

# Classical Coastlines

---

ENVIRONMENTAL CHANGE AND  
COMMUNITY RESILIENCE



# CONTENTS

3	INTRODUCTION
4	CLIMATE CHANGE AND COASTAL EROSION
5-6	THE ANCIENT AND MODERN WORLD
7	ST ANDREWS WEST SANDS
8	ELIE
9	ROME AND THE ROMAN EMPIRE
10	EPHESUS
11-12	WORKSHEET
13	PETTYCUR BAY
14	BUCKHAVEN
15	HELIKE
16	LYCIA AND PAMPHYLIA
17	EUESPERIDES
18	WORKSHEET

# INTRODUCTION

---

Welcome to Classical Coastlines! This training package will aim to address the ways in which coastal environmental change impacts local communities. It will focus on perceptions of and relations to the natural world, promoting reflection and critical thinking using ancient and modern case studies to illustrate how settlements were and are affected by environmental change. The project will introduce discussions of adaptation and resilience against erosion and flooding events through these classical examples..



The trip today will take you along the Fife Coastline, stopping at sites most affected by erosion and coastal change. At each site there will be discussion of both the problem at hand and what can be learned from an ancient case study. This handbook will provide context of the ancient sites.

No prior knowledge of the ancient Mediterranean is needed.



# CLIMATE CHANGE AND COASTAL EROSION



Almost all of the most deprived (top 5%) areas in Fife are coastal. (*Scottish Index of Multiple Deprivation 2020*)

It will be these communities which suffer the most in Fife from coastal erosion.

Wealthier areas at risk from erosion have the means to defend their property.

Over the past 20 years, relative sea-levels around Scotland have been increasing on average by 3 mm/yr. Since 1970, there has been a 39% increase in erosion, and a 22% decrease in accretion along soft coastlines.

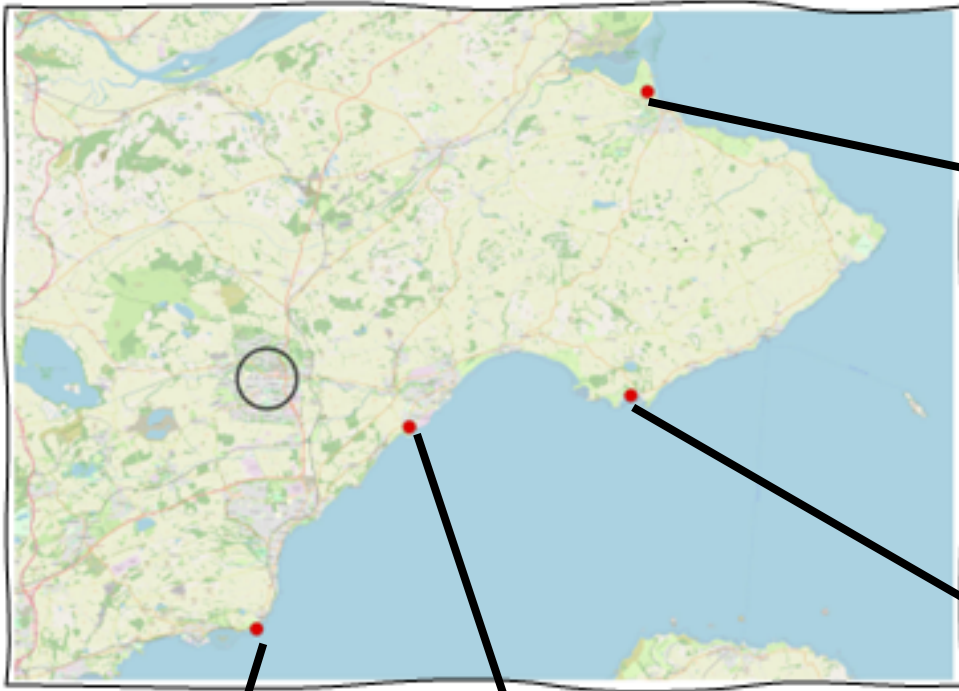
On these coastlines, erosion has nearly doubled to 1 m/yr .

(*Historic Environment Scotland 's Climate Action Plan 2020*)



Current methods of coastal defence include hard sea walls, and soft defences like sand dunes. Hard defences are effective, but often redirect the tidal energy to undefended areas, worsening erosion there. Soft defences are effective in diffusing the energy and reducing the harsh effects, but can be washed away leaving the area undefended.

