

NANNA HØEGH RAVN

Civil Engineer

Personal Information

- Married (formerly Nanna Høegh Nielsen)
- Children: 2
- Nationality: Danish
- Born: 20. November 1971

Profile

Specialized in design and solutions concerning storm water handling, sewage systems, and receiving waters using state of the art technologies and research. Been involved in co-management of Research and Development activities related to the urban water cycle in Krüger. Playing a key role in development of integrated flood models and other software tools, e.g. a model builder for sewer models. Project leader for PH-Consult's participation in the EU Life Treasure project, including design specification on basins, 2 year monitoring on the performance of the basins and concluding remarks. Participated in updating the guidelines on climate change adaption strategies for municipalities in Denmark for the Danish Water and Waste Water Association.

Education

1997 M.Sc., Civil Engineering (environment), University of Aalborg, Denmark (Thesis title: Oxidation of atmospheric methane in soil)

Employment

2011 - date LNH water, owner/partner, specialized consulting company on hydraulic modelling and urban flooding

2011 - date Technical University of Denmark, teaching "Afløbsteknik" (Course 12700 in Urban Drainage B.Sc.)

2010 - 2011 Maternity leave for twins Liv and Freja (May 2010-August 2011)

2008 - 2011 PH-Consult ApS and Krüger, co-responsible for R&D projects in urban water cycles activities

2004 - 2011 PH-Consult, project leader, developing, planning and designing sewage systems and the effects on receiving waters

1997 - 2002 University of Aalborg, PhD-student "Carbon Dynamics in Nutrient Poor Ecosystems in Greenland" and research assistant on different EU-projects e.g. "EUROTROPH Dissolved

Inorganic Carbon, Nutrients Cycling and the Trophic Status of Coastal Ecosystems” and “Novel techniques to identifying methane oxidizing bacteria”
1995 - 1997 N&R Ingeniør, engineer, planning of 7 regional airports in Greenland. Calculation in 3D on mass balance of rock in relation to flight profiles.

Major professional involvements

- Member of International Water Association
- Danish Engineering Society (IDA): been invited to give several lectures about different aspects on Urban Drainage, e.g. “Strategies for Climate Change Adaption for Utilities”, “Urban Flood Modelling” and “Pollution from CSO’s”
- Active in the Future Climate Forum and have participated in formulating the statements on climate change effects on the sewage system (IDA Environment)
- Danish Technological Institute. Been invited to give a lecture on “Integrated Optimization and Control of Urban Drainage Systems”, 2009
- Member of EVA (Udvalget for Erfaringsudveksling i Vandmiljøteknikken, Society for exchange of urban water management knowledge)

Research interest

- Modelling of urban drainage systems, including treatment plants and receiving waters
- Effects of climate change on urban drainage systems
- Urban flood management and modelling
- Real time control of urban drainage systems and use of radar to forecast rain events
- Advanced treatment of storm water
- Software development for urban drainage tools

Teaching and supervision

Been giving lectures on urban water management at the Technical University of Denmark since 2008. Been teaching at the University of Aalborg, Environmental Engineering and giving a lecture in the PhD School on climate change. Co-supervised M.Sc. thesis projects in urban drainage systems and supervised several other B.Sc student projects. Taken part in external financed projects related to urban drainage, e.g. Life Treasure (2006-2009).

Selected projects

Co-management of R&D activities related to the urban water cycle in Krüger. Playing a key role in development of integrated flood models and other software tools, e.g. a model builder for sewer models. Project leader for PH-Consult’s participation in the EU Life Treasure project, including design specification on basins, 2 year monitoring on the performance of the basins and concluding remarks. Participated in updating the guidelines on climate change adaption strategies for municipalities in Denmark for the Danish Water and Waste Water Association. Has in PH-Consult been project leader for several projects for municipalities and utilities involving planning, computer simulations of flow and effects in receiving waters, flood maps and necessary improvements and RTC optimization of systems.

- VandCenter Syd (2004-date) : e.g. contingency plans for extreme rain events, effects of sustainable and green city development on urban flooding, analysis of effects and location of infiltration to the sewage

system, plan for reduction of CSO's from the combined sewage system, hydraulic modelling of extreme rain events and solutions to reduce flooding, detailed modelling of regulation of terrain in Mike Flood, set-up of a numerical model for the sewage system, collection-monitoring-storage of data from the sewage system, assessment of the water quality in Odense Å (river) by modelling the transport of E-Coli and ammonia

