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## Curriculum Vitae of Dr. Klaus Jorde

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Name of Firm:	<b>KJ Consult (Consulting Engineer)</b>
Name of Staff:	<b>JORDE Klaus</b>
Profession:	<b>Civil Engineer, Dr.-Ing., Dipl.-Ing. (M.Sc.), PE</b>
Date of Birth:	<b>25th September 1959</b>
Years with Firm/Entity:	<b>Since 2012</b>
Nationality:	<b>German</b>
Country of Residence:	<b>Austria</b>
Membership in Professional Societies:	<b>International Association of Hydraulic Engineering and Research IAHR</b> <b>Deutscher Verband für Wasser, Abwasser und Gewässerschutz DWA</b> <b>Schweizerischer Wasserwirtschaftsverband</b>
e-mail address:	<b>klaus.jorde@kjconsult.net</b>

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### Key Qualifications

- Weirs, Hydropower Plants, Dams
- River Hydraulics, River Engineering and River Restoration
- River System Ecology, Aquatic Habitat Modeling
- “Green” Hydropower, Environmental Flows
- Environmental Impact Assessment for Hydropower Stations and Dam Operation
- Renewable Energies, Potentials and Technical Application, Financial Analysis
- Engineering hydrology and flood protection concepts
- Training and capacity building
- Numerical model development and application: CASiMiR series

### Education

2005	Professional Engineering License, Idaho, USA, License No. 11810
1996	Dr.-Ing. (Ph.D.), University of Stuttgart, Stuttgart, Germany, Hydraulic Engineering, Thesis: Ecological Impact of Dynamic Instream Flow Regulations. Summa cum laude.
1987	Dipl.-Ing. (M.Sc.), University of Stuttgart, Stuttgart, Germany, Civil Engineering, thesis on flexible membrane weirs
1984 - 1987	University of Stuttgart, Germany: Civil Engineering with majors in structural analysis and design, geotechnics and hydraulic engineering
1983 - 1984:	University of Calgary, Canada: Civil Engineering with majors in soil mechanics and foundation engineering

1980 - 1982: University of Stuttgart, Germany: Civil Engineering (Vordiplom)  
 1970- 1978 Secondary School, German Abitur  
 1966- 1970 Primary School

## Languages

	<i>speaking</i>	<i>reading</i>	<i>writing</i>
German (mother tongue)	excellent	excellent	excellent
English	excellent	excellent	excellent
French	fair	good	fair
Spanish	fair	fair	fair
Italian	beginner	fair	beginner

## Country Experience

<u>Country</u>	<u>Year(s)</u>	<u>Country</u>	<u>Year(s)</u>
Germany	1987-2001 (resident)	Austria	Since 2012 (resident)
Canada	1983-1984 (resident)	Russia	1996
South Africa	2002	Norway	1999, 2008 - 2014
Switzerland	1997-2001, 2008- 2012 (resident)	Chile	2005, 2006, 2013-2015
France	1996	Vietnam	2006, 2007
UK	1999	Spain	2003, 2004
Czech Republic	1997	New Zealand	2007
Slovakia	1998	South Korea	2005, 06, 07, 10
USA	2001-2007 (resident)	China	1997, 99, 2001
Ethiopia	2009	Bangladesh	2010, 2012
Thailand	2008, 2009	Pakistan	2010, 2011
Tunesia	2010	Nigeria	2011
Bhutan	2012 - 2017	Tajikistan	2008-2010, 2012-2013
Slovenia	2012	Montenegro	2013

Bosnia Herzegovina	2013, 2014	Georgia	2008-10, 2014-2015
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**Additional Country Experience (projects where I have not personally worked inside the country but worked on projects there, some (\*) visited privately)**

<u>Country</u>	<u>Year(s)</u>	<u>Country</u>	<u>Year(s)</u>
Afghanistan	2008 - 2012	Kazakhstan*	2008 - 2010
India	2011	Uzbekistan	2008 - 2010
Turkmenistan	2008 - 2010	Kirgistan*	2008 - 2010
Azerbaijan	2008 - 2011	Armenia	2008 - 2010
Nepal*	2009 - 2010		

**Employment Record**

Since 8/2012 ongoing	KJ Consult, independent consultant for hydropower and river environment
Since 2001	Co-Director (part time), SJE Schneider & Jorde Ecological Engineering GmbH, Stuttgart, Germany. Consultant for hydropower development, ecohydraulics, river hydraulics and sediment transport, river restoration, flood management, hydraulic structures
1/2008-7/2012	Vice Managing Director of Entec Consulting and Engineering AG, Switzerland
2008-2012	Chair of the Board of Directors, Entegra Wasserkraft AG, Switzerland
2001-2007	National Science Foundation Distinguished Professor of Civil Engineering, Center for Ecohydraulics Research, University of Idaho, Boise, USA, tenured since 2005.
1987-2001	Institute of Hydraulic Engineering, University of Stuttgart, Stuttgart, Germany. Founder and head of the "Hydroecologic Research Group Stuttgart"
1987-2001	Engineering Office Dr. Jorde, Stuttgart, Germany. Owner. Consultant for Hydropower feasibility studies, Environmental Impact Assessment of Hydropower Schemes, Ecological Improvement and Mitigation measures, Design of Hydropower Plants, Simulation Models (hydraulic, technical, ecological).
1978-1979	Military Service (18 months)

