

# Warm-up

05JAN2016

1. Welcome Back!
2. When is this Warm-Up sheet due for 10 points?

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05JAN2016

1. Welcome Back!
2. When is this Warm-Up sheet due for 10 points?

Friday 15\_JAN\_2016

Please use both sides of the paper

# Logistics

- For the rest of the year there will be 2 or 3 chapters covered in each Celebration.
- Expect the following for the next 3 weeks:
  - Quizzam/FRQ (1/22)
  - Personal Water Use survey (one week long)
  - “No water off a duck’s back” lab
  - ECO-Column Lab (long-term 4-6 weeks)
  - 10 vocabulary cards (1/8 and 1/22)
  - Warm-ups (1/15)
  - Klein Discussions on Mondays

# ECO-Column Supplies

- Each group will need the following by **Friday 15th**:
  - Small bag of rocks
  - 6 soda bottles WITH CAPS, 2 liter size. The generic Kroger ones work best, must be smooth.
  - A hand full of leaves, grass clipping, and fruit pieces to decompose



# Klein Discussion Points

*Public and Paid for: Overcoming Ideological Blocks to the Next Economy*

In earlier chapters we recognized a problem rooted in ecology, that has economic, social, and environmental causes (and solutions)

This chapter is the how to shift the economy to support a transitioning away from fossil fuels as the major energy source

# Thesis of Chapter 3

- It IS possible to transition from fossil fuels to renewable energy sources!  
Is there the political WILL?

# Discussion Points

Thinking back to our Friedman economics:

1. De-regulation
2. Privatization
3. Free-Market Trading

This explains the energy system at present

There are 2 ideologies that are at work that can help or harm progress towards the low carbon emission economy

# Compare and Contrast

Privately Owned Utilities  
(small government)

Publically owned Utilities  
(big government)



1. How do natural disasters make clear discrepancies between wealth?

2. What is meant by the following quote:

*“During good times, it’s easy to deride “big governments” and talk about the inevitability of cutbacks. But during disasters, most everyone loses their free market religion and wants to know that their government has their backs” (107)*

# Polluter Pays

1. What is Klein's plan to get the funds to make the transition away from fossil fuels?
2. How does the idea of "fairness" fit in the plan?
3. Do you think it is possible in our "culture of narcissism" for sacrifices to be made in an equitable way?

