Curriculum Vitae Bruce William Melville

PART 1

1a. Personal details				
Full name	*Title* Professor	*First name* Bruce	*Second name(s)* William	*Family name* Melville
Present position				
Organisation / employer	Civil & Environmental Engineer, The University of Auckland			
Contact Address	The University of Auckland Private Bag 92019, Auckland Mail Centre			
			Post code	
Work telephone		**Mobile**	021869727	
Email	b.melville@auckland.ac.nz			
Personal website (if applicable)	http://orcid.org/0000-0001-8377-0403			

1b. Academic qualifications

BE (1st Class Honours), University of Auckland, 1972
PhD (Civil Engineering), University of Auckland, 1975
Distinguished Fellow, EngNZ, 2011

1f. Professional distinctions and memberships (including honours, prizes, scholarships, boards of governance roles, etc)

FRSNZ, Fellow of the Royal Society of New Zealand, 2006
Hood Travelling Fellowship, 2011
ASCE Hydraulic Structures Medal, 2002
R J Scott Medal, RSNZ, 2007
Adjunct Research Professor, Center for Computational Hydroscience and Engineering, the University of Mississippi, Oxford, Mississippi, USA, 1997
ASCE Journal of Hydraulic Engineering, Award for Best Technical Note, 2006
Dobson Supreme Technical Award, Transportation Infrastructure, 2012
Henderson Oration Award, 2014
Associate Editor, ASCE Journal of Hydraulic Engineering, since 1993
Established the Centre for Infrastructure Research at University of Auckland, 2010
Founding member, World Association for Sediment Research, 2009
Member, US Transportation Research Board Committee A2AO3, 2000-
Marsden Fund Grant, 2003-2006, for project “Waves in submerged particulate beds”
Council member, International Association of Hydraulic Research, 2009-2014
Member PBRF Engineering Panels, 2003, 2006, 2012

e.g. Year / year-year, distinction.

1g. Total number of *peer reviewed* publications and patents	Journal articles	Books, book chapters, books edited	Conference proceedings	Patents
	167	9	125	0

PART 2

2a. Research publications and dissemination

Expand/reduce the following table as needed, listing publications relevant to your proposal. List in reverse date order. ***Bold*** *your name in lists of authors.*

Research Monograph
Melville, B.W. and Coleman, S.E. (2000) "Bridge Scour," Water Resources Publications, LLC, Colorado, USA, 550pp. ISBN:13:978-887-201-18-1
Peer-reviewed journal articles
Moridnejad, M., Cameron, S., Shamseldin, A. Y., Melville, B. W., Verhagen, F., & Moore, C. (2019). Temperature modelling and fibre optic temperature sensing to characterise groundwater discharge. *Groundwater*.
Akhter, M. S., Shamseldin, A. Y., & Melville, B. W. (2019). Investigation of climate change impacts on flow regime in the Lucas Creek catchment using multiple CMIP5 ensembles. *Urban Water Journal*, *16*(5), 389-401. doi:10.1080/1573062X.2019.1669199
Yang, Y., Melville, B. W., Sheppard, D. M., & Shamseldin, A. Y. (2019). Live-Bed Scour at Wide and Long-Skewed Bridge Piers in Comparatively Shallow Water. *Journal of Hydraulic Engineering*, *145*(5). doi:10.1061/(ASCE)HY.1943-7900.0001600
Guan, D., Chiew, Y. -M., Melville, B. W., & Zheng, J. (2019). Current-induced scour at monopile foundations subjected to lateral vibrations. *COASTAL ENGINEERING*, *144*, 15-21. doi:10.1016/j.coastaleng.2018.10.011
Akhter, M. S., Shamseldin, A. Y., & Melville, B. W. (2019). Comparison of dynamical and statistical rainfall downscaling of CMIP5 ensembles at a small urban catchment scale. *STOCHASTIC ENVIRONMENTAL RESEARCH AND RISK ASSESSMENT*, *33*(4-6), 989-1012. doi:10.1007/s00477-019-01678-y
Yang, Y., Melville, B. W., Macky, G. H., & Shamseldin, A. Y. (2019). Local Scour at Complex Bridge Piers in Close Proximity under Clear-Water and Live-Bed Flow Regime. *WATER*, *11*(8), 17 pages. doi:10.3390/w11081530
Akhter, M. S., shamseldin, A. Y., & Melville, B. W. (2019). Investigation of climate change impacts on flow regime in the Lucas Creek catchment using multiple CMIP5 ensembles. *Urban Water Journal*, 1-13.
Chen, D., Wang, Y., Melville, B., Huang, H., & Zhang, W. (2018). Unified Formula for Critical Shear Stress for Erosion of Sand, Mud, and Sand–Mud Mixtures. *Journal of Hydraulic Engineering*, *144*(8), 04018046. doi:10.1061/(ASCE)HY.1943-7900.0001489
Wang, L., Melville, B. W., Guan, D., & Whittaker, C. N. (2018). Local Scour at Downstream Sloped Submerged Weirs. *Journal of Hydraulic Engineering*, *144*(8), 04018044. doi:10.1061/(ASCE)HY.1943-7900.0001492
Hendi, E., Shamseldin, A. Y., Melville, B. W., & Norris, S. E. (2018). Experimental investigation of the effect of temperature differentials on hydraulic performance and flow pattern of a sediment retention pond. *Water Science and Technology*, *77*(12), 2896-2906. doi:10.2166/wst.2018.286
Liu, J., Guo, A., Nandasena, N. A. K., Melville, B. W., & Li, H. (2018). Theoretical and experimental investigation on wave interaction with a concentric porous cylinder form of breakwater. *Ocean Engineering*, *160*, 156-167. doi:10.1016/j.oceaneng.2018.04.050
Xu, Z., Nandasena, N. A. K., Whittaker, C. N., & Melville, B. W. (2018). Numerical

