




ARCHIPELAGOS

INSTITUTE OF MARINE CONSERVATION

Multidisciplinary Internship Opportunities

2019-2020





Archipelagos Institute of Marine Conservation is a non-profit, non-governmental organization committed to researching and defending the biodiversity of the Greek seas and islands as well as the entire eastern Mediterranean region.

Since 2001, Archipelagos has offered research opportunities to over 2,500 students, recent graduates and scientists from all over the world.



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WHO WE ARE

Since 1998, Archipelagos has focused on a combination of multidisciplinary scientific research and efficient conservation work, in which local communities play an active part. This cooperation creates a strategic foundation that enables and strengthens the activities of Archipelagos at the local, national and European level, allowing us to defend marine and terrestrial wildlife against the ever-increasing human threats.

HOW WE WORK

Archipelagos operates far from city centers and commercial interests, offering a pure, direct approach to environmental conservation. We are working in different areas of the Aegean Sea throughout the year, next to the ecosystems in need of protection and management. Despite adverse weather conditions, especially during the winter months, we manage to implement significant research and environmental protection activities thanks to the enthusiasm and dedication of our research team. These actions are combined with applied scientific research in the field and in the laboratory as well as developed in close cooperation with local communities, authorities, international NGO coalitions and national and European institutions.

OUR TEAM

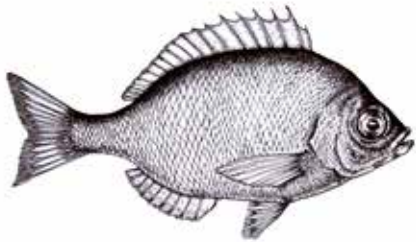
One of the main aims of Archipelagos is to bring together the expertise and know-how of the national and international scientific conservation community, gaining knowledge and experience which actively contribute to the conservation of the unique biodiversity hotspot of the Aegean Sea and the eastern Mediterranean.

Scientists, experts, recent graduates and students join forces with Archipelagos in its research bases on the eastern Aegean islands throughout the year. Teams are comprised of people from all over the world, with a wide background of specialties and skills, who actively participate in various projects. Archipelagos works closely with leading universities and research institutes from Europe, America, and Asia.



MAIN AREAS OF FOCUS

1



----- MARINE WILDLIFE ----- CONSERVATION

- . Marine mammals
- . Fisheries
- . Coastal ecosystems, focusing on endangered habitats and species
- . Invasive species
- . Oceanographic research
- . Water quality
- . Pollution assessment
- . Shipping disaster prevention.

2



----- TERRESTRIAL WILDLIFE ----- CONSERVATION

- . Island fauna, focusing on endangered species such as chameleons, jackals, bats and birds.
- . Island flora, focusing on the rare island forests and freshwater habitats.
- . Development of the Aegean Seed Bank
- . Pollution and human impact assessments
- . Management of priority habitats.

OUR BASES

Archipelagos Institute of Marine Conservation runs research bases and stations on seven islands of the Aegean: Samos, Ikaria, Lipsi, Arki, Marathi, Leros and Oinousses, which is situated further to the north.

Samos Island, Pythagorio – Main Research Base (1)
Samos Island, Vathi – Laboratories & Lecture Hall (2)
Ikaria Island – Forestry & Agronomy Research Base
Lipsi Island – Fisheries & Coastal Ecosystem Research Base

Oinousses Island – Marine Research Station
Arki Island – Coastal Biodiversity Research Station
Marathi Island – Coastal Biodiversity Research Station
Leros Island – Sustainable Aquaculture Research Station



MAIN RESEARCH BASE: PYTHAGORIO

Archipelagos' main research base is located close to the small town of Pythagorio, in the settlement of Mesokampos, on the southeastern part of Samos island. It is a multifunctional facility, which enables the conservation of coastal ecosystem and terrestrial biodiversity. The base houses offices with a small library and a presentation area, a small lab, dormitory style rooms for accommodation and a kitchen. Wireless Internet is available.



The building is situated just a few steps away from the beach, with a beautiful view facing the coast of Turkey and the national park of the Dilek peninsula. The Psili Ammos salt marsh, a protected Natura 2000 site, is located a few kilometers away and supports important migratory and resident bird populations, as well as other wildlife.



SAMOS ISLAND: VATHI

The laboratories and lecture hall are located in Vathi (also known as Samos Town), the capital of the island, in a beautiful neoclassical building provided by the University of the Aegean. It is comprised of spacious teaching and meeting rooms, offices, chemical and microbiological research laboratories, and serves as a seed and tissue bank. Wireless Internet is also available.

Situated on the coast and overlooking the harbor, the base is close to the centre of the picturesque town of Vathi. It is home to the Samos Archaeological Museum, regarded as one of the most interesting provincial museums of Greece. The old part of town, with its narrow streets, old churches, and spectacular view of the horseshoe-shaped bay below, is truly delightful.

RESEARCH BASES



LIPSI ISLAND

Archipelagos Fisheries & Coastal Ecosystem Research Base is situated in the centre of a small town and includes an office, dormitory style accommodations, a kitchen facility, and wireless internet is available throughout. Lipsi, a small, charming island complex in the northern Dodecanese, is inhabited by a population of 750 people. The island complex is part the EU Natura 2000 network, due to its special wildlife diversity. Its economy is based mainly on fisheries, so the locals heavily rely on the health of the surrounding waters. The population booms in the summertime, as many tourists and seasonal visitors are attracted to the beautiful landscapes, numerous small beaches, hospitable community and rich aquatic life. Lipsi is a blueprint for a "green island", as it is one of the very few Aegean islands where efficient recycling, waste and waste water management systems are in place.

LEROS ISLAND

Archipelagos is currently in the process of setting up a Sustainable Aquaculture Research Station in the northern part of Leros island. This station will support research on sustainable aquaculture practices and minimizing their impacts on marine ecosystems.



IKARIA ISLAND

The Forestry and Agronomy Research Base is located in the settlement of Kastanies, Rahes, within a traditional village community. Offices, a research laboratory, computer room and presentation area are provided and wireless Internet can be accessed throughout. Additionally, an online meteorological station and AIS receiver station are installed in the base. Dormitory style accommodation and kitchen facilities with a biomass heating unit are available. The base borders a small agricultural land, a pine forest and stream valleys with an amazing view.

Ikaria is a very special island of the Aegean, with beautiful beaches, traditional villages and very hospitable local community. The island is characterized by a unique natural environment with a rare combination of Mediterranean ecosystems. It is mountainous, with many streams and lakes, as well as large, diverse forests.



ARKI & MARATHI ISLETS (PATMOS AREA)

The Coastal Biodiversity Research Stations on the small islets of Arki and Marathi are housed in buildings provided by the Municipality of Patmos. The facility on Arki includes a simple office, laboratory, dormitory style accommodation and kitchen. On Marathi, the station is located in a small environmental observatory. Archipelagos' research teams use these facilities mainly for short term surveys.

