## Curriculum Vitae

## **RAYMOND A. COISH**

# Robert R. Churchill Professor Emeritus of Geosciences

# **ADDRESS**

Geology Department Bicentennial Hall Middlebury College Middlebury, VT 05753

e-mail: coish@middlebury.edu

## **EDUCATION**

1973 - 1977 University of Western Ontario, London, Canada Ph.D. - 1977 1968 - 1973 Memorial University of Newfoundland BSc. (Hons.) - 1973

# **AWARDS and RESEARCH GRANTS**

L	D3 and RESEARCH GRANTS		
	2012	John M. White Fellowship to Juliet Ryan-Davis (\$5000)	
	2010	John M. White Fellowship to Scott Zolkos (\$5000)	
	2008	008 Whiting Fellowship (The Volcanoes of Italy)	
	2008	John M. White Fellowship to Ryder Mussleman (\$4500)	
	2005	John M. White Fellowship to Nate Morris (\$4000)	
	2000	HHMI grant to support undergraduate student (\$3600)	
	1996	Perkins Award for Excellence in Teaching, Middlebury College	
	1994	KECK Foundation (\$90,000) - Purchase of electron microscope - matching funds	
1993 - 1995 NSF-ILI (\$87,093) (DUE-9351213)			
		Modern Electron-Microbeam Applications in a Problem-Oriented Geology Curriculum	
1991- 1993 NSF (\$32,500) (EAR-9017873)			
	Analysis of an interarc basin - The Missisquoi Formation, Vermont'		
1986 - 1991 NSF Grant (\$150,000) (R11-8610679)			
	'Geochemical investigation of volcanism in the late Precambrian of Vermont'		
	1983 - 1984 Research Corporation Grant (\$8,500)		
	'Origin of Chain Lakes massif, NW Maine'		
	1983 -	1984 NSF Equipment Grant (\$13,750) 'Purchase of used energy dispersive spectrometer'	
	1981 -	1982 NSF Equipment Grant (\$30,000) - 'Purchase of Used Electron Microprobe'	
	1977 -	1979 N.R.C. of Canada Postdoctoral Fellowship	
	1974 -	1977 N.R.C. of Canada Postgraduate Scholarship	

# **PROFESSIONAL EXPERIENCE**

2010 - 2016	Robert B. Churchill Chair in Geosciences
1991 - 2010	Professor of Geology - Middlebury College
1990 - 1991	Visiting Scientist - Geological Survey of Canada Vancouver, Canada
1986 -1991	Associate Professor of Geology - Middlebury College
1984 - 1985	Visiting Professor - The Open University, Milton Keynes, UK
1979 - 1986	Assistant Professor of Geology - Middlebury College
1978 - 1979	Postdoctoral Research Fellow - M.I.T.
1977 - 1978	Postdoctoral Research Fellow - University of Tennessee
1973 - 1976	Teaching Assistant - University of Western Ontario
1972 - 1973	Teaching Assistant - Memorial University
1971	Geological Survey of Canada
1969 - 1970	British Newfoundland Exploration Company

#### **COURSES TAUGHT**

FYS - The Geologic Landscape, Vermont in Time and Place; The Planets

GEOL 104 - Earthquakes and Volcanoes

GEOL 142 - The Ocean Floor (when P. Manley on leave)

GEOL 170 - Global Tectonics (renamed Dynamic Earth)

GEOL 192 - Planetary Geology (no longer offered)

GEOL 201 - Bedrock Geology of Vermont (CW)

GEOL 211 - Mineralogy

GEOL 296 - Geochemistry of the Natural Environment (now GEOL 283)

GEOL 303 – Geochemical Processes in the Earth

GEOL 300 - Introduction to Petrology

GEOL 322 - Igneous Petrology (no longer offered)

GEOL 492 - Advanced Petrology (no longer offered)

