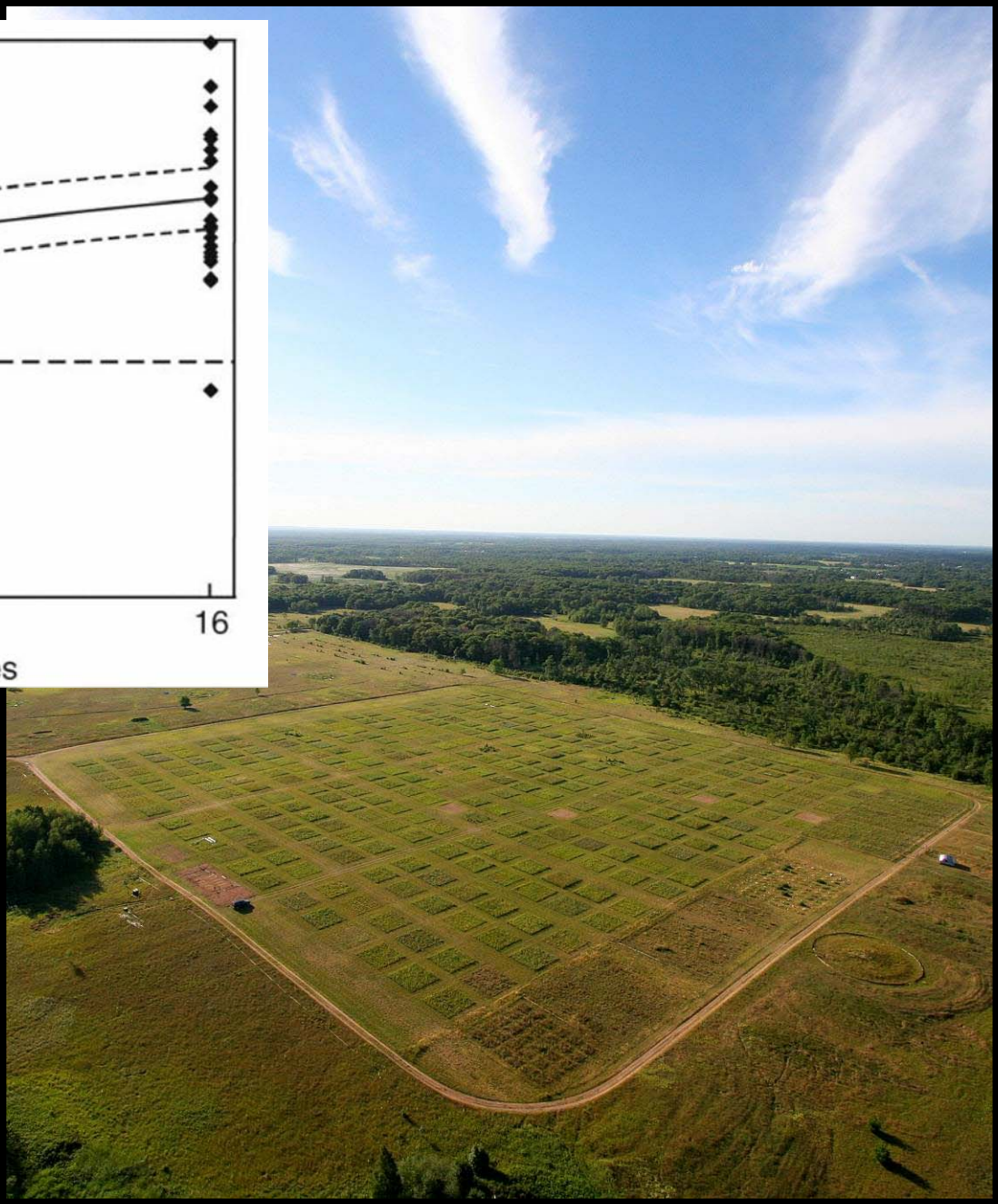
