

## BIOGRAPHICAL SKETCH

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Directed studies to assess past and present impacts of the U.S. Department of Energy's Hanford Site in southeastern Washington and Pantex Plant in the Texas Panhandle on the environment and surrounding human populations (included extensive public outreach and involvement programs). Directed studies to evaluate health and environmental impacts and improve the environmental acceptability of coal-conversion processes; assessed effects of nuclear, fossil, and hydroelectric power generation on water quality and the environment. Holds BA and MA degrees in biological sciences and a Ph.D. in zoology and ecology; authored more than 260 book chapters and open literature and symposia articles, over 70 technical reports, and edited 8 books. Member of the American Fisheries Society (AFS) and the Ecological Society of America. Past President of AFS Water Quality Section and Fellow of the American Institute of Fisheries Research Biologists (AIFRB). Member of AIFRB Fisheries delegation to East Asia. Appointed U.S. representative to International Atomic Energy Agency Scientific Panel on environmental monitoring and to Pima County (Arizona) Scientific Advisory Group to establish water quality criteria/standards for the arid and semi arid west. Served as consultant to Brookhaven National Laboratory, Upton, NY on environmental monitoring. Serving as consultant (principal investigator) to Southwest Research Institute, San Antonio, Texas on the Umatilla Chemical Agent Disposal Facility Comprehensive Environmental Monitoring Program in Oregon. Member of Environmental Protection Agency Science Achievement Panel in Biology/Ecology. Past Chairman of Richland Ecology Commission and member of Richland Board of Ethics.

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## RESUME

### ROBERT H. GRAY

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### EDUCATION

BA	Biology (cum laude), Winona State University	1964
MA	Biological Sciences, University of Oregon	1967
PhD	Zoology, Ecology, Illinois State University	1971

### SUMMARY OF QUALIFICATIONS

Formal graduate training and research and applied experience in environmental sciences and environmental protection. College level teaching experience. Experience in the design, direction and conduct of ecological research to assess effects of electric power generation and hazardous materials on aquatic and terrestrial biota. Experience in managing large multidisciplinary projects dealing with environmental, health, and engineering aspects of energy technology development. Numerous publications.

### EXPERIENCE

Joined staff of Battelle, Pacific Northwest National Laboratory (PNNL), Richland, WA in July 1973. Directed and implemented studies to assess environmental effects resulting from construction and operation of power plants (nuclear and hydroelectric) on the Columbia and Snake Rivers. Involved in assessing potential environmental effects from the proposed construction and operation of a nuclear power plant on Cape Cod Bay. Prepared various environmental planning documents, State Site Applications, Environmental Reports, Environmental Impact Statements, National Pollutant Discharge Elimination System Permit Applications, and interrogatories and testimony.

Assigned to Ocean Thermal Energy Conversion (OTEC) Biofouling and Corrosion Project Office in 1977. Prepared work statements and requests for proposals, evaluated proposals, served as technical monitor for funded research and developed plans for and designed future studies. PNNL managed the multi-disciplinary Biofouling and Corrosion Project for the U.S. Department of Energy's (DOE) Division of Solar Technology.

Became Associate Manager of Battelle's Freshwater Sciences Section in 1979.

Became Manager of the multidisciplinary Coal Liquefaction Environmental Research Program (CLERP) in 1981. The CLERP, funded by DOE, evaluated potential health and environmental impacts of coal liquefaction processes and identified the chemical agents responsible for effect. Resulting data were used in health and environmental assessments and to identify process changes and control technologies needed to design and develop an environmentally acceptable coal liquefaction industry. Program was later expanded and retitled Health and Environmental Research on Complex Organic Mixtures to include evaluation of other energy-related materials such as shale oils, petroleum, and combustion products.

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Became the Manager of the multimillion dollar Hanford Environmental Surveillance and Oversight Program (HES&OP) in 1987. The Program was designed to detect and assess environmental impacts of energy-related and other activities on DOE's Hanford Reservation in Washington State.

Became Manager of the Office of Hanford Environment in 1990 which, in addition to HES&OP, included National Environmental Policy Act (NEPA), Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act and radiological dose reconstruction activities, and oversight and management of analytical support services for the Hanford Site. Scope of these efforts was further broadened and the office retitled the Office of Health and Environment in 1993. Total funding for this work exceeded \$30M annually.

Became Manager of Environmental Protection for Battelle Pantex at the DOE Pantex Plant near Amarillo, TX in 1994. Responsibilities included environmental monitoring, public and environmental protection, analytical support services, environmental compliance for Plant operations, natural and cultural resource protection, emergency management support, meteorology, NEPA and other environmental reviews, permitting, and strategic planning. From 1994 to 1996, staff size grew from about 25 to 60 professionals.

Returned to PNNL as a Senior Program Manager for environmental business development in 1997.

Research activities have included: 1) adaptive significance of color polymorphism in amphibians and amphibian malformations and declines, 2) use of radiotelemetry to study depth distribution and behavior of adult salmonids in relation to gas supersaturated water and hydroelectric dams in the Snake River, and the seasonal location, distribution and movement of white sturgeon in the mid-Columbia River; 3) development and use of methods and systems to evaluate behavioral reactions of fish to a thermal stress; 4) development of methods to evaluate the effects of hazardous materials on the behavior and physiology of fish, invertebrates and algae; and 5) assessment of effects of cooling water intake structures and changes in engineering design and operating procedures for minimizing biological loss. I am a SCUBA diver, certified by the National Association of Underwater Instructors and the State of Washington.

Served as a consultant to the Italian National Government on gas bubble disease and other environmental problems related to energy-technology development. Member of the American Institute of Fisheries Research Biologists Delegation to East Asia in 1985. Invited to serve on a similar delegation to the Soviet Union in 1991.

Appointed United States representative on an International Atomic Energy Agency Scientific Panel in 1997 to develop standards/guidelines for environmental monitoring once a contaminated site is cleaned up. Selected to serve on the PIMA County (Arizona) Scientific Advisory Group (SAG) in 1998. The SAG sets the research agenda, determines the technical content of requests for proposals, and reviews progress on funded work to improve the scientific basis for establishing water quality criteria/standards for the arid and semiarid West, and for regulating discharge of treated wastewater and municipal and industrial stormwater. Also served as a consultant to Brookhaven National Laboratory, Upton, NY on issues related to environmental monitoring.

Retired from Battelle in 2000 to establish RH Gray & Associates. Currently a consultant to PIMA County, AZ on water quality issues related to the arid west and to Southwest Research Institute, San Antonio, TX on the Umatilla Chemical Agent Disposal Facility Comprehensive Environmental Monitoring Program (serves as Principal Investigator) in Oregon.

Served as referee for several technical journals including Herpetologica, Ecology, Journal of the Fisheries Research Board of Canada, Science, Aquatic Toxicology, Transactions of the American Fisheries Society, Canadian Journal of Fisheries and Aquatic Sciences, Journal of Fish Biology, Fishery Bulletin, Environmental

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Management, The Prairie Naturalist, Northwest Science, The Environmental Professional, Archives of Environmental Contamination and Toxicology, Fisheries, Transactions of the Illinois State Academy of Science and others. Edited the "Proceedings" of the Ocean Thermal Energy Conversion (OTEC) Biofouling and Corrosion, and Environmental Monitoring, Restoration and Assessment Symposia and co-edited the "Proceedings" of the Condenser Biofouling Control, Coal Conversion and the Environment, International Water Quality, and Health and Environmental Research on Complex Organic Mixtures Symposia. Edited a book describing the toxicological, chemical, and engineering database for coal conversion materials. Organized and served as chairman of several technical symposia for such organizations as DOE, the Electric Power Research Institute, the Environmental Protection Agency, the American Fisheries Society, the Society of Environmental Toxicology and Chemistry, and the American Chemical Society.

Academically, directed the graduate research of a master's candidate from Washington State University (as an adjunct professor), and a doctoral candidate from the University of Minnesota. Prior to joining Battelle, was on the full-time faculty of Lake Erie College, Painesville, OH, as Head of the Biology Department. Taught Introduction to Biology, Anatomy, Physiology, Developmental Biology, Ecology, Botany, and Organismic Biology. During the summer of 1972, was visiting professor at the University of North Dakota in Grand Forks and taught General Ecology, and a graduate seminar in Genetic Polymorphism. While in graduate school, held assistantships at the University of Oregon and Illinois State University (member, Graduate Student Advisory Committee) teaching General Biology, Vertebrate Biology, Human Physiology, Comparative Anatomy, Aquatic Biology and Marine Ecology. Also taught high school and was a research technician in Gastroenterology at the Mayo Clinic, Rochester, Minnesota.

**APPOINTMENTS AND OTHER ACTIVITIES**

Lake County Air Pollution Control Advisory Board, Painesville, OH, 1972

Lower Columbia Basin Search and Rescue Council, Richland, WA

President, 1975

Emergency Services Coordinator and Public Relations, 1976-1978,

Secretary, 1978

Richland Ecology Commission, Richland, WA, 1984-1992

Vice Chairman, 1986-1987

Chair, 1987-1991

Hanford Speakers Bureau, Richland, WA, 1989-1994

Hanford Technical Exchange

Chair, 1990-1994

Washington State University - Tri-Cities Consolidated Information Center, Richland, WA, 1993

Chair, Environmental Resource Center Subcommittee, 1993

Richland Board of Ethics, Richland, WA, 1993-1994

Federal Advisory Committee on Water Data for Public Use, Washington, D.C., 1993-1995

Pantex Plant Speakers Bureau, Amarillo, TX, 1994-1997

Pantex Plant Spokesperson, Emergency Management/Response Situations, Amarillo, TX, 1996-1997

International Atomic Energy Agency Scientific Panel on Post-Restoration Monitoring, 1997-1998

PIMA County (Arizona) Scientific Advisory Group on water quality and discharge of treated wastewater and municipal and industrial stormwater, 1998-present

Horn Rapids Home Owners Association, Architectural Committee

Chair, 2004-present

**ROBERT H. GRAY (continued)****HONORS AND AWARDS**

National Science Foundation Traineeship, 1968-1971  
 Phi Sigma National Honor Society Award (1969-1970) as outstanding graduate student with demonstrated research potential: given in conjunction with the National Office of Phi Sigma and Illinois State University  
 Illinois State University Alumni Achievement Award, 1983  
 Winona State University Distinguished Alumni Award, 1984  
 People to People Fisheries Research Delegation, Citizen Ambassador Program to East Asia (Japan, Peoples Republic of China, Republic of Korea), 1985  
 Illinois State University Outstanding Service Award, 1986  
 The Foundation for Environmental Conservation, Geneva Switzerland, Best Paper Prize for 1989 (Gray, R.H. and W.H. Rickard). The Protected Area of Hanford as a Refugium for Native Plants and Animals. Environmental Conservation 10(3):251-260 & 215-216), 1990.  
 DOE-RL Managers Award for Teamwork, 1992, for exemplary demonstration of teamwork on an activity that significantly advances Hanford's clean-up mission and environmental restoration.  
 Illinois State University Distinguished Alumni Award, 2004

**PROFESSIONAL AFFILIATIONS/COMMITTEES**

American Association for the Advancement of Science  
 American Fisheries Society  
     Environmental Concerns Committee, 1988-1989  
     Nominating Committee, 1988-1989  
     Permanent Home Fund Committee, 1984  
     Publication Awards Committee, 1987  
     Skinner Memorial Fund Committee, 1985  
     Time and Place Committee, 1987-1994, 1998-2004  
         Chair, 1987-1994  
     Water Quality Section, 1976-Present,  
         President, 1992-1993  
     Water Quality Symposium Committee,  
         Chair, 1986-1991  
     Western Division, Time and Place Committee, 2002-2003  
 American Institute of Fisheries Research Biologists  
     Member, 1976  
     Fellow, 1983  
 American Men and Women of Science  
 Canadian Directory of Aquatic Toxicologists and Related Specialists, 1985  
 Directory of North American Fisheries and Aquatic Sciences, 1984, 1987  
 Ecological Society of America  
 Hazardous Materials Control Research Institute  
 International Water Resources Association  
 International Who's Who of Professionals  
 National Audubon Society  
 National Geographic Society  
 National Wildlife Federation  
 Native American Fish & Wildlife Society

**ROBERT H. GRAY (continued)**

New York Academy of Sciences

Pacific Science Association

Communicating Science and Science Education Committee, 1995-present

Phi Sigma National Honor Society, Beta Lambda Chapter, 1967-1971

President, 1969-1970

Quality Amarillo

Society of Environmental Management and Technology

The George Wright Society

**PUBLICATIONS**Dissertation

Gray, R.H. 1971. Ecological Studies on Color Polymorphism in the Cricket Frog, *Acris crepitans* Baird. Ph.D. Dissertation, Illinois State University, Normal. 108 p.

Journal Articles/Book Chapters

Gray, R.H. 1971. Fall Activity and Overwintering of the Cricket Frog, *Acris crepitans*, in Central Illinois. *Copeia* 1971(4):748-750.

Gray, R.H. 1972. Metachrosis of the Vertebral strip in the Cricket Frog, *Acris crepitans*. *Am. Mid. Nat.* 87(2):549-551.

Gray, R.H. 1972. Ecological Studies on Color Polymorphism in the Cricket Frog, *Acris crepitans* Baird. *Diss. Abs. Int.* 32(7):3793-3794B.

Gray, R.H. 1976. Telemetry Studies at Battelle, Pacific Northwest Laboratories, *Underwater Telemetry* 6(1):19.

Gray, R.H., and D.D. Dauble. 1976. New Distribution Records and Notes on Life History and Behavior of the Sand Roller, *Percopsis transmontana* (Eigenmann and Eigenmann). *SYESIS* 9:369-370.

Gray, R.H., and D.A. Neitzel. 1976. Surber Sampling in Deep Water for Bottom Organisms. *Prog. Fish-Cult.* 38(3):142-143.

Haynes, J.M., R.H. Gray, and J.C. Montgomery. 1977. Seasonal Movements of White Sturgeon (*Acipenser transmontanus*) in the Mid-Columbia River, *Underwater Telemetry* 7(1):11.