GEOL 400 - Senior Seminar

### **COLLEGE SERVICE**

Segue on Segue Advisory Committee (2010 - 11), Student Symposium Committee (2011), Whiting Fellowship Committee (2011), Presidential Search Committee (2004), Committee on Reappointment (2001-03, 2005-06), Committee for Senior Faculty Review (2000-01), Educational Affairs Committee (1998 -2001), Teaching Load Committee, Teaching Resources Committee (1995-96), Chair of Geology (1985-1995; 1999-01), Chair of Natural Science Division (1995-96), Educational Council, Curriculum Committee, Independent Scholar Committee

#### RESEARCH INTERESTS

Geochemistry of meta-volcanic rocks in Appalachians (Vermont, Newfoundland, Maine)

- major and trace element chemistry, mineral chemistry, source area characterization Origin of granitic rocks in Vermont

Geochemistry of metasedimentary rocks in the Vermont Appalachians

Ultramafic rocks from ocean floors, ophiolites and mountain systems

Origin of Tertiary volcanic rocks in British Columbia

Lunar basalt petrology

- cooling rates, source regions

Ocean floor basalt petrology

- cooling rates, trace elements especially the rare earths

Low grade metamorphism and metasomatism in basic rocks

## **PROFESSIONAL AFFILIATIONS**

American Geophysical Union, Geological Society of America, Geological Association of Canada, Council on Undergraduate Research, Vermont Geological Survey

#### LABORATORY EXPERIENCE

X-ray Fluorescence Spectrometry, Electron Microprobe, Atomic Absorption, X-ray Diffraction, Neutron Activation Analysis, Inductively Coupled Argon Plasma (ICAP) Spectrometry, Scanning Electron Microscope

### **PUBLISHED PAPERS**

- West, D. P., Bradley, D., and Coish, R., 2016, The Litchfield Pluton in South-Central Maine: Carboniferous Alkalic Magmatism in northern New England, USA: Atlantic Geology, v. 52, p. 169-187.
- Coish, R., Kim, J., Twelker\*, E., Zolkos\*, S., and Walsh, G., 2015, Geochemistry and origin of metamorphosed mafic rocks from the Lower Paleozoic Moretown and Cram Hill Formations of north-central Vermont: delamination magmatism in the western New England Appalachians: American Journal of Science, v. 315, p. 809-845.
- Macdonald, F. A., Ryan-Davis\*, J., Coish, R. A., Crowley, J. L., and Karabinos, P. M., 2015, A newly identified Gondwanan terrane in the northern Appalachian Mountains: Implications for the Taconic orogeny and closure of the Iapetus Ocean: REPLY: Geology, v. 43, no. 4, p. e360, doi: 10.1130/g36575y.1.
- Macdonald, F. A., Ryan-Davis\*, J., Coish, R. A., Crowley, J. L., and Karabinos, P., 2014, A newly identified Gondwanan terrane in the northern Appalachian Mountains: Implications for the Taconic orogeny and closure of the Iapetus Ocean: Geology, v. 42, no. 6, p. 539-542, doi: 10.1130/g35659.1.
- Coish, R., Kim, J., Morris\*, N., and Johnson\*, D., 2012, Late stage rifting of the Laurentian continent: evidence from the geochemistry of greenstone and amphibolite in the central Vermont Appalachians: Canadian Journal of Earth Sciences, v. 49, p. 43-58.
- Coish, R. A., 2010, Magmatism in the Vermont Appalachians, *in* Tollo, R., Bartholomew, M. J., Hibbard, J. P., and Karabinos, P., eds., From Rodinia to Pangea: The Lithotectonic Record of the Appalachian Region, Geological Society of America Memoir 206, doi: 10.1130/2010.1206(05).
- Kim, J., Gale, M., Coish, R., Laird, J., and Walsh, G. J., 2009, Road to the Kingdom: A bedrock transect across the pre-Silurian Rowe-Hawley Belt in central Vermont, *in* Westerman, D. S., and Lathrop, A. S., eds., Guidebook for Field Trips in the Northeast Kingdom of Vermont and Adjacent Regions, New England Intercollegiate Geological Conference, 101st Annual Meeting, p. 95-120.
- Westerman, D., and Coish, R., 2009, Geochemistry and emplacement style in Acadian plutons between Woodbury and Northfield, Vermont, *in* Westerman, D. S., and Lathrop, A. S., eds., Guidebook for Field Trips in the Northeast Kingdom of Vermont and Adjacent Regions, New England Intercollegiate Geological Conference, 101st Annual Meeting, p. 261-274.
- D.W. Rankin, R.A. Coish, R. D. Tucker, Z.X. Peng, S. A. Wilson\*, and A. Rouff\* (2007) Silurian Extension in the Upper Connecticut Valley, United States and the Origin of Middle Paleozoic Basins in the Québec Embayment, *American Journal of Science*, v. 307, 216-264.
- West, D.P., Jr., Tomascak, P.B., Coish, R.A., Yates, M.G., and Reilly\*, M.J. (2007) Petrogenesis of the Lincoln Syenite, Maine: Late Silurian-Early Devonian melting of a source region modified by subduction driven metasomatism, *American Journal of Science*, v. 307, 265-310.
- Coish, Raymond A. and P.J. Gardner\* (2004) Suprasubduction zone peridotite in the northern USA Appalachians: evidence from mineral composition: Mineralogical Magazine, v. 68, 699-708.