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# Warm-Up

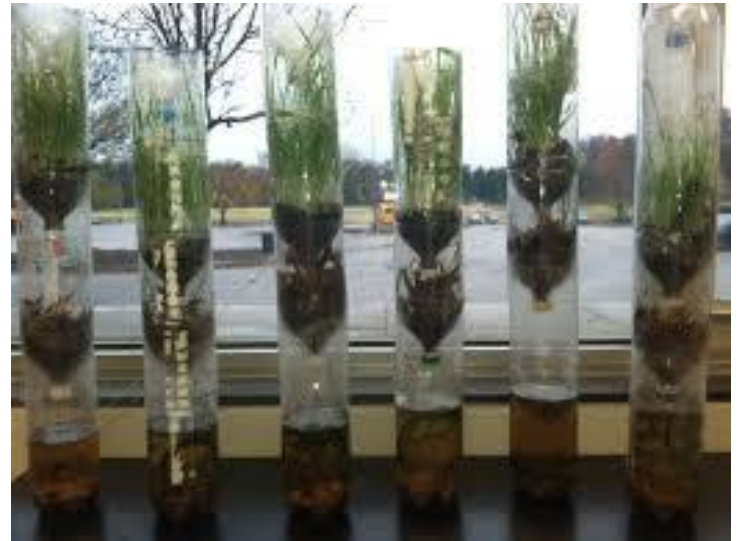
06JAN2016

1. What items does your group need to bring in for our Eco-Column Lab?



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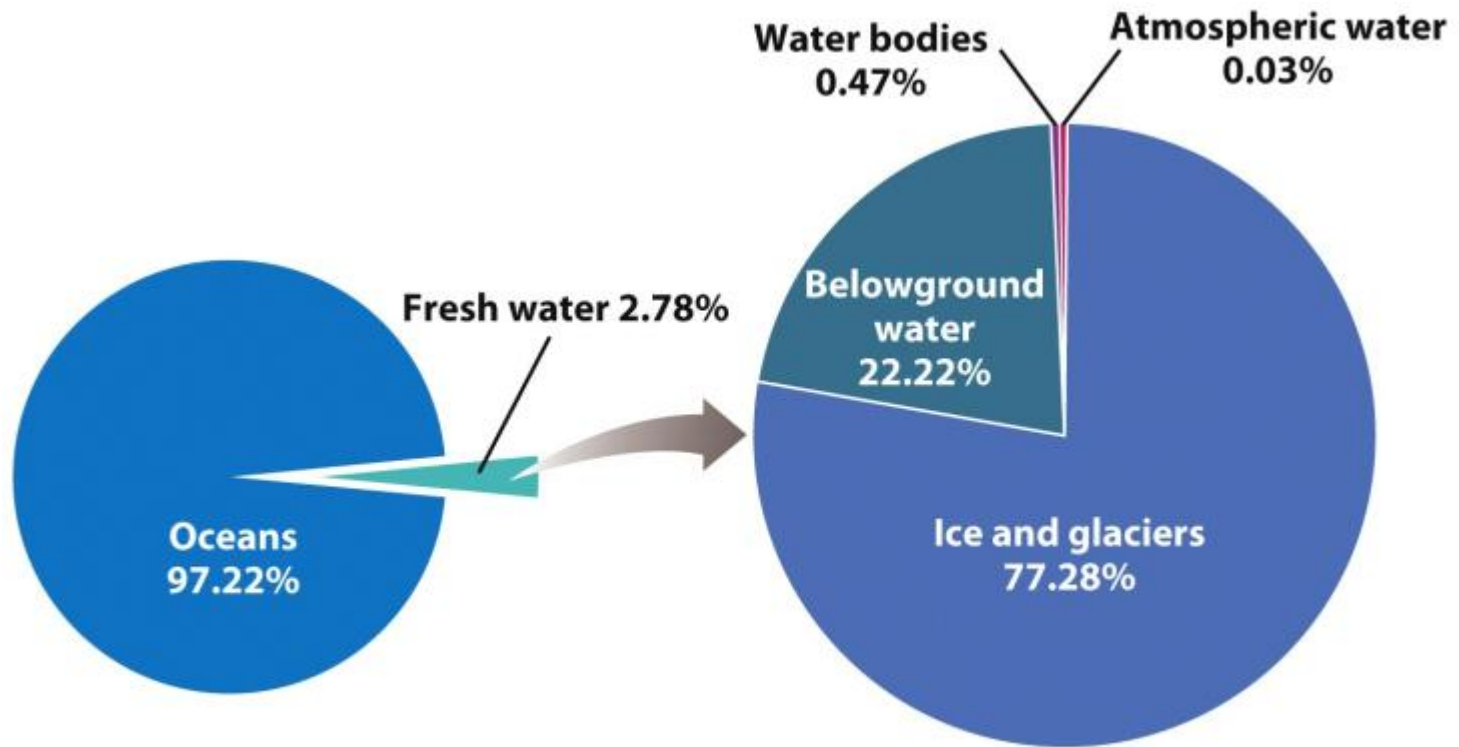


