



## **TECHNICAL NOTES**

### **Compendium of Philippine Environment Statistics 2010 – 2019**

#### **Component 1: Environmental Conditions and Quality**

---

#### **I. Conceptual Framework**

##### **Compendium of Philippine Environment Statistics (CPES)**

The compendium covers a core set of environment statistics which is grouped into six components namely: 1) environmental conditions and quality; 2) environmental resources and their use; 3) residuals; 4) extreme events and disasters; 5) human settlements and environmental health; and 6) environment protection, management and engagement.

As described in Framework for the Development of Environment Statistics (FDES), Basic Set of Environment Statistics has been set up following a progression of three tiers, based on the level of relevance, availability and methodological development of the statistics. Tier 1 is the core set of environment statistics that serve as an agreed and limited set of environment statistics that are of high priority and relevance to most countries. Tier 2 includes environment statistics which are of priority and relevance to most countries but require greater investment of time, resources, or methodological development. It is recommended that countries consider producing them in the medium-term. Tier 3 includes environment statistics which are either of lower priority or require significant methodological development. It is recommended that countries consider producing them in the long-term.

##### **Component 1: Environmental Conditions and Quality**

Environmental conditions and quality is central to the FDES including five other components which were established based on their relationship with Component 1. The environment provides goods and services essential to human well-being. The human sub-system uses the environment for habitat, to obtain important physical resources and as a recipient or sink for various residuals. Human societies, as well as their production and consumption patterns, affect the quality and condition of the environment, its natural processes and its capacity to provide goods and services (*UN FDES, 2013*). The changing environment, in turn, affects humans in different ways over time. This component has three subcomponents: physical conditions, land cover, ecosystems and biodiversity, and

environmental quality. Statistics under this component are useful in compiling environmental accounts as described in the System of Environmental Economic-Accounting (SEEA) 2012.

### **Subcomponent 1.1: Physical Conditions**

Physical Conditions aims to capture the physical aspects of the environment and includes statistics on meteorological, hydrographical, geological, geographical conditions and soil characteristics. These statistics are important in determining the scope of and influences on the environmental resources of a country. Furthermore, the latter, provides baseline information that may aid the government in assessing the need for and the effectiveness of environment-related policies. There are four topics under this subcomponent. The first topic is atmosphere, climate, and weather. Information on weather describes the atmosphere's behavior over a given territory in the short term. On the other hand, climate is determined by long-term weather conditions over that territory. Information on climate includes temperature, precipitation, humidity, pressure, wind speed, solar radiation, ultraviolet (UV) radiation and the occurrence of El Niño and La Niña events. Second is the hydrological characteristics, which include information on the extent, location and characteristics of lakes, rivers and streams, artificial reservoirs, watersheds, seas, aquifers and glaciers. Third, geological and geographical information includes general geological and topographic information on the extent and characteristics of the country's territory and relief. Fourth is the soil characteristics. As described in FDES, soil is a multifunctional part of the environment. Information on soil characteristics include soil types and soil degradation.

### **Subcomponent 1.2: Land Cover, Ecosystems and Biodiversity**

Land cover, as defined by the Food and Agriculture Organization (FAO), is the observed (bio) physical cover of the earth's surface. Ecosystems are community of organisms which have interacting and interdependent relationships. Biodiversity, a measure of ecosystem health, is the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems. There are three topics under this subcomponent. These are 1) land cover; 2) ecosystems and biodiversity; and 3) forests. The first topic includes information on the extent, and the physical and spatial characteristics of the land cover. Second, ecosystems and biodiversity, covers information on the physical quantitative as well as qualitative information and statistics about a country's main ecosystems,

including the extent, chemical and physical characteristics, and biological components (biodiversity) of the ecosystems. Third, forests provide livelihoods for millions of people around the world. It offers timber, food, shelter, fuel and medicinal products, and also perform significant ecosystem functions such as hydrological regulation, soil protection and biodiversity protection, and act as carbon sinks.

### **Subcomponent 1.3: Environmental Quality**

Environmental quality deals with the concentration of pollutants in the air, freshwater and marine water, and on soil pollution and noise levels which is a result from combined and cumulative impacts of human and natural processes. This information is important in monitoring pollution impacts to human sub-system and ecosystems. There are five topics under this subcomponent. The first topic is air quality includes information on the ambient monitoring pollution impacts to human sub-system and ecosystems. Second, freshwater quality which can be describe based on concentrations of nutrients and chlorophyll, organic matter, pathogens, metals and organic contaminants, and by physical and chemical characteristics in surface water and groundwater. Third is marine water quality. Oceans play a significant role in regulating weather and atmospheric processes, absorbing CO<sub>2</sub> emissions and provisioning of food and livelihood to humans. Statistics about marine and coastal water quality and pollutant concentrations may include, but are not limited to, nutrients and chlorophyll, organic matter, pathogens, metals, organic contaminants, physical and chemical characteristics, and coral bleaching. Fourth, soil pollution which is a result of disposing chemicals and other residuals by humans and directly affects human and environmental health and land productivity. Fifth is noise. This pollution exists in places where human activities are conducted and negatively affects the welfare and health of humans, as well as ecosystems.

