

Enhancing critical thinking in schools for marine pollution using innovative ICT technologies



About Sea4All

The project “Enhancing critical thinking in schools for marine pollution using innovative ICT technologies (Sea4All)” is funded in the framework of the Erasmus+ aims to help building a stronger environmental consciousness to students in school age and to the school teachers and educators through the creation of innovative resources and practices for training in marine pollution with special emphasis on oil spills and floating objects (e.g. plastics) by making effective use of ICT technologies in education.

Innovative educational material, school games and an educational portal for environmental consciousness raising and especially for **marine pollution** issues are some of the tools to be developed for addressing the goals of the project. They will be used for **educational purposes** in schools as part of a special educational curriculum for enhancing environmental awareness in schools. This endeavour is only possible as a result of the collective work of experienced teachers, marine scientists and computer scientists. We aim for these tools to result in innovative educational material, based on the combination of real environmental data with recognised interactive pedagogical practices, assisted by electronic tools.

Leader in this project is the Foundation for Research and Technology-Hellas, in Crete (Greece) in collaboration with six other organization from four different countries: The Regional Directorate of Primary and Secondary Education of Crete, the Archipelagos Institute of Marine Conservation in Greece, the Cardiff University (United Kingdom), the Inspectoratul Scolar Judetean in Romania, the University of Cyprus and the Ministry of Education and Culture in Cyprus in collaboration with local schools in Greece, Cyprus, Romania and United Kingdom.



Erasmus+

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Interview on Key Aspects of Sea4All

With Vasilis Kontogiannis (FORTH), Coordinator of the Sea4All project

Why Sea4All?

As the quality of our environment is continuously degrading, all partners believe that it is important to contribute in reversing this tendency through the formation of a strong environmental awareness and consciousness. And the best way to start, is school age. So, our main focus is children and students of school age, but we aim to engage the whole educational community in a playful manner, assisted by innovative pedagogical ICT tools.



The formation of a strong environmental consciousness is a Hot topic nowadays. Why do you believe this is important?

It is common knowledge that the environment as we have inherited it from our ancestors, is changing and not for the best. It seems that the environment, although constitutes a fundamental part of our existence, it is deteriorating mainly due to human activity on land and at the sea, also due to technological disasters.

Of course, we cannot resign on progress and technology, but we could find ways to combine progress with environmental protection through sustainable development. In this way, the human development goals as well as living conditions and resource use could be met without undermining the integrity and stability of the natural system.

We believe that if the schools understand that they should take care of the planet they will live in, then they will promote this culture and take everyday actions for protecting their environment.

How can the Sea4All project contribute to the formation of a strong environmental consciousness?

We have managed to build groups with participants from three different disciplines and they will work together for a common result. To this end, the training curriculum for the formation of the teachers in marine pollution and the pedagogical handbook will be created by the teachers for the teachers, but enriched with scientific and environmental data concerning marine pollution and coastal environment from scientists. At the same time all scientific and educational material will be presented, organized and enriched by electronic tools, like an e-learning platform, a serious game, animations, etc., so that students learn and understand the marine pollution issues in a more intriguing and playful manner. And of course, innovative pedagogical methodologies will be applied for the educational material, like transversal soft skills through exploratory learning and creative activities, for addressing multiple learning styles and intelligences as well as interests, goals and preferences and like learning practices that support free experimentation, creation of innovative content and artifacts etc.



Biodiversity of the Greek seas & the northeast Mediterranean region

Scientific Feature Article by Anastasia Miliou

The Mediterranean is a sea of incredible and unique biodiversity which supports 7% of the existing marine species in the world even though it only covers 0.8% of the seas' surface worldwide. In Greece the coastline exceeds 18,000km in length, while the seas sustain an important part of our national wealth, as their exceptional ecosystems have a great importance not only for the rare species they support, but also for our economy, culture and science. It is therefore strange that the environmental importance of our seas is still unknown to a large part of the public, in the country where research on marine species started for the first time in the mid 4th century BC by the philosopher Aristoteles. Even though this important biodiversity is being protected by the national and EU legislation, as well as by international conventions, the protection is not being enforced. As a result, species and habitats that have managed to survive for thousands of years, in harmony with humans, are now threatened by numerous anthropogenic factors within a few decades. These include: overfishing; chemical, plastic and noise pollution; deliberate killings; destruction of productive habitats and many more. These actions take place in a country with a long history in the protection of marine species, where over 2,500 years ago the killing of a dolphin was punishable by death.



