

## CURRICULUM VITA

### ERNEST M. AGEE

**Date of Birth:** 2 October 1942

#### **Education:**

- PhD, University of Missouri-Columbia, 1968 (Atmospheric Science)
- BS, Eastern Kentucky University (Mathematics and Physics)

#### **Professional Experience**

- Professor of Earth and Atmospheric Sciences, Purdue University, 1978-present
- Associate Professor (1972-78); Assistant Professor (1968-72), Purdue University
- Department Head, Earth and Atmospheric Sciences (1990-96), Acting Head (2004); Interim Head (2009-10); Associate Head (2005-09; 2010-present)
- Summer 1984 Invited Distinguished Scientist, Dept. of Physics, Institute of Meteorology and Oceanography, Utrecht University, The Netherlands
- Summer, 1983 Invited Distinguished Scientist, NOAA Environmental Research Labs, Boulder, CO
- Summer 1981 Invited Lecturer, Max-Planck Institute for Meteorology, University of Hamburg and Convener, IAMAP Special Assembly, Hamburg
- Summer, 1980 Visiting Senior Scientist, National Center for Atmospheric Research (NCAR), Boulder, CO
- Summer, 1979 Lecturer, NCAR's Advanced Study program for Women and Minorities, Boulder, CO
- Feb. 1974, 75 Scientific Participant, The Air Mass Transformation Experiment - a meteorology/oceanography field expedition over the East China Sea, invited by the Japanese government
- Aug. 1974, 75 Invited lecturer, Japan Meteorological Agency and University of Tokyo, sponsored by the USA-Japan Cooperative Science program

## **Professional memberships**

- Fellow, American Meteorological Society, elected 1982
- American Association for the Advancement of Science
- American Geophysical Union
- Meteorological Society of Japan
- Indiana Academy of Science, Fellow

## **Awards, Honors and Appointments**

- Cleveland Abbe Award, American Meteorological Society, 2010
- Science Advocate Award, University Corporation for Atmospheric Research, 2005-09
- Graduate Student Mentoring Award, College of Science, Purdue University, 2007
- Outstanding Teacher Award, Department of Earth and Atmospheric Sciences, 2004
- Sagamore of the Wabash, named by Governor Evan Bayh (Indiana), 1990.
- Purdue University's Scientific Member Representative to UCAR (University Corporation for Atmospheric Research, Boulder, Colorado), 1970-80; 1984-present.
- Member, Board on Oceans and Atmosphere, National Association of State Universities and Land Grant Colleges, 1993-98. Elected to 3-year term on the Executive Committee, 1995-98.
- USA representative, The International Association of Meteorology and Atmospheric Physics (IAMAP); Chairman - USA IAMAP; Member - IAMAP Cloud Dynamics Group; 1980-88.
- Member, The United States National Committee, International Union of Geodesy and Geophysics; nominated by the American Geophysical Union and appointed by the National Academy of Sciences, 1982-85 and 1985-88.
- Member, AMS-STAC Committee on Mesoscale Meteorology, American Meteorological Society (AMS), 1985-88.
- Trustee, The University Corporation for Atmospheric Research (UCAR), elected to the Board of Trustees by the member university consortium, 1979-83.
- Member, UCAR Nominating Committee, 1988-89; chairman, 1990.
- Vice Chairman UNIDATA Policy Committee and Executive Committee, appointed by UCAR President, 1983-88.
- Member, NOAA Profiler Committee, appointed by Director of NOAA-ERL, 1987-88.

- Member, STORM Program Scientific Steering Committee and Data Management Working Group, appointed by UCAR and NOAA, 1983-88.
- Chairman, UCAR Personnel Policy Committee, 1981-83.
- Member, Education and Manpower Commission, AMS, 1976-80.
- Eastern Kentucky University: Distinguished Alumnus Award, 1987

### **Abstract of Research and Engagement**

E. Agee (and his students) have a long track record of studying convective phenomena in the atmosphere, both shallow and deep convective systems. Fundamental discovery has been made in the manner that microscale convective structures in the surface boundary layer develop and subsequently organize into larger mesoscale convective patterns of 2-d and 3-d geometry. This work has focused on field investigation of wintertime cold-air outbreaks over warm ocean currents as well as the USA-Canada Great Lakes. Intensive field observation from aircraft platforms have been undertaken over the East China Sea, the Kuroshio and Gulf Stream currents, and Lake Michigan. Self-organizing convective patterns, observed and measured, have also been numerically simulated through Large Eddy Simulation (LES) models. This work has been extensively supported by the NSF and DOD. Deep convective systems, particularly severe thunderstorms and tornadoes, have also been studied both observationally and through laboratory investigation with a focus on vortex breakdown (a phenomenon in fluid mechanics that leads to turbulent vortex flows that bifurcate into multiple vortex phenomena). Professor Agee has also published papers in the areas of climate change, solar variability, statistical meteorology, chaos theory, satellite meteorology, and radioisotope analyses of convective rainfall. His research has been funded by NSF, DOD, NOAA, IBM, NASA and computer software companies. Agee's Science Citations are presently at 949 with an h-index of 21. Also, his average number of citations per item is 20.63, which compares favorably with the top faculty in geosciences in the world (see table on page 4).

Professor Agee and associates have also had several successful partnerships with the corporate world, including funding from IBM, Bell Labs, Microsoft, Monsanto, Alden Electronics and the UNISYS Corporation. These awards supported a Center for Climate Research, an Environmental Science and Engineering Lecture Series, and development of the commercial software package known as the Weather Processor (WXP).

## Top institutions in geosciences

Data provided by Thomson Reuters from its Essential Science Indicators, January 1999–June 2009

|     | Institution  | Papers | Citations | Citations per paper |
|-----|--|--------|-----------|---------------------|
| 1   | Met Office Hadley Centre for Climate Prediction and Research | 313    | 10,865    | 34.71               |
| 2   | Harvard University   | 1,248  | 31,735    | 25.43               |
| 3   | Lawrence Livermore National Laboratory                       | 924    | 22,487    | 24.34               |
| 4   | Princeton University   | 1,181  | 27,315    | 23.13               |
| 5   | University of East Anglia                                    | 817    | 18,833    | 23.05               |
| 6   | National Center for Atmospheric Research                     | 3,060  | 67,300    | 21.99               |
| 7   | European Centre for Medium-Range Weather Forecasts           | 502    | 10,907    | 21.73               |
| 8   | Max Planck Society   | 2,798  | 59,103    | 21.12               |
| 9   | National Oceanography Centre, Southampton                    | 576    | 11,627    | 20.19               |
| =10 | University of Washington                                     | 2,973  | 59,935    | 20.16               |
| =10 | University of California, Santa Barbara                      | 1,020  | 20,560    | 20.16               |
| 12  | CEA Saclay (Commission for Atomic Research)                  | 1,101  | 21,843    | 19.84               |
| 13  | University of Miami  | 1,102  | 21,810    | 19.79               |
| 14  | Columbia University  | 2,399  | 47,048    | 19.61               |
| 15  | Woods Hole Oceanographic Institution                         | 2,214  | 42,601    | 19.24               |
| 16  | Carnegie Institution for Science                             | 850    | 16,308    | 19.19               |
| 17  | National Oceanic and Atmospheric Administration              | 4,375  | 82,558    | 18.87               |
| 18  | University of California, Santa Cruz                         | 889    | 16,666    | 18.75               |
| 19  | California Institute of Technology                           | 1,935  | 36,149    | 18.68               |
| 20  | Massachusetts Institute of Technology                        | 1,929  | 35,978    | 18.65               |

The data above were extracted from the Essential Science Indicators database of Thomson Reuters. This database, currently covering the period January 1999 through June 2009, surveys only journal articles (original research reports and review articles) indexed by Thomson Reuters. Articles are assigned to a category based on the journals in which they were published and the Thomson Reuters journal-to-category field-definition scheme. Both articles tabulated and citation counts to those articles are for the period indicated. Naturally, institutions publishing large numbers of papers have a greater likelihood of collecting more citations than those publishing fewer papers.

