WORLD CLIMATE PROGRAMME

APPLICATIONS and SERVICES

BIBLIOGRAPHY OF URBAN CLIMATOLOGY FOR THE PERIOD 1992-1995

including a special section on

URBAN CLIMATE IN TROPICAL/SUBTROPICAL AREAS

prepared by

Ernesto Jáuregui
Rapporteur on Urban Climatology
Commission for Climatology
World Meteorological Organization

WCASP - 36

WMO/TD-No. 759
WORLD METEOROLOGICAL ORGANIZATION
May 1996

The WCP implemented by WMO in conjunction with other international organizations consists of four major components:

The World Climate Data and Monitoring Programme (WCDMP)
The World Climate Applications and Services Programme (WCASP)
The World Climate Impact Assessment and Response Strategies Programme (WCIRP)
The World Climate Research Programme (WCRP)

World Meteorological Organization
Case postale N° 2300
CH-1211 Geneva 2
Switzerland

Telephone: (022) 730 81 11
Telefax: (022) 734 23 26
Telex: 41 41 99 OMM CH

NOTE

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Meteorological Organization concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Editorial note: It should be noted that this Report is not an official WMO Publication, and has not been subjected to the Organization's standard editorial procedures. The views expressed by individuals or groups of experts, and published in a WMO Technical Document, do not necessarily have the endorsement of the Organization.

TABLE OF CONTENTS

INTRODUCTION

One specific objective of the first phase of the TRUCE project is the compilation of an inventory of available knowledge related to urban climate, particularly in tropical regions. In conformity with this plan the present writer has prepared this bibliography on urban climate that is a continuation of that published in WCASP-25, WMO/TD-No. 552. It includes references from 1992 till 1995. The number of papers becomes less complete in 1995 for obvious reasons.

The bibliography includes related areas of research such as urban air pollution, urban planning and energy consumption. The main source of information for this bibliography has been the scientific journals Meteorological and Geoastrophysical Abstracts, Mausam, Atmósfera, Energy and Buildings easily accessible in most university or institute libraries. Other sources were the books of abstracts of the American Meteorological Society and the International Geographical Union Congresses as well as the Proceedings of various meetings in Europe.

Fig. 1 shows the development of urban climate since 1981 by geographical regions the peaks in 1991 and 1994 correspond to the Kyoto and Dhaka Conferences. Table 2 shows the summary statistics of papers published on urban climate for the 1992-95 period. While the proportion of papers in the tropics during the last decade (19981-91) was 24% of the total (Jáuregui, 1994), the average for the four year period in the 1990's has decreased to 14%, however, if the subtropical work is included the participation of work in the tropics/subtropics increases in the 1990's from 27 to 32% of the total of papers published on the subject of urban climatology.

The number of papers on urban air pollution has also doubled from 16% in the 1980's to 35% in recent years pointing to the increasing relevance this area of research has gained mainly in mid-latitude and subtropical regions, as shown in table 2. Description of climate variables such as temperature, humidity, rainfall, wind, etc. in the urban canopy layer continues to be a popular topic among researchers of all latitudes. It is encouraging to note that activity in all areas of urban climatology has augmented in recent years: from an average of 63 published papers/year in the last decade to 85/year for the first half of the 1990's.

There is no doubt that the events on urban climate periodically organized under the auspices of the World Meteorological Organization e.g. the Kyoto and Dhaka meetings have been influential in the development of this area of research. In this respect the coming International Conference on Urban Climate (ICUC/96) that will take place in Essen in June will gather scientists of all latitudes. The number of papers accepted for presentation at ICUC/96 is double of those presented at the similar previous event in Dhaka, as may be seen in table 3. In addition to the traditional topics e.g. air pollution, urban/rural comparisons of climatological variables, other subjects such as urban planning, building climatology, boundary layer physics, urban parks, urban bioclimatology attest to the gradual broadening of the field of urban climatology that has taken place in recent years.

ACKNOWLEDGEMENTS

The author wishes to express his gratitude to the following persons: Adalberto Tejeda, Juan Cervantes, Jorge Luis Vázquez, and Elda Luyando who collected and processed the bibliographic material. designed the computer form for the data base. and did the computer graphics/tables work. Guadalupe Zárraga did the typing.

REFERENCES

Jáuregui, E. 1994. Overview of papers on urban climate in tropical/subtropical areas 1981-91. Report of the Technical Conference on Urban Tropical Climates, WCASP-30, WMO/TD-No. 647, 377-390.

Year/region	Geog.Uns. + Mid.Lat. + Subtrop.	Trop.	Total
1981	62	10	72
1982	56	11	67
1983	43	10	53
1984	24	13	37
1985	44	7	51
1986	39	21	60
1987	28	10	38
1988	37	6	43
1989	31	11	42
1990	44	28	72
1991	140	47	187
1992	64	12	76
1993	64	2	66
1994	121	36	157
1995	57	7	64
TOTAL	854	231	1085

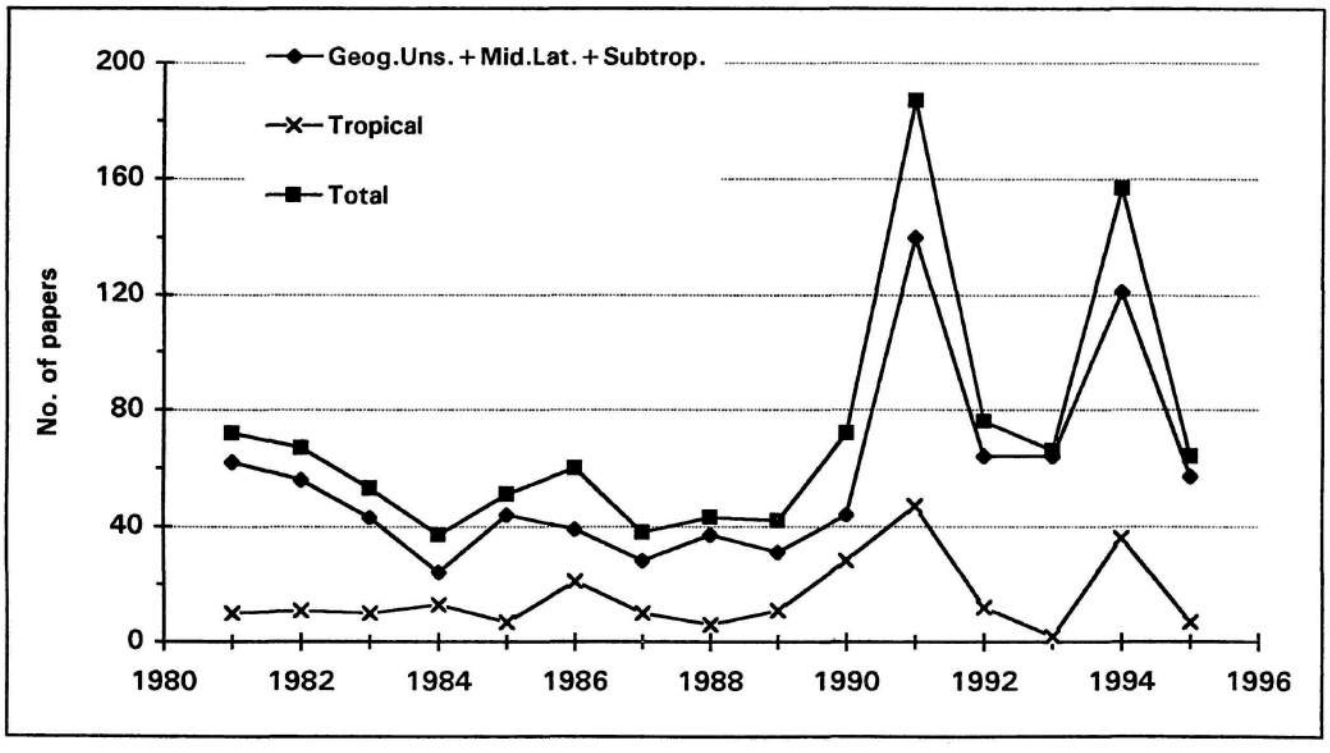

Fig. 1 Annual totals of publications in urban climatology for specifically the tropics (Trop.), other climate regions (Geophysically unspecified, mid-latitude and subtropics) and a global total (Total).

	GU	*HL*	*ML*	*ST*	*T*	TOTAL
1992	19	2	25	20	6	**72**
1993	15	3	34	15	6	**73**
1994	24	3	73	24	35	**159**
1995	12	6	40	8	7	**73**
TOTAL	70	14	172	67	54	377
%	18.6	3.7	45.6	17.8	14.3	100.0

REGIONS:

GU - GEOGRAPHICALLY UNSPECIFIED
HL - HIGH LATITUDES
ML - MIDDLE LATITUDES
ST - SUBTROPICAL
T - TROPICAL

Table 1 Summary of statistics of papers published on urban climate for 1992-95 period with respect to geographical regions.

SUBJECT / REGION	*GU*	*HL*	*ML*	*ST*	*T*	TOTAL
PhMUC	20	1	14	2	0	**37**
EUC	5	0	28	8	12	**53**
GUC	4	2	21	7	9	**43**
PhUC	6	0	16	4	4	**30**
QUA	10	8	57	35	12	**122**
RSUC	7	0	13	3	0	**23**
UBCL	7	1	5	5	6	**24**
UH	2	0	3	1	2	**8**
UP	9	2	15	2	9	**37**
TOTAL	**70**	**14**	**172**	**67**	**54**	***377***

Subjects:

PhMUC - Physical modeling urban climate.

EUC Energy consumption and urban climate

GUC General, descriptive urban climate e.g. description of near surface fields of temperature, wind, rainfall, humidity, etc.

PhUC Physical urban climate.

QUA Quality of urban atmosphere.

RSUC Remote sensing and urban climate.

UBCL Urban bioclimatology

UH Urban hidrology.

UP Urban planning.

REGIONS:

GU - *GEOGRAPHICALLY UNSPECIFIED*

HL - *HIGH LATITUDES*

ML - *MIDDLE LATITUDES*

ST - *SUBTROPICAL*

T - *TROPICAL*

Table 2 Papers published on urban climate for period 1992-95 according to various areas of research.

		TecTUC 1993	ICUC 1996	
			papers	posters
1	Climate change/variability and urban climate	2	6	3
2	Urban planning, urban parks building climatology	13	11	8
3	Energy balance, heat fluxes turbulence, radiation	-	8	4
4	Descriptive urban effects on temperature, wind, rain, etc.	10	27	25
5	Air pollution, aerosols, fog. urban odours, noise , instrumental	2	25	25
6	Urban hydrology	5	-	3
7	Urban bioclimatology, impact on health/vegetation	3	5	13
8	Urban boundary layer physics, dispersion modelling, wind tunnel	-	15	7
9	non-specified	4	1	-
		39	98	88

Table 3 A comparison of papers/posters presented at TecTUC/93 and ICUC/96 by topics in urban climatology.

BIBLIOGRAPHY OF URBAN CLIMATE (1992 - 1995)

Akland, Gerald G. et al. (1992). Global assessment of ambient urban air quality. The science of global change: the impact of human activity on the environment (ACS Symposium Series No. 483). Dunnette, David A. and O'Brien, Robert (eds). QUA; GU; *Urban Atmospheric pollution.*

Bacci, P. (1992). The urban heat island of Milan. Il Nuovo Cimento. C: Geophysics and Space Physics, 15(4): 417-424. GUC; ML; *Urban heat islands;*

Back, R. A. (1992). Climatic controls in relation to hot and cool cities. Journal of Meteorology 17(173): 294-296. UP; GU; *Urban temperatures; climatic effects on urban development.*

Baik, Jong-Jin. (1992). Response of a stably stratified atmosphere to low- level heating: an application to the heat island problem. Journal of Applied Meteorology, 31(3): 291-303. PhMUC; GU; *Airflow over cities; urban heat islands.*

Balling, Robert C., Jr. (1992). The urban heat island: contaminant to the global temperature record? In: Majumdar, Shyamal K. et al eds, Global climate change: implications, challenges & mitigation measures. Academy of Science. pp. 179-188. GUC; ML; *Urban heat islands; Urban influences on temperature.*

Bitan, Arieh. (1992). The high climatic quality city of the future. Atmospheric Environment, Part B: Urban Atmosphere, 26b(3): 313-329. QUA; GU; *Urban climatology; Urban atmospheric pollution; Town planning.*

Bitan, Arieh; Noy, Liath; Turk, Ronit. (1992). The impact of the seashore on the urban climate of Tel-Aviv; preliminary results of a research project. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung, Wissenschaftliche Berichte, Nr 16. GUC; ST; *Urban climates; Urban heat islands; Sea breeze- climate relationships;*

Blinda, S.; Manier, G.; Röckle, R. (1992). Numerical simulation of flow fields and air pollution in an urban area. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Karlsruhe, Germany Institut für Met. und Klimaforschung. pp. 161-167_PhMUC; GU; *Airflow in urban areas; Dispersion in urban areas; Urban atmospheric pollution.*

Busch F. John (1992). A tale of two populations: thermal comfort in air-conditioned and naturally ventilated offices in Thailand. Energy and Buildings 18: 235-249 EUC; T; *Thermal comfort.*

Byzova, N. L. (1992). Kharakteristiki turbulentnosti v nizhnem 300- metrovom sloye v usloviyakh malovo goroda. [Characteristics of turbulence in the lower 300-m layer in the conditions of a small town.] Trudy Instituta Eksperimental'noy Meteorologii, 55(155): 105-120. PhUC; ML; *Airflow in urban areas; Turbulence in urban areas;*

Catsaros, N. et al. (1992). Wind field and pollutant dispersion analysis in greater Athens area using the EURIDICE Code System In: van Dop, Han and Kallos, George (eds.) Air pollution modeling and its application. IX NATO Committee on the Challenges of Modern Society NATO Challenges of Modern Society, Volume 17. Plenum Press. QUA; ST; *Dispersion in urban areas; Airflow in urban areas; Radioactive pollution dispersion;*

Changnon, Stanley A. (1992). Inadvertent weather modification in urban areas: lessons for global climate change. Bulletin of the American Meteorological Society 73(5): 619-627. PhUC; ML; *Urban climates; Climate and human activity; Climatic change research.*

Changnon, Stanley A. (1992). Cloud and precipitation development related to the St. Louis summer rainfall anomaly. Report NOAA COM NA90 AA-H-0A175 AND COMNA 27 RA 0173-01. RSUC; ML; *Cloud development; precipitation formation; cloud-precipitation relationships; urban influences;*

Chen, Chang-he. (1992). Winter boundary layer characteristics over a Valley City. Chinese Science Bulletin 37(6): 490-493. PhUC; ST; *Boundary layer over urban areas; Urban atmospheric pollution; smog;*

Cheong, H. F.; Balendra, T.; Lee, S. L. (1992). Determination of wind effects on and around tall buildings. In: Chiu, Arthur N. L. and Danuatmodjo, Aspan S. (eds.), Proceeding of the Second US-Asia Conference on Enginneering for Mitigating Nat. Hazards Dam.. PhMUC; GU; *Wind load on buildings; Wind effects on buildings;*

Chow, Shu Djen. (1992). The urban climate of Shangai. Atmospheric Environment, Part B: Urban Atmosphere, 26B(1): 9-15. GUC; ST; *Urban climates;*

de Carvalho, Maria Lúcia A. M. (1992). The impact of urbanization on urban climate: a case study in Brazil. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung, Wissenschaftliche Berichte, Nr 16. GUC; ST; *Urban climatology;*

Eliasson, I. (1992). Infrared termography and urban temperature patterns. International Journal of Remote Sensing 13(5): 869-879. RSUC; GU; *Urban temperature distribution; infrared thermometry.*

Garfias, J. (1992). Air quality in Mexico City. The science of the global change: the impact of human activity on the environment (ACS Symposium Series, No. 483), Dunnette, David A. & O'Brien, R. (eds) QUA; ST; *Urban atmospheric pollution;*

Giovoni Baruch (1992). Comfort, climate analysis and building design guidelines. Energy and Buildings 18: 11-23. UP; GU;

Givoni, Baruch. (1992). Climatic aspects of urban design in tropical regions. Atmospheric Environment, Part B: Urban Atmosphere 26B(3): 397-406. UP; T; *Urban microclimates; Town planning.*

Goldreich, Yair. (1992). Urban climate studies in Johannesburg, a subtropical city located on a ridge- a review. Atmospheric Environment, Part B: Urban Atmosphere 26B(3): 313-329. GUC; ST; *Urban climates;*

Goodridge, James D. (1992). Urban bias influences on a long-term California air temperature trends. Atmospheric Environment, Part B: Urban Atmosphere 26B(1): 1-7. GUC; ML; *Temperature trend determination; Sea surface temperature trends; Urban influences on temperature.*

Grimmond, C.S.B. (1992). The suburban energy balance: methodological considerations and results for a mid-latitude Dwest coast city under winter and spring conditions. International Journal of Climatology 12(5): 418-497. EUC; ML; *Energy budget of urban areas;*

Grätz, A.; Jendritzky, G.; Sievers, U. (1992). The urban bioclimate model of the Deutscher Wetterdienst. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. UBCL; GU; *Urban bioclimatology.*

Homer, Björn. (1992). A simple operative method for determination of sky view factors in complex urban canyons from fisheye photographs. Meteorologische Zeitschrift, 1(15): 236-239. PhMUC; GU; *Radiation in street canyons; Sky view factor estimation.*

Höschele, K. (1992). Planning applications of urban and building climatology. Institut für Meteorologie und Klimaforschung, Universität/Kernforschungszentrum Karlsruhe. UP; ALL; *Climate and building design; Climate and town planning; Urban climatology.*

Ilvessalo, Pekko. (1992). Air quality indices and their application to urban air quality monitoring. Finnish Meteorological Institute. Publications on Air Quality, No. 12. QUA; HL; *Air quality standards; Atmospheric pollution monitoring; Urban atmospheric pollution;*

Janssen, Ulrike; Gross, Günter. (1992). Anwendungsmöglichkeiten mesoskaliger simulationsmo delle dargestellt am Bespiel Darmstadt. [On the application of mesoscale models with Dsarmastadt as an example. II: form. of photochemical oxidants Meteorologische Zeitschrift, 1(15): 240-246. PhMUC; ML; *Ozone in urban air; Photochemical ozone production Ozone atmospheric pollution relationships;*

Jáuregui, E.; Godinez, L.; Cruz, F. (1992). Aspects of heat-island development in Guadalajara, Mexico. Atmospheric Environment, Part B: Urban Atmosphere, 26B(3): 391-396. EUC; T; *Urban heat islands; urban influences on temperature.*

Karrasch, Heinz. (1992). Land-use parameters and bioindication as tools in the recognition of prediction of urban climatic effects. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. GUC; ML; *Urban climates; Land use effects on climate; Climate and town planning;*

Kazschner, Lutz. (1992). Criteria for urban climate studies in the urban planning process. In: Höschele, K. (ed.), Planning applications of urban and building climatology Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. UP; ML; *Urban climates; Climate and town planning;*

Kibler, David F. et al. (1992). Recomended hydrologic procedures for computing urban runoff from small developing watersheds in Pennsylvania. University Park, PA, Pennsylvania State University. UH; ML; *Runoff calculations; Runoff from urban areas;*

Kim, H. H. (1992). Urban heat island. International Journal of Remote Sensing, 13(12): 2319-2336. RSUC; ML; *Urba heat islands;*

Kjelgren, Roger K. (1992). Photosyntesis and leaf morphology of liquidambar styraciflua under variable urban radian-energy conditions. International Journal of Biometeorology 36(3): 165-171. UBCL; ML; *Radiation in urban areas; tree physiology; photosynthesis of trees.*

Kobysheva, N.Y. (1992). Guidance material on the calculation of climatic parameters used for building purposes. World Meteorological Organization. Techinal Notes. No. 187. UP; GU; *Climate and building design; building climatology.*

Kwok, K. C. S.; Smedley, D. J.; Kim, D. H. (1992). Snowdrift around Antartic building-effects of corner geometry and wind incidence. In: Triantafy- llou, M. S., et al. (eds.), Proceedings of the Second International Offshore and Polar Eng. Conf. Golden, CO, International Society of Offshore and Polar Enginneers. PhMUC; HL; *Snow drifting wind tunnel studies; Building design*

Lam, Joseph C.; Hui, Sam C. M.; Yuen (1992). Typical weather year for building energy simulation in Hong Kong. Hong Kong Meteorological Society Bulletin 2(1): 36-44. UP; ST; *Building climatology; Weather effects on electricity demand.*

Lee, Cheng-shang. (1992). Meteorological influences on the changes of suspended particulate concentration in the Great Taipei area. Atmospheric Sciences, 20(4): 341-361, QUA; ST; *Particulate matter in urban air; Atmospheric pollution-synoptic weather type relationships.*

Li, Guoping; Liu, Kaiwen. (1992). The heat island circulation in unestable urban boundary. Quaterly Journal of Applied Meteorology. 3(4): 431-436. PhUC; GU; *Airflow over cities; Urban heat islands.*

Li, Lequan. (1992). The interaction between nocturnal urban atmospheric boundary layers and aerosols. Quaterly Journal of Applied Meteorology. 3(1): 32-41. PhUC; ST; *Nocturnal boundary layer over urban areas; Urban heat islands; Aerosols in urban areas.*

Lodge, James P., Jr. (1992). Air quality in metropolitan Manila: inferences from a questionable data set. Atmospheric Environment, Part A: General Topics, 26A(15): 2673-2677. QUA; T; *Airquality; Urban atmospheric pollution; particulate atmopsheric pollution.*

Matzarakis, Andreas; Mayer, Helmut. (1992). Mapping of urban air paths for planning in Munich. In: Hoschële, K. (ed.), Planning applications or urban and buliding climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. UP; ML; *Climate and town planning;*

Mc Pherson, E. Gregory. (1992). Shading urban heat islands in U.S. desert cities. Wetter und Leben, 44(1-3): 107-123. EUC; ST; *Urban heat islands; Urban temperature control;*

Miranda, Patricia; Sheriff, Fernando. (1992). Determining thermal comfort in a warm humid region In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Kilmaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. UBCL; T; *Thermal comfort;*

Miranda, Patricia; Sheriff, Fernando. (1992). Evaluation of natural ventilation in a warm humid climate. In: Hoschele. (ed.). Planing applications of urban and building climatology. Karlsruhe, Germany, Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany GUC; T; *Airflow in urban areas.*

