NOAA Technical Memorandum EDS BC-105

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Environmental Data Service

An Annotated Bibliography on the Climate of Thailand

ANNIE E. GRIMES

SILVER SPRING, MD.
December 1971

NOAA TECHNICAL MEMORANDA

Environmental Data Service Series, Bibliography of Climate Subseries

The Environmental Data Service (EDS) is responsible for storing, retrieving, and publishing data gathered by NOAA and for developing systems to process and present NOAA data in the most useful historical and statistical form. These data, which relate to the solid earth, ocean, atmosphere, and extraterrestrial space, are the basic input in scientific and engineering studies having broad application in agriculture, commerce, defense, and industry.

NOAA Technical Memoranda in the EDS Bibliography of Climate (BC) subseries facilitate rapid distribution of annotated bibliographies of the climate of different nations and regions worldwide. Publications 1 to 101 are in the former series, Weather Bureau/Bibliography of Climate (WB/BC)--These are listed on the inside of the back cover; publications 102 to 104 are in the former series, ESSA Technical Memoranda, Environmental Data Service Technical Memoranda (EDSTM). Beginning with 105, publications are now part of the series, NOAA Technical Memoranda EDS.

Publications are available from the National Technical Information Service, U.S. Department of Commerce, Sills Bldg., 5285 Port Royal Road, Springfield, Va. 22151. Price: $3.00 hard copy; $0.95 microfiche. Order by accession number shown in parentheses at end of each entry.

ESSA Technical Memoranda

EDSTM-BC 102 An Annotated Bibliography on the Climate of Burma. Annie E. Grimes, May 1970. (PB-194 612)

EDSTM-BC 103 An Annotated Bibliography on the Climate of Ceylon. Annie E. Grimes, June 1970. (PB-194 607)

EDSTM-BC 104 An Annotated Bibliography on the Climate of the United Arab Republic. Henry Hacia and Vincent J. Creasi, July 1970. (PB-194 692)

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Environmental Data Service

NOAA Technical Memorandum EDS BC-105

AN ANNOTATED BIBLIOGRAPHY ON THE CLIMATE OF THAILAND

Annie E. Grimes
Atmospheric Sciences Library
Libraries Division
Environmental Science Information Center

Silver Spring, Md.
December 1971

UDC 016:551.582(593)

016 Special subject bibliographies
551.5 Meteorology
.582 Climate of particular places
(593) Thailand

TABLE OF CONTENTS

	Page
Introduction	v
Map of Regional Areas Southern and Eastern Asia	vi
Map of Southeast Asia	vii
Map of Thailand	viii
Sources and Abstracts	1-59
Author Index	61-
Subject Heading Index	

INTRODUCTION

This bibliography is one of a continuing series prepared at irregular intervals by the Foreign Branch, Climatology Division, Environmental Data Service. Earlier titles in this series are listed on the inside of the front cover.

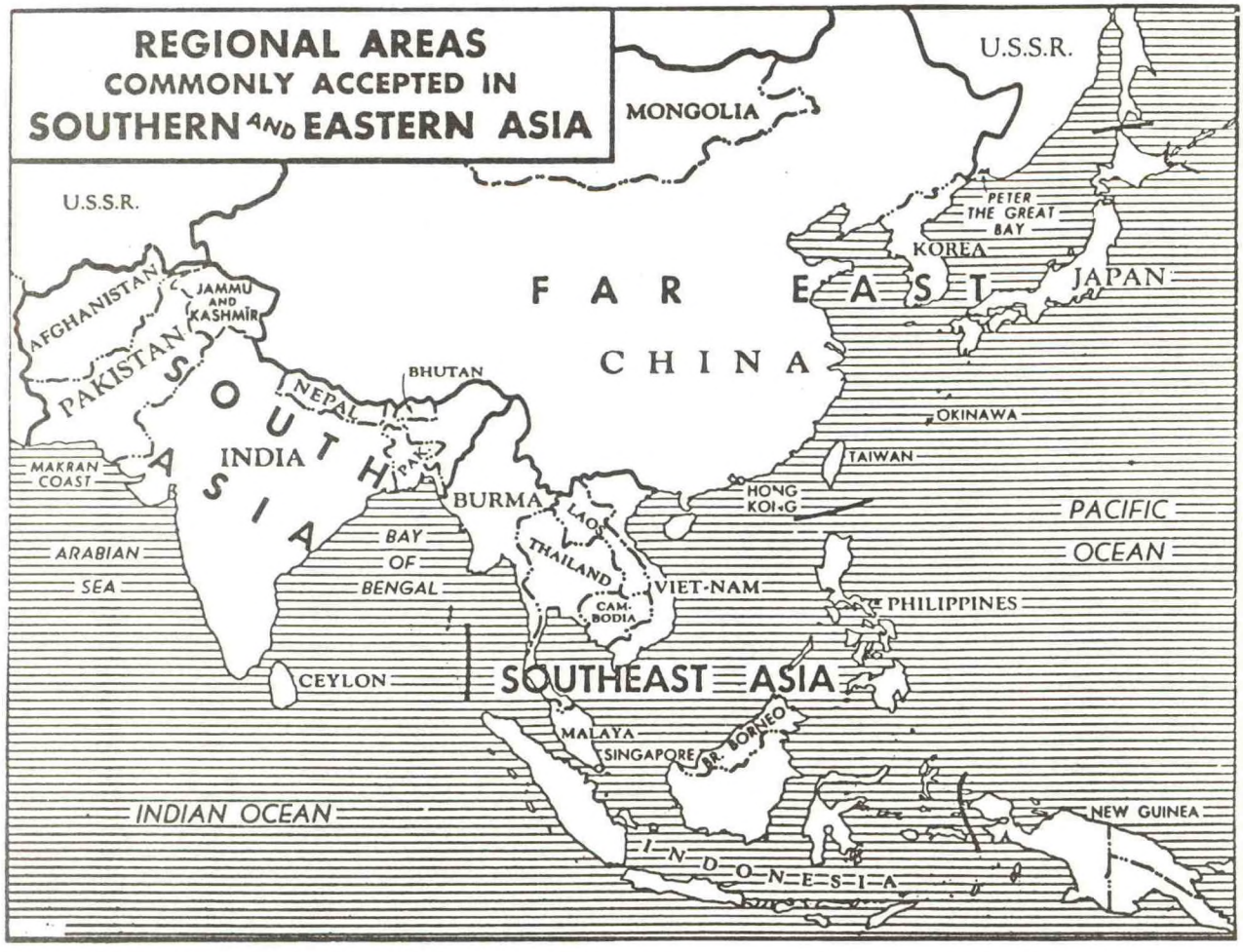
This bibliography on the climate of Thailand has been compiled from sources in three libraries of the Washington Metropolitan Area. Some sources may be in more than one of these libraries, however, the call number is recorded in the abstract for only one of them in the preferential order listed below:

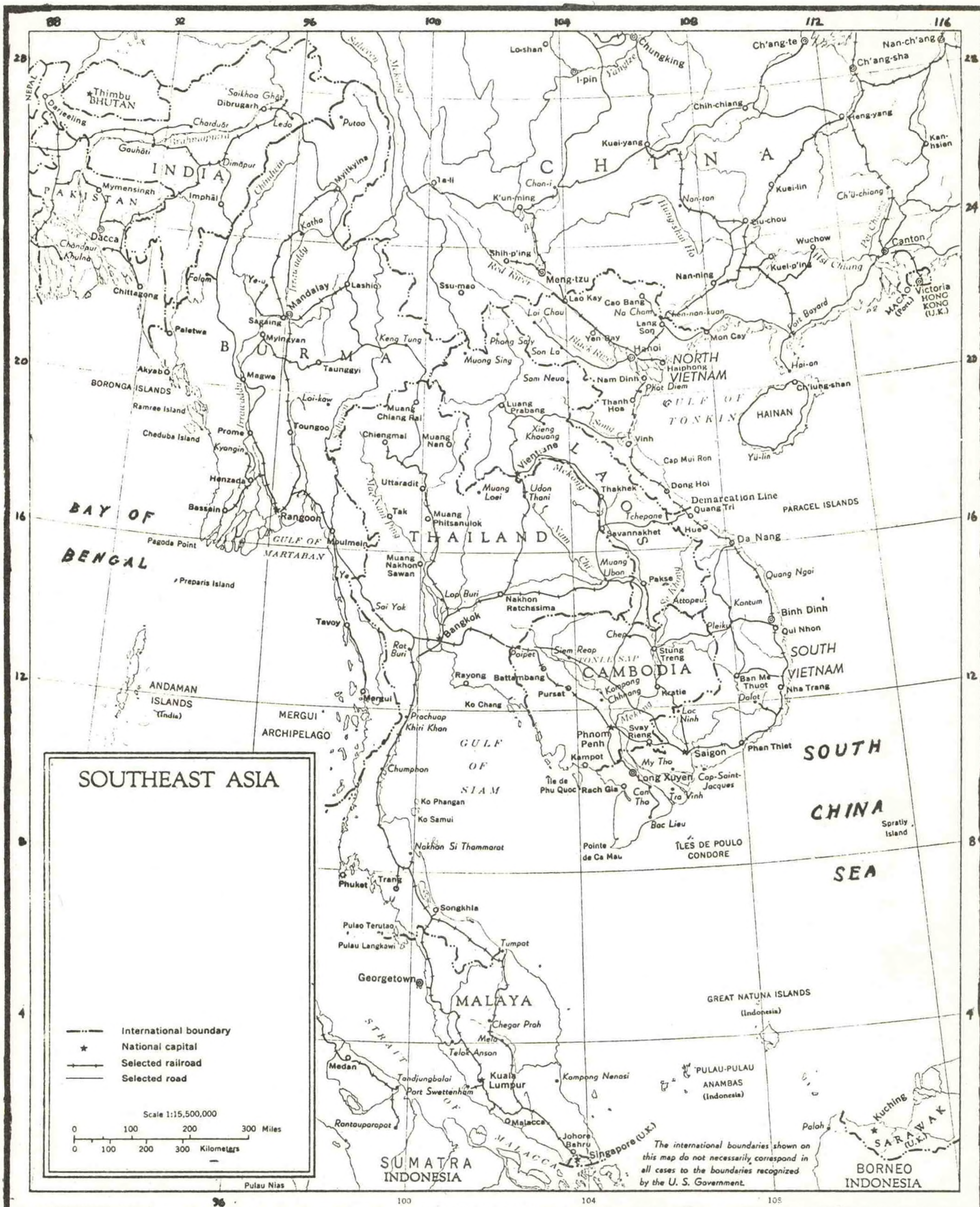
DAS	Atmospheric Sciences Library
DLC	Library of Congress
DN-HO	U.S. Naval Oceanographic Office Library

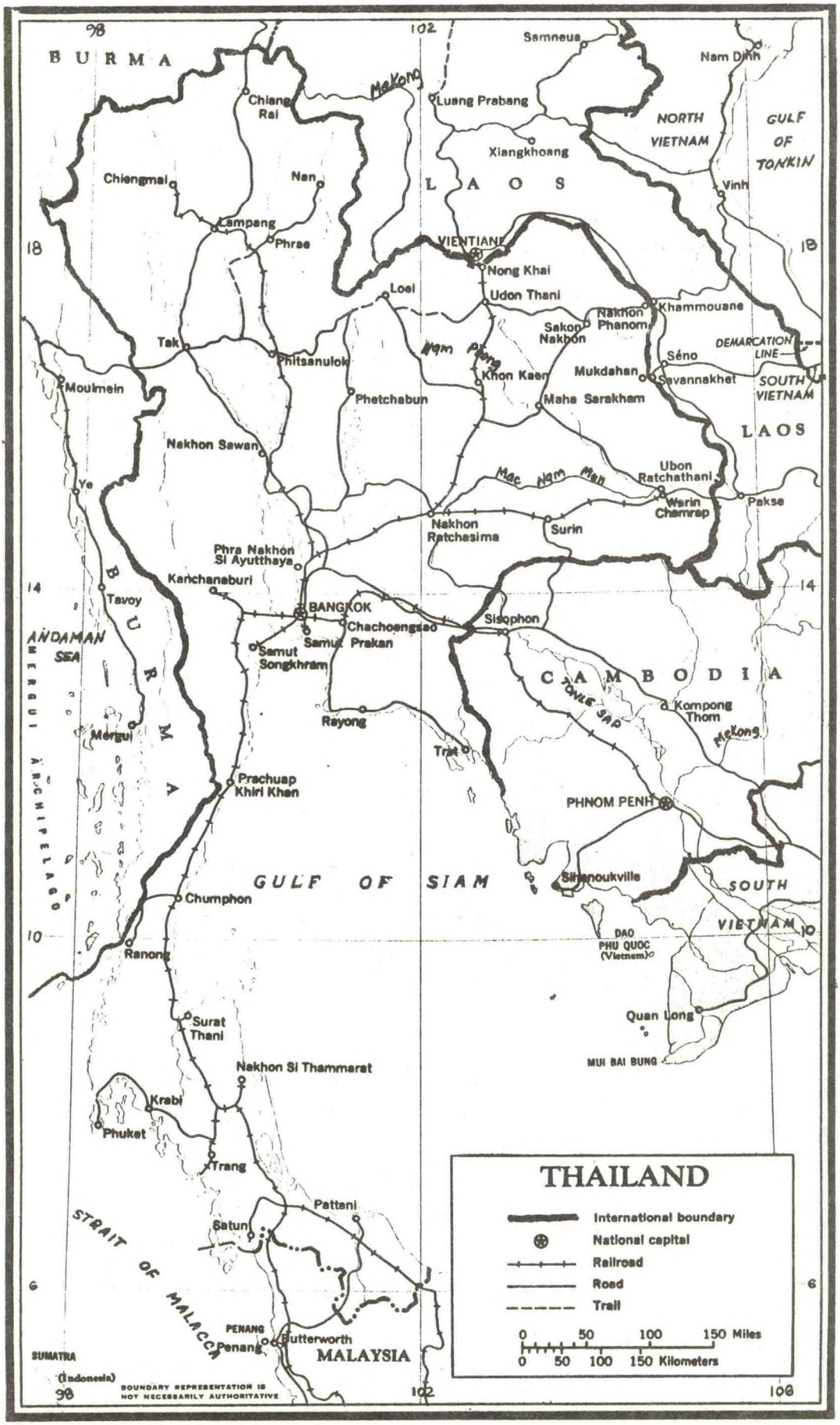
For example, a source listed in the Library of Congress, was not located in the Atmospheric Sciences Library, but it may be in the U.S. Naval Oceanographic Office Library.

The initials VTR at the end of the abstract for some sources indicate that the abstract was written by Virgilio Torres-Rentas. The initials MGA or MAB indicate that the abstract has been taken from the "Meteorological and Geoastrophysical Abstracts" (prior to 1960 title was "Meteorological Abstracts and Bibliography") of the American Meteorological Society.

Translations of foreign titles to English are recorded.


REGIONAL AREAS
COMMONLY ACCEPTED IN
SOUTHERN AND EASTERN ASIA
U.S.S.R.
MONGOLIA
U.S.S.R.
PETER THE GREAT BAY
KOREA
JAPAN
FAR EAST
CHINA
AFGHANISTAN
JAMMU AND KASHMIR
PAKISTAN
SOUTH ASIA
NEPAL
BHUTAN
INDIA
OKINAWA
TAIWAN
MAKRAN COAST
BURMA
HONG KONG
PACIFIC OCEAN
ARABIAN SEA
BAY OF BENGAL
LAOS
THAILAND
VIET-NAM
CAM-BODIA
PHILIPPINES
CEYLON
SOUTHEAST ASIA
MALAYA
SINGAPORE
BORNEO
INDIAN OCEAN
NEW GUINEA
INDONESIA


SOUTHEAST ASIA
International boundary
National capital
Selected railroad
Selected road
Scale 1:15,500,000
0 100 200 300 Miles
0 100 200 300 Kilometers
The international boundaries shown on this map do not necessarily correspond in all cases to the boundaries recognized by the U. S. Government.
C H I N A
I N D I A
PAKISTAN
BHUTAN
Thimbu
NEPAL
B U R M A
THAILAND
LAOS
CAMBODIA
NORTH VIETNAM
SOUTH VIETNAM
MALAYA
SUMATRA INDONESIA
BORNEO INDONESIA
SARAWAK (U.K.)
HAINAN
HONG KONG (U.K.)
MACAO (Port.)
BAY OF BENGAL
GULF OF MARTABAN
GULF OF TONKIN
GULF OF SIAM
SOUTH CHINA SEA
STRAIT OF MALACCA
ANDAMAN ISLANDS (India)
MERGUI ARCHIPELAGO
PARACEL ISLANDS
GREAT NATUNA ISLANDS (Indonesia)
PULAU-PULAU ANAMBAS (Indonesia)
ÎLES DE POULO CONDORE
Spratly Island
Demarcation Line
Chungking
Kun-ming
Hanoi
Haiphong
Rangoon
Mandalay
Bangkok
Vientiane
Luang Prabang
Phnom Penh
Saigon
Hue
Da Nang
Canton
Victoria
Singapore (U.K.)
Kuala Lumpur
Georgetown
Malacca
Kuching
Dacca
Chittagong
Moulmein
Chiengmai
Bandung


BURMA
LAOS
CAMBODIA
SOUTH VIETNAM
NORTH VIETNAM
GULF OF TONKIN
GULF OF SIAM
ANDAMAN SEA
STRAIT OF MALACCA
MALAYSIA
SUMATRA (Indonesia)
Mekong
Nam Ngum
Mae Nam Mun
Tonle Sap
Samneua
Nam Dinh
Luang Prabang
Xiangkhoang
Vinh
Chiang Rai
Chiengmai
Nan
Lampang
Phrae
VIENTIANE
Nong Khai
Loei
Udon Thani
Khammouane
Nakhon Phanom
Sakon Nakhon
Tak
Phitsanulok
Khon Kaen
Mukdahan
Séno
Savannakhet
DEMARCATION LINE
Moulmein
Phetchabun
Maha Sarakham
Nakhon Sawan
Ubon Ratchathani
Warin Chamrap
Pakse
Ye
Nakhon Ratchasima
Surin
Phra Nakhon Si Ayutthaya
Kanchanaburi
Tavoy
BANGKOK
Chachoengsao
Samut Prakan
Samut Songkhram
Sisophon
Kompong Thom
Rayong
Mergui
Trat
Prachuap Khiri Khan
PHNOM PENH
Sihanoukville
Chumphon
Ranong
DAO PHU QUOC (Vietnam)
Quan Long
MUI BAI BUNG
Surat Thani
Nakhon Si Thammarat
Krabi
Phuket
Trang
Pattani
Satun
PENANG
Penang
Butterworth
98
102
106
18
14
10
6
THAILAND
International boundary
National capital
Railroad
Road
Trail
0 50 100 150 Miles
0 50 100 150 Kilometers
BOUNDARY REPRESENTATION IS NOT NECESSARILY AUTHORITATIVE

AN ANNOTATED BIBLIOGRAPHY ON THE CLIMATE OF THAILAND

1870

1. Campbell, J. Pluviametrical observations. From Bangkok Calendar, 1870, p. 175. DAS C/ee AO-p.

...Consists of a table with monthly and annual summaries of precipitation amount for each year (1858-1861, 1863-1868) and over the period for Bangkok.

1879

2. Campbell, J. Meteorology of Bangkok, Siam. Meteorological Society, Quarterly Journal, V:82-89. London, 1879. DAS M(05) R888q.

...Presents monthly and annual summaries for Bangkok for each year (1858-1861, 1863-1868) of mean pressure, vapor pressure, cloud amount, temperature, and relative humidity; means at 1000 and 1600 of temperature, vapor pressure, relative humidity, and cloud amount; mean and absolute extreme temperatures; total and maximum amounts of rainfall; wind direction (8 points) frequency; number of days with rain, thunderstorms, clear sky, overcast sky, and lightning.

1883

3. Inskip, G. H. Diurnal rainfall at Bangkok. Meteorological Society, Quarterly Journal, IX:241. London, 1883. DAS M(05) R888q.

...Gives a table showing the frequency of rainfall at midnight, 0400, 0800, noon, 1600, and 2000 during September and October based on data for 1856 and 1857 at Bangkok.

1893

4. Bangkok rainfall. Royal Meteorological Society, Quarterly Journal, XIX:204. London, 1893. DAS M(05) R888q.

...Consists of monthly and annual summaries for each year (1882-1891) of total rainfall amount at Bangkok. This information was supplied by C. S. Leckie.

1900

5. Le Lay, G. Résumé des observations relevées dans les stations météorologiques secondaires de l'Indo-Chine pendant l'année 1899. (Summary of observations taken at secondary meteorological stations in Indochina during 1899.) Bulletin Économique de l'Indo-Chine, 3(25):383-388. (In French). Saigon, 1900. DLC HC441 .A4.

...Consists of tables with monthly and annual absolute and mean extreme temperatures, mean temperature and total rainfall amount for individual stations on the Indochinese Peninsula. These data are included for Chantaboun in Thailand.

1903 ?

6. Van der Heide, J. Homan. General report on irrigation and drainage in Lower Menam Valley. Siam, Ministry of Agriculture. Bangkok, 1903 ? DAS C/ee AO-i.

...In the appendix presents monthly and annual total rainfall amounts for each year at Bangkok (1845-1847, 1882-1891), Klong Rangsit (1901) and Chiengmai (1898-1900); monthly total number of days with rain for each year and monthly and annual rainfall amount for each year and over the period at Muaklek (1894-1899), Hinlap (1895-1899), Lopburi (1899-1901), Ban Pong (1900-1902) and Ratburi (1900-1902); monthly mean total rainfall amount over the period (1898-1901) for 13 stations in Thailand.

1904

7. Siam. Ministry of Agriculture. The Kingdom of Siam. 280 pp. New York, 1904. DAS C/ee S561.

...A general description of Siam is recorded on pages 19-62. This includes information on the climate. Tables contain monthly mean and extreme temperatures (°F) for 1902 and monthly and annual mean total amount of precipitation based on data during the 10-year period, 1882-1891 for Bangkok.

1905

8. Bangkok. Medical Officer of Health. Monthly abstract of meteorological observations. 1902-1905. DAS C/ee AO-a.

...Consists of tables with summaries for Bangkok of monthly and annual mean temperatures and total rainfall amount and monthly absolute maximum and minimum temperatures for each year (1902-1905); monthly mean maximum and minimum temperatures, mean daily range of temperature, and greatest and least daily temperature ranges for 1905; mean relative humidity for 1905.

1906

9. Highet, H. Campbell. Climate and health in Bangkok. Reprinted from the Journal of the Siam Society, Vol. III. 20 pp. Bangkok, 1906. DAS C/ee H638c.

...Consists of notes on the climate of Bangkok, tabular temperature and rainfall data for Bangkok and graphs presenting the temperature and rainfall summaries. The tabular summaries include mean temperature, mean maximum and minimum temperatures, mean temperature range, mean total rainfall amount and mean number of rainy days.

1907

10. Rainfall records of the Kingdom of Siam. Siam Society, Journal, 4(2):47-106. Bangkok, 1907. DAS C/ee S56.

Source No. 10 continued.

...Contains summaries for each year (April 1904-March 1906) of monthly total amount of rainfall (mm), monthly total number of rainy days and highest and lowest amounts of rainfall in 24 hours over a 12-month period at 22-77 stations in Siam. Coordinates and distance from seacoast are recorded for each station.

1909

11. Gerbing, W. Das Klima von Siam und die Ergebnisse der von Dr. Hosseus angestellten meteorologischen Beobachtungen. (The climate of Siam and the results of meteorological observations made by Dr. Hosseus.) Petermanns Geographische Mitteilungen, 55:128-133, 1909. DAS P.

...Discusses the climate of Siam and the results of meteorological observations. A table presents monthly summaries (December 1904-June 1905) for Djeng Mai of mean pressure, mean temperature, maximum and minimum temperatures, temperature range; means at specified hours (0700, 1400 and 2100) of absolute humidity, relative humidity, pressure and cloud amount. There are also tabular monthly summaries for each year (1901-1904) of total rainfall amount and total number of days with rainfall at Bangkok.

1911

12. Bangkok, Siam [U.S. Consulate-general]. Meteorological averages. November 1910, January-March, August-September, November-December 1911. DAS C/ee AO-me.

