ReefBase 2.0:
A Contribution to Environmental Conservation on a Global Scale

Lucy Halmarick

Abstract

The 1997 International Year of the Reef sees the release of ReefBase 2.0: A Global Database on Coral Reefs and their Resources. It provides the most comprehensive and accessible repository of information to date. Containing information on over 7 000 coral reefs in more than 123 countries, ReefBase 2.0 offers an extensive range of time-related data pertaining to coastal tourism, benthic environment ecology, fish population statistics, oceanography, socioeconomics, mariculture, and harvest activities. It also outlines the stresses causing reef degradation as well as management initiatives. Complemented by hundreds of digitized maps provided by the World Conservation Monitoring Centre (WCMC) and over 500 high quality photographs, ReefBase 2.0 is not only an essential tool for coral reef management but also a comprehensive guide for tourists, scuba divers and snorkelers alike. ReefBase has contributed substantially to the success of the International Coral Reef Initiative (ICRI) and serves as the official database of the Global Coral Reef Monitoring Network (GCRMN), bringing together an increasing volume of data on coral reef health, management and significance to humanity, and making it widely available. Over the next five years, the information contained within ReefBase will be utilized as an instrument for developing coral reef health assessment criteria, sustainable management criteria, and providing continuously updated summaries of threats endangering coral reefs around the globe. This will be a strong basis for focused corrective action in an attempt to conserve coral reefs and properly manage their resources for future generations.

Introduction

Since its inception in 1993, Project Reefbase has made considerable progress. The ReefBase 1.0 CD-ROM was released in June 1996 at the Eighth International Coral Reef Symposium in Panama. ReefBase 2.0 has now been released as a contribution to the movement towards environmental conservation on a global scale, providing the most comprehensive and accessible repository of information on coral reef systems and their resources.

ReefBase 2.0 contains information on over 7 000 coral reefs located in more than 123 countries and island states, with ecological data on the benthic environment including abiotic components and reef fish population statistics for 3 000 reefs, data regarding natural and anthropogenically induced stresses causing reef degradation for over 2 000 reefs, and lists of mariculture and harvesting activities for more than 1 500 reefs.
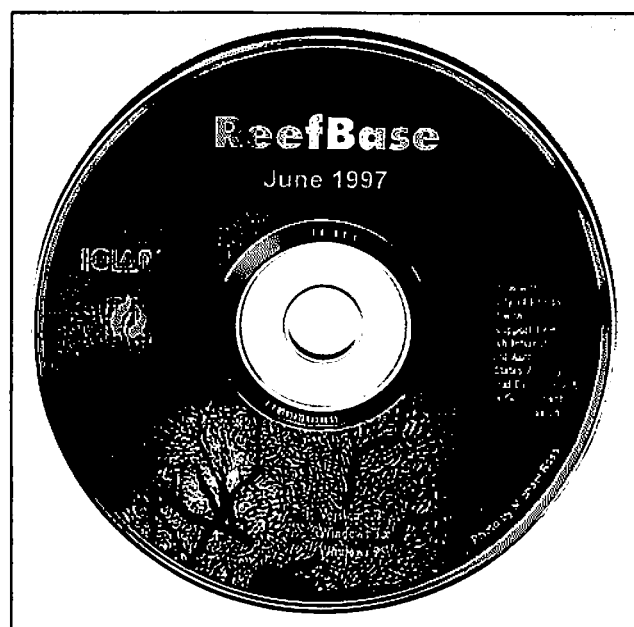
The ReefBase 2.0 CD-ROM.

Created using the WinMap or MAPPER for Windows, a low-level geographic information system, ReefBase's customized RBWinMap provides a means of accessing data geographically. Clicking on a dot representing blast fishing or *Acanthaster* outbreaks, for example, will display information on the occurrence of this reef stress.

An additional feature now included in ReefBase 2.0 is a large set of data from the Australian Coral Reef Ecology Database. This database on the ecology of Australian coral reefs located at the Australian Institute of Marine Science (AIMS), contains an enormous quantity of data from decades of coral reef surveys in the country. Efforts are underway to summarize this information and make it widely available. ReefBase 2.0 contains annual summaries of data, collected via manta board tow surveys from 1985 to 1996 which covers well over 1 000 coral reefs.

RAMP is a subdatabase within ReefBase 2.0. It includes a select set of indicators directed at providing information on coral reef related human behavior and incorporating socioeconomic, political and cultural variables which can be used to assess, predict and potentially manage these behaviors. ECOPATH 3.0 is an ICLARM

software package designed as an approach for constructing mass-balance trophic models of ecosystems, developed by Villy Christensen and Daniel Pauly based on pioneering work by J.J. Polovina on the northern reefs of Hawaii.

