

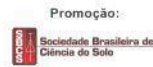
Application of electrical conductivity profiling for the characterization and textural discretization of a Technosol

Alexandre Muselli Barbosa
Camila Camolesi Guimarães

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Alexandre Muselli Barbosa
Institute for Technological Research (IPT)

Introduction

- The soil matrix is usually significantly heterogeneous and anisotropic;
- Vertical and horizontal variability of the media is a important data for environmental studies;
- The acquisition of large amounts of high-density data is a challenge when considering the vertical characterization of soils;
- An ideal penetrating data acquisition method must present characteristics that favor its field application, especially in contaminated sites;
- This study aims to evaluate the applicability of electrical conductivity profiling as an indirect, non-invasive characterization method of stratigraphic variation.

Methodology

Study Area:

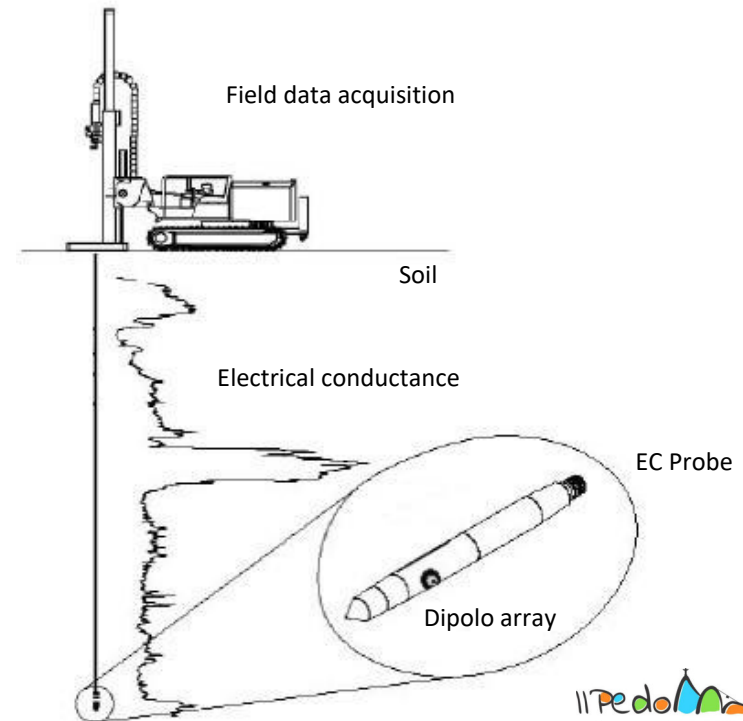
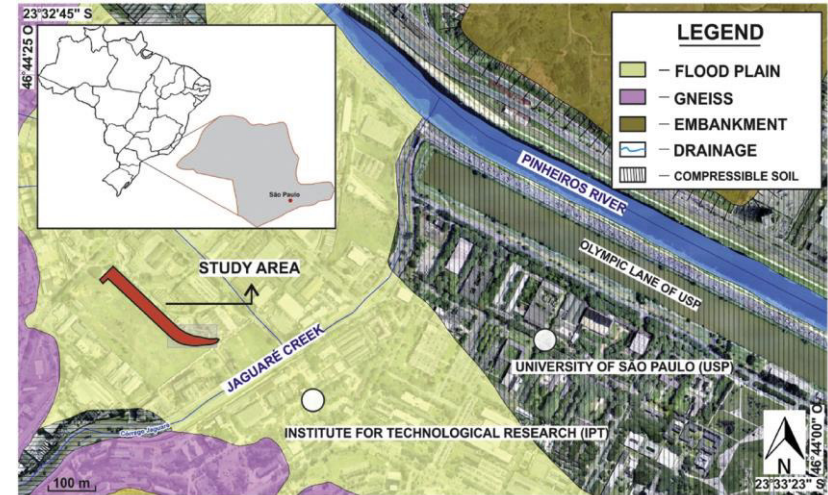
Urban zone, São Paulo

Field activities:

- Soil profile sample
- Electrical Conductivity profiling test

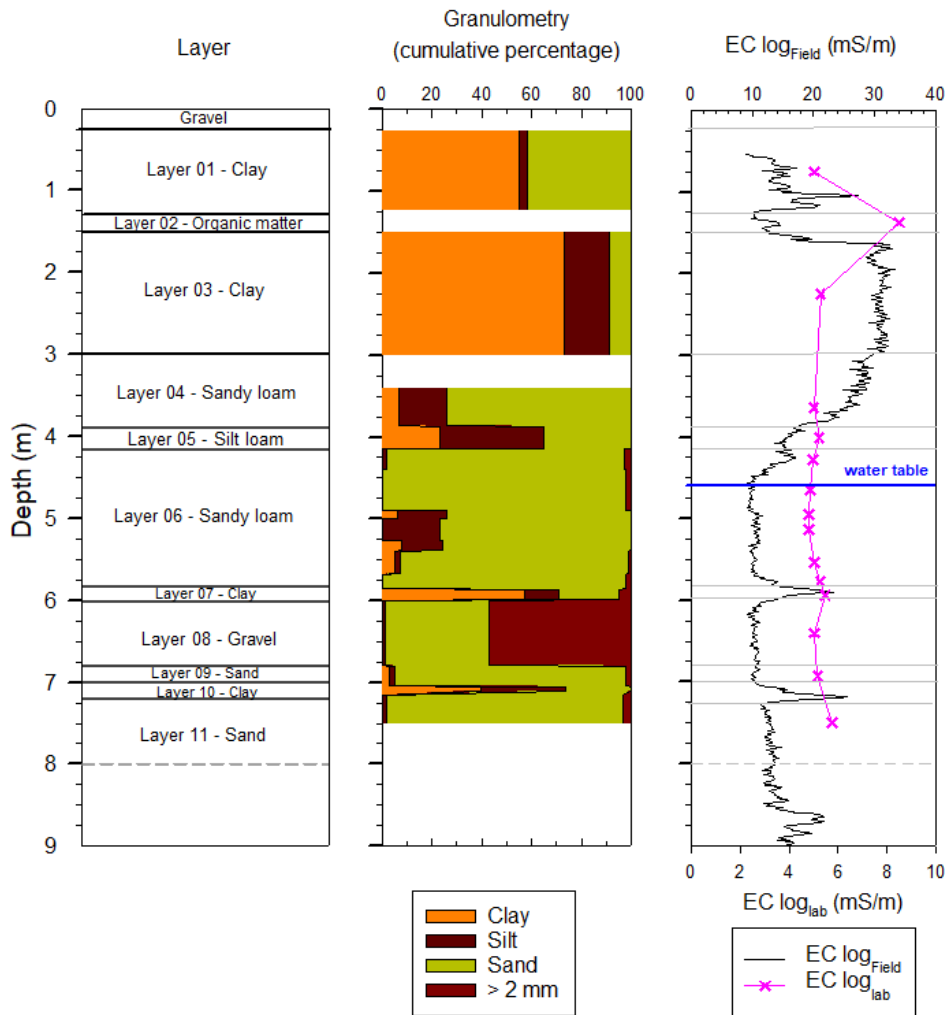
Laboratory activities:

- Manual description
- Soil Classification
- Samples selection
- Granulometric analysis, and
- electrical conductivity bench tests

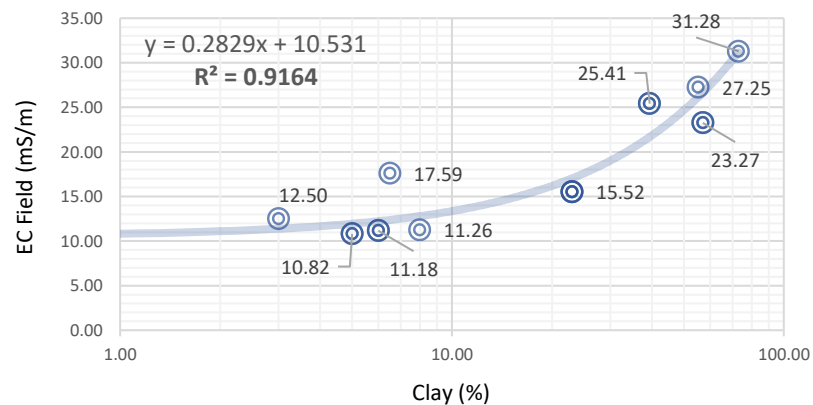


Results and discussion

Soil Classification: Epileptic Humic Technosol



Layer	Top	Base	Clay	Silt	Sand	EC Lab	EC Field
	(m)		(%)			(mS/m)	
01	0.26	1.24	55.2	3.2	41.6	5.03	27.3
02	1.24	1.50	-	-	-	8.51	9.9
03	1.50	3.00	73.0	18.3	8.7	5.33	31.3
04	3.40	3.87	6.5	19.5	74.0	5.02	17.6
05	3.87	4.15	23.0	42.0	35.0	5.23	15.5
	4.15	4.40	0.0	2.0	95.0	4.99	10.0
	4.40	4.90	0.0	0.0	98.0	4.86	9.3
	4.90	5.00	6.0	20.0	74.0	4.81	11.2
06	5.00	5.27	0.0	23.0	77.0	4.82	10.1
	5.27	5.40	8.0	16.0	76.0	-	11.3
	5.40	5.68	5.0	2.0	92.0	5.04	10.8
	5.68	5.87	0.0	0.0	98.0	5.28	9.8
07	5.87	6.00	57.0	14.0	24.0	5.46	23.3
08	6.00	6.80	0.0	1.4	41.4	5.05	9.7
09	6.80	7.00	3.0	2.0	93.0	5.18	12.5
10	7.00	7.05	39.4	34.5	26.1	-	25.4
11	7.05	7.50	0.0	2.0	71.7	5.76	11.6



Conclusions

- The application of the EC profiling test with horizontal dipole-type sensor array for stratigraphic characterization is feasible;
- Enabling the discretization of thin soil layers, even in a heterogeneous profile;
- The EC field values are directly related to clay layers, and inversely related to organic layers, requiring the collection of samples for the calibration and interpretation of indirect data from the site.
- Further studies are necessary to evaluate relationships with mineral and organic soil particles and the electrical conductivity profiling method in other tropical soils.



Thanks!

Alexandre Muselli Barbosa, MSc (muselli@ipt.br)

Researcher

Investigations, Risks and Environmental Management Section – IPT (www.ipt.br)

PhD Student

Postgraduate Program in Chemical Engineering – Poli/USP (sites.usp.br/peq_epusp/pb/)