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Sea-level Magnitudes and Variations Recorded by Continental Margin Sequences on the Marion Plateau, Northeast Australia

Proposal 510-Full 3

by

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D. Müller and F. Anselmetti

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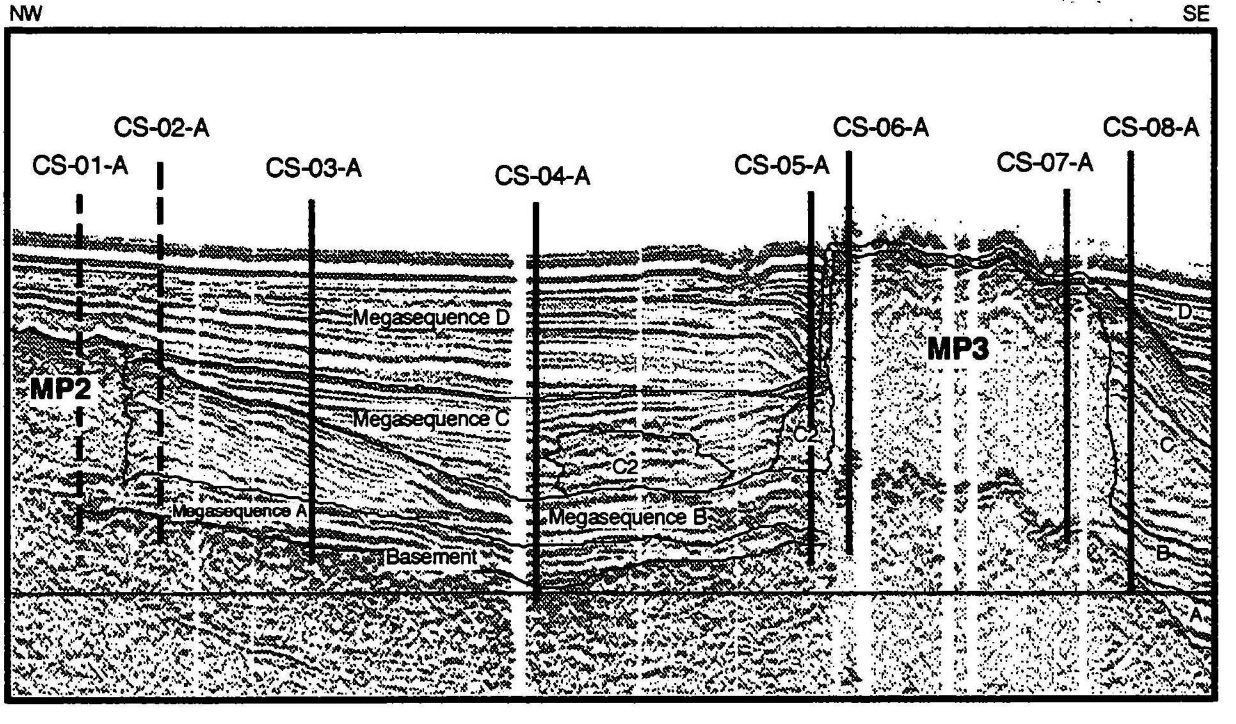

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March, 1998

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PREFACE TO PROPOSAL 510-FULL3

This proposal has been substantially revised from the last submission (Proposal 510-Full2) in order to address reviewer comments made at the SSEP meeting in October, 1997. In response to specific comments, we have made the following changes to the previous draft of the proposal:

- as suggested, we have added a tectonicist (D. Müller) to help address concerns about the tectonic development of the region and the Marion Plateau in particular;
- "ESSEP (and ISSEP) remain unconvinced that the tectonic history/subsidence of the Marion Plateau during the time interval in question can be classed as 'simple'." To address this, we have provided a more complete description of the tectonic influences on the Marion Plateau. This description utilises new modelling on the subsidence of the northeast Australia carbonate platforms and provides possible causes for the subsidence patterns seen. We have also clarified the section describing the facies geometry of the Marion Plateau which allows us to determine the magnitude of the Miocene N12-N14 sea-level fall regardless of plateau subsidence;
- "...the cartoon of the sea-level transect (CS-01 - CS-08) is insufficient by itself for the panel to judge the detailed rationale for site selection." To address this, we have included seismic data for two of the Marion Plateau transects, one of which was used to develop the diagram describing the facies evolution of the Marion Plateau (Figs. 3-4). Both of these lines were used for site selection. From these lines we have plotted expanded sections across each of the proposed drilling sites in both interpreted and un-interpreted forms. This will allow the panel to assess our site selections and the assertions that we make in the proposal concerning the development of the Marion Plateau and its utility to quantify the magnitude of the N12-N14 sea-level fall;
- shiptime has been granted for April 1999 (ORV Franklin) to collect detailed seismic surveys over the proposed drilling area. These data will supplement pre-existing seismic data, some of which has been provided in this revision of the proposal;

- two of the papers referenced in Section 2 (tectonics and subsidence sub-headings) are "submitted manuscripts", we have provided copies of these papers to the panel watch-dogs in case they need to be discussed;
- the environment SSEP recommended that a physical hydrogeologist be added to the proposal to strengthen the fluid flow objectives. We agree that this will be a great benefit, and we are currently seeking the appropriate person. As we were unable to find someone before this revision was due, we have no further information to add to the fluid flow section of the proposal and it has been omitted from this revision;
- although fluid flow objectives are an important complement to the sea-level objectives proposed in 510-Full2, we feel sea-level is the primary focus of this proposal. As such, we have downgraded the fluid flow objectives to secondary objectives. We would welcome the SSEP's advice on whether this is the appropriate strategy. If the SSEP's feel that we should leave fluid flow as a primary objective (with the appropriate addition of a physical hydrogeologist), we will do so;
- as recommended, sites relating to the recovery of pelagic sections for paleoceanography have been removed, as they were seen to detract from the coherence of the scientific objectives.

ABSTRACT

The proposed series of drillholes on the Marion Plateau in the western Coral Sea provides a superb opportunity to address the causes, magnitudes, and effects of sea-level change on continental margin sediments - a critical component of the ODP Long Range Plan. Specifically, the drilling transect on the Marion Plateau will provide fundamental information regarding the magnitude of Miocene sea-level variations, and the influence of these variations on continental margin sediments. There is general acceptance that one of the fundamental controls on the nature and geometry of continental margin deposition is sea-level fluctuations - however, much of the information on the relationship between sea-level and depositional facies is qualitative - the proposed drilling provides a superb and unique opportunity to determine the absolute magnitude of one of the major Cenozoic sea-level falls. As such, this drilling will be a significant complement to previous sea-level legs (Bahamas, New Jersey Margin).

Cretaceous rifting in the western Coral Sea formed continental fragments which are now capped by carbonate platforms. One of these fragments, the Marion Plateau, provides ideal drilling targets to determine the magnitude of sea-level change, and its influence on the geometry of continental margin sediments. This drilling will build on the achievements of earlier ODP drilling in the region (Leg 133), and accordingly will be able to specifically target sequences capable of resolving major scientific problems with a high likelihood of success.

Determining the magnitude of eustatic sea-level fluctuations has been a difficult problem, yet it is significant, not only for the establishment of a Phanerozoic sea-level curve, but also for understanding the stratigraphic response of continental margin sediments to sea-level forcing. Determining the magnitude of sea-level forcing on sedimentary facies also has major implications for global stratigraphic correlation and basin analysis.

The drilling strategy outlined for the Marion Plateau utilises the stratigraphic relationship between an early to middle Miocene second-order highstand carbonate platform complex and a late Miocene second-order lowstand platform complex to establish the magnitude of the middle Miocene N12-N14 sea-level fall. An important characteristic of this platform relationship is that the sites proposed are essentially located along a single strike line without intervening structural elements. Thus, subsidence of the platform will affect all sites equally, enabling a measure of the true amplitude of the sea-level fall that caused a shift in the locus of carbonate platform deposition.

In addition to the magnitude of the N12-N14 sea-level fall, the Marion Plateau also records an excellent Miocene sea-level record. This record is likely to include a complete third order event stratigraphy between 30-4 My.

1. SCIENTIFIC RATIONALE

1.1. The importance of determining the magnitude of eustatic sea-level variations

Measuring the amplitude and timing of eustatic sea-level fluctuations has proved to be a difficult problem, whose resolution is essential both for the establishment of an accurate eustatic sea-level curve for the Phanerozoic, and for the accurate interpretation of sediment sequences on continental margins. Several attempts have been made to determine the amplitude of glacioeustatic fluctuations, including passive-margin sequence stratigraphy (Vail et al., 1977; Vail and Hardenbol, 1979; Haq et al., 1987); modeling of sedimentary depositional regimes (Watts and Thorne, 1984); calibration of the oxygen isotope curve (Majors and Mathews, 1983; Miller et al., 1987; Williams, 1988); and analysis of the depositional history of carbonate sediments on atolls (Schlanger and Premoli-Silva, 1986; Halley and Ludwig, 1987; Moore et al., 1987; Lincoln and Schlanger, 1987, 1991). These analyses yield a wide range of results, but although there is often agreement between the different independent data sets with regard to timing of sea-level events, there are significant differences between estimates for the magnitude of sea-level events.

The establishment of a eustatic sea-level curve has major implications for global stratigraphic correlation and basin analysis, and defining the amplitude of such a curve remains one of the major challenges in sea-level research (COSOD II, 1987; Sahagian and Watts, 1991; JOIDES Planning Committee, 1996). In this proposal, we suggest that the excellent record of Miocene sea-level fluctuations preserved in the carbonate platforms of the Marion Plateau, southern Coral Sea (Fig. 1), provide an ideal opportunity to test sea-level models and quantify the magnitude of eustatic variations.

1.2. Absolute sea-level variations on the Marion Plateau

Extensive seismic surveys (Fig. 2) over the Marion Plateau have enabled the description of the various depositional sequences found on the plateau (Figs. 3-6). These data, along with sedimentological information from Leg 133 cores and dredge samples, have been used to develop a growth model for carbonate platform phases on the Marion Plateau, and the relationship of these platforms to sea-level change (Fig. 7).

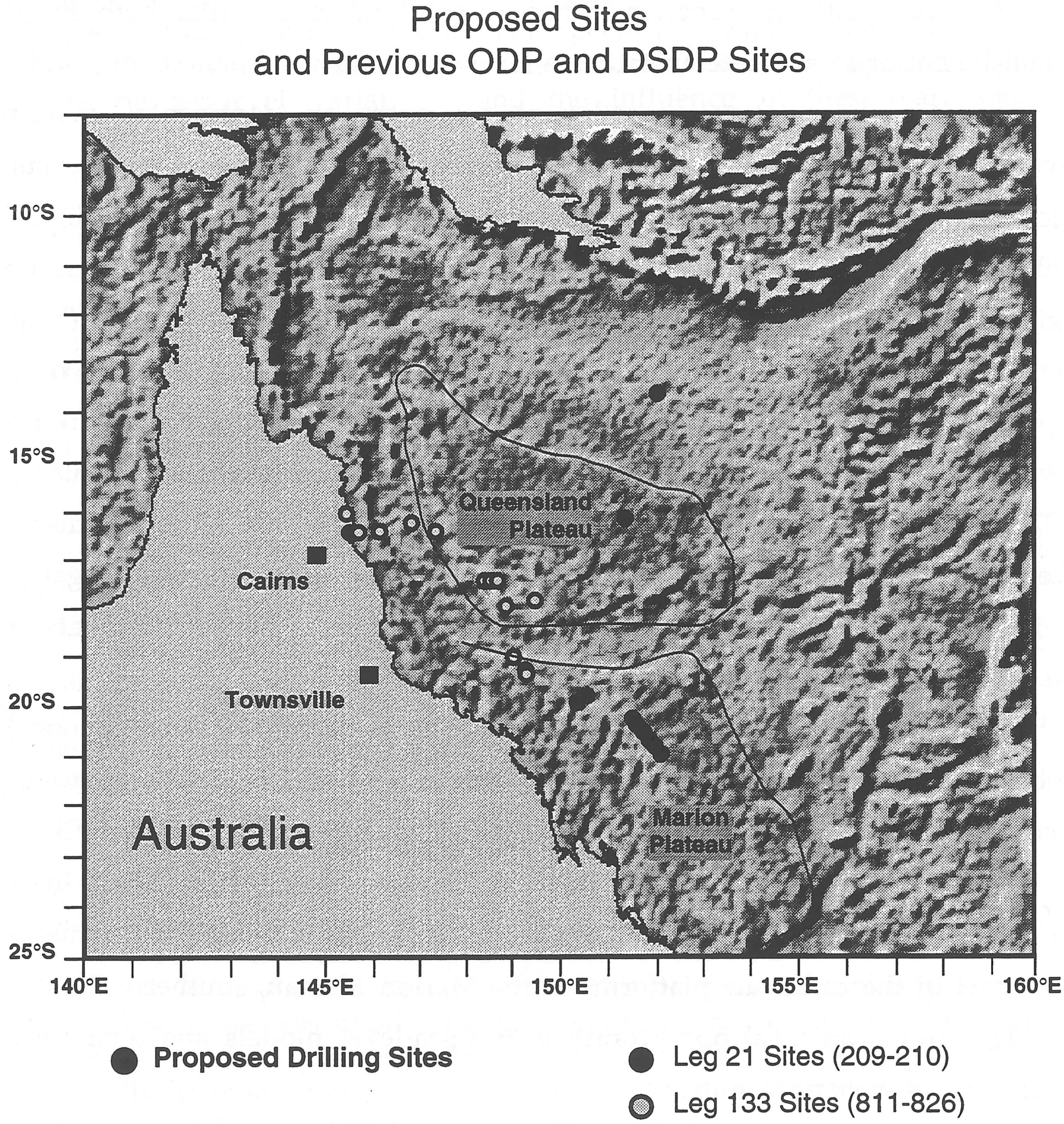

Figure 1: Gravity map of northeast Australia showing the Queensland and Marion Plateaus (outlined). Proposed drill sites on the Marion Plateau are shown in solid circles, with drill sites from Leg 21 shown in dark grey and Leg 133 in light grey.

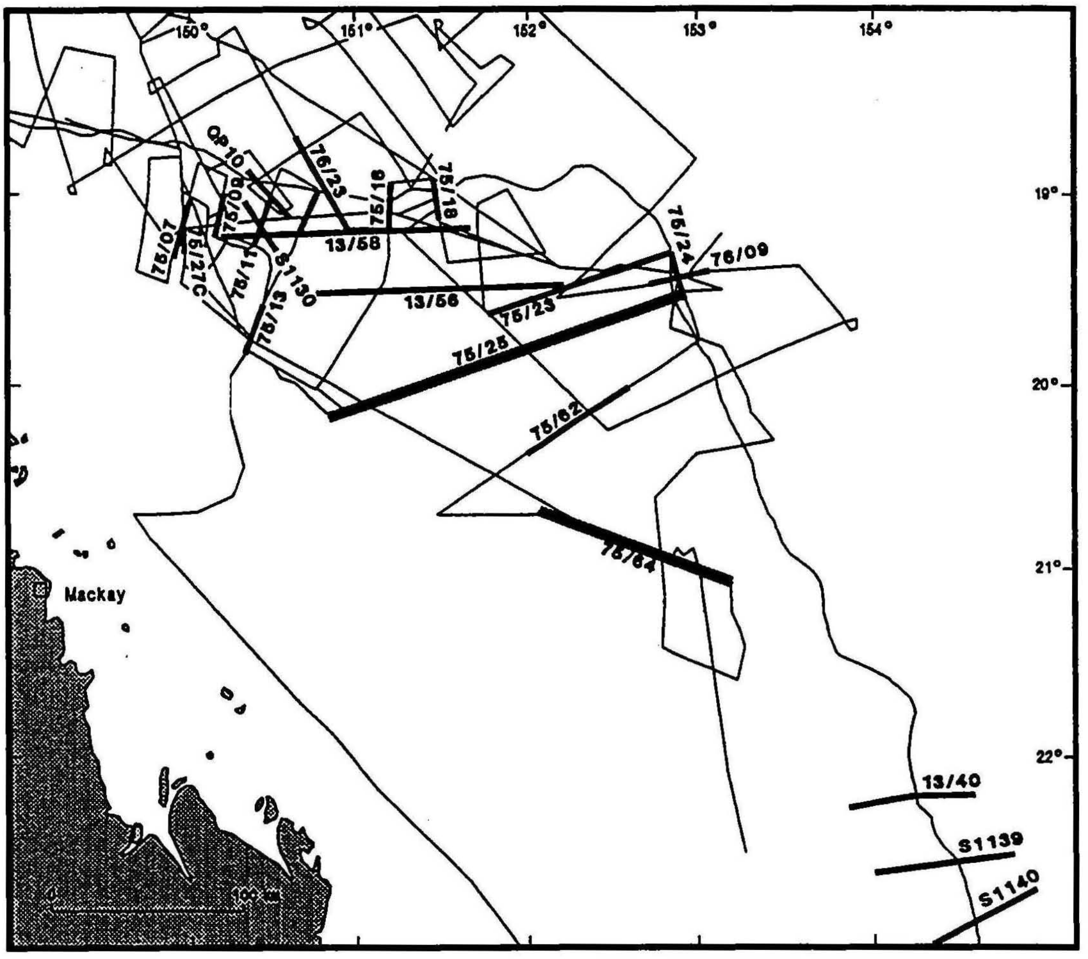

Figure 2: Locality map showing the positions of regional seismic lines. The proposed Marion Plateau drill sites are located on lines 75/25 and 75/64 (shown in gray).

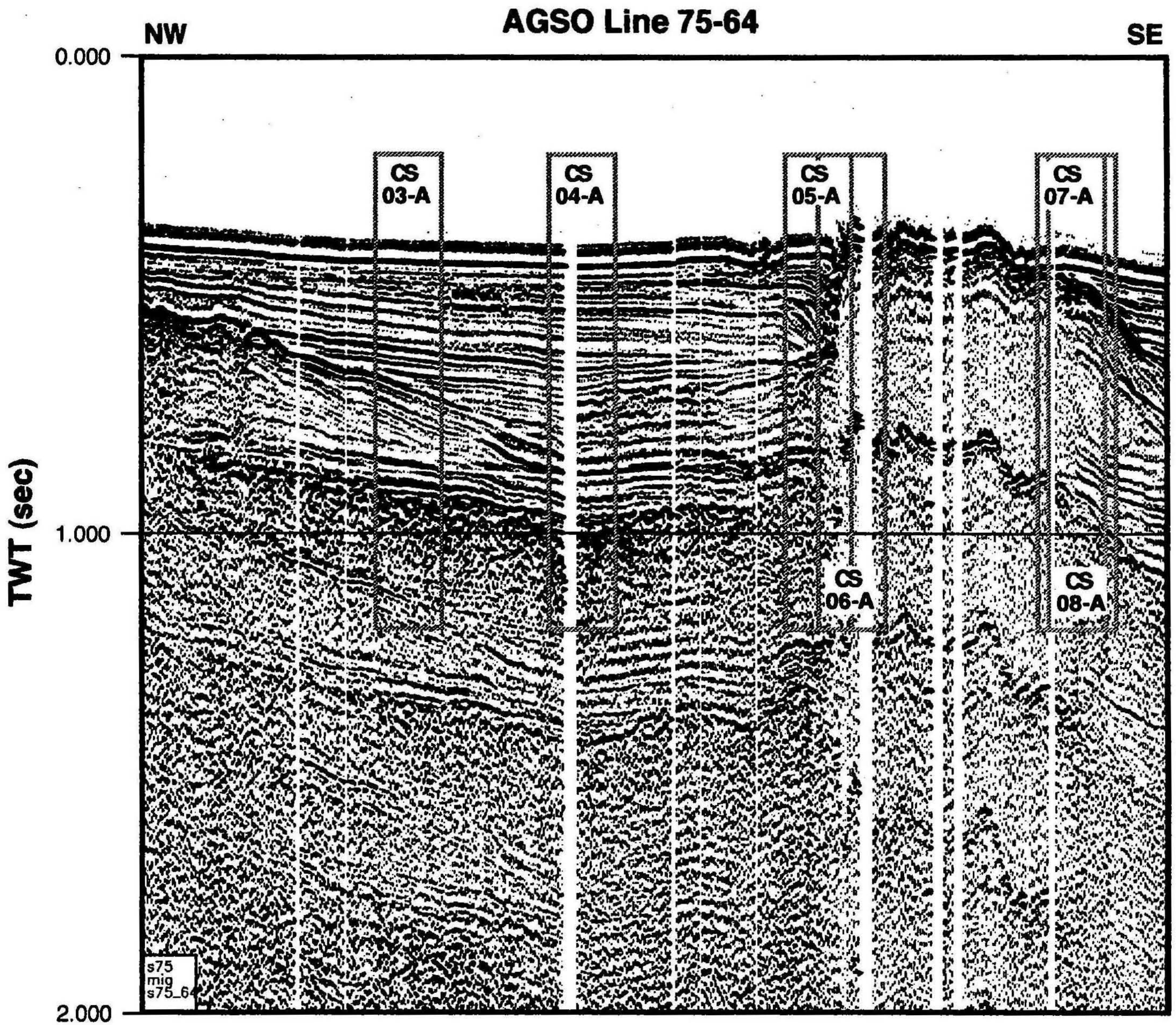

Fig 3: Un-interpreted AGSO seismic line 75-64 with boxes marking the location of detailed seismic figures found later in the text.

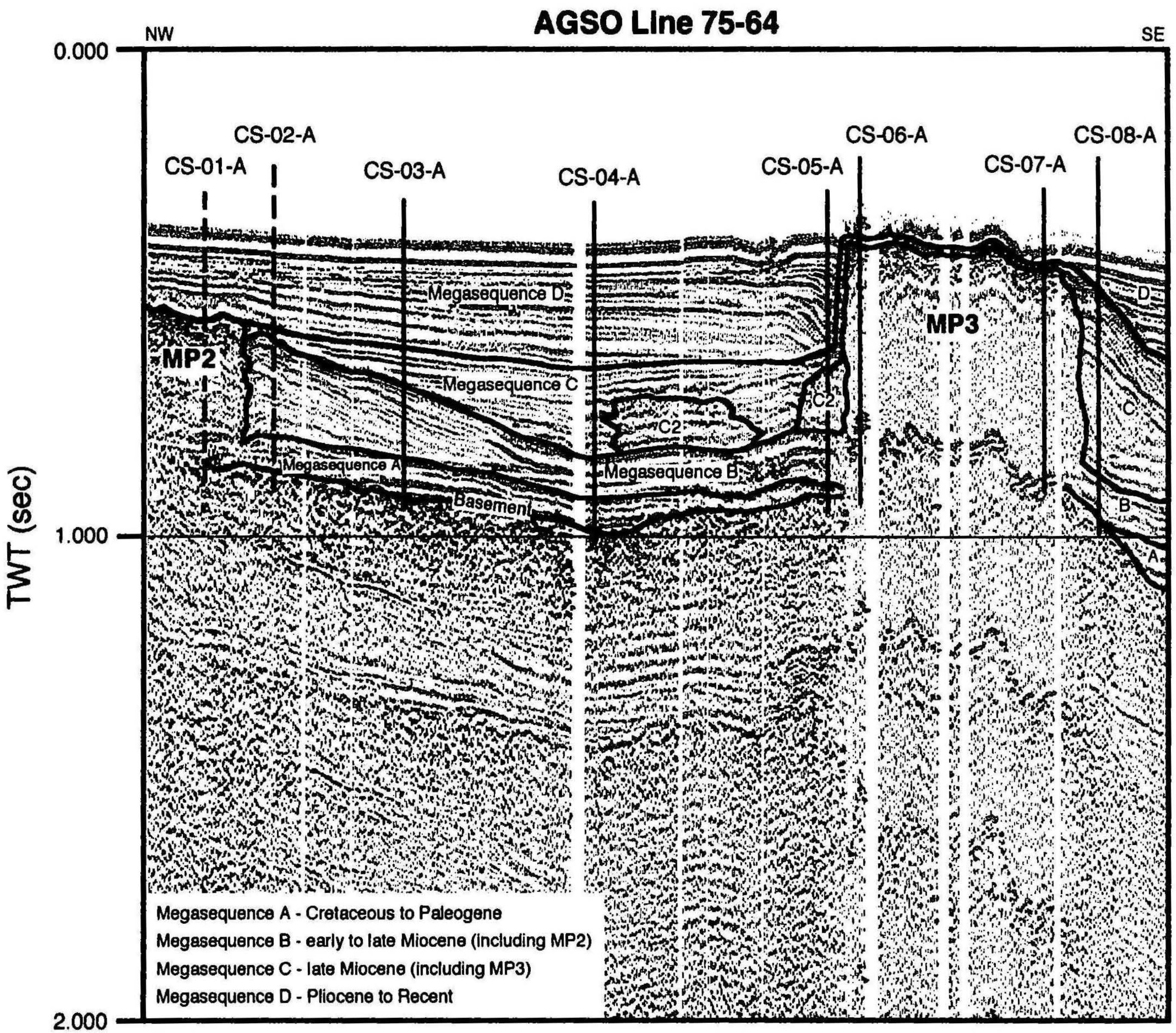

Figure 4: Interpreted AGSO line 75-64 with proposed sites and major sequence stratigraphic units. The facies geometry used to calibrate the amplitude of the Miocene N12-N14 sea level fall is shown by the relationship between platforms MP2 and MP3. Dashed lines indicate sites that have been chosen using Line 75-25 but can still can be identified within a similar facies on this line. More detail on site placement can be seen on subsequent detailed sections. C2 is a carbonate growth phase occurring during Megasequence C.