Moriyama, M.; Prihatman, K. (1992). Thermal environmental assessment using remote sensing data. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe, Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. RSUC; ML; *Urban temperatures.*

Narita, Ken-ichi. (1992). Effects of a body of water on urban thermal environment dependent on the types of on-shore building distribution measured by wind tunnel experiments. In: Höschele, K. (ed.), Planning applications of urban and bulding climatology. Universität Karlsruhe, Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany PhMUC; ML; *Urban microclimates; River influences on local climate.*

Narita, Ken-ichi. (1992). Effects of a body of water on urban thermal environment dependent on the types of on-shore building distribution along applications of urban and building climatology. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe, Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany PhMUC; ML; *Urban miroclimates; River influences on local climate.*

Niu J. and Kooi Der Van J. (1992). Two-dimensional simulation of airflow and thermal comfort in a room with open-window and indoor cooling system. Energy and Buildings 18: 65-75. UP; GU; *Numerical simulation, thermal comfort, open-window ventilation.*

Parlow, E. (1992). Potentials of satellite data for urban climatology. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany. RSUC; GU; *Urban climates; Urban heat islands; Satellite uses in urban climatology studies.*

Pitts, R.O.; Lyons, T. J. (1992). A coupled mesoscale/particle model applied to an urban area. Atmospheric Environment, Part B: Urban Atmosphere, 26B(3): 279-289. PhMUC; GU; *Atmospheric pollution models; Urban atmospheric pollution.*

Potcher, Oded. (1992). Adaptation of Romann ad Byzantine buildings to climate conditions of urban and building climatology. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany UP; ST; *Climate and building design; Building climatology;*

Singh, Hanwant B. (1992). Measurement of rotative organic chemicals at selected sites in California. Atmospheric Environment, Part A: General Topics, 26A(16): 2929-2946. QUA; ML; *Urban atmospheric pollution; Organic compounds atmospheric pollution;*

Sliggers, Johan. (1992). The CAR model: Calculation of Air pollution from Road traffic, a calculation method for the determination of air quality in city streets in The Netherlands. In: van Dop, et al. Air pollution IX. NATO Committee on the Challenges of Modern Society, Volume 17. New York, NY, Plenum Press. QUA; ML; *Air quality models; Urban atmospheric pollution; Atmospheric pollution control; Atm. poll. by mot.v*

Stock, Peter. (1992). Climatic classification of town areas. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany RSUC; GU; *Urban microclimates.*

Stoll, Matthew J.; Brazel, Anthony J. (1992). Surface air-temperature relationships in the urban environment of Phoenix, Arizona. Physical Geography, 13(2): 160-179. PhUC; ST; *Urban temperatures; surface-air temperature relationships;*

Suppan, P.; Rappenglück, B.; Fabian, P. (1992). Photooxidants in the urban area of Munich. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany QUA; ML; *Urban atmospheric pollution; Ozone in urban air; Peroxyacetylnitrate in air.*

Swaid, H. (1992). Intelligent urban forms (IUF): a new climate-concerned, urban planning strategy. Theoretical and Applied Climatology. 46(2-3): 179-191. UP; ML; *Climate and town planning; urban climatology.*

Tiwari N. G, Lugani and Singh K. A. (1992). Design parameters of a non-air-conditioned cinema hall for thermal comfort under arid-zone climatic conditions. Energy and Buildings 19: 249-261. EUC; ST; *Passive cooling; solar energy; solar architecture*

Todhunter, Paul E. (1992). A model of net radiation over suburban snowpacks. Atmospheric Environment, Part B: Urban Atmosphere, 26B(1): 17-27. EUC; ML; *Radiation over snow; Urban influences on snow melting.*

Tselepidaki, Moustris C.; Santamouris M., and Poulopoulou G. (1992). Analysis of the summer discomfort index in Athens, Greece for cooling purposes. Energy and Buildings 18: 51-26. UBCL; ST;

Unger, J. (1992). The seasonal system of urban temperature surplus in Szeged. Acta Climatologica, 24(16):49-57. EUC; ML; *Urban influences on temperature;*

Unger, J. (1992). Diurnal and annual variation of the urban temperature surplus in Szeged, Hungary. Idojaras 96(4): 235-244. GUC; ML; *Urban influences on temperature; Urban heat island*

Varotsos, C. et al. (1992). Relationship of ozone and its precursors in the West Coast Air Basin of Athens: statistical model for the assessment of air quality in an urban area. Atmospheric Research, 28(1): 41-47. QUA; ST; *Ozone in urban air; Ozone atmospheric pollution relationships; urban air;*

Varshney, C.K.; Aggarwal, Maneescha. (1992). Ozone pollution in the urban atmosphere of Delhi. Atmospheric Environment, Part B: Urban Atmosphere, 26B(3): 291-294. QUA; ST; *Ozone in urban air.*

Wang, Jiemin. (1992). Turbulence characteristics in an urban atmosphere of complex terrain. Atmospheric Environment, Part A: General Topics, 26A(15): 2717-2724. PhUC; ST; *Turbulence in urban areas; Dispersion in urban areas;*

Winkler, Christoph; Flassak, Thomas; San José, Roberto. (1992). Dispersion simulations of NOx in Athens, Greece, using a Lagrangian dispersion model. In: van Dop, Han and Kallos, George (eds.), Air pollution modeling and its application IX. NATO Committee onthe Challenges of Modern Society. NATO Challenges of Modern Society, Volume 17. New York, NY, Plenum Press. QUA; ST; *Atmospheric pollution sources; Nitrogen dioxides in urban air;*

Wisse, J. A.; Bottema, M. (1992). Urban geometry and wind. In: Höschele, K. (ed.), Planning applications of urban and building climatology. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany PhMUC; GU; *Winds over urban areas; Urban influences on wind.*

Yoshikado, Hiroshi. (1992). Numerical study of the day time urban effect and its interaction with the sea breeze. Journal of Applied Meteorology, 31(10) 1146-1164. PhMUC; GU; *Urban heat islands; Air flow in urban areas; Sea breezes in urban areas.*

Zhao, Zongci. (1992). Climatic change and urbanization effect in China Academy of Meteorological Science. EUC; ML; *Climatic trends; Urban climates;*

Zu, Tielin. (1992). Numerical simulation of air pollutant transport and diffusion in a mountainous city. Atmospheric Environment, Part A: General Topics. 26A(15): 2689-2697. PhMUC; ST; *Atmospheric pollution transport; Atmospheric pollution diffusion; Urban atmospheric pollution.*

Aceves, Merce. (1993). Seasonally dependet size distributions of aliphatic and polycyclic aromatic hydrocarbons in urban aerosols form densely populated areas. ES&T, 27(13): 2896-2908.QUA; ML; *Aerosol in urban areas; Hydrocarbons in aerosols.*

Asaeda, Takashi; Vu, Thanh Ca. (1993). The subsurface transport of heat and moisture and its effect on the environment: a numerical model. Boundary-Layer Meteorology, 65(1-2): 159-179, EUC; GU; *Heat transfer in soil; Soil temperatures; Water vapor transfer in soil; Urban heat islands.*

Asaeda, Takashi; Vu, Thanh Ca. (1993). Heating of paved ground and its effects on the near surface atmosphere. In: Bolle, H.J.; Feddes, R.A. and Kalma, J.D.(eds) Exchange processes at the land surface for a range of space and time scales. IAHS Pub.,212. Oxford. EUC; GU; *Soil heat storage; Street surface heat sotrage; Boundary layer heating.*

Beashlykov, V. M.; Ivanov, A. A. (1993). Spectroscopic measurements of NO2 content in the atmosphere of Moscow. Izvestiya, Atmospheric and Oceanic Physics, 29(1): 60-65. QUA; ML; *Nitrogen dioxide in urban air;*

Bizjak, M. (1993). Diurnal concentrations of black carbon and some other air pollutants in Ljubljana, Slovenia. Atmospheric Environment, Part A: General Topics. 27A(8): 1147-1550. QUA; ML; *Urban atmospheric pollution;*

Chapman, T. G. (1993). New methods of unitgraph and loss rate estimation applied to urban catchments. Journal of Hydrology (New Zeland), 31(2): 111-123. UH; ML; *Runoff from urban areas; Unit hydrographs.*

Cleugh, H. A.; Grimmond, C. S. B. (1993). A comparison between measured local scale suburban and arealy-averaged urban heat and water vapour fluxes. In: Bolle, H.J.; Feddes, R.A. and Kalma, J.D. (eds). Exchange processes at the land surface for a range of space and time scales. IAHS Pub.,212. Oxford. EUC; ST; *Sensible and latent heat flux in urban areas; Water vapor flux in urban areas;*

Cox, William M.; Chu, Shao-Hang. (1993). Meteorologically adjusted ozone trends in urban areas: a probabilistic approach. Atmospheric Environment, Part B: Urban Atmosphere, 27B(4): 425-434, QUA; ML; *Ozone trends; Ozone in urban air; Ozone Meteorological factor relation ships.*

Cruz, X. et al. (1993). Air Pollution modeling: effects of decreasing fuel reid vapor pressure on ozone levels in the Mexico City metropolitan area. International Symposium on Heat and mass transfer in energy systems and environmental effects., 158-161, QUA;T.

Dayal, Gopal et al. (1993). Impact of climatic conditions and socio-economic status on solid waste characteristics: a case study. Sciente of the Total Environment, 136(1-2): 143-153, QUA; ST; *Climate and environment; Urban waste;*

Eidels-Dubovoi, S. (1993). Solar radiation attenuation by atmospheric aerosol particles at different sites in the Mexico City Valley. International Symposium on Heat and mass transfer in energy systems and environmental effects., 140-142, QUA; T.

El-Shobokshy, Mohammad S.; Al-Saedi, Yaseen G. (1993). Atmospheric turbidity and transmittance of solar radiation in Riyadh, Saudi Arabia. Atmospheric Environment, 27B(4): 401-411, QUA; ST; *Particulate air pollutants; Atmospheric pollution effects on radiation.*

Frisbie, Paul R.; Hudson, James G. (1993). Urban cloud condensation nucli spectral flux. Journal of Applied Meteorology, 32(4): 666-676, QUA; ST; *Cloud condensation nuclei variations;Condensation nuclei in urban air.*

Gallo, K. P. (1993). The use of NOAA AVHRR data for assessment of the urban heat island effect. Journal of Applied Meteorology, 35(2): 899-908. RSUC; ML; *Urban heat islands; Urban influences on temperature.; satellite uses in urban climatology studies.*

Gallo, K.P. et al. (1993). The use of a vegetation index for assessment of the urban heat island effect. International Journal of Remote Sensing, 14(11): 2223-2230, RSUC; ML; *Satellite detection of urban heat islands; U.S. satellite, NOAA-11.*

Gotoh, Takao. (1993). Relation between heat islands and NO2 pollution in some Japanese cities. Atmospheric Environment, Part B: Urban Atmosphere. 27B(1): 121-128. QUA; ML; *Nitrogen dioxide in urban air; Atmospheric pollution temperature relations. Urb. heat island.*

Grcic, Marina; Sinik, Nadezda. (1993). Vertical eddy pollutant flux in urban conditions. Croatian Meteorological Journal, 28: 1-6. PhMUC; GU; *Atmospheric pollution dispersion; Dispersion in urban areas; Vertical diffusion.*

Grechki, Ye. I. et al. (1993). Study of the effect of atmospheric boundary-layer parameters on carbon monoxide content variability at the center of Moscow. Izvestiya, Atmospheric and Oceanic Physics, 29(1): 6-13, QUA; ML; *Carbon monoxide in urban air.*

Grimmond, C. S. B.; Oke, T. R.; Cleugh, H. A. (1993). The role of "rural" in comoparisons of observed suburban-rural flux differnces. In: Bolle, H.J.; Feddes, R.A. and Kalma, J.D. (eds) Exchange Processes at the land surface for a range of space and time scales. IAHS Publications, 212. EUC; ST; *Energy balance; Heat flux; Rural meteorology;*

Hildemann, Lynn M. et al. (1993). Mathematical modeling of urban organic aerosol: properties measured by high-resolution gas chromatography. ES&T, 27(10): 2045-2055, QUA; ML; *Atmospheric pollution chemistry; Aerosol in urban areas; Organic aerosols in atmosphere;*

Hitzenberger, Regina M. (1993). Absorption coefficients and mass concentrations of the urban aerosol of Vienna, Austria, during the years 1985 and 1986. Water, Air, & Soil Pollution, 71(1-2): 131-153, QUA; ML; *Aerosol in urban areas; Aerosol*

Hsu, Kuang-Jung et al. (1993). Ozone and PAN monitoring at springtime Taipei. Atmospheric Sciences, 21(1): 67-83, QUA; ST; *Ozone in urban air; Peroxyacetal nitrate in air; Photochemical atmospheric pollution.*

Jaffé Rudolf et al. (1993). Organic compounds and heavy metals in the atmosphere of the city of Caracas, Venezuela. I: Atmospheric particles. Water, Air, & Soil Pollution, 71(3-4): 293-313, QUA; T; *Urban atmospheric pollution; Particulate matter in urban air; Organic compounds in atmosphere.*

Jáuregui, Ernesto. (1993). Bibliography of urban climate in tropical-subrtropical areas 1981-1991. World Meteorological Organization, World Climate Programme: Applications and Services. Geneva, Switzerland. ALL; ALL; *Urban climatology bibliographies.*

Jáuregui, E. (1993). Meteorological aspects of ozone characterization and trend for period 1986-92 in Mexico City. International Symposium on Heat and mass transfer in energy systems and environmental effects., 162-163, QUA; T.

Jin, Shengxin; Demerjian, Kenneth. (1993). A photochemical box model for urban air quality study. Atmospheric Environment, 27B(4): 371-387, PhUC; GU; *Industrial atmospheric pollution; Environmental pollution,*

Jendritzky, G.; Grätz, A. (1993). Modelling the urban bioclimate for planning purposes. Proceedings of the 13th International Congress of Biometeorology. Part 2 Volume 3: 792-805, PhMuc; ML-

Jürrens, Rolf; Gross, Günter. (1993) Numerical simulations of the effects of a changing environment on the urban climate. Proceedings of the 13th International Congress of Biometeorology. Part 2 Volume 3: 786-791, PhMUC; ML.

Kadyshevich, Ye. A.; Yelanskiy, N. F. (1993). Measurement of surface ozone and nitrogen oxides concentrations in Moscow. Izvestiya. Atmospheric and Oceanic Physics, 29(3): 327-333, QUA; HL; *Nitrogen oxides in urban air; Ozone in urban air;*

Kawamura, Kimitaka; Ikushima, Kouichi. (1993). Seasonal changes in the distribution of dicarboxylic acids in the urban atmosphere. ES&T, 27(10): 2227-2235, QUA; ML; *Aerosol composition; Aerosol in urban areas;*

Kita, K. et al. (1993). Observations of atmospheric methane concentration in urban area aboard airship. In: Japan Earth and Planetary Science, QUA; ML; *Methane in urban atmosphere;*

Knaps, A.; Manier, G.; Röckle, R. (1993). Untersuchung der strömungsverhältnisse im bereich von industrieanlagen. [Study of the airflow conditions in industrial plant areas]. Meteorologische Zeitschrift, 2(5): 207-219. PhUC; ML; *Airflow around buildings; Airflow in urban areas; Airflow in street canyons.*

Lee, Hyoun-Young. (1993). An application of NOAA AVHRR thermal data to the study of urban heat islands. Atmospheric Environment, Part B: Urban Atmosphere 27B(1): 1-13. RSUC; ST; *Satellite temperature estimation; Satellite uses in urban climatology studies; urban heat islands.*

Lokoshchenko, M. A. et al. (1993). Studies of the atmospheric boundary layer over Moscow by remote sensing and in situ methods. Russian Meteorology and Hydrology, 9: 13-24. PhUC; ML; *Boundary layer over urban areas.*

Longhetto, A. et al. (1993). Solar-microclimate study in urban areas. Il Nuovo Cimento. C: Geophysics and Space topics, 16C(2): 163-178, PhUC; ML; *Radiation in urban areas; Radiation in street canyons.*

Masako, Furuta et al. (1993) The significance of clothing types and time of day for core and skin temperatures under the influences of wall temperature fall from 28 °C to 18 °C. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 3: 806-812., UBCL; GU.

Mc Kendry, Ian G. (1993). Ground-level ozone in Montreal, Canada. Atmospheric Environment, Part B: Urban Atmosphere 27B(1): 93-103. QUA; ML; *Ozone in urban air;*

Myrup, L. O.; McGinn, C. E.; Flocchini, R. G. (1993). An analysis of microclimatic variation in a suburban environment. Atmospheric Environment, 27B(2): 129-156, PhMUC; ML; *Urban microclimates; Urban temperatures.*

Oka, Taro. (1993). Changes of rainfall infiltration and runoff process due to urbanization. In: Gladwell, John Stuart (ed.) Hydrology of warm humid regions. IAHS Publications, 216. Oxfordshire UK, IAHS. p. 409-421. UH; GU; *Rainfall infiltration; Rainfall runoff; Urban influences on runoff.*

Oke, T. R. (1993). Global Change and Urban Climates. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 1: 123-134., GUC; GU.

Oke, T. R. (1993). Meteorology for the urban environment: technology-transfer options. World Meteorological Organization Bulletin, Geneva, Switzerland, 42(3): 214-217, QUA; GU; *Urban atmospheric pollution; Urban heat islands; Urban climatology;*

Osipov, Yu. S.; Tikhomirova, L. V. (1993). Ther air in Moscow. Russian Meteorology and Hydrology, 11: 74-82. QUA; HL; *Urban atmospheric pollution;*

Panel on the Assessment of Wind Engineering Issues in the US; Committee on Natural Disasters; (1993). Wind and the built environment: U.S. needs in wind engineering and hazard mitigation. National Academy Press, Washington, DC. UP; ML; *Wind damage to buildings; Wind damage prevention.*

Pastuszka, Josef; Hlawiczka, Stanislaw. (1993). Particulate pollution levels in Katowice, a highly industrialized polish city. Atmospheric Environment, Part B: Urban Atmosphere 27B(1): 54-65. QUA; ML; *Urban Atmospheric pollution; particulate atmospheric pollution.*

Portman, David A. (1993). Identifying and correcting urban bias in rengional time series: surface temperature in China's northern plains. Journal of Climate, 6(12): 2298-2308, GUC; ML; *Temperature measurement errors; Temperature trend determination; Urban influences on temperature;*

Qin, Y.; Chan, L. Y.; (1993). Traffic source emission and street level air pollution in urban areas of Guangzhou, South China (P.R.C.). Atmospheric Environment, Part B: Urban Atmosphere, QUA; ST; *Atmospheric pollution by motor vehicles; Street canyon pollution;*

Qin, Y.; Kot, S. C. (1993). Dispersion of vehicular emission in street canyons , Guangzhou City. South China (P.R.C.). Atmospheric Environment. Part B: Urban Atmosphere, 27B(3): 283-291, QUA; ST; *Atmospheric pollution by motor vehicles; Atmospheric pollution dispersion; Stret canyon pollution*

Rahman, A. (1993). Hydrological problems and solutions of a small island state in warm humid regions: case of Singapore. In: Gladwell, John Stuart (ed.), Hydrology of warm humid regions. IAHS Publications, 216. Oxfordshire UK, IAHS, Press, p. 343-351. UH; ST; *Urban influences on hydrology; Hydrologic problems.*

Rappenglück, B.; Kourtidis, K.; Fabian, P. (1993). Measurements of ozone and peroxyacetyl nitrate (PAN) in Munich. Atmospheric Environment, Part B: Urban Atmosphere, 27B(3): 292-315, QUA; ML; *Ozone in urban air; Peroxyacetylnitrate in air.*

Rea, William J. (1993). Studies of environmentally sensitive patients under less polluted conditions. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 1: 26-53, UB; GU.

Rogge, Wolfang F. (1993). Quantification of urban organic aerosols at a molecular level: identification, abundance, and seasonal variation. Atmospheric Environment, Part A: General Topics. 27A(8): 1309-1330. QUA; ML; *Aerosol in urban areas; Organic compounds in aerosols.*

Rotach, M. W. (1993). Turbulence close to a rough urban surface. Part I: Reynolds stress. Boundary-Layer Meteorology, 65(1-2): 1-28, PhUC; ML; *Airflow in urban areas; Turbulence in urban areas; Reynolds stress;*

Scheffe, Richard D. (1993). A review of the development and application of the urban Airshed Model. Atmospheric Environment, Part B: Urban Atmosphere, 27b(1): 23-29. PhMUC; GU; *Atmospheric pollution models; Urban atmospheric pollution.*

Sosa, G. et al. (1993) Evaluation of atmospheric mixing height in Mexico City. International Symposium on Heat and mass transfer in energy systems and environmental effects., 143-147, Phuc; T.

Swaid, H.; Bar-El, M. E. (1993). A bioclimatic design methodology for urban ourdoor spaces. Theoretical and Applied Climatology, 48(1): 49-61. UBCL; ST; *Urban microclimates; Urban bioclimatology; Comfort sensation.*

Swaid, Hanna. (1993). Urban climate effects of artificial heat sources and ground shadowing by buildings. International Journal of Climatology, 13(7): 797-812, PhMUC; GU; *Street microclimates; Urban temperatures.*

Swaid, Hanna. (1993). Numerical investigation into the influence of geometry and construction materials on urban street climate. Physical Geography, 14(4): 342-358, PhMUC; GU; *Street microclimates; Urban temperatures.*

Swaid, Hanna. (1993). The role of radiative-convective interaction in creating the microclimate of urban street canyons. Boundary-Layer Meteorology, 64(3): 231-259. EUC; GU; *Street microclimates; Airflow in street canyons.*

Sweet, Clyde W.; Vermette, Stephen J.; Landsberg, Sheldon. (1993). Sources of toxic trace elements in urban air in Illinois. ES&T, 27(12): 2502-2510, QUA; ML; *Particulate air pollutants; Trace elements in atmosphere; Atmospheric pollution sources.*

Tang G, Lee. (1993) Urban Effluents affecting the effectiveness of building ventilation. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 3 830-839, QUA; ML.