The small island of Arki has 45 inhabitants, while Marathi, an even smaller islet nearby, is permanently inhabited by only 3–5 people. Both stations are predominantly used by Archipelagos' teams for littoral ecosystem research. The surrounding area is unique because of its pristine natural environment, with almost no anthropogenic impact and rich marine biodiversity. It is a perfect location for studying and experiencing pure nature.

The area is part of the "Permanent Wildlife Refuge of Arki Island Complex & N. Patmos Islets", which consists of 14 isles in the Patmos region. It was established by the Greek authorities in 2004, based on research carried out by Archipelagos in cooperation with the local community, the Municipality of Patmos and the South Aegean District.



OINOUSSES ISLAND

The Marine Research Station provided by the Development Center of Oinousses Aegean is located in the heart of the only town on the island. The office facilities are set in a beautiful building overlooking the sea with wireless Internet available throughout. Between autumn and spring, thousands of cormorants migrate daily over Oinousses Town and can even be seen from the office window!

The beautiful island of Oinousses is situated east of Chios island and inhabited by 600 people. It is historically known for being home to a large number of ship owning families. On the island there are several small beaches and vineyards, as well as the magnificent Church of St. Nicholas and the Monastery of Evangelismos.

CONSERVATION VESSELS

OKEANOS MOTORBOAT

Archipelagos' research vessel, Okeanos, is a 12m Bertram motorboat. It supports several Archipelagos' projects, including the mapping of seagrass meadows and coralligene reefs with the use of an ROV, structure scanner and sonar, as well as monitoring IUU fisheries and marine mammal research. The boat is fully equipped with all navigation, safety and communication requirements as well as a radar, GPS plotter, structure scanner, autopilot and a 6.5 kVA generator.

Manufacturer: Bertram
Type: Motorboat
Overall Length: 12m
Engine: 2* Iveco 335 hp
Passenger Capacity: 12 persons



OUR BOATS

Archipelagos uses three boats which serve as mobile platforms for marine research and conservation work. They support our actions on the Greek seas and in the wider area of the eastern Mediterranean all year round.



PINELOPI

For oceanographic research and marine conservation actions, Archipelagos provides a dual-mast sailing boat, Pinelopi, of 16m length and 5m width. She is a traditional vessel, a copy of a famous sailing boat from 1811. Her structure is reinforced with 10mm steel so that she can withstand the harshest weather conditions. The boat is fully equipped with all navigation, safety and communication requirements.

Manufacturer: Perama, Athens 1979
Type: Traditional, steel dual-mast sailing boat
Overall Length: 16m
Engine: Ford Fumoko 140 hp
Passenger Capacity: 14 persons



NIREAS

For marine mammal research, Archipelagos uses a dual-mast sailing boat, Nireas, 13.4m in length. Nireas provides steering outside and inside, supporting the team's research needs even during winter months. The boat is fully equipped with all navigation, safety and communication requirements.


Manufacturer: Jouet 1300, 1982
Type: Sailing boat (Ketch)
Overall Length: 13.4m
Engine: Perkins 50 hp
Passenger Capacity: 12 persons



KAYAKS

Archipelagos also uses a small fleet of 8 kayaks to support coastal research. Kayaks are considered to be an ideal, eco-friendly means of researching coastal habitats, while the great clarity of the Aegean waters (down to 40m) makes it possible to survey relatively large depths.

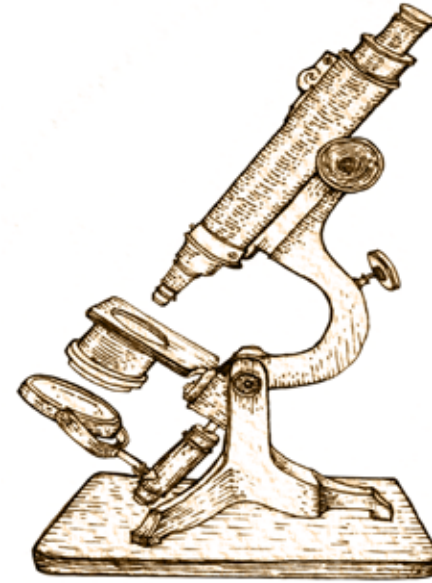
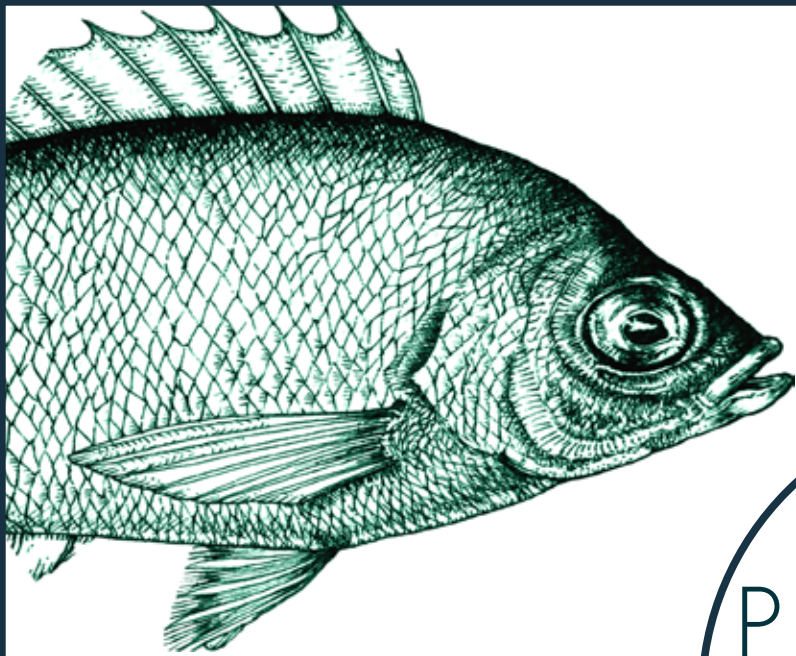
The kayaks are flexible, leave zero carbon footprint, cause no environmental impact and do not produce any noise pollution. One of the main applications of kayaks is monitoring and mapping the seagrass meadows, using a small structure scanner, an underwater camera and a bathoscope. During parallel surveys structure scanner readings can be shared via wi-fi on tablets on other kayaks. Kayak-based surveys also include sampling surface waters to study zooplankton and microplastics, monitoring seabirds and, with some luck, even marine mammals!



