

October 1, 2015

Curriculum Vitae of
ALLAN LUDMAN

PERSONAL DATA

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EDUCATION

B.S. (Geology)	1963	Brooklyn College, Brooklyn, New York
M.A. (Geology)	1965	Indiana University, Bloomington, Indiana
Ph.D. (Geology)	1969	University of Pennsylvania, Philadelphia, Pennsylvania

Thesis Titles:

M.A. Geology of the Mt. Doherty Igneous Complex, Jefferson County, Montana
Ph.D. Geology of the Skowhegan Quadrangle, Maine

ACADEMIC HONORS AND AWARDS

1959-1963: New York State Regents Scholarship
1965: Associate Membership, Society of the Sigma Xi
1967-68: Special George Leib Harrison Fellowship (University of Pennsylvania)
1967: Grant-in-aid of Research, Society of the Sigma Xi
1968-69: Dissertation Year Fellowship (University of Pennsylvania)
1987: Presidential Research Award, Queens College
1999: PSC-CUNY Performance Excellence Award
2003: Queens College Science Division Distinguished Service Award
2004: Queens College President's Award for Innovative Teaching
2007: Our Green Queens Award (from NYC Council Environment Committee Chair James Gennaro)

PROFESSIONAL EXPERIENCE

Teaching:

1983- present Professor of Earth and Environmental Sciences, Queens College, Flushing, New York
1979-1982 Associate Professor of Earth and Environmental Sciences, Queens College Flushing, New York
1975-1979 Assistant Professor of Earth and Environmental Sciences, Queens College, Flushing, New York
1969-1975 Assistant Professor of Geology, Smith College, Northampton, MA
1972 Adjunct Assistant Professor of Physical Sciences, Kingsborough Community College, Brooklyn, New York
(summer)
1970 Master Teacher: Smith College/Northampton High School Summer High School Program, Northampton, Massachusetts
(summer)
1965-1967 Laboratory Instructor, University of Pennsylvania, Philadelphia, Pa.
1963-1965 Laboratory Instructor, Indiana University, Bloomington, Ind.

Courses Taught:

Undergraduate: Physical Geology; Introduction to Geology; Mineralogy; Optical Mineralogy and Petrography; Igneous and Metamorphic Petrology; Geochemistry; Seminar in New England Geology; Field Methods; Field Geology (Co-Director, Queens College Geology Field Camp); Geology of Natural Disasters; The Physical Environment; Natural Resources; Earthquakes, Volcanoes, and Moving Continents; Geologic Reasoning; Geologic Mapping with GIS; Practicum in Earth Science teaching.

Graduate: Metamorphic Petrology; Graduate Field Geology; Tectonics of the Northern Appalachians; Mineralogy; Application of Igneous and Metamorphic Petrology to Tectonic Problems; Physical Geology for High School teachers; Strain history of metamorphic rocks; Geologic Mapping with GIS; Earth Materials and Earth Processes (for High School and Elementary School teachers); Applied Earth Systems Science: GLOBE Program for Elementary Education; GLOBE Program Research for Secondary Education teachers.

Thesis Research Supervised:**Baccalaureate Honors Theses** (Smith College):

Filbert, Carolyn, 1970, Polymetamorphism and multiple deformation at Walnut Hill, Goshen quadrangle, Massachusetts

Mulhern, Kathleen, 1971, Mineralogic and textural study of the Holyoke Flow at Mt. Nonotuck and Dry Knoll, Massachusetts Baccalaureate Honors Theses

Zigmont, Beth, 1972, The effect of chemical potential gradients on the muscovite-paragonite geothermometer in the Goshen Formation, western Massachusetts.

Keskinen, Mary, 1972, Optical and physical properties of coexisting ferromagnesian minerals in the Hoosac Formation (western Massachusetts) as related to compositional variations with increasing metamorphic grade.

Malcolm, Frieda, 1974, The role of ankerite and siderite in greenschist facies metamorphism in central Maine.

Downie, Elizabeth, 1974, Fe-Mg partitioning in coexisting staurolite-biotite-garnet in the Goshen Formation, western Massachusetts.

Masters Theses (Queens College):

Senz, Charles, D., 1979, Stratigraphy, paleoenvironmental analysis, and tectonic significance of the Cookson Formation in southeastern Maine.

Garcia, Dolores, 1979, Petrology of Binda, a cumulate eucrite meteorite.

Mangini, Michael, 1981, Stratigraphy and structure of Early Paleozoic rocks in the Danforth area, eastern Maine.

Coughlin, Susan, 1982, Petrology of the Staples Mountain layered gabbro, southeastern Maine.

Bromble, Sandra L., 1983, Thermal metamorphic history of the Digdeguash Formation in the inner portion of the Pocomoonshine Gabbro-Diorite contact aureole, Big Lake Quadrangle, southeastern Maine.

Sayres, Mindy, 1985, Stratigraphy, polydeformation, and tectonic setting of Ordovician volcanic rocks in the Danforth area, eastern Maine.

DeMartinis, James, 1985, Progressive thermal metamorphism of the Digdeguash Formation, eastern Maine.

Gibbons, Susan, 1999, Shallow crustal, multistage faulting of the Deblois pluton in the Norumbega fault zone, eastern Maine.

Osborne, Katherine, 2001, Petrology and tectonic significance of the Berry Brook gabbro-diorite, eastern Maine.

Doctoral Theses (City University of New York Earth and Environmental Sciences Program):

Brock, Pamela C., 1993, Geology of parts of the Peach Lake and Brewster quadrangles, southeastern New York and adjacent Connecticut, and basement blocks of the North-central Appalachians

Hopeck, John, 1998, Nature of the contact between the Miramichi and Aroostook-Matapedia terranes, eastern Maine.

Wang, Chunzeng, 2001, Extent, geometry, and evolution of the Norumbega fault system in the Great Pond-Grand Lake Stream area, eastern Maine.

Other:

Ghanem, Hind, in progress; Indiana University, co-advisor with Dr. Robert Wintsch. *Anticipated completion* June, 2015

Other thesis supervision: External member of Bachelors (Bates College), Masters (Virginia Polytechnic Institute and State University), and Doctoral committees (Columbia University; University of Maine). CUNY PhD thesis committees: Frederick Stumm, Qiang Yang.

ADMINISTRATIVE EXPERIENCE

(A) Departmental

Smith College

1972-1973 Acting Chairman, Department of Geology, Smith College

Queens College, Dept. of Earth and Environmental Sciences/Geology

1975-1976 Undergraduate Advisor

1975-1977 Masters Comprehensive Examination Committee

1976, 1978, 1980,
1984, 1986, 1988, Director, Geology Summer Field Camp

1990, 1992

1979-1984 Chairman, Space Committee

1980-1982

1984-2000 Personnel and Budget Committee

2002-2014

1981-1988 Deputy Chairman,

1985-2000 Departmental Academic Senator

1988-1992

1996-2000 Chairman, Geology Department /School of Earth & Environmental Sciences

12/09-2013

2004—present Coordinator, Advanced Graduate Certificate for Earth Science Teaching

2007—2009 SEES Teacher Academy admissions evaluation

(B) College-wide service (All at Queens College)

1987 Presidential Search: Faculty Interview Committee

1985-1988 Special College Governance Committee

1986-1988	President's Planning Committee on Non-traditional students
1987-1988	Co-Chair, Academic Senate Committee on General Education Requirements
1988	Presidential Research Awards Committee
1988-1989, 1996-1999, 2010-2012	Executive Committee, College Personnel and Budget Committee Chair, 1996-1999; Alternate
1988	President's Planning Committee
1989-1990	President's Council on Multiculturalism
1989-1990	Sub-committee on Multiculturalism and the Curriculum
1991-1992	Presidential Committee on Teaching and Service
1992-1994	Assistant to the Provost for Academic Programs (<i>Acting Associate Provost</i>)
1992-1994	Acting Director of Freshman Advisement
1992-1994	Coordinator of Departmental Program Reviews
1992-1995	Co-Director, Freshman Year Initiative
1993-1994	Chairman, Middle States Accreditation Self-Study Steering Committee
1996	Chairman, Search Committee for Vice-President for Graduate Studies
1996-97	President's <i>ad hoc</i> Committee on Restructuring the College
1997-1998	Graduate Fellowship Committee
1997-1998	Committee on Outcomes Assessment
1997-2000	Steering Committee for Queens College School for Math, Science, and Technology (PS/IS 499Q)
2000-2001	Interim Provost
2001	Assistant to the President for High School liaison
2001-present	Founding Director, GLOBE NY Metro (GLOBE Program partnership for southern New York State)
2001-2003	Academic Senate, Science Division Senator
2002-2005	President's Task Force on General Education
2003-2012	Academic Senate, College-at-Large Senator
2014-present	
2004-2008	Education Professional Advisory Committee, School of Education
2005-2008	Teacher Academy Steering Committee
2007-2009	Subcommittee on General Education course approval (PLAS)
2007-2012	Queens College Community Relations Committee
2008-2009	Vice President, Queens College Chapter, Society of the Sigma Xi
2009-2011	President, Queens College Chapter, Society of the Sigma Xi
2011-2012	Pathways curriculum implementation committee
2014- present	Academic Senate Executive Committee member
2015-2017	Middle States Accreditation task force: member, Governance Committee

