



Albert E. Giorgi, Ph.D.

Senior Fisheries Scientist, Washington

Dr. Albert E. Giorgi's field of expertise focuses on the effects of dams on aquatic resources, primarily involving large river systems in the western United States (e.g., Snake, Columbia, Klamath, and Sacramento rivers). He has been conducting research on anadromous salmonid resources and resident fish since 1982. He specializes in anadromous salmonid passage through impounded river systems, migratory behavior, juvenile salmon survival studies, biological effects of hydroelectric and water management operations, and fish passage modeling. In addition to anadromous salmonids, he has conducted migratory studies on bull trout, lamprey and redband trout. His research approaches have included the use of radio telemetry, acoustic tag and PIT-tag technologies. He has conducted research and analyses and advised a broad spectrum of agencies including the USACE, NPCC, BPA, National Research Council, USBR, the California Bay-Delta Authority, a number of power utilities, and a variety of engineering firms.

Dr. Giorgi regularly teams with structural and hydraulic engineers in the design and evaluation of fishways and fish bypass systems. He engages in a variety of formal consultations with federal agencies regarding ESA issues pertaining to salmon and steelhead in the Pacific Northwest, particularly regarding water management and dam operations.

Experience and Expertise

- ◆ Hydropower, irrigation and storage dam impacts on anadromous and resident fish
- ◆ Design and evaluation of fish bypass systems
- ◆ Survival and migratory behavior studies: telemetry, acoustic tags and PIT tags
- ◆ Fish passage modeling
- ◆ Effects of water management on salmonid populations
- ◆ Salmon ecology
- ◆ Salmon and trout migratory behavior

Education

- ◆ Ph.D., 1981, Fisheries, University of Washington
- ◆ M.A., 1975, Biology, Humboldt State University
- ◆ B.A., 1972, Biology, Humboldt State University

Professional Affiliations & Appointments

- ◆ American Fisheries Society
- ◆ National Research Council: Committee on Water Resources Management, Instream Flows, and Salmon Survival in the Columbia River, 2003-2004.
- ◆ National Research Council: Committee on sustainable Water and Environmental Management in the California Bay-Delta, 2010-2012.
- ◆ Associate editor, North American Journal of Fisheries Management (1980s)

Faculty Appointment

- ◆ 1989 - 2003, Affiliate Faculty, University of Washington, Seattle, WA.

Professional Experience with BioAnalysts, Inc.

1990 - Present: Senior Fisheries Scientist

Bonneville Power Administration

Senior Fisheries Scientist, Fish Passage and Survival: 1992-present

Since 1992, Dr. Giorgi has served in the capacity of senior fisheries scientist and technical analyst on a variety of BPA projects pertaining to the effects of hydroelectric operations on salmonid populations in the Snake and Columbia River Basin. He regularly performs analyses, technical reviews and writes planning documents regarding fish passage issues in the Columbia Basin. He teams with other regional scientists to evaluate the effectiveness of various water management alternatives and dam operations for improving survival of ESA salmon stocks migrating through the Columbia River hydroelectric system. With statisticians and modelers at the University of Washington, NOAA and other agencies, he has contributed to the design of protocols and models for estimating smolt survival through the Snake and Columbia rivers.

U. S. Army Corps of Engineers

Technical Analyst, Fish Passage and Survival Investigations: 1991-present

Since 1991, Dr. Giorgi has been a lead technical analyst on a variety of projects pertaining to the effects of hydroelectric projects on salmon stocks in the Columbia Basin. Those projects include; evaluation of the effects of reservoir drawdown on the passage and survival of smolts in the Snake River, the evaluation of surface flow bypass alternatives at Snake and Columbia River dams, and co-authoring an assortment of reports that synthesized biological information regarding smolt passage at dams on the lower Columbia River.

Senior Scientist, Fish Passage Design: 1991-present

Dr. Giorgi regularly acts as senior scientist on engineering projects that design fish passage facilities, by teaming with private engineering firms (see below) contracted by the COE. Types of bypass systems have included screen systems, surface flow bypasses, forebay occlusion barriers and ladders. The projects have been based in the Columbia-Snake River and its tributaries, and in the Willamette River system.

