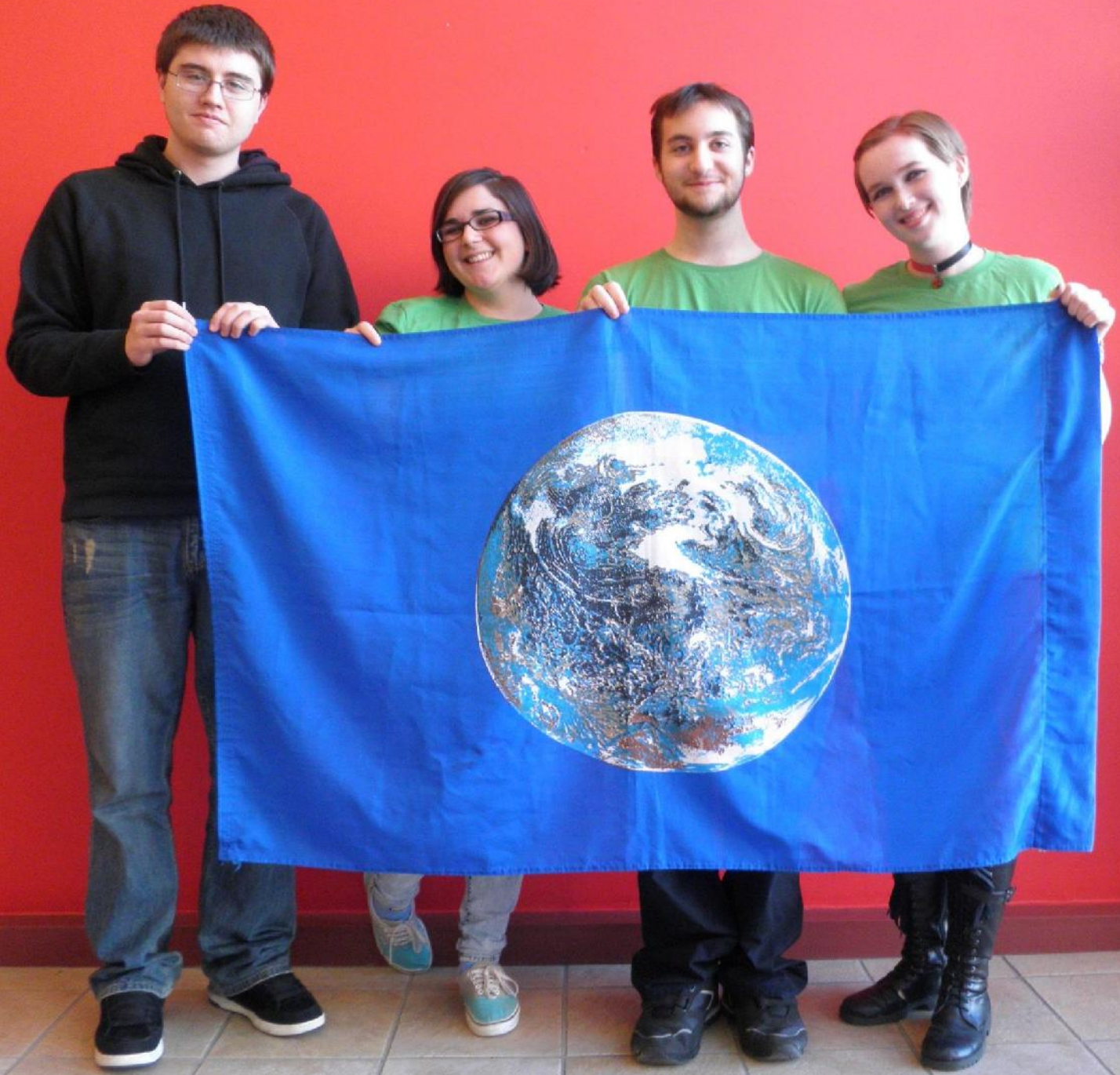
PLANETARY BOUNDARIES, ECOLOGICAL FRAMEWORKS, THRIVING FUTURES:

Reconnecting to Earth and Ourselves

by composting and more

Complied by Terri Eddy

Compost Forum 4.2016




ecos

LET'S BEGIN WITH THE WORLD THEY'RE INHERITING,
THE WORLD WE LIVE IN

A WIDER VIEW:

THE CURRENT STATE OF THE EARTH

HUMANKIND'S PLACE IN EARTH HISTORY

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

Stockholm University

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About Stockholm Resilience Centre

Stockholm Resilience Centre advances research on the governance of social-ecological systems with a special emphasis on resilience - the ability to deal with change and continue to develop.

The Stockholm Resilience Centre was established on 1 January 2007.

The vision of the Stockholm Resilience Centre is a world where social-ecological systems are understood, governed and managed, to enhance human well-being and the capacity to deal with complexity and change, for the sustainable co-evolution of human civilizations with the biosphere.

"Our societies are an integrated part of the biosphere and dependent upon functioning ecosystems. That is why we need to manage ecosystems so that we can handle the future's challenges and maintain our capacity to evolve in a positive way," says scientific director Carl Folke.

The mission of Stockholm Resilience Centre is to advance research for governance and management of social-ecological systems to secure ecosystem services for human wellbeing and resilience for long-term sustainability. The Centre applies and further develops the scientific advancements of this research within practice, policy, and in academic training.

LOGOS AND PUBLICATIONS

Logos

EPS High-res version

PNG High-res version

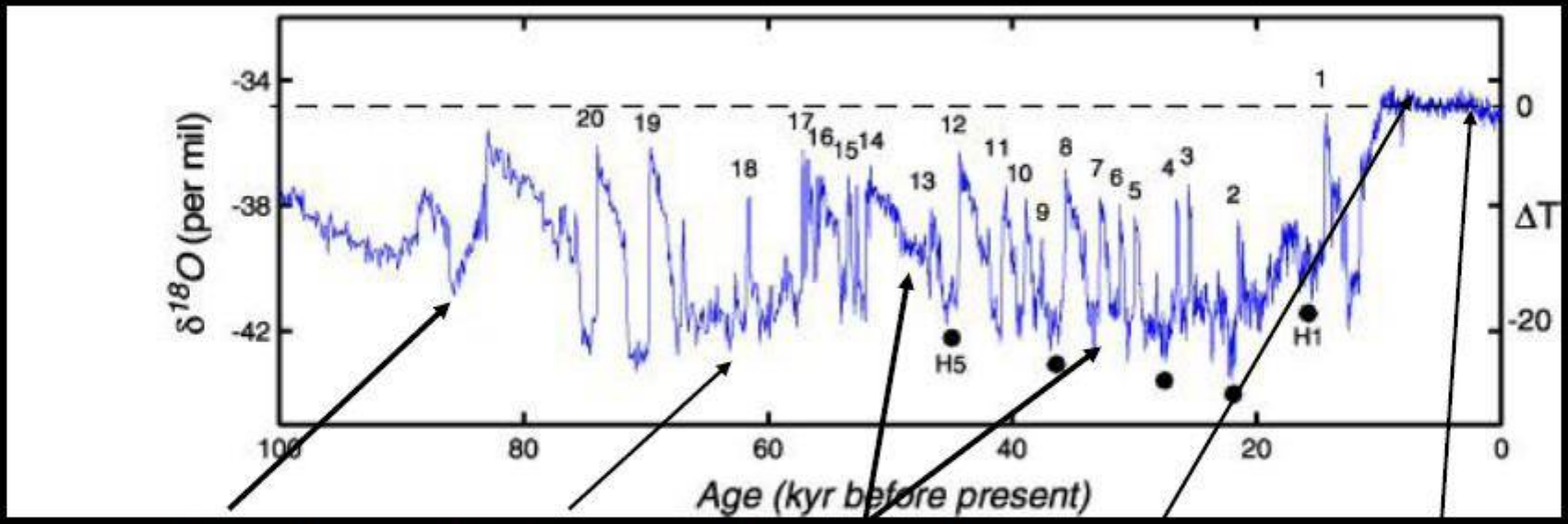
TIF High-res version

Publications

Download "What is resilience?" (pdf, 2 MB)

Download "Vad är resiliens?" Swedish version (pdf, 2.1 MB)

Human Development and Earth System Dynamics



First migration of fully modern humans out of Africa

Aborigines arrive in Australia

Migrations of fully modern humans from South Asia to Europe

Beginning of agriculture

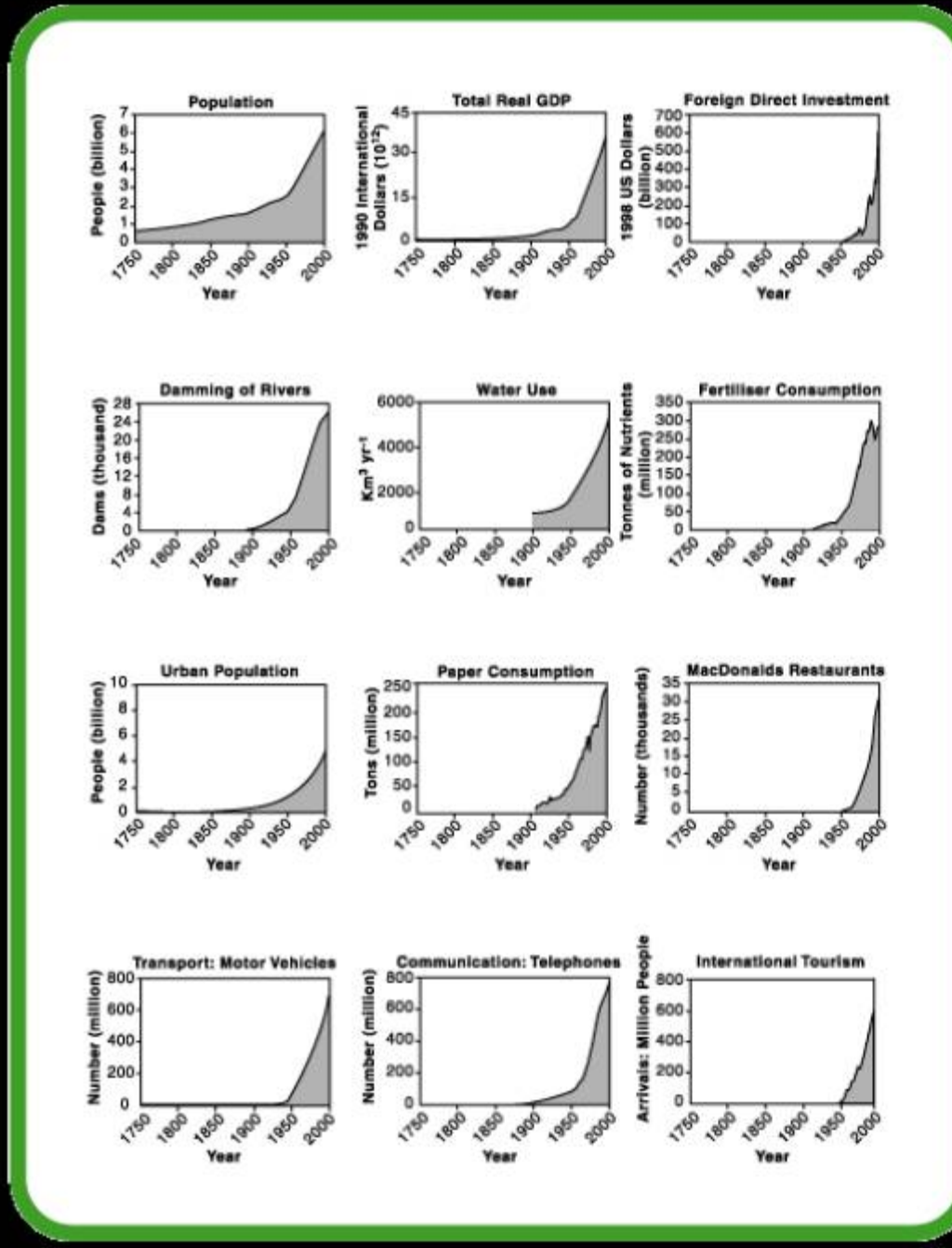
Great European civilisations: Greek, Roman

Source: GRIP ice core data (Greenland)
And S. Oppenheimer, "Out of Eden", 2004

Anthropocene Stage 2
(1945 - 2010/2020)

