NASA Applied Remote Sensing Training (ARSET) Program

Using NASA Remote Sensing for Disaster Management
2016

Homework # 1

Weeks 1 &2
Earthquakes, Tsunami, Volcanoes, and Wildfire Disasters

Earthquakes and Tsunamis

1) Annualized losses from earthquakes in the United States are approximately:

   a) $2.5B
   b) $5.3B
   c) $5.8B
   d) $7.9B

2) Earthquakes occur when there is gradual slipping along fault zones.

   a) True
   b) False

3) Tsunamis are caused by:

   a) Seafloor displacement
   b) High winds
   c) Shallow bays
   d) Ground shaking

4) In the case of a major earthquake or other disaster ____ may make data available for response.

   a) The International Agreement on Disaster Response Cooperation
   b) The UN Disaster Response Agency
   c) The Global Association of Disaster Managers
   d) The International Charter on Space and Major Disasters

5) Interferometric Synthetic Aperture Radar data can be collected by:

a) UAVSAR
b) COSMO-SkyMed
c) RADARSAT
d) all of the above

6) Analysis of MISR data can be used to detect damage following tsunami inundation.

a) True
b) False

Volcanoes

7) This method is used to monitor ground deformation of volcanoes:

a) InSAR (Interferometric Synthetic Aperture Radar)
b) GNSS (Global Navigation Satellite Systems) like GPS and GLONASS
c) Tilt Meters
d) all of the above

8) Seismic Activity provides a reliable way of predicting future volcanic eruptions.

a) True
b) False

9) Which of the following is more correct?

a) SO2 poses a threat to civilian aviation.
b) SO2 is used as a proxy for volcanic ash in determining threat to air traffic.

10) Volcanic ash hazards are well known to cause airplane crashes.

a) True
b) False

11) The CALIOP Lidar shows the vertical profile of ash clouds.

a) True
b) False

12) The Multi-angle Imaging SpectroRadiometer (MISR) instrument has a horizontal (spatial) resolution of about ___.

a) 250 m
b) 500 m
c) 1.1 km
d) 2.2 km

Wildfires

13) How are satellite data used to measure ground-based burn severity?

a) Digitizing a map
b) Analyzing spectral response curves
c) Analyzing active fire smoke
d) Analyzing map topography

14) Bare soil and healthy vegetation show the same spectral response curves.

a) True
b) False

15) The largest differences in the spectral response curves between healthy vegetation and burned areas occur in the:

a) Green and red wavelengths
b) Green and shortwave infrared wavelengths
c) Near infrared and shortwave infrared wavelengths
d) Red and Near infrared wavelengths

16) The MODIS Active Fire Detection detects thermal anomalies using the:

a) The red band
b) The thermal band
c) The blue band
d) the mid-infrared band

17) The MODIS and VIIRS active fire data can be obtained:

a) for the last 24 hours
b) for the last 48 hours
c) for the last 7 days
d) all of the above

18) Go to the Worldview website here: https://worldview.earthdata.nasa.gov/ Click on the Fires and Thermal Anomalies data. Select the Suomi NPP/VIIRS Fires and Thermal Anomalies products for both day and night. Name three countries in the world that generally experience a large amount of wildfires.