U.S. Bureau of Reclamation

Technical Advisor on an expert panel reviewing the California Valley fisheries program. 2008.

This panel provided an assessment of the USBR fisheries program for the Sacramento River and offered recommendations for improvement.

National Research Council of the National Academies

Technical Analyst on NRC committees, 2003-2004 and 2010-2012

Over the last decade, Dr. Giorgi has participated in two NRC technical committees. Those committees studied and evaluated water management actions in the Columbia River (2003-2004) and the California Bay-Delta (2010-2012). His assessments focused on anadromous salmonid resources in those river systems. He contributed to four reports produced by those committees.

Avista, Inc.

Technical Advisor and Senior Fish Passage Biologist, 2010-2017

Dr. Giorgi teamed with MWH to select and design fish passage facilities for Avista, Inc. The Team designed fish ladder-based trapping facilities at two sites on the Clark Fork River, Cabinet Gorge and Noxon Rapids dams. The objective was to efficiently and safely collect bull trout and Westslope cutthroat trout in an effort to reconnect populations in the system.

PacifiCorp, Inc.

Lead Scientist, Fish Passage Investigations: Periodically since 2001

Dr. Giorgi directed a series of fish passage studies conducted at dams on the Lewis River and Klamath rivers. The studies were prescribed as part of the dam relicensing process. At Swift Reservoir on the Lewis River (2001, 2002), telemetry studies assessed the feasibility of providing smolt passage facilities at the high-head hydroelectric plant, as part of a salmon re-introduction effort. On the Klamath River (2003) the research described the migratory characteristics of redband trout in response to specific dam operations. In 2004, a second telemetry-based study examined the feasibility of reintroducing salmon to the Klamath River. Most recently, he has been a technical advisor to PacifiCorp regarding the future of dam removal on the Klamath River.

Tacoma Power

Technical analysts, Fish Passage Alternative for Cowlitz Falls Project: 2008-2013

Dr. Giorgi was a member of a consultant team that developed alternatives for smolt collection facilities at the Cowlitz Falls Project. The facility is critical to ensure the successful re-introduction of anadromous salmonids to the basin.

Montana Power Company

Co-Investigator, Fish Passage Investigation: 1992-1994

Dr. Giorgi was a co-investigator on a study that evaluated the feasibility of providing fish passage at Milltown Dam, Missoula, MT. Species of concern included a variety of trout species, with emphasis on bull trout.

Chelan County Public Utility District

Senior Fisheries Scientist, Fish Passage Evaluation and Research: 1990-2011

For over two decades, Dr. Giorgi conducted fish passage research and evaluations for Chelan County PUD in Washington State. He designed and conducted research projects to: estimate smolt survival at PUD hydroelectric dams; assess the effects of dam and reservoir operations on adult salmon migration and spawning; and evaluate the feasibility of introducing salmon into new watersheds. As a technical advisor, he was a member of the PUD fish bypass design team, working closely with structural and hydraulic engineers. Those activities included planning and evaluation of a broad variety of biological investigations associated with the upcoming relicensing of Chelan County PUD Dams. As part of those efforts, he performed analyses involving smolt passage models, and contributed to technical documents submitted to FERC. He co-authored four status reports that compiled biological information pertaining to four salmonid stocks in the basin that are treated under the ESA.

Douglas County Public Utility District

Co-Investigator, Sockeye Migration Evaluation: 1990

Dr. Giorgi was a co-investigator on a field study designed to describe the migratory characteristics of a hatchery stock of sockeye salmon through the Columbia River.

Grant County Public Utility District

Principal Investigator, Dam Drawdown Evaluation: 1999

Dr. Giorgi was the principal investigator for a study evaluating the biological effects of Wanapum Dam drawdown. The analysis was in response to regional interest in lowering reservoir elevations to promote swifter migration and presumably higher survival of smolts. In 1999, he was the principal investigator for a telemetry-based study estimating smolt survival through Wanapum and Priest Rapids dams.

