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**Colorado State University**  
**Department of Civil and Environmental Engineering**  
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**EDUCATION**

- 1999 Ph.D. in Civil and Environmental Engineering, Colorado State University  
1995 M.S. in Civil and Environmental Engineering, Colorado State University  
1993 B.S. in Civil and Environmental Engineering, Colorado State University
- 1999 Professional Engineer License, Colorado (PE 33400)

**ACADEMIC POSITIONS**

- 2006- present Associate Professor, Civil and Environmental Engineering, Colorado State University, Fort Collins, CO  
2004- present Director, Engineering Research Center, Colorado State University, Fort Collins, CO  
1999-2006 Research Scientist, Civil and Environmental Engineering, Colorado State University, Fort Collins, CO  
1995-1999 Research Assistant, Civil and Environmental Engineering, Colorado State University, Fort Collins, CO

**HONORS AND AWARDS**

- 2013 Borland Professor Chair in Hydraulics  
2013 Faculty Research Award, awarded by the Civil and Environmental Engineering Department  
2012 Dr., Thornton was awarded a \$1.9 million dollar award by the U.S. Army Corps of Engineers to construct two commercial grade greenhouses, establish vegetation native to the Jacksonville area and conduct full-scale overwash testing essential to providing appropriate levels of confidence for future dam designs.  
2009 Dr. Thornton (CSU Team Leader) was awarded \$1.7 million by the U.S. Army Corps of Engineers to work with a world-renowned group of experts to generate guidelines and methodologies for designing levee overtopping protection for not only the New Orleans area damaged by Hurricane Katrina, but for virtually all levee systems.  
2007 Department Research Award, awarded by the Civil and Environmental Engineering Department  
2006 Research Faculty Award for Excellence, awarded by the Civil Engineering Department

**PUBLISHED WORKS**

Refereed Journal Articles:

**PUBLISHED:**

1. Cox, A., Saadat, S., MacKenzie, K., and Thornton, C. (2014). "Effect of Urban Debris on Hydraulic Efficiency of an Elliptical Sharp-Crested Weir." *ASCE Journal of Irrigation and Drainage Engineering.*, 10.1061/(ASCE)IR.1943-4774.0000837 , 06014006. October 2014.
2. Cox, A.L., E.G. Kullberg, K.A. MacKenzie, C.I. Thornton, (2014). "Stage-discharge Rating Equation for an Elliptical Sharp-crested Weir." *ASCE Journal of Irrigation and Drainage Engineering*, DOI: 10.1061/(ASCE)IR.1943-4774.0000730. June 2014.

3. Cox, A.L. and C.I. Thornton, (2014) “Articulated Concrete Block Stability Analysis for Embankment-Overtopping Conditions” *ASCE Journal of Hydraulic Engineering*, DOI: 10.1061/(ASCE)HY.1943-7900.0000844. May 2014.
4. Thornton, C.I., S.R. Abt, B.N. Scholl and T.R. Bender, (2013). “Enhancing Stone Size for Overtopping Flow.” *ASCE Journal of Hydraulic Engineering*, DOI: 10.1061/(ASCE)HY.1943-7900.0000830. October 2013.
5. Abt, Steven R., C.I. Thornton, B.N. Scholl and T.R. Bender. “Evaluation of Overtopping RipRap Design Relationships.” *Journal of the American Water Resources Association*, 49(4):923–937; DOI: 10.1111/jawr.12074. June 2013
6. Cox, A.L., C.I. Thornton and S.R. Abt., (2013). “Supercritical Flow Measurement Using Large Parshall Flumes.” *ASCE Journal of Irrigation and Drainage Engineering*. DOI: 10.1061(ASCE)IR.1943-4774.0000605. August 2013
7. Scholl, B.N., G.A. Holt, C.I. Thornton, and Sara Duke “Hydromulch Blends Using Agricultural Byproducts: Performance Implications of Cotton Quantity.” *Journal of Cotton Science*, Vol. 17:302–308. 2013
8. Comport, B.C., and C.I. Thornton, (2012). “Hydraulic Efficiency of Grate and Curb Inlets for Urban Storm Drainage.” *ASCE Journal of Hydraulic Engineering*, Vol. 138, No. 10, pp. 878-884, October.
9. Scholl, B.N., G.A. Holt, and C.I. Thornton. (2012). “Screening Study of Cotton-Based Hydromulch Blends.” *Journal of Cotton Science*, Vol. 16, pp. 249-254.
10. Scurlock, S.M., C.I. Thornton, and S.R. Abt, (2012). “Equilibrium Scour Downstream of Three-dimensional Grade-control Structures.” *ASCE Journal of Hydraulic Engineering*, 138(2), pp 167-176.
11. Thornton, C.I., M.W. Pierce., and S. R. Abt, (2011). “Enhanced Predictions for Peak Outflow from Breached Embankment Dams.” *ASCE Journal of Hydrologic Engineering*, Vol. 16, No. 1, pp. 81-88.
12. Thornton, C.I., A.M. Meneghetti, K. Collins, S.R. Abt, and S.M. Scurlock, (2011). “Stage-Discharge Relationships for U-, A- and W- Weirs in Un-submerged Flow Conditions.” *Journal of the American Water Resources Association*, Vol. 47(1), pp. 169-178, February.
13. Pierce, M.W., C.I. Thornton, and S.R. Abt, (2010) “Predicting Peak Outflow from Breached Embankment Dams.” *Journal of Hydrologic Engineering*, ASCE, Vol. 15 (5), pp. 338-349, May.
14. Kinzli, K.-D., and C.I. Thornton, (2009). “Predicting Velocity in Bendway Weir Eddy Fields.” *River Research and Applications*, DOI: 10.1002/rra.1289, published online: June 21, 2009.
15. Thornton, C.I., B. Smith, S.R. Abt, and M.D. Robeson, (2009). “Supercritical Flow Measurement Using a Small Parshall Flume.” *ASCE Journal of Irrigation and Drainage Engineering*, Vol. 135, No. 5, pp. 683-692.
16. Abt, S.R., C.I. Thornton, H. Gallegos, and C. Ullmann, (2008). “Round-shaped Riprap Stabilization in Overtopping Flow.” *ASCE Journal of Hydraulic Engineering*, Vol. 134, No. 8, pp. 1035-1041.
17. Thornton, C.I., and S.R. Abt, (2008). “Gully Intrusion Into Reclaimed Slopes: A Long-term Time Averaged Calculation Procedure.” *ASCE Journal of Energy Engineering*, Vol. 134, No. 1, pp. 15-23, March.

18. Abt, S.R., J.R. Leech, C.I. Thornton., and C.M. Lipscomb, (2001). “Articulated Concrete Block Stability Testing.” *Journal of the American Water Resources Association*, Vol. 37, No.1, pp. 27-34, February.
19. Thornton, C.I., S.R. Abt, C.E. Morris, and J.C. Fischenich, (2000). “Calculating Shear Stress at Channel-Overbank Interfaces in Straight Channels with Vegetated Floodplains.” *Journal of Hydraulic Engineering*, Vol. 126, No.12, pp. 929-936, December.
20. Leech, J.R., S.R. Abt, C.I. Thornton, and P.G. Combs, (1999). “Developing Confidence in Concrete Revetment Products for Bank Stabilization.” *Journal of the American Water Resources Association*, Vol. 35, No. 4, pp. 877-885, August.
21. Thornton, C.I., S.R. Abt, and W.P. Clary, (1997). “Vegetation Influence on Small Stream Siltation.” *Journal of the American Water Resources Association*, Vol. 33, No. 6, December.
22. Abt, S.R., T.L.Johnson, C.I. Thornton., and S.C. Trabant, (1998). “Riprap Sizing at the Toe of Embankment Slopes.” *Journal of Hydraulic Engineering*, ASCE, Vol. 124, No. 7, pp. 672-677, July.
23. Clary, W.P., C.I. Thornton, and S.R. Abt, (1996). “Riparian Forage Stubble Height and Recovery of Degraded Stream banks.” *Rangelands*, Vol. 18, No. 4, pp. 137-140, August.
24. Abt, S.R., C.I Thornton, and T. L. Johnson, (1995). “Estimating Drainage Area on Steep Uniform Slopes.” *AWRA Water Resources Bulletin*, Vol. 31, No. 1, pp. 53-58, February.
25. Abt, S.R., W.P. Clary, and C.I. Thornton, (1994). “Sediment Deposition and Entrapment in Vegetated Streambeds.” *ASCE Journal of Irrigation and Drainage Engineering*, Vol. 120, No. 6, pp. 1098-1111, November/December.

#### ACCEPTED/IN PRESS:

26. Scurlock, S. Michael, C.I. Thornton, D.C. Baird, S.R. Abt, (Accepted, Awaiting Publication, Expected November 2014). “Quantification of Transverse In-stream Structure Hydraulics” Submitted to the *ASCE Journal of Hydraulic Engineering*, April 2014.
27. Scurlock, S. Michael, C.I. Thornton, S.R. Abt, (Accepted, Awaiting Publication, Expected November 2014). “One-dimensional Modeling Techniques for Three-dimensional Grade-control Structures.” Submitted to the *ASCE Journal of Hydraulic Engineering*, August 2014.

#### IN REVIEW:

28. Cox, A.L., C.I. Thornton, and Z.H. Taylor, (In Review). “Method for Analyzing Cross-vane Hydraulics using Roughness with 1D Numerical Modeling.” Submitted to the *ASCE Journal of Hydraulic Engineering*, August 2013.

#### Non-Refereed Journal Articles:

1. Scholl, B.N., C.I. Thornton, and B. King, (2010). “Articulated Concrete Block Design.” *CE News*, Professional Development Series, August, 8 pp.

