

# PROJECTS FROM IODP EXPEDITION 359 - MALDIVES PLATFORM AND CURRENT DEPOSITS (YEAR 2)

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## MAIN PROJECTS OF IODP 359 POST-CRUISE RESEARCH AT THE CSL

- Document the drowning of carbonate platforms in the transition from sea-level controlled to current dominated sedimentation in the Maldives carbonate system.
- Comprehensively describe the hitherto unknown carbonate contourite fan in the Kardiva Channel.
- Give new insights into the formation of secondary porosity in the marine realm.
- Test the Extended Biot Theory in carbonates.

## 359 EXPEDITION OVERVIEW

The International Ocean Discovery Program (IODP) Expedition 359 drilled, cored, and logged at 8 sites in the carbonate edifice of the Maldives, located in the Indian Ocean (Fig. 1). Expedition 359 had two main focus points. The first was to date the onset of the current system that is potentially in concert with the intensification of the Indian monsoon and the initiation of the modern current system in the world's ocean (Betzler et al., 2016a). The second important outcome of Expedition 359 is documentation of the dramatic change in the style of the sedimentary carbonate sequence stacking, caused by a combination of relative sea-level fluctuations and ocean current changes (Betzler et al., 2016b). The Preliminary Report summarizing the results is available online [http://publications.iodp.org/preliminary\\_report/359/](http://publications.iodp.org/preliminary_report/359/).

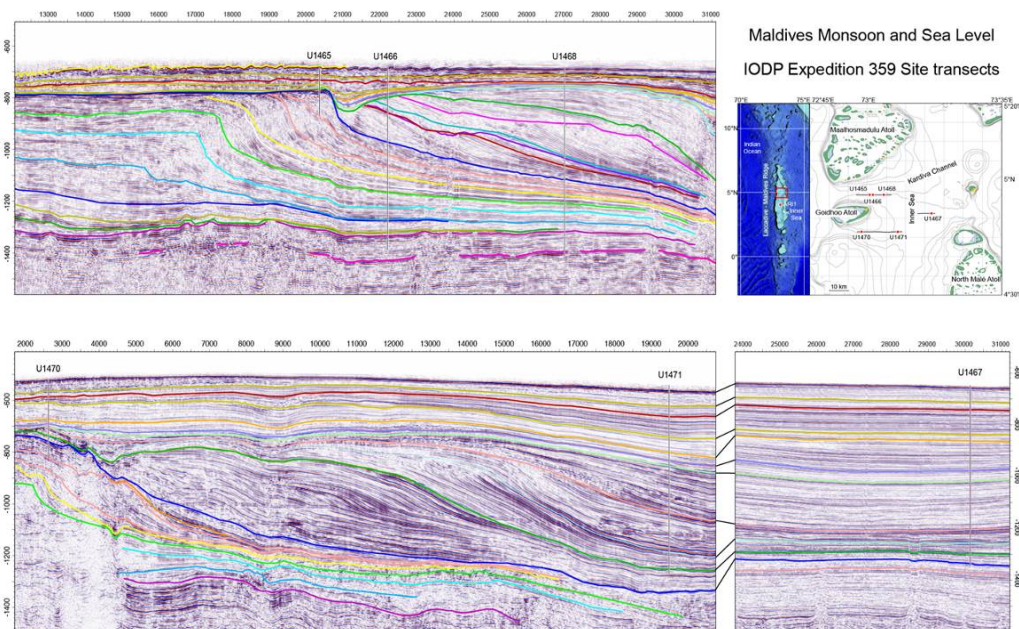


Figure 1. Seismic lines and location map of the two transects drilled during IODP Expedition 359 to the Maldives.

## **SIGNIFICANCE**

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The findings from Expedition 359 and the planned post-cruise research will add significant new knowledge with regards to the generation of organic-rich strata in shallow carbonate environments and the interaction between currents and platform evolution. The discovery of coarse-grained carbonate drift deposits, which had previously been interpreted as a sea-level driven downstepping platform (Belopolsky and Droxler, 2004), is the equivalent of finding a new carbonate depositional system. Similarly, the discovery of generating secondary porosity through the dissolution of celestine is a new diagenetic process, the importance of which was previously unrecognized. Together these findings improve our knowledge of sedimentologic and diagenetic processes in the carbonate environment. These findings will be clearly applicable to other Tertiary carbonate platforms in the Indo-Pacific region and to numerous others throughout the geological record.

## **SCOPE OF POST-CRUISE WORK**

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In April 2016, the scientists of Expedition 359, including the three cruise participants from the CSL (Swart, Eberli, Ling), gathered at the IODP core repository at Texas A&M to sample the 3096 m cores for post-cruise research. These samples and the high-resolution XRF data of the cores will complement all the data produced on board that includes lithologic descriptions, biostratigraphy, vast amounts of geochemical and petrophysical data as well as logs. This formidable data set is used for five follow-up projects within the CSL, some in collaboration with other scientists. Each one is described in detail in the following pages. They revolve around three topics:

1. The interplay of sea level and currents in controlling the architecture and demise of carbonate platforms.
2. The sedimentologic description and the petrophysical calibration of the discovered coarse grained carbonate drift fan.
3. The generation of organic-rich strata and other diagenetic processes in these strata.

## **REFERENCES**

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