indicates undergraduate at Middlebury College

- West, D.P., Jr., Coish, R.A., and Tomascak, P.B. (2004) Tectonic setting and regional correlation of Ordovician metavolcanic rocks of the Casco Bay Group, Maine: Evidence from trace element and isotope geochemistry: Geological Magazine, v. 141, p. 125-140.
- Kim, Jonathan, Coish, Raymond, Evans\*, Matt, Dick\*, Gregory (2003) Suprasubduction Zone Extensional Magmatism in Vermont and adjacent Quebec: implications for Early Paleozoic Appalachian Tectonics, Geological Society of America Bulletin, v.115, p. 1552-1569.
- Coish, R.A., Kretschmar\*, L.M. and Journeay, J.M. (1998), Geochemistry of the Mount Noel volcanics, British Columbia and comparison with the Columbia River Basalt. Journal of Volcanology and Geothermal Research, v. 83, p. 269-285.
- Coish, R.A. (1997) Rift and ocean floor volcanism from the Late Proterozoic and early Paleozoic of the Vermont Appalachians, in K. Sinha and J. Whalen (eds), The Nature of Magmatism in the Appalachians, Geological Society of America Memoir 191, pp. 129-145.
- Stanley, R. S., Martin, D. C. and Coish, R. A., 1993, A transect through the Taconide Zone of the central Vermont, in Cheney, J. T. and Hepburn, J. C., eds., Field Trip Guidebook for the northeastern United States: 1993 Boston GSA: Geological Society of America, p. F-1 F-31.
- Coish, R.A. and C.W. Sinton\* (1992) Geochemistry of mafic dikes in the Adirondack mountains: implications for late Proterozoic continental rifting, Contributions to Mineralogy and Petrology, v. 110, p. 500-514.
- Coish, R.A. and J.M. Journeay (1992) The Crevasse Crag Volcanic Complex, southwestern British Columbia: structural control on the geochemistry of arc magmas; in Current Research, Part A; Geological Survey of Canada, Paper 92-1a, p. 95-103.
- Coish, R.A., Bramley\*, A., Gavigan\*, T. and Masinter\*, R. (1991) Progressive changes in volcanism during lapetan Rifting: comparisons with the East African Rift Red Sea system, Geology, v. 19, p.1021-1024.
- Coish, R.A. (1990) Ophiolites, Magills Survey of Science, p. 1954 1960.
- Coish, R.A. (1989) Boninites in the northern Appalachians a review. In: Boninites (A.J. Crawford, ed), Chapter 10, p. 264 287, Allen and Unwin, London.
- Stanley, R.S., R. Coish, J. Laird, T. Armstrong and C. Mehrtens (1989) A transect through the Pre-Silurian foreland and hinterland of central Vermont. Fieldtrip Guide, International Geological Congress, July 1989.
- Isachsen, Y.W., Ray Coish, Chris Sinton\*, Matt Heisler and Bill Kelley (1988) Dikes of the northeast Adirondack region: Their distribution, orientation, mineralogy, chronology, chemistry and mystery. 60th New York State Geological Association Meeting, Fieldtrip Guidebook, p. 215-243.
- Coish, R.A. (1987) Regional geochemical variations in greenstones from the central Vermont Appalachians. New England Intercollegiate Geological Conference Guidebook, p. 345-350.
- Coish, R.A. and Rogers, N.W. (1987) The geochemistry of the Boil Mountain ophiolite, northwest Maine and tectonic implications. Contrib. Mineral. Petrol., 97, 51-65.

