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ENVIRONMENTAL

ETAC

TECHNICAL NOTE
69-1

A SELECTED CLIMATOLOGICAL BIBLIOGRAPHY FOR THAILAND

By

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Purpose

USAF ETAC Technical Notes are published by the USAF Environmental Technical Applications Center to disseminate aerospace sciences information to units of the Air Weather Service. Subject matter contained in these Technical Notes, while pertinent, is not deemed appropriate for publication as Air Weather Service Technical Reports which are confined to those studies, reports, techniques, etc., of a more permanent and specific nature. Technical Notes include such material as wind seminar listings, bibliographies, special data compilations, climatic studies, and certain USAF ETAC project reports which may be of special interest to units of the AWS organization. This series is published under the provision of AFR 6-1 and AWSR 80-2, as amended.

Distribution

Technical Notes will normally be given the same distribution as AWS Technical Reports which includes all AWS units through detachment level. Additional special distribution may be provided certain issues when the subject matter is believed to warrant wider dissemination within the scientific community.

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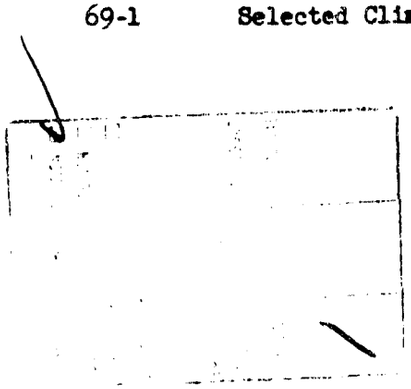

PREFACE

One of the primary functions of the Technical Information Section USAF Environmental Technical Applications Center (ETAC) is to locate climatological reference material requested by the various governmental agencies and those civilian organizations completing government contracts. The requests are generally initiated to aid in the solution of specific problems. However, many of these bibliographies represent a substantial listing of climatic sources which, having been assembled, could prove very beneficial to other researchers with similar interests in subject matter or area of coverage. It is with this in mind that USAF ETAC publishes certain reference listings such as this bibliography. It is believed that, by the publication and distribution of these consolidated reference lists, much of the time-consuming reference-searching of the climatologist can be eliminated.

INTRODUCTION

This bibliography was prepared as a by-product of the regular reference-searching that characterizes the normal workload of the Technical Information Section, USAF ETAC. All items are presented along with a brief abstract of their contents. Many abstracts were taken from the publications themselves and credit is given to the author. Others were written by individuals within USAF ETAC or the Foreign Branch, Environmental Data Service, ESSA. Identification of the personnel afforded credit for abstracts used in this bibliography is shown below.

Initials		Organization
AEG	Annie E. Grimes	FB, EDS, ESSA
ALS	Alvin L. Smith, Jr.	USAF, ETAC
EJS	Edgar J. Saltzman	FB, EDS, ESSA
MGA	Meteorological & Geoastrophysical Abstracts	
RAG	Richard A. Goldsmith, 1st Lt, USAF	USAF, ETAC
SJR	Simon J. Roman	FB, EDS, ESSA
VTR	Virgilio Torres-Rentas	FB, EDS, ESSA

This bibliography was compiled from sources of the various libraries in the Washington Metropolitan area, through cooperation with the Foreign Branch, Office of Data Information, Environmental Data Service, Environmental Science Services Administration, U.S. Department of Commerce. Some sources may be available in more than one of these libraries. In general, the bibliography search was limited to the 15-year period prior to 1968, however, several entries have been listed that date back to 1951.

References are listed alphabetically by author within the text and are numbered consecutively. An index by subject material is included which also indicates the type of information, tabular, descriptive, etc., in the references (see page vi)

All of the items listed are available at various libraries in the Washington, D.C. area and include the appropriate library-accession numbers and symbols. The abbreviations denoting the various libraries are identified under "Index to Source Symbols" (see page vii).

The author wishes to thank the personnel of the Editorial Section, Information & Publications Branch, USAF ETAC for their assistance in preparing this bibliography with special thanks to Mrs. Edna G. Robinson who typed the many abstracts required to complete this technical note. Mr. Vincent J. Creasi accomplished much of the reference searching for this project and his assistance is gratefully acknowledged.

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INDEX TO SOURCE SYMBOLS

DAS	Atmospheric Sciences Library, Silver Spring, Maryland
DLC	Library of Congress, Washington, D.C.
DNHO	U.S. Naval Oceanographic Office Library, Suitland, Maryland
FAS	Foreign Area Section, EDS, Silver Spring, Maryland
IPB	Information & Publications Branch, USAF ETAC
NODC	National Oceanographic Data Center Library, Washington, D.C.
NWRC	National Weather Records Center, Federal Bldg., Asheville, N.C.
EARI	Engineer Agency for Resources Inventories

Note: References showing an AD number can be purchased at the Clearinghouse for Federal Scientific & Technical Information, U.S. Dept. of Commerce, Springfield, Virginia 22151.

SELECTED CLIMATOLOGICAL BIBLIOGRAPHY FOR THAILAND

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1. Anstey, Robert L. Clothing Almanac for Southeast Asia. US Army Natick Labs., Earth Sciences Div., US Army Natick Labs., Natick, Mass. Jan 1966. ES-22. AD 633631. DAS M(055) U586tc.

...In this report monthly military clothing requirements are given for Southeast Asia, including the countries of Burma, Laos, Cambodia, Malaysia, Thailand, and Viet Nam. The almanac includes a summary of physical features of the region, high elevations, climate, biotic conditions and the relation of these features to the issue of special clothing items, see Tables II, III, IV, V, for climatic data. (Auth. Abst.)

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2. Atkinson, Guy D. Thunderstorms in Southeast Asia. Scientific Services, Det 1, 1st Wea Wg, APO San Francisco 96525, Technical Study 11, Mar 1967, 55 pp, 14 refs. AD 650257.

...This seven part study presents a comprehensive survey of thunderstorms in Southeast Asia (Republic of Vietnam, Cambodia, Thailand, Laos and North Vietnam). Part I introduces the subject. Part II discusses various Southeast Asian data sources used, the reliability of these sources and some difficulties involved in obtaining reliable thunderstorm data. Part III gives the monthly and annual frequencies of thunderstorm days for 83 stations in Southeast Asia, in both table and isoline map forms. Part IV discusses the year to year variations in the numbers of thunderstorms observed monthly and annually. Part V covers the duration and diurnal variation of thunderstorms. Part VI presents a thunderstorm persistency model developed from ten years of daily thunderstorm records for selected Thailand stations. Finally, Part VII shows how the local thunderstorm climatology can be approximated for a Southeast Asian location where no data are available. (Author)

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3. Atkinson, Gary D. A Preliminary Estimate of Extreme Wind Speeds in Thailand. Tech Study 3, Technical Services, Det 1, 1st Wea Wg, AWS (MAC), San Francisco, Oct 1966, 26 pp, 9 tables, 7 refs. AD 645089.

...A short discussion on extreme wind speeds is given, a description of the method used and a list of station locations with anemometer heights. Tables giving seasons of extreme winds by direction, peak gust speeds for 13 stations in Thailand and other useful nomograms, tables and figures, are included. (ALS)

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4. Ananthakrishnan, R. and Bhatia, K.L. Tracks of Monsoon Depressions and Their Recurvature Towards Kashmir. India Met. Dept. Symposium on monsoons of the world, Feb 1958. New Delhi, 1960. pp 157-172. DAS M53.21 S989sy.

...Contains 12 monthly charts of India (including Thailand) on a scale of [1:50 000 000] showing tracks of depressions and their recurvature. Winds and streamlines superimposed on the charts pertain to 12 km level. Data was extracted from Indian Met. Dept. "Annual Weather Reviews" for the period 1924-1952. (SJR)

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5. Barton, Thomas Frank. Thailand's Rainfall Distribution by Geographic Regions. Journal of Geography, 61(3):110-118. Chicago, 1962. DAS P Col.

...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 these six regions based on 20-year period from 1932-1952. Also, contains maps (scale [1:15 000 000]) of Thailand with mean annual rainfall, mean seasonal rainfall (May-Oct and Nov-Apr), mean rainfall during eight consecutive wettest months, and rainfall during four consecutive driest months by hatched areas. (ALS)

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6. Bunnag, C.V. and Buajitti, K. Upper Winds over Southeast Asia and Neighbouring Areas. 48 pp. Bangkok, Aug 1961. DAS M57.2 B942up. (oversize).

6. (cont)

...Presents maps (scale [1:30 000 000]) of southeast Asia (60°E-150°E, 10°S-45°N) with monthly mean streamlines at heights of 5,000 and 10,000 feet based on data for the period 1956-1958. (AEG)

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7. Bunnag, C.V. and Buajiiti, K. (both Dept. of Met.) A Summary of Upper Air Observation over Bangkok, Thailand. Nat'l Res. Council, Journal, 2(3):1-20 Sep 1961. 15 figs, tables, 2 refs. English and Thai summaries, p 1. DAS M57.2 B942a.

...This paper summarizes the variations of meteorological elements at various levels. The upper air observations during the period Jan 1957 to Aug 1966 have been utilized. The results revealed significantly strong easterly winds above 200 mb level from Jun to Sep. 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 Dec. (MGA)

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8. Broughton, Jerald D. et al. Mobility Environmental Research Study; a Quantitative Method for Describing Terrain for Ground Mobility; Vegetation. US Army Engineer Waterways Experiment Station, Vicksburg, Miss. Advanced Res. Projects Agency; Service Agency: US Army Materiel Command, Wash DC. Tech Rpt No. 3-726, Mar 1968. 151 pp, 7 refs. AD 830184.