...Consists of typewritten summaries of mean temperature, mean maximum and minimum temperatures, absolute maximum and minimum temperatures, greatest and least daily temperature ranges, mean daily temperature range, number of days with rain, total rainfall amount for each month (November 1910, January-March, August-September, November-December 1911) for Bangkok. Monthly summaries over specified periods (8 years for November and January; 9 years for February, March, August, September, November and December) of mean temperature, mean maximum and minimum temperatures, mean number of days with rain,and mean total rainfall amount are also recorded for Bangkok.

1912

13. Highet, H. Campbell. The climate of Bangkok. 38pp. Bangkok, 1912. DAS C/ee H638.

...Consists of notes on the climate of Bangkok, descriptive information on climatic conditions in Bangkok for each month, and climatic data in tables and on graphs for Bangkok. The tabular data include monthly summaries (1902-1911) for each year and over the period of mean temperature, mean maximum and minimum temperatures, absolute maximum and minimum temperatures with dates of occurrence, mean total rainfall amount (also 1882-1891), maximum amount of rainfall in 24 hours with

Source No. 13 continued.

date of occurrence, mean number of rainy days and mean solar radiation temperature; monthly summaries for each year (1902-1911) of maximum and minimum solar radiation temperatures; monthly summaries of mean relative humidity; monthly summaries over a 10-year period (1858-1868 circa) of computed temperature values for comparison.

1914

14. Bangkok. Medical Officer of Health. Mean and extreme temperature in shade in Bangkok during 12 years (1902-13) in Fahrenheit and Centigrade thermometer scales. Also: Mean and extreme rainfall in Bangkok during 12 years (1902-13) and Meteorological data registered in Bangkok during the year 1913. Bangkok, 1914. DAS C/ee AOm.

...Contains tabular summaries over the period (1902-1913) and for 1 year (1913) for Bangkok of monthly and annual mean temperature (°F and °C); monthly mean of the maxima and mean of the minima temperatures (°F and °C); monthly mean, maximum and minimum daily ranges of temperature (°F and °C); monthly absolute maximum and minimum temperatures (°F and °C) with years of occurrence; monthly and annual mean total amount of precipitation (in. and mm.); monthly number of days with rain; monthly maximum amount (in. and mm.) of rain in 24 hours; monthly mean relative humidity (%).

1915

15. Bangkok. Medical Officer of Health. Mean and extreme temperature in shade during 13 years (1902-14) in Fahrenheit and Centigrade thermometer scales. Also: Mean and extreme rainfall in Bangkok during 13 years (1902-14). Bangkok, 1915. DAS C/ee AO.

...Presents tabular summaries over the period (1902-1914) for Bangkok of monthly mean of the maxima and mean of the minima temperatures (°F and °C); monthly mean, maximum and minimum daily ranges of temperature (°F and °C); monthly absolute maximum and minimum temperatures (°F and °C) with years of occurrence; monthly and annual mean total rainfall amount (inches and millimeters); monthly number of days with rain; monthly maximum amount (inches and millimeters) of rainfall in 24 hours with date of occurrence; monthly mean relative humidity (%); monthly and annual mean temperature (°F and °C).

16. Stoddard, A.A. Available supplies. Siam, Royal Irrigation Department, Project Estimate for Works of Irrigation, Drainage and Navigation to Develop the Plain of Central Siam, Vol. 1. Hydraulic Data Collected and Projects Elaborated. pp. 7-23. Vol. 2. Statement of Rainfall, Supplies in River, Etc. as well as Estimates of the Irrigation and Drainage Projects. p. 77. Bangkok, 1915. DAS C/ec AOp.

...On pages 16-17 in Volume 1 discusses the yield of the catchment. In Volume 2 a table presents the annual rainfall for Ménam Catchment at Wad Dhāhād and for each of the six subcatchments for each year 1905-1913.

17. Stoddard, A.A. The rainfall of Siam north of the head of the Gulf. Siam, Royal Irrigation Department, Project Estimate for Works of Irrigation, Drainage and Navigation to Develop the Plain of Central Siam, Vol. 1. Hydraulic Data Collected and Projects Elaborated. pp. 1-6. Vol. 2. Statement of Rainfall, Supplies in Rivers, Etc., as well as Estimates of the Irrigation and Drainage Projects, pp. 1-51. Bangkok, 1915. DAS C/ec AOp.

...In Volume 1, Chapter 1 the author discusses available sources of rainfall information, subdivisions into separate rainfall tracts, treatment of data obtained, rainfall of Bangkok, comparison of rainfall in different tracts, comparison of monsoon periods in different tracts, mean annual distribution of rainfall, rainfall over central plains, total rainfall to end of successive ten day periods, year of greatest and least monsoon rainfall since 1905, and rainfall intensity. In Appendix A of Volume 2, there are monthly and annual rainfall amounts at about 32 stations (period varies by station) summarized for each year and over the period and monthly and annual total rainfall amount summarized for each year (period varies by station) at approximately 32 stations.

1917

18. Indochina. Service Météorologique. Régime pluviométrique de l'Indochine. (Pluviometric regime of Indochina). 50 pp. (In French). Hanoi-Haiphong, 1917. DAS C/ed AO-R.

...Presents monthly and annual summaries of mean total rainfall amount and mean number of days with rain based on data for the period 1906-1915 for Bangkok; monthly and annual total rainfall amount for 1915 at Krat and Chantaboun; annual maximum and minimum rainfall amounts and number of days with measurable rain with years of occurrence for Bangkok; maximum total rainfall amount and maximum total number of days with rain in one month with month and year of occurrence at Bangkok.

1925

19. Rangsit. Meteorological Station. Meteorological observations. October-December 1924, May 1925. DAS C/ee AOra.

...Consists of tabular monthly (October-December 1924, May 1925) summaries for Rangsit of mean, mean maximum and minimum, and absolute maximum and minimum temperatures (°C); temperature range; mean maximum, and highest and lowest absolute maximum solar radiation (°C); mean minimum, and highest and lowest absolute minimum earth radiation (°C); mean, highest and lowest daily means, and absolute maximum and minimum pressures; mean, highest and lowest daily means, and absolute maximum and minimum relative humidities; prevailing wind direction, resultant wind direction, mean wind force, and calms observed; mean cloud amount; total number of days with rain, total amount of rainfall, maximum amount of rainfall in 1 day with date of occurrence, greatest rainfall intensity with date of occurrence, and total number of days with drizzling rain (>1 mm.).

1926

20. Thunder in Siam. The Meteorological Magazine, 61:216, 217. London, October 1926. DAS M(05) G786m.

...Gives brief notes on thunder at Tung Song, Siam and presents monthly mean number of days with thunder heard at this station based on 3-5 years of data between 1921 and 1926. This information was supplied by R. Stanley Breton.

1927

21. Siam. Royal Irrigation Department. Administration report. 1914/15-1925/26. Bangkok, February 1927. DAS C/ec AOa.

...In Part X on pages 148-187, 214-215 and 219 the weather and water supply report is recorded. This report contains a descriptive weather summary for each year, a list of instruments installed at the station recently established at Rangsit as well as the additional instruments on order, notes concerning the observing and recording of meteorological data, notes on the climate of Siam, tabular meteorological summaries and precipitation maps. The tables present monthly and annual mean total rainfall amount summarized over 3-21 years for 88 stations; annual normal amount, greatest and least amounts with years of occurrence, and greatest monthly amount with date of occurrence of precipitation for 75 stations; monthly (April-November) normal rainfall amount for 60 stations; temperature, solar radiation, earth radiation, pressure, relative humidity, wind, cloud amount and rainfall summaries at Rangsit for the period (April 1925-March 1926) and for March 1926; monthly (June-November) summaries of total rainfall amount for each year (1915-1925) for 44 stations.

1928

22. Carton, P. Note sur le climat de l'Indochine. (Note on the climate of Indochina.) Extracted from La Feuille Mensuelle de Renseignements, Février 1928. 45 pp. (In French). Hanoi, 1928. DAS M82/596 C328n.

...Includes monthly and annual mean total amount of rain for varying periods of record within the period 1907-1926 at 14 stations in Thailand, and monthly and annual mean number of days with measurable rain for Bangkok (1907-1918, 1926).

23. Indo-China. Service Météorologique. Bulletin pluviométrique. Tableaux mensuels, annuels et cartes. (Rainfall bulletin. Monthly and annual tables and maps.) 1914-1928. (In French). Phu-Lien. DAS C/ed AO.

...Presents tables with summaries for each year during the period 1914-1928 for 1-42 stations in Thailand of monthly and annual total rainfall amount (mm.), monthly maximum rainfall in one day with date of occurrence, and monthly and annual number of days with rain. There are also, in the volume containing data for 1928, summaries over specified periods (vary by station and element) of monthly and annual mean total rainfall amount, maximum and minimum rainfall amounts with dates of occurrence and mean total number of days with rain for 42 stations in Thailand; maximum rainfall amount in one day for Rangsit.

24. Palau. Meteorological Observatory. Data of tropical climate. Vol. 1. Rainfall. (In Japanese and English). Palau, 1928. DAS M82.2/266 P154b.

...Includes tabular monthly and annual mean total rainfall amount (mm.) and mean number of days with rain ≥0.1 mm., summarized over a 10-year period for Bangkok on pages 16-17.

25. Sion, Jules. Asie des moussons. (Monsoon Asia.) Géographie Universelle, IX(1):1-272. (In French). Paris, 1928. DAS C/e S618.

...Describes the mechanism of the monsoons in winter and summer, presents the general characteristics of the monsoon, discusses the classification of climates and summarizes some results of monsoons in Monsoon Asia. Monsoon Asia includes India, Pakistan, Burma, Thailand, Cambodia, Laos, North Vietnam, South Vietnam, China, Korea, Japan, Taiwan, the Philippine Islands, Java, Sumatra, Borneo, and the Celebes.

1930

26. Brändli, H. Climate. Siam. Bureau of Communications, Siam: Nature and Industry, pp. 21-26. Bangkok, 1930. DAS C/ee AO-n.

...Describes the seasons, rainfall, winds and temperature of Siam (Thailand). The tables present annual tabular summaries over the period for Rangsit (1925-1929) and Chiengmai (1927-1929) of mean, mean maximum and minimum and absolute maximum and minimum temperatures; mean and extremes of maximum solar radiation; mean and extremes of minimum earth radiation; mean and absolute maximum and minimum pressures and relative humidities; mean evaporation; mean cloud amount; prevailing wind direction; mean wind speed; rainfall amount; rainfall intensity; number of rainy days; some additional completed values.

27. Bruzon, E. and Carton, P. Le climat de l'Indochine et les typhons de la Mer de Chine. (The climate of Indochina and the typhoons of the China Sea.) 310 pp. (In French). Hanoi, 1930. DAS M82/596 B914cl.

...Includes tabular monthly and annual mean total amount (mm.) of precipitation for Bangkok based on data over a 22-year period.

1931

28. Braak, C. Klimakunde von Hinterindien und Insulinde. (Climate of the East India Islands and Southeast Asia.) Handbuch der Klimatologie, Band IV, Teil R. 125 pp. (In German). Berlin, 1931. DAS M8 H236h Bd. Teil R. Translated into English by Weather Information Branch, Headquarters, Army Air Forces, March 1943 and issued as a U.S. Navy reprint in January 1944. DAS M8 H236h Bd. 4 T.R trans.

...Describes the climate of Siam (Thailand) on pages 38-42. The tables contain monthly and annual mean temperatures for 1928 at Patani, a representative station on the east coast of Thailand; monthly (June-November) rainfall amount at Rangsit; monthly and annual rainfall amount based on data for specified periods

Source No. 28 continued.

at Nakorn Nayok (18 years), Kanburi (18 years), Ranong (14 years), Takuapa (16 years), Langsuan (16 years), Nakorn-Sritamarat (16 years), Rangsit (1904-1922) and Bangkok (1905-1922); monthly and annual summaries over specified periods of mean temperature and annual mean extreme temperatures at Rangsit (1924-1928) and Bangkok (1858,...1918); climatic classification for Rangsit and Bangkok; summaries over specified periods of monthly mean relative humidity at Bangkok (1902-1918), monthly and annual mean wet bulb temperature at Bangkok (1902-1918), monthly and annual mean cloud amount (%) at Rangsit (1924-1928), and monthly and annual number of days with rain at Phre (1914-1921), Rangsit (1924-1928) and Bangkok (not specified).

29. Iyer, V. Doraiswamy. Rainfall of Siam. Its normal distribution and relation to Indian rainfall; possibility of forecasting monsoon rains. India Meteorological Department, Scientific Notes, IV(38):69-85. Calcutta, 1931. DAS M(055) I39s.

...Gives the monthly and annual normal mean rainfall amount in inches, mean number of rainy days ($\geq$0.1") and mean number of rainy days ($\geq$1 mm.) at 14-73 stations in Thailand based on data for the period 1906-07 to 1923-24 and discusses briefly the normal distribution of rainfall. There is a comparison of monsoon rain in Upper Siam with that in India. A formula is worked out for forecasting the monsoon rain in Upper Siam.

30. Köppen, W. Grundriss der Klimakunde. (Outline of climatology.) 388 pp. (In German). Berlin and Leipzig, 1931. DAS M8 K78g.

...Contains the following tabular summaries over an unspecified period on pages 331 and 359 for Bangkok: mean temperature, mean total rainfall amount, mean cloud amount, mean number days with precipitation, and mean relative humidity for months with highest and lowest means (months are designated); annual mean and extreme temperatures; annual mean total amount of rainfall.

1932

31. Brooks, C. E. P. Climate. Second edition: Revised. 199 pp. London, 1932. DAS M/1700 B873.

...On pages 98-107 discusses the climate of India and Further India. This region extends from the Arabian Sea to the Pacific Ocean between 30°N and the equator.

32. Indo-China. Service Météorologique. Annales. (Yearbook) 1928-1932. DAS C/ed AO-a.

...Contains summaries for each year 1928-1932 of monthly and annual total amount of rainfall and total number of days with rain for 1-42 stations in Thailand; summaries over specified periods of monthly and annual maximum amount of rainfall in one day for Rangsit; summaries over specified periods (vary by station and element) of monthly and annual mean total rainfall amount, maximum and minimum rainfall amounts with dates of occurrence and mean total number of days with rain for 42 stations in Thailand.

33. Iyer, V. Doraiswamy. A remarkable tropical storm. Royal Meteorological Society, Quarterly Journal, 58(245):292-294. London, July 1932. DAS M(05) R888q.

...Traces the Nhatrang typhoon from its origin on November 2 over the western Carolines until it dissipates on November 25, 1912 in central Burma. This typhoon, which caused extraordinary violence at Nhatrang, travelled across South Vietnam, Cambodia, Thailand, Bay of Bengal, Ceylon, India, and the Arabian Sea and recurved across India, East Pakistan and Burma.

1933

34. Theaman, John R. Mean monthly and annual precipitation tables for stations in Siam. International Meteorological Series, Climatological Paper Number 60. July 1933. DAS C/ee T374.

...Consists of brief notes on the climate of Siam (Thailand), monthly and annual tabular summaries over specified periods (vary by station) of mean total amount of precipitation for 42 stations in Siam (Thailand), notes on extremes of precipitation, and annual mean number of days with rain ≥ 0.5 mm. for 42 stations for varying periods of record.

1934

35. Carton, P. Le climat de l'Indochine. (The climate of Indochina.) Extracted from Bulletin général de l'Instruction publique, no. 2, October 1934. 31 pp. DAS M82/596 C328c.

...Includes monthly and annual summaries of mean total precipitation (mm) amount for Bangkok based on data for 22 years.

36. Great Britain. Meteorological Office. Karachi to Singapore air route. Aviation Meteorological Report 1. 64 pp. January 1934. DAS M82 G786.

...Describes weather along the Rangoon to Penang (via Bangkok) air route during the north-east monsoon season (November to February), the inter-monsoon season (March-April) and south-west monsoon season (May-October). The tables contain monthly mean total rainfall amounts (inches) for Taak, Pitsanlok, Nakon Sawan, Ang Ton, Bangkok, Prachwab-Kirikhan, Langsuan, Gerbi and Singora; monthly mean number of days with thunder; seasonal (October-February and March-May) wind direction (8 points and calm) frequency (%) at 0700, 1000, 1300, 1600 and 1900 at Rangsit; monthly (November-February) visibility frequency within specified limits based on 2 years of observations at 0700, 1300 and 1600 at Rangsit; monthly (March and April) fog and mist frequency within limits ($<$ 1100 yards and 1100-2200 yards) at 0700, 1300 and 1600 based on 2 years of observations. There are also monthly and annual summaries over specified periods (2-44 years) for Bangkok of mean pressure (mb.), mean temperature (°F), mean daily maximum and minimum temperatures (°F), absolute maximum and minimum temperatures (°F), mean relative humidity, mean air density (gm/m^3), absolute minimum air density, mean cloud amount (0-10), mean total amount of precipitation (mm), maximum amount of precipitation (mm) in 24 hours,

Source No. 36 continued.

mean number of days with precipitation, mean number of days with fog, mean number of days with thunder, wind direction (8 points) frequency (%) and mean wind force (Beaufort). Monthly wind roses at 1500, 3000 and 6000 feet are recorded for Don Muang.

37. Theaman, John R. The wettest spots in the world. 139 pp. Indianapolis, August 1934. DAS M/1210 T374w.

...On page 131 reports that Kratt, Siam is the only station in that country recording more than 100 inches of precipitation in a year. On page 137 the monthly and annual mean total amounts of precipitation based on data for the period 1922-1931 are included.

1935

38. Credner, Wilhelm. Siam das Land der Tai. (Siam, the land of the Thai.) Stuttgart, 1935.

...General climatic conditions described on p. 66-86 with summary tables and charts. -- MAB 5B-140.

39. Reed, W. W. The distribution of precipitation over the earth. 165 pp. Washington, 1935? DAS C/a R327.

...On page 101 monthly and annual summaries over specified periods (vary by station) of mean total amount (inches) of precipitation are recorded for 16 stations in Thailand.

40. Thailand. Department of General Statistics. Statistical yearbook of the Kingdom of Siam. 1916-1935. DAS H-2 MF-44.

...Consists of tabular monthly and annual summaries for 1-18 stations in Thailand of mean, mean maximum and mean minimum temperatures; mean, maximum and minimum ranges of temperature; mean, maximum and minimum solar radiation temperatures and earth radiation temperatures; rainfall amount, number of days with rainfall, maximum rainfall amount in 24 hours with date of occurrence, mean pressure, absolute maximum and minimum pressures, mean relative humidity, absolute maximum and minimum relative humidities, mean cloud amount, prevailing wind direction, and mean wind force. Periods of record vary by station and element. There are summaries by year and over specified periods.

1937

41. Great Britain. Meteorological Office. Weather in the China Seas and in the western part of the North Pacific Ocean. Volume II. Local information. Part 2A. China Sea south of latitude 10°N. including the Gulf of Siam, the east coast of the Malay Peninsula, the coast of Siam, and the south-west coast of Indo-China. pp. 71-110, 120-130. London, 1937. DAS M82/512.3 G786w.

Source No. 41 continued.

...Discusses the typhoons, surface and upper winds, visibility, clouds, rain, hail, air and sea temperatures, humidity, thunderstorm, squalls, tornadoes and waterspouts for the area. Tables present monthly and annual summaries over periods of 10-44 years for Bangkok of mean pressure (mb), mean temperature (°F), mean daily maximum and minimum temperatures, mean of highest and mean of lowest temperatures (°F) in each month, absolute maximum and absolute minimum temperatures (°F), mean relative humidity (%), mean cloud amount (0-10), mean total rainfall amount and maximum amount (mm) in 24 hours, number of days with rain, wind direction (8 points and calm) frequency (%) and number of days with thunder. For 1932 there are monthly wind speed frequencies within specified limits (< 3, 3-13, 14-27, 28-40 and >40 knots) by direction (8 points and calm) at heights of 1500, 3000, 6000 and 10,000 ft. for Bangkok. There are also monthly and annual mean total rainfall amounts for Langsuen and Praohub Kirikan based on data for the period 1907-1926.

42. U.S.S.R. Agro-gidrometeorologicheskiĭ Institut. Mirovoĭ Agro-klimaticheskiĭ spravochnik. (The world's agro-climatic handbook.) 419 pp. (In Russian.) Leningrad-Moscow, 1937. DAS M82.2/47 U58m.

...Includes the following tabular summaries over an unspecified period for Boneng and Bangkok: mean temperature for the warmest and for the coldest months; annual mean minimum and absolute minimum (for Boneng only) temperatures; annual mean amount of precipitation; first and last dates of drought with duration in days; first and last dates of dry period with duration in days.

1938

43. Great Britain. Meteorological Office. Weather in the China seas and the western part of the North Pacific. Volume 1, Part 1. General information. 165 pp. London, 1938. DAS M82/512.3 G786w.

...On page 105 presents lowest and highest temperatures (°F) with range for Bangkok.

44. Iyer, V. Doraiswamy. Foreshadowing formula for the monsoon rainfall of Upper Siam. Royal Meteorological Society, Quarterly Journal, 64(275):342-344. London, April 1938. DAS M(05) R888q.

...Tests the performance of a formula for forecasting the monsoon rainfall of Upper Siam. The author uses a ten year period, 1927-1936. -- VTR.

45. Siam. Section of Meteorology. Meteorological organisation for aviators. 38 pp. April 1938. DAS M/0445 S562.

...Presents in detail the information the Section of Meteorology of the Hydrographic Service, Royal Siamese Navy supplies to aviators. This information includes weather reports, upper wind reports and route forecast.

46. Thailand. Cotton Experiment Station, Klongtan, Swankaloke. Annual report. 1936-37 to 1937-38. 2 volumes. Bangkok, September 1938. DAS C/ee AO-C.

...Describes climatic conditions of Swankaloke in 1936-1937 and presents tabular weekly and monthly rainfall amounts (mm) and monthly mean maximum and minimum temperatures (°C) at Klongtan, Sawankaloke for June 1936-March 1937 in Vol. 1. The meteorological data at the Cotton Experiment Station are briefly discussed in Vol. 2, and tabular weekly and monthly rainfall amounts (mm), and monthly mean maximum and minimum temperatures are recorded for April 1937- March 1938.

1939

47. Siam. Section of Meteorology. Meteorological organisation for aviators. 33 pp. April 1939. DAS M/0445 S562.

...Presents the information the Section of Meteorology of the Hydrologic Office supplies to aviators, viz., weather reports, upper wind reports and route forecast; explains how weather reports and forecasts can be obtained; includes various codes.

1940

48. Carton, P. Le climat de l'Indochine. (The climate of Indochina.) Le Climat de l'Indochine et les typhons de la Mer de Chine par E. Bruzon, P. Carton et A. Romer, Tome I. 211 pp. (In French). Hanoi, 1940. DAS M82/596 B914cl.

...Includes tabular monthly and annual summaries over a 32-year period of mean total rainfall (mm.) for Bangkok. These data are also presented graphically.

49. Deppermann, Charles E. Upper air circulation (1-6 km.) over the Philippines and adjacent regions. 85 pp. Manila, 1940. DAS M57/914 P552u.

...Discusses the main air streams from 1-6 km. over the Philippines and adjacent regions month by month. The area covered runs from the longitude of Burma to that of Guam and New Guinea and from the latitude of north Formosa to that of north Australia. Charts are presented showing the mean extent, mean direction and mean force of each of these air streams at the surface and aloft for January, April, July and October. -- VTR.

1941

50. Japan. Hydrographic Office. Appendix to military weather data. Vol. 4. French Indo China, Burma, Malaya, Netherlands East Indies. Weather Tables. 92 pp. (In Japanese). April 1941. DN-HO QC944.61 Japan #433.

...Presents monthly and annual tabular summaries over the period for 2-4 stations of mean pressure, mean temperature, mean and absolute extreme temperatures, mean and minimum relative humidities, mean total amount of

Source No. 50 continued.

precipitation, maximum amount of precipitation in 24 hours, mean cloud amount, mean wind speed, prevailing wind direction,and mean number of days with rain. Period of record varies by station and element. The source also includes monthly (February-December) frequencies of wind speed by direction and visibility at 0700 and 1300 for 9 stations for the year 1937. Data are recorded for Chiengmai, Udorn, Maesord, Pitsanulok, Korat, Rangsit, Bangkok, Bandon, Singora and Patani.

51. Knoll, Denys W. Climatology - Asiatic station. H.O. No. 219. 97 pp. Washington, 1941. DAS M82.2/5 K72c.

...Presents tabular 10-day summaries of mean sea level pressure (inches), mean temperature (°F) and mean total rainfall amount (inches) for Bandon, Chiengmai, Pitsanuloki and Bangkok. For Bangkok there are also 10-day summaries of maximum and minimum temperatures (°F); wind direction and velocity (knots); number of clear, partly cloudy and cloudy days; number of rainy days; number of days with fog; number of days with flying conditions average or better; number of typhoons affecting area. Period of record is not specified. -- VTR.