As a further contribution to environmental conservation on a global scale, ReefBase has released a coral reef assessment and monitoring method designed for sport divers, park rangers and other coral reef conservation enthusiasts. Coral reef degradation is widespread throughout the trop-

ics and the impossibility of obtaining quantitative information on thousands of reefs by a limited number of scientists has long been recognized. There are, however, more than seven million sport divers today who provide a massive potential for the collection of ecological information. Through the ReefBase Aquanaut System, scuba instructors are certified to train divers who have no special knowledge in reef species identification to collect ecological information using a simple, yet statistically sound, technique on coral
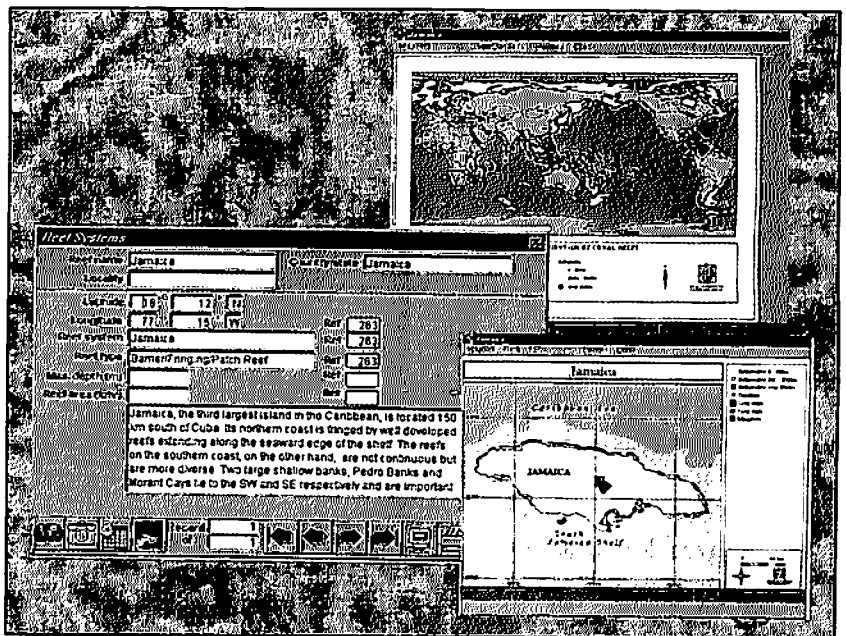
From the Reef Systems table, access to ReefMaps developed by WCMC provide the exact location of defined reefs.
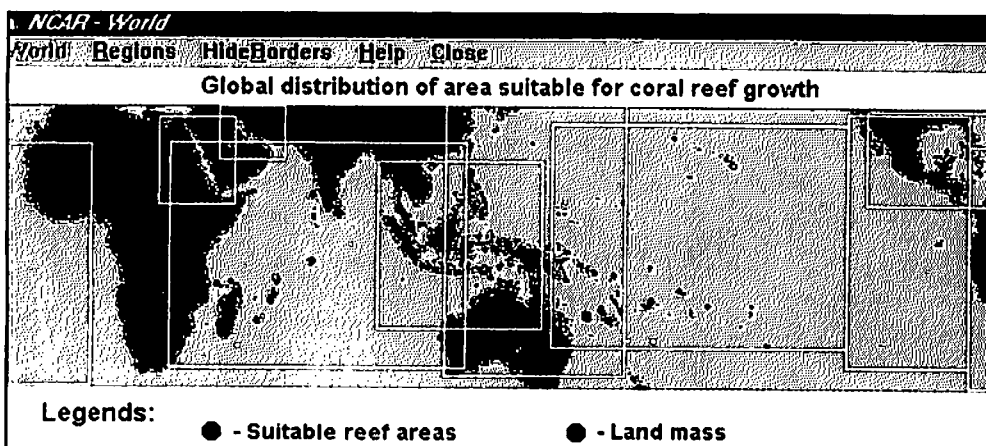
ReefHab—a breakthrough diagnostic model determining suitable areas for reef growth.

