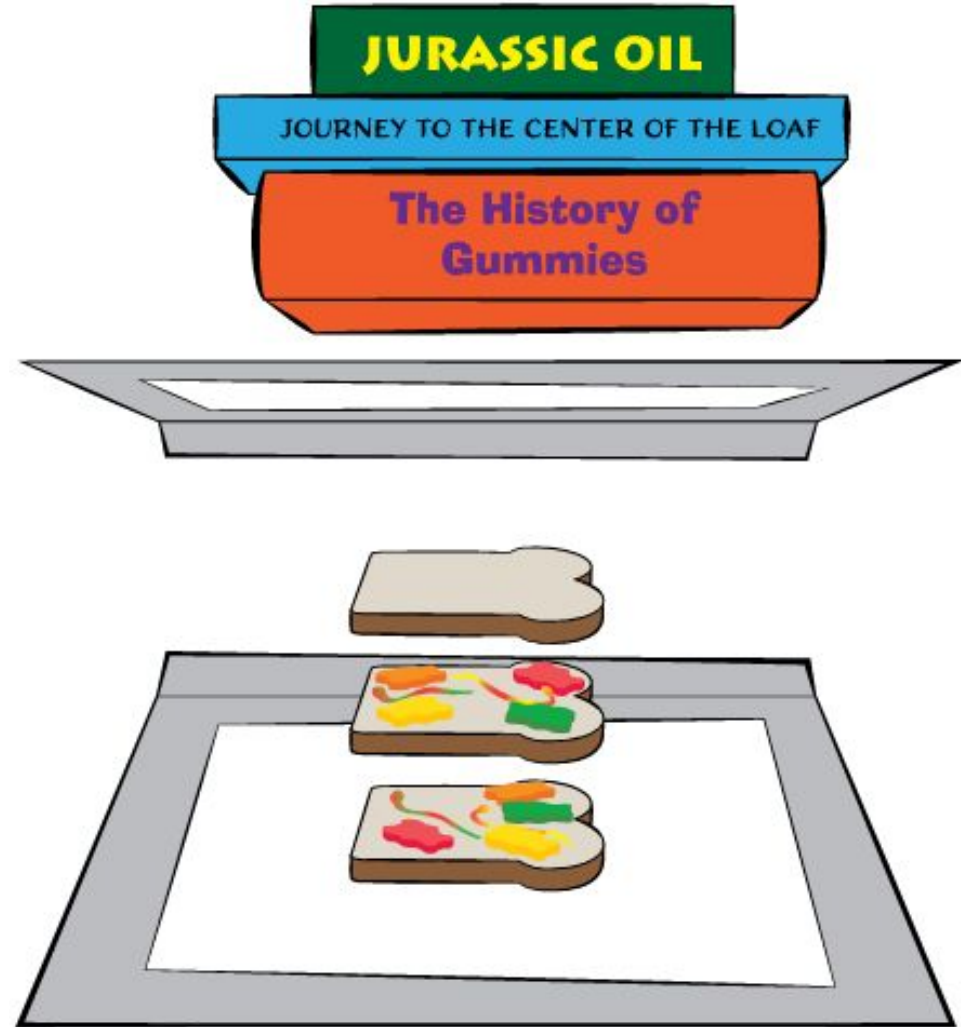




M | MUSEUM OF NATURAL HISTORY
UNIVERSITY OF MICHIGAN

Biomass

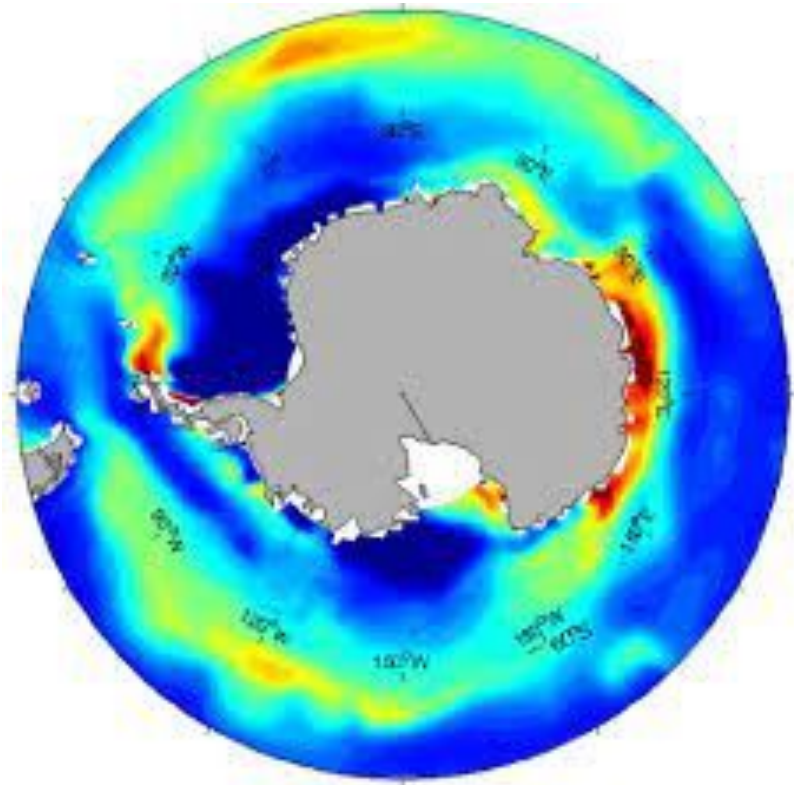
Create a sandwich with bread and M&Ms.
Place in an OPEN baggie between two pieces of wood. Compress with a clamp.



Most CO₂ is

- Created in the Northern hemisphere
- Absorbed in the South Pole by phytoplankton

You don't have to go to the South Pole to find phytoplankton



Detroit River sample is from the boat launch at Riverside Park, near Clippert



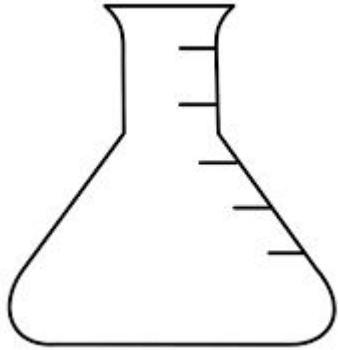
