

Daniel R. Obenour

311 Mann Hall
Department of Civil, Construction, & Environmental Engineering
Mailing: Campus Box 7908, Raleigh, NC 27695
Physical: 2501 Stinson Drive, Raleigh, NC 27607

(P) 919 / 515 – 7702
(F) 919 / 515 – 7908
drobenour@ncsu.edu
<http://obenour.wordpress.ncsu.edu/>

Education:

- **Ph.D.** Natural Resources & Environmental Engineering 2013
University of Michigan (Ann Arbor, MI)
Advisors: Anna M. Michalak and Donald Scavia
Dissertation: Assessing the causes and severity of Gulf of Mexico hypoxia
using geostatistical and mechanistic modeling
- **M.S.** Environmental & Water Resources Engineering 2004
University of Texas (Austin, TX)
Advisor: David R. Maidment
Thesis: Arc Hydro developments for the Lower Colorado River basin
- **B.S.** Civil Engineering, *summa cum laude* 2002
University of Akron (Akron, OH)
Honors Project: Disinfection by-product study for a local municipality

Positions Held:

- Assistant Professor 2014-present
North Carolina State University (NCSU)
Department of Civil, Construction, & Environmental Engineering
- University of Michigan Water Center Research Fellow 2013-2014
based at NOAA Great Lakes Environmental Research Laboratory
- EPA Science To Achieve Results (STAR) Fellow 2010-2013
University of Michigan, Department of Civil & Environmental Engineering/
School of Natural Resources and Environment (SNRE)
- Graduate Research Assistant 2009-2010
University of Michigan, SNRE
- Consulting Engineer, James Miertschin & Associates, Inc. (Austin, TX) 2005-2009
(water quality monitoring, watershed modeling, hydrologic modeling,
best management practice specification, watershed protection planning,
water & wastewater engineering, GIS development, stakeholder meetings)
- Consulting Engineer, Freese & Nichols, Inc. (Austin, TX) 2004-2005
(water & wastewater engineering; hydraulic modeling)
- Graduate Research Assistant, University of Texas at Austin, 2002-2004
Center for Research in Water Resources

D. R. Obenour

- Junior Officer of Public Health Service (summers only) 2000-2002
Indian Health Service, Office of Environmental Health & Eng.
- Intern/Co-op Engineer (various semesters) 1999-2001
Finkbeiner Pettis & Strout, Inc. (now ARCADIS, Inc.)

Professional and Volunteer Organization Membership:

- American Association of Environmental Engineering and Science Professor (AEESP): member (2015-present).
- American Geophysical Union (AGU): member (2013-present).
- American Society of Civil Engineers (ASCE): member (1998-present), student chapter vice president (2002), steel bridge team captain (2002), steel bridge team judge (2005), New Orleans volunteer trips (2006, 2009).
- American Water Resources Association (AWRA): member (2012-present).
- Association for the Sciences of Limnology and Oceanography (ASLO): member (2010-present).
- Texas 4000 for Cancer: member and co-founder of 4,000+ mile charity bicycle tour to Alaska (2004), ATLAS Ride Committee/Volunteer (2008-2010).
- Texas Professional Engineer: PE #100471 (2007).

Courses Taught (as primary instructor):

- Environmental Spatial Data Analysis: 3-credit graduate course at University of Michigan.
- Surface Water Quality Modeling: 3-credit graduate course offered at NC State University.
- Hydrology and Urban Water Systems: 3-credit undergraduate course offered at NC State University.
- Stochastic Methods in Water and Environmental Engineering (co-taught): 3-credit graduate course offered at NC State University.

Academic Service (outside of primary department):

- Proposal referee: NSF CBET, Texas Sea Grant, National Estuarine Research Reserve System.
- Journal Referee: *Continental Shelf Research, Ecological Indicators, Journal of Hydrology, Journal of the American Water Resources Association, Ecological Modeling, Environmental & Ecological Statistics, Environmental Modelling & Software, Environmental Science & Technology, Estuaries and Coasts, Estuarine Coastal & Shelf Science, Fisheries Research, Freshwater Biology, Journal of Marine Systems, Limnology & Oceanography, Scientific Reports, Water Resources Research, Water Science & Technology.*

Other Synergistic Activities:

- Gulf of Mexico Dead Zone forecast contributor (2015-present)
- Lake Erie Harmful Algal Bloom forecast contributor (2014-present)
- Albemarle-Pamlico National Estuary Partnership (APNEP) Science and Technical Advisory Committee (STAC) member (2017-present).
- Detroit Area Pre-College Engineering Program volunteer (2013, 2014).