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## Specific Projects

1. Förstermühle hydropower plant, environmental flow and fish migration (upstream and downstream), concept and design, since 2016.
2. Development of an E-Flow guideline and implementation of 4 pilot studies on e-flows for large hydropower plants (up to 1.2 GW) in Bhutan, Team leader for an Austrian/Swiss/German/Bhutanese consortium, National Environmental Commission, Royal Government of Bhutan, since 2015.
3. Hydrological analysis, general layout and annual energy generation for Aragvi 2 hydropower plant (2 MW), Georgia, since 2014
4. Hydrological analysis, general layout options, annual energy generation, pre-feasibility for Tskhvandiri-Okrili hydropower scheme, Georgia, since 2014
5. Hydrological analysis, general layout options, annual energy generation, pre-feasibility for Larakvakva hydropower scheme, Georgia, since 2014
6. Feasibility study and design, tendering, construction supervision, commissioning of Lakhami I and II medium - high head hydropower plants in Georgia, since 2014, ongoing.
7. Feasibility study and design, tendering, construction supervision, commissioning of Pichipedregoso (1 MW) and Pedregoso (2 MW) hydropower plants in Chile, since 2013, ongoing.
8. Murr flood retention basin, Oppenweiler, Germany. Development and evaluation of design options to allow the future operation of the Rülflensmühle HPP, since 2013, ongoing.
9. Design of 4.2 MW Bistrica hydropower plant, Montenegro. Design including evaluation of hydrological data, intake, sand trap, pipeline, power house and electromechanical equipment, 2013.
10. Evaluation of design and performance of the surge tank at Avče Pumped Storage Power Plant (120 MW), Slovenia, 2012.
11. Feasibility Study for the rehabilitation of 126 MW Kairakkum reservoir, dam and hydropower plant including effects of climate change, Team Leader of iC Group's International Expert Team, financed by EBRD, 2012 - 2013
12. Development of a strategy regarding environmental flows, hydropeaking regulation, fish migration, biodiversity protection, economic evaluation for river systems for the National Environmental Commission in Bhutan to be applied to hydropower plants between 100 MW and 1200 MW presently under construction or development, training and capacity building for NEC staff, 2012-2014.
13. Study of the regional hydropower potential for the Swiss Kanton of Schaffhausen, 2011-2012. GIS based hydropower assessment, identification of most feasible sites (mostly < 100 kW), site investigations, development of environmental criteria, pre-feasibility studies, financial feasibility, development of a regional hydropower utilization strategy.
14. Feasibility study for an increase of the impoundment level of Rheinkraftwerk Schaffhausen (25 MW), Switzerland, 2011. Feasibility study including technical, ecological, regulatory and financial aspects, recommendation to the utility and local government.
15. Feasibility Studies for Northcroft Nigeria Ltd, Nigeria, Consultancy Services for

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- Feasibility Studies, Engineering Designs and Preparation of Tender Documents for Small and Medium Hydropower Plants at Bakolori Dam and Goronyo Dam, 2011 (appr. 3 MW each). Site assessment including existing structures and electromechanical equipment, hydrological analysis, analysis of the hydropower generation potential, reservoir operation, financial analysis, tender documents. International Team Leader and Project Manager.
16. Consulting for GTZ on possibilities for private investment in hydropower developments on Himachal Pradesh, India, 2010.
  17. Consultant for Kreditanstalt für Wiederaufbau, Germany, Renewable Energy Program for Khyber Pakhtunkhwa Province in Pakistan, 2010-2011. General assessment for planning a renewable energy development program with more than 400 individual sites, including solar lighting systems, solar pumping irrigations systems, appr. 100 small hydropower sites (5-500 kW). Identification of local implementing organisations, site inspections, assessment of possible community contributions, provision of technical support.
  18. Small hydropower development in Switzerland (2008–2012), SHP Auerbach, Nothüsli, Wogmoos, Wängi, Chupferhammer, Dreien, Niederglatt (between 10 and 300 kW). Site inspection, hydrological analysis, technical design, environmental analysis, financial analysis, bankable feasibility studies.
  19. Consultant for Renewable Energy Development within the Korean Export Processing Zone in Chittagong, Bangla Desh, 2010-2011. Assessment of the hydropower potential (run-of-river, storage, tidal) within the KEPZ to supply energy for industries under development.
  20. Consultant for instream flow regulations for 2 small Hydropower plants, Aksu River in Turkey, jointly with Fichtner, 2010. Assessment of necessary environmental flows and consequences for energy generation.
  21. Project Manager for Gemadro Coffee Plantation Pancake Fall HPP (1,3 MW), Ethiopia, GTZ, inspection and evaluation of 6 possible sites, identification of the best one, hydrological analysis, environmental analysis, preliminary design and equipment specification, load demand analysis, hybrid grid concept development, training and capacity building for local hydropower engineers, bankable feasibility study.
  22. Consultant for design and construction of Nam Kha I and Nam Kha II Small Hydropower Plants and hybrid grid development, joint venture Entec AG – Sunlabob Ltd., Vientiane, Lao PDR.
  23. Design Review of Siuri Khola hydropower plant (5 MW) in Nepal, 2009. Own project, Entec AG was one of the shareholders of the Nyadi Group.
  24. Consultant for the Scientific Advisory Board of the Centre for Environmental Design of Renewable Energy (CEDREN), Norway, since 2010, ongoing. Evaluation of research projects related to environmental impact/mitigation of renewable energy projects, in particular hydropowerpeaking power plants with reservoirs and intermittent operation.
  25. Project Manager for CREDP/GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) Project “Renewable Energy in the Caribbean“, 2008 – 2012, US\$ 380,000. Feasibility and tender design of 3 hydropower plants up to 1.5 MW. Site inspections, hydrological analysis, inspection of existing structures and electromechanical components, technical design for replacement/new components, financial analysis, tender documents.