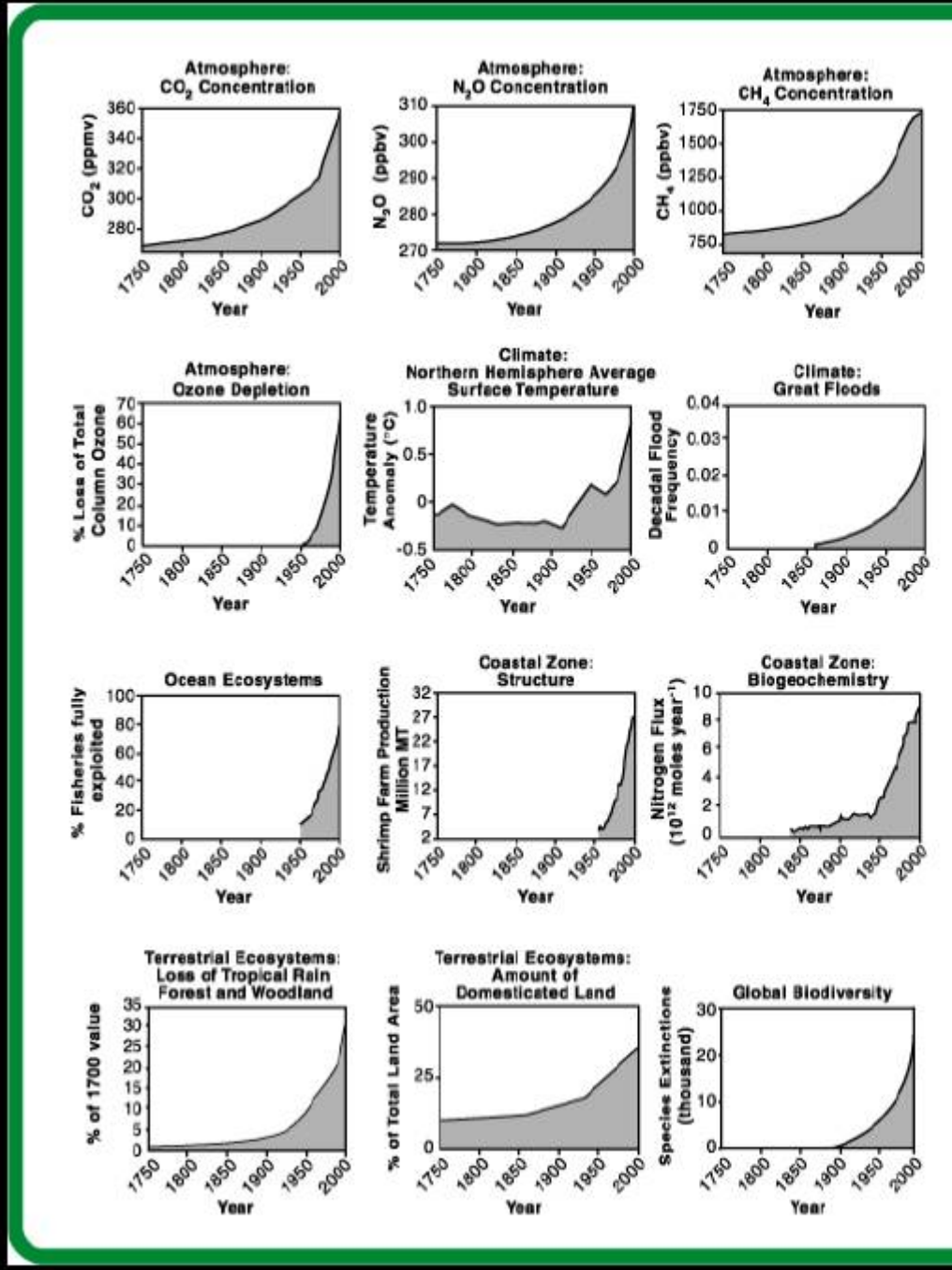
The changing 'human enterprise', from 1750 to 2000.

Note the start of the 'Great Acceleration' around 1950, when many activities began or accelerated sharply.



Responses of the biophysical Earth System to the accelerating 'human enterprise'.

The biophysical responses of the Earth System show many of the same features as the Great Acceleration in the human enterprise.



From: Steffen et al. 200

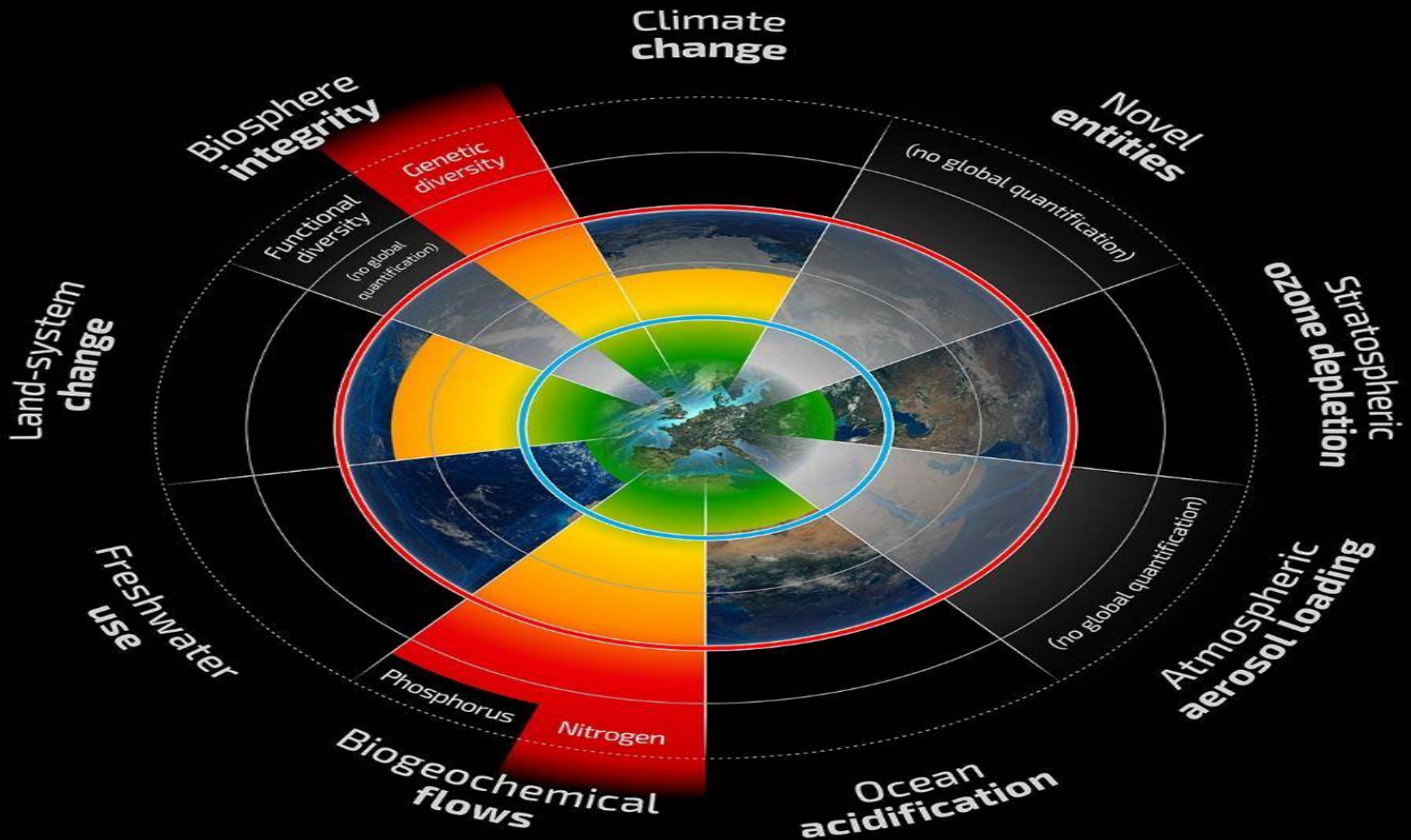
“WELCOME TO THE ANTHROPOCENE” YOUTUBE VIDEO

PLANETARY BOUNDARIES FRAMEWORK: A SAFE OPERATING SPACE FOR HUMANITY

STOCKHOLM RESILIENCE CENTER

Planetary Boundaries

A safe operating space for humanity

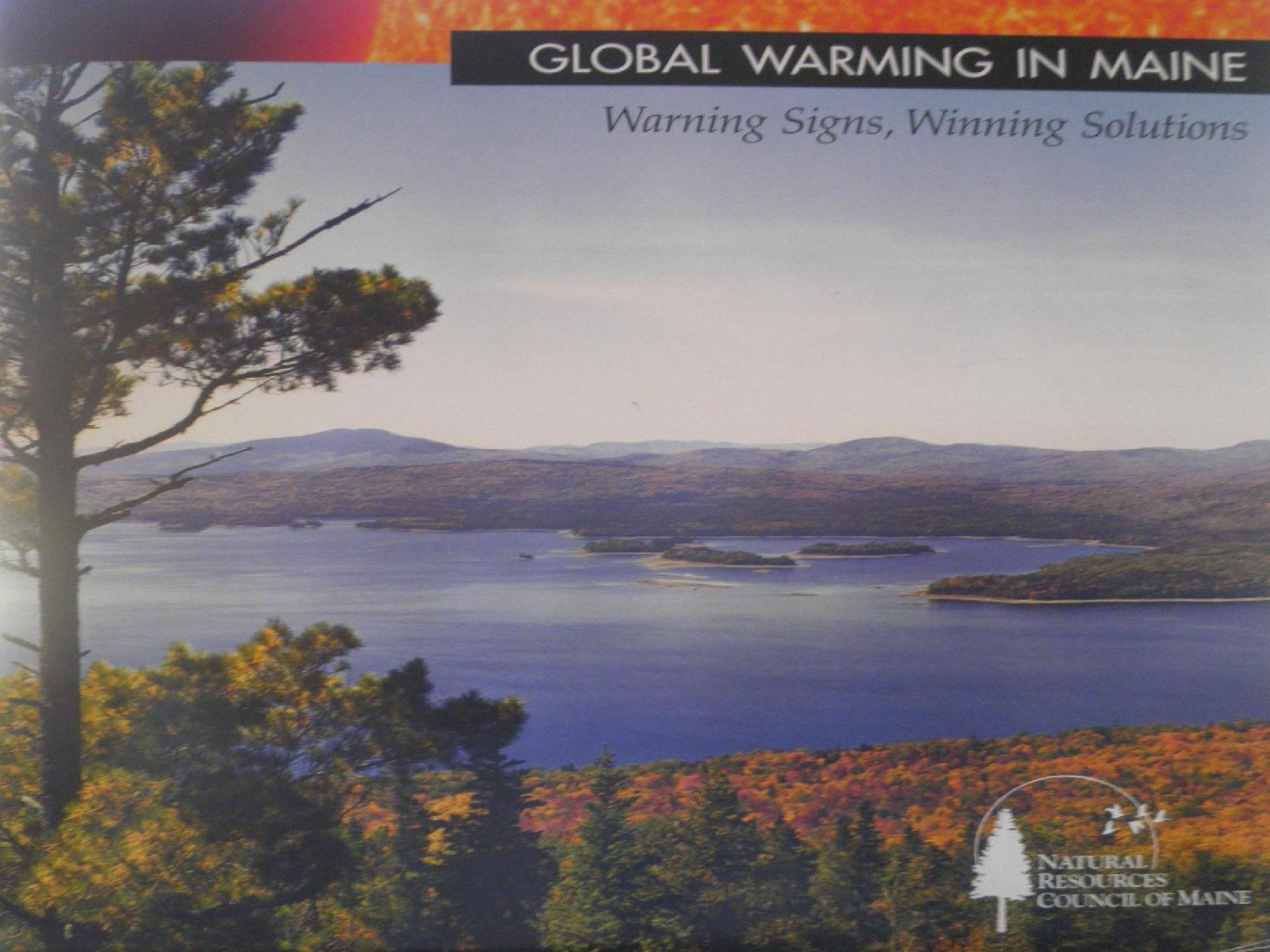


Beyond zone of uncertainty (high risk)
In zone of uncertainty (increasing risk)
Below boundary (safe)
Boundary not yet quantified

Source: Steffen et al. Planetary Boundaries: Guiding human development on a changing planet, *Science*, 16 January 2015.
Design: Globaia

GLOBAL WARMING IN MAINE

Warning Signs, Winning Solutions



NATURAL RESOURCES COUNCIL OF MAINE

Planetary Boundaries

A safe operating space for humanity

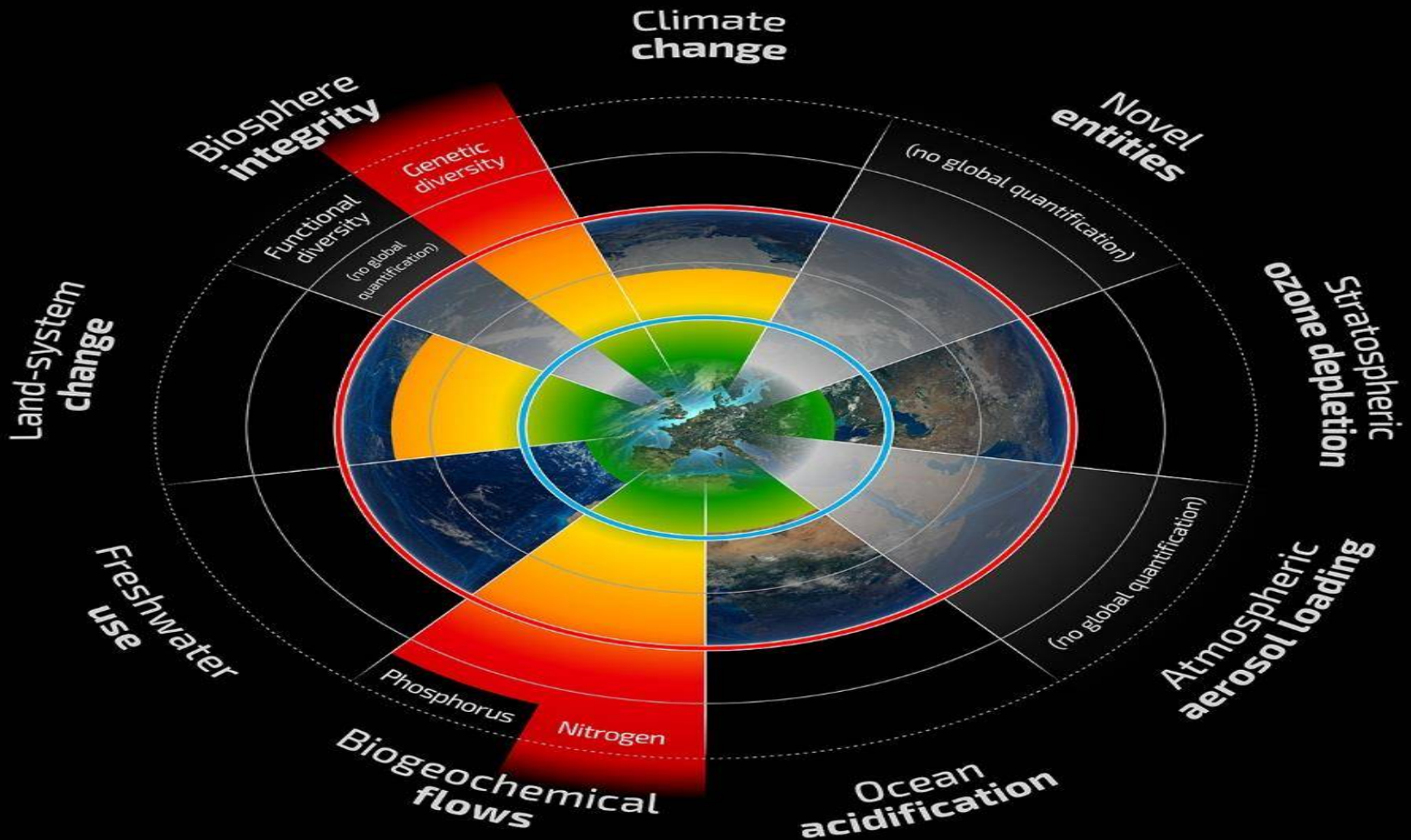


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Table 9: Possibly Extinct and Possibly Extinct in the Wild Species

The number of recent extinctions documented by the Extinct (EX) and Extinct in the Wild (EW) categories on The IUCN Red List is likely to be a significant underestimate, even for well-known taxa such as birds. The tags 'Possibly Extinct' and 'Possibly Extinct in the Wild' have therefore been developed to identify those Critically Endangered species that are, on the balance of evidence, likely to be extinct (or extinct in the wild). These species cannot be listed as EX or EW until their extinction can be confirmed (i.e., until adequate surveys have been carried out and have failed to record the species and local or unconfirmed reports have been investigated and discounted).