Gray, R.H., with R.G. Genoway and S.A. Barraclough. 1977. Behavior of Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) in Relation to Simulated Thermal Effluents. *Trans. Am. Fish. Soc.* 106(4):366-370.

Dauble, D.D., and R.H. Gray. 1977. A Microfiche Reader for Projecting Fish Scale Images. *Prog. Fish-Cult.* 39(2):75.

**ROBERT H. GRAY (continued)**Journal Articles/Book Chapters (continued)

Gray, R.H., and D.D. Dauble. 1977. Checklist and Relative Abundance of Fish Species from the Hanford Reach of the Columbia River. Northwest Sci. 51(3):208-215. Reprinted in: pp. 241-248, Museum Studies and Wild Life Management, 1979. Compiled and annotated by RC Banks. Smithsonian Institution Press, Washington, DC.

Gray, R.H., and J.M. Haynes. 1977. Depth Distribution of Adult Chinook Salmon (*Oncorhynchus tshawytscha*) in Relation to Season and Gas Supersaturated Water. Trans. Am. Fish. Soc. 106(6):617-620.

Gray, R.H. 1977. Lack of Physiological Differentiation in Three Color Morphs of the Cricket Frog (*Acris crepitans*) in Illinois. Trans. Ill. Acad. Sci. 70(1):73-79.

Haynes, J.M., R.H. Gray, and JC Montgomery. 1978. Seasonal Movements of White Sturgeon (*Acipenser transmontanus*) in the Mid-Columbia River. Trans. Am. Fish. Soc. 107(2):275-280.

Dauble, D.D., R.H. Gray, R.W. Hanf, and T.M. Poston. 1978. Occurrence of a Wild Albino Chinook Salmon (*Oncorhynchus tshawytscha*) in the Columbia River. Northw. Sci. 52(2):108-109.

Gray, R.H. 1978. Nondifferential Predation Susceptibility and Behavioral Selection in Three Color Morphs of Illinois Cricket Frogs (*Acris crepitans*). Trans. Ill. Acad. Sci. 71(4):356-360.

Gray, R.H., D.A. Neitzel, and T.L. Page. 1979. Water Intake Structures: Engineering Solutions to Biological Problems. The Northern Engineer 10(1):26-33.

Gray, R.H., and J.M. Haynes. 1979. Spawning Migration of Adult Chinook Salmon (*Oncorhynchus tshawytscha*) Carrying External and Internal Transmitters. J. Fish. Res. Board Can. 36(9):1060-1064.

Gray, R.H., and D.D. Dauble. 1979. Biology of the Sand Roller In the Central Columbia River. Trans. Am. Fish. Soc. 108(6):646-649.

Haynes, J.M., and R.H. Gray. 1980. Influence of Little Goose Dam on Upstream Movement of Chinook Salmon (*Oncorhynchus tshawytscha*). Fish Bull. 78(1):185-190.

Dauble, D.D., and R.H. Gray. 1980. Comparison of a Small Seine and a Backpack Electroshocker to Evaluate Nearshore Fish Populations in Rivers. Prog. Fish-Cult. 42(2):93-95.

Gray, R.H. 1980. Fish Behavior: Biological and Engineering Considerations. The Northern Engineer 12(2):4-12.

Dauble, D.D., R.H. Gray, and T.L. Page. 1980. Importance of Insects and Zooplankton in the Diet of O-age Chinook Salmon (*Oncorhynchus tshawytscha*) in the Central Columbia River. Northw. Sci. 54(4):253-258.

Dauble, D.D., E.W. Lusty, W.E. Fallon, and R.H. Gray. 1981. Mixing and Separation Device for Continuous Flow Bioassays with Coal Liquids. Bull. Environm. Contam. Toxicol. 26:717-721.

Haynes, J.M., and R.H. Gray. 1981. Diel and Seasonal Movements of White Sturgeon, *Acipenser transmontanus*, in the Mid-Columbia River. Fish Bull. 79(2):367-370.

**ROBERT H. GRAY (continued)**Journal Articles/Book Chapters (continued)

Gray, R.H., T.L. Page, M.G. Saroglia, and P. Bronzi. 1982. Comparative Tolerance to Gas Supersaturated Water of Carp, *Cyprinus carpio*, and Black Bullhead, *Ictalurus melas*, from the USA and Italy. J. Fish Biol. 20:223-227.

Gray, R.H., R.W. Hanf, D.D. Dauble, and J.R. Skalski. 1982. Chronic Effects of a Coal Liquid on a Freshwater Alga, *Selenastrum capricornutum*. Environ. Sci. & Technol. 16(4):225-229

Crass, D.W., and R.H. Gray. 1982. Snout Dimorphism in White Sturgeon (*Acipenser transmontanus*) from the Columbia River at Hanford, Washington. Fish Bull. 80(1):158-160.

Dauble, D.D., W.E. Fallon, R.H. Gray, and R.M. Bean. 1982. Effects of Coal Liquid Water-Soluble Fractions on Growth and Survival of Four Aquatic Organisms. Arch. Environ. Contam. Toxicol. 11:553-560.

Neitzel, D.A., T.L. Page, R.H. Gray, and D.D. Dauble. 1982. Once Through Cooling on the Columbia River--The Best Available Technology? Environ. Impact Assess. Rev. 3(1):43-58.

Gray, R.H., T.L. Page, M.G. Saroglia, and V. Festa. 1983. Tolerance of Carp, *Cyprinus carpio*, and Black Bullhead, *Ictalurus melas*, to Gas-Supersaturated Water under Lotic and Lentic Conditions. Environ. Pollut. (Series A) 30:125-133.

Gray, R.H., T.L. Page, and M.G. Saroglia. 1983. Behavioral Response of Carp (*Cyprinus carpio*) and Black Bullhead (*Ictalurus melas*) from Italy to Gas Supersaturated Water. Env. Biol. Fish. 8(2):163-167.

Gray, R.H. 1983. Seasonal, Annual and Geographical Variation in Color Morph Frequencies of the Cricket Frog (*Acris crepitans*) in Illinois. Copeia 1983(2):300-311.

Gray, R.H., R.M. Bean, D.D. Dauble, and W.E. Fallon. 1983. Chemical Characteristics and Acute Toxicity of Sequentially-Extracted, Water-Soluble Fractions of a Coal Liquid. Environ. Pollut. A32(2):79-88.

Gray, R.H. 1983. Behavioral Response of Fish to Altered Water Quality: A Review of Selected Examples with Emphasis on Salmonids. Environ. Impact Assess. Rev. 4(1):84-96.

Gray, R.H. 1983. A Strategy for Environmentally Acceptable Technology Development. The Northern Engineer 15(2):12-17.

Dauble, D.D., W.E. Fallon, R.M. Bean, R.H. Gray, and L.J. Felice. 1983. Retention and Toxicity of a Coal Liquid in Artificially Contaminated Sediments. Water, Air, and Soil Pollut. 20:391-399.

Gray, R.H. 1984. Health and Environmental Effects of Coal Liquefaction Processes: Environmentally Acceptable Technology Development. Energy 9(4):315-322.

Scarano, G., M.G. Saroglia, R.H. Gray, and E. Tibaldi. 1984. Hematological Responses of Sea Bass (*Dicentrarchus labrax*) to Sublethal Nitrite Exposures. Trans. Am. Fish. Soc. 113(3):360-364.

Gray, R.H. 1984. Chemical and Toxicological Aspects of Coal Liquefaction and Other Complex Mixtures. Reg. Toxicol. and Pharmacol 4:380-390.

**ROBERT H. GRAY (continued)**Journal Articles/Book Chapters (continued)

- Gray, R.H. 1984. Effective Breeding Size and the Adaptive Significance of Color Polymorphism in the Cricket Frog (*Acris crepitans*) in Illinois, USA. *Amphibia-Reptilia* 5:101-107.
- Gray, R.H., M.G. Saroglia, and G. Scarano. 1985. Comparative Tolerance to Gas Supersaturated Water of Two Marine Fishes (*Dicentrarchus labrax* and *Mugil cephalus*). *Aquaculture* 48:83-89.
- Dauble, D.D., R.H. Gray, J.R. Skalski, E.W. Lusty, and M.A. Simmons. 1985. Avoidance of a Water-Soluble Fraction of Coal Liquid by Fathead Minnows. *Trans. Am. Fish. Soc.* 114:754-760.
- Gray, R.H., T.L. Page, D.A. Neitzel, and D.D. Dauble. 1986. Assessing Population Effects from Entrainment of Fish at a Large Volume Water Intake. *Environ. Sci. & Health A21(2)*:191-209.
- Gray, R.H. 1986. Coal Liquefaction Process Development: Solving Potential Health and Environmental Problems. *Energy* 11:(11/12):1337-1346. In: T.A. Siddiqi and S. Shihua (eds.), *Newer Coal Technologies: Implications for Energy and Development Policies in Asia and the Pacific*. Pergamon, Oxford, United Kingdom.
- Gray, R.H. 1987. Coal: Can It Be Converted to Environmentally Acceptable Liquid Fuels? *J. Coal Quality*, 6(3):82-88.
- Gray, R.H., H. Drucker, and M.J. Massey. 1988. Chapter 1, Introduction and Summary, pp. 1-11. In: *Toxicology of Coal Conversion Processing*. Edited by R.H. Gray, H. Drucker and M.J. Massey, John Wiley & Sons, New York, NY.
- Dauble, D.D., D.A. Dankovic, C.S. Abernethy, and R.H. Gray. 1988. Induction of Hepatic Aryl Hydrocarbon Hydroxylase Activity in Rainbow Trout (*Salmo gairdneri*) Exposed to Coal Liquids. *Comp. Biochem. Toxicol.* 91C(2):431-435.
- Gray, R.H. 1989. Energy Production: Applied Environmental Evaluation and Assessment. *Intern. J. Environ. Studies* 32:269-284.
- Gray, R.H., R.E. Jaquish, P.J. Mitchell, and W.H. Rickard. 1989. Environmental Monitoring at Hanford, Washington, USA: A Brief Site History and Summary of Recent Results. *Environ. Manage.* 13(5):563-572.
- Gray, R.H., and W.H. Rickard. 1989. The Protected Area of Hanford as a Refugium for Native Plants and Animals. *Environ. Conserv.* 16(3):251-260 & 215-216.
- Gray, R.H. 1990. Fish Behavior and Environmental Assessment. *Environ. Toxicol. and Chem.* 9:53-67.
- Gray, R.H. 1991. Cleaning up Radioactive and Chemical Waste Sites: Is the Benefit Worth the Cost and Risk? *Fisheries* 16(3):2-3.
- Fitzner, R.E., and R.H. Gray. 1991. The Status, Distribution and Ecology of Wildlife on the U.S. DOE Hanford Site: A Historical Overview of Research Activities. *Environ. Mon. & Assess.* 18:173-202.
- Gray, R.H. 1992. Is the Cleanup Worth It? *Forum for Applied Research and Public Policy* 7(1):112.

**ROBERT H. GRAY (continued)**Journal Articles/Book Chapters (continued)

Becker, C.D., and R.H. Gray. 1992. Past and Present Water-Quality Conditions in the Hanford Reach, Columbia River. *Environ. Mon. & Assess.* 22:137-152.

Gray, R.H. 1992. Multimedia Environmental and Biological Surveillance at the U.S. Department of Energy's Hanford Site, Southeastern Washington (invited book chapter), pp. 21-34. In: R.L. Jolley and R.G.M. Wang (eds.), *Effective and Safe Waste Management: Interfacing Sciences and Engineering with Monitoring and Risk Analysis*. Lewis Publishers, Boca Raton, FL.

Gray, R.H., and C.D. Becker. 1993. Environmental Cleanup: The Challenge at the Hanford Site, Washington, USA. *Environ. Manage.* 17(4):461-475.

Gray, R.H. 1993. Case Study: Applying Total Quality Environmental Management to Hanford's Public Outreach and Involvement Efforts. *Federal Facilities Environ. J.* 4(2):231-243.

Gray, R.H. 1993. Multimedia Environmental Monitoring: 50 Years at Hanford. *Environ. Mon. & Assess.* 26:263-276.

Fitzner, R.E., L.E. Eberhardt, W.H. Rickard, and R.H. Gray. 1994. Great Basin Canada Goose Nesting on the Mid-Columbia River Washington: An Historical Perspective and Update, 1981-1990. *Northw. Sci.* 68(1):37-42.

Fitzner, R.E., and R.H. Gray. 1994. Winter Diet and Weights of Barrow's and Common Goldeneye in Southcentral Washington. *Northw. Sci.* 68(3):172-177.

Rickard, W.H., and R.H. Gray. 1995. The Hanford Reach of the Columbia River: A Refuge for Fish, and Riverine Wildlife and Plants in Eastern Washington. *Natural Areas J.* 15(1):68-74.

Fitzner, R.E., R.H. Gray, and W.T. Hinds. 1995. Heavy Metal Concentrations in Great Blue Heron Nesting Colonies in Washington State: A Technique for Monitoring Regional and Global Trends in Environmental Contaminants. *Bull. Environ. Contam. Toxicol.* 55(3):398-403.

Gray, R.H., and D.A. McGrath. 1995. Environmental Monitoring at DOE's Pantex Plant in Amarillo, Texas. *Fed. Fac. Environ. J.* 6(2):79-88.

Gray, R.H. 1995. Evaluation of Fish Behaviour as a Means of Pollution Monitoring (invited book chapter), pp. 336-361. In: B.C. Rana (ed.), *Pollution and Biomonitoring*. Tata McGraw Hill Publishing Co. Ltd., New Delhi, India.

Gray, R.H. 1995. An Unusual Color Pattern Variant in Cricket Frogs (*Acris crepitans*) from Southern Illinois. *Trans. Ill. Acad. Sci.* 88(3&4):137-138.

Gray, R.H. 1996. Stakeholder Involvement and Public Outreach at two Department of Energy Sites. *Health Phys.* 70(6, Suppl.1):569-570.