Engineering Firms: Alden Laboratories, ENSR, CH₂M Hill, Tetratech/Inca, AECOM, Montgomery Watson Harza, HDR, URS, R2 Resources

Lead Scientist, Fish Passage Facility Design and Evaluations: 1997-present

Dr. Giorgi regularly participates as lead scientist on engineering teams that design and evaluate a variety of fish passage facilities at dams in the Pacific Northwest. These projects are funded by the Corps, PUDs, or companies operating the facilities. Examples of projects include:

- ◆ Identify and design passage alternatives to facilitate the reintroduction of anadromous salmonids into blocked watersheds at a variety of sites in the Columbia Basin.
- ◆ Assess the feasibility of deploying an effective physical guidance device for smolts in the forebay of Bonneville Second Powerhouse,
- ◆ Evaluate alternatives to improve fish guidance in screen systems at Bonneville Second Powerhouse,
- ◆ Evaluate alternatives for improving upstream passage of adult salmon across Bonneville Dam,
- ◆ Design the high flow surface bypass (corner collector) and associated outfall at Bonneville Dam,
- ◆ Identify and design alternative passage strategies and facilities for smolts and adult salmonids at Cougar Dam on the McKenzie River,
- ◆ Develop alternatives for smolt collection facilities at Lookout Point Reservoir.
- ◆ Review critical features of surface flow outlets for passing smolts and write a compendium on the topic with AECOM/ENSR.
- ◆ Identify alternatives for improving upstream passage at The Dalles Dam.
- ◆ Design a lamprey passage system at Bonneville Dam.
- ◆ Evaluate the merits and deficiencies of vortex suppression devices at the spillway at The Dalles Dam.

Pacific Northwest Utility Conference Commission

Technical Advisor, Assessing Hydroelectric Impacts: 1990-1994

Dr. Giorgi provided assistance as technical advisor and analyst to the PNUCC. The emphasis was placed on identifying hydroelectric impacts on Snake River salmon stocks listed under ESA, and assessing effective means to mitigate for those impacts. The primary topic matter was evaluation of the effectiveness of regional water management strategies for recovery of ESA-listed salmon

stocks. He authored a status report on the population of Kootenai River White Sturgeon, and co-authored a status report on Snake River Chinook salmon stocks.

Northwest Power and Conservation Council

Technical Analyst, Fish Passage Strategies: 2000-2004

While serving as technical analyst to the Northwest Power Conservation Council (NPCC), Dr. Giorgi was a member of their steering committee for this multi-species framework planning process for the Columbia River Basin (1998-1999). In 2000-2002 he was a member of the Regional Assessment Advisory Committee for sub-basin planning. In 2002, he and his staff were contracted to synthesize and report on the benefits, risks and uncertainties attending three passage strategies in the Columbia Basin; smolt transportation, flow augmentation, and spill for enhancing smolt survival. In 2004, he assisted NPCC staff in organizing and conducting a symposium on summer flow augmentation alternatives.

Other Professional Experience

1982 - 1990: Fisheries Research Biologist and Manager, National Marine Fisheries Service, Northwest Fisheries Center, Coastal Zone and Estuarine Studies Division, Seattle, WA

Dr. Giorgi designed and conducted research studies on smolt survival through the hydroelectric complex on Snake-Columbia River system. He studied and published articles and reports describing migratory behavior, passage, estimated survival, and physiology of smolts, as well as fish guidance screen effectiveness, hydropower development, and impacts on fisheries resources. He used a variety of tools to conduct field investigations, including radio telemetry, PIT tag applications, and freeze brands to study marked and recaptured fish.

1978 - 1981: Fisheries Research Biologist, National Marine Fisheries Service, Northwest and Alaska Fisheries Center, Resource Ecology and Fisheries Management Division, Seattle, WA

Dr. Giorgi investigated and described the early life history of lingcod populations in Puget Sound. Research involved Field (SCUBA) studies and laboratory activities. He participated in high seas resource assessment surveys directed at demersal marine fish populations.

1972 - 1974: Research Assistant, Humboldt State University, Sea Grant Program, Arcata, CA

Dr. Giorgi participated in a field study of the ecology and reproductive biology of red abalone populations near Mendocino, CA. Research activities involved the use of SCUBA for collecting specimens for tagging and histological sampling and mapping the movement and growth of tagged specimens.

