

compass for two complete monsoons as shown in figure 3.

PREVAILING NW WINDS

What does it all mean..... Well it appears that the wind has been blowing significantly longer and stronger from the northwest than from any other direction. In theory this would mean that all the beaches should be migrating to the south east. Let us know whether this theory matches what you see happening to beaches on your resort.

UNDERSTANDING NATURE

In practice the presence of local reefs, occasional storm events, and the net wind rose over the past few years may confuse this. However, it is a first step to understanding how winds, waves, and sand act together in the Maldives. So next time the wind blows remember that what you see is only one small part of a long term, complex, cycle that needs to be accommodated and not fought. Build on piles and build well back from the beach and you should be able to relax and let nature do its own thing!

AND REMEMBER:-

**ALWAYS
BUILD ON
PILES**

NEAR THE BEACH!

REG. No: 354

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**Please give a Copy to
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COT
NEWS LETTER



GREAT BARRIER REEF
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22 APR 1991

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MARINE RESEARCH SECTION
MINISTRY OF FISHERIES AND AGRICULTURE
The Republic of Maldives

EDITORIAL

MALDIVES - DREAM-LIKE REALITY!

The COT newsletter started in February 1990 with the intention of increasing awareness about environmental issues in the Maldives.

Unfortunately, in far too many hearts, we still sense acceptance of the inevitability of a deteriorating environment. Indeed there is an almost, lemming-like, urge to charge towards, and over, the precipice of environmental no return... perhaps these people hope that it is all just a nightmare and the fall will wake-them up.

Well it is no nightmare... The Maldives environment is certainly deteriorating but it is certainly not too late to do something about it. You can still find beautiful islands with palm fringed sand beaches. The lagoon waters are still turquoise clear and the coral reefs still support a profusion of fish.

Now one year and twelve issues of the COT newsletter later the message to those who are awake to the risks and realities of a developing world remains unequivocal and clear-cut. Environmental degradation is not the inevitable consequence of this development. All the process requires is a little less consideration of short-term profit and a little more social responsibility. The means to manage natural resources are there and where there is doubt there is always the safety valve of caution.

The choice between 'give-up' or 'get-it-together' still exists. All it needs is the will!

1990 SUMMARY

And what of the health of the reefs and islands of the Maldives? In 1990 staff from Marine Research Section have travelled from the northernmost island in the archipelago, Haa Alif Thuraakunu, to the southernmost, the old RAF base on Gan in Addu atoll. They have visited 35 uninhabited islands, 56 local islands and at least 20 tourist Resorts. They

have checked reefs at more than 90 sites. If those Resorts that have joined the 'Adopt a Coral' scheme are included corals have been adopted at 57 separate locations in 16 administrative atolls (fig. 1). In north and south Male' atoll Marine Research Section staff have set-up 5 permanent reef monitoring sites to act as a baseline to monitor for longer-term environmental change.

STATE OF THE ISLANDS IN 1990?

