March 2021

- HIPPOCAMPUS MARINE ISTITUTE – HMI -

ANNUAL REPORT FOR THE YEAR 2020

ACTION PLAN FOR THE YEAR 2021

INTRODUCTION

Following the report of 2019 - 2020, in which all the actions of the institute were described up to the action of the Educational presentation to the children of the 87th Primary School of Thessaloniki for the hippocampus, on January 14, 2020, we continue for the rest of 2020 and our planning for 2021.

Unfortunately, since March 2020 and the emergence of the pandemic, many actions were postponed and many others were cancelled, but the most important ones were finally implemented.

Nevertheless, the overall report for 2020 was productive, with various publications, experiments, measurements, as well as various actions to raise awareness, education and citizen science about the environment and the sea monitoring, were completed!

SUPPORT

As in previous years, we have had material and moral support from many people and from many institutions, both from the private sector and from public bodies. But we want to emphasize the support from the community of Stratoni village, which is helpful in any action and beside us in any need that arises.

Details of the sponsors of the HMI and how we are supported are listed on the HMI web site.

CURRENT STATUS

In the past year, the existing situation in the area of the Stratoni coast has been better than last year. Fishing in this area has been significantly reduced, no extreme weather events have occurred that could alter the marine environment, and with reservations we can claim a slight recovery - stabilization of the population.

When we refer to recovery, we emphasize that the presence of some seahorses is in itself a recovery! If we consider that in 2019, there were dives where only one individual was detected, i.e. only one seahorse!

The fact is that the construction of the artificial habitats, especially the metal cages (seahorse hotels), have been instrumental in providing safe shelters for the few individuals we can potentially locate.

Finally actions such measurements, time-lapse video recordings, and experiments with the artificial habitats have led us to an initial conclusion to explain the presence of the seahorse core at this particular sea site. The metal cages were originally placed at different depths and locations. Then after almost a year we were able to observe thas the growth of the marine deposits on them as well as their colonization by seahorses.

What was observed was that the greatest growth of the sea deposits as well as the number of the seahorse individuals that detected, are in the core area of research and study, the area that we have identified and monitor for over 14 years.

The reason must be due to the rheumatism of the area. It is well known that the whole of the Strymonian Gulf is rich in bare deposits and sedimentary material coming from the land relief. This makes the water column particularly rich in food and nutrients. A simple proof for that is worth mentioning is that in just a period of two months our mooring line is covered with mussels. Almost at every trip we have to clean it, otherwise it became too heavy and it will sink.

So it seems that in the coastal Stratoni, the eddies of the sea currents lead the mass of particles to pass through this area making it rich in food. The seahorse, a creature without a highly developed digestive system, needs to feed throughout all the day and insists on staying in this area even if it is not such a friendly environment for them. An area without Neptune grass (Posidonia Oceanica) in which it can hide and hold itself with its tail, an area with strong wave energy, which sways and sometimes drifts the seahorses, leaving there exposed to its predators in a desert of golden sand, but in an desert rich in food!

If we observe the condition of the cages (hotel seahorses) from the growth of the sea deposits at the 3 different places where we originally placed them, we can easily understand the amount of hypertrophy that is present in this particular area.

A first working hypothesis is therefore that maybe this is the reason why in the recent years we have only found hippocampus in this particular, unique area. We are not saying that seahorses do not exist elsewhere else in the wider area, but according to our underwater time spending and area covering, the remaining seahorse population, statistically does not allow their detection. While in this particular area a small number of the remaining population seems to still find refuge there and always can detect there.

A second important event that took place in 2020 is the information and documentation of the existence of a significant population of seahorses in the Aitoliko Lagoon of Messolonghi area.

After contacting with professional diver Lambro Harelo, we were informed about the existence of a hippocampus population in the Aitoliko lagoon.

Almost immediately we went to the area and conducted dives. The picture of the lagoon is encouraging, estimating the population of hippocampus individuals to be in the hundreds.

IN CONCLUSION

The pandemic, combined with the declining fishing and natural disasters **that did not affect the region in the past year**, seems to stabilizing the decline of the seahorse population.

The placement, the maintenance and the incensement of the artificial habitat constructions, that are installed in the seahorse core main area, is consider particularly critical, as we believe it has contributed significantly to population containment and recovery.

ACTIONS REVIEW FROM FEBRUARY OF 2020 UNTIL TODAY

February of 2020

Article about Hippocampus Marine Institute, to the "DIVE PACIFIC", New Zealand's Dive Magazine.

SOUNDINGS
INTERNATIONAL NEWS

Greek Hippocampus Institute set up to study seahorses

There are 47 species of the seahorse, the extraordinary and charismatic marine creature in the scientific genus, Hippocampus. In Greek, hippos is "horse" and kampos is "sea monster".

Over the past decade, 14 additional species have been discovered. However, identifying them is always a challenge as seahorses have the ability to change their colour and shape in order to blend in with their environments.

Now, in Greece, the Hippocampus Marine Institute, has been set up mainly to study and protect seahorses. Vasilis Mentogiannis, a founder of the Institute, explains.

In November 2007, a group of the Marine Antiquities Ephorate diving crew visited Stratoni to inspect an underwater harbour

International Union for Conservation of Nature (IUCN), since 1996. Since 2003, seahorses have been categorized as "Data Deficient" worldwide, with the exception of the Mediterranean species which was re-classified as "Near Threatened" in 2016. Greece has signed four

phenomenon through many publications. All this resulted in the creation of the marine research centre specifically for the monitoring and protection of the seahorse.

We believe that the protection and overall communication of this rare population of seahorses in Stratoni will benefit the whole area by creating an underwater "theme park" focused on this mythical, dragon-like underwater species.

The technical challenge

One of the biggest difficulties was in scientifically proving and documenting the seahorse populations. We had to cover

Αναφορά για το ΙΕΙ στο περιοδικό DIVE PACIFIC, New Zealand's Dive Magazine

10 February 2020 09:00

Ο Αντιπρόεδρος Δ.Σ. του ΙΕΙ – Ιππόκαμπος Ενάλιο Ινστιτούτο κ. Βασίλης Μεντόγιαννης shares how the HMI's setup up to study seahorses with the DIVE PACIFIC, the New Zealand's Dive Magazine.

The Hippocampus Marine Institute give answers why conduct research in Stratoni, Halkidiki and how rare are the seahorses that have been encountered.

Special thanks to Divesoft. The HMI is so grateful for Divesoft's support with superior quality specialized diving equipment!

Download the article

Categories: Press, Νέα

February of 2020

Article about Hippocampus Marine Institute, to the " DIVE LOG", Australia's Premier Scuba Dive Magazine.

INTERNATIONAL NEWS

The Hippocampus Marine Institute's special focus positively influences the Greek Marine Ecosystem

There are 47 species of the seahorse, the extraordinary and charismatic marine creature within the scientific genus, *Hippocampus* (in Greek, *hippos* is "horse" and *kampos* is "sea monster").

