SOIL MAPPING IN MEXICO
CARTOGRAFÍA DE SUELOS EN MÉXICO

NATIONAL INSTITUTE OF STATISTICS AND GEOGRAPHY
INEGI

NATURAL RESOURCES DIRECTION
SOILS DEPARTMENT

2013 NATIONAL COOPERATIVE SOIL SURVEY NATIONAL CONFERENCE
JUNE 16-20-2013 Annapolis, Maryland

INEGI
INSTITUTO NACIONAL
DE ESTADÍSTICA Y GEOGRAFÍA

BACKGROUND

COMMISSION OF STUDIES OF THE NATIONAL TERRITORY

DIRECTION OF STUDIES OF THE NATIONAL TERRITORY

GENERAL DIRECTION OF GEOGRAPHY AND THE ENVIRONMENT

CETENAP 1968-CETENAL 1973 –DETENAL 1978 -INEGI 1983

CETENAP started as the National Mapping Agency; it had the responsibility of topographic and natural resources mapping

NATIONAL INSTITUTE OF STATISTICS AND GEOGRAPHY

In 1983, INEGI was created with the aim of coordinating the integration and development of the National System of Statistics, Geography and Informatics, joining the Statistical and Mapping Agencies in a single Information Agency

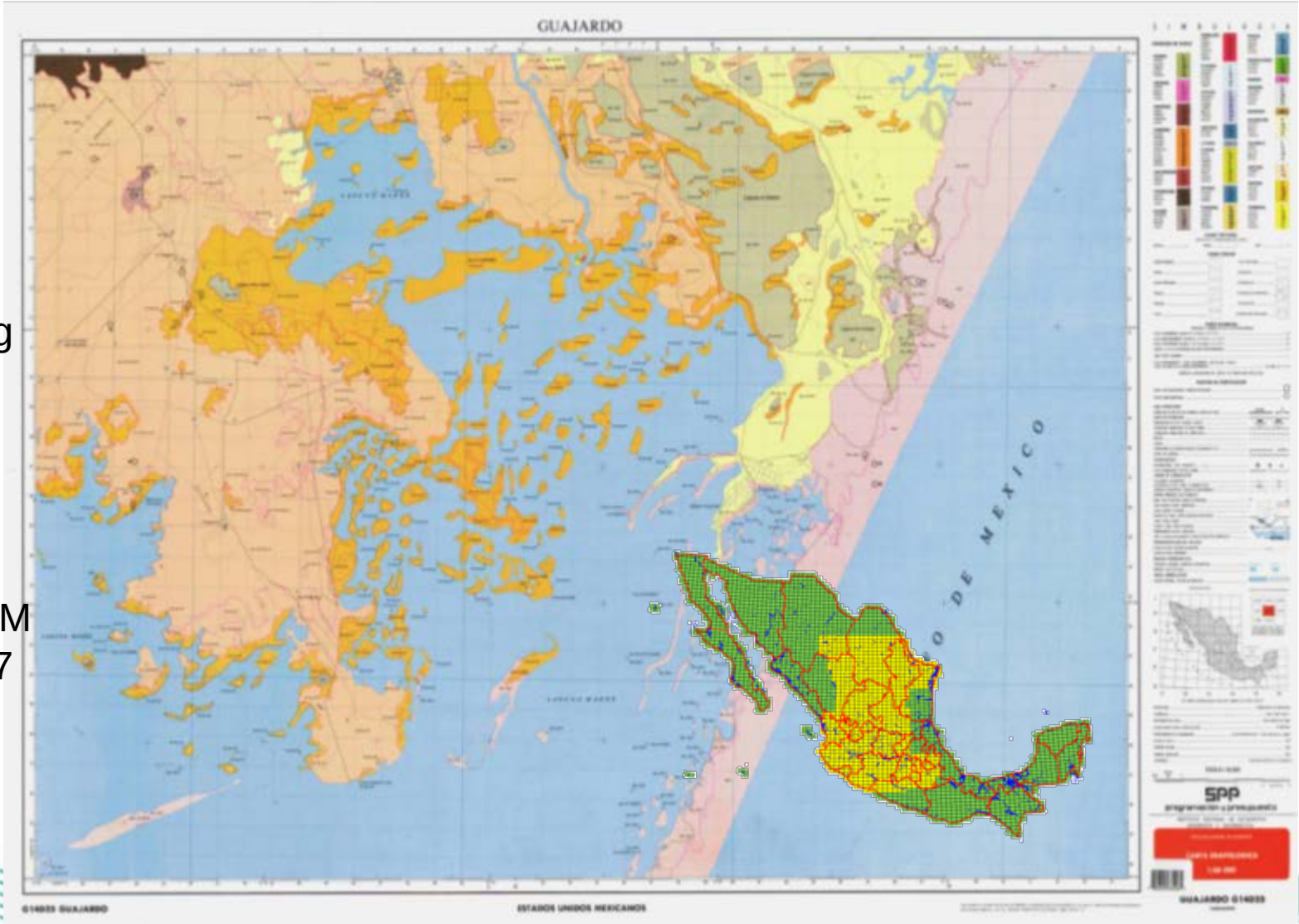
PEDOLOGICAL MAP SCALE 1:50000

Geographic Coverage
762 of 2285

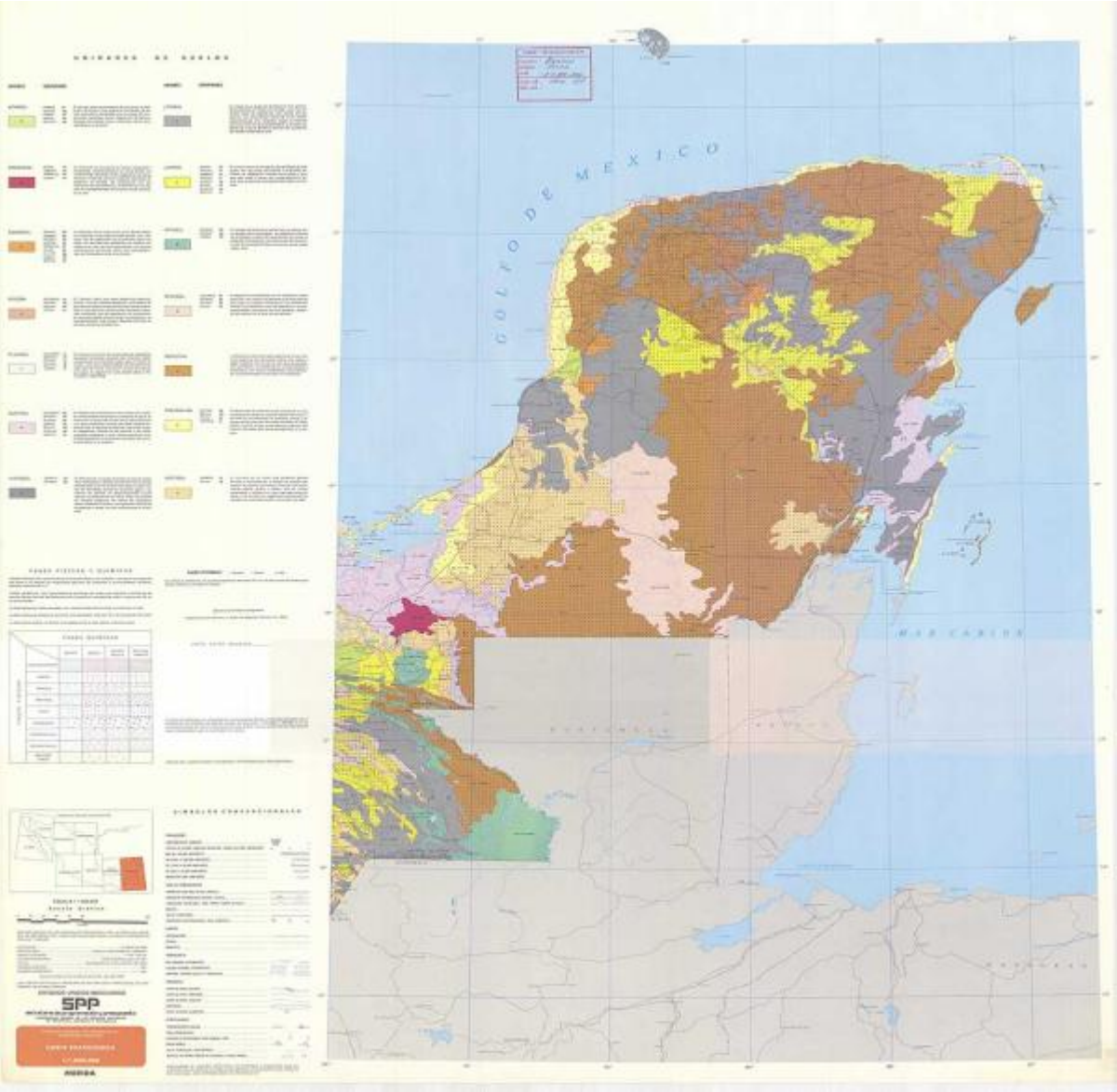
Date of editing
1968-1980

15' Latitude
20' longitude

Projection UTM
Datum NAD27



PEDOLOGICAL MAP SCALE 1: 1 000 000



Geographic Coverage
National (maps 8)

