Appendix B. Reference Stratigraphic Sections

Study Area 1

Except for core site SB1-03, the push cores collected at each marsh-core site were used to define most reference emergent-marsh stratigraphic thicknesses and contact elevations in study area 1 (fig. B1). Vibracore SB1-03v was used to define the reference emergent-marsh stratigraphy at core site SB1-03, where push core SB1-03p did not recover a complete stratigraphic section. The contact between stratigraphic units 2 and 3 is indistinct in push core SB1-05p, and push core SB1-09p did not penetrate below unit 3; for those contacts, vibracores SB1-05v and SB1-09v, respectively, were used to determine the reference stratigraphic thicknesses and elevations.

Study Area 2

Elevations at the bases of stratigraphic units 1 and 2 at core site SB1-14, located on an emergent-marsh remnant in the northern part of study area 2, average about 30 cm higher than those same contacts at the other emergent-marsh sites; also, the thickness of unit 3 in core SB1-14v (not penetrated in core SB1-14p) is about two to three times greater than the thickness of that same unit at any other core site. For these reasons, the emergent-marsh stratigraphy at core site SB1-14 was excluded from the reference stratigraphic section for study area 2. Push cores SB1-11p and SB1-16p were used to define the reference emergent-marsh stratigraphic thicknesses and contact elevations at those core sites. Push core SB1-18p did not penetrate below stratigraphic unit 2, and units 1 and 2 are undifferentiated in push core SB1-20p; at those core sites, vibracores SB1-18v and SB1-20v, respectively, were used to define the reference emergent-marsh stratigraphy.

The geometric solution along a single transect describes the reference stratigraphic section in two-dimensional (2-D) space such that the vertical thickness of each stratigraphic unit varies with distance along the transect. Where transects intersect, however, a simple three-dimensional (3-D) surface that is hinged along one of the transects was used to model the intersection of the 2-D reference sections. At study area 2 (figs. B2 and B3), the east-west transect between marsh-core sites SB1-18 and SB1-20 forms this hinge line, and the reference stratigraphic contacts dip toward the southern part of the study area, where marsh-surface elevations and peat thicknesses are the greatest. In this case, the reference stratigraphy solved at the open-water core site SB1-35 (intersection of transects) between emergent-marsh sites SB1-18 and SB1-20 (fig. B2) is held constant and those contact elevations are used to derive the geometric solution along the north-south transect between emergent-marsh sites SB1-11 and SB1-16 (fig. B3).

Study Area 3

The peat section (stratigraphic unit 1) recovered in push core SB5-10p was thicker (78 cm) than in any other emergent-marsh core except the interior-marsh push core SB5-07p, and the elevation at the base of unit 1 in core SB5-10p was deeper than at any other core site. In contrast, the decompacted peat thickness in vibracore SB5-10v (47 cm) was about 10 cm less than at the surrounding emergent-marsh sites SB5-01, SB5-03, and SB5-12, indicating that the linear decompaction method likely underestimated the magnitude of organic-sediment in this core. For these reasons, the emergent-marsh stratigraphy at core site SB5-10 was excluded from the reference stratigraphic section for study area 3. The push cores collected at each marsh-core site were used to define most reference emergent-marsh stratigraphic thicknesses and contact elevations in study area 3. The contact between stratigraphic units 2 and 3 is indistinct in push core SB5-08p; the decompacted base of unit 2 from vibracore SB5-08v was used to define the reference emergent-marsh stratigraphy at this core site.

At study area 3 (figs. B4 and B5), the 3-D geometric solution hinges along the east-west transect between marsh-core sites SB5-01 and SB5-05, and the reference stratigraphic contacts slope up toward marsh-core site SB5-08, where the marsh-peat section is thinnest. The reference stratigraphy solved at the open-water core site SB5-15 (intersection of transects) between emergent-marsh sites SB5-01 and SB5-03 (fig. B4) is held constant and those contact elevations are used to derive the geometric solution along the north-south transect between emergent-marsh sites SB5-08 and SB5-12 (fig. B5).

Study Area 4

The peat section (stratigraphic unit 1) recovered in push core SB5-34p was thicker (77 cm) than in any other emergent-marsh core collected in study area 4, and the elevation at the base of unit 1 in core SB5-34p was more than 20 cm deeper than at any other core site. In contrast, the decompacted peat thickness in vibracore SB5-34v (34 cm) was about half as thick as at any other emergent-marsh site. For these reasons, the emergent-marsh stratigraphy at core site SB5-34 was excluded from the reference stratigraphic section for study area 4. The push cores collected at each marsh-core site were used to define most reference emergent-marsh stratigraphic thicknesses and contact elevations in study area 4. Stratigraphic units 1 and 2 are undifferentiated in core SB5-26p. However, elevations at the base of unit 2 and at two correlated unit 3 interbeds in core SB5-26p are about the same (within 1 cm) for those

same contacts in core SB5-24p, so we assumed that the elevation at the base of the unit 1 peat was also the same in those cores when defining the reference emergent-marsh stratigraphy.

