

The author warmly thanks the reviewer for his/her detailed review. It will considerably improve the manuscript quality. Reviewer' comments are in italic, our answers are in bold.

Anonymous Referee #2

Received and published: 9 August 2016

Overall opinion

This is an interesting paper covering an important topic, namely the prediction of soil hydraulic properties, particularly the soil water retention curve for soils in Algeria. However, there are a number of issues that need to be addressed before publication could be recommended.

1. General comments

The real major issue that I have with this paper is its lack of novelty. A large number of papers on pedotransfer functions are being submitted to various peer-reviewed journals, which basically all follow the same pattern as this paper does:

1. Data are collected locally 2. 'Foreign' PTFs are tested 3. 'Home' PTFs are often developed, but not always 4. Home PTFs are deemed better - or a foreign PTF is found better than others.

I agree that using global sensitivity analysis is very useful in decomposing the variance of the response (soil water retention) into contributions from the individual input variables. However, this analysis does not add any new information on what is already known in literature about the contribution of various predictors to the predictive quality of point and parameter-based PTFs. This issue is long known and has been shown/commented on by many papers by now.

*Another weakness of the paper is its lack of clarity in many parts of the text. I expanded more on this in the specific and technical comments and the authors need to work on that. Good proofreading and editing would considerably improve the quality of the manuscript. **We also agree with the reviewer that a large number of papers on pedotransfer functions basically discuss the same point about limits on estimates of specific model to a local region or a particular bioclimatic environment when applied in a different context. That's why we developed local pedotransfer functions in this paper; no studies have been conducted before on this subject in Algeria.***

But beside this quite usual approach; the sensitivity analysis aims at more original objective. The idea is to rank by order of importance the input variables of Algerian FPT such as bulk density, soil texture, and organic matter content at -33 and -1500 kPa in order firstly to detect the contribution of each variable in improving estimates of soil water retention and secondly to identify the source of error and weakness in FPT in each textural class.

As a new analytical tool, we proposed to quantify the variation of the first sensitivity index (V_i) after fixing each variable in a central value $X_i = X_i^*$ (X_i^* : the average when the variable follows the normal distribution, the median when the variable follows the lognormal distribution). The variation (V_i) calculated by the corrected formula (answer: Page 1, line 27) specified in the section (II.2.3) in each textural class for both pressure point gives us an idea about the role of each input in improving the estimate (performance) or in the weakness of FPT (error).

What's more we characterized the water retention of Algerians soil by confronting the results of the global sensitivity analysis with research results that address the relationship among the soil water retention and the variables commonly used as input in PTF (Clay, Loam, Sand, bulk density and organic matter).

In the revised paper we will include an analysis a part of development of PTF in the section II.

2. Specific comments

Title: I would suggest: 'Sensitivity analysis of point and parametric pedotransfer functions for estimating water retention of soils in Algeria': **We totally agree with your suggestion. The title will be changed in the revised manuscript**

Page 1, line 27: What did the authors mean by: 'favourable impact'?: **The part of text where we explain how we can assess the impact (lines 160-165) will be modified following the modifications asked by another reviewer:**

In order to quantify the variation of sensitivity index (V_{Si}), of an input factor X_i , we can fix it at its "true" value, $X_i = X_i^*$ (X_i^* : the average when the variable follows the normal distribution, the median when the variable follows the lognormal distribution). To calculate how much this assumption change the variance of Y we propose:

$$V_{Si} = \left(\frac{V[E(Y/X)]}{V(Y)} - \frac{V[E(Y/X_i=X_i^*)]}{V(Y)} \right) * 100$$

$V_{Si} > 0$ and S_i close to 1 indicate increasing accuracy of PTFs

$V_{Si} < 0$ and S_i close to 1 indicate increasing accuracy of PTFs

$V_{Si} > 0$ and S_i close to 0 indicate decreasing accuracy of PTFs

$V_{Si} < 0$ and S_i close to 0 indicate decreasing accuracy of PTFs

We noted an improvement in the estimation of point and parametric PTF in medium textural class at -33 kPa when we have fixed the bulk density or the clay percentage. It means that C% or BD as input in medium textural class at -33 kPa produces more error. The favorable/adverse impact will be removed in the text.