52. Reed, Wesley W. The climates of the world. Climate and Man, Yearbook of Agriculture, 1941. pp. 665-684. Washington. DAS M82 R327cl.

...Includes tabular summaries over specified periods for Bangkok of mean temperature (12 years) in °F for January, April, July and October; annual absolute maximum and minimum temperatures (12 years) in °F; monthly and annual mean total precipitation amount (19 years) in inches.

53. Taiwan (Formosa). Weather Bureau. [Flight weather report for French Indo-China, Thailand, and Dutch East Indies.] Vol. 1. (In Japanese). Taihoku, January 1941. DAS M82.2/596 T135f.

...Presents tabular monthly and annual summaries over the period (1858-1867) for Bangkok of mean pressure, mean temperature, mean maximum and minimum temperatures, mean relative humidity, mean cloud amount, mean total amount of precipitation and mean number of days with rain.

54. Thailand. Meteorological Department. Monthly frequency tables of horizontal visibility, surface and upper winds. January 1938-September 1941. Bangkok. DAS M06.1/593 T364mo.

...Consists of monthly frequencies for each year 1938-September 1941 at 1-16 stations of visibility within specified limits (<50 m., 50-200 m., 200-500m, 500-1000 m., 1000-2000 m., 2000-4000 m., 4000-10,000 m., 10,000-20,000 m., 20,000-50,000 m. and >50 km.) at 0000 and 0600 GMT; wind speed within limits (6-25, 26-50, 51-75 and >75 kph) by direction (8 pts. and calm) at 0000 and 0600 GMT; wind speed within limits (6-25, 26-50, 51-75, and >75 kph) by direction (8 pts. and calm) at heights of 500, 1000, 2000 and 3000 m. at 2300 and 0500 GMT.

1942

55. Blair, Thomas Arthur. Climatology, general and regional. 484 pp. New York, 1942. DAS M8 G635cl.

...In Chapter XVI briefly describes the climate of Siam (Thailand) and Indo-China on pages 325 and 326.

56. U.S. Weather Bureau. Climatic data for selected stations in Burma and Thailand. Special Report no. 5. Washington, 1942. DAS M82.2 U587s.

...Presents tabular monthly and annual summaries over specified periods, of mean temperature (13 years), mean and absolute maximum and minimum temperatures (13 years), and mean total amount of precipitation (44 years) for Bangkok; tabular monthly summaries over a specified period (13 years) of maximum and minimum amounts of precipitation for Bangkok; tabular summaries over an unspecified period of monthly and annual mean total amount of precipitation for Chiengmai, Khon-Kaen, Bhuket, Chieng-Rai and Ubol.

57. U.S. Weather Bureau. Southeastern Asia, India, Farther India, and the East India. Preliminary Report 5. 264 pp. Washington, 1942. DAS M82 U587p No. 5.

Describes the climate and weather, surface and upper winds, cyclonic and local storms, thunderstorms, cloudiness, cloud ceilings, fog, visibility, precipitation and temperature of Farther India on pages 136-182. Farther India includes Thailand, Indo-China, the Malay Peninsula and the Andaman Islands. A description of the climate of Bangkok is recorded on pages 187-191. Tables present monthly and seasonal pilot balloon summaries for the period (1938-1939) for Don Muang, Bandon and Pitsanuloke; monthly and annual summaries over an unspecified period of mean number of days with fog, mean relative humidity (%), mean cloud amount (tenths) and prevailing wind direction for Bangkok; monthly mean wind speed (mph) based on data for a two-year period (1938-1939) for Bangkok; seasonal wind direction and speed (mph) at specified heights for Bangkok (Don Muang) during 1938-1939; monthly mean temperature (°F), mean maximum and mean minimum temperatures with range, absolute maximum and minimum temperatures with dates of occurrence, greatest and least daily ranges of temperature, mean total rainfall amount (inches), greatest amount of rainfall in 24 hours with date of occurrence and mean number of days with rain based on data for a 10-year period (1902-1911).

58. U.S. Weather Bureau. Target area -- Indo China, south. Special Report No. 369. 5 pp. Washington, 1942. DAS M82.2 U587s.

...Includes tabular monthly (January, April, July, and October) summaries over an unspecified period of wind direction (16 points and calm) frequency (%) and mean wind speed (mph) at heights of 3300, 6600, 9800, 13,100, 16,400 and 19,700 feet for Don Muang. Brief notes on upper winds are presented for Thailand.

1943

59. India. Meteorological Department. India's climates; summary for airmen (summaries of climates of Afghanistan, Persia, Ceylon, Burma, Siam and Indo China are also appended.) 49 pp. Poona, 1943. DAS M82.1/54 I39i.

...In Appendix IV seasonal (December-March, April and May, June-September, and October and November) state of sky, rainfall and number of rainy days, number of days with thunder and duststorms, miscellaneous information (visibility, fog, haze, etc.), surface winds and upper winds are briefly discussed for (1) western Siam, (2) lower Siam, and (3) eastern Siam, Cambodia, and Cochin-China.

60. Pendleton, Robert L. Land use in northeastern Thailand. The Geographical Review, 33(1): 15-41. New York, January 1943. DAS P.

...Contains brief notes on the climate of northeastern Thailand and presents for Nakorn Rachasima graphs with monthly total rainfall amount (April 1937-November 1940), mean evaporation (April 1939-March 1940), mean maximum and mean minimum temperatures (April 1939-March 1940) and mean maximum and mean minimum relative humidities (April 1939-March 1940). -- VTR.

61. U.S. Army Air Force. Climate of Bangkok (Thailand). General climatic information guide No. 75. Washington, December 1943. DAS M82.1 U58g.

...Describes the location of Bangkok and the topography of the southern portion of the lower Menam Valley near the Gulf of Siam; discusses briefly the air masses, temperature, precipitation, cloudiness, fog and visibility, and winds; includes textual information on a comparable western hemisphere station, which is Port-au-Prince, Haiti; presents maps showing the topography and the trafficability of the southern portion of the lower Menam Valley near the Gulf of Siam; gives military implications of climatic conditions for air and ground operations; contains graphs of climatic data for Bangkok. These graphs, which are based on data summarized over specified periods (vary by element), present the following: monthly mean, mean extreme, and absolute extreme temperatures (°F); monthly mean number of days with maximum temperature $\geq 90°F$ and mean number of days with minimum temperature $< 70°F$; monthly mean amount, maximum and minimum amounts, and maximum amount in 24 hours of precipitation (in.); monthly mean, maximum and minimum number of days with precipitation; monthly precipitation spells (% of cases) within specified periods (1-2, 3-6, and ≥7 consecutive days with precipitation); monthly maximum and mean number of days with wet soil; monthly mean number of clear (< 2/10 sky cover) and cloudy (>8/10 sky cover) days; monthly maximum, mean and minimum number of days with ceiling <1000 ft. and/or visibility < 1 1/4 miles; monthly wind speed frequency (%) within limits (calm, 1-7, 8-18, 19-31 mph); seasonal surface wind roses. -- VTR.

62. U.S. Department of the Air Force. Weather conditions affecting the target area of Indo-China, Thailand, Burma, Malay States, and occupied southern China. Air Weather Service Special Study No. 16. 10 pp. Washington, November 1943. DAS M'055) U58s no. 16.

Source No. 62 continued.

...Describes the seasonal (winter, transition period from winter to summer, summer and transition from summer to winter) synoptic weather conditions and typhoons affecting the target area of Indo-China, Thailand, Burma, Malay States, and occupied southern China. Vertical cross sections of the atmosphere taken along routes chosen to typify the distribution of meteorological elements during the two monsoon seasons are included.

63. U.S. Hydrographic Office. Strategic aerological surveys. Part II. Pacific and Indian Ocean areas. H.O. No. 222A. Washington, 1943. DAS M82/26 U58s Pt. 2.

...This source contains surveys of two areas which include portions of Thailand. They are Survey No. 121, Coast of Southern Indo China, and Survey No. 153, Bay of Bengal and Inland Stations. Monthly climatic summaries for Bangkok (Survey No. 121) and Chiengmai (Survey No. 153) of mean total rainfall amount (inches) by graphs and numerical values, mean temperature (°F) by graphs and numerical values and mean pressure (mbs) by numerical values are presented. There are also monthly summaries for Bangkok of prevailing wind direction (8 points); mean wind speed (kts) by numerical values; % of clear days, % of cloudy and overcast days, mean cloud amount (%), mean relative humidity (%), % of rainy days and % of days with fog by graphs and numerical values; % of days with slight or no swell for adjacent coast.

64. U.S. Weather Bureau. Climatic statistics for selected stations in French Indo-China and Thailand. Special Report No. 252. Washington, April 1943. DAS M82.2 U587s.

...Contains monthly and annual summaries over specified periods (vary by station and element) of mean temperatures, mean daily extreme and absolute extreme temperatures in °F, number of days with minimum temperature ≤32°F, mean total amount of precipitation (inches), greatest and least amounts of precipitation, maximum amount of precipitation in 24 hours, mean number of days with precipitation, mean snowfall amount (inches), number of days with snowfall, snow depth, number of days with ground covered with snow, mean relative humidity (%), mean cloud amount (0-10) at 0700 and at 1300, mean cloud amount (0-10), number of days clear, number of days partly cloudy, number of days cloudy, mean wind speed (mph), mean wind speed at 0700 and at 1300, maximum wind speed at 0700 and at 1300, prevailing wind direction, number of days with gales, number of days with thunderstorms, number of days with fog, number of days with thunder, number of days with squalls, dates of first and last snow, and dates of first and last frost. The above data are for 1-12 stations in Thailand.

1944

65. Eilertsen, Ernest B. and Banta, George S. The climate of Siam. Prepared under the Direction of Howard C. Davidson, Commanding General, Tenth U.S. Army Air Force. Calcutta, 1944? DAS M82.1/593 U581cl.

Source No. 65 continued.

...Discusses the thunderstorms, cloudiness, precipitation, surface visibility, surface winds and winds aloft for each season (December-March, April and May, June-September, and October and November) in Western Siam, Eastern Siam and Lower Siam.

66. Gherzi, Ernest. Zikawei Observatory. Climatological atlas of East Asia. 175 pp. Shanghai, 1944. DAS M82.3/5 Z68.

...Includes tabular summaries over specified periods (vary by station and element) of monthly and annual mean temperature, absolute extreme temperatures with dates and range, annual temperature range, monthly and annual mean relative humidity, monthly and annual mean total rainfall amount, monthly and annual mean number of rainy days ($\geq$ 0.2 mm.), monthly and annual mean pressure and monthly and annual prevailing wind direction at 4 stations (Chiengmai, Pitsanuloke, Bangkok and Bandon) in Thailand. This source also contains notes on tropical cyclones or typhoons and the main air masses prevailing over east Asia.

67. McIntosh, D.H. Tropical weather forecasting with particular reference to N.E. India, Burma and the Bay of Bengal. Synoptic Divisions Technical Memorandum No. 123, pt. 3 of Great Britain Meteorological Office. 1944. DAS M(055) G786s.

...Discusses the seasonal trend of weather for the tropical areas of India and southeast Asia; summarizes briefly for each season (winter or N.E. monsoon, pre-monsoon, S.W. monsoon and post monsoon) the normal air flow, flying dangers, and forecasting problems of the area; presents illustrative maps of India and southeast Asia.

68. U.S. Department of the Air Force. Forecasting and related problems in China. Air Weather Service Technical Report No. 105-32. 25 pp. December 1944. DAS M(055) U58a.

...On pages 22-25 includes information on Thailand in the report on the southern extent of the China haze. This haze, which would more nearly correspond to the definition of mist, may limit visibilities in southwest China, the Gulf of Tonking, northern French Indo-China, Thailand and Burma.

1945

69. Fletcher, Robert D. Lecture notes on climate and weather of southeast Asia. U.S. Army Air Forces, Tropical Weather School, APO 832, September 1945. 12 pp. DAS M15.8 F614la.

...Discusses the climate of the general circulation zones, seasonal changes in the general circulation, and the effects of orography and of zonal current perturbations on the general circulation in southeast Asia.

1946

70. John, I. G. and Hare, F. K. Winter circulation over Burma, Thailand and Indo-China. Synoptic Divisions Technical Memorandum No. 120 of Great Britain Meteorological Office. 10 pp. 1946? DAS M(055) G786s.

...Analyzes a series of synoptic charts for January 1938 for the purpose of explaining the typical winter circulation over Burma, Thailand and Indo-China. The authors discuss the general Asiatic circulation in winter, describe the synoptic meteorology of the region, give details concerning synoptic charts, and present synoptic charts of the region (Burma, Assam, Thailand, Indo-China and Tenasserim) for January 1938.

71. Thailand. Meteorological Department. Monthly radiosonde observation data. February-December 1946. Bangkok. DAS M06.1/593 T364mon.

...Consists of observations at 0400, monthly means at 0400 and monthly maximum and minimum values of altitude (meters), temperature (°C) and relative humidity (%) at surface and levels of 1,000, 950, 850, 800, 750, 700, 650, 600, 550, 500, 450, 400, 350, 300, 250, 200, 175, 150, 125, 100, 80, and 60 millibars for Bangkok.

1947

72. Bunnag, Charoon V. and Dhararaks, Khun Visisht. Climates of Siam. Royal Siamese Navy, Meteorological Department, Scientific Articles, No. 4. 16 pp. Bangkok, August 1947. DAS M82.1/593 B942c.

...Discusses the rainfall, temperature, wind, pressure, fog and seasons for the five topographical regions of Thailand, which was formerly known as Siam. Climographs showing monthly mean temperatures and mean total rainfall amounts are included for Chiengrai, Chiengmai, Udorn Dhani, Roi Et, Bangkok, Pitsanuloke, Songkla, Chumporn, Phuket and Chantaburi. The source also contains monthly and annual summaries over an unspecified period of mean temperature (°C), mean relative humidity, mean cloud amount (0-10) and mean pressure (mb) for Uttardith, Chiengmai, Nakorn Rajasima, Udorn Dhani, Arnyapradesa, Nakorn Sawan, Bandon, Naradihvas and Chantaburi.

73. Garbell, Maurice A. Tropical and equatorial meteorology. 237 pp. New York, 1947. DAS M G213t.

...Summarizes the weather in the southwestern North Pacific for each month by describing the air masses, circulation, tropical disturbances and typhoons of the area and presenting general remarks on the typical weather conditions on pages 150-161. This area includes Cambodia, North Vietnam, South Vietnam, Laos, Cambodia, Malay Peninsula, Thailand, Burma, Philippine Islands, Borneo, Celebes and adjacent sea areas.

74. Great Britain. Naval Weather Service. Summary of weather conditions on the China station. Memo No. 139/47. March 1947. DAS M(055) G786ma.

Source No. 74 continued.

...Summarizes weather conditions along the east coast of Malaya and Kra Peninsula and the eastern shore of the Gulf of Siam from Bangkok to Cape St. James. In this summary, descriptive information on surface and upper winds, weather, visibility, temperature and swell are recorded during the NE monsoon season (November-April) and the SW monsoon season (May-October). Typhoon information for the two areas is also included.

75. Guilmet, Bernard. Le temps en Indochine à l'usage des navigateurs aériens. (Weather in Indochina for the use of aircraft navigators.) 24 pp. (In French). circa 1947. DAS PF2924.

...Describes the seasonal (winter, warm, southwest monsoon and transition) weather, winds, low clouds and visibility along the Saigon-Bangkok and Bangkok-Rangoon routes.

1948

76. Kao, Y. S. General circulation of the lower atmosphere over the Far East. Memoirs of the Institute of Meteorology, Academia Sinica, 16(1):1-7. Nanking, July 1948. DAS M(055) A168m.

...Is a study based on pilot balloon data for 28 stations in China Proper and from data published in bulletins from Korea, Formosa, Indo-China, Siam (Thailand), Malaya, and India. The text presents a general description of the flow patterns and a description of the seasonal flow patterns.

1950

77. Alisov, B. P. Klimaticheskie oblasti zarubezhnykh stran. (Climatic regions of foreign lands.) 351 pp. (In Russian). Moscow, 1950. DAS M8 A414kl.

...Includes tabular maximum temperatures of the warmest month and the coldest month, annual mean maximum and minimum temperatures (°C), annual mean amount of precipitation (cm), annual maximum and minimum amounts of precipitation, annual maximum and minimum number of days with precipitation based on data for an unspecified period for Bangkok on pages 108 and 109.

78. Great Britain. Meteorological Office. Equivalent headwinds on some of the principal air routes of the world. Meteorological Reports No. 7 (Second Number of Volume II). 19 pp. London, 1950. DAS M82 G786m.

...Includes seasonal mean equivalent headwinds and standard deviation for direct route and return route from Bangkok to Hongkong.

79. United Nations, Economic Commission for Asia and the Far East. Flood damage and flood control activities in Asia and the Far East. Flood Control Series No. 1. 81 pp. Bangkok, October 1950. DAS M79.7 U58f.

Source No. 79 continued.

...Discusses the temperature, pressure, wind, precipitation and cyclones for the area known as Asia and the Far East. Monthly mean rainfall amount and mean temperature are presented on graphs for selected stations (Bangkok in Thailand) in the area.

1951

80. Brooks, C. E. P. Climate in everyday life. 314 pp. New York, 1951. DAS M86 B873c.

...On page 285 presents for Bangkok annual, January and July mean temperatures; annual maximum and minimum temperatures; January and July mean relative humidity; annual, wettest month and driest month mean total amount of rainfall (inches); annual number of days with rain; climatic character.

81. Thompson, B. W. An essay on the general circulation of the atmosphere over South-East Asia and the West Pacific. Royal Meteorological Society, Quarterly Journal, 77(334):569-597. London, October 1951. DAS M(05) R888q.

...Discusses the major airflows between the surface and 10,000 ft. for the area between Japan and the equator and longitudes 100°E to 150°E. This analysis is based on a study of the daily flow charts for the levels 2,000, 5,000 and 10,000 ft. prepared at the Royal Observatory, Hong Kong, since September 1947. -- VTR.

82. United Nations. Economic Commission for Asia and the Far East. Methods and problems of flood control in Asia and the Far East. Flood Control Series No. 2. Bangkok, 1951. DAS M79.7 U58m.

...Discusses on page 17 the methods and problems of flood control in Thailand. -- VTR.

83. U. S. Quartermaster Corps. Research and Development Division. Clothing almanac No. 18: Southeast Asia (Thailand, Burma, French Indochina and the Federation of Malaya). 22 pp. Washington, December 1951. DAS M86 U585c No. 18.

...Discusses briefly the climate (winds, temperature, and rain) of Southeast Asia. A table includes monthly summaries over the period of mean temperature (°F) and mean total rainfall (inches) amount for individual stations (Bangkok in Thailand). Period of record is not specified. -- VTR.

84. The Climate of the World. 4. Asia. Weather, VI(3):75-78. London, March 1951. DAS M(05) R888w.

...Includes graphs showing the monthly mean daily maximum and minimum temperatures, mean pressure, and mean total rainfall amount based on data for an unspecified period at Bangkok.

1952

85. Great Britain. Meteorological Office. Temperature, rainfall and humidity tables: Asia. London, 1952? DAS M82.2 G786t Asia.

...Includes monthly and annual summaries of mean daily maximum and minimum temperatures (°F), absolute maximum and minimum temperatures (°F), mean relative humidity at 0700 and 1300, mean relative humidity, mean total rainfall amount (in.), maximum amount of rainfall in 24 hours, mean no. of days with rainfall $\geq$T and mean no. of days with rainfall $\geq$ 0.04 in.; monthly mean monthly maximum and minimum temperatures (°F); annual average of highest each year and average of lowest each year. The above data are for 1-3 stations (Bandon, Bangkok and Chiengrai) in Thailand. Period of record varies by station and element.

86. Kambhu, Momlaung Xujati. Characteristics of floods and prevention of damages in Thailand. United Nations, Economic Commission for Asia and the Far East, Proceedings of the Regional Technical Conference on Flood Control in Asia and the Far East, Flood Control Series No. 3, pp. 240-243. Bangkok, 1952. DAS M79.7 U58p.

...Discusses rainfall, its course and season; surface conditions of land; runoff; system of flood control in Thailand.

87. Ramage, C.S. Relationship of general circulation to normal weather over southern Asia and the western Pacific during the cool season. Journal of Meteorology, Boston, 9:403-408, December 1952. DAS M(05) A512j.

...Explores the major factors controlling weather-sequences and weather-distributions over the tropical and subtropical regions of Asia and the West Pacific during the cool season (November-April).

88. Tannehill, Ivan Ray. Weather around the world. 212 pp. Second edition. Princeton, 1952. DAS M T166we 1952.

...On pages 119-120 briefly describes the climate of China and Southeastern Asia. Tables present monthly summaries over unspecified periods of mean daily maximum and minimum temperatures (°F), mean relative humidity (%), absolute maximum and minimum temperatures (°F), mean number of days with rain, and mean cloud amount (%) for Bangkok.

89. Thailand. Meteorological Department. Annual meteorological data. 160 pp. Bangkok 1952. DAS M06.1/593 T362an.

...Consists of tabular monthly and annual summaries for each year 1946-1950 for 13-33 stations of mean pressure (mb.); absolute maximum and minimum pressures with dates of occurrence; mean and mean maximum and minimum temperatures (°C); absolute maximum and minimum temperatures with dates of occurrence; mean relative humidity at 0700, 1300 and 1900; mean cloud

Source No. 89 continued.

amount (0-10) at 0700, 1000, 1300 and 1600; total rainfall amount and maximum amount (mm) in 24 hours with date of occurrence; total number of rainy days; total number of days with thunderstorms, lightning, thunder, fog, haze, dew, hail and squalls; wind direction frequency; mean wind force (0-12); maximum wind force with direction and date of occurrence; evaporation amount per day (mm.). There are monthly actinometric summaries for each year 1945-1950 at Bangkok.

90. Thailand. Meteorological Department. Monthly meteorological summary for aviation. Vol. 1-2, 1951-1952. Bangkok. DAS M06.1/593 T364ma.

...Consists of monthly summaries for each year (1951-1952) of number of simultaneous occurrences of specified visibility ranges and specified ranges of the height of the base of the lowest cloud layer covering more than 4/8 of the sky at 2-4 specified hours (0600, 1200, 1800 and 2400 GMT); wind speed (0, 1-3, 4-6, 7-10, 11-16, 17-21, 22-27, 28-33, 34-40, 41-47, 56-63 and ≥ 63 knots) frequency by direction (8 pts); wind direction (8 pts.) frequency; number of occurrences of concurrent wind speed and direction within specified ranges when the horizontal visibility and/or the height of the base of the lowest cloud layer covering more than 4/8 of the sky lie within specified ranges; number of occurrences of specified values of dry bulb and dew point temperatures at 0600, 1200, 1800 and 2400 GMT; number of occurrences of specified values of daily maximum, mean and minimum temperatures. The summaries are for Don Muang, Nakorn Rajasima, Songkhla, and Chiengmai (June 1951-December 1952).

1953

91. U.S. Quartermaster Research and Development Center, Natick, Mass. Environment of Southeast Asia. Environmental Protection Division, Report No. 219. 45 pp. August 1953. DAS M86 U585r no. 210.

...Discusses the regional climatic pattern, precipitation, temperature, humidity, winds, cloud cover and visibility, and storms of Southeast Asia. The tabular data include monthly mean total rainfall amount (in.) and maximum amount of rainfall in 24 hours based on 10-20 years of data at Bangkok, Muang Chiang Rai, Nakhon Ratchasima and Phuket; monthly and annual mean, mean maximum and minimum, and absolute maximum and minimum temperatures (°F) summarized over periods of 3-15 years for Bangkok, Muang Chiang Rai, Nakhon Ratchasima and Phuket; monthly and annual mean relative humidity based on data for 3-16 years for Bangkok, Chanthaburi, Muang Chiang Rai and Songkla; monthly and annual mean cloud amount (%), summarized over a period of 5 years for Bangkok and Muang Chiang Rai; monthly and annual summaries over an unspecified period of mean number of days with thunderstorms at Bangkok and Muang Chiang Rai.