...Vegetation characteristics were measured according to established sampling procedures at 295 sites within 6 areas of Thailand. From these samples, stem diameter and spacing data were extracted for analysis, since these are the factors that significantly affect performance of ground-contact vehicles. A dual classification system was devised for mapping these factors in which spacing values of 0-1.5 m, > 1.5-3.0 m, > 3.0-9.0 m, and > 9.0 m were determined for stem diameters of 5 cm or less, 13 cm or less, 23 cm or less, and 130 cm or less, and stem diameters of 3 cm or more, 8 cm or more, 15 cm or more, and 25 cm or more. Map units were identified and delimited aerial photographs by established photo-interpretation keys and techniques. Twenty-five 1:50 000 scale map sheets were prepared for the 6 study areas, on which 72 distinct mapping classes were identified. The vegetation field data for the 6 study areas are summarized in Appendix A. (Author

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9. Chambers, Jack V. An Environmental Comparison of SW Asia and the Island of Hawaii. Research Study Report RER-38, Hqs Quartermaster Research & Engineering Command, US Army, Natick, Mass. Jan 1961. DAS M86 U585r RER-38.

...This study is a summation of the overall environmental characteristics of the Island of Hawaii and SE Asia with special attention directed to precipitation, seasonality of climate, terrain and soils. Topography, precipitation station locator and soil type maps are included. Summarized tabular data for Bangkok is provided monthly and annually. Tables include temperatures, precipitation, relative humidity, cloudiness, windspeed, and wind direction. (ALS)

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10. Christensen, Knud et al. Rubber Plantations of Thailand: Environmental Characteristics of Military Interest. OSD/ARPA R & D Field Unit - Thailand, Military Res. & Dev. Center. 66-001. Jan 1966. AD 479336.

...In an effort to describe the environment of rubber plantations, 4 sample plots were inventoried in the vicinity of Chantaburi, one of the 2 rubber-producing areas in Thailand. 2 plots were in well-kept plantations and 2 were in poorly-kept plantations. Penetrability, trafficability, and horizontal visibility were found to be very good in the well-kept and generally very poor in the poorly-maintained plantations, as might be expected. Measurements to determine vegetative obscuration of air-to-ground visibility show that the average area of ground cover by the canopy is 94.1% and that the best angle of observation is 12.5 degrees from the zenith. It is difficult to generalize about soils in rubber plantations because rubber trees will grow on most soils if the rainfall is sufficient and the temperature is right. (Author)

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11. Cobb, L. Glenn. The Annual and Daily Distribution of Rainfall in Southeast Asia, Research on Tropical Rainfall Patterns and Associated Mesoscale Systems, Report No. 4 by Henry, W.K. et al, Texas A&M Univ., College Station Texas. Dec 1968. pp 53-75. DAS M(055) U5812ec ECOM-02313-SF.

...The purpose of this study is to consider the rainfall distribution at some stations in Southeast Asia. Fig. 21 is a map of Southeast Asia including Thailand. The station in Thailand used in this study is Buriram. Fig. 23b is a monthly rainfall graph

11. (cont)

showing the percentage of rain days needed to accumulate 50% of the rainfall. Fig. 25 is a rainfall mass distribution curve. Other statistics included for Buriram are: daily rainfall amounts greater than 60 mm, percentage frequency of rain days with 5 mm or less, and excessive rainfall during four days in Nov 1963. (ALS)

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12. Critchfield, Howard J. General Climatology. 465 pp. Englewood Cliffs, 1960. DAS MB C934ge.

...Contains Bangkok tabular summaries of monthly and annual mean temperature (°F) and mean precipitation (inches). Period of record is not specified. (VTR)

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13. Cronin, Jack. A Brief Summary of Enroute 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 on the Hong Kong-Bangkok-Hong Kong and Manila-Singapore-Manila routes. Presents monthly summaries of wind for both routes. The source also contains a listing of adverse weather conditions for all four terminals. (VTR)

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14. Curtis, Charles E. Terrain Analysis and Related Studies within Tropic Environments: Southeast Asian Region Surinam, and the Mali Republic. Aero Service Corp., 4219 Van Kirk St., Phil. Pa., 19135, AF Cambridge Res. Labs., Office of Aerospace Res., USAF, Bedford, Mass., Project No. 7628, Task No. 762801. Contract No. AF 19(628)-4166. Final Report. Jun 30, 1966. AD 812514. See also AD Nos. 812520L and 380464L.

...Terrain investigation of the Southeast Asian Region encompassing the countries of Burma, Thailand, Laos, Cambodia and the Vietnams shows a diversity of terrain and climate. Some general information is offered on the climate including variation of rainfall. The basic landforms of the area are described and areas in the United States analogous to those areas have been located and described. Engineering properties of the soils are also discussed. (ALS)

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15. Dent, F.J. and Cheutongdee, Mana. Soil Series Survey of Selected Study Areas in Thailand Appendix B: Soil Survey of the Lop Buri Area. Land Development Dept. Bangkok (Thailand) Soil Survey Div. Rept. for Mar-Jul 65. Aug 66, 146 p. AEWES CR-3-156-App-B. AD 489699.

...The soil survey of the Lop Buri study area was conducted during the period Mar 1965 to Jul 1965, and covered an area of approximately 3,802 sq km (1,468 sq mi). Reconnaissance was made along all accessible roads and trails. Soils were studied at road cuts and at exposures along drainage channels. In areas of good accessibility, borings and profile pits were made in order to study the soil in greater detail. An average of about 12 observations per square kilometer was recorded. Detailed field data were mapped on air photos at scales of 1:15 000 and 1:40 000, then transferred from the air photos to Series L708, Army Map Service topographic maps at a scale of 1:50 000. (Author)

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16. Dent, F.J. and Omakupt, Manu. Soil Series Survey of Selected Study Areas in Thailand. Appendix C: Soil Survey of Chiang Mai Area. Land Development Dept. Bangkok (Thailand) Soil Survey Div. Rept. for Oct 65-Jan 66, Aug 66, 128 p. AEWES CR-3-156-App-C. AD 489700.

...The soil survey of the Chiang Mai study area was conducted during the period Oct 1965 to Jan 1966, and covered an area of approximately 3,706 sq km (1,431 sq mi). Reconnaissance was made along all accessible roads and tracks. Soils were studied at road cuts and at exposures along drainage channels. In areas of good accessibility, borings and profile pits were made in order to study the soil in greater detail. Approximately 15 observations per square kilometer were recorded. Detailed field data were mapped on air photos at varying scales from 1:25 000 to 1:55 000, then transferred from the air photos to series L708, Army Map Service topographic maps at a scale of 1:50 000. (Author)

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17. Dhararaks, K.V. A Note on the Climatic Condition of Thailand. (Dept. of Meteorology, Royal Thai, Navy Bangkok). Pacific Science Congress, 9th, Bangkok, Nov 18-Dec 9, 1957, Proceedings, Vol. 13, Meteorology, Issued 1959. p 79-80. DAS M(06) P117p.

...The climate of Thailand is more or less determined by its topography. It is also influenced by the trade winds coming from the Pacific Ocean, and by the Asian monsoon. The

17. (cont)

development of two pressure patterns is analyzed. Rainfall starts with the onset of the Southwest Monsoon but varies with location. The central part of the country receives less but more variable amounts of rain due to the sheltering effects of the western mountain ranges. On the east coast of south Thailand rainfall reaches its maximum during the cold season. (EZS)

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18. Dobby, E.H.G. Monsoon Asia. Chicago, Quadrangle Books, Inc. 1961, 380 pp, 13 tables, 41 refs. DAS 915 D632mo.

...Gives textual notes on the climate of Thailand. Presents tabular monthly mean rainfall in inches for Cheng Mai and Bangkok. Period of record is not indicated. (VTR)

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19. Dornbusch, William K., Jr. Mobility Environmental Research Study; A Quantitative Method for Describing Terrain for Ground Mobility: Surface Geometry. US Army Engineer Waterways Experiment Sta., Vicksburg, Miss. Advanced Res. Projects Agency; Service Agency: US Army Materiel Command, Wash DC. Tech Rpt. No. 3-726, Sep 1967. 214 pp, 5 refs. AD 820788.

...This volume presents the methods used to collect, tabulate, and analyze basic data on the surface geometry of selected areas in Thailand. The descriptions of surface geometry features are so designed that the descriptive values can be used directly as input to an analytical model for predicting the cross-country speed of selected military vehicles. A method for classifying, interpreting, and mapping surface geometry factors from aerial photographs (air photos) was developed. Utilizing the field data collected and the air-photo interpretation methods developed, 25 surface geometry factor-family maps were prepared, together covering six selected study areas (Nakhon Sawan, Lop Buri, Chiang Mai, Pran Buri, Khon Kaen, and Chanthaburi). These maps are presented in Vol. VIII of this report. Air-photo interpretation methods for predicting and mapping surface geometry factors were largely successful. However, the degree of accuracy achieved for each of these factors varied considerably, being a function of the scale, quality, and vintage of the existing photography. It is recommended that studies be continued to develop air-photo interpretation techniques to improve the reliability of estimation of surface geometry factor values. (Author)

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20. Elahi, M.K. Agriculture in South East Asia. Pakistan Geographical Review (2)76-92. Lahore, 1959. DLC DS376 P29.

