

# Bart Rogiers




I am a scientific researcher and R enthusiast at the Belgian Nuclear Research Centre (aka SCK CEN), and also have a seat in the council of the International Association of Hydrogeologists' Belgian chapter.

My research interests are currently focused around the introduction of probabilistic programming in hydrogeology and radiological characterization, and leveraging procedural texture synthesis in the framework of porous media reconstruction.



I furthermore really enjoy introducing people to the modern side of R, and help them adopt it as their main workhorse for more reproducible science.







## PROFESSIONAL EXPERIENCE

- Present**  
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2013 • **Scientific researcher**  
SCK CEN | Belgian Nuclear Research Centre  Mol, Belgium
  - Present**  
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2015 • **Board member**  
BCH-CBH | IAH Belgium  Brussels, Belgium
  - 2009**  
|  
2008 • **Internship**  
Flanders Environment Agency  Brussels, Belgium
- Topic** River restoration of the Zwarte Beek between Beringen and Diest: Evaluation of the impact on the groundwater system.
- Supervisor** Lermytte J

## TEACHING EXPERIENCE

- Present**  
|  
2019 • **Modern R for data science: The core tidyverse, good practices and our corporate environment**  
SCK CEN Learning & development  Mol, Belgium
- Format** Yearly 4-day course
- Topics** Data reading, cleaning, manipulation and visualization - Iteration with functional programming - Exporting tables and figures - Literate computing - Reproducible workflow
- Present**  
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2020 • **Modern R for data science: Up your data viz game**  
SCK CEN Learning & development  Mol, Belgium
- Format** Yearly 1-day course
- Topics** More details on {ggplot2}, {scales} and extensions - Figure design principles - Data visualization types - Animation

## CONTACT INFO

 [rogiersbart.github.io](https://rogiersbart.github.io)  
 [github.com/rogiersbart](https://github.com/rogiersbart)  
 [twitter.com/rogiersbart](https://twitter.com/rogiersbart)  
 [rogiers.bart@gmail.com](mailto:rogiers.bart@gmail.com)  
 [bart.rogiers@sckcen.be](mailto:bart.rogiers@sckcen.be)

## SKILLS

R, MODFLOW, MT3D, SQL, git, GitHub, markdown, CSS, HTML, LaTeX, MS Office

## DOMAINS

Data science, hydrogeology, spatial data, porous media, radiological characterization

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Last updated on 2021-02-16.

- 2021  
2017 ● Training course on radioactive waste management  
SCK CEN Academy Mol, Belgium
- Format** 45-min lecture “Characterization techniques used at SCK CEN - Uncertainty quantification” during the 1.5-week radioactive waste management course
- Topics** Taylor expansion - Monte Carlo error propagation - Probabilistic programming - State of the art in radiological waste characterization

## ➤ SELECTED PAPERS

- 2019 ● Nested multiresolution hierarchical simulated annealing algorithm for porous media reconstruction. Physical Review E 100(5), 053316
- Authors** Lemmens L, Rogiers B, Jacques D, Huysmans M, Swennen R, Urai JL, Desbois G, Laloy E
- 2014 ● Multi-scale aquifer characterization and groundwater flow model parameterization using direct push technologies. Environmental Earth Sciences 72(5): 1303-1324
- Authors** Rogiers B, Vienken T, Gedeon M, Batelaan O, Mallants D, Huysmans M, Dassargues A
- 2014 ● High resolution saturated hydraulic conductivity logging of borehole cores using air permeability measurements. Hydrogeology Journal 22(6): 1345-1358
- Authors** Rogiers B, Winters P, Huysmans M, Beerten K, Mallants D, Gedeon M, Batelaan O, Dassargues A
- 2014 ● Demonstrating large-scale cooling in a Variscan terrane by coupled groundwater and heat flow modelling. Geothermics 51: 71-90
- Authors** Rogiers B, Huysmans M, Vandenberghe N, Verkeyn M
- 2013 ● Derivation of flow and transport parameters from outcropping sediments of the Neogene aquifer, Belgium. Geologica Belgica 16(3): 129-147
- Authors** Rogiers B, Beerten K, Smeekens T, Mallants D, Gedeon M, Huysmans M, Batelaan O, Dassargues A

See orcid or scholar for more extensive overviews.

