APPENDIX

APPENDIX A

The Calculation Step of SEBAL (Surface Energy Balance Algorithm for Land)

Appendix A

The Calculation Step of SEBAL (Surface Energy Balance Algorithm for Land)

SEBAL Equation for MODIS Image

1. Raw data from MODIS image is radiation.

2. Band 1 and 2 are already in reflectance but we need to make corrections for solar zenith angle.

3. Solar zenith angle is computed which latitude north and longitude east are positive

$$d_a = 2\pi \frac{(J-1)}{365} \tag{97}$$

$$E_t = 0.000075 + 0.001868\cos(d_a) - 0.032077\sin(d_a) - 0.014615\cos(2d_a) - 0.04089\sin(2d_a)$$

$$L_c = 4(L_s - Long) \tag{98}$$

$$LAT = LST - L_c + E_t \tag{99}$$

$$E_0 = 1.00011 + 0.034221\cos(d_a) + 0.00128\sin(d_a) + 0.000719\cos(2d_a) + 0.000077\sin(2d_a) \tag{100}$$

$$\delta = 0.006918 - 0.399912\cos(d_a) + 0.070257\sin(d_a) - 0.006758\cos(2d_a) + 0.000907\sin(2d_a) - 0.002697\cos(3d_a) + 0.00148\sin(3d_a) \tag{101}$$

$$\omega = 15[LAT(hs) - 12] \tag{102}$$

where ω is positive during evenings, negative during mornings and 'O' at noon.

$$\cos(\theta) = \sin(\phi)\sin(\delta) + \cos(\delta)\cos(\phi)\cos(\omega) \tag{103}$$

where J is the day number of the year ranging from 1 (January, 1) till 365 (December, 31). February is assumed to be always 28 days in this equation. d_a is the day angle (radians). E_t is the equation of time (minutes). L_c is the longitude correction (minutes). L_s is the standard longitude, as taken from a time zone map. Be aware that DST (daylight saving time) shifts the standard longitude -15^o. Long is the longitude of the pixel. Note: East longitude is positive. This is also valid for L_s. LST is the local time as measured by a local clock. LAT is the local apparent time or solar time (hs min sec). E_0 is the eccentricity correction factor for a day (constant). δ is the solar declination for the day (constant). ω is the hour angle (^{o}). ϕ is the latitude of the pixel in lat-long coordinates (north positive, south negative, in radians). θ is the solar zenith angle.

4. The distance Earth-Sun varying with the Julian day number J.

$$d_s = 1 + 0.01672\sin\left(\frac{2\pi(J - 93.5)}{365}\right) \tag{104}$$

5. Correction for Band 1 and 2

$$\text{(R) Re}\,flec\tan cePerBand = Band_1 \times 5.1078233 \times 10^{-5} \tag{105}$$

$$\text{(R) Re}\,flec\tan cePerBand = Band_2 \times 3.1889067 \times 10^{-5} \tag{106}$$

$$\text{Corrected reflectance per band} = \frac{R \times d}{E_0 \times d_a \times \cos(\theta)} = \rho \tag{107}$$

6. Broadband Albedo (TOA): ρ^{toa}

$$\rho^{toa} = 0.035 + 0.545\rho_1 + 0.32\rho_2 \quad (108)$$

7. Surface Broadband Albedo: ρ_0

$$\rho_0 = \frac{\rho^{toa} - r_a}{\tau_{sw}^2} \quad (109)$$

where r_a the broadband path radiance (0.025 is used), τ_{sw} the transmissivity single-way crossed by radiation of the atmosphere, $\tau_{sw} = 0.75 + 2\times10^{-5} z$; z = average of elevation (m).

8. NDVI (Normalized Difference Vegetation Index)

$$NDVI = \frac{\rho_2 - \rho_1}{\rho_2 + \rho_1} \quad (110)$$

9. Surface Emissivity; ε_0

$$\varepsilon_0 = 1.009 + 0.047\ln(NDVI) \quad (111)$$

10. Cover Band 31 and 32 from radiances to black body temperatures

Band 31 and 32 need to be covered from radiances to black body temperatures by applying the Planck equation (central wave length for band 31 and 32 is 11.03 and 12.02 micrometer, respectively)

From the L1B data, compute the radiance for channel 31, and 32, using the scaling equation.

radiance = radiance_scale * (SI - radiance_offset) (112)

with radiance_scale, radiance_offset, and SI ("signed integer" contained in channels data) coming from parameters of level 1B product.

On a per detector basis convert radiance to brightness temperature (BT) using the Planck function (c.f., The Physics of Atmospheres by John T. Houghton, Cambridge University Press.)

BT = c2 / (wavelength * ln (c1 / (wavelength^5 * radiance) + 1)) (113)

with c1 = 1.1911x10^{+8} W M^{-2} sr^{-1} (μm^{-1})$^{-4}$ and c2 = 1.439x10^{+4} K μm

where c1 and c2 are called the first and second radiation constants, and the values of which depends on the units.

11. Surface temperature (T_0) is obtained by following equation that is based on the split window technique.

$$T_0 = \left(0.39 \times BT_{31}^2\right) + \left(2.34 \times BT_{31}\right) - \left(0.78 \times BT_{31} \times BT_{32}\right) - \left(1.34 \times BT_{32}\right) + \left(0.39 \times BT_{32}^2\right) + 0.56 \quad (114)$$

12. Net Radiation (R_n)

$$R_n = (1 - \rho_0)K\downarrow + L\downarrow - L\uparrow \quad (115)$$

where ρ_0 is the broadband surface albedo map (-), $K\downarrow$ is instantaneous incoming shortwave radiation (watt m^{-2}), $L\uparrow$ is instantaneous outgoming long-wave radiation (watt m^{-2}), and $L\downarrow$ is instantaneous incoming long-wave radiation (watt m^{-2}),

$$K\downarrow^{exo} = SC \times E_0 \times \cos(\theta) \quad (116)$$

where $K\downarrow^{exo}$ is the instantaneous terrestrial solar radiation (watt m^{-2}) and SC is the solar constant = 1367 (watt m^{-2}).

$$K\downarrow = \tau_{sw} \times K\downarrow^{exo} \quad (117)$$

$$L\downarrow = \varepsilon_a \times \sigma \times T_a^4 \quad (118)$$

where $\varepsilon_a = 0.85 \times (-\ln \tau_{sw})^{0.09}$ which is atmospheric emissivity

T_a is Tcold in image (^oK). (119)

$\sigma = 5.67 \times 10^{-8}$ Watt $m^{-2}K^{-2}$ is the Stephan Boltzman constant

$$L\uparrow = (1-\varepsilon_0)L\downarrow + (\varepsilon_0 \times \sigma \times T_0^4) \quad (120)$$

where T_0 is the surface temperature map in K.

13. Soil heat flux (G)

$$G = R_n\left(\frac{T_0 - 273}{\rho_0}\right) \times \left[0.0032(1.1\rho_0) + 0.0062(1.1\rho_0)^2\right] \times \left(1 - 0.978NDVI^4\right) \quad (121)$$

14. The sensible heat flux to the air (H) can be computed from follow equation.

$$H = \frac{\rho \times c_p \times dT}{r_{ah}} \quad (122)$$

where ρ is air density (kg/m^3), c_p is air specific heat (1004 J/kg/K), dT (K) is the temperature difference (T_1-T_2) between two heights (z_1 and z_2), and r_{ah} is the aerodynamic resistance to heat transport (s/m).

From this equation, dT and r_{ah} is unknown for the sensible heat flux calculation. The steps as follow present the steps to calculate sensible heat flux (H).

14.1 Friction velocity ($u*$) can be computed as follow equation.

$$u* = \frac{ku_x}{\ln\left(\frac{z_x}{z_{om}}\right)} \tag{123}$$

The calculation of $u*$ requires a wind speed measurement (u_x) at a known height (z_x) at the time of the satellite image. Then, u_x and z_x are know, z_{om} is unknown. z_{om} can be calculated in many ways:

For agricultural area: z_{om} = 0.12 x height of vegetation (h)

From a land-use map

As a function of NDVI and surface albedo

From data of weather station, u_x, z_x, z_{om}, and $u*$ are know and are determined.

14.2 Wind speed at a height 200 m above the weather station can be computed as follow equation.

$$u_{200} = \frac{u* \ln\left(\frac{200}{z_{om}}\right)}{k} \quad (124)$$

14.3 $u*$ for each pixel is calculated using ERDAS Model Maker tool. u_{200} is assumed to be constant for all pixels of the image since it is defined as occurring at a "blending height" unaffected by surface features.

$$u* = \frac{ku_{200}}{\ln\left(\frac{200}{z_{om}}\right)} \quad (125)$$

From this equation, z_{om} is unknown to calculate $u*$, so z_{om} need to be fined.

where z_{om} is the particular momentum roughness length of each pixel, z_{om} for each pixel can be computed by two methods:

Using a land-use map (Calculate in Model Maker tool)

Using NDVI and surface albedo data (z_{om} is calculated in spreadsheet, z_{om} for each pixel is calculated by Model Maker)

For this pattern, land-use map is not available, and then NDVI and surface albedo data are used. In the method used NDVI and surface albedo, z_{om} is computed from the following equation:

$$z_{om} = \exp\left[\left(a \times \frac{NDVI}{\alpha}\right) + b\right] \quad (126)$$

where; a and b are correlation constants derived from a plot of ln(z_{om}) vs $\frac{NDVI}{\alpha}$ for two or more sample pixels representing specific vegetation types.

To determine a and b, a series of sample pixels representing vegetation types and conditions of interest are selected and the associated values for NDVI and surface albedo are obtained.

Typical surface albedo values	
Rice field	0.17 – 0.22
Deciduous forest	0.15 – 0.20

14.4 r_{ah} is computed as follow equation.

$$r_{ah} = \frac{\ln\left(\frac{z_2}{z_1}\right)}{u* \times k} \quad (127)$$

Based on experienced analysis, z_1 = 0.1 m, z_2 = 2 m.

14.5 Near Surface Temperature Difference (dT) is calculated in this step.

For each pixel, $dT = T_s - T_a$, T_a is unknown.

SEBAL assumes a linear relationship between T_s and dT

$$dT = b + aT_s \quad (128)$$

where b and a are the correlation coefficients.

To define these coefficients, SEBAL uses the “anchor” pixel where a value for H can be reliably estimated.

a. At the “Cold” pixel

$$H_{cold} = R_n - G - LE_{cold} \quad (129)$$

$$dT_{cold} = \frac{H_{cold} \times r_{ah}}{\rho \times c_p} \quad (130)$$

If “Cold” pixel is chose from a body of water, $H_{cold} = 0$

$$LE_{cold} = R_n - G$$

$$dT_{cold} = 0$$

b. At “Hot” pixel

$$H_{hot} = R_n - G - LE_{hot} \quad (131)$$

In the case of H_{hot}, $LE_{hot} = 0$

$$H_{hot} = R_n - G$$

$$dT_{hot} = \frac{H_{hot} \times r_{ah}}{\rho \times c_p} \quad (132)$$

Then,

$dT_{cold} = 0$ (T_{cold}, from select in above step)

$$dT_{hot} = \frac{H_{hot} \times r_{ah}}{\rho \times c_p}$$ (T_{hot}, from select in above step)

14.6 The sensible heat flux (H) is calculated in this step, called initial H, using Model Maker function.

14.7 Monin-Obukhov theory in an iterative process is applied in SEBAL to account for the buoyancy effects, which are generated by surface heating. The Monin-Obukhov length (L) is used to define the stability conditions of the atmosphere in the iterative process (note, this is not the same "L" as used in the SAVI computation). It is a function of the heat and momentum fluxes and is computed as follow:

$$L = -\frac{\rho c_p u*^3 T_s}{kgH} \tag{133}$$

$$L = -\frac{1 \times 1004 \times u*^3 T_s}{0.41 \times 9.81 H} \tag{134}$$

14.8 The values of the stability corrections for momentum and heat transport (ψ_m and ψ_h) are computed as follow, using the formulations by Paulson (1970) and Webb (1970). These values depend on the condition of atmosphere.

If L < 0; unstable condition:

$$\psi_{m(200)} = 2\ln\left(\frac{1+x_{(200m)}}{2}\right) + \ln\left(\frac{1+x_{(200m)}^2}{2}\right) - 2ARCTAN\left(x_{(200m)}\right) + 0.5\pi \tag{135}$$

$$\psi_{h(2m)} = 2\ln\left(\frac{1+x_{(2m)}^2}{2}\right) \tag{136}$$

$$\psi_{h(0.1m)} = 2\ln\left(\frac{1+x_{(0.1m)}^2}{2}\right) \tag{137}$$

where

$$x_{(200m)} = \left(1-16\frac{200}{L}\right)^{0.25} \tag{138}$$

$$x_{(2m)} = \left(1-16\frac{2}{L}\right)^{0.25} \tag{139}$$

$$x_{(0.1m)} = \left(1-16\frac{0.1}{L}\right)^{0.25} \tag{140}$$

If L > 0; stable condition:

$$\psi_{m(200)} = -5\left(\frac{2}{L}\right) \tag{141}$$

$$\psi_{h(2m)} = -5\left(\frac{2}{L}\right) \tag{142}$$

$$\psi_{h(0.1m)} = -5\left(\frac{0.1}{L}\right) \tag{143}$$

If L = 0; neutral condition: ψ_m and $\psi_h = 0$

14.9 The friction velocity ($u*$), which is a corrected values, is now computed for each successive iteration as:

$$u* = \frac{u_{200}k}{\ln\left(\frac{200}{z_{om}}\right) - \psi_{m(200m)}} \quad (144)$$

where u_{200} is in m/s and k is 0.41.

14.10 The aerodynamic resistance to heat transport (r_{ah}), which is a corrected value, is now computed during each iteration as:

$$r_{ah} = \frac{\ln\left(\frac{z_2}{z_1}\right) - \psi_{h(z_2)} + \psi_{h(z_1)}}{u* \times k} \quad (145)$$

14.11 Repeat the step of calculation from 5.3.5 to 5.3.10 until the successive values for dT_{hot} and r_{ah} at the hot pixel have stabilized.

15. Latent heat flux (LE), Instantaneous ET (ET_{inst}), and Reference ET Fraction (ET_rF) are computed in this step. The main equation of SEBAL is showed in equation (1).

$$LE = R_n - G - H \quad (146)$$

where LE is the latent heat flux (W/m^2), R_n is the net radiation flux at the surface (W/m^2), G is the soil heat flux (W/m^2), and H is the sensible heat flux to the air (W/m^2).

16. The instantaneous evapotranspiration of satellite image is estimated as follow equation.

$$ET_{inst} = 3600\frac{\lambda ET}{\lambda} \quad (147)$$

From this equation, 3600 is used to convert from seconds to hour. λ is latent heat of vaporize or the heat absorbed when a kilogram of water evaporates (J/kg). λ is relative function of temperature, so λ has different value in the different temperature. In practice, λ have to be calculated for each pixel. The equation, which use for λ calculation, is show as follow.

$$\lambda = 2.501 - \left(2.361 \times 10^{-3}\right)T \tag{148}$$

where the unit of λ is MJ/kg, and T is surface temperature in ^{o}C

$$\lambda(J/kg) = \left(2.501 - \left(2.361 \times 10^{-3}\right)T\right) \times 10^{6} \tag{149}$$

17. Evaporative Fraction (Λ) can be computed by the following equation.

$$\Lambda = \frac{LE}{R_n - G} = \frac{LE}{LE + H} \tag{150}$$

18. 24-Hour Evapotranspiration (ET_{24})can be computed by the following equation.

$$ET_{24} = \frac{86400\Lambda\left(R_n - G\right)}{\lambda} \tag{151}$$

SEBAL Equation for Landsat 7 Image

1. Raw data from Landsat 7 image is digital number (DN).

2. Band B1 to B7 are used for actual evapotranspiration calculate.

3. Convert from Digital Number (DN) to Radiances for all bands in Landsat7 image. An equation for converting is show in equation (4).

$$L_\lambda = \frac{\left(LMAX_\lambda - LMIN_\lambda\right)}{\left(QCALMAX - QCALMIN\right)} \times \left(QCAL - QCALMIN\right) + LMIN_\lambda \qquad (152)$$

where $LMAX_\lambda and LMIN_\lambda$ are differ for each bands, QCAL or DN, $LMAX_\lambda and LMIN_\lambda$ are input data. These elements are values in header file information.

4. Convert from Radiances to Reflected for all bands in Lansat7 image. For this converting, thermal band (band 6) is not considered. In practice, band 6 is converted, but it is a dummy in this file. The equation used to convert radiance to reflectance is presented as following

$$\rho_p = \frac{\pi \times L_\lambda}{ESUN_\lambda \times \cos\theta \times d_r} \qquad (153)$$

where L_λ calculate from above step. $\pi, ESUN_\lambda, \cos\theta, d_r$ are constant.

$$d_r = 1 + 0.033 \cos\left(DOY \frac{2\pi}{365}\right) \qquad (154)$$

where DOY (or J) is number of day in one year for example DOY of January 1 is 1 while DOY of December 31 is 365.

$$\cos\theta = \cos\left(90 - \beta\right) \qquad (155)$$

where β is sun elevation angle in degree and $\cos\theta$ is in degree.

$$[Radians] = \frac{\pi}{180} \times [decimal\,\deg rees] \tag{156}$$

5. Albedo for the Top of Atmosphere (α_{toa}) can be considered from follow equation

$$\alpha_{toa} = \sum(\omega_\lambda \times \rho_\lambda) \tag{157}$$

$$\omega_\lambda = \frac{ESUN_\lambda}{\sum ESUN_\lambda} \tag{158}$$

where ω_λ is weighting coefficient, which is constant value.

6. Surface Albedo Equation (α) can be considered from follow equation

$$\alpha = \frac{\alpha_{toa} - \alpha_{path\_radiance}}{\tau_{sw}^2} \tag{159}$$

where α_{toa} is calculated from previous step. $\alpha_{path\_radiance} \approx 0.03$.

$$\tau_{sw} = 0.75 + 2 \times 10^{-5} \times z \tag{160}$$

7. Incoming solar Radiation ($R_{s\downarrow}$) is estimated in spreadsheet using follow equation.

$$R_{s\downarrow} = G_{sc} \times \cos\theta \times d_r \times \tau_{sw} \tag{161}$$

where G_{sc} is solar constant value, 1367 W/m^2

8. Vegetation Indices can be considered from follow equations.

$$NDVI = \frac{\rho_4 - \rho_3}{\rho_4 + \rho_3} \tag{162}$$

$$SAVI = \frac{(1+L)(\rho_4 - \rho_3)}{L + \rho_4 + \rho_3} \tag{163}$$

$$LAI = -\frac{\ln\left(\frac{0.69 - SAVI}{0.59}\right)}{0.91} \tag{164}$$

where ρ_3 and ρ_4 are reflectance value in red and near-infrared bans, respectively. L is constant for SAVI (L= 0.5, when your area have no information for L). L = 0.5 is suitable for this practice.

9. Surface Emissivity (ε_o) can be considered from follow equation

$$\varepsilon_o = 1.009 + 0.047 \times \ln(NDVI) \tag{165}$$

where

For snow; $\alpha > 0.47$ $\varepsilon_o = 0.999$

For water; NDVI < 0 $\varepsilon_o = 0.999$

For desert; $\varepsilon_o < 0.9$ $\varepsilon_0 = 0.9$

10. Effective at Satellite Temperature (T_{bb}) can be considered from follow equation

$$T_{bb} = \frac{K_2}{\ln\left(\frac{K_1}{L_6} + 1\right)} \tag{166}$$

where K_1 in Watts/(meter squared *ster* μm) is 666.09 and K_2 (Kelvin) is 1282.71.

Then

$$T_{bb} = \frac{1282.71}{\ln\left(\frac{666.09}{L_6} + 1\right)}$$

For the calculation of thermal band, radiance image is used because thermal band is the dummy in reflectance image.

11. Surface Temperature (T_s) can be computed by following equation

$$T_s = \frac{T_{bb}}{\varepsilon_o^{0.25}} \tag{167}$$

12. Outgoing Longwave Radiation ($R_{L\uparrow}$) can be calculated by following equation

$$R_{L\uparrow} = \varepsilon_o \sigma T_s^4 \tag{168}$$

where σ = 5.67 x 10^{-8} W/(m^2-K^4).

13. For the selection of "Anchor Pixel", SEBAL process utilizes two "anchor" pixels to fix boundary condition for the energy balance.

a. "Cold" pixel: a wet, well-irrigated crop surface with full cover ($T_s \cong T_{air}$). In cold pixel, sensible heat flux (H) is usually zero so cold pixel should be selected from water area

b. “Hot” pixel should be located in a dry and bare agricultural field where one can assume there is no evapotranspiration taking place, and should have a surface albedo similar to other dry and bare field in the area of interest. It should have a LAI in the range of 0 to 0.4.

When you know the temperature of Cold and Hot pixel, these values are used for calculation in the next step.

14. Incoming Longwave Radiation ($R_{L\downarrow}$) is computed in spreadsheet using following equation.

$$R_{L\downarrow} = \varepsilon_a \times \sigma \times T_a^4 \tag{169}$$

$$\varepsilon_a = 0.85 \times \left(-\ln \tau_{sw}\right)^{0.09} \tag{170}$$

ε_a = atmospheric emissivity

$$R_{L\downarrow} = \varepsilon_a \times \sigma \times T_{cold}^4 \tag{171}$$

15. Net Surface Radiation Flux (R_n) can be computed by following equation

$$R_n = R_{s\downarrow} - \alpha R_{s\downarrow} + R_{L\downarrow} - R_{L\uparrow} - \left(1 - \varepsilon_o\right) R_{L\downarrow} \tag{172}$$

16. The soil heat flux (G) can be calculated from following equation.

$$\frac{G}{R_n} = \frac{T_s}{\alpha}\left(0.0038\alpha + 0.0074\alpha^2\right)\left(1 - 0.98NDVI^4\right) \tag{173}$$

$$G = \frac{G}{R_n} \times R_n \tag{174}$$

Flag for clear, deep water and snow:

If NDVI < 0; assume clear water, $\frac{G}{R_n} = 0.5$

If $T_s < 4^o C$ and $\alpha > 0.45$; assume snow, $\frac{G}{R_n} = 0.5$

After the above equations are computed, the next steps to obtain actual evapotranspiration are the same as the equations of MODIS. The following show the main equation for sensible heat flux, latent heat flux, evaporative fraction, and 24-hour actual evaporatranspiration.

17. Sensible Heat Flux (H)

$$H = \frac{\rho \times c_p \times dT}{r_{ah}} \tag{175}$$

18. Latent heat flux

$$LE = R_n - G - H \tag{176}$$

19. Evaporative Fraction

$$\Lambda = \frac{LE}{R_n - G} = \frac{LE}{LE + H} \tag{177}$$

20. The 24-hour actual evaporatranspiration

$$ET_{24} = \frac{86400\Lambda(R_n - G)}{\lambda} \tag{178}$$

APPENDIX B

Reliable Data and Result for Evapotranspiration

Appendix B

Reliable Data and Result for Evapotranspiration

Reference evapotranspiration from the FAO Penman-Monteith method was validated the accuracy by pan evaporation using correlation coefficient. Pan evaporation is recorded by Thai Meteorological Department (TMD). Pan evaporation and reference evapotranspiration depend on weather condition. They are a function of meteorological data such as temperature, wind speed, relative humidity, and net radiation. The following tables present the correlation coefficient between mean monthly pan evaporation in a 32-years period and mean monthly pan evaporation in 2002. Also, the correlation coefficient between mean monthly pan evaporation in 2002 and mean monthly reference evapotranspiation in 2002 for each weather station are shown as following table.

