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## **Personal Narrative of Professional Accomplishments**

A consistent research theme throughout my career has been to apply granular flow mechanics to the phenomenon of sediment transport. Merging these two fields using the principles of applied mechanics has led to innovative breakthroughs in sediment transport research. There had previously been no momentum-based theories for intense bedload sediment transport because of the lack of constitutive and energy conservation equations for flowing granular materials. In a series of papers (e.g. Hanes and Inman, 1985; Hanes and Bowen, 1985; Jenkins and Hanes, 1998; Hsu and Hanes, 2004; Yu, Hsu, and Hanes, 2010) my colleagues and I have established a new “granular” paradigm for better understanding the mechanics of intense bedload sediment transport.

A second career-long research theme has been to develop new observational and data analysis techniques in order to carry out innovative experimental studies and interpret the results. For example, in recognition of the disturbance that traditional instrumentation generated when observing sediment transport processes, my colleagues and I developed new acoustic-based instruments for remotely measuring sediment concentration and velocity near sand beds. The development, application, and interpretation of acoustic measurements (Hanes and Huntley, 1986; Hanes et. al, 1988; Vincent, Hanes, and Bowen, 1991; Lee and Hanes, 1995; Lee and Hanes, 1996; Jette and Hanes, 1997; Thosteson and Hanes, 1998; Thorne and Hanes, 2002; Hanes, 2012; Agrawal and Hanes, 2015; Hanes, 2016) has led to a new era of in-situ sediment transport observations.

While at USGS I led a project that addressed diverse issues such as sustainable sediment management, storm-induced erosion, morphology and dynamics of sandwaves, sediment transport processes near Crissy Marsh, the morphology and evolution of the San Francisco ebb tidal delta, and the impacts of sea level rise on coastal geomorphology and coastal hazards (Barnard et. al, 2006; Elfrink, Hanes, and Ruessink, 2006; Hanes and Barnard, 2007; Shi, Kirby, and Hanes, 2007; Sterlini, Hulscher, and Hanes, 2009; Hanes, 2009; Shi, Hanes, et. al, 2011; Hanes, Ward, and Erikson, 2011; Hanes, 2012; Hanes and Erikson, 2013)

My most recent research focus, at Saint Louis University, has shifted to Watershed Science, and the transport of contaminated sediment in the Meramec River Basin. We seek to discover and quantify the mechanisms for sediment transport and sediment storage that are slowly moving heavy-metal contaminated sediments from Missouri’s “old lead mining district” through the watershed toward the Mississippi River.

As a professor and scientist I have contributed toward the advancement of the profession in many ways in addition to research. I have mentored graduate students, post-doctoral fellows, and junior colleagues. I have advised approximately 35 graduate students and post-doctoral fellows. I have also advised more than 10 undergraduates involved in research. I have served on the thesis or dissertation committees of over 100 graduate students, at over 10 universities worldwide. I am frequently requested to write letters of reference for hiring, tenure, and promotion at national and international research universities. I have provided technical reviews for over 235 journal publications and research proposals.

Finally, I consider my philanthropic work as a founding board member of the PADI Foundation as a significant professional accomplishment. Since 1991 I have actively participated in the awarding of grants to a wide variety of people including: graduate students needing research funding; research experiences for disadvantaged youth; assistant professors with novel research ideas; scuba diving recompression chambers in remote parts of the world; shark and other conservation efforts; coral reef protection; and public education.

### Academic and Professional Activity Details

**Formal Course Instruction:** Nearshore Processes; Laboratory in Coastal Processes; Laboratory and Field Measurement Techniques; Ocean Waves: Linear; Ocean Waves: Laboratory; Mechanics of Coastal Sediment Transport; Data Analysis Techniques; Surface Water Hydrology; Environmental Issues; Introduction to Environmental Science; Introduction to Environmental Science Laboratory; Geosciences Journal Club; Environmental Sciences Seminar; Rivers Seminar, Coastal Geomorphology; Transport and Mixing in the Environment.

**M.S. Committee Chairman (20):** T. Tamura, 1986; E. Gonzales, 1988; K. Ludwig, 1989; S. Tyagi, 1990, J. McCardle, 1993; P. Dompe, 1993; T. Mason, 1993; C. Jette, 1994; E. Thosteson, 1995; D. Stubbs, 1995; K. Marusin, 1995; M. Krecic, 1995; C. Lee, 1996; V. Zakirov, 1997; V. Alymov, 1999; H. Qin, 1999; E. Cranston 2000; O. Mouraenko, 2001; Annika Gomell, 2015, Julia Mudd, 2016-,

**Ph.D. Committee Chairman (5):** T. Lee, 1994; J. Lee (Co-chairman), 1994; C. Jette, 1997; E. Thosteson, 1997; Y. Chang, 2001.