Rouge River sample is from a marshy area at Tattan Park, near Garden City Middle School



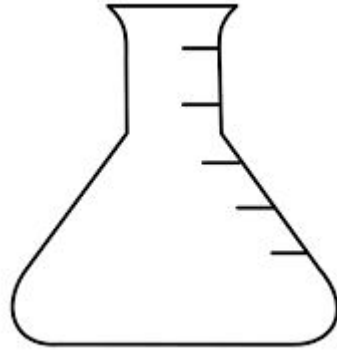
Huron River sample is from a bridge at Waterworks Park, near Ypsilanti Middle School



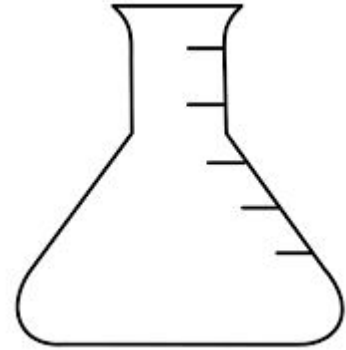
Which flask is which?



+ Light
+ Nutrients

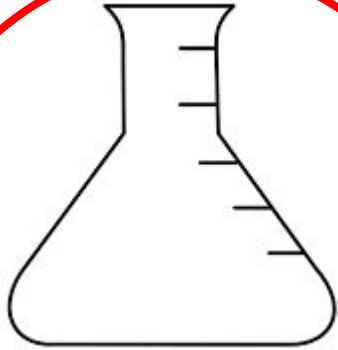


+ Light
- Nutrients



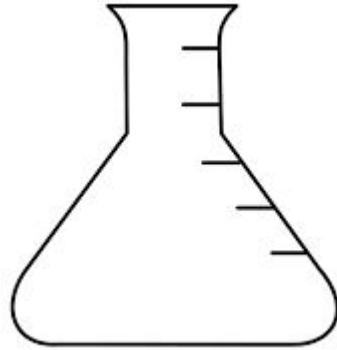
- Light
- Nutrients

Why does this one grow best?



Light

Nutrients



Light

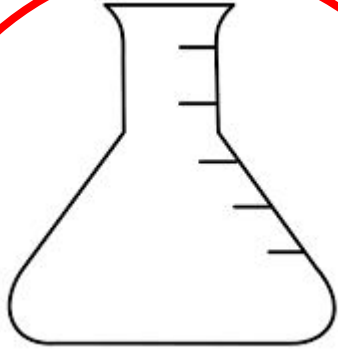
No nutrients



No light

No nutrients

Why does this one grow best?

