Leg 207 Titles List

(77 proposed papers)

PALEOGENE

Title: **PALEOGENE BIOSTRATIGRAPHY AND FAUNAL TURNOVER OF PLANKTIC FORAMINIFERS IN DEMERARA RISE, ODP LEG 207.**
Authors: Hiroshi Nishi and Richard Norris
Synopsis: We study the Paleogene biostratigraphy from Oligocene to Paleocene of planktic foraminifers using all samples (low-resolution) including Pal-, Bio- and our personal samples. In this cruse, early to middle Eocene continuous sequences from P11 to P7, PETM and K/T were recovered. We also provide a middle resolution(10 cm interval) biostratigraphic information during this interval. We will add information of BEE event using an extra samples of PETM. Moreover, we count numbers of specimens for each species per dry weight. We reveal bio-events of planktic foraminifers during Paleogene and mass flux change of planktic foraminifers through Paleogene.
Venue: PPP or SR.

Title: **PALEOGENE DIATOMS FROM ODP LEG 207**
Author: Gombos, Andrew (Exxon-Mobil)
Synopsis: A mostly biostratigraphic/taxonomic framework study with an eye out for indicators for upwelling, productivity, etc. Will concentrate mainly on the expanded middle Eocene of Hole 1260 and possibly 1259, depending on number of samples Gombos' company will let him work on

Title: **SILICOFLAGELLATES FROM ODP LEG 207**
Authors: McCartney, Kevin (Univ. of Presque Isle, Maine), Gombos (Exxon-Mobil), A. and student(s) at Presque Isle University.
Synopsis: A mostly biostratigraphic/taxonomic framework study; one in a series of McCartney's undergraduate student ODP projects that have been published in the ODP SR volumes. This study will utilize samples prepared by Gombos (see above).

Title: **THE STABILITY OF TROPICAL ATLANTIC INTERMEDIATE WATER MASS TEMPERATURES AND CARBON CYCLING DURING THE MIDDLE EOCENE**
Authors: Sexton, Wilson
Synopsis: Using $\delta^{18}O$ and $\delta^{13}C$ measurements on Middle Eocene benthic foraminifera, we propose to assess this problem using sediments (from biozones P12 and P13) with

continuous recovery through a ~100 m spliced section of Site 1260. Relatively high sedimentation rates of 2.8 cm/kyr permit assessment of secular variation of intermediate water properties at orbital timescales.
Venue: Outside Literature

Title: **PALAEOCLIMATIC AND PALAEOCEANOGRAPHIC SIGNIFICANCE OF MIDDLE EOCENE RADIOLARIAN ACUMULATION IN THE TROPICS**
Authors: Danelian, Sexton, Janecek, Norris, Wilson & Ogg
Synopsis: Middle Eocene Radiolarian chalk recovered on the Demerara Rise displays a well-preserved biogenic silica (opal) record, made essentially of radiolarians. The sequence displays an orbitally-tuned cyclic record in lithology, color and magnetic susceptibility. Two aspects will be investigated. Low-resolution (one sample per section) observations thoughout all Demerara sites in order to refine the extent of the Middle Eocene siliceous event and its preservational expression. High-resolution measurements in the biogenic opal/carbonate/clay content and the benthic foraminiferal isotopic signature in a well-defined cyclostratigraphic framework of Site 1260 to identify the orbital influence on opal productivity.
Venue: *Paleoceanography*

Title: **EVOLUTION OF TROPICAL ATLANTIC INTERMEDIATE WATER MASS TEMPERATURES AND CARBON CYCLING THROUGH THE EARLY EOCENE 'GREENHOUSE' AND MIDDLE EOCENE 'DOUBTHOUSE'**
Authors: Sexton, Norris, Wilson
We will conduct $\delta^{18}O$ and $\delta^{13}C$ measurements on Early and Middle Eocene benthic foraminifera from Sites 1258 and 1260, which form a relatively continuous sedimentary section from ~55 Ma to ~40 Ma. These data will provide a moderate resolution (~70 kyr) record of long-term evolution of intermediate water mass properties across the warmest interval of the past ~80 Myr and its subsequent termination during a period of rapid global cooling.
Venue: Outside Literature

Title: **ASTRONOMICAL TIME SCALE FOR EARLY THROUGH MIDDLE EOCENE MAGNETIC POLARITY CHRONS AND BIOSTRATIGRAPHIC EVENTS**
Authors: Janecek, Ogg, Danelian, Mutterlose, Nishi, Norris, Sexton, Suganuma, and Wise (and other named Leg 207 members that directly contribute to text and graphics) and Leg 207 Scientific Party
Synopsis: Middle and Early Eocene chalks recovered on the Demerara Rise display a polarity pattern from Chrons C17n through C24r and pronounced cyclicity in color, magnetic susceptibility, density and lithology. We will constrain each polarity boundary

at multiple sites to within a sedimentary cycle, and apply spectra analysis to determine the orbitally tuned duration of each chron. The final time scale has integrated foraminifer, nannofossil, radiolarian and magnetic polarity datums, and is calibrated at the base to the age of the base-Eocene stage boundary (PETM). The lowermost portion of this interval will test the cycle-magnetic scaling from Leg 171 sites.
Venue: *Paleoceanography*; Target data for initial submission = Jan, 2004

Title: **CALCAREOUS NANNOFOSSILS FROM THE PETM INTERVAL OF THE DEMERARA RISE: IMPLICATIONS FOR BIOGENIC PLANKTON CARBONATE PRODUCTION DURING A PERIOD OF ELEVATED ATMOSPHERIC CO_2 CONCENTRATION.**
Authors: Mutterlose, Joerg and Bornemann, Andree
Synopsis: Calcareous nannofossils will be studied on a high resolution scale (1cm/sample) from the PETM interval with respect to their abundance, diversity patterns, assemblage composition and carbonate accumulation rate. The objective is to better understand the reaction of this phytoplankton during periods of elevated atmospheric CO_2 concentration.
Venue: Outside journal

Title: **NANNOFOSSIL BIOSTRATIGRAPHIC AND ASSEMBLAGE CHANGES THROUGH THE PALEOCENE/EOCENE THERMAL MAXIMUM AT SITES 1258 AND 1259: A HIGH RESOLUTION STUDY WITH COMPARISONS WITH ODP SITE 1135, SOUTHERN OCEAN**
Authors: Jiang, Shijun and Wise, S. W.
Synopsis: We will compare and contrast quantitatively nannofossil assemblage changes at these Leg 207 equatorial sites with another we are studying from the Kerguelen Plateau.

Title: **PALEOCENE THROUGH EOCENE NANNOFOSSIL BIOSTRATIGRAPHIC FRAMEWORK, ASSEMBLAGE SUCCESSION, AND EVOLUTION OF DISCOASTERS.**
Authors: Jiang, Shijun and Wise, S. W.
Synopsis: This study will concentrate on the "shipboard designated splice(s)" (lower Eocene = Site 1258; Middle Eocene = Site 1260) in order to provide a biostratigraphic framework for other studies and to attempt to see how nannofossils contribute to sedimentary/climate events. A parallel site will be Site 1259.

The Paleocene from the K/T boundary up will be considered a secondary target depending on time and manpower available and needs/interest of others of the shipboard party (and possibly involving another FSU grad student where/if needed).

Work on the K/T sections appears to be limited by diagenesis in the limestones immediately about the boundaries sampled, but we will probe those samples with other techniques to see if useful nannos can be knocked out of them. This work with be coordinated with Helen Bostock and Dick Norris.

