Applied Remote Sensing Training (ARSET) Program

Techniques for Wildfire Detection and Monitoring (2018)

Homework Questions

Question 1

Fire severity is generally the product of:

Answers: (bold correct)

a. Fire intensity and composite burn index
b. Water repellency and tree loss
c. Fire intensity and residence time
d. Satellite imagery and healthy vegetation

Question 2

Healthy (unburned) vegetation has higher reflectance in the mid-infrared portion of the electromagnetic spectrum than burned vegetation.

Answers: (bold correct)

a. True
b. False

Question 3

The Normalized Burn Ratio uses the near-infrared band and the:

Answers: (bold correct)

a. Shortwave infrared band
b. Blue band
c. Red band
d. Green band

Question 4

The Relativized differenced Normalized Burn Ratio (RdNBR) removes bias associated with:

Answers: (bold correct)

a. Spatial resolution
b. Fire perimeter delineation
c. Actively burning fire locations
d. Pre-fire vegetation conditions

Question 5

To create a differenced Normalized Burn Ratio (dNBR), you need:

Answers: (bold correct)

a. Two post-fire NBR images
b. One pre-fire NBR and one post-fire NBR
c. One active fire pixel and one post-fire NBR
d. Two pre-fire NBR images

Question 6

The QGIS-Fire Mapping Tool (FMT) Plugin was designed to assist with mapping:

Answers: (bold correct)

a. Large fires already mapped by the Monitoring Trends in Burn Severity (MTBS)
b. Small fires (<10 hectares) not mapped by MTBS
c. Only fire perimeters
d. Only fire severity

Question 7

Identifying the "peak of green" after a fire is out is important for:

Answers: (bold correct)

a. Distinguishing the fire perimeter
b. Selecting the satellite to use for analysis
c. Discerning if the surviving vegetation will begin recovery or will eventually die
d. Discerning if a Landsat image is cloud free

Question 8

Which fire did we use as a case-study in the FMT Exercise?

Answers: (bold correct)

a. The Napa fire
b. The Paradise fire
c. The Fort McMurray fire
d. The Australian bush fires of 2017

Question 9

What can the user adjust on the Landsat image to improve the visualization of a fire?

Answers: (bold correct)

a. Brightness
b. Contrast
c. Band combinations
d. All of the above

Question 10

How many classes are recommended for categorizing the post scene dNBR image in the FMT Exercise?

Answers: (bold correct)

a. 23
b. 40
c. 5
d. 10

Question 11

According to Key and Benson, 2006, and as outlined in the FMT Exercise, the low breakpoint of dNBR values for burned/unburned vegetation is somewhere between

Answers: (bold correct)

a. 350-500
b. 0-5
c. 0-100
d. 100-200

Question 12

What were your threshold values for low, moderate, and high burn severity from the FMT exercise?

Answer (open ended):

Question 13

Describe how you might use the FMT Plugin for your work.

Answer (open ended):

Question 14

The Global Wildfire Information System (GWIS) provides data on:

Answers: (bold correct)

a. Actively burning fires
b. Fire danger forecasts
c. Fire emissions
d. All of the above

Question 15

The Build Up Index (BUI) is:

Answers: (bold correct)

a. A numeric rating of the total amount of fuel available for combustion
b. A numeric rating of the moisture content of litter and other cured fine fuels
c. A numeric rating of the average moisture content of deep, compact organic layers
d. A numeric rating of the expected rate of fire spread

Question 16

According to the GWIS Current Situation Viewer (http://gwis.jrc.ec.europa.eu/static/gwis_current_situation/public/index.html), list three regions in the world that are currently categorized in the highest Fire Danger Forecast Ranking (98-100)

Answer (open ended):

Question 17

In the GWIS Current Situation Viewer, click on the information icon next to ACTIVE FIRES. What is the spatial resolution of a MODIS active fire detection pixel?

Answers: (bold correct)

a. 375 m
b. 500 m
c. 1 km
d. 10 km

Question 18

The BURNT AREAS (MODIS) data available on GWIS identifies burn scars of approximately what minimum size?

Answers: (bold correct)

a. 5 hectares
b. 30 hectares
c. 300 hectares
d. 10 hectares

Question 19

The fire emissions species presented in GWIS aims to be compatible with estimates provided by the:

Answers: (bold correct)

a. U.S. Forest Service
b. U.S. Environmental Protection Agency
c. European Forest Fire Information System
d. European Commission

Question 20

Describe how you might use the GWIS Current Situation Viewer for your work.

Answer (open ended):