PALAEO-ENVIRONMENTAL STUDY AREA P9

ITCHEN RIVER, SOLENT REGION, SOUTH COAST, UK

AN ASSESSMENT OF THE ARCHAEOLOGICAL AND PALAEO-ENVIRONMENTAL EVIDENCE FOR COASTAL CHANGE IN THE MOUTH OF THE RIVER ITCHEN AT THE HEAD OF SOUTHAMPTON WATER, SOLENT REGION, UK

Plate P9 ***Volunteers record an eroding alignment of Roman posts on the east bank of the Itchen River, Solent. This is now a stressed environment in a setting subject to development pressure. These posts have survived for 2,000 years but the upstanding stumps now demonstrate new and active erosion. The underlying peat is a middle Holocene palaeo-environmental archive now subject to threat.***

1. LOCATION: GEOGRAPHICAL CHARACTER OF THE COAST

The Itchen river (Plate P9) flows from south central Hampshire, via Winchester into the eastern side of Southampton Water. It forms the western boundary to a Roman settlement and an eastern boundary to the Saxon settlement of *Hamwic.* The east side of the river mouth lies adjacent to the walled medieval town. The area to the south of the medieval town and the mouth of the Itchen was developed into a dock complex towards the end of the 19th century. The docks are still in use today forming part of an international trading port. They occupy an area which was formerly the waterfront and anchorage of the medieval tpwn and this gives them a notable archaeological value.

Local underlying geology in the region is a combination of Barton and Bracklesham Beds dating from the Eocene epoch of about 50 million years before present. Above these lie Pleistocene gravel deposits. These occur as terraces, outcropping at varying depths in different areas. At their lower level these are overlain by bands of peat, formed during the Holocene/Flandrian transgression. Peat has been detected above the lower gravels in samples taken from Southampton Water during past studies (Godwin & Godwin 1940 ;Everard 1954; Hodson & West 1972; Long & Scaife 1996; Watler 1998). The upper deposits at the head of Southampton Water and the mouth of the Itchen are a combination of silts and alluvial clays.

Cores taken from Southampton Western Docks, from the George V and Graving Docks show a sequence of alluvial clays dating from the Romano-British period, blanketing Neolithic and Mesolithic peat deposits (West, 1980).
The river is a flooded ria inlet fed from the north. The river mouth is tidal, the lower six kilometres being is navigable. The river opens into the head of Southampton water adjacent to the River Test.

2. MODERN HUMAN GEOGRAPHY

The city of Southampton is a major European deep-water port with a long historical pedigree which can be traced to Roman times. Its civil status is a *Unitary Authority* which differentiates it from the jurisdiction of the county of Hampshire. The operations of the city and its maritime access are managed by the *Association of British Ports* (ABP). Southampton is cited close to the head of navigation on the east bank of Southampton Water. Here the eastern boundary of the medieval town is bounded by the river Itchen.

The modern river is bordered by urban development, working docks and remnant intertidal mudflats. The latter are rich in wildlife. The western bank of the lower Itchen accommodated the Saxon and medieval towns of Southampton. This is now a city of over 216,000. On the eastern bank lies the site of a walled Roman shore fort suspected to be that of *Clausentum*. Both banks are heavily developed with commercial, residential and industrial premises. Such development reflects the equivalent importance of this location for the maritime communities of earlier times. Large tracts of the Itchen River are designated *Sites of Special Scientific Interest* (SSSI). These accompanied by *Special Protection Areas* and designated by *English Nature* and Ramsar sites.

Regional authorities are Southampton City Council; Associated British Ports (ABP) as Harbour

Authority, Crown Estates are responsible for the navigation in the channel and the intertidal zone. The Crown Estate Commissioners own much of river bed.

3. CONTEMPORARY COASTAL PROBLEMS

Modern development has strayed on to the flood plain of the Itchen. This is a location which is now vulnerable to flood threat. The river bank along the intertidal river system has been subject to hard engineering which has advanced the shoreline into the river. In addition, navigational dredging poses notable stress to the archaeological and palaeo-environmental resources in the river bed and intertidal margins. The effects of draw-down resulting from the removal of material in the riverbed have not been quantified but an effect should be considered on the natural equilibrium of neighbouring intertidal areas.

A combination of development pressures has altered the natural passage of the river. A comparison of aerial photographs from 1928 and 1945 with the contemporary situation shows large declines in the saltmarsh and mud flats. These changes are particularly visible opposite Millstone Point where ancient peat deposits have been identified below the intertidal mud flats. Such deposits are being exposed opposite Bitterne manor where a submerged land surface is visible on low water spring tides (Plate P9a).

The diminution of saltmarshes and intertidal mudflats in the river may be partly attributable to the die back of *Spartina* grass. This loss is evident throughout much of the Solent region. Changes in the river's hydrodynamic regime also have a part to play. Undeveloped sectors of the flood plain remain important wild-life habitats and it is important that these should not be disturbed or threatened by changes elsewhere. Such sensitivity can be seen at in the area opposite Millstone Point. If the current pressures on the river system continue, it will not be possible to sustain sites such as these.