(C) City University of New York

1981-1982, 1984-1985, 1995-96	PSC-BHE Review Panel in Earth and Atmospheric Sciences
1984-1986	Chairman, Governance Committee, Earth and Environmental Sciences PhD program (during creation of EES program)

1985-1987, 1995-2000	Curriculum and Examination Committee, Ph.D. Program in Earth and Environmental Sciences (Chairman, 1985-87)
1987-1989	Graduate Center President's Faculty Advisory Committee
1988-1992, 1996-2001 2009-2013	Ph.D. Admissions and Awards Committee (Earth & Environmental Sciences)
1991-1992 1993-1995 1994-2000	Faculty Advisory Council to the CUNY Research Foundation Editorial Board, CUNY Office of Academic Affairs Ph.D. Faculty Membership Committee (Earth and Environmental Sciences program)
2000-2001	CUNY Academic Council
2000-2001	Provost's Select Committee on General Education Requirements
2004	Discussant, PSC-CUNY panel on Tenure
2005-2008	CUNY EES Doctoral Program Curriculum Committee
2006	Participant, NSF Geoteach grantwriting task force
2009-2012	EES PhD Admissions Committee
2010-2012	CUNY Haitian initiative: coordinator, science education component at Université Publique du Sud aux Cayes
2011-present	CUNY Haitian initiative Advisory board

(D)Professional service

1996-2005	Co-discussant, Geological Society of America Roundtable on Academic employment
1997-1998	Vice-Chairman, Geological Society of America NE Section
1998	Geological Society of America NE Section nominating Committee
1998-1999	Chairman, Geological Society of America NE Section.
1999	NE Section representative to GSA Council & long-range planning committee
2003-2005	NYC Department of Education Working Group on High School science education.
2003-2007	NYC Department of Education Chancellor's Task Force on Science Education.
2005-2007	GLOBE Program International Advisory Council, North America Alternate Representative
2007-2009	Education Liaison, NYC Brownfields Consortium
2009-present	NYC Soil and Water Conservation District, Queens County Representative
2010-present	NYC Parks Department Million Trees Education Committee
5/2012-present	Board of Directors, Roebling Middle School for Science

External Geoscience program evaluator: Stockton State College, Pomona, NJ; Boston College, Chestnut Hill, MA; Rutgers University (Newark); Montclair State University, Upper Montclair, N.J.; University of Southern Maine, Portland, ME.

RESEARCH APPOINTMENTS

1966-present	Field Geologist— various affiliations with the Maine Geological Survey
1975-1978	Member, UNESCO-IGCP Appalachian-Caledonide Project, Eastern Margin Working Group.
1977-1979	Senior Principal Investigator, Study of the fracture systems in eastern Maine (a project of the Maine Geological Survey funded by the NRC)
1981-1983	Regional compiler, Bedrock Geologic Map of Maine (P.H. Osberg, A.M. Hussey, and G.M. Boone, Eds.)
1984	USGS field geologist in COGEOMAP project, eastern Maine
1999, 2001-2002,	USGS EDMAP program (through Maine Geological Survey)
2013-2014	USGS STATEMAP program (through Maine Geological Survey)

PUBLICATIONS, GEOLOGIC MAPS, AND REPORTS

A. *Publications (Reviewed)*

1. Senechal, M., G. Fleck, and **A. Ludman**, 1973, Introduction to the Symmetry Festival: Guidebook and introductory comments for the Vanderbilt Symmetry Symposium, Smith College; 42pp.
2. Ludman, Allan, and Griffin, J.R., 1974, Geology of central Maine; in Osberg, P.H., editor, New England Intercollegiate Geological Conference, Guidebook for trips in south-central and east-central Maine; p. 154-179.
3. Pankiwskyj, K., **A. Ludman**, J.R. Griffin, and W.B.N. Berry, 1976, Stratigraphic relationships on the southeast limb of the Merrimack Synclinorium in central and west-central Maine; in Brownlow, A., and Lyons, P., editors, *Studies in New England Geology*, Geological Society of America Memoir 146, p. 263-280.
4. Ludman, Allan, 1976, A fossil-based stratigraphy in the Merrimack Synclinorium, central Maine; in Page, L., editor, *Contributions to New England Stratigraphy*, Geological Society of America Memoir 148, p. 65-78
5. Ludman, Allan, 1977, Symmetry: Framework of the Earth; in Senechal, M., and Fleck, G., editors, *Patterns of Symmetry*; University of Massachusetts Press, Amherst, MA, p. 87-91. [Translated for Russian edition, Moscow]
6. Gates, O., **A. Ludman**, and D.S. Westerman, 1977, Bedrock geology of the Machias-Eastport-Calais-Wesley area, Maine; Geological Society of Maine Guidebook for field trips #1, p. 1-8.
7. Ruitenbergh, A.A., and Ludman, Allan, 1978, Stratigraphy and tectonic setting of Early Paleozoic rocks in the Wirral-Big Lake area, southwestern New Brunswick and southeastern Maine; *Canadian Journal of Earth Sciences*, v. 15, p. 22-32.
8. Ludman, Allan, 1978, Foreword: Geology of southeastern Maine and southwestern New Brunswick; in Ludman, A., editor, *New England Intercollegiate Geological Conference Guidebook for trips in southeastern Maine and southwestern New Brunswick*; pp. v-xv.
9. Ludman, Allan, 1978, Stratigraphy, structure, and progressive thermal metamorphism of Early Paleozoic rocks in the Calais-Big Lake area, Washington County, Maine; in Ludman, A., editor, *New England Intercollegiate Geological Conference Guidebook for trips in southeastern Maine and southwestern New Brunswick*; pp. 78-101.
10. Ludman, Allan, 1978, Stratigraphy and structure of Silurian and pre-Silurian rocks in the Brookton-Princeton area, eastern Maine; in Ludman, A., editor, *New England Intercollegiate Geological Conference Guidebook for trips in southeastern Maine and southwestern New Brunswick*; pp. 145-161.

11. Ludman, Allan, 1981, Significance of transcurrent faulting in eastern Maine and location of the suture between Avalonia and North America; *American Journal of Science*, v. 281, p. 463-483.
12. Ludman, Allan, 1986, Timing of terrane accretion in eastern and east-central Maine; *Geology*, v.14, p. 411-414.
13. Ludman, Allan, 1986, Reply to comment on: Timing of terrane accretion in eastern and east-central Maine; *Geology*, v. 14, p. 1052.
14. Ludman, Allan, and Osberg, Philip, 1987, Structure and stratigraphy of the Central Maine Turbidite Belt in the Skowhegan-Waterville region; *Geological Society of America Centennial Field Guide, Northeast Section*, p. 279-283.
15. Ludman, Allan, 1987, Pre-Silurian stratigraphy and tectonic significance of the St. Croix Belt, southeastern Maine; *Canadian Journal of Earth Sciences*, v. 24, p. 2459-2469.
16. Moench, R.M., K.A. Pankiwskyj, G.M. Boone, E.L. Boudette, **A. Ludman**, W.R. Newell, and T. Vehrs, 1988, Geologic map of western interior Maine; U.S. Geological Survey Miscellaneous Investigations MI-1692, 21 pp. + map.
17. Ludman, Allan, and Hopeck, John, 1988, Classification and significance of faults in eastern Maine; *Geological Society of Maine Field Trip Guidebook # 12*, 9 pp.
18. Fyffe, L.R., D.B. Stewart, and **A. Ludman**, 1988, Tectonic significance of black pelites and basalts in the St. Croix Terrane, coastal Maine and New Brunswick; *Maritime Sediments and Atlantic Geology*, v. 24, p. 281-288.
19. Ludman, Allan, S. Bromble, and J. DeMartinis, 1989, Multiple thermal metamorphism in the contact aureole of the Pocomoonshine gabbro-diorite, southeastern Maine; *Maine Geological Survey Jackson Memorial Volume Series #4*, p. 1-12.
- 20a Ludman, Allan, 1991, Introduction to the geology of the Coastal Lithotectonic Belt; in A. Ludman, editor, *Geology of the Coastal Lithotectonic Belt and neighboring terranes, eastern Maine and southern New Brunswick*; *New England Intercollegiate Geological Conference Guidebook*, p. vii-xii.
20. Ludman, Allan, 1991, Revised stratigraphy of the Cookson Group (St. Croix Terrane), eastern Maine and southwestern New Brunswick; in A. Ludman, editor, *Geology of the Coastal Lithotectonic Belt and neighboring terranes, eastern Maine and southern New Brunswick*; *New England Intercollegiate Geological Conference Guidebook*, p. 114-132.
21. Ludman, Allan, 1991, The Fredericton Trough and Norumbega Fault Zone in eastern Maine; in A. Ludman, editor, *Geology of the Coastal Lithotectonic Belt and neighboring terranes, eastern Maine and southern New Brunswick*; *New England Intercollegiate Geological Conference Guidebook*, p.186-208.
22. Ludman, Allan, 1991, Stratigraphy of the Miramichi terrane in eastern Maine; in A. Ludman, editor, *Geology of the Coastal Lithotectonic Belt and neighboring terranes, eastern Maine and southern New Brunswick*; *New England Intercollegiate Geological Conference Guidebook*, p. 338-357.
23. Ludman, Allan, 1991, revised stratigraphy of the Cookson Group in southeastern Maine and southwestern New Brunswick: An alternate view; *Atlantic Geology* v. 27, p. 49-57.
24. West, D.P., **A. Ludman**, and D.R. Lux, 1992, Silurian age for the Pocomoonshine gabbro-diorite, southeastern Maine, and its tectonic implications; *American Journal of Science*, v. 292, p. 253-273.
25. Ludman, Allan, J. Hopeck, and P.C. Brock, 1993, Nature of the Acadian orogeny in eastern Maine; in Roy, D.C. and Skehan, J.W., editors, *The Acadian Orogeny: Recent Studies in New*

