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E-mail: [moreya1@yahoo.com](mailto:moreya1@yahoo.com) ,

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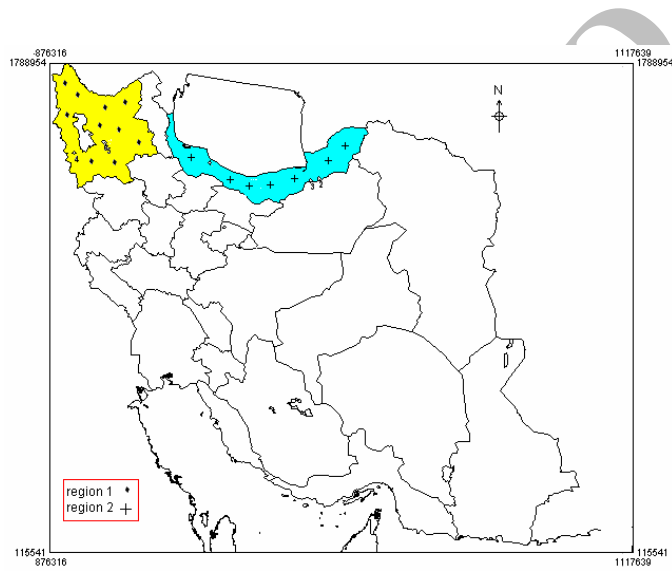
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- Physiography

- Bonta, 1997

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(m)	(m)	Km <sup>2</sup>	( )	(km)					
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C Q A :  
 . C .  
 :() Q= CA^( / A' ) ()  
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$Q_{max}$   
 $Q$   
 $A$   $T_p$  : ( )  
 $Q = \frac{I_a}{A} \cdot A$  ( )  
 :SCS  
 (TR-55)  $Q$   $A$

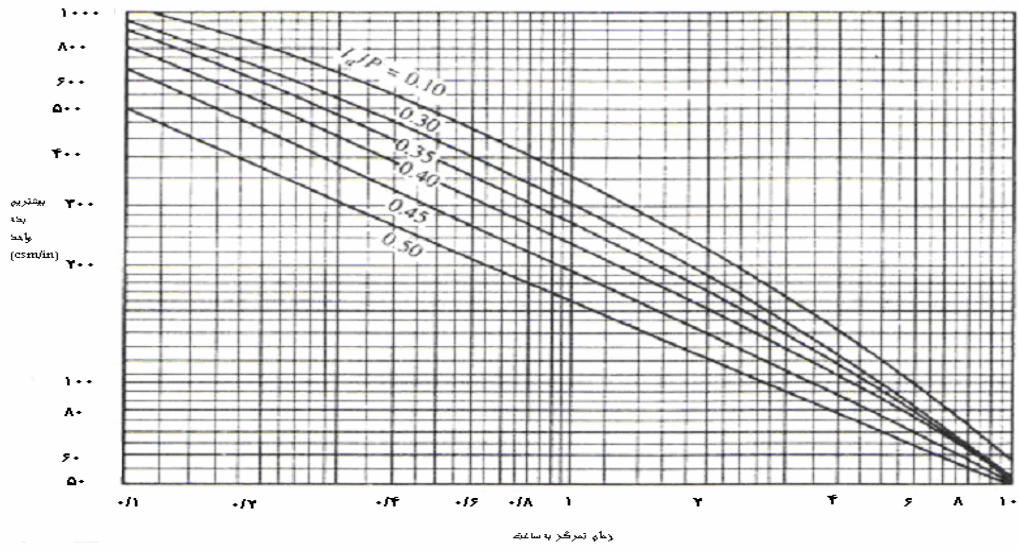
:  
 ( )  $q_{tr} = \left( \frac{I_a}{T} \right) / (A \cdot T)$  ( )  
 $q_{tr}$   
 $A$   $T$   
 ( )

II ( )  
 /  
 $Q = \left( \frac{I_a}{A} \right) / (A + A)$  ( )  
 $Q$   $A$   
 $p$  ( )  
 ( ) ( )  
 : FHWA

:  
 $q_p = q_u \cdot A \cdot Q$  ( ) :SCS  
 $A$   $q_p$   
 $Q$  ( )  
 $q_u$  ( )  
 :  
 $\log q_u = C_1 + C_2 \log tc + C_3 \log^2 tc$  ( )  $Q_{max} = \left( \frac{I_a}{A} \right) / (AQ) / T_p$  ( )  
 $C_1$   $C_2$   $C_3$   $tc$

( )  $\frac{I_a}{p}$   
 - Maier  
 - Horton  
 - Braid and Mc Illraith  
 NRCS  
 - Federal Highway Administration

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( SCS ) II

(n)

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$$\Sigma RSS = \left[ \frac{\Sigma (Q_o - Q_e)}{n} \right]^2 \quad ( )$$

( ) II FHAW

C	C	C	$\frac{Ia}{p}$
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$(\Sigma RSS)$				
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FHWA

FHWA	SCS	SCS	
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$(\sum RSS)$							
FHAW	SCS	SCS					
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/	/	/			/		
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SCS

FHWA

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( $\sum RSS = /$ )

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SCS

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( $\sum RSS =$  )

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## Maximum Flood Discharge Estimation for Small Watersheds

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### Abstract

One of the important problems in watershed management and water resources planning is maximum flood discharge estimation for small watersheds, due to a lack of hydrometric stations or data. In this study, two sets of methods were evaluated for determining the peak flood discharge, one is based on watershed area and another is based on physiographic and rain factors of the Watersheds. Watersheds were selected in North (Gorgan, Gilan and Mazandaran provinces as one region) and Azarbaijan (East and West Azarbaijan) as another region to determining rain depth efficient. The objective of this study was to find suitable methods for maximum flood discharge estimation in small watersheds. The results indicated that the Horton method in area base methods and SCS Graphical method in physiographic base methods had lower error in two regions. The FHWA method showed the maximum error for peak flood estimation in these regions. An error difference among area base methods wasn't more in two regions, but in physiographic methods amount of error in North region was much more than the Azarbaijan region. The results indicate, that amount of rainfall was a major factor that it influenced on errors. Generally, SCS Graphical method was showed a minimum error in compared with other selected methods.

**Keywords:** Maximum discharge, Flood estimation, Small watersheds, Curve number.

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