# Chapter 9

## Water Resources



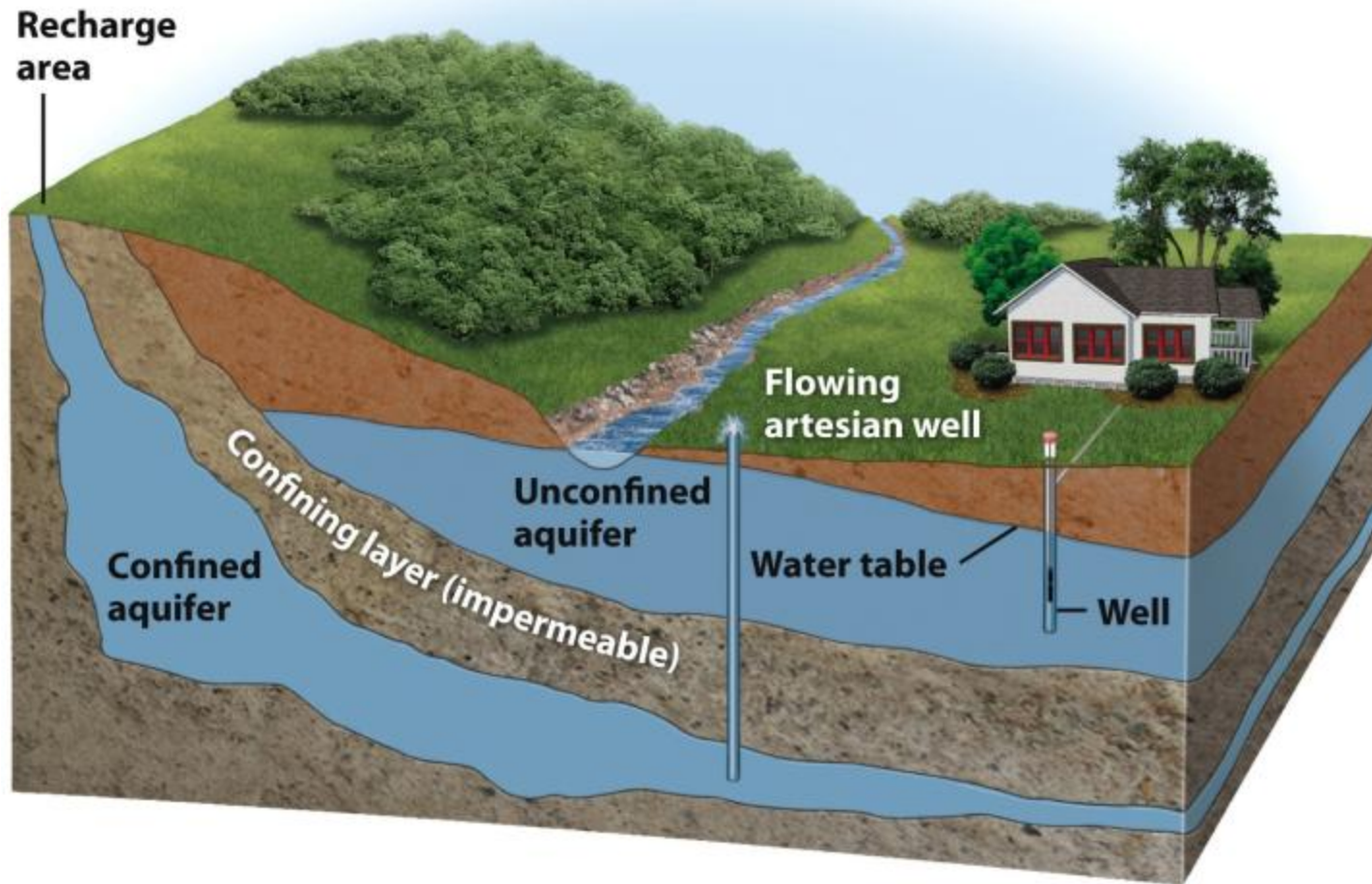
# Usable Water is Rare



**Figure 9.1**  
*Environmental Science*  
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# Groundwater

- Aquifers- small spaces found within permeable layers of rock and sediment where water is found.
- Unconfined aquifers- an aquifer that is simply porous rock covered by soil.
- Confined aquifers- an aquifer surrounded by a layer of impermeable



**Figure 9.2**  
*Environmental Science*  
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Recharge rates

# Groundwater

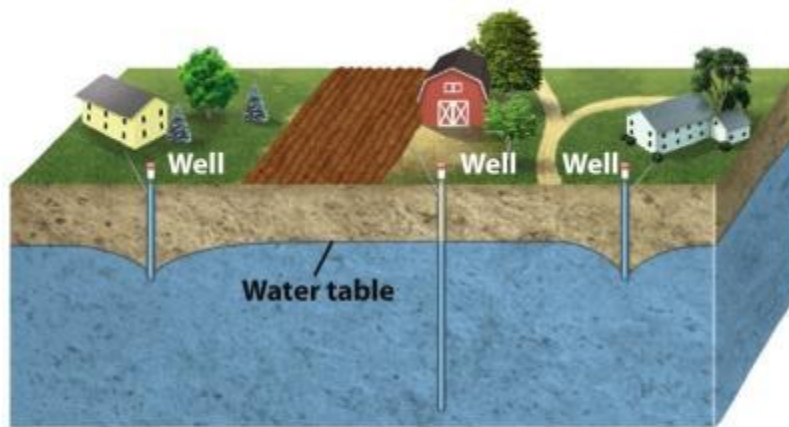
- Water table- the uppermost level at which the water in an area fully saturates the rock or soil.
- Recharge- the input process of water percolating into an aquifer.
- Springs- water from an aquifer that naturally percolates up to the surface



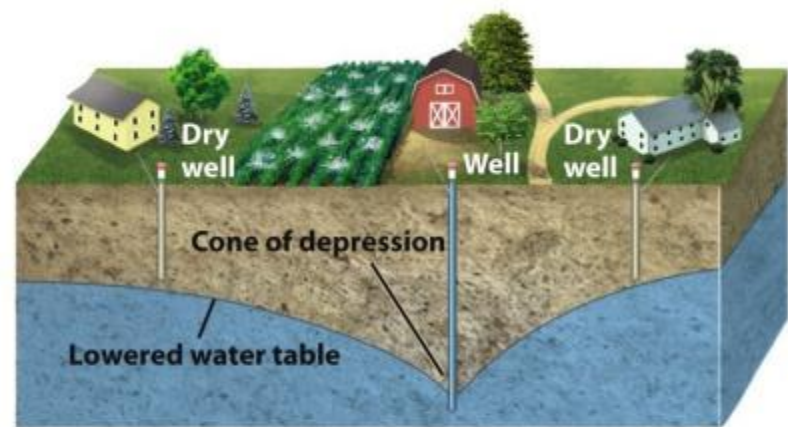
Figure 9.3  
Environmental Science  
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# Groundwater

- Cone of depression- an area where there is no longer any groundwater.