**External or International Ph.D. External Examiner (4):** I. Teackle, Queensland University, Australia, 2006; S. Kularatne, Univ West. Australia, 2006; F. M. Sterlini, University Twente, The Netherlands, 2009, Sylvia Rodriguez-Abudo, The University of New Hampshire, 2014.

**Post-doctoral Advisor (10):** Erdman, M. R., 1989-1990; Dick, J. E., 1990; Karangaonkar, T, 1990-1991; Gu, Z., 1990-1991, N. Wikramanayake, 1994; E. Thosteson, 1998; H. Liu, 2001-2002, P. Barnard, 2003-2005, L. Erikson 2006-2008; Adam J. Pearson, 2015-2017.

**Administrative and other University committees:**

Engineering library services advisory committee, University of Florida, 1989-1990, 1993-1997.

Ad Hoc committee on Ph.D. Program, Department of Coastal and Oceanographic Engineering, University of Florida, 1990.

Graduate Coordinator, Department of Coastal and Oceanographic Engineering, University of Florida, 1991-1993.

Faculty teaching and advising awards committee, College of Engineering, University of Florida, 1993, 1994, 1995.

Chair, search committee, faculty member in Mechanical Engineering, 1996-1997.

Senate Member, University of Florida, 1999-2001

Weil Hall Renovation and Space Committee, University of Florida, 1999-2001

Chair, search committees, two faculty searches in Coastal and Oceanographic Engineering, University of Florida, 2000-2001.

Chair, search committee, faculty search in Earth and Atmospheric Sciences, Saint Louis University, 2012, 2013, 2015.

Rank and Tenure committee member, Arts and Sciences, Saint Louis University, 2013-15

Rank and Tenure committee member, Center for Sustainability, Saint Louis Univ., 2014-16

Ritter Hall renovation and space committee, 2015-2016

Major Experiment Participation: Torrey Pines, CA,

Board of Directors PADI Foundation, 1991 to present.

Patent

Colorado State University, 2013.

New Jersey Institute of Technology, 2013.

Kavli Institute of Theoretical Physics, 2013.

Particles in Europe, 2014.

River Flow, The Eighth International Conference on Fluvial Hydraulics, 2016.

Ozarks Environmental and Water Resources Institute, Missouri State University, 2017

University of Queensland, Australia, 2017

**List of Publications**

Hanes, D.M., "Correction", *Journal*

- Jenkins, J.T. and D.M. Hanes, Collisional sheet flows of sediment driven by a turbulent fluid, *Journal of Fluid Mechanics*, 370, 29-52, 1998.
- Thosteson, E.D. and D.M. Hanes, A simplified method for determining sediment size and concentration from multiple frequency acoustic backscatter measurements, *Journal Acoustic Society of America*, 104 (2), 820-830, 1998.
- LoCurto, G.J., R.A. Bucklin, D.M. Hanes, A.A. Teixeira, O.R. Walton, and S.H. West, Chute flow of soybeans,



Barnard, P., D.M. Hanes, D.M. Rubin, and R.G. Kvitek, Giant sand waves at the mouth of San Francisco Bay, EOS, V. 87, No. 29, pp 285-286, 2006.

Elfrink, B., D.M. Hanes, and G.B. Ruessink, Parameterization and simulation of near bed orbital velocities under irregular waves in shallow water, Coastal Engineering, v. 53, No. 11, 915-927, 2006.

Barnard, P.L. and Hanes, D.M., Cover Photograph: San Francisco Bay, California, U.S.A., Journal of Coastal Research, cover photograph w/ extended caption. Volume 23, No. 3. pp. ii, 2007.

Hanes, D.M. and P.L. Barnard, Morphological evolution in the San Francisco bight, Journal of Coastal Research, SI 50 (Proceedings of the 9th International Coastal Symposium), 21 – 24. Gold Coast, Australia, ISSN 0749.0208, 469-473, 2007.

Shi, F., J.T. Kirby, and D.M. Hanes, An efficient mode splitting method for a curvilinear nearshore circulation model, Coastal Engineering, V.54, p.811-824 doi:10.1016/j.coastaleng.2007.05.009, 2007.

