Supplement to "Typhoon Haiyan's sedimentary record in coastal environments of the Philippines and its palaeotempestological implications"

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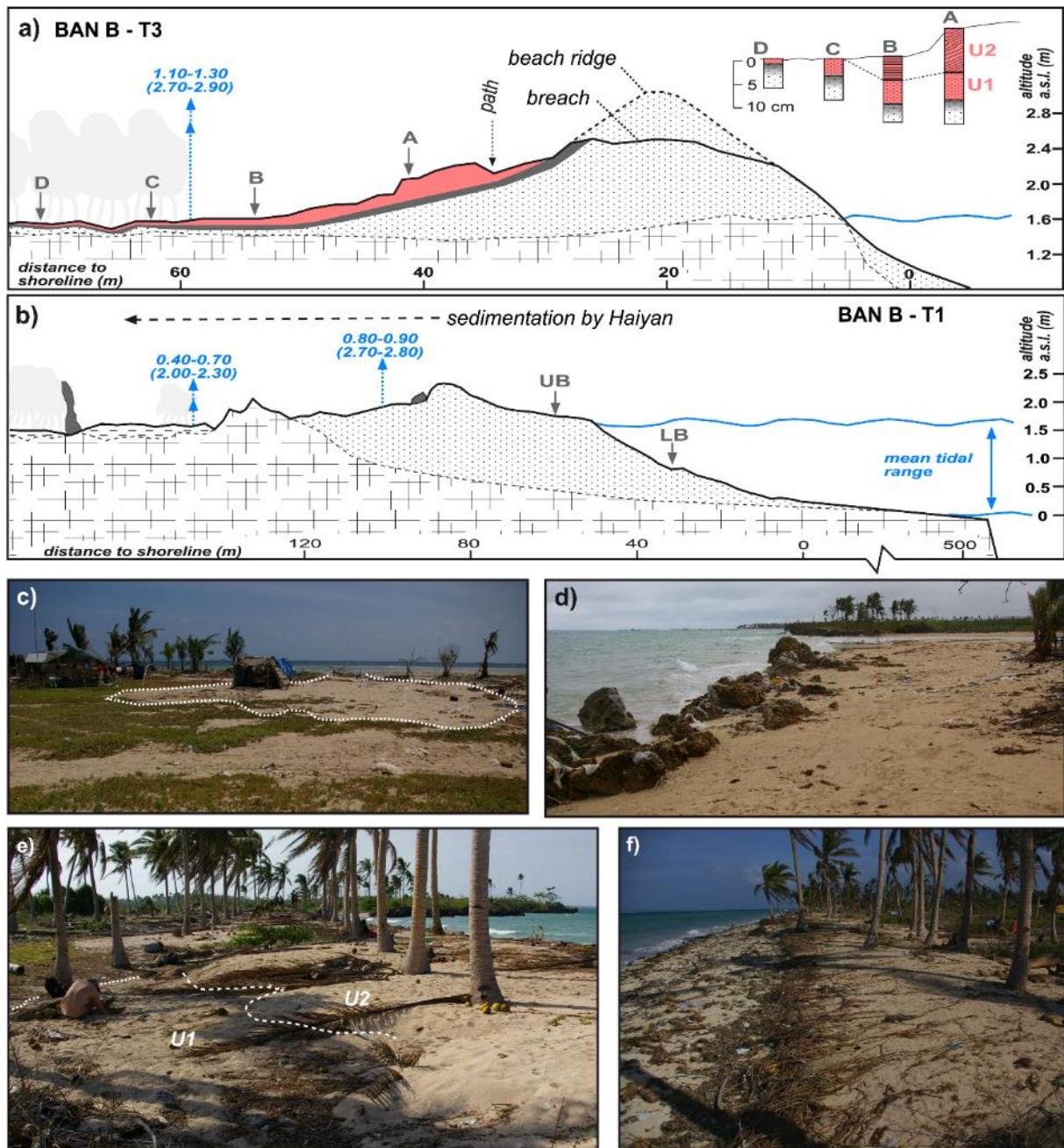
Fig. S1: Morphological and sedimentary characteristics of features created by Typhoon Haiyan at sites BAN A and BAN B. a) Cross section along transect 3 with locations of sampling sites. Directly behind a breach in the coastal barrier a landward thinning washover fan was formed by overtopping waves during Haiyan. The deposits consist of a massive sand sheet at the base (U1) and a laminated unit on top (U2). b) Cross section along transect 1 with location of reference samples from the modern beach (LB and UB). Flooding reached levels of nearly 3 m a.s.l., rapidly decreasing landward. c) Washover fan at BAN B shown from landward direction. d) Beach at BAN B. e) Washover fans at BAN A. Flat lobes of unit 1 (U1) are topped by steeper lobes with a smaller landward extent (U2). f) Beach at BAN A (date of all photographs 22-23 Feb 2014).
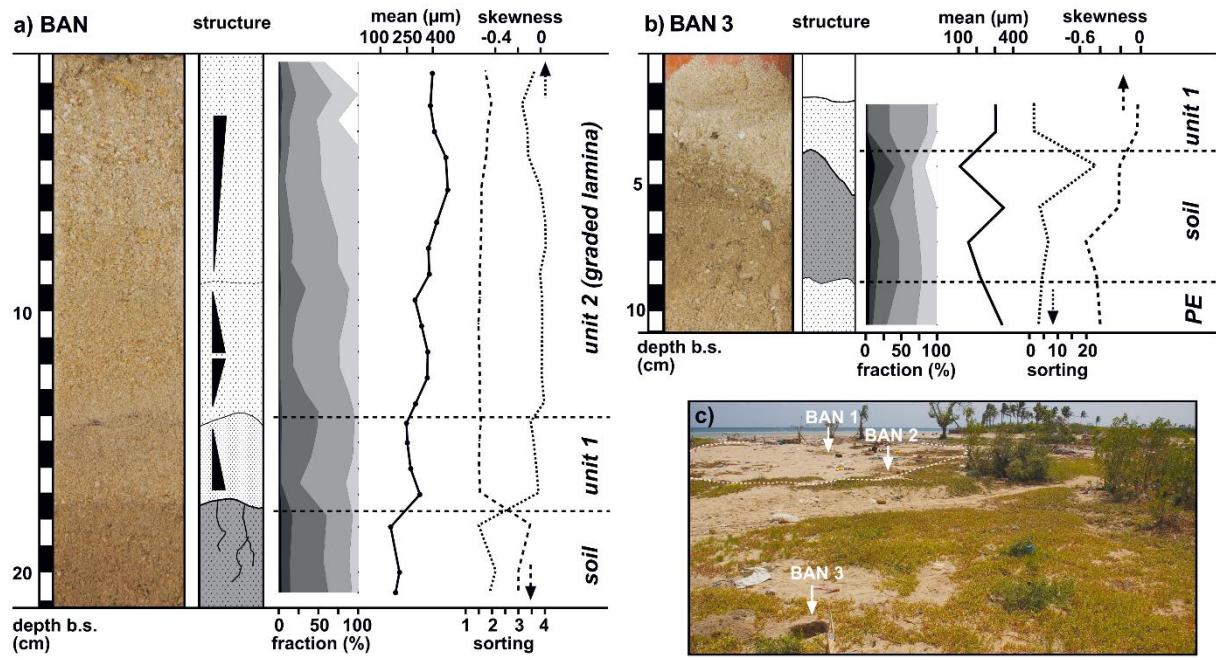
