

Bringing Dr. Sylvia Earle to Israel!

MKMRS, EcoOcean, Israeli Diving Authority



In the first public interface for shark and ray conservation, the University of Haifa (MKMRS), EcoOcean, the Israeli Diving Authority, and the Ministry of Culture and Sport, brought internationally-renowned marine scientist Dr. Sylvia Earle, to Israel for her second trip after 40 years! The diving activities, workshop, and speaker panel on Elasmobranch Conservation was a success, bringing 175 people to Isrotel Yam Suf, Eilat for a stunning 3-day event. The follow-up article from [Ha'aretz](#), who interviewed Dr. Earle before and during her trip, was nothing short of generous in commending the



organizer's ambition and dedication to the project. The team of MKMRS were honored to dive with Dr. Earle at Migdal Or beach, and unforgettable experience. The conference also saw talks from Amos Nachoum of [Big Animals Expedition](#),



Spotlight on:

Hagai Nativ, Media Manager

I'm an underwater photographer and a marine biologist so I am naturally interested in documenting the underwater world that is out of reach to so many.

In my work at Morris Kahn Marine Research Station, I'm the photographer and media manager - my responsibility is to visualize our work and make the station stand out with our capabilities and innovativeness in research methods.

My goal (and passion) is to get as much data as possible per dive time in a non-destructive way for later retrieval and analysis on the lab.

As a photographer of our station, I get to be the drone pilot, underwater videographer, footage and editor of our station site (*pending*) and social media presence. I feel my job is the most rewarding at the station and I'm very proud and lucky to be part of this special group of people.



**No water, no life. No blue,
no green.**

Sylvia Earle

BrainyQuote

Howard Rosenstein of [Fantasea Line](#), and international shark experts Dr. Yannis Papastamatiou, Dr. Demian Chapman (Florida Int'l University) and Dr. James Thorburn (Marine Scotland Science). The feedback is still coming in, and people are requesting to know when the next conference will take place!

Initiating the Top Predator Tagging Programme

Dr. Aviad Scheinin

Why focus on top predators? They are the best markers to assess the entire food web. We are going to harness state-of-the-art analytical methods to establish the condition by determining number of trophic levels and the trophic efficiency (how well is the energy transferred through the food web) of the system. This will be achieved using compound-specific stable isotope analysis (SIA) method. The advantage of using compound-specific SIA is that it is not limited only to $\delta^{13}\text{C}$ (stable carbon isotope ratio) but had expanded to include stable nitrogen isotopic composition ($\delta^{15}\text{N}$ stable nitrogen isotopes ratio). Both will allow us to determine the number of trophic levels, the trophic efficiency, and the food source. The method is based on observations of elevation in $\delta^{15}\text{N}$ values of organisms as they belong to higher trophic levels. The latter will allow us to compare present-day top predators with preserved samples we obtained from over 50 years ago. Thus, we will be able to tell what exactly happened to our local food web. The sharks are also tagged with special barcodes as well as with both acoustic and satellite tags



Mediterranean Nutrient Cycling

Dr. Michael Krom

We have just published a paper which describes for the first time – quantitatively - the reasons for the unique nutrient cycling in both the Eastern and Western Mediterranean. The paper (Powley et al., 2017) was published in *Global Biogeochemical Cycles*. It explains the reasons for the extreme oligotrophy of the Eastern Mediterranean. These include the unusual circulation of the system with nutrient-starved surface water flowing in at the Straits of Sicily and nutrient-enriched water flowing out underneath. This natural buffer system also reduces the effects of external pollutant inputs. We show that even though the Mediterranean is an inland sea with considerable inputs of pollutant nutrients, it behaves like an ocean gyre, to remove and

nutrient starved areas of the ocean.

In support of the research of Dr. Daniel Sher on phytoplankton processes in the offshore Eastern Mediterranean, we have measured dissolved nutrients at the ultra-low levels possible using the SEAL AA-3 autoanalyzer at the MKMRS lab in Sdot Yam. The data, measured by Anat Tsemel, on non-frozen samples shows the extreme nutrient depletion in the surface layers of the ocean typical of summer conditions. However, we also observed small but possibly real levels of ammonia, which requires further investigation.