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26. Project Manager of KfW Project "Training Programme for Operation and Maintenance of Hydro Power Station and Electricity Transmission/Distribution Systems in Afghanistan", 2008 – 2010, Euro 998,000. Development and implementation of a 2-year training program for capacity building of Afghan staff at Sarobi and Mahipar hydropower plants and Breshna Kot substation.
  27. Consulting for Private Investors to develop Hybrid Grids (wind, solar, pumped storage hydropower, diesel backup) on Con Dao Island, Vietnam, 2009-2011.
  28. Project Manager for GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) Project „Renewable Energies in Central Asia – Regional Report and Market Analysis“, 2008, Euro 103,000. Assessment of the framework conditions in 8 Central Asian Countries for domestic and foreign investors in the renewable power market. Evaluation of general energy supply situation, technical potentials for renewable energies, present use of renewables, market situation and access to markets, regulatory and administrative conditions, availability of financing, key institutions and persons.
  29. Programm Leader for the Swiss Hydropower Research Programm 2008-ongoing, funded by the Swiss Federal Office of Energy SFOE, CHF 600,000 (520,000 USD) annually. Development of the research program and main topics. Evaluation, revision and approval of research projects submitted to the Federal program. Participation in review panels and control of progress made in projects, final evaluation of the projects and results.
  30. Consultant for the Korean Institute for Construction Technology and Korean Water Institute: Operation of Geonsan Dam on the Dal River, 2006 – 2011. Simulation of the impact of the dam operations on fish habitats downstream. Recommendations for dam operation and environmental flow releases.
  31. Design and construction management of a Hydraulic Laboratory at the University of Idaho, Boise, including a 20 m tilting flume, sediment feeding and recirculation system, 2004-2007, \$ 2.5 Mio. funded by the US Congress.
  32. Feasibility studies for two small hydropower plants (3-4 MW) and capacity building in Vietnam, 2005-2006, funded by the European Community, Euro 640,000. Site inspections, revision of the hydrological analysis and technical design done by local consultants.
  33. Jorde, Egger, Benjankar: Operational Loss Assessment of the Lower Kootenai Floodplain, Part IV, BPA through Kootenai Tribe of Idaho, 2006-2007, \$ 87,902. Development of numerical simulation models to simulate floodplain vegetation development influenced by operation of Libby Dam, USA.
  34. Jorde, Tauber: Feasibility studies for 36 sites for low head hydro power plants for electricity generation at existing drop structures in Southern Idaho (USA) irrigation schemes, 2006-2007, Boise Project Board of Control. Site inspections, hydrological analysis, technical design, turbine selection, financial feasibility.
  35. Jorde, Benjankar: Operational Loss Assessment of the Lower Kootenai Floodplain (USA), BPA through Kootenai Tribe of Idaho, 2005-2006, \$ 79,169. Development of hydrodynamic numerical models for a large river and 200 km<sup>2</sup> of floodplain.
  36. Jorde, Parra: Pan American Advanced Study Institute "Balancing Hydropower Development and Biodiversity: Is Sustainability in an Adaptive Management Framework Achievable?" National Science Foundation, 2004- 2005, \$99,370. Organisation of a 2 week International workshop in Concepción, Chile, and in Patagonia. Participant selection criteria development and selection, scientific

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program organisation, chair of the workshop.

