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# Engineer Intelligence Guide 13, Glossary of Natural Terrain Features, November 1957

Army Map Service

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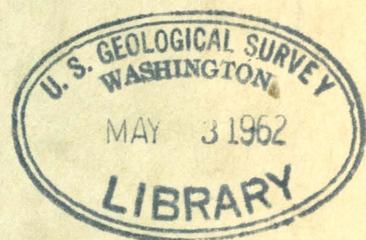
# ENGINEER INTELLIGENCE

EIG 13

GUIDE

## GLOSSARY OF NATURAL TERRAIN FEATURES

A TECHNICAL SERVICE INTELLIGENCE DOCUMENT



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CHIEF OF ENGINEERS  
DEPARTMENT OF THE ARMY  
WASHINGTON 25, D. C.

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DEPARTMENT OF THE ARMY  
OFFICE OF THE CHIEF OF ENGINEERS  
WASHINGTON 25, D. C.

ENGINEER INTELLIGENCE GUIDE NO. 13

GLOSSARY OF NATURAL TERRAIN FEATURES

GUIDANCE EFFECTIVE AS OF NOVEMBER 1957

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EIG 13

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#### PREFACE

Engineer Intelligence Guides (EIG's) are the media for the dissemination of intelligence collection, processing, production, and dissemination guidance by the Chief of Engineers to pertinent elements of the Corps of Engineers. EIG's are designed to provide orientation, direction, and instruction in the field of Engineer Intelligence. Comments on this Engineer Intelligence Guide and suggestions for additional EIG's are solicited from all recipients. Comments and suggestions should be addressed to:

Chief of Engineers  
Department of the Army  
Washington 25, D. C.  
ATTN: Engineer Intelligence Division

## Glossary of Natural Terrain Features

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## INTRODUCTION

### SECTION I

#### 1. Purpose

This glossary of natural terrain features is intended primarily as a reference for military personnel and others who may use terrain studies prepared by the Corps of Engineers. It also may serve as a guide to producers of Engineer terrain studies by standardizing and restricting the usage of technical terminology.

#### 2. Scope.

Because of the breadth of the topic, natural terrain features, limits were assigned to keep the glossary within reasonable bounds. Few topics embrace so many other fields that are subjects of study in themselves; physical geography, geology, hydrography, glaciology, botany, and pedology are only a few of the sciences which lend their terminology to the topic of terrain. In addition, terrain terminology includes not only the nomenclature of features and materials and the classes into which the features and materials fall, but also those terms dealing with acts, processes, and stages that are related to cause and effect.

Another problem affecting the scope of a terrain glossary is language. English terminology is voluminous, even without localisms and modifying adjectives; but added to this are innumerable foreign words which have crept into the English literature on the subject. All of these factors had to be considered in determining the limits of this glossary.

These factors were all evaluated and for reasons of practicability, the glossary was limited in the manner noted below; in general, the terms which appear have been used and are considered appropriate for Engineer terrain studies as well as for pertinent portions of National Intelligence Surveys (NIS).

- a. Only terms commonly used in designating natural features and materials, or classes of natural features and materials are included.
- b. Only those rock, mineral, and soil terms are included which are essential in Engineer studies.
- c. Only terms common to the English language are included except for a few foreign words that have achieved widespread usage in English literature on the subject or that have no English equivalent.
- d. Localisms and adjectival modifications of natural terrain features and materials are kept to an irreducible minimum.
- e. Excluded from the glossary are many terms related to cause and effect, such as acts, processes, or stages; terms related to technical concepts or characteristics of features and materials; names of specific trees or plants; names of sciences; and meteorological terms.

### 3. General

The definitions of the terms included in the glossary have been composed or selected after careful review of source material, including other glossaries relating to terrain. In some cases definitions from other sources have been accepted verbatim, but in most cases, definitions have been recast either to give them greater accuracy or to make them more readily understandable to the layman.

In a few cases, where feasible, arbitrary limits have been established to permit users and producers of Engineer studies to distinguish between terms that are similar in some respects: e.g., silt and sand, gravel and cobble. Other terms, e.g., brook and creek, plain and plateau, bay and plateau, bay and gulf, are of such a nature that they can be distinguished only by general remarks relating one to the other; in these cases, no definitive distinction can be drawn and terrain terminology remains loose;

many of these terms have their origin in popular rather than technical usage.

Adjectival modifications have been avoided as far as possible in the glossary. It is assumed that the user can relate combinations of terms and comprehend the meaning of the combined term formed: e.g., volcanic cone, beach ridge, evergreen forest. Where the combination of terms would have a meaning which is obscure or different from that which normally would be interpreted, the adjectival modification has been included either as a separate entry (e.g., flood plain, water gap, mud volcano) or on the entry for the basic term (e.g., barrier bar under bar, terminal moraine under moraine, fringing reef under reef).

Many of the terms included in the glossary are illustrated in the Appendices. Coordinates and a reference to the proper diagram are included on each term so illustrated.

GLOSSARY  
SECTION II

	<u>Appendix</u>	<u>Location</u>
AFFLUENT	1	V5
	A stream which flows into a larger stream or into a lake; a tributary.	
ALPINE		
	Of, pertaining to, or like the Alps, lofty mountains in Europe. Specifically, (topog.) characterized by sharp serrate peaks (horns), narrow, sharp-crested ridges (aretes), and cirques, or (veg.) characteristic of high elevations or cold climates, above tree line.	
ALLUVIAL FAN	3	05
	An accumulation of alluvial materials, formed where streams having a steep gradient have their velocity checked abruptly by flowing onto a gentle slope; generally shaped like an open fan or a segment of a cone.	
ALLUVIUM	1	S5
	Gravel, sand, silt, and clay deposited by running water. It makes up alluvial fans, natural levees, river bars, flood plains, deltas, etc.	

Appendix    Location

**ANHYDRITE**

A mineral, anhydrous calcium sulphate,  $\text{CaSO}_4$ , commonly occurring in sedimentary rocks associated with gypsum and rock salt. Anhydrite alters to gypsum, from which it differs in crystal form, in being harder, in lacking water of crystallization, and in being slightly less soluble.

**AQUIFER** A layer of rock or soil, or a zone of fractured rock, that yields or could yield water to wells.

**ARCHIPELAGO**

1                    L3

1. A continuous group of islands occupying a broad expanse in a large body of water.
2. A large body of water studded with islands.

**ARTESIAN WATER**

Ground water that is under sufficient natural pressure to rise above the level of the water table.

It may rise to or above the surface of the ground.

**ASPHALT (Natural)**

A dark brown to black, solid or viscous mixture of oxidized hydrocarbons that remains after the more volatile parts of petroleum have evaporated. It occurs in seeps, springs, lakes, and impregnations in rocks. Also called bitumen.

Appendix Location

ATOLL

1

K6

A ring-shaped coral formation consisting of coral reefs, coral islands, or most commonly both, encircling or nearly encircling a lagoon. The formation commonly is built up by algae as well as by coral animals.

BACKSHORE

1. The usually dry part of a beach which is reached only by the highest tides, or covered by water only during exceptional storms.
2. A narrow strip of relatively level coast bordering the sea.

BADLANDS

3

S5

An elevated, barren or nearly barren area with a maze of intricately eroded gullies and ravines and sharp ridges and pinnacles; the rugged surface is effected by occasional heavy rains falling on plantless strata of unequal resistance to erosion.

BANK

1

H6

1. The continuous sloping margin of a stream or other water body; on a stream designated left or right bank as it would appear to an observer facing downstream.
2. An elevated submerged tract forming a shallow sector in a sea, lake, or stream; a shoal or shelf.

Appendix    Location

BAR

1              P6

1. A mass of unconsolidated material, either submerged or at the surface, lying across the mouth of a stream, estuary, or bay (baymouth bar), or lying parallel to a shore (barrier bar), or a ridge of sand or gravel or both, lying seaward of a shore (offshore bar).
2. An accumulation of alluvial material in a stream channel, commonly emergent at low water (river bar).

BARCHAN (BARKHAN)

A crescent-shaped mound of windblown sand or snow; the horns of the cresent point downwind

BARREN(s)

1. A tract of lightly forested, relatively level terrain.
2. A sterile, desolate, more or less treeless area where plant cover when present is restricted to few species; e.g., an icecap or desert.

BASALT

Generally a fine-grained, dark, heavy igneous rock.

Appendix Location

BASIN

1. A broad surface depression which is entirely or nearly enclosed by high ground.
2. A broad, nearly enclosed section of a valley.
3. The area drained by a stream or a lake; a watershed.
4. Any enclosed surface trough; it may contain water; e.g., a lake or ocean basin.
5. An area in which the rock layers slope inward from all directions; a structural basin.

BAY

1

H5

A body of water lying in an indentation of a sea or lake coast, usually smaller than a gulf.

BEACH

1

O4

1. The gently sloping zone of unconsolidated material bordering a sea or lake, usually lying between the limits of low and high water.
2. The zone extending from low water landward to a definite change in material or physiographic form such as a sea cliff, or to the line of permanent vegetation.

