

NEREIS PARK NEWSLETTER

Number 7
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About strange holes

For most of us, bioturbation deals with muddy places where dives are not what we could watch in the Cousteau's movies. Lucky are the ones that can enjoy both beautiful and bioturbated diving seascapes. But the explanations of what they can find then are not as evident as a regular Nereis mudflat !

FG

Conferences' abstract submission



Abstract Submittal Deadline and Early Registration **End on 11th October 2010 !**

<http://www.aslo.org/meetings/sanjuan2011/>

Among the different special sessions, the one convened by Frank Wenzhoefer & Ronnie N. Glud: Benthic Biogeochemical Processes: From microscale patchiness to ecosystem function (S09) is of major interest.



Abstract submission will **open on November 15th 2010** and end in *January 31th 2011*.

Third Nereis Park Conference website at: <http://www.nereispark2011.org/>

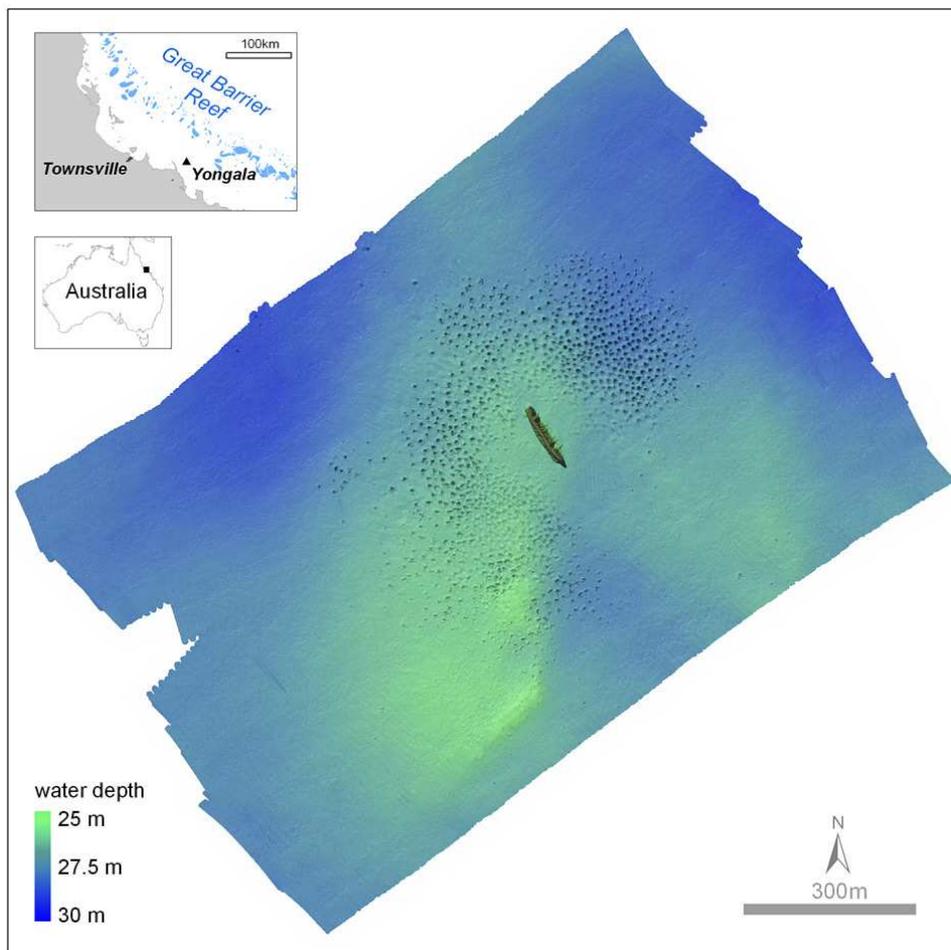


Quizz: Strange holes, who did burrow in this soft media (courtesy from the Lausanne University)?

Australian highlight

The Yongala's Halo of Holes – Who's Digging It?

The wreck of the *Yongala* is one of the world's most famous wreck-diving sites, attracting thousands of recreational divers each year. The passenger vessel sunk in 1911 during a cyclone, ca 30 nm east of Townsville. During a pilot study on acoustic mapping of the Great Barrier Reef seascape, we discovered a 'halo of holes' around the wreck. The depressions are in ca. 30 m of depth, up to 10 m in diameter and up to 1.5 m deep. They are distributed systematically, with the wreck located in the centre of the halo. The holes are most probably of biogenic origin. Anecdotal evidence from divers suggests that resident 'bullrays' or Black-blotched Fantail Rays (*Taeniura meyeni*) may be responsible for the holes, but other organisms may contribute to the earthwork activities.



Multibeam bathymetry map of the Yongala and its surrounding seafloor. The Halo of holes is prominently visible around the wreck.