(a) Before heavy pumping



(b) After heavy pumping

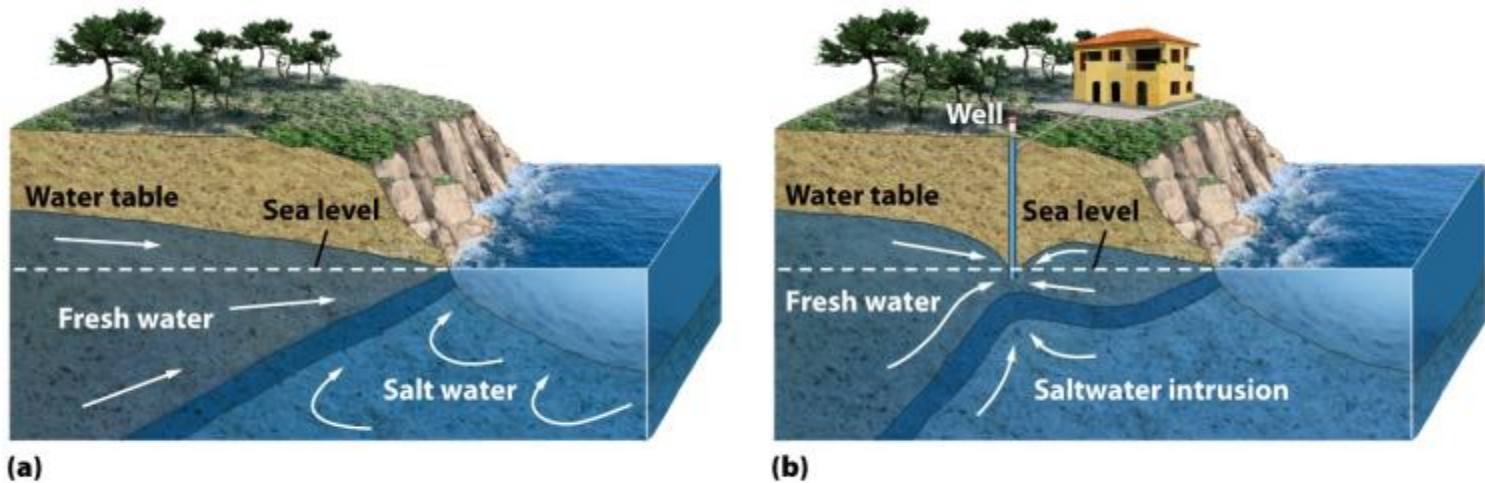
Figure 9.5

*Environmental Science*

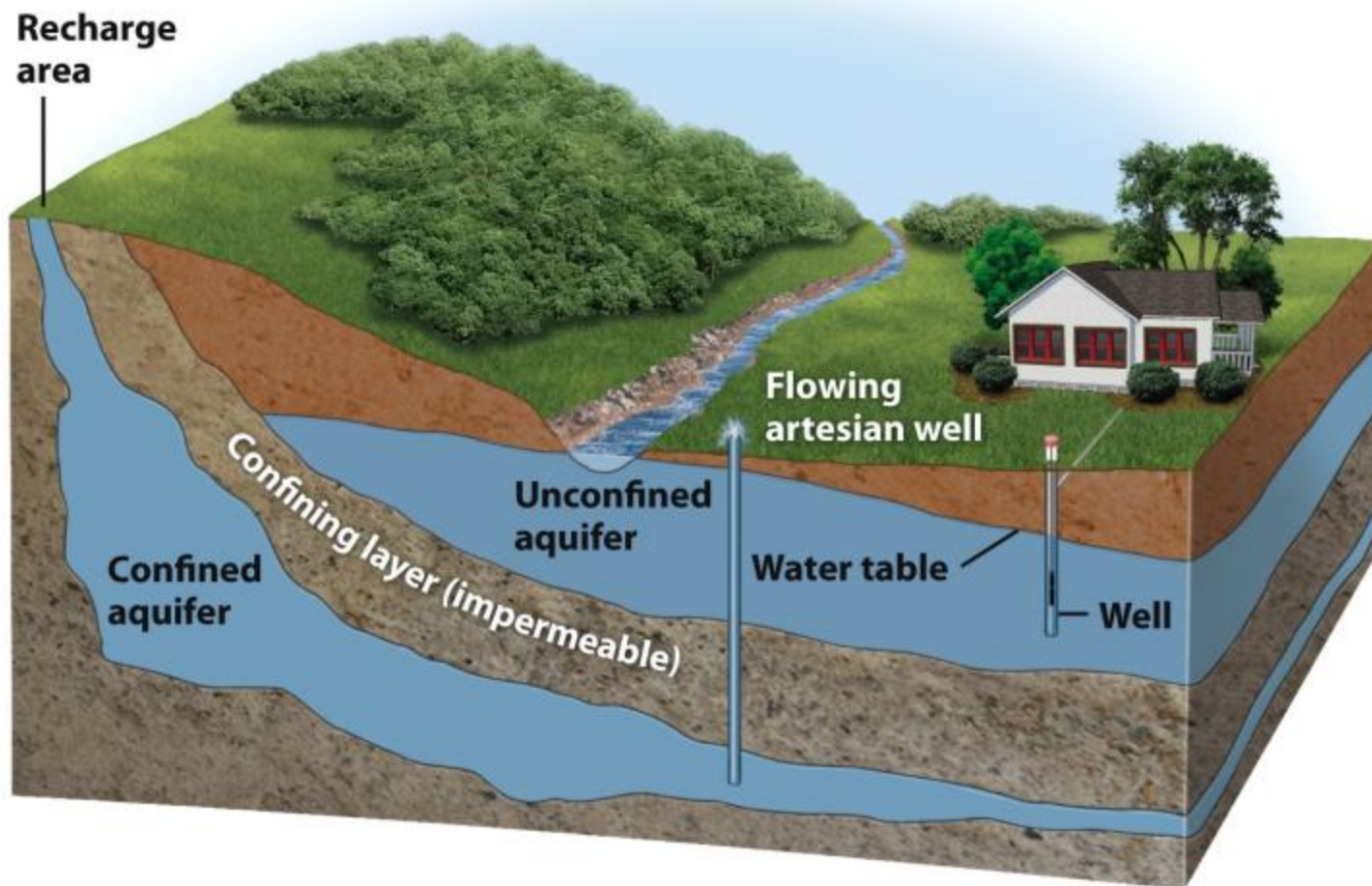
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# Groundwater

