

Warm-Up

11JAN2016

- How is the Personal Water Use Survey going? Questions? Thoughts? Concerns?

Logistics:

- Wash rocks everyday this week
- Warm-ups Due Friday
- Personal Water Survey Due Thursday
- Last Call at the Oasis questions due when we finish the documentary

Warm-Up

12JAN2016

- What is one way that “Last Call at the Oasis” and “This Changes Everything” are connected?
- DUE TOMORROW: Ozone Check for January
- You should have finished reading chapter 9 and start reading chapter 14 in the textbook
- Tuesday is APES and Beyond day!

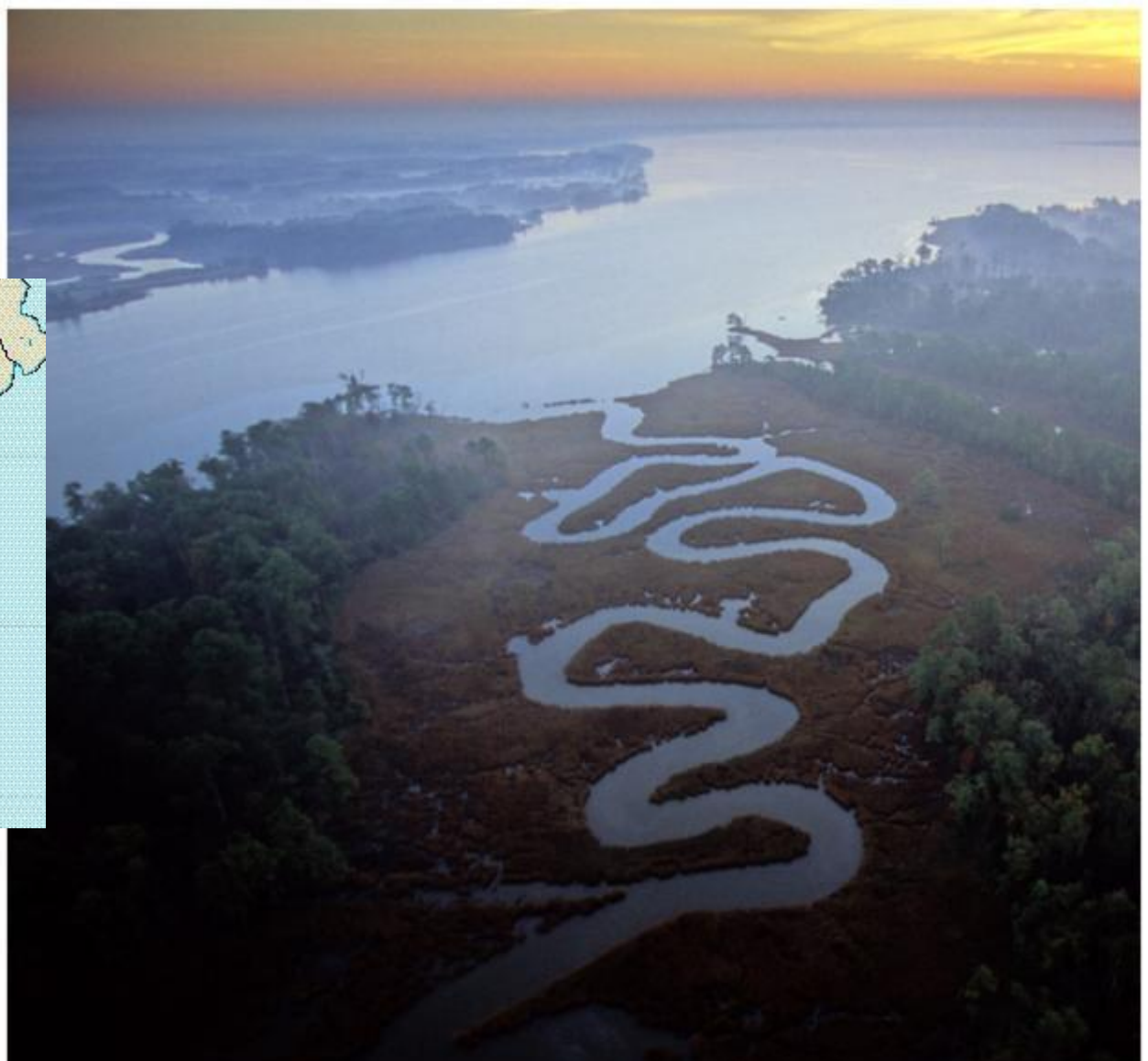
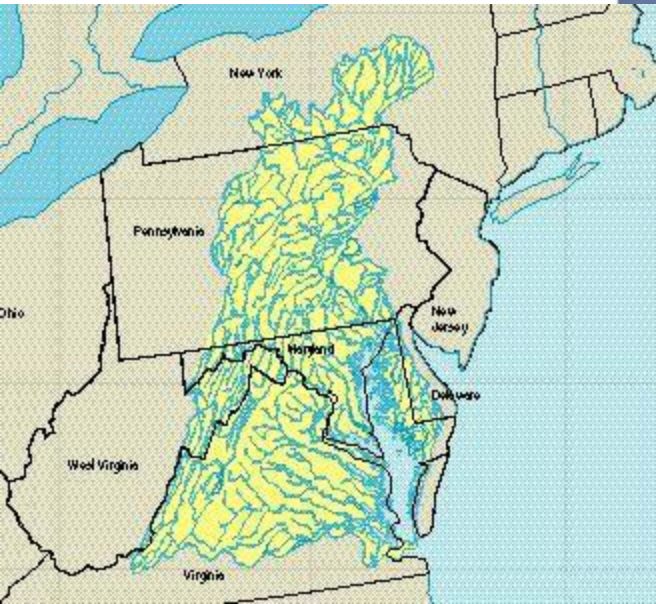
Warm-Up

13JAN2016

- Humans use water in many ways. What is the area that experts say will make the most difference in conserving water?
- Does this mean we don't have to conserve?

Logistics

1. Ozone Check TODAY
2. *Read Chapter 14*
3. *Read Klein #5*
4. Water Inventory is DUE TOMORROW
5. Eco-Column supplies (bottles) due Friday



Chapter 14

Water Pollution

Water Pollution

- ▣ Water pollution- the contamination of streams, rivers, lakes, oceans, or groundwater with substances produced through human activities and that negatively affect organisms.

Water Pollution

- ▣ Point sources- distinct locations that pump waste into a waterway.
- ▣ Nonpoint sources- diffuse areas such as an entire farming region that pollutes a waterway.