The land along the flood plain is, by definition, susceptible to inundation. Consequently, a threat must extend to development on this land. The Shoreline Management Plan identified this risk

and recognises that sea-level rise poses a flood threat in the Lower Itchen. There is a need to learn more about long-term behaviour of sedimentation and flood events on the margins of the river.

4. KNOWN HISTORY, ARCHAEOLOGY AND THE PALAEO-ENVIRONMENTAL SETTING OF THE COASTAL COMMUNITY

4.1 Historical setting

The City of Southampton lies at the confluence of the Rivers Test and Itchen. Dwelling patterns along the course of these rivers demonstrate their importance as highways into the heart of Hampshire. The first major settlement was the Roman *Clausentum*. This coastal settlement was eventually associated with the fort system which was developed to protect the 'Saxon shore' in third and fourth centuries AD. The site would certainly have encouraged a considerable amount of maritime traffic. The settlement and shore fort was situated to the east of the current position of Northam Bridge. This was an ideal fording point of the river. Occupation certainly persisted during and after the 5th century and it was later rejuvenated in medieval times when the site was occupied by Bitterne manor.

Until the middle of the nineteenth century most of the banks of the Itchen were used not for habitation or industry but for agriculture. After an Authorising Act had been approved in AD.1666 the river was made navigable as far as Winchester. Once the use this waterway had been encouraged it was not uncommon to find old watercraft abandoned along the intertidal margins of the river. The area around Northam Bridge seems to have been particularly favoured because of the proximity of shipyards which were hulking and reusing the components of old vessels.

Downstream, on the west bank near the mouth of the river lies the site of the Saxon town of *Hamwic*. During its occupation this town played a very important role in the region. Acting as the port town for the city of Winchester it became a centre for the trans-shipment of goods onto smaller vessels which could navigate up the Itchen. It was also became the centre of a medieval shipbuilding industry and it was here that the carrack Sovereign was constructed and launched in AD.1488. The next phase of development carried shipbuilding activities slightly upstream to the north. This expansion began at Northam some 250 years ago and it witnessed the construction of many great naval and mercantile vessels. Today, the shipbuilding has diminished but a number of abandoned hulks still litter the adjacent mud flats and these mark locations where the sediment archives of the river are relatively undisturbed.

The centre of the modern city of Southampton grew from the medieval town which established itself to the south west of Saxon *Hamwic*. The new city occupied higher ground which brought properties clear of the risk which could be brought by the river in winter to the flood plain. The west flank of the new walled town opened onto the river Test, which accommodated all the needs of a thriving port and waterfront. During and after the Norman period, trade with continent expanded and this brought increased demands for to wharves, jetties and docking facilities.

4.2 Archaeological setting

Evidence for human activity along the Itchen shoreline dates back to the mid-Holocene. Excavations in the Empress Dock in AD.1887 revealed layers of peat some 7 metres below Ordnance Datum. Some of these levels contained Neolithic flint implements, animal bones and tree remains all offering evidence of a coastal environment which had bordered a much lower shoreline (Plate P9b). During deeper excavations in 1889, further samples of wood and animal remains were exposed. At the same time, part of an Roman amphora was found in the upper alluvium (Shore & Elwes, 1889).

Various flint tools have been recovered during construction works on the western flood plain on the Itchen River and these are recorded in the *sites and monument record* of Southampton City Council. Further Neolithic tools have also been seen in gravel deposits exposed on the shore

beneath the Itchen Bridge (HWTMA 98). Farther upstream, towards the top of the tidal reach, excavations at Montefiore Hall have revealed a long history of human occupation on a site close to the river bank. The evidence from this location includes occupation in Neolithic, Iron Age, Roman, Saxon and medieval times (Hampshire SMR nos., 21204; 21208; 21213; 21215 & 21218). This excavated example attests a long history of human activity near the bank of the river and this certainly suggests that the intertidal and sub-tidal zones deserve appropriate archaeological attention and careful management.

4.3 Palaeo-environmental setting

During the lower sea-levels of the Early and Middle Holocene, the human activity would have been well-favoured on the former margins of the Itchen river. The ancient river provided an valuable subsistence resource for both animals and man and this is well attested by the early evidence of flint tools and faunal remains which were hastily recovered in this general region during the late 19th and twentieth centuries (Shore & Elwes 18 ; Godwin & Godwin 1942). As sea-level rose, the rivers Test and Itchen were progressively drowned and this process and turned the coastal strip into an environment which was well suited for the formation of peat. As peat is an excellent medium for preservation, it has the capacity to hold a wealth of archaeological and palaeo-environmental material.

Peat deposits have been identified at various points in the interidal zone of the Itchen river. Extensive deposits are also known near the mouth. On the shore at Weston peat deposits have been identified at the low water margin.and archaeological material has been recovered from exposed surfaces of these deposits. On the Weston shore of the Itchen, below the Vosper Thornecroft yard, cores taken for geotechnical purposes within the shipbuilding complex have confirmed the presence of peat in deposits ranging from -1m to -5m OD.