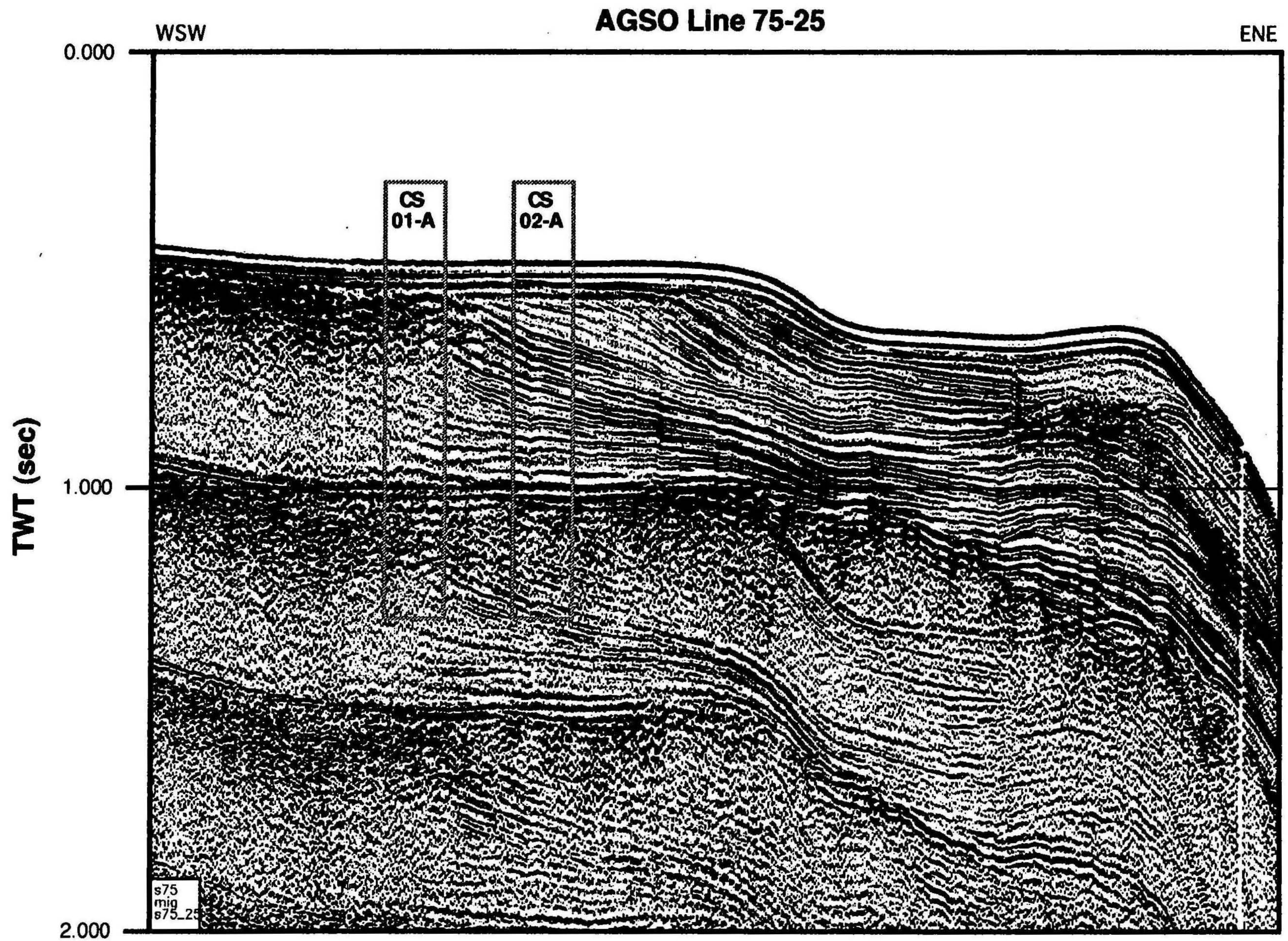

Fig 5: Un-interpreted AGSO seismic line 75-25 with boxes marking the location of detailed seismic figures found later in the text.

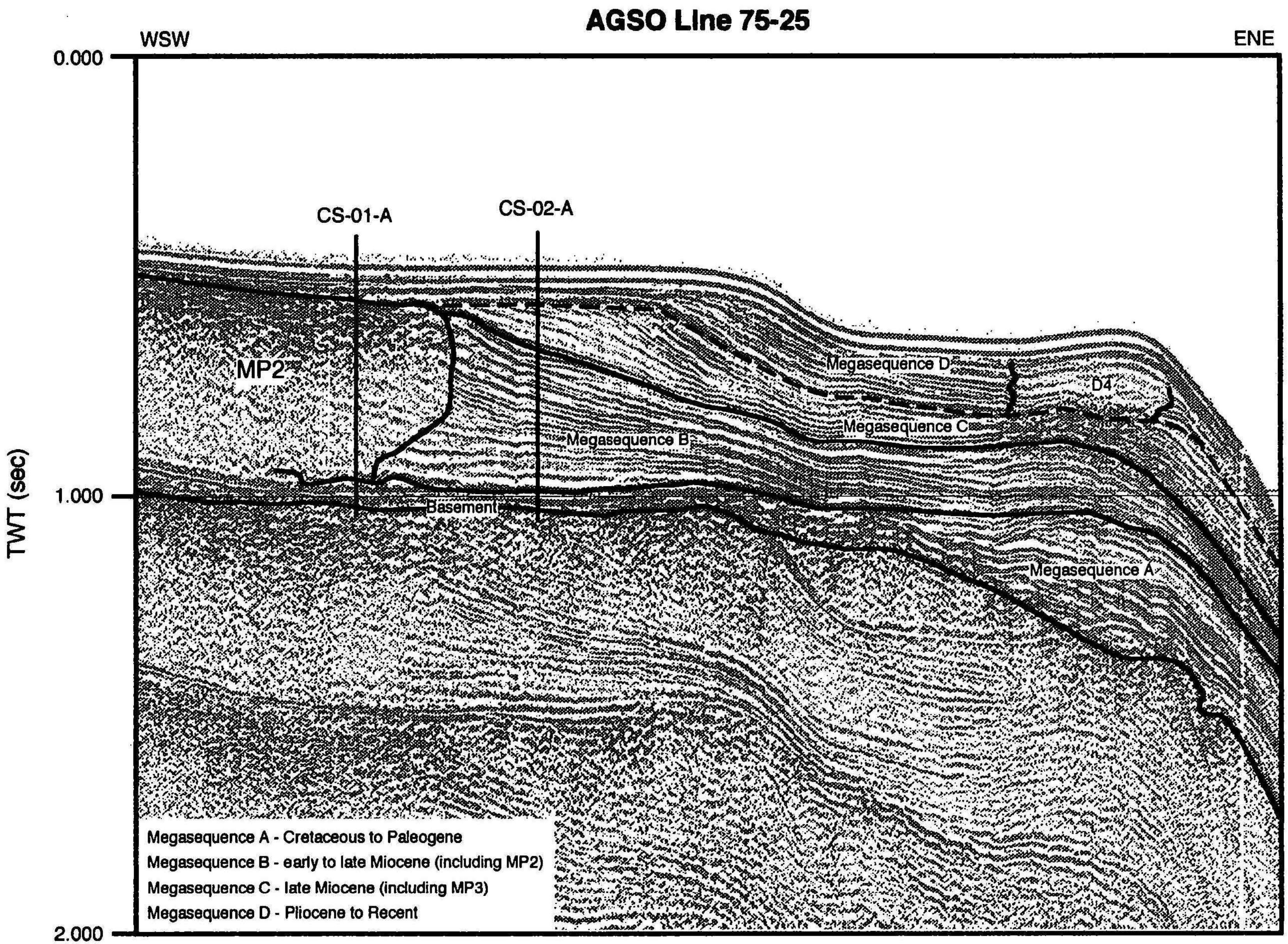

Figure 6: Interpreted AGSO line 75-25 with proposed sites and major sequence stratigraphic units. D4 is a growth phase occurring within Megasequence D.

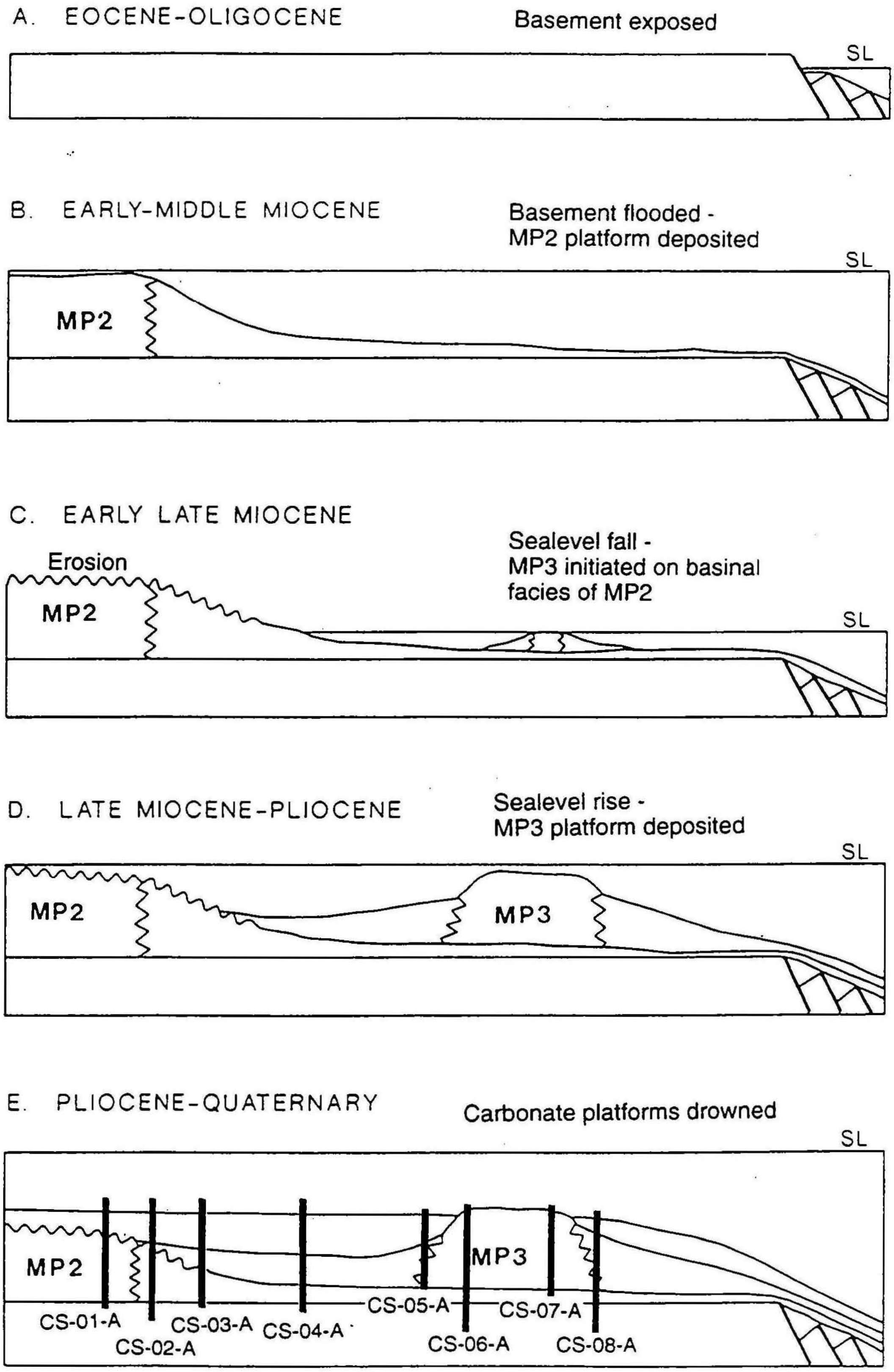

Figure 7 Schematic depositional history for MP2 and MP3 phases of Miocene to Pliocene carbonate platform development on the Marion Plateau illustrating the lowstand nature of the initial MP3 phase. Proposed drilling sites are marked on E.

To determine the sea-level event stratigraphy on the Marion Plateau through drilling, it will be necessary to establish:

1. the depositional history of the Miocene carbonate platforms of the Marion Plateau by (Figs. 3 - 7):
   - establishing a detailed chronostratigraphy for each platform phase;
   - determining the depositional environment of each platform phase;
   - determining the age and duration of each unconformity;
   - inferring the paleo-water depth of each phase; and
   - establishing the total thickness of each platform.
2. calculating the amplitude of the Middle Miocene (N14-N12) sea-level fall by:
   - determining the age, depth and paleo-water depth of the older (MP2) platform (Figs. 3 - 7);
   - determining the age, depth and paleo-water depth of the initial phase of the younger (MP3) platform.

The proposed drilling will achieve the following objectives:

- Drilling will determine the magnitude of the N12-N14 eustatic sea-level fall, one of the largest in the Cenozoic. An accurate understanding of the magnitude of this change is necessary to fully understand the development of continental margin facies;
- Drilling will recover the excellent Miocene sea-level record preserved in the carbonate platform growth phases of the Marion Plateau. Seismically, this record appears to include a complete third-order event stratigraphy from 30-4 Ma;
- Drilling will enable detailed investigation of the facies changes, and the development of sequence stratigraphic units, occurring with this sea-level fall in a mixed carbonate-siliciclastic margin environment;
- It is likely that the MP3 platform is at least partially composed of temperate to sub-tropical carbonates. Thus, the results of this drilling will rely on and extend the results of Leg 182 (Temperate-Water Carbonates).

To establish the magnitude of the sea-level fall that enabled the formation of the lowstand MP3 platform, it is first necessary to determine the paleowater depth of the top of the early-middle Miocene MP2 platform (Fig. 7). Leg 133 drilling (Sites 816 and 826) showed that the top of this platform consisted of a tropical platform assemblage deposited in water depths no greater than 20 m Davies, McKenzie, Palmer-Julson, et al., 1991). This depth defines the approximate point from which sea-level began to fall (Pigram et al., 1992). Sampling evidence indicates that the top of MP2 has been subjected to subaerial exposure. The dissolution and erosion which is likely to have resulted from exposure would have made the present-day top of MP2 lower than it originally would have been, thus introducing an error in determining the correct position of sea-level immediately prior to the fall. The extent of erosion is difficult to quantify, but generally it would be expected that the loss would be small since the high digenetic potential of these tropical carbonates would tend to create a carbonate pavement that would be difficult to erode. Any sediment loss to the top of MP2 will result in the underestimation of the true amplitude of sea-level fall (Pigram, 1993).

The low-point of the sea-level fall is defined by the paleo water depth at the time the first sediments of the late Miocene lowstand MP3 platform were deposited (Pigram et al., 1992; Fig. 7). The MP3 platform was not sampled during Leg 133 drilling and therefore the biofacies which compose this platform can only be inferred seismically. The seismic character of MP3 appears to have both "tropical" (vertically accreted) and "temperate" (mound-like) signatures.

Stable isotopic data from Leg 133 Site 811 showed that during the late Miocene, sea surface temperatures (SST) were cool (~20-22°C), as were global SST's (Isern et al., 1996). Given the more southerly location of the MP3 platform with respect to Site 811 (Queensland Plateau), it is likely that SST's were similar, if not cooler than over the Queensland Plateau. SST's at or below 20°C would not prevent tropical coral growth, but would make it more likely that the MP3 platform was constructed of a "cooler" more sub-tropical bio-assemblage. If MP3 is indeed composed of cooler water fauna, it is likely that the depth of platform initiation would be greater than for purely tropical carbonate. Thus, without sampling the MP3 platform we are unable to give an exact estimate of the paleowater depth of MP3 formation:

- If MP3 is entirely tropical, its formation depth was likely to be ~20-25 m. This results in a N12-N14 sea-level fall of 185-190 m. This eustatic change is greater than other estimates for this time interval (30-90 m Miller et al., 1987; >100m Vail and Hardenbol, 1979)

- If MP3 is sub-tropical in composition, the depth of initiation would have been ~50-70 m. Thus, the N12-N14 sea-level fall would be approximately 135-155 m;
- It is also possible that sea-level fell below the level on which MP3 was established, thus also affecting the estimate of sea-level change, but there is no seismic evidence to support this conclusion (Pigram et al., 1992).

1.3. The influence of subsidence on sea-level magnitudes

The inability to remove tectonic subsidence effects from relative sea-level signatures has hindered the quantification of eustatic sea-level variations in many areas. However, a sea-level shift that occurs between two sites of equal tectonic subsidence rates is an accurate record of the magnitude of eustatic change. Thus, for the difference between the top of MP2 and the initiation of MP3 to be an accurate measure of the N12-N14 eustatic fall, it is necessary to demonstrate that there is no differential subsidence along the drilling transect. There are two lines of evidence to support this:

First, the Marion Plateau is not structurally compartmentalised and therefore behaves as a single structural entity (Symonds et al., 1988). Seismic lines between the proposed sites (Figs. 3 - 6) show that there are no structural elements, such as faults, between the proposed drilling sites which would cause the sites to have relative differential subsidence.

Second, because the Marion Plateau basement surface is planated with minimal dip to the northeast (Figs. 3 - 6), depths to basement surface contours can be considered iso-subsidence lines (Fig. 8). The eight drilling sites proposed are all near the 1000 sec basement contour indicating that there is a minimal basement gradient between the sites, and thus negligible differential subsidence.

Calibration of eustatic sea-level variations can only be realistically estimated on slowly-subsiding, structurally well understood margins, where an accurate tectonic subsidence history can be established, and where sites of equal tectonic subsidence, that have both the highstand and the lowstand history preserved, can be located. The advantage of such areas is that, although falling

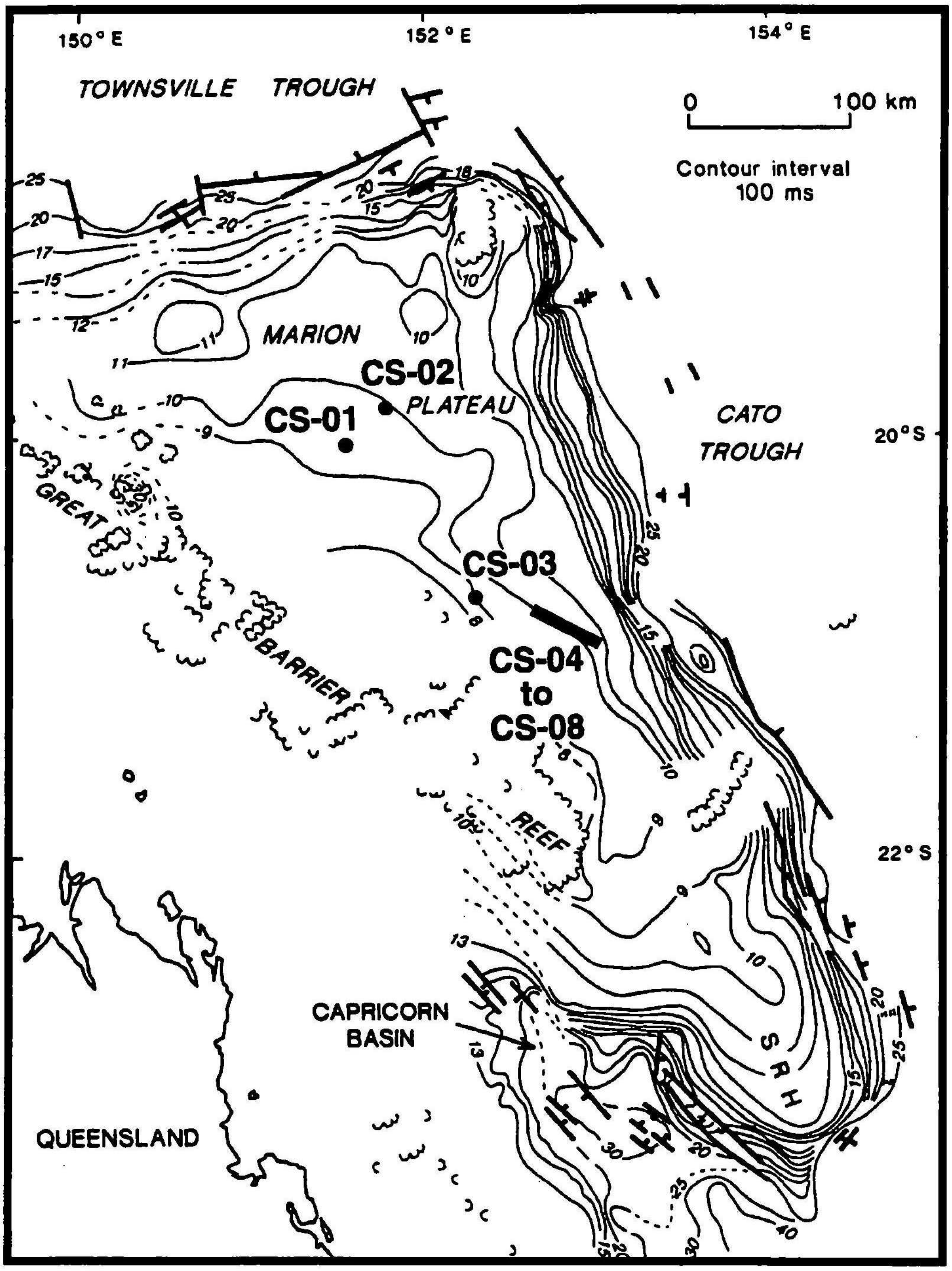

Figure 8. Structure contour map for basement of the Marion Plateau (after Pigram et al., 1992). Contours are effectively isosubsidence lines for total subsidence of basement. Locations of proposed drillsites are shown. Note that the sites are generally strike parallel to the flexural axis and have undergone similar total subsidence.