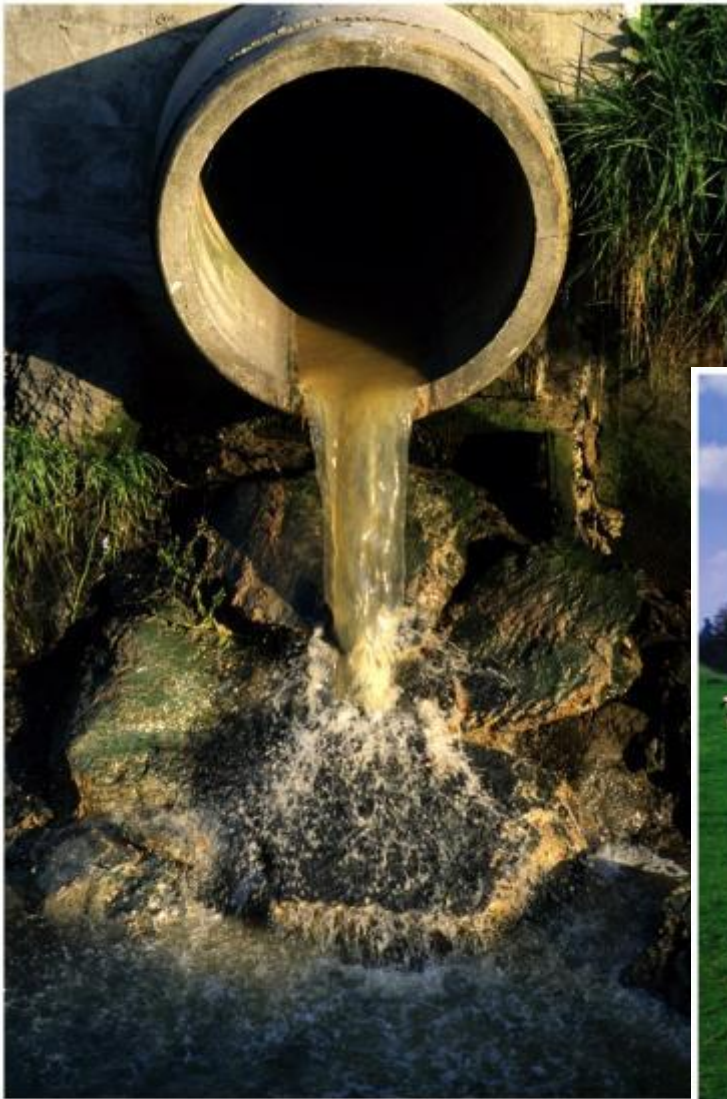
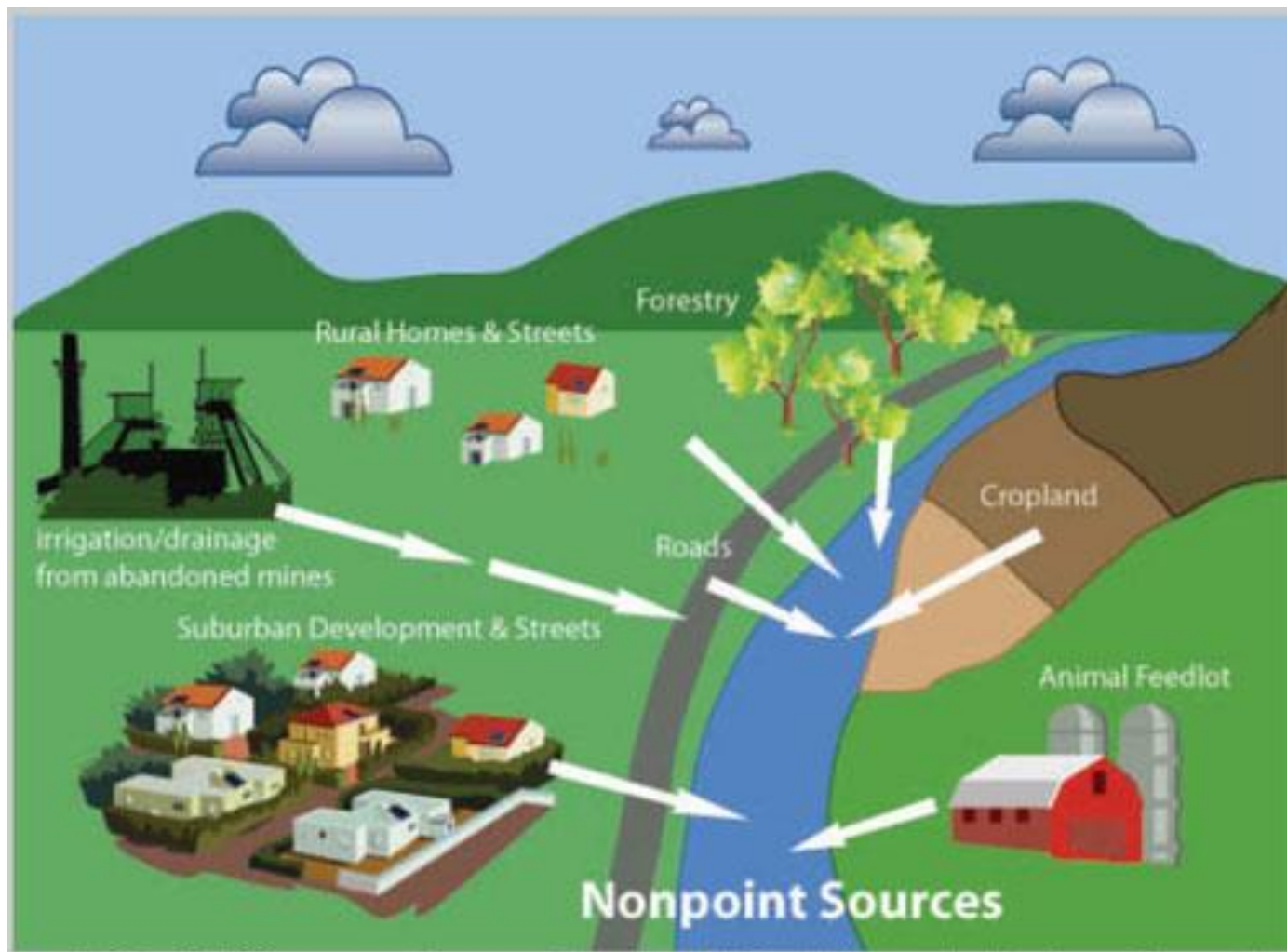


Figure 14.1a
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Figure 14.1b
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- The Clean Water Act regulates point source and non-point source pollutants differently.
- Also does not regulate groundwater
- There are efforts to include biodiversity as a measurement of water quality

- The Clean Water Act regulates point source and non-point source pollutants differently.
- Also does not regulate groundwater
- There are efforts to include biodiversity as a measurement of water quality

“Cheney Loophole”

- Compare and contrast point source pollution and non-point source pollution.
 - What are the environmental, social, and economical consequences of each?

Human Wastewater

- ▣ Water produced by human activities such as human sewage from toilets and gray water from bathing and washing clothes or dishes



Figure 14.2
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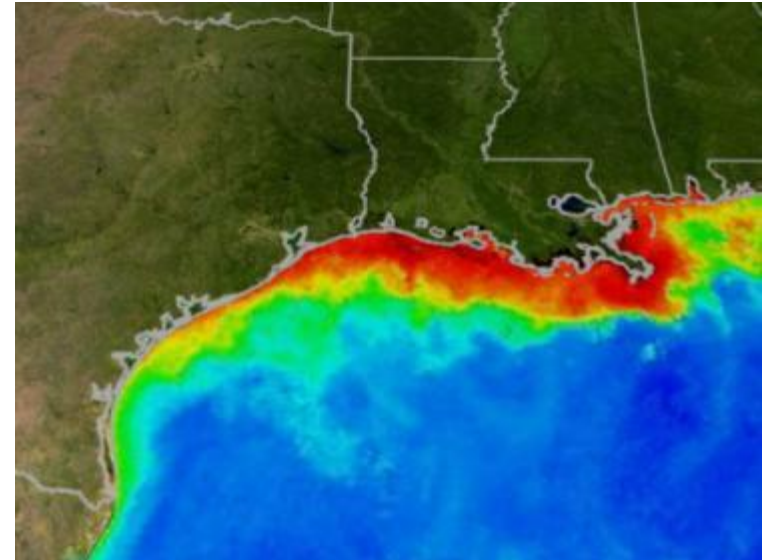
Three reasons scientists are concerned about human wastewater:

- ▣ Oxygen-demanding wastes like bacteria that put a large demand for oxygen in the water
- ▣ Nutrients that are released from wastewater decomposition can make the water more fertile causing eutrophication
- ▣ Wastewater can carry a wide variety of disease-causing organisms.

