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# **TAXONOMIC CLASSIFICATION OF THE SOILS OF PUERTO RICO, 1975**

M. A. LUGO-LÓPEZ  
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# TAXONOMIC CLASSIFICATION OF THE SOILS OF PUERTO RICO, 1975<sup>1</sup>

*M. A. Lugo-López and Luis H. Rivera<sup>2</sup>*

## INTRODUCTION

The soils of Puerto Rico were previously described and classified by Roberts (4) following the system of Baldwin, Kellogg and Thorp (1). The "Soil Survey of Puerto Rico" (4) was published in 1942 by the USDA Bureau of Plant Industry in cooperation with the Agricultural Experiment Station of the University of Puerto Rico. Since then, most of the soils of the Island have been surveyed and reclassified in much more detail using a new, comprehensive soil classification system. For this purpose the Island has been divided into the following six areas: Lajas, Mayagüez, Humacao, Ponce, San Juan and Arecibo. The report of the new classification of the Soils of the Lajas Valley Area appeared in 1965 (2). That of the soils of the Mayagüez Area is already in press. Those of the other four soil survey areas are under preparation.

The new classification system was developed by the Soil Survey Staff of the USDA Soil Conservation Service over a number of years since 1951. The system attempts to make provision for the classification of all the soils of the world. It was developed by a series of approximations which were tested to determine its defects and to gradually approach a workable system. The last approximation to date (the 7th) is presented and discussed in a publication of the Soil Survey Staff (5). It is expected that a final report on "Soil Taxonomy" will be published soon with the information concerning the system as finally adopted by the U.S. Department of Agriculture. A preliminary abridged text has been available for the use of SCS and experiment station scientists. In addition, a 1972 USDA-SCS publication presents the classification of all series mapped and described in the United States, Puerto Rico and the Virgin Islands(6).

The reports available so far are not intended for beginning students of soil classification but rather are written to introduce the new system to people familiar with the system in use. Terminology and concepts have been so changed that it has become increasingly difficult for nonspecialists who need this type of information to use it intelligently. The purpose of this paper is to present the taxonomic classification of the soils of Puerto Rico in a simplified fashion so that agronomists, experiment station staff, extension workers, teachers of vocational agriculture, college students, progressive farmers and other agriculturists may readily obtain the information they need without missing the fundamental aspects of the new system.

The system and nomenclature are briefly discussed by drawing liberally from previous reports (5,6). The soil series are listed each under

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the corresponding soil orders. Then a complete picture is given where each series can be located within the different categories of the system: order, suborder, great group, subgroup, and family. Definitions of some of them are given to facilitate the understanding of the meanings of the names of the various categories and how they describe a soil. A list of series, with their classification, facilitates the search for information.

## **THE NEW CLASSIFICATION SYSTEM: ITS NATURE AND NOMENCLATURE**

The new classification system consists of six categories: orders, suborders, great groups, subgroups, families and series. The system focuses primarily on the soils themselves from a quantitative rather than a qualitative approach. It is a natural classification based on both observable and measurable soil properties. Ten orders are recognized: Alfisols, Aridisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols and Vertisols.

Alfisols are relatively low in organic matter; they have a relatively high base saturation, an illuvial horizon of silicate clays, and sufficient moisture to mature a crop. They are approximately equivalent<sup>3</sup> to the Gray Brown Podzolic, Gray Wooded soils, Noncalcic Brown soils, Degraded Chernozem and associated Planosols and some Half Bog soils.

Aridisols are relatively low in organic matter with inadequate moisture to mature a crop without irrigation in most years, and they show some pedogenic horizons. They are equivalent to Desert, Reddish Desert, Sierozem, Solonchak, some Reddish Brown soils and associated Solonetz.

Entisols have either weak or no pedogenic horizons at all; they show no deep wide cracks in most years. Equivalent soils are the Azonal and some low Humic Gleys.

Histosols are organic soils in more than half of their upper 80 cm. They are equivalent to Bog soils.

Inceptisols have some pedogenic horizons and some weatherable minerals, enough moisture to mature a crop in most years, no horizon of illuvial clay, and are relatively low in either organic matter or base saturation or both. Equivalent soils are the Ando, Sol Brun Acide, some Brown Forest, Low Humic Gley and Humic Gley.

Mollisols have a thick dark surface horizon, relatively rich in organic matter, a high base saturation throughout, and no deep wide cracks in most years. Equivalent soils are the Chestnut, Chernozem, Brunizem (Prairie), Rendzinas, some Brown, Brown Forest, and associated Solonetz and Humic Gleys.

Oxisols have no weatherable minerals and no illuvial horizons of silicate clays; clays are inactive. They are equivalent to Laterite soils and Latosols.

Spodosols have an illuvial horizon of amorphous Al and organic matter, with or without amorphous Fe. Equivalent soils are Podzols,

<sup>3</sup>Equivalent to the soil orders of the *Soil Taxonomy* (1975) classification.

Brown Podzolic soils and Ground Water Podzols.

Ultisols have an illuvial horizon of silicate clays, low base saturation, and enough available moisture to mature a crop in most years. Equivalent soils include Red-Yellow Podzolic, Reddish Brown Lateritic and associated Planosols and Half-Bog soils.

Vertisols are clayey soils that exhibit deep wide cracks at some time in most years. They are equivalent to the Grumusols.

The following tabulation gives the names of each soil order and the formative element subsequently used in naming suborders:

<i>Order</i>	<i>Formative element</i>
Alfisols	alf
Aridisols	id
Entisols	ent
Histosols	ist
Inceptisols	ept
Mollisols	oll
Oxisols	ox
Spodosols	od
Ultisols	ult
Vertisols	ert

The name of the Suborder has two syllables: the last one is the formative element from the name of the order; the first connotes additional diagnostic properties of the soils. Thus, an Ultisol that has an appreciable amount of humus is called a Humult; if it is moist but not wet, it is called an Udult; if very wet, it is an Aquult. The following tabulation lists the first formative elements of suborder names and their connotations:<sup>4</sup>

<i>First formative element</i>	<i>Connotation</i>
alb .....	A nearly white eluvial horizon near the surface, reflecting wetness.
and .....	Presence of appreciable allophane.
aqu .....	A soil is very wet or that has been artificially drained.
ar .....	A soil having only fragments or horizons due to mixing by man.
arg .....	A soil having an illuvial horizon of silicate clays.
bor .....	A cool or cold soil, mean annual soil temperature <8° C.
ferr .....	Presence of appreciable free Fe.
fibr .....	Composed mostly of undecomposed plant fibers.
fluv .....	Composed of recent alluvium.
fol .....	Composed of leaves, twigs, and branches; all in various stages of decomposition.

