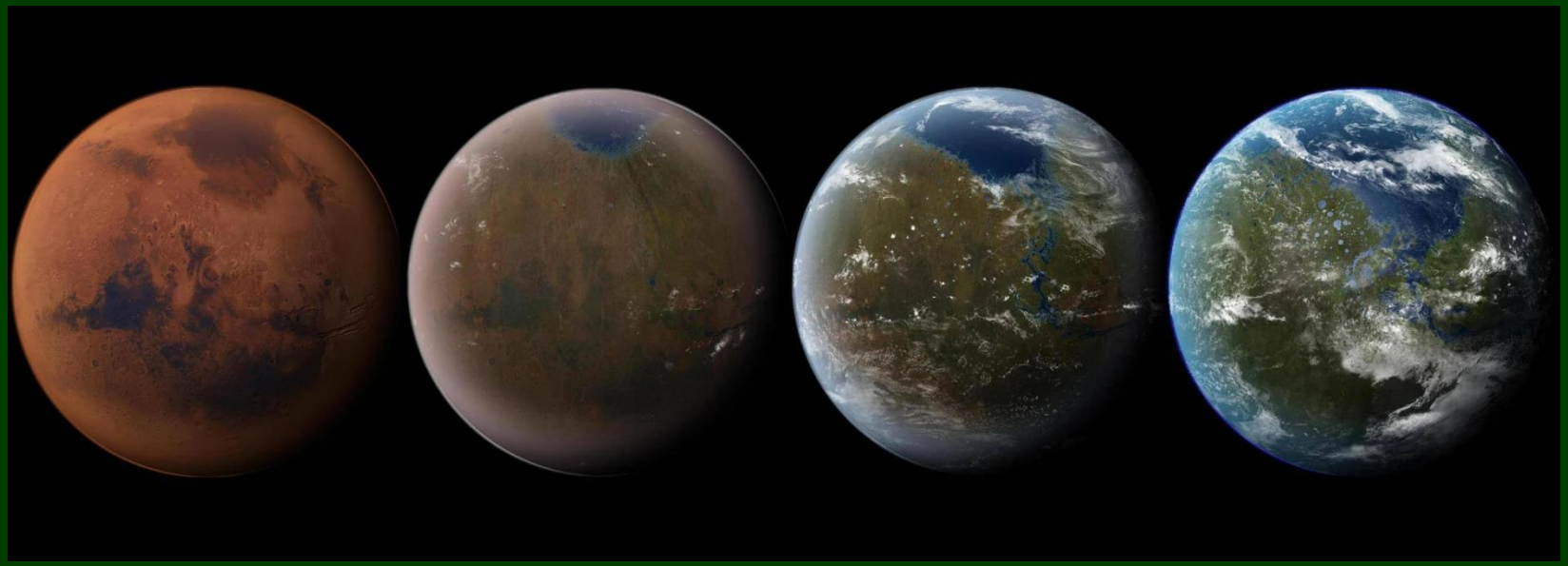
A Simple, 3-Step Process to Terraform the Earth into a Habitable Planet

By Charles Paidock

Secretary, Chicago Greens

Study of Epoch Periods - our ancestors may have come close to extinction during one period with a loss of 98.7 percent of their population

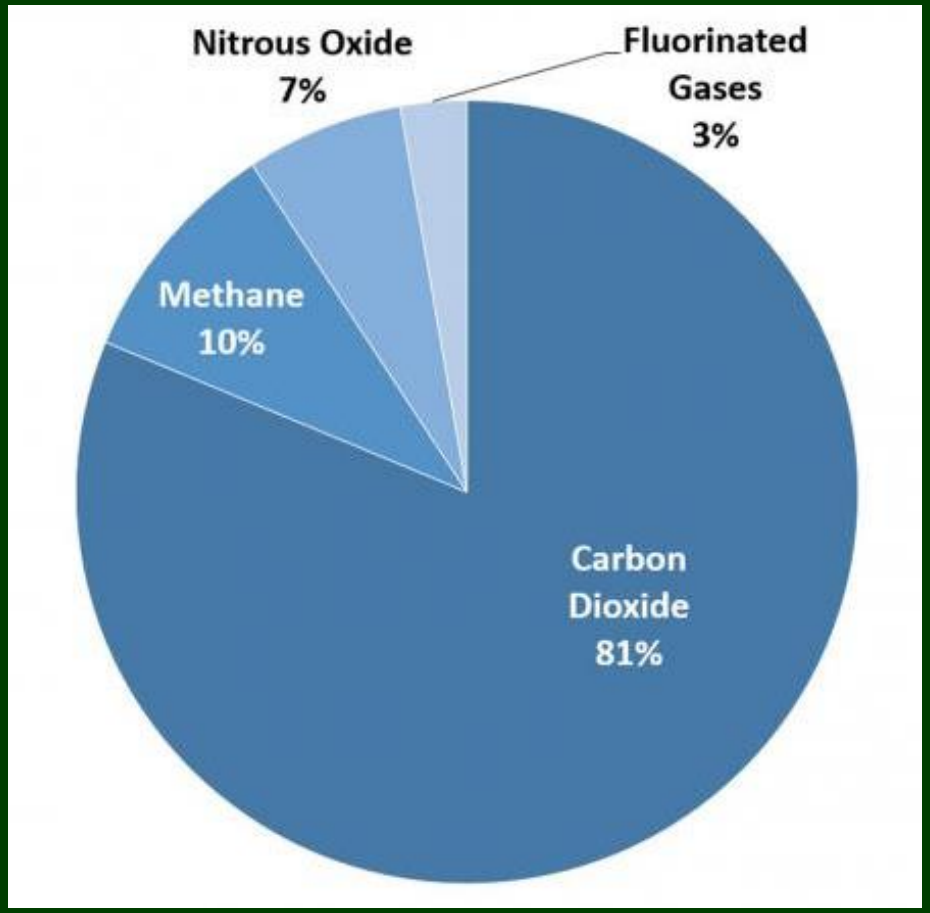
The hypothetical process of deliberately modifying the atmosphere of a planet to make it habitable for humans to live on



globally warmed

returnsd to normal

Problems persist with production of greenhouse gases primarily carbon dioxide and methane



Global fresh water demand will outstrip supply by 40% by 2030

There is little compliance with containment or control measures

2. Saudi Aramco - The biggest oil company and the most profitable company in the world, the only multinational with profits in excess of $100 billion, has the largest daily oil production in the world.

4. Volkswagen Group - The biggest automotive manufacturer in the world, has operations in more than 150 countries while maintaining at least 100 production facilities in more than two dozen countries.

7. Toyota Motor Corporation - a Japanese company which produces around 10 million cars every year.

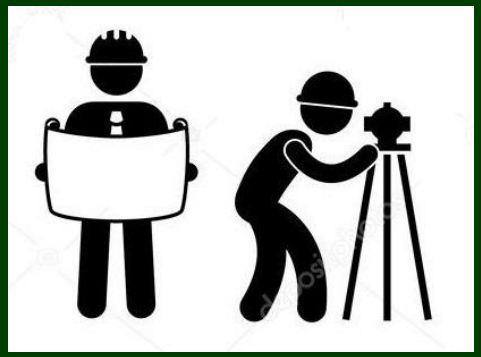
Biggest Multinational Companies in the World

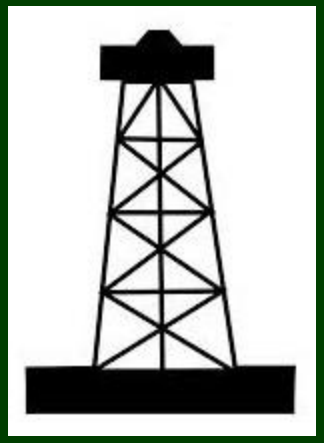
8. Sinopec Group - Chinese oil and gas company with 51 projects in more than 25 countries.

11. Shell - one of the biggest greenhouse gas producers in the world, operates more than 44,000 service stations globally.

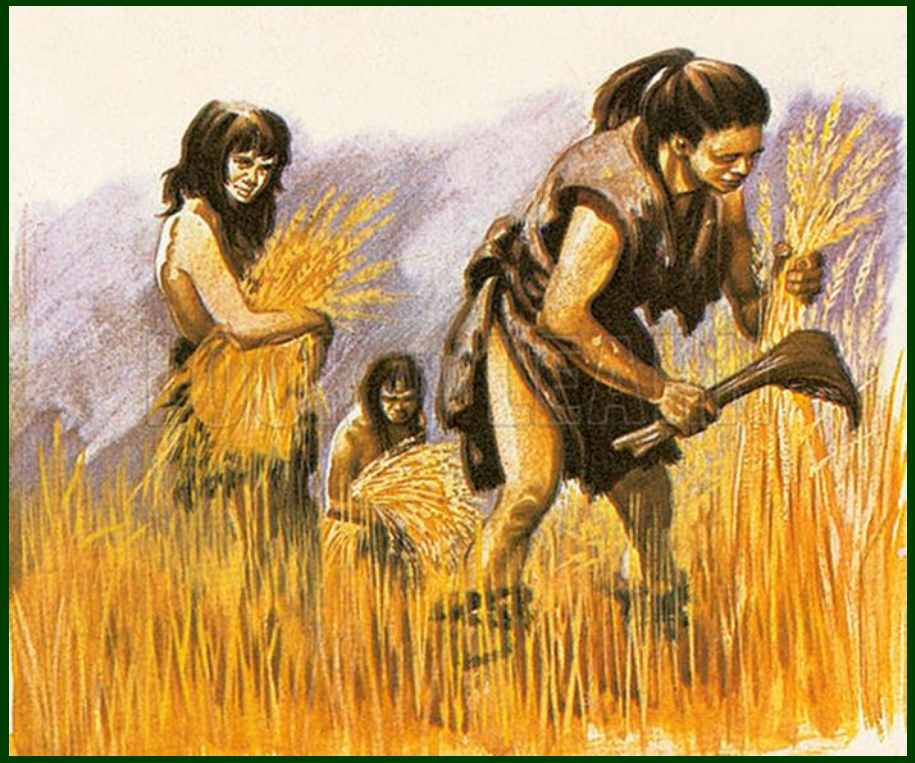
12. Exxon Mobil Corporation - among the biggest companies in the world in terms of revenue.