Appendix Table B1 The correlation coefficient between pan evaporation and reference evapotranspiration at Nakhon Sawan Station (Recorded evaporation: 1971-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	143.52	119.90	0.95	119.90	113.22	0.96
Feb.	171.26	137.10		137.10	137.18	
Mar.	230.04	187.70		187.70	180.42	
Apr.	241.05	206.90		206.90	193.92	
May	206.24	155.70		155.70	148.66	
Jun.	177.96	160.60		160.60	145.77	
Jul.	167.45	146.80		146.80	122.70	
Aug.	151.06	140.70		140.70	117.54	
Sep.	131.22	103.60		103.60	106.04	
Oct.	126.70	129.50		129.50	121.87	
Nov.	125.73	104.90		104.90	106.14	
Dec.	132.32	110.70		110.70	104.33	

Appendix Table B2 The correlation coefficient between pan evaporation and reference evapotranspiration at Suphan Buri Station (Recorded Evaporation: 1971-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	128.40	112.30		112.30	110.90	
Feb.	136.06	110.30		110.30	123.51	
Mar.	179.76	143.70		143.70	152.57	
Apr.	194.89	175.70		175.70	170.01	
May	184.68	153.50		153.50	144.27	
Jun.	169.37	157.30	0.90	157.30	139.78	0.87
Jul.	164.30	145.30		145.30	126.03	
Aug.	155.10	149.50		149.50	125.71	
Sep.	137.84	125.10		125.10	114.67	
Oct.	130.15	132.30		132.30	119.64	
Nov.	130.35	109.90		109.90	106.26	
Dec.	132.73	115.60		115.60	108.17	

Appendix Table B3 The correlation coefficient between pan evaporation and reference evapotranspiration at Lop Buri Station (Recorded Evaporation: 1982-1984, 1986-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	158.07	142.40		142.40	119.25	
Feb.	157.02	140.90		140.90	125.81	
Mar.	200.14	177.70		177.70	153.34	
Apr.	203.26	189.90		189.90	163.84	
May	190.55	152.40		152.40	137.59	
Jun.	172.84	166.90	0.87	166.90	136.19	0.92
Jul.	166.24	148.90		148.90	138.81	
Aug.	151.92	123.10		123.10	112.13	
Sep.	140.72	132.00		132.00	105.86	
Oct.	133.05	120.70		120.70	122.74	
Nov.	148.59	130.10		130.10	115.24	
Dec.	165.85	121.90		121.90	116.44	

Appendix Table B4 The correlation coefficient between pan evaporation and reference evapotranspiration at Bua Chum Station (Recorded Evaporation: 1971-1973, 1975-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	152.25	146.10		146.10	119.73	
Feb.	164.68	145.90		145.90	130.43	
Mar.	203.04	179.30		179.30	146.22	
Apr.	196.53	196.30		196.30	160.36	
May	175.05	147.40		147.40	127.74	
Jun.	155.83	154.80	0.84	154.80	122.28	0.97
Jul.	142.71	143.40		143.40	114.28	
Aug.	132.74	120.80		120.80	107.97	
Sep.	118.17	107.30		107.30	94.34	
Oct.	123.39	149.40		149.40	119.17	
Nov.	134.38	120.90		120.90	107.01	
Dec.	148.69	123.60		123.60	108.07	

Appendix Table B5 The correlation coefficient between pan evaporation and reference evapotranspiration at Kanchana Buri Station (Recorded Evaporation: 1976-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	139.77	137.00		137.00	107.87	
Feb.	148.48	143.40		143.40	121.21	
Mar.	203.16	184.80		184.80	150.19	
Apr.	209.48	223.80		223.80	162.45	
May	181.14	164.50		164.50	139.48	
Jun.	157.92	149.50	0.91	149.50	129.15	0.97
Jul.	158.04	143.80		143.80	118.17	
Aug.	153.29	133.70		133.70	115.60	
Sep.	136.38	115.40		115.40	111.12	
Oct.	116.27	129.20		129.20	113.76	
Nov.	126.90	106.50		106.50	98.52	
Dec.	141.28	110.80		110.80	102.47	

Appendix Table B6 The correlation coefficient between pan evaporation and reference evapotranspiration at Thong Phaphum Station (Recorded Evaporation: 1971-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	118.38	109.20		109.20	98.44	
Feb.	135.52	129.50		129.50	107.83	
Mar.	173.34	168.50		168.50	134.60	
Apr.	170.99	199.20		199.20	143.61	
May	138.13	114.10		114.10	118.13	
Jun.	93.42	92.30	0.95	92.30	121.34	0.85
Jul.	90.55	74.60		74.60	102.08	
Aug.	80.46	70.50		70.50	99.72	
Sep.	99.59	78.90		78.90	98.24	
Oct.	106.64	110.40		110.40	112.70	
Nov.	103.12	94.20		94.20	98.41	
Dec.	104.79	96.40		96.40	94.02	

Appendix Table B7 The correlation coefficient between pan evaporation and reference evapotranspiration at Bangkok Metropoli Station (Recorded Evaporation: 1971-1980, 1982-1991, 1995-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	130.04	108.60		108.60	116.03	
Feb.	136.06	124.30		124.30	129.09	
Mar.	174.27	146.90		146.90	152.72	
Apr.	174.21	164.90		164.90	164.20	
May	165.25	133.40		133.40	140.79	
Jun.	147.00	128.40	0.88	128.40	127.99	0.92
Jul.	142.86	133.50		133.50	114.16	
Aug.	150.08	111.00		111.00	115.15	
Sep.	130.57	114.00		114.00	111.87	
Oct.	120.75	102.10		102.10	114.74	
Nov.	124.26	101.60		101.60	102.50	
Dec.	132.54	100.50		100.50	107.80	

Appendix Table B8 The correlation coefficient between pan evaporation and reference evapotranspiration at Loei Station (Recorded Evaporation: 1971-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	112.83	87.80	0.92	87.80	96.42	0.96
Feb.	123.17	94.20		94.20	110.19	
Mar.	157.01	124.20		124.20	133.82	
Apr.	167.72	148.10		148.10	153.07	
May	147.57	115.60		115.60	127.77	
Jun.	133.76	108.60		108.60	120.95	
Jul.	127.84	109.10		109.10	110.87	
Aug.	115.05	98.00		98.00	106.11	
Sep.	104.39	63.70		63.70	92.60	
Oct.	107.53	100.00		100.00	113.42	
Nov.	101.76	85.60		85.60	92.56	
Dec.	100.49	74.60		74.60	87.70	

Appendix Table B9 The correlation coefficient between pan evaporation and reference evapotranspiration at Mae Hong Son Station (Recorded Evaporation: 1982-1983, 1985-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	95.92	75.20	0.97	75.20	78.12	0.96
Feb.	117.15	96.30		96.30	93.74	
Mar.	165.41	133.90		133.90	129.98	
Apr.	203.55	184.00		184.00	153.26	
May	184.77	153.30		153.30	131.51	
Jun.	133.17	120.30		120.30	116.22	
Jul.	116.10	76.50		76.50	95.97	
Aug.	111.32	79.50		79.50	99.56	
Sep.	120.41	92.00		92.00	94.27	
Oct.	117.75	107.90		107.90	102.20	
Nov.	93.74	75.40		75.40	80.95	
Dec.	84.84	69.90		69.90	74.36	

Appendix Table B10 The correlation coefficient between pan evaporation and reference evapotranspiration at Mae Sariannng Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	82.64	79.30	0.93	79.30	83.29	0.89
Feb.	102.91	97.90		97.90	96.67	
Mar.	152.29	136.90		136.90	130.88	
Apr.	172.61	173.20		173.20	152.01	
May	152.31	119.40		119.40	126.77	
Jun.	97.67	85.00		85.00	110.81	
Jul.	87.36	51.10		51.10	92.03	
Aug.	84.74	69.00		69.00	96.64	
Sep.	97.65	81.60		81.60	94.42	
Oct.	104.49	107.60		107.60	104.16	
Nov.	89.21	86.60		86.60	84.12	
Dec.	82.40	74.60		74.60	79.38	

Appendix Table B11 The correlation coefficient between pan evaporation and reference evapotranspiration at Chiang Rai Station (Recorded Evaporation: 1971-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	89.41	85.10	0.93	85.10	78.62	0.89
Feb.	116.46	98.10		98.10	94.99	
Mar.	140.61	130.60		103.60	121.72	
Apr.	169.00	146.10		146.10	148.33	
May	141.85	138.10		138.10	127.25	
Jun.	110.17	123.30		123.30	119.42	
Jul.	99.35	79.90		79.90	99.07	
Aug.	86.79	82.00		106.70	96.66	
Sep.	90.80	92.10		116.20	104.44	
Oct.	89.94	95.50		118.80	106.98	
Nov.	81.99	79.70		72.70	79.09	
Dec.	79.90	75.60		75.60	73.20	

Appendix Table B12 The correlation coefficient between pan evaporation and reference evapotranspiration at Phayao Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	95.94	89.90	0.96	89.90	81.85	0.95
Feb.	114.18	108.20		108.20	98.89	
Mar.	162.95	134.90		134.90	128.34	
Apr.	179.98	174.90		174.90	152.21	
May	156.86	141.60		141.60	128.37	
Jun.	136.91	132.30		132.30	122.12	
Jul.	123.83	108.10		108.10	101.14	
Aug.	114.85	103.10		103.10	98.66	
Sep.	107.13	80.30		80.30	104.26	
Oct.	100.70	102.20		102.20	106.66	
Nov.	87.39	72.10		72.10	79.60	
Dec.	86.76	72.40		72.40	74.34	

Appendix Table B13 The correlation coefficient between pan evaporation and reference evapotranspiration at Chiang Mai Station (Recorded Evaporation: 1973-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	92.45	95.10	0.97	95.10	87.87	0.98
Feb.	113.50	112.70		112.70	110.52	
Mar.	163.50	147.50		147.50	153.26	
Apr.	181.69	184.30		184.30	176.56	
May	170.55	153.40		153.40	143.44	
Jun.	135.10	133.00		133.00	123.64	
Jul.	120.29	106.40		106.40	103.01	
Aug.	120.45	115.90		115.90	106.11	
Sep.	123.21	115.80		115.80	100.29	
Oct.	116.43	120.20		120.20	112.15	
Nov.	99.63	89.10		89.10	86.21	
Dec.	91.66	80.00		80.00	83.16	

Appendix Table B14 The correlation coefficient between pan evaporation and reference evapotranspiration at Lampang Station (Recorded Evaporation: 1976-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	90.11	76.50	0.96	76.50	84.05	0.99
Feb.	110.99	100.90		100.90	102.59	
Mar.	157.28	141.90		141.90	139.24	
Apr.	167.15	187.20		187.20	155.65	
May	160.00	151.60		151.60	130.64	
Jun.	138.23	137.60		137.60	121.72	
Jul.	126.30	107.20		107.20	102.94	
Aug.	116.17	103.70		103.70	104.79	
Sep.	108.59	93.40		93.40	97.18	
Oct.	101.24	107.70		107.70	104.62	
Nov.	84.42	67.40		67.40	83.03	
Dec.	74.92	66.50		66.50	80.82	

Appendix Table B15 The correlation coefficient between pan evaporation and reference evapotranspiration at Lamphun Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	110.43	104.00	0.95	104.00	83.97	0.96
Feb.	133.61	130.00		130.00	104.67	
Mar.	201.20	167.50		167.50	146.00	
Apr.	216.72	218.10		218.10	163.98	
May	193.77	175.80		175.80	134.98	
Jun.	162.45	152.40		152.40	123.44	
Jul.	150.07	141.40		141.40	104.89	
Aug.	135.56	142.90		142.90	104.47	
Sep.	119.12	99.70		99.70	96.33	
Oct.	108.30	122.10		122.10	102.74	
Nov.	95.24	78.30		78.30	80.56	
Dec.	96.14	86.60		86.60	78.21	

Appendix Table B16 The correlation coefficient between pan evaporation and reference evapotranspiration at Phrae Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	106.09	81.70		81.70	93.35	
Feb.	121.04	88.90		88.90	106.67	
Mar.	178.47	138.10		138.10	139.54	
Apr.	199.19	187.70		187.70	169.02	
May	183.27	162.30		162.30	146.58	
Jun.	153.10	145.90	0.95	145.90	132.21	0.97
Jul.	142.15	112.10		112.10	111.30	
Aug.	132.23	133.60		133.60	114.83	
Sep.	125.81	96.50		96.50	102.57	
Oct.	121.51	105.90		105.90	110.74	
Nov.	104.44	82.70		82.70	94.25	
Dec.	99.60	73.60		73.60	88.22	

Appendix Table B17 The correlation coefficient between pan evaporation and reference evapotranspiration at Nan Station (Recorded Evaporation: 1971-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	81.38	72.80		72.80	80.96	
Feb.	89.76	81.50		81.50	98.13	
Mar.	119.56	109.60		109.60	121.66	
Apr.	140.79	147.70		147.70	146.16	
May	136.26	130.10		130.10	126.26	
Jun.	112.46	113.20	0.97	113.20	117.26	0.97
Jul.	101.52	90.00		90.00	97.54	
Aug.	94.91	87.50		87.50	96.17	
Sep.	99.59	82.30		82.30	102.61	
Oct.	100.59	101.20		101.20	106.34	
Nov.	85.64	74.40		74.40	80.91	
Dec.	79.47	70.40		70.40	74.65	

Appendix Table B18 The correlation coefficient between pan evaporation and reference evapotranspiration at Tha Wangpha Station (Recorded Evaporation: 1971-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	92.78	84.10	0.95	84.10	79.60	0.91
Feb.	108.78	92.50		92.50	95.98	
Mar.	147.71	143.20		143.20	123.58	
Apr.	165.95	152.60		152.60	149.24	
May	160.66	161.50		161.50	126.43	
Jun.	133.36	127.70		127.70	116.39	
Jul.	118.15	117.00		117.00	96.19	
Aug.	114.74	106.50		106.50	94.83	
Sep.	120.89	87.00		87.00	102.20	
Oct.	115.62	118.50		118.50	104.72	
Nov.	91.35	79.80		79.80	78.26	
Dec.	85.03	73.90		73.90	72.01	

Appendix Table B19 The correlation coefficient between pan evaporation and reference evapotranspiration at Thung Chang Station (Recorded Evaporation: 2000-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	102.95	83.90	0.91	83.90	87.24	0.92
Feb.	103.70	100.10		100.10	101.82	
Mar.	108.75	131.90		131.90	128.75	
Apr.	137.45	148.00		148.00	155.64	
May	109.70	114.10		114.10	128.32	
Jun.	102.00	92.50		92.50	117.27	
Jul.	83.65	70.30		70.30	96.34	
Aug.	88.50	77.80		77.80	96.11	
Sep.	83.95	75.20		75.20	102.23	
Oct.	107.35	106.30		106.30	107.74	
Nov.	96.70	69.50		69.50	84.22	
Dec.	87.05	66.50		66.50	81.06	

Appendix Table B20 The correlation coefficient between pan evaporation and reference evapotranspiration at Uttardit Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	111.83	103.60	0.92	103.60	97.27	0.94
Feb.	119.67	106.00		106.00	105.29	
Mar.	161.14	143.30		143.30	130.68	
Apr.	181.23	187.30		187.30	155.19	
May	169.62	158.40		158.40	143.40	
Jun.	131.12	144.10		144.10	130.19	
Jul.	123.28	98.80		98.80	109.82	
Aug.	121.04	105.80		105.80	114.02	
Sep.	120.25	109.70		109.70	103.11	
Oct.	125.49	128.80		128.80	113.81	
Nov.	115.53	104.70		104.70	98.92	
Dec.	113.60	110.50		110.50	94.71	

Appendix Table B21 The correlation coefficient between pan evaporation and reference evapotranspiration at Sukhothai Station (Recorded Evaporation: 2000-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	114.95	108.20	0.88	108.20	88.62	0.92
Feb.	106.25	113.50		113.50	110.55	
Mar.	150.05	150.00		150.00	144.34	
Apr.	188.05	214.70		214.70	165.22	
May	160.35	160.90		160.90	135.41	
Jun.	158.10	172.10		172.10	124.91	
Jul.	159.00	118.70		118.70	103.70	
Aug.	139.45	134.80		134.80	108.75	
Sep.	129.75	132.10		132.10	100.96	
Oct.	123.20	127.80		127.80	114.93	
Nov.	116.40	103.80		103.80	93.62	
Dec.	110.55	101.50		101.50	90.74	

Appendix Table B22 The correlation coefficient between pan evaporation and reference evapotranspiration at Tak Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	124.32	102.60		102.60	99.94	
Feb.	166.22	128.70		128.70	118.36	
Mar.	234.21	190.30		190.30	154.27	
Apr.	248.57	233.90		233.90	185.97	
May	200.12	155.30		155.30	152.80	
Jun.	153.51	154.70	0.95	154.70	141.04	0.98
Jul.	147.80	115.40		115.40	119.23	
Aug.	140.81	118.10		118.10	123.10	
Sep.	129.00	103.80		103.80	105.07	
Oct.	108.75	108.50		108.50	111.33	
Nov.	99.85	86.10		86.10	94.22	
Dec.	101.99	88.30		88.30	90.26	

Appendix Table B23 The correlation coefficient between pan evaporation and reference evapotranspiration at Mae Sot Station (Recorded Evaporation: 1975-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	115.22	115.60		115.60	103.79	
Feb.	137.26	128.00		128.00	117.55	
Mar.	187.33	175.60		175.60	150.15	
Apr.	205.72	224.80		224.80	178.26	
May	163.72	147.10		147.10	147.41	
Jun.	105.58	102.60	0.97	102.60	128.82	0.93
Jul.	97.07	91.60		91.60	105.96	
Aug.	88.64	87.10		87.10	109.95	
Sep.	102.18	94.50		94.50	101.36	
Oct.	119.28	117.90		117.90	116.17	
Nov.	121.47	107.10		107.10	103.28	
Dec.	119.09	93.10		93.10	98.78	

Appendix Table B24 The correlation coefficient between pan evaporation and reference evapotranspiration at Bhumibol Dam Station (Recorded Evaporation: 1971-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	109.90	90.40	0.91	90.40	98.26	0.94
Feb.	139.97	102.60		102.60	123.15	
Mar.	180.01	152.00		152.00	161.49	
Apr.	198.54	185.10		185.10	174.66	
May	164.52	146.50		146.50	135.31	
Jun.	136.07	149.70		149.70	125.77	
Jul.	138.58	93.10		93.10	105.48	
Aug.	127.93	108.60		108.60	110.64	
Sep.	119.33	91.00		91.00	100.41	
Oct.	108.39	94.20		94.20	110.21	
Nov.	97.41	83.90		83.90	88.12	
Dec.	96.89	78.20		78.20	87.73	

Appendix Table B25 The correlation coefficient between pan evaporation and reference evapotranspiration at Umphang Station (Recorded Evaporation: 1977-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	107.06	91.90	0.96	91.90	91.01	0.91
Feb.	121.81	105.60		105.60	100.87	
Mar.	155.10	140.00		140.00	124.06	
Apr.	156.85	147.60		147.60	135.62	
May	126.60	113.50		113.50	116.78	
Jun.	92.62	75.50		105.80	120.19	
Jul.	83.82	58.40		112.40	121.94	
Aug.	73.86	65.20		91.60	97.03	
Sep.	86.14	79.00		91.00	95.06	
Oct.	96.54	103.10		103.10	107.81	
Nov.	95.29	91.80		91.80	92.53	
Dec.	98.51	85.60		85.60	89.25	

Appendix Table B26 The correlation coefficient between pan evaporation and reference evapotranspiration at Phitsanulok Station (Recorded Evaporation: 1971-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	109.66	97.80	0.97	97.80	97.85	0.97
Feb.	119.00	106.10		106.10	111.10	
Mar.	160.92	141.40		141.40	141.45	
Apr.	186.25	182.00		182.00	164.57	
May	177.26	172.10		172.10	148.07	
Jun.	148.99	144.70		144.70	135.80	
Jul.	139.86	110.60		110.60	113.60	
Aug.	128.35	100.20		100.20	115.75	
Sep.	119.55	88.90		88.90	102.90	
Oct.	123.74	105.00		105.00	114.05	
Nov.	113.69	95.80		95.80	98.00	
Dec.	111.69	91.30		91.30	93.75	

Appendix Table B27 The correlation coefficient between pan evaporation and reference evapotranspiration at Phetchabun Station (Recorded Evaporation: 1974-1980, 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	121.29	121.50	0.87	121.50	107.14	0.97
Feb.	131.04	119.30		119.30	113.45	
Mar.	170.76	153.60		153.60	141.56	
Apr.	183.60	164.30		164.30	156.53	
May	155.89	132.90		132.90	136.24	
Jun.	129.34	141.50		141.50	136.31	
Jul.	118.93	109.40		109.40	103.30	
Aug.	106.78	123.80		123.80	102.05	
Sep.	103.07	99.70		99.70	92.27	
Oct.	118.77	119.40		119.40	114.81	
Nov.	121.05	109.70		109.70	105.31	
Dec.	127.20	112.30		112.30	97.06	

Appendix Table B28 The correlation coefficient between pan evaporation and reference evapotranspiration at Lom Sak Station (Recorded Evaporation: 1971-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	124.34	126.60		126.60	98.97	
Feb.	130.04	122.20		122.20	106.97	
Mar.	163.76	152.20		152.20	131.97	
Apr.	171.32	173.90		173.90	147.55	
May	164.41	162.00		162.00	132.54	
Jun.	143.48	134.30	0.90	134.30	134.33	0.88
Jul.	134.45	110.20		110.20	101.92	
Aug.	125.18	117.80		117.80	100.38	
Sep.	122.82	102.80		102.80	90.67	
Oct.	128.90	134.70		134.70	108.75	
Nov.	124.06	125.30		125.30	96.25	
Dec.	125.04	120.40		120.40	87.49	

Appendix Table B29 The correlation coefficient between pan evaporation and reference evapotranspiration at Wichian Buri Station (Recorded Evaporation: 1982-1983, 1986-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	128.16	112.60		112.60	105.48	
Feb.	141.23	123.00		123.00	113.72	
Mar.	185.34	162.60		162.60	141.57	
Apr.	185.63	154.50		154.50	153.85	
May	165.57	142.40		142.40	134.90	
Jun.	143.50	126.00	0.89	126.00	135.18	0.90
Jul.	136.85	110.20		110.20	102.02	
Aug.	126.88	107.70		107.70	101.03	
Sep.	116.42	91.40		91.40	92.44	
Oct.	125.92	133.90		133.90	113.11	
Nov.	126.01	121.50		121.50	101.58	
Dec.	131.27	108.40		108.40	93.43	

Appendix Table B30 The correlation coefficient between pan evaporation and reference evapotranspiration at Kamphaeng Phet Station (Recorded Evaporation: 1982-2002)

Unit: mm.

Month	The Checking of Reliable data			The Checking of Reliable Result		
	Averaged (32 year)	Evap_2002	Correlation Coef.	Evap_2002	Ref. ET 2002	Correlation Coef.
Jan.	105.53	87.50	0.97	87.50	103.59	0.97
Feb.	116.51	99.60		99.60	113.73	
Mar.	147.34	124.30		124.30	139.87	
Apr.	164.60	152.20		152.20	156.88	
May	153.28	135.10		135.10	137.18	
Jun.	119.03	109.10		109.10	132.74	
Jul.	113.99	88.60		88.60	102.99	
Aug.	105.23	94.20		94.20	106.43	
Sep.	104.03	87.90		87.90	102.83	
Oct.	98.51	93.70		93.70	117.90	
Nov.	92.04	75.20		75.20	100.11	
Dec.	97.26	78.50		78.50	97.33	

APPENDIX C

Algorithm 3B42 - TRMM Merged HQ/Infrared Precipitation

Appendix C

Algorithm 3B42 - TRMM Merged HQ/Infrared Precipitation

Algorithm Overview

The purpose of Algorithm 3B-42 is to produce Tropical Rainfall Measuring Mission (TRMM) merged high quality (HQ)/infrared (IR) precipitation and root-mean-square (RMS) precipitation-error estimates. These grid estimates are on a 3-hour temporal resolution and a 0.25-degree by 0.25-degree spatial resolution in a global belt extending from 50 degrees South to 50 degrees North latitude.

The 3B-42 estimates are produced in four stages; (1) the microwave estimates precipitation are calibrated and combined, (2) infrared precipitation estimates are created using the calibrated microwave precipitation, (3) the microwave and IR estimates are combined, and (4) rescaling to monthly data is applied. Each precipitation field is best interpreted as the precipitation rate effective at the nominal observation time.

High Quality (HQ) microwave estimates

All of the available passive microwave data are converted to precipitation estimates prior to use, then each data set is averaged to the 0.25° spatial grid over the time range ±90 minutes from the nominal observation time. All of these estimates are adjusted to a "best" estimate using probability matching of precipitation rate histograms assembled from coincident data. The algorithm takes the TCI as the calibrating data source. However, the coincidence of TCI with any of the sensors other than TMI is highly sparse, so we establish a TCI—TMI calibration, then apply that to TMI calibrations of the other sensors to estimate the TCI-calibrated values. The TCI—TMI relationship is computed on a 1°x1° grid for each month using that month's coincident data to accommodate the somewhat different climatology of the two estimates. Preliminary work showed that the TMI calibrations of the other

sensors' estimates are adequately represented by climatologically based coefficients representing large areas. In the case of the TMI—SSM/I calibration, separate calibrations are used for five oceanic latitude bands (40-30°N, 30-10°N, 10°N-10°S, 10-30°S, 30-40°S) and a single land area for each of the four three-month seasons. The TMI—AMSR-E and TMI—AMSU-B calibrations are set in the form of a single climatologically adjustment for land and another for ocean. The AMSU-B calibration has two additional issues. First, the NESDIS algorithm changed on 31 July 2003, so separate sets of calibrations are provided for the two data periods. Second, in both periods the AMSU-B fractional occurrence of precipitation in the subtropical highs is notably deficient. After extensive preliminary testing, the authors judged it best to develop the ocean calibration in regions of significant precipitation and apply it everywhere. In all cases the calibration is a simple match-up of histograms.

The calibration interval is chosen to be a month to ensure stability and representative, except the TMI—AMSR-E calibration is computed with 2 months for stability. The calibration interval for the IR is a calendar month, and the resulting adjustments are applied to data for the same calendar month. This choice is intended to keep the dependent and independent data sets for the calibrations as close as possible in time. In fact, the full month of data in the estimates includes the dependent data.

Once the estimates are calibrated for each satellite and audited for >40% "ambiguous pixels", the grid is populated by the "best" data from all available overpasses, although the most likely number of overpasses in the 3-hr window for a given grid box is either one or zero. When there are multiple overpasses, data from TCI, TCI-adjusted TMI, TCI-adjusted AMSR-E, and TCI-adjusted SSM/I are averaged together, and TCI-adjusted AMSU-B estimates are used if none of the others are available for the grid box. Tests show that the histogram of precipitation rate is somewhat sensitive to the number of overpasses averaged together when that number is small. Accordingly, in the future we expect to test a scheme taking the single "best" overpass in the 3-hr period.

Variable Rain Rate (VAR) IR estimates

3B-42 uses two different IR data sets for creating the complete record of 3-hrly 0.25° gridded T_b's. In the period 1 January 1998 to 6 February 2000, each grid box's histograms in the 1°x1° 3-hourly GPCP IR histograms is zenith-angle corrected, averaged to a single T_b value for the grid box, and plane-fit interpolated to the 0.25° grid. For the period from 7 February 2000 onwards, the CPC Merged IR is averaged to 0.25° resolution and combined into hourly files as ±30 minutes from the nominal time. The amount of imagery delivered to CPC varies by satellite operator, but international agreements mandate that full coverage is provided for the 3-hourly synoptic times (00Z, 03Z,…, 21Z). Histograms of time-space matched HQ precipitation rates and IR T_b's, each represented on the same 3-hourly 0.25° grid, are accumulated for a month, and then used to create spatially varying calibration coefficients that convert IR T_b's to precipitation rates. As in the HQ, the month over which the calibration coefficients are computed and applied is the calendar month. A second ambiguous screening is performed on the matched microwave data after accumulation; compared to instantaneous screening, the monthly screening provides better control of artifacts.