- Coish, R.A., Perry\*, D.A., Anderson\*, C.D., and Bailey\*, D. (1986) Metavolcanic rocks from the Stowe Formation, Vermont: remnants of ridge and intraplate volcanism in the Iapetus ocean. Amer. Jour. Sci., v. 286, 1 28.
- Coish, R.A., Fleming\*, F.S., Larsen\*, M., Poyner\*, R., and Seibert\*, J., (1985), Early history of the Proto-Atlantic ocean: geochemical evidence from metavolcanic rocks in Vermont. Amer. J. Sci., v. 285, p.351-378.
- Coish, R.A., Hickey, R. and Frey, F.A. (1982) Rare earth element geochemistry of the Betts Cove ophiolite, Newfoundland: complexities in ophiolite formation. Geochim. Cosmo. Acta, 46, 2117-21134.
- Coish, R.A. and Church, W.R. (1979). Igneous evolution of mafic rocks in the Betts Cove ophiolite, Newfoundland. Contrib. Mineral. Petrol. 70, 29-39.
- McSween, H.Y., Jr., Coish, R.A. and Norman, M. (1979) Coexisting acidic and basic melts: geochemistry of composite dikes A discussion. J. Geol. 87, 209-214.
- Coish, R.A. and Taylor, L.A. (1979) The effects of cooling rate on texture and pyroxene chemistry in DSDP Leg 34 basalt: a microprobe study. Earth Planet. Sci. Lett. 42, 389-398.
- Onorato, P.I.K., Uhlmann, D.R., Taylor, L.A., Coish, R.A. and Gamble, R. (1978) Olivine cooling speedometers. Proc. Lunar Sci. Conf. 9, 613-628.
- Gamble, R., Coish, R.A. and Taylor, L.A. (1978) The consanguinity of the oldest Apollo 11 basalts. Proc. Lunar Sci. Conf. 9, 495-507.
- Onorato, P.I.K., Uhlmann, D.R., Taylor, L.A. and Coish, R.A. (1978). An olivine cooling speedometer (ex. abstr.). Lunar Science IX, 835-837.
- Taylor, L.A., Onorato, P.I.K., Uhlmann, D.R. and Coish, R.A. (1978). Subophitic basalts from Mare Crisium: cooling rates. In: Mare Crisium: The View from Luna 24 (R.B. Merrill and J.J. Papike, eds.), Pergamon, 473-481.
- Norman, M., Coish, R.A. and Taylor, L.A. (1978) Glasses in the Luna 24 soil and petrogenesis of ferrobasalt. In: Mare Crisium: The View from Luna 24 (R.B. Merrill and J.J. Papike, eds.), Pergamon, 281-289.
- Coish, R.A. and Taylor, L.A. (1978) Mineralogy and petrology of basaltic fragments from the Luna 24 drill core. In: Mare Crisium: The View from Luna 24 (R.B. Merrill and J.J. Papike, eds.), Pergamon, 403-417.
- Gamble, R., Coish, R.A. and Taylor, L.A. (1978) The oldest mare basalts: mineralogy and petrology (ex. abstr.). Lunar Science IX, 368-371.
- Taylor, L.A., Onorato, P.I.K., Uhlmann, D.R. and Coish, R.A. (1977) Cooling rates of Luna 24 subophitic basalts (ex. abstr.). In: Papers Presented to the Conference on Luna 24, 193-196.
- Norman, M., Coish, R.A. and Taylor, L.A. (1977) Glass chemistry and magma evolution at Mare Crisium (ex. abstr.). In: Papers Presented to the Conference on Luna 24, 136-139. The Lunar Science Institute, Houston.

