Puglia 2003 - Final Conference
Project IGCP 437

Coastal Environmental Change
During Sea-Level Highstands:
A Global Synthesis with implications
for management of future coastal change

Otranto / Taranto - Puglia (Italy) 22-28 September 2003
Quaternary coastal morphology and sea level changes

Project 437

Mörner N.-A. (SE)* ,
Laborel J. (F), Tooley M. (GB), Dawson S. (GB), Allison W. (MV), Islam M.S. (BD),
Laborel F. (F), Collina J. (F), Rufin C. (F)

Sea Level Changes: The Maldives Project Freed From Condemnation to become Flooded

*President INQUA Commission on Sea Level Changes and Coastal Evolution
The Maldives Project
Paleogeophysics & Geodynamics, Stockholm University, Stockholm, Sweden
fax 46-8-164675, E-mail: morner@pog.su.se

Keywords: *sea level changes, the Maldives, no future flooding*

Abstract

The INQUA Maldives Project started in 2000. Prior to that, quite little was know about the actual changes in past sea level in the Maldives. In the IPCC project, low-lying areas and especially the Maldives have been condemned to become flooded in 50-100 years. With respect to multiple integrated sea level processes, the Maldives have a uniquely position (as described in Morner (2000a) Integrated Coastal Zone Management, No. 1, p. 17-20).

The Maldives do not consist of predominantly catch-up coral reefs of Holocene age as previously proposed. On the contrary, the Maldives are predominantly formed by older reefs. The Last Interglacial level is at about +1.5-2.0 m. The LGM level seems to be deeper than usually at –150 m due to increased geoid relief during the last glaciation maximum (LGM).

During this period the old reefs were strongly carstified. Paleogeographically they formed a few large islands, most probably covered by tropical forests and traversed by drainage patterns and river systems. From 18,000 to 5000 BP, sea level rose episodically cutting submarine shorelines and coastal caves. Present sea level was reached at about 4500 BP. Sea level oscillated around the present in the last 4000 years.

At 3900 BP, there was a short and sharp sea level high-stand at about +1.2 m. For the last millennium, a detailed sea level record is established: ±0 m 1000-800 BP, +60 cm 800-300 BP, 0 to just below 0 in the 18th century AD, +30 cm 1790-1970 AD, fall to 0 in ~1970 up to today. At about 1970, sea level fell by 20-30 cm (presumably due to increased evaporation).

This is recorded in storm level, high-tide level, mean sea level and in lake and lagoon levels. In the last decade, there are no signs of any rise in sea level. Hence, we are able to free the islands from the condemnation to become flooded in the 21st century.

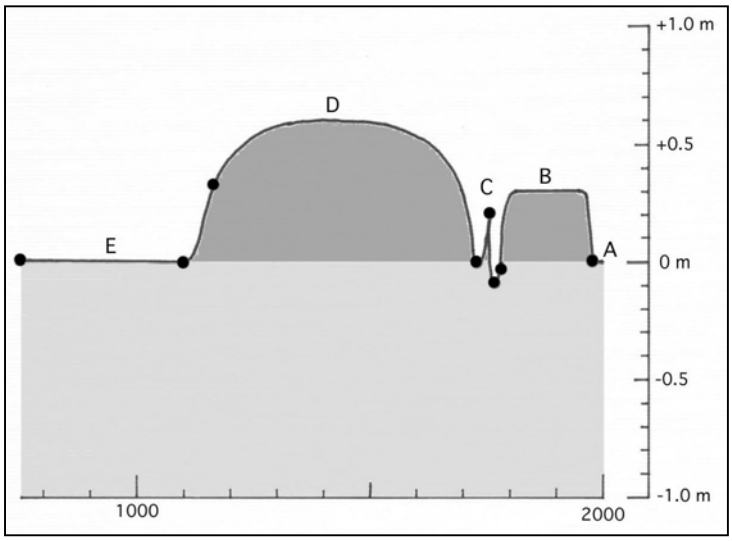

Figure 1. Sea level curve of the Maldives for the last 1250 years. Dots = dated levels. Morphological beach levels: (A) present beach, (B) the sub-recent +30 cm beach, (C) the fen levels Guidhoo Atoll, (D) the +60 cm high beach level, (E) the shore level of the "Reef Woman".

References

INQUA (2000). *Homepage of the Commission on Sea Level Changes and Coastal Evolution*. www.pog.su.se/sea, Sea level changes, News & Views, The Maldives Project.

IPCC (2001). *Climate Change 2001*. Cambridge Univ. Press.

Mörner N.-A. (2000a). *Sea level changes in the Indian Ocean*. Integrated Coastal Zone Management, Launch Ed., 17-20. IPC Publ. Ltd.

Mörner N.-A. (2000b). *Sea Level Changes along Western Europe*. Integrated Coastal Zone Management, Second Ed., 33-37. IPC Publ. Ltd.

Mörner N.-A. (2002). *Livello dei mari e clim*a. Nuova Secondaria, 10/2002, 43-45.

Mörner N.-A. (2003). *Estimating future sea level changes from past records*. In press.

Mörner N.-A. and Maldive Project Team Members (2003). *Sea level changes. The Maldives Project. Freed from condemnation to become flooded*. Abstracts EGS-AUG-EUG, Nice.