Lacy, J.R., D.M. Rubin, H. Ikeda, K. Mokudai, and D.M. Hanes, Bedforms created by simulated waves and currents in a large flume, Journal of Geophysical Research Oceans, doi:10.1029/2006JC003942, 2007.

Haas, K.A., L. Check, and D.M. Hanes, Modeling the effects of wave skewness and beach cusps on littoral sand transport, Journal of Coastal Research, 24(4C), 141–149, DOI: 10.2112/06-0759.1, 2008.

Ji, S., Hanes, D.M., and Shen, H.H., Comparisons of Physical Experiment and Discrete Element Simulations of Rapidly Sheared Granular Materials in an Annular Shear Cell, Mechanics of Materials, [doi:10.1016/j.mechmat.2009.01.029](https://doi.org/10.1016/j.mechmat.2009.01.029), 2009.

Sterlini, F., S. J. M. H. Hulscher, and D. M. Hanes, Simulating and understanding sand wave variation: A case study, Coastal Engineering, 55(1), 1-11, 2008. doi:10.1016/j.coastaleng.2007.05.009

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- Hanes, D.M., Erratum to “On the possibility of single-frequency acoustic measurement of sand and clay concentrations in uniform suspensions (Vol 46, 2012)”, *Continental Shelf Research*, Vol 54, 117-118, <http://dx.doi.org/10.1016/j.csr.2012.10.003>, 2013.
- Erikson, L.H., Wright, S., Elias, E., Hanes, D.M., Schoellhamer, D.H., and Largier, J., The use of modeling and suspended sediment concentration measurements for quantifying net suspended sediment transport through a large tidally dominated inlet, *Marine Geology*, <http://dx.doi.org/10.1016/j.margeo.2013.06.001>, 2013.
- Hanes, D.M. and Erikson, L.H., The significance of ultra-refracted waves on sheltered coasts, with application to San Francisco Bay, *Estuarine, Coastal, and Shelf Science*, 10.1016/j.ecss.2013.08.022, 2013.
- Agrawal, Y.C. and Hanes, D.M., The implications of laser-diffraction measurements of sediment size distribution in a river to the potential use of acoustic backscatter for sediment measurements, *Water Resources Research*, 51, doi:10.1002/2015WR017268, 2015.
- Hanes, D.M., Acoustic attenuation due to bi-modal size distributions of suspended sediment, *Journal of Coastal Research*, No 75, p. 23-27, 2016.
- Hanes, D.M., Human Instability Related to Drowning Risk in Surf Zones for Novice Beachgoers or Weak Swimmers, *Natural Hazards*, 83(1), 761-766, doi: 10.1007/s11069-016-2337-6, 2016.
- Talbot, C.J., E. Bennett, K. Cassel, D.M. Hanes, E. Minor, H. Paerl, P. Raymond, R. Vargas, P. Vidon, W. Wollheim, and M.A. Xenopoulos, Gains and losses of aquatic ecosystem services from small and extreme flooding, *Biogeochemistry*, submitted Oct 2017
- Macmillan S. K., Wilson H.F., Tague, C.L., Hanes, D.M., Inamdar, S., Karwan, D.L., Loecke, T., Morrison, J., Murphy, S.F., Vidon, P., Before the storm: Antecedent conditions as regulators of hydrologic and biogeochemical response to extreme climate events, *Biochemistry*, submitted 10/31/2017
- Hanes, D.M., Continental Shelf Seabed Surface Response to Large Hurricane Generated Waves in the Northeast Gulf of Mexico, in preparation.
- Hanes, D.M., Sand Waves of the Golden Gate, *Journal of Geophysical Research: Earth Surface*, in preparation.

### Published Proceedings of Conferences and Symposia

- Inman, D. L., J. A. Zampol, T. E. White, D. M. Hanes, B. W. Waldorf and K. A. Kastens, "Field measurements of sand motion in the surf zone", *Proc. 17th International Conference on Coastal Engineering, ASCE*, Sydney, Australia, 1980, 1215-1234.
- Hanes, D. M., "Flow resistance due to intense bedload transport", *Proc. 19th International Conf. on Coastal Engineering, ASCE*, Houston, Texas, 1984, 1306-1310.
- Hanes, D. M., "On the use of grain-flow dynamics to model intense bedload sediment transport", *Proc. of specialty conf. on Advances in Aerodynamics, Fluid Mechanics and Hydraulics, ASCE*, Ed: R.E.A. Arndt, 1986, 346-352.
- Ackerman, N. L., and D. M. Hanes, "Rapid shearing of granular solids: experimental results", *Proc. of specialty conference on Advances in Aerodynamic, Fluid Mechanics and Hydraulics, ASCE*, Ed: R.E.A. Arndt, 1986, 951-958.