# THE ANCIENT AND MODERN WORLD



**ST ANDREWS**



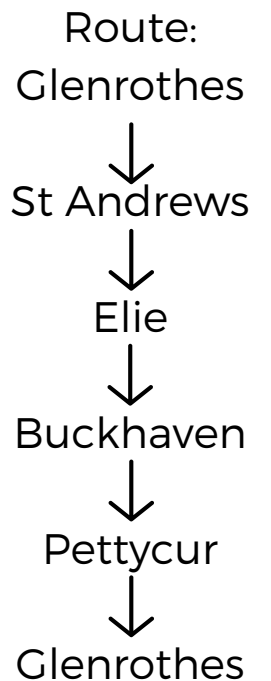
**ELIE**



**PETTYCUR**

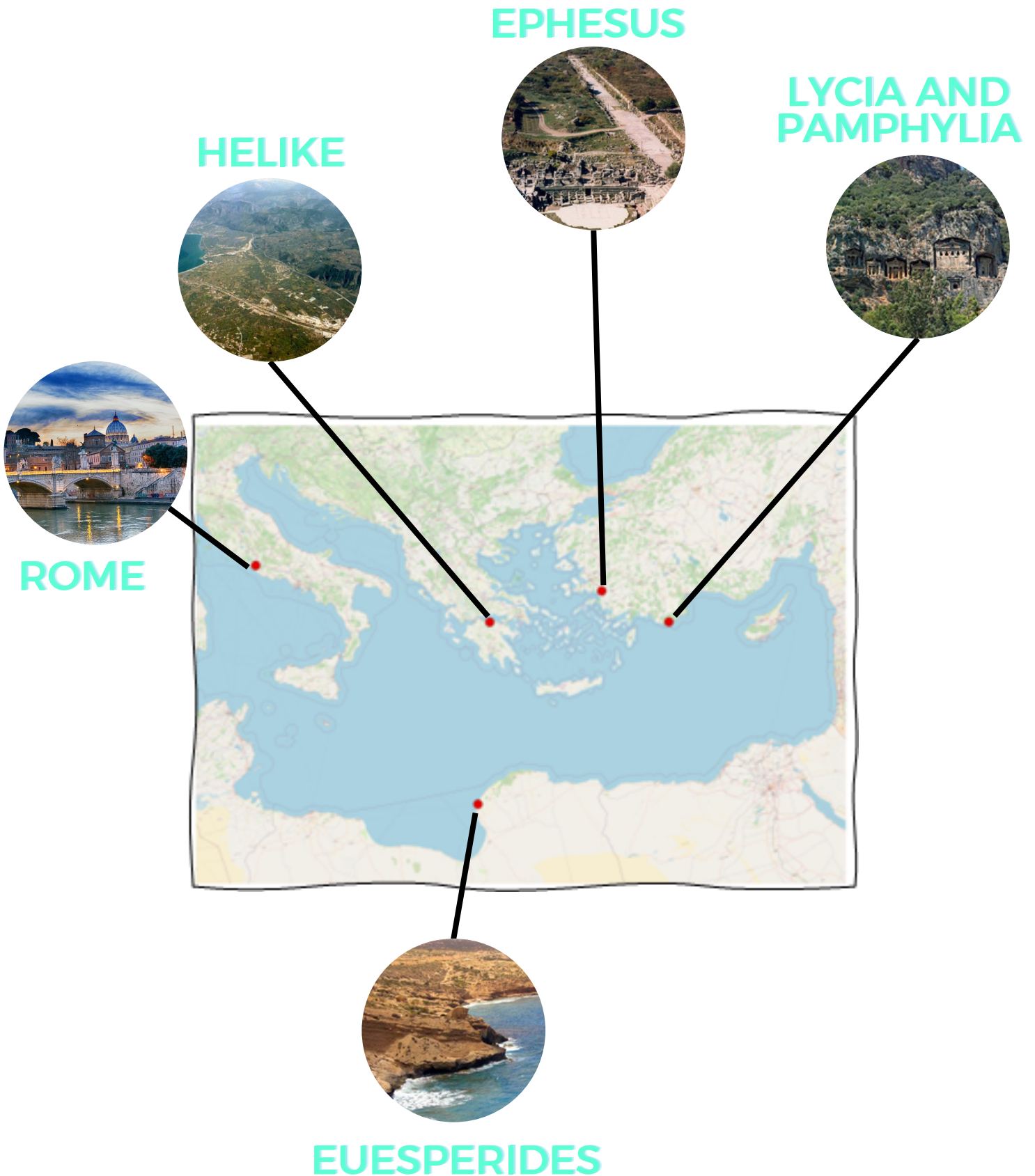


**BUCKHAVEN**



# THE ANCIENT AND MODERN WORLD

---





# ST ANDREWS WEST SANDS

---

The sand dunes at West Sands in St Andrews are eroding, meaning the coastal buffer is shortening. During high tide, the base of the sand dunes cracks and crumbles, and it takes longer for the sand dunes to naturally regenerate than it does for them to be washed away. Parts of the old course are at risk of being underwater by 2050 and almost fully underwater by 2100.

