



THREE YEAR REVIEW REPORT FOR ACADEMIC CENTRE

Academic Centres are approved for a term of five years, subject to a mid-term review during the third year of operation. The review will be conducted by Academic Council Committee on Academic Centres (ACCAC) on the basis of a report submitted by the Director of the Centre. This report should be completed by the Director of the Centre, and approved by the relevant Head of School and the College Principal. **Submission of this report is mandatory.** Those Centres which do not submit the report may be recommended to be abolished. Recommendations of the Committee will be submitted for approval by Academic Council.

The purpose of the **three year review** is to ensure that the Centre is meeting the objectives established during the application process. The Committee may recommend that: a/ the Centre should continue to operate for the original term of approval; b/ the Centre should re-submit a revised application for approval.

For more information please refer to the UCD Policy on Academic Centres available at:

<http://www.ucd.ie/registry/academicsecretariat/pol.htm>

SECTION 1 – CENTRE DETAILS

1		Name of Academic Centre	Centre for Water Resources Research
2	Type of Academic Centre <i>Please specify type of Academic Centre: (i) Research Centre, (ii) Centre for Continuing Professional Development (CPD), (iii) Combined Research and CPD Centre</i>	Research	
3	Date of Establishment <i>Under terms and conditions of the UCD Policy on Academic Centres, 2008</i>	Academic Council, 12 December 2008	
4	Centre Director <i>Please include full contact details</i>	Professor Michael Bruen, School of Civil Structural and Environmental Engineering, College of EA Ext 3212 e-mail: michael.bruen@ucd.ie	
5	Associated UCD School(s) <i>See UCD Policy on Academic Centres, section 5</i>	School of Civil Structural and Environmental Engineering School of Biology and Environmental Science School of Sociology	
6	Staff Affiliation <i>See UCD Policy on Academic Centres, sections 5 and 6</i>		
<i>Please list current staff affiliation to the Centre (list full-time, permanent academic and administrative staff and additional staff affiliated with the Centre including Postgraduate and Postdoctoral students.</i>			
Staff Name		School	
Prof Michael Bruen		School of Civil Structural and Environmental Engineering	
Dr Yaqian Zhao		School of Civil Structural and Environmental Engineering	
Dr Patrick J Purcell		School of Civil Structural and Environmental Engineering	

Dr William Magette	School of Civil Structural and Environmental Engineering
Dr John O'Sullivan	School of Civil Structural and Environmental Engineering
Mr Pat Kearney (technician)	School of Civil Structural and Environmental Engineering
Dr Mike Long (associate)	School of Civil Structural and Environmental Engineering
Dr Mary Kelly-Quinn (associate)	School of Biology and Environmental Science
Dr Diane Payne (associate)	School of Sociology
Mr. Andrew Griffiths (administrative)	School of Civil Structural and Environmental Engineering
<i>Please list new members who joined the Centre after its establishment.</i>	
Staff Name	School
Dr. Mike Long Dr. Diane Payne Dr. Mary Kelly-Quinn Dr. Mary Kelly (deceased)	CSEE Sociology SBES Sociology
<i>Please list any members that have left the Centre and provide reasons for leaving.</i>	
Staff Name	School
Mr. Aodh Dowley (deceased) Dr. Peter O'Connor (retired)	ALCE now CSEE
7 External Linkages <i>Please specify established partnerships and indicate whether there have been any changes to these external links.</i>	
No formal partnerships although many ad-hoc linkages established on a project by project basis, e.g. with EPA, OPW, NRA, SFI, EI, EU-COST, EU Interreg	

SECTION 2 – RESEARCH SUSTAINABILITY

This section should be completed by Research Centre, and Combined Research and CPD Centre

8	Please specify how the research plans for the Centre have been achieved, and how they have been aligned with School(s) and College plans. Please provide below a number of publications by year and attach a detailed list of research outputs.
(i) Published research outputs not including Associate Members (see Appendix A) 60 Peer reviewed Journal papers, many in the top 10 ranked journals in the Water area 56 Conference papers 2 books edited	
(ii) Research students (Postdoctoral, PhD and Research Masters students) 4 Postdocs completed (Nasr, Bedri, Desta, Babatunde) 1 Postdoc current (Bedri) 6 Ph.D.s completed. (Salah, Kumar, Ahilan, Yong, Zhao, Babatunde)	