All information in ReefBase 2.0 is clearly displayed in user-friendly table format with interactive request buttons that allow the utilization of a plethora of options. Access to this information begins via the main menu, providing a door to the main ReefBase 2.0 database, reef maps, over 500 colored photos, coastal tourism information, the 'Aquanaut' volunteer reef monitoring system, reef reports, indexes with lists of experts and organizations, references and a detailed help system. ReefBase 2.0 also includes additional features such as RAMP (Rapid Assessment of Management Parameters) and ECOPATH 3.0.

Upon opening the ReefBase database, the Reef Systems table appears displaying brief descriptions of a chosen reef, a general classification of its type, geographical coordinates and its associated reef systems. From here, the user can access time-related information on coastal tourism, ecology, government management, harvest, mariculture activities, oceanography, socio-economics, stresses and management initiatives. ReefBase 2.0 can therefore be an essential tool for coral reef management as well as a comprehensive guide for tourists

and divers. The tourism tables are comprised of information on dive sites and operations in the area, as well as coastal attractions, accommodation and rates.

The World Conservation Monitoring Centre (WCMC) has provided ReefBase 2.0 with global and regional maps that cover all major reef systems on a broad scale. Referred to as ReefMap, this set of detailed and uniformly formatted maps was created by digitizing published maps. Supplementing these broad-scaled maps are a further 200 maps that are finely detailed, allowing for the exact geographic positioning of reefs by ReefBase 2.0 users.

Complementing the WCMC maps is another set of maps based on ReefHab by Dr. Joanie Kleypas at the National Center for Atmospheric Research (NCAR) in Colorado, USA. Until now, most reefs charted by governments are at or near the ocean surface. It is believed, however, that most corals occur in subsurface coral assemblages on continental shelves. Using a wide range of environmental variables, such as salinity, depth, temperature, water clarity and nutrients, ReefHab provides an approximate prediction of such areas where corals are most likely to grow.

ReefBase 2.0
Current Status (June 97)

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λ **Total Reefs**	7,000
λ **Benthic ecology**	3,000
λ **Stress**	2,000
λ **Harvest**	1,500
λ **Tourism**	1,500
λ **Management**	500

Current status of ReefBase 2.0.

*Comprehensive picture show displaying over 500 high quality slides.*

reefs from sites that can be monitored year after year. Recorded on underwater forms, the data are sent to ReefBase and entered directly into the version available on the Internet. It is also summarized in the annual releases of the ReefBase CD-ROM. Copies of the data are made available for local, national and regional management purposes. There is a program whereby certifying scuba instructors can provide training to divers. Further information on the ReefBase Aquanaut System is available through the internet at the website http://www.cgiar.org/iclarm/reefbase.

To enable users to arrive at summaries and to answer questions addressed by the database tables, the custom query report system has been improved allowing the user to carry out complex searches and create summary reports. Users may now search the database for reef records by matching specifications set in a query statement created by simply clicking choices within list boxes. The resulting tables produced by this flexible query system will be particularly useful to investigators requiring information for spreadsheets for further analysis.

