

REGIONAL VARIATION IN EXTREME RAINFALL VALUES

GEO REPORT No. 115

N.C. Evans & Y.F. Yu

**GEOTECHNICAL ENGINEERING OFFICE
CIVIL ENGINEERING DEPARTMENT
THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION**

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Prepared by:

Geotechnical Engineering Office,
Civil Engineering Department,
Civil Engineering Building,
101 Princess Margaret Road,
Homantin, Kowloon,
Hong Kong.

PREFACE

In keeping with our policy of releasing information which may be of general interest to the geotechnical profession and the public, we make available selected internal reports in a series of publications termed the GEO Report series. A charge is made to cover the cost of printing.

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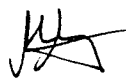


R.K.S. Chan
Head, Geotechnical Engineering Office
October 2001

FOREWORD

This Report presents the results of extreme-value analyses of rainfall data obtained from 46 raingauges throughout Hong Kong between 1984 and 1996. It examines whether these results are consistent with values calculated indirectly using other techniques and makes recommendations concerning their use.

The analyses were begun by Messrs A.C.W. Wong and W.K. Pun of Special Projects Division, with the assistance of Mr K.P. Wong of the Hong Kong Observatory (HKO). Mr N.C. Evans and Dr Y.F. Yu of Special Projects Division completed the analyses and compiled this Report. Dr W.L. Chang of the HKO and many colleagues in GEO gave useful comments and suggestions on a draft version of this Report. All contributions are gratefully acknowledged.



P.L.R. Pang
Chief Geotechnical Engineer/Special Projects

ABSTRACT

The standard references on extreme point rainfall values in Hong Kong use long-period data collected at the Hong Kong Observatory (HKO) in Tsimshatsui. It has long been recognised that these data may not be valid for other locations in Hong Kong.

This Report presents the results of statistical analyses of fourteen years of rainfall data recorded at 46 GEO automatic raingauges throughout Hong Kong. There are no firm rules regarding minimum periods of data for climatological extreme value analyses, but there are some guidelines. Discussions with the HKO, and a review of some of the literature, suggest that a period of only fourteen years is less than ideal, particularly when the data are not 100% complete.

Two indirect methods of estimating extreme rainfall values at these locations were also reviewed and developed for use in Hong Kong. One relies on a general relationship between extreme values for different durations and maximum 60-minute rainfall values recorded in a ten-year period, while the other postulates a correlation between extreme values and mean annual rainfall at a point.

Results from the indirect methods were compared with the values obtained from statistical analysis of the raingauge data. It is concluded that sufficient information exist to make a reasonable assessment of extreme rainfall values at any location in Hong Kong. The precise combination of data and analytical techniques which should be used will depend on the location of the site and the purpose of the assessment.

Further analysis of existing data from HKO autographic raingauges which have been set up for a long time might provide additional insights into the regional variation of extreme values. Similarly, when approximately 20 years of data become available from the GEO and HKO automatic raingauges, a review of the calculated extreme values would be beneficial.

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1. INTRODUCTION

Extreme rainfall values calculated from statistical analyses of data recorded at raingauge stations are used by civil and geotechnical engineers for slope and drainage design and for the analysis of landslides and flooding. Most such calculations use data collected at the Hong Kong Observatory (HKO) in Tsimshatsui. It has long been recognised that these data may not be representative of other parts of Hong Kong. This Note presents the results of statistical analyses of fourteen years of rainfall data recorded at 46 GEO automatic raingauges throughout Hong Kong. The results are compared with estimates of extreme values at these locations calculated using indirect techniques.

2. BACKGROUND

The Geotechnical Manual for Slopes (GCO, 1984) recommends that slope design and stability assessments be carried out for the groundwater conditions that would result from a rainfall event with a ten-year return period, and that slope surface drainage works be designed for 200-year return period events. Similarly, road drainage design commonly uses 50-year return period rainfall (HyD, 1994). Drainage Services Department (DSD) recommends using rainfall return periods of 50 years for main rural catchment drainage channels and urban drainage branch systems, and 200 years for urban trunk drainage systems (DSD, 1994).

The standard references for the estimation of extreme point rainfall in Hong Kong for various return periods are Peterson & Kwong (1981) and Lam & Leung (1994). Peterson & Kwong presented estimates derived from approximately 100 years of raingauge data from the Hong Kong Observatory in Tsimshatsui and 29 years of instantaneous rate-of-rainfall records from Kings Park. The authors pointed out in their report that the results may not be valid for other locations in Hong Kong. Lam & Leung updated the earlier work by Peterson & Kwong using additional data from the Observatory site and, in addition, 1980 to 1990 data from three outstations at Yuen Long, Tai Po Tau and Fanling. They found deviations from the Observatory storm profiles ranging from about -20% to +10%, although they also point out that the statistical reliability of these short-period data was limited.

Peart (1993) looked for differences in extreme values between the Observatory site and raingauges located at Aberdeen, Kai Tak and Tai Lam Chung, using 20 years of data from 1967 to 1988.

Wong & Ho (1996) considered the return periods of extreme rainfall and emphasised that, as pointed out by both Peterson & Kwong (1981) and Lam & Leung (1994), rainfall storm profiles and return periods evaluated using data from the Observatory should, strictly speaking, be applied to that site alone (Lam & Leung suggested that it was reasonable to use the data for the surrounding 25 km²). Wong & Ho also mentioned possible variability in extreme values resulting from orographic effects.

Ng & Wong (1996) presented data on the 30-year mean rainfall in Hong Kong from 1961 to 1990 (a climatological standard period).

Evans (1997) discussed rainfall distribution and possible orographic effects in Hong Kong, and concluded that annual rainfall across Hong Kong was not uniform, even when

increased rainfall due to elevation was taken into account (mean annual rainfall at stations close to sea level can vary by up to 170%). The coastal periphery, the outlying islands (Lamma, Cheung Chau, Po Toi, the Sokos, etc) and the northern New Territories appear to be significantly drier than elsewhere. Conversely, the central upland core of Hong Kong, and the lowland areas within this core (such as the Tai Wai/Shatin area), appeared to be most susceptible to extreme rainfall events.

The mathematics of return periods indicate that in a given ten-year period there is an approximately two in three chance that a ten-year return period rainfall parameter will be exceeded once or more at a given site (and a one in three chance that it will not). The probabilities are similar for other return periods. The difference between site-specific and Hong Kong-wide return periods should be noted. The probability that a given extreme value will be exceeded at a particular site (as discussed in this Note) will be, on average, considerably lower than the probability of that rainfall parameter being exceeded somewhere in Hong Kong. This is especially true of areas where extreme rainfall values may be consistently below average, while the tendency will be less marked in areas where extreme rainfall values are consistently above average.

3. DATA AND DATA VALIDITY

The GEO automatic raingauge system has been collecting rainfall data since 1984. By 1997 the system comprised 48 raingauges. The GEO raingauges transmit data at five-minute intervals. Each transmission comprises the amount of rain, in millimetres, which has fallen in the previous five minutes. These data are held in digital form. Note that raingauges N17 and N18 (both located on Lantau) only came into operation in 1991 and were not considered in this study. Figure 1 shows the locations of the relevant raingauges. The data analysed for this study covers the period 1984 to 1997 inclusive (a total of fourteen years). The data are not 100% complete - occasional raingauge and data transmission malfunctions have led to gaps and errors (see Section 4).

There are no firm rules regarding minimum periods of data for climatological extreme value analyses, but there are some guidelines. Discussions with the HKO suggest that a period of only fourteen years is less than ideal, especially when the data are not 100% complete. Shaw (1984) states that, in general, 20 years of data are required to determine representative rainfall frequency patterns. Studies on rainfall intensity/frequency/duration in the UK have tended to use 30 to 40 years of data. Lam & Leung concluded that eleven years of data were not sufficient to examine extreme values at rainfall stations in Hong Kong reliably.

4. ANALYSIS OF GEO RAINGAUGE DATA

Annual maxima were calculated for the 46 raingauges as follows, using rolling 5-minute data (with the obvious exception of the 5-minute maxima which use the clock 5-minute data intervals).

5-minute	1-hr	2-day
10-minute	2-hr	3-day
15-minute	4-hr	4-day
30-minute	6-hr	5-day
	8-hr	7-day
	12-hr	31-day
	18-hr	45-day
	24-hr	60-day

The maxima were then passed to the HKO who noted and discarded erratic or missing data (see Appendix A), corrected the maxima accordingly and analysed them using Gumbel's method. This method is generally considered to be more appropriate than the alternative Jenkinson's method when evaluating relatively short-period data sets (Peart, 1993 and Lam & Leung, 1994).

Very heavy rainfall (up to 800 mm in 24 hours) was recorded on 2 July 1997 in the Shatin - Ma Liu Shui area and, given the relatively short period for which data are available, the influence of this event on the calculated return periods might be disproportionate (see discussion on data validity in Section 3). To examine the effect of this event on the calculated extreme values, two sets of analyses were carried out, using firstly the 14 years of data from 1984 to 1997 and secondly the 13 years of data from 1984 to 1996 inclusive.

The results of the two analyses were compared. Inclusion of the 1997 data resulted in extreme values at Ma Liu Shui (raingauge N09) which exceeded those calculated using the 1984 to 1996 data by up to 77%. The discrepancy was worst for the 24-hour rainfall duration. The calculated 10- and 50-year return period 24-hour values at N09 (including the 1997 data) were 661 mm and 814 mm respectively, as compared to 431 mm and 507 mm respectively calculated by Lam & Leung (1984) from 100 years of data at the HKO. Using the 1984 to 1996 data, the calculated values are 393 mm and 460 mm respectively.

Overall, for 45 combinations of return period and rainfall duration, inclusion of the 1997 data resulted in calculation of extreme values which were higher by an average of 21% at Ma Liu Shui and 12% at Shatin. By contrast, in areas not affected by the severe rainstorm of 2 July 1997, inclusion of the 1997 data made little difference to the calculated values. As an illustration, at raingauge K01 in Homantin the differences between the two analyses varied from -3% to +6%, averaging 0.5%.

Consultation within the GEO and the HKO revealed a consensus in favour of retaining the 1997 data. The extreme values calculated using both the 1984/1996 and the 1984/1997 data are presented in Appendix B.

5. BELL'S METHOD

Bell (1969), as reported by Shaw (1984), derived generalised rainfall duration/frequency relationships for rainfall of up to two hours duration, based on an assumption that extreme values for periods of two hours or less are a result of the short duration convective cells which occur in many parts of the world (including Hong Kong). Bell's relationship is based on the observation that the ratio of the maximum 60-minute

(rolling 1-hour) rainfall observed in a ten-year period to t -minute depth of rainfall (for durations of 5 to 120 minutes) is consistent for given return periods of between 2 and 100 years. The generalised relationship is expressed as follows:

$$R_{t/T} = (0.21 \ln T + 0.52)(0.54 t^{0.25} - 0.50) R_{60/10} \dots\dots\dots (1)$$

where $R_{t/T}$ = the T -year, t -min rainfall
 T = return period
 t = rainfall duration (minutes)
 $R_{60/10}$ = the maximum recorded 10-year, 60-minute rainfall

Thus the rainfall depth for any duration and any return period within the limits given can be estimated from a knowledge of the maximum 10-year, 60-minute rainfall. Appendix C shows the results from this calculation for the 46 GEO raingauges for a selection of return periods. The maximum rolling 1-hour rainfall recorded at the 46 GEO raingauges during the ten years including and preceding 1997 is shown in Appendix C. Years with missing data were discarded and data from years before 1988 were included where necessary to give ten years of data for each raingauge.

6 RODDA'S METHOD

A study of extreme daily rainfall in the UK by Rodda (1967, 1973), as reported by Shaw (1984), looked at over 120 locations with 50 years or more of data. Gumbel extreme-value distributions were calculated for each station. A linear relationship was found between the calculated one-day extreme values for given return periods (from 2 years to 100 years) and the average annual rainfall at a station, permitting one-day extreme values to be calculated at any site for which the mean annual rainfall was known.

There may be a similar correlation between extreme values and mean annual rainfall in Hong Kong, perhaps also for durations other than one day. The climate in Hong Kong is such that most of the annual rainfall occurs during intense rainstorms. Therefore, areas which have a higher than average mean annual rainfall probably experience a higher than average number of rainstorms, or rainstorms of greater intensity (or both), leading to a statistical probability of higher extreme values.

The most comprehensive assessment of mean annual rainfall in Hong Kong carried out to date is that presented by Ng & Wong (1996), which calculated mean annual rainfall over the period 1961 to 1990 (an internationally accepted standard climatic interval). Ng & Wong used data from approximately 100 Hong Kong Observatory raingauges to arrive at both raingauge-specific mean annual rainfalls and a contoured mean annual rainfall isohyet map (Figure 2). Using these data the mean annual rainfall at the 46 GEO raingauges was estimated (Table 1).

The calculated 60-minute and 24-hour extreme values for return periods of 10, 50 and 100 years at the GEO raingauges were plotted against the estimated mean annual rainfall (Figures 3 and 4). Raingauge N09 (Ma Liu Shui) was omitted due to the considerable uncertainties in calculated extreme values at this location (see Section 4). The rolling 60-minute and 24-hour values were chosen for this analysis as these are the durations most

normally considered in geotechnical design and analysis. The correlation between these short-period (14-year) calculated values and the mean annual rainfall is not strong but can be seen. For simplicity, a linear correlation passing through the origin was assumed. Whether the correlation would be stronger, or could be refined, if long-period data were available is a matter for further investigation.

It is obviously not appropriate to derive a correlation from the calculated (short period) data, apply it to the stations using the mean annual rainfall and examine the results. This would be circular reasoning. An alternative method was therefore used.

The work of Peart (1993) was examined. Peart looked at 21 years of data (1967 to 1987) from recording autographic (not automatic) raingauges at the HKO, Aberdeen Lower Reservoir, Kai Tak Airport and Tai Lam Chung Reservoir. Rainfall for each 15 minute period was manually extracted from the raingauge record charts. Missing data were interpolated from nearby “check” stations. These data are probably of higher quality than the fourteen years of data analysed as part of the present study (longer period and the problem of missing data addressed). Peart derived extreme values for durations of 15 minutes to 31 days (including rolling 60-minutes and 24-hours) and return periods of two to 1 000 years, using both Gumbel and Jenkinson analyses.

The correlation of these parameters with mean annual rainfall is necessarily crude when compared with the work carried out by Rodda, as there are only four stations with relatively long-period data and the range of mean annual rainfall covered is rather low (1 991 mm to 2 214 mm as opposed to a total range of approximately 1 400 mm to 3 100 mm within the whole of Hong Kong). For this reason a simple linear correlation passing through the origin was assumed. These plots are shown in Figures 5 and 6. The equations of line are very similar to those derived from the short-period data calculated from the 46 GEO raingauges (see Figures 3 and 4).

The equations of line derived from Peart’s data were then applied at each of the GEO raingauges using the mean annual rainfall estimated from Ng & Wong (1996), allowing the extreme values to be calculated (Appendix D). The rationale behind this approach was that the absolute values (hence the slope of the equation of line) derived from Peart’s 21-year checked and interpolated data were probably more accurate than the results obtained from the analysis of the 14 years of data from the GEO raingauges.

7. DISCUSSION

The extreme values obtained using the three different techniques were compared for 60-minute and 24-hour durations with return periods of 10 years, 50 years and 100 years. These data are shown in Tables 2 and 3. In order to compare and assess the results from the different methods, the raingauges have been divided into five categories, as follows.

Category 1

The extreme value results agree within 15% or less for all return periods for both the 60-minute duration data (three methods) and the 24-hour data (two methods). There are 22

raingauges in this category, as follows:

H01, H02, H03, H04, H05, H06, H07, H08, H09, H12, H13, H14, H15, H16, H17, H20, H22
K06, K08
N01, N06, N10

The agreement between the various methods tends to suggest that the annual maxima and the calculated extreme values over the 14 years considered lie on the long-term trend, with extreme values also varying predictably with mean annual rainfall. The estimated mean annual rainfall at these stations ranges from 1 800 mm to 2 410 mm, which might indicate that the postulated correlation holds good over a broad range.

Category 2

The extreme values calculated from the GEO raingauge data (Gumbel distribution) and from the correlation with mean annual rainfall for all return periods for both the 60-minute and 24-hour durations are within 15%, but the values calculated using Bell's 10-year/1-hour maxima method deviate from the GEO raingauge data by more than 15%. There are six raingauges in this category, as follows:

H10, H19
K05
N02, N03, N04

For all six of these gauges the extreme values calculated from Bell's method are greater than those calculated from the GEO raingauge data or the mean annual rainfall correlation. This suggests that scatter in a small number of the annual maxima is driving the Bell calculation but is not affecting the Gumbel distribution significantly.

The data available therefore suggest that the extreme values derived from the Gumbel analyses of the GEO raingauge data are reasonable for the 28 raingauges listed above.

Category 3

The extreme values derived from Bell's method and from the Gumbel distributions of the GEO raingauge data are within 15% of each other for all the 60-minute duration return periods, but the extreme values derived from the mean annual correlations deviate from the Gumbel values by more than 15% for any return period for either the 60-minute or 24-hour data (or both). There are eleven raingauges in this category, as follows:

H11, H21
K01, K02, K03, K04
N05, N07, N12, N13, N15

For all these raingauges except N07, N12 and N13, the Gumbel values are less than the values derived from the mean annual rainfall correlation. The available data do not allow any conclusions to be reached regarding the factors affecting these results (the divergence in the extreme value distributions could be a result of a breakdown in the mean annual rainfall

correlation, an incorrect estimate of the mean annual rainfall at each gauge, or a coincidence between invalid Gumbel data and the extreme values derived from the 10-year/1-hour maxima). It might be prudent to assume that the Gumbel extreme values at these locations are an underestimate.

Category 4

The extreme values for any return period for the 60-minute duration data derived from both the mean annual rainfall correlation and the 10-year/1-hour maxima deviate from the Gumbel values by more than 15%. There are five raingauges in this category, as follows:

H18
K07
N08, N11, N16

At all five locations the Gumbel-derived values are less than those determined from the other techniques. Although it is not possible to determine which factors are affecting these results, it might be prudent to assume that the Gumbel values are an underestimate.

Category 5

There are two special cases - raingauges N09 (Ma Liu Shui) and N14 (Tai Mo Shan). N09, as discussed in Section 4, was affected by extreme rainfall in 1997. This appears to have skewed the 24-hour value to unreasonably high levels. On the other hand, if the 1997 data is not used, the calculated 24-hour extreme values are significantly lower than values obtained from the correlation with mean annual rainfall. A prudent approach to assessing extreme values at this location might be to assume that the long-term trends lie somewhere between the 84/97 data and the 84/96 data.

Raingauge N14 is unique in that it is situated at the summit of Tai Mo Shan, the highest point in Hong Kong (957 m). There are no other GEO raingauges at comparable elevations. While it is to be expected that both mean annual rainfall and extreme values here will be considerably above average, the actual calculated extreme values are noticeably higher than would be anticipated from the correlation with mean annual rainfall. This effect is again most noticeable in the 24-hour data. There are a variety of possible explanations. The data in the last 14 years may be atypical. The correlation between extreme values and mean annual rainfall may not be linear. Alternatively, it is possible that Tai Mo Shan has a genuinely different rainfall regime from most of Hong Kong. In the absence of data from other raingauges at high altitude it is not possible to assess which of these might be correct. It would be prudent to assume that the extreme values calculated from the GEO raingauge data are reasonable.

8 CONCLUSIONS

Extreme point rainfall values vary across Hong Kong. Values calculated from long-period data obtained at the Hong Kong Observatory site are not necessarily applicable elsewhere.

Sufficient information exist to make a reasonable assessment of extreme values at any location in Hong Kong, using either values calculated directly from point raingauge data, or indirect methods. These data are presented in Peterson & Kwong (1981), Lam & Leung (1994) and in this Report. Judgement is required to select the most appropriate data and analytical technique for a given purpose.

Extreme values calculated from 14 years of data at 46 GEO automatic raingauges are presented in this Report. These data indicate that there may be a broad correlation with mean annual rainfall, i.e. locations with higher than average mean annual rainfall tend to have higher than average extreme values, and vice-versa.

A generalised relationship between extreme values and the maximum 24-hr rainfall recorded in a given period was established by Bell (1969). This might also be of use in assessing extreme values in Hong Kong.

The extreme values calculated directly using data from 22 of the 46 GEO raingauges are in reasonable agreement (within 15%) with extreme values calculated using both of the indirect techniques mentioned above.

Extreme values calculated at the remaining 24 GEO raingauges differ by more than 15% from the results of one or both of the alternative methods. A conservative assessment might be appropriate at these locations.

9. RECOMMENDATIONS

When assessing extreme rainfall values the nature of the site (size of site and its catchment, topographic setting, type of development planned, etc) and the purpose of the analysis should be considered.

Assessment of extreme values at a point might be appropriate for some applications. If the site under consideration is close to, and at approximately the same elevation as, one of the 22 GEO raingauges (or the Hong Kong Observatory) where confidence in the calculated extreme values is reasonably high (see Section 7), it may be appropriate to use these data directly. If the site is close to one of the other 26 GEO raingauges, a conservative assessment would seem appropriate (see Section 7).

If considering a point location remote from any of the raingauges discussed in this Report, consideration should be given to using one or both of the alternative techniques discussed (see Sections 5 and 6), or to interpolating extreme values from surrounding raingauges. If interpolating between raingauges, due allowance should be made for any significant differences in elevation between the raingauges concerned and the site.

The definition of “close” when considering how far a raingauge is from a site is a matter of judgement. Lam & Leung (1994) have suggested that a “catchment” of 25 km² is appropriate when applying extreme values calculated at the Hong Kong Observatory.

In many instances it is necessary to consider extreme values over an area, usually a catchment, rather than at a point. Drainage design and groundwater modelling are two

examples. An assessment of extreme values over an area could make use of point data where they are available and suitable (see above). If point data are not available, or if the area being considered is large and/or contains significant elevation contrasts, one or both of the alternative assessment techniques discussed in this Report should also be considered. The precise combination of techniques and the weight given to the results obtained will be a matter of judgement.

As the size of the area being considered increases, scale effects begin to influence return periods. As an example, the annual probability of exceedance for rainfall at a given point is generally less than when the whole of Hong Kong is considered. For further discussion of this effect refer to Wong & Ho (1996) and Evans (1997). It must be emphasised that this Report discusses rainfall at a point, and does not examine Depth-Area-Duration (DAD) relationships.

The analyses presented in this Report are limited to maximum return periods of 100 years, owing to the relatively short duration of data available. Extreme values with return periods of up to 1 000 years have been calculated from the long-duration (approximately 100 years) of data from the HKO (Peterson & Kwong, 1981 and Lam & Leung, 1994). If extreme values with return periods of more than 100 years are required at locations other than the HKO, a reasonable approach might be to establish the 100-year return period event (see discussion above), then calculate the ratio between the corresponding desired return period event and the 100-year event at the HKO. The 100-year extreme value at the location or area being considered could then be factored up accordingly.

Analysis of longer-term data (perhaps 20 to 30 years) from a selection of HKO raingauges might help in assessing the validity of the extreme values calculated from the GEO raingauge data. These raingauges are not of the automatic type and the data would have to be extracted from paper records. Nevertheless, if a range of gauges covering the extremes of both altitude and mean annual rainfall was selected, valuable insights could be gained into correlations between medium-long duration values (perhaps daily) and shorter duration values. Longer duration values could be calculated directly. The GEO raingauge data suffer from being concentrated in the urban areas at low altitudes.

By the year 2004 there will be 20 years of detailed rainfall data available from over 40 of the GEO raingauges. This might be sufficient to permit extreme rainfall values at these locations to be calculated and used directly with added confidence. A review of the available data could be considered at that time.

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Table 1 - Estimated Mean Annual Rainfall at GEO Raingauges (1961-1990)

H01	1800		K01	2200		N01	2410
H02	1900		K02	2250		N02	2410
H03	1810		K03	2350		N03	2300
H04	2010		K04	2500		N04	2120
H05	1900		K05	2120		N05	2140
H06	2200		K06	2200		N06	2250
H07	2220		K07	2500		N07	1825
H08	2190		K08	2180		N08	2530
H09	2200					N09	2300
H10	2040					N10	2020
H11	2000					N11	1910
H12	2025					N12	1650
H13	2070					N13	2000
H14	2060					N14	3110
H15	1800					N15	2410
H16	2025					N16	2300
H17	2110						
H18	2200					HKO	2214
H19	2140						
H20	1750						
H21	1940						
H22	2150						

Table 2 - Comparison of 60-minute Extreme Values

	10 yr Return Period					50 yr Return Period					100 yr Return Period				
	Bell	Rodda	Calc	%B	%R	Bell	Rodda	Calc	%B	%R	Bell	Rodda	Calc	%B	%R
H01	104	91	95	-9	5	139	118	125	-11	6	154	130	138	-11	6
H02	102	96	93	-9	-3	136	125	120	-13	-4	151	138	132	-14	-4
H03	104	91	95	-10	4	139	119	124	-12	4	154	131	137	-13	5
H04	107	101	101	-6	0	143	132	132	-9	0	159	146	145	-10	0
H05	92	96	92	0	-4	123	125	118	-4	-6	136	138	128	-7	-7
H06	93	111	99	6	-11	124	145	132	6	-9	138	159	145	5	-9
H07	116	112	104	-12	-7	155	146	138	-13	-6	172	161	152	-13	-5
H08	101	110	97	-4	-12	135	144	128	-5	-11	149	159	141	-6	-11
H09	132	111	117	-13	6	176	145	156	-13	8	195	159	172	-14	8
H10	102	103	96	-6	-7	136	134	118	-15	-12	151	148	128	-18	-13
H11	93	101	96	4	-5	124	132	119	-4	-10	137	145	129	-6	-11
H12	92	102	94	3	-8	122	133	119	-3	-11	136	147	130	-4	-11
H13	106	104	113	6	8	142	136	153	7	12	157	150	169	7	13
H14	110	104	108	-2	4	147	136	144	-2	6	163	149	159	-3	7
H15	100	91	96	-4	6	133	118	120	-11	1	148	130	131	-13	1
H16	95	102	98	3	-4	127	133	127	0	-5	141	147	139	-1	-5
H17	103	106	102	-1	-4	138	139	133	-4	-4	153	153	147	-4	-4
H18	124	111	104	-20	-6	166	145	136	-22	-6	184	159	150	-23	-6
H19	145	108	111	-31	3	194	141	153	-27	9	216	155	171	-26	10
H20	96	88	91	-5	3	128	115	117	-9	2	142	127	128	-11	1
H21	82	98	85	3	-13	110	128	106	-3	-17	122	140	115	-6	-18
H22	110	108	103	-7	-5	147	141	132	-12	-7	163	156	145	-13	-7
K01	107	111	102	-5	-8	143	145	135	-6	-7	159	159	149	-7	-6
K02	104	113	104	0	-8	139	148	136	-2	-8	154	163	149	-3	-9
K03	109	118	117	7	-1	145	155	160	9	3	161	170	178	10	5
K04	102	126	104	2	-17	137	165	139	2	-16	151	181	153	1	-15
K05	130	107	111	-17	4	174	139	150	-16	8	192	153	166	-16	8
K06	120	111	108	-11	-3	161	145	148	-9	2	178	159	165	-8	4
K07	95	126	87	-9	-31	127	165	110	-16	-33	141	181	120	-17	-34
K08	115	110	107	-8	-3	154	143	144	-7	0	171	158	159	-7	1
N01	126	121	119	-6	-2	168	159	162	-4	2	186	174	181	-3	4
N02	125	121	105	-19	-14	167	159	137	-22	-14	185	174	150	-23	-14
N03	128	116	100	-28	-14	172	151	135	-27	-11	190	167	150	-27	-10
N04	129	107	108	-20	1	173	139	147	-18	5	192	153	164	-17	7
N05	81	108	79	-2	-27	108	141	101	-7	-28	119	155	111	-7	-28
N06	118	113	110	-7	-3	157	148	145	-9	-2	174	163	160	-9	-2
N07	99	92	88	-12	-4	132	120	118	-12	-2	146	132	130	-12	-2
N08	96	128	86	-11	-33	128	166	110	-16	-34	142	183	120	-18	-34
N09	111	116	98	-13	-15	149	151	126	-18	-17	165	167	137	-20	-18
N10	90	102	95	6	-7	120	133	128	6	-4	133	146	141	6	-4
N11	122	96	97	-26	1	163	126	131	-24	4	180	138	145	-24	5
N12	93	83	85	-9	2	124	109	110	-13	1	137	119	121	-13	1
N13	122	101	122	0	21	163	132	163	0	24	181	145	181	0	25
N14	213	157	158	-35	1	285	205	229	-24	12	315	225	259	-22	15
N15	86	121	87	1	-28	115	159	110	-5	-31	128	174	120	-6	-31
N16	134	116	110	-22	-5	179	151	150	-19	-1	198	167	167	-19	0
HKO(1)		112	103		-8		146	132		-9		160	144		-10
HKO(2)			104		-8			132		-9			144		-10
Legend:															
%B	$\frac{\text{Calc} - \text{Bell}}{\text{Calc}} \times 100$					%R	$\frac{\text{Calc} - \text{Rodda}}{\text{Calc}} \times 100$								
HKO(1)	data from 40 years of observations (after Lam & Leung, 1994)														
HKO(2)	data from 21 years of observations (after Peart, 1993)														

