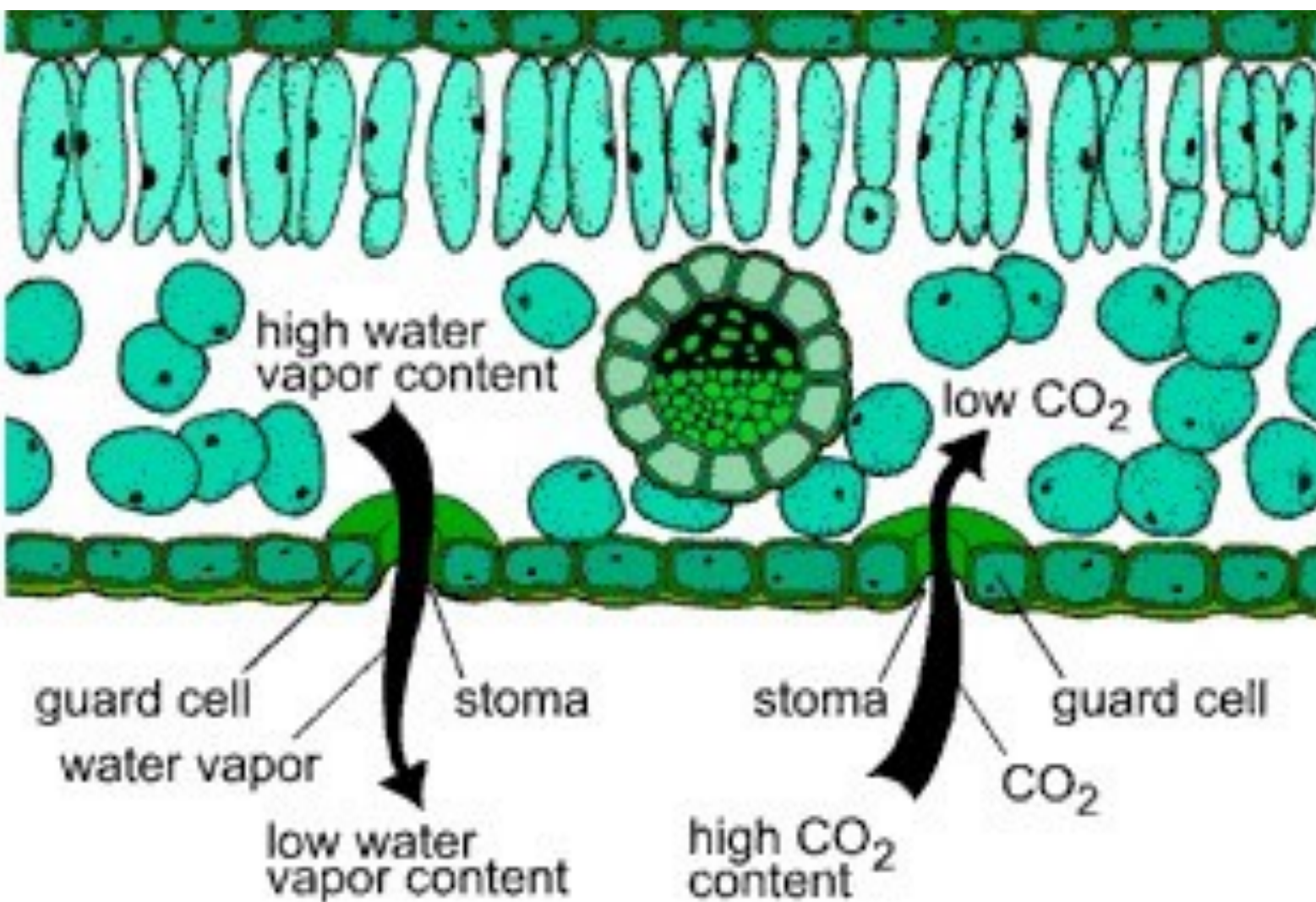


Black box of the submodes (ET for example)



Balance between water demand and water availability

Water **demand** from the atmosphere:
vapor pressure deficit (wind) and radiation

Penman- Monteith

Penman

$$E = \frac{s R_N + \rho_a c_p C_a [e_s(T_a) - e_a]}{[s + \gamma(1 + C_a/C_{can})] \lambda_v} \quad \text{(Radiation + VPD) / availability}$$

- s is slope of saturation vapor pressure deficit curve (Pa K⁻¹)
- R - net radiation (W m⁻²)
- ρ_a - density of the air (kg m⁻³)
- c_p - heat capacity of the air (J kg⁻¹ K⁻¹)
- γ - psychrometric constant (Pa K⁻¹)
- u - wind speed m/s
- C_a - aerodynamic conductance (m s⁻¹) often $f(\text{windspeed})$
- C_{can} - canopy conductance (plant regulation of water loss)
- e_s, e_a - vapor pressure (saturated and actual) could write as (1-relative humidity)* e_s
- λ_v latent heat of vaporization (MJ kg⁻¹)

Instantaneous!!