Figures 1. & 2. . It is strange how little we know about the giants of our seas: the sperm whales. They are truly charismatic animals, whose presence is documented in the Greek seas since the antiquity, with the impressive for the time description of this species by Aristoteles.

A Rare Natural Wealth

Scientific Feature Article by Anastasia Miliou

In the open seas reside some of the most important remaining populations of marine megafauna in the Mediterranean and Europe, which include:

- Important populations of the four dolphin species: Bottlenose dolphin (*Tursiops truncatus*), Common dolphin (*Delphinus delphis*), Striped dolphin (*Stenella coeruleoalba*), and Risso's dolphin (*Grampus griseus*)
- Whale species such as Sperm whale (*Physeter macrocephalus*), Cuvier's beaked whale (*Ziphius cavirostris*), and the Fin whale (*Balaenoptera physalus*)
- Other cetacean species which are less common in the Greek seas or are occasional visitors such as the Harbour porpoise (*Phocoena phocoena*) and the Humpback whale (*Megaptera novaeangliae*).
- The most important remaining global population of the highly endangered Mediterranean monk seal (*Monachus monachus*).
- Important populations of 3 species of sea turtles; more commonly the Loggerhead turtle (*Caretta caretta*), the Green turtle (*Chelonia mydas*), as well as the rarer Leatherback turtle (*Dermochelys coriacea*).
- Important populations of over 35 of the 47 species of sharks and rays found in the Mediterranean.



Founded in 2000, Archipelagos is a non-governmental organisation committed to defending the biodiversity of Greek seas, Greek islands and the North East Mediterranean region. Our predominant focus surrounds marine wildlife conservation and terrestrial wildlife conservation – more specifically: marine mammals, fisheries, maritime pollution, coastal ecosystems, island fauna and flora, pollution and human impact assessments. Archipelagos combines multidisciplinary scientific research and conservation work, using our scientific knowledge to co-operate with local communities and authorities, applying conservation projects with the aim of protecting habitats and species around Greece. This is achieved by preventing destructive human behaviors such as illegal fishing practices, waste disposal, maritime pollution and potential threats to biodiversity. Our research thus permits us to launch significant environmental actions and awareness campaigns at local, national and EU levels through the use of social media, video, animation and printed media in order to inform the public on how to better preserve and actively protect its natural resources. Read more at www.archipelago.gr and <https://www.facebook.com/Archipelago.gr/>



Figure 3. The Common Dolphin has for thousands of years been the most abundant species of dolphin in the Greek waters. Unfortunately, today its name seems ironic, as during the past decades its population has dramatically declined.

In coastal waters there are some of the most extensive areas of protected habitats remaining in the Mediterranean which play a fundamental role in maintaining the health of the marine ecosystems and fish stock productivity. These habitats are: Posidonia seagrass meadows (*Posidonia oceanica*), which are found from shallow waters reaching depths up to 50m and constitute a habitat for over 1000 species of fauna and 300 species of flora, and coralligenous algal reefs, which are found in depths of 50-170 meters and constitute a habitat for over 3.400 marine species (including numerous commercially important species). It is worth noting the especially slow growth rate of these habitats (0.006 - 0.83 mm/year), with the reefs in the Aegean Sea exceeding 7760 years in age. Therefore, the destructions that are caused by human activities in these habitats are considered non-reversible.



Figure 4. Coralligenous reefs in deep waters: referred to by many as the “best-kept secret of our seas”.

Games can be fun and educational

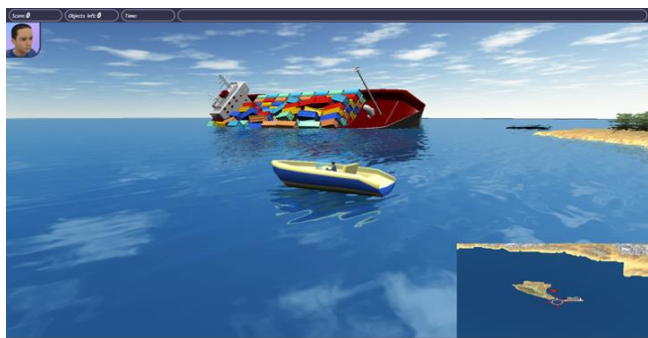
Focus Article by Vasso Theodorakopoulou

The electronic game focuses on marine pollution and is used as a key tool for raising awareness, cultivating consciousness and acquiring knowledge on marine pollution issues. Through stories based on scientific evidence and research results, the trainee learns to carry out missions in a fun and intriguing way, utilizing existing and newly acquired knowledge during playing.