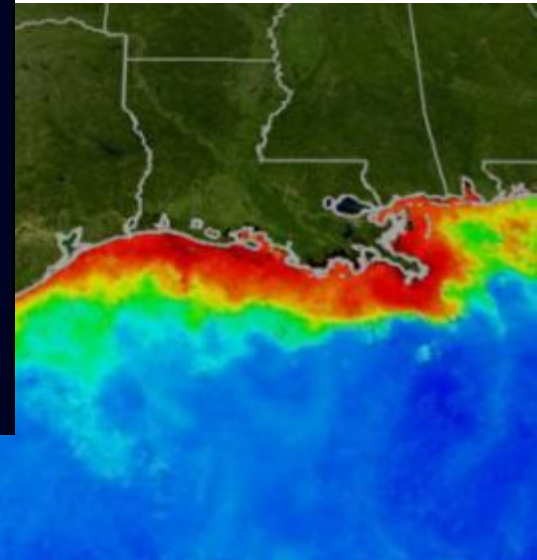
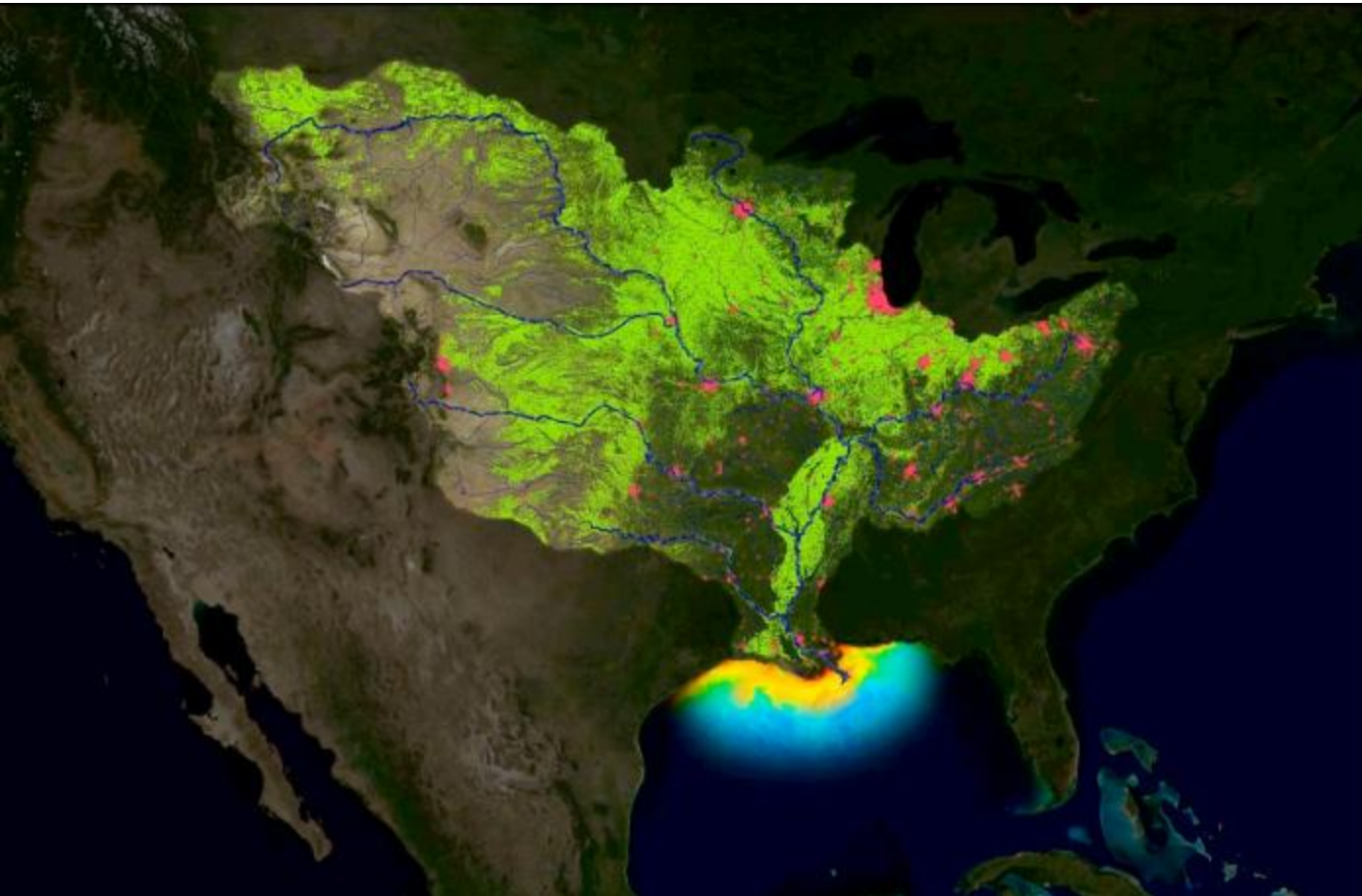
Biochemical Oxygen Demand (BOD)

- ▣ BOD- the amount of oxygen a quantity of water uses over a period of time at a specific temperature.
- ▣ Lower BOD values indicate the water is less polluted and higher BOD values indicate it is more polluted by wastewater.

