

Team Name: _____
Student Names: _____

Number: _____

Pal-Mac Invitational
Saturday, January 14, 2012

REMOTE SENSING

****Please answer all questions on your answer sheet****

Short Answer

Answer these in complete sentences.

1. What is remote sensing?
2. What is active remote sensing?
3. What is passive remote sensing?
4. Name two reasons remote sensing is valuable. **

Multiple Choice

1. What is the relationship between wavelength and frequency?
 - a. High frequency, long wavelength
 - b. High frequency, short wavelength
 - c. There is no relationship.
2. Which set of electromagnetic energies is correctly listed from longest wavelength to shortest wavelength?
 - a. Infrared, visible, ultraviolet, radio, microwave
 - b. Radio, microwave, infrared, visible, ultraviolet
 - c. Radio, infrared, microwave, visible, ultraviolet
 - d. Infrared, radio, visible, ultraviolet, microwave
3. Which is not part of remote sensing processes?
 - a. The Sensor
 - b. The Pterodactyl
 - c. The Target
 - d. The Signal
4. In thermal images showing land and water in mid-latitudes during the fall, water is often seen as
 - a. Light gray in the day and light gray at night
 - b. Light gray in the day and dark gray at night
 - c. Dark gray in the day and light gray at night
 - d. Dark gray in the day and dark gray at night
5. What feature could be identified using thermal imaging?
 - a. Effluent from a nuclear power plant
 - b. Nitrogen run-off from a farm
 - c. Methane released from a swamp
 - d. Water vapor released from transpiration

****Tie-breaker**

Diagram Analysis

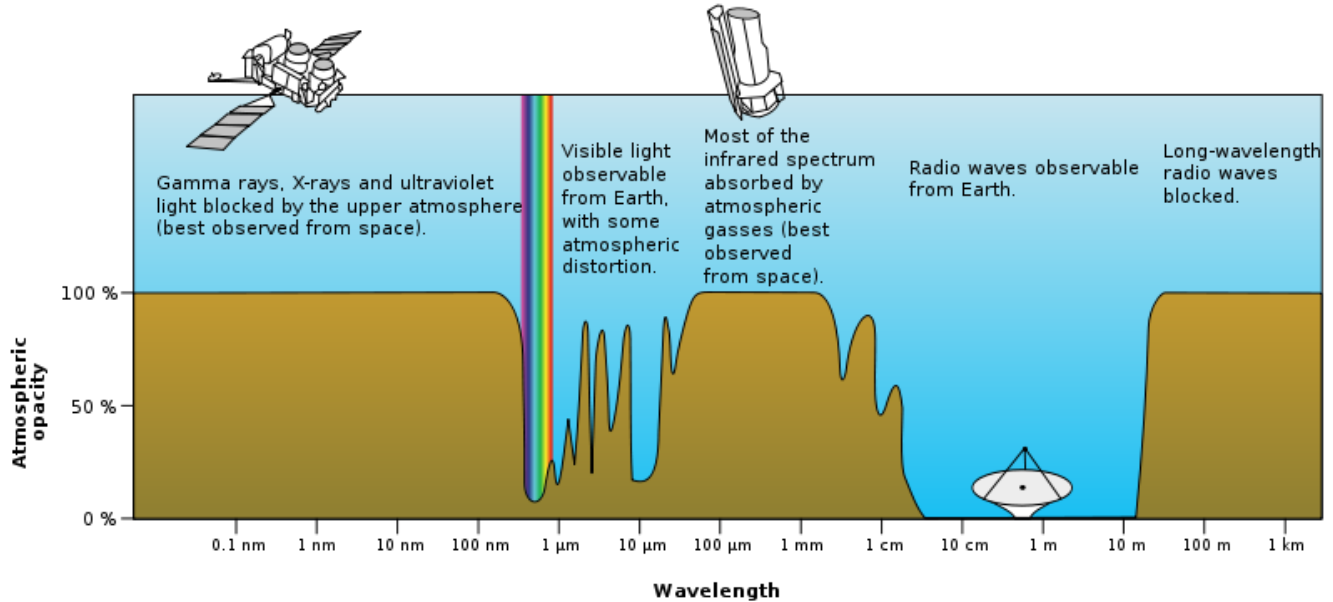


Image from: http://en.wikipedia.org/wiki/File:Atmospheric_electromagnetic_opacity.svg