All 'Possibly Extinct' and 'Possibly Extinct in the Wild' species on the current IUCN Red List are listed in the table below, along the year each assessment was carried out and, where available, the date each species was last recorded in the wild. Where the last record is an unconfirmed report, last recorded date is noted as "possibly".

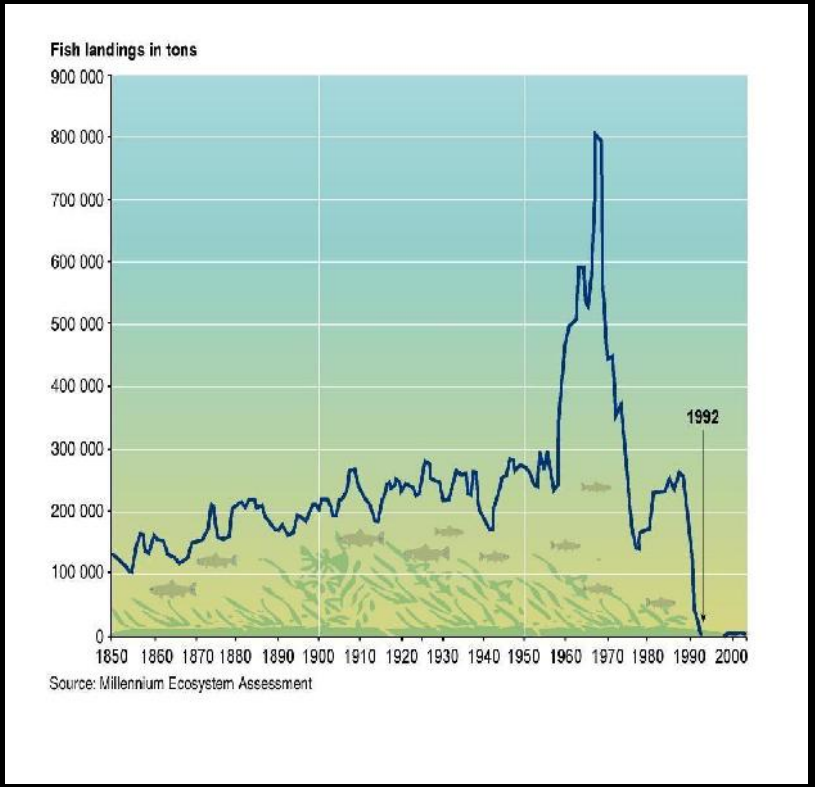
CR(PE) - Critically Endangered (Possibly Extinct), **CR(PEW)** - Critically Endangered (Possibly Extinct in the Wild).

Scientific name	Common name	IUCN Red List (2015) Category	Year of Assessment	Date last recorded in the wild
MAMMALS				
Bos sauveli	Kouprey	CR(PE)	2008	1969/70
Capromys garridoi	Garrido's Hutia	CR(PE)	2008	1989
Crateromys australis	Dinaget Crateromys	CR(PE)	2008	1975
Crocidura trichura	Christmas Island Shrew	CR(PE)	2008	1985
Crocidura wimmeri	Wimmer's Shrew	CR(PE)	2008	1976
Cryptochloris wintoni	De Winton's Golden Mole	CR(PE)	2008	1937
Dendrolagus mayri	Wondiwoi Tree-kangaroo	CR(PE)	2008	1928
Dipodomys gravipes	San Quintin Kangaroo Rat	CR(PE)	2008	1986
Leporillus apicalis	Lesser Stick-nest Rat	CR(PE)	2008	1970
Lipotes vexillifer	Baiji	CR(PE)	2008	2002
Melanomys zunigae	Zuniga's Dark Rice Rat	CR(PE)	2008	1949
Mesocapromys nanus	Dwarf Hutia	CR(PE)	2008	1937
Mesocapromys sanfelipensis	Little Earth Hutia	CR(PE)	2008	1978
Monodelphis unistriatus	Single-striped Opossum	CR(PE)	2011	1899
Murina tenebrosa	Gloomy Tube-nosed Bat	CR(PE)	2008	1962
Mystacina robusta	New Zealand Greater Short-tailed Bat	CR(PE)	2008	1967
Nilopegamys plumbeus	Ethiopian Amphibious Rat	CR(PE)	2008	1920s
Nyctophilus howensis	Lord Howe Long-eared Bat	CR(PE)	2008	1972
Peromyscus guardia	Angel Island Mouse	CR(PE)	2008	1991
Peromyscus melanurus	Puebla Deer Mouse	CR(PE)	2008	Before 1948
Phalanger matanim	Telefomin Cuscus	CR(PE)	2008	Possibly 1997
Pharotis imogene	Thomas's Big-eared Bat	CR(PE)	2008	1890
Pipistrellus murrayi	Christmas Island Pipistrelle	CR(PE)	2009	2009
Pteralopex pulchra	Montane Monkey-faced Bat	CR(PE)	2008	?
Pteropus aruensis	Aru Flying Fox	CR(PE)	2008	Possibly 1992
Pteropus tuberculatus	Vanikoro Flying Fox	CR(PE)	2008	Before 1930
Uromys emmae	Emma's Giant Rat	CR(PE)	2008	
Uromys imperator	Emperor Rat	CR(PE)	2008	Possibly 1960s
Uromys porculus	Guadalcanal Rat	CR(PE)	2008	1886-1888
Zyzomys pedunculatus	Central Rock Rat	CR(PE)	2008	2001
BIRDS				
Campephilus imperialis	Imperial Woodpecker	CR(PE)	2013	1956
Cyanopsitta spixii	Spix's Macaw	CR(PEW)	2013	2000
Eriocnemis godini	Turquoise-throated Puffleg	CR(PE)	2012	Possibly 1976
Eurostopodus exul	New Caledonian Nightjar	CR(PE)	2014	1939
Hemignathus lucidus	Nukupuu	CR(PE)	2012	1995-1996
Hydrobates macrodactylus	Guadalupe Storm-petrel	CR(PE)	2012	1912
Melamprosops phaeosoma	Poo-uli	CR(PE)	2012	2004
Myadestes lanaiensis	Olomao	CR(PE)	2013	1994
Numenius borealis	Eskimo Curlew	CR(PE)	2012	1963
Paroreomyza maculata	Oahu Alauahio	CR(PE)	2012	1985
Pomarea mira	Iia Pou Monarch	CR(PE)	2013	Possibly 2010
Psittirostra psittacea	Ou	CR(PE)	2012	1989
Pterodroma caribbaea	Jamaica Petrel	CR(PE)	2013	1879
Pyrrhura cahuindeo	Sinu Parakeet	CR(PE)	2014	1949
Siphonorhis americana	Jamaican Pauraque	CR(PE)	2012	1860
Sporophila melanops	Hooded Seedeater	CR(PE)	2012	1823
Turnix novaecaledoniae	New Caledonian Buttonquail	CR(PE)	2014	1911
Vermivora bachmanii	Bachman's Warbler	CR(PE)	2013	1988
REPTILES				
Anolis roosevelti	Culebra Giant Anole	CR(PE)	2009	1932
Calamaria prakkei	Prakke's Reed Snake	CR(PE)	2011	?
Capitellum parvicrusae	Lesser Saint Croix Skink	CR(PE)	2013	?
Celestus oneilpatus	Giant Hispaniolan Galliwasp	CR(PE)	2004	Possibly 2004
Contomastix vittata		CR(PE)	2009	?
Cyclura gorai		CR(PE)	2012	?
Gallotia auaritae	La Palma Giant Lizard	CR(PE)	2008	?

Human Imprint on Marine Ecosystems

Fisheries collapse

- The Atlantic cod stocks off the east coast of Newfoundland collapsed in 1992, forcing the closure of the fishery
- Depleted stocks may not recover even if harvesting is significantly reduced or eliminated entirely
- About 50% of all fish stocks are fully exploited, 18% are overexploited, and 10% have been depleted or are recovering from depletion



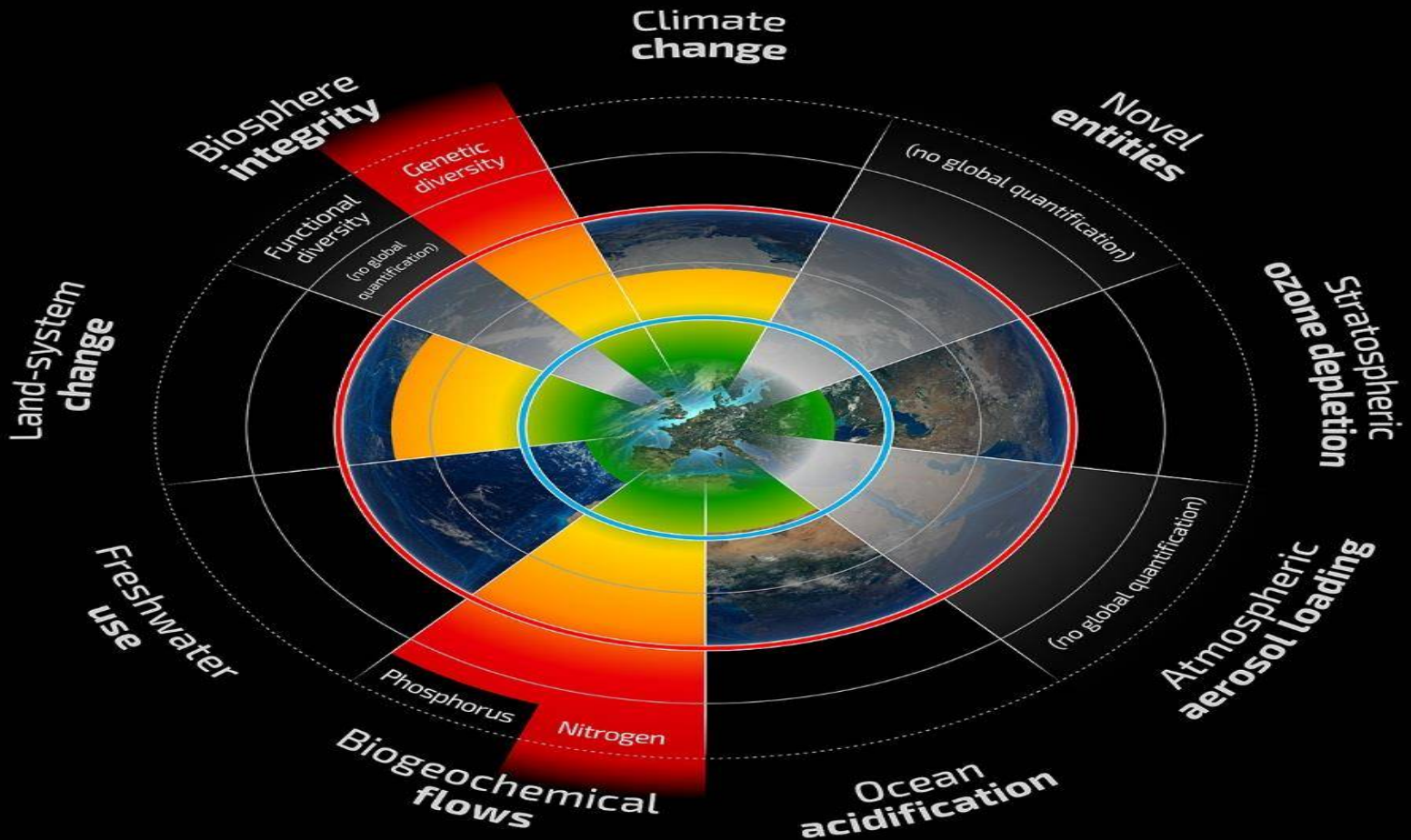
Millennium Ecosystem Assessment 2005, Steffen et al. 2004