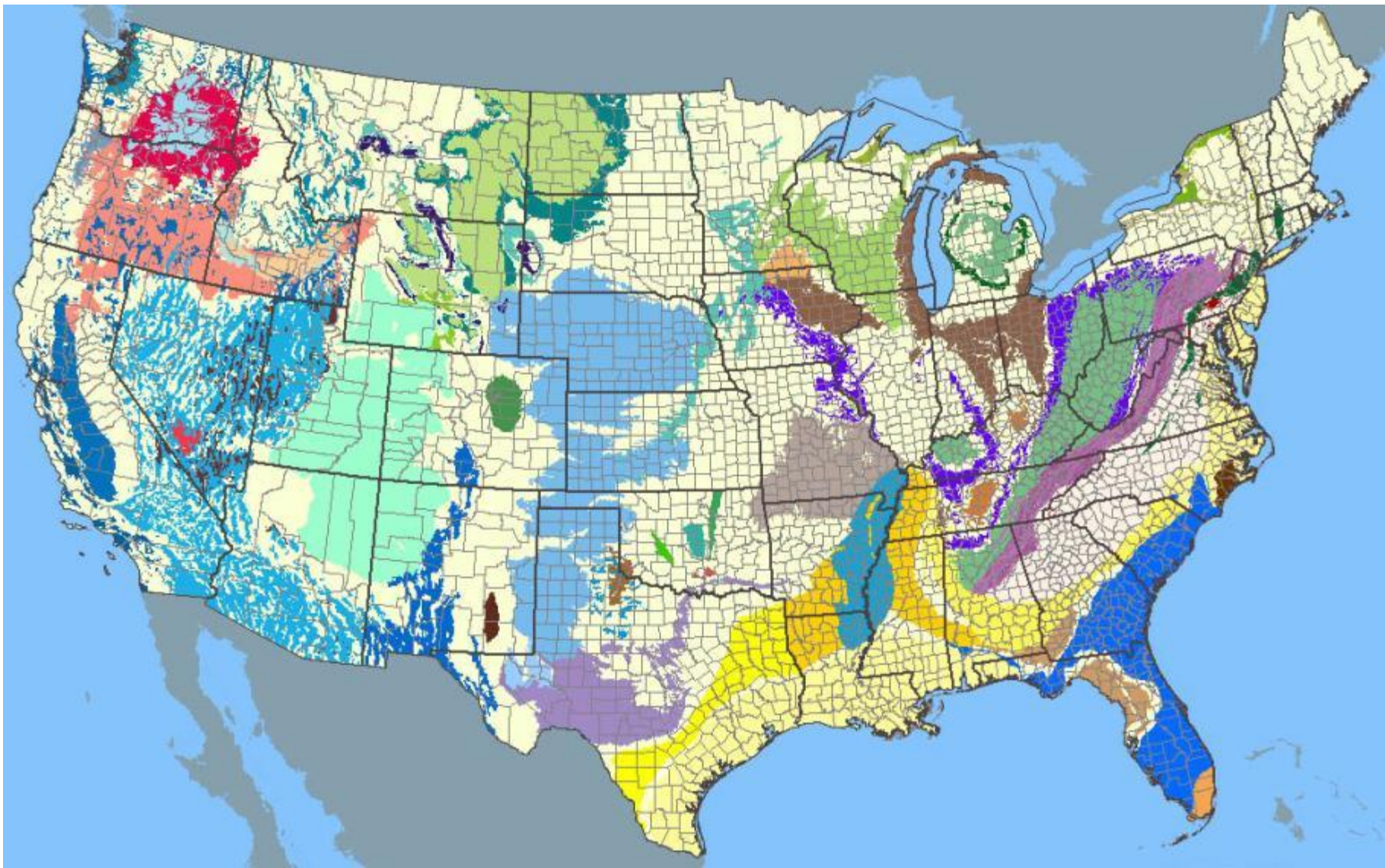
- Saltwater intrusion- when the pumping of fresh water out of a well is faster than the recharge. Near coastal areas this can cause salt water to infiltrate the aquifer.



**Figure 9.6**  
*Environmental Science*  
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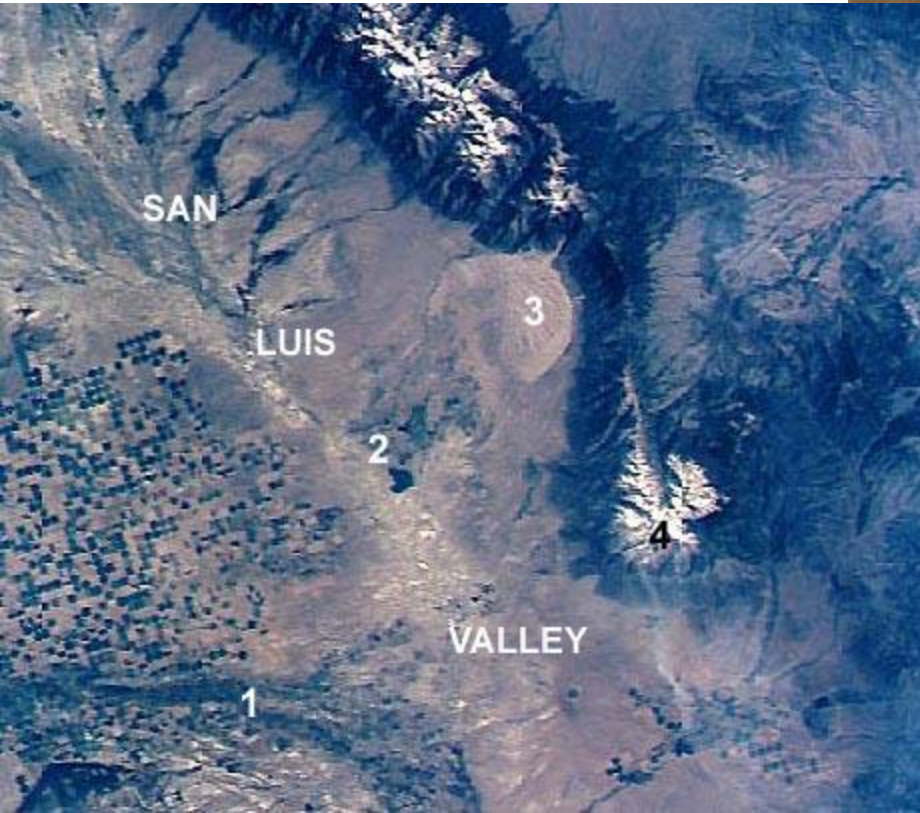