Page 1, lines 39-40: I would suggest: 'hydrologists face the situation where soil hydraulic data such as water retention or hydraulic conductivity are often missing. Therefore, pedotransfer functions (PTFs) are used as an alternative to estimate these properties.' **It will be done as suggested by the reviewer.**

Page 1, lines 40-41: I do not agree that reports on the evaluation of PTFs outside the area of development are rare (see general comments above). This is one of the main topics in PTF studies. Indeed. It will be modified as follows: the extrapolation of PTFs in different agropedoclimatic context limits their performance (Touil et al., 2016).

Page 2, line 54: Water retention points are not part of the widespread input data for PTF: **Indeed. It will be removed. And the sentence will be modified as follows: Schaap et al. (2001) developed the Rosetta package based on the artificial neural network method (ANN), which implements five hierarchical models to predict these parameters with well-defined limits (the soil texture classes only) and the input data (texture, density, and one or two values of water content at -33 and -1500 kPa).**

Page 2, lines 57-58: I am missing something here; why should we call it an advantage? **It will be modified as follow: 97 % are based on multiple linear and polynomial regression of n^{th} order techniques (Botula et al. 2014).**

Page 2, line 61: I would expect more recent references:

Mirus, B. B.,: Evaluating the importance of characterizing soil structure and horizons in parameterizing a hydrologic process model, Hydrological Processes, 29(21), 4611-4623, 2015.

The references were also added in the reference list.

Page 2, line 62: Could the authors provide some references? **We will add the following reference:**

Bruand, A., Perez-fernandez, P., duval, O., quetin, P., nicoullaud, B., gaillard, H., raison, L., pessaud, J.F. and prud'homme, L. : Estimation des propriétés de rétention en eau des sols: utilisation de classe de pédotransfert après stratifications texturale et texturo-structurale. *Etud. Gest. Sols*, 9:105-125, 2002.

Pachepsky, Y. A., Rawls, W.J.: Soil structure and pedotransfer function, *Eur, J. Soil Sci*, (54), 443-452, 2003.

The references were also added in the reference list.

Page 2, line 63: I would expect: 'Soil-water retention and hydraulic conductivity vary widely and non-linearly with soil water potential': **It will be done as suggested by the reviewer**

Page 2, line 68: Could the authors also provide more recent references:

Vereecken, H., Feyen, J., Maes, J. and Darius, P.: Estimating the soil moisture retention characteristic from texture, bulk density, and carbon content, *Soil Sci*, 148,389-403, 1989.

Winfield, K.A., Nimmo, J.R., Izbicki, J.A., and MartinResolving, P.M.: Structural Influences on Water-Retention Properties of Alluvial Deposits, *Vadose Zone Journal*, (5), 706-719, 2006.

The references were also added in the reference list.

Page 3, lines 85-86: 'comparing the predictive performance with the Rosetta models': this looks like a third objective: **Indeed, this sentence will be removed.**

Page 3, line 88: I am missing a short description of the study area and information on soil types: **The dataset used in this study consists of several subsets collected from some regions in the northern of Algeria. In the revised paper we will include in section II, a part of pedoclimatic information of the north of Algeria.**

Page 3, line 93: n has been used to design three different variables: (1) number of soil samples in a subset (Page 3, line 93); (2) shape factor of the water retention function (Page 3, line 111); (3) number of horizons (Page 4, line 125): **we will address these remarks in the revised manuscript as follows:**

