

# Integrated Ocean Drilling Program Expedition 320/321 Scientific Prospectus Addendum

## Pacific Equatorial Age Transect

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This IODP *Scientific Prospectus* is based on precruise Science Advisory Structure panel discussions and scientific input from the designated Co-Chief Scientists on behalf of the drilling proponents. During the course of the cruise, actual site operations may indicate to the Co-Chief Scientists, the Staff Scientist/Expedition Project Manager, and the Operations Superintendent that it would be scientifically or operationally advantageous to amend the plan detailed in this prospectus. It should be understood that any proposed changes to the science deliverables outlined in the plan presented here are contingent upon the approval of the IODP-USIO Science Services, TAMU, Director of Science Services in consultation with IODP-MI.

## Abstract

The Pacific equatorial age transect (PEAT) science program is based on Integrated Ocean Drilling Program (IODP) Proposal 626 and consists of Expeditions 320 and 321, grouped into one science program. The goal is to recover a continuous Cenozoic record of the equatorial Pacific by drilling at the paleoposition of the Equator at successive crustal ages on the Pacific plate. This addendum provides an updated schedule and operational plan for Expeditions 320 and 321. All other scientific operations are as described in the original Expedition 320/321 *Scientific Prospectus* ([publications.iodp.org/scientific\\_prospectus/320\\_321/](http://publications.iodp.org/scientific_prospectus/320_321/)).

## Introduction

Expedition 320 will begin in Honolulu, Hawaii (USA), on 5 March 2009 and end in Honolulu on 5 May. Expedition 321 is scheduled to begin in Honolulu on 5 May and end in Victoria, British Columbia (Canada), on 5 July; however, the Expedition 321 Scientific Party will disembark the ship on 23 June in San Diego, California (USA).

Based on the new schedule, ~10 additional days are now available for the operations plan described in the original Expedition 320/321 *Scientific Prospectus* ([publications.iodp.org/scientific\\_prospectus/320\\_321/](http://publications.iodp.org/scientific_prospectus/320_321/)). A total of 39 days is available for on-site operations during Expedition 320 (Table **T1**; Fig. **F1**). The Expedition 320 operations plan now includes drilling and coring at Sites PEAT-1C, 2C, 3C, 4C, and 6C. During Expedition 321 a total of 27 days is available for on-site operations (Table **T2**; Fig. **F1**). The Expedition 321 operations plan now includes drilling and coring at Sites PEAT-5C, 7C, and 8C. Three holes will be cored at each site, except at Site PEAT-8C.

All other scientific operations are as described in the original Expedition 320/321 *Scientific Prospectus* ([publications.iodp.org/scientific\\_prospectus/320\\_321/](http://publications.iodp.org/scientific_prospectus/320_321/)).

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**Table T1.** Revised summary of operations for Expedition 320.

Site	Location (latitude, longitude)	Seafloor depth (mbrf)	Operations description	Duration (days)			
				Task	Transit	Drilling/ Coring	Logging
Honolulu, Hawaii							
Transit ~1068 nmi from Honolulu to Site PEAT-1C at 10.5 kt				4.2			
PEAT-1C EPSP approved to 250 mbsf	12°04.089'N, 142°09.698'W	5143	Hole A: APC ~70 m/XCB to ~188 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (16.9 h) Hole B: APC ~70 m/XCB to ~187 mbsf Hole C: APC ~70 m/XCB to ~187 mbsf			2.5  1.6 2.0	0.9
Subtotal days on site: 7.0							
Transit ~66 nmi to Site PEAT-2C at 10.5 kt				0.3			
PEAT-2C EPSP approved to 250 mbsf	11°54.711'N, 141°02.744'W	4952	Hole A: APC ~70 m/XCB to ~163 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (16.9 h) Hole B: APC ~70 m/XCB to ~162 mbsf Hole C: APC ~70 m/XCB to ~162 mbsf			2.0  1.3 1.8	0.9
Subtotal days on site: 6.0							
Transit ~176 nmi to Site PEAT-3C at 10.5 kt				0.7			
PEAT-3C EPSP approved to 250 mbsf	10°30.997'N, 138°25.175'W	4885	Hole A: APC ~70 m/XCB to ~175 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (17.3 h) Hole B: APC ~70 m/XCB to ~174 mbsf Hole C: APC ~70 m/XCB to ~174 mbsf			2.1  1.4 1.8	1.0
Subtotal days on site: 6.3							
Transit ~411 nmi to Site PEAT-4C at 10.5 kt				1.6			
PEAT-4C EPSP approved to 300 mbsf	07°59.999'N, 131°58.396'W	4820	Hole A: APC ~70 m/XCB to ~269 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (17.6 h) - Optional: wireline logging with VSI (12.0 h; not included) Hole B: APC ~70 m/XCB to ~268 mbsf Hole C: APC ~70 m/XCB to ~268 mbsf			2.9  2.2 2.6	1.0
Subtotal days on site: 8.7							
Transit ~376 nmi to Site PEAT-6C at 10.5 kt				1.5			
PEAT-6C EPSP approved to 400 mbsf	05°18.736'N, 126°16.997'W	4362	Hole A: APC ~70 m/XCB to ~363 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (24.0 h) - VSP with VSI Hole B: APC ~70 m/XCB to ~362 mbsf Hole C: APC ~70 m/XCB to ~362 mbsf			3.5  2.8 3.3	1.8
Subtotal days on site: 11.4							
Transit ~2081 nmi to Honolulu, Hawaii, at 10.5 kt				8.3			
Honolulu, Hawaii				16.6	33.8	5.6	
Subtotal time on site: 39.4							
Total operating days: 56.0							
Total expedition (including 5 port call days): 61.0							