Title: **VARIABILITY IN NANNOFOSSIL VS. FORAMINIFERAL CARBONATE PROPORTIONS AND BURIAL RATES ON DEMERARA RISE (ODP LEG 207) DURING THE LATE PALEOCENE THROUGH MIDDLE EOCENE (AND ITS PLAUSIBLE CAUSES).**
Authors: Henderiks, J. and Shipboard Scientific Party of ODP leg 207
Synopsis: Preliminary data on bulk carbonate (and stable isotopes) will be achieved before the post-cruise sampling party, in order to better constrain final project and co-authors from the shipboard scientific party focussing on Paleocene-Eocene interval (Norris, Danelian, Mutterlose, Wilson, Sexton) Both coccolithophores and planktic foraminifera have evolved relatively rapidly since their first appearance in the Mesozoic. Their evolutionary patterns are characterized by several periods of increasing species diversity and subsequent decline, as well as changes in their size and morphology during the Cenozoic. To date, no data are available relating these evolutionary patterns to the global carbonate cycle, and therefore a low-resolution study of Paleogene (late Paleocene – middle Eocene; ~62-40 Ma) biogenic carbonate fractions is planned as a first study. Samples were requested from Leg 207 Sites 1258, 1259 and 1260 from the late Paleocene to middle Eocene nannofossil chalks. Sampling distribution will eventually allow for a temporal resolution of one sample every 100,000 years. Methods will include bulk and fine fraction (<38μm) carbonate, as well as stable isotope measurements at Stockholm University. The stable isotope measurements on the bulk and fine fraction (mainly nannofossil carbonate) will complement stable isotope analyses on benthic foraminifera through the same time interval, as will be carried out by other Leg 207 participants.
Venue: Paleoceanography or EPSL

Title: **CAN LONG-TERM TRENDS OF BIOGENIC CARBONATE BURIAL DURING THE PALEOCENE - EOCENE BE RELATED TO CONTEMPORANEOUS EVOLUTIONARY SIZE CHANGES OF CALCAREOUS NANNOFOSSILS (DEMERARA RISE ODP LEG 207)**
Authors: Henderiks, J., Backman, J. and Shipboard Scientific Party of ODP leg 207
Synopsis: To augment the long-term trends in biogenic carbonate burial on Demerara Rise, high-resolution studies will be undertaken on selected time intervals to address morphometric and species diversity patterns of coccoliths/calcareous nannofossils, in order to discern plausible causes for changes in proportions of biogenic carbonate input. The large variability in size of coccoliths, related to evolutionary and/or ecological changes, implies significant variability in the amount of coccolith carbonate buried into the geological record. For example, the succession of various species within the coccolithophore families Prinsiaceae and Noelaerhabdaceae displays distinct variability

in size and morphology over the last 65 Ma, following a major extinction event at the Cretaceous-Tertiary boundary.
Venue: Paleoceanography, EPSL or Marine Micropaleontology

Title: **THE CARBONATE LYSOCLINE DURING THE PALEOCENE/EOCENE TRANSITION**
Authors: Norris, R.D. Le Callonnec, L., and Rohl, U.
Summary: Discussion of depth-related trends in sedimentation rate, carbonate preservation and benthic foraminifer $\delta^{13}C$ during the Paleocene/Eocene Thermal Maximum based upon comparison of Sites 1258, 1260 and 1261. This study will present bulk carbonate and benthic foraminifer isotope stratigraphies for each site, and % carbonate measurements that will be used to evaluate depth-dependent nutrient status and carbonate undersaturation during the P/E event. Results of magnetic susceptibility and color reflectance scans of the cores will be used to generate time scales for the ~300-400 kyr interval surrounding the P/E boundary. This study will be followed up with chronological studies of the P/E interval by Norris, Rohl, Janecek and Ogg
Venue: *Science* or *Nature*

Title: **WATER GEOCHEMISTRY CHANGES AT THE PALEOCENE/EOCENE TRANSITION.**
Authors: Le Callonnec L., Norris D., Suganuma Y. and Renard M.
Synopsis: A high resolution geochemical study (on bulk sediments and on the carbonate phase), on the different water depth sites (1258, 1260 and 1261), will be correlated with the carbon isotopic trend and magnetic susceptibility record. Our objectif is to study variations (1) in redox conditions in the water column and in sediments, (2) trace element incorporation in calcium carbonate or their release and (3) nutrient concentrations.

Title: **AN OCEAN MODEL SIMULATION OF THE TROPICAL WATER COLUMN RESPONSE TO CIRCULATION CHANGE AT THE PALEOCENE-EOCENE THERMAL MAXIMUM**
Authors: Bice, K. L., Norris, R. D.
Summary: This study will include a detailed comparison of PETM benthic paleotemperature estimates from the Demerara Rise depth transect against global ocean model simulations across this interval. Bice and Marotzke (2002) observed a profound abrupt change in ocean circulation forced by gradual changes in moisture flux accompanying late Paleocene to early Eocene global warming. Intensification of the global hydrologic cycle led first to gradual warming at subthermocline depths (due to deepened subtropical subduction), followed by abrupt bottom water warming (due to an abrupt change in the site of deep water formation). In that study, model simulated bottom water temperatures and temperature changes compared very well with pre-PETM and peak PETM data from all available previously studied sites. Bice and Norris will compare new high resolution Leg 207 benthic isotope analyses (Norris et al., this leg) against the

models to either verify or refine the hypothesis proposed by Bice and Marotzke (2002). New atmosphere and ocean model experiments will be performed where warranted. Data presented in this study will include global simulations of atmosphere and ocean circulation patterns, moisture fluxes, and ocean temperature and salinity distributions. Literature: Paleoceanography or JGR-Oceans

Title: **HIGH-RESOLUTION MAGNETIC CHARACTERISTICS PROFILE AND THEIR PALEOCEANOGRAPHIC IMPLICATION ACROSS THE PALEOCENE TO EOCENE BOUNDARY**
Authors: Suganuma, Norris, Callonnec, Ogg (maybe with other participants)
Synopsis: We will perform rock magnetic analysis across the P/E boundary sediments at the Demerara Rise, in order to reveal the change of clastics supply process, the redox environment, and precise timing through the event. Bains *et al.*, (1999) suggested that the oceanic change had occurred before 30 ka of the Benthic Extinction Event (BEE), and caused the change in the heat transportation between high and low latitude, in which involved major release of the methane hydrate and rapid warming of the climate later. Besides this, various hypotheses are still discussed about the origin of PETM. In order to reconsider the event, we note oceanic circulation and redox environment at the mid Atlantic gateway based on an independent proxy such as magnetic properties. In addition, we also perform the grain size distribution analysis to calibrate the dust flux, and the high resolution susceptibility measurement to calibrate/correlate the timing of the event at each Site/Hole using the MST at the Bremen repository. Appropriated indexes are type and quantity of magnetic mineral grains, grain size, SEM, possibly XRD of the sample, and high resolution susceptibility data measured at the Bremen repository.
Venue: Paleoceanography or ???

