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

Evaluate Formula

Formula

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

Example with Units

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

2) Actual Vapour Pressure given Evaporation Loss Per Month Formula

Evaluate Formula

Formula

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

Example with Units

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

3) Atmospheric Pressure given Change in Vapour Pressure Formula

Evaluate Formula

Formula

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

Example with Units

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

4) Atmospheric Pressure given Evaporation Loss Per Day Formula

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

$$0.0153\,\text{cmHg} = \frac{8.2\,\text{cm}}{0.36 \cdot \left(1 + \left(\frac{8\,\text{km/h}}{16}\right)\right)}$$

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

Evaluate Formula

Formula

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

Example with Units

$$0.0275 = \frac{8.2\,\text{cm}}{0.2\,\text{cmHg} \cdot \left(1 + \left(\frac{8\,\text{km/h}}{16}\right)\right)}$$

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate 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

Evaluate Formula

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

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

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

Evaluate Formula

Formula

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

$$142921.184\,\text{cm} = 0.36 \cdot 0.2\,\text{cmHg} \cdot \left(1 + \left(\frac{8\,\text{km/h}}{16}\right)\right)$$

14) Maximum Vapour Pressure given Evaporation Loss Per Day Formula

Evaluate Formula

Formula

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

Example with Units

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

15) Maximum Vapour Pressure given Evaporation Loss Per Month Formula

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

$$0.0799\,\text{km/h} = \frac{\left(\frac{8.29\,\text{cm}}{0.75 \cdot \left(1.465 - \left(0.00732 \cdot 74.83\,\text{cmHg} \right) \right) \cdot \left(0.6\,\text{cmHg} - 0.4\,\text{cmHg} \right)} \right) - 0.44}{0.0732}$$

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

Evaluate Formula

Formula

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

Example with Units

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

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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