



Applied Remote Sensing Training (ARSET) Program

Transforming Earth Observation Data into Building Infrastructure Data
Sets for Disaster Risk Modeling

Homework Questions

Part 1: Development of Regional Exposure Data with Earth Observations

Question 1

How can building exposure data contribute to increased community resilience?

Answers: (bold correct)

- a. Integration into early warning tools
- b. Integration into studies justifying mitigation measures
- c. Identifying at-risk communities
- d. **All of the above**

Question 2

What are 3 techniques to characterize structural attributes of buildings for a given region?

Answers: (bold correct)

- a. **On-site inspection**
- b. **Reviewing streetview and other insitu photographs**
- c. **Reports by sovereign governments, NGOs, and professional organizations**
- d. Guessing

Question 3

What is vulnerability in the context of risk assessment?

Answers: (bold correct)

- a. The degree of risk for a specific type of asset
- b. The degree of hazard for a specific asset
- c. The recommended adaptation strategy
- d. The likelihood of damage given exposure to a hazard for a specific asset**

Question 4

What application of exposure data do you see for your community, region, or country?

Long answer text:

Part 2: Development of Site-specific Exposure Data with Earth Observations

For the site below (satellite images shown and linked to StreetView), view the StreetView map and answer the questions in the form ([Site 1 Link](#)).



Question 5

For Site 1, what is the use for the building?

Answers: (bold correct)

- a. Residential
- b. Commercial**
- c. Industrial
- d. Mixed
- e. Cannot determine

Question 6

For Site 1, how many floors (stories) does the building have?

Short answer text:

Question 7

For Site 1, estimate the first floor elevation (lowest point that water can enter).

Answers: (bold correct)

- a. Ground level**
- b. Less than 6 inches (15 cm)
- c. Between 6 inches and 24 inches (15 cm to 61 cm)
- d. Higher than 24 inches (61 cm)
- e. Cannot determine)

Question 8

For Site 1, what is the primary construction material of the building?

Answers: (bold correct)

- a. Masonry (e.g., cement or concrete block)

- b. Wood
- c. Brick
- d. Steel
- e. Cinder block**
- f. Other

For the site below (satellite images shown and linked to StreetView), view the StreetView map and answer the questions in the form ([Site 2 Link](#)).



Question 9

For Site 2, what is the use for the building?

Answers: (bold correct)

- a. Residential**
- b. Commercial
- c. Industrial
- d. Mixed
- e. Cannot determine

Question 10

For Site 2, how many floors (stories) does the building have?

Short answer text:

Question 11

For Site 2, estimate the first floor elevation (lowest point that water can enter).

Answers: (bold correct)

- a. Ground level
- b. Less than 6 inches (15 cm)
- c. Between 6 inches and 24 inches (15 cm to 61 cm)**
- d. Higher than 24 inches (61 cm)
- e. Cannot determine

Question 12

For Site 2, what is the primary construction material of the building?

Answers: (bold correct)

- a. Masonry**
- b. Wood
- c. Brick
- d. Steel
- e. Cement or concrete block
- f. Other

Part 3: Assessing Utility and Communicating Uncertainty

Question 13

When should data be used to assess site specific risks?

Answers: (bold correct)

- a. When it has been digitized in high resolution optical data
- b. When the site has been reviewed by a qualified engineer**
- c. When the results are available through HAZUS
- d. When tax assessor data is available

Question 14

What are some privacy and security concerns that need to be considered?

Answers: (bold correct)

- a. Informal housing in developing countries can be used against citizens
- b. Personally identifiable information in building datasets
- c. Assessing site-specific risk without qualified review and distributing that data online
- d. Location of vulnerable critical infrastructure
- e. All of the above**

Question 15

What are some problematic sources of bias in developing building exposure data?

Answers: (bold correct)

- a. Undercounting of ethnic minorities, nomadic peoples, and other marginalized communities
- b. Challenges extracting building footprints in mountainous areas or under tree canopies
- c. Data Vintage
- d. Observation bias of crowd-sourced data sets, streetview data, and training data for AI
- e. All of the above**

Question 16

What are the key elements needed to assess vulnerability to climate change for adaptation planning?

Answers: (bold correct)

- a. Hazard, exposure, vulnerability
- b. Exposure to climate hazards (current/future), sensitivity, potential impacts, and adaptive capacity**
- c. Adaptation actions, climate scenarios, sensitivity
- d. Exposure and adaptive capacity

Question 17

What do you think are the greatest challenges to implementing adaptation plans in your community, region, or country?

Long answer text:

Question 18

In an ISO geospatial metadata document, what is the recommended use for the "Lineage" section?

Answers: (bold correct)

- a. Recording your contact information (physical address, phone, and email)
- b. Tracking input databases, data manipulation procedures, and data processing steps**
- c. Storing the spatial extent geometry of the dataset
- d. Providing a final dataset quality review