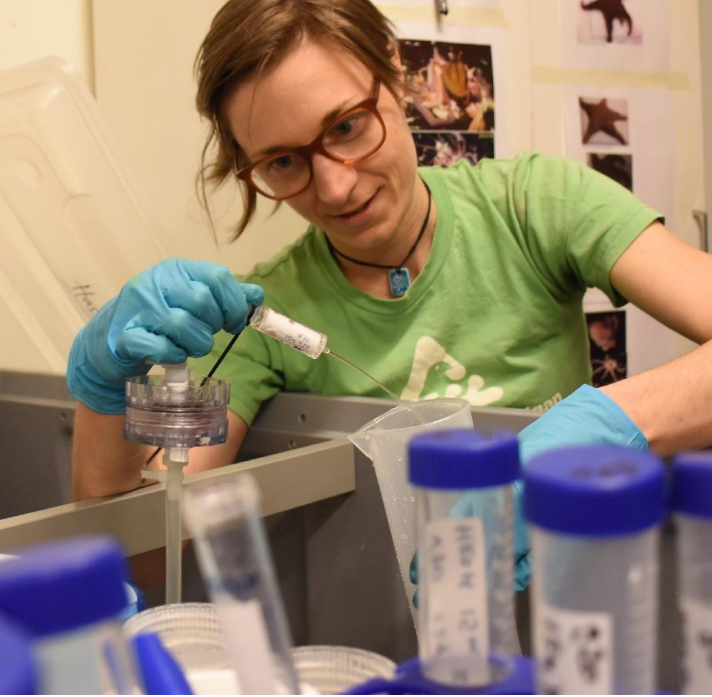


Light

Nutrients

Light - They're adapted to sunshine because there is no shade in the open ocean

Nutrients - Phytoplankton need nutrients just like people need vitamins



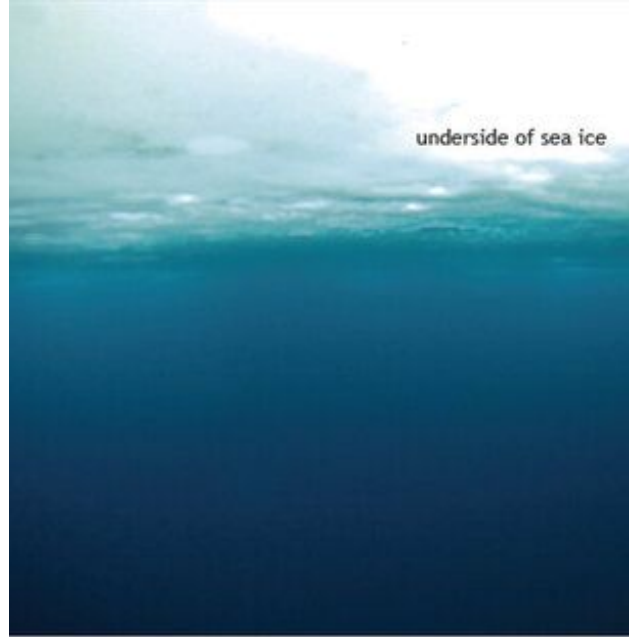
Where do Antarctic phytoplankton get light?





melt pond

from above: shallow melt ponds on solid pack ice



underside of sea ice

water color and clarity without bloom



underside of sea ice

water color and clarity during massive under-ice bloom

Phytoplankton grows under the polar ice
Melt pond “skylights” allow light to shine through





Where do Antarctic phytoplankton get nutrients?