<sup>4</sup>Taken directly from reference 6.

hem .....	Composed of partly decomposed plant materials.
hum .....	Presence of appreciable humus.
ochr .....	A surface horizon that is either light in color or low in organic matter, or both.
orth .....	The most representative, true Orthids have no illuvial B horizon of silicate clays; Orthents are on recently eroded slopes; Orthoxs have a short dry season or no dry season; Orthods have a B horizon that contains Fe, Al, and humus.
plagg .....	A surface mantle >50 cm thick of materials that have been added by continued manuring.
psamm .....	Sandy texture, sand, or loamy sand, to a depth of 1 m or more or to rock.
rend .....	A shallow (<50 cm deep) dark soil on highly limy material (> 40% CaCO <sub>3</sub> equivalent).
sapr .....	Composed mostly of highly decomposed plant materials.
torr .....	Inadequate moisture to mature a crop without irrigation.
trop .....	No distinct winter or summer; moist and tropical.
ud .....	Moist but not wet; dry for short periods or not at all.
umbr .....	A thick, acid, dark-colored surface horizon.
ust .....	Dry for long periods but moist in a growing season for 90 days or more in most years; droughts common.
xer .....	A soil in midlatitudes that is reliably moist in winter and dry in summer; reflecting a Mediterranean climate.

The names of the Great Groups have three or four syllables: the last two are the name of the Suborder: the first connotes additional diagnostic properties of the soils in that group; the second is formed when a vowel is added to connect the first to the last two syllables. For example, a Palehumult is a Humult with horizons that have more than normal development. An Entisol in the Suborder of Fluvents that is dry for long periods but moist in a growing season for 90 days or more in most years, droughts common, is called an Ustifluent, a four syllable name.

The following tabulation gives the first formative elements of great groups and their connotations:

<i>First formative element</i>	<i>Connotations</i>
acr .....	Extremely low CEC in clay fraction



agr .....	Having an illuvial horizon of clay and humus formed under cultivation.
alb .....	A nearly white eluvial horizon near the surface, reflecting wetness.
and .....	Presence of appreciable allophane.
arg .....	A soil having an illuvial horizon or silicate clays.
bor .....	A cool or cold soil, mean annual soil temperature <8° C.
calc .....	A soil that is calcareous throughout and that has a horizon with an appreciable accumulation of lime.
camb .....	A soil having an altered but not illuvial B horizon.
chrom .....	Brownish or reddish color.
cry .....	A soil that is relatively cold even in summer.
dur .....	A soil having a hardpan cemented with silica.
dys, dystr .....	Low base saturation.
eu, eutr .....	High base saturation.
ferr .....	Presence of appreciable free Fe.
frag .....	Presence of a fragipan.
fragloss .....	(See frag and gloss).
gibbs .....	Presence of gibbsite in sheets or nodules.
gloss .....	Presence of gray eluvial tongues in an illuvial horizon of silicate clay.
hal .....	Wet and somewhat salty.
hapl .....	The simplest set of horizons.
hum .....	Presence of appreciable amount of humus.
hydr .....	Presence of excess water.
luv .....	A soil having a horizon of illuvial humus.
med .....	A soil of midlatitudes.
nadur .....	(See natr and dur).
natr .....	Presence of significant amounts of exchangeable Na or of Mg and Na.
ochr .....	A surface horizon that is either light in color or low in organic matter, or that is both.
pale .....	A soil having horizons that have more than normal development.
pell .....	A soil that has low chroma.
plac .....	Presence of a thin (a few mm) pan, cemented by Fe or by Fe and humus.
plagg .....	A surface mantle, >50 cm thick, of materials that have been added by continued manuring.
plinth .....	Presence of large amounts of plinthite, an Fe-rich material that hardens irreversibly on

psamm .....	Sandy texture, sand or loamy sand, to a depth of 1 m or more.
quartz .....	More than 95% quartz.
rhod .....	Dark colors due to high Fe content, generally dark red.
sal .....	Presence of a horizon with >2% salt.
sider .....	Presence of appreciable free Fe.
sphagn .....	Mostly sphagnum.
sulf .....	Presence of appreciable shallow sulfides or products of their oxidation.
torr .....	Inadequate moisture to mature a crop without irrigation.
ud .....	Moist but not wet, and dry for short periods or not at all.
umbr .....	A thick, acid, dark-colored surface horizon.
ust .....	Dry for long periods but moist in a growing season for 90 days or more in most years; droughts common.
verm .....	Intensively mixed by animals, chiefly worms and their predators.
vitr .....	Large amounts of glass.
xer .....	A soil of midlatitudes that is reliably moist in winter and dry in summer, reflecting Mediterranean climate.

Great groups are divided into three kinds of subgroups: typic, intergrade and extragrade. The name of the subgroups is formed by placing one or more adjectives before the name of the great group. A typic subgroup represents the central concept of the great group. An intergrade subgroup has the properties of the great group whose name it carries, but also the properties of another taxon or more than one other taxon — an order, a suborder, or a great group. See the following example:

<i>Name of great group</i>	<i>Taxon to which it intergrades</i>	<i>Subgroup name</i>
Tropohumults	Aquults Orthox	Aquic Tropohumults Orthoxic Tropohumults

An extragrade subgroup has aberrant properties that do not represent intergrades to any known kind of soil. The following tabulation gives the adjectives used in the names of extragrade subgroups and their meanings:

<i>Adjective</i>	<i>Meaning</i>
abruptic .....	A large difference in percentage of clay between an eluvial horizon and an illuvial horizon without a significant transitional horizon.
aeric <sup>5</sup> .....	Browner and better aerated than typic.
anthr .....	A man-made dark-colored surface horizon.
arenic .....	Sandy eluvial horizons (sand or loamy sand), mostly between 50 cm and 1 m thick.
cumulic .....	An overthickened epipedon rich in humus.
glossic .....	Tongued eluvial and illuvial horizons.
grossarenic .....	Sandy eluvial horizons (sand or loamy sand) >1 m thick.
hydric .....	Organic soil floating on water if used in name of a Histosol.
leptic .....	Thin soil horizons.
limnic .....	Organic soil with basal layer of marl, diatoms, or sedimentary peat.
lithic .....	Hard rock within 50 cm of the surface.
pergelic .....	Presence of permafrost.
petrocalcic .....	An indurated horizon of lime accumulation.
petroferic .....	A shallow layer of ironstone.
pachi .....	A thick dark surface horizon.
plinthic .....	Presence of small amounts of plinthite, an Fe-rich material that hardens irreversibly on exposure.
ruptic .....	Intermittent horizons.
sulfic .....	Presence of deep sulfides or moderate amounts, if shallow, or products of sulfide oxidation.
superic .....	Very shallow plinthite.
terric .....	A mineral substratum in an organic soil.
thapto .....	A buried soil.

The families are differentiated within the subgroup primarily on the basis of properties important to the growth of plants. As an example, the Humatas series is a member of the Typic Tropohumults, clayey, kaolinitic, isohyperthermic family. The series is a collection of soil individuals essentially uniform in differentiating characteristics and in arrangement of horizons; or, if genetic horizons are thin or absent, a collection of soil individuals that, within defined depth limits, are uniform in all soil properties diagnostic for the series.

