



Applied Remote Sensing Training (ARSET) Program

Assessing the Impacts of Fires on Watershed Health (2023)

Homework Questions

Question 1

True or false: Wildfires are always ignited by natural causes.

Answers: (bold correct)

- a. True
- b. False**

Question 2

True or false: both MODIS and VIIRS observations can be used to derive NDVI.

Answers: (bold correct)

- a. True**
- b. False

Question 3

This fire risk indicator is used to monitor meteorological drought conditions:

Answers: (bold correct)

- a. Standardized Precipitation Index (SPI)**
- b. Evaporative Stress Index
- c. None of the above

Question 4

In addition to weather and climate conditions, these factors affect fire risk.

Answers: (bold correct)

- a. Elevation
- b. Slope and aspect of terrain
- c. Presence of peat

- d. All of the above

Question 5

After working through the code in Part 1, **adapt the code to your own study area and study period**, following the instructions outlined in slides 53–58. Take a **screenshot** of the results.

Question 6

Which accurately describes the Soil and Water Assessment Tool (SWAT)?

Answers: (bold correct)

- a. **SWAT is a conceptual watershed-scale hydrological model designed to address water management, sediment, climate change, land use change, and agricultural chemical yields related challenges.**
- b. SWAT is a land surface hydrological model designed to address water management, sediment, climate change, land use change, and agricultural chemical yields related challenges.
- c. SWAT is a hydrological model to simulate water and carbon cycles.
- d. SWAT is a land surface hydrological model to simulate water and nitrogen cycles.

Question 7

The SWAT Hydrologic response units (HRU):

Answers: (bold correct)

- a. Hydrologic response units (HRU) consist of land use, and management characteristics.
- b. **Hydrologic response units (HRU) consist of land use, management, and soil characteristics.**
- c. Hydrologic response units (HRU) are SWAT configuration.
- d. Hydrologic response units (HRU) are made of multiple cells.

Question 8

When describing NASAaccess,

Answers: (bold correct)

- a. NASAaccess is a platform for accessing and presenting quantitative remote sensing earth observation and climate data products.
- b. NASAaccess is a platform for SWAT remote sensing data access.
- c. NASAaccess is a platform for hydrological models remote sensing data access.
- d. **NASAaccess is an open-source platform for accessing and presenting quantitative remote sensing earth observation and climate data products.**

Question 9

Which of the following input datasets are needed to set up a SWAT model to simulate wildfire occurrence in a watershed?

Answers: (bold correct)

- a. Land use information including soil cover, land use land cover, and burn severity
- b. Topography
- c. Climate data such as precipitation, air temperature, wind speed, etc.
- d. **All of the above**

Question 10

True or False: After running a SWAT model simulation, the model results must be calibrated and validated using *in situ* measurements before interpretation.

Answers: (bold correct)

- a. **True**
- b. False

Question 11

Which of the following are descriptions of burn severity?

Answers: (bold correct)

- a. **The effect of a fire on ecosystem properties, often defined by the degree of mortality of vegetation**
- b. **Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time**
- c. Average radiance composite images using nighttime data

Question 12

Which of the following is the formula for a Normalized Burn Ratio (NBR)?

Answers: (bold correct)

- a. **$NBR = (NIR - SWIR) / (NIR + SWIR)$**
- b. $NBR = (NIR - RED) / (NIR + RED)$
- c. $NBR = (RED - SWIR) / (RED + SWIR)$
- d. $NBR = (BLUE - SWIR) / (BLUE + SWIR)$

Question 13

True or False: The calculation for a Differenced Normalized Burn Ratio (dNBR) is

$$\text{dNBR} = \text{Pre-Fire NBR} - \text{Post-Fire NBR}$$

Answers: (bold correct)

- a. **True**
- b. False

Question 14

True or false: Fire intensity dictates burn severity

Answers: (bold correct)

- a. **True**
- b. False

Question 15

Name two major post-fire impacts on the environment:

Answer: [open-ended]

Question 16

True or False: Fires do NOT have long-lasting impacts on human lives and infrastructure.

Answers: (bold correct)

- a. True
- b. **False**