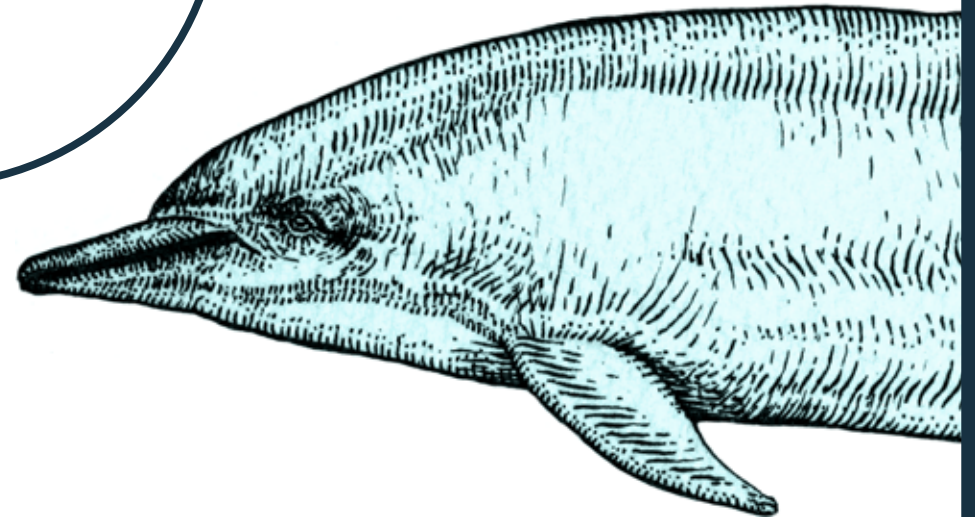
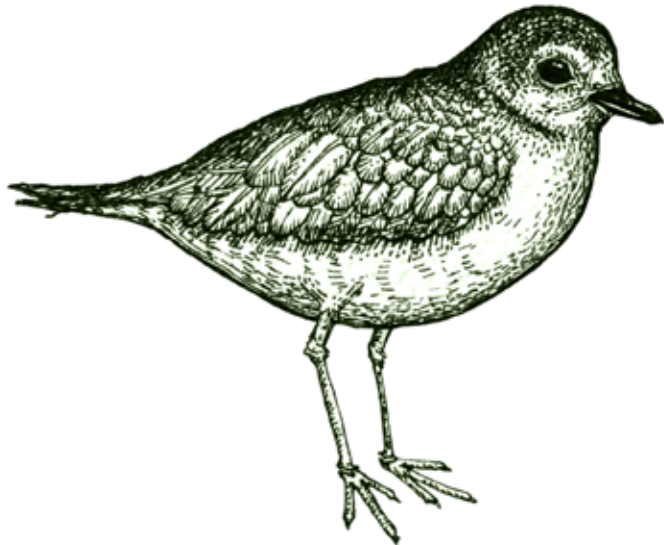
The Mediterranean is a unique sea with exceptional biodiversity within its waters. Although it represents only 0.8% of the seas worldwide, it supports 7% of the all existing marine species. Even though the rich biodiversity spans across the Mediterranean Sea, 25 hotspots have been found in the Eastern Basin alone, which covers the Levantine and Aegean Sea.

The Aegean Sea covers an area of approximately 214,000 km² and holds thousands of smaller and larger islands and islets in its waters. The Aegean Sea composes one of the most biodiverse regions in the entire Mediterranean. It hosts 12 marine mammal species that are at risk and supports extensive areas of priority protected habitats, including Posidonia seagrass beds and Coralligene reefs. The marine ecosystems of the region also support hundreds of fish species and thousands of invertebrate species.

All of the above highlight the magical world of the Greek seas, but the fact that this biodiversity still survives seems to be purely by luck since few protection or conservation measures are in place. This is a great challenge that all actions of Archipelagos aim to address.



PROJECT
AREAS





1 MARINE MAMMALS & SEA TURTLES

The eastern Aegean region is home to a large number of marine mammals which are classified either as at risk or data deficient. This habitat is in desperate need of protection, as it is subjected to a wide range of anthropogenic threats. The aim of Archipelagos is to better understand and monitor the habitat structure and population dynamics of cetaceans around the eastern Aegean islands. The ultimate goal is the implementation of “Marine Protected Areas” and supporting effective conservation actions and management policies in order to protect the cetacean and other species biodiversity.

OUR AIM

The Aegean, just like the whole Mediterranean Sea, is influenced by human activities such as shipping, tourism, unregulated fisheries practices and pollution, which threaten the survival of marine mammal populations. A vital sector of the eastern Aegean economy are the fisheries, which cause an unavoidable interaction between the marine mammals and the fishermen who are after the same prey.

The main goals of our research are:

- . Monitoring the habitat use, abundance and distribution of cetaceans, Mediterranean monk seals and sea turtles.
- . Studying the population structure and its dynamics.
- . Studying the behaviour through visual and acoustic data.
- . Investigating the impact of major threats, such as fishing and tourism, on the cetacean behavior.



HOW

Our current work includes the following activities:

- . Conducting boat-based surveys to collect data on cetacean abundance, distribution and behavior.
- . Conducting land-based surveys to investigate the effects that marine vessels and fishing pressure exert on the behavior of cetaceans and to collect data on the abundance, distribution and behavior of marine mammals.
- . Collecting data about different types of marine vessels, their distance from the focal group, fishing activities and marine debris during the boat and land surveys.
- . Assessing the populations of resident, transient and seasonal cetaceans through photo-ID.
- . Developing an online photo-ID network.
- . Using a hydrophone to collect acoustic data.
- . Creating GIS maps to pinpoint critical habitats and understand the factors threatening them.
- . Delivering first aid to live stranded animals
- . Performing necropsies of animals that have been found stranded dead



WHERE

The monitoring of marine mammal populations focuses on the sea around Samos and extends to the islands of Ikaria, Fourni, Patmos, Arki and Lipsi. From the research base of Pythagorio in Samos, land based surveys are also conducted from a number of observational points in different parts of the island.

The boats used by Archipelagos to carry out marine mammal surveys are anchored in Samos Marina, a little port next to the main research base.



WHAT

Research surveys can focus on:

- . Dolphin populations, including common dolphins, bottlenose dolphins, striped dolphins and Risso's dolphins.
- . Whale populations – sperm whales, Cuvier's beaked whales and occasionally fin whales.
- . Mediterranean monk seals.
- . Sea turtle populations, including green turtles and loggerhead turtles.



MARINE MAMMALS & SEA TURTLES

ARCMAP GIS

GENERAL MONITORING

The main task of the marine mammal team is to monitor the study area through both land and boat-based surveys in order to analyze the abundance, distribution and behavior of marine mammals and turtles. Data on various human impacts (marine vessels, fishing activity, debris) are also collected.

During surveys, the team is responsible for behavioral data collection, photographing individuals and later cataloging the photograph. All these data are recorded and stored in a database at the main research base for later analysis.

The marine mammal team utilizes ArcMap GIS for mapping the populations of species found in the Aegean Sea. By applying the data collected during surveys and fieldwork, we can show the distribution and abundance of different species, as well as hot spots and migration patterns in the sea.

