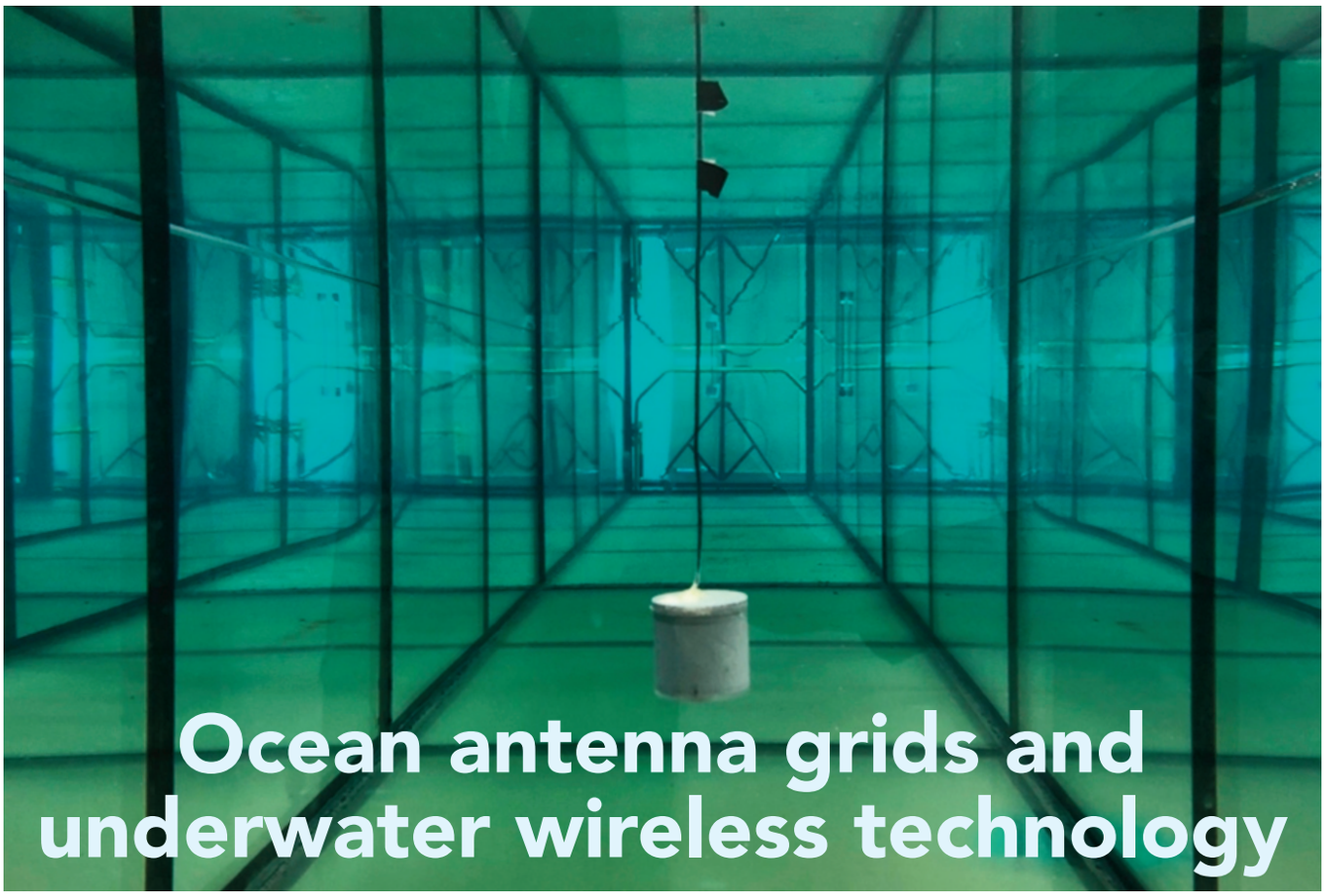


Ocean antenna grids and underwater wireless technology

(Image: news.mit.edu)

Greg Fredericks, ND NMD © 2022

Most of us have heard about Starlink, a grid of satellites surrounding the Earth, designed by Space X's Elon Musk to provide high-speed internet and satellite communication. This array of satellites has been of great concern and the cause of speculation by many scientists on the future health of humanity. Studies have shown that certain frequencies, such as 5G, can have a detrimental impact on human cellular mitochondrial processes, causing DNA damage which can lead to mutagenic cells, including cancer (Miller et al., 2019).