Over the past decade, 14 additional species have been discovered; the seahorse is a fascinating creature that is truly like a small dragon, however, the identification is always challenging as seahorses have the incredible ability to change their colour and shape in order to blend in with their environments.

The Hippocampus Marine Institute is a non-profit organization whose main focus is the study and protection of seahorses. The institute was created by the same people who have passionately worked all these years studying the seahorses, and bequeathed the results of their efforts to the institute.

It is an honor to welcome Mr. Vasilis Mentogiannis, one of the founders of the Institute, to share with us some of the benefits the Institute is bringing to the Greek waters.

Tell us Mr. Mentogiannis, about the moment you decided to dedicate your time to saving the seahorses.

In November 2007, we visited Stratoni se Marine Antiquities Ephorate diving crew staff members, to perform an underwater inspection for the mine company harbour installations. After finalizing the underwater inspection of the port, we decided to continue with our exploration and entered the water at "Aggeli" stream. While underwater, we spotted our first seahorse. The excitement was intense, as the seahorse we encountered was of a species that is quite rare. When we got back to Athens, we decided to visit this spot again to see if our first encounter would be repeated. When we returned a few months later in 2008, we indeed, had the same experience; there were a plethora of seahorses living in a hypertrophic, underwater habitat! We asked the locals if they know of their existence. The fishermen in Stratoni's fishing harbor were, and even showed us numerous specimens that had been accidentally caught in their nets (something that happens often, unfortunately).

How rare is the specimen of Seahorse you encountered? Where can we find the latest documentation on seahorse populations?

Seahorses have been listed as "Vulnerable" on the Red List of Threatened Species, of the International Union for Conservation of Nature (IUCN), since 1996. Since 2003, seahorses have been categorized as "Data Deficient" worldwide, with the exception of the Mediterranean species which was re-classified as "Near Threatened" in 2016. The latest documented populations of seahorses show they are in the Mediterranean Sea in Stratoni, Spain, Italy, and France and a population also exists in the Atlantic Sea in southern Portugal.

Why did you decide to conduct research specifically in the Chalkidiki, Stratoni area?

We aren't aware of any other areas in Greece where these particular seahorses can always be spotted. It's not even to say there like this in the Mediterranean. For the past decade, in this specific area of Chalkidiki, Stratoni, we have always encountered this magnificent phenomenon.

What's even more unique, is that we occasionally find both of the seahorse species normally found in Greek waters: the *Hippocampus hippocampus* and *Hippocampus guttulatus*.

Over the past ten years, we have been systematically monitoring, observing, taking measurements and water and sand samples, conducting surveys and many other initiatives. We have tried to establish the "Citizen Science" by sharing this spectacular Phenomenon through many press publications.

The resulting effort was the creation of the marine research center, specifically for the monitoring and protection of the seahorse.

What is the current status of the marine ecosystem in the Stratoni area? Have you taken any actions so far?

After the natural disaster in 2020, the marine plants (phanerogams), which are the seahorses' natural habitat, mostly disappeared, fortunately, their population has been slowly recovering since then. Seahorses are a particularly slow-moving species, preferring to stay attached to a particular substrate using their tail. For this reason, we placed a meandering rope along the seafloor offering them a secure place to attach to. We also placed fake aquarium plants mimicking an underwater garden, and other structures, creating extra shelter for them to use and latch onto. The initial results of this experiment were quick and impressive, as many seahorses colonized the artificial habitats immediately, and have remained there. These artificial habitats have been placed 7 to 13 meters deep within a 50m x 50m square area, delineated on the surface by four buoys. This area is vulnerable to fishing because the gear could cause damage to the habitat and the species themselves. Therefore, we advise fishing is avoided in this area. We believe that the protection and overall conservation of this one population of seahorses in Stratoni will benefit the whole area by creating an underwater "theme park" focused on this mythical, dragon-like underwater species.

As an additional activity at the Institute, you launched the International Marine Biology Summer School. Could you tell us more about this?

The 1st International Marine Biology Summer School took place in May of 2019, with the main focus being the Hippocampus of Stratoni Colony. It was attended by 19 participants, including our Institute's staff. The Summer School was organized by the Hippocampus Marine Institute, the Centre of Marine Sciences at the University of the Algarve, Portugal in cooperation with international seahorse protection organizations, Project Seahorse and T-Seahorse. The research aimed to investigate the phenomenon of this seahorse colony and its localization only in this small area, estimate their numbers, and complete filming for a documentary utilizing the visual material collected over the years.

Have you encountered any technical difficulties?

Yes, one of the biggest difficulties we experienced was in scientifically proving and documenting the seahorse populations. We had to cover a large underwater area and take a multitude of measurements. The Freedom computer, which each diver from the institute uses, helped incredibly with its O-led big screen. It was very easy to use and provided the data we needed with the single push of a button.

Which equipment did you use?

We used a lot of equipment from many manufacturers, but the most critical was the Liberty Rebreather, as we could make observations that couldn't be done with the open-circuit scuba. The use of this rebreather is also ensured absolute silence so we didn't disturb the underwater environment.

What do you appreciate most about the equipment?

The most important features of underwater equipment are their reliability, user-friendliness and state of the art technology, as it can be very easy to make mistakes under pressure. The SOLO Analyser is an excellent example: it's very easy to use and exhibits cutting-edge technology.

What are your plans for the future?

We plan to continue monitoring the area, place more artificial constructions (mainly ropes and metal cages) underwater, and install underwater sensors and cameras for data collection. Also, we would like to raise awareness for the elimination of fishing, build our international collaborations and expand the scientific documentation for the colony.

Thank you, Mr. Vasilis Mentogiannis, for taking the time to share the Hippocampus Marine Institute's exceptional efforts with us.

Αναφορά για το ΙΕΙ στο περιοδικό DIVE LOG, Australia's Premier Scuba Dive Magazine

1 February 2020 09:00

Ο Αντιπρόεδρος Δ.Σ. του ΙΕΙ – Ιππόκαμπος Ενάλιο Ινστιτούτο κ. Βασίλης Μεντόγιαννης μοιράζεται τις υπέρμετρες προσπάθειες του ΙΕΙ με το περιοδικό DIVE LOG, the Australia's Premier Scuba Dive Magazine.

