ECOLOGY FIELD GLOSSARY

A NATURALIST'S VOCABULARY

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PREFACE

This *Ecology Field Glossary: A Naturalist's Vocabulary* is intended largely for the nonspecialist interested in ecology, systematics, and other field-oriented areas in the environmental and natural sciences. It may be used as an adjunct to texts or popular articles, and, as explained in the Introduction, it is designed through a glossary outline to give the beginner a rapid familiarity with the vocabulary of these sciences.

Man's impact on the environment and biota is such that we should understand the interactions that exist between the living and nonliving components of our world. This is particularly important as we impinge upon our often fragile ecosystems as polluters and exploiters. If these self-sustaining natural systems are to be nurtured by man and sustained for long-range use and pleasure, individuals everywhere in the world must become familiar with the language of ecology and must learn to communicate meaningfully in that field. Simplified from the large but relatively inaccessible encyclopedias that thoroughly treat the subject, and more embrasive than the specialized glossaries of single disciplines, this glossary includes in a necessarily selective way those terms from the environmental and biological fields that focus on the ecosystem. Selections have been rigorous; definitions sometimes contain a subjective element; and synonymizing often is obtuse, in order to present a basic vocabulary within the constraints of limited pagination. Yet the user should be able to learn quickly the meaning and appreciate the importance of words from diverse sciences such as geology, climatology, evolution, genetics, and oceanography.

The glossary is only a primer. Nevertheless, it should have wide use for the nonspecialist and nature lover in the field, classroom, or home, whether traveling to different vegetation zones of the world, writing a term paper on a freshwater ecosystem, or reading the evening newspaper at home. The specialist, as well, who may be limited to the terminology of his own discipline, but who wishes to communicate with those in other fields, may find this glossary of practical value in his occupation.

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INTRODUCTION

Vocabulary is important for understanding the organisms on this earth in their interrelationship with the environment. Yet it is far from easy to comprehend even superficially the vast array of environmental terms associated with the lithosphere (earth's crust), the atmosphere, and the hydrosphere (water), and the many biological terms associated with the biosphere, whether on the land, in it, or at sea. Add to this already formidable task a comparatively new set of words relating to our awareness of man's direct influence on both the environment and the biota, and the nonspecialist as well as the specialist in one discipline is faced with a serious problem of learning a comprehensive vocabulary in these sciences.

A glossary outline has been formulated to help the beginner master this new set of terms. If the reader does not know the exact word needed, or if he wishes to learn of other words generally associated with one he already knows, then he can research his needs among four main headings: the terrestrial, aquatic, and soil ecosystems, and also man's impact on each of these ecosystems. Before using the outline, the reader should examine the following system in overview.

I. Terrestrial Ecosystems
   - A. Lithosphere
     1. Rocks
     2. Soils
     3. Landforms
   - B. Atmosphere
     1. Weather
     2. Climate—Classification
   - C. Biosphere (Biota)
     1. Time
        (a) Life Cycle and Development
        (b) Population—Community—Biome—Succession Cycle
        (c) Daily—Seasonal—Annual Cycle

2. Energy—Nutrition
3. Systems Analysis
4. Life Forms
   (a) Specific Organisms and Structures
   (b) Specific Substances and Compounds
   (c) Specific Ecotypes/Communities
5. Spatial
   (a) Distribution
   (b) Space Relations
   (c) Specific Habitats
6. Interactions and Comparisons: Individual to Community
7. Biology
   (a) Pollination
   (b) Reproduction
   (c) Cytology
   (d) Genetics
   (e) Evolution
   (f) Dispersion
8. Botany
   (a) Major Organisms Classified
   (b) Plant Adaptations
   (c) Plant Geographic Regions
   (d) Vegetational Classification Units
9. Zoology
   (a) Major Organisms Classified
   (b) Animal Adaptations
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   (d) Animal Geographic Regions
10. Classification and Collection Terminology
   (a) Taxonomic
   (b) Ecologic

II. Aquatic (Hydrosphere) Ecosystems
   A. Lithosphere
      1. Landforms
         (a) Landforms Associated with Water
         (b) Coastal and Other Marine Areas Associated with Land
         (c) Ocean Floor
      2. Deposits and Soils
      3. Currents and Oscillations
      4. Waves
      5. Water
      6. Frozen Water and Ground

B. Biosphere (Biota)
Aquatic Community Classification
Aquatic Zonation
1. Marine Ecosystem
(a) Marine Community Classification
(b) Specialized Communities
2. Nonmarine Aquatic Ecosystems
(a) Freshwater
(b) Salt Water

III. Soil Ecosystem

IV. Man's Impact on Ecosystems
A. Lithosphere
B. Atmosphere
C. Hydrosphere
D. Biosphere (Biota)
1. General
2. Disease and Syndrome

A simple example should help to illustrate the usefulness of the glossary outline. If one wishes to learn some of the diseases associated with human pollution of the air, water, and soil, and to define these diseases, under "Man's Impact on Ecosystems" he will find the "Biosphere" with a category for "Disease." The entries on poisons and toxicities should then lead him to the necessary words and their definitions.

