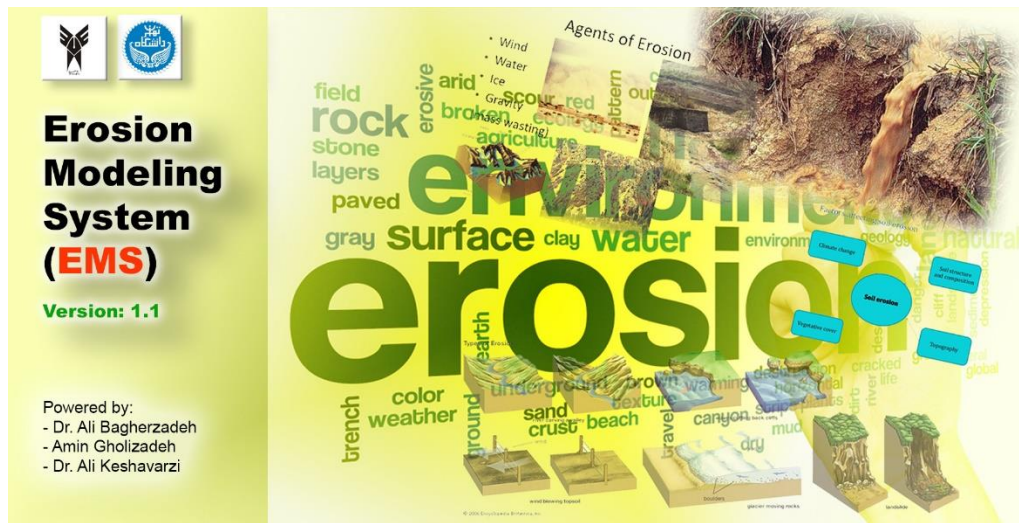# Erosion Modeling System (**EMS**)

Description

The algorithms of software for estimating soil losses and sediment production as well as erosion risk are based on the equations of each model. The program has been written in Delphi Programming language. The parameters are given in an Ms-Excel format file to SEE. The output results can also be demonstrated in Ms-Excel format. The software has the ability to show regression equation between the influencing parameters and the SEE derived by each equation. The software has been designed quite user friendly and conducts the user correctly through the calculations step by step and don't allow the user to make a mistake. It is compatible with 32 and 64-bit windows operating system types.

The output tables and screenshots of the software calculations has been shown below:

Soil App. : " D:_OTHERs_Dr.Bagherzadeh\App_Erosion\USLE_Data.xls "

File   Run   Help

☑ USLE (Universal Soil Loss Equation)

Load Data from Excel

C Factor values from different sources:
☐ C-Factor Based on yearly average of NDVI
☐ C-Factor Based on Land U
Land Use/Crop:
○ Fugazza (2011)
○ Drezwiecki et al. (2013)
○ Panagos et al (2015)

P values for different support practice factors:
Soil conservation:
P Factor:

☐ MUSLE
☐ EPM (Erosion Potential Method)
☐ MPSIAC
☐ WEPP
☐ EAR (Erosion Risk Evaluation)

Calculate ... >>   Export to Excel   Graph
EXIT

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	pointid	X	Y	SILT	SAND	CLAY	OC	Gravel 0-30	Surface Stoniness	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	λ	Slope	NDVI
2	1	xx.xxxxxx	xx.xxxxxx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx													xx.xx	xx.xx	0.xxx
3	2			(%)	(%)	(%)	(%)	(%)	(%)														(Deg)	
4	3																							

