

## Surface Characteristic Parameters

**Table 1:** Surface albedo by land-use and season

Land-use	Spring	Summer	Fall	Winter
Water (fresh and sea)	0.12	0.1	0.14	0.2
Deciduous Forest	0.12	0.12	0.12	0.50
Coniferous Forest	0.12	0.12	0.12	0.35
Swamp	0.12	0.14	0.16	0.30
Cultivated Land	0.14	0.20	0.18	0.60
Grassland	0.18	0.18	0.20	0.60
Urban	0.14	0.16	0.18	0.35
Desert Shrubland	0.30	0.28	0.28	0.45

**Note:** The Bowen ratio for winter in the following tables depends on whether a snow cover is present continuously, intermittently or seldom. For seldom snow cover, the values between autumn and winter may be more applicable; for continuous snow cover, the values for winter are applicable. For bodies of water, it is assumed that the surface is frozen.

**Table2a:** Day-time Bowen Ratio by land-use and season (dry conditions)

Land-Use	Spring	Summer	Autumn	Winter
Water (fresh and sea)	0.10	0.10	0.10	2.00
Deciduous Forest	1.50	0.60	2.00	2.00
Coniferous Forest	1.50	0.60	1.50	2.00
Swamp	0.20	0.20	0.20	2.00
Cultivated Land	1.00	1.50	2.00	2.00
Grassland	1.00	2.00	2.00	2.00
Urban	2.00	4.00	4.00	2.00
Desert Shrubland	5.00	6.00	10.00	10.00

Surface Characteristic Parameters Contd...

**Table 2b:** Day-time Bowen Ratio by land-use and season (average moisture conditions)

Land-Use	Spring	Summer	Autumn	Winter
Water (fresh and sea)	0.10	0.10	0.10	1.50
Deciduous Forest	0.70	0.30	1.00	1.50
Coniferous Forest	0.70	0.30	0.80	1.50
Swamp	0.10	0.10	0.10	1.50
Cultivated Land	0.30	0.50	0.70	1.50
Grassland	0.40	0.80	1.00	1.50
Urban	1.00	2.00	2.00	1.50
Desert Shrubland	3.00	4.00	6.00	6.00

**Table 2c:** Day-time Bowen Ratio by land-use and season (average wet conditions)

Land-Use	Spring	Summer	Autumn	Winter
Water (fresh and sea)	0.10	0.10	0.10	0.30
Deciduous Forest	0.30	0.20	0.40	0.50
Coniferous Forest	0.30	0.20	0.30	0.30
Swamp	0.10	0.10	0.10	0.50
Cultivated Land	0.20	0.30	0.40	0.50
Grassland	0.30	0.40	0.50	0.50
Urban	0.50	1.00	1.00	0.50
Desert Shrubland	1.00	1.50	2.00	2.00

## Surface Characteristic Parameters Contd...

**Table 3:** Surface roughness length in Meters by land-use and season

Land-Use	Spring	Summer	Autumn	Winter
Water (fresh and sea)	0.0001	0.0001	0.0001	0.0001
Deciduous Forest	1.00	1.30	0.80	0.50
Coniferous Forest	1.30	1.30	1.30	1.30
Swamp	0.20	0.20	0.20	0.05
Cultivated Land	0.03	0.20	0.05	0.01
Grassland	0.05	0.10	0.01	0.00
Urban	1.00	1.00	1.00	1.00
Desert Shrubland	0.30	0.30	0.30	0.15