Date of editing
1979-1983

Projection
Lambert Conformal Conic

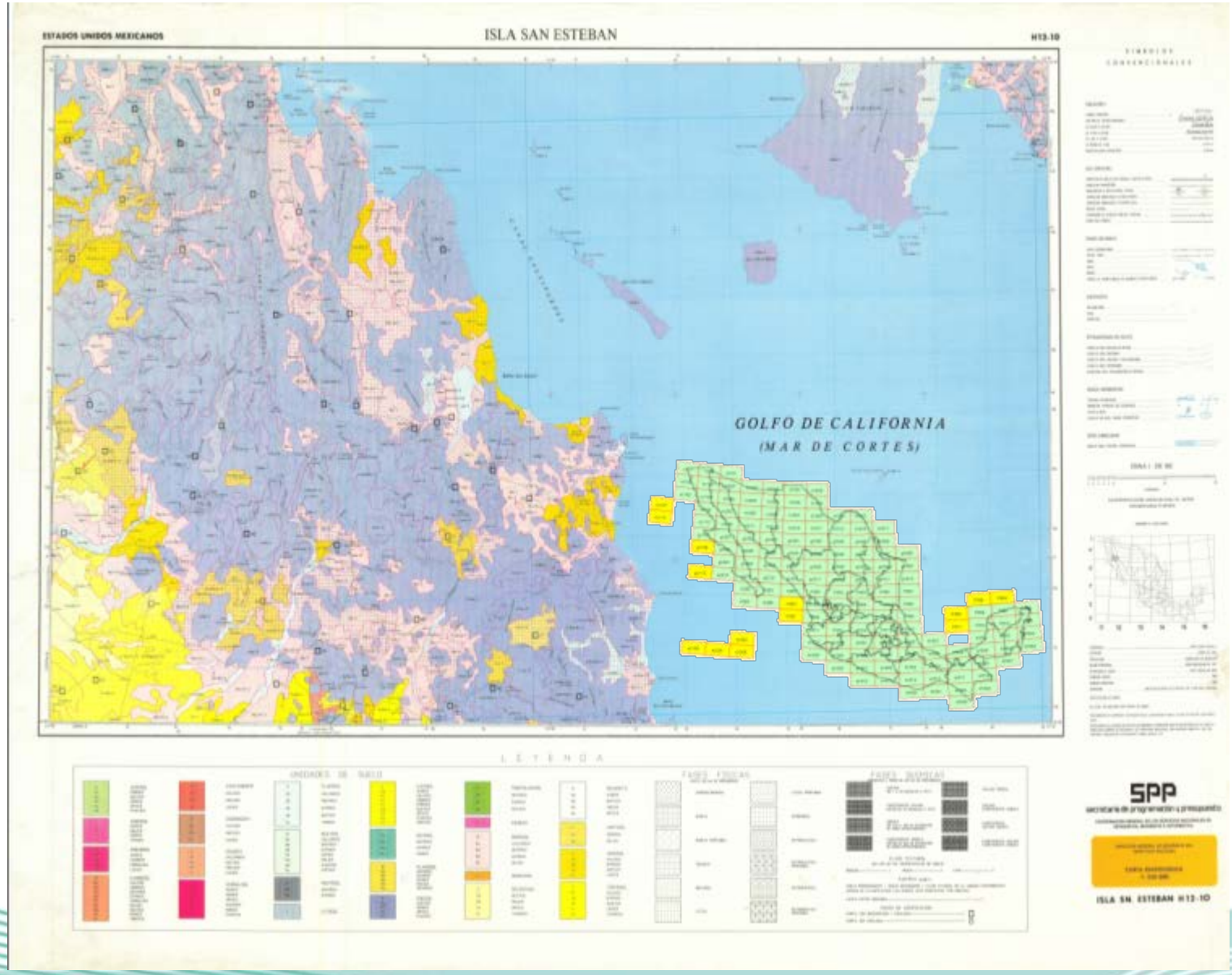
PEDOLOGICAL MAP SCALE 1: 250 000

Geographic Coverage
National

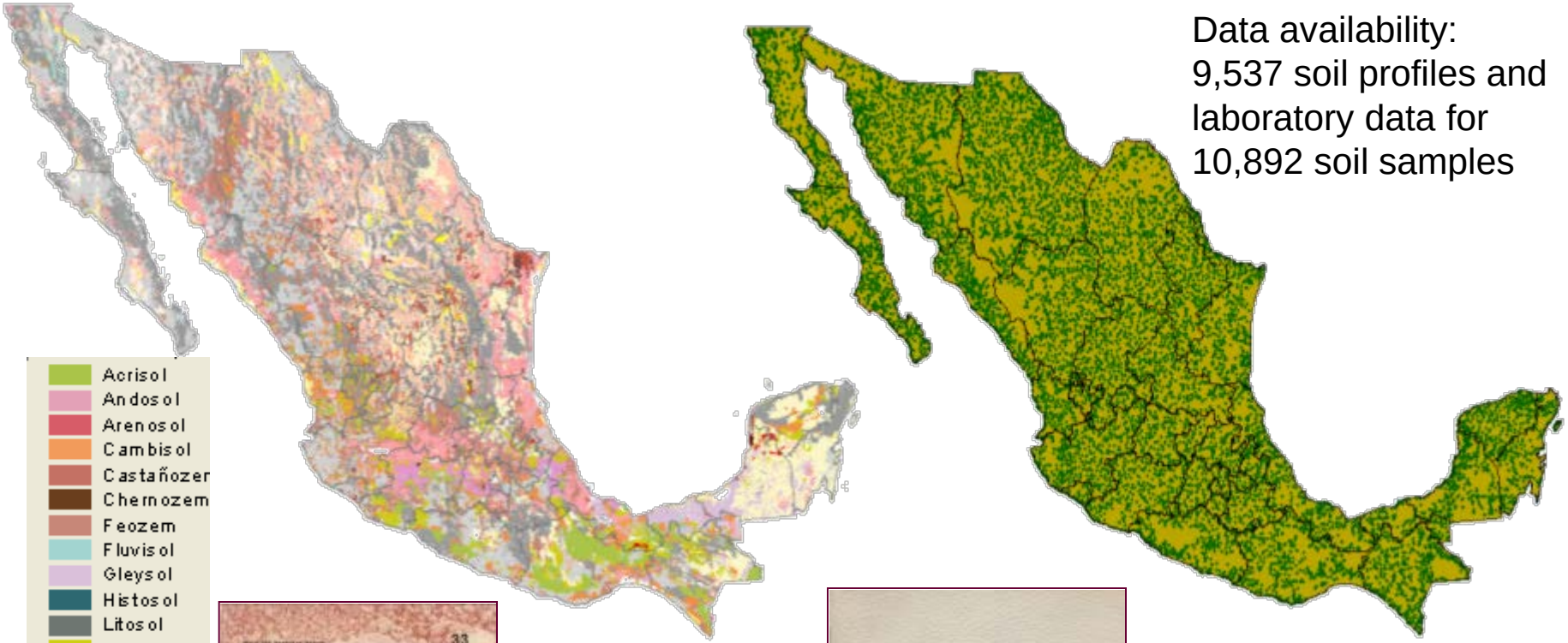
Date of editing
1980-1998

1° Latitude
2° longitude