By design, there is no precipitation when the 0.25°x0.25°-average T_b is greater than the local threshold value that matches the frequency of precipitation in the IR to that of the microwave. Increasingly colder T_b's are assigned increasingly large precipitation rates using histogram matching. Those grid boxes that lack coincident data throughout the month, usually due to cold-land dropouts or ambiguous editing, are given calibration coefficients by smooth-filling histograms of coincident data from surrounding grid boxes. Finally, preliminary testing showed that the precipitation rates assigned to the coldest T_b's by strict probability matching tended to show unphysical fluctuations. To ameliorate this effect, a somewhat subjectively chosen coldest 0.17% of the T_b histogram is specified by a fourth-order polynomial fit to climatology of coldest-0.17%—precipitation rate points around the globe. In each grid box a constant is added to each point on the climatologically curve such that it is piecewise continuous with the grid box's T_b-precipitation rate curve at the 0.17% T_b.

Once computed, the HQ-IR calibration coefficients are applied to each 3-hourly IR data set during the month.

Combined HQ and VAR estimates

The ultimate goal of this algorithm is to provide the "best" estimate of precipitation in each grid box at each observation time. It is frequently quite challenging to combine different estimates of an intermittent field such as precipitation. The process of combining passive microwave estimates is relatively well-behaved because the sensors are quite similar and GPROF is used for most retrievals. This is not the case for the HQ and VAR fields.

It currently take a simple approach for combining the HQ and VAR estimates, namely the physically-based HQ estimates are taken "as is" where available, and the remaining grid boxes are filled with VAR estimates. This scheme provides the "best" local estimate, at the expense of a time series that is built from data sets displaying heterogeneous statistics.

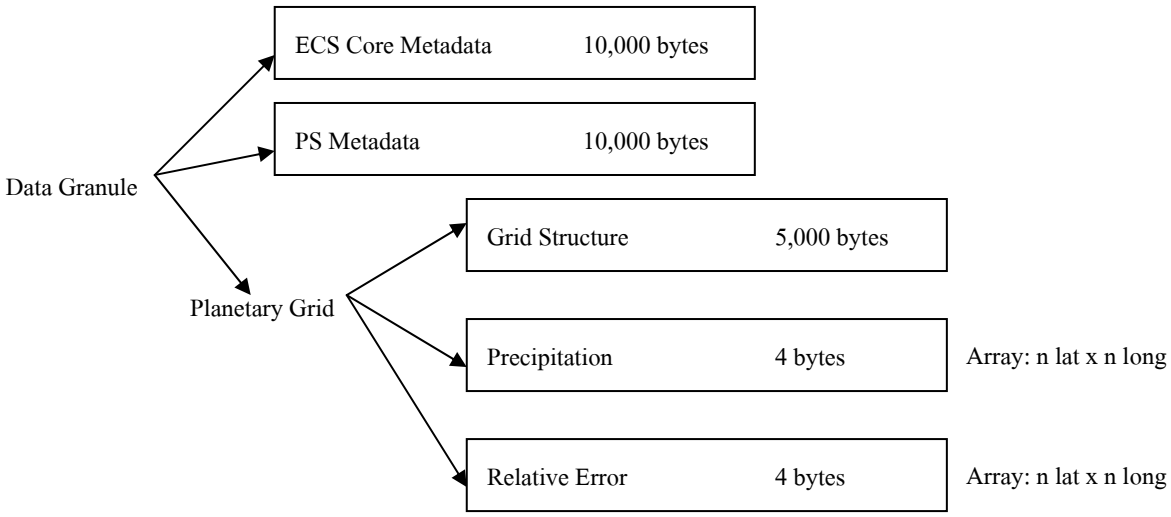
Rescaling to monthly data

The final step in generating 3B-42 is the indirect use of rain gauge data. It is highly advantageous to include rain gauge data in combination data sets. However, experience shows that on any time scale shorter than a month the gauge data are not reported with sufficient density nor reported with consistent observational intervals to warrant direct inclusion in a global algorithm that provides sub-monthly resolution. The authors solved this issue in the GPCP One-Degree Daily combination data set by scaling the short-period estimates to sum to a monthly estimate that includes monthly gauge data. Here, we take a similar approach with the 3B-42 estimates. All available 3-hourly HQ+VAR estimates are summed over a calendar month to create a monthly multi-satellite (MS) product. The MS and gauge are combined to create a post-real-time monthly satellite-gauge combination (SG), which is a TRMM product in its own

right (3B43). Then the field of SG/MS ratios is computed (with controls) and applied to scale each 3-hourly field in the month.

File Format

3B-42, "TRMM and other Global Precipitation Index (GPI) Calibration", provides precipitation estimates in the TRMM regions that have the (nearly-zero) bias of the "TRMM Combined Instrument" precipitation estimate and the dense sampling of geosynchronous IR imagery. Appendix Figure C1 shows the structure of the 3B-42 product in terms of the component objects and their sizes.



Appendix Figure C1 Data Format Structure for 3B-42, TRMM and other GPI Calibration

The contents of objects in the structure are as follows:

ECS Core Metadata (Attribute, 10,000-byte character) are metadata useful to most products stored at EOSDIS.

PS Metadata (Attribute, 10,000-byte character) are metadata defined by and specific to TSDIS.

Grid Structure (Attribute, 5,000-byte character) gives the specification of the geometry of the grids.

Precipitation (SDS, array size n lat x n long, 4-byte float): This is the adjusted GPI precipitation estimate at each 0.25o x 0.25o box. It ranges from 0.0 to 100 mm/hr.

Relative Error (SDS, array size n lat x n long, 4-byte float): This is the adjusted GPI relative error estimate at each 0.25o x 0.25o box. It ranges from 0.0 to 100 mm/hr.

Known Deficiencies

The IR data prior to February 2000 covers the span 40 degrees North to 40 degrees South. After and including February 2000, the data cover 50 degrees North to 50 degrees South. This results in a minor discontinuity in the data record. Also, HQ data sources are introduced at different points in the data record. Therefore, variations in HQ coverage will occur throughout the record, increasing as time progresses.

Planned Improvements

Efforts are currently focusing on the validation of the Product 3B-42 precipitation estimates with rain gauge data, ground-based radar data, and data from other satellites. Any shortcomings of the algorithm identified during the validation efforts will be addressed with associated enhancements to the algorithm implemented.

APPENDIX D

Student's t-Distributions, Percentage points

Appendix D

Appendix Table D1 Student's t-Distributions, Percentage points

df	0.60	0.75	0.90	0.95	0.975	0.99	0.995	0.999
1	0.325	1.000	3.078	6.314	12.706	31.821	63.657	318.32
2	0.289	0.816	1.866	2.920	4.303	6.965	9.925	22.327
3	0.277	0.765	1.638	2.353	3.182	4.541	5.841	10.215
4	0.271	0.741	1.533	2.132	2.776	3.747	4.604	7.173
5	0.267	0.727	1.476	2.015	2.571	3.365	4.032	5.893
6	0.265	0.718	1.440	1.943	2.447	3.143	3.707	5.208
7	0.263	0.711	1.415	1.895	2.365	2.998	3.499	4.785
8	0.262	0.706	1.397	1.860	2.306	2.896	3.355	4.501
9	0.261	0.703	1.383	1.833	2.262	2.821	3.250	4.297
10	0.260	0.700	1.372	1.812	2.228	2.764	3.169	4.144
11	0.260	0.697	1.363	1.796	2.201	2.718	3.106	4.025
12	0.259	0.695	1.356	1.782	2.179	2.681	3.055	3.930
13	0.259	0.694	1.350	1.771	2.160	2.650	3.012	3.852
14	0.258	0.692	1.345	1.761	2.145	2.624	2.977	3.787
15	0.258	0.691	1.341	1.753	2.131	2.602	2.947	3.733
16	0.258	0.690	1.337	1.746	2.120	2.584	2.921	3.686
17	0.257	0.890	1.333	1.740	2.110	2.567	2.898	3.646
18	0.257	0.688	1.330	1.734	2.101	2.552	2.878	3.610
19	0.257	0.688	1.328	1.729	2.093	2.539	2.861	3.579
20	0.257	0.687	1.325	1.725	2.086	2.528	2.845	3.552
21	0.257	0.686	1.323	1.721	2.080	2.518	2.831	3.527
22	0.256	0.686	1.321	1.717	2.074	2.508	2.819	3.505
23	0.256	0.685	1.319	1.714	2.069	205.00	2.807	3.485
24	0.256	0.685	1.318	1.711	2.064	2.492	2.797	3.467

Appendix Table D1 (cont'd)

df	0.60	0.75	0.90	0.95	0.975	0.99	0.995	0.999
25	0.256	0.684	1.316	1.708	2.060	2.485	2.787	3.450
26	0.256	0.684	1.315	1.706	2.056	2.479	2.779	3.435
27	0.256	0.684	1.314	1.703	2.052	2.473	2.771	3.421
28	0.256	0.683	1.313	1.701	2.048	2.467	2.763	3.408
29	0.256	0.683	1.311	1.699	2.045	2.462	2.756	3.396
30	0.255	0.683	1.310	1.697	2.042	2.457	2.750	3.385
40	0.255	0.681	1.303	1.684	2.021	2.423	2.704	3.307
50	0.254	0.679	1.299	1.676	2.009	2.403	2.678	3.261
60	0.254	0.679	1.296	1.671	2.000	2.390	2.660	3.232
70	0.254	0.678	1.294	1.667	1.994	2.381	2.648	3.211
80	0.254	0.678	1.292	1.664	1.990	2.374	2.639	3.195
90	0.254	0.677	1.291	1.662	1.987	2.368	2.632	3.183
100	0.254	0.677	1.290	1.660	1.984	2.364	2.626	3.174
120	0.254	0.677	1.289	1.658	1.980	2.358	2.617	3.160
150	0.254	0.676	1.287	1.655	1.976	2.351	2.609	3.145
∞	0.253	0.674	1.282	1.645	1.960	2.326	2.576	3.090

APPENDIX E

Actual Evapotranspiration from MODIS and Landsat 7 Image

APPENDIX F

The Values of Actual Evapotranspiration and Monthly Rainfall for Comparison

Appendix F

Appendix Table F1 The weather location and coordinate for the comparison

Weather Location No.	Weather Station	UTM: X [1]	UTM: Y [1]
1	NAKHON SAWAN	624954	1747159
2	SUPHAN BURI	622146	1599640
3	LOP BURI	673984	1636832
4	BUA CHUM	734480	1688998
5	KANCHANA BURI	557592	1549634
6	THONG PHAPHUM	460532	1628864
7	BANGKOK PORT	669422	1515097
8	LOEI	790333	1931415
9	MAE HONG SON	377424	2134435
10	MAE SARIANG	387181	2008953
11	CHIANG RAI	592424	2208036
12	PHAYAO	594652	2115824
13	CHIANG MAI	498244	2076854
14	LAMPANG	554608	2021610
15	LAMPHUN	503517	2052882
16	PHRAE	623397	2009017
17	NAN	687961	2077796
18	THA WANGPHA	689361	2112866
19	THUNG CHANG	697770	2146167
20	UTTARADIT	616704	1948115
21	SUKHOTHAI	561205	1902085
22	TAK	512426	1866653
23	MAE SOT	452016	1842735
24	BHUMIBOL DAM	505316	1905369
25	UMPHANG	485736	1770784
26	PHITSANULOK	634991	1856017
27	PHETCHABUN	729575	1818088
28	LOM SAK	739843	1855102
29	WICHIAN BURI	726900	1731352
30	KAMPHAENG PHET	556924	1822475

[1] Thailand: Projection is UTM zone 47.

Appendix Table F2 The comparison between actual evapotranspiration calculated by SEBAL and by the Penman-Monteith method and their correlation coefficients

Weather Location No.	Jan, 3, 02				Jan 17, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	3.32	3.47	0.15	4.30	4.09	5.83	1.74	29.82
2	3.09	4.77	1.68	35.15	3.01	3.95	0.94	23.74
3	2.60	3.76	1.16	30.77	4.00	4.16	0.16	3.73
4	2.73	2.09	-0.64	-30.86	3.00	4.16	1.16	27.85
5	3.00	3.69	0.69	18.66	5.00	4.25	-0.75	-17.62
6	1.19	1.75	0.56	31.95	3.68	3.29	-0.39	-11.85
7	6.00	6.87	0.87	12.63	5.36	5.55	0.19	3.43
8	7.00	7.44	0.44	5.93	3.00	4.16	1.16	27.85
9	4.00	4.59	0.59	12.85	0.00	0.05	0.05	-
10	4.00	4.59	0.59	12.85	3.00	4.59	1.59	34.57
11	4.75	4.59	-0.16	-3.40	1.02	5.04	4.02	79.78
12	1.66	1.07	-0.58	-54.42	2.61	5.21	2.61	50.02
13	4.85	4.59	-0.26	-5.61	1.11	1.13	0.03	2.35
14	4.66	4.59	-0.07	-1.52	5.86	5.82	-0.04	-0.70
15	4.86	4.59	-0.27	-5.94	2.51	2.14	-0.37	-17.45
16	2.59	2.19	-0.40	-18.04	3.06	3.36	0.30	8.98
17	1.30	1.27	-0.04	-2.94	1.55	1.79	0.24	13.42
18	1.16	1.99	0.82	41.46	1.38	1.56	0.18	11.27
19	7.98	7.38	-0.60	-8.16	1.23	1.94	0.71	36.72
20	2.52	2.51	-0.01	-0.38	3.25	3.91	0.65	16.76
21	1.88	2.07	0.19	9.35	2.62	2.92	0.30	10.33
22	5.97	5.47	-0.50	-9.16	1.36	1.06	-0.30	-28.74
23	1.60	1.35	-0.25	-18.61	5.70	5.50	-0.20	-3.64
24	7.12	7.87	0.75	9.58	0.15	5.42	5.26	97.17
25	-	Cloud	-	-	5.00	5.10	0.10	2.04
26	1.22	1.32	0.10	7.45	1.81	1.19	-0.62	-51.85
27	2.70	3.66	0.96	26.26	3.47	3.17	-0.30	-9.48
28	1.86	2.50	0.64	25.67	2.13	3.09	0.96	31.04
29	2.81	2.66	-0.15	-5.58	3.30	3.17	-0.13	-4.13
30	1.91	2.72	0.81	29.91	2.24	2.42	0.19	7.75
Average	3.46	3.70	0.24	6.59	2.85	3.50	0.65	18.51
Correlation Coefficients		0.95				0.65		

[1] The Penman-Monteith method

[2] Difference value = $ET_{c,SEBAL} - ET_{c,PM}$

[3] % Difference value = $100 - \frac{ET_{c,PM} \times 100}{ET_{c,SEBAL}}$

Appendix Table F2 (cont'd)

Weather Location No.	Jan 26, 02				Feb 2, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.15	5.45	1.30	23.85	4.50	6.53	2.03	31.05
2	4.05	3.46	-0.59	-17.04	-	Cloud	-	-
3	2.70	3.42	0.72	20.96	2.97	3.69	0.72	19.55
4	4.04	2.67	-1.38	-51.54	3.88	2.76	-1.12	-40.68
5	6.13	5.59	-0.54	-9.65	2.00	2.87	0.87	30.29
6	1.93	3.61	1.67	46.40	2.00	1.27	-0.73	-57.78
7	5.36	6.07	0.70	11.58	2.40	2.51	0.12	4.72
8	4.03	4.16	0.13	3.13	-	Cloud	-	-
9	3.26	3.98	0.72	18.10	3.00	3.67	0.67	18.14
10	7.26	7.45	0.19	2.62	7.00	7.83	0.83	10.58
11	3.09	4.12	1.03	25.04	1.17	1.96	0.79	40.18
12	2.89	4.53	1.64	36.23	3.05	2.75	-0.30	-11.06
13	3.13	4.37	1.24	28.34	1.30	2.29	0.99	43.12
14	2.00	2.28	0.28	12.28	1.02	2.32	1.30	56.05
15	2.71	1.78	-0.93	-52.35	3.11	3.09	-0.02	-0.63
16	3.46	2.16	-1.30	-59.94	3.48	2.25	-1.23	-54.83
17	1.72	1.68	-0.04	-2.48	1.77	2.75	0.98	35.59
18	3.53	4.86	1.33	27.44	1.56	1.92	0.36	18.85
19	3.31	3.60	0.29	7.97	1.29	2.81	1.52	54.04
20	3.55	2.48	-1.07	-43.04	3.50	2.39	-1.11	-46.53
21	2.71	1.80	-0.92	-51.07	3.05	1.95	-1.10	-56.58
22	3.54	4.38	0.84	19.14	1.62	1.15	-0.47	-40.47
23	3.83	3.90	0.07	1.73	1.94	1.42	-0.52	-36.36
24	0.16	0.35	0.19	55.57	1.16	1.49	0.33	21.96
25	4.24	4.84	0.61	12.54	2.00	1.76	-0.24	-13.64
26	3.99	4.53	0.54	11.86	2.09	4.19	2.10	50.10
27	3.57	3.00	-0.57	-19.17	3.83	4.40	0.57	13.00
28	2.17	3.78	1.61	42.53	2.40	4.69	2.28	48.67
29	3.46	4.61	1.15	24.96	3.81	4.45	0.64	14.36
30	2.32	2.61	0.29	11.10	2.43	2.57	0.14	5.37
Average	3.41	3.72	0.31	8.26	2.62	2.99	0.37	12.41
Correlation Coefficients		0.80				0.80		

Appendix Table F2 (cont'd)

Weather Location No.	Feb 9, 02 PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	Feb 18, 02 PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	5.05	4.23	-0.82	-19.51	5.46	5.59	0.12	2.21
2	4.40	3.53	-0.87	-24.54	4.45	4.38	-0.07	-1.67
3	3.90	3.48	-0.42	-12.07	3.37	2.29	-1.08	-47.38
4	4.09	4.98	0.89	17.95	4.07	2.23	-1.83	-82.00
5	3.36	4.34	0.98	22.49	3.00	3.38	0.38	11.11
6	2.17	1.31	-0.86	-65.77	-	Cloud	-	-
7	2.40	2.12	-0.28	-13.27	0.44	3.15	2.71	86.07
8	3.68	3.29	-0.39	-11.85	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	5.22	6.62	1.40	21.14	1.31	4.77	3.46	72.47
12	3.12	2.44	-0.69	-28.20	3.24	3.42	0.17	5.12
13	1.43	1.73	0.29	16.94	2.44	3.34	0.90	26.95
14	1.07	3.37	2.30	68.35	1.14	2.68	1.54	57.39
15	3.25	2.04	-1.21	-59.08	3.37	2.65	-0.72	-27.15
16	3.69	3.54	-0.15	-4.29	3.77	3.34	-0.43	-13.04
17	1.29	3.77	2.48	65.69	1.88	3.11	1.22	39.37
18	7.00	7.12	0.12	1.62	2.69	4.45	1.76	39.52
19	3.58	3.37	-0.22	-6.39	2.39	4.36	1.97	45.14
20	3.61	2.70	-0.92	-34.01	3.74	4.04	0.29	7.23
21	3.33	2.34	-0.99	-42.44	3.26	2.94	-0.33	-11.15
22	1.77	1.90	0.14	7.12	1.68	1.39	-0.29	-21.22
23	2.06	2.68	0.62	23.21	3.74	3.02	-0.72	-23.74
24	1.19	1.18	-0.02	-1.44	2.18	2.95	0.77	26.13
25	3.00	3.04	0.04	1.28	3.00	3.33	0.33	10.02
26	2.29	3.49	1.19	34.25	3.25	4.30	1.05	24.41
27	4.29	2.20	-2.09	-94.79	3.96	3.27	-0.69	-21.03
28	2.72	4.21	1.49	35.41	2.56	2.60	0.03	1.31
29	4.31	3.94	-0.37	-9.33	4.09	3.24	-0.86	-26.45
30	2.53	4.61	2.09	45.23	2.69	3.29	0.61	18.42
Average	3.21	3.34	0.13	4.00	2.97	3.36	0.40	11.76
Correlation Coefficients		0.67				0.69		

Appendix Table F2 (cont'd)

Weather Location No.	Feb 28, 02				Mar 13, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	5.41	5.87	0.46	7.76	5.65	4.86	-0.79	-16.19
2	5.23	3.59	-1.63	-45.44	5.20	3.38	-1.82	-54.02
3	3.35	4.37	1.01	23.20	3.54	2.45	-1.08	-44.17
4	4.24	0.47	-3.78	-810.64	4.34	2.15	-2.19	-102.00
5	0.00	0.00	0.00	-	7.00	7.85	0.85	10.78
6	2.62	4.47	1.85	41.34	2.69	1.45	-1.24	-85.71
7	0.39	4.59	4.19	91.41	2.39	2.20	-0.19	-8.66
8	-	Cloud	-	-	-	Cloud	-	-
9	0.00	0.00	0.00	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	3.29	4.70	1.41	30.03	1.32	3.14	1.82	57.85
12	3.38	4.72	1.34	28.36	3.40	4.85	1.45	29.92
13	3.75	4.67	0.91	19.58	1.71	1.13	-0.59	-52.05
14	3.28	4.68	1.40	29.94	1.19	1.53	0.34	22.15
15	3.66	4.58	0.92	20.12	3.68	1.76	-1.92	-108.95
16	3.91	4.50	0.58	12.98	3.95	3.09	-0.86	-27.73
17	2.04	1.53	-0.51	-33.26	1.99	3.12	1.13	36.27
18	3.87	4.54	0.67	14.76	1.70	5.52	3.82	69.21
19	3.49	4.52	1.02	22.67	1.37	4.60	3.23	70.21
20	3.72	4.48	0.76	16.92	3.71	1.61	-2.10	-130.18
21	3.53	4.43	0.90	20.40	3.54	2.77	-0.76	-27.54
22	3.66	4.70	1.04	22.20	1.70	3.72	2.02	54.31
23	2.40	4.59	2.19	47.67	2.33	1.84	-0.49	-26.45
24	4.28	4.48	0.20	4.40	0.26	1.82	1.56	85.91
25	4.51	4.81	0.30	6.13	-	Cloud	-	-
26	2.59	4.35	1.76	40.47	2.57	5.57	3.01	53.93
27	4.54	4.45	-0.09	-1.96	4.55	1.50	-3.05	-204.33
28	3.15	4.28	1.13	26.36	3.09	1.62	-1.47	-90.77
29	4.61	3.38	-1.23	-36.56	4.61	3.57	-1.04	-29.19
30	2.58	4.34	1.76	40.48	2.60	2.62	0.02	0.91
Average	3.27	3.93	0.66	16.87	3.08	3.07	-0.01	-0.44
Correlation Coefficients		0.53				0.58		

Appendix Table F2 (cont'd)

Weather Location No.	Mar 29, 02				Apr 3, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	3.51	4.81	1.31	27.11	7.28	7.25	-0.03	-0.36
2	5.61	5.91	0.30	5.15	4.98	5.11	0.13	2.62
3	4.35	6.54	2.19	33.56	4.49	3.82	-0.67	-17.44
4	4.90	5.35	0.45	8.44	4.55	3.11	-1.43	-46.05
5	6.00	7.06	1.06	15.00	2.00	3.15	1.15	36.49
6	2.91	2.41	-0.50	-20.58	2.63	3.78	1.15	30.51
7	0.48	1.47	0.99	67.43	2.54	3.31	0.76	23.02
8	-	Cloud	-	-	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	1.47	0.89	-0.58	-65.35	1.70	1.88	0.18	9.83
12	3.81	4.09	0.28	6.78	4.31	2.95	-1.36	-46.18
13	1.95	3.01	1.06	35.36	1.84	2.45	0.61	24.99
14	1.28	0.86	-0.42	-48.62	1.39	1.18	-0.21	-17.62
15	4.21	4.23	0.02	0.53	4.38	3.45	-0.93	-27.00
16	4.71	4.47	-0.24	-5.42	4.95	3.41	-1.54	-45.31
17	2.04	5.55	3.52	63.30	2.38	3.98	1.60	40.29
18	1.75	1.16	-0.59	-50.82	2.04	1.47	-0.57	-39.08
19	1.37	2.44	1.07	43.76	1.59	1.73	0.13	7.81
20	4.42	5.15	0.72	14.07	5.26	3.23	-2.02	-62.62
21	3.68	4.85	1.18	24.27	4.08	4.49	0.40	8.97
22	2.05	2.73	0.68	24.81	2.25	1.94	-0.31	-16.00
23	2.79	1.31	-1.48	-113.17	2.43	1.35	-1.08	-79.75
24	0.25	3.87	3.62	93.51	0.19	0.63	0.44	69.64
25	-	Cloud	-	-	-	Cloud	-	-
26	3.02	4.19	1.18	28.10	3.18	1.95	-1.23	-63.24
27	5.74	6.40	0.67	10.39	5.81	4.40	-1.41	-31.99
28	3.85	6.69	2.83	42.35	3.85	3.18	-0.67	-21.18
29	5.98	5.45	-0.53	-9.75	5.97	4.43	-1.54	-34.86
30	2.88	6.06	3.18	52.52	3.27	2.70	-0.56	-20.89
Average	3.27	4.11	0.84	20.54	3.44	3.09	-0.35	-11.20
Correlation Coefficients		0.83				0.89		

Appendix Table F2 (cont'd)