## **Mentoring of Students, Postdoctoral and Research Associates**

### *Undergraduate Research and Honors Students:*

- Jennifer Spinsky (1998)
- Dan Dawson (1999-2002)
- Paige Sweeney (2000-2002)
- Kent Knopfmeier (2002-2004)
- Rebecca Boltz (2003-2007)
- Emily Cornett (2007-2010)
- Kandace Gleason (2009-present)

### *Graduate Students:*

Eleven PhDs and 27 MS degrees supervised as Major Professor

Approximately 100 MS and PhD Advisory Committees

### *Postdoctoral Associates and Visiting Scientists:*

- Dr. Joseph Tribbia (Univ. of Michigan), 1976-78
- Dr. Kenneth Heikes (UCLA), 1978-79
- Dr. Fred Leslie, (Univ. of Oklahoma), 1979-80
- Professor Dang (Nanjing University, PROC), 1980-81
- Professor Ozturk (Izmir University, Turkey), 1981-82
- Dr. Marina Zivkovic (U. Maryland-Belgrade/Yugoslavia), 1986-89
- Dr. Lawrence Buja (Univ. of Utah), 1989-90
- Dr. Alan Howsmon (Purdue Univ.), 1989-91
- Dr. Alexander Gluhovsky (USSR Academy of Sciences-Moscow), 1992-1995

## **Reviewed Publications**

71. Agee, E. M., E. Cornett, K. Gleason, 2010: An extended Solar Cycle 23 with deep minimum transition to Cycle 24: Assessments and climate ramifications. *J. Climate*. (in press)
70. Agee, E., and E. Jones, 2010: Reply. *Wea. Forecasting*, **25**, 341-342.
69. Gluhovsky, A., and E. Agee, 2009: Estimating higher-order moments of nonlinear time series. *J. Appl. Meteor. Climatol.*, **48**, 1948-1954.

68. Agee, E., and E. Jones, 2009: Proposed Conceptual Taxonomy for Proper Identification and Classification of Tornado Events. *Wea. Forecasting*, **24**, 609-617.
67. Gluhovsky, A., and E. Agee, 2007: On the analysis of atmospheric and climatic time series. *J. Appl. Meteor. Climatol.*, **46**, 1125-1129.
66. Zurn-Birkhimer, S., E. M. Agee, and Z. Sorbjan, 2005: Convective structures in cold air outbreak over Lake Michigan during Lake-ICE. *J. Atmos. Sci.*, **62**, 2414-2432.
65. Gluhovsky, A., C. Tong, and E. M. Agee, 2002: On selection of modes in convective low-order models. *J. Atmos. Sci.*, **59**, 1383-1393.
64. Gluhovsky, A., and E. M. Agee, 2002: Improving the statistical reliability of data analysis from atmospheric measurements and modeling. *Mon. Wea. Rev.*, **130**, 761-765.
63. Agee, Ernest M., 2000: Shallow Convection Workshop Held at Purdue University. *Bull. Amer. Meteor. Soc.*, **81**, 1370.
62. Agee, Ernest and Alexander Gluhovsky, 1999: Further Aspects of Large Eddy Simulation Model Statistics and Inconsistencies with Field Data. *J. Atmos. Sci.*, **56**, 2948-2950.
61. Agee, Ernest and Alexander Gluhovsky, 1999: LES Model Sensitivities to Domains, Grids and Large Eddy Time Scales. *J. Atmos. Sci.*, **56**, 599-604.
60. Gluhovsky, Alexander and Ernest Agee, 1997: An Interpretation of Atmospheric Low-Order Models. *J. Atmos. Sci.*, **54**, 768-773.
59. Rao, Guan-Shu and Ernest M. Agee, 1996: Large Eddy Simulation of Turbulent Flow in a Marine Convective Boundary Layer with Snow. *J. Atmos. Sci.*, **53**, 86-100.
58. Agee, E. M., B. A. Hall, E. McCallum, G. A. Monk and A. J. Waters, 1995: Convection initiated over oceans. *Images in Weather Forecasting*. M. J. Bader, J. R. Grant, R. B. E. Lilley and A. J. Waters (Europe) and G. S. Forbes (North America), Eds., Cambridge University Press, 362-375.
57. Gluhovsky, Alexander and Ernest Agee, 1995: Reply to "Comments on 'A Definitive Approach to Turbulence Statistical Studies in Planetary Boundary Layers.'" *J. Atmos. Sci.*, **52**, 3197-3198.
56. Knies, D.L., D. Elmore, P. Sharma, S. Vogt, R. Li, M.E. Lipschutz, G. Petty, J. Farrell, M.C. Monaghan, S. Fritz, E. Agee, 1994:  $^7\text{Be}$ ,  $^{10}\text{Be}$ , and  $^{36}\text{Cl}$  in precipitation. *Nucl. Instr. and Meth. in Phys. Res.*, **B 92**, 340-344.

55. Gluhovsky, Alexander and Ernest Agee, 1994: A definitive approach to turbulence statistical studies in planetary boundary layers. *J. Atmos. Sci.*, **51**, 1682-1690.
54. Przybylinski, Ron W., John T. Snow, Ernest M. Agee and John T. Curran, 1993: The use of volumetric radar data to identify supercells: A case study of June 2, 1990. *The Tornado: Its Structure, Dynamics, Prediction, and Hazards*, C. Church, D. Burgess, C. Doswell and R. Davies-Jones, Eds., American Geophysical Union, 241-250.
53. Agee, Ernest M., 1993: Comparison of 1988 and 1991 precipitation deficiencies with corn yield in the U.S.A. Midwest. *Proc. Indiana Acad. Sci.*, **102**, 247-256.
52. Agee, Ernest M., Daniel M. Rozema and Guan-Shu Rao, 1993: Mean and turbulence statistics in a wintertime convectively-mixed boundary layer over Lake Michigan. *J. Great Lakes Res.*, **19(2)**, 453-469.
51. Agee, E.M., 1991: Trends in cyclone and anticyclone frequency and comparison with periods of warming and cooling over the Northern Hemisphere. *J. Climate*, **4**, 263-267.
50. Agee, E.M. and Mary L. Hart, 1990: Boundary layer and mesoscale structure over Lake Michigan during a wintertime cold air outbreak. *J. Atmos. Sci.*, **47**, 2293-2316.
49. Agee, E.M. and Steven R. Gilbert, 1989: An aircraft investigation of mesoscale convection over Lake Michigan during the 10 January 1984 cold air outbreak. *J. Atmos. Sci.*, **46**, 1877-1897.
48. Rothermel, Jeffry and Ernest Agee, 1989: Comments on "A Note on the Numerical Computation of Two-Dimensional Convective Flows". *J. Atmos. Sci.*, **46**, 2745-2746.
47. Agee, E.M. and James J. Lidrbauch, 1989: An observational case study of a continental mesoscale vortex. *Tellus*, **41A**, 222-245.
46. Zivkovic, Marina and Ernest Agee, 1988: Further aspects of transitions in two-dimensional thermal convection. *J. Atmos. Sci.*, **45**, 3983-3995.
45. Agee, E.M., 1987: Mesoscale cellular convection over the oceans. *Dyn. Atmos. Oceans*, **10**, 317-341.
44. Rothermel, Jeffry and Ernest M. Agee, 1986: Numerical study of atmospheric convective scaling. *J. Atmos. Sci.*, **43**, 1185-1197.
43. Agee, E.M., 1985: Extratropical cloud-topped boundary layers over the oceans. Modeling of Cloud-topped Boundary Layers, WMO Technical Report No. 75-WCP 106, Geneva, pp. 34-45.