At study area 4 (figs. B6 and B7), the 3-D geometric solution hinges along the primary transect between marsh-core sites SB5-24 and SB5-36 (fig. B6), and elevations of the reference stratigraphic contacts dip slightly toward marsh-core site SB5-28 near the center of study area 4. The reference stratigraphy solved at the open-water core site SB5-46 between emergent-marsh sites SB5-24 and SB5-28 is held constant, and those contact elevations are used to derive the geometric solution along the short intersecting transect between emergent-marsh sites SB5-32 and SB5-30 (fig. B7). Because we were unable to resolve the stratigraphic discrepancies at emergent-marsh site SB5-34, the reference stratigraphy solved at the open-water core site SB5-40 between emergent-marsh sites SB5-28 and SB5-36 was assumed to be the best representation of the reference section at core sites SB5-35 and SB5-41.

Although only a few centimeters of peat (stratigraphic unit 1) were recovered in marsh-edge core SB5-33p (appendix A), the contact elevations at the base of units 1 and 2 were higher than those elevations in any other core and were about 30 cm higher than the reference stratigraphic section at that location (table 1). The most likely explanation for this discrepancy is that the water depth measured in the field was inaccurate. For this reason, core SB5-33p was omitted from the stratigraphic cross sections.

Study Area 5

No vibracores were collected at study area 5. The push cores collected at each marsh-core site were used to define the reference emergent-marsh stratigraphic thicknesses and contact elevations (fig. B8).

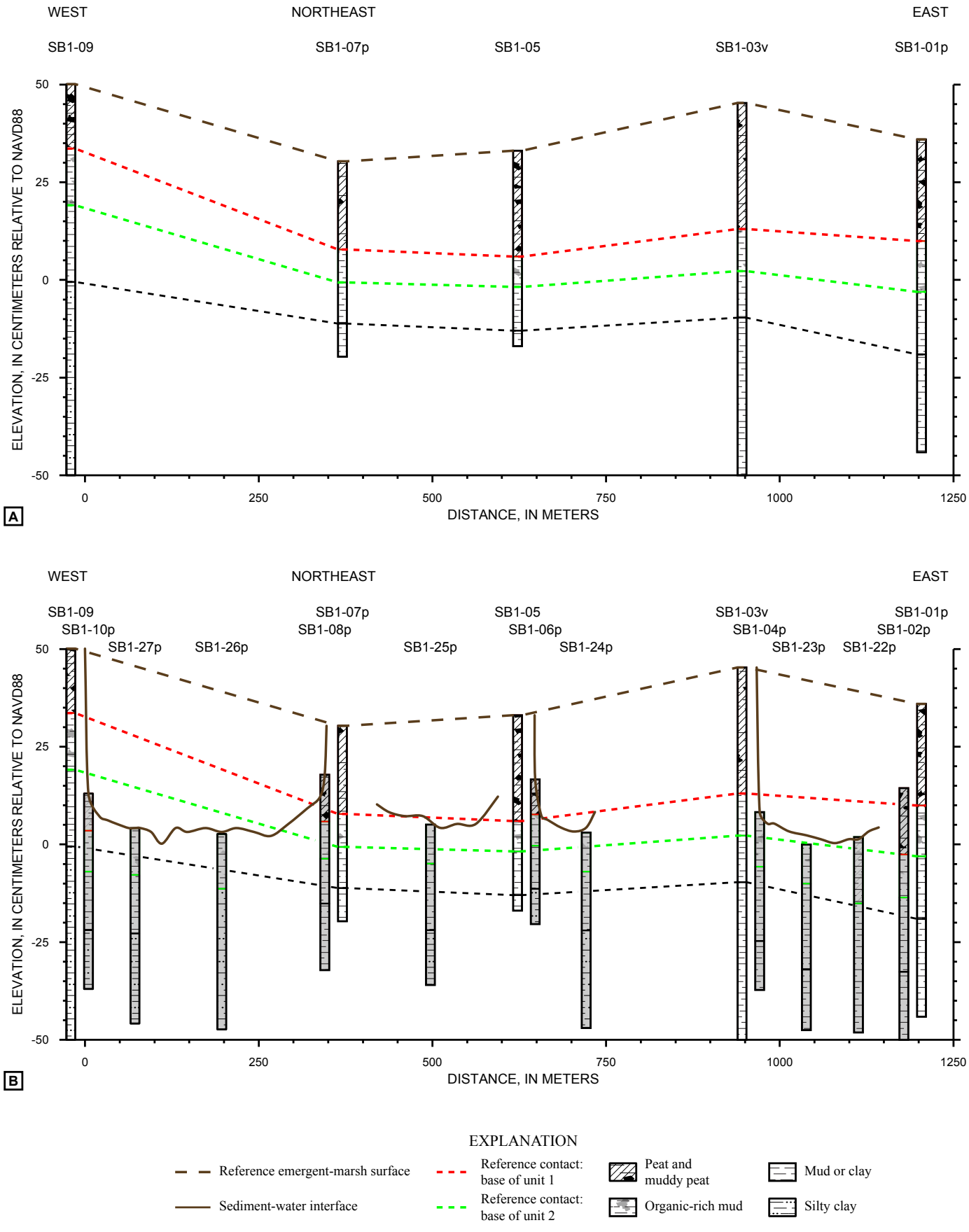

Figure B1. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB1-09 and SB1-01 at study area 1. (B) Reference stratigraphic section between emergent-marsh sites SB1-09 and SB1-01 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 12; vertical scale is greatly exaggerated.

