

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



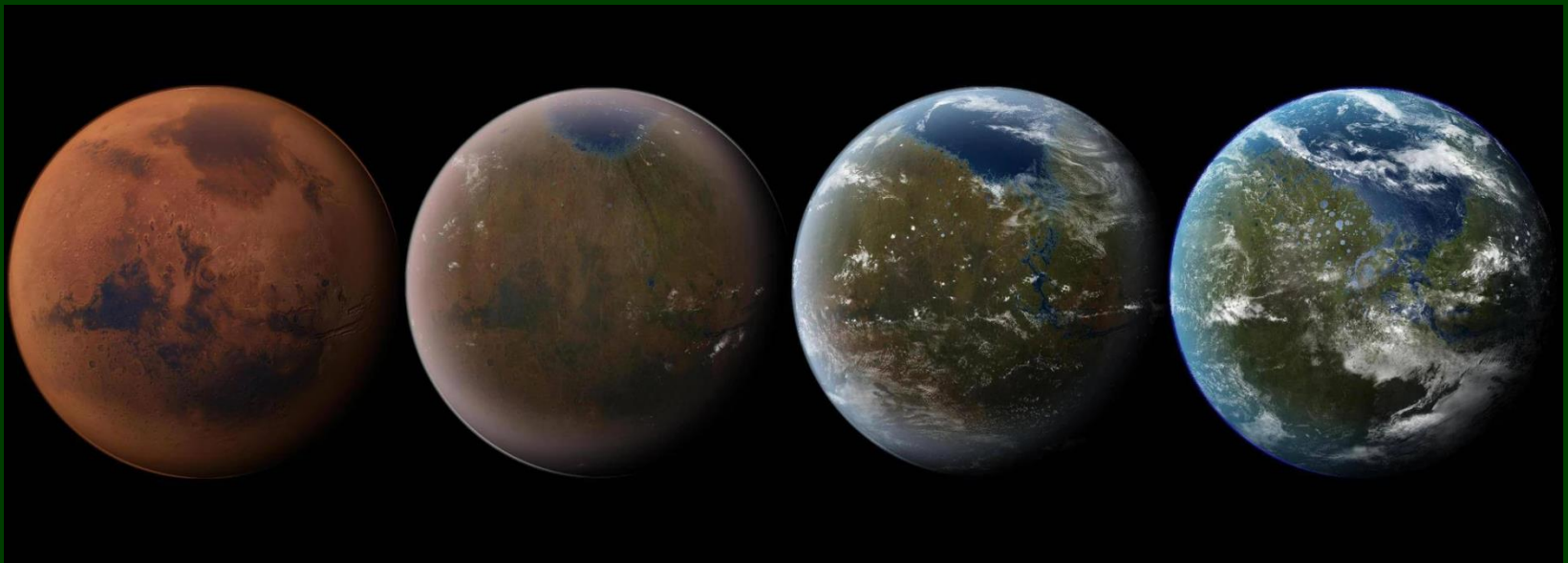
By Charles Paidock  
Secretary, Chicago Greens

A 3D-rendered spotlight fixture is positioned in the upper-left corner of a dark gray background. The spotlight is angled downwards and to the right, casting a wide, conical beam of light. The beam is a gradient of yellow-green, becoming more intense as it focuses on a bright yellow oval in the lower-right quadrant. Inside this oval, the text "Why Something Must Be Done" is written in a bold, black, sans-serif font, centered horizontally and vertically.

**Why Something  
Must Be Done**

**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

returned to normal

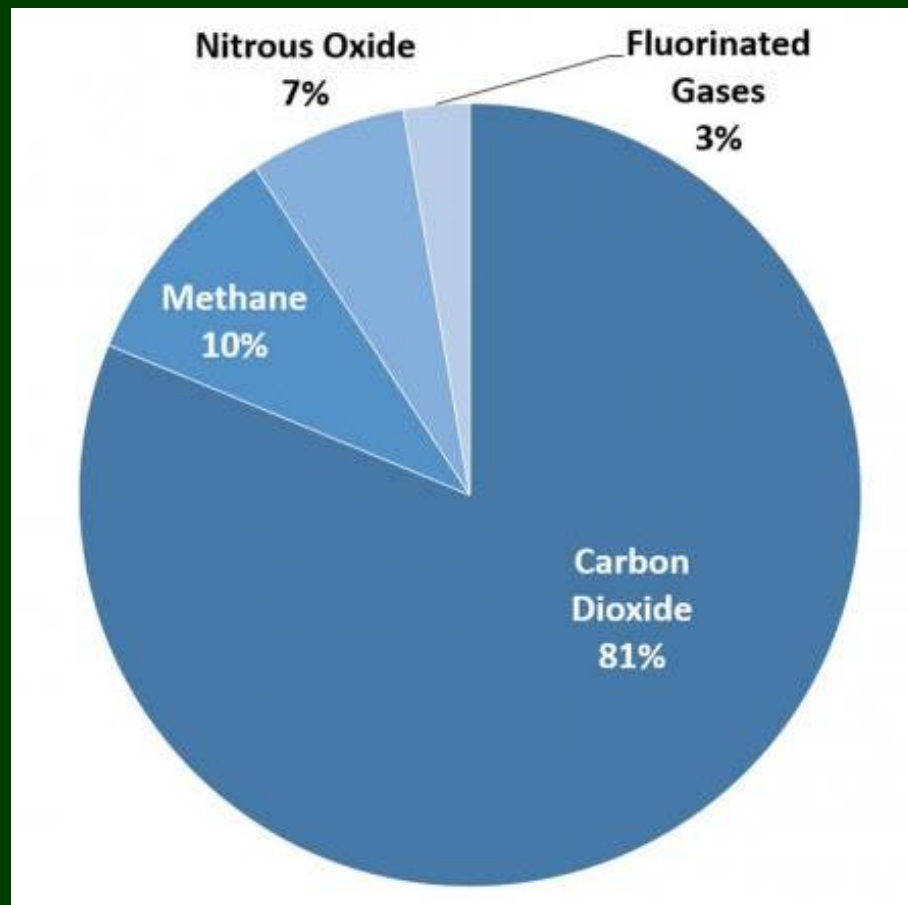


## **Earth 2030 If we do nothing**

The Anthropocene Epoch is a unit of geologic time, used to describe the most recent period in Earth's history when human activity started to have a significant impact on the planet's climate and ecosystems.



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  
“mutually agreed upon coercion”



**Transportation  
is the largest  
and fastest-  
growing  
source of U.S.  
greenhouse-  
gas emissions**

**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.

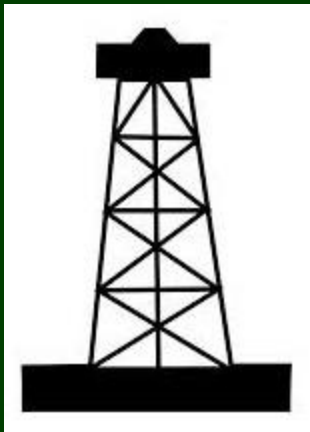
**8. Sinopec Group** - Chinese oil and gas company with 51 projects in more than 25 countries.

## Biggest Multinational Companies in the World

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

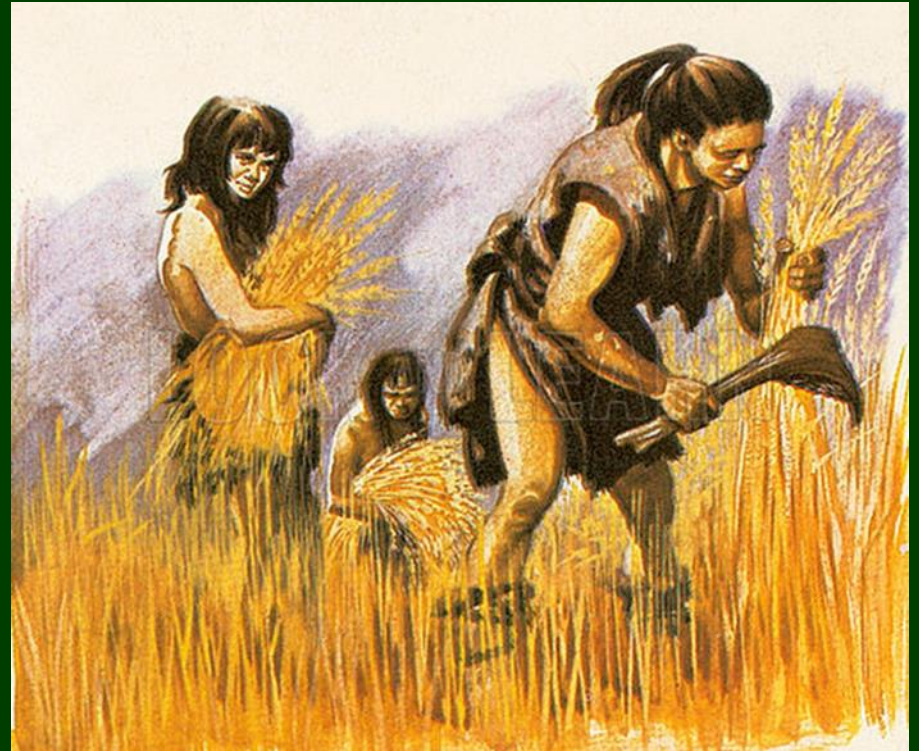
**12. Exxon Mobil Corporation** - among the biggest companies in the world in terms of revenue.