Southern China:
Loss of Biological Diversity

Photo: ICIMOD

Planetary Boundaries

A safe operating space for humanity



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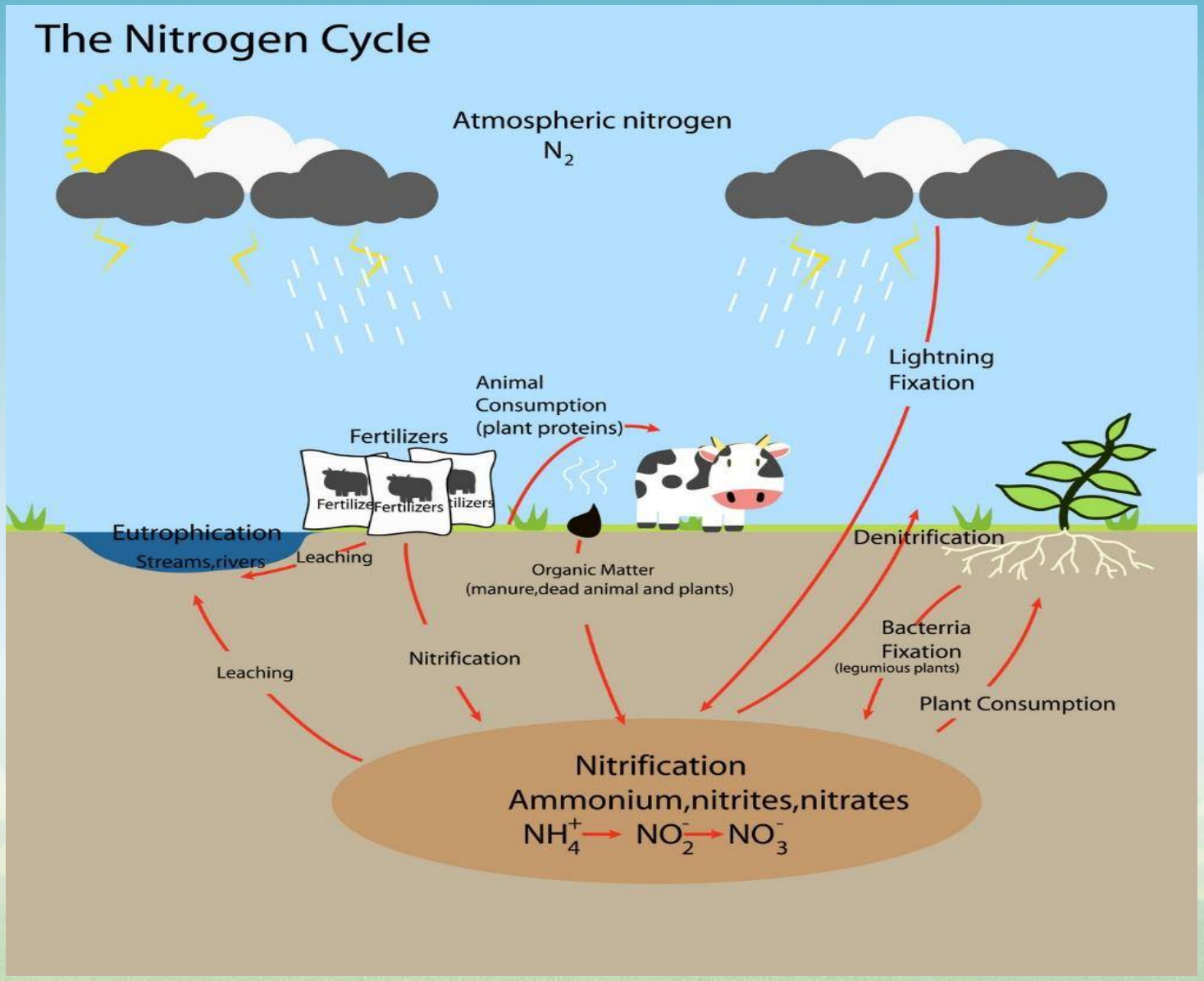
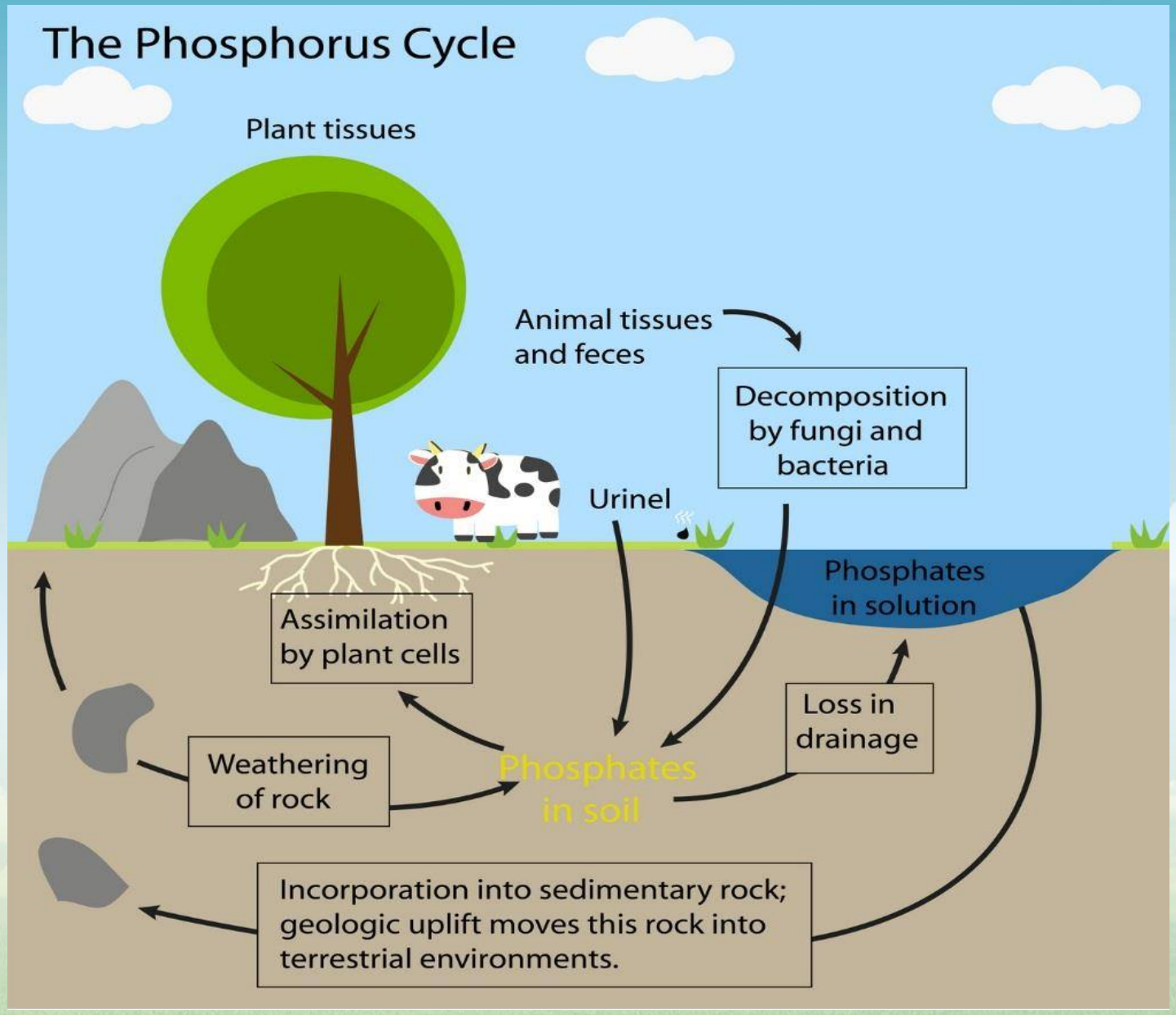
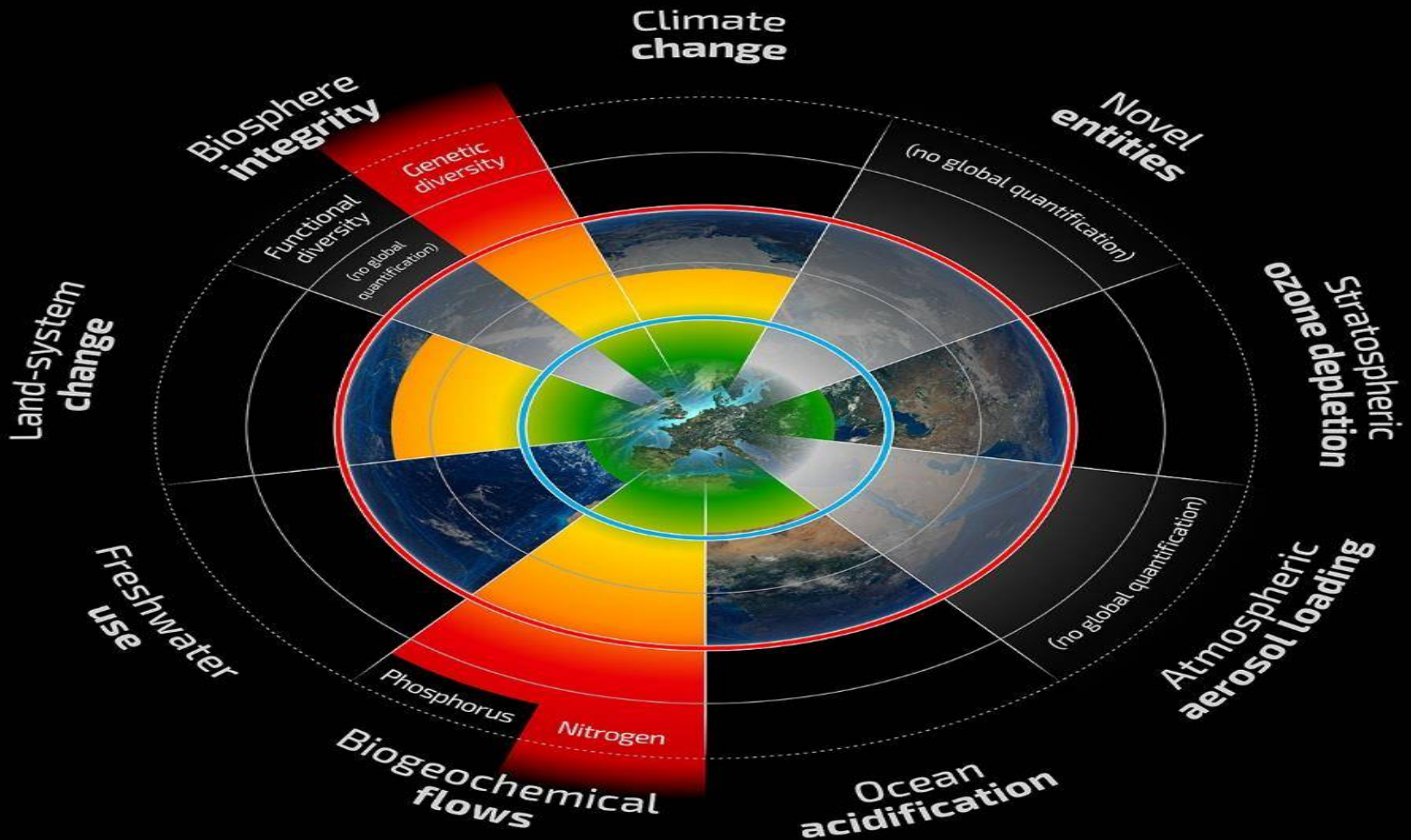

The Nitrogen Cycle
Atmospheric nitrogen
N_2
Lightning
Fixation
Animal
Consumption
(plant proteins)
Fertilizers
Fertilizers
Fertilizers
Eutrophication
Streams,rivers
Leaching
Organic Matter
(manure,dead animal and plants)
Denitrification
Bacterria
Fixation
(legumious plants)
Plant Consumption
Leaching
Nitrification
Nitrification
Ammonium,nitrites,nitrates
$NH_4^+ \rightarrow NO_2^- \rightarrow NO_3^-$


The Phosphorus Cycle
Plant tissues
Animal tissues and feces
Decomposition by fungi and bacteria
Urinel
Phosphates in solution
Assimilation by plant cells
Loss in drainage
Weathering of rock
Phosphates in soil
Incorporation into sedimentary rock; geologic uplift moves this rock into terrestrial environments.

Planetary Boundaries

A safe operating space for humanity



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HOW DID WE ARRIVE HERE?

~ INDUSTRIAL REVOLUTION, 1950S “GREAT ACCELERATION”
~ ADVANCES IN SCIENCE INCLUDING REMNANT SCIENCE/TECHNOLOGY OF WWII
~ CONSUMERISM/MARKETING/ECONOMIC “GROWTH IMPERATIVE”
~ GLOBALIZATION OF TRADE, FINANCE, COMMUNICATION, TOURISM, ETC
~ PRIVATIZATION AND COMMODITIZATION OF “THE COMMONS”, “PUBLIC GOODS”
~ ECONOMIC BOTTOM LINE (PROFIT), LACK OF ACCOUNTING OF “EXTERNALITIES”
~ TECHNOLOGY/MEDIA/COMMUNICATION
~ DRAMATIC SHIFTS IN POLITICAL AND ECONOMIC STRUCTURES
~ INCREASING POPULATION GROWTH
~ INCREASING FOOD AND ENERGY DEMANDS….

SCALE ~ COMPLEXITY ~ SPEED

LACK OF: KNOWLEDGE, WISDOM, WIDER VIEW, HUMANITY’S PLACE, GRASP OF RESPONSIBILITIES, CONSEQUENCES

A HUMANKIND OUT OF SINC WITH A LIVNG EARTH, HER SYSTEMS, AND HER ABILITY TO SUSTAIN US

“Sit, be still and listen.
For you are drunk,
And we are on the edge of the roof.”

~Rumi, 13th century Persian poet, scholar, jurist

“We are part of the Earth,
And it is part of us,
What befalls the Earth
Befalls the sons of Earth.”