Table 3 - Comparison of 24-hour Extreme Values

	10 yr Return Period					50 yr Return Period					100 yr Return Period				
	Rodda	Calc	Calc(2)	%R	%R(2)	Rodda	Calc	Calc(2)	%R	%R(2)	Rodda	Calc	Calc(2)	%R	%R(2)
H01	327	349		7		445	477		7		495	531		7	
H02	345	357		4		470	478		2		523	529		1	
H03	329	310		-6		448	410		-8		498	451		-9	
H04	365	391		7		497	529		6		553	588		6	
H05	345	328		-5		470	431		-8		523	474		-9	
H06	399	394		-1		544	540		-1		605	602		0	
H07	403	359		-11		549	481		-12		611	533		-13	
H08	397	403		1		542	555		2		602	619		3	
H09	399	384		-4		544	506		-7		605	558		-8	
H10	370	387		5		504	509		1		561	561		0	
H11	363	327		-10		495	418		-15		550	457		-17	
H12	368	354		-4		501	458		-9		557	503		-10	
H13	376	409		9		512	548		7		569	606		6	
H14	374	350		-6		509	483		-5		567	539		-5	
H15	327	334		2		445	433		-3		495	475		-4	
H16	368	353		-4		501	463		-8		557	509		-9	
H17	383	364		-5		522	479		-8		580	527		-9	
H18	399	346		-13		544	453		-17		605	498		-18	
H19	388	361		-7		529	486		-8		589	539		-8	
H20	318	301		-5		433	407		-6		481	452		-6	
H21	352	341		-3		480	468		-2		534	521		-2	
H22	390	362		-7		532	466		-12		591	510		-14	
K01	399	337		-16		544	444		-18		605	489		-19	
K02	408	348		-15		556	466		-16		619	516		-17	
K03	427	352		-17		581	484		-17		646	540		-16	
K04	454	342		-25		618	452		-27		688	499		-27	
K05	385	356		-7		524	486		-7		583	541		-7	
K06	399	364		-9		544	497		-9		605	553		-9	
K07	454	356		-22		618	479		-23		688	531		-23	
K08	396	348		-12		539	481		-11		600	537		-10	
N01	437	400		-9		596	554		-7		663	619		-7	
N02	437	446	341	2	-22	596	638	459	7	-23	663	719	508	8	-23
N03	417	358		-14		569	484		-15		633	537		-15	
N04	385	343		-11		524	461		-12		583	511		-12	
N05	388	379		-2		529	533		1		589	598		2	
N06	408	433		6		556	586		5		619	651		5	
N07	331	375		13		451	552		22		502	627		25	
N08	459	333		-27		626	445		-29		696	492		-29	
N09	417	543	341	30	-18	569	814	460	43	-19	633	928	510	47	-19
N10	367	377		3		500	517		3		556	577		4	
N11	347	291		-16		472	382		-19		525	420		-20	
N12	299	351		17		408	509		25		454	576		27	
N13	363	355		-2		495	476		-4		550	528		-4	
N14	564	703		25		769	1044		36		855	1188		39	
N15	437	346		-21		596	463		-22		663	512		-23	
N16	417	323		-23		569	429		-25		633	475		-25	
HKO(1)	402	371		-8		548	507		-7		609	565		-7	
HKO(2)		384		-5			516		-6		572			-6	
Legend:															
Calc	84 – 97 data					Calc(2)	84 – 96 data								
%R	$\frac{\text{Calc} - \text{Rodda}}{\text{Calc}} \times 100$					%R(2)	$\frac{\text{Calc}(2) - \text{Rodda}}{\text{Calc}(2)} \times 100$								
HKO(1)	data from 100 years of observations (after Lam & Leung, 1994)														
HKO(2)	data from 21 years of observations (after Peart, 1993)														

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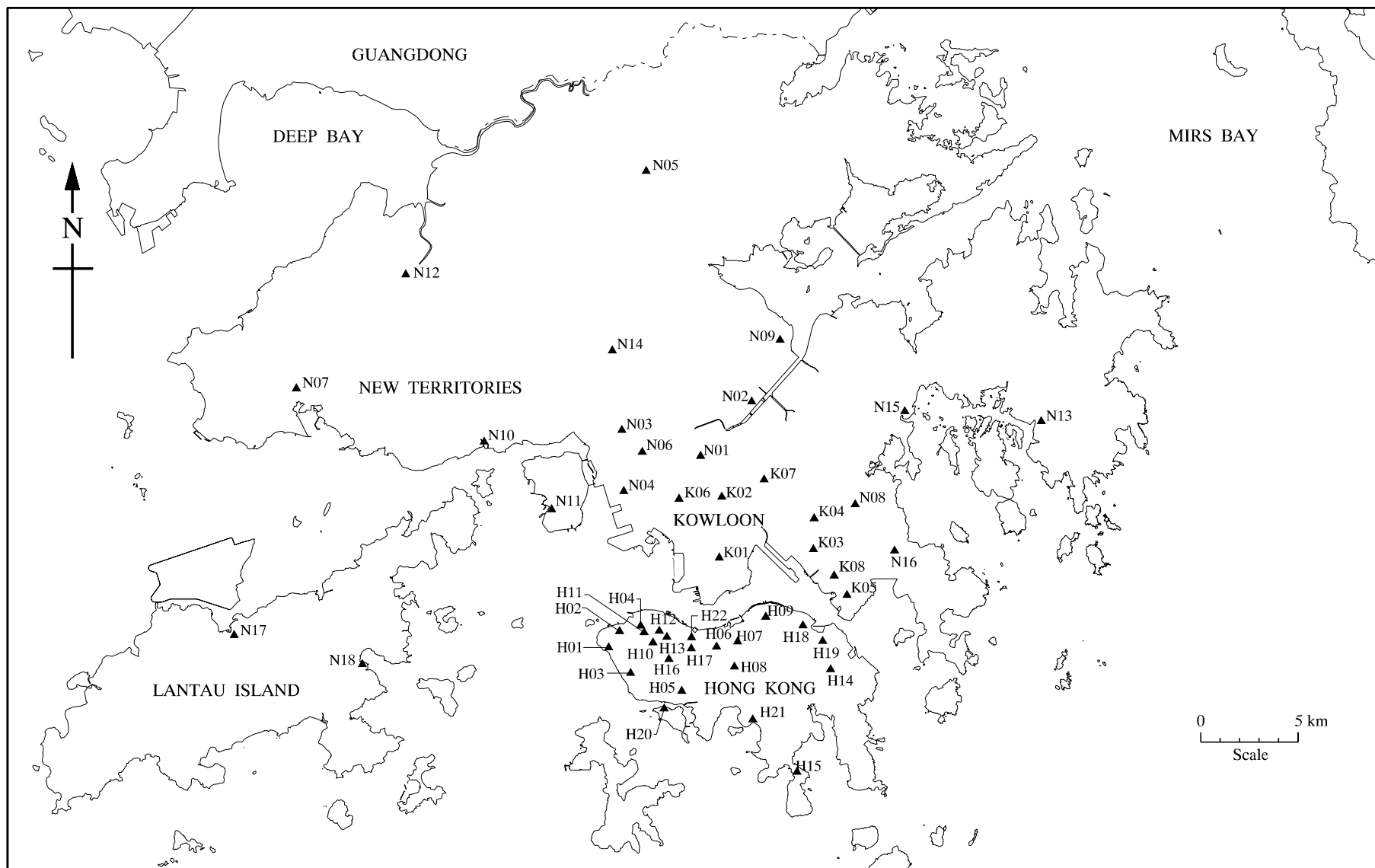


Figure 1 - Locations of the 46 GEO Raingauges Considered in this Report

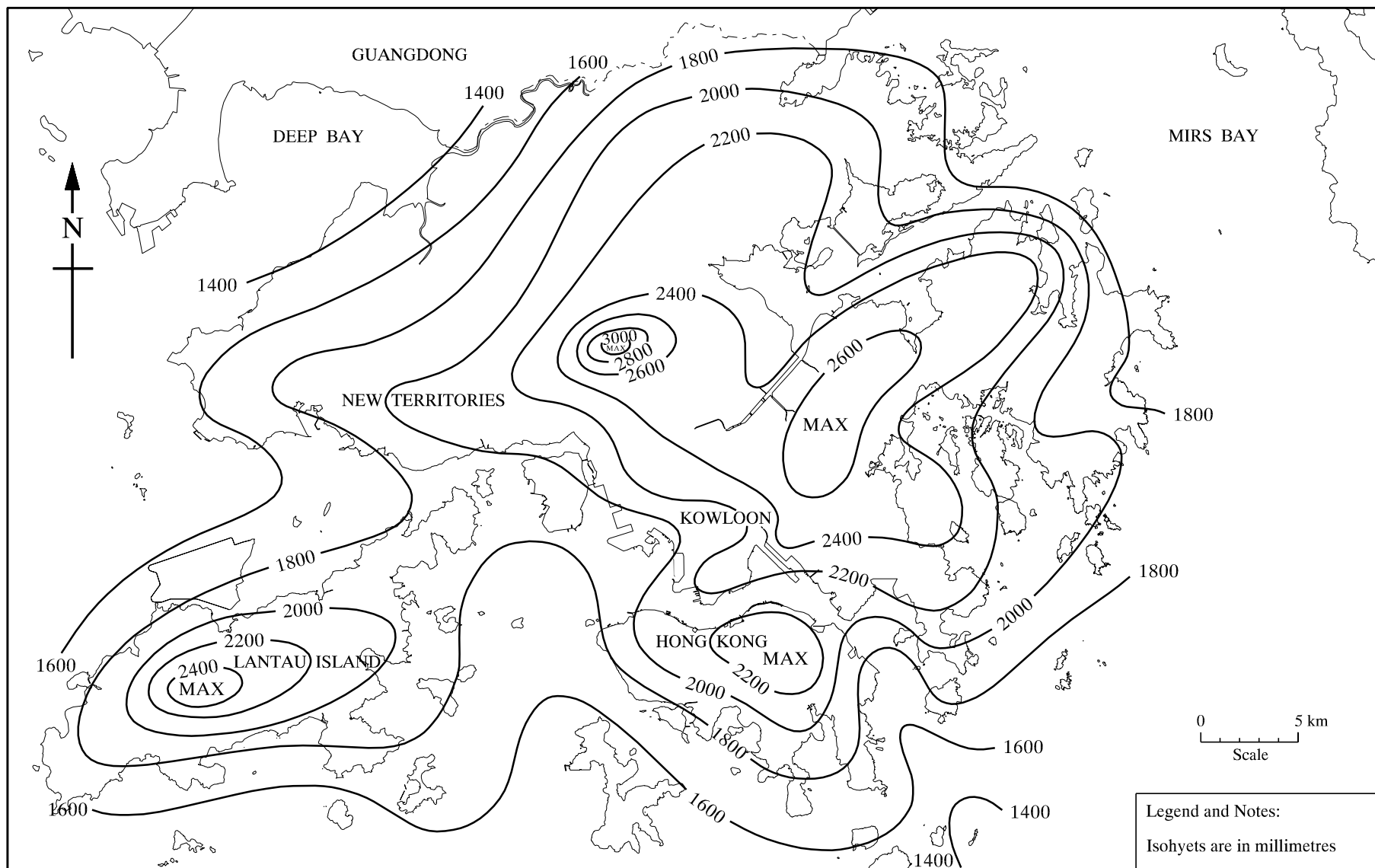
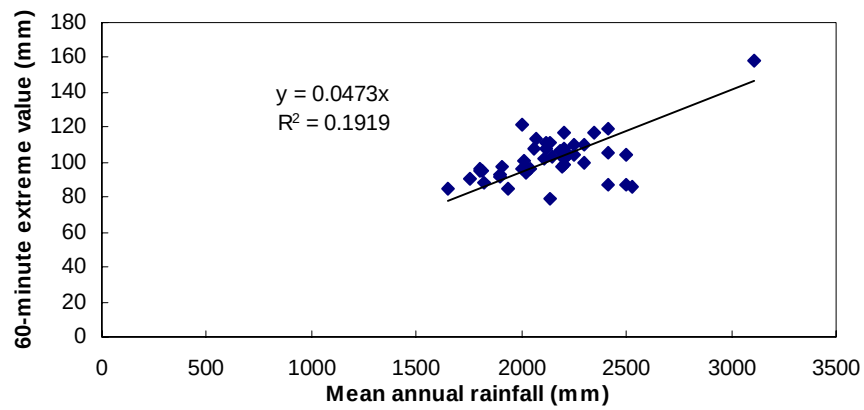
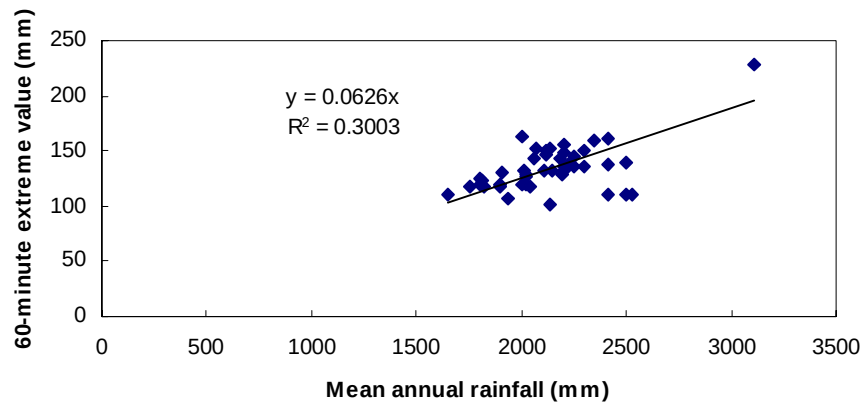


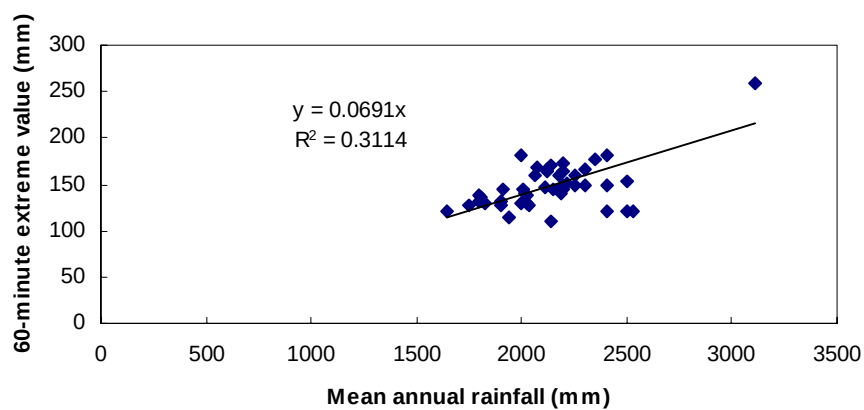
Figure 2 - Mean Annual Rainfall Distribution Map (1961-1990), after Ng & Wong (1996)



(a) 60-minute extreme values, 10-year return period

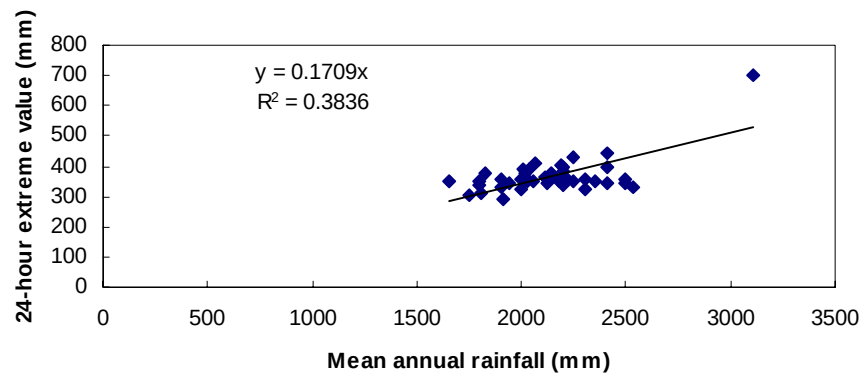


(b) 60-minute extreme values, 50-year return period

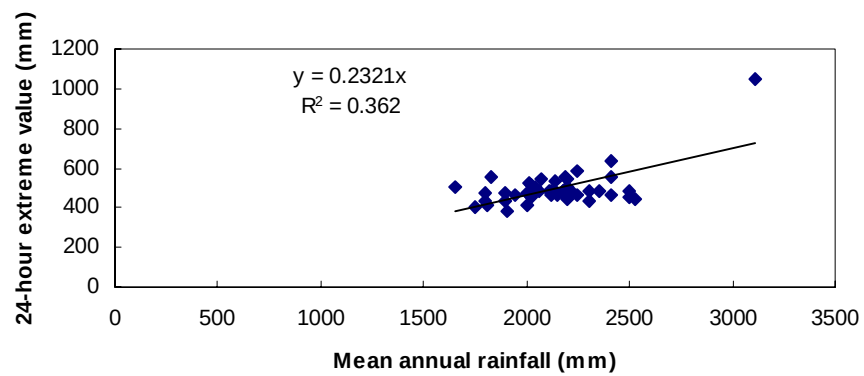


(c) 60-minute extreme values, 100-year return period

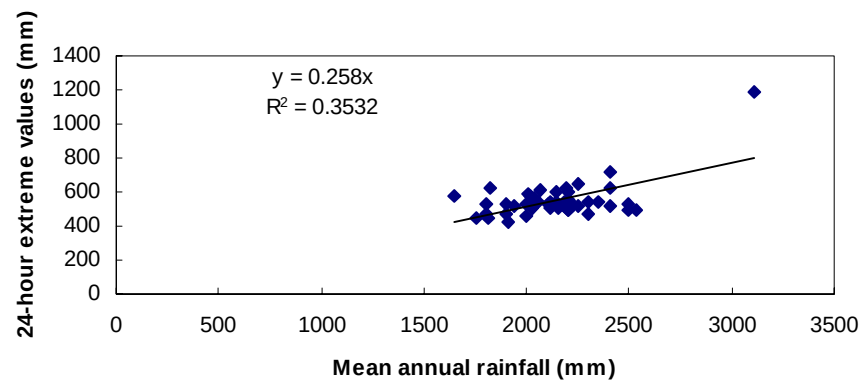
Figure 3 - 60-minute Extreme Values from 14 Years of Data Versus Estimated Mean Annual Rainfall



(a) 24-hour extreme values, 10-year return period

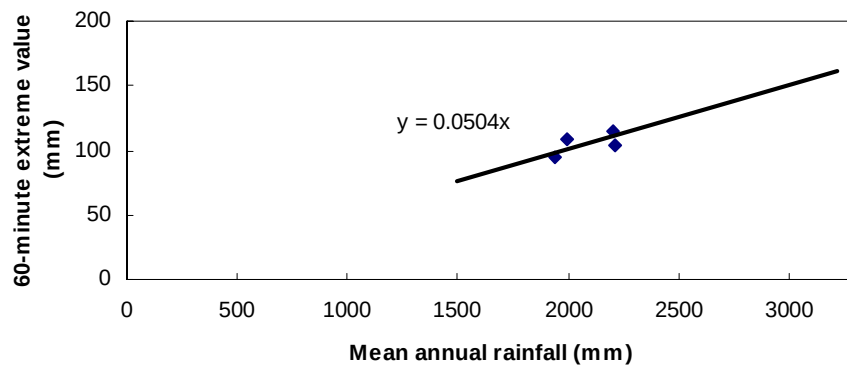


(b) 24-hour extreme values, 50-year return period

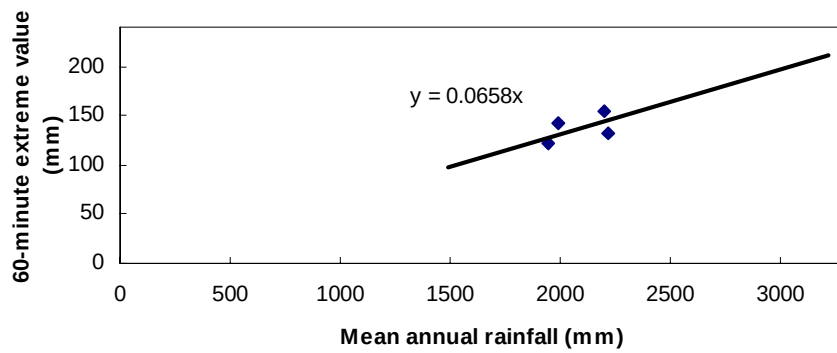


(c) 24-hour extreme values, 100-year return period

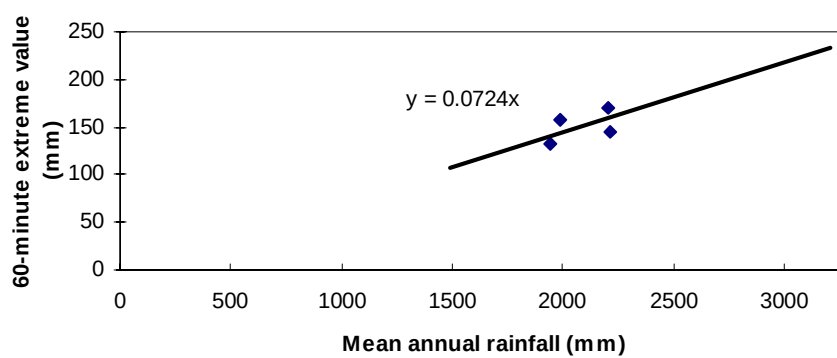
Figure 4 - 24-hour Extreme Values from 14 Years of Data Versus Estimated Mean Annual Rainfall



(a) 60-minute extreme values, 10-year return period

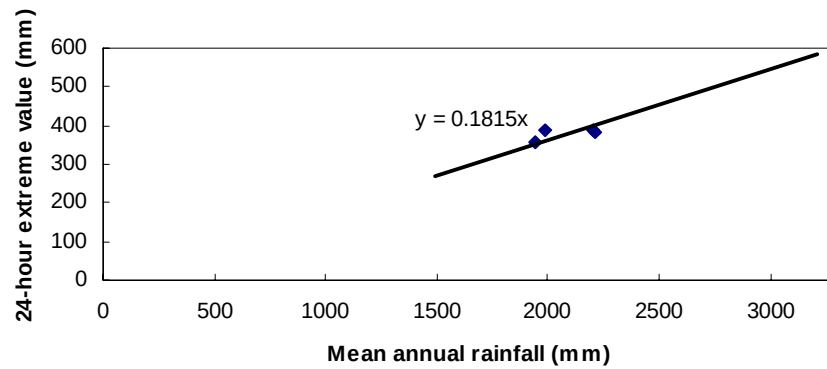


(b) 60-minute extreme values, 50-year return period

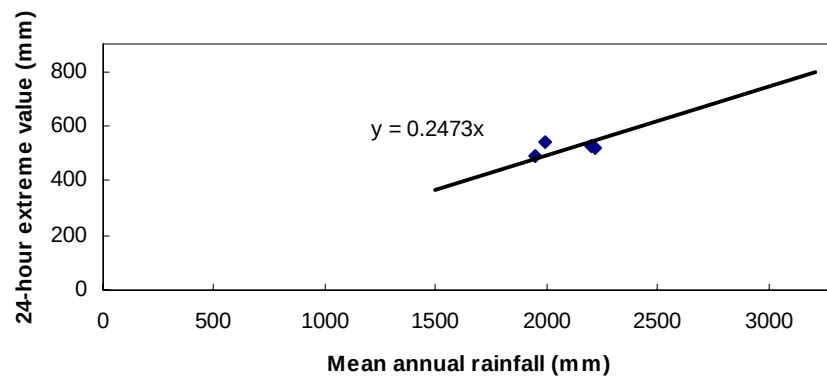


(c) 60-minute extreme values, 100-year return period

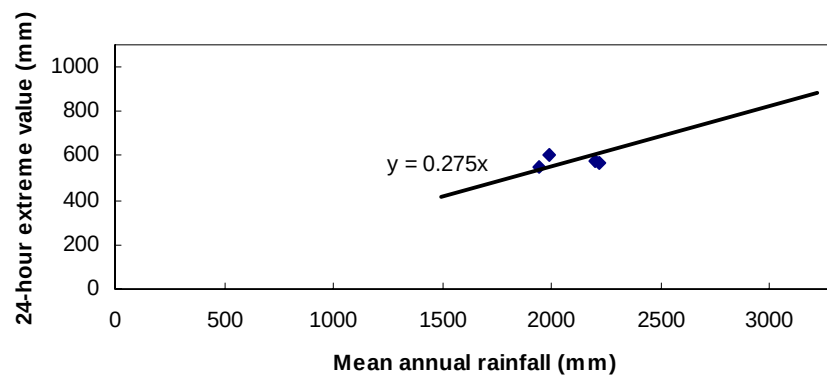
Figure 5 - 60-minute Extreme Values from 21 Years of Data Versus Estimated Mean Annual Rainfall



(a) 24-hour extreme values, 10-year return period



(b) 24-hour extreme values, 50-year return period



(c) 24-hour extreme values, 100-year return period

Figure 6 - 24-hour Extreme Values from 21 Years of Data Versus Estimated Mean Annual Rainfall

APPENDIX A

STATIONS WITH INCOMPLETE OR MISSING DATA DURING RAINSTORMS

H01 - 1989 - incomplete data on 2 May

H06 - 1989 - faulty data on 19 July, no data on 2 May

H07 - 1989 - faulty data on 1 June

H10 - 1988 - incomplete data on heavy rain days
1991 - faulty data on 4, 5 and 7 July

H11 - 1989 - incomplete data on 2 May

H12 - 1989 - faulty data on 5 May, incomplete data on 2 May

H17 - 1995 - no data on most heavy rain days

K01 - 1991 - incomplete data on most heavy rain days

K08 - 1988 - faulty data on 12 May
1989 - no data on 2 May

N04 - 1989 - faulty data on 12 May

N05 - 1987 - no data on heavy rain days
1988 - do data on heavy rain days

N07 - 1986 - incomplete data on heavy rain days
1987 - no data on heavy rain days
1989 - no data on most heavy rain days

N11 - 1986 - incomplete data on 11 May and 12 July
1989 - faulty data on 12 May

N15 - 1988 - faulty data on 26 May

N16 - 1989 - no data on heavy rain days

APPENDIX B

EXTREME RAINFALL VALUES AT 46 GEO RAINGAUGES CALCULATED
USING BOTH 1984 TO 1997 AND 1984 TO 1996 DATA

Raingauge H01

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H01 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	694.8	389.2	837.4	1278.6	1570.7	1850.9	2213.6	2485.4
45-day	601	349.5	729.1	1125.2	1387.5	1639	1964.6	2208.6
31-day	504.2	274.4	604.8	915.8	1121.7	1319.2	1574.9	1766.5
15-day	368.1	206.3	443.7	677.6	832.4	981	1173.2	1317.3
7-day	265.1	156.8	322.6	500.4	618.1	731	877.1	986.6
5-day	251.6	158.9	309.8	489.9	609.1	723.4	871.4	982.4
4-day	243.3	155.4	300.2	476.3	592.9	704.7	849.5	958
3-day	231.6	146.8	285.4	451.8	562	667.7	804.5	907
2-day	211.6	115.8	254.1	385.4	472.3	555.6	663.5	744.4
24-hr	174.8	77.4	203.1	290.8	348.9	404.6	476.7	530.7
18-hr	147.1	78	175.7	264.1	322.7	378.8	451.5	506
12-hr	126.7	75.6	154.4	240.1	296.8	351.3	421.7	474.5
8-hr	110.3	53.4	129.9	190.4	230.5	269	318.8	356.1
6-hr	101.1	42.8	116.8	165.4	197.5	228.4	268.3	298.2
4-hr	91.9	39.4	106.3	151	180.6	208.9	245.6	273.1
2-hr	70.2	30.2	81.2	115.5	138.1	159.9	188	209.1
1-hr	54.4	18.2	61	81.6	95.2	108.3	125.2	137.9
30-min	39	9	42.3	52.5	59.3	65.7	74.1	80.4
15-min	26.4	6	28.6	35.4	39.9	44.2	49.8	54
10-min	19.8	5.8	21.9	28.5	32.9	37.1	42.6	46.7
5-min	11.6	5.5	13.7	19.9	24.1	28.1	33.2	37.1

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H01 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	662.8	390	805.8	1247.9	1540.6	1821.3	2184.7	2457.1
45-day	573.5	353.2	702.9	1103.2	1368.2	1622.4	1951.5	2198.1
31-day	481.3	274	581.8	892.3	1097.9	1295.1	1550.4	1741.6
15-day	358.6	215.8	437.7	682.3	844.3	999.7	1200.8	1351.5
7-day	261.5	164.8	321.9	508.7	632.3	750.9	904.5	1019.5
5-day	247.5	166.9	308.6	497.8	623	743.2	898.6	1015.2
4-day	240.1	163.2	300	485	607.5	725	877.1	991
3-day	228.3	154.2	284.9	459.7	575.4	686.5	830.2	937.9
2-day	212	121.2	256.4	393.8	484.8	572.1	685	769.7
24-hr	175.3	80.9	204.9	296.7	357.4	415.6	491	547.5
18-hr	146.2	81.9	176.2	269.1	330.5	389.5	465.8	523
12-hr	126	79.4	155.1	245	304.6	361.7	435.6	491.1
8-hr	109.4	56.1	129.9	193.5	235.7	276.1	328.3	367.5
6-hr	100.7	45	117.1	168.1	201.9	234.2	276.1	307.5
4-hr	92.3	41.1	107.4	154	184.9	214.5	252.9	281.6
2-hr	70.1	31.7	81.7	117.6	141.3	164.1	193.6	215.7
1-hr	54	19.1	61	82.6	96.9	110.6	128.4	141.7
30-min	38.8	9.5	42.2	53	60.1	66.9	75.7	82.3
15-min	26.4	6.3	28.7	35.8	40.5	45.1	50.9	55.3
10-min	19.9	6.1	22.1	29	33.6	38	43.6	47.9
5-min	11.8	5.7	13.9	20.4	24.7	28.8	34.2	38.2

