

## CURRICULUM VITAE - LAURENCE S. KALKSTEIN

### PERSONAL DATA

Name: Laurence Saul Kalkstein  
Place of Birth: Brooklyn, New York, USA  
Qualifications: B.A. (1969), M.A. (1972), Ph.D. (1974)

### EDUCATION

#### Schools and Universities

Rutgers University, New Brunswick, New Jersey,  
1965-1969. B.A. with distinction in Geography.  
Louisiana State University, Baton Rouge, Louisiana,  
1969-1974.  
M.A. in Geography, 1972.  
Ph.D. in Geography/Climatology, 1974.  
Minor subject: Forestry.

### PRIZES, SCHOLARSHIPS, FELLOWSHIPS, AND HONORS

Graduate with Distinction in Geography, Rutgers University, 1969.  
Candidate for Henry Rutgers Scholar, 1969.  
National Science Foundation Assistantship, 1969-1970.  
National Science Foundation Traineeship, 1970-1972.  
Grant awarded for dissertation research, Southern Forest Disease and Insect Research Council, 1972-1973.  
Honorable mention for best graduate student paper at Southwestern Division Meeting of the Association of American Geographers, 1973.  
Recipient of award for contributing most toward southern forest pest research during 1973, Southern Forest Disease and Insect Research Council.  
L.S.U. dissertation-year fellowship, 1973-1974.  
Honorable Mention for Excellence in Teaching Award, University of Delaware, 1977, 1978, 1979.  
Excellence in Teaching Award, 1980.  
Recipient of grant-in-aid, \$500 award, University of Delaware, 1981-82.  
National Oceanic and Atmospheric Administration grant-in-aid for research at the Assessment and Information Services Center, \$10,000, 1982-1983.  
Listed in "American Men and Women in Science," 1986.  
Recipient of grant-in-aid, \$550 award, University of Delaware, 1986-87.  
Nominated by the Department of Geography and Anthropology, LSU, to the LSU Alumni Hall of Distinction, 1987.

Recipient of grant-in-aid, \$550 award, University of Delaware, 1987-88.  
 Recipient of an Intergovernmental Personnel Act (IPA) assignment to the U.S. Environmental Protection Agency as a visiting scientist, 1989-1990.  
 Selected by the World Meteorological Organization as Rapporteur on Climate and Human Health to the Commission for Climatology, 1989-present.  
 Listed in "Who's Who in the East", 1993.  
 Listed in "Who's Who in American Education", 1993.  
 Selected lead author on climate and health, Intergovernmental Panel on Climate Change (IPCC), 1993, 1994; selected as contributing author, 1999-2000.  
 Listed in "Who's Who in the World" - 12th Edition.  
 Listed in "Who's Who in Science and Engineering" - 3rd Edition and later.  
 Selected working group chairman for "Climate, Morbidity and Mortality": *International Society of Biometeorology*  
 Selected lead author by U.S. EPA: Criteria Document for Purposes of Amending the Clean Air Act  
 Recipient of grant-in-aid, \$1,000 award, University of Delaware, 1996-97.  
 Selected by International Society of Biometeorology as their liaison with the World Health Organization, 1996-present  
 Selected to deliver keynote address to 50th Anniversary Meeting of the World Meteorological Organization Executive Council, May 2000.  
 Selected Team Leader for the WMO Expert Team on Operational Heat/Health Warnings, 2002.  
 Elected President, International Society of Biometeorology, 2005.  
 Nobel Peace Prize participant, Intergovernmental Panel on Climate Change, 2008.  
 Co-winner of the "NOAA Administrators Award" for "developing the innovative Cold Advisory for Newborn Livestock decision support tool for use by NOAA's partners", 2011.

## THESIS AND DISSERTATION TITLES

"Spatial and Temporal Climatic Variations Along the Northern Gulf Coast by Means of Air Mass Analysis," M.A. Thesis, Louisiana State University, 1972.

"A Method to Determine Relationships Between Climate and Outbreaks of the Southern Pine Beetle (*Dendroctonus frontalis* Zimm.)," Ph.D. Dissertation, Louisiana State University, 1974.