Gray, R.H. 1997. A Description of Long-term Environmental Monitoring and Assessment Programs at two Department of Energy Sites (invited paper). *Water Environ. Res.* 69(5):1015-1021.

**ROBERT H. GRAY (continued)**Journal Articles/Book Chapters (continued)

Gray, R.H. 1997. Environmental Monitoring at two Department of Energy Sites, pp. 101-116. In: F.J. Dwyer, T.R. Doane, and M.L. Hineman (eds.), Environmental Toxicology and Risk Assessment: Modeling and Risk Assessment (Sixth Volume). ASTM STP 1317, American Society Testing and Materials, West Conshohocken, PA.

Gray, R.H. 1998. Damaged Ecosystems: Real or Perceived? (invited book chapter), pp.43-68. In: B.C. Rana (ed.), Damaged Ecosystems and Restoration. World Scientific Publishing Co., Singapore.

Fitzner, R.E., L.E. Eberhardt, W.H. Rickard, and R.H. Gray. 1998. The Great Basin Canada Goose in Southcentral Washington: A 40-Year Nesting History, p. 71. In: D.H. Rusch, M.D. Samuel, D.D. Humburg, and B.D. Sullivan (eds.), Biology and Management of Canada Geese. Proceedings, International Canada Goose Symposium, Milwaukee, WI.

Gray, R.H., and J.W. Meldrim. 2000. Reflections: The AFS Water Quality Section. Fisheries 25(4):4-6.

Gray, R.H. 2000. Morphological Abnormalities in Illinois Cricket Frogs, *Acris crepitans*, 1968-1971. In: H. Kaiser, G.S. Casper, and N. Bernstein (eds.), Investigating Amphibian Declines: Proceedings, 1998 Midwest Declining Amphibians Conference. J. Iowa Acad. Sci. 107(3,4):92-95.

Gray, R.H. 2000. Historic Occurrence of Malformations in the Cricket Frog (*Acris crepitans*) in Illinois. Trans. Ill. Acad. Sci. 93(4):279-284.

Gray, R.H., and D.D. Dauble. 2001. Cyprinids of the Mid-Columbia River: Hanford Reach. Northwest Sci. 75(2):122-136.

Gray, R. H. 2001. Cricket Frog, *Acris crepitans*, Malformations in Illinois: Past and Present. Herp. Nat. Hist. 8(1):75-77.

Gray, R.H., and L.E. Brown. Chapter 9, Decline of Northern Cricket Frogs (*Acris crepitans*) pp. 85-106. In: M.J. Lanoo (ed.), Status and Conservation of U.S. Amphibians, Part 1, Univ. Calif. Press, Berkeley, CA (in press).

Gray, R.H., L.E. Brown, and L. Blackburn. Species Accounts, Hylidae, *Acris crepitans*, Northern Cricket Frog, p. 874. In: M.J. Lanoo (ed.), Status and Conservation of U.S. Amphibians, Part. 2, Univ. Calif. Press, Berkeley, CA (in press).

Books

Gray, R.H. (ed.). 1978. Proceedings of the Ocean Thermal Energy Conversion (OTEC) Biofouling and Corrosion Symposium. USERD.A. Conf-771001, October 10-12, 1977. Pacific Northwest Laboratory, Richland, WA, NTIS, Springfield, VA. 469 p.

Garey, J.F., R.M. Jordan, A. Aitken, D.T. Burton, and R.H. Gray (eds.). 1980. Condenser Biofouling Control, Symposium Proceedings. Electric Power Research Institute CS-1450, March 25-29, 1979, Atlanta, GA, Ann Arbor Science, Ann Arbor, MI. 528 p.

**ROBERT H. GRAY (continued)**Symposia (continued)

Mahlum, D.D., R.H. Gray, and W.D. Felix (eds.). 1981. Coal Conversion and the Environment: Chemical, Biomedical and Ecological Considerations, 20th Hanford Life Sciences Symposium, CONF-801039, October 20-23, 1980. NTIS, Springfield, VA. 607 p.

Mehrle, P.M., R.H. Gray, and R.L. Kendall (eds.). 1985. Toxic Substances in the Aquatic Environment: An International Aspect. Papers from an International Symposium held in Conjunction with the American Fisheries Society, 112th Annual Meeting, Hilton Head, SC, September 22-25, 1982, American Fisheries Society, Bethesda, MD. 98 p.

Gray, R.H., E.K. Chess, P.J. Mellinger, R.G. Riley, and D.L. Springer (eds.). 1987. Health and Environmental Research on Complex Organic Mixtures. Proceedings, 24th Hanford Life Science Symposium, October 20-24, 1985, Richland, WA. Pacific Northwest Laboratory, Richland, WA. NTIS, Springfield, VA. 763 p.

Gray, R.H., H. Drucker, and M.J. Massey (eds.). 1988. Toxicology of Coal Conversion Processing. John Wiley & Sons, New York, NY. 603 p.

Gray, R.H. (ed.). 1990. Environmental Monitoring, Restoration and Assessment: What Have We Learned? Proceedings, 28th Hanford Symposium on Health and the Environment, October 16-19, 1989, Richland, WA. Battelle Press, Columbus, OH. 342 p.

Brown, L.R., R.M. Hughes, R.H. Gray and M.R. Meador (eds.). Effects of Urbanization on Stream Ecosystems. Papers from an International Symposium held in Conjunction with the American Fisheries Society, 133rd Annual Meeting, Quebec City, Quebec, Canada, August 10-14, 2003. American Fisheries Society, Bethesda, MD (in preparation).

Symposia

Gray, R.H. 1977. Avoidance of Thermal Effluent by Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) and its Implications in Waste Heat Management, pp. III-B-73-86. In: S.S. Lee and S. Sengupta (eds.), Proceedings Waste Heat Management and Utilization Conference. Vol. 1, University of Miami, FL, May 9-11.

Gray, R.H. 1977. Biological Limiting Factors in Ocean Thermal Energy Conversion. American Society of Limnology and Oceanography, Pacific Division, San Francisco State University, CA, June 12-16

Gray, R.H. 1977. An Overview of the OTEC Biofouling and Corrosion Program. OTEC Resource and Environmental Assessment Workshop. Florida Solar Energy Center, Cape Canaveral, FL. June 27-29.

Gray, R.H., and J.M. Haynes. 1977. In Situ Swimming Depths of Spring and Fall Run Chinook Salmon in Relation to Gas Supersaturated Water. American Fisheries Society, 107th Annual Meeting, Vancouver, British Columbia, September 12-17.

Page, T.L., R.H. Gray, and D.A. Neitzel. 1977. Fish Impingement and Screen Passage Studies at the Hanford Generating Project. American Fisheries Society, 107th Annual Meeting, Vancouver, British Columbia, September 12-17.

**ROBERT H. GRAY (continued)**Symposia (continued)

Schneider, M.J., and R.H. Gray. 1977. Effects of Phenol on Predation of Juvenile Rainbow Trout (*Salmo gairdneri*). Symposium of the Savannah River Ecology Laboratory, Augusta, GA, November 2-4.

Gray, R.H. 1977. Behavior as a Tool for Assessing the Effects of Water Quality Alterations on Fish: Case Studies--Thermal Discharges and Gas Supersaturation. Pacific Northwest Pollution Control Association Meetings, Portland, OR, November 2-4.

Page, T.L., D.A. Neitzel, and R.H. Gray. 1977. Comparative Fish Impingement at Two Adjacent Water Intakes on the Mid-Columbia River, pp. 257-266. In: L.D. Jensen (ed.), Proceedings of Fourth National Workshop on Entrainment and Impingement. Ecological Analysts, Melville, NY, December 5-7.

Perrigo, L.D., R.H. Gray, G.A. Jensen, W.W. Laity, and R.G. Moles. 1978. An Overview of the OTEC Biofouling and Corrosion Program, pp. 13-18. In: R.H. Gray (ed.), Proceedings of the Ocean Thermal Energy Conversion (OTEC) Biofouling and Corrosion Symposium. USERDA Conf-771001, October 10-12, 1977. Pacific Northwest Laboratory, Richland, WA.

Gray, R.H., and T.L. Page. 1978. Perspectives in Gas Bubble Disease. Joint Meeting of the University of Parma, University of Milan and the Ente Nazionale per l'Energia Elettrica, Center for Nuclear and Thermal Research, Milan Italy, January 13.

Gray, R.H. 1978. Microfouling in Ocean Thermal Energy Conversion Units. American Chemical Society, 52nd Colloid and Surface Science Symposium, University of Tennessee, Knoxville, TN. June 12-14.

Gray, R.H., and T.L. Page. 1978. Occurrence of Gas Bubble Disease in Connection With Outlets from Power Plants. Joint Meeting of the Universities of Milan, Parma and Pavia, the Hydro-biological Institute of Research in Pallanzo and the Ente Nazionale per l'Energia Elettrica, Center for Nuclear and Thermal Research, Milan, Italy, June 30.

Haynes, J.M., R.H. Gray, and J.C. Montgomery. 1978. Seasonal and Diurnal Movements of Radio-tagged White Sturgeon (*Acipenser transmontanus*) in Relation to Mid-Columbia River Temperatures. American Fisheries Society, 108th Annual Meeting, University of Rhode Island, Kingston, RI, August 21-25.

Gray, R.H. 1978. Fish Response to Thermal Discharge and Gas Supersaturated Water, 40th Midwest Fish and Wildlife Conference, Columbus, OH, December 10-13.

Page, T.L., R.H. Gray, M.G. Saroglia, and P. Bronzi. 1979. Comparative Fish Impingement at Italian and United States Water Intakes: Proceedings of a Workshop. Ente Nazionale per l'Energia Elettrica, Center for Thermal and Nuclear Research, Milan, Italy, December 1978. Battelle, Pacific Northwest Laboratories, Richland, WA. 28 p.

Gray, R.H. 1979. Sublethal, Chronic and Systems Toxicity of Solvent Refined Coal (SRC) Materials. SRC Research Workshop. Battelle Seminars and Studies Program. Seattle, WA, May 1-2.

Haynes, J.M., and R.H. Gray. 1979. Effects of External and Internal Radio Transmitter Attachment on Movement of Adult Chinook Salmon, pp. 115-127. In: F.M. Long (ed.), Proceedings of Second International Conference on Wildlife Biotelemetry, University of Wyoming, Laramie, WY, July 30 - August 1. University of Wyoming, Laramie, WY.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H., and J.M. Haynes. 1979. Delayed Upstream Migration of Chinook Salmon at Little Goose Dam. American Fisheries Society 109th Annual Meeting, West Yellowstone, MT, September 12-15.

Dauble, D.D., and R.H. Gray. 1979. Comparative Ecology of Two Sympatric Catostomids, *Catostomus macrocheilus* and *C. columbianus*, in the middle Columbia River. American Fisheries Society 109th Annual Meeting, West Yellowstone, MT, September 12-15.

Gray, R.H., and J.B. States. 1979. Evaluating Effects of Coal Liquefaction Materials on Aquatic Systems. 30th Alaska Science Conference, Fairbanks, AK, September 19-21.

Gray, R.H. 1979. Evaluating Environmental Effects: The Role of Organism Behavior. 30th Alaska Science Conference, Fairbanks, AK, September 19-21.

Gray, R.H., D.A. Neitzel, and T.L. Page. 1979. Effects of Water Intakes on Fish: Assessment, Engineering and Operational Procedures to Minimize Biological Loss. 30th Alaska Science Conference, Fairbanks, AK, September 19-21.

States, J.B., R.H. Gray, R.M. Bean, W.E. Fallon, and C.D. Becker. 1979. An Approach to Evaluating Ecological Effects of Coal Conversion Products on Freshwater Systems. Fourth American Society for Testing and Materials (ASTM) Symposium on Aquatic Toxicology, Chicago, IL, October 16-17. ASTM, Philadelphia, PA.

Gray, R.H., and J.A. Fava. 1980. Can Studies of Organism Behavior Provide Useful Data for Environmental Assessment? American Fisheries Society 110th Annual Meeting, Louisville, KY, September 22-24.

Gray, R.H., T.L. Page, and M.G. Saroglia. 1980. Response of Carp (*Cyprinus carpio*) and Black Bullhead (*Ictalurus melas*) to Gas Supersaturated Water. American Fisheries Society 110th Annual Meeting, Louisville, KY, September 22-24.

States, J.B., S.A. Barraclough, D.D. Dauble, W.E. Fallon, J.R. Skalski, R.M. Bean, and R.H. Gray. 1980. Comparative Toxicity of a Coal Liquid and Three Reference Oils to an Aquatic Invertebrate, *Daphnia magna*. In: Abstracts, Coal Conversion and the Environment: Chemical, Biomedical, and Ecological Considerations, Symposium, Pacific Northwest Laboratory (PNL), Richland, WA. October 20-23. PNL, Richland, WA.

Gray, R.H., and J.M. Haynes. 1981. Biotelemetry Studies with Chinook Salmon (*Oncorhynchus tshawytscha*) in the Lower Snake River, Southeastern Washington. Third Biennial Conference, Ethology and Behavioral Ecology of Fishes, Illinois State University, Normal, IL, May 19-22.

Dauble, D.D., W.E. Fallon, R.H. Gray, R.M. Bean, and J.B. States. 1981. Potential Ecological Effects of a Coal Liquid from the Solvent Refined Coal II Process to Aquatic Organisms, pp. 262-264. In: Western Proceedings, 61st Annual Conference, Western Association of Fish and Wildlife Agencies, Honolulu, HI, July 12-16, American Fisheries Society, Bethesda, MD.

Gray, R.H., and H. Drucker. 1981. Assessing Health and Environmental Effects of a Developing Fuel Technology, pp. 499-507. In: R.A. Fazzolare and C.B. Smith (eds.), Beyond the Energy Crisis:

**ROBERT H. GRAY (continued)**Symposia (continued)

Opportunity and Challenge, Vol. II. Proceedings of the Third International Conference on Energy Use Management, Berlin (West), Germany, October 26-30. Pergamon Press, Oxford, England.

