VITAE

Lawrence W. Braile

January, 2019

A. GENERAL INFORMATION

1. Personal Data

Birth Date: 2l March l947 - Seattle, Washington
Married, two children
Address:

Office: Dept. of Earth, Atmospheric, and Planetary Sciences
550 Stadium Mall Drive
Purdue University
West Lafayette, IN 47907-2051
(765) 494-5979 (Office)
(765) 496-1210 (FAX)
braile@purdue.edu
web.ics.purdue.edu/~braile

Home: 4609 Penelope Ct.
West Lafayette, IN 47906
(765) 463-6295

2. Education

University of Washington	1965-1969 B.S
University of Washington	1969-1970 M.S.
University of Utah	1970-1973 Ph.D.

3. Professional Experience

1969 - 1970	Teaching Asst., Introductory Geology, Mineralogy - Univ. of Washington
1970 - 1973	NSF Graduate Trainee in Geophysics, University of Utah
Aug-Sept. 197l and Sept.- Oct. 1972	Graduate Research Asst. in Seismology, University of Utah
Aug. 1973 - June 1978	Asst. Professor, Dept. of Geosciences, Purdue University
July 1978 - June 1983	Assoc. Professor, Dept. of Geosciences, Purdue University
July 1983 - July 2006	Professor (Associate Head of Department, 1993-2002), Department of Earth & Atmospheric Sciences, Purdue University
August 2006 - June 2009	Professor and Department Head, Department of Earth & Atmospheric Sciences, Purdue University
July 2009 – present	Professor, Department of Earth, Atmospheric and Planetary Sciences, Purdue University

4. Elected Memberships and Appointments

National Science Foundation Graduate Traineeship in Geophysics, University of Utah, 1970-1973

Co-General Chairman, Midwest American Geophysical Union Meeting, 1977
Associate Editor, Journal of Geophysical Research, 1982-1985, 1991-1993
Editorial Advisory Board, Seismological Research Letters, 1982-1995
Appointed to 3 year term (1983-1986) on the Committee on Seismology of the National ResearchCouncil, National Academy of Sciences
Appointed to 3 year term (1986-1988) and an additional 3 year term (1989-91) on the Standing Committee of PASSCAL, Incorporated Research Institutions for Seismology
Elected to 2 year term (1987-1988) and an additional 2 year term (1989-90) on the Executive Committee of the Board of Directors of the Incorporated Research Institutions for Seismology (IRIS)
Associate Editor, Geological Society of America Bulletin, 1989-91
Appointed to Earthquake Advisory Board, State Emergency Management Administration, State of Indiana, 1986-1992
Appointed representative of the Seismological Society of America to the Member Society Council of the American Geological Institute, 1986-1996
Member of Working Group on the December 2-3, 1990, Earthquake Prediction for the National Earthquake Prediction Evaluation Council (NEPEC), 1990
Appointed to Advisory Board for AGU "Earth and Sky" radio broadcast program, 1992-1994
Appointed member of the Committee on Public Affairs of the American Geophysical Union, 1996-98
Appointed Chair of the IRIS Education and Outreach Committee, 1996-2001
Appointed to the Education Award Committee, American Geophysical Union, 2006-08
Appointed Chair of the Education Award Committee, American Geophysical Union, 2008-10
Appointed to the IRIS Planning Committee, 2010-2013

5. Memberships in Professional Societies

American Geophysical Union
Geological Society of America (Fellow)
Seismological Society of America
Society of Exploration Geophysicists
National Science Teachers Association
California Science Teachers Association

B. TEACHING

1. Courses taught since 1973

*GEOS 557	Introduction to Seismology
*GEOS 591E	Earthquake Seismology
*GEOS 553	Exploration Seismology
*GEOS 509	Data Analysis Techniques in Geoscience
*GEOS 591Q	Earthquake Prediction and Control: Progress and Prospects (Seminar)
GEOS 455	Geophysical Exploration
*GEOS 650S	Advanced Topics in Seismology
*GEOS 100	Planet Earth (formerly titled: Frontiers in Geosciences)
*EAPS 10000	Planet Earth (online course)
*EAPS 19100	Planet Earth Laboratory (online course)
EAS 309	Computer Aided Analysis for Geosciences
*GEOS 450	Physics and Chemistry of the Solid Earth
*GEOS 650	Inverse Methods in Geophysics
*GEOS 650	Computational Methods in Seismology
*GEOS 591B	Geological Interpretation of Seismic Reflection Data

*GEOS 455 Exploration Geophysics

*denotes courses developed; GEOS courses are now labeled EAPS

2. Service Course Teaching

Dr. Braile developed an introductory geoscience course (EAS 100) covering the areas of Earth, Ocean, Atmosphere, and Astronomy. The course is designed primarily for non-science majors. Enrollments have been between 100 and 450 students per semester since 1989.

3. Graduate students supervised

Greg B. Young, M.S., 1974
W. Stephen Lowrey, M.S., 1976
Anthony Luca, M.S., 1978
Paul R. Black, Ph.D., 1978
John B. Hanten, M.S., 1978
Fred E. Mazzella, Ph.D., 1979
Juan M. Espindola, Ph.D., 1979
Mark R. Baker, M.S., 1979
Bruce Losee, M.S., 1980
Mark A. Sparlin, M.S., 198l
Thomas Fauria, M.S., 198l
Kevin W. Martindale, M.S., 198l
Arturo Bermudez, M.S., 1982
Richard Morneau, M.S., 1983
Michael Campbell, M.S., 1983
William Schroeder, M.S., 1983
Carl R. Daudt, M.S., 1983
Greg Elbring, Ph.D., 1984
C.S. Chiang, Ph.D., 1984
William Lutter, M.S., 1984
Shannon McClain, M.S., 1984
Jay Mitchell, M.S., 1984
Phillip Hodgson, M.S., 1984
Lee Ankeny, M.S., 1984
Fred Verner, M.S., 1985
Thomas Allotta, M.S., 1985
Karl Randall, M.S., 1985
Mark Brumbaugh, M.S., 1985
Mark Parrott, M.S., 1985
Michael Bowman, M.S., 1986
T.S. Chen, M.S., 1986
Ashutosh Ganju, M.S., 1987
Theodore Tomczyk, M.S., 1987
William G. Jardine, M.S., 1988
John W. Plappert, M.S., 1988
Mokhtar Shakshuki, M.S., 1988
Aysun Boztepe, Ph.D., 1992
Carl R. Daudt, Ph.D., 1992
Bin Wang, Ph.D., 1993
Dan Brehm, Ph.D., 1997
Mark Davidson, Ph.D, 2000
Jinjun Liu, Ph.D, 2005
Sweta Bhattacharya, MS, 2008
Tenille Medley, MS 2013

4. Awards and Recognitions

MAGSAT Scientific Investigation Team Group Achievment Award, NASA, 1984

Elected Fellow of the Geological Society of America

The faculty of the SAGE program (G.R. Jiracek, W.S. Baldridge, L.W. Braile, J.F. Ferguson, S. Biehler and B. Gilpin) were awarded the 1998 Excellence in Geophysical Education Award by the American Geophysical Union.

Dept. of Earth and Atmospheric Sciences Outstanding Teacher Award, 2001.

Selected as a Fellow of the Purdue University Teaching Academy (http://www.teachingacademy.purdue.edu/), 2010.

C. RESEARCH

1. Research Interests

Prof. Braile's research interests cover a broad range of solid Earth geophysics, but can be grouped into four basic areas: (a) Crustal seismic studies, (b) Applications of quantitative analysis methods in geology and geophysics, (c) Seismotectonics of midcontinental North America, and (d) Earth science education.

(a) Crustal Seismic Studies--Research efforts in crustal seismic studies since 1971 have included extensive seismic refraction/reflection profiling projects in both the western and eastern United States, and in Kenya.

Yellowstone-Snake River Plain Seismic Profiling Experiment, in which Prof. Braile was co-director (with Prof. R.B. Smith of the Univ. of Utah)--This international cooperative experiment (conducted in 1978 and 1980) involved scientists from seven U.S. Universities, two U.S. government agencies and two European geophysical institutes. As many as 220 portable seismographs were deployed for the experiment along about 800 km of seismic profiles in Yellowstone and along the eastern Snake River Plain in southern Idaho. The results of this intensive seismic experiment designed to study the crustal structure and geologic evolution of this major Cenozoic volcano-tectonic system are reported in a series of papers, six of which appear in a special issue of the Journal of Geophysical Research (April, 1982). Papers which have integrated the 1978 and 1980 crustal seismic results with more recent data have also been published (Smith and Braile, 1982, 1984, 1993, 1994).

PASSCAL Ouachita Lithospheric Seismology Experiment--This cooperative seismic profiling experiment involved researchers from Purdue University, the University of Texas at Dallas, the University of Texas at El Paso, Texas A&M University, Louisiana State University, The University of Alabama, and Memphis State University. The Principal Investigators were Profs. L.W. Braile (Purdue), G.R. Keller (UTEP) and G.A. McMechan (UTD). The study utilized 400 seismographs and 21 shotpoints in two deployments along a 200 km line to record a high resolution reflection and refraction profile from near-vertical to wide-angle coverage. The data have been utilized to image the Paleozoic continent to ocean transition of the buried Ouachita System.

Kenya Rift International Seismic Project (KRISP)--The KRISP project began with a preliminary program of seismic recording across the east African rift in Kenya in 1985. A major crustal seismic reflection and refraction program was conducted in 1990 involving an international team of seismologists, five deployments of over 200 portable seismographs and over 30 shotpoints. The derived crustal model indicates substantial crustal thinning directly beneath the rift valley and an anomalously low, upper mantle seismic velocity, which is probably caused by high temperature in the upper mantle beneath the rift. Overall, the crustal structure of the rift is quite symmetric and displays sharp transitions between the rift structure and adjacent cratonic areas. An extensive description and analysis of the KRISP data is contained in a series of paper in Tectonophysics (1994).

Jemez Tomography Experiment (JTEX)--The Jemez Tomography Experiment (JTEX) is a multi-disciplinary study designed to further our knowledge of the subsurface structure of the Valles Caldera and the volcanism associated with the Jemez Mountains in north central New Mexico. JTEX is designed to be a high-resolution study of the structure of the Valles Caldera, the Jemez Mountains, and nearby structural and tectonic features. To provide this level of detail, JTEX was designed to collect several types of geophysical data at relatively small spacing and provide an integrated interpretation of these data along with available geological and geophysical studies. The project consists of active (refraction/wide-angle reflection) and passive (teleseismic) seismic surveys, gravity, magnetic, and magnetotelluric work, in addition to geological, geochemical, and petrological studies. In the active seismic experiments, over 300 seismographs were deployed along a NW-SE line in 1993. In 1995, two seismic lines were recorded utilizing over 400 seismographs. The specific aim of JTEX is to develop a high resolution, three-dimensional crustal model of the Valles Caldera through the synthesis of these techniques and to develop an interpretation of the volcanic and structural evolution of the Jemez Mountains.