1. Which type of electromagnetic waves is able to reach Earth's surface?
 - a. Gamma rays
 - b. Infrared
 - c. X-rays
 - d. Radio waves
2. What is the approximate wavelength of red light?
 - a. 0.1nm
 - b. 1 μ m
 - c. 1m
 - d. 100m
3. Which wavelength has an atmospheric opacity of less than 50%?
 - a. Ultraviolet
 - b. Long-wave radio waves
 - c. Visible
 - d. X-rays
4. Which statement is most accurate?
 - a. Our atmosphere does not impact remote sensing.
 - b. Gamma rays have an atmospheric opacity of 50%.
 - c. Not all forms of electromagnetic energy reach Earth's surface.
 - d. Only land-based technologies are used in remote sensing.

Matching

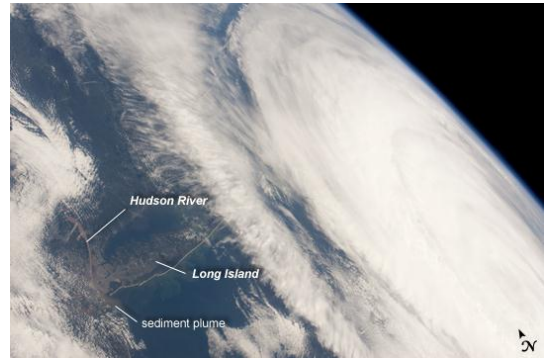
Images from: <http://earth.jsc.nasa.gov/>



1.



2.



3.



4.



5.



6.



7.



8.



9.

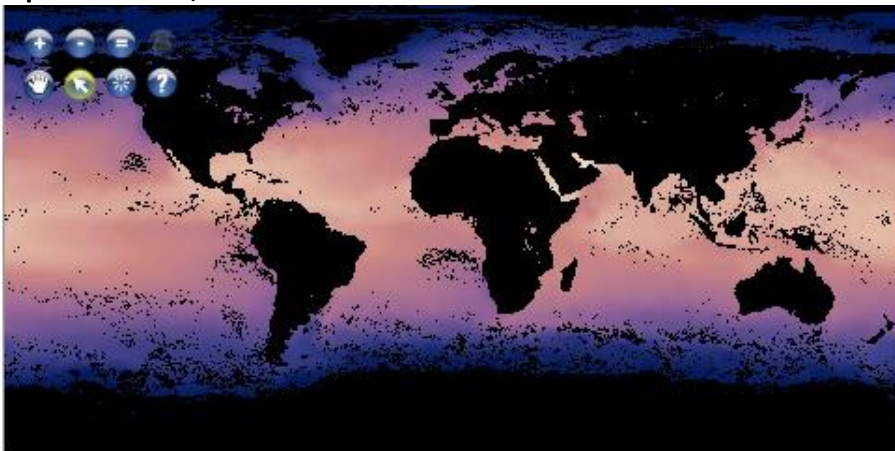
A. Sea monster	B. Plankton Bloom	C. Swamp	D. Flooded Amazon River
E. Ship's wake	F. Eddy	G. Great Salt Lake	H. Sunlint
I. Delta	J. Canals	K. Agricultural run-off	L. Reef
M. Thunderstorm	N. Hurricane Katia	O. Volcanic gas	P. Oil spill

Image Analysis – Short Answer
NOT complete sentences.

SEA SURFACE TEMPERATURE



September 1-30, 2006



March 1-31, 2006



1. In the September image, where are the warmest temperatures?

2. In the September image, where are the coldest temperatures?

3. In the March image, where are the warmest temperatures?

4. In the March image, where are the coldest temperatures?

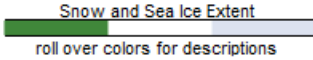
5. What do you notice is strange along the equator in March?

