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## DIGITALONLINE THE RESULTS ARE IN EARTH HOUR EVENT • NEW THREAT TO ENDANGERED SEA TURLES • MUSANDAM

**EARTH HOUR EVENT •** NEW THREAT TO ENDANGERED SEA TURTLES • MUSANDAM BIOSPHERE EXPEDITION • CHINHOYI CAVES • COSTA RICA • NO PANIC, WE'RE DIVERS

### **UAE DOLPHIN PROJECT – UPDATE** FIRST "REPORT A SIGHTING" RESULTS: THE PUBLIC CAN MAKE A DIFFERENCE! FEATURE AND PHOTOGRAPHY ADA NATOLI



### PLEASE BE DOLPHIN SMARTI

Report a sighting and demonstrate your support for dolphin conservation.

- 5 stay back 50 metres from dolphins (100m from whales).
- move away cautiously if dolphins/whales show signs of disturbance. (sudden change in behavior).
- \* always put your engine in neutral when dolphins/whales are near.
- R refrain from feeding, touching, or swimming with wild dolphins.
- teach others to be Dolphin SMART.

Be disiphin SNART code is based on international guidelines. Contents and design have been adopted from the Jonian Dolphin Project (Tethys Research Institute)

It has been three exciting months for the UAE ; it means that they actually use these coastal ; contribute to this research. We produced a Dolphin Project since its debut in 'Divers for the Environment' last March! We have been concentrating our efforts in raising public awareness. We participated in two great events, the Dubai International Boat Show and the first Dubai Marine and Heritage Festival, and engaged students of all ages through school presentations: now over 500 students across seven schools in Dubai know more about dolphins and whales and more importantly that dolphins also appear in Dubai waters!

We have received an encouraging number of sightings and our sighting map is filling up. Someone diligently kept records of past sightings as far back as 2008 and kindly agreed to share them with us. Interestingly since the middle of March, we received 19 sightings that mean more than 2 sightings in a week! The real number is actually higher as some sightings have only been reported by word of mouth, with limited data and was not submitted through our system.

The main locations where dolphins have been reported are close to shore; in Dubai between the Palm lumeirah and IBR, along lumeirah beach and in Abu Dhabi along the corniche. We also received sightings from the western region, around Abu Al Abyadh Island and sadly a worrying number of finless porpoise strandings from Kuwait (three since January). The finless porpoise is a very elusive species poorly studied worldwide, although defined as "Vulnerable" by the IUCN Red List. We are aware that this species also occurs in UAE waters as sightings and strandings have been reported.

Reported sightings are extremely useful information. Dolphins' coastal occurrences can simply be the result of the fact that people mostly frequent these areas rather than more offshore areas, however if dolphins are seen,

waters fairly regularly.

As we are planning to soon start a research survey to gather a better estimate of the population size, habitat use, and seasonality of these species, the data will provide us the baseline information to better define the study area. Also, it enables us to understand where dolphins occur on a larger geographical scale and potentially to track animal movements.

Pictures are extremely useful even if of low quality. Firstly they enable us to confirm the species and furthermore, if the dolphin is clearly marked, and pictures are taken from the correct angle, they allow us to recognise a single individual from cuts and notches on their dorsal fins. This is the principle of photo-identification that scientists use for the different species such as whale sharks. zebras, and leopards. The analysis of photoidentification data systematically collected provides information on whether a population is resident or migratory, its social structure, and helps estimate the population size. If you have any pictures of dolphins taken in the past and you can retrieve the date, approximate location and time, please submit them!

We believe that dive professionals and dive centres are amongst those that can greatly

simple booklet, freely downloadable from our website (www.uaedolphinproject.org) that shows how to recognise the three most frequent species, how to safely enjoy a dolphin encounter and how to report a sighting. If any dive centre is interested, please contact us at sighting@uaedolphinproject.org - we will be happy to come in and give an introductory talk about whales, dolphins, more detailed information about the project and provide you with an illustrative poster and stickers for display.

We would like to thank all the people that submitted their sightings, in particular Nautica and Abu Dhabi Marine Conservation Society for sending their whole dataset, and Anand, Hessa and Zainab from Kuwait. The Pavilion Diving Centre, the Dubai Dolphinarium and the Diving Village for supporting our participation to events.

If you encounter - dead or alive - a dolphin or whale, please Report Your Sighting at www. uaedolphinproject.org!

Alternatively you can text +971 56 671 7164 or email your information to sighting@ uaedolphinproject.org and/or post it on the project's Facebook or Twitter pages. Please make sure to note the date, time, location and include any images you may have of the encounter.