Raingauge H02

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H02 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	812.9	333.4	935	1312.9	1563	1803	2113.6	2346.3
45-day	703.3	302.6	814.2	1157.1	1384.2	1602	1884	2095.2
31-day	562.1	235.7	648.5	915.7	1092.6	1262.3	1481.9	1646.5
15-day	424.8	179.2	490.5	693.6	828.1	957.2	1124.2	1249.3
7-day	310.9	127.6	357.7	502.3	598	689.8	808.7	897.8
5-day	292.2	135.1	341.7	494.8	596.2	693.5	819.3	913.7
4-day	285.5	133.9	334.5	486.3	586.7	683.1	807.8	901.3
3-day	271	128.3	318	463.4	559.7	652	771.6	861.1
2-day	241.3	103	279.1	395.8	473.2	547.3	643.3	715.2
24-hr	193.6	72.8	220.3	302.8	357.4	409.8	477.6	528.5
18-hr	168.5	71.7	194.8	276.1	329.9	381.5	448.3	498.3
12-hr	142.1	66.6	166.5	241.9	291.9	339.8	401.8	448.3
8-hr	122.6	44.5	138.9	189.3	222.7	254.7	296.2	327.2
6-hr	109.7	36.3	123	164.2	191.4	217.5	251.4	276.7
4-hr	93.4	33.6	105.7	143.9	169.1	193.3	224.7	248.2
2-hr	69.2	25.4	78.5	107.2	126.3	144.5	168.1	185.9
1-hr	54.9	16.8	61.1	80.1	92.7	104.8	120.4	132.1
30-min	38.5	9.4	42	52.6	59.7	66.4	75.2	81.8
15-min	24.7	6.9	27.2	35	40.1	45	51.4	56.2
10-min	18.6	5	20.4	26.1	29.9	33.5	38.2	41.7
5-min	10.8	3.5	12.1	16	18.6	21.1	24.4	26.8

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H02 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	782.9	321.4	900.7	1264.9	1506.1	1737.5	2036.9	2261.3
45-day	676.1	291.9	783	1113.9	1332.9	1543	1815	2018.8
31-day	540.6	223.4	622.4	875.6	1043.2	1204	1412.1	1568
15-day	416.7	187.6	485.4	698	838.8	973.9	1148.6	1279.6
7-day	307.3	134	356.4	508.3	608.9	705.4	830.2	923.8
5-day	287.8	141.8	339.8	500.5	607	709.1	841.3	940.3
4-day	282.1	140.6	333.6	493	598.6	699.8	830.8	929
3-day	267.8	134.8	317.2	470	571.1	668.1	793.7	887.8
2-day	243.5	107.2	282.8	404.3	484.7	561.9	661.8	736.6
24-hr	195.5	75.6	223.2	308.9	365.6	420	490.4	543.2
18-hr	170.5	74.4	197.7	282.1	338	391.5	460.9	512.8
12-hr	143	69.5	168.4	247.2	299.3	349.3	414	462.5
8-hr	122.7	46.6	139.8	192.6	227.5	261	304.4	336.9
6-hr	110.4	37.8	124.3	167.1	195.5	222.7	257.9	284.3
4-hr	93.7	35.2	106.6	146.4	172.8	198.1	230.9	255.5
2-hr	68.7	26.6	78.5	108.7	128.7	147.8	172.7	191.3
1-hr	54.3	17.6	60.8	80.8	94	106.7	123.1	135.4
30-min	38.6	9.8	42.2	53.3	60.7	67.8	76.9	83.8
15-min	24.5	7.2	27.2	35.3	40.7	45.9	52.6	57.7
10-min	18.4	5.3	20.4	26.3	30.3	34.1	39	42.7
5-min	10.6	3.6	12	16.1	18.8	21.4	24.8	27.3

Raingauge H03

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H03 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	770.2	323	888.5	1254.6	1497	1729.4	2030.4	2255.9
45-day	666	289	771.9	1099.5	1316.4	1524.5	1793.8	1995.6
31-day	534	223	615.7	868.4	1035.8	1196.3	1404	1559.7
15-day	402.3	169	464.2	655.8	782.6	904.3	1061.8	1179.8
7-day	292.3	118.4	335.8	470	558.9	644.1	754.5	837.2
5-day	275.9	121.9	320.6	458.7	550.2	638	751.5	836.7
4-day	269.3	116.5	312	444.1	531.5	615.4	724	805.3
3-day	255.1	110.4	295.5	420.7	503.6	583.1	686	763.1
2-day	225.6	84	256.4	351.6	414.6	475	553.3	611.9
24-hr	175.1	60.1	197.1	265.2	310.3	353.5	409.5	451.4
18-hr	148.9	60.7	171.2	240	285.6	329.3	385.9	428.3
12-hr	125	61.8	147.6	217.7	264	308.5	366	409.2
8-hr	106.4	47.5	123.9	177.7	213.4	247.6	291.9	325
6-hr	98.8	36.7	112.2	153.8	181.3	207.7	241.9	267.5
4-hr	86.7	35.4	99.7	139.9	166.5	192	225	249.7
2-hr	67.5	31.4	79	114.6	138.2	160.8	190.1	212
1-hr	54.1	17.9	60.7	81	94.5	107.4	124.1	136.6
30-min	37.4	10.9	41.4	53.7	61.9	69.8	80	87.6
15-min	24.1	6.8	26.6	34.3	39.4	44.3	50.6	55.3
10-min	18.1	5.5	20.1	26.3	30.5	34.4	39.6	43.4
5-min	10.3	4.8	12	17.4	21	24.4	28.8	32.1

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H03 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	742.3	318.8	859.2	1220.5	1459.7	1689.2	1986.2	2208.8
45-day	644.2	294.3	752.1	1085.6	1306.5	1518.3	1792.5	1997.9
31-day	515.4	222.4	596.9	849	1015.9	1176	1383.2	1538.5
15-day	397.6	177.5	462.7	663.9	797.2	925	1090.4	1214.3
7-day	290.5	124.4	336.1	477.1	570.4	660	775.9	862.7
5-day	273	128.1	320	465.1	561.2	653.4	772.8	862.2
4-day	267.3	122.4	312.2	450.9	542.7	630.8	744.9	830.3
3-day	253.6	116	296.1	427.5	514.5	598	706.1	787
2-day	228	87.1	260	358.7	424	486.7	567.9	628.7
24-hr	176.1	62.6	199.1	270	317	362.1	420.4	464.1
18-hr	149.1	63.6	172.4	244.4	292.2	337.9	397.2	441.6
12-hr	124.4	64.8	148.2	221.7	270.3	317	377.4	422.7
8-hr	106.8	49.7	125	181.3	218.6	254.4	300.6	335.3
6-hr	98.8	38.4	112.9	156.4	185.3	212.9	248.7	275.5
4-hr	86.3	37.2	99.9	142.1	170	196.8	231.4	257.4
2-hr	66.3	32.9	78.4	115.7	140.4	164.2	194.8	217.8
1-hr	53.8	18.8	60.7	82	96.2	109.7	127.3	140.4
30-min	37.1	11.5	41.3	54.3	62.9	71.2	81.9	89.9
15-min	23.8	7.1	26.4	34.5	39.9	45	51.6	56.6
10-min	17.8	5.7	19.9	26.3	30.6	34.7	40.1	44.1
5-min	9.9	3.8	11.3	15.6	18.4	21.1	24.7	27.3

Raingauge H04

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H04 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	800.8	427.7	957.6	1442.4	1763.3	2071.2	2469.7	2768.4
45-day	705.2	374.3	842.4	1266.6	1547.5	1817	2165.8	2427.1
31-day	570.1	282.8	673.7	994.2	1206.4	1410	1673.4	1870.9
15-day	405.5	219.7	486	735	899.8	1058	1262.6	1416
7-day	302.3	158.5	360.4	540	659	773.1	920.8	1031.5
5-day	281.5	165.4	342.1	529.6	653.7	772.8	926.9	1042.4
4-day	276.4	165	336.9	523.8	647.6	766.4	920.1	1035.3
3-day	267.9	155.8	325	501.6	618.6	730.7	875.9	984.7
2-day	244.7	124.8	290.4	431.8	525.4	615.2	731.5	818.6
24-hr	201.9	83.8	232.6	327.7	390.6	450.9	529.1	587.6
18-hr	172.9	80.8	202.5	294.1	354.8	413	488.3	544.7
12-hr	147.4	75.4	175.1	260.6	317.2	371.5	441.8	494.4
8-hr	127.3	51.3	146.1	204.2	242.7	279.7	327.4	363.3
6-hr	112.6	41.8	127.9	175.3	206.6	236.7	275.6	304.8
4-hr	98	38.8	112.3	156.2	185.3	213.2	249.4	276.5
2-hr	74.2	29.7	85.1	118.7	141	162.3	190	210.7
1-hr	59.7	18.4	66.4	87.3	101.2	114.4	131.6	144.5
30-min	40.6	10.6	44.5	56.5	64.4	72.1	81.9	89.3
15-min	26.1	6.2	28.3	35.4	40	44.5	50.2	54.6
10-min	19	4.9	20.8	26.4	30.1	33.6	38.2	41.7
5-min	11	3.2	12.2	15.9	18.3	20.6	23.6	25.9

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H04 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	761.7	401.9	909	1364.6	1666.2	1955.5	2330	2610.7
45-day	672	364.4	805.5	1218.5	1492	1754.3	2093.8	2348.2
31-day	544.5	271.6	644.1	952	1155.8	1351.4	1604.5	1794.1
15-day	393.2	228.6	477	736.2	907.8	1072.3	1285.4	1445
7-day	296.9	166.4	357.9	546.5	671.3	791.1	946.1	1062.3
5-day	275.7	173.6	339.4	536.1	666.4	791.3	953.1	1074.3
4-day	271.4	173.2	334.9	531.2	661.2	785.9	947.4	1068.3
3-day	264.1	163.7	324	509.6	632.4	750.3	902.8	1017.1
2-day	244.4	130.8	292.3	440.5	538.6	632.8	754.6	845.9
24-hr	202.3	87.7	234.4	333.9	399.7	462.9	544.6	605.9
18-hr	173.3	84.6	204.3	300.1	363.6	424.5	503.3	562.3
12-hr	147.3	79.1	176.2	265.9	325.2	382.1	455.8	511
8-hr	125.3	53.8	145	205.9	246.3	285	335.1	372.7
6-hr	112	43.9	128.1	177.8	210.8	242.3	283.2	313.8
4-hr	97.2	40.7	112.1	158.3	188.8	218.2	256.1	284.6
2-hr	72.7	30.9	84	119.1	142.3	164.6	193.5	215.1
1-hr	58.3	18.8	65.2	86.5	100.6	114.1	131.6	144.7
30-min	39.9	10.9	43.9	56.2	64.4	72.2	82.4	90
15-min	25.5	6.2	27.8	34.8	39.4	43.8	49.6	53.9
10-min	18.6	5	20.4	26.1	29.8	33.4	38	41.5
5-min	10.8	3.4	12	15.8	18.4	20.8	23.9	26.3

Raingauge H05

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H05 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	772.1	411.9	923	1389.8	1698.9	1995.4	2379.2	2666.7
45-day	667.7	351.4	796.5	1194.8	1458.5	1711.4	2038.8	2284.1
31-day	555.9	262.2	652	949.2	1146	1334.7	1579	1762.1
15-day	397.9	208.6	474.3	710.8	867.3	1017.4	1211.8	1357.4
7-day	296.6	134.4	345.8	498.2	599	695.8	821	914.8
5-day	285.3	132.9	334	484.6	584.3	679.9	803.7	896.5
4-day	275.7	130.2	323.4	470.9	568.6	662.3	783.6	874.5
3-day	263.6	121.2	308.1	445.5	536.4	623.7	736.6	821.3
2-day	235.1	89.1	267.7	368.7	435.5	499.7	582.7	644.9
24-hr	188.8	62	211.5	281.8	328.3	372.9	430.7	474
18-hr	158	51	176.7	234.5	272.7	309.4	356.9	392.4
12-hr	133.5	45.3	150.1	201.5	235.5	268.1	310.3	342
8-hr	119.9	33.8	132.3	170.6	196	220.3	251.8	275.4
6-hr	111.7	27.4	121.7	152.8	173.3	193.1	218.6	237.7
4-hr	98.5	29.9	109.4	143.3	165.7	187.3	215.1	236
2-hr	74.5	21.1	82.2	106.1	121.9	137.1	156.8	171.5
1-hr	57.8	15.3	63.4	80.8	92.3	103.3	117.6	128.3
30-min	40	8.7	43.2	53.1	59.6	65.9	74	80.1
15-min	26.8	4.4	28.4	33.4	36.8	39.9	44.1	47.2
10-min	20.1	3.5	21.4	25.3	27.9	30.4	33.7	36.1
5-min	11.2	2.3	12	14.6	16.3	18	20.1	21.7

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H05 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	734.6	391.8	878.2	1322.2	1616.2	1898.3	2263.3	2536.9
45-day	637.4	346.6	764.4	1157.2	1417.3	1666.7	1989.6	2231.6
31-day	532.9	256.6	626.9	917.8	1110.4	1295.1	1534.2	1713.4
15-day	387.6	217.9	467.4	714.4	877.9	1034.7	1237.7	1389.9
7-day	290.8	140.8	342.4	501.9	607.6	708.9	840.1	938.3
5-day	278.9	138.9	329.8	487.2	591.4	691.3	820.7	917.7
4-day	271.1	136.6	321.2	476	578.5	676.9	804.2	899.5
3-day	260	127.3	306.7	451	546.5	638.1	756.8	845.6
2-day	235.2	93.3	269.4	375.2	445.2	512.3	599.2	664.4
24-hr	187.7	65.1	211.5	285.4	334.2	381.1	441.8	487.2
18-hr	156.6	53.5	176.2	236.8	277	315.5	365.4	402.7
12-hr	132.2	47.6	149.7	203.7	239.4	273.7	318	351.3
8-hr	118.8	35.5	131.8	172	198.7	224.2	257.2	282
6-hr	110.4	28.6	120.9	153.3	174.8	195.4	222	242
4-hr	96.9	31.2	108.4	143.7	167.1	189.6	218.6	240.4
2-hr	73.6	22.1	81.7	106.7	123.3	139.1	159.7	175.1
1-hr	56.8	15.8	62.6	80.5	92.4	103.8	118.5	129.5
30-min	39.4	9	42.7	52.9	59.6	66	74.4	80.6
15-min	26.8	4.6	28.5	33.7	37.2	40.6	44.9	48.1
10-min	19.8	3.6	21.2	25.2	27.9	30.5	33.8	36.3
5-min	11	2.2	11.8	14.2	15.8	17.4	19.4	20.9

Raingauge H06

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H06 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	874.1	468.7	1045.9	1577.1	1928.9	2266.3	2703	3030.3
45-day	743.8	408.3	893.5	1356.2	1662.6	1956.5	2336.9	2621.9
31-day	596.1	302.4	706.9	1049.7	1276.6	1494.3	1776	1987.2
15-day	433.6	251.3	525.7	810.5	999.1	1180	1414.1	1589.6
7-day	311.5	165.1	372	559.2	683	801.9	955.7	1071
5-day	290.3	170	352.6	545.3	672.8	795.1	953.5	1072.1
4-day	283.6	167.9	345.2	535.5	661.5	782.4	938.9	1056.1
3-day	276.3	153.2	332.4	506.1	621.1	731.4	874.1	981.1
2-day	239	118.1	282.2	416	504.6	589.6	699.6	782.1
24-hr	194.1	88.8	226.6	327.2	393.8	457.7	540.4	602.4
18-hr	164.8	75.5	192.4	278	334.7	389	459.3	512
12-hr	141.4	63.4	164.6	236.4	284	329.6	388.6	432.8
8-hr	124.6	47.4	141.9	195.6	231.2	265.3	309.4	342.5
6-hr	116.1	40.8	131.1	177.4	208	237.4	275.5	304
4-hr	101.2	38.8	115.4	159.4	188.5	216.4	252.5	279.6
2-hr	75.7	28.2	86.1	118	139.2	159.5	185.8	205.5
1-hr	55.1	19.6	62.2	84.5	99.2	113.3	131.6	145.3
30-min	39.4	9.6	43	53.9	61.1	68	77	83.7
15-min	24.4	4.8	26.2	31.6	35.2	38.6	43.1	46.4
10-min	18.7	3.4	19.9	23.7	26.3	28.7	31.9	34.2
5-min	10.6	2.6	11.6	14.5	16.4	18.3	20.7	22.4

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H06 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	828.8	446.8	992.5	1499	1834.3	2155.9	2572.2	2884.2
45-day	708.2	410	858.5	1323.3	1631	1926.1	2308.2	2594.5
31-day	569.4	302.7	680.3	1023.3	1250.5	1468.4	1750.4	1961.7
15-day	425.1	265.1	522.3	822.7	1021.7	1212.5	1459.5	1644.6
7-day	304.9	174	368.7	565.8	696.4	821.6	983.7	1105.2
5-day	283	179	348.6	551.4	685.7	814.6	981.3	1106.2
4-day	276.5	176.9	341.4	541.8	674.5	801.8	966.6	1090.1
3-day	270	161.4	329.1	512.1	633.2	749.4	899.8	1012.5
2-day	237.1	124.6	282.8	424	517.4	607.1	723.2	810.1
24-hr	191.3	93.7	225.6	331.8	402.1	469.5	556.7	622.1
18-hr	161	79.3	190	279.9	339.4	396.5	470.3	525.7
12-hr	137.7	66.2	162	237	286.7	334.4	396.1	442.4
8-hr	120.6	48.1	138.2	192.8	228.8	263.5	308.3	341.9
6-hr	112.3	40.1	127	172.5	202.6	231.5	268.8	296.8
4-hr	97.7	38.5	111.8	155.5	184.5	212.2	248.1	275
2-hr	73.4	28.6	83.9	116.4	137.9	158.5	185.2	205.2
1-hr	53.3	19.7	60.6	82.9	97.6	111.8	130.1	143.9
30-min	38.5	9	41.8	52	58.8	65.3	73.7	80
15-min	24	4.2	25.5	30.3	33.4	36.5	40.4	43.3
10-min	18.3	3	19.5	22.9	25.2	27.4	30.2	32.3
5-min	10.4	2.4	11.3	14	15.8	17.5	19.8	21.5

Raingauge H07

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H07 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	851.2	410.6	1001.7	1467.1	1775.2	2070.7	2453.3	2739.9
45-day	739.1	340.4	863.9	1249.7	1505.2	1750.2	2067.4	2305.1
31-day	591.3	245.9	681.5	960.2	1144.7	1321.7	1550.8	1722.5
15-day	435.8	200	509.1	735.9	886	1030	1216.4	1356.1
7-day	308.8	140.1	360.2	519	624.1	725	855.6	953.4
5-day	293.7	139.8	344.9	503.3	608.2	708.8	839	936.6
4-day	281.7	139.5	332.9	491	595.7	696.1	826.1	923.5
3-day	271.3	125.9	317.4	460.1	554.6	645.3	762.6	850.5
2-day	239.3	98.1	275.2	386.4	460	530.6	622.1	690.5
24-hr	193.2	73.8	220.2	303.9	359.4	412.5	481.3	532.9
18-hr	164.3	67.1	188.8	264.9	315.2	363.5	426	472.8
12-hr	138.4	65.7	162.5	237	286.3	333.7	394.9	440.8
8-hr	119.6	53.7	139.3	200.2	240.5	279.1	329.1	366.6
6-hr	112.5	44.8	128.9	179.6	213.2	245.4	287.1	318.4
4-hr	97.2	40.5	112	157.9	188.3	217.5	255.2	283.5
2-hr	71.8	32.4	83.6	120.3	144.6	167.9	198.1	220.7
1-hr	57	20.6	64.6	88	103.5	118.3	137.5	151.9
30-min	42.2	9.5	45.7	56.5	63.6	70.5	79.3	86
15-min	27.1	4.9	28.9	34.5	38.2	41.8	46.4	49.8
10-min	20.1	3.4	21.4	25.2	27.8	30.3	33.5	35.8
5-min	11.6	1.7	12.2	14.1	15.4	16.6	18.2	19.3

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H07 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	811.5	372.1	947.8	1369.5	1648.7	1916.6	2263.2	2523
45-day	707.4	334.2	829.9	1208.7	1459.5	1700.1	2011.5	2244.8
31-day	568.8	242.9	657.8	933.1	1115.4	1290.3	1516.6	1686.2
15-day	427.6	210.8	504.9	743.8	901.9	1053.6	1250	1397.2
7-day	303	147.6	357.1	524.4	635.1	741.4	878.9	982
5-day	287.7	147.2	341.7	508.5	618.9	724.9	862	964.8
4-day	275.6	146.9	329.5	495.9	606.1	711.9	848.7	951.3
3-day	265.5	132.5	314	464.1	563.5	658.9	782.3	874.8
2-day	237.9	103.5	275.8	393.1	470.7	545.2	641.6	713.9
24-hr	189.3	77.5	217.7	305.5	363.6	419.4	491.6	545.7
18-hr	159.8	69.8	185.4	264.5	316.8	367	432	480.7
12-hr	133.8	68	158.7	235.8	286.8	335.8	399.2	446.7
8-hr	114.9	53.9	134.7	195.7	236.1	274.9	325.1	362.7
6-hr	108.2	42.6	123.8	172.1	204	234.7	274.4	304.2
4-hr	93.3	39.1	107.6	151.9	181.2	209.3	245.7	273
2-hr	69.3	33.3	81.5	119.3	144.2	168.2	199.2	222.5
1-hr	55.3	21	63	86.8	102.6	117.7	137.2	151.9
30-min	41.4	9.7	45	56	63.3	70.3	79.3	86.1
15-min	26.7	5	28.6	34.3	38	41.7	46.4	49.9
10-min	19.8	3.5	21.1	25	27.7	30.2	33.4	35.8
5-min	11.5	1.8	12.1	14.1	15.4	16.7	18.3	19.5

Raingauge H08

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H08 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	782	479.7	957.8	1501.5	1861.5	2206.8	2653.7	2988.6
45-day	665.8	414.3	817.6	1287.2	1598.1	1896.3	2282.3	2571.6
31-day	561.7	302.3	672.5	1015.1	1241.9	1459.5	1741.1	1952.2
15-day	407.9	239.5	495.7	767.1	946.9	1119.3	1342.5	1509.7
7-day	304.9	146.1	358.4	524	633.6	738.7	874.8	976.8
5-day	288.7	151.6	344.3	516.1	629.9	739	880.3	986.1
4-day	281.6	151.9	337.3	509.5	623.5	732.9	874.5	980.6
3-day	270.8	141.8	322.8	483.5	589.9	692	824.1	923.1
2-day	243.2	112.5	284.4	412	496.4	577.4	682.3	760.8
24-hr	196.4	91.9	230.1	334.3	403.3	469.5	555.1	619.3
18-hr	167.8	81.7	197.8	290.5	351.8	410.6	486.8	543.9
12-hr	148.8	65.5	172.8	247.1	296.3	343.5	404.5	450.3
8-hr	124.3	51	143	200.8	239.1	275.8	323.4	359
6-hr	113	41.5	128.3	175.3	206.5	236.4	275.1	304.1
4-hr	96	40.2	110.7	156.3	186.5	215.4	252.9	281
2-hr	71.1	27.5	81.2	112.3	132.9	152.7	178.3	197.5
1-hr	54.6	18.8	61.4	82.7	96.8	110.3	127.8	140.9
30-min	39.9	9.4	43.4	54	61.1	67.8	76.6	83.1
15-min	24.7	5.3	26.6	32.6	36.6	40.4	45.3	49
10-min	18.5	3.8	19.9	24.2	27	29.8	33.3	36
5-min	10.5	2.7	11.4	14.5	16.5	18.4	20.9	22.8

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H08 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	738.1	448.6	902.5	1411	1747.6	2070.6	2488.6	2801.8
45-day	630.1	409.2	780.1	1243.9	1550.9	1845.5	2226.8	2512.5
31-day	535	294.9	643.1	977.3	1198.6	1410.9	1685.7	1891.6
15-day	397.9	251	489.9	774.4	962.7	1143.4	1377.2	1552.4
7-day	299.3	153.2	355.4	529.1	644	754.3	897	1003.9
5-day	282.5	158.9	340.7	520.7	639.9	754.3	902.3	1013.2
4-day	276	159.4	334.4	515.1	634.7	749.5	898	1009.3
3-day	265.6	148.7	320.1	488.7	600.3	707.3	845.9	949.8
2-day	242.9	118	286.1	419.8	508.3	593.2	703.2	785.5
24-hr	194.2	96.6	229.6	339.1	411.6	481.1	571.1	638.5
18-hr	164.5	85.7	195.9	293	357.3	419	498.8	558.7
12-hr	145.7	68.5	170.8	248.5	299.9	349.2	413	460.9
8-hr	120.5	52.1	139.6	198.6	237.7	275.1	323.6	360
6-hr	109.4	40.8	124.3	170.6	201.2	230.5	268.5	297
4-hr	92.6	40.1	107.3	152.7	182.8	211.7	249.1	277.1
2-hr	69	27.8	79.2	110.8	131.6	151.7	177.6	197.1
1-hr	53.1	18.9	60	81.3	95.5	109.1	126.6	139.8
30-min	39.2	9.5	42.6	53.3	60.4	67.2	76.1	82.6
15-min	24.2	5.3	26.1	32.1	36.1	39.9	44.8	48.5
10-min	18.2	3.8	19.5	23.8	26.7	29.4	32.9	35.5
5-min	10.3	2.8	11.3	14.5	16.6	18.6	21.2	23.2

Raingauge H09

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H09 (based on rainfall data, 1985-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	916.9	480.1	1092.8	1637	1997.2	2342.8	2790.1	3125.3
45-day	798.1	396.6	943.5	1393.1	1690.7	1976.2	2345.8	2622.7
31-day	650.6	285.5	755.3	1078.8	1293	1498.5	1764.5	1963.8
15-day	478.6	223.1	560.4	813.2	980.7	1141.3	1349.2	1505
7-day	353.5	141	405.1	564.9	670.7	772.2	903.5	1001.9
5-day	338.3	136.9	388.5	543.6	646.3	744.9	872.4	968
4-day	328.2	129.9	375.8	523	620.5	713.9	834.9	925.6
3-day	317.1	113.2	358.6	486.9	571.9	653.4	758.8	837.9
2-day	279.5	86.5	311.2	409.1	474	536.2	616.8	677.2
24-hr	217.1	74.1	244.3	328.3	383.9	437.3	506.3	558.1
18-hr	184.8	66.3	209.2	284.4	334.1	381.9	443.7	490
12-hr	155.5	63.1	178.7	250.3	297.6	343.1	401.9	446
8-hr	130.8	50.3	149.3	206.3	244.1	280.3	327.2	362.3
6-hr	125.8	41.3	141	187.8	218.8	248.5	287	315.9
4-hr	111.8	36.5	125.2	166.5	193.9	220.2	254.1	279.6
2-hr	85.1	30.8	96.4	131.4	154.5	176.7	205.4	227
1-hr	64.5	23.3	73.1	99.6	117.1	133.9	155.6	171.9
30-min	45.7	14.5	51	67.4	78.2	88.6	102.1	112.2
15-min	29.1	7	31.7	39.6	44.9	49.9	56.4	61.3
10-min	22.3	5	24.1	29.8	33.6	37.2	41.8	45.4
5-min	12.3	4.2	13.8	18.6	21.7	24.7	28.6	31.5

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H09 (based on rainfall data, 1985-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	866.9	447	1030.8	1537.5	1872.9	2194.7	2611.3	2923.4
45-day	758.5	388.9	901.1	1341.9	1633.7	1913.7	2276.1	2547.6
31-day	621.4	274.2	721.9	1032.6	1238.4	1435.8	1691.2	1882.7
15-day	464.4	234.4	550.3	816.1	992	1160.7	1379.2	1542.9
7-day	343.6	147.3	397.6	564.6	675.1	781.2	918.4	1021.3
5-day	327.9	142.3	380	541.3	648	750.4	882.9	982.3
4-day	319.7	136.2	369.7	524.1	626.4	724.4	851.4	946.5
3-day	311.7	119.8	355.6	491.5	581.4	667.7	779.3	863
2-day	277.7	91.7	311.3	415.3	484.1	550.2	635.6	699.7
24-hr	216.1	78.6	244.9	334	393	449.6	522.8	577.7
18-hr	182.1	70.3	207.9	287.6	340.3	390.9	456.5	505.6
12-hr	152	66.6	176.4	252	302	349.9	412	458.6
8-hr	126.4	51.4	145.3	203.5	242	279	326.9	362.8
6-hr	121.7	40.3	136.5	182.2	212.4	241.4	279	307.2
4-hr	108.4	36.8	121.9	163.6	191.3	217.8	252.1	277.8
2-hr	83.1	32.4	95	131.7	156	179.3	209.4	232
1-hr	62.8	24.3	71.7	99.3	117.5	135	157.7	174.6
30-min	44.3	14.3	49.5	65.7	76.4	86.7	100.1	110
15-min	28.4	6.6	30.8	38.3	43.3	48.1	54.2	58.9
10-min	21.8	5	23.6	29.3	33	36.6	41.3	44.7
5-min	12	4.3	13.6	18.4	21.7	24.8	28.8	31.8