<sup>5</sup>Not strictly an extragrade. Name is used to indicate a special departure from the typic subgroup.

## PROCEDURE

Information was obtained mainly from a published classification of the soils of the United States, Puerto Rico and the Virgin Islands (6). Unpublished material from the SCS Caribbean Office was also used. For the benefit of those in need of only general information, a table was prepared where the series were grouped within the corresponding soil order. For those in need of more specific information, a table was developed indicating the placement of each series within each of the categories of the system. Information is limited to Puerto Rico, and only the categories with representatives in the Island are mentioned. The tables do not give names of orders, suborders, great groups, subgroups or families not represented locally. Thus, it is easier to manage and understand, even if the omission of nonrepresented categories produces an incomplete system. Those interested in the complete U.S. Soil Taxonomy should consult other reference material (5).

Further, the soils have been listed in alphabetical order with their classification as of the date of this publication. Thus, it is easy to locate a given soil and find the corresponding classification within the new system.

## TAXONOMIC CLASSIFICATION OF PUERTO RICAN SOILS<sup>6</sup>

Following a system consistent with the classification of soils in the United States, the soils of Puerto Rico have been classified as shown in table 1. Alfisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Ultisols and Vertisols have been recognized. Spodosols are present but their classification awaits further studies. Aridisols are expected to occur in the drier parts of the Island.

In table 2 the soils of Puerto Rico are classified according to orders, suborders, great groups, subgroups, families and series.

Alfisols are generally moist with ochric epipedons and argillic horizons with medium to high base status, subdivided into 3 suborders, Aqualfs and Ustalfs, each with a great group, and Udalfs with 2 great groups. Tropaqualfs include 1 subgroup, 2 families, 3 series; Tropudalfs, 2 subgroups, 4 families, 4 series; Paleudalfs, 1 subgroup, 1 family and 2 series; and Haplustalfs, 3 subgroups, 3 families and 3 series. There are a total of 12 series in the Alfisols including the shallow, lithic, extensive Guayama and Tanamá soils.

The Entisols of Puerto Rico are young soils that lack diagnostic horizons, other than an ochric epipedon. They do not exhibit cracks in most years. They are similar to those in the United States, but unique in that the difference between mean summer and winter temperature is less than 5° C. They include Aquents with the great group Fluvaquents with 3 subgroups, 9 families, 11 series; the Fluvents with 1 great group, the subgroup Typic Ustifluvents, 1 family, 1 series; the Orthents with the great groups Troporthents and Ustorthents, 2 subgroups, 2 families, 2

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<sup>6</sup>This classification is based on field and laboratory work up to December 1974

Table 1. — Classification of the Soils of Puerto Rico by Orders

<i>Alfisols</i>			
Amelia	Fajardo	Machete	Tanamá
Candeleró	Guayama	Río Arriba	Vega Baja
Cayaguá	Juncal	San Sebastián	Via
<i>Entisols</i>			
Aguadilla	Córcega	Martín Peña	Serrano
Arenales	Espinal	Meros	Talante
Caribe	Fortuna	Piñones	Teja
Cataño	Jaucas	Reparada	Vayas
Coloso	Machuelo	San Germán	Zarzal
<i>Histosols</i>			
Saladar			
<i>Inceptisols</i>			
Adjuntas	Igualdad	Maresúa	Plata
Anones	Jácana	Mariana	Quebrada
Bajura	Juana Díaz	Maunabo	Sabana
Caguabo	Juncos	Mayo	Santa Marta
Callabo	Junquitos	Monte grande	Santoni
Cuchillas	Limani	Morado	Teresa
Descalabrado	Llanos	Múcara	Utua
Dique	Mabí	Pandura	Vieques
Guamaní	Maguayo	Parcelas	Vives
Guayabota	Malaya	Pellejas	Viví
Gurabo	Maní	Perchas	Yunes
Humacao	Maragüez		
<i>Mollisols</i>			
Aguilita	Cortada	Jacaguas	Santa Clara
Cintrona	Cuyón	Naranjo	Sóller
Coamo	Durados	Pozo Blanco	Toa
Colinas	Ensenada	Reilly	Tuque
Constancia	Estación		
	Guanábano	San Antón	Yauco
<i>Oxisols</i>			
Bayamón	Cotito	Delicias	Nipe
Catalina	Coto	Matanzas	Rosario
Comerio			
<i>Ultisols</i>			
Aceitunas	Daguao	Lares	Picacho
Aibonito	Dagüey	Limones	Río Lajas
Almirante	Guanajibo	Lirios	Río Piedras
Alonso	Guayabo	Los Guineos	Sabana Seca
Bejucos	Guerrero	Maleza	Sosa
Cabo Rojo	Hicaco	Maricao	Torres
Ciales	Humatas	Moca	Vega Alta
Cidral	Ingenio	Naranjito	Voladora
Consumo	Jagüeyes	Palmarejo	Yunque
Corozal	Jobos	Patillas	
<i>Vertisols</i>			
Aguirre	Fe	Guánica	Ponceña
Camagüey	Fraternidad	Paso Seco	Santa Isabel
Cartagena			

**Table 2. — Classification of the Soils of Puerto Rico in all Categories of the U.S. Taxonomy System**

Order	Suborder	Great Group	Subgroup	Family <sup>1</sup>	Series
Alfisols	Aqualfs	Tropaqualfs	Aeric Tropaqualfs	Fine-loamy, mixed, isohyperthermic	Candelero
				Fine, mixed, isohyperthermic	Cayaguá Vega Baja
	Udalfs	Paleudalfs	Vertic Paleudalfs	Fine, mixed, isohyperthermic	Fajardo Río Arriba
					San Sebastián
		Tropudalfs	Typic Tropudalfs	Clayey-skeletal, carbonatic, isohyperthermic	Via
				Fine-loamy, mixed, isohyperthermic	
		Haplustalfs	Lithic Tropudalfs	Fine, mixed, isohyperthermic	Juncal
				Clayey, mixed, isohyperthermic	Tanamá
			Typic Haplustalfs	Clayey-skeletal, mixed, isohyperthermic	Amelia
			Lithic Haplustalfs	Clayey, mixed, isohyperthermic	Guayama
Entisols	Aquentes	Fluvaquents	Udic Haplustalfs	Fine, mixed, isohyperthermic	Machete
			Aeric Tropic Fluvaquents	Coarse-loamy over sandy or sandy-skeletal, mixed, acid, isohyperthermic	Talante
				Fine-loamy over sandy or sandy-skeletal, mixed, nonacid, isohyperthermic	Córcega
				Fine, mixed, nonacid, isohyperthermic	Zarzal
					Coloso

Table 2. — Classification of the Soils of Puerto Rico in all Categories of the U.S. Taxonomy System (continued)

