



The result of processing of 60.8m<sup>2</sup> of reef at Ile Diamant, Peros Banhos on 10<sup>th</sup> March 2006 centred on the position 05°14.77'S 71°46.13'E, with source and stereoscopic (red/cyan) inserts indicating the available resolution of the image.

### ***High Definition Imaging as a reef monitoring Tool***

During the 2006 expedition, five sites around the Chagos Archipelago were surveyed using a newly developed structured radial video sampling method. The sites sampled were Ile Anglaise and Ile du Sel on the Salomon atoll, Ile Diamant and Ile de Passe on the Peros Banhos atoll and to the west of Egmont atoll.

Survey of the sites involved deployment of a rotational framework 5m in diameter by which rings of video were acquired, at stepped radial distances of 0.2m and encompassing a total area of 60.8m<sup>2</sup> of reef. The practical equipment and methodology were developed to allow solo operation by the author within the practical restrictions of single-visit one hour dives.

21 rings were sampled within the dive-time; a radius of 4.2m. In the subsequent processing the data were divided into 75 or 85 angularly stepped arms, established contextually upon the 21<sup>st</sup> ring. Consequently, after lens correction for each site, 1575 or 1785 frames were manually chosen by lateral alignment along each arm, these were then extracted and edge-blended. The images are at an average resolution (depending on depth) of 1.8mm per pixel. The radial pixel separation applied within each arm, corresponding to a real world separation of 0.2m, was chosen corresponding to alignment in the plane 1m from the camera arm. Such assignment is arbitrary but practical and uniform across the 5 data-sets. Objects nearer the camera than this plane suffer some spatial compression, and those further away suffer some ghost-like replication. These are artefacts of the process, but consequently allow for the distance from the camera, and thus the topology of the site, to be calculated. Similar processing also allows for the creation of stereoscopic representations of the data to be created, as illustrated in the image above.

Such structured, high resolution, three dimensional recording of a large area of reef benthos allows for new understanding and appreciation of the complex spatial relationships within the uniquely unspoilt ecological systems of the Chagos coral reefs; in addition to the interpretative and educational value of the images when printed at near life-size. Such systems are delicate and easily disrupted by anthropogenic impacts. The image shown above illustrates a complex and relatively healthy reef ecosystem. This imaging process is another tool which can be used in monitoring this unique area.

The **Chagos Conservation Trust** is a charity (Registered in the UK No. 1031561), whose aims are to promote conservation, scientific and historical research, and to advance education concerning the archipelago. The Trust is a non political association.

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