

## CURRICULUM VITAE

Andrew Dale Ashton  
Coastal Geomorphologist  
Assistant Scientist  
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### Education:

Cornell University; Ithaca, New York 1991 - 1995  
B.S. – School of Civil and Environmental Engineering  
Concentration: Water Quality, Hydraulics, and Hydrology

Duke University; Durham, North Carolina 1999 - 2005  
Ph.D. – Division of Earth & Ocean Sciences,  
Nicholas School of the Environment & Earth Sciences  
Certificate in Nonlinear and Complex Systems  
Concentration in Nearshore Processes and Geomorphology

### Professional Experience:

Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 2007 - present  
Assistant Scientist  
Geology and Geophysics Department  
Research focus: Coastal Processes and Sediment Transport

Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 2005 - 2007  
USGS Postdoctoral Scholar

USGS Woods Hole Field Center, Woods Hole, Massachusetts  
Postdoctoral Scholar (through Woods Hole Oceanographic Institution fellowship)

David J. Newton Associates; Portland, Oregon 1997 - 1999

- Civil Engineer focusing on hydrology and hydrodynamics
- Hydraulic and hydrologic design of gravel mining sites, water systems, including dams, culverts, storm drainage systems, water supply systems, and stormwater retention ponds.

Dewberry & Davis; Fairfax, VA 1996 - 1997

- Civil Engineer working on technical evaluation contract with Federal Emergency Management Agency (FEMA), for the National Flood Insurance Program (NFIP).

### Research Interests:

Coastal response to climate change, sea-level rise, and anthropogenic activities  
Development and testing of numerical and conceptual models of the formation and evolution of coastal sedimentary environments  
Plan-view delta evolution along wave-dominated coasts  
Evolution of carbonate and coral reef environments  
Field investigations of sedimentary deposits using geophysical tools (particularly ground-penetrating radar)  
Application of 'reduced complexity' morphodynamic models to study earth-surface evolution

### Papers in refereed journals or books:

- Ashton, A.D.**, Walkden, M., and Dickson, M., *in press*. Equilibrium responses of cliffed coasts to changes in the rate of sea level rise. *Marine Geology*.
- Thieler, E. R. & **Ashton, A.D.**, *in press*. Cape capture: Geologic data and modeling results suggest the Holocene loss of a Carolina Cape. *Geology*.
- Slott, J, Murray, A.B., and **Ashton, A.D.**, 2010. Large-Scale responses of complex-shaped coastlines to local shoreline stabilization and climate change, *J. Geophys. Res.*, 115, F03033, doi:10.1029/2009JF001486.
- Ashton, A.D.**, Murray, A.B., Littlewood, R., Lewis, D.A. and Hong, P., 2009. Fetch-limited self-organization of elongate water bodies. *Geology*, 37(2): 187-190. (*featured in Research Highlights: Nature 457, p.938*).
- Murray, A.B., E. Lazarus, **A. Ashton**, A. Baas, G. Coco, T. Coulthard, M. Fonstad, P. Haff, D. McNamara, C. Paola, J. Pelletier, and L. Reinhardt, 2009. Geomorphology, complexity, and the emerging science of the Earth's surface. *Geomorphology*, 103(3): 496-505.
- Ashton, A.D.**, Evans, R. and Donnelly, 2007. A Discussion of the Potential Impacts of Climate Change on the Shorelines of the Northeastern USA. *Mitigation and Adaptation Strategies for Global Change*, 10.1007/s11027-007-9124-3.
- Ashton, A.D.**, and A. B. Murray, 2006. High-angle wave instability and emergent shoreline shapes: 1. Modeling of sand waves, flying spits, and capes, *J. Geophys. Res.*, 111, F04011, doi:10.1029/2005JF000422.
- Ashton, A.D.**, and A. B. Murray, 2006. High-angle wave instability and emergent shoreline shapes: 2. Wave climate analysis and comparisons to nature, *J. Geophys. Res.*, 111, F04012, doi:10.1029/2005JF000423.
- Slott, J.M., Murray,A.B., **Ashton, A.D.**, & Crowley, T.J, 2006. Coastline responses to changing storm patterns, *Geophysical Research Letters*, Vol. 33, L18404,doi:10.1029/2006GL027445.
- Valvo, L.M., Murray, A.B., and **Ashton, A.D.**, 2006. How Does Underlying Geology Affect Coastline Change? An Initial Modeling Investigation. *Journal of Geophysical Research - Earth surface*, 111, F02025, doi:10.1029/2005JF000340.
- Ashton A.**, Murray A. B., & Arnoult, O., 2001. Formation of coastline features by large-scale instabilities induced by high-angle waves. *Nature*, 414, pp. 296-300.

