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First Name: **Bernie** Last Name: **Engel**

Title: **Professor and Head**

Institution: **Purdue University**

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Education:

PhD: Purdue University MS: University of Illinois at Urbana Champaign BS: University of Illinois at Urbana Champaign

General Areas of Expertise:

hydrologic/water quality modeling, environmental decision support systems, green infrastructure, best management practices

Short Bio:

Dr. Engel's research and teaching focus on the use of geographic information systems (GIS), expert systems, artificial intelligence and simulation to study and control agricultural and urban water resources and non-point source pollution of surface and ground water. He has extensive experience with the development and application of watershed hydrologic/water quality models to address a range of water resources and water quality issues at watershed scales. He has extensive experience in modeling pesticide, nutrient, and erosion losses from watersheds. Dr. Engel has also created numerous environmental decision support systems including web-based watershed and water quality decision support systems by integrating GIS and natural resources modeling tools.

Five Representative Publications:

1. Cho, Y. and B.A. Engel. 2017. NEXRAD quantitative precipitation estimates for hydrologic simulation using a hybrid hydrologic model. Journal of Hydrometeorology 18:25-47. DOI: http://dx.doi.org/10.1175/JHM-D-16-0013.1
2. Wallace, C.W., Flanagan, D.C., and Engel, B.A. 2017. Quantifying the effects of conservation practice implementation on predicted runoff and chemical losses under climate change. Agric. Water Manage. 186(2017): 51-65.
3. Liu Y., B. A. Engel, D. C. Flanagan, M. W. Gitau, S. K. McMillan, I. Chaubey. 2017. A review on effectiveness of best management practices in improving hydrology and water quality: Needs and opportunities. Science of the Total Environment 601–602 (2017) 580–593 http://dx.doi.org/10.1016/j.scitotenv.2017.05.212
4. Wallace, C.W., D. C. Flanagan, B. A. Engel. 2017. Quantifying the effects of future climate conditions on runoff, sediment, and chemical losses at different watershed sizes. Transactions of the ASABE Vol. 60(3): 915-929 https://doi.org/10.13031/trans.12094
5. Zhao, X., J. Harbor, B. Engel, L. Theller, F. Yu, G.C. Cao, Y.X. Cui, W.J. Tang and M.T. Zhang. 2017. FEW: Analysis of food-energy-water nexus based on competitive uses of stream flows of BeiChuan River in eastern QingHai-Tibet Plateau, China. Environmental Progress & Sustainable Energy. DOI: 10.1002/ep.12764

FEWSTERN Symposium 2017 Presentation Title and Abstract:

Opportunities to Capture Urban Stormwater Runoff for Food Production

Urbanization creates impervious surfaces that result in increased runoff from these areas relative to the land use prior to development. The increased runoff creates a series of challenges within urban areas and often highly engineered structures and practices are used to deal with the stormwater. A model-based decision support tool has been created to identify green infrastructure practices and their placement to address water quantity and quality issues. An optimization aspect of the tool allows identification of optimal plans to attain water quantity and quality goals at least cost. Extension of this tool could potentially be used to develop strormwater plans involving green infrastructure to obtain the quantity and quality of water needed for food production while meeting stormwater management needs within urban areas