Weather Location No.	Apr 21, 02				Apr 30, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.09	4.62	0.53	11.40	7.13	5.21	-1.92	-36.97
2	6.23	1.06	-5.17	-486.24	4.80	4.99	0.20	3.98
3	4.89	3.94	-0.96	-24.29	4.41	3.61	-0.80	-22.03
4	5.35	3.45	-1.90	-55.08	5.04	3.67	-1.37	-37.37
5	0.00	0.17	0.17	-	2.34	3.55	1.20	33.91
6	3.16	1.40	-1.76	-125.86	2.43	2.10	-0.33	-15.68
7	0.57	3.10	2.54	81.77	7.00	7.44	0.44	5.93
8	-	Cloud	-	-	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	1.49	1.53	0.04	2.46	1.47	3.26	1.79	54.94
12	4.24	4.33	0.09	2.03	4.36	4.73	0.37	7.84
13	2.15	1.01	-1.14	-113.33	1.97	2.91	0.94	32.33
14	1.41	1.43	0.01	0.95	1.37	3.89	2.52	64.89
15	4.18	0.98	-3.20	-327.03	4.10	5.31	1.21	22.72
16	4.98	4.64	-0.34	-7.30	-	Cloud	-	-
17	2.34	1.37	-0.98	-71.33	2.50	8.02	5.52	68.84
18	2.18	3.68	1.50	40.81	2.33	5.40	3.06	56.75
19	1.58	3.51	1.93	55.03	1.77	3.47	1.69	48.82
20	5.12	5.77	0.65	11.29	5.23	6.12	0.89	14.57
21	4.21	3.72	-0.49	-13.11	-	Cloud	-	-
22	2.45	1.14	-1.31	-114.32	-	Cloud	-	-
23	2.93	1.40	-1.53	-109.84	-	Cloud	-	-
24	0.28	1.49	1.22	81.56	-	Cloud	-	-
25	-	Cloud	-	-	-	Cloud	-	-
26	3.52	3.45	-0.08	-2.24	3.33	2.42	-0.91	-37.39
27	5.34	5.33	0.00	-0.09	6.09	0.00	-6.09	-
28	3.69	3.78	0.09	2.45	4.26	3.80	-0.46	-12.08
29	5.40	3.90	-1.49	-38.19	5.00	3.91	-1.09	-27.94
30	3.16	4.70	1.54	32.86	2.96	2.24	-0.72	-32.18
Average	3.27	2.88	-0.39	-13.39	3.80	4.10	0.29	7.16
Correlation Coefficients		0.68				0.67		

Appendix Table F2 (cont'd)

Weather Location No.	May 2, 02				May 7, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	6.38	4.19	-2.19	-52.11	6.35	4.01	-2.34	-58.53
2	5.46	6.16	0.70	11.35	-	Cloud	-	-
3	4.15	3.70	-0.46	-12.35	-	Cloud	-	-
4	4.54	2.14	-2.39	-111.69	-	Cloud	-	-
5	-	Cloud	-	-	-	Cloud	-	-
6	2.93	2.40	-0.53	-22.24	2.10	3.56	1.45	40.87
7	0.51	0.43	-0.08	-19.09	0.48	0.20	-0.28	-135.60
8	-	Cloud	-	-	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	0.00	0.45	0.45	-
11	1.09	2.36	1.27	53.86	1.32	4.10	2.78	67.73
12	2.57	3.57	0.99	27.89	4.00	3.87	-0.13	-3.34
13	1.30	0.48	-0.83	-173.73	1.98	1.77	-0.21	-11.61
14	1.04	5.01	3.97	79.33	1.40	1.68	0.28	16.77
15	2.87	3.80	0.93	24.57	3.87	3.98	0.10	2.53
16	4.19	2.41	-1.78	-73.83	4.77	4.04	-0.73	-18.21
17	1.53	2.74	1.20	43.97	2.36	3.36	1.00	29.73
18	1.45	1.01	-0.44	-43.92	2.33	1.79	-0.54	-30.13
19	1.14	1.52	0.38	24.94	1.77	1.78	0.00	0.22
20	4.50	3.48	-1.02	-29.24	1.09	0.97	-0.11	-11.59
21	2.81	0.94	-1.87	-199.30	3.96	3.68	-0.28	-7.60
22	1.78	1.92	0.14	7.20	2.14	1.64	-0.50	-30.80
23	2.28	0.61	-1.68	-277.29	2.78	3.00	0.22	7.29
24	5.17	1.97	-3.21	-163.19	0.27	1.30	1.04	79.56
25	-	Cloud	-	-	-	Cloud	-	-
26	2.84	2.11	-0.74	-35.03	3.22	3.92	0.70	17.80
27	6.17	1.65	-4.52	-274.52	4.97	5.62	0.65	11.60
28	4.37	2.96	-1.41	-47.46	3.70	1.43	-2.27	-159.08
29	6.14	6.33	0.18	2.91	5.04	5.47	0.43	7.89
30	2.62	2.90	0.27	9.46	2.72	1.12	-1.61	-144.30
Average	3.19	2.67	-0.52	-19.61	2.72	2.73	0.00	0.14
Correlation Coefficients		0.55				0.86		

Appendix Table F2 (cont'd)

Weather Location No.	Jun 3, 02				Jun 17, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	6.12	5.18	-0.94	-18.09	-	Cloud	-	-
2	4.69	4.09	-0.60	-14.63	-	Cloud	-	-
3	-	Cloud	-	-	-	Cloud	-	-
4	-	Cloud	-	-	-	Cloud	-	-
5	-	Cloud	-	-	-	Cloud	-	-
6	-	Cloud	-	-	-	Cloud	-	-
7	-	Cloud	-	-	-	Cloud	-	-
8	-	Cloud	-	-	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	-	Cloud	-	-	-	Cloud	-	-
12	-	Cloud	-	-	-	Cloud	-	-
13	1.27	1.61	0.34	21.12	1.23	3.71	2.48	66.84
14	1.12	2.62	1.50	57.22	1.07	1.71	0.64	37.33
15	3.23	4.19	0.95	22.80	3.16	3.88	0.72	18.65
16	4.32	3.35	-0.96	-28.75	4.60	3.77	-0.82	-21.86
17	-	Cloud	-	-	1.80	3.90	2.09	53.75
18	-	Cloud	-	-	-	Cloud	-	-
19	-	Cloud	-	-	-	Cloud	-	-
20	4.45	4.25	-0.20	-4.66	-	Cloud	-	-
21	3.21	4.08	0.87	21.30	3.05	4.91	1.86	37.92
22	-	Cloud	-	-	-	Cloud	-	-
23	1.92	3.84	1.92	49.96	2.24	2.90	0.67	22.95
24	3.15	4.08	0.93	22.80	-	Cloud	-	-
25	-	Cloud	-	-	-	Cloud	-	-
26	2.43	4.75	2.32	48.94	-	Cloud	-	-
27	5.72	5.19	-0.53	-10.12	3.60	1.68	-1.92	-114.74
28	2.30	3.53	1.22	34.68	2.33	2.32	-0.01	-0.34
29	-	Cloud	-	-	-	Cloud	-	-
30	2.68	4.54	1.86	40.96	-	Cloud	-	-
Average	3.33	3.95	0.62	15.72	2.56	3.20	0.63	19.84
Correlation Coefficients		0.92				0.87		

Appendix Table F2 (cont'd)

Weather Location No.	Aug 27, 02				Sep 14, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	3.74	2.95	-0.78	-26.50	4.62	2.96	-1.66	-56.01
2	4.07	4.43	0.35	7.99	3.91	5.54	1.64	29.55
3	2.47	1.94	-0.53	-27.40	3.33	4.72	1.39	29.48
4	-	Cloud	-	-	-	Cloud	-	-
5	-	Cloud	-	-	-	Cloud	-	-
6	2.02	3.61	1.59	43.99	-	Cloud	-	-
7	3.32	3.18	-0.13	-4.23	-	Cloud	-	-
8	0.00	0.05	0.05	-	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	-	Cloud	-	-	-	Cloud	-	-
12	-	Cloud	-	-	-	Cloud	-	-
13	-	Cloud	-	-	-	Cloud	-	-
14	3.80	4.58	0.77	16.86	7.89	8.69	0.80	9.26
15	3.22	4.11	0.88	21.52	-	Cloud	-	-
16	2.23	1.27	-0.96	-75.74	-	Cloud	-	-
17	1.60	2.69	1.09	40.64	-	Cloud	-	-
18	1.48	2.46	0.98	39.75	-	Cloud	-	-
19	1.14	3.83	2.69	70.31	-	Cloud	-	-
20	-	Cloud	-	-	-	Cloud	-	-
21	-	Cloud	-	-	-	Cloud	-	-
22	-	Cloud	-	-	-	Cloud	-	-
23	-	Cloud	-	-	-	Cloud	-	-
24	-	Cloud	-	-	-	Cloud	-	-
25	-	Cloud	-	-	-	Cloud	-	-
26	-	Cloud	-	-	-	Cloud	-	-
27	-	Cloud	-	-	2.69	5.94	3.25	54.67
28	-	Cloud	-	-	2.06	2.07	0.01	0.35
29	-	Cloud	-	-	2.79	1.21	-1.58	-130.22
30	-	Cloud	-	-	-	Cloud	-	-
Average	2.42	2.92	0.50	17.10	3.90	4.45	0.55	12.37
Correlation Coefficients		0.88				0.93		

Appendix Table F2 (cont'd)

Weather Location No.	Sep 28, 02				Oct 9, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.11	4.55	0.44	9.74	5.54	3.29	-2.26	-68.71
2	2.80	3.74	0.94	25.22	4.54	4.44	-0.10	-2.28
3	2.85	3.69	0.84	22.79	3.86	1.91	-1.95	-102.57
4	3.82	5.53	1.70	30.83	3.93	1.93	-2.00	-103.67
5	-	Cloud	-	-	0.00	0.67	0.67	-
6	1.41	2.16	0.75	34.63	2.23	3.28	1.04	31.86
7	0.35	0.88	0.52	59.69	0.48	1.56	1.08	69.36
8	-	Cloud	-	-	0.00	0.83	0.83	-
9	-	Cloud	-	-	5.09	3.03	-2.07	-68.33
10	-	Cloud	-	-	2.24	2.28	0.03	1.50
11	1.43	2.01	0.58	28.67	1.10	1.39	0.29	20.79
12	-	Cloud	-	-	2.68	1.40	-1.28	-90.92
13	1.50	2.44	0.94	38.48	1.37	0.91	-0.46	-51.23
14	1.07	1.42	0.35	24.62	1.01	0.84	-0.17	-20.28
15	3.45	4.67	1.22	26.19	2.85	2.98	0.13	4.46
16	4.09	5.45	1.36	24.92	3.32	2.58	-0.74	-28.55
17	1.87	1.29	-0.59	-45.68	1.58	0.96	-0.62	-63.94
18	1.55	1.90	0.35	18.22	1.36	0.86	-0.50	-57.86
19	1.21	1.50	0.30	19.73	1.05	1.08	0.03	2.39
20	-	Cloud	-	-	4.04	3.46	-0.58	-16.76
21	3.68	2.62	-1.07	-40.70	3.10	1.13	-1.97	-173.28
22	1.76	1.30	-0.46	-35.51	1.41	1.73	0.32	18.23
23	2.09	1.48	-0.61	-40.99	1.91	0.89	-1.03	-115.57
24	0.15	6.89	6.73	97.78	0.17	0.55	0.38	69.38
25	-	Cloud	-	-	-	Cloud	-	-
26	2.53	4.19	1.66	39.58	-	Cloud	-	-
27	4.62	5.71	1.09	19.06	4.39	3.40	-1.00	-29.29
28	-	Cloud	-	-	3.05	2.75	-0.30	-11.02
29	4.71	3.35	-1.36	-40.58	4.34	3.87	-0.47	-12.24
30	-	Cloud	-	-	2.68	1.51	-1.17	-77.78
Average	2.43	3.18	0.75	23.50	2.48	1.98	-0.49	-24.96
Correlation Coefficients		0.75				0.83		

Appendix Table F2 (cont'd)

Weather Location No.	Oct 25, 02				Oct 30, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.32	3.40	-0.92	-26.98	3.75	3.85	0.10	2.58
2	4.10	5.75	1.65	28.72	-	Cloud	-	-
3	3.02	4.08	1.06	25.98	2.60	1.89	-0.71	-37.82
4	3.78	3.95	0.16	4.11	2.88	3.95	1.07	27.13
5	3.32	3.42	0.10	3.00	-	Cloud	-	-
6	3.22	4.91	1.69	34.37	1.84	2.91	1.07	36.90
7	1.37	1.94	0.58	29.71	3.31	3.46	0.15	4.45
8	3.22	4.91	1.69	34.37	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	3.67	4.81	1.14	23.60
11	1.15	7.24	6.09	84.12	2.60	2.10	-0.50	-23.93
12	2.79	2.20	-0.59	-26.92	2.55	2.48	-0.07	-2.77
13	1.22	2.27	1.04	46.06	0.64	0.00	-0.64	-
14	0.96	0.52	-0.45	-86.48	0.48	0.00	-0.48	-
15	2.72	1.68	-1.04	-61.60	-	Cloud	-	-
16	3.03	2.09	-0.94	-44.69	2.97	2.35	-0.61	-26.12
17	1.56	2.77	1.21	43.63	1.40	2.28	0.88	38.60
18	1.39	4.45	3.06	68.77	1.29	2.06	0.77	37.47
19	1.16	0.50	-0.66	-130.78	-	Cloud	-	-
20	3.48	5.58	2.10	37.55	3.20	2.20	-1.00	-45.33
21	3.06	4.72	1.65	35.01	1.58	2.08	0.50	24.02
22	1.39	2.72	1.33	48.99	1.18	0.94	-0.25	-26.14
23	1.44	3.48	2.04	58.65	1.41	2.25	0.84	37.44
24	0.12	0.00	-0.12	-	2.07	2.16	0.09	4.35
25	3.26	3.47	0.21	6.16	2.37	2.46	0.09	3.58
26	2.13	1.14	-0.99	-87.12	-	Cloud	-	-
27	3.46	4.77	1.32	27.57	3.03	4.27	1.24	29.09
28	2.22	3.49	1.27	36.39	1.87	3.75	1.88	50.18
29	-	Cloud	-	-	2.94	2.25	-0.70	-31.04
30	1.99	3.98	2.00	50.12	-	Cloud	-	-
Average	2.40	3.31	0.91	27.44	2.25	2.48	0.22	8.96
Correlation Coefficients		0.64				0.89		

Appendix Table F2 (cont'd)

Weather Location No.	Nov 6, 02				Nov 5, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	3.35	3.18	-0.17	-5.48	-	Cloud	-	-
2	-	Cloud	-	-	-	Cloud	-	-
3	-	Cloud	-	-	3.59	2.77	-0.82	-29.78
4	2.82	4.09	1.27	31.05	3.34	2.47	-0.87	-35.24
5	-	Cloud	-	-	-	Cloud	-	-
6	-	Cloud	-	-	-	Cloud	-	-
7	0.28	1.37	1.08	79.23	-	Cloud	-	-
8	-	Cloud	-	-	-	Cloud	-	-
9	-	Cloud	-	-	-	Cloud	-	-
10	1.74	2.96	1.22	41.13	-	Cloud	-	-
11	3.53	4.20	0.67	15.90	5.52	5.12	-0.40	-7.73
12	3.28	3.35	0.07	2.06	1.22	8.60	7.38	85.85
13	3.59	3.67	0.09	2.35	-	Cloud	-	-
14	4.47	4.76	0.29	6.05	-	Cloud	-	-
15	1.24	2.35	1.11	47.26	1.18	5.00	3.82	76.37
16	2.47	1.73	-0.74	-42.47	-	Cloud	-	-
17	4.79	5.39	0.60	11.06	0.77	5.09	4.32	84.94
18	5.72	5.94	0.22	3.63	4.69	4.91	0.22	4.47
19	3.56	4.04	0.47	11.75	-	Cloud	-	-
20	2.87	2.39	-0.48	-20.30	-	Cloud	-	-
21	1.43	2.34	0.91	38.76	-	Cloud	-	-
22	1.04	1.50	0.47	31.08	1.16	1.33	0.17	12.77
23	1.45	2.72	1.27	46.64	1.54	3.46	1.92	55.43
24	3.08	3.56	0.47	13.30	2.08	3.47	1.38	39.95
25	3.08	4.02	0.94	23.28	-	Cloud	-	-
26	2.67	3.80	1.13	29.72	-	Cloud	-	-
27	3.10	3.59	0.49	13.61	4.27	4.07	-0.19	-4.76
28	2.06	1.25	-0.81	-65.01	2.90	2.50	-0.40	-16.22
29	3.07	1.38	-1.69	-122.59	4.21	1.55	-2.66	-171.74
30	1.52	2.36	0.85	35.75	2.05	3.04	0.99	32.51
Average	2.76	3.16	0.40	12.77	2.75	3.81	1.06	27.84
Correlation Coefficients		0.92				0.62		

Appendix Table F2 (cont'd)

Weather Location No.	Nov 20, 02				Dec 1, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	2.03	2.34	0.31	13.19	3.97	5.68	1.71	30.15
2	-	Cloud	-	-	3.14	1.92	-1.22	-63.69
3	-	Cloud	-	-	3.00	1.72	-1.28	-74.48
4	-	Cloud	-	-	2.65	4.90	2.25	45.97
5	-	Cloud	-	-	1.00	1.74	0.74	42.60
6	-	Cloud	-	-	1.83	5.37	3.54	65.97
7	-	Cloud	-	-	0.34	5.05	4.71	93.19
8	-	Cloud	-	-	1.11	1.81	0.70	38.46
9	-	Cloud	-	-	3.10	3.38	0.28	8.31
10	-	Cloud	-	-	-	Cloud	-	-
11	1.02	0.47	-0.55	-118.94	2.54	1.36	-1.19	-87.51
12	1.66	5.61	3.95	70.39	3.19	4.20	1.01	24.06
13	1.05	0.51	-0.54	-106.42	2.49	1.47	-1.02	-69.31
14	0.93	1.60	0.67	41.87	4.42	5.48	1.05	19.24
15	2.42	1.27	-1.15	-90.98	3.16	5.08	1.92	37.76
16	1.47	0.98	-0.49	-49.39	3.94	5.38	1.43	26.68
17	0.98	0.64	-0.34	-53.76	4.71	5.54	0.83	15.06
18	0.92	0.41	-0.51	-125.32	4.66	5.63	0.97	17.29
19	0.81	0.30	-0.51	-168.36	5.58	5.28	-0.29	-5.54
20	1.50	0.79	-0.71	-88.97	2.12	4.78	2.66	55.59
21	2.49	1.47	-1.02	-69.33	5.36	5.10	-0.26	-5.05
22	0.61	0.70	0.08	11.59	0.89	1.45	0.56	38.79
23	0.87	0.61	-0.26	-41.96	5.13	5.15	0.02	0.32
24	0.12	0.00	-0.12	-	5.06	5.19	0.13	2.57
25	-	Cloud	-	-	-	Cloud	-	-
26	0.83	1.51	0.68	44.99	1.21	2.04	0.83	40.63
27	2.05	1.10	-0.95	-86.82	3.80	5.31	1.51	28.40
28	1.27	0.48	-0.79	-162.27	2.33	5.15	2.81	54.68
29	1.98	1.25	-0.73	-58.58	3.63	5.08	1.45	28.52
30	0.92	0.57	-0.35	-62.21	1.74	1.75	0.01	0.72
Average	1.30	1.13	-0.17	-14.76	3.07	4.00	0.92	23.12
Correlation Coefficients		0.61				0.70		

Appendix Table F2 (cont'd)

Weather Location No.	Dec 8, 02 PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	3.91	5.21	1.30	25.01
2	-	Cloud	-	-
3	2.37	3.67	1.30	35.51
4	3.09	2.93	-0.16	-5.42
5	1.11	1.81	0.70	38.46
6	1.39	2.87	1.47	51.47
7	0.33	1.36	1.03	75.63
8	-	Cloud	-	-
9	-	Cloud	-	-
10	-	Cloud	-	-
11	-	Cloud	-	-
12	-	Cloud	-	-
13	-	Cloud	-	-
14	0.90	1.82	0.92	50.47
15	2.29	2.83	0.54	19.11
16	2.74	1.27	-1.47	-116.02
17	1.28	1.88	0.61	32.17
18	1.19	1.53	0.34	22.34
19	6.95	8.24	1.29	15.63
20	3.09	4.21	1.12	26.60
21	2.55	3.25	0.70	21.52
22	1.19	3.21	2.03	63.01
23	1.68	2.75	1.06	38.65
24	6.16	7.82	1.66	21.20
25	-	Cloud	-	-
26	1.73	2.29	0.55	24.22
27	3.40	2.27	-1.13	-49.69
28	2.26	2.89	0.64	22.01
29	3.17	2.47	-0.71	-28.58
30	1.73	2.79	1.06	38.02
Average	2.48	3.15	0.67	21.41
Correlation Coefficients		0.92		

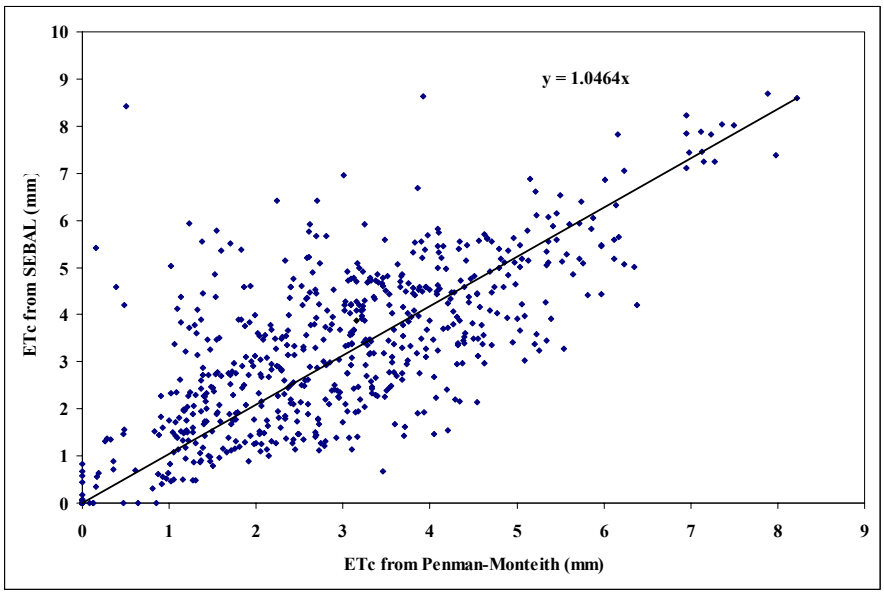


Figure F1 The distribution of all actual evapotranspiration used for comparison in 27 days of MODIS images

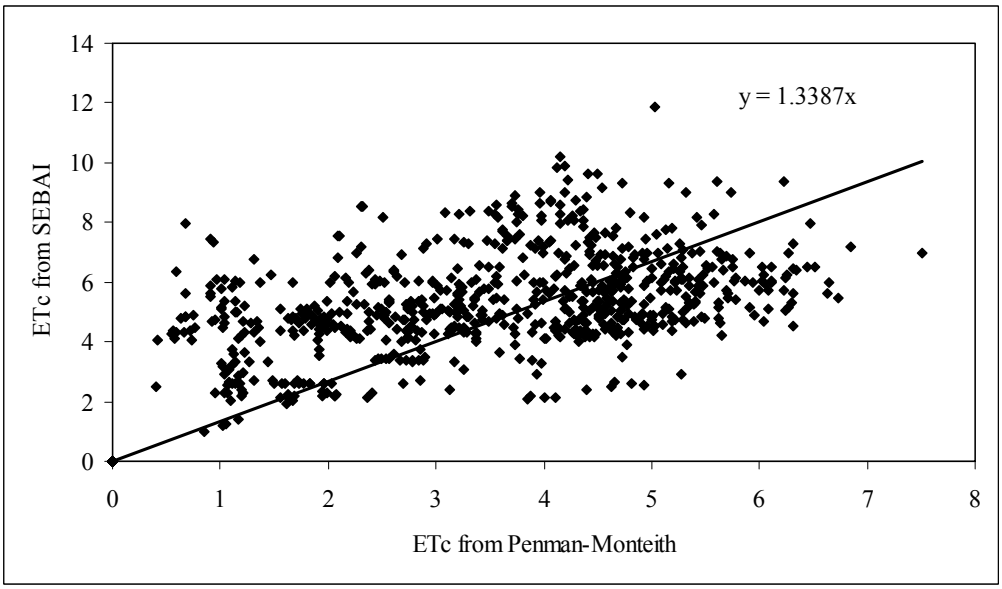


Figure F2 The distribution between actual evapotranspiration from SEBAL and actual evapotranspiration from the Penman-Monteith after there is temporal interpolation of actual evapotranspiration from SEBAL

Appendix Table F3 The comparison between actual evapotranspiration from SEBAL and from the Penman-Monteith method and their correlation coefficients after there is temporal interpolation of actual evapotranspiration from SEBAL

