

Important Flood Discharge Formulae Formulas PDF



Formulas
Examples
with Units

List of 22 Important Flood Discharge Formulae Formulas

1) Creager's Formula Formulas

1.1) Constant used in FPS Unit when Flood Discharge by Creager's Formula Formula

Formula

$$C_c = \frac{Q_c}{46 \cdot (A_1)^{0.894} \cdot A_1^{-0.084}}$$

Example with Units

$$60.6687 = \frac{4.2E6 \text{ ft}^3/\text{s}}{46 \cdot (2.6 \text{ mi}^2)^{0.894} \cdot 2.6 \text{ mi}^2^{-0.084}}$$

Evaluate Formula

1.2) Flood Discharge by Creager Formula

Formula

$$Q_c = 46 \cdot C_c \cdot (A_1)^{0.894} \cdot A_1^{-0.084}$$

Example with Units

$$4.2E+6 \text{ ft}^3/\text{s} = 46 \cdot 60 \cdot (2.6 \text{ mi}^2)^{0.894} \cdot 2.6 \text{ mi}^2^{-0.084}$$

Evaluate Formula

2) Dicken's Formula Formulas

2.1) Area of Basin given Flood Discharge by Dicken's Formula Formula

Formula

$$A_{\text{km}} = \left(\frac{Q_D}{C_D} \right)^{\frac{4}{3}}$$

Example with Units

$$2.4 \text{ km}^2 = \left(\frac{695125.6 \text{ m}^3/\text{s}}{11.4} \right)^{\frac{4}{3}}$$

Evaluate Formula

2.2) Constant used in Flood Discharge by Dicken's Formula Formula

Formula

$$C_D = \left(\frac{Q_D}{(A_{\text{km}})^{\frac{3}{4}}} \right)$$

Example with Units

$$11.4 = \left(\frac{695125.6 \text{ m}^3/\text{s}}{(2.4 \text{ km}^2)^{\frac{3}{4}}} \right)$$

Evaluate Formula

2.3) Flood Discharge by Dicken's Formula Formula

Formula

$$Q_D = C_D \cdot (A_{\text{km}})^{\frac{3}{4}}$$

Example with Units

$$695125.5995 \text{ m}^3/\text{s} = 11.4 \cdot (2.4 \text{ km}^2)^{\frac{3}{4}}$$

Evaluate Formula



2.4) Flood Discharge by Dicken's Formula for Northern India Formula

Formula

$$Q_D = 11.4 \cdot (A_{km})^{\frac{3}{4}}$$

Example with Units

$$695125.5995 \text{ m}^3/\text{s} = 11.4 \cdot (2.4 \text{ km}^2)^{\frac{3}{4}}$$

Evaluate Formula 

3) Fanning's Formula Formulas

3.1) Catchment Area given Flood Discharge by Fanning's Formula Formula

Formula

$$A_{km} = \left(\frac{Q_F}{C_F} \right)^{\frac{6}{5}}$$

Example with Units

$$2.4 \text{ km}^2 = \left(\frac{526837.2 \text{ m}^3/\text{s}}{2.54} \right)^{\frac{6}{5}}$$

Evaluate Formula 

3.2) Constant used in Flood Discharge by Fanning's Formula Formula

Formula

$$C_F = \left(\frac{Q_F}{(A_{km})^{\frac{5}{6}}} \right)$$

Example with Units

$$2.54 = \left(\frac{526837.2 \text{ m}^3/\text{s}}{(2.4 \text{ km}^2)^{\frac{5}{6}}} \right)$$

Evaluate Formula 

3.3) Flood Discharge by Fanning's Formula Formula

Formula

$$Q_F = C_F \cdot (A_{km})^{\frac{5}{6}}$$

Example with Units

$$526837.1819 \text{ m}^3/\text{s} = 2.54 \cdot (2.4 \text{ km}^2)^{\frac{5}{6}}$$

Evaluate Formula 

4) Fuller's Formula Formulas

4.1) Constant used in Flood Discharge by Fuller's Formula Formula

Formula

$$C_{FL} = \left(\frac{Q_{FL}}{\left((A_{km})^{0.8} \right) \cdot (1 + 0.8 \cdot \log(T_m \cdot e)) \cdot (1 + 2.67 \cdot (A_{km})^{-0.3})} \right)$$

Example with Units

$$0.185 = \left(\frac{25355.77 \text{ m}^3/\text{s}}{\left((2.4 \text{ km}^2)^{0.8} \right) \cdot (1 + 0.8 \cdot \log(2.2 \text{ Year}, e)) \cdot (1 + 2.67 \cdot (2.4 \text{ km}^2)^{-0.3})} \right)$$