Story: Gavdos Island is located at the southernmost tip of Greece and Europe, 26 nautical miles south of Chora Sfakion (Crete). The authorities of Crete are notified that in the sea of Gavdos, due to a ship accident there is an oil leak. The oil spill is spreading very fast to the

north, towards the coastline of Gavdos island that belongs to the network of Natura 2000 areas.

The game starts: The boy in the boat is wandering in the sea, when he is informed by radio about the oil spill. He decides to get involved in the mitigation of the oil spill. Having gained points and equipment, he can use booms that can confine the oil spill and keep it away from the coastline. Eventually, the oil spill is confined, the boy informs the authorities and the oil is collected.



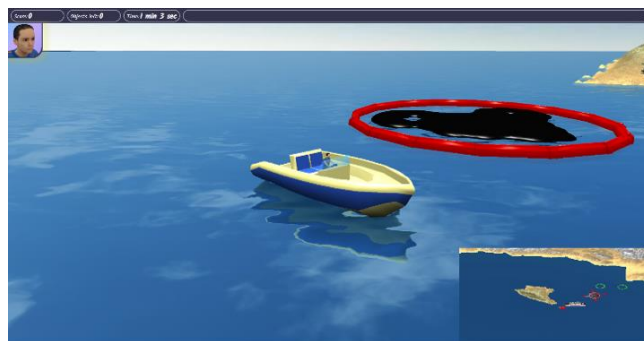
Educational impact: Overall, the student learns about oil spills, their mitigation, but also the consequences of an oil spill on coastline and the sea. Through quizzes, games, tables, animations, and other tools he learns about the possible effects of an oil spill at different types of coastlines. In the end, the boy is confronted with the fact that in such cases immediate action is the most effective mitigation plan. At the same time by learning to act immediately to avoid major damages, specific attitudes are strengthened, that can be integrated into everyday life and finally successful efforts rewarded.



The scenarios of the game are based on scientific information and they are contributing to the development of teaching material. The different stories of the game highlight the presence of oil spills and/or floating objects transported from the sea to the coastline and vice versa, thus also highlighting the different aspects of pollution.

During the game, various activities and missions are suggested and through his involvement, the student learns to take actions to address the specific pollution,

showing, also through experimentation, the need for active participation in everyday life. This will enable students to formulate a global view of the effects of marine pollution and realise they can take a role in tackling this problem.



Foundation for Research and Technology is a major Greek Research Centre. We, at Institute of Computer Science are conducting basic and applied research and developing applications and products. We have considerable experience in the development of ICT learning tools and training in marine pollution and civil protection issues. For FORTH it is a great challenge to create not only an e-learning platform based on innovative pedagogical methodologies, but also a serious game that could be used from teachers and students, and especially an intriguing game to be played among children as an entertaining but most importantly an educational tool. As a Research Centre it will make us very happy to see a result of our research incorporated in the school practice, and even more to see our serious game to be played by teachers and students not only in the school setting but also for fun.

Announcements and Upcoming Events

Webinars

Date: March 21, 2019 | Location: Online

As of March 21st, a Webinar will be given online once a month for educating the teachers on scientific and educational issues concerning marine pollution. Indicatively, all Webinars will be given on Thursdays 16:30 CET with relevant announcements.

Training Activity

Date: March 29-31, 2019 | Location: Cyprus

The teachers that have been selected for training teachers will be taking part in the Training Activity for working with the already developed material in order to optimize the results but also get ready to train more teachers.

Multiplier Events

In each participating country, a one-day event that aims to maximise the impact of the results achieved in the course of the project implementation, will take place from June to September. Relevant announcements will be public on social media, site, newsletter, the official pipelines of each country, etc.

Since the section of the website on upcoming events is regularly updated, we invite you to visit our [website](#) for most recent changes

Partners



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Disclaimer

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