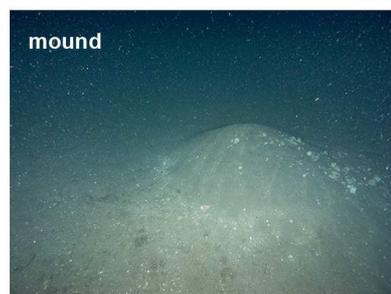
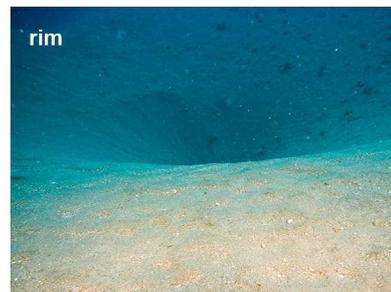
It is possible that the distribution of the holes represents a pattern in feeding behaviour. The distribution of holes shows an asymmetry with a clockwise pattern in hole depth. Possible explanations for the pattern include physical and biological processes, e.g. sediment infilling, predator-driven schooling by rays or rotational cropping. Deep holes (up to 1.5 m deep) are by and large barren, and show signs of ongoing excavation activity (fish bite marks).

Shallower holes (0.5 m deep) support diverse sessile faunal assemblages, or 'gardens' of sponges, soft corals and hard corals in an otherwise flat seafloor dominated by marine plants. The bioturbators are ecosystem engineers, creating a habitat for assemblages that are absent elsewhere on the adjacent seafloor.



The halo is densely packed with holes.

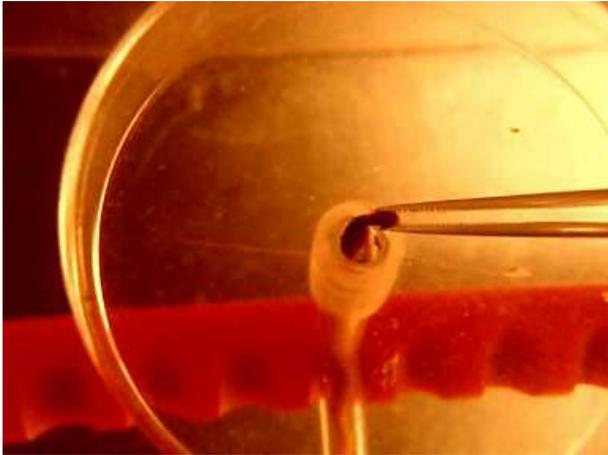
The observations at the Yongala demonstrate that large artificial reefs impact on the surrounding seascape. Perhaps the animals responsible for the earthworks should be regarded as a keystone species in such habitats. These findings suggest that the 'ecosystem wreck' extends further beyond the spatial confines of the hull of a wreck than previously considered. Similar observations of depressions around mid-shelf shoals indicate that such effects are not restricted to the Yongala's wreck. Only problem – we have not found the bioturbator yet! We have a few thoughts on who could be the culprit (is it one or many species?), but we are not sure. If anyone has seen similar 'mine fields' elsewhere in the tropics and has some thoughts on 'species-in-charge', we'd love to hear from you!



The holes are up to 10 m in diameter and up to 1.5 m deep. In the shallow holes in the southwestern section of the halo, dense coral and sponge gardens are found. Distinct mounds (worms?) are associated with many of the deep holes which we think are still being excavated.

By Thomas C. Stieglitz

Nereis Park Channel: the adventures of Denis, the trained *Nereis diversicolor*



The adventures of Denis, the trained *Nereis diversicolor* are viewable on the Nereis Park Channel (www.youtube.com/user/NereisParkChannel).

The snapshot on the left has been taken from the "Denis at the famous French restaurant Chez Matthieu" video by Matthieu Delefosse (provided by Erik Kristensen).

You are of course welcome to share your own videos in order to complete the *Adventures of Denis and his friends bioturbators*.

Some bioturbation-related in-press papers

Louise Askaer, Bo Elberling, Ronnie N. Glud, Michael Kühl, Frants R. Lauritsen, Hans P. Joensen. Soil heterogeneity effects on O₂ distribution and CH₄ emissions from wetlands: *In situ* and mesocosm studies with planar O₂ optodes and membrane inlet mass spectrometry. *Soil Biology and Biochemistry*.

Emma Michaud, Robert C. Aller, Georges Stora. Sedimentary organic matter distributions, burrowing activity, and biogeochemical cycling: Natural patterns and experimental artifacts. *Estuarine, Coastal and Shelf Science*.

Olivier Maire, J.N. Merchant, M. Bulling, L.R. Teal, A. Gremare, J.C. Duchene, M. Solan. Indirect effects of non-lethal predation on bivalve activity and sediment reworking. *Journal of Experimental Marine Biology and Ecology*.

Francesc Montserrat, W. Suykerbuyk, R. Al-Busaidi, T.J. Bouma, D. van der Wal, P.M.J. Herman. Effects of mud sedimentation on lugworm ecosystem engineering. *Journal of Sea Research*.



A potential suspect?

Ok, I apologize. This quizz was a bad one.