Wet, Wet, Wet...

Spatial Environmental Monitoring as a Tool to assess Environmental Security

Malta, by way of its Environment and Planning Agency, the University of Malta, the Malta Resources Authority, the National Statistics Office and the Environmental Health Directorate, is currently implementing a €4.6 million project. This involves the monitoring of five environmental themes - air, water, soil, radiation and noise. These studies are being carried out in conjunction with the implementation of 3D terrestrial and bathymetric surveys. This project is co-financed by the European Regional Development Fund, which provides 85% of the project's funding and the Government of Malta, which finances the rest under Operational Programme 1 - Cohesion Policy 2007-2013 - Investing in Competitiveness for a Better Quality of Life.

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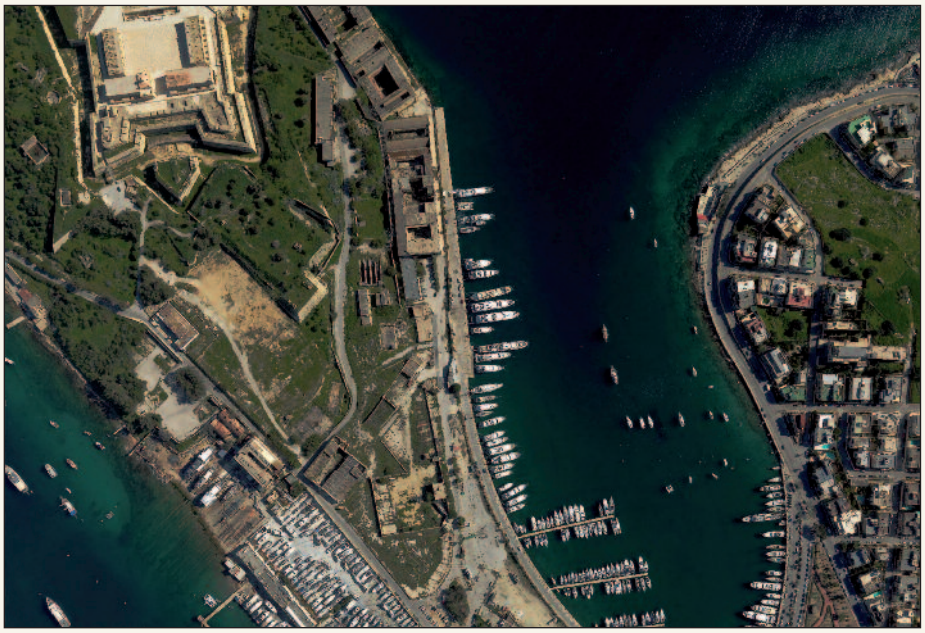

Orthoimage

In 2013, Malta initiated its second phase of GI-employment for spatial data enhancement in the physical, social and natural environments. This was made possible through the acquisition of a comprehensive set of data which will serve as a basis for cross-thematic research. This is further being facilitated through the creation of fundamental datasets which will bring Maltese terrestrial and bathymetric baseline free information to the public domain. Besides enabling Malta to achieve compliance with most EU environmental monitoring requirements, such an integrated and coherent approach for environmental data monitoring will provide improved tools and knowledge for effective environmental protection action and environmental policies. Since the state of the environment is intrinsically linked to the effect on human security and health, such environmental monitoring will be crucial to understanding the causalities and the effect of human activities on environmental security and health. This process entailed the amalgamation of the spatial and environmental practices together with the impacts on security and health realities and resulted in a better understanding of green criminology and development's impacts of human health.

Malta's target to acquire LIDAR scans, as well as a full bathymetric survey, is being carried out for all the Maltese terrestrial areas and the coastal waters. Whilst various terrestrial exercises were carried out for development planning and environmental protection purposes, various bathymetric surveys were carried out for specific projects and research work. The latter, however, were ad hoc and highly localized with occasional attempts at a strategic methodology.