Dead Zones



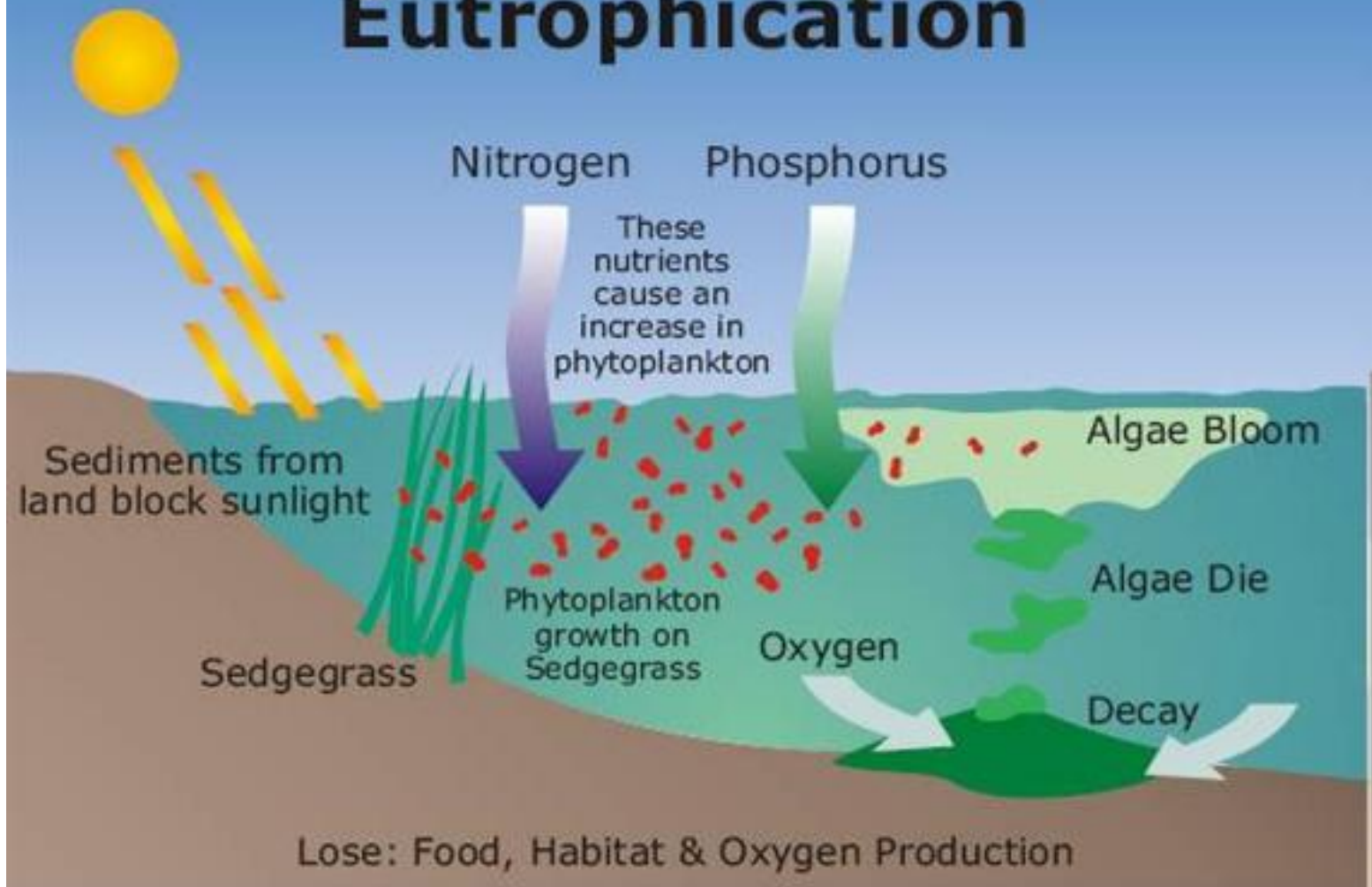
Dead Zones



Eutrophication

- ▣ Eutrophication is an abundance of fertility to a body of water.
- ▣ Eutrophication is caused by an increase in nutrients, such as fertilizers.
- ▣ Eutrophication can cause a rapid growth of algae which eventually dies, causing the microbes to increase the BOD.

Eutrophication



IMPACT

EUTROPHICATION

Before Eutrophication



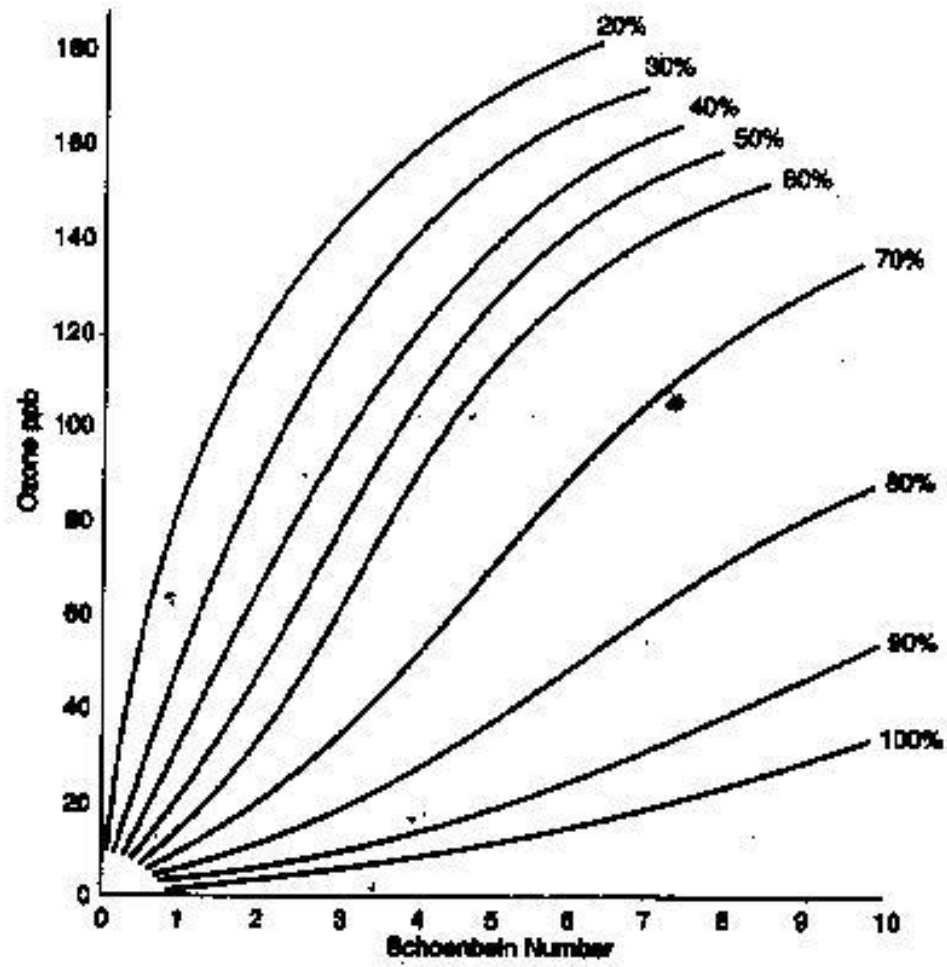
After Eutrophication



Common Diseases from Human Wastewater

- ▣ Typhoid fever
- ▣ Stomach flu
- ▣ Diarrhea
- ▣ Cholera
- ▣ Hepatitis

- How does a high BOD influence water quality?
- What is a “dead zone”? How do nitrogen and phosphorous contribute to dead zones?
- What pathogens are common in poorly treated wastewater? Where are they the biggest threat?



Warm-Up

14JAN2015

- What causes a “dead zone”?
- What is a difference between point source pollution and non-point source pollution?

Logistics

- Water Survey is Due today, Thursday
- Warm-ups Due Friday
- **DON'T FORGET YOUR BOTTLES (Kalynn will not be here) THIS IS AN EASY GRADE!**

