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( / / : / / : )

TPSS (WMA)

TPSS / /

RMSE MAE MBE

/ (R) /

TPSS :

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EI

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EI ( )

( )

(KE> )

$AI_m ( ) R \quad EI$

$( ) \frac{P}{\sqrt{t}} ( ) \frac{\sum_{i=1}^n p_i^*}{P} ( ) \frac{p_i^*}{P} ( ) KE > ( )$

( )

EI

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EI

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EI

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( )  $\frac{KE}{EI} >$  ( )  $AI_m$  ( )  $R$  EI

( )  $\frac{P}{\sqrt{t}}$

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Run Test

$$EI = \frac{\sum_{i=1}^n p_i^y}{P}$$

Archive of SID

TPSS

(CoK) (WMA) (OK)

( ) ( ) ( ) ( ) ( )

EI<sub>30</sub>

( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )

(MAE) (RMSE) (MBE )

EI

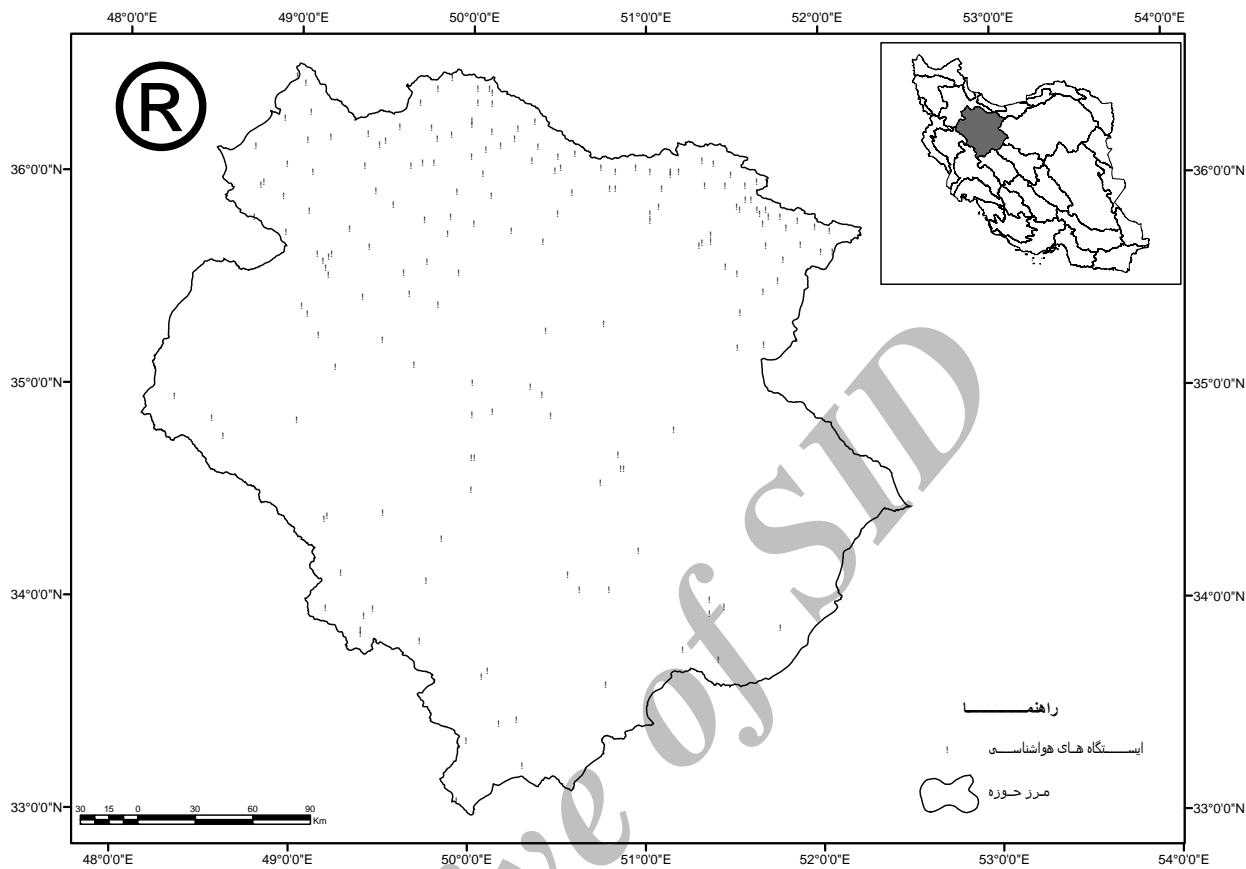
(MF)

$$MF = \frac{\sum_{i=1}^n p_i^y}{P}$$

- Thin Plate Smoothing Spline
- Weighted Moving Average
- Ordinary Kriging
- Co-Kriging
- Cross Validation
- Mean Bias Error
- Mean Absolute Error
- Root Mean Squared Error