- England, Maritime Canada, and the Autochthonous Foreland*; Geological Society of America Special Paper 275, p. 67-84.
26. Hubbard, M., D.P. West, Jr., **A. Ludman**, C.V. Guidotti, and D. Lux, 1995, The Norumbega fault zone, Maine: A mid- to shallow-level crustal section within a transcurrent shear zone *Atlantic Geology*, v. 31, p. 109-116.
 27. Doll, W.E., W.J. Domoracki, J.K. Costain, C. Coruh, **A. Ludman**, and J.T. Hopeck, 1996, Seismic reflection evidence for the evolution of a transcurrent fault zone: the Norumbega Fault Zone, Maine; *Geology*, v. 24, No. 3, p. 251-254.
 28. Ludman, Allan, 1998, Evolution of a transcurrent fault zone in shallow crustal metasedimentary rocks: the Norumbega fault system of the Northern Appalachians; *Journal of Structural Geology* v. 20, p. 93-107.
 29. Ludman, Allan, and Gibbons, Susan, 1999, Multistage shearing of the Deblois granite in the Kellyland fault zone, eastern Maine; in Ludman, A., and West, D.P., Jr., *Norumbega fault system of the Northern Appalachians*; Geological Society of America Special Paper 331, p 41-58.
 30. Ludman, Allan, A. Lanzirotti, D. Lux, and C. Wang, 1999, Constraints on timing and displacement of multistage shearing in the Norumbega fault system, eastern Maine; in Ludman, A., and West, D.P., Jr., *Norumbega fault system of the Northern Appalachians*; Geological Society of America Special Paper 331, p. 179-194.
 31. Ludman, A., Wang, Chunzeng, Gibbons, Susan, Idleman, B., and Holt, T., 2000, Geometry and timing of multiple faulting events in the Kellyland fault zone (Norumbega fault system) in the Fletcher Peak-Wabassus Mountain area, eastern Maine; in Kelly, J., and Lux, D., editors, *New England Intercollegiate Geological Conference Guidebook*, p. 1-22.
 32. Wang, C., and Ludman, A., 2002, Evidence for post-Acadian through Alleghanian deformation in eastern Maine: multiple brittle reactivation of the Norumbega fault system; *Atlantic Geology*, v. 38, #1, p. 32-52.
 33. Wang, C., and Ludman, A., 2004, Deformation conditions, kinematics, and displacement history of shallow crustal ductile shearing in the Norumbega fault system in the Northern Appalachians, eastern Maine; *Tectonophysics*, v. 384, p. 129-148.
 34. Wang, Chunzeng, and Ludman, Allan, 2006, Transect across the Norumbega fault system, Carboniferous redbeds, and the Turner Mountain syenite; in Gibson, D., Daly, J., and Reusch, D., eds., *Guidebook for field trips in western Maine*; 2006 New England Intercollegiate Geological Conference Guidebook, p. 57-76.
 35. Ludman, Allan, 2010, The Chester shear zone: nature and tectonic significance of kilometers-wide chaos in east-central Maine; in, Gerbi, C., Kelley, A, and Lux, D., eds., *New England Intercollegiate Geological Field Conference Guidebook*, p. A2 1-17
 36. Ludman, Allan, 2013 Closing the gap: Relationships of the Waterville and Aroostook-Matapedia sequences; in Hanson, L., ed., *Guidebook for field trips in north-central Maine*; New England Intercollegiate Geological Conference, Trip A-1, p. 1-14
 37. Ghanem, H. Kunk, M., Ludman, A., Wintsch, R., Bish, D., and Biasi, J., 2013 $^{40}\text{Ar}/^{39}\text{Ar}$ evidence for Late Devonian deformation in the Chester shear zone; in Hanson, L., ed., *Guidebook for field trips in north-central Maine*; New England Intercollegiate Geological Conference, Trip B-1, p. 91-124.
 38. Wang, C., **Ludman, A.**, and Xiao, L., 2014, Turner Mountain syenite, Maine: Geology, geochemistry, geochronology, petrogenesis, and post-orogenic exhumation; *Atlantic Geology*, v. 50, p. 233-248.

B. Published Geologic maps (reviewed)

1. Ludman, Allan, 1978, Bedrock geology of the Skowhegan 15' Quadrangle, Maine; Maine Geological Survey Geologic Map Series #5, 25 pp. + map.
2. Ludman, Allan, 1978, Bedrock geology of the Kingsbury 15' Quadrangle, Maine; Maine Geological Survey Geologic Map Series #6, 31 pp. + map.
3. Osberg, P.H., A.M. Hussey, G.M. Boone, eds, (with regional compilation by E.L. Boudette, W.H. Forbes, O. Gates, B.A., Hall, M.C. Loïselle, **A. Ludman**, R.H. Moench, K.A. Pankiwskyj, S.G. Pollock, and D.C. Roy, 1985, Bedrock Geologic Map of Maine; Maine Geological Survey, Augusta, Maine. Scale=1:500,000. (Regional compiler for southeastern, central-eastern and part of central Maine)
4. Ludman, Allan, 1986, Bedrock geology of the Big Lake 15' Quadrangle, eastern Maine; Maine Geological Survey OF 86-1, 44 pp. + map.
5. Ludman, Allan, and Hill, Malcolm, 1986, Bedrock geology of the Calais 15' quadrangle, eastern Maine; Maine Geological Survey OF 86-72, 54 pp. + map.
6. Ludman, Allan, 2003, Bedrock Geology of the Dill Hill 7½' quadrangle, Maine; Maine Geological Survey Open File Report OF 03-93 (map plus 16 page report).
7. Ludman, Allan, and Berry, Henry IV, 2003, Bedrock Geologic Map of the Calais 1:100,000 quadrangle; Maine Geological Survey Open File Report, OF 03-97
8. Ludman, Allan, 2014 (in press), Bedrock Geologic Map of the Greenfield 7½' quadrangle, Maine; Maine Geological Survey Open File Report, 1:24,000 geologic map and 30 page report.

C. Geologic mapping progress reports required by contract with Maine Geological Survey; *indicates reviewed)

1. Ludman, Allan, 1969, Preliminary geologic map of the Kingsbury Quadrangle, Maine; Maine Geological Survey, Open File Report, 11pp. + map.
2. Ludman, Allan, 1970, Report of mapping progress, Kingsbury Quadrangle, Maine; Maine Geological Survey Open File Report, 15 pp. + map.
3. Ludman, Allan, 1973, Bedrock geology of the Bingham, Kingsbury, and Guilford quadrangles, Maine; Maine Geological Survey Open File Report, 10pp. + map.
4. Ludman, Allan, 1974, Preliminary report on the geology of the Calais-Big Lake map area, eastern Maine; Maine Geological Survey Special Report, 32pp. + map.
5. Ludman, Allan, 1975, Calais-Big Lake map area, Washington County, Maine: Report of mapping progress; Maine Geological Survey Open File Report, 13pp. + map.
6. Ludman, Allan, 1979, Summary of mapping progress, Danforth-Forest-Scraggly Lake-Waite area Maine; Maine Geological Survey Open File Report, 22 pp. + map.
7. Ludman, Allan, 1980, Report of geologic mapping in the Danforth, Forest, Scraggly Lake, and Waite quadrangles, eastern Maine; Maine Geological Survey Open File Report, 22 pp. + map.
8. Ludman, Allan, 1981, Preliminary bedrock geologic map of the Fredericton 2° quadrangle, Maine; Maine Geological Survey open file map.
9. Ludman, Allan, 1981, Preliminary bedrock geologic map of the eastern portion of the Millinocket 2° quadrangle, Maine; Maine Geological Survey, open file map.
10. Ludman, Allan, 1982, Bedrock geology of the Fredericton 2° quadrangle, Maine; Maine Geological Survey Open File Map.