March of 2020

Protection and study of the seahorses with the assistance of "Citizen Science"

The aim of the event was to explore the potential of the relationship between recreational scuba diving and citizen science. Considering these as two important pillars for the preservation of the marine natural and cultural heritage, for sustainability in the Greek seas and for the advancement of ocean science, the issues addressed in the context of this workshop were:

a) to present typical applications concerning information, awareness raising, education or active participation of divers for the environment and marine culture,
b) to highlight as well practices the individual and group initiatives of citizens for direct or indirect support of scientific work carried out in the marine environment; and
c) to record personal opinions and suggestions on ways to responsibly involve amateur divers or active participation of citizens in underwater research activities

Η **Ομάδα Εναλίων Αποτυπώσεων** του **Εργαστηρίου Τοπογραφίας**, ΑΠΘ και το **Ναυτικό Μουσείο της Ελλάδος**

σας προσκαλούν το **Σάββατο 7 Μαρτίου 2020** (10:00) στην αίθουσα εκδηλώσεων του **Ναυτικού Μουσείου της Ελλάδος** (Ακτή Θεμιστοκλέους, Φρεαττύς, Πειραιάς)

σε ΗΜΕΡΙΔΑ - ΑΝΟΙΧΤΗ ΣΥΖΗΤΗΣΗ με θέμα:

Αυτόνομη Κατάδυση και Επιστήμη των Πολιτών

Η χρονιά που μόλις ξεκίνησε μας προετοιμάζει για την έναρξη μιας δεκαετίας προσανατολισμένης στην Θάλασσα (oceandecade.org). Κάτι που για τους αυτοδύτες αποτελεί καταδυτικό προορισμό (όπως για παράδειγμα ένας ύφαλος ή ένα ναυάγιο), για το ευρύ κοινό γίνεται αφορμή ενημέρωσης και ευαισθητοποίησης σε θέματα που σχετίζονται με το ενάλιο περιβάλλον και τον πολιτισμό του. Παράλληλα, με την κατάλληλη εκπαίδευση και την υπεύθυνη εμπλοκή εθελοντών, οι ερευνητές που ασχολούνται με τον θαλάσσιο χώρο αποκτούν μια πολύτιμη δυνατότητα για αξιοποίηση του δυναμικού των - καταδυόμενων ή μη - πολιτών, ως ένα σύνολο παρατηρητών και ανταποκριτών στο απαιτητικό (σε πόρους) ναυτικό πεδίο.

April of 2020

Publication of a scientific paper

The institute and its members participated in the writing of a scientific paper:

"Assessing population density and habitat use of Hippocampus species in a semi-closed north-eastern Mediterranean marine area (Stratoni, north Aegean Sea)"

Correiaa,b,*, M., Paulo, D.a, Samara, E.c, Koulouri P. d , Mentogiannis, V.c and Dounas, C.d

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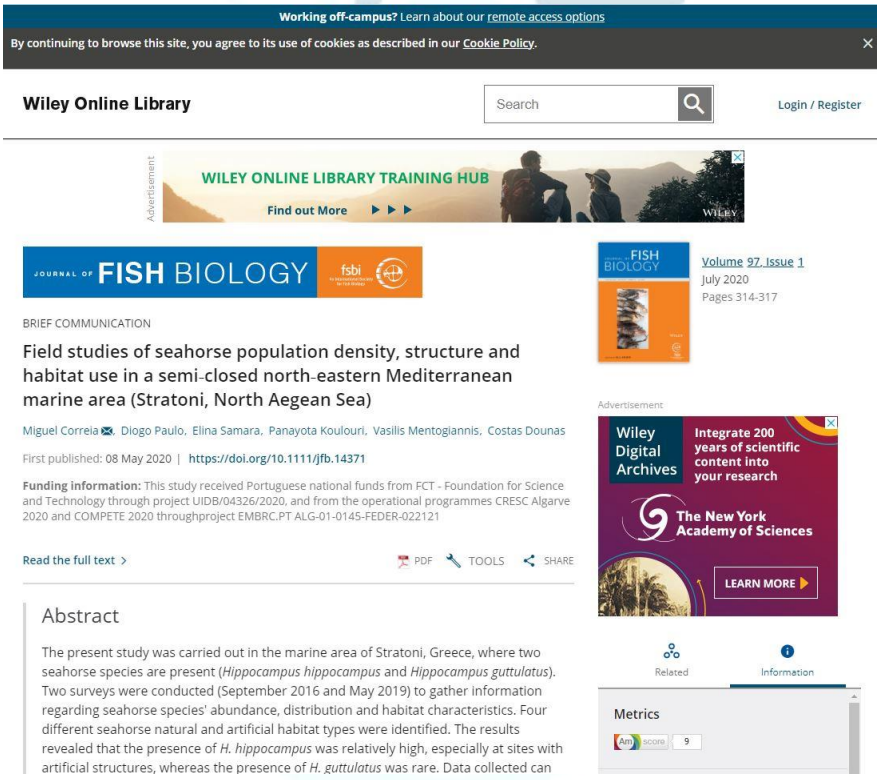


May of 2020

Survey for the existence of seahorses in the Aitoliko-Messologgi lagoon

After Mr. Lambros Harelos contacted the institute, we were informed about the existence of a seahorse population in the Aitoliko lagoon.

Lambros Harelos is a professional diver who lives permanently in Aitoliko and works in fish farms in Astakos area.

He often visits the lagoon fishing for sea breams and mullet fishes in shallow water.

For almost the last 2 years he has been observing seahorses. The seahorses caused his impression where he has been observing them systematically for the last 2 years until today. At shallow depths and in shallow waters with limited visibility, turbid waters he often encounters mostly large seahorses.

Individuals of seahorses, mainly Hippocampus gutulatus, have been found almost all over the periphery of the lake, but a main area that is located it is the area near Agios Ilias.

An area in which a particular densification of seahorse individuals are observed. Possibly due to a land water vein outlet, also the fact that this area is more distant and isolated is only working hypotheses for a first interpretation of the seahorse's preference in the Agios Ilias area.

A seahorse in the Aitoliko-Messologgi lagoon

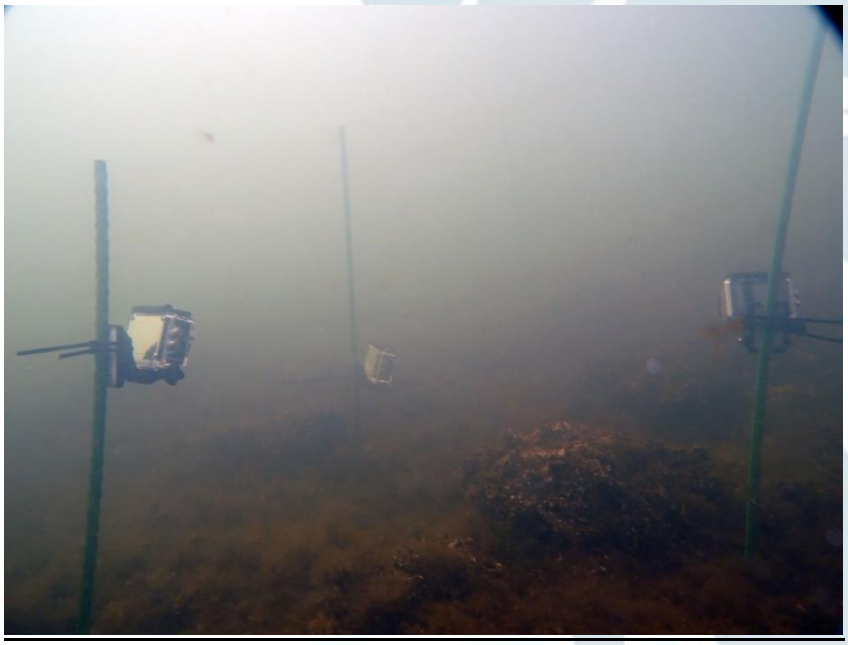
Thereafter, our communication with Mr. Lambro was almost weekly, where he kept us informed of the number and size of the individuals he was spotting, the location, temperature and depth. He sent photos and videos.