...Describes the climatic conditions of S.E. Asia lying between the latitudes of 28°N and 11°S. This area includes Burma North and South Vietnam, Cambodia, Laos, Philippines, Thailand, New Guinea, Indonesia, Timor, Brunei, Malaya, Northern Borneo, Sarawak and Singapore. (Author Abst.)

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21. Engineering Consultants Incorporated International S.A. "Feasibility Report," Me Tang Project, Thailand, prepared for Royal Irrigation Dept., Kingdom of Thailand, Engineering Consultants, Inc., Denver, Colo. Oct 27, 1961. EARI Ref. Br. 32939/TH.

...Chapter III on Hydrology, gives a general discussion on the drainage basin of the Me Tang River. In addition, precipitation data for several gaging stations in the area as well as monthly precipitation for selected stations (Table III-1); and monthly temperature, humidity, and evaporation data for Chieng Mai are given, (Table III-2). P.O.R. varies, 1914-1958. (ALS)

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22. Garrett, Edward E. Comparison of Ground Mobility Characteristics of Land-Marine Interfaces of Florida and Thailand. US Army Engineer Waterways Experiment Sta., Vicksburg, Miss. Advanced Res. Projects Agency & US Army Materiel Command. Misc. Paper No. 4-829, Aug 1966. 79 pp, 7 refs. AD 800075.

...A semiquantitative system for describing the pertinent characteristics of land-marine interfaces with regard to ground mobility is developed and presented herein. The description involves the subjective identification of characteristic zones of the interface, and the measurement or designation of significant properties of those zones. The range of values or designation exhibited by each property is divided into suitable classes, and each class is assigned a code number. A total of 27 coastal sites in northwest and west central Florida and the Florida Keys and 14 coastal sites in Thailand are evaluated according to the newly-developed system. A comparison of the Florida and Thailand coastal sites based on relative frequencies of occurrence of the range of values of each property is presented, and areas that may be expected to show some degree of similarity

22. (cont)

identified. General conclusions are: a) land-marine interfaces on the Gulf of Siam have characteristics that are closely approximated on the northwest and west central coasts of Florida, b) the land-marine interfaces on these shores exhibit a close analogy when compared with regard to structural zones, and c) land-marine interfaces of the two areas not within a gulf environment (i.e. those not protected from oceanic wave attack) exhibit divergent characteristics. (Author)

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23. Great Britain. Hydrographic Office. China Sea Pilot. Vol. I. Comprising the Western Shore of the China Sea from Tanjong Penawar, on the Eastern Side of Johore, to Fokai Point, Bias Bay; The Anambas Filanden and Hainan Island; also the Islands and Banks bordering the Main Route from Singapore Strait to Hong Kong. Second Edition. London, 1951. DAS M82/512.3 G786c.

...Discusses the climate and weather of this area which includes pressure, winds, cloud, rainfall, fog and visibility, temperature and humidity, and typhoons. Contains (for Bangkok) tabular monthly and annual summaries based on 5-44 years (1845-1950) of: mean pressure (mb), mean daily max and min temperatures (°F), extreme temperatures, mean relative humidity (%) at 0700 and 1300 LST, mean number of days clear (< 2/10) and cloudy (> 8/10), mean rainfall, mean number of days ≥ 0.04 inch of rain, wind direction frequency in percent (8 points and calm) at 0700 and 1300 LST, mean wind force (Beaufort Scale) at 0700 and 1300 LST, number of days wind force ≥ 8, and number of days with visibility < ½ mile. (VTR)

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24. Great Britain. Meteorological Office. Tables of Temperature, Relative Humidity and Precipitation for the World. Part V, Asia. 129 pp. London 1960. DAS M82.2 G786ta.

...Contains the following monthly and annual data, summarized over the period for Bandon (7-13 years), Bangkok (12-44 years), Chieng Mai (8-13 years), Nakarn Rajasima (5-20 years) and Phuket (5-33 years): mean daily maximum and minimum, mean of the highest and lowest, and absolute maximum and minimum temperatures (°F); mean relative humidity at 0630 and 1200 LST; mean amount of precipitation (inches); maximum amount of precipitation in 24 hours; and mean number of days with precipitation 0.04 inch or more. (VTR)

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25. Great Britain. Meteorological Office. Temperature, Rainfall and Humidity Tables: Asia. London, 1954? DAS M82.2 G786t Asia.

...The tables are arranged in alphabetical order of station names. Three stations in Siam (Thailand) - Bandon, Bangkok and Chiengrai, list average and extreme temperatures, rainfall, and humidity. (SJR)

---

26. Harza Engineering Company. Hydrologic Data, Mekong River Basin in Thailand. 1960-...(1961). (In English and French. 1962. DAS M79/593 H343hy.

...A report on hydrologic data for the Lower Mekong River basin in Thailand. Contains explanatory notes concerning observations, instruments, station description; tabular water temperature (°C) for specific dates per month (7 stations), hourly (6-10) and daily (5 stations) precipitation in millimeters, daily evaporation in millimeters (8 stations), and daily wind movement in kilometers for 8 stations. Period of record varies by station and element.

CLIMATIC MAPS. Contains a map (scale [1:5 200 000] determined from graticules) of Thailand showing the location of hydrologic stations. (VTR)

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27. Huke, Robert E. Thailand. Focus, XII (6):1-6. New York, Feb 1962. DAS P Col.

...Contains a brief discussion of the rainfall of Thailand. (VTR)

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28. Ing, G.K.T. Pressure Data for Stations in Thailand and S. Vietnam. 1WW, Scientific Services, Tech Study 15, Feb 1968. 5 + pp, 4 tables, appx. AD 667550.

...This study illustrates the computations of forecast altimeter settings and various pressure-altitude values for stations in SE Asia using mean diurnal pressure curves. Appendix I contains diurnal pressure curves for 7 stations in Thailand and 12 stations in S. Vietnam. Appendix II presents the data from Appendix I rearranged to list pressure values by month. (Author)

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29. Kambhu, M.L., Xujati et al. (Royal Irrigation Dept). Brief Description of Hydrologic Features of River Basins in Thailand. Thailand. Nat. Res. Council, Bangkok, Journal 2(1):39-48, Feb 1961. 8 figs (4 fold), 4 tables (1 fold). Eng. and Thai summaries p 39-40. DAS P Col.

...Thailand is located in the monsoon region having annual rainfall brought by monsoons of the order of 1200 mm into the mainland, but in the peninsular area, rainfall becomes approximately twice that in the mainland for being under both north and south monsoons. This results in a tremendous amount of runoff flowing through rivers. This brief description contains hydrologic features in various aspects including topography, climate, and variation of river water as well as ways and means to set up a control system of the rivers. (ALS)

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30. Kambhu, M.L. Characteristics of Floods and Prevention of Damages in Thailand. U.N. Economic Commission for Asia and the Far East. Flood Control Series, No. 3. Bangkok, 1952. DAS M79.7 U58f.

...An analysis of rainfall data during the rainy season is presented (pp 240-243). A small table compares the average rain for the year with the average rain in the rainy season for six regions in Thailand. (SJR)

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31. Kanchanalak, Boonchob. Some Aspects of Hydrological Features of the Me Ping River Basin and the Yanhee Reservoir. 5 pp. Bangkok, 1961. DAS M79/593 K16so.

...Presents the results of the research investigation on the hydrological aspects conducted on the Me Ping River basin for the Yanhee Project. The purpose of this report is to present some aspects of hydrological features of the river basin. Discusses briefly floods and evaporation observed at the damsite. Some charts are presented. (VTR)

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32. Kendrew, W.G. The Climates of the Continents. Fifth Edition. 608 pp. London, 1961. DAS M8 K33c.

32. (cont)

...Discusses in Chapter XXI the climate of Indonesia-Borneo-New Guinea-Southeast Asia as an area. Items discussed are air masses and winds, temperature, rainfall, and typhoons. Presents Bangkok tabular summaries (over the period) of monthly and annual mean rainfall; mean and mean daily extremes and daily range of temperatures for the warmest and coolest month; annual range of temperature; and annual absolute extreme temperatures. Period of record varies by element.

CLIMATIC MAPS. Includes a map (scale [1:70 000 000] determined from graticules) of area from the Equator-50°N latitude and 95°-150°E longitude with generalized tracks of typhoons. (VTR)

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33. Kennedy, J.G. et al. Moisture-strength characteristics of selected soils in Thailand Vol I - Analyses and Application of Data - Vol II - Basic data. US Army Engineer Waterways Experiment Sta., Vicksburg, Miss. Tech Rpt No. 3-791. AD 820220. Aug 1967. Both Vols in IPB Files.

...Soil moisture, soil strength, and other relevant data were collected in Thailand during 2 wet seasons and 1 dry season for use in the development of methods to predict soil trafficability for off-road ground-contact vehicles in SE Asia. Data were collected at 75 test sites distributed in 8 geographic areas which had differences in soils, weather regimes, terrain, and land use.

From data collected monthly at the 75 sites, specific soil strength-moisture relations were derived to depict the changes in strength that corresponded to changes in moisture content. From data collected daily at 17 sites, specific soil-moisture prediction relations were derived following procedures developed for sites in the US. Results showed that the prediction methods were applicable to Thailand sites that were well drained. Modifications in the methods should be developed to account for the influence of water tables when present. Similarities in specific prediction relations between Thailand and the western hemisphere indicated that the development of average prediction relations is feasible.

