WATERSHED, WATERSHED, EVERYWHERE!

1. Color in the Chesapeake Bay on the map below:

Delaware

Maryland

Maryland

Potomac River

Virginia

Chesapeake Bay

Virginia

Atlantic Ocean

Cape Charles

Cape Henry

MILES 20 40 80

National Atlas of the United States
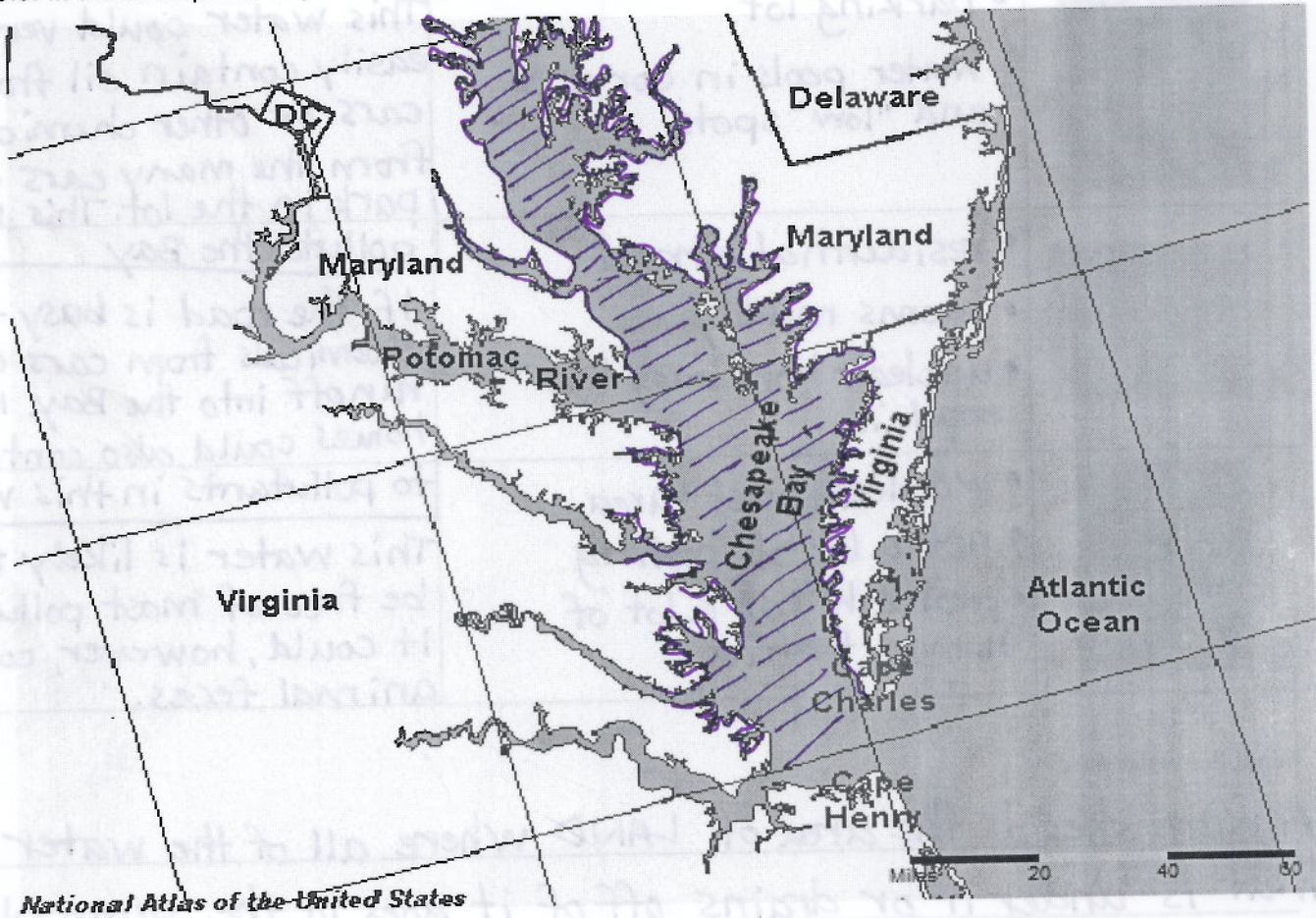
2. Picture Observations and Predictions:

PICTURE	OBSERVATIONS (What do you see?)	PREDICT How might the __WATER__ you see in each picture impact the __Chesapeake Bay__?
1	• Water pooling in grassy area • No apparent pollution • Water looks clean • water goes into storm drain	Based on these observations, the water in picture 1 seems to be clean. Therefore, it should not
2	• major waterway • looks dirty... • homes along coast could contribute to pollution	Based on these observations, I can predict that this water may contribute to the pollution of the Bay.

PICTURE	OBSERVATIONS (What do you see?)	PREDICT How might the WATER you see in each picture impact the Chesapeake Bay ?
3	○ parking lot ○ water pools in corners and "low" spots	This water could very easily contain oil from cars or other chemicals from the many cars that park in the lot. This will pollute the Bay
4	● residential street ● seems muddy ● unclear how busy this road is	If the road is busy – chemicals from cars could runoff into the Bay. Nearby homes could also contribute to pollutants in this water.
5	● wooded/forest area ○ not a lot of pooling ○ probably not a lot of human traffic	This water is likely to be free of most pollutants. It could, however, contain animal feces.

3. What is a watershed?

A watershed is the area of LAND where all of the water that is under it or drains off of it goes to the same place (usually a river, bay, or other large body of water).

4. Take a look at the Montgomery County watershed map at your table. Which major watershed do you live in?

(Answers will vary) Most LPMS students are in the...
Lower Potomac Direct or Seneca Creek Watersheds

5. Look at the *Montgomery County Stream Conditions* map at your table. Name at least two areas within the Montgomery County watershed that have poor water conditions.

*Silver Spring   * Bethesda   * Rockville
(highly populated, more urban areas)

6. List all of the states that make up the Chesapeake Bay Watershed:

*Maryland (MD)   *Virginia (VA)   *DC (not a state)   *Part of
                                       -but still a part-   New
*Delaware (DE)   *West Virginia (WV) *Pennsylvania (PA)   York (NY)

7. Explain: What are some things already in place, *or that we can put into place*, that would help protect the waters of the Chesapeake Bay? Think of land surfaces, pollution prevention, and water usage.

There are many things we could do...(1) Make sure our cars are not leaking chemicals on roads, (2) do not liter, (3) create more grassy areas in cities, (4) don't waste water, (5) don't wash cars near storm drains...

8. Does global warming relate at all to the topic of our Chesapeake Bay watershed? How?

Yes. The warmer the Earth gets, the more water in our water cycle (because glacial ice melts). More water means more runoff, which could mean more pollution in our Bay.

9. Looking at the data:

What is this graph showing you?
(See promethean board for a better picture)

* types of land developments in the Chesapeake Bay watershed (LAND USAGE) (cities, suburbs, forests, clearings, & water)

What can you <u>infer</u> about the water coming from the "high intensity developed areas on the map?

The water from these areas could contain more pollution from cars, machines, manufactering, liter, waste (human), and impervious surfaces.

Predict: Which type of land usage would allow the LEAST amount of runoff into the bay?

Woody areas <u>or</u> herbaceous (low lying vegetation)

