RANDALL C. MORRIS, Ph. D.

Consulting Scientist

PERSONAL INFORMATION

Address: 788 North Skyline Drive
Idaho Falls, Idaho 83402-2678
United States of America
Cell Phone: +1.208.521.4185
Email: morrisr@cableone.net

EDUCATION

Ph.D., Radioecology, Colorado State University, 1992
Program for Ecological Studies, Colorado State University, 1989
M.S., Radioecology, Colorado State University, 1987
B.S., Wildlife Biology, Colorado State University, 1984 with highest distinction

SUMMARY OF QUALIFICATIONS

Dr. Morris is an internationally known scientist with extensive experience in ecology, radioecology, environmental impact assessment, and ecological and human health risk assessment. He was Project Manager for North Wind's participation in the Idaho National Laboratory's (INL) Environmental Surveillance, Education, and Research program. He supported GE-Hitachi Nuclear Energy in assessing potential environmental impacts of their ESBWR (Economic Simplified Boiling Water Reactor) for the UK Environment Agency. Dr. Morris collaborates with scientists from around the world on problems of ecological risk assessment and was a member of the core team of the U.S. Department of Energy's (DOE) Biota Dose Assessment Committee and the ECORAD Working Group. Dr. Morris was instrumental in the development of the ecological risk assessment procedures now in place at the Idaho National Laboratory (INL) and has been active for many years in ecology and radioecology research. He has been an advisor to the Swedish Radiation Protection Institute, a Swedish government regulatory body, on potential harm to the environment from a planned radioactive waste repository. In support of a local NGO, he has traveled throughout western Belize and northern Guatemala to identify opportunities for sustainable economic development. Dr. Morris is currently supporting the Advanced Mixed Waste Treatment Plant (AMWTP) where he is a certified Acceptable Knowledge Expert (AKE), evaluating the relevance of historical waste disposal information for establishing whether the waste meets waste acceptance criteria at the Waste Isolation Pilot Plant. He has published over 20 technical publications and made dozens of presentations to both technical and lay audiences.

RELEVANT EXPERIENCE

Consulting Scientist, North Wind, Inc., Idaho Falls, ID

As a Consulting Environmental Scientist, Dr. Morris advises North Wind and its clients on environmental impact assessment, human health and ecological risk assessment, radioecology, and ecological issues. He was Project Manager for North Wind's participation in the Idaho National Laboratory's (INL) Environmental Surveillance, Education, and Research program. He supported GE-Hitachi Nuclear Energy in assessing potential environmental impacts of their ESBWR (Economic Simplified Boiling Water Reactor) for the UK Environment Agency. Dr. Morris wrote the screening human health and ecological risk assessment of Material Disposal Area (MDA) A at Los Alamos National Laboratory and, because of his successful work there, led the screening human health and ecological risk assessment of MDA G. He assisted in strategic planning for accelerating cleanup of the Tank Farms at the DOE's Hanford Site and

supported the Supplemental Technology Demonstration Program. He assisted CH2MHill Hanford Group with incorporating risk assessment information into the Engineering Desk Book for closure of tank C-106. Dr. Morris was Project Manager for North Wind's partnership with Jason Associates for the DOE Nationwide NEPA contract. He also managed a North Wind project to develop and analyze GIS coverages of sagebrush steppe habitat for sage grouse management.

Dr. Morris is a certified Acceptable Knowledge Expert (AKE), evaluating the relevance of historical waste disposal information for establishing whether the waste meets waste acceptance criteria at the Waste Isolation Pilot Plant. In this capacity, he supports the Advanced Mixed Waste Treatment Project at the Idaho National Laboratory (INL).

Dr. Morris managed three North Wind contracts with the National Park Service to analyze more than 500,000 comments on the proposed Winter Use Plans for Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller, Jr., Memorial Parkway.

Dr. Morris is active in North Wind's International Marketing Initiative and was North Wind's representative to the Watershed Research, Education, Conservation, and Development Association (WRECDA), a non-profit organization in Belize and Guatemala of which North Wind was a founding member. He traveled extensively throughout western Belize and the Petén District of Guatemala, working with local government officials, farmers, ranchers, and townspeople to identify sustainable economic development projects for WRECDA.

