

## NEW INNOVATIONS IN MARINE SCIENCE AND TECHNOLOGY: EMERGING TECHNOLOGIES... CONVERGING ON THE OCEANS

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The global ocean is critical to the Earth's ecosystem function, central to our continued well-being and to the future prosperity and survival of the human race. The seas and oceans are the heart and lungs of the planet; they represent important trade routes; are a climate regulator and a source of food, energy and recreation. The seas and oceans also face serious threats in terms of over-fishing, loss of biodiversity, climate change impacts and unsustainable exploitation.

Knowledge and understanding is the key to sustainable development and good ocean governance. New knowledge and technologies are emerging daily in all fields of science that facilitate a better understanding of the world in which we live and work. We now have a unique opportunity to harness emerging knowledge and technology from a broad range of sectors and apply it to the seas and oceans – what we term '*emerging technologies... converging on the oceans*'.

New developments, in particular from the Life Science (e.g. eco-genomics, smart sensors), Information & Communications Technology (e.g. cloud/grid computing, digital imaging, etc.) and NanoScience (e.g. miniaturisation, new synthetic materials, etc.) sectors provide an array of possibilities and new innovative tools that can be used to add value to traditional marine sectors, such as in seafood, fisheries and aquaculture, maritime safety and transport, marine leisure and tourism, and can catalyse the creation of new sustainable ocean industries in renewable ocean energy, blue biotechnology and in environmental protection, monitoring and assessment. They can and are also being used in deep-sea exploration, environmental monitoring, climate impact research and are providing solutions to climate change, informing potential mitigation and adaptation strategies.

Incorporating such innovative tools in our marine arsenal, we can begin to realise aims and objectives of the Integrated Maritime Policy, the Marine Strategy Framework Directive (MSFD) and the Europe 2020 Strategy and consolidate Europe's role in global ocean developments and governance.

This presentation will illustrate some of the new and exciting innovations in marine science and technology, borrowed from other disciplines, and emphasise the need to look across scientific disciplines to find new tools to address current marine challenges and opportunities.