11. Ludman, Allan, 1982, Bedrock geology of the eastern and southwestern portions of the Millinocket 2° quadrangle, Maine; Maine Geological Survey, Open File Map.
12. Ludman, Allan, 1984, Preliminary report on the pre-Silurian rocks of eastern Maine; Maine Geological Survey Open File Report, 34 pp. + maps.
13. *Ludman, Allan, 1985, Pre-Silurian rocks of eastern and southeastern Maine; Maine Geological Survey Open File Report 85-78, 29 pp. and maps.
14. Ludman, Allan, 1988, Revised bedrock geology of central-eastern and southeastern Maine; Maine Geological Survey, Open File Report, 36 pp. + maps.
15. Ludman, Allan, 1990, Report of mapping progress in the Danforth, Scraggly Lake, Waite, Forest, Kellyland, and Vanceboro 15' quadrangles, eastern Maine; Maine Geological Survey Open File Report, 34 pp. + maps.
16. Ludman, Allan, 1991, Updated geologic map of central-eastern Maine; Maine Geological Survey, Open File Report, 29 pp. + maps.
17. Ludman, Allan, 1992, Report of mapping progress, Danforth-Forest-Waite-Scraggly Lake area, eastern Maine; Maine Geological Survey Open File Report, 22 pp. + map.
18. Ludman, Allan, and Hopeck, John T., 2007, Draft Bedrock geology of the Danforth 1:100,000 quadrangle, eastern Maine; Maine Geological Survey Open File Report
19. Ludman, Allan, 2009, Revised bedrock geology of the Lincoln 100,000 quadrangle, east-central Maine: Progress Report; Maine Geological Survey Open File Report (19 pp. + geologic map)
20. Ludman, Allan, and Hopeck, John, 2012, Revised geologic map of east-central Maine (Calais, Danforth, Millinocket, and Lincoln 1:100,000 quadrangles; Maine Geological Survey Open File Report

D. Other professional reports

1. Ludman, Allan, 1978, Preliminary report on the bedrock geology of the Fredericton 2° sheet, with special emphasis on brittle deformation; Report to the Nuclear Regulatory Commission, 9 pp. + 1:250,000 fault map.
2. Ludman, Allan, 1981, Bedrock geology of the Fredericton 2° quadrangle, with special emphasis on brittle fracture systems; Report to the Nuclear Regulatory Commission, 15 pp.
3. Ludman, Allan, 1983, Faulting in the Grand Falls area, Kellyland 15' quadrangle, eastern Maine; Report to Maine Geological Survey and Nuclear Regulatory Commission, 13pp.
4. Ludman, Allan, 2001, Bedrock Geology of the Calais 1:100,000 quadrangle, eastern Maine; report to the U.S. Geological Survey STATEMAP project; 30 pp + geologic map.

BOOKS

A. Geologic research

1. Ludman, Allan, editor, 1978, *Guide to the geology of southeastern Maine and southwestern New Brunswick*; New England Intercollegiate Geological Conference Guidebook; Queens College Geology Bulletin #7, Flushing, NY, 183 pp.
2. Ludman, Allan, editor, 1991, *Geology of the Coastal Lithotectonic Block and neighboring terranes*; New England Intercollegiate Geological Conference Guidebook, 400 pp.
3. Ludman, Allan, and West, David P. Jr. editors, 1999, *Norumbega fault system of the Northern Appalachians*; Geological Society of America Special Paper 331, 202 p.

B. Textbooks and laboratory manuals

1. **Ludman, Allan**, and Coch, N.K., 1982, *Physical Geology*; McGraw-Hill Book Co, New York, NY, 608p.
2. **Ludman, Allan**, and Coch, N.K., 1982, *Instructor's Manual for Physical Geology*; McGraw-Hill Book Co., New York, N.Y., 161 pp.
3. Coch, N.K., and **A. Ludman**, 1991, *Physical Geology*; MacMillan Publishing Co., New York, NY, 678 pp.
4. Ludman, Allan, 1992, *Laboratory Exercises in Physical Geology*; Wm. C. Brown Publishers, Dubuque, Iowa, 228 pp.
5. **Ludman, Allan** and Marshak, Stephen, 2010, *Laboratory Manual for Introductory Geology*; W.W. Norton and Company, New York, NY, 407 pp.
6. **Ludman, Allan** and Marshak, Stephen, 2011, *Laboratory Manual for Introductory Geology*, 2nd edition; W.W. Norton and Company, New York, NY, 438pp.
7. **Ludman, Allan** and Marshak, Stephen, 2015, *Laboratory Manual for Introductory Geology*, 3rd edition; W.W. Norton and Company, New York, NY, 456 pp.
8. Ludman, Allan, 2015, Instructor's Manual for Laboratory Manual for Introductory Geology, 3rd edition; W.W. Norton and Company, New York, NY (online) 161 pp.

C. Queens College and GSA Course Manuals (*=reviewed)

1. Ludman, Allan, 1999, Caris GIS and Geologic mapping, 1st ed, 96 pp (for graduate/undergraduate course "Geologic Mapping Using Geographic Information Systems)
2. Ludman, Allan, and Klinger, Daniel, 2002, Caris GIS and Geologic mapping, 2nd ed., 112 pp (for graduate/undergraduate course "Geologic Mapping Using Geographic Information Systems)
3. *Crawford, M.L., Ludman, A., and van de Poll, W., 2002, Computer-based Geological Mapping in the GIS Environment; Short course manual for the 2002 NE GSA Section Meeting, Springfield/Amherst, MA
4. Ludman, A., Brock, P.W.G., Brock, P.C., and Klinger, D., 2004, *Understanding the Geology of New York City and its Parks*; 49 pp; Prepared for New York City Urban Park Ranger geology training workshop
5. Ludman, Allan, and Klinger, Daniel, 2004, *Investigating the Earth; A laboratory manual for Physical Geology* (SEES Geology 101)
6. Ludman, A., Brock, P.W.G., Brock, P.C., and Klinger, D., 2006, *Understanding the Geology of New York City and its Parks*, 2nd edition; 49 pp; Prepared for New York City Urban Park Ranger geology training workshop

MANUSCRIPTS IN REVIEW

MANUSCRIPTS IN PREPARATION *Italics indicate manuscript is included in publications box*
Ludman, Allan, Hopeck, John, and Berry, Henry, *Lithofacies and structural evidence for relationships among pre-Taconian Ganderian terranes and late Ordovician to mid-Silurian cover rocks, eastern and east-central Maine; 38 page manuscript to be submitted to Atlantic Geology December 20, 2015.*

Ghanem, H., Kunk, M., **Ludman, A.**, Bish, D, and Wintsch, R., Ar/Ar ages of white micas in the Chester shear zone: evidence for timing of multiple fault events in east-central Maine; to be

submitted December, 2015 to American Journal of Science or Geological Society of America Bulletin.

Ludman, Allan, and West, D. P. Jr, A long-lived zone of crustal weakness in the Northern Appalachians: the Norumbega fault system, Maine.

Ludman, A., Aleinikoff, J., Berry, H.W. IV, and Hopeck, J., Provenance of detrital zircons from post-Taconian cover rocks of the Ganderian composite plate, Maine.

BEDROCK GEOLOGIC MAPS IN PRODUCTION—Maine Geological Survey (Reviewed)
(Degree of completion indicated; publication dates depend on Maine Geological Survey resources and publication schedule)

Hopeck, John, and **Ludman, Allan**, Bedrock geology of the Bowers Mountain 7½' quadrangle, eastern Maine; Maine Geological Survey, Geologic Map Series (mapping completed).

Hopeck, John, and **Ludman, Allan**, Bedrock geology of the Springfield 7½' quadrangle, eastern Maine; Maine Geological Survey, Geologic Map Series (mapping completed)

Ludman, Allan and Hopeck, John, Bedrock geology of the Bottle Lake 7½' quadrangle, eastern Maine (mapping completed).

Ludman, Allan and Hopeck, John, Bedrock geology of the Weir Pond 7½' quadrangle, eastern Maine (mapping completed).

BEDROCK GEOLOGIC MAPS IN PROGRESS

Ludman, Allan, Bedrock Geology of the Lincoln 1:100,000 quadrangle, ME. (12 years mapping to date; completion anticipated 1/2016)

Hopeck, John T., and **Ludman, Allan**, Geology of the Danforth 1:100,000 quadrangle, ME (based on 30 years of mapping; final field check summer, 2014; to be submitted March 2015)

Ludman, A., and Hopeck, John T., Revised bedrock geology of eastern and east-central Maine (37 years of mapping). Planned 1:250,000 scale map plus Maine Geological Survey Bulletin.