2. Scholl, B.N., C.I. Thornton, and B. King, (2009). "Overtopping Flow Protection." *CE News*, Professional Development Series, August, 8 pp.
3. Scholl, B.N. and C.I. Thornton, (2008). "Scour in Bottomless Culverts." *CE News*, Professional Development Series, December, 8 pp.

Other (e.g. lab texts, book reviews, technical reports, in-house reports):

1. Scurlock, S.M., Thornton, C.I., and Abt, S.R. (2013- in review). "Middle Rio Grande Physical Modeling: Evaluation of bendway-weir structures within the native-topography channel." Colorado State University. Dept. of Civil and Environmental Engineering. Fort Collins, CO. Prepared for the U.S. Bureau of Reclamation.
2. Scurlock, S.M., Thornton, C.I., and Abt, S.R. (2013- in review). "Middle Rio Grande Physical Modeling: Reevaluation and comparisons of instream structures within the native-topography channel." Colorado State University. Dept. of Civil and Environmental Engineering. Fort Collins, CO. Prepared for the U.S. Bureau of Reclamation.
3. Scholl, B.N., and C.I. Thornton (2013). "Soil Anchor Pull-Out Strength." Letter report submitted to Landmark Earth Solutions, Inc., Kennesaw, GA, July, 23 pp.
4. Hughes, S. A., Thornton, C. I., Scholl, B. N., and Youngblood, N. (2013). "Full-Scale Wave Overtopping Tests of the HydroTurf™ System for Levee Landward-Side Slope Protection and Stability," Contract Report, Engineering Research Center, Colorado State University.
5. Scurlock, S.M., C.I. Thornton., S.R. Abt., and A.L. Cox, (2012). "Middle Rio Grande physical modeling - Transverse instream structure analysis: Maximum and average velocity ratios within the prismatic channel." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.
6. Hughes, S.A., Thornton, C.I., Scholl, B.N., Turner, M.D., and Youngblood, N.A. (2012) "Bonner Bridge Pier Scour Physical Modeling Test Program." Report submitted to Ocean Engineering Associates, Inc., Gainesville, FL, March, 235 pp.
7. Hughes, S.A., Thornton, C.I., and Scholl, B.N. (2012) "Full-Scale Wave Overtopping Test of Dormant Bermuda Grass with Open Weave Turf Reinforcement Mattress." Report submitted to U.S. Army Corps of Engineers, New Orleans District, Task Force Hope, New Orleans, LA, August, 33 pp.
8. Thornton, C.I., Abt, S.R., Clopper, C. Scholl, B.N. and Cox, A.L. (2012) "Rock Stability Testing in Overtopping Flow- 2012". Hydraulics Laboratory Technical Report No. 2012-1, Engineering Research Center, Colorado State University, Fort Collins, CO., April, 15 pp.
9. Abt, S.R., Thornton, C.I., Scholl, B.N. and Bender T.R. (2012) "Evaluation of Overtopping Riprap Design Relationships." Hydraulics Laboratory Technical Report No. 2012-2, Engineering Research Center, Colorado State University, Fort Collins, CO., May, 29 pp.
10. Scurlock, S.M., C.I. Thornton., S.R. Abt, A.H. Cobb, and A.L. Cox, (2012). "Middle Rio Grande physical modeling - Shear stress distributions within the prismatic and native-topography channels." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.

11. Thornton, C.I., Hughes, S.A., Scholl, B.N., and Youngblood, N.A. (2012). "Full-Sale Wave Overtopping Tests of the Hydro Turf System for Levee Landward –Side Slope Protection and Stability." Report submitted to Watershed Geosynthetics, LLC., Alpharetta, GA, December, 78 pp.
12. Thornton, C.I., Hughes, S.A., Scholl, B.N., and Youngblood, N.A. (2012) "Full-Scale Wave Overtopping Tests of Propex Turf Reinforcement Mats for Levee Landward-Side Slope Stability." Report submitted to Geotextile Systems by Propex, Chattanooga, TN, November, 89 pp.
13. Scurlock, S.M., A.L. Cox, C.I. Thornton, and S.R. Abt, (2012). "Middle Rio Grande physical modeling - Transverse instream structure analysis: Maximum outer-bank velocity reduction within the prismatic channel." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.
14. Thornton, C.I., Scholl, B.N., Youngblood, N.A., and Beeby, J.C. (2012) "Hydraulic Testing and Data report for TerraGuard." Report submitted to Erosion Abatement, Inc. Sugar Land, TX, November, 73 pp.
15. Scurlock, S.M., A.L. Cox, C.I. Thornton, T.R. Parker, and S.R. Abt, (2012) "Middle Rio Grande Physical Modeling - Native topography: Construction and evaluation of baseline hydraulic conditions." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.
16. Scurlock, S.M. (2012) "Bendway weir test program- status update" Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.
17. Scurlock, S.M., C.I. Thornton, A.L. Cox, and S.R. Abt, (2012) "Middle Rio Grande Physical Modeling - Native topography dataset evaluation summary." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.
18. Thornton, C.I., Cox, A.L., Ursic, M.E., and Youngblood, N.A. (2011) "Data Report for Completed Bendway Weir Configurations within the Native Topography Model." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM.
19. Turner, M.D., A.L. Cox, and C.I. Thornton (2011). "Drivable Grass- Report for Hydraulic Performance Testing." Draft report submitted to Soil Retention Systems, Inc., Carlsbad, CA, March, 62 pp.
20. Turner, M.D., A.L. Cox, and C.I. Thornton (2011). "Hydraulic Testing and Data Report for BD-400 OC Articulated Concrete Block." Draft report submitted to Shoretec in care of Premier Concrete Products, Inc., April.
21. Cox, A.L., C.I. Thornton, M.D. Turner, and B.K. Sollenberger, (2011) "Performance Testing of S32BD in Unvegetated Conditions." Report submitted to Erosion Control Blanket, Inc., Riverton, Manitoba, Canada, April, 160 pp.
22. Turner, M.D., C.I. Thornton, and A.L. Cox (2011). "ScourStop Transition Mat Culvert Outfall Design Guidance." Draft report submitted to Leggett & Platt, Inc., Carthage, MO, April, 54 pp.
23. Thornton, C.I., B.N. Scholl, and M.D. Turner, (2011). "Hydraulic Performance Testing and Data Report for Soil Cement." Report submitted to RJH Consultants, Inc., Englewood, CO, February, 115 pp.
24. Thornton, C.I. B.N. Scholl., and S.R. Abt, (2011). "Wave Overtopping Simulator Testing of Proposed Levee Armoring Materials." Report submitted to United States Army Corps of Engineers, New Orleans District, June, 302 pp.

25. Thornton, C.I. B.N. Scholl, and M.D Turner, (2010). “Unvegetated Invert testing of Two Rolled Erosion Control Products.” Report submitted to Propex, Inc., Chattanooga, TN, November, 31 pp.
26. Cox, A.L., C.I. Thornton, and M.D. Turner, (2011) “Hydraulic Testing and Data Report for Channel Flex – PBD Series Class 475.” Report submitted to Erosion Prevention Products, Houston, TX, July, 38 pp.
27. Cox, A.L., C.I. Thornton, and M.D. Turner (2011). “Hydraulic Testing and Data Report for Ultralok 4030” Draft report submitted to Submar, Inc., January
28. Sclafani, P., C.I. Thornton, A.L. Cox, and S.R .Abt, (2011). “Methodology for Predicting Maximum Velocity and Shear Stress in a Sinuous Channel with Bendway Weirs using 1-D HEC-RAS Modeling Results.” Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM, July, 366 pp.
29. Ursic, M.E., C.I. Thornton, A.L. Cox, and S.R. Abt, (2011). “Quantification of Shear Stress in a Meandering Native Topographic Channel using a Physical Hydraulic Model.” Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM, July, 154 pp.
30. Cox, A.L., J.L. Woidt, and C.I. Thornton, (2011). “M&T Pump Station Intake Second Physical Model Report.” Report submitted to Tetra Tech, Inc., Fort Collins, CO, April, 254 pp.
31. Turner, M.D., A.L. Cox, and C.I Thornton, (2011). “Hydraulic Testing Report for SD-475 OCT Articulating Concrete Block.” Report submitted to Shoretec, L.L.C. in care of Premier Concrete Products, Inc., Baton Rouge, LA, June, 97 pp.
32. Pluemer, T.M., A.L. Cox, C. I. Thornton., and M.D. Turner, (2011). “Hydraulic Jump Testing Report for SD-475 OCT Articulating Concrete Block.” Report submitted to Shoretec, L.L.C. in care of Premier Concrete Products, Inc., Baton Rouge, LA, June, 43 pp.
33. Thornton, C.I., A.L. Cox, M.E. Ursic., and N.A.Youngblood, (2011). “Data Report for Completed Bendway Weir Configurations within the Native Topography Model.” Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM, July, 81 pp.
34. Thornton, C.I., B.N. Scholl, and M.D. Turner, (2010). “Hydraulic Performance Testing and Data Report for Soil Cement.” Draft report submitted to RJH Consultants, Inc., Englewood, CO, December, 104 pp.
35. Thornton, C.I., B.N. Scholl, and S.R. Abt, (2010). “Wave Overtopping Simulator Testing of Proposed Levee Erosion Protection Methods.” Draft report submitted to the U.S. Army Corps of Engineers, New Orleans District, New Orleans, LA, December, 68 pp.
36. Cox, A.L., C.I. Thornton, and T.M. Pluemer, (2010). “Hydraulic Testing and Analysis Report for Western Excelsior Corporation PP5 – Xtreme with Kentucky Bluegrass 2010 Hydraulic Testing.” Report submitted to Western Excelsior Corporation, Evansville, IN, November, 49 pp.
37. Thornton, C.I., B.N. Scholl, and M.D. Turner, (2010). “Unvegetated Invert Testing of Two Rolled Erosion Control Products.” Draft report submitted to Propex Inc., Chattanooga, TN, October, 28 pp.
38. Scurlock, S.M., A.L. Cox, D.C. Baird, and C.I. Thornton, (2010). “Bendway Weir Analysis: Outer Bank Maximum Velocity Ratio for Type I and Type III Channel Bends.” Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM, October, 18 pp.