Title: **GEOCHEMICAL CYCLING OF BARIUM DURING PALEOGENE CLIMATIC PERTURBATIONS**
Authors: Castellini, D. G., Dickens, G. R.
Purpose: Bulk sediment from the Paleocene and Eocene will be analyzed for barium concentrations via ICP-OES. We will build a record of barite fronts during this time to establish how barium concentrations vary during periods of extreme periods of climatic instability, such as the LPTM.
Venue: Outside journal

Title: **BARITE IN PLANKTIC FORAMINIFERA AS A PROXY FOR BARIUM CONCENTRATIONS IN PALEOGENE OCEANS**
Authors: Castellini, D. G., Dickens, G. R.
Purpose: Planktic foraminifera will be extracted from Paleocene and Eocene sediments and will be evaluated for their barite content. Hypothetically, the amount of barium in

well-preserved foraminifera reflects the relative amount of barium in marine systems during the life of the organism. Therefore, this study will potentially establish a new proxy for barium in Paleogene waters.
Venue: Outside journal

Title: **ASTRONOMICAL TIME SCALE FOR LATE PALEOCENE MAGNETIC POLARITY CHRONS AND BIOSTRATIGRAPHIC EVENTS**
Author: Janecek, Ogg, Nishi, Norris, Suganuma, and Wise (and other named Leg 207 members that directly contribute to text and graphics) and Leg 207 Scientific Party
Synopsis: Paleocene clayey chalks recovered on the Demerara Rise display a polarity pattern from Chrons C24r through C27r and pronounced cyclicity in color and lithology. We will constrain each polarity boundary at multiple sites to within a sedimentary cycle, and apply spectra analysis to determine the orbitally tuned duration of each chron. The final time scale has integrated foraminifer, nannofossil and magnetic polarity datums, and is calibrated at the base to the age of the base-Eocene stage boundary (PETM). This interval will test the cycle-magnetic scaling from Leg 171 sites.
Venue: *Paleoceanography*; Target data for initial submission = March, 2004

Title: **MAGNETIC PROPERTIES AND PALEOCEANOGRAPHIC CHANGES AT THE DEMERARA RISE, WESTERN EQUATORIAL ATLANTIC OCEAN, ODP LEG 207**
Authors: Suganuma, Ogg
*Synopsis:*We perform rock magnetic analysis on Paleogene chalks recovered at the Demerara Rise, in order to reveal the sedimentation processes of these sediments and the paleoceanic/paleoclimatic changes of the mid Atlantic gateway through the Paleogene period. The Paleogene chalks display variations in color, lithology, and sedimentation rate of the each site through the age. The variation is probably caused by the change of the sedimentation processes and/or the paleoenvironment. Because the Carbon content of the Paleocene chalks from each site does not show obvious relationship with the variation, the change of intensity/depth of the counter current, and of the redox environment might causes the variation. In addition, the change records the transition of the oceanic circulation through the Paleogene epoch which is known as gradual trends of warming to cooling from carbon isotope data.Magnetic properties are an independent proxy for the reconstruction of paleoclimatic and Paleoceanic records (e.g., Thompson and Oldfield, 1986; F. Heider *et al.*, 2001). We analyze a large set of oriented 6cc cubes from ODP Sites 1257 to 1261 using alternating gradient magnetometer (AGM) and Magnetic susceptibility meter. Appropriated indexes are type, quantity, and anisotropy (orientation) of magnetic mineral grains, grain size, SEM, possibly XRD of the sample, and susceptibility data measured on the board.
Venue: *Marine Geology/Paleoceanography* or ???

Title: **DISSOLUTION EVENTS IN THE PALEOCENE: CHEMISTRY, BENTHIC RESPONSE AND PALEOCEANOGRAPHIC SIGNIFICANCE**
Authors (tentative order): Thurow, Le Callonnec, Kaminski

CRETACEOUS

Title: **A HIGH RESOLUTION GEOCHEMICAL RECORD OF THE PALEOCEANOGRAPHIC CHANGE ACROSS THE CRETACEOUS/TERTIARY BOUNDARY ON THE DEMERARA RISE, ODP LEG 207**
Authors: Bostock H.C., Opdyke B.N., Norris R. and Wilson P.A.

We plan to constrain the stratigraphic completeness of the K/T boundary record at two sites from the Demerara Rise (Site 1258 and 1259) by generating new records (stable isotope and trace elements, Ca, Mg, Sr, Mn, Fe) in bulk and benthic foraminiferal calcite. These records will be compared with similar records available from other sites (especially d13C). Site 1258 is thought to represent a relatively deep paleobathemetric site compared to Site 1259, so variations with depth will also be considered. The project will also incorporate a component of carbon cycle modeling to understand the chain of events that took place across this important boundary.

Title: **THE K/T RECORD AT DEMERARA RISE**
Author: MacLeod, Bostock, shorebased- Koeberl, Christian(?)
Synopsis: We will describe in detail the K/T boundary interval including examining potential reworking across the boundary, testing for an $^{87}Sr/^{86}Sr$, and documenting stable isotopic and trace element patterns.

Title: **VARIABILITY AMONG IMPACT SPHERULES FROM THE CRETACEOUS-TERTIARY BOUNDARY**
Authors: Christy Glatz (Graduate School TBA), Dallas Abbott (LDEO of Columbia University)
Synopsis: This paper will consist of SEM analysis of impact spherules from the KT boundary. It will discuss the varying compositions and textures of spherules. The paper will serve two purposes: The first is to prove that a single marine impact will produce an assortment of spherules. Second, to find a link between texture with composition and place of formation within the impact.

Title: **MAASTRICHTIAN PALEOCEANOGRAPHIC EVOLUTION IN THE TROPICAL ATLANTIC**
Authors: MacLeod, Ken shorebased- possibly Frank, Tracy; Huber, Brian; Thibault, Nicolas
Synopsis: This paper will use stable isotopic data and any changes among the foraminiferal and nannofossil assemblages as a starting point to examine paleoceanographic changes during the Maastrichtian in the region.

Title: **PALEOECOLOGY AND PALEOBIOGEOGRAPHY OF THE MAASTRICHTIAN CALCAREOUS NANNOFLORA IN THE EQUATORIAL ATLANTIC OCEAN (ODP LEG 207)**
Authors: Thibault N., Gardin S., Le Callonnec L., Wise W. and Kulhanek
Synopsis: We propose a detailed paleoecological analysis of the calcareous nannofossil assemblages (a quantitative and morphometric study by a separation of the different biological phases) in Holes 1258 and 1259. We will test the possibility that some Maastrichian calcareous nannofossil species can be used for fertility and paleoclimatological reconstructions. This will be tested by comparison of absolute and relative abundance, morphological variations, magnetic susceptibility, $CaCO_3$ content, clay mineralogy and stable isotopes of carbon and oxygen.

Title: **CRETACEOUS RADIOLARIAN ASSEMBLAGES, BIOSTRATIGRAPHY AND PALEOCEANOGRAPHY OF THE DEMERARA RISE**
Authors: Danelian, Moussavou-Musavu & Ricordel
Synopsis: Well-preserved Albian and Upper Cretaceous radiolarian fauna were encountered in several stratigraphic intervals of Leg 207. The Albian fauna is made of well-diversified pyritised radiolarians including well known morphotypes from Tethyan sections, which may improve calibration of existing radiolarian biozonations. Radiolarians are rare, but exceptionally well-preserved in the black shales (mainly the Cenomanian-Turonian interval) and may contribute in understanding water mass exchange between the Demerara Atlantic and Tethys ocean, as well as the biotic response of plancton to the C/T event. The Campanian sediments contain a well-preserved, diverse and abundant radiolarian record which will help with mapping and understanding the paleoceanographic significance of the Campanian siliceous event.
Venue: Palaeo-3/ MarMic/Cretaceous Research

Title: **ASTRONOMICAL TIME SCALE FOR MAASTRICHTIAN AND LATE CAMPANIAN MAGNETIC POLARITY CHRONS AND BIOSTRATIGRAPHIC EVENTS**

