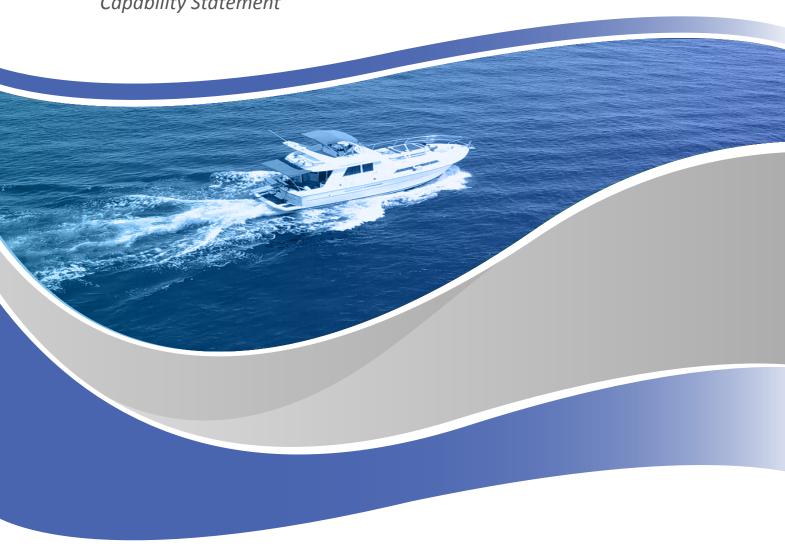


### **ABT Marine**

Capability Statement



Excellence through Innovation and Quality





#### **ABT Marine**

Capability Statement
Created by AquaBioTech Group
06 Nov 2017
vs. 2.0
© Copyright 2017

Who We Are	
Company Experience Profile	
Services	
Surveying Equipment	
Surveying Platforms	
Survey Vessels	
Laboratory and Analytical Capabilities	
National, EU and Global Research Initiatives	
Education and Training	
Internships	
Further Expansion	

**AquaBioTech Group** is an international aquaculture, fisheries and marine consultancy and engineering company with its headquarters strategically located in the centre of the Mediterranean, on the island of Malta, and with offices in five other countries. The location of **AquaBioTech Group** allows us to provide services to European partners, while keeping costs low. The network includes global clients in over fifty-five countries. Each department within the group has a specialised field of work, all related to aquatic sciences, engineering and technology. **AquaBioTech Group** is primarily involved in aquaculture, fisheries, environmental and other marine/oceanographic projects.

**ABT Marine** is part of **AquaBioTech Group**. As an independent marine hydrographic survey firm, we offer a broad range of capabilities in shallow water marine surveying, construction support, and precise positioning and project management within the marine industry. Our expertise covers a wide range of disciplines relating to marine data acquisition. Our key areas of expertise include:

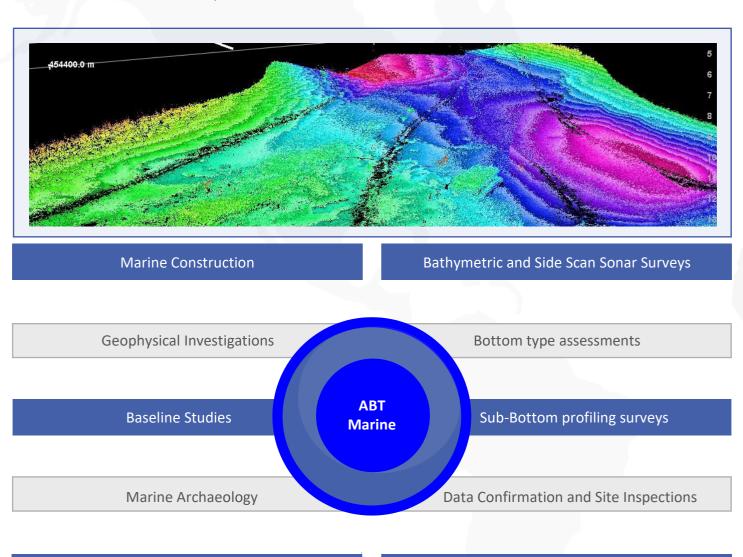
- Hydrographic and mooring surveys
- Hydrographic mapping and 3D modelling
- Seabed classification / ground discrimination surveys