Appendix Location

BEACH CUSP

One of a series of low mounds of beach material separated by crescent-shaped troughs spaced at more or less regular intervals along the foreshore of a beach.

BED

1. The bottom on which a body of water rests.
2. A layer of rock differing from layers above and below, or set off by more or less well marked divisional planes; a layer in a series of stratified (sedimentary) rocks.

BEDROCK

1 N8

Solid undisturbed rock either exposed at the surface or underlying soil, gravel, sand, clay, etc.

BENCH

1 K3

1. An elevated, narrow platform of relatively level earth or rock.
2. A terrace or shelf along a body of water, commonly representing its former level.

BEND

3 D4

A turn in the course of a stream

BENTONITE

Peculiar, light-colored clay, commonly having great ability to absorb or adsorb water, with accompanying swelling. It is formed from the decomposition of volcanic ash.

BERM

A nearly horizontal part of a beach or backshore extending landward beyond the normal limit of wave uprush; formed by the deposition of material induced by wave action. Some beaches have several berms, others have none. The crest of the most seaward berm divides the beach into a seaward part, foreshore, and a landward part, backshore.

BIGHT

1 03

1. A bend in a coast forming an open bay.
2. The open bay formed by the indentation.

BITUMEN (Natural)

A mixture of naturally occurring hydrocarbons such as natural gas, petroleum, asphalt, etc.

BLUFF

1 Q5

1. An extended steep, high slope, commonly bordering a stream or other body of water.
2. A steep, high bank of loosely consolidated material.

Appendix Location

BOG

1. Soft, wet, spongy ground, consisting chiefly of peat, supporting mosses, low shrubs, and in some places poorly developed trees.
2. An area overgrown with a blanket of peat moss.

BORE

A strong inflowing tide with a high, wall-like front that develops in some estuaries or bays.

BOULDER

A large rock fragment, commonly rounded or otherwise modified in shape while being transported. A boulder is larger than a cobble; 10 inches is arbitrarily suggested as a lower limit for its diameter.

BOULDER CLAY

Unstratified glacial material containing boulders, cobbles, pebbles, and sand that are usually embedded in a hardened clayey matrix.

BRACKISH (Water)

Slightly salty; intermediate in salt content between fresh water and sea water.

Appendix   Location

BRAIDED STREAM

3

E3

A stream flowing in several channels; stream divides and reunites in a pattern resembling the strands of a braid.

BRAKE

A dense growth of shrubs or small trees.

BRANCH

1. A small stream that flows into a larger one; a tributary.
2. A stream flowing out of the main channel of another stream and not rejoining it, as on a delta or an alluvial fan; a distributary.
3. A stream flowing out of another and rejoining it; a braid.

BROADLEAF TREE

A tree with broad, flattened leaves, which may be either deciduous or evergreen. Broadleaf trees produce wood known as hardwood. Opposed to NEEDLELEAF.

BROOK

1. A fresh-water stream of relatively small size, commonly in rugged terrain and quick flowing.
2. A tributary of a river or a larger stream.

BRUSH

1. Shrubs, bushes, small trees, or other low vegetation species, growing together either in a wood or in open areas.
2. A thicket of shrubs, bushes, small trees, etc.

BUSH

1. A low shrub, branching from the ground.
2. An uncleared, uncultivated area with shrubby vegetation.

BUTTE

3

A3

An isolated, flat-topped hill or mountain with steep sides, smaller than a mesa; it is generally situated in an arid region.

CALICHE

1. A calcareous material occurring in a layer or in layers at or near the surface in arid or semiarid areas. It consists of gravel, sand, or clay and a cementing material, generally calcium carbonate.
2. A soft horizon of lime accumulation in the soil.

Appendix Location

CANE BRAKE

A thicket of any bamboolike plant.

CANOPY

The overhanging, shading, or sheltering part  
of a tree or forest.

CANYON

2 T6

1. A deep, relatively narrow, steep-sided valley, generally with a stream occupying most of its floor.
2. In oceanography, a submerged, deep, steep-sided valley.

CAPE

1 L5

1. A pronounced irregularity of a coastline projecting into a large body of water.
2. The part of the irregularity projecting farthest into the water.

CASCADE

A small waterfall, often occurring as one of a series; it has a greater height and faster flow than a rapid.

CATARACT

1. A waterfall of great volume.
2. A series of waterfalls.

Appendix Location

CATCHMENT BASIN

The entire area drained by a body of water,  
including its tributaries.

CAVE

A sizable underground hollow, generally with  
a surface entrance.

CAVERN

A large cave, in places of indeterminate extent.      3      U8

CHAIN

1. An extended group of more or less parallel features of high relief, including mountains, hills, or plateaus.
2. Any series of related or interconnected natural features.

CHALK

A very soft, white to light gray, fine-grained variety of limestone composed largely of the calcareous shells of floating marine microorganisms.

Appendix Location

CHANNEL

1. The trench in which a stream normally flows.
2. A relatively narrow stretch of sea between two larger bodies of water; a strait.
3. The deepest part of a stream, bay, or strait through which the main current of water flows.
4. The part of a body of water deep enough to be used for navigation through an area which in places is too shallow.

CHASM

A deep, relatively narrow cleft in the earth's surface.

CHERT

A very compact siliceous rock occurring either as nodular or concretionary masses, or as distinct beds; usually occurs in association with limestone.

CIRQUE

1

F2

A deep, steep-walled hollow in a mountain or hill caused by glacial erosion; a snowfield or glacier may still occupy the cirque.

Appendix   Location

CLAY

3

U5

An aggregate of unconsolidated mineral particles that has a plasticity when wet and is hard when dry; it consists mainly of particles less than 0.074 mm. (passing No. 200 sieve) in diameter.

2

V6

CLIFF

A high, extremely steep slope, generally of rock.

CLINKER

1. Burnt-looking or slaggy matter thrown from a volcano.
2. Similar material developed on the surface of a lava flow.

COAST

1. The land bordering a large body of water.
2. A belt of land of varying width extending inland from the shore or beach of a sea or large lake to the line where the first major change in landform occurs.

COBBLE

A rock fragment, generally rounded, more than 3 inches in diameter. A very large cobble is a boulder.

Appendix    Location

COL

3        U1

A low place in a ridge or crestline;  
commonly the divide separating two valleys,  
especially if the valleys slope steeply away  
from the divide; a saddle or gap.

CONCRETION

A rounded, nodular, or irregular mass of  
material cemented into hard rock and inclosed  
in unconsolidated or soft rocks.

CONE

2        H4

A mountain or hill with a pointed top and  
shaped like a cone; generally characteristic  
of peaks of volcanic origin.

CONFLUENCE

1        U5

The place where two or more streams unite.

CONGLOMERATE

2        P7

Hard rock formed by the natural cementing  
together of rounded pebbles (gravel), cobbles,  
or boulders.

CONIFER

A tree or shrub, mostly evergreen, with  
needle-shaped leaves and bearing cones.

CONTINENT

1. A grand division of land on the earth.
2. A large, continuous extent of land; a mainland.

CONTINENTAL SHELF

The zone bordering a continent extending from the line of permanent immersion seaward to the depth (usually about 100 fathoms) where there is a marked or rather steep descent toward the great depths.

COPPICE

A woodland originating mainly from sprouts or root suckers from the stumps of cut trees.

Almost exclusively hardwood trees such as oak.

COPSE

A thicket of small trees and shrubs.

COQUINA

A coarse-grained, porous, friable variety of limestone, made up chiefly of fragments of shells cemented together as rock.

Appendix Location

CORAL (ROCK)

Rock made up in large part of the skeletons of corals (mainly calcium carbonate).

CORRIDOR

A natural passageway through high, poorly drained, forest-covered, or otherwise difficult terrain; broader than a defile.

COVE

1 D6

1. A small, sheltered inlet in a coast; a small bay.
2. A sheltered recess in hills or mountains.

CRAG

1. A rocky projection on an eminence.
2. A steep, rugged rock.

CRATER

2 H4

1. A bowl-shaped depression formed at the vent of a volcanic cone; in places, water occupies the depression, forming a crater lake.
2. A cavity formed by the impact of a meteorite.

CREEK

1. A fresh-water stream of intermediate size, i.e., smaller than a river and larger than a brook.
2. A relatively small tidal inlet or estuary of a coast; generally referred to as a tidal creek.

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Appendix Location

DEBRIS

Any accumulation of loose material resulting from the decay and disintegration of rocks.

It consists of rock fragments, earth, and sometimes organic matter. Debris may occur where it was formed, or where it was transported by water or ice.

DECIDUOUS PLANT

A tree or shrub whose leaves fall off during one or more seasons of the year of cold or drought, at the end of a growing period.

Most deciduous plants have broad, flat leaves.

DEEP

A part of a large body of water, especially an ocean, that has great depth.

DEFILE

A narrow, natural passageway through difficult terrain, especially mountainous areas.

