

## ESTIMATION OF INPUT PARAMETERS OF SWAT MODEL THROUGH GEOPROCESSING

Andrade, CWL<sup>1</sup>; Montenegro, SMGL<sup>2</sup>; Ribeiro Neto, A<sup>2</sup>.

<sup>1</sup> Federal Rural University of Pernambuco. Rua Dom Manuel de Medeiros, s/n, Dois irmãos, Recife, PE, Brazil, CEP 52171-900.  
<sup>2</sup> Federal University of Pernambuco. Avenida Professor Moraes Rego, 1235, Cidade Universitária, Recife, PE, Brazil, CEP 50670-901.

### INTRODUCTION

Studies concerning the water resources are of great importance for the development of a society. Hydrological models are useful tools to aid understanding of the processes occurring in a watershed. The SWAT Model have been widely used around the world and the successful implementation of the model depends in large part on the representativeness of the parameters used as input.

The objective was to estimate the soil average available water capacity of the Watershed Mundaú River, which is an input parameter of SWAT, through geoprocessing.

### MATERIAL AND METHODS

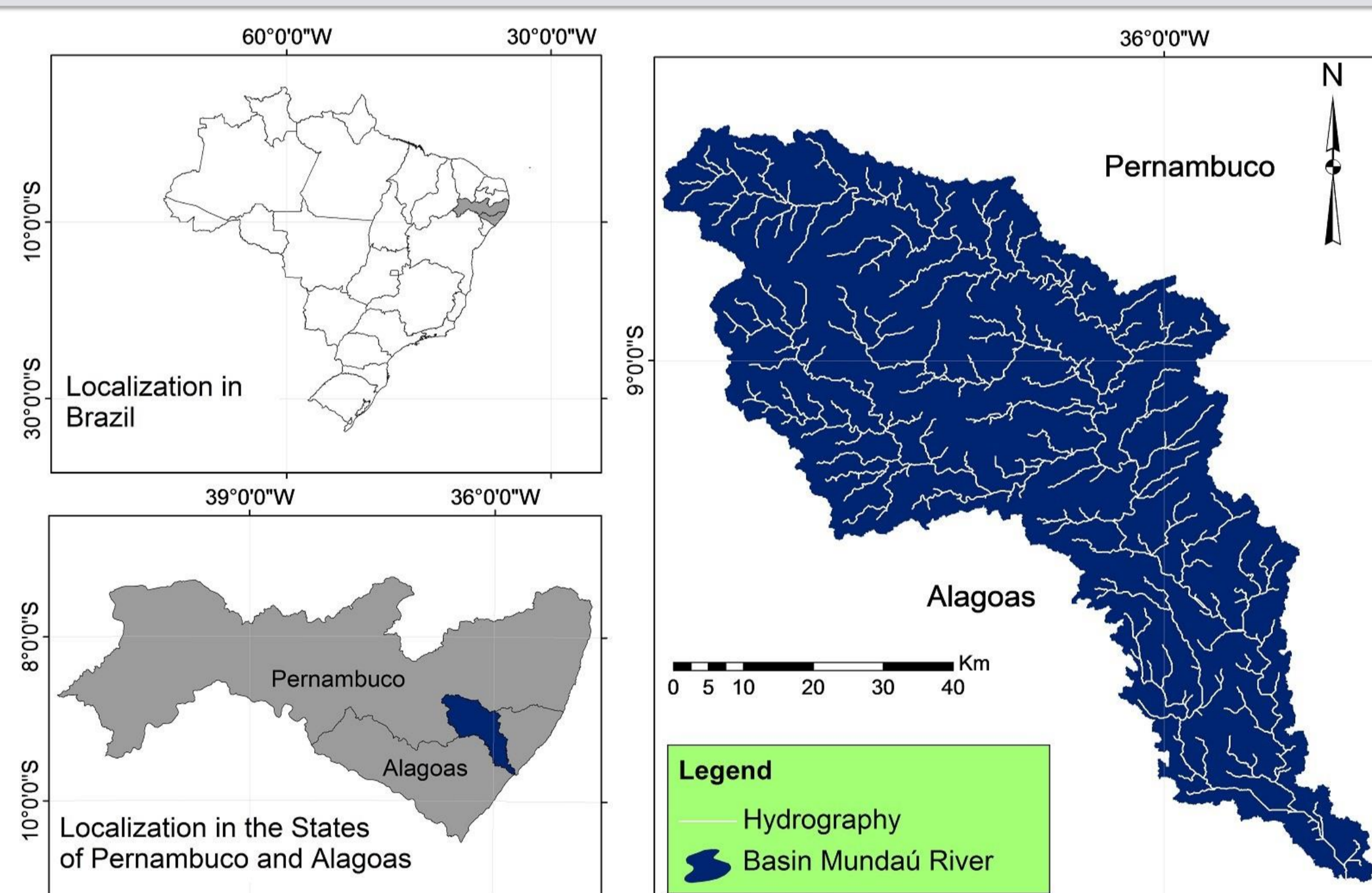


Figure 1. Localization of the study area

Map of soil types: EMBRAPA, IBGE (2011) and (ArcMap version 10.1).  
 SWAT Model: Available Water Capacity (AWC) (Oliveira et al., 2002):

$$U_{33-1500\text{ kPa}} = -0,000021AT + 0,000203S_i + 0,000054ARG + 0,021656D_s$$