### Papers in Revision

- Lazarus, E., **Ashton, A.D.**, Murray. A.B., Tebbens, S., Burroughs, S. Cumulative versus transient shoreline change: Dependencies on temporal and spatial scale. *Revision (accepted pending major changes) submitted to J. Geophy. Res.- Earth Surface 11/24/10*.

### Submitted Papers

- Ashton, A.D.** and Giosan, L. Wave-influenced delta evolution controlled by wave approach angle. *Submitted to Nature Geoscience 1/21/2010*.

### Other Publications:

- Ashton, A.D.**, and Ortiz, A., 2011. Overwash controls coastal barrier response to sea-level rise, 2011. *Coastal Sediments '11*. Miami, Florida, ASCE, 13pp.
- Ashton, A.D.** and Murray, A.B., 2010. Wave Processes and Shoreline Change, in *McGraw-Hill Yearbook of Science & Technology, 2010*, McGraw-Hill, p. 412-415.
- Ashton, A.D.** and Giosan, L., 2007. Investigating plan-view asymmetry in wave-influenced deltas. 5th IAHR Symposium on River, Coastal, and Estuarine Morphodynamics. International Association of Hydraulic Researchers, Enschede, Netherlands, p. 681-688.
- Ashton, A.D.**, Murray, A.B., and Littlewood, R., 2007. The response of spit shapes to wave-angle climates. *Coastal Sediments '07*, New Orleans, Louisiana, ASCE, p. 351-363.
- List, J.H. and **Ashton, A.D.** A circulation modeling approach for evaluating the conditions for shoreline instabilities. *Coastal Sediments '07*, New Orleans, Louisiana, ASCE, p. 327-340.
- Littlewood, R., Murray, A.B., and **Ashton, A.D.** An alternative explanation for the shape of 'log-spiral' bays. *Coastal Sediments '07*, New Orleans, Louisiana, ASCE, p. 341-350.

- Murray, A.B., Valvo, L., Slott, J, **Ashton, A.**, Crowley, T. Variable shoreline responses to sea-level rise and climate change. Coastal Sediments '07, New Orleans, Louisiana, ASCE, p. 1214-1226.
- Ashton, A.D.**, and Murray, A.B., 2005. Delta simulations using a one-line model coupled with overwash. Coastal Dynamics '05, Barcelona, Spain, ASCE.
- Valvo, L., Murray, A.B., and **Ashton, A.**, 2005, Investigating shoreface lithology effects in a process-based model of coastal change, Coastal Dynamics '05, Barcelona, Spain, ASCE.
- Ashton, A.D.**, Murray, A.B. and Ruessink, B.G., 2003. Initial tests of a possible explanation for alongshore sandwaves on the Dutch coast, 3rd IAHR Symposium on River, Coastal and Estuarine Morphodynamics, International Association of Hydraulic Researchers, Barcelona, Spain.
- Murray, A.B. & **Ashton, A.**, 2004. Extending a 1-line modeling approach to explore emergent coastline behaviors, Proceedings of the 29th International Conference on Coastal Engineering, Lisbon, Portugal.
- Ashton, A.**, List, J.H., Murray, A.B. and Farris, A.S., 2003. Links between erosional hotspots and alongshore sediment transport, Proceedings of the International Conference on Coastal Sediments 2003, Clearwater Beach, Florida, ASCE.
- Murray, A.B. & **Ashton, A.**, 2003. Sandy-coastline evolution as an example of pattern formation involving emergent structures and interactions, Proceedings of the International Conference on Coastal Sediments 2003, Clearwater Beach, Florida, ASCE.
- Murray, A.B., **Ashton, A.**, & Arnoult, O., 2001. Large-scale morphodynamic consequences of an instability in alongshore transport. Proceedings of the International Association for Hydraulic Research Symposium on River, Coastal, and Estuarine Morphodynamics, Obohiro, Japan, Sept 10-14.
- Murray, A.B., **Ashton, A.**, & Arnoult, O., 2001. An instability in shoreline shape, and connections with eolian morphodynamics. Proceedings of the 2<sup>nd</sup> International Conference on Dune Formation and Migration, Nouachott, Mauritania, February, 2001.