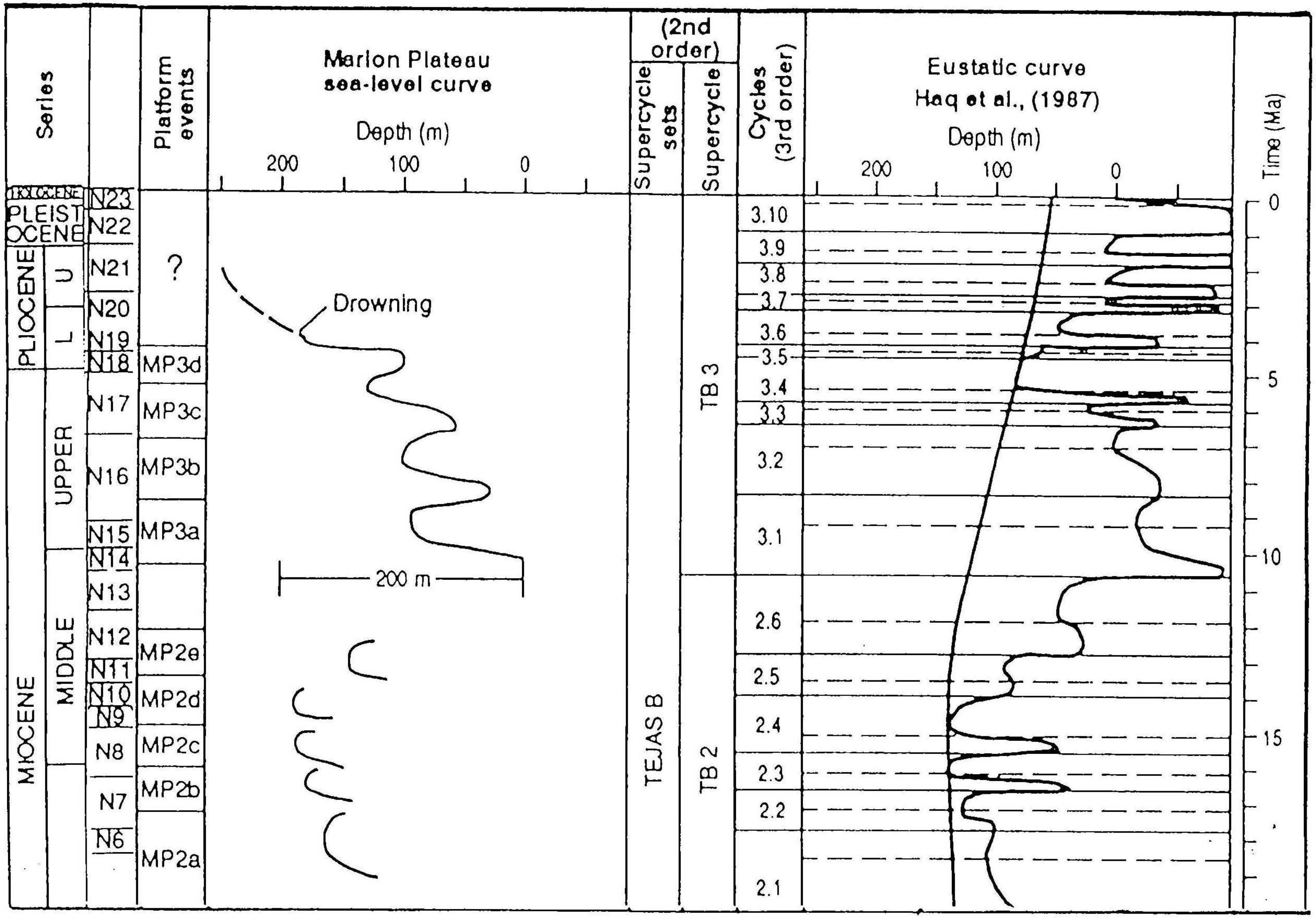

Figure 9 Marion Plateau sealevel events vs age compared to those from Haq et al., 1987.

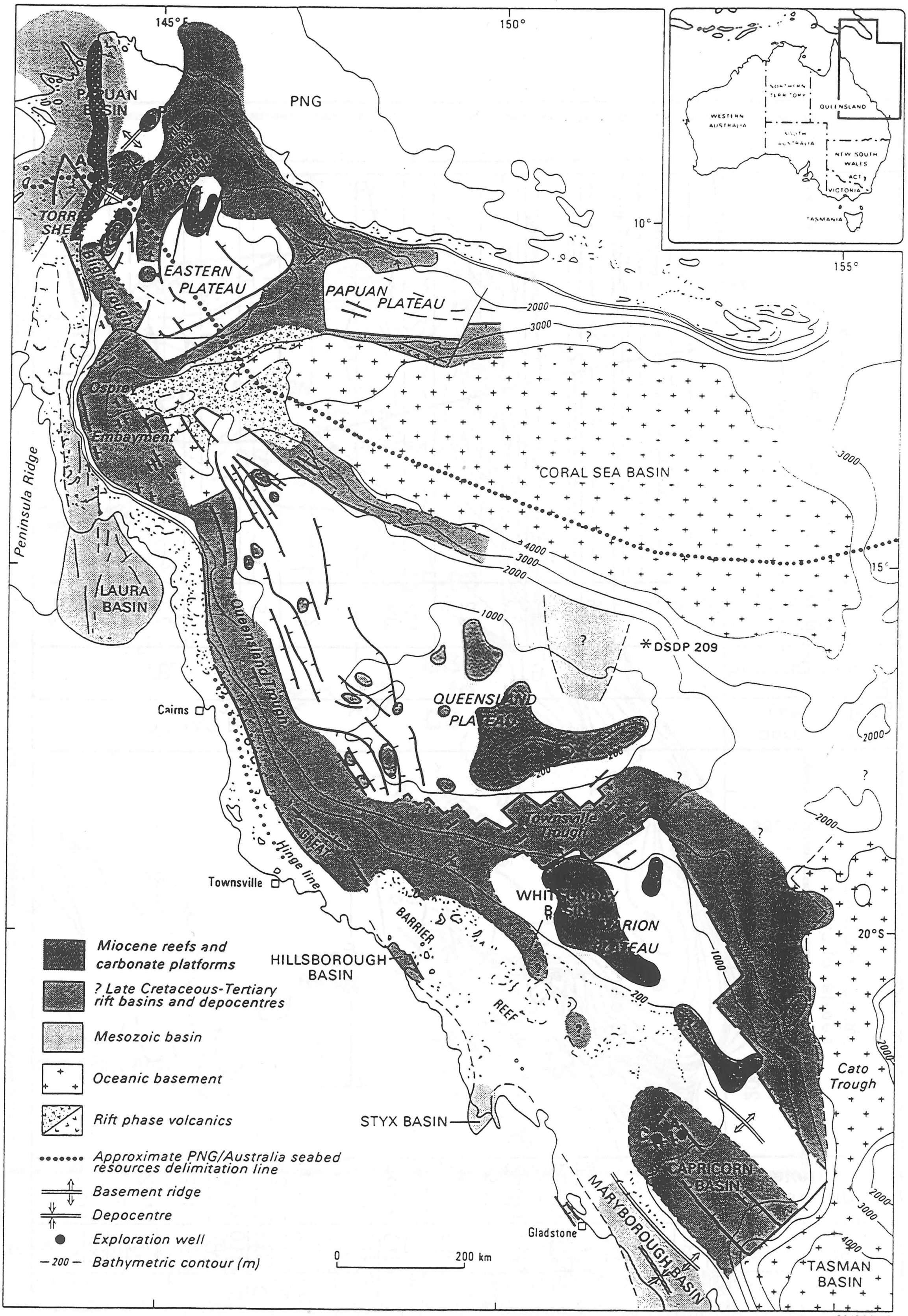

Figure 10 Map showing the major structural features of the Coral Sea

sea-level is following the tectonically subsiding platform, the depth change recorded between two sites is self-correcting, because they both subside by the same amount. The Marion Plateau fulfils the above criteria, and therefore the drillsites we have proposed will provide the ideal location to determine eustatic sea-level amplitudes and fluctuations in the South Pacific.

1.4. Growth phases of the Marion Plateau and their record of sea-level variations

Carbonate platforms are sensitive indicators of sea-level variations by recording growth during sea-level highstands, and shutdown during sea-level lowstands. Sampling through one of these platforms will record sea-level in a "dipstick" fashion. The carbonate platforms of the Marion Plateau have a record of well imaged seismic geometries which will enable the investigation, correlation, and dating of sediment sequences recovered from the plateau. This information will provide an independent basis for development and assessment of the global sea-level curve (Fig. 9).

The Miocene MP2 platform is likely to have formed as a series of transgressive and highstand system tracts (Fig. 9). Five highstand events are recorded by MP2 (MP2a - MP2e) thus providing a record of third-order sea-level variations during the time interval of deposition. Only MP2e was sampled during Leg 133 and thus the age at which the other events occur is not known.

The late Miocene MP3 platform began to form during a lowstand on the bathyal outer slope sediments of MP2. The MP3 phase subsequently evolved into a series of highstand systems tracts, but remained structurally lower than the top of MP2 for most of its history (Figs. 3, 4, and 7). The late Miocene MP3 platform records four sea-level cycles (MP3a - MP3d; Fig. 9). The sea-level rise during MP3d corresponds to the last phase of platform growth. This rapid sea-level rise, in conjunction with other environmental factors, resulted in the drowning of most of the plateau.

It is difficult to compare the growth phases recorded in MP2 and MP3 to global events, as the exact timing of their development will not be known until the sequences are drilled. But, seismic evidence shows that there is an excellent Miocene record of sea-level variations preserved in the carbonate platforms of the Marion Plateau. The recovery and dating of sediments from these sequences will provide important information on Miocene sea-level events and their influence on continental margin sedimentation, and provide data to be used in conjunction with the other "sea-level" legs drilled as part of the ODP global sea-level strategy.

2. GEOLOGIC BACKGROUND

2.1. Geologic Setting

The Marion Plateau is located between 18°S and 23°S in the area seaward of the south-central Great Barrier Reef on the northeastern Australian continental margin. This plateau is the most southerly of the northeast Australian Marginal Plateaus, and it forms a deeper extension of the Queensland continental shelf. The plateau is bounded along its northern margin by the Townsville Trough; the Cato Trough along the eastern margin, and the south-central Great Barrier Reef to the west (Fig. 10). The Marion Plateau is part of a slowly subsiding margin. It is believed that the plateau top remained exposed throughout much of the Paleogene, and became planated to form a gently northward-dipping, relatively smooth plateau surface (Pigram, 1993).

2.2. Tectonics of the Marion Plateau

The eastern Coral Sea has been affected by two distinct tectonic events. The earlier event, late Jurassic-Early Cretaceous in age, was responsible for the formation of the Queensland and Townsville basins which underlie the present-day bathymetric features of the Queensland and Townsville Troughs (Fig. 10). These basins formed due to oblique extension along pre-existing Paleozoic structural trends (Struckmeyer and Symonds, 1997). The Queensland and Townsville Basins do not appear to have been affected by the later tectonism responsible for seafloor spreading in the Tasman and Coral Sea Basins (Struckmeyer and Symonds, 1997).

In the late Cretaceous, rifting in the Coral Sea Basin created numerous continental fragments which are now capped by carbonate platforms, such as the Marion and Queensland Plateaus (Fig. 1 and 10). Rifting in the Coral Sea was an extension of late Cretaceous (80 Ma) seafloor spreading in the Tasman Basin, which extended to the north to form the Cato Trough and the Coral Sea Basin by

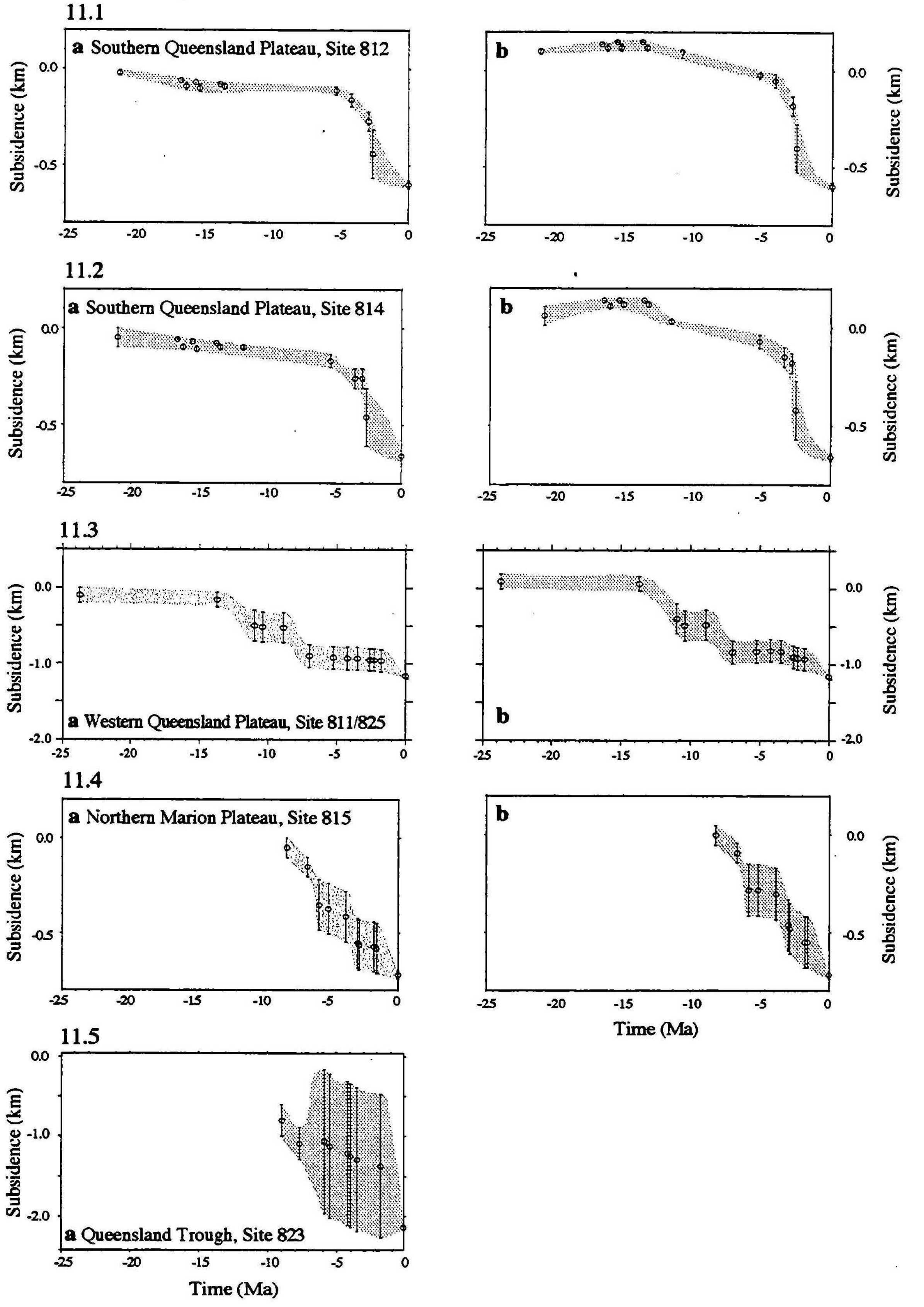

Figure 11. Water loaded tectonic subsidence (ie. with the isostatic sediment load removed) for ODP Leg 133 Sites 812, 814, 811/825, 815 and 823 assuming constant eustatic sea-level (a) and using eustatic sea-level variations of Haq et al. 1987 (b). The latter is not shown for Site 823, as the errors in water depth (vertical error bars) are much larger than eustatic sea-level variations. Shading around error bars indicates the area in which the true subsidence curve should occur.

Comparisons between (a) and (b) lets us evaluate the potential effect of eustatic variations on tectonic subsidence models. For instance, the first model for Site 814 (a) shows a gently subsiding platform until about 5 Ma, whereas the second model, including eustacy (b), shows a tectonic subsidence pulse between 14 and 12 Ma. Therefore, the latter may be entirely due to the input of an ill-constrained eustatic sea-level curve.

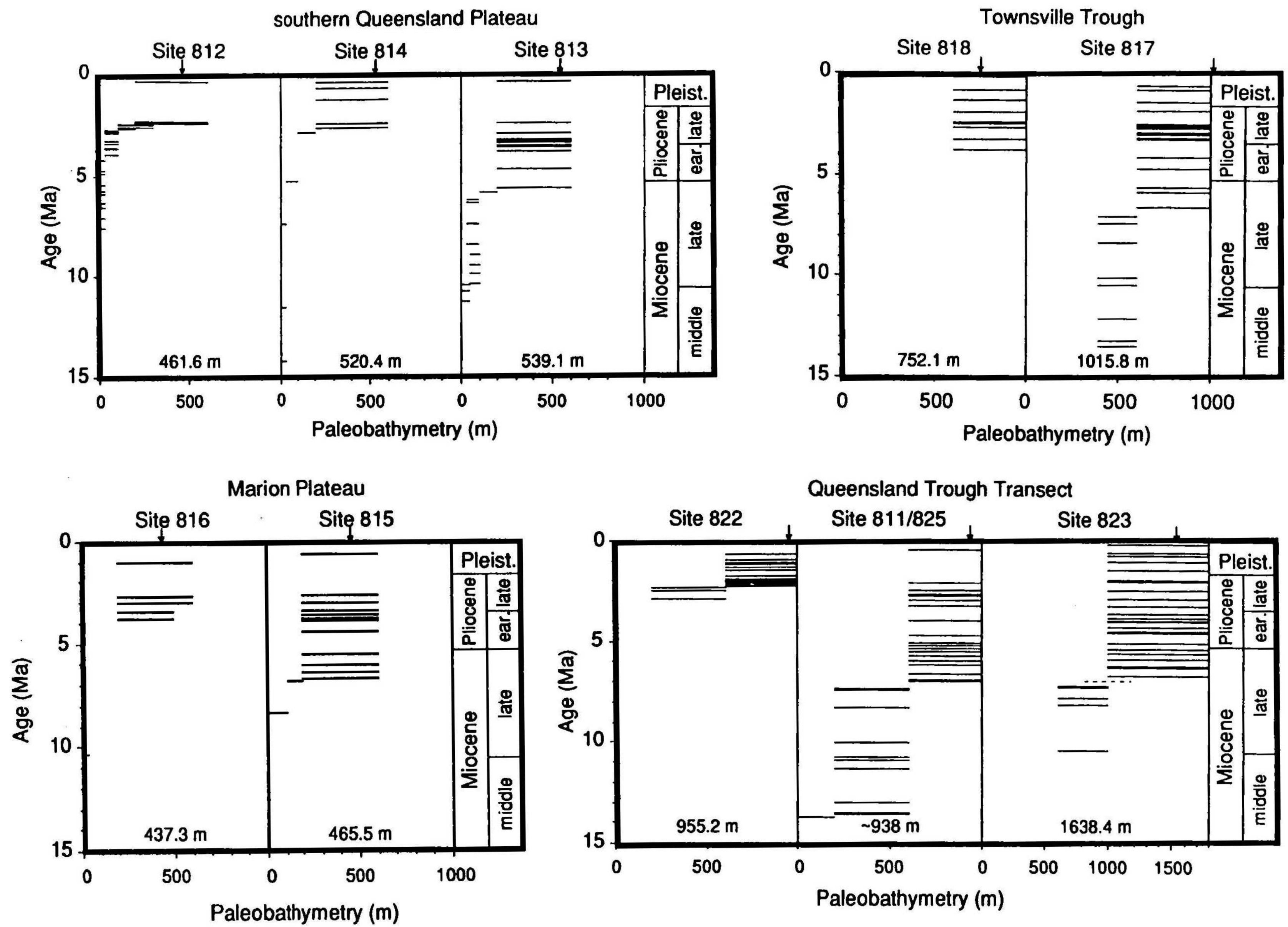

Figure 12: Paleobathymetric histories for the Queensland and Marion Plateaus as inferred from benthic foraminiferal data plotted versus age from Katz and Miller (1993). Present-day water depths are shown for all sites.

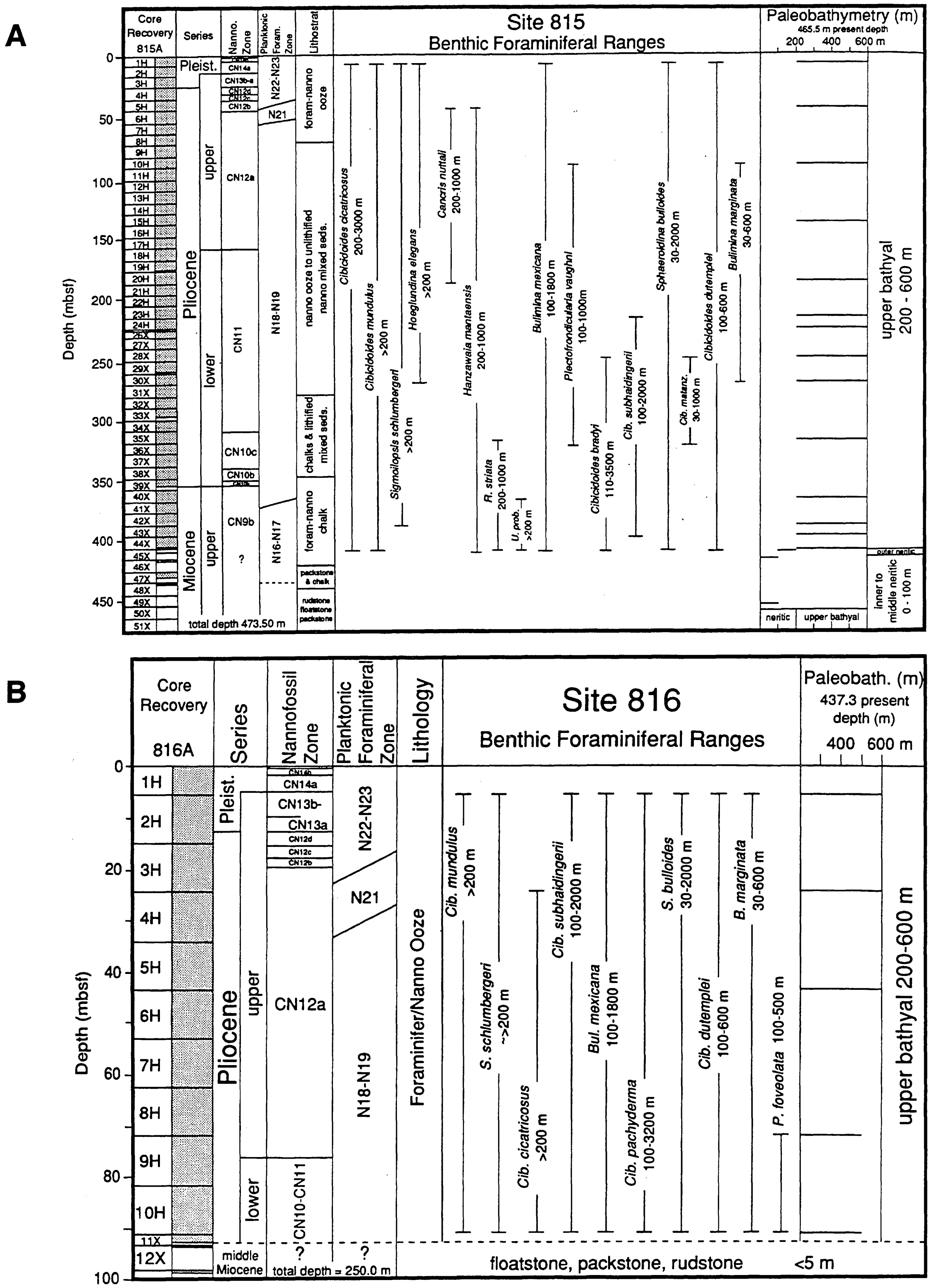

Figure 13:
a and b. Site 815 and 816 benthic foraminiferal range data and paleobathymetric interpretation. Nannofossil and planktonic foraminifer range zones are shown along with lithologies. Vertical range lines indicate the section over which a particular benthic foraminifer is present with its corresponding depth range. Paleobathymetry in final column is interpreted from range data.

All data is from Katz and Miller, 1993

65 Ma (Fig. 10) (Weissel and Hayes, 1971; Hayes, 1973; Shaw, 1978). Spreading is believed to have ceased along the length of the system by the earliest Eocene (52 Ma; Gaina et al., submitted). Thus, the main physical elements of the western Coral Sea were in place by the early Tertiary (Davies et al., 1989). Although the exact structural style and development history of the rift system is still not completely understood, it is clear that the late Jurassic-Early Cretaceous rifting event controlled the gross architecture of the margin in addition to the form of the high-standing structural elements on which the numerous carbonate platforms in the area are located.