42. Ross, Becky and Ernest Agee, 1985: Aircraft investigation of wintertime convection and non-convective boundary layers over the East China Sea. *J. Meteor. Soc. Japan*, **63**, 405-417.
41. Rokosz, Steve D. and Ernest M. Agee, 1984: Cold air outbreaks over Lake Michigan during the 1982-83 winter season. *Proc. Ind. Acad. Sci.*, **65**, 938-949.
40. Agee, E.M., 1984: Observations from Space and thermal convection - A historical perspective. *Bull. Amer. Meteor. Soc.*, **65**, 938-949.
39. Agee, E.M., 1982: An introduction to deep convective systems. *Cloud Dynamics*, E. M. Agee and T. Asai, Eds., D. Reidel Publishing Company, 195-232.
38. Agee, E.M., 1982: An introduction to shallow convective systems. *Cloud Dynamics*, E. M. Agee and T. Asai, Eds., D. Reidel Publishing Company, 3-30.
37. Agee, E.M., 1982: A diagnosis of twentieth century temperature records at West Lafayette, Indiana. *Climatic Change*, **4**, 399-418.
36. Agee, E.M., 1982: Terrestrial cooling and solar variability. NASA Technical Report, CR-161985. (Universities Space Research Association), Marshall Space Flight Center, Alabama, 52 pp.
35. Sheu, P.J., E.M. Agee and J.J. Tribbia, 1981: A numerical study of physical processes affecting convective cellular geometry. *J. Meteor. Soc. Japan*, **58**, 489-499.
34. Agee, E.M., et al., 1981: Scientific results of the air mass transformation experiment. GARP Publication No. 24, World Meteorological Organization and International Council of Scientific Unions, Geneva Switzerland, 236 pp.
33. Rothermel, Jeffry and Ernest M. Agee, 1980: Aircraft investigation of mesoscale cellular convection during AMTEX 75. *J. Atmos. Sci.*, **37**, 1027-1040.
32. Agee, E.M., 1980: Present climatic cooling and a proposed causative mechanism. *Bull. Amer. Meteor. Soc.*, **61**, 1356-1367.
31. Agee, E.M., 1979: Results of AMS questionnaire on role of undergraduate education in Meteorology. *Bull. Amer. Meteor. Soc.*, **60**, 973-977.
30. Church, C.R., J.T. Snow, G.L. Baker and E.M. Agee, 1979: Characteristics of tornado-like vortices as a function of swirl ratio: A laboratory investigation. *J. Atmos. Sci.*, **36**, 1755-1776.

29. Jensen, Niels O. and Ernest M. Agee, 1978: Vortex cloud street during AMTEX 75. *Tellus*, **30**, 517-523.
28. Agee, E.M. and Francis E. Lomax, 1978: Structure of the mixed layer and inversion layer associated with patterns of MCC during AMTEX 75. *J. Atmos. Sci.*, **35**, 2281-2301.
27. Van der Borgh, R. and E.M. Agee, 1978: Non-linear convection in a moist atmospheric layer heated from below. *J. Meteor. Soc. Japan*, **56**, 284-292.
26. Agee, E.M., 1978: Observations of the Malaspina Glacier. *Bull. Amer. Meteor. Soc.*, **59**, 1612-1613 (with cover photo).
25. Agee, E.M. and P.J. Sheu, 1978: MCC and gull flight behavior. *Bdry. Layer Meteor.*, **13**, 45-47.
24. Church, C.R., J.T. Snow and E.M. Agee, 1977: Tornado vortex simulation at Purdue University. *Bull. Amer. Meteor. Soc.*, **58**, 900-908.
23. Mitchell, David L. and Ernest M. Agee, 1977: A theoretical investigation of atmospheric convective modes as a function of Rayleigh Number, Prandtl Number and Eddy Anisotropy. *J. Meteor. Soc. Japan*, **55**, 341-363.
22. Burt, Wayne V. and Ernest M. Agee, 1977: Buoy and satellite observations of mesoscale cellular convection during AMTEX 75. *Bdry. Layer Meteor.*, **12**, 3-24.
21. Sheu, P.J. and E.M. Agee, 1977: Kinematic analysis and air-sea heat flux associated with mesoscale cellular convection during AMTEX 75. *J. Atmos. Sci.*, **34**, 793-801.
20. Agee, E.M., D. Keyser and C. Church, 1977: The modern climatology of Indiana tornadoes. *Proc. Indiana Acad. Sci.*, **86**, 380-390.
19. Agee, E.M. and R.P. Howley, 1977: Latent and sensible heat flux calculations at the air-sea interface during AMTEX 74. *J. Appl. Meteor.*, **16**, 443-447.
18. Agee, E.M., J.T. Snow, F.S. Nickerson, C.R. Church and L.A. Schaal, 1977: An observational study of the West Lafayette, Indiana, tornado of 20 March 1976. *Mon. Wea. Rev.*, **105**, 893-907.
17. Lenschow, D.H. and E.M. Agee, 1976: Preliminary results from the Air Mass Transformation Experiment (AMTEX). *Bull. Amer. Meteor. Soc.*, **57**, 1346-1355.
16. Agee, E.M., J.T. Snow and P.R. Clare, 1976: Multiple vortex features in the tornado cyclone and the occurrence of tornado families. *Mon. Wea. Rev.*, **104**, 552-563.

15. Agee, E.M., 1976: Observational evidence of cell flatness as a function of convective depth and eddy anisotropy. *J. Meteor. Soc. Japan*, **54**, 68-71.
14. Agee, E.M., 1975: Some inferences of eddy viscosity associated with instabilities in the atmosphere. *J. Atmos. Sci.*, **32**, 642-646.
13. Agee, E.M., C. Church, C. Morris and J. Snow, 1975: Some synoptic aspects and dynamic features of vortices associated with the tornado outbreak of 3 April 1974. *Mon. Wea. Rev.*, **103**, 318-333.
12. Agee, E.M. and K.E. Dowell, 1974: Observational studies of mesoscale cellular convection. *J. Appl. Meteor.*, **13**, 46-53.
11. Lenschow, D.H. and E.M. Agee, 1974: The Air Mass Transformation Experiment - Preliminary results from 1974 and plans for 1975. *Bull. Amer. Meteor. Soc.*, **55**, 1228-1235.
10. Agee, E.M., D. Brown, T. Chen and K. Dowell, 1973: A height-dependent model of eddy viscosity in the planetary boundary layer. *J. Appl. Meteor.*, **12**, 409-412.
9. Agee, E.M., T.S. Chen and K.E. Dowell, 1973: A review of mesoscale cellular convection. *Bull. Amer. Meteor. Soc.*, **54**, 1004-1012.
8. Agee, E.M. and T.S. Chen, 1973: A model for investigating eddy viscosity effects on mesoscale cellular convection. *J. Atmos. Sci.*, **30**, 180-189.
7. Agee, E.M., 1972: Note on ITCZ wave disturbances and the formation of Tropical Storm Anna. *Mon. Wea. Rev.*, **100**, 733-737.
6. Agee, E.M., 1971: Purdue tornado project activities - Part III. *Bull. Amer. Meteor. Soc.*, **52**, 575.
5. Agee, E.M., 1971: An artificially induced local snowfall. *Bull. Amer. Meteor. Soc.*, **52**, 557-560.
4. Geddes, J., T. Zimmerman, T. Schroeder, E. Agee and D. Schmidt, 1970: Preliminary design of tornado probe. *IEEE Trans. Geos. Elect.*, **8**, 279-284.
3. Agee, E.M., 1970: Purdue tornado project activities - Part II. *Bull. Amer. Meteor. Soc.*, **51**, 951.
2. Agee, E.M., 1970: The climatology of Indiana tornadoes. *Proc. Ind. Acad. Sci.*, **79**, 299-308.

