Computing Optimization for Design, Construction and Testing of Trawling Techniques

Technology within the fishing industry is advancing rapidly thanks to the introduction of new types of fibers, sensors for net control, etc. in this sector. Previous scientific projects for technology transfer developed under the supervision of Dr. Francesc Sardà PETRI 2 (1998-1999 (CICYTPETRI- 95-0236-OP) and PETRI 3 (2000-2003. PETRICICYT(PTR1995-0497-OP) have carried out research into the techniques used in trawling fishing. This has meant that science and technology are now actively involved in the development and modification of trawling techniques.

Fig. 3. Trawling Techniques

The Spanish fishing industry is less developed than elsewhere in Europe. The software available is unable to calculate, design, draw and simulate(in three dimensions and with movement), trawling techniques. This means that it is heavily dependent on computing systems and foreign organizations and their design software, In turn the national sector is slow to respond to the needs of the fishing industry and the the price of the final product is more expensive.

The introduction of suitable , modern computing systems is necessary if a quick, efficient and reliable design of trawling techniques is to be provided.. The objective of this project is to design, here in Spain the basic software required for trawling and the fishing sector in general.

3D Passive Acoustic Tracking of Cetaceans

Acoustic and physical interactions between human activities and coincident cetacean occurrence are becoming a major threat to marine mammal conservation. A case study in the Canary Islands highlighted the impact of shipping on the local sperm whale population. The use of active acoustic solutions (acoustic deterrents and active sonar) to prevent unfortunate encounters has shown to be either range-limited and intrusive or ineffective on cetaceans already highly tolerant to noise. An alternative solution based on passive detection, classification and localization has therefore been considered. Here, we introduce a time and cost effective minimal solution (in terms of software and hardware resources) to an automatic real-time 3D sperm whale localization.

The 3D localization is based on click arrival time-delays and the assumption that sound propagation can be modeled by straight rays, resolving both the azimuth and elevation on a short aperture tetrahedral array of passive sensors and the source distance from the time of arrival on a distant fourth hydrophone (wide aperture array). With this configuration, the 3D localization algorithm calculates the whale's position in the 3000m water column and at a 5km diameter range with a 200m maximum error distance. The system called WACS, Whale Anti-Collision System, further integrates the tracking of acoustically passive whales by a sperm whale click-based ambient noise imaging sonar. With an ambitious synthesis of many advanced acoustic technologies, the benefit is an efficient, non-intrusive system which can continuously3D track cetaceans in areas of interest.

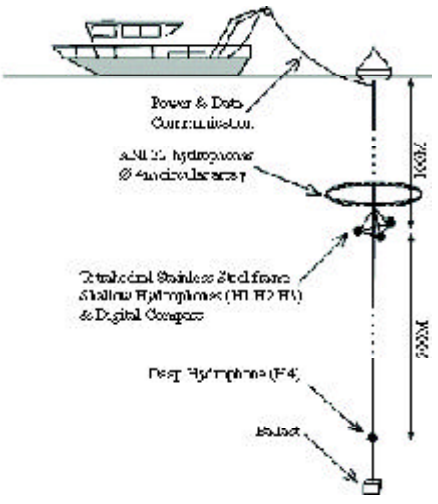

Fig 4.- Deployment of the WACS Technical Demostrator.