## EMPLOYMENT

2013-present Research Professor, Department of Public Health Sciences, Miller School of Medicine, University of Miami  
 2007-2013 Research Professor, Department of Geography and Regional Studies, University of Miami  
 2003-2006 Senior Research Fellow, Center for Climatic Research, Department of Geography, University of Delaware  
 2003-present President, Applied Climatologists, Inc.  
 1988-2003 Professor, Center for Climatic Research, Department of Geography, University of Delaware.  
 1989-1990 Visiting Scientist, Environmental Protection Agency, Global Climate Change Division Washington, DC.  
 January 1988 Visiting Scholar, Department of Atmospheric Science, Zhongshan University, Guangzhou, People's Republic of China.

1981-1988 Associate Professor, Center for Climatic Research, Department of Geography, University of Delaware.

August 1982- Feb. 1983 Visiting Scientist, National Oceanic and Atmospheric Administration, Climate Impact Assessment Division, Washington, D.C.

1975-1981 Assistant Professor, Department of Geography, University of Delaware.

1974-1975 Assistant Professor, Department of Geography, UCLA.

1973-1974 Acting Assistant Professor, Department of Geography, UCLA.

1972-1973 Graduate Student Instructor, Department of Geography and Anthropology, Louisiana State University.

## PROFESSIONAL SERVICE

**Invited reviewer of journal articles, monographs, and grant proposals, including:** *Publications in Climatology, Forest Science, The Professional Geographer, Annals of the Association of American Geographers, Southeastern Geographer, Climatological Review, Journal of Climate, Theoretical and Applied Climatology, International Journal of Climatology, International Journal of Biometeorology, Atmospheric Environment, Great Plains Research, Great Lakes Geographer, Journal of the American Medical Association, The Lancet, Water Resources Research, NOAA Climate Impact Assessment, Environmental Health Perspectives, Climatic Change, Journal of Applied Meteorology, Bulletin of the American Meteorological Society, Atmospheric Research, Meteorology and Atmospheric Physics, Climate Research, Experientia, Meteorology and Atmospheric Physics, Environmental Health Perspectives, Nature* and grant proposals for the National Science Foundation, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, and numerous others.

- Appointed Member, Water Resources Working Group, Consortium for Environmental Forestry Studies, 1979-1983.
- Appointed Member, Editorial Advisory Board, *Publications in Climatology*, 1979-present.
- Member, World Climate Impact Study Programme of the United Nations Environment Programme, 1984-present.
- Appointed Member, Gamma Theta Upsilon/AAG Visiting Scientists Program, 1986-present.
- Member, Program Committee, American Meteorological Society Conference on Applied Climatology, 1988-1992.
- Appointed Member, American Meteorological Society Committee on Applied Climatology, 1988-91.
- Appointed Member, American Meteorological Society Committee on Biometeorology, 1995-present.
- Appointed Principal Investigator, EPA Global Warming/Health Program, 1991- 1999.
- Appointed Editor, *Climate Research*, 1996-2000.
- Appointed Member, Editorial Board, *International Journal of Biometeorology*, 1994-2004.
- Appointed Chair, International Society of Biometeorology, Study Group 6 (SG6), [Climate, Morbidity, Mortality], 1994-2002.
- Selected Lead Author, U.S. Department of State, for IPCC Chapter on Climate Change and Human Health, 1994..
- Appointed Board Member to Evaluate the K through 12 Earth Sciences Curriculum for State of Delaware, 1995-96.
- Board Member, Physicians for Social Responsibility - 1995-present.
- International Society of Biometeorology Liaison Officer with WHO - 1995-present

- WMO's Rapporteur on climate and human health issues - 1995-present
- Appointed Editor, *Climate Research* - 1997-2002.
- Appointed Editor, *International Journal of Biometeorology* - 1997-present.
- Elected member of the International Society of Biometeorology Executive Council, 1999.
- Director, University of Delaware Collaborating Centre with WHO/WMO/UNEP, 1999.
- Selected Team Leader for the WMO Expert Team on Operational Heat/Health Warnings, 2002-present.
- President, of the International Society of Biometeorology, 2005-08.