- Vincent, C. E., D. M. Hanes, T. Tamura and T. L. Clarke, "The acoustic measurement of suspended sand in the surf zone", *International Conf. on Measurement Technology of Hydraulic Phenomena in Offshore, Coastal and Inland Waters*, London, UK, 9-11 April, 1986, 443-451.
- Hanes, D. M. and C. E. Vincent, "Detailed dynamics of nearshore suspended sediment", *Proc. Coastal Sediments '87*, ASCE, New Orleans, LA, 12-14 May, 1987, 285-299.
- Huntley, D. A., and D. M. Hanes, "Direct measurements of suspended sediment transport", *Proc. Coastal Sediments '87*, ASCE, New Orleans, LA, 12-14 May, 1987, 723-737.
- Vincent, C. E., D. M. Hanes, and D.A. Huntley, "Measurements of suspended sand transport in the near-shore zone using an acoustic backscatter profilometer", *Coastal Zone Symposium*, Beijing, China, 1988.
- Hanes, D. M., "Wave induced sediment suspension", *Beach Preservation Technology '89*, Tampa, Florida, 22-24 February, 1989, 127-134.
- Hanes, D. M., "The structure of intermittent sand suspension events under mild wave conditions", *Int. Conf. on Sediment Transport Modeling*, ASCE, Ed: S. S. Y. Wang, New Orleans, LA, August 14-18, 1989, 405-410.
- Hanes, D. M., "The intermittent suspension of sand due to shoaling waves", in Sand Transport in Rivers, Estuaries, and the Sea, R. Soulsby and R. Bettess, Eds, 1991, p. 125-130.
- Dompe, P.E., D.M. Hanes, T. Khangaonkar, and J. Anton, "Fluctuations in Turbidity and Waves at Hollywood, Florida", *Proceedings of the National Conference on Beach Preservation Technology*, FSBPA, Charleston, SC, 27 Feb-1 Mar, 1991, 384-399.
- Hanes, D.M., Qualitative features of granular flow down an inclined chute, *Proceedings of the NSF-DOE Workshop on Flow of Particulates and Fluids*, Gaithersburg, MD, 17-18 Sept., 1992.

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- Hanes, D.M., Y.S. Chang, C.D. Jette, E.D. Thosteson, and C.E. Vincent, "Field observations of small scale suspended sedimentation processes," *26th International Conf. on Coastal Engineering*, ASCE, Copenhagen, Denmark, June 22-26, 1998.
- Hanes, D.M. & Thosteson, E.D. Field Observations of Nearshore Bedforms and Suspended Sediment (in Russian), in The Shores of Seas, Natural, and Man-Made Lakes , A. Khabidov, A. Zhindarev, D.M. Hanes, et al., Co-editors, Siberian Branch of the Russian Academy of Sciences Publishers, Novosibirsk, 271 p. (in Russian) , 1999, pp. 172-182 .
- Marusin, K.V. and Hanes, D.M. Suspended Sediment Concentration and Grain Size Measurement in the Field by Acoustic Sensors (in Russian), in The Shores of Seas, Natural, and Man-Made Lakes , A. Khabidov, A. Zhindarev, D.M. Hanes, et al., Co-editors, Siberian Branch of the Russian Academy of Sciences Publishers, Novosibirsk, 271 p. (in Russian) , 1999, pp. 214-225.



Van der Meer, F., Hulscher, S. J. M. H., and Hanes, D. M., Non-linear modelling of offshore sand waves near San Francisco. In: 31<sup>st</sup> International Conference on Coastal Engineering, Hamburg, Germany, 2008.

List, J.H., Benedet, L., Hanes, D.M., Ruggiero, P., Understanding differences between Delft3D and empirical predictions of alongshore sediment transport gradients, Proceedings, 31th International Conference on Coastal Engineering, Hamburg, Germany, Coastal Eng. Found., Paper No. 260, 2008.

