

## CORRIGENDA

Raupach, M. R.: 1992, 'Drag and Drag Partition on Rough Surfaces', *Boundary-Layer Meteorology* **60**, 375–395 (R92)

Raupach, M. R.: 1994, 'Simplified Expressions for Vegetation Roughness Length and Zero-Plane Displacement', *Boundary-Layer Meteorology* **71**, 211–216 (R94)

The last section of paper R92 concerned a model for the roughness length  $z_0$  and zero-plane displacement  $d$  of a rough surface, in terms of the roughness height  $h$  and roughness density. The model for  $z_0$  depends upon the expression for  $d$ , and also on a coefficient  $c_w = (z_w - d)/(h - d)$  which specifies the depth of the roughness sublayer,  $z_w$ . Paper R94 proposed a simpler model for  $d$ , and thence  $z_0$ . A sequence of minor but confusing errors appeared in both papers concerning  $c_w$ . I am grateful to Drs Edgar Andreas and Watanabe Tsutomu for correspondence concerning these errors.

*Corrections to R92:*

(1) There is a sign error in the last term of Equation (29), and the last two terms of Equation (31). These equations should read:

$$\Psi \left( \frac{z - d}{z_w - d} \right) = \ln \left( \frac{z_w - d}{z - d} \right) + \frac{z - z_w}{z_w - d} \quad (29)$$

↑

$$\Psi_h = \ln(c_w) - 1 + c_w^{-1} \quad (31)$$

↑            ↑

where arrows indicate the sign changes. Consistent with the correct Equation (31), the in-line equation on page 392, line 14 should read  $\exp(\Psi_h) = c_w \exp(c_w^{-1} - 1)$ .

(2) The numerical values of  $c_w$  and  $\Psi_h$  given in R92 should be disregarded, because of the above error and also because the model for  $d/h$  in R92 has been superseded.

*Corrections to R94:*

(3) Two typographic errors occurred. First, Equation (4) should read

$$z_0/h = (1 - d/h) \exp(-\kappa U_h/u_* + \Psi_h). \quad (4)$$

↑

Second, a subscript  $w$  was omitted in the last term in the footnote on p. 212, which reproduces Equation (29) of R92. The correct equation is given above.

(4) The footnote on p. 214 is incorrect and should be deleted.

*Summary:* With corrections (3) and (4), R94 is correct. The R94 model for  $d$  supersedes that in R92. The value  $c_w = 2$  used in R94 is appropriate. Variation in  $c_w$  through a plausible range (1.5 to 2.5) does not have a strong effect on  $z_0/h$ , as confirmed by the accompanying table.

$c_w$	$\Psi_h$	$z_0/h$
1.0	0.000	0.067
1.5	0.072	0.072
2.0	0.193	0.081
2.5	0.316	0.091

*Table:* The dependence of  $\Psi_h$  and  $z_0/h$  on  $c_w$ , from R92 Equation (31) and R94 Equation (4). It is assumed that  $U_h/u_* = 3.3$ ,  $\kappa = 0.4$  and  $d/h = 0.75$  (where  $U_h$  is the mean velocity at height  $h$ ,  $u_*$  the friction velocity, and  $\kappa$  the von Karman constant); these values are appropriate for a roughness density ( $\lambda$ ) of 1.