Dune regeneration work and investigation into potential flood risk is funded partly by St Andrews Links Trust due to the proximity of the Old Course. The R&A launched 'Golf Course 2030' in 2018, to address challenges posed by global warming.

Green shores partnership – collaboration between coastal landowners and community organisations, that have created fringe salt-marsh habitat in key sections of degraded shoreline to reduce the impact of erosion and flooding of the land behind it by providing a stable shoreline that acts as a wave break.

Fringe salt-marsh restoration in Eden Estuary.

The public have been urged to donate Christmas trees to prevent crater erosion on the west sands' sand dunes.



# ELIE

---

Flood maps by the Dynamic Coast project predict that even with a global push to reduce carbon emissions, erosion and sea level rise would threaten homes in Elie and Earlsferry. Dunes are vital as they are the last line of defence against a storm surge. They can regenerate after suffering storm damage, but if they are eroded they won't regenerate as quickly or provide as much protection.

The community council created a beach group which raised funds for a survey undertaken in 2016 to work out how to best manage the beach sand dunes. Ivy has been removed from dunes and marram grass transplanted to areas at risk to protect the soil.

Not all residents like the grass, and it has been mown down in areas. Erosion is visible in areas where it has been mown down.

Many of the properties at the waterfront are second homes and their value comes from a sea view, which the grass can obscure. For the majority of the properties the curtilage extends to the dunes, so it is their land which leads to conflict in organising the protective measures.





# ROME AND THE ROMAN EMPIRE

---

Amongst early Greeks and Romans, nature was inherently religious, and in the realm of the gods. This left them to take great care in nature related activities such as hunting and agriculture. In contrast, from the period of the Roman Empire (27 BC), the Romans view of the environment world changed. It became defined by sceptical rationality that explained the world in natural terms and ignored the gods.

The Roman Empire exemplifies a society displaced by unsustainable practices, something that can be observed through various practices like imperialism, exploitation, and control of agricultural and water resources. We know Rome saw a decline in landscape maintenance, which persisted despite the wealth of the agricultural knowledge they possessed. Deforestation and landscape erosion during the Roman Empire was not as extensive as today, but serious enough to produce profound social and economic effects. This is seen in Ostia, Rome's major port at the mouth of the river Tiber, where repeated efforts were made to keep the port open.

They also experienced several periods of sea level changes. It is likely that the sea levels were lower in the Roman period, as evidenced by several Roman port facilities around the Mediterranean Sea which are now submerged.



# EPHESUS

---

Ephesus was a city on the south-west coast of modern-day Turkey. It was founded in the 10th century BC by colonists from Ancient Greece.

The settlement maintained no definitive location during the archaic period (c. 800-480 BC), and evidence suggest that the city moved around from as early as the Bronze Age until the Roman period. This was due to the movement of the nearby river and silting up of the natural harbours. The city saw significant prosperity. It was one of the largest cities in Asia Minor during the Roman period; during Augustus' reign it was made the capital of the region and Strabo exclaimed it was second in importance only to Rome. The city remained inhabited until the 15th century, when it became completely abandoned.

The site has seen significant changes in its coastline and access to water. The most significant changes occurred 1) in the Hellenistic period where the harbour silted up, and the resulting marshes caused increased numbers of malaria cases and consequent deaths, and 2) in the Byzantine period when the city lost access to the natural harbour and lost access to the Aegean Sea which had been crucial for their vast and long-lasting commercial activity.

Today, the ancient ruins of Ephesus are some 3-4 km (c. 2 miles) from the coastline as a result of long-term deforestation, overgrazing, erosion, and soil degradation.



# ◆ SITE ACTIVITY ◆ Worksheet

In groups, please discuss on the questions below, referring to the topics discussed. There are no 'right' answers, and we encourage you to bring in anything you think might be relevant

WHAT MIGHT HAVE MOTIVATED THE DIFFERENT ATTITUDES TO ENVIRONMENTAL CHANGE SEEN WITHIN THE ROMAN EMPIRE?