Tsitouridou, R.; Samara, C. (1993). First results of acidic and alkaline constituents determination in air particulates of Thessaloniki, Greece. Atmospheric Environment, Part B: Urban Atmosphere, 27B(3): 313-319, QUA; ST; *Aerosol composition.*

Valkonen, Esko. (1993). Malli typen oksidien muutunnalle katukuilussa. [A model for the transformation of nitrogen oxides in a street canyon]. Helsinki, Finland, Finnish Meteorological Institute, 57 p. QUA; HL; *Atmospheric pollution chemistry; Street canyon pollution; Nitrogen dioxide in urban air.*

Varotsos, C.; Kalabokas, P.; Chronopoulos, G. (1993). Atmospheric ozone concentration at Athens, Greece. Vertical ozone distribution in the troposphere. Atmospheric Research, 30(2/3): 151-155, QUA; ST; *Vertical ozone distribution measurement. Ozone in troposphere.*

Varotsos, C.; Varinou, M.; Kalabokas, P. (1993). Atmospheric ozone concentration at Athens, Greece. Part I: Surface ozone and its relationship with meteorological parameters. Atmospheric Research, 30(2/3): 143-149, QUA; ST; *Ozone concentration near the ground; Ozone in urban air; Ozone meteorologie relationships;*

Varshney, E. K.; Aggarwal, Maneesha. (1993). Vertical ozone varition in the lower troposphere of Delhi. Environmental Monitoring and Assessment, 25(1): 41-49. 1. QUA; ST; *Ozone profiles; ozone in urban air;*

Wagner, Dieter et al. (1993). On the eassessment of regional climate change effects in large urban areas. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 3: 813-818, PhMUC; ML.

World Meteorological Organization. (1993). Technical conference on tropical urban climates (Dhaka, Bangladesh), 28 March - 2 April 1993: extended abstracts. World Meteorological Organization. World Climate Programme: Applications and Services, WCASP 24. WMO/TD-No. 538. 104 p. ALL; T; *ALL .*

Xiuxian Li et al. (1993). The effects of two types of clothing on seasonal cold acclimation of thermophysiological responses. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 3: 840-845, UBCL; GU.

Yamashita, Shuji. (1993). On the generalization of the urban climates from the climageographical point of view. Japanese Progress in Climatology, GUC; GU; *Urban climates; Urban heat islands.*

Yamashita, Shuji et al. (1993) Diurnal and annual variations of heat island intensity and their relationships with causative factors. Proceedings of the 13th International Congress of Biometeorology. Part 2 volume 3: 819-829, GUC; ML.

Yazdani, Nur; Kadnar, Joy O. (1993). Effect of wind on coastal construction in Florida. Journal of Coastal Research, 9(4): 1054-1064, UP; ML; *Design winds; Wind effects on building design;*

Abdali, Fatima Kh.; Nasrallah, Hassan A. (1994). The effect of oil fires in the maximum and minimum temperatures in Kuwait City. Atmospheric Environment, 28(13): 2227-2278, QUA; ST; *Atmospheric pollution by fires; Oil fire pollution Atmospheric pollution effects on temperature.*

Addison, Doug. (1994). Comfort zones: smart designs yield homes that work with their climate. Weatherwise, 47(3): 14-21. UP; ML; *Indoor climates; Building climatology; Building design.*

Adebayo, Yinka R. (1994). Some observations on characteristics of rainfall in two African cities. Report of the Techical Conference on Tropical Urban Climates. TD-No. 647. 3-27. GUC; T;

Ahmed, Nawshad; Karim, Rafiul. (1994). Industrial wastes pollution: a case study of Hazaribagh area of Dhaka city. Report of the Technical Conference on Tropical Urban Climates. WMO. TD-No. 647. 233-244. UH; T;

Ahmed, Rafique. (1994). In search of the impact of urbanization on the the thermal environment of the city of Dhaka, Bangladesh during the pre-monsoon hot season from 1948 throught 1987. Report of the Technical Conference on Tropical Urban Climates. WMO. TD-No. 647. 295-315. UBCL; T;

Al-Saleh, I. A. (1994). Lead concentration in the atmosphere and soil of Riyadh, Saudi Arabia. Sciente of the Total Environment, 141(1-3): 261-267, QUA; ST; *Lead content of air; Lead content of soil;*

Alam, Kazi N.; Ullah, Salim. (1994). Reduction of heat transmission through building envelope: strategy for replacement of building elements. Report of the Technical Conference on Tropical Urban Climates. WMO. TD-No. 647. 395-412. EUC; T;

Alexander, Joachim. (1994). Bewertung von Klima und Luft bei Umweltverträglich keitsprüfungen. [Evaluation of climate and air quality in environmental compatibility tests.] Meteorologische Zaitschrift, 3(3): 111-115, PhMUC; ML; *Urban climates; Urban atmospheric pollution; Urban bioclimatology.*

Ara H., Shamim. (1994). A system of presenting climatic information for building design applications. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No 647. 329-338. UP; GU;

Arnfield, A. John; Mills, Gerald M. (1994). An analysis of the circulation characteristics and energy budget of a dry, a symmetric, east-west urban canyon. Circulation. International Journal of Climatology, 14(2): 119-134, EUC; ML; *Airflow in street canyons; Energy budget of street canyons.*

Arnfield, A. John; Mills, Gerald M. (1994). An analysis of the circulation characteristics and energy budget of a dry, asymmetric, east-west urban canyon. II: Energy budget. International Journal of Climatology, 14(3): 239-261, EUC; ML; *Energy budget of street canyons;*

Asaduzzaman, A. (1994). Impact of climate change on urbanization and urban society in Bangladesh. Report of the Tecnical Conference on Tropical Urban Climates. WMO, TD-No. 647. 59-69. GUC; ST;

Aziz-Ul Huq, Abu; Ara Hassan, Shamim. (1994). Global solar radiation on horizontal surface in Dhaka. Report of the technical conference on tropical urban climates. WMO, TD-No. 647. 517-531. EUC; T;

Baroncelli, A. et al. (1994). Air pollution recorded in Milan by a DOAS system. In: Baldasano, J. M., et al., Air pollution II. Vol. 1: computer simulation, Vol. 2: pollution control and monitoring. Computational Mechanics Publications QUA; ML; *Urban atmospheric pollution; Meteorological influences on air pollutants;*

Barros, Vicente; Camilloni, Inés. (1994). Urban biased trends in Buenos Aires mean temperature. Climate Research, 4(1): 33-45, April. GUC; ML; *Urban influences on temperature;*

Bittencourt, Leonardo. (1994). Low energy buildings in warm-humid regions: the use of perforated blocks. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 317-327. EUC; T;

Blazejczyk, K. and B. Krawczyk (1994). Bioclimateic Research based on man-environment heat exchange. In Brazdil and Kolar (eds) Contemporaty Climatology. Proceed. of the IGU Conference. Brno, Czech Republic. 55-60 UBCL; ML; *Human heat exchange; heat balance models;*

Bornstein, R; D. Dismachek and I. Imamura. (1994). Remote and in-situ measurements of Sacramento Urban Heat Islands. 1994 AAG Annual Meeting Abstracts (34) RSUC; ML; *Surface radiative temperatures; urban heat island; multispectral digital imagery.*

Borrego, C.; Coutinho, M.; Barros, N. (1994). Atmospheric pollution in the Lisbon airshed. In: Power, H.; Moussiopoulos, N. and Brebia, C.A.(eds) Urban air pollution: volume I. Computational Mechanics Publications. p. 101-136. QUA; ML; *Urban atmospheric pollution.*

Bower, J. S. (1994). Winter NO2 smog episode in the U.K. Atmospheric Environment, 28(3): 461-475. QUA; ML; *Nigrogen dioxide in urban air;*

Campolieti, D. et al. (1994). Measurement of turbidity parameters (AMAMILANO 93 first results). Il Nuovo Cimento. C: Geophysics and Space Physics, 17C(5): 625:634, PhUC; ML; *Turbidity parameters; Optical thickness of aerosols; Milan, Italy.*

Caratalis, C.; Varotsos, C. (1994). Surace ozone in Athens, Greece, at the beginging and the end of the twentieth century. Atmospheric Environment, Part A: General Topics, 28(1): 3-8, QUA; ML; *Ozone variations at ground level; Ozone in urban air; Secular onoze variations;*

Carter, Cyril. (1994). Few-day solar radiation cycles and their use in building simulation. Solar Energy, 53(5): 461-465. UP; GU; *Radiation effects on buildings; Heating requirements.*

Carvalho, Renato A. C. (1994). Air quality and meteorological study in a tropical urban area (Macau). Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 533-540. QUA; T;

Cha, Chang-Chuan; Lin, Shou-Hsiang; Her, Guor-Rong (1994). Office workers exposure to volatile organic compounds while commuting and working in Taipei City. Atmospheric Environment, 28(14): 2351-2359. QUA; ST; *Volatile organic compounds in atmosphere; Urban atmospheric pollution; Atmospheric pollution;*

Chan, E. B. A.; Tso, C. P.; Hashim, M. A. (1994). Urban thermal environmental studies in Kuala Lumpur. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 541-572. EUC; T;

Chen, Chang-He et al. (1994). Radiative effectsof urban aerosols and their influence on mixed layer development. Chinese Science Bulletin, 39(1): 56-61. PhMUC; ML; *Aerosol effects on radiation; Boundary layer over areas;*

Chock, D. P. et al (1994). Urban ozone air quality impact of emissions from vehicles using reformulated gasolines and M85. Atmospheric Environment, 28(17): 2777-2787, QUA; GU; *Ozone formation; Ozone in urban air; Ozone-atmospheric pollution relationships; Atmospheric pollut*

Choudhury, A. M.; Haque, M. A. (1994). Design of buildings and structures in urban areas taking into consideration the disastrous climate of Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 127-129. UP; T;

Choudhury, Jamilur R. (1994). The impact of natural disasters on urban infraestructure. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 139-148. UP; T;

Conlan, D. E. et al. (1994). Temporal and spatial patterns of nitrogen dioxide concentration in the conurbation of Greater Manchester. In: Baldasano, J. M. et al., Air pollution II. Vol. 1 and 2. Computational Mechanics Publications. QUA; ML; *Nitrogen dioxide measurements; Nitrogen dioxide in urban air;*

Cooper, D. I.; Eichinger, W. E. (1994). Structure of the atmosphere in an urban planetary boundary layer from lidar and radisonde observations. Journal of Geophysiscal Research, 99(D11): 22937-22948. PhUC; T; *Boundary layer over urban areas; Boundary layer flow;*

Davgun, S. (1994). Environment Pollution and its effects on health in Delhi, India. 1994 AAG Annual Meeting Abstract. (75). QUA; T; *Urban pollution; health; Delhi.*

Davidson, A. (1994). The Los Angeles aerosol characterization and source apportionment study: a meteorological-air quality analysis. Aerosol Science and Technology, 21(4): 269-282, QUA; ML; *Hydrogen peroxide in atmosphere;*

Delfino, Ralph, J. (1994). Estimation of unmeasured particulate air pollution data for an epidemiological study of daily respiratory morbidity. Environmental Research, 67(1): 20- 38, October. UBCL; ML; *Atmospheric pollution estimation; Particulate atmospheric pollution; Atmospheric poll. and healt.*

Devara, P. C. S. et al. (1994). Lidar-observed long-term variations in urban aerosol characteristics and their connection with meteorological parameters. International Journal of Climatology, 14(5): 581-591. QUA; ST; *Aerosol in urban areas; Aerosols-meteorological parameter relationships;*

Djen, Chow Shu; Jingchun, Zheng; Lin, Wu. (1994). Solar radiation and surface temperature in Shangai City and their relation to urban heat island intensity. Atmospheric Environment, 28(12): 119-2127.EUC; ST; *Urban heat islands;*

Dousset, Benedicte. (1994). Satellite observations of urban microclimates and their relationship to land use. 1994 AAG Annual Meeting Abstracts. (89). RSUC; ML; *Urban climatology; remote sensing.*

Eliasson, Ingegärd. (1994). Urban-suburban-rural air temperature differences related to street geometry. Physical Geography, 15(1): 1-22. EUC; GU; *Urban influences on temperature; Street canyons temperatures.*

Enam, Khairul. (1994). Application of passive cooling methods in the microlevel of Dhaka City, Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 427-433. EUC; T;

Endlicher, W. and E. Schultz. (1994). Local climate and air pollution at Tucumán/Argentina. In Brazdil and Kolar (eds). Contemporaty Climatology. Proceed. of the IGU. Brno, Czech Republic. 191-196. QUA; ST; *Urban climate; air pollution;*

Escada, R. (1994). Urban Climatology Modeling in Urban Design: Integration Architecture. 1994 AAG Annual Meeting Abstracts. (55). UP; GU; *Urban climate modeling; urban design.*

Faiers, Gregory E. (1994). An evaluation of urban-enhanced extreme 24-hour rainfall in the New Orleans area. National Weather Digest, 19(2): 25-30, GUC; ML; *Heavy rainfall; Urban influences on precipitation;*

Ferrándiz, José V. Colomer. (1994). Integrated freght transportation centers; influence on the decrease in environmental effects in urban areas. Sciente of the Total Environment, 146/147: 59-65, QUA; ML; *Urban atmospheric pollution; Atmospheric pollution by motor vehicles.*

Fouli, R. S. (1994). Effect of urbanization on some meteorological elements in greater Cairo region. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 471-496. GUC; T;

Fujibe, Fumiaki. (1994). Long-term failing trends of pressure over the Kanto plain as evidence of increasing heat content in the lower atmosphere in the daytime of the warm season. Journal of the Meteorological Society of Japan, 72(5): 785-792, GUC; ML; *Temperature trends; Pressure trends; Urban influences on temperature.*

Gadgil, Alaka S.; Deosthali, Vrishali. (1994). Temperature fields of Pune city. Current Science, 66(4): 297-299, GUC; ST; *Urban temperature distribution;*

Gallo, K. and J. D. Tarpley (1994). Urban heat island assessment with satellite data: progress and prospects. 1994 AAG Annual Meeting Abstracts. (117). RSUC; ML; *Urban climatology, remote sensing, satellite climatology.*

Ghauri, Badar; Salam, Manzar; Mirza, M. Ishaq. (1994). An assesment of air quality in Karachi, Pakistan. Environmental Monitoring and Assessment. 12(1): 37-45, QUA; ST; *Air quality; Atmospheric pollution surveys;*

Goma, Willy S. (1994). Seasonal weather events and their related impacts on building and settlement. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 391-393. UP; T;

Grasser, E. A. and H. Xia. (1994). A comparison of the microclimate in three shade environments. AMS. 21st Conference on Agricultural and Forest Meteorology. 11th Conference on Biometeorology and Aerobiology. 42-45. EUC; ST.

Gross, Günter; Röckle, Rainer; Janssen, Ulrike. (1994). ASMUS-Ein numerisches Modell zur Berechnung der Strömung un der Schadstoffverteilung im Bereich, [A numerical model for simulations of wind and pollutant dispersion around individual buildings I: wind field Meteorologische Zeitschrift, 3(5): 267-274. PhMUC; GU; *Airflow around buildings; Bulding effects on wind;*

Gupta, R. N. (1994). A study of effects of urbanisation on atmospheric diffusion meteorological parameters. Report of the Tecnical Conference on Tropical Urban Climates. WMO, TD-No. 647. 71-81. PhUC; T;

Gusten, H. et al. (1994). Ozone formation in the greater Cairo area. Sciente of the Total Environment, 155(33): 285-295, QUA; ST; *Ozone formation; Ozone in urban air;*

Heida, H.; de Jong, A. L.; Muchall, R. C. (1994). Traffic-related environmental impact mapping in downtown Amsterdam. In Baldasano, J. M. et al., Air pollution II. Vol. 1: computer simulation, Vol 2: Pollution control and monitoring. Computational Mechanics Publications. QUA; ML; *Urban atmospheric pollution; Noise surveys in urban areas; Atmospheric pollution by motor vehicles.*

Heisler, G. (1994). Modeling tree and building effects on microclimate in residential areas. 1994 AAG Annual Meeting Abstracts. (151). EUC; ML; *Urban climate; meteorology, tree influences.*

Hogland, William. (1994). Hydrological and environmental effects of agricultural and urban activities in a small Swedish river basin. Nordic Hydrology, 25(4): 247-266, PhUC; ML; *Urban influences on river water; Land use effects on river water;*

Hossain, Akram; Nooruddin Mohammed; Nessa, Begum. (1994). Human comfort in the urban areas of Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 205-231. UBCL; T;

Hossain, Ershad; Nooruddin, Md. (1994). Some aspects of urban climates of Dhaka City. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 497-516. GUC; T;

Hoydysh, Walter G.; Dabberdt, Walter F. (1994). A fluid modeling study of concentration distributions at urban intersections. Sciente of the Total Environment, 146/147: 425-432, PhMUC; GU; *Urban atmospheric pollution.*

Hoydysh, Walter G.; Dabberdt, Walter F. (1994). Concentration fields at urban intersections: fluid modeling studies. Atmospheric Environment, 28(11): 1849-1860, QUA; GU; *Dispersion in urban areas; Street canyon pollution*

Hubble, D. M. (1994). Assessment of near-surface climate using landsat thematic mapper in an urban area. 1994 AAG Annual Meeting Abstracts. (167) RSUC; ML; *Remote sensing; urban climatology.*

Hussain, Amirul; Sultana, Nahid; Ahmed, Shamsuddin (1994). A study on the physical relationship and interaction between urban and rural climates in Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 29-56. GUC; ST;

Imamuddin, Abu.; Aziz-Ul, Huq, Ansary; Bikash S.; Raihan A. Muhammad. (1994). Application of hollow roof tiles for passive solar heat control in tropical climates. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 343-355. EUC; T;

Imamura, I. R. (1994). Urban oases and forests and the urban planning process. 1994 AAG Annual Meeting Abstracts, (173). UP; GU; *Urban heat islands; urban forests, urban oases.*

Izquierdo, M.; Hernández, F.; Martín, E. (1994). Solar cooling in Madrid: available solar energy. Solar Energy, 53(5): 431-443, EUC; ML; *Solar energy;*

Jendritsky, G.; Gratz, A.; Schultz, E.; Endlicher W. (1994). Urban bioclimatology. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 245-264. UBCL; GU;

Johnson, Gregory L. (1994). Estimating urban temperature bias using polar-orbiting satellite data. Journal of Applied Meteorology, 33(3): 358-369, RSUC; ML; *Urban temperatures; Satellite temperature estimates.*

Jáuregui, E. (1994). Areal and temporal humidity variations in Mexico City. In Brazdil and Kolar (eds) Contemporary Climatology. Proceed. of the IGU Conference. Brno, Czech Republic. 287-292. GUC; T; *Urban climate; specific humidity; tropical cities.*

Jáuregui, E. and e. Romales. (1994). Urban effects on convective precipitation in Mexico city. 1994 AAG Annual Meeting Abstracts. (177) GUC; T; *Urban climate; urban precipitacion.*

Kadowaki, Satoshi. (1994). Characterization of carbonaceous aerosols in the Nagoya urban area. 2: Behavior and origin of particulate n-alkanes. ES&T, 28(1): 129-135, QUA; ML; *Aerosols in urban areas; Aerosol composition; Carbon particle sources;*

Karmakar, Samarendra; Khatun, Ayesha. (1994). On the variability and probabilistic extremes of some climatic elements over Dhaka. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 177-204. GUC; T;

Khaleque, M.A.; Habib, Arjumand; Ahmed, Shamsuddin (1994). Eco-climatic features of Dhaka city due to urbanization. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 521-531. GUC; T;

Kobayashi, Takahisa; Takamura, Tamio. (1994). Upward long-wave radiation from a non-black urban canopy. Boundary-Layer Meteorology, 69(1-2): 201-213, PhMUC; GU; *Radiation from urban areas.*

Kozuchowski, Krzysztof; Trepinska, Janina; Wibig, Joanna. (1994). The air temperature in Cracow from 1826 to 1990: persistence, fluctutations and the urban effect. International Journal of Climatology, 14(9): 1035-1049, GUC; ML; *Temperature regime; Secular temperature variations; Urban influences on temperature;*

Kretzchmar, J. G. (1994). Particulate matter levels and trends in Mexico City, Sao Paulo, Buenos Aires and Rio de Janeiro. Atmospheric Environment, 28(19): 3181-3191, QUA; ST; *Atmospheric pollution monitoring; Atmospheric pollution trends; Particulate pollutants;*

Kuo, Yu-Mei; Li, Chih-Shan. (1994). Seasonal fungus prevalence inside and outside of domestic environments in the subropical climate. Atmospheric Environment, 28(19): 3125-3130, UBCL; ST; *Fungi in air; Indoor air pollution;*

Kupiszewska, D.; Pior, K.; Pilling, M. J. (1994). Information system on urban air pollution. In: Zannetti, P. (ed.), Computer techniques in environmental studies 5. Vol. I: Pollution modeling and Vol. II: Environmental systems. Computational Mechanics Publications. QUA; ML; *Urban atmospheric pollution; Electronic computer applications to atmospheric pollution problems;*

Kyle, W. J. (1994). The human bioclimate of Hong Kong. In Brazdil and Kolar (eds). Contemporaty Climatology. Proceed. of the IGU. Brno, Czech Republic. 345-350. UBCL; ST; *Climate change, human bioclimate.*

Lecha E., Luis; Proveda, María Nieves; Paz C. Luis (1994). Investigations on urban climate in cuba. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 367-375. GUC;T;

Lee, D. S.; Longhurst, J. W. S. (1994). The urban modification of acid deposition. Idójárás, 98(2): 87-106, QUA; ML; *Precipitation composition; Acid precipitation; Urban influences on precipitation;*

Lee, I. Y.; Park, H. M. (1994). Parametrization of the pollutant transport and dispersion in urban street canyons. Atmospheric Environment, 28(14): 2343-2349, PhMUC; GU; *Dispersion in urban areas; Street canyon pollution*

Lee, Whei-May Grace; Tsay, Lin-Y. (1994). The partitioning model of polycyclic aromatic hydrocarbon between gaseous and particulate (PM10m) phases in urban atmosphere with high humidity. Science of the Total Environment, 145(1&2):163-171, QUA; ST; *Humidity-atmospheric pollution relationships; Hydrocarbons in air;*

Leporati, Ezio; Merclali, Luca. (1994). Snowfall series of Turin, 1784-1992: climatological analysis and acid on on structures. Annals of Glaciology, 19:77-84 UP; ML; *Long-period snowfall records; Snowfall regime; Snowfall trends;*

Liu, Jyh-Jian; Chan, Chang-Chuan; Jeng, Fu-Tien. (1994). Predicting personal exposure levels to carbon monoxide (CO) in Taipei, based on acutal comeasurements in microenvironments and a Monte Carlo simulation method. Atmospheric Environment, 28(14): 2361-2368, QUA; ST; *Carbon monoxide in urban air; Atmospheric pollution effects on health;*