Orlando, A.D., Hanes D.M., and Shen H.H., Scaling Effects in Direct Shear Tests, Powders and Grains, Denver,

- Hanes, D. M., "A 3-Mhz acoustic concentration meter that measures suspended sand", 114<sup>th</sup> Meeting of the Acoustical Society of America, *The Journal of the Acoustical Society of America*, Supplement 1, Vol. 82, Fall, 1987, p. S124.
- Hanes, D. M., and E. A. Gonzales, "Time averaged acoustic measurements of suspended sand concentration and their comparison with existing models", Joint Oceanographic Assembly, Acapulco, Mexico, 23-31 August, 1988.
- Hanes, D. M., and B. E. Jaffe, "Cross-shore sediment transport on a Gulf Coast barrier island shoreface", *Transactions, A. G. U.*, Vol. 69, No. 44, 1988, p 1238.
- Pescio, L., and D. M. Hanes, "Event analysis of local suspended sand concentration measurements", *Transactions, A. G. U.*, Vol. 69, No. 44, 1988, p 1250.
- Hanes, D. M., "Further considerations of annular shear experiments", 3rd Joint ASME/ASCE Mechanics Conference, La Jolla, California, 9-12 July, 1989.
- Hanes, D. M., "The depth of collisional interactions in a granular half-space subjected to gravity and surface traction", Symposium on Geophysical Grain Flows, La Jolla, CA, 13-15 July, 1989.
- Hanes, D. M., "The coupling of sediment concentration with fluid velocity: flux or foolishness?", *Transactions, American Geophysical Union*, v. 70, no. 43, p 1128, 1989.
- Tyagi, S., and D. M. Hanes, "The near bed fluid and fine sediment response to a storm in 7 meters depth off a Louisiana barrier island coast", *Transactions, American Geophysical Union*, v. 70, no. 43, p. 1128, 1989.
- Hanes, D. M., "The thickness of a collisional, granular, shear flow in a half-space with gravity", IUTAM Symposium on Mechanics of Fluidized Beds, 1-4 July, 1991.
- Hanes, D. M., J.E. Dick, and M.R. Erdman, "The relationship between sediment entrainment phase and cross-









Fall Meeting Supplement, San Francisco, Calif., 13-17 December 2004, vol. 85, no. 47, Abstract #OS21B-1225.

Nelson, T., Voulgaris, Hanes, D.M., and Warner, J.C., 2004, Spatial and temporal variability of wave ripple wavelengths in the inner shelf. EOS, Transactions, American Geophysical Union, Fall Meeting Supplement, San Francisco, Calif., 13-17 December 2004, vol. 85, no. 47, Abstract #OS21B-1232.

Shen, H.H., D.M. Hanes, and J.T. Jenkins, (2005) "Testing computer simulation of granular flows using annular shear cell experiments", NASA Workshop on Granular Materials in Lunar and Martian Exploration, Orlando, FL, Feb. 2-3, 2005.

Barnard, P.L. and Hanes, D.M., October 2005. Integrating engineering, geology, and nearshore processes: utilizing high resolution survey techniques and numerical modeling to support evolving dredge disposal practices, Ocean Beach, San Francisco, California. American Shore & Beach Preservation Association. San Francisco, CA.

Barnard, P.L. and Hanes, D.M., Integrating field research, modeling and remote sensing to quantify morphodynamics in a high-energy coastal setting, Ocean Beach, San Francisco, California. Coastal Dynamics Conference, Barcelona, Spain, 2005.

Barnard, P.L. and Hanes, D.M. Bedform Morphology Under Significant Wave-Tidal Current Interaction at the Mouth of a Major Tidal Inlet, San Francisco, California. American Geophysical Union Conference. San Francisco, CA. Poster presentation, 2005.

Hsu, T-J, Raubenheimer, B., Trowbridge, J. H., Cox, D., and Hanes, D. M., Modeling surf zone hydrodynamics and sediment transport toward an integrated approach. Eos Trans. AGU, 87 (52) Fall Meet. Suppl., Abstract OS41C-