Dr. Morris continues to be active in developing methods for assessing radiation doses to non-human biota, and other radioecological and ecological research topics. He was involved in developing an international philosophical and ethical framework for a system of protection of non-human biota from radiation and was an invited participant in an International Union of Radioecology workshop on the topic. In 2001, he advised the Swedish government on protection of the environment from the radiological, chemical, and physical hazards associated with a planned radioactive waste repository.

In the Spring of 2002, Dr. Morris was a keynote speaker in a NATO Advanced Research Workshop addressing the topic of methods for combining ecological and human health risk assessment approaches across the full spectrum of potential hazards. In this meeting, he presented a proposed methodology for combining risks which was widely accepted and he continues to collaborate with participants on development and evaluation of alternative methodologies.

Dr. Morris was a member of the core team of DOE's Biota Dose Assessment Committee, which developed a technical standard providing DOE guidance on assessing doses (and risks) to non-human biota and thus helping DOE facilities demonstrate compliance with currently proposed regulations. In 2001, this standard won the National Association of Environmental Professional's "Environmental Excellence" award in the category of Environmental Management. He continued this work as a member of ECORAD-WG, a cooperative workgroup between DOE, EPA, and the NRC to develop modeling tools for assessing risks to non-human biota and monitoring and contributing to the international dialogue on this subject. In 2003, Dr. Morris was asked by the U.S. Department of Energy to accept an invitation from the Japanese Institute for Environmental Sciences (IES) to make a presentation to the International Symposium on Radioecology and Environmental Dosimetry in Rokkasho, Japan on "The U.S. Department Of Energy's Graded Approach For Evaluating Radiation Doses To Non-Human Biota." This presentation was fully funded by the IES.

Dr. Morris is an accomplished proposal writer and assists in the development of many North Wind proposals. He has been Deputy Manager of the Idaho Falls Operations Division and Manager of the Technical Support Services Unit. He is currently Manager of the Public Involvement and Technical Editing Unit.

Co-owner and Vice President/Secretary, TREC, Inc., Idaho Falls, ID.

As co-owner and Vice President/Secretary of TREC, Inc., Dr. Morris' responsibilities included all aspects of management, marketing, and contract fulfillment in an environmental technical consulting firm. He developed and maintained a business plan that successfully supported securing a small business loan, oversaw the purchase of office equipment, developed and approved invoices, evaluated financial statements, and participated in all company strategic decisions. TREC, Inc. specializes in environmental services such as NEPA support, biological surveys and assessments, ecological risk assessments, and other services, as well as contract environmental research. Dr. Morris was active in several of TREC's projects, including herpetological surveys for the Nature Conservancy at Lava Lake Ranch, operating Monitoring Avian Productivity and Survivorship (MAPS) stations for the Idaho Department of Fish and Game at Deer Parks, wetlands delineation for a private client in Utah, preparing the Waste Isolation Pilot Plant Annual Site Environmental Report, and reviewing other project reports. He assisted in writing and reviewing the Closed Basins and Upper Snake Subbasin Assessments for the Columbia Basin Fish and Wildlife Authority. He was TREC's Quality Assurance Officer.

Co-director, Environmental Science and Research Foundation, Inc., Idaho Falls, ID

As Co-director of the Foundation, Dr. Morris shared responsibility for all aspects of Foundation management. He had particular responsibilities for personnel issues including work assignments, pay, benefits, and morale, with additional responsibility for strategic planning and all aspects of marketing. The Foundation was principally responsible for DOE-ID's Environmental Surveillance, Education, and Research program and Dr. Morris helped lead that effort. When the Foundation was established, Dr. Morris supported the original Director by developing initial cost plans, arranging for office furniture, allocating office space, and other tasks associated with a new office and a new contract. As an ESER Research Scientist, Dr. Morris had responsibility for managing and conducting ecological and radioecological research, including all aspects of sample collection, and quality assurance. Representative projects included:

- Developing an inventory of ^{129}I in the environment of the Idaho National Laboratory (INL).
- Determining uptake parameters for soils, contaminants, and plant species of interest to INL risk assessment.
- Studying the transport of radioactivity from the INL's TRA Warm Waste Pond by waterfowl and the potential doses to waterfowl and human hunters.
- Studying the effectiveness of different biotic intrusion barriers incorporated into low-level waste disposal caps based on evapotranspiration.
- Studying the impacts on plant and animal communities of the INL's current practice of irrigating native sagebrush steppe with sewage wastewater.
- Developing methodologies for ecological risk assessment on the INL and elsewhere.

