

# KARL -ERICH LINDENSCHMIDT

## PERSONAL

---

Address: University of Saskatchewan  
Global Institute for Water Security  
National Hydrology Research Centre  
11 Innovation Boulevard  
Saskatoon, Saskatchewan, S7N 3H5, Canada

Telephone: 001 (306) 966-6174

Email: [karl-erich.lindenschmidt@usask.ca](mailto:karl-erich.lindenschmidt@usask.ca)

Nationality: Canadian

Birth date and place: 31 October 1964 in Beausejour, Manitoba, Canada

Languages: English (native speaker); German (fluent); French & Spanish (some)

## EDUCATION

---

2006 Habilitation (Water Resources Management)  
Technical University of Cottbus supervised by Prof. Uwe Grünewald  
Thesis: *River water quality modelling for river basin and water resources management with a focus on the Saale River*

1998 PhD (Environmental Engineering)  
Technical University of Berlin supervised by Prof. W. Hegemann  
Thesis: *On the effect of artificial aeration on the phytoplankton populations of Lake Tegel, Berlin*

1989 Master of Applied Science (Mechanical Engineering)  
University of Toronto, Canada

1986 Bachelor of Science (Mechanical Engineering)  
University of Manitoba, Canada

## ASSOCIATIONS

---

- Professional member of the  
*APEGS – Association of Professional Engineers and Geoscientists of Saskatchewan*  
*APEGA – Associations of Professional Engineers and Geoscientists of Alberta*  
*PEGNL – Professional Engineers and Geoscientists of Newfoundland & Labrador*
- Board member of:  
*CWRA – Canadian Association of Water Resources (Saskatchewan Branch)*
- Member of:  
*CRIPE – Committee on River Ice Processes and the Environment*  
*IAHS – International Association for Hydrological Sciences*

## TEACHING EXPERIENCE

---

<b>institution</b>	<b>course name</b>	<b>semester</b>	<b>hours</b>
University of Saskatchewan	- River & lake ice processes	spring 2017	39 hrs compressed
	- Tools and Applications for Sustainability Problem-solving	winters 2015 - 2018	3 hrs/week for 13 weeks
	- Water Resources Management in Cold Regions	winters 2014 - 2018	''
	- River Science & Management	autumns 2013 - 2017	''
	- Principles of Fluvial Processes	winter 2013	''
University of Winnipeg	- GIS applications in hydrology and remote sensing	winter semesters 2009 & 2010	5 hrs/term
Cambridge University	- Spatial data analysis / Geostatistics	autumn 2008	2 hrs/week for 6 weeks
	- Hydrological modelling with GIS applications	spring 2009	2 hr/week for 6 weeks
	- Flood risk assessment and management	spring 2009	1 hr/week
Tech. Univ. of Cottbus	- Surface water and groundwater management	summer semesters 2001 - 2007	2 hr/week for 12 weeks
	- Watershed Modelling System	summer semesters 2001 - 2007	2 hr/week for 12 weeks
Univ. Concepción, Chile	- Integrated River Basin Management	summer semesters 2003 & 2004	1 module of short course

## INFORMATICS SKILLS

---

- water quality modeling - QUAL-2E, WASP5, DYRESM
- watershed modeling - WaSim, AGNPS
- groundwater modeling - ModFlow, ModPath, MT3
- river ice modeling - RIVICE, CRISSP
  
- computer programming - Java, C++, Fortran, Visual Basic, Assembler
- operating systems - Linux/Unix, Windows, DOS
- computer aided design - ACAD, CADAM, ANVIL
- finite element analysis - I DEAS, NASTRAN, ANSYS, ADINA
  
- computer software - ArcGIS, CorelDraw, MathCad, Grapher, Surfer
- statistics packages - SPSS, SYSTAT, R
- MS Office - Word, Excel, PowerPoint, Access
- internet site design - xml, html, FrontPage, NetObjects Fusion

## ENVIRONMENTAL SCIENCES & ENGINEERING EXPERIENCE

---

Feb/12 – present

### **Associate Professor**

*School of Environment & Sustainability, University of Saskatchewan*

- research topics include surface water quality modelling, fluvial geomorphology and river ice processes
- duties include supervision of graduate students, lecturing, acquisition of project funding and administrative tasks.

Mar/09 – Jan/12

### **Hydrologic Modelling Research Engineer**

*Government of Manitoba, Department of Water Stewardship*

- researched new remote sensing methodologies to investigate geomorphologic and hydraulic processes such as ice breakup and jamming
- computer modelling of ice-covered river hydraulics, river ice breakup and ice jamming including probabilities of occurrences and potential locations
- supported operations of the Winnipeg Floodway during flood events; consists of predicting flows and water levels in the City of Winnipeg (in collaboration with the flood forecasting team) for proper operation of the Floodway.
- developed methods to derive geomorphological response units of rivers to determine their instream flow needs.
- participated in a Manitoba-Saskatchewan drainage task force to investigate erosion control in Assiniboine tributaries.
- made recommendations regarding flows and water availability on applications for licenses and permits for water usage.
- provided hydrological input to the integrated watershed management planning process for river catchments.

Mar/09 – present

### **University Guest Lecturer**

*University of Winnipeg, Department of Geography*

- invited to give lectures and supervise student projects in
  - GIS for flood and flood risk management
  - GIS for hydrological modelling
  - remote sensing and GIS

Jan/08 – Feb/09

### **Integrated Water Resources Management**

*Mott MacDonald Group, Cambridge, UK*

- River Test Flood Forecasting - implemented a computational model of the River Test as part of a flood forecasting system for the River Test catchment.
- Risk Assessment of Sea Level Rise Impacts on Water Sources – managed the project to identify Anglian Water Services’ surface water and groundwater resources at risk from sea level rise.
- Shardlow Licence Variation – managed the project to carry out a group pumping test of groundwater production boreholes operated by Severn Trent Water Limited; results to supplement an application for licence variation to abstract water for drinking

from the River Trent during low flow conditions.