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





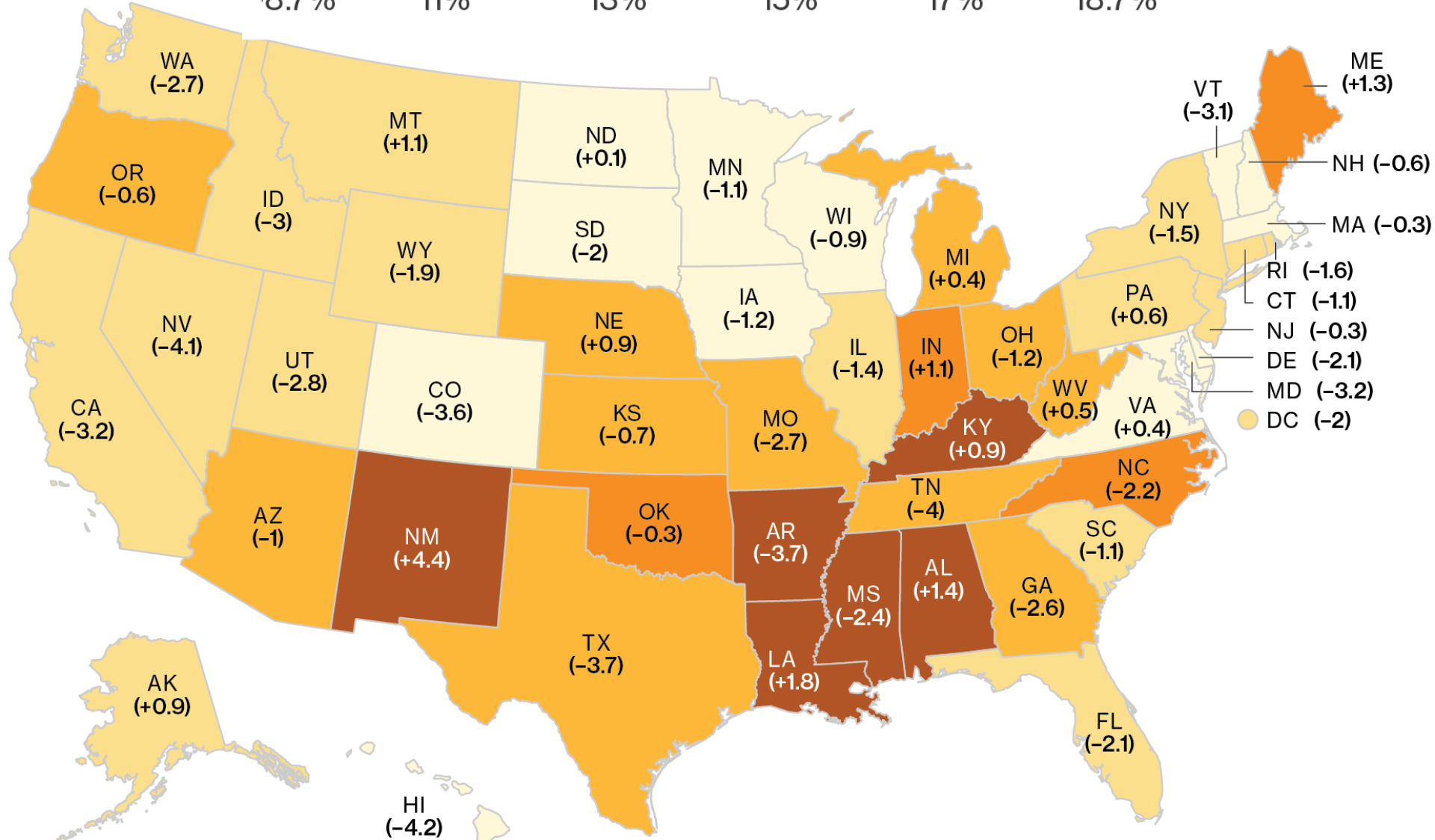
# Transition from hunter-gathering / foraging during neolithic period to predictive food sources through with tillage and intensification



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





Projected (1) increases in temperatures, (2) changes in precipitation patterns, (3) changes in extreme weather events, and (4) 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

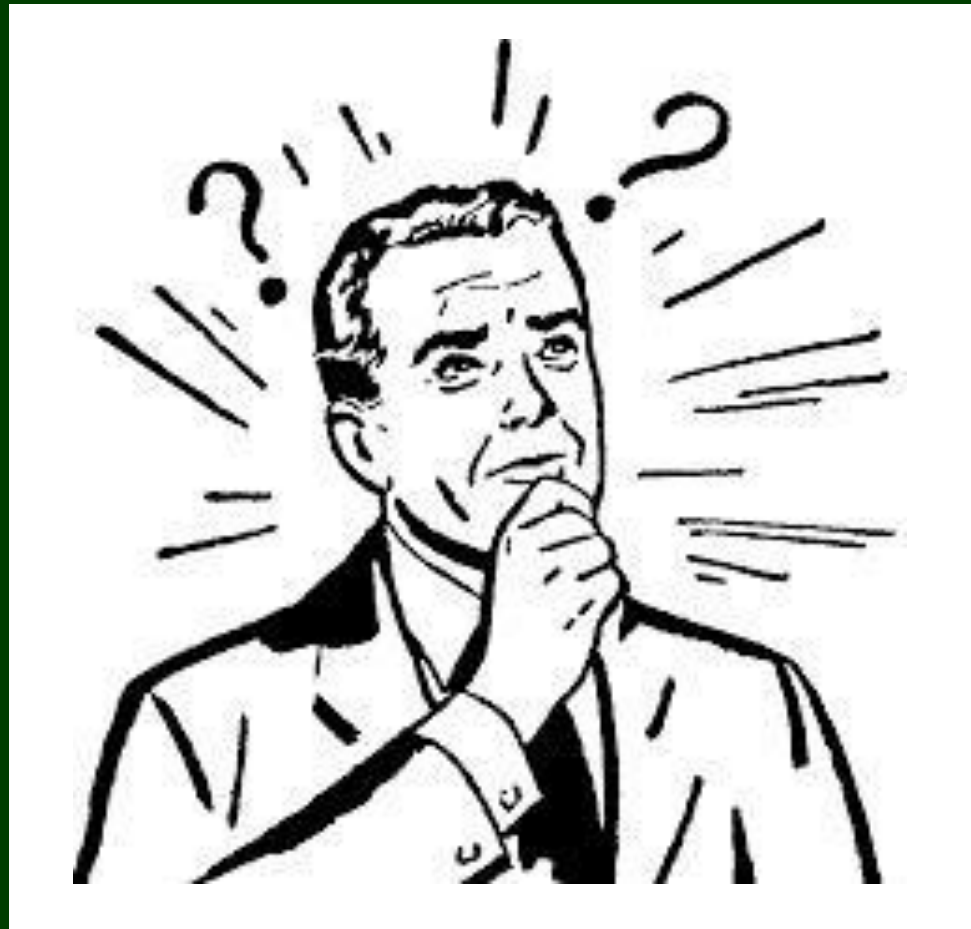
In the US,  
1 in 7  
People  
Struggles  
with  
Hunger



In the US,  
1 in 7  
People  
Struggles  
with  
Hunger

# What Can We Do to Mitigate this Situation?

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



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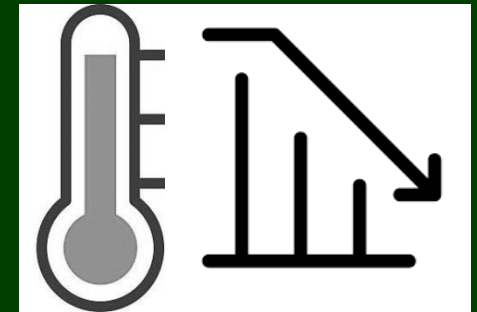
Answer:

- 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 Expand All US National Forests, and Rainforests Around the World

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

Deciduous trees lose their leaves in autumn

## 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. Engage in Topsoil Management to Improve and Expand Acreage for Food**

Produce a ground cover 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.

A 3D-rendered spotlight is positioned in the upper-left corner of a gray gradient background. The spotlight is angled downwards and to the right, casting a wide, conical beam of light. The beam is a lighter shade of yellow, while the central area where it hits the ground is a bright, solid yellow oval. Inside this oval, the words "Land for Cultivation" are written in a bold, black, sans-serif font, centered horizontally and vertically.

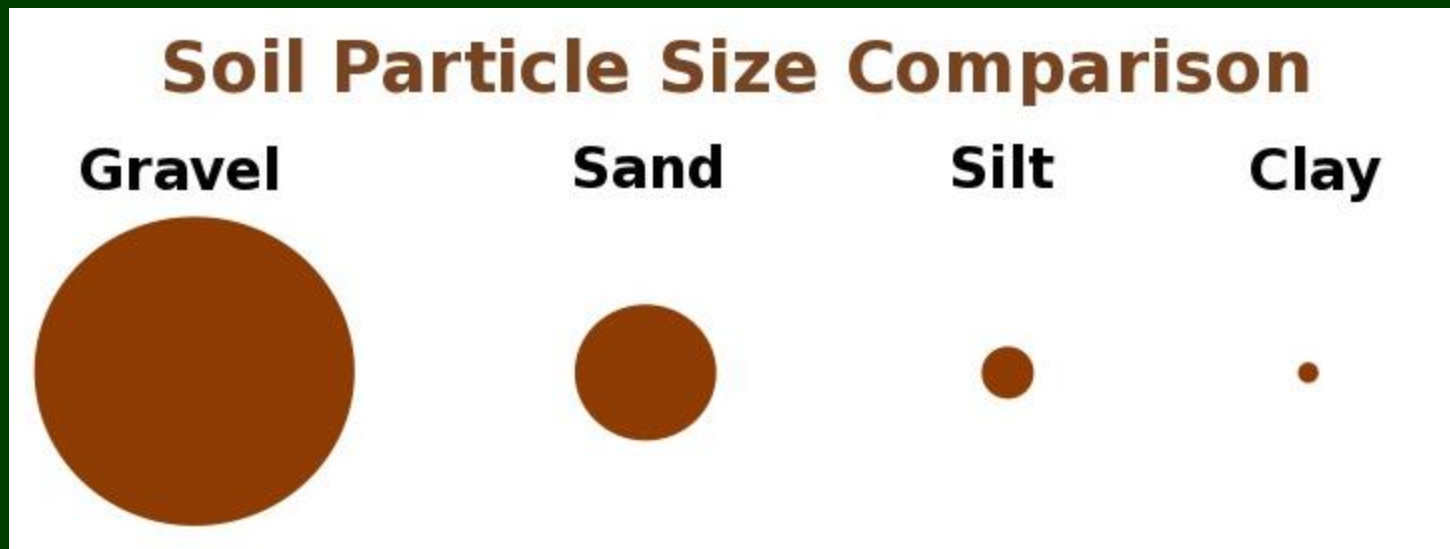
**Land for  
Cultivation**

# The Pedosphere - the soil mantle / 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.



# Land Cover

Land cover is the observed biophysical cover on the Earth's surface. This includes native vegetation, soils, exposed rocks and water bodies as well as anthropogenic elements such crops and structures built.

