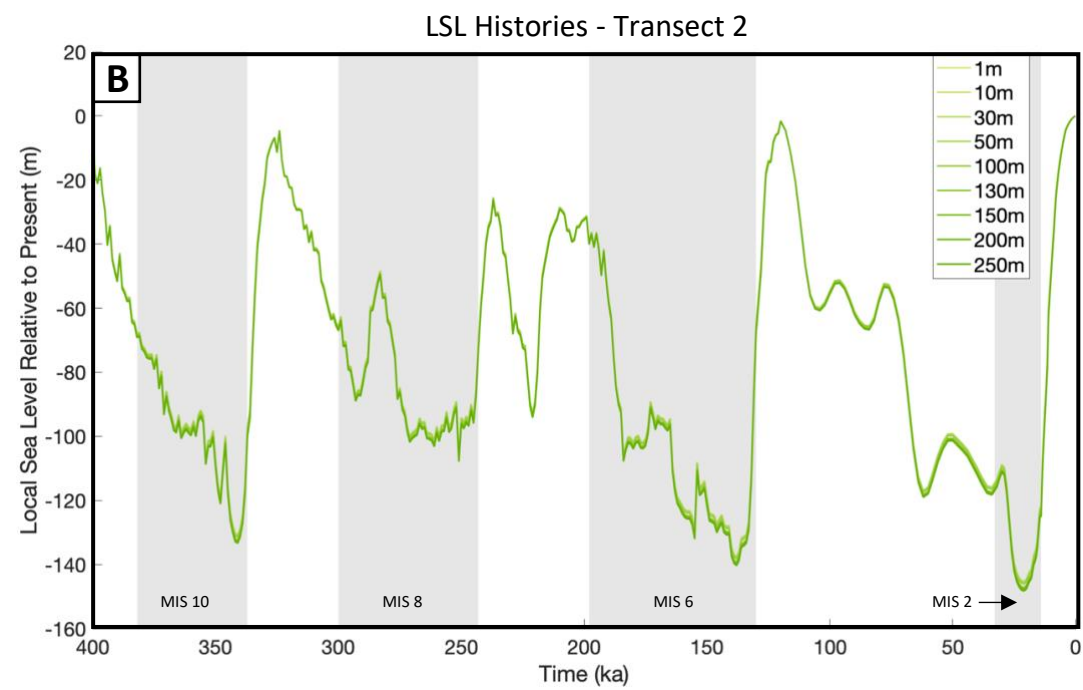
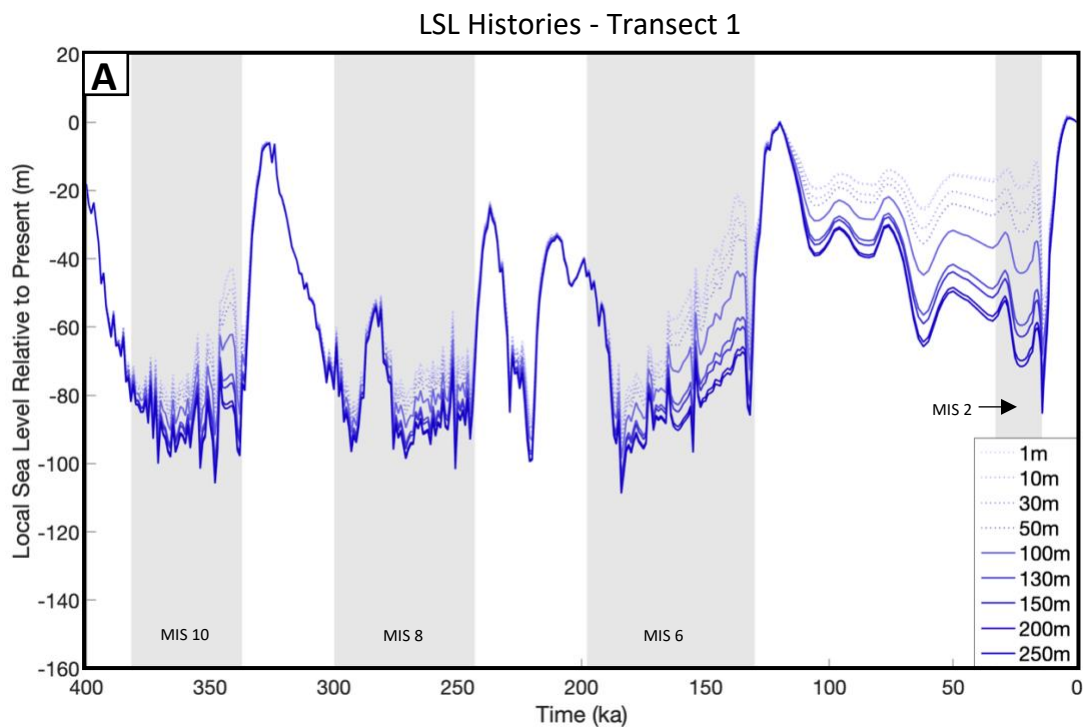


