



**Discussion of: van Gaalen, J.F.; Tebbens, S.F., and Barton, C.C., 2016. Longshore Sediment Transport Directions and Rates from Northern Maine to Tampa Bay, Florida: Literature Compilation and Interpretation. *Journal of Coastal Research*, 32(6), 1277–1301.**

Authors: Kelley, Joseph T., and FitzGerald, Duncan M.

Source: *Journal of Coastal Research*, 33(5) : 1235-1236

Published By: Coastal Education and Research Foundation

URL: <https://doi.org/10.2112/JCOASTRES-D-17A-00001.1>

---

BioOne Complete ([complete.BioOne.org](https://complete.BioOne.org)) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](https://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.



## DISCUSSION



www.cerf-jcr.org

### Discussion of: van Gaalen, J.F.; Tebbens, S.F., and Barton, C.C., 2016. Longshore Sediment Transport Directions and Rates from Northern Maine to Tampa Bay, Florida: Literature Compilation and Interpretation. *Journal of Coastal Research*, 32(6), 1277–1301.

Joseph T. Kelley<sup>†\*</sup> and Duncan M. FitzGerald<sup>‡</sup>

<sup>†</sup>School of Earth and Ocean Sciences  
University of Maine  
Orono, ME 024469, U.S.A.

<sup>‡</sup>Department of Earth and Environmental Sciences  
Boston University  
Boston, MA 02215, U.S.A.

The paper by van Gaalen, Tebbens, and Barton (2016) was brought to our attention as a citation in an undergraduate thesis. We read the paper, looking forward to an up-to-date compilation of the literature on longshore transport on the U.S. East Coast. However, we were disappointed that the paper (1) contained inaccurate information regarding the location cited by the student; (2) is based largely on older references; and (3) biased toward non–peer-reviewed publications.

The reference pertinent to the undergraduate's work was in Saco Bay, Maine, in which a 1956 Army Corps of Engineers report is cited to claim that sand for the beaches traveled south toward an old jetty at the mouth of the Saco River (USACE, 1956); this is actually cited by the Army in numerous reports as a 1955 report (USACE, 1955). This southerly transport of sand was part of the justification the Army made 150 years ago to construct a jetty at the mouth of the Saco River and to lengthen it greater than a mile. Great property losses in the vicinity of the jetty led local people to complain about the structure, which has long since outlived its original industrial purpose and resulted in numerous studies of the sand movement in the bay by ourselves and a number of colleagues. In a series of theses (Barber, 1995; Brothers, 2006; Heinze, 2001; Manthorp, 1995; van Heteren, 1996) and peer-reviewed papers (Brothers *et al.*, 2008; Buynevich, FitzGerald, and van Heteren, 2004; FitzGerald *et al.*, 2000, 2002, 2005; Hein *et al.*, 2014; Hill *et al.*, 2004; Kelley and Anderson, 2000; Kelley *et al.*, 2005; Kelley and Brothers, 2009; van Heteren *et al.*, 1996), we established that sand moves in a net northerly direction in the bay. The Army, after performing physical (Bottin, Mize, and Demirbilek, 1995) and numerical (Woods Hole Group Environmental Laboratories, 2006) modeling agreed with our field measurements. The problem of Gaalen *et al.* (2016) here was relying on a non–peer-reviewed publication by the Army that is 60 years old. A simple glance at Google Scholar shows that nine of the first 10 papers on the subject of “longshore transport Saco Bay Maine” are by

those listed above, and all disagree with the 1955 Army study, as do the more recent Corps publications.

Although we will not comment on the other locations cited in the van Gaalen, Tebbens, and Barton (2016) paper because we are not familiar with all of those locations, we remain skeptical about how many are accurate on the basis of the obvious misunderstanding of the sand dynamics of Saco Bay. Numerous references cited in the paper are non–peer-reviewed theses, technical reports, field guides, and Army Corps studies. Although these works may be accurate assessments, no objective, external reviewers ever had the opportunity to critique them.