37. Study of Reservoir Operations and Ecosystem Losses: Changes in Habitat Quality for Native Fish Species in the Río Biobío due to Ralco and Pangué Dam Operations, 2004-2006, joint research project between University of Idaho and University of Concepción, Chile.
38. Jorde, Burke, Benjankar: Operational Loss Assessment of the Lower Kootenai Floodplain, BPA through Kootenai Tribe, 2004-2005, \$ 47,138. Development of a numerical cottonwood recruitment model to study impacts of the dam operation on cottonwood recruitment.
39. Jorde, Buffington, Burke: Operational Loss Assessment of the Lower Kootenai Floodplain, BPA through Kootenai Tribe, 2003-04, \$87,643. Development of a 1D numerical hydrodynamic model for a 200 km reach of the Lower Kootenai, model development, calibration, development of an Index of Hydraulic Alteration.
40. Jorde, Luce (FKK 127): Energy Balance of Small Mountain Streams, US Forest Service, 2003-07, \$60,000. Influence of natural processes on the temperature regime of mountain streams and their impact on fish communities.
41. Jorde, Goodwin, Scherrer: Process based temperature modeling of Red River restoration site in Central Idaho, BPA, 2002-03, \$7,000. Development of a temperature model for Red River (USA) to study different thermal restoration scenarios.
42. Jorde, Goodwin, Buffington, Dibrani: River/Tributary Interaction on the Kootenai - Sediment Transport Modeling, BPA through Kootenai Tribe, 2002-03, \$9,259.
43. Jorde, Buffington, Zelch: River/Tributary Interaction on the Kootenai - Tributary Watershed Assessment, BPA through Kootenai Tribe, 2002-03, \$24,432.
44. Jorde, Buffington, Lewicky: Effects of Dynamic Landscape Processes on the Spatio-Temporal Distribution and Quality of Chinook Salmon Spawning Habitat in Mountain Watersheds, 2003-2006, \$ 140,000.
45. Jorde, Buffington., Isaak: Spatial Structure and Dynamics of Salmonid Populations and their Habitats, 2004-2005, \$ 65,703.
46. Jorde, Buffington, Rosenberger: Stream Ecosystem Response to Wildfire, 2003-2006, \$ 647,000.
47. Long term habitat simulations for fish and floodplain vegetation in the river Rhine in Germany and the Netherlands, Project Manager and Engineer, 2000-02.
48. Collaborative project "Oekostrom" with EAWAG (Swiss Federal Institute of Science and Technology): Synthesis of environmental flow regulations for a large alpine catchment (Val Blenio), Project Manager and Engineer, 2000-03.
49. Instream flow regulation at the Ringenthal Hydropower plant (500 kW), Germany, Project Manager, 2000.
50. Standards for ecological construction und operation of hydropower plants (river and alpine storage plants), Consultant for the Swiss Federal Institute of Aquatic Science and Technology, 2000-02.
51. Hydropower use at the Upper Eschach (6 small hydropower plants < 100 kW): Potentials, ecological deficits, flood protection deficits, alternative solutions, Project Manager and Engineer, 2000-02.
52. Environmental Impact Assessment for the Werdohl Hydropower Plant (900 kW)

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- including dynamic instream flow regulation and effects of the weir on upstream habitats, Project Manager and Engineer, 1999-2000.
53. Technical and economic hydropower potential of the Stuttgart Region and assessment of ecological conflicts, Project Manager, 1999-2000.
  54. Instream flow regulation at the Spoel river in Southern Switzerland downstream of the Livigno reservoir, Project Engineer and Project Consultant for other institutions, 1999.
  55. Research Project: Long term investigation of ecological consequences of the construction and operation of the Volk Hydropower Plant (300 kW) at the river Elz in the Black Forest (Funded by German Environmental Foundation), Project Manager and Engineer, 1999.
  56. Cooperative project "Oekostrom" with EAWAG: Habitat Modelling and instream flow regulations for a large alpine catchment (Pilot Project Val Blenio), Project Manager and Engineer, 1998-2002.
  57. Restoration of the Musikinsel Hydropower Plant (120 kW) including new turbines/generators, a flood protection concept, partial renewal of the weir und two fishways, Project Manager and Engineer, 1998-2002.
  58. Research Project: Further development of the simulation model CASIMIR for hydraulic and fish habitat simulation, Project Manager and Engineer, since 1998.
  59. Instream flow regulation and fish habitats in the River Inn at the Toeing Hydropower station (80 MW), Project Manager, 1998-99.
  60. Dynamic Instream flow regulation at the Goersdorf Hydropower plant (600 kW), Project Manager and Engineer, 1997.
  61. Fischway construction for a planned 900 MW Hydropower station in Russian Karelia, Project Consultant for St. Peterburg Technical University (Russia), 1996.
  62. Research Project: Development of habitat related simulation models (CASIMIR) for instream flow regulations, Project Manager and Engineer, 1994-98.
  63. Physical model investigation for a new bottom outlet (cone valve) at the Schwarzenbach Dam (Germany, Black Forest), Project Engineer, 1995.
  64. Energy production losses due to environmental flows at several hydropower plants at the Glems river, Germany, Project Engineer, 1994.
  65. Potentials and costs of hydropower use in Germany, Project Engineer, 1994.
  66. Development of simulation models for morphologic, hydraulic and ecologic parameters in river systems, Project Manager and Engineer, since 1992.
  67. Influence of hydropower use and instream flow regulations on CO<sub>2</sub> emissions in Germany, Project Engineer, 1992.
  68. Development of a simulation model for hydropower plants, 1991.
  69. Hydropower potentials, present production, costs and ecological problems in Baden-Wuerttemberg, Project Engineer, 1991.
  70. Design of a small hydropower plant (50 kW), Project Engineer, 1991.
  71. Hydropower potentials and present use in the Neckarwerke supply area, Project Engineer, 1990.
  72. Hydropower potentials in 6 regions of Southern Germany, Project Engineer, 1988-



89.

\*Project Manager (Organisational, scientific and financial responsibility)

\*Project Engineer (Project partly or completely realised by myself)

### **Other professional activities**

Since 2013	SCCER-SoE, Swiss Competence Center for Renewable Energy Research – Supply of Electricity, member of the international evaluation committee.
2011-2016	CEDREN Centre for Environmental Design of Renewable EnergyReview, Norway, member of the international scientific advisory panel
2004-2005	Review panel: Assessment of flood risk for the Idaho National Engineering and Environmental Laboratory, DoE
2002-2007	Chairman of the IAHR Ecohydraulics section, (re-elected 2004)
2000-2005	European Aquatic Modelling Group, Leader of the Working Group on Modelling, EU funded COST action.
1999-2002	Secretary of the IAHR Ecohydraulics section
1998-99	Baden-Wuerttemberg State Government, Committee on Renewable Energy, Hydropower expert,
1998-2002	German-Chinese Group on Unsteady Sediment Transport (GESINUS), Member
1994-present	International Aquatic Modelling Group (IAMG), Steering Committee Member
Since 1996	International Association of Hydraulic Engineering and Research (IAHR)
1990-98	LAWA (Laenderarbeitsgemeinschaft Wasser) and DVWK (Deutscher Verband fuer Wasserwirtschaft und Kulturbau) expert panels on instream flow regulations,