6. Look at the Gulf of Mexico. Compare the temperatures there during September and March.

7. What natural disaster is associated with this change in the Gulf of Mexico?*

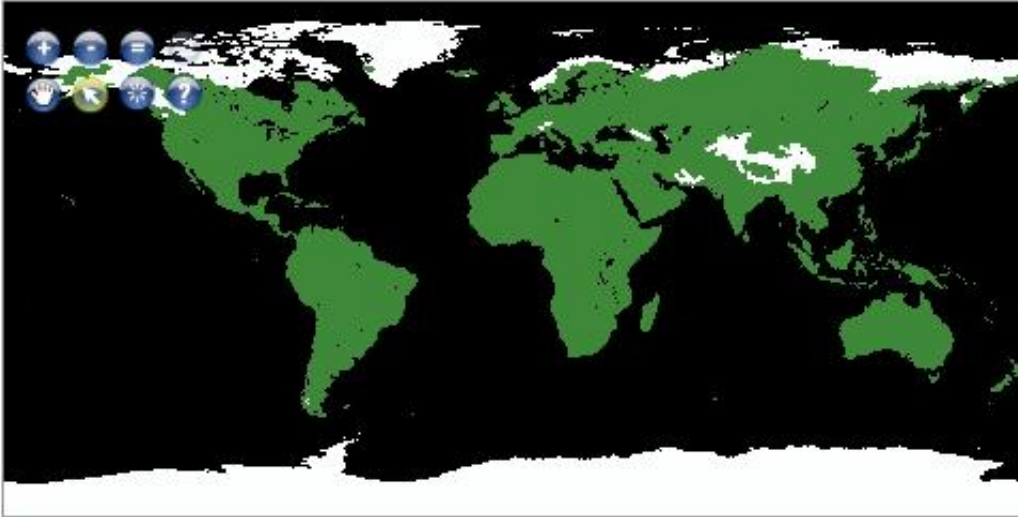
Image from: <http://neo.sci.gsfc.nasa.gov/Search.html;jsessionid=814038A6AA1A288FF00FE4DA757BC869?group=73>

Snow Cover and Sea Ice

Image Key:  Snow and Sea Ice Extent
roll over colors for descriptions

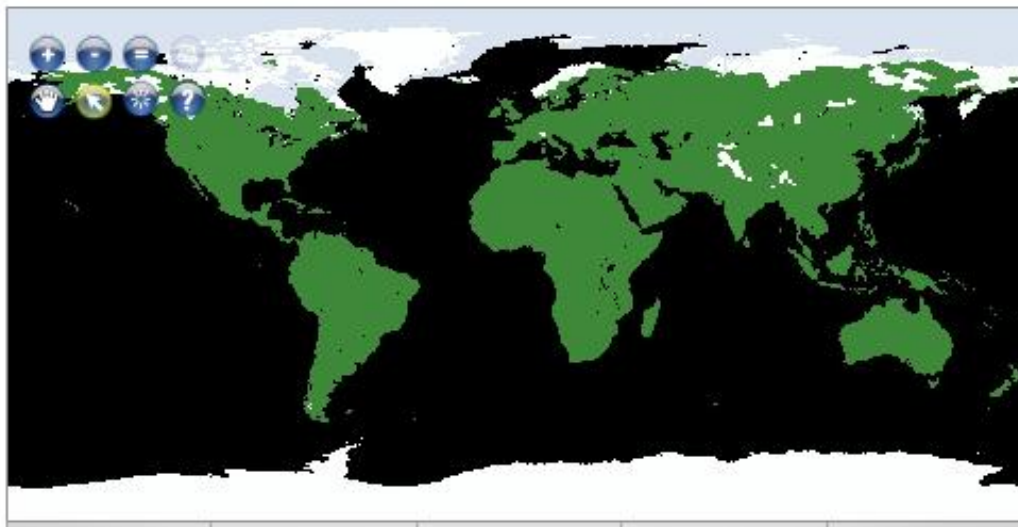
Green = snow-free land; White = snow-covered land; Grey = sea ice

October 3-10, 1966



1. Which will impact sea level change MORE: melting snow-covered land or melting sea ice?
2. Why?*
3. What change do you notice in the Himalaya Mountains from 1966 to 2005?
4. What impact could the change have for the people living around the Himalayas?

