Remote Sensing

1. What does the picture represent?
   - (A) Desert
   - (B) Healthy vegetation
   - (C) Buildings
   - (D) Mountains
   - (E) Populated areas

2. What is the area inside the white circle?
(A) Salt flats
(B)snow on mountain peak
(C) crater
(D) cloud
(E) pond covered with ice

The following is an image of Yellowstone National Park on July 22, 1988.

3. What is causing the white patches and hazy are in the white circle?

(A) rain cloud
(B) snow on mountain tops
(C) dust on satellite lens
(D) dust from stampeding herd of bison
(E) forest fires

4. What are the white patches in the circle in the image on the left?

(A) rain clouds
(B) forest fires
(C) craters
(D) snow on mountain top
(E) smoke from volcano

5. What do the large black shapes represent?

(A) canyons
(B)tar pits
(C)lakes
(D) black top
(E) cloud shadows

6. The image on the left is of the same area as the previous image, 2 months later. If green represents healthy vegetation, what does the pink represent?

(A) burned areas
(B) suburban areas
(C) logged areas
(D)desert
(E)water bodies

7. What is the lowest recorded temperature?

8. Warm/Cold (lower in the atmosphere) clouds give off more energy than Warm/Cold (higher) clouds.

11. Unlike POES satellite, GOES satellites orbit at an altitude of approximately _____ miles.

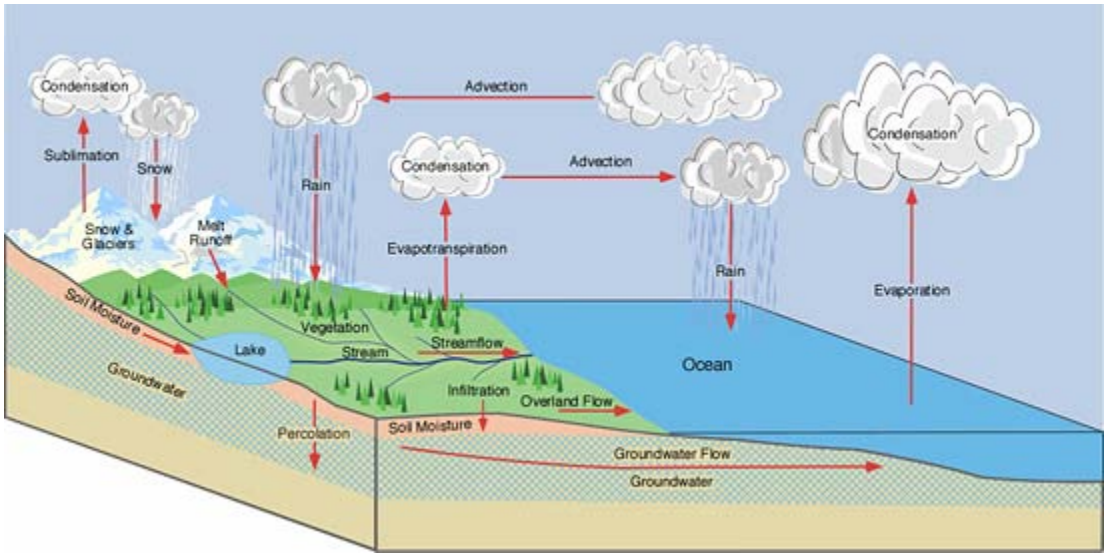
(A) 30,000
(B) 28, 000
(C) 24,000
(D)22,000
(E)20,000

12. What does a hook-shaped cloud mass composed of cold temperatures and high cloud tops indicate?

13a. What is the most abundant greenhouse gas in the atmosphere?

13b. Describe the process of the most abundant greenhouse gas' positive feedback loop.

14a.



Name the cycle illustrated by the above diagram.

14b. What influences the rate of evaporation/transpiration in the cycle?

14c. What are the two ways evaporated water return to the bodies of water?