## DELTA

1 06

A low, nearly level, alluvial plain situated at the mouth of a stream; generally triangular in shape and crossed by streams branching from the main channel (distributaries). A delta is built by the sediments carried by a stream into another body of water, generally a sea or lake, with weak waves and currents.

## DEPRESSION

A hollow completely enclosed by higher ground and having no surface drainage outlet. Water is lost either by going underground or by evaporation.

## DESERT

A region of little or no plant or animal life because of extreme aridity or cold. Although many deserts are plains or plateaus, no landform is implied by the term "desert". Wind action on weathered material produces the sand and dunes that are commonly associated with deserts in hot, dry areas.

## DETritus

Any material worn or broken from rocks by mechanical means rather than by decay.

DIATOMACEOUS EARTH

A soft, friable, earthy deposit composed of nearly pure silica, and consisting essentially of the frustules of microscopic plants called diatoms.

DIKE (Natural)

3            Q2

A tabular body of igneous rock that cuts across the structure of other rocks.

DISTRIBUTARY

3            N5

A branch that leaves the main channel of a stream and does not rejoin it. Distributaries usually are associated with deltas or alluvial fans.

DIVIDE

1. A line which follows the highest ground between streams or drainage systems.
2. A tract of relatively high ground between streams or drainage systems.

DOLOMITE

1. A rock resembling limestone but not readily yielding good quicklime when burned in a kiln.  
It is a magnesian limestone.
2. A mineral,  $\text{CaMg}(\text{CO}_3)_2$ , making up the bulk of dolomite rock.

Appendix Location

DOME

3

H5

1. A smoothly rounded, hemispherical eminence.
2. A roughly symmetrical upfold, the beds dipping in all directions, more or less evenly, from a point.

DRIFFT

Any rock material, such as boulders, gravel, sand, or clay, transported by a glacier and deposited by or from the ice or by water derived from the melting ice. Also called glacial drift.

DRUMLIN

3

H3

A smoothly rounded, oval hill built of glacial deposits, mainly boulder clay, and elongated in the direction of movement of a glacier across the area. The long axis is commonly  $\frac{1}{2}$  mile or more in length, the height 100 to 200 feet. The steepest slope faces the direction from which the ice approached.

DUFF

Plant litter in various stages of decomposition lying on the soil surface, usually in a forest.

Appendix Location

DUNE

An eminence consisting of loose, granular material, generally sand, piled up by the wind; usually an elongated or crescent-shaped prominence, common in arid areas and on beaches.

EARTH

1. The solid matter of the globe as distinguished from water and air; the ground.
2. The loose or softer material composing part of the surface of the globe, as distinguished from firm rock.

EDDY

A current of water running contrary to the main current, especially one moving in a circle; a whirlpool.

ELBOW

A sharp change in direction of a coastline, stream, bank, etc.

EMBAYMENT

1

P3

1. An open indentation of a shoreline.
2. The body of water lying in the indentation; an open bay.

Appendix Location

EMINENCE

1. An elevated area of any size, shape, or height.
2. The high point of an elevated feature.

ERG

A region in a desert where the surface is covered with sand dunes.

ESCARPMENT

3 Q2

A long, more or less continuous cliff or steep slope separating flat or gently sloping land lying at different levels.

ESKER

3 G4

A long, narrow, commonly winding ridge of gravel and sand deposited by a stream that formerly flowed between banks of a glacier.

ESTUARY

1 R3

That portion of a stream influenced by the tide of the body of the water into which it flows. Estuaries occur in coastal areas that have sunk with respect to sea level; parts of stream channels are thereby depressed below sea level, or "drowned."

Appendix Location

EVERGREEN PLANT

A tree or shrub that retains its foliage throughout the year. The term is occasionally used erroneously as a synonym for needleleaf plants, some of which are deciduous; also, some evergreens are not needleleafs.

FALL.(S)

1 F3

A precipitous descent of water in a stream, or from a spring or lake.

FAULT

2 I7

A fracture or fracture zone in the earth's crust along which there has been displacement (vertical or horizontal) of the two sides relative to one another parallel to the fracture. The displacement may be a few inches or thousands of feet.

FELSITIC ROCK

A fine-grained, light-colored igneous rock consisting dominantly of crystalline materials, but having few or no conspicuous crystals.

Appendix   Location

FIORD

1

D3

A long, narrow arm of the sea enclosed by steep rocky slopes. The water is generally deep but rock or earth sills are common on the bottom.

Fiords occur chiefly in areas of present or former glaciers.

FLANK

2

Q6

The lateral part of a ridge; a slope.

FLASH FLOOD

A sudden, swift torrent overflowing a stream channel, usually as a result of very heavy rains in areas having steep slopes.

FLAT

1

P5

1. A nearly level surface; a plain.
2. A nearly level tract along a stream, especially at the bottom of a narrow, steep-sided valley.
3. A relatively level tract lying at little depth below water or alternately covered and uncovered by a body of water; a shallow; a shoal.

Appendix   Location

FLINT

A compact, fine-grained form of silica, very tough and breaking with a smooth, shell-like surface and sharp cutting edges. May be white, yellow, gray, or black. Chert.

FLOE

A low, floating ice mass formed in a large body of water.

FLOOD

A relatively great cover of water on normally dry land, the water coming from the swelling of a water body beyond its normal confines.

FLOOD PLAIN

3

C4

The area along a stream that is subject to inundation when the stream overflows its banks. Sediment carried by the water is deposited on the flood plain.

FOLD

A bend in the strata or layers of rock.

FOLIAGE

The mass of leafage of a tree or other plant.

FOOTHILL

1

U4

An eminence at the base of an extensive area of higher mountains or hills. Generally used in the plural.

Appendix Locatio

FORD

A site in a stream or other water body that can be waded by man or traversed by a land vehicle such as a car, truck, or tank. The water body at a ford is shallow, and has low velocity and a firm, level, and not too bouldery bottom.

FORELAND

1 T<sub>4</sub>

1. A mass of high ground that projects into a large body of water such as a sea; a promontory or headland.
2. The land adjoining a highland and physiographically related to it.

FORESHORE

The part of the shore along a coast which is ordinarily traversed by the uprush and backwash of the waves as the tides rise and fall, i.e., between the crest of the most seaward berm and and the normal low water mark.

FOREST

An extensive area of vegetation dominated by closely spaced trees; in places there may also be dense undergrowth.

Appendix    Location

FORK

3

D5

1. The place where one stream flows into another; a confluence.
2. The smaller of the streams that unite; in places, each of the uniting streams when the resulting stream is much larger than either of them.
3. The land lying in the angle made by the junction of streams.

FRACTURE

A break or crack in rock.

FULLER'S EARTH

A very fine-grained earth, resembling clay but of unusually low plasticity; used for decolorizing oils and fats and for degreasing wool.

FUMAROLE

A vent in the earth's crust from which vapors issue; usually occurs in volcanic areas and in association with geysers.

Appendix   Location

GABBRO

1. A dark, coarse-grained igneous rock.
2. Technically, coarse-grained, dark-colored igneous rock, including gabbro (in the technical geologic usage), peridotite, pyroxenite, amphibolite, and diorite if dark colored (cf. BASALT, GRANITE). Also called DARK GRANITIC ROCK.

GALLERY FOREST

A relatively long and narrow strip of dense tree growth along a stream or lake; tree crowns may form a canopy over a stream; commonly in an area that does not have trees except along a water body.

GAP

2

Q5

1. A passage at a relatively low elevation through a high ridge or mountainous area.
2. Any significant break in the high elevation of a mountain or hill ridge or range.

Appendix   Location

GEYSER

2

K6

A spring which intermittently ejects jets of heated water and steam to a considerable height.

Its action results from the contact of percolating ground water with heated subterranean rock.

GLACIER

1

Gl

3

C3

A body of ice, originating on land by the recrystallization of snow and rime, and showing evidence of past or present flow. The ice is formed from the compaction and recrystallization of accumulations of snow and other forms of solid precipitation. Glaciers are categorized according to their location and extent as valley, piedmont, and continental.

GNEISS

A coarse-grained metamorphic rock characterized by rough, relatively coarse banding or foliation.

GORGE

2

E3

A deep, narrow, steep-sided valley, commonly with a stream occupying most of its floor.

Appendix Location

GRANITE

1. A coarse-grained, light-colored igneous rock.
2. Technically, a coarse-grained igneous rock consisting essentially of quartz and an alkali feldspar together with mica and a dark mineral.

GRASSLAND

An extensive area where the natural vegetation consists primarily of grass; commonly a nearly level area.

GRAVEL

Unconsolidated, coarse rock fragments larger than sand grains. Individual fragments or grains range in diameter from about 76 mm. (3 inches) to 4.76 mm. (retention on a No. 4 sieve) and are more or less rounded.

GROUND WATER

Water occurring in the pores and interstices of rock or soil below the water table.

GROVE (Uncultivated)

A small area covered by a dense growth of trees, usually with little undergrowth and surrounded by open land.