As a more extensive example, suppose someone wishes to describe in detail the habitat of a terrestrial plant. Beginning with "Terrestrial Ecosystems," under "Lithosphere," he would first explore words involving the earth's crust—what kinds of rock, soil, and landforms are found where the plant grows? And under "Atmosphere"—what are the important weather and climatic conditions for this particular plant? Following notation of these environmental phenomena, he would proceed to the third major category, "Biosphere," under which he would search for a wide array of words to characterize the individual, the population, the community, and the biome. For example, it might be important to include a description of the biome naming the dominant life forms, whereas at the individual level it is important to know the nutritional requirements of the plant (is it autotrophic or heterotrophic, and, if the latter, is it a saprophyte or parasite?) and the distributional and spatial relationships within the population. A description of the specific habitat occupied by the plant is also important at the individual level, and it should be determined whether interactions with other organisms exist. Important, too, are a number of features grouped in the outline under "Biology": What pollinating and reproductive aspects are noteworthy, and are there obvious adaptations of the plant to its habitat as might be found under dry, desertlike conditions? Are the leaves, stems, and roots, for example, or the life cycle,

modified in some way for growing under harsh, arid conditions? Categories for all these biological questions, which could be important in a description of the habitat of this terrestrial plant, can be found in the outline, and the several words listed under each may lead the reader immediately to those necessary for his description.

It should be remembered, however, that the outline is but a guide to the glossary itself when the user does not know the appropriate word required; it will not solve all difficulties, for a selection from a dozen or so words is still necessary. If the reader knows the word and needs only its definition, he can go directly to the glossary.

GLOSSARY OUTLINE

Some words are listed several times because they are appropriate under several headings; brackets around a word or words invariably indicate synonyms as treated here; words following a dash are defined in the glossary with the word preceding the dash; words in parentheses are used to qualify or define briefly the word they follow.

EARTH AS GLOBE: Antarctic Circle—antarctic zone; Arctic Circle—arctic zone; Antarctica; continent; continental bridge; continental drift; Coriolis force; equator; temperate zone; Tropic of Cancer; Tropic of Capricorn; tropic zone.
EARTH AS HISTORY: dating; fossil; era; geologic time scale; geology; half-life; palynology; Precambrian—Archeozoic, Proterozoic; Paleozoic—Cambrian, Ordovician, Silurian, Devonian, Carboniferous (Mississipian, Pennsylvanian), Permian; Mesozoic—Triassic, Jurassic, Cretaceous; Cenozoic—Tertiary (Paleocene, Eocene, Oligocene, Miocene, Pliocene), Quaternary (Pleistocene, Recent); Ice Age; pluvial periods; postglacial period.
EARTH WITH SEASONS: autumn [fall]—autumnal; equinox; solstice; spring—vernal; summer—estival; winter—hibernal.

I. TERRESTRIAL ECOSYSTEMS
  A. LITHOSPHERE
    1. ROCKS
      (a) ROCK-FORMING MINERALS AND COMPOUNDS: calcite; feldspars; gypsum; mica; olivine; quartz; serpentine; silica; talc.
      (b) BASIC ROCK TYPES
        (i) IGNEOUS ROCK: basalt; batholith; gabbro; granite; lava (*see* VOLCANIC ROCKS); magma; rhyolite.

(ii) METAMORPHIC ROCK: gneiss; hornfels; quartzite; schist; serpentinite; slate; soapstone.

(iii) SEDIMENTARY ROCK: chert—agate, flint; coal; *conglomerate—roundstone conglomerate, sharpstone conglomerate* [breccia]; diatomite; evaporite; gypsum rock; limestone—chalk, coquina, coralline, dolostone or dolomite, travertine; sandstone—graywacke, grit; shale; siltstone [mudstone].

(iv) VOLCANIC ROCKS: basalt; lava—block lava [aa], lava flow, pillow lava, ropy lava [pahoehoe]; pumice; scoria; volcanic ash, bomb, cinders, rock.

(v) MISCELLANEOUS: abrasion; ballast, beachrock; bedrock; boulder; cobblestone; colluvium; corrosion; eolian; exfoliation; exposure; exudation; float; fossil; gravel; outcrop; pebble; rock weathering; talus; tectonic—neotectonic; ventifact; warping.

2. SOILS (*see* comment under SOIL NOMENCLATURE)

(a) SOIL GROUPS

(i) HUMID CLIMATES: TEMPERATE—gray-brown podzol; podzol; red-yellow podzol. TROPICAL—laterite, latosol. FRIGID—tundra. *Also* INTRAZONAL—bog; meadow; planosol.

