Potential evaporation vs. available heat flux R_N - H_G

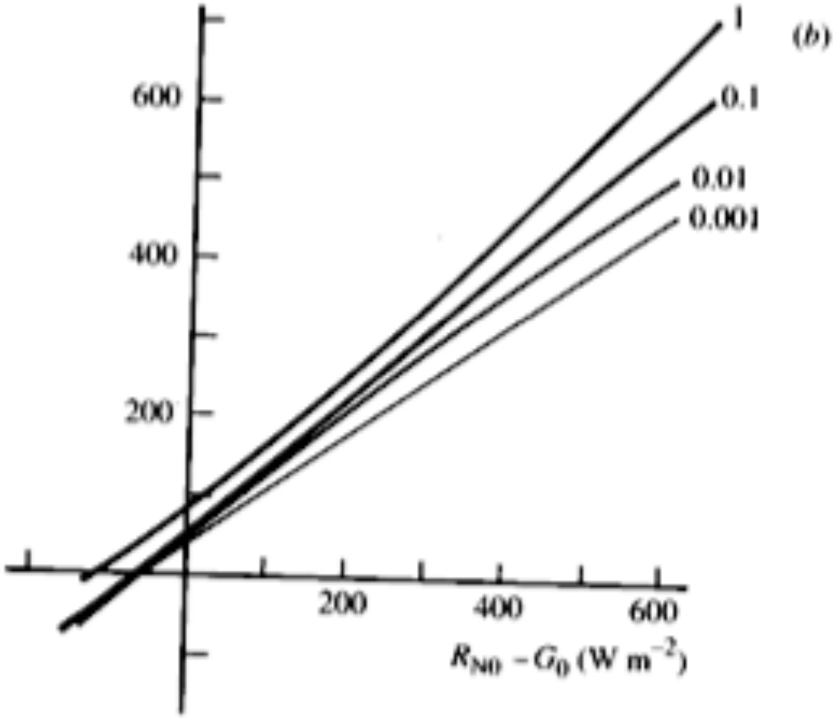

Fig. 5.6 Potential evaporation for different wet surfaces calculated from Eq. 5.26. In (*a*) neutral conditions have been assumed, and in (*b*) the full stability correction in r_{aV} is included (see Eqs. 3.47 and 3.57). Note how the effects of thermal stability tend to reduce the direct influence of aerodynamic roughness. Values of z_0 are as follows: 0.001 m, lake; 0.01 m, grass; 0.1 m, scrub; 1 m, forest. Further details of the calculations can be found in Webb (1975).

Evaporation vs. surface stomatal resistance

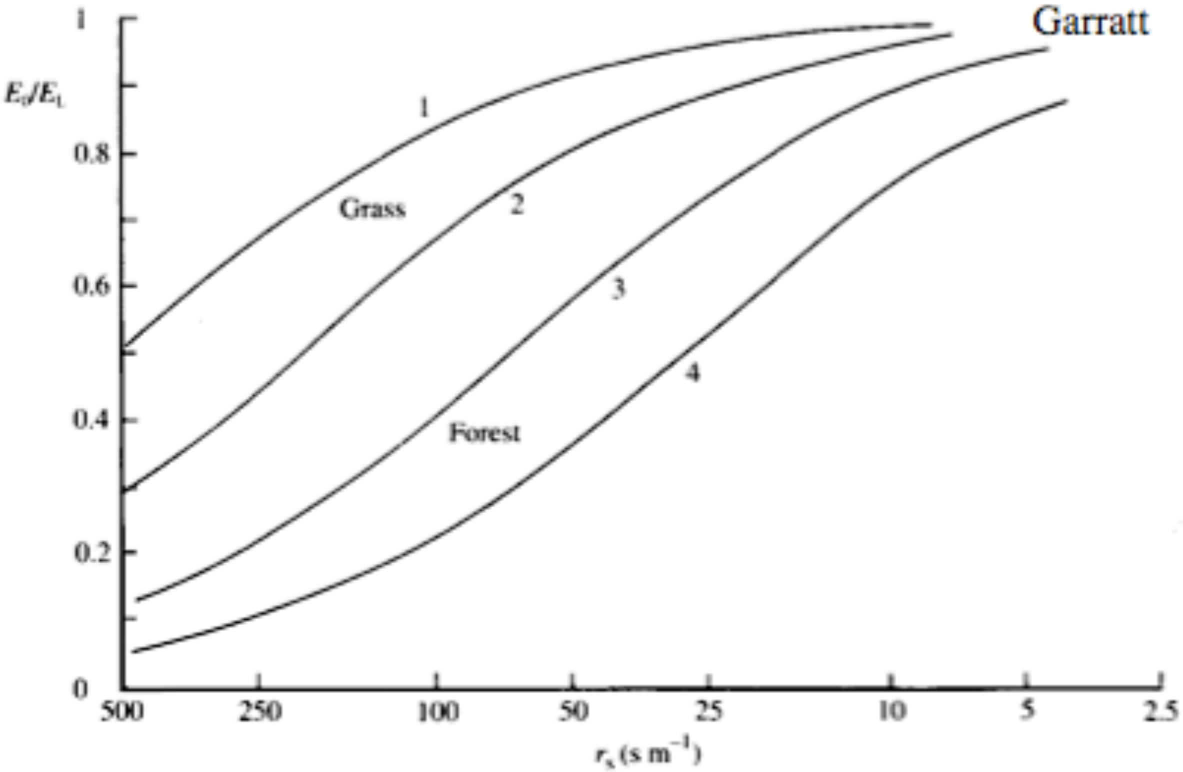

Fig. 5.8 Variations of E_0/E_L (Eq. 5.37) with surface resistance. Values of r_{aV} have been calculated for neutral conditions, with $z_q = z_0/7.4$. For short grass ($z_0 = 0.0025$ m): curve 1, $T = 303$ K; curve 2, $T = 278$ K. For forest ($z_0 = 0.75$ m): curve 3, $T = 303$ K; curve 4, $T = 278$ K.