Continental Rifts: Evolution, Structure, Tectonics (CREST)--The CREST project involved an interdisciplinary study of continental rifts by an international team of geoscientists. The resulting

volume, *Continental Rifts: Evolution, Structure, Tectonics* (a 466 page book edited by K.H. Olsen and published by Elsevier) presents an overview of the present state of understanding and knowledge of the processes of continental rifting from a multidisciplinary, lithospheric-scale perspective.

Additional crustal studies research has involved development and application of synthetic seismogram methods for modeling of crustal seismic refraction and reflection data. These methods include reflectivity, finite difference and ray-theoretical techniques applied to travel-time, amplitude and waveform modeling of seismic data.

(b) Application of Quantitative Analysis Methods in Geology and Geophysics--Research on quantitative methods and their applications includes utilization of generalized linear inversion methods for modeling geophysical data and application of digital processing techniques such as one- and two-dimensional filtering to gravity, magnetic and seismic data. Inverse methods have been successfully developed for seismic travel times, seismic surface wave dispersion analysis, gravity and magnetic anomaly modeling and spherical earth potential field processing.

Interest in these quantitative methods has led to the development of two new courses at Purdue University: Data Analysis Techniques in Geosciences, and Applications of Geophysical Inversion Theory.

(c) Seismotectonics of Midcontinent North America--As part of a research team from Purdue University, the University of Texas at El Paso, and the University of Pittsburgh, Prof. Braile has been actively involved in geological and geophysical studies of the midcontinent area of eastern North America. These studies have been aimed at evaluating the earthquake hazard and understanding the causes of seismicity in the midcontinent. A variety of geophysical and geological techniques have been utilized including gravity and magnetic anomaly mapping and seismic refraction and reflection profiling in order to delineate buried geologic structures which were caused by ancient tectonic events and which are now associated with earthquake activity. These studies have resulted in development of a seismotectonic model for the midcontinent region which is capable of explaining the major zones of earthquake activity and which is consistent with the contemporary geodynamics of the North American continent.

(d) Earth Science Education--Co-PI (with Prof. Gerald Krockover) on the NSF-sponsored EPIcenter (Earth Processes Instructional Center: A Summer Program for Middle Level Teachers) project. The program is designed to: 1) improve the background of Earth processes science content for teachers in grades 5-9; 2) assist teachers in applying Earth science content in their classrooms through training in use of Earth processes science teaching materials; 3) assist teachers in disseminating their understanding of Earth processes through local in-service, regional, and national presentations; 4) provide support for the participants to return to their schools in leadership roles via opportunities in grant writing and modeling skills. The project involves a 4-week, intensive summer workshop for 30 teachers, and significant academic year follow-up efforts. Three workshops (30 teachers each) have been completed in July and August of 1995, 1996 and 1997. The project was highly successful as evidenced by participant evaluation of the workshop of 4.7/5.0 for 1995, 4.6/5.0 for 1996 and 4.8/5.0 for 1997.

2. Refereed Publications

1) Braile, L.W. (1973). Inversion of Crustal Seismic Refraction and Reflection Data. J. Geophys. Res., 78, 7738-7744.

2) Braile, L.W., G.R. Keller and W.J. Peeples (1974). Inversion of Gravity Data for Two-Dimensional Density Distributions. J. Geophys. Res., 79, 2017-2021.

3) Braile, L.W., R.B. Smith, G.R. Keller, R.M. Welch and R.P. Meyer (1974). Crustal Structure across the Wasatch Front from Detailed Seismic Refraction Studies. J. Geophys. Res., 79, 2669-2677.

4) Braile, L.W. and R.B. Smith (1975). Guide to the Interpretation of Crustal Refraction Profiles. Geophys. J. Roy. Astr. Soc., 40, 145-176.

5) Braile, L.W. and G.R. Keller (1975). Fine Structure of the Crust Inferred from Linear Inversion of Rayleigh Wave Dispersion. Bull. Seism. Soc. Am., 65, 71-83.

6) Keller, G.R., R.B. Smith and L.W. Braile (1975). Crustal structure along the Great Basin - Colorado Plateau Transition from Seismic Refraction Studies. J. Geophys. Res., 80, 1093-1098.

7) Smith, R.B., L.W. Braile and G.R. Keller (1975). Upper-crustal Low Velocity Layers: Possible Effect of High Temperatures over a Mantle Upward at the Basin-Range - Colorado Plateau Transition. Earth and Planetary Science Letters, 28, 197-204.

8) Keller, G.R., R.B. Smith, L.W. Braile, R. Heaney and D.H. Shurbet (1976). Upper Crustal Structure of the Eastern Basin-Range, Northern Colorado Plateau and Middle Rocky Mountains. Bull. Seism. Soc. Am., 66, 869-876.

9) Young, G.B. and L.W. Braile (1976). A Computer Program for the Application of Zoeppritz's Amplitude Equations and Knott's Energy Equations. Bull. Seism. Soc. Am., 66, 1881-1885.

10) Braile, L.W. (1977). Interpretation of Crustal Velocity Gradients and Q-Structure using Amplitude-Corrected Seismic Refraction Profiles. Geophysical Monograph 20, American Geophysical Union, 427-439.

10a) Braile, L.W. (1981). Interpretation of Crustal Velocity Gradients and Q Structure using Amplitude Corrected Refraction Profiles, in Seismic Wave Attenuation (ed. by M.N. Toksoz and D.H. Johnston), Geophysics Reprint Series No. 2, 339-351, (reprinted from AGU Monogr. 20, 1977).

11) Braile, L.W. (1978). Comparison of Four Random to Grid Methods. Computers and Geosciences, 4, 341-349.

12) Keller, G.R., L.W. Braile and J.W. Schlue (1979). Regional Crustal Structures of the Rio Grande Rift from Surface Wave Dispersion on Measurements, in Rio Grande Rift: Tectonics and Magmatism, Am. Geophys. Union Monograph, 115-126.

13) Keller, G.R., L.W. Braile and P. Morgan (1979). Crustal Structure, Geophysical Models and Contemporary Tectonism of the Colorado Plateau. Tectonophysics, 61, 131-147.

14) Hinze, W.J., L.W. Braile, G.R. Keller and E.G. Lidiak (1979). Models for Midcontinent Tectonism, in Continental Tectonics National Acad. Sci., 73-83.

15) Olsen, K.H., L.W. Braile and P.A. Johnson (1980). Seismic Velocity and Q-Structure of the Upper Mantle Lid and Low Velocity Zone for the Eastern Great Basin. Geophys. Res. Letters, 7, 1029-1032.

16) Chandler, V.W., J.S. Koski, W.J. Hinze and L.W. Braile (1981). Correlation of Gravity and Magnetic Anomalies by Internal Correspondence Analysis. Geophysics, 46, 30-39.

17) Olsen, K.H. and L.W. Braile (1981). Seismograms of Explosions at Regional Distances in the Western United States: Observations and Reflectivity Method Modeling, in Identification of Seismic Sources - Earthquake or Underground Explosion (ed. by E.S. Husebye and S. Mykkeltveit), Reidel, New York, 453-466.

18) von Frese, R.R.B., W.J. Hinze and L.W. Braile (1981). Spherical Earth Gravity and Magnetic Anomaly Analysis by Equivalent Point Source Inversion. Earth and Planet. Sci. Letters, 53, 69-83.

19) von Frese, R.R.B., W.J. Hinze, L.W. Braile and A.J. Luca (1981). Spherical Earth Gravity and Magnetic Anomaly Modeling by Gauss- Legendre Quadrature Integration. J. Geophys., 49, 234-242.

20) Braile, L.W., W.J. Hinze, G.R. Keller and E.G. Lidiak (1982). The Northeastern Extension of the New Madrid Seismic Zone, U.S. Geol. Survey Professional Paper No. 1236, 173-184.

21) von Frese, R.R.B., W.J. Hinze and L.W. Braile (1982). Regional North American Gravity and Magnetic Anomaly Correlations. Geophys. J. Roy. Astr. Soc., 69, 745-761.

22) von Frese, R.R.B., W.J. Hinze, J.L. Sexton and L.W. Braile (1982). Verification of the Crustal Component in Satellite Magnetic Data. Geophys. Res. Letters, 9, 293-295.

23) Hinze, W.J., R.R.B. von Frese, M.B. Longacre, L.W. Braile, E.G. Lidiak and G.R. Keller (1982). Regional Magnetic and Gravity Anomalies of South America. Geophys. Res. Letters, 9, 314-317.

24) Russell, D.R., G.R. Keller and L.W. Braile (1982). A Technique to Determine the Three Dimensional Attitude and True Velocity of a Refractor. Geophysics, 47, 1331-1334.

25) Sexton, J.L., W.J. Hinze, R.R.B. von Frese and L.W. Braile (1982). Long-wavelength Aeromagnetic Anomaly Map of the Conterminous U.S.A. Geology, 10, 364-369.

26) Braile, L.W., R.B. Smith, J. Ansorge, M.R. Baker, M.A. Sparlin, C. Prodehl, M.M. Schilly, J.H. Healy, St. Mueller, and K.H. Olsen (1982). The Yellowstone-Snake River Plain Seismic Profiling Experiment: Crustal Structure of the Eastern Snake River Plain. J. Geophys. Res., 87, 2597-2609.

27) Baker, M.R., L.W. Braile and R.B. Smith (1982). Amplitude Normalization of Seismograms from Multiple Seismograph Recording Systems for the Yellowstone-Snake River Plain Seismic Refraction Experiment. J. Geophys. Res., 87., 2611-2618.

28) Schilly, M.M., R.B. Smith, L.W. Braile and J. Ansorge (1982). The 1978 Yellowstone-Eastern Snake River Plain Seismic Profiling Experiment: Data and Detailed Crustal Structure of the Yellowstone Region. J. Geophys. Res., 87, 2692-2704.

29) Lehman, J.A., R.B. Smith, M.M. Schilly and L.W. Braile (1982). Upper Crustal Structure of Yellowstone from Seismic and Gravity Observations. J. Geophys. Res., 87, 2713-2730.

