**APPENDIX B**

Stratigraphic logs, median grain size, X-ray images, radiocarbon age determinations, sedimentation rates estimated based on 210Pb measurements, as well as magnetic susceptibility of the ~3 to 9 m-long cores have been documented in detail by Ratzov (2009), Ratzov et al. (2010, 2012), Migeon et al. (2017) and Gonzalez (2018), and summarized below. Radiocarbon ages have been performed on planktonicforaminifera collected within hemipelagic layers, and calibrated results are presented on Appendix A.

***KAMA02-01-03*** cores are located from upstream to downstream of a ~1500 m-high slump scar south of the Atacames seamounts (Fig. 1). KAMA02 consists of homogeneous greenish-brown fine-grained, foraminifera-rich, and bioturbated, silty clay (Ratzov et al., 2010), characteristics of hemipelagic slope sediments. It presents large pods of tephra 1.1 mbsf (AMAD-37 sample; Fig. 2a, b), younger than 15 ka (Ratzov et al., 2010). KAMA01 is located within a small sedimentary basin located at mid-slope, that overlies a large slump, and consists of hemipelagic silty clay with few interbedded turbidites, and a thick debris flow deposit from 2.7 mbsf. KAMA03 is located below the slump scar, and presents 27 turbidite layers (Ratzov et al., 2010).

***KAMA17-18*** cores are located on both sides of the Manglares fault (Fig. 1). KAMA17 consists of silty clay interbedded by coarse turbiditic material and foraminifera-rich layers, and presents a 7 cm-thick gray tephra layer (AMAD-29; Fig. 2a) at 4.3 mbsf, deposited about 5368-5532 cal BP (Ratzov, 2009; Appendix A). KAMA18 site is sheltered from major terrigenous inputs and consists of a homogeneous silty sediment with a large tephra layer between 3.06 and 3.54 mbsf, and dated between 4 and 10 ka (AMAD-24-21-22; Fig. 2a). The upper part of the tephra layer presents laminated structures reflecting a subsequent local reworking, the middle part many sulfur crystals, and ended by pods of ocher tephra with massive glass shards.

***KAMA19-22*** cores were collected in 5-10 km-long extensional basins bordering the Ancon fault, northeast of the Manglares Basin (Fig. 1b). KAMA19 consists in homogeneous bioturbated green silty clay, and presents 2 tephra layers (Fig. 2a). The youngest tephra (AMAD-40 sample) is a 2 cm-thick pod located 0.48 mbsf, and deposited during the last 2.2 ka, whereas the oldest one (AMAD-34) is a 4 cm-thick gray-pink tephra located 7.65 mbsf, which was emitted slightly before 4628-4798 cal BP (Ratzov, 2009). KAMA22 presents at least 24 turbidite layers until 5.2 mbsf, and 3 light and pinkish tephra layers enriched in biotite crystals between 5.3 and 6 mbsf, older than 4.5 ka (AMAD-39-35-36).

***KAMA05-09-10-21-24*** cores are located in a distal part of the northern lobe of Patia Canyon (Fig. 1), in the proximal and distal of its southern lobe, on a 100 m-high levee near the mouth of Esmeraldas Canyon (Fig. 1), and on a terrace of Esmeraldas Canyon, respectively. They consist of silty and sandy beds alternating with muddy intervals (Migeon et al., 2017; Collot et al., 2019). KAMA21 presents a thin tephra layer at 5.6 mbsf, that is slightly older than 1295 ± 20 cal BP, based on a 14C age determination performed on wood fragments (Migeon et al., 2017). KAMA09 presents a tephra layer at 4.1 m-depth, whose age is undocumented, whereas KAMA05, KAMA10 and KAMA24 do not record any tephra layers (Migeon et al., 2017; Collot et al., 2019).

No description of ***KAMAf07*** or ***KAMA13*** (Fig. 1a) cores has been published. KAMAf07 is the northernmost site and is located north of the accretionary wedge basin. It is composed of several turbidite sequences interbedded with hemipelagic mud. KAMA13 is located in a small basin north of Manglares basin, isolated from terrestrial imputs, and composed of highly homogeneous hemipelagic sediments with 3 cm-thick tephra layer (AMAD-42; Fig. 2a, c) at 2.55 mbsf.

***KAT15*** is located on a landslide basin in the middle slope, and presents a 1 cm-thick tephra layer (ATAC-43; Fig. 2a) at 5.06 mbsf, deposited between 6.3 and 4.6 ka (Gonzalez, 2018), and interbedded with several turbiditic sequences and heterogeneous silty to sandy sedimentation.

***KAT16-17*** are located in the trench, west of Manta peninsula (Fig. 1b), and are composed of silty clay turbiditic sequences and hemipelagic deposits. KAT16 presents 3 tephra layers at 5.2, 5.6 and 5.9 mbsf, deposited between 1.5 and 9.4 ka. The upper tephra is 3 cm-thick and laminated with massive shards (ATAC-44), the intermediate tephra is 1 cm-thick and two-tones (ATAC-45), and the lower tephra is 1 cm-thick and laminated (ATAC-46). KAT17 records 4 tephra layers at 3.6, 5.2, 6.0 and 6.2 mbsf, deposited between 3.9 and 8.9 ka (Gonzalez, 2018; Fig. 2a). The upper tephra is 1 cm-thick with light shards (ATAC-47), the second tephra is 0.5 cm-thick and laminated (ATAC-48), the third tephra is 1 cm-thick and two-tones (ATAC-49), and the lower tephra consists of a 20 cm-thick mixture of clay and light glass shards (ATAC-50 sample).

***KAT18*** (Fig. 2a) is located on a small slope basin near an ancient canyon. It presents a heterogeneous sedimentation with several ~10-30 cm-thick turbidite sediments, interbedded with layers enriched in foraminifera, and highly bioturbated clay layers in deeper sections, as well as 3 tephra layers at 1.6, 2.1 and 2.9 mbsf, dated between 3.5 and 7.5 ka (Gonzalez, 2018). The upper tephra are 1 and 3-4 cm-thick and two-tones (ATAC-51 and ATAC 52, respectively), and the lower tephra is <1 cm-thick with light massive glass shards (ATAC-53).

***KAT20-21*** cores are located on a slope basin and on the trench, respectively, and are mainly composed of numerous turbitic sequences and hemipelagic sediments. KAT20 presents 3 debris flows between 6.4 and 5.2 mbsf, as well as 3 tephra layers, deposited at 1.83 and 1.98 mbsf during the last 4.3 ka (ATAC-55 and ATAC-56, respectively, and highly bioturbated), and at 3 mbsf (two-tones ATAC-57 sample) between 4.3 and 6.4 ka. KAT21 is located next to the Atacames seamonts (Fig. 1), and presents the deepest tephra layer of this study, recorded at 9.25 mbsf (ATAC-58; Fig. 2a), under sediments dated at 5.7 ka (Gonzalez, 2018).

***KAT22-23*** cores are located in the trench. KAT22 is composed by thick olive grayish turbidite clay without bioturbation, and presents a thick tephra layer 8.8 mbsf (ATAC-59; Fig. 2a), dated at 4052-4223 cal BP (Gonzalez, 2018; Appendix A), whereas KAT23 is only composed by a 5 m-thick turbidite sequence that cover a debris flow deposit.