State of the Union 2016

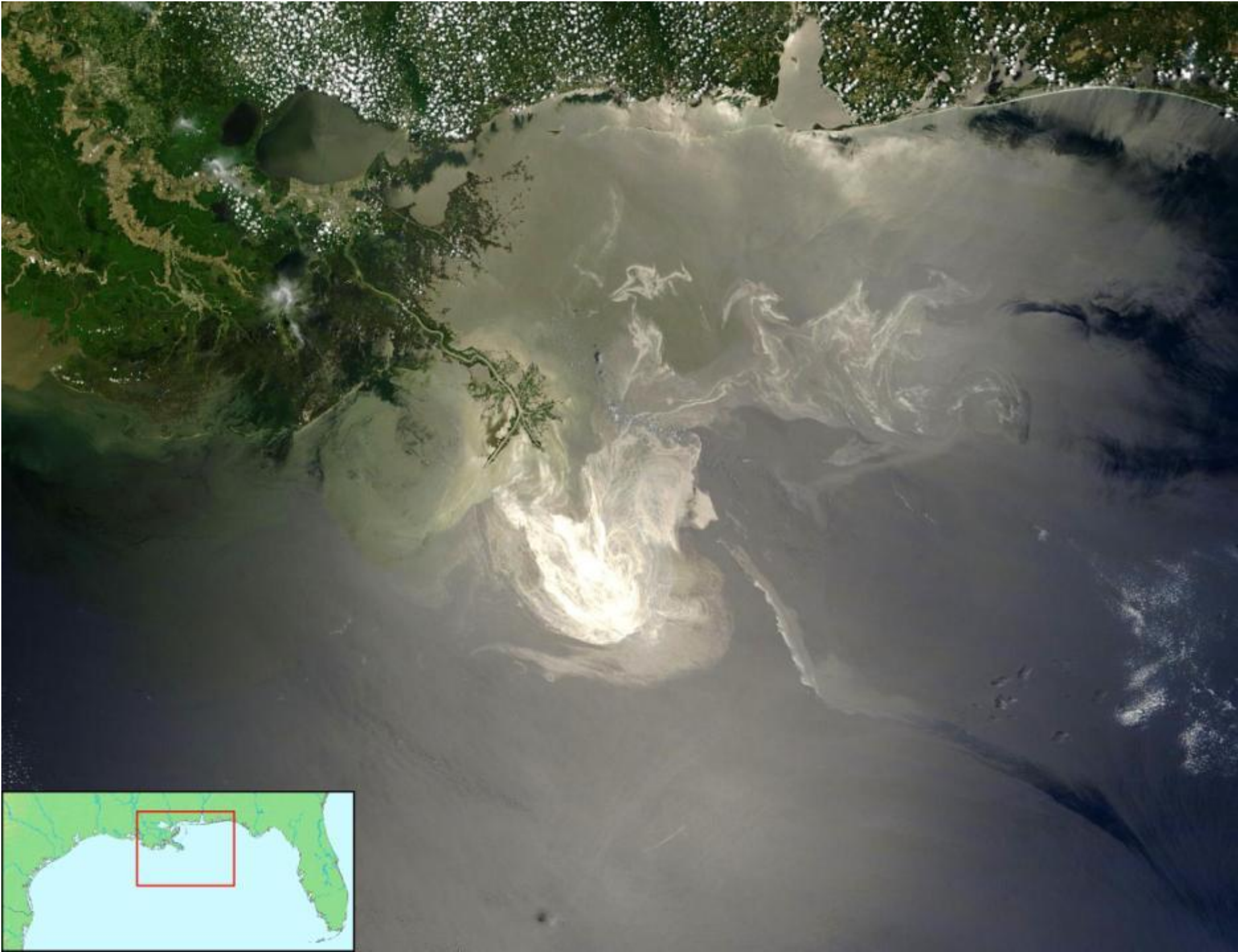
- But I can't do these things on my own. Changes in our political process — in not just who gets elected but how they get elected — that will only happen when the American people demand it. It will depend on you. That's what's meant by a government of, by, and for the people.
- What I'm asking for is hard. It's easier to be cynical; to accept that change isn't possible, and politics is hopeless, and to believe that our voices and actions don't matter. But if we give up now, then we forsake a better future. Those with money and power will gain greater control over the decisions that could send a young soldier to war, or allow another economic disaster, or roll back the equal rights and voting rights that generations of Americans have fought, even died, to secure. As frustration grows, there will be voices urging us to fall back into tribes, to scapegoat fellow citizens who don't look like us, or pray like us, or vote like we do, or share the same background.
- We can't afford to go down that path. It won't deliver the economy we want, or the security we want, but most of all, it contradicts everything that makes us the envy of the world.
- So, my fellow Americans, whatever you may believe, whether you prefer one party or no party, our collective future depends on your willingness to uphold your obligations as a citizen. To vote. To speak out. To stand up for others, especially the weak, especially the vulnerable, knowing that each of us is only here because somebody, somewhere, stood up for us. To stay active in our public life so it reflects the goodness and decency and optimism that I see in the American people every single day.
- It won't be easy. Our brand of democracy is hard. But I can promise that a year from now, when I no longer hold this office, I'll be right there with you as a citizen — inspired by those voices of fairness and vision, of grit and good humor and kindness that have helped America travel so far. Voices that help us see ourselves not first and foremost as black or white or Asian or Latino, not as gay or straight, immigrant or native born; not as Democrats or Republicans, but as Americans first, bound by a common creed. Voices Dr. King believed would have the final word — voices of unarmed truth and unconditional love.
- They're out there, those voices. They don't get a lot of attention, nor do they seek it, but they are busy doing the work this country needs doing.

Today...

- Complete your water inventory questions and calculations!
- You need to compare data
- I could use a couple volunteers to wash our rocks today 😊

Deepwater Horizon 2010





Warm-Up

15JAN2015

1. What was most surprising about the lab yesterday?



Logistics

- Due today: Personal Water Survey
- Bring your eco-column supplies tomorrow!!
 - 6 Bottles, leaves/grass, 3 caps with holes punched, fruit pieces
- Due Tomorrow:
 - 10 vocabulary
 - Warm-ups
 - “no water off a duck’s back questions”

Treatments for Human and Animal Wastewater

- ▣ Septic systems- a large container that receives wastewater from the house.