39. Cox, A.L., C.I. Thornton, and B.K. Sollenberger, (2010). "Performance Testing of S32BD in Unvegetated Conditions." Report submitted to Erosion Control Blanket, Inc., Riverton, Manitoba, Canada, September, 71 pp.
40. Cox, A.L., C.I. Thornton, and B.K. Sollenberger, (2010). "Hydraulic Testing Report for Shoreloc<sup>®</sup> Articulating Concrete Block." Report submitted to Shoretec, L.L.C. in care of Premier Concrete Products, Inc., Baton Rouge, LA, July, 66 pp.
41. Comport, B.C., A. L .Cox, and C.I. Thornton, (2010). "Performance Assessment of Grate Inlets for Highway Median Drainage." Report submitted to the Urban Drainage and Flood Control District, Denver, CO, July, 65 pp.
42. Cox, A.L., C.I. Thornton, and M.D. Turner, (2010). "Performance Testing of P32 in Unvegetated Conditions." Report submitted to Erosion Control Blanket, Inc., Riverton, Manitoba, Canada, June, 86 pp.
43. Thornton, C.I., A.L. Cox, and M.D. Turner, (2010). "Hydraulic Testing Report for Maccaferri Gabion Mattress." Draft report submitted to Maccaferri, Inc., Williamsport, MD, April, 25 pp.
44. Cox, A.L., C.I. Thornton, and M.D. Turner, (2010). "Performance Testing of P42 in Unvegetated Conditions." Report submitted to Erosion Control Blanket, Inc., Riverton, Manitoba, Canada, January, 91 pp.
45. Thornton, C.I., A.L. Cox, B.N. Scholl, and B.J. Meunier, (2009). "Hydraulic Testing and Analysis Report 2009 for Erosion Control Blanket, P-32 with Heritage Blend." Report submitted to Erosion Control Blanket, Inc., Riverton, Manitoba, Canada, December, 54 pp.
46. Thornton, C.I., A.L. Cox, B.N. Scholl, and B.J. Meunier, (2009). "Hydraulic Testing and Analysis Report 2009 for Erosion Control Blanket, P-42 with Heritage Blend." Report submitted to Erosion Control Blanket, Riverton, Manitoba, Canada, December, 66 pp.
47. Thornton, C.I., A.L.Cox, B.N. Scholl, and B.J. Meunier, (2009). "Hydraulic Testing and Analysis Report 2009 for Western Excelsior Corporation, PP5 – Xtreme with Kentucky Bluegrass." Report submitted to Western Excelsior Corporation, Evansville, IN, December, 23 pp.
48. Thornton, C.I., A.L. Cox, B.N.Scholl, and B.J. Meunier, (2009). "Hydraulic Testing for M4540T Articulating Concrete Block." Report submitted to Submar, Inc., Houma, LA, December, 66 pp.
49. Comport, B.C., C.I. Thornton, and A.L. Cox, (2009). "Hydraulic Efficiency of Grate and Curb Inlets for Urban Storm Drainage." Report submitted to the Urban Drainage and Flood Control District, Denver, CO, December, 134 pp.
50. Thornton, C.I., and M.D. Turner, (2009). "Hydraulic Testing Report for Twelve-inch Triton Marine Mattresses." Report submitted to Tensar International Corporation, Atlanta, GA, November, 51 pp.
51. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "GreenArmor<sup>®</sup> 7020 with Bermuda Grass Hydraulic Testing and Data Report." Report submitted to Profile Products, LLC, Buffalo Grove, IL, November, 27 pp.
52. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Hydraulic Testing and Data Report 2009 for Profile Products, LLC, GreenArmor<sup>®</sup> 7020 with Kentucky Bluegrass." Report submitted to Profile Products, LLC, Buffalo Grove, IL, October, 33 pp.

53. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Hydraulic Testing and Data Report for Channel Lock II Erosion Prevention Products." Report submitted to Erosion Prevention Products, Houston, TX, July, 41 pp.
54. Thornton, C.I., A.L. Cox, M.E. Ursic, and N.A. Youngblood, (2009). "Data Report for Completed Bendway Weir Configurations within the Native Topography Model." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM, July, 81 pp.
55. Thornton, C.I., and M.D. Turner, (2009). "Hydraulic Testing Report for Maccaferri Gabion Mattress." Report submitted to Maccaferri, Inc., Williamsport, MD, June, 20 pp.
56. Renholds, J.F., and C.I. Thornton, (2009). "Performance Testing of Geoweb<sup>®</sup> with Aggregate Fill." Report submitted to Presto Products Geosystems<sup>®</sup>, Inc., Appleton, WI, April, 84 pp.
57. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Hydraulic Testing and Data Report 2009 for Propex International, Pyramat with Kentucky Bluegrass." Report submitted to Propex International, Chattanooga, TN, March, 27 pp.
58. Scholl, B.N., C.I. Thornton, and A.L. Cox, (2009). "Hydraulic Performance of Sediment Retention Fiber Rolls." Report submitted to the Erosion Control Technology Council, St. Paul, MN, March, 46 pp.
59. Scholl, B.N., C.I. Thornton, and A.L. Cox, (2009). "Hydraulic Performance of Sediment Retention Fiber Rolls." Report submitted to Kristar Enterprises, Inc., Santa Rosa, CA, March, 20 pp.
60. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Hydraulic Testing and Data Report for Six-inch Triton Filter Mattress." Report submitted to Tensar International Corporation, Atlanta, GA, February, 69 pp.
61. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Hydraulic Testing and Data Report for Geoweb<sup>®</sup> 30V with Concrete." Report submitted to Presto Products Company, Appleton, WI, January, 82 pp.
62. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Geoweb<sup>®</sup> Cellular Confinement System (all products, 20V, 30V, 40V, and Concrete), Presto Products Geosystems<sup>®</sup>, Performance Testing." A total of five at-a-glance Research Summary Product Cards submitted to Presto Products Company, Appleton, WI, January, 2 pp. each.
63. Thornton, C.I., A.L. Cox, and M.D. Turner, (2009). "Hydraulic Testing and Data Report International Coastal Revetment Products, Coastal Control Block Open Cell, CCB-OC-06." Report submitted to International Coastal Revetment Products, Inc., Baton Rouge, LA, January, 39 pp.
64. Cox, A.L., C.I. Thornton, and J. Beeby, (2009). "Roughness Coefficient Testing for Large-diameter High-density Polyethylene Pipe." Report submitted to Advanced Drainage Systems, Cincinnati, OH, January, 26 pp.
65. Cox, A.L., C.I. Thornton, and J. Beeby, (2009). "Inlet Control Entrance Loss-coefficient Testing for Large-diameter High-density Polyethylene Pipe." Report submitted to Advanced Drainage Systems, Cincinnati, OH, January, 62 pp.
66. Walker, K.G., C.I. Thornton, S. R. Abt, and A.L. Cox, (2009). "Comparison of a Generalized Trapezoidal Hydraulic Model to a Native Topography Patterned Bed Surface Model of the Rio Grande." Report submitted to the U.S. Department of the Interior, Bureau of Reclamation, Albuquerque, NM, January, 156 pp.



67. Pierce, M.W., C. I. Thornton, and S.R. Abt, (2008). "Predicting Peak Outflow from Breached Embankment Dams." Report submitted to the National Dam Safety Review Board Steering Committee on Dam Breach Equations, Washington, DC, November, 44 pp.
68. Cox, A.L., C.I. Thornton, and M.D. Turner, (2008). "Performance Testing of P42 in Unvegetated Conditions." Report submitted to ErosionControlBlanket.com, Inc., St. Andrews, Manitoba, Canada, September, 74 pp.
69. Cox, A.L., C.I. Thornton, and M.D. Turner, (2008). "Norris Screen and Manufacturing, Inc. Coanda Intake Design Project Report 2008." Report submitted to Norris Screen and Manufacturing, Inc., Tazewell, VA, September, 48 pp.
70. Cox, A.L., C.I. Thornton, and S.M. Scurlock, (2008). "M&T Pump Station Intake Physical Model Report." Report submitted to Mussetter Engineering, Inc., Fort Collins, CO, August, 461 pp.
71. Thornton, C.I., A. L. Cox, and Z.K. Sigmond, (2008). "Roughness Testing of Coastal Control Block Open Cell." Report submitted to International Coastal Revetment Products, Inc., Baton Rouge, LA, August, 31 pp.
72. Thornton, C.I., A.L. Cox, and M.D. Turner, (2008). "GreenArmor<sup>®</sup> System Unvegetated Performance Testing for Profile Products, LLC." Report submitted to Profile Products, LLC, Buffalo Grove, IL, May, 116 pp.
73. Cox, A.L., C.I. Thornton, and J.F. Renholds, (2008). "Sutherland Reservoir Physical Modeling Summary Report." Report submitted to Nebraska Public Power District, Norfolk, NE, March, 86 pp.
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185. Abt, S.R., S.C. Trabant, and C.I. Thornton, (1996). "Riprap Sizing at the Toe of Steep Slopes." Report submitted to the U.S. Nuclear Regulatory Commission, Washington, DC., January.