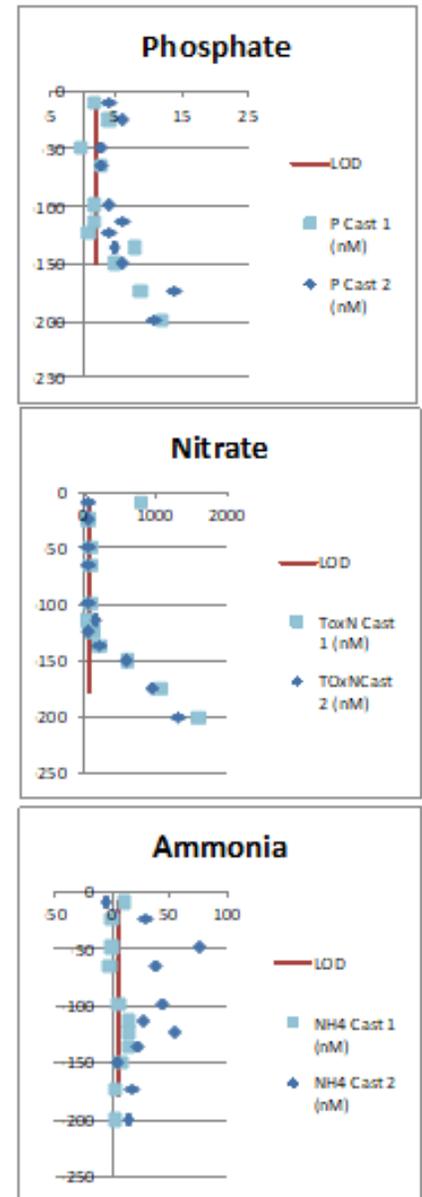


Figure: Showing dissolved phosphate, nitrate and ammonium in the upper 250m of the offshore Eastern Mediterranean. All concentrations are given in nanomoles/l together with the instrumental Limits of Detection (LOD).

Sediment microbial communities along the continental shelf of the East Mediterranean Sea (Israel)

Dr. Dalit Meron

Surface sediment bacteria play a significant ecological and biogeochemical role in marine ecosystems due to their high abundance relative to the overlying water column. They also play a key role in the decomposition of the organic matter, nutrient cycling and carbon flux. Despite their importance, our knowledge of the bacteria that inhabit the surface sediments is very limited, especially in the continental shelf of east Mediterranean Sea (Israel).

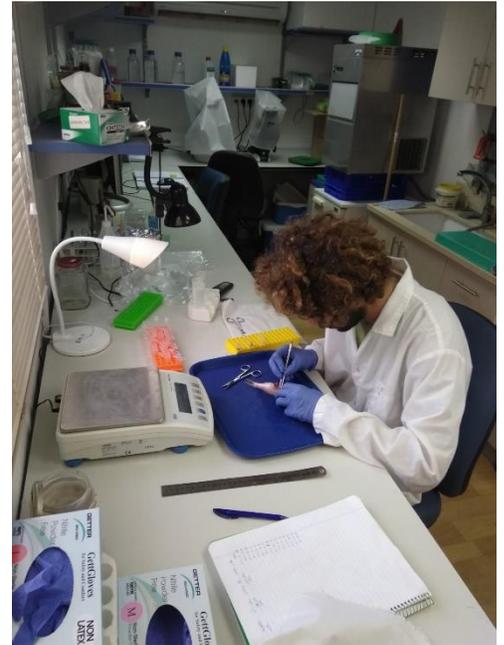
In order to provide a wide overview of the sites health and additional changes, following environmental changes, we started process of long term sediment monitoring including different geographic sites, depth transects, anthropogenic areas *etc.* In addition, to measure *in situ* abiotic parameters, we use the LANDER (see below) which contains micro electrodes for oxygen and pH measurements. Combining the microbial analysis with the environmental metadata enables us to create a database of sediment microbial communities and develop molecular indicator which will enable us to characterize the sites status.



Marine Pathogens Programme

Dr. Danny Morick

In our marine animals' pathogen screening program, we plan to establish a long-term research programme concerning pathogen emergence and disease transmission between aquatic animals in our region. Using cutting-edge technologies, these studies are expected to generate original knowledge about marine biology, while also relating to marine ecology and public health issues. We will examine pathogen transmission in the ocean by routinely collecting marine fish and shellfish specimens from various locations along Israel's Mediterranean coast, and the offshore finfish aquaculture farms. Data collection (over a period of three years) will enable us to assess the health status of selected marine fish species, and the results will be used to demonstrate the potential for the transmission of viruses from wild fish to farmed fish and vice versa. We intend to continue examining tissue samples of key top predators on the Israeli Mediterranean coast: sharks for levels of trace elements (Hg, Cd, Pb, Cu, Mn, Zn, Fe) and cetaceans (dolphins) for the distemper virus, the influenza virus, *Brucella* sp., and *Toxoplasma*. We will also continue our study on the herpes virus and nodavirus infection in sea turtles. For these projects, more advanced molecular methods such as new virus discovery and metagenomics will be evaluated and implemented.