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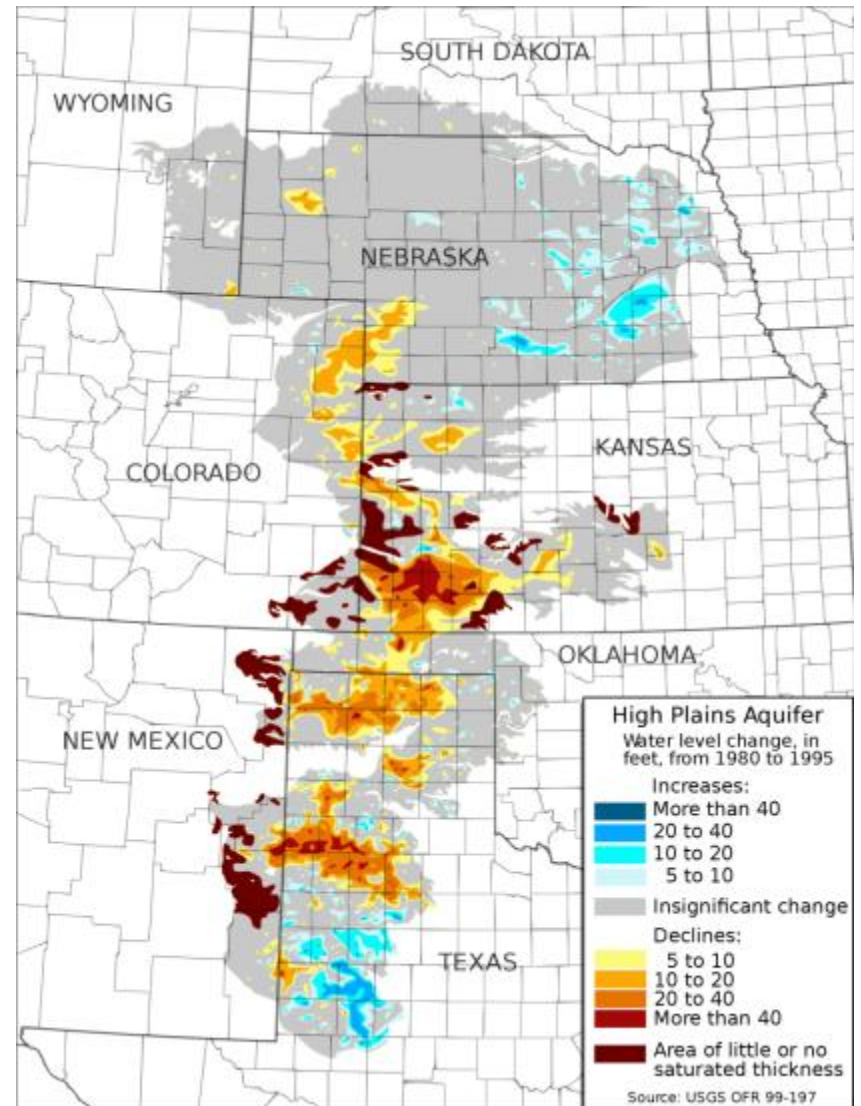
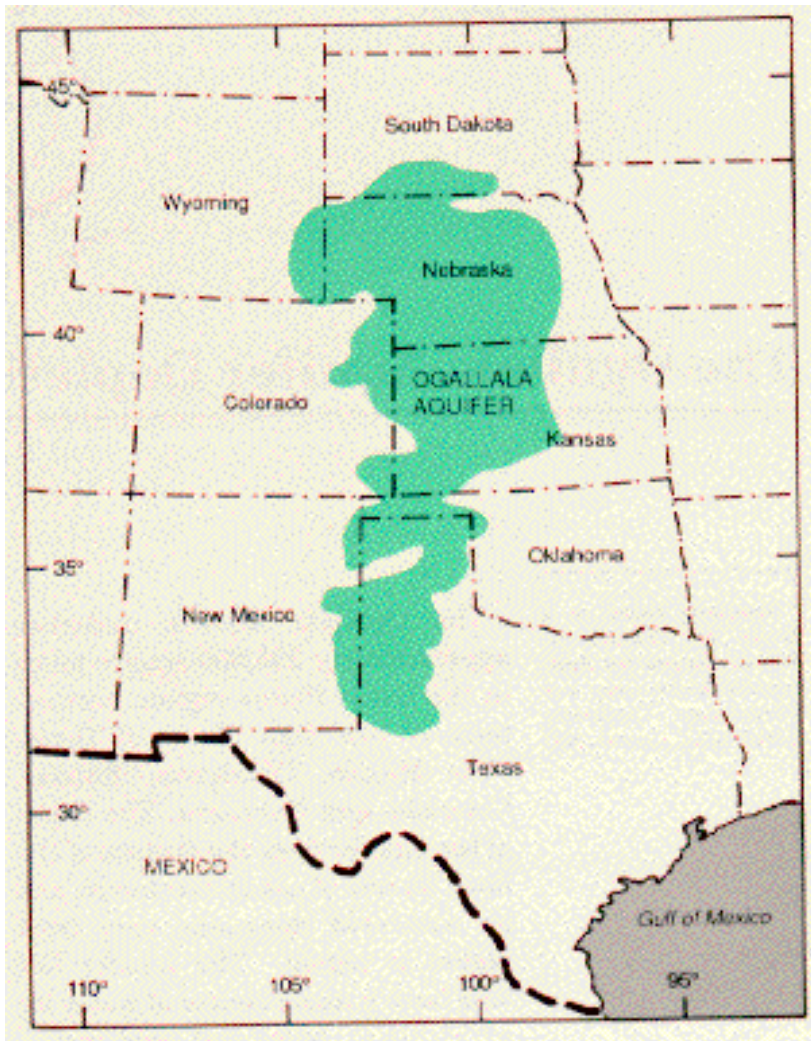




