We thank A. Revkin for pointing out alternative suggestions for the origin of the boulders and chevrons (V-shaped beach ridges) in the Bahamas. We were aware of those papers but included in our discussion only those mechanisms that could plausibly account for the relevant geological features. Our overall objective, improved insight about the threat of sea level rise and storminess posed by global warming, requires integrated analysis of information from paleoclimate and geologic studies, global modeling, and observations of modern climate change – together constituting a substantial undertaking. Thus we limited marginally pertinent material to avoid an unacceptably long paper. However, one merit of a "Discussion" journal such as ACPD is the opportunity for greater depth in response to specific comments and issues.

Hearty (1997) offered three working hypotheses for mechanisms to account for transport of at least seven "mega-boulders" lying on top of and landward of a 20-m high eolian ridge crest in North Eleuthera. Specifically, he considered tsunami, island margin collapse, and superstorms as potential sources of the large waves required to explain the geologic data. The geologic evidence is documented in several papers of Hearty and colleagues (referenced in our ACPD paper and below) based on numerous extended expeditions to the area; it includes mapping across the Bahamas of chevrons beach ridges that extend several km across lowland areas of islands, with beach-like beds observed to elevations as great as 40 m above sea level. Together the boulders, lowland chevrons, and run-up deposits can be *parsimoniously* accounted for only by large, oriented, and *sustained* long-period waves from the northeast onto the Bahamas.

As preliminary input helpful to addressing specific issues, we note some geologic data that supports a rapid late-Eemian sea level rise and superstorms:

1. Amino acid racemization (AAR, which is a highly effective tool for relative dating and correlation) is not required to establish some basic facts about the boulders and the substrate on which they rest. The boulders are composed of heavily cemented older limestone of hammer-ringing hardness. They rest upon very soft and punky young limestone containing exquisitely preserved fossil land snails that retain primary coloration (Figs. 4 and 5, Hearty, 1997), these characteristics being indicative of the relative youth of the substrate.
2. A "demonstration" of boulder-tossing ability of ocean waves is provided by boulders as large as 92 m^3 (a factor of 10 smaller than the Eemian-age boulders) within a few hundred meters of the boulders that we have associated with Eemian events. In both cases (Eemian and Holocene) the boulders are located at the apex of a narrowing horseshoe-shaped embayment that amplifies ocean surge and splash. The surfaces of Holocene-era boulders include encrusted serpulids, calcareous algae, and marine organisms indicating relatively recent movement from the marine environment to the supratidal. A boulder trim line marks the approximate top of an active abrasion platform on which ocean waves break up to ~10 m above present sea level.
3. Chevron ridges oriented SW-NE and run-up deposits are located not only within 5 km of the megaboulders, but exist in similar orientation along hundreds of km across the eastern Bahamian archipelago. These chevron ridges were formed by waves, not wind, as shown by bands of beach fenestrae preserved in the ridges, the fenestrae formed by air bubbles trapped in fine ooid sand inundated by water and quickly indurated. Some of the chevrons contain multiple smaller ridges nested in the seaward direction (Hearty et al., 1998), providing evidence that sea level was falling fast enough to strand and preserve the older chevrons as distinct landforms.
4. Numerous studies across the globe have identified and documented rapid shifts and sea level rise of several meters at the end of the Eemian (recently by O'Leary et al., 2013). Blanchon et al. (2009) used coral reef backstepping, i.e., the fact that the location of coral reef building moves shoreward as sea level rises, to infer that sea level jumped in the late Eemian by 2-3 meters within an ecological period, i.e., within several decades, during the latter part of the Eemian.

Now we address specific issues raised by Mr. Revkin and his sources:

1. Mylroie (2008; p. 71) states *"... examination of the current setting of the ''boulders'' suggests that they are actually tower karst, remnant hills left behind by erosion of an overlying eolianite unit."* This contrived karstic "process" is not supported by any field observations or data, indeed it is blatantly inconsistent with actual data. The "neat, simple drawing" in their Fig. 13 puts a "proto-boulder" in a limestone valley that then apparently became a hill. It fails to explain why the boulders are composed of diagenetically much older rock than the rock upon which they rest. A geologist visiting the site would recognize that the boulders, with highly disoriented original bedding, are much older than the substrate. The several boulders and their settings make it obvious that they are older rock that has been tossed onto a younger landscape, not relicts of an extensive paleo-landscape transformed by massive karstic dissolution.

   The Eemian era substrate is identifiable throughout the Bahamas by classical field geology mapping, carbonate petrology, and AAR (see above). Its stratigraphic position is as the latest Pleistocene oolitic unit predating the Holocene. Unique petrological characteristics have been used to achieve mapping of Eemian strata across Eleuthera and several other major islands by classical field techniques (Kindler and Hearty, 1996). Although they only rarely contain corals that permit dating, Eemian rocks generate a unique range of AAR ratios consistent with stratigraphy and its diagnostic aragonitic oolitic lithology (Hearty and Kaufman, 2000). These features of Eemian rock are distinctly more youthful and unlike those of the middle Pleistocene units with which the boulders are correlated. Although the AAR ratios cannot provide an exact age, they indicate that the boulders are *at least* 300-400 ky old, i.e., originating during or previous to Marine Isotope Stage 9-11.

2. We did not mention the Bourgeois and Weiss (2008) paper ("Chevrons" are not mega-tsunami deposits – a sedimentologic assessment) because we have never concluded that the chevrons in the Bahamas were a result of tsunamis. On the contrary, as stated by Hearty et al. (1998; p. 318): *"We consider extreme storms and attendant waves as the probable agents that formed these features, because of the northeastern orientation of the chevrons, the continuous and multiple bedding sets they contain, and the nature of the megaboulder deposition."*

   Bourgeois and Weiss (2008) confused the chevron matter by lumping Bahamian chevrons with chevron-shaped landforms in other parts of the world, some of which are obviously eolian dunes or subtidal deposits. The Bahamian chevrons that we consider, as made clear in our paper, are neither eolian dunes nor subtidal deposits. The Bahamian chevrons of concern are accompanied by run-up deposits and beach fenestrae reaching elevations on older immediately adjacent hills as great as 40 meters above today's sea level. Evidence of a succession of intense storm events during end-Eemian sea level regression is indelibly preserved among the sedimentary features in limestone rocks across the archipelago, which is a principal reason that we can exclude both mega-tsunami and island margin collapse as sources of the large waves.

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