(1) Page 3, line 93 and (Page 3, line 93): The PTFs are developed by using a database collected from some Algerian regions. Subset 1 containing 70 % of the samples from the coastal plain of Annaba located in the north-eastern part of Algeria (13 samples), the plain of Beni Slimane of Media (42 samples), the Kherba El Abadia plain of Ain defla (54 samples) and samples randomly selected from Lower Cheliff plain in northwestern of Algeria (80 samples), soil series was used as the calibration set. Subset 2 with the remaining 21% from Benziane valley in the south west lower Cheliff plain, soil series was selected to verify the PTFs (Table 1). The depth of the two upper horizons varies from site to site with maximum of 30 cm for surface horizons and upper than 30 cm for subsurface horizons. **(2) Page 3, line 111: n shape factor of the water retention function. (3) Page 4, line 125: N: number of horizons**

Page 3, line 96: What did the authors mean by: 'soil series was used as the calibration set'? *See also Page 3, line 97, 98:* **It an error, the first sentence (Page 3, line 96) will be removed. The second sentence (Page 3, line 97,98) will be : Subset 2 with the remaining 21% (n = 53) from Benziane valley in the south west lower Cheliff plain, soil series was selected to verify the PTFs 97 (Table 1).**

Page 3, lines 100-105: The authors should provide references for all the lab methods:

The particle size analysis, conducted using the international Robinson's pipette method (Robinson, 1922). Soil samples taken by cylinders of 500-1000 cm³ (According to the

case) were used to determine soil bulk density (BD). The water retention values at -33 kPa and -1500 kPa were obtained by Richards's apparatus (Richards, et al., 1943) for samples were collected in moisture nearby to field capacity, by cylinders with a volume of 100 cm³. The water content measurements were conducted by gravimetric method at 105 C° (24h). The organic carbon content was determined by wet oxidation method (Walkley and Black, 1934).

The references were also added in the reference list.

Page 3, lines 102-103: *I would rephrase it as follows: 'The water retention values at -33 kPa and -1500 kPa were obtained by the Richards's apparatus. Undisturbed soil samples were collected near field capacity with 100 cm³-cylinders':* **It will be done as suggested by the reviewer.**

Page 3, line 122: *What did the authors mean by: 'standardised module'?:* **It will be modified as follows: the index of agreement (d) developed by Willmott and Wicks (1980), and Willmott (1981) as a standardized measure of the degree of model prediction error.**

Page 4, line 126: *What did the authors mean by: 'The estimate is even less skewed than ME and is close to 0'?:* **It will be modified as follows: with N, number of horizons, θ_p , θ_m , predicted and measured volumetric water content, respectively. The estimate is better when ME is close to 0'. Also, negative ME values indicate an average underestimation of θ_m , while positive values indicate overestimation.**

Page 4, lines 141-142: *': may manage the functions and non-linear and nonmonotonic models': this sentence is not clear to me. Please rephrase:* **It will be: The Sobol method (Sobol, 1990) is an independent global sensitivity analysis (SA) that is based on decomposition of the variance. When the model is non-linear and non-monotonic, the decomposition of the output variance is still defined and can be used.**

Page 5, line 172: The first reason mentioned by the authors for selecting the Rosetta PTFs in their study seems weak to me as these PTFs have been published 15 years ago. It will be modified as follows: **The prediction quality of point and Parametric PTF developed from Algerian soils are then being compared with the three Rosetta PTFs (H1, H2, and H3). We choose in this work the Rosetta model firstly for the reason of it allows flexibility for the user to input data required (Stumpp et al., 2009) with option of five levels (H1, H2, H3, H4, H5), secondly it is one of the PTF gave reasonable predictions in several evaluation studies (Frederick et al. (2004), Nemes et al., 2003).**

It is of great practical use,

Page 5, line 175: *The authors should give more details on Rosetta models H1, H2 and H3:*

Three Five hierarchical Rosetta FPT (Schaap et al. 2002) are distinct as five levels based on the input data:

H1: The textural classes (USDA classification) ;

H2 : Clay+Silt+Sand;

H3: Clay+Silt+Sand+ Bulk density;

H4: Clay+Silt+Sand+ Bulk density+Volumic water at -33 kPa;

H5: Clay+Silt+Sand+ Bulk density+Volumic water at -33 kPa+ Volumic water at -1500 kPa;

