

Khara Grieger, Ph.D.

Senior Research Scholar

Genetic Engineering and Society Center

North Carolina State University

James B Hunt, Jr. Library; 1070 Partners Way, Raleigh, NC 27695

kdgriege@ncsu.edu

919-515-2594 (phone)

EDUCATION

- PhD, Environmental Engineering, 2011, Technical University of Denmark
- MSc, Environmental Engineering, 2006, Technical University of Denmark
- MS, Plant Biology, 2003, Michigan State University; Additional degree in Ecology, Evolutionary Biology and Behavior
- BS, Botany and Plant Pathology, 1999, Michigan State University; Graduated with High Honors

RESEARCH AND MANAGEMENT POSITIONS

- 2019 – Present, **Senior Research Scholar**, Genetic Engineering and Society Center, North Carolina State University, Raleigh, NC
 - Expert in science, technology, and society intersections of emerging issues and novel technologies; focus on nanotechnology, nanomaterials, societal implications, and policy
- 2011 – 2019, **Senior Environmental Research Scientist**, RTI International, Durham, NC
 - Expert in risk-based decision-making regarding emerging issues and novel technologies, including nanotechnology, nanomaterials, food safety and policy, with additional work in sustainable biogas production, geoengineering, and climate change
 - Project manager and technical lead for several complex, science-society relevant projects funded by national and international agencies (Army Center for Environmental Health Research, Food and Drug Administration, Environmental Protection Agency, European Commission, The National Institute for Occupational Safety and Health)
- 2017 – 2018, **Duke University Visiting Scholar**, Duke University-RTI International, Durham, NC
 - Program title: Developing Robust Strategies to Address Emerging Risks and Building Resilience
 - Supporting faculty: Dr. Mark Wiesner, Dr. Mark Borsuk, Dr. Christine Hendren (Dept. of Civil and Environmental Engineering) and Dr. Jonathan Wiener (Law School, Nicholas School of the Environment, and Sanford School of Public Policy)
- 2010 – 2011, **Post-Doctorate Researcher**, Technical University of Denmark, Kgs. Lyngby, Denmark
 - Researcher and group lead on risk governance of emerging technologies
- 2006 – 2007, **Research Project Manager**, Technical University of Denmark, Kgs. Lyngby, Denmark
 - Managed large European partner consortium for European Framework Programme (FP) 7 project
 - Science-policy intersections for reduction of priority pollutants in stormwater

PROFESSIONAL EXPERIENCE

- 2019 – Present, **External Advisory Board Member** for European Commission-funded project focused on risk governance of nanomaterials (caliBRate)
 - Advising project on diverse aspects of risk governance, risk analysis, and stakeholder perceptions
- 2018 – Present, **Environmental Advisory Board Member**, Town of Cary, NC
 - Advising Town of Cary on environmental issues

Grieger CV

- 2014-2018, Member of American National Standards Institute-Accredited **US Technical Advisory Group to International Standards Organization (ISO) Technical Committee (TC) 229 – Nanotechnologies**
 - RTI technical lead on nanotechnology standards for regulatory and non-regulatory purposes

HONORS AND AWARDS

- 2018, Research Triangle Nanotechnology Network (RTNN) Collaborative Award
- 2018, HOT paper selection for *Environmental Science: Nano*
- 2017, American Society of Civil Engineers State-of-the-Art Civil Engineering Award
- 2013-2017, Highly Published Author Award, RTI International
- 2014, 2017, Highly Cited Author Award, RTI International
- 2014, Professional Development Award, RTI International
- 2013, Early Career Award, RTI International
- 2011, Best Young Scientist Prize, Integ-Risk and Society for Risk Analysis
- 2010, Student Merit Award, Emerging Nanoscale Materials Specialty Group, Society for Risk Analysis
- 2010, Travel Scholarship, Society for Risk Analysis
- 2010, Travel Scholarship, Otto Mønstedts Fund
- 2009, Outstanding Student Paper Award Certificate, American Geophysical Union
- 2009, Student Award, Fourth International Conference on Environmental Effects of Nanoparticles

RESEARCH AND PROJECT SUPPORT

Pending

- I. **Grieger Co-PI**, Levis PI (NC State) EREF \$297,997
Cost-Effective Policies for Improving Environmental and Socio-Economic Sustainability of Residential Recycling, Submitted 4/22/2019
- II. **Grieger Co-PI**, Thomas PI (RTI) University of Nebraska \$24,853
Identifying Progress in STEC Research and Future Steps; Submitted 9/25/2018
- III. Borsuk PI (Duke University), Kuzma Co-PI (NC State) NSF/DRMS \$96,897
Quick Fixes to Collective-Risk Social Dilemmas; To be submitted 8/19/2019

Current

- I. **Grieger PI**, Kuzma Co-PI (NC State) USDA/NIFA \$499,856
Social Implications and Best Practices for Responsible Innovation of Nanotechnology in Food and Agriculture; Submitted 9/25/2018;
- II. **Grieger Co-PI**, Jones PI (NC State) RTI-NC State \$575,000
Game-Changing Research Incentive Program (GRIP); Water Sustainability through Nanotechnology
- III. **Grieger PI** (NC State – Duke University) SRA \$20,000
Society for Risk Analysis (SRA) Strategic Plan Initiative

Recent Unfunded Proposals (2017-2018)

- I. **Grieger Co-PI**, Levis PI (NC State) NSF/INFEWS \$2,499,994
INFEWS/T2: Integrated Framework for Evaluating the Trade-offs Among Alternative Strategies for Increasing Fruit and Vegetable Production; Submitted 10/1/2018
- II. **Grieger PI**, Wiesner PI (Duke University) USDA/NIFA \$497,230
Efficacy and Environmental Impacts of Nanofertilizers and Associated Socioeconomic Analysis Based on Stakeholder Perceptions; Submitted 8/6/2018