~Chief Seattle, 1852

“When the stakes are life on earth, all else is a diversion.”

~ Susan Murphy, American zen teacher

ECOLOGICAL FRAMEWORKS

"We can not solve our problems with the same thinking that created it"

~Albert Einstein

ICEBERG FRAMEWORK FOR ADDRESSING GLOBAL ISSUES


Life-affirming actions
in sync with Earth's
ability to sustain us
?
new ecological worldviews,
new stories:
The Well-being of Earth and
Humankind are One

ECOLOGICAL WORLDVIEWS GIVE RISE TO EXCITING OPPORTUNITIES AND INNOVATIONS

Systems thinking

Advances in science

sustainability science, soil science, toxicology……

Advances in technology

internet's global communication and connectivity: new ways to share, learn, gather…

Ecological economics

from maximizing profit, to sustaining life; regenerative over extractive economies; an accounting of "externalities"; triple bottom line; ecological and sacred economics…

Ecological design/waste reduction

cradle to cradle design, biomimicry, composting, zero waste…

Social marketing for sustainability

Ecological governance

UN Sustainability Goals, COP 21 Paris; national, regional, local policies…

Food security and sustainability

small scale local organic gardening and farming, csa farms, composting, permaculture…

Ecological art

New stories, new heroes

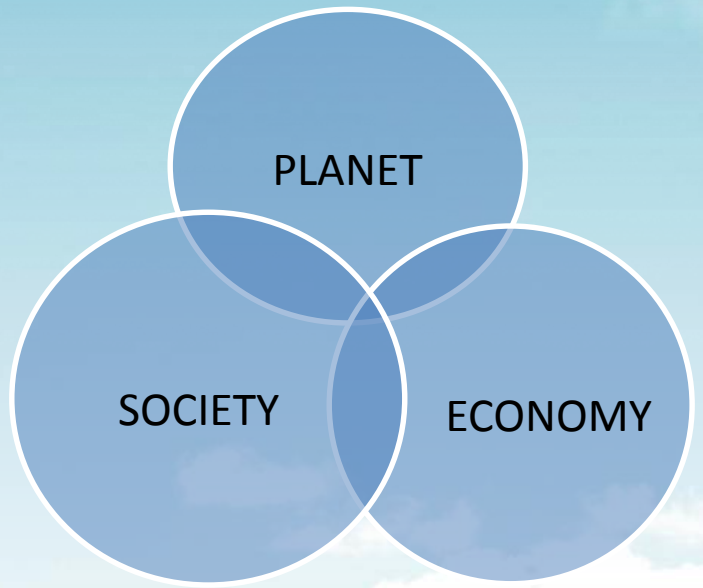
Spiritual ecology

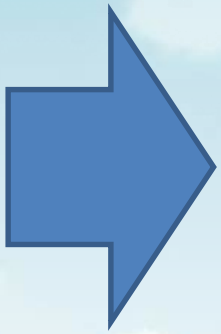
belonging, abundance, aliveness, gratitude, service, pathways for life in the Anthropocene

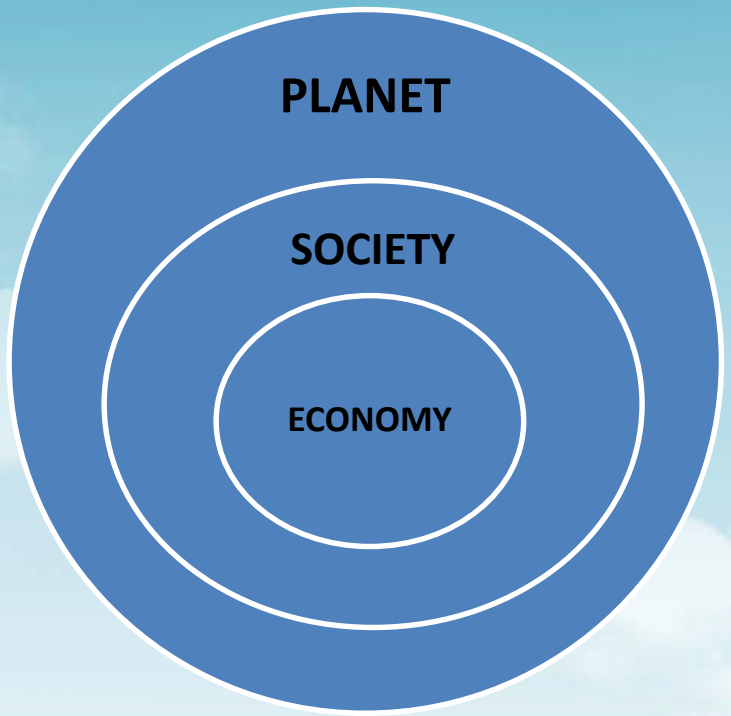
MORE IDEAS, INDIVIDUALS AND ORGANIZATIONS REFLECTING ECOLOGICAL WORLDVIEWS

“

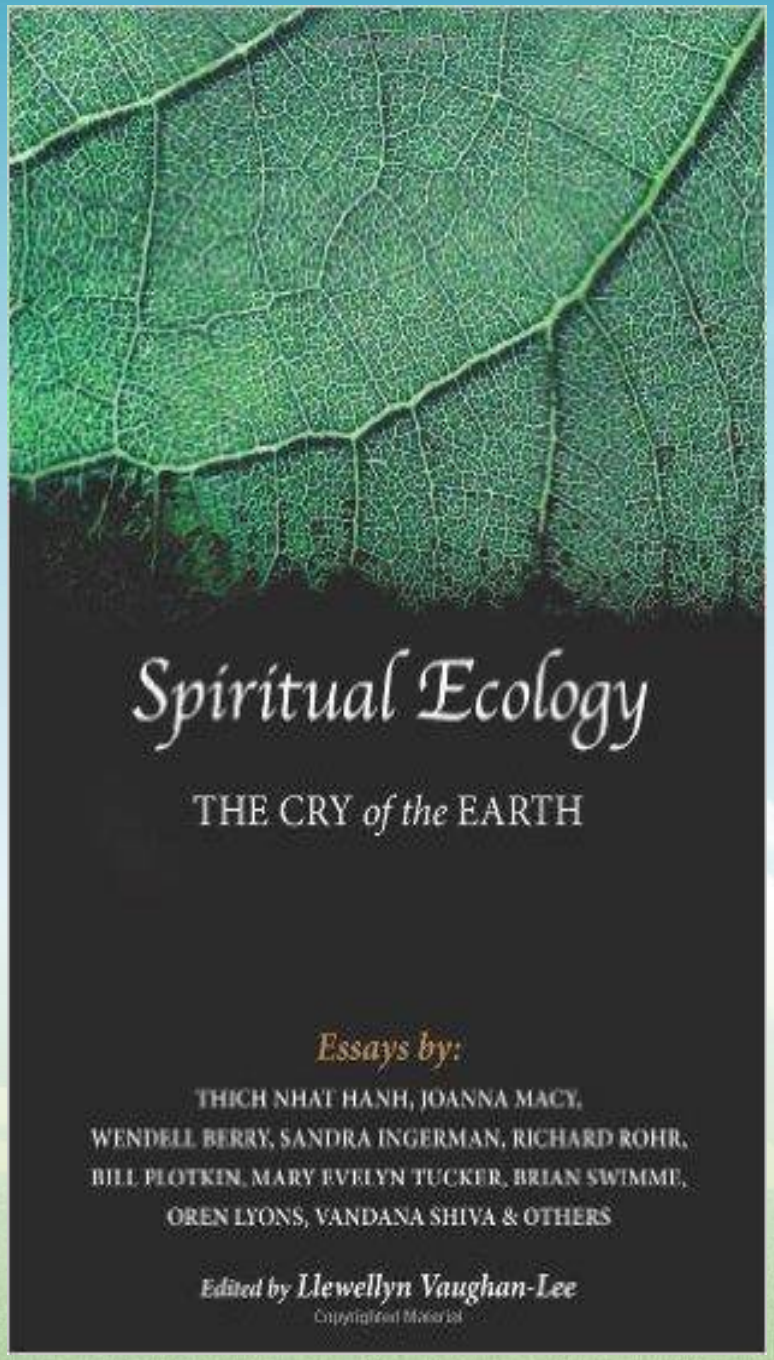
Triple bottom line



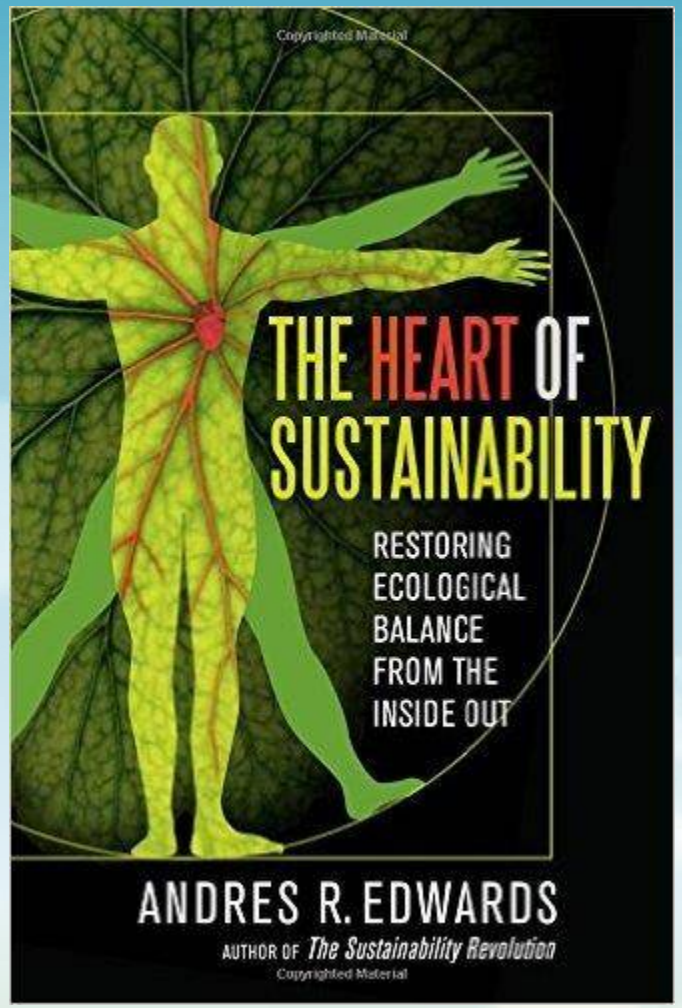




~ Thriving lives and livelihoods
~ Abundant secure food systems
~ Abundant secure water
~ Renewable, secure, clean energy
~ Healthy and productive ecosystems
~ Governance for thriving societies



~ Father Thomas Berry: earth-based spirituality
~ Sister Miriam MacGillis: Genesis Farm
~ Susan Murphy: zen buddhist teacher
~ Vandana Shiva: physicist, food security and social justice activist
~ Winona LaDuke: voice for indigenous consciousness
~ Wendell Berry: literary master, organic farmer
~ Bill Plotkin: psychologist, soul of the planet
~ Mary Evelyn Tucker: academic scholar, author
~ Llewellyn Vaughan-Lee: sufi teacher, author
~ Brian Thomas Swimme: mathematical cosmologist
~ John Stanly & Davis Loy: engaged Buddhists incorporating scientific realism
~ Satish Kumer: eco-philosopher, editor, college founder, (soil, soul, society)
~ Joanna Macy: eco-philosopher, spiritual activist
~ Thich Nhat Hanh: zen buddist monk



Thriveable Future Frameworks:

Inner Transformations,

Outer Actions

Four e's: ecology, economy, equity, education

Four c's: compassion, creative, conscious, connected

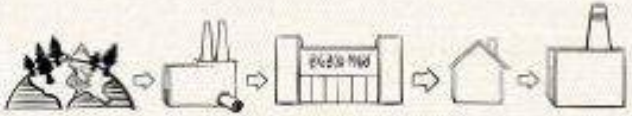
SPIRALS: scalable, place-making, intergenerational, resilient, accessible, life-affirming, self-care

COURAGE: compassion, openness, understanding, regeneration, action, gratitude, empathy

Sustainable Development Goals

"An eye-opening, humorous, and highly readable account of how our seemingly innocuous lifestyles are part of a larger system of destruction and dysfunction. A must-read." —Juliet B. Schor, author of *Plenitude: The New Economics of True Wealth*

THE STORY OF STUFF



The Impact of Overconsumption on the Planet, Our Communities, and Our Health— And How We Can Make It Better

Annie Leonard

Founder of The Story of Stuff Project

THE UPCYCLE

BEYOND SUSTAINABILITY– DESIGNING FOR ABUNDANCE

WILLIAM MCDONOUGH

FOREWORD BY PRESIDENT BILL CLINTON

&

AUTHORS OF *CRADLE TO CRADLE*

MICHAEL BRAUNGART

Soil
Foodweb Analysis

Report prepared for:
Go Green Landscaping
David Melevsky
10 Crossing Drive
Scarborough, ME 04074 USA

david@gogreenlandscaping.com

Report Sent:
Sample#: 03-009318 | Submission:03-004155
Unique ID: Peterson
Plant: turf
Invoice Number: 0
Sample Received: 6/7/2012

For interpretation of this report please contact:
Local Advisor: or regional lab
Soil Foodweb New Yor
soilfoodwebny@aol.co
631-750-1553
Consulting fees may apply