Excavations of the Southampton Dock system on the west side of the river mouth uncovered stratified prehistoric peats and associated sediments and these have been cited in the a preceding section of this text More recently, peat has been identified on the western bank of the Itchen west of Bitterne manor (Plate P9c). Here, the intertidal mud flats are eroding to reveal a submerged land surface with tree boles and root systems preserved *in-situ.* Opposite Millstone Point, in Chessil Bay, further peat deposits have also been identified. Aerial photographs during the last 70 years clearly demonstrated active erosion at this location. Until the outset of this LIFE project, this was an area that had attracted scant attention.

The rich palaeo-environmental resource uncovered in pits and ancient occupation sites during the excavations at Montefiore Hall has highlighted the potential wealth of material in archaeological contexts along the lower Itchen floodplain. Further palaeo-environmental deposits have been encountered during later building development although the true extent of the resource has yet to be assessed. When deposits are discovered, they are seldom interrogated for environmental or climatic information.

5. ARCHAEOLOGICAL AND PALAEO-ENVIRONMENTAL STUDIES AND POTENTIAL

5.1 Itchen River project

During the course of the LIFE programme, an assessment of the visible archaeological sites along the river has been carried out and a number of sites have been subject to more detailed study.

The objectives were:-

1. To identify sites and artefacts of archaeological importance within the River Itchen.
2. To position and record artefacts of archaeological importance in relation to the National Grid.
3. To target sites warranting additional survey.

4. To conduct site specific surveys
5. To compile *Geographical Information System* for recording sites along river.
6. To report on findings, all of which will be submitted to the Southampton City Archaeological Unit Sites and Monuments Record and the National Monuments Record (Maritime Sites).
7. To disseminate information with lectures, reports and on dedicated Web Site.

The project aim was to identify and assess the remaining maritime heritage within the Itchen before further losses occurred. The first phase was to carry out a documentary survey of the remaining hulks left within the intertidal and sub-tidal zones of the Itchen. This involved consulting a number of historical archives, charts and aerial photographs of the river ranging in date from AD.1698 to 1985. Whilst the older charts could not supply direct evidence of the wrecking or abandonment of vessels on the foreshore of the river they could provide indirect evidence of this possibility. While this survey produced no physical evidence of this activity it was able to demonstrated that much of the foreshore of the river had been covered with relatively modern debris that could readily mask older remains.

The survey revealed the remains of 44 different vessels that had been present on the foreshore some time since the earliest was recorded in 1928. The earliest evidence comes from a small group of aerial photographs taken that in that year. This revealed two hulks on the shore south of Northam Bridge, an iron and a wooden barge. The riveted iron barge was possibly of mid to late nineteenth century date and the wooden hulled vessel (now broken up) could be identified in 1928 as be a barge. The vessel had the remains of coal dust between her frames and this has suggested association with the coal wharf just across the river. Her construction was typical of shipbuilding prior to the industrial revolution. Her date of construction may well be mid nineteenth century or earlier, making her the oldest visible vessel so far located.

A series of aerial photographs taken in 1945 shows a further 4 hulks present in the river. It seems possible that these were the result of wartime actions. Local oral history gives one as being a barrage balloon vessel sunk during a bombing raid. Unfortunately one of these craft was destroyed for development whilst the present recoding work was being undertaken.

The 1970 port survey shows 23 hulks present in the Itchen, compared with just 7 which can be seen in 1945. The notable increase in number can only be explained by a substantial change in the way the port was being operated. This coincides with a time when the traditional functions of the port were in decline. At least one company in Southampton was fully employed breaking up barges on the western shore of Southampton Water during this period. It seems safe to assume that those barges now abandoned on the shore of the Itchen and the other arms of the Southampton Water are the last remaining examples of those used by the port. The range of craft include barges, hopper barges, tenders, ferries and pleasure craft.

The 44 different vessels have not yet been added to the Southampton *Sites and Monuments Record*. and they have not been given a score in relation to coastal change. These wrecks, however, are under constant threat from development along the shoreline and many have already been lost before they could be fully appraised. The removal and destruction of these wrecked craft provides a very useful index of modern human impacts which are changing the vulnerable historic environment of the coastal zone of the lower Itchen river.

5.2 Cobden Bridge Hulk Survey

In January 1999 the dismantling of a vessel hulked on the Itchen river was brought to the attention of the Hampshire and Wight Trust for Maritime Archaeology by Dr Andrew Russel, the Southampton City Archaeologist. The stern section was being cleared of overburden, sawn off and removed prior to building development on the adjacent shore. Following negotiations, the work was postponed for two weeks to allow a survey to be conducted of the cleared section (Plate P9d).

The wreck was only accessible at low water and hence could only be surveyed when the tides were suitable. A small team of students, volunteers and HWTMA staff set about recording the hulk. Three days were spent recording the hulk in tidal windows of less than three hours. The barge measured 29.29 m metres in length and was excellently preserved in anaerobic conditions within the mud and silt. The hulk proved to be fairly symmetrical, despite warping of the wood and inconsistent removal or loss of strakes from both the port and starboard sides.