14d. How is the imbalance between the rates of evaporation and precipitation corrected?

15. List the 4 forms in which carbon exists in the abiotic environment.

16. Describe the process through which carbon enters the biotic environment.

17. List the 3 ways carbon returns to the environment.

18. Typically, how do forests contribute to the carbon cycle?

19. The _____ is a naturally occurring process that aids in heating the Earth's surface and atmosphere.

20. The term _____ is used to describe the total mass of organic matter.

21. _____ refers to any fuel that is created from decomposed carbon-based plant and animal organisms

22. A _____ is the smallest element that can be displayed on a satellite image or computer monitor.

23. Define the following words:

a. Albedo

b. eccentricity

c. obliquity

d. precession

24. Earth is in a _____ orbit.

25. The geometric shape of satellite orbital paths around the Earth is called a(n) _____.

26. According to theory, how might changes in the eccentricity, obliquity, and precession result in an ice age?

27. What range of colors are used is for the sensing, representation, and display of images in modern electronic systems and photography.

(A) cyan, magenta, yellow
(B) red, green, blue
(C) cyan, green, yellow
(D) cyan, magenta, yellow, black
(E) red green yellow

28. Which of the following type of waves have the longest wavelength?

(A) X-rays
(B) hertzian waves
(C) gamma waves
(D) radio waves
(E) near infrared waves

29. What is remote sensing?

(A) Ability to gather information about a distant or unseen target using paranormal means or extra-sensory perception
(B) Small or large-scale acquisition of information of an object or phenomenon not in physical or intimate contact

(C) Electrical impedance measuring technique that uses separate pairs of current-carrying and voltage-sensing electrodes to make more accurate measurements
(D) Allowing graphical applications to be run remotely on a server, while being displayed locally
(E) Any system that captures, stores, analyzes, manages, and presents data that are linked to location.

30. What color does living vegetation appear as on false-color IR images?

(A) green
(B) red
(C) black
(D) blue
(E) yellow

For questions 31 and 32, use the below image.

July - September, 1989 August 12, 2003

31. What accounts for the difference of water color in the 1989 and 2003 pictures?

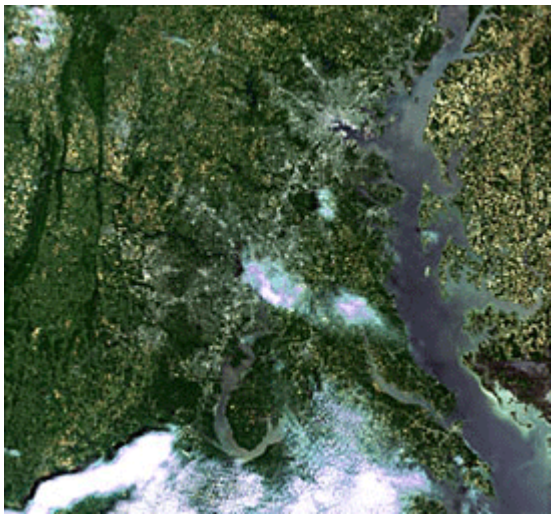
(A) depth of water
(B) pollutants in water
(C) wavelength of the water
(D) human development in the area

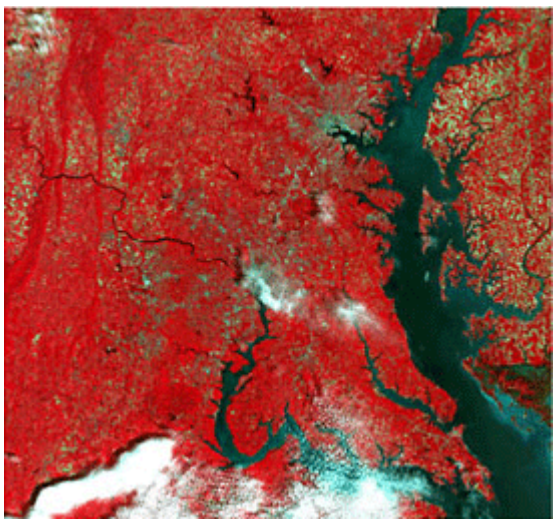
32. What substance may account for the white texture in the 2003 picture?