Select Publications and Reports

- Giorgi, A., and J. Stevenson. 2017. Evaluating Bull Trout Passage Survival, Migration Timing and Connectivity Within the Mainstem Columbia and Lower Snake Rivers. Technical Report submitted to BPA.
- National Research Council of the National Academies, (A. Giorgi contributing author). 2012. Sustainable Water and Environmental Management in the California Bay-Delta. The National Academies Press, Washington DC.
- National Research Council of the National Academies, (A. Giorgi contributing author). 2011. A review of the use of science and adaptive management in California's Bay Delta Conservation Plan. The National Academies Press, Washington DC.
- Giorgi, A., J. Skalski, C. Peven, M. Langeslay, S. Smith, T. Counihan, R. Perry, and S. Bickford. 2010. Guidelines for Conducting Smolt Survival Studies in the Columbia River. In the Pacific Northwest Aquatic Monitoring Partnership (PNAMP); Tagging, Telemetry and Marking Compendium, pages 49-69.
- Buchanan, R., J. Skalski, and A. Giorgi. 2010. Evaluating surrogacy of hatchery releases for the performance of wild yearling Chinook salmon from the Snake River Basin. *NAJFM* 30:1258-1269.
- National Research Council of the National Academies, (A. Giorgi contributing author). 2010. A scientific assessment of alternatives for reducing water management effects on threatened and endangered fishes in California's Bay-Delta. The National Academies Press, Washington DC. 93 pages.
- Cummins, Ken, Chris Furey, Albert Giorgi, Steve Lindley, John Nestler, and John Shurts. 2008. Listen to the River: An Independent Review of CVPIA Fisheries Program. Prepared under contract with Circlepoint for the U. S. Bureau of Reclamation and U. S. Fish and Wildlife Service.
- Zabel, R., J. Faulkner, S. Smith, J. Anderson, C. Van Holmes, N. Beer, S. Iltis, J. Krinke, G. Fredericks, B. Bellerud, J. Sweet, and A. Giorgi. 2008. Comprehensive passage (COMPASS) model: a model of downstream migration and survival of juvenile salmonids through a hydropower system. *Hydrobiologia* 609:289-300.
- National Research Council (contributing author). 2004. Managing the Columbia River, Instream Flows, Water Withdrawals and Salmon Survival. National Academy of Science Press, Washington D.C. 246 pages.
- Johnson, G., J. Hedgepeth, J. Skalski, and A. Giorgi. 2004. A Markov Chain analysis of fish movements to determine entrainment zones. *Fisheries Research* 69:349-358.
- Johnson, Gary E.; Blaine D. Ebberts; Dennis D. Dauble; Albert E. Giorgi; Paul G. Heisey; Robert P. Mueller, and Duane A. Neitzel. 2003. Effects of jet entry at high-flow outfalls on juvenile pacific salmon. *North American Journal of Fisheries Management*. 23:441-449.