“Scientists warn of crop failure ‘uncertainties’ as Earth heats up”

## Resilient Food Systems

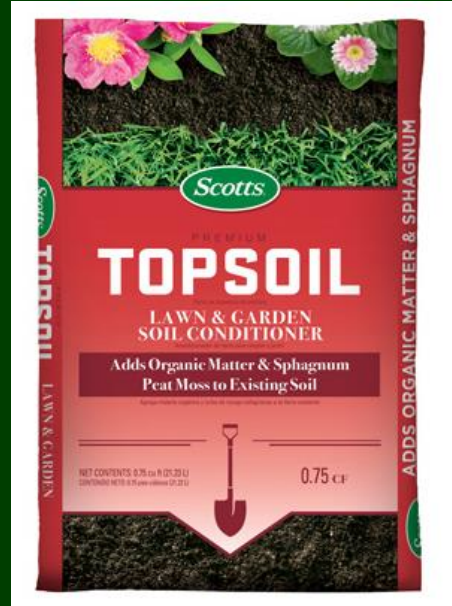
The capacity of a food system to withstand disturbances while maintaining its usual level of operation, one that can adjust to changes in the environment, such as shifts in climate, and still carry out its intended purpose.

**At the field level, resilience measurements might include:**

water-holding capacity of soil,  
buffering against wind and water erosion,  
biological activity rates,  
contaminant degradation rates, and  
ability to drain excess rainfall from farm land







It takes 100 years to create 1 inch of topsoil in nature





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



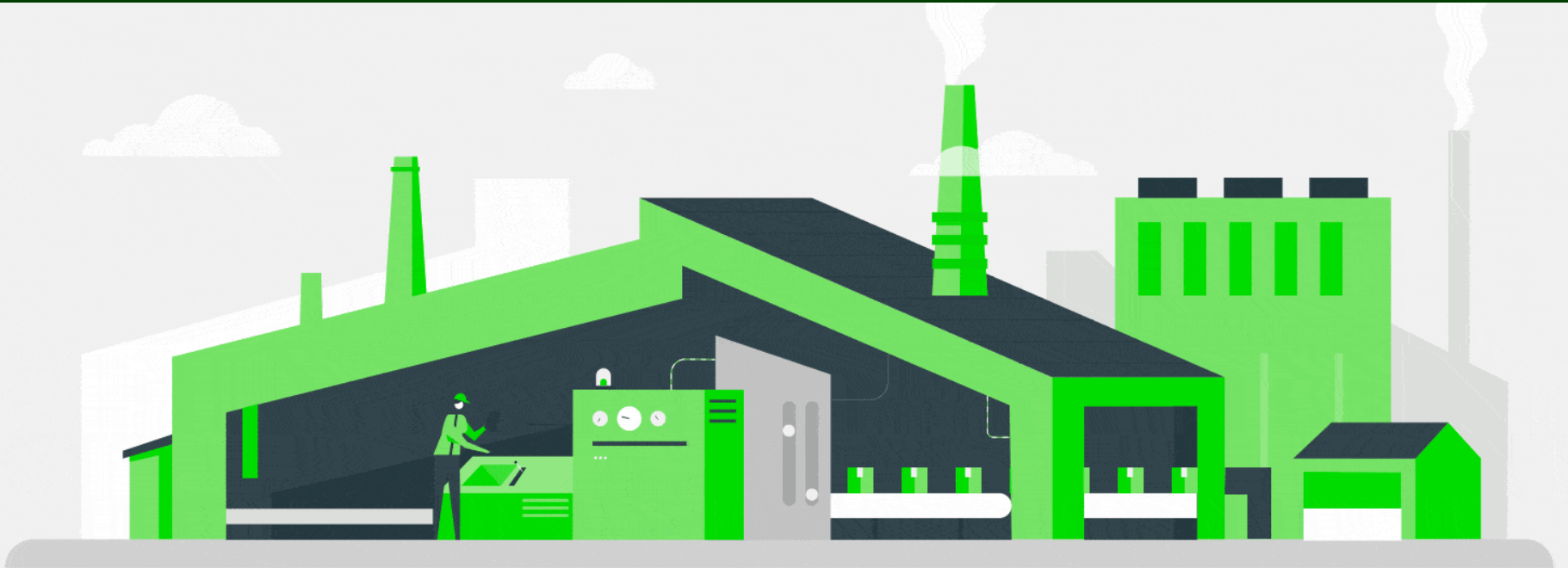
A special cellulose-based hydrogel called Polyter<sup>®</sup> claims it can absorb up to 500 times its initial weight in water.

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











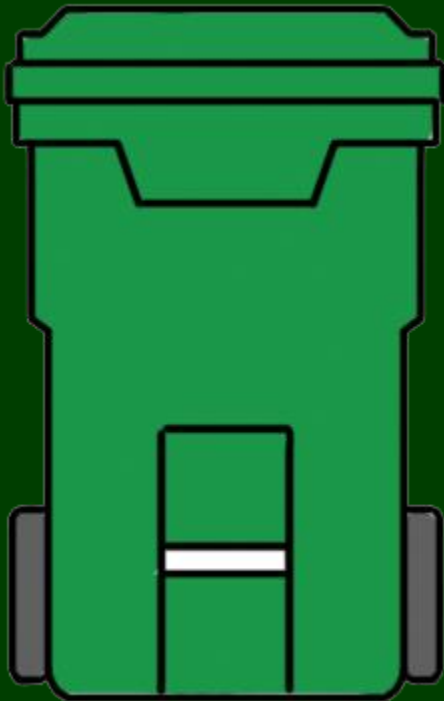
culls, leaves, peels, skins, rinds, cores, pits, pulp, stems, seeds, twigs



# 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





Cultivate  
Moss or Lichen  
provides stabilization for  
plant ecosystems the  
world over

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  
two or even three cuttings  
of hay in one year

Longer Crop  
Rotations vs.  
monoculture  
(cultivation of a  
single crop  
species)

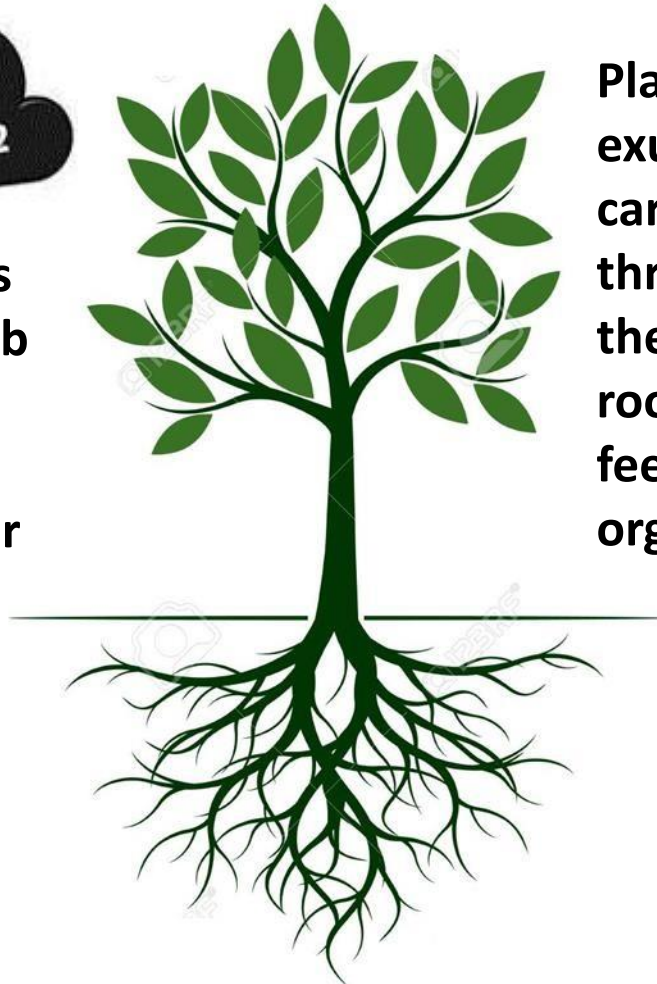


# Carbon Sequestration

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.



**Plants absorb CO<sub>2</sub> from the air**



**Plants exude carbon through their roots to feed soil organisms**

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.



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





# Climate Adaptation

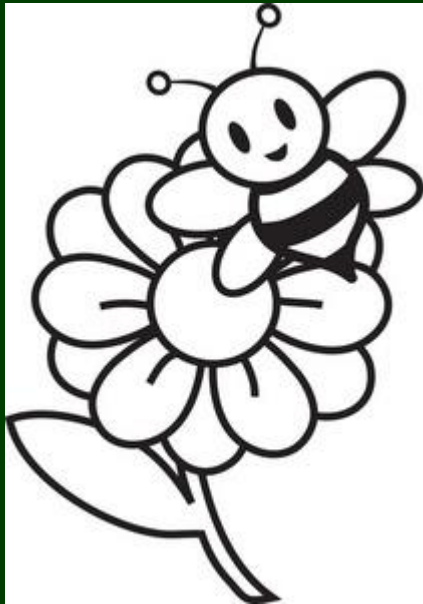
Prairie grass root systems are drought resistant, hold soils in place, and absorb water.