modelling of flow in Little Pigeon Bay due to the 2016 Kaikoura tsunami. *Ocean Engineering*, *159*, 228-236. doi:10.1016/j.oceaneng.2018.04.004

Yang, Y., Melville, B. W., Sheppard, D. M., & Shamseldin, A. Y. (2018). Clear-Water Local Scour at Skewed Complex Bridge Piers. *Journal of Hydraulic Engineering*, *144*(6), 04018019. doi:10.1061/(ASCE)HY.1943-7900.0001458

Wang, L., Melville, B. W., Whittaker, C. N., & Guan, D. (2018). Effects of a downstream submerged weir on local scour at bridge piers. *Journal of Hydro-environment Research*, *20*, 101-109. doi:10.1016/j.jher.2018.06.001

Chen, C., Melville, B. W., & Nandasena, N. A. K. (2018). Investigations of Reduction Effect of Vertical Wall on Dam-Break-Simulated Tsunami Surge Exerted on Wharf Piles. *Journal of Earthquake and Tsunami*, *12*(02), 1840006. doi:10.1142/S1793431118400067

Wang, L., Melville, B. W., & Guan, D. (2018). Effects of Upstream Weir Slope on Local Scour at Submerged Weirs. *Journal of Hydraulic Engineering*, *144*(3), 04018002. doi:10.1061/(ASCE)HY.1943-7900.0001431

Shafiei, S., Melville, B. W., & Shamseldin, A. Y. (2018). Instant tsunami bore pressure and force on a cylindrical structure. *Journal of Hydro-environment Research*, *19*, 28-40. doi:10.1016/j.jher.2018.01.004

Keshavarzi, A., Shrestha, C. K., Melville, B., Khabbaz, H., Ranjbar-Zahedani, M., & Ball, J. (2018). Estimation of maximum scour depths at upstream of front and rear piers for two in-line circular columns. *Environmental Fluid Mechanics*, *18*(2), 537-550. doi:10.1007/s10652-017-9572-6

Ahmad, N. (2018). EVALUATION OF PIER-SCOUR PREDICTIONS FOR WIDE PIERS USING FIELD DATA. *International Journal of GEOMATE*, *14*(42). doi:10.21660/2018.42.3516