Coupled with the problem of lack of peer reviewed work is that most of the references are dated. Clearly, there has been a reliance on studies from the 1970s and 1980s, and more recent research from 1990s and 21st century were missed. Almost 60% of the references are from the 1970s and 1980s, and more were published before 1970 than since 2000. Clearly our work from the 1990s and 21st century were missed; how many other recent papers were similarly ignored in favor of a paper from the past? We hope readers examine this paper to find how regions of their expertise were treated. van Gaalen, Tebbens, and Barton (2016) used dated and potentially erroneous work in an attempt “to provide a complete view of the longshore sediment transport from the northern border of Maine” (actually from southern Maine; see Kelley, Belknap, and Walsh [2015] for a paper on longshore transport on the northeasternmost beach in the United States) to the mouth of Tampa Bay, Florida. While broad trends in longshore transport on the east coast of the United States have been clearly recognized (see John Fisher's classic 1967 study), there are also many examples of longshore transport reversals owing to wave refraction around ebb tidal deltas.

To be fair to van Gaalen, Tebbens, and Barton (2016), they selected a daunting task for a Master's degree student to accomplish, and much of the paper may be correct, but for newcomers to the field like the undergraduate we worked with, there is a presumption of accuracy with the most recent peer-reviewed papers. To better accomplish this task, the authors would have been wise to consult with local experts or some of the existing books that describe regions of the United States in

DOI: 10.2112/JCOASTRES-D-17A-00001.1 received 3 January 2017; accepted 13 January 2017; corrected proofs received 14 May 2017; published pre-print online 22 June 2017.

\*Corresponding author: jtkelley@maine.edu

©Coastal Education and Research Foundation, Inc. 2017

detail, like Orrin Pilkey's *Living with the Shore* series by Duke University Press (e.g., Kelley, Kelley, and Pilkey, 1989), that are locally authored within each state. Consultation of newer books by Miles Hayes and Jacqueline Michel (e.g., Hayes and Michel, 2013) would also be encouraged.