**Invited lectures/presentations at the following agencies/institutions:**

Arizona State University, Louisiana State University, University of Missouri, University of Maryland, Pennsylvania State University, Villanova University, Temple University, University of North Carolina, UCLA, Indiana State University, Eastern Illinois University, Immaculata College, West Chester University, Rutgers University, University of Miami, United States Military Academy at West Point, Zhongshan University (China), Yunnan Administration of Meteorology (China), Centers for Disease Control, EPA Office of Policy Analysis, EPA Air Quality Division, NOAA National Climatic Data Center, National Weather Service, Assessment and Information Services Center, Climate Prediction Center, USDA Beneficial Insects Laboratory, Forest Service/Southern Forest Experiment Station, Environment Canada Atmospheric Environment Service, National Center for Atmospheric Research, National Academy of Sciences, New York Academy of Medicine, National Institutes of Health, Climate Institute, New York Museum of Natural History, EPA General Circulation Modelers Meeting, DuPont Corporation, Ain Shams University (Cairo, Egypt), Burkina Faso Meteorological Service, Onchocerciasis Control Program, United Nations Symposium on the Potential Impacts of Climate Change, National Association of Aerial Applicators, American Public Health Association, Intergovernmental Panel on Climate Change (IPCC), Wellington School of Medicine (Wellington, NZ), London School of Tropical Medicine and Hygiene, World Health Organization, World Meteorological Organization, University of Nebraska, Harvard Medical School (Center for Health and the Global Environment), Rome, Italy Health Authority, Universita di Bologna, Senator Bill Roth's 31st Youth Leadership Conference, London Mayor's Climate Change Summit, numerous National Weather Service Offices, Department of Health and Human Services, Department of Homeland Security, and many others.

**Invited debates/testimonies:**

National Governor's Conference, Mid American Power Pool, DuPont Corp., University of North Carolina, Congressional Subcommittee on Environment and Health, EPA Air Pollution Committee, National Institutes of Health Committee on Global Warming, EPA hearing to determine pollution controls on the Navajo Generating Station, Congressional hearing, (Committee on Environment and Health) on the impact of global warming on human health, U.S. EPA hearing on development of particulate pollution/health relationships for inclusion in the Clean Air Act, CNN Crossfire (twice), Congressional briefing (Environmental and Energy Study Institute), numerous television and radio appearances, U.S. EPA White House Conference; U.S. EPA Conference on Emerging Public Health Threats and Role of Climate Change. Numerous appearances on national television and radio shows, research highlighted on national and international television.

**Reviewed promotion dossiers for professors at:**

University of Nebraska, Arizona State University, Pennsylvania State University, Kent State University, University of Delaware, University of California, Davis, University of Birmingham (England), Louisiana State University, Rutgers University, University of North Carolina, Georgia State University,

University of Wisconsin, University of British Columbia, University of Virginia, University of Georgia, University of Haifa.