Ghavidelfar, S., Shamseldin, A. Y., & Melville, B. W. (2018). Evaluating spatial and seasonal determinants of residential water demand across different housing types through data integration. *Water International*, *43*(7), 926-942. doi:10.1080/02508060.2018.1490878

Ghavidelfar, S., Shamseldin, A. Y., & Melville, B. W. (2018). Evaluating the determinants of high-rise apartment water demand through integration of water consumption, land use and demographic data. *Water Policy*, *20*(5), 966-981. doi:10.2166/wp.2018.028

Chen, C., Melville, B. W., Nandasena, N. A. K., Shamseldin, A. Y., & Wotherspoon, L. (2017). Mitigation effect of vertical walls on wharf model subjected to tsunami bores. *Journal of Earthquake and Tsunami*, *11*(3), 19 pages. doi:10.1142/S179343111750004X

Ettema, R., Constantinescu, G., & Melville, B. W. (2017). Flow-field complexity and design estimation of pier-scour depth: Sixty years since Laursen and Toch. *Journal of Hydraulic Engineering*, *143*(9), 14 pages. doi:10.1061/(ASCE)HY.1943-7900.0001330

Yuan, C., Melville, B. W., & Adams, K. N. (2017). Scour at wind turbine tripod foundation under steady flow. *Ocean Engineering*, *141*, 277-282. doi:10.1016/j.oceaneng.2017.06.038

Shoaib, M., Shamseldin, A. Y., Khan, S., Khan, M. M., Khan, Z. M., Sultan, T., & Melville, B. W. (2018). A Comparative Study of Various Hybrid Wavelet Feedforward Neural Network Models for Runoff Forecasting. *Water Resources Management*, *32*(1), 83-103. doi:10.1007/s11269-017-1796-1

Ghavidelfar, S., Shamseldin, A. Y., & Melville, B. W. (2017). A multi-scale analysis of single-unit housing water demand through integration of water consumption, land use and demographic data. *Water Resources Management*, *31*(7), 2173-

2186. doi:10.1007/s11269-017-1635-4

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Guan, D., Yan, Y., Zheng, J., Melville, B., & Wang, L. (2017). Research progress on scour at weir-like structures. *Shuikexue Jinzhan/Advances in Water Science*, *28*(2), 311-318. doi:10.14042/j.cnki.32.1309.2017.02.017

Chen, C., Melville, B. W., Nandasena, N. A. K., & Farvizi, F. (2017). An experimental investigation of tsunami bore impacts on a coastal bridge model with different contraction ratios. *Journal of Coastal Research*. doi:10.2112/JCOASTRES-D-16-00128.1

Nordila, A., Thamer, M., Melville, B. W., Faisal, A., & Badronnisa, Y. (2017). Modelling the effect of sediment coarseness on local scour at wide bridge piers. *Pertanika Journal of Science and Technology*, *25*(1), 191-200. Retrieved from http://www.pertanika.upm.edu.my/regular_issues.php?jtype=2&journal=JST-25-1-1

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Shafiei, S., Melville, B. W., Shamseldin, A. Y., Adams, K. N., & Beskhyroun, S. (2016). Experimental investigation of tsunami-borne debris impact force on structures: Factors affecting impulse-momentum formula. *Ocean Engineering*, *127*, 158-169. doi:10.1016/j.oceaneng.2016.09.008

Chen, C., Melville, B., Nandasena, N., Shamseldin, A., & Wotherspoon, L. (2016). Experimental study of uplift loads due to tsunami bore impact on a wharf model. *Coastal Engineering*, *117*, 126-137. doi:10.1016/j.coastaleng.2016.08.001

Ghavidelfar, S., Shamseldin, A. Y., & Melville, B. W. (2016). A Multi-Scale Analysis of Low-Rise Apartment Water Demand through Integration of Water Consumption, Land Use, and Demographic Data. *Journal of the American Water Resources Association*, *52*(5), 1056-1067. doi:10.1111/1752-1688.12430

Shoaib, M., Shamseldin, A. Y., Melville, B. W., & Khan, M. M. (2016). A comparison between wavelet based static and dynamic neural network approaches for runoff prediction. *Journal of Hydrology*, *535*, 211-225. doi:10.1016/j.jhydrol.2016.01.076