Page 5, lines 175-176: *The second reason for selecting the Rosetta PTFs should be better explained:* **It will be modified as following: The three Rosetta models (H1, H2, and H3) were selected to compare their performance in the Algerian soils because they require only the texture data and bulk density as inputs as well as the locally-developed PTFs**

Page 5, line 188: *What did the authors mean by 'adapt better'?:* **It will be changed by : "give better estimation than"**

Page 5, line 193: *'Other evaluation criteria noted that the index of agreement also shows that the point PTF is': this sentence is not clear and should be rephrased:* **Furthermore, the**

results index of agreement shows that the point PTF is more suitable for Lower Cheliff soils than the parametric PTF (Fig. 6) with values of (d) (0.9975, 0.9911 cm³ cm⁻³).

Page 6, lines 199-200: Did the authors perform a significance test to confirm this?: It will be modified as follows: In table 3, no significant difference in RMSE values was observed between the parametric PTFs and Rosetta-H2 at -1500 kPa (RMSE : 0.0605 cm³ cm⁻³ and 0.0636 cm³ cm⁻³ for the parametric PTFs and Rosetta-H2, respectively).

Page 6, lines 216-217: ‘: with Si in order to (OM: 0.821; 0.630) and (C %: 0.782; 0.585) at -33 kPa and -1500 kPa, respectively (Fig. 2)’: this sentence should be rephrased: This sentence will be modified as follows: It is clear for the PTFs developed, the organic matter (OM %) and the clay percentages (C %) are the variables that have the most impact particularly on point PTF (MLR) estimation in two pressure points (Si: 0.821; 0.782 at -33 kPa and 0.630; 0.585 at -1500 kPa for the OM and C % respectively).

Page 6, line 227: *m* is directly linked to *n* by a simple relation (see Page 3, line 113). Therefore, we should only consider 4 parameters: α , r , θ_s and n : Indeed. (Parameters of the Van Genuchten curve: θ_r , θ_s , α , n).

Page 7, line 241: What did the authors mean by ‘The stability in estimation of PTF before and after classification’?: It mean that we didn’t observe the improvement in quality estimation of the parametric and point PTFs in the fine and very fine class. This sentence will be modified as follows: The results show that after the textural classification, the improvement of the quality estimation of PTFs is noted only in medium class (Fig. 4). Indeed, a better prediction was recorded by point PTF (RMSE = 0.027 cm³ cm⁻³) and parametric PTF (RMSE = 0.038 cm³ cm⁻³) at -1500 kPa.

Page 7, lines 265-266: What did the authors mean by: ‘when the variation sensitivity index calculated for sand is the leading’? Please rephrase: It will be modified as follows: ‘when the variation of the first order sensitivity index (V_{Si}), for sand is the most important’.

Page 7, line 276: What did the authors mean by ‘the majority presence’? Please rephrase: It will be removed.

Page 8, lines 290-294: These 2 sentences are not clear to me. Please rephrase: It may also explain the fact that many soils with high clay content in the database are vertisols in which the bulk density and volumetric water content were lower (Rawls et al., 2003). Indeed, the inclusion of the bulk density as input leads to pore volume information, and that can influence the performance of PTFs when they are applied on the soil with high clay content.

Page 8, lines 300-301: Which variable do the authors refer to?: It will be modified as follows: With the bulk density and the texture as inputs in point PTF (MLR) the nearest experimental results are obtained.

Page 8, line 306: What did the authors mean by: ‘favourable sensitivity’? Please rephrase: In medium texture increasing accuracy of PTFs is noted after fixing the clay content at -33 kPa.

Page 8, line 315: What did the authors mean by: ‘advanced water retention’? Please rephrase: It will be modified as follows: The water retention is higher in very fine and fine classes than the medium class, because it quickly drains water initially retained.

Page 8, line 320 to Page 9, line 321: This sentence is not clear to me. How the global sensitivity class and the silt can be estimates of water content? Please rephrase: It will be modified as follows : the global sensitivity analysis show that the silt percentage has the second strongest impact on estimation of parametric PTFs at -1500 kPa more than at -33 kPa.

