

# Preserving the maritime cultural heritage of the Mediterranean, a cradle of cultures, religions and civilizations—the holy land perspective

Ehud Galili · B. Rosen

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**Abstract** The article presents the main ancient marine sites of the Holy Land, points the endangered sites and the needed preservation activities. The ancient cultural heritage existing on the Mediterranean shores reflect important events in the history of humanity. It represents numerous important cultures, religions and traditions. This coastal and underwater heritage is rapidly eroded due to sea level rise, global changes and rapid coastal development. Actions taken by the state of Israel to rescue, protect and preserve the marine cultural heritage include: underwater rescue surveys, coastal erosion monitoring, risk assessment surveys and pilot projects for protecting and preserving the sea front of the antique sites at Akko, Apollonia and Ashkelon. Israel proposes that the Mediterranean and European countries will establish a collaborative project aimed at mapping the cultural recourses and establishing master plans for the protection and preservation of the marine and coastal cultural heritage of the Mediterranean.

**Keywords** Coastal archaeology · Marine archaeology · Underwater shipwrecks · ICZM · Israel

## Introduction

Natural landscapes, flora and fauna as well as modern man-made structures destroyed by the sea or by humans can be

duplicated and restored and may have substitutes. However destroyed ancient cultural complexes can never be restored, reproduced or duplicated in their entirety. Therefore endangered ancient coastal sites should be given the proper priority in any risk assessment survey and in coastal management documents or plans. Ancient sites are valuable cultural recourses and simultaneously tourist attractions, thus they have a considerable economic value. However they are not always given the proper priority in Coastal Zone Management documents and coastal protection plans. Coastal risk assessment surveys carried out in Mediterranean waters and coasts usually refers to modern and pre modern urban centers, infra structures and real estate and neglect cultural resources and ancient sites.

## The unique Mediterranean

Underwater and coastal environments possess rich and special natural environments such as islands, bays, estuaries, coastal dunes and underwater reefs, all of which supports rich, diverse and sensitive fauna and flora. Additionally to all these, the Mediterranean have unique cultural recourses as it is considered to be the cradle of many civilizations, religions and cultures. It is the origin of the olive oil culture and the Mediterranean diet. It is the physical place were major religion and cultures were born, expanded and shrank. No other sea contains such numerous, diverse and irreplaceable cultural resources.

## What should be preserved?

Underwater and coastal antiquities, archaeological sites, traditional material cultures such as fishermen communities employing traditional gear and instruments should be preserved. Also boats and watercraft building traditions, i.e. boats made of canes or reeds, the Egyptian Faluka and similar

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E. Galili (✉)  
Israel Antiquities Authority and Zinman Institute  
of Archaeology – University of Haifa, Haifa,  
POB 180, Atlit, Israel  
e-mail: udi@israntique.org.il

B. Rosen  
Israel Antiquities Authority,  
POB 180, Atlit, Israel

Turkish and Greek craft should be preserved. Also coastal agro-pastoral complexes, traditional coastal subsistence systems managing domesticated, semi-domesticated and wild resources such as pine resin collection, bee and honey cultivating should be preserved. Olive and vine cultivation techniques, unique houses and shelters and their construction materials should be preserved as well.

The time perspective of sea level rise and coastal erosion

Most civilizations and urban centers in the world evolved in the last 4,000 years during relatively stable sea level condition. During the 20th century a sea level rise of about 0.2 m was recorded all over the globe. The predicted sea level rise in the 21st century is about one meter. Such rise will have crucial impact on coastal regions. While urban centers and living human societies can adapt, change and move, coastal archaeological sites can not. After four millennia of relative stability, we are facing rapid global sea level rise. Records from the last million years indicate that sea level can reach as high as +7 m above present sea level. Such rises has occurred several times in the last million years even without major human intervention.

Human intervention and coastal development

In recent decades marine and coastal environments were intensively disturbed by humans. Massive construction activities are taken place along the Mediterranean coasts. From east to west, coasts, shores and shallow seas are being invaded by powerful mechanical agents financed by immense capital. Coastal-marine cultures that have evolved in these special environments for millennia are being eradicated. Standing evidences of past traditions and the living populations that have been evolving locally as well as the surrounding natural resources are being destroyed. The cultural and the natural heritage of the Mediterranean countries is strongly modified by climatic change and human intervention. Presently the coastal and underwater archaeological heritage is rapidly eroded and ancient coastal sites are being destroyed. There is an extremely narrow time span to salvage, protect and preserve the coastal and marine cultural resources of the Mediterranean.