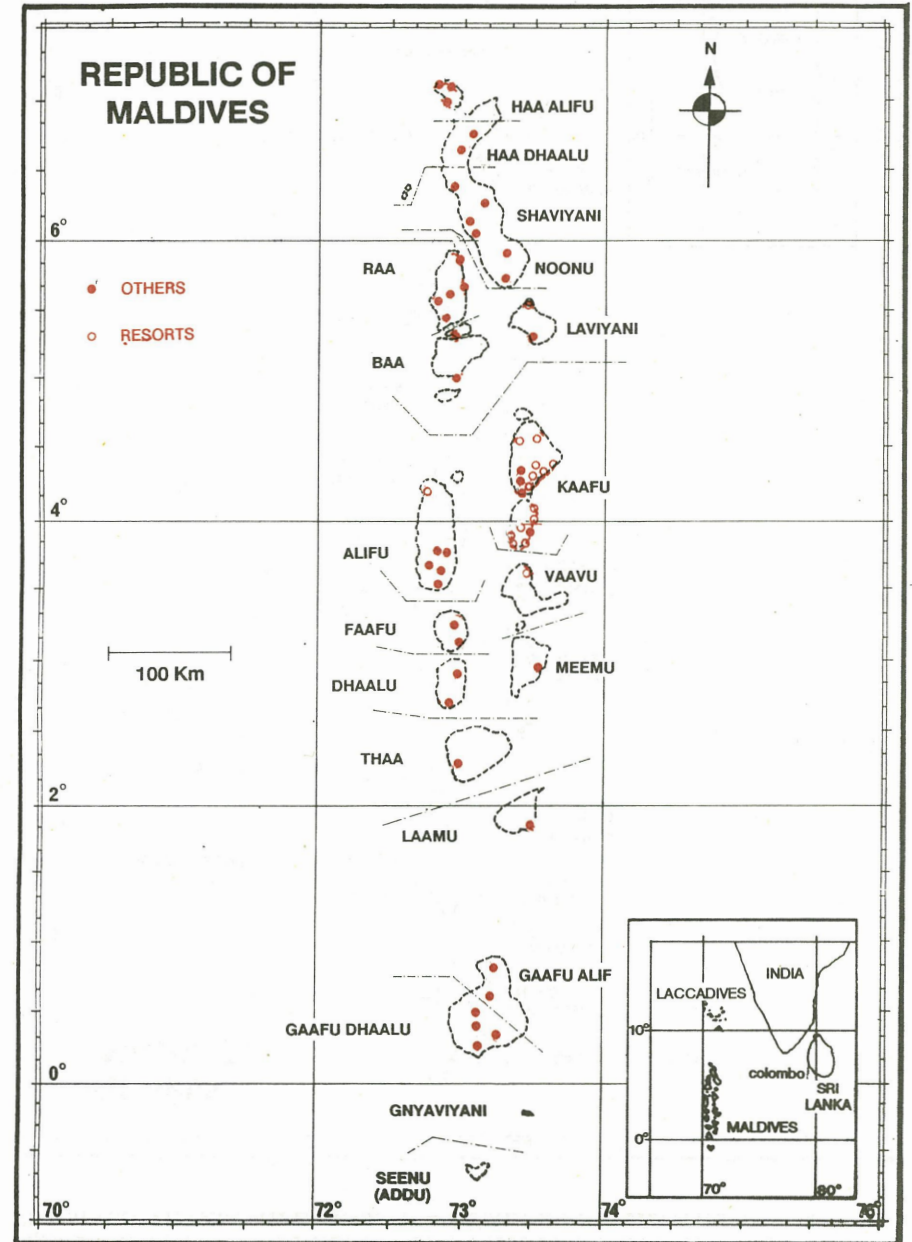
Fortunately serious population problems are only evident on a handful of the 56 inhabited local islands that were visited. At these densely populated islands nearly every inch of land is used for housing, there are few trees, the beaches are hidden beneath coral walls and the groundwater is increasingly salty. Yes the people are happy and cheerful but there is the suggestion that they might like to move, that there is no place to build a home for the children, that there are too many rats. Hopefully the time bomb of a population growth rate of 3.7% can be defused before all the islands become like this.

There are still many uninhabited islands to move to. Wave washed palm fringed coral sand beaches and turquoise lagoons are the norm. There are the scars of beach erosion if you look carefully but they come and go according to the natural cycles of the monsoons and their accompanying storms. The ominous evidence for greenhouse orchestrated beach erosion cannot be seen..... yet.

The frigate birds still come to roost on Baa Olhugiri and Gaaf Alif Hithaadhoo. The turtle still survives though the locals say nesting is rarer and occurs on fewer and fewer islands.

On many Resorts the story is less and less that of harmonious interaction with the natural environment and more and more a futile battle for subjugation. More and more beaches that were once sandy are now cemented coral rubble walls. Many resorts continue to treat the Maldives environment as a tip for their rubbish and their sewage.

Fig. 1 LOCATION OF CORALS ADOPTED IN 1990 IN THE REPUBLIC OF MALDIVES.



STATE OF THE REEFS IN 1990

THE GOOD NEWS

The good news is that there are still beautiful reefs in the Maldives. The Crown-of-thorns is not as widespread as we feared and is only a major problem in parts of North Male' and Ari atoll. Figure 2 illustrates and table 1. lists the incidence of COT reported from 111 sites throughout the Maldives archipelago in 1990. The list includes those returns made by Resorts (where there has been no visit by staff from Marine Research Section).

TABLE 1. INCIDENCE OF COT BY ATOLL FOR 111 SITES EXAMINED IN 1990.