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





suitable to land with  
low fertility

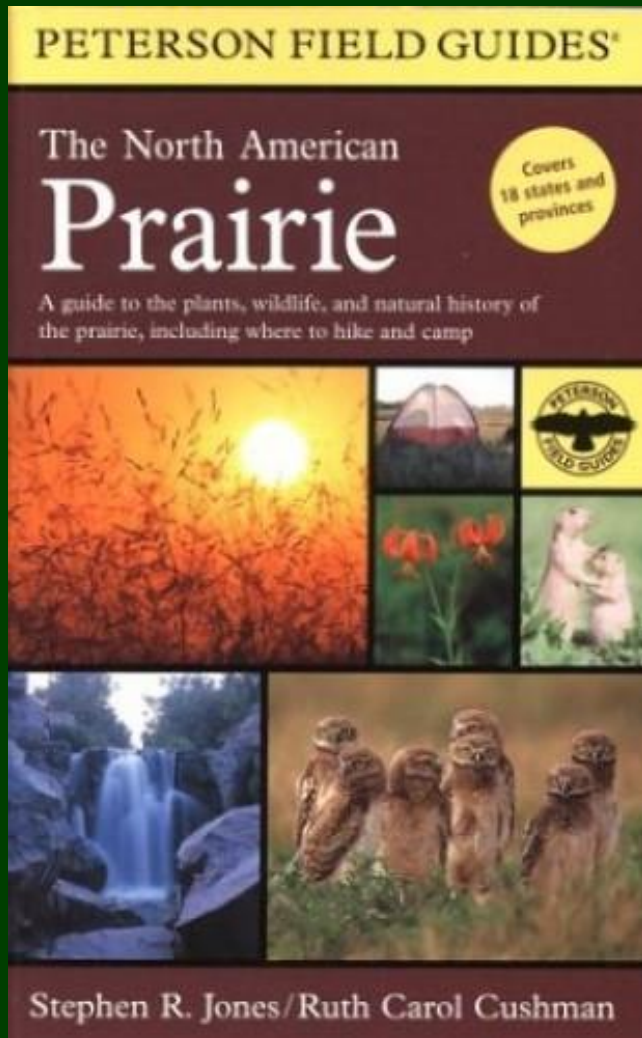


How to  
Create a  
Meadow

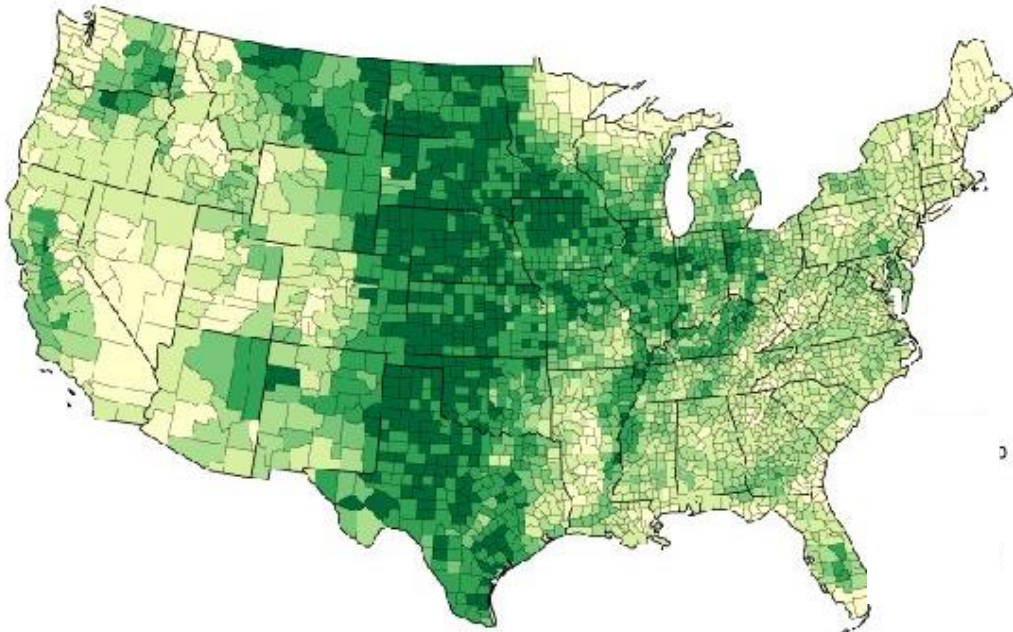
<https://youtu.be/9vSkI9fHW70>



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



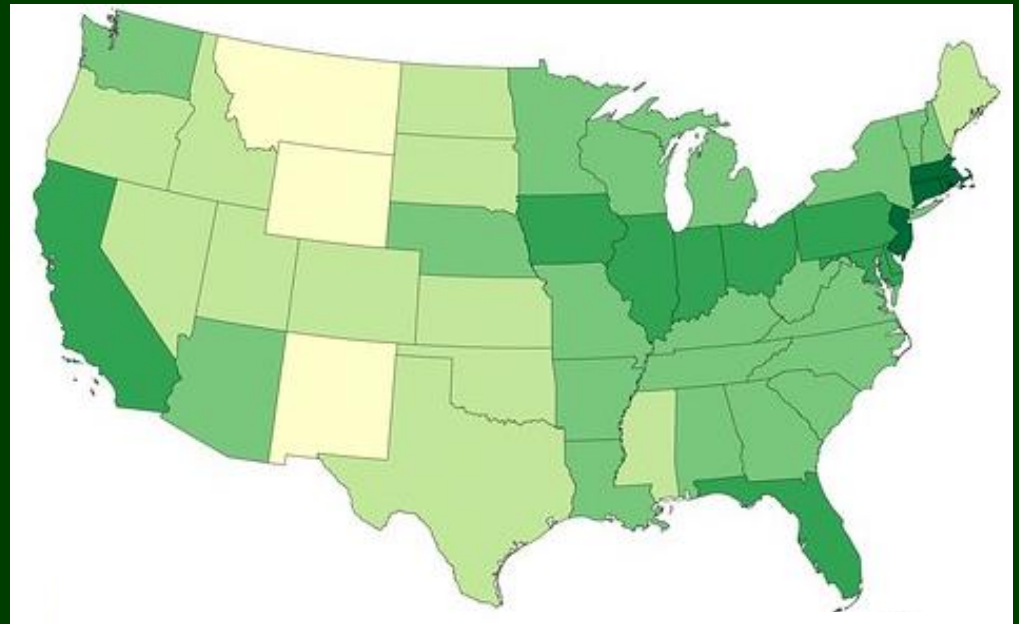




Loss of Our Food Supply

Concentration of  
Arable Farmland US

Value of Farmland



# Free Market Capitalism

## How Corporations Took Over Our Food System

*In These Times Report January 26, 2022*

farmers only plant chemical- + machinery- dependent monocrops like corn and soybeans

the largest food retailers are getting into livestock and dairy markets themselves, cutting out farmers altogether

the top four companies control 85% of the beef market, 85% of the corn seed market, and 90% of grain trade





Corn harvests have been increasing  
an average of 2 bushels per acre





# 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



the average supermarket carries  
between 15,000 and 60,000  
different products on sale



“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?

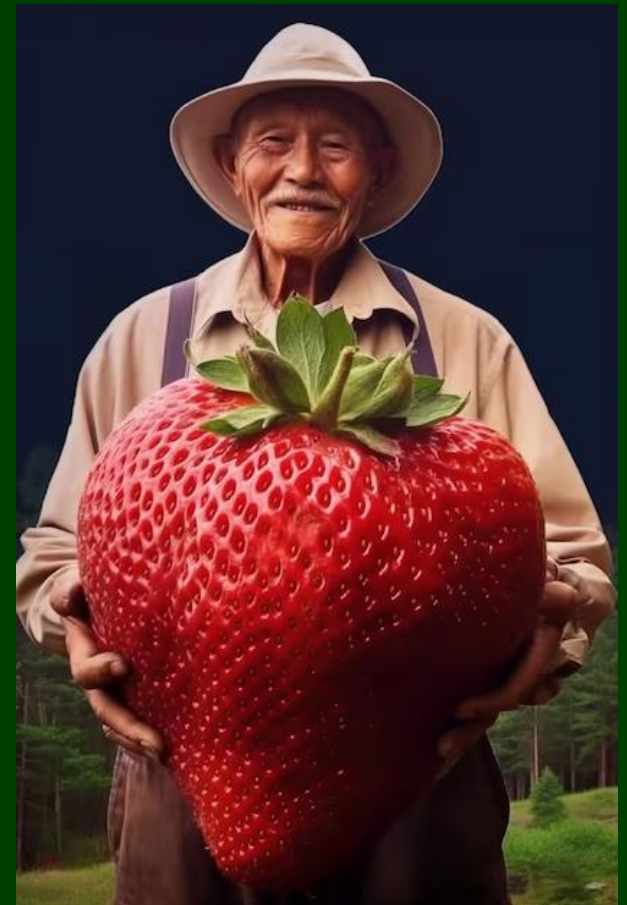
**Dandelion**

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

**Welcome to the People's Orchard #5**



**US Dept of Interior**



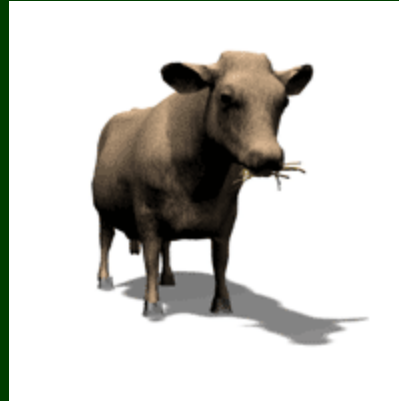
**Hydroponics**, where water is used as a medium for nutrients rather than regular soil

The Tomato Tree broke the record for most tomatoes harvested from a single plant in one year  
a harvest of 32,000 tomatoes, weighing a total of 1,151.84 pounds