Percent of Forest Cover in the Chesapeake Bay Watershed

67% Forest Cover
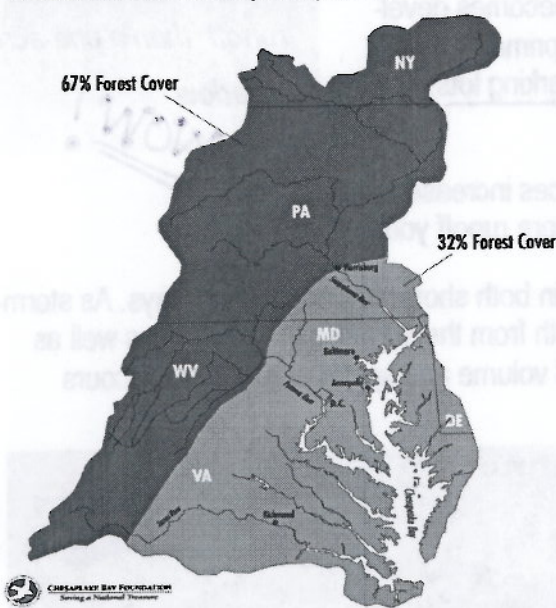
32% Forest Cover

What is this graph showing you?

The percent of forest cover in the C.B. watershed.
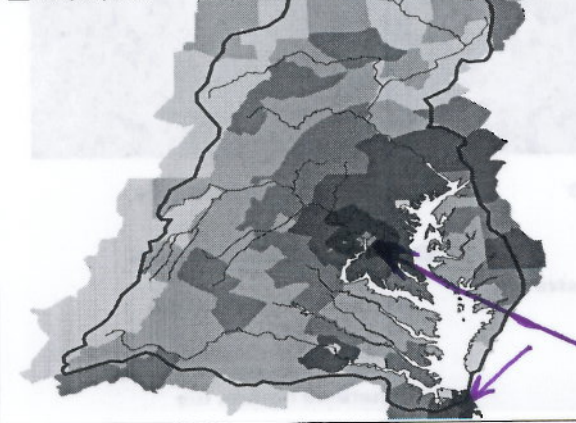(% of forest areas)

Which of the two highlighted areas is contributing more runoff to the Chesapeake Bay? Explain your answer.

MD, DC, VA, and DE...

...because these areas are closest to the Bay and have the least amount of forest cover (only 32% as compared to 67%).

KEY
Negative
0-10,000 persons
10,001-50,000 persons
50,001-200,000 persons
>200,000 persons

What is this graph showing you?

The number of people living in certain areas throughout the C.B. watershed.

What might the population of humans in a given area have to do with the health of the Chesapeake Bay?

Humans liter, drive cars, use pesticides and insecticides — this all goes into the C.B.

Draw an arrow to the area(s) on the map with the HIGHEST populations.

- D.C. and surrounding area
- Norfolk, VA
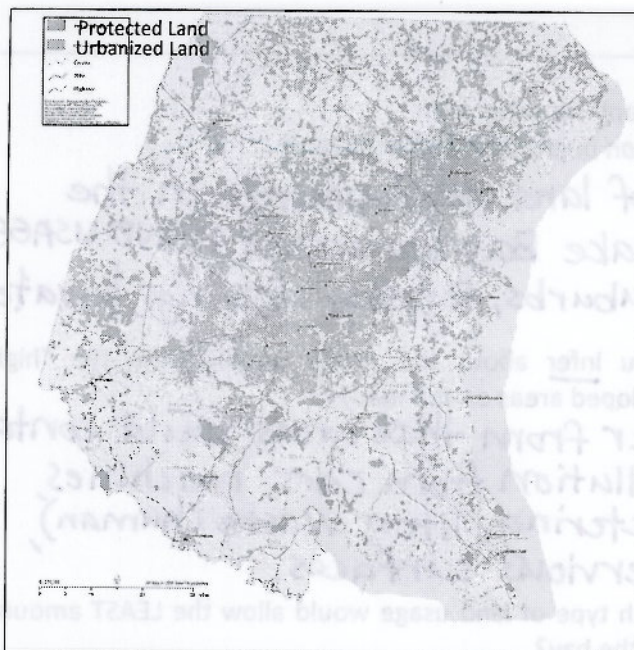
What is this graph showing you?
(See promethean board for a better picture)

Areas of land throughout the C.B. watershed that are protected or urbanized.

What do you think "urbanized" means?

Urbanized means that an area is highly populated and developed (houses, stores, buildings, etc.)

Which type of land is most represented in Maryland and Virginia (according to the map)?