(A) ice
(B) salt
(C) sand
(D) clouds

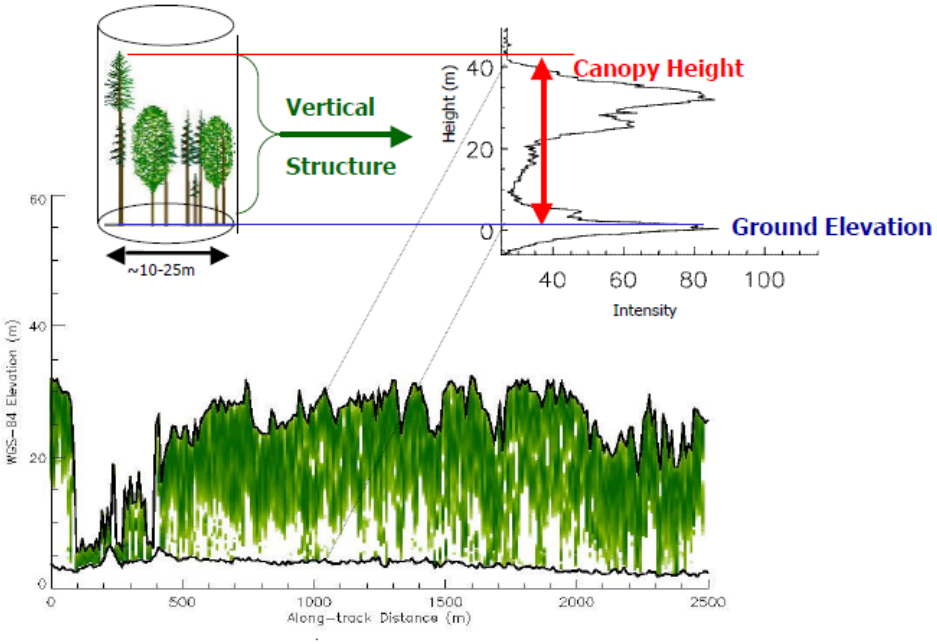
33. Describe the differences in the below 2 images using scientific terminology. How can remote sensing scientists produce these images from a satellite-based sensor such as LandSat? Why might remote sensing scientists want to create both types of images?

LandSat images taken of Chesapeake Bay, USA on August 23rd, 2004. The images were taken at the same time.

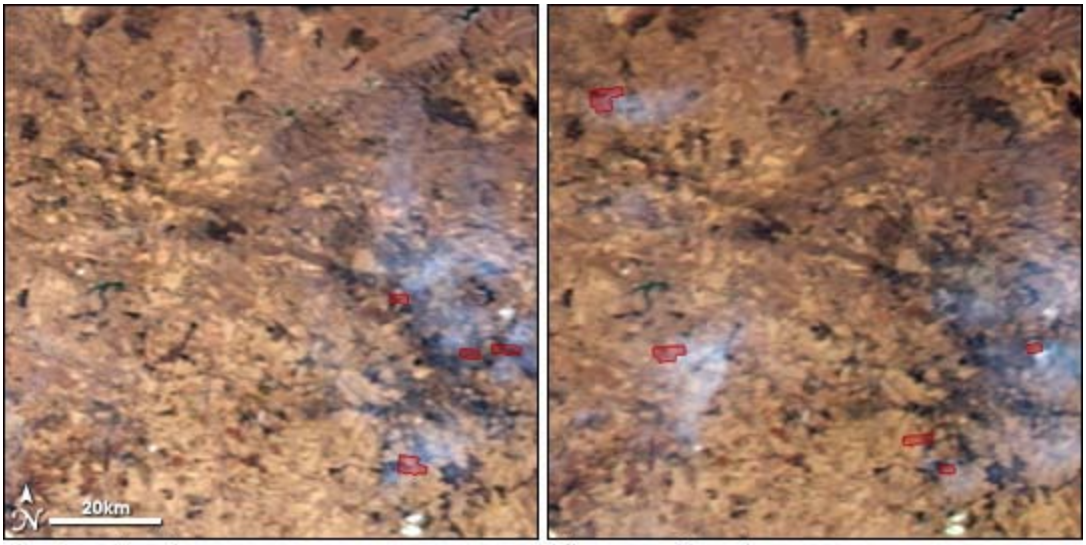
a) 