Continued reliance on oil, pressure for more drilling sights and routes for running pipelines





Transition from hunter-gathering / foraging during neolithic period to predictive food sources through with tillage and intensification

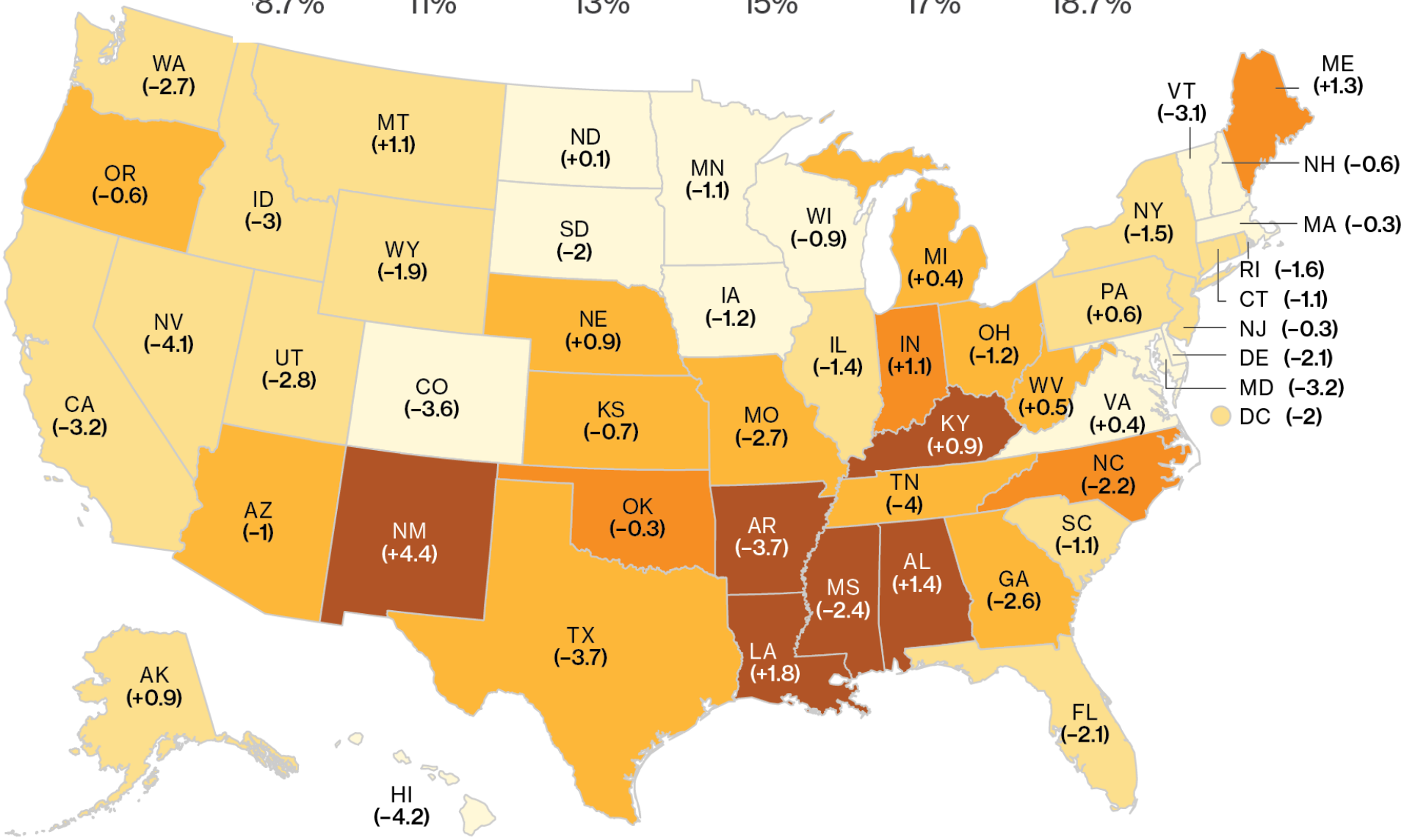


For roughly 90% of history, humans were foragers who used simple technology to gather, fish, and hunt wild food resources

Prevalence of Hunger by State

Average share of food-insecure households

8.7% 11% 13% 15% 17% 18.7%



Projected increases in temperatures, changes in precipitation patterns, changes in extreme weather events, and reductions in water availability may all result in reduced agricultural productivity.

Food is at the core of the Sustainable Development Goals (SDGs), the UN's development agenda for the 21st century.

Incidence of food insecurity increasing

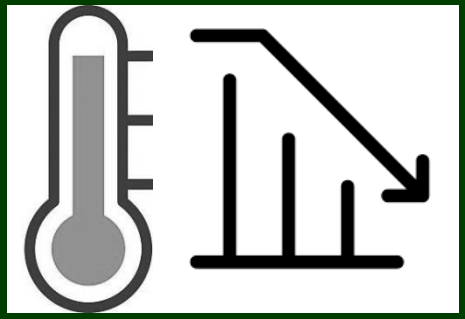
What Can We Do to Mitigate this Situation?

How do we get clean air, water, and have an adequate food supply?

How do we get clean air, water, and have an adequate food supply?

Answer:

- foster the spread of or set in motion ecosystems, worldwide, with proven benefits
- repair the land that has been damaged, and put this acreage under cultivation

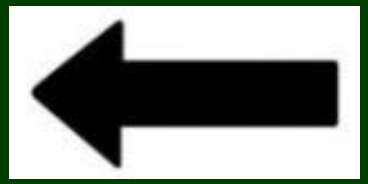


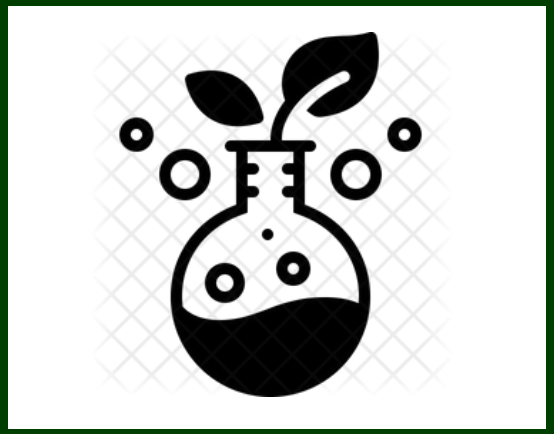
These are “natural solutions”

- with no reliance on technology which may or may not work, and
- require no ongoing maintenance or replacement at some time when worn out

While we develop environmental policies all nations can agree upon for the future

In order to repair the damage already done





Through
the application of
science to nature

Methodology for Mng't of the Natural Infrastructure

8 habitats:

Polar, Tundra, Evergreen forests, Seasonal forests, Grasslands, Deserts, Tropical Rainforests, Oceans

1. Preserve and and Expand Rainforests Around the World,

(forests characterized by a closed and continuous tree canopy with moisture-dependent vegetation)

and All US National Forests

2. Create Inland Wetlands

on floodplains along rivers and streams, where water covers the soil all year, or part of the year, especially during the growing season.

Provides clean water to streams, during periods of flooding or drought, and critical habitat for wildlife. As water moves slowly through a wetland, sediment and other pollutants settle to the substrate or floor of the wetland.

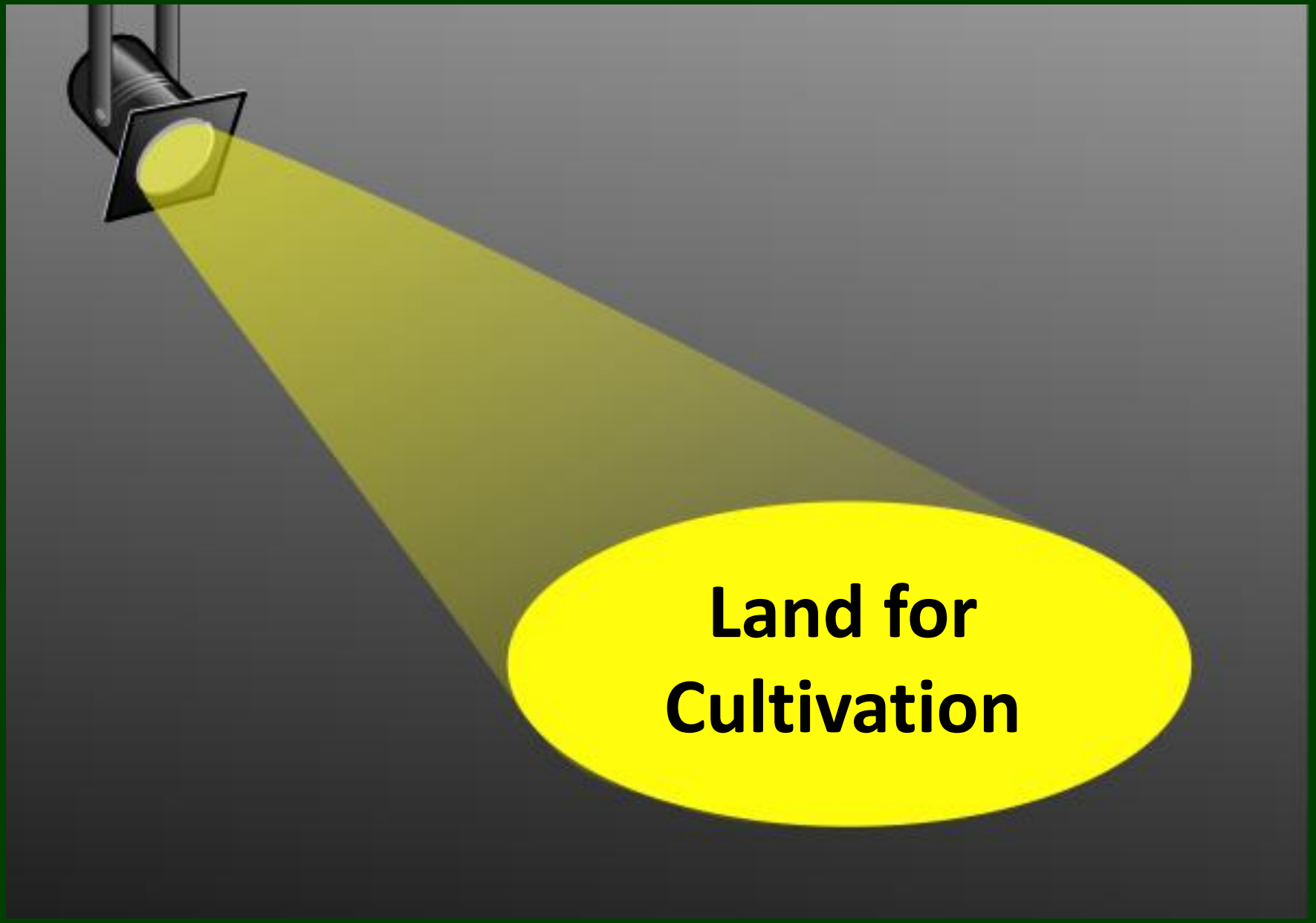
Due to their high levels of nutrients, freshwater marshes are one of the most productive ecosystems on earth.

The amount of tillable acreage is not finite

3. Manufacture Topsoil

with the highest concentration of organic matter and microorganisms, to spread on land to a depth of 1-5 inches. Little or no soil is usually used.

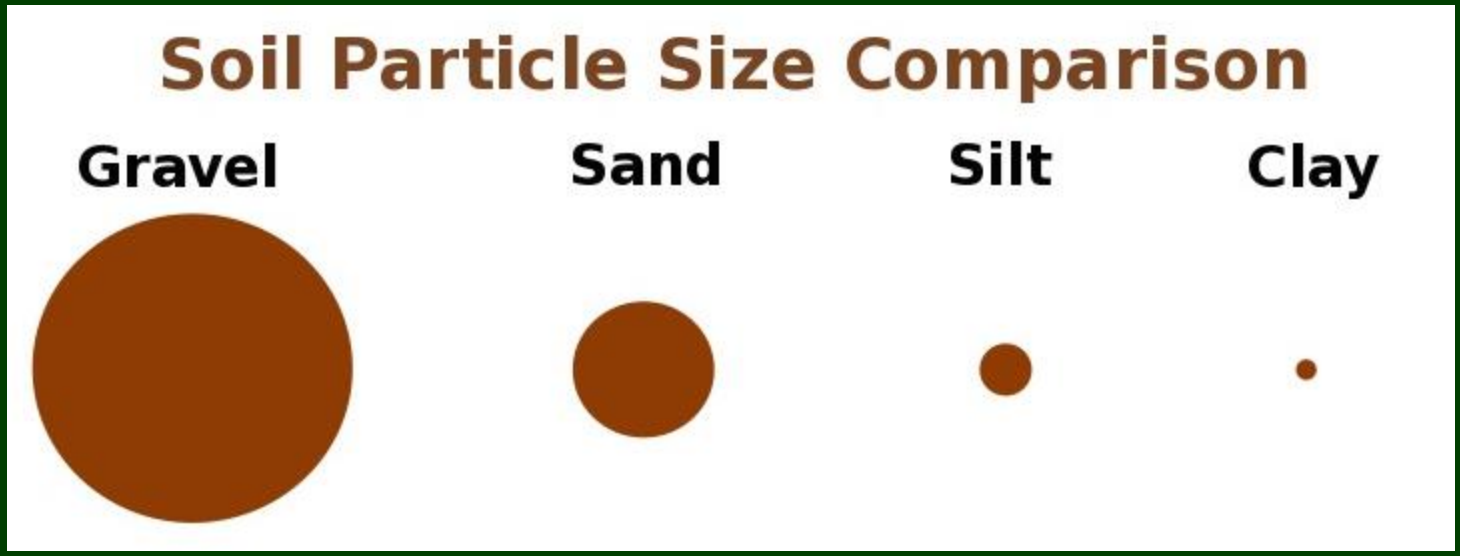
Materials used for growing mediums include: peat, food processing waste, wood products like bark and wood fiber, perlite, and recycled paper and cardboard. Other materials used include sand, vermiculite, and clays, and plant probiotics that promote root health.