92. World Meteorological Organization. World distribution of thunderstorm days. Part I: Tables. WMO No. 21. TP.6. 204 pp. (In English and French). Geneva, 1953. DAS M(06) W927p no. 21.

...Includes monthly, seasonal and annual mean number of days with thunderstorms, summarized over specified periods (3-10 years) for 30 stations in Thailand. -- VTR.

1954

93. Cronin, Jack. A brief summary of en route weather on the HKG/BKK/HKG and MNL/SIN/MNL routes. 7 pp. Bangkok, 1954. DAS M06.1/59 C947b.

...Discusses the general weather pattern along the Hong Kong-Bangkok-Hong Kong and Manila-Singapore-Manila routes. Monthly summaries of wind for both routes are presented. The source also contains a listing of adverse weather conditions for the four terminals, Manila, Singapore, Bangkok and Hong Kong. -- VTR.

94. Philbrick, A. K. Mean temperature and precipitation for selected southeast Asian stations. 1 graph. ⊏1954⊐. DLC Map Division.

...Is a graph showing the monthly mean temperature (°F) and mean total amount of precipitation (inches) for selected southeast Asian stations. This graph presents these summaries for Bangkok based on data for 84 years (temperature) and 55 years (precipitation). This source is in the collection of climatic maps for Indochina in the Map Division at DLC.

95. Thailand. Meteorological Department. Pilot balloon data. September 1936-October 1940, January 1949-February 1950, August 1950-December 1954. (In Thai and English). Bangkok, DAS MO6.7/593 T364p.

...Presents for 10 stations in Thailand daily observations at 1-4 specified hours (vary) of pilot balloon data (wind direction and speed at specified heights), visibility, cloud type and cloud amount for individual cloud types; monthly resultant wind direction, wind steadiness, prevailing direction, mean speed and maximum speed at specified levels; monthly mean visibility. Period of record varies by station and element.

1955

96. Ramage, C. S. The cool-season tropical disturbances of Southeast Asia. Journal of Meteorology, Boston, 12(3):252-262, June 1955. DAS M(05) A512j.

...During the cool season (November through April), two types of tropical disturbance occasionally bring rain to a normally dry part of southeast Asia. The area, enclosed approximately between 15°N and 25°N, and 95°E and 120°E, includes South China and the northern portion of Indo-China and Thailand.

Source No. 96 continued.

In late winter and spring, tropical troughs in the high-level (above 400 mb) southwesterlies cross southern India. Moving eastward, they link in the region of Burma and the low-latitude polar westerlies further north, then intensify and become stationary over the Thailand-Indo-China region. East of the trough line, disturbances with extensive rain areas develop on the China Sea polar front. -- Author's abstract.

97. Ramsey, B. Upper winds in the south-east Asia - west Australia region. Meteorological Magazine, 84(1,002):372-377. 1955. DAS M(05) G786m.

...Is a survey of upper winds centered along the meridian of 110°E. for April, July and October 1953,and January 1954. The author describes the data used and the mean cross-section for each month, presents cross-sections for each month, compares these cross-sections with other meridional cross-sections, and contains the tabular W. components for each month at each 10,000-ft level from 10,000 to 50,000 ft. and at each 10° latitude (20°N.-30°S.). This study is based on data from a number of stations in the area. These stations include Chiengmai, Bangkok and Songkla in Thailand.

98. Thailand. Meteorological Department. An account of the droughts experienced in certain parts of Thailand during the year 1954. 1 p. Bangkok, November 7, 1955. In its ⊏Miscellaneous papers⊐ DAS M06.2/593 T364mi.

...Defines absolute drought, partial drought and dry spell and presents brief notes on the drought in the northern part of Thailand in 1954.

99. Watts, I. E. M. Equatorial weather with particular reference to Southeast Asia. 224 pp. New York, 1955. DAS M82 W349e.

...The purpose of this source is to provide a report on the principles of analyzing equatorial weather. Although specific examples are presented for Southeast Asia the analysis is in general applicable to the entire equatorial region. Parallels and contrasts are drawn between conditions of this area and those of higher latitudes. The equatorial weather is discussed under the following headings: equatorial air circulation; observations; conditions in the upper air; formation of fog and cloud at low latitudes; strong convection and precipitation; rainfall; rainfall types of Southeast Asia; theory of equatorial air-movements; air-stream analysis; slope of air-stream boundaries; cloud structure on air-stream boundaries and convergence lines; circulation over Southeast Asia; examples of air-stream analysis; local disturbances; forecasting rain; equatorial air-stream boundaries elsewhere. The source also contains textual information on the distribution of rainfall over Thailand on pages 56-58 and tabular monthly and annual mean total rainfall amount (inches) for Bangkok (period of record not specified) on page 52. -- VTR.

1956

100. Emery, P. F. Strong winds at high levels in the equatorial zone of the Far East. Meteorological Magazine, 85(1011):275-277, September 1956. DAS M(05) G786m.

...Cites examples of strong winds at high levels in the Far East equatorial zone from aircraft reports and presents tables showing the observed wind speeds between 40,000 and 55,000 ft. on specified days in 1955 at stations near the air routes. Two of these stations are Bangkok and Songkla in Thailand.

101. Thailand. Meteorological Department. The climate of Bandon. 3 pp. Bangkok January 5, 1956. In its ⌈Miscellaneous papers⌋. DAS M06.2/593 T364mi.

...Describes the topography, seasons, temperature, pressure, winds, rainfall, relative humidity, cloudiness, visibility, thunderstorm activity, and typhoons and depressions for Bandon. Monthly and annual mean pressures at 0700 for the period 1939-1942 are recorded for Bandon. There are also tabular monthly summaries of wind direction (8 points and calm) frequency (%), mean wind force (Beaufort), mean maximum wind force, and absolute maximum wind force based on data for 1950-1954; mean, mean maximum and minimum temperatures summarized over the period 1940-1954; monthly and annual mean relative humidity; monthly absolute minimum relative humidity based on data for the period 1942-1954; monthly and annual mean cloud amount (0-10) and mean number of clear (0-2) days based on data for 1943-1946; monthly and annual mean total rainfall amount and mean number of rainy days summarized over the period 1932-1952; monthly and annual frequencies (days) of extreme wind velocities (24, 34, 44, 55, 68 and 82 kph) monthly mean number of days with fog (visibility <1 km) and mist (visibility 1-2 km) summarized over the period (1948-1952); mean number of days with thunderstorms based on 3 years of data; monthly and annual absolute extreme temperatures.

102. Thailand. Meteorological Department. Climatological data for Hua Hin. 2 pp. Bangkok, October 11, 1956. In its ⌈Miscellaneous papers⌋. DAS M06.2/593 T364mi.

...Consists of brief notes on the topography, temperature, relative humidity, cloudiness, rainfall, visibility, thunderstorms, typhoons and surface winds for Hua Hin.

103. Thailand. Meteorological Department. Surface and upper air observing stations in Thailand. n.p. Bangkok, 1956. DAS M01.9 T364su.

...Is an up-to-date list (October 1956) of meteorological stations in Thailand (47) with latitude, longitude, elevation, hours of observation, and type of observations taken. -- VTR.

1957

104. Thailand. Meteorological Department. Special climatic condition along the east coast from Cholburi to Sattahib. 2 + 10 pp. Bangkok, October 13, 1956. Also: Supplement to monthly frequencies of wind direction. 2 pp. Bangkok, September 7, 1957. In its ⌈Miscellaneous papers⌋. DAS M06.2/593 T364mi.

Source No. 104 continued.

...Consists of brief notes on the condition of sea and swell, typhoons and rainfall intensity for the area along the east coast of Thailand from Cholburi to Sattahib. There are tabular monthly wind direction (8 points and calm) frequencies (%), mean wind force and mean maximum wind force at 43 stations in Thailand.

105. Thailand. Meteorological Department. Weekly weather report, radiosonde and rawinsonde data in Thailand. January 1, 1955-June 8, 1957. (Broken period). DAS M06.7/593 T364we.

...Consists of observations at approximately 0230 GCT of geopotential height (GPM), temperature (°C), dew point (°C), relative humidity (%), wind direction (degrees) and wind speed (knots) at mandatory and significant pressure levels for Songkhla, Bangkok and Chiengmai.

1958

106. Graystone, P. Equivalent headwinds at heights of 30,000 feet & 40,000 feet along air routes. Supplemented and revised. Great Britain Meteorological Office, Meteorological Reports No. 20. 35 pp. London, 1958. DAS M82 G786m.

...Presents tabular average equivalent headwinds in knots on the route from the first-named of the terminal airports to second (Bombay-Bangkok, Calcutta-Bangkok, Bangkok-Hong Kong, Singapore-Bangkok, Darwin-Bangkok, Karachi -Bangkok, Bangkok-Manila, Bangkok-Tokyo, Bangkok-Djakarta, Bangkok-Okinawa, Bangkok-Delhi) and on the return flight and the variability of the equivalent headwinds from these mean values at given heights (30,000 and 40,000 feet) for each mid-season month.

107. Koeppe, Clarence E. and De Long, George C. Weather and climate. 341 pp. New York, 1958. DAS M K78wea.

...Includes monthly and annual mean temperature (°F) and mean total precipitation amount (inches) summarized over an unspecified period for Bangkok. -- VTR.

108. Koteswaram, P. The easterly jet stream in the tropics. Tellus 10(1): 43-57. Stockholm, 1958. DAS M(05) T277.

...Is a study of the high-tropospheric flow of the tropics over Asia and Africa for the purpose of jet stream analysis and an understanding of the upper wind circulation in these regions and their interaction with the large-scale circulation feature of the lower troposphere -- the summer monsoon.

109. Littlejohns, L. W. High cloud structure in equatorial south-east Asia. Meteorological Magazine, 87(1032):172-179, June 1958. DAS M(05) G786m.

...Based on statistical summaries of the incidence and height of high clouds found in the area from South India to North Borneo, high cloud was most

Source No. 109 continued.

prevalent from May to July, extending to April and August in some areas, with a further secondary maximum in November. Most tops of high clouds lay between 40,000 and 50,000 feet. Songkhla in South Thailand is included in the discussion.

110. Thailand. Meteorological Department. Climatological data. 10 year period 1943-1952. Vol. 7. 90 pp. (In Thai and English). Bangkok, 1958? DAS M06.3/593 T364cl v.7 1943-1952.

...Briefly describes the general climatic conditions, the seasons, temperature, rainfall, relative humidity, cloudiness, thunderstorms, surface winds and typhoons of Thailand. Explanatory notes concerning observations and instruments and station list with coordinates and elevation for each station are recorded. The tabular monthly and annual summaries based on 5-8 observations per day for the period 1943-1952 for 16-24 stations in Thailand are mean pressure (mb.), mean maximum and minimum pressures (mb.) and absolute extreme pressures (mb.) with dates; mean temperature (°C), mean maximum and minimum temperatures (°C) and absolute maximum and minimum temperatures with dates (°C); mean relative humidity (%) and mean maximum and minimum relative humidities (%); mean number of days with thunderstorms, thunder, lightning, dew, hail, haze, fog and squalls; wind direction frequency, mean wind force (Beaufort, 0-12) and maximum wind force with date of occurrence; mean amount (mm.) and maximum amount in 24 hours of precipitation with date of occurrence; mean number of rainy days; mean amount of evaporation; mean visibility (0-9) at 0700, 1000, 1300 and 1600; mean cloud amount (0-8) at 0700, 1000, 1300 and 1600. There are also monthly actinometric summaries (°C) for each year 1951-1955 for Bangkok.

111. Thailand. Meteorological Department. Distribution of thunderstorm days in Thailand. Various pagings. Bangkok, June 1958. In its ⊏Miscellaneous papers⊐. DAS M06.2/593 T364mi.

...Defines a thunderstorm day, lists regions in Thailand most subject to thunderstorms, presents the types of thunderstorms and records the times of maximum and minimum occurrences. The tables contain monthly and annual frequencies of thunderstorm days and frequencies of lightning and thunderstorm days for 43 stations based on data for the period 1948-1957, annual frequency for each year (1948-1957) and over the period of thunderstorm days and lightning and thunderstorm days for 43 stations, and extreme wind velocities for 45 stations during the 19-year period 1937-1955.

112. Thompson, Will F. Analogs of Canal Zone climate in India and Southeast Asia. U.S. Quartermaster Research and Engineering Center. Environmental Protection Research Division. Technical Report EP-91. Natick, 1958. DAS M86 U585t EP-91.

...Compares the climate of tropical regions with that of Cristobal and Balboa Heights, Canal Zone. The area covered in this report includes India, Pakistan, Ceylon, and the mainland of Southeast Asia south of the Himalaya and Chinese border, and north of 5° 31' N latitude. The following combinations

Source No. 112 continued.

of elements were studied: mean temperature of the warmest and coldest months, mean daily maximum temperature of the warmest month, mean daily minimum temperature of the coldest month, mean daily temperature range of the warmest month, mean annual precipitation, mean precipitation for the wettest month, number of wet months, relative humidity of the driest month, mean cloud cover of the wettest month and mean wind speed of the wettest month. Distribution of areas of analogy of pertinent climatic elements and combinations of these elements are shown on maps. There are for Bangkok monthly and annual tabular summaries over the period (17 years) of mean, mean daily maximum and mean daily minimum temperatures (°F); mean total precipitation (inches); mean cloudiness (tenths); mean relative humidity (%) and mean wind speed (mph). -- VTR.

1959

113. Chatterjee, Sujan Bandhaba. Monsoon and its influence on Southeast Asia people. International Geographical Union Regional Conference in Japan 1957, August 28-September 3, 1957, Tokyo and Nara, Proceedings. pp. 582-589. Tokyo, 1959. DAS 910.6 I61pr.

...Briefly discusses the wind regime and the summer monsoon of Southeast Asia.

114. Dhararaks, K. V. A note on the climatic condition of Thailand. Pacific Science Congress, 9th, Bangkok, 1957. Proceedings of the Ninth Pacific Science Congress of the Pacific Science Association Held at Chulalongkorn University, Bangkok, Thailand, November 18th to December 9th, 1957. Volume 13, Meteorology. pp. 79-80. Bangkok, 1959. DAS M(06) P117p 1957 v.13.

...Briefly discusses the development of the two pressure patterns in Thailand and the effect of these patterns on the weather.

115. Sokhrina, Raisa Fedorovna. Davlenie vozdukha, temperatura vozdukha i atmosfernye osadki severnogo polushariia. (Atmospheric pressure, air temperature, and precipitation for the Northern Hemisphere.) 474 pp. (In Russian). Leningrad, 1959. DAS M82 S683da.

...Includes monthly and annual summaries over specified periods of mean pressure at station level (1931-1940) and sea level, mean temperature (1901-1911, 1931-1940) and mean total amount of precipitation (1882-1891, 1901-1922, 1927-1929, 1931-1940) for Bangkok. Monthly and annual summaries over the period (1904-1922) of mean total amount of precipitation are recorded for Rangsit.

116. Thailand. Irrigation Department. Memorandum on the studies of the flood during September-October 1959 of the Me Ping River at the Bhumiphol Dam-site. [Bangkok] 1959. DAS M79/593 T364me.

Source No. 116 continued.

...Discusses the flood of the Me Ping River at the Bhumiphol Damsite during the period September 22-October 11, 1959. Charts, graphs and tabular data concerning this flood are included. -- VTR.

117. Thailand. Meteorological Department. An investigation of typhoons and tropical depressions. Bangkok, 1959. DAS M15.23 T364in.

...Consists of definitions of a tropical depression, a tropical storm and a typhoon; information on the effect of typhoons and depressions on Thailand; descriptive information concerning weather conditions prior to and during the typhoons that caused considerable damage to Thailand during the period 1947-1956; typhoon tracks.

118. Thailand. Meteorological Department. ⊏Miscellaneous tables of temperature and humidity in Thailand⊐. Various pagings. Bangkok, 1957-1959. In its ⊏Miscellaneous papers⊐. DAS M06.2/593 T364mi.

...Consists of monthly and annual summaries of means at each hour (0100-2400) of temperature (°C) and relative humidity (%) based on data for 1945-1954 for Bangkok; monthly, seasonal (NE monsoon, 1st transition, SW monsoon and 2nd transition) and annual summaries over varying periods between 1937 and 1958 of mean, mean maximum, mean minimum, absolute maximum and absolute minimum temperatures in °C for 44-47 stations in Thailand; monthly and annual summaries of mean, mean maximum, mean minimum, highest and lowest relative humidities (%) for 46 stations.

119. Meteorological assistance program in Thailand. Weather Bureau Topics, 18(3):45-46, March 1959. DAS M(06) U587w 18:1959.

...Describes the work of James A. Fellgren in the meteorological assistance program to improve and develop the National Weather Service in Thailand.

1960

120. Boonkird, Sa-ard; Dawson, M. D.; Stone, E. L., Jr. A preliminary study of teak soils and sites in Lampang Province, Thailand, June 1960. Thailand. National Research Council. Journal, 1 (Inaugural No.):27-75, November 1960. DAS.

...On pages 32-34 records some notes on the climate of the Lampang Province in northern Thailand and presents tables of monthly and annual summaries of mean temperature (°C) and total amount of rainfall at Lampang for each year (1945-1958) and over the period (1945-1958).

121. Buajitti, Kajit. Diurnal variation of precipitation at Bangkok. Thailand. National Research Council. Journal, 1 (Inaugural No.):1-19, November 1960. DAS.

Source No. 121 continued.

...This paper analyzes the diurnal variations of rainfall amounts and frequencies at Bangkok. Hourly rainfall observations during the period January 1937 to December 1959 have been utilized. The result revealed significant late afternoon maximum and secondary maximum around mid-night from May through August, while pronounced early morning and evening maxima occurred between September and October. During the Southwest monsoon season, mid May to mid October, frequency of rain was high between 1700 and 0700 hours. High frequency was noted in the morning during January and February, occurrence was also high in the afternoon from March through April. The maximum noted in the late afternoon from May through October, is probably due to convectional effects. The secondary maximum which occurs around mid-night, from May through August, is caused by vertical motion within the southwest monsoon airstream coupled with radiational cooling aloft. When augmented by the presence of the inter-tropical zone of convergence, during September and October, the maximum in the early morning is more pronounced. High frequencies of rain in the morning during January and February result from the outbreak of anticyclones from China. -- Author's abstract.

The source presents monthly frequencies of rainfall for each hour and for each year (1937-1959) by diagrams and monthly mean hourly rainfall amounts based on data for the period 1937-1959.

122. Critchfield, Howard J. General climatology. 465 pp. Englewood Cliffs, 1960. DAS M8 C934ge.

...Contains, for Bangkok, tabular summaries over the period of monthly and annual mean temperature (°F) and mean precipitation (inches). Period of record is not specified. -- VTR.

123. Ramage, C. S. (ed.) Notes on the meteorology of the tropical Pacific and Southeast Asia. U. S. Air Force, Cambridge Research Center, Geophysics Research Directorate. Air Force Surveys in Geophysics no. 126. 174 pp. Bedford, Massachusetts, June 1960. DAS M(055) U58as no. 126.

...On pages 101-120 discusses the synoptic climatology of the China Seas and Southeast Asia south of 30°N. This report contains the following descriptive data for this area: general climatological information, climatic conditions during the early winter (mid-October to mid-January) and late winter and spring (mid-January to the end of April), interruptions of the normal cycle, and clouds and rainfall during the winter monsoon; climatic conditions in early summer (May through late June or early July), early summer disturbances, climatic conditions during mid-summer (late June or early July to mid-July) and late summer and fall (mid-July to early or mid-October), easterly waves (usually in early summer and fall), and clouds and rainfall during the summer monsoon. The appendices consist of reprints of articles by C. S. Ramage. Abstracts of these articles pertaining to that section of southeast Asia which includes Thailand appear in this bibliography.

124. Srinkapaibulaya, Sa-ard. Study of rain-gauge networks over the central plain of Thailand. United Nations, Economic Commission for Asia and the Far East. Hydrologic Networks and Methods (Transactions of the Interregional Seminar on Hydrologic Networks and Methods, held at Bangkok, Thailand, from 14 to 27 July 1959), pp. 102-105. Flood Control Series, No. 15. Bangkok, 1960. DAS M79 U58hy.

...The purpose of this study was to find the relationship between the rain-gauge network density and the corresponding percentage error in computing the average rainfall depth of a moderate or a heavy storm for a given drainage basin. From the study it was learned that most of the departures from the true mean were negative. This indicates that each of the sparse networks tends to miss the heavy centers of the rainstorms. Another result of the study shows that the percentage error increases as either the gauge density or the area decreases.

125. U.S. International Cooperation Administration. An air system requirements plan and survey for the Kingdom of Thailand. 116 pp. December 1960. DAS M:629.13 U584air.

...On page 2 briefly describes the climate of Thailand. The meteorological program for Civil Aviation provided by the Meteorological Department, Royal Thai Navy, Ministry of Defense is presented on pages 105-111. An organization chart of the Meteorological Department is included.

126. Vadhanapanich, Charoen. Characteristics of rainfall over Thailand. United Nations, Economic Commission for Asia and the Far East. Hydrologic Networks and Methods (Transactions of the Interregional Seminar on Hydrologic Networks and Methods, held at Bangkok, Thailand, from 14-27 July 1959), pp. 138-140. Flood Control Series No. 15. Bangkok, 1960. DAS M79 U58hy.

...Characteristics of rainfall in the northern part, northeastern part, central part, east coast of Gulf of Thailand, west coast of Gulf of Thailand and west coast of southern Thailand are described in some detail. The rainfall pattern of a station depends on local effects as well as meteorological factors. A table presents the monthly mean number of days with thunderstorms based on data for the period 1943-1952 at Chiengmai, Bangkok, Songkhla and Nakhon Ratchasima.

127. Vitvitskiĭ, G.N. Klimaty zarubezhnoĭ Azii. (Climates in Asia outside of the U.S.S.R.). 396 pp. (In Russian). Moscow, 1960. DAS M82.1/5 V854kl.

...Includes the following monthly and annual summaries over the period for Bangkok: mean temperature (1931-1940) in °C; mean number of days with precipitation ≥1 mm. and mean relative humidity in % based on data for an unspecified period. The source contains brief climatic notes on the Siam region on pages 219 and 220.

1961

128. Bunnag, C.V. and Buajitti, K. A summary of upper air observation over Bangkok. Thailand. National Research Council, Journal, 2(3):1-5, September 1961. DAS M57.32 B942su.

...This paper summarizes the variations of meteorological elements at various levels. The upper air observations during the period January 1957 to August 1960 have been utilized. The results revealed significantly strong easterly winds above 200 mb. level from June to September. The transition from persistent westerlies to persistent easterlies abruptly occurs in May. During the period of strong easterlies aloft the mean height of the tropopause is quite low, but the pressures and temperatures are higher than any other period. The transition from easterlies to westerlies occurs in December. -- The authors' abstract.

129. Bunnag, C.V. and Buajitti, K. Upper winds over Southeast Asia and neighbouring areas. Thailand, Meteorological Department. 48 pp. Bangkok, August 1, 1961. DAS M57.2 T364up oversize.

...Monthly mean upper-level wind charts could assist as an analysis aid for forecasting wind fields. Since climatic charts for upper winds over Southeast Asia and neighbouring areas are inadequate, mean monthly streamline upper wind analyses at the 5,000 ft. and 10,000 ft. levels for the 1956-1958 period plus four north-south mean monthly zonal components near longitudes 100° E., 130° E., 140° E., and 165° E. for the period from 1956 to 1960 are presented here. -- Authors' abstract.

130. Dobby, E.H.G. Monsoon Asia. 381 pp. Chicago, 1961. DAS M53.21 D632mo.

...Presents tabular monthly mean total rainfall amounts in inches for Cheng Mai and Bangkok on page 179. Period of record is not indicated. -- VTR.

131. Harza Engineering Company. Hydrologic data, Mekong River Basin in Thailand. 1960-1961. (In English and French). DAS M79/593 H343hy.

...These reports for 1960 and 1961 on hydrologic data include for 18 stations (5-10 stations per element) tabular water temperature (°C) for selected dates per month, hourly amounts of precipitation (mm.), monthly and daily total amounts of precipitation (mm.), monthly and daily amounts of evaporation (mm.), daily wind movement (km.), and monthly total and mean wind movements (km.) for varying periods during the two years (1960-1961).

132. India. Meteorological Department. Meteorology for airmen. Part 3. Climatology of aerodromes. various pagings. New Delhi, 1961. DAS M82.1/54 I39m pt. 3.

Source No. 132 continued.