186. Watson, C.C., D. Gessler, S.R. Abt, C.I. Thornton, and P.B. Kozinski, (1996). "Demonstration Erosion Control Monitoring Sites 1995 Evaluation." Report submitted to the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS., January.
187. Trabant, S.C., C.I. Thornton, and S.R. Abt, (1995). "Feasibility Study for a Proportional Flow Diversion Structure." Report submitted to the USDA, Forest Service, Rocky Mountain Station, Fort Collins, CO, pp. 167, November.
188. Thornton, C.I., and S.R. Abt, (1995). "Gully Prediction Program Users Manual." Report submitted to the U.S. Nuclear Regulatory Commission, Washington, DC., October.
189. Abt, S.R., C.I. Thornton, S.A. Hogan, C.J. Pauley, and C.C. Watson, (1995). "Methodologies for Design of Soil Covers: Gully Intrusion Into Reclaimed Slopes." Report submitted to the U.S. Nuclear Regulatory Commission, Washington, DC, Contract No. NRC-01-91-0007, August.
190. Trabant, S. C., C.I. Thornton, and S.R. Abt, (1995). "Proportional Flow Splitting Device Design Program." Report submitted to the U.S. Forest Service, Rocky Mountain Station, Fort Collins, CO, pp. 16, May.
191. Abt, S.R., C.I. Thornton., S.A. Hogan, and G.V. Wilkerson, (1994). "Methodologies for Design of Soil Covers, Interim Report III: Rock Durability Assessment." Report submitted to the U.S. Nuclear Regulatory Commission, Washington DC, Contract No. NRC-02-91-0007, December.
192. Watson, C.C., S.R. Abt, and C.I. Thornton, (1994). "Recommendations for Bioengineering Stabilization of Five Sites on Harland Creek, Mississippi." Report submitted to the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS, pp. 39, November.
193. Thornton, C.I., S.R. Abt, and J.H. Batka, (1994). "Deposition and Entrapment of Sediments in Submerged Stream Vegetation." Report submitted to the USDA Forest Service, Intermountain Research Station, Boise, ID, Contract No. INT-91584-RSVA, pp. 154, October.
194. Abt, S.R., D. Gessler, and C.I. Thornton, (1994). "Auger Creek, White King Mine, Summary: HEC-1 and HEC-2 Analysis." Report submitted to the U.S. Forest Service, Lakeview Ranger District, Lakeview, OR., July.
195. Thornton, C.I., S.R. Abt, and J.H. Batka, (1994). "Sediment Deposition and Retention in Streambed Vegetation." Report submitted to the USDA Forest Service, Rocky Mountain Station, Fort Collins, CO, February.
196. Abt, S.R., S.A. Hogan, C.J. Pauley, C.I. Thornton, and J.P. Burgi, (1993). "Methodologies for Design of Soil Covers, Interim Report II: Gully Intrusion Into Reclaimed Slopes-Field Investigations." Report submitted to the U.S. Nuclear Regulatory Commission, Contract No. NRC-02910007, November.
197. Abt, S.R., C.C. Watson, D.D. Johns, G.B. Hamilton, A.D. Garton, C.B. Florentin, and C.I. Thornton, (1991) "Riprap Sizing Criteria for ARS-type Drop Structures, Final Report." Report submitted to the U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS, Research Contract No. DACW39-90-K-0027, pp. 105, September.

## **CONTRACTS & GRANTS**

### **Externally-Funded Projects as PI**

<b>Years</b>	<b>Title of Proposal</b>	<b>CoPI's (if any)</b>	<b>Agency</b>	<b>Amount</b>
2014	Developing Design Procedures for Debris Culverts	None	Colorado Department of Transportation	\$60,000
2013-2015	Hydraulic Study of Overflow Dikes	None	Flanders Hydraulics Research	\$144,517
2014-2015	High-Head Hydro Turbine CFD Study	None	Obermeyer Hydro, Inc.	\$162,253
2014-2015	Developing Bridge Scour Equations for Colorado Mountain Streams	None	Colorado Department of Transportation	\$79,999
2013-2015	Mount Saint Helens GBS Physical Model Study	None	Alden Research Laboratory, Inc.	\$463,968
2014	Evaluation of Environmentally Sensitive Stream Bank Protection Measures	Bryan Scholl	Ayers Associates	\$129,448
2013-2014	Herbert Hoover Dike Risk Assessment	None	URS Corporation, Inc.	\$32,624
2013	Overtopping Performance Testing	Bryan Scholl	Contech Construction Products, Inc.	\$118,646
2013	Culvert Baffle Testing	None	Contech Construction Products, Inc.	\$108,429
2012-2013	Full Scale Product Evaluation During Wave Overtopping	None	Various "For Profit" Sponsors	\$664,500
2012-2014	Evaluation of Transverse Feature Design Options	Steven Abt, Amanda Cox	DOI- Bureau of Reclamation	\$213,278
2012-2014	Developing Design Procedure for Debris Culverts	None	Colorado Department of Transportation	\$60,000
2012-2014	Evaluation and Performance of HDPE Pipe under CDO Highways, T-REX and Other Locations: CDOT Culvert Research Project	None	Colorado Department of Transportation	\$74,986
2012	Review the Draft Armoring Manual for the Hurricane and Storm Damage Risk Reduction System Levee Armoring Project	None	DOD-ARMY-Corps of Engineers	\$139,079
2011-2014	Full Scale Wave Overtopping Testing	None	DOD-ARMY-Corps of Engineers	\$2,092,795
2011-2012	Bonner Bridge Scour Test Program	Bryan Scholl	OEA, Inc.	\$211,700
2009-2011	Full Scale Wave Overtopping Testing	Steven Abt	DOD-ARMY-Corps of Engineers	\$1,946,991
2009-2010	Soil Cement Performance Testing	Amanda Cox	RJH Consultants, Inc.	\$104,000

2010	Two Phase Research Program	Amanda Cox	Propex, Inc.	\$93,958
2010-2011	Hydraulic Model Study: River Training Works at M&T Pumping Plant, Sacramento River	Amanda Cox	Tetra Tech, Inc.	\$256,000
2009-2010	ACB Test Quotation	Amanda Cox	Submar, Inc.	\$110,950
2009-2011	Proposal for Scaled Testing of ScourStop Transition Mat to Develop a Design Tool	Amanda Cox	Leggett & Platt, Inc.	\$103,806
2009-2010	Assessing the Interstitial Velocity within a Gabion Protection System	None	Maccaferri, Inc.	\$35,261
2009-2011	Hydro-Mulch Research Program	Amanda Cox	Leggett & Platt, Inc.	\$147,669
2009-2011	Phase II (A and B): Development of New Corrosion/Abrasion Guidelines for Culvert Materials	None	Colorado Department of Transportation	\$160,000
2009-2011	Hydraulic Model Study: Type C and D Grate Inlets for Highway Median Storm Drainage	Amanda Cox	Urban Drainage & Flood Control District	\$94,705
2008-2010	Overtopping and Manning Roughness Testing on Articulating Concrete Block System	Amanda Cox	International Costal Revetment Products	\$76,020
2008-2010	Overtopping Tests on Two Articulating Concrete Block Systems	None	Erosion Prevention Products	\$154,995
2008-2009	Vegetated Testing of RECP Products	None	Erosion Control/Blanket.com, Inc.	\$60,742
2008	ADS Roughness Testing	Amanda Cox	ADS- Advanced Drainage Systems, Inc.	\$38,568
2008-2010	Roof Drain Testing	Amanda Cox	Americast, Inc.	\$78,715
2008	Coanda Intake Weir Flow Testing	Amanda Cox	Norris Screen & Manufacturing, Inc.	\$124,502
2008-2009	Hydraulic Testing of Articulating Concrete Block	None	HydroPave	\$49,978

2008-2010	Tensor Overtopping Testing on Marine Mattress Systems	Amanda Cox	Tensor International Corporation, Inc.	\$69,948
2007	Alpha Weir Field Reconnaissance	None	DOI- Bureau of Reclamation	\$12,507
2007-2008	Physical Model Study of the Sutherland Reservoir Outlet Works and Stilling Basin	Amanda Cox	Nebraska Public Power District	\$137,200
2007	The Multi-Function River Design Criteria	None	Korea Institute of Construction Technology	\$30,000
2007-2012	Hydraulic Modeling of Stabilization Techniques	None	USDA-USFS-Rocky Mountain Research Station	\$590,566
2007-2008	Valenciano Dam Spillway	None	Hydrau-Tech, Inc.	\$84,714
2007-2008	Pre-Test and UnVegetated Testing of a Rolled Erosion Control Product (RECP)	None	Greenvision Ambiente S.p.A.	\$55,299
2007-2008	UnVegetated Testing of P42	None	Erosion Control Blanket.com, Inc.	\$99,521
2007	Hydraulic Model Study: River Training Works at M&T Pumping Plant, Sacramento River	None	MEI-Mussetter Engineering, Inc.	\$296,089
2007	Testing of Geoweb with Concrete in Overtopping Flow Conditions	None	Alcoa/Presto Products Company	\$55,660
2007-2008	Vegetated Testing of RECP Products	Michael Robeson	Profile Products, LLC.	\$78,464
2007-2008	UnVegetated Testing of RECP Products	Michael Robeson	Profile Products, LLC.	\$42,892
2006-2008	Improvement of Regression Equations for Analysis of Embankment Dam Breaking	Steven Abt	FEMA- Federal Emergency Management Agency	\$163,513
2006-2008	Articulated Concrete Block Systems Testing	None	Submar, Inc.	\$70,265
2006-2007	Flume Testing for Kootenai River Substrate Enhancement Project	None	MEI-Mussetter Engineering, Inc.	\$108,609