Dauble, D.D., W.E. Fallon, R.H. Gray, and R.M. Bean. 1981. Chronic Toxicity of Water-Soluble Fractions of Fresh and Waterleached Solvent Refined Coal (SRC-II) Liquids to a Benthic Invertebrate, pp. 212-222. In: D.D. Mahlum, R.H. Gray, and W.D. Felix (eds.), Coal Conversion and the Environment: Chemical, Biomedical, and Ecological Considerations, 20th Hanford Life Sciences Symposium, CONF-801039, Richland, WA., October 20-23, 1980. CONF-801039, NTIS, Springfield, VA.

Gray, R.H., T.L. Page, M.G. Saroglia, E. Tibaldi, and G. Paccheti. 1982. Responses of Carp (Cyprinus carpio L.) to Dubai Crude Oil, pp. 553-560. In: H. Leclerc and D. Dive (eds.), Colloque INSERM, Acute Aquatic Ecotoxicological Tests: Methodology, Standardization, Significance, University of Lille, Lille, France, November 17-19, 1981, Vol. 106, ISBN 2-85598-222-7, INSERM, Paris, France.

Gray, R.H. 1982. Overview of Coal Liquefaction and Potential Environmental Concerns. Ninth Intralaboratory Planning Workshop, Columbia National Fisheries Research Laboratory, Columbia, MO, May 17-20.

Dauble, D.D., R.H. Gray, E.W. Lusty, J.R. Skalski, and M.A. Simmons. 1982. Behavioral Reactions of Fathead Minnow (*Pimephales promelas*) and Rainbow Trout (*Salmo gairdneri*) to a Coal Liquid Water-Soluble Fraction, pp. 579-583. In: Proceedings, Western Association of Fish and Wildlife Agencies, Western Division, American Fisheries Society, Las Vegas, NV, July 19-22, American Fisheries Society, Bethesda, MD.

Page, T.L., R.H. Gray, and G. Matteucci. 1982. Entrainment of Fish, Phytoplankton, and Zooplankton at Italian and United States Water Intakes: Proceedings of a Workshop. Ente Nazionale per l'Energia Elettrica, Center for Thermal and Nuclear Research, Milan, Italy, July 12, 1979. Battelle, Pacific Northwest Laboratories, Richland, WA. 47 p.

Dauble, D.D., R.M. Bean, R.H. Gray, W.E. Fallon, L.J. Felice, and M.L. O'Malley. 1982. Acute Toxicity and Persistence of Phenolics in Sediments Contaminated with a Coal Liquid. Third Annual Meeting, Society of Environmental Toxicology and Chemistry, Arlington, VA, November 14-17.

Gray, R.H., and D.D. Dauble. 1983. Fish Behavior and Its Implications in the Assessment of Hazardous Materials. Fourth Biennial Conference, Ethology and Behavioral Ecology of Fishes, Illinois State University, Normal, IL, May 9-12.

Gray, R.H. 1983. A Multidisciplinary Approach to Identify, Characterize, and Minimize Potential Health and Environmental Problems Associated with Chemically Complex Mixtures: A Case Study. Society of Environmental Toxicology and Chemistry, Fourth Annual Meeting, Arlington, VA, November 6-9.

Gray, R.H. 1983. Chemical and Toxicological Aspects of Coal Liquefaction and Other Complex Mixtures. 8th International Symposium, Chemical and Toxicological Aspects of Environmental Quality, Institute fur Okologische Chemie, Munich, West Germany, November 22-23.

Gray, R.H. 1984. Finding Solutions to Potential Health and Environmental Problems Associated with Coal Liquefaction Materials, pp. 547-557. In: T.N. Veziroglu (ed.), The Biosphere: Problems and

**ROBERT H. GRAY (continued)**Symposia (continued)

Solutions. Proceedings of Miami International Symposium on the Biosphere, Miami Beach, FL, April 23-25. Elsevier Science Publishers, BV Amsterdam, The Netherlands.

Gray, R.H., T.L. Page, and M.G. Saroglia. 1984. Tolerance and Behavioral Responses of Two Nonsalmonids, *Ictalurus melas* and *Cyprinus carpio*, to Gas Supersaturated Water. American Fisheries Society 114th Annual Meeting, Cornell University, Ithaca, NY, August 12-17.

Gray, R.H., D.D. Mahlum, J.A. Strand, and W.C. Weimer. 1984. Summary of Health and Environmental Research: Coal Liquefaction, pp. 13-30. In: K.E. Cowser (ed.), Synthetic Fossil Fuel Technologies: Results of Health and Environmental Studies. Proceedings, Fifth ORNL Life Sciences Symposium, Gatlinburg, TN, October 24-27, 1982. Butterworth Publishers, Stoneham, MA.

Marchetti, R., M. Saroglia, E. Tibaldi, and R.H. Gray. 1985. Overview of Water Quality Problems in Italy, pp. 48-57. In: P.M. Mehrle, R.H. Gray, and R.L. Kendall (eds), Toxic Substances in the Aquatic Environment: An International Aspect, Papers from an International Symposium held in conjunction with the American Fisheries Society 112th Annual Meetings, Hilton Head, SC, September 22-25, 1982, American Fisheries Society, Bethesda, MD.

Gray, R.H., D.D. Dauble, and J.R. Skalski. 1985. Use of Ecotoxicological and Avoidance Data to Assess Effects of Hazardous Materials on Fish, pp. 321-335. In: P.G. Wells and R.F. Addison (eds.), Proceedings, Tenth Annual Aquatic Toxicity Workshop, Halifax, Nova Scotia, Canada, November 7-10, 1983. Can. Tech. Rep. Fish. Aquat. Sci. 1368, Dept. Fisheries and Oceans, Ottawa, Ontario, Canada.

Gray, R.H. 1985. Coal Liquefaction Process Development: Solving Potential Health and Environmental Problems. In: Conference on Newer Coal Technologies: Implications for Energy and Development Policies in Asia and the Pacific, East-West Center, Honolulu, HI, April 17-24.

Gray, R.H. 1985. Fish Behavior: Applied Studies to Assess Environmental Effects of Energy-Related Activities. In: Journal, People to People, Fisheries Research Delegation to East Asia (Japan, People's Republic of China, Republic of Korea), May 24-June 13, 1985. Citizen Ambassador Program, Spokane, WA.

Gray, R.H. 1985. Water Quality Concerns: Real or Perceived. American Fisheries Society 115th Annual Meeting, Sun Valley, ID, September 8-12.

Gray, R.H., D.D. Dauble, A.J. Scott, and B.L. Thomas. 1986. Comparative Solubility and Acute Toxicity to *Daphnia magna* of Coal Liquids, Shale Oil, and Petroleum, pp. 159-168. In: G.H. Geen and K.L. Woodward (eds.), Proceedings, Eleventh Annual Aquatic Toxicity Workshop, Vancouver, British Columbia, Canada, November 13-15, 1984. Can. Tech. Rep. Fish Aquat. Sci. 1480. Dept. Fisheries and Oceans, Ottawa, Ontario, Canada.

Gray, R.H., H Drucker, M.J. Massey, J.C. Craun, J.P. Fillo, C.A. Reilly, R.A. Renne, and B.W. Wilson. 1986. Technology Development: Relationships Among Physical, Chemical and Toxicological Properties of Coal Conversion Materials, pp. 126-131. In: S.S. Saluja (ed.), Search for a Bridge to the Energy Future. Proceedings, International Conference on the Development of Alternative Energy Sources and the Lessons Learned Since the Oil Embargo, Grand Forks, ND. May 23-24, University of North Dakota, Grand Forks, ND.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H., H. Drucker, M.J. Massey, J.C. Craun, J.P. Fillo, W. Hubis, C.A. Reilly, R.A. Renne, B.W. Wilson, D.W. Later, and D.A. Haugen. 1986. Compilation of Toxicological, Chemical and Engineering Data on Coal Conversion Process Materials: Status and Summary of Results, pp. 61-65. In: Health and Environmental Effects of Complex Chemical Mixtures, Proceedings, Second Annual DOE Contractors Meeting, CONF-8606161. Delavan, WI, June 17-18, NTIS, Springfield, VA.

Gray, R.H., and J.M. Haynes. 1986. Movements of White Sturgeon (Acipenser transmontanus) in an Impounded Section of the Mid-Columbia River, USA. International Conference of the Fisheries Society of the British Isles, The Behavior of Fishes. Bangor, Wales, United Kingdom, July 14-17.

Gray, R.H. 1986. Behavioral Responses of Fish: Applications to Environmental Assessment. International Conference of the Fisheries Society of the British Isles, The Behavior of Fishes. Bangor, Wales, United Kingdom, July 14-17.

Dauble, D.D., R.H. Gray, T.L. Page, and W.B. Duke, 1986. Hatchery-Reared Salmonids: Forgotten Predators in the Columbia Basin? Western Division Meetings, American Fisheries Society, Portland, OR, July 21-23.

Gray, R.H. 1986. Studies of Fish Migration and Their Application to Fisheries Management. American Fisheries Society 116th Annual Meeting, Providence, RI, September 14-18.

Gray, R.H. 1987. Coal Conversion: Reconciling Technology Development and Health and Environmental Concerns, pp. 383-392. In: P.D. Rao (ed.), Focus on Alaska's Coal '86, Anchorage, AK, October 27-30, 1986. University of Alaska, Fairbanks, Fairbanks, AK.

Gray, R.H. 1987. Applied Fish Behavior Studies: Assessing Environmental Effects of Energy-Related Activities, pp. 315-324. In: S.O. Kullander and B. Fernholm (eds.), Proceedings, Fifth Congress of European Ichthyologists, Stockholm, Sweden, August 12-16, 1985. Swedish Museum of Natural History, Stockholm, Sweden.

Gray, R.H., H. Drucker, M.J. Massey, J.C. Craun, J.P. Fillo, C.A. Reilly, R.A. Renne, and B.W. Wilson. 1987. Coal Conversion (Liquefaction/Gasification): Engineering Considerations and Relationships Among Physical, Chemical, and Toxicological Properties of Resulting Materials, pp. 61-70. In: T.N. Veziroglu (ed.), Alternative Energy Sources VII, Vol. 5, Hydrocarbons/Energy Transfers, Proceedings, Miami International Conference on Alternative Energy Sources, Miami Beach, FL, December 9-11, 1985. Hemisphere Publishing Corporation, Washington, DC.

Gray, R.H. 1987. Relationships Among Physical, Chemical, and Toxicological Properties of Coal Conversion Materials, pp. 921-928. In: J.A. Mouljin, K.A. Nater, and H.A.G. Chermin (eds.), Coal Science and Technology II, Proceedings, 1987 International Conference on Coal Science, Maastricht, The Netherlands, October 26-30. Elsevier Science Publishers B. V., Amsterdam, The Netherlands.

Gray, R.H. 1987. Behavior: Studies of Fish Migration and Their Application to Environmental Assessment. Society of Environmental Toxicology and Chemistry, Eighth Annual Meeting, Pensacola, FL, November 9-12.

Gray, R.H. 1987. Fish Behavior and its Application to Assessing Environmental Effects. Society of Environmental Toxicology and Chemistry, Eighth Annual Meeting, Pensacola, FL, November 9-12.

**ROBERT H. GRAY (continued)**Symposia (continued)

Dauble, D.D., R.H. Gray, A.J. Scott, and B.L. Thomas. 1987. Relationship Between Solubility and Acute Toxicity of Coal Liquefaction Materials to the Fresh Water Crustacean, *Daphnia magna*, pp. 657-666. In: R.H. Gray, E.K. Chess, P.J. Mellinger, R.G. Riley, and D.L. Springer (eds.), Health and Environmental Research on Complex Organic Mixtures, 24th Hanford Life Sciences Symposium, Richland, WA, October 21-24, 1985. Pacific Northwest Laboratory, Richland, WA. NTIS, Springfield, VA.

Gray, R.H. (ed.). 1988. The Hanford Environment: Where We Live and Work. Abstracts of a Hanford Technical Exchange, Richland, WA, January 20. Pacific Northwest Laboratory, Richland, WA.

Gray, R.H. 1988. Overview of a Comprehensive Environmental Monitoring and Surveillance Program: The Role of Fish and Wildlife. In: Proceedings, Western Association of Fish and Wildlife Agencies, Western Division, American Fisheries Society Annual Meeting. Albuquerque, NM, July 10-13. Western Association of Fish and Wildlife Agencies 68:317-326. WR 217.

Gray, R.H. 1988. Fisheries Science: One Component of a Multidisciplinary Environmental Monitoring Program at Hanford, Washington. American Fisheries Society 118th Annual Meeting, Toronto, Ontario, Canada, September 12-15.

Gray, R.H., and D.D. Dauble. 1988. Mechanisms of Organism Response to Toxicants. American Fisheries Society 118th Annual Meeting, Toronto, Ontario, Canada, September 12-15.

Gray, R.H. 1988. Environmental Monitoring at the U.S. Department of Energy's Hanford Site, Washington. In: pp. 1143-1152, Proceedings, DOE Model Conference, CONF-881054. Oak Ridge, TN, October 3-7. NTIS, Springfield, VA.

Gray, R.H. 1988. Water Quality: A Major Component of Environmental Monitoring at Hanford, Washington. 24th Annual Conference of the Water Resources Association, Milwaukee, WI, November 6-11.

Gray, R.H. 1988. Radiological, Chemical and Biological Evaluations of Site Operations at Hanford, Washington, USA, pp. 163-164. In: R. Van Coillie, A. Niimi, A. Champoux, and G. Joubart (eds.), Proceedings Fifteenth Annual Aquatic Toxicity Workshop, Montreal, Quebec, Canada, November 28-30. Canadian Tech. Rep. Fish. Aquat. Sci. 1714, Dept. Fisheries and Oceans, Burlington, Ontario, Canada.

Gray, R.H. 1989. Ecotoxicology: Behavior, Exposure, and Effects, pp. 275-291. In: H. Lokke, H. Tyle, and F. Bro-Rasmusson (eds.), Proceedings, 1st European Conference on Ecotoxicology, Copenhagen, Denmark, October 17-19, 1988, The Technical University of Denmark, Denmark, Lyngby, Denmark. DIS Congress Service, Vanlosse\Copenhagen, Denmark.