Academic Awards/Honors:

D. R. Obenour

- 2016 US EPA Level II Science and Technology Achievement Award (co-recipient)
- 2011 ASLO Outstanding Student Presentation Award (“for displaying notable innovation and significant scientific insight... and clear and concise presentation”).
- 2010 US Environmental Protection Agency (EPA) Science To Achieve Results (STAR) Fellowship (merit/proposal-based fellowship, providing \$111,000 in funding over 3 years).
- 2002 University of Texas Earnest & Agnes Gloyna Endowed Presidential Scholarship in Environmental and Water Resources Engineering (merit-based scholarship).
- 2001 Akron ASCE C.B. Drenon Memorial Award (“for scholarship, professionalism and future potential as a Civil Engineer”).
- 2001 Tau Beta Pi (engineering honor society).
- 1998 University of Akron Scholarship for Excellence (merit-based scholarship providing nearly full-ride funding through graduation).

Scholarly Works:

Journal Articles

1. Bertani, I., Steger, C. E., Obenour, D. R., Fahnenstiel, G. L., Bridgeman, T. B., Johengen, T. H., ... & Scavia, D. (2017). Tracking cyanobacteria blooms: Do different monitoring approaches tell the same story?. *Science of The Total Environment*, 575, 294-308.
2. Bertani, I., Obenour, D. R., Steger, C. E., Stow, C. A., Gronewold, A. D., & Scavia, D. (2016). Probabilistically assessing the role of nutrient loading in harmful algal bloom formation in western Lake Erie. *Journal of Great Lakes Research*, 42(6), 1184-1192.
3. Le, C., Lehrter, J. C., Hu, C., & Obenour, D. R. (2016). Satellite-based empirical models linking river plume dynamics with hypoxic area and volume. *Geophysical Research Letters*, 43, 2693–2699.
4. Rowe, M. D., Obenour, D. R., Nalepa, T. F., Vanderploeg, H. A., Yousef, F., & Kerfoot, W. C. (2015). Mapping the spatial distribution of the biomass and filter-feeding effect of invasive dreissenid mussels on the winter-spring phytoplankton bloom in Lake Michigan. *Freshwater Biology*, 60(11), 2270-2285.
5. Bradham, K.D., C. Nelson, A.L. Juhasz, E. Smith, K. Scheckel, D.R. Obenour, B.W. Miller, D.J. Thomas (2015). Independent data validation of an in vitro method for prediction of relative bioavailability of arsenic in contaminated soils. *Environmental Science and Technology*, 49 (10), pp 6312–6318.
6. Obenour, D. R., Michalak, A. M., & Scavia, D. (2015) Assessing biophysical controls on Gulf of Mexico hypoxia through probabilistic modeling. *Ecological Applications*, 25:492–505.
7. Obenour, D. R., Gronewold, A. D., Stow, C. A., & Scavia, D. (2014). Using a Bayesian hierarchical model to improve Lake Erie cyanobacteria bloom forecasts. *Water Resources Research*, 50(10), 7847-7860.
8. Scavia, D., M.A. Evans, & D.R. Obenour. (2013). A scenario forecast model for Gulf of Mexico hypoxic area and volume. *Environmental Science and Technology*, 47(18), 10423-10428.
9. Obenour, D. R., Scavia, D., Rabalais, N. N., Turner, R. E., & Michalak, A. M. (2013). Retrospective analysis of mid-summer hypoxic area and volume in the northern Gulf of Mexico, 1985-2011. *Environmental Science and Technology*, 47(17), 9808–9815.

D. R. Obenour

10. Zhou, Y., Obenour, D. R., Scavia, D., Johengen, T. H., & Michalak, A. M. (2013). Spatial and temporal trends in Lake Erie hypoxia, 1987–2007. *Environmental science & technology*, 47(2), 899-905.
11. Obenour, D. R., Michalak, A. M., Zhou, Y., & Scavia, D. (2012). Quantifying the impacts of stratification and nutrient loading on hypoxia in the northern Gulf of Mexico. *Environmental Science and Technology*, 46(10), 5489-5496.
12. Whiteaker, T. L., Robayo, O., Maidment, D. R., & Obenour, D.R. (2006) From a NEXRAD rainfall map to a flood inundation map. *Journal of Hydrologic Engineering*, 11(1), 37-45.