Soil moisture parameters

Garratt

Table A9. *Soil moisture quantities for a range of soil types, based on Clapp and Hornberger* (1978)

Quantities shown are as follows: η_s is the saturation moisture content (volume per volume), η_w is the wilting value of the moisture constant which assumes 150 m suction (i.e. the value of η when $\psi = -150$ m), ψ_s is the saturation moisture potential and $K_{\eta s}$ is the saturation hydraulic conductivity; b is an index parameter (see Eqs. 5.46–5.48).

Soil type	η_s ($m^3\ m^{-3}$)	ψ_s (m)	$K_{\eta s}$ (10^{-6} m s^{-1})	b	η_w ($m^3\ m^{-3}$)
1. sand	0.395	− 0.121	176	4.05	0.0677
2. loamy sand	0.410	− 0.090	156.3	4.38	0.075
3. sandy loam	0.435	− 0.218	34.1	4.90	0.1142
4. silt loam	0.485	− 0.786	7.2	5.30	0.1794
5. loam	0.451	− 0.478	7.0	5.39	0.1547
6. sandy clay loam	0.420	− 0.299	6.3	7.12	0.1749
7. silty clay loam	0.477	− 0.356	1.7	7.75	0.2181
8. clay loam	0.476	− 0.630	2.5	8.52	0.2498
9. sandy clay	0.426	− 0.153	2.2	10.40	0.2193
10. silty clay	0.492	− 0.490	1.0	10.40	0.2832
11. clay	0.482	− 0.405	1.3	11.40	0.2864

Surface RH vs. soil moisture

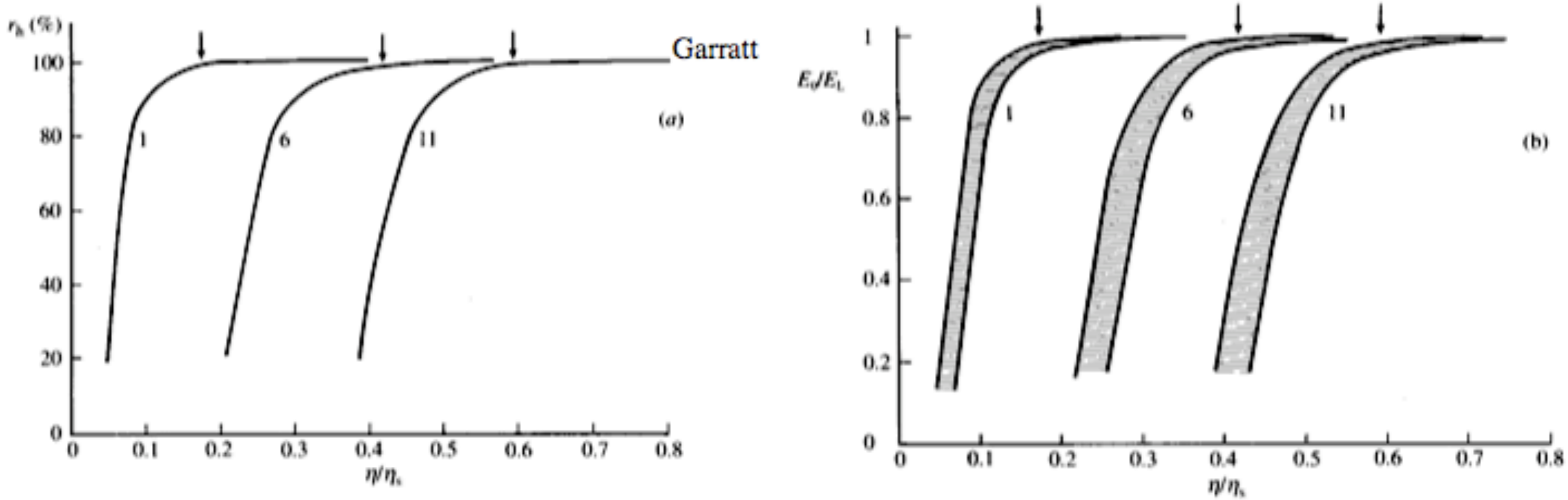

Fig. 5.9 (*a*) Relative humidity r_h as a function of relative soil moisture content η/η_s, based on Eq. 5.49 and data in Table A9 for soil types 1 (sand), 6 (loam) and 11 (clay). Calculations are for a temperature T_0 of 303 K. The vertical arrows indicate the wilting points. Note that combining Eqs. 5.46 and 5.49 allows r_h to be calculated from $\ln r_h = -(g/R_v T_0)\psi_s(\eta/\eta_s)^{-b}$. (*b*) E_0/E_L as a function of the relative soil moisture content, based on numerical simulations in an atmospheric model for a range of climate conditions (mid-latitude summer) represented by the shaded regions (the temperature range is 283–303 K and $q = 0.005$).