- 2013

● Efficient posterior exploration of a high-dimensional groundwater model from two-stage MCMC simulation and polynomial chaos expansion.  
Water Resources Research 📍 49(5): 2664-2682

**Authors** Laloy E, Rogiers B, Vrugt JA, Mallants D, Jacques D
  
- 2013

● Determination of Cs-137 contamination depth distribution in building structures using geostatistical modelling of ISOCS measurements.  
Applied Radiation and Isotopes 📍 79: 25-36

**Authors** Boden S, Rogiers B, Jacques D
  
- 2012

● Estimation of hydraulic conductivity and its uncertainty from grain-size data using GLUE and artificial neural networks.  
Mathematical Geosciences 📍 44(6): 739-763

**Authors** Rogiers B, Mallants D, Batelaan O, Gedeon M, Huysmans M, Dassargues A



## EDUCATION

- 2013  
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2009

● PhD in Geology  
SCK CEN & KU Leuven 📍 Mol, Belgium

**Thesis** Conditional Stochastic Simulation of Groundwater Flow and Contaminant Transport in a Sandy Aquifer at Mol/Dessel.

**Supervisory committee** Batelaan O, Mallants D, Gedeon M, Huysmans M, Dassargues A

**Additional members of the jury** Vandenberghe N, Swennen R, Vanderborcht J, Dietrich P
  
- 2009  
|  
2007

● Master of Science in Geology  
KU Leuven, magna cum laude 📍 Leuven, Belgium

**Thesis** Interpretation of the heat-flow density in the deep wells Soumagne, Grand-Halleux and Havelange in Belgium, by means of a numerical coupled heat transport and groundwater flow model.

**Promoters** Vandenberghe N, Huysmans M

2007  
|  
2004

- Bachelor of Science in Geology, Option Physics  
KU Leuven, cum laude  Leuven, Belgium

**Thesis** The meaning of heat-flow density measurements in the wells Grand-Halleux, Soumagne, Meer and Havelange.

**Promoters** Vandenberghe N, Huysmans M






## PEER REVIEWING

- Hydrogeology Journal (3)
- Water Resources Research (3)
- Computers & Geosciences (2)
- Journal of Hydroinformatics (2)
- Mathematical Geosciences (2)
- Toxics (2)
- Advances in Water Resources (1)
- Earth Science Informatics (1)
- Environmental Earth Sciences (1)
- Frontiers in Earth Science (1)
- Journal of African Earth Sciences (1)
- Journal of Environmental Quality (1)
- Journal of Hydrology and Hydromechanics (1)
- Vadose Zone Journal (1)

See publons for an up to date overview.



## PROFESSIONAL DEVELOPMENT

- 2019 ● Email - Go for 0 Inbox  
Loontjens S, Shortcuts, --06-06  Mol, Belgium
- 2019 ● Organize your time  
Loontjens S, Shortcuts, --05-06  Mol, Belgium
- 2018 ● Querying Data with transact-SQL  
RealDolmen, --11-14/15, ---27  Mol, Belgium

Note I am using the ISO 8601:2000 standard for truncated date (interval) notation.

- 2018 ● Making 3D drawings with Sketchup | Fundamentals  
Mangelschots N, SCK CEN Learning & development, --11-12  
📍 Mol, Belgium
- 2017 ● Git version control  
Van Robbroeck K, RealDolmen, --09-27/28      📍 Mol, Belgium
- 2016 ● MCNP - basic training course  
SCK CEN Academy, --11-08      📍 Mol, Belgium
- 2014 ● An introduction to Bayesian computing with INLA  
Rue H, --07-08      📍 Mines ParisTech, France
- 2014 ● Advanced stochastic simulations  
Lantuéjoul C, Romary T, --07-07      📍 Mines ParisTech, France
- 2014 ● Short course on underlying R&D for the disposal of  
radioactive waste  
SCK CEN Academy, --03-19/20      📍 Mol, Belgium
- 2013 ● Version control with subversion  
Bex G-J, ICTS KU Leuven, --02-26      📍 Leuven, Belgium
- 2013 ● HPC introduction  
Oldenhof M, ICTS KU Leuven, --02-19      📍 Leuven, Belgium
- 2012 ● Advanced R programming topics  
Wijffels J, BNOSAC, --10-18/19      📍 Leuven, Belgium
- 2012 ● Upgrade your written English  
Vermeire A, --04-19, --05-03/04      📍 Mol, Belgium
- 2012 ● LaTeX - introduction  
ICTS KU Leuven, --03-29/30      📍 Leuven, Belgium
- 2012 ● Data mining in practice  
CS KU Leuven, --02-06/07      📍 Leuven, Belgium
- 2011 ● Speedreading  
Lernout B, --10-11      📍 Mol, Belgium
- 2011 ● Scientific writing & speaking  
Vermeire A, --03-02, ---09, ---21, ---28      📍 Mol, Belgium
- 2010 ● Global sensitivity analysis techniques for  
probabilistic groundwater modeling  
Mishra S, --09-21      📍 Valencia, Spain
- 2010 ● 2nd summer school on flow and transport in porous and  
fractured media  
CNRS, --08-16/28      📍 Cargèse, France