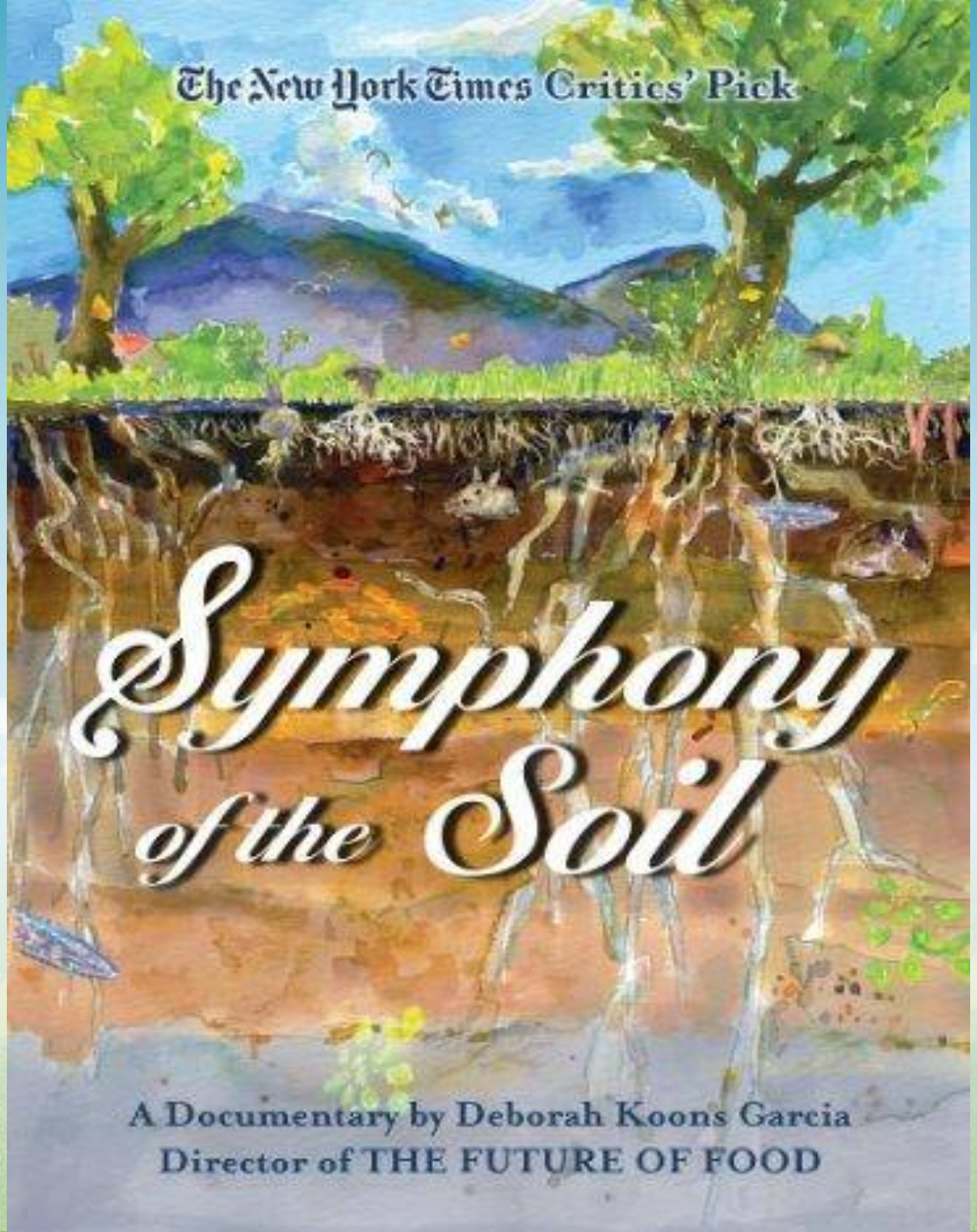
Organism Biomass Data		Dry Weight	Active Bacterial (µg/g)	Total Bacterial (µg/g)	Active Fungal (µg/g)	Total Fungal (µg/g)	Hyphal Diameter (µm)
Results		0.890	19.2	434	8.47	450	3
Comments		Too Dry	Good	Excellent	Low	Excellent	
Expected Range	Low	0.45	15	100	15	100	
	High	0.85	25	300	25	300	

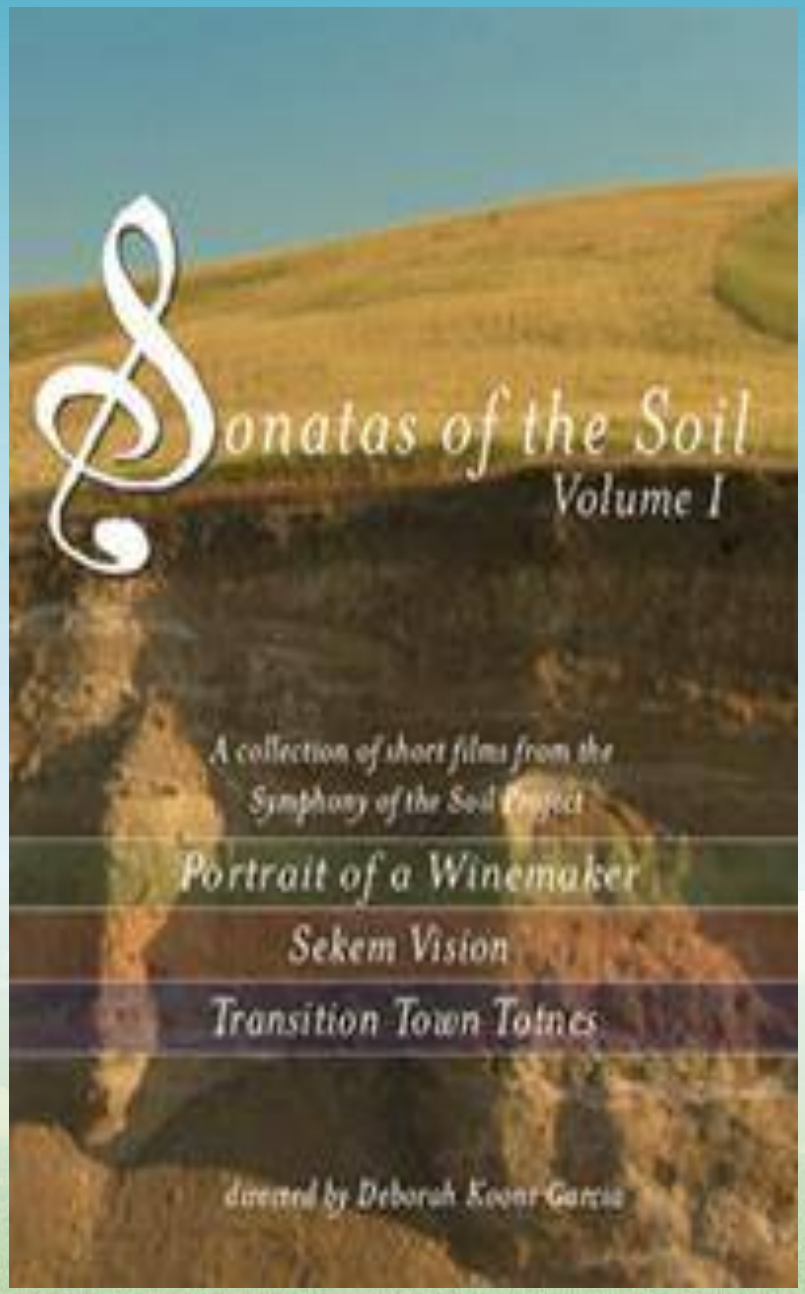
		Protozoa Numbers/g			Total Nematodes #/g	Percent Mycorrhizal Colonization	
		Flagellates	Amoebae	Ciliates		ENDO	ECTO
Results		15	518	0	4.62	4%	0%
Comments		Low	Low	Low	Low	Low	Low
Expected Range	Low	10000	10000	50	20	40%	40%
	High			100	30	80%	80%

Organism Biomass Ratios		Total Fungal to Total Bacterial	Active to Total Fungal	Active to Total Bacterial	Active Fungal to Active Bacterial	Plant Available N Supply (lbs/acre)
Results		1.04	0.02	0.04	0.44	<5
Comments		Good	Low	Low	Low	
Expected Range	Low	0.8	0.25	0.25	0.75	
	High	1.5	0.95	0.95	1.5	

Nematodes per Gram of Soil
Identification to genus

Bacterial Feeders		
Eucephalobus		0.60
Plectus		0.60
Fungal Feeders		
Aporcelaimium		0.48
Microdorylaimus		0.36
Fungal/Root Feeders		
Merlinius		0.48
Predatory		
Clarkus		0.84
Root Feeders		
Longidorus	Needle nematode	0.36
Paratylenchus	Pin nematode	0.36


The New York Times Critics' Pick
Symphony of the Soil
A Documentary by Deborah Koons Garcia
Director of THE FUTURE OF FOOD


Sonatas of the Soil
Volume I
A collection of short films from the
Symphony of the Soil Project
Portrait of a Winemaker
Sekem Vision
Transition Town Totnes
directed by Deborah Koons Garcia


Sonatas of the Soil
Volume II


Citizens for a Green Scarborough
CITIZENS FOR
A GREEN
SCARBOROUGH


Carson still a force of nature 50 years after 'Silent Spring'
CARSON
PURCHASE A $13 BEE OR BEETLE LAWN SIGN FROM
www.beyondpesticides.org
PESTICIDE
PESTICIDE
Healthy Fields for Healthy Kids
REFERENCE MATERIALS ONLY
PLEASE DO NOT TAKE
NOFA
FREE MATERIALS
TAKE SOME!
FREE MATERIALS
TAKE SOME!
TAKE A WORKSHOP!
LEARN HOW TO CREATE
SAFE LAWN FOR YOUR FAMILY
musco

Town of Scarborough Pest Management Policy

Adopted September 21, 2011

SECTION I. POLICY.

All pesticides are toxic to some degree and the widespread use of pesticides is both a major environmental problem and a public health issue. Federal regulation of pesticides is no guarantee of safety.

Scarborough recognizes that the use of pesticides may have profound effects upon indigenous plants, surface water and ground water, as well as unintended effects upon people, birds and other animals in the vicinity of treated areas. Scarborough recognizes that all citizens, particularly children, have a right to protection from exposure to hazardous chemicals and pesticides.

Scarborough recognizes that it is in the best interest of public health to eliminate the use of pesticides on town- owned lands; to encourage reduction and elimination of pesticide use on private property; and to introduce cultural and management practices to prevent, and when necessary, address pest problems on town-owned land.

Scarborough supports the Precautionary Principle (as defined by the Wingspread Statement of January 1998) as the basis for its Pest Management Policy. The Precautionary Principle states, "When an activity raises threats of harm to the environment or human health, precautionary measures should be taken, even if some cause and effect relationships are not yet fully established."

Therefore, it is the express policy of Scarborough to refrain from the use of pesticides upon property it owns, uses or controls, except in situations that pose an imminent threat of serious injury to persons, property or agriculture.

SECTION II. AUTHORITY.

The Scarborough Town Manager shall oversee the implementation of the Pest Management Policy. A Pest Management Advisory Committee shall act in an advisory capacity to develop and oversee a Pest

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Pest Management Advisory Committee

The Town of Scarborough Pest Management Advisory Committee (PMAC) shall act in an advisory capacity to develop and oversee a pest management program and advise the Town Manager of any problems encountered or amendments required to achieve the full and successful implementation of an organic pest management program.

Town of Scarborough Pest Management Policy [PDF]

Members

- Terri Eddy, Member At-Large - 2016
- Iver Carlsen, Recreation Advisory Board
- Todd Jepsen, School Department
- Chris Herrick, Member-At-Large - 2017
- Tim Lindsay, Arborist/Horticulturist - 2018
- Marla Zando, Knowledgeable about organics approach - 2018
- Vacant, Conservation Commission

Meetings

Committee meets on an as-needed basis.

Meeting Agendas & Minutes

Documents are in Adobe PDF format, and may take a few moments to load.

Recent List Items			
Date	Agenda	Minutes	Notes
March 15, 2016	Agenda		
November 17, 2015	Agenda		
August 11, 2015	Agenda	Minutes	
June 23, 2015	Agenda	Minutes	
May 5, 2015	Agenda	Minutes	

Showing 5 items from page Pest Management Advisory Committee Meetings sorted by Date. View more »

Liaisons

Thomas Hall
Town Manager
Phone: (207) 730-4031
Email: thall

Bruce Gullifer
Community Services Director
Phone: (207) 730-4150
Email: bgulli

Steve Quirk
Facilities Manager
Phone: (207) 883-7645
Email: squirk

Field Scouting Reports

Permaculture is an ecological design process…

which mimics Nature's wisdom, systems and patterns; is based in ethics; and supportive of human needs. It is a regenerative, holistic, systems-approach to cultivating resilience, abundance and thrivability at the personal and community levels.

Permaculture is best known as an organic food production system, offering pathways of evolution for organic gardening. With it twelve guiding principles and focus on **building living soil**, techniques include**:**

~no-till practices
~closed-loop systems
~stacked functions
~food forests
~sheet mulching
~edible perennials
~plant guilds
~polycultures
~herb spirals
~chicken tractors
~water catchment systems

….***and "permablitzs"***

More broadly, permaculture challenges our wider worldview with

systems thinking, horticultural and sustainability science, pattern literacy, transition modelling, and spiritual and deep ecology. Such concepts can be integrated, designed and radiate globally into: food security systems; regenerative over extractive economies; strategies for climate adaption; environmental restoration; renewable energies for post carbon societies; urban and suburban redesign; non-currency exchanges; collaborative participatory processes; and more.

Permaculture helps us "consciously live our way" toward a necessary new story for humankind.

The story involves humanity's inner collective transformation and its evolving reflection in the restored outer landscape and systems of Earth. Earth urgently calls us now, offering feedback, and permaculture teaches us to listen, to follow Earth's lead, to act.

Permablitz for The Bees!