Search and Rescue

- Subsea inspections (ROV camera systems)
- Side scan sonar, single and multibeam and interferometric sonar surveys

- Precise positioning
- Marine salvage surveys
- GIS and remote sensing data analysis
- Ground truthing surveys and sea bottom investigations

**Support Services** 



**ABT Marine** is established in the market and has undertaken assignments in the Mediterranean and Middle East. Projects undertaken include, but are not limited to:

- Marine Environmental Investigations at Grand Harbour, Malta
- Marine survey for proposed offshore cage fish farms
- Seabed classification and bathymetric profiling in Yemen, Indian Ocean
- Bathymetric surveys for the University of Maltain the NW coast of Ghawdex
- Offshore bathymetric mapping and classification for a potential wave-energy farm
- Coral mapping, seabed classification and bathymetric profiling in Saudi Arabia, Red Sea
- Marine bathymetric surveying of the entire coast of Malta, Environment & Planning Authority
- Sub-bottom profiling for CNR-ISMAR (Italy) for geo-morphological studies inti submarine landslides
- Sub-bottom profiling and bathymetry for Oil Tanking Malta as part of their land-reclamation studies
- Dredging support and bathymetry profiling for Transport Malta as part of their yearly Freeport surveys.

One of the largest assignments our company has undertaken in Malta related to the MEPA contract for the bathymetric mapping and grab-sampling of the entire Maltese coastline to one nautical mile or 300m depth. This competitive contract was awarded to our company as part of a consortium proposal whereby German partners performed terrestrial topographic LIDAR survey whilst our company undertook the marine surveys.

#### **FUTURE EXPANTIONS**

AquaBioTech Group is continuously obtaining new contracts, primarily but not limited to the growing aquaculture sector. Our offered services are being implemented in areas such as United Arab Emirates, East Africa and Kuwait. ABT Marine strives to offer additional services to complement AquaBioTech Group's diverse portfolio of products and services. Future expansions will include:

- Expand offshore testing capabilities
- Marine surveying courses (based in Malta)
- Risk assessments for fish cage installations
- Habitat modelling for fish restocking practices
- Pre and post fish cage installation survey inspections
- Assisting with marine survey department development in SMEs and research institutes



# AQUABIOTECH GROUP

#### AquaBioTech Group

Central Complex Naggar Street Targa Gap, Mosta MST 1761 MALTA G.C.

#### www.abtmarine.com

www.aquabt.com
www.abtinnovia.com
www.abtaquatics.com
www.aquacirc.com

#### **MARINE CONSTRUCTION**

By employing 3D bathymetric, side scan and sub-bottom profiling technologies accurate depth, sea-bottom and sub-bottom representations of a geographic area can be acquired in efficient time frames to assist in the planning of marine construction projects, dredging works or subsea installations.

# GEOPHYSICAL INVESTIGATIONS - SALVAGING OPERATIONS - DETECTION OF OBSTRUCTIONS

Side scan sonar is the industry-standard technology for detection of wreckages, obstructions and underwater objects. **ABT Marine** is capable of deploying its side scan sonar technology which features effective working depths down to 300 metres and very high image resolutions to aid in the detection of lost equipment, detached mooring structures, geological features and virtually any object laying on the seafloor.

The data acquisition techniques can vary, but they generally employ a combination of side scan sonar and sub-bottom profiling to detect features both on the seabed surface and below the seabed. 3D bathymetry can be used to discover undetected changes in the topography of the seafloor.

#### BASELINE STUDIES

General baseline and environmental risk data can be acquired using the whole range of **ABT Marine's** solutions. Marine charting, detection of objects, habitat mapping, seabed classification and oceanographic sampling techniques can be used to bring together an updated snapshot of a determined marine area.

#### MARINE ARCHAELOGY

**ABT Marine** has been involved in many marine archaeology projects for governments and universities throughout Europe. Our marine survey equipment and expertise can be used to localise wrecks as well as defining their dimensions, age, probable cargo and destination.