Weather Location No.	Jan 12, 02				Jan 21, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.36	6.00	1.64	27.29	4.83	6.53	1.70	26.07
2	3.44	5.78	2.34	40.47	3.82	6.23	2.41	38.66
3	2.52	4.87	2.35	48.32	4.33	5.90	1.57	26.59
4	4.37	5.34	0.97	18.12	-	Cloud	-	-
5	0.93	7.32	6.38	87.23	5.42	8.18	2.75	33.69
6	3.55	7.27	3.72	51.16	3.96	9.01	5.04	56.00
7	0.68	7.95	7.27	91.40	5.74	8.98	3.24	36.08
8	3.66	7.54	3.88	51.42	4.22	8.09	3.87	47.80
9	-	Cloud	-	-	3.31	7.27	3.96	54.49
10	2.97	6.06	3.08	50.92	3.49	6.51	3.02	46.40
11	3.09	8.30	5.22	62.82	3.56	8.59	5.02	58.50
12	3.25	5.84	2.59	44.32	3.71	8.56	4.84	56.63
13	3.22	5.82	2.60	44.60	3.77	8.43	4.66	55.31
14	-	Cloud	-	-	3.54	8.27	4.73	57.16
15	-	Cloud	-	-	3.58	8.17	4.58	56.13
16	3.48	7.37	3.90	52.84	3.98	8.21	4.23	51.49
17	3.26	7.35	4.09	55.60	3.76	8.29	4.53	54.64
18	3.20	5.62	2.42	43.06	3.70	8.65	4.95	57.22
19	3.54	5.97	2.43	40.66	4.07	8.70	4.63	53.24
20	3.67	7.39	3.72	50.38	4.16	8.30	4.14	49.92
21	3.20	5.59	2.39	42.74	3.80	8.22	4.42	53.74
22	3.73	7.46	3.73	50.00	4.26	8.22	3.96	48.15
23	3.80	6.84	3.04	44.42	4.15	7.98	3.83	47.98
24	3.62	7.74	4.12	53.19	4.36	8.43	4.07	48.27
25	3.49	8.39	4.91	58.45	3.73	8.93	5.20	58.22
26	3.67	7.41	3.74	50.50	4.11	6.21	2.09	33.70
27	3.95	7.39	3.45	46.64	4.34	8.40	4.06	48.31
28	3.62	7.69	4.07	52.92	3.97	8.63	4.65	53.96
29	3.88	7.23	3.35	46.35	4.29	8.07	3.78	46.87
30	4.00	7.17	3.17	44.24	4.37	8.07	3.70	45.87
Average	3.34	6.84	3.50	51.19	4.08	8.00	3.92	48.99
Correlation Coefficients	0.70				0.72			

[1] The Penman-Monteith method

[2] Difference value = $ET_{c,SEBAL} - ET_{c,PM}$

[3] % Difference value = $100 - \frac{ET_{c,PM} \times 100}{ET_{c,SEBAL}}$

Appendix Table F3 (cont'd)

Weather Location No.	Jan 29, 02				Feb 5, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	5.19	7.79	2.60	33.37	6.23	9.35	3.12	33.37
2	4.67	7.81	3.13	40.14	5.61	9.37	3.76	40.14
3	4.43	7.49	3.06	40.87	5.32	8.99	3.68	40.87
4	-	Cloud	-	-	4.03	4.10	0.07	1.79
5	1.62	1.95	0.33	16.95	1.94	2.34	0.40	16.95
6	3.98	3.27	-0.71	-21.60	4.78	3.93	-0.85	-21.60
7	0.85	0.99	0.13	13.49	1.02	1.18	0.16	13.49
8	4.40	2.42	-1.98	-82.04	5.28	2.90	-2.38	-82.04
9	3.58	3.64	0.06	1.68	4.30	4.37	0.07	1.68
10	3.74	8.02	4.28	53.32	4.49	9.62	5.13	53.32
11	3.85	2.09	-1.77	-84.63	4.62	2.50	-2.12	-84.63
12	4.01	2.15	-1.86	-86.41	4.81	2.58	-2.23	-86.41
13	4.11	2.13	-1.98	-92.86	4.93	2.55	-2.37	-92.86
14	3.88	2.19	-1.68	-76.84	4.65	2.63	-2.02	-76.84
15	3.99	5.96	1.98	33.12	4.79	7.16	2.37	33.12
16	4.24	5.50	1.26	23.00	5.08	6.60	1.52	23.00
17	4.02	5.70	1.68	29.43	4.83	6.84	2.01	29.43
18	3.94	2.91	-1.03	-35.36	4.73	3.49	-1.23	-35.36
19	4.17	5.38	1.21	22.47	5.01	6.46	1.45	22.47
20	4.28	4.29	0.00	0.07	5.14	5.14	0.00	0.07
21	4.12	6.22	2.10	33.80	4.94	7.46	2.52	33.80
22	4.65	6.89	2.24	32.54	5.58	8.26	2.69	32.54
23	4.24	5.00	0.76	15.12	5.09	6.00	0.91	15.12
24	4.59	5.45	0.86	15.76	5.51	6.54	1.03	15.76
25	3.93	5.65	1.72	30.42	4.72	6.78	2.06	30.42
26	4.32	4.02	-0.31	-7.63	5.19	4.82	-0.37	-7.63
27	4.53	5.07	0.54	10.61	5.44	6.09	0.65	10.61
28	4.19	9.89	5.70	57.62	5.03	11.86	6.84	57.62
29	4.54	5.87	1.34	22.75	5.45	7.05	1.60	22.75
30	4.55	6.58	2.03	30.80	5.46	7.89	2.43	30.80
Average	4.02	4.91	0.89	18.05	4.80	5.83	1.03	17.67
Correlation Coefficients		0.63				0.56		

Appendix Table F3 (cont'd)

Weather Location No.	Feb 14, 02				Feb 23, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	6.11	6.03	-0.08	-1.33	6.31	4.53	-1.78	-39.33
2	5.26	6.34	1.08	17.03	5.70	5.61	-0.09	-1.68
3	5.28	6.82	1.53	22.52	5.71	5.45	-0.27	-4.90
4	5.29	7.07	1.78	25.18	-	Cloud	-	-
5	-	Cloud	-	-	-	Cloud	-	-
6	4.19	9.02	4.82	53.49	4.19	6.76	2.57	38.01
7	0.91	7.44	6.53	87.80	0.97	6.10	5.14	84.16
8	5.16	9.31	4.16	44.64	-	Cloud	-	-
9	4.07	8.76	4.69	53.56	4.40	8.86	4.45	50.29
10	4.21	6.32	2.10	33.31	4.51	4.81	0.30	6.15
11	4.15	10.21	6.06	59.32	4.36	7.84	3.47	44.31
12	4.30	8.72	4.42	50.69	4.51	4.89	0.37	7.65
13	4.80	8.32	3.52	42.29	5.13	7.76	2.63	33.93
14	4.42	9.65	5.23	54.24	4.73	7.11	2.38	33.44
15	-	Cloud	-	-	-	Cloud	-	-
16	4.57	7.68	3.11	40.52	4.78	6.14	1.37	22.26
17	4.22	9.42	5.20	55.22	4.46	5.68	1.22	21.45
18	4.13	9.84	5.71	58.03	4.41	7.33	2.91	39.77
19	4.47	7.63	3.15	41.37	4.64	7.54	2.90	38.43
20	4.49	7.50	3.01	40.16	4.70	5.97	1.27	21.32
21	4.73	9.32	4.59	49.23	-	Cloud	-	-
22	5.11	6.09	0.98	16.10	5.32	4.64	-0.68	-14.75
23	4.44	7.25	2.81	38.73	4.59	5.79	1.19	20.64
24	5.29	6.11	0.81	13.31	5.64	4.65	-0.99	-21.40
25	4.54	9.18	4.64	50.58	4.53	6.90	2.37	34.35
26	4.75	6.35	1.60	25.20	5.00	4.83	-0.17	-3.52
27	4.93	8.15	3.22	39.48	4.96	4.55	-0.41	-8.92
28	4.64	6.10	1.45	23.84	4.68	4.49	-0.20	-4.36
29	4.96	6.99	2.03	29.03	4.93	5.25	0.33	6.23
30	5.00	6.17	1.16	18.84	5.11	4.60	-0.51	-11.07
Average	4.59	7.78	3.19	41.02	4.73	5.92	1.19	20.11
Correlation Coefficients	0.58				0.75			

Appendix Table F3 (cont'd)

Weather Location No.	Mar 6, 02				Mar 21, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	6.65	5.98	-0.67	-11.20	7.51	7.00	-0.51	-7.26
2	6.00	5.71	-0.29	-5.07	6.24	5.04	-1.21	-23.91
3	5.78	5.41	-0.37	-6.89	6.24	6.14	-0.11	-1.77
4	-	Cloud	-	-	6.22	5.72	-0.50	-8.77
5	6.10	6.51	0.41	6.23	6.31	6.47	0.16	2.52
6	4.57	6.90	2.33	33.79	5.20	6.62	1.42	21.40
7	1.01	5.77	4.75	82.44	1.08	2.65	1.57	59.32
8	-	Cloud	-	-	5.91	7.00	1.09	15.52
9	4.15	8.60	4.46	51.78	3.89	3.38	-0.51	-15.10
10	4.23	4.65	0.42	9.06	3.96	5.99	2.03	33.87
11	4.05	7.33	3.28	44.76	3.73	3.93	0.20	5.04
12	4.19	5.73	1.54	26.84	3.91	5.99	2.08	34.70
13	4.92	6.78	1.86	27.40	4.61	6.06	1.44	23.82
14	4.48	6.73	2.25	33.43	4.21	6.86	2.65	38.61
15	4.65	6.63	1.98	29.91	4.42	7.00	2.58	36.81
16	4.56	5.71	1.15	20.18	4.42	6.90	2.48	35.90
17	4.10	5.77	1.67	28.99	-	Cloud	-	-
18	4.07	7.38	3.31	44.82	3.77	7.61	3.83	50.43
19	4.29	7.26	2.97	40.87	3.91	7.13	3.21	45.07
20	4.39	5.68	1.29	22.71	4.14	6.95	2.81	40.45
21	-	Cloud	-	-	5.06	6.96	1.90	27.23
22	5.08	5.70	0.62	10.85	4.85	6.95	2.10	30.24
23	5.29	4.74	-0.55	-11.58	6.12	5.99	-0.13	-2.22
24	5.40	5.67	0.27	4.72	4.91	6.99	2.08	29.80
25	3.99	6.97	2.98	42.70	3.75	6.01	2.26	37.58
26	5.47	4.83	-0.64	-13.29	5.95	4.88	-1.07	-21.92
27	5.39	4.69	-0.70	-15.03	6.04	4.69	-1.35	-28.81
28	5.02	4.51	-0.52	-11.50	5.62	4.80	-0.83	-17.22
29	5.33	5.13	-0.20	-3.92	6.08	5.75	-0.34	-5.87
30	5.23	5.72	0.49	8.50	5.58	5.96	0.38	6.39
Average	4.76	6.02	1.26	20.97	4.95	5.98	1.02	17.14
Correlation Coefficients		0.67				0.56		

Appendix Table F3 (cont'd)

Weather Location No.	Mar 31, 02				Apr 11, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	6.85	7.16	0.32	4.41	2.09	7.56	5.47	72.30
2	6.27	5.16	-1.12	-21.67	2.62	6.33	3.72	58.69
3	6.63	5.62	-1.01	-17.90	3.01	7.43	4.41	59.41
4	6.30	5.29	-1.01	-19.14	2.44	6.11	3.68	60.16
5	6.28	6.95	0.67	9.66	3.62	7.14	3.52	49.33
6	5.61	7.01	1.40	19.97	2.10	7.53	5.43	72.06
7	1.08	3.06	1.98	64.84	1.11	2.63	1.52	57.94
8	5.27	7.27	2.01	27.58	4.74	5.28	0.54	10.14
9	2.56	5.29	2.72	51.56	1.06	1.26	0.20	15.71
10	2.56	5.40	2.84	52.58	1.04	2.31	1.27	54.95
11	2.44	4.90	2.46	50.13	1.04	5.36	4.32	80.68
12	2.56	5.37	2.81	52.32	1.07	2.55	1.48	58.20
13	2.97	5.97	3.00	50.25	1.19	6.00	4.81	80.21
14	2.72	5.25	2.53	48.20	1.07	2.30	1.23	53.39
15	2.86	5.44	2.58	47.36	1.12	3.24	2.13	65.61
16	2.88	5.00	2.12	42.35	1.16	4.09	2.92	71.50
17	-	Cloud	-	-	1.03	3.18	2.15	67.68
18	2.47	5.15	2.68	51.98	1.04	2.93	1.90	64.68
19	2.53	4.99	2.46	49.23	1.01	5.18	4.17	80.55
20	2.71	5.99	3.28	54.80	1.10	2.04	0.95	46.29
21	4.67	4.37	-0.30	-6.97	2.98	4.28	1.30	30.29
22	3.17	5.27	2.10	39.91	1.28	3.33	2.05	61.71
23	6.32	7.28	0.96	13.14	2.92	7.31	4.39	60.09
24	3.17	3.32	0.15	4.52	1.19	2.40	1.20	50.24
25	2.41	5.96	3.55	59.54	1.01	3.30	2.29	69.38
26	6.47	7.96	1.49	18.68	2.06	6.17	4.11	66.62
27	5.69	6.86	1.17	17.07	4.68	6.30	1.61	25.61
28	5.45	5.64	0.20	3.47	4.50	5.36	0.86	15.99
29	5.77	6.02	0.25	4.14	4.71	5.04	0.34	6.69
30	5.37	6.98	1.61	23.02	5.13	6.17	1.05	16.94
Average	4.21	5.72	1.51	26.44	2.17	4.67	2.50	53.54
Correlation Coefficients		0.71				0.58		

Appendix Table F3 (cont'd)

Weather Location No.	Apr 26, 02				May 1, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	2.30	8.54	6.24	73.04	3.43	4.89	1.46	29.82
2	2.88	7.16	4.28	59.79	5.35	5.32	-0.03	-0.63
3	3.32	8.39	5.08	60.49	5.35	5.30	-0.04	-0.83
4	2.68	6.91	4.23	61.22	5.17	5.08	-0.09	-1.77
5	3.98	8.07	4.09	50.68	6.26	6.25	-0.02	-0.27
6	2.31	8.51	6.20	72.80	5.62	5.31	-0.31	-5.93
7	1.22	2.97	1.75	59.05	-	Cloud	-	-
8	5.22	5.97	0.75	12.53	3.04	5.72	2.68	46.84
9	1.16	1.42	0.25	17.94	5.57	6.49	0.92	14.24
10	1.14	2.61	1.46	56.14	6.51	6.53	0.01	0.20
11	1.14	6.06	4.92	81.19	4.36	4.89	0.52	10.70
12	1.17	2.88	1.71	59.31	5.29	4.99	-0.30	-5.96
13	1.31	6.78	5.47	80.74	6.73	5.44	-1.29	-23.65
14	1.18	2.60	1.42	54.63	5.49	4.81	-0.69	-14.26
15	1.23	3.67	2.44	66.52	3.56	6.18	2.61	42.33
16	1.28	4.62	3.34	72.26	5.27	6.11	0.84	13.68
17	1.13	3.60	2.46	68.54	4.29	4.75	0.46	9.74
18	1.14	3.31	2.17	65.62	6.31	5.62	-0.69	-12.28
19	1.11	5.85	4.74	81.07	5.40	5.31	-0.10	-1.81
20	1.21	2.31	1.10	47.72	3.20	6.47	3.28	50.61
21	3.28	4.84	1.55	32.14	4.93	4.41	-0.51	-11.59
22	1.91	3.76	1.85	49.17	3.42	4.90	1.48	30.25
23	3.21	8.26	5.05	61.15	4.51	5.35	0.84	15.73
24	1.31	2.71	1.40	51.56	2.49	5.12	2.63	51.35
25	1.11	3.73	2.62	70.20	3.05	5.13	2.08	40.53
26	2.27	6.97	4.71	67.50	4.86	4.73	-0.13	-2.80
27	5.15	7.12	1.96	27.59	3.13	4.99	1.87	37.37
28	4.95	6.06	1.10	18.22	3.00	4.93	1.93	39.20
29	5.18	5.70	0.52	9.17	3.06	5.11	2.05	40.11
30	5.64	6.98	1.34	19.14	2.99	4.88	1.89	38.68
Average	2.40	5.28	2.87	54.45	4.54	5.34	0.81	15.07
Correlation Coefficients		0.85				0.60		

Appendix Table F3 (cont'd)

Weather Location No.	May 5, 02				May 20, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	1.14	5.34	4.21	78.69	3.40	6.54	3.14	47.99
2	4.36	5.15	0.79	15.35	2.39	4.66	2.28	48.82
3	6.09	5.12	-0.97	-18.87	5.32	5.50	0.17	3.17
4	5.19	4.35	-0.84	-19.22	5.02	4.35	-0.67	-15.42
5	5.93	5.98	0.04	0.71	5.76	6.52	0.77	11.75
6	5.47	6.27	0.79	12.67	5.27	6.12	0.85	13.88
7	-	Cloud	-	-	0.91	5.60	4.69	83.75
8	0.92	4.69	3.77	80.44	-	Cloud	-	-
9	4.67	6.32	1.65	26.16	4.98	4.91	-0.07	-1.47
10	4.50	6.55	2.04	31.23	4.68	4.82	0.14	2.97
11	4.55	4.92	0.38	7.62	4.69	4.86	0.17	3.50
12	4.43	6.08	1.65	27.09	4.71	5.92	1.21	20.39
13	5.16	6.34	1.18	18.67	5.47	5.90	0.43	7.27
14	4.57	5.01	0.44	8.76	4.99	5.44	0.46	8.39
15	4.73	6.05	1.32	21.89	5.20	6.46	1.26	19.57
16	5.75	6.77	1.03	15.15	6.02	6.51	0.49	7.46
17	4.36	5.84	1.48	25.32	4.56	5.67	1.11	19.51
18	4.45	6.01	1.56	25.96	-	Cloud	-	-
19	4.62	5.04	0.41	8.17	-	Cloud	-	-
20	5.65	6.76	1.12	16.49	6.04	6.23	0.19	3.01
21	3.22	5.96	2.74	45.96	5.04	7.58	2.54	33.53
22	6.03	6.05	0.03	0.46	6.34	6.40	0.07	1.03
23	6.44	6.51	0.07	1.05	6.05	5.92	-0.13	-2.21
24	4.73	6.22	1.49	23.90	5.29	6.53	1.23	18.87
25	4.91	4.92	0.00	0.09	5.00	4.73	-0.27	-5.74
26	4.93	5.88	0.95	16.22	3.14	6.16	3.03	49.11
27	1.03	4.86	3.82	78.70	3.36	5.45	2.09	38.33
28	1.01	5.12	4.11	80.27	3.34	5.21	1.86	35.76
29	1.03	4.63	3.60	77.70	3.36	4.63	1.27	27.50
30	1.04	6.09	5.05	82.91	3.11	5.73	2.62	45.80
Average	4.17	5.68	1.51	26.64	4.57	5.72	1.14	20.03
Correlation Coefficients		0.57				0.78		

Appendix Table F3 (cont'd)

Weather Location No.	Jun 10, 02				Jul 20, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	2.31	7.20	4.89	67.92	2.64	6.20	3.56	57.37
2	0.96	4.72	3.76	79.73	2.78	4.99	2.21	44.37
3	2.77	5.37	2.60	48.46	2.51	4.89	2.38	48.73
4	-	Cloud	-	-	-	Cloud	-	-
5	2.49	6.06	3.58	58.98	3.57	5.47	1.91	34.84
6	4.77	5.21	0.44	8.45	3.90	5.42	1.51	27.92
7	0.91	5.50	4.60	83.54	0.75	4.89	4.14	84.60
8	-	Cloud	-	-	-	Cloud	-	-
9	4.43	5.05	0.62	12.26	3.53	5.39	1.87	34.61
10	4.19	5.12	0.93	18.09	-	Cloud	-	-
11	4.21	5.08	0.88	17.21	2.09	6.81	4.72	69.27
12	4.30	4.69	0.39	8.29	2.11	5.00	2.89	57.85
13	4.71	4.82	0.12	2.43	1.80	5.12	3.31	64.79
14	4.60	5.31	0.71	13.37	3.76	4.77	1.01	21.16
15	4.76	5.38	0.62	11.60	1.83	4.97	3.14	63.24
16	5.91	5.14	-0.78	-15.12	2.37	5.01	2.64	52.68
17	4.11	4.67	0.55	11.88	2.98	4.93	1.95	39.59
18	-	Cloud	-	-	2.99	5.44	2.45	45.07
19	-	Cloud	-	-	-	Cloud	-	-
20	3.92	5.23	1.32	25.15	-	Cloud	-	-
21	4.46	6.54	2.08	31.80	1.98	5.36	3.37	62.98
22	3.21	5.02	1.81	36.06	2.71	4.73	2.02	42.79
23	2.17	4.93	2.76	55.89	-	Cloud	-	-
24	2.84	5.35	2.51	46.97	-	Cloud	-	-
25	5.10	4.96	-0.14	-2.88	2.17	5.35	3.18	59.44
26	3.12	5.03	1.91	37.96	2.04	4.92	2.89	58.66
27	4.82	5.36	0.54	10.07	1.23	5.18	3.95	76.30
28	4.74	4.74	0.00	-0.01	1.15	5.00	3.85	77.07
29	-	Cloud	-	-	-	Cloud	-	-
30	4.91	4.64	-0.27	-5.82	-	Cloud	-	-
Average	3.79	5.25	1.46	27.77	2.42	5.23	2.81	53.69
Correlation Coefficients		0.71				0.84		

Appendix Table F3 (cont'd)

Weather Location No.	Sep 5, 02				Sep 21, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.74	5.42	0.68	12.56	2.75	5.16	2.41	46.76
2	4.66	5.91	1.25	21.23	1.94	4.59	2.65	57.78
3	4.64	4.33	-0.32	-7.31	2.74	4.13	1.40	33.80
4	3.35	5.43	2.08	38.30	2.53	4.06	1.53	37.62
5	4.64	5.71	1.07	18.70	1.88	5.19	3.31	63.77
6	4.05	5.62	1.57	27.94	2.24	4.24	2.00	47.22
7	0.76	4.50	3.73	83.02	0.67	4.34	3.67	84.55
8	-	Cloud	-	-	2.69	4.76	2.07	43.47
9	2.80	4.74	1.93	40.85	1.19	4.23	3.04	71.80
10	-	Cloud	-	-	-	Cloud	-	-
11	3.25	3.06	-0.19	-6.18	1.22	4.33	3.11	71.83
12	-	Cloud	-	-	-	Cloud	-	-
13	2.93	4.96	2.03	40.86	1.36	4.50	3.14	69.77
14	2.86	4.33	1.47	33.84	1.21	4.67	3.46	74.05
15	-	Cloud	-	-	-	Cloud	-	-
16	-	Cloud	-	-	-	Cloud	-	-
17	-	Cloud	-	-	-	Cloud	-	-
18	-	Cloud	-	-	-	Cloud	-	-
19	-	Cloud	-	-	-	Cloud	-	-
20	-	Cloud	-	-	-	Cloud	-	-
21	-	Cloud	-	-	-	Cloud	-	-
22	-	Cloud	-	-	-	Cloud	-	-
23	-	Cloud	-	-	-	Cloud	-	-
24	-	Cloud	-	-	-	Cloud	-	-
25	-	Cloud	-	-	-	Cloud	-	-
26	3.13	2.40	-0.72	-30.13	4.39	4.17	-0.22	-5.24
27	2.86	3.74	0.88	23.43	4.15	4.18	0.03	0.76
28	2.85	2.71	-0.14	-5.09	4.09	4.49	0.40	8.85
29	-	Cloud	-	-	4.14	4.23	0.09	2.08
30	-	Cloud	-	-	4.66	4.23	-0.44	-10.34
Average	3.40	4.49	1.09	24.38	2.58	4.44	1.86	41.92
Correlation Coefficients		0.93				0.78		

Appendix Table F3 (cont'd)

Weather Location No.	Oct 3, 02 PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	Oct 15, 02 PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	4.38	4.37	-0.01	-0.13	3.17	7.44	4.27	57.37
2	4.33	4.28	-0.05	-1.22	3.33	5.99	2.66	44.37
3	4.01	4.14	0.12	2.99	3.01	5.87	2.86	48.73
4	4.92	4.89	-0.03	-0.54	5.41	5.38	-0.03	-0.54
5	3.15	4.43	1.28	28.85	4.28	6.57	2.29	34.84
6	4.34	4.37	0.02	0.49	4.69	6.50	1.82	27.92
7	3.73	4.28	0.55	12.84	0.90	5.87	4.97	84.60
8	4.57	4.45	-0.12	-2.70	5.02	4.89	-0.13	-2.70
9	3.22	4.50	1.28	28.46	4.23	6.47	2.24	34.61
10	3.26	4.50	1.24	27.50	3.59	4.95	1.36	27.50
11	3.14	4.47	1.33	29.84	2.51	8.17	5.66	69.27
12	4.14	4.47	0.33	7.44	2.53	6.00	3.47	57.85
13	3.37	4.27	0.89	20.91	2.16	6.14	3.98	64.79
14	4.27	5.51	1.25	22.61	4.51	5.72	1.21	21.16
15	3.25	4.31	1.05	24.48	2.19	5.96	3.77	63.24
16	3.38	4.34	0.97	22.27	2.85	6.01	3.17	52.68
17	4.11	4.35	0.24	5.51	3.57	5.91	2.34	39.59
18	4.12	4.37	0.25	5.72	3.59	6.53	2.94	45.07
19	3.12	4.29	1.17	27.31	3.43	4.72	1.29	27.31
20	-	Cloud	-	-	-	Cloud	-	-
21	3.88	4.34	0.46	10.51	2.38	6.43	4.05	62.98
22	2.34	5.25	2.92	55.49	3.25	5.67	2.43	42.79
23	4.72	4.27	-0.45	-10.59	5.19	4.69	-0.50	-10.59
24	2.39	4.41	2.02	45.85	2.63	4.85	2.22	45.85
25	1.90	4.61	2.71	58.82	2.60	6.42	3.82	59.44
26	4.47	4.18	-0.30	-7.06	2.44	5.91	3.47	58.66
27	4.45	4.25	-0.20	-4.79	1.47	6.22	4.75	76.30
28	4.29	4.41	0.12	2.63	1.37	6.00	4.62	77.07
29	4.40	4.39	-0.01	-0.27	4.84	4.82	-0.01	-0.27
30	4.32	4.33	0.01	0.29	4.75	4.76	0.01	0.29
Average	3.79	4.45	0.66	14.76	3.31	5.89	2.59	43.88
Correlation Coefficients		0.60				0.60		