30) Smith, R.B., M.M. Schilly, L.W. Braile, J. Ansorge, J.L. Lehman, M.R. Baker, C. Prodehl, J.H. Healy, St. Mueller and R.W. Greensfelder (1982). The 1978 Yellowstone-Eastern Snake River Plain Seismic Profiling Experiment: Crustal Structure of the Yellowstone Region and Experiment Design. J. Geophys. Res., 87, 2583-2596.

31) Sparlin, M.A., L.W. Braile and R.B. Smith (1982). Crustal Structure of the Eastern Snake River Plain Determined from Ray-Trace Modeling of Seismic Refraction Data. J. Geophys. Res., 87, 2619-2633.

32) Black, P.R. and L.W. Braile (1982). Pn Velocity and Cooling of the Continental Lithosphere. J. Geophys. Res., 87, 10557-10568.

33) Braile, L.W., G.R. Keller, W.J. Hinze and E.G. Lidiak (1982). An Ancient Rift Complex and its Relation to Contemporary Seismicity in the New Madrid Seismic Zone. Tectonics, 1, 225-237.

34) Banda, E., N. Diechmann, L.W. Braile and J. Ansorge (1982). Amplitude Study of the Pg Phase. J. Geophys., 51, 153-164.

35) Braile, L.W., W.J. Hinze, J.L. Sexton, G.R. Keller and E.G. Lidiak (1982). Seismicity and Tectonics of the Midcontinent United States, Proceedings Third International Earthquake Microzonation Conference, Seattle, Washington, June 28-July 1, 1982, 25-38.

36) Ansorge, J., C. Prodehl, D. Bamford, with contributions by E. Banda, E.N. Bessonova, L.W. Braile, V.M. Fishman, E. Fluh, V.S. Geyko, P. Giese, D.P. Hill, J.G. Jurov, I.P. Kosminskaya, W.D. Mooney, G. Muller, St. Mueller, S. Mykkeltveit, J.A. Orcutt, N.I. Pavlenkova, E.L. Reznikov, G.A. Sitnikova and R.B. Whitmarsh (1982). Comparative Interpretation of Explosion Seismic Data. J. Geophysics, 51, 69-84, 1982.

37) Olsen, K.H., L.W. Braile and J.N. Stewart (1983). Modeling Short-Period Crustal Phases (P, Lg) for Long Range Refraction Profiles. Physics of the Earth and Planetary Interiors, 31, 334-347.

38) Keller, G.R., E.G. Lidiak, W.J. Hinze and L.W. Braile (1983). The Role of Rifting in the Tectonic Development of the Midcontinent, U.S.A. Tectonophysics, 94, 391-412.

39) Smith, R.B. and L.W. Braile (1984). Crustal Structure and Evolution of an Explosive Silicic Volcanic System at Yellowstone National Park, in Explosive Volcanism, Inception, Evolution and Hazards, edited by F.R. Boyd, National Academy Press, Washington, D.C., 96-109.

39a) Smith, R.B. and L.W. Braile (1982). Crustal Structure and Evolution of an Explosive Volcanic System at Yellowstone National Park, Wyom. Geol. Assoc. Guidebook, Thirty-third Annual Field Conference, 233-250, (reprinted from Explosive Volcanism).

40) Chiang, C.S. and L.W. Braile (1984). An Example of Two-Dimensional Synthetic Seismogram Modeling, Bull. Seism. Soc. Am., 74, 509-519.

41) Lidiak, E.G., W.J. Hinze, G.R. Keller, J.E. Reed, L.W. Braile and R.W. Johnson (1985). Geologic Significance of Regional Gravity and Magnetic Anomalies in the East-Central

Midcontinent, in The Utility of Regional Gravity and Magnetic Anomaly Maps, edited by W.J. Hinze, Soc. of Explor. Geophysicists, Tulsa, 287-307.

42) Braile, L.W. and C.S. Chiang (1986). The Continental Mohorovicic Discontinuity: Results from Near-Vertical and Wide-Angle Seismic Reflection Studies, in Reflection Seismology: A Global Perspective, AGU Geodynamics Series, 13, edited by M. Barazangi and L. Brown, Amer. Geophys. Union, Wash. D.C., 257-272.

43) Sexton, J.L., L.W. Braile, W.J. Hinze and M.J. Campbell (1986). Seismic Reflection Profiling Studies of a Buried Precambrian Rift Beneath the Wabash Valley Fault Zone, Geophysics, 51, 640-660.

44) Braile, L.W., W.J. Hinze, J.L. Sexton, G.R. Keller and E.G. Lidiak (1986). Tectonic Development of the New Madrid Rift Complex, Mississippi Embayment, North America, Tectonophysics, 131, 1-21.

45) Olsen, K.H., L.W. Braile, J.N. Stewart, C.R. Daudt, G.R. Keller, L.A. Ankeny and J.J. Wolff (1986). The Jemez Mountains Volcanic Field, New Mexico: Time Term Interpretation of the CARDEX Seismic Experiment and Comparison with Bouguer Gravity, J. Geophys. Res.,. 91, 6175-6187.

46) Ankeny, L.A., L.W. Braile and K.H. Olsen (1986). Upper Crustal Structure Beneath the Jemez Mountains Volcanic Field, New Mexico Determined by Three-Dimensional Simultaneous Inversion of Seismic Refraction and Earthquake Data, J. Geophys. Res., 91, 6188-6198.

47) Khan, M.A., P.K.H. Maguire, W. Henry, M. Higham, G.R. Keller, S.Harder, C. Prodehl, J. Mechie, W. Kaminski, C.J. Swain, L.W. Braile, J. Davies, D.H. Griffiths, R.F. King, B. Guggisberg, R.P. Meyer, V. Green, A.E. Mussett, M. Mwangi, K.H. Olsen, J. Patel, G.A. Thompson, and J. Wohlenberg (1987). Kenya Rift International Seismic Project - Preliminary Results, Nature, 325, 239-242.

48) Hinze, W.J. and L.W. Braile (1988). Geophysical Aspects of the Craton: U.S., in The Geology of North America, The Sedimentary Cover-North American Craton, D-2, edited by L.L. Sloss, Geol. Soc. Am., Boulder, Colorado, 5-24.

49) Ravat, D.N., L.W. Braile and W.J. Hinze, (1987). Earthquakes and plutons in the midcontinent-evidence from the Bloomfield Pluton, New Madrid Rift Complex, Seism. Res. Letters, 58, 41-52.

50) Hinze, W.J., L.W. Braile, G.R. Keller and E.G. Lidiak (1988). Models for midcontinent tectonism: An update, Rev. Geophys., 26, 699-717.

51) Keller, G.R., L.W. Braile, G.A. McMechan, W.A. Thomas, S.H. Harder, W.F. Chang and W.G. Jardine (1988). The Paleozoic continent-ocean transition in the Ouachita Mountains imaged from PASSCAL wide-angle reflection-refraction data, Geology, 17, 119-122..

52) Daudt, C.R., L.W. Braile, C.S. Chiang and R.L. Nowack (1989). Comparison of explicit, implicit and Fourier methods for finite difference calculations of synthetic seismograms, Bull. Seism. Soc. Am., 79, 1210-1230.

53) Lutter, W.J., R.L. Nowack and L.W. Braile (1990). Seismic imaging of upper crustal structure using travel times from the PASSCAL Ouachita experiment, submitted to J. Geophys. Res., 95, 4621-4631.

54) Braile, L.W., W.J. Hinze, R.R.B. von Frese, G.R. Keller (1989). Seismic properties of the crust and upper-most mantle of the conterminous United States and adjacent Canada, in Geophysical Framework of the Continental United States, Geol. Soc. Am. Memoir 172, edited by L.C. Pakiser and W.D. Mooney, 655-680.

55) Braile, L.W. (1989). Crustal structure of the continental interior, in Geophysical Framework of the Continental United States, Geol. Soc. Am. Memoir 172, edited by L.C. Pakiser and W.D. Mooney, 285-315.

56) Mooney, W.D. and L.W. Braile (1989). The seismic structure of the continental crust and upper mantle of North America, in The Geology of North America: An Overview, edited by A. Bally and P. Palmer, Geol. Soc. Amer., Boulder, CO, 39-52.

57) Hinze, W.J., L.W. Braile and V.W. Chandler (1990). A geophysical profile of the southern margin of the Midcontinent Rift System in western Lake Superior, Tectonics, 9, 303-310.

58) Keller, G.R., M.A. Khan, P. Morgan, R.F. Wendlandt, W.S. Baldridge, K.H. Olsen, C. Prodehl, and L.W. Braile (1990). A comparative study of the Rio Grande and Kenya Rifts, Tectonophysics, 197, 355-371.

59) Biehler, S., J. Ferguson, W.S. Baldridge, G.R. Jiracek, J.L. Aldern, M. Martinez, R. Fernandez, J. Romo, B. Gilpin, L.W. Braile, D.R. Hersey, B.P. Luyendyk and C.L. Aiken (1991). A geophysical model of the Espanola Basin, Rio Grande Rift, New Mexico, Geophysics, 56, 340-353.

60) Braile, L.W., (1991). Seismic studies of the Earth's crust, Rev. Geophys., Supplement, 680-687.

61) KRISP Working Group (including L.W. Braile), (1991). Large-scale variation in lithospheric structure along and across the Kenya rift, Nature, 354, 223-226.

62) Keller, G.R., L.W. Braile, P.M. Davis, R.P. Meyer, W.D. Mooney and the KRISP Working Group, (1992). The Kenya Rift International Seismic Project (KRISP): 1989-90 Experiment, EOS, 73, 345-351.

63) Nowack, R.L. and L.W. Braile, (1993). Refraction and wide-angle reflection tomography - theory and results, in Seismic Tomography-Theory and Practice, edited by H.M.Iyer and K. Hirahara.

64) Smith, R.B. and L.W. Braile, (1994). The Yellowstone Hotspot, J. Volcanology and Geothermal Research, 61, 121-187.

64a) Smith, R.B., and L.W. Braile, (1993). Topographic signature, space-time evolution, and physical properties of the Yellowstone-Snake River Plain volcanic system: The Yellowstone hotspot, in Geology of Wyoming, edited by A.W. Snoke, J.R. Steidtmann, and S.M. Roberts, Geol. Survey of Wyoming, Memoir No. 5, 694-754.

65) Braile, L.W., B. Wang, C.R. Daudt, G.R. Keller and J.P. Patel, (1994). Modeling the 2-D seismic velocity structure across the Kenya rift, in Crustal and Upper Mantle Structure of the Kenya Rift, (ed. by C. Prodehl, G.R. Keller and M.A. Khan), Tectonophysics, 236, 251-269.