### **Consulting Activities:**

- Consultant to the Southern Forest Disease and Insect Research Council, 1973-74, to assist in the formulation of predictive equations to evaluate the relationship between climate and outbreaks of the southern pine beetle.
- Consultant to Publishing Companies, 1975-present, as a paid reviewer for: Houghton-Mifflin, Duxbury, Canfield Press, Harper & Row, Random House, McGraw Hill, and Blackwell Scientific Publications.
- Consultant to the Cousteau Society, Inc., 1976, to assist in the development of a series of television specials entitled, "Oasis in Space," relating to the general effect of man as a modifier of the biotic community.
- Consultant to Hercules, Inc., 1980, to develop a water budget to evaluate sludge decomposition at a dumping site in Virginia.
- Consultant to Robert Carpenter Estate, 1982, to evaluate the effects of weather on quail populations on a 17,000 acre estate in South Carolina.
- Consultant to the Seven-Up Company, 1986, to discuss the impact of weather upon human well-being to the national media.
- Consultant to Prism Productions, Inc., 1987, to develop a series, How About..., which reports on science and technology for television.
- Consultant to the Centers for Disease Control, 1987-88, to develop a climatic procedure to evaluate recurrent asthma outbreaks in Spain.
- Consultant to University of Delaware, College of Urban Affairs, 1988, to evaluate vegetation at locations on the State Historical Register.
- Consultant to the Salt River Project, 1989-1992, to determine sources of pollution in the Grand Canyon.
- Consultant to E. I. DuPont de Nemours & Co., Inc., 1989-93, to develop climate data base for use in determining the breakdown of pesticide residues; determination of proper meteorological conditions for aerial spraying of pesticides; development of meteorology course for DuPont professionals.
- Consultant to University of California, Berkeley, and the USDA, 1992, to determine health impacts of global warming.
- Consultant to U.S. EPA Environmental Criteria and Assessment Office (ECAO), 1994-95 to write section of PM/criteria document for inclusion in the Clean Air Act.
- Consultant to Australian Government, 1994 on climate/human health problems.
- Consultant to National Climatic Data Center, 1996 on the development of an environmental information database of air masses for North America.
- Consultant to Combe Incorporated, 1996 to 2004, to develop winter and summer dry skin indices.
- Consultant to EPA, 1997, to develop fact sheets on climate change impacts.
- Consultant to Johns Hopkins University, 1997-98, to evaluate pollution/heat impacts on human health.
- Consultant to the Health Effects Institute on evaluating means to account for weather in mortality/pollution relationships.
- Consultant to SDI, Inc., 1998-2006, on weather forecasts to determine product sales.
- Consultant to U.S. EPA and Stratus Consulting Co, 2003-present, on climate/health issues.
- Consultant to the Italian government, 2003-present, on developing Italian heat/health warning systems.
- Consultant to the Union of Concerned Scientists and the University Corporation for Atmospheric Research, 2004-2010, on climate change issues.
- Consultant to Redefining Progress, 2004, on climate change/environmental justice issues.

- Consultant to SwissRE and Harvard School of Public Health, 2005, on the economic impacts of climate change.
- Consultant, City of Philadelphia, 2005, on the impact of heat on human morbidity in Philadelphia.
- Consultant to EarthSat, Inc., 2005, on the development of an index to estimate utility loads.
- Consultant to the Attorney General Offices of New York and California on climate change issues, 2005-present.
- Consultant to Arizona Public Service, Entergy, and the Salt River Project on utilities response to heat, 2004-05
- Consultant to Peel Region of Ontario, Canada, on development of heat/health warning systems, 2006-present.
- Consultant to Union of Concerned Scientists, on determining impact of climate change on heat-related mortality, 2006-present.
- Consultant to US EPA, on developing an excessive heat events guidebook for health departments and other stakeholders, 2004-present.
- Consultant to the South Korean government, on the development of heat/health warning systems for the largest cities in Korea, 2007 to present.
- Consultant to the National Environmental Trust, to evaluate the impact of climate change on heat-related mortality, 2007 to present.
- Consultant to health departments in San Jose, CA and Des Moines, IA on the development of heat/warning systems for those urban areas, 2008 to present.
- Consultant to the Union of Concerned Scientists to determine frequency and character changes of air masses in U.S. cities related to climate change, 2011-present.
- Consultant to the Korea Meteorological Administration to evaluate the impact of climate change on human health in Korea, 2012-present.
- Consultant to the National Resources Defense Council (NRDC) on determining the impact of climate change on human mortality, 2012-present.
- Consultant to the Union of Concerned Scientists (UCS) on trends in air mass frequencies and character in the U.S. Midwest, 2012.
- Consultant to Global Cool Cities Alliance on the impact of urban cooling strategies on human health, 2013 to present.
- Consultant to Climate Resolve and the Los Angeles Health Department on mitigating heat-related health problems in that city, 2013-present.
- Consultant to the Delaware Department of Natural Resources and Environmental Control, and to Delaware Interfaith Power and Light, on the development of a heat-health warning system for the state of Delaware.