The barge was of post-medieval date, possibly mid to late 19th century. It was heavily constructed of grown oak frames and elm strakes. It was a well constructed vessel with a hull designed to deal with the rigors of coastal waters. The fastenings were of large iron bolts. The remains of a concrete engine mount and fixings for twin prop shafts showed that an engine had been added.

Two weeks after the survey, the section of the vessel that had been recorded was removed. Plans were put forward to survey the rest of the vessel but this was destroyed by the developers before any mitigatory action could be taken (Plate P9e). The ownership of the vessel was unknown and there was no statutory mechanism to prevent its immediate removal. It was a well constructed and well-preserved vessel over 100 years old (Plate P9f). It offered the potential of revealing much about past ship-building techniques in the Itchen river but it was destroyed before this could be achieved.

5.3 Development at Holdens Yard

The HWTMA carried out an assessment of the maritime archaeology on a foreshore in front of a proposed riverside development site. The foreshore was littered with ancient wooden debris which required identification and quantification. Historically, the area may have been very significant due to its close proximity to a ship building industry on the opposite bank. It also lay close to both the Roman and Saxon settlements which preceded the medieval town of Southampton.

Many hulks had been recorded sitting on the mud flats at this site and there was a strong possibility that earlier boat remains or drowned archaeology could be present below the surface of the mud (Plate P9g). Later archaeological features destined for destruction included two hulks that lay alongside the old shipbuilding yard. There were also components of old ships built into a quay wall and a slipway with some associated machinery.

5.4 A survey of barges

The inner barge had been used as a large skip in which to store greenheart wood and old tyres. This had a crane mounted on the stern and was of welded construction. This appeared to be have been built in the post Second World War period. Apart from her dilapidated appearance and a few holes in her hull this craft was largely sound. The craft could be classified as a general purpose lighter. She was described by the staff of the shipyard as a ‘waybarge’ and ‘coal barge’. Length 26.6m, breadth, 6.9m, depth 2.7m. She was welded with 10mm steel plate.

The outer barge was described by the shipyard staff as being a ‘munitions barge’. This craft was of riveted construction with some welded alterations and repairs. At her stern, approximately one third of her hold had been enclosed with a steel deck and bulkhead. Both of these features was of riveted construction. There was also a possible mounting for a crane fitted to this deck. The remains of a windlass was also evident (Plate P9h).

At the forward end of this barge it appeared that a ramp had been removed and a new steel plate welded to the bow to extend the hold. The forward end of the hold narrowed and was flanked by two bulks which terminated at the bow. This gave the necessary strength to support an open-ended vessel with a ramp. During World War II many barges had ramps built into their bows to land supplies on the beach. The unusual layout of this barge suggested that she may well have been used for this purpose.

The construction of this vessel suggests that she was originally built as a lighter and then adapted to allow access to the hold by means of a ramp. These adaptations to her bow were welded, suggesting a later modification to the original riveted construction. The ramp was later closed, presumably when the specialised function was no longer required. From the enclosed third of her hold to the stern she barge was covered using riveted construction. It is suggested that this was done after the work on the bow for whilst the construction method is older, this adaptation would have decreased the load-carrying capacity. This had been the barges primary function. These changes may well have been done to enclose some fitted machinery during the later use of the craft. The vessel was heavily corroded and, for safety reasons, could not be examined in greater detail. The conclusion was that she was historically interesting and could possible be a relic of the Second World War. Length 26m, breadth, 7m depth, 3m.

5.5 A survey of a slip & machine shed

Two slips remained at Holdens yard, served by a common machine shed. The slips were constructed of two parallel concrete bases laid in a north - south alignment. The west base was 0.85m higher that the east. Both slips were fitted with double parallel steel rails with the west slip having a central metal plate between the rails. Both bases were intact as far as they were visible. The upper portion of the west slip was covered in debris and the lower portion of the east slip was covered in mud.

The machine shed was a wooden structure composed of tongue and grooved planks held by a wooden frame. The shed measured 15m by 7m and was open to the south where the machinery was located. Behind the machinery was a working area since filled with debris. These included ship and car components, mooring gear and other items associated with the yard's varying uses in the past.

The machinery comprised a double pull winch with two barrels driven by a single electric motor and flywheel. Interviews with the yard's staff revealed that the winch was rated to pull 300 tons when new. The machinery was in use until approximately 10 years ago and was still effectively operational. It was used to pull the launching trolleys up the slip by means of a steel cable anchored to the floor of the shed. This passed through a pulley on the front of the trolley then back to the winch barrel. The trolley could be secured at the top of the slip by anchor points set either side of the barrel. It is believed that the machinery came from the Vosper Thornycroft yard during the early 1940's.

The trolley on the eastern slip lay *in-situ* while the trolley for the western one was had been broken up for scrap. The surviving trolley comprised a small front unit and three base sections of equal size. These were joined by chain so that the distance between them could be varied to accommodate craft of various lengths. All had uprights on their sides to act as guides when slipping vessels. The 1st and 3rd base section guides were fixed at the outer extremities whilst the guide for the central unit was of variable width.

5.6 The quay wall/revetment

A quay wall ran from the side of the Northam Bridge to the two slips described above. The first 120m at the western end was largely constructed of wood with the remainder made or replaced with concrete. It was the older wooden section that was of particular interest, especially those portions that appeared to be made of re-used boat timbers. It appeared that this wooden revetment had been built in two phases.