## **II. Compilation Methodology and Data Sources**

Following the structure and statistics listed in the FDES, data available within the national statistical system were identified and requested from data source agencies or gathered from statistical publications. The collected data are checked for consistency and formatted into statistical tables. The data for Component 1 of the CPES were obtained from the following:

Data Item	Source
<b>Physical Conditions</b>	
<ul style="list-style-type: none"> <li>• Temperature by Monitoring Station</li> <li>• Climatological Normals of Precipitation by Month and by Monitoring Station</li> <li>• Amount of Rainfall by Monitoring Station</li> <li>• Relative Humidity by Monitoring Station</li> <li>• List of Proclaimed Watershed by Region</li> </ul>	Philippine Atmospheric, Geophysical and Astronomical Services Administration
<ul style="list-style-type: none"> <li>• List of Proclaimed Watershed by Region</li> </ul>	Forest Management Bureau
<ul style="list-style-type: none"> <li>• Area of Lakes in the Philippines by Region</li> <li>• Land Cover of the Philippines by Region and Province</li> <li>• Coastal Resource Statistics</li> </ul>	National Mapping and Resource Information Authority
<ul style="list-style-type: none"> <li>• Area by Soil Taxonomy</li> </ul>	Bureau of Soils and Water Management
<b>Land Cover, Ecosystem and Biodiversity</b>	
<ul style="list-style-type: none"> <li>• Area of Ecosystems by Land Cover</li> <li>• Number of Known Fauna Species by Ecosystem</li> <li>• Number of Known Flora and Fauna Species by Status Category</li> <li>• Number of Known Flora and Fauna Species by Class</li> <li>• Number of Endemic Known Flora and Fauna Species by Taxonomic Group</li> <li>• Number of Invasive Alien Fauna Species by Taxonomic Group</li> <li>• Population of Threatened Species</li> <li>• Number of Threatened Wildlife Species by Taxonomic Group</li> <li>• List and Status of Protected Areas</li> </ul>	Biodiversity Management Bureau
<ul style="list-style-type: none"> <li>• Forest Cover of the Philippines by Forest Type</li> <li>• Forest Disturbance by Cause</li> </ul>	Forest Management Bureau
<b>Environmental Quality</b>	
<ul style="list-style-type: none"> <li>• Concentration Levels of PM10 by Monitoring Station</li> </ul>	Environmental Management Bureau

Data Item	Source
<ul style="list-style-type: none"> <li>• Concentration Levels of PM 2.5 by Monitoring Station</li> <li>• Concentration Levels of Ozone by Monitoring Station</li> <li>• Concentration Levels of CO by Monitoring Station</li> <li>• Concentration Levels of SO<sub>2</sub> by Monitoring Station</li> <li>• Concentration Levels of NO<sub>2</sub> by Monitoring Station</li> <li>• Annual Geometric Mean of TSP by Monitoring Station</li> <li>• Distribution of Pollutants by Type of Emission in the NCR</li> <li>• Concentration Level of BOD of Selected Freshwater Bodies by Region</li> <li>• Concentration Level of DO in Selected Freshwater Bodies by Region</li> <li>• Annual Geometric Mean of Total Coliform in Selected Marine Waterbodies</li> <li>• Concentration Level of DO in Selected Marine Waterbodies</li> </ul>	
<ul style="list-style-type: none"> <li>• Concentration Level of Nitrate in Laguna de Bay and its Major Tributaries</li> <li>• Concentration Level of Phosphate in Laguna de Bay and its Major Tributaries</li> <li>• Concentration Level of BOD in Laguna de Bay and its Tributaries</li> <li>• Concentration Level of COD in Laguna de Bay and its Tributaries</li> <li>• Annual Geometric Mean of Total Coliform in Laguna de Bay and its Tributaries</li> <li>• Concentration Level of Lead in Laguna de Bay and its Tributaries</li> <li>• Concentration Level of Cadmium in Laguna de Bay and its Tributaries</li> <li>• Levels of pH in Laguna de Bay and its Tributaries</li> </ul>	Laguna Lake Development Authority

Data Item	Source
<ul style="list-style-type: none"> <li>• Temperature of Laguna de Bay and its Tributaries</li> <li>• Concentration Level of DO in Laguna de Bay and its Tributaries</li> </ul>	

