

## FINAL CRUISE REPORT R/V CONRAD 29-01

R/V Conrad cruise 29-01 left Valparaiso, Chile on January 7, 1988 and arrived in Punta Arenas on February 10th. The cruise was carried out in two parts. The first part consisted of the acquisition of several MCS lines for Empresa Nacional del Petroleo (ENAP) near Isla Mocha, while the second part was an NSF funded site survey of the Southern Chile Triple Junction.

The cruise started off with a one and a half day transit to the start of the ENAP lines. The first deployment of the streamer took about 12 hours due to ballasting problems. Ballasting problems continued to hamper us for the first four deployments. The basic problem was that the streamer was way over weighted. Apparently the streamer had last been used in an area of abnormally hot and saline water and was heavily weighted. Although we took off weight during the initial deployment it wasn't enough and the streamer sank to a depth of 150 feet during a turn on the second day, causing the accidental inflation of one of the safety floatation bags and necessitating the round-tripping of the streamer. During this second deployment we again removed more weight, but the streamer was still on the heavy side. However, without further incident we collected the rest of the ENAP lines. Altogether we collected four dip lines and two oblique strike lines. The first two dip lines were shot using an air gun array of 4991 cu. in. and a pop rate of 27 seconds. The remaining lines were shot with a 3768 cu. in. array and an 18 sec. pop rate. The total time for acquiring these data was approximately six days. The raw data look very good, crossing a classic section of the Chile trench near Isla Mocha.

Following the acquisition of the ENAP lines we decided to refuel immediately and continue with the acquisition of the MCS lines for ODP. This was a deviation from our original plan in which we were going to run out to the axis of the Chile Ridge with SeaBeam before heading in for refueling. However, we decided that it was more important to get the MCS acquisition behind us and to wait until the end of the cruise to see if there was sufficient time to run out to the ridge axis. We topped off the fuel tanks in Puerto Montt on January 17th. Total amount of time lost due to transiting in and out of Puerto Montt and refueling was about 30 hours.

Following the refueling we transited about one day to the start of the ODP site survey. We chose a site about 20 miles northwest of Isla Guamblin for the first site. This corresponds to the portion of the trench where a ridge collision will take place 3 million years in the future. We initially ran a grid of SeaBeam lines before deploying the streamer in order to determine the suitability of this site (i.e. lack of submarine canyons). During the deployment of the streamer we took off the rest of the weights in an attempt to get the streamer properly ballasted. Although this was satisfactory for the first two lines, the next day we realized the streamer was too light for the sea conditions. Consequently we again round-tripped the streamer and removed the floats from the birds. Following this redeployment we were finally satisfied with the ballasting of the streamer. We shot a total of four MCS dip lines and one strike line in this area. One of the dip lines was particularly exciting since the monitor record showed a strong, decollmentish looking reflector that might document the subduction of a thick layer of sediments.

From the first site we steamed south collecting MCS data past Isla Guambin and crossing over an Arco drill site (Darwin #1) located south of Guambin and about 50 miles northwest of the triple junction. From there we ran offshore and carried out the main MCS survey of the collision zone. We shot 9 dip lines and 3 partial strike lines in this region. The results were very good. We were able to image the downgoing slab over a large region of the zone as well as several interesting mid-slope reflectors.

We finished the collision zone survey with a line down the axis of the rift valley. From there we placed 3 lines across the Taitao Ridge and then zigzagged down to the southernmost site survey area southwest of the Golfo de Penas. This survey area corresponds to the region where the ridge crest collided with the trench 10 m.y. ago. We shot 3 dip lines and 3 strike lines at this site, completing the MCS portion of the cruise on January 30th.

Following the completion of the MCS work, we steamed back to the previous site and started a saturation coverage SeaBeam survey of the ridge-trench collision zone on January 31st. During this survey we deployed a single 80 cu. in. water gun. The SeaBeam portion of the survey was run until the morning of Feb. 7th when we broke off to head for Punta Arenas. We acquired nearly 100% SeaBeam coverage of the mid and lower landward trench wall and the adjacent trench floor, between 45°40'S and 47°05'S.

The SeaBeam technicians, Joyce Miller and Scott Ferguson, quickly turned the raw SeaBeam data into a spectacular, finished contour map of the ridge-trench collision zone. The map revealed a normal looking rift valley at the north end of the collision zone, which, as it is followed southwards, becomes covered with sediment and then suddenly disappears beneath the landward trench slope. A series of spectacular slumps, folds, seamounts and canyons were imaged in the landward trench wall.