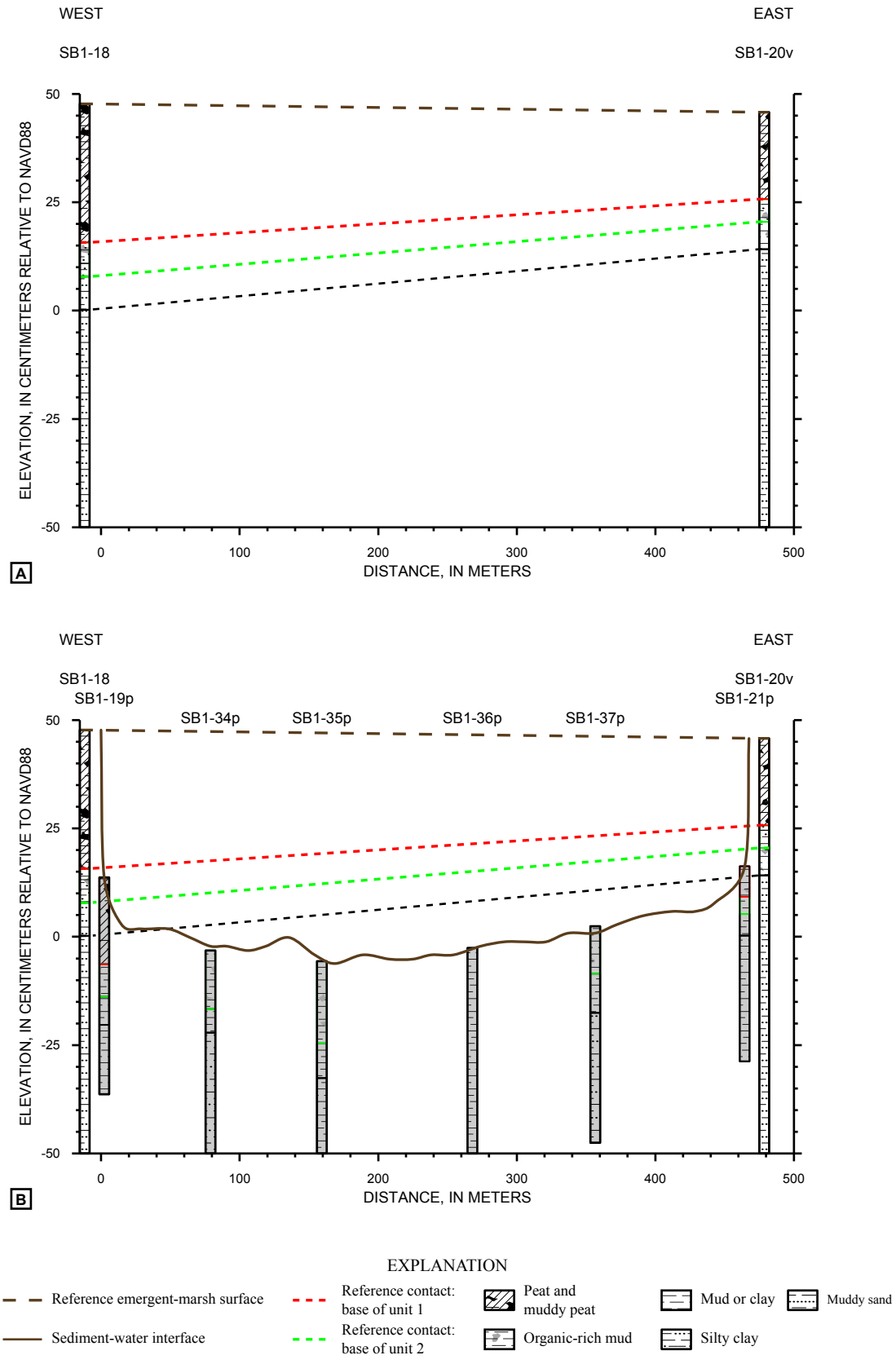

Figure B2. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB1-18 and SB1-20 at study area 2. (B) Reference stratigraphic section between emergent-marsh sites SB1-18 and SB1-20 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 14; vertical scale is greatly exaggerated.