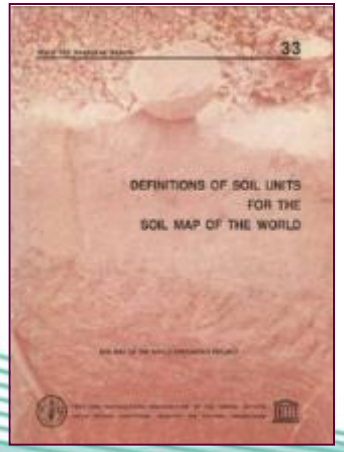
Projection UTM
Datum NAD27

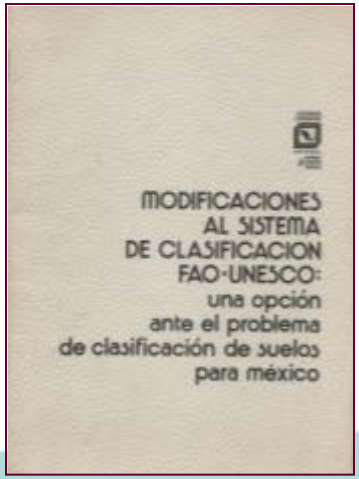


Pedological Data Set Scale 1:250000 Series I (1998- 2001)



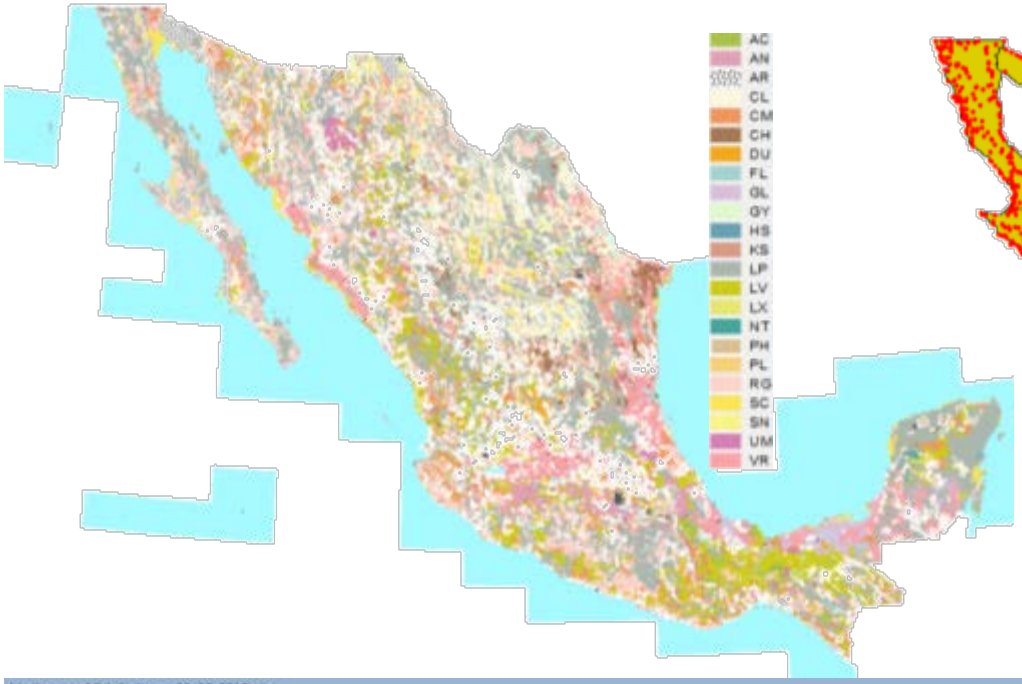
Data availability:
9,537 soil profiles and laboratory data for 10,892 soil samples