The Israeli perspective

The cultural heritage present on Israel coasts reflects important chapters and events in the history of humanity, starting with the Neolithic revolution and the appearance of the first Empires. It contains the physical evidences for the foundation of the major monotheistic religions and other major historical events. The Israeli coastal regions are sensitive to changes. Disturbances in the environmental

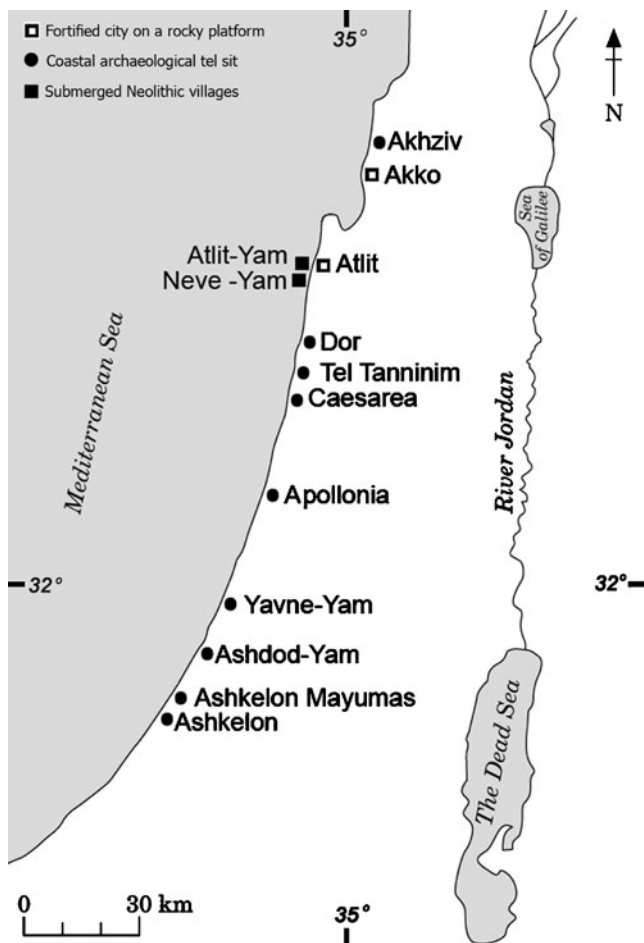
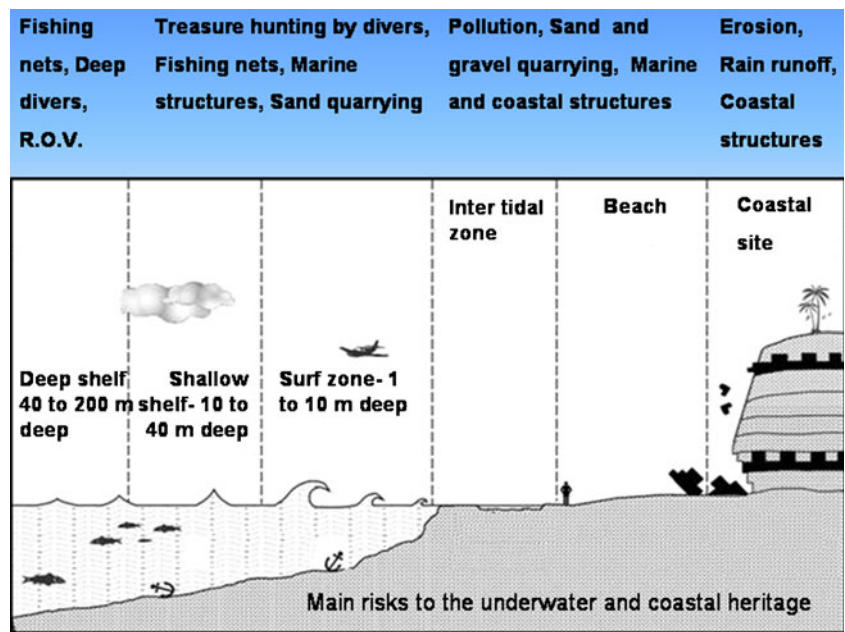
system are likely to have destructive effects on coastal and underwater sites. Human activity in the coastal region (particularly sand quarrying and the construction of marine structures) resulted in an extreme shortage of sand along the coast and rapid erosion. The problem has been exacerbated by the global rise in sea level over the last century. Ancient coastal settlements and underwater sites are rapidly damaged by erosion. Ancient sea walls, structures and installations collapsed. In certain places the erosion rate is up to one meter per year. If this process continues, a significant portion of the coastal and marine cultural heritage of Israel will disappear and archaeological, tourist and economic assets of great value will be lost. Due to the importance of these remains, it is necessary to preserve them and the hidden information carried within them, for the sake of future generations. Israel conducts a series of emergency actions dealing with this damage. These activities included legal actions, monitoring, risk assessment studies and preservation and protections plans. Some of the plans are being applied now.

