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## **Proposal for a manned underwater habitat program**

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reason for this could be a move away from concentration on a single user sector; interdisciplinary and civilian users are now on the list of potential customers. Spectacular projects such as "Poseidon Resorts", "Hydropolis" or "Sea Orbiter" combine tourism and science and were very close to be realized. In Italy, several participants of a television show called "Progetto Abissi" lived in small habitats.

At the same time, new technologies for remotely operated vehicles (ROVs) are rapidly developed, reaching easily any depth and allow studies to be carried out without endangering human life. However, voices like the American aquanaut Dr. Sylvia Earle claim that "we have to maintain a human presence on the seafloor" (URL 3).

As an advantage of underwater habitats, the ability to accommodate divers from greater depths is repeatedly mentioned. The technique behind this is called "saturation excursion diving". It means that the no-decompression depth (the depth that does not require decompression stops during ascent; about 8m for dives from the water surface) increases with saturation depth (also called storage depth). At a saturation depth of 250m, the no-decompression depth is 294m, so divers could dive 44m deeper for several hours before returning to the habitat at 250m without decompression. But even at lower depths the effect shows up: at a storage depth of 20m, the no-decompression depth is about 33m, so divers could move almost indefinitely to 33m and return to the habitat without decompression stops. A diver from the surface, on the other hand, would have to ascend after a few minutes in order to avoid decompression duties or accidents. Living in a habitat on the seafloor instead, he would also have the opportunity to study his surroundings 24 hours a day. (Lettnin, 1998)

It has to be noted that after many decades of industrial, scientific and military exploration of the marine environment there is sufficient knowledge of the human physiology and the engineering aspects. Michael Schutte, naval architect of Poseidon Resorts summarized: "From the technical point of view building an sophisticated underwater station is not a problem at all."

### Method

CalamarPark.com, an international initiative for the development of a new generation of manned underwater habitats, has been working since 2006 on their potential applications. It is obvious that no single institution would be willing to build a habitat or rent an offshore deep-sea diving facility, for example, for the exploration of a historical wreck. So the question arose, how a habitat could serve various sectors to maintain its own funding. For this question, the following sectors were defined and surveyed:

- environmental protection
- underwater archaeology
- marine sciences/oceanography

- education
- advertisement
- entertainment
- tourism

### Result

The result of these surveys led to the concept of a mobile underwater habitat for use in the Mediterranean, which directly neighbours 21 countries and indirectly all countries of the European Union, each with its own programs in the above-mentioned 7 main sectors. Depending on the individual mission goal it could be used at different depths. The habitat would have the size of a standard freight container ("tank container") and would be easily transportable by land and sea.



Fig. 2: A standard freight tank container,(Chatama [GFDL (URL 1) or CC BY-SA 3.0 (URL 2).



Fig. 3: Artistic rendering of the CalamarPark mobile habitat (courtesy CalamarPark.com)

- Mission in Tunisia for the PR campaign for a new aquarium
- Mission in Spain for a television program and live chats to nationwide schools
- Research on an antique shipwreck in Greece
- Commitment in Turkey for the PR of an environmental protection program
- Use of the outer shell for the placement of a sponsor logo
- Mission in Morocco for a study program of fish stocks

- Mission in Italy as a temporary destination for recreational divers

It is intended that this mobile habitat will serve as a precursor and part of a larger, modular structure, permanently installed and providing large spaces for appropriate habitation. This habitat is to be extended with additional modules and can serve as the main base for other laboratories in the vicinity at various depths. It will be part of a seabed park that will be open to, assist

and promote external ventures to develop new habitat concepts and their components in order to explore new living environments. As for stations in the arctic, space or on the moon there are unforeseeable benefits of a seabed habitation. One of the greatest accomplishments will be the direct and personal message, that the marine environment is not a distant and abstract term, but a vital part of our planets integrity. This proposal is therefore nothing less than a call for the construction of an international space station for the seabed.

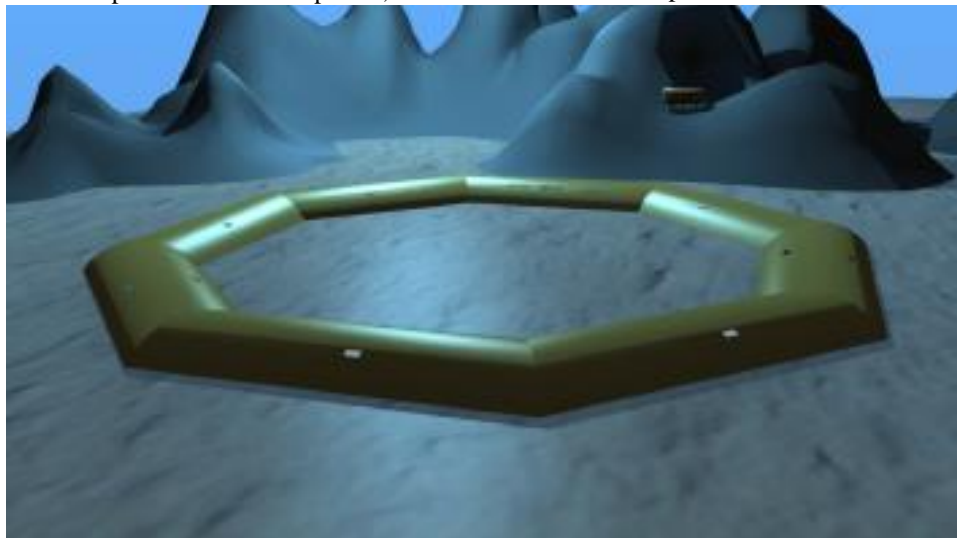


Fig. 4: A vision for an International Underwater Station (courtesy CalamarPark.com)

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