Important Evaporation and Transpiration Formulas **PDF**



Formulas Examples with Units

List of 17

Important Evaporation and Transpiration Formulas

1) Actual Vapour Pressure given Evaporation Loss Per Day Formula 🕝

$$\mathbf{v} = \mathbf{V} - \left(\frac{\mathbf{E}}{\mathbf{C}' \cdot (1.465 - (0.00732 \cdot \mathbf{P_a})) \cdot (0.44 + (0.0732 \cdot \mathbf{u}))} \right)$$

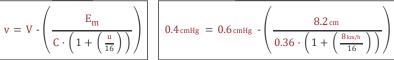
$$0.4\,\mathrm{cmHg} \,=\, 0.6\,\mathrm{cmHg} \, - \left(\frac{8.29\,\mathrm{cm}}{0.75\,\cdot\,\left(\,1.465\,-\,\left(\,0.00732\,\cdot\,74.83\,\mathrm{cmHg}\,\,\right)\,\,\right)\,\cdot\,\left(\,0.44\,+\,\left(\,0.0732\,\cdot\,8\,\mathrm{km/h}\,\,\right)\,\,\right)} \,\right)$$

2) Actual Vapour Pressure given Evaporation Loss Per Month Formula 🕝

Formula

$$v = V \cdot \left(\frac{E_m}{C \cdot \left(1 + \left(\frac{u}{16} \right) \right)} \right)$$

Example with Units



3) Atmospheric Pressure given Change in Vapour Pressure Formula 🕝



Evaluate Formula

Evaluate Formula (

$$P_{a} = \frac{1.456 - \left(\frac{E}{C' \cdot (0.44 + (0.0732 \cdot u)) \cdot \delta V}\right)}{0.00732}$$

Example with Units

$$73.629 \, \text{cmHg} = \frac{1.456 \cdot \left(\frac{8.29 \, \text{cm}}{0.75 \cdot \left(0.44 + \left(0.0732 \cdot 8 \, \text{km/h}\right)\right) \cdot 0.2 \, \text{cmHg}}\right)}{0.00732}$$

4) Atmospheric Pressure given Evaporation Loss Per Day Formula 🕝

Evaluate Formula (

Evaluate Formula

Evaluate Formula (

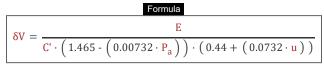
Evaluate Formula [

Evaluate Formula [

$$P_{a} = \frac{1.456 - \left(\frac{E}{C' \cdot (0.44 + (0.0732 \cdot u)) \cdot (V \cdot v)}\right)}{0.00732}$$

$$73.629 \, \text{cmHg} = \frac{1.456 - \left(\frac{8.29 \, \text{cm}}{0.75 \cdot \left(0.44 + \left(0.0732 \cdot 8 \, \text{km/h}\right)\right) \cdot \left(0.6 \, \text{cmHg} - 0.4 \, \text{cmHg}\right)\right)}{0.00732}$$

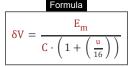
5) Change in Vapour Pressure given Evaporation Loss Per Day Formula 🕝



Example with Units

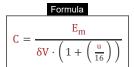
$$0.2_{\text{ cmHg}} = \frac{8.29_{\text{ cm}}}{0.75 \cdot \left(1.465 - \left(0.00732 \cdot 74.83_{\text{ cmHg}}\right)\right) \cdot \left(0.44 + \left(0.0732 \cdot 8_{\text{ km/h}}\right)\right)}$$

6) Change in Vapour Pressure given Evaporation Loss Per Month Formula 🕝





7) Constant Dependent on Depth of Water Bodies given Change in Vapour Pressure Formula



Example with Units

$$C = \frac{E_m}{\delta V \cdot \left(1 + \left(\frac{u}{16}\right)\right)} \qquad \boxed{0.0275 = \frac{8.2 \, \text{cm}}{0.2 \, \text{cmHg} \, \cdot \left(1 + \left(\frac{8 \, \text{km/h}}{16}\right)\right)}}$$

8) Constant used in Rohwer's Formula given Change in Vapour Pressure Formula 🕝

 $C' = \frac{E}{\left(1.465 - \left(0.00732 \cdot P_{a}\right)\right) \cdot \left(0.44 + \left(0.0732 \cdot u\right)\right) \cdot \delta V}$

$$0.7498 = \frac{8.29 \, \text{cm}}{\left(1.465 - \left(0.00732 \cdot 74.83 \, \text{cmHg}\right)\right) \cdot \left(0.44 + \left(0.0732 \cdot 8 \, \text{km/h}\right)\right) \cdot 0.2 \, \text{cmHg}}$$

9) Constant used in Rohwer's Formula given Evaporation Loss Per Day Formula 🕝

Formula

$$C' = \frac{E}{\left(1.465 - \left(0.00732 \cdot P_{a}\right)\right) \cdot \left(0.44 + \left(0.0732 \cdot u\right)\right) \cdot \left(V - v\right)}$$

Example with Units

$$0.7498 = \frac{8.29 \, \text{cm}}{\left(1.465 - \left(0.00732 \cdot 74.83 \, \text{cmHg}\right)\right) \cdot \left(0.44 + \left(0.0732 \cdot 8 \, \text{km/h}\right)\right) \cdot \left(0.6 \, \text{cmHg} - 0.4 \, \text{cmHg}\right)}$$

10) Evaporation Loss Per Day Formula 🕝

$$E = C' \cdot \left(1.465 - \left(0.00732 \cdot P_a\right)\right) \cdot \left(0.44 + \left(0.0732 \cdot u\right)\right) \cdot \left(V - v\right)$$