ATOLL	NUMBER OF COT SEEN				TOTAL
	0	1-9	10-99	>99	
HAA ALIF	9	1			10
HAA DHAAL	3				3
SHAVIYANI	5				5
NOON	3				3
RAA	6				6
LHAVIYANI	2				2
BAA	5				5
N. MALE'	8	5	1	1	15
S. MALE'	8	2			10
ARI	12	3			15
VAAV	1	1			2
FAAF	4	1			5
DHAAL	7				7
MEEM	1				1
THAA	4				4
LAAM	4				4
GAAF ALIF	2	4			6
GAAF DHAAL		5	1		6
ADDU	2				2
	86	22	2	1	111

Resorts in the major COT outbreak area are fighting to keep some areas of reef alive and healthy by collecting COT (table 2).

TABLE 2. COT COLLECTED DURING 1990 (TO NEAREST 100).

ATOLL	RESORT	NUMBER OF COT
N. Male'	Ihuru	300
	Makunudu	11400
	Nakatchafushi	18700
	Vabbinfaru	100

In many places it is evident that young corals are continuing to colonise reefs where the environment is healthy. The reef is alive and fighting back!

THE BAD NEWS

The bad news is that a significant number of reefs appear to be degraded. Some of the degradation is due to natural causes like storms. Some degradation is due to human activities like coral mining and anchoring. Some is probably due to a combination of both natural and human causes. A healthy reef may be able to survive natural stress but when human induced stress is added it may be too much.

Coral bleaching, the loss of symbiotic algae from the tissues of coral, was widespread in parts of north and south Male' atoll in the late spring of 1987. In 1990 bleached corals were a relatively rare sight.

PLAGUES TO WATCH OUT FOR.

Two potential plagues that may kill of coral were noted in a number of areas. 'Onion skin' algae, *Padina spp* were locally common in parts of north and south Male' atoll. 'Killer anemones' *Rhodactis sp* were widespread on a number of northern reefs in the archipelago.

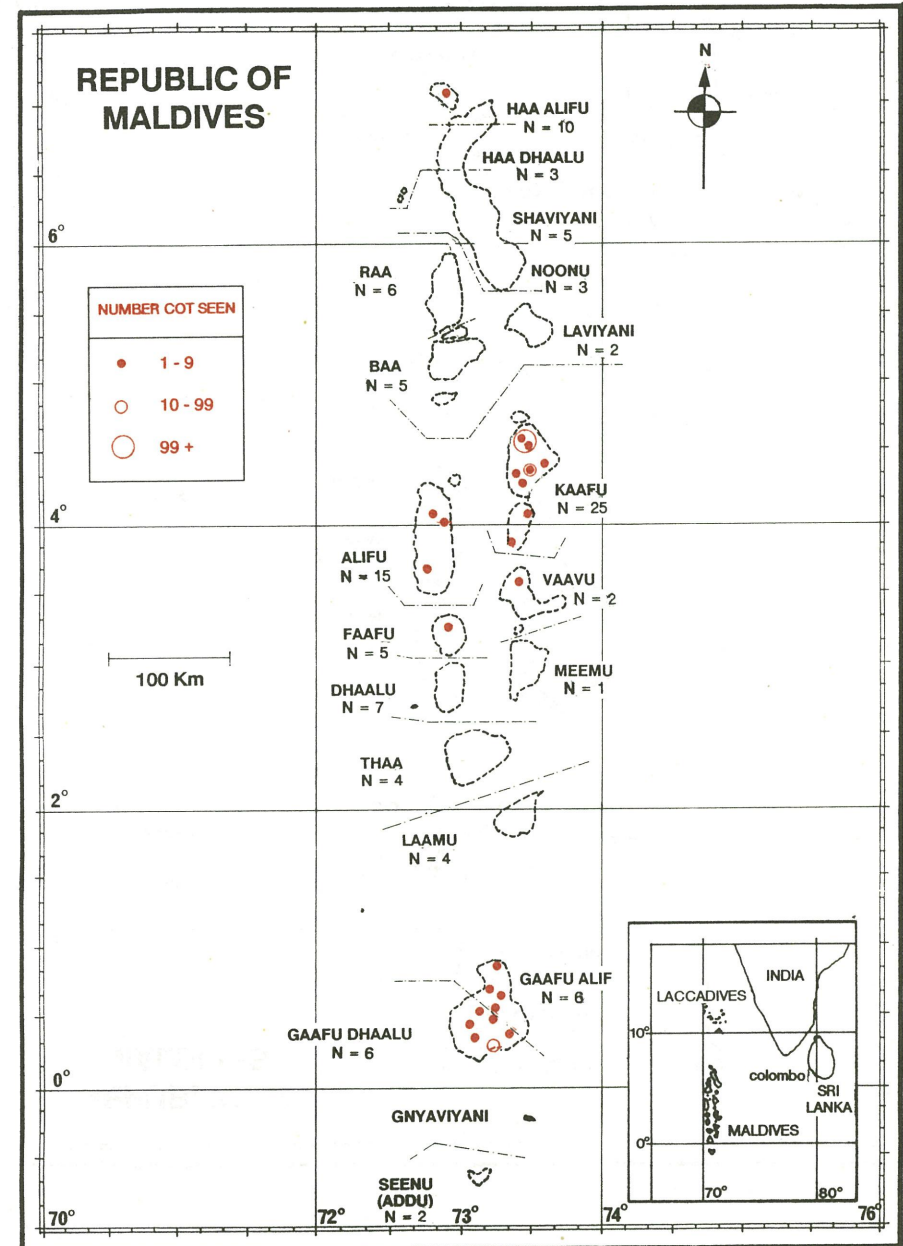
AND WHAT OF 1991?