Descriptions of Thailand and study areas are given in Appendix A. An application of the Thailand data, the derivation of a general soil-moisture map for South Vietnam, is given in Appendix B. The basic data are summarized in Vol. II, AD 820221. (Author)

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34. Koeppe, Clarence and DeLong, George C. Weather and Climate. 341 pp. New York-Toronto-London, 1958. DAS M K78wea.

...Includes monthly and annual mean temperatures (°F) and mean precipitation amounts (inches) summarized over an unspecified period for Bangkok. (VTR)

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35. Linke, Franz. Meteorologisches Taschenbuch. [Meteorological Handbook]. 2nd edition. 806 pp. (In German). Leipzig, 1962. DAS M B351m.

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

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36. Maruyama, Eizo. Rice Cultivation and Water Balance in Thailand. Geophysical Magazine, Tokyo, 33(4) 337-354 Dec 1967. Figs, tables, refs, English summary, p 337. DAS P Col.

...The relation between agrometeorological damage and water balance in Thailand is presented. The most important weather factor in rice cultivation in Thailand is rainfall, but factors such as runoff, water storage on the soil, and evapotranspiration have their influence on the occurrence of flood damage to rice crops. Consumptive use of water in rice growing (amount of water required for rice cultivation) is estimated by computing water balance; the value for the central, northern and northeastern regions is 1100 mm and for the southern region, 1400 mm. (Author)

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37. Meyer, Marvin P. Comparison of Engineering Properties of Selected Temperate and Tropical Surface Soils. US Army Engineer Waterways Experiment Sta., Vicksburg, Miss. Advanced Res. Projects Agency & US Army Materiel Command, Wash DC. Tech Rpt No. 3-732, Jun 1966. 238 pp, 26 refs. AD 486478.

...Field and laboratory tests were conducted on 11 fine-grained soils from the temperate climate of the US and 16 fine-grained soils from the tropical climates of Puerto Rico, Panama Canal Zone, Hawaii, and Thailand to determine the trafficability and other engineering properties of the soils. Soils were collected from the 6- to 12-in. layer for a wide range of parent materials.

37. (cont)

Temperate and tropical soils of each parent material were selected on the basis of their similarity in the Unified Soil Classification System and in topographic position. A comparison of physical, mineralogical, and chemical properties, and results of standard and special engineering tests indicate, with few exceptions, no significant differences between temperate and tropical soils from a similar parent material. It is concluded that temperate and tropical soils of similar parent material and Atterberg limits generally have other engineering properties that are similar and behave similarly when subjected to standard and special engineering laboratory tests. Differences in behavior between soils from each of the climates can be associated with differences in Atterberg limits. (Author)

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38. Meyer, Marvin P. Trafficability Classification of Thailand Soils. US Army Engineer Waterways Experiment Sta., Vicksburg, Miss. US Army Materiel Command. Tech Rpt No. 3-753, Jan 1967. 137 pp, 15 refs. AD 808540.

...Pertinent soil trafficability data were collected during the wet season at 846 sites in Thailand. The soils were identified according to the Unified Soil Classification System and the US Dept of Agriculture textual classification system. Two general topographic positions (high topography and low topography) and two general levels of wetness were considered. A scheme for classifying soils according to their trafficability was developed. The scheme lists the soil types in order of decreasing trafficability under each of three topography wetness-level categories and gives the probability of successful passage on each soil for vehicles of known soil-strength requirements. The scheme permits the estimation of the probability of a successful operation for given soil type, topography, and wetness-level conditions. If a choice of several routes and vehicles is available, the determination of the vehicles with the best chances of success over a given route or of the best route for given vehicles can be made. (Author)

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39. Michigan, Univ. of. Analysis of Geographic and Climatic Factors in Coastal SE Asia, Dept of Geography, Ann Arbor, Mich. Mar 1962, Report No. 04231-1-F, 178 pp, 31 illus. and 30 tables. DAS M(051) M624ana.

39. (cont)

...Included in this study are climatic controls, and climatic elements of temperature, precipitation, droughts, rainy days, dry days, various categories of precipitation, relative humidity, cool days, etc., by month for stations in Thailand. There are also chapters on soils and trafficability and maps of typhoon tracks, temperature graphs, precipitation, and prevailing winds. (ALS)

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40. Miller, Arthur A. Climatology Ninth Edition. 320 pp. London, 1961. DAS M8 M647c 1961.

...On pages 156-157 is a brief textual description of the climate of Siam [Thailand]. (VTR)

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41. Moncharoen, Lek et al. Soil Series Survey of Selected Study Areas in Thailand Appendix D: Soil Survey of the Pran Buri Area. Land Development Dept Bangkok (Thailand) Soil Survey Div. Rept. for Jul-Sep 64, Aug-Sep 65. Aug 66, 27 p. AEWESCR-3-156-App-D. AD 489701.

...The soil survey conducted in the Pran Buri study area covered an area of approximately 570 sq km (220 sq mi). Reconnaissance was made along all accessible roads and tracks. Soils were studied at road cuts and at exposures along drainage channels. In areas of good accessibility, borings and profile pits were made in order to study the soil in greater detail. Between 15 and 20 observations per square kilometer were recorded. Detailed field data were mapped on air photos at a scale of 1:20 000, then transferred from the air photos to Series L708 Army Map Service topographic maps at a scale of 1:50 000. (Author Abst.)

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42. Ohman, Howard L. Climatic Atlas of Southeast Asia, Tech Rpt ES-19, ESD, U.S. Army Materiel Command, U.S. Army Natick Labs., Natick, Mass., 94 pp, 87 maps, Dec 1965. AD 632878.

...Maps (87) present the distribution in SE Asia (Thailand, Vietnam, Laos, Cambodia, Burma S. of 25°N. latitude, and the peninsular portion of Malaysia) of various climatic statistics of temperature, rainfall, and the temperature-humidity index. Maps for each month of the year have been prepared for: mean

42. (cont)

monthly temperature, mean daily maximum temperature, mean daily minimum temperature, absolute maximum temperature, mean monthly rainfall, mean number of rainy days per month, and mean daily temperature-humidity index for the warmest hour of the day. Single maps of mean annual rainfall, the physiography of the region, and of the names and location of climatic stations are also included. The maps are drawn in considerable detail having been based not only on the available climatic data, but also on the distribution of mountain ranges, major water bodies, and other geographic features. A brief text discusses the preparation of the maps and describes a few of the important distributional aspects of climate shown by the maps. (Author)

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43. Orgill, M.M. Availability of Meteorological Data in Southeast Asia, Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S.D.A., Berkeley, Calif., 1968. 50 pp, 7 refs, 9 figs. AD 834460.

...This survey indicates what type of meteorological data is available within the respective countries of Southeast Asia; Thailand is covered pages 14-24. In addition to type of equipment and station location, the period of record and date stations began taking observations is included. (ALS)

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44. Pacific Science Congress. Proceedings of the Ninth Pacific Science Congress...1957, Vol. 13, Meteorology. 318 pp. Bangkok, 1959. DAS M(06) P117p 1957 V.13.

...On pages 79-80 are textual notes on the climate of Thailand. (VTR)

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45. Pendleton, Robert L. Thailand: Aspects of Landscape and Life. 321 pp. New York, 1962. DAS 915.93 P398t.

...Discusses, in Chapter IV, the climate of Thailand as a whole, and by regions. Items discussed are the monsoon and its seasons, rainfall, temperature, and climatic regions. Presents, for Bangkok, monthly climographs of mean and extreme rainfall; maximum rainfall in 24 hours; mean number of rainy days; mean, mean extreme, and absolute extreme temperatures; mean number of days

45. (cont)

with maximum temperature > 90°F, and mean number of days with minimum temperature < 70°F. No period of record is given for these climographs. The source also contains a list of the major meteorological stations in Thailand.

Contains maps, scale is not indicated (about 1:26 000 000), of Thailand with mean rainfall and mean temperature for Jan, Apr, Jul and Oct by hatched areas. No period of record is specified. (VTR)

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46. Philbrick, A.K. Mean Temperature and Precipitation for Selected Southeast Asian Stations. 1 graph. [1954]. DLC Map Division.

...A graph showing the monthly mean temperature (°F) and mean total amount of precipitation (inches) for selected southeast Asian stations is included. 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. (AEG)

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47. Philco-Ford. Changwat Handbook. Vol. 1, "Physical Environment," Prep. for Advanced Res. Pro. Agency, Off. Sec. of Defense, Philco-Ford Project R-1040, Contract No. DA HC04-67-C-0002, Joint Thai-U.S. Military Res. & Develop. Center, Bangkok, 1967, 800 p, tables. AD 828338.

...Contains general summary of physical environment information. This includes information on temperature, rainfall, winds, visibility, and relative humidity. Further physical description of soils, surface water, and ground water conditions are given. (ALS)

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48. Ramakrishnan, K.P. et al. Upper Air Climatology of India and Neighbourhood in the Monsoon Seasons, India Met. Dept. Symposium on Monsoons of the World, Feb 1958; New Delhi, 1960. DAS M53.21 S989sy.