Gray, R.H. 1989. Monitoring Fish, Wildlife, Radionuclides and Chemicals at Hanford Washington, pp. 77-84. In: P.R. Davis, J.C. Emerick, D.M. Finch, S.Q. Foster, J.W. Monarch, S. Rush, O. Thorne, II, and J. Todd (eds.), Proceedings IV: Issues and Technology in the Management of Impacted Wildlife, Glenwood Springs, CO, February 6-9. Thorne Ecological Institute, Boulder, CO.

Gray, R.H. 1989. Ferruginous Hawk Nesting on the U.S. DOE Hanford Site: A Recent Invasion Following Introduction of Transmission Lines. Paper by R.E. Fitzner and R.L. Newell, pp. 125-132. In: P.R. Davis, J.C. Emerick, D.M. Finch, S.Q. Foster, J.W. Monarch, S. Rush, O. Thorne, II, and J. Todd

**ROBERT H. GRAY (continued)**Symposia (continued)

(eds.), Proceedings IV, Issues and Technology in the Management of Impacted Wildlife, Glenwood Springs, CO, February 6-8. Thorne Ecological Institute, Boulder, CO.

Gray, R.H. 1989. Monitoring for Potential Environmental Problems at a Nuclear Research Facility at Hanford, Washington, U.S.A., pp. 245-259. In: K.L. Zirm and J. Mayer (eds.), Proceedings, Envirotech Vienna 1989, Vol. 2.1., First International Society for Environmental Protection (ISEP) Congress: Chemicals - Technologies - Hazardous Waste, Vienna, Austria, February 20-22. Westarp Wissenschaften, Vienna, Austria.

Gray, R.H. 1989. Monitoring for Potential Environmental Contaminants and Ecosystem Responses on the Hanford Nuclear Site, Washington, U.S.A. 11th Annual Meeting, North-Pacific International Chapter, American Fisheries Society, New Westminster, British Columbia, Canada, March 6-8.

Gray, R.H. 1989. Overview of the Environmental Monitoring Program at Hanford, Washington. Symposium, Solving Environmental Problems: The Past as Prologue to the Present, The Evergreen State College, Olympia, WA, April 27-30.

Gray, R.H. 1989. An Integrated Environmental Monitoring Program at a U.S. Nuclear Research Facility, pp. II 291 - II 300. In: Proceedings, Vol. II, International Symposium on Integrated Approaches to Water Pollution Problems (SISIPPA 89), Lisbon, Portugal, June 19-23. National Laboratory for Civil Engineering (LNEC), Lisbon, Portugal.

Gray, R.H. 1989. Environmental Monitoring at a Nuclear Research Facility. 74th Ecological Society of America Annual Meeting, Toronto, Ontario, Canada, August 6-10. Bull Ecol. Soc. Am. 70(2):127.

Gray, R.H. 1989. Hanford, Washington: Overview of a Comprehensive Environmental Monitoring and Surveillance Program. Ninth Oak Ridge National Laboratory Life Sciences Symposium. The Scientific Challenges of NEPA: Future Direction Based on 20 Years of Experience, Knoxville, TN, October 24-27.

Gray, R.H. 1989. Monitoring Chemicals, Radionuclides, Fish and Wildlife at Hanford, Washington, U.S.A. Society of Environmental Toxicology and Chemistry, 10th Annual Meeting, Toronto, Ontario, Canada, October 28-November 2.

Gray, R.H. 1989. Monitoring the Impact of Nuclear Facilities on the Environment. Second Scientific Conference of the Iraqi Atomic Energy Commission, Baghdad, Iraq, November 21-23.

Gray, R.H. 1990. Environmental Monitoring for Radionuclides, Chemicals, Fish and Wildlife at a U.S. Energy Research Facility: A Case Study, pp. 412-421. In: Proceedings, Vol. I, International Conference and Workshop on Global Natural Resource Monitoring and Assessments: Preparing for the 21st Century, Venice, Italy, September 24-30, 1989. American Society for Photogrammetry and Remote Sensing, Bethesda, MD.

Gray, R.H. 1990. Environmental Surveillance at the Hanford Site, Southeastern Washington, USA: A History of Success. Globe '90, Vancouver, British Columbia, Canada, March 19-23.

Gray, R.H. 1990. Monitoring Radionuclides, Chemicals, Fish and Wildlife at the Hanford Washington Nuclear Facility. The 1990 Midwest Pollution Control Biologists Meeting, Chicago, IL, April 10-12.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1990. Environmental Monitoring and Surveillance on the Hanford Site, Washington, pp. 49-53. In: Proceedings, 7th National RCRA/Superfund Conference, Hazardous Wastes and Hazardous Materials, St. Louis, MO, May 2-4. Hazardous Materials Control Research Institute, Silver Spring, MD.

Gray, R.H. 1990. A Forty-Five Year History of Environmental Monitoring and Surveillance: The Hanford Experience. 10th International Symposium on Environmental Pollution, Toronto, Ontario, Canada, June 7-8.

Gray, R.H. 1990. Environmental Surveillance and Oversight at Hanford: An Interdisciplinary Approach. 15th Annual Conference of the National Association of Environmental Professionals & NEPA Symposium, San Antonio, TX, June 19-22.

Gray, R.H. 1990. Monitoring the Hanford Nuclear Site and Surrounding Environment: Long-Term Trends, p. 49. In: Proceedings, ISPRS Commission VII Mid-Term Symposium, Global and Environmental Monitoring Techniques and Impacts, Victoria, British Columbia, Canada, September 17-21. Ministry of Forests, Victoria, British Columbia, Canada.

Gray, R.H. 1990. Environmental and Biological Monitoring for Radiological and other Contaminants at the Hanford Nuclear Site, USA, pp. 208-210. In: J. Barcelo (ed.), Proceedings, 4th International Conference on Environmental Contamination, Barcelona, Spain, October 1-4. CEP Consultants Ltd., Edinburgh, UK.

Gray, R.H. 1990. Biological and Environmental Monitoring and Surveillance at the Hanford Nuclear Site, U.S.A. 12th International Conference on Science & Technology, New Delhi, India, November 15-16.

Gray, R.H. 1990. Long-Term Environmental Monitoring at Hanford, Washington, pp. 285-289. In: Proceedings, 11th Annual Conference and Exhibition, SUPERFUND '90, Washington, DC, November 26-28. Hazardous Materials Control Research Institute, Silver Spring, MD.

Gray, R.H., and W.H. Rickard. 1991. The Hanford Reservation: A Refuge for Native Plants and Animals, pp. 66-73. In: R.D. Comer, P.R. Davis, S.Q. Foster, C.V. Grant, S. Rush, O. Thorne III and J. Todd (eds.), Proceedings V, Issues and Technology in the Management of Impacted Wildlife, Snowmass, CO, April 8-10. Thorne Ecological Institute, Boulder, CO.

Fitzner, R.E., L.E. Eberhardt, W.H. Rickard, and R.H. Gray. 1991. The Great Basin Canada Goose in Southcentral Washington: A 40-Year Nesting History, pp. 61-62. In: Proceedings, International Canada Goose Symposium, Milwaukee, WI, April 23-25.

Gray, R.H., and T.L. Brown. 1991. Communicating with Public and Scientific Audiences: Are they Really any Different?, pp. 112-115. In: Proceedings, Hazardous Materials Control (HMC)-South, '91, Conference, Houston, TX, April 24-26. HMC Research Institute, Greenbelt, MD.

Gray, R.H., and T.L. Brown. 1991. Public Outreach and Involvement: A Communications Agenda. 1991 Conference of the National Association of Environmental Professionals, Baltimore, MD, April 28-May 1.

Gray, R.H. 1991. Multimedia Environmental Monitoring: Components that Affect Surface and Ground Water, pp. C1-1 - C1-3. In: VIIth World Congress on Water Resources, Theme C, Institutional and

**ROBERT H. GRAY (continued)**Symposia (continued)

Financial Considerations for Water Development, Rabat, Morocco, May 13-18. Administration of Hydraulics, Rabat, Morocco.

Gray, R.H. 1991. Monitoring for Radiological and Other Contaminants at Hanford, Washington. XVII Pacific Science Congress, Towards the Pacific Century: The Challenge of Change, Honolulu, HI, May 27-June 2.

Gray, R.H. 1991. Translating Technical Communications for Lay Audiences through Public Outreach and Involvement. Society of Environmental Toxicology and Chemistry, 12th Annual Meeting, Seattle, WA, November 3-7.

Gray, R.H. 1992. Communicating Environmental Information to Public Audiences, pp. 2B-11 - 2B-21. In: Proceedings, HAZTECH International '92, Eleventh Annual Exhibition and Conference, Hazardous Waste, Solid Waste and Recycling Management, Houston, TX, February 4-6. HAZTECH International, Bellevue, WA

Gray, R.H. 1992. Overview of Multidisciplinary Environmental Monitoring Program at Hanford Washington, pp. 8B-1 - 8B-14. In: Proceedings, HAZTECH International '92, Eleventh Annual Exhibition and Conference, Hazardous Waste, Solid Waste & Recycling Management, Houston, TX, February 4-6. HAZTECH International, Bellevue, WA.

Gray, R.H. 1992. Multimedia Environmental Monitoring: 50 Years at Hanford. Improving Natural Resources Management through Monitoring, Corvallis, OR, March 10-11.

Gray, R.H. 1992. Reporting Environmental Monitoring Results: Scientific Versus Public Forums. Improving Natural Resources Management through Monitoring, Corvallis, OR, March 10-11.

Gray, R.H. 1992. Multimedia Environmental Monitoring and Assessment at Hanford Washington. American Society for Testing and Materials Symposium on Environmental Toxicology and Risk Assessment: Aquatic, Plant and Terrestrial, Pittsburgh, PA, April 26-29.

Gray, R.H. 1992. Public Information, Outreach and Involvement: Communicating Environmental Data. American Society for Testing and Materials Symposium on Environmental Toxicology and Risk Assessment: Aquatic, Plant and Terrestrial, Pittsburgh, PA, April 26-29.

Gray, R.H. 1992. Multidisciplinary Natural Resource Monitoring: The Role of Fisheries Science. World Fisheries Congress, Athens, Greece, May 3-8.

Gray, R.H. 1992. Environmental Education Through Public Outreach and Involvement. Air and Waste Management Association 85th Annual Meeting, Kansas City, MO, June 21-26.

Gray, R.H. 1992. Hanford Washington: Monitoring to Assess the State of the Environment. Air and Waste Management Association 85th Annual Meeting, Kansas City, MO, June 21-26.

Gray, R.H. 1992. Public Education, Outreach and Involvement: A New Environmental Challenge, pp. 43-45. In: J.P. Vernet (ed.), Proceedings, Environmental Contamination, 5th International Conference, Morges, Switzerland, September 29-October 1. CEP Consultants, Edinburgh, United Kingdom.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1992. Environmental Monitoring to Assess Contamination at a Nuclear Production Site in the United States, pp. 517-519. In: Proceedings, International Symposium on Environmental Contamination in Central and Eastern Europe, Budapest, Hungary, October 12-16. The Technical University of Budapest, Budapest, Hungary.

Gray, R.H. 1992. Public Outreach, Involvement and Education: Hanford's Challenge, pp. 6C-1 - 6C-18. In: Proceedings, HAZTECH International '92, San Juan Puerto Rico, October 21-23. HAZTECH International, E.J. Krauss & Assoc., Bethesda, MD.

Gray, R.H. 1992. A Unique Research Natural Area: The Hanford Nuclear Reservation. 19th Annual Natural Areas Association Meeting, Bloomington, IN, October 27-30.

Gray, R.H. 1992. Assessment and Monitoring of Natural Resources on the Hanford Reservation, Southeastern Washington. Society of Environmental Toxicology and Chemistry, 13th Annual Meeting, Cincinnati, OH, November 8-12.

Gray, R.H. 1992. Educating the Public: Information, Outreach and Involvement. The George Wright Society Seventh Conference on Research & Resource Management in Parks and on Public Lands, Partners in Stewardship, Jacksonville, FL, November 16-20.

Gray, R.H. 1993. Wildlife Monitoring, Research and Resource Management on the Hanford Reservation in Southeastern Washington, pp. 345-357. In: W.E. Brown and S.D. Veirs (eds.), Proceedings, Seventh Conference on Research & Resource Management in Parks and on Public Lands, Partners in Stewardship, Jacksonville, FL, November 16-20, 1992. The George Wright Society, Hancock, MI.

Gray, R.H. 1993. Evaluation of a Unique Ecosystem in Southeastern Washington, USA: The Hanford Site, pp. 157-170. In: E.G. Baddaloo, S. Ramamoorthy, and J.W. Moore (eds.), Proceedings, 19th Annual Aquatic Toxicity Workshop, Edmonton, Alberta, Canada, October 4-7, 1992. Can. Tech. Rep. Fish. Aquat. Sci. 1942. Dept. Fisheries and Oceans, Vegreville; Alberta, Canada.

Gray, R.H. 1993. Public Involvement: Environmental Monitoring, Fisheries and Other Issues. 13th Annual Meeting, North Pacific International Chapter, American Fisheries Society, Richmond, British Columbia, Canada, March 15-17.

Gray, R.H. 1993. Natural Areas Conservation: Public Education. 20th Annual Natural Areas Conference, Conservation in Working Landscapes, Orono, ME, June 22-25.

Gray, R.H. 1993. Protecting Public and Environmental Health: Ecological Monitoring and Research. VII Pacific Science Inter-Congress, Naha, Okinawa, Japan, June 27 - July 3.

Gray, R.H. 1993. Scientific Education and Communication Through Public Outreach and Involvement. VII Pacific Science Inter-Congress, Naha, Okinawa, Japan, June 27 - July 3.