### **Reviewer for Scientific Journals:**

- Water Resources Research
- Transactions of the American Fisheries Society
- Regulated Rivers: Research and Management
- River Research and Applications
- Journal of Unsteady Sediment Transport
- Environmental Modeling
- Ecological Engineering

### **Member of the Scientific Committee and International Advisory Boards:**

IAHR General Congress, Kuala Lumpur, Malaysia, 2017

International Symposium on Ecohydraulics, Melbourne, Australia, 2016

International Symposium on Ecohydraulics, Trondheim, Norway, 2014  
Swiss Competence Centers for Energy Research SCCER, SoE - Supply of Energy, Evaluation Panel member, since 2013  
Ecohydraulics Conference 2012, Vienna, Austria  
Ecohydraulics Conference 2010, Seoul, South Korea  
32<sup>nd</sup> IAHR General Congress 2007, Venice, Italy, special session on Operational Losses  
Hydroinformatics/Ecohydraulics Conference 2009, Concepción, Chile, organizing committee and scientific review panel  
Ecohydraulics Conference 2007, Christchurch, New Zealand, head of the scientific review panel  
31<sup>st</sup> IAHR General Congress 2005, Seoul, Korea, member of the scientific review panel  
Ecohydraulics Conference 2004, Madrid, head of the scientific review panel  
IAHR General Congress 2003, Thessalonica, Greece, scientific review panel  
Ecohydraulics Conference 2002 Cape Town, South Africa, international advisory board  
Ecohydraulics Conference 1999 Salt Lake City, Utah, USA, organizing committee

**Reviewer for Research Grants and Proposals:**

Commission for Technology and Innovation CTI, Switzerland  
Swiss Federal Office of Energy  
Swiss National Science Foundation  
German Environmental Foundation  
National Science Foundation, USA  
Norwegian Research Council  
Scientific Research Foundation, Austria

**Courses Taught:**

**University of Idaho: all courses at graduate student level**

Hydropower Schemes  
Hydraulic Structures, Design and Analysis  
Aquatic Habitat Modeling  
Seminar: Hydrologic Alterations and Floodplain Processes

**University of Stuttgart:**

Civil Engineering: Weirs, Hydropower plants, River Engineering, Energy Supply Systems, Engineering Hydrology, Fluid Hydraulics, River Hydraulics, Sediment Transport  
Environmental Engineering: Weirs, Hydropower Plants, River Engineering, River System Ecology, Ecohydraulics  
Water Resources Engineering and Management: Environmental Impact Assessment

**UNESCO- Institute for Hydrologic Education IHE, Delft:**

Visiting Lecturer: Hydropower Systems, 2008 and 2009

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## Publications and Conferences

### a) Peer Reviewed Journal Papers:

1. Benjankar, R., N. Glenn, G. Egger, K. Jorde, P. Goodwin (2010). Comparison of Field-Observed and Simulated Map Output from a Dynamic Floodplain Vegetation Model Using Remote Sensing and GIS Techniques. *GIScience & Remote Sensing*, 2010, 47, No. 4, p. 480–497
2. García, A., K. Jorde, E. Habit, O. Parra: Downstream Environmental Effects of Dam Operations: Changes in Habitat Quality for Native Fish Species, *River Research and Applications*, 2010, DOI: 10.1002/rra.1358
3. Burke, M., Jorde, K., Buffington, J. (2008): Application of a hierarchical framework for assessing environmental impacts of dam operation: Changes in streamflow, bed mobility and recruitment of riparian trees in a western North American river, *J. Environm. Managm.* 2008 in press.
4. Goodwin, P., K. Jorde, C. Meier, and O. Parra. 2006. Minimizing environmental impacts of hydropower development: transferring lessons from past projects to a proposed strategy for Chile. *Journal of Hydroinformatics* 4, 253-270.
5. Bratrich, C., Jorde, K., Truffer, B., Markard, J., Meier, W., Peter, A., Schneider, M., and Wehrl, B. (2004). "Green Hydropower: A New Assessment Procedure for River Management." *River Research and Applications*, 20, 865-882.
6. Truffer, B., Bratrich, C., and Jorde, K. (1999). "Oekostrom: Neue Perspektiven der Wasserkraftnutzung." *Wasserwirtschaft*, 89(10), 488-495. (Green Hydropower, German Journal of Water Resources).
7. Jorde, K., and Schneider, M. (1998). "Einsatz des Simulationsmodells PHABSIM zur Festlegung von Mindestwasserregelungen." *Wasser & Boden*, 50(4), 45-49. (Application of the simulation model PHABSIM to determine instream flows, German Journal for Water and Soil).
8. Jorde, K., and Bratrich, C. (1997). "Hydraulische und morphologische Modellierung von Fliessgewässern mit dem Simulationsmodell CASIMIR: Gewässerbiologie und Habitatmodellierung." *Wasserwirtschaft*, 87(7/8), 370-371. (Hydraulic and morphological modeling with CASiMiR: biology and habitats, German Journal of Water Resources)
9. Jorde, K. (1997a). "Bottom shear stress pattern and its ecological impact." *Int. J. Sediment Transport*, 12(3), 369-378.
10. Jorde, K. (1997b). "Hydraulische und morphologische Modellierung von Fliessgewässern mit dem Simulationsmodell CASIMIR: Sohlennahe Strömung." *Wasserwirtschaft*, 87(7/8), 368-369. (Hydraulic and morphological modeling with CASiMiR: bottom flows, German Journal of Water Resources).
11. Jorde, K., and Giesecke, J. (1997). "Ansätze zur ökologischen Optimierung von Mindestabflussregelungen in Ausleitungsstrecken." *Wasserwirtschaft*, 87(6), 232-237. (Methods for optimization of instream flow regulations, German Journal of Water Resources).
12. Jorde, K. (1996b). "Mindestwasserregelungen in Ausleitungsstrecken: Ein Simulationsmodell zur Beurteilung ökologischer und ökonomischer Auswirkungen." *Wasserwirtschaft*, 86(6), 302-308. (Instream flow in diverted river reaches, a simulation model for ecological and economic assessment, German