This paper presents the diversity and importance of the maritime and coastal heritage of Israel which is also a heritage of humanity. The paper will demonstrate the risks endangering these resources (Fig. 1) and the actions being taken to preserve them for future generations. It will also list management and legal tools which are being established and used and further actions that need to be taken.

## Methodology

The current paper presents the main endangered marine and coastal settlements. The data is based on a comprehensive risk assessment document which summarizes in detail the conservation works, protection means, salvage excavations and underwater surveys that are required to save the ancient marine cultural heritage. The document includes a detailed GIS mapping of all the marine and coastal archaeological sites, including polygonal marks designating the boundaries of the sites and an evaluation of the scientific and tourist potential and the importance of the sites (Galili 2006, 1999; Friedman and Galili 2004). The work was performed by expert conservators, marine archaeologists and engineers who surveyed the sites. Detailed risk assessment files were prepared for the sites of Akhziv, Akko, Atlit, Atlit-Yam, Neve-Yam, Tel Tanninim, Dor, Caesarea, Apollonia, Yavne-Yam, Ashdod-Yam, Ashkelon North, and Ashkelon (Fig. 2). The risk assessment document summarizes the data from the sites files. It forms a national document that specifies the risks faced by the various coastal sites, proposes remedial measures to be taken, and quantifies the necessary costs.

**Fig. 1** A tentative typical cross section of the coast with the possible risk factors to which the antiquities are exposed to in the different regions at different depths



**Fig. 2** Map demonstrating the main endangered coastal settlements in Israel (see also Fig. 15)

### Protection and conservation costs

The cost estimate of the conservation works relies on an evaluation of the current condition, information that has accumulated so far and conservation surveys performed at the different sites. The estimate is comprised of work that needs to be implemented only once and maintenance work that has to be attended to on an annual base.

### Salvage excavations

The excavations goals are: preventing the destruction of the ancient remains; if it is impossible to save the antiquities, an excavation will be conducted aimed at salvaging the archaeological information. The excavations will also moderate the slope and will facilitate the stabilization of the coastal cliffs by different engineering means and vegetation planting.

### Underwater salvage surveys

Underwater salvage surveys are meant to locate, map, document and salvage antiquities that are exposed on the seabed due to erosion and are considered to be at risk.

### Actions taken by Israel to rescue the coastal and underwater cultural heritage

The destruction of cultural assets was brought to the attention of the House of Representatives, and it was included in the special legislation for the protection of the coastal Environment in 2004. Public awareness was raised by publishing articles in Magazines for divers, fishermen

and scientists, lectures, popular press, radio and television programs, and other media. Several national organizations were convinced to collaborate in solving these problems: The Prime Minister's Office, Ministry of Education, Culture and Sports, The Ministry of interior—the committee for the protection of the coastal Environment, The Israel Antiquities Authority, Israel Nature and Parks Authority, Municipalities of Akko, Hertzelia and Ashkelon, The Israel Electric Corporation and the Israel committee for UNESCO. Underwater surveys aimed at rescuing and documenting underwater sites were carried. A comprehensive GIS data base was established for the coastal sites. Damage to the ancient coastal sites is constantly monitored visually, photographically and by field surveys. A policy document as well as risk assessment study of the coast and the ancient coastal heritage is being prepared by the Prime Minister's Office jointly with the Ministry for the protection of the environment, the Israel Antiquities Authority and other organizations. Pilot projects for preserving and protecting the sea fronts of Ashkelon, Apollonia and Akko were conducted.

### Underwater finds representing the ancient cultures of the holy land

The ancient coastal cultures have left behind a wealth of ancient remains underwater and on the Israeli coast. Among them are submerged prehistoric settlements, ancient coastal cities, and remains of shipwrecks, harbors and anchorages (Raban and Galili 1985; Galili et al. 2002; Galili and Rosen 2008a; Galili 2009).