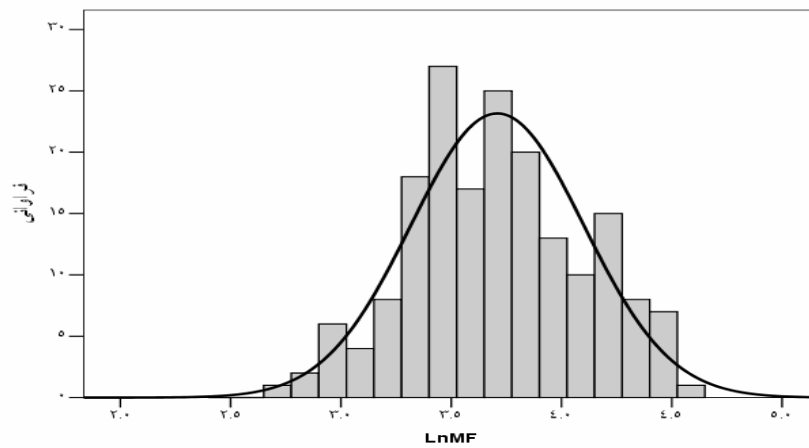
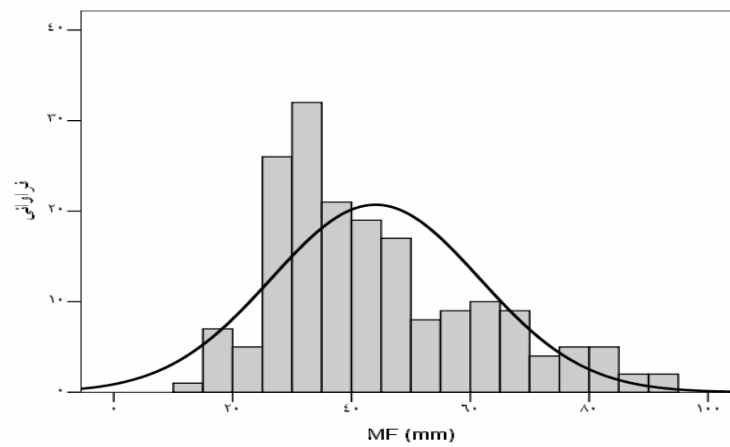
	(R)
( )	$MBE = \frac{\sum_{i=1}^n [Z^*(x_i) - Z(x_i)]}{n} \quad ( )$
( )	$MAE = \frac{\sum_{i=1}^n  Z^*(x_i) - Z(x_i) }{n} \quad ( )$
( )	$RMSE = \sqrt{\frac{\sum_{i=1}^n [Z^*(x_i) - Z(x_i)]^2}{n}} \quad ( )$
Kolmogorov-Smirnov	$R^* = \frac{\sum_{i=1}^n [Z^*(x_i) - \bar{Z}(x_i)]}{\sum_{i=1}^n [Z(x_i) - \bar{Z}(x)]} \quad ( )$
	$= n$
	$= Z^*(x_i)$
	$= Z(x_i)$
	$= \bar{Z}(x)$
	TPSS
	( ) ANUSPLINEA
	(CoK) (OK)
	GS <sup>+</sup> (WMA)