- Coish, R.A. and Taylor, L.A. (1977) Igneous rocks from Mare Crisium: mineralogy and petrology (ex. abstr.) In: Papers Presented to the Conference on Luna 24, 14-17. The Lunar Science Institute, Houston.
- Coish, R.A. (1977) Ocean floor metamorphism in the Betts Cove ophiolite, Newfoundland. Contrib. Mineral. Petrol. 60, 255-270.
- Church, W.R. and Coish, R.A. (1976) Oceanic versus island arc origin of ophiolites. Earth Planet. Sci. Lett. 31, 8-14.

## **PUBLISHED ABSTRACTS**

- Best\*, M., West Jr, D.P., and Coish, R. (2017), An early record of Rheic Ocean formation in the northern Appalachians: The North Haven Formation in Penobscot Bay, Maine: Geological Society of America Abstracts with Programs, v. 49, no. 6, doi: 10.1130/abs/2017AM-297867.
- Burke\*, W., West Jr, D. P., and Coish, R., 2016, Petrology and geochemistry of the metamorphosed Cambrian-Ordovician volcanic rocks of the St. Croix Belt, western Maine: Geological Society of America Abstracts with Programs, v. 48, no. 2, doi: 10.1130/abs/2016NE-272605.
- Scott\*, P., Coish, R., and Kim, J., 2016, Detrital zircon ages of the Umbrella Hill and Shaw Mountain formations, Vermont: Geological Society of America Abstracts with Programs, v. 48, no. 2, doi: 10.1130/abs/2016NE-272611.
- Coish, R., Kim, J., Ryan-Davis\*, J., Pierce, N., and Dietsch, C., 2015, Supra-subduction magmatism in the Moretown Terrane, a fragment of Gondwana in the western Appalachians: Geological Society of America Abstracts with Programs, v. 47, no. 3, p. 94.
- Connard\*, C. R., Coish, R., Kim, J., and Amidon, W. H., 2015, U-Pb dating of detrital zircons in the Cram Hill Formation, Vermont: implications for paleogeography and orogenesis: Geological Society of America Abstracts with Programs, v. 47, no. 3, p. 94.
- Honsberger, I. W., Laird, J., Bryce, J. G., Coish, R., and Prado, F. M., 2015, Regional geochemical comparison of metamorphosed lapetan basalts in Vermont: interactions between magmatism, rifting, and subduction: Geological Society of America Abstracts with Programs, v. 47, no. 3, p. 101.
- Patel\*, S., Coish, R., and Hampton, S., 2014, The magmatic history of the MT. Herbert Volcanic Group and the Akaroa Volcanic Complex, Banks Peninsula, New Zealand: Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 300.
- Reed\*, D. W., West Jr, D. P., and Coish, R., 2014, Petrology and geochemistry of the Alfred Complex in southwestern Maine: Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 323.
- Coish, R., Ryan-Davis\*, J., Amidon, W. H., Kim, J., and Dietsch, C., 2013, Origin of an Early Paleozoic arcrelated sedimentary basin in the northern Vermont Appalachians: a detrital zircon study: American Geophysical Union.
- Coish, R., and Kim, J., 2013, Magmas without borders: Geological Society of America Abstracts with Programs, v. 45, no. 1, p. 95.