The Marion Plateau is a largely undeformed basement block structured only on its margins. Basement along the northern margin consists of gently dipping ramps that gradually deepen towards the Townsville Trough until a fault is encountered. Normal extensional faults along this northern margin are restricted to the edge of the plateau, and include both down-to-basin faults with dips to the NNW and normal faults of opposite polarity which dip beneath the plateau (Symonds, et al., 1988). The eastern margin of the plateau is free of major structural offsets (Mutter and Karner, 1980) and the slope is apparently simple and continuous. Faults along this margin are steeply dipping to vertical and downfault the margin of the plateau into the Cato Trough. The southern part of the plateau is formed by a southeasterly plunging, gently arched basement high. The top of the arch is unstructured and faults are confined to the flanks of the arch and appear to be high-angle down-to-basin normal faults on conventional seismic data (Pigram, 1993)

The basement of the Marion Plateau is likely to be similar to that of the Queensland Plateau to the north. This basement was drilled during Leg 133 (Sites 824 and 825) and consists of fine grained, dark gray, poorly foliated, well-lithified, quartz-feldspar-mafic metasediment or metavolcanic rocks. These rocks are similar to those found in the onshore Queensland Hodgkinson Province (Ordovician-Devonian) which outcrops as part of the northern Tasman Fold Belt (Feary et al., 1993). Seismic data from the Marion Plateau show the basement to be a planated surface dipping slightly to the northeast (Fig. 8). Planation of the surface occurred during subaerial exposure in the Mesozoic prior to the deposition of Megasequence A (Figs. 3 - 6).

As stated previously, there is no direct sampling of the basement under the Marion Plateau, but a recently developed plate model and seismic data indicate that basement crustal blocks of the two plateaus had roughly similar tectonic histories in regard to rifting and extension (Gaina et al., submitted; Struckmeyer et al., 1997). The presence of shallow water (~20 m) carbonate sediments directly overlying basement at Sites 824 and 825 on the Queensland Plateau, indicates that the planated basement surface of the Queensland Plateau was at or near sea level immediately prior to the onset of sedimentation. Using this information, we can estimate the thickness of the crust under the Queensland Plateau. Assuming average crustal density, the upper surface of a 30 km thick crust would exist at sea level. Tectonic subsidence models (Fig. 11) show that there was nearly no change in the depth of the Queensland Plateau surface between 25-10 Ma (Fig. 11). Thus, it can be concluded that the early Tertiary opening of the Coral Sea resulted in little crustal thinning on the Queensland Plateau. Otherwise, we would not observe thermal subsidence rates equal, or close to zero in the early Tertiary. These results also show that thermal subsidence from the earlier late Jurassic-Early Cretaceous event could no longer be detected on the Queensland Plateau within the Neogene.

2.3. Subsidence history of the Marion Plateau

Although the Marion and Queensland Plateaus are located on a passive margin, approximately 1000 km south of the Pacific-Australian plate boundary, they record a greater amount of post 9 Ma subsidence than can be predicted from simple elastic models (post 9 Ma subsidence of 1300±200 m in the Queensland Trough, 650±200 m on the western margin of the Queensland Plateau, post 5 Ma subsidence of 500±30 m on the southern margin of the Queensland Plateau, and 660±50 m on the northern margin of the Marion Plateau; Figs. 11 - 13).

The tectonic histories of the Marion and Queensland plateaus are well constrained by Leg 133 drillholes (Fig. 1) and extensive multi-channel seismic data (Figs. 2-6). Subsidence curves for the Marion and Queensland Plateaus have been produced using both benthic foraminifera (Figs. 12 and 13) and geohistory modelling (Fig. 11). Geohistory models were calculated using integrated geophysical logs, biostratigraphic/lithological information, and seismic reflection data (Müller et al., submitted). These models show tectonic subsidence pulses occurred on both plateaus between 9 and 5 Ma. It is difficult to account for this observed subsidence, either by means of thrust loading in Papua New Guinea, or by a combination of the latter and in-plane stresses originating from collision along the Australian-Pacific plate boundary (Müller et al., submitted).

Müller et al. (submitted) suggest that the observed post 9 Ma tectonic subsidence of the Queensland and Marion plateaus and Queensland Trough is largely caused by dynamic surface topography due to Australia's northeastern margin overriding a slab burial ground, modulated by flexural deformation resulting from collision tectonics north of Australia. This conclusion is supported by shear wave tomography data (Zhang and Tanimoto, 1993) which shows a NNW-SSE trending band of anomalously high velocities in the upper mantle at depths between 300 and 650 km. Although unproven, this explanation appears most reasonable to account for all available data.

Despite the occurrence of post-9 Ma subsidence events on the Marion Plateau, the observed rates of tectonic subsidence are much slower than those of 3rd-order sea-level changes, and can thus be differentiated from glacial-eustasy. In addition, due to the methodology proposed here to investigate sea-level change, any unaccounted subsidence will be the same for all sites along the transect as they fall along lines of equal subsidence and thus modelled, slow, tectonic subsidence will not affect our attempts to quantify sea-level variations.

2.4. Stratigraphy of the Marion Plateau: evidence from prior drilling

Stratigraphies for the Marion Plateau were obtained during ODP Leg 133 (Fig. 14). These data supplement previously acquired, extensive seismic surveys over the plateau (Fig. 2). Both of these datasets have enabled a description of the Marion Plateau depositional history. Initiation of shallow marine carbonate sedimentation on the Marion Plateau began during the Paleogene, as the sea transgressed across the metasedimentary basement of the plateau (Davies, McKenzie, Palmer-Julson, et al., 1991). We have no direct age controls on the sediments which form Megasequence A (Figs. 3-6) as they have not been sampled. Their age is inferred by their stratigraphic position under Megasequence B (Pigram, 1993; Figs. 3-6). These first sediments over basement are believed to be

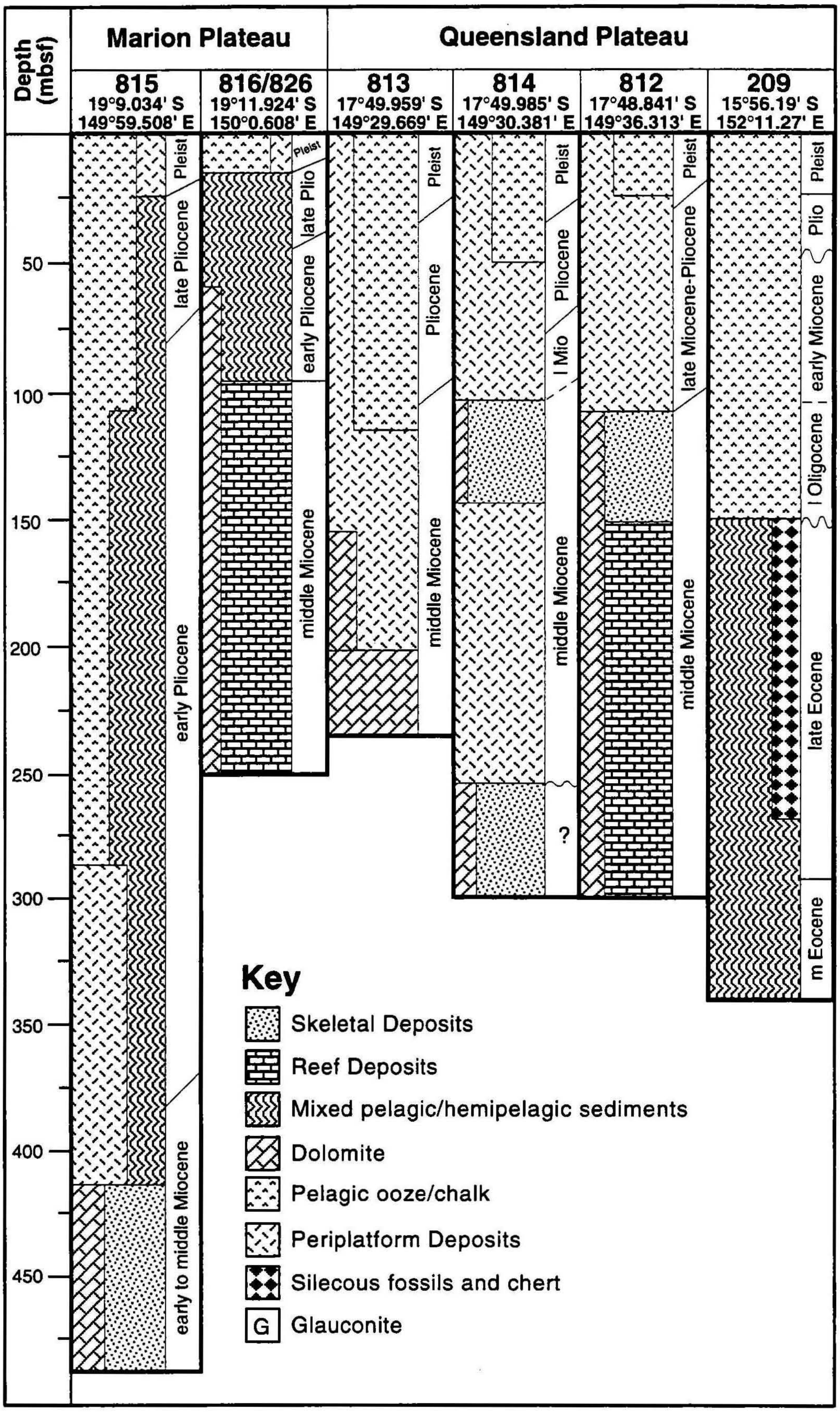

Figure 14 Stratigraphic summary of sites near proposed drilling areas. All sites were drilled during Le133 except for Site 209 which was drilled during DSDP Leg 21.

primarily clastics, with temperate water carbonates occurring in the eastern part of the sequence.

Sedimentary facies and correlation to seismic profiles indicate that tropical reef development was initiated on the Marion Plateau in the early Miocene and, by the middle Miocene, there was extensive reef growth on the plateau (Davies, McKenzie, Palmer-Julson et al., 1991). These reefal sediments are part of Megasequence B and include the MP2 platform (Figs. 3-6).

In the late middle Miocene, carbonate bank productivity rapidly diminished on the Marion Plateau, as shown by a reduced fine-grained, bank-derived component in slope sediments. This decline was primarily the result of subaerial exposure resulting from a sea-level regression which caused the demise of the MP2 platform. During the low sea-level interval between 11-7 Ma, the MP3 platform was initiated on the eastern side of the Marion Plateau. Despite the fact that MP3 developed during a lowstand, the platform continued its development during subsequent highstand intervals. During the development of MP3 the western 2/3 of the Marion Plateau was exposed, forming a broad low-relief karstic surface. Unlike MP2, MP3 has not completely drowned, but is now restricted to the area of Saumarez Reef. The limited sampling of MP3 inhibits speculation on the cause for partial drowning, although some likely factors are reduced sea surface temperatures (Isern et al., 1996) and increased terrigenous inputs which resulted in increased water column turbidity (Pigram, 1993).

Carbonate production from the Pliocene to Recent never again achieved the areal extent which existed in the Neogene. Instead, hemipelagic sediments dominated sedimentation on the Marion Plateau.

3. EXISTING DATA

3.1. Seismic data on the Marion Plateau

In the early 1970's, poor to moderate quality 6-channel sparker data was collected by the Australian Bureau of Mineral Resources (now AGSO) continental margin survey. In the 1970's and early 1980's, higher quality multi-channel airgun data were collected by the Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), various exploration companies, and the Bureau of Mineral Resources. In addition to these data sets, there are also high-resolution watergun data for Leg

133 site surveys collected by the Bureau of Mineral Resources on the Marion Plateau.

3.2. Previous ODP Sites on the Marion Plateau

Fifteen sites were drilled in two transects in the far western Coral Sea Basin during Leg 133 (Sites 811-826), primarily to study the evolution of the carbonate platforms off northeast Australia. Three of these sites were drilled on the Marion Plateau (815, 816, 826). The sediments from these drillholes provide important data on the sedimentary evolution of the northern Marion Plateau; in particular they have provided important information regarding the composition and age of the MP2 platform. In addition, the data from these holes have allowed us to better interpret the extensive seismic data already available for this region. The stratigraphy for some of the Leg 133 drillholes has been summarized in section 2.4 (Fig. 14).

4. TECHNICAL AND SAFETY CONSIDERATIONS

4.1. Safety issues

Previous drilling during ODP Leg 133 has demonstrated that there are no significant safety concerns for drilling on the Marion Plateau. The seafloor depth range for the sites is 293-393 m. Seismic data show no evidence that sites overlie closures.

4.2. Drilling Technology

The completion of the drilling proposed here will require technology currently available (APC, XCB, and RCB). It is expected that the sediments drilled will be comprised of variably-cemented carbonate horizons which will make it beneficial to have the MDCB available during drilling, but it will not be essential.

4.3. Site Surveys

Shiptime on the ORV Franklin has been scheduled for April, 1999 to complete site surveys for this proposal. Prior to the cruise we will liaise with SSP to ensure that we collect all the necessary site survey data.

5. REFERENCES

COSOD II, 1987. Report of the second conference on scientific ocean drilling. European Science Foundation, Strassbourg, France, 142 pp.

Davies, P. J., Symonds, P. A., Feary, D. A. and Pigram, C. J., 1989. The evolution of the carbonate platforms of northeast Australia. Society of Economic Paleontologist and Mineralogists Special Publication No. 44, 233-258.

Davies, P. J., McKenzie, J. A., Palmer-Julson, A., and Scientific Party, 1991. *Proc. ODP, Sci. Results, 133* :College Station, TX (Ocean Drilling Program).

Feary, D. A., Champion, D. C., Bultitude, R. J., and Davies, P. J., 1993. Igneous and metasedimentary basement lithofacies of the Queensland Plateau (Sites 824 and 825). In: J. A. McKenzie, P. J. Davies and A. Palmer-Julson (Editors), *Proceedings of the Ocean Drilling Program, Scientific Results*, 133: College Station, Texas (Ocean Drilling Program), pp. 535-540.

Gaina, C, Müller, R. D., Royer, J.-Y., Symonds, P. The evolution of the Louisiade Triple Junction. Submitted to Tectonics

Halley, R. B. and Ludwig, K. R., 1987. Disconformities and Sr-isotope Stratigraphy reveal a Neogene sea-level history from Enewetak Atoll, Marshall Islands, Central Pacific. Geological Society of America Abstracts with Programs, 19, 691.

Haq, B. U., Hardenbol, J., and Vail, P. R., 1987. Chronology of Fluctuating Sea-levels since the Triassic. Science, 235:1156-1167.

Hayes, D. E. and Ringis J., 1973. Seafloor spreading in the Tasman Sea. Nature, 243:454-458.

Isern, A. R., McKenzie, J. A., and Feary, D. A., 1996. The role of sea surface temperature as a control on carbonate platform development in the western Coral Sea. Paleo. Paleo. Paleo. 124:247-272

JOIDES, 1996. Ocean Drilling Program Long Range Plan: Understanding our dynamic Earth through ocean drilling. JOI, Washington, D. C., 79 pp.

Katz, M. E. and Miller, K. G., 1993. Neogene subsidence along the northeast Australian margin: Benthic foraminiferal evidence. In: J. A. McKenzie, P. J. Davies and A. Palmer-Julson (Editors), *Proceedings of the Ocean Drilling Program, Scientific Results*, 133: College Station, Texas (Ocean Drilling Program), pp. 75-92.

Lincoln, J. M. and Schlanger, S. O., 1987. Miocene sea-level falls related to the geologic history of Midway Atoll. Geology, 15:454-457.

Lincoln, J. M. and Schlanger, S. O., 1991, Atoll stratigraphy as a record of sea-level change: Problems and prospects: Journal of Geophysical Research, 96: 6727-6752.

Majors, R. P. and Mathews, R. K., 1983. Isotopic composition of bank margin carbonates on Midway Atoll: Amplitude constraints on post-early Miocene eustacy. Geology, 11:335-338.

Miller, K. G., Fairbanks, R. G., and Mountain, G. S., 1987. Tertiary oxygen isotope synthesis, sea-level history, and continental margin erosion. Paleoceanography, 2(1):1-19.

Moore Jr., T. C., Loutit, T. S., and Greenlee, S. M., 1987. Estimating short-term changes in eustatic sea-level. Paleoceanography, 2(6):625- 637.

Müller, R. D. , V. S. L. Lim, A. R. Isern. Late tertiary tectonic subsidence on the northeast Australian passive margin: response to dynamic topograpy. Submitted to Marine Geology.

Mutter, J. C. and Karner, G. D., 1980. The continental margin off northeast Australia. In: Henderson, R. A. and Stephenson, P. J. eds. *The geology and geophysics of northeast Australia*, pp 47-49, Geological Society of Australia (Queensland Division), Brisbane.

Pigram, C. J., Davies, P. J., Feary, D. A., and Symonds, P. A., 1992. Absolute magnitude of the second-order middle to late Miocene sea-level fall, Marion Plateau, northeast Australia. Geology, 20:858-862.

Pigram, C. J., Davies, P. J., and Chaproniere, G. C. H., 1993. Cement stratigraphy and the demise of the early-middle Miocene carbonate platform on the Marion Plateau. In J. A. McKenzie and P. J. Davies (Ed.), *Scientific Results of the Ocean Drilling Program*: College Station Texas (Ocean Drilling Program), 499-512.

Sahagian, D. L. and Watts, A. B., 1991. Introduction to the special section on measurement, causes, and consequences of long- term sea-level changes. Journal of Geophysical Research, 96:6585-6589.

Schlanger, S. O. and Premoli-Silva, I., 1986. Oligocene sea-level falls recorded in the mid-Pacific atoll and archipelagic apron settings. Geology, 14:392-395.

Shaw, R. D., 1978. Seafloor spreading in the Tasman Sea: A Lord Howe Rise - eastern Australian reconstruction. Australian Society of Exploration Geophysicists Bulletin, 9:75-81.

Struckmeyer, H. I. M. and Symonds, P. A., 1997. Tectonostratigraphic evolution of the Townsville Basin, Townsville Trough, offshore northeastern Australia. Australian Journal of Earth Sciences, 44:799-817.

Symonds, P. A., Davies, P. J., Feary, D. A., and Pigram, C. J.,1988. Geology of the northeast Australian margin basins. In *Queensland 88 - Exploration and Development, PESA (QLD) Petroleum Symposium.*

Vail, P. R. and Hardenbol, J., 1979. Sea-level change during the Tertiary. Oceanus, 22: 71-79.

Vail, P. R., Mitchum, R. M. Jr., Todd, R. G, Widmeir, J. M., Thompson III, S., Sangree, J. B., Bubb, J. N., and Hatelid, W. G., 1977. Seismic Stratigraphy and Global changes in Sea-level. In Payton C. E. (Ed). *Seismic Stratigraphy - Applications to Hydrocarbon Exploration*. American Association of Petroleum Geologists Memoir 26, 49-212.

Watts, A. B. and Thorne, J., 1984. Tectonics, Global changes in sea-level and their relationship to stratigraphic sequences at the U. S. Atlantic continental margin. Marine and Petroleum Geology, 1: 319-339.

Weissel, J. K. and Hayes, D. E., 1971. Evolution of the Tasman Sea reappraised. Earth and Planetary Science Letters, 36:77-84.

Williams, D. F., 1988. Evidence for and against sea-level changes from the stable isotope record of the Cenozoic. *In* Wilgus, C. K., Hastings, B. S., Kendall, C. G. St. C., Posamentier, H. W., Ross, C. A., Van Wagoner, J. C., (Eds.) *Sea-level changes: an integrated approach*. Society of Economic Paleontologist and Mineralogists Special Publication 42, 31-36.

Zhang, Y.-S. and Tanimoto, T., 1993. High resolution global upper mantle structure and plate tectonics. Journal of Geophysical Research, 98:9793-9823.

6. PROPOSED DRILL SITES AND DRILLING STRATEGY

The Marion plateau basement is overlain by a Miocene to Holocene carbonate platform comprised of several shallow-water accretion phases separated by unconformities (Figs. 3-6). The oldest and most extensive shallow-water phase (MP2) occupies the northern part of the plateau and is of early (?) to middle Miocene age (N7? to N10-12) (Chaproniere and Pigram, 1993). Two Leg 133 sites drilled on the Marion Plateau intersected the top of the MP2 platform (Davies, McKenzie and Palmer-Julson, et al., 1991). The late Miocene (N16? to N17) second phase of platform development (MP3) is confined to the eastern side of the plateau (Fig. 3-6). The MP3 phase has been sampled by dredging along the northern edge of the southern platform, and in part consists of latest Miocene age rhodolith-bearing wackestone.

The establishment of a sea-level curve for the Miocene in the Coral Sea region is critically dependent on determining the facies and age of the MP2 and MP3 platforms. Typically, precise dating of warm shallow water carbonate platforms is not possible due to the broad stratigraphic range of larger foraminifers and diagenetic alteration of the sediments. Therefore, the drilling strategy described here involves paired drillholes chosen so that one is located within predicted shallow water facies, and a second is located downslope to obtain correlative facies in which planktonic forms are preserved for high resolution dating. In order to ensure that the complete sedimentary sections for facies analysis and correlation are recovered, Sites CS-02-A to CS-05 will be double cored as outlined in the drilling time estimates in Appendix 1.

To accomplish the sea-level objectives, eight sites have been chosen following the strategy outlined above. All sites are to be drilled to basement and form a transect from a position within the shallow facies of MP2, across the platform edge and down slope to MP3 (Figs. 2-7). Several sites between the two shallow phases of platform facies are designed to establish whether lowstand signals can be detected in slope sediments (Figs 3-4). If such signals can be seen, it may be possible to establish rates as well as amplitudes of sea-level fluctuation. All of the sites outlined here are necessary to achieve the sea-level objectives outlined in this proposal. All holes should be logged with standard logging tools to provide information on sedimentary sequences whih may not have been completely recovered, and also to maximise the ability to correlate sedimentary sequences between sites and to seismic data.

Site CS-01-A: This site is positioned near the eastern edge of the early to middle Miocene MP2 platform in order to intersect all four platform phases of MP2 (Fig. 15).

The following objectives will addressed at Site CS-01-A:

- to determine the age of each phase of platform development, particularly the initial phase of MP2 platform;
- to determine the age and duration of the unconformities separating each platform phase;
- to determine the total thickness of MP2;
- to determine the age of initial marine transgression;
- to determine the age and nature of the basement.

Site CS-02-A: This site is positioned near the eastern edge of the early to middle Miocene MP2 platform on the inner slope facies to intersect the proximal slope facies of all four platform phases of MP2 (Fig. 16). The site presents the best opportunity for the development of a high quality MP2 chronostratigraphy.

The following objectives will addressed at Site CS-02-A:

- to determine the age and facies of each phase of platform development, particularly the initial phase of MP2 platform;
- to determine the age and duration of the unconformities separating each platform phase;
- to determine the age of initial marine transgression;
- to determine the age and nature of the basement.

Site CS-03-A: This site is located to intersect the distal slope facies of both the MP2 and MP3 platforms. Site CS-02-A will enable the identification of low stand sea-level signals and provide the opportunity to measure rates of sea-level fluctuations in an environment where there should be a complete sedimentary record for the Miocene (Fig. 17).

The following objectives will addressed at Site CS-03-A:

- to determine the complete age range for the MP2 and MP3 platforms. The record here should be complete whereas sites CS-01-A & CS-02-A will have gaps and unconformities;
- to determine the age of initial marine transgression;
- to determine the age and nature of the basement.

Site CS-04-A: This site intersects the distal slope facies of both the MP2 and MP3 platforms, and is approximately mid way between the southern edge of the shallow water phase of MP2 and the western edge of shallow water phase of MP3 (Fig. 18). The site is situated to identify sea-level lowstand signals and to provide the opportunity to measure rates of change in sea-level fluctuation in an environment where there should be a complete sedimentary record for the Miocene.

The following objectives will addressed at Site CS-04-A:

- to determine the complete age range for the MP2 and MP3 platforms. The record here should be complete whereas the record at sites CS-01-A & CS-02-A will have gaps and lost section due to unconformities.;
- to determine the age of initial marine transgression;
- to determine the age and nature of the basement.

Site CS-05-A: This site is located west of MP3 to intersect the distal slope facies of both MP3 and the condensed section equivalent to the MP3 platforms. Site CS-05-A will enable the identification of low stand sea-level signals and provide the opportunity to measure rates of sea-level fluctuations in an environment where there should be a complete sedimentary record for the Miocene (Fig. 19). This site is approximately mid way between the southern edge of the shallow water phase of MP2 and the western edge of shallow water phase of MP3.