Journal Articles – Completed and in federal agency or peer review

1. Bradham, K.D., C.M. Nelson, J. Kelly, A. Pomales, J.C. Misenheimer, K. Li, D.R. Obenour. Soil lead bioaccessibility in urban residential Philadelphia.
2. Nelson, C.M., Li, K., D.R. Obenour, J.C. Misenheimer, K. Scheckel, A. Betts, A.L. Juhasz, D.J. Thomas, J. Griggs, K.D. Bradham. Hierarchical Regression Modeling of Select Soil Geochemical Properties to Predict Arsenic Bioaccessibility.
3. Scavia, D., I. Bertani, D.R. Obenour, D.R. Forrest, R.E. Turner, A. Katin. Ensemble modeling informs environmental policy making: The case of hypoxia in the northern Gulf of Mexico.

Journal Articles – In preparation

1. Han, Y., J. Smithheart, T.N. Aziz, R.L., Smyth, D.R. Obenour. Factors controlling vertical diffusion in a shallow eutrophic reservoir with artificial mixing.
2. Li, K., J.W. Miller, K. Blackhart, D.R. Obenour. A hierarchical modeling assessment of anthropogenic stressors on habitat quality in Pacific coast estuaries.
3. Miller, J.W., P.C. Esselman, I. Alameddine, K. Blackhart, D.R. Obenour. Hierarchical Modeling shows the effect of Watershed Stressors on Fish and Invertebrate Species in Gulf of Mexico Estuaries.
4. Smyth, R.L., J. Smithheart, Y. Han, D.R. Obenour, and T.N. Aziz. Effects of solar-powered circulators on turbulence and stratification in a shallow embayment of a eutrophic reservoir.

Conference Proceedings

1. Obenour, D.R., D.R. Maidment, T. Evans, D. Yates. “An Interface Data Model for HEC-HMS.” AWRA Spring Specialty Conference: GIS and Water Resources III, Nashville, TN. May 2004.

Presentations:

Invited Presentations (as primary presenter)

1. Obenour, D.R., Y. Han, J. Smithheart, J., R.L. Smyth, T.N. Aziz. “Predicting cyanobacteria dominance in a shallow eutrophic reservoir.” The Society for Freshwater Science (SFS) Annual Meeting. Raleigh, NC. June 2017.
2. Obenour, D.R. and J.K. Craig, “Synthesis and Integrated Modeling of Long-term Data Sets to Support Fisheries and Hypoxia Management in the Northern Gulf of Mexico. Hypoxia Effects on Fisheries Workshop, New Orleans, LA., February 2017.

