SOCCER

Sea of Cortez Continental Extension and Rifting

Cruise Report

R/V New Horizon

15 September - 3 November 2002

San Diego - Guaymas - San Diego

A seismic and geologic study of Gulf of California rifting and magmatism:
A two-ship seismic experiment

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Principal Investigators

Daniel Lizarralde (lead P.I.) - Georgia Institute of Technology (Lead Institution) Atlanta, Georgia. Chief Scientist: R/V *Maurice Ewing*

Gary J. Axen - University of California, Los Angeles, California. Land deployments: mainland Mexico.

Graham M. Kent - Scripps Institution of Oceanography, San Diego, California. Land deployments: Baja California.

John M. Fletcher - Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Ensenada, Baja California. Shipboard scientist: R/V *Maurice Ewing*.

Antonio González-Fernández - Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Ensenada, Baja California. Land-sea co-ordination: Ensenada.

Alistair J. Harding - Scripps Institution of Oceanography, San Diego, California. Land deployments: mainland Mexico.

W. Steven Holbrook - University of Wyoming , Laramie, Wyoming. Shipboard scientist: R/V *Maurice Ewing*.

Paul J. Umhoefer - Northern Arizona University, Flagstaff, Arizona. Shipboard scientist: R/V *Maurice Ewing*.

Summary

This report documents the work of the R/V *New Horizon*, that along with the R/V *Maurice Ewing* and teams on land in Baja California and Mainland Mexico, participated in a crustal seismic reflection and refraction study of continental extension and rifting in the Gulf of California.

Experiment Goals (*Condensed from the project description submitted to the Scripps Institution of Oceanography Ship Scheduling Office by Dan Lizarralde.*) The goals of this project are to better understand the processes that have led to the rifting, or tearing away, of the Baja California peninsula from the Mexican mainland. By doing this, we hope to better understand the general processes through which continents rift apart to create new ocean basins. The Gulf of California is an ideal and unique location to study rifting processes, because rifting there is young and ongoing, the "style" of rifting varies along the length of the Gulf, and a large team of scientists at Centro de Investigación des Cientifica y de Educación Superior de Ensenada (CICESE) have been actively studying this problem for many years, providing a substantial resource of expertise in the area.

This project has been funded through the National Science Foundation, Division of Ocean Sciences, MARGINS Program. This program has as a central aim the study of continental rifting. The Gulf of California was chosen as a focus site for study through this program at a meeting held in Snowbird, Utah in January, 2000, that was attended by an international group of scientists, including scientists from Mexico.

Experiment Overview The seismic experiment, as planned, consisted of four main transects across the Gulf of California. The number of transects was changed to three (see basemap on page 16) during the course of the experiment primarily out of concern for marine mammal activity in the Gulf of California and to avoid blame for any contemporaneous beaching of whales that may have occurred in the region while we were operating. The central transect (1) across the Alarcón Basin is complemented by a coast-perpendicular line at each end (transects 0W and 0E). The northern transect (3) across the Guaymas Basin is accompanied by two coast-perpendicular segments (transects 3PW and 3PE). The southern transect (5) across the entrance to the Gulf of California is accompanied by a coast-perpendicular line on the eastern end (transect 5PE). We deployed ocean-bottom seismometers (OBSs) at 10-to-15-km intervals along each of these three transects. Seismograph stations deployed on land extended the transects across Baja California and well onto the Mexican mainland. The *Ewing* then shot airguns over each of these transects twice (with the exception of line 3 due to time constraints), using a different shot-repetition rate each time. Multi-channel seismic (MCS) data were recorded during one of the shooting passes on each transect. Several other transects (2, 2PE, 5PW and 6) were planned, but never shot; however, OBSs were deployed on portions of these transects and data from them has been archived.

The experiment was conducted using two ships. The R/V *Maurice Ewing* provided the airgun source and recorded the MCS data. The R/V *New Horizon* tended primarily to OBS operations. This two-ship strategy saved a substantial amount of time by enabling

the *Ewing* to acquire additional MCS profiles while the *New Horizon* recovered OBSs from one transect and moved them to another. These extra MCS profiles are central to the experiment, as they will enable us to constrain the three-dimensional geometry of rifting in this basin. It would not be possible to conduct this experiment with one ship alone, both because of the time necessary to deploy OBS instruments, and because the *Ewing* must pull in its MCS streamer (which is 6 km long) during OBS operations. Each deployment and recovery of the streamer requires 12 hours or more.

Both ships departed from San Diego, California, with the *New Horizon* departing 1 day in advance (September 15) of the *Ewing* (September 16) in order to deploy the first set of instruments. Seismic acquisition started with the central transect (Alarcón Basin), moved to the north (Guaymas Basin) and finally returned to the southernmost transect (Gulf of California entrance). Each transect required 10 to 15 days to complete, not including transit time between lines. The *New Horizon* can only stay at sea for roughly 22-days at a time, and so she entered port at Guaymas, Sonora, Mexico, on October 7 to refuel and resupply. Due to problems procuring fuel due to a political dispute within Petromex, the Mexican national oil company, the port call was extended to October 12. After completing another 18 days of work in the Gulf of California (including one day spent avoiding Hurricane Kenna on October 24/25), the *New Horizon* headed back to port in San Diego arriving four days later on November 3. The *Ewing*, with the exception of brief port visits in Guaymas and Puerta Vallarta to exchange marine mammal observers, stayed at sea for the whole experiment. After completing 45 days at sea, the *Ewing* arrived in port in Manzanillo, Mexico on October 30.