1. Agee, E.M., 1969: Tornado project activities at Purdue University. *Bull. Amer. Meteor. Soc.*, **50**, 806-807.

### **Conference Proceedings, Abstracts and Reports**

- Agee, Ernest, Benjamin MacCall and Alexander Gluhovsky, 2007: More LES Results for 13 January 1998 Cold Air Outbreak over Lake Michigan. *19<sup>th</sup> Conference on Climate Variability and Change*, Amer. Meteor. Soc., San Antonio, Texas, 14-18 January 2007, CD-ROM.
- Gluhovsky, Alexander, and Ernest Agee, 2007: Reliable Statistical Inference for Weather and Climate. *19<sup>th</sup> Conference on Climate Variability and Change*, Amer. Meteor. Soc., San Antonio, Texas, 14-18 January 2007, CD-ROM.
- Gluhovsky, Alexander, and Ernest Agee, 2006: Resampling Methods for Meteorological and Climatological Data Analysis. *18<sup>th</sup> Conference on Probability and Statistics*, Amer. Meteor. Soc., Atlanta, Georgia, 29 January – 2 February 2006, CD-ROM.
- Agee, Ernest: 2006: An Explanation of Actinae Cloud Patterns. *14<sup>th</sup> Conference on Interaction of Sea and Atmosphere*, Amer. Meteor. Soc., Atlanta, Georgia, 29 January – 2 February 2006, CD-ROM.
- Zurn-Birkhimer, Suzanne and Ernest M. Agee, 2003: Westerly Flow Cold Air Outbreak over Lake Michigan During Lake-ICE. *12<sup>th</sup> Conference on Interactions of the Sea and Atmosphere*, Amer. Meteor. Soc., Long Beach, California, 9-13 February 2003, CD-ROM.
- Potts, Shelley, L., and Ernest M. Agee, 2002: Multiple vortex phenomena in thunderstorms and tornadoes: Three scales for multiple vortices. *21<sup>st</sup> Conference on Severe Local Storms*, Amer. Meteor. Soc., San Antonio, Texas, 12-16 August 2002, 527-530.
- Gluhovsky, Alex, Christopher Tong, and Ernest Agee, 2001: Energy Conserving Low-Order Models for Potential Vorticity Dynamics and Convection with Shear. *13<sup>th</sup> Conference on Atmospheric and Oceanic Fluid Dynamics*, Breckenridge, Colorado, 4-8 June 2001, 117-121.
- Agee Ernest, Suzanne Zurn-Birkhimer, and Alexander Gluhovsky, 2000: Coherent Structures and Transitional Patterns in Convective Boundary Layers. Presented at the 14th Symposium on Boundary Layers and Turbulence, Amer. Meteor. Soc., Aspen, Colorado, 7-11 August, 2000, 492-495.

- Gluhovsky, Alex, and Ernest Agee, 1999: Comparative Statistical Analysis of Atmospheric Observations and Modeling. *The Joint Statistical Meetings.*, Amer. Statistical Assoc., Baltimore, Maryland, 8-12 August 1999.
- Gluhovsky, Alex, and Ernest Agee, 1999: On Discrepancies Between Characteristics of PBL from Field Data and Models. *European Geophysical Society XXIV General Assembly*, The Hague, The Netherlands, 19-23 April 1999.
- Agee, Ernest M., 1999: 2-D or not 2-D: That is the Question. 13th Symposium on Boundary Layers and Turbulence, Amer. Meteor. Soc., Dallas, Texas, 10-15 January 1999, 123-126.
- Agee, Ernest and Suzanne Zurn-Birkhimer, 1998: Variations in USA Tornado Occurrences During El Niño and La Niña. 19th Conference on Severe Local Storms, Minneapolis, Minnesota, 14-18 September 1998, 287-290.
- Agee, Ernest and Alexander Gluhovsky, 1998: Large Eddy Simulation of Convective Marine Boundary Layers. Presented at the Ninth Conference on Interaction of the Sea and Atmosphere, Amer. Meteor. Soc., Phoenix, Arizona, 11-16 January 1998, 125-131.
- Gluhovsky, Alexander and Ernest Agee, 1998: Statistical Reliability of Atmospheric Data Analysis and Modeling. 14th Conference on Probability and Statistics in the Atmosphere Sciences, Amer. Meteor. Soc., Phoenix, Arizona, 11-16 January 1998, 55-59.
- Gluhovsky, Alexander and Ernest Agee, 1997: Sensitivities in Turbulent Fields within LES of Convective PBLs. 12th Symposium on Boundary Layers and Turbulence, Vancouver, British Columbia, Canada, 28 July - 1 August 1997, 241-242.
- Gluhovsky, Alexander and Ernest Agee, 1997: Modeling Atmospheric Turbulence and Convection with coupled Simple Nonlinear Systems. Eleventh Conference on Atmospheric and Oceanic Fluid Dynamics, Tacoma, Washington, 23-26 June 1997, 30-34.
- Aanstoos, James V. and Ernest M. Agee, 1996: Spatial frequency analysis of mesoscale convective cloud fields from satellite imagery. Ninth IMDSP Workshop, Belize City, Belize. (March 1996)
- Sabones, Michael E., Ernest M. Agee and Michelle Akridge, 1996: The Pulaski County and West Lafayette, Indiana tornadoes, 26-27 April, 1994: A case of supercell (mesocyclone) and squall line bow-echo interaction. Eighteenth Conference of Severe Local Storms, San Francisco, California. (February 1996)

- Gluhovsky, Alexander and Ernest M. Agee, 1996: Comparative statistical analysis of convective marine boundary layers: Observations and large eddy simulations. Eighth Conference on Air-Sea Interaction, Amer. Meteor. Soc., Atlanta, Georgia, 18-20. (January 1996)
- Gluhovsky, Alexander and Ernest M. Agee, 1995: Making statistically reliable comparisons: Observations in PBL vs. large eddy simulations. Geophysical and Astrophysical Convection Workshop, Boulder, Colorado. (Poster session, October 1995)
- Rao, Guan-Shu and Ernest M. Agee, 1995: Large Eddy Simulation of Turbulent Flow in a Wintertime Marine Convective Boundary Layer. Fourth Conference on Polar Meteorology and Oceanography, Amer. Meteor. Soc., Dallas, Texas, (J12) 11-15 (January 1995)
- Oglesby, Robert J., Darrell I. Leap, Wen-Yih Sun and Ernest M. Agee, 1994: Modeling the effects of climatic changes on availability and quality of water. IBM Environmental Research Program, Washington, D.C. (September 1994)
- Knies, D., D. Elmore, S. Vogt, M. Wang, G. Petty and E. Agee, 1993: The Cosmogenic Radionuclides  $^7\text{Be}$ ,  $^{10}\text{Be}$ , and  $^{36}\text{Cl}$  in Precipitation. ANS Topical Meeting on Environmental Transport and Dosimetry, Amer. Meteor. Soc., Charleston, South Carolina.
- Rao, Guan-Shu and Ernest M. Agee, 1993: Large Eddy Simulation Model Structures in Type I and Type II Cloud-Topped Boundary Layers. Ninth Conference on Atmospheric and Oceanic Waves and Stability, Amer. Meteor. Soc., San Antonio, Texas. (May 1993)
- Ardeel, Christopher, E.M. Agee and Lawrence Buja, 1991: Peculiarities of the Processed NASA and UK-East Anglia Global Surface Temperature Data Sets. Proc. Second Symposium on Global Change Studies, Amer. Meteor. Soc., New Orleans, Louisiana, J5-J10. (January 1991)
- Agee, E.M., 1989: Purdue, NSF and IBM - An ACIS Partnership in the Atmospheric Sciences (abstract). IBM-ACIS Physical Sciences Forum. (November 1989)
- Agee, E.M., R. Aiken and M. Zivkovic, 1988: Scientific workstation connectivity to supercomputers. Proc. Fourth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology, Amer. Meteor. Soc., 156-159.
- Agee, E.M., Ross Aiken and Daniel Vietor, 1988: In atmospheric science, the sky's the limit. *Academic Computing*, Dec. 87/Jan. 88, pp. 32-33, 51-53.