#### Published Abstracts:

- Ashton, A.D.**, Walkden, M., and Dickson, M., 2010. Theoretical equilibrium responses of rocky coasts to changes in the rate of sea level rise. Eos Trans. AGU, 91(26), Ocean Sci. Meet. Suppl., Abstract GO51A-07.
- Ashton, A.D.**, Walkden, M., and Dickson, M., 2008. non-Bruun shoreline response to sea-level rise: simple models of the dynamic behavior of overwashing barriers and soft rock shores. American Geophysical Union Fall Meeting, Eos Trans. AGU, 89(53), Fall Meet. Suppl., Abstract OS23A-1252.
- Lazarus, E., **Ashton, A.D.**, Murray, A.B., Tebbens, S., Burroughs, S., 2008. Exploring the relationship between large-scale shoreline changes and wave climate. American Geophysical Union Fall Meeting, Eos Trans. AGU, 89(53), Fall Meet. Suppl., Abstract OS23A-1247.
- Ashton, A.D.**, 2008. Barrier response to sea-level rise: complex behaviors arising from a simple geomorphologic model. American Quaternary Association (AMQUA) Biennial Meeting, State College, PA.
- Ashton, A.D.**, 2008. Shoreface profile evolution on human timescales: morphodynamic versus morphokinematic approaches. 2008 Ocean Sciences Meeting, Orlando, FL, Meeting Abstracts p. 16.
- Ashton, A.D.** and Giosan, L., 2006. Emergent shoreline behaviors reflected in the depositional history of wave-dominated deltas. American Geophysical Union Fall Meeting, EOS Trans. AGU, 87(52), Fall Meet. Suppl., abstract NG53A-02.
- Ashton A.D.**, Littlewood, R., & Murray, A.B., 2006. Emergent interactions and self-organization in the shape evolution of enclosed water bodies, European Geosciences Union Spring Meeting, Geophysical Research Abstracts, Vol. 8, 08612.
- Slott, J., Murray, A. B., Valvo, L., **Ashton, A.**, 2006. Shoreline response to climate change in a model of large-scale coastal change, European Geosciences Union Spring Meeting, Geophysical Research Abstracts, Vol. 8, 05057.

- Ashton, A.** Murray, B., & Giosan, L., 2005. Wave-Dominated Delta Evolution: New Insights From One-Line Numerical Simulations. American Geophysical Union Fall Meeting, EOS Transactions 86(52), H51D-0400.
- Tebbens, S.F., Murray, A.B., and **Ashton, A.**, 2005, Quantifying coastal change patterns using LIDAR, *Eos Trans. AGU*, Fall Meet. Suppl.
- Slott, J.M., Murray, A.B., Valvo, L., and **Ashton, A.**, 2005, Shoreline responses to climate change and human manipulations in a model of large-scale coastal change, *Eos Trans. AGU*, Fall Meet. Suppl.
- Ashton, A.** Murray, B., 2004. Alongshore coastline instability: wave climate analysis and comparisons to nature. American Geophysical Union Fall Meeting, EOS Transactions 85(45), H41C-0317.
- Ashton, A.** & Murray, A.B., 2004. Self-organized behavior of modeled shoreline shapes. Dynamics Days 2004: 23<sup>rd</sup> Annual Conference on Nonlinear Dynamics and Complex Systems, 0Chapel Hill, NC. (contributed talk)
- Ashton, A.**, List, J.H., Murray, A.B., & Farris, A.S., 2002. Are There Connections Between Erosional Hot Spots and Alongshore Sediment Transport Along the North Carolina Outer Banks? American Geophysical Union Fall Meeting, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract OS52F-09.
- Ashton, A.**, Murray, B., 2001. Responses of simulated and natural shorelines to high-angle waves: Perturbation growth and long-range interactions. American Geophysical Union Fall Meeting, EOS Transactions 82, p. F623.
- Ashton, A.**, Murray, A.B., & McNinch, J., 2000. Modeling large scale coastal morphodynamics. American Geophysical Union Fall Meeting, EOS Trans. AGU 81(48), p. F681. Also presented at Dynamics Days 2001, Chapel Hill, NC.