Authors: Ogg, Janecek, MacLeod, Danelian, Mutterlose, Nishi, Norris, Suganuma, and Wise (and other named Leg 207 members that directly contribute to text and graphics) and Leg 207 Scientific Party
Synopsis: Thick and continuous successions of Maastrichtian through Upper Campanian chalks recovered on the Demerara Rise display a polarity pattern from Chrons C29r through C33n and pronounced cyclicity in color, magnetic susceptibility and lithology. We will constrain each polarity boundary at multiple sites to within a sedimentary cycle, and apply spectra analysis to determine the orbitally tuned duration of each chron. The final time scale has integrated foraminifer, nannofossil and magnetic polarity datums, and is calibrated at the top to the 65.7 Ma age of the end-Cretaceous boundary.
Venue: *Paleoceanography*; Target data for initial submission = Nov. 2003

Title: **SANTONIAN-CONIACIAN CALCAREOUS CALCAREOUS NANNOFOSSILS FROM ODP LEG 207**
Authors: Kulhanek, Denise, Wise, S. W., James Bergen (BP-Amoco, Houston)
Synopsis: A nannofossil biostratigraphic framework study with the aim of improving the biostratigraphy, taxonomy, following assemblage changes, and determining factors responsible for the acme of forms such as the enigmatic *Martasterites furcatus*, and seeing how nannofossils responded to the ventilation of the "black-shale" *sensu lato* basin. We'll also revisit the Campanian/Maastrichtian to improve the biostrat for Jim Ogg and Ken MacLeod respective studies and for the project coordinated by Laurence, Silvia Gardin, et al. .

Title: **THE OPENING OF THE EQUATORIAL ATLANTIC GATEWAY AS DOCUMENTED ON DEMERARA RISE (ODP LEG 207)**
Authors: Erbacher, Mutterlose, Norris, Nishi and Janecek:
Synopsis: benthic forams, planktic forams stable isotopes, trace fossils, cyclicity (Coniacian to late Campanian)

Title: **CENOMANIN TO TURONIAN PALEOCEANOGRAPHIC CHANGES ALONG THE DR DEPTH TRANSECT.**
Author: Friedrich, Mutterlose, Wilson and Erbacher:
Synopsis: stable oxygen and carbon isotopes, calcareous nannofossils, benthic forams

Title: **INOCERAMID STABLE ISOTOPIC RECORDS WITHIN THE BLACK SHALE FACIES ON DEMERARA RISE**
Author: MacLeod
Synopsis: I will measure stable isotopic ratios of inoceramid shells from the black shales. The hope is that the ratios measured in comparison to foraminiferal and organic isotopes

will provide clues regarding the ecology of the bivalves (epibenthic vs. infaunal vs. psuedoplanktonic, heterotrophic vs. chemosynthetic). I will also investigate the possibility of variation along growth transects to invetigate growth rates and perhaps fluctuations in the type or availabilty of food.

Title: **EVOLUTION OF TROPICAL SEA SURFACE TEMPERATURE DURING THE CRETACEOUS GREENHOUSE**
Authors: Norris, R.D., Wilson, P.A., and Bice, K.L.,
Summary: We will present a preliminary planktic foraminifer $\delta^{18}O$ and $\delta^{13}C$ record from the Albian to Santonian based upon planktic foraminifer $\delta^{18}O$ and $\delta^{13}C$. This study will present results of a pilot study of planktic foraminifer stable isotopes. We will provide an overview of the isotopic history of the Albian-Santonian record on Demerara Rise and its implications for Cretaceous climate and greenhouse forcing.
Venue: Geology or *Nature*

Title: **RECONSTRUCTION OF TROPICAL MID-CRETACEOUS SEA-SURFACE TEMPERATURES FOR THE DEMERARA RISE EMPLOYING A NOVEL ORGANIC MATTER BASED PROXY BASED ON CRENARCHAEOTAL MEMBRANE LIPIDS (TEX_{86}) IN CLOSE COMPARISON WITH SEA-SURFACE TEMPERATURE RECORDS GAINED BY $\delta^{18}O$-ANALYSIS ON PLANKTONIC FORAMINIFERA**
Authors: Astrid Forster, Ellen C. Hopmans, Richard D. Norris, Stefan Schouten, Jaap S. Sinninghe Damsté, Paul A. Wilson
Synopsis: The recently developed SST-proxy TEX_{86} will be employed to reconstruct paleo-sea surface temperatures for at least two sites of the Demerara Rise depth transect for the entire interval of Cretaceous black shales recovered (Albian to Santonian time range) in close comparison with well established isotope-based SST-proxies. Depending on the quality of the first results and the sensitivity of the TEX_{86} temperature proxy, more sites from the Demerara Rise could be included at a later stage in order to compare local SST-variations between different sites.
Venue: open literature

Title: **TROPICAL SEA SURFACE TEMPERATURE CHANGE ACROSS THE CENOMANIAN/TURONIAN BOUNDARY SEQUENCE AT DEMERARA RISE USING GLASSY PLANKTONIC FORMINIFERAL CALCITE**
*Authors***:** Wilson PA (+/- un-named PhD student or post-doc)
*Destination***:** outside literature
Stratigraphic extent: depends on chemostratigraphy (TPspls) and any biostratigraphic refinement.

Sample interval: 5 cm through the splice where lithology suitable.
Sample volume: 20cc 1.5cm right across the half round
Sites: 1258 (C/T; to be defined); 1259 (lower Turonian from C/T to ~530 mcd); 1260 (base of the non-tempestite Cenomanian to C/T)
Potential shipboard collaborators (within or subsequent spin out papers) include:
• Erbacher (benthic faunal & isotope records)
• Forster (SST via TEX_{86})
• Janecek (cyclostratigraphy)
• Mutterloser (faunal studies, nannofossils)
• Nishi (faunal studies, planktonic foraminifera)
• Norris (similar study, upper Turonian-Coniacian)
• Wise (biostratigraphy)

Title: **TURONIAN-SANTONIAN TROPICAL ATLANTIC SEA SURFACE TEMPERATURES: THE GREENHOUSE-ICEHOUSE TRANSITION**
Authors: Norris, R.D., and Wilson, P.A.
Summary: Results of our high-temporal resolution (~10 kyr sample spacing) analysis of planktic foraminifer stable isotopes from the mid Turonian to Santonian in Sites 1259 and 1257. We will address trends in tropical SST, evidence for Cretaceous ice and the nature of the transition between super warm climates of the Turonian and cooler climates of the later Cretaceous. This study will be followed up by a comparison of the planktic _^{13}C record to biomarker organic carbon δ^{13}C (K-U. Hinrichs), data-model work with K.L. Bice, and benthic foraminifer stable isotopes with J. Erbacher.
Venue: *Paleoceanography*

Title: **ULTRA-HIGH RESOLUTION PALEOCEANOGRAPHY AND CLIMATE CHANGE FROM MID-CRETACEOUS LAMINATED ORGANIC-RICH SEDIMENTS, LEG 207 (DEMERARA RISE)**
Authors: Thurow, Brumsack, Forster, Kemp, Meyers, Wilson

Title: **STRATIGRAPHY OF THE BLACK SHALES OF DEMERARA RISE REVEALED BY WIRELINE LOGGING AND CORE PHYSICAL PROPERTIES.**
Author: Brice R. Rea, Felix Heidersdorf, Matt A. O'Regan, Debora Berti, Thomas R. Janecek and David C.Mosher
Synopsis: using the suite of downhole logging data and core physical properties data produce an integrated, detailed stratigraphy and interpretation of the black shale sequences, including the intervals where core gaps exist. This will provide the basis for subsequent cyclostratigraphic analyses, fine tuning of age models, and will provide the full stratigraphy for anyone working on this sequence.