Raingauge H10

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H10 (based on rainfall data, 1984-1987, 1989-1990, 1992-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	899.8	415	1051.9	1522.2	1833.6	2132.4	2519	2808.8
45-day	771.2	367.7	905.9	1322.7	1598.6	1863.3	2205.9	2462.7
31-day	628.4	263.5	725	1023.6	1221.4	1411.1	1656.6	1840.6
15-day	428	209.4	504.8	742.1	899.3	1050	1245.2	1391.4
7-day	318.4	130.8	366.4	514.6	612.7	706.9	828.7	920
5-day	293.4	140.9	345	504.7	610.4	711.8	843	941.4
4-day	288.2	140	339.6	498.3	603.4	704.2	834.7	932.5
3-day	278.5	132.4	327	477.1	576.5	671.8	795.2	887.6
2-day	259.8	104.4	298.1	416.4	494.8	569.9	667.2	740.1
24-hr	220	74.2	247.2	331.3	386.9	440.3	509.4	561.2
18-hr	184.9	76.3	212.8	299.3	356.6	411.5	482.7	535.9
12-hr	156.2	74.8	183.6	268.4	324.5	378.3	448	500.2
8-hr	130.8	53.6	150.4	211.1	251.3	289.9	339.8	377.3
6-hr	122.5	42.4	138	186	217.8	248.3	287.8	317.4
4-hr	104.8	43.2	120.6	169.5	201.9	233	273.3	303.4
2-hr	78.8	29.5	89.6	123	145.2	166.4	193.9	214.5
1-hr	64.7	13.7	69.7	85.2	95.5	105.4	118.2	127.8
30-min	43.2	8.4	46.3	55.8	62.1	68.1	75.9	81.8
15-min	27.6	5.1	29.5	35.2	39	42.6	47.4	50.9
10-min	20	5	21.8	27.4	31.2	34.7	39.3	42.8
5-min	11.5	4	13	17.5	20.5	23.3	27.1	29.8

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H10 (based on rainfall data, 1984-1987, 1989-1990, 1992-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	858.4	407.7	1007.9	1470	1775.9	2069.4	2449.2	2733.9
45-day	742.1	380.8	881.7	1313.3	1599	1873.1	2227.9	2493.7
31-day	603.6	264.5	700.5	1000.4	1198.9	1389.3	1635.8	1820.5
15-day	419.5	222	500.9	752.6	919.2	1079	1285.9	1440.9
7-day	312.9	138.6	363.6	520.7	624.7	724.5	853.6	950.4
5-day	286.7	149.1	341.4	510.4	622.3	729.6	868.6	972.7
4-day	282	148.4	336.4	504.5	615.9	722.6	860.9	964.5
3-day	274	140.5	325.5	484.8	590.2	691.3	822.3	920.4
2-day	257.6	110.8	298.2	423.8	506.9	586.7	689.9	767.3
24-hr	219.3	78.6	248.1	337.2	396.2	452.7	526	580.9
18-hr	184.4	80.8	214.1	305.7	366.3	424.5	499.8	556.2
12-hr	156.6	79	185.6	275.1	334.3	391.2	464.8	519.9
8-hr	132.6	56	153.1	216.6	258.6	298.8	351	390
6-hr	123.9	44.3	140.1	190.3	223.5	255.4	296.6	327.5
4-hr	104.9	45.6	121.7	173.4	207.6	240.5	283	314.8
2-hr	78	31.3	89.5	125	148.5	171	200.2	222.1
1-hr	64.4	14.6	69.7	86.2	97.2	107.6	121.2	131.4
30-min	42.9	8.9	46.2	56.3	62.9	69.3	77.6	83.9
15-min	27.5	5.4	29.5	35.6	39.6	43.5	48.5	52.2
10-min	19.9	5.3	21.8	27.8	31.8	35.5	40.4	44.1
5-min	11.3	4.2	12.8	17.6	20.7	23.8	27.7	30.6

Raingauge H11

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H11 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	823.6	388	965.8	1405.6	1696.7	1976	2337.5	2608.4
45-day	720.6	336	843.7	1224.5	1476.7	1718.5	2031.6	2266.2
31-day	576.5	255.4	670.1	959.5	1151.2	1335	1573	1751.3
15-day	432.2	173.9	496	693	823.5	948.6	1110.6	1232
7-day	318.8	110.3	359.2	484.3	567	646.4	749.2	826.2
5-day	302.1	113.9	343.9	473	558.5	640.5	746.6	826.2
4-day	293.8	113.3	335.4	463.8	548.8	630.4	736	815.1
3-day	283.5	107.4	322.8	444.5	525.1	602.4	702.4	777.4
2-day	251.5	82.4	281.7	375.2	437	496.3	573.1	630.7
24-hr	202.1	55.3	222.4	285.1	326.7	366.5	418.1	456.7
18-hr	176.4	56.3	197	260.8	303.1	343.6	396	435.3
12-hr	150.4	56.2	171	234.6	276.8	317.2	369.5	408.7
8-hr	127.3	44.6	143.6	194.1	227.6	259.6	301.1	332.3
6-hr	115	36.8	128.4	170.1	197.8	224.2	258.5	284.2
4-hr	100.3	33	112.4	149.8	174.6	198.4	229.2	252.2
2-hr	79.6	23.8	88.3	115.3	133.1	150.2	172.4	189
1-hr	63.1	14.4	68.4	84.7	95.5	105.8	119.2	129.2
30-min	41.6	8	44.5	53.6	59.6	65.3	72.7	78.3
15-min	25.9	5.5	27.9	34.2	38.3	42.3	47.4	51.3
10-min	19.8	3.5	21.1	25.1	27.7	30.2	33.5	36
5-min	11.6	2.6	12.5	15.5	17.4	19.3	21.7	23.5

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H11 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	786.1	349.6	914.2	1310.4	1572.8	1824.4	2150.1	2394.1
45-day	687.9	316.3	803.9	1162.4	1399.8	1627.5	1922.2	2143.1
31-day	551.6	235.4	637.9	904.8	1081.4	1250.9	1470.3	1634.7
15-day	421.5	181.4	488	693.6	829.7	960.3	1129.3	1256
7-day	312.2	115.3	354.5	485.1	571.6	654.6	761.9	842.4
5-day	295.3	119	338.9	473.9	563.2	648.9	759.8	842.9
4-day	287.5	118.7	331	465.5	554.5	639.9	750.5	833.4
3-day	278.5	112.9	319.9	447.9	532.6	613.9	719.1	798
2-day	251	86.8	282.8	381.2	446.4	508.9	589.9	650.5
24-hr	201.6	58.3	223	289.1	332.9	374.9	429.3	470
18-hr	176.9	59.1	198.5	265.5	309.8	352.4	407.4	448.7
12-hr	150.5	59.1	172.2	239.1	283.4	325.9	380.9	422.2
8-hr	125.3	46.9	142.5	195.6	230.8	264.6	308.3	341
6-hr	114.6	38.8	128.9	172.8	201.9	229.8	265.9	293
4-hr	99.2	34.8	111.9	151.4	177.6	202.6	235.1	259.4
2-hr	77.8	24.4	86.7	114.4	132.7	150.3	173.1	190.1
1-hr	61.8	13.6	66.8	82.2	92.5	102.3	115	124.5
30-min	40.8	7.7	43.7	52.3	58.1	63.6	70.8	76.1
15-min	25.4	5	27.2	32.8	36.6	40.2	44.8	48.3
10-min	19.5	3.3	20.7	24.4	26.9	29.3	32.4	34.7
5-min	11.3	2.1	12.1	14.6	16.2	17.7	19.7	21.2

Raingauge H12

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H12 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	823.5	425.3	979.4	1461.4	1780.5	2086.6	2482.8	2779.7
45-day	703.7	377.1	841.9	1269.3	1552.3	1823.8	2175.2	2438.5
31-day	562.6	289.9	668.9	997.4	1214.9	1423.6	1693.6	1896
15-day	409.8	217.9	489.7	736.7	900.2	1057.1	1260.1	1412.2
7-day	322.2	137.1	372.4	527.8	630.6	729.3	857	952.7
5-day	305.8	140.7	357.4	516.9	622.6	723.9	855	953.2
4-day	297.4	140.5	348.9	508.1	613.5	714.7	845.5	943.6
3-day	288	129.6	335.5	482.3	579.6	672.8	793.6	884
2-day	259.9	99.7	296.4	409.5	484.3	556.1	649	718.7
24-hr	210.6	63.5	233.9	305.8	353.5	399.2	458.3	502.7
18-hr	180.2	61.4	202.8	272.4	318.5	362.7	419.9	462.8
12-hr	152.4	63.4	175.7	247.5	295.1	340.8	399.9	444.1
8-hr	127.3	48.9	145.2	200.7	237.4	272.6	318.1	352.3
6-hr	115.4	40.2	130.2	175.7	205.9	234.8	272.3	300.4
4-hr	99.5	36.4	112.8	154.1	181.4	207.7	241.6	267
2-hr	77.1	27.3	87.1	118	138.5	158.2	183.7	202.7
1-hr	60.1	15.1	65.6	82.8	94.1	105	119.1	129.6
30-min	39.7	8.6	42.9	52.6	59	65.2	73.1	79.1
15-min	24.6	5.5	26.6	32.8	36.9	40.9	46	49.9
10-min	18.3	4	19.8	24.3	27.3	30.1	33.8	36.6
5-min	10.6	2.9	11.7	14.9	17.1	19.2	21.9	23.9

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H12 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	782.2	401.7	929.4	1384.7	1686.2	1975.3	2349.6	2630.1
45-day	669.6	375	807.1	1232.1	1513.6	1783.5	2132.9	2394.8
31-day	536	286.2	640.9	965.4	1180.2	1386.2	1652.9	1852.8
15-day	400	229.3	484	743.9	916	1081	1294.7	1454.8
7-day	318.7	144.7	371.7	535.7	644.2	748.4	883.2	984.2
5-day	302.1	148.5	356.6	524.9	636.4	743.3	881.7	985.4
4-day	293.7	148.3	348.1	516.1	627.4	734.1	872.2	975.7
3-day	285.6	136.7	335.7	490.7	593.3	691.7	819.1	914.6
2-day	258.4	105.2	297	416.2	495.2	570.9	668.9	742.4
24-hr	209.4	67	234	309.9	360.2	408.4	470.9	517.7
18-hr	180	64.7	203.7	277	325.5	372.1	432.4	477.5
12-hr	153.1	66.5	177.5	252.9	302.8	350.7	412.7	459.1
8-hr	128.1	51.2	146.9	204.9	243.3	280.2	327.9	363.7
6-hr	116	42.1	131.4	179.2	210.8	241.1	280.3	309.8
4-hr	99.5	38.3	113.5	156.9	185.7	213.3	249	275.8
2-hr	76	28.8	86.6	119.2	140.8	161.6	188.4	208.5
1-hr	59.2	15.8	64.9	82.8	94.6	105.9	120.6	131.6
30-min	39.6	9	42.9	53.2	59.9	66.4	74.8	81.1
15-min	24.3	5.8	26.4	33	37.3	41.5	46.9	50.9
10-min	18.2	4.2	19.8	24.5	27.7	30.7	34.6	37.5
5-min	10.5	3	11.6	15	17.3	19.5	22.3	24.4

Raingauge H13

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H13 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	866	458.6	1034	1553.8	1897.9	2228	2655.3	2975.5
45-day	743.2	409.4	893.2	1357.2	1664.4	1959.1	2340.6	2626.4
31-day	603.9	313.8	719	1074.6	1310.1	1536	1828.4	2047.5
15-day	437.7	257.1	532	823.4	1016.3	1201.4	1441	1620.5
7-day	315.1	180.9	381.5	586.5	722.3	852.5	1021.1	1147.4
5-day	333.6	175.2	397.8	596.5	728	854.1	1017.4	1139.7
4-day	309.1	178.3	374.5	576.5	710.3	838.7	1004.8	1129.2
3-day	300.1	161.6	359.3	542.5	663.7	780	930.5	1043.3
2-day	268	126.4	314.4	457.6	552.5	643.5	761.3	849.5
24-hr	220.6	83.8	251.3	346.3	409.2	469.5	547.6	606.1
18-hr	187.5	78.2	216.2	304.8	363.5	419.7	492.6	547.2
12-hr	159.2	71.1	185.3	265.8	319.2	370.3	436.6	486.2
8-hr	134.3	49.2	152.4	208.2	245.2	280.6	326.5	360.9
6-hr	120.9	40.9	135.9	182.3	213	242.5	280.6	309.2
4-hr	105	38.3	119	162.5	191.2	218.8	254.6	281.3
2-hr	79.8	32.1	91.5	127.8	151.9	175	204.8	227.2
1-hr	59.7	23.8	68.4	95.4	113.3	130.5	152.7	169.3
30-min	42.4	13.8	47.4	63	73.3	83.2	96	105.7
15-min	27	7.9	29.8	38.7	44.6	50.3	57.6	63.1
10-min	20.1	5.4	22.1	28.3	32.3	36.2	41.3	45.1
5-min	11.6	3.8	13	17.3	20.1	22.8	26.4	29

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H13 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	825.8	449.6	990.6	1500.1	1837.5	2161.1	2579.9	2893.8
45-day	711.4	414.9	863.5	1333.7	1645	1943.7	2330.2	2619.9
31-day	579.4	317.6	695.8	1055.8	1294.1	1522.7	1818.6	2040.4
15-day	431.1	270.1	530.1	836.2	1038.9	1233.4	1485	1673.6
7-day	312.2	190	381.8	597.2	739.8	876.6	1053.7	1186.4
5-day	331.4	184	398.8	607.4	745.4	877.9	1049.3	1177.8
4-day	306.1	187.3	374.8	587	727.6	862.3	1036.8	1167.6
3-day	298.5	169.6	360.6	552.9	680.1	802.2	960.2	1078.6
2-day	269.9	131.9	318.2	467.7	566.6	661.5	784.4	876.5
24-hr	222.5	87.2	254.4	353.2	418.6	481.4	562.6	623.5
18-hr	189.1	81.4	219	311.2	372.3	430.8	506.6	563.5
12-hr	160.9	73.9	188	271.7	327.2	380.3	449.2	500.8
8-hr	133.9	51.7	152.8	211.4	250.2	287.4	335.6	371.7
6-hr	120.3	43	136	184.8	217	248	288	318
4-hr	103.8	40.3	118.6	164.2	194.4	223.4	260.9	289
2-hr	79.1	33.7	91.4	129.6	154.9	179.1	210.5	234
1-hr	59.3	25	68.4	96.8	115.6	133.6	157	174.4
30-min	42.1	14.5	47.4	63.7	74.6	85	98.4	108.5
15-min	26.7	8.3	29.8	39.1	45.3	51.3	58.9	64.7
10-min	19.8	5.6	21.9	28.3	32.5	36.6	41.9	45.8
5-min	11.4	3.9	12.8	17.3	20.2	23.1	26.7	29.5

Raingauge H14

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H14 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	781.6	437.9	942.1	1438.4	1767	2082.1	2490.1	2795.8
45-day	669.9	376.9	808	1235.1	1517.9	1789.2	2140.3	2403.5
31-day	535.4	303.2	646.5	990.2	1217.8	1436.1	1718.6	1930.3
15-day	396.7	230	481	741.6	914.2	1079.8	1294.1	1454.7
7-day	298.2	135	347.7	500.8	602.1	699.3	825.1	919.3
5-day	275.6	135	325.1	478.2	579.5	676.7	802.5	896.8
4-day	265.3	128.3	312.4	457.8	554.1	646.5	766	855.6
3-day	248.4	115.1	290.6	421	507.4	590.2	697.4	777.8
2-day	214.3	94.2	248.8	355.6	426.3	494.1	581.9	647.7
24-hr	169.6	80.3	199.1	290.1	350.4	408.3	483.1	539.2
18-hr	145.8	70.8	171.7	251.9	305	356	421.9	471.3
12-hr	131.2	55.3	151.5	214.1	255.5	295.3	346.8	385.4
8-hr	115.2	47.5	132.6	186.4	222.1	256.3	300.5	333.7
6-hr	107.9	44.7	124.3	175	208.6	240.8	282.5	313.7
4-hr	96.4	43.1	112.2	161	193.4	224.4	264.5	294.6
2-hr	76.5	29.5	87.3	120.7	142.8	164	191.5	212
1-hr	59.3	21.7	67.2	91.8	108.1	123.7	143.9	159
30-min	42.5	10.1	46.2	57.6	65.2	72.5	81.9	89
15-min	27.9	4.8	29.7	35.2	38.8	42.3	46.8	50.2
10-min	20.3	4.1	21.8	26.5	29.5	32.5	36.3	39.2
5-min	10.9	2.1	11.7	14.1	15.7	17.2	19.2	20.7

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H14 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	742.5	387.3	884.4	1323.4	1614	1892.8	2253.6	2524
45-day	635.4	354.1	765.1	1166.4	1432.1	1687	2016.9	2264.1
31-day	507.7	278.1	609.6	924.8	1133.5	1333.7	1592.8	1787
15-day	381.3	237	468.1	736.8	914.6	1085.2	1306.1	1471.5
7-day	286.4	132	334.7	484.3	583.4	678.4	801.4	893.6
5-day	263.5	130.5	311.4	459.3	557.2	651.2	772.8	864
4-day	254.1	125.9	300.2	442.9	537.4	628	745.3	833.1
3-day	240.1	117.8	283.3	416.7	505.1	589.9	699.6	781.8
2-day	206.5	94.2	241	347.7	418.4	486.2	573.9	639.7
24-hr	164.1	82.6	194.4	288	350	409.4	486.4	544
18-hr	140.6	72.2	167.1	248.9	303.1	355.1	422.3	472.8
12-hr	126.6	55	146.7	209.1	250.4	290	341.2	379.7
8-hr	110.8	45.1	127.4	178.5	212.3	244.8	286.8	318.3
6-hr	103.8	42.3	119.3	167.2	198.9	229.3	268.7	298.2
4-hr	92.7	42.5	108.3	156.4	188.3	218.9	258.5	288.2
2-hr	74.4	30.1	85.5	119.6	142.2	163.9	192	213
1-hr	58.3	22.7	66.6	92.4	109.4	125.7	146.9	162.8
30-min	42.5	10.6	46.4	58.4	66.3	73.9	83.8	91.2
15-min	27.8	5.1	29.7	35.5	39.3	42.9	47.7	51.2
10-min	20.4	4.3	21.9	26.8	30	33.1	37.1	40.1
5-min	10.9	2.2	11.7	14.2	15.9	17.5	19.6	21.1

Raingauge H15

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H15 (based on rainfall data, 1984-1988, 1991-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	937.4	315.7	1053.1	1410.9	1647.8	1875	2169.1	2389.5
45-day	769.1	270.6	868.3	1174.9	1378	1572.7	1824.8	2013.7
31-day	643.7	241.4	732.2	1005.9	1187	1360.8	1585.8	1754.3
15-day	472.3	166.7	533.4	722.3	847.4	967.4	1122.7	1239.1
7-day	308.5	127.5	355.3	499.8	595.5	687.3	806.1	895.2
5-day	342.1	117.5	385.2	518.3	606.5	691.1	800.6	882.6
4-day	300.6	122.5	345.5	484.4	576.4	664.6	778.7	864.3
3-day	277.6	109.1	317.6	441.3	523.2	601.7	703.4	779.6
2-day	248.8	92.7	282.7	387.7	457.3	524	610.3	675
24-hr	198.2	60.1	220.2	288.4	333.5	376.7	432.8	474.7
18-hr	176.6	51.1	195.3	253.2	291.5	328.3	375.8	411.5
12-hr	150.1	49.1	168.1	223.8	260.6	296	341.8	376
8-hr	135.3	41.8	150.6	198	229.4	259.5	298.5	327.7
6-hr	122.2	37.4	135.9	178.3	206.3	233.2	268	294.1
4-hr	108	32.2	119.8	156.3	180.5	203.7	233.8	256.3
2-hr	86	31	97.4	132.5	155.8	178.2	207.1	228.7
1-hr	62	15	67.5	84.4	95.6	106.4	120.3	130.8
30-min	42.8	10.3	46.6	58.3	66	73.4	83	90.2
15-min	28	6.6	30.4	37.9	42.8	47.6	53.7	58.4
10-min	20.8	4.8	22.5	27.9	31.5	34.9	39.4	42.7
5-min	11.7	2.3	12.6	15.2	17	18.6	20.8	22.5

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H15 (based on rainfall data, 1984-1988, 1991-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	907.1	262	1003.1	1300.1	1496.7	1685.3	1929.4	2112.3
45-day	741.1	245.1	830.9	1108.7	1292.7	1469.1	1697.5	1868.7
31-day	618.8	229.3	702.8	962.8	1134.9	1300	1513.6	1673.8
15-day	459.9	173.6	523.5	720.2	850.4	975.4	1137.1	1258.3
7-day	295.8	125.3	341.8	483.8	577.8	668	784.8	872.3
5-day	330.6	116.6	373.4	505.6	593.1	677.1	785.7	867.2
4-day	289.5	124.3	335.1	476	569.2	658.7	774.5	861.3
3-day	271	114.8	313	443.2	529.3	611.9	718.9	799.1
2-day	241.2	95.7	276.3	384.7	456.5	525.4	614.5	681.3
24-hr	193.7	62.6	216.7	287.6	334.6	379.6	438	481.7
18-hr	172.2	52.3	191.4	250.6	289.9	327.5	376.3	412.8
12-hr	145.5	49.4	163.6	219.6	256.7	292.2	338.3	372.8
8-hr	131	40.2	145.7	191.3	221.5	250.5	288	316.1
6-hr	118.5	36.5	131.9	173.3	200.7	227	261	286.5
4-hr	104.7	31.4	116.2	151.8	175.4	198	227.2	249.2
2-hr	82.8	28.6	93.2	125.6	147	167.6	194.2	214.1
1-hr	60.5	14.9	66	82.9	94.1	104.9	118.8	129.2
30-min	41.8	10.1	45.5	56.9	64.5	71.7	81.1	88.2
15-min	27.7	7	30.3	38.2	43.4	48.5	55	59.9
10-min	20.7	5.1	22.6	28.3	32.1	35.8	40.5	44
5-min	11.5	2.5	12.4	15.2	17.1	18.8	21.1	22.8

Raingauge H16

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H16 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	842.7	419.6	996.4	1472	1786.8	2088.8	2479.7	2772.7
45-day	712.5	378.3	851.2	1279.9	1563.8	1836.1	2188.6	2452.7
31-day	599.6	281.4	702.7	1021.7	1232.9	1435.4	1697.7	1894.1
15-day	435.9	229.2	519.9	779.6	951.6	1116.6	1330.1	1490.1
7-day	320.5	157.2	378.2	556.3	674.3	787.4	933.9	1043.6
5-day	308.7	154.6	365.4	540.5	656.5	767.8	911.8	1019.7
4-day	299	149.9	353.9	523.9	636.4	744.3	884	988.7
3-day	288.5	132	336.9	486.5	585.5	680.5	803.5	895.7
2-day	262.2	92.6	296.1	401.1	470.6	537.3	623.6	688.3
24-hr	203.4	66.4	227.8	303	352.8	400.6	462.5	508.8
18-hr	172.5	61.2	194.9	264.2	310.1	354.1	411.1	453.8
12-hr	143.8	57.3	164.8	229.8	272.8	314	367.4	407.4
8-hr	122.9	43.2	138.7	187.6	220	251.1	291.3	321.4
6-hr	112.3	34.9	125.1	164.7	190.9	216.1	248.6	273
4-hr	96.3	36.5	109.7	151.1	178.5	204.8	238.8	264.3
2-hr	72.5	29.6	83.4	116.9	139	160.3	187.8	208.5
1-hr	58.1	17.6	64.5	84.5	97.7	110.4	126.8	139.1
30-min	42.8	9.2	46.2	56.6	63.5	70.1	78.7	85.2
15-min	26.8	5.9	29	35.7	40.1	44.4	49.9	54.1
10-min	19.9	4.4	21.5	26.5	29.9	33.1	37.2	40.3
5-min	11.6	2.5	12.5	15.3	17.2	19	21.2	23

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H16 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	804.4	397.4	950	1400.4	1698.6	1984.6	2354.9	2632.3
45-day	680.1	374.1	817.2	1241.2	1522	1791.3	2139.9	2401.2
31-day	575.1	277	676.6	990.6	1198.4	1397.8	1655.9	1849.2
15-day	427.5	240.4	515.6	788.1	968.5	1141.6	1365.6	1533.4
7-day	315.5	165	375.9	563	686.8	805.6	959.4	1074.6
5-day	302.9	162.1	362.3	546	667.7	784.4	935.4	1048.6
4-day	293.9	157.4	351.6	530	648	761.3	907.9	1017.8
3-day	284.5	138.6	335.3	492.4	596.4	696.1	825.3	922.1
2-day	261.2	97.2	296.8	407	480	550	640.6	708.5
24-hr	201.4	69.7	227	306	358.3	408.5	473.5	522.1
18-hr	171.4	64.2	194.9	267.7	315.9	362.2	422	466.9
12-hr	143	60.2	165	233.3	278.4	321.7	377.8	419.8
8-hr	121.3	45.3	137.9	189.2	223.2	255.8	298	329.6
6-hr	110.4	36.3	123.7	164.8	192.1	218.3	252.1	277.5
4-hr	93.9	37.7	107.7	150.4	178.7	205.8	240.9	267.2
2-hr	71.1	30.9	82.4	117.4	140.6	162.9	191.6	213.2
1-hr	57.1	18.3	63.8	84.6	98.4	111.6	128.7	141.5
30-min	42.1	9.2	45.4	55.9	62.8	69.5	78.1	84.5
15-min	26.4	6.1	28.6	35.6	40.2	44.6	50.3	54.5
10-min	19.6	4.6	21.3	26.6	30.1	33.4	37.7	41
5-min	11.4	2.4	12.3	15	16.7	18.5	20.7	22.3

Raingauge H17

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H17 (based on rainfall data, 1984-1985, 1987-1989, 1991-1994, 1996-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	881.1	389.3	1023.7	1465	1757.1	2037.3	2400	2671.8
45-day	751.8	329	872.4	1245.3	1492.2	1729	2035.6	2265.3
31-day	613.3	249.5	704.8	987.6	1174.9	1354.5	1587	1761.2
15-day	433.1	220.6	513.9	763.9	929.5	1088.2	1293.8	1447.8
7-day	331.8	159.1	390.1	570.4	689.8	804.3	952.5	1063.6
5-day	310.4	163.7	370.4	556	678.8	796.7	949.2	1063.5
4-day	301.5	160.7	360.4	542.6	663.2	778.9	928.7	1040.9
3-day	292.8	145.6	346.2	511.2	620.4	725.2	860.8	962.5
2-day	260.9	108.7	300.8	424	505.6	583.9	685.2	761.2
24-hr	208.1	69.4	233.5	312.1	364.2	414.1	478.8	527.2
18-hr	179.6	65	203.5	277.2	326	372.8	433.4	478.8
12-hr	156.8	61.8	179.5	249.6	296	340.5	398.2	441.3
8-hr	135	46.8	152.1	205.2	240.3	274	317.7	350.4
6-hr	119.4	38.6	133.6	177.2	206.2	233.9	269.9	296.8
4-hr	102.6	37.1	116.2	158.3	186.1	212.8	247.4	273.4
2-hr	78.6	31	90	125.2	148.4	170.8	199.7	221.3
1-hr	59.2	19	66.2	87.7	101.9	115.6	133.3	146.5
30-min	40.2	12	44.6	58.2	67.2	75.9	87	95.4
15-min	26.6	5.7	28.7	35.2	39.5	43.7	49	53
10-min	20.1	3.5	21.4	25.4	28.1	30.6	33.9	36.4
5-min	11.1	2.9	12.2	15.5	17.7	19.8	22.5	24.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H17 (based on rainfall data, 1984-1985, 1987-1989, 1991-1994, 1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	838	347	965.2	1358.5	1618.9	1868.7	2192	2434.3
45-day	716	320	833.3	1196.1	1436.2	1666.6	1964.8	2188.3
31-day	586	241.4	674.5	948.1	1129.2	1303	1527.9	1696.4
15-day	423.3	235.4	509.6	776.4	953.1	1122.6	1342	1506.3
7-day	327.4	170	389.7	582.4	709.9	832.3	990.7	1109.4
5-day	304.4	174.9	368.5	566.7	698	823.9	986.8	1108.9
4-day	296.1	171.8	359	553.7	682.6	806.2	966.3	1086.2
3-day	289.2	155.5	346.2	522.5	639.2	751.2	896.1	1004.7
2-day	261.1	115.7	303.5	434.6	521.4	604.7	712.5	793.3
24-hr	207.5	74	234.6	318.5	374	427.2	496.2	547.8
18-hr	178.7	69.4	204.1	282.8	334.9	384.9	449.6	498.1
12-hr	156.8	65.8	180.9	255.5	305	352.3	413.7	459.7
8-hr	133.2	50	151.5	208.2	245.7	281.7	328.3	363.3
6-hr	117.2	41	132.2	178.6	209.4	238.9	277	305.7
4-hr	100	39.2	114.4	158.9	188.3	216.5	253.1	280.5
2-hr	76.8	32.9	88.9	126.2	150.9	174.6	205.3	228.3
1-hr	57.9	20	65.2	87.8	102.8	117.2	135.8	149.8
30-min	39.2	12.4	43.7	57.9	67.2	76.1	87.7	96.4
15-min	26.1	6	28.3	35.1	39.6	43.9	49.4	53.6
10-min	19.8	3.7	21.1	25.3	28.1	30.7	34.1	36.7
5-min	10.9	3.1	12	15.5	17.8	19.9	22.8	24.9

