Landscape and Environmental Change Unit 4: Hazard Mitigation Plan Assignment

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*For this assignment you will be working in groups (4-5) to create a hazard mitigation plan for one of two regions: Arizona or Puerto Rico.*

As you carry out this assignment, consider the following as a means of evaluating your own learning:

1. How has your understanding of existing landslide hazard maps changed after working through the units of this module?
2. Would you consider yourself an expert in landslide hazard mapping and prediction?
3. How has your understanding of the role of susceptibility mapping of any hazard changed?

# Risk Assessment

Unit 2 and Unit 3 generated a regional risk assessment in the form of a susceptibility model, but a more detailed risk assessment of three site locations will be required as part of the hazard mitigation document.

Students will choose to formulate their plan using either group A **or** group B below based on the selection of their region of study.

A. Puerto Rico Sites:

1. PONCE PR-9 (18.032043, -66.636127)
2. BARRANQUITAS PR-143 (18.176531, -66.337803)
3. MAMEYES (18.024682, -66.618523)

B. Arizona Sites:

1. BLACK CANYON CITY (34.095097, -112.133034)
2. MARCUS (33.679230, -111.799326)
3. AGUA FRIA NATIONAL MONUMENT (34.119677, -112.147299)

The **Risk Assessment** should be divided into different sections: 1) Regional risk assessment and 2) local (site-specific) risk assessment.

To accomplish number 2, first, use the coordinates, names, and provided aerial imagery to describe the broader setting of each site as thoroughly as possible. What is the societal and/or natural significance and history of each site?

Next, extensively describe the physical characteristics of each of the three sites. This description should include local geologic, climatic, geomorphic, and infrastructural information. Review the results of analyses from Units 1, 2, and 3 to arrive at these determinations.

# Hazard Mitigation Plan

Using the provided outlines, students will construct a hazard mitigation plan for their selected region and sites.

GENERAL OUTLINE OF A RISK ASSESSMENT AND HAZARD MITIGATION PLAN

The general outline of a risk assessment and hazard mitigation plan is best described by the FEMA local hazard mitigation planning document provided. Use this document, in conjunction with the local hazard mitigation plan for the city of Hayward, CA, USA as guides in developing your own hazard mitigation plan. NOTE: most hazard mitigation plans are not hazard specific, but in this case your groups will be hazard specific (mass movements).

DETAILED OUTLINE OF RISK ASSESSMENT AND HAZARD MITIGATION PLAN

1. Title: “Landslide Risk Assessment and Hazard Mitigation Plan for [region]”
   1. Region 1: Central Arizona
   2. Region 2: Puerto Rico
2. Planning Team [TASK 2]
3. Introduction
   1. What region is your group studying? [TASK 1]
   2. How has the region been impacted by mass movements? (will require outside sources)
      1. Loss of lives
      2. Damages/costs
      3. Major historical mass movements/events
   3. Why is it important to have a risk assessment and hazard mitigation plan for this region? [TASK 3]
   4. Briefly describe what this document will cover.
4. Background
   1. What are mass movements and their types?
   2. What are mechanisms that lead to slope failure?
   3. What events affect the frequency, or likelihood of a mass movement (sever events/catastrophes). NOTE: relate this to your region of study.
5. Risk Assessment [Units 1-3; TASK 5]
   1. Most common types of mass movement sin your region.
      1. Identify three mass movements (see provided data for each coordinate).
         1. Identify their type. How could you tell?
         2. Generate maps that identify their head, flanks, scarps, and internal features (if relevant). Make sure these maps are in your document.
         3. What mechanisms likely led to slope failure in each case?
   2. Susceptibility Mapping
      1. What is susceptibility mapping, and what is its value?
      2. What susceptibility method was used for this study? Describe it in detail.
      3. LSI factors
         1. What factors did you choose?
         2. How might each factor favor mass movements?
         3. Outline your methodology for extracting LSI values.
         4. Discuss (interpret/analyze) the LSI values.
      4. Susceptiblity model
         1. How did you generate the susceptibility model? Why did you choose the input factors that you did?
         2. How did you validate your model? Qualitative and quantitative!
   3. Interpret the susceptibility mapping results.
      1. What are potential losses?
6. Hazard Mitigation Plan [TASK 6]
   1. What is the blueprint for reducing the potential losses identified in the risk assessment?
   2. Provide suggestions for developing a new existing mitigation strategy.

Your grade for this assignment/project will be based on how well your group establishes context and purpose for writing, content development, organization, mechanics, and proper utilization of sources. For further information, refer to the Unit 4 – Hazard Mitigation Plan Assessment rubric.