Fig. S2: Sedimentary succession of cores BAN 2 and BAN 3 at BAN B. a) While BAN 2 is composed of two distinct units, a massive or graded unit at the base (unit 1) and a laminated unit on top (unit 2), b) the storm layer in BAN 3 is formed by a single unstructured sedimentary unit only (unit 1). c) Photo at the bottom right shows view to the east along transect 2 (Fig. 11).
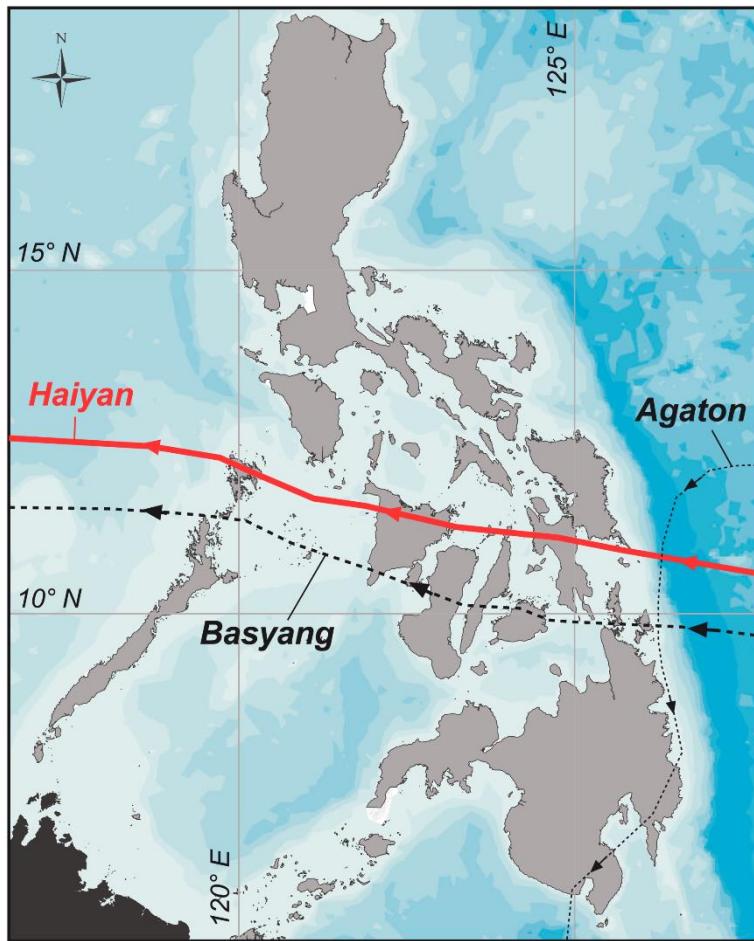
Fig. S3: Tracks of Typhoon Haiyan (NDRRMC 2014), tropical storm Basyang (PAGASA-DOST 2014a) and tropical depression Agaton (PAGASA-DOST 2014b) (map based on ESRI basemaps). While Agaton (January 19th, 2014) affected areas different from those affected by Haiyan, Basyang (February 1st, 2014) followed a similar, but more southern track. Nevertheless, the intensity of both Agaton (sustained wind speeds of up to 100 km/h) and Basyang (up to 120 km/h) was significantly smaller than that of Typhoon Haiyan (315 km/h) (PAGASA-DOST 2014).
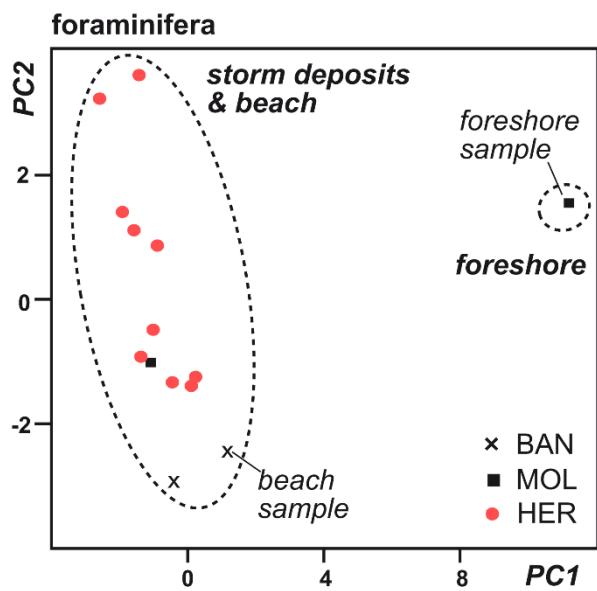
Fig. S4: PCA results on foraminifer data from all sites. Plotting of PC1 versus PC2 separates material from the foreshore on the one hand, and material from the beach and the storm deposits on the other.