PROTECTED LAND   (URBANIZED LAND)
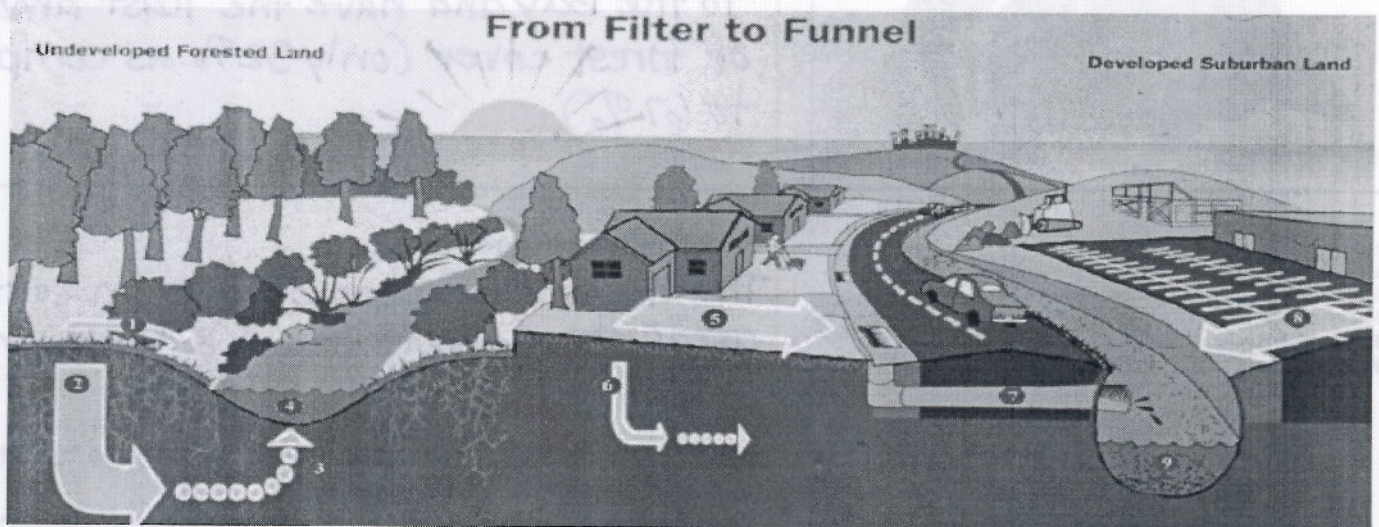

READ and REVIEW

As land changes from undeveloped to developed, its ability to absorb rainwater changes. This transformation can be likened to going from a filter to a funnel. Undeveloped land functions like a filter by allowing rainfall to percolate through the ground, which removes pollutants and other impurities. When land becomes developed, this filtering capacity is reduced or lost altogether. It happens primarily as a result of covering land with impervious surfaces—rooftops, roads, parking lots, and other hard surfaces that shed rainwater.

By preventing infiltration of rainfall into the ground, impervious surfaces increase the volume of runoff. The more impervious surfaces area there is, the more runoff you get.

The addition of impervious surfaces to a watershed affects streams in both short-term and lasting ways. As stormwater rushes quickly off impervious surfaces, it flushes pollutants both from the surfaces themselves as well as those contained in the rainwater into nearby streams. The increased volume and speed of runoff also scours stream channels, widening them and destroying in-stream habitats.

A one-acre parking lot produces 16 times more runoff than a one-acre meadow

WOW!

From Filter to Funnel

Undeveloped Forested Land

Developed Suburban Land

① Little rain runs off
② Plant cover and roots allow rainwater to seep slowly into soil
③ Water filters slowly through ground to stream
④ Water clear and clean Stream flow stable Little erosion

⑤ Most rainfall runs off quickly
⑥ Rainfall absorbed by soil reduced
⑤ Drainage structures replace steams and quicken runoff flow

⑧ All rainfall runs off very quickly
⑨ Floods and drought more frequent
Increased runoff erodes streambanks
Pollutants degrade water quality
Sediment clouds water and smothers bottom life