...On pages V.18-V.21 the topography, main climatological features, seasons, surface winds, thunderstorms, typhoons, visibility and ceilings at Don Muang Aerodrome (Thailand) are briefly discussed. Tables present monthly mean pressure (mb.) and mean temperature (°C) based on data for Bangkok for the period 1941-1950; monthly frequency of typhoons decreasing in intensity; monthly frequency of typhoons in the form of depressions in Thailand.

133. Kambhu, M. L. Xujati. Brief descriptions of hydrologic features of river basins in Thailand. Thailand. National Research Council, Journal, 2(1): 39-48, February 1961. DAS M79.6 K15br.

...Describes the location, topographic features and climate of Thailand. In describing the climate the author discusses seasonal characteristics for the country, the Intertropical Front and cyclonic storm, the temperature and the rainfall.

134. Kanchanalak, Boonchob. Some aspects of hydrological features of the Me Ping River Basin and the Yanhee Reservoir. 5 pp. Bangkok, June 1961. DAS M79/593 K16so.

...This report includes information on the rainfall in the Me Ping River Basin and evaporation from the Reservoir surface.

135. Kendrew, W. G. The climates of the continents. Fifth edition. 608 pp. Oxford, 1961. DAS M8 K33c 1961.

...Presents tabular summaries for Bangkok of monthly and annual mean total rainfall amount (44 years), mean temperature (61 years) for warmest month and coolest month, mean daily extreme temperatures (61 years) with range for warmest month and coolest month, and absolute extreme temperatures (61 years) for warmest month and coolest month.

136. Miller, Arthur Austin. Climatology. Ninth Edition. 320 pp. London, 1961. DAS M8 M647c 1961.

...On pages 156-157 gives a brief description of the climate of the Indochinese Peninsula and the Philippines. -- VTR.

137. Papadakis, J. Climatic tables for the world. 175 pp. Buenos Aires, 1961. DAS M82/2 P213cl.

...Presents monthly and annual summaries of evaporation (centimeters), annual humidity index, normal and maximum leaching rainfall, beginning and end of humid season, beginning and end of dry season, winter severity and summer heat, humidity regime, temperature regime and climatic classification for Bandon, Bangkok, Chiengmai, Nakorn Rajasima and Phuket in Siam (Thailand).

138. Sakornratana, Kachit. Observational studies on southwest monsoon weather over Thailand. U. S. -Asian Weather Symposium, John Hay Air Base, Philippine Islands, 13-17 February 1961. U. S. -Asian Weather Symposium; Exchange of Knowledge & Ideas for Increased Understanding. 16 pp. 1st Weather Wing, 1961. DAS M U582uni.

...Describes the aspects of weather in general, southwest monsoon weather patterns in general, influence of ITF and tropical cyclones and persistent weather pattern associated with a ridge of high pressure in the surface pressures over Thailand.

139. Vadhanapanich, Charoen. Significant meteorological achievements and events since the 1960 Symposium. U. S. -Asian Weather Symposium, John Hay Air Base, Philippine Islands, 13-17 February 1961. U. S. -Asian Weather Symposium; Exchange of Knowledge & Ideas for Increased Understanding. 3 pp. 1st Weather Wing, 1961. DAS M U582uni.

...Lists the 8 divisions of the Thai Meteorological Department, Royal Thai Navy; presents the purpose of this organization; describes the four types of meteorological stations; describes the plans and changes.

140. Vadhanapanich, Charoen. Some aspects of monsoonal rain in Thailand. Thailand. National Research Council, Journal, 2 (2): 49-54, May 1961. DAS M53.21 V123so.

...This paper gives an account of the characteristics of rainfall in Thailand. The physical features, rainfall patterns, tropical cyclones,and meteorological factors are described. A table presents monthly mean number of days with thunderstorms based on data for the period 1943-1952 for Chiengmai, Bangkok, Songkla and Nakhon Ratchasima. Graphs show the monthly distribution of rainfall amount (inches) for 21 stations based on 26 years (1932-1957) of data.

1962

141. Barton, Thomas Frank. Thailand's rainfall distribution by geographic regions. Journal of Geography, 61(3):110-118. Chicago, 1962. DAS P.

...Discusses the distribution of rainfall in Thailand by geographic regions, namely, southeast, west, southwest, south, northeast, north and central plain. According to the author this is the most realistic of all classifications. Contains monthly climographs of composite mean rainfall for each of these six regions based on data from 1932-1952. -- VTR.

142. Chareonsook, Dumrong. Analysis of a flood-producing storm. United Nations. Economic Commission for Asia and the Far East. Field Methods and Equipment used in Hydrology and Hydrometeorology; Transactions of the Interregional Seminar on Field Methods and Equipment used in Hydrology and Hydrometeorology held at Bangkok, Thailand, from 27 November to 11 December 1961, pp. 115-119. New York, 1962. DAS M79 U58f.

...Analyzes the storm of September 24-29, 1959. Some characteristics of storms which pass through Upper Thailand are provided by the mass curve of rainfall, isohyetal map, track of storm, depth-duration-area

Source No. 142 continued.

curve and hydrographs. Two problems about storm duration in this area are (1) duration cannot be determined accurately owing to the lack of automatic recording raingauges and (2) flood producing-storm rainfall is not due primarily to depressions. Active intertropical convergence zone both before and after the passage of a depression causes additional amounts of rainfall.

143. Huke, Robert E. Thailand. Focus, XII(6):1-6. New York, February 1962. DAS P.

...Contains a brief description of the rainfall of Thailand. -- VTR.

144. Linke, Franz. Meteorologisches Taschenbuch. (Meteorological handbook). 2nd edition. 806 pp. (In German). Leipzig, 1962. DAS M B351m.

...Includes tabular monthly and annual summaries over specified periods of mean amount of precipitation in millimeters (1910-1939), and mean number of days with precipitation (1907-1918, 1926) for Bangkok.

145. Michigan. University. Department of Geography. Analysis of geographic and climatic factors in coastal southeast Asia. Report No. 04231-1-F. 178 pp. Ann Arbor, Michigan, March 1962. DAS M(051) M624ana.

...Describes the area used in this study which is fifty mile strip around the coast of Southeast Asia from Pakistan to China. This study contains information on off-shore water depths, coastal type weather analysis, climate and weather, natural vegetation and land cover, generalized patterns of soils, analysis of characteristics of the transportation network, and native animals and diseases of importance to military operations. The chapter on climate and weather gives textual information on the climatic controls (latitude, altitude, and exposure to wind), temperature regimens, rainfall intensity in a day, diurnal distribution of rainfall, rainfall regimens, thunderstorms, and typhoons; analyzes weather stations; presents climatic maps of southeast Asia, graphs showing monthly values of various climatic elements at selected stations, maps of typhoon tracks for Indo-China and the South China Sea, and tabular monthly summaries of climatic data at individual stations in Burma, Malaya, Thailand, Singapore, North Vietnam, South Vietnam, Laos and Cambodia. The tabular monthly summaries include the following for Bangkok (5 years): mean number of dry days, rainy days, light rainy days (T-0.49"), heavy rainy days (.50-1.99") and very heavy rainy days (2.00"); mean number of short dry spells (1-3 days), long dry spells (4 days), short rainy spells (1-3 days) and long rainy spells (4 days); 24-hour maximum amount of rainfall; mean, greatest, and least amounts of rainfall; mean maximum and absolute maximum temperatures; means at 0600 and 1300 of temperature and relative humidity. The following monthly summaries are presented on diagrams for Bangkok: mean maximum temperatures; number of days with rain ($\geq$T), heavy rain (.5-1.99 inches) and very heavy rain ($\geq$ 2 inches); number of short rainy spells (1-3 days) and long rainy spells ($\geq$4 days).

146. Pendleton, Robert L. with the assistance of Robert C. Kingsbury and others. Thailand; aspects of landscape and life. An American Geographical Society Handbook. 321 pp. New York, 1962. DAS 915.93 P398t. Review by Thomas Frank Barton in Journal of Geography, 61(5):225-226, May 1962. DAS P.

...Discusses the monsoon and its seasons, climatological data, rainfall, temperature, climatic regions and water economy in Thailand on pages 113-133. Graphs present the monthly mean temperature, absolute maximum and minimum temperatures and mean maximum and minimum temperatures in °F; monthly mean total amount, maximum amount, minimum amount, and maximum amount in 24 hours of rainfall in inches; monthly mean maximum and minimum number of days with rainfall; monthly mean number of days with maximum temperature >90°F; monthly mean number of days with minimum temperature <70°F. Period of record is not specified.

147. Sternstein, Lawrence. The rainfall of Thailand. "This study was supported by the U.S. Army Quartermaster Corps, Research and Engineering Command, ... Contract No. DA19-129-QM-1582 (OI 5101)." 149 pp. Indiana University Foundation Research Division, Bloomington, Indiana, August 15, 1962. DAS M77.2 S839ra.

...Gives a description and analysis of rainfall characteristics in Thailand. The author discusses the annual, monthly, daily and hourly rainfall patterns as well as the duration, spacing and variation of the precipitation. Tables present a list of major precipitation stations in Thailand in 1960 with coordinates, elevation, date of commencement of observations, hours of observations and type of rain gauge for each station; a comparison of annual rainfall amounts for each year (1938-1950) observed by the Meteorological Department with those observed by the Agricultural Department at Chiangrai, Uttaradit, Udon Thani, Chanthaburi and Bandon; seasonal (northeast monsoon, first transition, southwest monsoon and second transition) mean total amount of rainfall, % of annual amount of rainfall, mean intensity (mm) of rainfall, relative variability (%) of rainfall, mean number of rainy days with % of annual number of rainy days for 22 selected stations based on data for the period 1951-1960; monthly rainfall frequency (%) within specified amounts (0.0 or trace, 0.1-10.0, 10.1-35.0, 35.1-90.0, >90.1 mm) for 44 stations based on data for the period 1951-1960; maximum and minimum mean intensity of rainfall in one month with month of occurrence based on data for the period 1951-1960 for 38 selected stations; maximum and minimum relative variability of rainfall in one month with month of occurrence and annual relative variability of rainfall based on data for the period 1951-1960 at 42 selected stations; dates and duration in days of longest dry spells during the period 1951-1960 and during the season May-September based on data for the period 1951-1960 for 30 stations; monthly and annual summaries of total rainfall amount (mm) and total number of rainy days for each year from inception of record through 1960 for 48 stations. Some data are also presented by diagrams or graphs.

148. Thailand. Meteorological Department. Monthly rainfall. January-April, July 1958; November 1958-July 1959; October 1959-April 1962; June-July 1962. DAS.

Source No. 148 continued.

...Describes the monthly rainfall situation. Tables present total number of rainy days and total rainfall amount (mm) for 32-76 stations in Thailand for each month (January-April, July 1957; November 1957-July 1958; October 1958-April 1962; June-July 1962); normal monthly mean number of rainy days and mean total rainfall amount (mm) for 33-76 stations; departure of rainfall amount (mm) from normal and maximum (mm) rainfall amount in one day with date of occurrence for each month (January-April, July 1958; November 1958-July 1959; October 1959-April 1962; June-July 1962) for 33-76 stations. Rainfall maps for each month are also included.

149. World Meteorological Organization. Climatological normals (CLINO) for CLIMAT and CLIMAT SHIP stations for the period 1931-1960. WMO No. 117. TP. 52. (In English and French). 1962. DAS M(06) W927p.

...Includes tabular monthly and annual normals of atmospheric pressure (mb.), temperature (°C), relative humidity (%) and amount of precipitation (mm) for eleven stations in Thailand for the period 1951-1960 except precipitation which is 1931-1960. -- VTR.

1963

150. Conway, H. McKinley, Jr.; May, Stancel L., Jr; Armstrong, Evan, Jr. The weather handbook. 255 pp. Atlanta, 1963. DAS M09 C767w.

...On page 182 present monthly summaries of mean maximum and minimum temperatures, absolute maximum and minimum temperatures, mean relative humidity at 1230, mean total amount of precipitation and mean number of days with precipitation ≥0.1 inch at Bangkok, Thailand. Period of record is not specified.

151. Nuttonson, M.Y. The physical environment and agriculture of Thailand. 256 pp. Washington, 1963. DAS M:63 N988pht.

...The climatic seasons of Thailand are presented by a broad classification (dry and wet), a general classification (cool, hot and rainy) and a meteorological classification (NE monsoon, 1st inter monsoon, SW monsoon and 2nd inter monsoon). The climate and climatic classification of Thailand are described. There are tabular monthly and annual summaries over specified periods (vary by station and element) for 1-35 stations of mean, mean maximum and minimum and absolute maximum and minimum temperatures (°F); mean amount, absolute maximum and minimum amounts, and maximum amount in 24 hours of precipitation (inches); mean number of days with precipitation; mean relative humidity.

152. Thailand. Meteorological Department. General climatic conditions for Thailand. U.S. Air Weather Service, Terminal Forecast Manual for Thailand with emphasis on Don Muang. pp. A-6 to A-11. September 1963. DAS M09.3 U581tt.

Source No. 152 continued.

...This paper written in October 1958 presents information on the seasons, temperature, rainfall, relative humidity, cloudiness, thunderstorms, surface winds and typhoons of Thailand. Tables contain (1) monthly and annual mean frequency of thunderstorm days for the northern part, north-eastern part, central part, east coast of gulf, and southern part of Thailand and (2) monthly number of tropical cyclones based on data for 1947-1955 in Thailand, Gulf of Thailand, and upper Thailand.

153. Thailand. Meteorological Department. Monthly and annual rainfall of Thailand. 1946-1963. Bangkok. DAS M06.1/593. T364mr.

...Contains for 75-387 stations in Thailand summaries for each year of monthly and annual total number of days with rain (1946-1963), total rainfall amount (1946-1963) in mm. with departure from the normal (1956) and maximum rainfall amount in 24 hours (1956). Monthly and annual normal rainfall amount and number of days with rain are also recorded.

154. Thailand. Meteorological Department. Monthly rawinsonde data. Vol. 18, Parts 1-12. DAS.

...Consists of tabular rawinsonde data for 1963 for Bangkok, Chiangmai, Songkhla and Ubon Ratchthani. These data include observations at 0000 GMT and at 1200 GMT (for Ubon Ratchathani only) of: $N_hC_LhC_MC_Hww$ at surface; pressure, temperature, relative humidity, and wind direction and speed at surface; dynamic height, temperature, relative humidity, and wind direction and speed at standard pressure levels, freezing level, maximum wind level, tropopause level, highest wind level and significant levels. There are also monthly summaries at 0000 GMT (for Ubon Ratchathani only) of: mean pressure at surface; mean dynamic height at standard pressure levels and at the tropopause level; mean temperature, mean relative humidity, resultant wind direction and speed, and wind steadiness at standard levels and at the tropopause level.

155. Thailand. Meteorological Department. Monthly summary of climatological data. February-March 1946, December 1946-March 1947, December 1947, February-March 1948, December 1948-March 1949, September 1949-December 1963. DAS M06.1/593 T364ms.

...Describes the monthly general weather conditions in Thailand. The tables contain for 18-52 stations in Thailand, monthly summaries for each year of mean pressure (mb), mean pressure at 0700, mean daily range of pressure, and maximum and minimum pressures with dates of occurrence; mean temperature (°C), mean maximum and minimum temperatures with range, greatest daily temperature range, and absolute maximum and minimum temperatures with dates of occurrence; mean dew point (°C); mean relative humidity (%) and maximum and minimum relative humidities; mean cloud amount (0-8, 0-10 prior to March 1949); mean visibility (0-9) at 0700 and 1600; total amount of evaporation (mm); total amount of rainfall (mm) with departure, total number of rainy days, and maximum amount of

Source No. 155 continued.

rainfall in 24 hours; prevailing wind direction, mean force (Beaufort) and maximum force with date of occurrence; total number of clear, partly cloudy, cloudy and overcast days; total number of days with dew, fog, haze, hail, thunderstorms, squalls, duststorms, lightning and thunder. Period of record varies by station and element.

156. U. S. Air Weather Service. Terminal forecast manual for Thailand with emphasis on Don Muang. various pagings. September 1963. DAS M09.3 U581tt.

...Describes the four natural regions of Thailand; discusses the weather in the Far East, the location and topography of Don Muang Airport, the local climatic effects in relation to the different seasons and the techniques of analysis and prognosis at Don Muang; provides information on the seasonal rules of thumb for Don Muang and the time cross section in Southeast Asia as forecast aids; comments on the winds, thunderstorms, typhoons, visibility, fog and ceilings at Don Muang. Monthly frequencies of typhoons decreasing in intensity and typhoons as depressions in Thailand are recorded. Tables and graphs present monthly absolute maximum and minimum temperatures and mean temperatures (°F), mean number of days with precipitation, mean total precipitation amounts (inches), maximum and minimum relative humidities (%), and mean cloud amount (%) at 0700 and 1300 LST for 5-6 stations (Bangkok, Songkhla, Surat Thani, Udon Thani, Chiengmai and Don Muang) in Thailand based on data for 10-20 years. The three papers incorporated in this manual are abstracted separately. They are "Climate of upper Thailand (north, northeast and central part)" by Bampen Xupravati, "A study on rainfall in Thailand during the southeast monsoon" by S. Vesa-rajananda, and "General climatic condition for Thailand" by the Thailand Meteorological Department.

157. Vesa-rajananda, S. A study on rainfall in Thailand during the southeast monsoon. U. S. Air Weather Service, Terminal Forecast Manual for Thailand with Emphasis on Don Muang. pp. A-12 to A-18. September 1963. DAS M09.3 U581tt.

...This study written in January 1960 discusses the southwest monsoon in Thailand from May until October. The tables contain monthly (June-November) and annual normal rainfall amounts (mm.) for 50 stations in Thailand.

158. Xupravati, Bampen. Climate of upper Thailand (north, northeast and central part). U. S. Air Weather Service. Terminal Forecast Manual for Thailand with Emphasis on Don Muang. pp. F-21 to F-26. September 1963. DAS M09.3 U581tt.

...Describes the seasonal (northeast monsoon, transition period from northeast to southwest monsoon, southwest monsoon, and transition period from southwest to northeast monsoon) general climatic conditions, pressure, temperature, relative humidity, rain, fog, cloudiness, haze, visibility, and surface and upper winds in upper Thailand.

1964

159. Tanner, Gilbert. A collection of selected climographs. 45 pp. Eau Claire, Wisconsin, 1964. DAS M82.3 T166c.

...Presents a climograph for Bangkok, Thailand. The data appearing on the climograph include station name, coordinates and elevation of station; Koppen's classification of climate with Trewartha's modification; numerical values of annual mean temperature, annual range of temperature and annual mean total rainfall amount; curves of monthly values of mean temperature and mean total rainfall amount.

160. Thailand. Meteorological Department. Climatological data. 10 year period 1951-1960. Bangkok, 1964. DAS M06.3/593 T364cl 1951-1960.

...Consists of monthly and annual summaries for 52 stations based on 5-8 observations per day for 1-10 years within the period 1951-1960. These summaries include mean pressure (mb.), absolute maximum and minimum pressures (mb.), mean daily range of pressure (mb.), mean temperature (°C.), mean maximum and minimum temperatures (°C.), absolute maximum and minimum temperatures (°C.) with dates, mean and minimum relative humidities (%), mean dew point temperature (°C.), mean amount of evaporation (mm.), mean cloud amount (0-8), mean visibility (kms.), prevailing wind direction, mean and maximum wind speeds (knots), mean total rainfall amount (mm.), mean number of rainy days, mean number of days with haze, mean number of days with fog, mean number of days with lightning, mean number of days with thunderstorms, mean number of days with squalls. Elevation of station above MSL, height of barometer above MSL, height of thermometer above ground, height of anemometer above ground, height of wind vane above ground and height of raingauge above ground are recorded for each station.

1965

161. Donn, William L. Meteorology. Third edition. 484 pp. New York, 1965. DAS M:551.46 D685m 1965.

...On page 450 monthly summaries of mean of monthly maximum and mean of monthly minimum temperatures (°F), mean relative humidity at 0800 or 0900, and mean number of days with rain $\geq$ 0.01 in. are recorded for Bangkok.

162. Thailand. Meteorological Department. Annual meteorological bulletin. 1937-1941, 1961-1965. (In Thai and English). Bangkok. DAS M06.1 T364a.

...Consists of station list with coordinates and elevation for each station, explanatory notes concerning observations and instruments, description of annual weather conditions, tabular summaries of meteorological data for individual stations, wind roses for selected stations (1938-1941) and a rainfall map of Thailand for 1941. The tabular summaries include the following monthly and annual data summarized for each year (1937-1941,

Source No. 162 continued.

1961-1965) for Bangkok: hourly means of pressure (mb), temperature (°C) and relative humidity (%); mean and mean extreme pressures, temperatures and relative humidities; ranges of pressure, temperature and relative humidity; hourly total amounts (mm) of rainfall; total amount of rainfall and total number of rainy days; wind direction (8 points and calm) frequency (no. of observations) and wind force (1-3, 4-7, ≥8 Beaufort) frequency at 0700 and 1300 for 1937-1941; wind direction (8 points and calm) frequency (%), mean wind force and maximum wind force with date for 1961-1965; maximum amount of rainfall in 24 hours with date of occurrence for 1961-1965; total amount of evaporation (mm) and maximum amount in 1 day with date of occurrence; mean cloud amount (0-10) and mean visibility (0-9) at 0700, 1000, 1300 and 1600 and mean of the 4 observations for 1937-1941; mean cloud amount (0-8) at 0100, 0400, 0700, 1000, 1300, 1600, 1900 and 2200 and mean of the 8 observations and visibility frequency within specified limits (<0.05, 0.05-0.1, 0.2-0.5, 0.6-1.0, 2-4, 5-10, 11-20, 21-30, and 31-50 km.) based on 8 observations per day for 1961-1965; mean number of days with thunderstorms, thunder, lightning, dew, fog, haze, hail, and mist (1961-1965). There are also monthly and annual summaries for each year (1937-1941, 1961-1965) for 7-35 stations of mean pressure (mb), mean temperature (°C), mean relative humidity (%), mean visibility (1937-1941) and mean cloud amount at 4-8 specified hours; mean cloud amount, pressure, visibility (1937-1941), temperature and relative humidity; mean extremes and absolute extremes with dates of pressure, temperature and relative humidity; maximum daily range of pressure; mean daily range of temperature; mean number of days with rain; total rainfall amount (mm); maximum amount of rainfall with date of occurrence; total amount of evaporation (mm); maximum amount of evaporation in 1 day with date of occurrence; wind direction (8 points and calm) frequency (%) for 1961-1965; wind direction (8 points and calm) frequency (number of observations) and wind force (1-3, 4-7 and ≥8 Beaufort) frequency (number of observations) at 0700 and 1300 for 1937-1941; visibility frequency within specified limits (0.05, 0.05-0.1, 0.2-0.5, 0.6-1.0, 2-4, 5-10, 11-20, 21-30 and 31-50 km) based on 8 observations per day; mean number of days with dew, fog, mist, haze, hail, lightning, distant thunderstorm, thunderstorm and squalls.

163. Thailand. Meteorological Department. Average semi-monthly rainfall for selected stations in Thailand. 22 pp. Bangkok, January 1965. DAS M77.2/593 T364av.

...Presents semi-monthly mean total amounts of precipitation (mm.), rainfall frequency (number of occurrences), and standard deviation for each three-hour period (2200-0100, 0100-0400, ..., 1900-2200) for 14 meteorological stations in Thailand based on data for 10 years (1951-1960).

164. Thailand. Meteorological Department. Mean values of wind, visibility, altitude of cloud base, temperature and dew point over a ten year period (1951-1960)...for Don Muang, Chiangmai, Songkhla and Nakhon Ratchasima. Bangkok, 1965? DAS M82.2/593 T364me.

Source No. 164 continued.

...Consists of tabular summaries of monthly mean number of simultaneous occurrences of specified visibility ranges and specified ranges of the height of the base of the lowest cloud layer covering more than 4/8 of the sky at 0000, 0300, 0600, 0900, 1200, 1500, 1800 and 2100 G. M. T. based on data for 1951-1960 at Don Muang, Nakhon Ratchasima, Songkhla and Chiangmai; monthly wind speed frequency within limits (1-3, 4-6, 7-10, 11-16, 17-21, 22-27, 28-33, 34-40, 41-47, 48-55, 56-63, >63 knots) by direction (8 points and calm) based on observations 0000-2300 G. M. T. summarized over the period 1951-1960 at Don Muang, Nakhon Ratchasima, Songkhla and Chiangmai; monthly number of occurrences of concurrent wind speed and direction within specified ranges when the horizontal visibility and/or the height of the base of the lowest cloud layer covering more than 4/8 of the sky lie within specified ranges based on observations 0000-2300 G. M. T. summarized over the period 1951-1960 at Don Muang, Nakhon Ratchasima, Songkhla and Chiangmai; monthly frequencies (mean number of occurrences) of dry bulb temperature and dew point temperature at specified hours (0000, 0600, 1200 and 1800 G. M. T.), daily maximum temperature, daily minimum temperature and mean temperature based on data for the period 1951-1960 for Don Muang, Nakhon Ratchasima, Songkhla and Chiangmai.

