

Biographical Sketch: LEE W. COOPER (August 2011)

Chesapeake Biological Laboratory
University of Maryland Center for Environmental Science
1 Williams St, PO Box 38
Solomons MD 20688

ph.: +1.410.326-7359

cooper@cbl.umces.edu

website: <http://arctic.cbl.umces.edu>

Research Interests: Interdisciplinary aspects of biogeochemistry and ecology, including stable and radioisotope composition of organic materials and natural waters; aquatic plant physiology; high latitude oceanography and hydrology

Education:

B.A., Biology, w/ Honors, University of California, Santa Cruz, 1978

M.S., Botany, University of Washington, Seattle, 1980

Ph.D., Oceanography, University of Alaska Fairbanks, 1987

Experience:

Research Professor, Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, 2008-

Research Professor, Department of Ecology and Evolutionary Biology, University of Tennessee, Knoxville, TN 37996, 2001-2008 Research Assistant Professor, Department of Ecology and Evolutionary Biology (formerly Graduate Program in Ecology) University of Tennessee, Knoxville, TN 37996, 1992-2001

Research Staff Member, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, 1995-2000; Research Associate, 1991-1995

Research Associate, Geology Dept, University of Tennessee, Knoxville, TN 37996, 1988-1991 Postdoctoral Associate, Earth and Space Sciences Dept., Univ. of Calif., Los Angeles, 1987-1988.

Synergistic Activities:

Member, National Oceanographic Laboratory System Arctic Icebreaker Coordinating Committee, 2008-

Member, National Academy Study Committee, Design of an Arctic Observing System, 2004-2005.

Chief Scientist and Co-Chief Scientist, eight research cruises of the USCGC Healy, 2002-2008; four research cruises of the USCGC Polar Star and Polar Sea; multi-team shipboard experience aboard RV Alpha Helix (ten cruises), Sir Wilfrid Laurier (ten cruises), N.B. Palmer and Russian vessels Rift, Hydrobiologist and Okean

Independent Contractor to the Ecosystems Center, Marine Biological Laboratory (Woods Hole), Pan-Arctic River Transport of Nutrients, Organic Matter, and Suspended Sediments ([PARTNERS](#)) project, 2003-2007

Director, Project Office, Russian-American Arctic Land-Shelf Systems Initiative/Land-shelf Interactions, Arctic System Sciences Program, National Science Foundation, 2002-2006.

Consultant to YAHS GS, LLC (Richland, Washington), Small Business Technology Transfer project: Polar On-Line Acquisition Relay And Transmission System, 2003-2004.

Lead editor, Land-Shelf Interactions Science Plan, supported by the National Science Foundation, Arctic System Program, 2000-2003

U.S. Delegate, International Arctic Science Advisory Committee, International Science Initiative in the Russian Arctic, 2001-

Member, Science Advisory Committee, Barrow Arctic Science Consortium, 2001-2005.

Lead Principal Investigator, NSF Long-term Arctic Environmental Observatory, Bering Strait, 1999-2006.

Participant, Interagency Working Committee on Environmental Security, Black Sea, 1997-1999

Member, International Steering Committee Russian-American Arctic Land-Shelf Systems Initiative, Arctic System Sciences Program, National Science Foundation, 1996-2005.

Instructor, Upper Division course, "Oceanography," Univ. of Tennessee, Fall Semester, 1996, 1998, 2004, 2006

Instructor, University of Tennessee, undergraduate and graduate level seminars, Spring Semester, 1996, 1999, 2003, 2005.

Contributor, Office of Technology Assessment report on Arctic Nuclear Contamination, 1995

Chief Scientist, USCG Polar Star Arctic Radioisotope Contamination Study, 1993

Delegation leader, Oak Ridge Nat'l Lab exchange, Shirshov Institute of Oceanology, Russia, 1992

Consultant for stable isotope mass spectrometry lab, Korea Ocean Research & Development Institute, Ansan, 1991

Manager, (under subcontract to Univ. Tennessee) stable isotope laboratory facilities, Environmental Sciences Division, Oak Ridge Nat'l Lab, 1988-1991

Coordination of docent programs for elementary education, Univ. of Alaska Museum, 1984-1986.

Teaching Assistant, University of Alaska, 1982, 1985, 1986, Organic Chemistry, Phytoplankton Ecology and Phycology

Developed directory of public transportation access to national parks and wilderness areas, 1981-1985, published as two editions of *How to Get to the Wilderness Without a Car. Public Transportation to Wilderness in Western North America* by Frosty Peak Books.