Gray, R.H. 1993. Environmental Monitoring: An Aid to Mixed Waste Management, pp. 8.4.1 - 8.4.7 In: A.A. Moghissi, R.K. Blauvelt, G.A. Bend, and N.E. Rothermich (eds.), Mixed Waste Proceedings, Second International Symposium, Baltimore, MD, August 17-20. American Society of Mechanical Engineers and Temple University, Philadelphia, PA.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1993. Hanford Ecology and the Environment. 123rd American Fisheries Society Annual Meeting, Portland, OR, August 29 - September 2.

Gray, R.H. 1993. Environmental Monitoring and Assessment: 50 Years at Hanford, pp. 277-287. In: Proceedings, Water Environment Federation 66th Annual Conference and Exhibition, Vol. 7, Surface Water Quality and Ecology, Anaheim, CA, October 3-7. Water Environment Federation, Alexandria, VA.

Gray, R.H. 1993. Public Education Through Outreach and Involvement, pp. 31-40. In: Proceedings, Water Environment Federation 66th Annual Conference and Exhibition, Vol. 8, Public Issues, Anaheim, CA, October 3-7. Water Environment Federation, Alexandria, VA.

Gray, R.H. 1993. Environmental Education: A Model for the Future. 47th Southeastern Association of Fish and Wildlife Agencies Annual Conference, Atlanta, GA, October 10-13.

Gray, R.H. 1993. Environmental Monitoring and Assessment: Pathways, Species and Communities. In: Proceedings, Pacific Basin Conference on Hazardous Waste, Honolulu, HI, November 8-12. Pacific Basin Consortium for Hazardous Waste, Honolulu, HI.

Gray, R.H. 1993. Public Information, Education, Outreach and Involvement. In: Proceedings, Pacific Basin Conference on Hazardous Waste, Honolulu, HI, November 8-12. Pacific Basin Consortium for Hazardous Waste, Honolulu, HI.

Gray, R.H. 1994. Involving the Public in Environmental Issues through Outreach and Education. American Defense Preparedness Association, 20th Environmental Symposium and Exhibition, San Antonio, TX, March 14-17.

Gray, R.H. 1994. Natural Resource Management: Societal Perception Versus Environmental Impact. Fifth International Symposium on Society and Resource Management, Fort Collins, CO, June 7-10.

Gray, R.H. 1994. Public Involvement in Environmental Issues. Fifth International Symposium on Society and Resource Management, Fort Collins, CO, June 7-10.

Gray, R.H. 1994. Environmental Management: The Role of Ecological Monitoring and Surveillance. In: Proceedings, Enviro-Pro Expo Mexico 94, Mexico City, Mexico, September 7-9. E.J. Krauss & Assoc., Bethesda, MD.

Gray, R.H. 1994. Helping the Public Understand Environmental Issues Through Outreach and Involvement, pp. 944-946. In: Proceedings, Second International Symposium on Environmental Contamination in Central and Eastern Europe, Budapest, Hungary, September 20-23. The Technical University of Budapest, Budapest, Hungary.

Gray, R.H. 1994. Integrated Monitoring: Linking Results of Environmental and Tissue Sample Analyses with Population Status of Key Species, pp. 159-161. In: S.P. Varnavas (ed.), Proceedings, 6th International Conference on Environmental Contamination, Delphi, Greece, October 10-12. CEP Consultants Ltd, Edinburgh, United Kingdom.

Gray, R.H. 1994. Communicating Science and Involving the Public in Environmental Assessments. 15th Annual Meeting, Society of Environmental Toxicology and Chemistry (SETAC), Denver, CO, October 30-November 3.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1994. Hanford Ecology: Fisheries and the Environment. 56th Midwest Fish and Wildlife Conference, Indianapolis, IN, December 4-7.

Gray, R.H. 1995. Natural Resource Monitoring: Public Outreach and Involvement, pp. 125-132. In: S.Q. Foster, S. Pas, S. Rush, and O. Thorne (eds.), Proceedings VI, Issues and Technology in the Management of Impacted Wildlife, Glenwood Springs, CO., April 6-8, 1994. Thorne Ecological Institute, Boulder, CO.

Gray, R.H. 1995. Ecosystem Monitoring and Protected Areas: The Hanford Reservation, pp. 223-236. In: T.B. Herman, S. Bondrep-Nielsen, J.H.M. Willison, and N.W.P. Monro (eds.), Proceedings, 2nd International Conference on Science and the Management of Protected Areas (SAMPAs), Halifax, Nova Scotia, Canada, May 16-20, 1994. SAMPAs Association, Wolfville, Nova Scotia, Canada.

Gray, R.H. 1995. Protected Areas: Public Outreach and Involvement, pp. 429-438. In: T.B. Herman, S. Bondrep-Nielsen, J.H.M. Willison, and N.W.P. Monro (eds.), Proceedings, 2nd International Conference on Science and the Management of Protected Areas (SAMPAs), Halifax, Nova Scotia, Canada, May 16-20, 1994. SAMPAs Association, Wolfville, Nova Scotia, Canada.

McGrath, D.A., and R.H. Gray. 1995. Environmental Monitoring Program at the U.S. Department of Energy's Pantex Plant, Amarillo, Texas. American Society for Testing and Materials, Symposium on Sampling Environmental Media, Denver, CO, April 5-7.

Gray, R.H. 1995. Natural Resource Monitoring at Two Protected Areas: The U.S. Department of Energy's Hanford and Pantex Sites. The George Wright Society 8th Conference on Research & Resource Management in Parks and on Public Lands, Sustainable Society and Protected Areas, Portland, OR, April 17-21.

Gray, R.H. 1995. Natural Resource Protection, Energy and the Environment. XVIII Pacific Science Congress, Population Resources and Environment: Prospects and Initiatives, Beijing, China, June 5-12.

Gray, R.H. 1995. Teaching Science through Public Outreach and Involvement. XVIII Pacific Science Congress, Population Resources and Environment: Prospects and Initiatives, Beijing, China, June 5-12.

Gray, R.H., and D.A. McGrath. 1995. Monitoring for Radionuclides and Chemicals at the U.S. Department of Energy's Pantex Plant in the Texas Panhandle, pp 1-15, 95-WP 82.08. In: Proceedings, 88th Annual Meeting Air & Waste Management Association (AWMA), Vol. 10. Measurement and Data Management of Air Pollutants, San Antonio, TX. AWMA, Pittsburgh, PA.

Gray, R.H. 1995. Public Participation: Education, Outreach and Involvement. 125th Annual American Fisheries Society Meeting, Tampa, FL, August 27-31.

Gray, R.H. 1995. Environmental Monitoring at two Superfund Sites, the U.S. Department of Energy's Hanford Reservation and Pantex Plant, pp. 1591-1595. In: S. Slate, R. Baker, and G. Benda (eds.), Proceedings, Fifth International Conference on Radioactive Waste Management and Environmental Remediation (ICEM), Vol. 2, Management of Low-Level Waste and Remediation of Contaminated Sites and Facilities, Berlin, Germany, September 3-9. American Society of Mechanical Engineers, New York, NY.

**ROBERT H. GRAY (continued)**Symposia (continued)

- Gray, R.H. 1995. Public Involvement in Environmental Activities: Initiatives and Lessons Learned, pp. 137-141. In: S. Slate, F. Feizollahi, and J. Creer (eds.), Proceedings, Fifth International Conference on Radioactive Waste Management and Environmental Remediation (ICEM), Vol. 1, Cross-Cutting Issues and Management of High-Level Waste and Spent Fuel, Berlin, Germany, September 3-9. American Society of Mechanical Engineers, New York, NY.
- Booker, J.D., C.J. Phagan, and R.H. Gray. 1995. Heavy Metal and Radionuclide Concentrations in Fly Ash Material, pp. 928-930. In: D.W. Tedder (ed.), Extended Abstracts, Emerging Technologies in Hazardous Waste Management VII, Atlanta, GA, September 17-20. American Chemical Society, Washington, D.C.
- Gray, R.H. 1995. Overview of Environmental Monitoring at the U.S. Department of Energy Pantex Plant, pp.791-794. In: P.W. Tedder (ed.), Extended Abstracts, Emerging Technologies in Hazardous Waste Management VII, Atlanta, GA, September 17-20. American Chemical Society, Washington, D.C.
- McGrath, D.A., and R.H. Gray. 1995. Achievement of Environmental Protection at the U.S. Department of Energy's Pantex Plant through Concurrent Project Management and Public Involvement, pp. 595-601. In: Proceedings, 26th Annual Seminar/Symposium, Project Management Institute (PMI), New Orleans, LA, October 16-18. PMI, Upper Darby, PA.
- Gray, R.H. 1995. Long-term Environmental Monitoring at two Department of Energy Nuclear Sites, pp. 469-477. In: Proceedings, 68th Annual Meeting & Exposition, Water Environment Federation (WEF), Vol. 6, Part II: Regulatory Issues and Federal Facilities, Miami, FL, October 21-25. WEF, Alexandria, VA.
- Gray, R.H. 1995. Risk Communication through Public Education and Involvement, pp. 115-120. In: Proceedings, 68th Annual Meeting & Exposition, Water Environment Federation (WEF), Vol. 7, Part I: Public Education and Local Issues, Miami, FL, October 21-25. WEF, Alexandria, VA.
- Gray, R.H. 1995. Ecosystem Monitoring at two U.S. Department of Energy Sites. Second Society of Environmental Toxicology and Chemistry World Congress (16th Annual Meeting), Global Environmental Protection: Science Politics and Common Sense, Vancouver, British Columbia, Canada, November 5-9.
- Gray, R.H. 1995. Long-term Monitoring at two Department of Energy Sites: Case Studies, pp. 317-324. In: Proceedings, Superfund XVI, Vol. 1, Washington, D.C., November 6-8. E.J. Krauss & Assoc., Bethesda, MD.
- Gray, R.H. 1995. Public/stakeholder Involvement at two Department of Energy Sites: Case Studies, pp. 341-345. In: Proceedings, Superfund XVI, Vol. 1, Washington, D.C., November 6-8. E.J. Krauss & Assoc., Bethesda, MD.
- Gray, R.H. 1995. Hanford's Irony: Natural and Cultural Resources. 57th Midwest Fish and Wildlife Conference, Detroit, MI, December 3-6.
- Gray, R.H. 1996. Environmental Education: Public Outreach and Involvement. 4th Annual Meeting, Southern Division, American Fisheries Society, Mobile, AL, February 23-26.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1996. Environmental Monitoring at two Department of Energy Sites. American Society for Testing and Materials, Sixth Symposium on Environmental Toxicology and Risk Assessment, Modeling and Risk Assessment, Orlando, FL, April 15-18.

Gray, R.H. 1996. Natural Resources: Science, Public Perception and Politics. Sixth International Symposium on Society and Resource Management, University Park, PA, May 18-23.

Gray, R.H. 1996. Environmental Education: Outreach and Public Involvement. Sixth International Symposium on Society and Resource Management, University Park, PA, May 18-23.

Gray, R.H. 1996. Public Outreach and Involvement Initiatives at two Department of Energy Sites, pp. 1-10, 96-TP161A.01. In: Proceedings, 89th Annual Meeting, Air & Waste Management Association (AWMA), Public Education Outreach Programs and Pollution Prevention Tools, Nashville, TN, June 23-28. AWMA, Pittsburgh, PA.

Gray, R.H. 1996. Stakeholder Involvement and Public Outreach at two Department of Energy Sites. 41st Health Physics Society Annual Meeting, Seattle, WA, July 21-25.

Meldrim, J.M., and R.H. Gray. 1996. A Brief History of the Water Quality Section: It's Origin and Accomplishments. 126th American Fisheries Society Annual Meeting, Symposium, That was Then, This is Now: Water Quality Issues for the Past 20 Years and Into the Next Century, Dearborn, MI., August 25-29.

Gray, R.H. 1996. A Perspective on Historical Water Quality Issues in the Mid-Columbia and Snake Rivers. 126th American Fisheries Society (AFS) Annual Meeting, Symposium, That was Then, This is Now: Water Quality Issues for the Past 20 Years and Into the Next Century, Dearborn, MI, August 25-29.

Gray, R.H. 1996. Environmental Monitoring, Assessment and Resource Management at the U.S. Department of Energy's Hanford Site and Pantex Plant, pp. 383-385. In: Proceedings, Third International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe, Warsaw, Poland, September 10-13. Florida State University, Tallahassee, FL.

Gray, R.H. 1996. Environmental Risk: Communicating with and Involving the Public. Society for Risk Analysis/International Society of Exposure Analysis Annual Meeting, New Orleans, LA, December 8-11.

Gray, R.H. 1997. Monitoring Environmental Quality and Natural Resource Management at Pantex Plant in the Texas Panhandle. 9th Conference on Research and Resource Management in Parks and on Public Lands, Making Protection Work, Parks & Reserves in a Crowded Changing World, Albuquerque, NM, March 17-21.

Gray, R.H. 1997. Interfaces: Facilitating Public Understanding and Involvement. 127th American Fisheries Society Annual Meeting, Monterey, CA, August 25-26.

Gray, R.H. 1997. Environmental Monitoring at the U.S. Department of Energy Pantex Plant, pp. 787-796. In: R. Baker, S. Slate, and G. Benda (eds.), Proceedings, ICEM'97, Sixth International Conference on Radioactive Waste Management and Environmental Remediation, Singapore, October 12-16. American Society of Mechanical Engineers, New York, NY.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1997. Bridging the Technology Gap through Communication and Education. Society of Environmental Toxicology and Chemistry, 18<sup>th</sup> Annual Meeting, San Francisco, CA, November 16-20.

Gray, R.H. 1997. Ecosystem Health: Comparing Analytical Data with Population Studies of Key Species. Society of Environmental Toxicology and Chemistry, 18<sup>th</sup> Annual Meeting, San Francisco, CA, November 16-20.

Gray, R.H. 1998. Morphological Abnormalities in Illinois Cricket Frogs, *Acris crepitans*, 1968-1971. In Proceedings, Midwest Declining Amphibians Conference, Milwaukee, WI, March 20-21.