Similar concerns are now beginning to emerge in relation to vast antenna arrays and other forms of electromagnetic frequency devices currently being developed for the Earth's oceans. Very little is known about the impact that these technologies will have on marine life and the ocean ecology.

In 1953, underwater explorer Jacques Cousteau published his first book, *The Silent World*, describing his explorations of the oceans around the globe. Today the silence of the oceans has been replaced with underwater electrosmog so prolific that many competitive corporations are now vying for a piece of the action in the new wireless underwater communications frontier.

In the 1970s Cousteau warned that the oceans were vulnerable and beginning to die from pollution, but who could have foreseen the assault of electromagnetic pollution infiltrating Earth's oceans in the 21st century? Some ocean communication companies have designed grid installations reminiscent of the Alaskan HAARP array

allegedly developed for the purpose of weather control and other experiments. The similar-looking ocean installations take up vast areas of the ocean floor and generally go unreported by mainstream media.

This article will discuss the current state of the oceans and examine some of the technology that will be deployed on an already compromised ecosphere.

Very little is known about most of the subterranean programs currently being developed. The oceans are a perfect environment for hidden secret agendas. The future consequences can only be determined from research and an investigation which starts now.

Before we investigate developments in wireless communication, let's consider some recent marine tragedies.

Marine Ecological Tragedies and the Dead Zone

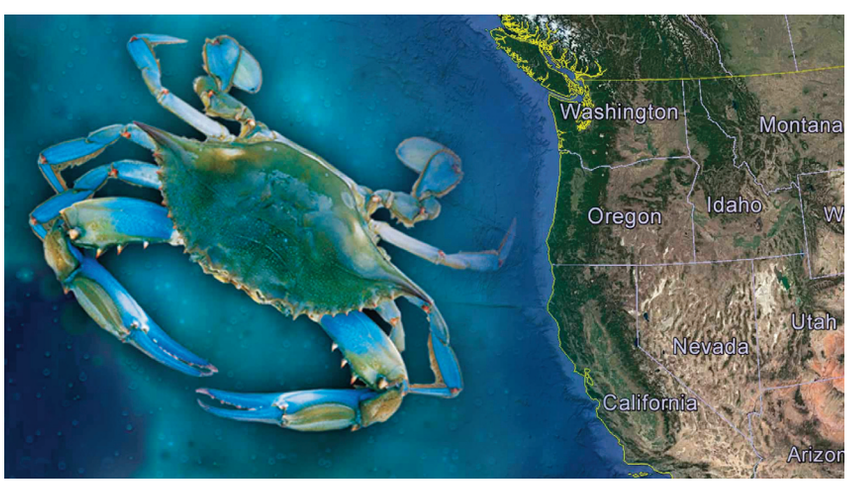
Marine activist and researcher Arthur Firstenberg has presented evidence of potential tragic effects of underwater communication devices on all sea creatures including coral, diatoms, seagrass, crustaceans and the entire ecosystem of the oceans. Before we consider the impact of potential EMF and other wireless technologies on the marine ecosphere, let us consider recent events that may or may not be related.

Catastrophic marine events that have already occurred and are not widely known include the recent finding that small Australian fish contain three milligrams of plastic for every gram of tissue. The xenoestrogens found in plastic are well-known endocrine disruptors and are potentially carcinogenic in human receptors (Ribeiro et al., 2020). Ironically many Australians consume the smaller fish in order to avoid the heavy metals found in the larger fish.

Last year saw the death of a thousand manatees off the coast of Florida, caused by them consuming polluted seagrass. Emergency measures were initiated by Florida wildlife officials to save the remaining starving manatees who could no longer graze in their marine habitat (Wetzel et al., 2021).