	<u>Appendix</u>	<u>Location</u>
GULF	1	F4
	A part of a large body of water lying in an indentation of a coast; usually larger than a bay.	
GULLY	3	T5
	A small surface trench excavated by running water, commonly intermittent. Gullies most commonly form on a bare slope, excavated in soil.	
GUMBO		
	A clay soil that yields a highly viscous, sticky mud when wet.	
GYPSUM		
	A rock or mineral, hydrous calcium sulphate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), commonly associated with anhydrite and rock salt. Used in the manufacture of plaster, portland cement, etc.	
HAMMADA		
	A desert surface that is either bedrock or bedrock covered by a thin veneer of sand or pebbles.	

Appendix   Location

HANGING VALLEY

1            F2

A valley the floor of which is notably higher than the valley or shore to which it leads; most common in areas that have been glaciated. The stream draining a hanging valley becomes a cascade or fall where the valley ends.

HARBOR

2            R4

A part of a water body that affords safe anchorage for vessels, or permits transfer of cargo and passengers between sea and land carriers.

HARDPAN

A hard, impervious soil layer.

HEAD

1. The source or upper part of a stream or other enclosed water body.
2. The upper part of a sloping feature such as a valley.
3. A headland.

HEADLAND

1            G6

1. An irregularity of a coastline, especially high ground, projecting into a large body of water.
2. The high ground flanking an enclosed water body, such as a cove; a promontory.

Appendix      Location

**HEADWATER(S)**

The upper part of a stream, near the source;  
generally in the plural.

**HEATH**

An extensive tract of relatively level ground  
having a cover of low shrubs; may also have a  
thin surface layer of dry peat.

**HEADGEROW**

A linear thicket of bushes, commonly with some  
trees, left between two fields of cleared land,  
or planted in order to separate fields.

Commonly standing on a ridge a few feet high,  
bordered by a ditch on one or both sides, or  
both. Especially common in parts of England  
and France.

**HIGHLAND**

A relatively large area of elevated or  
mountainous land standing prominently above  
adjoining low areas.

	<u>Appendix</u>	<u>Location</u>
HILL	1	U3
	<p>An eminence lower than a mountain standing prominently above adjacent ground; for definition purposes, 2,000 feet is set arbitrarily as the maximum difference of elevation between the base and top of a hill.</p> <p>A hill may be small or large in area and may be roughly circular or elongated in shape.</p>	
HILLOCK	2	G3
	<p>A small, low eminence.</p>	
HOLLOW		
	<ol style="list-style-type: none"> <li>1. A tract of low ground fringed by hills or mountains.</li> <li>2. A small, sheltered valley or basin in rugged terrain.</li> </ol>	
HOOK		
	<p>A low, sandy projection of a coastline having a curved or hook-shaped tip turned landward.</p>	
HORN	1	C1
	<p>A high, steep-sided pyramidal peak; generally occurs in glaciated mountainous areas, formed by the intersecting heads of three or more cirques.</p>	

HOT SPRING

1. A spring whose water is warmed by heated subterranean rock to a temperature considerably above the prevailing air temperature.
2. A spring whose water is heated to 98° F. or higher.

HUMMOCK

A small rounded or conical eminence; a knoll or hillock.

HUMUS

1. A dark-colored material formed in or on the soil by the decomposition of organic matter, primarily derived from plants.
2. The organic portion of the soil.

ICEBERG

1

J3

A large ice mass, afloat in the sea, which has broken from the end of a glacier; about seven-eights of it lies below the waterline.

	<u>Appendix</u>	<u>Location</u>
ICECAP	3	G3
<p>A glacier not bounded by valley walls and moving in all directions away from a center; an ice sheet. Snow may form a small icecap, as on some flat-topped peninsulas on Greenland, or an icecap may be very large, as in Antarctica; the latter type of icecap is also called a continental glacier.</p>		
IGNEOUS ROCK	2	G8
<p>Rock formed by cooling and solidification from a molten or partly molten state; may be coarse grained (granite if light colored, gabbro if dark), fine grained (rhyolite or basalt), or glassy (obsidian and other volcanic glass,) or may vary notably in grain size (porphyry). One of the three major classes of rock, the other two being sedimentary and metamorphic.</p>		
INLET	2	U8
<p>1. The body of water lying within a narrow recess in a coastline.</p> <p>2. A narrow channel connecting two broader water bodies, especially in coastal areas.</p> <p>3. A narrow channel between islands.</p>		

Appendix Location

INTERFLUVE

3

P5

The area lying between two streams.

INTRENCHED STREAM

A stream flowing in a narrow valley cut into  
a plain or relatively level upland.

ISLAND

1

L4

1. A tract of land surrounded by water;  
generally not applied to continental  
masses.
2. Any isolated, distinctive tract  
surrounded by terrain with other  
characteristics.

ISLET

1

L4

A small island.

ISTHMUS

A narrow strip of land which unites two  
broad land masses.

JOINT

1. One of a series of approximately parallel fractures that may divide a rock mass; unlike a fault, little or no displacement has taken place between blocks.
2. Any fissure or crack in rock.

JUNGLE

1. A dense, tangled vegetation; generally associated with equatorial areas. The term is often used improperly as a synonym for tropical rain forest, which is relatively clear of undergrowth.
2. Land covered by the dense, tangled vegetation described above.

KAME

A conical hillock or short irregular ridge built of sand and gravel deposits accumulated in contact with glacier ice.

3

F3

Appendix    Location

KARST

A limestone area with a very rugged surface dotted with sinkholes, ridges, and peaks; caves are common below ground, produced by the action of numerous underground streams flowing through the soluble limestone bedrock.

3

A5

KETTLE, KETTLE HOLE

3

F4

A small closed depression formed by the melting of a mass of glacier ice that was surrounded by or buried in drift; the depression may contain a lake or pond.

KNOB

A rounded hill or mountain, especially an isolated one.

KNOLL

A small, low eminence, generally rounded; a hillock or mound.

Appendix Location

LAGOON

- |   |   |    |
|---|---|----|
| 1. A shallow body of water partly or completely separated from the sea by a narrow strip of land; the water is generally salty. | 1 | M5 |
| 2. A shallow body of water enclosed or nearly enclosed by coral reefs or island, as in an atoll.                                | 1 | J6 |

LAKE

- |   |   |    |
|---|---|----|
| 1. A standing body of inland water, generally of considerable size.<br>(See POOL, POND) | 2 | E5 |
| 2. An accumulation of fluid matter such as oil or asphalt.                              |   |    |

LATERITE

Iron-and alumina-rich clay, usually reddish, which upon drying becomes permanently hard; most common in tropical areas.

LAVA

- |  |   |    |
|--|---|----|
| 1. Molten rock such as that which emanates from a volcano.                           | 2 | F5 |
| 2. The same material after it has solidified by cooling at the surface of the earth. |   |    |

**LEA**

A grassy tract.

**LEDGE**

1. A narrow, nearly level surface, especially one projecting from a steep, rocky slope.
2. A reef, especially one near the shore.

**LEVEE (Natural)**

An embankment along a stream, built from sediments deposited by floodwaters, which serves to limit floods. If now qualified as natural, the term refers to an artificial embankment, commonly built on top of a natural levee.

**LIANA**

Any climbing plant with ground roots. Woody lianas are common in jungles.

**LICHEN**

One of a large group of small, flowerless plants, world-wide in distribution, that grow on rocks, soil, and tree trunks. Lichens are the only important vegetation in many arctic, antarctic, and mountain-top regions.

Appendix Location

LIMESTONE

A sedimentary rock consisting chiefly  
of calcium carbonate ( $\text{CaCO}_3$ ). Many  
limestones are formed from the shells  
of animals.

3 T7

LITTORAL

1. The land immediately adjoining a sea or  
lake.
2. The land along a coast lying between high and  
low tide levels.

1 T6

LOAM

A soil containing nearly equal proportions of  
sand, silt, and clay; may also contain minor  
amounts of humus, pebbles, or boulders.

LOCAL RELIEF

Difference between highest and lowest elevations  
within a specified horizontal distance or given area.

LOESS

A homogeneous unconsolidated or weakly consolidated  
deposit consisting largely of silt-sized grains  
mainly unstratified and with a tendency to stand in  
vertical banks when cut; generally considered to be  
an accumulation of windblown dust.

Appendix Location

LOWLAND

1

Q4

1. A tract of low ground by comparison with a neighboring area of greater elevation and ruggedness; generally, a relatively large region with a predominantly level surface.
2. An area of low, nearly level land, i.e., a plain.

MANGROVE SWAMP

A wet or water-covered coastal area in the tropics or subtropics covered by a dense, practically impenetrable growth of trees and shrubs with long, tangled, above-ground roots. The swamps commonly fringe the mouth of estuaries and are subject to tidal inundation.

MANTLE ROCK

The loose, unconsolidated rock material, such as sand, gravel, clay, and disintegrated and decomposed bedrock, resting on the solid rock; see SOIL.

