Data Repository material to "How stable is the Mississippi Delta?" by T.E. Törnqvist, S.J. Bick, K. van der Borg, and A.F.M. de Jong

CROSS SECTIONS

The basal-peat samples from the southwestern Mississippi Delta were obtained from four cross sections (three from the Bayou Cypremort area, one from the Bayou Sale area). Locations of the cross sections are shown in Figure DR1. The Pleistocene basement in this area consists of Peoria Loess, typically a few meters in thickness, and in turn overlying the highly consolidated Prairie Complex (Autin et al., 1991).

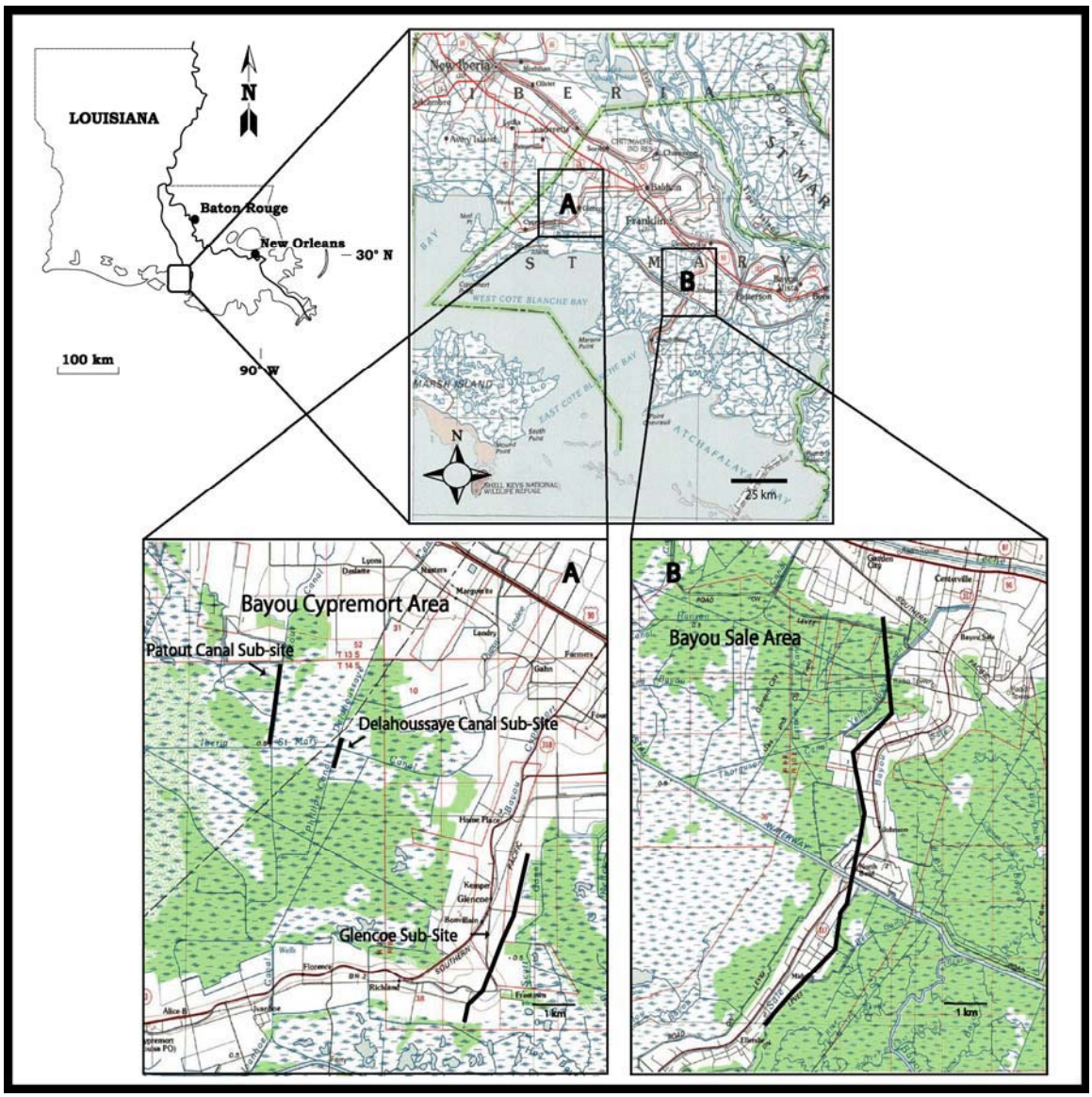

Figure DR1

The Bayou Sale cross section (Fig. DR2) shows a dipping Pleistocene basement capped by a weakly developed paleosol consisting of a dark gray A-horizon (cf. Törnqvist et al., 2004a). The Holocene succession is predominantly clastic, consisting primarily of silty overbank facies of Bayou Sale and possibly older distributaries. The deepest part of the clastic unit contains bivalves of *Rangia cuneata*, indicating deposition in a brackish, lagoonal environment. A basal peat bed is encountered at depths >11 m below MSL; three ^{14}C samples were obtained in a vertical range of ~3 m.