The eastern section of the revetment was approximately 78 metres long and comprised a fairly regular arrangement of horizontal planks held in place by vertical piles. The uniformity suggested that the construction method had changed very little since the revetment was initially built although there was evidence of extensive repair. The degree of decay varied from pile to pile with many relatively modern reinforcing members being placed next to heavily degraded piles. This was also true of the planks used to hold back the bank. A number of planks and

piles seemed to had been cut for this specific purpose, but many appear to be re-used.

The western section of the revetment was 42m long and was of particular interest because it was clearly made of a large number of re-used timbers. Some of these could be attributed to ships and some to other maritime structures. This had resulted in a confused looking frontage which was much less uniform than the eastern section (Figure P9.1).

A	Reused timber
B	Frames within barge section
C	Planks of barge section (associated with B)
D	Reused planking
E	Double diagonal planking
F	Iron knee
G	Large squared beam
H	Piles to support revetment (iron/timber)
I	Reinforcement plate
J	Rubble
K	Concrete
L	Tar
M	Treenails
N	Iron nail (round headed)
O	Iron nail (square headed)
P	Round wooden peg
Q	Holes for fastenings (round head, square shaft)
R	Holes for fastenings (round head, round shaft)
S	Square holes for wooden pegs

Table 1 Identified components in the Holdens Yard waterfront

The phase 2 structure comprised vertical piles capped with large horizontal beams. Behind these a variety of hull members had been incorporated to contain the infill. In some places iron knees had been used to support the capping. The most striking of these sections was part of a double diagonal hull, possibly from a motor torpedo boat (MTB) of WWII date. This component filled the space between three of the piles. Further east east the sides of an old ferry or barge had been used to form a foundation. Here, other vertical timbers had been mounted on top. Sections of similar vessels could be also be seen in the adjacent mud-flats.

The revetment was capped by the beams which appeared to be parts of old pontoons. More of these vessels lay on the nearby foreshore. This whole section of revetment had been faced with vertical and horizontal timbers which had been obtained from the the hulls of various vessels whioch had once been moored in the Itchen river.

5.7 Interpretation of the survey at Holdens Yard

Aerial photographs from 1928 show a section of ‘phase 1’ of the quay wall. The quay at the western end of phase 1 turns 90 degrees and runs landward. This is a corner which still survives today and it is the point at which the two constructional phases meet. ‘Phase 2’ of the revetment had not been constructed at this date and the western end of Holdens Yard was still a silty inlet with saltmarsh at the landward extremity.

As has been outlined above, phase 1 was constructed to a regular design with horizontal planks supported by piles. This area of revetment hasdbeen subject to continual reinforcement. Phase 2 was built with the aim of reclaiming the mudflats to the west of previous reclamation. It extended quayline some 40m to meet Northam Bridge. When phase 2 was added to phase 1,

the majority if not all of the materials appear to have been re-used timbers obtained from vessels and structures on the foreshore at the time.

Information provided by the staff from the yard indicated that the current frontage had been installed in the 1960's but the archaeological evidence suggested that this was probably no more than a period of strengthening and reinforcement.

5.8 Studies of the possible Roman riverfront facilities at St. Deny's.

A number of horizontal upstanding posts, seemingly in alignment, were located in the inter-tidal zone of the river Itchen between Bitterne Manor and St.Deny's (Plate P9). This site lay in close proximity to the Roman settlement of *Clausentum*and this suggested this feature might be of Roman date. This was confirmed early in 1999 when a radiocarbon date of an oak post dated to AD 15-319.

During the summer of 1999 a survey was conducted to determine the spatial limits of the feature and to achieve a two dimensional site plan. The survey involved a record and outline of every visible post and plank at a 1:20 scale. Each of the elements was numbered, tagged, measured and photographed. In total 175 wooden elements were located. It is suspected that the site was originally a riverfront facility, incorporating a jetty and shoreline revetment. This would have been suitable for the loading and unloading Roman vessels entering the mouth of the Itchen. A question pertinent to sea-level studies is whether any craft could have penetrated the river as far as the Roman town of Winchester.

5.9 A submerged and eroding ancient landscape

Within 15m of the Roman features and east into the river channel, the alluvial overburden had been eroded to reveal a submerged land surface. The remains of tree trunks and root boles were all visible in peat. These deposits were only visible at low water spring tides and they had become exposed as a result of a change in the hydrodynamic regime. This deposit represents a rich archaeological and palaeo-environmental archive which is now is under direct threat (Plate P9i).

6. DESK TOP ASSESSMENT SCORES

The number of sites identified in the desk top assessment as part of the LIFE Project was primarily based on sites which were close to the shoreline and recorded in the Hampshire *Sites and Monument Record*. Many more sites had been recorded on the *Sites and Monument Record* of Southampton City Council but these were not assessed as part of this study. Problems of incompatibility between the local and regional records was not fully appreciated at the outset of this project. It has become apparent through the course of this research that there is a need to streamline data sets housed by different authorities when studying coastal issues. As boundaries are invariably political rather than geomorphological this is a problem that might best be resolved at European level where there is a broader need to quantify the loss of coastal archaeological and palaeo-environmental resources and exchange and share and exchange information which has been assembled to a common data-standard.