Local apiary property

Portland Permaculture Meetup


KEY

Portland Maine Permaculture

THE resilience HUB
permaculture
food systems
new economy

Home | Members | Sponsors | Photos | Pages | Discussions | More | My profile

resilience

Portland, ME

Founded Nov 28, 2005

About us...

Invite friends

Permies	2,363
Group reviews	198
Upcoming Meetups	29
Past Meetups	724
Our calendar	

Learn skills. Make connections. Live well.

+ SUGGEST A NEW MEETUP

Upcoming 29 | Past | Calendar

FEATURED MEETUP

2016 Maine Permaculture Design Certification Course - 5 Weekend Format

MOFGA Common Ground Education Center
294 Crosby Brook Road, Unity, ME (map)

Be part of creating a better future. A one-weekend-per-month format for the internationally-recognized full Permaculture Design Certificate Course, running June through September 2016. Typically sells out. 2016 MAINE LOCATION: We will return to MOFGA's beautiful and spacious facility in Unity Maine (2h drive from Portland). Co-sponsored by... LEARN MORE

Fri Jun 3
9:00 AM
RSVP

15 going
9 spots left
2 comments
Price:
$250.00 deposit

What's new

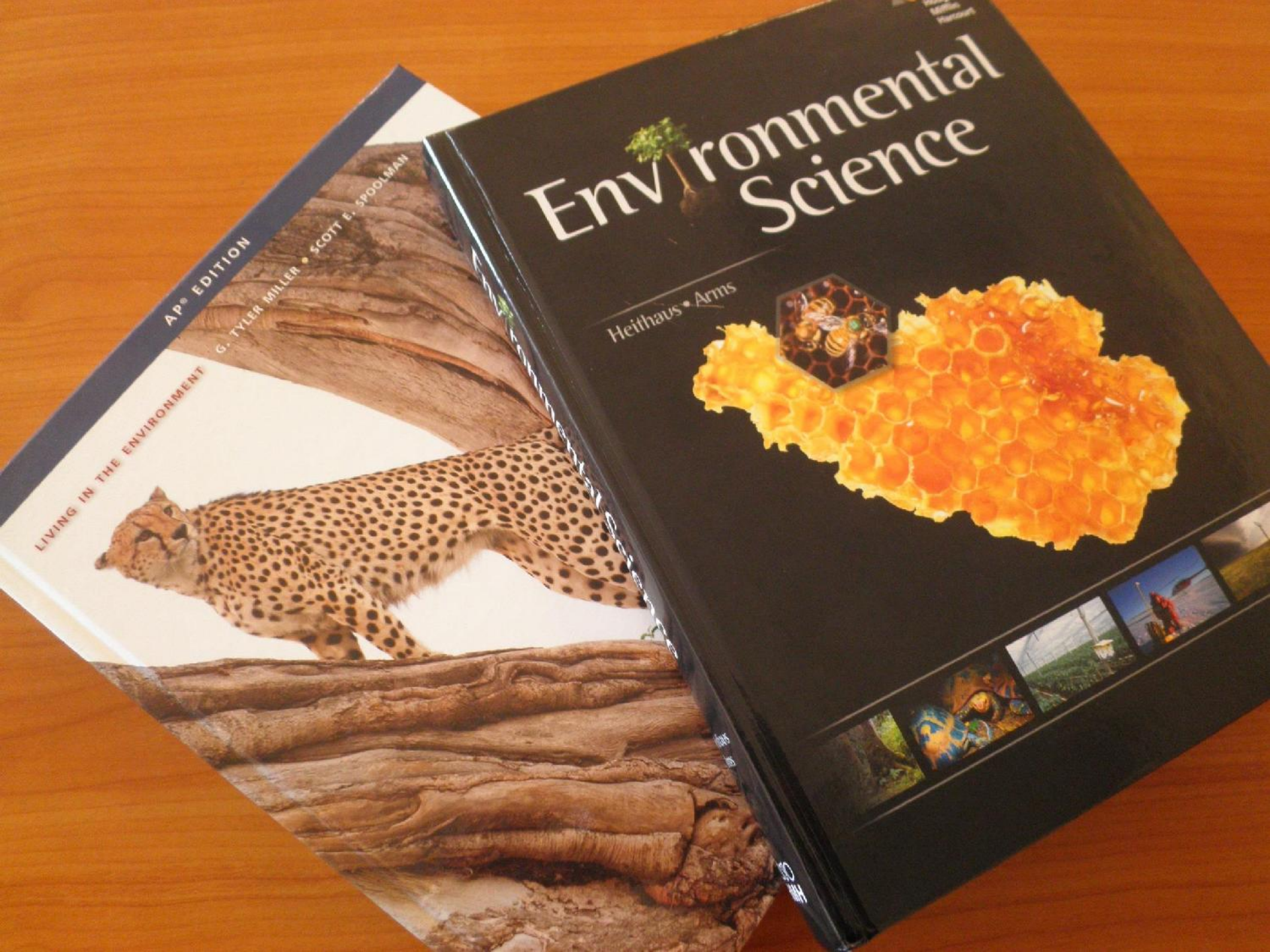
MORE


Welcome!
PERMABLITZ SCHEDULE
WORK PROJECTS!
LUNCH + BEE TALK
WORK PROJECTS + BEE ED
Clean up


APIARY
ETIQUETTE
• Don't be afraid of the bees - they love life and do not want to sting you.
• DON'T SWAT if a bee approaches you. Don't even think about swatting.
• If you feel angry, WHISTLE. The bees don't understand your anger.
ABOVE ALL, send the bees LOVE
Every little thing in the world wants to be loved.


HÜGEL
TRAIL BUILDING
SWALES of COMFREY
VEG. GARDEN REHAB
POLYCULTURES for Orchard Trees


TRUPER


AP® EDITION
G. TYLER MILLER • SCOTT E. SPOOLMAN
LIVING IN THE ENVIRONMENT
Environmental Science
Heithaus • Arms

Crops and Soil

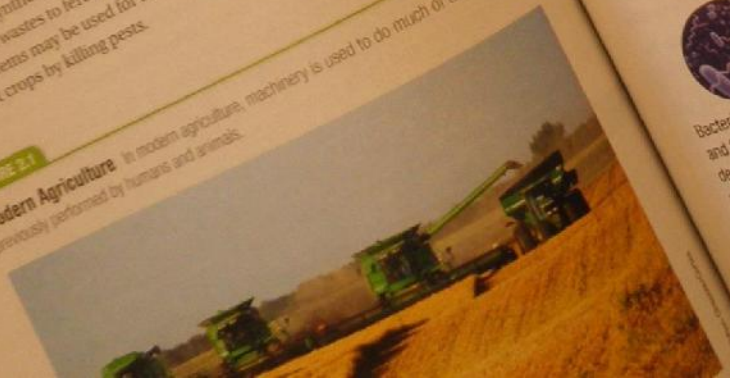
Much of Earth's surface cannot be farmed. Only about 37 percent of Earth's land surface is agricultural, or land that can be used to grow crops. Urban areas occupy about 3 percent of Earth's land surface and are expanding, often into agricultural land. We need to use our remaining agricultural land as efficiently as possible for it to continue to grow enough food for the world while maintaining natural resources.

Agriculture: Traditional and Modern

The basic processes of farming include plowing, fertilization, irrigation, and pest control. In traditional agriculture, plows are pushed by the farmer or pulled by livestock. Plowing helps crops grow by mixing soil nutrients, loosening soil particles, and uprooting weeds. Organic fertilizers, such as manure, are used to enrich the soil so that plants grow strong and healthy. Fields are irrigated by water flowing through ditches. Weeds are removed by hand or machine. These traditional techniques have been used since the earliest days of farming, centuries before tractors and pesticides were invented.

In industrialized countries, the basic processes of farming are now carried out using modern agricultural methods. Machinery powered by fossil fuels is now used to plow the soil and harvest crops, as shown in **Figure 2.1.** Synthetic chemical fertilizers are now used instead of manure and plant wastes to fertilize soil. A variety of overhead sprinklers and drip systems may be used for irrigation. Synthetic chemicals are used to protect crops by killing pests.

FIGURE 2.1
Modern Agriculture In modern agriculture, machinery is used to do much of the work previously performed by humans and animals.



Key Terms
- topsoil
- erosion
- desertification
- compost
- salinization
- pesticide
- biological pest control
- genetic engineering

Fertile Soil: The Living Earth

Soil that can support the growth of healthy plants is called *fertile soil.* Plant roots grow in **topsoil,** the surface layer of soil, which is usually richer in organic matter than the subsoil is. Fertile topsoil is made up of living organisms, rocks, water, air, and organic matter, such as dead organisms.

Most soil starts to form when rock is broken down into smaller and smaller fragments by wind, water, and chemical weathering. *Chemical weathering* happens when the minerals in the rock react chemically with substances such as water to form new materials. Temperature changes and moisture cause rock to crack and break apart, which creates smaller particles on which the seeds of pioneer plants fall and take root. The dead material from plants and other organisms add to the soil. It can take hundreds or even thousands of years to form a few centimeters of soil.

Other processes also help to produce fertile topsoil. The rock particles supply mineral nutrients to the soil. Fungi and bacteria live in the soil. They decompose dead plants and organic debris, and add more nutrients to the soil. Earthworms, insects, and other small animals help plants grow by breaking up the soil and allowing air and water into it.

As you can see in **Figure 2.2,** several layers of soil lie under the topsoil. The bottom layer is bedrock, which is the solid rock from which most soil originally forms.

CHECK FOR UNDERSTANDING
Identify Name two processes that help to make soil fertile.

FIGURE 2.2
Soil Profile Soil is made of rock particles, air, water, and dead and living organisms. The number and characteristics of the soil layers may be different in different types of soil.

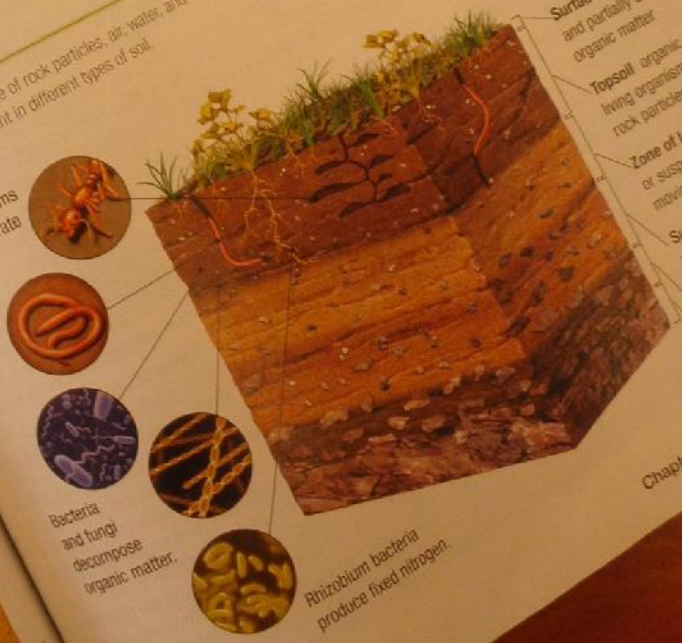
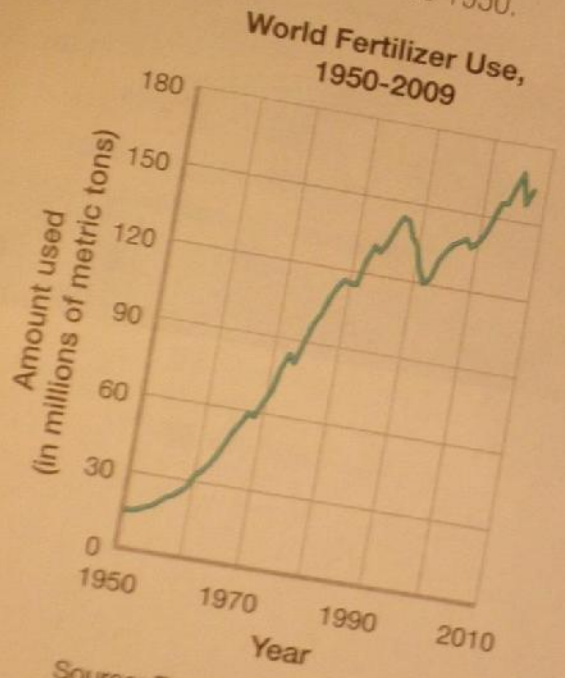


FIGURE 2.6

World Fertilizer Use The use of inorganic fertilizers has increased dramatically worldwide since 1950.



Source: Earth Policy Institute

Enriching the Soil

In traditional farming, the soil is enriched by adding or
as manure and leaves, to the soil. As the organic matter
adds nutrients to the soil and improves the texture of th
inorganic fertilizers that contain nitrogen, phosphorus, a
have changed farming methods. Without these fertilizers
production would be less than half of what it is today. Ove
50 years, the use of such fertilizers has increased rapidly, a
in **Figure 2.6.**

A modern method of enriching the soil is to use both org
inorganic fertilizers by adding compost and chemical fertiliz
soil. **Compost** is partly decomposed organic material. Compo
from many sources. For example, you can buy composted cow
a garden store. Also, many cities and industries now compost y
and crop wastes. This compost is sold to farmers and gardeners
process is saving costly landfill space.

Salinization

The accumulation of salts in the soil is known as **salinization** (sal uh
ZAY shuhn). Salinization is a major problem in places such a
California, and Arizona, which have low rainfall and nat
In these areas, irrigation water comes from rivers or gro
is saltier than rainwater. When water e
are left behind. Eventu
not grow

MAKING YOUR OWN COMPOST HEAP

Why on Earth would you want to pile a bunch of garbage in your yard and let it rot? Crazy as the idea may sound, it's actually a very good one—copied straight from nature itself.