The Rapunzel Tomato  
(a long trailing vine variety  
of cherry tomatoes)

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

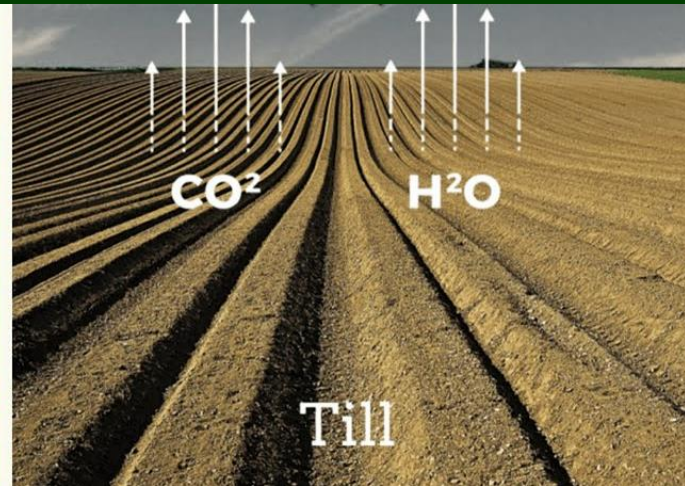
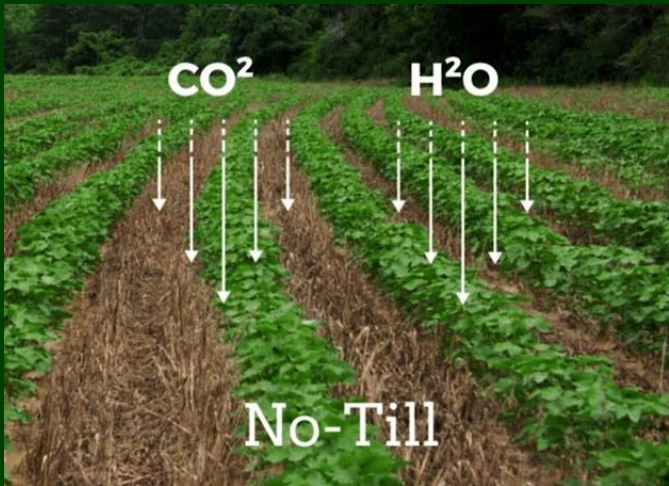
Modern cows are a human creation,  
they wouldn't even be able to survive in the wild.



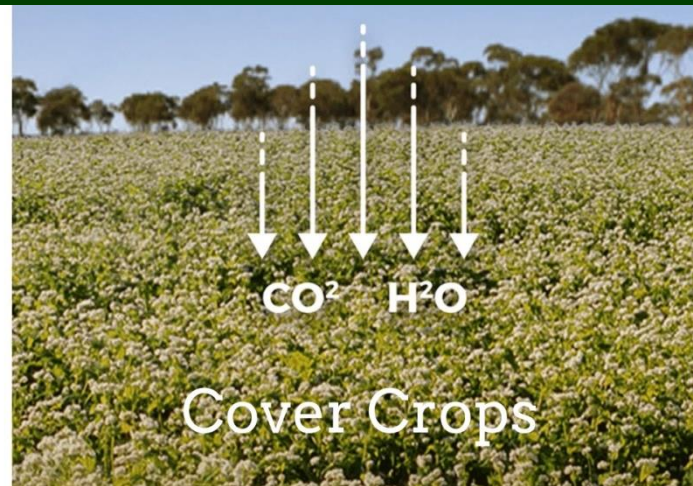
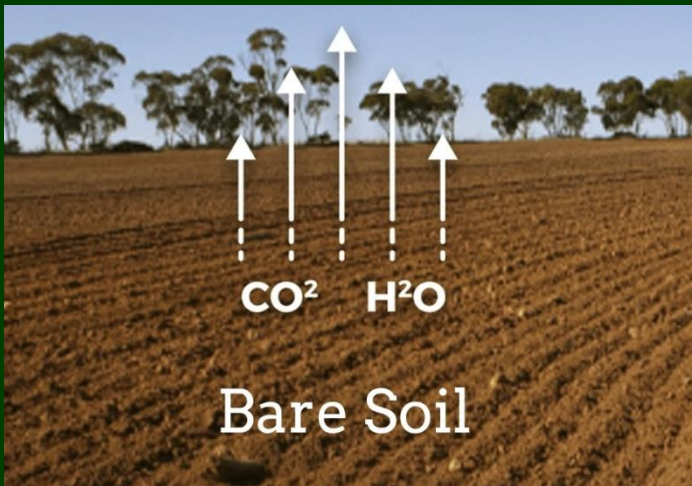
Native American Indians believed the Great Spirit had provided a perfect world in which to live







# Regenerative Agriculture





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



30 November 2023

“Australia will promote our climate-smart agriculture practices and commitment to climate action at the United Nations Climate Change Conference, COP28 in Dubai.”

## Contact Us:

National office

Department of Agriculture, Fisheries  
and Forestry

Street address: Agriculture House  
70 Northbourne Avenue  
Canberra 2601, Australia

**Invitation sent to attend  
presentation  
at the College of Complexes**



**Australian Government**

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**Department of Agriculture,  
Fisheries and Forestry**







# First Russian Tractor for the collective



In 1917 across the whole of Russia there were only 165 tractors  
By the beginning of WWII, 25 years later, the Soviet Union occupied  
first place in the world for the production of tractors

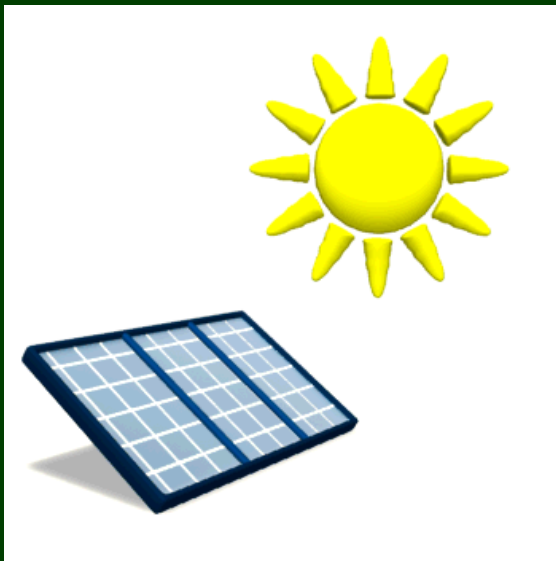
# Nationalize Farm Implement Production and Fleet Maintenance







# Solar Panels on Barn to Power EV Tractors





**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



# Locust Swarm in Mexico Dec 8, 2023





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



A 3D-rendered spotlight is positioned in the upper-left corner of the frame. It is angled downwards and to the right, casting a bright yellow beam of light onto a dark gray background. The beam tapers as it moves away from the spotlight, creating a soft, glowing oval shape on the ground. Inside this oval, the text "Create Wetlands" is written in a bold, black, sans-serif font. The entire scene is set against a dark green background.