pointid	X	Y	SILT	SAND	CLAY	OC	CRF_22_5	CRF_2_5	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Slope L	Slope (De	NDVI
20173	58.9977446664	36.9033634013	38	40	22	7	23	20													30	86.3249	0.12021
20569	59.0227446664	36.8866967347	38	40	22	7	21	19													30	85.5063	0.12016
25112	59.0727446664	36.8033634013	36	47	18	3	19	18													30	86.6631	0.11956
27634	58.9727446664	36.7033634013	37	44	19	8	19	17													30	64.64	0.11950
29288	59.0727446664	36.6783634013	35	41	25	8	5	5													30	69.4533	0.11945
28312	59.2727446664	36.6783634013	37	42	21	7	22	19													30	63.7939	0.11939
33737	59.7227446664	36.5866967347	37	40	23	6	19	17													30	31.2228	0.12047
33891	58.9727446664	36.5783634013	37	41	22	13	22	19													30	37.2635	0.12042
33914	59.064411333	36.5783634013	39	39	22	11	25	22													30	87.2925	0.12037
38319	58.9310779997	36.5366967347	39	40	21	14	26	22													30	71.2182	0.12031
38431	59.864411333	36.5366967347	37	42	22	6	19	17													30	85.4474	0.12026
41948	59.4810779997	36.420030068	35	45	20	5	12	11													30	86.4514	0.11967
47551	59.8477446664	36.3366967347	36	48	17	4	16	15													30	81.268	0.11961
49330	59.8477446664	36.2783634014	33	49	18	5	13	12													30	73.6374	0.11956
55939	59.564411333	36.145030068	32	51	17	11	19	16													30	61.4244	0.11950
19343	58.4977446664	36.9366967347	42	36	23	11	23	20													30	80.4868	0.11944
20180	59.0560779997	36.9033634013	38	42	20	9	30	26													30	85.9014	0.11939
20243	59.5810779997	36.9033634013	38	42	20	16	30	26													30	22.068	0.11933
20352	58.9560779997	36.895030068	33	49	17	5	17	16													30	17.8848	0.11951
20382	59.1060779997	36.895030068	39	41	20	9	28	25													30	85.3906	0.11945
20395	59.214411333	36.895030068	34	46	20	5	18	16													30	80.944	0.1194
20536	58.7477446664	36.8866967347	32	49	19	6	7	7													30	83.9692	0.11934
20540	58.7810779997	36.8866967347	35	47	17	6	18	17													30	82.1645	0.11928
20561	58.9560779997	36.8866967347	37	46	18	3	19	17													30	84.8127	0.11922
20581	59.1227446664	36.8866967347	39	42	19	10	28	24													30	85.9518	0.11916
20591	59.2060779997	36.8866967347	38	44	18	5	20	17													30	83.6597	0.11910

Monthly Precipitation (mm)

SEE App. : " D:_OTHERs_Dr.Bagherzadeh\App_Erosion\USLE_Data.xls "

File   Run   Help

Title of Chart:
[X Axis] Parameter: A_usle
[Y Axis] Parameter: K_Factor
[Z Axis] Parameter: R_Factor

A_usle: 0.00 ~ 0.15
K_Factor: 0.00 ~ 0.15
R_Factor: 0.43 ~ 17.24

Creat Charts ... >>
Export to EXCEL
<< Return

	A_usle	K_Factor	R_Factor
20173	0.109	0.038	0.435
20569	0.114	0.038	0.466
25112	0.153	0.046	0.501
27634	0.075	0.039	0.512
28288	0.069	0.034	0.466
28312	0.064	0.038	0.458
33737	0.017	0.037	0.466
33891	0.019	0.03	0.458
33914	0.132	0.036	0.538
38319	0.074	0.031	0.52
38431	0.124	0.038	0.505
41948	0.143	0.043	0.506
47551	0.135	0.046	0.498
49330	0.098	0.042	0.474
55939	0.058	0.035	0.484
19343	0.102	0.038	0.466
20180	0.117	0.038	0.47
20243	0.009	0.03	0.569

K_Factor
$Y = 0.0450 x + 0.0334$
$R2 = 0.1402$
A_usle

R_Factor
$Y = -0.0081 x + 0.4893$
$R2 = 0.0001$
A_usle

R_Factor
$Y = 0.5240 x + 0.4686$
$R2 = 0.0066$
K_Factor

— A_usle [1.00 ~ 100.00]
— K_Factor [0.00 ~ 1.00]
— R_Factor [0.00 ~ 1.00]

- Dr. Ali Keshavarzi

Saturday, August 4, 2018