MARBLE

2

D7

1. Limestone or dolomite recrystallized by metamorphism.
2. Commercially, any calcareous rock that will take a polish.

Appendix Location

MARL

Calcareous clay, commonly including shell  
fragments.

MARSH

A tract of wet or water-covered ground                   1           S5  
dominated by grasses, cattails, or similar  
growth.

MEADOW

1. A nearly level, grassy tract.
2. A grassy tract on a wooded slope.

MEANDER

One of a series of arc-shaped bends of a  
stream, generally occurring where a stream  
has a low gradient.

MESA

A flat-topped, steep-sided hill or mountain                   3           N3  
of smaller extent than a plateau; it is  
generally situated in an arid region. Although  
a mesa is generally an isolated feature, the  
term is also applied to any broad, flat, elevated  
surface which is bounded on at least one side by  
a steep slope.

**METAMORPHIC ROCK**

Rock formed by recrystallization or pre-existing igneous or sedimentary rock under the influence of heat, pressure, or both. Most metamorphic rocks are foliated (gneiss if coarsely banded, schist if nearly uniform and coarse grained, slate if fine grained), but some, chiefly monominerlic rocks, lack foliation (e.g., marble, some quartzite, some serpentine). One of the three major classes of rock, the other two being sedimentary and igneous.

2	Q8
3	E8
3	F8
3	M8

**MICA**

Any of a group of platy minerals, generally hydrous aluminum silicates; readily separates into very thin leaves.

**MICRORELIEF**

Features of relief too small to show on topographic maps having a scale of 1:50,000 or smaller, and a contour interval of 10 feet or larger, such as small gullies, mounds, boulders, small pinnacles and sink holes in karst, and bumpiness of the ground; such features are less than 200 feet across, and less than 20 feet high.

MINERAL

A natural inorganic substance having a chemical composition and physical characteristics within definite limits.

MINERAL SOIL

Soil composed of mineral matter, in contrast to decayed plant accumulations.

MIRE

Wet, sticky soil having low bearing strength.

MONSOON FOREST

Partially or wholly deciduous forest in a tropical region where rainy seasons alternate with long dry seasons, the trees being more or less leafless during the dry season. Monsoon forests are rich in woody vinelike plants, but the trees are not as large as in rain forests.

MOOR

A desolate area, generally elevated, covered with low shrubs, rough grass, and wet moss; commonly marshy in places.

<u>Appendix</u>	<u>Location</u>
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MORAINE	1 3	H2 H4
---------	--------	----------

An accumulation of fragments of earth and rock transported or deposited by glaciers. Moraines are categorized according to their relationship with the glacier that transported or deposited them; e.g., lateral and medial moraines are the materials transported on the side and central part of a glacier, respectively; terminal moraines are the materials deposited at the end of a glacier.

MORASS

A tract of soft, waterlogged ground, generally covered with decaying vegetable matter; it may contain some live plants.

MOUND (Natural)

A low, isolated, rounded eminence, generally of earth; a knoll.

MOUNTAIN

An eminence higher than a hill standing prominently above adjacent ground; for definition purposes, 2,000 feet is set arbitrarily as the minimum difference of elevation between the base and top of a mountain. A mountain may be small or large in area and may be roughly circular or elongated in shape.

<u>Appendix</u>	<u>Location</u>
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MOUTH

1. The place where a stream discharges its waters into the sea.
2. The place where one body of water flows into or mixes with the waters of another.
3. The opening of a physiographic feature as a cave, volcano, valley, etc.

MUCK

Dark-colored material or soil, commonly in wet places, that has a high percentage of decomposed or finely divided organic matter.

MUD

A slimy, sticky or slippery mixture of finely divided particles of solid material with water, in which larger fragments also may be suspended.

MUD VOLCANO

A vent from which mud, generally mixed with various gases, is ejected.

MUSKEG

Unstable tussocky bog with a deep accumulation of organic material, common in northern regions.

Appendix      Location

NARROW(S)

1. A contracted part of a water body usually in the plural.
2. A narrow body of water connecting two larger bodies; a strait.

NECK

1                    R3  
2                    J6

1. A narrow strip of land connecting two broader sections; an isthmus.
2. Any narrow strip of land such as a cape, peninsula, bar, hook, etc.
3. A lava-filled conduit of an extinct volcano that is exposed by erosion.
4. A narrow body of water connecting two larger bodies; a strait.

NEEDLELEAF PLANT

A tree or shrub with spiny leaves like that of the pine; needleleaf plants usually retain their foliage throughout the year.

NEVE

Granular snow partly converted to ice; a stage in the change from loose snow to glacier ice.

NUNATAK

An isolated rock peak which projects through and is entirely surrounded by ice and snow, as in a glacier, snowfield, or icecap.

3

H2

OASIS

A fertile green spot in a desert, resulting from springs or the presence of ground water near the surface.

OBSIDIAN

Volcanic glass, usually dark colored but transparent or translucent on thin edges; characterized by conchoidal fracture.

Usually has the composition of rhyolite.

OCEAN

1. The continuous body of salt water filling the great depressions on the earth's surface and surrounding the continents; it covers nearly three-fourths of the earth's surface.
2. A major division of the above, resulting from the position of the great land masses.

ORGANIC SOIL

A dark soil whose properties are determined by a high content of partially decomposed plant matter; includes peat and muck. No limit is specified, but most organic soils contain more than 30% of organic matter. Equals "highly organic soil" of the Army's Unified Soil Classification System.

OUTCROP

The part of a stratum or mass of rock that appears at the surface.

OUTLET

A relatively narrow opening through which a water body discharges.

OUTWASH

3

I4

Detrital material carried by running water from a melting glacier and deposited beyond the terminal moraine.

OVERBURDEN

1. Loose soil, sand, gravel, etc. that lies above bedrock.
2. Material, consolidated or unconsolidated, that must be removed to gain access to useful deposits such as coal, ore or gravel.

Appendix      Location

OXBOW LAKE

3

C5

A crescent-shaped water body that was formerly part of a stream meander. When the stream cuts a new shorter channel across the neck of the meander, the ends of the meander become silted up, separating the oxbow lake from the stream.

PARKLAND

A relatively large, open, grassy tract with scattered clumps of trees and shrubs.

PASS

1. A natural passageway through high, difficult terrain.
2. A relatively low place or gap in a high ridge or highland.
3. A relatively narrow, navigable channel between islands, reefs, bars, shoals, etc.

PEAK

3

U1

1. The highest point or summit area of a prominent hill or mountain, generally pointed.
2. A prominent summit in an area of mountains or hills.
3. A hill or mountain with a conspicuous summit.

PEAT

Brown or black, soft, partially decomposed vegetable material that has accumulated in a wet environment such as a marsh or bog; peat has a high carbon content and will ignite and burn freely when dry.

PEAT MOSS

A mass formed of the partially decayed parts of various mosses of the Sphagnum group, which form extensive peat bogs in the cold-temperate portions of North America, Europe, and Asia.

Peat moss is very acid and has high water-holding capacity.

PENINSULA

1                    M6

A relatively large tract of land projecting from a land mass into a sea or lake and nearly surrounded by water.

PERMAFROST

Perennially frozen ground; most common in arctic and subarctic regions.

PIEDMONT

2                    B4

An area lying at the foot of a mountain area.

PINGO

A more or less conical eminence of soil, usually high in organic content, mantling a mass of perennial ice. Small mounds have a smooth shape and a cover of vegetation, but larger ones are ruptured by irregular fissures formed by the upwelling of ground water under pressure. The eminences are commonly 40 to 70 feet high, but may be as much as 300 feet high and 3,000 feet across.

PINNACLE

1. A spire-shaped mass at the summit of a mountain or hill.
2. A hill or mountain with a pointed summit.
3. A small, isolated spire of rock or coral, either submerged or awash, dangerous to navigation.

PLAIN

1

S 6

An area of level or nearly level land not noticeably diversified by marked elevations or valleys. "Plain" generally is used for such an area near sea level, whereas "plateau" commonly is its designation at high altitudes.

<u>Appendix</u>	<u>Location</u>
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PLATEAU

A nearly level elevated area of considerable extent. Its surface may be deeply cut by streams, but summits remain at a general level. The same physiographic feature may be both a plain and a plateau; however, a plateau is elevated on at least one side above an adjoining area.

POINT

- |  |   |    |
|--|---|----|
| 1. The tip section or extremity of a tapering tract of land projecting into a water body, usually a sea or lake. | 1 | K4 |
| 2. The entire tapering projection; a cape.   |   |    |

POLYGONAL GROUND

Ground having a polygonal pattern produced by frost action; occurs mainly in gently sloping or level areas.

POND

A body of water occupying a small surface depression; a small lake.

**POOL**

1. A small body of standing water or other liquid.
2. A deep and still place in a stream.

**PORPHYRY**

Any igneous rock in which relatively large conspicuous crystals are set in a finer grained or glassy groundmass.