Order	Suborder	Great Group	Subgroup	Family <sup>1</sup>	Series
			Thapto-Histic Tropic Fluvaquents	Fine, mixed, acid, isohyperthermic	Piñones
				Fine, mixed, nonacid, isohyperthermic	Reparada
			Tropic Fluvaquents	Fine-loamy over sandy or sandy skeletal, mixed, isohyperthermic	Serrano
				Fine, mixed, acid, isohyperthermic	Fortuna
				Fine, mixed, nonacid, isohyperthermic	Martín Peña
					Vayas
				Fine, mixed (calcareous), isohyperthermic	Machuelo
	Fluvents	Ustifluvents	Typic Ustifluvents	Fine-loamy, mixed, nonacid, isohyperthermic	Caribe
	Orthents	Troporthents	Lithic Troporthents	Loamy-skeletal, mixed, acid, isohyperthermic	Teja
		Ustorthents	Lithic Ustorthents	Loamy-skeletal, carbonatic, isohyperthermic	San Germán
	Psamments	Tropopsamments	Typic Tropopsamments	Carbonatic, isohyperthermic Mixed, isohyperthermic	Cataño Aguadilla Espinal
		Ustipsamments	Typic Ustipsamments	Carbonatic, isohyperthermic Mixed, isohyperthermic	Jaucas Arenales Meros

Histosols	Saprists	Troposaprists	Fluvaquentic Troposaprists	Euic, isohyperthermic	Saladar
Inceptisols	Aquepts	Halaquepts	Vertic Halaquepts	Fine, mixed, isohyperthermic	Teresa
		Tropaquepts	Typic Tropaquepts	Clayey over sandy or sandy-skeletal, mixed, nonacid, isohyperthermic	Igualdad
				Fine, mixed, acid, isohyperthermic	Maunabo
			Lithic Tropaquepts	Clayey, mixed, acid, isothermic	Perchas
			Vertic Tropaquepts	Fine, mixed, nonacid, isohyperthermic	Guayabota
				Fine, mixed, (calcareous), isohyperthermic	Bajura
				Loamy-skeletal, mixed, isohyperthermic, shallow	Santoni
				Coarse-loamy, mixed, isohyperthermic	Yunes
				Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic	Mayo
				Fine, mixed, isohyperthermic	Pellejas
				Fine, oxidic, isohyperthermic	Adjuntas
					Anones
					Santa Marta
			Fluventic Dystropepts	Fine-loamy, mixed, isohyperthermic	Limaní
			Lithic Dystropepts	Clayey, mixed, isohyperthermic	Sabana
	Tropepts	Dystropepts	Typic Dystropepts		



**Table 2. — Classification of the Soils of Puerto Rico in all Categories of the U.S. Taxonomy System (continued)**

Order	Suborder	Great Group	Subgroup	Family <sup>1</sup>	Series
		Eutropepts	Ustic Dystropepts	Fine, mixed, isohyperthermic	Mariana
			Vertic Dystropepts	Fine, mixed, isohyperthermic	Parcelas
			Typic Eutropepts	Loamy-skeletal, mixed, isohyperthermic	Plata
				Clayey-skeletal, mixed, isohyperthermic	Maresúa
				Loamy, mixed, isohyperthermic, shallow	Pandura
				Fine-loamy, mixed, isohyperthermic	Maragüez
					Morado
				Fine, mixed, isohyperthermic	Quebrada
			Aquic Eutropepts	Fine, mixed, isohyperthermic	Junquitos
			Fluvaquentic Eutropepts	Fine, mixed, isohyperthermic	Maní
			Fluventic Eutropepts	Coarse-loamy, mixed, isohyperthermic	Viví
				Fine-loamy, mixed, isohyperthermic	Dique
					Humacao
			Lithic Eutropepts	Loamy-skeletal, mixed, isohyperthermic	Caguabo
				Clayey, mixed, isohyperthermic	Malaya
				Clayey, montmorillonitic, isohyperthermic, shallow	Múcara
			Vertic Eutropepts	Clayey over loamy, mixed, isohyperthermic	Gurabo

				Fine, mixed, isohyperthermic	Monte grande
				Fine, montmorillonitic, isohyperthermic	Juncos
	Humitropepts	Typic Humitropepts		Loamy, mixed, isothermic, shallow	Mabí
				Fine-loamy, mixed, isothermic	Cuchillas
	Ustropepts	Typic Ustropepts		Loamy, mixed, isohyperthermic, shallow	Utua
				Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic	Juana Díaz
				Fine, mixed, isohyperthermic	Vieques
		Fluventic Ustropepts		Fine-loamy, mixed, isohyperthermic	Callabo
				Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic	Vives
				Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic	Guamaní
		Lithic Vertic Ustropepts		Clayey, mixed, isohyperthermic	Descalabrado
		Vertic Ustropepts		Fine, mixed, isohyperthermic	Jácana
					Llanos
					Maguayo
Mollisols	Aquolls	Calcicquolls	Typic Calcicquolls	Fine, mixed, isohyperthermic	Cintrona
			Aeric Calcicquolls	Fine, mixed, isohyperthermic	Constancia
	Rendolls	Rendolls	Eutropeptic Rendolls	Fine-loamy, carbonatic, isohyperthermic	Colinas

Table 2. — Classification of the Soils of Puerto Rico in all Categories of the U.S. Taxonomy System (continued)

Order	Suborder	Great Group	Subgroup	Family <sup>1</sup>	Series
				Clayey, mixed, isohyperthermic, shallow	Sóller
				Fine, mixed, isohyperthermic	Naranjo Santa Clara
	Udolls	Hapludolls	Fluventic Hapludolls	Sandy-skeletal, mixed, isohyperthermic	Reilly
				Sandy, mixed, isohyperthermic	Durados
				Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic	Estación
	Ustolls	Argiustolls	Typic Argiustolls	Fine, mixed, isohyperthermic	Toa
				Clayey-skeletal, mixed, isohyperthermic	Ensenada
				Fine-silty, mixed, isohyperthermic	Guanábano
		Calciustolls	Typic Calciustolls	Fine, mixed, isohyperthermic	Coamo
				Loamy-skeletal, carbonatic, isohyperthermic, shallow	Aguilita
				Loamy, carbonatic, isohyperthermic, shallow	Pozo Blanco
				Fine-silty, carbonatic, isohyperthermic	Yauco
			Petrocalcic Calciustolls	Clayey-skeletal, mixed, isohyperthermic, shallow	Tuque
	Haplustolls		Cumulic Haplustolls	Fine-loamy, mixed, isohyperthermic	Cortada

