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Prediction of Sediment Distribution Formulas

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List of 16 Prediction of Sediment Distribution Formulas

Prediction of Sediment Distribution

Area Increment Method

1) Depth at which Reservoir is Completely Filled up

Open Calculator

fx $$h_o = H - \left(\frac{V_s - V_o}{A_o} \right)$$

ex $$2\text{m} = 11\text{m} - \left(\frac{455\text{m}^3 - 5\text{m}^3}{50\text{m}^2} \right)$$

2) Incremental Sediment Volume

Open Calculator

fx $$V_o = (A_o \cdot \Delta H)$$

ex $$25\text{m}^3 = (50\text{m}^2 \cdot 0.5\text{m})$$

3) Original Reservoir Area at New Zero Level

Open Calculator

fx $$A_o = \frac{V_s - V_o}{H - h_o}$$

ex $$50\text{m}^2 = \frac{455\text{m}^3 - 5\text{m}^3}{11\text{m} - 2\text{m}}$$

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4) Sediment Volume between Old Zero and New Zero Bed Level

Open Calculator

fx $V_o = V_s - (A_o \cdot (H - h_o))$

ex $5\text{m}^3 = 455\text{m}^3 - (50\text{m}^2 \cdot (11\text{m} - 2\text{m}))$

5) Sediment Volume to be Distributed in Reservoir

Open Calculator

fx $V_s = A_o \cdot (H - h_o) + V_o$

ex $455\text{m}^3 = 50\text{m}^2 \cdot (11\text{m} - 2\text{m}) + 5\text{m}^3$

Empirical Area Reduction Method

6) Difference in Elevations and Original Bed of Reservoir given New Total Depth of Reservoir

Open Calculator

fx $H = D + h_o$

ex $11\text{m} = 9\text{m} + 2\text{m}$

7) Difference in Elevations of Full Reservoir Level and Original Bed of Reservoir

Open Calculator

fx $H = \frac{h_o}{p}$

ex $11.0011\text{m} = \frac{2\text{m}}{0.1818\text{m}}$

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8) Height up to which Sediment Completely Fills up given New Relative Depth

Open Calculator

fx $h_o = p \cdot H$

ex $1.9998\text{m} = 0.1818\text{m} \cdot 11\text{m}$

9) New Total Depth of Reservoir

Open Calculator

fx $D = H - h_o$

ex $9\text{m} = 11\text{m} - 2\text{m}$

10) Relative Area for Different Type Classification of Reservoir

Open Calculator

fx $A_p = C \cdot (p^m\_\{1\}) \cdot (1 - p)^n\_\{1\}$

ex $0.201478 = 5.074 \cdot \left((0.1818\text{m})^{1.85}\right) \cdot (1 - 0.1818\text{m})^{0.36}$

11) Relative Area given Soil Erodibility Factor

Open Calculator

fx $A_p = \frac{A_s}{K}$

ex $1.9 = \frac{0.323\text{m}^2}{0.17}$

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12) Relative Depth at New Zero Elevation

Open Calculator

fx $$p = \frac{h_o}{H}$$

ex $$0.181818\text{m} = \frac{2\text{m}}{11\text{m}}$$

13) Sediment Area at any Height above Datum

Open Calculator

fx $$A_s = A_p \cdot K$$

ex $$0.323\text{m}^2 = 1.9 \cdot 0.17$$

14) Volume of Sediment Deposited between two Consecutive Heights by Average End Area Method

Open Calculator

fx $$\Delta V_s = (A_1 + A_2) \cdot \left(\frac{\Delta H}{2}\right)$$

ex $$5\text{m}^3 = (14\text{m}^2 + 6\text{m}^2) \cdot \left(\frac{0.5\text{m}}{2}\right)$$

15) Volume of Sediment Deposited between two Consecutive Heights by Weighted Area Method

Open Calculator

fx $$\Delta V_s = \left(A_1 + A_2 + \sqrt{A_1 \cdot A_2}\right) \cdot \left(\frac{\Delta H}{3}\right)$$

ex $$4.860859\text{m}^3 = \left(14\text{m}^2 + 6\text{m}^2 + \sqrt{14\text{m}^2 \cdot 6\text{m}^2}\right) \cdot \left(\frac{0.5\text{m}}{3}\right)$$

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16) Volume of Sediment Deposition given Incremental Area

Open Calculator

fx $\Delta V_s = 0.5 \cdot ((A_1 + A_2) \cdot \Delta H)$

ex $5m^3 = 0.5 \cdot ((14m^2 + 6m^2) \cdot 0.5m)$

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Variables Used

- A_1 Cross-Sectional Area at Point 1 *(Square Meter)*
- A_2 Cross-Sectional Area at Point 2 *(Square Meter)*
- A_o Area at the New Zero Elevation *(Square Meter)*
- A_p Dimensionless Relative Area
- A_s Sediment Area *(Square Meter)*
- **C** Coefficient c
- **D** New Total Depth of Reservoir *(Meter)*
- **H** Difference in the Elevation (FRL and Original bed) *(Meter)*
- h_o Height above Bed *(Meter)*
- **K** Soil Erodibility Factor
- m_1 Coefficient m1
- n_1 Coefficient n1
- **p** Relative Depth *(Meter)*
- V_o Volume of Sediment *(Cubic Meter)*
- V_s Volume of Sediment to be Distributed *(Cubic Meter)*
- ΔH Change in Head Between the Points *(Meter)*
- ΔV_s Volume of Sediment Deposit *(Cubic Meter)*

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Constants, Functions, Measurements used

- Function: **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: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Volume** in Cubic Meter (m^3)
  Volume Unit Conversion
- Measurement: **Area** in Square Meter (m^2)
  Area Unit Conversion

Check other formula lists

- **Prediction of Sediment Distribution Formulas**

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