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Journal of Water Resources).

**b) Refereed Conference Papers:**

1. Jorde, K., Davies, C., Seidelmann, R., Watzal, M. 2015: Increasing resilience against climate change impacts while rehabilitating Kairakkum HPP in Tajikistan. Hydro 2015, Bordeaux, France.
2. Egger, G., Benjankar, R., Davis, L. and Jorde, K. 2007. Simulated effects of dam operation and water diversion on riparian vegetation of the Lower Boise River, Idaho, USA. 32<sup>nd</sup> IAHR General Congress, Venice, Italy.
3. García A., Jorde K., Parra O., Habit E. 2007. Downstream environmental effects of Ralco and Pangué dam operations: Changes in habitat quality for native fish species, Biobío River, Chile. 32<sup>nd</sup> IAHR General Congress, Venice, Italy.
4. Benjankar, R., G. Egger, Y. Xie, and K. Jorde. 2007. Reservoir Operations and Ecosystem Losses: Concept and Application of a Dynamic Floodplain Vegetation Model at the Kootenai River, U.S.A. Proc. 7th Ecohydraulics Conference, Christchurch, New Zealand.
5. Burke, M., and K. Jorde. 2007. Reservoir Operations and Ecosystem Losses: Modified Fluvial Processes Downstream of Libby Dam, Kootenai River, U.S.A. and Canada. Proc. 7th Ecohydraulics Conference, Christchurch, New Zealand.
6. Garcia-Lancester, A., E. Habit, O. Parra, and K. Jorde. 2007. Reservoir Operations and Ecosystem Losses: Changes in Habitat Quality for Native Fish Species due to Ralco and Pangué Dam Operations, Biobio River, Chile. Proc. 7th Ecohydraulics Conference, Christchurch, New Zealand.
7. Burke, M., Jorde, K., Benjankar, R., Buffington, J. M., and Braatne, J. (2006). "Spatial Distribution of Impacts to Channel Bed Mobility due to Flow Regulation, Kootenai River, USA." *8th Federal Interagency Sedimentation Conference*, 8 p.
8. Jorde, K., and Scherrer, I. (2005) "Stream Temperature Modelling and Thermal Restoration Potentials." *31. IAHR Congress*, Seoul, 11 p.
9. Jorde, K., and Burke, M.(2005). "Conceptual framework for assessment of ecosystem losses due to reservoir operations." *COST-626 European Aquatic Modelling Network*, Silkeborg, Denmark, 157-165.
10. Burke, M., and Jorde, K. (2004). "Physical process based conceptual framework for assessment of ecosystem losses in river floodplain systems due to reservoir operations." *Fifth International Symposium on Ecohydraulics*, Madrid, Spain, 840-844.
11. Schneider, M., and Jorde, K. (2003) "Fuzzy-Rule Based Models for the Evaluation of Fish Habitat Quality and Instream Flow Assessment." *International IFIM Users' Workshop*, Fort Collins, Colorado, USA.
12. Schneider, M., Jorde, K., Zöllner, F., Kerle, F., and Eisner, A.(2002) "Use of Habitat Models for Decision Support in Water Resources Management." *Proc. 3rd Int. Conf. on Water Resources and Environment Research (ICWRER) - water quantity and quality aspects in modeling and management of ecosystems*, Dresden, Germany, July 22-26.
13. Giesecke, J., Schneider, M., and Jorde, K. (1999). "Analysis of Minimum Flow Stretches Based on the Simulation Model CASIMIR." *28th IAHR General Congress*,

Graz, Austria.