Details of the work of the New Horizon are laid out in other parts of this document. In summary, deployment of the L-CHEAPO 2000 ocean bottom instruments went very smoothly. 201 of 207 deployments recovered useable data. This is an OBS cruise for the record books with more deployments made than in any prior experiment. On-board scientists worked in three eight-hour shifts with three or four to a team. This was quite satisfactory for such a long cruise as it gave everyone enough time off each day to be fully recovered by the time the next shift started. The scientific crew and ship personnel worked very well together and in general the camaraderie on board was high. Communication between the Ewing and the New Horizon was good with at least two email connections made each day and a scheduled satellite telephone conversation each evening at 7 p.m. PDT.

As suggested earlier, the "whale issue" became central to substantial changes in plan during this cruise. Just after the commencement of airgun operations on transect 1, the beaching of two beaked whales was investigated by a group of vacationing American marine biologists on the south end of Isla San José in the northern part of Bahía de la Paz. While there was no evidence that the beachings were the result of the *Ewing*'s airgun activity — and in fact there is considerable evidence that the beachings occurred long before the *Ewing* arrived in the area — the decision was made to modify the experiment substantially to avoid any appearance of wrongdoing on our part. The *Ewing* switched to a daylight shooting schedule only, brought additional marine mammal observers on board who were specialists in the particular type of whales that had beached themselves, and

commenced aerial surveys prior to airgun work to determine the distributions of nearby whale populations. These program modifications are consistent with other seismic surveys that have been conducted under the authority of the Marine Mammals Protection Act. As a result, the planned acquisition of four transects was reduced to three.

The program was further affected when the Center for Biological Diversity (CBD) sued the National Science Foundation (the owner of the R/V *Maurice Ewing* and the funding agency for this research.) In its suit, the CBD asked for a temporary restraining order be issued to stop airgun activity. The basis for this request was that the CBD interpreted our research to need a U.S. permit under the Marine Mammals Protection Act. Since we were working in Mexican waters, our interpretation of the Act had been that we needed Mexican approval for the research (which we had obtained.) A federal judge in San Francisco sided with the CBD and issued the temporary restraining order on Monday 28 October. This resulted in no source locations for 50 km of transect 5 immediately west of the Islas Marias.

Regardless of the difficulties incurred during the cruise, the experiment in general and the OBS component in particular were great successes. OBS instrument and data recovery rates were extremely high. Instrument deployments and recoveries were very smooth. Data reduction from raw to SEG-Y files was successfully and easily accomplished on board.

R/V New Horizon Crew

Wes Hill, Captain

Roger Price, First Mate

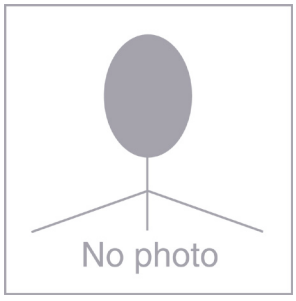
Tom Luke, Third Mate

Ron Wheatley,
Chief Engineer

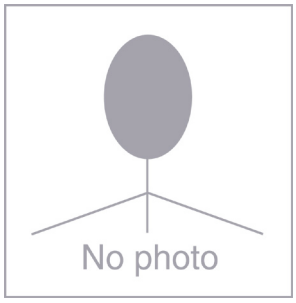
Laddie Rayala,
Asst. Engineer

Greg Lynch,
Third Engineer

Ron Hough, AB

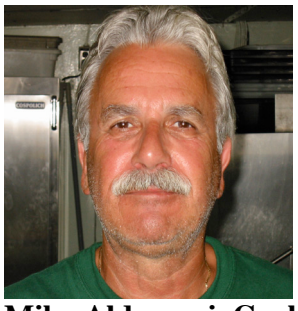


Joe Piranio, AB



Bill Warnock, AB

Eddie Bautista, Wiper



Mike Alderucci, Cook

Laura Franklund, Cook

Scientific and Technical Crew

Andrew Gorman, Chief Scientist
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University of Otago
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San Diego - Guaymas - San Diego

I was born in Ireland, grew up in southern Saskatchewan (that's in Canada), and got turned on to geophysics in Calgary. After six years in the oil patch I saw the light and headed to the University of British Columbia for a PhD in continental crustal seismology - which naturally led me to the ever growing marine geology group at the University of Wyoming. I am married, have 2.75 children (at press time) and will soon be moving the whole crew to Dunedin in New Zealand where I will be starting a faculty position in January 2003.

Adam Agundes
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Guaymas - San Diego

I was born in Red Bluff, CA. In 2001 I received my BS in cognitive science with a specialization in human computer interaction at University of California, San Diego. I have worked in several labs at Scripps Institute of Oceanography in the last three years. For the last year I have been working in an EM lab for Steve Constible. Who knows how long I will be doing this, but so far I have had a great time. I enjoy basketball, football, golfing, bowling, and co-founding the bleached hair at sea tradition.