66) Jacob, A.W.B., R. Vees, L.W. Braile and E. Criley, (1994). Optimization of wide-angle seismic signal-to-noise ratios and P-wave transmission in Kenya, in Crustal and Upper Mantle

Structure of the Kenya Rift, (ed. by C. Prodehl, G.R. Keller and M.A. Khan), Tectonophysics, 236, 61-79.

67) Keller, G.R., J. Mechie, L.W. Braile, W.D. Mooney and C. Prodehl, (1994). Seismic structure of the uppermost mantle beneath the Kenya rift, in Crustal and Upper Mantle Structure of the Kenya Rift, (ed. by C. Prodehl, G.R. Keller and M.A. Khan), Tectonophysics, 236, 201-216.

68) Mechie, J., G.R. Keller, C. Prodehl, S. Gaciri, L.W. Braile, W.D. Mooney, D. Gajewski and K.-J. Sandmeier, (1994). Crustal structure beneath the Kenya rift from axial profile data, in Crustal and Upper Mantle Structure of the Kenya Rift, (ed. by C. Prodehl, G.R. Keller and M.A. Khan), Tectonophysics, 236, 179-200.

69) Keller, G.R., C. Prodehl, J. Mechie, K. Fuchs, M.A. Khan, P.K.H. Maguire, W.D. Mooney, U. Achauer, P.M. Davis, R.P. Meyer, L.W. Braile, I.O. Nyambok, and G.A. Thomspon, (1994). The East African rift system in the light of KRISP 90, Tectonophysics , 236, 465-483.

70) Baldridge, W.S., J.F. Ferguson, L.W. Braile, B. Wang, K. Eckhardt, D. Evans, C. Schultz, B. Gilpin, G.R. Jiracek, and S. Biehler, (1994). The western margin of the Rio Grande rift in northern New Mexico: An aborted boundary?, Geol. Soc. Am. Bull., 105, 1538-1551.

71) Boztepe, E.A., and L.W. Braile, (1994). Kinematic inversion for the 2-D horizontal and vertical qP-wave velocities and depths to interfaces applied to the TACT seismic profile, southern Alaska, Geophys. J. Int., 119, 529-547

72) Braile, L.W., G.R. Keller, S. Mueller, and C. Prodehl, (1995). Seismic techniques, in Continental Rifts: Evolution, Structure, Tectonics, (ed. by K.H. Olsen), Elsevier, Amsterdam, 61-92.

73) Braile, L.W., G.R. Keller, R.F. Wendlandt, P. Morgan, and M.A. Khan, (1995). The east African rift system, in Continental Rifts: Evolution, Structure, Tectonics, (ed. by K.H. Olsen), Elsevier, Amsterdam, 213-231.

74) Allen, D.J., L.W. Braile, W.J. Hinze, and J. Mariano, (1995). The midcontinent rift system, U.S.A.: A major Proterozoic continental rift, in Continental Rifts: Evolution, Structure, Tectonics, (ed. by K.H. Olsen), Elsevier, Amsterdam, 375-407.

75) Baldridge, W.S., G.R. Keller, and L.W. Braile, (1995). Continental rifting: A final perspective, in Continental Rifts: Evolution, Structure,Tectonics, (ed. by K.H. Olsen), Elsevier, Amsterdam, 453-459.

76) Ferguson, J.F., W.S. Baldridge, L.W. Braile, S. Biehler, B. Gilpin and G.R. Jiracek, (1995). Structure of the Espanola basin, Rio Grande rift, New Mexico, from SAGE seismic and gravity data, New Mexico Geological Society Guidebook, 46th Field Conference, 105-110, 1995.

77) Wang, B., and L.W. Braile, (1996). Simultaneous inversion of reflection and refraction seismic data and application to data from the northern Rio Grande rift, Geophys. J. Int., 125, 443-458.

78) Jiracek, G.R., C.L. Kinn, C.L. Scott, M.G. Kuykendall, W.S. Baldridge, S. Biehler, L.W. Braile, J.F. Ferguson, and B. Gilpin, (1996). Tracing crustal isotherms under the western

margin of the Jemez Mountains using Sage and industry magnetotelluric data, New Mexico Geological Society Guidebook, 47th Field Conference, 129-134, 1996.

79) Hinze, W.J., D.J. Allen, L.W. Braile and J. Mariano, (1997). The Midcontinent rift system: A major Proterozoic continental rift, in Middle Proterozoic to Cambrian Rifting, Central North America, (ed. by R.W. Ojakangas, A.B. Dickas, and J.C. Green), Boulder, Colorado, Geol. Soc. Am. Special Paper 312, 7-35.

80) Braile, L.W., W.J. Hinze, and G.R. Keller (1997). New Madrid seismicity, gravity anomalies and interpreted rift structures, Seis. Res. Lett., 68, 599-610.

81) Baldridge, W.S., L.W. Braile, M.C. Fehler, and F.A. Moreno, (1997). Science and sociology butt heads in tomography experiment in sacred mountains, EOS, Trans. Am. Geophys. Union, 78, 422-423.

82) Brehm, D.J. and L.W. Braile (1998). Intermediate-term earthquake prediction using precursory events in the New Madrid Seismic zone, Bull. Seism. Soc. Am., 88, 564-580.

83) Brehm, D.J. and L.W. Braile (1999). Intermediate-term earthquake prediction using the modified time-to-failure method in southern California, Bull. Seism. Soc. Am., 89, 275-293.

84) Ravat, D., Z. Lu, and L.W. Braile (1999). Velocity-density relationships and modeling the lithospheric density variations of the Kenya Rift, Tectonophysics, 302, 225-240.

85) Brehm, D.J. and L.W. Braile (1999). Refinement of the modified time-to-failure method for intermediate-term earthquake prediction, J. Seism., 3, 121-138.

86) Davidson, M.E. and L.W. Braile (1999). Vibroseis recording techniques and data reduction from the Jemez Tomography Experiment (JTEX), Bull. Seism. Soc. Amer., 89, 1352-1365.

87) Braile, L.W., (2009) Seismic Monitoring, in *Geologic Monitoring Manual*, GSA Monograph in cooperation with the National Park Service, p. 229-244.

3. Geoscience Education Publications (not peer reviewed unless noted)

1) Braile, L.W. and S.J. Braile: Ocean bathymetry "shoebox" models (lesson plan and instructions for constructing), Society of Elementary Presidential Awardees Newsletter, 1998, 9, 71-77.

2) Hennet, C.B., and L.W. Braile: Exploring the Earth using seismology (color poster), The IRIS Consortium, Washington, DC, (www.iris.edu), 1998.

3) Braile, L.W.: The instructor edition chapter grid, in Earth Science Today, Instructor's Edition (Brendan Murphy and Damian Nance, Brooks/Cole Publishing, Pacific Grove, California, 684 pp., 1999, 16 pages.

4) Braile, L.W.: Study Guide to Earth Science Today, Brooks/Cole Publishing, Pacific Grove, California, 1999, 94 pages.

5) Braile, L.W.: Seismic waves and the slinky: A guide for teachers, informal publication, 2000, 35 pages.

6) Boone, W.J., L.W. Braile, G.H. Krockover, and A. Rizzo: Science instruction for all: Implications for science educators, Science Educator, 8 (Spring), 1999, 43-48 (peer reviewed).

7) Boone, W.J., G.H Krockover, L.W. Braile, and A.M. Rizzo: An analysis of Earth science content emphasis as related to the National Science Education Standards, The Hoosier Science Teacher, 25, March, 69-79, 2000 (peer reviewed).

8) Braile, L.W., Earth science activities on the internet (the equivalent of over 300 pages of figures and text in over 20 educational modules, mostly seismology and plate tectonics related), web.ics.purdue.edu/~braile, 2000.

9) Jiracek, G.R., W.S. Baldridge, S. Biehler, L.W. Braile, J.F. Ferguson, B.E. Gilpin, and D.L.Alumbaugh, SAGE: Learning geophysics by immersion, The Leading Edge, 19, September, 986-990, 2000 (peer reviewed).

10) Braile, L.W., Images of Earth (review of Earth science books for children), Nature, 408, November 30, 2000, 521-522.

11) Braile, L.W., Michelle Hall-Wallace, Rick Aster and John Taber (editors), L.W. Braile and others, (contributing authors), Making Waves: the IRIS Education and Outreach Program Plan, Incorporated Research Institutions for Seismology, Washington DC, 2002, 51 pages.

12) Braile, L.W., R.W.Ridky and B.A.Bolt, Earthquakes and Plate Boundaries, AGI EarthInquiry education module, Freeman, New York, 2002, 12 pages.

13) Jones, Alan, L.W.Braile and S.J.Braile, A suite of educational computer programs for seismology, Seismological Research Letters, , 74, 2003, 605-617 (peer reviewed).

14) Braile, L.W., Michelle Hall-Wallace, Rick Aster and John Taber, The IRIS education and outreach program plan, in press, Seismological Research Letters, 74, 2003, 503-510 (peer reviewed).

15) Hubenthal, Michael, Larry Braile, and John Taber, Redefining Earthquakes, *The Science Teacher*, p. 32-36, January, 2008 (peer reviewed)

16) Jiracek, G.R., W.S. Baldridge, A.J.Sussman, Shawn Biehler, L.W.Braile, J.F.Ferguson, B.E. Gilpin, D.K. McPhee, and Louise Pellerin, SAGE celebrates 25 years of learning geophysics by doing geophysics, The Leading Edge, p. 1340-1344, October, 2008.

17) Jiracek, G. R., J. F. Ferguson, L. W. Braile, and B. E. Gilpin, DAGSAW, 2007-2016 (Digital Analysis of Geophysical Signals and Waves) educational web site: (http://www-rohan.sdsu.edu/~jiracek/DAGSAW/).

18) Baldridge, W.S., Braile, L.W.,Biehler,S.,Jiracek, G.R., Ferguson, J.F., Hasterok, D., Pellerin, L., Bedrosian, P.A., McPhee, D.K, and Snelson, C.M., SAGE at 30: *The Leading Edge*, 31 , no. 6, 702-708, 2012.

19) Baldridge, W. Scott, Paul A. Bedrosian, Shawn Biehler, Lawrence W. Braile, John F. Ferguson, Matthew Folsom, George R. Jiracek, Shari A. Kelley, Darcy K. McPhee, Louise Pellerin, and

Catherine M. Snelson, Summer of Applied Geophysical Experience (SAGE): Training for our future geoscientists, *The Leading Edge*, 1214-1219, October, 2015.

4. Other Publications, Abstracts and Reports

l) Braile, L.W. (1970). The Isostatic Condition and Crustal Structure of Mount Saint Helens as Determined from Gravity Data. M.S. Thesis, University of Washington, Seattle, Washington, 37 pages.