Photo-identification: adult dolphins often exhibit permanent cuts and notches on their dorsal fin that enable to univocally recognize the individual. Good photo-identification pictures are taken perpendicularly to the dorsal fin.

## DOES NITROX PREVENT DEPTH NARCOSIS? FEATURE PATRICK VAN HOESERLANDE, LEENTJE VERVOORT AND KIKI VLEESCHOUWERS



healthy and scientific attitude. In our first article of the series 'tested and proven', we showed that depth intoxication at 30m has a negative effect on our ability to think. Depth makes us think slower and makes us more prone to error, Neither experience, nor sex protects us from it. Depth has the same consequences for divers as for instructors, and for women as for men! Nothing to do against it!

Nothing? I hear you think: what about Nitrox? That was our reaction too. Doesn't the specialty Nitrox diver handbook enumerate this reduced influence of nitrogen as one of the benefits? But is this really true? Are we really less intoxicated? Or do we just feel better because of the extra oxygen? This question was worth an experiment.

Time to call up the Experimental Deep Dive Team, Kiki Vleeschouwers, psychologist Leentje Vervoort and I just adapted our proven test design a little bit – a group of divers performing comparable intelligence tests on 2.5m and 35m. Again we chose the deepest swimming pool in the world, because in open water there would be other factors such as darkness, dust, cold...influencing the results. If we wanted to measure the positive effects of Nitrox on nitrogen intoxication, we had to keep all the other variables constant and that

'Do not believe everything they tell you', is a ; is very difficult to open water. In addition, a ; The design was similar to that of our previous pool with spring water offered the possibility to organize everything in one evening and to better control the procedure. Being able to take beautiful pictures and a movie, was a nice added bonus.

> With our experiment, we wanted to show (or contradict if necessary) the effects of depth while using Nitrox versus air, as well as some 'sensory factors' such as cold, clarity of thought, ease of breathing, etc. We didn't want to investigate other phenomena such as nonpsychological advantages and disadvantages (such as reducing decompression accidents, extend the bottom time in relation to decompression...) nor the effects of oxygen toxicity. Testing these was far beyond our capabilities.

> For the intelligence tests we could again cooperate with Mensa, the society for people with high IO.We also added our own memory test in the form of imaginary fish. This memory test simulated the situation whereby a diver would discover an unknown fish and try to memorize it. Once back at the surface, he tries through the recollection of the characteristics to determine the fish with the aid of a specialized book. To be sure that no diver would recognize even the most exotic fish, we created two new, imaginary species.

#### FEATURES

experiment on depth narcosis and consists of comparing the results of equivalent intelligence (i.e. Mensa) and memory tests made at a depth of 2.5m and 35m. In addition to make good use of the experience we had with this kind of setup, was the ability to confirm the results of our first experiment. The intelligence tests consisted in giving as many possible correct answers in a 7 minute period. The clear and warm spring water of Nemo 33 ensures that the conditions in terms of light, temperature, ...on both depths are almost equal. Only the pressure is different. The difference with the last experiment was the gas mixtures. It was a so-called blind test. The divers didn't know the gas mixture (air or Nitrox) in their tank. They got a numbered bottle, which didn't mention the mixture inside (every tank was Nitrox approved). In addition, we've made them believe they were all diving with one of the possible, safe combinations of Nitrox, while in reality half the bottles were filled with air the other half with Nitrox 32.

This blind test, however, meant a deviation from one of the basic security rules of Nitrox diving, that every self-respecting Nitrox diver should analyze his own mixture. However, this was a necessary deviation given the experiment.

### **FEATURES**

Again, we could count on the logistical support ; last divers, including me, would come out of ; Although most divers indicated that they saw of the local dive shop Scuba Service Store.

Another difference with the first experiment was the additional questionnaire that gauged the 'sensory factors' (supposed advantages and disadvantages of Nitrox). Hereby we let the divers believe they had been diving with a mixture.The last question was if they could guess the kind of Nitrox they had been diving with.

On the evening of the experiment, although there were 3 divers we had to replace because of illness, 16 divers, of which 8 experienced Nitrox instructors and divers and 8 novice Nitrox divers, were ready. All had previously been diving to 30m or more. To exclude the impact of nitrogen habituation, if that should exist, none of them had been diving the week before. It was also an international group: five very enthusiastic Dutch divers were also present. It was not easy to find enough Nitrox test divers in Flanders, but thanks to this international flavor we had our 16.