2006-2007	Hydraulic Model Study of Grate and Curb Inlets for Storm Drainage	Michael Robeson	Urban Drainage & Flood Control District	\$187,592
2006-2007	NCHRP Project 24-26: Effects of Debris on Bridge-Pier Scour	None	Ayres Associates	\$180,740
2006-2007	Hydraulic Study of Sloped Rock Structures	None	SNWA-Southern Nevada Water Authority	\$232,911
2005-2006	Hydraulic Model Study, Baglihar Hydropower Development, Sediment Excluding Intake Hydraulic Model	Michael Robeson	PJR Consulting, Inc.	\$67,173
2005-2006	Wedge Block Performance	None	Armortec	\$94,654
2005	Kootenai River Hydraulic Model Study	None	MEI-Mussetter Engineering, Inc.	49,881
2005-2009	Investigation of Alphabet Weirs	None	DOE-Bureau of Reclamation	\$250,000
2005	Yalobusha River Data Collection and Training	None	Cottonwood Research, LLC.	\$111,264
2005-2007	Development of new corrosion/abrasion guidelines for culvert materials	None	Colorado Department of Transportation	\$50,000
2004-2006	Hydraulic Investigation of the American River	None	DOI- Bureau of Reclamation	\$192,121
2004	Flow Depth Measurements for Armortec Erosion Control Solutions	None	Armortec	62,894
2004-2005	Guidelines for Correlation of Test Results from Bench-Scale and Large-Scale Testing of Rolled Erosion Control Products	None	National Academy of Sciences	\$50,000
2004	Horseshoe Bend Model Study	Michael Robeson	Horseshoe Bend Hydroelectric Company	\$139,827
2003-2004	American River Model Study	None	McLaughlin Water Engineering, LTD.	\$360,400

2002-2005	Hydraulic, Hydrologic, Geomorphic, Sediment, & Investigations of the Rio Grande	Steven Abt, Chester Watson	USDA-USFS-Rocky Mountain Research Station	\$343,289
2002-2005	Hydraulic Modeling of Stabilization Techniques	Steven Abt, Chester Watson	USDA-USFS-Rocky Mountain Research Station	\$472,627
2002-2006	Countermeasures to Protect Bridge Piers from Scour	Steven Abt	Ayres Associates	\$260,025
2002-2004	Development of Guidelines & Specifications for Using Culvert Pipe Liners	Steven Abt	DOT-Federal Highway Administration	\$60,525
2001-2002	Calibration of Renee Creek Flume Structure, Yellowstone National Park	Steven Abt	DOI-NPS- National Park Service	\$53,429
2000-2001	Activated Concrete Block Performance Testing	None	Armortec	\$90,000
2000-2001	Investigation of A-Jacks Implementations	Steven Abt, Chester Watson	Armortec	\$152,350
1998-1999	Armortec L-Block Testing	Steven Abt, Chester Watson	Armortec	\$85,700
1998-1999	Armortec L-Block Testing	Steven Abt, Chester Watson	Armortec	\$148,750
1998	Hydraulic Testing of Erosion Controls Materials for Field Application	Steven Abt	Hydrotex Synthetics, Inc.	\$50,255

#### Externally-Funded Projects as Co-PI

Years	Title of Proposal	PI	Agency	Amount
2011-2013	Detention Pond Outlet Structure Model	Amanda Cox	Urban Drainage & Flood Control District	\$79,390
2011	Evaluation of Hydraulic Capabilities of the E-Tube Sediment Retention Device	Amanda Cox	North American Tube Products	\$26,560
2010-2011	Evaluation of a vegetated TRM	Amanda Cox	Profile Products, LLC	\$36,033
2008-2009	Channel Testing Services on Scour Stop Transition Mat	Amanda Cox	Erosion Tech, Inc.	\$35,656
2006-2007	Vegetated Testing of Pyramat	Michael Robeson	Propex Fabric, Inc.	\$44,768

2005-2006	Unvegetated and Vegetated Testing of Composite Geoweb and RECP/TRM System	Michael Robeson	Alcoa/Presto Products Company	\$99,743
2006-2007	Proposal for Adjustable Slope Channel Testing Services on Scour Stop Transition Mat (TM)	Michael Robeson	Erosion Tech, Inc.	\$77,714
2005	Unvegetated Testing on New TRM	Michael Robeson	Synthetic Industries	\$14,750
2007-2008	Unvegetated Testing of P42	Michael Robeson	ErosionControlBlanket.com	\$31,985
2005-2006	Hydraulic Testing Services on Riprap	Michael Robeson	DBA Carpenter Erosion Control	\$23,773
2007-2008	Vegetated Testing of RECP Products	Michael Robeson	ErosionControlBlanket.com	\$60,742
2005-2006	Unvegetated Testing of RECP Products	Michael Robeson	ErosionControlBlanket.com	\$35,674
2006-2007	Vegetated Testing of Landlock 300	Michael Robeson	Propex Fabrics, Inc.	\$35,708
2005	Vegetated Testing of Pyramat X3 and a New TRM	Michael Robeson	Synthetic Industries	\$74,454
2006-2007	Testing of Geoweb with Aggregate	Michael Robeson	Alcoa/Presto Products Company	\$174,972
2006-2009	Secondary Impacts of Corrosion Control on Distribution System and Treatment Plant Equipment	Neill Grigg,	AWWA Research Foundation	\$125,000
2000-2002	Rio Grande Channel Maintenance Mode	Steven Abt,	DOI- Bureau of Reclamation	\$477,899
2000-2001	Mississippi River Dike Field Investigation	Chester Watson	USDA-USFS-Rocky Mountain Research Station	\$78,921

#### **PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES/PROFESSIONAL MEETINGS/WORKSHOPS**

1. Thornton, C. I., Hughes, S. A., Scholl, B. N., and Youngblood, N. (2014). "Estimating Grass Slope Resiliency During Levee Wave Overtopping: Results from Full-Scale Overtopping Simulator Testing," Proceedings of the 34<sup>th</sup> Coastal Engineering Conference, June 15-20, Seoul, South Korea.
2. Thornton, C. I., Hughes, S. A., and Beasley, J. S. (2014). "Full-Scale Wave Overtopping Resiliency of Grass Established on Sandy Soils," Proceedings of the IAHR 3<sup>rd</sup> Europe Congress, International Association for Hydraulic Research, April 14-16, Porto, Portugal.
3. Thornton, C.I. and Hughes, S.A., (2013) "Dynamic Wave Overtopping Tests for Sandy Reservoir Embankments Exposed to Tropical Cyclones." Presented at ICE Breakwaters conference, September 17-20, Edinburgh, Scotland.
4. Hughes, S. A., Thornton, C. I., Scholl, B. N., Youngblood, N., Beasley, J. S., Tucker, R., and Van der Meer, J. W. (2013). "Wave Overtopping Resiliency of Grass and Turf Reinforcement Mats on Sandy Soils," Proceedings of



Coasts, Marine Structures and Breakwaters 2013 Conference, Institution of Civil Engineers, September 17-20, Edinburgh, Scotland.

5. Flikweert, J., Thornton, C. I., Beasley, J. S., Rowlette, R. A., Kluskens, R., and Hughes, S. A. (2013). "Resiliency Against Overtopping – Determining the Need for Armoring on the Levees of New Orleans," Proceedings of Coasts, Marine Structures and Breakwaters 2013 Conference, Institution of Civil Engineers, September 17-20, Edinburgh, Scotland.
6. Thornton, C.I. and Hughes, S.A., (2013) "Resiliency of Grass and Turf Mats During Levee Wave Overtopping." Presented at Coasts and Ports Conference, September 9-13, Manly, Australia.
7. Thornton, C.I. and Hughes, S.A., (2013) "Armoring Lessons Learned from Full-Scale Hydraulic Testing; Whenis Overtopping Protection Needed." Presented at ICOLD Conference, August 16, Seattle, WA.
8. Youngblood, N.A., Thornton, C. I., Hughes, S.A., Scholl, B.N., Beasley, J.S. (2013) "Results of Full Scale Wave Overtopping Simulation on Levee Slopes with Vegetative and Manufactured Protective Cover." Association of State Dam Safety Officials, September 7-12, Providence, RI.
9. Thornton, C.I., (2013) "Modeling in a Hydraulics Lab" FEMA National Dam Safety Seminar, February 19-22, Baltimore, MD.
10. Thornton, C.I., (2013) "Vegetative Cover and Turf Reinforcement Mats" FEMA National Dam Safety Seminar, February 19-22, Baltimore, MD.
11. Hughes, S.A., Scholl, B.N. and Thornton, C.I. (2012) "Wave Overtopping Hydraulic Parameters on Protected-Side Slopes." Presented at the USSD (United States Society on Dams) Dams and Levee Conference, April 24-29, New Orleans, LA.
12. Thornton, C.I., Hughes, S.A., and Scholl, B.N. (2012) "Full Scale Testing of Levee Resiliency During Wave Overtopping." Presented at the ICSE-6 (International Conference on Scour and Erosion), August 27-31, Paris, France.
13. Thornton, C.I., Ursic, M.E., Baird, D., Sin, K., and Abt, S.R. (2012) "Evaluating Boundary Shear Stresses in Natural-Shaped Channel Bendways." Presented at ASCE-EWRI World Environmental & Water Resources Congress, May 20-24, Albuquerque, NM.
14. Scurlock, S.M., Cox, A.L., Thornton, C.I., Baird, D., and Abt, S.R. (2012) "Maximum Velocity Effects from Vane-Dike Installations in Channel Bends." Presented at ASCE-EWRI World Environmental & Water Resources Congress, May 20-24, Albuquerque, NM.
15. Cox, A.L., Thornton, C.I., Woidt, J.L., MacKenzie, K.A. and Mommandi, A. (2012) "Physical Modeling and Evaluation of Hydraulic Efficiencies for Colorado Department of Transportation Type C and D Median Inlets." Presented at STORMCON, August 19-23, Denver, CO.
16. Thornton, C.I., Hughes, S.A., Abt, S.R., and Scholl, B.N. (2012) "Evaluating Earthen Levee Erosion Resistance in the Colorado State University Wave Overtopping Simulator." Presented at the Association of State Dam Safety Officials, September 17, Denver, CO.
17. Scholl, B.N., Thornton, C.I., and Hughes, S.A. (2012) "Full-Scale Hydraulic Measurements of Wave Overtopping Flows in the Colorado State University Wave Overtopping Simulator." Presented at the ASCE-EWRI Hydraulic Measurement & Experimental Methods Conference, August 13-15, Snowbird, UT.