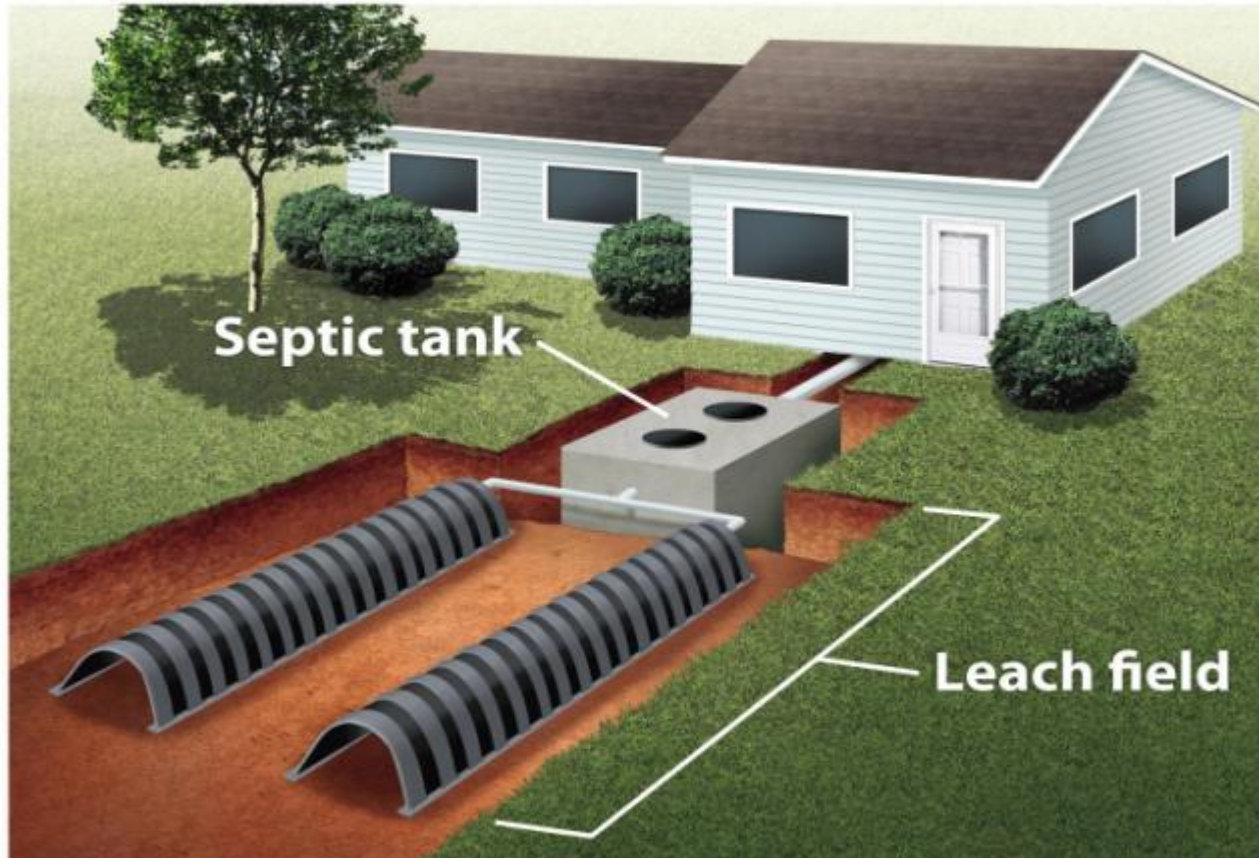


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Treatments for Human and Animal Wastewater

- ▣ Sewage Treatment Plants- centralized plants in areas with large populations that receive wastewater via a network of underground pipes.

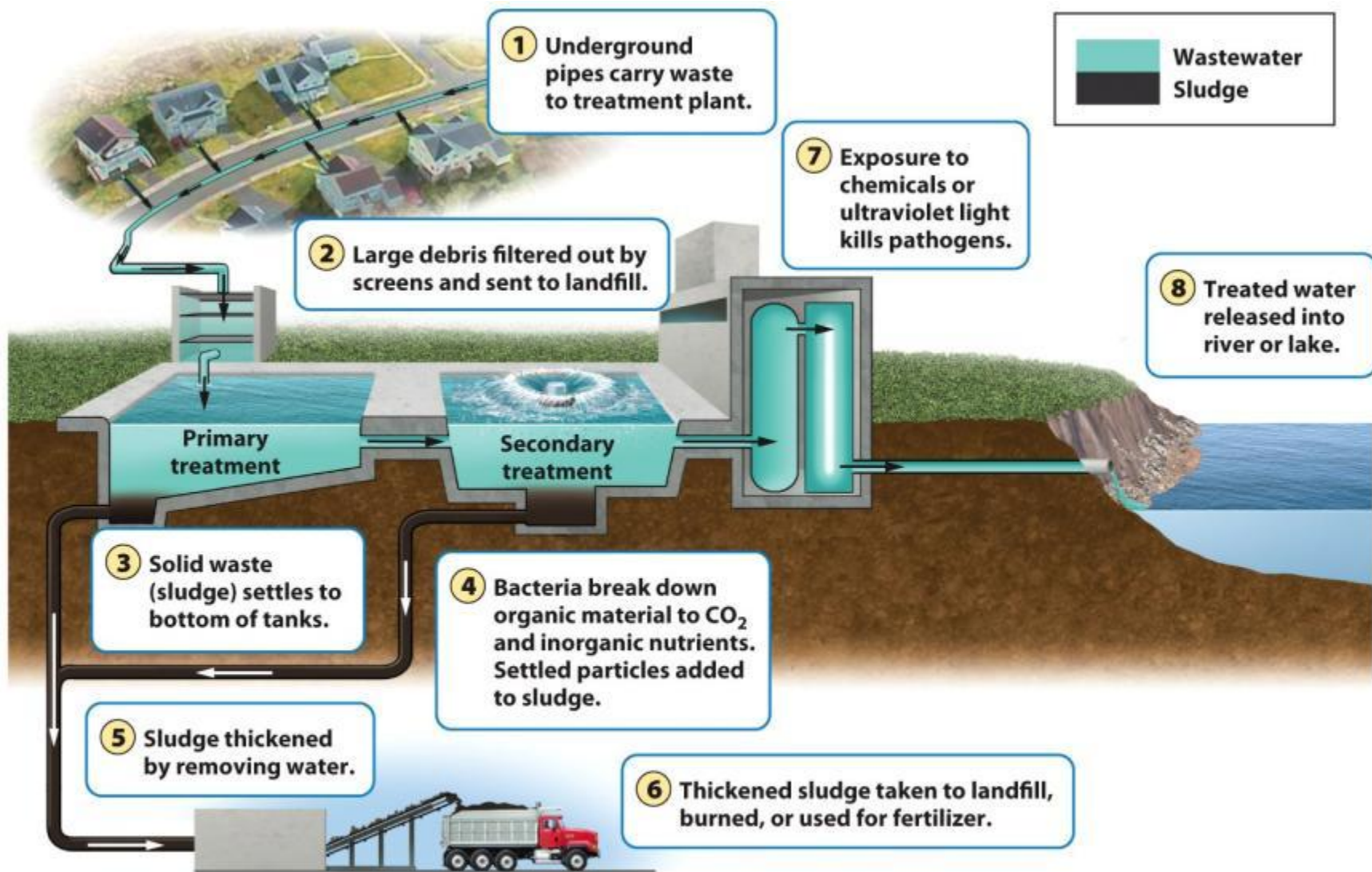


Figure 14.6

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- Both kinds of wastewater processing use bacteria to break down the organic matter into inorganic compounds including: phosphorous and nitrate.

Treatments for Human and Animal Wastewater

- ▣ Manure lagoons- large, human-made ponds lined with rubber to prevent the manure from leaking into the groundwater. After the manure is broken down by bacteria, it is spread onto fields as fertilizers.



Figure 14.7
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- video

- What problems are associated with sewage?
- Describe and contrast the 2 most common ways to treat wastewater.
- Describe the advantages and disadvantages of both septic systems and sewage plants.
- What is the role of bacteria in the treatment of human and animal waste?

Heavy Metals and Other Substances that can threaten human Health and the Environment

- ▣ Lead
- ▣ Arsenic
- ▣ Mercury
- ▣ Acids
- ▣ Synthetic compounds (pesticides, pharmaceuticals, and hormones)