2) Braile, L.W. (1973). Seismic Interpretation of Crustal Structures Across the Wasatch Front and Applications of Geophysical Data Inversion. Ph.D. Thesis, University of Utah, Salt Lake City, Utah, 143 pages.

3) Hinze, W.J., L.W. Braile, V.W. Chandler and F.E. Mazzella (1975). Combined Magnetic and Gravity Analysis. Final Technical Report #S-500 29A Modification No. 8, NASA Goddard Space Flight Center, 87 p.

4) Hinze, W.J., L.W. Braile, G.R. Keller and E.G. Lidiak (1977). A Tectonic Overview of the Central Midcontinent. Technical Report #NUREG/CR-0382, U.S. Nuclear Regulatory Commission, 106 p.

5) Chandler, V.W., J.F. Koski, L.W. Braile and W.J. Hinze (1977). Utility of Correlation Techniques in Gravity and Magnetic Interpretation. Final Technical Report #NAS5-22816, NASA Goddard Space Flight Center, 119 p.

6) Braile, L.W., W.J. Hinze, G.R. Keller and E.G. Lidiak (1978). An Integrated Geophysical and Geologic Study of the Tectonic Framework of the 38th Parallel Lineament in the Vicinity of its Intersection with the Extension of the New Madrid Fault Zone. Technical Report #NUREG/CR-0449, U.S. Nuclear Regulatory Commission, 67 p.

7) Braile, L.W., W.J. Hinze, J.L. Sexton, G.R. Keller and E.G. Lidiak (1979). An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament in the Vicinity of its Intersection with the Extension of the New Madrid Fault Zone. Technical Report #NUREG/CR-1014, U.S. Nuclear Regulatory Commission, 191 p.

8) Bowman, P.L., L.W. Braile, V.W. Chandler, W.J. Hinze, A.J. Luca and R.R.B. von Frese (1979). Magnetic and Gravity Anomaly Correlation and its Application to Satellite Data. Technical Memorandum #79702, NASA Goddard Space Flight Center, 156 p.

9) Braile, L.W., W.J. Hinze, J.L. Sexton, G.R. Keller and E.G. Lidiak (1980). An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament in the Vicinity of its Intersection with the Extension of the New Madrid Fault Zone. Annual Progess Report #NUREG/CR-1878, U.S. Nuclear Regulatory Commission, 131 p.

10) von Frese, R.R.B., W.J. Hinze, L.W. Braile and A.J. Luca (1980). Spherical Earth Gravity and Magnetic Anomaly Modeling by Gauss-Legendre Quadrature Integration. Technical Report #NAS5-25030, NASA Goddard Space Flight Center, 116 p.

11) von Frese, R.R.B., W.J. Hinze and L.W. Braile (1980). Spherical Earth Analysis and Modeling of Lithospheric Gravity and Magnetic Anomalies. Technical Memorandum #80709, NASA Goddard Space Flight Center, 163 p.

12) Braile, L.W., J.L. Sexton, K.W. Martindale and C.S. Chiang (1982). Seismic Wave Generation and Propagation from Coal Mine Blasts at the Wright Mine, Warrick County, Indiana. Final Report, Contract No. J6611205, U.S. Office of Surface Mining, 343 p.

13) Braile, L.W. (1982). Synthetic Seismogram Modeling, Technical Report ONR-l-82, ONR Contract No. N00014-75-C-0972, 99 pages.

14) Chiang, C.S. and L.W. Braile (1983). Guide to Seismic Ray Tracing (RAY2DM) and Disk Ray Theory (DRT) Synthetic Seismogram Programs for Two-Dimensional Seismic Velocity Models, Technical Report, ONR Contract N00014-82-K-033, 87 pages.

15) Hinze, W.J., L.W. Braile, G.R. Keller and E.G. Lidiak (1983). Geophysical-Geological Studies of Possible Extensions of the New Madrid Fault Zone, U.S. Nuclear Regulatory Commission Technical Report NUREG/CR-3174, 88 pages.

16) Braile, L.W., C.S. Chiang and C.R. Daudt (1983). Synthetic Seismogram Calculations for Two-Dimensional Velocity Models, Technical Report ONR-l-83, ONR Contract N00014-82-K-033, 80 pages.

17) Harrison, W., D. Edgar, A. Van Luik, W. Hinze, L. Braile, J. Kalliokoski, H. Pfannkuch, H. Wright, Jr., M. Tisue and M. Sood (1984), Geology, Hydrology, and Mineral Resources of Crystalline Rock Areas of the Lake Superior Region, United States, Argonne National Laboratory Report ANL/ES-134, Parts 1 and 2.

18) Hinze, W.J., L.W. Braile, R.R.B. von Frese, E.G. Lidiak, R.E. Denison, G.R. Keller, R.F. Roy, C.A. Swanberg, C.L.V. Aiken, P. Morgan (1986), Exploration for Hot Dry Rock Geothermal Resources in the Midcontinent USA, Los Alamos National Laboratory Report LA-10659-HDR, Vol. I and II.

19) Braile, L.W., (compiler), Proceedings of the United States-Latin American Partnership to Enhance Cooperation in Earthquake Hazard Research, CUSEC Conference Proceedings, April, 1992, 184 pp.

Over 170 Abstracts of Papers presented at National and International meetings in the past 40 years.

5. Research Grants

ONR -"Investigations of the Fine Structure of Seismic Velocity Transition Zones using the Spectral Ratio of Reflected and Refracted Phases"
Principal Investigator - May 1, 1974-April 30, 1975, $7,180.

NSF -Undergraduate Research Participation Project
Research Supervisor with W.J. Hinze as Principal Investigator - March 15, 1974-May 31, 1975, $10,070

Grant from Purdue University under the Faculty Grant Program for Instructional Development and Innovation. "Instructional Development in the Geosciences: A Geophysical Exploration Computer Game"
Faculty Associate with R.F. Roy; Principal Investigator W.J. Hinze - July 1, 1974-June 30, 1975, $2,500

ONR -"Seismic Velocity and Q-Structure of the Upper Crust Determined from Amplitude - Frequency - Distance Variations of the Pg Phase"
Principal Investigator - May 1, 1975-April 31, 1976, $11,200

NSF -"Crustal Structure Studies of the Western United States using Intermediate Period Surface Wave Dispersion"
Principal Investigator - May 15, 1975-October 31, 1976, $19,262*

NASA -"The Utility of Correlation Techniques on Gravity and Magnetic Interpretation"
Faculty Associate with W.J. Hinze as Principal Investigator - November 25, 1975-November 24, 1976, $24,725

USGS -"A Feasibility Study of Seismic Refraction Profiling in the Northeastern Snake River Plain"
Principal Investigator - April 1, 1976-March 31, 1977, $15,000

ONR -"Relationship of Temperature in the Earth's Crust to Seismic Wave Attenuation and Shear Velocity"
Principal Investigator - May 1, 1976 - April 30, 1977, $20,000

NRC -"An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament in the Vicinity of its Intersection with the Extension of the New Madrid Fault Zone: Phase I"
Principal Investigators, W.J. Hinze and L.W. Braile - July 1, 1976-June 30, 1978, $44,000

ONR -"Synthetic Seismogram Modeling"
Principal Investigator - May 1, 1977-April 30, 1978, $21,800

NASA -"The Utility of Correlation Techniques on Gravity and Magnetic Interpretation"
Faculty Associate with W.J. Hinze as Principal Investigator - November 25, 1976-November 24, 1977, $26,316*

NRC -"An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament in the Vicinity of its Intersection with the Extension of the New Madrid Fault Zone: Phase II"
Principal Investigators, W.J. Hinze and L.W. Braile - July 1, 1977-June 30, 1978, $100,000

NSF -"Investigation of a Tectonic Model for the Snake River Plain using Seismic Refraction Profiling"
Principal Investigator - March 15, 1978-March 14, 1980, $l09, 579*

USGS -"West Yellowstone Seismic Refraction Studies"
Principal Investigator - August 24, 1977-November 23, 1977 $2,500

NRC -"An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament and its Intersection with the Extension of the New Madrid Zone: Phase III"
Principal Investigators, W.J. Hinze and L.W. Braile - July 1, 1978-June 30, 1979, $l00,000

NASA -"Lithospheric Models of the North American Continent Utilizing Surface and Satellite Geophysical Data"
Faculty Associate with W.J. Hinze as Principal Investigator - May 4, 1978-July 3, 1979, $62,628*

USGS -"Support of Seismic Refraction Profiling Research in Yellowstone and the Snake River Plain"
Principal Investigator - July 1, 1978-November 39, 1979, $66,341*

USGS -"Support of Drilling and Blasting for Yellowstone-Snake River Plain Seismic Refraction Profiling"
Principal Investigator - September 1, 1978-expended, $9,500

ONR -"Synthetic Seismogram Modeling"
Principal Investigator - May 1, 1978-April 30, 1979, $35,422

NASA -"Lithospheric Models of the North American Continent Derived from Seismic Refraction and Surface Wave Studies"
Principal Investigator - July 1, 1979-June 30, 1980, $42,492*

NRC -"An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament and its Intersection with the Extension of the New Madrid Fault Zone: Phase IV"
Principal Investigators, W.J. Hinze and L.W. Braile - July 1, 1979-June 30, 1980, $109,980

ONR -"Synthetic Seismogram Modeling"
Principal Investigator - May 1, 1979-November 30,1979, $19,197

NRC -"An Integrated Geophysical and Geological Study of the Tectonic Framework of the 38th Parallel Lineament and its Intersection with the Extension of the New Madrid Fault Zone: Phase V"
Principal Investigators, W.J. Hinze and L.W. Braile - July 1, 1980-June 30, 1981, $104,000

USGS -"Evaluation of Detailed Seismic Refraction Profiling for Regional Geothermal Exploration with Application to Yellowstone and the Snake River Plain and Adjacent Areas"
Principal Investigator - December 1, 1979-May 31, 1982, $231,966

LASL -"An Integrated Geophysical Geological Study of Potential Dry Hot Rock Sites in the Midcontinent"
One of 8 principal investigators - May 1, 1980-October 31, 1983, $247,350

ONR -"Synthetic Seismogram Modeling"
Principal Investigator - December 1, 1979-May 31, 1981 $29,043

NRC -"Wabash Valley Seismic Reflection Profiling"
Principal Investigators, J.L. Sexton, L.W. Braile and W.J. Hinze - September 8, 1980-September 7, 1983, $256,000

NASA -"Application of MAGSAT to Lithospheric Modeling in South America: Part I-Processing and Interpretation of Magnetic and Gravity Anomaly Data"
Principal Investigators, W.J. Hinze and L.W. Braile
September 26, 1980-January 26, 1984, $92,140