#### LITERATURE CITED

- Barber, D.C., 1995. Holocene Evolution and Modern Sand Budget of Inner Saco Bay, Maine. Orono, Maine: University of Maine, Master's thesis, 178p.
- Bottin, R.R.; Mize, M.G., and Demirbilek, Z., 1995. *Camp Ellis Beach, Saco Bay, Maine Model Study of Beach Erosion*. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station, Technical Report CERC-95-11, 246p.
- Brothers, L.L., 2006. Nearshore Sedimentary Pathways and their Social Implications: Saco Bay, Maine. Orono, Maine: University of Maine, Master's thesis, 122p.
- Brothers, L.L.; Belknap, D.F.; Kelley, J.T., and Jantzen, C.D., 2008. Sediment transport and dispersal in a cool temperate estuary and embayment, Saco River estuary, Maine, USA. *Marine Geology*, 251(3-4), 183-194.
- Buynevich, I.B.; FitzGerald, D.M., and van Heteren, S., 2004. Sedimentary records of intense storms in Holocene barrier sequences, Maine, USA. *Marine Geology*, 201(1-4), 135-148.
- Fisher, J.J., 1967. Origin of barrier island chain shorelines, Middle Atlantic States. *Geological Society of America Special Paper*, 115, 66-67.
- FitzGerald, D.M.; Buynevich, I.V.; Davis, R.A., Jr., and Fenster, M.S., 2002. New England tidal inlets with special reference to riverine-associated inlet systems. *Geomorphology* 8(1-3), 179-208.
- FitzGerald, D.M.; Buynevich, I.V.; Fenster, M.S.; Kelley, J.T., and Belknap, D.F., 2005. Coarse grained sediment transport in northern New England estuaries: A synthesis. In: FitzGerald, D.M. and Knight, J. (eds.), *High Resolution Morphodynamics and Sedimentary Evolution of Estuaries*. Amsterdam, The Netherlands: Springer, pp. 195-213.
- FitzGerald, D.M.; Buynevich, I.V.; Fenster, M.S., and McKinlay, P.A., 2000. Sand dynamics at the mouth of a rock-bound, tide-dominated estuary. *Sedimentary Geology*, 131(1-2), 25-49.
- Hayes, M.O. and Michel, J., 2013. *A Tide-Swept Coast of Sand and Marsh: Coastal Geology and Ecology of Georgia*. Columbia, South Carolina: Pandion Books, 299p.
- Hein, C.J.; FitzGerald, D.M.; Buynevich, I.V.; Van Hereren, S., and Kelley, J.T., 2014. Evolution of paraglacial coasts in response to changes in fluvial sediment supply. In: Martini, I.P. and Wanless, H. (eds.), *Sedimentary Coastal Zones from High to Low Latitudes: Similarities and Differences*. Geological Society of London Special Publication 388, pp. 247-280.
- Heinze, F.W., 2001. Anthropogenic Influences and Meteorological Effects: How They Are Changing the Sand Beaches in Southern Maine. Orono, Maine: University of Maine, Master's thesis, 380p.
- Hill, H.; Kelley, J.T.; Belknap, D.F., and Dickson, S.M., 2004. The effects of storms and storm-generated currents on the sand beaches in southern Maine. *Marine Geology*, 210(1-4), 149-168.
- Kelley, J.T. and Anderson, W.A., 2000. The Maine shore and the Army Corps; a tale of two harbors, Camp Ellis and Wells, Maine. *Maine Policy Review*, 9, 20-35.
- Kelley, J.T.; Barber, D.C.; Belknap, D.F.; FitzGerald, D.M.; van Heteren, S., and Dickson, S.M., 2005. Sand budgets at geological, historical and contemporary time scales for a developed beach system, Saco Bay, Maine, USA. *Marine Geology*, 214(1-3), 117-142.
- Kelley, J.T.; Belknap, D.F., and Walsh, J.A., 2015. Tidal flat-barrier spit interactions in a fetch-limited, macro-tidal embayment, Lubec, Maine, USA. In: Randazzo, G.; Jackson, D., and Cooper, J.A.G. (eds.), *Sand and Gravel Spits*. Berlin, Germany: Springer, pp. 195-216.
- Kelley, J.T. and Brothers, L., 2009. Camp Ellis, ME: A small beach-front community with a big problem/jetty. In: Kelley, J.T.; Pilkey, O.H., and Cooper, J.A.G. (eds.), *America's Most Vulnerable Shorelines. Geological Society of America Special Paper 460*, pp. 1-20.
- Kelley, J.T.; Kelley, A.R., and Pilkey, O., 1989. *Living with the Maine Coast*. Durham, North Carolina: Duke University Press, 174p.
- Manthorp, P.A., 1995. Estuarine Circulation and Sediment-Transport in the Saco River Estuary, Maine. Boston, Massachusetts: Boston University, Master's thesis, 230p.
- U.S. Army Corps of Engineers, 1955. *Saco, Maine Beach Erosion Control Study*. Washington, D.C.: U.S. Government Printing Office, U.S. House Document No. 32, 84th Congress, 1st Session.
- U.S. Army Corps of Engineers, 1956. *Saco, Maine, Beach Erosion Control Study*. Washington, D.C.: U.S. Government Printing Office, U.S. House Document No. 32, 85th Congress, 1st Session.
- van Gaalen, J.F.; Tebbens, S.F., and Barton, C.V., 2016. Longshore sediment transport directions and rates from northern Maine to Tampa Bay, Florida: Literature compilation and interpretation. *Journal of Coastal Research* 32(6), 1277-1301.
- van Heteren, S., 1996. Preserved Records of Coastal-Morphologic and Sea-Level Changes in the Stratigraphy of Paraglacial Barriers. Boston, Massachusetts: Boston University, Ph.D. dissertation, 248p.
- van Heteren, S.; FitzGerald, D.M.; Barber, D.C.; Kelley, J.T., and Belknap, D.F., 1996. Volumetric analysis of a New England barrier system using ground-penetrating-radar and coring techniques. *Journal of Geology*, 104(4), 471-483.
- Woods Hole Group Environmental Laboratories, 2006. *Saco River and Camp Ellis Beach*. Raynham, Massachusetts: Woods Hole Group, Section 111 Project. Prepared for the New England Division of the U.S. Army Corps of Engineers, Waltham, Massachusetts, 253p.