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- I. **Grieger Co-PI**, Levis PI (NC State) EREF \$298,000
Burn to Benefits: Diverting Waste from Burn Piles into Beneficial Use or Sanitary Disposal; Submitted 06/01/2018
- II. **Grieger Technical Lead**, Gilmore PI (RTI) Linden Trust for Conservation \$991,995
National Carbon Dioxide Removal Technology Roadmap and Program Design; Submitted 07/03/2018
- III. **Grieger PI**, Cuchiara Co-PI (NC State) NSF/SCISIP \$298,435
Elucidating Barriers and Incentives to Guide Sustainable Innovation: The Case for Nanotechnology; Submitted 9/6/2017
- IV. **Grieger Co-PI**, Mortensen PI (RTI) NIEHS \$533,317
Risk Evaluation of Exposures to Engineered Nanomaterial Mixtures in Dietary Sources and Interactions with Endotoxin from Foodborne Pathogens; Submitted 6/8/2017
- V. **Grieger Technical Lead**; Berube PI (NC State) NSF/INFEWS \$2,453,787
INFEWS/T2: Decision Analysis for Nano Materials at the Intersection of Food, Energy, and Water; Submitted 3/6/2017

Past Support

- I. **Grieger Co-PI**, Parvathikar PI (RTI) RTI \$85,000
Sustainable Farming Practices via Biogas-Derived Chemicals
- II. **Grieger RTI Lead**, Jensen PI (Danish National Research Centre for the Working Environment) caLIBRATE: Risk governance for manufactured nanomaterials and products €9.7M
- III. **Grieger Governance Lead**, Borsuk PI Duke University, \$92,312
Duke University Collaboratory Grant: Decisions, Risks, and Governance of Geoengineering
- IV. **Grieger PI and Technical Lead** Duke University, \$51,947
Developing Robust Strategies to Address Emerging Risks and Building Resilience; 2017-2018
- V. **Grieger Project Manager and Technical Lead**; RTI FDA/CVM
Decision Analysis Support for Implementing a Risk-Informed Decision Making System in the FDA Foods and Veterinary Medicine Program; 2016-2018
- VI. **Grieger Project Manager and Technical Lead**; RTI FDA/CFSAN
Develop and Validate Risk Ranking Model (version 3); 2015-2017
- VII. **Grieger Project Manager and Technical Lead**; RTI FDA/CFSAN
Development of a Risk-Ranking Tool for the Determination of High Risk Foods Among U.S. Food and Drug Administration-Regulated Products; 2013-2015
- VIII. **Grieger Technical Lead**; RTI NIOSH
Validation of Tier 2 Processes for Occupational Exposure Banding; 2014
- IX. **Grieger Project Manager**; RTI IFT
Implement and Evaluate the High Risk Foods Model: For Recordkeeping and Product Tracing; 2012-2013
- X. **Grieger Project Manager**; RTI FDA/CFSAN
Development of a Risk Ranking Tool for the Determination of High Risk Foods among FDA-Regulated Products; 2012-2013
- XI. **Grieger Project Manager and Technical Lead**; RTI Army
Identify Army Materiel Incorporating Nanomaterials and Associated Soldier Health Risks; 2011-2012
- XII. **Grieger Project Manager and Technical Lead**; RTI EPA
Conceptual Model Development - Comprehensive Environmental Assessment Web Interface; 2012
- XIII. **Grieger Project Manager and Technical Lead**; RTI EPA
Nanomaterial Case Study Workshop Process: Identifying and Prioritizing Research for Multiwalled Carbon Nanotubes; 2011-2012
- XIV. **Grieger Technical Lead**; Technical University of Denmark European Commission
 - NanoImpactNet: European Network on the Health and Environmental Impact of Nanomaterials; 2011

Grieger CV

- iNTeg-Risk: Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related Risks; 2011
- PlasmaNice: Atmospheric Plasmas for Nanoscale Industrial Surface Processing; 2011
- RiskBridge; 2007-2009