NRC -"Geophysical-Geological Studies of Possible Extensions of the New Madrid Fault Zone"
Principal Investigators, L.W. Braile, W.J. Hinze, J.L. Sexton, G.R. Keller and E.G. Lidiak - October 1, 198l-September 30,1982, $110,000

Office of Surface Mining - "Ground Motion Monitoring of Coal Mine Blasts"
Principal Investigators, J.L. Sexton and L.W. Braile - March 15, 1981-April 30,1982, $40,000

ONR -"Synthetic Seismogram Modeling"
Principal Investigator - October 1, 1981-March 30, 1983, $39,933

NRC -"Geophysical-Geological Studies of Possible Extensions of the New Madrid Fault Zone"
Principal Investigators, L.W. Braile, W.J. Hinze, G.R. Keller and E.G. Lidiak - October 1, 1982-November 27, 1983, $90,000

NASA -"Improving the Geological Interpretation of Magnetic and Gravity Satellite Anomalies", NAG5-304
Principal Investigators, W.J. Hinze, R.R.B. von Frese and L.W. Braile - April 1, 1983-March 31, 1984, $45,000

NRC -"Geophysical-Geological Studies of Possible Extensions of the New Madrid Fault Zone"
Principal Investigators, L.W. Braile, W.J. Hinze, G.R. Keller and E.G. Lidiak - November 28, 1983-November 27, 1984, $l00,000

NSF -"Cooperative Lithospheric Seismology Program -- Phase I - Seismograph Evaluation and Data Management Development", EAR-8401330
Principal Investigator, - July 15, 1984-June 30, 1986, $51,700.

NRC -"Geophysical Geological Studies of Possible Extensions of the New Madrid Fault Zone", NRC-04-81-195-01
Principal Investigators, W.J. Hinze and L.W. Braile, - September 27, 1984-June 19, 1987, $80,000.

NASA -"Improving the Geological Interpretation of Magnetic and Gravity Satellite Anomalies", NAG5-304, Suppl. #1
Principal Investigators, W.J. Hinze and L.W. Braile, - July 1, 1984 - August 31, 1985, $29,999.

LANL -"Seismic Reflection Studies of Shallow Structure in the Jemez Mountains, New Mexico", X85U35581
Principal Investigator - January 14, 1985-September 30, 1985, $25,569.

NSF -"A Rapid Finite Difference Synthetic Seismogram Method for Heterogeneous Elastic Media", EAR-8418672
Principal Investigator - August 1, 1985-January 31, 1987, $35,908.

NASA -"Improving the Geological Interpretation of Magnetic and Gravity Satellite Anomalies", NAGW-736
Principal Investigators, W.J. Hinze and L.W. Braile - April 24, 1985-May 31, 1988, $117,504.

NSF/IRIS - "Gathering and Analysis of Array Seismic Data for Deep Crustal Structure in the Ouachita System", IRIS 0110, EAR8642240/X
Principal Investigator - March 1, 1986-December 31, 1987, $44,000.

NSF -"Cooperative, Interdisciplinary Synthesis of Global Data on the Structure and Evolutionary Processes of the Lithosphere in Continental Rift Zones", EAR-8617315
Principal Investigators, L.W. Braile and W.J. Hinze - February 15, 1987-September 30, 1991, $51,000.

NSF/IRIS - "Processing and Interpretation of the PASSCAL Ouachita Refraction/Reflection Data", IRIS 0110, EAR8642240/X
Principal Investigator - January 1, 1988-June 30, 1989, $20,000.

NSF - "KRISP90: Kenya Rift International Seismic Project - An International Cooperative Experiment", EAR8711604
Principal Investigator - August 1, 1988-July 31, 1993, $174,837.

NSF - "Evaluation and Enhancement of the Fourier Method for Rapid Synthetic Seismogram Calculation in Heterogeneous Elastic Media", EAR8817048
Principal Investigator - January 1, 1989-June 31, 1991, $90,000.

NSF - "The Jemez Tomography Experiment (JTEX)", EAR-9219759
Principal Investigator - June 1, 1993-May 31, 1997, $350, 521.

NSF - “Upgrading the Geophysics Computer Network at Purdue”, EAR-9206036
Principal Investigators, S.D. King, L.W. Braile, R.L. Nowack, and W.J. Hinze - July 1, 1992-January 30, 1995, $65,000.

USGS/NEHRP - "Evaluation of the Time of Failure Method for Intermediate Term Earthquake Prediction in the New Madrid Area", USGS-1434-94-G-2413
Principal Investigator - January 21, 1994-July 21, 1995, $48,163.

NSF - "Earth Processes Education Program for Teachers (Grades 5-9)", ESI-9355721
Principal Investigators, G.H. Krockover and L.W. Braile - May 1, 1994-April 30, 1999, $734,190.

NSF - “Collabortive Research: An Asthenosphere/Lithosphere Probe in North America - An International Multiscale Seismic Experiment”, EAR-9418718
Principal Investigator -April 15, 1995-March 31, 1997, $118,000.

NSF - “Implementing the PEPP Program in the Central Midwest States (Indiana, Illinois, Kentucky, Ohio); Support for a Teacher Workshop at Purude University, West Lafayette, Indiana”, EAR-9254951-RED
Principal Investigators, L.W. Braile and R.L. Nowack - March 1, 1996-December 31, 1996, $45,000.

NSF – “Improvements in the Time-to-Failure Method for Intermediate-Term Earthquake Prediction and Testing Using the Extensive Southern California Earthquake Catalog”, 9614658-EAR

Principal Investigator - March 1, 1997-February 28, 1999, $49,121.

NSF – “An Integrated Earth and Atmospheric Sciences Computer Laboratory for Undergraduate Instructional Improvement”, DUE-9751613
Principal Investigators, C.A. Clayson, L.W. Braile, J.M. Harbor, J.G. Ogg, G.W. Petty, S.D. King, and R.J. Oglesby – August 15, 1997-July 31, 1999, $39,115

NSF/IRIS – “Purdue PEPP (Princeton Earth Physics Project) Follow-up, Teachers Workshop—Installation and Operation of PEPP Seismographs”, EAR-9529992
Principal Investigator – September 1, 1997-August 31, 1999, $5,000.

NSF/IRIS – “Earthquake workshop for Teachers at the 1998 NSTA Meeting”, EAR-9529992
Principal Investigator – November 1, 1997-April 30, 2001, $14,000.

NSF – “Upgrading (and Expanding) the Geophysics Computer Network at Purdue”, EAR-9726013
Principal Investigators, S.D. King, L.W. Braile, D.E. Granger, J.M. Harbor, and R.O. Sack – April 1,1998-March 31, 2001, $150,000.

NSF – "Development of Inquiry-Based Earth Dynamics Lessons Using SeisVolE (An Earthquake and Volcano Plotting and Analysis Computer Program) for Grades 7-9", EAR-9907752
Principal Investigator – September 15, 1999-August 31, 2003, $100,049.

NSF/IRIS – 6/1/2002 - 6/30/2005 ($32,000) “Development of Three Discovery-Learning Activities for Use with Educational Seismograph Data”, IRIS subaward, PI: L. W. Braile.

NSF/IRIS – 6/30/2004 – 6/30/2006 ($15,000) “Development of New Entries for the SCEC Electronic Encyclopedia of Earthquakes-Part II”, IRIS subaward, PI: L. W. Braile.

NSF/EDU/DUE – “REU Site: Summer of Applied Geophysical Experience (SAGE)”, EAR-0755066 PI: L.W. Braile, May 1, 2008 – April 30, 2014, (total funding $525,000).

NSF/EDU/DUE – “REU Site: Addition of a Geothermal Research and Education Focus to Enhance the SAGE (Summer of Applied Geophysical Experience) REU Program”, EAR-1156934 PI: L.W. Braile, August 1, 2012 – July 31, 2014, $89,000.

*Includes Purdue Cost Sharing

Industry funding for the SAGE program (L. Braile, PI): ExxonMobil: $37,500, 2009; $37,500, 2010; $37,500, 2011; $35,000, 2012; $35,000, 2013. SEG Foundation: $20,000, 2009; $20,000, 2010; $20,000, 2011, $10,000, 2012; $20,000, 2013; $18,284.70, 2014.

David Ross/PRF Grants

"Determination of Temperature in the Earth's Crust from the Velocity and Attenuation of Seismic Shear Waves" Paul R. Black - David Ross Fellow, March 1, 1976-February 28, 1977, $3,600 - Renewed March 1, 1977-February 28, 1978

"Synthetic Seismogram Modeling of Realistic Geology using a Finite Difference Method" Fred E. Mazzella - David Ross Fellow, April 1, 1977-March 31, 1978, $4,050 - Renewed April 1, 1978-March 31, 1979, $4,050

"Tomographic Crustal Imaging of the Valles/Toledo Caldera Complex and the jemez Mountains, New Mexico" Mark Davidson - Purdue Research Foundation Fellow, January 6, 1997-January 5, 1999, $22,800.

PRF –CS&E – Jinjun Liu, one year – August, 2001-May 2002.

6. Conferences Attended

American Geophysical Union Fall Annual Meeting, San Francisco, CA, December 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2018 (Wash. DC).

American Geophysical Union Spring Annual Meeting, Washington, DC, April 1974; June 1975; April 1976; June 1977; June 1979; May 2002. Cincinnati, OH, May 1984; Baltimore, MD, 1985, 1987, 1994, 1997.

Seismological Society of America Annual Meeting, Golden, CO, May 1973; Las Vegas, NV, March 1974; Reno, NV, April 1978; Golden, CO, May 1979; Seattle, WA, April 1980; Salt Lake City, UT, May 1983; Charleston, SC, April 1986; Santa Fe, NM, April 1992; Pasadena, CA, April 1994; El Paso, TX, March, 1995; St. Louis, MO, April, 1996; Seattle, WA, May, 1999; San Juan, Puerto Rico, May, 2003, Portland, OR, April 2010, Anchorage, AK, April-May, 2014, Miami, Florida, 2017.

Seismological Society of America, Eastern Section Meeting, Columbia, SC, October 1973; St. Louis, MO, November 1975; Ann Arbor, MI, 1976.

Geological Society of America Annual Meeting, Denver, CO, 1976; Seattle, WA, 1977; Cincinnati, OH, 1981; Indianapolis, IN, 1983, Reno, NV, 1984; San Antonio, TX, 1986; Phoenix, AZ, 1987; Denver, CO, 1988; St. Louis, MO, 1989; Dallas, TX, 1990; San Diego, CA, 1991; Cincinnati, OH, 1992; Seattle, WA, 1994; New Orleans, LA, 1995; Denver, CO, 1996; Denver, CO, 1999; Reno, NV, 2000; Boston, MA 2001; Denver, CO 2002; Denver, CO 2007, Houston, TX 2008, Portland, OR, October, 2009.