#### **SEARCH AND RESCUE**

Side Scan and ROV technology can be deployed for search and rescue purposes. Both technologies can be used to accurately locate wrecks or any kind of debris at the seafloor. The ROV can thereby work beyond the reach of work traditionally carried out by divers and replace them to increase work safety, operating depths and power while minimising costs.

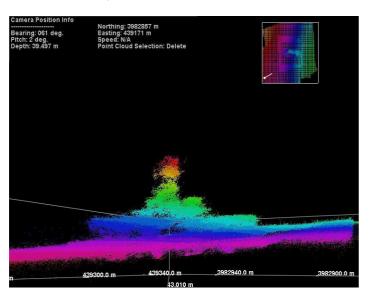


## BATHYMETRIC AND SIDE SCAN SONAR SURVEYS

**ABT Marine** is able to offer fully comprehensive seabed mapping composed of Bathymetric and Side Scan surveying, down to depths of 300 metres. Bathymetric data shows an accurate, colour-coded depiction of seabed elevation that can be presented in 2D or 3D according to the nature of works or requirements of the client. This technique is ideal when accurate depth profile information is necessary to support marine construction, aquaculture sea cages installations, environmental assessments, dredging works, wind farm locations selection and many other marine activities. Side Scan Sonar data provides a flat, monochromatic, picture-like representation of the surveyed area. Side Scan data alone does not represent bathymetry (depth), but its image resolution makes it ideal for detailed examinations of the seabed where obstructions, wreckages, debris, boulders, cables, habitats or any other feature must be identified.

#### BOTTOM TYPE ASSESSMENTCS

In addition to seabed mapping, **ABT Marine** can provide ground discrimination/benthic mapping. Our technology can be applied to provide accurate, geographically referenced data on the characteristics of the benthos. This technology can be used as a standalone application or in conjunction with bathymetric/side scan surveys.



#### SUB-BOTTOM PROFILING SURVEYS

When sub-bottom information is required, powerful low frequency echo-sounding devices can be used to obtain information of the upper layers of the ocean bottom, down to 40 metres.

#### SUPPORT SERVICES

In addition to our hydrographic services, **ABT Marine** offers a range of solutions to complement data acquisition activities. Data post processing, data quality control and GIS modelling can be performed in-house while ground truthing surveys including precise positioning, in-situ sampling and SCUBA/ROV investigations can be used to confirm previously acquired data in the field.



#### **Marine Service Areas**

- Seabed bathymetric services
- Marine construction support
- Sediment classification sampling
- Baseline environmental monitoring
- Aquaculture site pre-installation surveys

#### **WATER AND SEDIMENT QUALITY STUDIES**

**ABT Marine** provides analysis services of seawater and freshwater for physical and chemical quality including biotic and abiotic parameters such as temperature, salinity, density, dissolved oxygen, pH, turbidity, color, Secchi transparency, nitrites, nitrates, phosphates and sulfides. These main quality parameters can affect certain human activities such as aquaculture development including site selection studies, using spectrophotometry. Additionally, sediment analysis including granulometry and pollution can be conducted.

#### LAGOON STUDIES

Lagoons are special and sensitive coastal ecosystems. They serve as wintering areas of migratory species (mainly birds) and nesting areas of protected species. At the same time, most of these water bodies are exploited for fisheries and aquaculture and they receive strong pressure from other economic activities such as agriculture and livestock (pollution from chemicals and by-products), uncontrolled tourism, illegal hunting and more. Lagoons also offer important ecosystem services that need to be preserved and enhanced such as carbon sequestration, protection from flooding and storms and biodiversity. Services offered include lagoon management plans, lagoon engineering, water and sediment quality analysis, and telemetry applications for online and real time monitoring.

#### MARINE SPATIAL PLANNING AND MSFD

Services include the study of the effects of spatial planning and Marine Strategy Framework Directive (MSFD) on coastal and marine economic activities and their conflicts as well as the quantification of negative externalities of economic activities (coastal and marine) as the result of the application of MSFD policies at the national and regional (Mediterranean) levels. **AquaBioTech Group** offers its collaboration in projects which focus on the collection and measurement of raw data required for the national MSFD reporting and establishment of GES.

