83-2

SOIL-ASSOCIATION MAP OF THE WESTERN HALF OF THE TUCSON 1 x 2 DEGREE QUADRANGLE

1:120,000 scale, prepared by Roger B. Morrison

This map has been prepared primarily by photointerpretation, using mainly 1:120,000-scale true-color aerial photographs, supplemented in places by 1:120,000 and 1:60,000-scale color-infrared aerial photographs. The published Soil Survey Reports on the Tucson and Casa Grande areas provided useful ground control, but their coverage is limited essentially to farming areas in the Santa Cruz River valley. Field-check traverses were made throughout the area, the density of traverses depending upon the variability and complexity of geomorphic and soil relationships and upon the available roads; additional field checks will be made before the final map is prepared.

The soil-association map units are assemblages of various kinds of soils that occur in close association in natural terrain units. Boundaries between the map units generally are gradational, although in places they are sharp. The soils are classified in terms of great soil groups of the new U. S. system of soil classification (given in Soil Taxonomy -- Agriculture Handbook 436, prepared by the Soil Survey Staff, Soil Conservation Service, U. S. Dept. of Agriculture, 1975); the soils are not classified in terms of soil series. The 'Appendix to Soil-Association Map Explanation' gives summary definitions of the great soil group terms used in the Map Explanation below. The map-unit symbols are designed to be direct-reading and to convey the maximum amount of specific information. The symbols on the first line show the "mix" of soil great groups within a given area -- the first symbol indicates the commonest great group, the second symbol the next-commonest great group, and so on. The symbols on the second line denote the particle-size distribution and the principal lithologies of any gravel-size particles.

The soil-association map will be most useful if it is used in combination with several other maps of this area: slope/relief, erosion susceptibility/ease of excavation, and geomorphic features.

SOIL-ASSOCIATION MAP OF THE WESTERN HALF OF THE TUCSON 1 x 2 DEGREE QUADRANGLE

Explanation

TOP LINE: SOIL GREAT GROUPS, listed in order of decreasing abundance in each map unit

C	Calciorthids (with minor Paleorthids in places)
Cm	Paleorthids (with minor Calciorthids locally)
Cb	Camborthids
F	Torrifluvents, locally with Torriorthents, Torripsamments and/or Cumulic ("alluvial") Haplustolls
H	Haplargids, minor Paleargids in places
Hω	Haplargids, weak to marginal, includes Camborthids locally
N	Natrargids
P	Torripsamments, generally without appreciable $CaCO_3$ concentration, locally with minor Torrifluvents, Torriorthents, and/or Cumulic Haplustolls
Pc	Torripsamments with appreciable $CaCO_3$ concentration
Pd	Torripsamments, mostly eolian sand (commonly as coppice dunes)
R	Rockland (mostly exposed bedrock; local inclusions of Entisols and shallow developed soils; lower case letters after R indicate rock type (see below))
Ad	mine waste dumps
At	mill tailings ponds
Am	open-pit mines

SOIL-ASSOCIATION MAP OF THE WESTERN HALF OF THE TUCSON 1 x 2 DEGREE QUADRANGLE

Explanation, page two

BOTTOM LINE: PARTICLE-SIZE and ROCK TYPE (lower-case letters except for R)

Particle-size

g	gravel (pebbly to bouldery)
gs	gravelly sand
s	sand
sts	sandy loam
st	loam, silt loam, silt
stc	clay loam, silty clay, and clay
R	many small rock outcrops, generally increasing in abundance toward mountains

Rock type (for gravelly and rockland units; in parenthesis)

g	"granite"--granitic rocks including granitic gneiss
l	calcareous rocks (limestone, dolomite, calcareous shale)
m	metamorphic rocks (gneiss, schist, phyllite, slate)
s	sedimentary rocks, generally non-calcareous and non-volcanic
t	tuffaceous rocks (tuff, tuff breccia, tuffaceous conglomerate and sandstone)
v	volcanic rocks, mixed types
vi	volcanic rocks, intermediate to basic
vs	volcanic rocks, silicic
x	mixed rock types

APPENDIX TO SOIL-ASSOCIATION MAP EXPLANATION

SUMMARY DEFINITIONS[1/] OF ORDERS, SUBORDERS, AND GREAT GROUPS OF THE NEW U. S. SYSTEM OF SOIL CLASSIFICATION

In the new system of soil classification developed by the U. S. Soil Conservation Service, soils are classified into orders, suborders, great groups, and subgroups. Brief definitions through the great group category follow, for those great groups that are represented on the soil association map. Present dominant land use is given for the suborders.