Raingauge H18

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H18 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	828.4	453.1	994.5	1508	1848	2174.1	2596.2	2912.6
45-day	718.2	372.4	854.7	1276.7	1556.2	1824.2	2171.2	2431.2
31-day	573.3	291.3	680.1	1010.3	1228.9	1438.6	1710	1913.4
15-day	405.5	218.7	485.6	733.5	897.6	1055	1258.7	1411.4
7-day	301.7	139.7	352.9	511.2	616.1	716.6	846.8	944.3
5-day	287.5	140.1	338.9	497.7	602.8	703.7	834.2	932.1
4-day	285.1	132.7	333.7	484.1	583.7	679.2	802.8	895.5
3-day	273.7	117.9	316.9	450.6	539.1	624	733.9	816.2
2-day	250.6	89.3	283.4	384.6	451.6	515.9	599.1	661.4
24-hr	200.7	64.6	224.4	297.6	346.1	392.7	452.9	498
18-hr	170.6	61.4	193.1	262.7	308.8	353	410.2	453.1
12-hr	147.5	55.3	167.8	230.5	272	311.8	363.4	402
8-hr	131.2	40	145.9	191.2	221.3	250.1	287.4	315.3
6-hr	123.5	33.1	135.6	173	197.9	221.6	252.4	275.5
4-hr	110.7	30.7	121.9	156.7	179.8	201.9	230.5	251.9
2-hr	81.8	25.6	91.2	120.2	139.4	157.9	181.7	199.6
1-hr	60.6	19.4	67.7	89.8	104.3	118.3	136.4	150
30-min	40.7	11.9	45	58.5	67.5	76	87.1	95.5
15-min	24.6	5.5	26.6	32.9	37.1	41.1	46.3	50.1
10-min	18.7	3.5	20	23.9	26.6	29.1	32.4	34.8
5-min	11	2.3	11.8	14.5	16.2	17.9	20.1	21.7

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H18 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	787.3	407.9	936.8	1399.1	1705.2	1998.8	2378.9	2663.7
45-day	684.1	348.6	811.9	1206.9	1468.5	1719.4	2044.2	2287.5
31-day	546.8	265.1	643.9	944.4	1143.3	1334.1	1581.1	1766.1
15-day	390.1	224.4	472.4	726.7	895.1	1056.6	1265.7	1422.4
7-day	290	139.3	341	498.9	603.4	703.6	833.4	930.6
5-day	275.6	139.1	326.6	484.2	588.6	688.7	818.3	915.5
4-day	274.7	134.2	323.8	476	576.7	673.3	798.3	892
3-day	265.1	120.6	309.3	445.9	536.4	623.2	735.5	819.7
2-day	245.1	92.5	279	383.8	453.2	519.8	605.9	670.5
24-hr	198.9	67.9	223.8	300.8	351.7	400.6	463.9	511.3
18-hr	168.5	64.4	192.1	265.1	313.4	359.8	419.9	464.9
12-hr	145.7	58.1	167	232.8	276.4	318.2	372.3	412.8
8-hr	128.8	41.6	144.1	191.2	222.4	252.3	291.1	320.1
6-hr	121	33.8	133.4	171.7	197	221.3	252.8	276.4
4-hr	108.7	31.7	120.3	156.3	180.1	202.9	232.5	254.6
2-hr	80.7	26.8	90.5	120.9	141	160.3	185.2	203.9
1-hr	59.9	20.4	67.3	90.4	105.7	120.4	139.4	153.6
30-min	40	12.4	44.5	58.5	67.8	76.7	88.2	96.8
15-min	24.4	5.8	26.5	33.1	37.4	41.6	47	51.1
10-min	18.5	3.7	19.8	24	26.7	29.4	32.8	35.3
5-min	10.8	2.4	11.7	14.5	16.3	18.1	20.4	22.1

Raingauge H19

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H19 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	875.9	441.7	1037.8	1538.4	1869.9	2187.8	2599.3	2907.7
45-day	755.5	379.6	894.6	1324.9	1609.8	1883.1	2236.8	2501.9
31-day	595.1	300.1	705.2	1045.3	1270.6	1486.6	1766.3	1975.9
15-day	430.8	238.6	518.2	788.6	967.7	1139.4	1361.7	1528.3
7-day	325.7	141.6	377.6	538.1	644.4	746.4	878.3	977.2
5-day	306.6	142.6	358.9	520.5	627.5	730.1	863	962.5
4-day	294.8	138	345.4	501.8	605.4	704.8	833.4	929.8
3-day	284	123.4	329.2	469	561.6	650.4	765.4	851.5
2-day	242.7	97.3	278.4	388.7	461.7	531.8	622.4	690.4
24-hr	190	75.8	217.8	303.8	360.7	415.3	486	538.9
18-hr	162.3	73.6	189.3	272.7	327.9	380.9	449.5	500.9
12-hr	140.2	63.8	163.6	235.9	283.8	329.7	389.2	433.7
8-hr	124.2	51	142.9	200.7	238.9	275.6	323.1	358.7
6-hr	114.1	43.8	130.2	179.8	212.7	244.2	285.1	315.6
4-hr	100.1	41.8	115.5	162.9	194.3	224.4	263.4	292.6
2-hr	75.4	33.8	87.7	126.1	151.5	175.8	207.3	231
1-hr	53.6	25.5	62.9	91.8	111	129.3	153.1	170.9
30-min	37.9	11.5	42.1	55.1	63.7	71.9	82.6	90.6
15-min	24.9	5.6	26.9	33.3	37.5	41.5	46.8	50.7
10-min	18.1	4.8	19.8	25.2	28.8	32.2	36.7	40
5-min	10.5	2.7	11.5	14.6	16.6	18.5	21	22.9

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H19 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	833.6	391.6	977.2	1421.1	1715	1996.9	2361.8	2635.2
45-day	718.9	362.8	851.9	1263.1	1535.4	1796.6	2134.7	2388
31-day	565.9	280	668.5	985.8	1195.9	1397.5	1658.3	1853.8
15-day	416.8	249.5	508.2	791	978.2	1157.8	1390.3	1564.5
7-day	314	143.9	366.7	529.8	637.8	741.4	875.5	976
5-day	294.4	143.9	347.2	510.3	618.3	721.9	855.9	956.4
4-day	284.6	142.3	336.8	498.1	604.9	707.3	839.9	939.3
3-day	275	127.5	321.7	466.2	561.9	653.6	772.4	861.4
2-day	236.9	101.7	274.2	389.4	465.7	538.8	633.6	704.5
24-hr	187.1	79.9	216.4	307	367	424.5	499	554.9
18-hr	159.1	77.5	187.5	275.4	333.6	389.3	461.6	515.7
12-hr	137.4	67.2	162	238.1	288.5	336.8	399.4	446.3
8-hr	120.8	53	140.3	200.4	240.2	278.3	327.7	364.8
6-hr	110.7	45	127.2	178.2	211.9	244.3	286.2	317.6
4-hr	97.2	43.4	113.1	162.3	194.9	226.1	266.5	296.8
2-hr	73.4	35.4	86.3	126.4	152.9	178.4	211.4	236
1-hr	52.2	26.8	62	92.4	112.5	131.7	156.7	175.4
30-min	37.5	12.1	42	55.7	64.8	73.5	84.8	93.2
15-min	24.6	5.9	26.7	33.4	37.8	42	47.5	51.6
10-min	17.8	5	19.6	25.2	29	32.5	37.2	40.6
5-min	10.4	2.8	11.5	14.7	16.8	18.9	21.5	23.5

Raingauge H20

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H20 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	699.2	415.5	851.5	1322.4	1634.2	1933.3	2320.4	2610.5
45-day	596	358.4	727.3	1133.6	1402.5	1660.5	1994.4	2244.7
31-day	492.5	275	593.3	905	1111.4	1309.4	1565.7	1757.7
15-day	358	214.8	436.7	680.2	841.3	995.9	1196	1346
7-day	250.8	148.6	305.2	473.7	585.2	692.2	830.7	934.4
5-day	242.6	148.8	297.1	465.7	577.4	684.5	823.1	926.9
4-day	235.2	141.1	286.9	446.9	552.8	654.4	785.9	884.4
3-day	220.5	132.1	269	418.7	517.9	613	736.1	828.4
2-day	196.4	96	231.6	340.4	412.4	481.5	571	638
24-hr	155.8	64.4	179.4	252.4	300.7	347	407	452
18-hr	131.5	52.9	150.9	210.9	250.5	288.6	337.9	374.8
12-hr	114.8	48.1	132.5	187	223.1	257.8	302.6	336.2
8-hr	103	41.4	118.2	165.2	196.3	226.1	264.7	293.7
6-hr	98.3	35	111.1	150.8	177	202.2	234.7	259.2
4-hr	89.4	35.2	102.3	142.2	168.6	194	226.8	251.4
2-hr	72.8	23.8	81.6	108.5	126.4	143.5	165.6	182.3
1-hr	55.6	15.7	61.4	79.1	90.9	102.2	116.8	127.8
30-min	38.3	10.3	42.1	53.7	61.4	68.8	78.3	85.5
15-min	24.4	4.2	25.9	30.7	33.8	36.9	40.8	43.7
10-min	18.7	2.8	19.7	22.9	25.1	27.1	29.8	31.7
5-min	11	3.6	12.4	16.5	19.2	21.8	25.2	27.7

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H20 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	664.1	413.1	815.5	1283.7	1593.7	1891	2275.9	2564.3
45-day	568.6	364	702	1114.6	1387.7	1649.7	1988.9	2243
31-day	470	275.9	571.1	883.8	1090.9	1289.4	1546.5	1739.1
15-day	348.8	224.9	431.3	686.3	855.1	1017	1226.6	1383.6
7-day	243.6	155.3	300.5	476.5	593.1	704.9	849.6	958.1
5-day	235	155.2	291.9	467.8	584.3	696.1	840.7	949.1
4-day	229.1	147.8	283.3	450.8	561.8	668.2	805.9	909.1
3-day	216.9	138.8	267.8	425.1	529.3	629.2	758.5	855.5
2-day	197.6	100.2	234.3	347.9	423.1	495.2	588.6	658.6
24-hr	154.4	67.6	179.2	255.8	306.6	355.2	418.2	465.5
18-hr	129.5	55.5	149.8	212.6	254.3	294.2	345.9	384.6
12-hr	113.5	50.5	132	189.3	227.2	263.6	310.7	346
8-hr	102.4	43.5	118.3	167.6	200.3	231.6	272.2	302.6
6-hr	97.5	36.7	111	152.6	180.2	206.6	240.9	266.5
4-hr	88.7	37	102.3	144.2	171.9	198.6	233	258.9
2-hr	71.8	24.9	81	109.2	127.9	145.8	169.1	186.5
1-hr	55	16.4	61	79.6	92	103.8	119.1	130.6
30-min	38.3	10.7	42.2	54.4	62.5	70.2	80.2	87.7
15-min	24.4	4.4	26	31	34.3	37.5	41.5	44.6
10-min	18.7	3	19.8	23.1	25.4	27.5	30.3	32.4
5-min	10.8	3.8	12.2	16.5	19.3	22	25.5	28.1

Raingauge H21

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H21 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	752.4	402.1	899.8	1355.5	1657.2	1946.7	2321.3	2602.1
45-day	630.8	338.2	754.7	1138.1	1391.9	1635.4	1950.5	2186.6
31-day	524.1	265	621.3	921.7	1120.6	1311.4	1558.3	1743.4
15-day	382.2	215.4	461.2	705.3	867	1022.1	1222.8	1373.2
7-day	273.2	147	327	493.7	604	709.8	846.8	949.4
5-day	259.9	146.9	313.8	480.3	590.6	696.4	833.3	935.9
4-day	250.2	142	302.2	463.2	569.7	671.9	804.2	903.3
3-day	237	128.6	284.1	429.8	526.3	618.9	738.7	828.4
2-day	211.8	102.8	249.5	366	443.2	517.2	613	684.8
24-hr	169.1	76.5	197.1	283.9	341.3	396.4	467.7	521.1
18-hr	151.2	60.5	173.4	241.9	287.3	330.8	387.1	429.3
12-hr	129.9	53.1	149.3	209.5	249.3	287.5	337	374
8-hr	112.6	43.5	128.6	178	210.6	242	282.6	313
6-hr	100.3	41.4	115.5	162.4	193.5	223.3	261.9	290.9
4-hr	87.8	38.5	101.9	145.6	174.5	202.2	238.1	265
2-hr	70	21.1	77.8	101.7	117.5	132.7	152.4	167.2
1-hr	55.7	12.9	60.5	75.1	84.8	94.1	106.1	115.1
30-min	39.4	7.5	42.1	50.6	56.3	61.7	68.6	73.9
15-min	24	4.3	25.6	30.4	33.7	36.8	40.8	43.8
10-min	17.9	3.3	19.1	22.8	25.3	27.7	30.8	33.1
5-min	10.8	2.2	11.6	14.1	15.8	17.3	19.4	20.9

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H21 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	715.7	365.1	849.6	1263.4	1537.4	1800.3	2140.5	2395.4
45-day	600.9	330	721.8	1095.8	1343.4	1581	1888.4	2118.8
31-day	501	260.2	596.3	891.2	1086.5	1273.8	1516.2	1697.8
15-day	370.7	224.5	453	707.5	876	1037.6	1246.8	1403.6
7-day	262	149.4	316.7	486.1	598.2	705.8	845	949.3
5-day	248.5	148.7	303	471.5	583.1	690.1	828.7	932.5
4-day	240	145.4	293.3	458.2	567.3	672	807.5	909.1
3-day	230.7	134.3	279.9	432.2	533	629.7	754.9	848.7
2-day	204.8	105.8	243.6	363.5	442.9	519.1	617.7	691.6
24-hr	164.8	79.6	194	284.2	344	401.3	475.5	531.1
18-hr	146.9	62	169.6	239.8	286.3	330.9	388.7	431.9
12-hr	125.5	53.1	145	205.2	245.1	283.3	332.8	369.9
8-hr	108.7	41.1	123.7	170.3	201.2	230.7	269	297.7
6-hr	96.5	38.3	110.5	154	182.7	210.3	246	272.7
4-hr	84.5	37.9	98.3	141.2	169.6	196.9	232.2	258.6
2-hr	68.4	21.4	76.3	100.6	116.7	132.1	152.1	167.1
1-hr	54.7	13	59.4	74.1	83.9	93.2	105.3	114.4
30-min	39	7.8	41.9	50.8	56.7	62.3	69.6	75.1
15-min	23.6	4.3	25.2	30.1	33.3	36.4	40.4	43.4
10-min	17.7	3.5	19	22.9	25.5	28	31.2	33.6
5-min	10.8	2.3	11.6	14.3	16	17.6	19.8	21.4

Raingauge H22

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H22 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	914.6	375	1052.1	1477.1	1758.5	2028.4	2377.8	2639.6
45-day	765.9	328.2	886.2	1258.2	1504.5	1740.8	2046.6	2275.7
31-day	622.7	243.6	712	988	1170.8	1346.1	1573.1	1743.1
15-day	455	205.4	530.3	763.1	917.2	1065	1256.4	1399.8
7-day	332.8	139.5	383.9	542	646.6	747	877	974.4
5-day	315.3	141.4	367.1	527.4	633.5	735.3	867.1	965.8
4-day	305.7	141.6	357.6	518.1	624.3	726.2	858.1	956.9
3-day	296.5	131.8	344.8	494.2	593.1	688	810.8	902.8
2-day	270.1	94.4	304.7	411.7	482.5	550.4	638.4	704.3
24-hr	220.9	62.7	243.9	315	362.1	407.3	465.7	509.5
18-hr	186.8	59.4	208.5	275.9	320.4	363.2	418.5	459.9
12-hr	158.1	57.1	179	243.7	286.5	327.6	380.8	420.6
8-hr	135.4	44.1	151.6	201.6	234.6	266.4	307.5	338.2
6-hr	124.5	34.5	137.2	176.3	202.3	227.1	259.3	283.4
4-hr	105.3	33.8	117.7	156	181.4	205.8	237.3	261
2-hr	78.2	29.9	89.1	123	145.4	167	194.8	215.7
1-hr	62.3	18	68.9	89.2	102.7	115.6	132.4	144.9
30-min	43.1	10.9	47.1	59.4	67.6	75.4	85.6	93.1
15-min	27.1	6.2	29.3	36.4	41	45.5	51.2	55.6
10-min	19.8	4.4	21.4	26.4	29.7	32.8	36.9	40
5-min	12.1	2.6	13.1	16	18	19.9	22.3	24.1

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. H22 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	880.3	350.7	1008.8	1406.2	1669.4	1921.8	2248.5	2493.4
45-day	737.5	323.2	855.9	1222.3	1464.8	1697.5	1998.6	2224.3
31-day	601.1	237.2	688	956.9	1134.9	1305.6	1526.6	1692.2
15-day	447	215.4	525.9	770	931.7	1086.7	1287.4	1437.7
7-day	328.7	146.5	382.4	548.4	658.3	763.8	900.2	1002.5
5-day	311.2	148.5	365.6	534	645.4	752.3	890.7	994.4
4-day	302.3	148.7	356.8	525.4	637	744	882.6	986.4
3-day	294.5	138.4	345.2	502.1	606	705.6	834.6	931.3
2-day	268.8	99.1	305.1	417.4	491.8	563.1	655.5	724.7
24-hr	219.3	65.9	243.4	318.1	367.6	415	476.4	522.5
18-hr	185.3	62.4	208.2	278.9	325.7	370.6	428.7	472.3
12-hr	156.8	60	178.7	246.7	291.7	334.8	390.7	432.6
8-hr	133.2	46	150	202.2	236.7	269.8	312.7	344.8
6-hr	122.2	35.6	135.2	175.6	202.3	227.9	261	285.8
4-hr	102.9	34.7	115.6	154.9	181	205.9	238.3	262.5
2-hr	76.7	31.2	88.2	123.6	147	169.5	198.6	220.4
1-hr	61.2	18.6	68	89	103	116.3	133.6	146.6
30-min	42.6	11.3	46.7	59.6	68.1	76.2	86.8	94.7
15-min	26.7	6.4	29.1	36.4	41.2	45.8	51.8	56.3
10-min	19.5	4.4	21.1	26.1	29.4	32.6	36.7	39.8
5-min	12	2.7	13	16.1	18.1	20.1	22.6	24.5

Raingauge K01

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K01 (based on rainfall data, 1984-1988, 1990, 1992-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	836	485.2	1013.8	1563.8	1927.9	2277.2	2729.3	3068.1
45-day	734.2	425.2	890.1	1372	1691.1	1997.2	2393.4	2690.3
31-day	607.9	313.9	723	1078.8	1314.4	1540.4	1832.8	2052
15-day	419.8	232.3	505	768.3	942.6	1109.8	1326.2	1488.4
7-day	269	162.3	328.6	512.6	634.4	751.3	902.5	1015.9
5-day	287.1	157.8	344.9	523.7	642.1	755.7	902.7	1012.9
4-day	255.4	159.9	314	495.3	615.3	730.5	879.5	991.2
3-day	240.5	140.7	292.1	451.5	557.1	658.4	789.5	887.7
2-day	224.4	104.6	262.8	381.4	459.9	535.2	632.7	705.7
24-hr	192.4	64.4	216	289	337.3	383.7	443.7	488.6
18-hr	166.5	69.6	192	270.8	323	373.1	437.9	486.5
12-hr	144.3	73.3	171.2	254.3	309.3	362.1	430.4	481.5
8-hr	125.5	53.2	145	205.2	245.2	283.4	333	370.1
6-hr	116.4	51.5	135.3	193.6	232.3	269.3	317.3	353.2
4-hr	101.6	50.3	120	177	214.7	250.8	297.7	332.8
2-hr	79.2	30.9	90.5	125.5	148.7	170.9	199.7	221.2
1-hr	56.9	19.9	64.2	86.8	101.8	116.1	134.7	148.6
30-min	37.3	10.5	41.1	53	60.8	68.4	78.1	85.5
15-min	22.5	6.5	24.9	32.2	37	41.7	47.7	52.2
10-min	17.1	4.4	18.7	23.8	27.1	30.3	34.4	37.5
5-min	10.1	3.3	11.3	15.1	17.5	19.9	22.9	25.2

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K01 (based on rainfall data, 1984-1988, 1990, 1992-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	785.7	458.7	953.8	1473.7	1817.9	2148	2575.4	2895.6
45-day	690.3	404.6	838.6	1297.1	1600.7	1891.9	2268.9	2551.3
31-day	575.3	288.3	681	1007.8	1224.2	1431.7	1700.4	1901.7
15-day	401.4	240.5	489.6	762.2	942.6	1115.7	1339.8	1507.7
7-day	261.8	172	324.8	519.8	648.8	772.6	932.8	1052.9
5-day	281.1	167.3	342.5	532.1	657.7	778.1	934	1050.9
4-day	248.5	169.5	310.6	502.7	629.9	751.9	909.8	1028.1
3-day	234.3	149.1	288.9	457.9	569.7	677	815.9	920
2-day	218.7	110.4	259.1	384.3	467.1	546.6	649.5	726.6
24-hr	188.1	67.6	212.9	289.5	340.2	388.9	451.8	499
18-hr	161.9	73	188.6	271.3	326	378.6	446.5	497.5
12-hr	139.4	76.8	167.5	254.6	312.3	367.6	439.2	492.8
8-hr	120.3	52.9	139.7	199.6	239.3	277.4	326.6	363.5
6-hr	111.2	50	129.5	186.2	223.7	259.7	306.3	341.2
4-hr	97	50.9	115.7	173.4	211.6	248.3	295.8	331.3
2-hr	76.2	30.9	87.5	122.5	145.7	167.9	196.7	218.2
1-hr	55.4	20.7	62.9	86.3	101.8	116.7	135.9	150.4
30-min	36.4	10.8	40.4	52.6	60.7	68.5	78.6	86.2
15-min	22	6.7	24.5	32.1	37.1	42	48.2	52.9
10-min	16.9	4.7	18.6	24	27.5	30.9	35.3	38.6
5-min	10.1	3.5	11.4	15.3	17.9	20.4	23.6	26.1

Raingauge K02

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K02 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	877.3	504.2	1062.1	1633.7	2012.1	2375	2844.8	3196.9
45-day	752.8	440.7	914.3	1413.8	1744.5	2061.7	2472.3	2780
31-day	617.2	341.2	742.2	1129	1385	1630.7	1948.6	2186.8
15-day	425.5	225.5	508.1	763.7	932.9	1095.3	1305.4	1462.8
7-day	296.2	162.4	355.7	539.8	661.6	778.5	929.7	1043.1
5-day	275.6	163.4	335.5	520.7	643.4	761	913.3	1027.4
4-day	264.6	164	324.7	510.6	633.7	751.8	904.6	1019.1
3-day	251.6	143.3	304.2	466.6	574.2	677.4	810.9	911
2-day	227.6	109.4	267.7	391.7	473.8	552.5	654.5	730.9
24-hr	186.8	71.6	213.1	294.2	348	399.5	466.3	516.3
18-hr	165.2	69.9	190.8	270	322.5	372.8	437.9	486.7
12-hr	145	73.2	171.9	254.8	309.8	362.5	430.7	481.8
8-hr	126.3	61.2	148.8	218.1	264	308.1	365.1	407.8
6-hr	113.9	56.8	134.7	199	241.6	282.5	335.4	375.1
4-hr	102.5	50.8	121.1	178.7	216.9	253.4	300.8	336.3
2-hr	79	34.6	91.7	130.9	156.8	181.7	213.9	238
1-hr	60.5	19.2	67.6	89.3	103.8	117.6	135.5	148.9
30-min	40.5	10.2	44.2	55.7	63.3	70.6	80.1	87.2
15-min	24.8	5.8	27	33.6	38	42.2	47.6	51.7
10-min	19.1	3.5	20.4	24.4	27.1	29.6	32.9	35.4
5-min	11.8	1.5	12.4	14	15.2	16.2	17.6	18.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K02 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	833.9	410.5	984.3	1449.6	1757.7	2053.2	2435.7	2722.3
45-day	713.9	364.5	847.5	1260.6	1534.1	1796.4	2136	2390.5
31-day	588.1	276.1	689.3	1002.2	1209.4	1408.1	1665.4	1858.1
15-day	403.8	216.5	483.2	728.6	891	1046.8	1248.6	1399.7
7-day	259.8	156.1	317	494	611.2	723.5	869	978
5-day	280.4	151.2	335.8	507.2	620.7	729.5	870.4	976
4-day	248.7	155.6	305.8	482.1	598.9	710.9	855.9	964.6
3-day	237.7	131.4	285.9	434.8	533.5	628.1	750.6	842.3
2-day	217	99.6	253.4	366.3	441	512.7	605.4	675
24-hr	180.1	62	202.8	273.1	319.7	364.4	422.2	465.5
18-hr	158.4	63.8	181.8	254.2	302.1	348	407.5	452.1
12-hr	138.1	64.5	161.7	234.8	283.2	329.6	389.7	434.7
8-hr	122.2	44.3	138.5	188.7	222	253.9	295.2	326.2
6-hr	109.6	43.1	125.4	174.2	206.5	237.5	277.7	307.8
4-hr	97.9	43	113.6	162.4	194.7	225.7	265.8	295.9
2-hr	75.7	32.1	87.4	123.7	147.8	170.9	200.7	223.1
1-hr	58.7	17.6	65.1	85.1	98.4	111.1	127.5	139.8
30-min	39.6	10.3	43.4	55	62.8	70.2	79.8	87
15-min	24.4	6	26.6	33.4	37.9	42.2	47.8	52
10-min	18.8	3.6	20.1	24.2	26.9	29.5	32.9	35.4
5-min	11.7	1.5	12.3	14	15.2	16.3	17.7	18.8

Raingauge K03

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K03 (based on rainfall data, 1984-1987, 1989-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	849.6	440.2	1010.9	1509.9	1840.2	2157.1	2567.3	2874.7
45-day	732.7	388.5	875.1	1315.5	1607	1886.7	2248.7	2520
31-day	589.2	315.4	704.8	1062.2	1298.9	1525.9	1819.8	2040
15-day	404.8	247.4	495.5	776	961.7	1139.8	1370.3	1543.1
7-day	287.6	152.4	343.5	516.2	630.5	740.2	882.1	988.5
5-day	273.9	152.9	330	503.2	618	728	870.5	977.2
4-day	265.6	150.5	320.7	491.3	604.2	712.5	852.7	957.8
3-day	252.3	138	302.9	459.3	562.8	662.1	790.7	887
2-day	220.5	105.4	259.1	378.5	457.6	533.5	631.7	705.3
24-hr	172.6	79.9	201.8	292.3	352.3	409.7	484.1	539.9
18-hr	158.8	66.6	183.2	258.8	308.8	356.8	418.9	465.4
12-hr	143	65.7	167.1	241.5	290.8	338.1	399.3	445.2
8-hr	120.9	58.3	142.3	208.4	252.1	294.1	348.5	389.2
6-hr	106.7	55.7	127.2	190.3	232.2	272.3	324.2	363.1
4-hr	92.7	57.6	113.9	179.2	222.4	263.9	317.6	357.9
2-hr	74.2	46.7	91.3	144.3	179.3	213	256.5	289.1
1-hr	58.8	25.8	68.3	97.6	116.9	135.5	159.6	177.6
30-min	38.8	19.3	45.9	67.8	82.3	96.2	114.2	127.6
15-min	23.9	15.2	29.5	46.7	58.1	69.1	83.2	93.9
10-min	17.8	11.5	22	35.1	43.7	52	62.8	70.8
5-min	10.3	7.7	13.1	21.8	27.6	33.1	40.2	45.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K03 (based on rainfall data, 1984-1987, 1989-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	822.2	426.9	978.7	1462.6	1783	2090.3	2488.1	2786.2
45-day	703	374.2	840.1	1264.2	1545	1814.3	2162.9	2424.2
31-day	561.4	298.2	670.7	1008.6	1232.4	1447	1724.9	1933.1
15-day	393.7	267.1	491.6	794.4	994.8	1187.1	1436	1622.5
7-day	273.6	166.6	334.7	523.5	648.6	768.5	923.8	1040.1
5-day	258.5	167.2	319.8	509.3	634.8	755.1	910.9	1027.7
4-day	249.3	164.1	309.4	495.4	618.6	736.7	889.6	1004.2
3-day	236.2	149.1	290.9	459.9	571.8	679.1	818.1	922.2
2-day	205	113.2	246.5	374.8	459.8	541.3	646.8	725.9
24-hr	159.2	80.3	188.6	279.6	339.8	397.6	472.4	528.5
18-hr	147.3	67.4	172	248.4	299	347.5	410.3	457.4
12-hr	130.7	62.2	153.5	224	270.7	315.5	373.4	416.9
8-hr	110.9	42.6	126.5	174.8	206.7	237.4	277	306.8
6-hr	98.3	40.3	113.1	158.9	189.1	218.2	255.8	283.9
4-hr	84.7	38.9	99	143.1	172.3	200.3	236.6	263.7
2-hr	69.3	30.2	80.3	114.6	137.3	159	187.1	208.2
1-hr	54.8	21.4	62.6	86.8	102.9	118.3	138.2	153.1
30-min	36.7	15	42.2	59.2	70.5	81.2	95.2	105.7
15-min	23.5	8.3	26.6	36	42.2	48.2	55.9	61.7
10-min	17.6	5.9	19.8	26.5	31	35.2	40.7	44.9
5-min	10.6	3	11.7	15.2	17.4	19.6	22.4	24.6