In addition, he led a multi-disciplinary survey of the mineral and biotic resources of two caves at Craters of the Moon National Monument and collaborated with other Foundation staff to organize a national conference entitled "Landfill capping in the semi-arid west: Problems, perspectives, and solutions." He co-edited the conference proceedings.

Radioecologist, U.S. Department of Energy, Radiological and Environmental Sciences Laboratory, Idaho Falls, ID

As a Radioecologist, Dr. Morris was responsible for managing and conducting ecological and radioecological research as well as providing environmental information for DOE and contractor staff. He contributed the radioecology sections to the INL Site-wide EIS (later incorporated into the Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Final EIS). The general

duties and research topics of this position were similar to his duties in the Foundation. He maintained an "L" level security clearance for this position.

WORK HISTORY

2002–Present	North Wind, Inc., Idaho Falls, ID, *Consulting Environmental Scientist, Manager – Public Involvement and Technical Editing*
2001–2003	TREC, Inc., Idaho Falls, ID, *Co-owner, Vice President/Secretary*
2000–2003	Environmental Science and Research Foundation, Inc., Idaho Falls, ID, *Co-director (Personnel)*
2000	Department of Physics and Health Physics, Idaho State University, *Adjunct Faculty Member*
1994–2000	Environmental Science and Research Foundation, Inc., Idaho Falls, ID, *Research Scientist*
1994-2000	Department of Biological Sciences, Idaho State University, *Adjunct Faculty Member*
1990–1994	Radiological and Environmental Sciences Laboratory, U.S. Department of Energy, Idaho Operations Office, *Radioecologist*

AWARDS

National Association of Environmental Professional's "Environmental Excellence" award in Environmental Management, 2001

Performance Awards from U.S. Department of Energy, 1992, 1993

Sigma Xi, 1984

Phi Beta Kappa, 1983

TRAINING

INEEL Radiation Worker II.
OSHA Hazardous Waste Operations
RCRA Hazardous Waste Identification
First Aid and CPR

PUBLICATIONS

Morris, R.C., 2006, "Applying DOE's biota dose assessment methodology at the INL," *Journal of Environmental Radioactivity*, 87:77-100.

Hampton, N. L., R. C. Morris, and R. L. VanHorn, 1998, "Methodology for conducting screening-level ecological risk assessments for hazardous waste sites, Part II: Grouping Ecological Components, *International Journal of Environment and Pollution*, 9:47–61.

VanHorn, R. L., N. L. Hampton, and R. C. Morris, 1998, "Methodology for conducting screening-level ecological risk assessments for hazardous waste sites, Part I: Overview," *International Journal of Environment and Pollution*, 9:26–46.

Ibrahim, S. A. and R. C. Morris, 1997, "Distribution of plutonium among soil phases near a subsurface disposal area in southeastern Idaho, USA," *Journal of Radioanalytical and Nuclear Chemistry*, 226:217–220.

Morris, R. C. and L. Fraley, Jr., 1994, "Soil Permeability as a function of vegetation type and soil water content," *Health Physics*, 66:691–698.

Morris, R. C. and L. Fraley, Jr., 1989, "Effects of vegetation, a clay cap and environmental variables on ^{222}Rn fluence rate from reclaimed U mill tailings," *Health Physics*, 56:431–440.

Published Reports, Symposia, and Proceedings

Morris, R.C. and S.L. Domotor, 2004, "The U.S. Department Of Energy's Graded Approach For Evaluating Radiation Doses To Non-Human Biota," Proceedings of the International Symposium on Radioecology and Environmental Dosimetry, 22-24 October 2003, Rokkasho, Aomori, Japan. Rokkasho, Japan, Institute for Environmental Sciences.