Page 9, line 322: What did the authors mean by: ‘the main values of V_{Si} ’? Please rephrase: It will be modified as follows: After textural stratification, the important variation of the

first order sensitivity index (V_{Si}) have been observed in medium class (-36.7% to -1500 kPa).

Page 9, line 323: 'or the texture is pure clay': I do not understand this part of the sentence. Please rephrase: **It will be removed.**

Page 9, line 325: Do the authors refer to the estimate of water retention or of the van Genuchten parameters?: **Indeed: It will be modified as follows: It is clear that the percentage of silt has a very important role in estimating the Van Genuchten parameters (α , n), and consequently, its use as input influences the estimate in the medium and fine class.**

Page 9, lines 325-327: These 2 sentences are not clear to me. What did the authors mean by 'favourable impact', 'a better pedological interpretation'? Please rephrase: **It will be modified as follows: Nevertheless, there is an increasing accuracy of PTFs recorded in fine class at -1500 kPa. Its presence with the clay content as inputs has led to a better estimation.**

Page 9, lines 335-336: ': : as the latter is always considered as the best predictor of soil water retention particularly in clayey soils'. Could the authors support this affirmation by references to recent literature?: **It will be removed.**

Page 9, line 336: What did the authors mean by 'positive sensitivity impact'? Please rephrase: **the positive impact mean that the increasing accuracy of PTFs was observed when we had fixed the OM. This sentence will be modified as follows: However, the increasing accuracy of parametric PTFs is observed in medium-textured soils at -33 kPa where the OM is used as input to predict saturated soil water contents.**

Page 9, lines 345-347: This sentence is very weak and does not add on what is already well known from previous studies: **It will be modified as follows:**

The objective of this study was to analyze the sensitivity of estimating water retention properties of Algerian soil by pedotransfer functions. We presented the development and validation of point and parametric PTFs for estimation of soil hydraulic parameters from basic soil properties regression methods and comparison of the predictive capabilities of these methods with the Rosetta model using some evaluation criteria.

Page 9, line 348: ': : predicts more accuracy than: : ': Please rephrase: **it will be modified as follows: The reliability tests show that the point PTF produces more accurate estimations than the parametric models.**

Page 9, lines Tables and figures - Tables and figures should be self-explanatory in their titles and contents. The authors should provide all the necessary information such as explanation for abbreviations, measurement units, etc. Please see also specific comments.

- The order of captions of tables and figures should generally correspond with the order of appearance in the text: **All these comments will be addressed in the revised manuscript**
- What do the authors mean by cubic model in Table 2? **It's one of the no linear multiple regression models which we have used to develop the parametric PTFs to estimate the VG parameters. The revised paper will explicitly present the PTF we developed.**

3. Technical comments

Title: I would suggest: *Sensitivity analysis of point and parametric pedotransfer functions for estimating water retention of soils in Algeria.* **We agree with the reviewer.**

Page 1, lines 20-21: the way values of RMSE are reported in the abstract is confusing. Page 1, line 21: RMSE values are in $cm^3 cm^{-3}$ as units for water retention. Page 1, line 28: medium textural class Page 2, lines 44-45: 'estimated' instead of 'constructed' Page 2, line