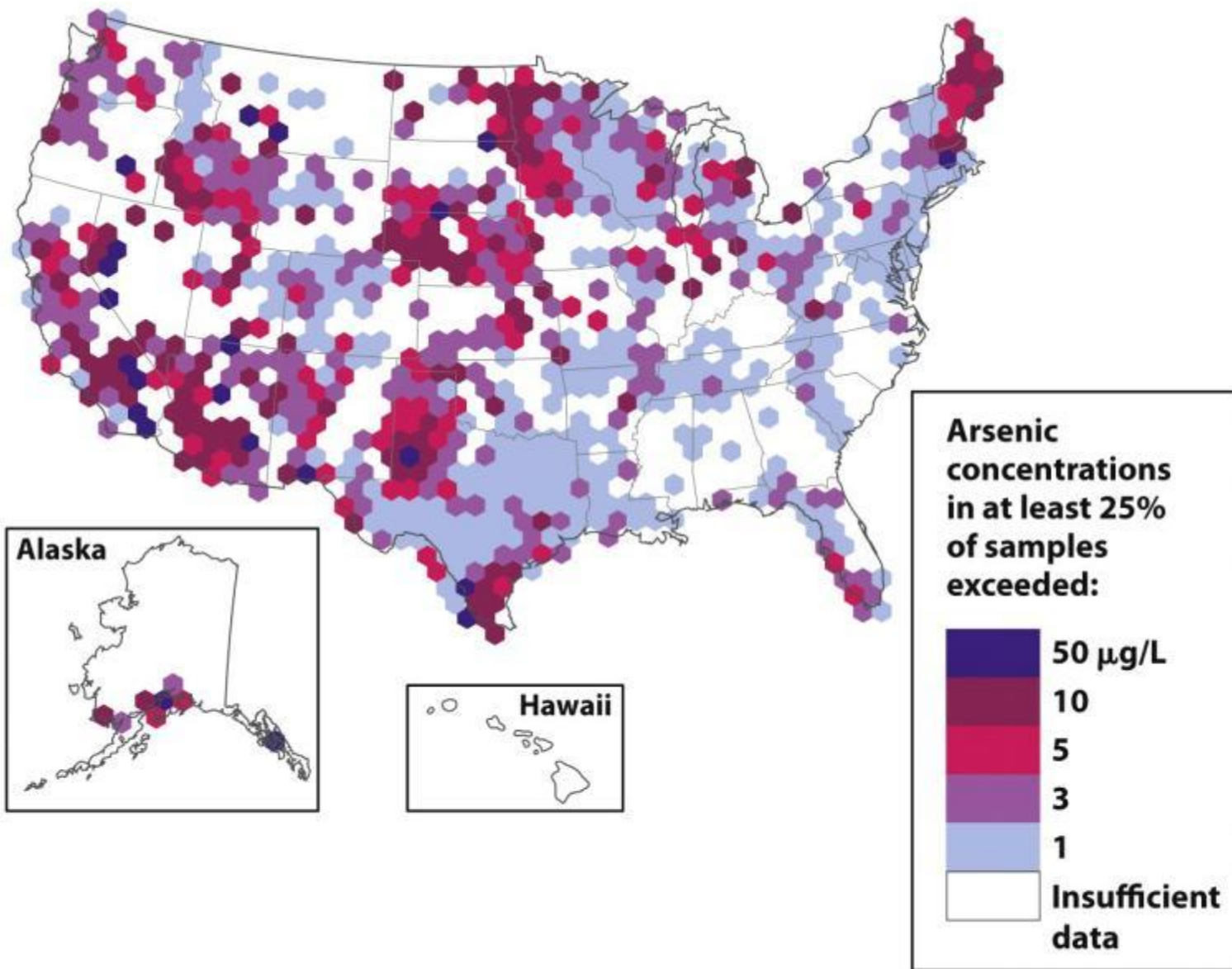


Figure 14.8

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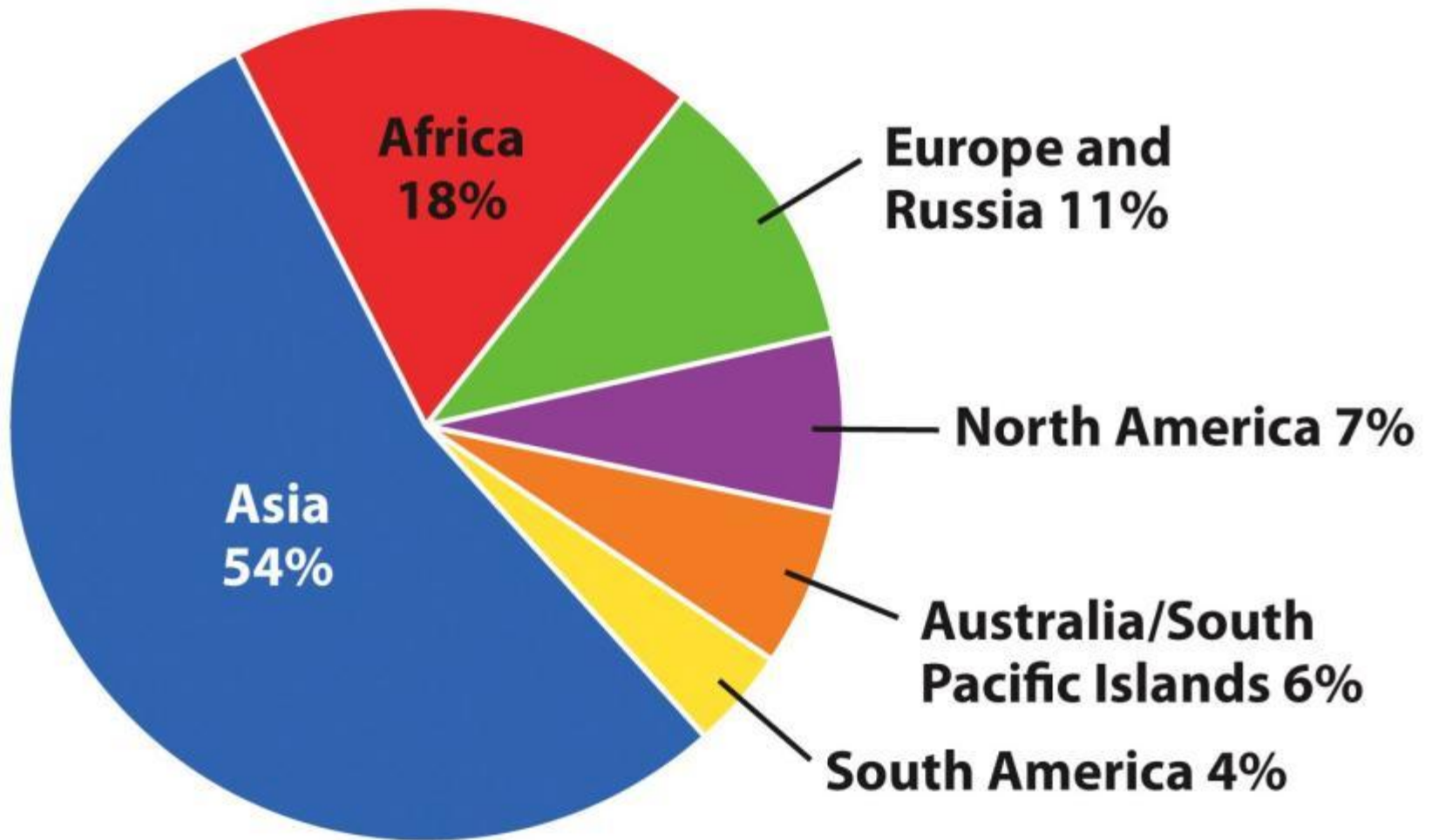
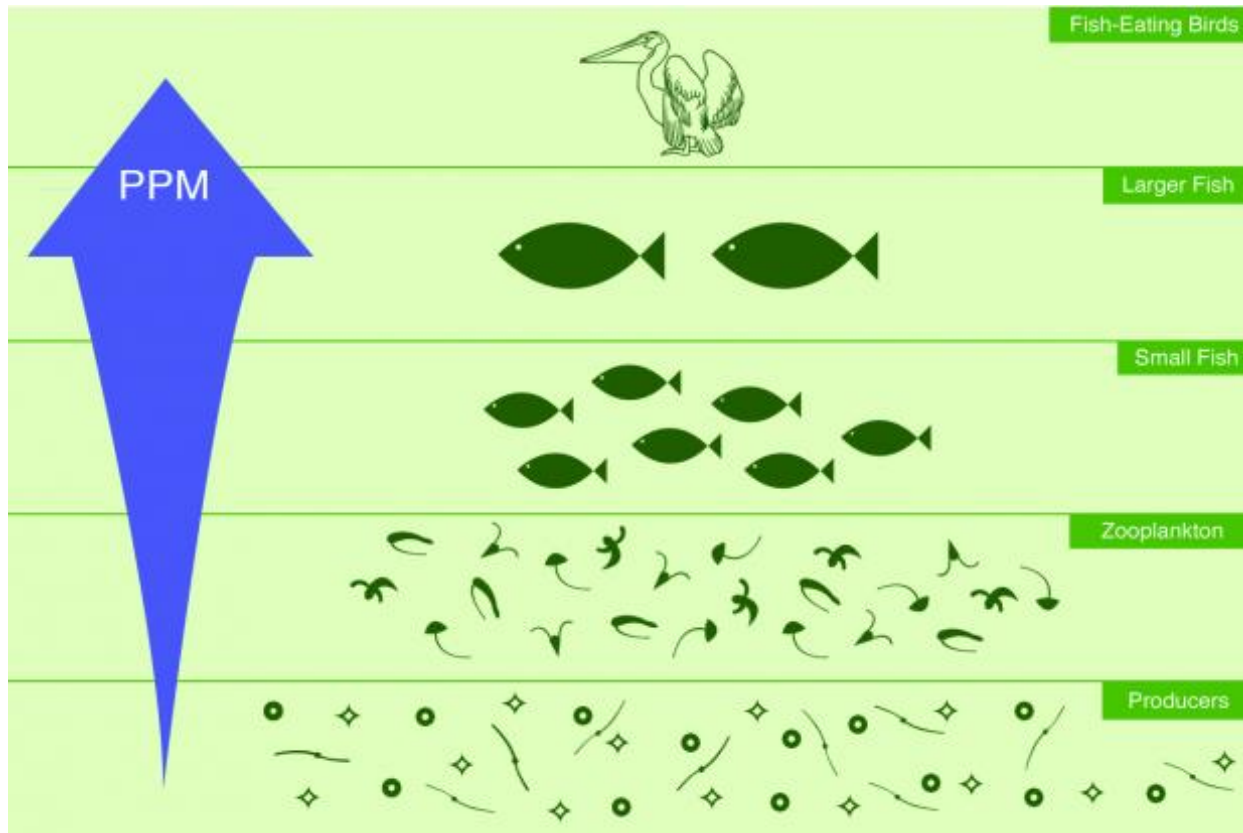