Intern, California State Legislature, 1977

Publications:

- Cooper, L.W. and C. P. McRoy, 1988. Stable carbon isotope variability in marine macrophytes along intertidal gradients. *Oecologia* 77, 238-241.
- Cooper, L.W. and C. P. McRoy, 1988. Anatomical adaptations to rocky substrates and surf exposure by the seagrass genus *Phyllospadix*. *Aquatic Botany* 32, 365-381.
- Cooper, L.W., 1989. Patterns of carbon isotopic variability in eelgrass, *Zostera marina* L., from Izembek Lagoon, Alaska. *Aquatic Botany* 34, 329-340.
- Cooper, L.W. and M.J. DeNiro, 1989. Stable carbon isotope variability in the seagrass *Posidonia oceanica*: Evidence for light intensity effects. *Marine Ecology - Progress Series* 50, 225-229.
- Cooper, L.W. and M.J. DeNiro, 1989. Depletion of light isotopes of oxygen and hydrogen in tissue water of intertidal plants: Implications for water economy. *Marine Biology* 101, 397-400.
- Cooper, L.W. and M.J. DeNiro, 1989. Covariance of oxygen and hydrogen isotopic compositions in plant water: Species effects *Ecology* 70, 1619-1628.
- Cooper, L.W. and M.J. DeNiro, 1989. Oxygen-18 content of atmospheric oxygen does not affect the oxygen isotope relationship between environmental water and cellulose in a submerged aquatic plant, *Egeria densa* Planch. *Plant Physiology* 91, 536-541.
- DeNiro, M.J. and L.W. Cooper, 1989. Post-photosynthetic modification of oxygen isotope ratios of carbohydrates in the potato: Implications for paleoclimatic reconstruction based on isotopic analysis of wood cellulose. *Geochimica et Cosmochimica Acta* 53, 2573-2580.
- Grebmeier, J.M., L.W. Cooper, and M.J. DeNiro, 1990. Oxygen isotope composition of bottom seawater and tunicate cellulose used as indicators of water masses in the northern Bering and Chukchi Seas. *Limnology and Oceanography* 35, 1182-1195.

Cooper, L.W., M.J. DeNiro, and J. Keeley, 1991. The relationship between stable oxygen and hydrogen isotope ratios in water of astomatal plants. In: *Stable Isotope Geochemistry, A Tribute to Sam Epstein*, pp 247-255. H.P. Taylor, J.R. O'Neill, I.R. Kaplan, eds. Geochemical Society, San Antonio.

Cooper, L.W., C.R. Olsen, D.K. Solomon, I.L. Larsen, R.B. Cook, and J.M. Grebmeier, 1991. Stable isotopes of oxygen, and natural and fallout radionuclides used for tracing runoff during snowmelt in an arctic watershed. *Water Resources Research* 27, 2171-2179.

Kang, D.-J., C. S. Chung, L.W. Cooper, C. Y. Kang, Y.D. Kim, and G.H. Hong, 1992. Oxygen-18 and nutrients in the surface waters of the Bransfield Strait, Antarctica during austral summer 1990/91. *Journal of the Oceanological Society of Korea* 27, 250-258.

Cooper, L.W., C. Solis, D.L. Kane, L.D. Hinzman, 1993. Application of oxygen-18 tracer techniques to arctic hydrological processes. *Arctic and Alpine Research* 25, 247-255.

Grebmeier, J. M., L.W. Cooper, I.L. Larsen, C. Solis, and C.R. Olsen, 1993. Cesium-137 inventories in Alaskan tundra, lake and marine sediments: An indicator of recent organic material transport? In: *Applications of Isotope Techniques in Studying Past and Current Environmental Changes in the Hydrosphere and the Atmosphere*, pp 147-159. International Atomic Energy Agency, Vienna,

McCarthy, J.F., T.M. Williams, L. Liang, P.M. Jardine, L.W. Jolley, D.L. Taylor, A.V. Palumbo, and L.W. Cooper, 1993. Mobility of organic matter in a sandy aquifer. *Environmental Science and Technology* 27, 667-676.

Grebmeier, J.M. and L.W. Cooper, 1994. A decade of benthic research on the continental shelves of the northern Bering and Chukchi Seas: Lessons learned. In: R.H. Meehan, V. Sergienko, and G. Weller, eds. *Bridges of Science between North America and the Russian Far East*, pp 87-98, Arctic Division, American Association for the Advancement of Science, Fairbanks, Alaska.