Venue: Journal Publication

Title: **COMPARISON OF MID-CRETACEOUS ORGANIC-RICH SEDIMENTATION ON BOTH SIDES OF THE PROTO-NORTH ATLANTIC**
Authors: Thurow, Brumsack, Erbacher, Mutterlose, Kuhnt (?)

Title: **CHARACTERIZATION OF CARBONATE DIAGENESIS IN CRETACEOUS BLACK SHALES OF DEMARARA RISE**
Authors: Junium, Malone, Thurow and Arthur
Synopsis: This study will attempt to understand the processes contributing to the formation of diagenetic carbonates and "exotic" cements (beef layers and carbonate fans) within the black shales. Measurements will include stable isotopes of carbon and oxygen, elemental compositions via ICP and microprobe, thin section petrography, BSE, CL and XRD.

Title: **CRETACEOUS BIOSTRATIGRAPHY AND FAUNAL TURNOVER OF FORAMINIFERS IN BLACK SHALES IN DEMERARA RISE, ODP LEG 207.**
Authors: Hiroshi Nishi, Richard Norris, Jochen Erbacher and Oliver Freidlich
Synopsis: We study a biostratigraphy of planktic foraminifers in black shales from Santonian to Albian in Leg 207. For this study, we need lots of additional black shales samples of middle-resolution (2-3 samples per section) or low-resolution (1 sample per section) in this study except PAL- and a few BIO-samples. Because the planktic assemblages recovered from this cruse are very similar in those of the Cretaceous assemblages in northwest Japan, we can correlate between two assemblages in detail. Unfortunately, the assemblages sometimes lack the Cretaceous zonal markers and we need to calibrate the datums based on nannofossil biostratigraphy. Black shale assemblages of planktic and benthic foraminifers are quite different from the typical Tethyan faunas. We must study the faunal composition and its turnover during Santonian through Albian. We count all specimens numbers for each species of foraminifers and calculated their abundance per weight. Those informations suggest reconstruction of paleocenographic circulation and paleoproductivity during the Cretaceous hothouse.
Venue: PPP or SR.

Title: **CALCAREOUS NANNOFOSSIL BIOSTRATIGRAPHIC FRAMEWORK AND ASSEMBLAGE CHANGES THROUGH THE "BLACK SHALES" SENSU LATO OF ODP SITE 1260 (AND THE "SHIPBOARD DESIGNATED SPLICE")**
Authors: Kulhanek, Denise, Wise, S. W., James Bergen (BP-Amoco, Houston)
Synopsis: This study will seek to strengthen biostratigraphic control through the "black shale" sequence in support of others studies utilizing this sequence and well as the

"shipboard-designated splice" designed by Norris/Wilson/Splicers, which as we understand it will start in the Albian of Site 1258, thence over to the Cenomanian of Site 1260, next crossing over into the Turonian at Site 1259, thence through the Turonian of 1259, and finally to the Coniacian/Santonian of Sites 1259 and 1257. A detailed study in collaboration with Phil Meyers will be attempted in the Cenomanian over a short (2-m interval) to look at nannofossil changes/cycles over a short time frames.

Title: **BIOSTRATIGRAPHY, PALECOLOGY AND PALEOCEANOGRAPHY OF CALCAREOUS NANNOFOSSILS FROM THE CENOMANIAN/TURONIAN BLACK SHALES.**
Authors: Mutterlose, Joerg, Erbacher, Jochen ?.. (others, if none nannofossil data will be used).
Synopsis: Calcareous nannofossils will be studied on a low resolution scale (~50 cm/sample) to decipher the biostratigraphy, palecology and paleoceanography of the Cenomanian/ Turonian black shales. The second part of the reseach will concentrate on a high resolution analyses (1cm/sample) of 2-3 cycles within the black shales. Both data will shadow light on the genesis of black shales in the western part of the then opening Atlantic.
Venue: Outside journal

Title: **A HIGH RESOLUTION STABLE CARBON ISOTOPE RECORD OF OCEANIC ANOXIC EVENT 2 (LATE CENOAMNIAN-EARLY TURONIAN) OF DEMERARA RISE.**
Authors: Erbacher, Mutterlose and Wilson
Synopsis: bulk carbon carbon isotopes and correlation to shipboard biostratigraphy

*Title***: CHEMOSTRATIGRAPHY AND CARBON CYCLE PERTURBATION ACROSS OAE-2 AT DEMERARA RISE USING GEOCHEMICAL RECORDS IN BOTH FORAMINIFERAL CALCITE AND BULK CORG AND SIMPLE NUTRIENT-ISOTOPE BOX MODELS**
Authors: Wilson PA (+/-un-named PhD student) Palmer MR Tyrell T (SOC)
*Destination***:** outside literature
Sample interval: 5 cm through the splice where lithology suitable.
Sample volume: 20cc 1.5cm right across the half round
Sites: 1258 (C/T; to be defined); 1259 (lower Turonian from C/T to ~530 mcd); 1260 (base of the non-tempestite Cenomanian to C/T)
Potential shipboard collaborators (within or subsequent spin out papers) include:
• Brumsack (bulk sediment geochemistry)
• Erbacher (benthic foram records; bulk Corg stratigraphy)
• Forster (biomarkers)
• Janecek (cyclostratigraphy)
• Mutterloser (faunal studies, nannofossils; bulk Corg stratigraphy)

• Wise (biostratigraphy)

Title: **DIAGENESIS OF ORGANIC MATTER WITHIN THE CRETACEOUS BLACK SHALES OF DEMARARA RISE: EVIDENCE FROM STABLE ISOTOPES OF NITROGEN AND CARBON OF SEDIMENT AND PORE WATERS**
Authors: Junium, Arthur (shorebased) and collaboration with Meyers
Synopsis: This study will appraise the extent of diagenesis of organic matter within Cretaceous high TOC sediments with a focus on the relationship of pore waters and their host sediments. Measurements will include C/N ratios, TOC, Rock Eval pyrolosis, stable isotopes of carbon (bulk organic) and nitrogen (inorganic, organic, pore water and sorbed). These analyses will shed light upon the diagenetic processes resulting from burial and microbial degredation. These processes can obscure isotopic values that hold clues to the conditions under which the compounds were formed and subsequently deposited. The goal of this study is to determine the integrity of d13Corg and d15N as proxies of paleoceanographic conditions, surface nutrient utilization and the extent of microbial degredation within these sediments.

Title: **THE RELATIONSHIP OF ORGANIC MATTER, CLAY MINERALOGY AND MINERAL SURFACE AREA, AN ASSESSMENT OF THE SORBATIVE-PROTECTIVE PATHWAY IN ORGANIC MATTER PRESERVATION IN CRETACEOUS BLACK SHALES OF DEMARARA RISE**
Authors: Junium and Arthur (shorebased)
Synopsis: Mineral surface area, specifically, the percent of interlayered, smectitic clays has been invoked in previous studies as the primary control on preservation of and subsequent burial of organic carbon via the ?sorbative-protective pathway?. This contradicts the model proposed for OAE events where enhanced preservation of organic matter is due to bottom-water anoxia. This study will determine the role of mineral surface area and clay mineralogy in the preservation of apparently very immature organic matter at the Demarara Rise. Measurements will include quantitative XRD, BET and ethylene glycol monoethyl ether-mineral surface area analyses, TOC, percent POM (by Coulter Counter studies), elemental analyses of kerogen separates and petrographic and SEM analyses.