165. Thailand. Meteorological Department. Monthly and annual rainfall of Thailand with departure from normal (for the period from 1911 to 1960). 90 pp. Bangkok, 1965? DAS M06.1/593 T364mt.

...Consists of tables with monthly rainfall amounts and departures from normal for each year 1911-1960 and normal monthly rainfall amounts based on data for the same period for 45 stations in Thailand.

166. Thailand Meteorological Department. Upper winds over Southeast Asia and neighbouring areas. 86 pp. Bangkok, January 1, 1965. DAS M57.2 T364 up Jan. 1965 oversize.

...Monthly mean upper-level wind charts are valuable in studying the general circulation and as an analysis aid for forecasting wind fields. Since climatic charts for upper winds over Southeast Asia and neighbouring areas, particularly over the Republic of China, are inadequate, mean monthly streamline upper wind analyses at 5,000 ft., 10,000 ft., 20,000 ft. and 40,000 ft. levels, together with four north-south cross sections showing mean monthly zonal components near longitudes 100° E, 130° E, 140° E and 165° E, for the period from 1956 to 1960 are presented here. This is a continuation of our work published under the same title in the year 1961. -- Author's abstract.

Work published under the same title in the year 1961 appears in this bibliography under personal authors, C. V. Bunnag and K. Buajitti.

167. Thailand. Meteorological Department. Upper winds over Southeast Asia and neighbouring areas. 12 pp. Bangkok, April 15, 1965. DAS M57.2 T364 up Apr. 1965. oversize.

Source No. 167 continued.

...Monthly mean upper-level wind charts are valuable in studying the general circulation and as analysis aid for forecasting wind fields. Since climatic charts for upper winds over Southeast Asia and neighbouring areas, particularly over the Republic of China are inadequate, mean monthly streamline upper wind analyses at 2,000 ft. level for the period from 1956 to 1960 are presented here. This is a continuation of our works published under the same title in the year 1961 and 1 January 1965. -- Author's abstract.

Work published under the same title in the year 1961 appears in this bibliography under personal authors, C.V. Bunnag and and K. Buajitti.

168. United Nations. Committee for Coordination of Investigations of the Lower Mekong River Basin. Lower Mekong hydrologic yearbook. 1964-1965. 2 vol. Text and legends in English and French. DAS M79/596 U583lo.

...Includes annual rainfall amount for 114-274 stations, daily and monthly precipitation amounts for 21-22 stations, daily and monthly amounts of evaporation for 12-13 stations, and daily and monthly wind movement for 7 stations in Thailand for each year (1964-1965).

169. U.S. Air Weather Service, 1st Weather Wing. Climate of Thailand. Special Study 105-10. 127 pp. APO San Francisco, August 1965. DAS M(055) U58s 105-10.

...Describes the geography, climatic controls, general weather phenomena, special weather phenomena of Thailand. There is a station list with coordinates and elevation (ft.). The tables present January, February, April, July, September and October mean resultant winds (ddd/ff) at 2,000, 5,000, 10,000, 20,000 and 30,000 ft. at Chiangmai, Udorn, Ubon, Korat, Phitsanulok, Bangkok and Songkhla; monthly mean number of days at 5-8 specified hours (0100, 0400, 0700, 1000, 1300, 1600, 1900 and 2200) with (1) total cloud cover $\leq$3/10 and visibility $\geq$2 1/2 miles, (2) low cloud cover $\leq$3/10 and visibility $\geq$2 1/2 miles, (3) surface wind $\geq$17 knots and no precipitation, (4) ceiling $\geq$1000 ft., visibility $\geq$2 1/2 miles and wind $\leq$10 knots, and (5) surface wind 4-10 knots, temperature 33°-89°F. and no precipitation at 46 stations; monthly frequency at all hours and at specified intervals (0000-0500, 0600-1100, 1200-1700, and 1800-2300) of (1) ceiling $\geq$500 ft. and visibility $\geq$1 mile, (2) ceiling $\geq$1500 ft. and visibility $\geq$3 miles and (3) ceiling $\geq$ 5000 ft. and visibility $\geq$5 miles at Chiangmai, Takhli, Nakhon Ratchasima, Bangkok, Don Muang and Songkhla; monthly frequency at 5-6 specified hours (0100, 0700, 1000, 1300, 1600 and 1900) of (1) ceiling $<$700 ft. and/or visibility $<$1 1/4 miles, (2) ceiling $\geq$1000 ft. and visibility $\geq$ 2 1/2 miles and (3) ceiling $\geq$5000 ft. and visibility $>$5 miles at 42 stations; monthly mean cloud amount at 24 stations; monthly mean cloud amount at 0700, 1000, 1300 and 1600 for 25 stations; monthly and annual (1) mean, mean maximum, mean minimum, absolute maximum and absolute minimum temperatures, (2) mean dew point temperature, (3) mean amount, maximum and minimum amounts and maximum amount in 24 hours of precipitation, (4) mean number of days with precipitation, thunderstorms, fog and haze,

Source No. 169 continued.

(5) mean, mean maximum, mean minimum, absolute maximum, and absolute minimum relative humidities, (6) extreme maximum wind speed, (7) mean, absolute maximum and absolute minimum pressures and (8) evaporation amount for 49-52 locations.

170. U. S. Air Weather Service. Climatic summary, Republic of Vietnam, North Vietnam, Laos. March. APO San Francisco, Det. 14, 30th Weather Squadron. 1965. DAS M82.2/592 U581cl.

...On page 15 presents mean winds for March at heights of 5000, 7000, 10000, 15000, 20000, 25000, 30000, 35000, 40000, 45000 and 50000 feet at Ubon.

1966

171. Anstey, Robert L. Clothing almanac for Southeast Asia. U.S. Army Natick, Massachusetts, Technical Report ES-22. 35 pp. January 1966. DAS M(055) U586te ES-22.

... On pages 6-12 the climate of Southeast Asia is discussed. The tables contain monthly and annual mean temperature (°F), mean total amount of precipitation (inches) and mean relative humidity for Bangkok.

172. Atkinson, Gary D. Comparison of VFR percentages in Southeast Asia. U.S.Air Weather Service, 1st Weather Wing, Technical Study 6. 15 pp. APO San Francisco, California, December 1966. DAS M(055) U58tes No. 6.

...VFR (ceiling $\geq$1500 feet and visibility $\geq$3 miles) percentages obtained from various sources are compared for major air bases in Southeast Asia. In general, previous estimates obtained primarily from N summaries and 1st Weather Wing Special Summaries give significantly higher percentages below VFR than data obtained from hourly WBAN observations. Since up to four years of these WBAN observations are now available, the author recommends using them to modify previous estimates of VFR percentages. -- Author's abstract.

A table presents monthly and annual summaries of below VFR (ceiling $<$1500 feet and visibility $<$3 miles) percentages for 7 Thailand bases for specified periods of record. The 7 bases are Udorn, Nakhon Phanom, Ubon, Korat, Takhli, Don Muang and Sattahip (substituted for U-Tapao).

173. Atkinson, Gary D. A preliminary estimate of extreme wind speeds in Thailand. U.S. Air Weather Service, 1st Weather Wing, Technical Study 3. 26 pp. APO San Francisco, California, October 1966. DAS M(055) U58tes no. 3.

...Discusses the annual extreme wind speeds in Thailand, the seasonal differences in peak gusts at most stations, monthly extreme wind speeds, elevation corrections, sustained wind speeds, direction of extreme winds,

Source No. 173 continued.

and time of extreme wind occurrence and compares thunderstorm wind speeds. The tables present monthly and annual peak gusts for each year (1956-1965) and over the period (1956-1965) for 13 stations in Thailand.

174. Frisby, E. M. and Sansom, H. W. Hail incidence in the tropics. U. S. Army Electronics Command, Fort Monmouth, New Jersey, Technical Report ECOM 02105-F. Final Report, Contract No. DA-043 AMC-02105(E). 48 pp. September 1966. DAS M(055) U5812ec ECOM 02105-F.

...On pages 43-44 presents monthly summaries over specified periods of hail frequency (number of cases) for 20 stations in Thailand.

175. Fujioka, Yoshikazu. An outline of climate of Southeast Asia. Water Resource Utilization in Southeast Asia, Symposium Series III, pp. 51-54. Kyoto University, 1966. DAS M(055) K99sy no. 3.

...Discusses the system of winds and precipitation and temperature in Southeast Asia. The table contains monthly and annual mean temperature and mean total amount of precipitation for Bangkok, Chiangmai and Nakon-Ratchasima based on data for 10-30 years within the period 1931-1960.

176. Great Britain. Meteorological Office. Tables of temperature, relative humidity and precipitation for the world. Part V, Asia. Second edition. 126 pp. London 1966. DAS M82.2 G786ta.

...Contains the following monthly and annual data, summarized over the period for Bandon (7-13 years), Bangkok (12-44 years), Chiengmai (8-13 years), Nakorn Raj asima (5-20 years) and Phuket (5-33 years): mean daily maximum and minimum, mean of the highest and of the lowest, and absolute maximum and minimum temperatures (°F); mean relative humidity at approximately 0630 and 1230; mean amount of precipitation (inches); maximum amount of precipitation in 24 hours; mean number of days with precipitation 0.04 inch or more. These data are also published (1958) in the first edition of this reference.

177. Kato, Hiroshi; Iki, Kunio; Matsui, Masaharu. Nam Kam Development Project in Thailand. Water Resource Utilization in Southeast Asia, Symposium III, pp. 193-207. Kyoto University, 1966. DAS M(055) K99sy no. 3.

...On page 195 brief notes on the climate of the Nam Kam Development Project area in northeastern Thailand. A table presents monthly total amount of precipitation (mm.) summarized over the period, November 1958-October 1959, and mean temperature (°C) based on 10 years (1947-1958) of data for Sakol Nakorn.

178. Noda, Akiyoshi. Pattani development project in southern Thailand. Water Resource Utilization in Southeast Asia, Symposium Series III, pp. 209-220. Kyoto University, 1966. DAS M(055) K99sy no. 3.

Source No. 178 continued.

...Includes brief notes on the climate of southern Thailand; graphs showing the monthly mean, mean maximum and mean minimum temperatures (°C) and numerical monthly mean temperatures for Narathiwat based on data for 1943-1960; tabular monthly and annual mean temperature based on data for an unspecified period of years for Yala, mean evaporation (mm.) summarized over the period 1962-1963 for Bannang Sata, mean total amount of precipitation (mm) summarized over specified periods for Bannang Sata (1952-1960), Yarang (1952-1953, 1961-1963) and Pattani (1952-1963).

179. U.S. Air Weather Service. Climate of Southeast Asia. Special Study 105-11/1-12. 12 volumes. APO San Francisco, 1965-1966. DAS M(055) U58s 105-11/1-12.

...Presents brief notes on the climate of Southeast Asia for individual months. Southeast Asia includes the Republic of Vietnam, North Vietnam, Laos, Cambodia and Thailand. Descriptive information on the geographic features, precipitation, thunderstorms, cloudiness, visibility, fog, temperature, relative humidity, winds, fronts, intertropical convergence zone, land and sea breezes, typhoons, crachin, upper level haze, turbulence, icing, flooding, tractionability, sea surface currents, sea surface temperature, sea, swell and breakers for individual countries of the area or for the area as a whole are recorded.

180. U.S. Air Weather Service. 1st Weather Wing. Objective method to forecast low morning visibilities at Ubon, Thailand (Jan-Mar). Technical Study 4. 9 pp. APO San Francisco, November 1966. DAS M(055) U58tes no. 4.

...An objective method is derived to forecast occurrence of surface visibilities less than 5 miles caused by ground fog, haze and/or smoke at Ubon, Thailand, from 1 January to 15 March. -- The author.

1967

181. Atkinson, Gary D. Thunderstorms in Southeast Asia. U.S. Air Weather Service, 1st Weather Wing, Technical Study 11. 55 pp. APO San Francisco, California, March 1967. DAS M(055) U58tes no. 11.

...Presents a comprehensive survey of thunderstorms in Southeast Asia (Thailand, Laos, Cambodia, North Vietnam and Republic of Vietnam). The source also contains a description of the data source used in this study and a discussion on the mean number of thunderstorm days. The tables contain monthly and annual mean number of thunderstorm days for individual stations (approximately 35 in Thailand) in Southeast Asia. The period of record varies by station.

182. Atlantic Research Corporation, Alexandria, Virginia. Tropical Propagation Research. Semiannual Report Number 9, 1 January 1967-30 June 1967. Contract Number DA 36-039 Sc90889. Prepared for U.S. Army Electronics Command. 170 pp. DAS M(051) A881se no. 9.

...Reports the experimental results of the first series of tests conducted near Songkhla and Satun (Area II Test Site) in southern Thailand to study radio propagation in tropical areas with heavy vegetation. The climate in the test area is described. Graphs present monthly (November-June) maximum and minimum temperatures (°F), mean temperature (°F), mean total rainfall amount (inches), mean relative humidity (%), maximum and minimum relative humidities for Area II Test Site in southern Thailand. The climate in Area II Test Site is compared with Area I Test Site (the jungles near Pak Chong, Thailand).

183. Frisby, E.M. and Sansom, H.W. Hail incidence in the tropics. Journal of Applied Meteorology, Boston, 6(2):339-354, April 1967. DAS M(05) J86joa.

...Presents a table with monthly summaries over specified periods (vary by station, but within the period 1943-1963) of hail frequency (number of cases) for 20 stations in Thailand.

184. Maruyama, Eizo. Rice cultivation and water balance in Thailand. Geophysical Magazine, Tokyo, 33(4):337-353, 1967. DAS P.

...Briefly describes the climate of Thailand and discusses (1) the flood and drought damage to rice crops and (3) water balance and rice cultivation in Thailand. Tables present summaries over a period (1951-1962) for 22 stations in Thailand of monthly and annual actual and potential evapotranspiration, mean total amount of precipitation, water deficiency and water surplus; mean total amount of rainfall during the rice growing season.

185. Ogino, Kazuhiko. A climatological classification of Thailand with special reference to humidity. Southeast Asian Studies, Kyoto, Japan, 5(3):500-531, December 1967. (In Japanese).

...This humidity classification of Thailand contains extensive climatological data for individual meteorological stations on the wind regime, atmospheric temperature, precipitation, evaporation, moisture deficit, for each month; and the average number of humid and dry months per year. Maps showing the regions of Thailand classified according to humidity are presented. -- MGA 10.11-500.

186. Schutz, C. Monsoonal influences on wind, rain, and cloud throughout Southeast Asia: a study covering the peninsula and archipelago. Research Memorandum RM-5418-PR. 152 pp. The Rand Corporation, Santa Monica, California, October 1967. DAS 507.2 R186r no. 5418-PR.

Source No. 186 continued.

...Discusses the effect of air masses on the weather, the positions of the Intertropical Convergence Zone, the monsoon circulation, the tropical cyclones and the convergence lines and convergence zones of Southeast Asia. The text also includes information on (1) the southwest monsoon and the southeast trades of Burma and Thailand and (2) the northeast monsoon of Thailand. The tables present for 10-71 stations in Thailand for 2 seasons (winter, summer) wind direction (16 pt. and calm) frequency (%); monthly (June-August, December-February) and for 2 seasons (winter, summer) cloud amount frequency (%) within limits ($<$1/8, 1/8-4/8, 5/8-7/8, and 8/8) at 0700, 1300 and 1600; seasonal mean amount of precipitation (inches) and number of days with precipitation.

187. U.S. Air Weather Service. U.S. Naval Weather Service world-wide airfield summaries. Volume 1. Southeast Asia. 462 pp. June 1967. DAS M06.3 U5815u v.1.

...Presents tabular monthly and annual summaries over specified periods (vary by station and element) for 36 airfields and 4 climatic areas in Thailand on pages 311-388. The summaries for the airfields include absolute maximum and minimum temperatures (°F), mean number of days with maximum temperature $\geq$90°F, mean number of days with minimum temperature $\leq$32°F and $\leq$0°F, mean dew point temperature (°F), mean relative humidity (%), mean pressure altitude (ft), mean total precipitation amount (in), mean total snowfall amount (in), mean number of days with snowfall $\geq$1.5 inches, mean number of days with precipitation $\geq$ 0.1 in, mean number of days with an occurrence of visibility $<$0.5 mile, mean number of days with thunderstorms, percent frequency surface wind speed $\geq$17 knots and $\geq$28 knots, percent frequency of ceiling $<$ 5000 ft and/or visibility $<$ 5 miles, percent frequency of ceiling $<$1500 ft and/or visibility $<$3 miles in specified 3-hourly periods (00-02, 03-05, 06-08, 09-11, 12-14, 15-17, 18-20 and 21-23 LST) and percent frequency of ceiling $<$300 ft and/or visibility $<$1 mile in specified 3-hourly periods (00-02, 03-05, ..., 21-23 LST). There are also summaries for the airfields and climatic areas of mean maximum and minimum temperatures (°F); mean number of days with ceiling $>$1000 ft and visibility $>$3 miles at 0700, 1300, 1900 and 0100 LST; mean number of days with ceiling $>$2000 ft and visibility $>$3 miles with surface wind $<$10 knots at 0700, 1300, 1900 and 0100 LST; mean number of days with surface winds $\leq$17 knots and no precipitation at 0700, 1300, 1900 and 0100 LST, mean number of days with surface wind 4-10 knots and temperature 33-89°F and no precipitation at 0700, 1300, 1900 and 0100 LST; mean number of days with sky cover $<$3/10 and visibility $>$3 miles at 0700, 1300, 1900 and 0100 LST; mean number of days with ceiling $\geq$2500 ft and visibility $\geq$3 miles at 0700, 1300, 1900 and 0100 LST; mean number of days with ceiling $\geq$6000 ft and visibility $\geq$ 3 miles at 0700, 1300, 1900 and 0100 LST; mean number of days with ceiling $>$10,000 ft and visibility $\geq$3 miles at 0700, 1300, 1900 and 0100 LST. Largest and smallest mean total amounts of precipitation are recorded for each climatic area.

188. U.S. Weather Bureau. 0-3/10 cloud cover information for selected sites around the world. 11 pp. June 1967. DAS M76.2 U587ze.

...Contains monthly and annual percent frequencies of cloud cover 0-2/10 and monthly percent frequencies of sunshine duration for Bangkok (substituted for Klongtoi) based on 10 years of data.

189. Wexler, Ruth L. The relationship between daily and annual rainfall in Thailand. U.S. Air Weather Service. Proceedings of the Technical Exchange Conference, 4-7 April 1967 (Its AWS Technical Report 196). pp. 226-242. July 1967. DAS M(055) U58a 196.

...The probable spectra of precipitation rates over brief periods of time may be critical in the design of Army materiel. Generally, such information is not available. To meet the problem, empirical methods have been relied on for the derivation of daily, hourly, or instantaneous precipitation rates from ordinary climatic data. The basis of these methods rests on the fact that for many regions of the world the mass distribution of rain tends to follow a predictable pattern. Whether this is so throughout the monsoon climate has been a question. Consequently, from daily rainfall observations in Thailand for a number of stations, the respective annual rainfall mass distributions have been determined. Preliminary results indicate that these distributions are similar to those found elsewhere. Therefore, a universal rainfall distribution curve may be employed for estimates of daily (hourly) intensities, as is demonstrated. Prediction equations and nomograms are provided. Estimates are compared with observations. The required parameters are the total amount of annual precipitation and the corresponding number of rain days per year. While the study is concerned mainly with the relationship between the daily and annual rainfall, hourly intensities are considered briefly. -- Author's abstract.

Tables present daily, monthly and annual rainfall for 1964 for Kantharalak and Ban Nong Prue; annual rainfall amount (mm), number of rainy days, observed and estimated daily rainfall amount at indicated percentile (50% and 90%), observed and estimated number days of indicated intensity (6 mm and 12 mm), and observed and estimated maximum daily rainfall amounts at 13 stations (3-8 stations per year) for 1962-1964.

190. World weather records. 4 volumes. Issuing office varies: Smithsonian Institution as Smithsonian Miscellaneous Collections, Volume 105; U.S. Weather Bureau; U.S. Environmental Data Service. Washington, 1947-1967. DAS M06.1 W927wo.

...Presents tabular monthly and annual summaries for each year within the period (1931-1960) and over 1-3 specified periods (1931-1940, 1941-1950, 1951-1960) of mean station and sea level pressures (mb), total amount of precipitation (mm) and mean temperature (°C) for Bangkok (1931-1960) Aranyaprathet (1951-1960), Chantaburi (1951-1960), Chiang Mai (1951-1960), Chumphon (1951-1960), Nakhon Ratchasima (1951-1960),

Source No. 190 continued.

Nakhon Sawan (1951-1960), Phitsanulok (1951-1960), Prachuap Khirikhan (1951-1960), Songkhla (1951-1960) and Udon Thani (1951-1960). In the last volume, which was issued by the U.S. Environmental Data Service in 1967, there are monthly and annual climatic normals of mean sea level pressure and mean temperature based on data for the period 1951-1960 and mean total amount of precipitation based on data for the period 1931-1960. These normal values were taken from the World Meteorological Organization publication, Climatological Normals (CLINO) WMO/OMM - No. 117 T.P.52.

1968

191. Applied Scientific Research Corporation of Thailand. Tropical Environmental Data (TREND); semi-annual report no. 2 for period 1 July to 31 December 1967. 93 pp. Bangkok, 1968. DAS M(051) A652tro no. 2.

...On pages 18-23 discusses briefly the meteorological observations to be made in this program and presents daily maximum and minimum temperatures, observations at 0900 of dry bulb and wet bulb temperatures, daily relative humidity and dew point for November and December 1967 at living quarters at Sakaerat Experiment Station.

192. Benham, Alan D. Determination of potential evapotranspiration and soil moisture deficiency from climatologic and hydrologic data. United Nations Economic Commission for Asia and the Far East. The Use and Interpretation of Hydrologic Data. Proceedings of nine seminars conducted by an Advisory Group in Afghanistan, Ceylon, China (Taiwan), Hong Kong, Iran, Malaysia, Pakistan, the Philippines and Thailand between 22 September 1965 and 26 July 1966. (Its Water Resources Series No. 34) pp. 48-56. 1968. DAS M79 U58us.

...Presents information on (1) the role of evapotranspiration in the hydrologic cycle, (2) the evaluation of potential evapotranspiration, and (3) the determination of actual evapotranspiration and soil moisture deficiency. The steps in the computation of actual and potential evapotranspiration and soil moisture deficiency are recorded. A table contains monthly mean temperature (°C), monthly and annual heat index, monthly standardized potential evapotranspiration (mm) with correction factor, monthly and annual assessed potential evapotranspiration (mm) and mean precipitation amount (mm), and monthly and annual uncorrected actual evapotranspiration (mm) for Petchabun, Thailand.

193. Benham, Alan D. Determination of the runoff factor of a small basin lacking sufficient streamflow data. United Nations Economic Commission for Asia and the Far East, The Use and Interpretation of Hydrologic Data. Proceedings of nine seminars conducted by an Advisory Group in Afghanistan, Ceylon, China (Taiwan), Hong Kong, Iran, Malaysia, Pakistan, the Philippines and Thailand between 22 September and 26 July 1966. (Its Water Resources Series No. 34) pp. 84-87. 1968. DAS M79 U58us.

Source No. 193 continued.

...Includes a table with precipitation intensities expressed in millimeters per hour for specified intervals (20, 40, 60, 80, 100 and 120 minutes) during periods of 10, 20 and 50 years at Bangkok.

194. Charoen-rajapark,. C. Evaporation and precipitation as basic data needed for planning and management of water. In: International Conference on Water for Peace, Washington, D.C., May 23-31, 1967, Water for Peace. Washington, D.C., U.S. Government Printing Office, 1968. Vol. 4:800-805. French and Spanish summaries pp. 804-805. DAS333.91 I61 wa v.4.