Land for
Cultivation

The Pedosphere - the outermost layer of the Earth

The fertility of the soil refers to the ingredients in the soil that allow for plant and tree growth.
Things like nitrogen, potassium, phosphorous, etc.

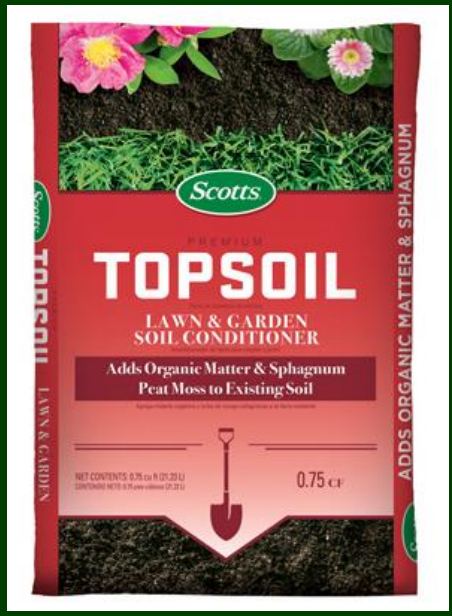
The loam or texture of the soil is the actual physical structure of the dirt itself, such as clay and sand, which affects the drainage of water.




CEDAR GROVE
PREMIUM
TOP SOIL
PLANTING MIX
Perfect for area leveling or filling
Local
Organic


CREEKSIDE
Premium
Topsoil
Ready to Use | Lawn & Garden | All-Purpose
NET WT. 40 LBS
Topsoil


New Plant Life
ALL PURPOSE TOP SOIL
EXCELLENT FOR
Lawn Seeding, Gardening, & Landscaping
DIRECTIONS
40 LBS. NET WT. (18.14 Kg)
WWW.MARKMANPEAT.COM

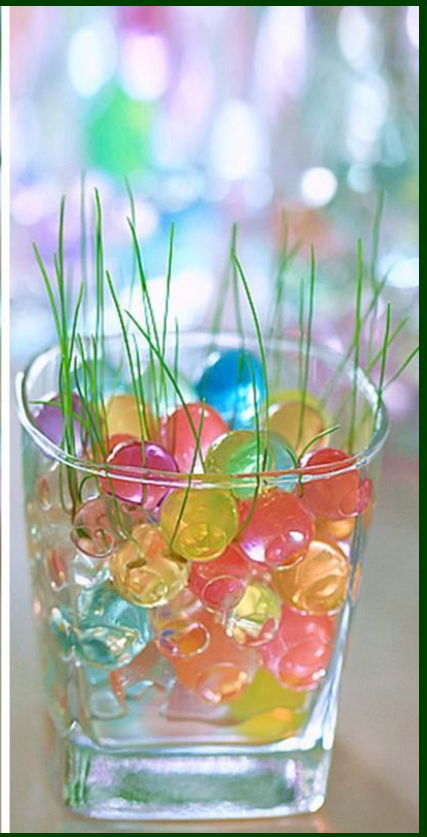

Scotts
TOPSOIL
LAWN & GARDEN
SOIL CONDITIONER
Adds Organic Matter & Sphagnum Peat Moss to Existing Soil
0.75 CF
ADDS ORGANIC MATTER & SPHAGNUM

There are a variety of soil mix combinations, but it is recommended using one that contains:

An organic component
(e.g. peat moss, compost, bark)
Vermiculite or perlite
(to help retain moisture)
Sand
Nutrients
Limestone
Soil mixes might also contain a slow-release fertilizer, or moisture-retaining treatments like “hydrogels” or “water storing crystals.”

Hydrogel in soil

Hydrogel in ground soil retains water and nutrients by plant roots, thus reducing the need for watering by 50 - 70 % for at least 5 years.



One Day a Year

A special cellulose-based hydrogel called Polyter ® claims it can absorb up to 500 times its initial weight in water.

Special polymers developed in laboratories reach ratios of up to 1,500! Such a capacity to retain water explains why they're usually used in small amounts in agricultural applications. Usually, only a couple pounds or kg is enough for an entire field.

Theoretically, it should be possible to design water-absorbing polymers in such a way as to make it possible to never need to irrigate at all. All that's needed is at least one day of natural rainfall in the year. All the water on that single day of rainfall could be absorbed by the hydrogel embedded in the soil. As time passes, it would slowly be released to the plants around it.

Industrial Chemistry

A processing center for producing top soil and liquid nutrients should be established in each bioregion of the country by the US Dept of Land Management


Great Dane

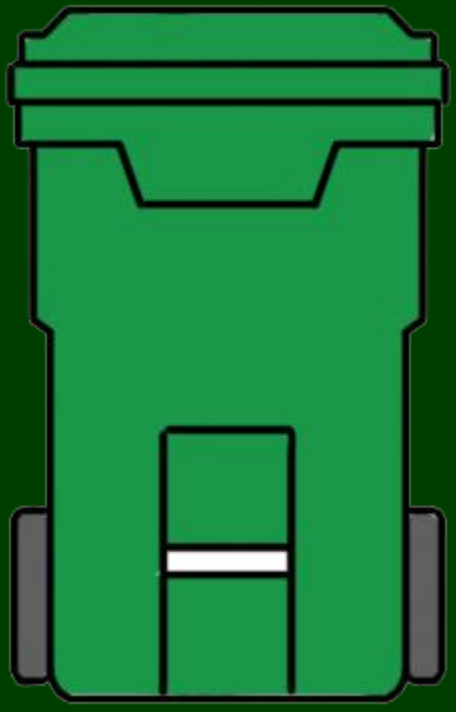

JCB

culls, leaves, peels, skins, rinds, cores, pits, pulp, stems, seeds, twigs

Composting organic materials produces methane and carbon dioxide

aerobic composting keeps the production to a minimum

50% of typical municipal garbage set out at the curb is compostable



21% food scraps
15% paper / cardboard
8% yard trimmings
8% wood waste

Correct Use of Mulch – ground cover – applied to the surface of soil to prevent erosion yet allow for water and gas movement

smothering

Moss provides stabilization for plant ecosystems the world over (non-vascular) small herbaceous (non-woody) plants

Seaweed, is a naturally occurring fertilizer that floats freely on the ocean surface (> 150’) and is abundant in the Atlantic Ocean and the Gulf of Mexico

A 5,000-mile seaweed belt is headed toward Florida
March 22, 2023


Before

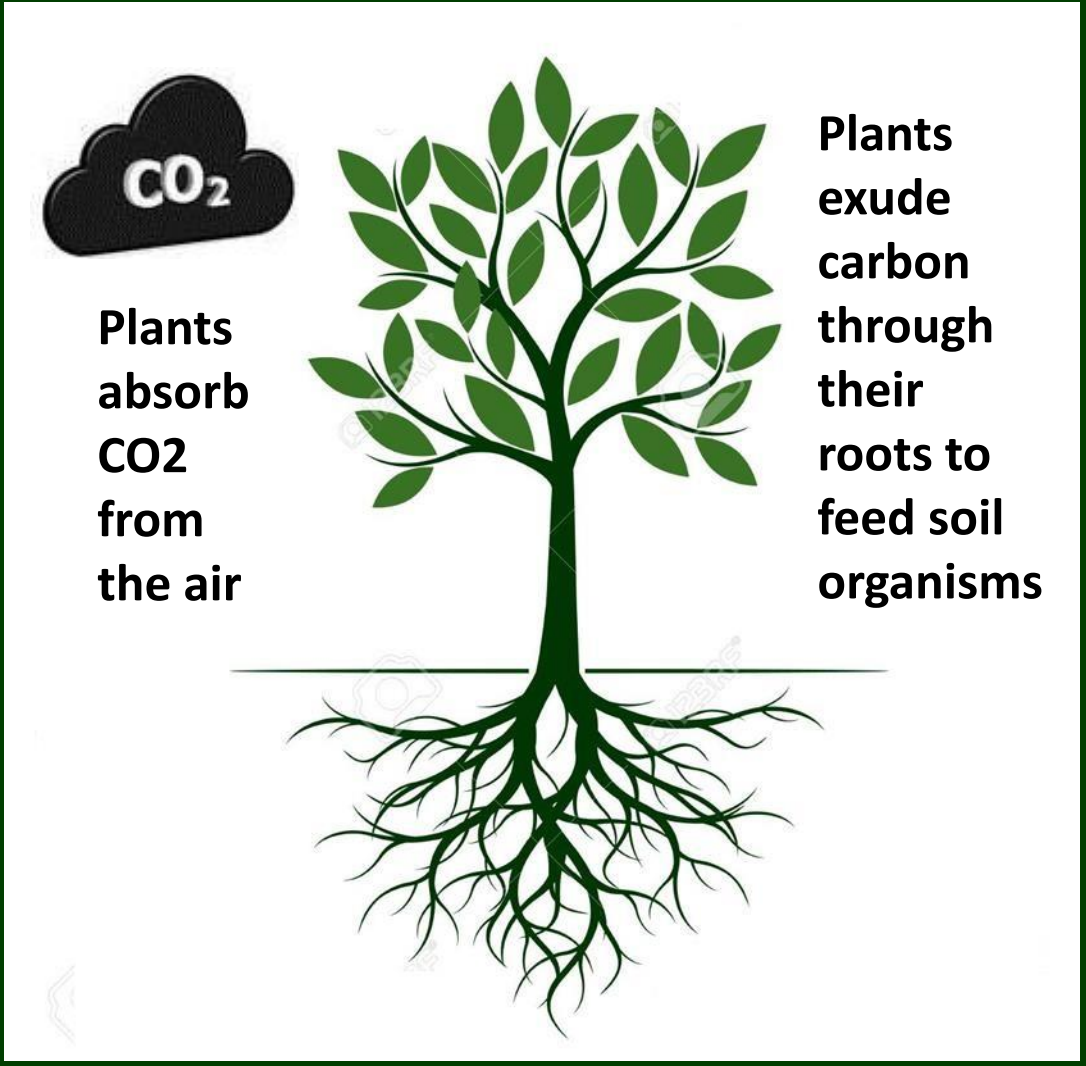

After

Nutrient Removal

Longer Crop Rotation Cycles

Carbon Sequestration

The average person in the United States produces a whopping 15.5 tons of carbon dioxide a year compared with 1.9 tons for an average person in India.