## **RESEARCH AND PROFESSIONAL ACTIVITIES**

### Research Topics

#### Applied Climatology

- Climate/health relationships
- Climate impact assessment
- Development of climate indices for problem evaluation

#### Synoptic Climatology

- Development of automated synoptic indices
- Climate/pollution problems
- Quantitative assessment of air mass frequencies
- Development and implementation of a hot weather-health watch/warning systems

#### Bioclimatology

- Climate/organism relationships
- Physiological responses of organisms to climatic stress
- Forest insect problems

### Advising

Major advisor for 10 Ph.D. students and 30 Masters students. My advisees are now professors at many major academic institutions such as the University of Virginia, University of Oklahoma, University of Alberta, Kent State University, California State University system, and many others. Some have major government positions at places such as the National Climatic Data Center, EPA, the State of Delaware, and the Geophysical Fluid Dynamics Laboratory in Princeton.

### Fulbright Sponsorships

I am presently sponsoring Dr. Elena Grigorieva, Russia Academy of Sciences, on a Fulbright Scholarship awarded to her. I have been asked to sponsor Dr. Jennifer Vanos, Health Canada, on a Fulbright Scholarship. The decision on her award is pending.

## Extramural Research Grants

Principal Investigator on the following projects:

Period	Title	Agency	Amount
1973	Relationships Between Climate and Outbreaks of the Southern Pine Beetle	So. Forest Insect and Disease Research Council	\$ 4,500
1980-82	Climatic Stress and Morbidity in the Wilmington, DE Area	NOAA/National Climatic Data Center	\$ 36,500
1981-84	Proposal for Center for Climatic Research/CEAS Cooperative Climate/Socio-Economic Program	NOAA/Assessment and Information Services Center	\$ 268,300
1983	Development of Comfort Index Data Bases	NOAA/National Climatic Data Center	\$ 13,600
1983	A Pilot Study to Identify Pollen Concentration Data Sources	NOAA/National Climatic Data Center	\$ 5,050
1983	The Construction of Weather Stress Index Maps for Inclusion into the National	NOAA/National Climatic Data Center	\$ 10,300
1983	Development of Synoptic Climatology Indices for Future NOAA Assessment Products	NOAA/Assessment and Information	\$ 10,000
1983-85	The Effect of Climate on the Agricultural Economies of Central America and the Caribbean Basin	NOAA/Assessment and Information Services Center	\$ 56,500
1984	The Impact of Lightning Strike on the Susceptibility of Trees to Southern Pine Beetle Attack	U.S. Forest Ser.	\$ 6,100
1985-86	The Impact of Climate on Human Mortality	NOAA/Assessment and Info. Service Center	\$ 40,000
1985-86	The Importance of CO <sub>2</sub> and Trace Gas-Induced Climatic Change Upon Human Health	EPA/Office of Policy Analysis	\$ 67,000
1986	Synoptic Weather Indices and Pollution Levels	EPA/Office of Policy Analysis	\$ 24,300
1987-1990	The Importance of CO <sub>2</sub> and Trace Gas-Induced Climatic Change Upon Human Health	EPA/Office of Policy Analysis	\$170,000