Mapping the terrestrial and seabed topography has various applications. It will provide a base map from which various environmental studies can be carried out. These include studies as required by the Corine Landcover

Initiative, the Water Framework Directive and the Marine Strategy Framework Directive who are endeavouring to protect the territorial landmass and the marine environment in a more effective way and subsequently influence the health of the region's population. It will also serve as a tool for the impact analysis of development planning, pollution and chemical prediction modelling, climate change monitoring as well as render recognition of features. It will also serve to aid enforcement officers in analysing the trends in security breaches and illegal development as well as plan for potential health hazards. This is especially true due to a lack of high quality 3D spatial data. It was, therefore, felt necessary to commission such a project whereby researchers can study the changes in environmental structures and the resultant impacts on human security and health.

In addition, it will allow thematic experts to study, monitor, analyse and protect those areas which are vulnerable to degradation and exposure. Spin-offs from the results include updated nautical charts, viewshed analysis and cross-thematic studies in the physical, social and environmental domains.

Having been structured around a number of international directives, the project will ensure the free delivery of all data to the general public. This is the result of an integrated exercise to adhere to the requirements as outlined by the Commission's Communication COM (2008) 46 Final "Towards a Shared Environmental Information System", the INSPIRE Directive (Directive 2007/2/EC) and the Aarhus Convention.

All data from this project will be made viewable and disseminated through a web portal, currently being designed, known as a Shared Environmental Information System (SEIS). This will be launched towards the end of the project in June 2013.

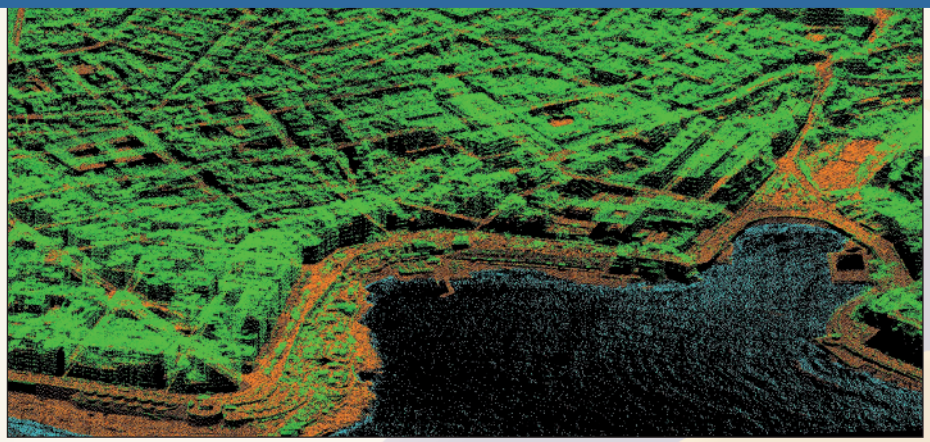

Figure 2: Lidar image depicting the Sliema seafront in Malta

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Bios:

Saviour Formosa is a Senior Lecturer at the University of Malta. His main area of research is in spatio-temporal analysis of crime and its social and physical relationships using spatial information systems. His main expertise lies in the implementation of cross-thematic approaches and uses to the data cycle and management with emphasis in on the thematic and spatial data structures, visualisation, modelling, web-mapping, analysis and dataflow management and reporting. He has led projects on Aarhus, INSPIRE, ERDF, ISEC, ESPON and serves as the contact point for various international fora.

Dr. Formosa has a Ph.D. in spatio-temporal environmental criminology (University of Huddersfield 2007), having acquired an MSc in GIS (University of Huddersfield 2000) and a BA (Hons) in sociology (University of Malta, 1994).

Janice Formosa Pace is a visiting lecturer at the University of Malta. Her main area of research is in the transmission of crime across the generations with emphasis on the period between 1950 and 2010 in the Maltese Islands. She is a council member of the Malta Union of Teachers. Ms. Formosa Pace is also a Member of the Malta Criminology Association. She provides expertise for the www.crimemalta.com website.