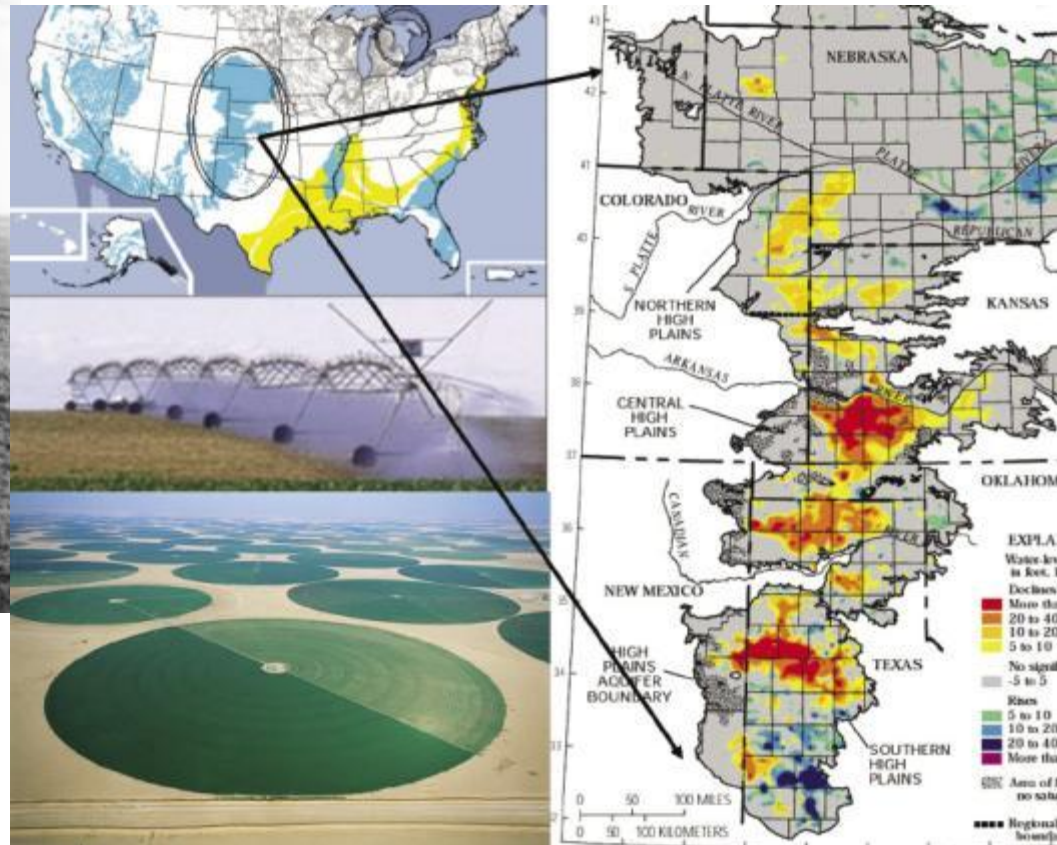
# San Luis Valley, CO



# Ogallala Aquifer



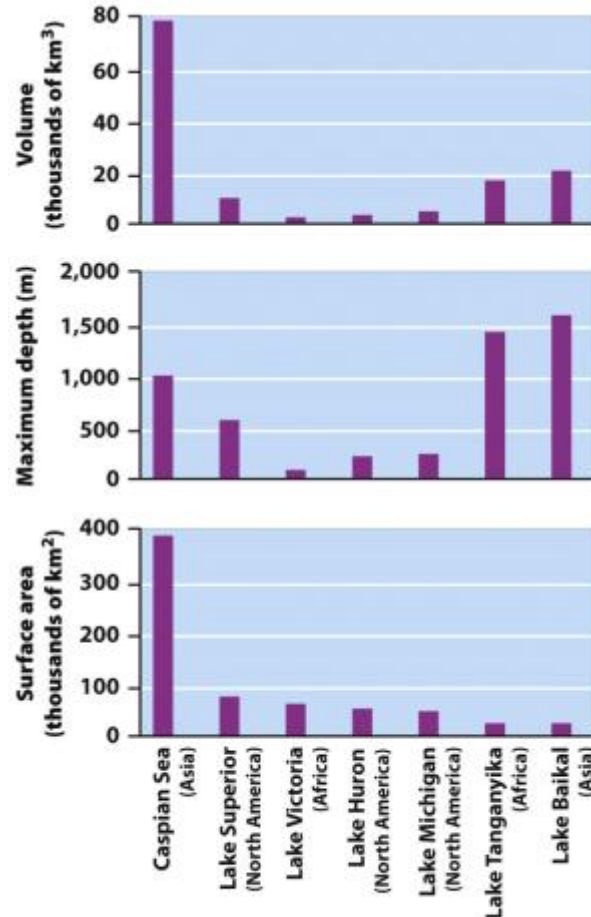
# Ogallala Aquifer



- video

# Surface Water

- Streams, rivers, ponds, lakes and wetlands

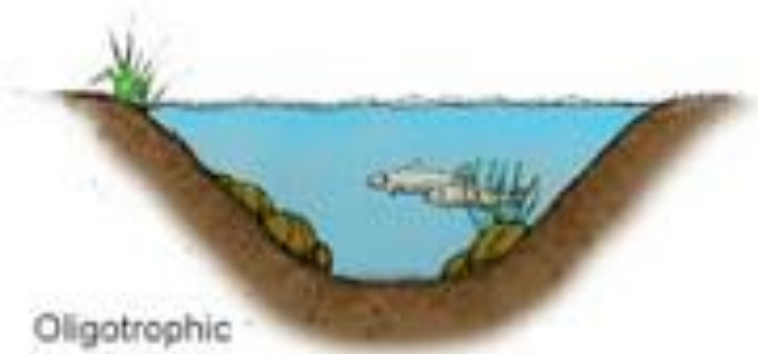


**Figure 9.7**  
*Environmental Science*  
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# Surface Water

- Productivity in a lake:
  - Oligotrophic- low amounts of nutrients such as phosphorous and nitrogen.
  - Mesotrophic- a moderate level of productivity
  - Eutrophic- high levels of productivity





Oligotrophic

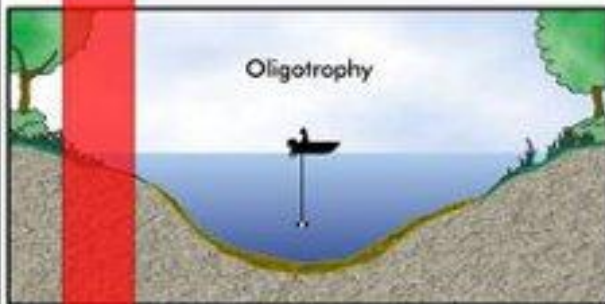


Mesotrophic

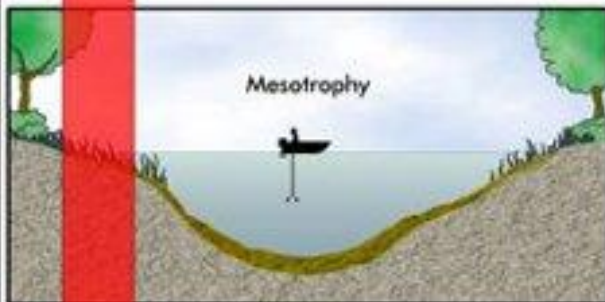


Eutrophic

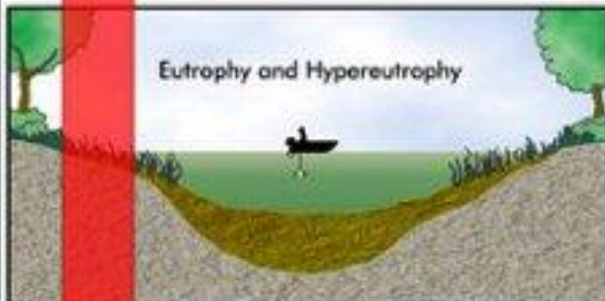