**Create Wetlands**

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

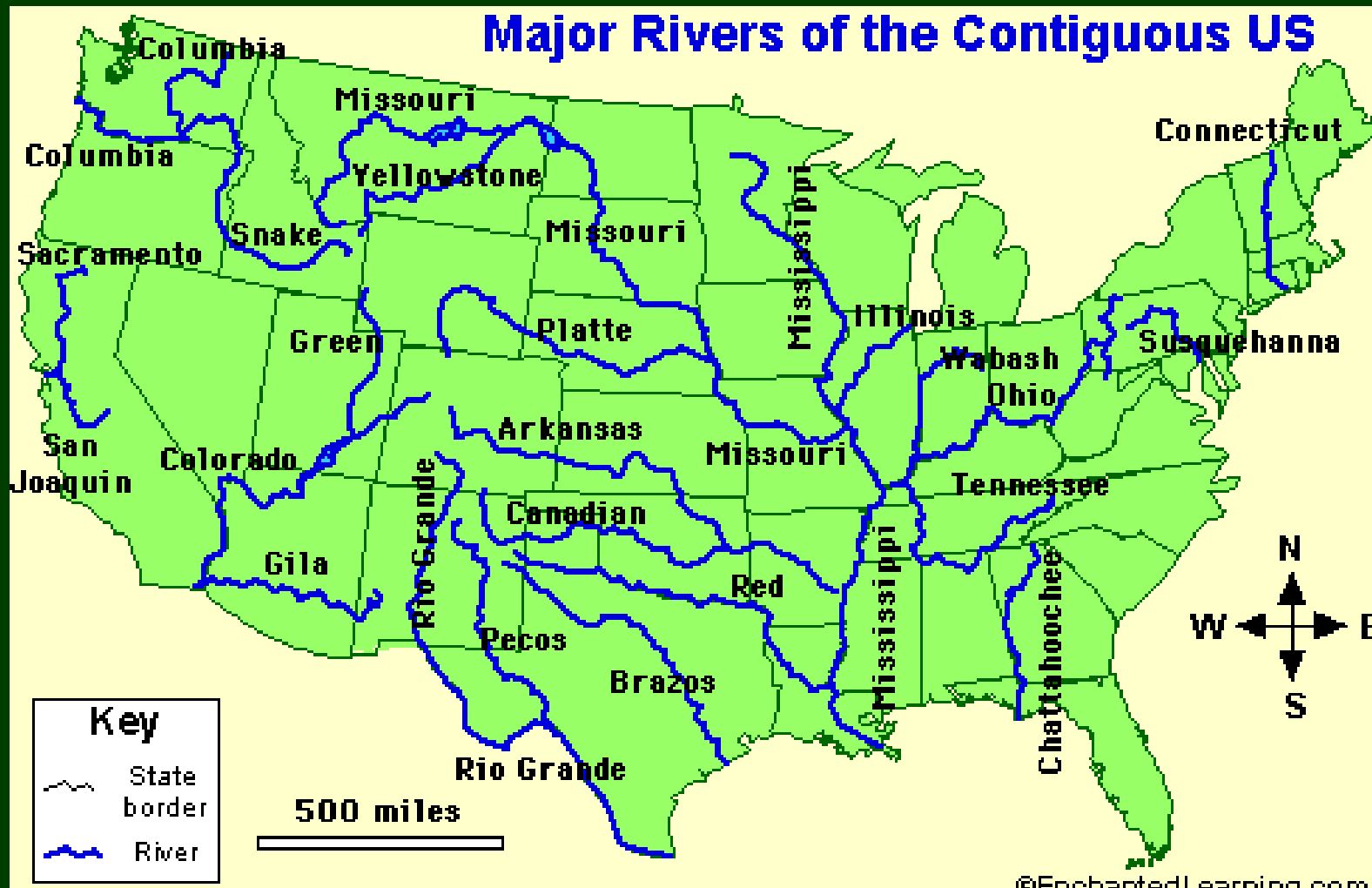
hydrology



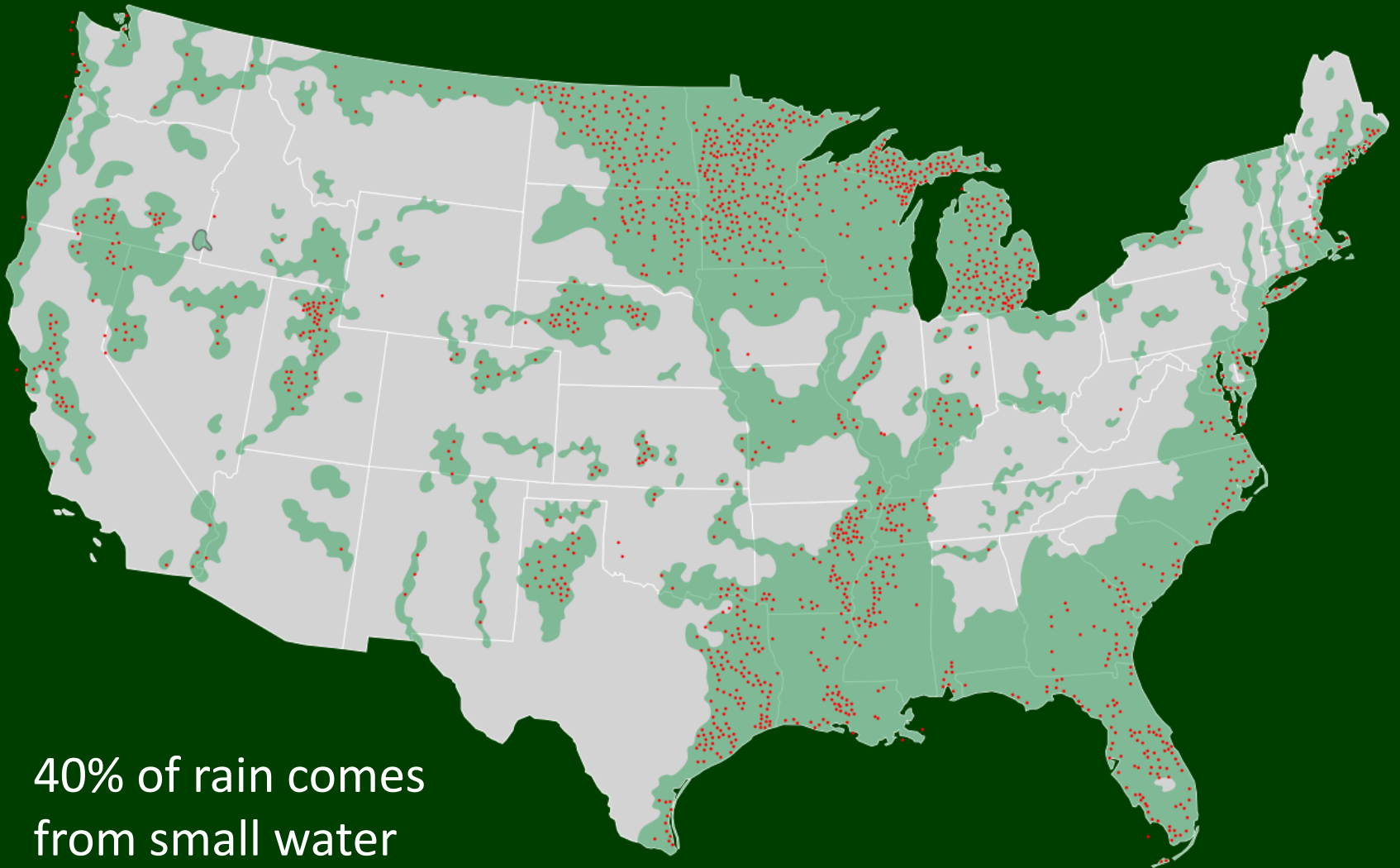
A marsh is a wetland dominated by herbaceous plants such as grasses or rushes, and usually form along the shallow edges of lakes and rivers



# Potential Wetland Locations



# Existing Wetland Areas in the US



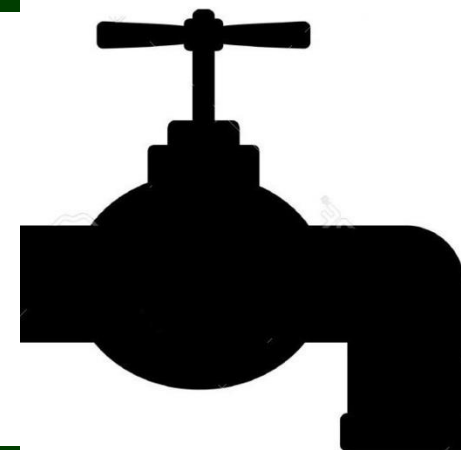
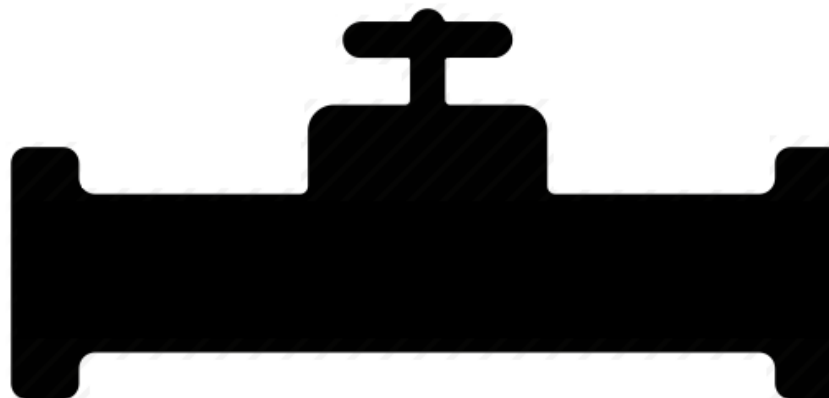
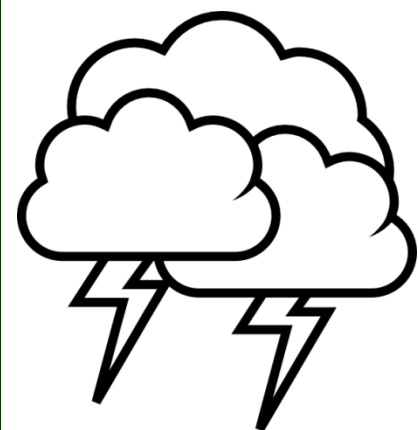
40% of rain comes  
from small water  
cycles