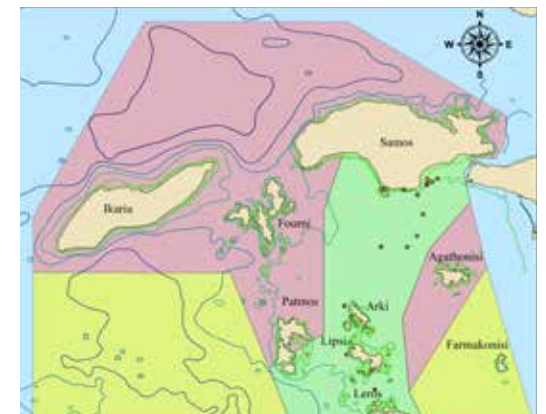
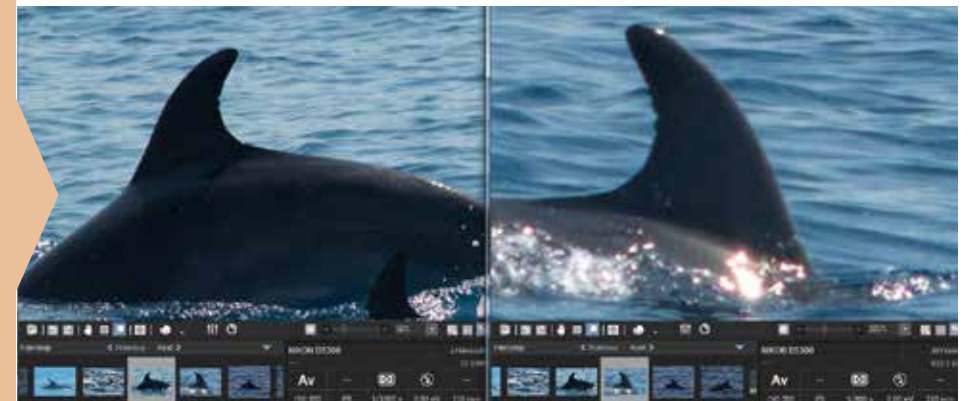


PHOTO IDENTIFICATION

During marine mammal pods sightings, the Archipelagos marine mammal team gathers photographic material used for identifying individuals inhabiting the studied area. To facilitate this process, all pictures are sorted, cropped and named. The identification is done by comparing different morphological aspects of the body and fin, such as patches of color, shape, scars, nicks, notches etc.

Once the individuals have been identified and classified, they are introduced into a photo-ID catalog which includes all the cetaceans spotted so far.

As a result of this process, the team can get a better idea of the population size in the study area, compare it along the coming years and identify the social structure and residency pattern of target species.



STRANDING RESPONSE PROJECT

Archipelagos' team takes part in rescuing stranded marine mammals and turtles when such incidents occur in the study area. After being notified of a stranding, the team members assess the situation and provide first aid in order to improve the health of the animal. If the individual is already dead, necropsy is carried out to determine the cause of death and to collect samples

for analyses (for example toxicological, DNA and stomach content). Through this work, we can gain a better understanding of the factors that threaten the populations of these charismatic animals and take actions that will efficiently protect them.



TURTLE MONITORING

In the eastern Aegean, there are no extensive nesting beaches for turtles. However, numerous sites can be found on the island every summer. At the same time, rich feeding areas are abundant in the region, therefore, turtle encounters occur year round. Archipelagos'

turtle monitoring project includes various activities ranging from observation at sea, monitoring the nests, administering first aid to injured turtles and performing necropsies of turtles found dead in the region.



MEDITERRANEAN MONK SEAL

Mediterranean monk seals are considered to be the second most endangered marine mammals in the world. It is estimated that only 450 individuals remain. One of the most important surviving populations of the species resides along the Greek and Turkish coasts of the Aegean Sea. Research on monk seal population includes monitoring the nesting and feeding areas as well as assessing the interaction with fisheries.

Since the spring of 2014, Archipelagos has been involved in daily monitoring and conservation of a young monk seal which displays a highly unusual behavior, approaching inhabited coastal areas and touristic beaches. Archipelagos' team works closely with the local community in a unique conservation effort to ensure the wellbeing of this special seal pup and facilitate her reintroduction to the natural environment.



2

MARINE CONSERVATION

With over 18,000 km of coastline and one of the largest fishing fleets in Europe, the monitoring of marine activities in Greece is not a simple task. The Aegean Sea supports exceptional biodiversity, including rare and protected marine habitats and species. For over a decade, Archipelagos has been collecting data and monitoring important ecosystems of the region, assessing habitats and populations as well as the different factors impacting them. Knowledge acquired in this way enables us to develop successful, targeted management and conservation plans.



FISHERIES

Fisheries have been an activity of vital importance to the island and Greek coastal communities for thousands of years.

However, over the past couple of decades, marine resources have become over-exploited, frequently through the use of destructive practices. If drastic measures are not introduced, the fishing industry will face the risk of collapse. Archipelagos' work to prevent this threat includes a combination of the following projects:

- . Recording the landings of artisanal fisheries' fleets.
- . Correlating catch data versus temperature data originating from loggers installed on fishermen's gear.
- . Conducting questionnaire-based surveys to collect information about fisheries in the area, such as gear used, effort per catch, differences in catches over time and other historical data.
- . Researching and recording Illegal, Unregulated and Unreported (IUU) fisheries in the Greek waters.
- . Work related to the development and assessment of successful fisheries management measures.
- . Working on the establishment of the first "fisheries co-managed area" in Greece.

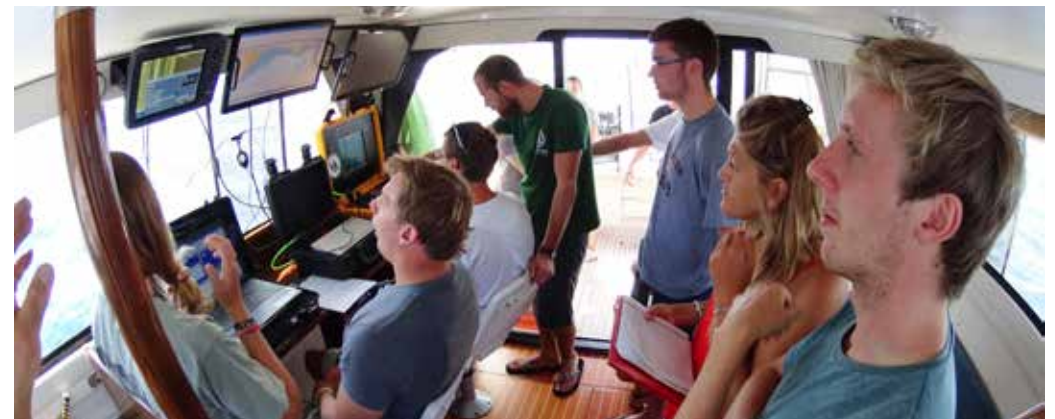


MONITORING THE POSIDONIA MEADOWS

Posidonia oceanica seagrass of the Mediterranean is believed to be the oldest living organism on Earth. It can be over 100,000 years old. The eastern Aegean still supports extensive meadows of *Posidonia*, while in other parts of the Aegean they have been damaged or destroyed as a result of urbanisation of the coastal areas, marine pollution and climate change. The EU and national legislation protecting this priority habitat is not enforced in many parts of the Mediterranean, therefore mapping, monitoring and protecting the *Posidonia* meadows is of the utmost importance.