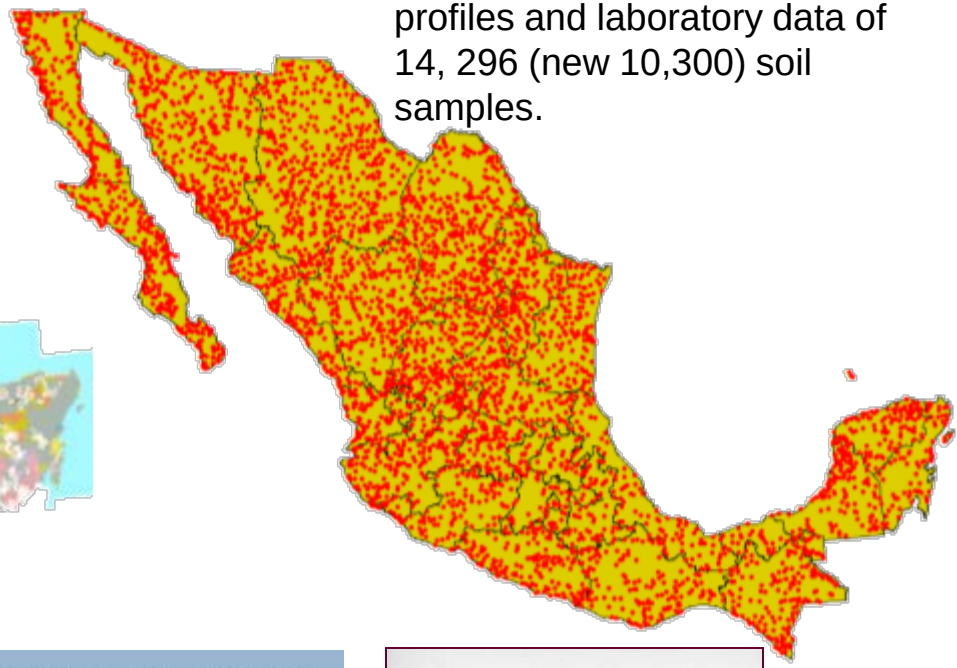




Pedological Data Set Scale 1:250000 Series II (2002-2008)

Information 4,429 (new 2,979) profiles and laboratory data of 14, 296 (new 10,300) soil samples.

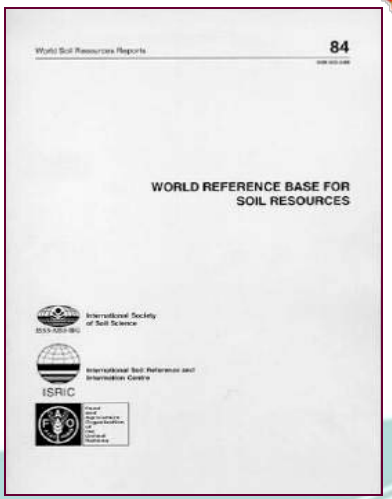




Attributes of Edaf_sii_pts_22-02-2013.shp

Id_perfil	Coord_x	Coord_y	Fecha	Clave_web	Altitud	Precip	Temp	Geología	Vegetación	Pendiente	Relieve	Lim_sup	Lim_inferior	Horizonte	Tipo_A	Hor	Ist_lat	Ist_lat	Ist_ut	Col_campo
016207-1	712875	2125983	20/11/2002	ANlivvjlum.ph,ap)/2	1450	2000	18	Ígnea extrusiva	PASTIZAL	20	5	0	29	A1	Vítrico	N	1	8	2	1	10YR2/1
016207-2	712875	2125983	20/11/2002	ANlivvjlum.ph,ap)/2	1450	2000	18	Ígnea extrusiva	PASTIZAL	20	5	29	63	A2	Vítrico	N	1	7	1	1	10YR2/2
016207-3	712875	2125983	20/11/2002	ANlivvjlum.ph,ap)/2	1450	2000	18	Ígnea extrusiva	PASTIZAL	20	5	63	95	B1	Árgico	N	1	7	1	1	10YR3/1
016207-4	712875	2125983	20/11/2002	ANlivvjlum.ph,ap)/2	1450	2000	18	Ígnea extrusiva	PASTIZAL	20	5	95	102	B2	Cámbico	N	1	6	3	2	10YR3/4
016207-5	712875	2125983	20/11/2002	ANlivvjlum.ph,ap)/2	1450	2000	18	Ígnea extrusiva	PASTIZAL	20	5	102	130	B3	Cámbico	N	1	6	4	2	10YR5/4
016207-6	712875	2125983	20/11/2002	ANlivvjlum.ph,ap)/2	1450	2000	18	Ígnea extrusiva	PASTIZAL	20	5	130	200	B4	Cámbico	N	1	6	4	2	10YR4/4

Ar	L	A	Clas_tx	Col_seco	Col_hum	Ce	Ph	Co	Cic	Sb	Sna	K	Ca	Na	Mg	Caco3	Caso4	Id_foto
8	30	62	Ca	2.5Y4/3	2.5Y2.5/1	0.1	5.9	10.3	65.7	13.4	0.2	0.3	6.2	0.1	2.2	0.0	0.0	016207-1
12	28	60	Ca	2.5Y4/2	2.5Y3/1	0.0	5.9	6.2	56.6	5.6	0.7	0.2	1.6	0.4	1.0	0.0	0.0	016207-1
24	18	58	Cra	10YR5/4	10YR4/4	0.3	5.8	3.5	47.9	7.0	2.1	0.2	1.1	1.0	1.0	0.0	0.0	016207-1
26	30	44	C	10YR5/6	10YR3/6	0.0	6.0	1.7	42.4	5.5	0.4	0.1	1.2	0.2	0.8	0.0	0.0	016207-1
28	24	48	Cra	10YR6/6	10YR3/6	0.0	6.2	1.2	54.5	4.1	0.3	0.1	1.1	0.2	0.9	0.0	0.0	016207-1
28	22	50	Cra	10YR6.5/6	10YR4/6	0.0	6.1	1.0	55.6	6.1	0.6	0.1	1.1	0.3	1.8	0.0	0.0	016207-1