-
- Skalski, John R., James Lady, Richard Townsend, Albert E. Giorgi, John R. Stevenson, Charles M. Peven, Robert D. McDonald. 2001. Estimating inriver survival of migrating salmonid smolts using radio telemetry. *Canadian Journal of Fisheries and Aquatic Sciences* 58 (10): 1987-1997.
- Skalski, John R., Richard Townsend, James Lady, Albert E. Giorgi, John R. Stevenson. 2002. Estimating route-specific passage and survival probabilities at a hydroelectric project from smolt radio telemetry studies. *Canadian Journal of Fisheries and Aquatic Sciences* 59(8):1385-1393.
- Giorgi, A. E., G.E. Johnson, and M.W. Erho. 2000. Critical Assessment of Surface Flow Bypass Development in the Lower Columbia and Snake Rivers during 1995-1996. In *Advances in Fish Passage Technology*, (M. Odeh, Editor). American Fisheries Society, Bethesda, MD. pp. 41-56.
- Giorgi, A. E.; T.W. Hillman, and J.R. Stevenson. 1997. Factors that influence the Downstream Migration Rates of Juvenile Salmon and Steelhead through the Hydroelectric System in the Mid-Columbia River Basin. *North American Journal of Fisheries Management*; 17(2):268-28.
- Giorgi, A., D. Miller, and B. Sanford. 1994. Migratory characteristics of juvenile ocean-type Chinook salmon in the John Day Reservoir on the Columbia River. *Fishery Bulletin*. 92:872-879.
- Muir, W., A. Giorgi, and T. Coley. 1994. Behavioral and physiological changes in yearling Chinook salmon during hatchery residence and downstream migration. *Aquaculture*. 127:69-82.
- Muir, W., W. Zaugg, A. Giorgi, and S. McCutcheon. 1994. Accelerating smolt development and downstream movement in yearling Chinook salmon with advanced photoperiod and increased temperature. *Aquaculture*. 123: 387-399.
- Giorgi, A. 1992. Are we failing to capture critical details in relationships derived from smolt system survival estimates? pp. 121-126 In: *Proceedings of AFS Chinook Smolt Survival Workshop*. American Fisheries Society, Idaho Chapter, Moscow, ID.
- Parker, N., A. Giorgi, R. Heidinger, D. Jester, E. Prince, and G. Winans. 1991. *Proceedings of the international symposium and educational workshop on fish-marking techniques*. American Fisheries Society, Symposium #7. Bethesda, MD. 879 pp.
- Wilson, J., A. Giorgi, and L. Stuehrenberg. 1991. Method for estimating spill effectiveness for passing juvenile salmon and its application at Lower Granite Dam on the Snake River. *Can. J. Fish. Aquat. Sci.* 48:1872-1876.
- Stuehrenberg, L., A. Giorgi, and C. Bartlett. 1990. Pulse-coded radio tags for fish identification. pp. 370-374, In: Parker, N., A. Giorgi, R. Heidinger, D. Jester, E. Prince, and G. Winans, Eds. *Fish-Marking Techniques: Proceedings of the International Symposium and Educational Workshop on Fish-Marking Techniques*. American Fisheries Society, Symposium #7, Bethesda, MD.
- Giorgi, A., G. Swan, W. Zaugg, T. Coley, and T. Barila. 1988. Smolt development in yearling Chinook salmon, *Oncorhynchus tshawytscha*, and susceptibility to bypass systems at hydroelectric dams. *N. Am. J. Fish. Manage.* 8:25-29.
-

-
- Giorgi, A., and C. Sims. 1987. Estimating the daily passage of juvenile salmonids at McNary Dam on the Columbia River. *N. Am. J. Fish. Manage.* 7: 215-222.
- Giorgi, A. 1977. Study of the reproductive biology of the red abalone, *Haliotis rufescens* Swainson, near Mendocino, California. *California Fish and Game.* 63:80-94.
- Ploskey, G., G. Johnson, A. Giorgi, R. Johnson, J. Stevenson, C. Schilt, P. Johnson, D. Patterson, 2007. Synthesis of biological research on juvenile fish passage and survival at Bonneville Dam, through 2005. Final report to USACE, Portland District Office.
- Washington Group International, ENSR Engineering, and BioAnalysts, Inc. 2007. The Dalles Dam-North fish ladder alternatives report. Final report to USACE, Portland District Office.
- Sweeney, C., A. Giorgi, G. Johnson, R. Hall, and M. Miller. 2007. Surface bypass program comprehensive review report. Final report to USACE, Portland District Office.
- Peven, C., A. Giorgi, J. Skalski, M. Langeslay, A. Grassell, S. Smith, T. Counihan, R. Perry, S. Bickford. 2005. Guidelines and recommended protocols for conducting, analyzing, and reporting juvenile salmonid survival studies in the Columbia River Basin. Prepared for the USACE, Portland District Office, and Chelan and Douglas PUDs.
- John R. Stevenson, John R. Skalski, Peter Westhagen, Albert E. Giorgi, 2004. Fish passage efficiency of juvenile yearling and subyearling chinook, steelhead and sockeye at Rocky Reach and Rock Island Dams, 2003: Telemetry investigation. Chelan County PUD, Wenatchee, WA.
- Miller, M., A. Giorgi, D. Snyder, N. Mikkelsen and B. Nishitani. 2004. Description of migratory behavior of juvenile salmon smolts through California reservoirs, using radio-telemetry techniques in the Klamath Basin. Research report to PacifiCorp, Portland, OR.
- Miller, M.D., Albert E. Giorgi, Nels E. Mikkelsen, 2003. Adult Rainbow Trout Movement Study, Klamath River, 2003. PacifiCorp, Portland, OR.
- Anglea, S.M., G.E. Johnson, T.O. Wik, L.A. Reese, A.E. Giorgi. 2002. Development of the surface bypass and collector for juvenile salmon and steelhead at Lower Granite Dam 1994-2000. Prepared by Battelle for the U.S. Army Corps of Engineers, Walla Walla, WA.
- Giorgi, A.E., Mark Miller, John Stevenson, 2002. Mainstem passage strategies in the Columbia River system: transportation, spill, and flow augmentation. Northwest Power Planning Council, Portland, Oregon.
- Pacific Northwest National Laboratory, BioAnalysts, ENSR International, I., Normandeau Associates, I., 2001. Design Guidelines for High Flow Smolt Bypass Outfalls: Field, Laboratory, and Modeling Studies - FINAL. Pacific Northwest National Laboratory, Richland, WA.
- CH2M Hill, Montgomery Watson, Northwest Hydraulic Consultants/BioAnalysts, 2000. Alternatives Report for Fish Passage Cougar Lake WTC Project - Final, Task Order No. 15. CH2M Hill and Montgomery Watson, Bellevue, Washington.