### Natural Eutrophication



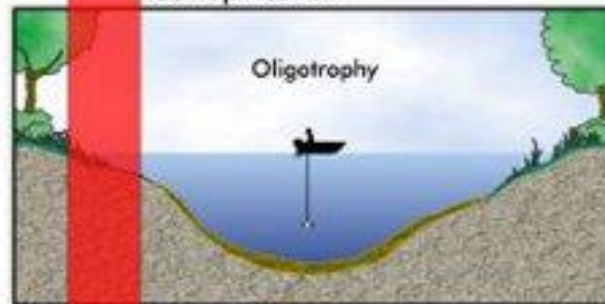
Thousands of years



Hundreds of years

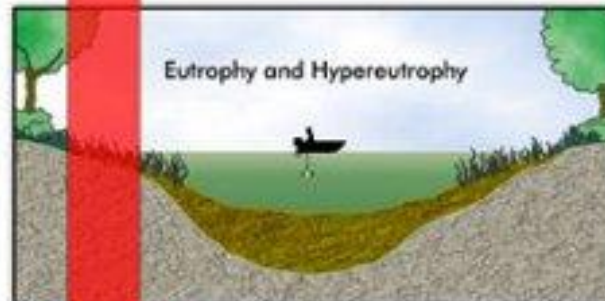


### Anthropogenic or "Man-made" eutrophication



Decades

Urban Runoff  
Industrial Discharge  
Fertilizers and Pesticides  
Erosion and Sedimentation  
Nonpoint Source Pollution  
from Cottages



Drawing: Francine Matte Savard  
Ministère du Développement durable,  
de l'Environnement et des Parcs, 2005



- What are the primary repositories of fresh water on Earth? Which are the largest?
- What is the difference between a confined and unconfined aquifer? How do their recharge rates differ?
- How do human activities worsen the effects of droughts and floods?