47: the parameters of the van Genuchten model (θ_s , θ_r , n and m) have been introduced before the van Genuchten model itself (line 51). It would be more logical to remove them in line 47 and insert them in line 53. Page 2, line 53: I would suggest: ': to predict the van Genuchten parameters (θ_s , θ_r , n and m) with soil texture classes only: : : ' Page 2, line 54: 'bulk density' instead of 'density' Page 2, line 55: 'Pedotransfer functions' instead of 'PTFs' Page 2, line 60: 'water retention' instead of 'the water retention' Page 2, line 72: 'pedotransfer' should be deleted Page 2, line 76: 'complementary' instead of 'complimentary' Page 3, lines 82-83: I would suggest: 'Deriving and validating two approaches of PTFs using regression methods:' Page 3, line 87: 'input perturbation' is not appropriate. Please rephrase. Page 3, line 92: I would suggest: 'The PTFs are developed using a database of soil samples collected from some regions in Algeria' Page 3, line 93: 'contains' instead of 'containing' Page 3, line 99: 'more than 30 cm' instead of 'upper than 30 cm' Page 3, line 100: 'was conducted using: : : ' Page 3, line 100: I would suggest: 'Undisturbed soil samples taken: : : ' Page 3, line 101: '(According to the case)' should be deleted Page 3, line 104: I would suggest: 'Water content measurements were conducted by the gravimetric method' Page 3, line 106: The word 'defended' is inappropriate. Please rephrase Page 3, lines 111- 112: 'were calculated' instead of 'will be calculated' Page 3, line 117: 'by comparing the values that they predicted' Page 3, lines 118-119: I would suggest: 'To discuss the validity of the PTF developed, we used the following criteria:' Page 3, lines 119-120: 'the root mean square error (RMSE)' instead of 'the mean square error (RMSE)' Page 3, line 120: 'of the quality of the prediction' instead of 'of quality prediction' Page 4, line 129: 'the root mean square error (RMSE)' instead of 'the mean square error (RMSE)' Page 4, lines 143-144: Is it X_1 or X_1 ? This needs to be uniform. Page 4, line 144: I would suggest: ': : : $X=(X_1, : : , X_p)$ is the input variable set' Page 4, lines 147-149: The elements of equations 6 and 7 are not explained Page 4, line 157: 'between 0 and 1' instead of 'between [0.1]' Page 5, line 161: What is X_i^* in equation 9? Page 5, line 168: I am missing sentences that introduce Table 1 and Table 2. Moreover, Table 2 is not mentioned in the whole text. Page 5, line 170: I would suggest as title: 'Development of PTFs' Page 5, lines 172-173: With respect to the title in line 170, this sentence should be placed at the end of the paragraph Page 5, line 177: 'soil water retention' instead of 'the soil water retentions' Page 5, line 184: I would suggest: 'the point MLR PTFs' instead of 'the PTF points (MLR)' Page 5, line 185: '0.041 and 0.044' instead of '0,041 and 0,044' Page 5, line 188: 'parametric PTFs' instead of 'parametric PTF' Page 5, line 189: 'neural' instead of 'neuron' Page 5, line 189: 0.0613 and 0.0605 cm³ cm⁻³ Page 6, line 199: 'while' should be deleted Page 6, line 207: 'PTFs' instead of 'pedotransfer functions' Page 6, line 209: 'fundamental to understand the: : : ' instead of 'fundamental to understanding the: : : ' Page 6, line 211: 'as bulk density' instead of 'as the bulk density' Page 6, lines 214-217: This sentence is too long and should be divided into 2 sentences. Page 6, lines 215-216: 'at two pressure points' instead of 'in two pressure points' Page 6, line 219: 'in third place' instead of 'in third order' Page 6, line 222: 'MLR' instead of 'linear multiple regression' Page 6, line 224: I would suggest: 'point PTF using MLR is mainly based on: : : ' Page 6, line 225: I would suggest: 'parametric PTF using MNL' Page 6, line 226: I would suggest: 'which has other inputs than texture and bulk density' Page 6, line 229: I would suggest: 'textural grouping' instead of 'textural classification' (see Page 6, line 234) Page 6, lines 231-232: I would suggest: ': : : used to develop PTFs from basic soil characteristics to estimate water retention for different textural classes' Page 6, line 235: 'FAO' instead of 'FOA' Page 6, line 238: I would suggest: 'textural grouping' instead of 'textural stratification' Page 6, line 239: I would suggest: 'a better prediction at -1500 kPa was provided by point PTF' Page 7, lines 242-243: I would suggest: 'explained by difficulties in linking water retention properties of the soil samples with their particle size distribution as...' Page 7, line 244: I would suggest: 'After textural grouping, MLR and MNL PTFs developed