Loranger, Sylvain; Zayed, Joseph; Forget, Eric. (1994). Manganese contamination in Montreal in relation with traffic density. Water, Air, & Pollution, 74(3-4): 385-396, QUA; ML; *Atmospheric pollution by motor vehicles; Manganese in atmosphere;*

Lorente, J.; Redaño A.; de Cabo, X. (1994). Influence of urban aerosol on spectral solar irradiance. Journal of Applied Meteorology, 33(3): 406-415, QUA; ML; *Aerosol effects on radiation; Aerosol effects on ultraviolet radiation; Atmospheric pollution effects;*

Mallick, Fuad H. (1994). Shadowing patterns of some typical urban housing layouts in Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 413-426. UP; T;

Marsik, F. J. and P. J. Samson. (1994). Effects on canopy micrometeorology on the turbulent transport within an urban deciduous forest AMS. 21st Conference on Agricultural and Forest Meteorology. 11th Conference on Biometeorology and Aerobiology. 50-51. PhMUC; ML;

Mieth, P.; Unger, S.; Sydow, A. (1994). Scenario analysis of a summer smog episode in Berlin. In: Baldasano, J. M. et al., Air pollution II. Vol. 1: Computer simulation, Vol. 2: Pollution control and monitoring. Computational Mechanics Publications. QUA; ML; *Ozone production; Ozone concentration factors; Smog episodes;*

Miller, Paul R. et al. (1994). Comparison of ozone exposure characteristics in forested regions near Mexico City and Los Angeles. Atmospheric Environment, Part A: General Topics, 28(1): 141-148, QUA; ML; *Ozone concentration near the ground; Ozone effects on trees;*

Mishra, J. K.; Aarathi, R.; Joshi, M. D. (1994). Remote sensing quantification and change direction of natural resources over Delhi. Atmospheric Environment, 28(19): 3131-3137, RSUC; ST; *Deforestation effects on rainfall; Vegetation influences on rainfall; Urban environment;*

Mobashsher A., Alí. (1994). Ventilation and comfort in interior spaces. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 339-341. UBCL; T;

Moore, I. et al. (1994). A numerical model of blowing snow around an Antartic building. Annals of Glaciology, 20: 341- 346. UP; HL;*Snow drifting; Snow loads on buildings; Building design;*

Moreno-García, M. Carmen. (1994). Intensity and form of the urban heat island in Barcelona. International Journal of Climatology, 14(6): 705-710, EUC; ML; *Urban heat islands;*

Munoz Ledo, R. et al. (1994). Ozone isopleths for Mexico City using CBM4 within AQUAMI. In: Baldasano, J. M. et al., Air pollution II, Vol. 1: computer simulation, Vol. 2: pollution control and monitoring. Computational Mechanics Publications. QUA; T; *Ozone in urban air; Ozone-atmospheric pollution relationships; Photochemistry of atm. pollution.*

Nord, Anders G.; Svardh, Anna; Tronner, Kate. (1994). Air pollution levels reflected in deposits on buildings stone. Atmospheric Environment, 28(16): 2615-2622, QUA; ST; *Atmospheric pollution deposition; Atmospheric pollution damage to buildings;*

Ohta, Satio. (1994). Concentrations of atmospheric aerosols and sulfur dioxide in the Persian Gulf urban area of Iran. Journal of the Meteorological Society of Japan, 72(2): 337-340, QUA; ST; *Aerosol composition; Aerosol in urban areas; sulfur dioxide in urban air.*

Ojo, O. (1994). Implications of global warming and climate change on urban planning and building operations in west and central Africa. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 547. 573-575. UP; T;

Oke, Tim R. (1994). Moisture exchange mechanisms over a patchy suburban surface. 1994 AAG Annual Meeting Abstracts, (280). EUC; ML; *Evaporation-urban; urban climatology; atmospheric turbulence.*

Ovanesyants, A. M; Belova, N. A.; Savel'yev, V. A. (1994). O zagryaznenii okruzhayuschey sredy i radiatsion-noy obstanovke na territorii Rossii v iyle 1994. (On the environment pollution and the radiation situation in Russia in July 1994 (of. stat. Rgdmt.)) Meteorologiya i Gidrologiya, 10: 116-117, QUA; HL; *Atmospheric pollution; Radioactive contamination; Environmental pollution;*

Padmanabhamurty, B. (1994). Tropical urban climate- a scientific challenge. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 449-470. EUC; T;

Padmanabhamurty, B.; Bandopadhyay, D. (1994). Radiation balance in a tropical city-Delhi (India). Boundary-Layer Meteorology, 70(1-2): 197-210, EUC; T; *Urban influences on radiation; Radiation balance of urban areas;*

Pandey, J; Agrawal, M. (1994). Diurnal seasonal variations in air pollutant concentrations in a seasonally dry tropical urban environment. Current Science, 66(4): 299-303, QUA; T; *Urban atmospheric pollution; Diurnal atmospheric pollution variations; Seasonal atmospheric var.*

Pfeffer, Hans-Ulrich. (1994). Ambient air concentrations of pollutants at traffic-related sites in urban areas of North Rhine Westphalia, Germany. Science of the Total Environment, 146/147: 263-273, QUA; ML; *Atmospheric pollution monitoring; Atmospheric pollution by motor vehicles;*

Plesko, Nada et al. (1994). Weather conditions and the sino-bronchial syndrome in children in Zagreb. Croatian Meteorological Journal, 29: 1-10. UBCL; ML; *Weather effects on respiratory diseases;*

Pönka, A.; Virtanen, M. (1994). Chronic bronchitis, emphysema, and low-level air pollution in Helsinki, 1987-1989. Environment Research, 65(2): 207 - 217, UBCL; HL; *Atmospheric pollution-respiratory disease relationships;*

Quatrocchi, Dale A. (1994). Thermal remote sensing for characterization of landscape influences on the urban climate. 1994 AAG Annual Meeting Abstracts. (309). RSUC; ML; *Urban energy balance; thermal remote sensing; urban landscape.*

Ridd, Merril K. (1994). Characterizing urban ecosystems. 1994 AAG Annual Meeting Abstracts, 317. GUC; ML; *Urban ecosystems; biophysical composition.*

Rosenfeld, Jeff. (1994). Safety factors: your home can be built to withstand worse winds than you thought. Watherwise, 47(3): 22-26, UP; ML; *Hurricane 'Andrew' (1992); Hurricane damage to buildings; Building construction.*

Rotach, M. W. (1994). Determination of the zero plane displacement in an urban environment. Boundary-Layer Meteorology, 67(1-2): 187-193, PhUC; GU; *Airflow in urban areas.*

Roth, M.; Oke, T. R. (1994). Comparison of modelled and "measured" heat storage in suburban terrain. Contributions to Atmospheric Physics, 67(2): 149-156, EUC; ML; *Urban heat storage.*

Salerno, R.; Vignati, E. (1994). Evaluation of the trasport and diffusion of pollutants over an urban area using a local-scale advection-diffusion model and a sub-grid street model. In: Zannetti, P. (ed.) Computer techniques in environmental studies 5. Vol. I and Vol. II., Computational Mechanics Publications. QUA; GU; *Urban atmospheric pollution; Atmospheric pollution dispersion; Dispersion in urban areas;*

Sánchez, M. L.; Sánz, J. (1994). Application of discriminant analysis to interpret the behaviour of photochemical oxidants in an urban area. Atmospheric Environment, 28(6): 1147-1157, QUA; ML; *Urban atmospheric pollution; Atmospheric pollution chemistry; Ozone formation; Photochemical oxidant.*

San Jose, R. et al. (1994). Photochemical air polution model for the Madrid area. In: Zannetti, P. (ed.), Computer techniques in environmental studies 5. Vol. I:Pollution modeling, Vol II: Environmental Systems. Computational Mechanics Publications. QUA; ML; *Atmospheric pollution models; Photochemical atmospheric pollution.*

Sarma, Bijon B. (1994). Traditional architecture and its application in urban area focusing on Khulna City. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 283-293. UP; T;

Schiller De, Silvia; Evans, John M. (1994). Climate responsive urban development in tropical cities: training and practice. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 357-364. UP; T;

Schuster, P. F.; Reddy, M. M.; Sherwood, S. I.; (1994). Effects of acid rain and sulfur dioxide on marble dissolution. In: Krumbein, Wolfgang E., et al. (eds.)."Durability and change: the science, responsability, and cost of sustaining cultural heritage" (Dahlem Workshop Reports: Environment Sciences Research Reports, ES 15). West Sussex, England, John Wiley & Sons, Inc. QUA; GU; *Atmospheric pollution damage to building; Acid precipitation damage to buildings;*

Shamsuddin, Dara. (1994). Rainfall in Dhaka City and aspects of its drainage system development: a historial perspective. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-NO. 647. 97-102. UH; T;

Simpson, R. W.; Xu, Hongchang. (1994). Atmospheric lead pollution in an urban area-Brisbane, Australia. Atmospheric Environment, 28(19): 3073-3082, QUA; ST; *Lead content of air;*

Soler, M. R.; Ruiz, C. (1994). Urban albedo derived from direct measurements and LANDSAT 4 TM satellite data. International Journal of Climatology, 14(8): 925-931, RSUC; ML; *Albedo of urban areas;*

Spronken-Smith, Rachel A. (1994). Energetics of suburban parks in different climates 1994 AAG Annual Meeting Abstracts, (361). EUC; ML; *Climatology-urban; energy balance-park; evaporation-urban.*

Stettler, M.; von Hoyningen-Huene, W. (1994). Three years of aerosol extinction measurements with a He-Ne-lasser in the urban boundary layer of Leipzig, Germany. Contributions to Atmospherics Physics, 67(3): 169-180, QUA; ML; *Aerosol extinction; Turbidity in urban areas;*

Striebel, T.; Daub, J.; Herrman, R. (1994). A sampling device for measuring physical and chemical characterisitcs of urban street runoff. Sciente of the Total Environment, 146/147: 515-523, UH; GU; *Runoff formation.*

Subramanyam, V. et al. (1994). Gas-to-particle partitioning of polycyclic aromatic hydrocarbons in an urban atmosphere. Atmospheric Environment, 28(19): 3083-3091, QUA; ML; *Aerosol formation; Hydrocarbons in air;*

Susan, Mains. (1994). Permeable spaces: special places to hide and seek. 1994 AAG Annual Meeting Abstracts, (252). UP; ML; *Urban design; gender; neighbourhoods.*

Trier, A.; Firinguetti, L. (1994). A time series investigation of visibility in an urban atmosphere. Y. Atmospheric Environment, 28(5): 991-996, QUA; ML; *Visibility in urban areas; Visibility in forecasting.*

Tripathi, Anamika. (1994). Airborne lead pollution in the city of Varanasi, India. Atmospheric Environment, 28(14): 2317-2323, QUA; ST; *Lead content of air;*

Tso, C. P. (1994). The impact of urban development on the thermal environment of Singapore. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 269-280. UBCL; T;

Unger, J. and A. Csaki (1994). Temperature characteristics of an urban local climate. In Brazdil and Kolar (eds) Contemporaty Climatology. Proceed. of the IGU. Brno, Czech Republic. 550-557. GUC; ML; *Heat island intensity; weather type; cloudiness; wind speed; urban station network.*

Viet L., Tran. (1994). Climate zoning for building and urban planning in Vietnam. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 163-175. UP; T;

Voogt, James A. (1994). Thermal remote sensing of the three-dimensional urban surface. 1994 AAG Annual Meeting Abstracts, (390). RSUC; GU; *Urban climatology; remote sensing.*

Wang, Cunzhong. (1994). Spectral characteristics of surface-layer turbulence over the suburbs of Tianjin. Acta Meteorologica Sinica, 8(2): 220-228. PhMUC; ST; *Turbulent diffusion of pollutants.*

Wilson, David, J.; Lamb, Brian K. (1994). Dispersion of exhaust gases from roof-level stacks and vents on a laboratory building. Atmospheric Environment, 28(19): 3099-3111, QUA; GU; *Atmospheric pollution dispersion; Building effects on diffusion;*

Word Meteorological Asociation. (1994). Report of the Technical Conference on Tropical Urban Climates, 28 March-2 April,1993, Dhaka, Bangladesh. WMO World Climate Programme: Applications and Services. WCASP-30. TD-No. 647. Geneva, Switzerland. GUC; GU; *Urban climatology simposia.*

Wu, Lin. (1994). Simulation of surface radiation balance in the CBD area of downtown Los Angeles. 1994 AAG Annual Meeting Abstracts, 420. EUC; ML; *Climate-urban; simulation-radiation; gis-model.*

Xu. P. et al. (1994). An economic input-output analysis for urban stormwater quality planning. Water Resources Management, Dordrecht, 8(2): 155-170, 1994. UP; GU; *Runoff water pollution; Runoff form urban areas.*

Yang, Xingwei; Zhou, Hongmei; Lou, Meng. (1994). The application of meteorological satellite data in the temperature distribution analysis in Pudong New Area of Shangai. Journal of Applied Meteorology, 5(3): 369-373, RSUC; ST; *Urban temperature distribution; Satellite temperature estimates;*

Yoshikado, Hiroshi. (1994). Interaction of the sea breeze with urban heat islands of differnte sizes and locations. Journal of the Meteorological Society of Japan, 72(1): 139-143, PhMUC; GU; *Urban heat islands; Sea breeze effects on urban heat islands.*

Yoshino, Masatoshi (1994). Urban systems in a large-scale climate context. Report of the technical conference on tropical urban climates. WMO, TD-No. 647. 83-94. GUC; GU;

Zaninovie, Ksenija. (1994). FIzikalna osnova za bioklimatsku klasifikaciju Hrvatske. (Bioclimatic classification of Croatia). Croatian Meteorological Journal, 29: 80. UBCL; ML; *Bioclimatology of Croatia;*

Agarwal, P. et al. (1995). Surface layer turbulence processes in low wind speeds over land. Atmospheric Environment, 29(16): 2089-2098, PhUC; T; *Boundary layer turbulence; boundary layer turbulent diffusion.*

Al-Temeemi, A. S. (1995). Climatic design techniques for reducing cooling energy consumption in Kuwaiti houses. Energy and Buildings 23: 41-48. EUC; T;

Alary, Rene; Donati, Jacques; Viellard, Henri. (1995). La pollution automobile a Paris influence du traffique et des conditions meteorologiques. (The influence of car exhaust and meteorological conditions on air quality in Paris). Science of the Total Environment, 169: 53-61, QUA; ML; *Atmospheric pollution by motor vehicles; Meteorological influences on air pollutants;*

Arnfield, A. J.; Johnson, G. T. (1995). Coupled energy budget, windfield and dispersion model simulations in urban canyons. 1995 AAG Annual Meeting Abstracts: (12). PhMUC; GU; *Urban climate; urban canyons simulation.*

Ashie, Yasunobu. (1995). A predictive model of urban climate for the land utilization. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 43-46, PhMUC; ML.

Bao, Baotang; Shu, Jiaxin; Zhu, Binquan. (1995). Study of physicochemical properties of urban fog in Shangai. Journal of Nanjing Institute of Meteorology, 18(1): 114-118. QUA; ML; *Fog physics; Fog chemistry; Urban fog;*

Bashylkov, V. M. et al. (1995). Investigation of the NO2 and O3 daily varitions in the Moscow atmosphere using the spectral optical ray path method. Izvestiya Atmospheric and Oceanic Physics, 30(1): 50-56. QUA; HL;*Nitrogen dioxide in urban air; Ozone in urban air;*

Baumbach, G. et al. (1995). Air pollution in a large tropical city with a high traffic density: results of measurements in Lagos, Nigeria. Science of the Total Environment, 169: 25-31, QUA; T; *Atmospheric pollution by motor vehicles; Atmospheric pollution and healt;*

Boybeyi, Zafer; Raman, Sethu; Zannetti, Paolo. (1995). Numercial investigation of possible role of local meteorology in Bhopal gas accident. Atmospheric Environment, 29(4): 479-496, QUA; T; *Gas dispersion; Urban influences on atmospheric dispersion;*

Camilloni, Ines; Barros, Vicente. (1995). Influencia de la isla urbana de calor en la estimación de las tendencias seculares de la temperatura en Argentina subtropical. Geofisica Internacional, 34(2): 161-170, EUC; ML;*Temperature trends; Urban temperatures,;*

Chiquetto, Sergio; Mackett, Roger. (1995). Modelling the effects of transport policies on air pollution. Sciente of the Total Environment, 169: 265-271, QUA; ML; *Atmospheric pollution by motor vehicles; Urban Atmospheric pollutions;*

Coursimault, Annie; Donati, Jacques; Viellard, Henri. (1995). La pollution automobile due aux hydrocarbures aromatiques monocycliques a Paris. (Mobile source pollution due to monocyclic aromatic hydrocarbons in Paris). Sciencce of the Total Environment, 169: 17-23, QUA; ML; *Atmospheric pollution by motor vehicles; Hydrocarbons in air;*

Dabbertdt, W. et al. (1995). Dispersion modeling at urban intersections. Science of the Total Environment, 169: 93-102, QUA; GU; *Urban atmospheric pollution; Dispersion in urban areas; Dispersion models.*

Debnath Arabinda, Singh V. S.; Singh P. Y. (1995). Comparative assessment of energy requirements for different types of residential buildings in India. Energy and Buildings, 23: 141-146. EUC; T; *Residential buildings; energy requirements.*

Derwent, R. G. et al. (1995). Analysis and interpretation of air quality data from an urban roadside location in central London over the period from July 1991 to July 1992. Atmospheric Environment, 29(8): 923-946, QUA; ML; *Urban atmospheric pollution; Atmospheric pollution sources; Atmospheric pollution episodes;*

Donev, E. et al. (1995). Boundary layer growth and lapse rate changes determined by lidar and surface heat flux in Sofia. Acta Meteorologica Sinica, 9(1): 101-111. PhUC; ML; *Boundary layer over urban areas; Boundary layer height; Lapse rates;*

Dounis, A.I.; M.J. Santamouris; C.C. Lefas; A. Argiriou. (1995). Design of a fuzzy set environment comfort system. Energy and Buildings, 22: 81-87. PhMUC; GU; *Thermal comfort; visual comfort; fuzzy control theory; expert system.*

Emeis, Stefan. (1995). The variation of mean flow and turbulence over a small escarpment. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 37-41, PhUC; ML.

Epperson, David L. et al. (1995). Estimating the urban bias of surface shelter temperatures using upper-air and satellite data.Part II.: Estimation of the urban bias. Journal of Applied Meteorology, 34(2): 358-370, RSUC; ML; *Temperature normals; Terrain effects on temperature;*

Eritt, Jurgen. (1995). Harvesting the sun. German Research Service, Special Science Reports, 11(5): 7-8, UP; ML;*Short-wave radiation balance; Satellite radiation budget investigations.*

Fernandez-Bremauntz, Adrian A.; Ashmore, Michael R (1995). Exposure of commuters to carbon monoxide in Mexico City. I. Measurement of in-vehicle concentrations. Atmospheric Environment, 29(4): 525-532, QUA; ST; *Carbon monoxide in urban air;*

Fiedler, F. (1995). Numerical simulation of the energy budget in urban areas. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 17-23, PhMuc; ML.

Fung, Y. S.; Wong, L. W. Y. (1995). Apportionment of air pollution sources by receptor models in Hong Kong. Atmospheric Environment, 29(16): 2041-2048, QUA; ST; *Atmospheric pollution sources;*

Gallo, K. P. et al. (1995). Assessment of urban heat islands: a satellite perspective. Atmospheric Research, 37(1-3): 37-43, RSUC; GU; *Urban heat islands; Satellite detection of urban heat islands.*

Gan, Guohui. (1995). Numerical investigation of local thermal discomfort in offices with displacement ventilation. Energy and Buildings, 23: 73-81. UBCL; GU; *Numerical investigation; thermal discomfort; commercial buildings; displacement ventilation.*

Glikson, M. et al. (1995). Microscopic and submicron components of atmospheric particulate matter during high asthma periods in Brisbane, Queensland, Australia. Atmospheric Environment, 29(4): 549-562, QUA; ST;*Particulate matter in urban air; Particulate matter sources; Atmospheric pollution effects;*

Gobmann, H. et al. (1995). Urban climate and city planning. (Some examples in Freiburg I. Brsg.) Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 65-70, UP; ML.

Goldreich, Yair. (1995). Urban climate studies in Israel: a Review. Atmospheric Environment, 29(4): 467-478, GUC; ML; *Urban climates.*

Grätz, A.; Jendritzky, G. (1995). Preliminary climatic study of the Karlsruhe area: Part 1 - Ubiklim, a tool for climatologically- related planning in urban environment. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 143-148, PhMUC; ML.

Grimmond, C. S. B.; Oke, T. R. (1995). Comparison of heat fluxes from summertime observations in the suburbs of four NorthAmerican cities Journal of Applied Meteorology, 34(4): 873-889, EUC; ML; *Energy budget of urban areas;*

Gustavsson, Torbjorn. (1995). A study of air and road-surface temperature variations during clear windy nights. International Journal of Climatology, 15(8): 919-932, UP; HL; *Nocturnal temperatures; Air-road temperature relationships; Shelterbelt effectos on temperature;*

Gutheim, T. L. and A. C. Comrie. (1995). Explaining Interannual Variability in Urban Air Pollution Using Economics Indicators.1995 AAG Annual Meeting Abstracts. (114). QUA; ML;*Air pollution; economic indices; urban air quality*

Hardie, R. Wayne; Thayer, Gary R.; Barrera-Roldan, Adrian. (1995). Development of a methodology for evaluating air pollution options for improving the air quality in Mexico City. Science of the Total Environment, 169: 295-301, QUA; ST; *Atmospheric pollution control;*

Harley, Robert A.; Cass, Glen R. (1995). Modeling the atmospheric concentrations of individual volatile organic compounds. Atmospheric Environment, 29(8): 905-922, QUA; ML; *Air quality models; Volatile organic compounds in atmosphere;*

Hashimoto, T. et al. (1995). Heat flux above the roof of a building by turbulent measurements. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 105-109, EUC; ML.

Hesek, Ferdinand. (1995). Metodika navypocet automobiloveho znecistenia ovdusia. (Methodology for calculation of automobile air pollution. Meteorologicke Zpravy, 48(2): 33-36. QUA; ML; *Atmospheric pollution calculations; Atmospheric pollution by motor vehicles;*

Horikawa, Susumu. (1995). Planning and field measurements of heating and cooling system utilizing natural energy for K Plaza Building. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 87-92, EUC; ML.