...The paper presents 48 maps showing: the normal distribution of temperatures at the standard isobaric surfaces of 850, 700, 500, 300, 200 and 100 mb and winds at the standard heights of 1.5, 3, 6, 9, 12, and 16 km for the months of May, Jun, and Jul, representing the southwest monsoon season; and Nov, representing

48. (cont)

the northeast monsoon season, based on pilot balloon and radar/ rawin ascents made in India. Available upper air data (up to the end of 1956) of neighboring countries, including Thailand, have been utilized in drawing the isotherms, streamlines, and isotachs. All maps are on a scale of [1:60 000 000]. (SJR)

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49. Ramsey, B. Upper Winds in the Southeast Asia-West Australia Region. Meteorological Magazine 84(1):pp 372-377. 1955. DAS M(05) G786m.

...Contains a survey of upper winds centered along the meridian of 110°E for Apr, Jul, and Oct 1953 and Jan 1954. The author describes the data used and presents cross-sections for each month; also compares these cross-sections with other meridional cross-sections. This study is based on data from a number of stations in the area. These stations include Chiengmai, Bangkok, and Songkla in Thailand. (AEG)

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50. Rojanasoonthon, Santhad. Great Soil Group Survey of Selected Study Areas in Thailand, Vol. 1, Summary Report. Kasetsart Univ. Bangkok (Thailand) Jun 66, 63 p. Contract ARPA Order-400. AEWESCR-3-150-Vol 1. AD 488314. (See also Vol 2, AD 488315).

...This report presents a summary of the methods and techniques used in the survey and describes: 1) the physiographic regions of Thailand and their occurrence within the study areas. 2) the great soil groups identified in this survey: 3) the map units and the occurrence of these map units in the physiographic regions of Thailand; and 4) the general soil conditions of Southeast Asia. Interim reports for each of the 7 study areas were prepared and are included in Appendix A through G in Vol 2 (AD 488315). Each report includes a general description of the environmental conditions of the study area as related to the individual soils mapped. The maps presented in the Appendix are to be considered as reconnaissance soil maps because of the small map scale used and the minimum amount of work performed in the field, particularly in areas without reasonable access routes. (Author)

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51. Sakornratana, Kachit. Observational Studies on Southwest Monsoon Weather over Thailand. Presented at the 2nd U.S.-Asian Weather Symposium, John Hay AB, Philippines, 13-17 Feb 61. 3 p text, 13 figs. IPB Files.

...This discussion is confined to the various surface pressure systems that are associated with the weather patterns during the southwest monsoon period. It is a good article for weather forecasting during the SW monsoon period. One of the charts gives the mean monthly position of ITF over SE Asia; others show streamlines of prevailing wind flow (surface and upper air), typical tracks of tropical cyclones, and areas of cloudiness. (ALS)

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52. Sangthongloun, Yongyuth. Topographic Parameters in Evaluating Runoff. SEATO Graduate School of Engineering, Thesis No. 135. Bangkok, Thailand. 1966. EARI Ref 33476/TH. IPB Files.

...General discussion on monsoon, intertropical front, cyclonic disturbances, and rainfall. Average rainfall over Thailand (Table 3.1 p 31), and monthly rainfall for Pranburi, Kang Kra Chan, and Hua Hin given in Appendix VI. (ALS)

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53. Schutz, C. Monsoonal Influences on Wind, Rain, and Cloud throughout SE Asia: A Study Covering the Peninsula and the Archipelago, Rand Corp., Santa Monica, Calif. Memorandum RM 5418 PR, Oct 1967. 152 pp, 25 figs, tables. AD 661373. IPB Files (oversize).

...A general discussion of air masses, ICZ and monsoon circulation, tropical cyclones, convergence lines and zones, the southwest monsoon and southeast trades, etc., for Timor, Ceram and Celebes, Java and Sumatra, Mala[illegible]eo, Burma, Thailand, Vietnam, Cambodia and Laos. This discus[illegible] is followed by maps (wind roses, streamlines, etc.) and tables of winds, precipitation, and cloud cover for numerous stations, by season. (Author)

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54. Srinkapaibulaya, Sa-ard. Study of Rain Gauge Networks over the Central Plain of Thailand. U.N. Economic Comm. for Asia and Far East. Flood Control Series, No. 15:102-105. 1960. 3 figs, 6 tables. DAS (M79 U58hy).

54. (cont)

The precipitation data, collected by 29 automatic rain gage stations and 480 nonautomatic stations, are studied with tabulated data and correlation curves. The study is made in order to establish the relationships between the rain-gage density and the corresponding error in computing the average depth rainfall for a given drainage basin. The method and procedure of analysis and evaluation of the tabulated results are described in detail and final relationships between errors and precipitation in the investigated area are summarized in the conclusion for different areas, per recording gage (from 200-1000 km^2 per gage). (Author)

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55. Sternstein, L. Rainfall of Thailand. Indiana Univ. Foundation Res. Div., Bloomington, Ind. Final Report, 15 Aug 62, 149 pp, illus., tables, maps. DAS M57.2 S839ra.

...This report is a major contribution on the rainfall of the area. The monograph is based on the 48 synoptic stations of the Meteorological Dept. Mean monthly and annual rainfall maps and tables are shown based on 1951-60. The average number of days with a trace of rain or none, 0.1 to 10 mm, 10.1 to 35 mm, 35.1 to 90 mm, and over 90 mm are given in a table for each month. The number of occurrences of rain for each month-hour for each year (1937-59) is given in figures for Bangkok. Graphs of mean hourly rainfall are also given. Intensity, variability, dry spells, and spacing of rains are discussed. The country is divided into climatic regions based primarily on the rainfall amounts and seasons. (ALS)

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56. Sturgill, Lester G., and Staff. Tropical Propagation Research (U), Jansky and Bailey Engineering Dept., Shirley Hwy., at Edsall Road, Alex., Va. 22314, Advanced Res. Projects Agency, Wash., DC, 31 Jun 1966. AD 660318. IPB Files.

...This final report, Vol. I, presents the results obtained from the first phase of an extensive experimental and theoretical research program on radio-wave propagation in the environment of a tropical, thickly-vegetated jungle. Although aimed primarily at the problems encountered by ground based, tactical radio communications systems, the measured data and the results derived therefrom are general enough to have applications in the field of electromagnetic surveillance

56. (cont)

and intrusion detection. The experimental work during this first phase has been carried out in Thailand in a geographical area classified as a wet-dry, or monsoon, tropical region. (Author)

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57. Tannehill, Ivan R. Weather Around The World. 2nd ed. Princeton Univ. Press, 1952. 212 pp, 59 figs, 5 tables. DAS M T166 we.

...Discusses briefly the climate of Thailand. Presents for Bangkok monthly tabular summaries (over the period) of mean daily maximum and minimum temperatures (°F), mean relative humidity (%), mean number of rainy days, mean cloudiness (%), highest, and lowest temperatures of record. Period of record is not indicated. (Author)

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58. Thailand. Average Annual Rainfall for the Period 1903-1937. Map No. 20054-B N.P.D. DLC Map Division.

...One map of Thailand shows the average annual rainfall for the period 1903-1937 on a scale of 1:5 000 000. Isohyets range from under 500 mm to over 4,000 mm. (SJR)

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59. Thailand. Average Rainfall During the Irrigation Season from Jun-Nov. Map No. 20054-A. N.P.D. Rec'd at DLC Map Div. Mar 1959.

...One map shows the average rainfall in Thailand during the irrigation season from Jun-Nov. The period of record is 1903-1937 with a map scale of 1:5 000 000. Isohyets range from less than 500 mm to over 4000 mm. (SJR)

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60. Thailand. Irrigation Dept. Memorandum on the Studies of the Flood during Sep-Oct 1959 of the Me Ping River at the Bhumiphol Damsite. Bangkok 1959. DAS M79/593 T364me.

...Discusses the flood of the Me Ping River at the Bhumiphol Damsite during the period, Sep 22-Oct 1959. Includes charts, graphs, and tabular data concerning this flood. (VTR)

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61. Thailand. Meteorological Dept. Annual Meteorological Data for the Year 1946-1950. (In Thai and English). Bangkok, 1952. DAS M06.1/593 T364an.

...Contains for 22-33 stations monthly and annual tabular summaries for each year (1946-1950) of: mean and extreme pressures (mb); mean, mean maximum and mean minimum temperatures (°C); extreme temperatures with dates of occurrence; mean relative humidity (%) at 0700, 1300 and 1900; mean cloud amount (0-10) at 0700, 1000, 1300 and 1600; total amount of rainfall; maximum precipitation in 24 hours with date; total number of rainy days; total number of days with thunderstorms, lightning, thunder, fog, haze, dew, hail and squalls; frequency of wind direction (number of obs); mean wind force (0-12) Beaufort Scale; maximum wind force with direction and date of occurrence; mean evaporation per day (mm). (ALS)

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62. Thailand. Meteorological Dept. An Investigation of Typhoons and Tropical Depressions. Bangkok, Royal Thai, Navy, 1959. (In English and Thai). DAS M15.23T364 (oversize).

...Gives monthly and yearly, typhoon tracks from 1947 through 1956. Chiefly charts and tables. (ALS)

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63. Thailand. Meteorological Dept. Average Semi-monthly Rainfall for Selected Stations in Thailand. Bangkok, Thailand, Jan 1965. DAS M77.2/593 T364av.

...This report presents the half-month average of rainfall in mms, together with standard deviation for each 3-hr period for 14 stations covering a period of 10 years (1951-60). (ALS)

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64. Thailand. Meteorological Dept. Climate. Thailand, Nature and Industry. Bangkok, 1951. DLC DS562 .T52 V.2.