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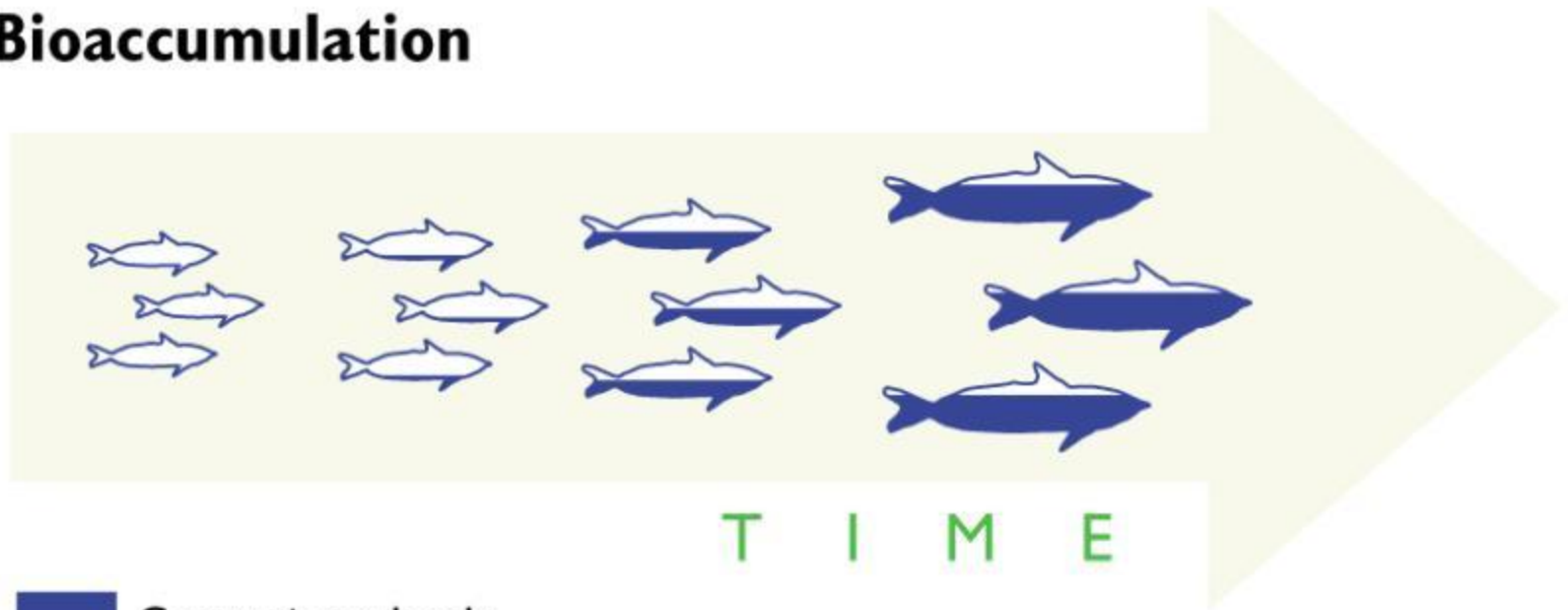
World Mercury Pollution

Bioaccumulation

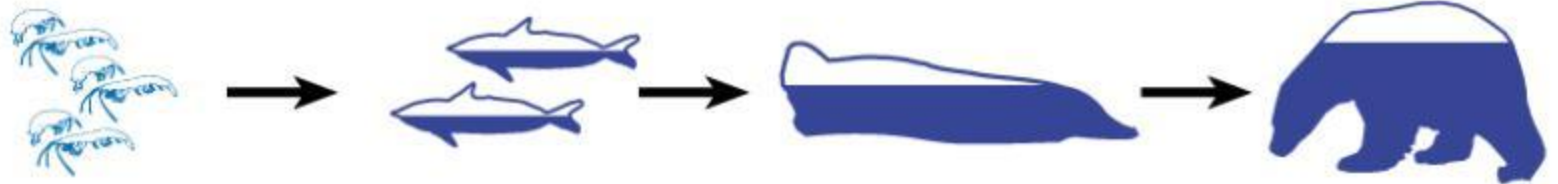
- An increasing of concentration of pollutants as the toxin travels up the food chain



Bioaccumulation



■ Contaminant levels



■ Contaminant levels

Biomagnification





- Mercury
- Methylmercury
- Tetramethyllead
- DDT
- Strontium-90



Warm-Up

16JAN2015

- Turn in the following:
 - 10 Vocabulary
 - Warm-ups
 - Personal Water Survey
 - “No water off a duck’s back”
- Gather up your supplies for the Eco-Column