...A review of the history and present status of evaporation, precipitation, and wind data in Thailand the collection of which is the responsibility of the Meteorological Service reporting directly to the Cabinet. Observations at most stations began more than 30 yr ago. Precipitation is being measured at 600 stations covering the 500,000-km kingdom. Evaporation observations began only a few years ago. Progress is being made in the determination of average precipitation by a radar network. Plans are being made for automatic recording of precipitation with recording raingages. Steps are thus being taken to collect the basic data needed for planning and evaluation of water sources. Cooperation and coordination have been instituted among governmental and international (WMO, UNESCO, and IHD) agencies. -- MGA 21.8-349.

195. Cobb, L. Glen. The annual and daily distribution of rainfall in Southeast Asia. U.S. Army Electronics Command, Technical Report ECOM-02313-SF, Research on Tropical Rainfall Patterns and Associated Mesoscale Systems, Report No. 4 by Walter K. Henry, John F. Griffiths, L. Glenn Cobb, Donald R. Gibson and Panchapakesa Srinivasan. Texas A&M University, College Station, Texas, December 1968. pp. 53-75. DAS M(055) U5812ec ECOM-02313-SF.

...This study has been made to consider the rainfall distribution at selected stations in Southeast Asia to see if the results of previous investigations are substantiated in the two different monsoonal regimes and to seek further information on the precipitation patterns in this area. Tabular daily rainfall amounts $\geq$60 mm, number of rainy days, number of days with rain $\leq$5 mm, % of days with rain $\leq$5 mm, annual rainfall amount, and annual estimated and observed maximum daily rainfall are included for Buriram, Thailand for 1953 and 1964.

196. Henry, Walter K. The mesoscale rainstorm in parts of Southeast Asia. U.S. Army Electronics Command, Technical Report ECOM-02313-SF, Research on Tropical Rainfall Patterns and Associated Mesoscale Systems Report No. 4 by Walter K. Henry, John F. Griffiths, L. Glen Cobb, Donald R. Gibson and Panchapakesa Srinivasan. Texas A&M University College Station, Texas, December 1968. pp. 4-13. DAS M(055) U5812ec ECOM-02313-SF.

Source No. 196 continued.

...The purpose of this study was to determine the movement of the mesoscale systems in parts of Southeast Asia. This area includes North Thailand plateau region and an interior valley of Thailand. Due to the lack of suitable data, the use of three day rainfall totals was not successful as a means of tracking mesoscale systems in Southeast Asia.

197. Ing, Gordon K. T. Pressure data for stations in Thailand and South Vietnam. U.S. Air Weather Service, 1st Weather Wing, Technical Study 15. 6 pp. APO San Francisco, February 1968. DAS M(055) U58tes no. 15.

...Presents monthly mean station and sea level pressures and average hourly departures from these means in Appendix I for Udorn, Nakhon Phanom, Takhli, Ubon, Korat, Don Muang and U-Tapao (Sattahip) in Thailand. Coordinates and elevation are included for each station.

198. Nelson, H. L. Climatic data for representative stations of the world. 81 pp. Lincoln, Nebraska, 1968. DAS M82.2 N426cl.

...Presents monthly mean temperatures (°F) and monthly and annual mean total amount of precipitation (in.) for Bangkok.

199. Orgill, M.M. Availability of meteorological data in Southeast Asia. Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, Berkeley, California, 1968. 50 pp. DAS M(051) O68av.

...Information for this survey was compiled from personal communication with personnel associated with various weather services of Southeast Asia; personal communication and correspondence with National Weather Records Center, Asheville, North Carolina; information from Clyde O'Dell, who visited Southeast Asia in 1967. On pages 14-24 the survey indicates what type of meteorological data is available within Thailand and also at National Weather Records Center, Asheville, N.C.

200. Rumney, George R. Climatology and the world's climates. 656 pp. New York, 1968. DAS M82 R937cl.

...In Chapter 23 presents tabular summaries of mean temperature for the coolest month and the warmest month with range for Phuket, absolute maximum and minimum temperatures with range for Phuket, monthly mean temperature (°F) for Bangkok, and monthly and annual mean total amount of precipitation (inches) for Bangkok. The temperature and rainfall data are also presented on a graph.

201. Sangmitr, Soranee. Characteristics of rainfall over Thailand. In: International Conference on Water for Peace, Washington, D.C., May 23-31, 1967, Water for Peace. Washington, D.C., U.S. Government Printing Office, 1968. Vol. 4:806-809. French and Spanish summaries. p. 809. DAS 333.91 I61 wa v.4.

...The paper deals with the various factors affecting the amounts of rainfall in the different parts of Thailand. As everywhere, the nature of rainfall depends on the topography and meteorological phenomena. The monsoon and tropical storms determine rainfall amounts. Annual normals range from 870 mm in the relatively dry to ≥5 m in humid regions. Agriculture is relatively difficult in the plains of the NE where the soil underlain by nearly horizontal sandstone and schist strata is infertile and infiltration is not favorable. -- MGA 21.8-388.

202. Smith, Alvin, L., Jr. A selected climatological bibliography for Thailand. U.S. Air Force, Environmental Technical Applications Center, Technical Note 69-1. 37 pp. Washington, March 1968. DAS M(055) U58ten 69-1.

...This bibliography contains 105 separate sources on climatological data and textual references for Thailand. All entries are in alphabetical order by author or originating agency. All items are furnished with a brief abstract. A subject index of the items is included. All items indicate the source library where the reference is filed. -- Author's abstract.

203. Stol, Ph. Th. and Sybesma, R. P. Determination of the relationship between precipitation intensity, duration and frequency of occurrence. United Nations Economic Commission for Asia and the Far East, The Use and Interpretation of Hydrologic Data. Proceedings of nine seminars conducted by an Advisory Group in Afghanistan, Ceylon, China (Taiwan), Hong Kong, Iran, Malaysia, Pakistan, the Philippines and Thailand between 22 September 1965 and 26 July 1966. (Its Water Resources Series No. 34) pp. 66-71. 1968. DAS M79 U58us.

...Plotted and tabulated data for Roiet, Thailand and for Bangkok are used to illustrate the discussed depth-duration-frequency and intensity-duration-frequency relationships. Empirical relationships of the well known type $I = k/(t + \tau)^d$ are discussed. A general equation is derived for Bangkok rainfall. The relationship $K = f(T)$ (T = return period) for Bangkok is shown in a graph. The obtained results are compared with those for: U.S. stations, Taichung (Taiwan), and Hong Kong. Areal variations and means of taking them into account are considered. The variation of the Gumbel μ and $1/\alpha$ with precipitation duration at Hong Kong is shown graphically. -- MGA 20.7-407.

204. Stroschein, L. A. Project Trend meteorology program. Proceedings of the 1967 Army Conference on Tropical Meteorology held at University of Miami, Coral Gables, Florida 8-9 June 1967 prepared by Homer W. Hiser and Harold P. Gerrish. Institute of Marine Sciences, University of Miami, Report No. 15. pp. 31-35. January 1968. DAS M(051) M618in no. 15.

...Project Trend, a Department of Defense research program designed to collect data on natural factors affecting the soldier, material and operations in two vegetation types has been initiated in Thailand. After two years of observations at a site in the dry evergreen forest, a similar two year program is planned for another station in the tropical rainforest area. The objectives and required instruments are discussed.

205. Thailand. Meteorological Department. Monthly meteorological bulletin. April 1937-1942, 1948-1953, 1957, 1959-... (December 1968). Issued by Siam Hydrographic Service. Section of Meteorology 1937-1942. Bangkok. DAS M06.1/593 T364m.

...Describes the monthly general weather conditions in Thailand. The tables present hourly observations of pressure (mb), temperature (°C), relative humidity (%), wind direction and force and rainfall (mm) for Bangkok; observations at 0700, 1000, 1300 and 1600 of visibility, cloud amount and cloud types for Bangkok; daily weather remarks by symbols for Bangkok; daily and monthly summaries of mean pressure, mean temperature, maximum and minimum temperatures with range, mean relative humidity, mean wind speed, absolute maximum wind speed, mean cloud amount, total amount of rainfall, mean visibility and total amount of evaporation for Bangkok; monthly absolute maximum and minimum pressures with range and dates of occurrence, mean maximum and minimum pressures, mean maximum and minimum temperatures, absolute maximum and minimum relative humidities, resultant wind direction, departure of rainfall from normal, and maximum rainfall intensity for Bangkok; monthly wind roses for Bangkok and Chiangmai; monthly resultant wind direction (16 points and calm) frequency in hours and %, wind movement by direction (16 points and calm) and mean wind velocity by direction (16 points and calm) for Bangkok and Chiangmai; monthly state of sea frequency within limits (calm, smooth, slight, moderate, rough, very rough, high and swell) for 8-11 coastal stations in Thailand; monthly total number of days with clear, partly cloudy, cloudy and overcast skies for Bangkok; monthly total number of days with dew, ground fog, mist, haze, thunderstorm, distant thunderstorm, rain and lightning for Bangkok. There are also summaries for 7-78 stations in Thailand of monthly mean pressure, mean pressure at specified hours (0100, 0400, 0700, 1000, 1300, 1600, 1900 and 2200), pressure range, mean temperature, mean maximum and minimum temperatures, absolute maximum and minimum temperatures, temperature range, mean relative humidity, absolute maximum and minimum relative humidities with dates of occurrence, resultant wind direction and wind steadiness (%)

Source No. 205 continued.

at 2-4 specified hours (0700, 1000, 1300 and 1600), prevailing wind direction and calms at 0700 and 1300, mean wind force and maximum wind speed at 0700 and 1300, mean cloud amount and mean visibility at 0700 and 1300, maximum wind force, wind direction (8 points and calm) frequency at specified hours (0700, 1000, 1300 and 1600); wind force frequency within specified limits (1-3, 4, 5-6, 7, 8-9, >9 Beaufort) at specified hours (0700, 1000, 1300 and 1600), total number of rainy days, total rainfall amount, maximum amount of rainfall in 24 hours with date of occurrence,mean solar radiation,absolute maximum and minimum solar radiation with dates of occurrence, mean terrestrial radiation, absolute maximum and minimum terrestrial radiation with dates of occurrence, total amount of evaporation, maximum amount of evaporation in 1 day with date of occurrence, visibility frequency within specified limits (<0.05, 0.05-0.1, 0.2-0.5, 0.6-1.0, 2-4, 5-10, 11-20, 21-30, 31-50 and ≥50 km.). In addition to the above data there are monthly summaries for 7-59 stations of clear, partly cloudy, cloudy and overcast days; total number of days with dew, hail, fog, haze, lightning, distant thunderstorm, drizzle, squalls, and waterspouts. Period of record varies by station and element.

206. World Meteorological Organization. Expansion of meteorological services in Thailand. General Report. WMO No. RP. TC.SF.7. 44 pp. Geneva, 1968. DAS M(06) W927ra RP. TC. SF. 7.

...The Government of Thailand, with the help of the World Meteorological Organization and the United Nations Development Programme, has expanded the agricultural meteorological and hydrometeorological services of the country for the purpose of increasing agricultural productivity and conservation of natural resources. Chapter one describes the monsoon climate, topography and natural resources of Thailand. In the second chapter the setting up of new hydrological and agricultural meteorological stations, the development of training and research programs, and the establishment of the instrument laboratory are described. The third chapter deals with the situation of the expanded services at the end of the Project. In the last chapter the results of the Project are evaluated.

1969

207. Crutcher, H. L.; Nash, S. Bintasant; Kropp, D. K. A note on climatology of Thailand and Southeast Asia. U. S. Environmental Science Services Administration, Environmental Data Service, ESSA Technical Memorandum EDSTM 10. 166 pp. Silver Spring, May 1969. DAS M(055) U5883 tem EDSTM 10.

...This study presents information on the climate of Southeast Asia with emphasis on Thailand. Thunderstorms and turbulence, visibility, land and sea breezes, and cloudiness are discussed in general. Temperature, dew points, winds, precipitation, typhoons, monsoons, harmonic analysis and spectrum analysis are discussed in more specific terms.

208. Dalrymple, Paul C. Micromet programs in East Antarctica and Thailand. American Meteorological Society, Bulletin, 50(2):80-81, February 1969. DAS M(05) A512b.

Source No. 208 continued.

...A brief letter reporting and briefly describing the micrometeorological programs being conducted by the Earth Sciences Lab. of the U.S. Army, Natick, Mass. in the extreme cold dry climate of interior East Antarctica and the hot humid climate of Southeast Asia. The Plateau station was closed in Jan. 1969, but the program in Thailand is still under way. Meteorologists interested in visiting the station for special projects should communicate with Paul Dalrymple at the U.S. Army Natick Labs. -- MGA 20.10-445.

209. Griffiths, John F. A statistical survey of long period stations in Southeast Asia using pentad analysis. U.S. Army Electronics Command, Technical Report ECOM 0203-1, Research on Tropical Rainfall Patterns and Associated Mesoscale Systems, Report No. 1 by Walter K. Henry, John F. Griffiths and John Moore. Texas A&M University, College Station, Texas, December 1969. pp. 17-41. DAS M(055) U5812ec ECOM-0203-1.

...The primary purpose of this investigation was to study the correlation between two consecutive pentad periods of mean amounts of precipitation and to discover whether the apparent variations from pentad to pentad are attributable to special synoptic variations or they are sampling fluctuations or errors. This statistical investigation was based on the rainfall data by pentads for eight selected long-period stations in Southeast Asia. Three of these stations (Korat, Lampang and Chanthaburi) are in Thailand. More detailed investigations are necessary to identify periods of maximum change.

210. Henry, Walter K. Comments on the rainfall in Southeast Asia. U.S. Army Electronics Command, Technical Report ECOM 0203-1, Research on Tropical Rainfall Patterns and Associated Mesoscale Systems, Report No. 1 by Walter K. Henry, John F. Griffiths and John Moore. Texas A&M University College Station, Texas, December 1969. pp. 1-16. DAS M(055) U5812ec ECOM-0203-1.

...The five day totals of rainfall was the method selected to interpret the variation of dry and wet seasons in Southeast Asia. The text contains information on the method of interpreting the variation of seasons, beginning and end of rainy seasons, movement of the surges of rainfall and the frequency of rain pentads. Data for 35 stations in Southeast Asia were used in this report. Twelve of these stations are located in Thailand.

211. Henry, Walter K. Maximum amounts of five day totals of rainfall. U.S. Army Electronics Command, Technical Report ECOM 0203-1, Research on Tropical Rainfall Patterns and Associated Mesoscale Systems, Report No. 1 by Walter K. Henry, John F. Griffiths and John Moore. Texas A&M University, College Station, Texas, December 1969. pp. 42-47. DAS M(055) U5812ec ECOM-0203-1.

...Maximum amounts of rainfall may occur during dry season, larger rainfall amounts than this study indicates are possible, and large amounts of rainfall do occur but are for from world records in Southeast Asia. Maximum total amount and second greatest total amount of rainfall in five days with dates of

Source No. 211 continued.

occurrence and number of pentads with maximum total rainfall within specified amounts are included for 12 stations in Thailand. Period of record varies by station.

212. Henry, Walter K.; Griffiths, John F.; Moore, John. Research on tropical rainfall patterns and associated mesoscale systems. U.S. Army Electronics Command, Technical Report ECOM-0203-1, Report No. 1. (Texas A&M University, College Station, Texas) 106 pp. December 1969. DAS M(055) U5812ec ECOM-0203-1.

...Consists of 4 papers dealing with rainfall patterns in Southeast Asia. Three include information on Thailand and are abstracted separately. They are "Comments on the rainfall in Southeast Asia" by Walter K. Henry, "A statistical survey of long period stations in Southeast Asia using pentad analysis" by John F. Griffiths and "Maximum amounts of five day totals of rainfall" by Walter K. Henry.

213. U.S. Air Force.Cambridge Research Labs., Bedford, Mass. Atmospheric visibility in Southeast Asia. By the Optical Physics Lab. U.S. Air Force. Office of Aerospace Research, Research Review, 8(3):12-13, May/June 1969. DLC.

...This article deals with the 10-wk series of optical measurements begun of Feb. 14, 1969, over Thailand. The program conducted during the dry season is designated Phase 2. Phase 1 was conducted in the same area during the monsoon season. The data obtained in both phases will be analyzed by computers to establish prediction criteria for the performance of optical sensors in a given environment. -- MGA 21.2-341.

214. U.S. Air Weather Service. 1st Weather Wing. Climatology for Asian and Pacific visits. Special study 105-60. 129 pp. APO San Francisco 96553, April 1, 1969. DAS M(055) U58s 105-60.

...Presents a descriptive summary of the climate of Thailand for each month; monthly tabular summaries of absolute maximum and minimum temperatures (°F), mean daily maximum and minimum temperatures (°F), mean total amount of precipitation (inches), mean number of days with precipitation, mean number of days with thunderstorms and mean relative humidity for Bangkok, Korat, Nakhon Phanom, Takhli, Ubon, Udorn, and U-Tapao; a map showing the location of stations in this study. Data for Thailand is on pages 115-126.

215. U.S. Engineer Agency for Resources Inventories. Selected bibliography, Lower Mekong Basin. Vol. 1. Various pagings. 1969. DAS 016.9159 U582se v.1.

...Includes a regional bibliography on the climate of the Lower Mekong Basin and a bibliography on the climate of Thailand. The entries primarily represent material available in the Washington, D.C. area.

216. U. S. Environmental Data Service. Climates of the World. 28 pp. Washington, January 1969. DAS M82.1/2 U5883cl.

...On page 22 presents tabular summaries for Bangkok of mean daily maximum and minimum temperatures (°F) for January, April, July and October based on data for 10 years; annual maximum and minimum temperatures based on 10 years of data; monthly and annual mean total amount of precipitation summarized over a period of ten years.

1970

217. Krishnamurti, T. N. and Hawkins, R. S. Mid-tropospheric cyclones of the southwest monsoon. Journal of Applied Meteorology, Boston 9(3): 442-458, June 1970. DAS M(05) J86joa.

...Mid-tropospheric cyclones are an important part of the tropical general circulation of the summer season. These are synoptic-scale disturbances which appear in the daily monthly mean circulation maps with greatest intensity at levels near 500 mb. The structure and energetics of this type over southeast Asia are discussed in this paper. Interesting features include a warm anomaly above the cyclone and a cold anomaly below.

A five-level non-geostrophic balanced model is used in this study to obtain the distribution of vertical motion. The model includes a parameterization of cumulus-scale convection. In the middle levels, rising motions are found west of the cyclone and sinking motions to the east. This is primarily due to the thermal structure of the atmosphere and associated advection of colder air from the oceanic regions and warmer air from land areas. A marked diurnal change in the vertical velocity is noted in the computations; magnitudes are large at 0700 local time compared to 1900. This diurnal change is primarily due to changes in the wind direction and speed. The important result of this study is that both the cumulus- and synoptic-scale motions exhibit the following dual roles in the maintenance of this midlevel system:

1) Both scales contribute to a net warming of the air above the cyclone, diabatic warming by cumulus-scale motions and adiabatic warming by the descent of synoptic-scale motions.

2) The two scales oppose each other in the transformation eddy available potential energy into eddy kinetic energy. Cumulus-scale motions contribute to a net generation, while synoptic-scale motions transform kinetic energy into potential energy. This latter result is consistent with 1) because the areas of descent are somewhat closer to the warm temperature anomaly than are the areas of ascent. -- Author's abstract.

218. Thailand. Meteorological Department. Daily weather bulletin. December 1950-...(September 1970). Title prior to circa 1960: Weather map and meteorological information. DAS M09.2/593 T364w.

...Describes the general weather situation for each day in Thailand; presents daily weather maps at 0700, maps showing the daily rainfall amount for individual stations, maps showing the daily highest and lowest

Source No. 218 continued.

temperatures for individual stations, and maps showing the distribution of winds at 600 meters at 0700; contains the daily weather forecast; reports daily observations at 0700 of pressure, temperature, relative humidity, wind direction and wind speed for 28-58 stations; records daily maximum and minimum temperatures and total rainfall amount for 28-58 stations.

219. Thailand. Meteorological Department. Weekly weather report ... and weather outlook ..., November 1958-...(December 1970). Title varies: Weekly temperature and rainfall...and weather outlook, November 1958-October 1960; Weekly temperature and rainfall of Thailand..., November 1960-July 1962; Weekly rainfall over Thailand..., July-October 1962; Weekly weather report..., October 1962-October 1963. (In Thai and English). Bangkok. DAS M06.1/593 T364we.

...Describes the weekly weather situation in Thailand and presents the weather outlook for the next seven days. The tables contain for about 55-350 stations in Thailand daily and weekly rainfall amounts (mm), weekly normal rainfall amount, weekly departure of rainfall from normal, accumulative rainfall amount from January 1 with departure from normal, daily maximum and minimum temperatures, weekly mean maximum and minimum temperatures, weekly absolute maximum and minimum temperatures, weekly mean temperatures and monthly normal temperatures (°C). Period of record varies by station and element.

220. U.S. Environmental Data Service. Monthly climatic data for the world. March 1949-...(April 1970). Asheville, North Carolina. DAS M06.1 U587m.

...Consists of monthly summaries of mean pressure, mean temperature with departure from normal, mean vapor pressure with departure from normal, number of days with precipitation, total amount of precipitation with departure from normal, precipitation quintile and sunshine duration for 4-13 stations in Thailand. There are also monthly summaries of dynamic height, mean temperature, mean dew point and temperature, dew point depression and wind direction, wind speed and wind steadiness factor at standard levels for 1-2 stations (Bangkok and Songkla) in Thailand. Period of record varies by station and element.