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# Increase Green Acreage in Urban Areas
concrete = 15F hotter at night

Climate Adaptation

Prairie grass root systems are drought resistant, hold soils in place, and absorb water.

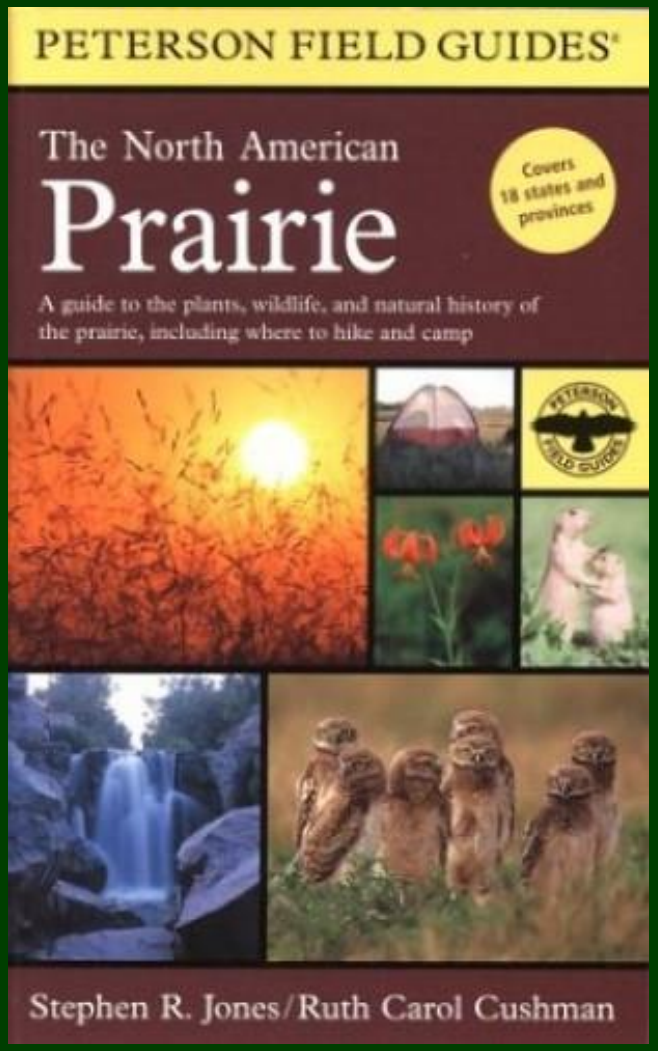
“Native plant communities” form recognizable units that repeat over space and time.

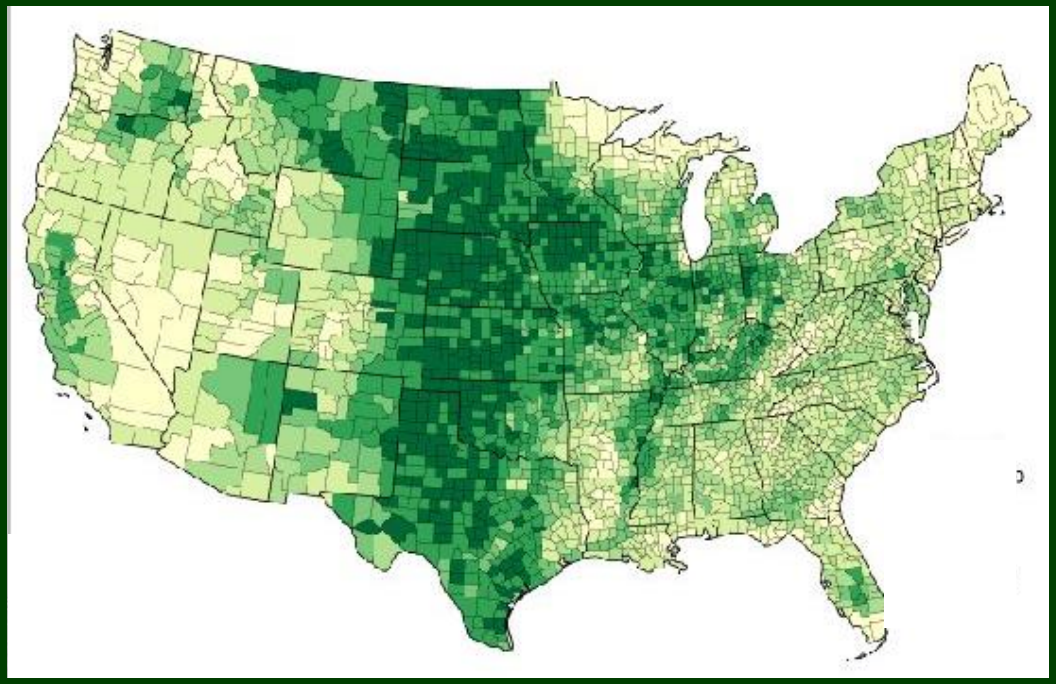
suited to land with low fertility

How to Create a Meadow

https://youtu.be/9vSkl9fHW70

Grasses grow at the stem, seasonal fires remove the litter layer, which allows water and nutrients to penetrate the soil.

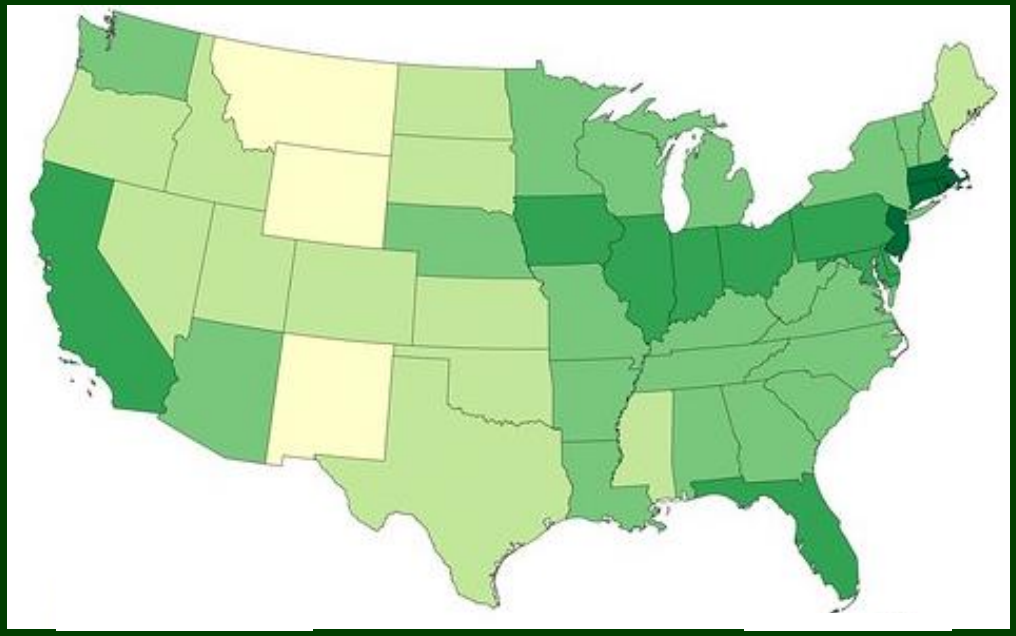




Loss of Our Food Supply

Concentration of
Arable Farmland US

Value of Farmland



Creates Opportunities for New Farm Operations, e.g., small, specialty cash crops

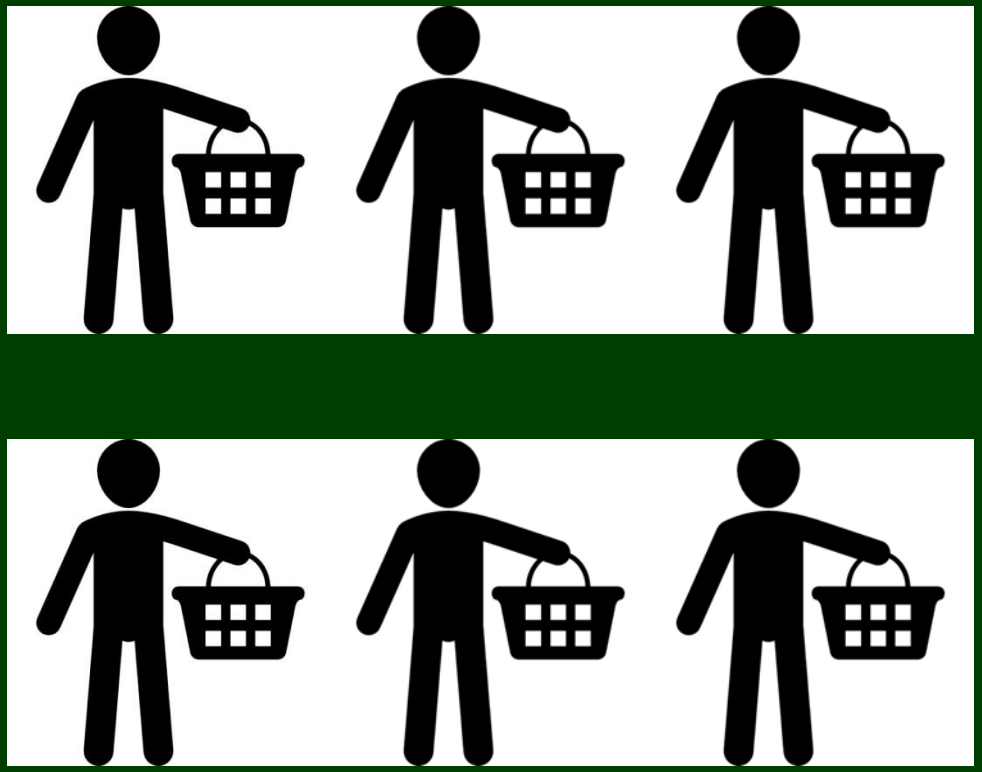
?

natural
fresh
local

organic agriculture has a 25% lower crop yield compared to conventional farming

And Food to Feed the World

at the rate soil is being lost, only 60 crops remain



“plant forward dining”

There are more than 50,000 edible plants in the world, but just 15 of them provide 90 percent of the world's food energy intake. Rice, corn, and wheat make up two-thirds of this.

sugarcane
corn
rice
wheat
potatoes
soy beans
cassava
tomatoes
bananas
onions
apples
grapes

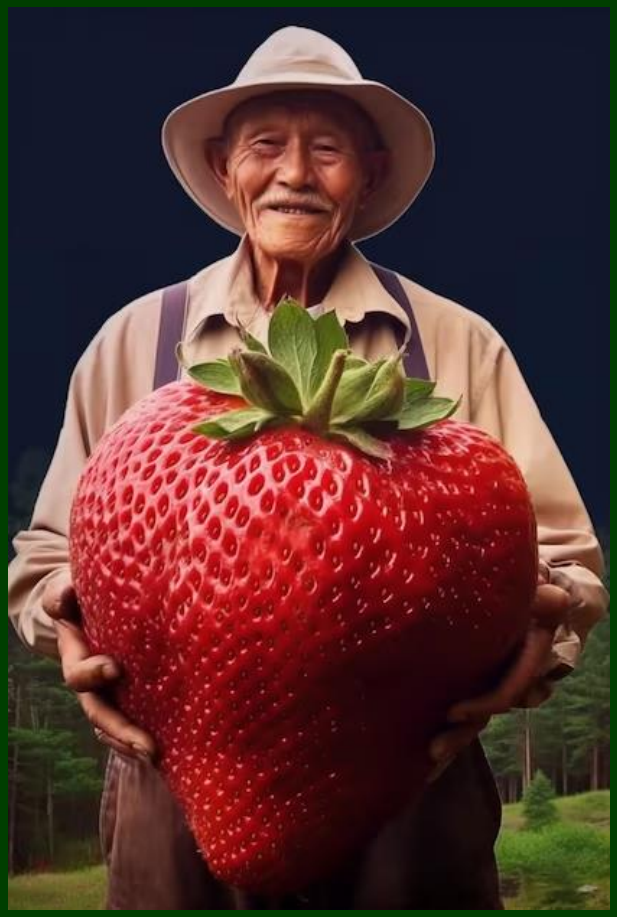
(by metric ton)

4 lbs per person per day

What is the most edible plant?
Dandelion
Known as a ubiquitous weed worldwide, dandelion has been a staple part of many food cultures for millennia, as all parts of the plant, at every stage of its lifecycle, are edible.