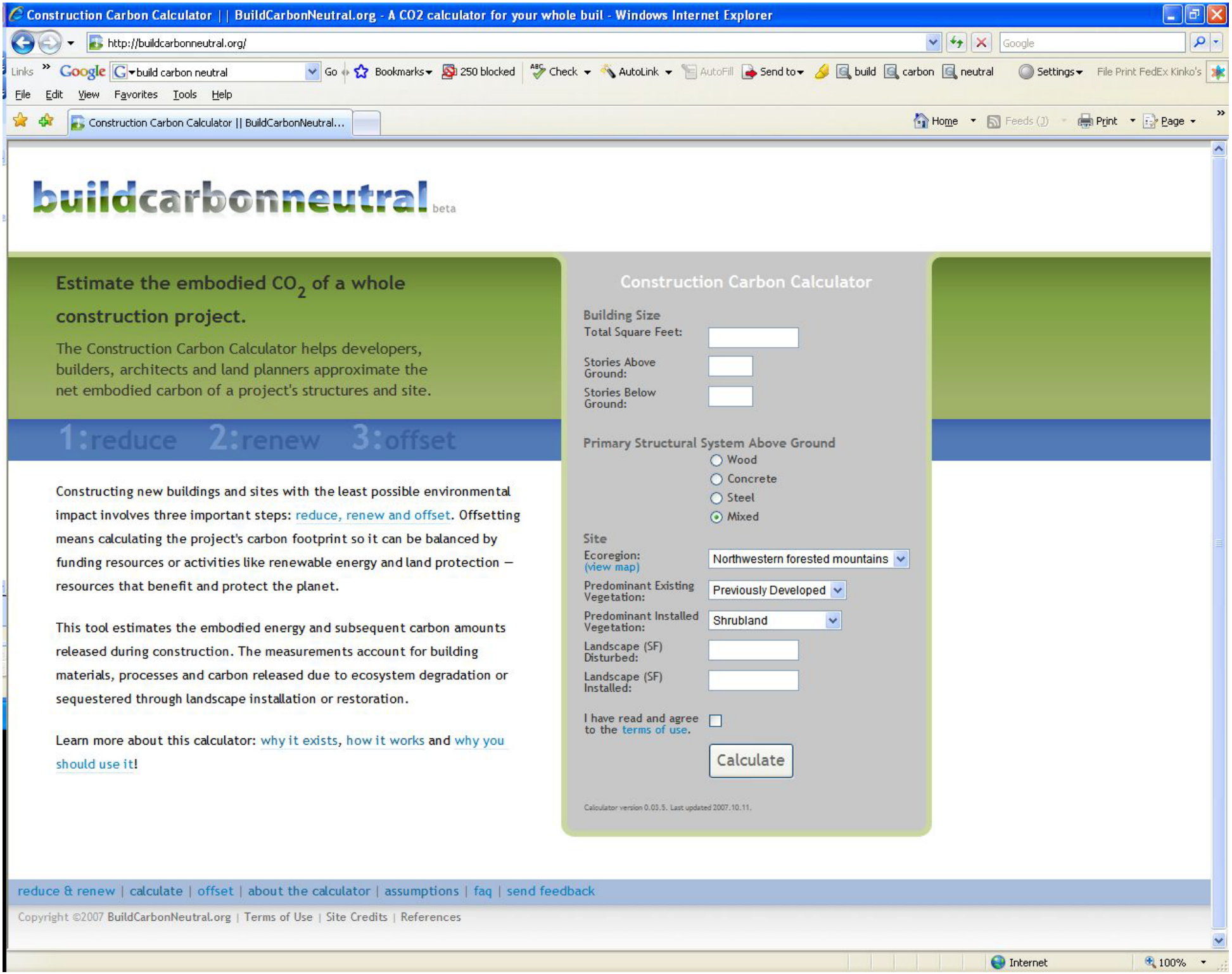