14 Ph.D.s current (Blacklocke, Clarke, Mockler, Quinn, Saraiva, Hu, O'Loughlin, Fallon, Bradford, Conway, Willuweit, Buckley, McGann, Gibson)
1 M.Eng.Sc. current (Keane)

(iii) Research income (grants and awards)

On-going

Pathways (Bruen) / EPA/ 359k of a total(2M)
Hydrofor (Bruen) /EPA/ 500k of a total(2M)
Siltflux (Bruen, O'Sullivan) /EPA/ 222k of a total (500k)
SmartCoasts (O'Sullivan, Bruen) /EU INTERREG 600k of a total(4.9M)
Environmental Impact of Road Drainage (Purcell, O'Sullivan, Bruen) 215k

Completed in reporting period

WINCOMS (Bruen – completed within reporting period) /EPA of a total (300k)
Coupled catchment constructed wetland model (Zhao) completed (2010) 250k
Validation of a CW reactor (Zhao) completed (2009) 72k
Critical Analysis of flow regimes – fellowship (Bruen) completed (2010) 209k

Other

COST731 (Bruen sole Irish delegate and vice chairman – no grant but travel costs paid)

9 Inter-disciplinary Research

Please specify how plans for inter-disciplinary research have been achieved (if applicable)

All of the above list projects have an inter-disciplinary and inter-institutional nature;
Pathways involves Dr. Mary Kelly-Quinn (UCD SBES) and TCD (hydrogeology) and QUB(hydrogeology) and EPA and GSI.

Hydrofor involved Dr. Mary Kelly-Quinn (UCD SBES), UCC(Zoology), NUIG(Engng) EPA and the Marine Institute

Siltflux involves Dr. Mary Kelly-Quinn (UCD SBES), and the Central Fisheries Board and EPA.

SMARTCOAST involves Prof. Win Meier (UCD Microbiology), Prof. Gregory O'Hare(CLARITY) and Wicklow Country Council. And also Geographers from the University of Aberystwyth University

Road Drainage project involves Dr. Mary Kelly-Quinn (UCD SBES) and the NRA

WINCOMS (now completed) involved Dr. Mary Kelly (UCD School of Sociology) and EPA

COST731 involved the meteorological and hydrological services of approx. 15 European Countries.

Note CWRR personnel are involved in the Earth Institute, both as PIs (Bruen) and research project supervision (O'Sullivan, Bruen)

SECTION 3 – PROGRAMME PORTFOLIO

This section should be completed by CPD Centre, and Combined Research and CPD Centre

10	Please outline the programme portfolio delivered over the course of last three years and specify how this offering has been aligned with School plans.
n.a.	
11	Please outline the revised / new programme portfolio for the next two years (if applicable).
n.a.	
12	Please specify what your target audience has been, how recruitment has been undertaken and satisfaction / quality evaluated.
n.a.	
13	Please provide numbers of students who graduated from each programme offering by year for the last three years. Please indicate whether these numbers are expected to increase, decrease or continue.

SECTION 4 – CENTRE OBJECTIVES

This section should be completed by Research Centre, CPD Centre, and Combined Research and CPD Centre

14	Please indicate the main research / scientific / innovation / outreach / teaching and learning achievements, as appropriate, and how they map to objectives established during the application process. Please also specify how these objectives have been aligned with the University Strategic Plan.
<p>The original policy of CWRR remains substantially the same, i.e. the CWRR is engaged in research in surface and groundwater hydrology, modelling of water movement and water quality, water and effluent analysis, modelling of aquatic chemistry, water treatment technology including laboratory and pilot plant studies, treatment and disposal of sludges, computational hydraulics and physical modelling of hydraulic structures. CWRR undertakes contract and sponsored research projects for public and private sector clients and through academic research projects associated with postgraduate degree studies. As part of the School of Civil Structural and Environmental Engineering it has the twin aims of (a) making the resources of the School available for the execution of specific research projects as a service to the civil engineering profession, the construction industry and local authorities and (b) fostering research activity within the Department through the provision of better opportunities for the best young graduates to apply their research and innovative skills in areas of identified need. Collaborative research was and is being undertaken under the aegis of various EPA and EU-funded programmes including BRITE-EURAM, COPERNICUS, EPOCH and STRIDE programmes. The CWRR also encourages joint, multi-disciplinary, research efforts by the engineering, science and other Schools, particularly in relation to environmental matters.</p>	

The KPIs listed in Section 2 above show that the objectives are achieved.