Other marine tragedies have been directly related to low oxygen levels in the ocean causing havoc to ocean life. The year 2021 saw the death of large numbers of bottom-dwelling crabs caused by a lack of oxygen in their normal marine environment off the coast of Oregon USA. This event has raised fears that the change in the ecology of the coastal waters has created a "marine dead zone" (Parks et al., 2021).

One of the potential causes of the reduction of oxygen in many marine environments is due to dwindling populations of krill, algae and diatoms which are valuable oxygen producers. Krill are small shrimplike crustaceans which are an essential dietary staple for whales, penguins sea turtles, and seals. Krill populations have declined by 80 per cent since the 1970s (Poppick et al., 2019). According to Firstenberg, the lack of oxygen in the ocean affects the deepest part of the ocean first and has become a major concern to many scientists. Reported by the International Union for the Conservation of Nature in an article entitled "Ocean Deoxygenation", there is increasing evidence of the disintegration of the subterranean ecosphere (Welch et al., 2015; Poppick et al., 2019; Isensee et al., 2018; Parks et al., 2021). Is it possible that EMF technologies could be implicated?



Hanging on by a Thread

Jacques Cousteau believed as early as the 1970s that most life in the ocean was hanging on by a thread long before 5G communication technology. Even before we consider the possible devastating effects of wireless technology, there is already a problem—the effects of noise pollution on marine life.

According to Lindy Weilgart, a Dalhousie University Marine biologist from Nova Scotia, there are many studies demonstrating the effects of noise pollution on

whales and dolphins and there is ample evidence pointing to detrimental effects on many other species of fish and marine life. In a meta-analysis of 115 research studies, Weilgart details the effects of noise frequencies on 66 species of fish and 36 species of invertebrates that use sound for vital functions. Detrimental effects reported include: body malformations; slower growth rates; diminished egg production; immature mortality caused by internal injuries; neuroendocrine malformations; reduced spawning; anti-predator defence mechanism depletion; and navigation misalignment—some of the anatomical impacts caused by marine noise pollution.

The potential area affected by human-created noise comprises millions of square kilometres of ocean, especially where there are commercial shipping routes and gas exploration. Weilgart says "the detrimental effects of noise on marine life is a relatively new area of research but the lack of information by commercial projects on sea life is much more dangerous".

...Sea Shepherd has stated that the new technological wireless transmitter assault dwarfs all previous noise pollution in its scope and magnitude.

United Nations Guidelines

The harm to "living resources" by thermal and acoustic sources was addressed by the United Nations General Assembly (UNGA) in paragraph 107 of its resolution 61/222 on "Oceans and the Law of the Sea", adopted in 2006. Since then an amendment adopted on 23 December, 2015 notes with concern that human-related threats such as underwater noise may severely impact marine life, and calls upon States and competent international organisations to coordinate their research efforts to reduce these impacts and preserve the integrity of the whole marine ecosystem.

The mitigation strategies adopted so far from the UNGA include "safety zones" and "marine protected areas". The safety zones provide some spatio-temporal restriction on noise activities in certain areas where spawning, breeding, migration, feeding or resting of marine species takes place. An example of this is the banning of sonar and naval exercises in and around the Canary Islands by the Spanish government.

Mitigating Technologies to Reduce Noise Pollution

Other mitigating tools to help reduce noise pollution include the adoption of quiet technologies. These include quieter ship engines and the use of an alternative to seismic airguns, called marine vibroseis, which cut out the harmful frequencies up to 150 kHz that affect whales and dolphins. The normal seismic airguns make a sound like a gunshot that creates zero to a high frequency instantaneously, producing injurious concussions to porpoises, dolphins, killer whales, belugas and narwhals. The quiet seismic technology is a welcome change to help marine life, although it is not nearly enough with other impending technologies.

Wireless: More Dangerous than Noise Pollution?

The marine environmental protection organisation known as Sea Shepherd has stated that the new technological wireless transmitter assault dwarfs all previous noise pollution in its scope and magnitude. Sea Shepherd describes the new underwater GPS systems that use acoustic waves, radio waves, lasers, LED light and magnetic induction. Their belief is that these devices will flood the oceans with multiple configurations of data that carry other potential consequences.