...Contains a chapter on the climate of Thailand. Discusses the most important climatic features (rainfall, temperature, prevailing winds, pressure, fog, seasons, conditions of the sea) of the country by areas (northern, northeastern, central plain, southern and the Gulf of Thailand). Includes tabular monthly and annual summaries for an unspecified period of

64. (cont)

mean temperature (°C), relative humidity (%), cloud amount (0-10), rainfall (mm) and pressure (mb) at 0700 for Uttaradit, Chienginai, Nakhon Rajasima, Udon Thani, Aranyaprathes, Nakhon Sawan, Bandon, Naradihvas and Chanthaburi. The source also contains graphs showing mean monthly values of total rainfall (mm) and temperature (°C) for Chiengrai, Chiengmai, Roi Et, Udon Thani, Pitsanuloke, Bangkok, Chanthaburi, Songkhla, Chumphon, and Phuket; graphs comparing daily values of temperature for Apr and Jan for Chiengmai, Nakhon Rajasima, Lapburi and Bandon. Maps also included. (ALS)

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65. Thailand. Meteorological Dept. Climate of Thailand. A map prepared in Aug 1961, printed in Oct 1961. CIA Map Library. H503-9 137645.

...A large scale map of Thailand showing for each station (19 in number) by bar graphs the monthly and annual rainfall (mm); and by a line curve the annual march of temperature; by coloring the climatic regions for the country (Savanna climate, tropical monsoon climate and tropical rain forest), scale: 1:1 000 000. (ALS)

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66. Thailand. Meteorological Dept. Climatological Data. 90 pp. (In Thai and English). Bangkok. DAS M06.3/593 T364cl.

...Discusses temperature, rainfall, relative humidity, cloudiness, thunderstorms, surface winds, and typhoons in Thailand. Contains a list of meteorological stations and explanatory notes concerning observations and instruments. Includes monthly and annual tabular summaries over the period (1943-1952) for 24 individual stations of mean, mean maximum and mean minimum pressures (mb); extreme pressures with dates of occurrence; mean, mean maximum and mean minimum temperatures (°F); extreme temperatures with dates of occurrence; mean, mean maximum and mean minimum relative humidity (%); mean number of days with thunderstorm, thunder, lightning, dew, hail, haze, fog and squall; frequency wind direction (8 points and calm); mean wind force (Beaufort Scale); maximum wind force with date of occurrence; mean rainfall (mm); mean number of rainy days; maximum amount of rainfall in 24 hours with date of occurrence; mean evaporation; mean visibility (0-9) at 0700, 1300 and 1600; mean cloud amount (0-8) at 0700, 1000, 1300 and 1600. The source also contains for Bangkok only monthly summaries year-by-year (1951-1955) of actinometric observations

66. (cont)

which include black and bright bulb in vacuo (°C), maximum black and bright bulb with dates of occurrence.

CLIMATIC MAPS. Contains polychrome maps (scale 1:18 000 000 determined from graticules) of Thailand with mean monthly rainfall (intervals of 0-25, 25-50, 50-75, 75-125, 125-200, 200-300, 300-400, 400-500 and 500 mm); mean monthly temperature (intervals of 18-20, 20-22, 22-24, 24-26, 26-28, 28-30, 30-32 and 32-34) in degrees centigrade. No period of record is specified. (VTR)

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67. Thailand. Meteorological Dept. Mean Values of Wind, Visibility, Altitude of Cloud Base, Temperature and Dew Point over a Ten Year Period, 1951-1960. DAS M82.2/593 T364me.

...Presents mean monthly data (1951-1960) for Don Muang, Chiangmae, Songkhla and Nakhon Ratchasima. The data includes mean # of occurrences of specified ceiling and visibility and height of low clouds covering > 4/8 of sky at each synoptic hour, wind direction and speed at each synoptic hour, wind direction and speed with specified visibility and/or low cloud heights covering > 4/8 of sky and occurrences of specified ranges of dry bulb temp and dew point at 00, 06, 12 and 18 GMT. (ALS)

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68. Thailand. Meteorological Dept. [Miscellaneous Papers]. Bangkok, 1956-1959. DAS M06.2/593 T364mi.

...A collection of miscellaneous papers. Includes the following: discussion on the climate of Hua Hin and Bandon (topography, temperature, relative humidity, cloudiness, rainfall, visibility, thunderstorms, typhoons and surface winds); textual notes on the distribution of thunderstorm days in Thailand; an account of the droughts experienced in certain parts of Thailand during the year 1954; climatic condition along the east coast from Cholburi to Sattahib. This source presents tabular summaries over the period for 1-46 stations within the period 1932-1958. The monthly and annual summaries consist of mean, mean extreme and absolute extreme temperatures (°C); mean, mean extreme and absolute extreme relative humidities (%); mean hourly relative humidity and temperature; mean cloudiness (0-10); mean rainfall amount (mm); mean number of days with clear skies (0-2/10), rain, thunderstorms and lightning and thunderstorms. The monthly summaries include wind direction frequency (%);

68. (cont)

mean wind force (Beaufort Scale); mean maximum wind force; mean number of days with fog, mist and thunderstorms. The seasonal (NE monsoon, 1st transition, SW monsoon and 2nd transition) summaries are mean, mean extreme and absolute extreme temperatures (°C). The source also contains, for 43-45 stations, tabular annual extreme wind velocity (Beaufort Scale) with date of occurrence during the period 1937-1955 and total number of days with thunderstorms and with thunderstorms and lightning summarized for each year (1948-1957) and over the period.

CLIMATIC MAPS. Contains a map, scale 1:6 000 000, of Thailand with mean annual rainfall (intervals of 600-1200, 1200-2000, 2000-2500, 2500-5000 and > 5000 mm) by hatched areas. No period of record is specified. (VTR)

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69. Thailand. Meteorological Dept. Monthly and Annual Rainfall of Thailand with Departure from Normal (For Period from 1911 to 1960). Bankot. DAS M06.1/593 T364mt.

...This report presents the actual monthly and annual rainfall for about forty-five stations in Thailand as well as the monthly normals for the same 50-year period. (ALS)

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70. Thailand. Meteorological Dept. Monthly Summary of Climatological Data, 1946-...(May 1963). (In Thai and English). Bangkok. DAS M06.1/593 T364ms.

...Contains data for about 46 stations in Thailand; monthly tabular summaries for each year of mean and absolute extreme pressures (mb); mean, extreme and absolute extreme temperatures (°C); mean dew point (°C); mean and absolute extreme relative humidities (%); daily range pressure and temperature; mean cloudiness (0-8); total rainfall (mm); total number of rainy days; maximum rainfall in 24 hours with date of occurrence; rainfall departure from normal; total evaporation (mm); prevailing wind direction; mean wind force (Beaufort Scale); maximum wind force (Beaufort Scale); total number of days with dew, fog, haze, hail, thunderstorms, squalls, duststorms, lightning, thunder and clear, partly cloudy, cloudy, and overcast skies are included. The source also includes a general weather summary for each month. (VTR)

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71. Thailand. Meteorological Dept. Monthly Temperature: 24 Year Records 1937-1960. DAS M82.3/593 T 384mo.

...This is a large fold-out map showing the monthly temperature distribution. Map scale is 1:3 000 000; period of record is 1937-60; isolines and colored areas give respective temperatures. (ALS)

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72. Thailand. Meteorological Dept. Monthly and Annual Rainfall of Thailand, 1946-...(1963). (In Thai and English). Bangkok. DAS M06.1/593 T364mr.

...Contains, for 92-350 stations in Thailand, monthly and annual tabular summaries for each year with total rainfall (mm), normal rainfall, total number of rainy days (0.1 mm), rainfall departure from normal, and maximum rainfall in 24 hours with date of occurrence. The source also includes, for 78 stations, monthly and annual normals of rainfall and number of rainy days based on the period 1932-1952.

CLIMATIC MAPS. Contains the following: maps, scale 1:6 000 000, of Thailand with normal annual rainfall (no period of record is given) and some individual years by hatched areas; maps scale 1:10 000 000 of area 15°S-45°N latitude and 66°E-150°E longitude with typhoon tracks for 1955 and 1956. (VTR)

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73. Thailand. Meteorological Dept. Pilot Balloon Data, 1936-1954. (In Thai and English). Bangkok. DAS M06.7/593 T364p.

...Contains daily observations and monthly summaries of pilot balloon data (wind direction and speed) at specified levels, visibility (km), types of cloud and amount for stations, time and period as follows: Don Muang at 0600, 1200 (1936-1940), 0700 and 1000 LST (1949-1954); Pitsanuloke at 0600, 1200 (1936-1940) and 1000 LST (1952-1954); Korat at 0600 and 1200 LST (1938-1940); Bangkok at 0400, 0700, 1000, 1600 and 2200 LST (1949-1954); Chiengmai at 0700, 1000 and 2200 LST (1949-1954); Udorn Dhani at 0700 and 1000 LST (1949-1954); Songkhla at 1000 and 2200 LST (1951-1954); Nakorn Rajasima at 1000 and 2200 LST (1951-1954). Not all times either months are available for every station. (VTR)

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74. Thailand. Meteorological Dept. Office of the Prime Minister, Bangkok. Mean Percentage of Winds over Thailand. (1951-1960) EARI 32798/TH.

...Data of surface wind observation at 48 observing stations in Thailand for the period of 1951-1960 have been compiled. The monthly mean percentage of occurrences of concurrent wind speed and direction within specified ranges is then obtained. (ALS)

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75. Thailand. Ministry of National Development. Mobility Environmental Research Study in Thailand. "Interim Reports on the Great Soil Group Survey," III: Chiang Mai Study Area by S. Rojanasoonthon, Soil Survey Division, Bangkok, Jun 1965. 12 refs, maps. 30 pp. AD 480682.