Höschele, Darl. (1995). Urban planning in the upper Rhine Valley. The importance of climatic aspects. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 3-8, UP; ML.

Hubble, Mark D. and C. S. B. Grimmond. (1995). Intercomparison of energy balance fluxes in two neighborhoods with differing tree cover: San Gabriel Valley, Los Angeles, California. 1995 AAG Annual Meeting Abstracts. (135) EUC; ML;*Energy balance, urban climatology, vegetation.*

Imhoff, R. E. (1995). The production of O3 in an urban plume: ariborne sampling of the Atlanta urban plume. Atmospheric Environment, 29(17): 2349-2358. QUA; ML; *Ozone production; Ozone in urban air; Ozone-atmospheric pollution relationships;*

Kalogiros, J. A.; Helmis, C. G. (1995). Second-order spectral local isotropy of the humidity and temperature fields in an urban area. Quartely Journal of the Royal Meteorological Society, 121(5223 Part A):545-567, PhUC; GU;*Urban temperature fields; Urban humidity fields.*

Kambezidis, H. D.; Peppes, A. A.; Melas, D. (1995). An environmental experiment over Athens urban area under sea breeze conditions.Atmospheric Research, 36(1-2): 139-156, PhUC; ML;*International boundary layer; Boundary layer over urban areas; Sea-breeze-boundary layer relationship.*

Kaneyasu, Naoki; Ohta, Sachio; Murao, Naoto; (1995). Seasonal variation in the chemical composition of atmospheric aerosols and gaseous species in Sapporo, Japan. Atmospheric Environment, 29(13): 1559-1568, QUA; HL;*Aerosol composition; Urban atmospheric pollution;*

Kaniecki, Alfred. (1995). Przemiany stosunkow wodnych na obszarze Poznania wczasach historycznych. (Transformation of water conditions within the Poznan area in the historical times). Przeglad Geograficzny, 67(1-2): 109-120. UH; ML; *Urban hydrology;*

Karaca, M.; Anteplioglu, U.; Karsan, H. (1995). Detection of urban heat island in Istanbul, Turkey Il Nuovo Cimento. C: Geophysics and Space Physics, 18C(1): 49-55, EUC; ML; *Urban heat islands;*

Katayama, Tadahisa et al. (1995). Contributions of sea breeze and natural coverings to air temperature distribution in a seaside city. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 71-76, GUC;ML.

Keller, J.; Lamprecht, R. (1995). Road dust as an indicator for air pollution transport and deposition: an application of SPOT imagery. Remote Sensing of Environment, 54(1): 1-12, October. QUA; HL; *Dust deposition; Atmospheric pollution deposition on plants; Atmospheric pollution transport;*

Khemani, L. T. et al. (1995). Study of surface ozone behaviour at urban and forested sites in India. Atmospheric Environment, 29(16): 2021-2024, QUA; T; *Ozone in forest air; Ozone in urban air;*

Lercher, Peter; Schmitzberger, Rudi; Kofler, Walter. (1995). Perceived traffic air pollution, associated behavior and health in an alpine area. Science of the Total Environment, 169: 71-74, QUA; ML; *Atmospheric pollution by motor vehicles; Atmospheric pollution and healt; Atm. poll. and the public*

MacKenzie, A. R. et al. (1995). The ozone increments in urban plumes. Sciente of the Total Environment, 159(2-3): 91-99, QUA; ML; *Ozone in rural areas; Ozone-atmospheric pollution relationships.*

Matsuura, K. (1995). Effects of climate change on building energy comsumption in cities. Theoretical and Applied Climatology, 51(1-2): 105-117. EUC; GU; *Urban climates; Climate and energy consumption;*

Mills, Gerald. (1995). The energy balance of the Los Angeles basin. 1995 AAG Annual Meeting Abstracts. (211). EUC; ML;*Energy balance.*

Miyazaki, Hiroshi. (1995). Field study on green canopy as urban cool-spot. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 125-130, GUC; ML.

Mizuno, Minoru et al. (1995). Waste heat from space cooling systems -Do the cooling systems for buildings promote the urban heat island?- Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 77-82, EUC; ML.

Moriyama, Masakazu. (1995). A simple prediction model of air temperature on the inside of street canyon and green canopy. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 131-136, PhMUC; GU.

Muir, David; Laxen, Duncan P. H. (1995). Black smoke as a surrogate for PM10 in health studies?. Atmospheric Environment, 29(8): 959-962, QUA; ML; *Atmospheric pollution and health; Particulate matter and health.*

Narita, Den-ichi et al. (1995). Evaluation of ventilation rate in built-up area using convective transfer coefficient. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 25-29, PhUC; GU.

Nakamura, Y. et al. (1995). Difference of urban effects of climate in Kyoto city between a weekday and a holyday. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 119-123, GUC; ML.

Nakashima, Tomoyuki. (1995). Kobe ecological architecture started the outline of proyect and awaiting solutions. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 83-86, UP; ML.

Newman, E. Lynn. (1995). Land use effects on microclimatic responses: 1994 annular eclipse. 1995 AAG Annual Meeting Abstracts, (227). EUC; ML; *Urban climatology; land use; energy balance.*

Niccum, Elizabeth M.; Lehrman, Donald E.; Knuth, William R.; (1995). The influence of meteorology on the air quality in the San Luis Obispo County-southwestern San Joaquin Valley region for 3-6 August 1990. Journal of Applied Meteorology, 34(8): 1834-1847, QUA; ML; *Air quality; Ozone concentration factors; Atmospheric pollution transport; Ozone transport;*

Oikawa, Susumu; Meng, Yan. (1995). Turbulence characteristics and organized motion in a suburban roughness sublayer. Boundary-Layer Meteorology, 74(3): 289-312, PhUC; ML; *Airflow in urban areas; Turbulence in urban areas; Temperature-airlow relationships;*

Oke, T. R. (1995). Sundborg, A. 1951: climatological studies in Uppsala with special regard to the temperature conditions in the urban area. Geographica 22. Progress in physical Geography, 19(1): 107-113, GUC; HL;*Urban temperatures; Urban heat islands;*

Oseland; A. Nigel. (1995). Predicted and reported thermal sensation in climate chambers, offices and homes. Energy and Buildings, 23: 105-115. UBCL; GU; *Thermal sensation; climate chambers; residential buildings; commercial buildings.*

Pfeffer, Hans-Ulrich et al. (1995). Air pollution monitoring in street canyons in North Rhine-Westphalia, Germany. Science of the Total Environment, 169: 7-15, QUA; ML; *Atmospheric pollution by motor vehicles; Street canyon pollution;*

Rosenfeld H. Arthur; Akbari Hashem; Bretz Sarah; Fishman L. Beth;Kurn M.Dan;Sailor David;Taha Haide (1995). Mitigation of urban heat islands: materials, utility, programs, updates. Energy and Buildings, 22: 255-265. EUC; ML;*Urban heat islands; utility programs; air-conditioning electricity savings; smog mitigation.*

Rotach, M. W. (1995). Profiles of turbulence statistics in and above an urban street canyon. Atmospheric Environment, 29(13): 1473-1486, PhUC; GU;*Turbulence in urban areas.*

Roth, M.; Oke, T.R. (1995). Relative efficiencies of turbulent transfer of heat, mass, and momentum over a patchy urban surface. Journal of the Atmospheric Sciences, 52(11): 1863-1874, PhUC; ML; *Turbulent transfer over urban areas;*

Ruffieux, Dominique. (1995). Winter surface energy budget in Denver, CO. Atmospheric Environment, 29(13): 1579-1587, EUC; ML; *Energy budget of urban areas;*

Rutllant, Jose; Garreaud, Rene. (1995). Meteorological air pollution potential for Santiago, Chile: towards an objective episode beforecasting. Environmental Monitoring and Assessment, 34(3): 223-244, QUA; ML;*Atmospheric pollution forecasting;*

Sachweh, M.; Koepke, P. (1995). Radiation fog and urban climate. Geophysical Research Letters, 22(9): 1073-1076, EUC; ML; *Fog frequencies; Urban influences on fog;*

Sailor, David J. (1995). Simulated urban climate response to modifications in surface albedo and vegetative cover. Journal of Applied Meteorology, 34(7): 1694-1704, EUC; ML; *Urban meteorology; Urban climates; Albedo-climate relationships; Vegetation influences on urban climate*

Schädler, G. (1995). Preliminary climatic study of the Karlsruhe area: Part II - Wind field and drainage flows. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 149-152, PhMUC; ML.

Schütz, Marcus. (1995). Urban precipitation patterns in the Rhine-Ruhr-area. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 111-114, GUC; ML.

Sekhar, S. C. (1995). Higher space temperatures and better thermal comfort a tropical analysis. Energy and Buildings, 23: 63-70. UBCL; T; *Tropical buildings; space temperatures; thermal comfort.*

Selover, J. Nancy (1995). Predicting the spatial distribution of convective rainfall around Phonix, Arizona. 1995 AAG Annual Meeting Abstracts, (276). GUC; ML; *Synoptic climatology; precipitation-convective, urban climatology.*

Shimoda, Y.; Mizuno, M. (1995). Survey of outdoor air temperature distribution on the site of exposition. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 93-98, GUC; ML.

Shrivastav, Rohit; Mathur, Sanjay Kumar; Shrivastav, Shobhit. (1995). Thermodynamical analysis of atmospheric deterioration of portland cement. Current Science, 68(3): 335-337, QUA; GU;*Atmospheric pollution damage to buildings; Acid precipitation damage to buildings.*

Stanhill, G.; Kalma, J. D. (1995). Solar dimming and urban heating at Hong Kong. International Journal of Climatology, 15(8): 933-941. EUC; ST; *Urban influences on temperature; Urban heat islands; Temperature-radiation relationships.*

Stock, Peter. (1995). The climatic analyses in the Ruhr area. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 9-16, UP; ML.

Stulov, E. A. (1995). Urban effects on summer precipitation in Moscow. Russian Meteorology and Hydrology, 11:3 34-41, GUC; HL; *Urban influences on precipitation.*

Tarleton, Lesley F.; Katz, Richard W. (1995). Statistical explanation for trends in extreme summer temperatures at Phoenix, AZ. Journal of Climate, 8(6): 1704-1708, EUC; ST; *Temperature trends; Urban heat islands;*

Tsinonis, A; I. Koutsogiannakis; M. Santamouris and I. Tselepidaki. (1995). Statistical analysis of summer comfort conditions in Athens, Greece. Energy and Buildings. 19: 285-290. UBCL; ST; *Comfort conditions.*

Tsutsumi, Jun-ichiro et al. (1995). One- and two- dimensional numerical simulation of atmosphere in an urban area. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 47-52, PhMUC; GU.

Twohy, Cynthia H. et al. (1995). Effects of aerosol particles on the microphysics of coastal stratiform clouds. Journal of Climate, 8(4): 773-783, PhMUC; ML; *Aerosols-cloud relationships; Atmospheric pollution-cloud relationships; Stratiform microphy*

Varotsos, C. A.; Kondratyev, K. Ya. (1995). Ozone dynamics over Greece as derived from satellite and in situ measurements. International Journal of Remote Sensing, 16(10): 1777-1798, QUA; ML; *Ozone variations at ground level; Ozone-meteorological factor relationships;*

Villalobos-Pietrini, Rafael; Blando Salvador; Gomez Arroyo, Sandra. (1995). Mutagenicity assessment of airborne particles in Mexico City. Atmospheric Environment, 29(4): 517-524, QUA; ST; *Particulate matter in urban air; Atmospheric pollution and health; Mutation;*

Voogt, J. A. (1995). "Complete" Urban Surface Temperatures. 1995 AAG Annual Meeting Abstracts. (314) RSUC; GU; *Urban climatology; surface temperature; remote sensing.*

Watanabe, Hironori. (1995). City planning and urban climate -The example of Damiohoka, Yokohama city-. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 137-141, UP; ML.

Westcott, Nancy E. (1995). Summertime cloud-to-ground lightning activity around major mid-western urban areas. Journal of Applied Meteorology, 34(7): 1633-1642, GUC; ML; *Cloud-to-ground lightning; Lightning frequencies; Urban influences on lightning;*

Yoshida, Atsumasa. (1995). Field study on thermal environments in some types of urban blocks. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 31-35, EUC; ML.

Yoshida, Harunori; Yamamoto, Ichiro. (1995). Vertical temperature and humidity profiles in Osaka city and its effect on air-conditioning load. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 99-104, PhUC; ML.

Zimmerman, Heinz. (1995). Urban boundary layer -A case study-. Klimaanalyse für die Stadtplanung. Climate Analysis for Urban Planning. Proceedings of a Japanese-German Meeting. 53-64, PhUC; ML.

BIBLIOGRAPHY OF URBAN CLIMATE IN TROPICAL/SUBTROPICAL AREAS (1992 - 1995)

Busch F. John

1992. A tale of two populations: thermal comfort in air-conditioned and naturally ventilated offices in Thailand. Energy and Buildings 18: 235-249

EUC; T

ABSTRACT: A field study of thermal comfort was conducted in Bangkok, Thailand, in which over 1100 office workers responded to a questionnaire while simultaneous physical measurements were taken. In this study we explore whether there is justification for adopting a comfort standar that differs from those developed for office workers accustomed to more temperate climates. Both air-conditioned and naturally ventilated offices were surveyed. Participants cast votes on standar subjective thermal eating scales and these were correlated with temperature indices that variously account for the thermal impacts of humidity, radiant temperature, air velocity, and clothing levels. Following the criteria used in developing a widely adoopted thermal comfort standar, it was found than the upper temperature for a Thai comfort standar. instead of being the currently accepted level of 26.1 °C, should be as high as 31 °C for office workers accustomed to naturally ventilated spaces, and as high as 28 °C for those accustomed to air-conditioning. Comparing the responses from the naturally ventilated buildings with those from the air-conditioned buildings and from studies conducted in the temperate regions provides convincing evidence of acclimatization. These and other findings of this study suggest that interior spaces in Thailand can be cooled to a far lesser degree without sacrificing comfort.

Catsaros, N. et al.

1992. Wind field and pollutant dispersion analysis in greater Athens area using the EURIDICE Code System In: van Dop, Han and Kallos, George (eds.) Air pollution modeling and its application. IX NATO Committee on the Challenges of Modern Society NATO Challenges of Modern Society, Volume 17. Plenum Press.

QUA; ST;
Dispersion in urban areas; Airflow in urban areas; Radioactive pollution dispersion;

Chen, Chang-he.

1992. Winter boundary layer characteristics over a Valley City. Chinese Science Bulletin 37(6): 490-493.

PhUC; ST;
Boundary layer over urban areas; Urban atmospheric pollution; smog;

Chow, Shu Djen.

1992. The urban climate of Shanghai. Atmospheric Environment, Part B: Urban Atmosphere, 26B(1): 9-15.

GUC; ST;
Urban climates; urban meteorology, Shanghai.

ABSTRACT: Shanghai is the most important industrial and commercial city in China in terms of population and building density, consumption of energy and development rate. Meteorological data from the urban Shangai Central Observatory over the last 100 years are combined with similar 20-year data sets from 10 nearby suburban and rural stations to analyse climatic impacts from Shanghai's urbanization. Results show itrs urban heat island effect is large and has enhanced with

time. The effect is more obvious in urban-rural differences of annual mean minimum temperatures than in annual mean temperatures. During recent decades, the urban centre of Shangai has experienced lower wind speeds, lower humidity, fewer fog days, fewer sunny days, increased low cloudiness and increased overcast days. Concurrent variations at nearby rural stations were dissimilar. Solar radiation in urban Shangai shows accelerating decreases of both direct solar radiation (S) and global radiation, but increase of both diffuse radiation (D) and average turbidity (D/S).

de Carvalho, Maria Lúcia A. M.

1992. The impact of urbanization on urban climate: a case study in Brazil. In: Höschele, K. (ed.), Planning applications of urban and building climatology. 135-146. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung, Wissenschaftliche Berichte, Nr 16.

GUC; ST;

ABSTRACT: This is a case study which endeavours to analyse in time and space the modifications, encountered in a natural habitat of lagoons and dunes in Brazil. It is related to the impact caused by urbanization on the environment, particularly on the climate. It can also be viewed as a study on the control of hygrothermic quality of the urban atmospheric environment, which can interfere with human thermal comfort.

The main objective of this report is to analyse, on the one hand, the modified hygrothermic qualities of the atmosphere as elements of the local climate wich have been changed into urban climate. On the other hand, it also analyses the modifications imposed by transformation of the active surface of the geoecological space, resulting from appropriation of nature by man during the process of urbanization.

This repport attempts to describe and analyse the various interactive processes which occur between both modifications aiming at clarifying them in the ligth of its dynamics as a unit of object and subject, production and product, genesis and structure.

Garfias, J.

1992. Air quality in Mexico City. The science of the global change: the impact of human activity on the environment (ACS Symposium Series, No. 483), Dunnette, David A. & O'Brien, R. (eds)

QUA; ST;
Urban atmospheric pollution;

Givoni, Baruch.

1992. Climatic aspects of urban design in tropical regions. Atmospheric Environment, Part B: Urban Atmosphere 26B(3): 397-406.

UP; T;
Urban microclimates; Urban design, urban climate, tropical urban areas.

ABSTRACT: The paper describes the climatic characteristics relevant to urban and building design in hot-humid and in hot-dry tropical regions, respectively. It then discusses the different human comfort issues, the design objectives and the urban design elements which affect and can modify the urban microclimate. The design elements discussed in the paper are; location of towns in a region, density of the built-up area an people outdoors, and the design details of "green" areas. The appropriate (from the climatic aspect) design details of the above urban design elements, and some comments on building design in tropical regions, are discussed with respect to each climate type. Subjects of needed research on issues concerning comfort and design problems in tropical cities, on which more knowledge is needed, are suggested. The paper is based on a recent WMO Document (Givoni, 1989, WCAP-10, WMO/TD, No. 346.)

Goldreich, Yair.

1992. Urban climate studies in Johannesburg, a subtropical city located on a ridge- a review. Atmospheric Environment, Part B: Urban Atmosphere 26B(3): 313-329.

GUC; ST;
Urban climates;

Jáuregui, E.; Godinez, L.; Cruz, F.

1992. Aspects of heat-island development in Guadalajara, Mexico. Atmospheric Environment, Part B: Urban Atmosphere, 26B(3): 391-396.

EUC; T;
Urban heat islands; Mexico, tropical urban climate, heat island.

ABSTRACT: The magnitude of the urban effect on temperature in the tropical city of Guadalajara is examined. Parallel to the city's growth, air temperature shows an increasing trend; over a 40- year period (1931-1970) this rate was of the order of 0.03 °C yr $^{-1}$. As would be expected, this rate of temperature increase has been uneven over the period. When population increase per decade was large (90%) as in the 1940s the corresponding rate was significant (0.4 °C per decade). The largest warming rate (0.7 °C per decade) occurred during the 1960s when population growth was 73%. These results suggest that other factors (on a regional/global scale) may have been at play. Results show that estimates of the intensity of the heat island in a tropical city are likely to be dependent (besides the physical properties in Guadalajara, heat-island intensity is highest during the dry season and declining in the wet season when contrasts in urban/rural thermal admittance are likely to be minimal). The presence of lower temperatures in the city during the afternoon hours suggests that the city (especially in the dry season) acts as a moisture source. This "cool" island has also been observed in other cities with similar regional climate.

Lam, Joseph C.; Hui, Sam C. M.; Yuen

1992. Typical weather year for building energy simulation in Hong Kong. Hong Kong Meteorological Society Bulletin 2(1): 36-44.

UP; ST;
Building climatology; Weather effects on electricity demand.

Lee, Cheng-shang.

1992. Meteorological influences on the changes of suspended particulate concentration in the Great Taipei area. Atmospheric Sciences, 20(4): 341-361,

QUA; ST;
Particulate matter in urban air; Atmospheric pollution-synoptic weather type relationships.

Li, Lequan.

1992. The interaction between nocturnal urban atmospheric boundary layers and aerosols. Quaterly Journal of Applied Meteorology. 3(1): 32-41.

PhUC; ST;
Nocturnal boundary layer over urban areas; Urban heat islands; Aerosols in urban areas.

Lodge, James P., Jr.

1992. Air quality in metropolitan Manila: inferences from a questionable data set. Atmospheric Environment, Part A: General Topics, 26A(15): 2673-2677.

QUA; T;
Airquality; Urban atmospheric pollution; particulate atmopsheric pollution.

Mc Pherson, E. Gregory.
1992. Shading urban heat islands in U.S. desert cities. Wetter und Leben, 44(1-3): 107-123.

EUC; ST;
Urban heat islands; Urban temperature control;

Miranda, Patricia; Sheriff, Fernando

1992. Determining thermal comfort in a warm humid region. In: Höschele, K. (ed.), Planning applications of urban and building climatology. 58-64 Universität Karlsruhe. Institut für Meteorologie und Kilmaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany.

UBCL; T;

Miranda, Patricia; Sheriff, Fernando.
1992. Evaluation of natural ventilation in a warm humid climate. In: Hoschele. (ed.). Planing applications of urban and building climatology. 48-57. Karlsruhe, Germany, Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany

GUC; T;

ABSTRACT: Some evaluation methods of natural ventilation in built humid tropical areas are tested by applying climatic data. These values have been compared with the natural ventilation conditions needed for achieving thermal comfort conditions in tropical zones.

Potcher, Oded
1992. Adaptation of Romann and Byzantine buildings to climate conditions of urban and building climatology. In: Höschele, K. (ed.), Planning applications of urban and building climatology. 35-47. Universität Karlsruhe. Institut für Meteorologie und Klimaforschung. Wissenschaftliche Berichte, Nr 16. Karlsruhe, Germany.

UP; ST;

ABSTRACT: History presents numerous examples of adaptation in building design to climatic conditions in various geographical regions. This research examines to what extent climatic aspects were taken into consideration in building design, in two different climatic zones of Israel during the Roman and Byzantine period (300-400 A.D.).

Stoll, Matthew J.; Brazel, Anthony J.
1992. Surface air-temperature relationships in the urban environment of Phoenix, Arizona. Physical Geography, 13(2): 160-179.

PhUC; ST;
Urban temperatures; surface-air temperature relationships;

Tiwari N. G, Lugani and Singh K. A.
1992. Design parameters of a non-air-conditioned cinema hall for thermal comfort under arid-zone climatic conditions. Energy and Buildings 19: 249-261.