**POTHOLE**

A smooth circular hole in solid rock; generally deeper than wide. It is worn into the rock by the grinding action of stones, gravel, and sand spun around by the force of stream current.

**PRAIRIE**

A grassy, nearly level and treeless tract; generally of great extent.

**PRECIPICE**

A very steep face of any relatively high eminence; it generally is a bare rock slope, and may be vertical or even overhanging.

3

S6

QUICKSAND

Sand in a semi-suspended state upon the access of water. Quicksand is shifting or semiliquid, and is incapable of supporting a load.

RACE

1. A strong or rapid current of water, or its channel.
2. A rapid tidal current, usually through a narrow channel; commonly due to the tidal range being greater at one end of the channel than at the other.

RANGE

A more or less continuous series of mountain or hill ridges, and peaks.

RAPID(S)

A part of a stream where the current moves with greater than normal swiftness, but without actual waterfall; the stream has a higher gradient in this sector and generally flows through rocks or other obstructions.

Appendix      Location

RAVINE

A deep, relatively narrow, steep-sided valley,  
commonly with a stream on its floor; larger than  
a gully but smaller than a canyon.

3

03

REACH

1. An arm of the sea extending into the land;  
e.g., an estuary or bay.
2. The section of a stream between two bends;  
a straight portion of a stream.

REEF

A ridge of rock, coral, or sand lying at  
or near the surface of the water, generally  
the sea. Reefs are often categorized according  
to their relationship to the coast or the material  
of which they are composed; e.g., a barrier  
reef is roughly parallel to the coastline but  
is some distance offshore; a fringing reef is  
attached to a shore; a coral reef consists mainly  
of the skeletons of coral.

1

J6

REG

An extensive, nearly level area in a desert from  
which the fine sand has been blown away, leaving  
a rocky and stone-covered surface.

	<u>Appendix</u>	<u>Location</u>
<b>RELIEF</b>		
1. The elevations of inequalities of a land surface, considered collectively.		
2. Representation of landforms on a map.		
<b>RHYOLITE</b>		
A fine-grained, light-colored igneous rock.		
<b>RIA</b>	1	M5
A long, narrow arm of the sea penetrating the coast; its depth and width gradually diminish inland.		
<b>RIDGE</b>	1	I2
1. An elongated eminence		
2. The high ground lying between valley bottoms	2	P5

Rest of page not used ]

## RIVER

1. A major or very large body of flowing, fresh water.
2. A large stream, fed by the water from numerous tributary streams; larger than a creek or brook.

## ROCK

1. In engineering, the firm and coherent or consolidated material of the earth's crust, as opposed to soil.
2. In geology, any material that forms an essential part of the earth's solid crust. It includes firm, hard, consolidated material (bedrock) such as granite, sandstone, and limestone, as well as loose, incoherent material (mantle rock) such as clay, sand, and gravel. Most rocks are aggregates of minerals, but some are composed essentially of only one mineral, such as quartzite, gypsum, dolomite, and ice, and some consist partly or entirely of organic matter, such as coal or peat.

Appendix      Location

ROCK FLOUR

A general term for pulverized rock material corresponding in grade to mud, but formed by the grinding action of glaciers and ice sheets, and therefore composed largely of unweathered mineral particles; common in outwash deposits.

RUBBLE (Natural)

1. Rough or irregular pieces of broken rock.
2. A mass or layer of rock fragments; talus.

RUNNEL

A corrugation of the foreshore of a beach formed by wave or tidal action.

SADDLE

1. A low place on a ridge or crestline; commonly at the upper ends of two valleys, which extend perpendicularly from it in opposite directions.
2. A gap or pass.

SALT DOME

A dome-shaped upfold in sedimentary rocks, of which the core is a mass of rock salt. The doming is caused by the pressure of the rock salt punching up through the sedimentary rocks.

SALINE (Water)

Possessing a high degree of salinity; generally impotable. (cf. BRACKISH)

SALTPAN (Natural)

An undrained natural depression in which water gathers and evaporates, leaving a salt deposit.

SAND

Soil or an unconsolidated material consisting dominantly of grains with a diameter range from 4.76 mm. (passing No. 4 sieve) to 0.074 mm. (retention on a No. 200 sieve). most sands consist largely of quartz, but some consist of other minerals of rock fragments.

SANDSTONE

3

V5

A sedimentary rock consisting of cemented sand grains, usually predominantly of quartz.

<u>Appendix</u>	<u>Location</u>
-----------------	-----------------

## SAVANNA

1. A grassy, practically treeless plain.
2. A tropical or subtropical grassland with scattered trees and other drought-resistant vegetation.

## SCARP

3

M6

1. A relatively straight, steep slope separating land lying at different levels; generally the margins of plateaus, mesas, terraces, benches, etc.
2. A steep slope formed by faulting.
3. A low, nearly vertical slope along a beach formed by wave erosion.

## SCHIST

A metamorphic rock that splits into thin, irregular plates due to the presence of parallel grains of mica or other cleavable minerals. Differs from slate in that the crystals of mica are large enough to be visible to the naked eye.

SCORIA

Irregular, rough clinkerlike, highly vesicular, fragmental volcanic rock; usually dark colored. Heavier, darker colored, and usually with larger cavities than pumice. Fragments of scoria between 1/16 and 1-1/3 inches (4 and 32 mm) are called volcanic cinders.

SCREE

- |  |   |    |
|--|---|----|
| 1. A sloping heap of coarse rock waste at the base of a steep, rocky slope; talus. | 3 | S7 |
| 2. A sheet of coarse debris mantling a hillside or mountain slope.                 |   |    |

SCRUB

Vegetation consisting chiefly of dwarf or stunted trees and shrubs (such as sagebrush or mesquite), often thick and impenetrable; usually grows in poor soil or sand.

SEA

1. A large body of salt water, smaller than an ocean; nearly landlocked but connected with the ocean.
2. In a general sense, the continuous body of salt water covering the greater part of the earth's surface; the ocean.
3. A large inland body of salt water; a salt lake.

SEDIMENTARY ROCK

Rock formed from material accumulated as a deposit (sediment) in water (aqueous deposits) or from air (eolian deposits). Two broad categories: those formed from igneous or metamorphic rock fragments or particles (e.g., sandstone, conglomerate, shale) and the others formed from chemical or biochemical sediments (e.g., anhydrite, limestone, coral rock). Many sedimentary rocks are characterized by their arrangement in layers called strata or beds. One of the three major classes of rock, the other two being igneous and metamorphic.

#### SEEP

- An area where water or petroleum oozes from the earth often forming the source of a small trickling stream.

#### SERPENTINE

1. A mineral, hydrous magnesium silicate ( $Mg_3Si_2O_5(OH)_4$ ). Most asbestos is serpentine.
2. A rock, usually dark green to black, varying from fairly hard to soft, made up largely of the mineral serpentine.

#### SHALE

A laminated sedimentary rock consisting of more or less consolidated clay or silt.

#### SHELF

1. An elevated submerged ledge of rock or sand in a water body, especially the sea; a reef or shoal.
2. A projecting ledge of rock on a slope.

#### SHOAL

1. A shallow place in a body of water.
2. A sand bank or bar which lies close to the surface of the water, i.e., within six fathoms.

SHORE

The land immediately adjoining a body of water, especially a large one.

SHRUB

A small woody plant, usually with several stems, that is normally less than 10 feet tall when mature.

SILICEOUS

Containing or consisting of silica ( $\text{SiO}_2$ ); containing abundant quartz.

SILT

1. Fine-grained soil that has a low plasticity in relation to the liquid limit (the moisture content at which the soil passes from a plastic to a liquid state), or is entirely nonplastic, and consists mainly of particles that have a diameter of less than 0.074 mm. (passing through No. 200 sieve). The individual grains are largely angular in shape.  
In the Army's Unified Soil Classification System, silt and clay are considered fines and are differentiated on the basis of plasticity, not by the dimensions of particles.
2. Soil consisting dominantly of mineral grains between 0.074 and 0.005 mm. in diameter.

**SILTSTONE**

A very fine-grained sedimentary rock consisting of hardened silt.

**SINK, SINKHOLE**

3

A6

A surface depression, generally in limestone which has subsurface drainage only, formed by the solution of soluble rock. Many sinkholes are formed by the collapse of roofs over caverns.

**SLATE**

A compact, fine-grained metamorphic rock having the property of easy fissility along planes independent of the original bedding, whereby it can be parted into thin plates indistinguishable from one another in lithological characteristics.

**SLOPE**

1. The inclined surface of a hill, mountain, ridge, plateau, or any part of the surface of the earth.
2. The angle at which a surface deviates from the horizontal; measured in degrees or percent. A slope of 45 degrees is a slope of 1 on 1, or 100%.

**SLOUGH**

1. A tract of soft, wet ground; commonly a bog or marsh.
2. A small side channel of a stream in low, level ground.

Appendix    Location

**SNOWFIELD**

1. An area where snow endures from year to year.
2. A valley glacier normally originates in a snowfield.

**SNOWLINE**

The elevation of the lower limit of continuous snow and ice on slopes in a mountainous or hilly area; it may indicate a perennial condition or that which exists at a given time.