Shafiei, S., Melville, B. W., & Shamseldin, A. Y. (2016). Experimental investigation of tsunami bore impact force and pressure on a square prism. *Coastal Engineering*, *110*, 1-16. doi:10.1016/j.coastaleng.2015.12.006

Shafiei, S., Melville, B. W., Shamseldin, A. Y., Beskhyroun, S., & Adams, K. N. (2016). Measurements of tsunami-borne debris impact on structures using an embedded accelerometer. *Journal of Hydraulic Research*, *54*(4), 435-449. doi:10.1080/00221686.2016.1170071

Shoaib, M., Shamseldin, A. Y., Melville, B. W., & Khan, M. M. (2016). Hybrid wavelet neuro-fuzzy approach for rainfall-runoff modeling. *Journal of Computing in Civil Engineering*, *30*(1). doi:10.1061/(ASCE)CP.1943-5487.0000457

Ghavidelfar, S., Shamseldin, A. Y., & Melville, B. W. (2016). Estimation of the effects of price on apartment water demand using cointegration and error correction techniques. *Applied Economics*, *48*(6), 461-470.

doi:10.1080/00036846.2015.1083082

Guan, D., Melville, B., & Friedrich, H. (2016). Local scour at submerged weirs in sand-bed channels. *Journal of Hydraulic Research*, *54*(2), 172-184. doi:10.1080/00221686.2015.1132275

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Ghavidelfar, S., Shamseldin, A. Y., & Melville, B. W. (2015). Estimation of soil hydraulic properties and their uncertainty through the Beerkan infiltration experiment. *Hydrological Processes*, *29*(17), 3699-3713. doi:10.1002/hyp.10466

Shoaib, M., Shamseldin, A. Y., Melville, B. W., & Khan, M. M. (2015). Runoff forecasting using hybrid Wavelet Gene Expression Programming (WGEP) approach. *Journal of Hydrology*, *527*, 326-344. doi:10.1016/j.jhydrol.2015.04.072

Farjood, A., Melville, B. W., & Shamseldin, A. Y. (2015). The effect of different baffles on hydraulic performance of a sediment retention pond. *Ecological Engineering*, *81*, 228-232. doi:10.1016/j.ecoleng.2015.04.063

Farjood, A., Melville, B. W., Shamseldin, A. Y., Adams, K. N., & Khan, S. (2015). Evaluation of hydraulic performance indices for retention ponds. *Water Science and Technology*, *72*(1), 10-21. doi:10.2166/wst.2015.178

Khan, M. M., Shamseldin, A. Y., Melville, B. W., & Shoaib, M. (2015). Stratification of NWP Forecasts for Medium-Range Ensemble Streamflow Forecasting. *Journal of Hydrologic Engineering*, *20*(7). doi:10.1061/(ASCE)HE.1943-5584.0001075

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Khan, M. M., Shamseldin, A. Y., Melville, B. W., & Shoaib, M. (2015). Impact of Ensemble Size on TIGGE Precipitation Forecasts: An End-User Perspective. *Journal of Hydrologic Engineering*, *20*(2). doi:10.1061/(ASCE)HE.1943-5584.0001025

Pham, H. X., Shamseldin, A. Y., & Melville, B. W. (2015). Assessment of Climate Change Impact on Water Balance of Forested and Farmed Catchments. *Journal of Hydrologic Engineering*, *20*(10), 1084-0699. doi:10.1061/(ASCE)HE.1943-5584.0001169

Phukoetphim, P., Shamseldin, A. Y., & Melville, B. W. (2014). Knowledge Extraction from Artificial Neural Networks for Rainfall-Runoff Model Combination Systems. *Journal of Hydrologic Engineering*, *19*(7), 1422-1429. doi:10.1061/(ASCE)HE.1943-5584.0000941

Shoaib, M., Shamseldin, A. Y., & Melville, B. W. (2014). Comparative study of different wavelet based neural network models for rainfall–runoff modeling. *Journal of Hydrology*, *515*, 47-58. doi:10.1016/j.jhydrol.2014.04.055