Gray, R.H. 1998. Environmental Monitoring and Effects Assessment: Comparing Results from Sample Analyses and Wildlife Studies. 54<sup>th</sup> Annual Northeast Fish & Wildlife Conference, Camp Hill, PA, May 3-6.

Gray, R.H. 1998. Integrating Environmental Monitoring through Sample Analyses (Chemistry) and Population Studies (Biology). Seventh International Symposium on Society and Resource Management: Culture, Environment, and Society, Columbia, MO, May 27-31.

Gray, R.H. 1998. Understanding Natural and Cultural Resources. Seventh International Symposium on Society and Resource Management: Culture, Environment, and Society, Columbia, MO, May 27-31.

Gray, R.H. 1998. Consultation with Stakeholders and the Public: Case Studies, 98-RA96A.02. In: Proceedings, 91<sup>st</sup> Annual Meeting, Air & Waste Management Association (AWMA). Public Participation in Environmental Issues, San Diego, CA, June 14-19. AWMA, Pittsburgh, PA.

Gray, R.H. 1998. Environmental Monitoring and Assessment: Integrating Results of Sample Analyses and Population Studies, 98-MP25.05. In: Proceedings, 91<sup>st</sup> Annual Meeting, Air & Waste Management Association (AWMA), Health Risk Assessment, San Diego, CA, June 14-19. AWMA, Pittsburgh, PA.

Gray, R.H. 1998. Public Involvement and Environmental Monitoring, pp. 651-655. In: A. Roth (ed.), Proceedings, DisTec '98, International Conference on Radioactive Waste Disposal, Hamburg, Germany, September 9-11. Kontec, Hamburg, Germany.

Gray, R.H. 1998. Environmental Monitoring and Assessment: Consistency Among Data from Radiological/Chemical Analyses and Wildlife Population Studies. In: Proceedings, Fourth International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe, Warsaw, Poland, September 15-17. Florida State University, Tallahassee, FL.

Gray, R.H., and D.A. McGrath. 1998. Environmental Surveillance and Natural Resource Monitoring at the U.S. Department of Energy Pantex Plant. American Nuclear Society Winter Meeting, Washington DC, November 15-19. Trans. Am. Nuc. Soc. 79:57-58.

Gray, R.H. 1998. Malformed Amphibians: A Challenge for the New Millennium? American Water Resources Association (AWRA) Annual Water Resources Conference, Point Clear, AL, November 15-19.

Gray, R.H. 1998. Consultation with Stakeholders and the Public: Case Studies. American Water Resources Association (AWRA) Annual Water Resources Conference, Point Clear, AL, November 15-19.

**ROBERT H. GRAY (continued)**Symposia (continued)

Gray, R.H. 1999. Amphibian Malformations: A Wildlife Concern for the 21<sup>st</sup> Century. 55<sup>th</sup> Annual Northeast Fish & Wildlife Conference, Manchester, NH, April 11-14.

Gray, R.H. 1999. Industrialization versus Wildlife: The Irony of two DOE Sites, the Hanford Reservation and Pantex Plant. 4<sup>th</sup> International Symposium on Urban Wildlife Conservation, Tucson, AZ, May 1-5.

Gray, R.H. 1999. Amphibian Malformations: Real or Perceived? Western Division, American Fisheries Society (AFS) Meeting, Moscow, ID, July 12-14.

Gray, R.H. 1999. Fish and Amphibian Malformations: A Cause or a Cause for Concern? 129<sup>th</sup> Annual American Fisheries Society (AFS) meeting, Charlotte, NC, August 30-September 2.

Gray, R.H. 1999. Public Involvement: A Way of Doing Business. In: Proceedings, ICEM'99, 7<sup>th</sup> International Conference on Radioactive Waste Management and Environmental Remediation, Nagoya, Japan, September 26-30. American Society of Mechanical Engineers, New York, NY.

Gray, R.H. 1999. Multimedia Monitoring for Environmental Impacts, pp. 253-262. In: Proceedings, Sardinia 99, Seventh International Waste Management and Landfill Symposium, Vol. IV, Environmental Impacts, Aftercare and Remediation, Cagliari, Italy, October 4-8. CISA- Environmental Sanitary Engineering Center, Cagliari, Sardinia, Italy.

Gray, R.H. 1999. Addressing Public Concerns through Outreach and Involvement, pp. 607-612. In: Proceedings, Sardinia 99, Seventh International Waste Management and Landfill Symposium, Vol. V, Waste Management and Treatment of Municipal and Industrial Waster, Cagliari, Italy, October 4-8. CISA- Environmental Sanitary Engineering Center, Cagliari, Sardinia, Italy.

Gray, R.H. 2001. Amphibian Malformations and Population Declines May not be Linked. In: Proceedings, 6<sup>th</sup> International Symposium on the Pathology of Reptiles and Amphibians, St. Paul, MN, April 18-20.

Gray, R.H. 2001. Are Amphibian Malformations and Population Declines Linked? Ecological Society of America 86<sup>th</sup> Annual Meeting, Madison, WI, August 5-10.

Gray, R.H. 2001. Education, Outreach and Public Involvement in Environmental Decision Making, pp. 18-21. In: R. Field, R. Warren, H. Okarma and P. Sievert (eds.), In: Proceedings, 2<sup>nd</sup> International Wildlife Management Conference, Godollo, Hungary, June 28-July 2, 1999. The Wildlife Society, Bethesda, MD.

Gray, R.H. 2001. Amphibian Malformations and Population Declines may Result from Different Causes. 63rd Midwest Fish and Wildlife Conference, Des Moines, IA, December 9-12.

Research Reports

Page, T.L., E.G. Wolf, R.H. Gray, and M.J. Schneider. 1974. Ecological Comparison of the Hanford No. 1 and WNP-2 Sites on the Columbia River. Battelle, Pacific Northwest Laboratories, Richland, WA. 17 p.

**ROBERT H. GRAY (continued)**Research Reports (continued)

Page, T.L., E.G. Wolf, R.H. Gray, and M.J. Schneider. 1974. Ecological Comparison of the Hanford No. 1 and WNP-2 Sites on the Columbia River (Revised). Battelle, Pacific Northwest Laboratories, Richland, WA. 14 p.

Gray, R.H., T.L. Page, E.G. Wolf, and M.J. Schneider. 1975. A Study of Screen Impingement and Fish Passage at Hanford Generating Project - A Progress Report. Battelle, Pacific Northwest Laboratories, Richland, WA. 47 p.

Page, T.L., R.H. Gray, and E.G. Wolf. 1975. Report on Impingement Studies Conducted at the Hanford Generating Project March and April 1975. Battelle, Pacific Northwest Laboratories, Richland, WA. 9 p.

Gray, R.H., and D.D. Dauble. 1976. Synecology of the Fish Community Near Hanford Generating Project and Assessment of Plant Operation Impacts, pp. 5.1 - 5.56. In: Final Report on Aquatic Ecological Studies Conducted at the Hanford Generating Project 1973-1974. WPPSS Columbia River Ecology Studies, Vol. I, Battelle, Pacific Northwest Laboratories, Richland, WA.

Page, T.L., R.H. Gray, and E.G. Wolf. 1976. Final Report on Aquatic Ecological Studies Conducted at the Hanford Generating Project 1973-1974. WPPSS Columbia River Ecology Studies, Vol. I, Battelle, Pacific Northwest Laboratories, Richland, WA. 206 p.

Gray, R.H., and D.D. Dauble. 1976. Synecology of the Fish Community Near WNP 1, 2 and 4 and Assessment of Suitability of Plant Area for Salmonid Spawning, pp. 5.1 - 5.71. In: Report on Aquatic Ecological Studies Conducted near WNP 1, 2 and 4, September 1974 Through September 1975. WPPSS Columbia River Ecology Studies, Vol. 2, Battelle, Pacific Northwest Laboratories, Richland, WA.

Gray, R.H., T.L. Page, and E.G. Wolf. 1976. Report on Aquatic Ecological Studies Near WNP 1, 2 and 4, September 1974 Through September 1975. WPPSS Columbia River Ecology Studies, Vol. 2, Battelle, Pacific Northwest Laboratories, Richland, WA. 115 p.

Page, T.L., R.H. Gray, and D.A. Neitzel. 1976. Fish Impingement Studies at the Hanford Generating Project (HGP) December 1975 Through April 1976, Battelle, Pacific Northwest Laboratories, Richland, WA. 22 p.

Gray, R.H., and D.D. Dauble. 1977. Fish Community Studies Near WNP 1, 2, and 4, October 1975 through February 1976, pp. 5.1 - 5.45. In: Aquatic Ecological Studies near WNP 1, 2 and 4, October 1975 Through February 1976, WPPSS Columbia River Ecological Studies, Vol. 3, Battelle, Pacific Northwest Laboratories, Richland, WA.

Gray, R.H., and T.L. Page. 1977. Aquatic Ecological Studies Near WNP 1, 2 and 4, October 1975 Through February 1976. WPPSS Columbia River Ecology Studies, Vol. 3, Battelle, Pacific Northwest Laboratories, Richland, WA. 80 p.

Page, T.L., D.A. Neitzel, and R.H. Gray. 1977. Impingement Studies at 100 N-Reactor Water Intake. Battelle, Pacific Northwest Laboratories, Richland, WA, BNWL-2401. 29 p.

Gray, R.H., and D.D. Dauble. 1978. Fish Studies Near WNP 1, 2, and 4, March Through December 1976, In: Aquatic Ecological Studies Near WNP 1, 2 and 4, WPPSS Columbia River Ecology Studies, Vol. 4, Battelle, Pacific Northwest Laboratories, Richland, WA. pp. 5.1-5.74.

**ROBERT H. GRAY (continued)**Research Reports (continued)

Gray, R.H., and T.L. Page. 1978. Aquatic Ecological Studies Near WNP 1, 2 and 4, WPPSS Columbia River Ecology Studies Vol. 4, Battelle, Pacific Northwest Laboratories, Richland, WA. 118 p.

Gray, R.H., and D.D. Dauble. 1978. Fish Studies Near WNP 1, 2, and 4, January Through December 1977, pp. 5.1 - 5.64. In: Aquatic Ecological Studies Near WNP 1, 2 and 4, WPPSS Columbia River Ecology Studies, Vol. 5, Battelle, Pacific Northwest Laboratories, Richland, WA.

Gray, R.H., and T.L. Page. 1978. Aquatic Ecological Studies Near WNP 1, 2 and 4, WPPSS Columbia River Ecology Studies, Vol. 5, Battelle, Pacific Northwest Laboratories, Richland, WA. 132 p.

Page, T.L., and R.H. Gray. 1978. Effects of Gas Supersaturated Water on Aquatic Biota A Research Program for the Ente Nazionale per l'Energia Elettrica (ENEL), Battelle, Pacific Northwest Laboratories, Richland, WA. 25 p.

Gray, R.H., and D.D. Dauble. 1979. Fish Studies Near WNP 1, 2 and 4, January Through August 1978, pp. 5.1 - 5.52. In: Aquatic Ecological Studies Near WNP 1, 2 and 4, WPPSS Columbia River Ecology Studies, January Through August 1978, Vol. 6, Battelle, Pacific Northwest Laboratories, Richland, WA.

Gray, R.H., and T.L. Page. 1979. Aquatic Ecological Studies Near WNP 1, 2 and 4, WPPSS Columbia River Ecology Studies, January Through August 1978, Vol. 6, Battelle, Pacific Northwest Laboratories, Richland, WA. 120 p.

Gray, R.H., D.G. Watson, G.A. Jensen, and R.G. Moles. 1980. Preliminary Assessment of Potential for Geothermal Enhancement of Aquaculture Facilities in Alaska, Battelle, Pacific Northwest Laboratories, Richland, WA. 36 p.

Gray, R.H. 1981. Geothermal Enhancement of Aquaculture Facilities in Alaska, Battelle, Pacific Northwest Laboratories, Richland, WA. 20 p.

Dauble, D.D., R.H. Gray, J.R. Skalski, W.E. Fallon, S.A. Barraclough, R.W. Hanf, A.J. Scott, and C.S. Abernethy. 1981. In: pp. 5.50-5.82. J.A. Strand and B.E. Vaughan (eds.), Ecological Fate and Effects of Solvent-Refined Coal (SRC) Materials: A Status Report, PNL-3819, Pacific Northwest Laboratory, NTIS, Springfield, VA.

Strand, J.A., R.A. Renne, J.W. Anderson, M.L. Warner, and R.H. Gray. 1981. Selection of Petroleum Reference Standards for Comparison in Studies of Carcinogenic and Toxicological Properties of Coal Syngases. (Draft). Pacific Northwest Laboratory, Richland, WA. 19 p.

Gray, R.H., and K.E. Cowser (eds.) 1982. Status of Health and Environmental Research Relative to Direct Coal Liquefaction: 1976 to the Present. DOE/NBM-1016. U.S. Department of Energy, NTIS, Springfield, VA. 77 p.

Gray, R.H., S. Meloni, M. Oddone, T.L. Page, P. Perrone, and G. Queirazza. 1982. Monitoring Program for Dissolved Gases in Selected Stretches of the Po River: Results. Battelle, Pacific Northwest Laboratories, Richland, WA. 64 p.

**ROBERT H. GRAY (continued)**Research Reports (continued)

Gray, R.H., and T.L. Page. 1982. Dissolved Gas Research Conducted by Battelle, Pacific Northwest Laboratories and Ente Nazionale per l' Energia Elettrica: A Summary Report. Battelle, Pacific Northwest Laboratories, Richland, WA. 7 p.

Callaway, J.M., J.P. Fillo, R.H. Gray, W.D. Felix, and D.D. Mahlum. 1982. Benefit Cost Analysis of Selected DOE/OHER Investments in Coal Liquefaction, PNL-4371, Pacific Northwest Laboratory, NTIS, Springfield, VA. 37 p.

Hillman, R.E., D.A. Anson, J.M. Corliss, B.W. Vigon, R.H. Gray, and H.J. Bomelburg. 1985. Biofouling Detection Monitoring Devices: Status Assessment. EPRI CS-3914, Battelle New England Marine Research Laboratory, Duxbury, MA. Electric Power Research Institute, Palo Alto, CA.