Example with Units

$$8.2919 \, \text{cm} = 0.75 \cdot (1.465 - (0.00732 \cdot 74.83 \, \text{cmHg})) \cdot (0.44 + (0.0732 \cdot 8 \, \text{km/h})) \cdot (0.6 \, \text{cmHg} - 0.4 \, \text{cmHg})$$

11) Evaporation Loss Per Day given Change in Vapour Pressure Formula 🕝

$$E = C' \cdot \left(\left. 1.465 \cdot \left(\left. 0.00732 \cdot P_a \right) \right. \right) \cdot \left(\left. 0.44 + \left. \left(\left. 0.0732 \cdot u \right. \right) \right. \right) \cdot \delta V$$

Example with Units

$$0.0829\,\text{cm} \ = \ 0.75 \cdot \left(\ 1.465 - \left(\ 0.00732 \cdot 74.83\,\text{cmHg}\ \right)\ \right) \cdot \left(\ 0.44 + \left(\ 0.0732 \cdot 8\,\text{km/h}\ \right)\ \right) \cdot 0.2\,\text{cmHg}$$

12) Evaporation Loss Per Month Formula 🕝

$$\mathbf{E}_{\mathbf{m}} = \mathbf{C} \cdot \left(\mathbf{V} - \mathbf{v} \right) \cdot \left(1 + \left(\frac{\mathbf{u}}{16} \right) \right)$$

Example with Units

8.2 cm =
$$0.36 \cdot \left(0.6 \, \text{cmHg} - 0.4 \, \text{cmHg}\right) \cdot \left(1 + \left(\frac{8 \, \text{km/h}}{16}\right)\right)$$

13) Evaporation Loss Per Month given Change in Vapour Pressure Formula 🕝

Formula

Example with Units

Evaluate Formula (

Evaluate Formula

Evaluate Formula

Evaluate Formula

$$E_{m} = C \cdot \delta V \cdot \left(1 + \left(\frac{u}{16}\right)\right) \left[142921.184 \, \text{cm} = 0.36 \cdot 0.2 \, \text{cmHg} \cdot \left(1 + \left(\frac{8 \, \text{km/h}}{16}\right)\right) \right]$$

14) Maximum Vapour Pressure given Evaporation Loss Per Day Formula 🕝

Formula

$$V = v + \left(\frac{E}{C' \cdot (1.465 - (0.00732 \cdot P_a)) \cdot (0.44 + (0.0732 \cdot u))}\right)$$

Example with Units

$$0.6\,\text{cmHg} \,=\, 0.4\,\text{cmHg} \,+ \left(\frac{8.29\,\text{cm}}{0.75\cdot\left(\,1.465\,-\,\left(\,0.00732\cdot74.83\,\text{cmHg}\,\,\right)\,\,\right)\cdot\left(\,0.44\,+\,\left(\,0.0732\cdot8\,\text{km/h}\,\,\right)\,\,\right)}\right)$$

15) Maximum Vapour Pressure given Evaporation Loss Per Month Formula 🕝



Evaluate Formula (

Evaluate Formula (

Evaluate Formula (

Formula

$$V = v + \left(\frac{E_m}{C \cdot \left(1 + \left(\frac{u}{16}\right)\right)}\right)$$

Example with Units

$$V = v + \left(\frac{E_m}{C \cdot \left(1 + \left(\frac{u}{16}\right)\right)}\right) \qquad 0.6 \, \text{cmHg} \, = \, 0.4 \, \text{cmHg} \, + \left(\frac{8.2 \, \text{cm}}{0.36 \cdot \left(1 + \left(\frac{8 \, \text{km/h}}{16}\right)\right)}\right)$$

16) Mean Wind Velocity at Ground Level given Evaporation Loss Per Day Formula 🦵



$$u = \frac{\left(\frac{E}{C' \cdot (1.465 \cdot (0.00732 \cdot P_a)) \cdot (V \cdot V)}\right) - 0.44}{0.0732}$$

Example with Units

$$0.0799\,\mathrm{km/h}\ = \frac{\left(\frac{8.29\,\mathrm{cm}}{0.75\cdot\left(1.465\cdot\left(0.00732\cdot74.83\,\mathrm{cmHg}\,\right)\right)\cdot\left(0.6\,\mathrm{cmHg}\,\cdot\,0.4\,\mathrm{cmHg}\,\right)}\right) - 0.44}{0.0732}$$

17) Monthly Mean Wind Velocity given Evaporation Loss Per Month Formula 🕝



Formula

$$u = \left(\left(\frac{E_{m}}{C \cdot (V - v)}\right) - 1\right) \cdot 16$$

$$0.08\,\mathrm{km/h}\ = \left(\left(\frac{8.2\,\mathrm{cm}}{0.36\cdot\left(\ 0.6\,\mathrm{cmHg}\ -\ 0.4\,\mathrm{cmHg}\ \right)}\right) - 1\right)\cdot 16$$

Variables used in list of Evaporation and Transpiration Formulas above

- . C Meyer's Constant
- C' Rohwer's Formula Constant
- **E** Evaporation Loss per Day (Centimeter)
- E_m Evaporation Loss per Month (Centimeter)
- P_a Atmospheric Pressure (Centimeter Mercury (0 °C))
- **u** Mean Wind Velocity (Kilometer per Hour)
- V Actual Vapour Pressure (Centimeter Mercury (0 °C))
- V Maximum Vapour Pressure (Centimeter Mercury (0 °C))
- δV Change in Vapour Pressure (Centimeter Mercury (0 °C))

Constants, Functions, Measurements used in list of Evaporation and Transpiration Formulas above

- Measurement: Length in Centimeter (cm)
 Length Unit Conversion
- Measurement: Pressure in Centimeter Mercury (0 °C) (cmHg)
 - Pressure Unit Conversion
- Measurement: Speed in Kilometer per Hour (km/h)
 Speed Unit Conversion

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