Gary Austin
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Born in Elyria, OH and raised in a small town just about 25 minutes SW of Cleveland. Joined the Navy two years out of high school. After four years in the Navy I returned

home for about two years then moved to California. Started working for Scripps in the fall of 1979. While at Scripps I've worked at MPL, a Floating Lab Crewman on R/P Flip, and with the Deep Tow Project before moving up to IGPP early this year.

Jeff Babcock
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I'm too sexy for this ship.

Natanya Black
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Well my story goes like this… I have lived in many places throughout California and currently reside in Los Angeles. I received my B.S. in Geology at UC Santa Barbara, and I am working towards my M.S. in Geology at UCLA. I study the structural geology of the Southern Sierra San Felipe's in Baja. More specifically, I am focusing on a low angle normal fault that bounds the eastern side of these mountains. I hope to continue towards my Ph.D. next year, and follow the path of geophysics. Outside of school - I love all ocean activities, snorkeling, kayaking, etc., and spend a lot of my free time running and trying to enjoy life!

Dave DuBois
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I was born in Rochester, NY and moved to Valatie, NY at an early age growing up on a dairy farm until the age of 11. I wanted to be an oceanographer like Jacques Cousteau so I went to Duke University and got a degree in Geology, preparatory to advanced study in oceanography (which meant I got to go to sea as an undergrad)! Took a summer job at WHOI in 1981 and went on to U. Delaware to study microtektites. Finished my Masters

in Geology in 1983 and started work at WHOI that fall. Some 30 cruises and 19 years later I am now a Senior Research Assistant, travelling the world as a seagoing tech and data processor. When home I like to compete with the White Lightning Country Dance team, collect stamps, and play G&G softball. Glad to be part of this fun and history making expedition. Thanks to all ;>) !!!

Paul Georgief
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There is not much to say about myself. Where I have been does not matter. Where I am going - that also is irrelevant. What you should know about me is that I like cartoons, waffles with cheese, good coffee, and oatmeal. Anything more would be superfluous.

Mark Gibaud
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I was born and raised in Rochester, NY. When I was eighteen I join the United States Marine Corps, were I was trained to become a Combat Engineer. I traveled the world and learned many lessons of life. When my enlistment was up I stayed in San Diego and started to work for Scripps. I thought the work would be different and new challenge, and it has been.

Crispin Hollinshead
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I was born in Syracuse, NY, in 1947 and have lived in California since 1960. I was a member of the first undergraduate class at UCSD, receiving a BS in mechanical engineering in 1968. I first started working at Scripps as a lab flunky in 1966. I have been involved in OBS's, off and on, since then. I am responsible for the mechanical design of the LCHEAPO fleet, and coordinate the production and construction.

In the rest of my life, I am a fine woodworker, and was involved in the formation of a fine woodworking school at the College of the Redwoods in Fort Bragg, CA, in 1981. I have been a model maker all my life. In the early 80's I produced fine scale doll house furniture. My current interest is outdoor model railroading. I have been a philosopher since college, particularly interested in the implications of the philosophic shift from Newtonian mechanics to quantum mechanics. I consider myself a Buddhist/Physicist and believe that the purpose of life is to grow as a human being.

Carlos I. Huerta López
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The fourth son of Jesus Huerta Torres and Elvia Lopez de Huerta, born in Tijuana B.C., Mexico. After graduating from the High School Lazaro Cardenas in his own town Tijuana, he moved to Mexico City and enrolled in the National Polytechnic Institute (IPN) where he earned the B.Sc. degree in Geophysics. After graduating from college, he worked for the oil exploration company GSI of Mexico. He later moved to Ensenada B. C. and enrolled at CICESE as a graduate student. During his last year as graduate student at CICESE he worked for the Mexican Electric Power Company (CFE). After he graduate from CICESE he became part of the seismology department as a faculty member doing teaching and research in geophysics and seismology. Lately he spent a sabbatical year at the University of Texas at Austin, were he later became graduate student and earned the Ph.D. degree. The research topic of his doctoral dissertation included subjects like non-conventional signal processing techniques for applications in: geophysics; exploration seismology; engineering seismology and its application to geotechnical engineering, local site effects, as well as the amplification effect on soils; and seismology. Currently he has more than 20 years of experience in teaching and research in geophysics, exploration seismology, engineering seismology as well as seismology.

Sangmyung (Sang) Kim
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I was born in New York and went to Korea when I was five years old. I came back to the US to study marine geophysics in 1997. I got a MS degree in geophysics from

University of Houston and now I am a Ph.D. student at Georgia Tech. I just passed my comprehensive exam lately and this is the second long-term cruise for me. Although I don't like being sea sick, surging waters in unbroken blue oceans and watching sea animals give me a lift. I am a die-hard fan of heavy metal, industrial, techno and some sort of hip-hop.

Ignacio (Nacho) Méndez Figueroa
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Mi nombre es Ignacio (Nacho) y soy originario de Ensenada Baja California México. Actualmente trabajo en el Centro de Investigación Científica y de Educación Superior de Ensenada en el Area de Sismología, en la Red Sísmica del Noroeste de México (RESNOM), soy tecnico capturista de datos mi trabajo consiste en la localización y calculo de magnitud de los sismos que ocurren en Noroeste de Baja California, para mi ha sido una experiencia extraordinaria ya que desconocia como se hacian los estudios sismológicos en el mar asi como los equipos que utilizan para tal efecto pienso que los datos recolectados son de gran valor para la sismología, ademas ser parte de este equipo me ha dado la oportunidad de regresar al mar ya que de hecho tenía alrededor de 28 años que no me subía en un barco y esto para mi no creo que lo vuelva a repetir.