Raingauge K04

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K04 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	867.4	442.5	1029.6	1531.2	1863.3	2181.9	2594.2	2903.2
45-day	732.8	385.1	874	1310.5	1599.5	1876.7	2235.6	2504.5
31-day	601.8	313.3	716.6	1071.7	1306.9	1532.4	1824.4	2043.2
15-day	413.9	223.8	495.9	749.6	917.5	1078.6	1287.2	1443.4
7-day	295.2	157.5	352.9	531.4	649.5	762.9	909.6	1019.5
5-day	278.9	158.2	336.8	516.1	634.8	748.6	896	1006.4
4-day	269.9	155.3	326.9	503	619.5	731.4	876.1	984.6
3-day	262.5	134.1	311.7	463.7	564.3	660.8	785.8	879.4
2-day	239.1	105.6	277.8	397.5	476.7	552.7	651.1	724.9
24-hr	192.8	66.5	217.2	292.5	342.4	390.3	452.2	498.7
18-hr	167.7	60.4	189.9	258.3	303.7	347.2	403.4	445.6
12-hr	144.7	63.3	167.9	239.7	287.2	332.8	391.8	436
8-hr	128	59.3	149.7	216.9	261.4	304.1	359.3	400.7
6-hr	114.3	51.5	133.1	191.4	230.1	267.1	315.1	351
4-hr	103.4	49	121.3	176.8	213.6	248.8	294.5	328.7
2-hr	77.1	38.2	91.1	134.4	163.1	190.6	226.2	252.9
1-hr	56.3	21.1	64	87.9	103.7	118.9	138.5	153.2
30-min	38.6	12.2	43.1	57	66.2	75	86.4	95
15-min	23.7	8.1	26.6	35.8	41.8	47.6	55.1	60.7
10-min	17.2	5.8	19.4	26	30.4	34.6	40	44.1
5-min	10	4.3	11.5	16.4	19.6	22.7	26.6	29.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K04 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	845	400.4	991.7	1445.6	1746.1	2034.4	2407.5	2687.1
45-day	717.2	331.6	838.7	1214.6	1463.4	1702.1	2011.1	2242.6
31-day	585.1	260.8	680.7	976.4	1172.1	1359.9	1602.9	1785
15-day	399.7	228.5	483.4	742.3	913.8	1078.2	1291.1	1450.6
7-day	281.7	169.8	343.9	536.4	663.8	786	944.3	1062.8
5-day	264.1	170.7	326.7	520.2	648.3	771.2	930.3	1049.5
4-day	254.3	167.2	315.6	505	630.5	750.9	906.6	1023.4
3-day	246.7	142.3	298.9	460.2	567	669.4	802	901.3
2-day	222.8	105.8	261.6	381.5	460.8	537	635.5	709.4
24-hr	180.7	55.8	201.2	264.4	306.3	346.4	398.4	437.4
18-hr	157.3	53.6	177	237.7	277.9	316.4	366.3	403.7
12-hr	134.1	49.9	152.4	209	246.4	282.3	328.8	363.7
8-hr	120.6	34	133.1	171.6	197.1	221.6	253.3	277
6-hr	106.5	33.6	118.9	157	182.2	206.4	237.7	261.2
4-hr	96.4	33.1	108.5	146.1	170.9	194.8	225.7	248.8
2-hr	73.1	27.8	83.3	114.8	135.6	155.6	181.5	200.9
1-hr	53.1	18.2	59.8	80.4	94	107.1	124	136.7
30-min	36.9	9.4	40.3	50.9	58	64.7	73.4	80
15-min	23.2	4.5	24.8	30	33.4	36.6	40.9	44
10-min	16.8	3.7	18.2	22.3	25.1	27.7	31.1	33.7
5-min	10	2.2	10.7	13.2	14.8	16.3	18.4	19.9

Raingauge K05

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K05 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	797.7	482.6	974.6	1521.6	1883.7	2231.1	2680.8	3017.7
45-day	685.2	406	834	1294.2	1598.9	1891.2	2269.5	2553
31-day	557.6	315.7	673.3	1031.1	1268	1495.2	1789.4	2009.8
15-day	401	231.3	485.7	747.8	921.4	1087.8	1303.3	1464.8
7-day	306.2	142.3	358.3	519.5	626.3	728.7	861.2	960.6
5-day	282.9	145.3	336.1	500.9	609.9	714.5	849.9	951.4
4-day	276.3	142.2	328.5	489.6	596.3	698.6	831.1	930.4
3-day	266.6	126.5	312.9	456.3	551.2	642.3	760.1	848.5
2-day	231.5	100	268.2	381.5	456.6	528.6	621.7	691.6
24-hr	179.7	78.4	208.5	297.4	356.2	412.7	485.8	540.5
18-hr	157.3	69.5	182.8	261.6	313.7	363.7	428.5	477
12-hr	134.8	61.9	157.5	227.7	274.2	318.8	376.5	419.8
8-hr	119.5	47.6	136.9	190.9	226.6	260.9	305.3	338.5
6-hr	108.4	45.5	125.1	176.7	210.9	243.7	286.1	317.9
4-hr	98.1	44.9	114.6	165.5	199.2	231.5	273.4	304.7
2-hr	78.3	31	89.7	124.8	148.1	170.4	199.4	221
1-hr	58.4	23.3	67	93.4	110.9	127.8	149.5	165.8
30-min	42.2	13.3	47.1	62.2	72.1	81.7	94.1	103.3
15-min	27.4	4.8	29.2	34.6	38.1	41.5	46	49.3
10-min	20.9	3.3	22.1	25.9	28.4	30.8	33.9	36.2
5-min	11.5	1.6	12.1	14	15.2	16.3	17.8	19

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K05 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	753.9	434.7	913.2	1405.9	1732.1	2045	2450.1	2753.6
45-day	648.1	371.5	784.2	1205.3	1484.1	1751.6	2097.7	2357.1
31-day	529.2	280.3	631.9	949.6	1159.9	1361.7	1622.8	1818.5
15-day	383.9	236	470.4	737.9	915	1084.8	1304.7	1469.5
7-day	295.2	144.4	348.1	511.8	620.1	724.1	858.6	959.4
5-day	271.3	146.5	325	491	600.9	706.4	842.9	945.2
4-day	265	143.3	317.5	479.9	587.4	690.6	824.1	924.1
3-day	255.9	125.9	302	444.7	539.2	629.9	747.2	835.1
2-day	223.5	100.7	260.4	374.6	450.2	522.7	616.5	686.9
24-hr	176.4	82.2	206.5	299.7	361.3	420.5	497	554.4
18-hr	156.8	72.9	183.5	266.2	320.9	373.4	441.3	492.3
12-hr	134	65	157.9	231.6	280.4	327.2	387.8	433.2
8-hr	117.6	49.9	135.9	192.5	230	266	312.5	347.4
6-hr	106	47.5	123.4	177.2	212.8	247	291.3	324.4
4-hr	95.4	46.6	112.5	165.3	200.3	233.8	277.2	309.7
2-hr	76.5	32.3	88.4	124.9	149.2	172.4	202.5	225
1-hr	57.4	24.4	66.3	94	112.4	130	152.7	169.8
30-min	41.6	13.9	46.7	62.4	72.8	82.8	95.7	105.4
15-min	27	4.6	28.7	33.9	37.4	40.7	45	48.2
10-min	20.7	3.4	21.9	25.8	28.4	30.9	34	36.4
5-min	11.5	1.7	12.1	14	15.2	16.5	18	19.2

Raingauge K06

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K06 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	828.4	459	996.7	1516.9	1861.4	2191.8	2619.4	2939.9
45-day	699.7	402.3	847.2	1303.1	1604.9	1894.5	2269.3	2550.1
31-day	569.6	309.1	682.9	1033.3	1265.3	1487.8	1775.8	1991.7
15-day	410.7	197.3	483	706.7	854.8	996.8	1180.7	1318.5
7-day	296.3	145.8	349.8	515	624.4	729.3	865.2	967
5-day	270.2	150.5	325.4	496	608.9	717.3	857.5	962.6
4-day	263.4	148.3	317.8	485.9	597.2	704	842.2	945.8
3-day	253.9	131.9	302.2	451.7	550.7	645.7	768.6	860.7
2-day	230.5	105.4	269.1	388.5	467.6	543.5	641.7	715.3
24-hr	183.4	80.4	212.9	303.9	364.2	422.1	497	553.1
18-hr	166.5	71.3	192.6	273.4	326.9	378.2	444.6	494.3
12-hr	140.7	74.3	167.9	252.2	308	361.5	430.7	482.6
8-hr	117.8	62.5	140.7	211.5	258.4	303.3	361.5	405.2
6-hr	108.9	57.2	129.9	194.7	237.6	278.7	332	371.9
4-hr	101.2	51.7	120.1	178.6	217.4	254.6	302.7	338.8
2-hr	77.9	35.1	90.8	130.6	157	182.3	215	239.5
1-hr	53.6	24.3	62.5	90	108.3	125.8	148.4	165.4
30-min	38.3	10.9	42.3	54.6	62.8	70.6	80.7	88.3
15-min	26.5	5.1	28.3	34.1	38	41.7	46.4	50
10-min	19.7	3.5	21	25	27.6	30.2	33.5	35.9
5-min	11.2	2	11.9	14.1	15.6	17	18.8	20.2

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K06 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	795.4	355.7	925.8	1329	1595.9	1852	2183.5	2431.8
45-day	669.6	317.5	786	1145.9	1384.2	1612.7	1908.6	2130.3
31-day	547.6	238.6	635	905.5	1084.6	1256.4	1478.7	1645.4
15-day	392.7	179.9	458.6	662.5	797.4	926.9	1094.5	1220.1
7-day	256.7	134.5	306	458.4	559.3	656.2	781.5	875.4
5-day	283.6	126.2	329.8	472.8	567.5	658.3	775.9	864
4-day	250.1	131.9	298.4	448	547	641.9	764.8	857
3-day	242.8	110.7	283.4	408.9	492	571.7	674.8	752.1
2-day	222.4	84	253.2	348.4	411.5	472	550.3	609
24-hr	178.3	59.2	200	267.1	311.5	354.1	409.2	450.6
18-hr	160.2	62.4	183.1	253.8	300.7	345.6	403.8	447.4
12-hr	134.6	61.4	157.1	226.7	272.7	316.9	374	416.9
8-hr	115.5	40	130.2	175.5	205.5	234.3	271.5	299.4
6-hr	106	39.5	120.5	165.2	194.8	223.2	260	287.5
4-hr	97.4	40	112.1	157.5	187.5	216.3	253.6	281.5
2-hr	75.2	28.2	85.5	117.5	138.6	158.9	185.1	204.7
1-hr	51.6	20.3	59	82.1	97.3	111.9	130.9	145.1
30-min	37.5	8.8	40.7	50.7	57.3	63.6	71.8	78
15-min	26	4.8	27.7	33.2	36.8	40.2	44.7	48
10-min	19.4	3.6	20.7	24.8	27.4	30	33.3	35.8
5-min	11	1.9	11.7	13.9	15.4	16.8	18.6	19.9

Raingauge K07

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K07 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	903	504.7	1088	1660	2038.7	2402	2872.2	3224.6
45-day	773.7	444.9	936.8	1441	1774.9	2095.1	2509.6	2820.3
31-day	620.1	363	753.2	1164.6	1437	1698.3	2036.6	2290
15-day	442.1	251.3	534.2	819.1	1007.7	1188.6	1422.8	1598.3
7-day	305.2	177.2	370.1	571	703.9	831.5	996.5	1120.3
5-day	279.1	174	342.9	540.1	670.7	796	958.1	1079.6
4-day	267.8	172.1	330.9	526	655.1	779	939.3	1059.5
3-day	256.9	154.8	313.6	489	605.2	716.6	860.8	968.8
2-day	233.2	114.2	275	404.4	490.1	572.3	678.7	758.4
24-hr	187.9	74.5	215.2	299.6	355.5	409.1	478.5	530.5
18-hr	167.8	68.5	192.9	270.6	322	371.3	435.1	483
12-hr	145.4	65.2	169.3	243.2	292.1	339	399.8	445.3
8-hr	121.4	52.4	140.6	199.9	239.2	276.9	325.6	362.2
6-hr	108.7	43.9	124.8	174.6	207.6	239.2	280.1	310.7
4-hr	94.9	38.2	108.9	152.2	180.8	208.3	243.9	270.6
2-hr	74.3	25.2	83.5	112.1	131	149.1	172.6	190.2
1-hr	55.2	14.1	60.4	76.4	87	97.2	110.3	120.2
30-min	36.3	12.6	41	55.3	64.8	73.8	85.6	94.4
15-min	22.3	11.4	26.5	39.5	48	56.3	66.9	74.9
10-min	16.9	7.2	19.6	27.7	33.1	38.3	45	50.1
5-min	10	3.4	11.2	15.1	17.7	20.2	23.4	25.8

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K07 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	858	444.7	1021	1525	1858.6	2178.7	2593	2903.5
45-day	733	408.7	882.8	1346	1652.6	1946.8	2327.6	2612.9
31-day	586.9	332.7	708.9	1086	1335.7	1575.2	1885.2	2117.6
15-day	421.9	253.2	514.7	801.8	991.8	1174.1	1410.1	1586.9
7-day	290.6	177.4	355.6	556.7	689.8	817.5	982.8	1106.6
5-day	264.9	174.7	329	527	658.1	783.9	946.6	1068.6
4-day	253.6	172.1	316.7	511.8	640.9	764.8	925.2	1045.3
3-day	243.5	152.7	299.5	472.5	587.1	697	839.3	945.9
2-day	223.2	112.2	264.4	391.5	475.7	556.4	661	739.3
24-hr	181.2	71.8	207.5	288.8	342.6	394.3	461.2	511.3
18-hr	162	68.2	187	264.3	315.5	364.6	428.2	475.8
12-hr	139.4	61.6	162	231.8	278	322.3	379.7	422.7
8-hr	117.7	40.4	132.4	178.2	208.5	237.5	275.2	303.3
6-hr	105.6	34.2	118.1	156.8	182.5	207.1	238.9	262.8
4-hr	91.7	32.2	103.5	139.9	164.1	187.2	217.2	239.6
2-hr	72	23.7	80.7	107.5	125.3	142.4	164.5	181
1-hr	54.5	14.8	59.9	76.6	87.7	98.3	112.1	122.4
30-min	35.8	13.2	40.7	55.7	65.6	75.1	87.5	96.7
15-min	22.1	12	26.5	40.1	49.1	57.8	69	77.3
10-min	16.9	7.6	19.6	28.2	33.9	39.3	46.4	51.6
5-min	9.9	3.6	11.2	15.3	18.1	20.7	24	26.5

Raingauge K08

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K08 (based on rainfall data, 1984-1987, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	860.8	493.8	1041.8	1601.4	1972	2327.4	2787.5	3132.3
45-day	735	432.2	893.4	1383.2	1707.5	2018.6	2421.3	2723.1
31-day	596	343.5	721.9	1111.2	1369	1616.3	1936.3	2176.2
15-day	434.1	255.9	527.9	817.9	1010	1194.2	1432.7	1611.4
7-day	316.1	157.8	374	552.8	671.2	784.8	931.8	1041.9
5-day	293.3	161.4	352.4	535.4	656.5	772.7	923	1035.7
4-day	284.8	159.4	343.2	523.8	643.4	758.1	906.6	1017.9
3-day	270.5	141.8	322.5	483.1	589.5	691.6	823.7	922.7
2-day	228.1	113.4	269.7	398.2	483.4	565	670.7	749.9
24-hr	166.4	80.6	195.9	287.3	347.7	405.8	480.8	537.1
18-hr	149.3	65.7	173.3	247.8	297	344.3	405.5	451.3
12-hr	132.2	57.3	153.2	218.2	261.1	302.4	355.7	395.7
8-hr	119.7	43.6	135.7	185.1	217.8	249.1	289.7	320.2
6-hr	105.4	42.6	121	169.3	201.3	232	271.7	301.4
4-hr	92.2	43.7	108.2	157.8	190.6	222.1	262.8	293.4
2-hr	73.7	32.5	85.6	122.4	146.8	170.2	200.5	223.2
1-hr	56.4	22.3	64.6	89.9	106.6	122.7	143.5	159.1
30-min	40.1	15.5	45.8	63.3	74.9	86.1	100.5	111.4
15-min	25.1	6.7	27.5	35.2	40.2	45	51.3	56
10-min	18.5	4.4	20.1	25.1	28.5	31.7	35.8	38.9
5-min	10.8	1.7	11.4	13.4	14.6	15.9	17.5	18.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. K08 (based on rainfall data, 1984-1987, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	809.5	450.8	974.7	1485.6	1823.9	2148.4	2568.4	2883.1
45-day	690.3	389.5	833.1	1274.5	1566.8	1847.2	2210.2	2482.1
31-day	561.5	297.3	670.4	1007.4	1230.5	1444.5	1721.5	1929
15-day	412.6	263.1	509	807.2	1004.6	1194	1439.1	1622.8
7-day	302.1	160.5	360.9	542.9	663.3	778.9	928.5	1040.6
5-day	278.4	163	338.1	522.9	645.2	762.5	914.4	1028.2
4-day	269.9	160.4	328.7	510.6	631	746.5	896	1008
3-day	256.5	139.9	307.7	466.3	571.2	671.9	802.2	899.9
2-day	217.1	112.9	258.5	386.5	471.3	552.5	657.8	736.6
24-hr	160.3	83.8	191.1	286.1	349	409.4	487.5	546
18-hr	145.5	69.2	170.9	249.3	301.3	351.1	415.6	464
12-hr	127.5	58.9	149.1	215.9	260.1	302.5	357.4	398.5
8-hr	115.3	42.4	130.8	178.9	210.7	241.2	280.7	310.3
6-hr	101	41.2	116.1	162.9	193.8	223.5	261.9	290.7
4-hr	87.7	41.4	102.8	149.7	180.7	210.5	249	277.9
2-hr	70.4	31.5	81.9	117.6	141.2	163.9	193.2	215.2
1-hr	54.3	22.4	62.5	87.9	104.7	120.8	141.6	157.3
30-min	39.1	16.3	45.1	63.5	75.7	87.5	102.6	114
15-min	24.6	7	27.2	35.2	40.5	45.5	52.1	57
10-min	18.2	4.7	19.9	25.2	28.8	32.1	36.5	39.8
5-min	10.8	1.8	11.4	13.5	14.8	16.1	17.8	19.1

Raingauge N01

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N01 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	947.3	478.8	1122.7	1665.4	2024.7	2369.4	2815.5	3149.8
45-day	800.2	393.3	944.3	1390.2	1685.3	1968.5	2335	2609.6
31-day	644.2	308.6	757.3	1107.1	1338.6	1560.7	1848.3	2063.7
15-day	485.8	198.2	558.4	783.1	931.8	1074.4	1259.1	1397.5
7-day	333.2	147.2	387.1	553.9	664.4	770.3	907.5	1010.2
5-day	298.7	154.4	355.3	530.3	646.2	757.4	901.2	1009
4-day	286.7	157	344.3	522.2	640	752.9	899.2	1008.8
3-day	274.8	140.3	326.3	485.3	590.5	691.5	822.2	920.2
2-day	242.7	115.8	285.1	416.4	503.2	586.6	694.4	775.3
24-hr	190.1	93.3	224.3	330	400	467.2	554.1	619.2
18-hr	175.8	76.2	203.7	290.1	347.3	402.2	473.3	526.5
12-hr	156.4	62.5	179.3	250.1	297	342	400.2	443.9
8-hr	131.8	57.9	153.1	218.6	262.1	303.7	357.6	398
6-hr	119.9	53.8	139.6	200.6	241	279.7	329.8	367.3
4-hr	109.7	50.1	128.1	184.9	222.4	258.5	305.1	340.1
2-hr	83.1	44.3	99.3	149.5	182.7	214.6	255.8	286.7
1-hr	59.1	26.4	68.8	98.7	118.5	137.5	162.1	180.6
30-min	41.7	11.4	45.8	58.7	67.2	75.4	86	94
15-min	27	6.9	29.5	37.3	42.5	47.4	53.8	58.6
10-min	20.4	6.2	22.7	29.6	34.3	38.7	44.5	48.8
5-min	11.8	3.7	13.2	17.3	20.1	22.7	26.1	28.7

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N01 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	907.3	400.8	1054.2	1508.5	1809.2	2097.7	2471.2	2751
45-day	767.3	329.6	888.1	1261.6	1508.9	1746.2	2053.3	2283.4
31-day	617.7	263.2	714.2	1012.5	1210	1399.4	1644.6	1828.3
15-day	467.7	185.9	535.8	746.5	886.1	1019.9	1193.1	1323
7-day	284.9	136.8	335.1	490.1	592.8	691.3	818.7	914.2
5-day	272.7	138.6	323.5	480.6	584.5	684.3	813.4	910.2
4-day	320.4	126.6	366.8	510.3	605.2	696.3	814.3	902.6
3-day	263.3	116.1	305.9	437.5	524.6	608.1	716.3	797.3
2-day	235.2	86.1	266.8	364.3	428.9	490.9	571	631.1
24-hr	186.3	61.3	208.7	278.3	324.3	368.4	425.6	468.4
18-hr	169.7	61.8	192.4	262.5	308.9	353.4	411	454.2
12-hr	151.4	51.1	170.1	228	266.4	303.2	350.8	386.5
8-hr	128	43.4	143.9	193.1	225.6	256.8	297.2	327.5
6-hr	115.5	44.5	131.8	182.3	215.7	247.7	289.2	320.2
4-hr	105.2	45.4	121.8	173.2	207.3	240	282.2	313.9
2-hr	79.1	39.9	93.7	138.9	168.8	197.5	234.7	262.5
1-hr	56.8	23.2	65.3	91.7	109.1	125.8	147.5	163.7
30-min	40.6	10.3	44.4	56.1	63.8	71.2	80.8	87.9
15-min	26.5	7	29.1	37	42.3	47.3	53.8	58.7
10-min	20.1	6.5	22.5	29.8	34.7	39.4	45.4	49.9
5-min	11.8	3.8	13.2	17.6	20.5	23.2	26.8	29.5

Raingauge N02

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N02 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	932.6	477.8	1107.7	1649.3	2007.8	2351.7	2796.9	3130.5
45-day	784.3	408.6	934.1	1397.2	1703.9	1998	2378.7	2664
31-day	629.5	332.8	751.5	1128.6	1378.4	1617.9	1927.9	2160.3
15-day	457.9	225.2	540.5	795.7	964.7	1126.8	1336.6	1493.9
7-day	323.1	170.2	385.4	578.3	706	828.5	987.1	1105.9
5-day	289.1	174.3	352.9	550.4	681.2	806.6	969	1090.6
4-day	272.2	175.5	336.6	535.5	667.2	793.6	957.1	1079.7
3-day	261.1	167.2	322.3	511.8	637.2	757.6	913.3	1030
2-day	234.2	141.9	286.2	447.1	553.6	655.7	788	887.1
24-hr	183.6	116.5	226.3	358.3	445.7	529.6	638.1	719.4
18-hr	169.1	94	203.6	310.2	380.7	448.4	536	601.7
12-hr	153.8	71.3	179.9	260.8	314.3	365.6	432.1	481.9
8-hr	133	59.9	154.9	222.8	267.7	310.8	366.6	408.4
6-hr	123.2	50.2	141.6	198.4	236.1	272.2	319	354
4-hr	108.9	39.5	123.4	168.1	197.8	226.2	262.9	290.5
2-hr	86.2	30.7	97.4	132.2	155.3	177.4	206	227.5
1-hr	61.8	19.2	68.8	90.6	105.1	118.9	136.8	150.2
30-min	41.6	8.5	44.7	54.4	60.8	67	74.9	80.9
15-min	26.5	7.2	29.1	37.3	42.7	47.9	54.6	59.6
10-min	19	6.5	21.4	28.8	33.7	38.3	44.4	48.9
5-min	10.3	5.8	12.4	19	23.4	27.5	33	37

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N02 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	892.6	400.7	1039.4	1493.5	1794.2	2082.6	2455.9	2735.6
45-day	749.1	350	877.3	1274	1536.7	1788.6	2114.7	2359
31-day	599.7	294.6	707.7	1041.6	1262.6	1474.7	1749.1	1954.8
15-day	437.4	203.9	512.2	743.3	896.3	1043.1	1233.1	1375.4
7-day	275.6	139.4	326.7	484.7	589.4	689.7	819.6	916.9
5-day	311	131.2	359.1	507.8	606.3	700.8	823.1	914.7
4-day	259.1	138.7	309.9	467	571.1	670.9	800.1	896.9
3-day	249.2	128.8	296.4	442.4	539	631.7	751.7	841.6
2-day	226.2	100.7	263.1	377.3	452.8	525.3	619.2	689.5
24-hr	180.4	71.3	206.5	287.4	340.9	392.2	458.6	508.4
18-hr	163.6	67.8	188.4	265.2	316.1	364.9	428.1	475.4
12-hr	148.7	54.9	168.8	231	272.2	311.7	362.8	401.1
8-hr	131.1	37.3	144.8	187	215	241.8	276.6	302.6
6-hr	121.5	31.6	133.1	168.9	192.6	215.3	244.7	266.8
4-hr	106.3	29.6	117.2	150.8	173	194.4	222	242.7
2-hr	84.5	21.4	92.4	116.6	132.7	148.1	168.1	183
1-hr	60.8	13.4	65.7	80.9	90.9	100.5	113	122.3
30-min	40.9	7	43.5	51.4	56.6	61.7	68.2	73.1
15-min	26	7.5	28.8	37.2	42.8	48.2	55.2	60.4
10-min	18.7	6.8	21.2	28.9	34	38.9	45.3	50
5-min	10.2	6.1	12.5	19.4	23.9	28.3	34	38.3

Raingauge N03

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N03 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	780.4	435.7	940.1	1433.9	1760.9	2074.5	2480.5	2784.7
45-day	673.5	371.4	809.6	1230.5	1509.1	1776.4	2122.4	2381.7
31-day	562.9	289.5	669	997.2	1214.5	1422.9	1692.7	1894.9
15-day	408.7	188.3	477.7	691.2	832.5	968.1	1143.6	1275.1
7-day	295.9	129	343.2	489.4	586.2	679.1	799.3	889.4
5-day	265.7	130.8	313.7	462	560.1	654.3	776.2	867.5
4-day	261.4	125	307.2	448.9	542.7	632.7	749.2	836.5
3-day	254.2	118.2	297.6	431.6	520.3	605.4	715.5	798.1
2-day	230.5	94.4	265.2	372.2	443.1	511.1	599.1	665
24-hr	186.7	76.2	214.6	300.9	358	412.8	483.8	537
18-hr	167.1	65	190.9	264.5	313.3	360	420.6	465.9
12-hr	142.8	47.9	160.4	214.6	250.6	285	329.7	363.1
8-hr	107.7	43.2	123.5	172.5	204.9	235.9	276.2	306.3
6-hr	118.1	40.9	133.1	179.4	210.1	239.5	277.5	306.1
4-hr	94.8	39.9	109.4	154.7	184.6	213.4	250.6	278.4
2-hr	74	35	86.9	126.5	152.8	178	210.6	235
1-hr	53	21.1	60.7	84.6	100.4	115.6	135.3	150
30-min	37	14.7	42.4	59.1	70.1	80.7	94.4	104.6
15-min	24	7.1	26.6	34.7	40	45.1	51.8	56.7
10-min	18.1	4.7	19.9	25.2	28.7	32.1	36.5	39.7
5-min	10.5	2.5	11.4	14.2	16.1	17.9	20.3	22