Cooper, L.W. and R.J. Norby, 1994. Atmospheric CO₂ enrichment can increase the ¹⁸O content of leaf water and cellulose: paleoclimatic and ecophysiological implications. *Climate Research* 4, 1-11.

Cooper, L.W., J.M. Grebmeier, I.L. Larsen, C. Solis, C., and C.R. Olsen, 1995. Evidence for redistribution of cesium-137 in Alaskan tundra, lake and marine sediments. *Science of the Total Environment* 160/161, 296-306.

Grebmeier, J.M. and L.W. Cooper, 1995. Influence of the St. Lawrence Island Polynya on the Bering Sea benthos. *Journal of Geophysical Research* 100, 4439-4460.

Cooper, L.W., I.L. Larsen, C. Solis, J.M. Grebmeier, C.R. Olsen, D.K. Solomon, and R.B. Cook, 1996. Isotopic Tracers for Investigating Hydrologic Processes. In: *Landscape Function: Implications for Ecosystem Response to Disturbance, A Case Study in the Arctic*, J.F. Reynolds and J.D. Tenhunen, eds. pp. 165-182, Springer-Verlag, New York.

Cooper, L.W., I.L. Larsen, G.L. Franklin, G.F. Houser, L.G. Emelyanova, L.N., Neretin, 1996. Anthropogenic radioactivity levels in the vicinity of the Bilibino Nuclear Power Station, Chukotka, Russia. *Polar Geography* 20, 3-19.

Beasley, T.M., L.W. Cooper, J.M. Grebmeier, L.R. Kilius, and H.A. Synal, 1997. ³⁶Cl and ¹²⁹I in the Yenesei, Kolyma and Mackenzie Rivers, 1993. *Environmental Science and Technology* 31, 1834-1836.

Cooper, L.W., T.T. Whittedge, J.M. Grebmeier, and T. Weingartner, 1997. Nutrient, salinity and stable oxygen isotope composition of Bering and Chukchi Sea in and around the Bering Strait. *Journal of Geophysical Research* 102, 12,563-12,574.

Egorov, V.G., S.E. Nalivaiko, V.S. Pavlenko, V.S., O.S. Rzshevsky, L.W. Cooper, J.M. Grebmeier, and L.R. Shugart, 1997. Submersible UV-B spectroradiometer using an acousto-optic tunable filter. *Proc. SPIE* Vol. 2963: 664-669, Ocean Optics XIII, Steven G. Ackelson, editor. The International Society for Optical Engineering

Cooper, L.W., I.L. Larsen, T.M. Beasley, S.S. Dolvin, J.M. Grebmeier, J.M. Kelly, M. Scott, and A. Johnson-Pyrtle, 1998. The distribution of radiocesium and plutonium in sea ice-entrained Arctic sediments in relation to potential sources and sinks. *Journal of Environmental Radioactivity* 39, 279-303.

Beasley, T. M., L.W. Cooper, J.M. Grebmeier, K. Aagaard, J.M. Kelly, L.R. Kilius, 1998. $^{237}\text{Np}/^{129}\text{I}$ atom ratios in Arctic Ocean surface waters: Has ^{237}Np from European fuel reprocessing facilities entered the Arctic Ocean? *Journal of Environmental Radioactivity* 39, 255-277

Cooper, L.W., T.M. Beasley, X.-L.Zhao, C. Soto, K.L. Vinogradova, and K.H. Dunton, 1998. Marine algae as historical indicators of the transport of nuclear fuel re-processing wastes from mid-to-high latitudes in the Atlantic Ocean. *Marine Biology* 131, 391-399.

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Cooper, L.W., 1998. Isotopic fractionation in snow cover, In: *Isotopic Tracers in Catchment Hydrology*, pp. 119-136, J.J. McDonnell and C. Kendall, eds. Elsevier, Amsterdam

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Cooper, L.W., G.F. Cota, L. Pomeroy, and J.M. Grebmeier. 1999. Modification of NO, PO, and NO/PO during flow across the Bering and Chukchi Shelves: Implications for use as Arctic water mass tracers. *Journal of Geophysical Research* 104, 7827-7836.

Cooper, L.W., T.M. Beasley, K. Aagaard, J.M. Kelley, I.L. Larsen, and J.M. Grebmeier. 1999. Distributions of nuclear fuel-reprocessing tracers in the Arctic Ocean: Indications of Russian river influence. *Journal of Marine Research* 57, 715-738.