(ii) ARID TO SUBHUMID CLIMATES: black earth; chestnut and brown; desert; prairie; saline-alkali; salinity. *Also* INTRAZONAL—regur.

(iii) AZONAL: lithosol (of mountains); regosol (of sand dunes and alluvium).

(b) SOIL PARTICLES: clay; sand; silt.

(c) SOIL TEXTURE/POROSITY: clay; clay loam; loam; sand; sandy loam; silt loam; silty clay.

(d) PAN (HARDPAN): caliche; claypan; duricrest; fragipan; iron pan.

(e) GLACIAL-ASSOCIATED SOIL: glacial drift; placer; till.

(f) SPECIALIZED SOIL TYPES OR CONDITIONS: *calcareous soil; calcification; eluviation, field capacity; guano; gumbo;* illuviation; kaolin [china clay]; lacustrine deposits; loess; mine tailing; muck; mud; mull; quicksand; serpentine soil; snow flush; soil creep [solifluction]; surface soil [topsoil].

(g) SOILS AND DEPOSITS OF WATER BOTTOMS: alluvium; diatomaceous earth; evaporite; humic acid; lacustrine; marl; ooze; placer; red clay; varve.

(h) ORGANIC MATTER: duff; humus; litter; mor; mulch; peat.

(3) LANDFORMS

(a) PLAINS AND MOUNTAINS

(i) CLIFFS AND ROCKY OUTCROPS: bluff; cliff—precipice; crag; escarpment [scarp]; inselberg; outcrop; tor; volcanic neck.

(ii) DEPRESSIONS, FISSURES, AND FOLDINGS: basin—plunge basin; block mountain; blowout; bolsón; cave—grotto; continental drift; crevice; earthquake; epicenter; fault—fault block; fold—anticline, syncline; graben; horst; intermontane; kettle hole; polygonal ground; pan [pit]; pothole; saltpan; sinkhole; speleology.

(iii) HILLS: brae; cuesta; down; drumlin; dune—clay dune, sand dune [erg]; foothills; hill—small hill [hillock, knob, knoll, mound]; hum; hummock [palsa]; inselberg; loma; moraine; piedmont; pingo; puy; rand; sandhill; tussock (*see* MOUNTAINS).

(iv) MOUNTAINS AND RIDGES: adret; arête; avalanche; berm; block mountain; col; cone; cordillera; crown; dome; fell [fellfield]; hammada [reg]; hogback; horn [matterhorn]; horst; louderback; massif; mesa [butte, kopje]; monadnock; monolith; montaña; montane; mountain—block mountain, folded mountain, relict mountain; mountain range and chain; nunatak; pass; peak; ria; ridge; saddle [col]; sierra; ubac; volcanic neck; volcano; watershed—continental divide.

(v) PLAINS AND PLATEAUS: bench; delta; fall line; fjell; flat; landes; peneplain; plain—alluvial plain; coastal plain; flood plain; plateau [meseta]—continental plateau [tableland], intermontane plateau, piedmont plateau; puna; veld. (*See* BIOME C.1.b.)

(vi) VALLEYS AND CANYONS: arroyo [coulee, donga, nullah, wadi]; canyon [cañon, gorge, glen, gulch, gully, ravine]—box canyon; cluse; dale; dell [dingle]; draw; intermontane; rift valley; shut-in; valley [strath, vale].

(b) VARIOUS LANDFORM ASSOCIATIONS

(i) ALLUVIAL ASSOCIATED: alluvial fan; alluvial plain [bottom, doab]; bar—sandbank; flood plain; hook; levee; outwash plain; spit [nehrung].

(ii) ARID ASSOCIATED: arroyo [coulee, donga, nullah, wadi]; badland; bolsón; butte; blowout; canyon [cañon, gorge, gulch, ravine]—box canyon; clay dune; coppice mount; desert; desert alkali lake; desert salt lake; dune; foredune; gibber; hammada [reg, serir, saï]; mesa; oasis; playa [khabari, mamlahah, salina, shott]—alkali flat; salt marsh; saltpan [saline]; sand dune [erg]—barchan; sandhill.

(iii) FROST AND GLACIAL ASSOCIATED: cirque; crevasse; drift area; driftless area; drumlin; esker; forest heaving; glaciation; glacier; horn; ice cap [ice sheet]; kame; kettle

hole; moraine; outwash plain; placer; snow line; striae; tarn; valley train. (*See* FROZEN WATER AND GROUND II.A.6.)

(iv) LIMESTONE ASSOCIATED: cave—grotto; *grike*; *hum* [*mogote, pepino*]; *karren* [*lapiés*]; karstland; negrohead; polje [doline]; sinkhole [aven, cenote, ivama, ponor, pothole, shake hole, sink, sotch, swallow hole, uvala]; stalactite, stalagmite.

