



Empirical Formulae for Flood-Peak Area Relationships Formulas

Calculators!

Examples!

Conversions!

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - 30,000+ Calculators!

Calculate With a Different Unit for Each Variable - In built Unit Conversion!

Widest Collection of Measurements and Units - 250+ Measurements!

Feel free to SHARE this document with your friends!

Please leave your feedback here...





List of 17 Empirical Formulae for Flood-Peak **Area Relationships Formulas**

Empirical Formulae for Flood-Peak Area Relationships 🗗

Dicken's Formula (1865)

1) Catchment area when maximum flood discharge is considered in Dickens formula

$$\mathbf{f}$$
 $\mathbf{A} = \left(rac{\mathrm{Q}_{\mathrm{mp}}}{\mathrm{C}_{\mathrm{D}}}
ight)^{rac{1}{0.75}}$

Open Calculator

$$oxed{88.3 \mathrm{m}^3/\mathrm{s}}{36.06445 \mathrm{km}^2} = \left(rac{88.3 \mathrm{m}^3/\mathrm{s}}{6.0}
ight)^{rac{1}{0.75}}$$

2) Dicken's Formula for maximum flood discharge 🗗

fx
$$oxed{Q_{mp} = C_D \cdot A^{rac{3}{4}}}$$



$$ext{ex} \ 96.32578 ext{m}^3/ ext{s} = 6.0 \cdot (40.5 ext{km}^2)^{rac{3}{4}}$$





3) Dicken's Formula for Maximum Flood Discharge in Central Andhra and Orrisa

fx $m Q_{mp} = C_{CA} \cdot A^{rac{3}{4}}$

Open Calculator

 $ext{ex} \ 417.4117 ext{m}^3/ ext{s} = 26 \cdot (40.5 ext{km}^2)^{rac{3}{4}}$

4) Dicken's Formula for Maximum Flood Discharge in Central India

 $m Q_{mp} = C_{CI} \cdot A^{rac{3}{4}}$

Open Calculator

 $ext{ex} \ 401.3574 ext{m}^3/ ext{s} = 25 \cdot \left(40.5 ext{km}^2
ight)^{rac{3}{4}}$

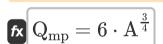
5) Dicken's Formula for Maximum Flood Discharge in North-Indian Hilly Regions

 $\mathbf{K} \mathbf{Q}_{\mathrm{mp}} = \mathbf{C}_{\mathrm{NH}} \cdot \mathbf{A}^{rac{3}{4}}$

Open Calculator 🚰

 $\mathbf{ex} \ 192.6516 \mathrm{m}^3/\mathrm{s} = 12 \cdot (40.5 \mathrm{km}^2)^{rac{3}{4}}$

6) Dicken's Formula for Maximum Flood Discharge in North-Indian Plains



Open Calculator

 $ext{ex} 96.32578 ext{m}^3/ ext{s} = 6 \cdot (40.5 ext{km}^2)^{rac{3}{4}}$





Inglis Formula (1930) 🗗

7) Inglis Formula for Areas between 160 to 1000 square kilometers

 $Q_{
m mp} = 123.2 \cdot \sqrt{
m A} - (2.62 \cdot (
m A_L - 259))$ Open C

Open Calculator 🗗

8) Inglis Formula for Larger Areas 🗗

$$\mathbf{E} \mathbf{Q}_{\mathrm{mp}} = rac{124 \cdot \mathrm{A}}{\sqrt{\mathrm{A} + 10.4}}$$

Open Calculator

ex $703.9111 \mathrm{m}^3/\mathrm{s} = rac{124 \cdot 40.5 \mathrm{km}^2}{\sqrt{40.5 \mathrm{km}^2 + 10.4}}$

9) Inglis Formula for Small Areas (also applicable for fan shaped catchment)

 $m [R] Q_{mp} = 123.2 \cdot \sqrt{A}$

Open Calculator

ex $784.04 \mathrm{m}^3/\mathrm{s} = 123.2 \cdot \sqrt{40.5 \mathrm{km}^2}$



Other Formulae 2

10) Baird and McIllwraith (1951) Formula for Maximum Flood Discharge 🗗

$$ext{Q}_{ ext{mp}} = rac{3025 \cdot ext{A}}{\left(278 + ext{A}
ight)^{0.78}}$$

Open Calculator 🗗

$$ext{ex} \ 1366.958 ext{m}^3/ ext{s} = rac{3025 \cdot 40.5 ext{km}^2}{\left(278 + 40.5 ext{km}^2
ight)^{0.78}}$$

