Remote Sensing Applications in Natural Resources Using ArcGIS

NRM641 CRN 35760

https://elearning.uaf.edu/courses-code-keep/course-details-17-18/?crn=35760

CREDITS: 3

PREREQUISITES: Basic ArcMap experience

LOCATION: Distance Delivery from Fairbanks campus

MEETING TIME: Spring Semester 2018 Jan. 16 May 1

INSTRUCTOR: Dr. David Verbyla (email: dlverbyla@alaska.edu)

OFFICE LOCATION: ONEILL 368

OFFICE HOURS: Tues/Weds 1-2pm face to face, google hangout, or phone/email or email any time (I try to return emails within 24 hours of receiving them)

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COURSE DESCRIPTION

This course is primarily for graduate students and GIS professionals who want to learn remote sensing applications in natural resource management using a variety of remotely sensed Alaska data ranging from high resolution LIDAR to statewide AVHRR data. The class will be taught using a sequence of weekly video sessions and weekly hands-on ArcGIS problems.

COURSE GOALS

1) To learn basic image processing methods using ArcMap including panchromatic pseudocolor, and color image display, image georeferencing, change detection methods, supervised and unsupervised classification, and accuracy assessment methods.

2) To learn about sensors especially applicable to vegetation applications in Alaska including hyperspectral data, LIDAR, IFSAR, Landsat, MODIS, and AVHRR sensors and data products.

3) To use ArcGIS to explore changes associated with climate warming in Alaska including greening of the arctic, browning of the boreal forest, mapping wildfire severity and hotspots, mapping shrinking lakes and coastal erosion, etc.

	Sensor Applications
Feb 26 – Mar 2	**AVHRR Sensor Applications:** The Advanced Very High Resolution Radiometer Processing GIMMS-NDVI Rasters 20-Year Change in Peak Summer NDVI By Ecoregion Working with 1-KM AVHRR Alaska Products
Mar 5 - 8	**MODIS Sensor Applications** MODIS Land Products Assessing MODIS NDVI Reliability Assessing eMODIS NDVI Reliability Working With 250-m NDVI Tiles in Alaska 500-m Snow Product in Alaska
Mar 12 -16	**Spring Break (no classes)**
Mar 19 - 22	**Landsat Sensor Applications:** Landsat Sensors Mapping Burned Areas Mapping Arctic Greening Mapping Aspen Defoliation Mapping Radiant Temperature
Mar 26 – Mar 30	**IFSAR and LIDAR Applications:** Working With IFSAR Data Assessing LIDAR Precision and Accuracy Using LIDAR to Locate Tall Trees Using LIDAR to Map Percent Forest Canopy Closure
April 2 -5	**Point Sensor Applications:** Creating Density Maps From Point Locations Mapping Hotspot Polygons Interpolating Depth Points Lightning Detections and Weather Station Data
April 9 – May 1	**Student Climate Warming Mini-Projects (4 of 8)**
	Mapping Lake Area Change in a Warming Boreal Climate 25-Year Trend in Annual Maximum NDVI 35-Years of Declining Sea Ice Extent Mapping Glacier Recession in the Alaska Range Mapping Coastal Erosion in a Warming Arctic Decadal Arctic NDVI and Summer Warmth Index Winter Warming, Canopy Icing, and White Spruce Mortality Declining Sea Ice Concentration and Autumn Warming at Barrow

STUDENT LEARNING OUTCOMES

After successfully completing this course you will:

Understand what spectral bands are most appropriate for a variety of remote sensing applications
Understand how to effectively display panchromatic, color, color infrared and false color imagery.
Understand how to merge panchromatic and multispectral bands and how to create fly in and fly-by animations.
Use unsupervised classification and supervised classification methods to create land cover maps.
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Apply your skills learned in this course to:is course to:

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