Our current work includes the following activities:

- . Mapping *Posidonia* seagrass meadows with a combination of boat, kayak and drone-based surveys.
- . Assessing the impact caused by illegal trawling activity and invasive species.
- . Monitoring fishing activities and promoting sustainability.
- . Experimental installation of sustainable mooring systems over seagrass meadows.
- . Environmental campaigns about *Posidonia* meadows and coralligenous reefs to enlist public support for their protection.



MARINE CONSERVATION



COASTAL ECOLOGY

For over 15 years, Archipelagos has been monitoring the biodiversity of shallow, littoral zone ecosystems of the eastern Aegean Sea. The data collected enables us to get an understanding of local conditions, ecosystem changes, processes and threats. Surveys have a wide range of focus, including biodiversity assessments (fish, invertebrates and algae) and the spread of invasive species. They also include the impacts of the factors threatening protected species and ecosystems, colonization rates, experiments on sustainable mooring systems and artificial reefs, and many more.

SHIPPING RISK ANALYSIS

The Mediterranean is considered to be of high risk for major spills from large cargo ships and tankers. However, only a medium level of preparedness to deal with such accidents exists. The main shipping areas in the Aegean Sea, between Greece and Turkey, have largely unmonitored shipping traffic and are considered to be of even higher risk, as over 75% of all Mediterranean maritime accidents have been recorded in this region. Research in this field focuses on the risk assessment and analysis, as well as the development of management and prevention measures.



AQUACULTURE IMPACTS

The increasing demand for seafood, along with continued overfishing, have resulted in intensified aquaculture production in the Mediterranean. Recent aquaculture developments have been carried out with a focus on market demand, creating strong impacts on coastal ecosystems, wild fish stocks and local communities. Archipelagos strives to implement more sustainable aquaculture practices and to assess the impacts of units operating over intensively. Work in this field includes:

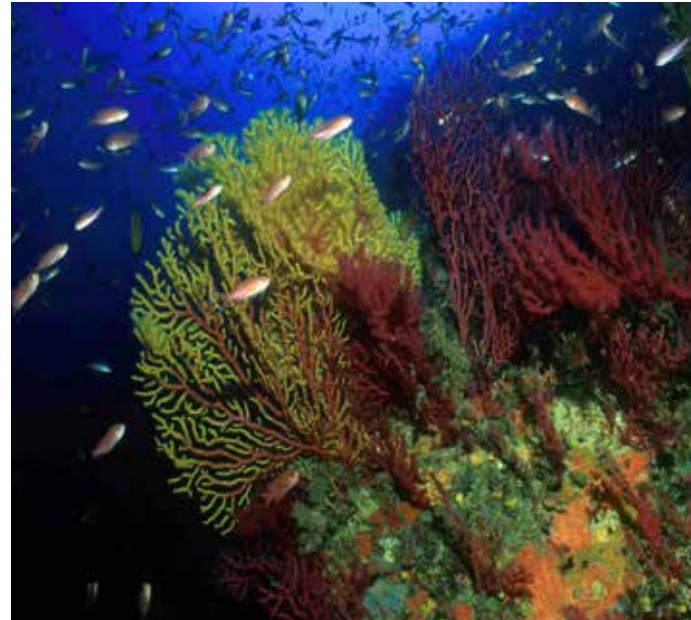
- . Analyzing the impact of aquaculture on coastal habitats and the accuracy of existing EIAs.
- . Collecting preliminary data to identify the impacts on biodiversity caused by different aquaculture practices and creating models of more sustainable approaches to aquaculture.
- . Cooperating with a medium sized aquaculture company on Leros island to modify its practices in order to create an eco-friendly model that respects the carrying capacity of the area.



CORALLIGENE MAPPING

Coralligenous reefs are frequently referred to as the best kept secret of the Mediterranean. Because of the lack of awareness, they have been greatly overlooked in terms of conservation, partially due to the lack of efficient research on these habitats in the Aegean. In cooperation with UNEP MAP-RAC/SPA, we are confirming the location of coralligenous reefs based on a combination of data acquired from fishermen

and boat-based surveys. By producing maps and putting pressure on the authorities, we strive to enforce EU legislation that bans trawling over reefs which causes their irreversible destruction. Our work includes participatory GIS surveys and boat-based surveys with the use of a cartographic camera, structure scanner and an ROV in order to create a map of coralligenous reefs in the eastern Aegean. (Coral pictures: E. Ballesteros)



INVASIVE SPECIES

For decades, fishermen and scientists have observed an increased influx of invasive species into the Aegean Sea that originates from both the Red Sea and from ballast waters of cargo ships. This sometimes causes important ecosystem changes, affecting both habitats and fisheries' production. Aiming to understand the extent of the problem in the Aegean, Archipelagos monitors the interaction of invasive species within the coastal zone ecosystems and fisheries landings. This includes:

- . The collection of data regarding invasive species via underwater visual census (UVC) surveys, questionnaires and recordings of fisheries' landings.
- . The creation of GIS maps which provide an overview of alien species distribution.



TERRESTRIAL CONSERVATION

The islands of the eastern Aegean are home to a rich biodiversity of flora and fauna. Thick pine forests, dense oak woods and green riparian valleys linked to rare island freshwater ecosystems can be found here, alongside garrigue and maquis types of vegetation. Samos is the only island in the Mediterranean where golden jackals can be found and the only place in Greece where Mediterranean chameleons still survive. The island of Ikaria supports an ancient holm oak forest, which is more than 500 years old. The surrounding islands and islets are important transit stations, feeding grounds and breeding spots for a large number of protected birds, including flamingos, Eleonora's falcons and Audouin's gulls.

OUR AIM

Archipelagos initiated its actions with focus on marine research and conservation, but the field of action gradually expanded to cover the terrestrial island habitats, which are also of great environmental importance. Both marine and terrestrial ecosystems are integral parts of a unified system and effective protection can only be achieved if we treat them as a whole.