### III. Glossary of Terms

1. Amphibian - A cold-blooded, smooth-skinned vertebrate capable of living on land and in water, such as frogs, toads, and salamanders *{Department of Environment and Natural Resources (DENR) Administrative Order 2009-01}*.
2. Angiosperm - A flowering plant that produces seeds enclosed in a structure derived from the ovary *(Flora of the Chicago Region, Conservation Research Institute Glossary of Botanical Terms)*.
3. Annual Cropland - Land cultivated with crops with a growing cycle of up to one year, which must be newly sown or planted for further production after harvesting *(DENR Memorandum Circular 2005-05)*.
4. Atmosphere - The mass of air surrounding the earth, composed largely of oxygen and nitrogen *{United Nations (UN) Glossary of Environment Statistics Updated Web Version 2001}*.
5. Avian or Bird - Refers to warm-blooded, egg-laying vertebrates of the class Aves characterized by feathers and forelimbs modified into wings, such as jungle fowl and wild ducks *(DENR Administrative Order 2009-01)*.
6. Barren Area - Land not covered by (semi-)natural or artificial cover. It includes sand dunes, riverwash, lahar-laden areas, and rocky or stony areas *(DENR Memorandum Circular 2005-05)*.
7. Biochemical Oxygen Demand (BOD) - Dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water *(UN Glossary of Environment Statistics Updated Web Version 2001)*.
8. Biodiversity - The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems. It is also a measure of ecosystem health. \*
9. Birds or Avian - Refers to any of the various warm-blooded, egg-laying vertebrates of the class Aves, characterized by feathers and forelimbs modified into wings. This includes jungle fowl, wild ducks and the like *(DENR Administrative Order 2009-01)*.

10. Built-up Area - Composed of areas of intensive use with much of the land covered by structures. It includes cities, towns, villages, strip developments along highways, transportation, power, and communication, facilities, and areas occupied by mills, shopping centers, etc (*DENR Memorandum Circular 2005-05*).
11. Cadmium - A heavy metal with a high toxicity. Cadmium is toxic at very low exposure levels and has acute and chronic effects on health and environment. Cadmium is not degradable in nature and will thus, once released to the environment, stay in circulation (*Nordic Council of Ministers Cadmium Review, World Health Organization*).
12. Carbon Dioxide - A colorless, odorless, and nonpoisonous gas resulting from fossil fuel combustion. It is normally a part of ambient air and produced in the respiration of living organisms (plants and animals) and considered to be the main greenhouse gas contributing to climate change (*UN Glossary of Environment Statistics Updated Web Version 2001*).
13. Carbon Monoxide - A colorless, odorless, and poisonous gas produced by incomplete fossil fuel combustion. It combines with the hemoglobin of the human beings reducing its oxygen carrying capacity with effects harmful to human beings (*UN Glossary of Environment Statistics Updated Web Version 2001*).
14. Chemical Oxygen Demand (COD) - Index of water pollution measuring the mass concentration of oxygen consumed by the chemical breakdown of organic and inorganic matter (*UN Glossary of Environment Statistics Updated Web Version 2001*).
15. Climate - The condition of the atmosphere at a particular location (microclimate) or region over a long period of time. It is the long-term summation of atmospheric elements, such as solar radiation, temperature, humidity, precipitation type (frequency and amount), atmospheric pressure, and wind (speed and direction), and their variations (*UN Glossary of Environment Statistics Updated Web Version 2001*).
16. Closed Forest - A formation where trees in the various storeys and the undergrowth cover a high proportion (more than 40%) of the ground and do not have a continuous dense grass layer. It is either managed or unmanaged forest, in advanced state of succession and may have been logged-over one or more times, having kept its characteristics of forest stands, possibly with modified structure and composition (*DENR Memorandum Circular 2005-05*).
17. Coast - The geographical area of contact between the terrestrial and marine environments, a boundary area of indefinite width,

- appreciably wider than the shore (*Integrated Coastal Area Management and Agriculture, Forestry and Fisheries, FAO 1998*).
18. Coastal Area - A geographic entity of land and water affected by the biological and physical processes of both the terrestrial and the marine environments, and defined broadly for the purpose of natural resources management. Coastal area boundaries usually change over time without regard to enabling legislation (*Integrated Coastal Area Management and Agriculture, Forestry and Fisheries, FAO 1998*).
  19. Coliform Organism - Micro-organism found in the intestinal tract of human beings and animals. Its presence in water indicates faecal pollution and potentially dangerous bacterial contamination. See also *Escherichia coli* (*UN Glossary of Environment Statistics Updated Web Version 2001*).
  20. Concentration - The amount of a chemical in a particular volume or weight of air, water, soil, or other medium (*UN Framework Convention on Climate Change Glossary*).
  21. Conservation Status - The sum of influences acting on species that affect its long-term distribution and abundance (*Biodiversity Management Bureau (BMB) 2003 Statistics on Philippine Protected Areas and Wildlife Resources*).
  22. Coral - A general term used to describe a group of cnidarians; indicates the presence of skeletal material that is embedded in the living tissue or encloses the animal altogether (*National Oceanic and Atmospheric Administration (NOAA) Coral Reef Information System – Glossary of Terms*).
  23. Critically Endangered Species - Refers to a species or subspecies that is facing extremely high risk of extinction in the wild in the immediate future (*RA No. 9147 “An Act Providing for the Conservation and Protection of Wildlife Resources and Their Habitats, Appropriating Funds Therefor and For Other Purposes”*).
  24. Dissolved Oxygen - The amount of gaseous oxygen (O<sub>2</sub>) actually presents in water expressed in terms either of its presence in the volume of water (milligrams of O<sub>2</sub> per liter) or of its share in saturated water (percentage) (*UN Glossary of Environment Statistics Updated Web Version 2001*).
  25. Ecosystem - A dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit. \*