Equivalents also are given, both in terms of the old U. S. (great soil group) classification, and also according to the World Soil Map classification of the Food and Agriculture Organization of the United Nations (the equivalents listed under "FAO =").

ARIDISOLS

Soils that have pedogenic horizons and are low in organic matter (i.e., have an ochric epipedon) and are never moist as long as 3 consecutive months.

Argids

Aridisols that have a horizon in which clay has accumulated with or without alkali (sodium). Used mostly for rangeland and some irrigated crops.

Haplargids:-- Argids that have a loamy horizon of clay accumulation with or without alkali (sodium). In this area all the Haplargids also have an underlying horizon of calcium carbonate accumulation. Formerly Desert, Red Desert, Sierozem, and some Brown soils (US); FAO = Luvic Ermosols.

Natrargids:-- Argids that have a horizon of clay and alkali (sodium) accumulation. Formerly Solonetz soils (US); FAO = Ochric Solonetz soils.

Paleargids:-- Argids that have an indurated (petrocalcic) horizon cemented by carbonates or have a clayey subsurface horizon with or without alkali (sodium) tha abruptly changes in texture into an overlying horizon. Formerly Desert, Red Desert, and Sierozem soils (US); FAO = Luvic Ermosols.

Orthids

Aridisols that have accumulations of calcium carbonate, gypsum, or other salts more soluble than gypsum but have no horizon of accumulation of clay. They may have horizons from which some materials have been removed or altered. Used mostly for range and for some irrigated crops.

Calciorthids:-- Orthids that lack a B horizon but have a horizon in which large amounts (more than 15%) of calcium carbonate or gypsum have accumulated. Formerly Calcisols (US); FAO = Calcic Ermosols, Gypsic Ermosols.

Camborthids:-- Orthids with a horizon from which some materials have been removed or altered (a cambic horizon) but without large accumulation of calcium carbonate or gypsum. Formerly some Desert, Red Desert, and Sierozem soils (US); FAO = Calcic Cambisols and Cambisols.

Paleorthids:-- Orthids that have a hardpan (petrocalcic horizon) cemented with carbonates. Formerly Calcisols (US); FAO = Calcic Ermosols.

ENTISOLS

Soils that have (presumably[2]) no pedogenic horizons.

Fluvents

Entisols that have organic-matter content that decreases irregularly with depth; formed in loamy or clayey alluvial deposits. In dry regions used for rangeland and irrigated crops.

Torrifluvents:-- Fluvents that are never moist as long as 3 consecutive months. Formerly Alluvial soils (US); FAO = Fluvisols.

Orthents

Loamy or clayey Entisols that have a regular decrease in organic-matter content with depth. In dry regions used for rangeland and (locally) irrigated crops.

Torriorthents:-- Orthents that are never moist as long as 3 consecutive months. Formerly Regosols (US); FAO = Rhegosols.

Psamments

Entisols that have textures of loamy fine sand or coarser. Used for rangeland and irrigated crops in arid areas.

Torripsamments:-- Psamments that contain easily weatherable minerals; they are never moist as long as 3 consecutive months. Formerly Regosols (US); FAO = Rhegosols.

MOLLISOLS

Soils that have nearly black friable organic-rich surface horizons high in bases; formed mostly in subhumid and semiarid warm to cold climates.

Ustolls

Mollisols that are mostly in semiarid regions. During the warm season of the year, these soils are intermittently dry for a long period; many have subsurface horizons in which salts or carbonates have accumulated. Used for rangeland and timberland in map area.

Calciustolls:-- Ustolls that are calcareous throughout and have either an indurated (petrocalcic) horizon cemented by carbonates or a horizon in which calcium carbonate or gypsum has accumulated. Formerly Calcisols (US); FAO = Calcic Xerosols.

Haplustolls:-- Ustolls that have a subsurface horizon high in bases but without large accumulations of clay, calcium carbonate, or gypsum. Formerly Chernozem, Chesnut, and Brown soils (in part)(US); FAO = Haplic Xerosols, Haplic Castanozems.

1/ From "Soils in the United States" (compiled by the U. S. Soil Conservation Service, 1967): National Atlas, sheet 85, 1969, U. S. Geological Survey.

2/ Some Entisols actually have weak pedogenic horizons, e. g. in this area many Psamments, Orthents, and Fluvents have appreciable accumulation of pedogenic calcium carbonate, but too little to qualify as Calciorthids. (Some soil scientists now classify such soils as Camborthids.)