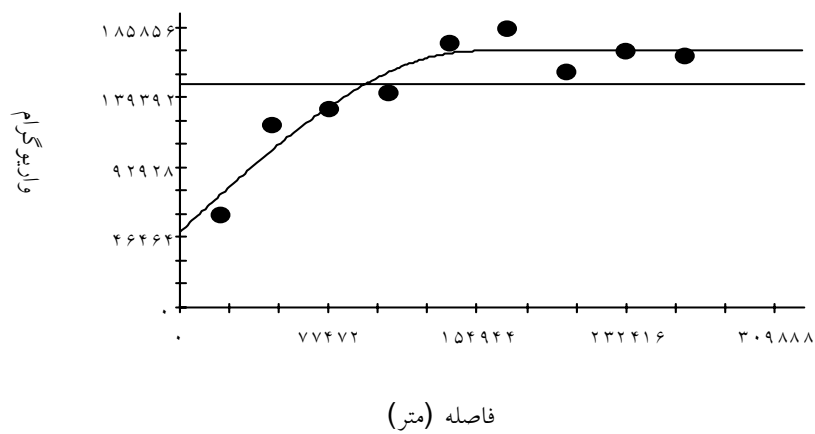
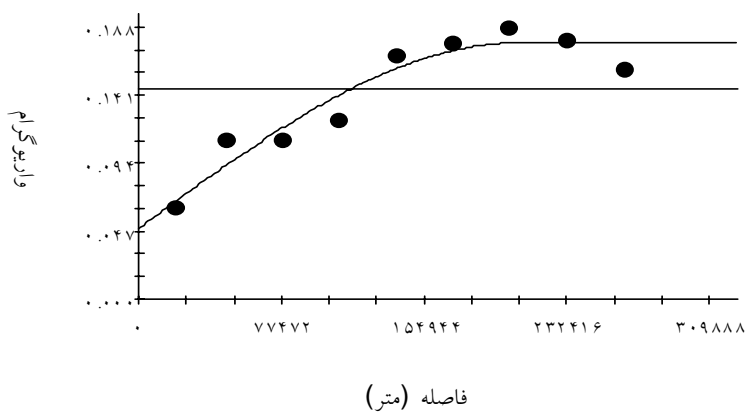
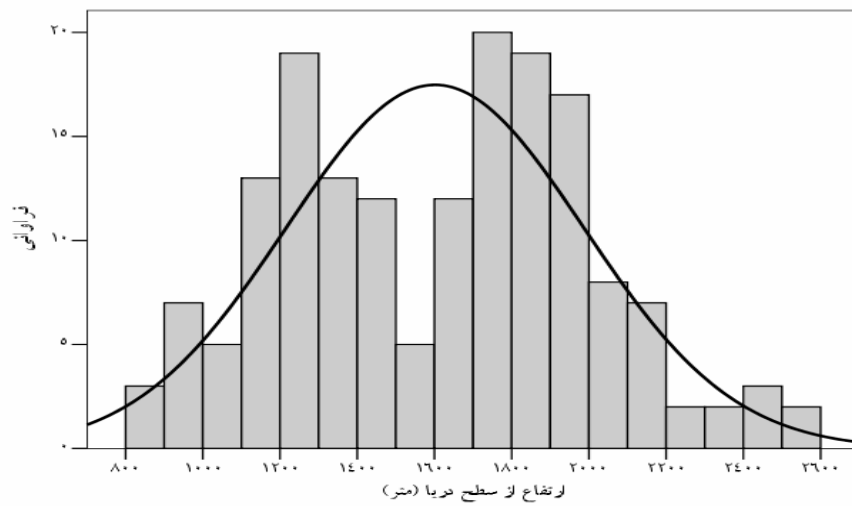
- Nugget effect
- Sill
- Range of influence