- DANVA (Danish Water and Wastewater Association) (2011) : Co-author of "En kagebog for klimaændringernes effekter på oversvømmelser i byer" ("Guidelines on climate change effects on urban flooding")
- Danish Road Directorate (2009) : project leader for developing a method to assess flood risk on Danish national roads in a large area in the middle and southern part of Jutland, Denmark, project was part of the SWAMP project. It is part of an ERA-NET ROAD initiated transnational research programme called "Road Owners Getting to Grips with Climate Change". The four projects commissioned under this programme are funded jointly by the road administrations of Austria, Denmark, Finland, Germany, Ireland, Netherlands, Norway, Poland, Spain, Sweden and United Kingdom.
- Master plans (2006-date) : master plans for system improvements in the combined sewage and use of Real Time Control for optimization of the sewage system, e.g. Kolding, Hvidovre and Hjørring
- Optimization of the sewage system in Kolding (2009-2010) : set-up of a fully automated and reproducible model tool to handle the sewer model, monitoring plan and calibration of models, plan for implementation of a RTC strategy to system improvements and an integrated software platform
- Flood maps (2008-2010) : creation of flood maps for different municipalities and utilities in Denmark, e.g. Fredensborg, Århus, Odense, Kalundborg and Solrød
- European Union (EU) in collaboration with Århus Kommune, Silkeborg Forsyning, VandCenter Syd, University of Aarhus and University of Aalborg (2006-2009) : participation in a LIFE TREASURE project. The main result of the TREASURE project is the demonstration and verification of treatment facilities obtaining very high pollutant removal in urban stormwater and road runoff by removing soluble and colloidal bound pollutants from the runoff. Contributions to the project include design specification on basins, 2 year monitoring on the performance of the basins and concluding remarks.
- Danish EPA (2008) : Use of radar for control of sewage system and treatment plants
- Storm water handling in relation to restoration of the river Harrestrup Å (2006)

Publications

Articles in international, refereed scientific journals

1. Nielsen N., Ramussen M. R. and Rasmussen S. R. (2011) Development of a screening method to assess flood risk on Danish national roads and highway systems. *Water Science and Technology* volume 63, no 12
2. Nielsen, N (2011) Development of an automated method for determining urban runoff by use of spectral analysis. In progress for *Water Environment Research*
3. Nielsen, N and Jensen L. N. (2011) Uncertainties in 1d-1d modelling of urban flooding. In progress for *Journal of Environmental Engineering*
4. Vollertsen, J., Lange, K. H., Pedersen, J., Hallager, P., Laustsen, A., Bundesen, V. W., Brix, H., Nielsen, A. H., Nielsen, N. H., Wium-Andersen, T. and Hvitved-Jacobsen, T. (2009). Monitoring the startup of a wet detention pond equipped with sand filters and sorption filters. *Water Science and Technology*, volume 60, no 4, pp 1071-1079
5. Middelburg, J.J., Nieuwenhuize, J., Iversen, N., Høegh, N., de Wilde H., Helder W., Seifert R. and Christof O. (2002) Methane distribution in European tidal estuaries. *Biogeochemistry* Volume 59, Numbers 1-2, May 2002, pp. 95-119

Books and reports published by authorities or scientific bodies

1. Paludan B., Brink-Kjær A., Nielsen N. H., Linde J.J., Jensen L. N. and Mark, O (2011) En kagebog for klimaændringers effekter på oversvømmelser i byer (Guidelines on climate change effects on urban flooding). *F&U rapport 19, DANVA (Danish Water and Wastewater Association)*

2. Larsen, M, Nielsen, N and Rasmussen, S. (2010) The blue spot model. Development of a screening method to assess flood risk on highways. The Danish Road Institute, report 183
3. IDA's Klimaplan 2050 (2009) Contribution: "Klimatilpasning: Spildevand – en udfordring både nu og i fremtiden", Eds. Fonnesbech, B. and Hagedorn-Rasmussen, P., Ingeniørforeningen IDA, august 2009, EAN 979-87-87254-23-6
4. Høgeh, N. (2001) Uptake and Emissions of CH₄ in Zackenbergdalen, *Zackenberg Ecological Research Operations 5th Annual Report 1999*, pp. 47-48
5. Høgeh N. (1999): Oxidation of Atmospheric Methane in Danish and Greenlandic Soils. *Ecosystems Research Report 31*, pp. 140
6. Høgeh N. (1999): Atmospheric Fluxes of CO₂ and CH₄ from Lakes in Zackenbergdalen, *Zackenberg Ecological Research Operations 4th Annual Report 1998*, pp. 42-43

