

Geotechnical Hazard Identification

Aerial Photography: Aerial photography is used in geotechnical hazard identification to obtain visual data about the terrain, which can help identify potential hazards such as landslides, erosion, and other geological features. Related terms include remote sensing, photogrammetry, and geographic information systems.

Active Fault: An active fault is a fault that has moved recently, is expected to move again, and poses a significant hazard to people and infrastructure. Related terms include fault line, seismic hazard, and earthquake risk.

Airborne Lidar: Airborne lidar is a remote sensing technique used to create high-resolution topographic maps of the ground surface, which can help identify geotechnical hazards such as landslides and erosion. Related terms include aerial photography, photogrammetry, and geographic information systems.

Alluvial Fan: An fan is a geological feature formed by the deposition of sediment at the mouth of a river or stream, which can pose a geotechnical hazard due to its unstable nature. Related terms include floodplain, delta, and sediment transport.

Anisotropy: Anisotropy refers to the directional dependence of the mechanical properties of a rock or soil, which can affect its behavior under different loading conditions and pose a geotechnical hazard. Related terms include isotropy, homogeneity, and soil mechanics.

Aquifer: An aquifer is a geological formation that stores and transmits large amounts of water, which can pose a geotechnical hazard due to its potential to cause erosion, landslides, and other groundwater-related problems. Related terms include groundwater, water table, and hydrogeology.

Artificial Neural Network: An artificial neural network is a computational model inspired by the structure and function of the human brain, which can be used to predict geotechnical hazards such as landslides and earthquakes. Related terms include machine learning, data mining, and pattern recognition.

Asset Management: Asset management refers to the systematic process of maintaining and upgrading infrastructure assets, such as buildings, roads, and bridges, to mitigate geotechnical hazards and reduce risks. Related terms include risk management, maintenance, and rehabilitation.

Bearing Capacity: Bearing capacity refers to the ability of a soil or rock to support a load without failing, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include foundation design, settlement, and stability.

Borehole: A borehole is a narrow, deep hole drilled into the ground to collect geological and geotechnical data, such as soil and rock samples, and to monitor groundwater levels and quality. Related terms include drilling, logging, and sampling.

Brittleness: Brittleness refers to the tendency of a material to fail suddenly and without warning, which can pose a geotechnical hazard in rocks and soils. Related terms include ductility, toughness, and fracture mechanics.

Clastic Rock: Clastic rock is a type of sedimentary rock formed from the accumulation and cementation of

clastic sediments, such as sand, silt, and clay, which can pose geotechnical hazards due to its variability and instability. Related terms include sedimentary rock, stratigraphy, and geological mapping.

Climate Change: Climate change refers to the long-term warming of the planet, which can cause geotechnical hazards such as landslides, erosion, and sea-level rise. Related terms include global warming, greenhouse effect, and sustainability.

Collapse: Collapse refers to the sudden and catastrophic failure of a geological or man-made structure, such as a mine, tunnel, or building, which can pose a significant geotechnical hazard. Related terms include failure, instability, and risk assessment.

Compaction: Compaction refers to the process of densifying a soil or rock by applying pressure or vibration, which can improve its mechanical properties and reduce geotechnical hazards. Related terms include consolidation, settlement, and stabilization.

Computed Tomography: Computed tomography is a non-destructive testing technique used to create detailed images of the internal structure of a material or object, which can help identify geotechnical hazards such as cracks, voids, and inclusions. Related terms include imaging, scanning, and diagnostics.

Cone Penetration Test: A cone penetration test is a type of in-situ test used to measure the mechanical properties of a soil, such as its strength and stiffness, which can help identify geotechnical hazards. Related terms include standard penetration test, dynamic probing, and soil investigation.

Creep: Creep refers to the slow and gradual deformation of a material over time, which can pose a geotechnical hazard in rocks and soils. Related terms include strain, stress, and viscoelasticity.

Critical Infrastructure: Critical infrastructure refers to the essential systems and assets that support the functioning of a society, such as transportation networks, energy systems, and water supply systems, which can be vulnerable to geotechnical hazards. Related terms include resilience, vulnerability, and risk management.

Deformation: Deformation refers to the change in shape or size of a material or object, which can pose a geotechnical hazard in rocks and soils. Related terms include strain, stress, and displacement.

Density: Density refers to the mass per unit volume of a material, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include unit weight, specific gravity, and porosity.

Design Life: Design life refers to the expected lifespan of a structure or system, which can be affected by geotechnical hazards such as earthquakes, landslides, and erosion. Related terms include service life, durability, and maintenance.