-
- Hillman, T. W., D.W. Chapman, A.E. Giorgi, M.D. Miller and S.D. Kreiter. 2000. Potential Productivity of Anadromous Salmonids in the Lake Chelan Basin. Wenatchee, WA: Chelan County PUD.
- Miller, M., Skalski, J. R., Lady, J., Giorgi, A. E., and J. R. Stevenson. 2000. A pilot investigation to assess the feasibility of estimating steelhead survival at Wanapum and Priest Rapids projects using radio telemetry analysis, 1999. BioAnalysts, Inc. Report to Grant County Public Utility District, Ephrata, WA.
- Johnson, G., A. E. Giorgi, C. Sweeney, M. Rashid, and J. Plump. 1999. High Flow Outfalls for Juvenile Fish Bypasses: Preliminary Guidelines and Plans for Research and Implementation. Final Report. Portland OR: US Army COE.
- Johnson, G. E. and A.E. Giorgi. 1999. Development of surface flow bypasses at Bonneville Dam: A synthesis of data from 1995-1998 and a draft M&E plan for 2000. Vancouver, WA US Army COE.
- Marmorek, D., I. Parnell, C.N. Peters, C. Alexander, P. Budy, T. Cooney, R. Deriso, A. E. Giorgi, R. Hinrichsen, C. McConnaha, R. Peterman, C. Petrosky, C. Paulsen, H. Schaller, C. Toole, J. Williams, and E. Weber. 1999. PATH: Scoping of Candidate Research, Monitoring, and Experimental Management Actions: Concurrently Reducing Key Uncertainties and Recovering Stocks--Draft 4. Draft 4 edition. Vancouver, B.C., CAN: ESSA Technologies Ltd.
- Zabel, R. W., A.E. Giorgi and P.R. Mundy. 1999. Literature Review of Factors Affecting the Behavior Anadromous Fish Emigrating through Lakes and Reservoirs. PacifiCorp, Portland, OR.
- Giorgi, A. E. and J.W. Schlecte. 1997. An evaluation of the effectiveness of flow augmentation in the Snake River, 1991-1995, Phase I Final Report. Portland, OR. Bonneville Power Administration.
- Johnson, G. E., A.E. Giorgi, and M.W. Erho. 1997. Critical Assessment of Surface Flow Bypass Development in the Lower Columbia and Snake Rivers, Completion Report. Portland OR: US COE.
- Stevenson, J. R., A.E. Giorgi, W.R. Koski, K.K. English and C.A. Grant. 1997. Evaluation of juvenile spring chinook and steelhead migratory patterns at Rocky Reach and Rock Island Dams using radio telemetry techniques, 1996. Redmond, WA: BioAnalysts, Inc.
- Giorgi, A. and T. Hillman. 1996. PIT tag recovery data from Cassimer Bar Hatchery sockeye salmon, 1996. BioAnalysts, Inc., Report to Douglas County Public Utility District, East Wenatchee, WA. 21 pp.
- Chapman, D., A. Giorgi, T. Hillman, C. Peven and F. Utter. 1995. Status of spring Chinook salmon in the mid-Columbia region. Don Chapman Consultants, Inc., Boise, ID. 477 pp.
- Chapman, D., A. Giorgi, T. Hillman, C. Peven, J. Stevenson, M. Miller, M. Hill and F. Utter. 1995. Status of sockeye salmon in the mid-Columbia region. Don Chapman Consultants, Inc., Boise, ID. 413 pp.
- Giorgi, A. and J. Stevenson. 1995. Review of biological investigations describing smolt passage behavior at Portland District Corps of Engineers projects: implications to surface collection systems. Don
-