b) 

34. Lidar is a relatively new remote sensing platform that uses lasers to determine elevation. Provide at least 1 advantage and disadvantage Lidar has compared to traditional reflectance-based sensors (ex: LandSat, MODIS). How might scientists interpret information from canopy height and ground elevation acquired from the Lidar data transect presented in the following picture?



Use to the following 2 images for #35 and #36

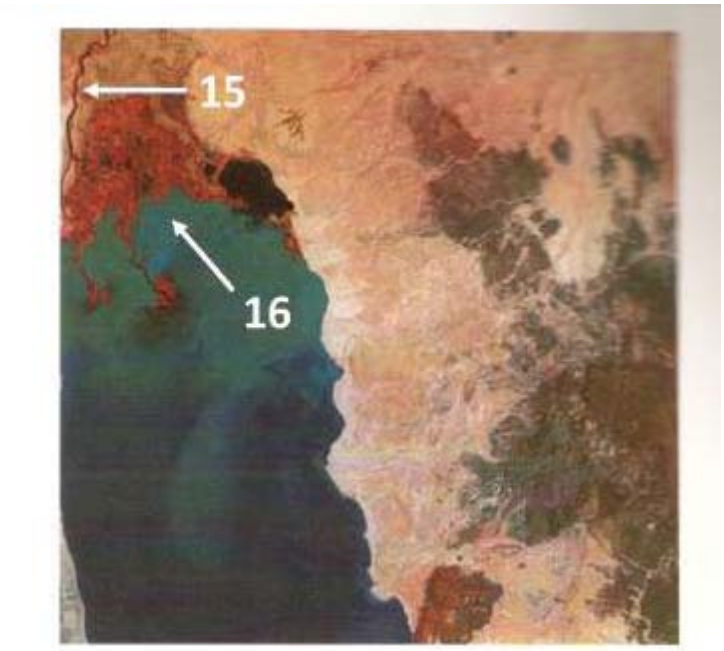


Morning (Terra) **Afternoon** (Aqua)

35. What do the red boxes represent?
(A)clouds
(B) dust storms
(C) fires
(D) cities

36. What type of image is used to detect the strength of the occurrence in the images?
(A) visible light
(B) X-ray
(C) ultra violet
(D) infrared

Use the following image to answer #37 -39.



37. What is the blue blob on the left side of the image?
(A) river
(B) gulf of california
(C) lake
(D) city

38. What does the red line indicate with arrow #15?
(A) river
(B)canal
(C)highway
(D) valley

39. What is the red area marked with arrow #16?

(A) forested area
(B) aquatic vegetation
(C) irrigated cropland
(D) beach

40. Use the following image of a map of forest cover change in a region of India. Summarize the overall land management in terms of maintaining the amount of forest from 1996 to 2002. Can forest managers increase the density of forest located in the green areas from the 2002 densities?
Map of forest change. Values are in percent forest cover 1) >80% 2) 61-80%, 3) 41-60%, 4) 21-40%, 5) <20%, 6) No Forest. Colors correspond to a change from forest coverage 'x' to 'y'. Four examples are displayed within the figure.