#### Submerged Neolithic villages

Six submerged Neolithic villages dated from ca 9,000 to 7,500 years before present (BP) were discovered off the Carmel coast. They represent an important stage in the Neolithic revolution when the agro-pastoral societies have reached the Mediterranean coasts and joined the local coastal communities subsisting on hunting, fishing and gathering. The result of this meeting was a new mode of subsistence known as the Mediterranean fishing village subsisting on agriculture, herding and fishing. Atlit-Yam, the Pre Pottery Neolithic site (see below), represents the earliest and best preserved Mediterranean Fishing village, with the earliest known stone built water wells (Fig. 3) and the only submerged settlement to contain tens of human burials (Fig. 4). Five Pottery Neolithic sites were recovered as well, containing the earliest known evidence for olive oil extraction, the earliest wooden-walled water wells (Fig. 5) and the earliest known separated and well organized cemetery (see Neve Yam site below, Fig. 6).

#### The beginning of urbanization and the spread of Egyptian culture

It is claimed that an early Levantine civilization, i.e. kingdom and kings, appeared in Egypt as a quantum leap around 5300–5200 BP (Redford 1992). At about 5,000 BP this social system started to spread away from Egypt. This revolutionary social “invention” spread north and affected the farther development of the human societies. Signs of this spreading process are found on the shores of southern Israel and underwater. A pottery vessel containing bivalve shells of Nilotic origin found at the North Bay of Atlit (Fig. 7) was dated to the Early Bronze Age (5,000 BP). It represents the earliest evidence of open sea navigation along the south Levantine coast and testifies to maritime connections between Egypt and the Syrian- Palestinian coast at that time.

#### The Bronze Age and the sea people

Urbanization started in the Levant during the Bronze Age and the remains of certain early urban centers present on the coast are endangered by the rising sea. The struggles for dominance between Egypt in the south and the Hittites Empire, the sea people and their successors in the north occurred in this area, partly in the sea. Some times during the end of the Bronze Age monotheism started to evolve in what is now Israel. Also at this period the sea people, including the Philistines, appeared on these shores. Finds on the coast and underwater from the end of the Bronze Age, an important transition period, includes urban sites along the coast as well as stone anchors (Fig. 8), ox hide copper ingots and bun tin ingots (Fig. 9). Weapons recovered includes: arrow heads, daggers, bronze axes and sickle swords. Also pottery remain indicate active international shipping activities along this coast.

#### The Iron Age and the Persian period

There are scarce archaeological findings testifying to nautical activity in this area during the Early Iron Age. Much of the Phoenicians activity at that period occurred north of Israel and less on the Israeli shores. However after the Assyrian and the Babylonians Empires appeared the Persian Empire together with a strong economic and demographic revival on the Israeli coast. This revival is seen by the construction of numerous shore sites testifying to Phoenician expansion as well as a built harbor in Atlit. Underwater finds such as the Ma'agan Michael wreck (Fig. 10) and shipwreck assemblages testify to an increase in marine activity reflected also in the central and west Mediterranean.



**Fig. 3** Stone built water well from Atlit- Yam



### The period of the Greek—Hellenistic expansion

The Hellenistic period coming after the defeat of the Persian Empire by Alexander the Great left many marks on the Israeli coast and underwater. The marine connections with the central and west Mediterranean intensified, as seen by findings ashore and underwater. At that period the functioning of the Mediterranean as a connecting agent between distant shore populations is demonstrated by numerous archaeological sites and

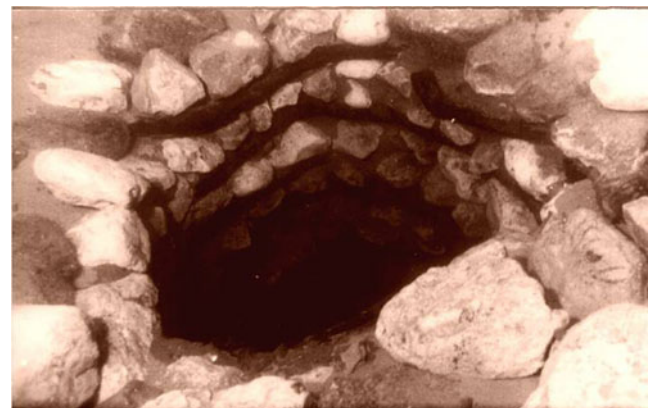
artifacts presently endangered by sea level rise and human activities. Akko harbor was constructed at the 2ed cent BC and the archaeological finds there shed light on material and spiritual life at this period. The Hellenistic bronze battering ram found at Atlit is a notable underwater find from that period (Fig. 11). Also found were numerous shipwreck assemblages containing thousands of artifacts including hoards of silver coins and bronze figurines.