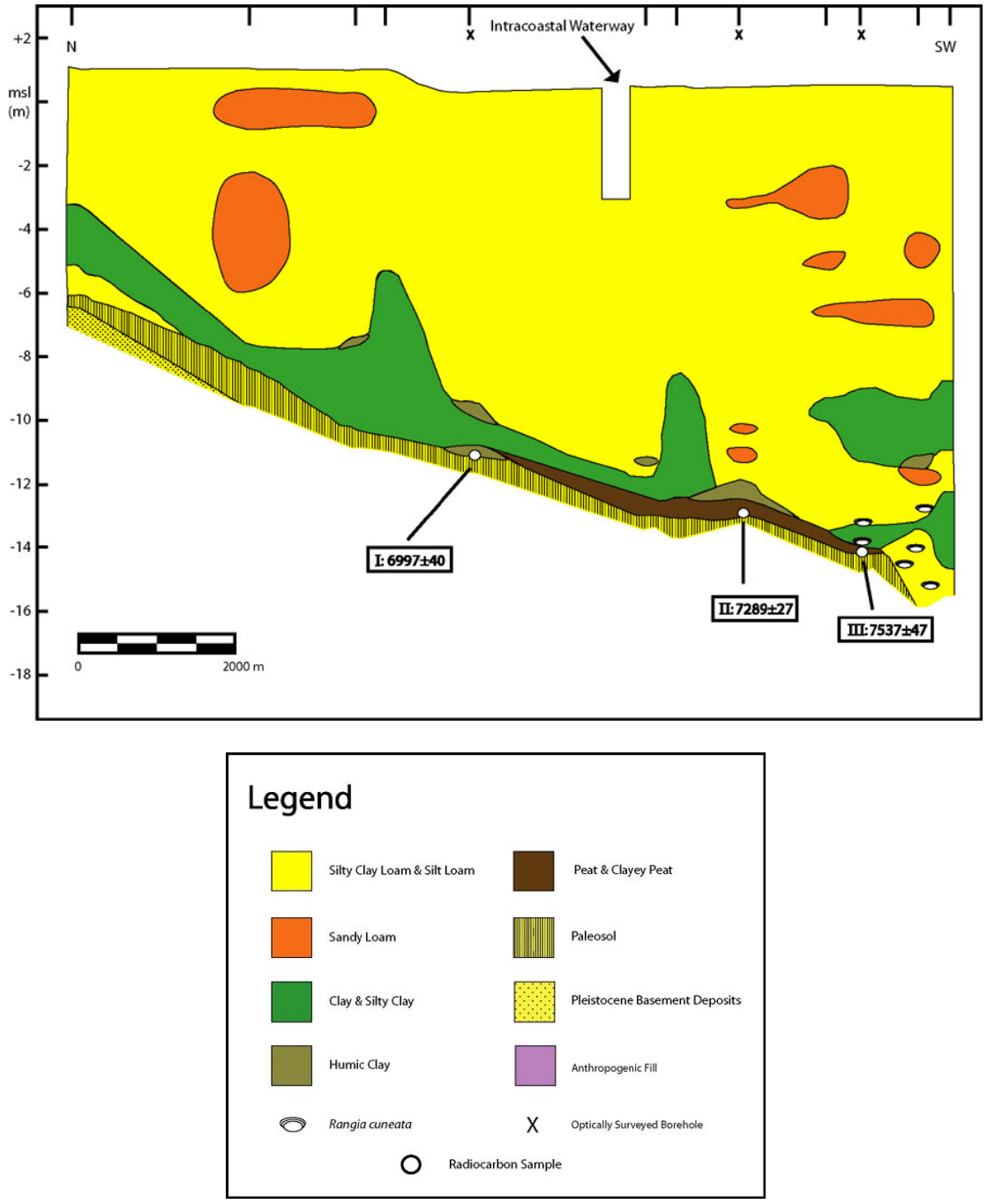

Figure DR2

The Glencoe cross section (Fig. DR3) is located in the southeastern part of the Bayou Cypremort area where the Pleistocene basement is the deepest. Basal peat is found nearly throughout this cross section on top of an undulating Pleistocene surface; the deepest peat occurrences are overlain by lagoonal facies. The three ^{14}C samples cover a depth range from ~10 to ~5 m below MSL and track about 2000 ^{14}C yr of RSL rise.