26. Emissions - Substances released to the environment by establishments and households as a result of production, consumption and accumulation processes. \*
27. Endangered Species - Refers to species or subspecies that is not critically endangered but whose survival in the wild is unlikely if the causal factors continue operating (*RA No. 9147 “An Act Providing for the Conservation and Protection of Wildlife Resources and Their Habitats, Appropriating Funds Therefor and For Other Purposes”*).
28. Endemic - Refers to species or subspecies that is naturally occurring and found only within specific areas in the country (*RA No. 9147 “An Act Providing for the Conservation and Protection of Wildlife Resources and Their Habitats, Appropriating Funds Therefor and For Other Purposes”*).
29. Environment - The totality of all the external conditions affecting the life, development, and survival of an organism (*UN Glossary of Environment Statistics Updated Web Version 2001*).
30. Environmental Health - Focuses on how environmental factors and processes impact and change human health. It can be defined as an interdisciplinary field that focuses on analyzing the relationship between public health and the environment. From the health perspective, WHO states that “environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. \*
31. Fauna - The animal life of a particular region or time. It is generally regarded as that which is naturally occurring and indigenous. \*
32. Fishpond - A land-based facility enclosed with earthen or stone material to impound water for growing fish. It also refers to a land-based type of aquafarm or a body of water (artificial or natural) where fish and other aquatic products are cultured, raised or cultivated under controlled conditions (*RA No. 8550 “An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources, Integrating All Laws Pertinent Thereto, and for Other Purposes”*; *PSA-Bureau of Agricultural Statistics Glossary of Terms Online*).
33. Flora - The plant life of a particular region or time. It is generally regarded as that which is naturally occurring and indigenous. \*
34. Forest - Land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 percent, or trees

able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. \*

35. Forest Cover - Refers to natural and manmade forests, including forests within wetlands and built-up areas (*DENR 2008 Compendium of Basic ENR Statistics for Operations and Management*).
36. Forest Disturbance - Refers to any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources and substrate availability of the physical environment (*DENR 2008 Compendium of Basic ENR Statistics for Operations and Management*).
37. Forest Land - Includes the public forest, the permanent forest or forest reserves, and forest reservations (*Presidential Decree No. 705 “Revising Presidential Decree No. 389, Otherwise Known as the Forestry Reform Code of the Philippines”*).
38. Freshwater - Refers to water containing less than 500ppm dissolved common salt, sodium chloride, such as that in groundwater, rivers, ponds, and lakes (*RA No. 9275 “An Act Providing for a Comprehensive Water Quality Management and for Other Purposes”*).
39. Game Refuge and Bird Sanctuary - Refers to a forest land designated for the protection of game animals, birds, and fish and closed to hunting and fishing in order that the excess population may flow and restock surrounding areas (*Presidential Decree No. 705 “Revising Presidential Decree No. 389, Otherwise Known as the Forestry Reform Code of the Philippines”*).
40. Grassland - An area predominantly vegetated with grasses such as *Imperata*, *Themeda*, and *Saccharum spp.*, among others (*DENR Memorandum Circular 2005-05*).
41. Gymnosperm - Seed-bearing plant in which the ovule is borne on an open scale, not embedded in an ovary (*Flora of the Chicago Region, Conservation Research Institute Glossary of Botanical Terms*).
42. Inland Waters - Bodies of water surrounded by land, such as rivers, lakes, streams, mudflats, ponds and fishponds, dams, and reservoirs (*DENR Memorandum Circular 2005-05*).
43. Invasive Alien Species - Refer to species introduced deliberately or unintentionally outside their natural habitats where they have the ability to establish themselves, invade, outcompete native species, and take over the new environment (*RA No. 11038 “An Act Declaring Protected Areas and Providing for their Management, Amending for this Purpose Republic Act No. 7586, Otherwise Known as the*