Jeff Nealon
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I hail from northern New York and bounced around the coasts of Maine and Massachusetts learning geology at Bowdoin and working geophysics in Woods Hole before heading to Wyoming for my PhD. There I am using marine seismology to study methane hydrates on the Blake Ridge and Storeagga Slide. If all goes well I'll add a chapter or two on the hydrates in the Guaymas Basin to my work. As a founding member of the Wyoming Oceanographic Institute I am pleased to participate in second WYOI expedition.

Geoff Ravenhill - Resident Technologist
Scripps Institution of Oceanography
University of California at San Diego
La Jolla, CA
San Diego - Guaymas - San Diego

Born to anthropologist parents in the small village of Bouake, Cote d'Ivoire, West Africa, I spent the first 11 years of my life as a French speaking, Safari going, G.I.Joe playing little African kid. My school years in Africa, and later while in the states, were nicely balanced by long youthful summers spent on an island off the coast of Maine. A year into my second decade of wonderful life, our family moved to Washington DC, USA. I learned to read and write English at 11. Spent my formative years in the District of Columbia's public school system, and then onto college at the University of Rhode Island - graduating with a BS in Marine Sciences. I then spent a year or so in the Philippines working to combat dynamite and cyanide fishing and coral reef destruction…The ongoing Philippino civil war got the best of me and chased me away to Southern California. San Diego is where I now live, though Maine is still very much my home. ResTech'ing is what I do to get by, breathing is what I do to live…
-to be continued.

Donna Shillington
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I was born and raised in Atlanta, Georgia. I decided to attend the University of Georgia for my undergraduate degree. After pondering majors in a host of liberal arts, I decided on journalism. At the age of 20, I came to the harsh realization that journalism sucked (!), and turned to the world of geology. Since then, I've completed my B.S. in Geology and A.B.J. in Journalism at the University of Georgia. I worked for a year in Atlanta monitoring vibration levels from blasting and carrying out sledge-hammer seismology. I've spent the last three years working on my PhD in geophysics (crustal seismology, particularly) at the University of Wyoming at the blossoming WYoming Oceanographic Institute (WYOI). For my dissertation, I am studying continental rifting and initial seafloor spreading using multi-channel seismic reflection data collected off the coast of Newfoundland and island arc dynamics using a wide-angle data set collected along the Aleutian Islands. These "professional" endeavors are interspersed with occasional world travel, regular happy hours, long trail runs, weekend backpacking, telemarking, cross country skiing, cycling, lots of reading, and other flavors of fun.

Fiona Sutherland
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I completed my undergraduate education in Geophysics and the University of Leeds, England. During that time I was an exchange student at UC Santa Barbara, where I went on my first marine seismology cruise on the R/V Ewing. Back at Leeds, in the wind and rain, I decided the Southern California lifestyle was for me and applied to Scripps for grad school. I am now starting my third year at Scripps, and am going to work on the data collected on this cruise for my PhD – investigating continental rifting.

Steve Swift
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Raised in New Hampshire, I have been working in oceanography since 1973 at Oregon State University, PMEL/NOAA in Seattle, and WHOI.