In addition to the Hampshire and Wight Trust for Maritime Archaeology is compiling its own inventory of sites in the region. All these sites will be passed on to the National Monuments Record and the local *Sites and Monuments Records* when it is in an appropriate format.

The Hampshire Sites and Monuments Record identified a total of 46 sites in the lower Itchen study area. Nine of these sites scored 8 or more point and were considered to be pertinent to this LIFE study (Appendix P9.1).

7. CURRENT APPROACH TO THE IDENTIFICATION AND PROTECTION OF THE ARCHAEOLOGICAL RESOURCE

The Archaeology and Heritage Management Section of Southampton City Council defines a

number of areas of archaeological importance within the city limits. Sites bordering the maritime zone are Tickleford Gully which runs into Netley Bank on Southampton Water; Redbridge Causeway which has been an active crossing point on the river since Roman times and finally the medieval waterfront behind the Town Quay. The majority of the shoreline immediately along the Itchen has little or no archaeological protection and very few sites are recorded on the Southampton City *sites and monuments record.*. The sites of the Roman settlement at Bitterne and Saxon town of *Hamwi*c, are very rich in archaeological material and are slightly set back from the modern shoreline.

When a development proposal is put before the City Council it is subject to an archaeological evaluation. The extent of this will depend on the scale of development and the archaeological sensitivity of a site. The initial evaluation is based on the local *sites and monuments record*. If features are not recorded on this record then they may not be considered for evaluation or protection.

With time, the archaeological resource along the intertidal reaches of rivers maybe more readily recognised. In the past, very little has been recorded in this environment due to restrictions on accessibility and limited pressure for development. This has allowed the presence of archaeological and palalaeo-environmental resources to be escape attention. However, as the desirability for riverside homes grows and residential developments increase, attention is being drawn to the dearth of knowledge in this zone.

8. CURRENT APPROACH TO THE IDENTIFICATION AND PROTECTION OF THE PALAEOENVIRONMENTAL RESOURCE

The palaeo-environmental resource is currently subject to debate. It has been recognised that the wealth of information within these deposits can tell us much about past environments and that they may harbour valuable archaeological information. However, the true extent needs to by quantified with a tangible value attributed to the resource before it can be comprehensively protected.

At present palaeo-environmental material has no statutory protection. Consequently,developers and harbour authorities cannot be readily induced to assess and accommodate investigation of this valuable resource ahead of development unless it ia directly associated with archaeological remains.

9. SUCCESSES AND PROBLEMS IDENTIFIED BY LIFE PROGRAMME

The inter-tidal zone of the river has been subject to some preliminary archaeological survey. This has resulted in the creation of a catalogue of archaeological sites to be added to the sites and monuments record. It has also helped draw attention to the archaeological resource in and around the Itchen as archaeological material is poorly recorded in the intertidal zone.

The incompatibility between the local and regional sites and monuments records was not fully appreciated at the outset of the project. It has become apparent through the course of this research that there is a need to streamline data sets housed by different authorities when studying coastal issues.

The work has demonstrated that incursions into the river banks by hard engineering and into the riverbed by dredging have been detrimental to the archaeological and palaeo-environmental resource. It also appears to have changed the hydro-dynamic regime of the river causing erosion of archaeological and palaeo-environmental material. Undeveloped sectors of the flood plain which remain important wild-life habitats and should not be disturbed, are also being affected. If the current pressures on the system continue, it will not be possible to sustain these sites.

The research suggests the area should be very rich in archaeological material. In particular the deposits associated with the past riverine environment. Archaeological information has already been uncovered in such sites although the associated palaeo-environmental evidence has not

been fully assessed.

At present palaeo-environmental material has no statutory protection. Consequently, the investigation of this valuable resource is rarely considered by planning departments when giving consent for development. This can result in the loss of palaeo-environmental deposits without mitigatory investigation or recording. This can permit the loss of evidence pertinent to the understanding of coastal behaviour and flooding events.

The land along the flood plain is by definition susceptible to inundation. Consequently, the threat must extend to development on that land. The *Shoreline Management Plan* (SMP) of 1998 identified this risk and recognises that sea-level rise poses a flood threat in the Lower Itchen. It recommends holding the line in the lower Itchen. This may be resolved on the embanked industrial waterfronts but the impact on the natural and historic environments of the undefended shoreline seems far less clear. The policy of the harbour authority regarding these resources is not known. There is a need to learn more about long-term behaviour of sedimentation and flood events on the margins of the river.

A *shoreline management plan* for this heavily developed estuary anticipates future flood protection needs but has failed to identify the archaeological palaeo-environmental potential of the estuary including those context which may be pertinent to the understanding of past coastal behaviour. A preliminary intertidal archaeological survey has yet to be briefed and equipped to investigate the shoreline evolution of the river. It is also clear that significant development has proceeded on the flood plain in recent years and that planning policies have not drawn wisdom of hindsight from the higher and more secure location of the medieval settlement.