Morris, R.C., 2003, "Defining the spatial area for assessing doses to non-human biota," Proceedings of the Third International Symposium on the Protection of the Environment from Ionising Radiation (SPEIR-III), 22-26 July, 2002, Darwin, Northern Territory, Australia. IAEA-CSP-17. Vienna, International Atomic Energy Agency.

Morris, R.C., 2003, "The application of the U.S. Department of Energy's Graded Approach at the Waste Isolation Pilot Plant: A Case Study," Proceedings of the Third International Symposium on the Protection of the Environment from Ionising Radiation (SPEIR-III), 22-26 July, 2002, Darwin, Northern Territory, Australia. IAEA-CSP-17. Vienna, International Atomic Energy Agency.

Morris, R.C. and R.L. VanHorn, 2003, "Ecological risk assessment as a method for integrating risks from multiple stressors at hazardous waste sites," Proceedings of Ecological Standardization And Equidozimetry For Radioecology And Environmental Ecology, NATO Advanced Research Workshop, 14-19 April 2002, Kiev, Ukraine, Amsterdam, Kluwer Press.

Isaeff, P. I., T. D. Reynolds, and R. C. Morris, 2001, "Upper Snake River Province, Snake Headwaters Subbasin Summary," Northwest Power Planning Council, Columbia Basin Fish and Wildlife Authority, http://www.cbfwa.org/files/province/uprsnake/subsum..htm, 310 pp + 11 appendices.

Morris, R. C., T. D. Reynolds, 2001, "Waste Isolation Pilot Plant 2000 Site Environmental Report," DOE/WIPP 01-2225, 161 pp + 8 appendices.

Reynolds, T. D., P. I. Isaeff, and R. C. Morris, 2001, "Upper Snake River Province, Closed Basin Subbasin Summary," Northwest Power Planning Council, Columbia Basin Fish and Wildlife Authority, http://www.cbfwa.org/files/province/uprsnake/subsum..htm, 178 pp + 8 appendices.

Evans, R. B., A. A. Luft, D. Martin, R. C. Morris, T. D. Reynolds, R. W. Warren, 2000, "Waste Isolation Pilot Plant 1999 Site Environmental Report," Environmental Science and Research Foundation, Inc., Idaho Falls, ID.

Morris, R. C. and R. L. VanHorn, 1999, "Screening risks to terrestrial vertebrates from radionuclide contamination in soil and water," Proceedings of the Waste Management 99 Conference, 28 February – 4 March 1999, Tucson, AZ.

Morris, R. C. and R. D. Blew, eds., 1997, "Environmental Science and Research Foundation Annual Technical Report to DOE-ID, Calendar Year 1996," ESRF-017, Environmental Science and Research Foundation, Idaho Falls, ID.

Reynolds, T. D. and R. C. Morris, eds., 1997, "Landfill capping in the semi-arid west: problems, perspectives, and solutions," ESRF-019, Environmental Science and Research Foundation, Idaho Falls, ID, available at http://esrf.org/pdf/Capping.htm

Morris, R. C., R. C. Anderson, S. Earl, M. McCurry, and L. Pearson, 1996, "A mineral and biotic survey of two caves at Craters of the Moon National Monument," ESRF-008, Environmental Science and Research Foundation, Idaho Falls, ID.

Reynolds, T. D. and R. C. Morris, eds., 1996, "Environmental Science and Research Foundation Annual Technical Report to DOE-ID, Calendar Year 1995," ESRF-012, Environmental Science and Research Foundation, Idaho Falls, ID.

Earl, S. and R. C. Morris, 1995, "A survey of 14 caves on the Idaho National Engineering Laboratory," ESRF-006, Environmental Science and Research Foundation, Idaho Falls, ID.

VanHorn, R. L., N. L. Hampton, and R. C. Morris, Principle Investigators, 1995, "Guidance Manual for Conducting Screening Level Ecological Risk Assessments at the INEL," INEL-95/0190, Idaho Falls, ID.

Morris, R. C., 1993, "The implications of lined radioactive waste ponds for waterfowl contamination," pages 147–155 in R. L. Kathren, D.H. Denham, and K. Salmon, eds., "Environmental Health Physics: Proceedings of the Twenty-Sixth Midyear Topical Meeting of the Health Physics Society," Columbia Chapter of the Health Physics Society, Richland, WA.