So on May 30, a group of 2 people from the institute left Athens to meet Mr. Lambros and dive in the area of the Aitolikos lagoon in Agios Ilias spot.

The Aitoliko-Messologgi lagoon at the area of Agios Ilias spot.

Diving in the Aitoliko Lagoon, Agios Ilias area. Following Mr. Lambros we started a coastal underwater South-Eastern course, in depths from -0,5 meters to -2,5 meters. The visibility was about not more than half a meter and the bottom was characterized by a very rich bottom, with mussels, tiny crustaceans and many other species. With a relatively high dispersion and frequency within a period of about 2 hours and a distance of about 350 meters, we detected more than 25 big in size seahorses. The vast majority of them were males. At depths of -0.5 to -2 meters. At 15 individuals we stopped photographing them numerically and continued simply retaining only the total number. The area offers perhaps the best possible camouflage. Making tracking them particularly very difficult. Medium sized as well as small sized individuals we did not detect at all. Obviously they are too difficult to locate and observe them. All the hippocampus that were spotted were only of the specie Hippocampus gutulatus.

In one of those seahorses, we placed 5 cameras for about 3 hours, recording time lapse video every 5 seconds. Apart from the observations on the seahorse, we were impressed by a water snake and a turtle passing by the area that being also filmed.



The time lapse cameras were placed at 2 points, one for each day.

A seahorse grubbing at Mr. Labros finger.

The next day we also dived in the same area but we moved independently underwater, to carry out different tasks.

The divers conducted a method to measure population density (transects). The methodology is a 50 m long tape measure deployment (transects). At point "0" start and end point "50". Investigation of the 50-meter transect by a diver on each side of the tape measure. For example, the diver to the left of the tape recorder records the presence of seahorse individuals up to 3 m from the tape recorder.

This is how they were identified:

At mm 00, distance 1 meter, normal to medium sized female.

At mm 02, distance 3 meters, a large male.

At mm 47, distance 3 meters away, large male, medium to large size.

At mm 49, distance 3 meters away, large male, 3 m away.

A total of 2 individuals were detected on the land side.

At mm 03, distance 3 meters away, large male

At site 50, distance 1 meter away, large male

A total of 6 individuals were detected on a 50 meter long and 6 meter wide track.

We also repositioned 5 cameras for about 3 hours, with time lapse video recording every 1 second to monitor and record a seahorse.

Then with the boat of the president of the local fishermen Mr. Kargiophylli Spyro, we made some salinity measurements.

Salinity measurements of the water column. The salinity instrument was the YSI Pro30.

So we have the following measurements:

GPS position	Depth are in WM	Temperature at the measuring depth	Salinity (ppt*)
38,28.660N-021,18.284E	0,5	23.5c	16.2ppt
	1	23.3c	16.3ppt
	5	22.9c	16.4ppt
	10	19,4c	16.7ppt
	18	15.9c	17.9ppt

*Parts Per Thousand

In conclusion, we have a successive drop in temperature in the water column from the surface to the bottom and an increase in salinity.

In summary, the general conclusion from Aitoliko lagoon, is encouraging, estimating that the population of the individuals to be about to hundreds. As Mr. Lambros Harelos informed us, seahorses of the species Hippocampus hippocampus have been found also in the northern part of the lagoon where the bottom is more sandy.

In the area we surveyed at Agios Ilias, the seahorses did not appear to be threatened, as they are located in shallow water and the morphology of the bottom does not allow for fishing with towed gear and nets.

The president of the fishermen informed us that they relatively often catch seahorses in their nets. He told to us:

"20 years ago, there were thousands; it was well known that, in the area! Now, the lagoon is dying, at -4 meters now the water is rising".

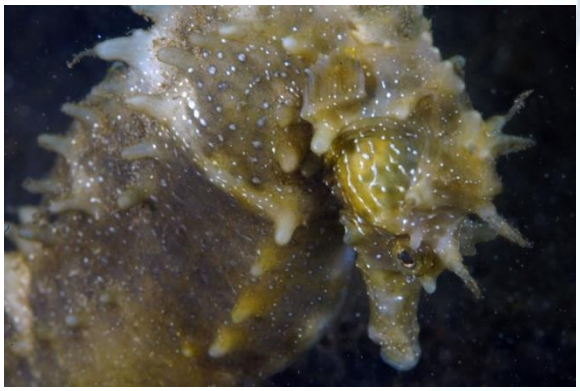
How do you know this, we asked him? *"when I fish, the live bait dies after -4 meters",* he said to us.

Indeed during our 1st dive we headed deeper to explore the area at greater depth. We noticed that after -4 meters, the environment becomes grey, dark and at -5 meters we did not observe any living organisms. A zone of dense hydrogen sulphide has turned most of the lake upward.

The lake is dying. Fresh water and fertilizers are polluting the lake's waters. The decline in fresh seawater enrichment is further aggravating its condition. Facts that we have been informed of and we have not yet documented by ourselves.

We have already collected relevant literature, we have spoken to the former director of the local organization, which has recently ceased their operations, and we have also contacted with the University of Patras and the University of Ioannina, to have more scientific information’s and data.