Gray, R.H., and G.L. Hanson. 1986. Hanford Life Sciences Symposium: History, Planning, and Financial Guidelines. Pacific Northwest Laboratory, Richland, WA.

Becker, C.D., and R.H. Gray. 1989. Abstracted Publications Related to the Hanford Environment, 1980 to 1988. PNL-6905, Pacific Northwest Laboratory, Richland, WA. NTIS, Springfield, VA.

Gray, R.H. 1994. Hanford Environmental Publications/Presentations 1989-1993. PNL-9971, Pacific Northwest Laboratory, Richland, WA. NTIS, Springfield, VA.

Gray, R.H. 1997. Long-term Environmental Monitoring as a Basis for Post-Restoration Characterization and Examples of Post-Restoration Monitoring, 11.2 Annex III. In Post-Restoration Monitoring of Decommissioned Sites to Ensure Compliance with Cleanup Criteria (Draft). International Atomic Energy Agency, Vienna, Austria.

Annual and Quarterly Reports

Gray, R.H., and J.M. Haynes. 1976. Upstream Movement of Adult Salmonids in Relation to Gas Supersaturated Water, pp. 73-76. In: Pacific Northwest Laboratory Annual Report for 1975. Vol. I, Life Sciences, Part 2, Ecological Sciences, BNWL-2100, Pacific Northwest Laboratory, Richland, WA.

Gray, R.H., and R.G. Genoway. 1976. Initial Response of Juvenile Salmonids to a River-Thermal Plume Interface. pp. 76-77. In: Pacific Northwest Laboratory Annual Report for 1975. Vol. I, Life Sciences, Part 2, Ecological Sciences, BNWL-2000, Pacific Northwest Laboratory, Richland, WA.

Gray, R.H., and J.M. Haynes. 1977. Depth Distribution of Chinook Salmon in Relation to Gas Supersaturated Water, pp. 7.30 - 7.33. In: Pacific Northwest Laboratory Annual Report for 1976. Vol. I, Life Sciences, Part 2, Ecological Sciences, BNWL - 2100, Pacific Northwest Laboratory, Richland, WA.

Gray, R.H., J.M. Haynes, and J.C. Montgomery. 1977. Seasonal Location and Movement of White Sturgeon in the Hanford Reach of the Columbia River, p. 7.34. In: Pacific Northwest Laboratory Annual Report for 1976. Vol. I, Life Sciences, Part 2, Ecological Sciences, BNWL-2100, Pacific Northwest Laboratory, Richland, WA.

Gray, R.H., R.G. Genoway, and S.A. Barraclough. 1977. Initial Response of Juvenile Chinook Salmon to a Simulated River Thermal Plume Interface, pp. 7.34 - 7.36. In: Pacific Northwest Laboratory Annual

**ROBERT H. GRAY (continued)**Annual and Quarterly Reports (continued)

Report for 1976. Vol. I, Life Sciences, Part 2, Ecological Sciences, BNWL-2100, Pacific Northwest Laboratory, Richland, WA.

Perrigo, L.D., D.B. Cash, C.I. Gibson, R.H. Gray, G.A. Jensen, and W.W. Laity. 1977. OTEC Quarterly Report to the Division of Solar Energy for October Through December 1976, Pacific Northwest Laboratory, Richland, WA, 23 p.

Perrigo, L.D., D.B. Cash, C.I. Gibson, R.H. Gray, G.A. Jensen, W.W. Laity, and R.G. Moles. 1977. OTEC Quarterly Report to the Division of Solar Energy for January Through March 1977, Pacific Northwest Laboratory, Richland, WA, 31 p.

Gray, R.H., and J.M. Haynes. 1978. Effects of Water Quality Alterations on Fish, pp. 7.11 - 7.12. In: Pacific Northwest Laboratory Annual Report for 1977. Vol. I Life Sciences, Part 2, Ecological Sciences, PNL-2500, Pacific Northwest Laboratory, Richland, WA.

Becker, C.D., D.H. Fickeisen, R.H. Gray, and J.C. Montgomery. 1979. Effects of Hydroelectric Generation on Riverine Ecology, pp. 7.3 - 7.4. In: Pacific Northwest Laboratory Annual Report for 1978. Vol I, Life Sciences, Part 2, Ecological Sciences, PNL-2850, Pacific Northwest Laboratory, Richland, WA.

Bean, R.M., C.D. Becker, D.A. Cataldo, R.H. Gray, T.M. Poston, W.H. Rickard, J.R. Skalski, J.B. States, D.G. Watson, and R.E. Wildung. 1980. Synfuels, pp. 45-54. In: Pacific Northwest Laboratory Annual Report for 1979. Vol. I Life Sciences, Part 2, Ecological Sciences, PNL-3300, Pacific Northwest Laboratory, Richland, WA.

Brewer, J.H., J.L. Ferill, R. Gray, R.E. Thomas, B. Gowey, S. Gorton, and J. Champion. 1999. Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the April 1999 Sampling Event. Southwest Research Institute, San Antonio, TX, Raytheon Demilitarization Company, Umatilla, OR.

Staff Reports

A Summary of the Thermal Effects of the Proposed WNP-1 Plant on Anadromous Fish in the Columbia River, Battelle-Northwest, Richland, WA, to United Engineers and Constructors, Inc., 1973.

Report to the Washington Department of Fisheries in Response to Questions from the Department of Fisheries and Game, Battelle, Pacific Northwest Laboratories, Richland, WA, to United Engineers and Constructors, Inc., 1974.

Environmental Studies in the Vicinity of the Proposed WNP-1 Site. Battelle, Pacific Northwest Laboratories, Richland, WA, to United Engineers and Constructors, Inc., 1974.

Preliminary Assessment of Water Temperature and Aquatic Ecology Effects of N-Reactor Discharge. Battelle, Pacific Northwest Laboratories, Richland, WA, to Energy Research and Development Administration, 1975.

**ROBERT H. GRAY (continued)**  
Staff Reports (continued)

Recommendations for Site Assessment Studies (Ecological): N-Reactor and Hanford Water Intake Operations. Battelle, Pacific Northwest Laboratories, Richland, WA, to Energy Research and Development Administration, 1975.

Responses to Comments from the Washington State Department of Ecology, Oregon State Department of Environmental Quality and U.S. Environmental Protection Agency Concerning Washington Public Power Supply System's NPDES Permit Application, to Washington State Department of Ecology, 1978.

Solvent Refined Coal-II (SRC-II) Detailed Environmental Plan. Pacific Northwest Laboratory, Richland, WA, to U.S. Department of Energy, 1980. Solvent Refined Coal-I (SRC-I) Joint Environmental Plan: Biomedical and Ecological Effects. Pacific Northwest Laboratory, Richland, WA, to U.S. Department of Energy, 1981.

Contributor to

Draft Environment Statement Related to the Proposed Pilgrim Nuclear Power Station Units 2 and 3, Boston Edison Company. Directorate of Licensing U.S.A.E.C., Docket No. 50-471 and 50-472, Washington, DC, 1974.

Environmental Report Amendment No. 1 Related to WPPSS Nuclear Project No. 1 Relocated Site. Washington Public Power Supply System, Richland, WA, 1974.

Application for Washington State Site Certification Amendment No. 1 Related to WPPSS Nuclear Project No. 1 and 4. Washington Public Power Supply System, Richland, WA, 1974.

Final Environmental Statement Related to the Proposed Pilgrim Nuclear Power Station Unit 2, Boston Edison Company. Directorate of Licensing U.S.A.E.C., Docket No. 50-471, Washington, DC, 1974.

A Feasibility Study of Hydroacoustic Assessment Techniques in the Columbia River at Hanford, Washington. Fisheries Research Institute, University of Washington, Seattle, WA, 1977.

Supplemental Information on the Hanford Generating Project in Support of a 316(a) Demonstration. Washington Public Power Supply System, Richland, WA, 1978.

Environmentally Sensitive Areas of Richland, Washington. Richland Ecology Commission, Richland, WA, 1987.

Guidelines for Environmental Specimen Banking with Special Reference to the Federal Republic of Germany: Ecological and Managerial Aspects, U.S. Man and the Biosphere Program Report No. 12, R.A. Lewis (ed.). U.S. Department of the Interior, National Park Service, Washington DC, 1987.

Basic Research for Environmental Restoration. Office of Energy Research. US Department of Energy, Washington, DC. National Technical Information Service, Springfield, VA, 1990.

Post-Restoration Monitoring of Decommissioned Sites to Ensure Compliance with Cleanup Criteria. International Atomic Energy Agency, Vienna, Austria, 1999.

**ROBERT H. GRAY (continued)**Staff Reports (continued)

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the July 1999 Sampling Event. Raytheon Demilitarization Company, Hermiston, OR, 1999.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the October 1999 Sampling Event. Raytheon Demilitarization Company, Hermiston, OR, 2000.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the January 2000 Sampling Event. Raytheon Demilitarization Company, Hermiston, OR, 2000.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Annual Report for April 1999 through January 2000. Raytheon Demilitarization Company, Hermiston, OR, 2000.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the April 2000 Sampling Event. Raytheon Demilitarization Company, Hermiston, OR, 2000.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the July 2000 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2000.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the October 2000 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2000.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the January 2001 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2001.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, 2000 Annual Report. Washington Demilitarization Company, Hermiston, OR, 2001.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the April 2001 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2001.

Design and Implementation of an Environmental Monitoring Program for a Hazardous Waste Incinerator, by S. K. Johansen. In: Proceedings, Twentieth International Conference on Incineration & Thermal Treatment Technologies (IT3), May 14-18, 2001, Philadelphia, PA. University of Maryland, College Park, MD, 2001.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the July 2001 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2001.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the October 2001 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2001.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the January 2002 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2002.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, 2001 Annual Report. Washington Demilitarization Company, Hermiston, OR, 2002.

**ROBERT H. GRAY (continued)**  
Staff Reports (continued)

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the April 2002 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2002.

Comprehensive Monitoring Program Sampling and Analysis Plan for the Umatilla Chemical Agent Disposal Facility and Umatilla Chemical Depot, Hermiston, Oregon. Washington Demilitarization Company, Hermiston, OR, 2002.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the July 2002 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2002.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program Baseline Report. Washington Demilitarization Company, Hermiston, OR, 2003.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the October 2002 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2002.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the January 2003 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2003.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the April 2003 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2003.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the July 2003 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2003.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, 2003 Annual Report. Washington Demilitarization Company, Hermiston, OR, 2003.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the October 2003 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2003.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the January 2004 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2004.

Umatilla Chemical Agent Disposal Facility Comprehensive Monitoring Program, Quarterly Report for the April 2004 Sampling Event. Washington Demilitarization Company, Hermiston, OR, 2004.

I am interested in learning more about environmental consulting positions with FERC. I am currently a private consultant and have extensive teaching, research and management experience in the environmental arena.

I was Manager of Environmental Protection at Battelle Pantex in Amarillo, Texas where I was responsible for permitting, environmental monitoring (sampling and analysis), environmental compliance, natural and cultural resources protection, land/range management and agricultural issues, National Environmental Policy Act (NEPA) activities, meteorology, and emergency preparedness/response support. A significant part of our efforts involved interactions with the scientific community, the regulators, and the public through an extensive outreach program.

I held various positions at the Pacific Northwest National Laboratory in Richland, Washington. For example, I was Manager of the Office of Health and Environment which was responsible for multidisciplinary programs designed to assess the health and environmental effects of the Hanford Site. Responsibilities involved site-wide monitoring of air, ground and surface waters, wildlife, fish, soils, vegetation and agricultural products; Resource Conservation and Recovery Act ground-water monitoring and Comprehensive Environmental Response, Compensation and Liability Act efforts; maintaining emergency preparedness and radiological standards and calibrations sources; operating a meteorology and climatologic station; protecting natural and cultural resources; providing dose assessments (past, includes the Hanford Environmental Dose Reconstruction effort, and present); documenting NEPA requirements; procurement and management of subcontractors to provide analytical services for the Hanford Site; and related items.

I have represented Hanford and Pantex environmental activities at both the national and international levels, and interacted with various parts of DOE, locally, regionally, and at headquarters, and with other Federal and State agencies and organizations. In 1997, I was appointed to an International Atomic Energy Agency Scientific Panel on post-remediation monitoring.

I have also directed studies to evaluate the toxicological effects and environmental fate and effects of complex organic mixtures. Part of the effort involved the development of acute and chronic systems to evaluate toxicological effects on a range of aquatic organisms. The effort also sought to identify the chemical agents responsible for toxicological activity of synthetic fuels, and the biological and chemical mechanisms through which toxicological activity is manifest. The work culminated in numerous articles and a book, "Toxicology of Coal Conversion Processing" which I edited. The study involved multi-agency interactions with DOE, the U.S. Environmental Protection Agency, State entities, and a variety of industrial organizations and public interest groups.

I have directed and conducted studies to assess effects of electric power generation (nuclear, fossil, hydroelectric) on water quality and the environment, and have managed other multidisciplinary programs dealing with the environmental, health and engineering

aspects of energy technology development. Most recently, I have been involved with studies focused on the issue of amphibian declines and malformations, have developed business plans for hydroelectric project relicensing efforts, served as a consultant to Brookhaven National Laboratory, Upton, NY, and currently serve as a consultant (Principal Investigator) to Southwest Research Institute, San Antonio, TX on the Comprehensive Monitoring Program at the Umatilla Chemical Agent Disposal Facility in Oregon, and to Pima County, Tucson, Arizona on water quality issues associated with the arid west.

I have authored more than 260 journal, symposium and book articles, over 65 technical reports and impact statements, and edited seven books. I have extensive experience in the preparation, development, and review of large programs, publications, management plans, proposals and budgets. I have organized numerous seminars, workshops and symposia dealing with a variety of environmental topics, have taught at both the undergraduate and graduate levels at four colleges/universities, and am an active member of the American Fisheries Society in which I am a past President of the Water Quality Section.

My biosketch and resume are attached.

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