Münchow, A., T. Weingartner, and L.W. Cooper. 1999. The summer hydrography and surface circulation in the East Siberian Shelf Sea. *Journal of Physical Oceanography* 29, 2167-2182

Schlosser, P., R. Bayer, G. Bönisch, L. Cooper, B. Ekwurzel, W.J. Jenkins, S. Khatiwala, S. Pfirman, and W.M. Smethie. 1999. Pathways and mean residence times of dissolved pollutants in the ocean derived from transient tracers and stable isotopes. *Science of the Total Environment* 237/238, 15-30.

Garten, C.T., L.W. Cooper, W.M. Post, and P.J. Hanson. 2000. Climate controls on soil carbon isotope ratios in forests along an elevation gradient in the southern Appalachian Mountains. *Ecology* 81, 1108-1119.

- Cooper, L.W., J.M. Kelley, L.A. Bond, K.A. Orlandini, and J.M. Grebmeier. 2000. Sources of the transuranic elements plutonium and neptunium in arctic marine sediments. *Marine Chemistry* 69, 253-276.
- Cooper, L.W., I.L. Larsen, T.M. O'Hara, S. Dolvin, V. Woshner, and G.F. Cota, 2000. Radionuclide burdens in arctic marine mammals harvested during subsistence hunting. *Arctic*, 53, 174-182.
- Naidu, A.S., L.W. Cooper, B.P. Finney, R.W. Macdonald, C. Alexander, and I.P. Semiletov, 2000. Organic carbon isotope ratios ($\delta^{13}\text{C}$) of Arctic Amerasian continental shelf sediments. *International Journal of Earth Sciences* 89, 522-531.
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- Cooper, L.W., J.M. Grebmeier, I.L. Larsen, V.G.Egorov, C. Theodorakis, H.P. Kelly, J.R. Lovvorn, 2002. Seasonal variation in water column processes and sedimentation of organic materials in the St. Lawrence Island polynya region, Bering Sea. *Marine Ecology Progress Series* 226, 13-26.
- Hong, G.H., Y.I. Kim, S.H. Lee, L.W. Cooper, S.M. Choe, A.V. Tkalin, T. Lee, S.H. Kim, C.S. Chung, K. Hirose, 2002. $^{239+240}\text{Pu}$ and ^{137}Cs concentrations for zooplankton and nekton in the Northwest Pacific and Antarctic Oceans (1993-1996). *Marine Pollution Bulletin* 44, 660-665.
- Cooper, L.W. and C. Solis, 2003. ^{18}O and ^{13}C in leaf litter versus tree-ring cellulose as proxy isotopic indicators of climate change. In (P.J. Hanson and S.D. Wullschleger eds): *North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes*, pp 140-159. Springer-Verlag, New York.
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- Grebmeier, J.M., G.R. DiTullio, J.P. Barry and L.W. Cooper, 2003. Benthic Carbon Cycling in the Ross Sea Polynya, Antarctica: Benthic Community Metabolism and Sediment Tracers. Pp 313-326 In: (R Dunbar, ed): *Biogeochemistry of the Ross Sea*. Antarctic Research Series, Vol. 78, American Geophysical Union, Washington, DC
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- Cooper, L.W., 2003. Contributions of the Russian-American Initiative for Land-Shelf Environments in the Arctic (RAISE) to Arctic System Science. *Arctic Research of the United States* 17: 33-42. Full article is available on-line at: <http://www.nsf.gov/pubs/2003/nsf03048/start.htm>
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- Cooper, L.W., I.L. Larsen, J.M. Grebmeier, and S.B. Moran, 2005. Detection of rapid deposition of sea ice-rafted material to the Arctic Ocean benthos demonstrated using the cosmogenic tracer ^7Be *Deep-Sea Research II*, 52:3452-3461, doi:10.1016/j.dsr2.2005.10.011
- Moran, S.B., R. P. Kelly, K. Hagstrom, J. N. Smith, J.M. Grebmeier, L.W. Cooper, G. F. Cota, J.J. Walsh, N.R. Bates, D. A. Hansell, W. Maslowski, 2005. Seasonal changes in POC export flux in the Chukchi Sea and implications for water column-benthic coupling in Arctic shelves. *Deep-Sea Research II*, 52:3427-3451. doi:10.1016/j.dsr2.2005.09.011
- Clement, J.L., W. Maslowski, L.W. Cooper, J. M. Grebmeier, and W. Walczowski, 2005. Ocean circulation and exchanges through the northern Bering Sea: 1979-2001 model results. *Deep-Sea Research II*, 52:3509-3540.
- Lovvorn, J.R., L.W. Cooper, M.L. Brooks, C. C. DeRuyck, J.K. Bump, and J.M. Grebmeier, 2005. Organic matter pathways to zooplankton and benthos under pack ice in late winter and open water in late summer in the north-central Bering Sea. *Marine Ecology-Progress Series*, 291:135-150
- Cooper, L.W., R. Benner, J. McClelland, B. Peterson, R. Holmes, P.A. Raymond, D. Hansell, J.M. Grebmeier, and L.A. Codispoti, 2005. The linkage between runoff, dissolved organic carbon and the stable isotope composition of seawater and other water mass indicators in the Arctic Ocean. *Journal of Geophysical Research-Biogeosciences*, 110, G02013
- Cooper, L.W. L.A. Codispoti, V. Kelly, G.G. Sheffield, and J.M. Grebmeier, 2006. The potential for using Little Diomedede Island as a platform for observing environmental conditions in Bering Strait. *Arctic*, 59(2): 129-141
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Seminars, invited talks or meeting presentations:

Polar Research Board, National Academies, September 2010
 Alaska Marine Science Symposium, Anchorage, January 2010
 Alaska Marine Science Symposium, Anchorage, January 2009
 Horn Point Laboratory, Univ. Maryland Center for Environ. Science, Nov. 2008
 North Pacific Research Organization, October 2008, Dalian (China)
 Ocean Sciences Meeting, Orlando, Florida, March 2008
 Estuarine Research Federation meeting, Providence, November 2007
 Children's Museum of Oak Ridge, April 2007
 Invited speaker, Gordon Research Conference on Polar Science, March 2007, Ventura
 Shelf-Basin Exchange Workshop, Sopot, Poland, September 2006
 Shelf Basin Interactions PI meeting, Kauai, Feb. 2006
 Ocean Sciences Meeting, Honolulu, Feb. 2006
 American Society of Limnology and Oceanography, Santiago de Compostela, June 2005
 American Geophysical Union, San Francisco, Dec. 2004
 University of South Carolina, Dec. 2004
 Society for Environmental Toxicology, Portland, Oregon, Nov. 2004
 Arctic Climate Impact Assessment, Iceland, Nov. 2004
 Ocean Research Conference, Honolulu, Feb. 2004

Barrow Arctic Science Consortium Outreach Series, July 2003
 Arctic Research Commission, Washington, Jan. 2003
 American Geophysical Union, San Francisco, Dec. 2002
 Arctic Division meeting, AAAS, Fairbanks, AK, Sept. 2002
 NSF ARCSS All-Hands Meeting, Seattle, WA, Feb. 2002
 Ocean Sciences Meeting, Honolulu, Feb. 2002
 NSF ARCSS OAI/LAI/RAISE All-Hands Meeting, Salt Lake City, UT, Nov. 2001
 North Pacific Research Program Principal Investigators Meeting, Fairbanks, AK, Oct. 2001
 Arctic Consortium of the United States, Annual meeting, Washington, DC, May, 2001
 International Arctic Research Center, Fairbanks, AK, May, 2001
 University of North Carolina, Wilmington, Feb. 2001
 Shelf-Basin Interactions Pan Arctic Meeting, Callaway Gardens, GA, Nov. 2000
 AGU/ASLO Ocean Sciences, San Antonio, TX, Jan. 2000
 U.S. - Russia Environ. Agreement, Area V BERPAC synthesis, Shepherdstown, WV, Feb. 1999
 Amer. Geophys. Union, San Francisco, CA, Dec. 1998
 ASLO/ESA, St. Louis, MO, June 1998
 AGU/ASLO Ocean Sciences, San Diego, CA, Feb. 1998
 Amer. Geophys. Union, San Francisco, CA, Dec. 1997
 University of Louisville, Oct. 1997
 Biogeomon, Third International Symposium on Ecosystem Behavior, Villanova, PA, June, 1997
 25th Anniversary, Area V, U.S. - Russia Environmental Agreement, Washington, D.C., June, 1997
 Third International Symposium on Arctic Radioactivity, Tromsø, Norway, June, 1997
 University of Aarhus, Aarhus, Denmark, May, 1997
 National Science Foundation, Arctic Systems Science Program, Ocean-Ice-Atmosphere Interactions, "All PI Workshop," Virginia Beach, Virginia, May, 1997
 International Ocean Pollution Symposium, Ft. Pierce, Florida, April, 1997
 Benthic Ecology Meetings, Portland, Maine, March, 1997
 American Society of Limnology & Oceanography, Aquatic Sciences Meeting, Santa Fe, Feb. 1997
 Amer. Geophys. Union, San Francisco, CA, Dec. 1996
 Geological Society of America, San Antonio, TX, Oct. 1996
 Ocean Optics XIII, Halifax, Nova Scotia, Oct. 1996
 19th BERPAC Symposium, Moscow, Russia, Sept. 1996