- Zivkovic, Marina and E.M. Agee, 1988: Heat flux transitions in thermal convection. Proc. Seventh Conference on Ocean-Atmosphere Interaction, Amer. Meteor. Soc., 234-235.
- Agee, E.M. and Donald E. Lund, 1987: A classification system for atmospheric thermal convection. Proc. Third Conference on Mesoscale Processes, Amer. Meteor. Soc., 204-205.
- Agee, E.M., Daniel E. Vietor and Keith R. Lingwall, 1987: An IBM microcomputer system with networking: A UNIDATA standard for meteorological data acquisition, processing and display. Proc. Third International Conference Interactive Information and Processing Systems for Meteorology, Oceanography and Hydrology, Amer. Meteor. Soc., 35-37.
- Agee, E.M., Ben Domenico and Daniel E. Vietor, 1987: A GKS version of NCAR graphics ported to the IBM PC. Proc. Third International Conference Interactive Information and Processing Systems for Meteorology, Oceanography and Hydrology, Amer. Meteor. Soc., 123-126.
- Smith, D.R. E. Agee and T.E. Klingler, 1985: Severe and non-severe weather development in the upper Midwest on 27 April 1984. Proc. Fourteenth Conference Severe Local Storms, Amer. Meteor. Soc., 305-308. Best paper award.
- Agee, E.M., K. Lingwall and J. Lidrbauch, 1985: A microcomputer system for weather data acquisition, processing and display. Proc. International Conference Interactive Information and Processing Systems for Meteorology, Oceanography and Hydrology, Amer. Meteor. Soc., 97-104.
- Agee, E.M., 1985: Extratropical cloud-topped boundary layers over the oceans. WMO Workshop on Boundary Layer Processes, Colorado State University, 12 pp.
- Agee, E.M., 1984: Modification of polar air masses over Lake Michigan (USA). Convection Workshop, Utrecht University, The Netherlands, 9 pp.
- Agee, E.M., 1984: Cloud patterns in convective boundary layers over water. Convection Workshop, Utrecht University, The Netherlands, 10 pp.
- Agee, E.M., D. Baker, G. Baker and R. Pauley, 1982: The Rush County Indiana tornado of 9 July 1980. Proc. Twelfth Conference Severe Local Storms, Amer. Meteor. Soc., 379-382.
- Agee, E.M., J.T. Snow, G.L. Baker and R. Pauley, 1979: Diagnostics of severe downburst-tornadic storms. Proc. Eleventh Conference Severe Local Storms, Amer. Meteor. Soc., 49-56.

- Agee, E.M., J.T. Snow and R. Pauley, 1979: Severe convective storms and possible gravity wave mechanisms. Proc. Eleventh Conference Severe Local Storms, Amer. Meteor. Soc., 433-440.
- Agee, E.M. and Jeffrey Rothermel, 1979: Aircraft investigation of mesoscale cellular convection during AMTEX 75 (abstract). Third Conference on Ocean-Atmospheric Interaction.
- Agee, E.M., J.T. Snow, C.R. Church and G.L. Baker, 1977: Characteristics of velocity field measurements associated with single and multiple vortex phenomena. Proc. Tenth Conference Severe Local Storms, Amer. Meteor. Soc., 329-336.
- Agee, E.M., J.T. Snow, C.R. Church, G.L. Baker and B.J. Barnhart, 1977: Experimental vortex configurations as a function of increasing swirl ratio. Proc. Tenth Conference Severe Local Storms, Amer. Meteor. Soc., 337-343.
- Agee, E.M., F.S. Nickerson and J.T. Snow, 1977: Analysis of suction debris vortices in the West Lafayette, Indiana, tornado of 20 March 1976. Proc. Tenth Conference Severe Local Storms, Amer. Meteor. Soc., 471-478.
- Agee, E.M. and R.P. Howley, 1977: A study of the onset and circulation direction of mesoscale cellular convection during AMTEX 75 (abstract). IAGA/IAMAP Joint Assembly Abstracts, AGU and AMS, 147.
- Agee, E.M., 1977: Collected scientific contributions of the AMTEX, Vol. 1, Japan National Committee for GARP, 149-166.
- Agee, E.M., 1975: Observational studies of MCC during AMTEX I. Proc. Fourth AMTEX Study Conference, AMTEX Report No. 8, Tokyo, 47-50.
- Agee, E.M. and J.T. Snow, 1975: Vortex splitting in the tornado cyclone and the occurrence of tornado families. Proc. Ninth Conference Severe Local Storms, Amer. Meteor. Soc., 270-277.
- Agee, E.M., 1975: Final Report on Severe local storms research at Purdue University. NOAA Report No. 75-041601. Department of Commerce, Washington, D.C., 19 pp.
- Agee, E.M., 1974: Indiana tornadoes. Hazard Analysis, prepared by Indiana Department of Civil Defense, 61-68.
- Agee, E.M., 1974: Climatic impact study of Flint Creek power plant site - A critique. Final Report of Energy Resources Council of Northwest Arkansas, 15 pp.

- Agee, E.M. and T. Schroeder, 1973: Final Contract Report on severe local storms, National Severe Storms Laboratory, NOAA, 13 pp.
- Agee, E.M. and T. Schroeder, 1971: A regression model for tornado distribution in a synoptically homogeneous region. Proc. Seventh Conference Severe Local Storms, Amer. Meteor. Soc., 45-58.
- Agee, E.M., (with Purdue Tornado Group), 1970: Preliminary system design for probing tornadoes. Proc. Fourth Conference Aerospace Meteor., Amer. Meteor. Soc. and AIAA, 1-6.
- Agee, E.M. and P.J. Smith, 1969: Empirical equations for estimating mechanical draft cooling tower plumes. Final Report to Indianapolis, Power and Light Company, 16 pp.

#### **Invitations, and Talks (1980-present)**

- "Are There Any Wild Cards in Global Climate Change?" Department of Earth & Atmospheric Sciences, Purdue University (August 2008)
- "2-D or Not 2-D Convection That is the Question" Department of Earth & Atmospheric Sciences, Purdue University (September 2006)
- "An Explanation of Actiniae Cloud Patterns." 14<sup>th</sup> Conference on Interaction of Sea and Atmosphere, Atlanta, Georgia (January/February 2006).
- "Tornadoes." Northern Illinois University Colloquium, Department of Geography, DeKalb, Illinois (September 2005)
- "Westerly Flow Cold Air Outbreak over Lake Michigan during Lake-ICE." Department of Atmospheric Sciences, University of Illinois, Champaign, (November 2002).
- "Coherent Structures and Transitional Patterns in Convective Boundary Layers." 14th Symposium on Boundary Layers and Turbulence, Aspen, Colorado, (August 2000).
- "Tornadoes." Gala Week Talk, Purdue, (April 1999).
- "2-D or not 2-D: That is the Question." 13th Symposium on Boundary Layers and Turbulence, Dallas, Texas, (January 1999).
- "Tornadoes." Indianapolis Chapter of the Purdue Alumni Club, Indianapolis, IN (May 1998).
- "Mesoscale Cellular Convection over the Oceans." University of South Carolina, Columbia, South Carolina, (April 1998).