Appendix Table F3 (cont'd)

Weather Location No.	Oct 28, 02				Nov 3, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	3.56	4.77	1.20	25.24	3.37	6.10	2.73	44.82
2	3.13	4.43	1.30	29.33	3.23	5.21	1.98	37.97
3	3.37	4.13	0.76	18.39	3.19	5.00	1.81	36.19
4	3.72	4.48	0.75	16.77	4.57	4.93	0.36	7.32
5	2.52	4.81	2.29	47.69	3.40	5.69	2.29	40.27
6	3.29	4.30	1.01	23.52	3.99	5.40	1.41	26.17
7	2.20	4.31	2.11	48.93	1.55	5.09	3.54	69.51
8	3.63	4.60	0.97	21.17	4.33	4.75	0.42	8.88
9	2.21	4.36	2.16	49.48	3.22	5.42	2.20	40.60
10	1.63	2.25	0.62	27.50	2.61	3.60	0.99	27.50
11	2.18	4.40	2.22	50.51	2.34	6.29	3.94	62.70
12	2.07	2.24	0.17	7.44	2.30	4.12	1.82	44.16
13	2.37	4.38	2.01	45.99	2.26	5.26	3.00	56.96
14	2.74	5.09	2.35	46.19	3.63	5.41	1.78	32.95
15	1.63	2.15	0.53	24.48	1.91	4.06	2.15	52.96
16	1.69	2.17	0.48	22.27	2.27	4.09	1.83	44.61
17	2.06	2.18	0.12	5.51	2.81	4.04	1.23	30.41
18	2.06	2.18	0.12	5.72	2.82	4.36	1.53	35.21
19	1.56	2.15	0.59	27.31	2.49	3.43	0.94	27.31
20	-	Cloud	-	-	-	Cloud	-	-
21	1.94	2.17	0.23	10.51	2.16	4.30	2.14	49.73
22	1.17	2.63	1.46	55.49	2.21	4.15	1.94	46.81
23	2.36	2.13	-0.23	-10.59	3.78	3.41	-0.36	-10.59
24	1.19	2.20	1.01	45.85	1.91	3.53	1.62	45.85
25	0.95	2.31	1.36	58.82	1.78	4.36	2.59	59.28
26	4.43	4.17	-0.26	-6.15	3.44	5.04	1.60	31.83
27	4.30	4.22	-0.09	-2.04	2.89	5.22	2.33	44.65
28	4.19	4.45	0.26	5.77	2.78	5.22	2.44	46.71
29	4.27	4.31	0.04	0.88	4.55	4.57	0.01	0.27
30	4.49	4.28	-0.21	-4.96	4.62	4.52	-0.10	-2.19
Average	2.65	3.53	0.87	24.79	2.98	4.71	1.73	36.73
Correlation Coefficients		0.89				0.75		

Appendix Table F3 (cont'd)

Weather Location No.	Nov 13, 02				Nov 25, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	-	Cloud	-	-	-	Cloud	-	-
2	3.30	4.83	1.53	31.73	-	Cloud	-	-
3	-	Cloud	-	-	5.64	4.23	-1.41	-33.32
4	3.92	4.59	0.67	14.63	-	Cloud	-	-
5	-	Cloud	-	-	-	Cloud	-	-
6	3.74	5.08	1.34	26.31	5.22	4.75	-0.48	-10.01
7	0.73	4.36	3.63	83.33	-	Cloud	-	-
8	0.59	6.36	5.77	90.68	3.49	4.68	1.20	25.57
9	-	Cloud	-	-	-	Cloud	-	-
10	-	Cloud	-	-	-	Cloud	-	-
11	1.62	4.79	3.16	66.09	1.91	4.26	2.35	55.19
12	1.67	4.83	3.16	65.37	1.91	5.05	3.14	62.22
13	-	Cloud	-	-	-	Cloud	-	-
14	-	Cloud	-	-	-	Cloud	-	-
15	-	Cloud	-	-	-	Cloud	-	-
16	-	Cloud	-	-	-	Cloud	-	-
17	1.76	4.95	3.19	64.45	1.99	4.39	2.40	54.72
18	1.67	5.97	4.29	71.98	1.92	4.45	2.53	56.83
19	1.75	5.08	3.34	65.66	2.06	4.47	2.41	53.90
20	3.48	5.80	2.31	39.88	2.72	4.36	1.64	37.57
21	-	Cloud	-	-	-	Cloud	-	-
22	3.20	4.83	1.63	33.76	2.56	4.64	2.08	44.84
23	3.85	4.96	1.11	22.30	3.17	4.52	1.35	29.83
24	1.88	4.77	2.89	60.64	2.73	4.31	1.57	36.52
25	3.25	5.04	1.79	35.51	2.77	4.53	1.75	38.77
26	2.91	4.72	1.81	38.38	1.69	4.21	2.52	59.87
27	0.68	4.84	4.15	85.87	0.59	4.32	3.73	86.35
28	0.63	4.78	4.15	86.83	0.54	4.26	3.71	87.24
29	0.67	5.60	4.93	88.01	0.58	4.11	3.54	86.01
30	0.67	4.86	4.18	86.14	0.56	4.37	3.81	87.23
Average	2.10	5.05	2.95	58.44	2.34	4.44	2.10	47.37
Correlation Coefficients		0.68				0.74		

Appendix Table F3 (cont'd)

Weather Location No.	Dec 4, 02			
	PM [1] (mm)	MODIS (mm)	D [2] (mm)	% D [3] (%)
1	2.01	5.99	3.97	66.37
2	-	Cloud	-	-
3	2.68	4.02	1.35	33.50
4	-	Cloud	-	-
5	-	Cloud	-	-
6	2.93	4.89	1.96	40.08
7	-	Cloud	-	-
8	1.37	4.00	2.63	65.81
9	2.64	4.44	1.80	40.55
10	2.74	4.16	1.42	34.14
11	1.98	4.57	2.58	56.54
12	1.96	4.82	2.86	59.27
13	1.70	4.81	3.11	64.66
14	1.67	4.39	2.72	61.99
15	1.56	4.35	2.78	64.04
16	2.23	5.68	3.45	60.74
17	1.03	4.45	3.43	76.94
18	1.98	4.76	2.77	58.28
19	1.15	5.00	3.86	77.07
20	1.35	4.69	3.34	71.26
21	1.66	4.71	3.05	64.66
22	1.31	4.32	3.01	69.66
23	1.72	4.65	2.93	62.95
24	1.79	4.76	2.97	62.43
25	0.74	4.07	3.33	81.80
26	0.42	4.05	3.64	89.72
27	2.12	4.52	2.39	52.97
28	1.93	4.77	2.83	59.46
29	2.05	4.58	2.53	55.27
30	1.85	4.56	2.72	59.51
Average	1.79	4.62	2.82	61.19
Correlation Coefficients	0.76			

Appendix Table F4 Monthly rainfall from TRMM image and from rain gauge station and their correlation coefficients

January									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	0.00	0.00	0.00	-	26	3.73	0.00	3.73	-
2	0.18	0.00	0.18	-	27	0.52	0.00	0.52	-
3	0.00	0.00	0.00	-	28	2.12	6.42	-4.30	66.92
4	0.00	0.00	0.00	-	29	1.74	0.00	1.74	-
5	0.00	0.00	0.00	-	30	0.00	0.00	0.00	-
6	0.00	0.00	0.00	-	31	0.00	0.00	0.00	-
7	0.00	0.00	0.00	-	32	5.05	5.50	-0.45	8.09
8	0.00	0.00	0.00	-	33	2.03	5.50	-3.47	63.02
9	0.00	0.00	0.00	-	34	8.42	0.80	7.62	-952.85
10	0.00	0.00	0.00	-	35	0.79	1.00	-0.21	20.86
11	0.00	0.00	0.00	-	36	2.86	6.50	-3.64	55.94
12	0.00	0.00	0.00	-	37	1.21	0.60	0.61	-101.28
13	0.88	0.00	0.88	-	38	1.24	0.00	1.24	-
14	1.12	1.00	0.12	-11.54	39	1.44	2.50	-1.06	42.38
15	0.00	0.00	0.00	-	40	4.48	5.80	-1.32	22.70
16	0.00	0.00	0.00	-	41	0.00	5.80	-5.80	100.00
17	0.30	0.70	-0.40	57.14	42	0.00	0.00	0.00	-
18	3.83	1.00	2.83	-283.40	43	0.06	0.00	0.06	-
19	2.79	0.00	2.79	-	44	6.76	8.40	-1.64	19.49
20	0.09	0.00	0.09	-	45	0.30	0.00	0.30	-
21	0.00	0.00	0.00	-	46	0.06	0.00	0.06	-
22	0.00	0.00	0.00	-	47	0.00	0.00	0.00	-
23	0.00	0.00	0.00	-	48	0.00	0.00	0.00	-
24	0.00	0.00	0.00	-	49	0.00	0.00	0.00	-
25	1.86	0.00	1.86	-	50	0.00	3.50	-3.50	-

[1] Rain gauge station

[2] Difference value = $\text{Rainfall}_{\text{TRMM}} - \text{Rainfall}_{\text{rain gauge station}}$

[3] % Difference value = $100 - \dfrac{Ra\inf all_{RainGaugeStation} \times 100}{Ra\inf all_{TRMM}}$

Appendix Table F4 (cont'd)

January									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	5.85	7.80	-1.95	24.99	76	4.37	6.50	-2.13	32.82
52	0.06	2.80	-2.74	97.86	77	8.06	12.10	-4.04	33.39
53	0.00	0.00	0.00	-	78	13.60	12.10	1.50	-12.36
54	0.00	0.00	0.00	-	79	11.16	12.10	-0.94	7.75
55	9.10	10.90	-1.80	16.53	80	0.00	0.00	0.00	-
56	11.90	11.30	0.60	-5.30	81	3.29	7.40	-4.11	55.53
57	8.26	7.80	0.46	-5.92	82	3.72	6.50	-2.78	42.78
58	6.50	5.20	1.30	-25.05	83	0.06	0.00	0.06	-
59	0.00	0.00	0.00	-	84	7.14	8.00	-0.86	10.80
60	0.00	0.00	0.00	-	85	8.63	6.50	2.13	-32.83
61	9.90	10.90	-1.00	9.18	86	0.54	0.00	0.54	-
62	13.04	13.50	-0.46	3.44	87	3.12	1.00	2.12	-211.80
63	13.83	13.50	0.33	-2.41	88	1.74	0.00	1.74	-
64	14.49	14.00	0.49	-3.47	89	9.31	9.80	-0.49	4.96
65	12.92	7.90	5.02	-63.54	90	8.26	8.10	0.16	-1.97
66	10.02	7.90	2.12	-26.89	91	8.17	8.10	0.07	-0.86
67	10.29	0.00	10.29	-	92	13.43	9.80	3.63	-37.07
68	12.23	17.70	-5.47	30.93	93	0.00	0.00	0.00	-
69	12.78	14.90	-2.12	14.20	94	12.70	9.80	2.90	-29.56
70	15.59	14.90	0.69	-4.63	95	16.59	16.60	-0.01	0.07
71	17.99	13.50	4.49	-33.27	96	14.97	16.60	-1.63	9.84
72	8.37	12.10	-3.73	30.81	97	17.21	8.20	9.01	-109.83
73	8.01	14.90	-6.89	46.26	98	4.11	0.00	4.11	-
74	16.72	13.50	3.22	-23.87	99	13.08	8.20	4.88	-59.51
75	4.54	0.00	4.54	-	100	7.00	13.70	-6.70	48.94
All average	TRMM	4.67							
	RG [1]	4.51							
	D [2]	0.15							
	% D [3]	-3.41							
Correlation Coefficient						0.87			

Appendix Table F4 (cont'd)

February									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	5.32	4.00	1.32	-33.11	26	0.06	1.50	-1.44	96.00
2	0.18	0.00	0.18	-	27	0.96	0.00	0.96	-
3	3.76	0.00	3.76	-	28	3.22	1.52	1.70	-111.43
4	0.00	0.00	0.00	-	29	3.60	0.90	2.70	-300.12
5	1.02	0.00	1.02	-	30	2.73	3.70	-0.97	26.16
6	0.66	0.00	0.66	-	31	1.69	3.70	-2.01	54.25
7	10.48	0.00	10.48	-	32	2.52	0.00	2.52	-
8	4.49	0.00	4.49	-	33	2.94	0.00	2.94	-
9	3.50	0.00	3.50	-	34	4.33	0.00	4.33	-
10	3.63	5.20	-1.57	30.15	35	0.00	0.00	0.00	-
11	0.00	0.00	0.00	-	36	0.78	0.00	0.78	-
12	8.28	1.20	7.08	-590.06	37	4.74	0.00	4.74	-
13	1.34	0.00	1.34	-	38	0.00	0.00	0.00	-
14	4.25	0.00	4.25	-	39	7.09	0.00	7.09	-
15	5.09	0.00	5.09	-	40	15.55	2.90	12.65	-436.13
16	3.06	1.20	1.86	-155.35	41	33.90	2.90	31.00	-1068.94
17	0.84	0.00	0.84	-	42	0.00	0.00	0.00	-
18	0.00	0.00	0.00	-	43	0.00	0.00	0.00	-
19	0.00	0.00	0.00	-	44	4.86	2.90	1.96	-67.60
20	4.56	0.00	4.56	-	45	5.97	0.00	5.97	-
21	5.86	0.00	5.86	-	46	0.00	0.00	0.00	-
22	1.78	0.00	1.78	-	47	0.06	0.40	-0.34	85.00
23	2.01	0.00	2.01	-	48	10.10	2.60	7.50	-288.47
24	2.52	0.00	2.52	-	49	0.00	0.00	0.00	-
25	0.80	1.50	-0.70	46.78	50	8.79	2.30	6.49	-282.20

Appendix Table F4 (cont'd)

February									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	3.80	0.00	3.80	-	76	8.37	6.50	1.87	-28.71
52	4.00	2.60	1.40	-53.77	77	3.06	5.90	-2.84	48.13
53	12.21	2.60	9.61	-369.73	78	0.18	0.60	-0.42	70.00
54	0.00	0.00	0.00	-	79	0.36	0.20	0.16	-80.00
55	0.21	0.00	0.21	-	80	10.26	4.50	5.76	-128.00
56	1.87	1.00	0.87	-86.60	81	9.16	5.30	3.86	-72.88
57	2.66	0.00	2.66	-	82	11.70	11.80	-0.10	0.84
58	3.49	0.00	3.49	-	83	8.78	9.20	-0.42	4.62
59	5.09	0.00	5.09	-	84	1.62	1.10	0.52	-47.15
60	7.32	0.00	7.32	-	85	0.00	0.00	0.00	-
61	0.42	0.00	0.42	-	86	9.87	9.90	-0.03	0.30
62	0.61	1.00	-0.39	39.44	87	10.04	9.90	0.14	-1.41
63	1.48	0.00	1.48	-	88	9.09	17.20	-8.11	47.15
64	2.05	0.00	2.05	-	89	4.76	2.70	2.06	-76.32
65	0.36	0.50	-0.14	28.00	90	1.05	1.10	-0.05	4.91
66	5.14	0.50	4.64	-927.42	91	0.00	0.00	0.00	-
67	2.21	0.00	2.21	-	92	8.10	13.50	-5.40	40.00
68	0.00	0.00	0.00	-	93	4.80	5.10	-0.30	5.88
69	0.90	1.40	-0.50	35.71	94	15.77	13.50	2.27	-16.82
70	0.96	1.40	-0.44	31.43	95	6.48	6.50	-0.02	0.31
71	3.37	0.20	3.17	-1583.50	96	9.00	6.50	2.50	-38.46
72	1.05	0.00	1.05	-	97	15.83	6.50	9.33	-143.50
73	0.12	0.00	0.12	-	98	16.62	16.60	0.02	-0.12
74	0.18	0.20	-0.02	10.00	99	21.00	25.50	-4.50	17.64
75	9.61	10.70	-1.09	10.18	100	0.00	0.00	0.00	-
All average	TRMM	4.42							
	RG [1]	2.40							
	D [2]	2.02							
	% D [3]	-84.20							
Correlation Coefficient						0.63			

Appendix Table F4 (cont'd)

March									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	40.08	23.30	16.78	-72.02	26	48.03	34.60	13.43	-38.81
2	51.98	25.00	26.98	-107.92	27	10.98	18.40	-7.42	40.33
3	53.45	26.70	26.75	-100.19	28	37.43	36.78	0.65	-1.77
4	7.50	4.50	3.00	-66.67	29	58.03	78.21	-20.17	25.80
5	9.00	12.00	-3.00	25.00	30	66.72	94.40	-27.68	29.32
6	23.04	21.00	2.04	-9.71	31	48.34	22.30	26.04	-116.77
7	27.84	31.70	-3.86	12.18	32	10.68	11.70	-1.02	8.72
8	42.18	50.20	-8.02	15.98	33	4.00	11.90	8.10	-69.71
9	43.26	50.20	-6.94	13.82	34	70.34	57.70	12.64	-21.91
10	37.32	21.70	15.62	-71.98	35	1.86	0.00	1.86	-
11	9.30	14.50	-5.20	35.86	36	0.54	0.70	-0.16	22.86
12	44.35	33.60	10.75	-32.00	37	68.08	57.70	10.38	-17.99
13	66.84	41.30	25.54	-61.83	38	0.36	0.00	0.36	-
14	35.18	39.30	-4.12	10.49	39	45.23	22.50	22.73	-101.04
15	17.88	4.90	12.98	-264.90	40	75.06	66.70	8.36	-12.53
16	46.87	32.90	13.97	-42.46	41	66.32	66.70	-0.38	0.57
17	56.34	31.00	25.34	-81.73	42	0.12	0.00	0.12	-
18	63.79	41.30	22.49	-54.45	43	1.08	1.20	-0.12	10.00
19	33.91	34.60	-0.69	1.98	44	83.15	66.70	16.45	-24.66
20	5.88	4.90	0.98	-20.00	45	92.26	62.90	29.36	-46.68
21	18.60	24.10	-5.50	22.82	46	9.75	1.80	7.95	-441.77
22	54.61	32.90	21.71	-65.98	47	0.54	1.20	-0.66	55.00
23	53.52	7.20	46.32	-643.30	48	0.11	2.10	2.01	200.84
24	33.75	10.70	23.05	-215.40	49	11.21	2.10	9.11	-433.77
25	50.42	34.60	15.82	-45.73	50	14.56	10.20	4.36	-42.73

Appendix Table F4 (cont'd)

March									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	84.33	75.30	9.03	-11.99	76	19.05	21.00	-1.95	9.27
52	83.88	15.50	68.38	-441.18	77	22.83	18.40	4.43	-24.10
53	82.12	11.60	70.52	-607.92	78	15.66	15.40	0.26	-1.69
54	9.80	10.20	-0.40	3.94	79	21.43	15.40	6.03	-39.16
55	39.87	73.40	-33.53	45.68	80	4.28	0.80	3.48	-434.96
56	47.11	39.00	8.11	-20.79	81	1.92	0.50	1.42	-284.00
57	70.74	62.80	7.94	-12.64	82	3.00	5.20	-2.20	42.31
58	75.20	75.30	-0.10	0.13	83	13.09	18.40	-5.31	28.85
59	81.34	15.50	65.84	-424.80	84	24.81	25.30	-0.49	1.93
60	65.83	16.00	49.83	-311.44	85	20.01	21.20	-1.19	5.63
61	35.73	15.30	20.43	-133.50	86	3.51	1.40	2.11	-150.45
62	29.52	21.60	7.92	-36.67	87	3.60	2.00	1.60	-80.00
63	30.48	21.60	8.88	-41.11	88	2.10	0.00	2.10	-
64	42.32	21.60	20.72	-95.92	89	12.03	7.60	4.43	-58.24
65	48.38	27.40	20.98	-76.56	90	23.57	24.60	-1.03	4.18
66	54.91	27.40	27.51	-100.41	91	19.11	21.20	-2.09	9.88
67	34.34	21.00	13.34	-63.54	92	2.70	0.80	1.90	-237.50
68	12.54	12.80	-0.26	2.03	93	1.98	1.20	0.78	-64.62
69	22.76	27.10	-4.34	16.01	94	6.21	11.90	-5.69	47.81
70	26.44	27.10	-0.66	2.43	95	5.64	5.40	0.24	-4.44
71	29.90	27.10	2.80	-10.33	96	6.95	6.40	0.55	-8.62
72	16.38	16.00	0.38	-2.38	97	7.72	6.40	1.32	-20.67
73	20.91	14.70	6.21	-42.25	98	1.24	1.20	0.04	-3.43
74	24.01	22.30	1.71	-7.66	99	8.16	9.60	-1.44	14.98
75	5.58	0.80	4.78	-597.50	100	1.82	0.00	1.82	-
All average	TRMM	32.08							
	RG [1]	23.22							
	D [2]	8.86							
	% D [3]	-38.16							
Correlation Coefficient						0.73			

Appendix Table F4 (cont'd)

April									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	46.34	33.40	12.94	-38.73	26	101.31	102.70	-1.39	1.35
2	40.51	34.90	5.61	-16.08	27	65.28	55.30	9.98	-18.05
3	71.95	27.60	44.35	-160.70	28	118.74	72.66	46.08	-63.42
4	54.99	33.40	21.59	-64.64	29	133.99	72.66	61.33	-84.41
5	47.19	18.60	28.59	-153.74	30	150.44	150.44	0.00	0.00
6	43.17	33.40	9.77	-29.26	31	139.16	150.44	-11.28	7.50
7	97.04	5.50	91.54	-1664.38	32	82.97	28.60	54.37	-190.12
8	96.47	81.80	14.67	-17.93	33	110.42	10.30	100.12	-972.00
9	89.37	74.50	14.87	-19.96	34	88.91	74.10	14.81	-19.99
10	73.46	50.70	22.76	-44.88	35	57.06	57.80	-0.74	1.28
11	35.40	33.40	2.00	-5.99	36	27.06	29.80	-2.74	9.19
12	127.12	126.80	0.32	-0.25	37	110.94	69.60	41.34	-59.39
13	97.76	92.90	4.86	-5.23	38	37.62	53.60	-15.98	29.81
14	87.92	61.20	26.72	-43.67	39	95.25	69.60	25.65	-36.85
15	25.98	46.80	-20.82	44.49	40	61.99	57.80	4.19	-7.26
16	153.17	126.80	26.37	-20.80	41	64.46	57.80	6.66	-11.53
17	114.23	114.30	-0.07	0.06	42	12.90	12.10	0.80	-6.61
18	108.48	92.90	15.58	-16.77	43	16.14	16.80	-0.66	3.93
19	86.71	90.70	-3.99	4.40	44	66.46	53.60	12.86	-23.98
20	127.09	84.80	42.29	-49.87	45	77.23	16.80	60.43	-359.71
21	147.98	84.80	63.18	-74.50	46	18.42	21.50	-3.08	14.33
22	128.49	126.80	1.69	-1.33	47	18.12	21.50	-3.38	15.72
23	124.02	75.90	48.12	-63.40	48	87.65	14.50	73.15	-504.52
24	172.50	102.70	69.80	-67.96	49	6.18	3.10	3.08	-99.35
25	106.65	102.70	3.95	-3.85	50	33.63	50.40	-16.77	33.28

Appendix Table F4 (cont'd)

April									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	64.44	44.20	20.24	-45.80	76.00	25.13	25.80	-0.67	2.61
52	72.57	59.40	13.17	-22.17	77.00	40.51	55.30	-14.79	26.74
53	80.18	59.40	20.78	-34.98	78.00	28.23	25.90	2.33	-8.99
54	3.36	11.20	-7.84	70.00	79.00	36.96	36.90	0.06	-0.17
55	26.72	14.20	12.52	-88.16	80.00	12.50	25.80	-13.30	51.55
56	47.18	81.60	-34.42	42.18	81.00	17.86	10.10	7.76	-76.80
57	58.35	17.20	41.15	-239.24	82.00	19.75	19.50	0.25	-1.29
58	64.20	27.70	36.50	-131.76	83.00	33.49	33.00	0.49	-1.49
59	68.81	59.40	9.41	-15.83	84.00	30.02	30.30	-0.28	0.93
60	72.82	72.00	0.82	-1.14	85.00	34.65	27.30	7.35	-26.92
61	23.56	64.80	-41.24	63.64	86.00	15.23	11.20	4.03	-36.01
62	30.50	25.30	5.20	-20.55	87.00	16.21	13.30	2.91	-21.86
63	37.39	25.30	12.09	-47.79	88.00	23.99	26.00	-2.01	7.74
64	60.54	27.70	32.84	-118.57	89.00	31.64	44.30	-12.66	28.57
65	67.51	77.50	-9.99	12.89	90.00	32.95	27.30	5.65	-20.69
66	69.00	77.50	-8.50	10.96	91.00	36.65	38.80	-2.15	5.55
67	60.37	64.80	-4.43	6.84	92.00	31.49	34.90	-3.41	9.76
68	53.48	55.90	-2.42	4.34	93.00	18.97	13.30	5.67	-42.60
69	36.81	36.90	-0.09	0.24	94.00	39.43	34.90	4.53	-12.98
70	60.32	36.90	23.42	-63.46	95.00	47.30	38.80	8.50	-21.91
71	65.09	36.90	28.19	-76.40	96.00	45.55	34.90	10.65	-30.52
72	22.80	16.30	6.50	-39.87	97.00	57.98	68.20	-10.22	14.98
73	21.13	26.50	-5.37	20.27	98.00	17.13	32.20	-15.07	46.81
74	55.59	36.90	18.69	-50.66	99.00	61.61	68.20	-6.59	9.67
75	23.10	25.80	-2.70	10.45	100.00	20.49	36.90	-16.41	44.48
All average	TRMM	61.08							
	RG [1]	49.75							
	D [2]	11.33							
	% D [3]	-22.77							
Correlation Coefficient						0.78			