Oxisols	Orthox	Acrorthox	Fluventic Haplustolls	Sandy-skeletal, mixed, isohyperthermic	San Antón Cuyón
				Loamy-skeletal, mixed, isohyperthermic	Jacaguas
		Eutrorthox	Typic Acrorthox	Clayey, oxidic, isohyperthermic	Nipe
			Tropeptic Eutrorthox	Clayey, kaolinitic, isohyperthermic, shallow	Cotito
		Haplorthox		Clayey, oxidic, isohyperthermic	Matanzas
			Typic Haplorthox	Clayey, oxidic, isohyperthermic	Bayamón
					Delicias
			Tropeptic Haplorthox	Clayey, kaolinitic, isohyperthermic	Coto
Ultisols	Aquults	Plinthaquults		Clayey, oxidic, isohyperthermic, shallow	Catalina
			Oxic Plinthaquults	Clayey, mixed, isohyperthermic	Comerio Rosario
	Humults	Palehumults	Typic Palehumults	Clayey, oxidic, isohyperthermic	Sabana Seca
			Epiaquic Palehumults	Clayey, mixed, isothermic	Aceitunas
					Yunque
			Plinthic Palehumults	Clayey, oxidic, isohyperthermic	Torres

Table 2 — Classification of the Soils of Puerto Rico in all Categories of the U.S. Taxonomy System (continued)

Order	Suborder	Great Group	Subgroup	Family <sup>1</sup>	Series
		Tropohumults	Typic Tropohumults	Clayey, kaolinitic, isohyperthermic	Humatas
				Clayey, mixed, isohyperthermic	Dagualo
			Aquic Tropohumults	Clayey, mixed, isohyperthermic	Naranjito
				Clayey, mixed, isothermic	Lares
			Epiaquic Tropohumults	Clayey, mixed, isothermic	Ciales
			Epiaquic Orthoxic Tropohumults	Clayey, kaolinitic, isohyperthermic	Picacho
			Orthoxic Tropohumults	Clayey, oxidic, isohyperthermic	Los Guineos
					Limones
					Aibonito
					Alonso
					Dagüey
					Cidral
	Udults	Paleudults	Typic Paleudults	Clayey, mixed, isohyperthermic	
				Clayey, oxidic, isohyperthermic	Bejucos
			Arenic Plinthic Paleudults	Clayey, oxidic, isohyperthermic	Maleza
			Arenic Rhodic Paleudults	Loamy, siliceous, isohyperthermic	Guerrero
			Fragic Paleudults	Clayey, oxidic, isohyperthermic	Río Lajas
					Jobos

	Plinthic Paleudults	Fine-loamy, oxidic, isohyperthermic	Guanajibo
		Clayey, oxidic, isohyperthermic	Almirante
	Rhodic Paleudults	Clayey, mixed, isohyperthermic	Cabo Rojo
Rhodudults	Typic Rhodudults	Clayey, oxidic, isohyperthermic	Voladora
Tropudults	Typic Tropudults	Clayey, kaolinitic, isohyperthermic	Río Piedras
		Clayey, over loamy, mixed, isohyperthermic	Lirios
	Aquic Tropudults	Clayey, mixed, isohyperthermic	Corozal
	Dystropeptic Tropudults	Fine-loamy, mixed, isohyperthermic	Patillas
		Clayey, mixed, isohyperthermic	Consumo
		Clayey, mixed, isothermic	Maricao
	Orthoxic Tropudults	Fine-loamy, mixed, isohyperthermic	Jagüeyes
		Clayey, mixed, isohyperthermic	Ingenio
	Plinthaquic Tropudults	Clayey, oxidic, isothermic	Hicaco
	Plinthic Tropudults	Clayey, mixed, isohyperthermic	Vega Alta
	Vertic Tropudults	Clayey, mixed, isohyperthermic	Moca

Table 2. — Classification of the Soils of Puerto Rico in all Categories of the U.S. Taxonomy System (continued)

Order	Suborder	Great Group	Subgroup	Family <sup>1</sup>	Series
Vertisols	Ustults	Haplustults	Typic Haplustults	Clayey, mixed, isohyperthermic	Palmarejo
			Arenic Haplustults	Clayey, mixed, isohyperthermic	Guayabo
			Plinthic Haplustults	Clayey, oxidic, isohyperthermic	Sosa
	Uderts	Pelluderts	Typic Pelluderts	Fine, montmorillonitic, isohyperthermic	Camagüey
	Usterts	Chromusterts	Paleustollic Chromusterts Udic Chromusterts	Fine, mixed, isohyperthermic	Fe
				Clayey, over loamy-skeletal, mixed, isohyperthermic	Paso Seco
				Fine, mixed, isohyperthermic	Cartagena
				Very fine, montmorillonitic, isohyperthermic	Fraternidad
		Pellusterts	Udic Pellusterts	Fine, mixed, isohyperthermic	Aguirre Guánica Ponceña Santa Isabel
				Fine, montmorillonitic, isohyperthermic	

<sup>1</sup>The family name includes the subgroup name, i.e., Typic Tropohumults, clayey, kaolinitic, isohyperthermic family.

series; and the Psamments with the great groups Tropopsamments and Ustipsamments, 2 subgroups, 4 families and 6 series. A total of 20 series are classified in the Entisols including the Coloso and Vayas soils.

Histosols have been identified recently in the humid, coastal lowlands and classified in Puerto Rico. They are deep, black, organic soils developed on highly decomposed residues derived from grasses under high water tables. They include 1 suborder, 1 great group, 1 subgroup and 1 family which is represented by the Saladar series.

Inceptisols of Puerto Rico lack horizons of clay accumulation and include the wet soils where gleying is dominant, eluvial soils, and others where the impact of soil forming processes are yet too weak. These soils characterize the very steep, unstable slopes of the mountain areas. They are classified in two suborders: Aquepts and Tropepts. The Aquepts include the great groups of the Halaquepts and the Tropaquepts with 1 and 3 subgroups, respectively. There is 1 family with 1 series of Halaquepts and 5 families and 6 series of Tropaquepts. The Tropepts include the great groups of Dystropepts, Eutropepts, Humitropepts and Ustropepts with a total of 16 subgroups, 33 families and 39 series. The extensive shallow Múcara (Vertic Eutropepts) and Descalabrado (Lithic Vertic Ustropepts) are included in this order.

The Mollisols recognized in Puerto Rico include Aquolls, Rendolls, Udolls and Ustolls. These are the soils with dark-colored surface horizons which include 21 series classified into 19 families, 9 subgroups, 6 great groups and 4 suborders. Such important agricultural soils as the Toa (Fluventic Hapludolls) and the San Antón (Cumulic Haplustolls) are included. Also included are other dark clay soils, not classified as Vertisols, such as Santa Clara (Eutropeptic Rendolls). The Coamo (Typic Argiustolls) offers a good potential for intensive agriculture if it could be irrigated.

Oxisols are unique soils of the tropics which have an oxic horizon and occur on very old, stable land surfaces. Geomorphological evidence shows these soils occur mainly in ancient transported sediments that were weathered chemically before deposition. The oxic horizon lacks clayskins and has a very weak, coarse prismatic or coarse to medium blocky structure. It is similar to a cambic horizon in many respects, but has a lower exchange capacity or smaller amounts of minerals that can weather. There are 9 series of Oxisols in Puerto Rico, all in one suborder (Orthox), 3 great groups, 4 subgroups and 7 families. The Nipe is a Typic Acrorthox; Cotito and Matanzas are Tropeptic Eutrorthox; Bayamón and Delicias are Typic Haploorthox, while Coto, Catalina, Comerío and Rosario are Tropeptic Haploorthox.