The intertidal archaeological survey of the lower Itchen should be briefed and equipped to address the long term behaviour of the river. The working practices and duty of 'regard' by the Port and Harbour Authority could be better implemented if they included practical provision for the recognition, evaluation and protection of natural and historic resources which are concealed within the intertidal and sub-tidal zones.

10. SOCIAL INCLUSION AND COMMUNITY INVOLVEMENT ISSUES

A consultation leaflet on the *Shoreline Management Plan* for Western Solent and Southampton Water encouraged public participation in policy-making in 1997.

Objectives for the work on the Itchen by the Hampshire and Wight Trust for Maritime Archaeology included:

1 The training of students and volunteer members of the local community to participate in site survey.
2 Involvement of volunteers when conducting site surveys.
3 Dissemination of information with lectures, reports and on dedicated Web Site.

A major component of the work on the Itchen has been to encourage the help of volunteers and students. The hulks on the Itchen have offered an ideal training ground for students to gain practical survey experience while gathering data for the project. Volunteers from the local community have been encouraged to participate wherever possible.

During their involvement they learn about the maritime history of the city as well as mastering basic survey skills. This heightens their awareness of the past and enables them to act effectively upon discovery of something themselves. The results of the work have been disseminated on a dedicated Web Site, published in the public realm, the subject of lectures and it is envisaged that display boards will be erected at choice locations around the river.

11. CONCLUSION AND KEY ISSUES

1 A recent study of post-medieval wrecks and boatyards in this river has essentially sought to record the cultural heritage yet an addition outcome of this survey has been the recognition of sediment archives and vulnerable palaeo-environmental contexts concealed beneath the intertidal muds. The diminution of the wooden hulks of relatively recent date can also be seen as an index of increasing development pressures and new environmental changes which are affecting of the river.

2 The case-study of the lower Itchen river provides an example where modern development has strayed on to the flood plain of the river. This is a location which is now vulnerable to flood threat.

3 The banks of the intertidal river system have been subject to hard engineering and advancement of the shoreline into the river. In addition, navigational dredging poses notable stress to the archaeological and palaeo-environmental resources in the river bed and intertidal margins.

4 The effects of draw-down resulting from the removal of material in the riverbed have not been quantified but undoubtedly have a detrimental effect on the natural equilibrium in neighbouring areas. It is unclear whether environmentally sensitive areas within the intertidal zone can be sustained.

5 Current studies suggest that the area is rich in archaeological and palaeo-environmental evidence of past coastal and riverine behaviour. However, it is clear that the palaeo-environmental evidence is not being fully assessed.

6 Archaeological and palaeo-environmental material is poorly recorded in the intertidal zone.The resources need to be identified and added to local *sites and monuments record*s if their sustainability is not to be overlooked.

7 The monitoring and protection of archaeological sites and palaeo-environmental resources in the intertidal zone requires awareness and actions from the local authority which lie beyond the development-specific vision outlined in Planning Policy Guidance (PPG16).

8 As riverside development increases, threats to the archaeology of the intertidalzone also increases. A dearth of knowledge in this zone permits oversight of the need for protective and mitigatory measures.

9 At present palaeo-environmental material is not been given appropriate consideration in planning and coastal management processes.

10 This case study concerns the riverine frontage of an international European port claiming a cultural ancestry set in Roman, Saxon and medieval times. The intertidal and sub-tidal muds of the river remain important repositories or ‘archives’ attesting natural and human events on the changing coastal margins. Increased threat of flood makes these fragile resources a matter for planned evaluation by both the coastal defence authority and the Port and Harbour Authority.

12. BIBLIOGRAPHY

Everard, C.E., 1954. ‘Submerged gravel and peat in Southampton Water’, *Proceedings of the Hampshire Field Club* 18, 263-285

Everard, C.E., 1954. ‘The Solent River: a geomorphological study’, *Transactions of the Institute of British Geographers* 20, 41-58.

Hampshire County Council 1991, *A strategy for Hampshire Coast.* Hampshire County Council. 13 - 42.

Shore, T.W. & Elwes, J.W., 1889. ‘The New Dock Excavation at Southampton’, *Proceedings of the Hampshire Field Club* 1, 43-56.

West, I. M, 1980. 'Geology of the Solent Estuarine System', *The Solent Estuarine System - An assessment of present knowledge*. NERC Publications, series C, No. 22, pp 6-18.

13. ACKNOWLEDGEMENTS

Hampshire Sites and Monuments Record; Dr. Andy Russel: Southampton City Archaeology Department; Southampton City Council.