Compost is the natural product of Earth's organic decaying process. When a dead organism decomposes, nutrients are returned to the soil. A compost heap is a collection of organic materials such as leaves, grass, and fruit peelings that will decompose over time to create rich, fertile soil. By making your own compost heap, you can reduce the amount of waste you send to the local landfill and create an excellent natural fertilizer for your garden.

There are many opinions on how to construct the best compost heap—it can be as basic or as fancy as you like. Either way, composting is easy, and it's almost impossible to foul up the process.

A compost heap can be placed just about anywhere in the yard. Either a sunny or a shady spot will be fine. You will want to keep it out of the way of normal activity, however.

Many people choose a spot on a concrete slab or a grassy area and then simply pile their materials there. This method is easy and effective.

A compost heap contains a mishmash of many different organic materials. Most of your heap will probably consist of grass clippings and leaves. You can also add raw vegetables, other uncooked food scraps, coffee grounds, tea bags, cotton, dust, discarded plants, and weeds. Avoid adding pet manure, cooked foods, and meat of any kind. If you add raw food wastes, cover them with leaves to keep away flies and to prevent an unpleasant odor.

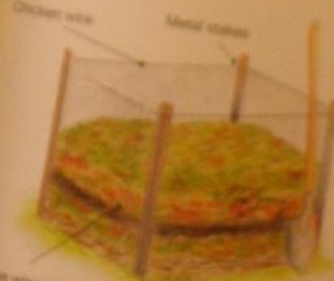
Your heap will begin to decompose through the action of microorganisms. It's a good idea to shovel a couple of scoops of soil from your yard into the heap. The microorganisms in the soil will immediately begin decomposing the items in the heap.

By making your own compost heap, you can reduce the amount of waste you send to the local landfill and create an excellent natural fertilizer for your garden.

You may choose to keep your compost pile in a ready-made container similar to this one.

Turn the heap at least once a month to keep it well aerated and active. After the organic matter has broken down to the point that no single item is recognizable, it's ready to work into your garden's soil. The entire process can take anywhere from two months to one year, depending on the kinds of materials being decomposed and how often the heap is turned. Composting is more of an art than a science, so be prepared to experiment!

Compost Heap Container



Loose wire can be twisted around two sections of chicken wire to create a "door" for easy turning.

You can build this container for your compost heap with a few materials from your local hardware store.

Compost Container

[illegible]

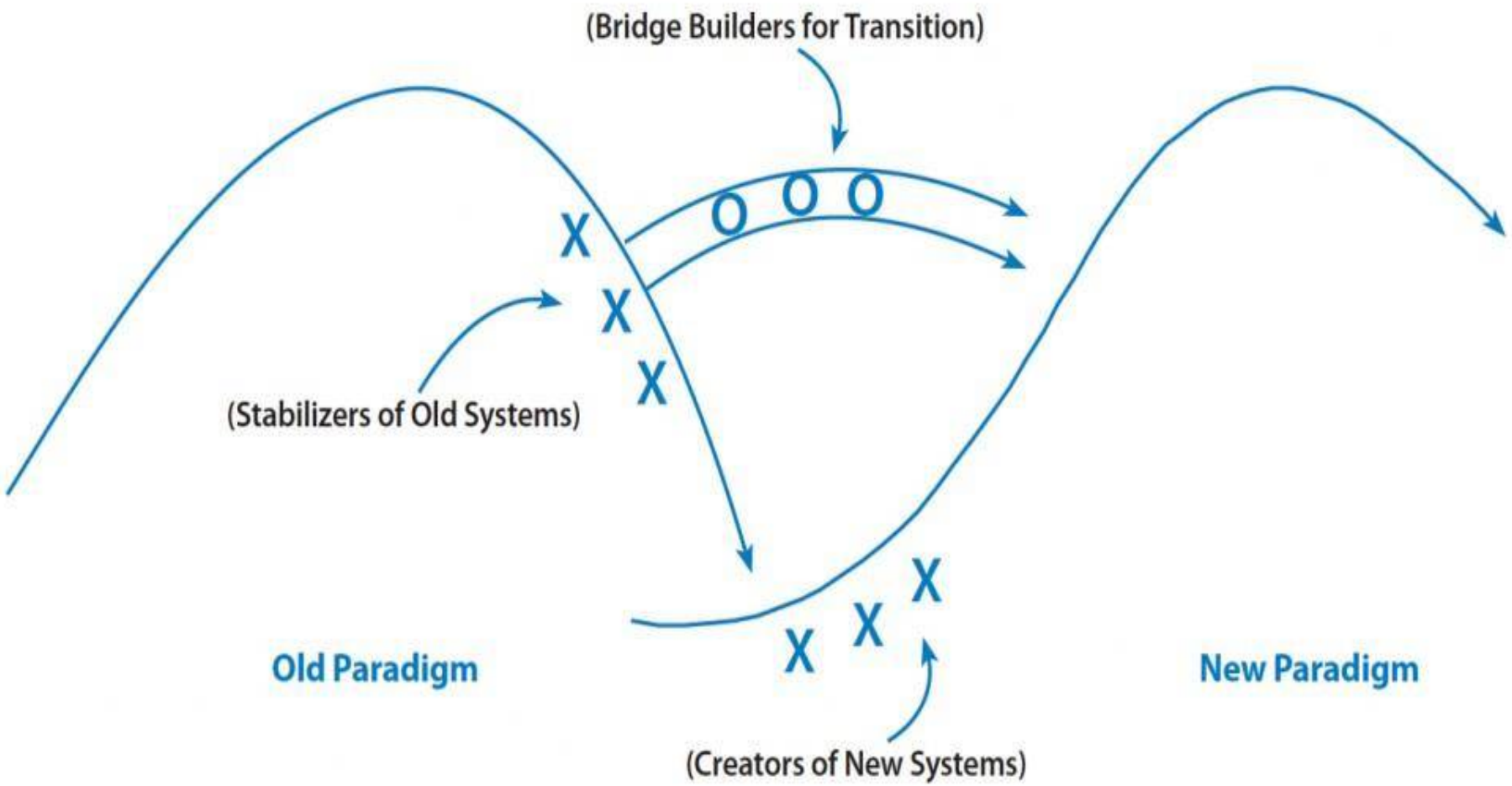
[illegible]

FOR MORE INFORMATION

Consult your library for a manual on composting. You might find one of these helpful:

The Complete Compost Gardening Guide, by Barbara Pleasant and Deborah L. Martin. North Adams, Massachusetts: Barbara Pleasant and Deborah L. Martin, 2008.

Learn to Compost: 30 Easy Tips to Turn You into the Master Composter, by Alex Masters. Alex Masters, 2012.

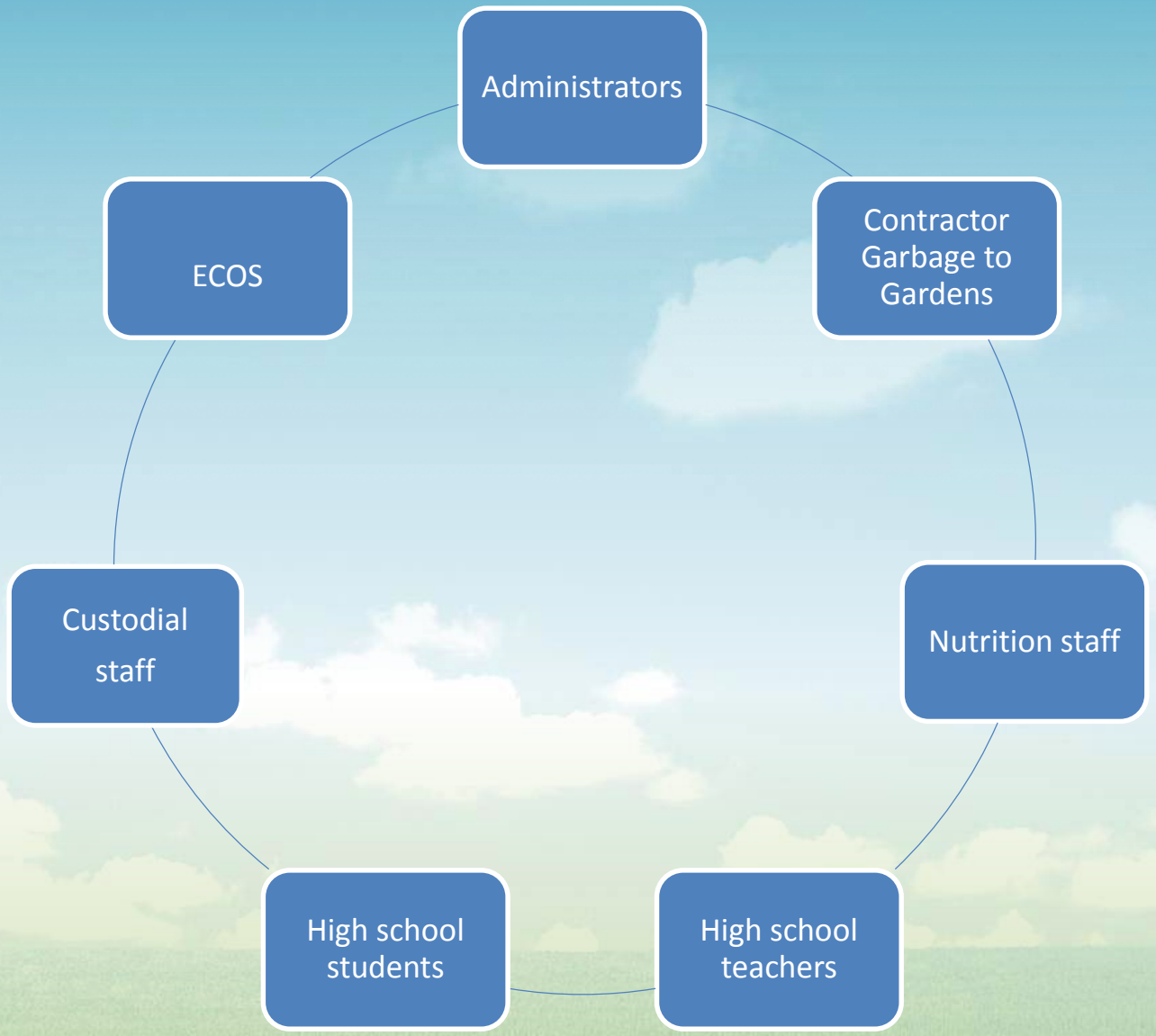


Two Hoops Transition Model, Bob Steigler, www.newstories.org


BRUTE
give back.
ecos

Top reasons to compost

- ✓ 35 million tons of **food waste** per year ends up in US landfills and incinerators
- ✓ **Landfills and incinerators contribute to climate change.** Landfills take up space, emit methane, and contribute to greenhouse gases; incinerators leave toxic ash waste and release carbon dioxide
- ✓ **Composting reduces climate change** by acting as a carbon sink, absorbing carbon
- ✓ Compost is Nature's life-sustaining **Black Gold**, feeding plants, which feed us
- ✓ Add compost to your garden or lawn **instead of synthetic chemical fertilizers and pesticides**
- ✓ Compost doesn't negatively impact **human health and the environment**, or create artificial plant dependencies like synthetic chemical fertilizers and pesticides
- ✓ Composting does not pollute groundwater, **enhances soil's ability to retain water**, reduces the need for irrigation, and protects against erosion
- ✓ Compost restores healthy soil biology/microbial activity, promoting a complex, living underground **soil web of life**
- ✓ **Enhanced soil biology/microbial activity** adds soil nutrients, combats plant disease, and grows healthier food
- ✓ **Imagine**... turning old apple cores, tea bags, coffee grounds and paper plates into sweet carrots, juicy tomatoes and strawberries!
- ✓ Remember **Great Gramma's garden** ....she knew best after all!
- ✓ **Combat global warming with out even leaving the high school cafeteria!**


Administrators
Contractor Garbage to Gardens
Nutrition staff
High school teachers
High school students
Custodial staff
ECOS


Top reasons to compost
WHY COMPOST?
Why not?
WHY COMPOST?


Biotray
Compost Me!
Oakhu
COMPOSTING
LET'S DO THIS!
WHICH ONE?
Top reasons to comp
35 million tons of food waste per year ends up in US
Landfills and incinerators contribute to climate
space, emit methane, and contribute to greenhouse
toxic ash waste and release carbon dioxide
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Add compost to your garden or lawn instead of sy
and pesticides
Compost doesn't negatively impact human health
create artificial plant dependencies like synthetic
pesticides
Composting does not pollute groundwater, enhan
water, reduces the need for irrigation, and protec
Compost restores healthy soil biology/microbial a
living underground soil web of life
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Imagine... turning old apple cores, tea bags, co
into sweet carrots, juicy tomatoes and strawber
Remember Great Gramma's garden ....she kn
Combat global warming with out even leav


WHY COMPOST?
to end use of synthetic fertilizers!
plants want real food
WHY COMPOST?
to landfill?
to incinerator?
to compost pile?
COMPOSTING
LET'S DO THIS!
Oakhurst
Orange
we are done with Styro!!


COMPOST
ALL FOOD & LIQUIDS!
paper with NO sheen ok
Compost This
CANS
BOTTLES
EMPTY LIQUID INTO COMPOST FIRST!
TRASH
WHEN IN DOUBT, THROW IT OUT!
Coming soon, another bin for....
RECYCLING
...single sort like at home!
MD811893
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(207) 332-0277
GARBAGETOGARDEN.ORG
give back.
ecos
ALT. E.D.


ecomaine

You, Earth, its systems and all living things are One.

How will that change how you live your life?

What legacy will you leave your children and grandchildren?

…and will that include composting?

CREDITS

KITCHEN GARDENERS INTERNATIONAL

KGI.ORG

MAINE DEP

WORM MAINEA