AUTHOR INDEX

	Source Number with Publication Date
Alisov, B. P.	77(1950)
Anstey, Robert L.	171(1966)
Applied Scientific Research Corporation of Thailand	191(1968)
Armstrong, Evan, Jr.	150(1963)
Atkinson, Gary D.	172(1966), 173(1966), 181(1967)
Atlantic Research Corporation, Alexandria, Virginia	182(1967)
Bangkok, Medical Officer of Health	8(1905), 14(1914), 15(1915)
Bangkok, Siam. [U.S. Consulate-General]	12(1911)
Banta, George S.	65(1944)
Barton, Thomas Frank	141(1962), 146(1962)
Benham, Alan D.	192(1968), 193(1968)
Blair, Thomas Arthur	55(1942)
Boonkird, Sa-Ard	120(1960)
Braak, C.	28(1931)
Brandli, H.	26(1930)
Breton, R. Stanley	20(1926)
Brooks, C. E. P.	31(1932), 80(1951)
Bruzon, E.	27(1930)
Buajitti, Kahit	121(1960)
Bunnag, C. V.	128(1961) 129(1961)
Bunnag, Charoon V.	72(1947)
Campbell, J.	1(1870), 2(1879)
Carton, P.	22(1928), 27(1930), 35(1934), 48(1940)
Chareonsook, Dumrong	142(1962)
Charoen-Rajapark, C.	194(1968)
Chatterjee, Sujan Bandhaba	113(1959)
Cobb, L. Glen	195(1968)
Conway, H. McKinley, Jr.	150(1963)
Credner, Wilhelm	38(1935)
Critchfield, Howard J.	122(1960)
Cronin, Jack	93(1954)
Crutcher, H. L.	207(1969)
Dalrymple, Paul C.	208(1969)
Dawson, M.D.	120(1960)
DeLong, George C.	107(1958)
Deppermann, Charles E.	49(1940)
Dhararaks, K. V.	114(1959)
Dhararaks, Khun Visisht	72(1947)
Dobby, E. H. G.	130(1961)
Donn, William L.	161(1965)

Eilertsen, Ernest B. 65(1944)
Emery, P. F. 100(1956)

Fletcher, Robert D. 69(1945)
Frisby, E. M. 174(1966), 183(1967)
Fujioka, Yoshikazu 175(1966)

Garbell, Maurice A. 73(1947)
Gerbing, W. 11(1909)
Gherzi, Ernest 66(1944)
Graystone, P. 106(1958)
Great Britain, Meteorological Office 20(1926), 36(1934), 41(1937), 43(1938), 78(1950), 85(1952), 176(1966)
Great Britain, Naval Weather Service 74(1947)
Griffiths, John F. 209(1969), 212(1969)
Guilmet, Bernard 75(1947)

Hare, F. K. 70(1946)
Harza, Engineering Company 131(1961)
Hawkins, R. S. 217(1970)
Henry, Walter K. 196(1968), 210(1969), 211(1969), 212(1969)
Highet, H. Campbell 9(1906), 13(1912)
Huke, Robert E. 143(1962)

Iki, Kunio 177(1966)
India, Meteorological Department 59(1943), 132(1961)
Indochina, Service Meteorolgique 18(1917), 23(1928), 32(1932)
Ing, Gordon K. T. 197(1968)
Inskip, G. H. 3(1883)
Iyer, V. Doraiswamy 29(1931), 33(1932), 44(1938)

Japan, Hydrographic Office 50(1941)
John, I. G. 70(1946)

Kambau, M. L. Xujati 133(1961)
Kambhu, Momlaung Xujati 86(1952)
Kanchanalak, Boonchob 134(1961)
Kao, Y. S. 76(1948)
Kato, Hiroshi 177(1966)
Kendrew, W. G. 135(1961)
Kingsbury, Robert C. 146(1962)
Knoll, Denys W. 51(1941)
Koeppe, Clarence E. 107(1958)
Koppen, W. 30(1931)
Koteswaram, P. 108(1958)
Krishnamurti, T. N. 217(1970)
Kropp, D. K. 207(1969)

Leckie, C. S. 4(1893)
Le Lay, G. 5(1900)
Linke, Franz 144(1962)
Littlejohns, L. W. 109(1958)

McIntosh, D. H. 67(1944)
Maruyama, Eizo 184(1967)
Matsui, Masaharu 177(1966)
May, Stancel L., Jr. 150(1963)
Michigan, University, Department of Geography 145(1962)
Miller, Arthur Austin 136(1961)
Moore, John 212(1969)

Nash, S. Bintasant 207(1969)
Nelson, H. L. 198(1968)
Noda, Akiyoshi 178(1966)
Nuttonson, M. Y. 151(1963)

Ogino, Kazuhiko 185(1967)
Orgill, M. M. 199(1968)

Palau, Meteorological Observatory 24(1928)
Papadakis, J. 137(1961)
Pendleton, Robert L. 60(1943), 146(1962)
Philbrick, A. K. 94(1954)

Ramage, C. S. 87(1952), 96(1955), 123(1960)
Ramsey, B. 97(1955)
Rangsit, Meteorological Station 19(1925)
Reed, Wesley W. 39(1935), 52(1941)
Royal Meteorological Society, London 4(1893), 84(1951)
Rumney, George R. 200(1968)

Sakornratana, Kachit 138(1961)
Sangmitr, Soranee 201(1968)
Sansom, H. W. 174(1966), 183(1967)
Schutz, C. 186(1967)
Siam. Ministry of Agriculture 7(1904)
Siam. Royal Irrigation Department 21(1927)
Siam. Section of Meteorology 45(1938), 47(1939)
Siam Society 10(1907)
Sion, Jules 25(1928)
Smith, Alvin L., Jr. 202(1968)
Smithsonian Institution 190(1967)
Sokhrina, Raisa Fedorovna 115(1959)
Srinkapaibulaya, Sa-Ard 124(1960)
Sternstein, Lawrence 147(1962)
Stoddard, A. A. 16(1915), 17(1915)
Stol, Ph. Th. 203(1968)
Stone, E. L., Jr. 120(1960)
Stroschein, L. A. 204(1968)
Sybesma, R. P. 203(1968)

Taiwan (Formosa). Weather Bureau 53(1941)
Tannehill, Ivan Ray 88(1952)
Tanner, Gilbert 159(1964)

Thailand, Cotton Experiment Station, Klongtan, Swankaloke — 46(1938)
Thailand, Department of General Statistics — 40(1935)
Thailand, Irrigation Department — 116(1959)
Thailand, Meteorological Department — 54(1941), 7(1946), 89(1952), 90(1952), 95(1954), 98(1955), 101(1956), 103(1956), 104(1957), 105(1957), 110(1958), 111(1958), 117(1959), 118(1959), 148(1962), 152(1963), 153(1963), 154(1963), 155(1963), 160(1964), 162(1965), 163(1965), 164(1965), 165(1965), 166(1965), 167(1965), 205(1968), 218(1970), 219(1970)
Theaman, John R. — 34(1933), 37(1934)
Thompson, B. W. — 81(1951)
Thompson, Will F. — 112(1958)

United Nations Committee for Coordination of Investigations of the Lower Mekong River Basin — 168(1965)
United Nations Economic Commission for Asia and the Far East — 79(1950), 82(1951)
U.S.S.R. Agro-Gidrometeorologicheskiĭ Institute — 42(1937)
U.S. Air Force Cambridge Research Labs., Bedford, Mass. — 213(1969)
U.S. Air Weather Service — 156(1963), 169(1965), 170(1965), 179(1966), 180(1966), 187(1967), 214(1969)
U.S. Army Air Force — 61(1943)
U.S. Department of the Air Force — 62(1943), 68(1944)
U.S. Engineer Agency for Resources Inventories — 215(1969)
U.S. Environmental Data Service — 190(1967), 216(1969), 220(1970)
U.S. Hydrographic Office — 63(1943)
U.S. International Cooperation Administration — 125(1960)
U.S. Quartermaster Corps. Research and Development Division — 83(1951)
U.S. Quartermaster Research and Development Center, Natick, Mass. — 91(1953)
U.S. Weather Bureau — 56(1942), 57(1942), 58(1942), 64(1943), 119(1959), 188(1967), 190(1967)

Vadhanapanich, Charoen — 126(1960, 139(1961), 140(1961)
Vanderheide, J. Homan — 6(1903 ?)
Vesa-Rajananda, S. — 157(1963)
Vitvitskiĭ, G. N. — 127(1960)

Watts, I. E. M. — 99(1955)
Wexler, Ruth L. — 189(1967)
World Meteorological Organization — 92(1953), 149(1962), 206(1968)

Xupravati, Bampen 158(1963)

Zikawei Observatory 66(1944)

SUBJECT HEADING INDEX

	Source Numbers
Absolute humidity	See Humidity absolute
Air circulation	See Upper wind and Wind
Air density	
absolute minimum	36
mean	36
Air masses	61, 66, 73, 186
Breezes, land and sea	179, 207
Ceiling	57, 132, 156
Ceiling/visibility frequency	61, 169, 172, 187
Ceiling/visibility/wind frequency	169, 187
Climate	7, 9, 11, 13, 21, 28, 31, 34, 38, 46, 55, 57, 60, 69, 83, 91, 110, 112, 114, 120, 123, 125, 127, 132, 133, 136, 145, 146, 151, 158, 169, 171, 177, 178, 179, 182, 184, 207, 214
Climatic classification	25, 28, 137, 146, 151, 159, 185
Climatological bibliographies	202, 215
Cloud amount	21, 154
frequency	186, 188
mean	2, 11, 19, 26, 28, 30, 36, 40, 41, 50, 53, 57, 63, 64, 72, 88, 89, 91, 101, 110, 112, 155, 156, 160, 162, 169, 205
observations	95, 205
Cloud height	154 See also Ceiling
Cloudiness	41, 57, 61, 65, 91, 101, 102, 110, 123, 152, 158, 179, 207
Clouds	
low	75
structure of high	109
Cloud types	95, 154, 205
Crachin	179
Cyclones	79 See also Storms
mid-tropospheric	217
tropical	66, 138, 140, 152
Depressions	101, 117, 132
Dew	89, 110, 155, 162, 205
Dew point temperature	191, 207
frequency	90, 164
mean	155, 160, 169, 187
Disturbance, tropical	73, 96, 123
Drizzle	19, 205
Drought	42, 98
Dry spell	42, 145, 147
Duststorms	59, 155

Earth radiation — See Terrestrial radiation
Easterly wave — 123
Evaporation — 26, 60, 89, 110, 131, 134, 137, 155, 160, 162, 168, 169, 178, 185, 195, 205

Evapotranspiration
  actual — 184, 192
  potential — 184, 192

Flood control — 82, 86
Floods — 116
Flying conditions — 51
Fog — 36, 51, 57, 59, 61, 63, 64, 72, 89, 101, 110, 155, 156, 158, 160, 162, 169, 179, 205 See also Ground fog

Fog and mist frequency — 36
Forecasting
  low morning visibilities — 180
  monsoon rain — 29, 44
  techniques — 156
  weather — 67
Forecasts — 218, 219
Front — 179 See also Intertropical front
Frost, dates of first and last — 64

Gales — 64
Ground fog — 205

Hail — 41, 89, 110, 155, 162, 174, 183, 205
Haze — 59, 68, 89, 110, 155, 158, 160, 162, 169, 205

Headwind — 78, 106
Heat index — 192
Humidity — 41, 91, 185
  absolute, mean — 11
  index — 137
  range — 162
  regime — 137
  relative — 21, 101, 102, 110, 152, 154, 158, 179, 191,
    highest daily mean — 19
    lowest daily mean — 19
    maximum — 19, 26, 40, 118, 155, 156, 162, 169, 182, 205
    mean — 2, 8, 11, 13, 14, 15, 19, 26, 28, 30, 36, 40, 41, 50, 53, 57, 63, 64, 66, 72, 80, 85, 88, 89, 91, 101, 110, 112, 118, 127, 145, 149, 150, 151, 155, 160, 161, 162, 169, 171, 176, 182, 187, 205, 214
    mean maximum — 60, 110, 118, 162, 169
    mean minimum — 60, 110, 118, 162, 169
    minimum — 19, 26, 40, 50, 101, 118, 155, 156, 160, 162, 169, 182, 205

observations 154, 205, 218
range 162

Icing 179
Intertropical Convergence Zone 179, 186
Intertropical front 133, 138 See also Front

Jet stream 108

Lightning 2, 89, 110, 155, 160, 162, 205
Lightning and thunderstorms 111

Meteorological
assistance program 119
data availability 199
organization 45, 47
program 125, 139, 204, 206
station locations 103, 110, 162, 169 See also Precipitation, station locations
Micrometeorological research 208
Mist 101, 162, 205
Monsoon 25, 113, 146, 157, 207
circulation 186
climate 206
rain 140
weather 138

Precipitation 17, 21, 26, 29, 41, 57, 59, 61, 65, 72, 79, 83, 86, 91, 99, 101, 102, 110, 123 126, 133, 134, 140, 141, 143, 145, 146, 147, 148, 152, 158, 175, 179, 185, 187, 189, 195, 196, 207, 209, 210, 211, 212

amount
departure from normal 148, 153, 155, 165, 205, 219, 220
intensity 17, 19, 26, 104, 145,147, 189, 192, 205,
maximum 2, 18, 21, 23, 32, 56, 61, 64, 77, 145, 146, 151, 169, 195, 211
maximum in 24 hours 10, 13, 14, 15, 19, 23, 32, 36, 40, 41, 50, 57, 61, 64, 85, 89, 91, 110, 145, 146, 148, 151, 153, 155, 162, 169, 176, 189, 205
mean total 1, 6, 7, 9, 12, 13, 14, 15, 17, 18, 21, 22, 23, 24, 26, 27, 28, 29, 30, 32, 34, 35, 36, 37, 39, 40, 41, 42, 48, 50, 51, 52, 53, 56, 57, 61, 63, 64, 66, 72, 77, 79, 80, 83, 84, 85, 91, 94, 99, 101, 107, 110, 112. 115, 120, 121, 122, 130, 135, 140, 144, 145, 146, 147, 148, 149, 150, 151, 153, 156, 157, 159, 160, 163, 165, 169, 171, 175, 176, 178, 182, 184, 186, 187, 190, 192, 198, 200, 214, 216, 219
minimum 18, 21, 23, 32, 56, 61, 64, 77, 145, 146, 151, 169

Total — 1, 2, 4, 5, 6, 8, 10, 11, 12, 16, 17, 18, 19, 21, 23, 32, 40, 46, 60, 89, 120, 131, 146, 147, 148, 153, 155, 162, 165, 168, 177, 190, 195, 205, 218, 219, 220

Days — 2, 6, 9, 10, 11, 12, 13, 14, 15, 18, 19, 22, 23, 24, 26, 28, 29, 30, 32, 34, 36, 40, 41, 50, 51, 53, 57, 59, 61, 63, 64, 66, 77, 80, 85, 88, 89, 101, 110, 127, 144, 145, 146, 147, 148, 150, 151, 153, 155, 156, 160, 161, 162, 169, 176, 186, 187, 189, 195, 205, 214, 220

Frequency — 3, 121, 147, 163, 195

Measurements — 194

Regime — 145, 201, 212

Station locations — 147

Pressure — 21, 72, 79, 101, 154, 158

highest daily mean — 19

lowest daily mean — 19

maximum — 19, 26, 40, 89, 110, 155, 160, 162, 169, 205,

mean — 2, 11, 19, 26, 36, 40, 41, 50, 51, 53, 63, 66, 72, 84, 89, 101, 110, 115, 132, 149, 154, 155, 160, 162, 169, 190, 197, 205, 220

mean maximum — 110, 162, 205

mean minimum — 110, 162, 205

minimum — 19, 26, 40, 89, 110, 155, 160, 162, 169, 205

observations — 154, 205, 218

range — 155, 160, 162, 205

Project Trend — 204

Rainfall — See also Precipitation

Rainfall depth-duration frequency — 203

Rainfall intensity-duration frequency — 203

Rain gage network — 124

Relative humidity — See Humidity, relative

Sea temperature — 41, 131, 179

Sky cover (low)/visibility frequency — 169

Sky cover (total)/visibility frequency — 169, 187

Snow

dates of first and last — 64

depth — 64

Snow cover, days with — 64

Snowfall

amount — 64, 187

days — 64, 187

Solar radiation — 21

maximum

highest — 13, 19, 26, 40, 205

lowest — 19, 26, 205

mean 13, 26, 40, 205
mean maximum 19
minimum 13, 40, 205
Squalls 41, 64, 89, 110, 155, 160, 162, 206
State of sea 63, 74, 104, 179, 205
State of sky 59
clear days 2, 51, 61, 63, 64, 101, 155, 205
cloudy days 51, 61, 63, 64, 155, 205
overcast days 2, 63, 155, 205
partly cloudy days 51, 64, 155, 205
Storms 57, 91, 133, 142, 196 See also Cyclones
Sunshine 188, 220

Temperature 21, 26, 41, 57, 61, 72, 74, 79, 83, 91, 101, 102, 110, 133, 146, 152, 154, 158, 175, 179 185, 191, 207, 220
frequency 61, 64, 90, 146, 164, 187
maximum 2, 57, 8, 11, 12, 13, 14, 15, 19, 26, 30, 36, 41, 43, 50, 51, 52, 56, 57, 61, 64, 66, 77, 80, 85, 88, 89, 91, 101, 110, 118, 135, 145, 146, 150, 151, 155, 156, 160, 162, 164, 169, 176, 182, 187, 191, 200, 205, 214, 216, 218, 219
mean 2, 5, 7, 9, 11, 12, 13, 14, 15, 19, 26, 28, 30, 36, 40, 41, 42, 50, 51, 52, 53, 56, 57, 61, 63, 64, 66, 72, 79, 80, 83, 89, 91, 94, 101, 107, 110, 112, 115, 118, 120, 122, 127, 132, 135, 145, 146, 151, 155, 156, 159, 160, 162, 164, 169, 171, 175, 177, 178, 182, 190, 192, 198, 200, 205, 219, 220
mean maximum 2, 5, 8, 9, 12, 13, 19, 26, 28, 36, 40, 41, 46, 50, 53, 56, 57, 60, 61, 64, 77, 84, 85, 88, 89, 91, 101, 110, 112, 118, 135, 145, 146, 150, 151, 155, 156, 160, 162, 169, 176, 178, 187, 205, 214, 216, 219
mean minimum 2, 5, 8, 9, 12, 13, 19, 26, 28, 36, 40, 41, 42, 46, 50, 53, 56, 57, 60, 61, 64, 77, 84, 85, 88, 89, 91, 101, 110, 112, 118, 135, 146, 150, 151, 155, 156, 160, 162, 169, 176, 178, 187, 205, 214, 216, 219
mean of maxima 14, 15, 41, 85, 161, 176
mean of minima 14, 15, 41, 85, 161, 176
minimum 2, 5, 7, 8, 11, 12, 13, 14, 15, 19, 26, 30, 36, 41, 42, 43, 50, 51, 52, 56, 57, 61, 64, 66, 80, 85, 88, 89, 91, 101, 110, 118, 135, 146, 150, 151, 155, 156, 160, 162, 164, 169, 176, 182, 187, 191, 200, 205, 214, 216, 218, 219
observations 154, 191, 205, 218
range 8, 9, 11, 12, 14, 15, 19, 40, 43, 57, 66, 112, 135, 155, 159, 162, 200, 205
regime 137, 145

Terrestrial radiation 21
  maximum 40, 205
  mean 26, 40, 205
  mean minimum 19
  minimum
    highest 19, 26
    lowest 19, 26, 40, 205
Thunder 20, 36, 41, 59, 64, 89, 110, 155, 162
Thunderstorms 41, 57, 65, 101, 102, 110, 111, 132, 145, 152, 156, 179, 181, 207
  days 2, 64, 89, 91, 92, 101, 110, 111, 126, 140, 152, 155, 160, 162, 169, 181, 187, 205, 214
  days with distant 162, 205
Tornado 41
Tropical disturbance See Disturbance, tropical
Turbulence 179, 207
Typhoons 33, 41, 51, 62, 66, 73, 74, 101, 102, 104, 110, 117, 132, 145, 152, 156, 179, 207
  frequency of those as depressions 132
  frequency of those decreasing in intensity 132, 156
  tracks 117, 145

Upper air
  altitude or height 71, 105, 154, 220
  dew point 105, 220
  dew point depression 220
  haze 179
  humidity, relative 71, 105, 154
  temperature 71, 105, 154, 220
Upper wind 41, 49, 57, 58, 59, 65, 69, 70, 73, 74, 75, 76, 81, 87, 97, 128, 129, 158, 166, 167, 170
  direction 57, 220
    frequency 58
    observations 95, 105, 154
    prevailing 95
    resultant 57, 95, 154, 169
  speed 57, 220
    frequency by direction 41, 54
    maximum 95
    mean 57, 58, 95
    observations 95, 105, 154
    resultant 57, 154, 169
  steadiness 95, 154
  steadiness factor 220
  strong 100

Vapor pressure
  departure of mean from normal 220
  mean 2, 220

Visibility 41, 57, 59, 61, 65, 74, 75, 91, 101, 102, 132, 156, 158, 179, 187, 207, 213
  frequency 36, 50, 54, 162, 205
  mean 95, 110, 155, 160, 162, 205
  observations 95, 205
Visibility/cloud height frequency 90, 164

Water deficiency 184
Waterspout 41, 205
Water surplus 184
Water temperature 131
Weather 21, 36, 57, 62, 67, 73, 74, 75, 87, 93, 99, 138, 145, 154, 155, 156, 162, 169, 186, 205, 218, 219

Wet bulb temperature 28, 191
Wet spells 61, 145
Wind 21, 26, 41, 57, 59, 61, 65, 67, 69, 70, 72, 74, 79, 83, 91, 93, 101, 102, 110, 132, 152, 154, 156, 158, 175, 179, 207
  direction
    frequency 2, 36, 41, 89, 90, 101, 104, 110, 162, 186, 205
    observations 154, 205, 218
    prevailing 19, 26, 40, 50, 51, 57, 63, 64, 66, 155, 160, 205
    resultant 19, 205
    resultant frequency 205
  force See also Wind speed
    frequency 162, 205
    maximum 101, 110, 155, 162, 205
    maximum with direction 89
    mean 19, 36, 40, 89, 101, 104, 110, 155, 162, 205
    mean maximum 101, 104
    observations 205
  movement 131, 168
  movement by direction 205
  peak gusts 173
  regime 113, 185
  roses 36, 61, 162, 205
  speed See also Wind force
    frequency 61, 101, 187
    frequency by direction 50, 54, 90, 164, 205
    maximum 64, 111, 160, 169, 173, 205
    mean 26, 50, 51, 57, 63, 64, 112, 160, 205
    mean by direction 205
    observations 154, 218
    steadiness 205
Wind speed ≥17 kts/no precipitation frequency 168, 187
Wind speed/wind direction/visibility and/or cloud height frequency 90, 164
Wind speed/temperature/no precipitation frequency 169, 187

BIBLIOGRAPHY ON THE CLIMATE OF:

1955

WB/BC

1 British East Africa I (AD-666 893) (also No. 7)
2 Cabinda (AD-670 028)
3 Cameroons (AD-670 029)
4 French Equatorial Africa (AD-670 030)
5 Peru (AD-670 031)
6 Rio Muni and Gulf of Guinea Island (AD-670 032)
7 British East Africa II (AD-670 033) (also No. 1)

1956

8 Angola (AD-669 410)
9 Antarctica (AD-670 034)
10 Arctic (AD-666 894)
11 Belgian Congo (AD-670 035)
12 Chile I (AD-670 036) (also No. 23)
13 Colombia (AD-669 411)
14 Costa Rica (AD-670 637)
15 Ecuador I (AD-670 038) (also No. 24)
16 Guatemala (AD-670 039)
17 Honduras (AD-670 040)
19 Federation of Rhodesia and Nyasaland (AD-669 412)
21 Salvador (AD-670 041)
22 Venezuela I (AD-670 042) (also No. 27)
23 Chile II (AD-670 043) (also No. 12)
24 Ecuador II (AD-670 044) (also No. 15)
27 Venezuela II (AD-670 045) (also No. 22)

1957

28 Greenland I (AD-670 046) (also No. 40)
29 Guianas (British, French, Dutch) (AD-670 047)
30 Indochina I (AD-666 895) (also No. 38)
31 Iran (AD-664 694)
32 Iraq I (AD-665 182) (also No. 35)
33 Turkey I (AD-665 183) (also No. 34)
34 Turkey II (AD-665 184) (also No. 33)
35 Iraq II (AD-665 185) (also No. 32)

1958

36 Cuba (AD-665 186)
37 Cyprus (AD-665 187)
38 Indochina II (AD-665 188) (also No. 30)
39 Malta and Gibraltar (AD-664 695)
40 Greenland II (AD-665 189)
41 Germany I--1950-1957 (AD-665 190) (also No. 69)

1960

42 Arabian Peninsula (AD-664 696)
43 Caucasus (AD-664 697)
44 Australia (AD-664 746)
45 Greece (AD-660 880)
46 Norway (AD-665 191)
47 South Pacific Islands (AD-665 192)

1961

49 Jordan (AD-664 727)
50 Lebanon (AD-664 698)

1962

52 British Honduras (AD-660 869) (updates No. 48)
53 Luxembourg (AD-660 873)
54 China (Formosa) (AD-660 870)
56 Hong Kong (AD-660 871)
57 Israel (AD-660 872)
58 Azores (AD-660 877)
59 Iceland (AD-664 728)
60 Madeira (AD-660 876)
61 Cape Verde Islands (AD-660 799)
62 The Dominican Republic (AD-660 795)
63 Nicaragua (AD-660 817)
64 British Borneo (AD-660 818)
65 Portugul (AD-660 798)

1963

66 Albania (AD-660 816)
67 Andorra (AD-660 815)
68 Canary Islands (AD-660 825)
69 East Germany II (AD-660 824)
70 Indian Ocean Islands (AD-660 814) (updates No. 51)
71 Sinkiang (China) (AD-660 813)
72 Balearic Islands (AD-660 811)
73 Reunion Island (AD-660 812)
74 Bolivia (AD-660 800)
75 Panama and Canal Zone (AD-660 801) (updates No. 20)
76 Spain (AD-660 794)

1964

77 New Zealand (AD-660 796) (updates No. 18)
78 Hungary (AD-660 802)
79 French West Indies (AD-660 803)
80 Sudan (AD-660 804)
81 Denmark and Faeroe Islands (AD-660 805)

1965

82 Tibetan Highlands (AD-660 793)
83 Northeast China (AD-660 806)
84 North China (AD-660 822)
85 Korea (AD-660 823)
86 Macao (AD-660 821) (updates No. 55)
87 South China (AD-660 819)
88 North Vietnam (AD-664 699)
89 Mongolia (AD-664 702)

1966

90 Republic of Vietnam (AD-664 703)
91 Paraguay (AD-664 704)
92 Netherlands Antilles (AD-664 729)
93 Haiti (AD-664 705)

1967

94 Somali (AD-670 048)
95 Nepal (AD-670 049)

1968

96 Laos (AD-664 923)
97 Cambodia (AD-669 947)
98 Philippines (AD-669 879)
99 Czechoslovakia (AD-673 494)
100 Ethiopia (AD-675 135)
101 French Somaliland (AD-680 446)