Create a Database

to determine the ideal growing conditions for the 15 most common edible plants



Edible self-seeding perennials

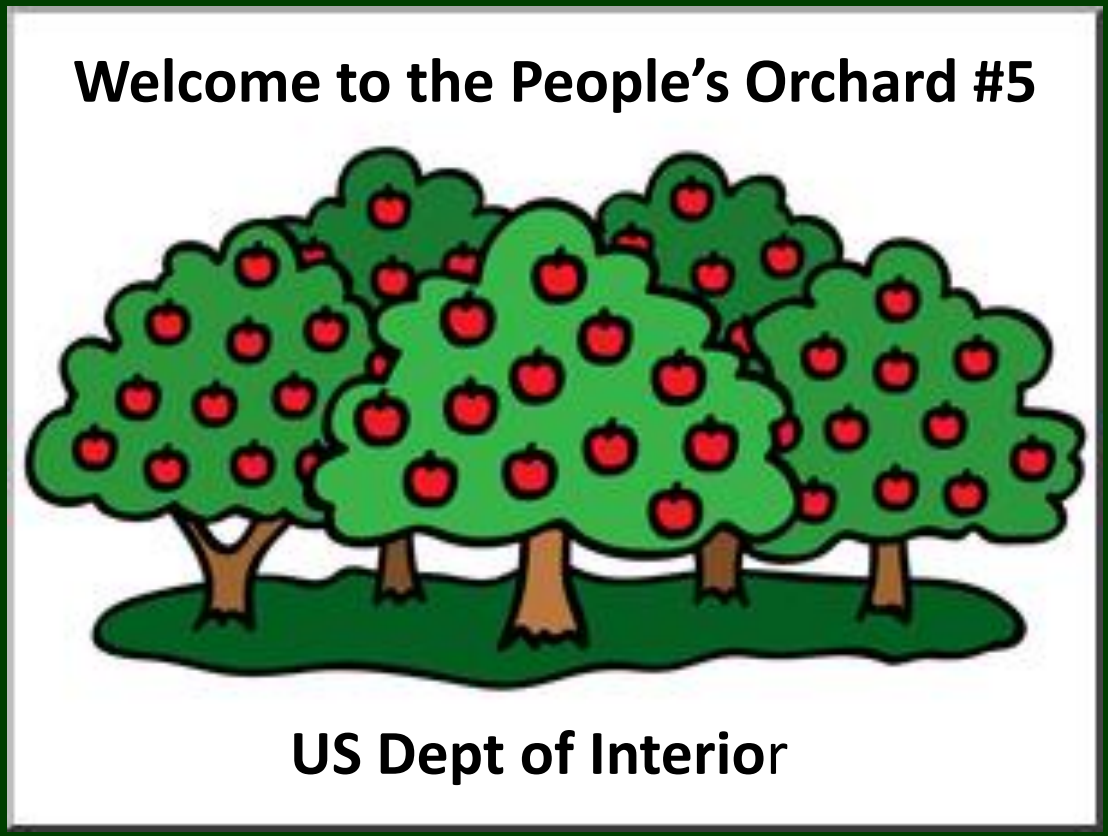
plants that will drop seeds and germinate on their own the following year

onions, cabbage, beets, potatoes, tomatoes, squash, pumpkins, spinach, carrot, lettuce, radishes, broccoli, cucumbers, berries

Public Orchards

a collection of fruit trees shared by communities and growing in publicly accessible areas such as public greenspaces, parks, schools, churchyards

The government will declare eminent domain over all existing commercially, for profit operated orchards, and open these for the people to acquire food



Less Confinement Agriculture - The Availability of Meat and Dairy Products will Increase due to the Expansion in Acreage for Pastureland

"The methane that cattle produce is oxidized in the atmosphere, and comprises only 3.3% of US GHG emissions"

Cultured Clean Meat roughly $17 per pound

"meat grown directly from animal cells - rather than raising a whole animal, we grow only the meat we want to eat"

first large-scale commercial plant opened in Glenview, IL:

187,000 sq. ft., with potential to produce up to 30 million lbs. of ground cultivated chicken annually

4-6 weeks vs 18-24 months

Animal Integration - Bureau of Land Mng't, US Dept of Interior, Open Range

Modern cows are a human creation,
they wouldn't even be able to survive in the wild.

Regenerative Agriculture

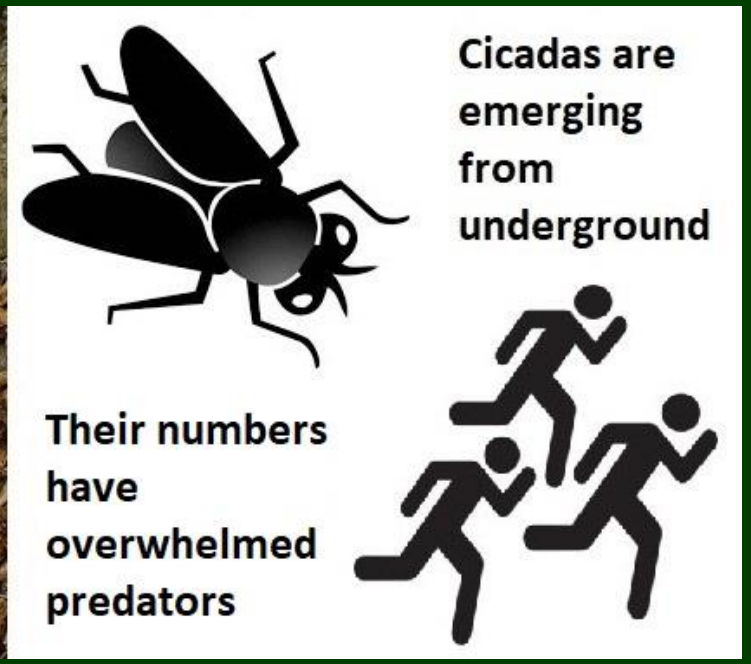
“How Australia is Regreening its Deserts Back into a Green Oasis” YouTube 2022 for an emerging Asian market for food

Self-Driving Farm Robot Uses Lasers To Kill 100,000 Weeds An Hour, Saving Land And Farmers From Toxic Herbicides

Biopesticides

Toxic products carry the signal word CAUTION, WARNING, or DANGER on their labels

Plants: dill, catnip, garlic, lavender, lemongrass, mint, etc



Biopesticides, in general:

have a narrow target range and a very specific mode of action, suppress, rather than eliminate, a pest population, and present no residue problems

canopy

to ground

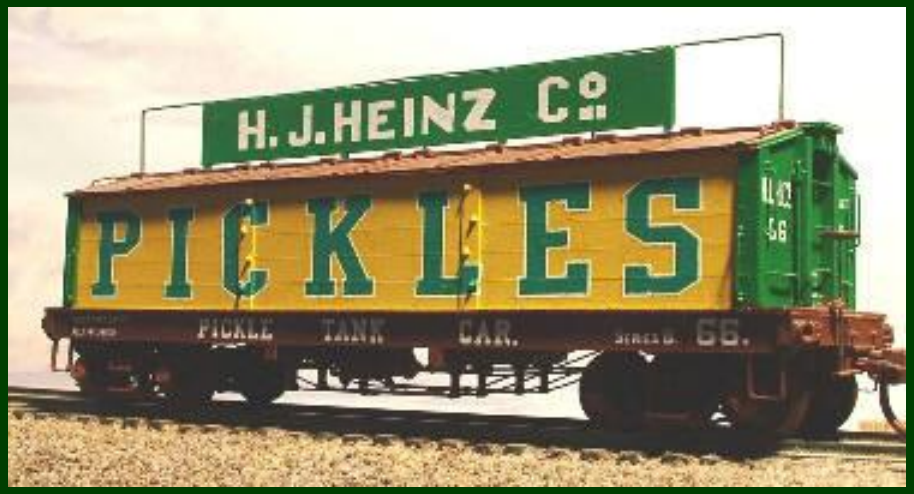
Habitat: vertical structure of friendly plant communities for insects

Railroads move millions of tons of raw materials used to produce fertilizer each year.
One rail tank car carries enough to fertilize 770 acres of corn, or approximately one farm.

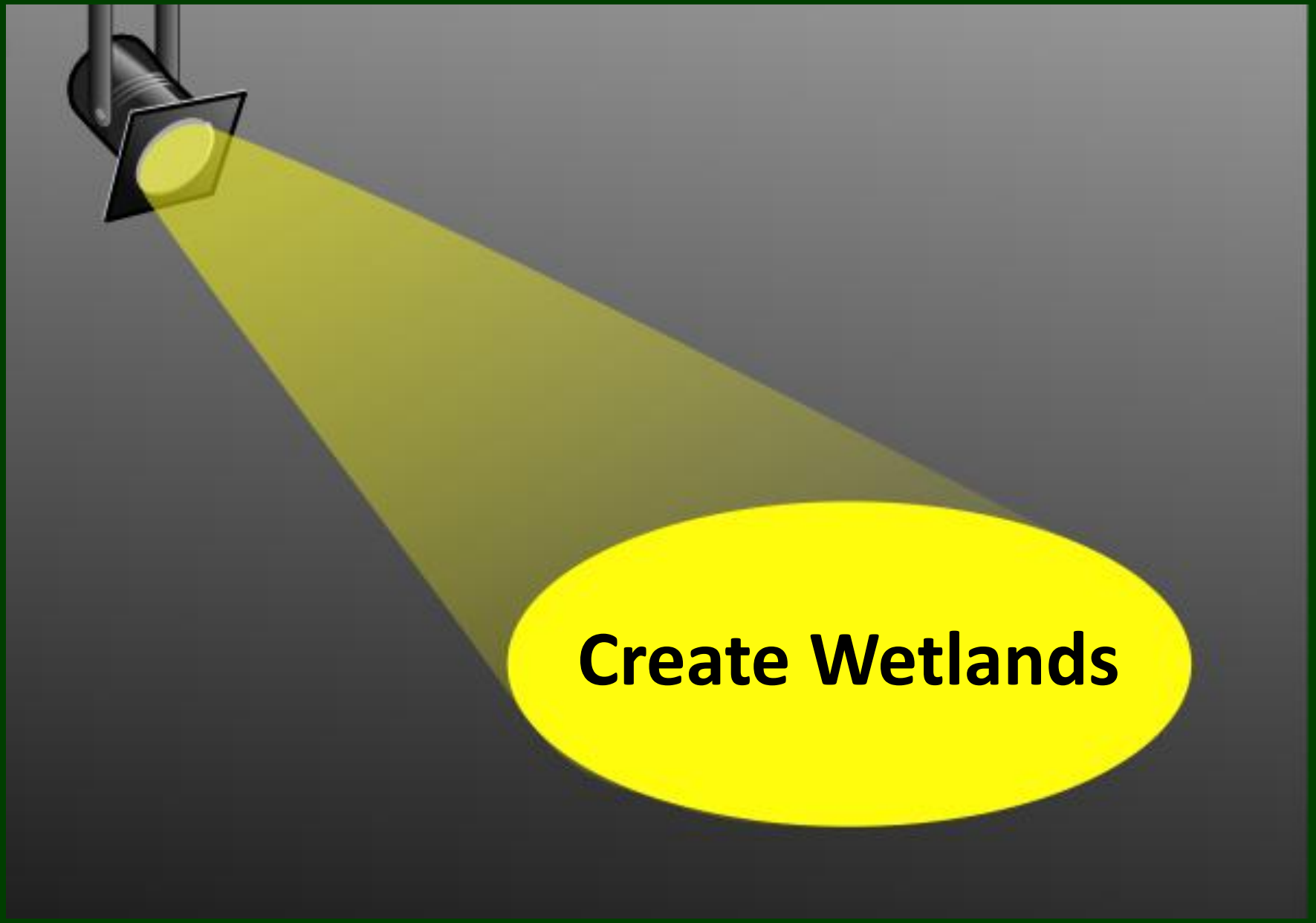
Food Miles

It is estimated that the meals in the US travel about 1,500 miles to get from farm to plate