PUBLICATIONS

Journal Articles

1. **Grieger, K.**, Felgenhauer, T., Renn, O., Wiener, J., Borsuk. 2019. Emerging Risk Governance for Stratospheric Aerosol Injection as a Climate Management Technology. *Environmental System and Decisions*, Published online April 30, 2019; <https://doi.org/10.1007/s10669-019-09730-6>.
2. Isigonis, P., Hristozov, D., Benighaus, C., Giubilato, E., **Grieger, K.**, Pizzol, L., Semenzin, E., Linkov, I., Zabeo, A., Marcomini, A. 2019. Risk Governance of Nanomaterials: Review of Criteria and Tools for Risk Communication, Evaluation, and Mitigation. *Nanomaterials*, 9(696), doi:10.3390/nano9050696
3. **Grieger, K.**, Bossa, N., Levis, J., von Borries, K., Strader, P., Cuchicara, M., Hendren, C.O., Hansen, S.F., Jones, J. 2018. Application and Testing of Risk Screening Tools for Nanomaterial Risk Analysis. *Environmental Science: Nano*, 5:1844-1858.
4. Mortensen, N.P., Johnson, L., **Grieger, K.**, Ambroso, J.L. Fennell, T.R. 2019. Biological Interactions between Nanomaterials and Placental Development and Function Following Oral Exposure. *Reproductive Toxicology- Accepted, In revision*.
5. Hjorth, R., Holden, P.A., Hansen, S.F., Colman, B.P., **Grieger, K.**, Hendren, C.O. 2017. The Role of Alternative Testing Strategies in Environmental Risk Assessment of Engineered Nanomaterials. *Environmental Science: Nano*, 4:292-301.
6. Ruzante, J., **Grieger, K.**, Woodward, K., Lambertini, E., Kowalcyk, B. 2017. The Use of Multi-Criteria Decision Analysis in Food Safety Risk-Benefit Assessment. *Food Protection Trends*, March: 132-139.
7. Lebov, J., **Grieger K.**, Womack D., Zaccaro, D. Whitehead, N. Kowalcyk, B., Macdonald, P. 2017. A Framework for One Health Research. *One Health*, 3:44-50.
8. **Grieger, K.**, Harrington, J., Mortensen, N. 2016. Prioritizing Research Needs for Analytical Techniques Suited for Engineered Nanomaterials in Food. *Trends in Food Science & Technology*, 50: 219-229.
9. **Grieger, K.**, Hansen, S.F., Mortensen, N., Cates, S., Kowalcyk, B. 2016. International Implications of Labeling Foods containing Engineered Nanomaterials. *Journal of Food Protection*, 79(5): 830-842.
10. Powers, C., **Grieger, K.**, Meacham, C., Lassiter, M., Gift, J., Lehmann, G., Hendren, C., Davis, M., Burgoon, L. 2016. Applying Comprehensive Environmental Assessment to Research Planning for Multiwalled Carbon Nanotubes: Refinements to Inform Future Stakeholder Engagement. *Integrated Environmental Assessment and Management*, 12(1): 96-108.
11. **Grieger, K.**, Redmon, J., Money, E., Widder, M. Van der Schalie, W., Beaulieu, S., Womack, D. 2015. A Relative Ranking Approach for Nano-Enabled Applications to Improve Risk-Based Decision Making: A Case Study of Army Materiel. *Environment, Systems and Decisions*, 35(1):42-53.
12. **Grieger, K.**, Sayes, C., Chen, E., Ensor, D., Jayanty, R.K.M. 2015. Safe Handling of Engineered Nanomaterials: Turning Knowledge into Practice. *RTI Press Publication No. OP-0022-1505*. Research Triangle Park, NC: RTI Press. <http://dx.doi.org/10.3768/rtipress.2015.op.0022.1505>
13. Bates, M.E., **Grieger, K.D.**, Trump, B.D., Keisler, J.M., Plourde, K.J., Linkov, I. 2015. Emerging Technologies for Environmental Remediation: Integrating Data and Judgment. *Environmental Science & Technology*, 50(1): 349-358.
14. Powers, C., **Grieger, K.**, Beaudrie, C., Hendren, C., Davis, M., Wang, A., Sayes, C. MacDonell, M., Gift, J. 2015. Data dialogues: critical connections for designing and implementing future nanomaterial research. *Environment, Systems and Decisions*, 35(1):76-87.
15. **Grieger, K.**, Sayes, C., Hendren, C.O., Rothrock, G., Mansfield, C., Jayanty, R.K.M., Ensor, D. 2013. Multi-stakeholder collaboration is key to solving society's grand challenges: The case of responsible nanomaterial development. *EHS Today – December Issue*; Available: <http://ehstoday.com/training/finding->

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- key-responsible-nanomaterial-development?page=1.
16. Powers, C., **Grieger, K.**, Hendren, C., Meacham, C., Lassiter, M.G., Gurevich, G., Money, E., Lloyd, J., Beaulieu, S.M. 2014. A web-based tool to engage stakeholders in informing research planning for future decisions on emerging materials. *Science of the Total Environment*, 470-471:660-668.
 17. Hansen, S.F., Nielsen, K.N., Knudsen, N., **Grieger, K.**, Baun, A. 2013. Operationalization and application of “early warning signs” to screen nanomaterials for harmful properties. *Environmental Science: Processes & Impacts*, 15: 190-203.
 18. Hendren, C., Lowry, M., **Grieger, K.**, Money, E., Johnston, J., Wiesner, M., Beaulieu, S. 2013. Modeling Approaches for Characterizing and Evaluating Exposure to Engineered Nanomaterials: A Critical Review. *Environmental Science & Technology*, 47(3):1190-205.
 19. Renn, O., **Grieger, K.**, Øien, K., Andersen, H.B. 2013. Benefit-Risk Tradeoffs in Retrospect: How major stakeholders perceive the decision making process in the Goliat oil field development in the Barents Sea. *Journal of Risk Research*, 16(9):1163-1185.
 20. **Grieger, K.**, Wickson, F., Andersen, HB, Renn, O. 2012. Improving risk governance of emerging technologies through public engagement: the neglected case of nano-remediation? *International Journal of Emerging Technologies and Society*, 10:61-78.
 21. **Grieger, K.**, Laurent, A., Miseljic, M., Christensen, F., Baun, A. 2012. Analysis of current research addressing complementary use of life-cycle assessment and risk assessment for engineered nanomaterials: have lessons been learned from previous experience with chemicals? *Journal of Nanoparticle Research*, 14(7): 958-981.
 22. **Grieger, K.**, Linkov, I., Hansen, S.F., Baun, A. 2012. Environmental risk analysis for nanomaterials: Review and evaluation of frameworks. *Nanotoxicology*, 6(2):196-212.
 23. **Grieger, K.**, Hansen, S.F., Sørensen, P.B., Baun, A. 2011. Conceptual modeling for identification of worst case conditions in environmental risk assessment of nanomaterials using nZVI and C60 as case studies. *Science of the Total Environment*, 409: 4109-4124.
 24. **Grieger, K.** 2011. Understanding and assessing potential environmental risks of nanomaterials: Emerging tools for emerging risks - a PhD project. *Miljø og Sundhed*, 17(1): 43-46.
 25. **Grieger, K.** 2011. Assessing the Potential Risks of Nano-Materials – Emerging Tools for Emerging Risks. *European Safety and Reliability Association*, September: 4-5.
 26. **Grieger, K.**, Fjordbøge, A., Hartmann, N.B., Eriksson, E., Bjerg, P.L., Baun, A. 2010. Environmental benefits and risks of zero-valent iron nanoparticles (nZVI) for in situ remediation: risk mitigation or trade-off? *Journal of Contaminant Hydrology*, 118: 165-183.
 27. **Grieger, K.**, Baun, A, Owen, R. 2010. Redefining Risk Research Priorities for Nanomaterials. *Journal of Nanoparticle Research*, 2(2): 383–392.
 28. Wickson, F., **Grieger, K.**, Baun, A. 2010. Nature and Nanotechnology: Science, Ideology and Policy. *International Journal of Emerging Technologies and Society*, 8(1): 5-23
 29. **Grieger, K.**, Hansen, S.F., Baun, A. 2009. The known unknowns of nanomaterials: Describing and characterizing uncertainty within environmental, health and safety risks. *Nanotoxicology*, 3(3): 1-12.
 30. Baun, A., Hartmann, N.B., **Grieger, K.**, Hansen, S.F. 2009. Setting the limits for engineered nanoparticles in European surface waters. *Journal of Environmental Monitoring*, 11(10): 1774 - 1781.
 31. Kristensen, J., Vinding, K., **Grieger, K.**, Hansen, S.F. 2009. Adopting eco-innovation in Danish polymer industry working with nanotechnology: drivers, barriers and future strategies. *Nanotechnology Law & Business* 6(416) (Fall 2009): 416-440.
 32. Sørensen, P., Thomsen, M., Assmuth, T., **Grieger, K.**, Baun, A. 2009. Conscious worst case definition for risk assessment, part I: A knowledge mapping approach for defining most critical risk factors in integrative risk management of chemicals and nanomaterials. *Science of the Total Environment*, 408, 3852-3859.
 33. Baun, A., Hartmann, N.B., **Grieger, K.**, Kusk, K.O. 2008. Ecotoxicity of engineered nanoparticles to aquatic invertebrates – a brief review and recommendations for future toxicity testing. *Ecotoxicology*, 17 (5), 387-395.