...A general description is given of the area, physiography, geology, soil forming materials, climate, vegetation, land use, and hydrography. A more detailed description of the nature of the soils and a description of the soil mapping units are included. (ALS)

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76. Thailand. National Office of Statistics. Statistical Bibliography. "An Annotated Bibliography of Thailand Government Statistical Publications," Office of the Prime Minister, pp 95-98. Census T32 A4, 1964.

...In the chapter "Meteorological Department more than 40 publications, papers and/or pamphlets (In English, unless otherwise specified) are listed on weather and climate, for Thailand. These are not listed in WMO No. 174, Tp. 86 "catalog of meteorological data for research." (ALS)

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77. Thailand. National Statistical Office. Statistical Yearbook 1966, Changwat Chon Buri. Office of the Prime Minister. Census T32C45 A84, 1966.

...Table 1 contains a summary of meteorological data for Changwat Chon Buri station, FOR 1956-1966. Elements covered are: mean monthly pressures, temperatures, rainfall temperature extremes, mean number of days with rain and mean relative humidity. (ALS)

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78. Thailand. National Statistical Office. Statistical Yearbook 1966, Changwat Chiang Mai. Office of the Prime Minister. Census T32C43 A84, 1966.

...Table 1 contains a summary of meteorological data for Changwat Chiang Mai station. POR 1956-1966. Elements covered are: mean monthly pressures, temperatures, rainfall temperature extremes, mean number of days with rain and mean relative humidity. (ALS)

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79. Thailand. National Statistical Office. Statistical Yearbook 1966, Changwat Phitsanulok. Office of the Prime Minister. Census T32P55 A84, 1966.

...Table 1 contains a summary of meteorological data for Changwat Phitsanulok station. POR 1956-1966. Elements covered are: mean monthly pressures, temperatures, rainfall temperature extremes, mean number of days with rain and mean relative humidity. (ALS)

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80. Thailand. National Statistical Office. Statistical Yearbook 1966, Changwat Udon Thani, Office of the Prime Minister. Census T32UD7 A84, 1966.

...Table 1 contains a summary of meteorological data for Udorn Thani station. POR 1956-1966. Elements covered are: mean monthly pressures, temperatures, rainfall temperature extremes, mean number of days with rain and mean relative humidity. (ALS)

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81. Thailand. Royal Thai Survey Dept. Average Temperature. 1964. Map. EARI Ref. Br. 00111/TH.

...Map of Thailand showing mean annual temperature. Temp values are divided into 3 different categories, 24°-26°C, 26°-28°C and 28°-30°C. Period of record is up to 24 years (1937-1960). Map scale is 1:2 500 000. (RAG)

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82. Thailand. Royal Thai Survey Dept. Average Pressure in Millibars. Map. EARI Ref. Br. 00109/TH. (1964)

82. (cont)

...Map of Thailand showing mean annual pressure. Four divisions of pressure values are shown which range from 1008.5 to 1010.5 mb. Period of record is up to 10 years (1951-1960). Scale of map is 1:2 500 000. (RAG)

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83. Thailand. Royal Thai Survey Dept. Annual Evaporation in Millimeters. 1964. Map. EARI, Ref. Br. 00108/TH.

...Map of Thailand showing annual evaporation in mm. Evaporation amounts are divided into 7 categories ranging from less than 500 mm to greater than 1200 mm. Period of record is up to 14 years. Map scale is 1:2 500 000. (RAG)

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84. Thailand - U.S. Military Research & Development Center. Changwat Handbook, Vol. I, Physical Environment. Bangkok, Thailand. 1967. 800 p, tables. AD 828338.

...Chapter IV includes a discussion on the weather and climate of Changwat Nakhon Phanom. Climatic briefs are included for several stations, as well as yearly data (1963). Tables of mean monthly and annual rainfall for Nakhon Phanom (1911-1960), Mukdahan (1934-1960), are included. Other data include 5-yr averages of rainfall, mean number of days with rainfall, and thunderstorms. Several monthly rainfall and annual rainfall maps, a mean annual number of rainy days, mean annual intensity of rainfall, monthly temperature maps, and other climatic data are included. (ALS)

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85. Thompson, Will F. Analogs of Canal Zone Climate in India and Southeast Asia. U.S. Quartermaster Res. & Eng. Center. Environmental Protection Res. Div. Technical Report EP-91. Natick, 1958. DAS M86 U585t. AD 206427.

...The area covered in this report includes Thailand. The following combinations of elements were studied: mean temperature of the warmest and coldest month, 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

85. (cont)

of the driest month, mean cloud cover of the wettest month and mean wind speed of the wettest month. Contains 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).

Contains maps with numerical values of mean temperature for the warmest month, mean daily maximum temperature for the warmest month, mean temperature for the coldest month, mean daily minimum temperature for the coldest month, mean daily temperature range for the warmest month, mean annual precipitation, mean precipitation for the wettest month, mean number of wet months, mean relative humidity for the driest month, mean cloudiness for the wettest month, mean wind speed for the wettest month and composite analogous areas. (Author)

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86. Tongsanga, Snit. A Preliminary Report on the Combination of Plachon (Ophicephalus Striatus Bloch) and Tilapia (Tilapia Mossambica Peters) in Thailand. Journal of the National Research Council of Thailand. Vol. 2, No. 2, May 1961. DLC Annex Oruntalia Div.

...Graphs are given of mean monthly rainfall at 21 stations. In contrast to other parts of SE Asia maximum rainfall occurs during the retreat of the monsoon in Aug and Sep. On the west coast of the Gulf of Thailand the maximum is in Oct and Nov. Table 1 gives the mean monthly number of thunderstorm days at 4 stations. (ALS)

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87. United Nations. Bureau of Flood Control, 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)

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88. United Nations. Committee for Coordination of Investigations of the Lower Mekong Basin, Lower Mekong Hydrologic Yearbook, 1965. Thailand, 1967. 392 p. Almost entirely tables and charts. Text and legends in English and French. DAS (M79/596 U583Lo).

88. (cont)

...Contains stream flow, sediment, precipitation, evaporation and wind data for stations in the 4 riparian countries (Thailand, Cambodia, Laos, and Vietnam) and seismic data for the Chiang Mai and the Songkhla stations in Thailand. Locations of hydrologic meteorologic stations are shown on a map of the Lower Mekong Basin. Precipitation data consist of daily data from recording rain gages at the stations. An isohyetal map developed from the annual data of 382 stations is included. The evaporation and wind data were obtained from Class A evaporation pans and anemometers, resp. The seismic data include information on instrumentation, period of record, and a map of epicenter locations during 1963-1965. (ALS)

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89. USAF, AWS, 1st Weather Wing. Climate of Thailand. Det 51, APO San Francisco, Aug 1965. 127 pp, 84 figs. AD 470686.

...A discussion on the geography and climate of Thailand including numerous maps, figures and tables. A great part of the study consists of climatic briefs for more than 50 stations. Climatic elements covered are temperatures, humidity, precipitation, cloudiness, visibility, surface winds, ceilings, upper air winds and temperatures, and thunderstorms. The various monsoon seasons are also described by synoptic patterns and maps are presented showing prevailing winds, humidity, temperatures and precipitation. (ALS)

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90. USAF, AWS, 1st Weather Wing. Objective Method to Forecast Low Morning Visibilities in Ubon, Thailand (Jan-Mar). Scientific Services, Det 1, 1st Wea Wg, APO San Francisco 96525. Technical Study 4, Nov 1966. AD 645090.

...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 Jan to 15 Mar. (Author)

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91. USAF, AWS, 1st Weather Wing. Medium Level Persistency Analysis for Southeast Asia. Special Study 105-1 3/1, APO San Francisco 96525, Jul 1966. Maps. AD 488117.

91. (cont)

...This study was prepared as a planning aid to forecaster in Southeast Asia. Twelve charts are presented for each month of persistency of ceilings 5000 ft and/or visibility 5 miles. These show percent frequency at 0700, 1300, 1900 LST and probability of continuing from 0700 to 1000, 1300, 1600, 1900, 0700 LST and from 1300 to 1600, 1900, 0700 LST and from 1900 to 0700 LST.

The period of record for data used in the analyses varies from 2 years to 10 years, but generally is based on 6 to 7 years record. Data used came from the 1965 ETAC study "Percent Frequency of Durations of Ceiling-Visibility and Precipitation Condition," which was based on 3 hourly observations. Therefore the titles may in some cases be misleading. As an example the "Probability of < 5000 ft a/o < 5 mi at 0700 LST Continuing to 1900 LST" chart gives the percent that at 3 hourly intervals < 5000 a/o 5 continued from 0700 to 1900. It is possible that the ceiling or the visibility went above these parameters between two consecutive 3 hourlys then lowered again. This is even more probable at night, as the 1900 LST and 0700 LST observations are considered as consecutive observations. Therefore, charts such as the "0700 to 0700 LST" chart are best used to consider the probability that conditions will remain below 5000 a/o 5 most of the day, and will again be < 5000 a/o 5 at 0700 LST the next morning. (ALS)

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92. U.S. Army. Engineer Agency for Resources Inventories. The Lower Mekong Basin Resources Atlas Project. "Draft Bibliography," for Agency for International Dev., Wash. DC, Jan 1966. IPB Files.