Tab. S1: Eyewitness accounts obtained from interviews at the investigated sites. Additional explanations in square brackets are added by the authors. E1-E8 are locations on Bantayan as marked on Figure 1.

Site	Location	Eyewitness	Observation
Hernani	11.300139°N, 125.602389°E	local resident	- inundation reached slope of hill with school building of barangay Batang [260 m inland] - onland flood level in barangay up to 9 m without reaching top of hill with school [12 m a.s.l.]
	11.321244°N, 125.615472°E	local resident	- two storms between Haiyan and field survey [Agaton and Basyang] that caused no significant inundation
Carbin Reef	10.978228°N, 123.464416°E	Guard of Sagay Marine Reserve	- sandy core of the island was completely flooded - strong waves came from changing directions
		fisherman	- coral rubble ridge did not exist prior to Yolanda
Suyac	10.948417°N, 123.455577°E	local resident	- destruction of seawalls and movement of wall blocks by Yolanda - gradual change of wind and wave direction from NNW to WSW (strongest waves)
Bantayan	E1: 11.167167°N, 123.803139°E	local resident	- flooding reached only about 30 m landward of the barrier to the first line of houses - only a few cm of sand at the seaward side of houses
	E2: 11.172222°N, 123.800389°E	local resident	- flooding reached only about 30 m landward of the barrier to the first line of houses - a 8 m long boat was washed over the barrier - waves during Yolanda were so high that people could not see the island 2.5 km offshore anymore [Cabulauan Island]
	BAN A: 11.177550°N, 123.793002°E	local resident	- strong erosion of the beach including basements of exposed houses during Yolanda and Basyang (5–10 m in total) - no significant onshore transport of sediment
	E5: 11.185417°N, 123.782528°E	local resident	- strong erosion of the beach (5–10 m) during Basyang, while erosion by Yolanda was significantly less severe
	E6: 11.232917°N, 123.762361°E	local resident	- flooding by Yolanda reached 100 m inland [at a funnel-shaped inlet] - gradual change of wind direction from north to south during passage of Yolanda - no significant flooding by Basyang or Agaton
	E8: 11.268056°N, 123.755333°E	local resident	- destruction of houses and mangroves up to 50 m inland by Yolanda - no significant impact of Basyang or Agaton
	BAN B: 11.285031°N, 123.748628°E	local resident	- flooding by Yolanda reached at least 100 m inland and flow levels of 1.5 m a.s. in mangroves - Yolanda strongest typhoon of last 20 years; Basyang and Agaton caused no flooding behind the barrier

References

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