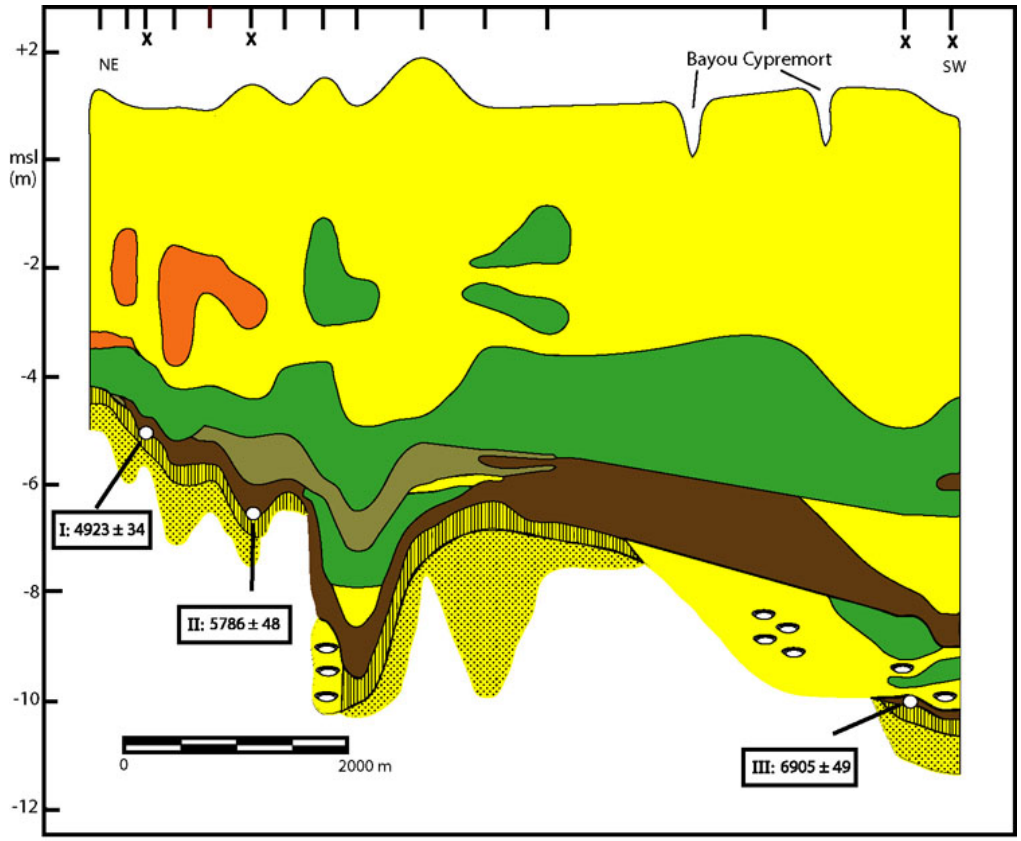

Figure DR3

The Delahoussaye Canal cross section (Fig. DR4) shows a gently dipping Pleistocene basement, mostly onlapped by a highly consolidated, clayey to silty overbank deposit that is capped by an A-horizon similar to the one found at the top of the Pleistocene basement. The clastic Holocene unit is most likely an overbank deposit of Bayou Teche, the trunk channel belt of the Teche subdelta. Basal peat resting on the Pleistocene is only found in the deepest part of the cross section and pinches out under the Teche overbank deposit. The uppermost of the two ^{14}C samples not only provides a sea-level index point, but also constrains the maximum age of the Teche subdelta. Its ^{14}C age (4419 ± 42 yr B.P.) is considerably younger than the widely used age of Frazier (1967) of ~5700 yr B.P., suggesting that the Teche subdelta age has been overestimated by more than 1000 ^{14}C yr (cf. Törnqvist et al., 1996).