SUPPLEMENT



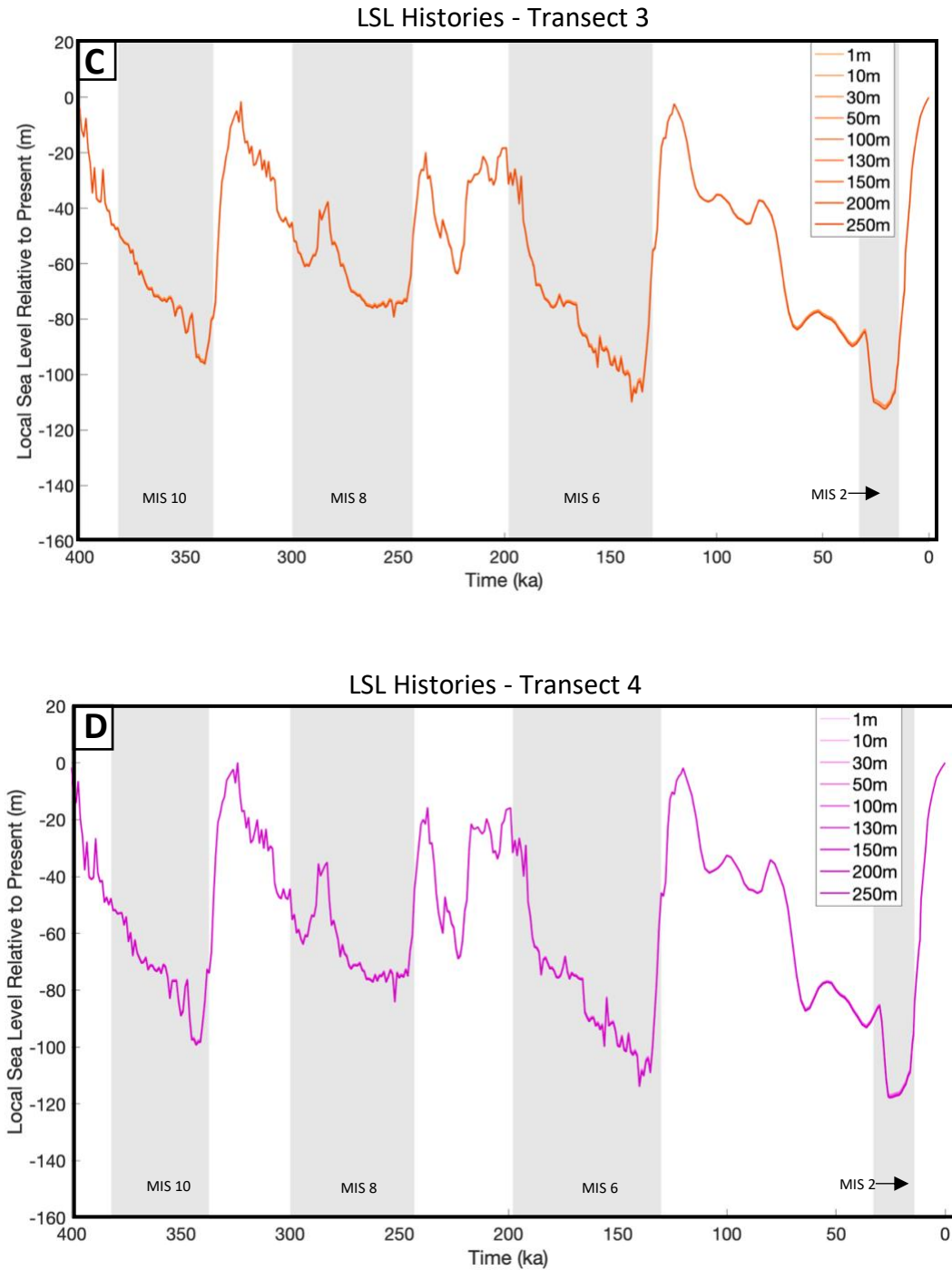


Figure S1. MIS 11 to present-day local sea level (LSL) histories for all nine depth-sites (1 - 250 m, see inset key) along each individual transect (T₁-T₄, see Fig. 1a). Transects are in order from north to south. The darker the color of the line, the further the site to the present-day shoreline. (A) LSL histories along T₁ vary during glacial periods (up to 55 m around 25 ka), but coalesce into a single line during interglacial periods. Dotted lines represent periods where sites 1-50 m were overridden by ice. (B-G) LSL histories along T₂-T₄ display very little variation during glacial periods (<5 m), and amalgamate into a single line during interglacial periods. See main text for a physical description of the differences between the LSL histories.