18. Hughes, S.A., Thornton, C.I., van der Meer, J., and Scholl, B.N. (2012) “Improvements in Describing Wave Overtopping Process.” Presented at the International Conference for Coastal Engineering, June 29-July 7, Santander, Spain.
19. Thornton, C.I., Scholl, B.N., Hughes, S.A. and Abt, S.R. (2012) “Full-Scale Testing of Levee Resiliency During Wave Overtopping.” Presented at the USSD (United States Society on Dams) Dams and Levee Conference, April 24-29, New Orleans, LA.
20. Scholl, B. N., Hughes, S. A. and Thornton, C.I. (2012) Testing Levee Slope Resiliency at the New Colorado State Wave Overtopping Test Facility.” Presented at Hydrology Days, March 21-23 2012. Fort Collins, CO.
21. Thornton, C.I., van der Meer, J., Scholl, B.N., Hughes, S.A., and Abt, S.R. (2011). “Testing Levee Slope Resiliency at the new Colorado State University Wave Overtopping Facility.” Presented at the Coastal Structure Conference, September 4-9, Yokohama, Japan.
22. Van der Meer, J., Thornton, C.I., and Hughes, S.A. (2011). “Design and Operation of the U.S. Wave Overtopping Simulator.” Presented at the Coastal Structure Conference, September 4-9, Yokohama, Japan.
23. Cox, A.L., Turner, M.D., and Thornton, C.I. (2011). “New Scour Protection Technology – How does it Stack Up?” Presented at International Erosion Control Association Environmental Connection 2011 Conference, February 22-24, Orlando, FL.
24. Scurlock, M.S., Cox, A.L., Thornton, C.I., and Baird, D.C. (2011). “Maximum Outer-bank Velocity Reduction for Vane-dike Fields Installed in Channel Bends.” Presented at AGU Hydrology Days 2011, March 21-23, Fort Collins, CO.
25. Turner, M.D., Cox, A.L., and Thornton, C.I. (2011). “Development of Transition Mat Scour Protection Design Methodology and Comparison to the State-of-the-practice.” Presented at AGU Hydrology Days 2011, March 21-23, Fort Collins, CO.
26. Woidt, J.L., Cox, A.L., and Thornton, C.I. (2011). “Evaluation of Sedimentation and Erosion Trends in the Sacramento River near the M&T/Llano Seco Pump Station.” Presented at AGU Hydrology Days 2011, March 21-23, Fort Collins, CO.
27. Scholl, B.N., Holt, G.A. and Thornton, C.I. (2011). “Screening Study of Select Cotton-Based Hydromulch Blends Using the Cross-Linked Biofiber Process.” To be presented at International Symposium on Erosion and Landscape Evolution 2011 Conference, September 18-21, Anchorage, AK.
28. Scholl, B.N., and Thornton, C.I. (2010). “Manning’s Roughness Value for Large Diameter Corrugated HDPE Pipe.” Transportation Research Board Annual Meeting 2010, Washington, DC, January 10-14, Paper #10-2349, in the TRB 89th Annual Meeting Compendium of Papers DVD
29. Cox, A.L., Thornton, C.I., and Turner, M.D. (2010). “New Scour Protection Technology – How Does it Stack Up?” Presented at the 2010 National Hydraulic Engineering Conference (NHEC), Park City, UT, August 31 - September 3.
30. Presented paper “Manning’s Roughness Value for Large Diameter Corrugated HDPE Pipe” at the Transportation Research Board (TRB) Annual Meeting 2010, in Washington, DC, January 10-14, 2010.
31. Presented paper “Erosion Control and TRMs 101” at the International Erosion Control Association (IECA) Environmental Connection 2010 (EC10), in Dallas, TX, February 19, 2010.

32. Presented “The ABCs of ACBs” and conducted erosion control training seminars entitled “Hard Armor and Engineered Solutions” in Portland, OR, during June 14-16, 2010 and in Fresno, CA, June 22-25, 2010.
33. Invited panelist for the Pre-conference Two-day Certification Workshop “Certified Professional in Erosion and Sediment Control (CPESC) Review Course” at the 2010 StormCon Conference (The North American Surface Water Quality Conference and Exposition) in San Antonio, TX, August 1-5, 2010.
34. Invited speaker presenting “Levee Overtopping Protection” at the American Society of Civil Engineers (ASCE) Coasts, Oceans, Ports, and Rivers Institute (COPRI) Conference on Levee Overtopping in Memphis, TN, November 14-17, 2010.
35. Presented “Colorado State University Hydraulic Modeling and Analysis Summary” at the Department of the Interior, Bureau of Reclamation in Albuquerque, NM, on November 18, 2009.
36. Presented “Colorado State University Hydraulic Modeling and Analysis Summary” for members of Erosion Tech, LLC, and Leggett and Platt in Des Moines, IA, on December 17, 2009.
37. Cox, A.L., Thornton, C.I., and Eriksen, K.W. (2008). “Effectiveness of Artificial Substrate in Capturing and Retaining Sturgeon Eggs.” Presented at the ASCE World Environmental & Water Resources Congress 2008, May 12-16, Honolulu, HI.
38. Eriksen, K.W., Coburn, A.A., Cox, A.L., and Thornton, C.I. (2008). “The Use of Physical Modeling to Design Kootenai River White Sturgeon Spawning Habitat.” Presented at the ASCE World Environmental & Water Resources Congress 2008, May 12-16, Honolulu, HI.
39. Clopper, P.E., and Thornton, C.I. (2008). “Water Quality Aspects of Partially Grouted Riprap.” Presented at the ASCE World Environmental & Water Resources Congress 2008, May 12-16, Honolulu, HI.
40. Kimbrel, S.W., Thornton, C.I., and Cox, A.L. (2008). “Investigation of Lateral Channel Migration and Sedimentation with Physical Modeling: M&T Pump Station on the Sacramento River.” Poster presented at the ASCE World Environmental & Water Resources Congress 2008, May 12-16, Honolulu, HI.
41. Cox, A.L., and Thornton, C.I. (2008). “Large-scale Physical Modeling of Rock Grade Control Structures.” Poster presented at the ASCE World Environmental & Water Resources Congress 2008, May 12-16, Honolulu, HI.
42. Attended and presented paper entitled “Water Quality Aspects of Partially Grouted Riprap” at the ASCE World Environmental & Water Resources Congress 2008 in Honolulu, HI, on May 12-16, 2008.
43. Attended and presented “Partnering in Research: Instream Flow Control Structures” at the U.S. Department of Transportation, Federal Highway Administration, 2008 National Hydraulic Engineering Conference in Portland, ME, on August 26-29, 2008.
44. Invited presenter at the Fourth International Conference on Scour and Erosion (ICSE-4) 2008 in Tokyo, Japan, on November 5-7, 2008.
45. Thornton, C.I., Abt, S.R., Baird, D., and Padilla, R. (2007). “Hydraulics of Bendway Weirs.” In: Proceedings of the Fourth International Conference on River Basin Management, River Basin Management 2007, Kos, Greece, May 23-25, 2007.

46. Invited to make a presentation entitled “Hydraulics of Bendway Weirs” at the Fourth International Conference on River Basin Management, River Basin Management 2007, in Kos, Greece, on May 23-25, 2007.
47. Invited to present a series of lectures in the northeast United States in spring 2007.
48. Cox, A.L., and Thornton, C.I. (2006). “Overtopping Analysis – The State of the Practice.” Proc. of the 2006 Association of State Dam Safety Officials Annual Conference, Boston, MA, September 11-14.
49. Thornton, C.I., Baird, D.C., Abt, S.R., and Padilla, R.S. (2006). “The Hydraulics of Bendway Weirs.” Presented at the Joint Federal Interagency Conferences 2006 (3rd Federal Interagency Hydrologic Modeling Conference and the 8th Federal Interagency Sedimentation Conference), Reno, NV, April 2-5.
50. Invited to make a presentation entitled “Dam Overtopping Design” at the GE06 Geosynthetic Conference sponsored by Terrafix Geosynthetics Inc., in Toronto, Canada, on February 28 – March 2, 2006.
51. Presented paper entitled “The Hydraulics of Bendway Weirs” at the Joint Federal Interagency Conferences 2006 (3<sup>rd</sup> Federal Interagency Hydrologic Modeling Conference and the 8<sup>th</sup> Federal Interagency Sedimentation Conference), in Reno, NV, on April 2-5, 2006.
52. Invited to make a presentation entitled “Proper Use of Manufacturers Bench Test Results in Design Applications” at the 2<sup>nd</sup> National Hydraulic Engineering Conference (50 Years of Highway Hydraulics: Where We’ve Been and Where We’re Going), in San Diego, CA, on August 29 - September 1, 2006.
53. Invited to make a presentation entitled “Overtopping Analysis – The State of the Practice” at the 2006 Association of State Dam Safety Officials Annual Conference, in Boston, MA, on September 11-14, 2006.
54. Boroughs, C.B., and Thornton, C.I. (2005). “Formation of Sediment Plugs at Constrictions in Alluvial Rivers.” Presented at the AWRA 2005 Annual Water Resources Conference, Seattle, WA, November 7-10, 4 p.
55. Thornton, C.I., Heintz, M.L., Abt, S.R., Baird, D.C., and Padilla, R.S. (2005). “Effects of Bendway Weir Characteristics on Resulting Flow Conditions.” Proceedings of the ASCE World Water & Environmental Resources Congress (CD ROM), Anchorage, AK, May 15-19.
56. Lipscomb, C.M., Thornton, C.I., Nelsen, R.J., and Abt, S.R. (2005). “Development of Vegetated Systems and Engineered Vegetated Systems Testing Protocol in Channelized Flow.” In: Proceedings of the ASCE Geo-Frontiers 2005 (CD ROM), Austin, TX, January 24-26.
57. Invited to make two presentations entitled “The ABC’s of ACB’s – Articulating Concrete Block Design Considerations” and “A-Jacks Concrete Armour Units for Erosion Control Applications” at the Geosynthetics Symposium for Terrafix Geosynthetics Inc., Toronto, Canada, March 1-2, 2005.
58. Presented paper entitled “Effects of Bendway Weir Characteristics on Resulting Flow Conditions” at the ASCE World & Environmental Resources Congress, in Anchorage, AK, on May 13-19, 2005.
59. Invited to make a presentation entitled “Manufactured BMPs: ASTM to the Rescue” at the Transportation Research Board Stormwater Management for Highways Symposium, in Bonita Springs, FL, on July 10-15, 2005.

