Table 3.2. Computation of rain and snow drift for computing precipitation trajectories over Blue Canyon, California, test area (based on sounding of 3 p.m. 22 December 1955 at Oakland, California)

Inflow data										
P (*hPa*)	*V* (*kn*)	$\overline{V}$ (*kn*)	ΔP (*mb*)	$\overline{V}_{\Delta P}$	*DRR* (*nmi*)	*DRS* (*nmi*)	(*UT*) Σ *DRIFT* (*nmi*)	(*LT*) Σ *DRIFT* (*nmi*)	(*UT*) 50.30 – Σ *DRIFT* (*nmi*)	(*LT*) 46.80 – Σ *DRIFT* (*nmi*)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
350	97.7									
		81.9	50	4 095	1.90	9.04				
400	66.1									
		68.6	50	3 430	1.59	7.57				
450	71.0						51.18[a]	48.55[a]	–0.88	–1.75
		66.4	50	3 320	1.54	7.33				
500	61.8						43.85[a]	41.22[a]	6.45	5.58
		59.6	50	2 980	1.38	6.58				
550	57.4						37.27[a]	34.64[a]	13.03	12.15
		62.7	50	3 135	1.45	6.92				
600	67.9						30.35[a]	27.72[a]	19.95	19.08
		62.8	50	3 140	1.45	6.93				
650	57.6						23.42[a]	20.79[a]	26.88	26.01
		55.1	50	2 755	1.28	6.08				
700	52.6						17.34[a]	14.71[a]	32.96	32.09
		49.8	50	2 490	1.15	5.50				
750	47.0						11.84[a]	9.21[a]	38.46	37.59
		50.1	50	2 505	1.16	5.53				
800	53.1						6.31[a]	3.68	43.99	43.12
		51.4	25	1 285	0.59	2.84				
825	49.6						3.47[b]	3.09	46.83	43.71
		49.2	6	295	0.14	0.65				
831	48.7						2.95	2.95	47.35	43.85
		47.2	19	897	0.42	1.98				
850	45.7						2.53	2.53	47.77	44.27
		44.2	25	1 105	0.51	2.44				
875	42.7						2.02	2.02	48.28	44.78
		42.7	25	1 068	0.49	2.36				
900	42.7						1.53	1.53	48.77	45.27
		41.9	25	1 048	0.49	2.31				
925	41.1						1.04	1.04	49.26	45.76
		37.6	25	940	0.44	2.08				
950	34.1						0.60	0.60	49.70	46.20
		29.9	25	748	0.35	1.65				
975	25.7						0.25	0.25	50.05	46.55
		19.4	25	485	0.22	1.07				
1 000	13.1						0.03	0.03	50.27	46.77
		11.1	5	56	0.03	0.12				
1 005	9.1						0	0	50.30	46.80

[a] Using snow drift
[b] Arbitrary (to keep trajectory on or above freezing line)

Legend: DRR = $\overline{V}_{\Delta P}$/2 160 = Horizontal rain drift
DRS = $\overline{V}_{\Delta P}$/453= Horizontal snow drift
UT = Upper precipitation trajectory
LT = Lower precipitation trajectory

The orographic model is generally used to compute rainfall by 6-hour increments, so Equation 3.12 becomes:

$$\mathrm{Vol}_{6\ \mathrm{hour}} \approx 0.0612\overline{V}_1 \Delta P_1 (\overline{W}'_1 - \overline{W}') \qquad (3.13)$$

where $\mathrm{Vol}_{6\ \mathrm{hour}}$ is in mm (nmi)^2; $\overline{V}_1$ in kn; ΔP_1 in hPa; $(\overline{W}'_1 - \overline{W}')$ in g/kg; and the coefficient 0.0612 has the dimensions nmi hour (6 hour)$^{-1}$ kg/g mm/hPa.

Table 3.1 shows the computation of orographic rainfall under the two precipitation trajectories shown in Figure 3.6. The following example demonstrates how the table was prepared.

Consider the layer between the streamlines passing through inflow pressures 850 and 875 hPa (P = 25 hPa). The air at 850 hPa has a temperature of 10.3°C, relative humidity 96 per cent, and horizontal component of wind speed parallel to the sides of the selected ground area of 45.7 kn. Plotting 10.3°C at 850 hPa on a pseudo-adiabatic chart, the saturation mixing ratio is seen to be about 9.30 g/kg. The actual mixing ratio is 96 per cent of this, or 8.93 g/kg.

From Figure 3.6, the pressures where the streamline through 850 hPa intersects the two precipitation trajectories are seen to be 703 and 680 hPa. Following the dry adiabat through 850 hPa and 10.3°C upward to where it crosses the saturation mixing ratio of 8.93 g/kg, the condensation pressure is seen to be about 843 hPa and the temperature 9.6°C (not shown). Since the air is now saturated, the moist adiabat is followed