WHAT

Archipelagos' terrestrial research focuses on:

- . Rare wetland habitats: the protected Alyki salt marsh, Mesokampos salt marsh and Potokaki pools in the southeastern part of Samos.
- . Internationally important and protected bird species: greater flamingo, ruddy shelduck, Eleonora's falcon, Audouin's gull, Scopoli's shearwater etc.
- . Mammals: golden jackals, wild boars, beech martens, weasels, hares and small rodents.
- . Reptiles and amphibians: Mediterranean chameleons, Caspian whip snakes, Balkan terrapins, tree frogs and numerous other species.
- . Insects: dragonflies, butterflies, moths and beetles, as well as other brackish and freshwater species.
- . Plants: ancient trees, orchids, marshland flora and endemic plant species.



BIRDS

The islands of the Aegean are crucial feeding and breeding grounds for numerous species of birds. More than 200 species have been reported on Samos, already constituting up to 50% of all bird species found in Greece. Current avian studies within Archipelagos involve the collection of baseline qualitative sightings data related to threatened wetland habitats of Samos and other important ecosystems in the eastern Aegean islands and islets. Using this information we hope to improve site protection and ecological status of these areas.

Archipelagos' work in this field includes a combination of the following projects:

- . Collecting information on a daily basis via standardised point count methods and transect surveys in order to observe accurate temporal comparisons.
- . Study of the nesting behavior with the use of camera traps.
- . Caring for injured birds before releasing them back into the wild.
- . Other studies depending on personal interests (e.g. raptor, migration) and qualifications (e.g. ringing license) of the research team.



TERRESTRIAL CONSERVATION



CHAMELEON POPULATION

Samos is the only part of Greece which still supports a population of Mediterranean chameleons. However, the fragile population of this species is increasingly threatened and human factors are to blame.

Surveys are carried out in spring, summer and autumn, ceasing in winter due to the annual hibernation of chameleons. Archipelagos' work in this field includes a combination of the following projects:

- . Surveys determining the population size and distribution, involving mark–recapture techniques and morphometrical analysis.
- . Surveys assessing seasonal variation of habitats and vegetation type preference.

BAT RESEARCH

Bat research is conducted depending on qualifications (e.g. licenses) of the research team members, as there is no such expertise in the Archipelagos core team.

In cooperation with experts, we have managed to identify eleven species of bats on Samos. With threats such as pesticides, light pollution and loss of habitat connectivity on the rise, there is an increasing need of continuing the research.

- Archipelagos' work in this field includes:
- . Surveying transects and analyzing sound files recorded.
 - . Visiting caves to identify species.
 - . Mist netting for species identifications.
 - . Assessing the impact of wind farms on local bat populations.

ANCIENT TREES

Surveys of ancient trees have been carried out across the eastern Aegean islands to profile some of the most biologically important flora. Age of the trees is estimated to designate them as Monuments of Nature and allow the implementation of protection laws.

Archipelagos' work in this field includes a combination of:

- . Locating and identifying ancient trees across Samos, Ikaria and other islands of the eastern Aegean.
- . Determining the age of the specimen by measuring trunks and taking bark samples.
- . Creating a GIS map pinpointing the locations of ancient trees and enforcing their legal protection.



JACKAL POPULATIONS

Samos is currently the only island of the Mediterranean where golden jackals can be found. The local population is genetically unique, and the factors influencing its distribution and foraging behavior are subjects of Archipelagos' research.

Researchers attend a selection of sites on a regular basis in order to determine whether anthropogenic disturbance has an impact on the habits and ecology of the jackals. Archipelagos' work in this field includes a combination of the following projects:

- . Nighttime acoustic surveys monitoring territorial groups with the use of vocalization techniques to estimate the number of packs on the island.
- . Behavioral surveys using camera traps.
- . Necropsies of dead individuals.



AEGEAN SEED BANK

In the spring of 2005, Archipelagos created the Aegean Seed Bank with the aim of collecting and preserving different kinds of seeds from around the Aegean and promoting their use among local farmers. These seeds are also propagated under suitable conditions and used to present the benefits of traditional, organic agricultural practices.

Archipelagos' work in this field includes a combination of the following projects:

- . Research into traditional agricultural farming techniques practiced by local communities on the Aegean islands.
- . Experimental application of these practices as well as organic farming techniques.
- . Collection, classification and analysis of local seed varieties preserved in the Aegean Seed Bank.



LAB RESEARCH

Marine debris is everywhere in our seas, in the form of large or small fragments or as microplastics fibers. It has been detected in all of our oceans and seas worldwide, as well as on six continents from the poles to the equator. Traveling on a ship thousands of miles from lands you can find floating pieces of plastic, which break down into invisible microplastics. According to a report by the United Nations, it is estimated that in every square kilometer of the ocean there are approximately 13,000 pieces of plastic.

OUR AIM

One of the main efforts of Archipelagos has been the establishment of the first non-governmental, non-profit, independent laboratory in Greece.

The Archipelagos laboratory facilitates studies which detect and analyze potential sources of pollution harmful for marine and terrestrial ecosystems. Such contamination can also damage the health of people who live on the islands and in the coastal regions of the eastern Mediterranean. The Archipelagos laboratory offers local communities the analysis of drinking water, swimming water and soil quality free of charge. Analyses are being performed with the aim of detecting pesticide residues in plant tissues, final products (e.g. wine and oil), as well as in soil samples. Potential microbial contamination of vegetables is also being assessed. Other analyses include determining the pharmacological potential of marine organisms.



MICROPLASTICS

The invisible world of microplastics pollution

The issue of microplastics pollution is similar to that of climate change, in the sense that it is an invisible problem that is easily neglected by the authorities and the public, but it is an issue bequeathed to future generations. Not only the food chain, but also water sources can hold microplastics for very long periods, possibly for centuries.

Plastic is everywhere around us: in plastic bags, bottles, toys, screw caps, packaging etc. In 2012 the global plastic production exceeded 280 million tons. Of these only 1% was recycled and it is estimated that only 50% of plastic waste ends up in landfills. The rest is dispersed in the environment, directly or indirectly, and as a result, plastics are one of the main polluters of the world's waters today.



OUR ACTIONS

Archipelagos Institute of Marine Conservation, in 2009, was the first organisation in Greece to initiate research assessing the extent of microplastics distribution. The research illustrated the scale of the problem and the results were shocking.

Analysing more than 1000 samples from 167 beaches of the Greek coast, every sample contained microplastic fibers. Samples from remote islands and uninhabited areas were found to contain microplastics fibers in an amount equivalent to the beaches of Athens. Further analysis carried out to date shows that almost 100% of fish and marine invertebrates examined (such as sponges and sea cucumbers) contained microplastics fibers in their stomachs. The goal of Archipelagos is to identify the main source of influx of microplastics into the Aegean and verify whether they are indeed traveling through the food chain, from plankton to humans. The findings of this research will be used for awareness campaigns.