EUC; ST;
Passive cooling; solar energy; solar architecture

ABSTRACT: In this communication, a design of a cinema hall suitable for climatic conditions in an arid zone has been presented. The various cooling techniques, namely evaporative cooling, wind tower, ventilation/infiltration and natural cooling, have been incorporated in the design to achieve thermal comfort during the period of operation. The design parameters have been optimized on the basis of numerical computations after establishing an energy balance for each component of a cinema hall. It is observed that cooling treatment, i.e., a wind tower with a cooling pool on the roof provides reasonable thermal comfort inside the enclosure.

Tselepidaki, Moustris C.; Santamouris M., and Poulopoulou G.
1992. Analysis of the summer discomfort index in Athens, Greece for cooling purposes. Energy and Buildings 18: 51-26.

UBCL; ST;

ABSTRACT: The discomfort index (DI) proposed by Thom is calculated for the summer period in Athens. The mean daily and hourly variations of DI are given and analysed. The relation between high ambient temperatures and discomfort index is investigated. The probable persistance of the DI is evaluated while statistical methods have been used to analyse and predict spells of consecutive hours characterized by high values of the discomfort index.

Varotsos, C. et al.
1992. Relationship of ozone and its precursors in the West Coast Air Basin of Athens: statistical model for the assessment of air quality in an urban area. Atmospheric Research, 28(1): 41-47.

QUA; ST;
Ozone in urban air; Ozone atmospheric pollution relationships; urban air;

ABSTRACT: Surface measurements of ozone are correlated to measurements of its precursors (Nox and hydrocarbons) for the period 1986-1989, for the West Coast Air Basin of Athens. We first find that the concentrations of total hydrocarbons (THC) and non-methane hydrocarbons (NMHC) are linearly correlated. We then attempt to express the relationship of ozone to its precursors via polynomial and multiplicative regression models, to find that in all cases ozone variation is explained by the mixing ratios of Nox and non-methane hydrocarbons in conjunction with a meteorological parameter, namely the temperature at the pressure level of 850 hPa. Depending on the regression model, the correlation coefficient increases from 0.73 to 0.98. The satisfactory performance of the regression models support their application for both the assessment of air quality in urban areas and the formulation of localized environmental protection policies.

Varshney, C.K.; Aggarwal, Maneesha.
1992. Ozone pollution in the urban atmosphere of Delhi. Atmospheric Environment, Part B: Urban Atmosphere, 26B(3): 291-294.

QUA; ST;
Air pollution, ozone monitoring, urban pollution, photochemical oxidant, air quality.

ABSTRACT: Measurements of ozone in the urban environment of Delhi were carried out synoptically at four different sites during 1989-1990. The amount of ozone in the ambient air varied from 9.4 to 128.31 ppbv exhibiting wide temporal and seasonal variation. The ozone concentration invariably peaked at noontime and remained high during early summer and spring periods. On many occasions 1-h ozone concentration was more than 113 ppbv, which represents the maximum 1.h limit ozone in

ambient air as prescribed by de U.S. EPA. The results of the study show that there is a significant build up of tropospheric ozone in the urban environment of Delhi.

Wang, Jiemin.
1992. Turbulence characteristics in an urban atmosphere of complex terrain. Atmospheric Environment, Part A: General Topics, 26A(15): 2717-2724.

PhUC; ST;
Turbulence in urban areas; Dispersion in urban areas;

Winkler, Christoph; Flassak, Thomas; San José, Roberto.
1992. Dispersion simulations of NOx in Athens, Greece, using a Lagrangian dispersion model. In: van Dop, Han and Kallos, George (eds.), Air pollution modeling and its application IX. NATO Committee on the Challenges of Modern Society. NATO Challenges of Modern Society, Volume 17. New York, NY, Plenum Press.

QUA; ST;
Atmospheric pollution sources; Nitrogen dioxides in urban air;

Zu, Tielin.
1992. Numerical simulation of air pollutant transport and diffusion in a mountainous city. Atmospheric Environment, Part A: General Topics. 26A(15): 2689-2697.

PhMUC; ST;
Atmospheric pollution transport; Atmospheric pollution diffusion; Urban atmospheric pollution.

Cleugh, H. A.; Grimmond, C. S. B.
1993. A comparison between measured local scale suburban and arealy-averaged urban heat and water vapor fluxes. In: Bolle, H.J.; Feddes, R.A. and Kalma, J.D. (eds). Exchange processes at the land surface for a range of space and time scales. IAHS Pub.,212. Oxford.

EUC; ST;
Sensible and latent heat flux in urban areas; Water vapor flux in urban areas;

Cruz, X. et al.
1993. Air Pollution modeling: effects of decreasing fuel reid vapor pressure on ozone levels in the Mexico City metropolitan area. International Symposium on Heat and mass transfer in energy systems and environmental effects., 158-161,

QUA;T.

ABSTRACT: The application of an air quality model to describe the diurnal variation of ozone in the Mexico City Metropolitan Area as well as the impact of reducing the gasoline Reid Vapor Pressure (RVP) is presented. Three cases were simulated: the case that describes ozone evolution along the trajectory of the prevalent wind in the city, and two cases representing the effect of decreasing gasoline RVP, through reducions in the hydrocarbons and different reductions of Nox emissions.

Dayal, Gopal et al.
1993. Impact of climatic conditions and socio-economic status on solid waste characteristics: a case study. Science of the Total Environment, 136(1-2): 143-153,

QUA; ST;
Climate and environment; Urban waste;

Eidels-Dubovoi, S.

1993. Solar radiation attenuation by atmospheric aerosol particles at different sites in the Mexico City Valley. International Symposium on Heat and mass transfer in energy systems and environmental effects., 140-142,

QUA; T.

ABSTRACT: Mie theory is used to calculate extinction coefficients and single scattering albedos, w, from average particle size distribution measured in the diameter range 0.006-1.0 um, during February 16-March 1, 1991, at three different sites in the Mexico City Valley. Calculations are done for four wavelengths 0.50, 0.55, 0.88, 1.06 um, assuming a typical tropospheric aerosol refractive index of 1.65-.005I. Visibility is derived from Koschmieder formula and found to be minimum on February 23 (5.4 km) and maximum on February 27 (47 km).

El-Shobokshy, Mohammad S.; Al-Saedi, Yaseen G.

1993. Atmospheric turbidity and transmittance of solar radiation in Riyadh, Saudi Arabia. Atmospheric Environment, 27B(4): 401-411,

QUA; ST;
Particulate air pollutants; Turbidity, transmittance of solar radiation, particulate pollution.

ABSTRACT: During the last two decades, the urban areas in the city of Riyadh -the capital of Saudi Arabia- were increasing at an exceptionally high rate through a series of development plans. The major plans had been completed by the end of 1982. Some other big utility projects were started and completed during 1987. As a consequence, the air quality has deteriorated markedly an air pollution episodes recorded during these activities showed that particulates were present in the atmosphere at high concentrations. Later in January 1991 the Gulf war started and the firing of the oil fields in Kuwait soon followed. It was estimated that soot particulates were emitted at a rate of 600 ton d-1 along with high rates of other gases. This event has led to significant air quality and visibility problems. The total horizontal and direct normal solar radiation measurements during some days when the dark smoke emitted from the oil field fires in Kuwait were passing over Riyadh are presented. The reduction in solar irradiation reflects the intensity of dark smoke at a distance of 500 km from Kuwait.

Frisbie, Paul R.; Hudson, James G.

1993. Urban cloud condensation nuclei spectral flux. Journal of Applied Meteorology, 32(4): 666-676,

QUA; ST;
Cloud condensation nuclei variations;Condensation nuclei in urban air.

Grimmond, C. S. B.; Oke, T. R.; Cleugh, H. A.

1993. The role of "rural" in comparisons of observed suburban-rural flux differences. In: Bolle, H.J.; Feddes, R.A. and Kalma, J.D. (eds) Exchange Processes at the land surface for a range of space and time scales. IAHS Publications, 212.

EUC; ST;
Energy balance; Heat flux; Rural meteorology;

Hsu, Kuang-Jung et al.

1993. Ozone and PAN monitoring at springtime Taipei. Atmospheric Sciences, 21(1): 67-83,

QUA; ST;
Ozone in urban air; Peroxyacetal nitrate in air; Photochemical atmospheric pollution.

Jaffé Rudolf et al.

1993. Organic compounds and heavy metals in the atmosphere of the city of Caracas, Venezuela. I: Atmospheric particles. Water, Air, & Soil Pollution, 71(3-4): 293-313,

QUA; T;
Urban atmospheric pollution; Particulate matter in urban air; Organic compounds in atmosphere.

ABSTRACT: Aliphatic and aromathic hydrocarbons, fatty acids and heavy metals (Pb, Cu, Ni, Zn, Fe and Cd) were analyzed in atmospheric particulatte matter in the city of Caracas, venezuela. Samples were taken from 6 stations within the metropolitan area of Caracas, characterized as industrial (one), urban (two) suburban (two) and rural (one). In addition, the concentration and composition of the organic compounds was monitored over a 5 month period at an urban site to determine seasonal and temporal variabilities.
In general terms, the concentrations of pollutants decreased from industrial and urban sites to suburban to rural. A similar trend was observed for preliminary toxicity tests carried out on the oarticulate extracts. The concentration levels of most of the pollutants were high for the industrial and urban sites, and comparable with those of other major cities worldwide.

Jáuregui, Ernesto.

1993. Bibliography of urban climate in tropical-subtropical areas 1981-1991. World Meteorological Organization, World Climate Programme: Applications and Services. Geneva, Switzerland.
ALL; ALL;
Urban climatology bibliographies.

Jáuregui, E.

1993. Meteorological aspects of ozone characterization and trend for period 1986-92 in Mexico City. International Symposium on Heat and mass transfer in energy systems and environmental effects., 162-163,

QUA; T.
air pollution; ozone; Mexico City

ABSTRACT: Using data for O3 from 10 monitoring stations an analysis is made of changes observed in Mexico City for period 1986-92. An attempt is made to assess impact of a day-without-a-car program established since 1990. Analysis is undertaken to evaluate contribution of meteorological conditions during an emergency air pollution event in 1992.

Lee, Hyoun-Young.

1993. An application of NOAA AVHRR thermal data to the study of urban heat islands. Atmospheric Environment, Part B: Urban Atmosphere 27B(1): 1-13.

RSUC; ST;
AVHRR, heat island, brightness temperature, temperature gradient.

ABSTRACT: Brightness temperatures were derived from the Advanced Very High Resolution Radiometer (AVHRR) at channel 4 (10.5-11.5 μm) on the NOAA-9 and NOAA-10 satellites to examine the applicability of the AVHRR thermal data to the study of urban heat silands. Air and ground surface temperatures measured at meteorological stations in large cities (population over 300,000) in South Korea were compared with *in situ* brightness temperature data. The correlation coefficient between air temperatures and brightness temperatures is 0.85 and the relationship may be expressed by de regression: AT= 0.59 BT + 2.54. This equation explains 73% of variances at the 0.02% significance level. The best-fit line, however, underestimates air temperatures in such heat-processing industrial cities as Ulsan and Pohang, where smoke puffs up from the high stacks of industrial plants, and overestimates them in the Seoul metropolitan area. Urban land-use, such as

built-up, residential and industrial areas, was clearly identified from the AVHRR thermal data, while small-scale land-use, like parks, were not distinguishable. Brightness temperatures for the intensity of heat islands were related to the population size of cities.

Qin, Y.; Chan, L. Y.
1993. Traffic source emission and street level air pollution in urban areas of Guangzhou, South China (P.R.C.). Atmospheric Environment, Part B: Urban Atmosphere,

QUA; ST;
Atmospheric pollution by motor vehicles; Street canyon pollution;

Qin, Y.; Kot, S. C.
1993. Dispersion of vehicular emission in street canyons , Guangzhou City. South China (P.R.C.). Atmospheric Environment. Part B: Urban Atmosphere, 27B(3): 283-291,

QUA; ST;
Atmospheric pollution by motor vehicles; Atmospheric pollution dispersion; Street canyon pollution.

Rahman, A.
1993. Hydrological problems and solutions of a small island state in warm humid regions: case of Singapore. In: Gladwell, John Stuart (ed.), Hydrology of warm humid regions. IAHS Publications, 216. Oxfordshire UK, IAHS, Press, p. 343-351.

UH; ST;
Urban influences on hydrology; Hydrologic problems.

Sosa, G. et al.
1993. Evaluation of atmospheric mixing height in Mexico City. International Symposium on Heat and mass transfer in energy systems and environmental effects., 143-147,

Phuc; T.

ABSTRACT: In this work the mixing heigth evolution and the atmospheric stability in Mexico City is presented. The results were obtained from atmospheric sounding analysis. the data were ghatered from a comprehensive campaign of atmosphere characterization realized in February 1991, in the Mexico City. We also present the influence of mixing height on carbon monoxide and sulfur dioxide concentration, measured on the surface terrain, and finally, we present the correlation between mixing height and surface temperature.
It was found that maximum heights of the convective layer range between 200 to 2000 meters above the ground, and a mean height of 700 m, approximately. We found that the surface temperature drives the mixing height for almost days analysed, which it means that synoptic influences was not important on local dynamics.
The surface concentration of non reactive pollutants (carbon monoxide and sulfur dioxide) is driven by mixing height, which is not clear for reactive pollutants (ozone) because its chemical dynamics.

Swaid, H.; Bar-El, M. E.
1993. A bioclimatic design methodology for urban ourdoor spaces. Theoretical and Applied Climatology, 48(1): 49-61.

UBCL; ST;
Urban microclimates; Urban bioclimatology; Comfort sensation.

ABSTRACT: The development of a bioclimatic urban design methodology is described. The cluster

thermal time constant (CTTC) model for predicting street-level urban air temperature variations is coupled with the wind-profile power law and the index of thermal stress (ITS) for human comfort. The CTTC model and the power law produce the diurnal air temperature and wind speed variations in various canyon-like urban forms. The thermal comfort requirements for lightly-dressed, moderately-walking/seated persons in the outdoor space in summer are then obtained using the ITS model. The proposed methodology enables a first-order assessment of the climatic implications of different features of the physical structure of the city such as street orientation, canyon height-to-width ratio, building density, and street shading. The application of the proposed methodology is demonstrated for Tel Aviv.

Tsitouridou, R.; Samara, C.

1993. First results of acidic and alkaline constituents determination in air particulates of Thessaloniki, Greece. Atmospheric Environment, Part B: Urban Atmosphere, 27B(3): 313-319,

QUA; ST;
Atmospheric particulates, acidic and alkaline constituents, sea sprays.

ABSTRACT: Atmospheric aerosol samples were collected by a low volume sampler in a typical urban site of Thessaloniki city, from March 1989 to December 1990. Data obtained showed a significant correlation aerosol chlorides but only 1.5% of aerosol sulfates. Aerosol sulfates are neutralized by atmospheric ammonia to form $(NH_4)_2SO_4$. Data evaluation considering wind direction led to the conclusion that local urban and industrial emission sources are primarily responsible for aerosol sulfates.

Varotsos, C.; Kalabokas, P.; Chronopoulos, G.

1993. Atmospheric ozone concentration at Athens, Greece. Vertical ozone distribution in the troposphere. Atmospheric Research, 30(2/3): 151-155,

QUA; ST;
Vertical ozone distribution measurement. Ozone in troposphere.

ABSTRACT: In the framework of the European Arctic Stratosperic Ozone Experiment (EASOE) and the Tropospheric Ozone Research (TOR) programme we have performed twenty ozone soundings over Athens, Greece (37.9 °N, 23.8 °E) during the period from December 1991 to March 1992. The intercomparison of Athens tropospheric mean values with the corresponding values which have been measured at Julich, Germany (50.6 °N, 6.2 °E) two years ago, shows that in the height region of 1-4 km Athens values are about 10%higher than those obtained in Julich. Finally the examination of the transport occured at 700 hPa level showed that with advection from the north-western sector the ozone mean value was 50.9 +- 3.8 ppb, while 46.9 +- 2.1 ppb with advection from the south-southwestern direction.

Varotsos, C.; Varinou, M.; Kalabokas, P.

1993. Atmospheric ozone concentration at Athens, Greece. Part I: Surface ozone and its relationship with meteorological parameters. Atmospheric Research, 30(2/3): 143-149,

QUA; ST;
Ozone concentration near the ground; Ozone in urban air; Ozone meteorologic relationships;

ABSTRACT: Daily measurements of surface (O3) and (NOx) from five stations in the Greater Athens Basin, over the period 1987-1988 are used in order to examine the main features of basin-wide O3-HC-NOx relationships. A simple regression model between the surface ozone concentration and the temperature at the 850 hPa level which was first tested in Los Angeles gave satisfactory results in reproducing the mean monthly ozone variation in Athens, when coefficients extracted from local data

were used in the regression equation.

Varshney, E. K.; Aggarwal, Maneesha.

1993. Vertical ozone variation in the lower troposphere of Delhi. Environmental Monitoring and Assessment, 25(1): 41-49. 1.

QUA; ST;
Ozone profiles; ozone in urban air;

World Meteorological Organization.

1993. Technical conference on tropical urban climates (Dhaka, Bangladesh), 28 March - 2 April 1993: extended abstracts. World Meteorological Organization. World Climate Programme: Applications and Services, WCASP 24. WMO/TD-No. 538. 104 p.

ALL; T;
ALL.

Abdali, Fatima Kh.; Nasrallah, Hassan A.

1994. The effect of oil fires in the maximum and minimum temperatures in Kuwait City. Atmospheric Environment, 28(13): 2227-2278,

QUA; ST;
Atmospheric pollution by fires; Oil fire pollution Atmospheric pollution effects on temperature.

ABSTRACT: The ingnition of some 732 oil wells in Kuwait City by Iraqis has caused the release into the atmosphere of large quantities of smoke, particulate matter, sulfur oxides, nitrogen oxides, carbon monoxide and many other petroleum-related compounds. The climatological data for minimum temperature showed a slight warming which is related to the heat island generated by the fires. However, the maximum temperature showed a slight decrease during the same period of measurement.

Adebayo, Yinka R.

1994. Some observations on characteristics of rainfall in two African cities. Report of the Techical Conference on Tropical Urban Climates. TD-No. 647. 3-27.

GUC; T;

ABSTRACT: Rainfall frequency and magnitude were analyzed for two urban and two rural stations in Ibadan. Initially, a 5-year moving average of rainfall for a period of 20 years was plotted for the two urban stations. From the analysis, it could be observed that rainfall tended to be higher in magnitude at that station which is more urban-located. In order to further examine this observation, a study of rainfall over a period of two years (1985-1986) was carried out, using data from four stations. The analysis showed evidence that rainfall was higher both in frequency and in magnitude at the city centre than at the rural sites. For Nairobi, analysis of rainfall characteristics, during 1985-1986, also point towards the fact than the suburban area experienced more rainfall than the rural counterpart. In all, altough the evidence of artificial rainfall are not very clear, specially because of the influence of the topography in Nairobi, the analyses carried out so far support the general theory of inadvertent modification of climate in the urban area.

Ahmed, Nawshad; Karim, Rafiul.

1994. Industrial wastes pollution: a case study of Hazaribagh area of Dhaka city. Report of the Technical Conference on Tropical Urban Climates. WMO. TD-No. 647. 233-244.

UH; T;

ABSTRACT: Industrial waste pollution has become an increasingly felt health hazard in the major urban areas of Bangladesh. The problem is all the more pronounced in Dhaka and its adjacent area. The wastes are produced by an array of agro-based industries, textiles, tanneries, chemical and electroplating industries. Most of the largest industries in jute and textiles sectors are under public ownership and they don't have own waste water treatment plants. Private sector industries don't similary have water treatment plants and use natural water courses to dispose off wastes. The consequential pollution of water has constituted the major health problem in thickly populated urban centers, primarily the Dhaka city.

There are 151 tanneries concentrated in Hazaribagh area of Dhaka city interspreed with residental houses and commercial blocks. The filthy odor and wastes, both liquid as well as non-liquid, pollute the residential environment of the area. The industries which grew up in the last three decades in the area in an unplanned way have become a cause for great concern for the people of the locality. There has been moves by the government to shift the tanneries from Hazaribagh area towards urban fringe locations, without having any success. New tanneries are still springing in the area, very much with government approval. No policy to clean up the area despite efforts at the highest government level have so far produced any result.

Ahmed, Rafique.

1994. In search of the impact of urbanization on the the thermal environment of the city of Dhaka, Bangladesh during the pre-monsoon hot season from 1948 throught 1987. Report of the Technical Conference on Tropical Urban Climates. WMO. TD-No. 647. 295-315.

UBCL; T;

ABSTRACT: The area of Dhaka has increased from approximately 50 sq. km in 1948 to 300 sq. km in 1992. Corresponding change in population in that time period was from approximately 250,000 to 7.4 million, thereby making it one of the twenty most populated cities in the world in 1992. These changes were accompanied by extensive growth in construction of roads and new buildings, specially tall structures. All these had caused conversion of open and low-lying areas into urban areas, which tend to modify the energy and water balance, and hence the thermal environment of the city. The pre-monsoon season, March through May, is the hottest season of the year in Bangladesh. So, extensive urbanization in Dhaka is likely to have grater impact on its thermal environment during this season than any other season. Thermal environment of the city of Dhaka for each of the three-month period of the pre-monsoon hot season has been evaluated as temperature and apparent temperature. Although temperature is the commonly used measure of thermal state, it does not fully convey the "feeling" of temperature when relative humidity is high. So, apparent temperature, a measure of sultriness, is a better measure of the thermal environment in a humid tropical environment because it represents the combined effects of temperature and relative humidity. Trends in temperature and apparent temperature in the 40- year period from 1948 through 1987, and the decadal mean values of temperature and apparent temperature of the City of Dhaka are presented and discussed in this paper. This study reveals the inadequacy of the existing data because of the problem of representativity. Suggestions were made for improving the design of data collection in the future for the purposes of urban design and planning.

Al-Saleh, I. A.

1994. Lead concentration in the atmosphere and soil of Riyadh, Saudi Arabia. Science of the Total Environment, 141(1-3): 261-267,

QUA; ST;
Lead content of air; Lead content of soil;

Alam, Kazi N.; Ullah, Salim.

1994. Reduction of heat transmission through building envelope: strategy for replacement of building elements. Report of the Technical Conference on Tropical Urban Climates. WMO. TD-No. 647. 395-412.

EUC; T;

Asaduzzaman, A.

1994. Impact of climate change on urbanization and urban society in Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 59-69.

GUC; ST;

Aziz-Ul Huq, Abu; Ara Hassan, Shamim.