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34. Baun, A., Hartmann, N.B., **Grieger, K.**, Hansen, S.F. 2010. Risikable nanomaterialer?- øget anvendelse af nanomaterialer sætter nye krav til riskovurdering. *Aktuel Naturvidenskab*, 3: 30-32.
35. Baun, A., Hartmann, N.B., **Grieger, K.**, Hansen, S.F. 2009. Riskovurdering i nano-dimensioner: Øget anvendelse af nanomaterialer sætter nye krav til riskovurdering. *Dansk Kemi*, 90(3): 14-16.

Book Chapters

1. **Grieger, K.**, Carpenter, A.W., Klaessig, F., Lefevre, E., Gunsch, C., Soratana, K., Landis, A.E., Wickson, F., Hristozov, D., Hjorth, R., Linkov, I. 2019. Chapter 9: Sustainable Environmental Remediation using nZVI by Managing Lifecycle Benefit-Risk Tradeoffs. In: *Nanoscale Zerovalent Iron Particles for Environmental Restoration: From Fundamental Science to Field Scale Engineering Applications*, Gregory Lowry and Tanapon Phenrat (Eds), Springer.
2. Eisenberg, D., **Grieger, K.**, Hristozov, D., Bates, M., and Linkov, I. 2015. Risk Assessment, Life Cycle Assessment, and Decision Methods for Nanomaterials. *Nanomaterials in the Environment*: pp. 383-419. doi: 10.1061/9780784414088.ch15; *Awarded American Society of Civil Engineers State-of-the-Art Civil Engineering Award* (2017).
3. **Grieger, K.**, Hansen, S.F., and Baun, A. Nanoparticles: Uncertainty Risk Analysis. In: *Encyclopedia of Environmental Management*; S.E. Jorgensen, ed. Taylor & Francis: New York, 2013; Vol. III, 1742–1751.
4. Hansen, S.F., **Grieger, K.**, and Baun, A. Nanomaterials: Regulation and Risk Assessment. In: *Encyclopedia of Environmental Management*; S.E. Jorgensen, ed. Taylor & Francis: New York, 2013; Vol. III, 1722–1732.
5. Elder, A., Lynch, I., **Grieger, K.**, Chan-Remillard, S., Gatti, A., Gnewuch, H., Kenawy, E., Korenstein, R., Kuhlbusch, T., Linker, F., Matias, S., Monteiro-Riviere, N., Pinto, V.R.S., Rudnitsky, R., Savolainen, K. & Shvedova, A. 2009. Human health risks of engineered nanomaterials: Critical knowledge gaps in nanomaterials risk assessment. In: *Nanotechnology. Risks and Benefits*, Linkov, I. & Steevens, J. (eds.), Springer, Dordrecht, NL, 3-29.
6. Owen, R., Crane, M., **Grieger, K.**, Handy, R., Linkov, I. & Depledge, M. 2009. Strategic approaches for the management of environmental risk uncertainties posed by nanomaterials. In: Linkov, I. & Steevens, J. (eds.), *Nanotechnology. Risks and Benefits*, pp. 369-384. Springer, Dordrecht, NL.
7. **Grieger, K.**, Hansen, S.F., Baun, A. 2009. Limitations of current risk assessment of nanomaterials and uncertainty analysis related to nanomaterials. In: Craye, M. (eds), *Governance of Nanotechnologies : Learning from Past Experiences with Risks and Innovative Technologies*, pp. 45-54. Report for FP 6 Co-ordination action: Risk-Bridge - Building Robust, Integrative Inter-Disciplinary Governance Models for Emerging and Existing Risks Riskfield 5 – Nanotechnologies.
8. Hansen, S.F., **Grieger, K.**, Baun, A. 2009. Limitations of current regulation of nanomaterials. In: Craye, M. (eds), *Governance of Nanotechnologies : Learning from Past Experiences with Risks and Innovative Technologies*, pp. 54-58. Report for FP 6 Co-ordination action: Risk-Bridge - Building Robust, Integrative Inter-Disciplinary Governance Models for Emerging and Existing Risks Riskfield 5 – Nanotechnologies.

Policy and Technical Reports

1. **Grieger, K.D.**, Ruzante, J., Lillys, T., Lambertini, T., Linkov, I. 2018. *Decision Analysis Support for Implementing a Risk-Informed Decision-Making System in the FDA Foods and Veterinary Medicine Program: Final Report*. Prepared for FDA.
2. **Grieger, K.D.**, Aceituno, A., Andrews, L., Womack, D., Li, M., Havellar, A. 2017. *Develop and Validate Risk Ranking Model v3 to Inform RRM-PT List: Final Report*. Prepared for FDA.
3. Jovanovic, A.; Ahmad, M.; Quintero, F.A.; Porcari, A.; Borsella, E.; Hristozov, D.; **Grieger, K.D.**; Jensen, K. *Comprehensive analysis of available tools and methodologies for Horizon Scanning*. 2017, Deliverable 1.2 caLIBRAte research project.
4. **Grieger, K.D.**, Kowalczyk, B., Ruzante, J., Havelaar, A. 2016. *Task 2 Deliverable: Review Public Comments and Provide Recommendations Relevant for Animal Feed/Pet Food in RRM-PT*. Prepared for FDA.