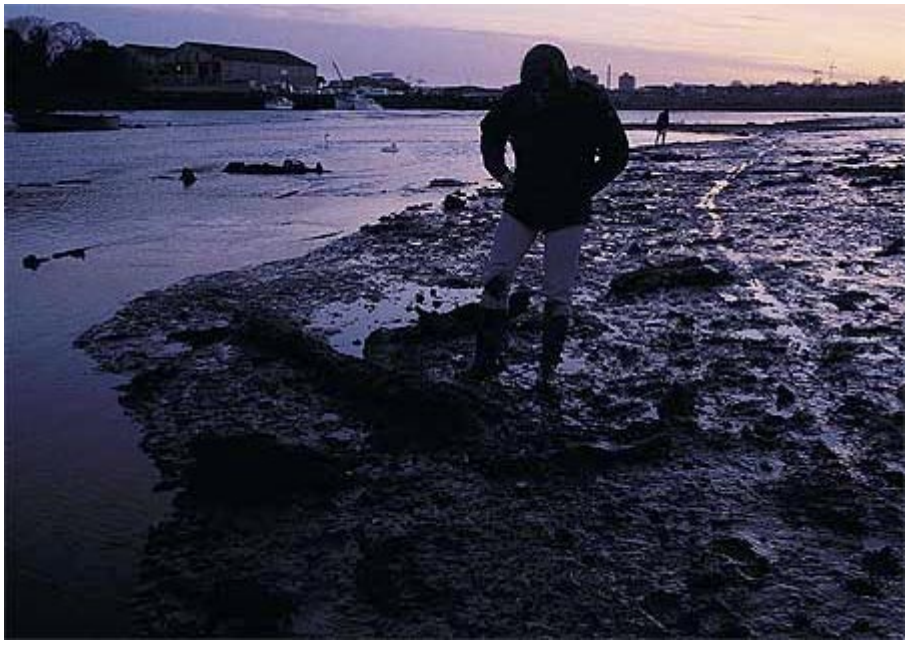

Plate P9a ***An eroding drowned landscape exposed at low Spring tides in the Itchen River***

Plate P9b ***The skull of this Pleistocene hippopotamus demonstrates the wealth of palaeo-environmental evidence which was destroyed during the construction of Southampton's Ocean Dock in the 1880's.***

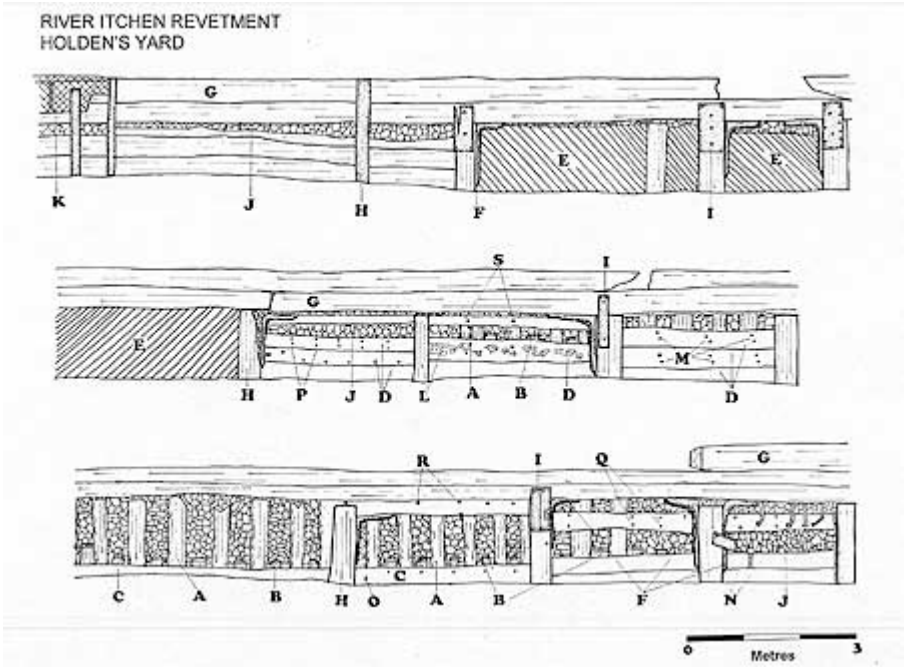

Figure P9.1 ***Historic ship's timbers incorporated into this waterfront offer cultural and dendrochronological information. This structure is scheduled for demolition.***

Plate P9c ***Extracting middle Holocene paet and sell preserved wood with a hand auger on the western bank of the River Itchen***

Plate P9d ***A volunteer team attempts to survey a historical wreck which offers a chronological marker in the silting of the Itchen Estuary near Cobden Bridge. This is a stressed environment subject to increasing development pressure***.

Plate P9e ***The historic wreck at Cobden Bridge is destroyed by development before archaeological and palaeo-environmental investigations can be completed***

Plate P9f ***The timbers of the historic wreck at Cobden Bridge are burnt and destroyed before a dendrochronological study can be conducted.***

Plate P9g ***Volunteers survey an historic wooden hopper barge to be cleared ahead of development at Holdens Yard***

Plate P9h ***The flat bottoms of these historic barges seal a sediment surface which has remained undisturbed since their abandonment in the mid to last 20th century. Sealed environments such as these may offer a potential measure of environmental change.***

Plate ***P9i New development on the flood plain of the Itchen has increased the artificial confinement of the river channel. Increased erosion has exposed the formerly preserved Roman posts. These are now subject to attrition and loss. Here the exposed archaeology demonstrates induced hydrodynamic changes to the tidal channel.***