The Ultisols are rather important in Puerto Rico. They occur in regions of high rainfall where leaching exceeds base liberation. They do not always occur in the oldest, stable surface. Slopes are not as steep as in the Inceptisols in the same rainfall belt. All the recognized suborders of Ultisols, except Xerults, are recognized in Puerto Rico with 39 series. Among the Aquults some Plinthaquults are present; they are Oxic Plinthaquults represented by the Sabana Seca series. The Humults are represented by Palehumults and Tropohumults, with 3 and 5 subgroups, respectively. Three great groups of Udults occur in Puerto Rico:



Paleudults, Rhodudults and Tropudults, represented by 9, 1 and 11 series, respectively. Ustults are represented by Haplustults, 3 subgroups, each with 1 family and 1 series.

The Vertisols of Puerto Rico have many properties in common with those of the United States or other parts of the world. These are the "cracking" dark soils. They are classified into Uderts and Usterts; the Uderts are all Pelluderts; and the Usterts are classified into Chromusterts and Pellusterts. There are 2 subgroups of Chromusterts and 1 of each of the other 2 great groups. Of the 9 series included, Camaguey is a Typic Pelluderts; Fe is a Paleustollic Chromusterts; Paso Seco, Cartagena and Fraternidad are Udic Chromusterts; Aguirre, Guánica, Ponceña and Santa Isabel are Udic Pellusterts. Most of the dark clay soils of Puerto Rico are herein included.

There are a total of 181 soil series in Puerto Rico of which 157 already are classified within the new system. About 19 of these are tentative series as yet, and 138 are established series. Another 22 series have not been classified within the new system mostly because of original broad or vague definitions, and 2 series are inactive. All the series — established, tentative, not classified and inactive — are included in the alphabetical listing provided in table 3.

Although not officially included in the classification, there are Spodosols in Puerto Rico. They are likely to be recognized on the north coast near Arecibo. Among the Spodosols, Tropaquods and Tropohumods probably will be found. In them the spodic horizon is more likely to be an accumulation of Al and organic matter. Some of the Spodosols are characterized by very thick white sandy A<sub>2</sub> horizons that overlie a brittle, slightly cemented spodic horizons.

As previously mentioned, Aridisols are likely to occur in the drier parts of the Island, i.e., along the southern coast and on adjacent small islands.

### SUMMARY

This paper describes the new U.S. Soil Taxonomy System and its nomenclature as applied to Puerto Rico. The system consists of the following categories: orders, suborders, great groups, subgroups, families and series. Definitions are given to facilitate understanding of the meanings of the names of the various categories and how these names are connotative of the characteristic features of the soil. The system focuses primarily on the soils themselves, in a quantitative approach. It is a natural classification based on soil properties. Following a system consistent with the classification of soils in the United States, the soils of Puerto Rico have been classified into the following orders: Alfisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Ultisols and Vertisols. Spodosols are present, but their classification awaits further studies. Aridisols can be expected to occur in the drier part of the Island. There are a total of 181 (157 classified) soil series in Puerto Rico.

Table 3. — Listing and Classification of Soil Series of Puerto Rico

Series	Subgroup	Family
Aceitunas	Typic Palehumults	Clayey, oxidic, isohyperthermic
Adjuntas	Typic Dystropepts	Fine, mixed, isohyperthermic
Aguadilla	Typic Tropopsamments	Mixed, isohyperthermic
Aguilita	Typic Calciustolls	Loamy-skeletal, carbonatic, isohyperthermic, shallow
Aguirre	Udic Pellusterts	Fine, mixed, isohyperthermic
Aibonito	Orthoxic Tropohumults	Clayey, oxidic, isohyperthermic
Algarrobo	Not classified because of original, broad or vague definition	
Almirante	Plinthic Paleudults	Clayey, oxidic, isohyperthermic
Alonso	Orthoxic Tropohumults	Clayey, oxidic, isohyperthermic
Altura	Not classified because of original, broad or vague definition	
Amelia	Typic Haplustalfs	Clayey-skeletal, mixed, isohyperthermic
Anones <sup>1</sup>	Typic Dystropepts	Fine, oxidic, isohyperthermic
Arcadia	Not classified because of original, broad or vague definition	
Arenales	Typic Ustipsamments	Mixed, isohyperthermic
Bajura	Vertic Trophaquepts	Fine, mixed, nonacid, isohyperthermic
Barrancas	Not classified because of original, broad or vague definition	
Bayamón	Typic Haplorthox	Clayey, oxidic, isohyperthermic
Bejucos <sup>1</sup>	Typic Paleudults	Clayey, oxidic, isohyperthermic
Cabo Rojo	Rhodic Paleudults	Clayey, mixed, isohyperthermic
Caguabo	Lithic Eutropepts	Loamy-skeletal, mixed isohyperthermic
Caguas	Not classified because of original, broad or vague definition	
Callabo	Typic Ustropepts	Fine, mixed, isohyperthermic
Camagüey	Typic Pelluderts	Fine, montmorillonitic, isohyperthermic
Candelero	Aeric Trophaqualfs	Fine-loamy, mixed, isohyperthermic
Caribe <sup>1</sup>	Typic Ustifluvents	Fine loamy, mixed, nonacid, isohyperthermic
Cartagena	Udic Chromusterts	Fine, mixed, isohyperthermic
Catalina	Tropeptic Haplorthox	Clayey, oxidic, isohyperthermic
Cataño	Typic Tropopsamments	Carbonatic, isohyperthermic

Table 3. — Listing and Classification of Soil Series of Puerto Rico (continued)