Where: Si - silt, (g.kg<sup>-1</sup>); ARG - clay, (g.kg<sup>-1</sup>); AT - total sand, (g.kg<sup>-1</sup>); Ds - soil density (kg.m<sup>-3</sup>)

Table 1. Description of soil attributes considered in the database

Sampling Municipality	Soil type	Layer	Clay	Silt	Sand
			g/kg		
Bom Conselho - PE	Planosol	0-20 cm	100	230	670
		20-50 cm	480	100	420
		> 50cm	320	180	500
Garanhuns - PE	Red-Yellow Ultisol	0-40 cm	580	90	330
		40-65 cm	630	90	280
		65-90 cm	660	60	280
		90-120 cm	620	120	260
		> 120 cm	500	190	310

### RESULTS AND DISCUSSION

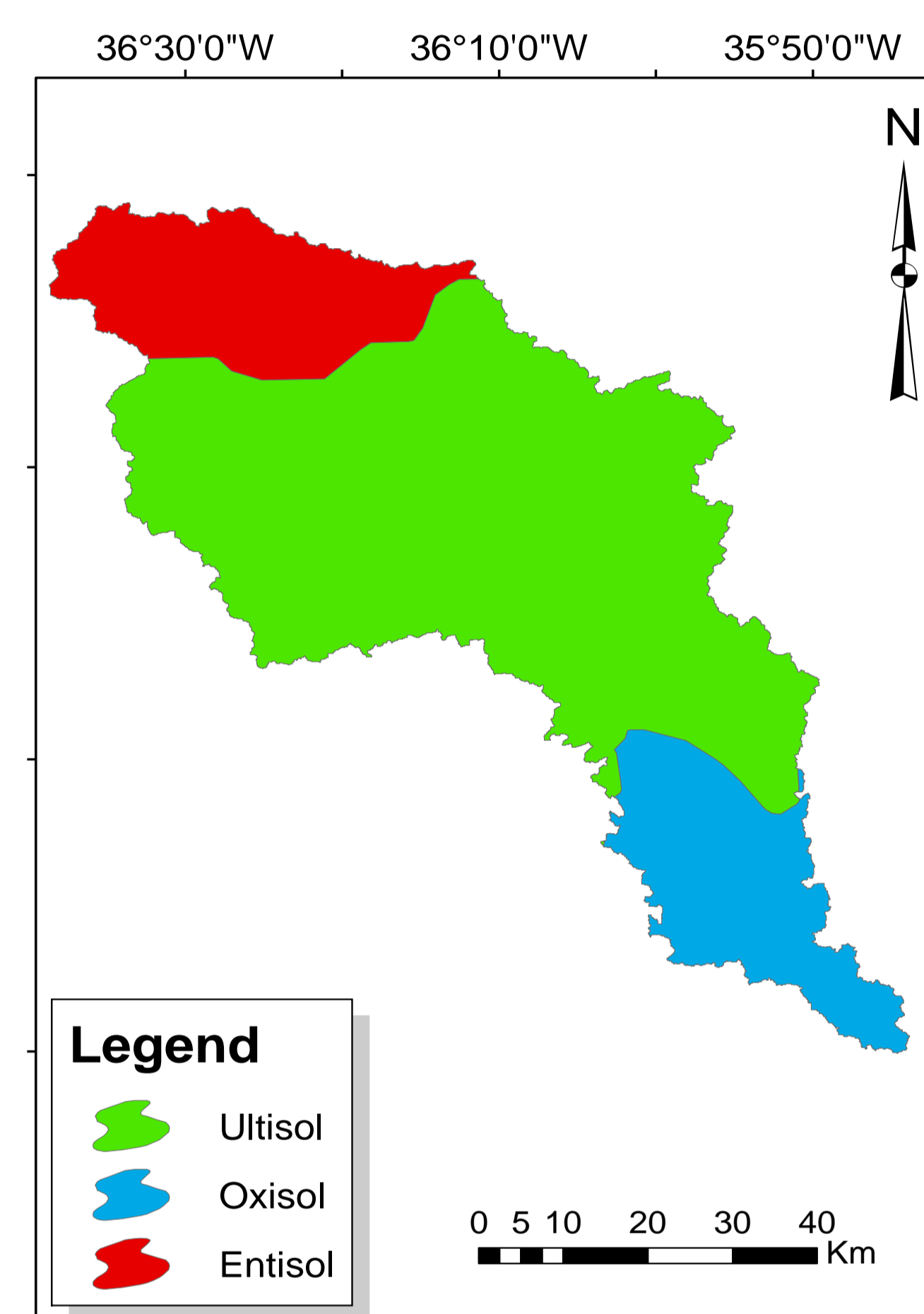


Figure 2. Map of soil types

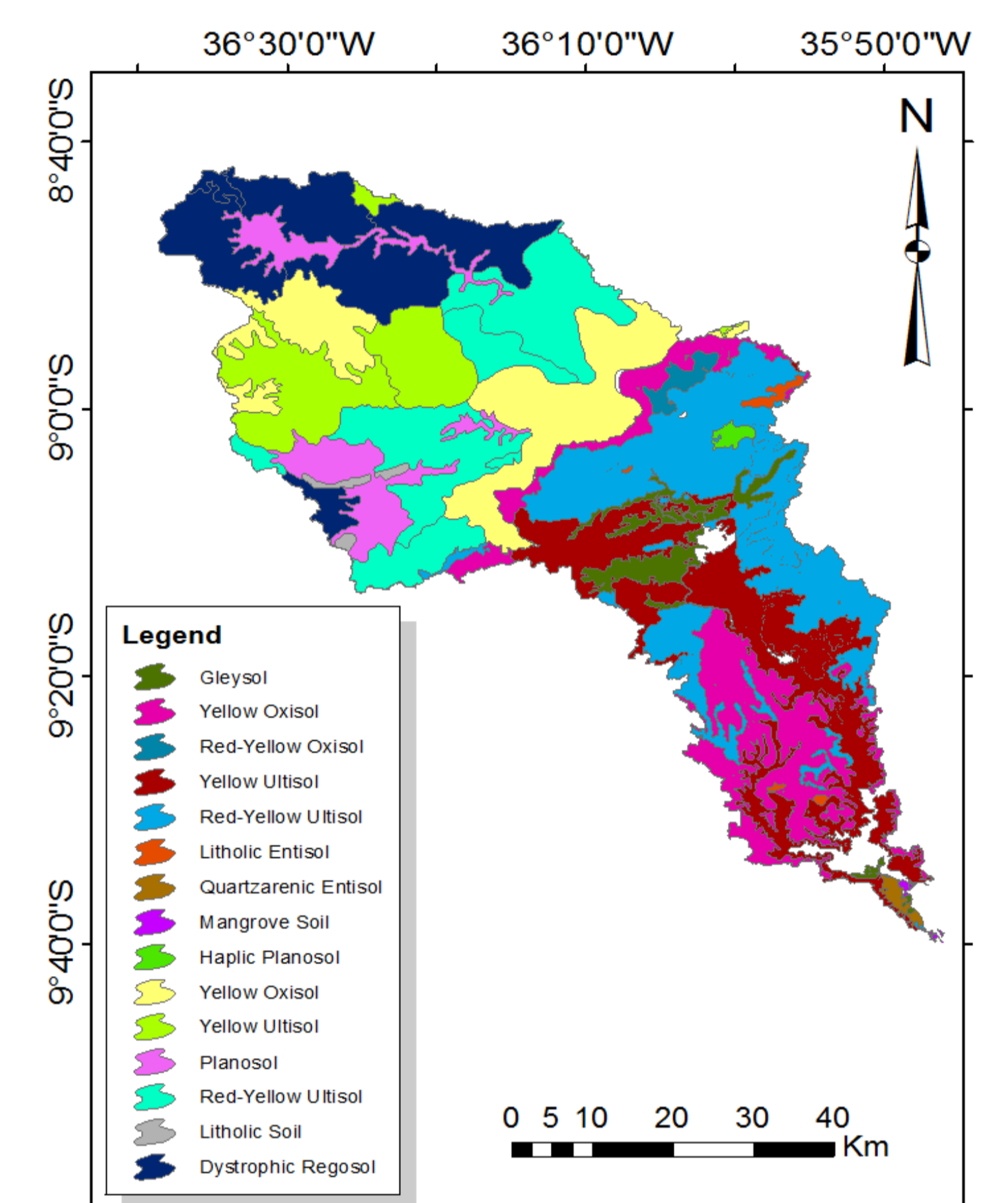


Figure 3. Detailed map of soil types in the Watershed of Mundaú River

Table 2. Available water capacity in different types of soil Watershed of Mundaú River

Sampling Municipality	Soil type	Layer	AWC (%)	Area (%)
Bom Conselho - PE	Planosol	0-20 cm	7.0504	4.52
		20-50 cm	6.9884	
		> 50cm	7.5804	
Garanhuns - PE	Red-Yellow Ultisol	0-40 cm	7.5144	13.41
		40-65 cm	7.23972	
		65-90 cm	6.79272	
		90-120 cm	7.83672	
		> 120 cm	8.50472	

### CONCLUSIONS

1. The estimated average value of the available water capacity (AWC) Watershed of the Mundaú River, according to soil types, was equal to 5.68%.
2. The geoprocessing tools combined with the GIS enabled the estimation of one of the SWAT model input parameters, is of great importance to support the hydrological modeling.