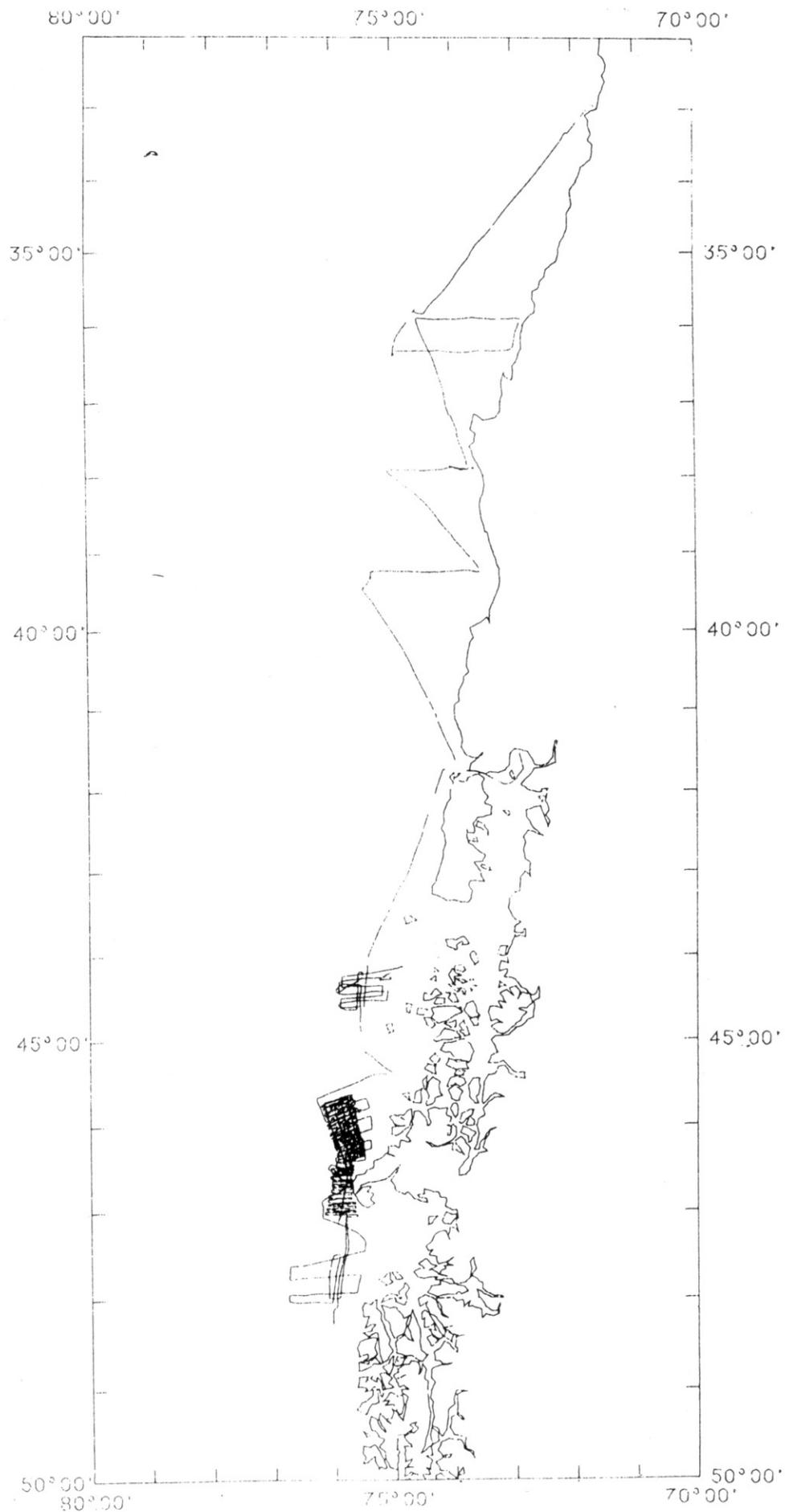
The cruise was remarkably successful. We achieved nearly 100% of our objectives. Once the ballasting problems with the streamer was remedied, there were no additional problems with the Digicon system. The 10 gun array operated flawlessly as did the SeaBeam, magnetics and gravity systems. All of the technicians worked at the highest professional level and there was excellent help and cooperation provided by the officers and the Captain. We were also blessed with exceptionally good weather. No time was lost due to stormy conditions.

During the cruise, two Chilean scientists from the Hydrographic Office in Valparaiso collected surface water samples and made periodic XBT measurements. At the end of the cruise, copies of the SeaBeam results were given to all three Chilean organizations represented on the cruise: the Hydrographic Office, ENAP, and the Servicio Nacional de Geología y Minería.

We collected a total of 17 days of MCS data and 7 days of SCS data.

## Scientific Personnel

Steve Cande	Co-Chief Scientist	I-DGO
Steve Lewis	Co-Chief Scientist	USGS
Nathan Bangs	Graduate Student	L-DGO
Kim Kane	Graduate Student	L-DGO
Sarah Tebbens	Graduate Student	L-DGO
Adriana Sepulveda	Watch Stander	L-DGO
Margaret Winslow	Watch Stander	L-DGO
Alfredo Garcia	Observer	Chile
Christian Anwandter	Observer	Chile
Ricardo Recabal	Observer	Chile
Joe Stennett	Science Officer	L-DGO
Bruce Francis	Electronic Support	L-DGO
Rob Blaes	Computer Technician	L-DGO
Martin Iltzsche	Air Gunner	L-DGO
John DeBernardo	Air Gunner	L-DGO
Tim Nolan	Air Gunner	L-DGO
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Paul Bennet	Electronic Support	L-DGO
Joyce Miller	SeaBeam Technician	URI
Scott Ferguson	SeaBeam Technician	URI



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VALPARAISO TO PUNTA ARENAS, CHILE  
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