14. Giesecke, J., and Jorde, K. (1999). "Technical and Ecological overall Concepts for the Reactivation, Modernization and Relicensing of Hydropower plants." *28th IAHR General Congress*, Graz, Austria.
15. Jorde, K., Fassnacht, B., and Bratrich, C. (1999). "Oekostrom: Benthic Habitat Quality and Annual Energy Production in Alpine Streams." *3rd Int. Symp. Ecohydraulics*, Salt Lake City, 3.
16. Jorde, K., and Truffer, B. (1999). "Oekologische Forderungen beim Bau von Kleinwasserkraftanlagen." *Zweites Anwenderforum Kleinwasserkraftwerke*, Passau, 133-147.
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18. Giesecke, J., and Jorde, K. (1998). "Technisch-oekologische Gesamtkonzepte bei Reaktivierung, Modernisierung und Neukonzessionierung von Wasserkraftanlagen." *Planung und Realisierung im Wasserbau*, Garmisch, Germany, 361-373.
19. Jorde, K., and Bratrich, C. (1998). "Influence of river bed morphology and flow regulations in diverted streams: effects on bottom shear stress patterns and hydraulic habitat." *Advances in River Bottom Ecology IV*, G. Bretschko and J. Helesic, eds., Backhuys Publishers, Leiden, The Netherlands, 47-63.
20. Giesecke, J., and Jorde, K. (1997). "Approaches Towards an Ecological Optimization of Minimum Flow Regulations in Diverted Streams." *27th IAHR Congress*, San Francisco, USA, 528-533.
21. Jorde, K. (1996). "Ecological Evaluation of Instream Flow Regulations Based on Temporal and Spatial Variability of Bottom Shear Stress and Hydraulic Habitat Quality." *Proc. 2nd International Symp. on Habitat Hydraulics, Ecohydraulics, 2000*, Quebec City, Canada, 163-174.

### c) Books, Book Chapters:

1. Tonina, D. & Jorde, K. (2013). Hydraulic Modelling Approaches for Ecohydraulic Studies: 3D, 2D, 1D and Non-Numerical Models. In: *Ecohydraulics: An Integrated Approach*, Maddock, Harby, Kemp, Wood (eds.), Wiley-Blackwell, ISBN: 978-0-470-97600-5 Pp. 31-74.
2. Jorde, K. et al. (2013). "Stromerzeugung aus Wasserkraft." *Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte*, M. Kaltschmitt, A. Wiese, and W. Streicher, (eds.), 5. Auflage, Springer Vieweg, Berlin, 555-619
3. Jorde, K. (editor) 2009: *Good and Bad of Micro Hydro Power – Vol. 1 (Site Identification, Civil Works, Electro-Mechanical) and Vol. 2 (transmission & Distribution, House Installations, Management & Administration, Utilization of Energy)*, published by ACE/GTZ 2009.
4. Jorde, K. & Kaltschmitt, M. (2007): *Hydroelectric Power Generation*. In: *Renewable Energy – Technology, Economics and Environment*. Kaltschmitt, Streicher, Wiese (eds.), Springer Publishers, Berlin, pp. 349-373.
5. Jorde, K. (2003a). "Ökologische Analyse." *Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte*, M. Kaltschmitt, A. Wiese, and W. Streicher, eds.,

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6. Jorde, K. (2003b). "Stromerzeugung aus Wasserkraft." Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, M. Kaltschmitt, A. Wiese, and W. Streicher, eds., Springer, Berlin, 333-379.
7. Jorde, K. (1998a). "Chapter 19: Wasserkraft und Umwelt." Wasserkraftanlagen - Planung, Bau und Betrieb, J. Giesecke and E. Mosonyi, eds., Springer Verlag, Berlin.
8. Jorde, K. (1998b). "Chapter 20: Mindestwasser und Gewässerstruktur." Wasserkraftanlagen - Planung, Bau und Betrieb, J. Giesecke and E. Mosonyi, eds., Springer Verlag, Berlin.
9. Jorde, K., and Kaltschmitt, M. (1997). "Grundlagen des regenerativen Energieangebots, Lauf- und Speicherwasserangebot." Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, M. Kaltschmitt and A. Wiese, eds., Springer Verlag, Berlin, 78-90.
10. Jorde, K., and Kaltschmitt, M. (1995). "Grundlagen des regenerativen Energieangebots, Lauf- und Speicherwasserangebot." Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, M. Kaltschmitt and A. Wiese, eds., Springer Verlag, Berlin, 68-80.
11. Jorde, K., Wiese, A., Kaltschmitt, M., and Hartmann, D. (1997). "Stromerzeugung aus Wasserkraft." Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, M. Kaltschmitt and A. Wiese, eds., Springer Verlag, Berlin, 297-344.
12. Jorde, K., Wiese, A., Kaltschmitt, M., and Hellwig, T. (1995). "Stromerzeugung aus Wasserkraft." Erneuerbare Energien - Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, M. Kaltschmitt and A. Wiese, eds., Springer Verlag, Berlin, 295-344.

**d) Keynote and invited Presentations/Papers:**

1. Jorde, K. (2006). Reservoir Operations and Ecosystem losses. Pages 41-66 in C. W. Kim, and H. Woo, editors. The 2nd International Workshop on River Environment. Korean Institute for Construction Technology, Seoul, South Korea.
2. Jorde, K., Burke, M., Scheidt, N., Welcker, C., Borden, C., King, S., Benjankar, R., McFall, J., and Caamano, D. (2005). "Reservoir Operations and Ecosystem losses." *6th Gravel Bed River Conference*, St. Jakob, Austria (invited keynote lecture).
3. Jorde, K. (2004). "River Restoration - Potential, Constraints and the Role of Ecohydraulics." *Proc. 4th Ecohydraulics Conference, Capetown, South Africa, March 3-8, 14.* (invited keynote lecture).
4. Jorde, K., Schneider, M., Peter, A., and Zöllner, F. (2001) "Fuzzy based Models for the Evaluation of Fish Habitat Quality and Instream Flow Assessment." *Intern. Symp. Environm. Hydraulics, ISEH*, Tempe, Arizona (invited lecture).
5. Jorde, K., Schneider, M., and Zoellner, F. (2000). "Oekologisch begründete Mindestwasserregelungen." *Wasserbewirtschaftung an Bundeswasserstrassen - Probleme, Methoden, Loesungen*, Berlin, Germany, 203-224 (invited lecture).
6. Jorde, K., Schneider, M., and Zöllner, F. (2000). "Analysis of instream habitat quality - preference functions and fuzzy models." *Stochastic Hydraulics 2000*,