Ludman, A., in progress, Bedrock Geology of the East Winn 7½' quadrangle, east-central Maine
Completion anticipated September, 2016

Ludman, A., in progress, Bedrock Geology of the Lee 7½' quadrangle, east-central Maine
Completion anticipated September, 2016

Ludman, A., in progress, Bedrock Geology of the Lincoln Center 7½' quadrangle, east-central Maine
Completion anticipated September, 2016

Ludman, A., in progress, Bedrock Geology of the Lincoln East 7½' quadrangle, east-central Maine
Completion anticipated September, 2016

Ten additional 7½' quadrangle geologic maps have been requested by the Maine Geological Survey for which only final field check and outcrop database are required. These will be completed as maps listed above are submitted and published. Tentative completion date for the next block of four quadrangles:

PUBLISHED ABSTRACTS (Juried)

1. Ludman, A., 1969, Structure and stratigraphy of Silurian rocks in the Skowhegan area, south-central Maine; Geological Society of America Abstracts with Programs, v. 1, p. 37-38.
2. Ludman, Allan, 1971, A fossil-based stratigraphy in the Merrimack Synclinorium, central Maine; Geological Society of America Abstracts with Programs, v. 3, p. 43.

3. Ludman, A., J.R. Griffin, and N. Lindsley-Griffin, 1972, Sedimentary facies relationships in the Siluro-Devonian slate belt of central Maine; Geological Society of America Abstracts with Programs, v. 4, p. 28.
4. Ludman, Allan, 1975, Origin of prograde metamorphic pseudomorphs after ferroan carbonates in greenschist facies metamorphic rocks of central Maine; Geological Society of America Abstracts with Programs, v. 7, p. 91.
5. Ludman, Allan, 1977, Nature of faults bounding tectonostratigraphic blocks in the Calais area, southeastern Maine; Geological Society of America Abstracts with Programs, v. 9, p. 295-296.
6. Ludman, Allan, 1978, Sequence of orogenic events in eastern and southeastern Maine; Geological Society of America Abstracts with Programs, v. 10, p. 73-74.
7. Senz, Charles, and **Ludman, Allan**, 1978, The Cookson Formation (Cambro-Ordovician) in southeastern Maine: A sedimentary record of Early Paleozoic tectonism; Geological Society of America Abstracts with Programs, v. 10, p. 85.
8. Ludman, Allan, 1981, Stratigraphy and structure of the Miramichi Anticlinorium in eastern Maine; Geological Society of America Abstracts with Programs, v. 13, p. 143.
9. Ludman, Allan, 1982, Paleozoic volcanism in eastern Maine and New Brunswick: Where are the subduction zones? Geological Society of America Abstracts with Programs, v. 15.
10. Ludman, Allan, and Morisi, Lillian, 1984, Stratigraphic and structural control in eastern Maine; Geological Society of America Abstracts with Programs, v. 16, p. 48.
11. Ludman, Allan, 1985, Pre-Silurian (Taconian?) deformation of the Cookson Formation in southeastern Maine; Geological Society of America Abstracts with Programs, v. 17, p. 32.
12. Morisi, Lillian, and **Ludman, Allan**, 1985, Deformation history of the Kingman Fault Zone in east-central Maine; Geological Society of America Abstracts with Programs, v. 17, p. 54-55.
13. Sayres, Mindy, and **Ludman, Allan**, 1985, Stratigraphy and polydeformation of Tetagouche (Ordovician) volcanic rocks of the Miramichi Anticlinorium in the Danforth quadrangle, eastern Maine; Geological Society of America Abstracts with Programs, v. 17, p. 62.
14. Hopeck, J.T., **A. Ludman**, and R. Hon, 1988, Ages of tectonic fabrics in the Bottle Lake complex, eastern Maine; Geological Society of America Abstracts with Programs, v. 20, p. 28.
15. Pollock, S.G., D.R. Roy, **A. Ludman**, B.A. Hall, and J. Repetski, 1988, Terrane accretion in the Northern Appalachians of the northeastern United States and Canada; Geological Society of America Abstracts with Programs (National meeting), v. 20, p. 124.
16. Hopeck, J.T., **A. Ludman**, and P.C. Brock, 1989, Acadian evolution of the Miramichi Anticlinorium and Aroostook-Matapedia Belt, eastern Maine; Geological Society of America Abstracts with Programs, v. 21, p. 23.
17. Doll, W.E., J.K. Costain, C. Coruh, W.D., Domoracki, S.S. Potts, **A. Ludman**, and J.T. Hopeck, 1989, Results of a seismic reflection and gravity study of the Bottle Lake complex, Maine; EOS, v. 70 p. 401.
18. Doll, W.E., J.K. Costain, W.D. Domoracki, C. Coruh, **A. Ludman**, and J.T. Hopeck, 1989, Interpretation of seismic reflection lines crossing the Norumbega Fault Zone and Bottle Lake plutonic complex, eastern Maine; Geological Society of America Abstracts with Programs, v. 21, p. 320.
19. Costain, J.K., W.D. Domoracki, C. Coruh, W.E. Doll, and **A. Ludman**, 1990, Enhancement of crustal reflection data by binning (sorting) along tectonic strike: An example from the Northern Appalachians; EOS, v. 71, p. 556-557.
20. Doll, W.E., J.K. Costain, W.D. Domoracki, C. Coruh, **A. Ludman**, and J.T. Hopeck, 1990, Geophysical and geological characterization of tectonic features in the Bottle Lake plutonic

complex and Norumbega Fault Zone, eastern Maine; *Seminaire sur la Geologie des Appalaches*, Institut Laval, Quebec, Canada.

21. Ludman, A., J.T. Hopeck, J.K. Costain, W.D. Domoracki, C. Coruh, and W.E. Doll, 1990, Seismic reflection evidence for the northwest limit of Avalon in east-central Maine; *Geological Society of America Abstracts with Programs*, v. 22, p. 32.
22. Ludman, Allan, 1993, Acadian Orogeny? Which Acadian Orogeny?; *Geological Society of America Abstracts with Programs*, v. 25.
23. Ludman, Allan, and West, David, P., 1994, Constraints on timing of the multiple offset history of the Norumbega Fault Zone, eastern Maine; *Geological Society of America Abstracts with Programs*, v. 26, p. 57.
24. Ludman, Allan, 1994, Multiple displacement history and nature of deformation of the Kellyland Fault (Norumbega Fault Zone), eastern Maine; *Geological Society of America Abstracts with Programs*, v. 26, p. 57.
25. Ludman, Allan, 1995, Strain partitioning, timing, and amount of offset on the Norumbega fault zone, eastern Maine; *Geological Society of America Abstracts with Programs*, v. 27, p. 65.
26. Ludman, Allan, and Gibbons, Susan, 1995, Supracrustal shearing of granite in the Norumbega fault zone at Wabassus Mountain, eastern Maine; *Geological Society of America Abstracts with Programs*, v. 27, p. 65-66.
27. Ludman, Allan, and West, David P., Jr., 1996, "Cool" shallow crustal generation of mylonites: Examples from the Norumbega fault zone, Maine; *Geol. Soc. Am. Abs. with Prog.*, 28, No. 3, p. 77.
28. Ludman, Allan, and Idleman, Bruce, 1998, The Berry Brook gabbro-diorite: NW-most Siluro-Devonian mafic magmatism in the Coastal Lithotectonic belt, Maine; *Geological Society of America Abstracts with Programs*, v. 30, p. 58.
29. Liogys, T., and **Ludman, A.**, 1998, Spatial and temporal relationships of epizonal "mylonitized" Deblois granite in the Kellyland fault zone, eastern Maine; *Geological Society of America Abstracts with Programs*, v. 30, p. 57.
30. Idleman, B., and **Ludman, A.**, 1998, Cooling history of the Deblois pluton: Implications for detecting mid- and late-Paleozoic deformation in eastern Maine; *Geological Society of America Abstracts with Programs*, v. 30, p. 27.
31. Idleman, B.D., and **Ludman, A.**, 1998, Dating low-temperature brittle deformation using $^{40}\text{Ar}/^{39}\text{Ar}$ K-feldspar thermochronology: An example from the Norumbega fault zone, Maine; *Geological Association of Canada, Program with Abstracts*, v. 23, p. A-84.
32. Hussey, A.M. II, **Ludman, A.**, Bothner, W., and West, D.P., Jr., 1999, The Fredericton and Merrimack troughs: Once one or forever two? *Geological Society of America Abstracts with Programs*, v. 31, no. 2, p. A-25.
33. Wang, Chunzeng, and **Ludman, Allan**, 1999, Deformation history the Norumbega fault system, in the Fletcher Peak 7½' quadrangle, eastern Maine; *Geological Society of America Abstracts with Programs* v. 31, no. 2, p. A-77.
34. Ludman, Allan, and Van de Poll, Robert, 1999, High-resolution digital terrain models, free for the making: An example from eastern and east-central Maine; *Geological Society of America Abstracts with Programs (national meeting)*, p. A-111.
35. Ludman, Allan, 2000, Field geology courses and GIS: Teaching in the next century; *Geological Society of America Abstracts with Programs*, v 32, No. 1, p. A-32.