WHAT MIGHT BE SOME REASONS TO IGNORE AWARENESS OF ENVIRONMENTAL CHANGES CAUSED BY HUMAN USE?

DOES HOW WE THINK ABOUT, AND PERCEIVE, NATURE AND THE ENVIRONMENT PLAY A ROLE IN THE DECISIONS WE MAKE ABOUT PRACTICES THAT AFFECT THE ENVIRONMENT?





# PETTYCUR BAY

---

In 2020 there was a landslide at Pettycur Bay Holiday Park, 27 people were rescued by fire crews and 218 people had to be relocated when 450 mobile homes were affected. The landslide also blocked the railway line and caused road closure of the A921 between Kinghorn and Burntisland. (the main road between the two)

The historic harbour at Pettycur has also been eroded away, which has been a significant loss to the community of fisherfolk who once lived in the area. While a modern harbour has been built, it is not used in the same capacity as it once was, and the loss of this infrastructure was a loss to the whole community. It has been reported through history that Pettycur is vulnerable to storms, with damage to the harbour being recorded in 1625 particularly:

“A greate and ferefull storne and tempest which led to the harbour of Pretticur being totallie overthrawin and brokin down”

*(church record dated 25th August 1625, from SCAPE trust)*

People have still chosen to make their homes up on the edge of the cliffs and along the seafront, despite this risk.





# BUCKHAVEN

---

3m of land has eroded away in the past year, threatening thousands of pounds worth of improvements to the area made by a charity group CLEAR Buckhaven, including new paths, benches and picnic tables.

This area of Fife is the 7th most deprived area in Scotland.

Concerns have been passed to Fife Council, which deals with coastal protection, but it seems this particular stretch falls between two sections of sea armour which are maintained, so no action has been promised.

Latest erosion may expose contaminated material which is a further risk to the community.



# HELIKE

---

Helike was a city in the gulf of Corinth basin on the south coast of Greece. The area is regularly affected by earthquakes as it has two fault lines running through it.

The city was devastated multiple times throughout antiquity by earthquakes, tsunamis, and landslides. The most famous earthquake was in 373 BC when the town was leveled by a quake during the night and then submerged by a tsunami or mudflow the next day.

Pausanias 7.24.12-14 Earthquake leveled Helike to the ground. The sea flooded a great part of the land and covered up the whole of Helike. Moreover, the tide was so deep in the grove of Poseidon that only the tops of trees remained visible. What with the sudden earthquake and the invasion of the sea that accompanied it, the tidal wave swallowed up Helike and every man in it.

Helike was rebuilt or built over from the Bronze Age to the late Byzantine period. Helike's patron god being Poseidon proves that the people who lived there knew they were at risk from both the sea and earthquakes, yet continued to make their homes there.