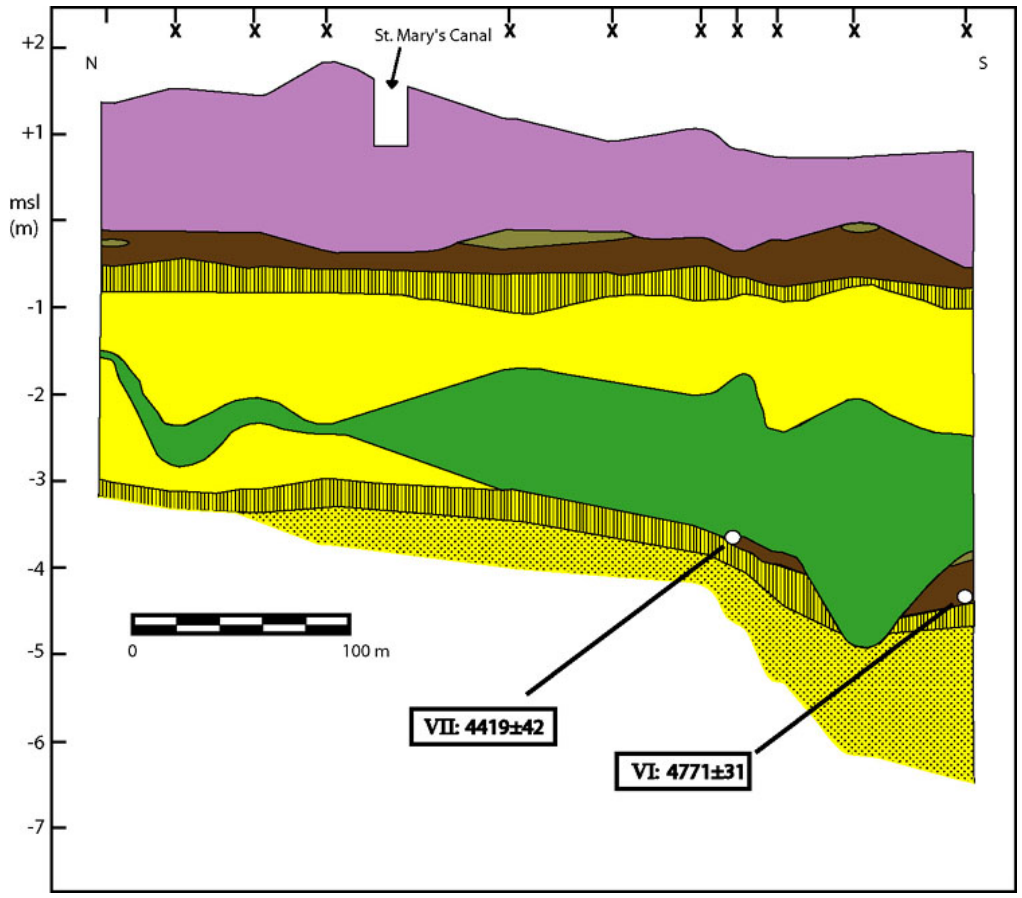

Figure DR4

The Patout Canal cross section (Fig. DR5) shows a stratigraphy very similar to that in the Delahoussaye Canal area, but no basal peat is found immediately overlying the Pleistocene basement. However, a laterally extensive peat bed buries the overbank strata of Bayou Teche and rests on a similar paleosol. The Teche deposit is extremely consolidated, indicating that compaction of this unit after peat onlap has been negligible. Three ^{14}C samples track RSL rise through the uppermost meter into the present. The robustness of these data is indicated by the shallowest sample that is nearly modern in age and is located near present MSL.