ReefBase is fast evolving into an analytical database. It is envisioned that succeeding versions will be capable of deriving fisheries production on a per reef or per country basis. Efforts are currently underway for the extraction of reef areas per country and ultimately on a global basis. With further inputs from collaborators worldwide, ReefBase will play a major role in the management and conservation of coral reefs and their resources.
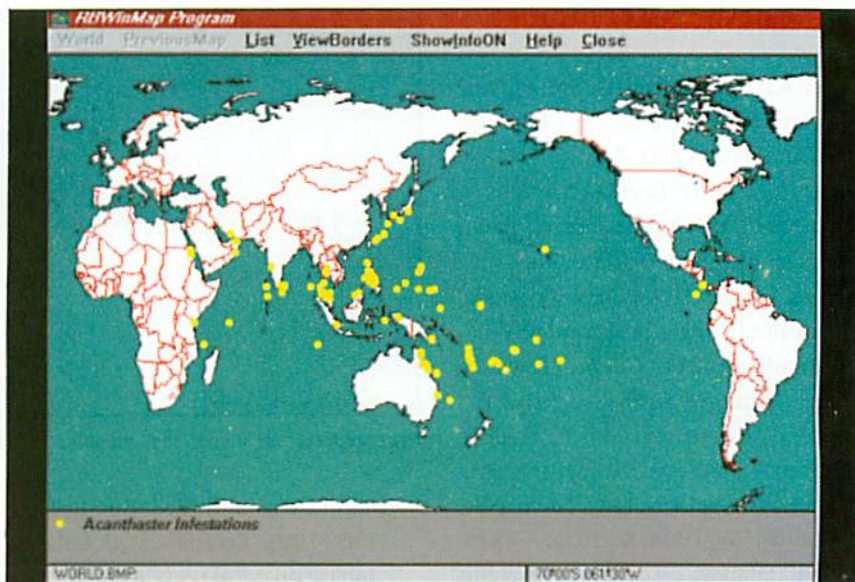
RBWinMap–yellow dots displaying locations of Acanthaster outbreaks.
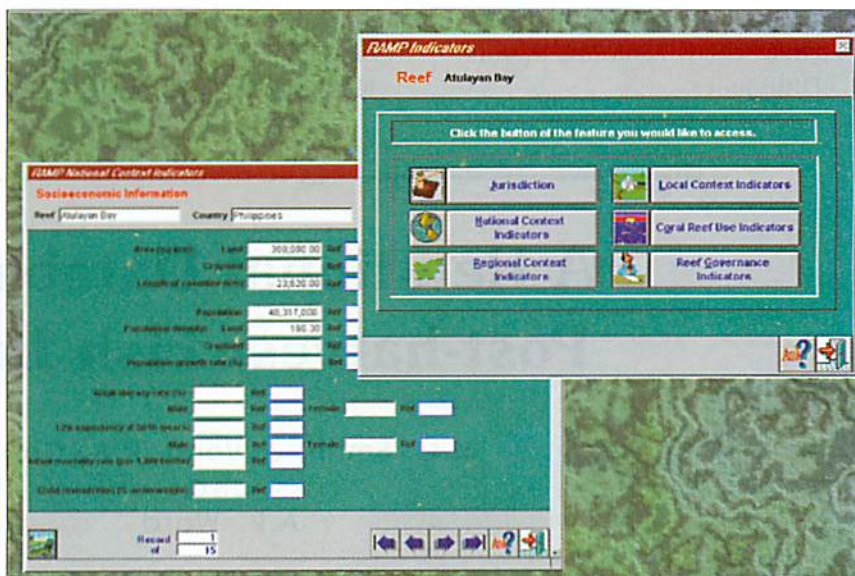
Rapid Assessment of Management Parameters (RAMP) providing National Context Indicators for management.

ECOPATH 3.0 in ReefBase. An approach and software for constructing mass-balance trophic ecosystem models.

Further Reading

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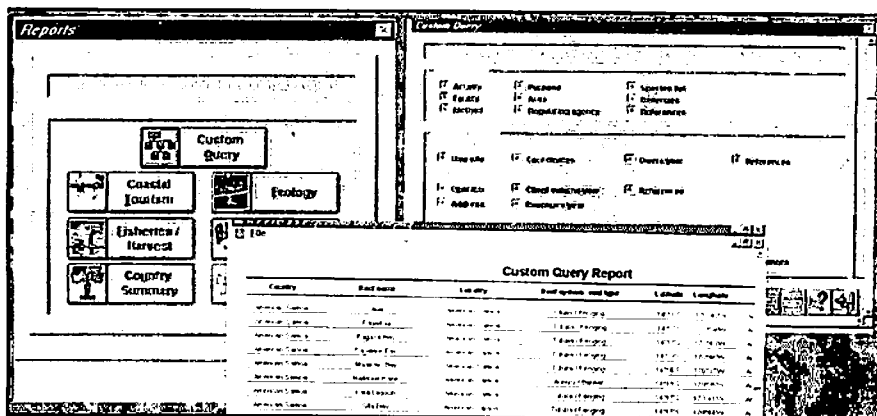
Reef reports including the modified flexible custom query system

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A Relational Database of Post-harvest Fish Losses

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Abstract

The article describes FISHLOSS, a database of post-harvest fish losses devised by the Natural Resources Institute (NRI) UK. The database contains 450 records of post-harvest fish losses from 150 sources. The majority of the estimates are shelf-life estimates. Designed to be a reference for people studying post-harvest fish losses, it draws attention to areas requiring future research to identify significant losses and the factors which cause them. All researchers and users are encouraged to send NRI their own estimates for inclusion in revised versions of FISHLOSS.

Introduction

Estimates vary of losses in the quality and quantity of fish caught, but there is general agreement that they are of sufficient importance to merit attempts to reduce them. The available information on post-harvest fish losses is piecemeal, and usable data-sets and analyses are often restricted to unpublished reports or are published in journals which are often difficult to access. In addition, assessment methods and data-recording techniques are by no means standardized, which makes comparisons difficult.

In an attempt to collate the reports on losses experienced by artisanal fisherfolk and to provide