hippocampus
marine institute



June of 2020

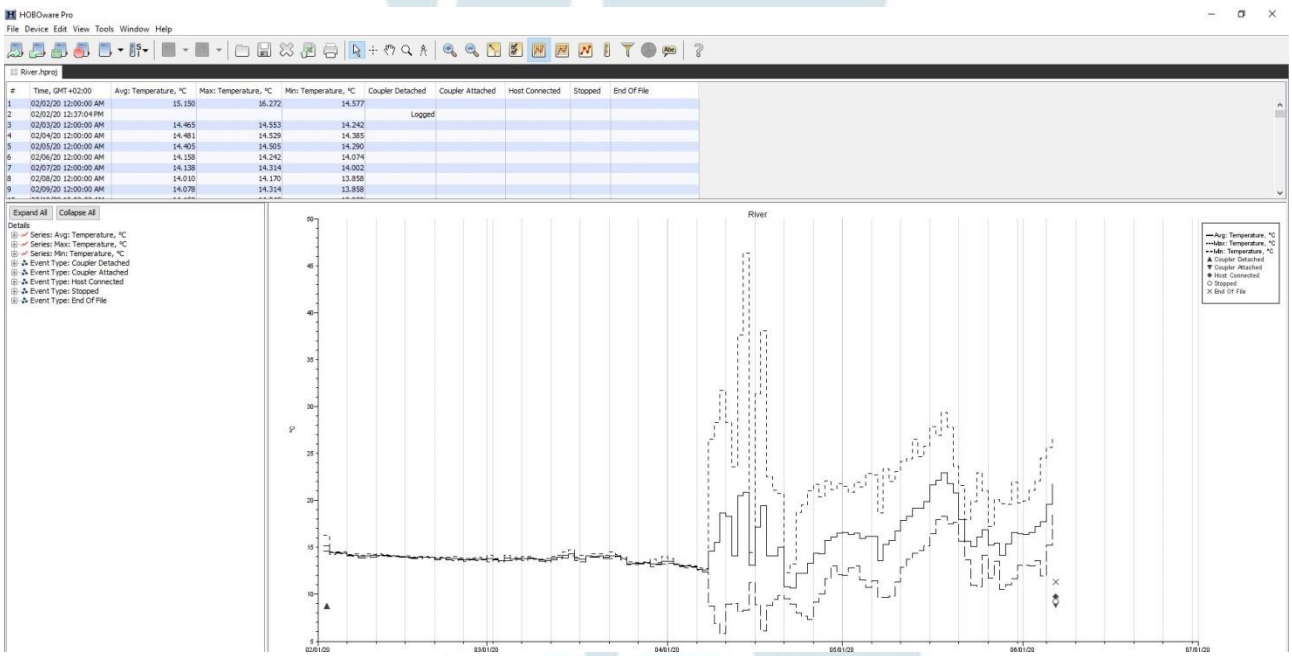
World Environment Day - Voluntary Cleaning of Ierissos Port

On June 6, World Environment Day, the institute together with nine volunteer divers and with the support of municipal councillors of the Municipality of Aristotle and the Hellenic Coast Guard, carried out a clean-up of the port of Ierissos.

The team identified, recovered and removed a lot of rubbish from the seabed.

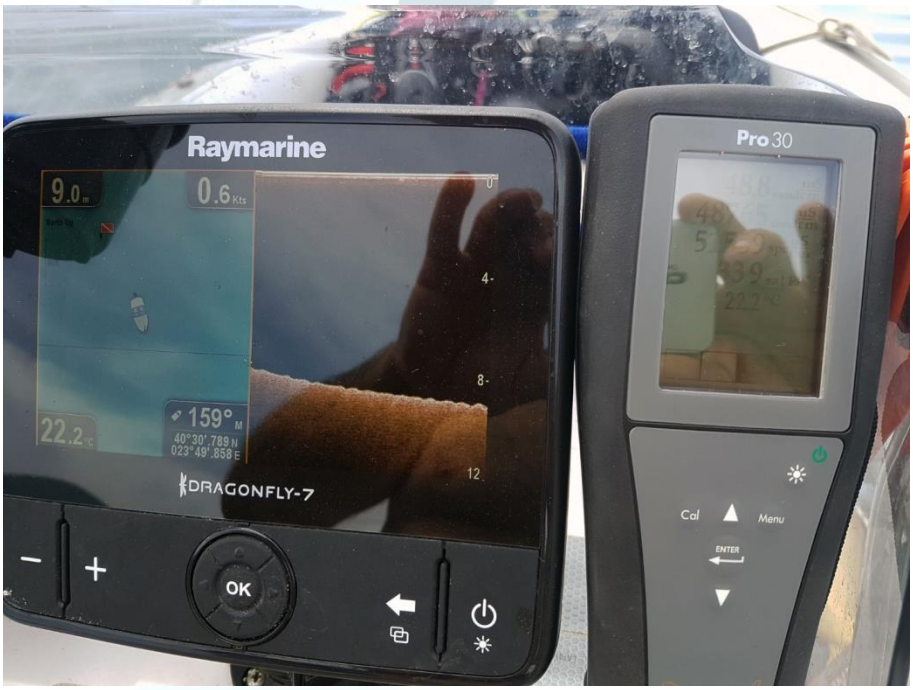
Begging June of 2020 – Field Work

Visit of the institute in Stratoni, to carry out salinity measurements, diving for the collection of the "Hobo" sensors and uploading - storing the data in institute archives.



Graphs with dates and temperatures from one of the three "Hobo" sensors

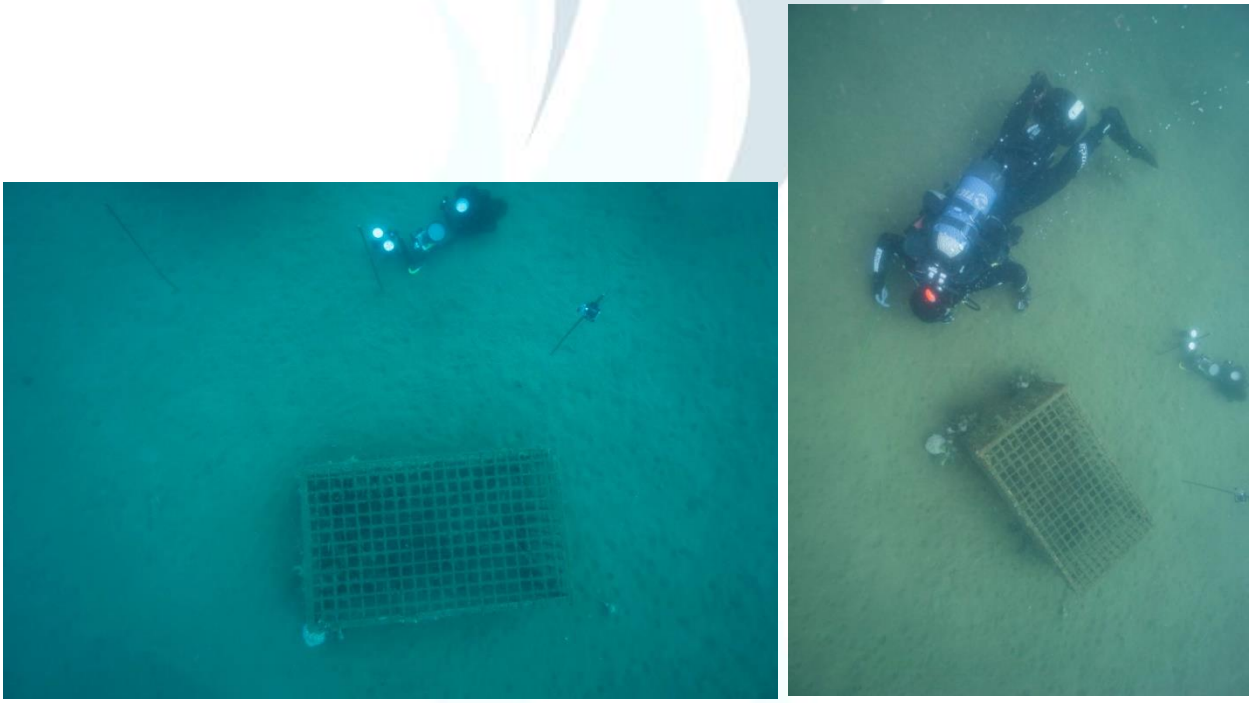
On the right we see the salinity measuring instrument and right next to it a navigation instrument for geo-referencing of the measurements.