World Soil Resources Reports 84

WORLD REFERENCE BASE FOR SOIL RESOURCES

International Society of Soil Science

International Soil Reference and Information Centre

ISRIC

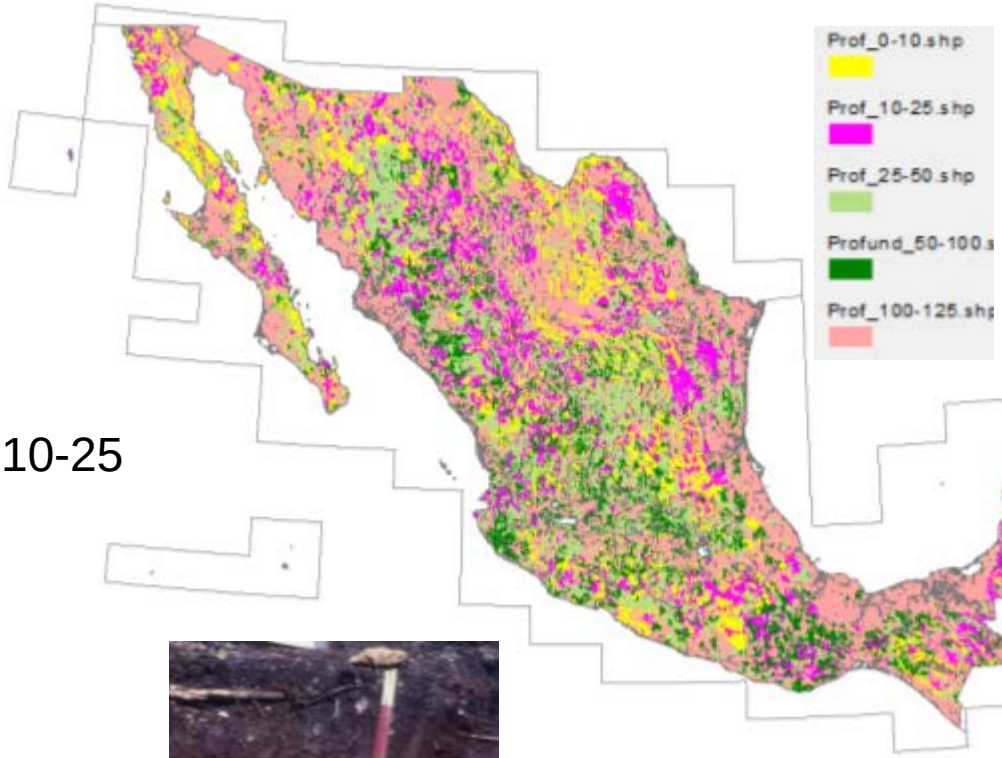
Dominant soil groups in Mexico

SOIL DEPTH MAP (POLYGONS)

Extremely shallow soil 0-10

Very shallow soil 10-25

Shallow soil 25-50

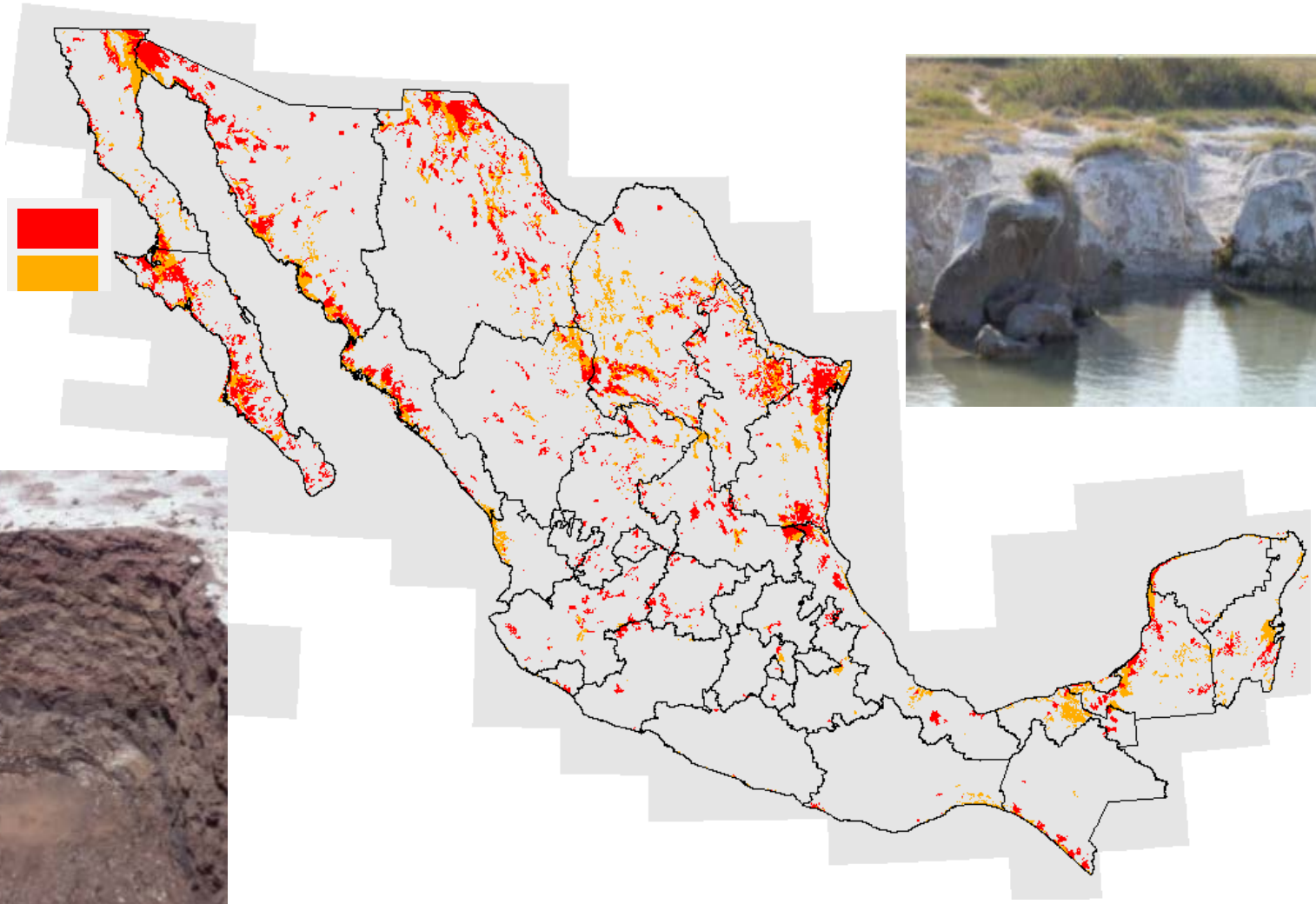


Generated using the soil depth qualifier. (WRB1998)