WATER QUALITY

The Archipelagos laboratory analyzes both marine and freshwater samples, defining the content of microbes, nutrients and other chemical compounds. The aim is to assess the safety of local potable water, groundwater and swimming water in order to protect human health as well as the environment. When contamination is detected, Archipelagos informs and collaborates with communities as well as relevant authorities (local, national and/or EU) for the development and application of appropriate measures.

All of the techniques used in the Archipelagos laboratory are certified and produce scientific, reliable results. Further analyses which require resources beyond these currently available at the Archipelagos laboratory are undertaken at partner university laboratories.

The Archipelagos laboratory is located in the Archipelagos research base on Samos and a smaller lab unit operates in the Archipelagos research base on Ikaria. In addition, an on-board lab is currently being developed on the Archipelagos research boat, Pinelopi. The on-board lab will facilitate water analyses in various parts of the Greek seas during Archipelagos' research expeditions.



DRINKING AND GROUNDWATER

Archipelagos provides analyses of drinking water on various islands of the Aegean, focusing especially on the islands where the local authorities do not conduct regular monitoring. In most places drinking water can originate from different sources, hence the risk of pollution caused by nearby anthropogenic activities and natural rock erosion. On small islets and islands of the Aegean, where the water resources are limited and potable water is transported to people via water tankers, the quality of the water can differ with each shipment delivered. The Archipelagos laboratory provides local island communities with water quality analyses in order to ensure that they have free, safe access to drinking water. In addition, Archipelagos tests the water in regions where the contamination of groundwater is possible. When sources of pollution are detected, Archipelagos collaborates with local, national and EU authorities in order to eliminate them.



SWIMMING WATERS

The Archipelagos laboratory supplies data on swimming water quality at various beaches and informs local authorities, communities and visitors whether the waters are safe for them and their children to swim in or not. In many places around the Greek coastline, such samples are not regularly collected by the national authorities. Even when these tests are conducted, the results are not shared with the local communities.

Our chemical water analyses are carried out using the photometric method (certification ISO 9001: 2000) and a digital arsenator (certification ISO 9001: 2000). The microbiological analyses are also carried out (IDEXX Collert-18/ Quanti-Tray®: ISO 9308-3 (E. coli).



SOIL QUALITY

Growing healthy and productive crops requires good soil quality. If your soil is poor, you can selectively add the nutrient that is lacking from your soil for the specific crop you are growing in place of adding chemical fertilizers. On the basis of this principle, the Archipelagos laboratory team offers free analyses of soil quality for farmers who are also advised of the nutrient content

of their soil and of natural methods of replenishing any nutrients that are missing.

Our laboratory provides analyses of soil samples for the following parameters:

Ammonia, calcium, chloride, free chlorine, copper, iron, pH, magnesium, manganese, nitrate, nitrite, phosphate, phosphorus.



PESTICIDE RESIDUES

Archipelagos conducts research on pesticide residues in order to assess environmental effects of the use of pesticides and herbicides in farming practices and to inform consumers and farmers about these effects. Using the results of our analyses, we create awareness campaigns that explain the health hazards of pesticides and encourage farmers to choose organic methods in place of chemical agents. Our laboratory team collects samples from olive groves, vineyards, vegetable gardens and greenhouses. Samples are collected and analyzed from the main crops, the produced goods (e.g. wine and oil), the surrounding vegetation growing on the ground and the soil. In recent years there has been a slow but steady shift towards organic farming by people who live on the islands. Nevertheless, a lot of work is still needed for progress to be made on a large scale.

5 MEDIA & PUBLIC RELATIONS PROJECTS

Archipelagos' research and conservation projects can be successful only if they are known, understood and believed in by the local communities and the wider public. Our media and public relations team creates posters, leaflets, animations and documentaries as well as uses social media in order to ensure our success. Working closely with Archipelagos researchers and volunteers, the team shows the unique nature of the Aegean Sea and islands to the world.





MEDIA AND PUBLIC RELATIONS

Thanks to the media and public relations team, the Archipelagos' efforts are made public in real time. Archipelagos is a non-profit organization, therefore fundraising campaigns are essential for our continuous work. Activities may include:

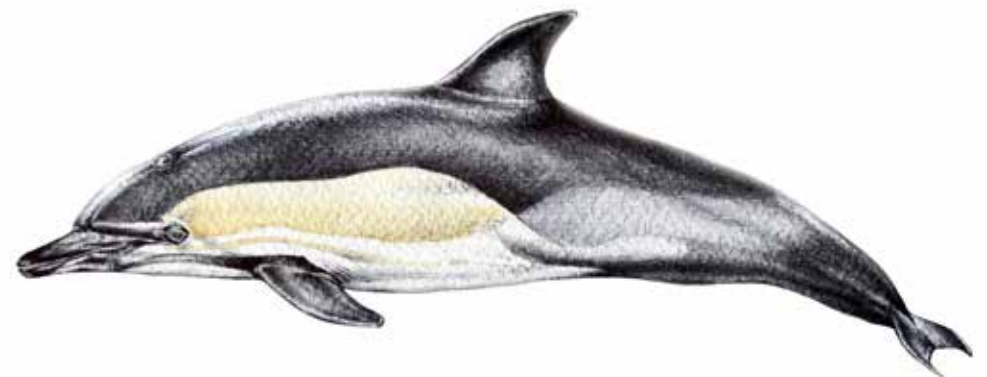
- . Creating press releases for newspapers, internet, television and radio.
- . Establishing new social network profiles and using them to promote Archipelagos' work and launch awareness campaigns.
- . Extending Archipelagos' partnerships by contacting international universities, institutions and embassies.
- . Designing and preparing fundraising campaigns and events.



ILLUSTRATIONS OF FLORA AND FAUNA

Focusing on illustrating marine and terrestrial biodiversity, from mammals to flora, this placement provides an opportunity to work on numerous projects. The participant will contribute to environmental conservation efforts while developing a dynamic personal portfolio. Activities include:

- . Creating scientific illustrations of the species of the Greek seas and islands, both marine and terrestrial.
- . Creating illustrations to be used for informational material in related conservation activities with the aim of raising public awareness.



EDUCATION

Archipelagos plays an active role in raising environmental awareness among children living in the local communities and throughout Greece by creating educational material and presentations. Qualified educators, passionate about the environment and seeking to expand their knowledge and experience are needed for this purpose.

Work may include:

- . Preparing lesson plans, presentations, educational games and other teaching aids for children of different ages.
- . Cooperating with different Archipelagos teams to create and develop teaching packs.
- . Visiting local schools to present teaching material and implement lesson plans.