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SOIL

1. In engineering, unconsolidated surficial material of the earth's crust, as opposed to rock. Both rock and soil are aggregates of minerals, and the dividing line between them is subject to interpretation. Typically, soil consists of fragments (ranging from microscopic particles to large boulders) readily separated by mechanical action, whereas in rock the mineral grains are bonded together. Peat and manmade fills are included in the term soil.
2. In pedology, the natural medium for the growth of land plants on the surface of the earth; consists of organic and mineral materials.

SOUND

1. A relatively long, narrow water channel between a mainland and an offshore island.
2. A relatively narrow water passage connecting two large bodies of water; usually wider than a strait.

SOURCE

1. The origin of a stream.
2. The upper part or small tributaries of a large stream; headwaters.

SPIT

1. A small, low tongue of land projecting into a body of water, usually the sea; generally sandy.
2. A long, narrow shoal or reef extending from the shore.

SPRING

1. A place where water issues naturally from the earth.
2. A place where water emerges from the ground in sufficient quantity to form a flowing stream, in contrast to a seep, from which there is no stream flowing; a stream source.

SPUR

A ridge projecting laterally from the main crest of a hill or mountain.                    1                I 2

STACK

A rocky spire near a coastline isolated by the erosive action of the waves.

STAND

1. A growth of trees or other plants; generally expressed with regard to distribution or number in a given area.
2. In a forest, the trees, collectively, with more or less uniformity of composition or age.

STEPPE

A vast, nearly level grassy plain devoid of forests; generally subject to extreme temperature ranges.

STONE

1. Concreted earthy or mineral matter.
2. A small piece of rock. Large natural masses of stone are generally called rock.

STRAIT

1

03

A relatively narrow water passage connecting two large bodies of water.

STRAND

1. The land bordering a body of water,  
especially the sea or a lake.
2. The part of a beach or coast lying between  
high and low water.

STRATUM

3

C7

One or more beds or layers of  
approximately the same kind of rock  
material. It is separated from adjacent  
strata by surfaces of erosion, nondeposition,  
or abrupt change in character of the rock.

STREAM

1. The general term for any body of water  
flowing in a channel on the land, e.g.,  
a river, brook, creek.
2. A well-defined oceanic current, such as the  
Gulf Stream.

SUBSOIL

The soil layer, commonly between 1 and 3  
feet thick, that is immediately under the  
normally plowed surface layer or under a  
corresponding layer (5 to 8 inches thick)  
in untilled soils; roughly the same as the  
B horizon (in technical usage).

<u>Appendix</u>	<u>Location</u>
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**SURFACE SOIL**

That part of the upper soil of arable soils commonly stirred by tillage implements, or an equivalent depth (5 to 8 inches) in nonarable soils.

**SUMMIT**

1 F1

The apex or upper sector of a peak or ridge.

**SWALE**

A slight depression or valley in gently undulating land; commonly a marsh or bog.

**SWAMP**

A tract of wet or water-covered ground overgrown with trees and shrubs.

**TABLELAND**

2 U5

A broad, nearly level elevated area such as a mesa or plateau.

**TAIGA**

A broad zone in subarctic and arctic areas covered primarily with evergreen needleleaf forests but also including areas of deciduous broadleaf trees; many parts contain bogs.

Appendix      Location

TALIK

1. A layer of unfrozen ground between the seasonal frozen ground (active layer) and the permafrost.
2. An unfrozen layer within the permafrost.

TALUS

Rock debris accumulated at the base of a cliff or slope.

TARN

1

E1

A small lake in a rocky basin of mountainous or hilly terrain, commonly in a cirque.

TERRACE

3

07

A relatively narrow plain from which the surface descends on one side and ascends on the other; a bench or ledge. It commonly borders a stream, lake, or sea, representing a former water level.

THICKET

1. A dense growth of shrubs.
2. A thick grove or coppice.

TIDE

The alternate rising and falling of water,  
especially in the sea, resulting from the  
gravitational attraction of the moon and sun  
acting upon the rotating earth.

TILL

Unsorted and unstratified deposit of rock  
fragments ranging in size from clay to  
boulders deposited directly by a glacier,  
without transportation or sorting by water  
from the glacier.

TIMBERLINE

1. The elevational limit above which there  
are no trees or only a few scattered trees.  
Also known as treeline.
2. The poleward limit of trees.

TOMBOLO

1

j4

An area of unconsolidated material,  
deposited by wave action or currents,  
which connects an island to the mainland  
or to another island.

TONGUE

1. A narrow strip of land projecting into a body of water.
2. The front or projecting part of a physiographic feature shaped like a tongue, e.g., front of a valley glacier, mountain ridges projecting onto a plain.

TOPSOIL

Surface soil, as distinguished from subsoil.

TORRENT

A stream of water flowing with great violence or turbulence during a rapid snowmelt or period of heavy rain.

TRAPROCK

2

H7

Any of various fine-grained, dark-colored igneous rocks, such as basalt, used commonly for road building.

TREELINE

The elevational or poleward limit above which there are no tree or only a few scattered trees. See timberline.

TRIBUTARY

A stream which flows into a larger stream or into a lake.

## TROPICAL RAIN FOREST

A growth of diverse, dense, tall broadleaf evergreen trees relatively free of underbrush except where a break in the canopy admits light; associated with tropical areas. The term is often used improperly as a synonym for jungle, which has a comparatively dense undergrowth. Commonly called a rain forest.

## TROUGH

3

L6

1. A long, narrow valley.
2. An elongated depression with no surface outlet for drainage.
3. The channel in which a stream flows.

## TSUNAMI

A wave, sometimes of great height, caused by a submarine earthquake, landslide, or volcanic eruption; often improperly called a tidal wave.

TUFA

A spongy, porous rock that consists of calcium carbonate and occurs as a surficial deposit about mineral springs and seeps, and, exceptionally in streams or lakes.

TUFF

A rock formed of compacted volcanic fragments, generally smaller than 4 mm. in diameter; a compacted volcanic ash.

TUNDRA

A nearly level, treeless area characteristic of arctic regions; has a black mucky soil with a permanently frozen subsoil. Tundra begins at the limit of treelike vegetation; it supports a dense growth of mosses, lichens, and a few shrubs.

TUSSOCK

A dense tuft of grass or grasslike plants.

UNDERBRUSH

Shrubs, bushes, and other small trees growing beneath the layer trees in a forest; commonly dense enough to impede foot travel.

<u>Appendix</u>	<u>Location</u>
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**UNDERGROWTH**

The small or young plants growing under  
a forest canopy.

**UPLAND**

3           B4

1. A relatively large area of elevated land standing prominently above adjoining low areas.
2. Elevated ground above the low areas along streams.

**VALLEY**

Any low-lying land bounded by higher ground, usually hills or mountains; generally elongated and not completely enclosed. A completely enclosed valley is usually called a basin or depression.

**VINE**

A plant whose stem requires support; may climb on objects or creep along the ground.

**VARVE**

An annual layer of sediment deposited in a lake or other body of still water.

	<u>Appendix</u>	<u>Location</u>
VOLCANO	2 2	N3 I1
1.	A hill or mountain composed wholly or in part of materials ejected from the interior of the earth; usually cone-shaped with a crater on top. A volcano is called active while it commonly erupts, dormant during a long cessation of activity and extinct after eruptions have ceased completely.	
2.	A vent in the earth's crust from which molten or hot rock issues.	
VOLCANIC ASH	3	V3
	Uncemented pyroclastic material consisting of fragments mostly under 4 mm. in diameter. Coarse ash is from 1/4 to 4 mm. in grain size, fine ash is below 1/4 mm. Without a qualifying adjective the term should be applied only to essential ejecta.	
VOLCANIC BRECCIA		
	Rock composed largely of large volcanic fragments; cemented volcanic rubble.	

Appendix Location

VOLCANIC GLASS

A volcanic rock of glassy texture. Includes obsidian.

VOLCANIC RUBBLE

An unconsolidated accumulation of coarse to fine pyroclastic material.

WADI

1. A stream valley in an arid area; it is dry most of the year and is generally steep-sided and bouldery.
2. The intermittent stream in such a valley.

WASH

3

N4

The dry bed of an intermittent stream, commonly at the bottom of a canyon. Also called dry wash.

WASTELAND

Unused, especially barren land.

WATERCOURSE

1. A channel in which water flows.
2. A stream.

Appendix      Location

WATERFALL

1'      F3

A precipitous descent of water from  
a stream, spring, or lake.

WATER GAP

A pass in a ridge through which a stream flows.

WATERSHED

1. The area drained by a stream or lake, including the sections drained by its tributaries.
2. The boundary separating the natural drainage which flows into different catchment basins; a divide or water parting.

WATER TABLE

The upper surface of the zone within the ground saturated with water.