In many cases resembling an antenna grid, the antennae are positioned at different depths on the ocean floor which transmit horizontally and vertically to satellites which communicate with computer monitoring systems in countries around the world. The technology is claimed to be used for climate change monitoring, pollution control and tracking, disaster prevention including tsunami warning, ocean exploration, fishing and aquaculture, coral reef harvesting, tectonic plate monitoring, navigation, global ocean trade, oil and gas exploration and production, military communication and surveillance (Firstenberg et al., 2022).

The IoT Smart Grid

A research and development team at the Massachusetts Institute of Technology (MIT) has developed a system to connect information relayed from

The picture above depicts "the internet of things" below the surface, developed by researchers from MIT who have developed a battery-free underwater communication system that uses near-zero power to transmit sensor data. (Image: pioneeringminds.com)

various grids including the undersea grids to people's homes. "The internet of things" otherwise known as "IoT" has the ability to relay early warning information from the grid. Embedded sensors and software can relay data to other devices and reroute power during storms and other disasters. MIT claims IoT offers protection to humanity by providing early warning in extreme weather events, earthquakes, tsunamis and slow-onset disasters like droughts and polar vortexes.

Light-Beam Wireless Marine Technology

Standard radio wave communication can only be sent through sea water at extra low frequencies of 30–300 Hz and requires a very large antenna and huge transmission power. In replacement of radio waves, one of the new underwater communication technologies uses transmitted light beams. The light beams are picked up by photo detectors on the surface of the sea and converted to an electrical signal. The information is sent to the cloud for storage before it is used. This system known as Li-Fi uses light fidelity modems for long range underwater communication. This is one of the many wireless types of products currently in use.

Marine Technology Conferences

The year 2022 sees many conferences in Europe and the UK where wireless ocean technology companies have/will display their products. Some of the conventions include the 2022 Oceanology International Conference in London, UK on March 15–18, the Aquafuture Conference in Silleda, Galicia, Spain on March 24–26, Aquaculture Conference in Aviemore, Scotland on May 3–5, HavExpo in Sotra, Norway on May 10–12, NorFishing Conference in Trondheim, Norway on August 23–26.

The following is a compilation of some of the wireless marine technology companies featured at the Oceanology International Conference in London and other conferences. The goals of most of these companies is to promote the deployment of long-range wireless digital communication systems in various configurations using acoustic waves, lasers, and advanced sonar technology. There is also a contingent of various underwater drones and autonomous underwater vehicles (AUVs) used for surveillance and exploration. Some of these are described as "swarms", where hundreds or thousands of small robots work together like a Borg or a Hive to carry out surveillance activity.

• 3D at Depth Inc. will be displaying their advanced subsea Lidar Laser systems which project resonant frequency beams to its target.

• Dynautics is a company that has developed small uncrewed marine mission vehicles that operate by remote control. They offer communication and power management systems for exploration, assessment, security, charting and research, mining, oceanography, marine transport and defence/security.

• Evo Logics has several series of long-range acoustic modems designed for different applications from navigating uncrewed underwater vehicles, retrieving data from subsea sensors and deploying complex underwater sensor networks for monitoring and exploration.

• GeoSpectrum uses a very low-frequency sound projector which operates at resonant frequencies as low as 15 Hz. It offers a more efficient broader bandwidth offering surveillance. They have portable acoustic targets and multipurpose autonomous subsurface targets used for training.