60. Invited to make a presentation entitled “ABCs of ACBs” at the Association of State Dam Safety Officials Annual Conference, in Orlando, FL, on September 25-27, 2005.
61. Invited to present a seminar at the Iowa Institute of Hydraulic Research, University of Iowa, in Cedar Rapid, IA, on October 28-29, 2004.
62. Lipscomb, C.M., Thornton, C.I., Theisen, M.S., and Abt, S.R. (2003). “Performance Testing of Vegetated and Engineered Vegetated Systems.” In: Proceedings of the International Erosion Control Association Conference.
63. Invited to make a presentation at a Transportation Research Board meeting held in Washington, DC, on January 14, 2003.
64. Invited to present lecture as invited speaker at the annual meeting of the National Concrete and Masonry Association in Salt Lake City, UT, on February 18-20, 2003.
65. Invited to make a presentation for the West Virginia Department of Transportation in Nashville, TN, on March 27-28, 2003.
66. Invited to make a presentation for the Wisconsin Department of Transportation in Milwaukee, WI, on April 3-4, 2003.
67. Invited to make a presentation at the Hydraulic Design of Stable Channels Workshop for the U.S. Army Corps of Engineers, Omaha District, in Omaha, NE, on August 14-15, 2003.
68. Thornton, C.I., and Kees, D.B. (2002). “A-Jacks Hard Armor Units B Experiences with Bridge Scour Countermeasures and Toe Protection.” Presented at the 2002 FHWA Hydraulic Engineering Conference, Bowling Green, KY, September 17-19.
69. Thornton, C.I., Hughey, W., and Clopper, P.E. (2002). “Standards and Practices for Erosion and Sediment Control.” Presented at the 2002 IECA Annual Conference, Orlando, FL, February 25-2
70. Lipscomb, C.M., Thornton, C.I., and Abt, S. R. (2002). “Steep Slope Roughness Values as Observed in Performance Testing of Articulated Concrete Block Systems.” Presented at the 2002 IECA Annual Conference, Orlando, FL, February 25-28.
71. Invited to make an ASTM presentation in Orlando, FL, on March 4, 2002.
72. Invited to make a presentation at an Armortec/Contec Training Seminar in Bowling Green, KY, on September 4-7, 2002.
73. Invited to make a presentation at an International Erosion Control Association Seminar in Orlando, FL, on November 12-15, 2002.
74. Thornton, C.I., Watson, C.C., and Abt, S.R. (2001). “Field Assessment of A-Jacks Installations, A Case Study of: Brush Creek, Kansas City, Missouri and Powell Creek, Waukegan Illinois.” Presented at ASCE Wetlands 2001 Conference and Exposition, Reno, NV, August 26-30.

75. Thornton, C.I., Abt, S.R., Kees, D.B., and Gardner, R. (2001). "A-Jacks Armor Units, a Case Study in Scour Mitigation." Poster Presentation, ASCE Environmental and Water Resources Institute Conference, Orlando, FL, May 20-25.
76. Lipscomb, C.M., Thornton, C.I., Abt, S.R., and Leech, J.R. (2001). "Performance of Articulated Concrete Blocks in a Vegetated and Unvegetated Condition." Proceedings of the International Erosion Control Association 32nd Annual Conference and Exposition, Las Vegas, NV, February 5-8.
77. Invited to lecture at a course sponsored by the U. S. Environmental Protection Agency on Stream Erosion in Oahu, HI, during February 26 – March 6, 2001.
78. Invited to conduct training seminars for the erosion control industry in Seoul, Korea during March 16-22, 2001 and in Beijing, China during March 23-27, 2001.
79. Invited to conduct an Armortec Training Session in Bowling Green, KY, during August 14-17, 2001.
80. Invited to conduct an Armortec Training Session during an Annual Meeting in Bowling Green, KY, on February 1-4, 2000.
81. Invited to presented several lectures at Woodward Clyde on Articulated Block in Austin, TX, on September 5-6, 2000.
82. Invited to conduct an Armortec Training Session in Bowling Green, KY, on November 27-30, 2000.
83. Morris, C.E., Abt, S.R., Thornton, C.I., and Fischenich, J.C. (1998). "Resistance to Flow at the Channel-Overbank Interface." Proceedings of the ASCE International Water Resources Engineering Conference, Memphis, TN, pp. 748-753, August 3-7.
84. Thornton, C.I., Abt, S.R., and Johnson, T.L. (1998). "Gully Stabilization Methods Utilizing Launching Stone." Proceedings of the ASCE International Water Resources Engineering Conference, Memphis, TN, pp. 1559-1564, August 3-7.
85. Thornton, C.I., and Arneson, L.A. (1998). "Investigation of Velocity Patterns Under a Bridge Deck in a Pressure Flow Condition." Proceedings of the ASCE International Water Resources Engineering Conference, Memphis, TN, pp. 320-325, August 3-7.
86. Thornton, C.I., Abt, S.R., and Johnson, T.L. (1997). "Riprap Rock Durability Versus Rock Quality: A Case Study." Proceedings of Tailings and Mine Waste '97, Fort Collins, CO, January 13-16.
87. Abt, S.R., Thornton, C.I., Johnson, T.L., and Watson, C.C. (1995). "Gully Erosion on Steep Embankment Slopes." Proceedings of the 15th Annual USCOLD Lecture Series, San Francisco, CA, pp. 199-212, May 15-19.
88. Thornton, C.I., Abt, S.R., and Clary, W.P. (1995). "Sediment Entrapment Potential of Submerged Stream Channel Vegetation." Proceedings of the International Erosion Control Association 26th Annual Conference and Exposition, Atlanta, GA, February 28 - March 3.

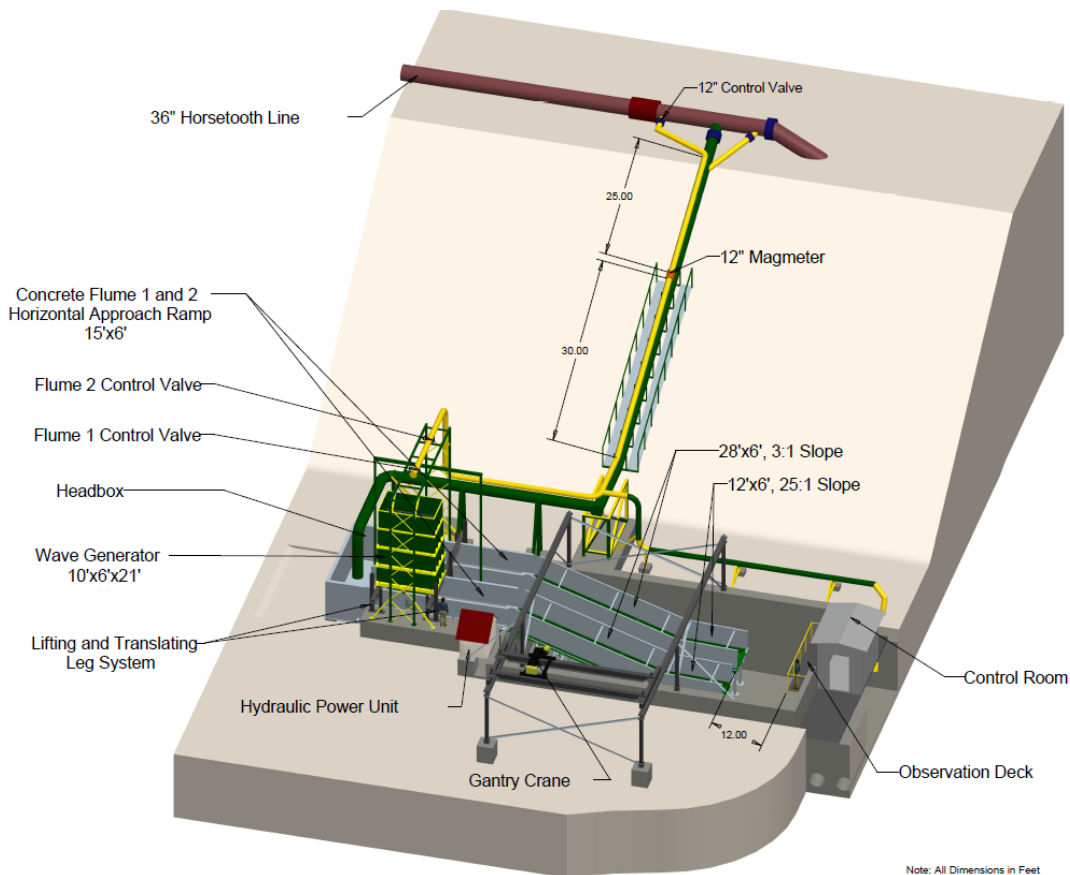
89. Abt, S.R., Clary, W.P., and Thornton, C.I. (1993). "Sediment Entrapment in Vegetated Streambeds." Proceedings of the International Erosion Control Association 24th Annual Conference and Exposition, Indianapolis, IN, pp. 73-91, February 23-26.
90. Clary, W.P., Abt, S.R., and Thornton, C.I. (1993). "Vegetation Effects on Retention of Stream Channel Sediments." Conference on Riparian Management: Commission Threads and Shared Interest, Rocky Mountain Forest and Range Experiment Station, Albuquerque, NM, February 4-6.
91. Abt, S.R., Clary, W.P., and Thornton, C.I. (1992). "Ability of Streambed Vegetation to Entrap Fine Sediments." Proceedings of the American Institute of Hydrology National Conference, Portland, OR, pp. 249-259, October 17-22.
92. Clary, W.P., Abt, S.R., and Thornton, C.I. (1993). "Sediment Entrapment by Stream Channel Vegetation." Proceedings of ASCE Conference on Irrigation and Drainage Engineering, Park City, UT, July 21-23.

