CMER/Policy Interaction Framework Prospective Six Questions

UNSTABLE SLOPE CRITERIA PROJECT: STUDY DESIGN FOR OBJECT-BASED MAPPING WITH HIGH-RESOLUTION TOPOGRAPHY

Approved by CMER on February 25th, 2020

Type of Product in Review:
Prospective Answers: ☐ Charter ☐ Scoping Document ☐ Study Design
Retrospective: ☐ Completed Pilot/Study Phase ☐ Completed Final Study Report

Brief Description: This is a study design for developing a methodology to use LiDAR and machine learning to identify landform features. This is a precursor phase to moving forward with examining the criteria used to identify unstable slopes.

1. **Does the study inform a rule, numeric target, Performance Target, or Resource Objective?**

   No

2. **Does the study inform the Forest Practices Rules, the Forest Practices Board Manual guidelines, or Schedules L-1 or L-2?**

   No. This is a precursor study that will allow us to determine whether we can objectively map landforms for future empirical evaluation of shallow landslide susceptibility and runout in later phases of this research effort.

3. **Was the study carried out pursuant to CMER scientific protocols?**

   Yes. The study design was reviewed and approved by CMER and ISPR.

4. **What does the study tell us?**

   This study is designed to identify methods for consistent automated delineation of landforms using computer-based techniques and high-resolution LiDAR digital elevation models (DEM)s, and potentially other data sources. The automated landform model will provide the baseline geomorphic features from which to evaluate landslide susceptibility and runout, and it will incorporate data from process-based models to train the automated classification of landforms.

   What does the study not tell us?

   This precursor method development study does not directly evaluate landform susceptibility to landslides, including that of the current potentially unstable landforms. It only tells us whether we can objectively map landforms, including the current rule-identified landforms, for use in future planned studies that will use empirical data to evaluate susceptibility to failure.

5. **What is the relationship between this study and any others that may be planned, underway, or recently completed?**

   In April 2017, Policy approved a phased series of related studies that together will address the critical question "Are unstable landforms being correctly and uniformly identified and evaluated for potential hazard?" This is the first study in the series of studies. This study will

determine whether the proposed approach to the follow-up studies is feasible.

6. **What is the scientific basis that underlies the rule, numeric target, Performance Target, or Resource Objective that the study informs? How much of an incremental gain in understanding do the study results represent?**

   A fundamental basis for rule definitions, targets, and objectives is the assumption that geomorphic landforms serve as proxies for mechanistic characteristics that drive landslide processes. Although the landform mapping study will not evaluate landform susceptibility to landslides (to be investigated during subsequent studies using landform mapping products, as noted above), it is important to objectively and accurately detect and delineate landforms and their distributions prior to implementing the susceptibility research. However, if we cannot do this mapping, then empirical evaluation of landform susceptibility and refinement of the current unstable slope criteria as currently planned may not be possible.