Notes: Seafloor depth = prospectus water depth plus 11.0 m adjustment from water line to rig floor (i.e., drillers depth). Logging times include hole preparation, rig-up/down, etc. Actual wireline times are shown in parentheses. APC = advanced piston corer, XCB = extended core barrel, APCT3 = third-generation advanced piston corer temperature tool, DVTP = Davis-Villinger Temperature Probe, triple combo = triple combination, FMS-sonic = Formation MicroScanner-sonic tool string.

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**Table T2.** Revised summary of operations for Expedition 321.

Site	Location (latitude, longitude)	Seafloor depth (mbrf)	Operations description	Duration (days)			
				Task	Transit	Drilling/ Coring	Logging
Honolulu, Hawaii							
Transit ~1908 nmi to Site PEAT-5C at 10.5 kt				7.6			
PEAT-5C EPSP approved to 300 mbsf	07°42.075'N, 128°15.254'W	4322	Hole A: APC ~70 m/XCB to ~254 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (16.6 h) Hole B: APC ~70 m/XCB to ~254 mbsf Hole C: APC ~70 m/XCB to ~254 mbsf			2.8 1.9 2.3	0.9
Subtotal days on site: 7.9							
Transit ~380 nmi to Site PEAT-7C at 10.5 kt				1.5			
PEAT-7C EPSP approved to 480 mbsf	03°50.009'N, 123°12.352'W	4502	Hole A: APC ~70 m/XCB to ~453 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (19.9 h) Hole B: APC ~70 m/XCB to ~452 mbsf Hole C: APC ~70 m/XCB to ~452 mbsf			4.3 3.6 4.0	1.1
Subtotal days on site: 13.0							
Transit ~321 nmi to Site PEAT-8C at 10.5 kt				1.3			
PEAT-8C EPSP approved to 480 mbsf	02°36.327'N, 117°59.412'W	4341	Hole A: APC ~70 m/XCB to ~447 mbsf (~1 m into basement) - 3 APCT3 and 2 DVTP temperature measurements - Wireline logging with triple combo and FMS-sonic (19.7 h)			4.2	1.6
Subtotal days on site: 5.8							
Transit ~1811 nmi to San Diego, California, at 10.5 kt				7.2			
San Diego, California						17.6	23.1
Subtotal time on site: 26.7							
Total operating days: 44.3							
Total expedition (including 4 port call days): 48.3							

Notes: Seafloor depth = prospectus water depth plus 11.0 m adjustment from water line to rig floor (i.e., drillers depth). Honolulu port call is assumed to be only 4.0 days. Expedition is expected to end on the morning of 23 June 2009 (49.0 operating days). Site PEAT-8C is only planned as a single hole with logging. Time permitting, additional holes could be drilled. Logging times include hole preparation, rig-up/down, etc. Actual wireline times are shown in parentheses. APC = advanced piston corer, XCB = extended core barrel, APCT = third-generation advanced piston corer temperature tool, DVTP = Davis-Villinger Temperature Probe, triple combo = triple combination tool string, FMS-sonic = Formation MicroScanner-sonic tool string.

**Figure F1.** Proposed drill sites and survey coverage. Sites in red will be drilled during Expedition 320, sites in yellow will be drilled during Expedition 321. F.Z. = fracture zone. Hawaii, Tahiti, and Baja California are indicated for orientation.