36. Wang, Chunzeng, **Ludman, A.**, and Gayron, B, 2000, Ductile shear geometry of the Norumbega fault system in the Great Pond—Grand Lake Stream area, eastern Maine; Geological Society of America Abstracts with Programs, v 32, No. 1, p. A-81.
37. Wang, Chunzeng, and **Ludman, A.**, 2000, Evolution of Norumbega fault system in eastern Maine; Geological Society of America Abstracts with Programs, v. 32, No. 7, p. A-230.
38. Osborne, Katherine, Giallorenzo, Michael, and **Ludman, Allan**, 2001, Geology and petrology of the Berry Brook pluton, eastern Maine; Geological Society of America Abstracts with Programs, v. 33, No. 1 p. A-77.
39. **Ludman, A.**, Schmidt, P., and Borman, G., 2003, Implementing the GLOBE Program in the New York City Metropolitan area: Trials, Errors, and Successes; *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract ED21D-01, American Geophysical Union annual meeting (invited)
40. Ludman, A., 2007, After 40 years of mapping, we still don't know....; Geological Society of America Abstracts with Programs, v. 39, no. 1, p.
41. Ludman, Allan, 2009 "Value added" geologic mapping: Case histories from Eastern Maine; Geological Society of America Abstracts with Programs, v. 41, #3, p. 42.
42. Ludman, Allan, 2010, It started in the field and some if "It" is still there: Revised bedrock geology of the Lincoln area, E-central Maine; Geological Society of America Abstracts with programs, v. 42, #1.
43. Wang, C., West, D.P., Jr., and **Ludman, A.**, 2010, The Norumbega fault system (NFS): Long-lived transcurrent faulting in eastern and south-central Maine; Geological Society of America Abstracts with programs, v. 42, #1.
44. Hodzic, N., Brock, P.W.G., **Ludman, A.**, and West, D.P. Jr., 2010, Origin and tectonic significance of unusual Fe-Mn rich rocks, Eastern Maine; Geological Society of America Abstracts with programs, v. 42, #1.
45. **Ludman, A.**, Hopeck, J., and Lippitt, C., 2011, Correlation accomplished! (25 years later): Relationships between the Aroostook-Matapedia and Waterville sections, NE and Central Maine; Geological Society of America Abstracts with programs, v. 43, #1, p. 117.
46. **Ludman, A.**, and Hopeck, J., 2011, Tectonic implications of a revised bedrock geologic map of east-central Maine; Geological Society of America Abstracts with programs, v. 43, #1, p. 160.
47. Ludman, A., 2012, Feeding mechanisms of caddis fly larvae: a caution for paleocurrent analyses based on aligned *Tentaculites* fossils; Geological Society of America Abstracts with Programs, v. 44, #1, p. 67
48. Ludman, A., 2012, New approaches to long-standing problems: examples from the Northern Appalachians; Geological Society of America Abstracts with programs, v. 44, #1, p. 87
49. Wang, C., and **Ludman, A.**, 2012, Exhumation of the Turner Mountain syenite fault sliver in the Norumbega fault zone of Maine: implications for kinematics of orogen-parallel fault reactivation; Geological Society of America Abstracts with programs, v. 44, #1, p. 106
50. West, D.P. Jr., and **Ludman, Allan**, 2013, The Norumbega fault system: forty years of study directed at understanding 250 million years of tectonic activity; Geological Society of America Abstracts with Programs, v.45, #1, p. 45.
51. Ghanem, H., Kunk, M.J., **Ludman, A.**, Bish, D., and Wintsch, R.P., 2013, A Late Devonian age for the Chester shear zone, Central Maine: evidence from $^{40}\text{Ar}/^{39}\text{Ar}$ age spectra; Geological Society of America Abstracts with Programs, v.45, #1, p. 107.
52. Ghanem, H., Kunk, M.J., **Ludman, A.**, Bish, D., and Wintsch, R.P., 2013, Multiple deformation and cleavage development by dissolution-precipitation in the metasedimentary

- rocks of the Chester shear zone, central Maine, USA; Geological Society of America Abstracts with Programs, v. 45, #7, p. 403.
53. Wang, Chunzeng, and **Ludman, A.**, 2013, Complexities of orogen-parallel faults: An example from the Norumbega fault zone in central-eastern Maine; Geological Society of America Abstracts with Programs, v. 45, #7, p. 809.
 54. Bastas-Hernandez, A., and **Ludman, A.**, 2014, Textural evidence in the contact aureole of the Passadumkeag River pluton, east-central Maine, for multiple magma injection and disequilibrium mineral growth; Geological Society of America Abstracts with Programs, v. 46, No. 2, p. 50.
 55. **Ludman, A.**, J. Aleinikoff, J. Hopeck, and H. Berry, IV, 2014, SHRIMP U-Pb geochronology of pre-Acadian Silurian basins of central and east-central Maine and the Pocomoonshine pluton: Diverse sources, rapid sedimentation, tectonism and intrusion; Geological Society of America Abstracts with Programs, v. 46, No. 2, p. 122.
 56. Berry, H.N IV., J. Aleinikoff, **A. Ludman**, and J. Hopeck, 2014, U-Pb geochronology of detrital zircon in Silurian sandstones of eastern Maine: A glimmer of hope; Geological Association of Canada-Mineralogical Association of Canada Abstracts, v. 37, p. 26-27.
 57. Gales, E., J. Marsh, **A. Ludman**, and A. Bastas-Hernandez, 2015, Investigating the metamorphic history of the Passadumkeag River pluton aureole; Geological Society of America Abstracts with Programs, v. 47, #3, p.
 58. **Ludman, A.**, Porter-Morgan, H., and Trujillo, M., 2015, Freshman Year to Geoscience Career: GEOPATHS strategies to nurture urban undergraduates for geoscience careers and graduate school. Geological Society of America Abstracts with Programs, v. 47, #7.
 59. Schmidt, P., **Ludman, A.**, Jakim, D., and Leou, M., 2015, Into the Woods: Training urban elementary teachers to use the outdoors as a classroom to improve Environmental Literacy. Geological Society of America Abstracts with Programs, v. 47, #7.
 60. Eaton, T., **Ludman, A.**, Gales, E., and Marsh, J., 2015, Magnetic constraints on the southwestern contact of the Bottle Lake igneous complex near Passadumkeag Mountain, Maine. Geological Society of America Abstracts with Programs, v. 47, # 7.

INVITED TALKS

1. 1974 Invited discussant on the Merrimack Synclinorium at Penrose Conference on "Recent advances in geophysics and geology in the Northern Appalachians."
2. 1975 Geologic evolution of Silurian and Devonian rocks of central Maine; Department of Geological Sciences, SUNY-Albany.
3. 1976 Evolution of the Northern Appalachians in eastern Maine and western New Brunswick; Department of Geology, Rutgers University, New Brunswick, NJ.
4. 1976 Structural problems in central Maine; Department of Geology, Brooklyn College.
5. 1976 Tectonic setting of eastern Maine in the Calais area; U.S. Geological Survey, Reston.
6. 1978 Tectonic evolution of the Northern Appalachians in Maine; New York Academy of Sciences.
7. 1979 Geologic history of Maine; Maine Audubon Society, Schoodic Chapter, Calais, Maine.
8. 1979 Geology of the Border area; Calais Rotary Club, Calais, Maine.
9. 1980 A field excursion to examine rocks of eastern Maine; Maine Audubon Society, Schoodic Chapter, Calais, Maine.
10. 1980 Petrologic and structural problems with tectonic models for the Northern Appalachians; Department of Geology, SUNY-Binghamton.