Aligning with the University Strategic Plan

CWRR's activities are aligned with UCD's first major research theme : Earth Science, Energy and Environment. (see page 21 of UCD Strategic Plan)

Aligning with College Strategic Plan

CWRR's expertise and activities in the area of Water and Environment is one of the pillars of the "Critical Infrastructures" priority area of the College of Engineering and Architecture.

Dissemination

1. The CWRR is playing a key scientific role in the organisation of the forthcoming International Water Association World Congress on Water, Climate and Energy to be held in the National Conference Centre in Dublin in 2012 and through CWRR may UCD staff have been involved in its Scientific Committee (see <http://iwa-wcedublin.org/>) More than 700 abstracts have been received for the Congress.
2. The CWRR runs occasional Professional Development Courses as a way of disseminating our expertise and research results (latest one was on Flood Hydrology for Engineers and Planners and was delivered in 2007)
3. CWRR personnel (Bruen) organised a module on Science and Technology in Development Practice as part of the joint TCD/UCD M.Sc. programme on Development Practise (McArthur Foundation). Other CWRR members contributed to the academic content as did some mebers of other Schools in the College of EA.

ResearchStudent Support

CWRR provided financial support in the form of a scholarship for a research student (now Dr. Ahilan) to enable him complete his doctorate after his original project funding ceased.

Note CWRR has recently applied to the Registrar for a change of name to "Dooge Centre for Water Resources Research"

15 Please explain why some objectives have not been achieved (if applicable).

n.a.

16 Please outline any revised/new objectives for the next two years (if applicable).

n.a.

SECTION 5 – FINANCIAL SUSTAINABILITY

This section should be completed by CPD Centre, and Combined Research and CPD Centre

17 Please outline how the Centre achieved financial sustainability for the three-year period. Budget periods should be aligned with the date of Centre approval.

Timeframe	Income	Expenditure	Comment
Budget: Years 1-3 <i>Please indicate timeframe & target budget as outlined in the original application</i>	n.a.	n.a.	The research activities of the Centre for Water Resources Research are funded through externally awarded research grants'
Budget: Years 1-3 <i>Please indicate timeframe & actual budget for this period</i>	n.a.	n.a.	The research activities of the Centre for Water Resources Research are funded through externally awarded research grants'
Budget: Year 4 <i>Please indicate timeframe & target budget</i>	n.a.	n.a.	The research activities of the Centre for Water Resources Research are funded through externally awarded research grants'
Budget: Year 5 <i>Please indicate timeframe & target budget</i>	n.a.	n.a.	The research activities of the Centre for Water Resources Research are funded through externally awarded research grants'
Total five-year projection <i>Please indicate timeframe & target budget</i>	n.a.	n.a.	The research activities of the Centre for Water Resources Research are funded through externally awarded research grants'

18 **SIGNATURES**
By signing this form, you are confirming that the above application has been reviewed and is supported by the appropriate Head(s) of School (s) and the College Principal (s)¹

Centre Director <i>(Print name and Signature)</i>	Michael Bruen	Date	9/12/2011
Head of School <i>(Print name and Signature)</i>	Mark Richardson	Date	
College Principal <i>(Print name and Signature)</i>	Gerald Byrne	Date	

¹ College Principal support assumes the support of the College Finance Manager.

Appendix A : Publications List

Peer Reviewed Journals: (60)

Earle, J.R., Blacklocke, S., Bruen, M., Almeida, G. & Keating, D. (2011) 'Integrating the Implementation of the European Union Water Framework Directive and Floods Directive in Ireland'. *Water Science Technology*, 64 (10):2044-2051. [\[Details\]](#)

Bedri, Z, Bruen, M, Dowley, A, Masterson, B (2011) 'A Three-Dimensional Hydro-Environmental Model of Dublin Bay'. *Environmental Modelling and Assessment*, 16 (4):369-384. [\[DOI\]](#) [\[Details\]](#)

O'Sullivan J.J, Bruen M., Purcell P.J., Gebre, F. (2011) 'Urban Drainage in Ireland - Embracing Sustainable Systems'. *Chartered Institution of Water and Environmental Management (Ciwem)*, . [\[Details\]](#)