Dip Slope: A dip slope is a type of slope formed by the inclination of a geological layer or structure, which can pose a geotechnical hazard due to its instability. Related terms include bedding plane, joint, and fault.

Displacement: Displacement refers to the movement of a material or object from its original position, which can pose a geotechnical hazard in rocks and soils. Related terms include deformation, strain, and stress.

Drainage: Drainage refers to the natural or artificial removal of water from a site or area, which can affect geotechnical hazards such as landslides, erosion, and flooding. Related terms include groundwater, hydrology, and water management.

Ductility: Ductility refers to the ability of a material to deform without failing, which is an important

consideration in geotechnical hazard identification and mitigation. Related terms include brittleness, toughness, and fracture mechanics.

Earthquake: An earthquake is a sudden release of energy in the Earth's crust, which can cause geotechnical hazards such as ground shaking, landslides, and liquefaction. Related terms include seismicity, seismic hazard, and earthquake risk.

Elasticity: Elasticity refers to the ability of a material to return to its original shape after being deformed, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include plasticity, viscoelasticity, and strain.

Embankment: An embankment is a man-made structure, such as a dam or a levee, built to prevent or control the flow of water, which can pose a geotechnical hazard due to its instability. Related terms include dam, levee, and flood control.

Engineering Geology: Engineering geology is the application of geological principles and techniques to the design, construction, and maintenance of engineering projects, such as tunnels, bridges, and buildings, which can be affected by geotechnical hazards. Related terms include geological engineering, geotechnical engineering, and civil engineering.

Erosion: Erosion refers to the removal of soil, rock, or other materials from a site or area by natural or artificial means, such as water, wind, or ice, which can pose a geotechnical hazard. Related terms include sediment transport, deposition, and geomorphology.

Expansive Soil: Expansive soil is a type of soil that can undergo significant volume changes in response to changes in moisture content, which can pose a geotechnical hazard due to its potential to cause damage to structures. Related terms include shrinkage, swelling, and soil mechanics.

Failure: Failure refers to the loss of structural integrity or functionality of a material or object, which can pose a geotechnical hazard in rocks and soils. Related terms include collapse, instability, and risk assessment.

Fault: A fault is a fracture or crack in the Earth's crust, which can pose a geotechnical hazard due to its potential to cause earthquakes, landslides, and other geological hazards. Related terms include fault line, seismic hazard, and earthquake risk.

Flood: A flood is an overflow of water that can pose a geotechnical hazard due to its potential to cause erosion, landslides, and damage to structures. Related terms include flooding, inundation, and hydrology.

Fracture Mechanics: Fracture mechanics is the study of the formation and propagation of cracks and fractures in materials, which can pose a geotechnical hazard in rocks and soils. Related terms include crack, fracture, and failure.

Geochemistry: Geochemistry is the study of the chemical composition and processes that occur in the Earth's crust, which can affect geotechnical hazards such as contamination, corrosion, and degradation. Related terms include geology, chemistry, and environmental science.

Geodesy: Geodesy is the study of the size, shape, and gravity field of the Earth, which can provide information on geotechnical hazards such as subsidence, uplift, and sea-level rise. Related terms include geophysics, surveying, and mapping.

Geographic Information System: A geographic information system is a computer-based tool used to collect, store, and analyze spatial data, which can help identify and mitigate geotechnical hazards. Related terms

include GIS, mapping, and spatial analysis.

Geology: Geology is the study of the Earth's physical structure, composition, and processes, which can provide information on geotechnical hazards such as earthquakes, landslides, and volcanic activity. Related terms include geoscience, earth science, and geological engineering.

Geomorphology: Geomorphology is the study of the shape and features of the Earth's surface, which can provide information on geotechnical hazards such as landslides, erosion, and flooding. Related terms include geography, geology, and earth science.

Geophysics: Geophysics is the study of the Earth's internal and external physical processes, which can provide information on geotechnical hazards such as earthquakes, volcanic activity, and groundwater flow. Related terms include geology, physics, and earth science.

Geospatial Analysis: Geospatial analysis is the use of geographic information systems and other spatial analysis techniques to study and understand the relationships between different variables and geotechnical hazards. Related terms include spatial analysis, mapping, and GIS.

Geotechnical Engineering: Geotechnical engineering is the application of geological and engineering principles to the design, construction, and maintenance of engineering projects, such as tunnels, bridges, and buildings, which can be affected by geotechnical hazards. Related terms include geological engineering, civil engineering, and engineering geology.