Two of the four buoys that mark the main seahorse core, had been cut off. One was located on the shores of Stratoni, was repaired and repositioned. The other is lost and must be replaced.

Repositioning of the buoy.

Preceding the works on the field, we repositioned the “Hobo” sensors to their place to continue data recording. Then we place for once more the intermittent time lapse recording cameras in one of the "hotel cages" for observations.



We placed 5 cameras to cover almost every angle of the cage. The cameras are either fixed on the sides of the cages or attached to small masts that were embedded in the sand.

Video snapshot taken from one of the cameras that was placed from one side of the cage. A seahorse can be seen in the background on the left.

Dives were also made on the reef in the area of the wildlife sanctuary (Natura) in Brostomnitsa area. The reef, almost a year after the abandoned nets (ghost fishing) were retrieved, shows great improvement in marine life.

Sponge samples were taken from the reef to find new species of gastropods. Sampling resulted in the scientific publication below. *(Rissoella angeli n. sp. (Gastropoda: Heterobranchia: Rissoellidae) and additional new records of molluscs for the Mediterranean and the Hellenic Seas. Xenophora Taxonomy, Vol 31, January 2021 T. MANOUSIS, G. ZAMINOS, E. SAMARA, G. MBAZIOS & S. GALINOU-MITSOUDI)*

The institute's marine biologist Elina Samara, during the collection of samples from the reef.

Finally, the disappearance of the fan mussels, which lined the bottom of the reef, is now a documented fact!

All those that were spotted for years now they are dead. The fan mussels, or Pinna nobilis, was one of the largest and most impressive bivalve molluscs in the Mediterranean Sea and now are in danger of extinction. On 15 January 2020, the International Union for Conservation of Nature announced that it was placed on the Red List of Threatened Species as a "critically endangered species".

A dead fun mussel at the reef.

July of 2020

Filming for the show "Mare-TV" which was dedicated to North - East Halkidiki, for the German state channel ZDF. They visited the facilities of the institute in Stratoni, accompanied us in diving for two days and watched the development of an experimental system that we were testing for the first time.

July of 2020 – Field work

Back to the field work in Stratoni, to repeat the salinity measurements, monitor the hotel cages and test a new system, the design of which has started in 2019 and continues.

The locations where salinity measurements are taken.

The salinity sensor.

The tests for the construction of the prototype visual monitoring and protection system for the hippocampus and the specific area where the hippocampus population (core) is located Stratoni, Halkidiki, it is continued.

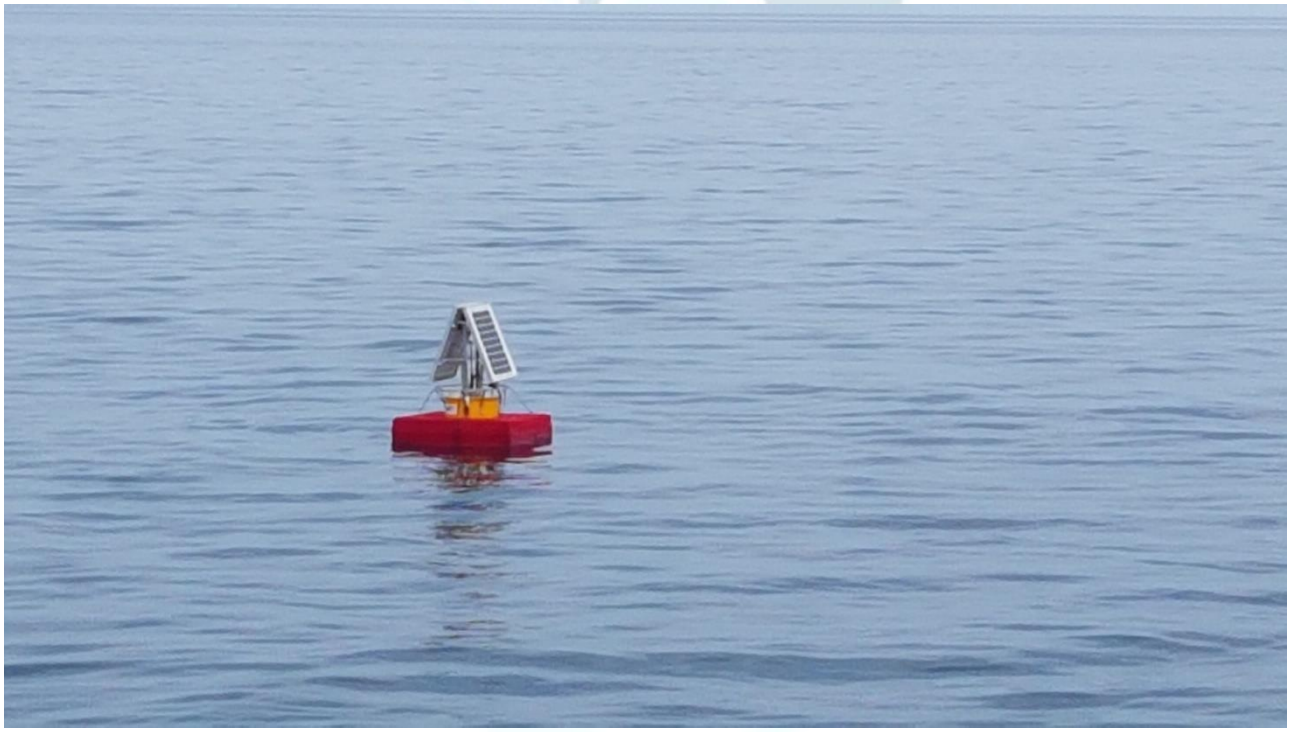
The NOUS system - **uNdersea vision sUrveliance System,** is an innovative unique system designed and manufactured by the Hippocampus Institute, the NOUS team and the School of Naval Mechanical Engineering of the National Technical University of Athens (NTUA).

It is an underwater vision monitoring system for the observation of the seahorses and other organisms - species, with permanent image and video recording and adjustable sampling frequency. The system is self-powered with photovoltaic panels mounted on a buoy on the surface.

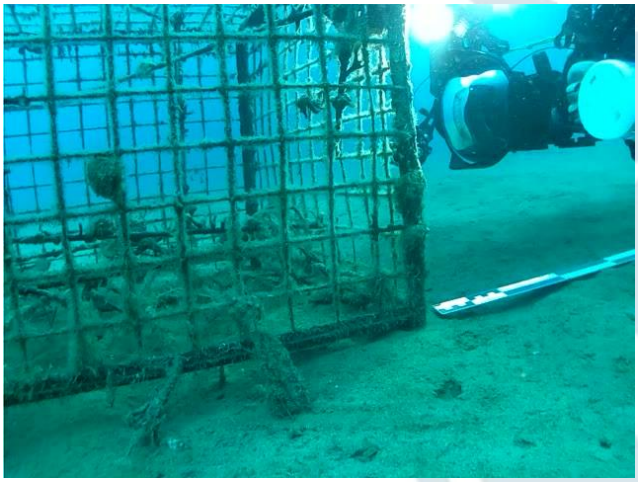
During this test the system was set up for twenty-four hours, checking the connection of the underwater camera to the station (buoy) on the surface.