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

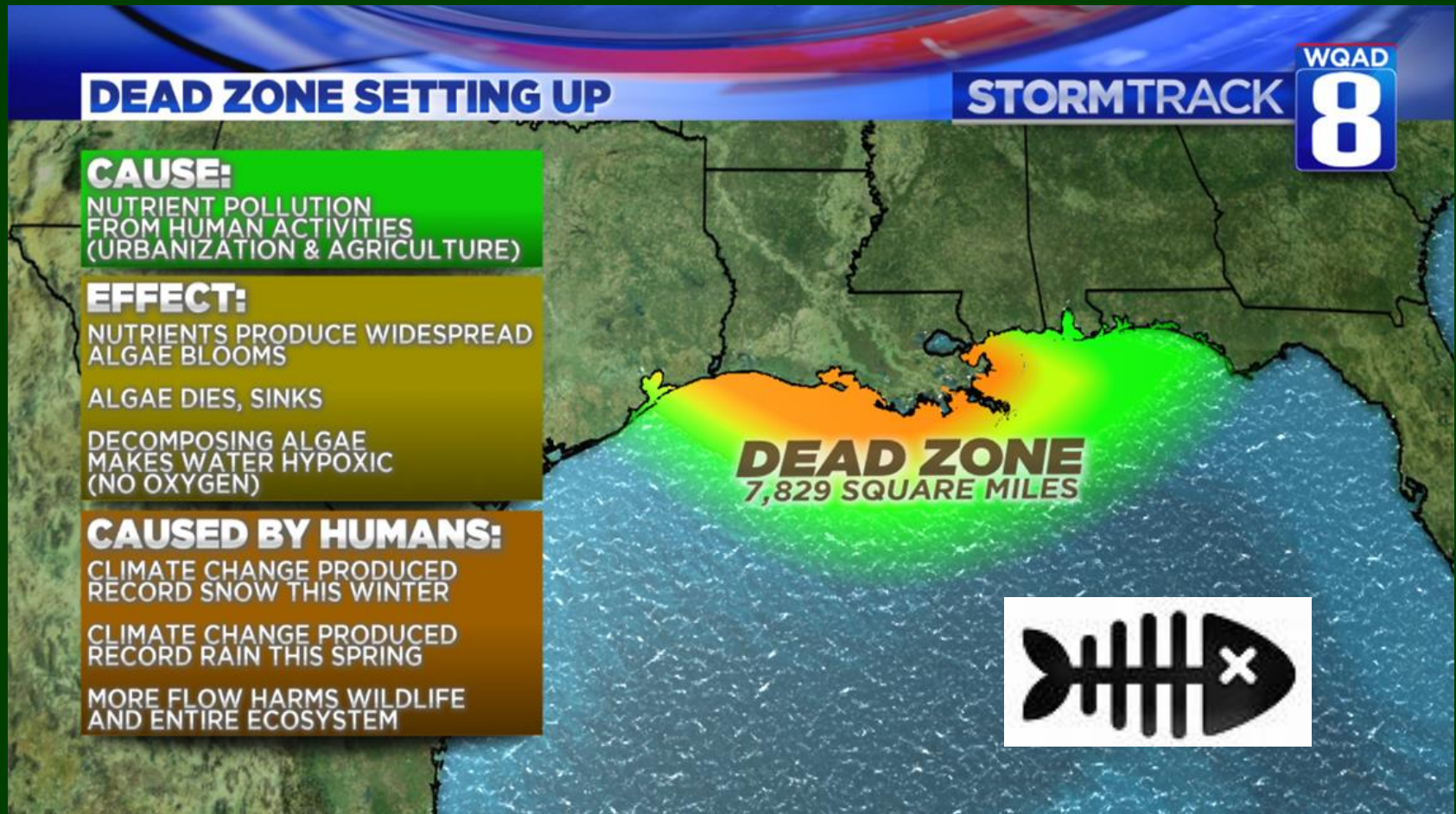
Rio Grande River

Pacific Northwest

Texas Gulf Coast



# Mississippi “Dead Zone” 7,829 sq miles



A 3D-rendered spotlight is positioned in the upper-left corner of a dark gray rectangular area. The spotlight is angled downwards and to the right, casting a wide, conical beam of light. The beam is a gradient of yellow-green, becoming more vibrant as it reaches a bright yellow oval at the bottom-right. Inside this oval, the text "Tropical and Natural Forests" is written in a bold, black, sans-serif font. The background of the entire image is a solid dark green.

**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.

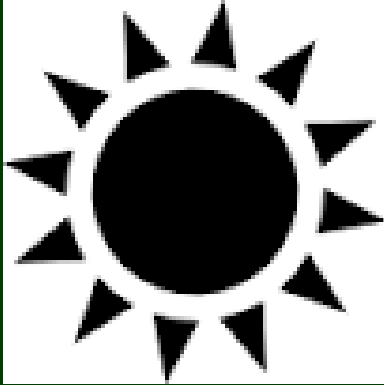


Of the approximately 14.5 m sq kilometres of tropical rainforest that once covered Earth's surface, only 36 % remains intact.

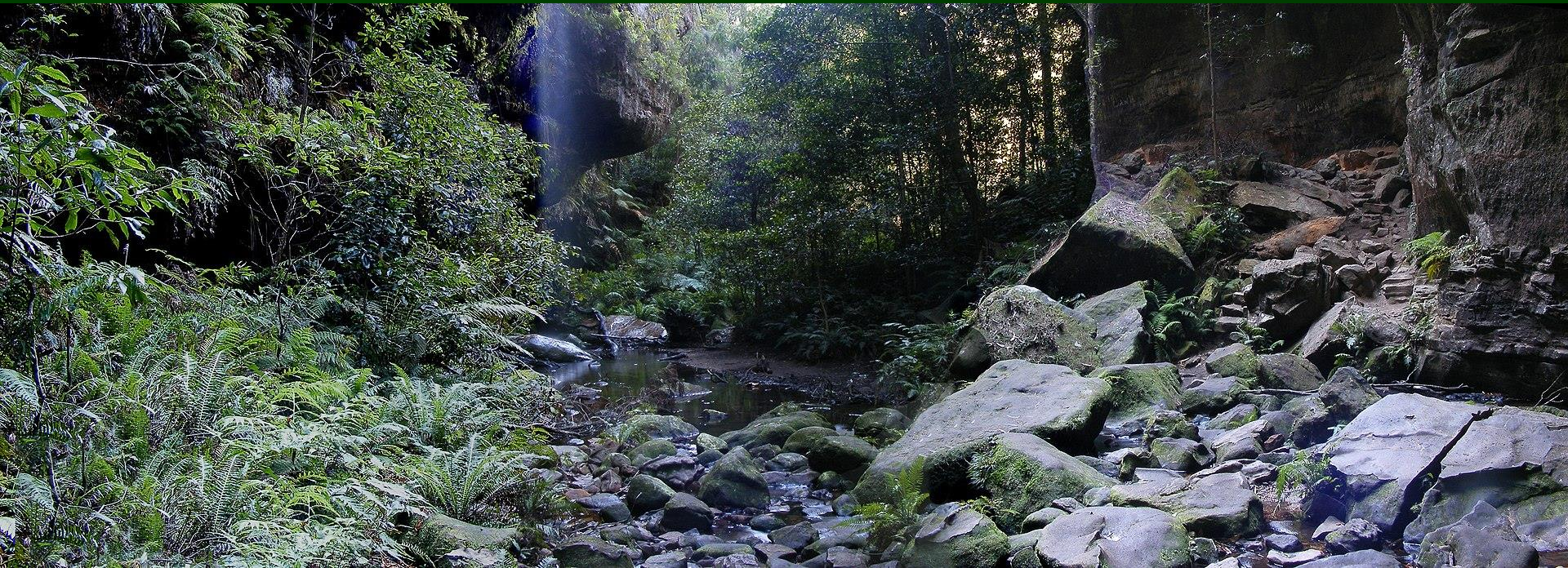
Just over a third, 34%, is completely gone, and the last 30 % is in various forms of degradation.