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5. **Grieger, K.D.**, Kowalczyk, B., Sifleet, S., Aceituno, A. 2016. *Task 4 Deliverable: Identify, Collect Data, and Perform Expert Elicitation for New Food-Hazard Pairs involving Human Food*. Prepared for FDA.
6. **Grieger, K.D.**, Kowalczyk, B., Li, M., Havelaar, A. 2016. *Task 5 Deliverable: Evaluate Options to Aggregate Risk Scores in RRM-PT*. Prepared for FDA.
7. **Grieger, K. D.**, Tulloch, M.L., Kowalczyk, B., Sifleet, S. 2015. *Update and Validate Risk Ranking Model to Inform High Risk Foods List. High-Risk Foods (HRF) Model: Final Report*. Prepared for FDA.
8. **Grieger, K. D.** 2014. Investigating the invisible. Biodiversity, Ecosystems, Science. Gland, Switzerland: The International Union for Conservation of Nature. <https://portals.iucn.org/blog/>
9. Zhang, J., Bhatt, T., Newsome, R., Fisher, W., **Grieger, K. D.**, Anderson, M. E., Mokhtari, A. H., Woodward, K. P., Tulloch, M. L., & Beaulieu, S. M. 2013. *Implement and Evaluate the High Risk Foods (HRF) Model: For Recordkeeping and Product Tracing -Final Report*. Prepared for FDA.
10. **Grieger, K. D.**, Tulloch, M. L., Anderson, M. E., Pierson, K. A., Mokhtari, A. H., & Beaulieu, S. M. 2013. *Development of a Risk Ranking Tool for the Determination of High Risk Foods among FDA-regulated Products - Final Report*. Prepared for FDA.
11. Redmon, J. H., Money, E. S., Tulloch, M. L., **Grieger, K. D.**, Lloyd, J. M., Sayes, C. M., Hendren, C. O., Womack, D. S., & Beaulieu, S. M. 2013. *Identifying army materiel incorporating engineered nanomaterials and associated health risks*. Prepared for U.S. Army Center for Environmental Health Research.
12. **Grieger, K. D.**, Hendren, C., Smith, K. N., Scruggs, M. D., & Beaulieu, S. M. 2012. *Nanomaterial Case Study Workshop Process: Identifying and Prioritizing Research for Multiwalled Carbon Nanotubes*. Summary Report-Final. Deliverable for US EPA. Available: <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=244011#Download>
13. Renn, O., Benighaus, C., Schweizer, P.J., Webler, T., Jovanovic, A., Lim, R., Schneider, R., Klimek, P., **Grieger, K.**, Andersen H.B. 2011. *D2.3.7 – Modeling the Perception of Emerging Risks*. Deliverable for iNTeg-Risk: Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related, Risks.
14. Kozine, I., **Grieger, K.D.** 2011. *Task 2.5.2. RP: Uncertainty handling (unknown phenomena)*. Deliverable for iNTeg-Risk: Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related, Risks.
15. Duijm, N.J., **Grieger, K.D.**, Markert, F. 2011. *Deliverable D8.4 Occupational safety assessment*. Deliverable for PlasmaNice: Plasmas for Nanoscale Industrial Surface Processing.
16. **Grieger, K.** 2010. *Understanding and assessing environmental risks of nanomaterials: Emerging tools for emerging risks*. PhD thesis, Department of Environmental Engineering, Technical University of Denmark.
17. **Grieger, K.**, Gundersen, A.T. 2010. *DTU Environment Green Account Report 2009*. Department of Environmental Engineering, Technical University of Denmark
18. Eilersen, A.M., Gundersen, A.T., Christensen, N., (**Grieger, K.** prepared English version). 2009. *DTU Environment Green Account Report 2008*. Technical University of Denmark, Kongens Lyngby, Denmark.
19. **Grieger, K.** 2006. *Pesticide regulations in drinking water versus other beverages: A case of an unjustified discrepancy*. MSc thesis, Department of Environmental Engineering, Technical University of Denmark.
20. **Grieger, K.** and Murphy, P. 2003. *Spatial and temporal patterns in the spread of Austrian pine in four Lake Michigan sand dune habitats*. Final report, including brochures, pamphlets, and public information booklets, were submitted to the State of Michigan, Department of Natural Resources.
21. **Grieger, K.** 2003. *Spatial and temporal patterns of Pinus nigra (Austrian pine) spread in four Lake Michigan sand dune habitats*. Thesis for the Degree of M.S., Michigan State University, East Lansing, MI.

Peer-Reviewed Published Conference Abstracts

1. **Grieger, K.** 2018. Application and testing of risk screening tools for nanomaterial risk analysis. Society for Risk Analysis, New Orleans, LA.
2. **Grieger, K.** 2018. Governance strategies for emerging risks of solar radiation management. Society for Risk Analysis, New Orleans, LA.