We still have a choice of what will happen in 1991.... there is time to do things right and there is no reason, or excuse, to give-up.

WORKSHOP

In October 1991 there are plans to hold a follow-up workshop to the 1990 workshop entitled 'Environmental health and Diver Safety'. Not one comment has been received on the workshop recommendations printed

Fig 2. INCIDENCE OF COT REPORTED IN 1990 FROM 111 SITES THROUGHOUT THE MALDIVES ARCHIPELAGO. (N = NUMBER OF SITES EXAMINED).



in the November edition of the COT Newsletter. We hope to present a modified set of recommendations based on discussions with diving operators at selected resorts later in 1991.

SAND AND CORAL MINING AREAS

There are plans to identify specific areas for sand and coral mining in North and South Male' Atoll and in Ari atoll. Other atolls will follow. Be prepared to be involved in the consultative process that is planned for designating these areas.

NATIONAL ENVIRONMENTAL ACTION PLAN

It is hoped to initiate the 'National Environmental Action plan' and improve the capacity of Government to manage environmental issues through the Environmental Research Unit of the Ministry of Planning and Environment.

BLUE PEACE AND TURTLES

The NGO 'Blue Peace' will be campaigning for the environment. Their attention is presently focussed on the plight of the turtle.

GETTING THINGS DONE.

Attention is now being directed towards environmental issues as never before. Your individual support and responsible actions are needed as never before. There is hope. Be positive. 1991 is the year for starting to get things done!

1989-1990 WINDS

Throughout the last year we have brought you information about periods of strong winds. There is no doubt that wind generated waves within the atolls are significant in moving sand around island beaches. Linking such movements with the winds is the first stage to managing beaches properly and to

removing the fear and ignorance that results in 'crisis' construction of seawalls and groynes.

WIND ROSE

One way of summarising information about winds over a period of time is to produce a wind rose (see fig. 3). Windroses are a way of visually representing data relating to wind speed and direction over a period of time. The windrose shows the number of wind readings taken for each point of the compass. The readings at each compass point are further divided according to wind speed category. Readings when the wind is calm fill the central circle of the rose. There is then a series of stacked boxes extending out from this circle of calms. The radial extent of each box represents the number of wind readings for that point of the compass falling within that windspeed category. The combined radial extent of all boxes shows the total number of wind readings for that point of the compass.

MONSOON CHANGE

Wind speed and direction taken every three hours at Hulule was obtained from the Department of Meteorology and analysed by computer at Marine Research Section. Data for two complete monsoons was taken. As there is no one date when a monsoon begins and ends the monsoon change was taken as the beginning of the month when most of the wind direction readings were different to those in the previous month. In 1989-1990 this method showed the 'so-called' north-easterly monsoon running from the beginning of November 1989 to the end of March 1990 and the 'so-called' south westerly monsoon running from then until the end of November 1990.

NET WIND SPEED AND DIRECTION

Since we are only concerned about a net movement of sand each year, and not about the movement of sand back and forth with each monsoon, we decided to present a windrose showing the net difference in windspeed groups for opposite points of the

Fig 3. WIND ROSE SHOWING THE DIRECTION OF 1637 NET WIND SPEED READINGS FROM THE NE AND SW MONSOON (NOV. 1989 - NOV. 1990)