1994. Global solar radiation on horizontal surface in Dhaka. Report of the technical conference on tropical urban climates. WMO, TD-No. 647. 517-531.

EUC; T;

ABSTRACT: Global solar radiation in Dhaka (Latitude 23°43'N) is presented here in the form of monthly average daily total radiation, daily insolation pattern for the months of December and April. Clearness index values have also been calculated, clearness index ranges from 0.35 for the month of June-July ond 0.5 for the month of February.

Bittencourt, Leonardo.

1994. ow energy buildings in warm-humid regions: the use of perforated blocks. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 317-327.

EUC; T;

ABSTRACT: The paper discusses cooling strategies for warm-humid climates and examines the potential of using perforated blocks as an adequate building component for these regions. It focus on the coast line of the Brazilian northeastern region, where the blocks have been used for a long time with satisfactory results.

Carvalho, Renato A. C.

1994. Air quality and meteorological study in a tropical urban area (Macau). Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 533-540.

QUA; T;

Chan, Chang-Chuan; Lin, Shou-Hsiang; Her, Guor-Rong

1994. Office workers exposure to volatile organic compounds while commuting and working in Taipei City. Atmospheric Environment, 28(14): 2351-2359.

QUA; ST;
Volatile organic compounds in atmosphere; Urban atmospheric pollution; Atmospheric pollution;

ABSTRACT: This study examined office workers' exposure to volatile organic compounds (VOCs) from two activities: commuting and working in an office in Taipei, Taiwan in the spring of 1992. We found that similar VOC species were present in commutes and in offices except that chloroform and 1,1,1,-thrichloroethane were only present in offices. The in-vehicle VOC concentrationsin Taipei were about 2-30 times higher than levels in many western cities. The VOC concentrations in commute varied only with different commuting vehicles. The in-vehicle concentrations were not affected by

either time-of-day or route-of-traffic.

Chan, E. B. A.; Tso, C. P.; Hashim, M. A.

1994. Urban thermal environmental studies in Kuala Lumpur. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 541-572.

EUC; T;

ABSTRACT: Malasya being a rapidly developing country is only relatively recently concerned about the environment and its conservation, particularly about the environmental damages brougth about by active urban growth and industrial expansion. This paper surveys the state of thermal environment studies that have been conducted upon the Kuala Lumpur metropolis. This studies may be identified as those involving measurements and descriptions of specific areas in the metropolis, and a new look into an application of energy balance. Existing and suggested programmes are also discussed.

Choudhury, A. M.; Haque, M. A.

1994. Design of buildings and structures in urban areas taking into consideration the disastrous climate of Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 127-129.

UP; T;

ABSTRACT: Bangladesh is one of the most disaster prone countries in the world. Tropical ccyclones, floods, nor'westers and tornadoes occur in Bangladesh almost every year. Tropical cyclones affect mostly the coastal areas, where the urban areas could be affected by both high winds associated with torrential rain and storm surge. About one fifth of the country is flooded every year on average whereas in an extreme flood year as much as two thirds of the country could be affected by flood as happened in 1988, when three fourths of the capital city Dhaka was also inundated by flood water. Nor'westers with wind speed upto 150 km/hr occurs almost throughout the country whereas tornadoes exceeding wind speed of 500 km/hr. are mainly concentrated near the big rivers.

This, buildings and structures in Bangladesh urban areas should be constructed taking into consideration these hazardous climatic factors. In the coastal cities and towns which are likely to be inundated by storm surges if high magnitude, a gap of ten to twelve feet should be left open for surge water to pass. The buildings should be designed in such a way that they can withstand the high wind pressure and they should be multi-storied so that if the ground floor is submerged, people can take shelter in upper floors. In the high risk flood zones, buildings should be multi-storied leaving a gap of few feet so that flood water can pass. Buildings in tornado affected area shold be constructed taking into consideration of the high wind factor. Special care should be taken in the case of buildings of strategic importance. Similar considerations should be be taken in case of other structures like bridges, embankments, etc. as Bangladesh falls into high monsoon region characterized by heavy rain and high humidity during summer season, these factors should be taken in consideration in the construction of buildings, roads and highways.

Choudhury, Jamilur R.

1994. The impact of natural disasters on urban infraestructure. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 139-148.

UP; T;

Cooper, D. I.; Eichinger, W. E.

1994. Structure of the atmosphere in an urban planetary boundary layer from lidar and radisonde observations. Journal of Geophysiscal Research, 99(D11): 22937-22948.

PhUC; T;
Boundary layer over urban areas; Boundary layer flow;

Davgun, S.
1994. Environment Pollution and its effects on health in Delhi, India. 1994 AAG Annual Meeting Abstract. (75).

QUA; T;
Urban pollution; health; Delhi.

ABSTRACT: The urban environment in the Developing World is a victim of neglect and a lack of proper planning. Various human factors including rapid industrialization, urbanization, automobile revolution, the omnipresence of poverty, voluminous rural-urban migration, crowding and congestion contribute to the continuous of numerous pollution related health problems have increased in the cities.
Delhi, the capital of India, is one of the megacities shoked by pollution. According to the World Health Organization this city is the 4th most polluted in the world. The air quality has declined partially due to the increase in number of vehicles, presence of different types of industries, and the indoor burning of fuel. There is a fast increase in the respiratory and eye ailments. The open sewerlines dump the domestic and insdustrial waste in Yamuna River, which provides about two-thirds of Delhi's water supply. About 34% the population consumes untretaed water. The lowlying areas lack underground sewers and treated drinking water. the outbreak of cholera and other diseases is a frequent ocurrence in some parts of this city. Delhi is among the noisiest cities in the world. The large number of vehicles, frequent use of loudspeakers, presence of factories in the residential area, and the blaring radios in shops and houses contribute to the noise pollution in this city. This high level of pollution contributes to various health problems. The results of a field investigation indicate the varying effects of pollution on different segments of the population.

Devara, P. C. S. et al.
1994. Lidar-observed long-term variations in urban aerosol characteristics and their connection with meteorological parameters. International Journal of Climatology, 14(5): 581-591.

QUA; ST;
Aerosol in urban areas; Aerosols-meteorological parameter relationships;

ABSTRACT: More than 200, weekly spaced, lidar-derived vertical profiles of aerosol concentration in the lower atmosphere (up to 1380 m above ground level) obtainded during night-time between October 1986 and August 1990 at the Indian Institute of Tropical Meteorology (IITM), Pune (18 ° 32', 73 ° 51' E, 559 m above mean sea-level), India, have been used to study the long-term variations in aerosol concentration in different air layers. Selected meteorological parameters for the above period at Pune have also been examined to investigate their association with the aerosol concentration. The spectral analysis of the data revealed significant periodicities in four different characteristic ranges, namely 2.5-13.5, ca. 27, ca 33 and 40-48 weeks in both lidar-derived aerosol content and meteorological parameters; the fourth range being more predominant in all the parameters. These results. together with those of cross-correlation analysis of the data, indicate an association between the long-term trends present in both aerosol and meteorological parameters at the station.

Djen, Chow Shu; Jingchun, Zheng; Lin, Wu.
1994. Solar radiation and surface temperature in Shanghai City and their relation to urban heat island intensity. Atmospheric Environment, 28(12): 119-2127.EUC;

ST;
Urban heat islands;

Enam, Khairul.

1994. Application of passive cooling methods in the microlevel of Dhaka City, Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 427-433.

EUC; T;

ABSTRACT: The paper discusses the various possibilities of passive cooling methods and their application potentials in the warm-humid region of Bangladesh. The proper attempts to recognize the natural balance of global system as a generating force, opens a new dimension in architecture and landscape design, the dimension that has been long ignored. The concept of passive system is a new beginning of an old forgotten idea. The study attempts to compile some of the results of works on passive cooling and outlines as approach towards a site specific problem evaluation.

Endlicher, W. and E. Schultz.

1994. Local climate and air pollution at Tucumán/Argentina. In Brazdil and Kolar (eds). Contemporaty Climatology. Proceed. of the IGU. Brno, Czech Republic. 191-196.

QUA; ST;
Urban climate; air pollution;

ABSTRACT: Investigations on the urban climate and the air quality of Tucumán have been carried from 1991 to 1993. An Urban Heat Island was especially well defined during the dry winter season. Air pollution levels are 3 to 5 times higher than in Central Europe.

Fouli, R. S.

1994. Effect of urbanization on some meteorological elements in greater Cairo region. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 471-496.

GUC; T;

ABSTRACT: A long term time series of data of temperature (T), relative humidity (RH), and wind speed (V) have been analyzed for six meteorological stations in Greater Cairo region (GCR). Mean diurnal variation of T and RH; and long range change in the diurnal amplitude of T and some stations in areas of different degree of urbanization are discussed.

Effect of urbanization on the climatological normals of minimum temperature (Tmin), RH and V has been investigated for differents areas in GCR. It has been concluded that areas characterised by overpopulation and higher degree of urbanization are associated with greater increase in Tmin than those of smaller population density and lower degree of urbanization. Concerning long range changes in these elements, critical values for RH and V have been obtained.

Gadgil, Alaka S.; Deosthali, Vrishali.

1994. Temperature fields of Pune city. Current Science, 66(4): 297-299,

GUC; ST;
Urban temperature distribution;

Ghauri, Badar; Salam, Manzar; Mirza, M. Ishaq.

1994. An assesment of air quality in Karachi, Pakistan. Environmental Monitoring and Assessment. 12(1): 37-45,

QUA; ST;
Air quality; Atmospheric pollution surveys;

Goma, Willy S.

1994. Seasonal weather events and their related impacts on building and settlement. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 391-393.

UP; T;

Grasser, E. A. and H. Xia.

1994. A comparison of the microclimate in three shade environments. AMS. 21st Conference on Agricultural and Forest Meteorology. 11th Conference on Biometeorology and Aerobiology. 42-45.

EUC; ST.

Gupta, R. N.

1994. A study of effects of urbanisation on atmospheric diffusion meteorological parameters. Report of the Tecnical Conference on Tropical Urban Climates. WMO, TD-No. 647. 71-81.

PhUC; T;

ABSTRACT: The process of urbanisation produces radical changes in the radiative, thermal, moisture and aerodynamic characteristics of the atmosphere. The dense urban construction material increase the heat storage capacity and in turn the urban wind develops depending upon the intensity of urban heat island. The diffusion meteorological parameters i.e. wind speed, stability of the atmosphere and mixing depth have been studied at four locations in Delhi during December, 86 to February, 87. The four sites were selected with a view to monitor meteorological information at (i) rural environment location, (ii) residential area, (iii) highly commercialized area and (iv) industrialized area in the city of Delhi. The variation in the values of hourly mixing depths and hourly stabilities from one location to another location have been insignificant while the variation in the wind speed are significant.

Gusten, H. et al.

1994. Ozone formation in the greater Cairo area. Sciente of the Total Environment, 155(33): 285-295,

QUA; ST;
Ozone formation; Ozone in urban air;

Hossain, Akram; Nooruddin Mohammed; Nessa, Begum.

1994. Human comfort in the urban areas of Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 205-231.

UBCL; T;

ABSTRACT: Human comfort and discomfort over Bangladesh in the morning and evening hours for different months of the year are studied on the basis of Thom's discomfort index, computed from the climatological data for different urban and rural areas of the country. Discomfort index over northern part of Bangladesh for the winter months (November to March) has also been evaluated from Sipple and Passel's wind chill index and the results are compared with those obtained from Thom's discomfort index. The results indicated that during the month of March in the morning hours, February and November in the evening hours are quite comfortable all over the Bangladesh.

Hossain, Ershad; Nooruddin, Md.

1994. Some aspects of urban climates of Dhaka City. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 497-516.

GUC; T;

ABSTRACT: The tempeature, humidity and wind data for 40 years from 1951 to 1990 for Dhaka city have been studied. The monthly mean temperature, relative humidity and wind speed of Dhaka city had been discussed. These have been compared with the neighbouring suburban and rural stations. Urban heat island effect, monthly rainfall distribution and incoming solar radiation have also been discussed

Hussain, Amirul; Sultana, Nahid; Ahmed, Shamsuddin

1994. A study on the physical relationship and interaction between urban and rural climates in Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 29-56.

GUC; ST;

ABSTRACT: Urbanisation is increasing on the earth and rural are decreasing. At same time, global climate is also changing. In this paper, P-E index values for 35 stations during the period 1947-80 have been calculated and analyzed. The lowest minimum temperature, highest maximum temperature, and average temperature during the period 1961-80 for four cities namely Dhaka, Chittagong, Rajshahi, Khulna and their adjoining corresponding rural areas Narayangonj, Maizdicourt, Ishurdi, Satkhira have been studied. Temperature Humidity Index (THI) values for two cities (Rajshahi and Khulna) and two rural areas (Ishurdi and Satkhira) during the period 1981-87 have been calculated and studied.

Imamuddin, Abu.; Aziz-Ul, Huq, Ansary; Bikash S.; Raihan A. Muhammad.

1994. Application of hollow roof tiles for passive solar heat control in tropical climates. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 343-355.

EUC; T;

ABSTRACT: The present research work was conducted with two isolated and identical rooms having South facing roofs specially constructed for the purpose. It was made possible for the roofs to be tilted at different angles. The roof of one room was finished with hollow brick tiles and the other with bare concrete. Thus the effect of hollow brick tiles as a means of passive solar heat control, could be compared with that of concrete roof under similar conditions. Experimental results show a substantial reduction of ceiling temperature for the room with hollow brick roof tiles and in some extreme conditions it was found to be around 12 °C lower than that of the concrete roof ceiling.

Jáuregui, E.

1994. Areal and temporal humidity variations in Mexico City. In Brazdil and Kolar (eds) Contemporary Climatology. Proceed. of the IGU Conference. Brno, Czech Republic. 287-292.

GUC; T;
Urban climate; specific humidity; tropical cities.

ABSTRACT: Using a network of about 20 urban/suburban/rural thermohygrographic stations in Mexico city and its environs analysis of areal and seasonal variation of specific humidity (q) is made for year 1990. A marked seasonal variation of q is observed with higher values during wet season. When diurnal urban/rural humidity comparisons (delta q) are made, nigthtime humidities are higher in the city than in nearby country. In general urban/rural humidity contrasts in a tropical city are similar to those observed in mid-latitude cities.

Jáuregui, E. and E. Romales

1994. Urban effects on convective precipitation in Mexico city. 1994 AAG Annual Meeting Abstracts. (177)

GUC; T;
Urban climate; urban precipitacion.

ABSTRACT: Many studies have shown that precipitation appears to increase in or downwind of large urban areas. Using data from an automatic rainfall network of 30 urban/suburban stations spatial and temporal analysis is made for Mexico city for the period 1981-1992. In a number of cases the so called rain island phenomenon is clearly evident for 24 hrs precipitation periods with rainfall amounts decreasing at the foot hills to the west and downwind of the city where orographic lifting usually originates higher precipitation as shown in the monthly isoyets. This result would tend to support the notion that condesation/freezing nuclei form more cloud droplets which compete for the moisture and thus result in less precipitation downwind. Analysis if mean seasonal precipitation for 12 urban stations shows an increasing trend for the period 1981-92. Analysis of long-term (1935-90) hourly rainfall data for Tacubaya observatory reveal a significant increase in the frequency and severity (more than 20 mm/hr) of convective storms for the july-september period, from 4 storms during the 1940's to 20 storms in the 1980's decade. Although intense showers occur more frequently in the afternoon nigth time (19-24 hrs) storms have doubled their frequency during the 1980's since 1950's decade. This result suggest that increasing effect of the nocturnal heat island phenomenon on enhancement of short duration nigth-time heavy rain storms of convective nature.

Kadowaki, Satoshi.
1994. Characterization of carbonaceous aerosols in the Nagoya urban area. 2: Behavior and origin of particulate n-alkanes. ES&T, 28(1): 129-135,

QUA; ML;
Aerosols in urban areas; Aerosol composition; Carbon particle sources;

Karmakar, Samarendra; Khatun, Ayesha.
1994. On the variability and probabilistic extremes of some climatic elements over Dhaka. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 177-204.

GUC; T;

ABSTRACT: Data on different climatic elements like (i) monthly rainfall and highest 24 hours' monsoon rainfall, (ii) monthly mean relative humidity, mean relative humidity at different times of observations and monthly lowest relative humidity, (iii) monthly mean temperatures, (iv) monthly mean maximum and minimum temperatures with monthly extreme values and (v) monthly mean prevailing wind speeds over Dhaka for the months of January through December during the period 1961 through 1990 have been considered to study their variability and to determine the probabilistic extreme values of these elements. The probabilistic extreme values have been computed for three time scales (a) in 1 year out of 4 years, (b) in 1 year of out 10 years, and (c) in 1 year out of 25 years-representing relatively more frequent events, moderately extreme events and extreme events, respectively.

The probabilistic extreme values of the maximum wind over Dhaka during the premonsoon season have also been computed by considering the data of 1982 through 1991. The pressures exerted on a wall corresponding to the extreme wind speeds have been determined accordingly. The Discomfort Index and its probabilistic extreme values over Dhaka have been determined too. The results are believed to be very useful in urban planning and building.

Khaleque, M.A.; Habib, Arjumand; Ahmed, Shamsuddin
1994. Eco-climatic features of Dhaka city due to urbanization. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 521-531.

GUC; T;

ABSTRACT: Urban temperature is of interest in air pollution studies. A characteristic feature of cities is the urban heat island which is found even in small cities. Dhaka city exhibited several warm pockets during winter months. Two peaks of heat island intensity are observed; one in the early morning and another in the early nigth. The early morning heat island is stronger than the early nigth. It has also been observed that maximum heat island intensity is of the order of 3.8°C, only in the winter month and formed over the densily populated residential and, high-rise built-up area. During summer months heat island intensity is insignificant to consider, it is of the order of 0.8 °C. Humidity island exhibited inverse relation to heat islands whenever moisture is less but followed heat islands in intensity whenever moisture is high.

Kretzchmar, J. G.

1994. Particulate matter levels and trends in Mexico City, Sao Paulo, Buenos Aires and Rio de Janeiro. Atmospheric Environment, 28(19): 3181-3191,

QUA; ST;
Suspended particulate matter; lead; megacities; Latin America; smoke;

ABSTRACT: Air pollution monitoring in Mexico City, Sao Paulo, Buenos Aires and Rio de Janeiro had already started by the sixties. Monitoring slowly improved as a function of time became more generalized and systematic by the mid-eighties, at least in three of the four megacities. Particulate matter levels, measured as smoke or gravimetrically determined by Hi-Vol sampling, have routinely and consistently been followed at quite a number of sites. To a lesser extent inhalable particulate matter levels (PM10) and ambient lead levels have also been investigated in a number of (exploratory or routine) monitoring campaigns.
A review is given of the historical data, the present levels and their trends as a function of time and space. Emission data, source information and local topographical and climatological data supplement the picture.
In Sao Paulo as well as in Rio de Janeiro average and extreme levels almost sistematically decreased as a function of time, but air quality standards are still exceeded in roughly 50% of the sites. In Mexico City SPM-levels increased up to the mid-eighties, and stabilized at levels (significantly) above the air quality standards. Due to a lack of reliable data the situation in Buenos Aires is not clear at all.

Kuo, Yu-Mei; Li, Chih-Shan.

1994. Seasonal fungus prevalence inside and outside of domestic environments in the subropical climate. Atmospheric Environment, 28(19): 3125-3130,

UBCL; ST;
Airborne fungi; Indoor air; outdoor air; seasonal variations; subtropical country.

ABSTRACT: Airborne fungi were collected using the N6 Andersen sampler at 1-month intervals for 1 yr inside and outside of six apartments in Taipei. It was shown that seasonal variations of indoor and outdoor fungus number concentration were remarkable and indoor and outdoor spore counts varied considerably from residence to residence. The geometric mean concentrations of indoor and outdoor fungi were found to be higher than 1000 CFU/m3 during the summer months and abruptly decreased to below 100 CFU/m3 in the winter. A high correlation coefficient was found between fungus concentrations in living rooms and outdoors. Moreover, the ratios of indoor to outdoor fungus concentrations (0.21-3.81) were too low to indicate the presence of any indoor fungus sources.

Kyle, W. J.

1994. The human bioclimate of Hong Kong. In Brazdil and Kolar (eds). Contemporaty Climatology. Proceed. of the IGU. Brno, Czech Republic. 345-350.

UBCL; ST;
Climate change, human bioclimate; baseline synthesis; Hong Kong.

ABSTRACT: With the potencial for an enhanced greenhosuse effect forced climate change ocurring in the coming decades it is important to assess its implications for human bioclimate in different parts of the world. To date, little information is available to help assess scenarios. This study attempts to provide such a baseline by investigating the elements of Human Bioclimate in Hong Kong. The investigation is developed in two parts. First, the principal constituent elements of human bioclimate are examined separately, with emphasis placed on the frequency and mode of distribution as much, if not more, than on the so-called "normal" condition. Following that an attempt is made to regroup the climate observations into a coherent synthesis which can be used to describe quantitatively the present human bioclimate of Hong Kong.

Lecha E., Luis; Proveda, María Nieves; Paz C. Luis
1994. Investigations on urban climate in cuba. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 367-375.

GUC;T;

ABSTRACT: The main results obtained in investigations about the urban climate of some cities in Cuba, showing the behaviour of the principal climatic elements inside the cities, in close relation with the typological styles and physico-ambiental characteristics are presented in this paper. The results show a well defined heat island effect, observed with relative independence of the size of the city and justified by the intense flux of solar radiation and the absence of wind in the inland cities, but in the coastal areas the effect of the marine breeze is fundamental to make comfort conditions. Some results related with the urban and architectural design in the humid tropics, that are the basis to offer comfort living conditions to the population are also given. The paper is illustrated with tables and figures that complete the information.

Lee, Whei-May Grace; Tsay, Lin-Y.
1994. The partitioning model of polycyclic aromatic hydrocarbon between gaseous and particulate (PM10m) phases in urban atmosphere with high humidity. Science of the Total Environment, 145(1&2):163-171,
QUA; ST;
Humidity-atmospheric pollution relationships; Hydrocarbons in air;

Liu, Jyh-Jian; Chan, Chang-Chuan; Jeng, Fu-Tien.
1994. Predicting personal exposure levels to carbon monoxide (CO) in Taipei, based on actual comeasurements in microenvironments and a Monte Carlo simulation method. Atmospheric Environment, 28(14): 2361-2368,

QUA; ST;
Carbon monoxide in urban air; Atmospheric pollution effects on health;

Mallick, Fuad H.
1994. Shadowing patterns of some typical urban housing layouts in Bangladesh. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 413-426.