Penguins poop a LOT

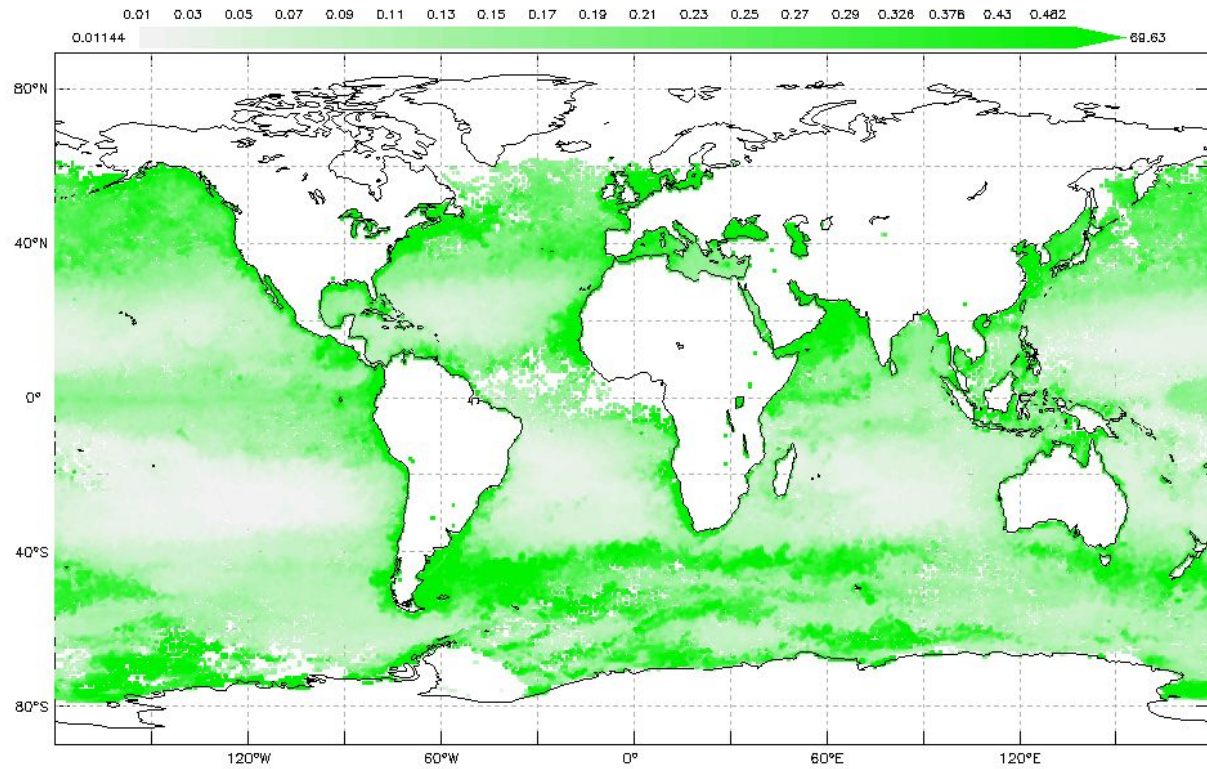
Phytoplankton Bloom: Before



Phytoplankton Bloom: After



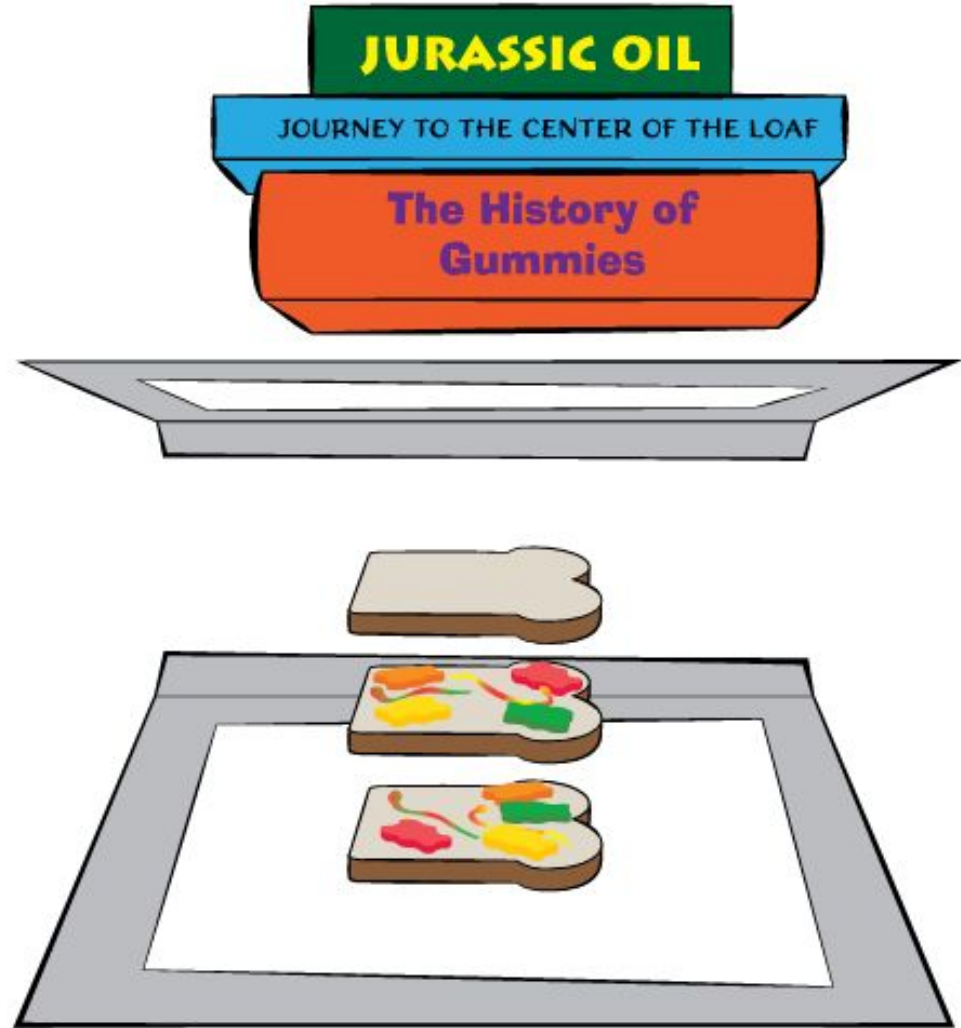
Phytoplankton transfer over **10 gigatons*** of carbon from air to ocean every year



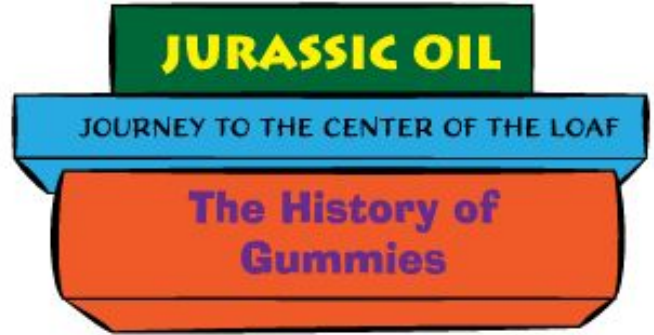