The following objectives will addressed at Site CS-05-A:

- to determine the age of each phase of platform development, particularly the initial phase of MP3 platform;
- to determine the age and duration of the unconformities separating each platform phase;
- to determine the age of the initial phase of MP3;

- to determine the age and nature of the condensed section equivalent to MP2;
- to determine the age and nature of the basement.

Site CS-06-A: This site is located near the western edge of the late Miocene MP3 platform and will intersect all four platform phases of MP3 (Fig. 20).

The following objectives will addressed at Site CS-06-A:

- to determine the age and facies of each phase of platform development, particularly the initial phase of MP3 platform;
- to determine the palaeowater depth of the initial phase of MP3;
- to determine the age and duration of the unconformities separating each platform phase;
- to determine the total thickness of MP3;
- to determine the age and nature of the condensed section equivalent to MP2;
- to determine the age and nature of the basement.

Site CS-07-A: This site is located near the eastern edge of the late Miocene MP3 platform to intersect all four platform phases of MP2 (Fig. 21).

The following objectives will addressed at Site CS-07-A:

- to determine the age and facies of each phase of platform development; particularly the initial phase of MP3 platform;
- to determine the palaeowater depth of the initial phase of MP3;
- to determine the age and duration of the unconformities separating each platform phase;
- to determine the total thickness of MP3;
- to determine the age and nature of the condensed section equivalent to MP2;
- to determine the age and nature of the basement.

Site CS-08-A: This site is located east of MP3 to intersect the proximal slope facies of MP3 and the condensed section equivalent to the MP2 platforms (Fig. 22).

The following objectives will addressed at Site CS-08-A:

- to determine the age of each phase of platform development, particularly the initial phase of MP3 platform;

- to determine the age and duration of the unconformities separating each platform phase;
- to determine the age and nature of the condensed section equivalent to MP2;
- to determine the age and nature of the basement

Site CS-01-A

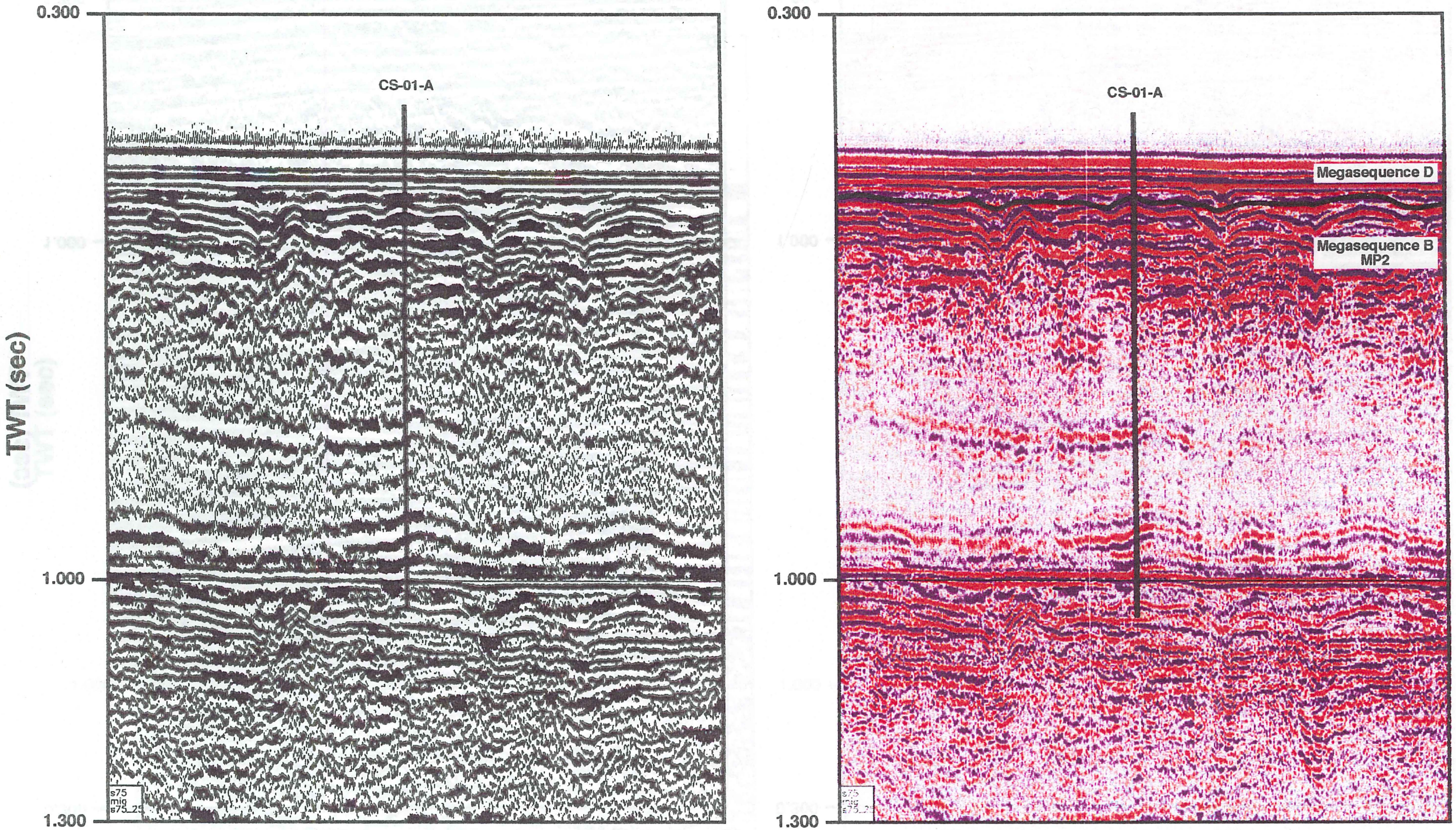

Figure 15: Detailed seismic section used to locate Site CS-01-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 5 and 6.

Site CS-02-A

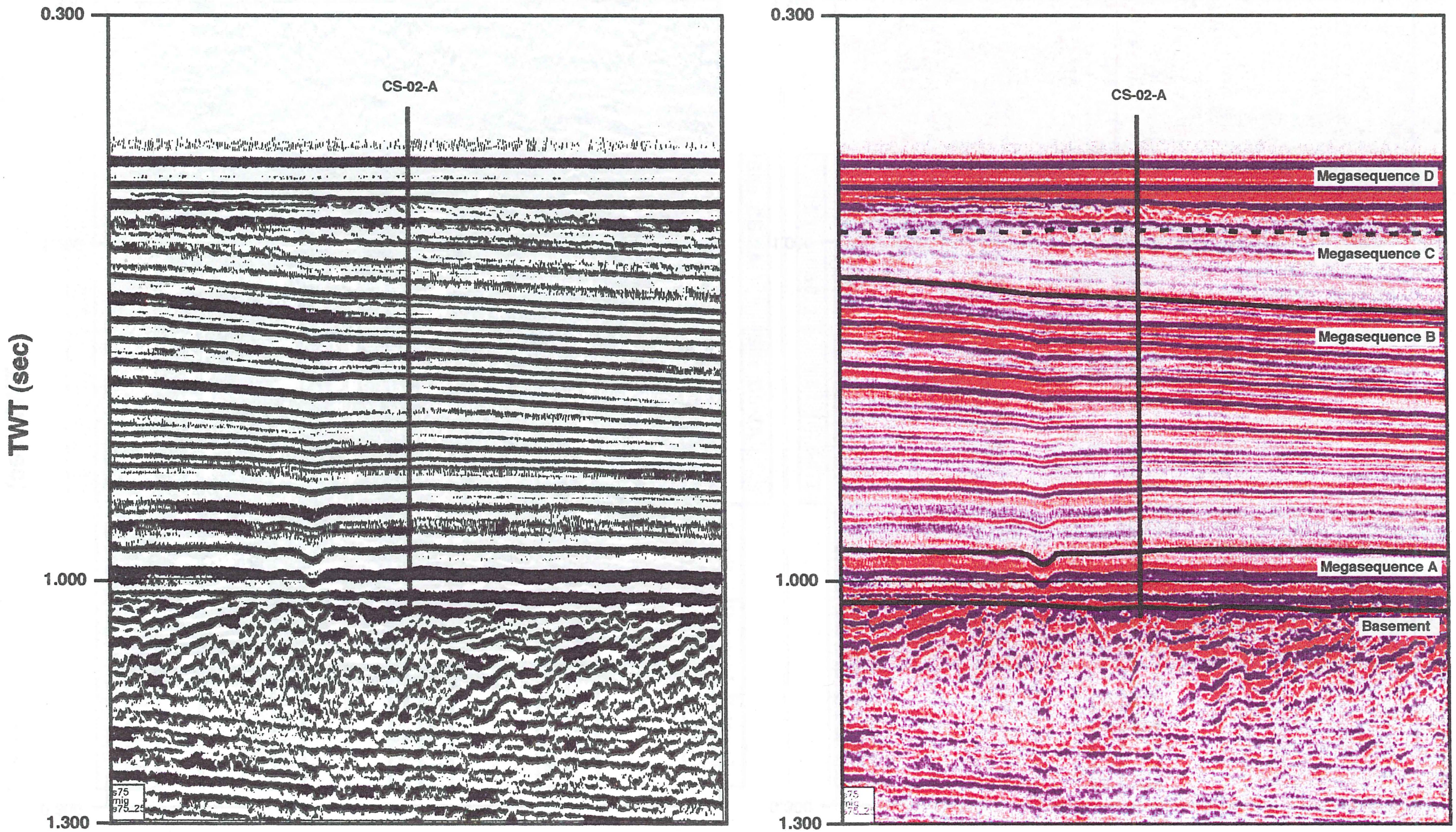

Figure 16: Detailed seismic section used to locate Site CS-02-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 5 and 6.

Site CS-03-A

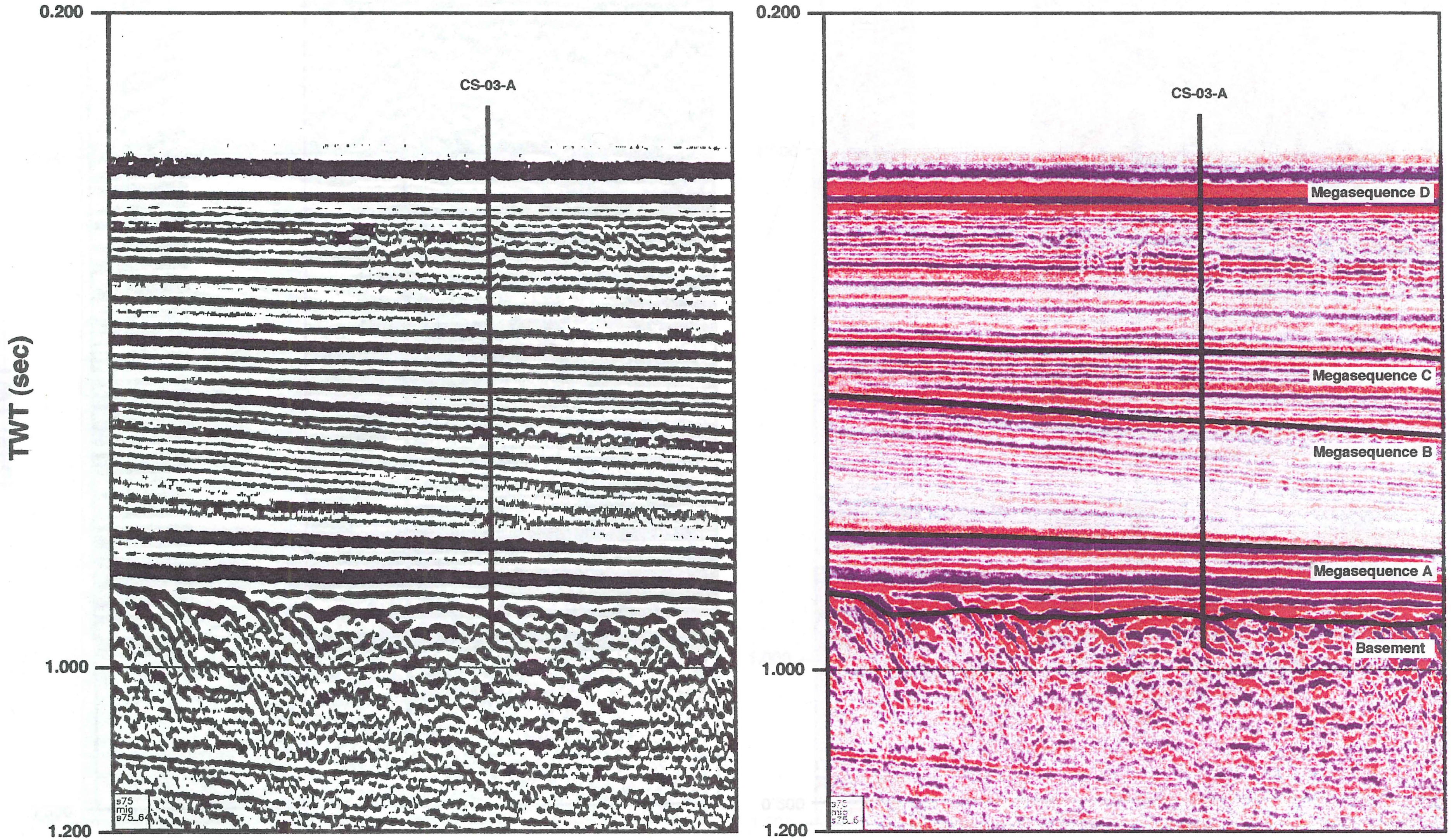

Figure 17: Detailed seismic section used to locate Site CS-03-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 3 and 4.

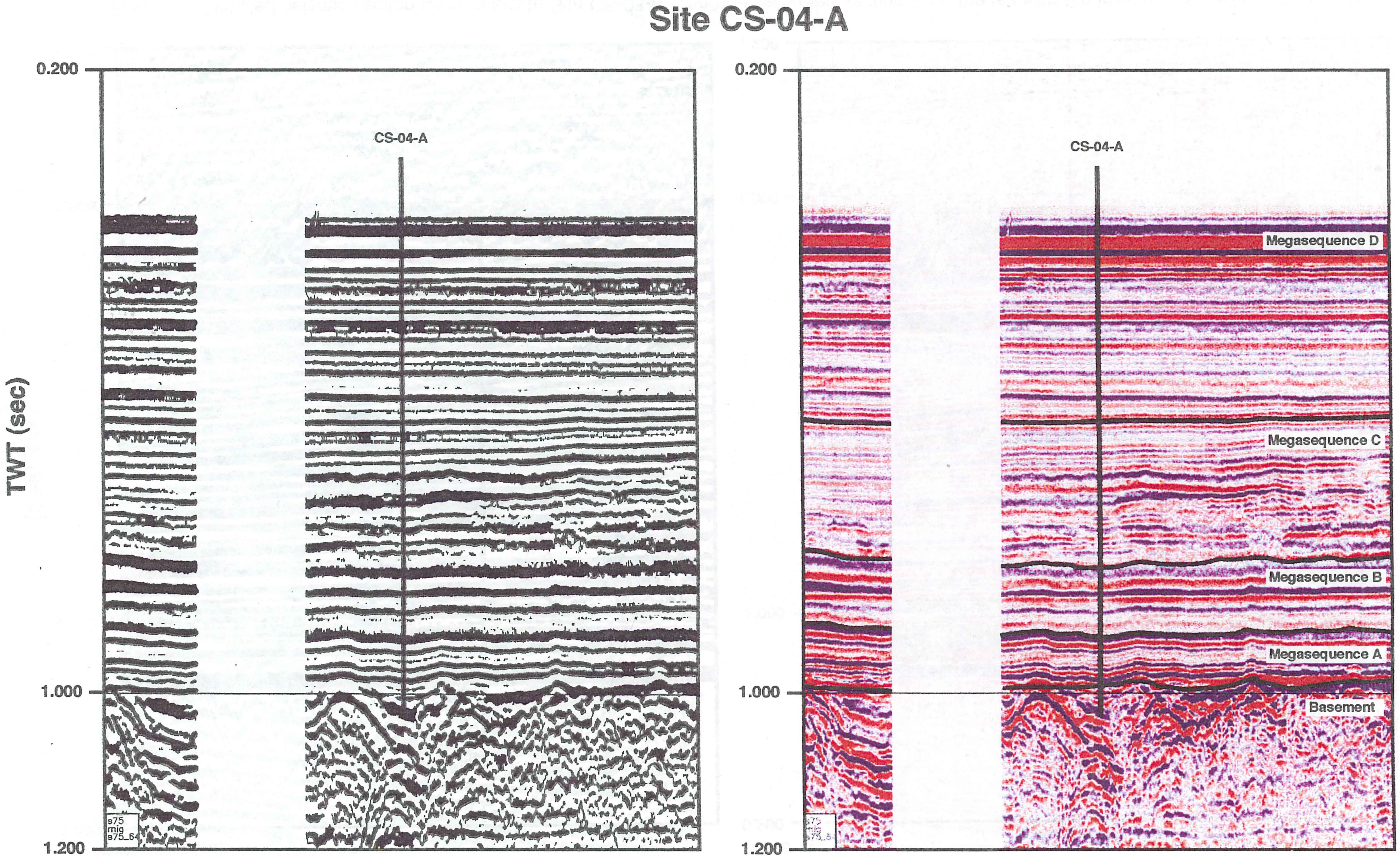

Figure 18: Detailed seismic section used to locate Site CS-04-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 3 and 4.

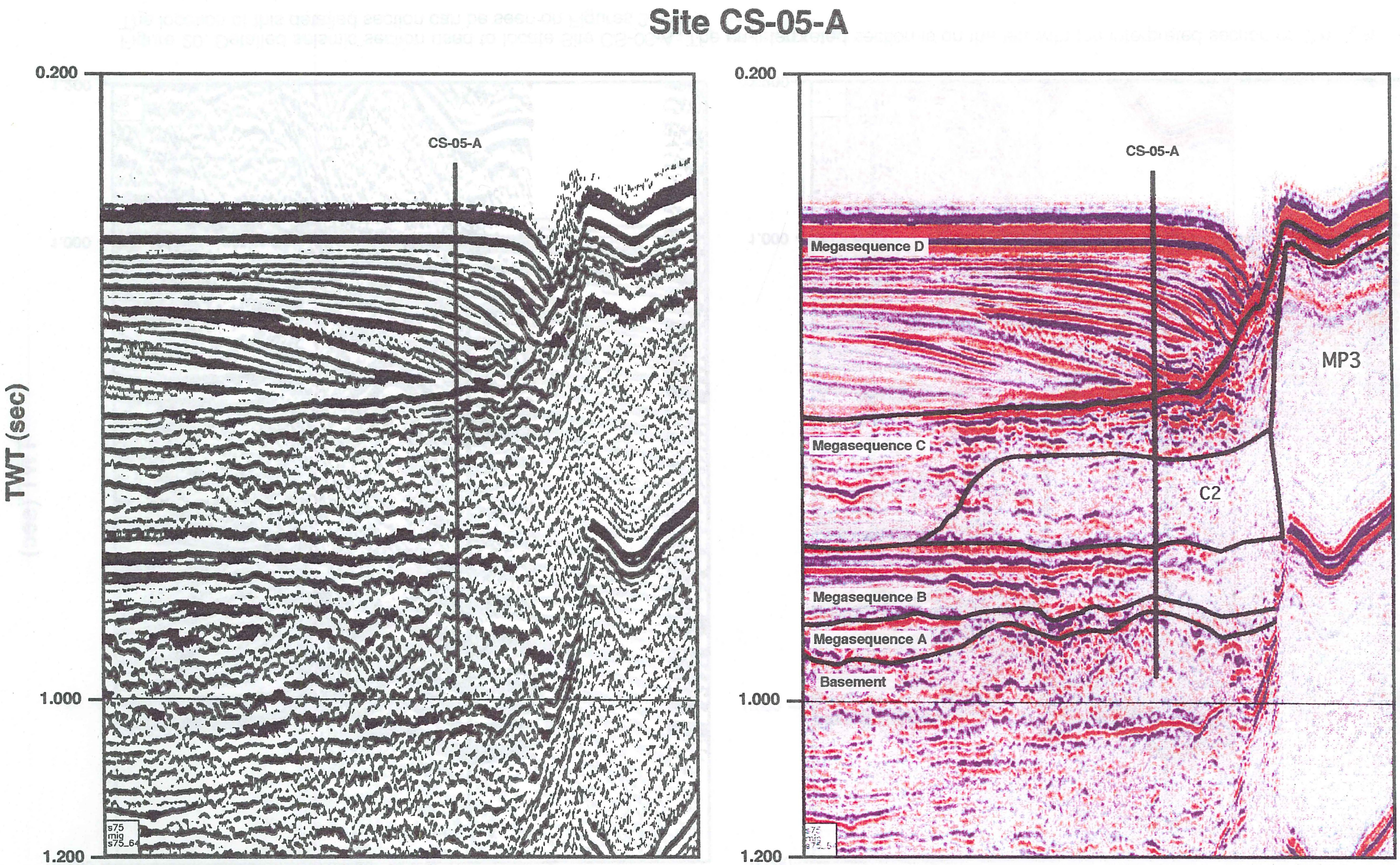

Figure 19: Detailed seismic section used to locate Site CS-05-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 3 and 4.

Site CS-06-A

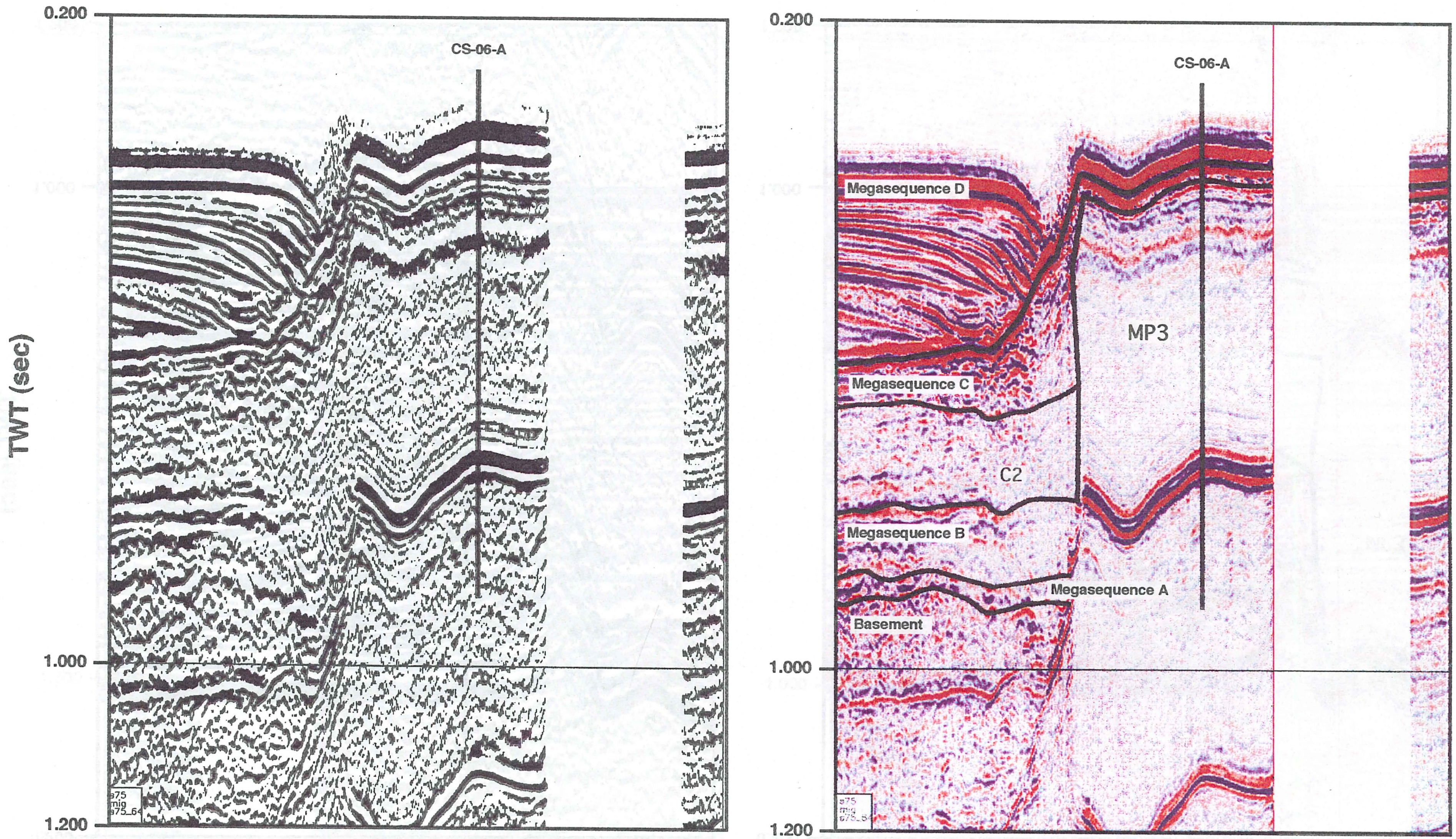

Figure 20: Detailed seismic section used to locate Site CS-06-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 3 and 4.