- “Mesoscale Cellular Convection over the Oceans.” University of Kentucky, Lexington, Kentucky, (February 1998).
- “Large Eddy Simulation of Convective Marine Boundary Layers.” Ninth Conference on Interaction of the Sea and Atmosphere, Phoenix, Arizona, (January 1998).
- “Mesoscale Cellular Convection: From Observations to Models.” University of Illinois, Champaign, IL (October 1997)
- “Sensitivities in Turbulent Fields within LES of Convective PBLs.” 12th Symposium on Boundary Layers and Turbulence, Amer. Meteor. Soc., Vancouver, British Columbia, Canada, (July 1997)
- “Tornadoes,” Optimist Club, West Lafayette, IN (October 1996)
- “Tornadoes,” Kiwanis Club, West Lafayette, IN (July 1996)
- “Tornadoes,” Wabash Area Lifetime Learning Association (WALLA), Lafayette, IN (March 1996)
- “The Nuts and Bolts of Global Climate Change,” Midwest Gas Association, Indianapolis, IN (May 1995)
- “Large Eddy Simulation of Turbulent Flow in a Wintertime Marine Convective Boundary Layer.” Fourth Conference on Polar Meteorology and Oceanography, Amer. Meteor. Soc., Dallas, TX. (January 1995)
- Invited Participant, IBM Environmental Research Program Symposium, Washington, D.C. (September 1994)
- “Tornadoes,” Lafayette Rotary Club, Lafayette, IN (July 1994)
- “Large Eddy Simulation Model Structures in Type I and Type II Cloud-Topped Boundary Layers,” Ninth Conference on Atmospheric and Oceanic Waves and Stability, American Meteorological Society (May 1993)
- Invited Participant, Congressional Forum on Oceans and the Atmosphere: Economic Security and Environmental Sustainability. Sponsored by Joint Oceanographic Institute and University Corporation for Atmospheric Research, Washington, D.C. (March 1993)
- Invited Participant, University Colloquium on Environmental Research and Education. Sponsored by Sigma Xi, Raleigh, NC (September 1992)

- “Turbulence Fields in a Wintertime Convectively-Mixed Boundary Layer over Lake Michigan,” 35th Annual Conference on Great Lakes Research, Waterloo, Ontario, Canada (June 1992)
- “Peculiarities of the Processed NASA and UK-East Anglia Global Surface Temperature Data Sets,” National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, AL (June 1991)
- “Purdue's Research and Industrial Affiliation in the Atmospheric Sciences,” National Science Foundation, Washington, D.C. (July 1990)
- “Global Climate Change,” Earth Day at Purdue University (April 1990)
- “Tornadoes” Director's Forum, The State Emergency Management Agency, Indianapolis, IN (March 1990)
- “Purdue, NSF and IBM: An ACIS Partnership in the Atmospheric Sciences,” IBM-ACIS Physical Sciences Forum, Tucson, AZ (November 1989)
- “Mesoscale Cellular Convection,” School of Geophysical Sciences, Georgia Tech, Atlanta, GA (February 1989)
- “Advanced Workstations in Atmospheric Sciences,” IBM Physical Sciences Forum, Tucson, AZ (November 1987)
- Chairman - External Review Committee, Meteorology Division, Atmospheric Sciences Research Laboratory, EPA, Research Triangle Park, NC, Final Report (September 1987)
- “Workstations for Atmospheric Science from Observation to Prediction,” IBM University Study Conference, Boston, MA (June 1987)
- “Atmospheric Thermal Convection: Observations and Theory,” Atmospheric Science Division, National Science Foundation, Washington, D.C. (May 1987)
- “UNIDATA and CYPRESS/NSFNET Connectivity,” UNIDATA Policy Committee Meeting, National Science Foundation, Washington, D.C. (May 1987)
- “An IBM Microcomputer System with Networking: A UNIDATA Standard for Meteorological Data Acquisition, Processing and Display,” Third International Conference on Information Processing Systems, New Orleans, LA (January 1987)
- “A PC System with Networking: A UNIDATA Standard for Meteorological Data Acquisition, Processing, and Display,” IBM Forum for the Physical Sciences, Scottsdale, AZ (December 1986)

- “Meteorology, Climatology and Hydrology of the Illinois River Basin,” Illinois State Water Survey (April 1986)
- “Convective Marine Boundary Layers,” Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, Raleigh, NC (February 1986)
- “Mesoscale Cellular Convection Over the Oceans,” Fourth Scientific Assembly of IAMAP, Session on Air-Sea Interaction, Honolulu, Hawaii (August 1985)
- “Extratropical Cloud-topped Boundary Layers Over the Oceans,” WMO Workshop on Boundary Layer Processes, Fort Collins, CO (April 1985)
- “Convective Phenomena in Polar Air Streams Over Lake Michigan,” Greater Chicago Chapter of AMS, Chicago, IL (November 1984)
- “Multiple Vortex Phenomena in Thunderstorm/Tornado Systems,” Department of Geography and Geology, Indiana State University (October 1984)
- “Is There a Formula for Life?,” 45th Commencement Address, Madison Central High School, Eastern Kentucky University Alumni Coliseum (June 1984)
- “Convective Boundary Layers Over the Oceans,” Department of Physics, Utrecht University, Utrecht, Holland (May 1984)
- “The Theory of Multiple Vortex Formation in Thunderstorm-Tornado Systems,” Department of Physics, Utrecht University, Utrecht, Holland (May 1984)
- “Modification of Polar Air Masses Over the Great Lakes Region (USA),” Department of Physics, Utrecht University, Utrecht, Holland (May 1984)
- “Software Development for Access and Display of Meteorological Data Fields,” National Center for Atmospheric Research, Boulder, CO (March 1984)
- “New Horizons for Meteorological Data: Communications and Computer Processing,” 25th Annual Meeting of Midwest Gas Dispatchers, Chicago, (October 1983)
- “Polar Air Mass Modification over Lake Michigan,” The University of Chicago (September 1983)
- “Application of Microcomputers to Meteorology,” National Science Foundation, Washington, D.C. (February 1983)
- “Climate Change during the 20th Century,” Annual Meeting of the American Meteorological Society, New Orleans (January 1983)

- “On the Formation and Demise of Tornadoes,” NOAA Environmental Research Labs (January 1983)
- “Atmospheric Manifestations of Benard-Rayleigh Convection,” Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, Raleigh, NC (October 1982)
- “Tornadoes-Indiana's Other Hysteria,” Indiana Chapter meeting of Certified Life Underwriters (May 1982)
- “Solar Variability and Climatic Cooling,” Department of Geography, Central Michigan University (March 1982)
- “A Proposed Mechanism for Climatic Cooling,” Illinois State Water Survey/University of Illinois (February 1982)
- “Atmospheric Manifestations of Benard-Rayleigh Convection,” Department of Meteorology, University of Utah (January 1982)
- “Observational and Theoretical Studies of Mesoscale Cellular Convection,” Max-Planck Institut fur Meteorologie, Universitat Hamburg (August 1981)
- “Present Climatic Cooling - A Possible Causative Mechanism,” Department of Meteorology, University of Maryland (April 1981)
- “Solar-Terrestrial Relationships and Weather-Climate Variability,” Marshall Space Flight Center, NASA-Huntsville (March 1981)
- “Present Climatic Cooling - A Proposed Causative Mechanism,” Department of Electrical Engineering, Ohio State University (March 1981)
- “Occurrence and Interpretation of Multiple Vortex Events in Thunderstorms and Tornadoes,” Department of Atmospheric Science, University of Wyoming (January 1981)
- “Similarities of Mesoscale Convection Over Lake Michigan and The East China Sea,” Greater Chicago Chapter of the American Meteorological Society (December 1980)
- “Multiple Vortex Theory and Observations in Thunderstorms and Tornadoes,” Department of Physics, University of Kentucky (August 1980)
- “Mesoscale Cellular Convection and the 20th Anniversary of TIROS I,” Seminar at the National Environmental Satellite Service, NOAA (April 1980)