David Willoughby
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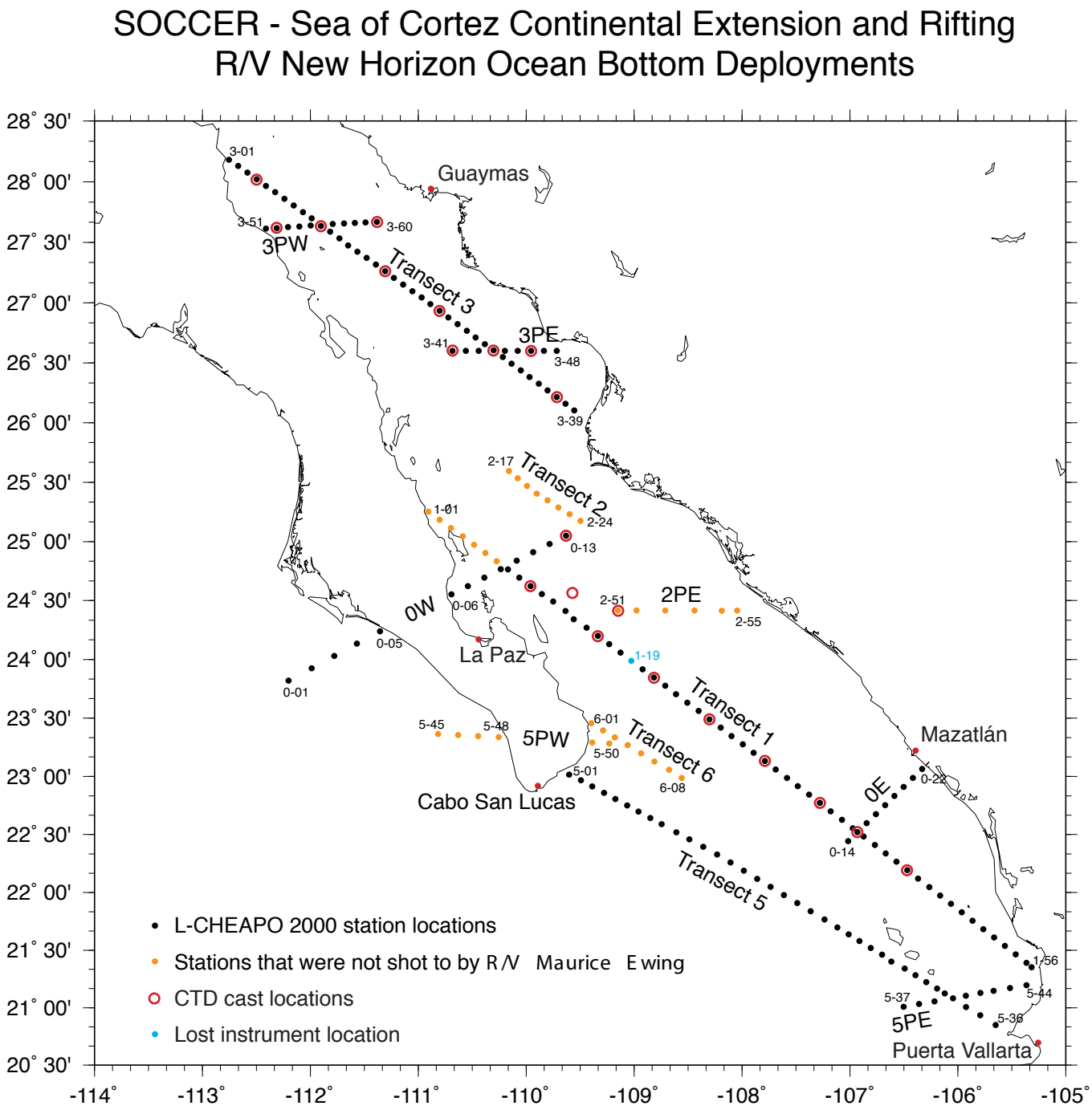
I emerged into the world just outside Philadelphia, Pa. in 1946, almost exactly nine months after the end of World War II. When I was six months old, we moved to San Diego, and I have mostly lived there ever since. I was in the first freshman class at UCSD and received a B.A. in Physics there in 1968. Through then-classmate and current shipmate Crispin Hollinshead, I met researcher Bill Prothero, who was developing the first digital ocean bottom seismometer (OBS) at Scripps. I accepted the offer of a job in his lab at IGPP in 1972 and after several years became the engineer responsible for the lab's electronic designs. I retired in 2001, intending to return intermittently to help with instrument design, debugging and seagoing operations like this one.

I'm married but have never had kids and have been separated from my wife for over a decade – we're still good friends. I have a lot of interests that keep me busy – I'm very fond of old stuff, including music, houses, cars, trains, airplanes and ships. (This seems sort of handy, since we're all in the process of becoming old stuff.) Along with Crispin, I'm also a founding member of an organization that's building a large model railroad exhibit in San Diego's Balboa Park.



Overview map showing positions of all L-CHEAPO 2000 stations. Certain stations are annotated as shown in the legend.

Log from the Sea of Cortez
(Cruise Narrative)

Sunday 15 September 2002 - Day 1

Departure from San Diego Harbor - 9:30 a.m. PDT (14:30 Z)

Lizarralde, Holbrook, Palermo and Brown along with spouses and partners of the Scripps crew graciously saw us off from the Scripps Institution of Oceanography Nimitz Marine Facility Pier. After a last minute mechanical issue (pitch of the port engine) was rectified (or was it!), we were on our way.

11:00 a.m. (18:00 Z) - Safety Meeting and first boat and fire drill

Geoff Ravenhill (restech) went through the safety issues for the ship. We then had our first fire drill which will be held every Sunday from now on.

1:00 p.m. (20:00 Z) - Science Meeting

Jeff Babcock and Andrew Gorman went through the whys and whats of the cruise. Shifts for the science party were assigned as follows:

Noon - 8 p.m.: Jeff Nealon / Natanya Black / Crispin Hollinshead / Steve Swift

8 p.m. - 4 a.m.: Fiona Sutherland / Sang Kim / Jeff Babcock / Gary Austin / Mark Gibaud

4 a.m. - Noon: Andrew Gorman / Carlos Huerta / Paul Georgief / Dave DuBois

We had a good look at the maps provided by Fiona Sutherland and compared them to those that Carlos Huerta had brought with him from CICESE. The CICESE maps appear to have a bit better control in the shallowest parts of the ocean than the Sandwell and Smith information on the GMT maps plotted by Fiona. We are planning to send some depth information to the Ewing along the lines that we traverse as we deploy the OBS's so that the Ewing will have a better idea of what to expect regarding bathymetry.

8:30 p.m.

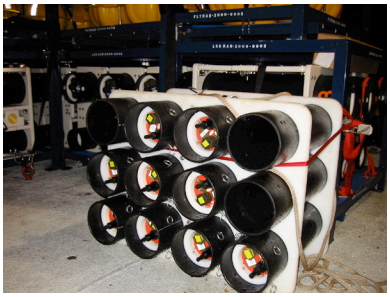
Jeff Babcock (after speaking with the captain) asked that I write a letter formally asking the Mexican government for approval to conduct CDT tests. Since this is not mentioned in our original approval, we think it likely that this could be added as an amendment.