## **OTHER ACTIVITIES/ACCOMPLISHMENTS- PUBLICATIONS/SCHOLARLY RECORD**

### **Wave Overtopping Simulator**

Beginning in August 2009, a hydraulic performance testing program, under wave overtopping conditions was initiated by Colorado State University under contract with the United States Army Corps of Engineers, New Orleans District. The objective of the research program was the evaluation of proposed levee erosion control materials on the landward (protected) side of levees during wave overtopping conditions resulting from extreme storm surge events. Analysis of the damage caused by Hurricane Katrina demonstrated that the protected sides of levee slopes are vulnerable to erosion and therefore potential catastrophic breach during large hurricane events. Prior to development of this program, knowledge of resistance to erosion caused by wave-only overtopping is under developed and knowledge related to designing erosion armoring systems to protect against wave-only overtopping was altogether lacking.

An international team of experts was assembled to design, construct and operate the largest wave overtopping simulator in the world. As seen in the schematic below, the device is capable of testing prototype overtopping conditions on common levee geometries. Vegetation and engineered erosion control solutions are able to be evaluated under varying storm conditions and results obtained from this facility have been used to develop design guidance and methodologies for the Greater New Orleans area. Additionally, data obtained from the facility will be used to develop robust design tools capable of being employed in an international arena.



The most recent wave overtopping project with the United States Army Corps of Engineers, Jacksonville District included the construction of two 60X90 commercial grade greenhouses in which southeastern United States vegetation was established in 40-foot-long, six-foot-wide trays filled with different soil types native to the Jacksonville area. The greenhouses provide Colorado State University with the ability to establish grass in soils native to the areas for which the tests are conducted.

### **Development of International ASTM Standards**

During the past six years, work conducted at the Hydraulics Laboratory has been instrumental in defining and developing standards for performance testing of engineered erosion control solutions. Partnerships formed with other research institutions have resulted in interdisciplinary collaborations that have defined frameworks describing the complex problem of soil erosion and stability. By coupling industry participation and resources with the historic procedures developed through ASTM International, numerous standards have been developed that provide the engineering and design communities with quantifiable procedures to facilitate project design and permit compliance. Standards developed through this effort are routinely specified by federal and international agencies.



**TEACHING**

<u>Year</u>	<u>Semester</u>	<u>Course No. /Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2014	Fall	CIVE402/ Senior Design Principals	3	108
2014	Spring	CIVE403/ Senior Project Design	3	84
2013	Fall	CIVE402/ Senior Design Principals	3	84
2013	Spring	CIVE403/ Senior Project Design	3	78
2012	Fall	CIVE402/ Senior Design Principals	3	78
2012	Spring	CIVE403/ Senior Project Design	3	106
2011	Fall	CIVE402/ Senior Design Principals	3	89
2011	Spring	CIVE403/ Senior Project Design	3	88
2010	Fall	CIVE402/ Senior Design Principals	3	89
2010	Fall	CIVE510/ Applied Hydraulic Systems Design	3	9
2010	Spring	CIVE403/ Senior Project Design	3	80
2009	Fall	CIVE402/ Senior Design Principals	3	80
2009	Spring	CIVE403/ Senior Project Design	3	71
2008	Fall	CIVE402/ Senior Design Principals	3	72
2008	Fall	CIVE510/ Applied Hydraulic Systems Design	3	13
2008	Spring	CIVE403/ Senior Project Design	3	88
2007	Fall	CIVE402/ Senior Design Principals	3	88
2006	Fall	CE 510/ Applied Hydraulic Design	3	17

**ADVISING****STUDENT ADVISING/GRADUATE SUPERVISION****UNDERGRADUATE STUDENTS:**

2014	5 Undergraduate Advisees
2013	4 Undergraduate Advisees
2012	6 Undergraduate Advisees
2011	9 Undergraduate Advisees
2010	7 Undergraduate Advisees
2009	7 Undergraduate Advisees
2008	5 Undergraduate Advisees
2007	3 Undergraduate Advisees

**GRADUATE STUDENTS:**

## Current Graduate Advisees:

- A. Chestnut (MS)
- C. Michalos (PhD)
- B. Scholl (PhD)
- C. Ubing (MS)
- N. Youngblood (PhD)

## Current Graduate Committee Member:

- A. Fricke (PhD)
- H. Kim (PhD)

K. Lim (PhD)  
A. Parthasarathy (MS)  
A. Pierce (MS)

Graduate Degrees Completed Under Dr. Thornton's Supervision (as Advisor)

2014 M. Robeson (PhD)  
2014 S-K. Shin (PhD)  
2014 S. M. Surlock (PhD)  
2014 M. Yaw (MS)  
2014 A. Cobb (MS)  
2014 T. Parker (MS)  
2012 A. Clopper (ME)  
2011 T. Bender (MS)  
2011 M. Turner (MS)  
2011 J. Woitdt (MS)  
2011 N. Youngblood (MS)  
2010 A. Cox (PhD)  
2008 S. Hunt (PhD)  
2010 B. Compost (MS)  
2010 P. Sclafani (MS)  
2010 S-K Shin (MS)  
2010 M. Ursic (MS)  
2009 N. Holste (MS)  
2009 A. Meneghetti (MS)  
2009 J. Renholds (MS)  
2009 S. Scurlock (MS)  
2008 M. Pierce (MS)  
2008 B. Tanaka (MS)  
2008 K. Walker (MS)  
2008 M. Walker (MS)  
2007 S. Kimbrel (MS)  
2007 J. Mercure (MS)  
2007 T. Rounsaville (MS)  
2006 D. Varyu (MS)  
2006 C. Omdahl (MS)

Graduate Committee Membership not including those above)

17 MS/MA  
9 PhD

**POSTDOCTORAL STUDENTS/RESEARCH ASSOCIATES:**

Current:

Steven Abt (PhD)  
Jason Berg (BS)  
Steven Hughes (PhD)

Bryan Scholl (MS)

Previous:

Amanda Cox (PhD)  
 Thomas Brisbane (MS)  
 Denny Dahlin (BS)  
 Andrew Darrow (BS)  
 Chad Lipscomb (MS)  
 Michael Robeson (MS)  
 Matthew Stockton (BS)

**COMMITTEES/SERVICE**

University Committees/Appointments

2000- Present Director, Hydraulic Hydromachinery Laboratory, prepares biennial reviews for unit as part of the Centers, Institutes, and Other Special Units (CIOSU)

College Committees/Appointments

2005-Present Director, Engineering Research Center

Department Committees/Appointments

2006-Present Serves as Academic Advisor for several senior design projects  
 2004-2010 Coordinated the ERC segment of the CE Water Resources and Environmental Engineering Graduate Visit Day for students actively exploring options in Hydraulics and related water fields  
 2008-2012 Serves on Strategic Planning Committee, Civil and Environmental Engineering Department  
 2008-Present Serves on Internal Advisory Committee, Civil and Environmental Engineering Department

Other Committees/Appointments

Coordinate tours of the CSU Engineering Research Center (ERC), Hydraulics Laboratory, for local, national, and international audiences.

2001-Present Member, Larimer County Flood Control Board  
 2008-Present ASCE Hydraulic Structure Committee  
 2006-Present ASTM Subcommittee Chair: D18.25 Soil and Rock; D18.25.09 Erosion and Sediment Control Terminology  
 2004-Present ASTM Section Member: D18.25.03 Turf Reinforcement Matting; D18.25.04 Articulating Concrete Block Revetments; D18.25.11 Modular Erosion Control Systems  
 2008-2012 IECA- Chair, Standards and Practice Committee  
 2005-Present Serve on NCHRP project panels

**PROFESSIONAL AFFILIATIONS AND ACTIVITIES**

Memberships in Professional Societies

2004-Present Voting Member for CSU, American Society for Testing and Materials  
 2004-Present Member, Erosion Control Technology Council  
 2002-Present Member, Environmental and Water Resources Institute  
 2005-2007 Affiliate Member, Association of State Dam Safety Officials  
 2004-Present Member, American Society of Civil Engineers  
 1996-2004 Associate Member, American Society of Civil Engineers

1996-Present Member, International Erosion Control Association  
2005-Present Member, American Water Resources Association

Offices in Professional Societies

2005-Present Transportation Research Board, Member: Hydrology, Hydraulics, and Water Quality (AFB60)  
2009-2010 International Committee on Scour and Erosion: Invited member of Steering Committee and 2010 Conference Planning for the Fifth International Conference on Scour and Erosion (ICSE-5)