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3. **Grieger, K.** 2018. Sustainable development of engineering nanomaterials. Carolina Science Symposium, North Carolina State University, Raleigh, NC.
4. **Grieger, K.** 2018. Application and testing of risk screening tools for nanomaterial risk analysis. 13th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials, Durham, NC.
5. **Grieger, K.** 2018. NEXUS 2018: Water, Food, Energy and Climate, Chapel Hill, NC.
6. **Grieger, K.** 2017. Moving from risk assessment to risk governance and decision support for nanomaterials: Lessons learned from select case studies. Society of Risk Analysis, Arlington, VA.
7. **Grieger, K.** 2017. Nanomaterials in Select Consumer and Military Applications. Genetics and Environmental Mutagenesis Society Spring Meeting, Environmental Protection Agency (EPA) headquarters, Research Triangle Park, NC.
8. **Grieger, K.,** Berube, D., Jones, J. 2017. Ensuring Sustainable Development of Water Treatment Technologies. Water Resources Research Institute (WRRRI), Raleigh NC.
9. **Grieger, K.** 2015. A qualitative risk-benefit assessment for nanomaterials in food. Society of Risk Analysis, Arlington, VA.
10. **Grieger, K.** 2015. A Risk Ranking Approach for Nano-Enabled Applications for the US Army. Sustainable Nanotechnology Conference, Venice, Italy.
11. **Grieger, K.** 2014. Ensuring the sustainable development and use of nZVI for environmental remediation. 9th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials, Columbia, SC.
12. **Grieger, K.,** Laurent, A., Miseljic, M., Christensen, F., Baun, A. 2013. Complementary use of life cycle assessment and risk assessment for engineered nanomaterials: Lessons learned from chemicals? Society of Risk Analysis, Baltimore, MD.
13. Bates, M., **Grieger, K. D.,** Trump, B., & Linkov, I. 2013. Nanoparticles and Health Case studies II. Environmental Health 2013 Science and Policy to Protect Future Generations, Boston, MA.
14. **Grieger, K.,** Linkov, I., Hansen, S.F., Baun, A. 2011. Assessing the environmental risks of nanomaterials: Critical review of risk analysis frameworks. Society of Environmental Toxicology and Chemistry (SETAC), 14-17 November 2011, Boston, USA.
15. **Grieger, K.,** Andersen, H.B. 2011. Emerging nanotechnologies and risk perception. Integ-Risk and Society of Risk Analysis (SRA) conference, 6-8 June 2011, Stuttgart, Germany.
16. **Grieger, K.,** Markert, F. 2011. Practical applications of life cycle assessment and risk analysis: Lessons learned from PlasmaNice. Safety issues of Nanomaterials along their life cycle, 04-05 May 2011, Barcelona, Spain.
17. **Grieger, K.,** Linkov, I., Hansen, S.F., Baun, A. 2011. Critical analysis of frameworks and approaches to assess the environmental risks of nanomaterials. NanoImpact Net, 14-17 February 2011, Lausanne, Switzerland.
18. **Grieger, K.,** Hansen, S.F., Linkov, I., Baun, A. 2010. A Review of Frameworks and Approaches for Assessing Environmental Risks of Nanomaterials. Society for Risk Analysis, 5-8 December 2010, Salt Lake City, USA.
19. **Grieger, K.,** Grieger, K., Baun, A., Owen, R. 2010. Assessing the Environmental Risks of Nanomaterials: A Comparison of Risk Assessment Frameworks. Environmental Decisions: Risks and Uncertainties, 25-29 April 2010, Monte Verita, Switzerland
20. **Grieger, K.,** Baun, A., Owen, R. 2010. Redefining risk research priorities for nanomaterials. NanoImpact Net, 09-12 March 2010, Lausanne, Switzerland.
21. **Grieger, K.,** Fjordbøge, A., Hartmann, N.B., Eriksson, E., Bjerg, P.L., Baun, A. 2009. Environmental benefits and risks of zero-valent iron nanoparticles (nZVI) for in situ remediation: risk mitigation or trade-off? American Geophysics Union (AGU), 14-18 December, San Francisco, USA.
22. **Grieger, K.,** Baun, A., Owen, R. 2009. Redefining risk research priorities for nanomaterials. Environmental Effects of Nanoparticles and Nanomaterials, 06-09 September 2009, Vienna, Austria.

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23. Hansen, S.B., Clausen, A., **Grieger, K.**, Baun, A. 2009. Environmental risks and benefits of cerium oxide nanoparticles. Environmental Effects of Nanoparticles and Nanomaterials, 06-09 September 2009, Vienna, Austria.
24. **Grieger, K.**, Baun, A., Owen, R. 2009. Nanomaterial risk research needs: Time to re-evaluate? International Workshop "Nanotechnology Governance Compared", 17-18 June 2009, Vienna, Austria.
25. **Grieger, K.**, Hansen, S.F., Baun, A. 2009. Quality assurance for risk assessment of nanomaterials. NanoImpact Net conference, 24-25 March 2009, Lausanne, Switzerland.
26. **Grieger, K.**, Hansen, S.F., Baun, A. 2008. Analyzing uncertainty within environmental, health, and safety risks of nanomaterials. Symposium for US Environmental Protection Agency, 11 December 2008, Research Triangle Park, NC, USA.
27. **Grieger, K.**, Hansen, S.F., Baun, A. 2008. Analyzing uncertainty within environmental, health, and safety risks of nanomaterials. Society for Risk Analysis, 7-10 December 2008, Boston, USA.
28. Baun, A., Hartmann, N., **Grieger, K.**, Foss Hansen, S. Engineered nanoparticles - environmental contaminants and carriers? NanoDTU Day, December 2008, Technical University of Denmark.
29. **Grieger, K.**, Hansen, S.F., Baun, A. 2008. Identifying and mapping parameters influencing EHS risks of nanomaterials: Comparing research gaps, recommendations and government funding. NanoRisk 2008, 21-24 October 2008, Paris, France.
30. **Grieger, K.**, Hansen, S.F., Baun, A. 2008. Uncertainty and Sensitivity Analysis of Environmental and Health Risks of Nanomaterials: Ensuring that EHS Research Prioritization and Efforts Transform into Short-term Decision-making Processes. Risk Trace, 27-30 May 2008, Faro, Portugal.
31. **Grieger, K.**, Hansen, S.F., Baun, A. 2008. The known "knowns" and known "unknowns": Mapping uncertainty in regard to the potential human and environmental health risks of manufactured nanoparticles. NanoEco: Nanoparticles in the Environment- Implications and Applications, 2-7 March 2008, Ascona, Switzerland.
32. Mikkelsen, P.S., **Grieger, K.**, Ledin, A., Rasmussen, B., Revitt, M., Scholes, L., Verdonck, F., Benedetti, L., Castillo, L., Lecloux, A., Kompare, B., Banovec, P., Bessat, C., Trouve, J., Sörme, L., Jonsson, A. & Vanrolleghem, P. 2007. SCOREPP - Source Control Options for Reducing Emissions of Priority Pollutants. Abstract MO PC7-7. SETAC Europe 17th Annual Meeting "Multiple stressors for the environment and human health - present and future challenges and perspectives", 20-24 May 2007, Porto, Portugal.
33. **Grieger, K.** and Trapp, S. 2006. Pesticide residues in drinking water versus other beverages: a case of an unjustified discrepancy? Ethics and the politics of food- Preprints of the 6th Congress of the European Society for Agricultural and Food Ethics, EurSAFE 2006, June 22-24 2006, Oslo, Norway.
34. **Grieger, K.** and Trapp, S. 2006. Setting standards: water versus wine. Controversies and solutions in environmental sciences, SETAC Europe 16th annual meeting, May 7-11 2006, The Hague, Netherlands.