Evaluate Formula 



4.2) Constant used in FPS Unit given Flood Discharge by Fuller's Formula Formula

Formula

Evaluate Formula 

$$C_{FLF} = \left(\frac{Q_{FLF}}{\left((A_1)^{0.8} \right) \cdot \left(1 + 0.8 \cdot \log(T_m, e) \right) \cdot \left(1 + 2 \cdot (A_1)^{-0.2} \right)} \right)$$

Example with Units

$$27.9993 = \left(\frac{321.30 \text{ ft}^3/\text{s}}{\left((2.6 \text{ mi}^2)^{0.8} \right) \cdot \left(1 + 0.8 \cdot \log(2.2 \text{ Year}, e) \right) \cdot \left(1 + 2 \cdot (2.6 \text{ mi}^2)^{-0.2} \right)} \right)$$

4.3) Flood Discharge by Fuller's Formula Formula

Formula

Evaluate Formula 

$$Q_{FL} = C_{FL} \cdot \left((A_{km})^{0.8} \right) \cdot \left(1 + 0.8 \cdot \log(T_m, e) \right) \cdot \left(1 + 2.67 \cdot (A_{km})^{-0.3} \right)$$

Example with Units

$$25355.7715 \text{ m}^3/\text{s} = 0.185 \cdot \left((2.4 \text{ km}^2)^{0.8} \right) \cdot \left(1 + 0.8 \cdot \log(2.2 \text{ Year}, e) \right) \cdot \left(1 + 2.67 \cdot (2.4 \text{ km}^2)^{-0.3} \right)$$

4.4) Flood Discharge in FPS Unit by Fuller's Formula Formula

Formula

Evaluate Formula 

$$Q_{FLF} = C_{FLF} \cdot \left((A_1)^{0.8} \right) \cdot \left(1 + 0.8 \cdot \log(T_m, e) \right) \cdot \left(1 + 2 \cdot (A_1)^{-0.2} \right)$$

Example with Units

$$321.3084 \text{ ft}^3/\text{s} = 28 \cdot \left((2.6 \text{ mi}^2)^{0.8} \right) \cdot \left(1 + 0.8 \cdot \log(2.2 \text{ Year}, e) \right) \cdot \left(1 + 2 \cdot (2.6 \text{ mi}^2)^{-0.2} \right)$$

5) Inglis Formula Formulas

5.1) Flood Discharge by Inglis Formula Formula

Formula

$$Q_I = \frac{123 \cdot A_{km}}{\sqrt{A_{km} + 10.4}}$$

Example with Units

$$190550.3678 \text{ m}^3/\text{s} = \frac{123 \cdot 2.4 \text{ km}^2}{\sqrt{2.4 \text{ km}^2 + 10.4}}$$

Evaluate Formula 

5.2) Flood Discharge in FPS Unit by Inglis Formula Formula

Formula

$$Q_{IF} = \frac{7000 \cdot A_1}{\sqrt{A_1 + 4}}$$

Example with Units

$$7084.3167 \text{ ft}^3/\text{s} = \frac{7000 \cdot 2.6 \text{ mi}^2}{\sqrt{2.6 \text{ mi}^2 + 4}}$$

Evaluate Formula 



6) Nawab Jang Bahadur Formula Formulas

6.1) Constant used in Flood Discharge by Nawab Jang Bahadur Formula Formula

Formula

Example with Units

Evaluate Formula 

$$C_N = \frac{Q_N}{\left(A_{km}\right)^{0.993 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(A_{km}\right)}}$$

$$48 = \frac{128570.5 \text{ m}^3/\text{s}}{\left(2.4 \text{ km}^2\right)^{0.993 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(2.4 \text{ km}^2\right)}}$$

6.2) Constant used in FPS Unit given Flood Discharge by Nawab Jang Bahadur Formula Formula

Formula

Evaluate Formula 

$$C_{NF} = \left(\frac{Q_{NF}}{\left(A_1\right)^{0.92 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(A_1\right)}} \right)$$

Example with Units

$$1600.0001 = \left(\frac{3746.224 \text{ ft}^3/\text{s}}{\left(2.6 \text{ mi}^2\right)^{0.92 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(2.6 \text{ mi}^2\right)}} \right)$$

6.3) Flood Discharge by Nawab Jang Bahadur Formula Formula

Formula

Evaluate Formula 

$$Q_N = C_N \cdot \left(A_{km}\right)^{0.993 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(A_{km}\right)}$$

Example with Units

$$128570.497 \text{ m}^3/\text{s} = 48 \cdot \left(2.4 \text{ km}^2\right)^{0.993 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(2.4 \text{ km}^2\right)}$$