After the necessary administration (correct certification? how many dives? how many to 30m?...) the entire team was briefed and the whole procedure 'dry' practiced. The few visitors at the divers café looked pretty baffled while watching our dry run, but it was no luxury. There were plenty of questions that couldn't be answered under water. Underwater communication in unforeseen circumstances is difficult at least, and I, as dive leader at 35m, could be 'under the influence' too!

After the safety briefing, we had the mandatory 10-minute free diving session. The preparation of the material turned into a big confusion. This resulted in a very late start. The descent of the first team was not so smooth and troubleshooting at depth still proves very difficult. I saw my 'no deco' time counting down. My first deco stage appeared half way on the first session.

When I saw the second team coming down, it became clear to me that I would never end this experiment within the foreseen, and paid. hour. Thanks to the Nitrox in my bottle – at least I thought so at that time – I could think clearly about the problem at hand. Breaking up meant a total failure of the experiment combined with a great uncertainty about a possible second chance. So I decided to noted that this probably had to do with the continue. My decision, however, meant that the use of another regulator.

the water much later than agreed on.

After the wet part, it was now time for the dry part. The test divers still had to write down what they remembered from the imaginary fish and to answer some questions about Nitrox. The evening ended with a short debriefing and a cozy chat about the experiment and about diving.

While we agree how everyone could receive the pictures and the movie, I already started to go through the questions. Would they have guessed the mixture they had been diving with? Did Nitrox let us think clearer at depth? Or was that only an imaginary feeling? And what about the effect on memory recollection? Would the divers with Nitrox have remembered more than the air divers?

#### THE SCIENTIFIC SIDE OF THE EXPERIMENT Would the divers be able to guess what mixture they had been diving with?

To find out, we let the participants indicate what mixture they thought to have been diving on (air, Nitrox 26, Nitrox 28, Nitrox 30 or Nitrox 32). The air divers had some difficulty with this question: one air diver thought wrongly – to have dived with Nitrox 28 while two others indicated that they had no idea. For the Nitrox divers, however, it was very clear: they all correctly indicated that they had been diving with a Nitrox mixture. We have no idea on what this judgment was based on, because they all, just as the air divers, noted no difference between this dive and their last air dive, and despite this, the ideal circumstances of Nemo 33 (nice and warm, clear water, no current...)

One Nitrox diver got it really hot, while one air diver and one Nitrox diver thought it was a lot hotter than their previous dive, but for the others there was no difference with the previous dive. One even indicated that it was chilly. He had probably just returned from a tropical dive. One air diver and two Nitrox divers wrote down that they were less thirsty than after the previous air dive, but the others mentioned no difference. Only two Nitrox divers and one air diver indicated they had experienced greater breathing resistance than during their previous air dive. One of them

no better or worse, 2 air divers and 4 Nitrox divers thought their vision was improved, which, according to one of them, had to do with the clarity of the pool water. The Nitrox divers and the air divers had on average about 75 bar consumed (total M = 75 bar, standard deviation, SD or the average deviation of the average = 25.71 bar). According to most air divers that matched their consumption during their previous dive, two air divers thought they probably had consumed more air than during their previous dive. However, most Nitrox divers declared that consumption during this dive was different than normal: two of them thought to have consumed more breathing gas, another three, that they had consumed less. The three others thought their consumption was the same as during their previous dive. About half of the divers, 4 air divers and 3 Nitrox divers, felt after this dive no difference in fatigue. The other 4 air and 5 Nitrox divers found swimming in Nemo 33 less tiring. This single dive was probably too relaxed and too short to demonstrate this effect of Nitrox that is felt after multiple diving days, Half of the Nitrox divers indicated they could consider that during this dive, their thinking was clearer than their last air dive. So people have the impression they think clearer when they dive with Nitrox.

In the previous experiment with only air divers, we had seen that depth made us slower and did make us prone to error. The number of completed questions was much less at a depth of 35 meters than at 2.5 meters. The same pattern was observed in this experiment: the air divers completed 16 questions at 35 meters and 18 questions at 2.5 meters. The Nitrox divers in this experiment answered more questions: 19 questions at 35 meters and 20 at 2.5 meters. Although these differences were very small (and not significant), it seems that divers can think faster when they dive with Nitrox instead of air.