- “National Integrated Protected Areas System (NIPAS) Act of 1992”, and for Other Purposes”).*
44. Invertebrates - Refer to the type of animals that do not have backbones or spinal columns, such as worms, insects, spiders and the like (*DENR Administrative Order 2009-01*).
  45. Kaingin - A portion of the forest land, whether occupied or not, that is subjected to shifting and or permanent slash-and-burn cultivation having little or no provision to prevent soil erosion (*Presidential Decree No. 705 “Revising Presidential Decree No. 389, Otherwise Known as the Forestry Reform Code of the Philippines”*).
  46. Land - Provides space for natural ecosystems, human habitats and human activities. As this space is finite, the expansion of human activities can reduce the space occupied by natural ecosystems, thus reducing ecosystems’ capacity to yield ecosystem goods and services for all living beings. From the resource perspective, land is a unique environmental resource that delineates the space in which economic activities and environmental processes take place and within which environmental resources and economic assets are located. \*
  47. Land Cover - The observed (bio) physical cover on the earth’s surface. \*
  48. Lake - An inland body of water, an expanded part of a river, a reservoir formed by a dam, or a lake basin intermittently or formerly covered by water (*RA No. 8550 “An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources, Integrating All Laws Pertinent Thereto, and for Other Purposes”*).
  49. Lead - A heavy metal whose compounds are highly poisonous to health. Its use in gasoline, paints and plumbing compounds has been generally reduced (*UN Glossary of Environment Statistics Updated Web Version 2001*).
  50. Mammal - Refers to any of the various warm-blooded vertebrates of the class *Mammalia*, characterized with hair covering on the skin and milk-producing mammary glands (among females) for nourishing the young (*DENR Administrative Order 2009-01*).
  51. Mangrove Forest - A forested wetland growing along tidal mudflats and along shallow water coastal areas extending inland along rivers, streams, and their tributaries where the water is generally brackish and composed mainly of *Rhizophora*, *Bruguiera*, *Ceriops*, *Avicenia*, *Aegiceras*, and *Nipa* species (*DENR Memorandum Circular 2005-05*).

52. Marine Park - Any offshore area inhabited by rare and unique species of marine flora and fauna (*BMB 2003 Statistics on Philippine Protected Areas and Wildlife Resources*).
53. Marshland - A natural area usually dominated by grass-like plants such as cat tails and sedges, which are rooted in bottom sediments but emerge above the surface of the water. It contains emergence vegetation and usually develops in zones progressing from terrestrial habitat to open water (*DENR Memorandum Circular 2005-05*).
54. Methane (CH<sub>4</sub>) - A colorless, nonpoisonous, and flammable gaseous hydrocarbon created by anaerobic decomposition of organic compounds. It is a potent greenhouse gas (*UN Glossary of Environment Statistics Updated Web Version 2001*).
55. Migrant - A species that winter in the Philippines on a seasonal basis or those that cross transboundaries on several states (*BMB 2003 Statistics on Philippine Protected Areas and Wildlife Resources*).
56. Mobile Source - Any vehicle or machine propelled by or through oxidation or reduction reactions, including combustion of carbon-based or other fuel, constructed and operated principally for the conveyance of persons or the transportation of property or goods, which emit air pollutants as a reaction product (*RA No. 8749 "An Act Providing for a Comprehensive Air Pollution Control Policy and for other Purposes"*).
57. Mollusk - Soft-bodied invertebrate animal (*International Union for Conservation of Nature and Natural Resources (IUCN) Glossary of Terms*).
58. Monitoring Station - A facility used to measure emissions or ambient concentrations of pollutants (*UN Glossary of Environment Statistics Updated Web Version 2001*).
59. National Park - A forest reservation essentially of natural wilderness character, which has been withdrawn from settlement, occupancy, or any form of exploitation except in conformity with approved management plan and set aside as such exclusively to conserve the area or preserve the scenery, the natural and historic objects, wild animals and plants therein, and to provide enjoyment of these features in such areas (*RA No. 7586 "An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining Its Scope and Coverage, and For Other Purposes"*).
60. Natural Forest - Forests composed of indigenous trees, not planted by humans. Or in other words forests excluding plantations. Natural

forests are further classified using the following criteria: 1) forest formation (or type): closed/open; 2) degree of human disturbance or modification; and 3) species composition (*Global Forest Resources Assessment, FAO 2000*).

61. Natural Monument - A relatively small area focused on protection of small features to protect or reserve nationally significant natural features on account of their special interest or unique characteristics (*RA No. 7586 “An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining Its Scope and Coverage, and For Other Purposes”*).
62. Natural Park - A relatively large area not materially altered by human activity where extractive resource uses are not allowed and maintained to protect outstanding natural and scenic areas of national or international significance for scientific, educational and recreational use (*RA No. 7586 “An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining Its Scope and Coverage, and For Other Purposes”*).
63. Nitrate - A nitrogen-containing compound that can exist in the atmosphere or as a dissolved gas in water. It may produce harmful effects on humans and animals (*UN Glossary of Environment Statistics Updated Web Version 2001*).
64. Nitrogen Oxide (NO<sub>x</sub>) - A product of combustion from transportation and/ stationary sources. It is a major contributor to acid depositions and the formation of ground-level ozone in the troposphere (*UN Glossary of Environment Statistics Updated Web Version 2001*).
65. Nitrous Oxide (N<sub>2</sub>O) - A relatively inert oxide of nitrogen produced as a result of microbial action in the soil, use of fertilizers containing nitrogen, burning of timber, and so forth. This nitrogen compound may contribute to greenhouse and ozone depleting effects (*UN Glossary of Environment Statistics Updated Web Version 2001*).
66. Non-vascular Plants - Plants, such as mosses, liverworts, and hornworts, which do not contain the specialized vascular tissue (xylem and phloem) such as is found in the ferns, gymnosperms, and angiosperms {*United States Department of Agriculture (USDA) National Agricultural Library (NAL) Thesaurus and Glossary*}.
67. Open Forest - Refers formations with discontinuous tree layer with coverage of at least 10% and less than 40%. They are either managed or unmanaged forests in initial state of succession (*DENR Memorandum Circular 2005-05*).