...This preliminary bibliography of more than 6,000 entries is divided into the following areas - Cambodia, Laos, Vietnam, Thailand, Mekong, Asia, and Southeast Asia. Further, it is divided into books, articles, and maps. No abstracts are included. Climatic entries are limited. Most entries are political, economic, social, and medical. A few entries are on flooding, soil studies, highways, and land use. (Author)

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93. U.S. Army Natick Laboratories. Notes on some Environmental Conditions Affecting Military Logistics in Thailand. Special Report S-1, Q.R. and E.C., ESD, Natick, Mass., Jun 1962. 20 figs, 40 pp. AD 278584.

93. (cont)

...A discussion on the climate of Thailand its temperatures and precipitation, and seasonal variations is given supplemented by 20 maps on station locations, physical regions, temperatures, wet and dry seasons, rainy days, precipitation, climatic analogs and color region maps. (ALS)

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94. U.S. Hydrographic Office. Sailing Directions for the Western Shores of the South China Sea from Singapore Strait to and including Hong Kong. H.O. Pub. No. 93. Fifth Ed. Wash, 1957. DAS M82/512.3 U58s.

...Discusses the climatology of this area which includes pressure, winds, temperature, relative humidity, precipitation, cloudiness, visibility and typhoons. The source also presents the following monthly and annual tabular data summarized over the period for Krung Thep (Bangkok) mean sea level pressure (mb); mean, mean extreme and absolute extreme temperatures (°F); mean relative humidity at 0700 and 1300; mean cloud cover (tenths); mean number of days clear (< 2/10) and cloudy (> 8/10); mean amount and maximum amount in 24 hours of precipitation; greatest and least amount of precipitation; mean number of days $\geq$ 0.01 inch; mean number of rainy days; wind direction frequency (8 points and calm) at 0700 and 1300; mean wind speed (knots) at 0700 and 1300; mean number of days with wind $\geq$ 34 knots; mean number of days with visibility < $\frac{1}{8}$ nautical mile. Period of record varies by element. (VTR)

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95. U.S. Quartermaster Corps. Research & Development Div. Clothing Almanac No. 18: Southeast Asia. Thailand, Burma, French Indochina and the Federation of Malaya. 22 pp, Wash., 1951. DAS M86 U585c.

...Discusses briefly the climate (winds, temperature and rain) of Southeast Asia. Includes monthly tabular summaries over the period of mean temperature (°F) and mean rainfall (inches) for individual stations (Bangkok in Thailand). No period of record is specified. (VTR)

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96. U.S. Quartermaster Research & Development Center. Environment of Southeast Asia. Report No. 219, E.P.D., Natick QM Res. & Dev. Lab. Aug 1953, 45 pp. DAS M86 V585r.

...Discusses the climate of Southeast Asia including Thailand. Tabulated data for 4 stations in Thailand include, temperatures, precipitation and humidity mean cloud cover and mean number of days with thunderstorms are included for 2 stations in Thailand. Maps of average precipitation and prevailing surface winds during Dec, Jan, Feb, and Jun, Jul and Aug are provided. (ALS)

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97. U.S. Quartermaster Research & Engineering Command. Notes on some Environmental Conditions Affecting Military Logistics in Thailand. Special Report S-1, Earth Sciences Division, Natick, Mass. Jun 1962. 41 pp, 20 figs. AD 278584.

...Thailand's climate is characterized by a rainy and a dry season, except for small areas of year-long wet conditions. Shortage of potable water is a problem in much of the country especially during the dry season. The amount and color of the foliage and the problems associated with mud or dust, change greatly with the seasons. Average annual rainfall varies from 40" to 180";differences in intensity and in dates of beginning and end of the rainy season, fluctuate strikingly from year to year and place to place. Temperatures are relatively high throughout the year, with maxima above 90 F possible in any month. Cold weather is rare, but an occasional reading as low as 40 F is reported in Dec or Jan. Compared to the climate elsewhere in S.E. Asia, the climate of most of Thailand is most analogous to that of Burma to the west, and Laos, Cambodia, and Vietnam to the east. Only the southern part of Thailand in the Kra Peninsula, has a climate with heavy rain throughout the year such as prevails in most of the Indonesian Islands on the south. (Author)

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98. Vadhanapanich, Charoen. Characteristics of Rainfall over Thailand. UN Economic Comm. for Asia and Far East, Flood Control Series, No. 15-138-140, 1960. 6 figs, 2 tables. DAS (M79 U58hy).

...The causes of considerable rainfall during the monsoon period are discussed with consideration of the physical features (mountain area, tropical climate, etc.) of Thailand and meteorological data collected during 25 years by the Climatological Division. The precipitation patterns are studied with

98. (cont)

mean monthly rainfall data plotted on 6 charts for different parts of Thailand (northern-northeastern), central, east coast, west coast, and west coast of southern Thailand. Each chart is analyzed separately and the causes of major rainfalls are summarized. (Author)

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99. Vadhanapanich, Charoen. Some Aspects of the Monsoonal Rain in Thailand. Extracted from the Journal of the National Research Council, Vol. 2, No. 2, May 1961. (In Thai and English). 13 pp. Bangkok, 1961. DAS M53.21 V123so.

...Gives an account of the characteristics of rainfall in Thailand. Items discussed are physical features and rainfall patterns with a description of the normal rainfalls over 6 regions of the country, namely, the northern part, northeastern part, central part, east coast of the Gulf of Thailand, west coast of the Gulf of Thailand and west coast of southern Thailand. Contains for Chiengmai, Bangkok, Songkhla and Nakhon monthly tabular summaries over the period (1943-1952) of mean number of days with thunderstorms. Presents graphs with mean monthly rainfall for 21 stations based on the period 1932-1957. (VTR)

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100. Vesa-Rajananda, S. Mean Annual and Monthly Rainfall over Thailand. Met. Dept., Office of the Prime Minister, Bangkok, Jul 1964, 13 pp, 12 figs. EARI, Ref. Br. A-01000/TH.

...Contains maps showing the mean annual and monthly rainfall for Thailand. Period of record is from 1931-1960. The map scale is 1:5 000 000. (RAG)

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101. Vitvitskii, G.N. Klimaty zarubeyhnai Azii. [Climates in Asia outside of the USSR] 396 pp. (In Russian). Moscow, 1960. DAS M82.1/5 V854 kl.

...Includes the following monthly and annual summaries over the period for Bangkok; mean temperature (1931-1940) in °C; mean number of days with precipitation $\geq$ 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 319 and 320.

101. (cont)

Includes maps (scale 1: 80 000 000 determined from graticules) of southeast Asia (5°-40°N, 80°-145°E) showing the air currents at the height of 3 km by arrows for April, second half of June and first half of July, second half of July, and August; map (scale 1:11 200 000 determined from graticules) of Thailand showing the annual distribution of total precipitation amount (mm) by hatched areas. These maps are based on data for an unspecified period. Additional maps in the source are for larger areas. (AEG)

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102. Volker, A. Surface Hydrology of Deltaic Areas. (Rijkswaterstaat, The Hague). United Nations Educational, Scientific & Cultural Organization, Humid Tropics Research, [Vol. 61, 1966. p 143-150. Figs. French summary p 150. (UNESCO, Scientific Problems of the Humid Tropical Zone Deltas and their Implications: Proceedings of the Dacca Symposium, Dacca, East Pakistan, 1964). DAS (574.9 U581sc).

...This paper deals with both the hydrology of the river and its branches and the surface hydrology of the land areas in a delta. The surface hydrology is governed by the climatic conditions and the physical characteristics of the areas as well as by the regime of the river. There is a pronounced relationship between microtopography, flooding and land use. The various stages of development of deltaic areas in the humid tropical zone are: occupancy of natural ridges such as natural river levees, present and former beach lines; opening up the area by canals; spreading of the river floods over the various distributaries; partial flood protection by open embankments; canals in the land areas for drainage purposes; adequate flood protection by closed embankments; adequate water control in the land areas;and finally water control measures in the upstream portions of the river basin. The deltaic areas referred to here are: the Ganges (India and East Pakistan), Irrawaddy (Burma), Chao-Phya (Thailand), Mekong (Vietnam) and Pampanza (Luzon, Philippines). (Author)

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103. Williams, Llewelyn. Vegetation of Southeast Asia Studies of Forest Types. U.S.D.A., ARPA Order No. 424, Wash. D.C. Dec 1965. 302 pp. AD 629181.

...This report treats with the vegetation and other natural features of Cambodia, Laos, North and South Vietnam, and particularly those of Thailand. The vegetation of Thailand, in general, is representative of the countries drained by the Mekong River and its tributaries. Part I contains a discussion

103. (cont)

of the systems, proposed by various ecologists or phytogeographers, to classify tropical vegetation. The principal forest types of Thailand, and applicable to Southeast Asia in general, are described.

Limited climatic information is given (pages) 63, 65, 66, 67. A soil map, a rainfall map and a temperature map of Thailand are also included. (ALS)

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104. World Meteorological Organization. Climatological Normals (Clim) for Climat and Climat Ship Stations for the Period 1931-1960. WMO No. 117. TP 52. (In English and French). DAS M(06) W927P. No. 117.

...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)

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105. World Meteorological Organization. World Distribution of Thunderstorms Days. Part 1: 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 a period (3-10 years) for 30 stations in Thailand. (VTR)

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13. ABSTRACT

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.

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