Of course it's not only important to think guickly, but also to think correctly. The air divers on the previous experiment made significantly more errors at 35m than at 2.5m. The same can be observed with the air divers of this experiment: at 35m they had on average only 8 questions correct (M = 7.86, SD = 3.53), while at 2.5m they had 11 questions correct (M = 10.71, SD = 5.35). We did not see that difference with the Nitrox divers; they





depths (M = 10.75, SD = tablets 2.5m, M =  $\frac{1}{2}$ 11.49, SD = 6.85). Although these differences seems that Nitrox 'protects' us against the effects of depth during our thinking abilities.

In the previous experiment, it seemed that not all aspects of our thinking are influenced by depth. Divers were able to recall as much (or better, as little) of the imaginary fish they encountered at 35m as of the ones at 2.5m, In both cases they remembered less than half the features. We concluded that it was difficult to recognize the attributes of an unknown fish. Unlike in the previous experiment, where the divers had not had the chance to prepare for this kind of test, we showed them during the dry-run, an example of a home-made fish (as well as a sample of the questions).

This preparation proved its effect. The divers were able to remember the fish a lot better. Where the divers from the previous experiment could hardly remember half the fish (3 of the 7 characteristics), the divers of the current experiment remembered on average, 6 of the 7 characteristics of the fish at 2.5m and an average of 5 of the 7 features of the 35m fish. Unlike the intelligence test, the effect of depth on the memory was no different for air or Nitrox divers. Both types of divers remembered | characteristic more from the 2.5m fish than the one at 35m.

AND WHAT HAVE WE LEARNT TODAY?

I. Depth makes us slower thinkers and more

correctly answered 11 guestions at both ; prone to mistakes, but Nitrox can protect us. 2. Depth also has an effect on our memory, but Nitrox doesn't offer a protection against it. are not really big (but almost significant), it 3. The protective effect of Nitrox does not apply to all aspects of our thinking.

#### AND WHAT ABOUT THE GUINEA PIGS OR BETTER. THE UNDERWATER TEST RATS?

An enthusiastic group that gathered on time in Nemo 33. Many familiar faces. They had taken part in the first experiment and had really enjoyed it, so much that they wanted to participate in the Nitrox version of it.

Happy memories of the last experiment. And yes, they wanted to participate for the cozy atmosphere, but they were also very curious about the effect of Nitrox.

We had the same team photographers. camera and lighting crew. Less nervous this time, but equally passionate and enthusiastic.

One group was really special. All the Dutch participants had the same wonderful t-shirt with the logo of, our 'Experimental Deep Dive Team' on it, "Yes," said Arjan, one of the t-shirt guinea pigs, "we found this experiment very interesting. And that is why we are here with full commitment. We had those t-shirts printed to show team spirit. We want this experiment to succeed. And we are very curious about the results". It was very fun working with such a bunch of committed people...

And they had not known that after their hard underwater work, we had foreseen a relaxing phase with food, drink and lots of fun...That was our little secret.

Everyone did his/her very best during the experiment: test divers, photographers, camera crew, lighting crew, escort divers and yes, we ran out of time. But never mind, the experiment was successful and with these results, our statistical expert Leentje could do something with it all

After the hard work, we had our relaxation time in the restaurant. Some refreshments. questionnaires filled out, spaghetti plates emptied, and lots of stories. The following roaring statements were shared at the table:

- "Difficult tests those Mensa-tests" (they were intelligence tests!).
- "I know for sure that I have been diving with Nitrox'' (proved to be not true).
- "When's the next experiment? I would like to join again" (will come for sure).
- "It's very nice to get to know other people this way" (it is indeed not a regular dive trip)

And so you see, running experiments are all part work, part fun...

#### **PARTICIPANTS** (in alphabetic order)

Carry Benoy – Jan Boeye – Liesbeth Boeye – Benjamin Boeye – Nanou Bultynck – Eric Burgers – Ann Cockx – Nick De Loose – Claudia Gravenstein - Rudi Janssen - Sander Kik – Ian Lumbeeck – Gerard Mirer – Olivier Simons – Peter Smets – Patrick Steeno – Kristof Steeno – Peter van Bragt – Jose Van

### **FEATURES**

den Bleeken – Walter Van Deuren – Arjan Van Es – Glenn van Ginkel Raymond – Patrick Van Hoeserlande – Amber Van Hoeserlande – Frederik Van Poucke – Tine Vanderaspoilden – Dora Verhoeven – Kiki Vleeschouwers.

USEFUL WEBSITES Nemo33 – www.nemo33.com Scuba Service – www.scubaservice.be Mensa – www.mensa.be









44 DIVERS FOR THE ENVIRONMENT, JUNE 2013



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