-
- Chapman Consultants, Inc., Report to the U. S. Army Corps of Engineers, Portland District, Portland, OR. 33 pp.
- Chapman, D., A. Giorgi, T. Hillman, D. Deppert, M. Erho, S. Hays, C. Peven, B. Suzumoto, and R. Klinge. 1994. Status of summer/fall Chinook salmon in the mid-Columbia region. Don Chapman Consultants, Inc., Report to Chelan, Douglas, and Grant County Public Utility Districts, WA. 412+ pp.
- Chapman, D., C. Peven, T. Hillman, A. Giorgi, and F. Utter. 1994. Status of summer steelhead in the mid-Columbia River. Don Chapman Consultants, Inc., Report to Chelan, Douglas, and Grant County Public Utility Districts, WA. 318+pp.
- Giorgi, A. and J. Stevenson. 1994. Biological issues pertaining to aquatic resources affected by Wanapum Reservoir drawdown. Don Chapman Consultants, Inc., Boise, ID. 28 pp.
- Skalski, J., G. Tartakovsky, S. Smith, P. Westhagen, D. Yasuda and A. Giorgi. 1994. Real-time prediction of the run timing of wild migrant yearling chinook in the Snake River basin. Bonneville Power Administration, Portland, OR. 20 pp.
- Giorgi, A. 1993. Flow augmentation and reservoir drawdown: strategies for recovery of threatened and endangered stocks of salmon in the Snake River basin. Recovery issues for threatened and endangered Snake River Salmon: technical report 2 of 11. Bonneville Power Administration, DOE/BP-99564-2, Portland, OR. 50 pp.
- Giorgi, A. 1993. Status of Kootenai River white sturgeon. Don Chapman Consultants, Inc. for Pacific Northwest Utilities Conference Committee, Portland, OR. 59+ pp.
- Dauble, D., J. Skalski, A. Hoffman, and A. Giorgi. 1993. Evaluation and application of statistical methods for estimating smolt survival. Bonneville Power Administration, DOE/BP-62611-1, Portland, OR. 71 pp.
- Hill, M., A. Giorgi, and T. Hillman. 1993. Fish passage at Milltown Dam, Montana: a feasibility study. Don Chapman Consultants, Inc., Report to Montana Power Company, Butte, MT. 85 pp.
- Skalski, J., and A. Giorgi. 1993. Juvenile passage program: a plan for estimating smolt travel time and survival in the Snake and Columbia rivers. Bonneville Power Administration, DOE/BP-35885-3, Portland, OR. 55 pp.
- Smith, S., J. Skalski, and A. Giorgi. 1993. Statistical evaluation of travel time estimation based on data from freeze-branded Chinook salmon on the Snake River, 1982-1990. Bonneville Power Administration, DOE/BP-35885-4, Portland, OR. 113 pp.
- Giorgi, A. 1992. Fall Chinook salmon spawning in Rocky Reach Pool: effects of a three-foot increase in pool elevation. Don Chapman Consultants, Inc., Report to Chelan County Public Utility District, Wenatchee, WA. 36+pp.