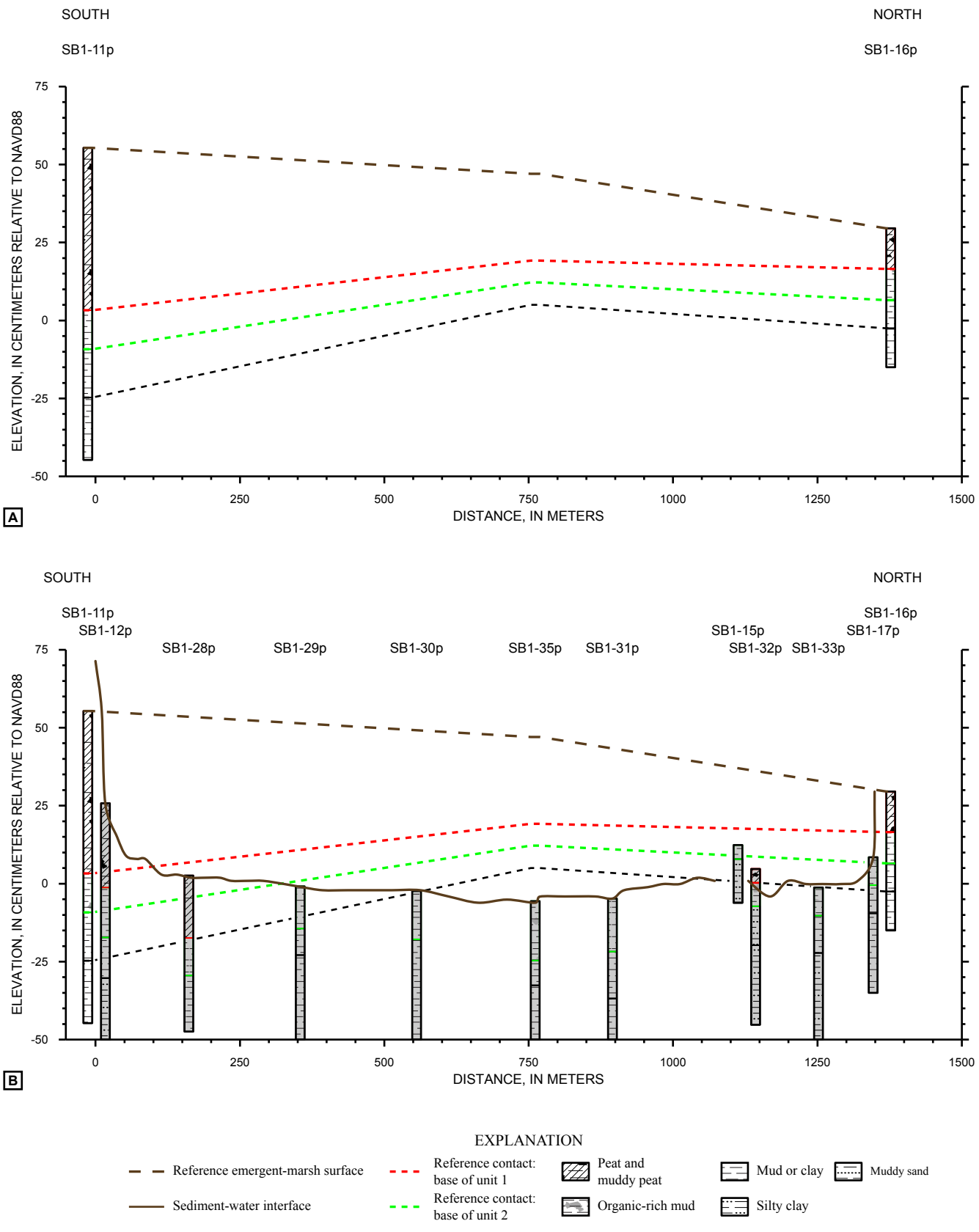

Figure B3. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB1-11 and SB1-16 at study area 2. Reference marsh-surface and contact elevations at core site SB1-35 (intersection of transects) are the same as in figure B2. (B) Reference stratigraphic section between emergent-marsh sites SB1-11 and SB1-16 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 14; vertical scale is greatly exaggerated.

