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UNIVERSITY OF CALIFORNIA, SAN DIEGO  
LA JOLLA, CALIFORNIA 92093

# *Westward Expedition*



*R/V Melville*  
*November 1993 -- June 1994*

LEGS 1-5

CRUISE PROSPECTUS

*Robert A. Knox*  
Robert A. Knox  
Associate Director, SIO

October 29, 1993

**Westward EXPEDITION**

**R/V MELVILLE**

**Leg 01**

T. Urabe, Geophysical Survey of Japan  
81-298-54-3636  
OBS, SEA BEAM, CTD  
San Diego - Papeete  
23 Nov - 30 Dec 1993

**Leg 02**

P. Lonsdale, Scripps Institution of Oceanography  
(619) 534-2855  
SEA BEAM  
Papeete - Wellington  
3 Jan - 8 Feb 1994

**Leg 03**

S. Bloomer, Boston University  
(617) 353-5511  
J. Natland, RSMAS  
(305) 361-4123  
P. Castillo, Scripps Institution of Oceanography  
(619) 534-0383  
Dredging, SEA BEAM  
Wellington - Iquique  
14 Feb - 21 Mar 1994

**Leg 04**

M. McCartney, Woods Hole Oceanographic Institution  
(508) 548-1400 X2797  
WOCE P21, Hydrographic Oceanography  
Iquique - Papeete  
27 Mar - 15 May 1994

**Leg 05**

H. Bryden, Woods Hole Oceanographic Institution  
(508) 548-1400 X2806  
WOCE P21, Hydrographic Oceanography  
Papeete - Brisbane  
19 May - 25 June 1994

**Leg 03**  
**Sherman Bloomer, Boston Univ.**  
**James Natland, RSMAS**  
**Paterno Castillo, SIO**  
**Wellington - Iquique**  
**14 Feb - 21 Mar 1994**

A 37-day expedition is planned using R/V *Melville*, to the southern Pacific Ocean (~56° to 50°S) in the Austral summer. The expedition will start from Wellington, New Zealand and end in Iquique, Chile. The main objective of the expedition, conducted in international waters, is to sample the plutonic rocks exposed in the Eltanin Transform System and the young volcanic rocks erupted in the adjacent neo-volcanic zones. Plutonic rock samples will be collected along the north-facing scarp of Heezen transverse ridge and shoalest part of the Tharp transverse ridge. Volcanic rock samples will be collected, through a combination of dredging and gravity coring, from the East Pacific Rise (EPR) segment between Heezen and Tharp (during transit from Heezen to Tharp) and the volcanic targets within the transform systems, which include young lavas on mid-Eltanin axis and adjacent volcanic ridge formed by inside corner rifting. If time and weather permit, the EPR segment between Heezen and Raitt Fracture Zone and the overshoot ridge and the intra-transform spreading segment within Raitt will also be sampled. We expect to collect a total of ~100 dredge hauls/glass cores during the expedition and these samples will be analyzed for their petrographic, chemical, and isotopic compositions in research facilities in the United States to understand in detail the petrology of the oceanic crust in the southern oceans.

SEA BEAM 2000 will be used to pinpoint sampling targets. The SEA BEAM 2000 is a 91- to 121-beam echosounding system that surveys the seafloor as the ship is steaming over it. There also is a provision for a side-scan sonar fracture that presents the data in the form of a "shadowgraph" picture like and aerial photograph. It has good resolution in both shallow and deep waters, with a substantial increase in the rate of mapping compared to conventional systems. At a depth of 11,000 meters, the swath will be 22 kilometers wide. SEA BEAM 2000 will also be employed to collect bathymetric data in the territorial waters of New Zealand and Chile during the transit to and from the sampling area. Clearance has been requested from New Zealand and Chile.

**Scientific party: Leg 03:**

1. Dr. Sherman Bloomer, Chief Scientist, Boston U.
2. Dr. Paterno Castillo, Co-chief Scientist, UCSD/SIO
3. Mr. James Charters, Programmer, UCSD/SIO/STS
4. Mr. Ronald Comer, Resident Technician, UCSD/SIO
5. Dr. Andrew Goodwilly, Post Doc, UCSD/SIO/GRD
6. Dr. Yao Ling Niu, Assistant Professor, University of Queensland, Australia
7. Dr. James Natland, Co-chief Scientist, RSMAS
8. Mr. Todd Porteous, Programmer, UCSD/SIO/STS
9. TBN
10. TBN
11. TBN
12. TBN

UNDERWAYMODIFIED ACQUISITION PLAN

Date revised: 19 Oct 1993  
By: S.M. Smith

LEG: Westward, Leg 3 (WEST03MV) R/V *Melville*

DATES: and ship-days: 14feb-21mar94 (42 days)

PORTS: Wellington, New Zealand - Iquique, Chile

CHIEF SCIENTIST(S): Sherman Bloomer, Boston Univ., James Natland, RSMAS, Paterno Castillo, SIO

FOREIGN CLEARANCES REQUESTED FOR: New Zealand & Chile

UW DATA COLLECTION (yes/no) DAYS PAID FOR; RATE and FUNDING SOURCE

\_\_\_ Depth, 12kHz (analogue,wide) (included in daily ship rate)

\_\_\_ Depth, 3.5kHz (analogue,wide) (included in daily ship rate)

yes Magnetics (included in daily ship rate)

no Gravity

no Seismic Reflection, Analogue

no Seismic Reflection, Digital

yes SEA BEAM 2000 with sidescan:

Collection Mode (one only):

\_\_\_ Full Rate w/ processor

\_\_\_ Full Rate w/o processor

x Intermittent use mode

\_\_\_ Non G&G Ancillary

21 days @ \$250/day Castillo

21 days @ \$250/day Lonsdale/Bloomer/

36 sea-days @\$250/day requested from  
NGDC/DMA

DATA SHIPMENT AT END OF LEG: Ship Records back to GDC/SIO via Air Freight at STS expense

NOTES: Castillo: 30 dredges + 1 pinger; 30-40 rock cores  
Bloomer/Lonsdale: 40 dredges + 1 pinger

Contact:

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Scripps Institution of Oceanography

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