Jeff wrote an email to the powers-that-be at Scripps to try to get the go ahead to fix the software side of the email system aboard the ship. As it stands, personal email will be sent out twice a day - 8:30 a.m. and 6 p.m. and business email can be sent out at any time from the bridge. Paul Georgief has quite a bit of system administration experience, so we are hopeful that the system will yet be fixed.

AirPort network up and running. I got my Orinoco Silver card installed with no problems.

Monday 16 September 2002 - Day 2

Cruising down the Pacific Coast of Baja California.



Due to the presence of Tropical Storm Iselle at the entrance to the Gulf of California, we decided to hold position north of line 0WW in roughly 3000 m of water at 26°58'N 114°56'W and conducted the rosette acoustics test for the OBS instruments. The tests were started at approximately 8 p.m. PDT and continued through the night. During the tests, the ship drifted to the west (into deeper water). No problems were noted with the instruments during the rosette tests.

Tuesday 17 September 2002 - Day 3

Rosette tests completed at approximately 10:00 a.m. PDT Most of the day was spent cruising south to OBS position 0-01. Tropical Storm Iselle was heading out into the Pacific and the captain felt that there would be no problem getting between her and the coast.

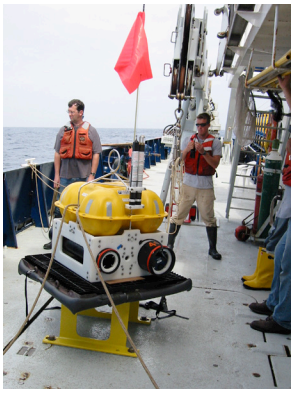
OBS positions are to be named as follows: a single digit line number followed by a dash followed by a two digit deployment number for the particular line. In general, deployment numbers will increase from west to east.

Wednesday 18 September 2002 - Day 4

OBS's Deployed Today: 5 Total Deployed: 5 Total Down: 5

The agitated sea state led to a few cases of seasickness on board during the day.

Deployed line 0WW starting at approximately 10 a.m. PDT and ending at approximately 5 p.m. PDT. Deployment was from deep to shallow water. The process went smoothly.



After deploying station 0-05 (in about 28 m of water 5 km off the coast) we steamed 1 km closer to shore to record bathymetry data to pass on to the Ewing. It is doubtful that they are even going to want to record over station 0-05 because of the depths at that point (~38 m). It would be good to clarify just how deep the water must be for the Ewing to record. Made contact with the Ewing at 7:00 p.m. and with Graham Kent on Baja at 8:00 p.m. Everything is going to plan although Graham reported bad weather the day before - including a tornado and washed out access roads. The Ewing was deploying it's streamer and was planning to start shooting shorting after midnight.

Thursday 19 September 2002 - Day 5

OBS's Deployed Today: 4 Total Deployed: 9 Total Down: 9
CTD Casts Today: 1 Total CTD Casts: 1

Rounded Cabo San Lucas at approximately 5:00 a.m. PDT. Great views of the condos! Cruised north to the center of the gulf to deploy line 0WE from east to west. Stations were named 0-13 to 0-07 (with 0-07 being the westernmost station.)

Deployment began at approximately 7:25 p.m.. Following station 0-13, a CTD test was run at the same location to a depth of 350 m. Three more stations were deployed before midnight (stations 0-12 to 0-10).

Friday 20 September 2002 - Day 6

OBS's Deployed Today: 16 Total Deployed: 25 Total Down: 25
CTD Casts Today: 1 Total CTD Casts: 2

In order to ensure that there would be daylight when we deployed station 0-07 (closest to shore) four stations from line 1 (stations 1-06, 1-07, 1-08 and 1-09) were deployed in addition to 0-09 to 0-07.

After the deployment of station 0-07 at approximately 7:00 a.m. PDT, the New Horizon continued shoreward for another km collecting bathymetry data to pass on to the Ewing. We then headed north into the channel between the mainland and Islas San Francisco and San José. The stratified cliff faces on the eastern shore of Baja California were spectacular. The good weather and fine scenery made for an excellent cruise. The transit to the north end of line 1 lasted almost five hours. Deployment of line 1 started just before midday.

The co-ordinates given for station 0-04 (located just north of Isla San José) were only about 800 m offshore, so the station was moved an additional 800 m away from the island to allow for some leeway in the pickup of the instrument.

A CTD cast was run to 850 m at site 1-10.

By midnight, Stations 1-01 to 1-05 and 1-10 to 1-13 had been deployed.

Saturday 21 September 2002 - Day 7

OBS's Deployed Today: 26 Total Deployed: 51 Total Down: 51
CTD Casts Today: 2 Total CTD Casts: 4

Routine day spent deploying line 1. Stations 1-14 through 1-39 deployed. CTD casts were made at locations 1-26 (900 m) and 1-36 (1650 m).

Sunday 22 September 2002 - Day 8

OBS's Deployed Today: 18 Total Deployed: 69 Total Down: 69
CTD Casts Today: 1 Total CTD Casts: 5

(Bilbo and Frodo Baggins' birthday today.)

CDT cast made at station 1-44 (150 m). Line 1 was completed (SE end at station 1-56) at approximately 2:30 p.m. and the ship made way for line 0E. Station 1-56 was moved approximately 2 km up along the line because of the shallow water and risk of rock hazards near shore. The shore here is much more vegetated than on the Baja California side of the Gulf, however visibility was not all that great due to the high humidity.