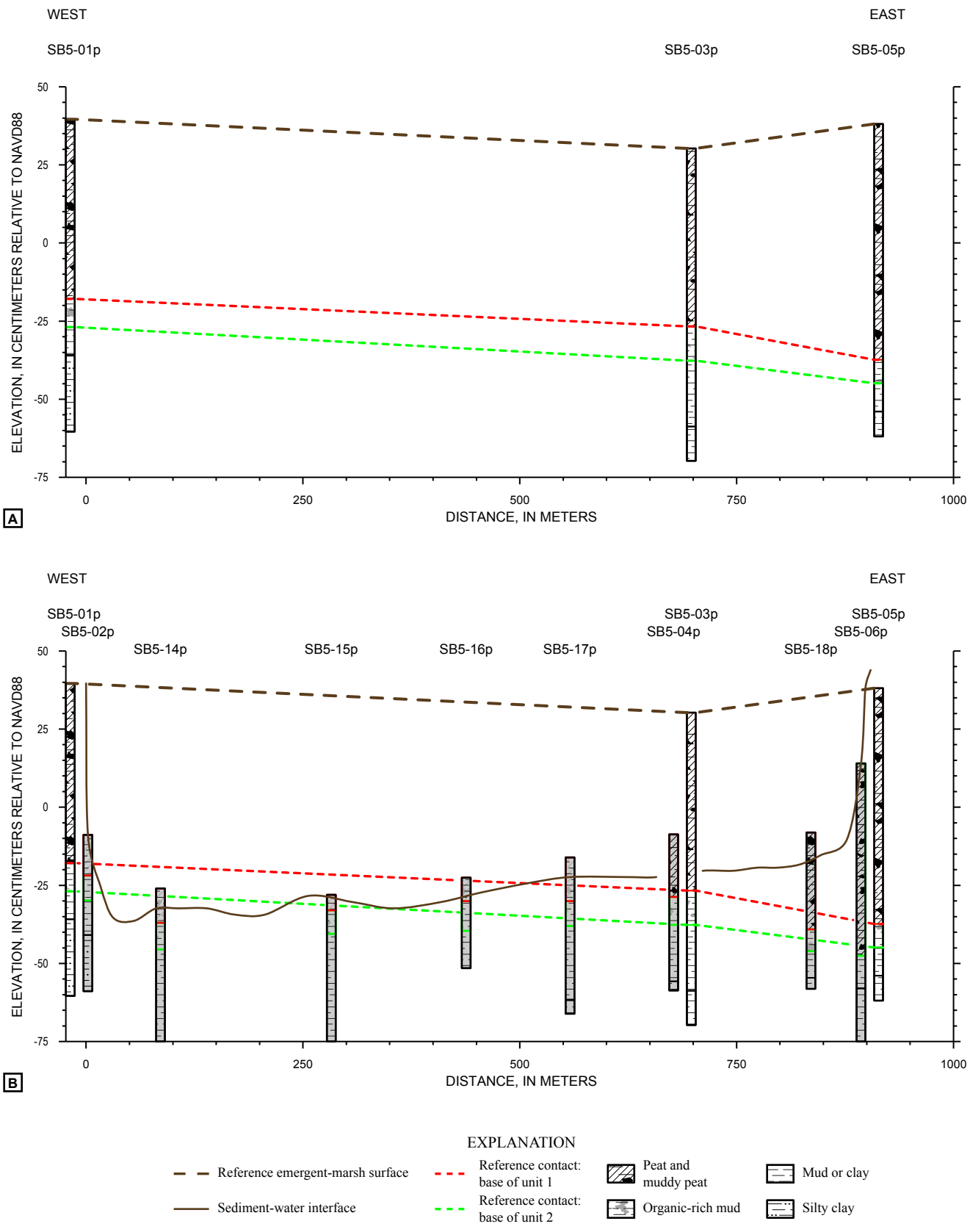

Figure B4. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB5-01 and SB5-05 at study area 3. (B) Reference stratigraphic section between emergent-marsh sites SB5-01 and SB5-05 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 17; vertical scale is greatly exaggerated.