6.4) Flood Discharge in FPS Unit by Nawab Jang Bahadur Formula Formula

Formula

Evaluate Formula 

$$Q_{NF} = C_{NF} \cdot \left(A_1\right)^{0.92 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(A_1\right)}$$

Example with Units

$$3746.2237 \text{ ft}^3/\text{s} = 1600 \cdot \left(2.6 \text{ mi}^2\right)^{0.92 - \left(\frac{1}{14}\right) \cdot \log_{10}\left(2.6 \text{ mi}^2\right)}$$



7) Ryve's Formula Formulas

7.1) Catchment Area for Flood Discharge by Ryve's Formula Formula

Formula

$$A_{\text{km}} = \left(\frac{Q_R}{C_R} \right)^{\frac{3}{2}}$$

Example with Units

$$2.4 \text{ km}^2 = \left(\frac{120997.9 \text{ m}^3/\text{s}}{6.75} \right)^{\frac{3}{2}}$$

Evaluate Formula 

7.2) Constant used in Flood Discharge by Ryve's Formula Formula

Formula

$$C_R = \left(\frac{Q_R}{(A_{\text{km}})^{\frac{2}{3}}} \right)$$

Example with Units

$$6.75 = \left(\frac{120997.9 \text{ m}^3/\text{s}}{(2.4 \text{ km}^2)^{\frac{2}{3}}} \right)$$

Evaluate Formula 

7.3) Flood Discharge by Ryve's Formula Formula

Formula

$$Q_R = C_R \cdot (A_{\text{km}})^{\frac{2}{3}}$$

Example with Units

$$120997.9282 \text{ m}^3/\text{s} = 6.75 \cdot (2.4 \text{ km}^2)^{\frac{2}{3}}$$




Evaluate Formula 



Variables used in list of Flood Discharge Formulae above

- **A₁** Area of Basin (Square Mile)
- **A_{km}** Catchment Area for Flood Discharge (Square Kilometer)
- **C_c** Creager Constant
- **C_D** Dicken's Constant
- **C_F** Fanning's Constant
- **C_{FL}** Fuller's Constant
- **C_{FLF}** Fuller's Constant for FPS
- **C_N** Nawab Jang Bahadur Constant
- **C_{NF}** Nawab Jang Bahadur Constant for FPS
- **C_R** Ryve's Constant
- **Q_c** Flood Discharge by Creager's Formula (Cubic Foot per Second)
- **Q_D** Flood Discharge by Dicken's Formula (Cubic Meter per Second)
- **Q_F** Flood Discharge by Fanning's Formula (Cubic Meter per Second)
- **Q_{FL}** Flood Discharge by Fuller's Formula (Cubic Meter per Second)
- **Q_{FLF}** Flood Discharge by Fuller's Formula in FPS (Cubic Foot per Second)
- **Q_I** Flood Discharge by English Formula (Cubic Meter per Second)
- **Q_{IF}** Flood Discharge by English Formula in FPS (Cubic Foot per Second)
- **Q_N** Flood Discharge by Nawab Jung Bahadur's Formula (Cubic Meter per Second)
- **Q_{NF}** Flood Discharge by Nawab J Bahadur Formula for FPS (Cubic Foot per Second)
- **Q_R** Flood Discharge by Ryve's Formula (Cubic Meter per Second)
- **T_m** Time Period for a Flood Discharge (Year)

Constants, Functions, Measurements used in list of Flood Discharge Formulae above

- **constant(s): e**, 2.71828182845904523536028747135266249
Napier's constant
- **Functions: log**, log(Base, Number)
Logarithmic function is an inverse function to exponentiation.
- **Functions: log10**, log10(Number)
The common logarithm, also known as the base-10 logarithm or the decimal logarithm, is a mathematical function that is the inverse of the exponential function.
- **Functions: sqrt**, sqrt(Number)
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement: Time** in Year (Year)
Time Unit Conversion 
- **Measurement: Area** in Square Mile (mi²), Square Kilometer (km²)
Area Unit Conversion 
- **Measurement: Volumetric Flow Rate** in Cubic Foot per Second (ft³/s), Cubic Meter per Second (m³/s)
Volumetric Flow Rate Unit Conversion 



Download other Important Surface Water Hydrology PDFs

- [Important Computation of Runoff Formulas](#) 
- [Important Evaporation and Transpiration Formulas](#) 
- [Important Flood Discharge Formulae Formulas](#) 
- [Important Flood Discharge Method Formulas](#) 

Try our Unique Visual Calculators

-  [Percentage of number](#) 
-  [LCM calculator](#) 
-  [Simple fraction](#) 

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

9/18/2024 | 12:10:57 PM UTC