## Research Grants

- Pending: Co-Principal Investigator (with Alexander Gluhovsky) – January 2011 to December 2013. Taming Complexity of Mesoscale Dynamics with Low-Order Models (\$485,441)
- Co-Principal Investigator (with Alexander Gluhovsky) – September 2005 to August 2009. Modeling Coherent Structure in Convective Boundary Layers. National Science Foundation (\$407,724).
- Co-Principal Investigator (with Alexander Gluhovsky) - October 2004 - October 2005: Modeling Mesoscale Circulations by Coupled Nonlinear Systems. NSF (\$60,000)
- Co-Principal Investigator (with Alexander Gluhovsky) - February 2000 to January 2004. Modeling Mesoscale Convection by Coupled Nonlinear Systems. National Science Foundation (\$255,071).
- Principal Investigator - January 1999 to December 2002. Microscale and Mesoscale Structures in Convective Marine Boundary Layers. National Science Foundation (\$318,193).
- Co-Principal Investigator (with Alexander Gluhovsky) - December 1995 to December 1998: Modeling Mesoscale Convection by Coupled Nonlinear Systems. National Science Foundation (\$210,340).
- Principal Investigator - January 1995 to December 1998. Microscale and Mesoscale Structures in Convective Marine Boundary Layers. National Science Foundation (\$318,193).
- Co-Principal Investigator (with Professors Leap, Oglesby and Sun) - January 1993 to December 1997: Modeling the Effects of Climatic Changes on Availability and Quality of Water. IBM (\$2,479,335 includes \$2 million computer equipment award).
- Co-Principal Investigator (with Michael Sabones and Michelle Akridge) - April 1995 to April 1996. The Pulaski County and West Lafayette Indiana Tornadoes, April 26-27, 1994 A Case of Supercell (Mesocyclone) and Squall Line Bow-Echo Interaction. COMET Partners Project (\$5,000).
- Co-Principal Investigator (with Professor Ogg) - August 1992 to July 1996. Earth System Science Education Curriculum Development at Purdue University. USRA (\$75,000).
- Principal Investigator - December 1991 to May 1995: Mesoscale-Microscale Convective Structures in Type I Cloud-Topped Boundary Layers. National Science Foundation, Grant ATM-9111197 (\$344,400).

- Principal Investigator - May 1986 to December 1992: Convective Marine Boundary Layers. DOD-ONR, Marine Meteorology Program (\$865,230).
- Principal Investigator - May 1991 to August 1992: Collaboration with Unidata Project Center to Modify Scientific Data Management Software Version 3.0. UCAR/NSF (\$30,000).
- Principal Investigator - August 1987 to January 1992: Observational and Theoretical Study of Convective Boundary Layers. National Science Foundation, Grant ATM-8711611 (\$382,600).
- Principal Investigator - November 1989 to January 1992: Meteorological Software in Distributed AIX Environments. IBM (\$118,000).
- Co-Principal Investigator (with Judith A. Curry) - November 1988 to May 1991: Port of Climate Model to IBM-3090 at PUCC. IBM (\$133,098 in cash and \$372,000 for Vector facility).
- Principal Investigator - February 1990 to September 1990: Collaboration with Unidata Project Center to Modify Scientific Data Management Software Version 1.0. UCAR/NSF (\$30,086).
- Principal Investigator - January 1990 to June 1990: Advanced Function Workstation/Peripherals. IBM-ACIS (\$112,000).
- Co-Principal Investigator (with Judith Curry) - January 1989 to June 1990: A Distributed Computer Facility in Support of the Atmospheric Sciences at Purdue. NSF-ATM (\$174,300).
- Principal Investigator - November 1988: Research Special Bid for IBM 9370 Computer System. IBM-ACIS (\$260,707 in computer hardware and software).
- Principal Investigator - October 1987 to September 1989: Innovative Application of the IBM-RT PC in the Atmospheric Sciences. IBM-ACIS (\$209,000 in cash and \$120,000 in computer hardware and software).
- Principal Investigator - November 1986 to January 1988: UNIDATA Project Phase III and Phase IV. University Corporation for Atmospheric Research, S8704 (\$87,581).
- Principal Investigator - July 1985 to December 1987: Modification of Polar Air Masses Over the Great Lakes Region. National Science Foundation, Grant ATM-8505477 (\$234,400).
- Principal Investigator - August 1986 to July 1987: Advanced Computer Workstation Award/Peripherals. IBM-ACIS (\$56,000).

- Principal Investigator - August 1985 to July 1986: A Local Network for Meteorological Data Acquisition, Processing and Display. National Science Foundation, Grant ATM-8506124 (\$72,600).
- Principal Investigator - November 1984 to April 1986: Communications System for Minicomputer. National Science Foundation, Grant ATM-8410560 (\$26,500).
- Principal Investigator - July 1983 to December 1985: Modification of Polar Air Masses Over the Great Lakes Region. National Science Foundation, Grant ATM-83-04336 (\$168,000).
- Equipment Award - November 1983: Data General Minicomputer System and AFOS Graphics Terminal. National Science Foundation (\$165,000).
- Principal Investigator - April 1980 to March 1983: Microscale-Mesoscale Convection. National Science Foundation, GARP Grant ATM 79-27149 (\$205,000).
- Principal Investigator - September 1978 to September 1982: Severe Local Storms. National Oceanic and Atmospheric Administration, Grant 04-5-022-15 (\$26,000).
- Faculty Associate - June 1980 to June 1982: Laboratory Study of Tornado-Like Vortex Features. National Science Foundation, Grant ATM 80-03403 (\$52,000).
- Principal Investigator - March 1978 to December 1980: Mesoscale Cellular Convection. National Science Foundation, GARP Grant ATM 78-00609 (\$129,000).
- Principal Investigator - March 1976 to August 1978: Mesoscale Cellular Convection. National Science Foundation, GARP Grant ATM 76-00211 (\$118,000).
- Principal Investigator - November 1969 to February 1977: Mesoscale Cellular Convection. National Science Foundation, GARP Grants GA-24136 #1, #2, #3 and #4, ATM 76-00211 (\$310,000).
- Principal Investigator - September 1972 to August 1978: Severe Local Storms. National Oceanic and Atmospheric Administration, Grants 04-3-022015 #1, #2, #3, #4, #5, #6 and #7 (\$48,000).
- Co-Principal Investigator - December 1977 to December 1979: Laboratory Study of Tornado-Like Vortex Features. National Science Foundation, Grant ATM 77-16955 (\$122,000).
- Co-Principal Investigator - September 1975 to December 1977: Laboratory Study of Tornado-Like Vortex Features. National Science Foundation, Grant ATM 75-15526 (\$68,736).

- Co-Director - September 1968 to August 1970: Purdue Tornado Research Project. National Aeronautics and Space Administration, Grant NGR-15-005-029 (\$75,000).

### **Broad and Distinguished Impacts of a Multi-dimensional Career**

When Professor Agee received the prestigious Cleveland Abbe Award on January 20, 2010, at the 90th Annual Meeting of the American Meteorological Society in Atlanta he was cited for "nearly 40 years of contributions and service to atmospheric science at the local, national and international levels." These contributions are represented by a solid research record and reputation, visionary leadership in the atmospheric science profession, key participant and leader in the planning of national and international field programs, distinguished service to UCAR and the AMS, and to the state of Indiana; co-founder of the atmospheric science program at Purdue University, and educator and mentor to hundreds of undergraduate and graduate students (and recipient of mentoring and teaching awards).

Early in his career, Professor Agee's research was featured on the cover of the 1976 NSF Annual Report to President Gerald Ford. This work was a part of an international field program, held over the East China Sea, organized by the Japan Meteorological Agency. Agee visited Japan many times and gave talks (sometimes partly in Japanese) and published several papers on air-sea interaction. Later, this work paved the way for understanding the scientific relationship of classical thermal convection studies to convective marine boundary layers in the atmosphere. The late Jerry Namias, a member of the National Academy of Sciences, wrote to Agee in 1984 to compliment his work and to identify its importance in the study of air-sea interaction and climate. Also in 1984, Professor Agee was invited to Utrecht University in the Netherlands, where he joined another visiting scientist (G. Nicolis), to discuss the self-organization of convective patterns in the atmosphere (especially over the North Sea). Agee's summer leave to Utrecht followed four years of service to the nation as a member of UCAR's Board of Trustees (elected by the national membership in the university consortium). Agee also later served a term on NASULGC's Board on Oceans and Atmospheres.