Period	Title	Agency	Amount
1988-89	A Synoptic Typing for Northern Arizona: The Development and Utility of a Three Dimensional Model	Salt River Project, Arizona State Univ.	\$ 20,000
1988-89	Development of Chinese/American Synoptic Climatological Model	Univ. of Delaware/Office of International Programs	\$ 1,000
1988-89	A Synoptic Evaluation of SCENES Air Quality Data in Northern Arizona	Salt River Project	\$ 25,000
1988-90	The Impact of CO <sub>2</sub> -Induced Warming on Water Supply in the Delaware River Basin	U.S. Geological Survey	\$ 23,000
1989-90	A Climatic Model to Evaluate Variations in Asthma Outbreaks in Barcelona, Spain	CDC/Barcelona Medical Investigation Team	\$ 3,000
1989-90	The Development of A Watch-Warning System for the Estimation of the Impact of Weather on Human Mortality in Missouri	Centers for Disease Control	\$ 6,000
1989-90	Evaluation of SCENES Air Quality Data Using a Three-Dimensional Synoptic Approach	Salt River Project	\$ 47,000
1989-90	Intergovernmental Personnel Act Agreement	EPA/Office of Policy Analysis	\$ 79,000
1990-91	A New Approach to Evaluate Fine Mass Concentrations and Visibility	Salt River Project	\$ 40,000
1990-91	Climate Change and Mortality in Canada	Environment Canada	\$ 60,000
1991	Navajo Generating Station Emissions and Meteorology: A More Intensive Evaluation	Salt River Project	\$ 8,288
1992-93	The Differential Impact of Pollution and Heat Stress Upon Human Mortality	EPA/Ambient Standards Branch	\$ 22,027

Period	Title	Agency	Amount
1990-95	A Domestic and International Global Warming/Health	EPA/Office of Policy Analysis	\$1,109,544

1992-95	Initiative NASA Global Change Fellowship (with Scott Greene)	NASA/Earth Science and Applications Division	\$ 66,000
1992-93	NIH Graduate Student Fellow for Infectious Disease Research	National Institutes of Health (NIAID)	\$ 16,410
1993-94	Development and Application of a New Regional Climatology for the Southern Climate Climate Center	Southern Regional Climate Center - Louisiana State Univ.	\$ 12,990
1994-95	Development of a Weather Human Mortality Watch/Warning System for the Southern United States	Southern Regional Climate Center Louisiana State Univ.	\$ 16,622
1994-95	NIH Graduate Student Fellow for Infectious Disease Research	National Institutes of Health (NIAID)	\$ 20,520
1994	Analysis of Onchocerciasis	National Institutes of Health (NIAID)	\$ 12,000
1995-01	Climate Change and Impacts on Human Health and Welfare (1) Incremental funding for Development of Heat/Health Watch/Warning system for Southwestern Ohio Incremental funding for (2) Evaluation of heat impacts on Native American Population in Phoenix, AZ	U.S. EPA, OPPE, CCD [R-82440401] (\$25,000)  (\$25,000)	\$ 327,216
1997-98	A Procedure to Evaluate the Effectiveness of Two Watch/Warning Systems	NOAA/NWS	\$ 50,689
1997-99	An Integrated Assessment of the Impacts of Global Climate Change	Subcontract from Johns Hopkins Univ.	\$ 50,000
1997-98	A Synoptic Climatology of North American Air Masses	NOAA/EPA/NCDC	\$ 55,000
1998	A Determination of Atmospheric Sources of Inorganic Nitrogen to the Delaware Inland Bays Watershed	Center for the Inland Bays, (DNREC)	\$ 24,500

Period	Title	Agency	Amount
1998-99	Atmospheric Sources of Inorganic Nitrogen to the Delaware Inland Bays Watershed	Center for the Inland Bays (DNREC)/EPA	\$ 15,000
1998-00	Evaluation of Meteorological Causes of Nutrient Enrichment in the Delaware Inland Bays Watershed	Center for the Inland Bays (DNREC)/EPA	\$ 25,000
1999-01	A Synoptic Approach to Evaluate Climate and Pollution Effects on Asthma	Philadelphia Dept. of Public Health/EPA	\$ 31,241
1998-01	Center for Climatic Research Collaborating Center for U.N. Environment Programme	United Nations Environment Programme	\$ 50,000
1999	Analysis of Regional Climatic & Local Environmental Factors Affecting Atmospheric Wet Deposition Rates of Contaminants	Div. of Soil and Water Conservation, Delaware Coastal Program (DNREC)	\$ 6,000
1999-00	A Synoptic Climatology of North American Air Masses	NOAA - Climate and Global Change Program	\$ 50,840
1999-01	Development of Heat-Health Watch/Warning System for Rome and Shanghai	WMO/WHO/USEPA	\$ 50,000
2000-01	Development of a Heat/Health Watch/Warning system and ozone alert system for Southwest Ohio	Combined Health District of Montgomery County Ohio	\$ 75,000
2000-01	Showcase Project - Development of heat/health watch/warning system for Rome and Shanghai	EPRI	\$ 5,000
2000-01	Development of a Heat/Health Watch/Warning system for Phoenix, AZ	Salt River Project	\$ 25,000
2001-02	Development of a Heat-Health Watch/Warning system for the Phoenix Metropolitan Area	NOAA/National Weather Service	\$ 25,000
2000-01	Development of Heat/Health Watch/Warning system for Toronto, Canada	Toronto Public Health Dept.	\$ 40,000
2001	Apparent Temperature Climatology of the U.S.	NOAA/National Climatic Data Center	\$ 25,000
2001	Using Value-of-Information Analyses to Estimate the Economic Benefits of Heat/Health Early Warning Systems	EPRI	\$ 15,000