Society of Exploration Geophsyicists Annual Meeting, Houston, TX, 1976; New Orleans, LA, November 1979; Houston, TX, 1980; Dallas, TX, 1982; Las Vegas, NV, 1983; Washington, DC, 1985; Houston, TX, 1986; Houston, TX, 1999; San Antonio, TX 2001; Houston, TX, 2005; New Orleans, LA, 2006; San Antonio, TX, 2007; Las Vegas, NV 2008; Houston, TX, October 2009; Denver, CO, October, 2010, San Antonio, TX, September, 2011; Las Vegas, NV, November, 2012; Houston, TX, September, 2013.

Geological Society of America Sectional Meeting, Kalamazoo, MI, 1976; Carbondale, IL, 1977; Mountain View, AR, 1979; Bloomington, IN, 1980; West Lafayette, IN, 1982; Salt Lake City, UT, May 1983.

International Association of Seismology and Physics of the Earth's Interior Assembly, Durham, England, August 1977.

American Geophysical Union Midwest Meeting, Ann Arbor, MI, 1976; West Lafayette, IN, 1977; Columbus, OH, 1979.

International Union of Geodesy and Geophysics, Canberra, Australia, December 1979; Vancouver, Canada, August, 1987.

Office of Naval Research Workshop on Seismic Propagation, Washington, DC, April 1980.

Mountain Building Symposium, Zurich, Switzerland, July 198l.

Workshop on the Rio Grande Rift, Los Alamos, NM, March 1982.

Workshop on Geophysical Methods of Hot Dry Rock Exploration, Los Alamos, NM, June 1982.

Third International Conference on Earthquake Microzonation, Seattle, WA, June 1982.

IRIS Annual Workshop, Stanford, CA, 1989; Alta UT, 1990; Hilton Head, SC, 1991, 1992; Waikaloa, Hawaii, 1993; Glendale, CA, 1994; Breckenridge, CO, 1997; Santa Cruz, CA, 1998; Yosemite, CA, 1999; Samoset, ME, 2000; Jackson, WY 2001; Waikoloa, HI 2002.

Hoosier Association of Science Teachers Inc., Indianapolis, IN, 1993, 1994, 1995, 1997, 2001, 2002, 2004, 2007, 2008. (Conducted one or two 60 minute workshops for teachers at each of these meetings.)

National Science Teachers Association, Boston, MA, 1992; Kansas City, MO, 1993; Anaheim, CA, 1994; Philadelphia, PA, 1995; St. Louis, MO, March, 1996; New Orleans, LA, April, 1997; Las Vegas, NV, April, 1998; Boston, MA, March, 1999; Orlando, FL, April, 2000, St. Louis, MO, March, 2001; Philadelphia, PA, March 2003; Atlanta, GA, April, 2004; Dallas, TX, March 2005; Anaheim, CA, April, 2006; St. Louis, MO, March 2007; Boston, MA, March, 2008, Indianapolis, IN, March, 2012; Portland, OR, 2016. (Conducted one or two 60 minute workshops for teachers at each of these meetings.)

California Science Teachers Association, Sacramento, CA, October, 2000; Palm Springs, CA 2001; San Francisco, CA 2002, Long Beach, CA 2003; San Jose, CA 2004; Palm Springs, CA, 2005; San Francisco, CA 2006, Long Beach, CA 2007; San Jose, CA 2008; Palm Springs, CA, 2009; Sacramento, CA, 2010, Pasadena, CA, 2011; San Jose, CA, 2012; Palm Springs, CA, 2013; Sacramento, CA, 2014; Long Beach, CA, 2015; Sacramento, CA, 2016; Sacramento, CA, 2017; Pasadena, CA, 2018. (Conducted one or two 60-90 minute workshops for teachers at each of these meetings.)

7. Invited Conferences and Papers

Penrose Conference (GSA) on Regional Geophysics and Tectonics of the Intermountain West. Alta, UT, September 1975.

North-Central Section of the Geological Society of America Annual Meeting, Kalamazoo, MI, April 1976 (invited paper); South Bend, IN, April 1989.

Office of Naval Research Symposium on the Nature and Physical Properties of the Earth's Crust, Vail, CO, August 1976.

Departmental Seminar, Northwestern University, Evanston, IL, November 1976.

Departmental Seminar, Oregon State University, Corvallis, OR, November 1976.

Seminar, Los Alamos Scientific Laboratory, Los Alamos, NM, July 1977.

Workshop on Seismic Refraction Interpretation, sponsored by the Commission on Controlled Source Seismology of the International Association of Seismology and Physics of the Earth's Interior, Karlsruhe, Germany, August 1977.

Geological Society of America Annual Meeting, Seattle, WA, November 1977 (invited paper).

Departmental Seminar, IU-PU, Fort Wayne, IN, November 1977.

Workshop on Active and Passive Seismic Methods Applied to Geothermal Systems, Taos, NM, October 1978.

International Symposium on the Rio Grande Rift, Santa Fe, NM, October 1978.

Seminar, Union Oil Company Research Laboratory, Brea, CA, December 1977.

Departmental Seminar, Southern Methodist University, Dallas, TX, April 1980.

Workshop on Seismic Studies in Laterally Heterogeneous Structures, Commission on Controlled Source Seismology of the International Association of Seismology and Physics of the Earth's Interior, Park City, UT, August 1980.

Aeromagnetic Mapping Conference, Workshop on Tectonic Interpretation of the Aeromagnetic Map of the Northern Rocky Mountains and Adjacent Areas, Colorado Spring, October 1981.

Fall American Geophysical Union Meeting, San Francisco, CA, 1979 (invited paper).

Seminar, Institute for Geophysics, Swiss Federal Institute of Technology, Zurich, Switzerland, May 1981.

Seminar, Geophysics Institute, University of Karlsruhe, Karlsruhe, Germany, June 1981.

Seminar, Institute for Geophysics, Swiss Federal Institute of Technology, Zurich, Switzerland, July 1981.

Seminar, September Meeting of Indiana Geologists, September 1981.

Seminar, Los Alamos National Laboratory, Los Alamos, NM, November 198l.

Seminar, Department of Geology, Northern Illinois University, DeKalb, IL, November 1981.

Seminar, Department of Geology, Indiana University, Bloomington, IN, January 1982.

Seminar, Department of Geology, University of Colorado, Boulder, CO, October 1982.

Seismological Society of America Meeting, Salt Lake City, UT, May 1983 (invited paper).

Seminar, Texaco Research Laboratory, Houston, TX, September 1983.

Seminar, Department of Geology, Northwestern University, Evanston, IL, October 1983.

Seminar, Indiana-Kentucky Geological Society, Evansville, IN, January, 1984.

International Symposium on Deep Structure of the Continental Crust: Results from Reflection Seismology, Cornell Univ., June 26-28, 1984.

Seminar, Department of Geosciences, Penn State University, February, 1987.

Presentation on Plate Tectonics and Earthquakes, Evansville, IN area High Schools, Special Science Program, November, 1988.

Seminar, Department of Geophysics, Colorado School of Mines, February, 1989.

Seminar, Department of Geological Sciences, University of British Columbia, February, 1989.

NSF/EAR Workshop on the Continental Lithosphere, Mesa, AZ, March 1989.

New Madrid Workshop, Memphis, TN, November 1989.

Invited presentation, Symposium on Intraplate Seismicity and Deformation, GSA Meeting, November, 1989.

AGU Chapman Conference, "Rocky Mountains: Plate Puzzle?", Santa Fe, NM, September 1991.

AGI K-12 Earth Science Education Conference, Washington, DC, February 1991.

Coalition for Earth Science Education, organizational meeting, Racine, WI, February 1993.

CUSEC US-Latin America Partnership Conference, Indianapolis, IN, December 1991.

Seminar, Department of Geological Sciences, University of Texas at El Paso, April, 1988; July, 1992.

Invited presentation, AGU Meeting, Baltimore, MD, May, 1994.

AGU Chapman Conference, "Scrutiny of Undergraduate Geoscience Education", Washington, D.C., September, 1994.

AGU Workshop on Undergraduate Earth Sciences Education – "Spheres of Influence: Shaping the Future of Earth Systems Science Education," Washington, D.C., November, 1996.

Project Kaleidoscope Workshop – "Improving the Quantitative Skills of Majors and Non-Majors in Earth and Planetary Sciences," Williamsburg, VA, January, 1999.

Invited presentation, Seismological Society of America, Annual Meeting, "The SAGE (Summer of Applied Geophysical Experience) Program – Integration of Education and Research in Geophysics", Seattle, WA, May, 1999.

Seminar, Department of Earth and Atmospheric Sciences, Purdue University, "Science Education – Why Should We Care?", September, 1999.

Seminar, Department of Geology, University of Illinois, "Science Education – Why Should We Care?", March, 2000.

Seminar, Department of Geology, University of Illinois, "The New Madrid Seismic Zone", March, 2000.

Seminar, Department of Geological Sciences, San Diego State University, "Science Education – Why Should We Care? What Can We Do?", September, 2000.

Invited Presentation, Project Kaleidoscope Workshop – "Improving the Undergraduate Curriculum in Earth and Planetary Sciences," Snowbird, UT, July, 2001.

Invited Participant, EarthScope Education workshop, (Chair of organizing committee), Boulder, CO, January 2002

IRIS GeoEd workshop, May 2003

Invited Participant, Workshop on "Teaching Public Policy in the Geosciences" (SERC/NAGT, http://serc.carleton.edu/NAGTWorkshops/publicpolicy06/index.html), Presentation – *Introductory Earth Science Courses* - http://serc.carleton.edu/files/NAGTWorkshops/publicpolicy06/braile_talk.ppt

Presenter and Co-convener, NSF/NAGT sponsored workshop "Teaching Geophysics in the 21st Century" held at Jackson, Wyoming, August 11-15, 2007.

Invited Presentation (Field Geophysics at SAGE: Strategies for Effective Education) and Participant, "Teaching Geoscience in the Field in the 21st Century" workshop (SERC/NAGT, http://serc.carleton.edu/NAGTWorkshops/field/workshop10/index.html), Bozeman, MT, August, 2010

Invited Participant, NSF GeoPRISMS Rift Initiation and Evolution (RIE) workshop, Santa Fe, NM, November, 2010.

Invited Participant, NSF Workshop – InTeGrate: Broadening Access to the Earth and Environmental Sciences, Arizona State University, Tempe, AZ, February 2014.