* The weight of a billion elephants



How does
phytoplankton
turn into oil, coal,
and natural gas?



What do the books (or in your example the clamp) represent?



What does the bread represent?



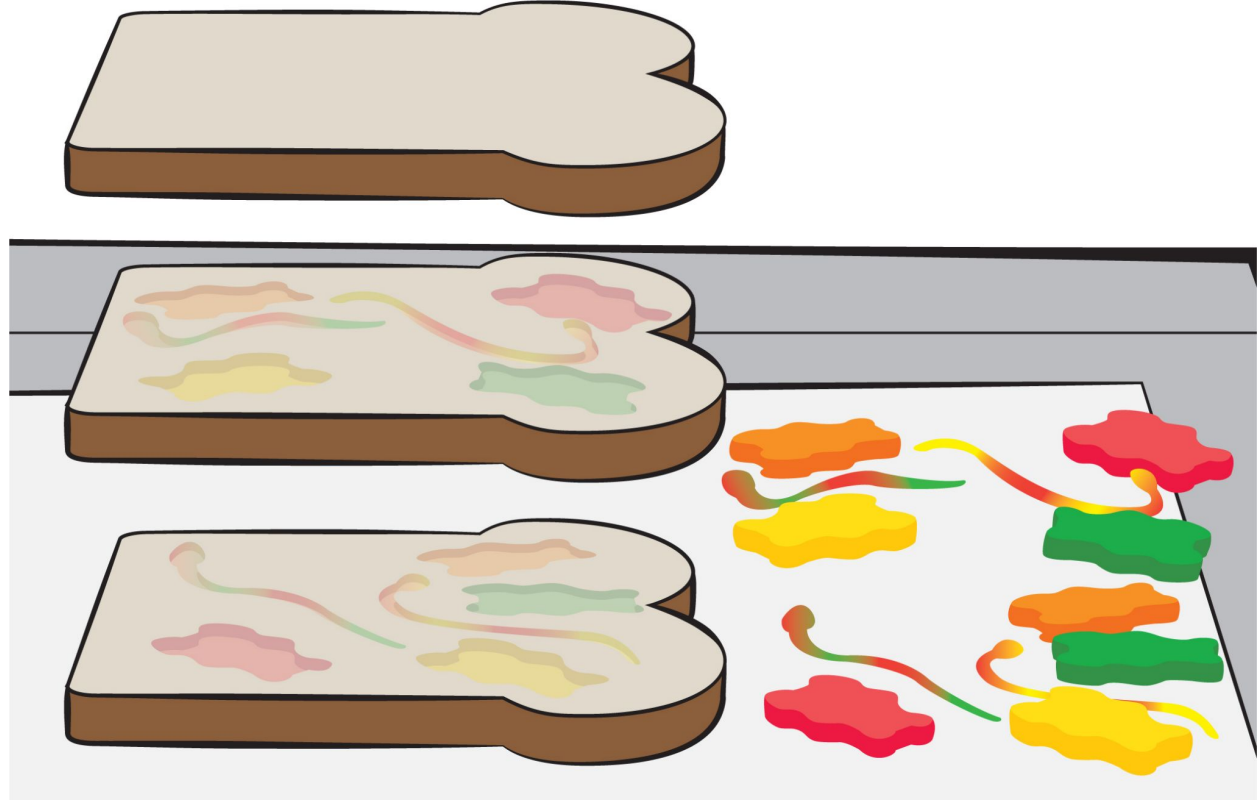
What do the M&Ms represent?