Title: **ORGANIC MATTER CHARACTERIZATION BY INVESTIGATIONS OF BULK AND MOLECULAR BIOGEOCHEMISTRY ON CRETACEOUS BLACK SHALES LEG 207 EMPLOYING SHIPBOARD AND POST-CRUISE RESULTS FROM SITES 1257 AND 1258**
Authors: Astrid Forster, Helen Sturt, Phil Meyers
Synopsis: Results based on the organic matter analysis on-board supplemented by more sophisticated shore-based analysis should lead to a general characterization of the organic matter preserved in black shales at these two sites on the Demerara Rise

Journal: SR volume (this can be done very fast) – but will maybe be included into the Initial Reports already

Title: **ORIGIN AND ACCUMULATION OF ORGANIC MATTER IN ALBIAN TO SANTONIAN BLACK SHALES ON THE DEMERARA RISE**

Authors: Meyers, P.A., A. Forster, H. Sturt, and Shipboard Party

Summary: Shipboard analyses of the amount and type of organic matter present in the several black shale sequences cored during Leg 207 at the five Demerara Rise sites will be compiled and interpreted in terms of the paleooceanographic and paleodepositional conditions they record.

Venue: *Organic Geochemistry*

Title: **MAJOR AND MINOR ELEMENT COMPOSITION OF ORGANIC CARBON-RICH SEDIMENTS ENCOUNTERED DURING ODP LEG 207.**
Authors: Brumsack, H.J., Schnetger, B., NN (graduate student)

Synopsis: The inorganic geochemical composition of black shales sampled at 20-40 cm intervals will be determined, with special emphasis on specific trace metals (Ag, Cd, Re, U, V, Zn, etc.). This study will be used to determine the range of metal concentrations in OC-rich intervals of Demerara Rise sediments, to make a comparison with other OC-rich settings from other locations and Recent settings of OC accumulation, and to provide a basis for the high-resolution study of C/T boundary sediments planned thereafter.

Title: **A HIGH-RESOLUTION STUDY OF MAJOR AND MINOR ELEMENT VARIATION IN C/T BOUNDARY SEDIMENTS OF DEMERARA RISE.**
Authors: NN (graduate student), Brumsack, H.-J.
Synopsis: Two C/T boundary intervals will be studied at high-resolution (2-5 cm sample intervals) for major and minor elemental composition. The focus of this study lies on high-resolution geochemical records of major and minor elements in C/T black shales recovered during Leg 207 on Demerara Rise. The C/T boundary is characterized by specific enrichments in diagnostic trace metals, such as Ag, Cd, Re, Mo, V, and Zn. Studies of modern analogues of organic carbon-rich sedimentation typically reveal quite different enrichment patterns to those at the C/T boundary. It is therefore suggested, that trace metals provide useful information deciphering the paleoenvironment of deposition and paleoceanographic setting. Furthermore major elements contain useful information on the provenance of terrigenous detrital material and the weathering regime in the hinterland.This study will concentrate on intervals characterized by the carbon isotope

shift and correlative micropaleontological and organic geochemical events. We will try to decipher the most likely source for trace metal enrichments and will address the question if there exist any indications for a hydrothermal contribution. Finally we?ll try to model the significance of trace metal enrichments in C/T black shales in relation to global trace metal cycles and budgets?

Title: **^{87}Sr/^{86}Sr evidence for increased extrusion rates of oceanic plateau basalts around the CTBE?**
Authors (tentative order): Thurow, Vonhoff, Nederbragt

Title: **Impact of oceanic anoxic events on the global carbon cycle: reconstruction and monitoring *p*CO_2-variations during the OAE II?**
Authors: Astrid Forster, Richard D. Norris, Stefan Schouten, Jaap S. Sinninghe Damste, Paul A. Wilson
Synopsis: pCO_2-reconstruction for the OAE II should be achieved by recalculation of the isotopic fractionation factor of marine phytoplankton (ε_p) combining compound specific $\delta^{13}C$-isotope measurements (preferable S-bound phytane) and the $\delta^{13}C$ -record of dissolved inorganic carbon (DIC) on suited foraminiferal calcite
Journal: open literature

Title: **Employing the compound specific $\delta^{13}C$-record of the OAE II as a stratigraphic tool combined with biostratigraphic and other $\delta^{13}C$-isotopic records**
Authors: Astrid Forster, Jochen Erbacher, Richard D. Norris, Stefan Schouten, Jaap S. Sinninghe Damsté, Joerg Mutterlose, Thomas Wagner, Paul A. Wilson – *list of co-authors varies depending on the OAEs included and/or interest of scientist to participate*
Synopsis: In addition to biostratigraphy, isotopic records have been proven to be very useful with regard to stratigraphic correlation purposes for the Cretaceous OAEs. Therefore, I would suggest to employ the biomarker based isotopic record for the OAEs recoverd by LEG 207 combined with biostratigraphy (foraminifera, nannofossils, radiolaria) and other $\delta^{13}C$ -records available. For the OAEs recovered by LEG 207 this should mainly focus on OAE II – but potentially could also include Lower Cretaceous OAEs and the OAE III as well - if recovered.
Venue: potentially SR volume

Title: **Characterization and paleoenvironmental implications of the preserved organic matter in black shales deposited during the OAE II from one to two sites located at the Demerara Rise**

Authors: Astrid Forster, Hans Brumsack, Jaap S. Sinninghe Damsté
Synopsis: results from high resolution organic and inorganic geochemical analysis of the OAE II sediments will be employed to evaluate the primary organic matter sources and to reconstruct the paleoenvironmetal setting (e.g. occurrence photic zone anoxia, presence of an oxygen minimum zone, enrichment of trace-metals) during the OAE II at one or two sites from Leg 207
Journal: open literature

Title: **MOLECULAR, ISOTOPIC, AND ELEMENTAL EVIDENCE OF CHANGES IN THE MODES OF MARINE ORGANIC MATTER PRODUCTION DURING DEPOSITION OF CENOMANIAN TO SANTONIAN BLACK SHALES ON THE DEMERARA RISE**

Authors: Meyers, P.A., and M. Arnaboldi

Summary: Relative contributions of algal and microbial primary production of organic matter will be assessed from biomarker extractions and carbon and nitrogen isotope analyses in black shales from different parts of the late Cretaceous at Sites 1257, 1258, and 1260.

Venue: *Paleoceanography* or *Marine Geology*

Title: **A STUDY OF SUBSURFACE MICROBIAL ECOSYSTEMS ASSOCIATED WITH OCEANIC ANOXIC EVENTS AT DEMERARA RISE.**
Authors: Sturt H.F., Hinrichs K-U., Teske A.
Synopsis: We predict that organic-material rich black shales representing Oceanic Anoxic Events (OAEs) and other periods of increased organic carbon deposition will harbor elevated populations of prokaryotes as demonstrated in Pleistocene sapropels (Coolen et al, Science, 2002, 296, 2407-2410).
A complete down-core profile of intact polar lipids (IPLs) and functional genes will furnish information on the function and nature of deeply buried microbes associated with regions of high organic matter deposition in sediments at Demerara Rise. Intact polar lipids are the molecules that form the membranes of all living cells, they degrade rapidly after death of the organism and are sufficiently specific to distinguish different groups of organisms such as sulfate reducers and methanogens. IPL qualitative and quantitative analyses will be carried out using a liquid chromatograph coupled to an ion trap mass spectrometer *via* an electrospray interface. Isotopic IPL analyses will be carried out using out using a liquid chromatograph coupled to an isotope-ratio mass spectrometer *via* a moving-wire interface. We will analyze phylogenetically and physiologically informative key genes for sulfate reduction (dissimilarity sulfite reductase (dsrAB) and adenosine-Phosphosulfate-reductase (apsA)) and for methane cycling (the alpha subunit

of methyl coenzyme M reductase (mcr)). These genes allow functional analyses together with phylogenetic identifications of the microbial communities involved in these processes. We will investigate the relationship between sediment-bound hydrocarbon gases and microbial processes in the subsurface.