11. 1981 Plate tectonics and the Northern Appalachians-some problems; Department of Geology, Brooklyn College.
12. 1981 Plate tectonic models for the Northern Appalachians in Maine and New Brunswick: Where are the subduction zones?; Department of Geologic Sciences, SUNY New Paltz.
13. 1984 Paleozoic volcanism and orogenesis in the Northern Appalachians; Department of Geology, University of Pennsylvania.
14. 1984 Silurian and Devonian stratigraphy of eastern and east-central Maine; invited paper at Symposium on Silurian and Devonian stratigraphy in New England, University of Massachusetts - Amherst.
15. 1987 Paleozoic evolution of eastern Maine and adjacent New Brunswick; Department of Geological Sciences, University of Maine, Orono.
16. 1988 Tectonic framework of the Appalachian Mountain System; Guilin College of Geology, Guilin, Guangxi, People's Republic of China.
17. 1988 Methods of terrane analysis; Guilin College of Geology, Guilin, Guangxi, People's Republic of China.
18. 1988 Terrane accretion history of the Northern Appalachian orogen; Guangdong Mineral Exploration Company, Guangzhou (Canton), People's Republic of China.
19. 1988 New thoughts on the terrane accretion history of eastern and central Maine; Department of Geological Sciences, Rutgers University, Newark.
20. 1990 Identification of basement blocks in the Northern Appalachians; Department of Geological Sciences, Boston College.
21. 1990 The terranes in Maine were plainly quite mundane; Department of Geological Sciences, Boston College.
22. 1991 Late stage (Mesozoic?) motion on the Norumbega Fault Zone, Department of Geological Sciences, University of Maine, Orono.
23. 1992 Seismic reflection profile of the crust beneath the Northern Appalachians in eastern Maine; Department of Geological Sciences, Boston College.
24. 1995 Determining timing and amount of displacement during multiple faulting events on the Norumbega fault zone, eastern Maine; Department of Earth and Space Sciences, SUNY at Stony Brook.
25. 1995 A four-dimensional profile of the Norumbega fault zone, eastern Maine; Department of Geology, SUNY-Binghamton
26. 1996 Mechanics of supracrustal shearing in granite vs metasedimentary rocks; Brooklyn College
27. 1996 The Norumbega fault zone: Maine's own San Andreas; Maine Audubon Society
28. 1996 The Norumbega-Fredericton fault system; University of New Brunswick
29. 1996 Shallow crustal evolution of a transcurrent fault zone; Temple University
30. 1997 Effects of shallow crustal shearing on granites and metasedimentary rocks along the Norumbega fault zone, eastern Maine; Wellesley College.
31. 1997 200 million years of shallow crustal shearing in the Norumbega fault zone, eastern Maine; Lamont-Doherty Earth Observatory (Columbia University)
32. 1999 The Norumbega fault system: New England's own "San Andreas"; Queens Mineral Society
33. 2000 The Norumbega fault system: The Eastern End; Geological Society of Maine keynote address, Brunswick, ME.

34. 2000 Effects of epizonal ductile and brittle faulting in the Norumbega fault system, eastern Maine; Department of Geological Sciences, Virginia Polytechnic Institute (9/7/00).
35. 2000 Geographic information systems (GIS) and geologic mapping; Department of Geological Sciences, Virginia Polytechnic Institute (9/8/00)
36. 1999 Effects of shearing on granitic and metasedimentary rocks in the Norumbega fault system, eastern Maine; Department of Earth and Space Sciences, SUNY—Stony Brook
37. 2001 Shallow crustal ductile faulting in eastern Maine (Alumni keynote speaker, Brooklyn College Millennium Alumni Reunion)
38. 2001 Earthquakes in the New York City metropolitan area: Is the big one coming? Queens College Alumni Day speaker
39. 2001 Faults and earthquakes: Predicting the future by reading the past; Phi Beta Kappa (Sigma Chapter, Queens College) annual address
40. 2001 GIS and geologic mapping (Brooklyn College AAPG Student Symposium Speaker)
41. 2001 Batteries and field boots: Modern geologic mapping (Lafayette College Dept of Geology)
42. 2001 “Earth Science by Inquiry: A problem for Geology and Environmental Science Laboratories”; New York Academy of Sciences, Education Division
43. 2004 The modern field geologist: laptops and bootstraps; Newtown High School
44. 2004 Inquiry Based Science Education, K-16; Dowling College
45. 2004 Geologic history of the New York metropolitan area; CUNY Nurturing New York’s Nature course and public program.
46. 2005 Audubon’s Grave and the Nature of New York; New York Historical Society, Bernard and Irene Schwartz Distinguished Speakers Series.
47. 2006 Urbanizing GLOBE; GLOBE Learning Community annual conference, Anaheim, CA.
48. 2007 The geologic evolution of eastern Maine; Down East Land Trust public lecture series, Grand Lake Stream, Maine.
49. 2007 Evolution of an epizonal transcurrent fault system: the Norumbega fault system of the Northern Appalachians; Queens College SEES Colloquium
50. 2007 Evolution of an epizonal transcurrent fault system: the Norumbega fault system of the Northern Appalachians; Brooklyn College Geology Department
51. 2007 Earthquakes: What happens when the ground shakes? Queens College Presidential Roundtable.
52. 2010 Earthquakes, volcanoes, and moving continents: the geologic history of eastern Maine; Wheaton Land Trust lecture series, Forest City, Maine.
53. 2010 Keynote speaker, Bethpage School District inaugural Science Symposium.
54. 2014 lithofacies and detrital zircon age evidence for Silurian sediment/source relationships and paleogeography of the Ganderian composite plate, Maine and New Brunswick. Queens College SEES colloquium.

OTHER PROFESSIONAL ACTIVITIES

- 1973 Co-organizer of a Vanderbilt Symmetry Symposium, Smith College.
- 1975 Organizer of a symposium on plate tectonics and Appalachian history, Smith College.
- 1976 Visiting Scientist, Lunar Science Institute, Houston, Texas.
- 1977& Geologic consultant, Georgia-Pacific Corporation, Woodland, Maine: *identify cause and help design remediation of leaks from paper mill effluent treatment plant*
- 1978 Organizer, New England Intercollegiate Geological Field Conference, Calais, Maine.

- 1981 Co-chairman, Geological Society of America, Northeastern Section Meeting, Section on Tectonics.
- 1981-1983 Regional compiler, Bedrock geologic map of Maine
- 1988 Visiting Scholar, Guilin College of Geology, Guilin, People's Republic of China.
- 1989 Interviews on WABC TV Eyewitness News (October 18, 19; to discuss Loma Prieta earthquake).
- 1991 Organizer, New England Intercollegiate Geological Field Conference, Princeton, Maine.
- 1994-5 Host to visiting scholar (Prof. Wang Chunzeng) from Guilin Institute of Technology
- 1995 Invited poster presentation, Geological Society of America Penrose Conference "Fine-grained fault rocks" in Leavenworth, Washington.
- 1995 Member, External Review Committee to evaluate Department of Geology and Geophysics, Boston College.
- 1996 Organizer, first annual "Friends of the Norumbega" field conference
- 1997 Petrographic consultant for Chevron Overseas Corporation (*diagenesis in carbonates and volcanic rocks from offshore Chinese drill samples*)
- 2001 Community School District 26 staff development workshops for science cluster teachers: rocks and minerals.
- 2002 Woodrow Wilson Foundation, Teachers as Scholars Program: Seminar Series Leader: Scientific Inquiry
- 2003 Presentation on the GLOBE Program to the Institute for Student Achievement, Columbia University Teachers' College.
- 2004 Founding partner, GLOBE School for Environmental Research (a Middle School in northeastern Bronx) *in collaboration with NYC Dept of Education, YMCA of Greater New York, Bronx Zoo, and New York Botanical Gardens*
- 2005 Host and speaker at NYCDOE Region 4 annual principals' meeting
- 2005 Host and keynote speaker, NYC DOE Region 2 Annual Science Conference
- 2007- Environmental Education Consultant, Mary E. Hooker Magnet Elementary School renovation project, (Hartford, Connecticut; BL Companies)
- 2010- present Consultant, S.W. Cole Co., Bangor Maine (geologic site analyst for wind farm electric generation construction projects.
- 2011- 2013 GLOBE Program Regional Ambassador (Northeastern North America)
- 2013-present Roebling Global Technology Charter School, Brooklyn, NY; Founding Advisory Board member.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Society of the Sigma Xi (Member)
- Geological Society of America (Fellow)
- Geological Association of Canada (Fellow)
- Society of Maine Geologists (Founding member)
- Atlantic Geoscience Society

GRANTS RECEIVED

1. Research grants (*Does not include decades of summer salary and logistical support from Maine Geological Survey*)

- 11/78-10/80 Absolute dating of plutonism and brittle deformations in southeastern Maine (with Hannes Brueckner); NSF EAR-7803629, (\$51,892)