(v) VOLCANIC ASSOCIATED: caldera; cone; coulee; crater [maar]; louderback; puy; volcano; volcanic lake; volcanic neck.

(vi) WATER ASSOCIATED: alluvial plain [bottom, doab]; archipelago; atoll [faro]; backshore; bank; bar—barrier bar, sandbank, tombolo; beach [strand]; bench; bluff; causeway; chute; cliff; coastal plain; dam; delta; dike; ditch; escarpment [scarp]; flood plain; foreshore; hammock; headland [cape, naze, ness, point]; hook; hummock; interfluve; island; isthmus; key [cay, kay]; levee; lowland; mud flat [tidal flat]; peatland; peninsula; polder; riparian; shore; spit [nehrung]—tombolo; stack; strait; terrace; tussock; waterfall [cataract]—cascade, rapid, weir.

(c) MISCELLANEOUS LAND TYPES: field—fallow field; badland; barren land; hinterland; lowland; pasture; pine barren; rangeland (for additional LAND TYPES, *see* glossary).

B. ATMOSPHERE: aerobiology; air; air shed; ambient air; atmosphere—troposphere, stratosphere, ionosphere; atmospheric pressure [barometric pressure]; condensation; drought; dry season [verano]; evaporation; evapotranspiration; fire—crown fire, ground fire, surface fire; freezing nucleus; gravity; humidity—relative humidity; ignis fatuus [jack-o'-lantern, will-o'-the-wisp]; meteorology; methane; precipitation; Saint Elmo's fire; turbulence; vapor—water vapor; wind.

1. WEATHER

(a) AIR TEMPERATURE: energy; greenhouse effect; heat; insolation; inversion; radiation—[radiant energy, solar energy]; reradiation; wavelength.

(b) AIR PRESSURE: anticyclone; atmospheric pressure [barometric pressure]; col; cyclone; high pressure—subtropical belts, polar highs; low pressure—equatorial belt, subpolar lows; ridge; trough.

(c) WIND

WIND SYSTEM: equatorial calms [doldrums]; trade winds; subtropical high-pressure belts [horse latitudes]; westerlies; polar easterlies; *also* anticyclone, cycline, jet stream.

(i) SEASONAL WINDS: monsoon.

(ii) LOCAL WINDS: breeze; gust; local winds—

antitriptic, instability, jet effect; mistral; mountain gap; whirlwind.

(iii) ANABATIC (UPSLOPE) AND CATABATIC (DOWNSLOPE) WINDS: mountain and valley wind—canyon wind, gorge wind; land and sea breezes—lake breeze; foehn wind—chinook; fall wind; bora wind.

(iv) COLD WINDS: cold winds; norther; pampero.

(v) DESERT WINDS: desert winds; harmattan [doctor]; yellow wind.

(d) ATMOSPHERIC MOISTURE

(i) HUMIDITY: dew—dew point; humidity—relative humidity.

(ii) CONDENSATION: adiabatic rate; cloud—cloud classification: cumuliform—cumulus, cumulonimbus; stratiform—altocumulus, altostratus, cirrocumulus, cirrostratus, cirrus, nimbostratus, stratocumulus, stratus; fog [cacimbo, garúa, haar, llorano]—radiation fog; supercool.

(iii) PRECIPITATION: cloudburst—local rain; drizzle [mist]; hail; rain; sleet [glaze]; snow.

(e) FRONTS: cold front; intertropical front; polar front; warm front.

(f) STORMS: blizzard [barber, buran, burga, purga]; cyclone [depression, low]—northeaster, sudestada; duststorm (*see* DESERT WINDS); gale; sandstorm; squall—black, white; snowstorm; thunderstorm—lightning, thunder; tornado [twister]; tropical cyclone [hurricane, typhoon].

(g) PARTICULATE MATTER: dust; haze [bruma, calina]—soft haze; smog; smoke.

2. CLIMATE—CLASSIFICATION

(a) CLIMATE CONTROL BY EQUATORIAL AND TROPICAL AIR MASSES: dry climate of tropical west coasts; dry tropical climate; wet climate of tropical windward coasts; wet-dry tropical climate; wet equatorial climate.

(b) CLIMATE CONTROL BY TROPICAL AND POLAR AIR MASSES: dry middle-latitude climate; humid middle-latitude continental climate; wet climate of windward middle-latitude west coasts; wet climate of subtropical-warm temperate eastern continental margins; wet winter-dry summer climate of middle-latitude west coasts.

(c) CLIMATE CONTROL BY POLAR AND ARCTIC-ANTARCTIC AIR MASSES: cold climates of arctic-antarctic air mass regions; cold climates of the arctic front zone; cold climates of continental polar air mass regions.