### The Roman “Mare Nostrum”

During the Roman period the unification of practically all the shores of the Mediterranean under one political-economic system is seen in shore structures and artifacts recovered by coastal and underwater archaeological investigations along the Israeli coast. The nautical activities of the Jewish Hashmonaeans kings, first independent and later vassals of Rome, is seen in numismatic finds as well as in materials collected from marine archaeological explora-



**Fig. 4** A Neolithic burial of a female from Atlit-Yam



**Fig. 5** A water well from Kfar Samir walled by wooden branches

**Fig. 6** A Neolithic dwelling being eroded in the submerged Neve Yam site



tions. The influence of Rome is demonstrated by the unique harbor in Caesarea and by numerous shipwreck sites, including wooden hulls, anchors, marble and bronze figurines (Fig. 12), coins, fishing gear and other marine objects. The boat from the Sea of Galilee, dated to that period, is an outstanding well preserved find from inland waters.



**Fig. 7** An Early Bronze Age Egyptian pottery vessel containing Nilotic shells

The beginning of Christianity in the Late Roman period

An outstanding find is the bronze standard from Atlit, bearing inscription mentioning the coastal Talmudic city of Shikmona and Jewish symbols (menorah with seven candles). The Jews, not being a sea minded people, left only few nautical antiques. The rise of Christianity in its native land, and later visits by numerous pilgrims left traces ashore and underwater. The Byzantine period is widely



**Fig. 8** A diver documenting a Late Bronze Age stone anchor of the Carmel coast



**Fig. 9** A Bronze Age cargo of copper ox hide ingots and tin bun ingots



represented in the archaeological record, by shore sites and numerous shipwreck assemblages. Shipwreck assemblages from this period include many bronze artifacts, fishing gear and sounding weights, some decorated with crosses (Fig. 13). The farther growth of Christianity in its native land is seen by the Byzantine heritage, including numerous shore sites and several shore churches.

The first Islamic expansion, the early Islamic period, the Mameluks and the Ottomans

The traces of the Islamic regimes can be observed along the Israeli coast. Remains of Islamic periods are seen in various monumental shore fortifications both in the large cities like Akko and Ashkelon and also in small coastal places like Jaffa and Dor –Tantura (see below). Also several shipwreck assemblages such as: the Megadim Mameluk wreck (Fig. 14)



**Fig. 10** A fourth century B.C. ship from Ma'agan Michael, Hecht Museum Haifa

and the cannon carrying ship wrecked at Atlit shed light on the naval activities and trade at these periods.

#### The Crusaders period

The Crusaders period is rich in coastal and underwater remnants. Traces of wars between Christians and Muslims, recorded in various written documents, can be seen underwater, like the gold coins found in Akko harbor. The



**Fig. 11** A Hellenistic bronze battering ram from Atlit



**Fig. 12** A bronze figurine of Serapis from a 2nd century AD Roman shipwreck off the Carmel coast

intensive Mediterranean maritime commerce at that period and the role of the Italian maritime cities in it is reflected by numismatic finds as well as by ceramics and pottery finds, on shore and underwater. Also shore fortifications and activities in them documented in writing, can be observed in coastal archaeological excavations. Such informative sites are the port of Akko, the fortress of Atlit and smaller shore fortifications as in Apollonia (see below). Underwater finds from that period include gold coins (Fig. 15) and few underwater wreck sites.



**Fig. 13** A Byzantine lead sounding weight bearing a cross



**Fig. 14** 14th century AD bronze artifacts from a Mameluk shipwreck off the Carmel coast

#### Aircrafts and warships lost at war

In recent years lost battle ships, submarines (Fig. 16) and aircrafts are protected as memorial monuments. These wrecks are of great emotional value to many people and are part of the heritage that should be preserved for future generations.