- Coconut Island Lagoon – managed the project to carry out water quality modelling of a resort lagoon to advise on construction and determine specifications for further water monitoring.
- Sizewell Electrical Substation – assessed the impact of substation construction on the natural environment and sensitive habitat; develop and supervise a monitoring program to control water levels so as not to endanger surrounding flora and fauna.
- Northern Distributor Road in Norwich - assessed the hydrology and hydrogeology aspects related to the construction as part of an environmental impact assessment.
- River Yare Crossing – as part of the development of the scheme design and optioneering, undertook flood risk assessment and water and sediment quality assessments to identify risks to the third River Yare crossing in Great Yarmouth.

Jan/08 – Feb/09

### **University Guest Lecturer**

*Cambridge University, Department of Geography*

- responsible for lecturing Master and Bachelor courses in
  - geostatistics and spatial data analysis
  - GIS and modelling applications for hydrological systems
  - flood risk assessment, mapping and management

Aug/04 – Dec/07

### **Extreme Flood Management and Risk Assessment**

*Team leader of Flood Research Group*

*GFZ – GeoForschungsZentrum (Helmholtz), Potsdam, Germany*

- promoted strategies to integrate the EU water framework and flood directives for sustainable water use in river basins
- hydraulic and hydrological modelling of extreme flood events
- assessed and mapping flood risk in dyked and non-dyked reaches of the Elbe and Mulde rivers
- assessed environmental risk of contamination and eutrophication in flood detention basins on agricultural lands
- simulating water-quality changes in rivers and inundated areas
- assessed environmental impact of infrastructures constructed for flood management as required by EU floods directive
- developed methods to quantify model structural uncertainty

Oct/01 – Dec/07

### **University Lectureship**

*Brandenburg Technical University of Cottbus, Germany*

- responsible for lecturing two full-credit courses per year in the field of *Water Resource Management*
- supervised Master and PhD students with their theses work
- partook in the design and implementation of new course modules for the international graduate program

Jun/99 – Jul/04

### **River Basin Development**

*UFZ – Environmental Research Centre (Helmholtz), Magdeburg, Germany*

- successful applicant as partner of EU-project "FloodSite"; responsible for developing a real-time flood forecasting model for the lower Mulde river (Elbe catchment, Germany)

- developed a quasi-2D river hydrodynamic modelling approach to better capture flow characteristics of flood events.
- river water-quality modelling of the Saale river (Elbe catchment, Germany); investigating the effects of floodplains and weirs on the water quality of a heavily modified river
- hydrological and erosion modelling of river catchment areas by coupling the computer models WaSiM and AGNPS
- linked computer models in HLA (High Level Architecture) and OMS (Object Modelling System).
- helped develop a river catchment management system which incorporated an interface between environmental processes with socio-economic and political decision making potential

Nov/98 – May/99

### **Biotechnology**

*Section Head of Biotechnology Department*

*Energy of Nature GmbH, Leipzig, Germany*

- coordinated design of biogas plants
- modelled flow behaviour in bioreactors to optimize configuration of mixing devices
- modelled water and chemical regime of landfills
- modelled chemical and biological processes in bioreactors

Aug/97 – Oct/98

### **Environmental Modelling Consultancy**

*Econumerics, Berlin, Germany (consultant)*

Contracts acquired and successfully completed:

- investigation of hydraulic changes due to the extension of the Havel River / Sacrow-Peritzer Channel system - contract from *Association for Environment & Nature, Germany*
- databank development and statistical analyses of biological and chemical parameters sampled from 200 German lakes - contract from *German Environment Agency*
- co-design of TrintSim (Trench-Infiltration-Trough-Simulation); contract from *Engineering Firm Prof. Sieker mbH, Berlin*.
- translation of technical reports and journal articles – several contracts from *Berlin Water Works*

Jan/93 – Jul/97

### **Environmental Management**

*Institute for Technical Environmental Protection, TU Berlin*

Acquisition and coordination of the following research projects:

- loading of solute and suspended solids from rural catchment areas flowing into Lake Victoria in Uganda
- control and optimization of mobile and stationary aeration systems for Berlin surface waters

## MECHANICAL ENGINEERING EXPERIENCE

---

Jan/91 – Dec/92

### **Materials Science**

*Engineering Mechanics & Design Laboratory, University of Toronto*

- measurement of residual stresses in shot-peened metal surfaces
- ultrasonic characterization of new materials, such as metal and ceramic matrix composites, and metal plasma coatings
- finite element modelling & programming signal processing tools
- laboratory manager and computer system administrator

Jan/90 – Dec/90

### **Biomedical Robotics**

*Andronic Devices Ltd., Vancouver, Canada*

- designed robotical limb positioners and accessories (traction devices, sterility drapes and weight compensators) for surgery
- consulted with surgeons and other medical professionals to improve product design and investigate new markets

Sep/86 – Sep/87

### **Ultrasonic Non-destructive Testing**

Oct/88 – Dec/89

*Ontario Hydro Research, Toronto, Canada*

- evaluated various non-destructive ultrasonic techniques for measuring crack depths in thin tubular sections
- optimized a technique and designed a system to measure crack and flaw depths in CANDU reactor pressure tubes

Oct/87 - July/88

### **Automobile Stress Analysis**

*Vehicle Design Institute, Braunschweig, Germany*

- modelled a 1988 Ford Sierra automobile body using finite elements for stress analysis
- carried out bending and torsional displacement experiments on a car body to correlate results with theoretical computations