Conference and Seminar Presentations

1. Baylor University, Environmental Science Department Seminar Presentation, Waco, TX, USA. Oral Presentation, 2019.
2. Genetic Engineering and Society Seminar Presentation, North Carolina State University, Raleigh, NC, USA. Oral Presentation, 2019.
3. Society for Risk Analysis, Annual Meeting, New Orleans, LA, USA. Oral Presentations (N=2), 2018.
4. Carolina Science Symposium, North Carolina State University, Raleigh, NC, USA. Oral Presentation, 2018.
5. 13th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials, Durham, NC, USA. Oral Presentation, 2018.
6. NEXUS 2018: Water, Food, Energy and Climate, Chapel Hill, NC, USA. Poster Presentation, 2018.
7. Society for Risk Analysis, Annual Meeting, Arlington, VA, USA. Oral Presentation, 2017.
8. International Society of Exposure Science, Research Triangle Park, NC, USA. Oral Presentation, 2017.

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9. Genetics and Environmental Mutagenesis Society, Research Triangle Park, NC, USA. Oral Presentation, 2017.
10. Water Resources Research Institute, Raleigh, NC, USA. Oral Presentation, 2017.
11. Society for Risk Analysis Annual Meeting, Arlington, VA, USA. Oral Presentation, 2015.
12. Sustainable Nanotechnology Conference, Venice, Italy, Poster Presentation, 2015.
13. 9th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials, Columbia, SC, Oral Presentation, 2014.
14. Society for Risk Analysis Annual Meeting, Baltimore, MD, USA. Oral Presentation, 2013
15. Society of Environmental Toxicology and Chemistry, Boston, USA. Oral Presentation, 2011
16. Integ-Risk: Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related Risks and Society of Risk Analysis, Stuttgart, Germany. Oral Presentation and Session Chair (received student award), 2011
17. Safety Issues of Nanomaterials along their Life Cycle, Barcelona, Spain. Poster Presentation, 2011
18. NanoImpact Net, EU FP7 project, Lausanne, Switzerland. Poster Presentation, 2011
19. Society for Risk Analysis Annual Meeting, Salt Lake City, UT, USA. Oral Presentation (received student and travel awards), 2010
20. Environmental Decisions: Risks and Uncertainty, Acona, Switzerland. Oral Presentation, 2010
21. NanoImpact Net, EU FP7 Project, Lausanne, Switzerland. Oral and Poster Presentations, 2010
22. American Geophysics Union, San Francisco, USA. Oral Presentation (received student award on presentation), 2009
23. Nanotechnology Risk Governance, Vienna, Austria. Poster Presentation, 2009
24. NanoImpact Net, EU FP7 project, Lausanne, Switzerland. Oral Presentation, 2009
25. US Environmental Protection Agency, Research Triangle Park, NC, USA. Oral Presentation, 2008
26. The Society for Risk Analysis Annual Meeting, Boston, MA, USA. Poster Presentation, 2008
27. NanoRisk 2008: Determining occupational, environmental, and health impacts, Paris, France. Oral Presentation, 2008
28. Third Workshop of the RISKBRIDGE FP 6 Coordination Action: Building bridges in risk governance, Gorizia, Italy. Assisted with Oral Presentation, 2008
29. Nanomaterials: Environmental Risks and Benefits and Emerging Consumer Products, Faro, Portugal. Poster Presentation, 2008
30. Nanoparticles in the Environment- Implications and Applications, Ascona, Switzerland. Oral Presentation, 2008
31. Second International Advanced Course Public Communication & Applied Ethics of Nanotechnology - Learning from the GM debate, Oxford, UK. Oral Presentations, 2007
32. Second Workshop of the RISKBRIDGE FP 6 Coordination Action: Exploring the Interface between Science and Policy making, Bentivoglio, Italy. Oral Presentation, 2007
33. Society Environmental Toxicology and Chemistry, Porto, Portugal. Poster Presentation, 2007
34. Sixth Congress of the European Society for Agricultural and Food Ethics, Oslo, Norway. Session Chair and Poster Presentation, 2006
35. Society of Environmental Toxicology and Chemistry, The Hague, Netherlands. Poster Presentation, 2006
36. Use of Precautionary Principle in Nordic Countries, Oslo, Norway, 2005
37. Annual conference of Michigan Academy of Science, Arts, and Letters, Holland, Michigan. Oral Presentation, 2003

MEDIA AND PRESS COVERAGE

- 2018, Featured in RTI University Collaboration Office, Universities and Research Institutions video: www.rti.org/universities-and-research-institutions and www.youtube.com/watch?v=AM3Ihk8TSCA
- 2018, RTI external expert page: www.rti.org/expert/khara-grieger

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TEACHING AND ADVISING

Courses

Duke University

- Guest lecture, Senior Sustainability Engagement Certificate Capstone Project Seminar 2019
- Bass Connections: Decisions on Complex Interdisciplinary Problems of Health and Environmental Risk 2017-2018
 - Course Involvement through Duke Scholars Program
- Introduction to Environmental Health course June 2015, 2016
 - Lecturer, course manager
 - One-week intensive course with Duke's One Health Training Program
 - Course associated with Duke's Global Health Institute

Meredith College

2014-2014

- Adjunct Professor, course lecturer and manager
 - Environmental Science (lectures, lab, excursions, course management)
 - Plant Biology (lectures, course management)