Site CS-07-A

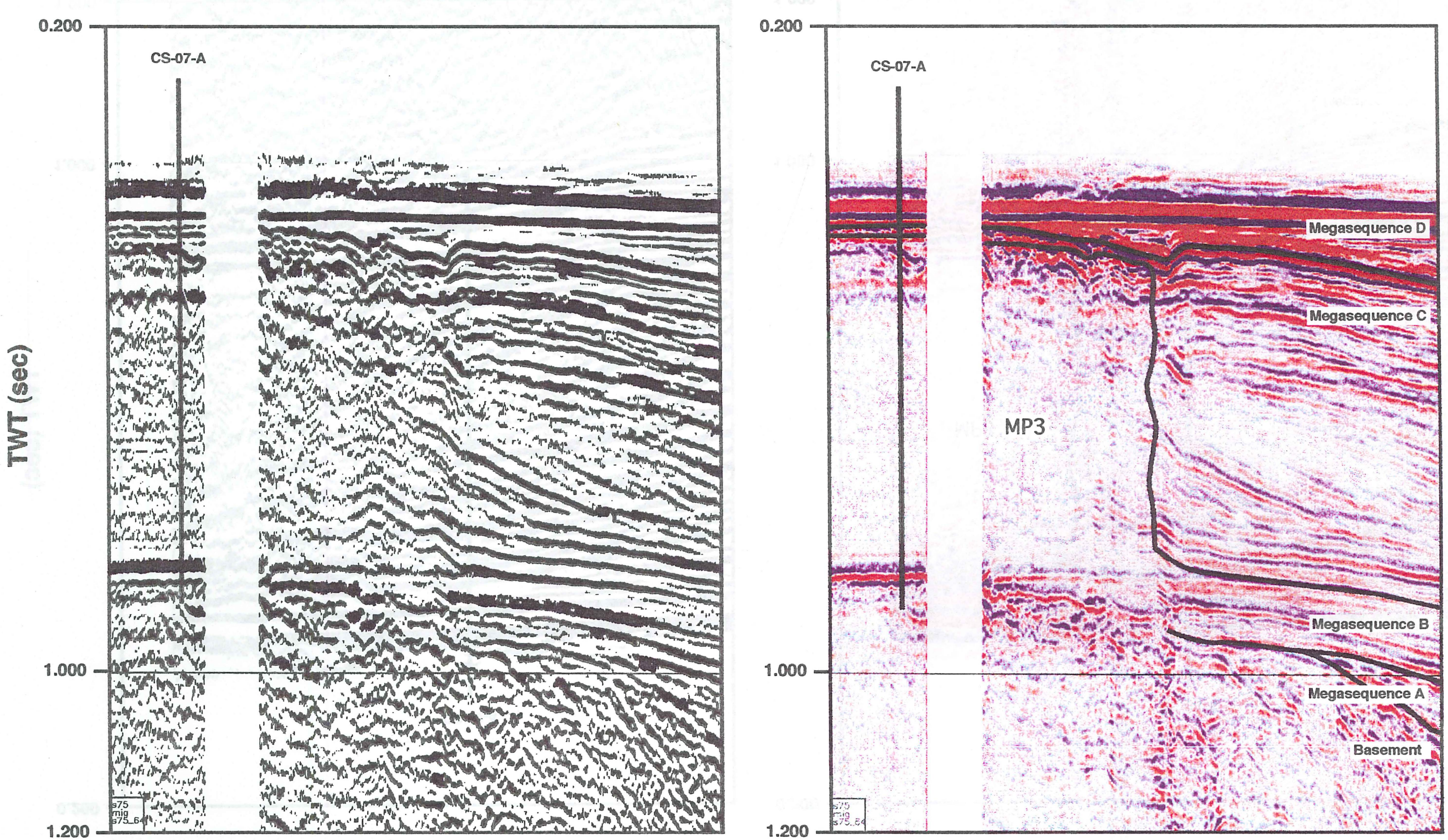

Figure 21: Detailed seismic section used to locate Site CS-07-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 3 and 4.

Site CS-08-A

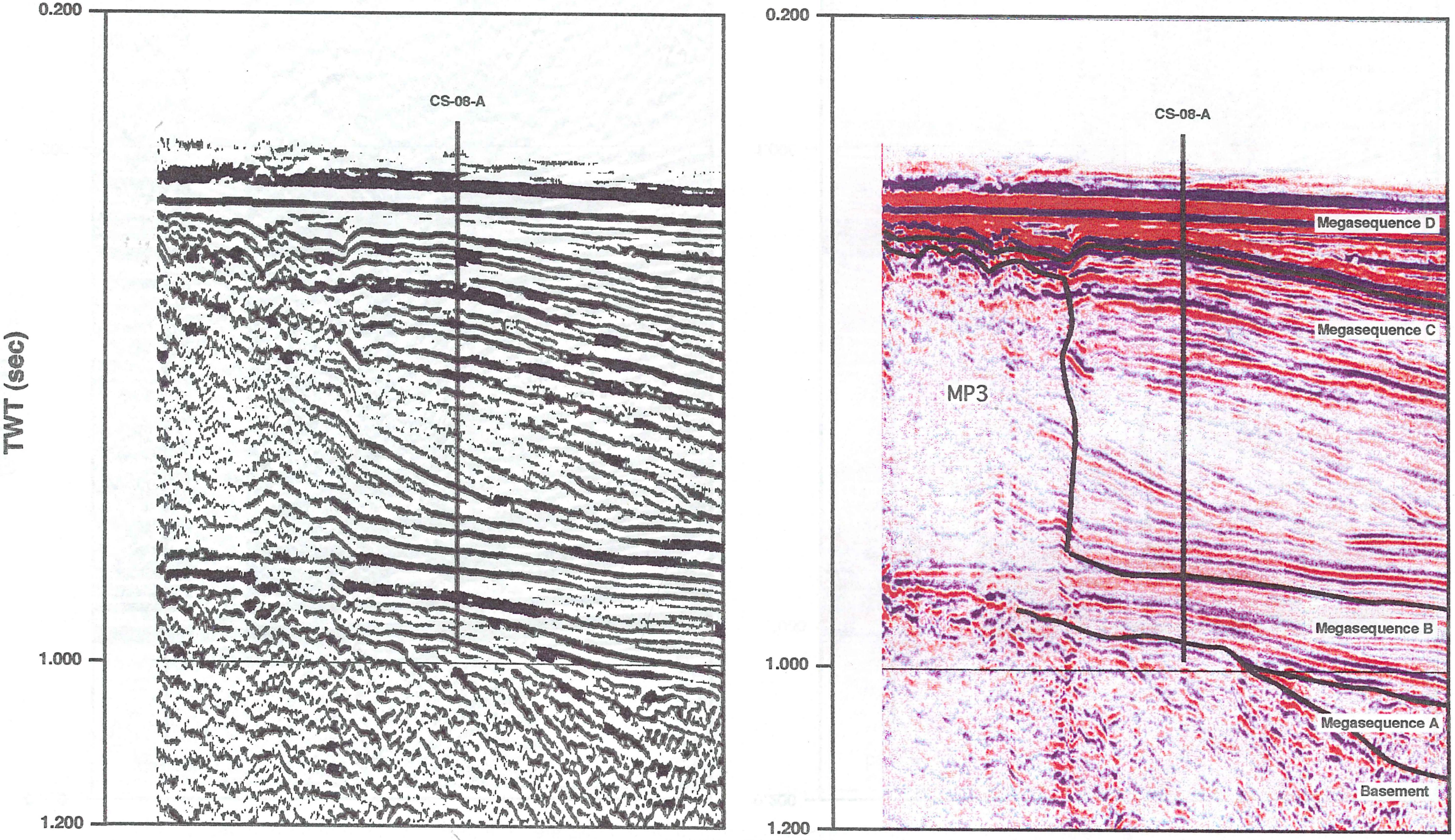

Figure 22: Detailed seismic section used to locate Site CS-08-A. The un-interpreted section is on the left with the interpreted section on the right. The location of this detailed section can be seen on Figures 3 and 4.

Appendix 1: Summary of transit, coring, and logging times

Proposal 510-Rev 1

Townsville to Townsville

Site Name	Latitude N Longitude W	Water Depth (m)	Penetr'n (m)	Location	Operations (mbsf)	Transit 10.5 kt (days)	Coring Time (days)	Total (days)
CS-01A	19°55.6 S 151°36.2 E	354	694	Marion Plateau	A: 0-80 APC; 80-180 XCB B: 180-694 RCB Logging 20	1.1	1.0 5.0 0.8	7.9
CS-02A	19°49.8 S 151°54.7 E	363	626	Marion Plateau	A: 0-80 APC; 80-160 XCB C: 160-626 RCB B: 0-80 APC; 80-160 XCB D: 160-626 RCB Logging 20	0.1	0.9 3.5 0.7 3.8 0.8	9.7
CS-03A	20°48.0 S 152°17.7 E	318	600	Marion Plateau	A: 0-150 APC; 150-230 XCB C: 230-600 RCB B: 0-150 APC; 150-230 XCB D: 230-600 RCB Logging 20	0.3	1.1 2.8 0.9 3.1 0.8	8.7
CS-04A	20°55.7 S 152°37.8 E	319	610	Marion Plateau	A: 0-150 APC; 150-240 XCB C: 240-610 RCB B: 0-150 APC; 150-240 XCB D: 240-610 RCB Logging 20	0.1	1.2 2.9 0.9 3.2 0.8	9.0
CS-05A	20°58.1 S 152°44.6 E	309	570	Marion Plateau	A: 0-100 APC; 100-280 XCB C: 280-570 RCB B: 0-100 APC; 100-280 XCB D: 280-570 RCB Logging 20	0.0	1.3 2.1 1.1 2.5 0.8	7.8
CS-06A	20°58.6 S 152°46.1 E	293	720	Marion Plateau	A: 0-10 APC; 10-100 XCB B: 100-710 RCB Logging 20	0.0	0.8 6.1 0.8	7.7
CS-07A	21°03.7 S 153°01.6 E	326	610	Marion Plateau	A: 0-45 APC; 45-100 XCB B: 100-610 RCB Logging 20	0.0	0.7 3.9 0.8	5.4
CS-08A	21°04.3 S 153°03.2 E	326	580	Marion Plateau	A: 0-70 APC; 70-200 XCB B: 200-580 RCB Logging 20	0.0	1.1 3.1 0.8	5.0
S-08A - port: Townsville						1.5		1.5
					Est Time=	3.1	60.3	61.4
					Available Time =			

Appendix 2: Transit times

PROPOSAL	510	Rev 1
Coral Sea		

Yellow cells are for data entry.
Blue cells are calculated answers based on embedded formula

Travel Time between coordinate points is based on a speed of:

>>>>> 10.5 KNOTS = nmi/hr <<<<<

	INITIAL POINT		FINAL POINT		MILES	TIME	TIME
	[deg.]	[min.]	[deg.]	[min.]	[nmi]	[hours]	[days]
	Townesville		Site CS-1A		[nmi]	[hours]	[days]
LAT	19	16	19	55.6	274.4	26.13	1.09
LONG	146	48	151	36.2			
	Site CS-1A		Site CS-2A		[nmi]	[hours]	[days]
LAT	19	55.6	19	49.8	18.3	1.75	0.07
LONG	151	36.2	151	54.7			
	Site CS-2A		Site CS-3A		[nmi]	[hours]	[days]
LAT	19	49.8	20	48	62.1	5.91	0.25
LONG	151	54.7	152	17.7			
	Site CS-3A		Site CS-4A		[nmi]	[hours]	[days]
LAT	20	48	20	55.7	20.30	1.93	0.08
LONG	152	17.7	152	37.5			
	Site CS-4A		Site CS-5A		[nmi]	[hours]	[days]
LAT	20	55.7	20	58.1	6.79	0.65	0.03
LONG	152	37.5	152	44.6			
	Site CS-5A		Site CS-8A		[nmi]	[hours]	[days]
LAT	20	58.1	21	4.3	18.44	1.76	0.07
LONG	152	44.6	153	3.2			
	Site CS-8A		Townsville		[nmi]	[hours]	[days]
LAT	21	4.3	19	16	368.43	35.09	1.46
LONG	153	3.2	146	48			

Total Transit 3.0505

Appendix 3: Coring and logging time estimates

CORING TIME ESTIMATES

12-Mar-98 12:48 PM

Yellow cells are for data entry
Blue cells are calculated answers based on embedded formulas.

1) Default values can be changed. Enter "0" to cancel operation.
2) Choose from the several common coring scenarios listed.
3) Refer to the guidelines below for common coring performance ranges.

LEG: Coral Sea
SITE: CS-01A
WATER DEPTH: 326 Meters

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	326	3.0			
APC To:	80	3.2	8	0.4	
Orient:		0.9	5	0.17	
Adara Heat flow:		0.9	3	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	180	8.3	10	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 23.3 Hours= 1.0 Days

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:		0.0			
Trip In:	326	3.0			
APC To:	0	0.0	0	0.0	
Orient:		-0.5	-3	0.17	
Zone 1, XCB To:	0	0.0	0	0.0	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		0.0			

Hole B= 0.0 Hours= 0.0 Days

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	326	3.0			
Drill To:	0	0.0			70
Zone 1, RCB To:	0	0.0	0	0.0	12
Zone 2, RCB To:	0	0.0	0	0.0	4.5
Zone 3, RCB To:	0	0.0	0	0.0	3.0
Zone 4, RCB To:	0	0.0	0	0.0	2.0
Trip for Bit:		0.0	-1	0.0	
Treat Hole,Drop Bit:		0.0			
Logging:		0.0			
Trip Out to Ship:	426	3.2			

Hole C= 0.0 Hours= 0.0 Days

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	326	3.0			
Drill To:	180	2.6			70
Zone 1, RCB To:	550	50.3	39	0.5	12
Zone 2, RCB To:	600	14.1	5	0.6	4.5
Zone 3, RCB To:	694	37.3	10	0.6	3.0
Zone 4, RCB To:	0	0.0	0	0.0	2.0
Trip for Bit:		0.0	0	8.1	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	426	3.2			

Hole D= 138.6 Hours= 5.8 Days

SITE (Holes A-D)= 161.9 Hours= 6.7 Days

SITE: CS-02A
WATER DEPTH: 363 **Meters**

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	363	3.1			
APC To:	80	3.2	8	0.4	
Orient:		0.9	5	0.17	
Adara Heat flow:		0.9	3	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	160	6.7	8	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 21.7 **Hours=** 0.9 **Days**

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:		2.0			
Trip In:	363	3.1			
APC To:	80	3.2	8	0.4	
Orient:		0.9	5	0.17	
Zone 1, XCB To:	160	6.7	8	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole B= 16.8 **Hours=** 0.7 **Days**

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	363	3.1			
Drill To:	160	2.3			70
Zone 1, RCB To:	550	53.0	41	0.5	12
Zone 2, RCB To:	626	21.7	8	0.6	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	-4	7.1	
Treat Hole,Drop Bit:		1.0			
Logging:					
Trip Out to Ship:	463	3.3			

Hole C= 84.3 **Hours=** 3.5 **Days**

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	363	3.1			
Drill To:	160	2.3			70
Zone 1, RCB To:	550	53.0	41	0.5	12
Zone 2, RCB To:	626	21.7	8	0.6	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	-4	8.4	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	463	3.3			

Hole D= 111.3 **Hours=** 4.6 **Days**

SITE (Holes A-D)= 234.1 **Hours=** 9.8 **Days**

SITE: CS-03A
WATER DEPTH: 318 Meters

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	318	3.0			
APC To:	150	6.4	16	0.4	
Orient:		2.2	13	0.17	
Adara Heat flow:		1.5	5	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	230	6.7	8	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 26.8 Hours= 1.1 Days

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	0	2.0			
Trip In:	318	3.0			
APC To:	150	6.4	16	0.4	
Orient:		2.2	13	0.17	
Zone 1, XCB To:	230	6.7	8	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole B= 21.3 Hours= 0.9 Days

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	318	3.0			
Drill To:	230	3.3			70
Zone 1, RCB To:	550	43.2	33	0.5	12
Zone 2, RCB To:	600	14.1	5	0.6	4.5
Zone 3, RCB To:	0	0.0	0	0.0	3.0
Zone 4, RCB To:	0	0.0	0	0.0	2.0
Trip for Bit:		0.0	-4	7.0	
Treat Hole,Drop Bit:		1.0			
Logging:		0.0			
Trip Out to Ship:	418	3.2			

Hole C= 67.8 Hours= 2.8 Days

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	318	3.0			
Drill To:	230	3.3			70
Zone 1, RCB To:	550	43.2	33	0.5	12
Zone 2, RCB To:	600	14.1	5	0.6	4.5
Zone 3, RCB To:	0	0.0	0	0.0	3.0
Zone 4, RCB To:	0	0.0	0	0.0	2.0
Trip for Bit:		0.0	-4	8.1	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	418	3.2			

Hole D= 94.8 Hours= 3.9 Days

SITE (Holes A-D)= 210.6 Hours= 8.8 Days

SITE: CS-04A
WATER DEPTH: 319 **Meters**

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	319	3.0			
APC To:	150	6.4	16	0.4	
Orient:		2.2	13	0.17	
Adara Heat flow:		1.5	5	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	240	7.5	9	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 27.6 **Hours=** 1.2 **Days**

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:		2.0			
Trip In:	319	3.0			
APC To:	150	6.4	16	0.4	
Orient:		2.2	13	0.17	
Zone 1, XCB To:	240	7.5	9	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		0.0			

Hole B= 21.1 **Hours=** 0.9 **Days**

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	319	3.0			
Drill To:	240	3.4			70
Zone 1, RCB To:	550	41.8	32	0.5	12
Zone 2, RCB To:	610	16.9	6	0.6	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	0	7.0	
Treat Hole,Drop Bit:		1.0			
Logging:		0.0			
Trip Out to Ship:	419	3.2			

Hole C= 69.4 **Hours=** 2.9 **Days**

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	319	3.0			
Drill To:	240	3.4			70
Zone 1, RCB To:	550	41.8	32	0.5	12
Zone 2, RCB To:	610	16.9	6	0.6	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	0	8.2	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	419	3.2			

Hole D= 96.4 **Hours=** 4.0 **Days**

SITE (Holes A-D)= 214.5 **Hours=** 8.9 **Days**

SITE: CS-05A
WATER DEPTH: 570 Meters

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	570	3.4			
APC To:	100	4.0	10	0.4	
Orient:		1.2	7	0.17	
Adara Heat flow:		0.9	3	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	280	15.5	19	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			
Hole A=		32.0	Hours=	1.3	Days

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	0	2.0			
Trip In:	570	3.4			
APC To:	100	4.0	10	0.4	
Orient:		1.2	7	0.17	
Zone 1, XCB To:	280	15.5	19	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			
Hole B=		27.1	Hours=	1.1	Days

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	570	3.4			
Drill To:	280	4.0			70
Zone 1, RCB To:	570	39.2	30	0.5	12
Zone 2, RCB To:		0.0	0	0.0	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	-3	0.0	
Treat Hole,Drop Bit:		1.0			
Logging:		0.0			
Trip Out to Ship:	670	3.6			
Hole C=		51.2	Hours=	2.1	Days

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	570	3.4			
Drill To:	280	4.0			70
Zone 1, RCB To:	570	39.2	30	0.5	12
Zone 2, RCB To:		0.0	0	0.0	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	-3	0.0	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	670	3.6			
Hole D=		78.2	Hours=	3.3	Days

SITE (Holes A-D)=	188.6	Hours=	7.9	Days

SITE: CS-06
WATER DEPTH: 720 Meters

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	720	3.7			
APC To:	10	0.4	1	0.4	
Orient:		-0.3	-2	0.17	
Adara Heat flow:		0.0	0	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	100	7.5	9	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 18.3 Hours= 0.8 Days

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	0	2.0			
Trip In:	720	3.7			
APC To:	0	0.0	0	0.0	
Orient:		-0.5	-3	0.17	
Zone 1, XCB To:	0	0.0	0	0.0	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole B= 0.0 Hours= 0.0 Days

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	720	3.7			
Drill To:	0	0.0			70
Zone 1, RCB To:	0	0.0	0	0.0	12
Zone 2, RCB To:	0	0.0	0	0.0	4.5
Zone 3, RCB To:	0	0.0	0	0.0	3.0
Zone 4, RCB To:	0	0.0	0	0.0	2.0
Trip for Bit:		0.0	-1	0.0	
Treat Hole,Drop Bit:		0.0			
Logging:		0.0			
Trip Out to Ship:	820	3.9			

Hole C= 0.0 Hours= 0.0 Days

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	720	3.7			
Drill To:	100	1.4			70
Zone 1, RCB To:	550	61.0	47	0.5	12
Zone 2, RCB To:	600	14.1	5	0.6	4.5
Zone 3, RCB To:	700	39.3	10	0.6	3.0
Zone 4, RCB To:	710	5.6	1	0.6	2.0
Trip for Bit:		9.5	1	9.5	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	820	3.9			

Hole D= 166.6 Hours= 6.9 Days

SITE (Holes A-D)= 184.9 Hours= 7.7 Days

SITE: CS-07A

WATER DEPTH: 326 Meters

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	326	3.0			
APC To:	45	2.0	5	0.4	
Orient:		0.3	2	0.17	
Adara Heat flow:		0.6	2	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	100	4.8	6	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 17.8 Hours= 0.7 Days

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	326	0.0			
Trip In:	0	0.0			
APC To:	0	0.0	0	0.0	
Orient:		-0.5	-3	0.17	
Zone 1, XCB To:	0	0.0	0	0.0	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		0.0			

Hole B= 0.0 Hours= 0.0 Days

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	326	0.0			
APC To:	0	0.0	0	0.0	
Zone 1, XCB To:	0	0.0	0	0.0	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Treat Hole:		0.0			
Logging:		0.0			
Trip out to Ship:	326	1.5			

Hole C= 1.5 Hours= 0.1 Days

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	326	3.0			
Drill To:	100	1.4			70
Zone 1, RCB To:	550	61.0	47	0.5	12
Zone 2, RCB To:	610	16.9	6	0.6	4.5
Zone 3, RCB To:		0.0	0	0.0	3.0
Zone 4, RCB To:		0.0	0	0.0	2.0
Trip for Bit:		0.0	-4	8.2	
Treat Hole, Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	426	3.2			

Hole D= 113.6 Hours= 4.7 Days

SITE (Holes A-D)= 132.9 Hours= 5.5 Days

SITE: CS-08
WATER DEPTH: 326 **Meters**

APC/XCB CORE 3 HOLES, NO LOGS

Hole A

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Survey & Loc Site:		4.0			
Trip In:	326	3.0			
APC To:	70	2.8	7	0.4	
Orient:		0.7	4	0.17	
Adara Heat flow:		0.6	2	0.3	
WSTP:		2.0	2	1.0	
Zone 1, XCB To:	200	11.3	14	0.5	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		1.0			

Hole A= 25.4 **Hours=** 1.1 **Days**

Hole B

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	326	0.0			
Trip In:	0	0.0			
APC To:	0	0.0	0	0.0	
Orient:		-0.5	-3	0.17	
Zone 1, XCB To:	0	0.0	0	0.0	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Pull up to Sea Floor:		0.0			

Hole B= 0.0 **Hours=** 0.0 **Days**

Hole C

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Move & Spaceout:	326	0.0			
APC To:	0	0.0	0	0.0	
Zone 1, XCB To:	0	0.0	0	0.0	30.0
Zone 2, XCB To:	0	0.0	0	0.0	20.0
Treat Hole:		0.0			
Logging:		0.0			
Trip out to Ship:	326	1.5			

Hole C= 0.0 **Hours=** 0.0 **Days**

DRILL TO APC/XCB REFUSAL, RCB CORE & LOG

Hole D

ACTION	PENETRATION (meters)	TIME (hours)	CORES (number)	TIME/RT (hours)	PEN RATE (meter/hr)
Trip In:	326	3.0			
Drill To:	200	2.9			70
Zone 1, RCB To:	550	47.2	36	0.5	12
Zone 2, RCB To:	580	8.5	3	0.6	4.5
Zone 3, RCB To:	0	0.0	0	0.0	3.0
Zone 4, RCB To:	0	0.0	0	0.0	2.0
Trip for Bit:		0.0	-4	8.1	
Treat Hole,Drop Bit:		8.0			
Logging:		20.0			
Trip Out to Ship:	426	3.2			

Hole D= 92.7 **Hours=** 3.9 **Days**

SITE (Holes A-D)= 118.1 **Hours=** 4.9 **Days**

Total Drilling 60.2 Days

Appendix 4: Site summary forms

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New** **Revised**

Section A: Proposal Information

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 1998
Site Specific Objectives (Must include general objectives in proposal)	• age of each phase of platform development, particularly the initial phase of MP2 platform; • age and duration of the unconformities separating each platform phase • total thickness of MP2 • age of initial marine transgression; age and nature of the basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-01-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 19°	Min: 55.6 S	Jurisdiction:	Australia (Queensland)
Longitude:	Deg: 151°	Min:36.2 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	354

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	0.54 sec TWT; 684 m	10 m
General Lithologies:	60 m ooze, 624 m dolomitized framestone; packstone	?Palaeozoic phyllite and slate
Coring Plan (circle):	**1-~~2-3-~~APC** ~~VPC*~~ **XCB** ~~MDCB* PCS~~ **RCB** ~~Re-entry HRGB~~ ** Systems Currently Under Development*	

Logging Plan:	Standard Tools		Special Tools	LWD
	Triple-Combo	FMS-Sonic	Borehole Televiewer	Density-Neutron
	Neutron-Porosity	Acoustic	Geochemical	Resitivity-Gamma Ray
	Litho-Density	FMS	Resistivity-Laterolog	
	Natural Gamma Ray		High Temperature	
	Resistivity-Induction		Magnetic/Susceptibility	

Estimated days:	Drilling/Coring: 5.9 days	Logging: 0.8	Total On-Site: 6.7 days
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.