- 2010 ● Inverse modelling in earth and environmental sciences  
Vrugt J, Huisman S, --07-26/29 📍 Leuven, Belgium
- 2010 ● Meet the expert in hydrology - Round tables among  
young and established scientists  
Carrera J, --05-05 📍 Vienna, Austria
- 2010 ● Short course on geostatistical analysis of  
environmental data  
Goovaerts P, --03-08/12 📍 Gainesville, FL, USA
- 2010 ● Introduction to R  
ICTS KU Leuven & LStat, --02-22/23 📍 Leuven, Belgium
- 2010 ● Multivariate data analysis, with applications  
ICTS KU Leuven & LStat, --02-08/10 📍 Leuven, Belgium
- 2010 ● Hydrological modelling and uncertainty analysis  
Buytaert W, --01-18 📍 Louvain-la-Neuve, Belgium



## GRANTS

- 2013 | 2009 ● SCK CEN PhD scholarship  
SCK CEN Academy PhD program 📍 Mol, Belgium



## STAYS ABROAD

- 2013 ● CSIRO Land & Water and Flinders University  
Scientific visit, --05-22/06-15 📍 Adelaide, Australia



## STUDENT SUPERVISION

- Present | 2018 ● Casillas A, PhD  
SCK CEN & Ghent University  
  
**Topic** Joint inversion of physical and chemical state variable data within a multi-model subsurface hydrology framework.  
  
**Supervisors** *Walraevens K*, Rogiers B, Beerten K, Wouters L
- Present | 2017 ● Lu M, PhD  
SCK CEN & KU Leuven  
  
**Topic** Quantifying and predicting river-aquifer exchange in lowland floodplains (Nete, Demer and Dijle).  
  
**Supervisors** *Huysmans M*, Gedeon M, Beerten K, Rogiers B

*University promoter in italic.*

Present  
|  
2017

- Moudud H, PhD  
SCK CEN & Vrije Universiteit Brussel

**Topic** Decreasing global uncertainty in mapping site & environmental contamination by combining different measurement techniques in a joint (geo)statistical interpretation.

**Supervisors** *Huysmans M*, Vidmar T, Rogiers B

Present  
|  
2016

- Lemmens L, PhD  
SCK CEN & KU Leuven

**Topic** 3D Porous media reconstruction for natural and engineered radioactive waste confinement barriers – A multiresolution-multiphase approach.

**Supervisors** *Huysmans M*, Rogiers B, Laloy E

2016

- Neyens C, MSc thesis  
Faculty of Science, KU Leuven

**Topic** Analysis of pumping tests in a sandy aquifer in Northern Belgium.

**Supervisors** *Huysmans M*, Gedeon M, Laloy E, Rogiers B

2015

- Janssens L, BSc thesis  
Faculty of Science, KU Leuven

**Topic** Omzetting van digitale foto's van ontsluitingen in hydraulische conductiviteit, met behulp van beeldanalyse en luchtpermeameter datasets.

**Supervisors** *Huysmans M*, Rogiers B

2015

- Hoedemaekers T, BSc thesis  
Faculty of Science, KU Leuven

**Topic** Slug- en dilutietesten in de Neogene aquifer, in en rond de nucleaire zone te Mol-Dessel- Geel.

**Supervisors** *Huysmans M*, Rogiers B, Gedeon M

2014

- Bennett G, MSc thesis  
Faculty of Engineering, Vrije Universiteit Brussel

**Topic** Integration of detailed borehole core measurements and pump test data from the aquifers below the Boom Clay in a groundwater flow model.

**Supervisors** *Huysmans M*, Rogiers B, Vandersteen K

- 2014 ● Potums L, BSc thesis  
Faculty of Science, KU Leuven
- Topic** Gedetailleerde karakterisatie van boorkernen uit de diepe aquifers rond de Boomse klei, met behulp van een luchtpermeameter.
- Supervisors** *Huysmans M*, Rogiers B
- 2012 ● Winters P, BSc thesis  
Faculty of Science, KU Leuven
- Topic** Haalbaarheidsstudie voor de gedetailleerde opmeting van de hydraulische conductiviteit op boorkernen, met behulp van een luchtpermeameter.
- Supervisors** *Huysmans M*, Rogiers B



## EXAMINATION COMMITTEES

- 2016 ● Nhu Viet Ha, PhD  
Department of Hydrology and Hydraulic Engineering, Vrije Universiteit Brussel
- Thesis** Spatio-temporal prediction of land subsidence using GIS-based 3D geological, geotechnical and groundwater flow models in Hanoi city (Vietnam).
- 2013 ● Nafyad Serre Kawo, MSc  
Interuniversity programme: Master of Science in Physical Land Resources, Universiteit Gent - Vrije Universiteit Brussel
- Thesis** Model Based Evaluation of the Protection Zones around the WaterGroep Public Drinking Water Well Field in Huiskens (Korbeek-Lo), Belgium.