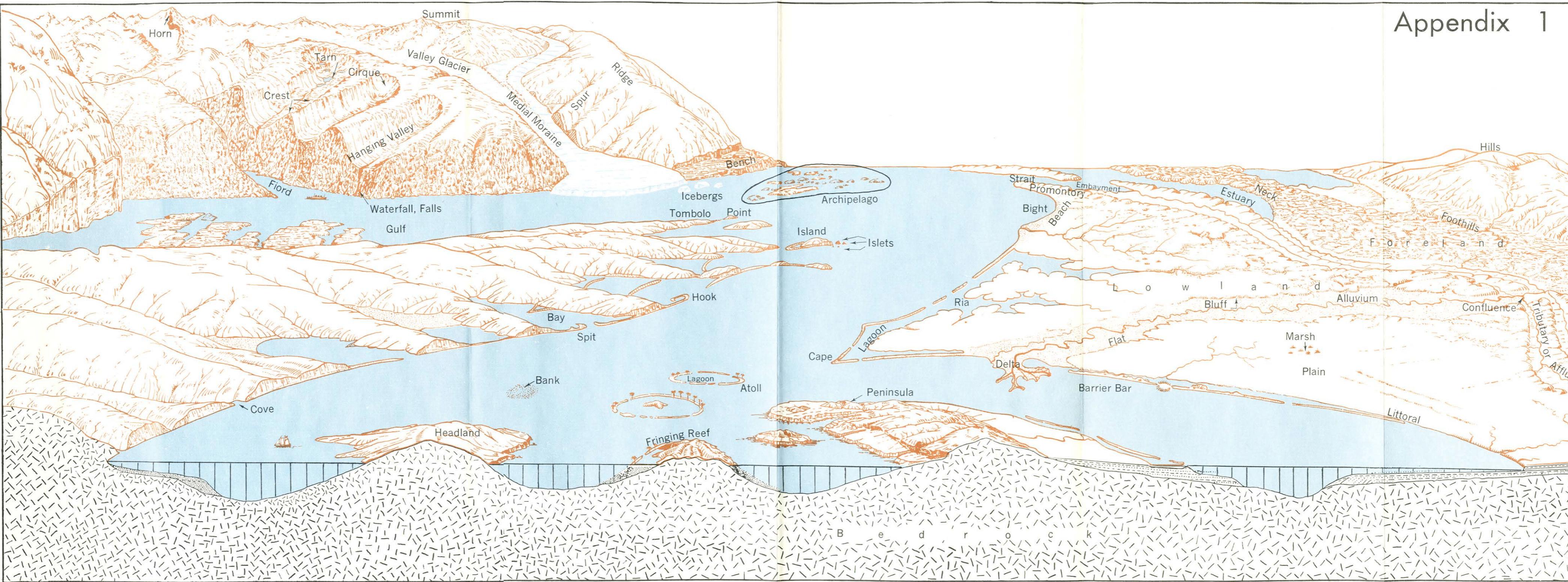
WHIRLPOOL

A vortical movement of water in a water body.

WOOD(S)

A dense growth of trees, usually greater in extent than a grove and smaller than a forest; more often used in the plural.

— | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | —

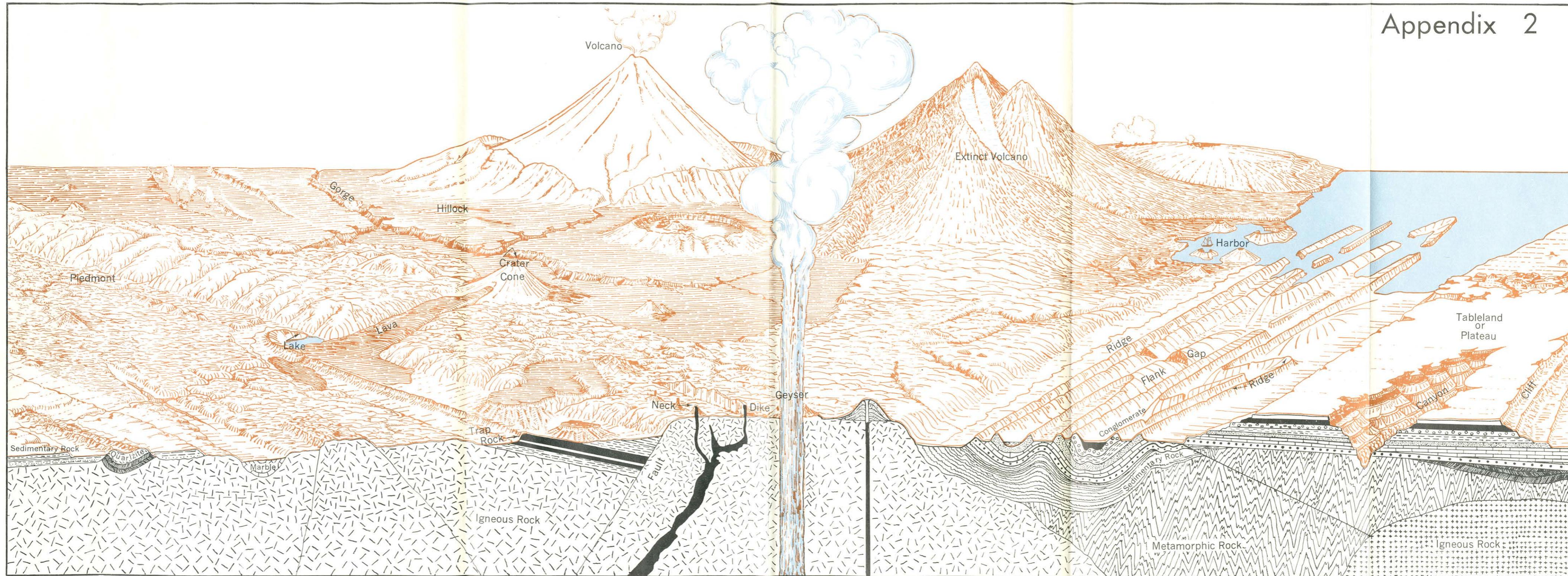


## Appendix 1

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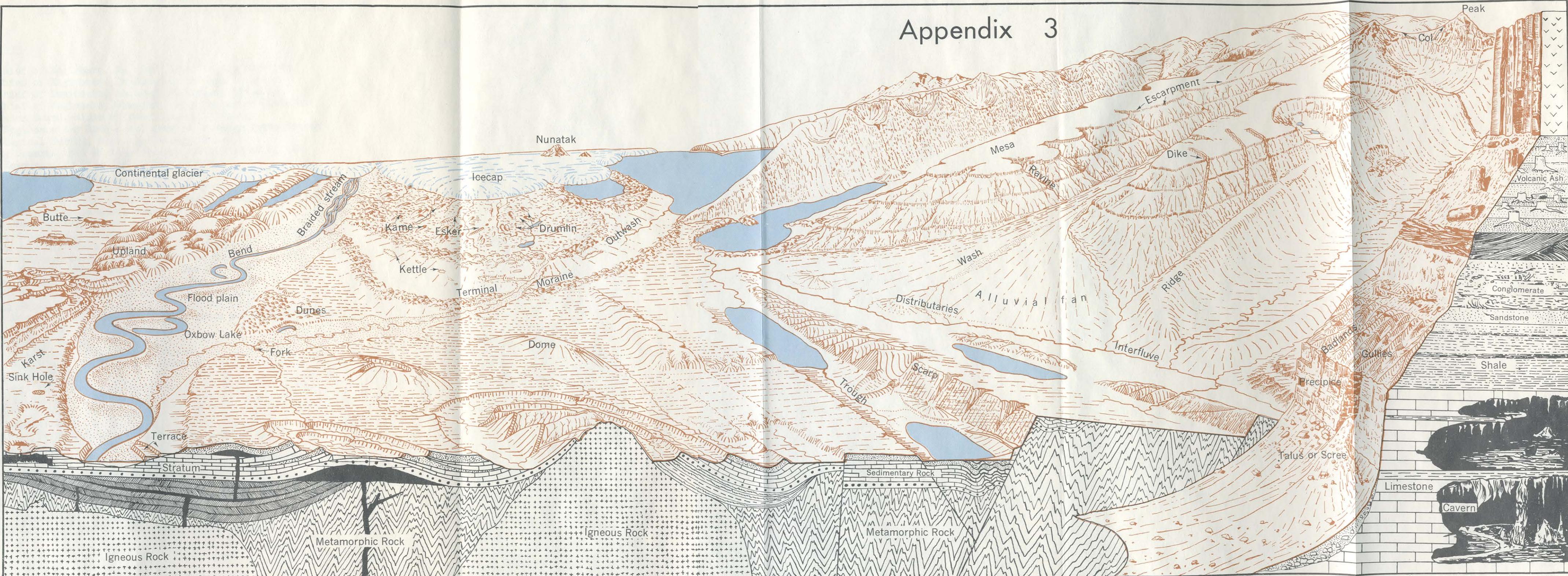
## Appendix 2



[ A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V ]

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## Appendix 3



A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V