Geotechnical Hazard: A geotechnical hazard is a potential source of harm or damage to people, property, or the environment, caused by geological or geotechnical factors such as earthquakes, landslides, and erosion. Related terms include hazard, risk, and mitigation.

Glacier: A glacier is a large, slow-moving river of ice and snow, which can pose a geotechnical hazard due to its potential to cause landslides, floods, and other geological hazards. Related terms include glaciology, ice, and snow.

Global Positioning System: A global positioning system is a network of satellites used to provide location information and precise positioning, which can be used to monitor and study geotechnical hazards such as landslides and earthquakes. Related terms include GPS, navigation, and mapping.

Ground Improvement: Ground improvement refers to the techniques and methods used to improve the engineering properties of a soil or rock, such as its strength, stability, and durability, which can help mitigate geotechnical hazards. Related terms include soil improvement, rock reinforcement, and stabilization.

Groundwater: Groundwater is the water stored in the soil and rocks beneath the Earth's surface, which can pose a geotechnical hazard due to its potential to cause erosion, landslides, and other groundwater-related problems. Related terms include aquifer, water table, and hydrogeology.

Hydrogeology: Hydrogeology is the study of the movement, distribution, and quality of groundwater, which can provide information on geotechnical hazards such as contamination, erosion, and flooding. Related terms include hydrology, geology, and water resources.

Hydrology: Hydrology is the study of the movement, distribution, and quality of water, which can provide information on geotechnical hazards such as flooding, erosion, and drought. Related terms include hydrogeology, water resources, and environmental science.

Inclinometer: An inclinometer is a device used to measure the inclination or tilt of a structure or object,

which can help monitor and study geotechnical hazards such as landslides and subsidence. Related terms include tiltmeter, sensor, and monitoring.

Instrumentation: Instrumentation refers to the use of sensors, monitoring systems, and other devices to collect data on geotechnical hazards such as landslides, earthquakes, and erosion. Related terms include monitoring, measurement, and data analysis.

Joint: A joint is a fracture or crack in a rock, which can pose a geotechnical hazard due to its potential to cause instability and failure. Related terms include fracture, crack, and rock mechanics.

Karst: Karst is a type of landscape formed from the dissolution of soluble rocks, such as limestone and dolomite, which can pose a geotechnical hazard due to its potential to cause sinkholes, caves, and other geological hazards. Related terms include karst terrain, sinkhole, and cave.

Landslide: A landslide is the movement of rock, soil, or debris down a slope, which can pose a significant geotechnical hazard due to its potential to cause damage to structures, infrastructure, and the environment. Related terms include landslide hazard, landslide risk, and landslide mitigation.

Liquefaction: Liquefaction is the process by which a soil or rock loses its strength and stiffness due to shaking or other dynamic loads, which can pose a geotechnical hazard during earthquakes and other seismic events. Related terms include liquefaction hazard, soil liquefaction, and seismic hazard.

Mapping: Mapping is the process of creating a visual representation of an area or feature, which can help identify and mitigate geotechnical hazards such as landslides, earthquakes, and erosion. Related terms include cartography, geographic information system, and spatial analysis.

Mass Movement: Mass movement refers to the downslope movement of rock, soil, or debris, which can pose a geotechnical hazard due to its potential to cause damage to structures, infrastructure, and the environment. Related terms include landslide, rockfall, and debris flow.

Microtremor: A microtremor is a small, low-frequency vibration of the ground, which can be used to study and monitor geotechnical hazards such as landslides and earthquakes. Related terms include seismic noise, ambient vibration, and site characterization.

Mitigation: Mitigation refers to the actions taken to reduce the risk or impact of a geotechnical hazard, such as landslides, earthquakes, and erosion. Related terms include risk reduction, hazard mitigation, and disaster risk reduction.

Modeling: Modeling is the process of creating a mathematical or numerical representation of a system or phenomenon, which can be used to study and predict geotechnical hazards such as landslides, earthquakes, and erosion. Related terms include simulation, analysis, and prediction.

Monitoring: Monitoring refers to the systematic observation and measurement of a geotechnical hazard, such as a landslide or earthquake, to track its behavior and predict its impact. Related terms include surveillance, observation, and data collection.

Mudflow: A mudflow is a type of landslide that involves the movement of a mixture of water and sediment, which can pose a significant geotechnical hazard due to its potential to cause damage to structures, infrastructure, and the environment. Related terms include mudslide, debris flow, and landslide hazard.

Natural Hazard: A natural hazard is a potential source of harm or damage to people, property, or the environment, caused by natural factors such as earthquakes, landslides, and floods. Related terms include

geotechnical hazard, hazard, and risk.