Period	Title	Agency	Amount
2001-02	Development/Implementation Of Heat-Health Watch/Warning System for the New Orleans Region	Entergy	\$ 180,000
2001-02	Meteorological Influences on the Dispersion of White Pine Blister Rust	USDA Forest Service	\$ 25,000
2002-04	The Development of an Asthma Weather Watch Warning System For Philadelphia	US EPA/City of Philadelphia, Dept. of Public Health	\$ 39,000
2002-03	The Impact of Heat Island Reduction Strategies on Health Debilitating Oppressive Air Masses in Urban Areas	US EPA	\$ 40,000
2002	The Impact of 'Cool Homes' on Interior Temperatures of Low Income Row Homes in Phila.	Energy Coord. Agency of Philadelphia, Inc.	\$ 10,000
2002-03	Evapotranspiration and the Standardized Precipitation Index: An Improved Index for Global Drought Assessment	NOAA/NCDC	\$ 30,000
2003-present	A Prelude to the Development of a National System of Heat-Health Watch Warning Systems	NOAA/NWS	\$ 470,000
2003-2011	Meteorological Influences on the Dispersion of White Pine Blister Rust (Part II)	USDA Forest Service	\$ 75,000
2004	The Impact of Heat Island Reduction Strategies on Health Debilitating Oppressive Air Masses in Urban Areas	US EPA	\$ 30,000
2004-07	Mitigation of Urban Heat Islands	NSF	\$ 55,000
2006-present	NOAA COMET Grant: Cold Weather Watch Warning Systems	NOAA	\$ 42,000
2007-2011	Development of a Population - Weighted Heat Stress Index	Health & Human Services	\$ 87,000
2007-present	Trajectory Models to Trace Gypsy Moth Movements	USDA Forest Service	\$ 75,000
2008-present	Impact of Climate Change on Human Health in California	California Air Resources Board	\$ 37,000
2013	Evaluation of Climate in the Russian Far East	CRDF Collaborative Russian/U.S. Research	\$ 42,000
Pending	Development of a National System of Heat-Health Watch Warning Systems	NOAA/NWS	undetermined

Copyrighted Product

"The Weather Stress Index," an index designed to measure the relative impact of weather on human behavior and activity. Presently published monthly by NOAA and utilized by numerous professionals nationwide.

Membership to Scholarly Societies

World Meteorological Organization, Commission on Climatology  
American Meteorological Society  
Committee on Biometeorology, American Meteorological Society  
Committee on Applied Climatology, American Meteorological Society  
International Society of Biometeorology  
United Nations Environment Program, Collaborative Scientist  
World Health Organization, Collaborative Scientist

