Team Name: _____
Student Name(s): _____
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Remote Sensing (C)
Nebraska Science Olympiad
Regional Competition
Henry Doorly Zoo
Saturday, February 25th 2012
120 points total (10 pts each).

Show all mathematical operations using significant figures and proper units. Answer all questions with complete sentences unless noted.

1) In Figure 1 there are three examples of changing coast line. What changes are occurring in each of the boxes? What are some possible causes of these changes?

2) Using Figure 2, when is the ocean the warmest to swim in the Atlantic Ocean? Does this hold true farther off the coast where the ocean depth reaches 600 ft.? Why is this the case?

Team Name: _____
Student Name(s): _____
_____

3) Figure 3 shows the trend of CO_2. What are some possible causes of the differences in oscillations between latitudes?

4) How does the CO_2 distribution change throughout the day in Figure 4? What are the likely sources of change documented in this figure?

Team Name: _____
Student Name(s): _____
_____

5) Phytoplankton causes the reflectance of clear water to decrease in the visible region (Figure 5). Why?

6) The Red Edge NDVI is defined as

(NIR-Red Edge)/(NIR + Red Red Edge)

Where the Red Edge is the region in the electromagnetic spectrum that is in between Red and NIR. Using Figure 5, explain why the Red Edge region might be better than red reflectance for healthy vegetation.

Team Name: _____
Student Name(s): _____
_____

7) Using the equation in question 6 and Figure 5, determine the value of Red Edge NDVI for health vegetation and soil. Be sure to show your work. (Full sentences are not required for this question. Part of this question will be used as a tie breaker)

8) What is the distribution of Total Suspended Sediments (TSS) in Chesapeake Bay on June 30th 2006 (Figure 6)? Provide an explanation on why this distribution is occurring on this particular date.

Team Name: _____
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_____

9) Upon examining Figure 7, which (left or right) image is likely before hurricane Katrina hit the Mississippi River Delta? Explain how remote sensing scientists can take these two images and create a land cover change

10) Percent vegetation cover is a measure of vegetation biomass. Explain how it is determined and some limitations in using this metric.

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11) Name at least one NASA EOS satellite sensor and describe its spectral characteristics. (Additional satellite sensors will be used as a tie-breaker)

12) What is remote sensing? Can remote sensing be conducted using hand-held equipment? Why or why not?