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N03 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	753.4	319	870.3	1231.9	1471.2	1700.9	1998.1	2220.8
45-day	646.3	290	752.6	1081.3	1298.9	1507.7	1777.9	1980.3
31-day	537.4	252.7	630	916.3	1105.9	1287.8	1523.2	1699.6
15-day	391.8	166.5	452.9	641.6	766.6	886.5	1041.7	1157.9
7-day	288	94.1	322.5	429.2	499.8	567.6	655.3	721.1
5-day	257.2	97.8	293	403.8	477.2	547.6	638.8	707
4-day	252.6	96	287.8	396.7	468.7	537.9	627.4	694.4
3-day	246.6	87.8	278.8	378.3	444.1	507.3	589.1	650.3
2-day	226.2	63.5	249.5	321.4	369	414.7	473.8	518.1
24-hr	184	48.5	201.7	256.7	293.1	328	373.1	407
18-hr	162.9	48.2	180.6	235.2	271.4	306.2	351.1	384.8
12-hr	138.6	42	154	201.6	233.2	263.4	302.6	331.9
8-hr	104.7	32.9	116.8	154	178.7	202.3	233	255.9
6-hr	115.5	30	126.5	160.5	182.9	204.5	232.4	253.3
4-hr	92.4	29	103	135.9	157.7	178.6	205.7	226
2-hr	72.5	23.4	81.1	107.6	125.2	142.1	163.9	180.3
1-hr	52.6	12.3	57.1	71.1	80.3	89.2	100.7	109.3
30-min	35.8	12.3	40.3	54.2	63.4	72.2	83.7	92.2
15-min	23.3	6.7	25.8	33.3	38.3	43.1	49.3	53.9
10-min	17.7	4.5	19.4	24.5	27.8	31.1	35.3	38.4
5-min	10.3	2.6	11.2	14.1	16	17.9	20.3	22

Raingauge N04

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N04 (based on rainfall data, 1984-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	806.4	413.5	957.9	1426.6	1736.8	2034.5	2419.7	2708.4
45-day	709.1	338.7	833.2	1217.2	1471.4	1715.2	2030.8	2267.3
31-day	584.4	260.5	679.9	975.2	1170.7	1358.2	1601	1782.9
15-day	418.5	171.5	481.3	675.6	804.3	927.7	1087.5	1207.2
7-day	292	114.3	333.9	463.5	549.3	631.6	738.2	818
5-day	265.8	119.7	309.7	445.3	535.1	621.2	732.7	816.2
4-day	261.9	113.5	303.5	432.1	517.2	598.9	704.6	783.8
3-day	252.1	105.1	290.7	409.8	488.7	564.3	662.3	735.7
2-day	232.6	89.4	265.3	366.7	433.8	498.2	581.5	643.9
24-hr	181.8	71.6	208	289.1	342.8	394.3	461	511
18-hr	162.1	74.7	189.5	274.2	330.3	384.1	453.7	505.9
12-hr	140.9	76.9	169.1	256.3	314	369.3	441	494.7
8-hr	118.3	65.1	142.2	216	264.9	311.8	372.5	417.9
6-hr	110.3	55.2	130.5	193	234.4	274.1	325.5	364
4-hr	97	49.2	115	170.8	207.8	243.2	289.1	323.5
2-hr	75.4	34.5	88	127.1	153	177.8	209.9	233.9
1-hr	53.7	24	62.5	89.7	107.7	125	147.4	164.1
30-min	37.6	14.4	42.9	59.1	69.9	80.2	93.6	103.6
15-min	25.1	7.9	28	36.9	42.9	48.6	56	61.5
10-min	18	5.7	20.1	26.6	30.8	34.9	40.2	44.2
5-min	10.3	2.9	11.4	14.7	16.9	18.9	21.7	23.7

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N04 (based on rainfall data, 1984-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	774.8	315.9	890.6	1248.6	1485.6	1713	2007.3	2227.9
45-day	682.1	264.2	778.9	1078.4	1276.7	1466.9	1713.1	1897.6
31-day	563.5	203.8	638.2	869.3	1022.3	1169	1358.9	1501.2
15-day	402	164.2	462.1	648.2	771.4	889.6	1042.6	1157.2
7-day	281.1	101	318.1	432.6	508.5	581.2	675.3	745.9
5-day	254.4	105.8	293.2	413.1	492.5	568.7	667.3	741.2
4-day	251	101	288	402.5	478.3	551	645.1	715.6
3-day	242.5	89.7	275.3	377	444.3	508.9	592.5	655.2
2-day	224.3	76.2	252.3	338.7	395.9	450.8	521.8	575
24-hr	175.3	60.2	197.3	265.5	310.7	354	410.1	452.1
18-hr	155.7	60.9	178	247	292.8	336.6	393.4	435.9
12-hr	135.1	58.5	156.5	222.9	266.8	308.9	363.4	404.3
8-hr	118.8	31.7	130.4	166.3	190	212.8	242.4	264.5
6-hr	109.7	29.5	120.5	153.9	176.1	197.3	224.8	245.4
4-hr	95.5	29.2	106.2	139.4	161.3	182.4	209.6	230
2-hr	73.6	23.2	82.1	108.4	125.8	142.5	164.1	180.3
1-hr	52.3	16.6	58.4	77.2	89.7	101.6	117.1	128.7
30-min	36.4	11.3	40.6	53.4	61.8	69.9	80.5	88.3
15-min	24.3	7.2	26.9	35.1	40.5	45.7	52.4	57.4
10-min	17.5	5.3	19.4	25.5	29.5	33.3	38.3	42
5-min	10	2.8	11	14.2	16.3	18.3	20.9	22.9

Raingauge N05

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N05 (based on rainfall data, 1984-1986, 1989-1991, 1993-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	814	403.1	961.8	1418.7	1721.3	2011.4	2387.1	2668.6
45-day	703.6	349.9	831.8	1228.4	1490.9	1742.8	2068.8	2313.1
31-day	567.4	278.6	669.6	985.3	1194.4	1395	1654.6	1849.1
15-day	401.1	169.3	463.1	655.1	782.1	904	1061.8	1180
7-day	304.3	123.8	349.7	489.9	582.8	671.9	787.2	873.6
5-day	272.5	124.8	318.3	459.7	553.3	643.1	759.4	846.5
4-day	279.7	122.6	324.6	463.5	555.5	643.8	758	843.6
3-day	254	111.9	295.1	421.9	505.9	586.4	690.7	768.8
2-day	217.2	104.6	255.5	374	452.5	527.8	625.3	698.3
24-hr	170.2	92.9	204.3	309.7	379.4	446.3	532.9	597.8
18-hr	152.6	75.7	180.4	266.2	323	377.5	448	500.9
12-hr	129.1	61.5	151.6	221.3	267.5	311.8	369.1	412
8-hr	110.9	54.6	130.9	192.7	233.6	272.9	323.7	361.8
6-hr	99.8	47.5	117.2	171	206.6	240.8	285	318.2
4-hr	82.1	38.1	96	139.2	167.7	195.1	230.6	257.2
2-hr	65.2	18.4	71.9	92.7	106.5	119.8	136.9	149.7
1-hr	48.6	13.6	53.6	68.9	79.1	88.9	101.5	110.9
30-min	35.3	8.5	38.4	48	54.4	60.5	68.4	74.3
15-min	21.2	7.6	24	32.7	38.4	43.9	51	56.3
10-min	16	6.1	18.2	25.1	29.6	34	39.7	43.9
5-min	9.7	2.9	10.7	14.1	16.3	18.4	21.1	23.2

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N05 (based on rainfall data, 1984-1986, 1989-1991, 1993-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	769	374.4	906.3	1330.7	1611.7	1881.2	2230.1	2491.5
45-day	665.5	340	790.1	1175.5	1430.7	1675.5	1992.3	2229.7
31-day	540.2	283.4	644	965.2	1177.9	1381.9	1646	1843.8
15-day	384.9	173.2	448.4	644.7	774.7	899.4	1060.8	1181.7
7-day	293.3	128.1	340.3	485.5	581.6	673.9	793.3	882.7
5-day	264.9	132.5	313.5	463.7	563.1	658.4	781.9	874.4
4-day	271.9	130	319.6	466.9	564.5	658.1	779.2	869.9
3-day	248.9	119.4	292.7	428	517.6	603.6	714.8	798.2
2-day	212.8	111.7	253.7	380.3	464.1	544.5	648.5	726.5
24-hr	172.1	98.3	208.2	319.5	393.3	464	555.6	624.2
18-hr	153.7	80.2	183.1	274	334.2	392	466.7	522.7
12-hr	128.5	65.6	152.5	226.9	276.1	323.3	384.4	430.3
8-hr	111.6	57.8	132.8	198.3	241.7	283.4	337.2	377.6
6-hr	101.9	49.6	120.1	176.4	213.6	249.3	295.6	330.3
4-hr	83.5	39.9	98.2	143.4	173.4	202.1	239.3	267.2
2-hr	65.8	19.3	72.9	94.8	109.3	123.2	141.2	154.7
1-hr	49.5	14	54.7	70.5	81	91	104.1	113.8
30-min	35.2	9	38.5	48.8	55.6	62.1	70.5	76.8
15-min	21.3	8.1	24.3	33.4	39.5	45.3	52.9	58.5
10-min	16.1	6.4	18.4	25.7	30.5	35.2	41.2	45.7
5-min	9.4	3.1	10.6	14	16.3	18.6	21.4	23.6

Raingauge N06

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N06 (based on rainfall data, 1985-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	1009.2	476.4	1183.8	1723.7	2081.2	2424.1	2867.9	3200.5
45-day	867.5	398.2	1013.5	1464.8	1763.6	2050.2	2421.2	2699.2
31-day	712.6	302.1	823.3	1165.6	1392.3	1609.7	1891.2	2102.1
15-day	518	199.8	591.2	817.7	967.7	1111.5	1297.7	1437.3
7-day	331.3	145.4	384.5	549.3	658.4	763	898.5	1000
5-day	367.2	136	417	571.2	673.2	771.1	897.9	992.8
4-day	323.6	140.4	375.1	534.1	639.5	740.5	871.3	969.3
3-day	315.2	130.4	363	510.7	608.6	702.4	823.9	915
2-day	287.2	107	326.4	447.7	528	605.1	704.8	779.6
24-hr	223.5	93	257.5	362.9	432.6	499.5	586.1	651
18-hr	191.7	86.2	223.3	320.9	385.6	447.6	527.9	588.1
12-hr	170.4	68.5	195.5	273.2	324.6	373.9	437.8	485.7
8-hr	145.4	51.7	164.3	222.8	261.6	298.8	346.9	383
6-hr	132.6	47.1	149.8	203.2	238.5	272.4	316.2	349.1
4-hr	114.9	38.3	128.9	172.3	201	228.6	264.3	291
2-hr	92.3	28.9	102.9	135.7	157.4	178.2	205.1	225.3
1-hr	62.5	21.2	70.3	94.3	110.1	125.4	145.1	159.9
30-min	43.1	13.9	48.2	63.9	74.3	84.3	97.2	106.9
15-min	28.1	8.3	31.1	40.5	46.7	52.7	60.4	66.2
10-min	21	5.3	22.9	28.9	32.9	36.7	41.6	45.3
5-min	12.2	2.6	13.1	16.1	18	19.9	22.3	24.1

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N06 (based on rainfall data, 1985-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	969.2	382.3	1109.3	1542.6	1829.5	2104.6	2460.8	2727.7
45-day	831.8	332.9	953.8	1331.1	1580.9	1820.6	2130.7	2363.1
31-day	684.5	259.7	779.7	1074	1268.9	1455.8	1697.7	1879.1
15-day	498.5	184.1	566	774.7	912.9	1045.4	1217	1345.6
7-day	318.3	120.9	362.6	499.7	590.5	677.5	790.2	874.6
5-day	355.5	110.5	396	521.2	604.2	683.7	786.7	863.8
4-day	311	117.6	354.1	487.4	575.7	660.3	769.9	852.1
3-day	304.1	105	342.6	461.6	540.4	615.9	713.8	787
2-day	279.8	78.1	308.5	397	455.6	511.9	584.7	639.2
24-hr	217.5	66	241.7	316.6	366.2	413.7	475.2	521.4
18-hr	184	71.6	210.3	291.4	345.1	396.6	463.3	513.3
12-hr	163.7	63.8	187.1	259.4	307.3	353.3	412.8	457.3
8-hr	141.4	39.6	155.9	200.8	230.6	259.1	296.1	323.7
6-hr	128.4	38.7	142.6	186.4	215.5	243.3	279.3	306.3
4-hr	111.3	37.3	125	167.3	195.3	222.1	256.9	283
2-hr	89.7	24.4	98.6	126.3	144.6	162.1	184.9	201.9
1-hr	60.5	18.7	67.3	88.5	102.5	115.9	133.3	146.3
30-min	41.9	13.9	46.9	62.7	73.1	83	96	105.6
15-min	27.5	8.6	30.7	40.5	47	53.2	61.2	67.3
10-min	20.6	5.5	22.7	28.9	33	37	42.1	46
5-min	12	2.7	13	16.1	18.2	20.1	22.7	24.6

Raingauge N07

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N07 (based on rainfall data, 1984-1985, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	610.1	317.4	726.4	1086.1	1324.3	1552.7	1848.4	2070
45-day	520.2	299.6	630	969.6	1194.4	1410.1	1689.2	1898.4
31-day	412.9	229.8	497.1	757.6	930.1	1095.5	1309.6	1470.1
15-day	313.4	150.2	368.4	538.7	651.4	759.5	899.5	1004.3
7-day	220.3	127.1	266.9	411	506.5	598	716.4	805.2
5-day	241.2	122.5	286	424.8	516.8	604.9	719	804.5
4-day	213	127	259.6	403.5	498.7	590.1	708.4	797.1
3-day	198	128.7	245.1	391	487.6	580.3	700.2	790.1
2-day	177.7	118.6	221.2	355.7	444.7	530.1	640.6	723.5
24-hr	133.2	107.4	172.5	294.3	374.9	452.2	552.3	627.2
18-hr	125.8	101.5	163	278.1	354.3	427.3	521.9	592.8
12-hr	112.1	93.7	146.4	252.7	323	390.5	477.8	543.2
8-hr	100	70.6	125.9	205.9	258.9	309.7	375.4	424.7
6-hr	91.9	61	114.3	183.4	229.1	273	329.8	372.4
4-hr	80.8	49.7	99	155.3	192.6	228.4	274.7	309.4
2-hr	62.9	30.8	74.2	109.2	132.3	154.5	183.2	204.7
1-hr	47.3	18.1	53.9	74.4	87.9	100.9	117.7	130.3
30-min	33.7	7.9	36.6	45.5	51.4	57.1	64.5	70
15-min	21.6	6.5	24	31.3	36.2	40.9	46.9	51.5
10-min	16.3	4.1	17.8	22.5	25.5	28.5	32.3	35.1
5-min	9.8	3.1	10.9	14.4	16.7	19	21.9	24

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N07 (based on rainfall data, 1984-1985, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	576.3	324	695	1062.3	1305.5	1538.7	1840.7	2066.9
45-day	491.1	311.7	605.3	958.5	1192.4	1416.8	1707.1	1924.7
31-day	389.9	238	477.1	746.9	925.5	1096.8	1318.5	1484.7
15-day	303.4	160.8	362.3	544.6	665.2	781	930.8	1043
7-day	213.2	136.6	263.3	418.1	520.6	618.9	746.2	841.6
5-day	234.5	131.7	282.8	432	530.8	625.6	748.2	840.2
4-day	206.6	136.6	256.7	411.5	514	612.3	739.6	835
3-day	191.1	138.4	241.8	398.6	502.5	602.1	731	827.7
2-day	171.4	127.6	218.2	362.8	458.5	550.4	669.2	758.3
24-hr	132.9	115.3	175.1	305.8	392.3	475.3	582.7	663.2
18-hr	125.4	109	165.4	288.9	370.7	449.1	550.7	626.8
12-hr	115.5	99.2	151.8	264.3	338.7	410.1	502.5	571.8
8-hr	103.1	74.5	130.3	214.7	270.6	324.2	393.6	445.6
6-hr	94.8	64.2	118.3	191.1	239.2	285.4	345.2	390
4-hr	84.6	51.4	103.5	161.7	200.3	237.3	285.1	321
2-hr	64.2	32.5	76.1	113	137.4	160.8	191.1	213.9
1-hr	46.3	19.4	53.4	75.4	90	103.9	122	135.6
30-min	32.7	7.2	35.4	43.6	49	54.2	60.9	65.9
15-min	20.8	6.5	23.2	30.5	35.4	40	46	50.5
10-min	15.8	4	17.3	21.8	24.7	27.6	31.3	34
5-min	9.5	3.2	10.7	14.3	16.7	19.1	22.1	24.3

Raingauge N08

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N08 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	887	431.6	1045.2	1534.4	1858.2	2168.9	2571	2872.3
45-day	757.3	384.8	898.3	1334.5	1623.3	1900.3	2258.8	2527.5
31-day	625.3	329.6	746.2	1119.8	1367.1	1604.4	1911.6	2141.7
15-day	438.9	242.5	527.8	802.6	984.6	1159.2	1385.2	1554.5
7-day	312.7	141.6	364.5	525	631.2	733.1	865	963.8
5-day	281.9	145.4	335.2	500	609.1	713.8	849.3	950.9
4-day	269.1	144.4	322	485.6	594	697.9	832.5	933.3
3-day	257.4	128.2	304.4	449.7	545.9	638.2	757.7	847.2
2-day	234	91.7	267.6	371.6	440.4	506.4	591.9	656
24-hr	181.3	67.6	206	282.7	333.4	382.1	445.1	492.3
18-hr	157.4	56.7	178.2	242.5	285	325.9	378.7	418.3
12-hr	137.7	49.5	155.9	212	249.2	284.8	331	365.5
8-hr	118.8	47.9	136.4	190.7	226.7	261.2	305.8	339.2
6-hr	107.8	37.8	121.6	164.5	192.8	220	255.2	281.6
4-hr	96.6	31.1	108	143.2	166.5	188.9	217.8	239.5
2-hr	73.7	19.5	80.9	103	117.7	131.8	150	163.6
1-hr	53.9	14.3	59.1	75.4	86.1	96.5	109.8	119.8
30-min	38.2	8.5	41.3	50.9	57.3	63.4	71.4	77.3
15-min	24.2	4.6	25.9	31.1	34.5	37.8	42.1	45.3
10-min	17.5	3.1	18.7	22.3	24.6	26.9	29.8	32
5-min	10.2	1.6	10.7	12.5	13.7	14.9	16.3	17.4

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N08 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	849.1	374.8	986.5	1411.3	1692.6	1962.4	2311.7	2573.4
45-day	724.4	327	844.3	1215	1460.4	1695.8	2000.5	2228.9
31-day	598	274.6	698.7	1009.9	1216	1413.7	1669.5	1861.3
15-day	418.2	240.3	506.3	778.6	959	1131.9	1355.8	1523.6
7-day	301.5	143.1	353.9	516.1	623.5	726.5	859.8	959.6
5-day	270.1	146.3	323.8	489.6	599.4	704.7	841.1	943.2
4-day	257.3	144.8	310.4	474.5	583.2	687.5	822.4	923.5
3-day	246.4	126.8	292.8	436.5	531.7	622.9	741.1	829.6
2-day	225.7	88.3	258.1	358.2	424.4	488	570.3	631.9
24-hr	175.1	64.3	198.7	271.5	319.7	366	425.9	470.8
18-hr	152.3	50.2	170.7	227.6	265.3	301.4	348.2	383.3
12-hr	135.1	34.6	147.8	187	213	238	270.2	294.4
8-hr	118.9	25.1	128.1	156.5	175.4	193.4	216.8	234.3
6-hr	106	25.5	115.4	144.3	163.4	181.8	205.5	223.3
4-hr	95.2	20.7	102.8	126.2	141.7	156.6	175.8	190.2
2-hr	71.9	18.8	78.8	100.1	114.2	127.7	145.2	158.3
1-hr	52.9	14.8	58.3	75	86.1	96.8	110.5	120.8
30-min	37.6	8.8	40.8	50.8	57.4	63.8	72	78.1
15-min	24	4.8	25.8	31.2	34.8	38.3	42.8	46.2
10-min	17.4	3.3	18.7	22.4	24.9	27.3	30.3	32.6
5-min	10.1	1.7	10.7	12.6	13.8	15	16.5	17.7

Raingauge N09

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N09 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	894	562.2	1100.1	1737.3	2159.2	2563.9	3087.8	3480.4
45-day	762	475.3	936.2	1474.9	1831.6	2173.7	2616.5	2948.4
31-day	632.9	365.3	766.7	1180.8	1454.9	1717.9	2058.2	2313.3
15-day	438	266.4	535.6	837.5	1037.4	1229.2	1477.4	1663.3
7-day	312.5	209.6	389.3	626.9	784.2	935.1	1130.4	1276.8
5-day	281.1	208.4	357.5	593.7	750.1	900.2	1094.4	1239.9
4-day	274.8	206.6	350.5	584.7	739.8	888.6	1081.1	1225.4
3-day	262.7	202.5	336.9	566.4	718.4	864.1	1052.8	1194.2
2-day	229.2	184.5	296.8	505.9	644.3	777.1	948.9	1077.7
24-hr	175	163.6	235	420.5	543.3	661.1	813.6	927.8
18-hr	161	136	210.8	365	467.1	565	691.7	786.7
12-hr	150.4	84.1	181.2	276.5	339.6	400.1	478.4	537.1
8-hr	133.3	64.1	156.8	229.5	277.7	323.8	383.6	428.4
6-hr	124.7	54.1	144.5	205.8	246.4	285.4	335.8	373.6
4-hr	113.1	42.8	128.8	177.4	209.5	240.4	280.3	310.2
2-hr	88	25.7	97.4	126.5	145.7	164.2	188.1	206
1-hr	60.7	16.6	66.8	85.7	98.1	110.1	125.5	137.1
30-min	39.4	11.4	43.5	56.4	64.9	73.1	83.7	91.6
15-min	26.7	8.4	29.8	39.4	45.7	51.7	59.6	65.4
10-min	19.6	6.4	21.9	29.2	33.9	38.6	44.5	49
5-min	10.9	3.5	12.2	16.2	18.8	21.3	24.5	27

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N09 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	863.6	394.6	1008.2	1455.5	1751.6	2035.6	2403.3	2678.8
45-day	735.8	335.4	858.7	1238.9	1490.6	1732	2044.5	2278.7
31-day	610.7	265.6	708	1009.1	1208.4	1399.5	1647	1832.4
15-day	424.7	182.8	491.7	698.9	836.1	967.6	1137.9	1265.6
7-day	310.6	116.2	353.2	484.9	572.2	655.8	764.1	845.2
5-day	277.4	121.3	321.8	459.3	550.3	637.6	750.6	835.3
4-day	270.4	122.1	315.2	453.6	545.3	633.2	747	832.3
3-day	258.9	118.1	302.2	436.1	524.7	609.7	719.8	802.2
2-day	228.1	100.6	265	379.1	454.6	527.1	620.8	691.1
24-hr	180.5	71.6	206.8	287.9	341.7	393.2	459.9	509.9
18-hr	162.7	67.1	187.3	263.3	313.7	362	424.5	471.3
12-hr	147.2	54.1	167.1	228.5	269.1	308.1	358.5	396.3
8-hr	133.2	34.3	145.8	184.6	210.4	235.1	267	291
6-hr	123.8	31.1	135.2	170.5	193.9	216.3	245.3	267.1
4-hr	110.7	30.6	121.9	156.5	179.4	201.4	229.9	251.2
2-hr	86.4	18.8	93.3	114.6	128.7	142.2	159.7	172.8
1-hr	59.6	12.7	64.2	78.7	88.3	97.4	109.3	118.2
30-min	38.3	10.9	42.3	54.7	62.8	70.7	80.8	88.4
15-min	26	8.4	29.1	38.6	44.8	50.9	58.6	64.5
10-min	19	6.4	21.4	28.7	33.5	38.2	44.2	48.6
5-min	10.7	3.6	12	16.1	18.8	21.4	24.8	27.3

Raingauge N10

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N10 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	755.1	453.2	921.1	1434.8	1774.8	2101	2523.2	2839.6
45-day	660.5	403.3	808.3	1265.4	1568.1	1858.4	2234.2	2515.9
31-day	541.9	322	659.9	1024.8	1266.5	1498.3	1798.3	2023.1
15-day	392.6	185.8	460.7	671.2	810.6	944.3	1117.4	1247.1
7-day	300.5	133.1	349.3	500.2	600.1	695.9	819.9	912.8
5-day	285.6	126.5	332	475.4	570.4	661.5	779.4	867.7
4-day	278	125.2	323.9	465.9	559.8	650	766.7	854.1
3-day	258.5	115.4	300.9	431.7	518.3	601.4	709	789.6
2-day	237	98.3	273	384.4	458.2	528.9	620.4	689.1
24-hr	185.6	85	216.8	313.1	376.9	438	517.2	576.6
18-hr	166.1	77.2	194.4	281.9	339.8	395.4	467.3	521.2
12-hr	144.2	57.4	165.2	230.3	273.4	314.7	368.2	408.3
8-hr	119.8	50.2	138.2	195	232.7	268.8	315.6	350.6
6-hr	106.4	43.7	122.4	172	204.8	236.3	277	307.6
4-hr	90.7	36.3	104	145.1	172.4	198.5	232.3	257.7
2-hr	69.3	30.5	80.5	115	137.9	159.8	188.2	209.4
1-hr	50.6	19.7	57.9	80.2	95	109.2	127.5	141.3
30-min	34.6	13.6	39.5	55	65.2	75	87.6	97.1
15-min	23.3	7.4	26	34.4	40	45.3	52.2	57.4
10-min	18.2	4.6	19.9	25.1	28.5	31.8	36	39.2
5-min	10.7	2.7	11.7	14.8	16.8	18.8	21.4	23.3

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N10 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	714.9	397.4	860.5	1310.9	1609.1	1895.2	2265.4	2542.9
45-day	624.4	356.2	755	1158.7	1426	1682.3	2014.2	2262.9
31-day	512.4	302.8	623.4	966.6	1193.9	1411.8	1694	1905.4
15-day	376.1	162.6	435.7	620.1	742.1	859.2	1010.8	1124.3
7-day	290	108.1	329.6	452.2	533.3	611.2	712	787.5
5-day	274.5	110.2	314.9	439.7	522.4	601.7	704.3	781.2
4-day	266.9	110.3	307.3	432.3	515	594.4	697.2	774.2
3-day	248.4	100	285.1	398.5	473.6	545.6	638.8	708.6
2-day	228.3	86	259.8	357.3	421.9	483.8	563.9	623.9
24-hr	177.8	78	206.4	294.8	353.4	409.5	482.2	536.6
18-hr	159.2	74.7	186.5	271.2	327.3	381	450.6	502.8
12-hr	141.3	60	163.3	231.3	276.3	319.4	375.3	417.2
8-hr	116.2	51.5	135.1	193.5	232.1	269.2	317.2	353.1
6-hr	102.8	43.9	118.9	168.6	201.5	233.1	274	304.6
4-hr	87.8	36.5	101.2	142.6	170	196.3	230.4	255.9
2-hr	66.8	30.3	77.9	112.3	135.1	156.9	185.2	206.4
1-hr	48.9	19	55.8	77.4	91.7	105.3	123.1	136.3
30-min	33.5	13.7	38.5	54	64.2	74	86.8	96.3
15-min	22.7	7.5	25.4	33.9	39.5	44.8	51.8	57
10-min	17.9	4.7	19.6	25	28.5	31.9	36.3	39.6
5-min	10.5	2.8	11.6	14.8	16.9	19	21.6	23.6

Raingauge N11

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N11 (based on rainfall data, 1984-1985, 1987-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	754.3	430.6	912.1	1400.2	1723.3	2033.3	2434.5	2735.2
45-day	652.2	359.1	783.8	1190.8	1460.3	1718.7	2053.3	2304
31-day	537.4	275.6	638.4	950.7	1157.5	1355.9	1612.6	1805.1
15-day	389.5	151.8	445.2	617.2	731.1	840.3	981.7	1087.6
7-day	290.4	109.3	330.5	454.3	536.3	615	716.8	793.1
5-day	270.7	108.8	310.5	433.8	515.4	593.7	695	771
4-day	259.9	107.6	299.3	421.3	502	579.5	679.8	754.9
3-day	242	94.4	276.6	383.6	454.4	522.4	610.3	676.2
2-day	218.6	77.3	247	334.5	392.5	448.1	520.1	574
24-hr	167.8	54.8	187.8	249.9	291	330.4	381.5	419.7
18-hr	153.3	54.9	173.4	235.7	276.9	316.5	367.7	406
12-hr	142	51.4	160.8	219.1	257.7	294.7	342.6	378.4
8-hr	120.4	45.8	137.1	189	223.4	256.3	298.9	330.9
6-hr	110.4	41.8	125.8	173.2	204.6	234.7	273.7	302.9
4-hr	95.2	35.3	108.2	148.2	174.7	200.2	233.1	257.8
2-hr	75	27.6	85.1	116.4	137.1	157	182.8	202.1
1-hr	51.2	20.4	58.6	81.7	97	111.6	130.6	144.8
30-min	34.2	11.2	38.3	51	59.4	67.4	77.8	85.7
15-min	23.8	5	25.6	31.2	35	38.5	43.2	46.6
10-min	18.1	4.3	19.7	24.5	27.8	30.9	34.9	37.9
5-min	10.5	4	12	16.5	19.5	22.4	26.1	28.9