Alexandrov, GA, Ames, D, Bellocchi, G, Bruen, M, Crout, N, Erechtkoukova, M, Hildebrandt, A, Hoffman, F, Jackisch, C, Khaiteer, P, Mannina, G, Matsunaga, T, Purucker, ST, Rivington, M, Samaniego, L (2011) 'Technical assessment and evaluation of environmental models and software: Letter to the Editor'. *ENVIRONMENTAL MODELLING & SOFTWARE*, 26 :328-336. [\[DOI\]](#) [\[Details\]](#)

He, Y., Pappenberger, F., Thielen-del Pozzo, J., Weerts, A., Ramos, M.-H., and Bruen, M. (2011) 'Towards practical applications in ensemble hydro-meteorological forecasting. Preface to Special Issue'. *Advances in Geosciences*, 29 :119-121. [\[DOI\]](#) [\[Details\]](#)

Ahilan, S., O'Sullivan, J.J. and Bruen, M. (2011) 'Influences on flood frequency distributions in Irish river catchments'. *Hydrology and Earth System Sciences Discussions*, 8 . [\[DOI\]](#) [\[Details\]](#)

Bruen, M, Krahe, P, Zappa, M, Olsson, J, Vehvilainen, B, Kok, K, Daamen, K (2010) 'Visualizing flood forecasting uncertainty: some current European EPS platforms-COST731 working group 3'. *Atmospheric Science Letters*, 11 :92-99. [\[DOI\]](#) [\[Details\]](#)

Rossa, A., Lleichti, K., Zappa, M., Bruen, M., Germann, U., Haase, G., Keil, K. and Krahe, P. (2010) 'A Review on uncertainty propagation in advanced hydro-meteorological forecast systems'. 100 (2/3):150-167. [\[Details\]](#)

Zappa, M., Beven, K.J., Bruen, M., Cofiño, A.S., Kok, K., Martin, E., Nurmi, P., Orfila, B., Roulin, E., Schröter, K., Seed, A., Szturc, J., Vehviläinen, B., Germann, U., Rossa, A. (2010) 'Propagation of uncertainty from observing systems and NWP into hydrological models: COST-731 Working Group 2'. *Atmospheric Science Letters*, 11 (2):83-91. [\[DOI\]](#) [\[Details\]](#)

O'Sullivan, JJ, Gebre, F, Bruen, M, Purcell, PJ (2010) 'An evaluation of urban flood estimation methodologies in Ireland'. *Environment*, 24 :49-57. [\[DOI\]](#) [\[Details\]](#)

- Bruen, M. (2009) 'Hydrology and the Water Framework Directive in Ireland'. *Biology and Environment*, 109B (3):207-220. [\[Details\]](#)
- Geng Yani; Zhang Jun; Zhou Qi; Xu Chundi; Zhao Yaqian (2011) 'Fuzzy synthetic evaluation of Weihe water quality'. *Environmental Engineering and Management Journal*, (in press) . [\[Details\]](#)
- Zhao, XH; Zhao, YQ; Kearney, P. (2011) 'Transformation of beneficially reused aluminium sludge to potential P and Al resource after employing as P-trapping material for wastewater treatment in constructed wetland'. *Chemical Engineering Journal*, 174 (1):206-212. [\[Details\]](#)
- Kumar, JLG; Zhao, YQ; Babatunde, AO; (2011) 'Process-based modelling of phosphorus removal in a novel constructed wetland system using dewatered alum-sludge as substrate'. *Water Science Technology*, 64 (5):774-780. [\[Details\]](#)
- Hu, YS; Kumar, JLG; Babatunde, AO; Zhao, XH; Zhao, YQ. (2011) 'Effects of livestock wastewater variety and disinfectants on the performance of constructed wetlands in organic matters and nitrogen removal'. *Environmental Science and Pollution Research*, 18 (8):1414-1421. [\[Details\]](#)
- Kumar, JLG; Zhao, YQ; Babatunde, AO; Zhao, XH; Jørgensen, SE; (2011) 'STELLA software as a tool for modelling phosphorus removal in a constructed wetland employing dewatered alum sludge as main substrate'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 46 (7):751-757. [\[Details\]](#)
- Yang, Y; Zhao, YQ; Wang, SP; Guo, XC; Ren, YX.; Wang, L.; Wang, XC. (2011) 'A promising approach of reject water treatment using a tidal flow constructed wetland system employing alum sludge as main substrate'. *Water Science Technology*, 63 (10):2367-2373. [\[Details\]](#)
- Yang, Y; Zhang, L.; Zhao, YQ; Wang, SP; Guo, XC; Guo, Y; Wang, L.; Ren, YX.; Wang, XC; (2011) 'Towards the development of a novel construction solid waste (CSW) based constructed wetland system for tertiary treatment of secondary sewage effluents'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 46 (7):758-763. [\[Details\]](#)
- Cui, F; Zhou, Q; Wang, Y; Zhao, YQ; (2011) 'Application of constructed wetland for urban lake water purification: Trial of Xing-qing Lake in Xi'an city, China'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 46 (7):795-799. [\[Details\]](#)
- Hu, YS; Zhao, YQ; Sorohan, B. (2011) 'Removal of glyphosate from aqueous environment by adsorption using water industrial residual'. *Desalination*, 271 (1-3):150-156. [\[Details\]](#)
- Babatunde, AO; Kumar, JLG; Zhao, YQ (2011) 'Constructed wetlands using aluminium-based drinking water treatment sludge as P-removing substrate: Should aluminium release be a concern?'. *Journal of Environmental Monitoring*, 13 (6):1775-1783. [\[Details\]](#)
- Zhao, YQ; Doherty, LP; Doyle, D. (2011) 'Fate of water treatment residual: An entire profile of