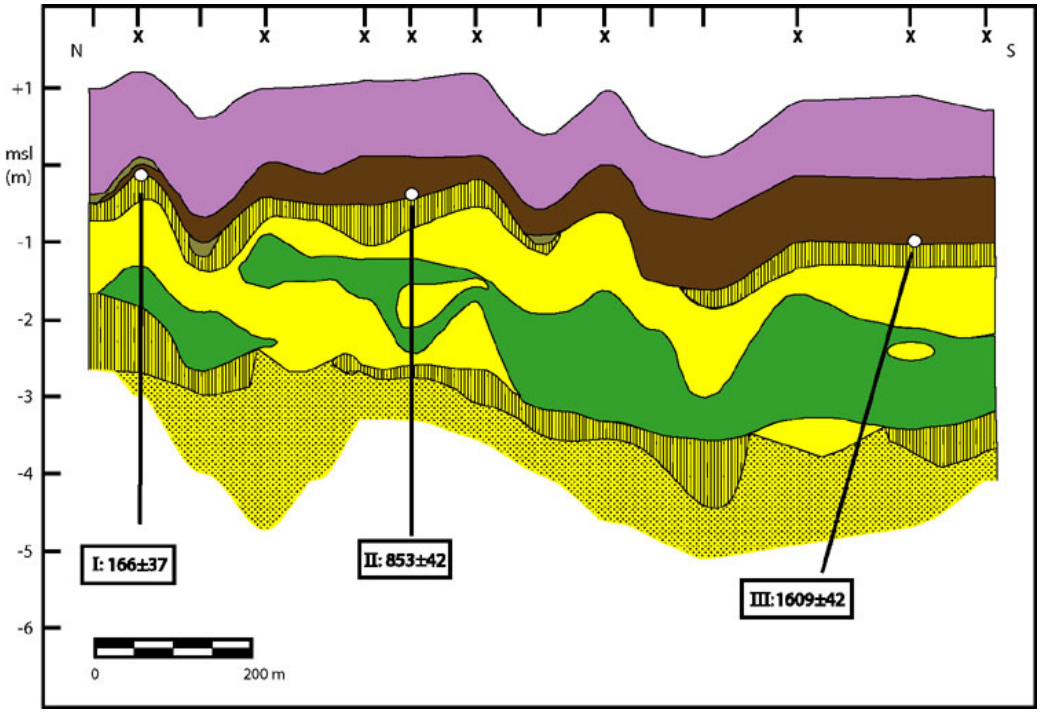

Figure DR5

RADIOCARBON DATA

Table DR1

Sample name	UTM-coordinate (N)	UTM-coordinate (E)	Surface elevation (m)	Depth below surface (cm)	Material dated	$\delta^{13}C_{PDB}$ (‰)	Age (^{14}C yr B.P.)	Lab number
Patout Canal I-1	3302.960	622.520	1.20	129-133	5 Cyperaceae achenes	–25.4	166 ± 37	UtC-12115
Patout Canal II-1	3302.620	622.480	1.09	146-150	9 *Scirpus* spp. achenes	–27.1	853 ± 42	UtC-12101
Patout Canal III-1	3302.000	622.380	0.92	189-193	4 charcoal fragments	–25.5	1609 ± 42	UtC-12102
Delahoussaye Canal VI-1a	3301.600	624.180	0.84	513-517	4 *Polygonum* spp. achenes	–27.3	4661 ± 46†	UtC-12503
Delahoussaye Canal VI-1b	3301.600	624.180	0.84	513-517	>10 charcoal fragments	–12.0	4867 ± 43†	UtC-12504
Delahoussaye Canal VII-1	3301.720	624.230	0.85	452-454	1 charcoal fragment	–26.2	4419 ± 42	UtC-13281
Glencoe I-1	3298.040	629.680	0.91	587-591	25 *Scirpus* spp. achenes	–25.7	4923 ± 34	UtC-12103
Glencoe II-1	3298.340	629.500	1.44	798-802	20 *Scirpus* spp. achenes	–25.5	5786 ± 48	UtC-12104
Glencoe III-1a	3295.080	628.060	1.34	1131-1135	11 *Scirpus* spp. achenes	–25.7	6934 ± 84†	UtC-12116
Glencoe III-1b	3295.080	628.060	1.34	1131-1135	3 charcoal fragments	–17.0	6890 ± 60†	UtC-12105
Bayou Sale I-1	3286.280	648.320	0.27	1156-1158	15 *Carex peryginum* type achenes	–26.7	6997 ± 40	UtC-12505
Bayou Sale II-1a	3282.340	647.520	0.48	1353-1355	2 charcoal fragments	–21.6	7480 ± 110†	UtC-12506
Bayou Sale II-1b	3282.340	647.520	0.48	1353-1355	5 charcoal fragments	–18.3	7265 ± 32†	UtC-12487
Bayou Sale II-2	3282.340	647.520	0.48	1350-1353	15 *Scirpus* spp. achenes	–27.9	7317 ± 60†	UtC-12872
Bayou Sale III-1a	3281.100	646.080	0.48	1474-1476	11 *Scirpus* spp. achenes	–26.3	7830 ± 60‡	UtC-12488
Bayou Sale III-1b	3281.100	646.080	0.48	1474-1476	1 charcoal fragment	–13.0	7537 ± 47	UtC-12507

†Weighted mean ages for Delahoussaye Canal VI-1: 4771 ± 31; Glencoe III-1: 6905 ± 49; Bayou Sale II-1/2: 7289 ± 27
‡Rejected (see Törnqvist et al., 2004b)

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