- Pierce, N., Dietsch, C., Kim, J., Coish, R., and Widom, E., 2013, Compilation of geochemical data of meta-volcanics from the Rowe-Hawley Zone of western New England are consistent with backarc, arc, and forearc regions of one composite arc: Geological Society of America Abstracts with Programs, v. 45, no. 1, p. 106.
- Ryan-Davis\*, J., Coish, R., and Amidon, W. H., 2013, Origins of the Moretown Formation, Vermont: a detrital zircon study: Geological Society of America Abstracts with Programs, v. 45, no. 1, p. 95.
- Pierce, N., Dietsch, C., Kim, J., and Coish, R. (2012) Geochemical analysis and along-strike discrimination of Taconian arc regions along the Rowe-Hawley Zone of western New England: Geological Society of America Abstracts with Programs, v. 44, no. 7, p. 282.
- Coish, R., Kim, J., Gale, M., and Laird, J., 2010, Contrasting origins of mafic rocks in the Rowe-Hawley Belt of Vermont: Evidence from geochemistry: Geological Society of America, Abstracts with Programs, v. 42, no. 1, p. 88.
- Guevara\*, V. E., and Coish, R., 2010, A geochemical and petrographic analysis of the Echo Pond pluton, VT: Geological Society of America, Abstracts with Programs, v. 42, no. 1, p. 158.
- Kim, J., Gale, M. H., Coish, R., and Laird, J., 2010, Tectonic evolution of the Rowe-Hawley Belt in central and northern Vermont: Geological Society of America, Abstracts with Programs, v. 42, no. 1, p. 55.
- Westerman, David S. and Coish, Raymond A. (2008), Magma trap selection as a function of magma batch size: a case study from the Northeast Kingdom batholith (Vermont USA), (extended abstract), LASI III Conference, Physical geology of Subvolcanic Systems: Laccolith, Sills and Dykes, Elba Island, September 2008.
- Ryan, Peter C., Coish, Ray, and Joseph\*, Kristiaan (2007), Ordovician K-Bentonites in western Vermont: mineralogic, stratigraphic and geochemical evidence for their occurrence and tectonic significance, Geological Society of America Abstracts with Programs, v. 39, n. 1, p. 50.
- Gleason\*, Michael J., Kim, Jonathan, Coish, Raymond and Ryan, Peter C, (2007) Radionuclide-enriched groundwater, Knox Mountain pluton, Vermont: occurrence and lithologic controls, Geological Society of America Abstracts with Programs, v. 39, n. 1, p. 102.
- Ryan, Peter C., Coish, Ray, and Joseph\*, Kristiaan (2006), Stratigraphic, mineralogic, and geochemical evidence for Ordovician K-Bentonites in western Vermont, Geological Society of America Abstracts with Programs, v. 38, n. 7, p. 370.
- Morris\*, Nathan, Coish, Raymond, and Kim, Jonathan (2006), Geochemistry of metavolcanic rocks in the southern Worcester mountain area, Vermont, Geological Society of America Abstracts with Programs, v. 38, n. 2, p. 92.
- West, David P. Jr, Tomascak, Paul B., Coish, Raymond A. (2006), Petrogenesis of the Lincoln syenite, Maine: evidence for Late Silurian-Early Devonian melting of a source region modified by subduction driven metasomatism, Geological Society of America Abstracts with Programs, v. 38, n. 2, p. 31.
- Twelker\*, Evan, Raymond A. Coish and Jonathan Kim (2004) Field relations and geochemistry of greenstones in the Moretown and Cram Hill Formations, central Vermont: Geological Society of America Abstracts with Programs, v. 36, no. 2, p. 28.