Series	Subgroup	Family
Cayaguá	Aeric Tropaqualfs	Fine, mixed, isohyperthermic
Ciales	Aquic Tropohumults	Clayey, mixed, isothermic
Cialitos <sup>2</sup>	Not classified because of original, broad or vague definition	
Cidral <sup>1</sup>	Typic Paleudults	Clayey, mixed, isohyperthermic
Cintrona	Typic Calciaquolls	Fine, mixed, isohyperthermic
Coamo	Typic Argiustolls	Fine, mixed, isohyperthermic
Colinas	Eutropeptic Rendolls	Fine-loamy, carbonatic, isohyperthermic
Coloso	Aeric Tropic Fluvaquents	Fine, mixed, nonacid, isohyperthermic
Comerio <sup>1</sup>	Tropeptic Haplorthox	Clayey, oxidic, isohyperthermic
Constancia	Aeric Calciaquolls	Fine, mixed, isohyperthermic
Consumo	Dystropeptic Tropudults	Clayey, mixed, isohyperthermic
Córcega	Aeric Tropic Fluvaquents	Fine-loamy over sandy or sandy-skeletal, mixed, nonacid, isohyperthermic
Corozal	Aquic Tropudults	Clayey, mixed, isohyperthermic
Corozo	Not classified because of original, broad or vague definition	
Cortada	Cumulic Haplustolls	Fine-loamy, mixed, isohyperthermic
Cotito <sup>1</sup>	Tropeptic Eutrorthox	Clayey, kaolinitic, isohyperthermic, shallow
Coto	Tropeptic Haplorthox	Clayey, kaolinitic, isohyperthermic
Cuchillas <sup>1</sup>	Typic Humitropets	Loamy, mixed, isothermic, shallow
Cuyón	Fluventic Haplustolls	Sandy-skeletal, mixed, isohyperthermic
Daguao	Typic Tropohumults	Clayey, mixed, isohyperthermic
Dagüey	Orthoxic Tropohumults	Clayey, oxidic, isohyperthermic
Delicias <sup>1</sup>	Typic Haplorthox	Clayey, oxidic, isohyperthermic
Descalabrado	Lithic Vertic Ustropepts	Clayey, mixed, isohyperthermic
Dique	Fluventic Eutropepts	Fine-loamy, mixed, isohyperthermic
Dominguito	Not classified because of original, broad or vague definition	
Durados	Fluventic Hapludolls	Sandy, mixed, isohyperthermic
Ensenada	Typic Argiustolls	Clayey-skeletal, mixed, isohyperthermic

Espinal	Typic Tropopsamments	Mixed, isohyperthermic
Espinosa	Not classified because of original, broad or vague definition	
Estación	Fluventic Hapludolls	Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic
Fajardo	Vertic Paleudalfs	Fine, mixed, isohyperthermic
Fe	Paleustollic Chromusterts	Fine, mixed, isohyperthermic
Fortuna	Tropic Fluvaquents	Fine, mixed, acid, isohyperthermic
Fraternidad	Udic Chromusterts	Very fine, montmorillonitic, isohyperthermic
Guamaní	Fluventic Ustropepts	Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic
Guanábano	Typic Argiustolls	Fine-silty, mixed, isohyperthermic
Guanajibo <sup>1</sup>	Plinthic Paleudults	Fine-loamy, oxidic, isohyperthermic
Guánica	Udic Pellusterts	Fine, mixed, isohyperthermic
Guayabo	Arenic Haplustults	Clayey, mixed, isohyperthermic
Guayabota	Lithic Tropaquepts	Clayey, mixed, acid, isothermic
Guayama	Lithic Haplustalfs	Clayey, mixed, isohyperthermic
Guerrero <sup>1</sup>	Arenic Plinthic Paleudults	Clayey, oxidic, isohyperthermic
Gurabo	Vertic Eutropepts	Clayey over loamy, mixed, isohyperthermic
Hicaco <sup>1</sup>	Plinthaquic Tropudults	Clayey, oxidic, isothermic
Humacao	Fluventic Eutropepts	Fine-loamy, mixed, isohyperthermic
Humatas	Typic Tropohumults	Clayey, kaolinitic, isohyperthermic
Igualdad	Typic Tropaquepts	Clayey over sandy or sandy-skeletal, mixed, nonacid, isohyperthermic
Ingenio	Orthoxic Tropudults	Clayey, mixed, isohyperthermic
Iruena	Not classified because of original, broad or vague definition	
Islote	Not classified because of original, broad or vague definition	
Jacaguas	Fluventic Haplustolls	Loamy-skeletal, mixed, isohyperthermic
Jácana	Vertic Ustropepts	Fine, mixed, isohyperthermic
Jagüeyes	Orthoxic Tropudults	Fine-loamy, mixed, isohyperthermic
Jaucas	Typic Ustipsamments	Carbonatic, isohyperthermic
Jayuya	Not classified because of original, broad or vague definition	

Table 3. — Listing and Classification of Soil Series of Puerto Rico (continued)

Series	Subgroup	Family
obos	Fragic Paleudults	Clayey, oxidic, isohyperthermic
osefa <sup>2</sup>	Not classified because of original, broad or vague definition	
uana Díaz	Typic Ustropepts	Loamy, mixed, isohyperthermic, shallow
uncal	Typic Tropudalfs	Fine, mixed, isohyperthermic
uncos	Vertic Eutropepts	Fine, montmorillonitic, isohyperthermic
unquitos	Aquic Eutropepts	Fine, mixed, isohyperthermic
ajajas	Not classified because of original, broad or vague definition	
lares	Aquic Tropohumults	Clayey, mixed, isohyperthermic
las Piedras	Not classified because of original, broad or vague definition	
limaní <sup>1</sup>	Fluventic Dystropepts	Fine-loamy, mixed, isohyperthermic
limones	Epiaquic Orthoxic Tropohumults	Clayey, kaolinitic, isohyperthermic
lirios	Typic Tropudults	Clayey over loamy, mixed, isohyperthermic
llanos	Vertic Ustropepts	Fine, mixed, isohyperthermic
lave	Not classified because of original, broad or vague definition	
los Guineos	Epiaquic Tropohumults	Clayey, mixed, isothermic
mabí	Vertic Eutropepts	Fine, montmorillonitic, isohyperthermic
machete	Udic Haplustalfs	Fine, mixed, isohyperthermic
machuelo	Tropic Fluvaquents	Fine, mixed (calcareous), isohyperthermic
maguayo	Vertic Ustropepts	Fine, mixed, isohyperthermic
malaya	Lithic Eutropepts	Clayey, mixed, isohyperthermic
maleza	Typic Paleudults	Clayey, oxidic, isohyperthermic
maní	Fluvaquentic Eutropepts	Fine, mixed, isohyperthermic
maragüez	Typic Eutropepts	Fine-loamy, mixed, isohyperthermic
maresúa <sup>1</sup>	Typic Eutropepts	Clayey-skeletal, mixed, isohyperthermic
mariana	Ustic Dystropepts	Fine, mixed, isohyperthermic
maricao	Dystropeptic Tropudults	Clayey, mixed, isothermic
martín Peña	Tropic Fluvaquents	Fine, mixed, nonacid, isohyperthermic
matanzas	Tropeptic Eutrorthox	Clayey, oxidic, isohyperthermic