68. Other Threatened Species - Refers to a species that is not critically endangered, endangered nor vulnerable but is under threat from adverse factor, such as over collection throughout its range and is likely to be moved to the vulnerable category in the near future. It also includes species that have the tendency to become threatened due to predation, destruction of habitats, or other similar causes, new species and species with insufficient scientific information. Such species may be included in the threatened species list by the Secretary upon the recommendation of the Philippine Red List Committee (PRLC) for Wild Fauna and endorsement of the National Wildlife Management Committee (NWMC) (*DENR Department Administrative Order 2019-09*).
69. Ozone (O<sub>3</sub>) - A pungent, colourless, toxic gas that contains three atoms of oxygen in each molecule. It occurs naturally at a concentration of about 0.01 parts per million (p.p.m.) of air. Levels of 0.1 p.p.m. are considered to be toxic. In the stratosphere, ozone provides a protective layer shielding the earth from the harmful effects of ultraviolet radiation on human beings and other biota. In the troposphere, it is a major component of photochemical smog, which seriously affects the human respiratory system (*UN Glossary of Environment Statistics Updated Web Version 2001*).
70. Particulates - Fine liquid or solid particles, such as dust, smoke, mist, fumes, or smog, found in air or emissions (*UN Glossary of Environment Statistics Updated Web Version 2001*).
71. Perennial Cropland - Refers to land cultivated with long term crops that do not have to be replanted for several years after each harvest. Harvested components are not timber but fruits, latex, and other products that do not significantly harm the growth of the planted trees or shrubs; orchards, vineyards and palm plantations, coffee, tea, sisal, banana, abaca, among others (*DENR Memorandum Circular 2005-05*).
72. pH Value - Measure of the acidity or alkalinity of a liquid. A pH value in the range of 0 to 7 indicates acidity, a pH value in the range of 7 to 14 indicates alkalinity, and a pH value of 7 signifies neutrality (*UN Glossary of Environment Statistics Updated Web Version 2001*).
73. Plantation Forest - Refers to forest stands established by planting and or seeding in the process of afforestation or reforestation. It may be composed of broadleaved, coniferous, and or mixed forests (*DENR Memorandum Circular 2005-05*).
74. PM<sub>2.5</sub> - "Fine particles," such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be

directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air (*United States Environmental Protection Agency Website*).

75. PM10 - "Inhalable coarse particles," such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter (*United States Environmental Protection Agency Website*).
76. Pollutant - Any substance, whether solid, liquid, gaseous, or radioactive, which directly or indirectly alters the quality of any segment of the receiving water body so as to affect or tend to affect adversely any beneficial use thereof; is hazardous or potentially hazardous to health; imparts objectionable odor, temperature change, or physical, chemical, or biological change to any segment of the water body; or is in excess of the allowable limits or concentrations or quality standards specified, or in contravention of the condition, limitation, or restriction prescribed in Republic Act No. 9275 (*RA No. 9275 "An Act Providing for a Comprehensive Water Quality Management and for Other Purposes"*).
77. Protected Area - Refers to identified portions of land and water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploitation (*RA No. 7586 "An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining Its Scope and Coverage, and For Other Purposes"*).
78. Protected landscape/seascape - Areas of national significance that are characterized by the harmonious interaction of man and land while providing opportunities for public enjoyment through the recreation and tourism within the normal lifestyle and economic activity of these areas (*RA No. 7586 "An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining Its Scope and Coverage, and For Other Purposes"*).
79. Pteridophyte - A vascular plant which reproduces by spores; the ferns and fern allies (*Flora Base, The Western Australian Flora Glossary of Botanical Terms Online*).
80. Rainfall - A term sometimes synonymous with rain, but mostly used in reference to amounts of precipitation which includes snow, hail, etc. (*Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) Meteorological Terms Online*).

81. Relative Humidity - The ratio of the actual vapor pressure to the vapor pressure corresponding to saturation at the prevailing temperature, or simply the percentage of saturation (*PAGASA Meteorological Terms Online*).
82. Reptile - Refers to any of the various cold-blooded, air breathing vertebrates of the class *Reptilia*, such as snakes, lizards, crocodiles, turtles, and the like, which have scales or horny plates as external covering (*DENR Administrative Order 2009-01*).
83. Residuals - Flows of solid, liquid and gaseous materials, and energy, that are discarded, discharged or emitted by establishments and households through processes of production, consumption or accumulation. \*
84. Resource Reserve - An extensive and relatively isolated and uninhabited area normally with difficult access designated as such to protect natural resources of the area for future use and prevent or contain development activities that could affect the resource pending the establishment of objectives which are based upon appropriate knowledge and planning (*RA No. 7586 "An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining Its Scope and Coverage, and For Other Purposes"*).
85. Shrubland - A land where the dominant woody vegetation are shrubs, which are generally more than 0.5 meter and less than five meters in height in maturity and without a definite crown. The growth habit can be erect, spreading or prostrate. The height limits for trees and shrubs should be interpreted with flexibility, particularly the minimum tree and maximum shrub height, which may vary between five and seven meters approximately (*DENR Memorandum Circular 2005-05*).
86. Soil - Provides the physical base to support the production and cycling of biological resources, provides the foundation for buildings and infrastructure, constitutes the source of nutrients and water for agriculture and forestry systems, provides a habitat for diverse organisms, plays an essential role in carbon sequestration and fulfills a complex buffering role against environmental variability, ranging from dampening diurnal and seasonal change in temperature and water supply to the storage and binding of a range of chemical and biological agents. The main environmental concerns about soil pertain to its degradation through soil erosion or nutrient depletion, among other processes. \*