D. R. Obenour

3. Obenour, D.R., “Enhancing Ecological Assessment and Prediction through Probabilistic Modeling: Examples from the Dead Zone”, Peking University College of Environmental Sciences and Engineering Seminar. Beijing, China, June 2016
4. Obenour, D.R., J. Smithheart, J., Y. Han, R.L. Smyth, T.N. Aziz. “Assessing vertical mixing and its impacts on phytoplankton in Jordan Lake.” Cape Fear River Assembly Annual Meeting. Fayetteville, NC. May 2016.
5. Obenour, D.R., Y. Zhou, D. Scavia, A.M. Michalak. “Mapping and Modeling Hypoxia in Marine and Freshwater Systems.” Coastal and Estuarine Research Federation Conference, Portland, OR, 10 Nov 2015.
6. Obenour, D.R., M.D. Rowe, T.F. Nalepa, H.A. Vanderploeg, F. Youself, W.C. Kerfoot. “Mapping the Dreissenid Mussel Invasion of Lake Michigan.” International Association of Great Lakes Research Conference, Burlington, VT, 27 May 2015.
7. Obenour, D.R., P.C. Esselman, J.W. Miller, I. Alameddine. “A Standardized Framework to Assess the Condition and Stresses of Estuary Ecosystems at Regional Scales.” NFHP Science and Data Committee Meeting, San Marcos, TX, 16 April 2015.
8. Obenour, D.R., "Enhancing Ecological Prediction through Probabilistic Modeling." UNC Institute for Marine Sciences, Morehead City, NC, 6 February 2015.
9. Obenour, D.R., A.D. Gronewold, C.A. Stow, & D. Scavia. “Lake Erie Bloom Forecasting Model.” Great Lakes Water Quality Agreement Phosphorus Load Response Modeling Meeting, Ann Arbor, MI. 9 April 2014.
10. Obenour, D.R., and D. Scavia. “Probabilistic Modeling to Assess Temporal Change in Complex Aquatic Systems.” Chesapeake Bay Program Scientific and Technical Advisory Committee (STAC) Workshop, Annapolis, MD. March 2014.
11. Obenour, D.R. “Grappling with Environmental Uncertainty through Better Modeling Practices: Examples from the Dead Zone”. Departmental Seminar, North Carolina State University, Raleigh, NC. January 2014.
12. Obenour, D.R., A.M. Michalak, D. Scavia. “A Parsimonious Mechanistic Model for Assessing Multiple Drivers of Gulf Hypoxia.” Forum for Gulf of Mexico Hypoxia Research Coordination and Advancement, Stennis Space Center, MS. April 2013.
13. Obenour, D.R., A.M. Michalak, D. Scavia, Y. Zhou. “Sizing up the Gulf’s Dead Zone through Geostatistical Modeling.” Departmental Seminar, Carnegie Institution for Science, Stanford, CA. March 2012.

Other Conference and Workshop Presentations

1. Aziz, T.N., A. Mangot, A. Schnetzer, D.R. Obenour “A Novel Water Column Reactor for Exploring the Effects of Mixing on Harmful Algal Blooms.” The Society for Freshwater Science (SFS) Annual Meeting. Raleigh, NC. June 2017.
2. Blackhart, K., K. Li, J.W. Miller, D.R. Obenour. “Meta-Analysis Identifying Significant Anthropogenic Stressors in Pacific Coast Estuary Taxa.” Annual Meeting of the American Fisheries Society, Tampa, FL, August 2017.
3. Aziz T.N., D.R. Obenour. “Assessing the Role of Turbulent Mixing on Phytoplankton Dynamics in Piedmont Reservoirs”, North Carolina Water Resources Research Institute Annual Conference (WRRRI). Raleigh, NC. March 2017.

D. R. Obenour

4. Davenport, J.M., J.W. Miller, D.R. Obenour. "A hierarchical model for multi-decadal ungauged stream flow and nutrient loading estimation". North Carolina Water Resources Research Institute Annual Conference (WRRRI). Raleigh, NC. March 2016.
5. Miller, J.W., P.C. Esselman, I. Alameddine, K. Blackhart, D.R. Obenour. "Using Hierarchical Modeling to Assess Anthropogenic Watershed Stressors in Gulf of Mexico Estuaries". Coastal and Estuarine Research Federation Conference, Portland, OR, 12 Nov 2015.
6. Blackhart, K., Esselman, P.C., Obenour, D.R., Qian, S., Alameddine, I. Cha, Y.K., "A standardized framework to Assess the Condition and Stresses of estuary Ecosystems at Regional Scales." Restore America's Estuaries 7th National Summit. November, 2014.
7. Michalak, A.M., D.R. Obenour, & Y. Zhou "Statistical approaches for assessing and predicting hypoxic extent," Keynote address presented at the Computational Methods in Water Resources XX. International Conference, University of Stuttgart, Germany. June 2014.
8. Obenour, D.R., A.D. Gronewold, C.A. Stow, & D. Scavia. "A Decision Support Model for Cyanobacteria Blooms in the Western Basin of Lake Erie." IAGLR Conference, Hamilton, ON. May 2014.
9. Zhou, Y., D.R. Obenour, D. Scavia, & A.M. Michalak. "Advances in Hypoxic Extent Estimation through Geostatistical Modeling." The 46th Annual Leige Colloquium, Leige, Belgium. May, 2014.
10. Obenour, D.R., A.D. Gronewold, C.A. Stow, & D. Scavia. "Exploring Lake Erie's Increasing Susceptibility to Cyanobacteria Blooms through Probabilistic Modeling." Joint Aquatic Sciences Meeting, Portland, OR. May 2014.
11. Obenour, D.R., D. Scavia, N.N. Rabalais, R.E. Turner, A.M. Michalak. "New Approaches for Exploring Trends in Gulf Hypoxia Formation." ASLO Aquatic Sciences Meeting, New Orleans, LA. February 2013.
12. Obenour, D.R., A.M. Michalak, Y. Zhou, D. Scavia. "Exploring the Extent of the Gulf's Dead Zone through Universal Kriging and Conditional Simulation." AWRA Spring Specialty Conference: GIS and Water Resources VII, New Orleans, LA. March 2012.
13. Obenour, D.R., A.M. Michalak, D. Scavia, Y. Zhou. "Understanding the Causes of Gulf of Mexico Hypoxia: A Geostatistical Approach." ASLO Aquatic Sciences Meeting, San Juan, PR. February 2011.
14. Zhou, Y., A.M. Michalak, D.R. Obenour. "Temporal Variability of Hypoxic Volume in the Chesapeake Bay." ASLO Aquatic Science Meeting, San Juan, PR. February 2011.
15. Obenour, D.R., J. Miertschin. "San Antonio River Loop Hydraulics and Water Quality Modeling." Texas Water Conference, San Antonio, TX. March 2008.
16. Obenour, D.R., J. Miertschin. "Nueces River Basin TDS Trends and Water Quality Standards." Texas-Section ASCE Fall Meeting, Ft. Worth, TX. 2007.
17. Obenour, D.R. "GIS Flood Damage Evaluation Toolset." Texas Floodplain Management Association Spring Conference, Del Rio, TX. April 2005.