- 1978-1979 Rubidium-Strontium whole-rock isochron dating of plutonism and associated brittle deformation in southeastern Maine (with Hannes Brueckner); CUNY PSC-BHE grant 12315, (\$7,625)
- 1980-1981 Composition of Early Paleozoic mafic and felsic volcanic rocks in eastern Maine as a test of Ordovician subduction models; PSC-BHE grant 13376, (\$6,010)
- 1981-1982 Taconic and pre-Taconic deformation in the Miramichi Anticlinorium, eastern Maine; PSC-BHE grant 13601, (\$7,440)
- 1983-1984 Multi-deformation history of pre-Silurian rocks near Woodland, Maine; PSC-BHE grant 663194, (\$6,384)
- 1984-1985 Chemistry of selected Ordovician volcanic rocks in eastern Maine as a test of plate tectonic models; PSC-BHE grant 664161, (\$5,400)
- 1985-1986 Volcanic rocks of the Miramichi Anticlinorium in eastern Maine: An Ordovician island arc? PSC-BHE grant 665190, (\$7,658)
- 1986-1987 Terrane boundaries in the Northern Appalachians: Exotic or not? PSC-BHE grant 666320, (\$6,000)
- 1987-1989 Stratigraphic and tectonic relationships between the Miramichi Anticlinorium and Aroostook-Matapedia terrane; PSC-BHE grant 667212, (\$12,000)
- 1987-1989 Timing and nature of terrane accretion in the Northern Appalachians: A multi-disciplinary approach. NSF EAR 8706963, (\$60,000)
- 1989-1990 Connecting southeastern Maine (stratigraphically) to the rest of the state; PSC-BHE grant 661182, (\$7,700)
- 1992-1993 Nature of the Norumbega Fault zone in eastern Maine; PSC-BHE grant 663318, (\$2,700)
- 1993-1995 A crustal profile of a major transcurrent fault suture: the Norumbega Fault Zone, eastern Maine. NSF grant, (\$57,000) [Collaborative grant with Mary Hubbard, Charles Guidotti, and Dan Lux, University of Maine - Orono]
- 1995-1997 Radiometric dating of displacements along the Norumbega Fault Zone, eastern Maine; PSC/BHE, (\$12,000).
- 1997-1998 SEM analysis of shallow-crustal high-strain mylonites; PSC-CUNY, \$4,500.
- 1997-98 Bedrock geology of the Fletcher Peak 7½' quadrangle, Maine; U.S. Geological Survey EDMAP program, \$12,500
- 1998-1999 Dating shallow crustal, multiple shearing events in the Norumbega fault system, eastern Maine; PSC-CUNY program, \$4,250.
- 1999-2000 Nature of the Kellyland and Waite fault zones (Norumbega fault system) in the Fletcher Peak and Gassabias Lake 7½' quadrangle, eastern Maine. USGS-EDMAP program, \$7,500
- 1999 Bedrock geology, of the Dill Hill 7½' quadrangle, Calais 1:100,000 sheet, Maine; USGS STATEMAP program (in cooperation with the Maine Geological Survey); \$4,500 + field vehicle, boat, and radiometric dating.
- 2000-2001 Petrology of the Berry Brook gabbro-diorite, eastern Maine; PSC-CUNY \$4,800 + field vehicle.
- 2000-2001 Bedrock geology of the Calais 1:100,000 quadrangle, Maine; USGS STATEMAP program (in cooperation with the Maine Geological Survey); \$8,450 + field vehicle.
- 2012-2013 Connecting Silurian sediments to their source rocks in eastern and east-central Maine; PSC-CUNY grant, \$6,000

- 2013-2014 Ludman, Allan, Bedrock Geology of the Greenfield quadrangle, Maine; *United States Geological Survey STATEMAP proposal through Maine Geological Survey November, 2012.* \$5,000,
- 2013-2014 Ludman, Allan, Ages of detrital zircons from Silurian sandstones in eastern and east-central Maine; Maine Geological Survey, \$3,000 for partial cost of 7 zircon age spectra.

Pending grants and contracts

- Ludman, A., J. Bird, S. Farenga, G. O’Mullan, S. Pekar, M. Trujillo, and H. Potter-Morgan, *Freshman Year to Geoscience Career*, NSF IUSE-GEOPATHS STEM education proposal, \$350,000 (three year)
- Farenga, S., Subramaniam, G., D. Lauridsen, A. Ludman, P. Schmidt, (title?) NSF Noyce Science Teacher preparation proposal..... \$1.2 million.

2. Institutional grants (to Queens College) (\$1,400,000)

- 1992-1993 Freshman Learning Communities I: City University of New York Freshman Year Initiative, (\$90,000).
- 1993-1994 Freshman Learning Communities II: City University of New York, Freshman Year Initiative (\$103,000)
- 1993-1996 Creating a sense of community at a commuter college; Department of Education, Fund for the Improvement of Post-secondary Education (FIPSE), (\$293,000; with Judith Summerfield)
- 1994-1995 A coordinated freshman program; City University of New York, Freshman Year Initiative, (\$415,000; with Judith Summerfield)
- 1996-1997 Geographic Information Systems (GIS) in geologic research; CUNY Graduate Research and Technology Initiative, \$57,000.
- 1998-1999 Converting an urban campus into an environmental groundwater laboratory; NSF-ILI program, \$70,326 (with Kenneth Belitz).
- 2015-2018: Freshman Year to Geoscience Career; NSF GEOPATHS project in collaboration with Queensborough and LaGuardia Community Colleges. \$371,000.

3. Other resources obtained for Queens College

- 2005 Negotiated agreement in which the US Department of Agriculture (through the NYC Soil and Water Conservation District) paid half the salary and research support costs for a soil scientist faculty line for five years).
- 2014 After several years of negotiation, finalized a \$1,000,000 alumnus donation to SEES. Funds are supporting a faculty line in Mineralogy-Petrology (\$750,000) and have also endowed a graduate student scholarship fund (\$250,000)
- 2013-2014 After extensive bureaucratic delays, received approximately \$150,000 from CUNY for X-ray energy dispersion spectrometer attachment for Scanning Electron Microscope lab and two advanced microscopes for graduate and undergraduate student research.

4. Queens College GLOBE NY Metro teacher training and support Partnership (GLOBE Program Partner for southern New York State). Includes Grants and Contracts

2000	Consolidated Edison,	\$15,000.
2001	Consolidated Edison,	\$15,000.
2002	Consolidated Edison,	\$25,000

	KeySpan Energy,	\$17,500
	CUNY Workforce Development Initiative	\$25,000
2003	GreenPoint Foundation	\$ 1,000
	GreenPoint Bank	250
	NYC Dept of Education	38,000
	Consolidated Edison	\$50,000
	Varnum-DeRose Trust (Bank of New York)	\$10,000
	CUNY (College NOW Program)	\$76,000
2004	New York City Council	\$50,000
	Consolidated Edison	\$50,000
	CUNY (College NOW)	\$93,000
	New York State Math/science Partnership With NYC DOE Region 2 (Bronx)	\$ 304,000 (to Queens College)
2005	Consolidated Edison	\$50,000
	CUNY (College NOW Program)	37,000
	New York City Council	50,000
	NYS Math/Science Partnership	770,000 (to Queens College)
2006	Consolidated Edison	\$50,000
	CUNY College NOW	27,000
	NYS Math/Science Partnership	280,000 (to Queens College)
	EPA Environmental Education Award	49,958*
	* Largest award in NE Region	
	NY City Council	50,000
	NYC Dept of Education, Region 4	10,000
	NYC Department of Parks	750
2007	NYC Dept of Education, Region 7	\$26,000
	Waste Management, Inc.	8,000
	Franklin K. Lane High School	4,700
	Consolidated Edison	50,000
	NYS Math/Science Partnership (Districts 8, 11, 12)	208,000
	NYS STEM award (Districts 24 and 32)	459,000
	NY City Council	25,000
2008	Consolidated Edison	50,000
	NYCDOE Knowledge Network	20,000
	NYS Math/Science Partnership (Districts 8, 11, 12)	227,000
	NYS STEM awards (Districts 24 and 32)	459,000
2009	Consolidated Edison	50,000
	Knowledge Network L.S.O.	17,000
	NYS Math/Science Partnership (Districts 8, 11, 12)	187,000

	NYS STEM awards (Districts 24 and 32)	375,000
2010	Consolidated Edison	50,000
	Red Bank, NY School District	12,000
2011-	NASA: Scientific literacy (co-PI; Peter Schmidt, PI)	143,000
2011	Consolidated Edison	50,000
2012	NOAA Environmental Literacy (co-PI; Peter Schmidt, PI) ("Into the Woods") (4 yrs)	1,355,000*
	* Largest (by 50%) of 8 awards granted nationally. Certificate of excellence presented at Queens College by NOAA Director Dr. Jane Lubchenco	
2015	NY City Council (in collaboration with NASA Goddard Institute for Space Science and NYC Department of Education). Pilot GLOBE training workshops and instruments for student research for 40 teachers:	
2015	NSF IUSE-GEOPATHS award <i>Freshman year to Geoscience Career</i> (PI in collaboration with LaGuardia and Queensborough community colleges), 3 years, \$371,000.	
2015	NSF NOYCE award <i>STEM Academy for Sustainability</i> ; (Co-PI with Stephen Farenga and Gopal Subramaniam), 3 years, \$1.3 million.	