#### The main ancient coastal settlements at risk in Israel

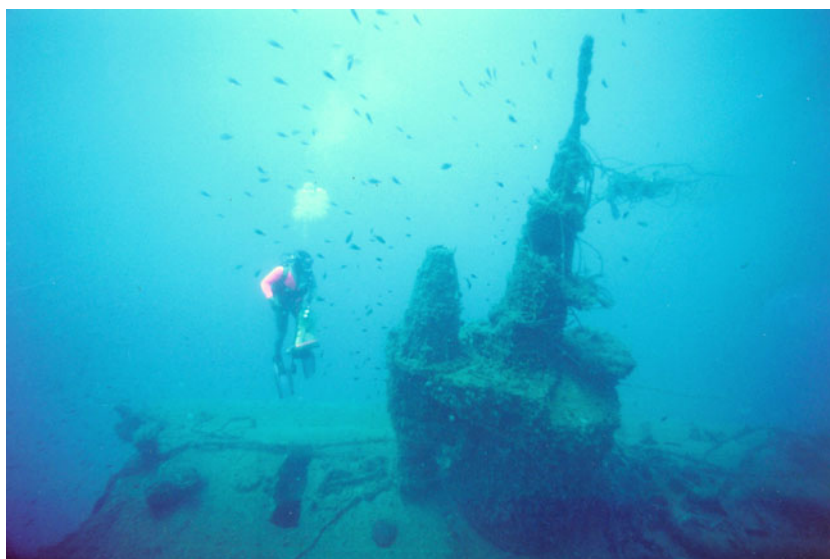
The coastal settlements at risk can be classified according to three categories based on morphological characteristics: Fortified coastal city with sea wall founded on a rocky platform; Stratified coastal tel; Submerged Neolithic settlement (Fig. 17a, b, c). Surveys results are presented in brief, including site description, the main problems and actions to be taken (Galili 2006, 1999; Friedman and Galili 2004).



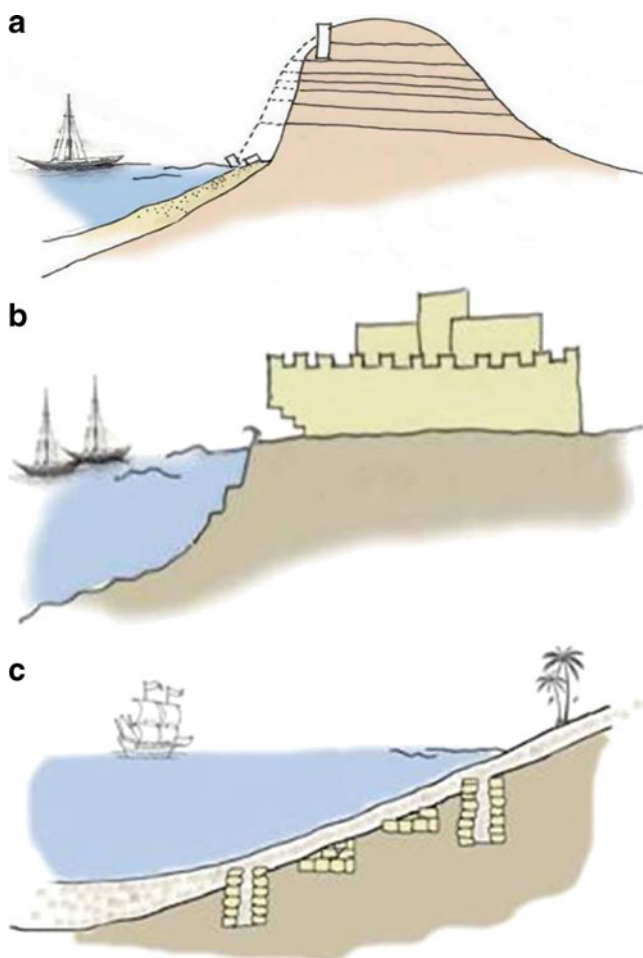
**Fig. 15** A hoard of 13th century AD gold florins from Akko harbor



**Fig. 16** The Italian submarine Scire sunk in Haifa bay during World War two



Coastal sites at major risk



**Fig. 17** A classification scheme of endangered marine sites in Israel: a. Ancient tel; b. fortified settlement; c. submerged prehistoric site

*Akko* Akko is a world Heritage site, and historic Mediterranean port city that functioned continuously since the Bronze Age. The presently visible Othman city is built on the ancient ruins of the Byzantine, Early Islamic and Crusader fortifications. The harbor was built in the Hellenistic period and was used almost uninterruptedly till today (Galili and Rosen 2008b). *Principal Risks*: the lower parts of the city walls are being eroded by the waves. The upper parts are being damaged by the waves spray and wind. City walls in the southern Pisan quarter sea front are exposed to storm waves from the southwest. Sections of the city wall collapsed (Fig. 18). *Measures required for salvaging the site*: implementation of conservation and maintenance treatment in problematic sections of the city wall according to the risk and conservation surveys. Ongoing multi-year preventive maintenance: conservation-engineering treatment, filling empty spaces, adding stones, pointing up joints, periodic monitoring in the different sections (panoramic photographs, locating new risks).