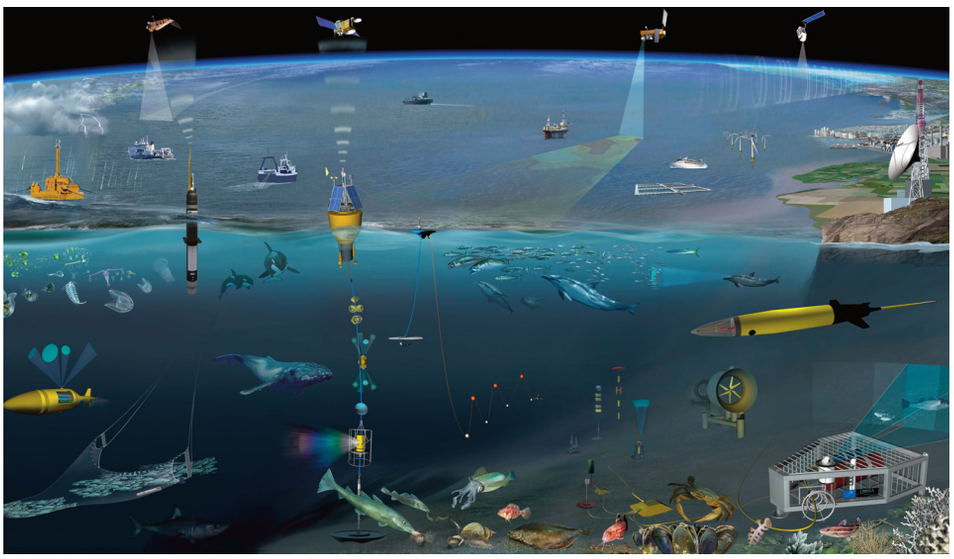
• Hydromea offers the first tetherless remotely operated vehicle (ROV), used for monitoring and inspection of "submerged assets" with live video footage streaming.

• Lincoln Laboratories made history when they combined with NASA for the Lunar Laser

This picture depicts various underwater AUVs, drones, swarm robots, acoustic modems and laser beam (Li-Fi) communication devices currently on the market by the companies listed at right. (Image: spotmydive.com)

Communication Demonstration (LLCD). They used a pulsed laser beam to transmit data from a satellite orbiting the Moon to Earth—more than 239,000 miles at a record-breaking download speed of 622 megabits per second. This narrow-beam technology claims to be 10,000 times more efficient than other approaches and is now available for underwater communication applications.

• Photonic Sciences uses a blue-light laser technology that emits a highly focused light with wavelengths of about 450 nm directed over long distances. These lasers use Lidar techniques which can record and image underwater objects, submarines and archaeological sites. They offer a new method of wide-band interception-proof communication. Their CIMAP has recently achieved a record 7.5 W constant wave output at 452 nm wavelength capable of penetrating through water at long distances.



A depiction of many autonomous and remote sensing platforms that comprise an ocean observation system. Credit: Glynn Gorick and the NeXOS project (Image: frontiersin.org)

• Seaber are developers of low-cost micro autonomous underwater vehicles (AUVs) which act as underwater drones.

• Sonar Dyne will be demonstrating its 6G hardware platform used for deploying, tracking and recovering moorings and equipment. They use a digital wireless acoustic modem to aid in oil and gas exploration and military applications.

• Vertex is a company that manufactures autonomous underwater swarm drones which are connected by a multi-hop radio network. Each AUV can triangulate its position in the swarm fleet with each robot receiving continuous information. The AUV is claimed to be very good for detection of oil spills and determining the size of the plume.

• Water Linked AS provides acoustic modems for servicing underwater navigation and aquaculture. The Water Linked AS website states it is "on a mission to disrupt the market for underwater acoustics".

• Woods Hole Co. will be displaying their acoustic-based underwater robots which work as a "swarm" where many robots, sometimes numbering into the thousands, work together in synchronicity.

Many of the personnel from smaller marine tech companies believe their technologies will have very little effect on marine life. Some of the larger marine tech companies with military applications often have narratives that emphasise the benefits for humankind. Descriptions found on websites describe the early warning systems previously discussed, monitoring pollution levels in the oceans, security from drug smugglers and other illegal activity and port security.

Along with the ever increasing variety of underwater wireless technologies very little has been done to scientifically evaluate the effects on marine ecology. Most research of EMF effects is based on the effects it has on humans. In 2011 the International Agency for Research on Cancer (IARC) reported concern for Radio Frequency Radiation (RFR) frequencies emitted by mobile phones on young people. The IARC review reported a 10-fold vulnerable effect of RFR frequencies on the brains of children. The review also mentioned mitochondrial DNA damage and low sperm counts exhibited in males who kept mobile phones in their pockets.