# STAKEHOLDER MANAGEMENT AND PARTICIPATION

Stakeholder assessment and identification per project requirement and needs. Stakeholder surveys using structured questionnaires and statistical stratification techniques. Stakeholder categorization and stakeholder expectation assessment using CHAIN analysis. Stakeholder participation methodology applications and organisation of workshops and roundtables.

#### MARINE LITTER SURVEYS

Study of the distribution and quantification of main litter categories at the seafloor, through commercial fishing activities using trawls, at the coast, by visual analysis of plots, and in the water column, by special towed net samplers.





# INTEGRATED COASTAL ZONE MANAGEMENT STUDIES

Holistic management studies of the human economic activities, which compete for space and resources along the coastal zone including fisheries, aquaculture, tourism, industry, primary land production (agriculture, livestock), urbanisation and protected areas and ecosystems. Identification and quantification of ecosystem services as coastal exploited resources and their preservation and conservation in favour of the local inhabitants and their economic activities. Conflict management and resolution studies between coastal human activities including coastal engineering and site selection of activities. Establishment, study and management of Marine and Freshwater Coastal Protected Areas. Data collection and estimation of integrated coastal zone management indicators based on the DEDUCE and PEGASO factsheets with knowledge on more than 300 indicators that have been proposed until today. Analysis of natural phenomena and the effects of climate change on the coast and the coastal economic activities.

# The new Common Fisheries Policy: sustainability in depth | Property | Proper

#### COMMON FISHERY POLICY STUDIES

Participation in CFP supporting LOT contracts. Effects of CFP policies and resulting regulations on the national and regional (Mediterranean) commercial and sport fisheries, aquaculture and processing sectors. Effects of national policies and legislation on the fisheries and aquaculture sectors. Topics include fisheries and aquaculture production, aquaculture site selection, fishery product processing quality, consumer product quality and fishing fleet management. In addition, the services offered include conflict studied and resolution among fishing fleet and métier segments, conflicts between commercial and sport fishermen and conflicts between commercial fisheries and aquaculture.





#### SWATHplus

The SWATHplus is a sonar system for surveying underwater surfaces, providing high-density bathymetric data and seafloor imagery. The SWATHplus sonar system produces 3D digital terrain models and side scan imagery. Being IHO-S44 capable, this interferometric sonar comes with dual 117 KHz transducers that offer a depth range of 300 metres and maximum horizontal ranges of 600 metres depending on depth and weather conditions. The system works in real time with its own post-processing software to output bathymetry, reflectivity files, plot files, processed files and semi-raw files in a number of industry standard formats compatible with mainstream GIS and hydrographic software applications.

#### ROXANN GROUND DISCRIMINATION SYSTEM

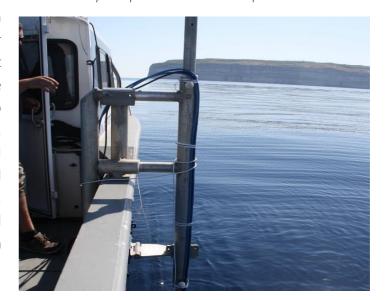
The RoxAnn GDx Ground Discrimination System is a remote acoustic sounder that can be used to develop sediment classifications and bathymetry of the sea floor. The single beam transducer operates in the range of 50-200 kHz at a rate of one cycle per second and can be used in depths of one to 200 meters. The transducer for the RoxAnn system generates sound waves that come into contact with the seafloor, and the way these sound waves, or echoes, are reflected are utilised to classify various bottom types (e.g., sandy vs. muddy). The properties (e.g., amplitude & shape) of a sound wave reflected from the seafloor are determined mainly by the roughness and hardness of the bottom, the change in acoustic impedance between water and sea floor materials, and how sound reverberates within materials at the water/sea floor.

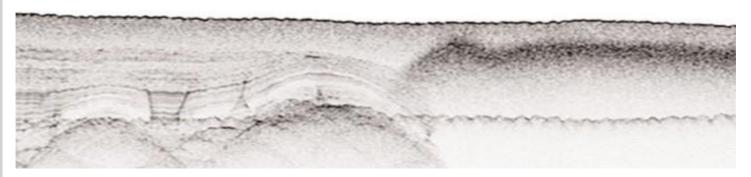
#### SHIPMOTION SMC-108

Pitch, heave and roll corrections will be achieved using a motion sensor installed at the sonar head. Heading corrections are achieved by using a vessel-mounted magnetic compass, which is calibrated prior to surveying operations.