Poster Presentations (where a student advisee or I was lead presenter):

1. Katin, A., D.R. Obenour. "Hypoxia and algal bloom modeling for the Neuse River estuary", North Carolina Sea Grant Conference. Raleigh, NC. April 2017.

D. R. Obenour

2. Strickling, H., D.R. Obenour. "Modeling nitrogen loading trends in three North Carolina river basins", North Carolina Sea Grant Conference. Raleigh, NC. April 2017.
3. Han, Y., J. Smithheart, T.N. Aziz, D.R. Obenour. "Modeling vertical diffusion and its effect on cyanobacterial algal blooms in a shallow eutrophic reservoir", North Carolina Water Resources Research Institute Annual Conference (WRRRI). Raleigh, NC. March 2017.
4. Smithheart, J., Y. Han, D.R. Obenour, T.N. Aziz. "Analyzing Cyanobacterial Trends in Three Piedmont Reservoirs Varying Levels of Enhanced Circulation", North Carolina Water Resources Research Institute Annual Conference (WRRRI). Raleigh, NC. March 2017.
5. Mangot, A., A. Schnetzer, D.R. Obenour, T.N. Aziz. "Testing of a Novel Laboratory-based Reactor to Explore the Effects of Mixing on Cyanobacteria Suppression", North Carolina Water Resources Research Institute Annual Conference (WRRRI). Raleigh, NC. March 2017.
6. Walker, B., D.R. Obenour, M.C. Moorman. "Hydrologic Modeling to Improve Management Practices at Lake Mattamuskeet." Mattamuskeet Technical Working Group Meeting. Raleigh, NC. August 2016.
7. Obenour, D.R., J. Smithheart, J., Y. Han, T.N. Aziz. "Assessing vertical mixing and algal bloom potential in Jordan Lake, North Carolina." North Carolina Water Resources Research Institute Annual Conference (WRRRI). Raleigh, NC. March 2016.
8. Obenour, D.R., A.D. Gronewold, C.A. Stow, I. Bertani, C.E. Steger, S.A. Ruberg, and D. Scavia. "Probabilistic Forecasting of Harmful Algal Blooms in Western Lake Erie." AGU Fall Meeting, San Francisco, CA. December 2014.
9. Obenour, D.R., A.M. Michalak, D. Scavia, Y. Zhou. "Sizing up the Gulf's Dead Zone through Geostatistical Modeling." 3rd Annual Gulf of Mexico Hypoxia Research Coordination Workshop, Bay St. Louis, MS. March 2012.
10. Obenour, D.R. "A Geostatistical Model of Hypoxia Formation in the Northern Gulf of Mexico." EPA STAR Graduate Fellowship Conference, Washington, D.C. September 2011.