Technical University of Denmark

2005-2011

- Teaching Assistant (lectures, course management)
 - Environmental Management and Ethics
 - Nanotechnology and Environment
- Guest lectures
 - Introduction to Nanotechnology
 - Mapping Controversies

Michigan State University

1999-2003

- Teaching Assistant (lectures, course management)
 - Ecology
 - Ecology Laboratory
 - Introductory Plant Biology Laboratory
 - Plant Ecology
 - Plants of Michigan
 - Tropical Biology

Student Advising

RTI International

2014-2018

- Mentor to two junior staff and students

Technical University of Denmark

2017

- External supervisor for special student project
- Supervisor for two undergraduate student bachelor research projects

2010-2011

Michigan State University

2002-2003

- Supervisor for four undergraduate student bachelor research projects

SERVICE

- Advisory Board Member, NC State University Analytical Instrumentation Facility (AIF), 2019 to date
- Advisory Board Member, European Commission-funded project caLIBRAte, 2019 to date
- Environmental Advisory Board Member, Town of Cary, NC, 2018 to date
- Review Editor in *Medicine and Public Health*, part of the journal(s) *Frontiers in Big Data and Artificial Intelligence*, 2018 to date
- Sponsor for RTI University Scholar, Dr. James Levis, NC State University, 2018
- Co-Chair of Symposium, From Nanotechnology Risk Management to Innovative Governance: Developing Reliable and Trustable Framework and Tools, Society of Risk Analysis Annual Meeting, 2017

Grieger CV

- Member and RTI representative, American National Standards Institute (ANSI)-Accredited U.S. Technical Advisory Group (TAG) ISO/TC 229 Nanotechnologies, Member of Working Group 3 (Health, Safety and Environment) and Working Group 5 (Consumer and Societal Implications), 2014-2018
- Leader of Nanotechnology Workforce, International Union for Conservation of Nature (IUCN), Lausanne, Switzerland, 2014-2017
- Co-Chair of Symposium, Strategic Research Planning for MWCNTs, Society of Risk Analysis, Annual Meeting 2013, Baltimore, MD, USA
- RTI Mentor, RTI International, Environmental & Health Science Unit, Research Triangle Park, NC, 2013 to date
- Guest Lecturer, Department of Civil and Environmental Engineering, North Carolina State University, 2013, 2016
- Founder and Coordinator of Intra-Departmental Research Group, Emerging Risks Research Group, Department of Management Engineering, Technical University of Denmark, 2011
- Conference Session Chair, Integ-Risk and Society of Risk Analysis (SRA) Conference, Stuttgart, Germany, 2011
- Departmental Green Account Project Manager, Department of Environmental Engineering, Technical University of Denmark, 2009-2010
- Founder and Project Leader, Carbon-Reduction Initiative group, Department of Environmental Engineering, Technical University of Denmark, 2007-2010
- Reporteur, World Health Organization: Enhanced policy advice on environment and health in Europe (PAVEL), Bonn, Germany, 2008
- Reporteur, Nanomaterials: Environmental Risks and Benefits and Emerging Consumer Products (NATO workshop), Faro, Portugal, 2008
- Conference Session Chair, Foundational Issues in Philosophy and Ethics, 6th Congress of the European Society for Agricultural and Food Ethics, Oslo, 2006
- English Editor, for over 70 scientific journal articles, documents, theses, 2005-2011
- Volunteer for United Nations Volunteers and NetAid, assigned to The Gaia Movement Trust, 2006
- Intern, Société Ingénierie et Technique, France, 2004
- Treasurer, Graduate Student Organization, Botany and Plant Pathology Department/ Plant Biology Department, Michigan State University, 2001 – 2003
- Departmental Steward, Graduate Employees Union, Michigan State University, 2000 – 2003

JOURNAL AND PROPOSAL SERVICE

Reviewer of Manuscripts and Book Chapters:

- *ACS Book, Symposium Series Chapter*
- *Advances in Water Resources*
- *Chemical Papers*
- *Chemosphere*
- *Critical Reviews in Toxicology*
- *Elsevier books*
- *Environment International*
- *Environmental Modeling & Software*
- *Environmental Pollution*
- *Environmental Science: Nano*
- *Environmental Science & Technology*
- *Environmental Systems and Decisions*
- *Environmental Science and Pollution Research*
- *Food Research International*
- *Journal of Environmental Management*

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- *Journal of Nanoparticle Research*
- *Journal of Occupational Medicine and Toxicology*
- *NanoImpact*
- *Nano Today*
- *Risk Analysis*
- *RTI Press*
- *The Science of the Total Environment (STOTEN)*

Reviewer of Research Proposals:

- ETH Zurich Research Commission
- Israel Science Foundation

PROFESSIONAL COURSEWORK & TRAINING

- 2017: International Society of Exposure Science Annual Meeting
 - Assessing Exposure to Chemicals in Consumer Products for Alternatives Assessment, Life Cycle Assessment, and High-throughput Risk Screening – the Product Intake Fraction Framework Theory and Practical Examples
- 2012-2019: RTI Required Training
 - Avoiding Plagiarism
 - Handling Third Party Commitments
 - International Trade Compliance Export/Import
 - IT Security Awareness
 - Retaliation, Reporting, and Creating an Open-Door Environment
 - RTI Annual Environmental, Health and Safety (EHS) Awareness
 - RTI Best Practices
 - RTI Conflicts of Interest Game
 - RTI Privacy
 - RTI Staff Safety and Security Awareness
 - Time Reporting Awareness

PROFESSIONAL MEMBERSHIP

- Society for Risk Analysis, 2008-present
- American National Standards Institute, U.S. TAG to ISO/TC 229, Nanotechnologies, 2013-2018
- Society of Environmental Toxicology and Chemistry, 2005-2011
- American Geophysical Union, 2009-2010
- European Society for Agriculture and Food Ethics, 2006-2008
- Ecology, Evolutionary Biology and Behavior, Michigan State University, 1999-2003
- Phi Kappa Phi Honor Society, 1998-1999