#### **EDGETECH 3100**

Sub-bottom profiling systems identify and measure various marine sediment layers that exist below the sediment/water interface. These acoustic systems use a technique that is similar to single beam echo sounders. Sub-bottom profiling systems can be useful for characterising benthic habitats since they provide information about sub-surface sediment structure. No other acoustic technique provides this type of information and only physical sampling via drilled cores will allow for characterisation of subsurface structures. Under proper conditions, a sub-bottom profiler can read down to 300 metres below the seabed, which is considerably deeper than cores can penetrate.





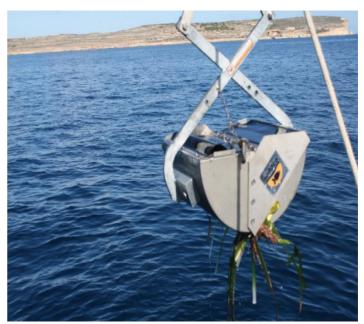
#### VALEPORT MINI SVP

Sound velocity compensation data can be acquired using a Valeport Mini SV sound velocity profiler. Considered as being the world's most accurate sound velocity probe, the Rapid SV probe operates with an almost instantaneous response time providing the highest quality sound profiles.



#### VAN VEEN PONAR SEDIMENT GRAB

For the benthic sampling a Van Veen type self-triggering sampler uses a spring-loaded pin which releases when the grab makes impact with the seabed. The sampler can take clean fragments with minimal lateral losses and is ideally suited for the any substrate area. The stainless steel SS316 construction ensures that proper cleaning can be performed on the grab prior to each sampling. Once the samples have been collected, they can be sieved to identify species and size of benthic fauna and to determine the sediment grain size distribution of the seabed.





**ABT Marine** has a number of marine survey/research vessels available enabling us to cover all types of shallow-water and offshore surveys. All of our vessels are capable of good cruising speeds for rapid deployment and economical survey speeds for good fuel efficiency. Accommodation is available on one of the offshore vessels as well as all the necessary gear for deployment and recovery of sensing equipment. A work area at the stern provides space for easy deployment of all types of equipment and direct access to the interior where the topside units and laptops are located.

#### **Suitable Uses of the Vessels**

- Swath surveys
- Magnetometer investigations
- Hydrographic survey support
- Metocean equipment deployment
- ROV inspections (recoveries, filming)
- Environmental studies (trawling, benthic)
- Geophysical surveys (pinger, boomer, SPB)

- Resource recovery
- Positioning services
- Seabed classification
- Bathymetric mapping
- Sidescan sonar surveys
- Marine heritage / Archaeological services

#### DEEP TREKKER ROV

**AquaBioTech Group** houses a Deep Trekker ROV, which allows our qualified staff to perform various underwater observations at ease. The Deep Trekker ROV can be used in a variety of sectors including aquaculture monitoring and net inspections, marine biodiversity and salvage surveys, and water and sediment sample collection. The ROV is fitted with 330° range of view camera, auxiliary lighting, a two-function grabber arm and four vector thrusters to enhance lateral movement. The unit is connected to a topside hand-held control module. This system is very portable and has a small footprint, making it easy to mobilise and incorporate into any project if needed.