Appendix Table F4 (cont'd)

May									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	186.94	135.10	51.84	-38.37	26	188.11	176.90	11.21	-6.34
2	177.14	177.50	-0.36	0.20	27	407.49	230.50	176.99	-76.79
3	168.11	179.30	-11.20	6.24	28	422.10	396.82	25.28	-6.37
4	156.23	179.30	-23.07	12.87	29	352.04	173.53	178.51	-102.87
5	170.08	190.30	-20.22	10.63	30	314.86	176.90	137.96	-77.99
6	165.94	140.80	25.14	-17.85	31	264.39	176.90	87.49	-49.45
7	289.31	125.00	164.31	-131.44	32	392.41	151.10	241.31	-159.70
8	211.50	214.80	-3.30	1.54	33	348.22	133.70	214.52	-160.45
9	181.83	184.60	-2.77	1.50	34	208.10	192.50	15.60	-8.10
10	168.75	149.00	19.75	-13.25	35	349.73	158.50	191.23	-120.65
11	161.78	140.80	20.98	-14.90	36	352.29	375.60	-23.32	6.21
12	269.28	168.20	101.08	-60.09	37	326.51	149.70	176.81	-118.11
13	196.11	182.90	13.21	-7.22	38	383.83	158.50	225.33	-142.16
14	169.00	161.30	7.70	-4.77	39	308.99	199.60	109.39	-54.81
15	535.27	518.30	16.97	-3.27	40	128.58	123.50	5.08	-4.11
16	330.75	293.60	37.15	-12.65	41	140.73	123.50	17.23	-13.95
17	220.10	195.60	24.50	-12.52	42	433.52	174.40	259.12	-148.58
18	190.98	161.30	29.68	-18.40	43	451.11	174.40	276.71	-158.66
19	174.92	132.90	42.02	-31.62	44	154.73	101.40	53.33	-52.59
20	432.35	434.20	-1.85	0.43	45	160.69	145.40	15.29	-10.52
21	547.69	434.20	113.49	-26.14	46	404.33	145.40	258.93	-178.08
22	415.47	125.40	290.07	-231.32	47	478.92	145.40	333.52	-229.38
23	335.52	109.60	225.92	-206.13	48	182.32	145.40	36.92	-25.39
24	251.68	176.90	74.78	-42.27	49	351.61	145.40	206.21	-141.82
25	217.16	176.90	40.26	-22.76	50	387.87	201.10	186.77	-92.88

Appendix Table F4 (cont'd)

May									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	160.06	173.50	-13.44	7.74	76	239.44	235.80	3.64	-1.54
52	182.37	126.60	55.77	-44.05	77	245.75	230.50	15.25	-6.62
53	198.77	106.80	91.97	-86.11	78	278.80	252.90	25.90	-10.24
54	436.00	181.90	254.10	-139.69	79	312.41	354.10	-41.69	11.77
55	148.95	159.20	-10.25	6.44	80	235.05	217.70	17.35	-7.97
56	147.37	137.20	10.17	-7.41	81	228.28	217.70	10.58	-4.86
57	169.89	163.60	6.29	-3.84	82	230.86	217.00	13.86	-6.39
58	173.75	173.50	0.25	-0.14	83	234.37	230.50	3.87	-1.68
59	190.43	126.60	63.83	-50.42	84	300.21	357.40	-57.19	16.00
60	233.29	181.90	51.39	-28.25	85	321.63	354.10	-32.47	9.17
61	157.52	188.10	-30.58	16.26	86	228.25	221.80	6.45	-2.91
62	157.28	137.20	20.08	-14.64	87	229.99	226.50	3.49	-1.54
63	160.72	163.60	-2.88	1.76	88	229.31	272.60	-43.30	15.88
64	170.74	173.50	-2.76	1.59	89	255.28	243.80	11.48	-4.71
65	181.87	175.00	6.87	-3.92	90	345.24	350.40	-5.16	1.47
66	207.20	114.30	92.90	-81.28	91	345.68	350.40	-4.72	1.35
67	268.50	250.00	18.50	-7.40	92	253.40	243.80	9.60	-3.94
68	232.73	241.30	-8.57	3.55	93	264.25	269.70	-5.45	2.02
69	188.18	191.00	-2.82	1.48	94	262.23	269.20	-6.97	2.59
70	211.56	218.30	-6.74	3.09	95	284.96	301.30	-16.34	5.42
71	218.78	218.30	0.48	-0.22	96	277.53	269.20	8.33	-3.09
72	217.41	208.30	9.11	-4.37	97	291.44	290.40	1.04	-0.36
73	216.38	193.50	22.88	-11.82	98	272.05	269.70	2.35	-0.87
74	228.45	224.20	4.25	-1.89	99	297.75	290.40	7.35	-2.53
75	221.33	205.20	16.13	-7.86	100	273.73	249.70	24.03	-9.62
All average	TRMM	260.35							
	RG [1]	207.83							
	D [2]	52.52							
	% D [3]	-25.27							
Correlation Coefficient						0.49			

Appendix Table F4 (cont'd)

June									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	117.65	156.10	-38.45	24.63	26	105.65	105.60	0.05	-0.04
2	114.44	131.70	-17.26	13.11	27	171.18	76.00	95.18	-125.23
3	90.73	92.70	-1.97	2.13	28	147.07	148.37	-1.30	0.88
4	87.64	92.70	-5.06	5.46	29	151.17	148.37	2.80	-1.89
5	93.93	85.20	8.73	-10.25	30	146.74	141.60	5.14	-3.63
6	96.05	155.40	-59.35	38.19	31	126.26	121.80	4.46	-3.66
7	86.13	115.40	-29.27	25.37	32	169.99	164.90	5.09	-3.08
8	83.72	92.70	-8.98	9.69	33	157.56	177.40	-19.84	11.18
9	76.17	92.70	-16.53	17.83	34	130.50	126.70	3.80	-3.00
10	78.87	91.40	-12.53	13.71	35	231.19	264.90	-33.71	12.72
11	84.72	81.80	2.92	-3.57	36	232.43	249.60	-17.17	6.88
12	70.34	63.50	6.84	-10.77	37	154.44	141.20	13.24	-9.38
13	84.50	103.40	-18.90	18.28	38	242.31	264.90	-22.59	8.53
14	87.22	85.00	2.22	-2.62	39	158.11	141.20	16.91	-11.98
15	171.94	125.90	46.04	-36.56	40	103.95	91.30	12.65	-13.85
16	95.29	103.70	-8.41	8.11	41	90.61	168.80	-78.19	46.32
17	89.26	103.40	-14.14	13.67	42	362.97	250.80	112.17	-44.73
18	88.16	89.20	-1.04	1.16	43	401.49	250.80	150.69	-60.08
19	93.82	89.20	4.62	-5.18	44	171.81	177.30	-5.49	3.10
20	185.33	125.90	59.43	-47.20	45	144.09	144.40	-0.31	0.21
21	162.26	186.50	-24.25	13.00	46	397.57	245.50	152.07	-61.94
22	134.53	82.40	52.13	-63.27	47	464.41	245.50	218.91	-89.17
23	102.70	94.00	8.70	-9.26	48	129.20	137.40	-8.20	5.97
24	92.66	82.20	10.46	-12.73	49	431.29	270.10	161.19	-59.68
25	99.88	105.60	-5.72	5.42	50	239.57	261.40	-21.83	8.35

Appendix Table F4 (cont'd)

June									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	185.78	161.70	24.08	-14.89	76	111.05	107.00	4.05	-3.78
52	175.01	171.10	3.91	-2.28	77	73.56	71.00	2.56	-3.60
53	143.41	151.30	-7.89	5.22	78	88.33	103.00	-14.67	14.25
54	323.07	273.90	49.17	-17.95	79	107.96	111.60	-3.65	3.27
55	122.80	11.70	111.10	-949.55	80	136.23	107.00	29.23	-27.32
56	152.82	116.10	36.72	-31.63	81	113.32	121.60	-8.28	6.81
57	165.67	156.70	8.97	-5.73	82	110.41	94.00	16.41	-17.45
58	170.08	147.00	23.08	-15.70	83	92.34	94.00	-1.66	1.77
59	175.64	171.10	4.54	-2.65	84	90.88	73.80	17.08	-23.14
60	152.69	152.70	-0.01	0.00	85	111.56	111.60	-0.04	0.03
61	90.24	64.40	25.84	-40.12	86	138.92	123.80	15.12	-12.21
62	109.58	116.10	-6.52	5.61	87	128.78	123.80	4.98	-4.02
63	118.18	116.10	2.08	-1.79	88	96.41	97.80	-1.39	1.42
64	132.24	127.50	4.74	-3.72	89	91.28	105.80	-14.52	13.72
65	144.72	171.10	-26.38	15.42	90	101.35	124.20	-22.85	18.40
66	168.39	171.10	-2.71	1.59	91	107.23	124.20	-16.97	13.66
67	48.57	64.40	-15.83	24.58	92	113.23	122.80	-9.57	7.79
68	49.48	64.40	-14.92	23.17	93	188.62	184.50	4.12	-2.23
69	98.17	158.80	-60.63	38.18	94	132.64	122.80	9.84	-8.02
70	113.13	158.80	-45.67	28.76	95	118.23	129.30	-11.07	8.56
71	125.30	49.70	75.60	-152.11	96	117.04	143.00	-25.96	18.16
72	69.52	67.70	1.82	-2.69	97	117.73	129.30	-11.57	8.95
73	74.21	71.60	2.61	-3.65	98	206.46	150.60	55.86	-37.09
74	114.32	111.60	2.72	-2.44	99	129.46	129.30	0.16	-0.12
75	109.34	107.00	2.34	-2.19	100	198.92	108.40	90.52	-83.50
All average	TRMM	141.84							
	RG [1]	131.91							
	D [2]	9.92							
	% D [3]	-7.52							
Correlation Coefficient						0.81			

Appendix Table F4 (cont'd)

July									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	78.64	74.80	3.84	-5.13	26	143.01	115.60	27.41	-23.71
2	82.68	67.50	15.18	-22.50	27	353.32	112.70	240.62	-213.50
3	96.80	87.00	9.80	-11.27	28	369.44	262.56	106.88	-40.71
4	99.16	89.70	9.46	-10.55	29	337.87	159.93	177.94	-111.26
5	83.77	76.10	7.67	-10.07	30	295.72	115.60	180.12	-155.81
6	80.93	72.70	8.23	-11.32	31	251.60	115.60	136.00	-117.64
7	189.38	73.70	115.68	-156.96	32	330.87	109.00	221.87	-203.55
8	144.20	114.90	29.30	-25.50	33	331.86	34.40	297.46	-864.71
9	113.14	114.90	-1.76	1.53	34	213.07	78.90	134.17	-170.06
10	104.09	101.40	2.69	-2.65	35	368.09	99.40	268.69	-270.31
11	99.68	100.80	-1.12	1.11	36	337.35	345.40	-8.05	2.33
12	219.27	120.30	98.97	-82.27	37	309.52	130.50	179.02	-137.18
13	129.88	146.70	-16.82	11.46	38	385.30	146.50	238.80	-163.01
14	118.93	129.20	-10.27	7.95	39	318.87	170.80	148.07	-86.69
15	344.86	234.30	110.56	-47.19	40	67.68	59.90	7.78	-13.00
16	265.22	120.30	144.92	-120.46	41	80.02	91.50	-11.48	12.54
17	169.30	76.50	92.80	-121.30	42	456.14	181.00	275.14	-152.01
18	136.54	129.20	7.34	-5.68	43	430.74	146.50	284.24	-194.02
19	117.18	105.90	11.28	-10.65	44	77.69	90.50	-12.81	14.15
20	384.76	234.30	150.46	-64.22	45	76.80	64.40	12.40	-19.25
21	407.82	200.70	207.12	-103.20	46	364.20	99.30	264.90	-266.77
22	336.94	120.30	216.64	-180.08	47	386.55	99.30	287.25	-289.28
23	270.83	60.70	210.13	-346.18	48	67.36	84.10	-16.74	19.91
24	232.24	115.60	116.64	-100.90	49	410.97	138.50	272.47	-196.73
25	175.35	115.60	59.75	-51.68	50	331.99	137.80	194.19	-140.92

Appendix Table F4 (cont'd)

July									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	56.40	64.40	-8.00	12.42	76	109.34	103.60	5.74	-5.54
52	77.86	99.30	-21.44	21.59	77	94.22	106.60	-12.38	11.62
53	70.70	84.10	-13.40	15.94	78	140.55	122.30	18.25	-14.92
54	436.88	107.90	328.98	-304.89	79	146.37	178.00	-31.63	17.77
55	117.25	39.70	77.55	-195.35	80	109.99	92.10	17.89	-19.42
56	109.16	116.40	-7.24	6.22	81	108.70	92.10	16.60	-18.02
57	96.10	104.00	-7.90	7.60	82	103.13	102.80	0.33	-0.32
58	78.18	104.00	-25.82	24.83	83	90.89	102.80	-11.91	11.58
59	78.98	126.50	-47.52	37.57	84	130.00	119.10	10.90	-9.15
60	80.74	107.70	-26.96	25.04	85	156.00	158.10	-2.10	1.33
61	109.96	47.90	62.06	-129.56	86	118.86	92.10	26.76	-29.05
62	124.98	122.30	2.68	-2.19	87	114.09	89.30	24.79	-27.76
63	119.64	104.00	15.64	-15.04	88	91.40	110.40	-19.00	17.21
64	88.73	86.20	2.53	-2.94	89	110.96	110.40	0.56	-0.50
65	82.68	85.30	-2.62	3.07	90	160.29	161.30	-1.01	0.62
66	81.16	85.30	-4.14	4.86	91	172.48	161.30	11.18	-6.93
67	87.67	67.00	20.67	-30.85	92	106.14	105.60	0.54	-0.51
68	89.61	65.20	24.41	-37.44	93	131.98	139.70	-7.72	5.53
69	126.36	116.90	9.46	-8.10	94	124.41	124.70	-0.29	0.23
70	100.40	99.40	1.00	-1.01	95	164.62	217.90	-53.28	24.45
71	98.91	104.00	-5.09	4.89	96	143.22	155.00	-11.78	7.60
72	123.01	112.70	10.31	-9.15	97	155.98	155.00	0.98	-0.63
73	138.33	122.30	16.03	-13.10	98	135.77	142.70	-6.93	4.86
74	109.72	100.80	8.92	-8.85	99	170.81	155.00	15.81	-10.20
75	116.65	103.60	13.05	-12.59	100	128.94	119.60	9.34	-7.81
All average	TRMM	175.97							
	RG [1]	116.67							
	D [2]	59.30							
	% D [3]	-50.82							
Correlation Coefficient						0.48			

Appendix Table F4 (cont'd)

August									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	92.12	137.70	-45.58	33.10	26	211.33	218.30	-6.97	3.19
2	126.21	172.00	-45.79	26.62	27	421.05	316.60	104.45	-32.99
3	104.83	107.80	-2.97	2.75	28	416.50	369.12	47.38	-12.84
4	99.67	107.80	-8.13	7.54	29	358.07	263.94	94.13	-35.66
5	104.04	103.60	0.44	-0.42	30	338.88	249.40	89.48	-35.88
6	118.00	97.40	20.60	-21.15	31	310.76	249.40	61.36	-24.60
7	224.12	120.70	103.42	-85.68	32	436.53	210.10	226.43	-107.77
8	163.13	122.90	40.23	-32.73	33	381.67	210.10	171.57	-81.66
9	141.55	122.90	18.65	-15.18	34	291.61	189.40	102.21	-53.97
10	148.90	176.20	-27.30	15.49	35	537.45	170.60	366.85	-215.04
11	160.19	176.20	-16.01	9.09	36	501.19	242.70	258.49	-106.51
12	254.08	136.30	117.78	-86.41	37	375.83	241.10	134.73	-55.88
13	167.08	155.90	11.18	-7.17	38	583.23	206.60	376.63	-182.30
14	169.25	140.90	28.35	-20.12	39	400.31	245.40	154.91	-63.12
15	429.39	542.60	-113.21	20.87	40	237.62	206.60	31.02	-15.01
16	323.35	136.80	186.55	-136.37	41	230.12	206.60	23.52	-11.38
17	205.06	193.50	11.56	-5.97	42	676.47	290.20	386.27	-133.10
18	183.67	180.70	2.97	-1.64	43	743.14	290.20	452.94	-156.08
19	188.76	180.70	8.06	-4.46	44	253.79	206.60	47.19	-22.84
20	471.18	542.60	-71.42	13.16	45	256.66	219.30	37.36	-17.04
21	444.63	542.60	-97.97	18.06	46	612.02	353.80	258.22	-72.99
22	351.24	151.30	199.94	-132.15	47	669.18	353.80	315.38	-89.14
23	303.39	166.20	137.19	-82.55	48	208.77	194.30	14.47	-7.45
24	268.54	248.20	20.34	-8.19	49	532.73	353.80	178.93	-50.57
25	223.05	224.80	-1.75	0.78	50	448.33	440.50	7.83	-1.78

Appendix Table F4 (cont'd)

August									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	279.79	270.70	9.09	-3.36	76	290.24	288.00	2.24	-0.78
52	259.69	286.30	-26.61	9.29	77	296.56	316.60	-20.04	6.33
53	219.26	194.30	24.96	-12.85	78	313.78	318.00	-4.22	1.33
54	406.62	440.50	-33.88	7.69	79	283.89	318.00	-34.11	10.73
55	288.35	181.20	107.15	-59.13	80	280.79	274.10	6.69	-2.44
56	313.31	270.70	42.61	-15.74	81	288.04	277.40	10.64	-3.83
57	303.33	305.80	-2.47	0.81	82	303.76	320.50	-16.74	5.22
58	290.40	282.60	7.80	-2.76	83	298.85	297.30	1.55	-0.52
59	276.77	365.50	-88.73	24.28	84	318.44	318.00	0.44	-0.14
60	243.59	288.20	-44.61	15.48	85	297.53	318.00	-20.47	6.44
61	280.12	202.80	77.32	-38.12	86	287.60	277.40	10.20	-3.68
62	316.47	305.80	10.67	-3.49	87	291.18	297.30	-6.12	2.06
63	314.54	305.80	8.74	-2.86	88	299.18	297.30	1.88	-0.63
64	280.65	282.60	-1.95	0.69	89	318.69	307.60	11.09	-3.61
65	273.48	261.80	11.68	-4.46	90	312.14	320.90	-8.76	2.73
66	272.34	261.80	10.54	-4.02	91	292.76	320.90	-28.14	8.77
67	274.03	288.80	-14.78	5.12	92	301.93	375.90	-73.97	19.68
68	271.65	288.80	-17.15	5.94	93	273.74	286.40	-12.66	4.42
69	304.87	317.60	-12.73	4.01	94	276.79	203.50	73.29	-36.02
70	272.59	284.40	-11.81	4.15	95	284.37	272.20	12.17	-4.47
71	270.25	235.90	34.35	-14.56	96	278.09	272.20	5.89	-2.16
72	310.42	316.60	-6.19	1.95	97	283.38	272.20	11.18	-4.11
73	321.64	373.70	-52.07	13.93	98	310.35	214.70	95.65	-44.55
74	282.25	317.60	-35.35	11.13	99	295.37	272.20	23.17	-8.51
75	286.62	288.00	-1.38	0.48	100	328.37	212.10	116.27	-54.82
All average	TRMM	305.17							
	RG [1]	259.53							
	D [2]	45.64							
	% D [3]	-17.59							
Correlation Coefficient						0.53			

Appendix Table F4 (cont'd)

September									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	251.65	257.20	-5.55	2.16	26	308.93	301.20	7.73	-2.57
2	225.60	239.30	-13.70	5.73	27	431.00	283.30	147.70	-52.13
3	270.85	257.20	13.65	-5.31	28	452.93	333.91	119.01	-35.64
4	259.67	249.30	10.37	-4.16	29	375.50	333.91	41.59	-12.45
5	236.94	235.60	1.34	-0.57	30	367.09	344.60	22.49	-6.53
6	215.51	184.40	31.11	-16.87	31	352.92	344.60	8.32	-2.41
7	327.01	211.90	115.11	-54.32	32	589.67	299.80	289.87	-96.69
8	260.10	247.30	12.80	-5.17	33	417.10	367.20	49.90	-13.59
9	236.48	193.40	43.08	-22.27	34	351.89	306.10	45.79	-14.96
10	225.69	224.90	0.79	-0.35	35	493.94	337.10	156.84	-46.53
11	224.91	218.20	6.71	-3.07	36	543.29	500.80	42.49	-8.48
12	333.49	247.30	86.19	-34.85	37	428.38	457.30	-28.92	6.32
13	259.67	195.20	64.47	-33.03	38	514.86	481.40	33.46	-6.95
14	229.12	172.00	57.12	-33.21	39	445.76	411.90	33.86	-8.22
15	550.46	573.00	-22.54	3.93	40	298.82	317.40	-18.58	5.85
16	325.62	203.40	122.22	-60.09	41	311.24	317.40	-6.16	1.94
17	304.17	218.50	85.67	-39.21	42	539.46	481.40	58.06	-12.06
18	290.58	301.20	-10.62	3.53	43	589.62	481.40	108.22	-22.48
19	269.24	288.40	-19.16	6.64	44	326.85	339.50	-12.65	3.73
20	557.02	573.00	-15.98	2.79	45	319.29	317.40	1.89	-0.59
21	561.93	573.00	-11.07	1.93	46	527.64	579.90	-52.26	9.01
22	370.38	319.80	50.58	-15.82	47	481.66	579.90	-98.24	16.94
23	304.33	272.10	32.23	-11.84	48	343.15	361.70	-18.56	5.13
24	358.43	217.60	140.83	-64.72	49	485.88	437.30	48.58	-11.11
25	322.33	301.20	21.13	-7.02	50	408.16	405.20	2.96	-0.73

Appendix Table F4 (cont'd)

September									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	352.61	297.30	55.31	-18.60	76	276.25	278.10	-1.85	0.66
52	364.04	348.70	15.34	-4.40	77	265.26	248.00	17.26	-6.96
53	372.56	348.70	23.86	-6.84	78	284.73	269.10	15.63	-5.81
54	423.67	439.20	-15.53	3.54	79	309.87	335.00	-25.13	7.50
55	340.34	428.50	-88.16	20.57	80	227.37	227.60	-0.23	0.10
56	369.84	392.80	-22.96	5.84	81	248.83	269.80	-20.97	7.77
57	373.30	373.00	0.30	-0.08	82	260.81	257.10	3.71	-1.44
58	376.26	373.00	3.26	-0.87	83	278.95	257.10	21.85	-8.50
59	382.57	403.40	-20.83	5.16	84	282.18	286.50	-4.32	1.51
60	422.26	439.20	-16.94	3.86	85	271.62	269.10	2.52	-0.94
61	358.99	309.40	49.59	-16.03	86	237.59	222.30	15.29	-6.88
62	351.51	373.00	-21.49	5.76	87	253.32	255.30	-1.99	0.78
63	364.06	373.00	-8.94	2.40	88	259.41	257.10	2.31	-0.90
64	426.92	405.70	21.22	-5.23	89	260.19	240.80	19.39	-8.05
65	457.71	406.40	51.31	-12.63	90	254.81	252.20	2.61	-1.03
66	468.79	406.40	62.39	-15.35	91	264.89	286.50	-21.61	7.54
67	323.07	303.30	19.77	-6.52	92	252.25	240.80	11.45	-4.76
68	347.79	309.40	38.39	-12.41	93	239.07	186.50	52.57	-28.19
69	381.85	365.30	16.55	-4.53	94	232.54	235.80	-3.26	1.38
70	448.30	365.30	83.00	-22.72	95	249.05	259.40	-10.36	3.99
71	463.34	316.80	146.54	-46.26	96	225.92	235.80	-9.88	4.19
72	299.45	366.40	-66.95	18.27	97	228.15	259.40	-31.25	12.05
73	315.15	325.60	-10.45	3.21	98	245.50	204.50	41.00	-20.05
74	422.44	496.60	-74.16	14.93	99	219.41	259.40	-39.99	15.42
75	256.25	227.60	28.65	-12.59	100	230.76	204.50	26.26	-12.84
All average	TRMM	342.98							
	RG [1]	321.88							
	D [2]	21.10							
	% D [3]	-6.56							
Correlation Coefficient						0.84			

Appendix Table F4 (cont'd)