UP; T;

ABSTRACT: The paper discusses the architectural potential of spaces between buildings in housing states as a result of the patterns of shadows cast by these buildings on these spaces. It tries to relate activity types with shadowing conditions and identify the layouts that meet these conditions through computer simulation studies. The location of the study is in Dhaka, Bangladesh where a space in

shadow is more welcome as an activity area rather than one exposed to direct radiation.

Mishra, J. K.; Aarathi, R.; Joshi, M. D.
1994. Remote sensing quantification and change direction of natural resources over Delhi. Atmospheric Environment, 28(19): 3131-3137,

RSUC; ST;
Deforestation effects on rainfall; Vegetation influences on rainfall; Urban environment;

Mobashsher A., Alí.
1994. Ventilation and comfort in interior spaces. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 339-341.

UBCL; T;

Muñoz Ledo, R. et al.
1994. Ozone isopleths for Mexico City using CBM4 within AQUAMI. In: Baldasano, J. M. et al., Air pollution II, Vol. 1: computer simulation, Vol. 2: pollution control and monitoring. Computational Mechanics Publications.

QUA; T;
Ozone in urban air; Ozone-atmospheric pollution relationships; Photochemistry of atm. pollution.

Nord, Anders G.; Svardh, Anna; Tronner, Kate.
1994. Air pollution levels reflected in deposits on buildings stone. Atmospheric Environment, 28(16): 2615-2622,

QUA; ST;
Atmospheric pollution deposition; Atmospheric pollution damage to buildings;

Ohta, Satio.
1994. Concentrations of atmospheric aerosols and sulfur dioxide in the Persian Gulf urban area of Iran. Journal of the Meteorological Society of Japan, 72(2): 337-340,

QUA; ST;
Aerosol composition; Aerosol in urban areas; sulfur dioxide in urban air.

Ojo, O.
1994. Implications of global warming and climate change on urban planning and building operations in west and central Africa. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 547. 573-575.

UP; T;

Padmanabhamurty, B.
1994. Tropical urban climate- a scientific challenge. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 449-470.

EUC; T;

Padmanabhamurty, B.; Bandopadhyay, D.
1994. Radiation balance in a tropical city-Delhi (India). Boundary-Layer Meteorology, 70(1-2): 197-210,

EUC; T;
Urban influences on radiation; Radiation balance of urban areas;

ABSTRACT: The impact of the urbanization is assessed by comparing values of the radiation parameters at an urban location with those of a rural site. Urban Delhi was divided according to land use and the effects of urbanization was studied on incoming short wave, albedo, incoming longwave, outgoing longwave and net radiation were individually studied at four representative sites (rural, commercial, residential and industrial). Maximum shortwave was observed in the rural and commercial areas whereas high longwave was observed in the commercial and industrial locations.

Pandey, J; Agrawal, M.
1994. Diurnal seasonal variations in air pollutant concentrations in a seasonally dry tropical urban environment. Current Science, 66(4): 299-303,

QUA; T;
Urban atmospheric pollution; Diurnal atmospheric pollution variations; Seasonal atmospheric var.

Sarma, Bijon B.
1994. Traditional architecture and its application in urban area focusing on Khulna City. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 283-293.

UP; T;

Schiller De, Silvia; Evans, John M.
1994. Climate responsive urban development in tropical cities: training and practice. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 357-364.

UP; T;

Shamsuddin, Dara
1994. Rainfall in Dhaka City and aspects of its drainage system development: a historical perspective. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-NO. 647. 97-102

UH; T;

Simpson, R. W.; Xu, Hongchang
1994. Atmospheric lead pollution in an urban area-Brisbane, Australia. Atmospheric Environment, 28(19): 3073-3082,

QUA; ST;
Lead. unlead petrol, statistical distributions, ATDL;

ABSTRACT: The lead pollution levels recorden in Brisbane at six sites for 1979-91 have been analysed to identify seasonal variations, temporal change and the statistical characteristics of the data sets. The seasonal variations of lead levels from winter to summer are very significants; also the spatial correlations between the load levels at different sites are generally strong, except for the one site near a busy road (Woolloongabba). The lead levels have decreased markedly since year 1986, probably due to the introduction of unleaded petrol fuelled vehicles at that time. Since, then the violations of lead standard have also dramatically decreased. The log-normal distribution was found to be the most preferred; this means that lead levels are more probably high near busy roads. The mean and variance of the lead data all sites apart from Woolloongaba were able to be predicted to a reasonable degree of accuracy by the ATDL dispersion model. The Woolloongaba data clearly need accurate models for near roadway conditions using on-site meteorological data.

Tripathi, Anamika.
1994. Airborne lead pollution in the city of Varanasi, India. Atmospheric Environment, 28(14): 2317-2323,

QUA; ST;
Lead content of air;

Tso, C. P.
1994. The impact of urban development on the thermal environment of Singapore. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 269-280.

UBCL; T;

ABSTRACT: Singapore, lying just north of the equator, is an island state of dominantly urban setting with an overall population density of 4800 per km2. The rapid urbanization over the past two decades has caused changes to the city skyline as well as to the thermal environment. Based on past studies there is evidence that the regions of urban development tends to be the regions with higher air temperatures. The blue-prints for the control of future growth and the implementation of urban planning for the nation is briefly discussed, and the reserach direction of an active group on thermal environment is indicated.

Viet L., Tran.
1994. Climate zoning for building and urban planning in Vietnam. Report of the Technical Conference on Tropical Urban Climates. WMO, TD-No. 647. 163-175.

UP; T;

Voogt, James A.
1994. Thermal remote sensing of the three-dimensional urban surface. 1994 AAG Annual Meeting Abstracts, (390).

RSUC; GU;
Urban climatology; remote sensing.

Wang, Cunzhong.
1994. Spectral characteristics of surface-layer turbulence over the suburbs of Tianjin. Acta Meteorologica Sinica, 8(2): 220-228.

PhMUC; ST;
Turbulent diffusion of pollutants.

Yang, Xingwei; Zhou, Hongmei; Lou, Meng.
1994. The application of meteorological satellite data in the temperature distribution analysis in Pudong New Area of Shangai. Journal of Applied Meteorology, 5(3): 369-373,

RSUC; ST;
Urban temperature distribution; Satellite temperature estimates;

Agarwal, P. et al.
1995. Surface layer turbulence processes in low wind speeds over land. Atmospheric Environment, 29(16): 2089-2098,

PhUC; T;
Boundary layer turbulence; boundary layer turbulent diffusion.

Al-Temeemi, A. S.

1995. Climatic design techniques for reducing cooling energy consumption in Kuwaiti houses. Energy and Buildings 23: 41-48.

EUC; T;
Kuwait; Residential buildings; Energy consumption; Design

ABSTRACT: The paper discusses energy conservation and climatic design techniques that can be implemented in the single-family houses of Kuwait to reverse the current trend of constructing energy wasteful buildings. A comparison is made between the indigenous houses of Kuwait, which existed before the discovery of oil, and the modern houses. Simple recommendations are presented which will result in consequential energy savings while preserving comfort.

Baumbach, G. et al.

1995. Air pollution in a large tropical city with a high traffic density: results of measurements in Lagos, Nigeria. Science of the Total Environment, 169: 25-31,

QUA; T;
Atmospheric pollution by motor vehicles; Atmospheric pollution and healt;

Boybeyi, Zafer; Raman, Sethu; Zannetti, Paolo.

1995. Numercial investigation of possible role of local meteorology in Bhopal gas accident. Atmospheric Environment, 29(4): 479-496,

QUA; T;
Gas dispersion; Urban influences on atmospheric dispersion;

Debnath Arabinda, Singh V. S.; Singh P. Y.

1995. Comparative assessment of energy requirements for different types of residential buildings in India. Energy and Buildings, 23:141-146.

EUC; T;
Residential buildings; energy requirements.

ABSTRACT: This paper presents a comparison of the energy required for major building materials at the time of construction of single and double storey residential buildings with load bearing walls, and four storey residential buildings with reinforced concrete construction in India. For the total floor area of 50-200 sq. m, total energy consumption per unit of floor area decrease, from 5 to 4.1 GJ for single storey, from 4.2 to 3.7 for double storey, and from 4.3 to 3.1 GJ for four storey buildings.

Fernandez-Bremauntz, Adrian A.; Ashmore, Michael R

1995. Exposure of commuters of carbon monoxide in Mexico City. I. Measurement of in-vehicle concentrations. Atmospheric Environment, 29(4): 525-532,

QUA; ST;
Carbon monoxide in urban air;

Fung, Y. S.; Wong, L. W. Y.

1995. Apportionment of air pollution sources by receptor models in Hong Kong. Atmospheric Environment, 29(16): 2041-2048,

QUA; ST;

Urban air pollution; receptor models; source apportionment; factor analysis; multivariate regression analysis;

ABSTRACT: The application of a receptor modelling method for the apportionment of air pollution in sources in a highly urbanised area has been investigated using trace metals as marker elements in air particulates sampled at five stations in New Territories in Hong Kong. The elemental profile of the coal used for burning, the fly ash obtained after the electrostatic precipitor and the ambient particulates collected at the five sampling sites were determined. The variability is found to be substantial and necessitates the use of factor analysis to identify. Six factors are successfully isolated and their sources identified.

Glikson, M. et al.

1995. Microscopic and submicron components of atmospheric particulate matter during high asthma periods in Brisbane, Queensland, Australia. Atmospheric Environment, 29(4): 549-562,

QUA; ST;
Particulate matter in urban air; Particulate matter sources; Atmospheric pollution effects;

Hardie, R. Wayne; Thayer, Gary R.; Barrera-Roldan, Adrian.

1995. Development of a methodology for evaluating air pollution options for improving the air quality in Mexico City. Science of the Total Environment, 169: 295-301,

QUA; ST;
Atmospheric pollution control;

Khemani, L. T. et al.

1995. Study of surface ozone behaviour at urban and forested sites in India. Atmospheric Environment, 29(16): 2021-2024,

QUA; T;
Surface ozone; forest environment; diurnal and seasonal variation; dynamical exchange processes,; pollutant transports; monsoon circulation

ABSTRACT: Surface ozone concentrations were measured continuously at Pune for a period of one year during 1991-92 and for a period of 10 days in January 1992 at Upper Kargudi and in April 1992 at Bandipur, core zones of the Nilgiri Biosphere Reserve forest located at Tamil Nadu and Karbataka States, respectively, in south India. There is a marked diurnal variation in the concentration of surface ozone which crearly follows the diurnal variation of surface temperatture. The monthly maximun concentration was observed during the summer season (March-May) and minimum during the monsoon season (June-September).

Sekhar, S. C.

1995. Higher space temperatures and better thermal comfort a tropical analysis. Energy and Buildings, 23: 63-70.

UBCL; T;
Tropical buildings; space temperatures; thermal comfort.

ABSTRACT: In tropical buildings, is not uncommon to find low space temperatures around 23 °C and high relative humidity levels in the order of about 70-75%. The present paper explores the possibility of operating at space temperatures close to 26 °C with relative humidity around 60%. The study is based on acceptable thermal comfort conditions in the space by resorting to ASHRAE comfort chart and comfort diagrams. The psychrometric challenge, as a consequence of higher space

temperatures, is illustred in the paper and an alternative method of air conditioning to overcome the problem is demonstrated. The analysis also reveals the potential savings in energy that could be obtained as a result of reduced space cooling loads due to higher-space temperatures.

Stanhill, G.; Kalma, J. D.
1995. Solar dimming and urban heating at Hong Kong. International Journal of Climatology, 15(8): 933-941.

EUC; ST;
Urban influences on temperature; Urban heat islands; Temperature-radiation relationships.

Tarleton, Lesley F.; Katz, Richard W.
1995. Statistical explanation for trends in extreme summer temperatures at Phoenix, AZ. Journal of Climate, 8(6): 1704-1708,

EUC; ST;
Temperature trends; Urban heat islands;

ABSTRACT: A reanalysis of the same Phoenix daily minimum and maximun temperature data examined by Balling at al. has been perfomed. As evidence by substantial increasing trends in both the mean minimum and maximun temperatures, this area has experienced a marked heat island effect in recent decades. Balling at al. found that a statistical model for climate change in which simple a trend in the mean is permitted is inadequate to explain the observed trend in ocurrence of extreme maximum temperatures. The present reanalysis establishes that by allowing for the observed decrease in the standard deviation, the tendency to overestimate the frequency of extreme high-temperature events is reduced. Thus, the urban heat island provides a real world application in which trends in variability need to be taken into account to anticipate changes in the frequency of extreme events.

Tsinonis, A; I. Koutsogiannakis; M. Santamouris and I. Tselepidaki.
1995. Statistical analysis of summer comfort conditions in Athens, Greece. Energy and Buildings 19: 285-290.

UBCL; ST;
Comfort conditions.

Villalobos-Pietrini, Rafael; Blanco Salvador; Gomez Arroyo, Sandra.
1995. Mutagenicity assessment of airborne particles in Mexico City. Atmospheric Environment, 29(4): 517-524,

QUA; ST;
Particulate matter in urban air; Atmospheric pollution and health; Mutation;

REPORTS PUBLISHED IN THE
WORLD CLIMATE APPLICATIONS PROGRAMME (WCAP)/
WORLD CLIMATE APPLICATIONS AND SERVICES PROGRAMME (WCASP)
SERIES

WCAP - 1 CLIMATE AND HUMAN HEALTH. Proceedings of the Symposium in Leningrad, 22-26 September 1986, Volume I

WCAP - 2 CLIMATE AND HUMAN HEALTH. Proceedings of the Symposium in Leningrad, 22-26 September 1986, Volume II

WCAP - 3 ANALYZING LONG TIME SERIES OF HYDROLOGICAL DATA WITH RESPECT TO CLIMATE VARIABILITY - Project Description *(out of print)*

WCAP - 4 WATER RESOURCES AND CLIMATIC CHANGE: SENSITIVITY OF WATER-RESOURCE SYSTEMS TO CLIMATE CHANGE AND VARIABILITY. Norwich, U.K., November 1987

WCAP - 5 FOURTH PLANNING MEETING ON WORLD CLIMATE PROGRAMME - WATER. Paris, 12-16 September 1988 *(out of print)*

WCAP - 6 CLIMATE APPLICATIONS: ON USER REQUIREMENTS AND NEED FOR DEVELOPMENT [Reports of the CCl rapporteurs on Users' Requirements and Publicity (F. Singleton) and New Approaches in Applications (D.W. Philips) to the tenth session of the Commission for Climatology, Lisbon, April 1989]

WCAP - 7 DROUGHT AND DESERTIFICATION. [Report of the CCl Rapporteur on Drought and Desertification in Warm Climates to the tenth session of the Commission for Climatology (Lisbon, April 1989) (L.J. Ogallo) and lectures presented at the training seminar in Muñoz, Philippines (14-24 November 1988) by N. Gbeckor-Kove] *(out of print)*

WCAP - 8 REPORT OF THE FIRST SESSION OF THE CCl WORKING GROUP ON CLIMATE AND URBAN AREAS INCLUDING BUILDING AND OTHER ASPECTS AND SOME RELATED PAPERS by Professors E. Jauregui and Shen Jianzhu, Members of the Working Group

WCAP - 9 REPORT OF THE EXPERT MEETING ON CLICOM CLIMATE APPLICATIONS (INCLUDING CARS), Geneva, 6-10 November 1989

WCAP - 10 URBAN DESIGN IN DIFFERENT CLIMATES by B. Givoni, University of California, U.S.A.

WCAP - 11 FIFTH PLANNING MEETING ON WORLD CLIMATE PROGRAMME - WATER, Laxenburg, Austria, 30 April - 4 May 1990 *(out of print)*

WCAP - 12 IMPACT POSSIBLE DES CHANGEMENTS CLIMATIQUES A VENIR SUR LES RESSOURCES EN EAU DES REGIONS ARIDES ET SEMI-ARIDES, par Jacques Sircoulon, ORSTOM, Paris, France, June 1990 *(out of print)*

WCAP - 13 INFORMATION ON METEOROLOGICAL EXTREMES FOR THE DESIGN AND OPERATION OF ENERGY SYSTEMS by G.A. McKay, Consulting climatologist, Canada, September 1990 *(out of print)*

WCAP - 14 EXTREMES AND DESIGN VALUES IN CLIMATOLOGY by Tibor Faragó, Hungarian Meteorological Service, Budapest, Hungary and Richard W. Katz, National Center for Atmospheric Research, Boulder, U.S.A.

WCAP - 15 BIBLIOGRAPHY OF URBAN CLIMATE, 1981-1988. Prepared by Prof. T.R. Oke, Atmospheric Science Programme, Department of Geography, University of British Columbia, Vancouver, B.C., Canada

WCAP - 16 REPORT OF THE WORKSHOP ON A CLICOM-HOMS INTERFACE, University of Reading, U.K., 6-15 March 1990)

Note: ***Following the change of the name of the World Climate Applications Programme (WCAP) to World Climate Applications and Services Programme (WCASP) by the Eleventh WMO Congress (May 1991), the subsequent reports in this series will be published as WCASP reports, the numbering being continued from No. 16 (the last "WCAP" report).***

WCASP - 17 A NONPARAMETRIC FRAMEWORK FOR LONG-RANGE STREAMFLOW FORECASTING by J.A. Smith, G.N. Day and M.D. Kane, Hydrologic Research Laboratory, National Weather Service, U.S.A.

WCASP - 18 REPORT OF THE FIRST SESSION OF THE ADVISORY COMMITTEE ON CLIMATE APPLICATIONS AND DATA (ACCAD), Geneva, 19-20 November 1991 (also appears as WCDMP-17) *(out of print)*

WCASP - 19 URBAN CLIMATOLOGY IN AFRICA (Special issue of the journal "African Urban Quarterly"), Yinka R. Adebayo, guest editor, August 1992 *(out of print)*

WCASP - 20 OPERATIONAL CLIMATOLOGY - CLIMATE APPLICATIONS: ON OPERATIONAL CLIMATE SERVICES AND MARKETING, INFORMATION AND PUBLICITY. Reports to the eleventh session of the Commission for Climatology, Havana, February 1993 by the CCl rapporteurs on Operational Climatological Services (J.M. Nicholls) and Marketing, Information and Publicity (D.W. Phillips)

WCASP - 21 CLIMATE APPLICATIONS: ON USER REQUIREMENTS AND CLICOM APPLICATIONS. Reports to the eleventh session of the Commission for Climatology, Havana, February 1993 by the CCl rapporteurs on User Requirements (O. Moch) and CLICOM Applications (P. David and S. Roy) *(out of print)*

Disponible en français: APPLICATIONS CLIMATOLOGIQUES: LES BESOINS DES USAGERS, LE CLICOM/APPLICATIONS. Rapports à la onzième session de la Commission de climatologie, La Havane, février 1993, par les rapporteurs de la CCl pour les besoins des usagers (O. Moch) et le CLICOM/Applications (P. David et S. Roy) (out of print)

WCASP - 22 REPORT OF THE SECOND SESSION OF THE ADVISORY COMMITTEE ON CLIMATE APPLICATIONS AND DATA (ACCAD), Geneva, 16-17 November 1992 (also appears as WCDMP-22)

WCASP - 23 A SURVEY OF CURRENT APPROACHES TO MODELLING OF HYDROLOGICAL TIME-SERIES WITH RESPECT TO CLIMATE VARIABILITY AND CHANGE. Prepared for the World Climate Programme - Water, Project A2, by George S. Cavadias, November 1992

WCASP - 24 TECHNICAL CONFERENCE ON TROPICAL URBAN CLIMATES - EXTENDED ABSTRACTS (Dhaka, Bangladesh, 28 March - 2 April 1993) *(out of print)*

WCASP - 25 BIBLIOGRAPHY OF URBAN CLIMATE IN TROPICAL/SUBTROPICAL AREAS 1981-1991. Prepared by Dr. E. Jauregui, CCl Rapporteur on Urban Climatology, May 1993

WCASP - 26 HYDROLOGICAL DESIGN DATA ESTIMATION TECHNIQUES. Prepared by Oldřich Novický, Ladislav Kašpárek, Světlana Kolářová, Czech Hydrometeorological Institute. Report of the WCP-Water Project C.5 - Re-analysis of Hydrological Observations in Czechoslovakia. May 1993 *(out of print)*

WCASP - 27	REPORT OF THE WORKSHOP ON USER NEEDS AND REQUIREMENTS (Norrköping, Sweden, 4-8 October 1993) *(out of print)*
WCASP - 28	DROUGHT AND DESERTIFICATION. Reports to the Eleventh session of the Commission for Climatology (Havana, February 1993) by Kerang Li and A. Makarau, CCl Rapporteurs on Drought *(out of print)*
WCASP - 29	SIXTH PLANNING MEETING ON WORLD CLIMATE PROGRAMME - WATER (Wallingford, 1-5 March 1993)
WCASP - 30	REPORT OF THE TECHNICAL CONFERENCE ON TROPICAL URBAN CLIMATES (TeCTUC) (Dhaka, Bangladesh, 28 March - 2 April 1993)
WCASP - 31	REPORT OF THE FIRST SESSION OF THE CCl WORKING GROUP ON OPERATIONAL USE OF CLIMATOLOGICAL KNOWLEDGE (Vacoas, Mauritius, 22-26 November 1994)
WCASP - 32	REPORT FROM THE MEETING OF EXPERTS ON CLIMATE INFORMATION & PREDICTION SERVICES, CLIPS (Melbourne, Australia, 28 to 31 March 1995) *(out of print)*
WCASP - 33	REPORT FROM THE MEETING OF EXPERTS ON CLIMATE, TOURISM AND HUMAN HEALTH (Topes de Collantes, Cuba, 22-29 January 1995)
WCASP - 34	REPORT OF THE TENTH SESSION OF THE ADVISORY WORKING GROUP OF THE COMMISSION FOR CLIMATOLOGY (Geneva, 20-22 September 1995) (also appears as WCDMP-24)
WCASP - 35	REPORT OF THE FIFTH SESSION OF THE ADVISORY COMMITTEE ON CLIMATE APPLICATIONS AND DATA (ACCAD) (Geneva, 26 September 1995) (also appears as WCDMP-25)
WCASP - 36	BIBLIOGRAPHY OF URBAN CLIMATOLOGY FOR THE PERIOD 1992-1995. Prepared by Professor E. Jáuregui, CCl Rapporteur on Urban Climatology, May 1996