How far produce traveled to a Chicago “terminal market” where wholesalers buy produce to sell to grocery stores and restaurants



Apples: 1,555 miles
Tomatoes: 1,369 miles
Grapes: 2,143 miles
Beans: 766 miles
Peaches: 1,674 miles
Winter Squash: 781 miles
Greens: 889 miles
Lettuce: 2,055 miles

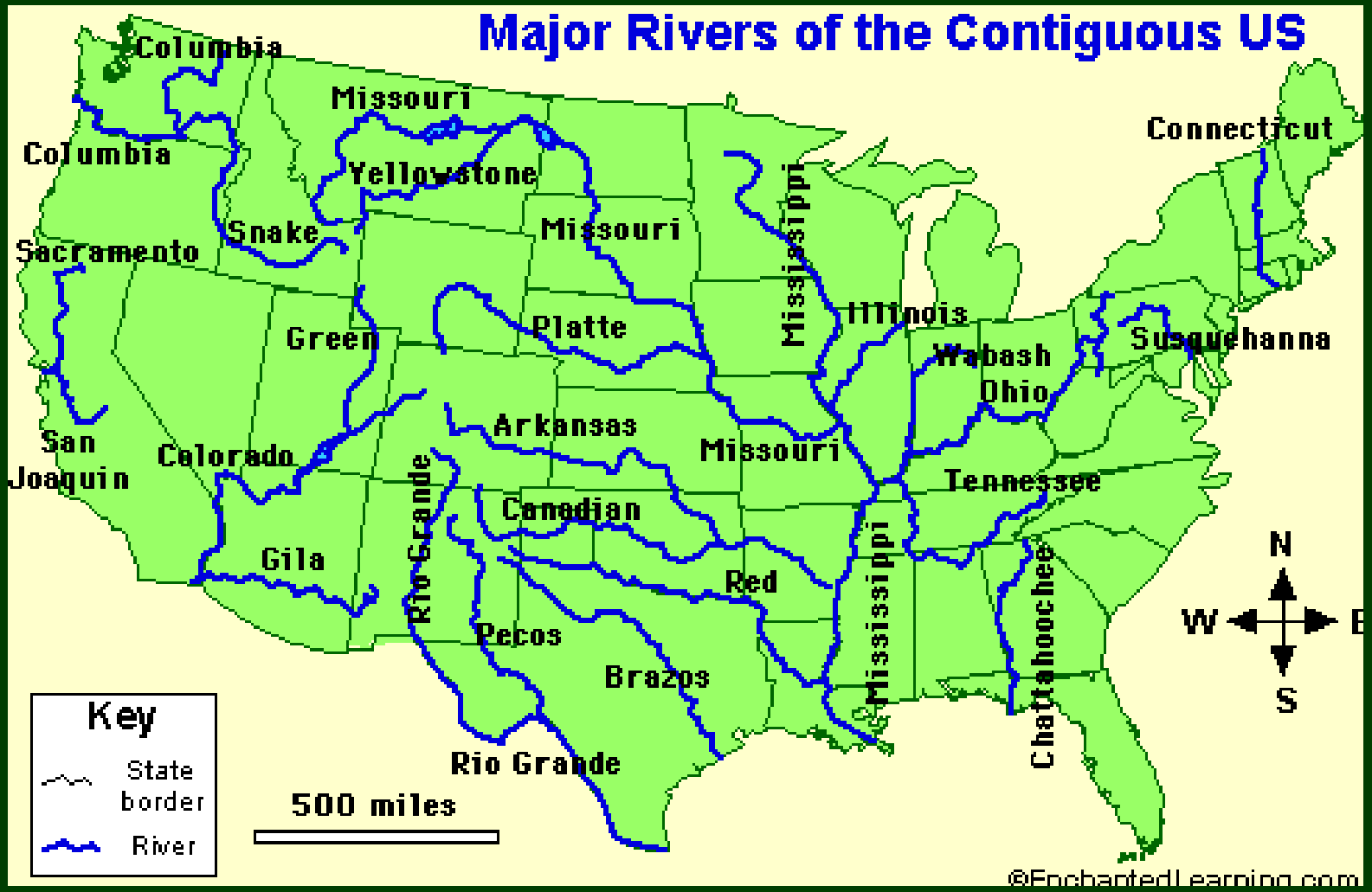

Create Wetlands

A swamp is a wetland permanently saturated with water and dominated by trees

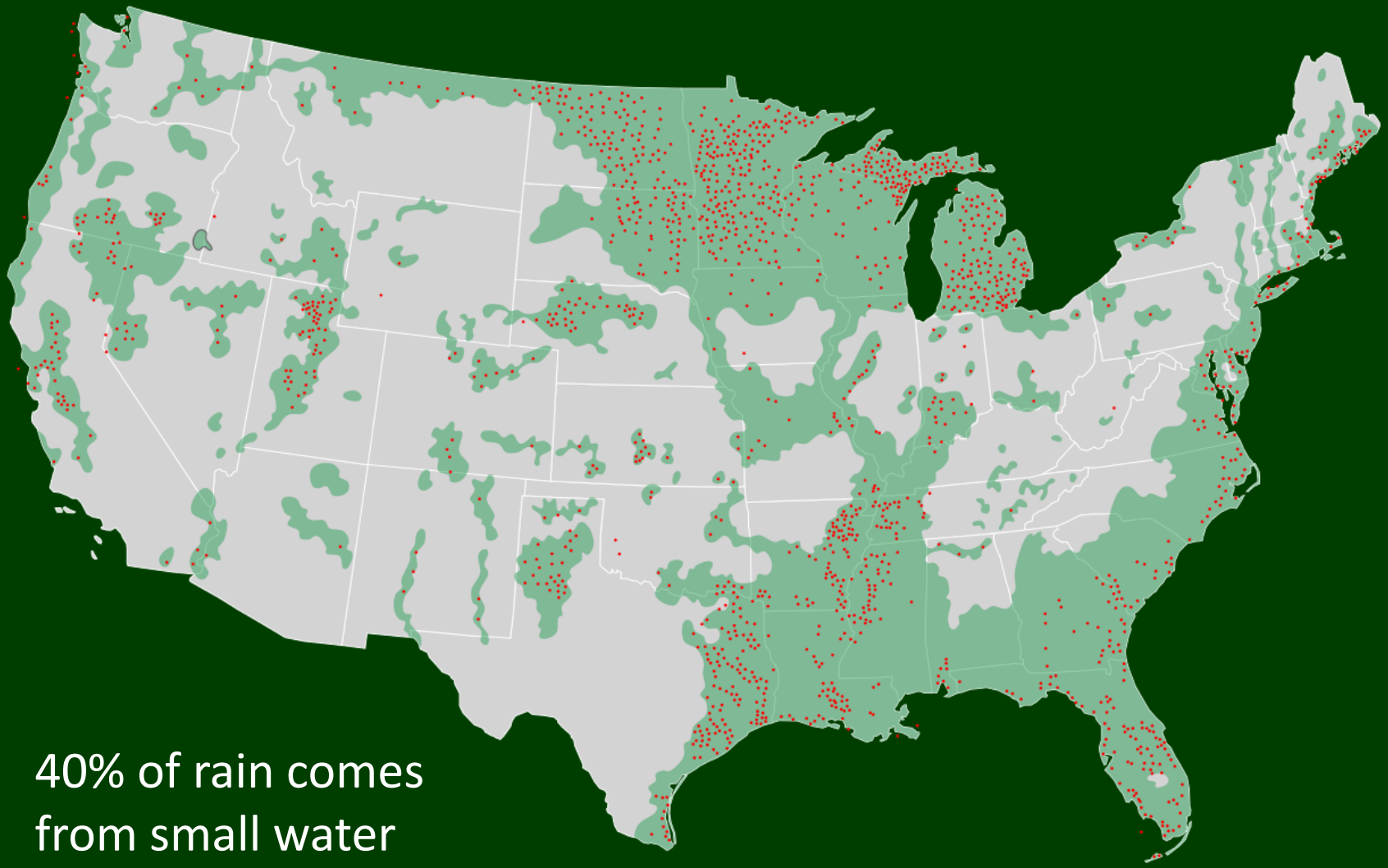
hydrology

A marsh is a wetland dominated by herbaceous plants such as grasses or rushes, and usually form along the shallow edges of lakes and rivers