Monday 23 September 2002 - Day 9

OBS's Deployed Today: 9 Total Deployed: 78 Total Down: 78
CTD Casts Today: 1 Total CTD Casts: 6

Line 0E was deployed from station 0-16 (just east of line 1) toward the shore (near Mazatlán) at station 0-22. Deployment was made in very hazy conditions. The Mexican Navy buzzed around us at station 0-22 in a fast boat, but they did not make contact and seemed to be satisfied that we were legitimate.

We then made way to deploy our last two extra OBS's at stations 0-15 and 0-14 on the west end of line 0E. A CTD test was run at station 0-15 to 1350 m. These two stations were not in the original plan but we decided to deploy them so as not to leave two

instruments sitting on the deck. Their positions were chosen to extend line 0E by 24 km to the west which will give better coverage at depth for reconstructing profile 0 prior to rifting in the Gulf of California.

At about 1:30 p.m. PDT, the last station was deployed and we made way for line 0WE. All 78 OBS instruments are now on the seafloor. No problems had been encountered during deployment. Since we are not due to start picking up line 0WE until at least 9 p.m. on Wednesday, we decided to cut one engine to conserve fuel. Three additional CDT casts were planned for the cruise north and a speed of 5 knots was set to get us there in time.

Tuesday 24 September 2002 - Day 10

CTD Casts Today: 3 Total CTD Casts: 9

Cruising north along line 1.

CDT casts made at OBS position 1-31 to a depth of 2450 m at approximately 2 a.m. PDT, at OBS position 1-21 to a depth of 2600 m at ~3 p.m., and at OBS position 1-16 to a depth of 1400 m at ~ midnight.

Wednesday 25 September 2002 - Day 11

OBS's Recovered Today: 1 Total Recovered: 1 Total Down: 77

We continued our cruise along line 1 to the intersection of line 0W where we intersected the course of the Maurice Ewing at 2 p.m. Conditions were great for photographs. The sound of the airguns could just barely be heard during our 30-minute parallel course. The New Horizon stayed about 800 m south of the Ewing while it headed along line 0W-E shooting in MCS configuration.

After the rendez-vous, we cut our engines and drifted with no plans until OBS pickup was to start at 8 a.m. the following morning. However, just after 5:30 p.m. we received word from the Ewing that she had ceased shooting due to word of two beached whales in Bahía de la Paz. Over the course of the evening, through various VHF radio contacts between an American yacht *No Slack*, the Ewing and New Horizon, we found that the whales were beaked whales (related to bottlenose dolphins) discovered by the No Slack, with five fishery / cetacean experts on board. As reported by the No Slack to First Mate Roger Price, the whales were found on the southern shore of Isla San José at 24°52.52' N by 110°33.7' W and they had been beached for under 24 hours. The crew of the No Slack were somehow connected to Prof. John Hildebrand at Scripps who has done a lot of work

with acoustic capabilities of whales. At one point they asked if the Ewing could possibly transport a whale head to La Paz for analysis. Neither the Ewing nor the New Horizon has gone through Mexican customs yet, so we cannot approach land.

We recovered OBS station 0-09 and examined the records to make sure that signal strength was fine. The Ewing decided to reduce gun capacity and headed to the intersection of lines 0W and 1 to start up again heading south. The northern 80+ km of line 1 have not been shot by the Ewing.

Thursday 26 September 2002 - Day 12

OBS's Recovered Today: 7 Total Recovered: 8
OBS's Deployed Today: 3 Total Deployed: 81 Total Down: 73

During the night we headed to the western end of line 0W-E (near shore) and at ~8 a.m. started to recover the line. All OBS's were recovered by ~ 7 p.m.

Due to the events of the previous day, the Ewing's schedule had changed and they were suddenly a day ahead of their plan. Our next job was to pick up OBS's on line 1, but since we needed to wait until the Ewing got farther down the line before starting that, we decided to deploy the 8 OBS's on board along line 2. This was started at ~ 9 p.m. with station 2-24. By midnight, stations 2-23 and 2-22 had also been deployed.

Friday 27 September 2002 - Day 13

OBS's Deployed Today: 5 Total Deployed: 86
OBS's Recovered Today: 5 Total Recovered: 13 Total Down: 73

OBS locations 2-21 to 2-17 were deployed by 5:30 and we made way for station 1-02 for the first of the pickups on that line. Since the Ewing had decided not to record the northern portion of line 1, it was decided to leave odd numbered stations in the range 1-01 to 1-13. Even-numbered stations within this range were to be recovered, leaving the odd-numbered stations in case an opportunity arose for the Ewing to return to the line.

The transit to line 1 took about six hours. Station 1-02 was contacted at about 12:30 p.m. and on the surface at 12:57. Recovery of the even-numbered stations proceeded as planned with station 1-10 being recovered just before midnight.

Saturday 28 September 2002 - Day 14

OBS's Recovered Today: 10 Total Recovered: 23 Total Down: 63

Recovery continued through the day. At ~ 4 a.m., station 1-14 was recovered and from this point onwards every station was recovered.