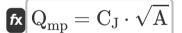
11) Fuller's formula for Maximum Flood Discharge

 $ag{Q}_{ ext{Tp}} = ext{C}_{ ext{f}} \cdot ext{A}^{0.8} \cdot (1 + 0.8 \cdot \log 10(ext{T}_{ ext{r}}))$

Open Calculator

$$\texttt{ex} \ 95.30714 \mathrm{m}^{_{3}}/\mathrm{s} = 1.80 \cdot (40.5 \mathrm{km}^{_{2}})^{0.8} \cdot (1 + 0.8 \cdot \log 10(150))$$

12) Jarvis Formula for Peak Discharge 🗗



Open Calculator

$$ext{ex} 89.09545 ext{m}^3/ ext{s} = 14 \cdot \sqrt{40.5 ext{km}^2}$$





Ryves Formula (1884) 🗗

13) Catchment area when maximum flood discharge in Ryve's formula 🚰

$$\mathbf{K} \mathbf{A} = \left(rac{\mathrm{Q}_{\mathrm{mp}}}{\mathrm{C}_{\mathrm{R}}}
ight)^{1.5}$$

Open Calculator 🚰

ex $46.79265 ext{km}^2 = \left(\frac{88.3 ext{m}^3/ ext{s}}{6.8}\right)^{1.5}$

14) Ryves Formula for maximum flood discharge

fx $\mathrm{Q}_{\mathrm{mp}} = \mathrm{C}_{\mathrm{R}} \cdot \mathrm{A}^{rac{2}{3}}$

Open Calculator

 $80.19469 \mathrm{m}^3/\mathrm{s} = 6.8 \cdot (40.5 \mathrm{km}^2)^{\frac{2}{3}}$

15) Ryves Formula of Maximum Flood Discharge for Areas within 80-160km from East Coast

fx $m Q_{mp} = 8.5 \cdot A^{rac{2}{3}}$

Open Calculator 🗗

 $ext{ex} \left[100.2434 ext{m}^3/ ext{s} = 8.5 \cdot (40.5 ext{km}^2)^{rac{2}{3}}
ight]$

16) Ryves Formula of Maximum Flood Discharge for Areas within 80km from East Coast

 $m Q_{mp}=6.8\cdot A^{rac{2}{3}}$

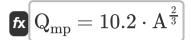
Open Calculator

 $\mathbf{ex} = 80.19469 \,\mathrm{m}^3/\mathrm{s} = 6.8 \cdot (40.5 \,\mathrm{km}^2)^{\frac{2}{3}}$





17) Ryves Formula of Maximum Flood Discharge for Limited Areas near Hills



Open Calculator

 $ext{ex} \left[120.292 ext{m}^3/ ext{s} = 10.2 \cdot (40.5 ext{km}^2)^{rac{2}{3}}
ight]$





Variables Used

- A Catchment Area (Square Kilometer)
- Al Catchment for Larger Area (Square Kilometer)
- CCA Dickens's Constant for Coastal Andhra and Orissa
- Ccl Dicken's Constant for Central Indian
- Cn Dicken's Constant
- Cf Fuller's Coefficient
- C₁ Coefficient (Jarvis Equation)
- CNH Dickens's Constant for North India hilly regions
- CR Ryve's Coefficient
- Q_{mp} Maximum Flood Discharge (Cubic Meter per Second)
- Q_{Tp} Maximum 24-hour Flood Peak Discharge (Cubic Meter per Second)
- T_r Return Period





Constants, Functions, Measurements used

- Function: log10, log10(Number)

 Common logarithm function (base 10)
- Function: sqrt, sqrt(Number) Square root function
- Measurement: Area in Square Kilometer (km²)
 Area Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Meter per Second (m³/s)

 Volumetric Flow Rate Unit Conversion





Check other formula lists

- Empirical Formulae for Flood-Peak Area Relationships
 Formulas
- Gumbel's Method for Prediction of Flood's Peak Formulas
- Rational Method to Estimate the Flood Peak Formulas

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

2/14/2024 | 3:03:05 PM UTC

Please leave your feedback here...