Potential Wetland Locations



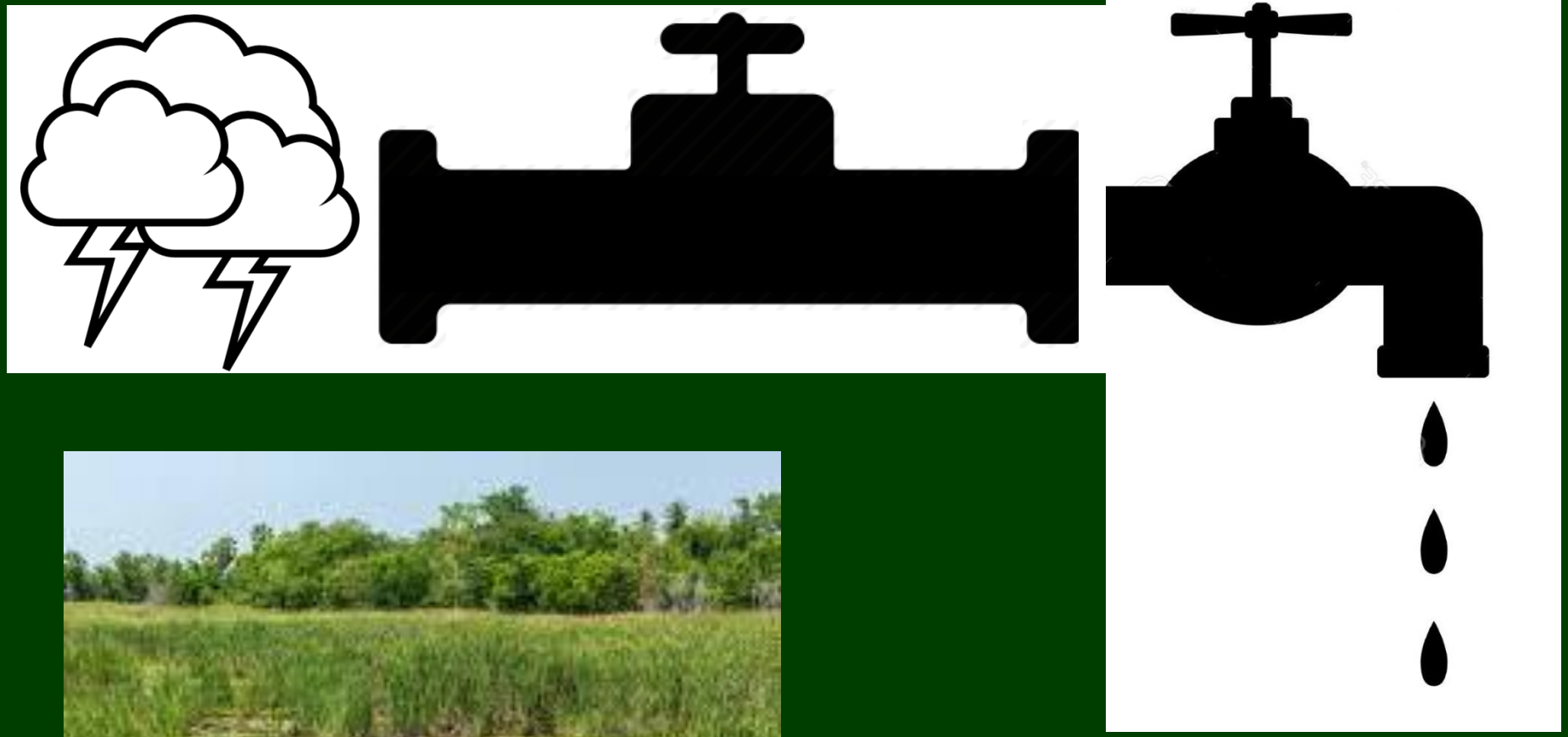
Existing Wetland Areas in the US



40% of rain comes from small water cycles

A not-so-obvious benefit of wetlands is flood control, holding storm water and releasing it gradually, reducing flood damage

Vegetated wetlands also can protect shorelines against erosion caused by waves because they can absorb much of the energy



Filtration of Impurities

Chemical Detoxification

Many pollutants are washed by rainfall into wetlands, which includes fertilizers, pesticides, grease and oil from cars and trucks, and road salts.

The roots of wetland plants bind and remove as much as 90% of sediments present in runoff.

Dead plant leaves and stems break down in the water to form small particles of organic material called “detritus” which feeds many small aquatic insects, shellfish, and small fish.

Later they are food for larger predatory fish, reptiles, amphibians, birds, and mammals.

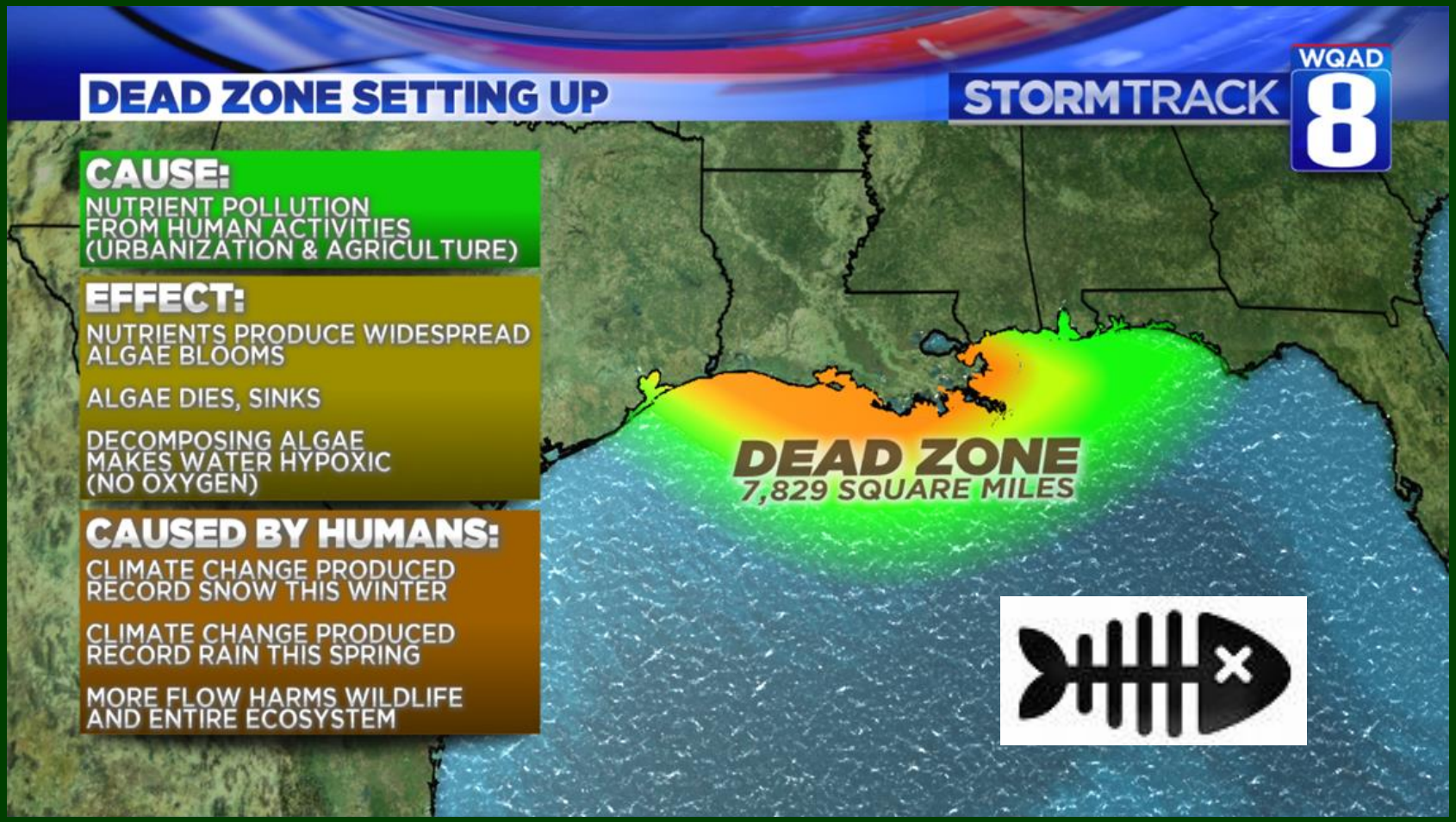
Ocean Water Sources

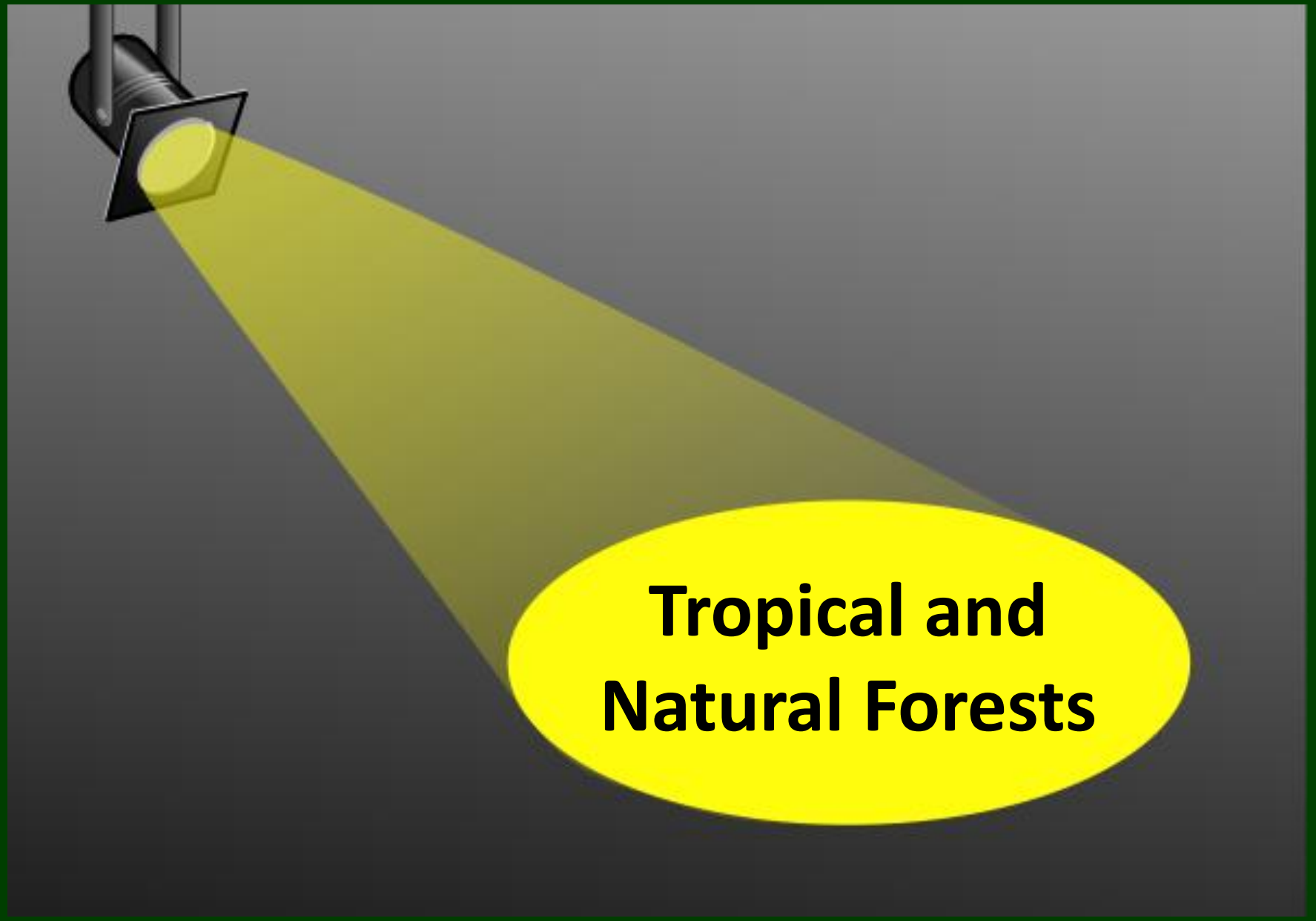
A river basin is made up of many different watersheds

Some major drainage basins of the United States:

Atlantic Seaboard
Gulf of Mexico
Great Lakes--St. Lawrence
Rio Grande River
Pacific Northwest
Texas Gulf Coast

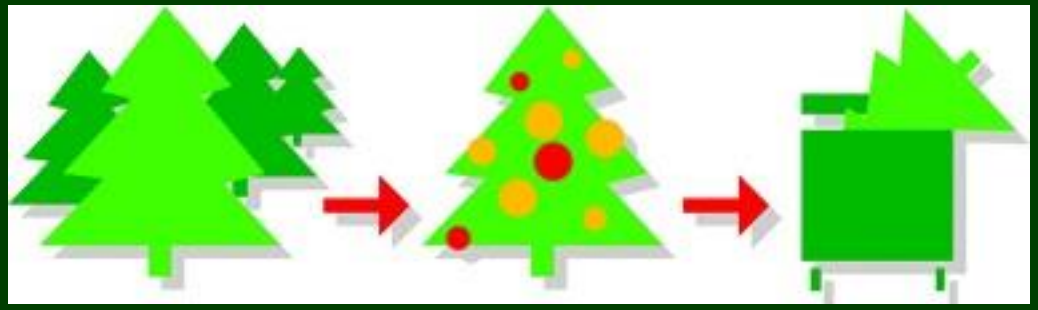
Mississippi “Dead Zone” 7,829 sq miles




Tropical and
Natural Forests

There are about 3 trillion trees on Earth, which is only half as many as 12,000 years ago, at the start of human civilization.