8. Cooperative Programs

KRISP - (Kenya Rift International Seismic Project) Active in KRISP85 and KRISP90 projects involving U.S., European and Kenyan research institutions in a cooperative explosion and earthquake seismology study of the East African Rift System in Kenya. A special issue of Tectonophysics (Prodehl et al., 1994) includes numerous papers describing this research.

CREST - (Continental Rifts: Evolution, Structure and Tectonics) Member of 16-person international research team involved in a global study of continental rifts (1987-95). A research monograph (Olsen, 1995) has been produced by the research group reporting on the results of the study.

JTEX - (Jemez Tomography Experiment) An integrated geological and geophysical study of the deep structure of the Jemez Mountains Volcanic Field by a cooperative university, U.S. Geological Survey, and Los Alamos National Laboratory research team (1992-present).

SAGE - (Summer of Applied Geophysical Experience) One of participating faculty (1985-present) in a summer geophysics field research and teaching program sponsored by the IGPP/Los Alamos and supported by the NSF and industry affiliates. Co-Director of SAGE program, 2008-present. Several publications (including Biehler et al., 1991; Baldridge et al., 1994; Ferguson et al., 1995; Jiracek et al., 1996; Wang and Braile, 1996) have resulted from the research conducted as part of the SAGE program. Recent information on SAGE:

http://web.ics.purdue.edu/~braile/sage/SAGE2010Highlights.pdf
http://web.ics.purdue.edu/~braile/sage/SAGE2011Highlights.pdf
http://web.ics.purdue.edu/~braile/sage/SAGE2012Highlights.pdf
http://web.ics.purdue.edu/~braile/sage/SAGE2013Highlights.pdf
http://web.ics.purdue.edu/~braile/sage/SAGE2014Highlights.pdf

http://web.ics.purdue.edu/~braile/sage/SAGE2015Highlights.pdf

Interdisciplinary Activities:

Participated for 3 ½ years (2010-13) in the SLED (Science Learning through Engineering Design NSF-supported MSP project through Purdue's Colleges of Education and Engineering, Ayssa Panitch, P.I.; https://stemedhub.org/groups/sled/design_resources). Braile contributed to 3 teams of faculty participants and was team leader for two of those teams. K-6 lessons/activities were created by each team and area teachers (about 40 each year) were trained in the use of the lessons during a summer workshop. The lessons were piloted in six classroom visits and in five presentations to SLED program faculty members. Braile contributed to the following activities:

2010-2011
Jenny Daugherty, Larry Braile, Helen McNally, Kavita Ramane, and Keith Bowman, ***Rock Steady: Designing a Sensor*** (https://stemedhub.org/resources/648)
Lesson plan designed for grade 6 on designing a sensor to detect vibrations and introducing seismic waves and seismometers.

2011-2012
Larry Braile, Jenny Daugherty, Helen McNally, Inez Hua, Jenniffer Dickensheets, Pam Stamm, and Melissa Colonis, ***Plastic Water Bottle Design – What's the Best Shape?*** (https://stemedhub.org/resources/1514)
This lesson plan, intended for grade 6, focuses on using mathematics to design the shape of a plastic water bottle to optimize the surface area to volume ratio and so reduce the amount of plastic used to make the bottles.

Larry Braile, Jenny Daugherty, Helen McNally, Inez Hua, Jenniffer Dickensheets, Pam Stamm, and Melissa Colonis, ***Seasons and Shadows*** (https://stemedhub.org/resources/1511)
The Reasons for Seasons lesson, designed to meet 5th grade standards, addresses an important science concept involving the movements of the Earth around the Sun and the tilt of the Earth's rotational axis.

2012-2013
Kendra Erk, John Lumkes, Larry Braile, Anne Brickler, and Anna Matthys, ***Light – Just Right!*** (https://stemedhub.org/resources/1790)
This 4th grade design activity focuses on electrical current and resistance. Students design a way to make a bulb light with differing brightnesses.

Larry Braile, John Lumkes, Kendra Erk, Anne Brickler, Anna Matthys, ***Sound Absorption*** (https://stemedhub.org/resources/1766)
This grade 3 lesson plan focuses on a design task to create a wall to absorb sound.

9. Consulting

Served as a consultant to Phillips Petroleum Company, Geothermal Operations, for geophysical exploration for geothermal resources, 44 days during 1976.

Served as consultant to Seismology Group (EES-3) of Los Alamos National Laboratory, Los Alamos, NM, 1977-1990; IGPP, 1990-1995; Scientific Affiliate, 1996-present.

Served as consultant to Argonne National Laboratory for preparation of report on seismicity of the Lake Superior Region, February-September 1982, January-February 1983; and for the Review Panel for the Salt Waste Isolation Program, 1985-1994.

Served as consultant to Harcourt, Brace Jovanovich Publishers for review of Elementary School Science Textbooks, 1987-88.

Served as consultant to Brooks/Cole publishers, 1998-99.

Served as consultant to McGraw-Hill publishers, 2000.

Review of *Foundations of Earth Science textbook*, 2017, for Prentice Hall.

D. SERVICE

1. Committee Assignments

University:
- Teacher Education Council (1976-1979)
- Graduate Council (1995-1998)

College of Science:
- School of Science Faculty Council (1982-1988)
- Secretary of Faculty of School of Science (1982-1986)
- Dean Search Committee (1991-92)
- Area Promotion and Tenure Committee (1995-2002, 2006-2009, 2013-14)
- Ad hoc Distinguished and Named Professor Selection Committee (1999)
- Ad hoc University Faculty Scholar Selection Committee (2001)
- Ad hoc Distinguished Professor Evaluation Committee (Chair, 2002)

Department:
- Schedule and Space Deputy (1974-1977)
- Curriculum Committee (1975-1980)
- Seminar Committee (1975-1977)
- Course Improvement and Evaluation, Chairman (1975-1977)
- Library Committee (1974-1980); (1988-1990)
- Ad hoc Committee on Visiting Committee Report (1976)
- Space Planning and Coordinating Committee, Chairman (1975-1977)
- Graduate Committee (1979-1981); (1988-1989), Chairman (1990-1996)
- Committee on Academic Review, Chairman (1986-1987)
- Head Search Committee (1987-1988)
- Computer Committee (1988-1989)
- Outreach Committee (1992-1996)
- Undergraduate Committee, Chair (1996-2002)

Infrastructure Committee (1996-2002)
Faculty Peer Teaching Evaluation Committee (1996-99, 2000-2001)
Department Executive Committee (1999-2003)
EAS Executive Council (1999-2006)
Alumni and Corporate Realations Committee (2009-present)
Computing Committee (2009-2011)

2. Research

Review of Manuscripts for: Journal of Geophysical Research, Geological Society of America Bulletin, Tectonophysics, Seismological Research Letters, Geology, Bulletin of the Seismological Society of America, Geophysics, Geophysical Journal International, Journal of Geophysics, Geophysical Research Letters.

Review of Proposals for: U.S. National Science Foundation, U.S. Department of Energy, Petroleum Research Foundation, U.S. Geological Survey, Canadian National Science and Engineering Research Council.

Served on Site Review Committee for proposal evaluation for Canadian National Science & Engineering Research Council, Univ. of British Columbia, Vancouver, Canada, October 1983.

Served on IRIS/PASSCAL site review committee for PASSCAL Instrument Centers, 1988, 1991.

Served on NSF committee to review the IRIS program, June 1992.

Served on USGS/NEHRP panel to review internal, central US proposals, September 1992.

Served on USGS/NEHRP panel to review external, central US proposals, July, 1993.

Served on NSF site review committee as Chairman for evaluation of the IRIS program, October, 1995.

Served on NSF/GEO Ad hoc Education Working Group, 1996

Served on DSWA proposal review panel, February, 1997.

Served on NSF/EHR panel to review Instructional Materials Development proposals, October, 1997.

Served on NSF/GEO panel to review GeoEd proposals, May, 1998.

Served on NSF/EHR panel to review Course, Curriculum and Laboratory Improvement proposals, February, 1999.

Served on USGS/NEHRP panel to review external, central US proposals, August, 2000.

Served on NSF/EHR panel to review Local Systemic Curriculum proposals, November, 2001.

Served on DOE panel to review geophysics proposals, May, 2002.

Served on NSF/GEO panel to review Geoscience Education proposals, February, 2006.

Invited participant at NSF workshop on "Proactive Recruitment in the Lower Division," (Math and other sciences, NSF/DMS) April, 2008 in Washington, DC.

Served on NSF/EHR panel to review Graduate Research Fellowship Program (GRFP) proposals in geoscience, February, 2010.

3. Community Service

Served on textbook selection committee, Elementary Science and Health Curriculum, Kingston Elementary School, West Lafayette, IN, 1981.

Presented mini-courses on Geology (Spring, 1977, 1978, 1979) and lectures on Mt. Saint Helens (May, 1980; February, 1982), Kingston Elementary School, West Lafayette, IN.

Presented numerous lectures on Mt. Saint Helens and Earthquakes at meetings of a variety of community groups during the past several years.

Presented numerous lectures and demonstrations on earthquakes, volcanoes and tsunamis at local Elementary schools, WALLA and Imagination station.

Prepared brochure entitled "SEISMOLOGY - Resource for Teachers" which is distributed by the SSA and available on the Internet – at http://web.ics.purdue.edu/~braile/edumod/seisres/seisresweb.htm.

Developed numerous Earth science education teaching modules, particularly in seismology, that are widely used in K-12 and college teaching. These materials are available at: web.ics.purdue.edu/~braile.

Presented over 120 teacher workshops (1 hour to 2-1/2 days) at national and state science teacher meetings and and IRIS-sponsored workshops since 1996.

Purdue President's Council Back to Class, *The M9.0 Andaman Islands-Sumatra Earthquake and Tsunami of 26 December 2004*, October 7, 2005 (also presented at West Lafayette WALLA program, 2007).

Purdue President's Council Back to Class, *The Future of Energy – Fossil Fuels, Alternatives, and Environmental Impact*, October 5, 2007, Purdue University and February 9, 2008, Naples, Florida, (also presented at University Place and Lafayette Rotary Club, 2008)

Presentation (*When the Earth Shakes – Central United States Earthquaskes* - http://web.ics.purdue.edu/~braile/new/EarthShakes.ppt) at Wednesday in the Wild Program at Lilly Nature Center, West Lafayette, IN, November, 2008.

Presentation (*The New Madrid Earthquakes of 1811-1812* - http://web.ics.purdue.edu/~braile/new/NewMadridEQs.ppt) at The Battle of Tippecanoe Bi-Centennial, Battleground Indiana, November 2011.