*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

Proposal #: 510-Full3	Site #: CS-01-A	Date Form Submitted: 15 March 98

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/25 @ 256:1440 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samples from nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New Revised

*

Proposal #: 510-Full3	Site #: CS-01-A	Date Form Submitted: 15 March 98
Water Depth (m): 354 m	Sed. Penetration (m): 684 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:_

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New** **Revised**

Section A: Proposal Information*

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 1998
Site Specific Objectives (Must include general objectives in proposal)	• age and facies of each phase of platform development, particularly the initiation of MP2; • age and duration of the unconformities separating each platform phase • age of initial marine transgression • age and nature of the basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-02-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 19°	Min: 49.8 S	Jurisdiction:	Australia (Queensland)
Longitude:	Deg: 151°	Min: 54.7 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	363

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	540 msec TWT; 616 m	10 m
General Lithologies:	160 m ooze, wackestone; 372 m wackestone 84 m sandstone, mudstone	?Palaeozoic phyllite and slate
Coring Plan (circle):	**1-2-~~3~~-APC ~~VPC*~~ 1-2 XCB ~~MDCB* PCS~~ 1-2 RCB ~~Re-entry HRGB~~** ** Systems Currently Under Development*	

Logging	Standard Tools		Special Tools	LWD
Plan:	Triple-Combo Neutron-Porosity Litho-Density Natural Gamma Ray Resistivity-Induction	FMS-Sonic Acoustic FMS	Borehole Televiewer Geochemical Resistivity-Laterolog High Temperature Magnetic/Susceptibility	Density-Neutron Resitivity-Gamma Ray
Estimated days:	Drilling/Coring: 9.0	Logging: 0.8	Total On-Site: 9.8	
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None	

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.

*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes New **Revised**

Proposal #: 510-Full3	Site #: CS-02-A	Date Form Submitted: 15 March 98

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/25 @ 256:1100 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samples from nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New Revised

*

Proposal #: 510-Full3	Site #: CS-02-A	Date Form Submitted: 15 March 97
Water Depth (m): 363 m	Sed. Penetration (m): 616 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:_

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	2
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New Revised**

Section A: Proposal Information*

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 1998
Site Specific Objectives (Must include general objectives in proposal)	• complete age range for the MP2 and MP3 platforms. • age of initial marine transgression • age and facies of lowstand deposits • age and nature of the basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-03-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 20°	Min: 48.0 S	Jurisdiction:	Australia
Longitude:	Deg: 152°	Min: 17.7 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	318 m

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	590 m	10 m
General Lithologies:	230m ooze, wackestone; 260 m wackestone 100m sandstone, mudstone	?Palaeozoic phyllite and slate
Coring Plan (circle):	**1-2-~~3~~-APC ~~VPC*~~ 1-2 XCB ~~MDCB* PCS~~ 1-2 RCB ~~Re-entry HRGB~~** ** Systems Currently Under Development*	

Logging Plan:	Standard Tools		Special Tools	LWD
	Triple-Combo Neutron-Porosity Litho-Density Natural Gamma Ray Resistivity-Induction	FMS-Sonic Acoustic FMS	Borehole Televiewer Geochemical Resistivity-Laterolog High Temperature Magnetic/Susceptibility	Density-Neutron Resitivity-Gamma Ray

Estimated days:	Drilling/Coring: 8.0	Logging: 0.8	Total On-Site: 8.8
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.

*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

*

Proposal #: 510-Full3	Site #: CS-03-A	Date Form Submitted: 15 March 98

*

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/64 @ 274:0200 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samples from nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New <u>Revised</u>

*

Proposal #: 510-Full3	Site #: CS-03-A	Date Form Submitted: 15 March 98
Water Depth (m): 318 m	Sed. Penetration (m): 590 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:_

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New** **Revised**

Section A: Proposal Information*

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 M arch, 1998
Site Specific Objectives (Must include general objectives in proposal)	• complete age range for the MP2 and MP3 platforms. • age of initial marine transgression • age and facies of lowstand deposits • age and nature of the basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-04-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 20°	Min: 55.7 S	Jurisdiction:	Australia
Longitude:	Deg: 152°	Min: 37.8 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	319

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	600 m	10 m
General Lithologies:	240m ooze, wackestone; 360 m wackestone	?Palaeozoic phyllite and slate
Coring Plan (circle):	**1-2-~~3~~-APC ~~VPC*~~ 1-2 XCB ~~MDCB* PCS~~ 1-2 RCB ~~Re-entry HRGB~~** ** Systems Currently Under Development*	

Logging	Standard Tools		Special Tools	LWD
Plan:	Triple-Combo Neutron-Porosity Litho-Density Natural Gamma Ray Resistivity-Induction	FMS-Sonic Acoustic FMS	Borehole Televiewer Geochemical Resistivity-Laterolog High Temperature Magnetic/Susceptibility	Density-Neutron Resitivity-Gamma Ray
Estimated days:	Drilling/Coring: 8.1	Logging: 0.8	Total On-Site: 8.9	
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None	

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.

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2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

*

Proposal #: 510-Full3	Site #: CS-04-A	Date Form Submitted: 15 March 98

*

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/64 @ 274:0410 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samplesfrom nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New Revised

*

Proposal #: 510-Full3	Site #: CS-04-A	Date Form Submitted: 15 March 98
Water Depth (m): 319 m	Sed. Penetration (m): 600 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes New **Revised**

Section A: Proposal Information*

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 98
Site Specific Objectives (Must include general objectives in proposal)	• age of each phase of platform development, particularly the initiation of MP3; • age and duration of the unconformities separating each platform phase; • age and nature of the condensed section equivalent to MP2; • age and nature of the basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-05-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 20°	Min: 58.1 S	Jurisdiction:	Australia
Longitude:	Deg: 152°	Min: 44.6 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	309 m

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	530 msecsTWT; 560 m	10 m
General Lithologies:	280 m pelagic ooze; 150 m wackestone, packstone; 100 m wackestone, sandstone	?Palaeozoic phyllite and slate
Coring Plan (circle):	**1-2-~~3~~-APC ~~VPC*~~ 1-2 XCB ~~MDCB* PCS~~ 1-2 RCB ~~Re-entry HRGB~~** ** Systems Currently Under Development*	

Logging	Standard Tools		Special Tools	LWD
Plan:	Triple-Combo	FMS-Sonic	Borehole Televiewer	Density-Neutron
	Neutron-Porosity	Acoustic	Geochemical	Resitivity-Gamma Ray
	Litho-Density	FMS	Resistivity-Laterolog	
	Natural Gamma Ray		High Temperature	
	Resistivity-Induction		Magnetic/Susceptibility	

Estimated days:	Drilling/Coring: 7.1	Logging: 0.8	Total On-Site: 7.9
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.
*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

*

Proposal #: 510-Full3	Site #: CS-05-A	Date Form Submitted: 15 March 98

*

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/64 @ 274:0700 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samplesfrom nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New <u>Revised</u>

*

Proposal #: 510-Full3	Site #: CS-05-A	Date Form Submitted: 15 March 98
Water Depth (m): 309 m	Sed. Penetration (m): 570 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:_

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New** **Revised**

Section A: Proposal Information

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 98
Site Specific Objectives (Must include general objectives in proposal)	• age and facies of each phase of platform development, particularly the initiation of MP3 • paleowater depth of the initial phase of MP3; and the total thickness of MP3 • age and duration of the unconformities separating each platform phase • age and nature of the condensed section equivalent to MP2 and the basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-06-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 20°	Min: 58.6 S	Jurisdiction:	Australia (Queensland)
Longitude:	Deg: 152°	Min:46.1 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	293

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	560 msec TWT; 710 m	10 m
General Lithologies:	10 m pelagic ooze; 600 m of framestone, packstone, wackestone; 100 m wackestone	?Palaeozoic phyllite and slate
Coring Plan (circle):	**1-~~2-3-~~APC ~~VPC*~~ XCB ~~MDCB* PCS~~ RCB ~~Re-entry HRGB~~** ** Systems Currently Under Development*	

<table>
<tr><td>Logging</td><td colspan="2">Standard Tools</td><td>Special Tools</td><td>LWD</td></tr>
<tr><td>Plan:</td><td><u>Triple-Combo</u>
Neutron-Porosity
Litho-Density
Natural Gamma Ray
Resistivity-Induction</td><td><u>FMS-Sonic</u>
Acoustic
FMS</td><td>Borehole Televiewer
Geochemical
Resistivity-Laterolog
High Temperature
Magnetic/Susceptibility</td><td>Density-Neutron
Resitivity-Gamma Ray</td></tr>
<tr><td>Estimated days:</td><td>Drilling/Coring: 6.9 days</td><td colspan="2">Logging: 0.8 hrs</td><td>Total On-Site: 7.7 days</td></tr>
<tr><td>Hazards/ Weather</td><td colspan="3">List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.
Cyclone season (November-May)</td><td>What is your Weather Window?
None</td></tr>
</table>

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.
*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

*

Proposal #: 510-Full3	Site #: CS-06-A	Date Form Submitted: 15 March 98

*

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/64 @ 274:0720 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samplesfrom nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New Revised

*

Proposal #: 510-Full3	Site #: CS-06-A	Date Form Submitted: 15 March 98
Water Depth (m): 293 m	Sed. Penetration (m): 710 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:_

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New** **<u>Revised</u>**

Section A: Proposal Information

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 98
Site Specific Objectives (Must include general objectives in proposal)	• age and facies of each phase of platform development, particularly the initiation of MP3 • paleowater depth of the initial phase of MP3 and the total thickness of MP3 • age and duration of the unconformities separating each platform phase • age and nature of the condensed section equivalent to MP2 and basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-07-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 21°	Min: 03.7 S	Jurisdiction:	Australia (Queensland)
Longitude:	Deg: 153°	Min:01.6 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	326

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	500 msec TWT; 600 m	10 m
General Lithologies:	45 m pelagic ooze; 455 m of framestone, packstone, wackestone; 100 m wackestone	?Palaeozoic phyllite/slate
Coring Plan (circle):	**1-~~2-3-~~APC ~~VPC*~~ XCB ~~MDCB* PCS~~ RCB ~~Re-entry HRGB~~** ** Systems Currently Under Development*	

Logging Plan:	Standard Tools		Special Tools	LWD
	Triple-Combo	FMS-Sonic	Borehole Televiewer	Density-Neutron
	Neutron-Porosity	Acoustic	Geochemical	Resitivity-Gamma Ray
	Litho-Density	FMS	Resistivity-Laterolog	
	Natural Gamma Ray		High Temperature	
	Resistivity-Induction		Magnetic/Susceptibility	

Estimated days:	Drilling/Coring: 4.7 days	Logging: 0.8 hrs	Total On-Site: 5.5 days
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.

*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

*

Proposal #: 510-Full3	Site #: CS-07-A	Date Form Submitted: 15 March 98

*

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/64 @ 274:1000 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samplesfrom nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New Revised

*

Proposal #: 510-Full3	Site #: CS-07-A	Date Form Submitted: 15 March 98
Water Depth (m): 326 m	Sed. Penetration (m): 600 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:_

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at:

borehole@ldeo.columbia.edu

http://www.ldeo.columbia.edu/BRG/brg_home.html

Phone/Fax: (914) 365-8674 / (914) 365-3182

Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

ODP Site Description Forms: Page 1 - General Site Information

Please fill out information in all gray boxes **New** **Revised**

Section A: Proposal Information

Title of Proposal	Sea-level magnitudes and variations recorded by continental margin sequences on the Marion Plateau, northeast Australia		
Proposal Number:	510-Full3	Date Form Submitted:	15 March, 98
Site Specific Objectives (Must include general objectives in proposal)	• age of each phase of platform development, particularly the initiation of MP3 • paleowater depth of the initial phase of MP3; • duration of the unconformities separating each platform phase; • age and nature of the condensed section equivalent to MP2 and basement		
List Previous Drilling in Area:	Leg 133 Sites 815-816/826		

Section B: General Site Information*

Site Name: (e.g. SWPAC-01A)	CS-08-A	If site is a reoccupation of an old DSDP/ODP Site, Please include former Site #	Area or Location:	Marion Plateau
Latitude:	Deg: 21°	Min: 04.3 S	Jurisdiction:	Australia (Queensland)
Longitude:	Deg: 153°	Min:03.2 E	Distance to Land:	
Priority of Site:	Primary: X	Alt:	Water Depth:	326

Section C: Operational Information*

	Sediments	Basement
Proposed Penetration (m)	560 msec TWT; 570 m	10 m
General Lithologies:	70 m pelagic ooze; 400 m wackestone, packstone; 100 m wackestone, sandstone	?Palaeozoic phyllite, slate
Coring Plan (circle):	~~1-2-3-~~**APC** ~~VPC*~~ **XCB** ~~MDCB* PCS~~ **RCB** ~~Re-entry HRGB~~ ** Systems Currently Under Development*	

Logging Plan:	Standard Tools		Special Tools	LWD
	Triple-Combo	FMS-Sonic	Borehole Televiewer	Density-Neutron
	Neutron-Porosity	Acoustic	Geochemical	Resitivity-Gamma Ray
	Litho-Density	FMS	Resistivity-Laterolog	
	Natural Gamma Ray		High Temperature	
	Resistivity-Induction		Magnetic/Susceptibility	

Estimated days:	Drilling/Coring: 4.1 days	Logging: 0.8 hrs	Total On-Site: 4.9 days
Hazards/ Weather	*List possible hazards due to ice, hydrocarbons, dumpsites, cables, etc.* Cyclone season (November-May)		*What is your Weather Window?* None

Instructions:

Please fill out these forms for each site that you are proposing to drill, including as much detail as possible. The following table describes the purpose of each page, what information is needed, and when each page should be submitted.
*

Page	Information needed	Used By	When to submit	Contact for more information
1	General Info. about proposals, site location and basic operational needs	JOIDES Office, Data Bank, Logging Group, ODP/TAMU, SSP, PPSP	When submitting preliminary proposal and when updating site information.	JOIDES Office email: joides@whoi.edu www: http://www.whoi.edu/joides/
2	Information regarding site survey data available and to-be-collected	JOIDES Office, Data Bank, SSP, PPSP	When submitting full proposal and when updating site survey information	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
3	Detailed Logging Plan	JOIDES Office, Logging Group, ODP/TAMU	When submitting full proposal and when updating logging plan	ODP-LDEO Wireline Logging Services email: borehole@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/BRG/brg_home.html
4	Lithologic Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/
5	Pollution and Safety Hazard Summary	JOIDES Office, Data Bank, ODP/TAMU, PPSP	When proposal is placed on Drilling schedule, prior to PPSP review.	Site Survey Data Bank email: odp@ldeo.columbia.edu www: http://www.ldeo.columbia.edu/databank/

ODP Site Description Forms: Page 2 - Site Survey Detail

Please fill out information in all gray boxes **New** **Revised**

*

Proposal #: 510-Full3	Site #: CS-08-A	Date Form Submitted: 15 March 98

*

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
1	High resolution seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Watergun MCS available; high-res MCS to be collected Site is located on BMR Line 75/64 @ 274:1020 (Julian Time) Crossing Lines(s):
2	Deep Penetration seismic reflection			Primary Line(s): Location of Site on line (SP or Time only) Crossing Lines(s):
3	Seismic Velocity†	X		To be Collected
4	Seismic Grid	X		To be Collected
5a	Refraction (surface)			
5b	Refraction (near bottom)			
6	3.5 kHz	X		Location of Site on line (Time) To be Collected
7	Swath bathymetry			
8a	Side-looking sonar (surface)			
8b	Side-looking sonar (bottom)			
9	Photography or Video			
10	Heat Flow			To be Collected
11a	Magnetics			To be Collected
11b	Gravity			To be Collected

	Data Type	SSP Requirements	Exists In DB	Details of available data and data that are still to be collected
12	Sediment cores			To be Collected: Some samples from nearby Leg 133 Sites
13	Rock sampling			To be Collected: Some samplesfrom nearby Leg 133 Sites
14a	Water current data			To be Collected
14b	Ice Conditions			
15	OBS microseismicity			
16	Navigation			To be Collected
17	Other			Water-column samples to be collected during site survey

*

SSP Classification of Site:	SSP Watchdog:	Date of Last Review:
SSP Comments:		

X=required; X*=may be required for specific sites; Y=recommended; Y*=may be recommended for specific sites; R=required for re-entry sites; T=required for high temperature environments; † Accurate velocity information is required for holes deeper than 400m.

ODP Site Description Forms: Page 3 - Detailed Logging Plan

New **Revised**
*

Proposal #: 510-Full3	Site #: CS-08-A	Date Form Submitted: 15 March 98
Water Depth (m): 326 m	Sed. Penetration (m): 570 m	Basement Penetration (m): 10 m

Do you need to use the conical side-entry sub (CSES) at this site? **No**

Are high temperatures expected at this site? **No**

Are there any other special requirements for logging at this site? **No**

If "Yes" Please describe requirements:

What do you estimate the total logging time for this site to be: **20 hours**

Measurement Type	Scientific Objective	Relevance (1=high, 3=Low)
Neutron-Porosity		
Litho-Density	Standard: Porosity, correlation of sediments to logs and physical property data, sedimentology	1
Natural Gamma Ray	Standard: Sediment compositional changes, identification of hard-grounds, core-log correlation, stratigraphic correlation	1
Resistivity-Induction	Standard: Stratigraphic correlation, sediment physical properties	1
Acoustic	Standard: Stratigraphic correlation, core-log correlation, correlation with physical property data	1
FMS	Standard: Stratigraphic correlation, sediment structure, core-log correlation	1
BHTV		
Resistivity-Laterolog		
Magnetic/Susceptibility		
Density-Neutron (LWD)		
Resitivity-Gamma Ray (LWD)		
Other: Special tools (CORK, PACKER, VSP, PCS, FWS, WSP	VSP for sediment/seismic correlation	1

*

For help in determining logging times, please contact the ODP-LDEO Wireline Logging Services group at: borehole@ldeo.columbia.edu http://www.ldeo.columbia.edu/BRG/brg_home.html Phone/Fax: (914) 365-8674 / (914) 365-3182	Note: Sites with greater than 400 m of penetration or significant basement penetration require deployment of standard toolstrings.

Appendix 5: Scientific Background of Proponents

Alexandra R. Isern

PERSONAL DETAILS

DATE OF BIRTH:	6 February, 1966
BIRTHPLACE:	West Palm Beach, Florida, USA
NATIONALITY:	USA and Australia
ADDRESS:	12 Hartley St. Rozelle, NSW 2039

EDUCATION:

BSC (HON)	University of Florida	1987
MSC	University of Rhode Island (Oceanography) Thesis: *Accumulation Rates of Carbonate and Organic Carbon Along a Transect of the Equatorial Pacific:*	1990
PHD	Swiss Federal Institute of Technology Dissertation: *Carbonate Platform Development off Northeast Australia: The Importance of Paleoceanographic and Environmental Change.*	1993

PROFESSIONAL EXPERIENCE:

Co-chief scientist R/V Franklin Cruise for geophysical and sedimentological sampling of the western Coral Sea, April 1999.

Logging Scientist on Ocean Drilling Program Leg 182, Great Australian Bight (10/98-12/98).

Physical Properties Specialist on Ocean Drilling Program Leg 166, Bahamas Drilling Transect (Co-Chief Scientists: Dr. G. Eberli and Dr. P. K. Swart) (2/96-4/96).

Director Stable Isotope Facility, Department of Geology and Geophysics/Marine Studies Centre, University of Sydney (10/95-Present).

Research Cruise on the R/V Franklin to the Australian Southern Margin to investigate the patterns and influences on temperate water carbonate deposition (6/94). Responsible for the analysis of nutrients in samples from vertical water column profiles.

Lecturer, Department of Geology and Geophysics/Marine Studies Centre, University of Sydney. Courses taught (in part or whole): Introductory Marine Science, Marine Chemistry, Paleoceanography and Climate Change, Environmental Geology (5/94-Present).

Professional Officer, Australian Geological Survey Organisation, Environment and Groundwater Group (2/94-5/94).

Visiting Research Scientist, Department of Geological Sciences, Queens University, Kingston Ontario, Canada (8/93-1/94). Assisting in the compilation of data for an Ocean Drilling Program Drilling Proposal.

Inorganic Geochemist on Ocean Drilling Program Leg 133, Northeast Australian Margin (Co-Chief Scientists: Dr. J. A. McKenzie and Dr. P. J. Davies) (8/90-10/90). Responsible for inorganic geochemical measurements on sedimentary pore fluids.

Research Cruise (URI/GSO) to the Equatorial Pacific (Wecoma 8803B) as a preliminary study for the Joint Global Ocean Flux Program (Co-Chief Scientists: Dr. M. Leinen and Dr. M. Bender) (4/88). Responsible for collation of seismic data, preparation of site surveys, and core description.

PUBLICATIONS:

1998 Müller, R. D. , V. S. L. Lim, **A. R. Isern**. Late tertiary tectonic subsidence on the northeast Australian passive margin: response to dynamic topograpy. Submitted to Marine Geology.

1998 **Isern, A. R.**, Influences on water column structure in the eastern Great Australian Bight as shown by CTD and stable oxygen isotopic data. Submitted to Marine and Freshwater Research.

1997 **Isern, A. R.**, C. J. Pigram, P. K. Swart, and F. Anselmetti. ODP Drilling in the Coral Sea: Sea-level variation, fluid flow, and paleoceanography. AGSO Record, 115 pages.