Title: **PALEOENVIRONMENTAL CHANGES IN THE EARLY CENOMANIAN DEDUCED FROM CALCAREOUS NANNOFOSSILS**
Authors: Mutterlose, Joerg
Synopsis: The transition from the Albian - Cenomanian clay and siltstone facies, which underlies the black shales, and the black shales itself will be analysed in a high resolution study (~1cm/sample). Calcareous nannofossils will be studied to supply information about environmental changes.
Venue: Outside journal.

Title: **ALBIAN BENTHIC FORAMINIFERA FROM SITE 1258**
Authors: Erbacher, Friedrich and ???:

LONG-TERM AND OTHER STUDIES

Title: **THE DEMERARA RISE PALEOCEANOGRAPHIC DEPTH TRANSECT - CRITICAL BOUNDARIES, BLACK SHALES AND THE OPENING OF THE EQUATORIAL ATLANTIC GATEWAY**
Authors: Erbacher, Mosher, Malone, Norris, Wilson and Leg 207 Shipboard Scientific Party:
Venue: EOS or Geotimes thing: *< 1yr publication*

Title: **ANATOMY OF OLIGOCENE-MIOCENE DEBRIS FLOWS AND SLUMPS FROM THE DEMERARA RISE: COMPARISONS WITH THE ODP NEW JERSEY TRANSECT AND IMPLICATIONS FOR MARGIN DESTRUCTION.**
Authors: Ingram, Wes, Wise, S. W., Norris, Richard and Dave Mosher
Synopsis: Follow up of shipboard nannofossil and foram studies with comparisons to the New Jersey ODP Transect; correlations with sea-level history, faulting, ???.

Title: **CURATION OF DEEP-SEA SEDIMENT SAMPLES FOR QUANTITATIVE NANNOFOSSIL ANALYSES: TO FREEZE OR NOT TO FREEZE (DRY). THAT'S THE QUESTION…**
Authors: Henderiks, J. and Shipboard Scientific Party of ODP leg 207

Synopsis: The observation that nannofossil slides, that are prepared from fresh core material display much better preserved, and sometimes more diverse assemblages (i.e. delicate marker species disappear), than slides prepared post-cruise from samples that were kept in 'standard ODP' sample packages, is the main incentive for this project.
I intend to test if the usual post-cruise processing of sediment samples (i.e. drying in oven at 40-50°C), or simple 'stowing away' whilst still humid until smearslides are prepared, may be the main problem.
By freeze-drying a sub-set of sediment right after sampling from the fresh core onboard, I presume to have created a 'best-preserved' control. Freeze drying is considered the most effective way of drying material, with the least chemical alteration / cementation. A sub-set exists for all shipboard samples (~2 samples per core in Paleocene and Eocene chalks at Sites 1258, 1259 and 1260).
Venue: Marine Micropaleontology

Paleoceanography/Paleoclimatology

Title: **A DATA-MODEL DETERMINATION OF CENOMANIAN THROUGH EOCENE CLIMATE USING MULTIPLE PROXIES FROM EQUATORIAL ODP LEG 207 (DEMERARA RISE)**
Authors: Bice, K. L., Norris, R. D., Meyers, P. A., Hinrichs, K.-U., Sturt, H. F.
Summary: The study will use multiple proxies of paleotemperature (foraminiferal $\delta^{18}O$ and Mg/Ca) and pCO_2 ($\delta^{11}B$ of foraminifera and $\delta^{13}C$ of marine organic matter) to estimate tropical ocean conditions and atmospheric carbon dioxide concentrations. Numerical experiments using atmosphere, ocean and biogeochemical models in forward and reverse approaches will be performed to ascertain whether ocean climate data inferred from the multiple proxies are mutually consistent and plausible, or which proxy results are more/less plausible from a global climate perspective. Although the study will incorporate, where possible, data from coeval marine sediments collected at other drill sites, the accurate determination of atmospheric CO_2 using model-data comparison is most dependent on tropical mixed layer temperature estimates, as observed by Bice and Norris (2002). Other data resulting from this study will include global atmosphere and ocean circulation patterns, ocean overturning rates, temperatures, salinities, winds, precipitation and evaporation rates. Estimates of ocean pO_2, alkalinity and pH will also be generated at a coarse resolution (box model) scale. The study will be performed using Leg 207 samples taken shipboard at low resolution (1 per core). The marine organic matter $\delta^{13}C$ pCO_2 proxy data will be generated only from sediment samples with greater than 1% TOC. Proxy data based on foraminiferal calcite will be generated where calcite preservation is moderate to excellent. Where planktonic foraminiferal preservation is

only moderate, mixed layer paleotemperatures calculated from $\delta^{18}O$ will be taken as minimum estimates.

Literature: JGR-Atmospheres or Paleoceanography

Title: **SECULAR CHANGE IN SEAWATER Mg/Ca AND Sr/Ca USING BENTHIC FORAMINIFERAL CALCITE OF CRETACEOUS AND PALAEOGENE AGE FROM DEMERARA RISE AND SIMPLE BOX MODELS**

Authors: Wilson PA (+/-un-named PhD student) German CD Tyrell T (SOC)

Destination: outside literature

Sample interval: ~250-500 ky where preservation suitable.

Sample volume: 20cc 1.5cm right across the half round

Sites: 1257 (Paleocene); 1258 (lower Eocene); 1260 (middle Eocene); Cretaceous as above

Potential shipboard collaborators (within or subsequent spin out papers) include:

- Bice (palaeothermometry, pCO_2 & GCModels, tectonic timescales)
- Erbacher (stable isotope records in Cen-Con benthic foraminiferal calcite)
- Norris (stable isotope records in Lower Eocene benthic foraminiferal calcite)
- Sexton (stable isotope records in middle Eocene benthic foraminiferal calcite)

Title: **PALEOCEANOGRAPHIC AND WATER GEOCHEMISTRY CHANGES FROM UPPER MAASTRICHTIAN TO LOWER EOCENE IN THE EQUATORIAL ATLANTIC OCEAN, COMPARISON WITH THE TETHYAN OCEAN.**

Authors : Le Callonnec L., Renard M., and Person A.

Synopsis: Using carbonate trace elements (Mg, Fe, Sr, Mn ?), carbon and oxygen stable isotopes on bulk carbonate, we propose to study, on a depth trend in all 207 ODP leg holes, the carbon cycle changes (related to paleoproductivity and organic matter preservation variability and clathrate destabilisation). We will also investigate the control of carbonate pelagic production and sea level fluctuations on the carbonate trace elements trend. We will compare the 207 leg sites with the Tethyan record in order to better understand the paleoceanographic changes at a global scale.