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



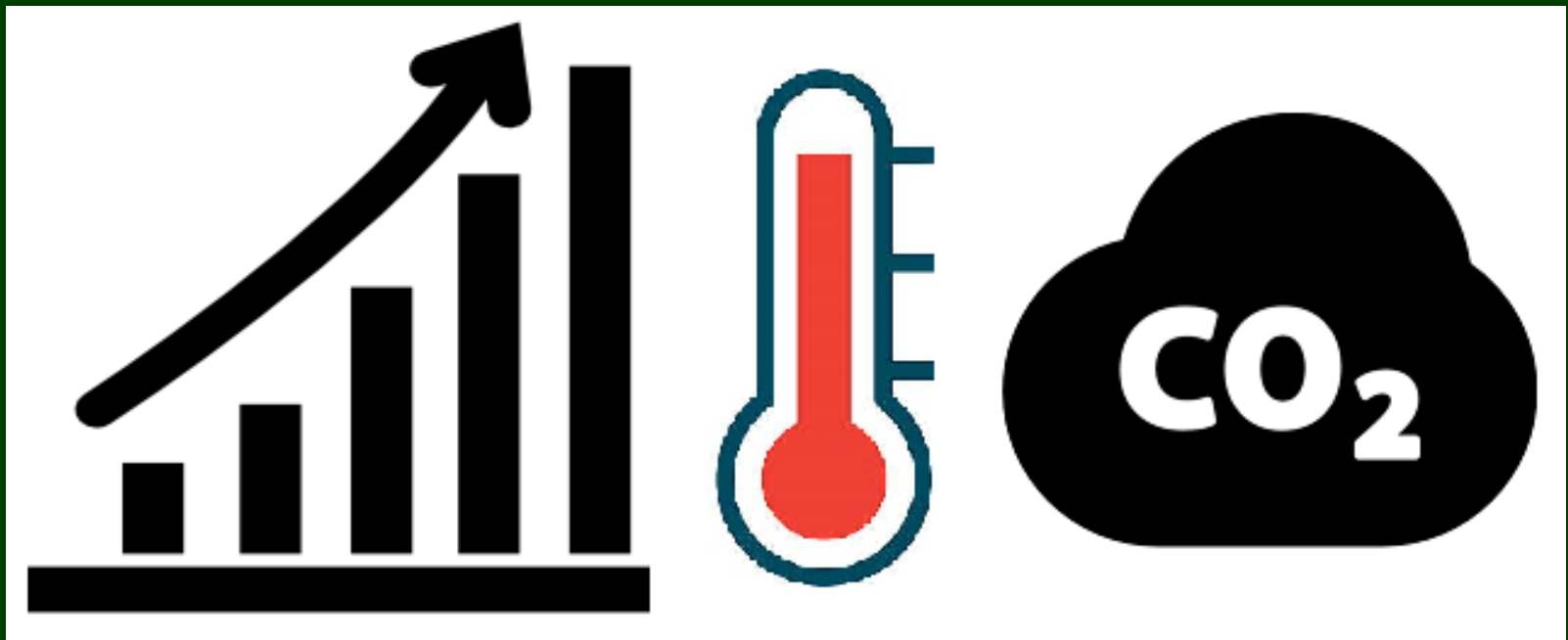


# Habitat Destruction for monocultures banana plantations

**palm oil** (a small ingredient in the U.S. diet,  
but more than half of all packaged products)

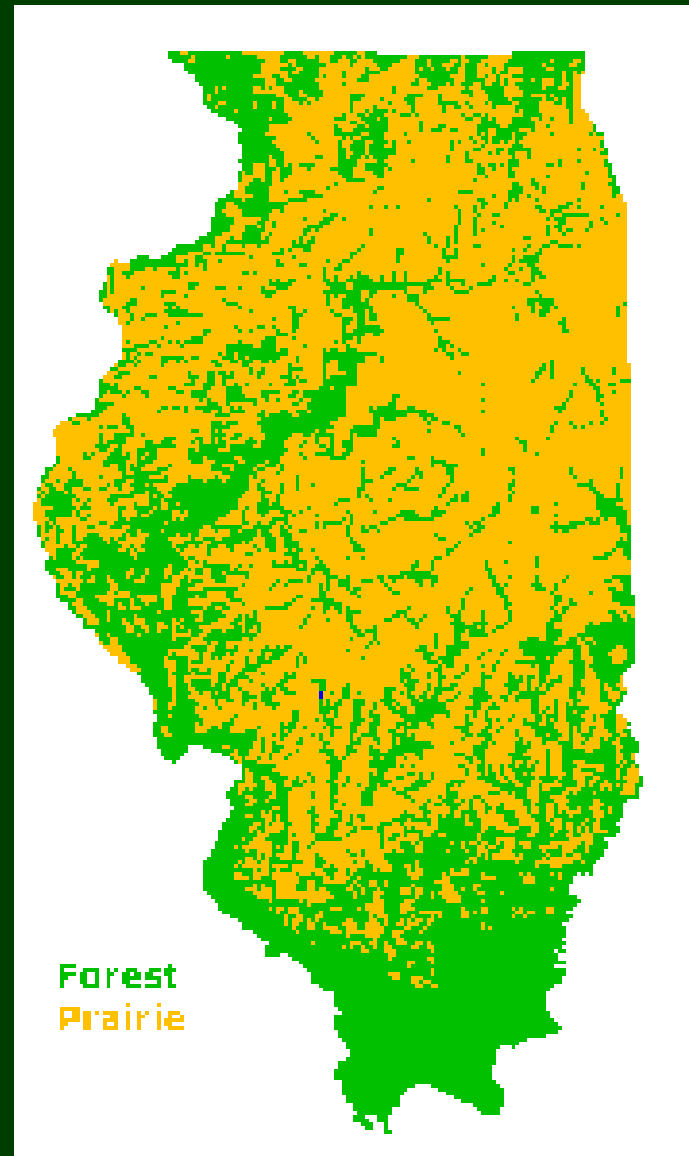


One acre of forest can absorb 4.5 to 40.7 tons of carbon dioxide and produce four tons of oxygen. The capture is enough to offset the annual carbon emissions produced by driving your car 26,000 miles.





# US National Forests



# 300,000 Carloads of Wood Shipped Annually





# Need to Restore Forests Lost to Fire





“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





# Urban Tree Care







Reverse  
Habitat Loss  
for Wildlife  
due to  
Urban  
Sprawl







**Activists Renew Calls For Cook County Forest  
Preserves To Free Rocky the Coyote  
has been living in an enclosure at a nature center  
since 2018  
Tuesday, Nov 14th at 10 AM**



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**Assorted Topics**

# Government

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





# Establish New Administrative Units of Government BioRegions 12 lie partly or wholly within the US

Arctic Cordillera, Tundra, Taiga,  
Hudson Plains, Northern Forests,  
Northwestern Forested Mountains,  
Marine West Coast Forests,  
Eastern Temperate Forests,  
Great Plains,  
North American Deserts,  
Mediterranean California,  
Southern Semi-Arid Highlands,  
Temperate Sierras,  
Tropical Dry Forests



# 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

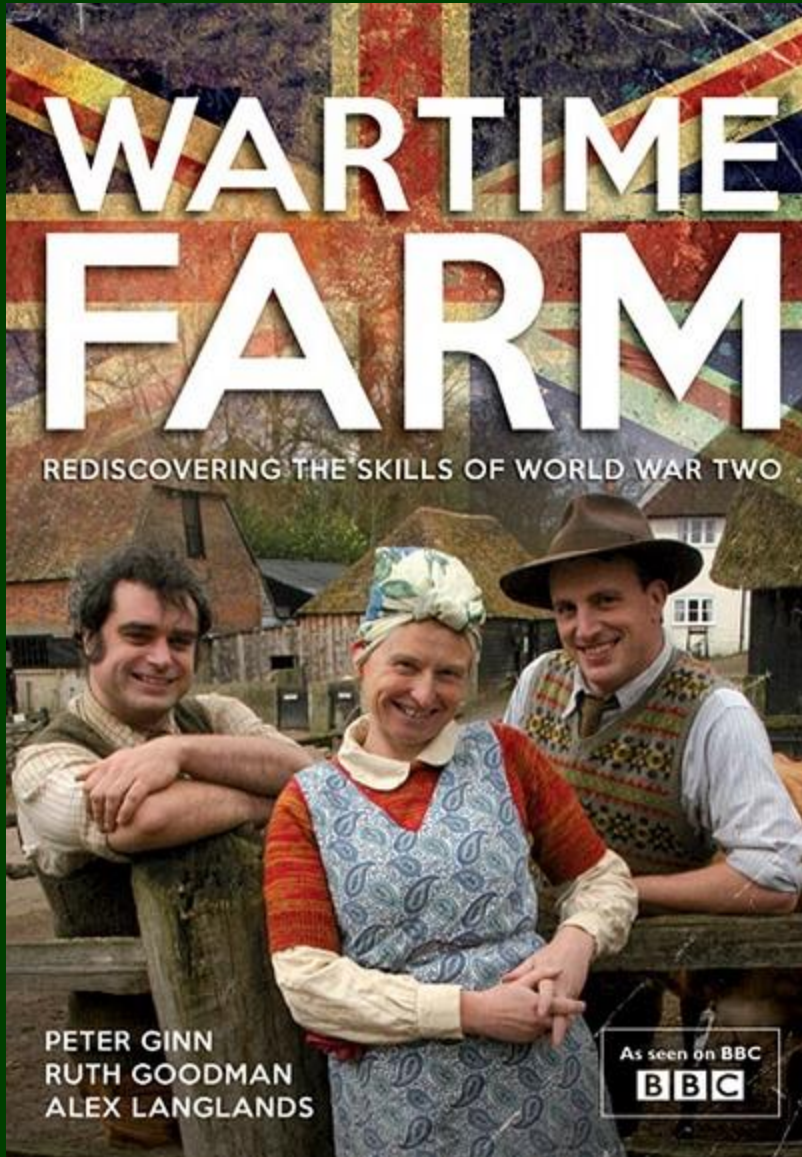





Would eliminate employee issues in the fields, fast food,  
and processing factories



**Nabisco workers call for boycott of  
Oreos Chips Ahoy! Ritz Crackers**

**TO EVERY LIVESTOCK FARMER:**

**the Minister of Agriculture, Mr. R. S. Hudson, appeals for self-sufficiency on farms**

stock. You know only too well that the last year's crop of imported feeding stuffs were smaller still next winter. For the country's sake, do all you can to reduce the dependence on imported supplies.

Make the utmost of your own land to replace imported supplies on your arable and grassland.

Are there any possible ways of growing your own farm? Your County Agricultural Committee are distributing "Your Feed." If you have not got one. Act on the valuable advice it gives.

*R. S. Hudson*  
 MINISTER OF AGRICULTURE.

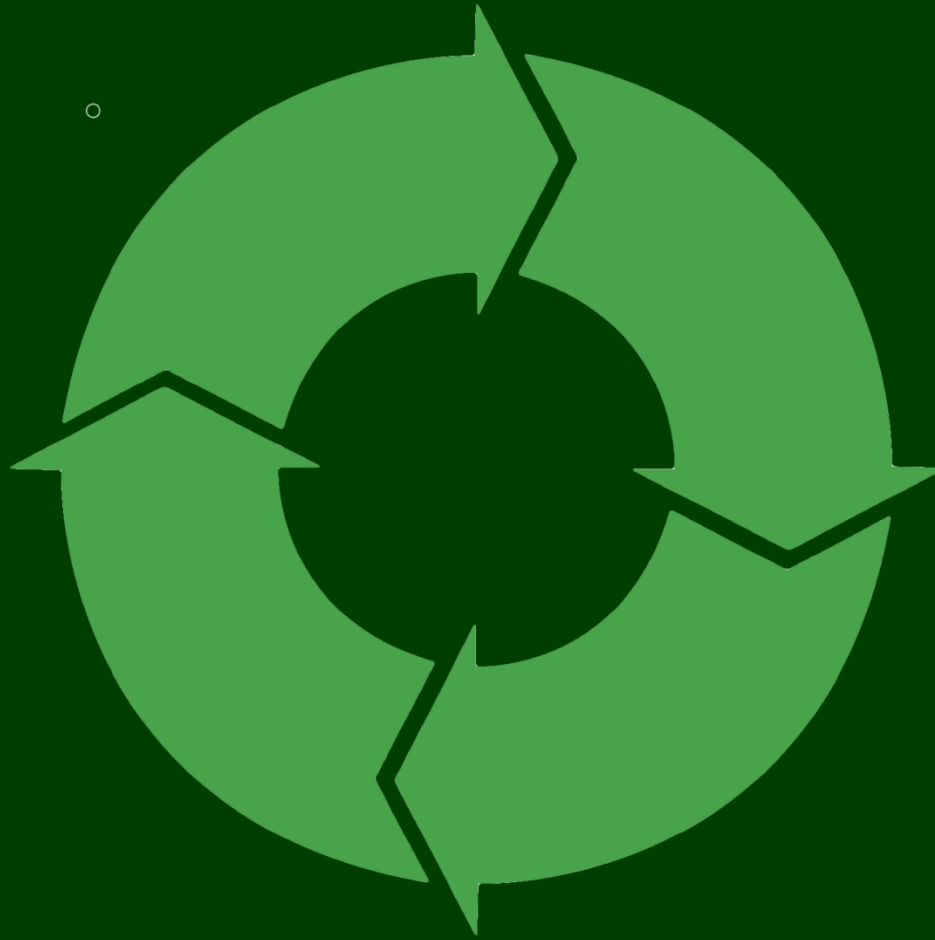
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 THE MINISTRY OF AGRICULTURE & FISHERIES, London, S.W.1





# Sustainably Sourced Ingredients

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





**You are hereby invited to be a point person in your  
Congressional District as part of our  
"Adopt-A-District" for the**

**H.R. 598**

**Earth Bill campaign  
Illinois Districts Open**

**H.R. 598**



# Incident upon return of starship USS Enterprise to Earth after the 5 year voyage

**“Captain, our sensors indicate it is an uninhabited planet with no apparent life forms, a high surface temperature, and an atmosphere of CO<sub>2</sub>”**



Earth



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.



# Thank You for Coming!