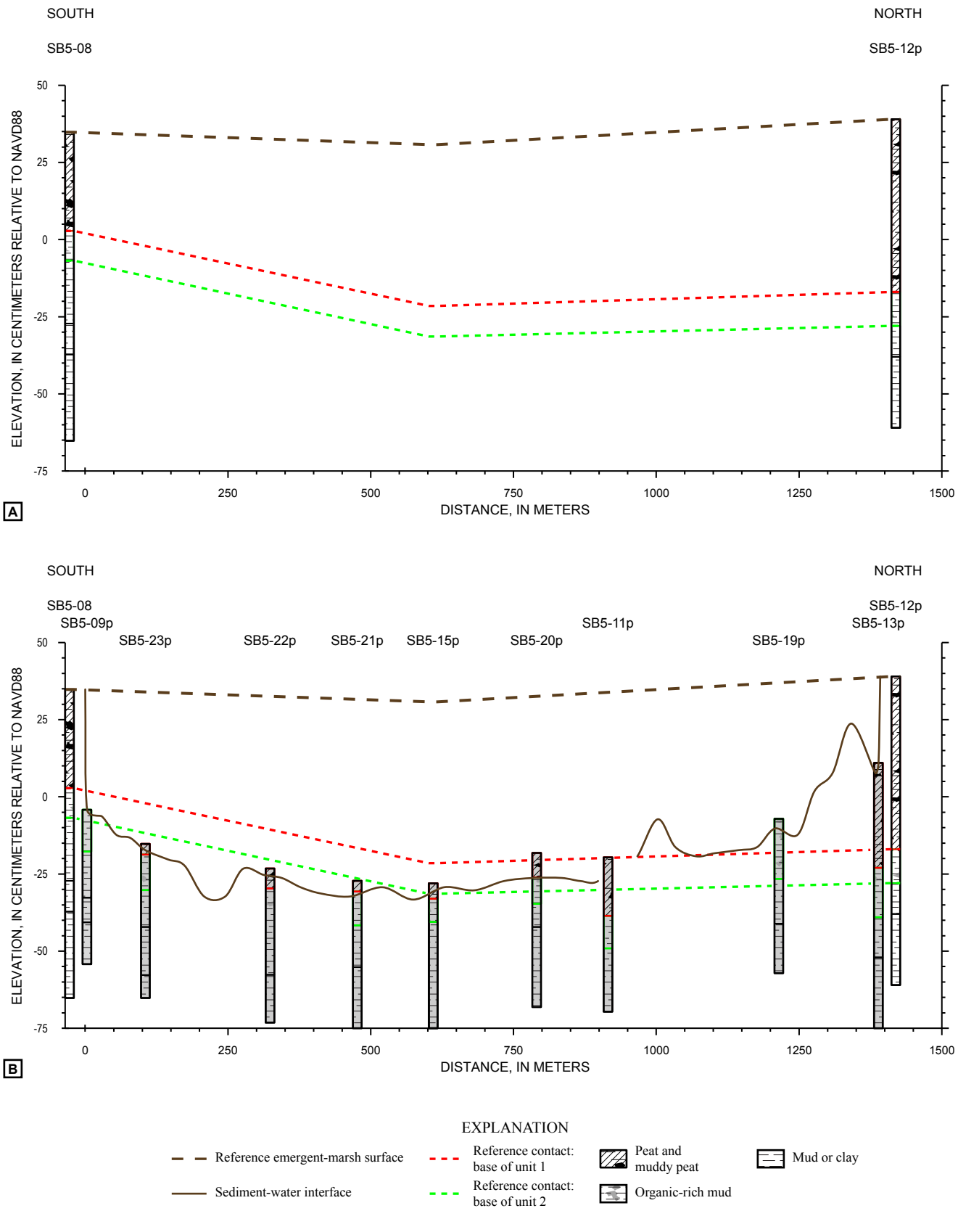

Figure B5. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB5-08 and SB5-12 at study area 3. Reference marsh-surface and contact elevations at core site SB5-15 (intersection of transects) are the same as in figure B4. (B) Reference stratigraphic section between emergent-marsh sites SB5-08 and SB5-12 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 17; vertical scale is greatly exaggerated.