Magnetostratigraphy

Title: **MAGNETOSTRATIGRAPHY OF THE CAMPANIAN - PRIABONIAN SEDIMENTS OF ODP LEG 207, DEMERARA RISE**

Authors: Suganuma, Ogg

Synopsis: This paper is a synthesis of the paleomagnetic polarity sequences from Campanian to Priabonian of the each site, ODP Leg 207. Using thermal

demagnetization, we analyze suite of discrete samples for removal of over print and the improvement of accuracy of shipboard paleomagnetic measurements, which generally indicate a polarity pattern consistent with chrons expected from the biostratigraphy. We describe magnetic characteristics of each facies and construct the magnetostratigraphy of each site and each time-slice (e.g., Eocene, and Maastrichtian) of ODP Leg 207.
Venue: Scientific Results

Geochemistry

Title: **SULFUR BIOGEOCHEMISTRY OF POREWATERS AND SEDIMENTS FROM DEMERARA RISE, ODP LEG 207.**
Authors: Brumsack, H.J., Böttcher, M.E., Wilson, P.A., Schnetger, B.
Synopsis: Using the elemental and isotopic (sulfate-O, S, Sr) composition of pore waters and corresponding solids, we will attempt to provide information on the black shale "bioreactor" that governs pore water geochemistry at all Leg 207 drillsites. We will concentrate on sulfide and sulfate phases, as well as sulfur intermediates, when present. Special emphasis will also be put on barite front formation and elemental analysis of separated pyrite/marcasite and barite/celestine phases.

Title: **GEOCHEMICAL EVIDENCE FOR THE ORIGIN OF CHLORIDE ANOMALIES ON DEMERARA RISE: IMPLICATIONS FOR FLUID FLOW ON CONTINENTAL MARGINS**
Authors: Malone, M.J., Brumsack, H.J., Wilson, P.A.
Synopsis: Using the isotopic (O, H, Sr, B, Cl) and elemental composition (Na/Cl, Br/Cl, etc.) of pore waters, we will attempt to determine the origin of the brines (Sites 1257, 1258, 1261) and pore-water freshening (Sites 1258 and 1260) encountered during Leg 207.
Venue: *Geochimica et Cosmochimica Acta* or *EPSL*

Title: **GEOCHEMICAL AND PALEOENVIRONMENTAL PARITY OF MEDITERRANEAN SAPOPRELS AND CRETACEOUS BLACK SHALES**

Authors: Arnaboldi, M., and P.A. Meyers

Summary: Similarities and differences between Mediterranean sapropels and Demerara Rise black shales will be described using a suite of organic and inorganic geochemical paleooceanographic and paleodepositional proxies.

Intended publication: *Geochimica et Cosmochimica Acta*

Composite depths and cyclostratigraphy

Title: **CENOMANIAN TO MIDDLE EOCENCE CYCLOSTRATIGRAPHY, DEMERARA RISE**
Authors: T. Janecek, B.Rea, and others who contribute (biostratigraphers, paleomagnetists, geochemistis)
Synopsis: This manuscript will document the variability and examine the potential forcing functions of proxy lithologic data (magnetic susceptibility, GRA bulk density, Natural gamma ray, spectral reflectance) from the Cenomanian to Middle Eocene using a composite section developed from Leg 207 sites. Comparison will be made to equatorial sections in the Pacific as well as equivalent age high-latitude sections (e.g., Leg 189).
Venue: *Paleoceanography*

*Title***: An Orbitally Tuned, Time Scale for the Eocene through Late Campanian (37 Ma to 80 Ma), and Implications for Global Spreading Rates**
Author: Ogg, Janecek, Norris, Suganuma, and Wise (and others?)
Synopsis This synthesis paper is the culmination of the Maastrichtian-Campanian, Middle-and-Early Eocene, and Late Paleocene studies, and will merge previous cycle-magnetic calibrations across the Cretaceous/Paleocene boundary, Danian to Early Eocene, and latest Eocene. Two main figures -- a full-page bio-magnetic-age scale, and a spreading-rate-through-tine diagram for all major oceanic spreading centers -- and a detailed table of age-event will be the highlight of this summary. The direct assignment of durations to magnetic anomalies will test the current model that the South Atlantic and other ocean basins underwent significant slowing of spreading rates from Campanian to Paleogene, followed by a major acceleration during the Early to Middle Eocene. It is possible that this compilation will be paired with a Neogene through Oligocene to latest Eocene synthesis paper by Leg 199 and Utrecht authors; thereby presenting a complete 80 myr astronomical-tuned time scale.
Venue: Geology 4-page synthesis; Target data for initial submission = July, 2004

Title: **REVISED COMPOSITE DEPTH SCALES FOR LEG 207 SITES**
Authors: T. Janecek, B. Rea (or B.Rea and T.Janecek), K. Bice, F. Heidersdorf, and others who may wish contribute.
Synopsis: This manuscript will provide a revised composite depth scale for Leg 207 cores. The new depth scale will include revisions based upon (1) the integration core data with logging data and (2) adjusting depths to incorporate intra-core stretching and squeezing.
Venue: Leg 207 Scientific Results volume

Geophysics and Physical Properties

Title: **SEISMIC STRATIGRAPHY OF THE DEMERARA RISE, SURINAME, SOUTH AMERICA.**
Author: Mosher, D.C., Erbacher, J., Zuehlsdorff, L., Meyer, H., and ODP Leg 207 Shipboard Scientific Party.
Venue: Marine Geology.

Title: **INVESTIGATION OF THE SEISMIC ARCHITECTURE OF DEMERARA RISE: USING CORE, LOG AND CHECKSHOT DATA.**
Authors: Felix Heidersdorf, Brice R. Rea, David C. Mosher, Debora Berti, and Matthew A. O'Regan
Synopsis: Integrate core and log density and velocity data and investigate different pressure, temperature and downhole/core offset corrections utilizing the checkshot interval velocities from the three sites where this is available. Apply these corrections to the other two sites and compute synthetic seismograms to tie the core and log data to the seismics.

Title: **EFFECT OF DIAGENESIS AND BURIAL ON THE PERMEABILITY OF THE DEMERARA RISE SEDIMENTS**
Author: Debora Berti, Matt O'Regan, Brice Rea, Felix Heidersdorf, Thomas R. Janecek and David C.Mosher
Synopsis: Combining porometry and microfabric determined by SEM analysis with resistivity and permeability measured on whole round samples, we will assess the effect of diagenesis and burial on microfabric, porosity structure and permeability of the carbonates at the Demerara Rise. We will integrate the results with high resolution FMS data as one part in the construction of continuous permeability profiles for each site.
Venue: scientific results volume

Title: **STRESS HISTORY AND COMPACTION BEHAVIOR OF DEMERARA RISE SEDIMENTS**
Author: Matt O'Regan, Debora Berti, Brice Rea, Felix Heidersdorf, Thomas R. Janecek and David C.Mosher
Synopsis: We will determine the present and past effective stress regime of Demerara Rise sediments by combining consolidation testing with log and core physical property data collected during ODP Leg 207.
Venue: Data report-scientific results volume

Title: **POTENTIAL FOR LATERAL FLUID FLOW THROUGH THE BLACK SHALE SEQUENCE AT DEMERARA RISE.**

Matt O'Regan, Debora Berti, Brice Rea, Felix Heidersdorf, Thomas R. Janecek and David C.Mosher,

Synopsis: Post cruise results from permeability tests will be integrated with core and log data to develop high-resolution consolidation and permeability profiles for the black shales at each site. By comparing the profiles we will determine the potential for later fluid flow, highlighting physical diffferences between sites that may account for the presence of brines at 1257,1259 and 1261.

Venue: Journal

SHOREBASED PARTICIPANT TITLES TO BE ADDED:

Schippers/Neretin: microbiology
Wagner/Hofmann geochem OAE 3
Lueckge/Wilson/Erbacher: alkenones
Hinrichs/Hayes/Spivack: VFA porewaters
Hathorne: Li isotopes at LPTM
Amann/Francis: none, to provide data to O’Regan and Berti