Photo: Cedar Creek LTER Site


Construction Carbon Calculator || BuildCarbonNeutral.org - A CO2 calculator for your whole buil - Windows Internet Explorer
http://buildcarbonneutral.org/
Google
build carbon neutral
Bookmarks
250 blocked
Check
AutoLink
AutoFill
Send to
build
carbon
neutral
Settings
File Edit View Favorites Tools Help
Construction Carbon Calculator || BuildCarbonNeutral...
Home
Feeds (J)
Print
Page
buildcarbonneutral beta
Estimate the embodied CO_2 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)
Northwestern forested mountains
Predominant Existing Vegetation:
Previously Developed
Predominant Installed Vegetation:
Shrubland
Landscape (SF) Disturbed:
Landscape (SF) Installed:
I have read and agree to the terms of use.
Calculate
Calculator version 0.03.5. Last updated 2007.10.11.
reduce & renew | calculate | offset | about the calculator | assumptions | faq | send feedback
Copyright ©2007 BuildCarbonNeutral.org | Terms of Use | Site Credits | References
Internet
100%

= **240** metric tonnes CO2

Source: The Ladybird Johnson Wildflower Center and Mithun

= **220** metric tonnes CO2

+

Source: The Ladybird Johnson Wildflower Center and Mithun

= **205** metric tonnes CO2

+

+

Source: The Ladybird Johnson Wildflower Center and Mithun

= **190** metric tonnes CO2

Source: The Ladybird Johnson Wildflower Center and Mithun

= **-10** metric tonnes CO2


+

+

+

+


Source: The Ladybird Johnson Wildflower Center and Mithun

= **-15** metric tonnes CO2


+

+

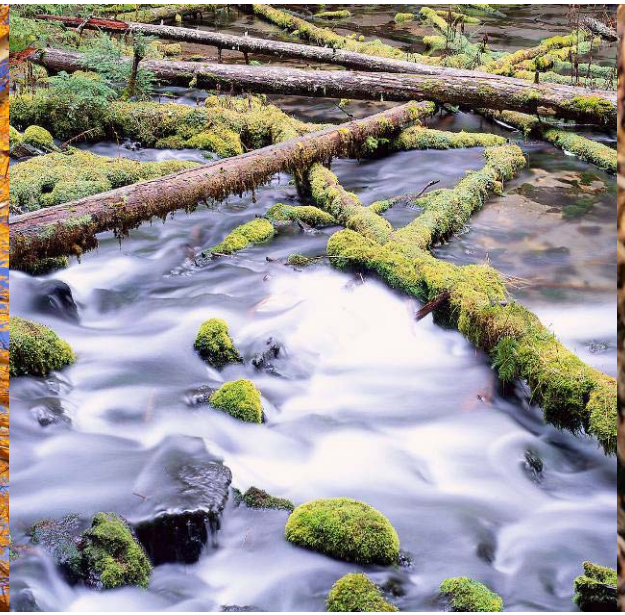
+

+

+


Source: The Ladybird Johnson Wildflower Center and Mithun

How can a site protect or enhance ecosystems services?


Hierarchy of 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

HYDROLOGY potential strategies

- **Restore impacted wetlands, streams and habitat features**
- **Harvest rainwater and reuse graywater**
- **Direct runoff from impervious areas to water quality facilities such as vegetated soil-based infiltration systems**

SOILS potential strategies

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

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 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**

HUMAN WELL-BEING potential strategies

- **Provide a sense of security**
- **Coherent design – repeated themes and textures**
- **Provide both visual and physical access**
- **Provide opportunities to interact with nature**
- **Offer places for rest and reflection**

THE SUSTAINABLE SITES INITIATIVE™

SCHEDULE

(tentative to project funding)

THE SUSTAINABLE SITES INITIATIVE™

FOR MORE INFORMATION or TO GET INVOLVED:

www.sustainablesites.org

info@sustainablesites.org

AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

Lady Bird Johnson Wildflower center THE UNIVERSITY OF TEXAS AT AUSTIN

UNITED STATES BOTANIC GARDEN