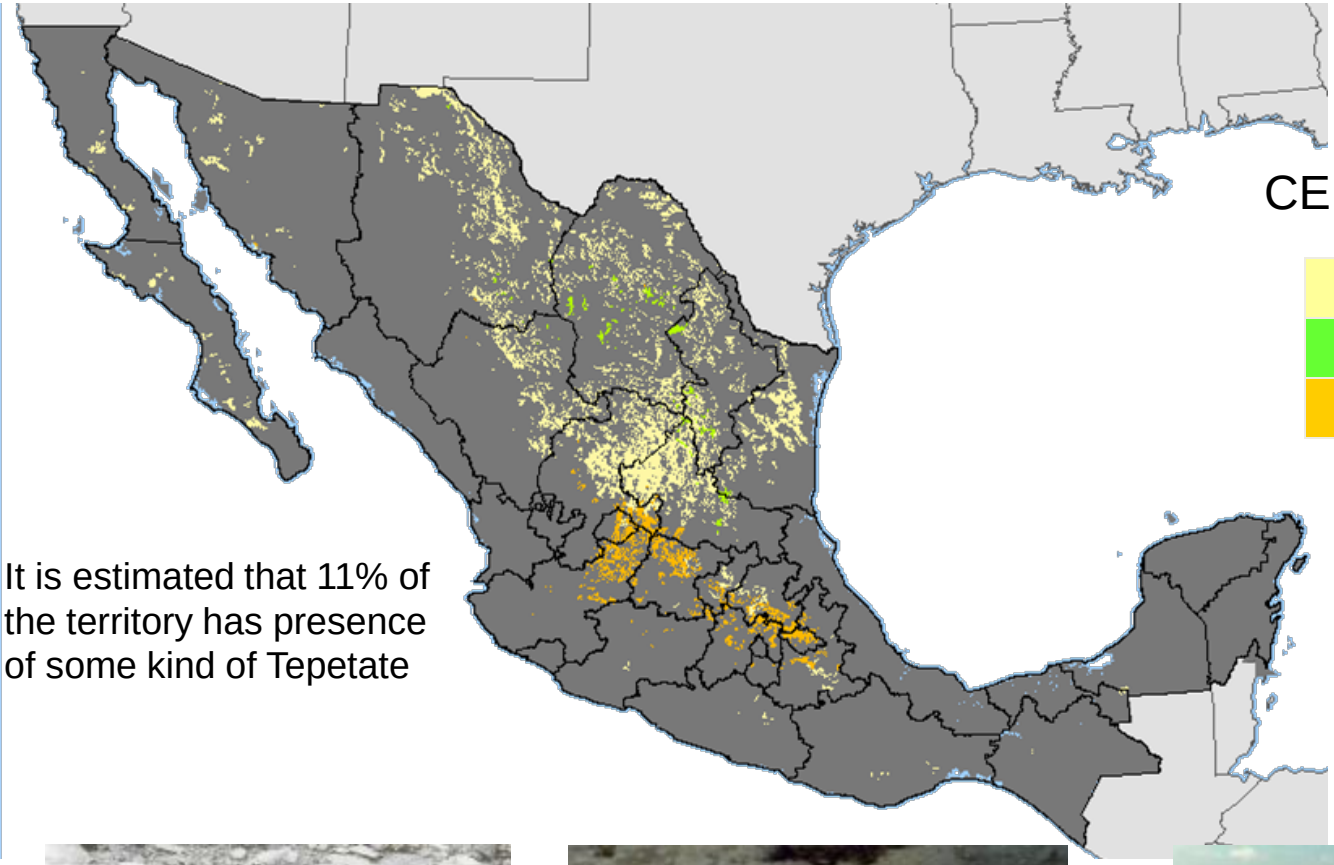
Moderately deep soil 50-100

Deep soil >100

SALTS AND/OR SODIUM IN THE SOIL MAP



TEPETATES (STONE BED) CEMENTATION

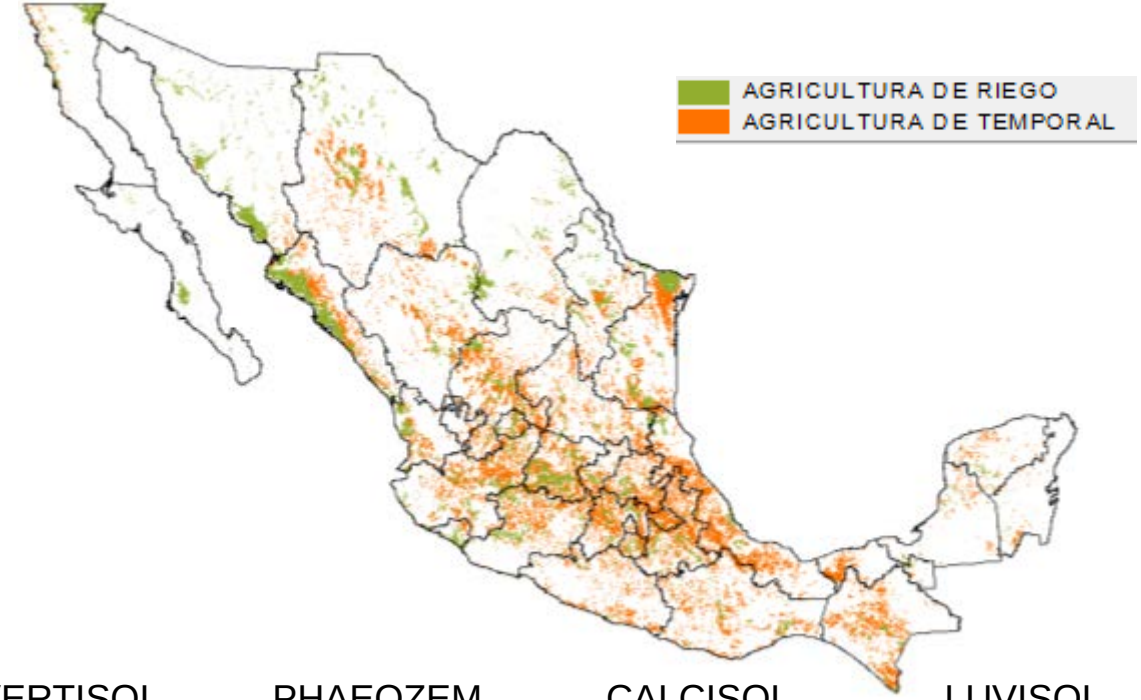


CEMENTING AGENT

- calcium carbonate
- calcium sulphate
- silica

It is estimated that 11% of the territory has presence of some kind of Tepetate

SOIL GROUPS IN THE AGRICULTURAL AREAS OF MEXICO



WITH IRRIGATION AGRICULTURE

SUELO	HECTÁREAS	% ESTIMADO
VERTISOL	3,582,239	37
PHAEOZEM	1,326,847	14
CALCISOL	1,089,752	11
CAMBISOL	619,155	6
LUVISOL	602,587	6
OTROS SUELOS	2,588,969	26