- Shi, F., Kirby, J. T., and Hanes, D. M., Modeling of an Erosional Hot Spot at Ocean Beach, CA, ROMS workshop, Los Angeles, Oct. 2007.
- Hanes, D.M., Barnard, P.L., Kvitek, R.G. and Iampietro, P.J., Giant sand waves at the mouth of San Francisco Bay. State of the Estuary Conference, Oakland, CA, October 16-18 (POSTER PRESENTATION), 2007.
- Barnard, P.L., Hanes, D.M., Erikson, L.H., Elias, E., Rubin, D.M., Dartnell, P., and Kvitek, R.G., Sediment transport patterns in the San Francisco Bay Coastal System based on bedform morphology and numerical modeling. State of the Estuary Conference, Oakland, CA, October 16-18 (POSTER PRESENTATION), 2007.
- Erikson, L.H., Elias, E., Shi, F., Barnard, P.L. and Hanes, D.M., Numerical modeling of the Golden Gate and Ocean Beach. State of the Estuary Conference, Oakland, CA, October 16-18 (POSTER PRESENTATION), 2007
- Erikson, L.H., Eshleman, J.L., Barnard, P.L. and Hanes, D.M., Physical process measurements near the mouth of San Francisco Bay. State of the Estuary Conference, Oakland, CA, October 16-18 (POSTER PRESENTATION), 2007.
- Eshleman, J.L., Shi, F., Erikson, L.H., Elias, E., Barnard, P.L. and Hanes, D.M., Wave conditions and focusing patterns seaward of the Golden Gate and at adjacent Ocean Beach. State of the Estuary Conference, Oakland, CA, October 16-18 (POSTER PRESENTATION), 2007
- Eshleman, J.L., Barnard, P.L., Erikson, L.H., and Hanes, D.M., 2007. Coupling alongshore variations in wave energy to beach morphologic change using the SWAN wave model at Ocean Beach, San Francisco, CA [abs.]: International Workshop on Wave Hindcasting and Forecasting, 10th, Oahu, Hawaii, November 11-16 (ORAL PRESENTATION), 2007.
- Erikson, L.H., Barnard, P.L., Elias, E., Hanes, D.M. and Mull, P., Coastal morphodynamic response of a shallow sediment mound forced by strong tidal currents and large waves. Eos Transactions AGU, Volume 88, Number 52, Fall Meeting Supplement, Abstract H41B-0510 (POSTER PRESENTATION), 2007.
- Hanes, D.M., Erikson, L.H., and Traykovski, P., Sand Ripples and Surficial Grain Size on the Florida Continental Shelf Following 2004 Hurricane Ivan, Eos Transactions AGU, Volume 88, Number 52, Fall Meeting Supplement, 2007.
- Barnard, P.L. and Hanes, D.M., The performance of dredge disposal off Ocean Beach, San Francisco, California. Dredged Material Management Office (DMMO) Meeting, United States Army Corps of Engineers, Oakland, CA (ORAL PRESENTATION, INVITED), 2008.
- Barnard, P.L., Hanes, D.M., Erikson, L.H., Rubin, D., Determining sediment transport pathways in the San



- Hanes, D.M., The Significance of Ultra-Refracted Ocean Waves to Sediment Dynamics and Water Quality in Sheltered Areas, With Application to Crissy Field Marsh, San Francisco Abstract 1802792, EOS Transactions, American Geophysical Union Fall Meeting, San Francisco, CA, 2013.
- Andes, L., F. Wu, J. Lo, M. MacWilliams, C. Lu, R. Dean, and D.M. Hanes, Estimating the Response and Uncertainty Limits of Physical Processes in the South San Francisco Bay for Extreme Water Elevation Frequency Analysis, Abstract 1807554, EOS Transactions, American Geophysical Union Fall Meeting, San Francisco, CA, 2013.
- Hanes, D.M., Field observations of pattern formation and evolution of marine sandwaves, European Geophysical Research Abstracts, Vol. 16, EGU2014-3095, 2014.
- Andes, L., Wu, F., Lo, J-M., MacWilliams, M., Lu, C-C., Dean, R., and D.M. Hanes, South San Francisco Bay shoreline study-A case study in estimating extreme water surface elevation, International Workshop on the Application of Fluid Mechanics to Disaster Reduction, Sendai, Japan, 22-24 February, 2014.
- Hanes, D.M., The confounding effects of particle characteristics on acoustic backscatter measuring techniques, Particles in Europe, Keynote Speaker, Esbjerg, Denmark, October, 2104.
- Andes, L.C. and D.M. Hanes, Flood Risk and Warning Time in Communities Near River Confluences, Mississippi River Education Symposium, National Great Rivers Center, Alton, IL, 14 November 2014.
- Healy, K.M., A.L. Cox, D.M. Hanes, and L.G. Chambers, State of the Practice of Sediment Management in Reservoirs, Minimizing Sedimentation and Removing Deposits, 3<sup>rd</sup> Joint Federal Interagency Conference on Sedimentation and Hydrologic Modeling (SEDHYD), Reno, NV. 2015.
- Hanes, D.M., and Y.C. Agrawal, On Acoustic Measurement of Sediments in a River, International Coastal Symposium, Sydney, Australia, 2016.
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