are: : :’ Page 7, line 247: I would suggest: ‘In the MNLN PTFs’ instead of ‘Into the MNLN’ Page 7, line 259: ‘fractions’ instead of ‘fraction’ Page 7, line 260: ‘observed’ instead of ‘observe’ Page 7, line 268: ‘in all texture classes’ instead of ‘on all texture classes’ Page 7, line 269: ‘in the validation dataset’ instead of ‘in the dataset of validation’ Page 7, line 275: ‘increases’ instead of ‘increase’ Page 7, line 280: ‘low sand content’ instead of ‘small sand content’ Page 8, line 283: ‘This is the second most influential variable’ Page 8, line 285: ‘bulk density’ instead of ‘the bulk density’ Page 8, line 289: ‘highly related’ instead of ‘hugely related’ Page 8, line 291: Vertisols Page 8, lines 299-300: ‘has a major influence’ instead of ‘is a major influence’ Page 8, lines 301-302: I would suggest: ‘predicted values very close to the experimental results are obtained’ Page 8, line 303: I would suggest: ‘depends on the type of regression techniques’ Page 8, line 309: ‘PTFs’ instead of ‘PTF’ Page 8, line 312: ‘with Clay (%)’ instead of ‘with the Clay (%)’ Page 8, line 315: ‘than’ instead of ‘t’ Page 8, line 319: I would suggest: ‘at high and medium soil water potentials’ Page 8, lines 321-322: I would suggest: ‘textural grouping’ Page 9, line 323: I would suggest: ‘The lowest values were recorded’ Page 9, line 324: ‘of’ should be deleted Page 9, lines 330-331: I would suggest: ‘textural grouping’ Page 9, lines 331-332: I would suggest: ‘by the poor OM content in the Algeria soil samples’ Page 9, lines 331-332, 333-334: Sometimes ‘OM’, sometimes ‘organic matter’. Please be consistent Page 9, line 333: I would suggest: ‘...water retention. Danalatos et al. (1994) attributed it to...’ Page 9, lines 337-338: I would suggest: ‘to predict θ_s values’ instead of ‘to predict saturated soil water contents’ Page 9, line 348: ‘Indeed’ should be deleted Page 9, line 354: I would suggest: ‘textural grouping’ Page 9, line 355: ‘classes’ instead of ‘class’ Page 10, lines 359-360: I would suggest: with clay content > 60% Page 10, line 361: I would suggest: ‘textural grouping’ Tables and figures Tables Table 1: - I would suggest as title: ‘Soil characteristics of the development and validation datasets’ - I would suggest PSD (particle size distribution) instead of Granulometry - ‘CV: coefficient of variation’ is reported three times on the same table’ Table 2: - the line separating MLN and MNLN PTFs is not at the right place - ‘Point PTFs’ instead of ‘Points PTF’ - ‘multiple R²’ instead of ‘R² multiple’ - a, b, c,...j are not clearly explained. It would be good to write a general equation with a, b, c,...j as coefficients for more clarity - θ_s should be in kPa-1 - (respectively) should be deleted Table 3: - I would suggest as title: ‘Evaluation criteria of water retention pedotransfer functions at -33 kPa and -1500 kPa’ Table 4 is missing Table 5: - I would suggest as title: ‘Variation of first order sensitivity index along different textural classes’ - What does ‘Abs’ mean? Table 6: - I would suggest as title: ‘Pearson correlation matrix between basic soil characteristics in the validation dataset of 53 soil samples’ Figures Each figure caption should be located beneath the respective figure Figures 1, 2, 4, 5 and 6: ‘,’ should be replaced by ‘.’ Figure 2: - I would suggest as title: ‘Particle size distribution of xx soil samples from Algeria according to the FAO textural triangle’ Figure 3: - Figure 3 is not mentioned in the text Figure 4: - I would suggest as title: ‘Root mean square error (RMSE) values calculated for different textural classes’ Figure 5: - I would suggest as title: ‘Variation of first sensitivity index with RMSE after textural grouping’ Figure 6: - Police sizes on the 2 graphs are not the same - ‘Point PTF’ instead: **All these comments will be addressed in the revised manuscript.**

Additional References

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