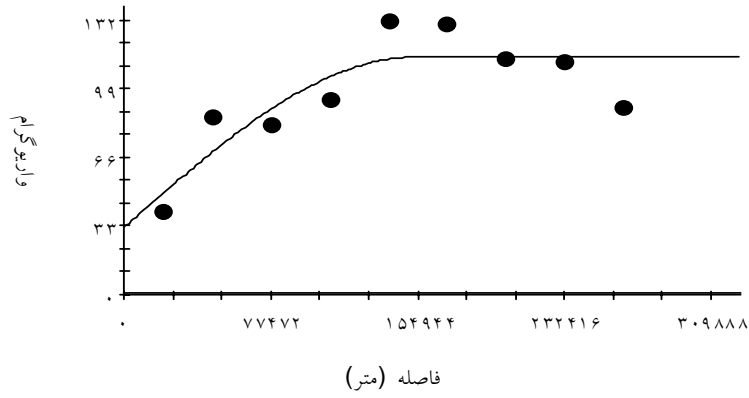
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 (Co-TPSS )  
 RMSE TPSS  
 Co-TPSS  
 MAE MBE  
 Co-TPSS TPSS  
 R RMSE  
 MAE Co-TPSS  
 TPSS  
 WMA  
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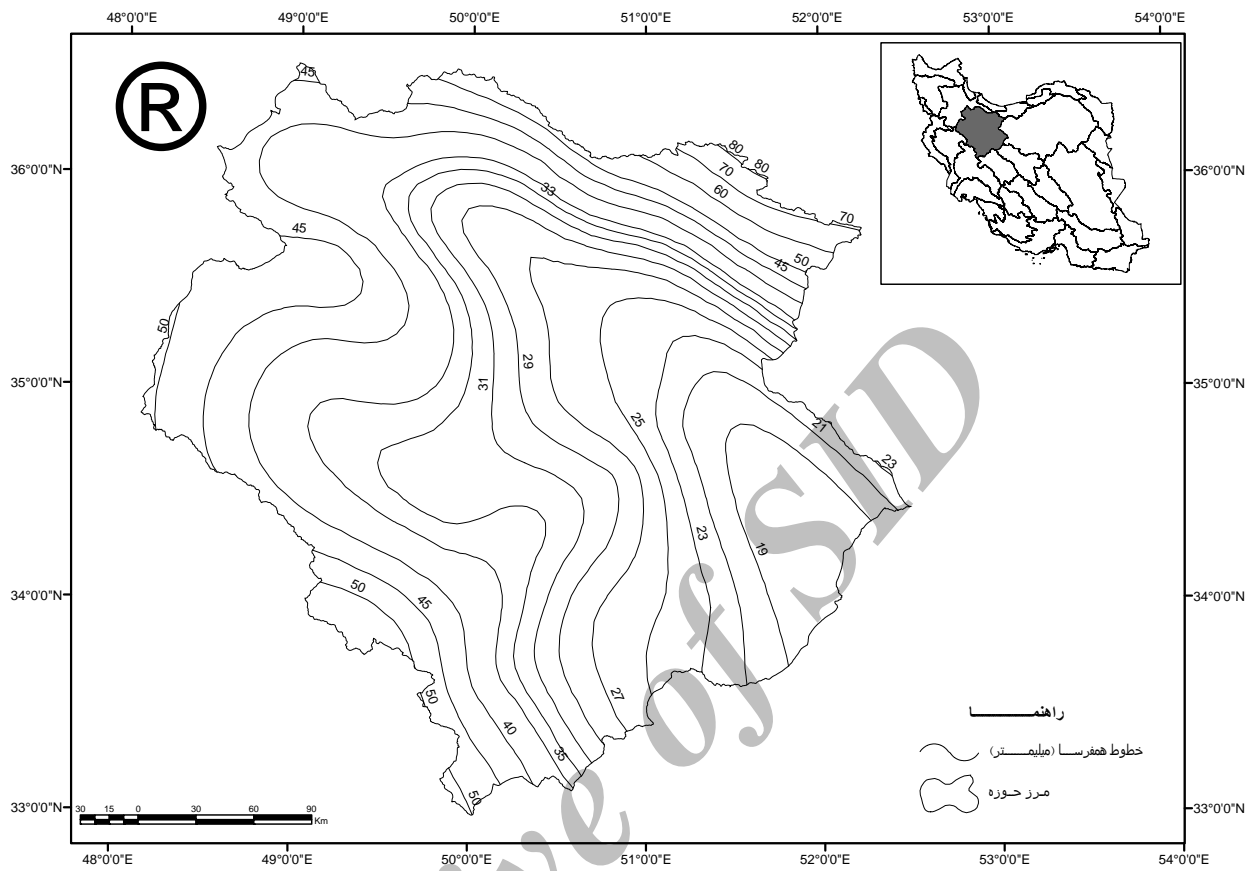
	R	RMSE	MAE	MBE	
		( )			
	/	/	/	/	TPSS
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	/	/	/	/	TPSS
	/	/	/	/	TPSS
	/	/	/	/	Co-TPSS
	/	/	/	/	Co-TPSS
	/	/	/	/	Co-TPSS
	/	/	/	/	Co-TPSS
	/	/	/	/	Cok
	/	/	/	/	Ok
	/	/	/	/	WMA
	/	/	/	/	WMA
	/	/	/	/	WMA
	/	/	/	/	WMA

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 TPSS ( )

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MBE  
 / / / RMSE MAE

/ (R)



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(R)

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## Mapping rainfall erosivity for Namak lake basin

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### Abstract

Rainfall erosivity is one of the most important factors determining soil erosion. This factor is usually expressed as erosion indices that are based on rainfall characteristics. There are various indices that may be determined in weather stations but determining these indices in other places requires development erosion maps. This research was aimed at developing the rainfall erosion map for the Namak Lake basin. In the first step, weather stations were examined in term of their locations and the quality and type of the data provided by them. Reviewing studies and researches conducted in the world and regarding the limited number of the weather stations equipped with recording rain gauges and other instruments, the modified Fournier index that may be derived from statistics of monthly precipitation was used. For this purpose, the index was computed in 182 the weather stations having records of precipitation over the last 20 years. Minimum, Medium and maximum values of modified Fournier index were obtained 14, 44 and 95 millimeters, respectively. The interpolation methods under consideration consist of TPSS (thin plate smoothing spline) with powers of 2, 3, 4 and 5 and with and without secondary variable; WMA (weighted moving average) with powers of 1, 2, 3 and 4; and ordinary Kriging, and Cokriging. The method of TPSS with power of 2 was found the most suitable. MBE, MAE, RMSE and  $R^2$  (determination coefficient of observed and estimated data based on the TPSS method) were -1.21, 4.46, 6.24 millimeters and 0.85, respectively.

**Key words:** Modified Fournier index, TPSS, Erosivity index, Interpolation methods, Namak lake basin

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