 Clay Mineral Society meeting, Gatlinburg, TN, June, 1996
 Japan-Russia-U.S. Study Group on Dumped Nuclear Waste, Sea of Japan, Sea of Okhotsk, and N. Pacific, Niigata, Japan, June, 1996
 Korea Ocean Research & Development Institute, June, 1996
 NSF ARCSS & ONR ANWAP P.I. meetings, Snowbird, UT, May, 1996
 AGU/ASLO Ocean Sciences, San Diego, CA, Feb. 1996
 Science Planning Meeting, Research Priorities for Russian Arctic Land-Shelf Systems, National Science Foundation, Arlington, VA, October 1995
 College of Marine Studies, University of Delaware, October 1995
 Arctic Nuclear Waste Assessment Program, Woods Hole, MA, May 1995
 Workshop on Monitoring of Nuclear Contamination in Arctic Seas, Naval Research Lab, Jan. 1995
 Japan-Russia-U.S. Study Group on Dumped Nuclear Waste, Sea of Japan, Sea of Okhotsk, and N. Pacific, Biloxi, MS, Jan. 1995
 Appalachian State University, Boone, NC, October, 1994
 Briefing, Office of Technology Assessment, Washington, DC, Sept. 1994
 Arctic Division meeting, AAAS, Anchorage, AK, and Vladivostok, Russia, Aug. - Sept. 1994
 Ecological Society of America, Knoxville, TN, Aug. 1994
 Seoul National University, March, 1994
 Korea Ocean Research & Development Institute, March, 1994
 AGU/ASLO Ocean Sciences Meeting, San Diego, CA, Feb. 1994
 Appalachian State University, Boone, NC, October, 1993
 Internat'l Symposium on the Ecological Effects of Arctic Air Contamination, Reykjavik, Oct, 1993

Interagency Arctic Research Policy Workshop on Arctic Contamination, Anchorage, May, 1993
 The Oceanography Society, Seattle, April, 1993
 International Atomic Energy Agency, Vienna, April 1993
 Amer. Geophys. Union, Montréal, PQ, May 1992
 University of Tennessee, Knoxville, March 1992
 Institute of Oceanology, Russian Academy of Sciences, Moscow, Jan. 1992.
 15th Annual Plant Physiology Symposium, Riverside, CA, Jan. 1992
 Amer. Geophys. Union, San Francisco, CA, Dec. 1991
 Seoul National University, August, 1991
 Korea Ocean Research & Development Institute, August, 1991
 University of Alaska, Fairbanks, July, 1991
 Amer. Society of Limnology and Oceanography, Halifax, N.S. June, 1991
 Ecological Society of America Annual Meeting, Snowbird, UT, August, 1990
 Amer. Geophys. Union, San Francisco, CA, Dec. 1989
 Arctic Division meeting, AAAS, Fairbanks, AK, Sept. 1989
 Amer. Society of Limnology and Oceanography, Fairbanks, AK, June, 1989
 University of Tennessee, Knoxville, March, 1989
 Ecological Society of America Annual Meeting, Davis, CA, August, 1988
 Amer. Geophys. Union and Amer. Soc. of Limnol. and Oceanogr. mtg., New Orleans, Jan. 1988
 Western Society of Naturalists meeting, Long Beach, CA, Dec. 1987
 XIV Internat'l Botanical Congress, Berlin, August, 1987
 Amer. Geophys. Union and Amer. Soc. of Limnol. and Oceanogr. mtg., New Orleans, Jan. 1986
 Western Society of Naturalists meeting, Monterey, CA, Dec. 1985
 Arctic Division meeting, AAAS, Fairbanks, AK, Sept. 1985
 International Symposium on Aquatic Macrophytes, Silkeborg, Denmark, Aug. 1985

Graduate and Postdoctoral Advisor, Graduate Advisory Committee Service

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