People cut down an estimated 15 billion trees each year.



The average tree takes up 50 pounds of carbon dioxide a year.

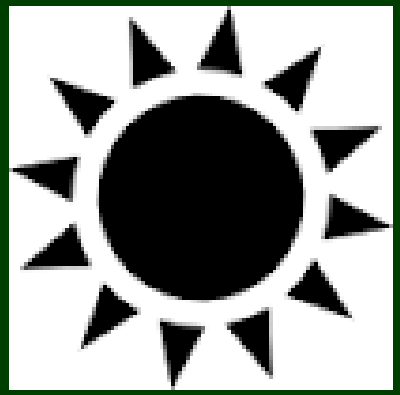
Trees should not be planted where they didn’t grow before, such as in native grasslands.

Rainforests of the World

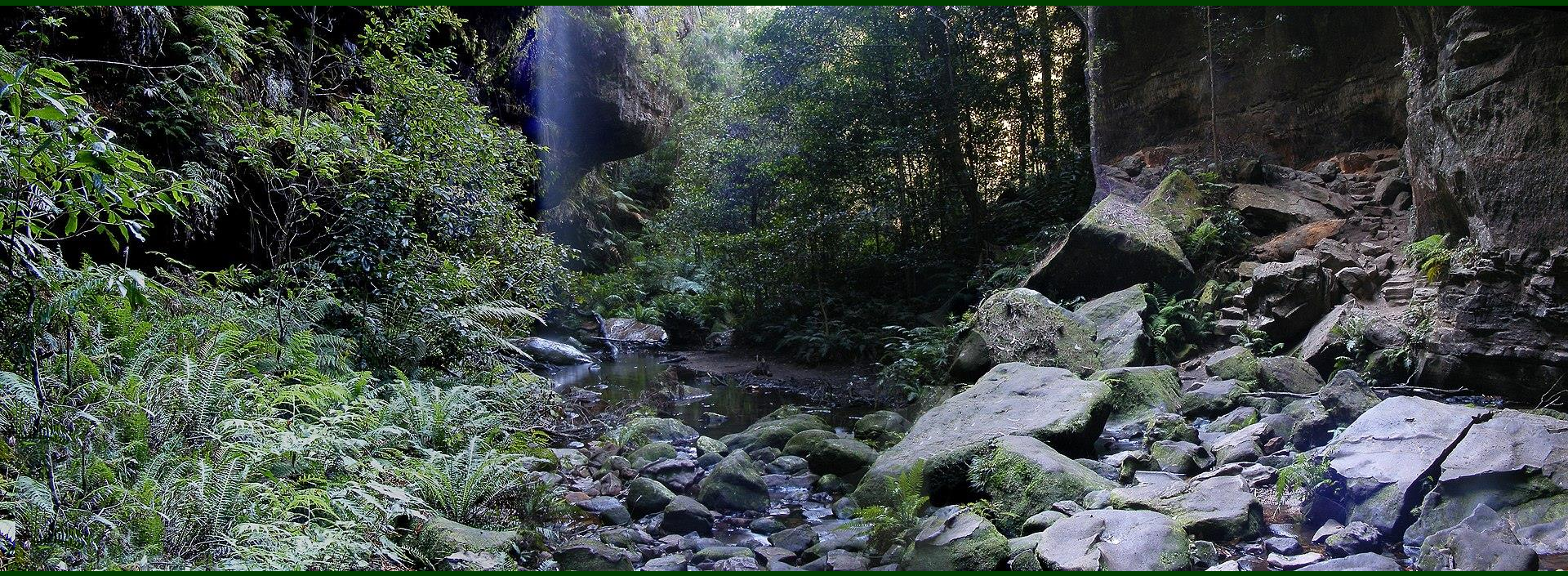
Rainforests are Earth's oldest living ecosystems, with some surviving in their present form for at least 70 million years.

Rainforests cover less than 3 percent of the planet.

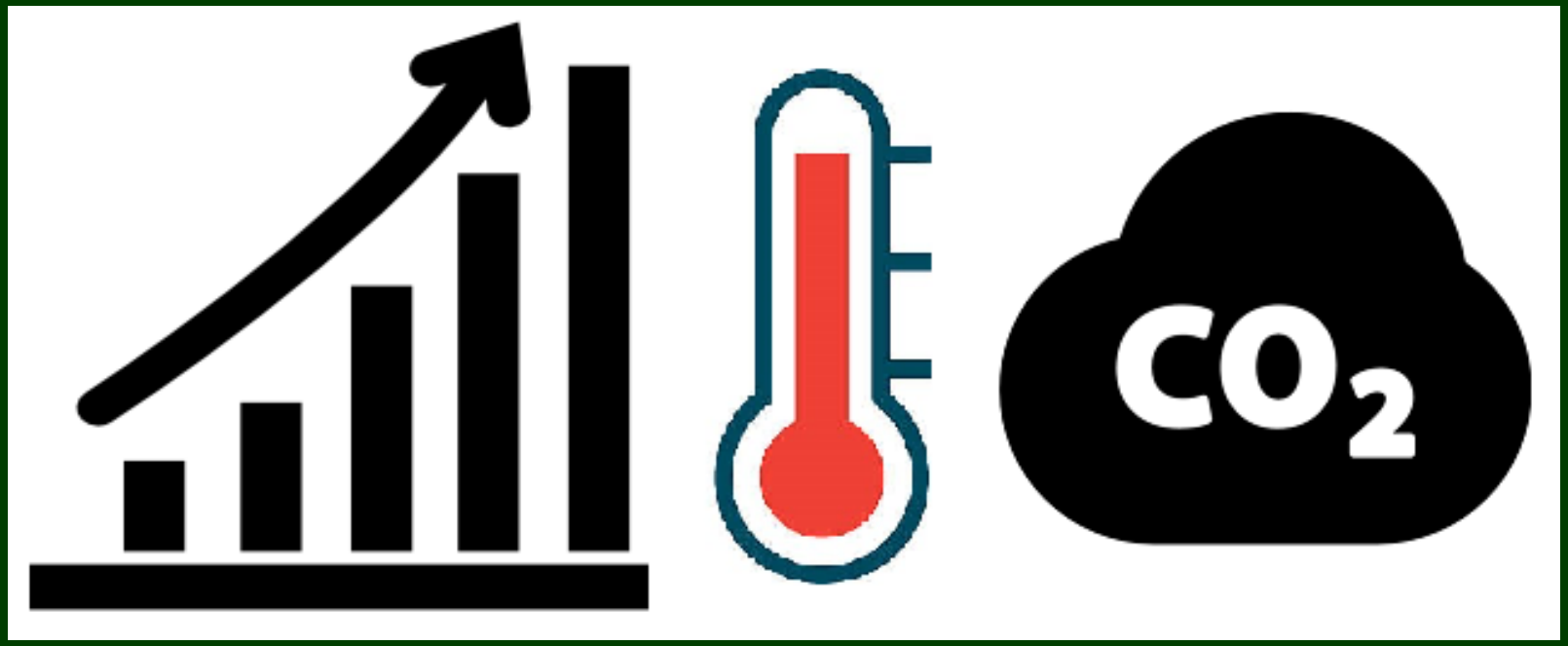
Of the approximately 14.5 m sq kilometres of tropical rainforest that once covered Earth's surface,
only 36 % remains intact.
Just over a third, 34%, is completely gone,
and the last 30 % is in various forms of degradation.



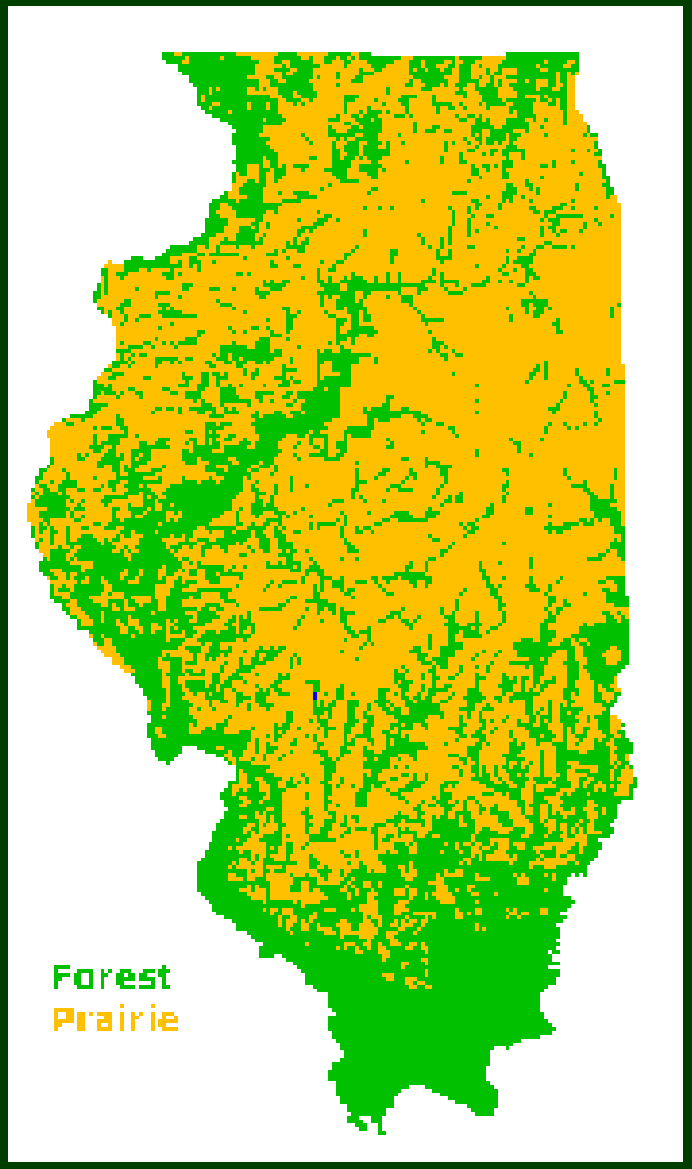
The forest floor of a rainforest, receives only 2% of the sunlight - only plants adapted to low light can grow in this location.



One acre of forest can absorb 4.5 to 40.7 tons of carbon dioxide and produce four tons of oxygen. The capture is enough to offset the annual carbon emissions produced by driving your car 26,000 miles.



US National Forests



300,000 Carloads of Wood Shipped Annually

Need to Restore Forests Lost to F**ire**

“a tree farm is not a forest”

GMO Trees

Marauding insects have become a leading threat to the nation's forests over the past decade, a problem made worse by drought and a warming climate

Government

world-wide intervention and implementation of this plan is necessary for preservation of the planet

US Food Co-Op

Recommended Step for Implementation:

Nationalization of All US Food Production for the People and Not for Profit by Agribusiness

People's Food Depository #5

Television series features the industrial production lines of major food companies

Sustainably Sourced Ingredients

foods that are grown, cultivated, packaged, and transported in a sustainable way


Earth 2030
If we do nothing

You are hereby invited to be a point person in your Congressional District as part of our "Adopt-A-District'' for the Earth Bill campaign Illinois Districts Open

Question Submitted to Each of You: Are you going to advance Chuck's plans to save the earth?

1. Yes, it is well thought-out and I am convinced this is what we need to do, and quickly.

2. Maybe later, since I have other things to do right now.

Incident upon return of starship USS Enterprise

"Captain, our sensors indicate it is an uninhabited planet with no apparent life forms, a high surface temperature, and an atmosphere of CO2"

Thank You for Coming!

Charles Paidock