RAINFED AGRICULTURE

SUELOS	HECTÁREAS	% ESTIMADO
PHAEOZEM	4,523,735	20
VERTISOL	3,785,539	17
LUVISOL	2,826,724	13
REGOSOL	1,973,095	8
CALCISOL	1,138,303	6
OTROS SUELOS	8,105,067	36

VERTISOL

PHAEOZEM

CALCISOL

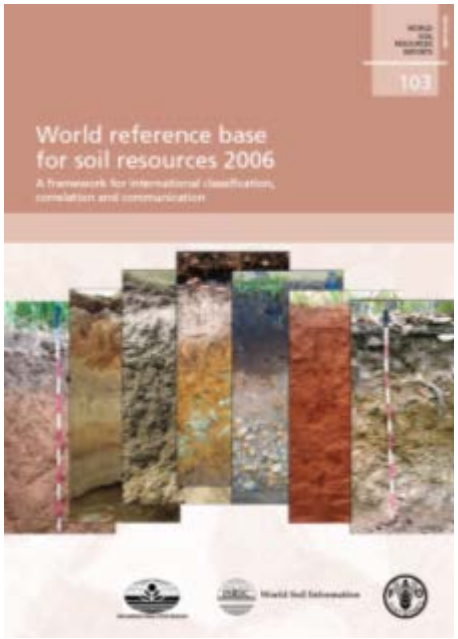
LUVISOL

REGOSOL

CAMBISOL

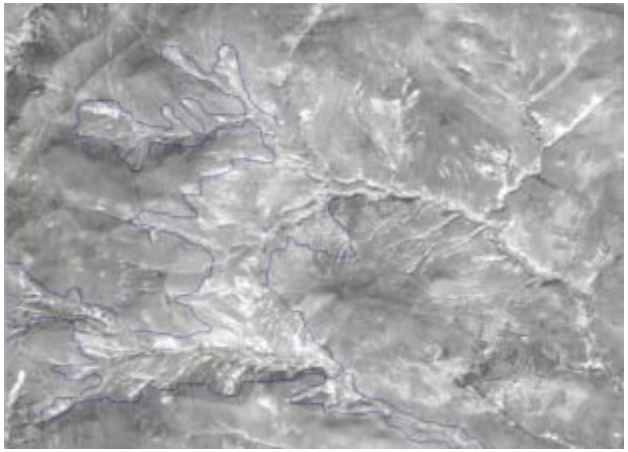
PEDOLOGICAL INFORMATION SCALE 1: 250 000 SERIES III (2013-2017)

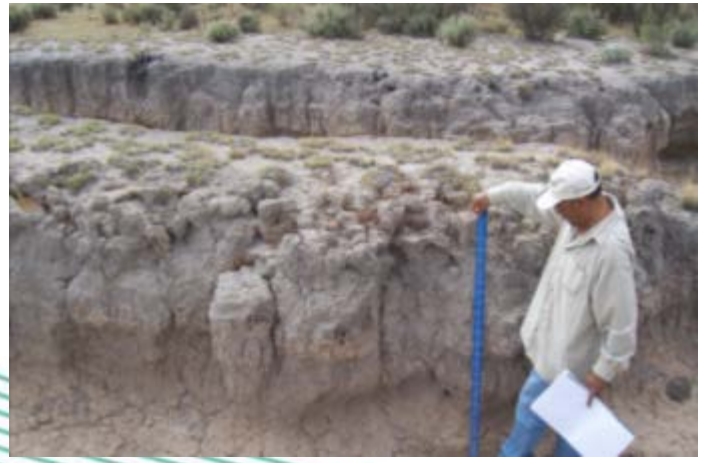
Reclassification and conversion of series II data

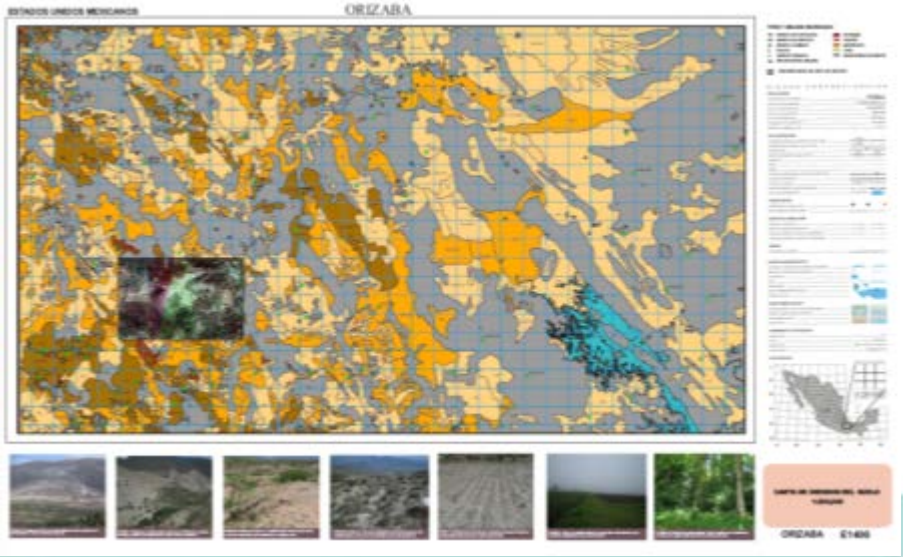


SOIL EROSION MAP SCALE 1:250000

Generate an inventory of eroded areas through interpretation and analysis of images, supported with field work.