#### Conference/Workshop Presentations

- Ashton, A.D.** et al., Coupling between Coastline and Fluvial Dynamics (Keynote presentation). Community Surface Dynamic Modeling System Meeting 2010: "Modeling for Environmental Change", Oct 14-17, San Antonio, TX.
- Ashton, A.D.** et al., Africa Partnership Station: Developing Coastal Research Capabilities in Ghana. ONR Coastal Geosciences Review. June 2-4, 2010, Chicago, IL.
- Ashton, A.** Shoreline Shape Instability: Large-Scale Behavior (and Implications). Invited presentation at: Linear stability analysis in coastal morphodynamics: essential or useless? Barcelona, Spain, January 21-22, 2010.
- Ashton, A.**, Beyond the 'Bruun rule': dynamic shoreline responses to sea-level rise. Presented at: PALSEA: Understanding future sea level rise: The challenges of dating past interglacials, Woods Hole Oceanographic Institution, September 21-25 2009. Morss Presentation and panel discussion.

#### Cruises/ Field Experience:

- Destin, Florida, January 3-13, 2011. Collection of sediment samples of Santa Rosa Island using Geoprobe MC5 system. Also GPR and GPS surveys.
- Ghana coast, June 20-July 1, 2010. Reconnaissance survey of entire coast, collection of geomorphic data and sediment samples. Also conducted workshop on development of coastal research capabilities (with Hapke, USGS).
- Ebro Delta, Spain, May 2-12, 2010. Investigation of Ebro River delta and floodplain, including GPR surveys and sediment core collection.
- Barbados, April 9-16, 2010. High-resolution GPS surveys of coral sample outcrops for sea-level reconstruction (with Bill Thompson).
- Destin, Florida, January 13-19, 2010. Reconnaissance and GPR and GPS survey of Santa Rosa Barrier Island.
- Martha's Vineyard and Cape Cod. June-August, 2009. Led GPR investigations of barrier architecture and overwash, developing techniques for 3-D sampling.

Martha's Vineyard, July 13-15, 2009. *R.V. Tioga*. Geophysical surveying (CHIRP) and Rossfelder vibracoring of offshore deposits (Chief Scientist for one leg).

Ghana, Feb19-28, 2009. Reconnaissance GPR investigations of sedimentary coastal landforms along central and western Ghanaian coast.

French Polynesia, January 7-24, 2009. *Robert C. Seamans*. Vibracoring and CHIRP investigations of back-reef environments. Investigations and sediment sampling of reef and back-reef regions.

Martha's Vineyard, June 16-19, 2007. *R.V. Tioga*. Geophysical surveying (EM and CHIRP) and Rossfelder vibracoring of offshore deposits.

Danube Delta, Romania, September 1-14, 2006. Vibracoring, CHIRP surveying, and gravity coring of Danube river floodplain and Danube Delta to locate recent flood deposits and to further develop age models of the Danube Delta formation.

Masachusetts/Rhode Island, summer 2006. Vibracoring and geophysical surveying (CHIRP, GPR) of multiple coastal ponds, lagoons, and marshes.

### **Professional Activities:**

Deltas breakout facilitator, keynote presentation: Community Surface Dynamic Modeling System Meeting 2010: "Modeling for Environmental Change", Oct 14-17, San Antonio, TX.

Advisory Reviewer: COMET online science course: The Changing Ocean- Past, Present, & Future, B. The Coast to Come: What to Expect and When

Co-led ONR-sponsored 'Coastal Erosion' workshop as part of the Africa Partnership Station, February 2009, University of Ghana, Accra, Ghana

Led and helped conduct workshop: "Discussing the Long-term Effects of human Activities on Barrier Islands", December 2008, Woods Hole Oceanographic Institution.

Convener: Special Session "Coastal Geomorphology and Morphodynamics," AGU Fall meeting, 2006

Author: Union of Concerned Scientists Northeast Climate Change Impact Report (Spring 2007)

Member: Community Surface Dynamics Modeling System (CSDMS): Coastal, Terrestrial, Carbonate, and Marine Working Groups

Participant: Meeting of Young Researchers in Earth Science 2008 (MYRES), "Dynamic Interactions of Life and its Landscape, May 2008, Tulane University, New Orleans, LA.