Ireland regarding beneficial reuse'. *International Journal of Environmental Studies*, 68 (2):161-170. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; Doyle, RJ; Rackard, SM; Kumar, JLG; Hu, YS. (2011) 'Performance evaluation and prediction for a pilot two-stage on-site constructed wetland system employing dewatered alum sludge as main substrate'. *Bioresource Technology*, 102 (10):5645-5652. [\[Details\]](#)

Kumar, JLG; Zhao, YQ. (2011) 'A review on numerous modeling approaches for effective, economical and ecological treatment wetlands'. *Journal of Environmental Management*, 92 (3):400-406. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; Doyle, RJ; Rackard, SM; Kumar, JLG; Hu, YS. (2011) 'On the fit of statistical and k-C* models to projecting treatment performance in a constructed wetland system'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 46 (5):490-499. [\[Details\]](#)

Dong, C; Zhu, W; Gao, M; Zhao, LF; Huang, JY; Zhao, YQ. (2011) 'Diurnal fluctuations in oxygen release from roots of *Acorus calamus* Linn in a modeled constructed wetland'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 46 (3):224-229. [\[Details\]](#)

Dong, C; Zhu, W; Zhao, YQ; Gao, M. (2011) 'Diurnal fluctuation of root oxygen release rate and dissolved oxygen budget in wetland mesocosm'. *Desalination*, 272 (1-3):254-258. [\[Details\]](#)

Tony, Maha A; Zhao, YQ; El-sherbiney, MF. (2011) 'Fenton and Fenton-like AOPs for alum sludge conditioning: Effectiveness comparison with different Fe²⁺ and Fe³⁺ salts'. *Chemical Engineering Communications*, 198 (3):442-452. [\[Details\]](#)

Zhao, YQ; Babatunde, AQ; Hu, YS; Kumar, JLG; Zhao, XH (2011) 'Pilot field-scale demonstration of a novel alum sludge-based constructed wetland system for enhanced wastewater treatment'. *Process Biochemistry*, 46 (1):278-283. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; Zhao, XH; (2010) 'Alum sludge-based constructed wetland system for enhanced removal of P and OM from wastewater: Concept, design and performance analysis'. *Bioresource Technology*, 101 (16):6576-6579. [\[Details\]](#)

Li, WC; Zhao, YQ; (2010) 'Phosphorus immobilization in Al-drinking water treatment sludge (Al-DWTS) and soil under laboratory conditions'. *International Journal of Environmental Studies*, 67 (5):747-762. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; (2010) 'Leachability and leaching patterns from aluminium-based water treatment residual used as media in laboratory-scale engineered wetlands'. *Environmental Science and Pollution Research*, 17 (7):1314-1322. [\[Details\]](#)