# LYCIA AND PAMPHYLIA

---

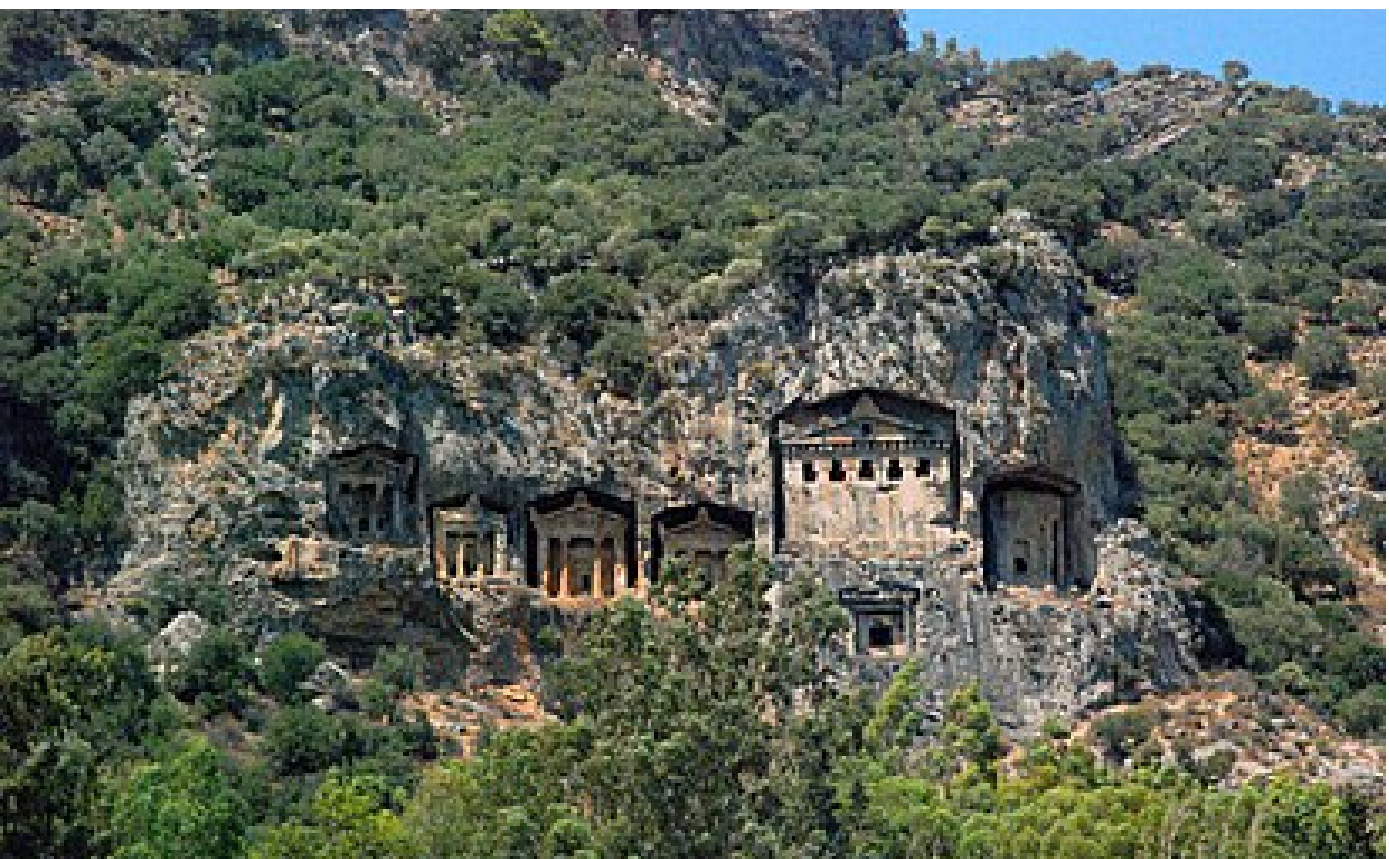
Lycia and Pamphylia was an area of settlement in South west Turkey. The coastal and interior plateau regions have zones with distinct microclimates.

Environmental data was taken from 9 sites at various altitudes (pollen), Kocain Cave (Speleothem), Lake Gölhisar (lake-water balance/ effective moisture), Lake Salda (lake-water balance), in order to establish evidence for habitation by ancient settlers.

These sites have settlement records spanning from the Bronze Age to the middle Byzantine period. There were 381 settlements, 8 of which were occupied in all 6 periods. 238 settlement sites contained evidence for 1-3 periods.

The average elevation of sites rises in Hellenistic-Roman periods, and the environmental data shows wetter conditions in this time too, which suggests that people had to move upland due to flooding.

In the early Byzantine period a reduction in accessible environmental moisture content forced people to move back down towards the coast for better growing conditions.





# EUESPERIDES

---

Euesperides was one of Cyrenaica's most important cities. The site is in modern Libya. It was founded in 525 BC on the edge of a lagoon that fed into the sea, allowing for fishing and trade.

After the marriage of Ptolemy III to Berenice, daughter of the Cyrenean Governor Magas, around the middle of the 3rd century, many Cyrenaican cities were renamed to mark the occasion and so Euesperides became Berenice.

Around this time the city was deserted and the people moved to where Berenice (now Benghazi) is today. Its desertion was probably due to the silting up of the lagoon, as the economy relied at least partly on access to the sea.



◆ SITE ACTIVITY ◆

# Worksheet

In groups, please discuss on the questions below, referring to the topics discussed. There are no 'right' answers, and we encourage you to bring in anything you think might be relevant.

WHICH VOICES WE ARE HEARING, AND WHO MIGHT BE MORE OR LESS AFFECTED BY THE ENVIRONMENTAL CHANGES THEY EXPERIENCE?

WHY DO PEOPLE CHOOSE TO STAY IN AT RISK AREAS?

WHERE WILL PEOPLE LIVE IF THEIR HOMES ARE DESTROYED BY EROSION?





## The Classical Coastlines Project

---

Classics for the Modern World:  
Interventions and Applications  
CL4467  
Module Co-ordinator:  
Dr Alice König

Caitlin Brown  
Kristoffer Naas  
Lily Talbot