Also tested, the underwater mounting of the camera, the suitability of the vision coverage of the underwater camera lens (wide, ultra wide etc), the pair of low power infrared lights for watching in the darkness and finally the remote command-activated led light, were also tested.

Preparation of the system at the offices of the institute in Stratoni



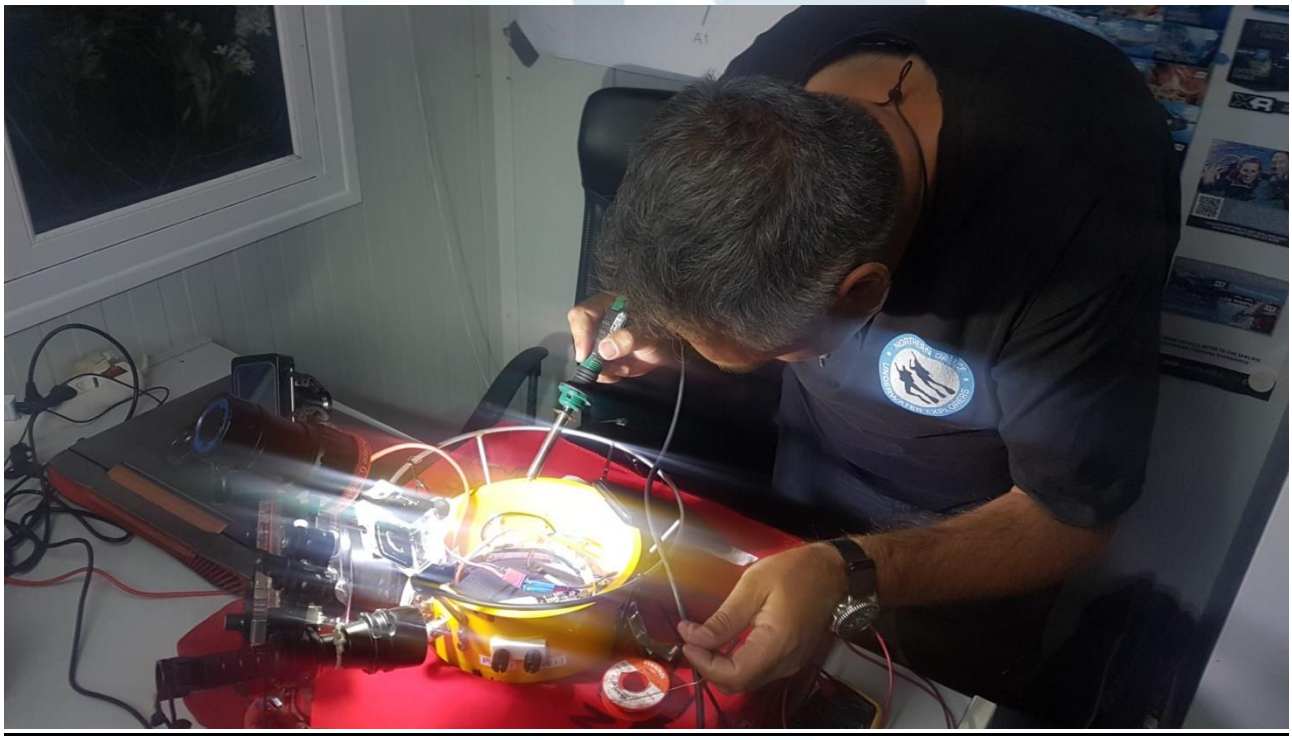
The buoy of the system with the small photovoltaic unit. The system buoy is also equipped with an ultra-wide-angle camera for visual monitoring on the surface.



Video snapshot from the system's underwater camera

Video snapshot of the underwater camera at night using the led light.

To summarize, the system worked satisfactorily, recording video footage from both cameras, autonomously with its own power supply (stand-alone) but without achieving wireless communication (via GSM).



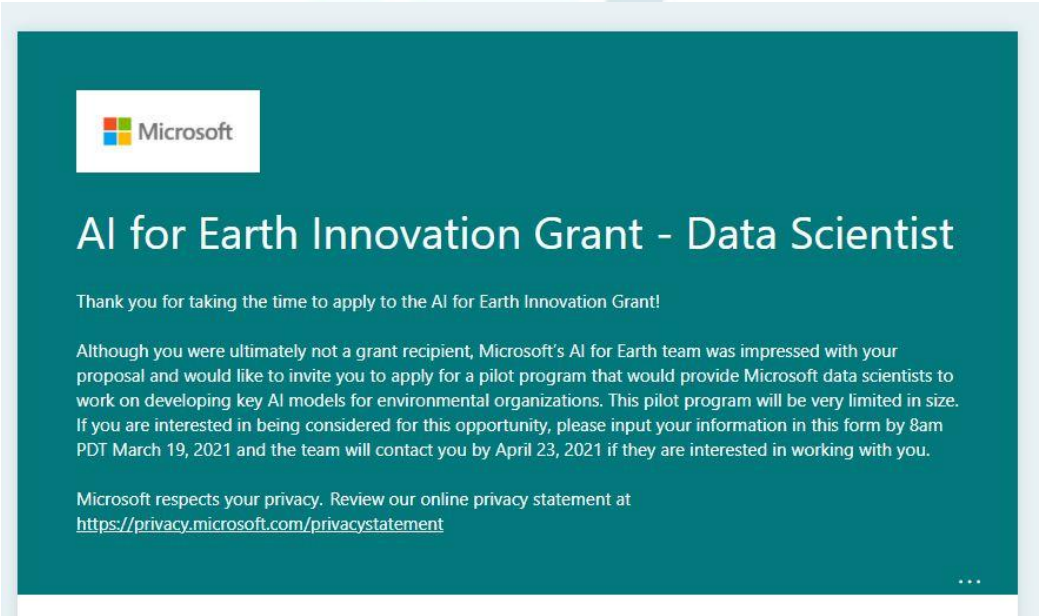
Adaptation and testing for the wireless connection to the system, through the mobile telephony network, GSM, at the offices of the institute in Stratoni.

September 2020 & March 2021

Application for funding from National Geographic

The institute submitted a full proposal for funding from National Geographic in the RECOVERY OF SPECIES ON THE BRINK OF EXTINCTION/IUCN & Species Survival Commission (SSC) project. Due to the pandemic, the funding program will not be implemented as planned but as an exception for the HMI, the Microsoft AI Team, who are the technical advisor and partner of National Geographic, have requested that further steps be taken for the collaboration between the HMI and Microsoft AI, because they have stated that they are "impressed" with the proposal.