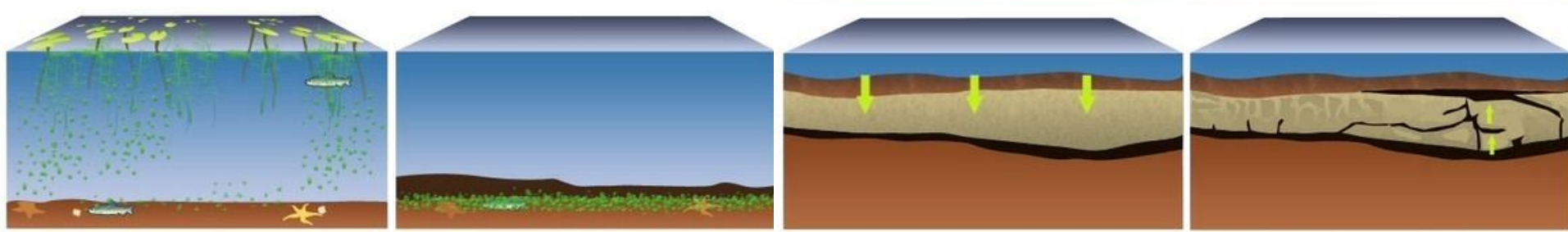
What do you notice about the sandwich?
What do you think the inside looks like?



What do you notice about the inside?



Phytoplankton Becoming Oil



Marine plants and animals die and sink to the bottom of the sea

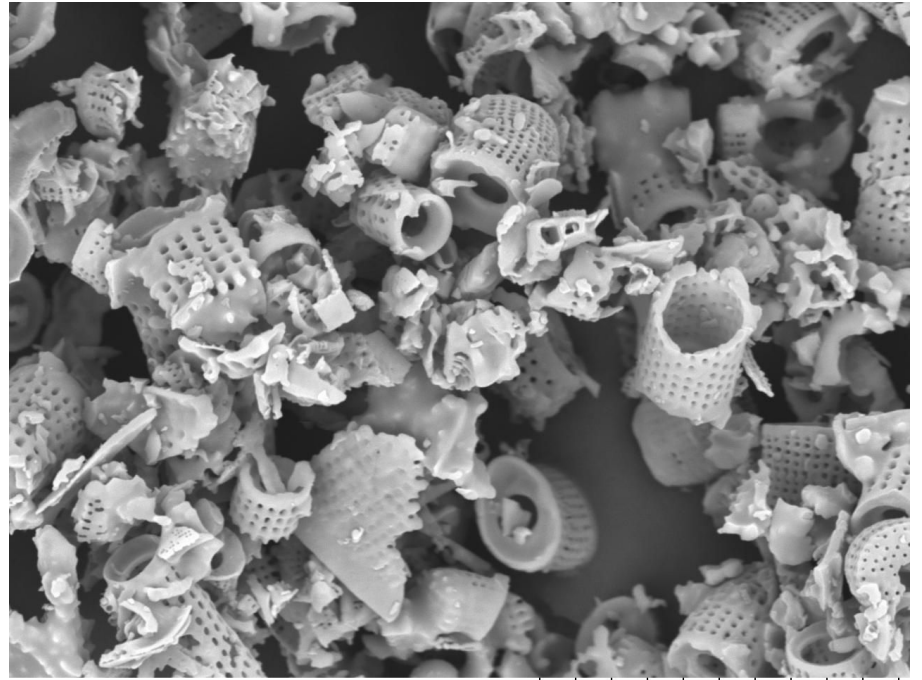
The plant and animal layer gets covered with mud