*Caesarea* The city, a National park, was founded during the Hellenistic period, reaching its peak in the Roman period. King Herod built a large harbor at Caesarea that served the Roman Empire in the eastern Mediterranean. Remains of the harbor are located on the seabed. In the Roman period numerous public structures, such as a theater, aqueduct and hippodrome, were built. During the Byzantine period the city was protected by a wall, the later Crusaders walls are still visible. *Principal Risks*: massive coastal erosion due to the construction of a power plant harbor south of the site, similar to the case of Ashkelon (see below). *Measures required for salvaging the site*: as in Ashkelon below.

**Fig. 18** Section of the Akko seawall under reconstruction works



*Apollonia (Arsuf)* The site, a national park, includes Roman, Byzantine, Muslim and Crusader settlements. During the Crusader period a fortress was built, later it was besieged, conquered and destroyed by the Muslims. *Principal Risks:* massive destruction of the seafront and a collapse of buildings, as in Ashkelon. Shipwrecks and cargos are exposed on the seabed and are threatened by treasure hunting. *Measures Required for Salvaging the Site:* as in Ashkelon below.

*Yavne-Yam* The site was settled from the Bronze Age to the Byzantine period. West of the settlement are the remains of a natural basin that served in antiquity as the principal anchorage of southern Israel. *Principal Risks, and Measures required for Salvaging the Site:* as in tel Ashkelon.

*Tel Ashkelon* The site is a national park. The fortified city was founded during the Bronze Age. Numerous granite and marble architectural elements are indicative of the magnificence of the city during the Hellenistic and Roman periods. In the Early Islamic and the Crusader periods the city was fortified by a heavy wall and the seawall was reinforced by granite columns taken from ancient buildings. *Principal risks:* collapse and massive destruction of the seawalls, erosion and run-off accelerate the destruction of the coastal cliff. There is a significant narrowing of the sandy beach due to the construction of harbor installations south of the site. As a result waves are directly damaging the archaeological remains. There is a dire safety problem stemming from landslides, deterioration and collapse of sections of the coastal cliff, parts of buildings and installations. In the absence of protective beach sands, the tel strata are being

washed away after the collapse of the sea walls. Shipwrecks and cargos are exposed on the seabed and are threatened by treasure hunters. *Measures required for salvaging the site:* archaeological salvage excavations of the buildings and the installations on the tel seafront which are in immediate danger of destruction, dismantling dangerous buildings that cannot be stabilized. *Conservation works of buildings and installations at the seafront* (Fig. 19): filling empty overhanging spaces, pointing up joints, stabilizing slopes by means of terraces, vegetation and nets, arranging drainage on the slope and above it, protecting the seafront by reconstructing Crusaders seawalls, or building a protective seawall of boulders and/or depositing sand. *Follow-up and yearly monitoring:* panoramic photography and locating new risks when they occur; underwater surveys to be carried out year round to locate, document and salvage the remains of shipwrecks and cargos newly exposed on the sea bottom.

*Ashkelon Mayumas (Ashkelon North)* Settlement remains from the Byzantine period and a fortified compound are located on the coastal cliff and are currently being destroyed by the sea (Fig. 20). Shipwrecks and cargos are often being exposed on the sea bottom. Archaeological salvage excavations are to be carried as well as underwater surveys year round.

#### Coastal sites at minor risk

*Akhziv* The site, a national park, was inhabited almost continuously from the Middle Bronze Age till the 20th century. Protection and conservation works are required along sections of the seafront.

**Fig. 19** The Ashkelon seawall after conservation



*Atlit* The site, a future national park, was inhabited during the Middle Bronze Age. A nine century BC Phoenician harbor was perfectly preserved. A well preserved Crusader fortress is subject to marine erosion. North of the fortress there is a Crusader cemetery with dozens of tombstones, some of which are decorated. A modern protective wall built around the cemetery was destroyed in several places. The Crusader fortress requires conservation and rehabilitation work, and the modern protecting walls of the Crusader cemetery are to be repaired. On going underwater rescue surveys are required.

*Tel Tanninim* A coastal Roman Byzantine settlement on the southern bank of Nahal Tanninim. North of the tel there are the impressive remains of an Ottoman stone bridge. The settlement is weathered by the sea. Protection and conservation measures are needed as well as salvaging excavation and underwater surveys.