Subsequently, we expect to have a sound perspective of flagship marine animal health status in our region in the near future. We strongly believe that this will lead to an improved understanding of the origins and spread of viruses in aquaculture and will assist us to fine tune the molecular basis of fish viruses.

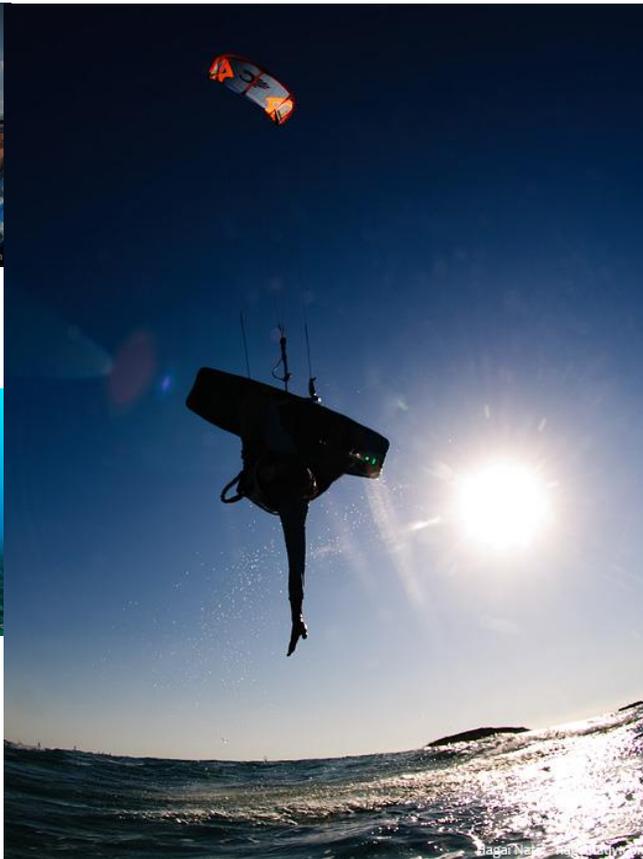
In our 2016-2017 fish pathogens monitoring program, we sampled brain, liver and kidney tissues from 400 fish. RNA was extracted from the brain of 90% of animals, DNA extracted from liver and kidneys of 70% of the animals and molecular PCR systems were established for 3 pathogens.

We are currently still busy with analyzing data from our first monitoring season, and a paper describing our findings is in preparation. We are already collecting and processing data from this coming season (2017-2018), and we will adjust our program following last year's conclusions. Regarding pathogens screening of marine mammals, we recently finished a study where we detected (for the first time) *Toxoplasma gondii* protozoa in 3 bottlenose dolphins. We are now in the process of submitting the article.

Publications accepted:

[Powley, H.R., Krom, M.D., and Van Cappellen, P. \(in press\) Understanding the unique biogeochemistry of the Mediterranean Sea: Insights from a coupled phosphorus and nitrogen model. *Global Biogeochemical Cycles*, 11; 1010-1031. DOI 10.1002/2017GB005648](#)

[Einbinder S, Gruber DF, Salomon E, Liran O, Keren N and Tchernov D \(2016\) Novel Adaptive Photosynthetic Characteristics of Mesophotic Symbiotic Microalgae within the Reef-Building Coral, *Stylophora pistillata*. *Front. Mar. Sci.* 3:195. doi: 10.3389/fmars.2016.00195](#)



This is the first quarterly review of the Morris Kahn Marine Research Station's progress over 2017. We thank you for your kind generosity and support as our marine research and objectives take shape!

Thanks to the incredible generosity of our donors:

*Morris Kahn Foundation
The Crown Foundation
The J. Isaacs Charitable Trust
Mr. Peter Kadas
The Helmsley Charitable Trust*

Dr. Dan Tchernov & Dr. Shai Einbinder

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