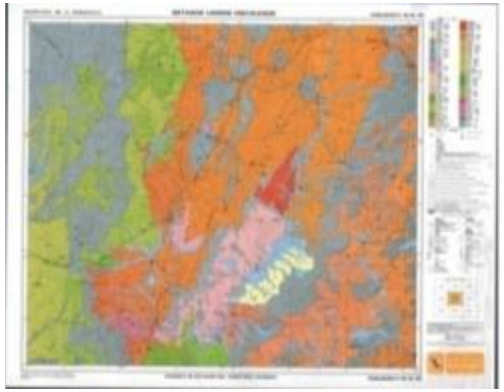






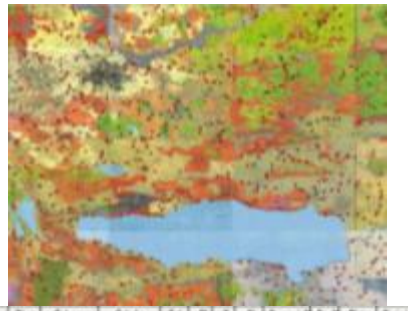
PEDOLOGICAL MAPPING SCALE 1:50000

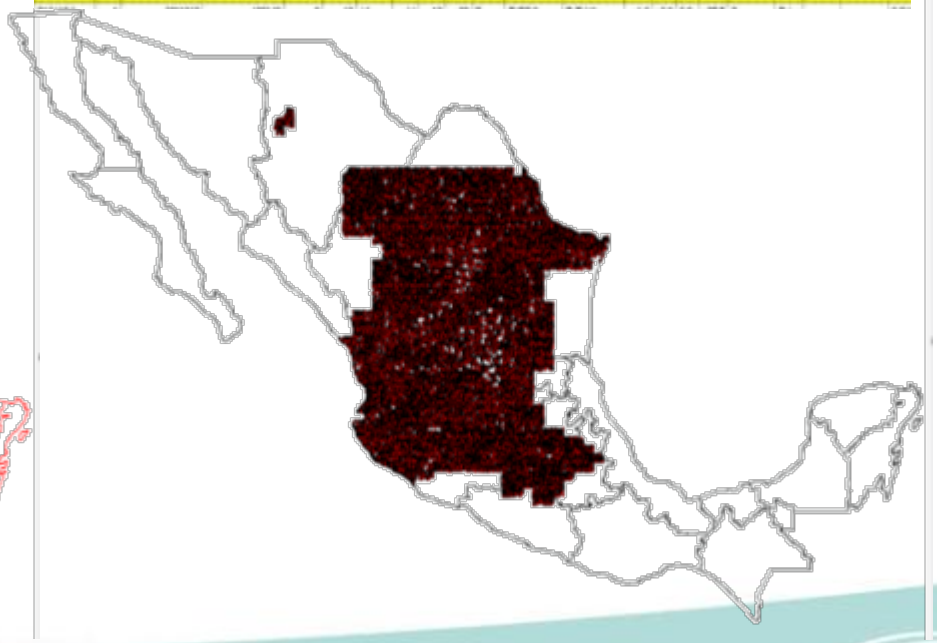
Scanning and georeferencing (762)



22993 Soil Profiles scale 1: 50 000

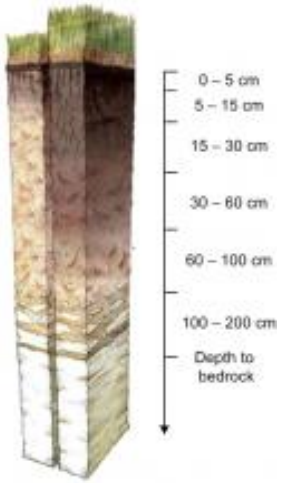
22, 993

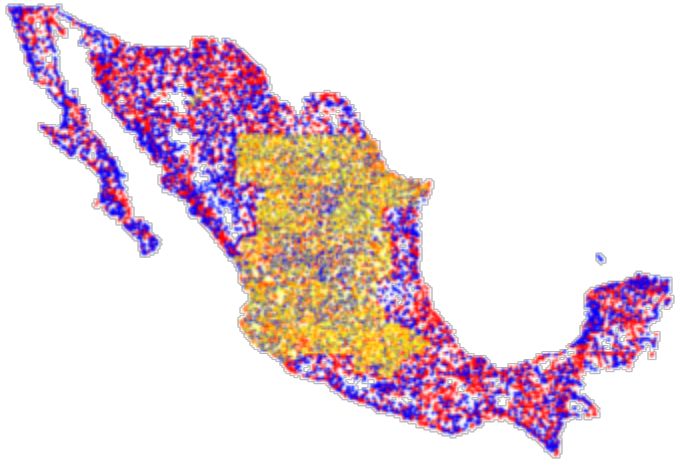




Global Soil Map.net

Ten soil properties will be estimated at each location. These are: (1) total profile depth (cm), (2) plant exploitable (effective) soil depth (cm), (3) organic carbon (g/kg), (4) pH, (5) sand (g/kg), (6) silt (g/kg), (7) clay (g/kg), (8) gravel (g/kg), (9) bulk density (Mg/m^3) and (10) available water capacity (mm). Additional soil properties including ECEC (cmol$_c$/kg) and EC (dS/m) may be predicted but these are not mandatory.





Standardization of the information

Id_perfil	Coord_x	Coord_y	Fecha	Clave	Lim_sup	Lim_inf	R	L	A	Clas_text	Col_seco_l	Col_hum_la	Ce	Ph	Co	Cic	Sb	Sna	K	Ca	Mg	Na	Caco3	Caso4
000120-1	771256	1750509	11/10/1986	CMdyphu(ro)/3R	0	11	44	32	24	R	5YR5/4	5YR3/4	1.0	6.0	2.0	23.0	53.0	0.0	0.3	9.4	2.5	0.0	9999.	9999.
000120-2	771256	1750509	11/10/1986	CMdyphu(ro)/3R	11	24	46	30	24	R	5YR4/6	5YR3/4	1.0	5.9	1.3	18.8	61.7	0.0	0.1	9.7	1.8	0.0	9999.	9999.
000120-3	771256	1750509	11/10/1986	CMdyphu(ro)/3R	24	40	48	34	18	R	2.5YR5/6	2.5YR3/6	1.0	5.9	0.8	21.5	53.0	0.5	0.0	9.4	1.9	0.1	9999.	9999.
000120-4	771256	1750509	11/10/1986	CMdyphu(ro)/3R	40	74	38	46	16	Crl	2.5YR4/8	2.5YR3/6	1.0	5.7	0.3	19.8	46.5	0.0	0.0	6.6	2.6	0.0	9999.	9999.
000120-5	771256	1750509	11/10/1986	CMdyphu(ro)/3R	74	87	22	26	52	Cra	2.5YR5/8	2.5YR4/6	1.0	5.5	0.2	17.3	54.3	0.6	0.2	6.3	2.8	0.1	9999.	9999.

30 cm of soil separates man from hunger

thank you very much

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