*Tel Dor* The site is planned as a future national park. Habitation there began during the Middle Bronze Age and continued uninterrupted until the Roman period. South of the site there is a natural anchorage in which numerous ship-

**Fig. 20** A temporary coastal protection at Ashkelon Mayu-mas using a geo-technique sleeve filled with sand





wrecks were discovered. The southern and western parts of the tel are undergoing rapid weathering and destruction. The ancient buildings on the southern sea front and a number of sections in the western part require conservation works. Protective measures are needed as well as underwater salvage excavations and surveys.

*Ashdod-Yam* The site, an Early Islamic and Crusader fortress, is surrounded by a wall. Parts of the seawalls have undergone conservation and were restored. The fortress and the seawalls are damaged by the waves. Conservation and restoration measures are required.

#### Submerged Neolithic settlements at risk

*Atlit-Yam: submerged Pre-Pottery Neolithic settlement* The 9,000 years old site include rectangular stone structures, megalithic installations, hearths, human burials and numerous faunal and floral remains (Galili et al. 1993; Galili and Nir 1993). The oldest known stone built wells were discovered at this site. Underwater surveys and excavations are needed in order to document and salvage the remains that are occasionally exposed and eroded.

*Neve-Yam: submerged Pottery Neolithic settlement* The 7,000 years old site is located near the shoreline. A unique cemetery with stone built cist graves was discovered (see above). The structures are heavily eroded by the sea. On going surveys and excavations should be conducted aimed at locating and documenting installations, dwellings (Fig. 6) and graves which are exposed on the seabed.

### Conclusions

The marine archaeological heritage of the Mediterranean represents important chapters in the history of humanity. Sea level rise and human activities, mainly building and quarrying, are causing massive coastal erosion and the rapid destruction of unique coastal and underwater sites. In recent years, significant damage caused to the ancient coastal settlements and valuable archaeological assets have been lost. Rising sea levels during the 21st century will cause a severe damage to the ancient coastal settlements. Without the implementation of protective and conservation measures, substantial parts of the ancient coastal settlements will be lost within several decades.

### Recommendations

National and regional master plans for the protection of the coasts should be drafted; the treatment of the ancient

coastal settlements must be included within this framework as a matter of high priority.

Emergency plans should be drawn up for immediate action in the coastal cities at Akko, Atlit, Apollonia, Yavne-Yam, Ashkelon North, Tel Ashkelon, where the damage is especially severe. Temporary protection and conservation measures should be implemented until permanent solutions are found.

Salvage excavations at the seafront of the aforementioned ancient coastal cities must be conducted urgently to salvage the archaeological information.

Simultaneously, a plan for the on going conservation works for all of the ancient coastal settlements should be prepared.

Underwater salvage surveys should be performed year round in the vicinity of the ancient coastal cities.

Action must be taken to ensure that the conserving coastal cultural resources become part of the public and government agenda and given the right priority.

The ancient coastal settlements must be granted the preference they deserve in the national order of priorities for financing the treatment of the endangered sites.

A national budgetary framework must be created for the short and long term preservation and protection of the ancient coastal settlements.

Contractors should be required to bear the long term responsibility for either direct or indirect damages likely to be caused as a result of building structures and installations on or close to ancient coastal settlements. This should be specifically stipulated in the building permits.

Some of the income of the beaches, marinas and national parks should be allocated to the preservation of the ancient coastal cities.

The risk survey indicates a budget of ca.30 million Euros is needed to ensure the protection and preservation of the coastal sites of Israel for the coming decades, and additional million Euros a year is needed for monitoring, surveying and maintenance.

Research institutions from Israel and abroad should be encouraged to conduct archaeological salvage excavations in highly endangered coastal sites.

### Proposal for International collaboration

Each Mediterranean state should prepare and apply national master plans for the protection of the marine Archaeological heritage. States and organizations should collaborate and establish international and regional projects aimed at mapping the cultural resources, assessing the risks and protecting and preserving the endangered archaeological sites. It is proposed to compose a Mediterranean atlas of cultural resources both archeological remains and living active human societies. Such Atlas will serve as a base for

assessing cultural resources at risk, establishing policies and master plans for the protection and the preservation of the cultural resources along the Mediterranean coasts. The atlas project will include a division of the various coasts according to degrees of risks in different coastal segments, categories of risks, priorities for preservation and protection and preservation techniques, budgetary and funding programs for short and long terms and plans for pilot projects in the Mediterranean countries according to priorities including their monitoring.

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