- West, David P., Jr., Coish, R.A. and Tomascak, P.B. (2003) Tectonic and regional correlation of Ordovician metavolcanic rocks of the Casco Bay Group, south central Maine: evidence from trace element and isotope geochemistry: Geological Society of America Abstracts with Programs, v. 35, p. 35.
- Coish, Raymond A. and Gardner\*, Parham (2002) Geochemistry and Tectonic implications of serpentinized ultramafic rocks in Vermont. Geological Society of America, 2002 annual meeting, abstracts with programs, v 34, n 6, p.361.
- Coish, Raymond A., Rouff\*, A., Wilson\*, Sharon A. and Rankin, Douglas (2001) Silurian Extensional magmatism in the Appalachians: Geochemistry of dikes from northeastern Vermont. Geological Society of America, 2001 annual meeting, abstracts with programs, v 33, n 6, p.A-375.
- Wilson\*, Sharon and Coish, Raymond A. (2001) The geochemical and mineralogical analysis of Siluro-Devonian mafic dikes in east-central Vermont, Geological Society of America, Northeastern Section, 2001 annual meeting abstracts with programs, v. 33, no. 1, p.A-9.
- Kim, Jon and Coish, Ray (2001) Northern Vermont metadiabasic intrusives: a connection to the Bolton igneous group, Geological Society of America, Northeastern Section, 2001 annual meeting, abstracts with programs, v. 33, no 1, p.A-20.
- Hannula, K.A. and Coish, R.A. (1999) Synchronous Acadian magmatism and faulting in northeastern Vermont: the last gasp of western Acadian contraction. Geological Society of America, Northeastern Section, 1999 annual meeting, abstracts with programs, v.31, no. 2, p. A-20.
- Anderson\*, Myrth T. and Coish, Ray (1999) Depth constraints on the origin of Northeast Kingdom granites. Geological Society of America, Northeastern Section, 1999 annual meeting, abstracts with programs, v.31, no. 2, p. A-1.
- Coish, R.A. (1998) Teaching the geological evolution of Vermont in an inquiry-based course, Geological Society of America, 1998 annual meeting, abstracts with programs, v 30, n 7, p.A-351.
- Hannula, K.A., Coish, R.A., and Applegate\*, G.S. (1998) Geochemistry and Ar Cooling ages of the syn-Acadian Victory pluton, Northeastern Vermont, USA, Geological Society of America, 1998 annual meeting, abstracts with programs, v 30, n 7, pA-240.
- Coish, R.A., Kretschmar\*, L.M. and Journeay, J.M. (1997) Geochemistry and origin of the Mount Noel Volcanic Complex, southwestern British Columbia: Miocene extensional volcanism, Geological Society of America, Cordilleran Section, 1997 annual meeting, abstracts with programs, v. 29, no. 5, p. 8.
- Applegate\* G.S., Coish R.A. (1997) Geochemistry and tectonic setting of the Victory pluton, Northeast Kingdom, Vermont. GSA Abstracts with Programs v.29, n. 1.
- Coish, R.A., Evans\*, M.E., Minnis\*, Y., Dick\*, G. Pugin\*, P.A. (1995) Eastern limits of early Paleozoic rift volcanism in the northern Vermont Appalachians, Geological Society of America, 1995 annual meeting, abstracts with programs, p. A-224.
- Coish, R.A. (1993) The use of geochemistry in interpreting the origin of metavolcanic rocks in the northern Appalachians, Northeastern section Geological Society of America, annual meeting, abstracts with programs, v 25, p. 9.