87. Soil Taxonomy - The classification and naming of soils (*Plant and Soil Sciences eLibrary–Soil Classification and Geography Glossary*).
88. Species - Refers to the smallest population, which is permanently distinct and distinguishable from all others. It is a primary taxonomic unit (*DENR Administrative Order 2007-01*).
89. Stationary Source - Refers to any building or immobile structure, facility, or installation that emits or may emit any air pollutant (*RA No. 8749 “An Act Providing for a Comprehensive Air Pollution Control Policy and for other Purposes”*).
90. Strict nature reserve/ wilderness area - Protected area managed mainly for science or wilderness protection. These areas possess some outstanding ecosystems, features and/or species of flora and fauna of national scientific importance, or they are representative of particular natural areas. They often contain fragile ecosystems or life forms, areas of important biological or geological diversity, or areas of particular importance to the conservation of genetic resources. Public access is generally not permitted. Natural processes are allowed to take place in the absence of any direct human interference, tourism and recreation. Ecological processes may include natural acts that alter the ecological system or physiographic features, such as naturally occurring fires, natural succession, insect or disease outbreaks, storms, earthquakes and the like, but necessarily excluding man-induced disturbances (*Global Forest Resources Assessment, FAO 2000*).
91. Sulphur Dioxide (SO<sub>2</sub>) - A heavy, pungent, colorless gas formed primarily by the combustion of fossil fuels. It is harmful to human beings and vegetation, and contributes to the acidity in precipitation (*UN Glossary of Environment Statistics Updated Web Version 2001*).
92. Suspended Particulate Matter (SPM) - Finely divided solids or liquids that may be dispersed through the air from combustion processes, industrial activities or natural sources (*UN Glossary of Environment Statistics Updated Web Version 2001*).
93. Taxonomy (Taxonomic Group) - The classification of animals and plants based upon natural relationships (*Convention on Biological Diversity Glossary*).
94. Temperature - The degree of hotness or coldness of an object. The temperature of an object, usually measured in degrees-Fahrenheit or degrees-Celsius, tells us how much heat, or energy, the object has (*National Geographic Resource Library Encyclopedia Online*).

95. Threatened Species - A general term used to denote species or subspecies considered as critically endangered, endangered, vulnerable, or other accepted categories of wildlife whose population is at risk of extinction (*RA No. 9147 “An Act Providing for the Conservation and Protection of Wildlife Resources and Their Habitats, Appropriating Funds Therefor and For Other Purposes”*).
96. Vascular Plants - Plants containing specialized vascular tissue (xylem and phloem) which are more highly evolved than such bryophytes as mosses and liverworts. Vascular plants include ferns, gymnosperms, and angiosperms (*USDA NAL Thesaurus and Glossary*).
97. Volatile Organic Compound - Organic compounds that evaporate readily and contribute to air pollution mainly through the production of photochemical oxidants (*UN Glossary of Environment Statistics Updated Web Version 2001*).
98. Vulnerable Species - Refers to species or subspecies that is not critically endangered or endangered but is under threat from adverse factors throughout their range and is likely to move to the endangered category in the near future (*RA No. 9147 “An Act Providing for the Conservation and Protection of Wildlife Resources and Their Habitats, Appropriating Funds Therefor and For Other Purposes”*).
99. Watershed - A land area drained by a stream or fixed body of water and its tributaries having a common outlet for surface-runoff (*Presidential Decree No. 705 “Revising Presidential Decree No. 389, Otherwise Known as the Forestry Reform Code of the Philippines”*).
100. Watershed Reservation - A forest land reservation established to protect or improve the conditions of the water yield thereof or reduce sedimentation (*Presidential Decree No. 705 “Revising Presidential Decree No. 389, Otherwise Known as the Forestry Reform Code of the Philippines”*).
101. Weather - A day-to-day or sometimes even instantaneous change of atmospheric conditions over a given place or area. In contrast, climate encompasses the statistical ensemble of all weather conditions during a long period of time over that place or area. Atmospheric conditions are measured by the meteorological parameters of air temperature, barometric pressure, wind velocity, humidity, clouds, and precipitation (*UN Glossary of Environment Statistics Updated Web Version 2001*).