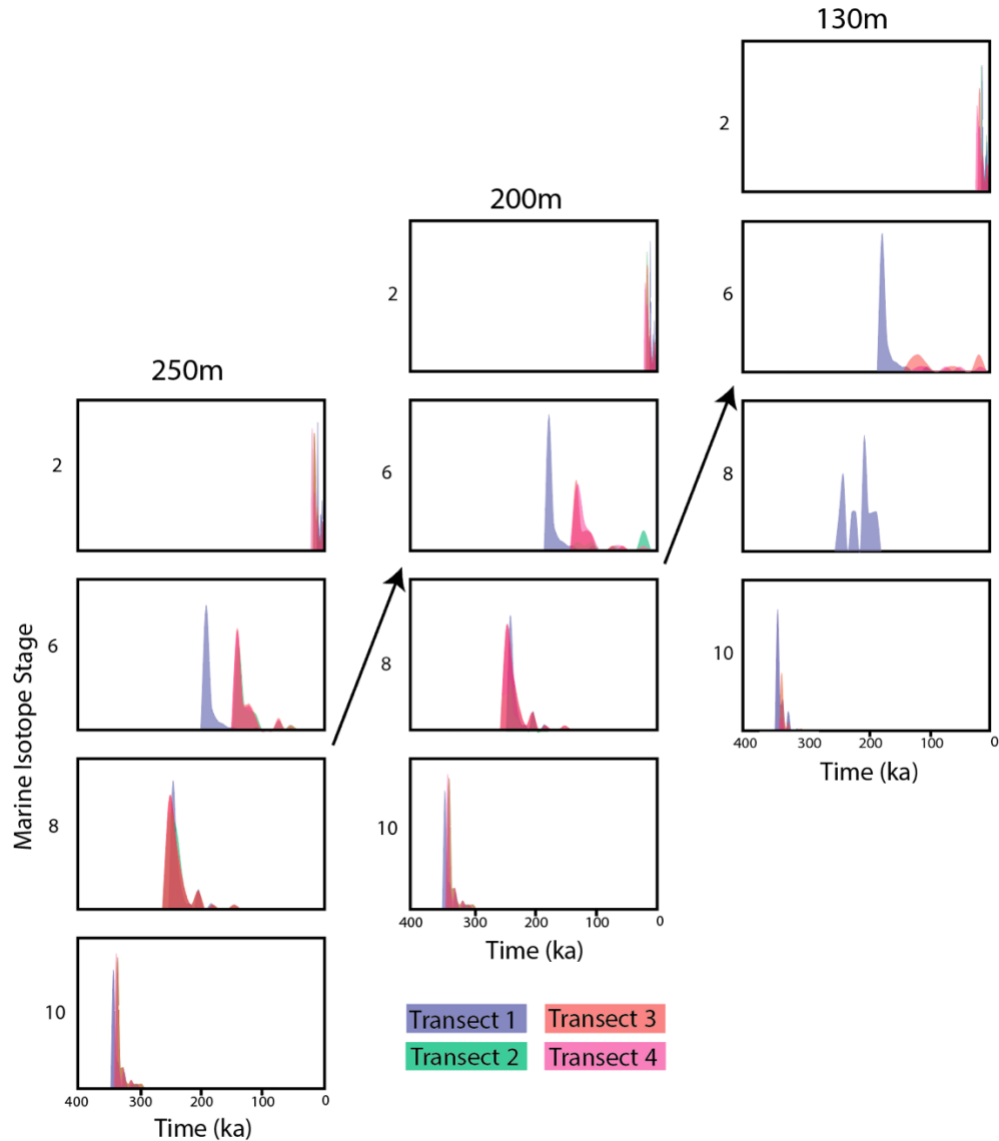


Figure S2. Glacial isostatic adjustment produces diachronous subaerial unconformities and correlative conformities (MIS 2 – 10). Actual model age distributions for subaerial unconformities/correlative conformities representing MIS 2, 6, 8 and 10 glacial low stands at the (from left to right) 250, 200, and 130 m depth-sites along T₁ (blue), T₂ (green), T₃ (red) and T₄ (magenta). At each depth, MIS 10 and MIS 2 are the least variable, with peak ages only differing by up to ~10 ky between transects. However, this peak age difference dramatically increases with MIS 6 where depth ages can vary by up to ~150 ky, with T₁ appearing the earliest (Fig. 4). With respect to MIS 8 the 250 m and 200 m sites have similar ages, but up-dip at the 130 m site only T₁ is preserved. T₂ does not preserve MIS 6, 8, or 10 at the 130 m site.

Table S1. Mean count of genetic stratigraphic sequences. Values are derived from all 50 model runs at each site. Green boxes indicate statistically significant ($p < 0.05$) differences in mean when compared to the same depth-site along other transects. The count of sequences varies the most at the intermediate depth sites. The deeper the site, the higher the count of sequences.