#### CHARACTERISTICS

#### PRINCIPAL FEATURES:

Vessel Type: Rigid Inflatable Boat

Length Overall: 7.3 m

Vessel use: Survey / Research / Supply

#### **NAVIGATIONAL EQUIPMENT:**

Furuno colour echo sounder Garmin GPS with integrated AIS

#### **REGISTRATION:**

Port of Registry: Valetta, Malta

Official Number: 9307

Gross: 2.67 tons

Built: 2004

#### ACCOMODATION:

Passengers: 5

Crew: 1



#### CHARACTERISTICS

#### PRINCIPAL FEATURES:

Vessel Type: Glass Fiber Length Overall: 11m

Vessel use: Survey / Research / Supply

#### **NAVIGATIONAL EQUIPMENT:**

Simrad radar

Robertson Autopilot

Furuno colour echo sounder Garmin GPS with integrated AIS

#### **REGISTRATION:**

Port of Registry: Valetta, Malta

Official Number:11682

Gross: 14.11 tons

Built: 2001

#### ACCOMODATION:

Berths: 5

Seating Capability: 12

#### INTERNAL ANALYSIS AND PRACTICES

- General biometry
- Examination via gross necropsy
- Optical microscopy
- Histology
- Microbiology
- Taxonomy
- Digital Imaging
- Vaccine residue
- Elastomer and PITs
- Tagging
- Spielberg test
- Physiological / Biochemical parameters

# WITH PARTNER LABORATORIES AND RESEARCH CENTRES

- Respiratory burst
- Heat Shock Proteins
- RT PCR
- ELISA
- Viral isolation and cell culture
- Enzymatic activity at tissue level
- Proximate composition of whole body or target organs
- Protein expression in specific tissue
- mRNA expression in specific tissue
- Sediment analysis
- HPLC
- Off flavouring geosmin / MIB







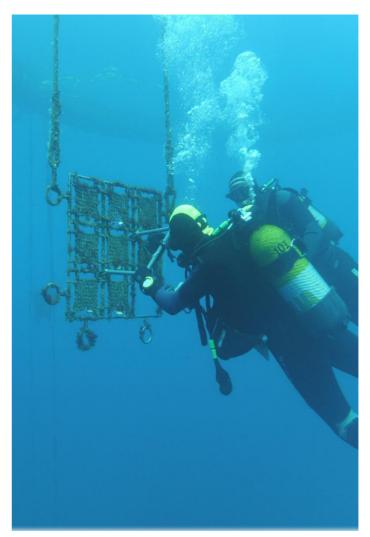


**AquaBioTech Group** is actively involved in research and academic activities at both National and European level, either in collaboration with local universities and public bodies or as part of larger consortia which takes part in Europe's main research schemes.

**Malta:** Collaboration with the University of Malta performing oceanographic work such as ROV surveys, seabed mapping and sampling work.

**EU:** Active involvement in collaborative research projects and other initiatives. Currently, **AquaBioTech Group** is actively involved in 4 running Horizon 2020 projects whilst many more have been completed.

International: AquaBioTech Group collaborates at an international level with various stakeholders under the MarTERA, PRIMA Initiative (ERA-NETs), JPI Ocean, Eureka-Eurostars Programme and other initiatives focusing on research, business and technology cooperation.







As part of its sustained commitment to increase training and educational opportunities in themes related to marine biology and ecology, **AquaBioTech Group** offers a number of short, intensive, hands-on courses in marine sciences.

#### MARINE BIOLOGY COURSE

A stimulating three (3) day course organised by **AquaBioTech Group** in Malta, including lectures on marine biology, the underwater life and the formation of the Mediterranean Sea led by Prof. Alan Deidun. SCUBA diving and snorkelling sessions with PADI certified instructors and marine biologists are also part of this course.



#### **ANTIFOULING TRAINING COURSE**

AquaBioTech Group organised a training course on antifouling testing and aquaculture consisting of both practical and theoretical elements. Lectures were given on the fundamentals of antifouling testing (mechanisms of common biocides, antifouling testing models, major marine habitats, etc.) and aquaculture (general overview, obstacles, biofouling in aquaculture, recent trends, etc.). Practical antifouling tests were executed in AquaBioTech Group's laboratories on anti-macrofouling bioassays, chlorophyll analysis via spectrophotometry and biomass determination. Participants were able to visit AquaBioTech Group's field test sites and perform semi-quantitative assessment of fouling communities on coatings for the shipping and aquaculture industry.



#### MARINE SURVEYING INTRODUCTORY COURSE

AquaBioTech Group hosts an interactive 4-day course which offers an introduction to marine surveying and the various tasks involved. The course is comprised of classroom theory and in-field equipment deployment experiences to offer the best hands-on experience. During the classroom sessions, the students will learn about the various sectors of marine surveying, ranging from habitat mapping and offshore constructions to coastal geological surveys. The field component will incorporate the applications of marine surveying used in Malta's marine environment.