Professor Agee's research on shallow marine convective layers over the Earth's major ocean currents also ran in parallel with studies of deep convection systems in the troposphere, particularly thunderstorms and the associated development of tornadoes. Agee and associates built the world's largest laboratory simulator for the experimental study of tornado-like vortices. Field observations of multiple vortex tornadoes in the Midwest, and particularly in

Indiana, provided key evidence for simulating vortex breakdown and subsequent bifurcation into multiple vortex events. From the early field study of waterspouts in the Florida Keys, to ground and aerial surveys of major tornado events in the Midwest, to laboratory investigation with colleagues Chris Church and John Snow, several advances were made to understand the development, structure and behavior of tornadoes (including an explanation and documentation of Fujita's proposed parallel-mode tornado family). Agee's knowledge of tornadoes was brought into consideration by the state of Indiana when he proposed increased safety measures for nerve gas cylinders stored at the Newport Army facility. These recommendations were adopted (after a major tornado passed within one mile of the nerve gas facility) and Governor Evan Bayh recognized Agee's service by naming him a "Sagamore of the Wabash." Professor Agee has also spoken to many service groups, and in particular, schools and classrooms on tornado safety, as well as safety practices at the nuclear power plant facilities of Commonwealth Edison (west of Chicago).

A review paper by Atkinson and Zhang (1996) entitled "Mesoscale Shallow Convection in the Atmosphere" published in *Reviews of Geophysics* highlighted the earlier pioneering work by Agee and his students. This highly cited review paper included references to 22 separate publications by Agee's group (more than any of the other cited authors), which largely addresses the onset of convection, preferred geometry, aspect ratio and circulation direction for geometric arrays of mesoscale cellular convection in marine boundary layers. These arrays occur in Type I and Type II Cloud-Topped Boundary Layers that form respectively over warm and cold ocean currents (to the east of continents in the winter and to the west of continents in the summer).

From 1996 to 2005, Agee and his associates undertook a new approach to study organized convection in marine boundary layers using Large Eddy Simulation (LES). His first paper was with PhD student Guan-Shu Rao in 1996, which simulated the modulating effects of snow precipitation on the fields of turbulence, and was the first LES model to incorporate cold cloud microphysics. Later, publications by Agee and Gluhovsky examined the sensitivity of turbulence fields to LES model parameters, including a determination of the number of "Large Eddy Turnover Times" for achieving steady-state higher-order turbulence statistics. His latest LES investigation was with PhD student Suzanne Zurn-Birkhimer, and their 2005 publication addressed the combined effects of buoyancy and shear in determining the preferred convection

geometry in cold air outbreaks over warmer water. Agee's more recent research has focused on a variety of topics from the analysis of weather and climate data, to development of a tornado taxonomy, to solar variability and its relationship to climate, as well as a proposed mechanism for CO<sub>2</sub> sequestration.

## Teaching

### Courses developed and/or taught at Purdue

(Instructor Evaluations; Minimum = 1.0, Maximum = 5.0)

- EAS 117 Introduction to Atmospheric Sciences (4.9, 4.9, 4.7, 4.5, 4.6)
- EAS 133 Profession of Meteorology (4.9)
- EAS 138 Thunderstorms and Tornadoes (4.7, 4.6, 4.2, 4.6, 4.7, 4.7, 4.4, 4.3, 4.5, 4.5, 4.1)
- EAS 230 Survey of Meteorology (3.7, 4.2)
- EAS 391 Introduction to Atmospheric Science for Engineers/Physical Scientists (4.8)
- EAS 421 Application of Microcomputers to Meteorology (4.2, 4.2)
- EAS 432 Atmospheric Dynamics I (4.6, 5.0)
- EAS 433 Atmospheric Dynamics II (4.6, 4.8, 4.4, 4.3, 4.6)
- EAS 538 Cumulus Dynamics (4.2, 4.6, 4.2, 4.5, 4.6, 5.0, 4.0)
- EAS 639 Atmospheric Fluid Dynamics
- EAS 690 Seminar in Atmospheric Science
- EAS 698 MS Thesis Research
- EAS 699 Ph.D. Dissertation Research

## Service

### Professional

- Reviewer of proposals to National Science Foundation, NASA, Department of Defense and Environmental Protection Agency
- Reviewer of journal manuscripts to *Journal of the Atmospheric Sciences*, *Monthly Weather Review*, *Boundary Layer Meteorology*, *Journal of Applied Meteorology and Climatology*, *Weather and Forecasting* and *Journal of Climate*
- Book Reviews and Chapter Reviews
- Served on External Review Committees at Environmental Protection Agency (Chairman), Research Triangle Park, Raleigh, North Carolina; Department of Geological and Atmospheric Sciences, Iowa State, Ames, Iowa

## **Purdue**

### University

- Purdue Scientific Representative to UCAR, 1970-79 and 1984-present  
(Serve concurrently with Jeff Roberts, Dean of Science)
- Member, Provost's Committee for Review of Faculty Promotion Documents (2002-2004)
- Member, Purdue Planning Team for “Center for Aviation Systems Research,” 1996
- Chairman, Monsanto Lecture Series in Environmental Sciences and Engineering, 1993-96
- Member, University Committee for Environmental Initiatives, 1992-96
- Graduate School Council, 1979-82  
(Appointed by Dean of the Graduate School)
- Chairman, Physical Science and Engineering Area Committee  
Graduate School, 1979-80 (position later was named Assistant Dean)
- Member, Search Committee, 1980  
Vice President for Research and Dean of the Graduate School
- Graduate School Fellowship Committee, 1969-78
- Initiated Purdue's application to the University Corporation for Atmospheric Research  
(UCAR), 1972; application prepared by ATMS faculty
- Purdue-Lafayette Regional Science Fair, 1968-73; Director, 1971-73

### College of Science

- Faculty Honors Committee (Chair), 2006
- Space Committee (Chair), 2006
- College Hiring Priorities Committee, 2006
- Grade Appeals Committee, 2006
- Dean's Leadership Council, 2006
- Center for the Environment Director Search Committee, 2006
- Associate Dean Search Committee, 2005
- Chemistry Head Search Committee, 2005
- Search Committee – COALESCE (Chair – Computation Science Geophysical Fluid  
Dynamics), 2005
- Search Committee – COALESCE (Chair – Computational Science), 2003

- Search Committee – Associate and Assistant Deans, School of Science. 2003
- Distinguished Professor Nomination Committee, 2003
- Member, School of Science Strategic Planning Committee, 1992-96
- Member, Faculty Promotions Committee, 1978-80, 1989-present
- Arranged program/visit - IBM Executives, 1985-97
- Participant, Parents Day and School of Science Open House 1976-77, 1982-83, 1990-96
- Speaker, Annual Meeting of the Purdue Research Foundation, Board of Directors, 1979, 1984
- Speaker, Focus on Purdue Program for Indiana State Legislators, 1976, 1988, 1989
- School of Science Faculty Grievance Committee, 1972-76  
(Elected by School of Science Faculty)
- School of Science Fellowship Committee, 1969-73
- Numerous talks to Indiana high schools and area organizations, 1968-present

#### Department

- Departmental Leadership Team
- Alumni & Corporate Relations Committee (Chair)
- Strategic Planning Committee
- Executive Committee(elected)
- Peer Teaching Committee (elected)
- EAS Honors/Awards Nominations Committee
- Participant, 40<sup>th</sup> Anniversary Planning Committee
- Participant, EAS Alumni Advisory Council