Non-Destructive Testing: Non-destructive testing refers to the methods and techniques used to evaluate the properties and behavior of a material or structure without causing damage or destruction, which can be used to study and monitor geotechnical hazards. Related terms include NDT, inspection, and evaluation.

Permafrost: Permafrost is a type of soil or rock that remains frozen for two or more consecutive years, which can pose a geotechnical hazard due to its potential to cause thawing, settlement, and other geological hazards. Related terms include permafrost terrain, frozen ground, and cryosphere.

Photogrammetry: Photogrammetry is the science and technology of extracting information from photographs and other imaging systems, which can be used to study and monitor geotechnical hazards such as landslides and earthquakes. Related terms include remote sensing, aerial photography, and mapping.

Piezometer: A piezometer is a device used to measure the pressure or level of groundwater in a borehole or well, which can help monitor and study geotechnical hazards such as landslides and erosion. Related terms include water level, groundwater monitoring, and hydrology.

Pore Pressure: Pore pressure refers to the pressure exerted by fluids, such as water or gas, within the pores of a soil or rock, which can affect its mechanical properties and behavior. Related terms include pore water pressure, soil mechanics, and rock mechanics.

Porosity: Porosity refers to the amount of empty space or voids within a soil or rock, which can affect its mechanical properties and behavior. Related terms include void ratio, permeability, and soil mechanics.

Probability: Probability refers to the likelihood or chance of a geotechnical hazard occurring, which can be used to assess and mitigate risks. Related terms include probability theory, risk analysis, and uncertainty.

Remote Sensing: Remote sensing is the use of sensors and other technologies to collect data about the Earth's surface from a distance, which can be used to study and monitor geotechnical hazards such as landslides, earthquakes, and erosion. Related terms include aerial photography, satellite imagery, and geographic information system.

Reservoir: A reservoir is a body of water, such as a lake or a dam, which can pose a geotechnical hazard due to its potential to cause flooding, erosion, and other geological hazards. Related terms include water storage, dam, and flood control.

Resilience: Resilience refers to the ability of a system or community to withstand and recover from a geotechnical hazard, such as a landslide or earthquake. Related terms include resilience theory, risk reduction, and disaster risk reduction.

Risk: Risk refers to the likelihood and potential impact of a geotechnical hazard, which can be assessed and mitigated through various techniques and strategies. Related terms include risk analysis, risk assessment, and risk management.

Risk Assessment: Risk assessment is the process of identifying, analyzing, and evaluating the risks associated with a geotechnical hazard, which can be used to develop strategies for mitigation and management. Related terms include risk analysis, hazard identification, and risk evaluation.

Rock Mechanics: Rock mechanics is the study of the behavior and properties of rocks, which can provide information on geotechnical hazards such as landslides, earthquakes, and rockfalls. Related terms include

rock engineering, geomechanics, and geological engineering.

Rockfall: A rockfall is a type of landslide that involves the movement of rocks or boulders down a slope, which can pose a significant geotechnical hazard due to its potential to cause damage to structures, infrastructure, and the environment. Related terms include rockslide, rock avalanche, and landslide hazard.

Sediment Transport: Sediment transport refers to the movement of sediment, such as sand, silt, or clay, through a fluid, such as water or air, which can pose a geotechnical hazard due to its potential to cause erosion, landslides, and other geological hazards. Related terms include sedimentation, deposition, and erosion.

Seismic Hazard: A seismic hazard is a potential source of harm or damage to people, property, or the environment, caused by earthquakes and other seismic events. Related terms include earthquake hazard, seismic risk, and seismic mitigation.

Seismicity: Seismicity refers to the frequency and intensity of earthquakes in a given area, which can provide information on geotechnical hazards such as seismic hazard and earthquake risk. Related terms include earthquake activity, seismic hazard, and seismic risk.

Sensitivity Analysis: Sensitivity analysis is a technique used to evaluate the effects of changes in input parameters on the output of a model or system, which can be used to study and predict geotechnical hazards such as landslides and earthquakes. Related terms include uncertainty analysis, risk analysis, and decision-making.

Shear Strength: Shear strength refers to the maximum stress that a material can withstand without failing in shear, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include shear stress, soil mechanics, and rock mechanics.

Sinkhole: A sinkhole is a depression or hole in the ground, which can pose a geotechnical hazard due to its potential to cause damage to structures, infrastructure, and the environment. Related terms include sinkhole hazard, karst terrain, and subsidence.