1996 **Isern, A. R.**, J. A. McKenzie, and D. A. Feary. The role of sea surface temperature as a control on carbonate platform development in the western Coral Sea. Paleo. Paleo. Paleo. 124:247-272

1996 **Isern, A. R.** Geology of the atmosphere. Edgeworth-David Day Symposium Conference Publication, Earth Resources Foundation, Sydney.

1995 Langford, R. P., Wilford, G. E., Truswell, E. M., and **Isern, A. R.**, Paleogeographic Atlas of Australia, Volume 10: Cainozoic. Australian Geological Survey, Canberra.

1994 Kuo-Yen Wei, Ze-Wei Zhang, Min-Te Chen, **A. R. Isern**, Chung-Ho Wang, M. Leinen. Latest Quaternary Paleoceanography of the Central Equatorial Pacific: A quantitative record of planktonic foraminiferal, isotopic, organic carbon, and carbonate changes. Journal of the Geological Society of China, 37:475-496.

1993 **Isern, A. R.**, J. A. McKenzie, and D. W. Müller. Paleoceanographic changes and reef growth off the northeast Australian margin: Stable isotopic data from ODP Leg 133 Sites 811 and 817, and DSDP Leg 21 Site 209. *In* J. A. McKenzie, & P. J. Davies (Ed.), Scientific Results of the Ocean Drilling Program: College Station Texas (Ocean Drilling Program), 263-280.

1993 McKenzie, J. A., **A. R. Isern**, H. Elderfield, A. Williams, and P. K. Swart. Strontium isotope dating of paleoceanographic, lithologic, and dolomitization events on the northeast Australian margin, Leg 133. *In* J. A. McKenzie, & P. J. Davies (Ed.), Scientific Results of the Ocean Drilling Program: College Station Texas (Ocean Drilling Program), 489-498.

1993 Swart, P. K., **A. R. Isern**, H. Elderfield, and J. A. McKenzie. A summary of interstitial-water geochemistry of Leg 133. *In* J. A. McKenzie, & P. J. Davies (Ed.), Scientific Results of the Ocean Drilling Program: College Station Texas (Ocean Drilling Program), 705-722.

1993 Murray, R. W., M. Leinen, and **A. R. Isern**. Biogenic flux of Al to sediment in the central equatorial Pacific Ocean: Evidence for increased productivity during glacial periods. Paleoceanography, 8:651-670.

1989 McKenzie, J. A., **A. R. Isern**, A. M. Karpoff, and P. K. Swart. Basal Dolomitic Sediments, Tyrrhenian Sea, Scientific Results Ocean Drilling Program Leg 107 Volume B, pp. 141-151.

***NAME*:** CHRISTOPHER JOHN PIGRAM
DATE OF BIRTH: 28 February 1952

ACADEMIC QUALIFICATIONS:
1974 B.App.Sc. (Hons) University of New South Wales; 1994 PhD, The Australian National University.

***CURRENT APPOINTMENT*:**
Chief of Division (Level2), Petroleum and Marine Division, Australian Geological Survey Organisation (AGSO)

PREVIOUS APPOINTMENTS:
August 1996-May 1997: Acting Chief of Divsion (level 2), Minerals Division. AGSO.
May 1993 - August 1996 - Acting Chief of Division, Marine Geoscience and Petroleum Geology and subsequently Marine Petroleum and Sedimentary Resources Division.
August 1994 - appointed Senior Principal Research Scientist, Division of Marine Geoscience and Petroleum Geology, Australian Geological Survey Organisation, Canberra, Australia.
March 1991 - appointed Principal Research Scientist, Division of Marine Geoscience and Petroleum Geology, Bureau of Mineral Resources, Canberra, Australia.

***PROFESSIONAL AFFILIATIONS*:**
Geological Society of Australia;
American Association of Petroleum Geologists
Petroleum Exploration Society of Australia

AWARDS:
1985 - HAROLD RAGGAT AWARD - coauthor best paper BMR Symposium.
1988 - coauthor - PESA BEST PRESENTED PAPER AT APEA CONFERENCE
1991 - Australia Day Award presented to the Northeast Australia Group.

REFEREEING
GEOLOGY - member of editorial panel 1992-1994; associate editor 1994-1996;
Marine Geology
TECTONICS
South East Asian Journal of Earth Sciences
Indonesian Petroleum Association
Bulletin of the Geological Research and Development Centre
Third Circum Pacific/AAPG Terranes volume
Australian Journal Of Earth Sciences
2nd PNG Petroleum Conference Editorial Panel
AGSO Journal of Australian Geology and Geophysics
Reviewed Research Proposals for the National Research and Environment Council of the U.K. and reviewed final research report at the end of the grant period.

PUBLICATIONS
P.J. Davies, P.A. Symonds, D.A. Feary and **C.J. Pigram**, 1987 - Horizontal plate motion - a key allocyclic factor in the evolution of the Great Barrier Reef of Northeastern Australia. Science, 238, 1697-1700.
P.J. Davies, P.A. Symonds, D.A. Feary and **C.J. Pigram**, 1988 - Facies models in exploration - the carbonate platforms of northeast Australia. The APEA Journal, 123-143.
P.J. Davies, P.A. Symonds, D.A. Feary and **C.J. Pigram**, 1989 - The evolution of the carbonate platforms of northeast Australia: Society of Economic Paleontologists and Mineralogists, Special Publication No. 44, p 233- 258.
C.J. Pigram, P.J. Davies, D.A. Feary, and P.A. Symonds 1989 - Tectonic controls on carbonate platform evolution in southern Papua New Guinea :passive margin to foreland basin. Geology, 17, 199-202.
C.J. Pigram, P.J. Davies, D.A. Feary, P.A. Symonds and G.C.H. Chaproniere, 1990 - Controls on the Tertiary Carbonate Platform Evolution in the Papuan Basin: New Play Concepts. in Carman, G.J., & Carman, Z., (eds), Petroleum Exploration in Papua New Guinea: Proceedings of the first PNG Petroleum Convention, Port Moresby.

Feary, D.A., Davies, P.J., **Pigram, C.J.**, and Symonds, P.A., 1991. Climatic evolution and control on carbonate deposition in Northeast Australia. Palaeogeography, Palaeoclimatology, Palaeoecology (Global and Planetary Change Section) 89, 341-361.

Feary, D.A., **Pigram, C. J.**, Davies P.J., Symonds, P.A., Droxler, A., W., Peerdeman, F., 1990. Ocean Drilling Project - Leg 133 Safety Package. Bureau Mineral Resources Australia Record 1990/6.

C.J. Pigram, Davies, P.J., Feary, D.A., and Symonds P.A., 1989. Tectonic controls on carbonate platform evolution in southern Papua New Guinea: passive margin to foreland basin. Geology, 17, 199-202.

C.J. Pigram, Davies, P. J., Feary, D. A., Symonds, P. A., and Chaproniere, G. C. H., 1992. Absolute magnitude of the second-order Middle to late Miocene sea-level fall, Marion Plateau, Northeast Australia. Geology 20, p. 858-862.

C.J. Pigram and P.A. Symonds, 1993 - Eastern Papuan Basin - a new model for the tectonic development, and implications for petroleum prospectivity. *in* Carmen G. J. and Carmen Z., Eds., Petroleum Exploration and Development in Papua New Guinea: Proceedings of the Second PNG Petroleum Convention, Port Moresby, p. 213-231.

C.J. Pigram, Davies, P.J., and Chaproniere, G.C.H., 1993. Cement stratigraphy and the demise of the early to middle Miocene carbonate platform on the Marion Plateau: *in* McKenzie, J.A., Davies P.J., Palmer-Julson, A.A., Proceedings Ocean Drilling Program Scientific Results, 133: College Station, Texas, Ocean Drilling Program.

D.A. Feary, P.A. Symonds, P.J. Davies, **C.J. Pigram**, and R. D. Jarrard, 1993. Geometry of Pleistocene facies on the Great Barrier Reef outer shelf and and upper slope - seismic stratigraphy of ODP sites 819-821. *in* McKenzie, J.A., Davies P.J., Palmer-Julson, A.A., Proceedings Ocean Drilling Program Scientific Results, 133: College Station, Texas, Ocean Drilling Program.

G.C.H.Chaproniere, and **Pigram, C.J.**, 1993. Miocene to Pleistocene foraminiferal biostratigraphy of dredge samples from the Marion Plateau, offshore Queensland, Australia. AGSO Journal of Australian Geology and Geophysics, p1-20.

Liu, K., **Pigram, C .J.**, Paterson, L., and Kendall, C.G. St C., in press. Computer simulation of a Cainozoic carbonate platform, Marion Plateau. International Association of Sedimentology Special Publication.

CURRICULUM VITAE

NAME	: Ralph Dietmar Müller
PLACE/DATE OF BIRTH	: Neumünster, Germany, May 18th, 1959
CITIZENSHIP	: German
PRIVATE ADDRESS	: 3 Bradford St., Balmain, NSW 2041, Australia Phone: 61-2-810-9280
OFFICE ADDRESS	: Department of Geology and Geophysics, Building F05, The University of Sydney, NSW 2006, Australia Phone: 61-2-351 2003, Fax: 61-2-351 0184

EDUCATION	: Abitur 6/1978; military service 7/1978 - 10/1979; Diplom in geology/paleontology 3/1986 at Christian-Albrechts Univ./Kiel; supervisor: Prof. Jörn Thiede; grad. Student at UT Austin, TX/USA from 9/1988-9/1990; transfer to UC San Diego/SIO 10/1990; superviser: Prof. John G. Sclater; Ph.D. 6/1993.
LANGUAGES	: German, English
RESEARCH INTERESTS	: Marine geophysics, global geodynamics
EMPLOYMENT HISTORY:	Research Assistant at Christian-Albrechts Universität/Kiel from 5/1986 to 9/1988 in the project "History of the North Atlantic". Teaching Assistant at the Department of Geological Sciences/Univ. Texas for "Geology for Engineering" (312K), 1989/1990. Research Assistant, Scripps Inst. of Oceanography, 10/1990 - 6/1993. Research Geophysicist, Scripps Inst. of Oceanography, 7/1993 - 10/1993. Lecturer in Geophysics, Department of Geology and Geophysics, Sydney University, initial appointment October 25, 1993.
PH.D. THESIS	A quantitative analysis of post-chron 34 (83 Ma) plate motions between North America, Africa, and South America.
PULICATIONS	REFEREED JOURNALS:

Gahagan, L.M., Scotese, C.R., Royer, J.-Y., Sandwell, D.T., Winn, J.K., Tomlins, R.L., Ross, M.I., Newman, J.S., Müller, R.D., Mayes, C.L., Lawver, L.A. and Heubeck, C.E., 1988, Tectonic Fabric Map of the Ocean Basins From Satellite Altimetry Data. *Tectonophysics* 155, 1-26.

Lawver, L.A, Müller, R.D., Roest, W. R., and Srivastava, S. P., 1990, The Opening of the Arctic Ocean, in: U. Bleil and J. Thiede, eds., *Geological History of the Polar Oceans: Arctic Versus Antarctic*, Kluwer Academic Publishers, 29-62.

Müller, R.D. and Spielhagen, R.F., 1990, Evolution of the Central Tertiary Basin of Spitsbergen: Towards a Synthesis of Sediment and Plate Tectonic History. *Palaeogeography, Palaeoclimatology, Palaeoecology,* 80, 153-172.

Müller, R.D., Sandwell, D.T., Tucholke, B.E., Sclater, J.G., and Shaw, P.R., 1991, Depth to Basement and Geoid Expression of the Kane Fracture Zone: A Comparison. *Marine Geophysical Researches*, 13, 105-129.

Nürnberg, D. and Müller, R.D., 1991, The Tectonic Evolution of the South Atlantic.from Late Jurassic to Present. *Tectonophysics*, 191, 27-53.

Müller, R.D.and Roest, W.R , 1992, Fracture Zones in the North Atlantic from combined Geosat and Seasat data, *Journal of Geophysical Research*, 97, 3337-3350.

Roest, W.R., Müller, R.D. and Verhoef, J., 1992, Age of the ocean floor: A digital data set for the Labrador Sea and Western North Atlantic, *Geoscience Canada*, 19, 27-32.

Royer, J.-Y., Sclater, J.G., Sandwell, D.T., Cande, S.C., Schlich, R., Munschy, M., Dyment, J., Fisher, R.L., Müller, R.D., Coffin, M.F., Patriat, P., and Bergh, H.W., 1992, Indian Ocean Plate Reconstructions Since the Late Jurassic, in Duncan, R.A., Rea, D.K., Kidd, R.B., von Rad, U., and Weissel, J.K., The Indian Ocean: A Synthethis of Results from the Ocean Drilling Program, Geophysical Monograph 70, American Gephysical Union (Washington, D.C.), 471-475.

Müller, R.D., Royer, J.-Y. and Lawver, L.A., 1993, Revised Plate Motions Relative to the Hotspots from Combined Atlantic and Indian Ocean Hotspot Tracks, *Geology*, *21*, 275-278.

Müller, R.D. and Smith, W.H.F., 1993, Deformation of the oceanic crust between the North American and South American plates, *Journal of Geophysical Research*, *93*, 8275-8292.

Müller, R.D., Royer, J.-Y. and Lawver, L.A., 1994, Revised Plate Motions Relative to the Hotspots from Combined Atlantic and Indian Ocean Hotspot Tracks, Reply *Geology*, 22, 277-278.

Lawver, L.A. and Müller, R.D., 1994, The Iceland hotspot track, *Geology,* 22, 311-314.

Müller, R.D., Roest, W.R., Royer, J.-Y., Gahagan, L.M., and Sclater, J.G., 1997, Digital isochrons of the world's ocean floor, *J. Geophys. Res.*, 102, 3211-3214.

Müller, R.D., Overkov, N., Royer, J.-Y., Dutkiewicz, A., Keene, J., 1997, Seabed classification of the South Tasman Rise from SIMRAD EM12 backscatter data using artificial neural networks, *Aus. Jour. Earth Sci.*,44, 689-700.

Gurnis, M., Müller, R.D., and Moresi, L., 1998, Dynamics of Cretaceous to the Present Vertical Motion of Australia and the Origin of the Australian-Antarctic Discordance, *Science,* 279, 1499-1504.

Cande, S., Stock, J., Raymond, C., and Müller, R.D., 1998, New constraints on an old plate tectonic puzzle of the Southwest Pacific, *EOS*, 79, 81-82.

Mihut, D., and Müller, R.D., 1997, Volcanic margin formation and Mesozoic rift propagators in the Cuvier abyssal plain off Western Australia. *J. Geophys. Res.*, in press.

Müller, R.D., Cande, S.C., Royer, J.-Y., Roest, W.R., and Maschenkov, S., 1997, New constraints on the Late Cretaceous/Tertiary plate tectonic evolution of the Caribbean. *Elsevier special volume on Caribbean sedimentary basins,* Ed. P. Mann, in press.

Gaina, C., Müller, R.D., Royer, J.-Y., Stock, J., Hardebeck, J., Symonds, P.A., The tectonic history of the Tasman Sea: a puzzle with 13 pieces, *J. Geophys. Res.*, in press.

PUBLICATIONS SUBMITTED

Müller, R.D., Roest, W.R., and Royer, J.-Y., *Nature,* Seafloor spreading: a tug-of-war in equilibrium?, in revision.

Gaina, C., Müller, R.D., Royer, J.-Y., and Symonds, P., subm. to *Tectonics*, The evolution of the Louisiade Triple Junction.

Gaina, C., Roest, W., Müller, R.D., and Symonds, P.A., subm to *Earth Interactions.*, The opening of the Tasman Sea: A gravity anomaly grid animation.

Müller, R.D., Lim, V., and Isern, A., subm. to *Marine Geology*, Late Tertiary tectonic subsidence on the Queensland Plateau: response to dynamic topography

Müller, R.D., Lim., V. and Mason, I., subm. to *Exploration Geophysics*, Seismic reflectors on the Queensland Plateau: What do they mean?

Müller, R.D., subm. to *Neoproterozoic and Phanerozoic Earth History of Australia*, ed.: J.J. Veevers., Australia's plate motion with respect to the hotspot frame.

Müller, R.D., Mihut, D., and Baldwin, S., A new kinematic model for the formation and evolution of the West Australian margin, *submitted to: West Australian Basins Symposium 98, Perth, Western Australia.*

Mihut, D., and Müller, R.D. Revised seafloor spreading history of the Argo Abyssal Plain, *accepted for publ. in: West Australian Basins Symposium 98, Perth, Western Australia.*

CURRICULUM VITAE

Flavio Stefano Anselmetti

Date of Birth: September 3, 1965

Place of Birth: Basel

Nationality: Swiss

Address: Geologisches Institut
Swiss Federal Institute of Technology ETH
Sonneggstrasse 5, CH-8092 Zürich, Switzerland
Tel.: 41-1-632 6569, Fax.: 41-1-632 1080
e-mail: flavio@erdw.ethz.ch
home: Freyastrasse 11, CH-8004 Zürich
Tel.: 41-1-241 5692

Current Position: Research Associate, ETHZ

Research Interests: Acquisition, processing and interpretation of seismic data
Petrophysical rock properties
Petrography and diagenesis of carbonates
Seismic modelling
Seismic records of lakes as indicator for environmental change

Geological Education:
1984-1990: Diploma student at the Geological Institute of the University of Basel, Switzerland.

1990: Diploma in Geology and Geophysics. Diploma thesis: Geologie und Tektonik der frontalen Wildhorndecke in der Morgenberghorn-Dreispitzgruppe (Suldtal - Kiental / Berner Oberland). Supervisor Prof. H.P. Laubscher, Basel.

1990-1994 Ph.D. student at the Geological Institute of the Swiss Federal Institute of Technology, Zürich, Switzerland. Supervisors Prof. D. Bernoulli, ETH Zürich and Prof. G. Eberli, RSMAS-MGG, Univ. of Miami, U.S.A.

1991-1993: Visiting student at the Rosenstiel School of Marine and Atmospheric Science, Division of Marine Geology and Geophysics, University of Miami, U.S.A.

September '94: Ph.D. defense at the ETHZ, Thesis title: Physical properties and seismic response of carbonate sediments and rocks.

October '94: Postdoctoral Asscociate at RSMAS/MGG, University of Miami Fellowship from Swiss National Science Foundation. Acquisition, processing and interpreation of multichannel seismic data from site survey for ODP Leg 166 (Bahamas Transect).

Jan. 1996: Research Associate at University of Miami, RSMAS/MGG.

as of June 1997: Assistant at the Geological Institute of ETH Zürich, Switzerland.

Practical Experiences:
February/April 1996: Physical properties specialist onboard R/V Joides Resolution, ODP Leg 166, Bahamas Transect.

1995-1996: Two months consultant for Schlumberger-Doll Research Laboratory, Ridgefield, Connecticut:

May/June 1994: Shipboard scientist for an ODP site survey (Leg 166, Bahamas Transect) on Great Bahama Bank and in the Straits of Florida: Multichannel seismic data acquisition, piston coring.

1991-1993: University of Miami, Rosenstiel School of Marine and Atmospheric Science, sponsored by Shell K.S.E.P.L. Research Laboratory, Rijswijk, Holland. Installation of the Petrophysics Laboratory (high pressure/ultrasonic velocity-meter).

1991: Shipboard scientist during the drilling campaign of the Bahamas Drilling Project, Great Bahama Bank.

1990-1994: Teaching assistant (several classes and field courses) at the ETHZ.

1991: Field assistant of seismic campaign in Central Alps, Switzerland: multichannel seismic data acquisition in context with the new railway tunnels through the the base of the Alps (NEAT).

1988-1989: Drill-site geologist of two geothermal deep drillholes in Riehen/BS, Switzerland.

1988-1990: Teaching assistant at the Geological Institute of the University of Basel, Switzerland, (several classes and field courses).

1987: Summer-employee of the X-ray laboratory of Ciba-Geigy, Basel, Switzerland. Powder diffractometry for mineral identification.

Publications:

Anselmetti, F.S., Eberli, G.P. and Bernoulli, D. (1997), Seismic modeling of a carbonate platform margin (Montagna della Maiella, Italy): Variations in seismic facies and implications for sequence stratigraphy, *in* Palaz, I. and Marfurt K.J. (eds.), Carbonate Seismology, SEG Geophysical Developments Series, 6, 373-406.

Anselmetti, F.S. and Eberli, G.P. (1997), Sonic velocity in carbonate sediments and rocks, *in* Palaz, I. and Marfurt K.J. (eds.), Carbonate Seismology, SEG Geophysical Developments Series, 6, 53-74.

McNeill, D.F., Cunningham, K.J., Guertin, L.A., Melim, L.A., Warzeski, E.R., Anselmetti, F.S., Ginsburg, R.N., Eberli, G.P., and Swart, P.K. (1996), Data report: Tertiary-Quaternary cores from the Florida Keys and Everglades. Miami Geological Society, 98 p.

Anselmetti, F. S., Luthi, S. and Eberli, G.P. (1996), A Study of Carbonate "End Member" Rocks, Part 1: Petrographic Image Analyses - Internal report for Schlumberger-Doll Research Laboratory, Ridgefield, Connecticut, 34 p.

Anselmetti, F.S. (1994), Physical Properties and Seismic Response of Carbonate Sediments and Rocks, Dissertation ETH Nr. 10845.

Anselmetti, F.S. and Eberli G.P. (1993), Controls on sonic velocity in carbonates, Pure and Applied Geophysics 141/2-4, 287-323.

Anselmetti, F.S. (1990), Geologie und Tektonik der frontalen Wildhorndecke in der Morgenberghorn-Dreispitzgruppe (Suldtal - Kiental / Berner Oberland), Diplomathesis at the University of Basel, Switzerland.

Publications (in press):

Anselmetti, F.S., von Salis, G.A., Cunnningham, K.J. and Eberli, G.P. (1997), Controls and distribution of sonic velocity in Neogene carbonates and siliciclastics from the subsurface of the Florida Keys: Implications for Seismic Reflectivity, Marine Geology.

Anselmetti, F.S. and Eberli, G.P. (1997), Sonic velocity in carbonates - a combined product of depositional lithology and diagenetic alterations, *in* Ginsburg, R.N.G. (ed.), Ground Truthing Seismic Stratigraphy of a Prograding Carbonate Platform Margin, Neogene, Great Bahama Bank - Integrated Analysis of Sedimentology, Stratigraphy, Diagenesis and Petrophysics: Concepts in Sedimentology and Paleontology, SEPM.

Melim, L.A., Anselmetti, F.S., and Eberli, G.P. (1997), The importance of pore type on permeability of Neogene carbonates, Great Bahama Bank, *in* Ginsburg, R.N.G. (ed.), Ground Truthing Seismic Stratigraphy of a Prograding Carbonate Platform Margin, Neogene, Great Bahama Bank - Integrated Analysis of Sedimentology, Stratigraphy, Diagenesis and Petrophysics: Concepts in Sedimentology and Paleontology, SEPM.

Eberli, G.P., Anselmetti, F.S., Kenter J.A.M., McNeill, D.F., Melim, L.A., (1997), Facies, diagenesis and timing of prograding seismic sequences on western Great Bahama Bank, *in* Ginsburg, R.N.G. (ed.), Ground Truthing Seismic Stratigraphy of a Prograding Carbonate Platform Margin, Neogene, Great Bahama Bank - Integrated Analysis of Sedimentology, Stratigraphy, Diagenesis and Petrophysics: Concepts in Sedimentology and Paleontology, SEPM.

Eberli, G.P., Anselmetti, F.S., Melim, L.A. and Kenter, J.A.M. (1997), Facies, diagenesis and petrophysics of a prograding carbonate platform margin, Neogene, Great Bahama Bank: Core Workshop Manual, CSPG-SEPM Joint Convention, Calgary, Canada, 18 p.

Publications (submitted):

Anselmetti, F.S. and Eberli, G.P. (in review), The Velocity-Deviation Log: A tool to predict pore type and permeability trends in carbonate drillholes from sonic and porosity/density logs, submitted to: AAPG Bulletin.

Anselmetti, F.S., Lüthi, S. and Eberli, G.P (in review), Quantitative characterization of carbonate pore systems by digital image analysis, submitted to AAPG Bulletin.