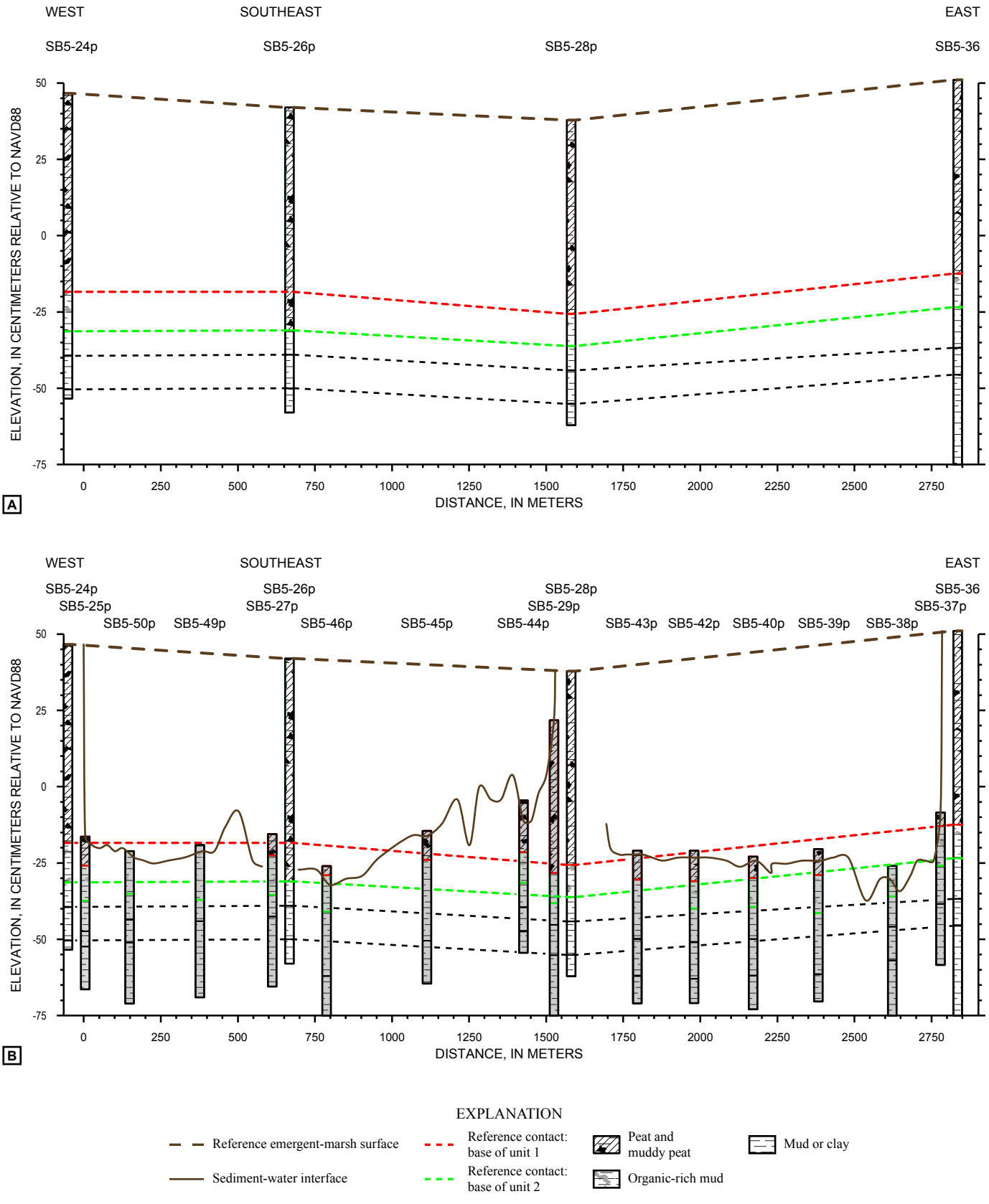

Figure B6. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB5-24 and SB5-36 at study area 4. (B) Reference stratigraphic section between emergent-marsh sites SB5-24 and SB5-36 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 20; vertical scale is greatly exaggerated.

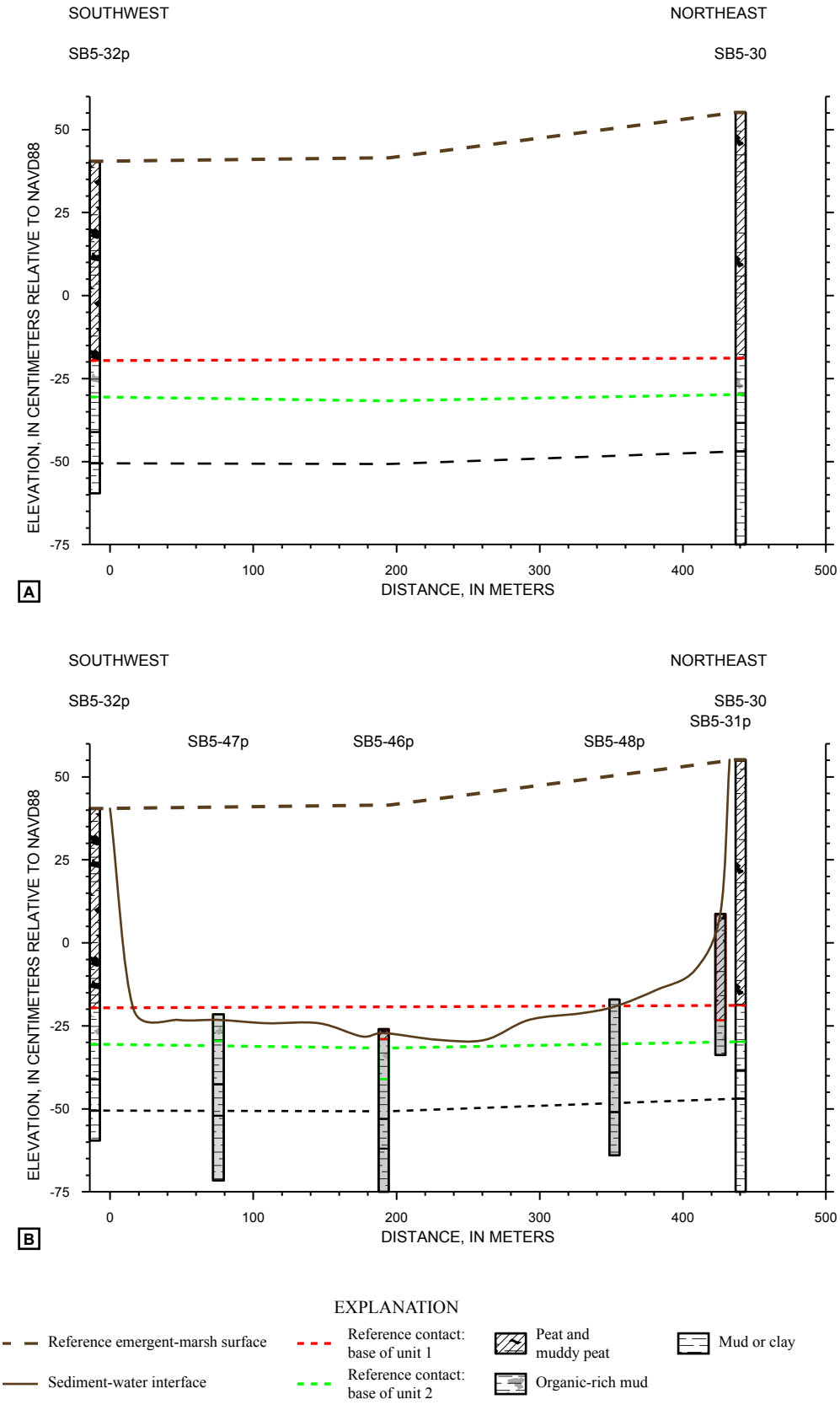

Figure B7. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB5-32 and SB5-30 at study area 4. Reference marsh-surface and contact elevations at core site SB5-46 (intersection of transects) are the same as in figure B6. (B) Reference stratigraphic section between emergent-marsh sites SB5-32 and SB5-30 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 20; vertical scale is greatly exaggerated.