Over time, more sediment creates pressure, compressing the dead plants and animals into oil

Oil moves up through porous rocks and eventually forms a reservoir

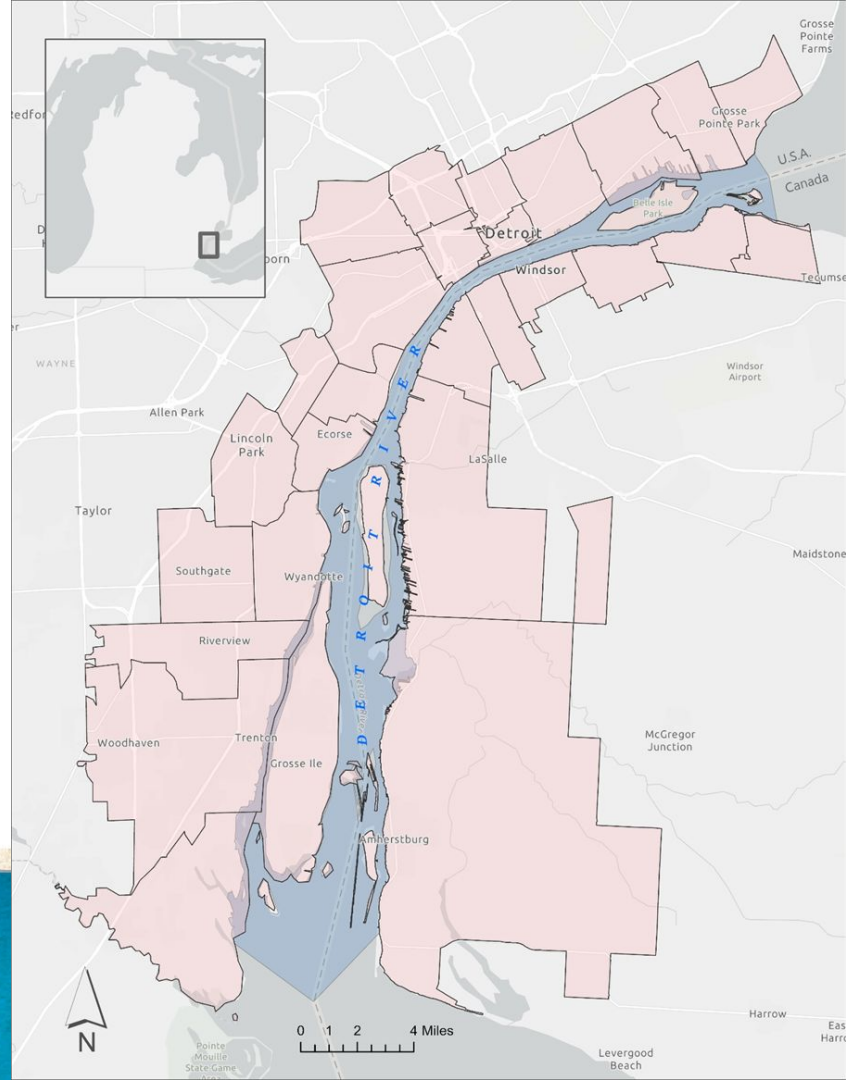
Diatom shells can become sedimentary rock.

Colorado and Las Vegas have layers of diatoms hundreds of meters thick



30 um

Carbon Use on the Detroit River





What questions do
you have?



M | UMMNH