-
- Chapman, D., A. Giorgi, M. Hill, A. Maule, S. McCutcheon, D. Park, W. Platts, K. Pratt, J. Seeb, L. Seeb, and F. Utter. 1991. Status of Snake River Chinook salmon. Don Chapman Consultants, Inc., Report to Pacific Northwest Utilities Conference Committee, Portland, OR. 251 pp.
- Giorgi, A. 1991. Biological issues pertaining to smolt migration and reservoir draw-down in the Snake and Columbia Rivers, with special reference to salmon species petitioned for listing under the Endangered Species Act. Prepared for the U. S. Army Corps of Engineers, and Bonneville Power Administration under the System Operation Review. Portland, OR. 41 pp.
- Giorgi, A. 1991. Mortality of yearling Chinook salmon prior to arrival at Lower Granite Dam, on the Snake River. Bonneville Power Administration, DOE/BP-16570-1. Portland, OR. 26 pp.
- Giorgi, A., D. Miller, and B. Sanford. 1990. Migratory behavior and adult contribution of summer out migrating sub yearling Chinook salmon in John Day Reservoir, 1981-1983. Bonneville Power Administration, DOE/BP-39645-3, Portland, OR. 38 pp.
- Giorgi, A., W. Muir, W. Zaugg, and S. McCutcheon. 1990. Biological manipulation of migrational rate: the use of advanced photoperiod to accelerate smoltification in yearling Chinook salmon. Bonneville Power Administration, DOE/BP-50301-2, Portland, OR. 38 pp.
- Giorgi, A., L. Stuehrenberg, and J. Wilson. 1990. Juvenile radio-tag study: Lower Granite Dam, 1985-86. Bonneville Power Administration, DOE/BP-21237-2, Portland, OR. 36 pp.
- McCutcheon, C., and A. Giorgi. 1990. Assessment of freeze-brand and PIT tag recovery data for juvenile salmonids at McNary Dam, 1988. Bonneville Power Administration, DOE/BP-34269-2, Portland, OR. 28 pp.
- Giorgi, A. and L. Stuehrenberg. 1988. Lower Granite pool and turbine survival study 1987. Bonneville Power Administration, DOE/BP-1123, Portland, OR. 60 pp.
- Miller, D., and A. Giorgi. 1987. Effects of flow on the migratory behavior and survival of juvenile and summer Chinook salmon in John Day Reservoir. Bonneville Power Administration, DOE/BP-39645-2, Portland, OR, 35 pp.
- Stuehrenberg, L., A. Giorgi, C., Sims, J. Ramonda-Powell, and J. Wilson. 1986. Juvenile radio-tag study: Lower Granite Dam, Annual report 1985. Bonneville Power Administration, DOE/BP-21237-1, Portland, OR, 68 pp.
- Giorgi, A., L. Stuehrenberg, D. Miller, and C. Sims. 1985. Smolt passage behavior and flow-net relationship in the forebay of John Day Dam. Bonneville Power Administration. Portland, OR. 184 pp.
- Giorgi, A., D. Brastow, J. Williams, and C. Sims. 1984. Data analysis system for monitoring the seaward migration of juvenile salmonids in the Snake-Columbia River System. NOAA Technical Memo. NMFS-F/NWC-5-6. Seattle, WA. 14 pp.

- Johnson, R., C. Sims, D. Brege and A. Giorgi. 1984. Monitoring of downstream salmon and steelhead at federal hydroelectric facilities. Coastal Zone and Estuarine Studies, Seattle, WA. 5 pp.
- Sims, C., A. Giorgi, R. Johnsen, and D. Brege. 1984. Migrational characteristics of juvenile salmon and steelhead in the Columbia River Basin - 1983. National Marine Fisheries Service, Report to U. S. Army Corps of Engineers, Contract DACW57-83-C-0314). 31 pp.
- Sims, C., A. Giorgi, R. Johnsen, and D. Brege, 1983. Migrational characteristics of juvenile salmon and steelhead in the Columbia River Basin - 1982. National Marine Fisheries Service, Report to U.S. Army Corps of Engineers, Contract DACW65-78-C-0113. 35 pp.