White Papers

Morris, R.C., R. VanHorn, and D. Arrenholz, 2002, "The future of ecological risk assessment at the Idaho National Engineering and Environmental Laboratory," NWE-ID-2002-051, Prepared for the Environmental Surveillance, Education, and Research Program and the U.S. Department of Energy, Idaho Operations Office.

Morris, R.C., 2003, "Biota dose assessment guidance for the INEEL," NW-ID-2003-062, Prepared for the Environmental Surveillance, Education, and Research Program and the U.S. Department of Energy, Idaho Operations Office.

Technical Presentations

Dr. Morris has presented dozens of technical papers, chaired technical sessions, and served as the invited keynote speaker at regional, national, and international scientific meetings.

Professional Activities

Past Member Member of Editorial Board for the Journal of Environmental Radioactivity

Peer Reviewer for Health Physics, Journal of Environmental Radioactivity, Journal of Environmental Quality, Environmental Toxicology and Chemistry, and Environmental Monitoring and Assessment.

Past Book Review Editor for Northwest Science.

Invited Speaker on the topic of the U.S. Department of Energy's Graded Approach For Evaluating Radiation Doses To Non-Human Biota at the International Symposium on Radioecology and Environmental Dosimetry, 22-24 October 2003, Rokkasho, Aomori, Japan.

Invited Keynote Speaker on the topic of ecological risk assessment methods at the NATO Advanced Research Workshop "Ecological Standardization and Equidosimetry for Radioecology and Environmental Ecology," 14–19 April 2002, Kiev, Ukraine. This workshop focused on developing methods for analyzing ecological and human health risks from chemical, radiological, and physical hazards in a common framework, thus enabling managers to work with a single risk evaluation for a given landscape. Dr. Morris will coauthor the final report from this workshop and continues to interact with the other participants on the workshop issues.

Member of an international team providing advice to the Swedish Radiological Protection Institute on protection of the environment from the potential radiological, chemical, and physical hazards associated with a proposed high-level waste repository.

Invited participant in "Radiation Protection in the 21st Century: Ethical, Philosophical and Environmental Issues, A consensus conference on protection of the environment." This was an international consensus conference sponsored by the Norwegian Radiation Protection Authority, the Agricultural University of Norway, the NKS, and the International Union of Radioecology, Oslo, Norway, 22–25 October 2001.

Member of the Core Team of DOE-HQ's Biota Dose Assessment Committee to develop methodologies for demonstrating compliance with proposed regulations (10CFR834, subpart f) limiting radiation dose to non-human aquatic and terrestrial biota. As a member of the team Dr. Morris made important contributions to an interim standard, "A graded approach for evaluating radiation doses to aquatic and terrestrial biota." In 2001, this standard won the National Association of Environmental Professional's "Environmental Excellence" award in the category of Environmental Management.

Participated, by invitation, in a DOE-HQ sponsored workshop to assess the adequacy of current International Atomic Energy Agency recommendations for radiological protection of non-human aquatic and terrestrial biota and their relevancy to DOE facilities, June 14–15, 1995.

Participated, by invitation, in a DOE-HQ funded workshop entitled "Improving the DOE/EM Risk Information," October 3–4, 1996.

Participated in DOE's Risk-based Standards Working Group, Ecological Risk Task Force, 1993–1996.

Session chair at 1999 annual meeting of the Ecological Society of America and 2001 Meeting of the Health Physics Society.

In cooperation with another Foundation staff member, planned, conducted, and edited the proceedings of a national conference entitled "Landfill Capping in the Semi-Arid West: Problems, Perspectives, and Solutions," May 1997.

Society Memberships

The International Union of Radioecology
Health Physics Society including Environmental Radiation Section.
The Ecological Society of America including the Applied Ecology Section.

Community Activities

Greater Idaho Falls Chamber of Commerce Legislative Committee.
Tech Connect East Board of Directors.
Idaho Falls Higher Education Advisory Council – Advocacy Committee.

Personal Activities

First Degree Black Belt and Former Instructor Trainee in Songham Taekwondo