

Science, Models and Reality – Where are we at with MPR's?

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Abstract

Since the first published article on 'Artificial Surfing Reefs' by Dr. Richard Grigg in Surfer Magazine in 1969, postulation has become reality. However, how does the reality of Multi-purpose Reefs (MPR's) relate to what was envisaged in 1969, or the growing volume of scientific understanding and investigations using hydrodynamic numerical and physical models? With several MPR's (although often termed M-ASR's, multi-purpose artificial surfing reefs, due to their primary goal of creating new surfing breaks) now constructed, or in construction world-wide, we can now compare the findings of the science and the results numerical and physical modeling with monitoring and observational data that has been collected from actual projects. A confounding factor associated with the surfing aspects of M-ASR's is the media-hype, rumour, speculation and often unrealistic expectations associated with these type of projects that invariably have high public profiles. However, objective comparison of the theory, the modeling and the application strongly indicate that there is a sufficient knowledge base (both scientifically and within the construction process) and model validation to design surfing breaks to pre-defined parameters. Here, we consider the knowledge-base for MPR design, the application and the results and lessons learnt from projects in the water that are shaping the future directions of MPR design and application.



(a) a wave breaking over a laboratory model of the Boscombe Reef and (b) a wave breaking over the nearly completed reef.

Dr. Shaw Mead

Shaw Mead is currently an environmental scientist and Managing Director at ASR Ltd, which is a marine consulting and research organization based at one of New Zealand's premier surfing locations, Raglan, where research and pleasure

come together daily. Dr. Mead's background in coastal oceanography and marine ecology, specialising in hydrodynamic numerical modelling, coastal processes, offshore submerged reefs, coastal protection and amenity enhancement, and ecological assessment, allows him to effectively bridge the multi-disciplinary gap between physical processes and marine ecological impacts. His PhD thesis in physical oceanography is based on a series of peer-reviewed papers that together with more than 30 popular articles, have presented novel techniques to record the shape of surfing reefs, specify the breaking tube condition and to break-down surfing reefs into their morphological components using numerical modelling. Shaw's research and consulting have led to advances in our knowledge of offshore reefs for the development of multiple-use structures (coastal protection, amenities such as surfing, wind-surfing, diving, fishing, and ecological enhancement), and have incorporated numerical modelling of waves, currents and sediment transport to develop the designs and assess the impacts of coastal structures over a large range of spatial and temporal scales.



At work and play, Indicators, Raglan