October									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	184.22	219.90	-35.68	16.23	26	141.32	156.50	-15.18	9.70
2	224.52	200.50	24.02	-11.98	27	94.83	80.80	14.03	-17.37
3	133.59	143.40	-9.81	6.84	28	120.92	124.60	-3.67	2.95
4	138.61	143.40	-4.79	3.34	29	99.43	74.20	25.23	-34.00
5	151.47	141.60	9.87	-6.97	30	106.93	81.10	25.83	-31.85
6	185.52	177.50	8.02	-4.52	31	117.27	81.10	36.17	-44.60
7	112.29	111.80	0.49	-0.44	32	126.92	118.70	8.22	-6.93
8	119.03	111.80	7.23	-6.47	33	116.36	118.70	-2.34	1.97
9	127.57	128.60	-1.03	0.80	34	130.05	114.20	15.85	-13.88
10	136.74	133.00	3.74	-2.81	35	90.98	96.00	-5.02	5.23
11	135.70	138.70	-3.00	2.16	36	88.70	137.30	-48.60	35.40
12	94.96	109.30	-14.34	13.12	37	130.21	122.80	7.41	-6.04
13	126.81	113.20	13.61	-12.02	38	82.11	96.00	-13.89	14.47
14	130.34	105.80	24.54	-23.19	39	108.19	108.30	-0.11	0.10
15	104.17	176.00	-71.83	40.81	40	125.82	145.20	-19.38	13.34
16	100.29	109.30	-9.01	8.24	41	113.57	145.20	-31.63	21.79
17	125.61	76.30	49.31	-64.63	42	83.44	79.40	4.04	-5.09
18	128.91	118.20	10.71	-9.06	43	106.85	127.90	-21.06	16.46
19	134.62	102.90	31.72	-30.83	44	96.15	145.20	-49.05	33.78
20	128.53	176.00	-47.47	26.97	45	105.65	91.90	13.75	-14.96
21	116.21	139.10	-22.89	16.45	46	114.39	110.20	4.19	-3.80
22	99.20	109.30	-10.10	9.24	47	85.15	91.90	-6.75	7.34
23	110.87	139.10	-28.23	20.30	48	138.75	141.10	-2.35	1.66
24	120.98	118.20	2.78	-2.35	49	151.84	141.10	10.74	-7.61
25	127.15	102.90	24.25	-23.57	50	108.26	103.10	5.16	-5.00

Appendix Table F4 (cont'd)

October									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	95.41	69.20	26.21	-37.88	76	109.29	99.80	9.49	-9.51
52	103.66	99.90	3.76	-3.76	77	93.45	91.40	2.05	-2.25
53	143.92	153.90	-9.98	6.49	78	95.66	118.20	-22.54	19.07
54	72.22	79.20	-6.98	8.82	79	95.90	109.80	-13.90	12.66
55	113.84	126.10	-12.26	9.72	80	88.67	78.30	10.37	-13.25
56	115.66	125.90	-10.24	8.13	81	94.90	99.80	-4.90	4.91
57	91.72	148.80	-57.08	38.36	82	97.81	69.30	28.51	-41.14
58	90.34	88.70	1.64	-1.85	83	94.95	80.80	14.15	-17.51
59	94.52	99.90	-5.38	5.38	84	93.83	64.10	29.73	-46.37
60	143.00	168.10	-25.10	14.93	85	98.32	72.30	26.02	-35.99
61	102.63	95.30	7.33	-7.69	86	92.43	99.80	-7.37	7.38
62	103.19	104.20	-1.01	0.97	87	92.87	115.20	-22.33	19.38
63	99.16	103.20	-4.04	3.91	88	91.05	51.10	39.95	-78.17
64	90.29	103.20	-12.91	12.51	89	88.44	61.40	27.04	-44.04
65	84.77	99.90	-15.13	15.15	90	96.38	116.80	-20.42	17.48
66	91.93	99.90	-7.97	7.98	91	99.12	116.80	-17.68	15.13
67	104.67	95.30	9.37	-9.83	92	95.63	102.80	-7.17	6.98
68	106.20	107.60	-1.40	1.30	93	88.97	98.00	-9.03	9.22
69	96.46	109.80	-13.34	12.15	94	93.58	102.80	-9.22	8.97
70	86.56	84.00	2.56	-3.05	95	104.31	102.80	1.51	-1.47
71	84.53	73.10	11.43	-15.64	96	97.56	92.30	5.26	-5.69
72	100.58	119.30	-18.72	15.69	97	101.31	92.30	9.01	-9.76
73	98.26	118.20	-19.94	16.87	98	85.39	77.30	8.09	-10.46
74	101.35	109.80	-8.46	7.70	99	100.93	89.50	11.43	-12.77
75	106.41	99.80	6.61	-6.62	100	86.62	63.90	22.72	-35.56
	TRMM	109.81							
All	RG [1]	111.27							
average	D [2]	-1.47							
	% D [3]	1.32							
Correlation Coefficient						0.73			

Appendix Table F4 (cont'd)

November									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	149.21	133.00	16.21	-12.19	26	98.60	117.70	-19.10	16.22
2	118.81	135.10	-16.29	12.06	27	59.12	93.80	-34.68	36.97
3	135.83	133.00	2.83	-2.13	28	64.19	48.77	15.43	-31.63
4	154.11	168.00	-13.89	8.27	29	58.37	48.77	9.60	-19.69
5	154.93	135.90	19.03	-14.00	30	61.92	60.70	1.22	-2.02
6	169.51	153.70	15.81	-10.28	31	63.25	60.70	2.55	-4.20
7	50.58	66.00	-15.42	23.36	32	70.31	70.50	-0.19	0.26
8	70.74	104.00	-33.26	31.98	33	66.18	33.30	32.88	-98.73
9	121.77	117.50	4.27	-3.63	34	52.87	27.20	25.67	-94.38
10	128.41	117.50	10.91	-9.29	35	63.25	61.60	1.65	-2.68
11	135.08	62.30	72.78	-116.82	36	60.55	60.20	0.35	-0.58
12	65.18	66.00	-0.82	1.24	37	63.70	35.10	28.60	-81.47
13	119.92	94.50	25.42	-26.90	38	69.13	69.30	-0.17	0.25
14	136.71	100.70	36.01	-35.76	39	80.52	35.10	45.42	-129.41
15	105.69	97.50	8.19	-8.40	40	22.61	61.60	-38.99	63.29
16	39.24	77.30	-38.06	49.24	41	29.17	61.60	-32.43	52.65
17	91.77	79.50	12.27	-15.43	42	111.66	113.50	-1.84	1.62
18	115.38	117.70	-2.32	1.97	43	75.18	82.50	-7.32	8.87
19	110.50	105.30	5.20	-4.94	44	14.37	69.30	-54.93	79.27
20	68.53	97.50	-28.97	29.72	45	16.29	17.50	-1.21	6.89
21	62.62	50.10	12.52	-24.99	46	105.35	32.50	72.85	-224.14
22	56.92	50.10	6.82	-13.62	47	72.42	32.50	39.92	-122.83
23	55.91	50.10	5.81	-11.60	48	8.10	19.00	-10.90	57.37
24	59.55	60.20	-0.65	1.07	49	96.50	32.50	64.00	-196.92
25	85.27	117.70	-32.43	27.55	50	72.24	19.00	53.24	-280.21

Appendix Table F4 (cont'd)

November									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	19.30	15.30	4.00	-26.13	76	135.54	132.60	2.94	-2.22
52	10.14	19.00	-8.86	46.63	77	148.91	120.50	28.41	-23.57
53	5.04	3.50	1.54	-44.00	78	90.17	88.70	1.47	-1.66
54	93.71	25.20	68.51	-271.87	79	63.43	55.10	8.33	-15.12
55	48.55	28.50	20.05	-70.36	80	34.32	50.50	-16.18	32.04
56	29.16	35.50	-6.34	17.86	81	91.44	75.40	16.04	-21.27
57	21.94	15.30	6.64	-43.40	82	117.72	120.50	-2.78	2.31
58	19.86	13.70	6.16	-44.97	83	198.54	184.20	14.34	-7.78
59	17.22	13.70	3.52	-25.69	84	102.38	88.70	13.68	-15.42
60	11.88	18.60	-6.72	36.13	85	72.35	55.10	17.25	-31.30
61	58.75	102.50	-43.75	42.69	86	30.48	50.50	-20.02	39.64
62	40.28	58.80	-18.52	31.49	87	71.70	25.40	46.30	-182.28
63	36.72	58.80	-22.08	37.56	88	203.42	184.20	19.22	-10.43
64	42.43	32.70	9.73	-29.76	89	167.91	152.60	15.31	-10.03
65	40.26	32.70	7.56	-23.13	90	87.01	64.40	22.61	-35.10
66	42.73	32.70	10.03	-30.67	91	33.96	27.10	6.86	-25.31
67	122.71	131.70	-8.99	6.83	92	192.25	158.90	33.35	-20.99
68	88.26	85.10	3.16	-3.71	93	73.62	150.00	-76.38	50.92
69	28.08	22.10	5.98	-27.06	94	184.20	158.90	25.30	-15.92
70	18.06	22.10	-4.04	18.28	95	121.08	87.20	33.88	-38.85
71	57.72	54.40	3.32	-6.10	96	207.78	158.90	48.88	-30.76
72	81.04	83.40	-2.36	2.83	97	164.34	157.40	6.94	-4.41
73	63.19	59.20	3.99	-6.73	98	127.02	137.80	-10.78	7.82
74	16.20	11.10	5.10	-45.95	99	182.94	157.40	25.54	-16.23
75	109.92	132.60	-22.68	17.10	100	110.10	137.80	-27.70	20.10
All average	TRMM	82.54							
	RG [1]	77.42							
	D [2]	5.11							
	% D [3]	-6.60							
Correlation Coefficient						0.87			

Appendix Table F4 (cont'd)

December									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
1	28.88	23.00	5.88	-25.54	26	33.09	33.60	-0.51	1.51
2	34.20	24.10	10.10	-41.92	27	30.27	13.10	17.17	-131.10
3	26.34	28.70	-2.36	8.24	28	30.93	35.64	-4.71	13.22
4	31.76	33.70	-1.94	5.76	29	41.92	35.97	5.95	-16.55
5	40.06	54.10	-14.04	25.95	30	50.59	42.30	8.29	-19.61
6	33.57	28.30	5.27	-18.61	31	39.47	42.30	-2.83	6.70
7	25.05	39.00	-13.95	35.76	32	16.08	16.30	-0.22	1.35
8	26.20	28.70	-2.50	8.70	33	31.81	16.30	15.51	-95.13
9	29.00	28.70	0.30	-1.05	34	40.98	33.20	7.78	-23.43
10	31.13	38.30	-7.17	18.72	35	0.00	0.00	0.00	-
11	31.09	10.00	21.09	-210.91	36	0.00	0.00	0.00	-
12	29.62	25.30	4.32	-17.06	37	45.26	40.90	4.36	-10.67
13	38.16	61.50	-23.34	37.96	38	0.00	2.50	-2.50	100.00
14	32.73	21.00	11.73	-55.85	39	34.11	33.00	1.11	-3.37
15	10.74	9.50	1.24	-13.05	40	30.09	23.90	6.19	-25.88
16	36.51	38.60	-2.09	5.42	41	26.66	23.90	2.76	-11.56
17	27.17	33.80	-6.63	19.60	42	14.82	5.30	9.52	-179.62
18	43.15	33.60	9.55	-28.41	43	13.62	5.30	8.32	-156.98
19	44.45	33.60	10.85	-32.28	44	25.76	23.90	1.86	-7.79
20	21.33	9.50	11.83	-124.56	45	24.12	14.90	9.22	-61.89
21	26.90	17.90	9.00	-50.30	46	6.36	5.30	1.06	-20.00
22	53.25	38.60	14.65	-37.94	47	0.00	0.00	0.00	-
23	55.86	28.30	27.56	-97.38	48	21.41	25.10	-3.69	14.70
24	43.22	42.30	0.92	-2.19	49	0.00	0.00	0.00	-
25	29.70	33.60	-3.90	11.61	50	9.06	4.50	4.56	-101.33

Appendix Table F4 (cont'd)

December									
Location No..	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)	Location No.	TRMM (mm)	RG [1] (mm)	D [2] (mm)	% D [3] (%)
51	26.16	24.70	1.46	-5.91	76	34.68	35.60	-0.92	2.58
52	19.77	11.50	8.27	-71.94	77	27.18	14.90	12.28	-82.42
53	22.99	25.10	-2.11	8.40	78	32.33	31.20	1.13	-3.61
54	17.40	15.90	1.50	-9.43	79	32.29	34.90	-2.61	7.49
55	17.28	15.20	2.08	-13.68	80	58.65	59.10	-0.45	0.76
56	45.02	58.40	-13.38	22.90	81	55.31	59.10	-3.79	6.41
57	22.02	5.90	16.12	-273.22	82	79.87	85.10	-5.23	6.14
58	25.73	58.40	-32.67	55.94	83	42.21	45.30	-3.09	6.82
59	25.15	11.50	13.65	-118.66	84	32.90	34.90	-2.00	5.74
60	24.44	20.50	3.94	-19.24	85	33.75	34.90	-1.15	3.31
61	0.06	0.00	0.06	-	86	59.69	59.10	0.59	-1.00
62	33.42	39.20	-5.78	14.74	87	58.28	61.30	-3.02	4.93
63	36.43	5.90	30.53	-517.46	88	48.18	37.50	10.68	-28.47
64	39.14	46.20	-7.06	15.28	89	44.08	52.50	-8.42	16.04
65	40.84	46.20	-5.36	11.60	90	31.99	39.00	-7.01	17.98
66	37.97	46.20	-8.23	17.81	91	34.83	39.00	-4.17	10.69
67	18.61	18.20	0.41	-2.25	92	37.86	41.90	-4.04	9.64
68	18.84	25.50	-6.66	26.11	93	37.32	41.80	-4.48	10.72
69	23.64	17.00	6.64	-39.06	94	80.09	56.90	23.19	-40.76
70	30.30	29.50	0.80	-2.71	95	64.94	63.30	1.64	-2.59
71	21.18	29.50	-8.32	28.20	96	76.51	63.30	13.21	-20.87
72	10.80	10.60	0.20	-1.89	97	66.20	63.30	2.90	-4.58
73	13.38	16.00	-2.62	16.38	98	40.03	41.80	-1.77	4.24
74	35.64	29.50	6.14	-20.81	99	68.26	63.30	4.96	-7.84
75	45.08	35.60	9.48	-26.64	100	18.30	35.50	-17.20	48.45
All average	TRMM	32.44							
	RG [1]	30.78							
	D [2]	1.66							
	% D [3]	-5.39							
Correlation Coefficient						0.85			

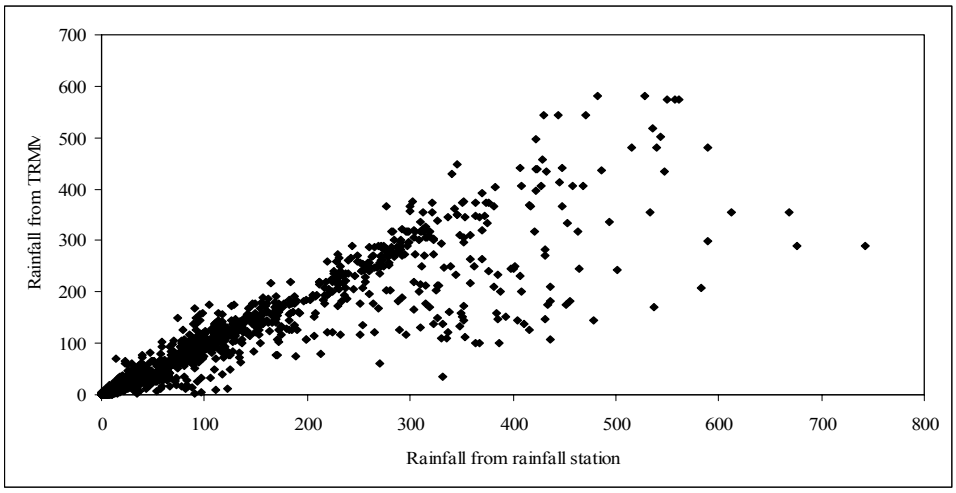


Figure F3 The distribution of all monthly rainfall used for comparison

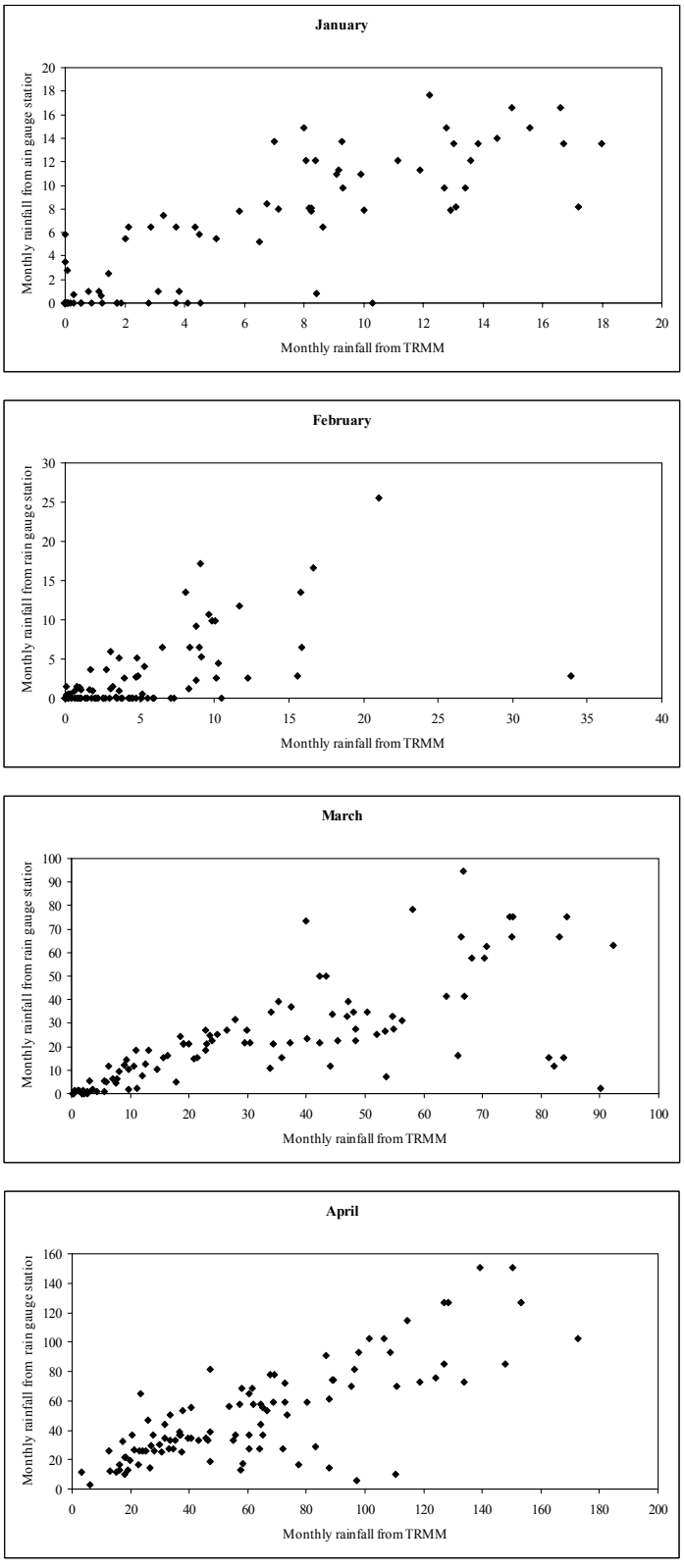


Figure F4 The distribution of monthly rainfall used for comparison in each month

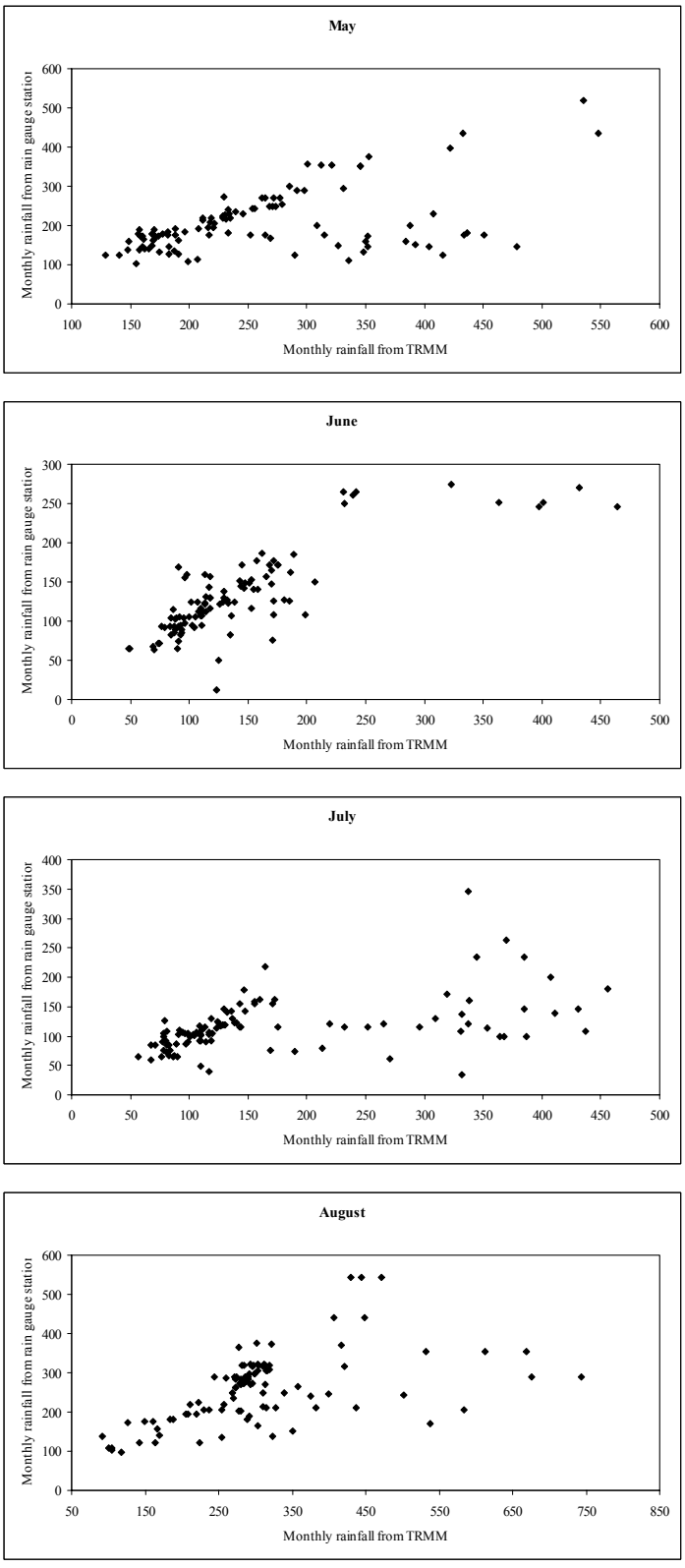


Figure F4 (cont'd)

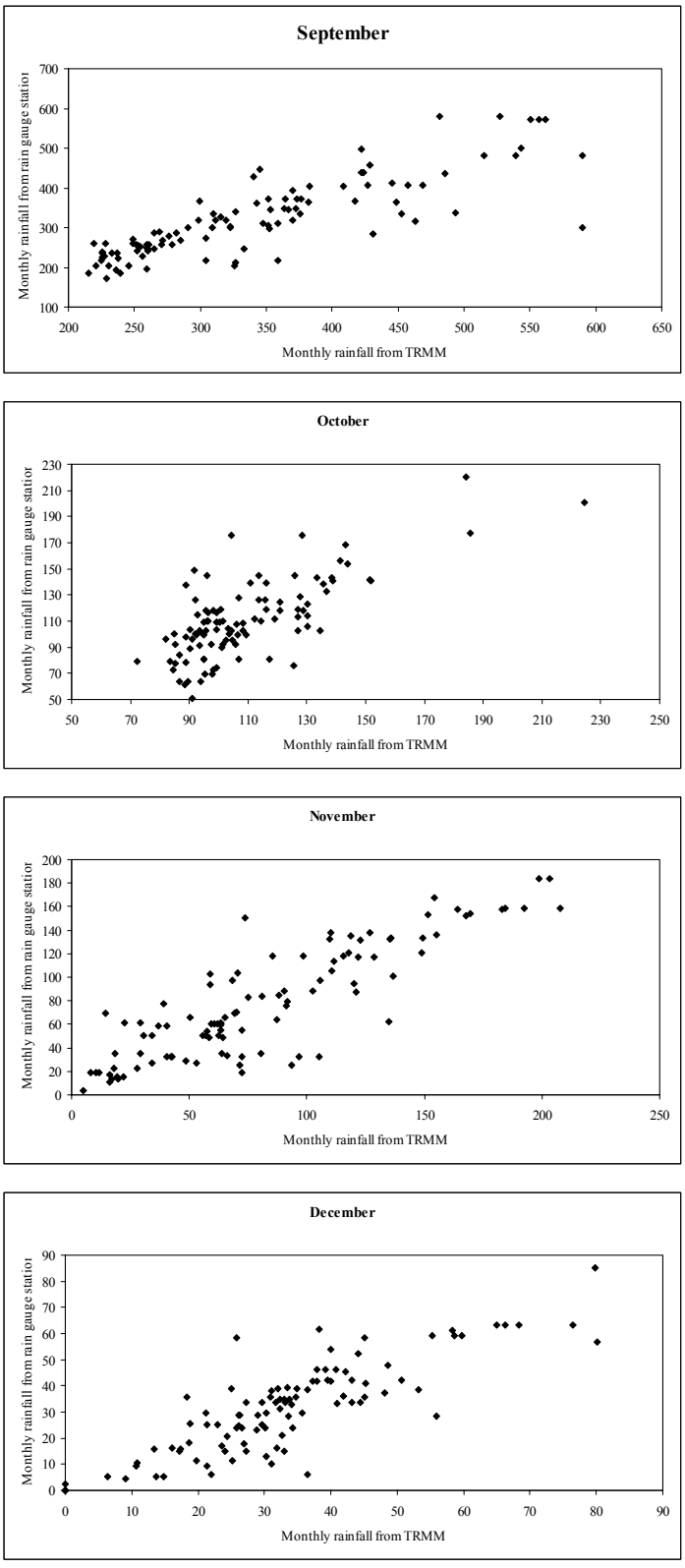


Figure F4 (cont'd)