Maunabo	Typic Tropaquepts	Fine, mixed, acid, isohyperthermic
Mayo	Typic Dystropepts	Coarse-loamy, mixed, isohyperthermic
Mercedita	Not classified because of original, broad or vague definition	
Meros	Typic Ustipsamments	Mixed, isohyperthermic
Moca	Vertic Tropudults	Clayey, mixed, isohyperthermic
Montegrande	Vertic Eutropepts	Fine, mixed, isohyperthermic
Morado	Typic Eutropepts	Fine-loamy, mixed, isohyperthermic
Múcara	Vertic Eutropepts	Clayey, montmorillonitic, isohyperthermic, shallow
Naranjito	Typic Tropohumults	Clayey, mixed, isohyperthermic
Naranjo <sup>1</sup>	Eutropeptic Rendolls	Fine, mixed, isohyperthermic
Nipe	Typic Acrorthox	Clayey, oxidic, isohyperthermic
Palmarejo	Typic Haplustults	Clayey, mixed, isohyperthermic
Palmas Altas	Not classified because of original, broad or vague definition	
Pandura	Typic Eutropepts	Loamy, mixed, isohyperthermic, shallow
Parcelas	Vertic Dystropepts	Fine, mixed, isohyperthermic
Paso Seco	Udic Chromusterts	Clayey over loamy-skeletal, mixed, isohyperthermic
Patillas	Dystropeptic Tropudults	Fine-loamy, mixed, isohyperthermic
Pellejas	Typic Dystropepts	Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic
Perchas <sup>1</sup>	Typic Tropaquepts	Fine, mixed, acid, isohyperthermic
Picacho	Aquic Tropohumults	Clayey, mixed, isothermic
Piñones	Thapto-Histic Tropic Fluvaquents	Fine, mixed, acid, isohyperthermic
Plata	Typic Eutropepts	Loamy-skeletal, mixed, isohyperthermic
Ponceña	Udic Pellusterts	Fine, mixed, isohyperthermic
Portugués	Not classified because of original, broad or vague definition	
Pozo Blanco	Typic Calciustolls	Loamy, carbonatic, isohyperthermic, shallow
Quebrada	Typic Eutropepts	Fine, mixed, isohyperthermic
Reilly	Fluventic Hapludolls	Sandy-skeletal, mixed, isohyperthermic
Reparada	Thapto-Histic Tropic Fluvaquents	Fine, mixed, nonacid, isohyperthermic
Resolución	Not classified because of original, broad or vague definition	
Río Arriba	Vertic Paleudalfs	Fine, mixed, isohyperthermic

Table 3. — Listing and Classification of Soil Series of Puerto Rico (continued)

Series	Subgroup	Family
Río Cañas	Not classified because of original, broad or vague definition	
Río Lajas	Arenic Rhodic Paleudults	Loamy, siliceous, isohyperthermic
Río Piedras	Typic Tropudults	Clayey, kaolinitic, isohyperthermic
Rosario	Tropeptic Haplorthox	Clayey, oxidic, isohyperthermic, shallow
Sabana	Lithic Dystropepts	Clayey, mixed, isohyperthermic
Sabana Seca	Oxic Plinthaquults	Clayey, mixed, isohyperthermic
Saladar	Fluvaquentic Troposaprists	Euic, isohyperthermic
San Antón	Cumulic Haplustolls	Fine-loamy, mixed, isohyperthermic
San Germán	Lithic Ustorthents	Loamy-skeletal, carbonatic, isohyperthermic
San Sebastián <sup>1</sup>	Typic Tropudalfs	Clayey-skeletal, carbonatic, isohyperthermic
Santa Clara	Eutropeptic Rendolls	Fine, mixed, isohyperthermic
Santa Isabel	Udic Pellusterts	Fine, montmorillonitic, isohyperthermic
Santa Marta	Typic Dystroperpts	Fine, oxidic, isohyperthermic
Santoni <sup>1</sup>	Vertic Tropaquepts	Fine, mixed, (calcareous), isohyperthermic
Serrano	Tropic Fluvaquents	Fine-loamy over sandy or sandy-skeletal, mixed, isohyperthermic
Sóller	Eutropeptic Rendolls	Clayey, mixed, isohyperthermic, shallow
Sosa	Plinthic Haplustults	Clayey, oxidic, isohyperthermic
Talante	Aeric Tropic Fluvaquents	Coarse-loamy over sandy or sandy-skeletal, mixed, acid, isohyperthermic
Tanamá	Lithic Tropudalfs	Clayey, mixed, isohyperthermic
Teja	Lithic Troporthents	Loamy-skeletal, mixed, acid, isohyperthermic
Teresa	Vertic Halaquepts	Fine, mixed, isohyperthermic
Tiburones	Not classified because of original, broad or vague definition	
Toa	Fluventic Hapludolls	Fine, mixed, isohyperthermic
Torres	Plinthic Palehumults	Clayey, oxidic, isohyperthermic
Tuque	Petrocalcic Calciustolls	Clayey-skeletal, mixed, isohyperthermic, shallow

Ursula	Not classified because of original, broad or vague definition	
Utado	Typic Humitropepts	Fine-loamy, mixed, isothermic
Vayas	Tropic Fluvaquents	Fine, mixed, nonacid, isohyperthermic
Vega Alta	Plinthic Tropudults	Clayey, mixed, isohyperthermic
Vega Baja	Aeric Tropaqualfs	Fine, mixed, isohyperthermic
Via	Typic Tropudalfs	Fine-loamy, mixed, isohyperthermic
Vieques	Typic Ustropepts	Fine-loamy over sandy or sandy-skeletal, Mixed, isohyperthermic
Vives	Fluventic Ustropepts	Fine-loamy, mixed, isohyperthermic
Viví	Fluventic Eutropepts	Coarse-loamy, mixed, isohyperthermic
Voladora <sup>1</sup>	Typic Rhodudults	Clayey, oxidic, isohyperthermic
Yabucoa	Not classified because of original, broad or vague definition	
Yauco	Typic Calciustolls	Fine-silty, carbonatic, isohyperthermic
Yunes	Typic Dystropepts	Loamy-skeletal, mixed, isohyperthermic, shallow
Yunque	Epiaquic Palehumults	Clayey, mixed, isothermic
Zarzal <sup>1</sup>	Aeric Tropic Fluvaquents	Fine-loamy over sandy or sandy-skeletal, mixed, nonacid, isohyperthermic

<sup>1</sup>Refer to tentative series.

<sup>2</sup>Refer to inactive series.



### RESUMEN

En este trabajo se describe un nuevo sistema de clasificación de suelos conocido como U.S. Soil Taxonomy y su nomenclatura tal y como aplica a Puerto Rico. El sistema incluye las siguientes categorías: Ordenes, Subórdenes, Grandes Grupos, Subgrupos, Familias y Series. Se incluyen definiciones para que se facilite entender el significado de los nombres de las categorías y cómo estos nombres de por sí indican los rasgos característicos del suelo. El sistema está basado primordialmente en el suelo en sí y en criterios que se pueden cuantificar. Es una clasificación natural basada en las propiedades de los suelos. Siguiendo un sistema armónico con la clasificación de los suelos de los Estados Unidos, los de Puerto Rico se han clasificado en los siguientes órdenes: Alfisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Ultisols y Vertisols. Se han reconocido Spodosols en Puerto Rico, pero su clasificación está pendiente de estudios más profundos. Es de esperarse que también se encuentren Aridisols en las partes más áridas de la Isla. Hay un total de 181 series de suelos en Puerto Rico, de las cuales 157 ya están clasificadas.

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