- Kafka\*, Todd K., Elbert, David C. and Coish, R.A. (1993) Geochemistry of a sheared grenstone in the Pinney Hollow Formation: small scale igneous variations, Northeastern section Geological Society of America, annual meeting, abstracts with programs, v 25, p. 27.
- Badger, R. and Coish, R.A. (1992) Highly enriched magmas of the Adirondack lowlands: correlation with geochemical trends of late Proterozoic rift-related magmas of central and western Vermont, Annual Meeting, Geological Association of Canada, Wolfville, Nova Scotia, May 1992.
- Coish, R.A. and J.M. Journeay (1991) The Crevasse Crag Volcanic Complex, southwestern British Columbia: preliminary field relations, geochemistry and tectonic setting, Annual Meeting, Geological Association of Canada, Toronto, May 1991.
- Coish, R.A. (1989) Ancient volcanic rocks in Vermont: Third Annual EPSCoR conference, University of Vermont, 25 May.
- Coish, R.A. (1989) The significance of geochemical trends in Vermont greenstones (extended abstract). In: Proceedings of the Quebec Vermont Workshop (M. Colpron and B. Doolan, eds), p. 82 85.
- Stanley, R.S., T.R. Armstrong, R.A. Coish and Jo Laird (1989) A transect through the Taconian Orogen in central Vermont. Ann. Meeting Geological Society of America, abstracts with program, v. 21, p. 68.
- Stanley, R.S., T.R. Armstrong, DelloRusso, V., R.A. Coish and Jo Laird (1989) The Taconian Orogen as shown in central Vermont, USA. International Geological Congress, Washington, D.C., July 1989.
- Stanley, R.S., R.A. Coish, and Jo Laird (1989) Aspects of the Taconian orogen in central Vermont (extended abstract). In:Proceedings of the Quebec Vermont Workshop (M. Colpron and B. Doolan, eds), p. 67 -68.
- Stanley, R.S., T.R. Armstrong and R.A. Coish (1988) Palinspastic analysis of the Taconian hinterland as shown in the central Vermont transect. Ann. Meeting Geological Society of America, abstracts with program, v. 20, p. A395.
- Coish, R.A. and C. Sinton\* (1988) Opening of Iapetus: Rift & Ridge volcanics in Vermont. Ann. Meeting Geological Association of Canada, abstr. with programs, v. 13, p. A23.
- Coish, R.A. (1987) Geochemistry of greenstones in central Vermont: A window on the early stages of opening of lapetus. Green Mountain Geologist, v. 13, n. 4, p. 5.
- Coish, R.A. (1986) Major and trace element geochemistry of a mafic-ultramafic complex, NW Maine: a supra-subduction ophiolite?, Geol. Soc. Amer. mtg, NE section.
- Coish, R.A., Bailey\*, D., Fleming\*, S. and Poyner\*, R. (1982) REE geochemistry of rift and ocean ridge volcanics in the Vermont Appalachians. Ann. mtg. Geol. Soc. Amer., NE-SE sections, abstr. with prog., 14, p.13.
- Frey, F.A., Roden, M. and Coish, R.A. (1981) Rare earth elements in oceanic ultramafics. Chapman conference on The Oceanic Lithosphere. April, 1981.
- Coish, R., Roden, M., Frey, F. and Suen, C.J. (1979) Rare earth element abundances in ultramafic rocks from ocean floor, ophiolites and alpine peridotites. Ann. Mtg. Geol. Soc. Amer., abstr. with prog. 11, p.403.

- Coish, R.A. (1979) Rare earth geochemistry of basalts from the Betts Cove ophiolite, Newfoundland. Ann. Mtg. Geol. Soc. Amer., abstr. with prog. 11, p.403.
- Coish, R.A. and Church, W.R. (1979) Regional geochemical variations in Newfoundland ophiolites. Geol. Assoc. Can. Mtg., Quebec City, Prog. with abstr. 11, p.43.
- McSween, H.Y., Jr., Coish, Ray A. and Norman, Marc (1979) Petrogenesis of composite dikes near Winnsboro, South Carolina. Ann. mtg. SE section GSA, abstr. with prog. 11, p.205.
- Coish, R.A. and Taylor, L.A. (1978) The effects of cooling rate on the chemistry of pyroxene in DSDP Leg 34 basalt. Ann. mtg. Geol.Soc. Amer., p.382.
- Taylor, L.A., Onorato, P.I.K., Uhlmann, D.R. and Coish, R.A. (1978) An olivine cooling speedometer. AGU ann. spring mtg., EOS 59, p.396-397.
- Coish, R.A. and Church, W.R. (1978) The Betts Cove ophiolite, Newfoundland: some unusual chemical characteristics. AGU ann. spring mtg, EOS 59, p.408.
- Norman, M., Coish, R.A. and Taylor, L.A. (1978) Fractional crystallization: an example from the moon. Ann. Mtg. SE section GSA, abstr.with prog. 10, p.194.
- Coish, R.A. (1978) Recognition of remnant oceanic crust in orogenic zones. Ann. Mtg. SE section GSA, abstr. with prog. 10, p.165.
- Norman, M., Coish, R.A. and Taylor, L.A. (1978) Luna 24 core samples from Mare Crisium: glass chemistry and magma evolution. AGU Midwest mtg. EOS 59, p.223.
- Coish, R.A., Hu, H-N. and Taylor, L.A. (1978) Luna 24 core samples from Mare Crisium: mineralogy and petrology. AGU Midwest mtg., EOS 59, p.223.