Pham, H. X., Shamseldin, A. Y., & Melville, B. W. (2014). Statistical Properties of Partial Duration Series and Its Implication on Regional Frequency Analysis. *Journal of Hydrologic Engineering*, *19*(7), 1471-1480. doi:10.1061/(ASCE)HE.1943-5584.0000916

Amini, A., Melville, B. W., & Ali, T. M. (2014). Local scour at piled bridge piers including an examination of the superposition method. *Canadian Journal of Civil Engineering*, *41*(5), 461-471. doi:10.1139/cjce-2011-0389

Khan, M. M., Shamseldin, A. Y., & Melville, B. W. (2014). Impact of Ensemble Size on Forecasting Occurrence of Rainfall Using TIGGE Precipitation Forecasts.

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Pham, H. X., Shamseldin, A. Y., & Melville, B. (2014). Statistical Properties of Partial Duration Series: Case Study of North Island, New Zealand. *Journal of Hydrologic Engineering*, *19*(4), 807-815. doi:10.1061/(ASCE)HE.1943-5584.0000841

Heays, K., Friedrich, H., & Melville, B. (2014). Laboratory study of gravel-bed cluster formation and disintegration. *Water Resources Research*, *50*(3), 2227-2241. doi:10.1002/2013WR014208

Melville, B. W., & Lim, S. Y. (2014). Scour caused by 2D horizontal jets. *Journal of Hydraulic Engineering*, *140*(2), 149-155. doi:10.1061/(ASCE)HY.1943-7900.0000807

Keshavarzi, A., Melville, B. W., & Ball, J. (2014). Three-dimensional analysis of coherent flow structure around a single circular bridge pier. *Environmental Fluid Mechanics*, *14*(4), 821-847. doi:10.1007/s10652-013-9332-1

Heays, K., Friedrich, H., Melville, B., & Nokes, R. (2014). Quantifying the dynamic evolution of graded gravel beds using particle tracking velocimetry. *Journal of Hydraulic Engineering*, *140*(7), . doi:10.1061/(ASCE)HY.1943-7900.0000850

Sheppard, D. M., Melville, B., & Demir, H. (2014). Evaluation of existing equations for local scour at bridge piers. *Journal of Hydraulic Engineering*, *140*(1), 14-23. doi:10.1061/(ASCE)HY.1943-7900.0000800

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Khan, S., Melville, B. W., & Shamseldin, A. (2013). Design of storm-water retention ponds with floating treatment wetlands. *Journal of Environmental Engineering*, *139*(11), 1343-1349. doi:10.1061/(ASCE)EE.1943-7870.0000748

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Khan, S., Melville, B. W., Shamseldin, A. Y., & Fischer, C. (2013). Investigation of flow patterns in storm water retention ponds using CFD. *Journal of Environmental Engineering*, *139*(1), 61-69. doi:10.1061/(ASCE)EE.1943-7870.0000540

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Dwivedi, A., Melville, B., Raudkivi, A., Shamseldin, A., & Chiew, Y. -M. (2012). Role of turbulence and particle exposure on entrainment of large spherical particles in flows with low relative submergence. *Journal of Hydraulic Engineering*, *138*(12), 1022-1030. doi:10.1061/(ASCE)HY.1943-7900.0000632

Ghodsian, M., Melville, B., & Coleman, S. (2012). Local scour due to sediment-carrying free-overfall water jet. *Proceedings of the ICE - Water Management*, *165*(1), 21-29. doi:10.1680/wama.2012.165.1.21

Dwivedi, A., Melville, B. W., Shamseldin, A. Y., & Guha, T. K. (2011). Analysis of hydrodynamic lift on a bed sediment particle. *Journal of Geophysical Research - Earth Surface*, *116*(2). doi:10.1029/2009JF001584

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khan, S., Melville, B. W., & Shamseldin, A. Y. (2011). Retrofitting a stormwater retention pond using a deflector island. *Water Science and Technology*, *63*(12), 2867-2872. doi:10.2166/wst.2011.569

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