Zhao, YQ; Yang, Y; (2010) 'Extending the use of dewatered alum sludge as a P-trapping material in effluent purification: Study on two separate water treatment sludges'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental*

Engineering, 45 (10):1234-1239. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; (2010) 'Equilibrium and kinetic analysis of phosphorus adsorption from aqueous solution using waste alum sludge'. *Journal of Hazardous Materials*, 184 (1-3):746-752. [\[Details\]](#)

Zhao, YQ; Babatunde, AO; Hu, YS; Kumar, JLG; Zhao, XH. (2010) 'A two-prong approach of beneficial reuse of alum sludge in engineered wetland: First experience from Ireland'. *Waste and Biomass Valorization*, 1 (2):227-234. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; (2010) 'Two strategies for improving animal farm wastewater treatment in reed beds'. *Environmental Technology*, 31 (12):1343-1348. [\[Details\]](#)

Tony, Maha A; Zhao, YQ; Tayeb, Aghareed M; (2009) 'Exploitation of Fenton and Fenton-like reagents as alternative conditioners for alum sludge conditioning'. *Journal of Environmental Sciences*, 21 (1):101-105. [\[Details\]](#)

Zhao, XH; Zhao, YQ; (2009) 'Investigation of phosphorus desorption from P-saturated alum sludge used as a substrate in constructed wetland'. *Separation and Purification Technology*, 66 (1):71-75. [\[Details\]](#)

Zhao, XH; Zhao, YQ; (2009) 'Decolouration of H₂SO₄ leachate from phosphorus-saturated alum sludge using H₂O₂ and advanced oxidation processes in phosphorus recovery strategy'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 44 (14):1557-1564. [\[Details\]](#)

Tony, Maha A; Zhao, YQ; Purcell, PJ; El-Sherbiny, MF; (2009) 'Evaluating the photo-catalytic application of Fenton's reagent augmented with TiO₂ and ZnO for the mineralization of an oil-water emulsion'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 44 (5):488-493. [\[Details\]](#)

Tony, Maha A; Purcell, PJ; Zhao, YQ; Tayeb, AM; El-Sherbiny, MF; (2009) 'Photo-catalytic degradation of an oil-water emulsion using the photo-fenton treatment process: Effects and statistical optimization'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 44 (2):179-187. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; Burke, AM; Morris, MA; Hanrahan, JP; (2009) 'Characterization of aluminium-based water treatment residual for potential phosphorus removal in engineered wetlands'. *Environmental Pollution*, 157 (10):2830-2836. [\[Details\]](#)

Zhao, YQ; Zhao, XH; Babatunde, AO; (2009) 'Use of dewatered alum sludge as main substrate in treatment reed bed receiving agricultural wastewater: Long-term trial'. *Bioresource Technology*, 100 (2):644-648. [\[Details\]](#)

Zhao, YQ; Babatunde, AO; Zhao, XH; (2009) 'An innovative solution for managing waterworks sludge: Developing an alum sludge-based multistage constructed wetland system for wastewater treatment'. *Journal of ASTM International*, 6 (6):395-405. [→ \[Details\]](#)

Yang, Y; Zhao, YQ; Babatunde, AO; Kearney, P; (2009) 'Two strategies for phosphorus removal from reject water of municipal wastewater treatment plant using alum sludge'. *Water Science and Technology*, 60 (12):3181-3188. [\[Details\]](#)

Zhao, YQ; Keogh, C; Tony, Maha A; (2009) 'On the necessity of sludge conditioning with non-organic polymer: AOP approach'. *Journal of Residuals Science & Technology*, 6 (3):151-155. [\[Details\]](#)

Babatunde, AO; Zhao, YQ, (2009) 'Forms, patterns and extractability of phosphorus retained in alum sludge used as substrate in laboratory-scale constructed wetland systems'. *Chemical Engineering Journal*, 152 (1):8-13. [\[Details\]](#)

Zhao, YQ; Babatunde, AO; Zhao, XH; Li, WC; (2009) 'Development of alum sludge-based constructed wetland: An innovative and cost-effective system for wastewater treatment'. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering*, 44 (8):827-832. [\[Details\]](#)

Babatunde, AO; Zhao, YQ; (2009) 'Phosphorus removal in laboratory-scale unvegetated vertical subsurface flow constructed wetland systems using alum sludge as main substrate'. *Water Science and Technology*, 60 (2):483-489. [\[Details\]](#)