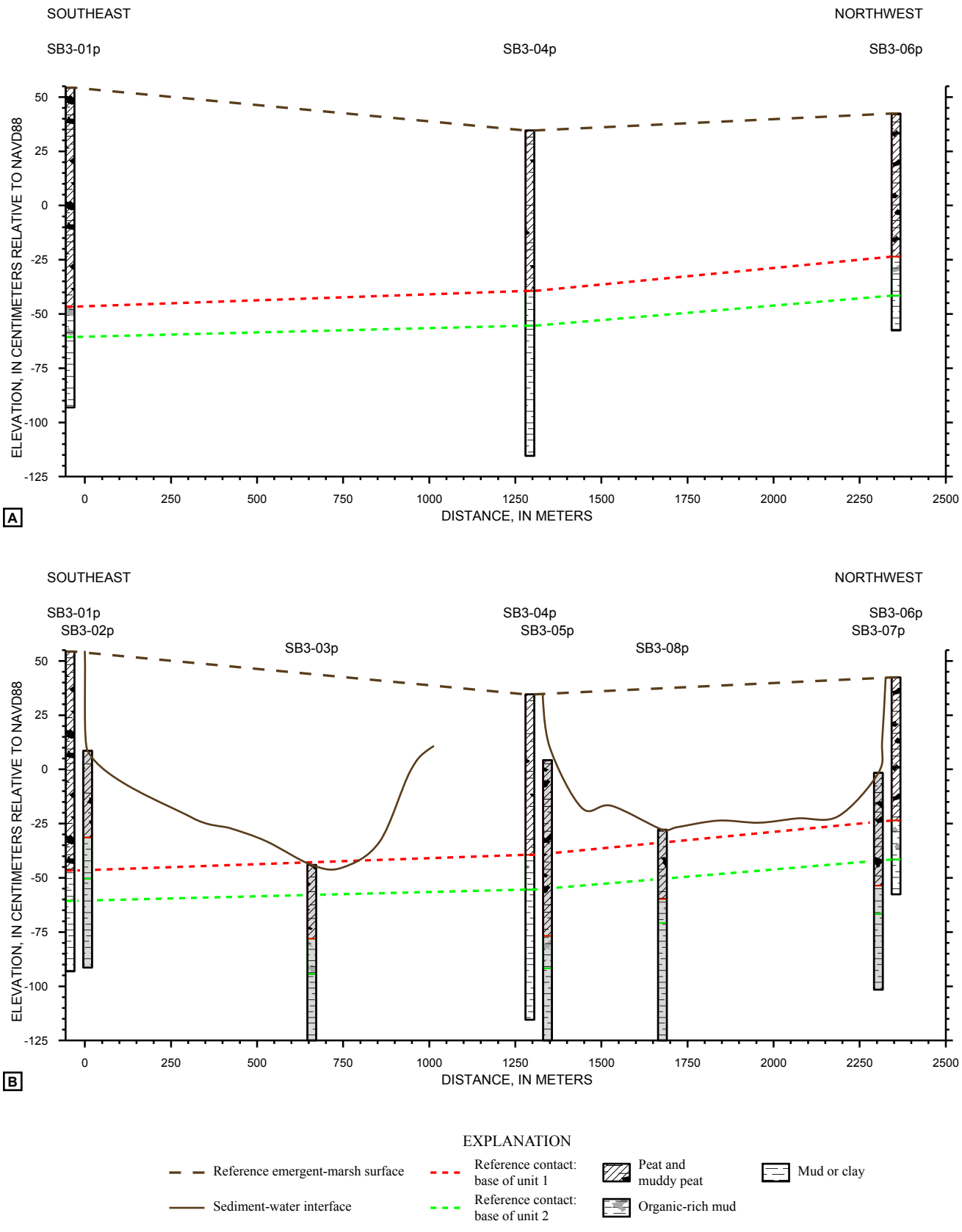

Figure B8. (A) Geometric derivation of the reference stratigraphic section used to estimate subsidence and wetland erosion between emergent-marsh sites SB3-01 and SB3-06 at study area 5. (B) Reference stratigraphic section between emergent-marsh sites SB3-01 and SB3-06 with extant sediment-water interface and marsh-edge and open-water cores (in gray). Highlighted contacts are the base of stratigraphic units 1 (in red) and 2 (in green). Core locations are shown in figure 23; vertical scale is greatly exaggerated.