Funded Research Projects:

1. D.R. Obenour, J.K. Craig. NGOMEX 2016: Synthesis and Integrated Modeling of Long-term Data Sets to Support Fisheries and Hypoxia Management in the Northern Gulf of Mexico. NOAA, 2016-2020. \$692,000; \$372,000 CCEE.
2. D.R. Obenour. Coastal SEES: Enhancing Sustainability in Coastal Communities Threatened by Harmful Algal Blooms by Advancing and Integrating Environmental and Socio-Economic Modeling. University of Michigan/NSF, 2016-2019. \$290,000 CCEE.
3. R. von Haefen, D.R. Obenour, et al. "Estimating the Benefits of Stream Water Quality Improvements in Urbanizing Watersheds: An Ecological Production Function Approach." EPA, 2016-2019. \$799,657; \$61,720 CCEE.
4. T.N. Aziz, D.R. Obenour. "Predicting the Effectiveness of Artificial Mixing for Controlling Algal Blooms in Piedmont Reservoirs." NC Water Resources Research Institute (WRRRI), 2016-2018. \$120,000.
5. D.R. Obenour, H.W. Paerl. "Hypoxia and Algal Bloom Forecasting for the Neuse River Estuary" NC Sea Grant, 2016-2018. \$100,000; \$85,000 CCEE.

D. R. Obenour

6. D.R. Obenour, et al. "Transitioning to Operations NOAA-Supported Statistical Hypoxia Models and Forecasts in the Gulf of Mexico and Chesapeake Bay" University of Michigan/NOAA, 2015-2017. \$50,000.
7. D.R. Obenour, "Gulf of Mexico and Pacific Coast Estuarine and Marine Fish Habitat Assessment: A Submission to the National Sea Grant College Program 2014 Special Project F Competition." NOAA, 2015-2016. \$ 59,890.
8. D.R. Obenour, "Demonstration of a Bayesian Mechanistic Model for Falls Lake", NCSU FRPD, 2015-2016. \$6975.
9. T.N. Aziz, D.R. Obenour, et al. "Development of a Reservoir Column Reactor to Experimentally Evaluate the Effect of Mixing on Harmful Algal Communities" NC State Research Innovation Seed Funding (RISF), 2015-2016. \$20,000
10. D.R. Obenour, T.N. Aziz. "RAPID: Effects of Enhanced Circulation on Vertical Mixing and Algal Blooms in Freshwater Reservoirs" National Science Foundation (NSF), 2015-2016. \$48,874.
11. D.R. Obenour. "Gulf of Mexico Estuarine and Marine Fish Habitat Assessment: A submission to the National Sea Grant College Program 2014 Special Project "F" competition." NOAA, 2014-2015. \$31,694.

Students and Researchers Supervised as Advisor or Co-advisor:

Shiqi Fang	PhD Student	2016-Present
Alexey Katin	PhD Student	2016-Present
Yue Han	PhD Student (co-advisee)	2015-Present
Jonathan Miller	PhD Student	2014-Present
Jeremy Smithheart	MS Student (co-advisee)	2016-Present
Rohith Matli	MS Student	2016-Present
Alexander Mangot	MS Student (co-advisee)	2016-Present
Hayden Strickling	MS Student	2016-Present
Riyana Ayub	MS Student (co-advisee)	2015-Present
Justin Davenport	MS Student	2015-2016
Kevin Li	Post-MS Researcher	2015-2017
Brianne Walker	BS Student	2016
Elizabeth Wallner	BS Student (co-advisee)	2016
Kristen McCahill	BS Student	2015
Jeremy Smithheart	BS Student (co-advisee)	2015-2016

Technical and Pedagogical Workshops Attended:

- Summer School in Environmental Systems Analysis*, led by Peter Reichert, Eawag, Dübendorf, Switzerland. 3-7 June 2013.
- Pedagogy for the Engineering Classroom*, three sessions with Michael Prince from Bucknell University. 9 April 2013.
- Water Quality Analysis Simulation Program (WASP7.2) Workshop*, EPA Region 4, Atlanta, GA. 23-27 July 2007.

D. R. Obenour

Modeling Software Experience (used in research and/or consulting projects):

ArcGIS, HEC-HMS, HEC-RAS, HSPF, MATLAB, QUAL2K, R, Stan, Visual Basic,
WaterCAD, WASP, Win/OpenBUGS.

Last updated June 2017