## PUBLICATIONS

### 1. Refereed Manuscripts, Monographs, Government Publications:

- Kalkstein, L.S., 1974. A Method to Determine Relationships Between Climate and Outbreaks of the Southern Pine Beetle. *Publications in Climatology*, 27:1-65.
- Kalkstein, L.S., 1976. Effects of Climatic Stress Upon Outbreaks of the Southern Pine Beetle (*Dendroctonus frontalis* Zimm). *Environmental Entomology*, 5:653-659.
- Kalkstein, L.S., 1979. Forest Diversity on the Delmarva Peninsula. *The Philadelphia Region: Selected Essays*, Association of American Geographers, 114-131.
- Mather, J.R., R.T. Field, L.S. Kalkstein and C.J. Willmott, 1980. Climatology: The Challenge for the Eighties. *The Professional Geographer*, 32:285-292.
- Kalkstein, L.S., 1981. Differential Response of Loblolly Pines to Climatic Stress. *The Professional Geographer*, 33(1):122-128.
- Kalkstein, L.S. and W.C. Liebhardt, 1981. Comparative Climate-Corn Yield Relationships in Three Delmarva Counties. *The Southeastern Geographer*, 21(1):26-39.
- Kalkstein, L.S., 1981. An Improved Technique to Evaluate Climate-Southern Pine Beetle Relationships. *Forest Science*, 27(3):579-589.
- Mather, J.R., R.T. Field, L.S. Kalkstein, C.J. Willmott and W.J. Maunder, 1981. Climatology: The Impact of the Seventies and the Challenge for the Eighties. *Weather and Climate*, 1:69-76.
- Mather, J.R., R.T. Field, L.S. Kalkstein and C.J. Willmott, 1981. Reply to Comments by Chakravarti and Barry on "Climatology: The Challenge for the Eighties." *The Professional Geographer*, 33:259-260.
- Kalkstein, L.S., 1982. The Weather Stress Index. *NOAA/National Weather Service Technical Procedures Bulletin Series No. 324*, 17 pages.
- Kalkstein, L.S., 1982. A Comparative Evaluation of the Winters of 1976-1977 and 1981-1982 Using the Weather Stress Index. *U.S. Department of Commerce/NOAA Climate Impact Assessment: United States*, 18-29.
- Kalkstein, L.S., 1982. Assessment of Human Well-Being. *U.S. Department of Commerce/NOAA Climate Impact Assessment: United States*, August, September, and December.
- Kalkstein, L.S., 1983. The Development of Indices for Climate/Socio-Economic Assessment: The "Weather Stress Index" as an Example. *The Pennsylvania Geographer*, 21:7-17.
- Kalkstein, L.S., 1983. Assessment of Human Well-Being. *U. S. Department of Commerce/NOAA Climate Impact Assessment: United States*, January.
- Kalkstein, L.S., 1984. The Impact of Winter Weather on Human Mortality. *U. S. Department of Commerce/NOAA Climate Impact Assessment: United States*, 21-27.
- Kalkstein, L.S. and P. Corrigan, 1986. A Synoptic Climatological Approach for Geographical Analysis: Assessment of Sulfur Dioxide Concentrations. *Annals of the Association of American Geographers*, 76(3):381-395.
- Kalkstein, L.S. and K.M. Valimont, 1986. An Evaluation of Summer Discomfort in the United States Using a Relative Climatological Index. *Bulletin of the American Meteorological Society*, 67(7):842-848.
- Kalkstein, L.S., G. Tan and J. Skindloy, 1987. An Evaluation of Objective Clustering Procedures for Use in Synoptic Climatological Classification. *Journal of Climate and Applied Meteorology*, 26(6):717-730.

- Kalkstein, L.S. and K.M. Valimont, 1987. An Evaluation of Winter Weather Severity in the United States Using the Weather Stress Index, *Bulletin of the American Meteorological Society*, 68(12):1535-1540.
- Kalkstein, L.S. and K.M. Valimont, 1987. Climate Effects on Human Health, In *Potential Effects of Future Climate Changes on Forests and Vegetation, Agriculture, Water Resources, and Human Health*, EPA Science and Advisory Committee Monograph #2538, pp. 122-152.
- Yarnal, B., R. Crane, A. Carleton and L.S. Kalkstein, 1987. A New Challenge for Climate Studies in Geography. *The Professional Geographer*, 39(4):465-473.
- Kalkstein, L.S., 1988. The Impacts of Predicted Climate Change on Human Mortality. *Publications in Climatology*, 41, 127 pages.
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