Mean Count of Genetic Stratigraphic Surfaces						
Transect	250 m	200 m	150 m	130 m	100 m	50 m
1	4.98	4.98	4.96	4.84	3	2
2	5	4.64	2.45	2	2	2
3	5	5	4.37	3.61	2	2
4	5	5	4.08	3.27	2	2

Table S2. The mean apparent water-depth change preserved in model regressive systems tracts leading into glacial maxima (MIS 2 - 10). T₁ underestimates the change in eustatic sea level, whereas T₃ overestimates the same metric.

Mean Apparent Change in Water Depth Leading to a Glacial Maximum (m)							
MIS	Transect	250 m	200 m	150 m	130 m	100 m	50 m
2	1	-88.05	-91.16	-79.97	-77.74	-48.91	
	2	-138.55	-108.24	-70.88			
	3	-111.07	-104.58	-88.933	-91.99		
	4	-111.34	-99.2	-104.72	-104.26		
MIS	Transect	250 m	200 m	150 m	130 m	100 m	50 m
6	1	-59.13	-61.22	-83.85	-71.29	-49.38	
	2	-114.41	-126.4	-96.82			
	3	-92.45	-92.78	-99.27	-95.37		
	4	-98.51	-98.41	-92.16	-98.84		
MIS	Transect	250 m	200 m	150 m	130 m	100 m	50 m
8	1	-85.5	-84.66	-71.86	-76.19	-53.46	
	2	-92.07	-83.39				
	3	-76.73	-76.29	-63.74			
	4	-80.35	-79.95	-66.81			
MIS	Transect	250 m	200 m	150 m	130 m	100 m	50 m
10	1	-65.35	-64.74	-62.95	-56.76	-59.67	
	2	-97.52	-85.23				
	3	-77.77	-79.71	-73.85	-44.45		
	4	-76.55	-78.51	-70	-31.54		