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- Balkema, Rotterdam, ISBN 90 5809 166X, 671-680 (invited lecture).
7. Jorde, K. (2000). "Application of Simulation Tools to Improve Ecological Sustainability of Hydropower Operation." Colloquium: Green Electricity from Hydropower, University of Trondheim & SINTEF, Trondheim, Norway (invited lecture, no publication).
  8. Jorde, K., and Bratrich, C. (2000). "Oekostrom - A Green Label for Hydropower Plants in Switzerland." Colloquium: Green Electricity from Hydropower, University of Trondheim & SINTEF, Trondheim, Norway (invited lecture, no publication).
  9. Jorde, K. (1999). "Die Problematik des Restwassers." *Lebensraum Fließgewässer - Charakterisierung, Bewertung und Nutzung*, Laufen, Germany, 129-144 (invited lecture).
  10. Jorde, K. (1999). "Das Simulationsmodell CASIMIR als Hilfsmittel zur Festlegung oekologisch begründeter Mindestwasserregelungen." *Euronatur Tagung Problemkreis Pflichtwasserabgabe*, Graz, Austria (invited lecture).
  11. Jorde, K. (1998). "Habitatbezogene Ansätze zur Festlegung von Mindestwasserregelungen: Wechselwirkungen zwischen Abfluss und Gewässermorphologie, Tagungsband zur ?" *Fachtagung Wildfluss contra Wasserkraft: Entwicklung von Leitbildern fuer Isar und Inn*, Munich, Germany, 13-25 (invited lecture).

**e) Conference Presentations (no paper published):**

1. Scherrer, I., and Jorde, K. (2004). "Stream Temperature Modelling and Thermal Restoration Potentials." Fifth International Symposium on Ecohydraulics, International Association of Hydraulic Engineering and Research, Madrid, Spain.
2. Jorde, K., Borden, C., and Zoellner, F. (2004). Fifth International Symposium on Ecohydraulics, International Association of Hydraulic Engineering and Research, Madrid, Spain.
3. Jorde, K. (2002a). "Ecological Sustainability of Hydropower Use." 37th Symposium on Engineering Geology and Geotechnical Engineering, Boise, Idaho.
4. Jorde, K. (1998d). "Simulation of Ecohydraulic and Ecomorphologic Patterns in Instream Flow Assessment Methodologies." VII International Congress of Ecology, Firenze, Italy.
5. Bratrich, C., and Jorde, K. (1997). "Hydraulische und morphologische Modellierung von Fließgewässern mit dem Simulationsmodell CASIMIR: Gewässerbiologie und Habitatmodellierung." Internationales Symposium: Ermittlung oekologischer Mindestwasserregelungen,, University of Stuttgart, Stuttgart, Germany.
6. Jorde, K. (1997c). "Hydraulische und morphologische Modellierung von Fließgewässern mit dem Simulationsmodell CASIMIR: Sohlnahe Stroemung." Internationales Symposium: Ermittlung oekologischer Mindestwasserregelungen,, University of Stuttgart, Stuttgart, Germany.

**f) Research Reports:**

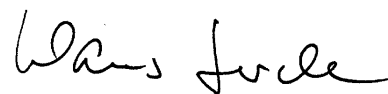
1. Giesecke, J., Jorde, K., Schneider, M., and Kerle, F. (2000). "Umweltverträglichkeitsstudie zur Wasserkraftanlage Werdohl-Schlacht an der Lenne."
2. Giesecke, J., Schneider, M., and Jorde, K. (1999b). "Auswirkungen von

Abflussvariationen auf das aquatische Habitatangebot in der Teststrecke Kraiburg/Inn."

3. Giesecke, J., Jorde, K., Schneider, M., and Bratrich, C. (1997). "Beurteilung ökologischer Auswirkungen von Mindestwasserregelungen in der Ausleitungsstrecke Mühle Görsdorf an der Flöha."
4. Giesecke, J., Jorde, K., and Haakh, F. (1991). "Wasserkraft in Baden-Wuerttemberg." Ministerium fuer Wirtschaft, Mittelstand und Technologie, Baden-Württemberg, Stuttgart, Germany.
5. Jorde, K. (1987). "Untersuchung des Schwingungsverhaltens von flexiblen Wehren bei varrierenden Unterwassersänden", Diplomarbeit (MSc. thesis), Universität Stuttgart, Stuttgart, Germany.
6. Jorde, K. (1997). "Ökologisch begründete, dynamische Mindestwasserregelungen bei Ausleitungskraftwerken," Dissertation, Universität Stuttgart, Stuttgart, Germany.

Research results were often published as Master`s or Doctoral thesis, I supervised more than 50 M.Sc. and Ph.D. students at the University of Stuttgart and at the University of Idaho and as external committee member at other universities. A separate list is available upon request.

Klagenfurt, Feb. 2017



Klaus Jorde