Slope: A slope is a surface or area that is inclined or tilted, which can pose a geotechnical hazard due to its potential to cause landslides, erosion, and other geological hazards. Related terms include slope stability, slope failure, and landslide hazard.

Slope Stability: Slope stability refers to the ability of a slope to resist movement or failure, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include slope instability, landslide hazard, and geotechnical hazard.

Soil Mechanics: Soil mechanics is the study of the behavior and properties of soils, which can provide information on geotechnical hazards such as landslides, erosion, and foundation failure. Related terms include soil engineering, geotechnical engineering, and civil engineering.

Stability: Stability refers to the ability of a system or structure to resist change or movement, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include instability, stability analysis, and risk assessment.

Standard Penetration Test: A standard penetration test is a type of in-situ test used to measure the mechanical properties of a soil, such as its strength and stiffness, which can help identify geotechnical hazards. Related terms include cone penetration test, dynamic probing, and soil investigation.

Static Analysis: Static analysis is a technique used to evaluate the behavior of a system or structure under static or non-dynamic loads, which can be used to study and predict geotechnical hazards such as landslides and foundation failure. Related terms include dynamic analysis, stability analysis, and risk assessment.

Stratigraphy: Stratigraphy is the study of the layering and composition of rocks and sediments, which can provide information on geotechnical hazards such as landslides, earthquakes, and erosion. Related terms include geological mapping, rock stratigraphy, and sedimentology.

Subsidence: Subsidence refers to the sinking or settling of the ground surface, which can pose a geotechnical hazard due to its potential to cause damage to structures, infrastructure, and the environment. Related terms include subsidence hazard, sinkhole, and land subsidence.

Surface Roughness: Surface roughness refers to the irregularities or unevenness of a surface, which can affect the behavior and properties of a material or structure, and pose a geotechnical hazard. Related terms include surface texture, surface finish, and tribology.

Sustainability: Sustainability refers to the ability to maintain or support a system or process over time, without depleting natural resources or causing harm to the environment, which is an important consideration in geotechnical hazard identification and mitigation. Related terms include sustainable development, environmental sustainability, and social sustainability.

Thermal Expansion: Thermal expansion refers to the increase in size or volume of a material due to an increase in temperature, which can affect its mechanical properties and behavior, and pose a geotechnical hazard. Related terms include thermal contraction, thermal stress, and thermodynamics.

Topography: Topography refers to the study of the shape and features of the Earth's surface, which can provide information on geotechnical hazards such as landslides, earthquakes, and erosion. Related terms include geomorphology, geography, and mapping.

Tunnel: A tunnel is a narrow, underground passage or structure, which can pose a geotechnical hazard due to its potential to cause instability, collapse, and other geological hazards. Related terms include tunnel engineering, tunnel construction, and geotechnical engineering.

Uncertainty: Uncertainty refers to the lack of knowledge or certainty about a particular parameter or variable, which can affect the accuracy and reliability of geotechnical hazard assessments and predictions. Related terms include uncertainty analysis, sensitivity analysis, and risk assessment.

Unsaturated Soil: Unsaturated soil is a type of soil that contains air or water in its pores, which can affect its mechanical properties and behavior, and pose a geotechnical hazard. Related terms include unsaturated soil mechanics, soil suction, and soil water content.

Upstream: Upstream refers to the area or location that is higher in elevation or further away from a particular point or feature, which can affect the behavior and properties of a material or structure, and pose a geotechnical hazard. Related terms include downstream, watershed, and catchment.

Vibration: Vibration refers to the repetitive motion or oscillation of a material or structure, which can affect its mechanical properties and behavior, and pose a geotechnical hazard. Related terms include vibration analysis, dynamic analysis, and seismic hazard.

Volcanic Hazard: A volcanic hazard is a potential source of harm or damage to people, property, or the

environment, caused by volcanic activity, such as eruptions, lava flows, and ash fall. Related terms include volcanic risk, volcanic hazard assessment, and volcanic hazard mitigation.

Water Content: Water content refers to the amount of water present in a soil or rock, which can affect its mechanical properties and behavior, and pose a geotechnical hazard. Related terms include moisture content, soil suction, and soil water potential.

Weathering: Weathering refers to the breakdown or decomposition of rocks and minerals due to exposure to the environment, which can affect their mechanical properties and behavior, and pose a geotechnical hazard. Related terms include weathering process, weathering rate, and rock decay.

Zonation: Zonation refers to the division of an area or region into different zones or areas, based on their geotechnical characteristics, such as landslide hazard, earthquake risk, or flood vulnerability. Related terms include zoning, mapping, and geographic information system.