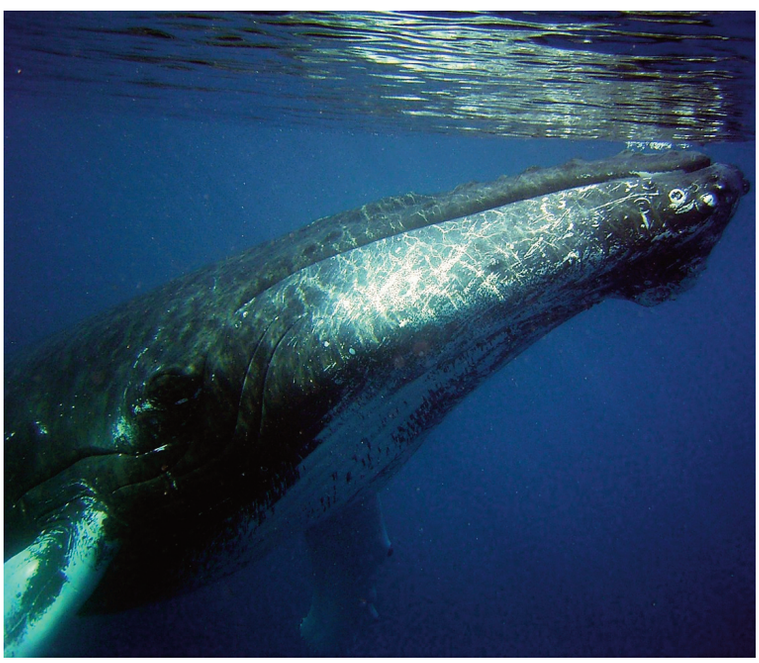
Further investigations show ionising radiation generates free radical oxidation as it passes through living tissues. These tissue interactions cause DNA damage which lead to mutagenic cells including cancer.

Further investigations show ionising radiation generates free radical oxidation as it passes through living tissues. These tissue interactions cause DNA damage which lead to mutagenic cells including cancer (Miller et al., 2019). The fact that EMFs are possibly carcinogenic according to the IARC should not be overlooked or interpreted with bias, and the opinions of clinicians should be given more weight than those of

industries in the establishment of safety policies for EMF use (Moon et al., 2020).

EMR Aware is a group of researchers that offers over 2,300 peer review research studies on the effects of electromagnetic radiation. Each study from their cloud archives associates one or more biological or psychological abnormalities with the types of EMR increasingly prevalent in our daily environment. (For more, see https://is.gd/bAGXsz.)

Current United Nations guidelines for protection of marine life only offer short-term solutions on noise restrictions which do not include all wireless frequency configurations. From a noise perspective, the new underwater communication modems are producing frequencies as powerful as 202 decibels, equivalent to 139 decibels on land. To understand how loud that is, a noise level above 85 decibels is considered potentially harmful to humans, and volume levels at heavy rock concerts are usually at around 120 decibels. It is still unclear how this will affect marine life including fish, octopuses, whales and especially dolphins that use an acoustic range of 7 kHz to 170 kHz.



In every case, commercial and military interests are being prioritised before the considerations of marine life. Wireless marine technology is developing much faster than the roll out of ocean environmental protection laws.

We now live in a world where corporations wield significant political power over the interests of the people. If they claim they are developing programs for the best interests of humanity and to keep us safe, some scepticism may be warranted.

The effect of wireless technology on marine ecology is a new field of research that drastically needs attention. More than marine life may be at stake.

About the Author:

Greg Fredericks has been practising naturopathic medicine since receiving a doctorate degree in 1987 and has worked with some of the world's leading biologists and scientists. He believes people can be empowered to take control of their own health and longevity if they are given the proper blueprint. He has contributed many articles to NEXUS Magazine in recent years on topics such as cannabis alchemy, the CMAH alien gene code, lectins, the microbiome, nagalase and cancer. He appeared at the 2014 NEXUS Conference and his books, *Alternative and Integrative Oncology* and *Darkfield Warriors* were reviewed in NEXUS 25/05 and 20/03 respectively. Fredericks is an executive board member of the Complementary Medicine Association of Australia (CMA) and a member of the American Naturopathic Medical Association (ANMA) and he presented at the ANMA Convention in Las Vegas Nevada in August 2019. For more information visit gregfredericksnaturopath.com.

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