RGS-IBG Field Research Programmes

Royal Geographical Society

with IBG

Advancing geography and geographical learning

- Shoals Capricorn Programme
- Western Indian Ocean
- 1998-2001

A marine science research and education programme to investigate the remote Mascerene Plateau in the western Indian Ocean, and develop knowledge and skills for the management and protection of its resources.

Organised by the Royal Geographical Society (with The Institute of British Geographers) In collaboration with The Royal Society and the Governments of Seychelles and Mauritius.

Patron: HRH Prince Michael of Kent Field Director: Juliet Burnett

The overall aim of the *Shoals* Programme was to conduct an investigative, multi-disciplinary study of the marine environment of the Mascarene Plateau, ensuring that the research was of value to the host nations. Alongside this research aim, it was agreed that of equal importance were education and training objectives to ensure that skills and knowledge were passed on to assist the long term continuity of research and marine management in the region. Working closely with the Governments of Seychelles and Mauritius, plans began to develop as to how best put the Programme into action.

The Mascarene Plateau has c. 20,000km of shallow water, with abyssal depths either side, so it was a challenge to study this large area of ocean effectively with only a small budget. Many years of research and unlimited funds would be needed before data could begin to indicate the role the plateau might play in the large scale oceanatmosphere interactions of the western Indian Ocean. The Programme thus started small with a three-pronged approach - research, training and education. Field bases for hosting visiting experts were established, each staffed by marine science graduates who set up and ran long-term monitoring projects. Every effort was made to attract international research interest in the region, and to host and support as many visiting

researchers as possible. Comprehensive training courses were initiated for the local researchers and rangers with whom we worked, to enable these local stakeholders ultimately to take over the monitoring work and the hosting of visiting researchers. Efforts were put into writing funding bids that included long-term provisions for training alongside strong science research projects. Finally, education programmes were initiated for the local communities and children, to raise the profile of marine environmental issues, and to put in place measures for long term marine science studies in the region.

As the Programme developed, increased efforts were put into seeking funding for scientists and research cruises to visit the more remote areas of the Mascarene Plateau. During 2001, emphasis was placed on attracting researchers from as many international research institutes as possible, thereby increasing the possibilities for returning research visits. The highlight of this approach was the International Workshop on the Biodiversity of the Rodrigues Lagoon, which attracted researchers from over 12 different countries, and set up strong links for future collaboration in the region.

Achievements and Legacies of the *Shoals* Programme

Since 1998, Shoals has hosted over 200 scientists from 21 countries, all investigating different aspects of the marine environments of Seychelles, Mauritius and Rodrigues. Scientific outputs are, of course, only just coming together from these studies, but the bibliography of outputs from Shoals already shows a broad range and impressive number of reports and papers. Alongside this, more than 300 local people from a wide range of Government and non-government groups have been trained in scientific, practical and marine safety skills, and are now in a much stronger position to support marine research in the region into the future. Behind all of this has run a broad-reaching education programme. Shoals has directly involved more than 400 local children and has assisted in establishing marine education and conservation issues into the National Curricula, thereby setting in place a mechanism for the continuity of marine education for future generations.

It was never anticipated that, in a three-year field campaign, the Shoals Programme would answer all the questions about the dynamics and systems of the western Indian Ocean region, and indeed we have not done so. However, the Programme has achieved an astonishing amount in such a short time and on so small a budget. In 1995, scientists suspected that the Mascarene Plateau is a rich and important oceanographic area: the Shoals Programme data can now prove that this is the case. We have found out, through the planktonic data collected, that the Plateau causes large scale ocean mixing, and the waters to the west of the Plateau are as rich as those in the North Atlantic. We have recorded the first film footage of remote coral reefs on the Saya de Malha banks, only previously estimated remotely. We have shown that the reefs of Seychelles, which suffered from the dramatic coral bleaching associated with the warm water episode of 1997/98, are showing signs of new coral recruitment and growth, encouraging in that it shows there are at least reefs which are spawning the new larval recruits needed for regeneration.

The International Workshop on the Biodiversity of the Rodrigues Lagoon has raised the total species list for the lagoon of Rodrigues from 45 to over 1,000 species, of which over 100 are thought to be new to science. Impressive though this is, however, such species numbers are low for the region as a whole, which in itself raises questions about the age of the Rodrigues lagoon, and the geological history of the region as a whole.

What all of these apparently unrelated scientific facts show is that the Shoals Programme has opened the door to a whole range of future scientific studies in the region surrounding the Mascarene Plateau, and has put this area on the map for international research priorities. We are now in a better position to ask the right scientific questions about the region, and focus future research efforts more effectively. Indeed, although the budget precluded us from commissioning large oceanographic research cruises in the region, the Shoals Programme has been able to assist in supporting a National Environmental Research Council (NERC) vessel, the Charles Darwin, in 2002, to focus on the oceanography of the Mascarene Plateau helping us to fill in some of the gaps in our knowledge. Plans are already underway for a second biodiversity workshop in the region in 2003 to continue to address the taxonomic insufficiency still existing in many regional countries. Finally, enough interest has been generated within the UK that the western Indian Ocean region is to be the focus of an International Discussion Meeting, probably in 2004, which will review these research efforts.

The RGS-IBG and the Royal Society will continue to promote the region for research work into the future, and assist the Governments, where possible, in attracting researchers into the region. And it is perhaps here where the *Shoals* Programme has achieved its greatest goal and best helped such future research. Although the field phase of the *Shoals* Programme drew to a close in November 2001, we have left in place strong research centres - through the Seychelles Centre for Marine Research and Technology and *Shoals*

Rodigues - to host visiting scientists who can continue the research efforts and begin to answer some of these questions. These centres are staffed and assisted by local individuals, many of whom have benefited directly from practical training given through the *Shoals* Programme. Alongside the Governments of Mauritius and Seychelles, *Shoals* has put in place mechanisms for ongoing marine education so that perhaps in the future, more children will consider further training into careers in marine research.

None of this would have been possible without the vision of the RGS-IBG and the Royal Society; the generous support of our sponsors; the tireless efforts and visions of our many staff and volunteers; the support and advice of local Governments, and the goodwill and efforts of the people of Seychelles, Mauritius and Rodrigues.

Programme Funding

Considerable funding was required to support this ambitious Programme, which has a total budget of £1.5 million. *The Shoals of Capricorn Programme* has received support from the following:

Corporate Partners, Partner Organisations, Trusts and Grant-giving bodies:: The Omega Watch Company UK Ltd; Guinness – through Diageo; The Darwin Initiative; The Lottery Community Fund; Land Rover, EarthTech Engineering Limited

With additional support from:

Abercrombie & Kent Global Foundation;
Accenture; Air Mauritius; Australian High
Commison, Mauritius; Barclays Bank plc,
Seychelles; bcontemporary; BDA Overseas;
British Airways; British Council, Mauritius; Brish
High Commsionnones of Mauritius and
Seychelles; Cable & Wireless Seychelles; Central
Search; Esmee Fairbairn Foundation; FCO
Environment Project Fund; Fishmongers'
Company; Fugro-Geos; Gladwins; Geotck; The
GreenCard Thurs; Hawkshead; Hertofrdshire
Display plc; Honda Marine; Indian Ocean
Commission; Last Chance Expeditions; Maersk

Line; Mauritius Research Council; Mauritius Oceanography Institue; PADI Project AWARE (UK); Photobition; Ralph Brown Memorial Fund; The Rogers Group, Mauritius; Royal Life Saving Society; Scubapro; Sun International; Uyea Trust; Valeport; The Worshipful Companies of Scientific Instrument Makers and Water Conservators.

Further Reading:

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