The facilities at **AquaBioTech Group** offer a unique experience for undergraduates and post-graduate students to gain valuable exposure to the aquaculture and aquatic research industry. **AquaBioTech Group** encourages such prospects to undertake training sessions to advance their practical and hands-on skills. Many of the past students that have undertaken placements within the various companies of the Group have linked their training to EU or state funded training sessions.

**AquaBioTech Group** offers placements ranging from 3 to 12 months within the four entities:

**ABT Innovia** offers research services to support the development of vaccines, functional feeds, alternative protein sources, culture technologies and production techniques with a wide range of commercially important species under any combination of culture conditions in our fully licensed and bio-secure R&D facilities.

**ABT Aquaculture** has developed a number of highly efficient and cost-effective Recirculating Aquaculture Systems (RAS). These can be applied to hatcheries, broodstock, aquatic research and on-growing operations. Our highly sustainable approach incorporates aquaponics and hydroponic systems. We constantly strive to be at the forefront of our industry by testing and developing innovative technologies.

**ABT Marine** provides a range of services including marine surveying, construction support and mapping/GIS. The techniques we employ include bathymetric and side scan sonar surveys, bottom type assessments, sub- bottom assessments, data confirmation and site inspections using both remote sensing and underwater video techniques.

**ABT Aquatics** main areas of undertaken work range from initial feasibility studies, outline planning with concept development, architectural & structural design with engineering, filtration and Life Support System (LSS) development, through to livestock supply, management support and turnkey operations.







AquaBioTech Group provides ample opportunity for students and trainees to develop skills and know-how in the various fields of activity in which it operates: fish rearing, aquaculture engineering, water chemistry, fish health and nutrition, toxicology, marketing, project management, business development, etc.

We have been receiving an increasing number of trainees over the years, coming from all over the

world and contributing to and enriching our international dimension. We are familiar with the EU framework and the Erasmus+ program and are ready to provide the necessary help regarding the administrative and scholarship requirements.

We look forward to welcoming all applicants that wish to enhance their CV with a new, significant and professional experience for a duration of between 3-12 months.



Camilla De Gitz

Denmark



Noemi Cubo *Spain* 



Sam Clough England



Monika Šatková Slovakia



Alejandra Gimeno *Spain* 



Gourav Kumar Thazhathillath India



Karl Peebo Estonia



Elena Zarnier Italy

Canada
USA
Mexico
Columbia
Venezuela
Costa Rica
Brazil
Portugal

Norway
UK
Ireland
Germany
The Netherlands
France
Italy
Spain

Russia
Poland
Hungary
Slovenia
Moldova
Bulgaria
Turkey
Vietnam

Greece
Malta
Morocco
Egypt
Lebanon
Saudi Arabia
Nigeria
Zimbabwe

We believe our first responsibility is to our clients who utilise our products and unique professional services. Meeting their needs and demands is our primary goal, this strives us to carry out every task with the upmost of quality to the highest standard.

We constantly strive to reduce our costs in order to maintain reasonable prices, as this will enable our clients to obtain the best value for their money from our services. Our customer's demands and problems are of the highest importance to us and are serviced promptly and accurately.

Experimentation with new ideas, developments, concepts and research are a continual process at **AquaBioTech Group**, and innovative programs are constantly developed with new services and technologies offered.

In accordance with our mission statement, in July 2015 we started the third phase of our expansion and it is expected that a number of new wet labs and facilities will be available by the end of 2016 in order to satisfy the growing sectoral demand. These facilities will include additional quarantine and stock fish rooms and additional RAS facilities for fish nutrition and challenge trials.

The company has also recently expanded its licensed offshore marine experimental site area which is used for applied research and testing for a range of actions including the testing of anti-fouling materials, water quality monitoring equipment and other oceanographic instrumentation / research activities.

"Quality is the customer coming back – not just the service"



#### Address

Central Complex, Naggar Street, Targa Gap, Mosta MST 1761, MALTA G.C.

**Telephone** +356 2258 4100

**E-mail** info@aquabt.com

#### Website

www.aquabt.com www.abtinnovia.com www.abtmarine.com www.abtaquatics.com www.aquacirc.com