O'Sullivan, J.J., Bruen, M., Purcell, P.J. and Gebre, F. (2010) 'An evaluation of urban flood estimation methodologies in Ireland'. *Chartered Institution of Water and Environmental Management (Ciwem)*, 24 (1):49-57. [\[Details\]](#)

Tony, M., Purcell, P., Zhao, Y., Tayeb, A., El-Sherbiny, F. (2009) 'Photo-catalytic degradation of an oil-water emulsion using the photo-Fenton treatment process: effects and statistical optimisation'. *Journal of Environmental Science and Health Part a-Toxic/Hazardous Substances & Environmental Engineering*, 44 (2):179-187. [\[Details\]](#)

Ryan, R, Purcell, P (2008) 'A mathematical model of the sealing of earth-banked tanks for animal slurry'. *Biosystems Engineering*, 99 :267-272. [\[DOI\]](#) [\[Details\]](#)

Bruen, M, O'Sullivan, JJ, Gebre, FA, Purcell, PJ (2008) 'Designing for surface water runoff control: end-user requirements in Ireland'. *Natural Hazards and Earth System Sciences*, 8 :635-640. [→ \[Details\]](#)

Cocchiglia L., Kelly-Quinn M., Bruen M., O'Sullivan J., Purcell P. (2011) 'Water quality monitoring during the construction of the M3 motorway in Ireland'. *Chartered Institution of Water and Environmental Management (Ciwem)*, . [\[Details\]](#)

Palmer, RE, Meisinger, JJ and Magette, WL (2011) 'Undisturbed Soil-Columns for Lysimetry: I. Collection, Field Testing, and Construction'. *Journal of Applied Engineering in Agriculture*, 27 (3):379-389. [\[Details\]](#)

Palmer, RE, Hill, RL, Meisinger, JJ and Magette, WL (2011) 'Undisturbed Soil-Columns for Lysimetry: II. Miscible Displacement and Field Evaluation'. *Journal of Applied Engineering in*

Agriculture, 27 (3):391-400. [\[Details\]](#)

Purcell, M and Magette, WL (2011) 'Targeted intervention strategies to optimise diversion of BMW in the Dublin, Ireland region'. *Waste Management*, . [\[DOI\]](#) [\[Details\]](#)

Purcell, M. and Magette, W.L. (2010) 'Attitudes and behaviour towards waste management in the Dublin, Ireland region'. *Waste Management*, 30 (10):1997-2006. → [\[DOI\]](#) [\[Details\]](#)

Hughes, KJ, Magette, WL, Kurz, I (2005) 'Identifying critical source areas for phosphorus loss in Ireland using field and catchment scale ranking schemes'. *Journal of Hydrology*, 304 :430-445. [\[DOI\]](#) [\[Details\]](#)

Collins, C; Crowley, D; Thunhurst, C; Staines, A; Bruen, M; Magette, W; Malone, D; Ryan, M; Dean, A; McMahon, L; (2002) 'Waste management in Ireland. A qualitative study of the knowledge and attitudes of the public, industry and service providers'. *Epidemiology*, 13 (4):253-253. [\[Details\]](#)

Shirmohammadi, A, Yoon, KS, Magette, WL (1997) 'Water quality in mixed land-use watershed - Piedmont Region in Maryland'. *Transactions of the Asae*, 40 :1563-1572. [\[Details\]](#)

Purcell, M. and W. Magette (2009) 'Prediction of Household and Commercial BMW Generation According to Socio-economic and Other Factors for the Dublin Region'. *Waste Management*, 29 (4):1237-1250. [\[Details\]](#)

Conference Publications: (56)

Desta, M.B., O'Loughlin, F., and Bruen, M. (2011) Potential of radar data for flood forecasting and warning in lowland catchments in Ireland International Symposium Weather Radar and Hydrology [\[Details\]](#)

Bruen, M. (2011) Radar for hydrological modelling: from Theory to operational practice International Symposium on Weather Radar and Hydrology [\[Details\]](#)

Mashingia, F., Mtalo, F. and Bruen, M. (2011) Water, Poverty and sustainable livelihoods: a challenge for water resources management in the Eastern Arc Mountains in Tanzania LARS Symposium, Nairobi [\[Details\]](#)

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