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N11 (based on rainfall data, 1984-1985, 1987-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	711.8	366.4	846	1261.3	1536.3	1800.1	2141.5	2397.3
45-day	615.9	312.8	730.5	1085.1	1319.8	1545	1836.4	2054.8
31-day	509.8	237.5	596.8	866.1	1044.3	1215.3	1436.6	1602.5
15-day	374.2	147.7	428.3	595.7	706.6	812.9	950.5	1053.6
7-day	279.1	102.2	316.5	432.4	509	582.6	677.8	749.2
5-day	259.4	102.3	296.9	412.9	489.7	563.3	658.7	730.1
4-day	248.9	104.3	287.2	405.4	483.7	558.8	656	728.8
3-day	232.2	87.7	264.3	363.7	429.5	492.6	574.3	635.5
2-day	210.6	71.7	236.9	318.2	372.1	423.7	490.6	540.7
24-hr	162.1	49.5	180.2	236.3	273.5	309.1	355.2	389.8
18-hr	147.7	47.9	165.3	219.6	255.6	290.1	334.8	368.2
12-hr	137.6	39.7	152.1	197.1	226.8	255.4	292.3	320
8-hr	117.8	29.9	128.7	162.6	185.1	206.6	234.5	255.4
6-hr	107.8	28.4	118.2	150.3	171.6	192	218.4	238.2
4-hr	92.9	24.2	101.8	129.2	147.4	164.8	187.4	204.3
2-hr	73	19.7	80.2	102.6	117.4	131.6	150	163.8
1-hr	51.2	9.5	54.7	65.5	72.7	79.6	88.5	95.1
30-min	34.3	4.9	36.2	41.8	45.5	49	53.6	57.1
15-min	23.5	3.5	24.7	28.6	31.2	33.7	37	39.4
10-min	17.7	3.7	19	23.2	26	28.6	32	34.6
5-min	10.2	4.2	11.8	16.5	19.7	22.7	26.6	29.6

Raingauge N12

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N12 (based on rainfall data, 1984-1985, 1987-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	651	338.6	775.1	1158.9	1413	1656.8	1972.3	2208.7
45-day	558.8	293.2	666.3	998.7	1218.7	1429.8	1703	1907.7
31-day	452.3	227.9	535.8	794.2	965.2	1129.3	1341.7	1500.8
15-day	328.1	139.1	379	536.7	641	741.1	870.7	967.8
7-day	223.6	139.3	274.6	432.5	537.1	637.4	767.2	864.5
5-day	246	133.9	295.1	446.8	547.3	643.6	768.3	861.8
4-day	210.4	140.6	261.9	421.3	526.8	628.1	759.1	857.3
3-day	193.7	117.8	236.9	370.4	458.8	543.6	653.4	735.6
2-day	175.1	102.6	212.7	329	406.1	479.9	575.6	647.2
24-hr	135.7	95.7	170.8	279.2	351	419.8	509	575.7
18-hr	126.9	93.4	161.1	267	337.1	404.4	491.5	556.7
12-hr	108.4	87.2	140.4	239.2	304.6	367.4	448.7	509.6
8-hr	98.4	59.7	120.2	187.9	232.7	275.7	331.3	373
6-hr	92	54.6	112	173.9	214.9	254.2	305.1	343.2
4-hr	81.1	43.9	97.2	147	180	211.6	252.5	283.2
2-hr	62.6	25.4	71.9	100.7	119.7	138	161.6	179.3
1-hr	49.8	15.5	55.5	73.1	84.7	95.8	110.2	121
30-min	37.4	9.5	40.9	51.6	58.7	65.6	74.4	81
15-min	23.3	8.6	26.5	36.3	42.8	49	57	63.1
10-min	17.7	6.8	20.2	27.9	33	37.9	44.2	49
5-min	10.3	3.8	11.7	15.9	18.8	21.5	25	27.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N12 (based on rainfall data, 1984-1985, 1987-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	618.9	297	727.7	1064.3	1287.2	1501	1777.7	1985
45-day	530.3	268.5	628.8	933.1	1134.7	1328	1578.2	1765.7
31-day	433.7	232	518.7	781.6	955.7	1122.7	1338.8	1500.8
15-day	316.1	140.1	367.5	526.3	631.5	732.3	862.9	960.8
7-day	214.1	144.6	267.1	431	539.5	643.6	778.4	879.3
5-day	237	139	288	445.5	549.8	649.9	779.4	876.5
4-day	200.5	145.7	253.9	419	528.3	633.2	768.9	870.6
3-day	184.2	120.2	228.3	364.5	454.7	541.3	653.3	737.2
2-day	166.6	104.3	204.8	323	401.2	476.2	573.4	646.2
24-hr	130	100	166.6	280	355	426.9	520.1	589.9
18-hr	121.5	97.8	157.4	268.3	341.7	412.1	503.2	571.5
12-hr	104.9	91.9	138.6	242.7	311.7	377.8	463.5	527.6
8-hr	97	63	120.1	191.5	238.8	284.1	342.8	386.8
6-hr	91.4	57.6	112.5	177.8	221	262.5	316.1	356.3
4-hr	80.6	46.3	97.6	150.1	184.9	218.2	261.4	293.7
2-hr	62.6	26.7	72.4	102.7	122.7	141.9	166.8	185.4
1-hr	49.5	16.3	55.5	74	86.2	98	113.2	124.6
30-min	37.2	10	40.8	52.2	59.7	66.9	76.2	83.2
15-min	22.9	9.1	26.2	36.5	43.3	49.9	58.3	64.7
10-min	17.5	7.2	20.1	28.2	33.6	38.8	45.5	50.5
5-min	10.1	4	11.6	16.1	19.1	21.9	25.6	28.4

Raingauge N13

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N13 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	964.5	383.2	1104.9	1539.2	1826.8	2102.6	2459.6	2727.2
45-day	805.8	320.9	923.4	1287.1	1527.9	1758.9	2057.9	2281.9
31-day	662.3	253.7	755.2	1042.8	1233.1	1415.7	1652.1	1829.2
15-day	478.1	191	548.1	764.6	907.9	1045.3	1223.3	1356.6
7-day	347.3	153.3	403.4	577.2	692.2	802.5	945.3	1052.3
5-day	307.5	150.9	362.8	533.9	647.1	755.7	896.3	1001.7
4-day	285	143.3	337.5	499.9	607.4	710.5	844	944.1
3-day	259.6	134.7	309	461.7	562.8	659.8	785.3	879.3
2-day	240.7	99.4	277.1	389.8	464.4	535.9	628.5	697.9
24-hr	190.4	73.3	217.2	300.3	355.3	408.1	476.3	527.5
18-hr	179.5	70.2	205.2	284.8	337.5	388	453.5	502.5
12-hr	155.6	61.7	178.2	248.2	294.5	338.9	396.5	439.6
8-hr	140.5	50.5	159	216.3	254.2	290.5	337.6	372.8
6-hr	125.6	47.4	143	196.7	232.2	266.3	310.4	343.5
4-hr	112.1	43.3	128	177	209.5	240.7	281	311.3
2-hr	87.7	34.5	100.4	139.5	165.4	190.3	222.5	246.6
1-hr	66.2	24.9	75.4	103.6	122.3	140.2	163.4	180.8
30-min	43.3	14.1	48.5	64.5	75.1	85.3	98.4	108.3
15-min	28	8	31	40	46	51.8	59.3	64.9
10-min	22.1	6.2	24.4	31.4	36.1	40.6	46.3	50.7
5-min	13.3	3.7	14.6	18.8	21.6	24.2	27.7	30.2

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N13 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	929.4	360.3	1061.4	1469.8	1740.2	1999.6	2335.3	2586.9
45-day	776.9	309.6	890.4	1241.2	1473.6	1696.4	1984.8	2201
31-day	639.1	239.9	727	999	1179.1	1351.8	1575.3	1742.9
15-day	461.8	189.3	531.2	745.7	887.8	1024	1200.4	1332.6
7-day	333.3	146.2	386.9	552.6	662.3	767.5	903.7	1005.7
5-day	293.8	142.9	346.1	508.1	615.3	718.1	851.2	951
4-day	271.8	132.4	320.3	470.3	569.7	664.9	788.3	880.7
3-day	247.3	123	292.4	431.8	524.1	612.6	727.2	813.1
2-day	231.7	88.9	264.3	365.1	431.8	495.9	578.7	640.8
24-hr	183.8	71.1	209.9	290.4	343.7	394.9	461.1	510.7
18-hr	174.7	72.3	201.2	283.2	337.4	389.5	456.9	507.3
12-hr	154.8	64.8	178.6	252	300.7	347.3	407.7	453
8-hr	139.6	53	159	219.1	258.9	297.1	346.6	383.6
6-hr	124.6	49.8	142.8	199.2	236.6	272.4	318.7	353.5
4-hr	111.1	45.5	127.8	179.4	213.5	246.2	288.6	320.4
2-hr	87.1	36.3	100.4	141.5	168.7	194.8	228.6	254
1-hr	66.2	26.1	75.8	105.4	124.9	143.7	168	186.2
30-min	43.6	14.7	49	65.6	76.7	87.3	101	111.3
15-min	28.2	8.3	31.3	40.7	46.9	52.9	60.7	66.5
10-min	22.3	6.5	24.6	31.9	36.8	41.4	47.4	51.9
5-min	13.4	3.8	14.8	19.1	22	24.7	28.3	31

Raingauge N14

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N14 (based on rainfall data, 1984-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	1090.4	837	1397.2	2345.8	2973.9	3576.4	4356.3	4940.7
45-day	958.2	743.1	1230.5	2072.8	2630.4	3165.3	3857.6	4376.5
31-day	794.6	606.4	1016.9	1704.2	2159.2	2595.7	3160.8	3584.1
15-day	577.3	405.9	726	1186.1	1490.7	1782.8	2161	2444.4
7-day	394.3	324.5	513.2	881	1124.5	1358.1	1660.4	1886.9
5-day	358.4	327.6	478.5	849.8	1095.7	1331.5	1636.8	1865.5
4-day	347.4	320.9	465	828.8	1069.6	1300.6	1599.7	1823.7
3-day	333.9	303.8	445.3	789.6	1017.6	1236.3	1519.3	1731.5
2-day	301.5	263.7	398.2	697.1	894.9	1084.8	1330.5	1514.6
24-hr	238.2	206.4	313.9	547.8	702.7	851.3	1043.6	1187.7
18-hr	207.7	192.7	278.3	496.7	641.3	780.1	959.6	1094.1
12-hr	170.1	169.9	232.3	424.9	552.4	674.7	833	951.7
8-hr	144.2	123.2	189.3	329	421.5	510.2	625	711.1
6-hr	131.9	101.8	169.2	284.6	360.9	434.2	529	600
4-hr	115.8	76.4	143.8	230.5	287.8	342.8	414.1	467.4
2-hr	88.5	54.8	108.5	170.6	211.7	251.1	302.2	340.4
1-hr	61.9	42.9	77.7	126.3	158.4	189.3	229.3	259.2
30-min	43.9	35.2	56.8	96.6	123	148.3	181.1	205.6
15-min	31.6	22.5	39.8	65.3	82.2	98.3	119.3	134.9
10-min	25.2	14	30.3	46.2	56.7	66.8	79.8	89.6
5-min	15.1	8.3	18.1	27.5	33.7	39.6	47.3	53.1

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N14 (based on rainfall data, 1984-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	1013.7	776.1	1298.2	2177.8	2760.2	3318.9	4042	4583.9
45-day	891.7	719.7	1155.5	1971.1	2511.2	3029.2	3699.8	4202.2
31-day	749.4	618.1	976	1676.5	2140.3	2585.2	3161.1	3592.7
15-day	548.6	416.3	701.2	1173.1	1485.5	1785.2	2173.1	2463.8
7-day	370.1	330.7	491.3	866	1114.2	1352.2	1660.3	1891.2
5-day	335.2	335.9	458.3	839	1091.1	1332.9	1645.8	1880.3
4-day	325.7	330.3	446.7	821.1	1069	1306.8	1614.6	1845.3
3-day	314.4	313.9	429.4	785.2	1020.8	1246.7	1539.2	1758.4
2-day	285.5	273.4	385.8	695.7	900.8	1097.7	1352.4	1543.3
24-hr	224.5	212.8	302.5	543.8	703.5	856.7	1055	1203.6
18-hr	197	200.6	270.6	497.9	648.5	792.9	979.8	1119.8
12-hr	164.1	178.3	229.4	431.5	565.3	693.7	859.8	984.3
8-hr	138.5	128.9	185.7	331.8	428.5	521.3	641.4	731.4
6-hr	125.6	105.4	164.3	283.8	362.9	438.8	537	610.6
4-hr	110	77.6	138.4	226.4	284.7	340.5	412.9	467.1
2-hr	84.6	56.1	105.1	168.7	210.8	251.2	303.5	342.7
1-hr	58.9	43.9	75	124.8	157.7	189.3	230.3	260.9
30-min	42	36.6	55.4	96.9	124.3	150.7	184.8	210.3
15-min	30.3	23.3	38.9	65.3	82.9	99.7	121.4	137.7
10-min	24.3	14.5	29.6	46.1	56.9	67.4	80.9	91
5-min	14.7	8.7	17.9	27.7	34.2	40.4	48.5	54.5

Raingauge N15

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N15 (based on rainfall data, 1984-1987, 1989-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	899	498.7	1081.7	1647	2021.2	2380.2	2844.8	3193
45-day	733.2	411.8	884.2	1350.9	1659.9	1956.4	2340.1	2627.6
31-day	615.8	341.5	741	1128	1384.3	1630.1	1948.3	2186.8
15-day	437.1	230	521.4	782	954.6	1120.2	1334.5	1495.1
7-day	314.3	159	372.6	552.8	672.1	786.5	934.7	1045.7
5-day	289.5	159	347.7	527.9	647.2	761.6	909.7	1020.7
4-day	283.2	154.3	339.7	514.7	630.5	741.6	885.4	993.1
3-day	270.4	144.5	323.4	487.2	595.6	699.6	834.3	935.2
2-day	242.3	99.7	278.9	391.9	466.7	538.5	631.4	701
24-hr	186.2	70.8	212.1	292.4	345.6	396.5	462.5	512
18-hr	167.5	59.4	189.3	256.6	301.2	343.9	399.3	440.7
12-hr	148.8	42	164.2	211.8	243.3	273.5	312.6	341.9
8-hr	130.4	37.9	144.3	187.2	215.7	243	278.3	304.8
6-hr	118.6	34.8	131.3	170.8	197	222	254.5	278.8
4-hr	104.8	29.4	115.6	149	171	192.2	219.6	240.2
2-hr	74.3	19.8	81.6	104.1	118.9	133.2	151.7	165.5
1-hr	55.7	14	60.8	76.7	87.1	97.2	110.2	119.9
30-min	38.4	9.5	41.8	52.6	59.7	66.5	75.3	81.9
15-min	24.9	6.1	27.2	34.1	38.7	43.1	48.8	53.1
10-min	18.9	5.3	20.8	26.8	30.7	34.5	39.4	43
5-min	11.6	3.1	12.7	16.3	18.6	20.9	23.8	25.9

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N15 (based on rainfall data, 1984-1987, 1989-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	850.6	473.2	1024.1	1560.3	1915.4	2256	2696.9	3027.2
45-day	693.8	396.5	839.1	1288.5	1586	1871.4	2240.8	2517.6
31-day	582.7	323	701	1067.1	1309.5	1542	1843	2068.5
15-day	415.9	227	499.1	756.4	926.8	1090.2	1301.8	1460.3
7-day	299.4	155.8	356.5	533.1	650	762.2	907.4	1016.2
5-day	274.6	155.9	331.8	508.5	625.5	737.7	883	991.8
4-day	268.7	150.6	323.9	494.6	607.6	716	856.3	961.5
3-day	256.6	139.2	307.6	465.3	569.8	669.9	799.6	896.8
2-day	232.6	92.8	266.6	371.8	441.4	508.2	594.6	659.4
24-hr	179.4	62.3	202.3	272.8	319.6	364.4	422.4	465.9
18-hr	161.8	56.8	182.6	247	289.6	330.5	383.4	423.1
12-hr	144.8	40.7	159.8	205.9	236.5	265.8	303.8	332.3
8-hr	127.4	38.8	141.6	185.6	214.7	242.7	278.8	306
6-hr	116.4	36.3	129.7	170.8	198	224.1	257.9	283.3
4-hr	103.5	31	114.8	149.9	173.1	195.4	224.2	245.9
2-hr	74	20.9	81.6	105.3	121	136.1	155.6	170.2
1-hr	55.4	14.7	60.8	77.5	88.6	99.2	112.9	123.2
30-min	38.4	10	42	53.3	60.8	67.9	77.2	84.2
15-min	25.2	6.3	27.6	34.7	39.4	44	49.8	54.2
10-min	19	5.5	21	27.2	31.3	35.3	40.4	44.2
5-min	11.5	3.3	12.7	16.5	18.9	21.3	24.4	26.7

Raingauge N16

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N16 (based on rainfall data, 1985-1988, 1990-1997)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	802.1	436.5	962.1	1456.9	1784.5	2098.7	2505.5	2810.2
45-day	693.8	378.1	832.4	1261	1544.8	1817	2169.3	2433.3
31-day	570.7	321.6	688.6	1053.1	1294.4	1525.9	1825.6	2050.1
15-day	428.7	228.4	512.4	771.3	942.8	1107.2	1320.1	1479.6
7-day	305	149.6	359.9	529.5	641.7	749.4	888.8	993.3
5-day	284.5	154	340.9	515.5	631.1	742	885.5	993.1
4-day	275.7	150.6	330.9	501.5	614.5	722.9	863.1	968.3
3-day	262.3	134.1	311.4	463.4	564	660.5	785.5	879.1
2-day	230	100.1	266.7	380.1	455.2	527.3	620.5	690.4
24-hr	177	64.7	200.7	274	322.5	369.1	429.3	474.5
18-hr	151.8	65.8	175.9	250.5	299.9	347.2	408.5	454.5
12-hr	133.2	59.5	155	222.4	267	309.8	365.2	406.7
8-hr	116.2	47.7	133.7	187.7	223.5	257.9	302.3	335.6
6-hr	106.4	42.5	122	170.2	202.1	232.7	272.3	301.9
4-hr	97.6	36.2	110.9	151.9	179.1	205.2	238.9	264.2
2-hr	76.5	31.9	88.2	124.4	148.3	171.2	201	223.2
1-hr	55.7	24.3	64.6	92.1	110.3	127.8	150.4	167.3
30-min	39.2	12.8	43.9	58.4	68	77.2	89.1	98.1
15-min	24.4	6.4	26.7	33.9	38.7	43.3	49.2	53.6
10-min	18.1	5.1	20	25.8	29.6	33.3	38.1	41.6
5-min	10.5	3.1	11.6	15.1	17.4	19.6	22.4	24.6

Extreme Rainfall Depths Corresponding to Various Return Periods (Using Gumbel's Method) at GEO
Raingauge No. N16 (based on rainfall data, 1985-1988, 1990-1996)

Duration	Parameters		Return Periods (years)					
	m	$1/a$	2	5	10	20	50	100
	mm	mm	mm	mm	mm	mm	mm	mm
60-day	763	345.9	889.8	1281.9	1541.5	1790.5	2112.8	2354.3
45-day	657.4	314.9	772.8	1129.6	1365.9	1592.6	1885.9	2105.8
31-day	544.9	240.5	633	905.5	1086	1259.1	1483.1	1651
15-day	406.4	226.5	489.4	746.1	916.1	1079.2	1290.2	1448.4
7-day	290.7	149.2	345.4	514.5	626.5	734	873	977.2
5-day	269.4	152.5	325.3	498.2	612.6	722.4	864.5	971
4-day	260.9	148.7	315.4	484	595.6	702.6	841.2	945.1
3-day	248.5	128.6	295.7	441.4	537.9	630.5	750.4	840.2
2-day	219.6	92.9	253.7	359	428.7	495.6	582.2	647.1
24-hr	171.9	67	196.4	272.4	322.6	370.9	433.3	480
18-hr	146.9	68.5	172	249.6	301	350.3	414.1	461.9
12-hr	127.6	59.6	149.4	217	261.7	304.6	360.1	401.7
8-hr	111.2	43.2	127.1	176	208.4	239.5	279.7	309.8
6-hr	102.1	37.4	115.8	158.1	186.1	213	247.9	273.9
4-hr	93.8	34	106.3	144.8	170.3	194.8	226.5	250.2
2-hr	73.4	31.6	85	120.9	144.6	167.4	196.9	219
1-hr	53.7	25	62.9	91.3	110.1	128.1	151.4	168.9
30-min	38.4	13.4	43.3	58.5	68.6	78.3	90.8	100.2
15-min	23.9	6.6	26.3	33.9	38.8	43.6	49.8	54.4
10-min	17.8	5.3	19.7	25.7	29.7	33.5	38.5	42.2
5-min	10.3	3.2	11.5	15.1	17.6	19.9	22.9	25.2

APPENDIX C

60-MINUTE MAXIMA IN A 10-YEAR PERIOD AND ASSOCIATED CALCULATED EXTREME VALUES

Annual 60-minute maxima																
	84	85	86	87	88	89	90	91	92	93	94	95	96	97		10-yr max
H01	50	64.5	83.5	57	41.5	x	48	37.5	103	74.5	92.5	64	60	63.5		103
H02	52.5	63.5	67	51.5	43	48	52.5	44.5	84	91	101	60	64	66		101
H03	48	64	72	55	66.5	28.5	62.5	35	103.5	74	81.5	59.5	73.5	62.5		103.5
H04	53.5	64.5	60.5	43	57.5	52	90.5	46	92	83	106.5	64	68.5	85.5		106.5
H05	43.5	59.5	82	65	74.5	48.5	42.5	43.5	64.5	81.5	71.5	75	91.5	76		91.5
H06	41	69	84.5	62.5	49	x	43.5	27.5	92.5	76.5	59.5	87.5	66	86		92.5
H07	x	55.5	76	66	47	x	39	33.5	115.5	66.5	73	77.5	75	86.5		115.5
H08	44	52	64.5	55	45.5	47	45.5	45.5	100	71	76	98	70	84		100
H09	30	73.5	86.5	81	61.5	x	40	42.5	131	76.5	80	88	64	91		131
H10	51.5	71.5	78.5	57.5	32.5	73.5	61.5	x	101	74.5	91	54.5	63.5	70.5		101
H11	54.5	64.5	73	49	62.5	x	79.5	47.5	90	70.5	89.5	75	68	92		92
H12	51.5	66	66.5	47.5	59	x	79	37	91	74	87.5	77	69	76		91
H13	38	63.5	75	45.5	60	54	98	35.5	101	x	105.5	84	64.5	70		105.5
H14	54.5	55	75.5	72.5	41.5	39	88.5	40	109.5	97.5	80.5	94.5	59	77		109.5
H15	70	64	x	80	52.5	x	x	77.5	67.5	40	60.5	99	68	86		99
H16	46	59	85	75	76	46.5	59	34.5	88	52	86.5	94.5	61	75.5		94.5
H17	44.5	63.5	x	62	72	58	x	38	90	84.5	102.5	44.5	62.5	78.5		102.5
H18	49.5	66.5	85.5	73	59	71	45.5	51	123.5	62.5	94.5	70	61	75		123.5
H19	41	51	64	52.5	57	x	38.5	62.5	144.5	76.5	71	73	57	76		144.5
H20	45.5	51	64.5	58	79	38.5	38.5	58	77.5	68	76	73.5	95	67.5		95
H21	48	68	57.5	71.5	50	44	46	56.5	49	81.5	70	79	75.5	76		81.5
H22	44.5	65.5	77	71.5	67	37.5	68	55.5	97.5	75.5	109.5	80.5	68	83		109.5
K01	74	61.5	68.5	50	36.5	42.5	34	46	106.5	70.5	83.5	78	59.5	81		106.5
K02	84	85	52.5	62	42.5	x	46.5	50.5	99	84	74	72.5	58	103		103
K03	49	57.5	47	59.5	x	x	51	47.5	108	65	99.5	83.5	52.5	86		108
K04	57	53	46.5	50.5	54	x	53.5	50.5	99.5	68.5	101.5	59	53.5	79.5		101.5
K05	39.5	63	80.5	65	53	83.5	46.5	34	129	74.5	88	89.5	61	77.5		129
K06	67	116.5	65.5	52.5	41.5	53.5	39	45	64.5	82.5	73	61.5	42.5	119.5		119.5
K07	75	54	49.5	57	77.9	45.5	39	49	94.5	70	69	64.5	61	68		94.5
K08	44.5	49	42.5	61.5	x	36	55.5	55.5	114.5	60	90.5	89.5	57	91.5		114.5
N01	x	132.5	63	64	52.5	70.5	76	46	59.5	98	65	72.5	49.5	125		125
N02	x	80	59	67.5	72.5	49.5	61.5	49	69	101.5	68	78.5	x	124		124
N03	50.5	63	42.5	58.5	54.5	70	61	44	71.5	86.5	63	58	41.5	127.5		127.5
N04	55.5	59	56.5	71.5	60.5	x	31.5	52	82	97	59	61	42.5	128.5		128.5
N05	56	44.5	59.5	29.5	28.5	55	34.5	39.5	x	80	59.5	66	70	44.5		80
N06	31.5	58	46.5	73	55	71	81	63.5	83.5	117	74.5	68.5	47	113.5		117
N07	48.5	62.5	36.5	12.5	x	42	53.5	38.5	55	98	62.5	54.5	29.5	60		98
N08	56	60.5	56	60.5	54	44	54.5	51.5	95	42.5	72.5	85.5	52.5	71.5		95
N09	77	63.5	55.5	68	50	80.5	54.5	46	52.5	69	83.5	77	81.5	110.5		110.5
N10	30.5	44	94	50	62.5	60.5	36.5	41	71.5	80.5	85	45	59.5	89		89
N11	38	53	40	53.5	54.5	x	54	49.5	63	78	60	56	56.5	121		121
N12	60.5	50	x	62.5	60.5	62	33.5	36	61	79.5	92	52.5	42.5	57.5		92
N13	x	104	97.5	96	41.5	67	67.5	27.5	121.5	66.5	82	67.5	82.5	72		121.5
N14	57.5	61.5	101.5	44	74.9	61.5	60	33.5	84	99.5	211.5	112	53.5	118.5		211.5
N15	54.5	57.5	84	84.5	x	44	53.5	40.5	65.5	66	61	85.5	57.5	62.5		85.5
N16	x	66.5	62.5	62	34.5	90	46.5	65.5	133	81.5	50	68.5	58	86.5		133

APPENDIX D

EXTREME VALUES AT GEO RAINGAUGES CALCULATED FROM CORRELATION WITH MEAN ANNUAL RAINFALL

	30-year MAR	60-min/10-yr	60-min/50-yr	60-min/100-yr	24-hr/10-yr	24-hr/50-yr	24-hr/100-yr
H01	1800	91	118	130	327	445	495
H02	1900	96	125	138	345	470	523
H03	1810	91	119	131	329	448	498
H04	2010	101	132	146	365	497	553
H05	1900	96	125	138	345	470	523
H06	2200	111	145	159	399	544	605
H07	2220	112	146	161	403	549	611
H08	2190	110	144	159	397	542	602
H09	2200	111	145	159	399	544	605
H10	2040	103	134	148	370	504	561
H11	2000	101	132	145	363	495	550
H12	2025	102	133	147	368	501	557
H13	2070	104	136	150	376	512	569
H14	2060	104	136	149	374	509	567
H15	1800	91	118	130	327	445	495
H16	2025	102	133	147	368	501	557
H17	2110	106	139	153	383	522	580
H18	2200	111	145	159	399	544	605
H19	2140	108	141	155	388	529	589
H20	1750	88	115	127	318	433	481
H21	1940	98	128	140	352	480	534
H22	2150	108	141	156	390	532	591
K01	2200	111	145	159	399	544	605
K02	2250	113	148	163	408	556	619
K03	2350	118	155	170	427	581	646
K04	2500	126	165	181	454	618	688
K05	2120	107	139	153	385	524	583
K06	2200	111	145	159	399	544	605
K07	2500	126	165	181	454	618	688
K08	2180	110	143	158	396	539	600
N01	2410	121	159	174	437	596	663
N02	2410	121	159	174	437	596	663
N03	2300	116	151	167	417	569	633
N04	2120	107	139	153	385	524	583
N05	2140	108	141	155	388	529	589
N06	2250	113	148	163	408	556	619
N07	1825	92	120	132	331	451	502
N08	2530	128	166	183	459	626	696
N09	2300	116	151	167	417	569	633
N10	2020	102	133	146	367	500	556
N11	1910	96	126	138	347	472	525
N12	1650	83	109	119	299	408	454
N13	2000	101	132	145	363	495	550
N14	3110	157	205	225	564	769	855
N15	2410	121	159	174	437	596	663
N16	2300	116	151	167	417	569	633
HKO	2214	112	146	160	402	548	609
Legend: MAR Mean Annual Rainfall (mm) 60-min/10-yr 60-minute extreme value, 10-year return period							