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## **Geomorphology and Surficial Processes (Domain D)**

*[Note: Examples given below are descriptive only and are not all-inclusive lists of items]*

### D-1. Basic processes

- D-1.1 Driving forces (e.g., climate, gravity, tectonics)
- D-1.2 Resisting forces (e.g., lithology, structure, friction)

### D-2. Weathering and soil development

- D-2.1 Chemical weathering processes (e.g., oxidation, dissolution, hydrolysis) and products (e.g., clay minerals, laterite)
- D-2.2 Physical weathering processes (e.g., frost wedging, sheeting) and products (e.g., talus, grus)
- D-2.3 Soil development (e.g., profile/horizon development, residual [in-situ] vs transported)

### D-3. Analysis of surficial materials

- D-3.1 Grain size analysis (e.g., sieve, hydrometer)
- D-3.2 Soil classification systems (e.g. USDA, USCS)
- D-3.3 Age dating techniques (e.g., relative vs. absolute; optical stimulated luminescence [OSL], radiocarbon)

### D-4. Fluvial processes and landforms

- D-4.1 Erosional processes and landforms (e.g., cut bank, point bar)
- D-4.2 Depositional processes and landforms (e.g., delta, alluvial fan)
- D-4.3 Hydraulic gradient and equilibrium
- D-4.4 Channel morphology, patterns, and profiles (e.g., meandering, braided, dendritic, trellis)
- D-4.5 Sediment grain size and distribution
- D-4.6 Effects of external influences (e.g., climate, urbanization, changes in base level)

### D-5. Mass movements and slopes

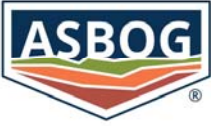
- D-5.1 Factors initiating movement (e.g., angle of repose, role of water)
- D-5.2 Classification of movement type (e.g., slump, slide, earthflow, debris flows, lahars)

### D-6. Aeolian processes and landforms

- D-6.1 Erosional processes (e.g., deflation) and landforms (e.g., blowouts, desert pavement)
- D-6.2 Depositional processes and deposits (e.g., loess, dunes)

### D-7. Glacial processes and landforms

- D-7.1 Formation, movement, and mass balance



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- D-7.2 Erosional processes (e.g., plucking, abrasion) and landforms (e.g., arete, cirque, horn)
  - D-7.3 Depositional processes and landforms/deposits (e.g., lateral moraines, kettles, till)
  - D-7.4 Sediment grain size and distribution
  - D-7.5 Isostatic effects
  - D-7.6 Effects of changing variables (e.g., climate, ice temperature, albedo)
  
  - D-8. Karst processes and landforms
    - D-8.1 Erosional processes and landforms (e.g., sinkhole, sinking stream, cave)
    - D-8.2 Hydrology and drainage
    - D-8.3 Cave development
  
  - D-9. Coastal processes and landforms
    - D-9.1 Erosional processes and landforms (e.g. wave-cut platforms)
    - D-9.2 Depositional processes and landforms (e.g. spits, barrier islands, tombolo)
    - D-9.3 Waves, tides, and currents
    - D-9.4 Drivers and effects of sea level change (relative and absolute, past and future)
    - D-9.5 Beaches and shorelines
  
  - D-10. Volcanic processes and landforms
    - D-10.1 General features (e.g. vent, crater, caldera)
    - D-10.2 Intrusive (e.g., dike, sill, batholith) and extrusive landforms (e.g. cinder, composite, shield)
    - D-10.2 Types of volcanic eruptions (e.g. plinian, strombolian) and associated deposits
  
  - D-11. Project planning and hazard analysis (**PG Only**):
    - D-11.1 Work scoping and cost estimating
    - D-11.2 Literature and regulatory review
    - D-11.3 Site-specific data, maps, and health & safety plans
    - D-11.4 Hazard identification and analysis