102. Wild Fauna - Undomesticated animals living independently of humans {*Information on Multilateral Environmental Agreements (MEA) Glossary of Terms Online*}.
103. Wild Flora - Plants growing in a natural state (independent of humans, therefore not cultivated) (*Information on MEA Glossary of Terms Online*).
104. Wild Species - Organisms captive or living in the wild that have not been subject to breeding to alter them from their native state (*Convention on Biological Diversity Glossary*).

\*FDES, 2013 Glossary

#### IV. Dissemination of Results and Revision

The Compendium of Philippine Environment Statistics is published bi-annually with three (3) components are release and posted in PSA website every year. The web release material includes press release, statistical tables, infographics, and social cards.

List of Statistical Tables:

Table 1.1	Temperature by Monitoring Station, 2010 to 2019
Table 1.2	Climatological Normals of Precipitation by Month and by Monitoring Station, 1981 to 2010
Table 1.3	Amount of Rainfall by Monitoring Station, 2010 to 2019
Table 1.4	Relative Humidity by Monitoring Station, 2010 to 2019
Table 1.5	List of Proclaimed Watershed by Region, as of 2019
Table 1.6	Area of Lakes in the Philippines by Region, as of 2016
Table 1.7	Land Cover of the Philippines by Region and Province, as of 2015
Table 1.8	Coastal Resource Statistics, 2013 to 2016
Table 1.9	Area by Soil Taxonomy
Table 1.10	Area of Ecosystems by Land Cover, as of 2019
Table 1.11.1	Number of Known Fauna Species by Ecosystem, as of 2019
Table 1.11.2	Number of Known Flora and Fauna Species by Status Category, 2016 to 2019

Table 1.11.3	Number of Known Flora and Fauna Species by Class, 2017 to 2019
Table 1.12	Number of Endemic Known Flora and Fauna Species by Taxonomic Group, 2010 to 2019
Table 1.13	Number of Invasive Fauna Species by Taxonomic Group, as of 2019
Table 1.14	Population of Threatened Species, 2010 to 2019
Table 1.15	Number of Threatened Wildlife Species by Taxonomic Group, 2010 to 2019
Table 1.16	List and Status of Protected Areas, as of 2019
Table 1.17	Forest Cover of the Philippines by Forest Type, 2010 and 2015
Table 1.18	Forest Disturbance by Cause, 2010 to 2017
Table 1.19	Concentration Levels of PM10 by Monitoring Station, 2012 to 2019
Table 1.20	Concentration Levels of PM 2.5 by Monitoring Station, 2015 to 2019
Table 1.21	Concentration Levels of Ozone by Monitoring Station, 2013 to 2019
Table 1.22	Concentration Levels of CO by Monitoring Station, 2010 to 2019
Table 1.23	Concentration Levels of SO2 by Monitoring Station, 2013 to 2019
Table 1.24	Concentration Levels of NO2 by Monitoring Station, 2013 to 2019
Table 1.25	Annual Geometric Mean of TSP by Monitoring Station, 2008-2019
Table 1.26	Distribution of Pollutants by Type of Emission in the NCR, 2009 to 2018
Table 1.27	Concentration Level of Nitrate in Laguna de Bay and its Major Tributaries, 2010 to 2019
Table 1.28	Concentration Level of Phosphate in Laguna de Bay and its Major Tributaries, 2010 to 2019
Table 1.29.1	Concentration Level of BOD of Selected Freshwater Bodies by Region, 2010 to 2019
Table 1.29.2	Concentration Level of BOD in Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.30	Concentration Level of COD in Laguna de Bay and its Tributaries, 2010 to 2019

Table 1.31	Annual Geometric Mean of Total Coliform in Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.32.1	Concentration Level of Lead in Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.32.2	Concentration Level of Cadmium in Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.33	Levels of pH in Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.34	Temperature of Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.35.1	Concentration Level of DO in Selected Freshwater Bodies by Region, 2010 to 2019
Table 1.35.2	Concentration Level of DO in Laguna de Bay and its Tributaries, 2010 to 2019
Table 1.36	Annual Geometric Mean of Total Coliform in Selected Marine Waterbodies, 2010 to 2019
Table 1.37	Concentration Level of DO in Selected Marine Waterbodies, 2010 to 2019

## V. Citation

Philippine Statistics Authority. (30 June 2021). *Technical Notes on Compendium of Philippine Environment Statistics 2010 – 2019 Component 1: Environmental Conditions and Quality*. <https://psa.gov.ph/sites/default/files/attachments/ird/specialrelease/3.%20CPES%20Technical%20notes.pdf>

## VI. Contact Information

Ms. Virginia M. Bathan  
Chief Statistical Specialist  
Environment and Natural Resources Accounts Division  
(632) 8376-2041  
[enradstaff@gmail.com](mailto:enradstaff@gmail.com)

### **For data request, you may contact:**

Knowledge Management and Communications Division  
(632) 8462-6600 locals 839, 833, and 834  
[info@psa.gov.ph](mailto:info@psa.gov.ph)