

GEOG/GEOL 4093
Remote Sensing of the Environment



GEOG/GEOL 4093

Remote Sensing of the Environment

Lecture: CLUB 13, Tues. & Thurs. 2:00 - 3:15

Lab: GUGG 6 (KESDA Lab), Friday 9:00-10:50

Pakorn Petchprayoon

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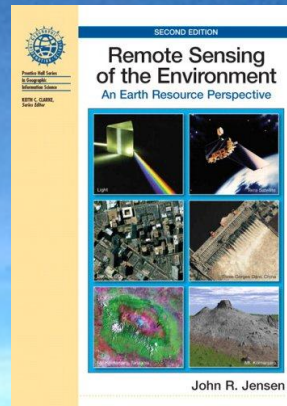
**Office Hours: CIRES Ekeley S236, 3:30 – 4:30 Tuesdays and Thursdays,
and by appointment**

Teaching Assistant: Sarah Hart

Email: sarah.hart@Colorado.edu

**Office Hours: GUGG 312, Tues 1:00 - 2:00 pm and Fri 11:00 - 12:00 am
and by appointment**

Required Text: *Remote Sensing of the Environment: An Earth Resource Perspective*; John R. Jensen, Prentice Hall Series in Geographic Information Science, 2nd edition, Year published 2007, (ISBN 0-13-188950-8).



Grading: Midterm (30%), 13 October, 2011; Final (30%), 8 December, 2011, Lab (40%), to be returned following week during lab.

Class web page: <http://cires.colorado.edu/esoc/classes/geog5093>



Lab: Friday 9:00-10:50
KESDA LAB (GUGG 6)

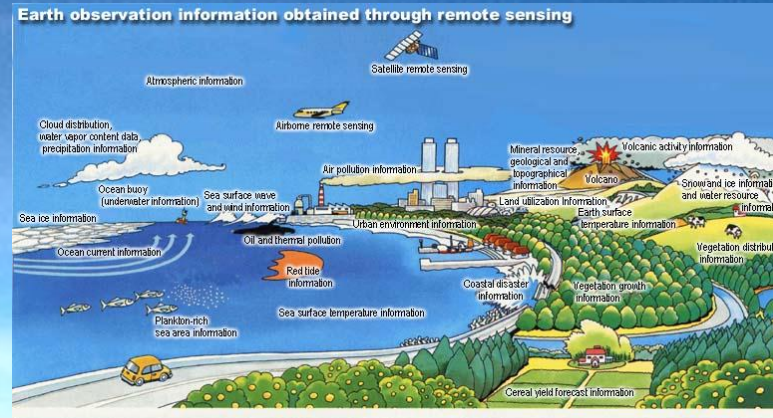


We will be using Environment for Visualizing Images (ENVI) software for most of the labs

Course Outline

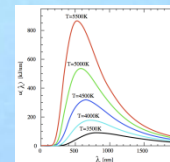
Week 1

General concepts



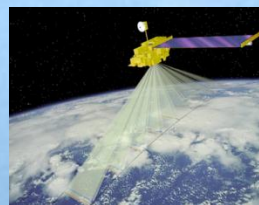
Week 2

Physical Principles



Week 3

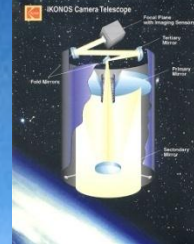
Platforms



Course Outline

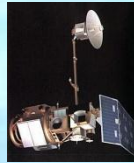
Week 4

Aerial and Space Photography



Week 5,6

Imaging systems: Passive Sensors



Week 7

Imaging Systems: Active Sensors



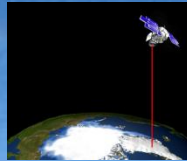
Week 8

MIDTERM (October 13)

Course Outline

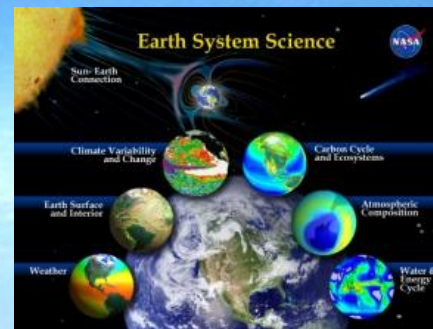
Week 9

Non-Imaging Systems



Week 9,10

Earth Observing System



Week 10

Remote Sensing and GIS



Course Outline

Week 10,11

Application: Atmosphere

Radiation Budget, Atmospheric Temperature structure,
Cloud classification, Detection of hurricanes
Antarctic ozone hole

Week 12

Application: Cryosphere

Snow mapping, Bi-directional reflectance snow
Onset of snow melt, Elevation: Greenland ice sheet

Week 12, 13

Application: Hydrosphere

Sea surface temperature, Ocean circulation
El Nino, Winds over the ocean & lake
Ocean altimetry and sea level rise

Week 13

Application: Biosphere

Vegetation damage, Crop identification
Estimation of green leaf area, Estimation of global biomass

Week 14

Thanksgiving Break

Week 15

Application: Lithosphere

Geological reconnaissance, Detection of landforms
Thermal inertia mapping, Spectral remote sensing in Geology
Crustal Deformation from InSAR


Week 16

FINAL (December 8)

Remote Sensing: Requirements for Image of the Day (Week 5 – Week 15)

This is a simple exercise that involves each member of the class to locate 1-2 images obtained from a remote sensing platform. It is your responsibility to locate an image that you think is interesting and appropriate for the class. During your short presentation (5 minutes) you should make sure to discuss the following:

- Satellite or aerial **platform** used to obtain the image
- Important **characteristics** of the platform
- The common **applications** of this platform
- The **channels** used in this image and how are these **wavelengths** represented in the image (e.g. color scheme used in the image)?
- What does the image show and **how is this important** to our understanding of processes on the Earth
- Will this image and others like it provide **data sets** that will be useful in addressing global change issues, in determining natural variability and monitoring global and regional changes of the Earth?

A satellite in orbit above Earth, with the text "REMOTE SENSING: OBSERVING THE EARTH" overlaid in a stylized font. The satellite is positioned at the top of the Earth's curve, and the text is centered over the Americas. The background is a clear blue sky with some light clouds.

REMOTE SENSING:
OBSERVING THE EARTH

NASA Goddard Space Flight Center