

Appendix 20.2

Sea Level Change

Tidal Lagoon Swansea Bay plc



Geological Epoch	NW European chronozones	PZ	Glacial Stage	Approximate Date	Relative Sea Level	OIS	Archaeological period	Environment of site	Ref.
Pleistocene				780,000 BP			Lower and Middle Palaeolithic	Hominids at Pakefield, Surrey.	
			Cromerian Interglacial	480,000 BP		13			
			Anglian Glacial Maximum	425,000 BP	-120m	12		Although sea levels are lower the site is likely to have been under the Anglian ice sheet	(Wenban- Smith 2002:3)
			Hoxnian Stage	424,000 BP- 374,000 BP	Higher (?)	10-11		Swansea Bay likely to have been submerged. Climate relatively warm and relative sea level higher than today.	
				339,000 BP		9			
				300,000 BP	Higher (?)	8			
				245,000 BP					
			Mitchin Hole D/L Stage Interglacial	225,000 BP	Lower	7		Lower sea levels are likely to have left the site as dry land. Evidence of occupation at Pontnewydd Cave, North Wales.	
				186,000BP		6			
				128,000BP	Higher	5e-5c		Raised beaches along the Gower, esp. Patella Beach. Climate as warm as today, with mixed oak woodland	(Bowen 1980: 8)
			Ipswichian	105,000 BP- 70,000 BP	c.+5m	5b 5a		Evidence of raised beaches from this period indicate Swansea Bay is likely to have been submerged, although variations in sea level may have left the site as dry land at some point during this period. Periglacial climate	(Nayling 2002: 26)
			Devensian	59,000 BP	Lower			Sea levels lower, site likely to have been exposed.	
			Chelford Interstadial			4			
			Upper Warren Interstadial/ Middle Devensian	50,000 BP					
	Middle Weichselian	1a	Late Devensian/ Glacial Maximum	24,000BP- 14,000 BP (maximum c. 20,000-18,000 BP)		3	Upper Palaeolithic	Lower sea level but site is under ice sheet. Ice sheet did not cover the Gower Peninsula, and cave sites on the peninsula have produced evidence of activity during the Devensian glaciation, e.g. Paviland Cave, burial dated to c.26,000 BP. Deglaciation was complete in lowland areas by c. 14,500 BP.	
	Bølling	1b	Lateglacial interstadial	13,000 BP	Low		Late Upper Palaeolithic	Site dryland. (Land bridge crossing the channel extant in this period due to low sea levels). Late glacial warming	(Barton 2003: 15)
	Older Dryas	1c	Transition/Windermere Interstadial	12,000 BP				Site likely to have been dryland. Warm. Expansion of birch woodland c.12,000 BP.	(Barton 2003: 15)

Tidal Lagoon Swansea Bay plc



Geological Epoch	NW European chronozones	PZ	Glacial Stage	Approximate Date	Relative Sea Level	OIS	Archaeological period	Environment of site	Ref.
Holocene	Allerød	II	Transition/Windermere Interstadial Younger Dryas Stadial	11,800 BP				Site likely to have been dryland. Warm. Expansion of birch woodland c.12,000 BP. Cool, re-expansion of ice sheets in North Wales and Scottish Highlands. Sea Level?	
	Younger Dryas	III	Transition/Windermere Interstadial Younger Dryas Stadial Flandrian Interglacial/ Postglacial	10,800 BP				Site likely to have been dryland. Warm. Expansion of birch woodland c.12,000 BP. Cool, re-expansion of ice sheets in North Wales and Scottish Highlands. Sea Level? Rapid warming.	
	Pre-boreal	IV	Transition/Windermere Interstadial Younger Dryas Stadial Flandrian Interglacial/ Postglacial	10,000 BP-9500 BP	Between - 37m OD to - 16m OD by end of Mesolithic		Mesolithic	Site likely to have seen a series of marine transgressions and regressions. River Neath valley appears to have run through the site, providing an inlet for marine inundations, and a riverine environment. Climate warm. Expansion of birch woodland, with pine.	(Godwin 1940; Caseldine 1990)
	Boreal	V		9500-7000BP				During the later Mesolithic period oak and elm increased	
	Atlantic			7000- 6500BP					
				4000-2400BC			Neolithic	Riverine	
				2400- 700BC			Bronze Age	Coastal/ Marine	
				700BC- 43 AD			Iron Age	Coastal/ Marine	
				43 AD onward	As present		Roman period onward	Intertidal/ Marine	

*PZ= Pollen Zone and OIS= Oxygen Isotope Stage