This placement focuses on creating animated films which help to raise awareness about environmental issues. Activities include:

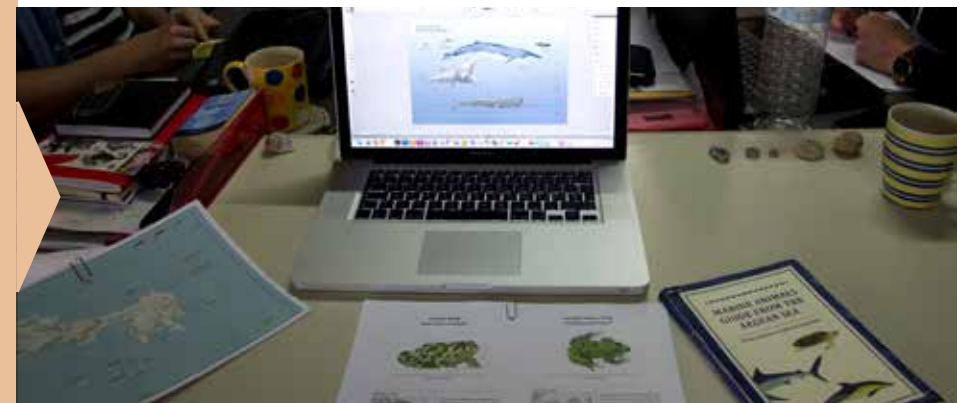
- . Making animations about marine and terrestrial biodiversity of the Aegean ecosystems and the factors which threaten them.
- . Participating in awareness campaigns at a local, Greek and European level.



GRAPHIC DESIGN

Archipelagos' research and conservation work requires creative individuals to prepare innovative graphic material in order to launch and promote awareness campaigns. Volunteers taking part in such placement will be expected to use their graphic design skills in environmental awareness campaigns, educational material and promotion of environmental conservation through a variety of media. A working knowledge of design software is essential in order to produce professional quality graphics. Main fields of activity include:

- . Designing posters, leaflets, booklets and material for lectures which present the natural environment of the Aegean to raise awareness regarding local biodiversity and threats to it.
- . Working closely with other members of the media team to integrate illustrations into posters.



DOCUMENTARY FILM PRODUCTION

The footage created in the course of this placement can be used in various genres, from awareness videos to documentaries for children, giving the participant an opportunity to contribute to environmental conservation efforts while developing a varied showreel and portfolio. A working knowledge of video editing software is essential in order to produce professional quality videos.

Main fields of activity are:

- . Filming the research activities carried out by Archipelagos' teams.
- . Wildlife, nature and landscape filming on the islands of the eastern Aegean.
- . Video journalism covering the issues related to biodiversity and factors impacting the natural environment.
- . Editing underwater videos using the archive material.
- . Filming and editing material for different media (TV, Internet).
- . Producing promotional, awareness and educational material about the local biodiversity and threats to it.
- . Working with members of other teams to incorporate various forms of media into the production process, e.g. illustrations or graphic designs.



ENVIRONMENTAL PHOTOGRAPHY

Focusing on photographing marine and terrestrial biodiversity as well as landscapes, this placement provides an opportunity to work on a range of projects. A working knowledge of photo editing software is desirable to produce professional quality images. Activities include:

- . Wildlife and nature photography of species found in the eastern Aegean.
- . Landscape photography on the islands of the eastern Aegean.
- . Portrait photography.
- . Photographing the research activities carried out by Archipelagos' teams.
- . Working with members of the research teams and helping them with basic photography and editing techniques.



OTHER PROJECTS



INFORMATION TECHNOLOGY

The work of Archipelagos' teams produces large datasets and media archives which need to be organized in easily searchable databases. Archipelagos also runs a number of websites, such as the wildlife library, which need to be continually maintained and updated. The placement focuses on database design and data mining, general system administration as well as creating new websites.

Projects may involve the following:

- . Content management system administration.
- . Database design and implementation.
- . Data mining and modeling.
- . Website design.
- . Designing and implementing an intranet website for the ease of information and file sharing.

ADMINISTRATIVE WORK

At Archipelagos we are always in need of assistance to help with office organization and other relevant tasks. Work will involve:

- . Organizing the participants' files and documents.
- . Creating standardized protocols for storing all paperwork.
- . Organizing various material generated during Archipelagos' research and conservation activities.
- . Helping with the general upkeep of Archipelagos' bases and stations, as well as research work as required.
- . Correspondence and other administrative tasks.

GIS MAPPING

In order to effectively preserve and manage different areas of the eastern Aegean, they need to be accurately identified. Unfortunately, the region has not been mapped in enough detail to allow this. During all field surveys, both marine and terrestrial, the paths, locations and relevant points of interest are marked and recorded so that a database of GIS material can be created. Participants of a GIS placement can expect to work on some of the following assignments:

- . Participating in fieldwork in order to log tracks, locations and points of interest on a GPS device.
- . Boat and kayak-based surveys for mapping *Posidonia oceanica* and coralligene reefs.
- . Creating maps for various in-house and external projects, using both raw and secondary GIS data.
- . GIS analysis of both marine and terrestrial habitats and ecosystems.
- . Collecting additional GIS information from external sources.
- . Creating "participatory GIS maps" based on the data collected from local communities.



RENEWABLE ENERGY SOURCES

Energy demand is constantly increasing in the whole world and Greece is not an exception. Archipelagos is developing projects which involve experimentation and application of small-scale renewable energy sources. Such solutions are low cost, sustainable and beneficial to the environment and the island communities.

The aim is to examine efficient and inefficient examples of renewable energy sources and develop an optimal proposal which could be successfully applied on small-scale across the Greek islands. The work involved in this area includes:

- . Launching a campaign e.g. for the promotion of reusing cooking oil waste for producing biodiesel.
- . Carrying out general research regarding the application of renewable energy sources for the island

communities, using the new research base in Lipsi island as a study site where numerous renewable energy and desalination applications will be used to provide power and water.

- . Establishing contacts and partnerships with researchers in Greece and the rest of Europe in order to identify environmental impacts of large scale renewable energy developments.
- . Research into energy self-sufficiency using the islands of the eastern Aegean as an example and promoting sustainable, efficient application of renewable energy technologies.
- . Participating in conservation activities and creating informational material with the aim of raising public awareness regarding the use of small-scale renewable energy sources.



LEGAL WORK

Due to the dynamic nature of Archipelagos' work, we need to have an understanding of both national and international laws and policies in order to assess the relevant enforcement. This knowledge is required to combat environmental crimes and to implement our management and conservation strategies of the environment.

Some of the work involved may include research and legal analysis related to:

- . EU fisheries legislation and Illegal, Unregulated and Unreported (IUU) fisheries.
- . Combating the illegal trade of endangered plants and animals.
- . Combating environmental crimes, pollution incidents and the destruction of natural habitats and wildlife.
- . Shipping, ship traffic and maritime accidents.
- . Uncontrolled use of live ammunition by the armed forces posing threats to public health and wildlife
- . Creating, implementing and managing protected areas.

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