May 30-June 6, 2005



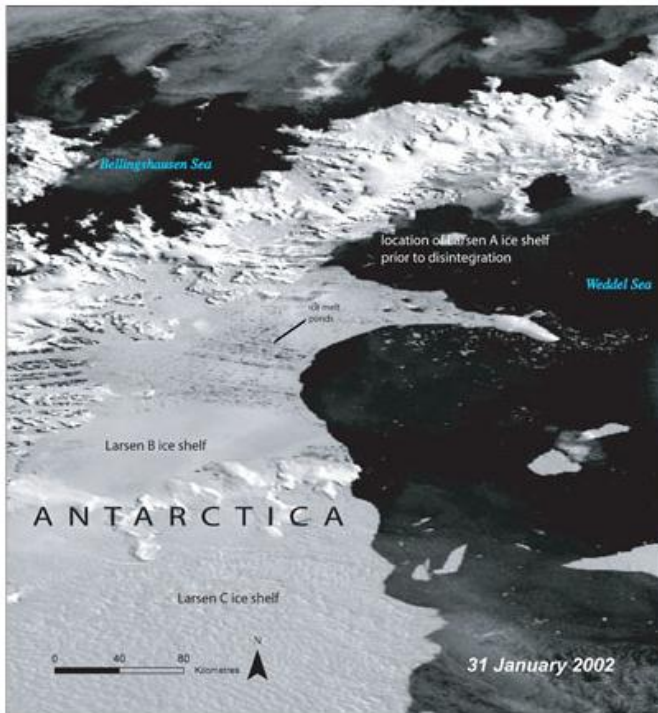
5. What change do you notice in the Arctic from 1966 to 2005?
6. What would cause this change in the Arctic from 1966 to 2005?

Image from: http://neo.sci.gsfc.nasa.gov/Search.html?pg=1&datasetId=SCSIE_W&group=50

Larsen Ice Shelf, Antarctica

January 2002

February 2006



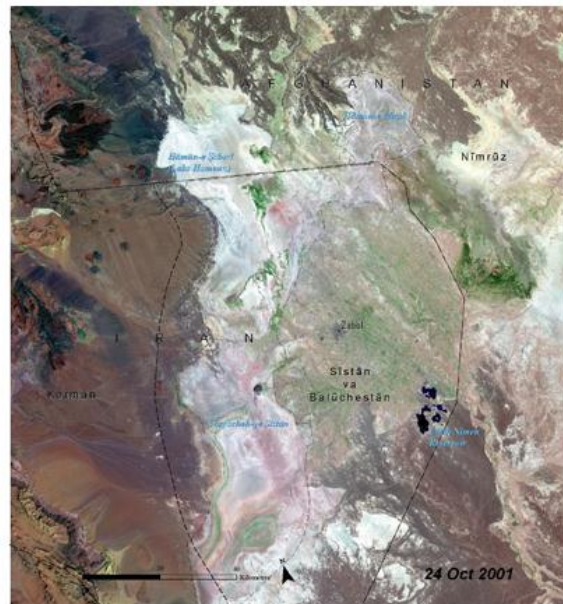
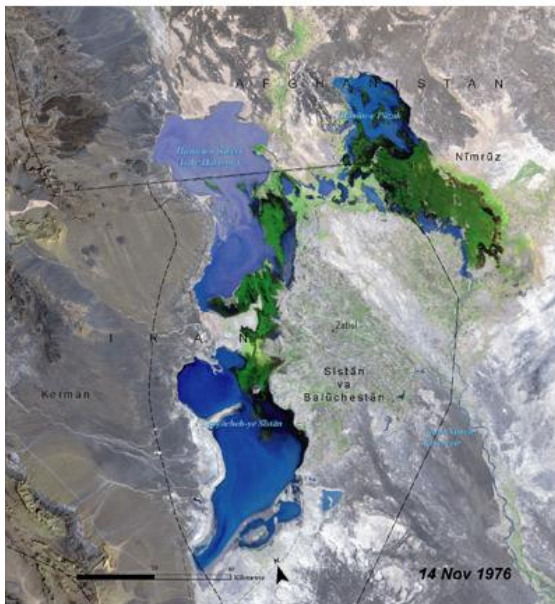
<http://na.unep.net/atlas/webatlas.php?id=265>

1. What significant change do you notice between January 2002 and February 2006?
2. How do you think the image would look in January 2012?

Lake Hamoun, Iran

November 1976

October 2001



<http://na.unep.net/atlas/webatlas.php?id=131>

1. What change do you notice between November 1976 and October 2001?
2. What is one possible cause of this change?