International refereed conference papers

1. Nielsen, N (2011) Spectral analysis for use in urban drainage modelling. *Submitted 9th International Conference on Urban Drainage Modelling 2012, Beograd*
2. Jørgensen, A., Jensen L. N., and Nielsen N. (2011) Urban drainage model handling tool. *12th International Conference on Urban Drainage, Porto Alegre/Brazil, 11-16 September 2011*
3. Jensen L. N., Bassø, L. and Nielsen N. (2011) Applying simple hydraulic approach for strategic planning of adaptation to climate changes in large city areas. *12th International Conference on Urban Drainage, Porto Alegre/Brazil, 11-16 September 2011*
4. Jensen L. N., Paludan B., Nielsen N. H. and Edinger K. (2010) Large scale 1D-1D surface modelling tool for urban water planning. *Novatech 2010 - France*
5. Nielsen N., Ravn C. and Mølbye N. (2010) Implementation and design of a RTC strategy in the sewage system in Kolding, Denmark. *Novatech 2010 - France*
6. Rasmussen M. R., Nielsen N. H. and Rasmussen S. R. (2010) Development of a screening method to assess flood risk on Danish national roads and highway systems. *Novatech 2010 - France*
7. Paludan B., Brink-Kjær A., Nielsen N. H., Linde J.J., Jensen L. N. and Mark O. (2010) Climate change management in drainage systems – A "Climate Cookbook" for adapting to climate changes. *Novatech 2010 – France*
8. Nielsen, N. H. Jensen L. N., Linde J. J. and Paludan B. (2009) 1d-1d modelling of urban flooding. *8th International Conference on urban flooding modelling – Japan*
9. Nielsen N. H., Linde J. J., and Ravn C. (2009) RTC optimization of the sewage system in Kolding, Denmark. *10th IWA Conference on Instrumentation, Control and Automation - Australia*
10. Arias C. A, Vollertsen J., Lange K. H., Pedersen J., Hallager P., Bruus A., Laustsen A., Bundesen V. W., Nielsen A. H., Nielsen N. H., Andersen T. W., Hvitved-Jacobsen T. and Brix H. (2008) Integrating constructed wetland filters and wet detention ponds for the treatment of urban stormwater runoff, *11th International Conference on Wetland Systems for Water Pollution Control 2008 - India*
11. Vollertsen, J. Lange, K.H., Pedersen, J., Hallager, P., Bruus, A., Laustsen, A., Bundesen, V.W. Brix, H., Nielsen, A.H. Nielsen, N.H., Wium-Andersen, T. and Hvitved-Jacobsen, T. (2008) Removal of soluble and colloidal pollutants from stormwater in full-scale detention ponds, *11th International Conference on Urban Drainage 2008 - Edinburgh*
12. Nielsen, N.H., Jensen, L.N., Linde, J.J. and Halager, P. (2008) Urban Flooding Assessment, *11th International Conference on Urban Drainage 2008 - Edinburgh*

13. Vollertsen, J., Lange, K.H., Nielsen, A., Nielsen, N.H. and Hvitved-Jacobsen, T. (2007) Treatment of urban and highway stormwater runoff for dissolved and colloidal pollutants, *Novatech 2007- France*

Selected other scientific publications

1. Ravn C., and Nielsen N. (2010) Optimering og styring i afløbssystemet i Kolding (Optimizing and control of the sewage system in Kolding). *Spildevandteknisk tidsskrift, nr. 1, marts, 38 årgang*
2. Bassøe L., Nielsen N.H, Adeler O.F. and Lynggaard-Jensen, A. (2009) Århus Vand og Spildevand styrer sig igennem klimaudfordringen (The use of RTC in the Municipality of Århus to adapt to climate change), *danskVand, årgang 77 nr. 6, pp. 66-69*
3. Wium-Andersen T., Haaning-Nielsen A., Nielsen N. H., Hvitved-Jacobsen T., and Vollertsen J. (2009) Regnvands toksicitet (Toxicity of rainwater). *danskVand, april 2009, årgang 77, pp. 42-44*
4. Nielsen N. H., Ravn, C. and Uggerby M. (2009) Styr på kloakkerne I Kolding (Optimization of the sewage System in Kolding). *Teknik & Miljø, Stads og Havneingeniøren, marts 2009 nr. 3. pp. 48-50.*
5. Paludan B., Brink-Kjær A., Nielsen N. H., Linde J.J., Jensen L. N. and Mark O., Climate change management in drainage systems (2009) *The 11th Nordic / NORDIWA Wastewater Conference 2009 – Denmark*
6. Jensen L. N., Nielsen N. H. and Paludan B. (2009) GIS based model setup for urban flooding. *The 11th Nordic / NORDIWA Wastewater Conference 2009 – Denmark*
7. Nielsen, N. H. and Ravn C. (2009) RTC control of the sewage system in Kolding, Denmark. *The 11th Nordic / NORDIWA Wastewater Conference 2009 – Denmark*
8. Jørgensen A., Nielsen N.H. and Hansen S.B. (2009) From raw data to masterplan :case study in the municipality of Solrød, Denmark. *The 11th Nordic / NORDIWA Wastewater Conference 2009 – Denmark*
9. Vollertsen, J. Lange, K.H., Pedersen, J., Hallager, P., Bruus, A., Laustsen, A., Bundesen, V.W. Brix, H., Nielsen, A.H. Nielsen, N.H., Wium-Andersen, T. and Hvitved-Jacobsen, T. (2009) Advanced stormwater treatment – comparison of technologies. *The 11th Nordic / NORDIWA Wastewater Conference 2009- Denmark*
10. Vollertsen, J., Lange K.H, Nielsen A.H., Nielsen N.H and Hvitved-Jacobsen, T. (2007) Treatment of soluble and colloidal pollutants in stormwater runoff - The EU LIFE TREASURE project. *The 10th Nordic / NORDIWA Wastewater Conference 2007- Norway*
11. Larsen T., N. Høegh, K. Gunnarsson og T.B. Hansen (1997): Vandkvalitetsmodel for Mariager Fjord *Vand og Jord, Juni 1997*
12. Høegh N. (1997): Oxidation of atmospheric methane in soils. A study of Hjelm Hede. *Thesis from the University of Aalborg, Institute of Environmental Engineering*