Participant: NE Airborne Lidar Workshop for the Coastal Zone, USGS Woods Hole Field Center, 2009

Participant: NSF-sponsored workshop (hosted by CSDMS), "Community Sedimentary Model for Carbonate Systems", February 2008, Golden, Colorado.

Participant: National Center for Earth-Surface Dynamics Working Group: Field, Experimental, Modeling and Computational Issues Related to Moving Boundaries in the Environment, Massachusetts Institute of Technology, Cambridge MA, July, 2005; Woods Hole Oceanographic Institution, July, 2008 (local host).

Participant: USACE workshop on coastal erosion hotspots, Duck, NC. 2002.

### Journal Reviewer:

Earth Surface Processes and Landforms  
 Estuarine, Coastal and Shelf Science  
 Geology  
 Geophysical Research Letters  
 GSA Bulletin  
 Journal of Coastal Research  
 Journal of Geophysical Research- Earth Surface  
 Journal of Geophysical Research- Oceans  
 Marine Geology  
 Nonlinear Processes in Geophysics  
 Ocean Engineering

### Proposal Reviewer:

National Science Foundation:  
GLD- Geomorphology and Land Use Dynamics  
P2C2- Paleo Perspectives on Climate Change Program  
EAR-PF- Postdoctoral Fellows  
National Institute for Climate Change Research, Department of Energy  
Netherlands Organisation for Scientific Research (NOW) Council for the Earth and Life  
sciences (ALW)  
Petroleum Research Fund

**Institution Activities:**

Coastal Ocean Institute Advisory Committee, 2008-present  
Geology and Geophysics Department Seminar Series, 2008-2009  
Geology and Geophysics Department Curriculum Committee, 2010-present  
Host, Mary Sears Visiting Scholar Selorm Ababio, University of Ghana, 2009

**Invited Talks:**

Institute of Arctic and Alpine Research, Colorado University, 2010  
Massachusetts Institute of Technology, Earth, Atmosphere & Planetary Science, 2009  
University of Pennsylvania, Department of Earth and Environmental Science, 2008  
Provincetown Center for Coastal Research, 2008  
Rice University, Department of Earth Sciences, 2007  
Woods Hole Oceanographic Institution, Coastal and Ocean Fluid Dynamics Laboratory (COFDL)  
Seminar, 2007, 2008, 2010  
Tulane University, Department of Earth and Environmental Sciences, 2007  
University of Virginia, Department of Environmental Sciences, 2007  
Woods Hole Oceanographic Institution, Geology and Geophysics Department, Geophysics  
Seminar, 2007  
Naval Research Laboratory, Marine Geosciences, Stennis, Mississippi, 2007  
University of Michigan, Department of Geological Sciences, 2007  
University of Texas, Jackson School of Geosciences, 2006  
Woods Hole Oceanographic Institution, Applied Ocean Physics and Engineering Department  
Seminar, 2006  
Massachusetts Institute of Technology, Department of Civil & Environmental Engineering,  
Environmental Fluid Mechanics Seminar, 2006  
USGS Woods Hole Field Center, 2006  
Boston University, Department of Earth Sciences, 2006  
Naval Research Laboratory, Washington DC, 2005  
US Army Corps of Engineers Field Research Facility, Duck, North Carolina, 2004

**Education:**

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|-------------------------|--|
| Ph.D Students:          | Alejandra Ortiz, MIT-WHOI JP (2010-)   |
| Masters Students:       | Emily Carruthers, MIT-WHOI JP (2009-)  |
| Committee member:       | Michael Toomey, MIT-WHOI JP (2008-)<br>Phil Lane, MIT-WHOI JP (2007-)  |
| Summer Student Fellows: | Cherie Meyer, Columbia University, 2010<br>Andrew Delman, Yale University, 2008  |
| Summer Guest Students:  | Nick Magliocca, Duke University, 2008<br>Holly Taylor, Northeastern University, 2009<br>Anastasia Pilliouras, University of Pennsylvania, 2009 |
| Other advising:         | Jaap Nienhuis, University of Twente (M.S.)<br>Selorm Ababio, University of Ghana (PhD)   |