Janice Formosa Pace is a Ph.D. Candidate in intergenerational transmission of crime from the University of Huddersfield, having acquired an MSc in forensic and legal psychology (University of Leicester 2003), a B.Psych (University of Malta, 1995) and a Diploma in Probation Services (University of Malta, 1996).

Ashley Farrugia is a senior information resources officer at the Malta Environment and Planning Authority. She is currently project leader of the ERDF project - Developing national environmental monitoring infrastructure and capacity. Ms. Farrugia holds an MSc in Geographical Information Systems (Manchester Metropolitan University, U.K.).

First accredited hydrographers graduate in Antwerp and Ghent

Hydrography made in Belgium

Nautical charts for mariners, tidal predictions, changes in navigational areas: the data collected in the world's oceans and seas have many applications which are indispensable to merchant marine, offshore, dredging and underwater projects. This vast area of responsibility falls under the umbrella of hydrographers, who are experts in a field which is of great importance to modern society. This illustrates the significance of providing good education in this field.

By Micha Libert

The Institute for Hydrography

The Hydrography B programme is the first of its kind in Belgium. The Institute for Hydrography (IVH) is a special unit which has been created within the Antwerp Maritime Academy to facilitate its organisation. The collaboration between the Antwerp Maritime Academy and Ghent University has resulted in a unique concentration of combined knowledge and experience, which has enabled it to become one of the leading institutes of hydrography.

FIG commission 4 delegate for Belgium, Axel Annaert, conveying his knowledge during practical sessions.

The Hydrography B programme is built on a solid theoretical framework, complemented by practical, hands-on experience. For the integrated fieldwork and fieldwork-related aspects, the IVH relies on its partners in governmental organisations and the industry: the Agency of Maritime and Coastal Services (MDK), Flanders Hydraulics Research, DEME, Eurosense, GEO.xyz, G-tec, and Jan De Nul.

Fieldwork with the University of Ghent.

The programme

The Hydrography B postgraduate programme is accredited by the International Hydrographic Organization (IHO) as a Category B programme. The programme is organised on a modular basis. There are 4 theoretical modules, each lasting three weeks, with lectures taking place in Antwerp and Ghent. The modules are alternated with fieldwork periods. During this time students have the opportunity to participate in fieldwork in one of the collaborating industries or organisations. The programme has a minimum duration of one year. After two theory modules, in January and June, examinations take place. Around May there is an integrated fieldwork period organised by the Institute for Hydrography. With an internationally recognized category B certificate, the hydrographer can independently carry out parts of the survey process and specialize in a certain discipline, such as multi beam echo sounder or data processing.

Accessibility

The programme allows flexibility and accessibility for students and active hydrographers alike. The alternation of theory and fieldwork allows the students to expand their knowledge as well as practise and absorb this theory during fieldwork. There is an additional advantage: people working in the hydrographic sector can undertake the programme with greater ease, as their project-based work schedule means they can alternate work and class modules. Through a selection committee, exemptions can be given to those who have already studied similar courses or have relevant experience in the sector. This arrangement allows for a considerable shortening of the programme. All courses are lectured in English to enhance the international character of the programme.

Prospects

In September, when this article will be in print, the first accredited hydrographers of the Hydrography B postgraduate programme will be graduating in Antwerp. Hydrographers often used to receive in-house training in their company. This proved to be expensive and time-consuming and had the additional problem that the hydrographers were not certified. The Hydrography B programme offers the opportunity to students, junior and senior hydrographers to get qualitative training and obtain this certificate. By educating skilled people, sea and subsea activities will become better and safer.

Hydrography B in short:

Title Postgraduate Hydrography
Study Modular
Duration min. 1 year
Start date End of September, annually
Accreditation IHO-Cat. B

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