The proposal is being reviewed and we will have their first response on April 23, 2021.



December of 2020

First time Live Streaming from the NOUS prototype system

Real-time image transmission from the seahorse colony

Visit of the institute in Stratoni, to continue the testing of the **NOUS - uNdersea vision sUrveliance System.**

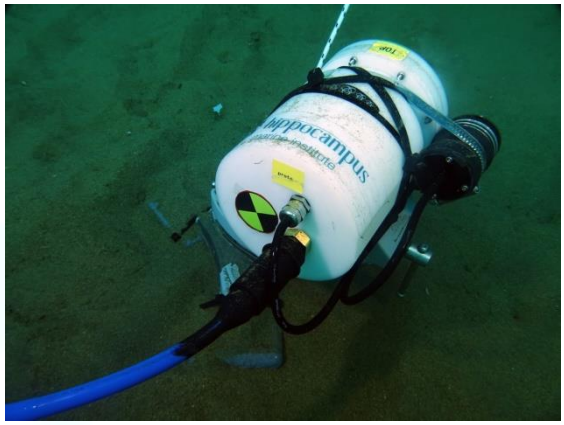
Almost before the end of 2020, the communication with the system and its full remote control became operational. Dives were carried out and for the first time in the world a live streaming transmission from underwater cameras from the seahorse core (main area) was made!

The system is a highly innovative solution, which has already received a very positive evaluation and acceptance from major stakeholders *(Hellenic Ministry of Culture, National Geographic, Microsoft, Universidade de Gambelas, Rio Formosa seahorses – Portugal, etc.*).

Installation of the system

The buoy on the surface

The surface buoy



The underwater camera

January of 2021

Article for the institute to the magazine SCUBAVERSE - The World's Best Online Dive Companion / "SAVING SEAHORSES DURING A PANDEMIA"

SCUBAVERSE

HOME NEWS COMPETITIONS TRAVEL PHOTO & VIDEO GEAR MARINE LIFE & C

MARINE LIFE & CONSERVATION

Saving Seahorses during a Panden

Published 6 hours agoon January 4, 2021
By **Jeff Goodman**

DIVESOFT

The Hippocampus Marine Institute's special focus positively influences the Greek Marine Ecosystem

There are 47 species of the seahorse, the extraordinary and charismatic marine creature within the scientific genus, Hippocampus (in Greek, *hippos* means "horse" and *kampos* means "sea monster"). Over the past decade, 14 additional species have been discovered; however, the identification is always challenging as they have the ability to change their color and shape to blend with their environment.

The Hippocampus Marine Institute is a Non-Profit Organization whose main focus is the study and protection of Seahorses. The institute was created by the same people who have passionately worked all these years and bequeathed all the results of their efforts to the institute.

PLANS FOR THE REST OF 2021 – MAIN OBJECTIVES

- Primary action for 2021 is the start of work and the preparation of studies for the licensing of a marine -diving park. The marine - diving park is the absolute priority for the conservation and safeguarding of the remaining population in this area. The establishment of a diving park is the most quickly way to achieve this. It is a project that enhances tourism so it will be supported by the local community, promotes environmental awareness, provides field research, Citizen Science and creates a refuge for the seahorses and many other species.

  The creation of marine-diving parks that are also Marine Protected Areas (MPAs), is perhaps the only hope for saving our seas.

  In addition to the European Directive, it is perhaps the only immediate global strategy to save some cores until we face and comprehensively deal with the pollution of the atmosphere and seas. The proposed **Marine-Diving Park** will include a marine section in the coastal Stratoni (which overlaps the area where we locate the core of the seahorse colony) and another section on a reef, in the area of the wildlife reserve in Brostomnica (it is foreseen by law that Diving Parks can consist of multiple non-contiguous areas). The reef we propose was one of those that was cleaned and ghost nets removed (as part of an international Ghost Fishing action organized and supported by **HMI**) and is now buzzing of marine life.

- **In this direction, the HMI is currently seeking funding for the preparation of all necessary studies and services required under the laws concerning the establishment and operation of diving parks/protected areas 3409/2005, 4296/2014, 4688/2020 for their submission to the Ministry of Environment (MECC).**

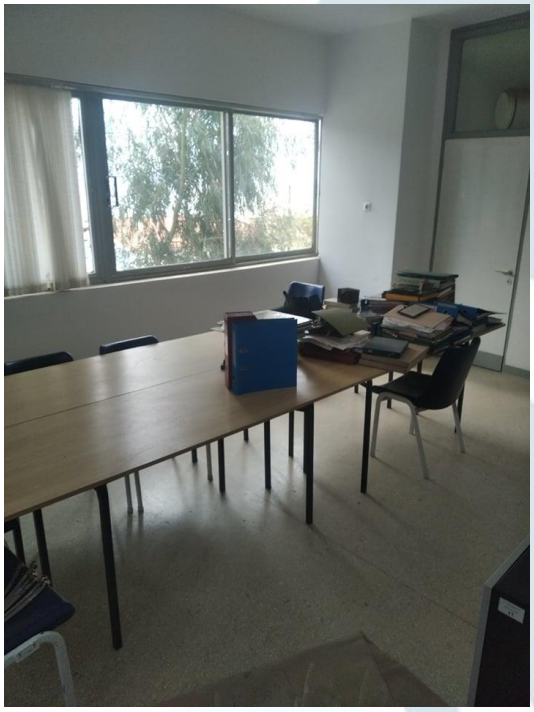
- Organization of the second international Summer School of marine biology with the exclusive focus on the study of the Stratoni's seahorse, as well as other species under protection and vulnerable to extinction. It is organized by the Hippocampus Marine Institute and the **Universidade do Algarve Campus de Gambelas of Portugal**. Due to the pandemic, the dates have not yet been finalized.

- Cooperation and support to students and researchers for the writing of degree theses and scientific papers.

- An important action of publicity - information - dissemination of the public will be the diving of young children (aged about 12 to 14 years,) in the colony of the seahorses with simultaneous transmission of live streaming video from underwater cameras. (nous.com.gr).

- Create training programmes for universities and schools from around the world to intensify research and get hands-on experience in the field. The institute and the Stratoni community are working to implement the appropriate infrastructure to systematically launch such programmes. We already have two sea-going vessels, remote-controlled underwater vehicles, a decompression chamber, high-pressure air compressors, a wide range of diving equipment, measurement and documentation instruments. The Stratoni community will soon (within May 2021) have completed the hostel.

- Finally, maintenance of the infrastructures of the institute, maintenance and enhancement of the underwater artificial habitats for the seahorses.



Photos from the hostel being built by the Community of Stratoni

On behalf of the Board of Directors of "Hippocampus Marine Institute"

Vasilis Mentogiannis
Vice Chairman of "Hippocampus Marine Institute"