Station 1-19 was not recovered. Contact was made with the OBS's acoustics unit and release commands were sent and acknowledged. Release 1 was sent twice; release 2 was sent twice and still the instrument remained on the seafloor. The instrument was abandonned.

Station 1-22 caused some stress as it took a long time to surface. At first, it was thought that the instrument had been deployed with the light and radio turned off. However, it turned out that one of the four glass balls in the float had a hole which had filled with water. The instrument was eventually recovered after more than 2 hours rising from the bottom.

Station 1-23 was the last station recovered before midnight.

Sunday 29 September 2002 - Day 15

OBS's Recovered Today: 1 **Total Recovered: 24**
OBS's Deployed Today: 6 **Total Deployed: 92** **Total Down: 68**
CTD Casts Today: 1 **Total CTD Casts: 10**

Station 1-24 was recovered at ~ 1 a.m. completing the pickup of the northern portion of line 1. The ship then headed back to site 1-19 to give one more shot at releasing the OBS stranded on the bottom there. Contact was again made and two release commands were sent to burn wire 2 followed by four release commands for burn wire 1. Unfortunately, no lift off was achieved.

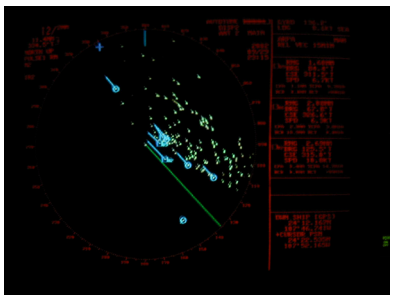
We then headed to the west end of line 2PE to begin the deployment of this short line (6 OBS locations) running perpendicular to line 2 on the eastern side of the Gulf. Station 2-51 was deployed at ~09:20 a.m. followed by a CTD cast to 3100 m. Deployment of the line (including station 2-37 which lies at the intersection of lines 2 and 2PE) continued through the day with station 2-55 being deployed at ~20:50. More than 30 fishing boats were observed near the eastern end of line 2PE. As these boats appeared to be shrimp boats with drag nets, we moved station 2-55 west to deeper water and away from the fishing boats. The new location of station 2-55 is 24°24.93'N by 108°02.58'W.

We then proceeded down line 2 to the southeast as our intention was to deploy the 8 stations from 2-42 to 2-50 while in transit to line 0E. In the end we did NOT deploy any of these stations due to the presence of the shrimping flotilla. Instead, we drove the line to observe fishing activities. There were rarely fewer than 30 or 40 boats on our screen as we headed south and we estimate that we passed approximately 1000 boats along the route between 2-55 and 2-48. In general, the boats did not seem to come out into water that is deeper than ~40 - 45 m, but there also seemed to be exceptions. Stations 2-49 and 2-50 are in shallow water where many boats are at work; we do not feel comfortable deploying those two stations. Stations 2-42 - 2-48 are in about 50 m of water and most of

the time the fishing boats appeared to stay about 1.5 km inboard. However, one of the AB's on board, Bill Warnock, has experience with shrimping in the Gulf of Mexico and he was saying that there the shrimpers routinely drag to water depths of up to 200 feet; if the Mexican fishing boats are similar this would affect all of the southern 8 stations on line 2.

Monday 30 September 2002 - Day 16

OBS's Recovered Today: 9 Total Recovered: 33 Total Down: 59



Observation of fishing activities along the Sonoran coast continued through the morning. Shrimp boats were observed without letup the whole way to line 0E. The easternmost station, 0-22, about 10 km south of Mazatlán was recovered at ~11:00 a.m. and then recoveries continued through the day. The westernmost station, 0-14, was recovered at ~10:30 p.m. (The green line - on photo to the left - is the New Horizon's course. White dots are shrimp boats.)

We received an email during the day informing us that the Ewing had been ordered to stop shooting in order to give our research institutions time to clear up the situation regarding the two whales that were beached last week. This will not affect the New Horizon's operations for the next few days as we will be recovering line 1 for at least 48 hours.

Tuesday 1 October 2002 - Day 17

OBS's Recovered Today: 12 Total Recovered: 45 Total Down: 47

The transit to the southeast end of line 1 was completed just before noon and recoveries commenced. By midnight, 12 stations (1-56 to 1-45) had been recovered.

During the day, we learned that there will be a meeting with NSF on Wednesday regarding our situation.

Wednesday 2 October 2002 - Day 18

OBS's Recovered Today: 15 Total Recovered: 60 Total Down: 32

Recovery of line 1 continued through the day. The instrument at station 1-43 was recovered successfully, but the drive was found to be empty and it appears that the instrument somehow reset itself (battery short?) The last station recovered prior to midnight was 1-30 at 11 p.m.

Thursday 3 October 2002 - Day 19

OBS's Recovered Today: 11 Total Recovered: 71 Total Down: 21

Stations 1-29 to 1-25 were recovered by 8 a.m. and then the ship made way for the east end of line 2PE to recover this line which was never shot. Recovery of line 2PE (stations 2-51 to 2-55 plus 2-37) was complete just prior to midnight and we made way for station 1-13 to recover the final seven stations on the north end of line 1.

An earthquake (M6.2) occurred on the ridge just south of line 1 today which was recorded. Unfortunately, the closest stations (in the central portion of line 1) had already been recovered when the earthquake occurred.

The discussion of the experiment's future by government and institution officials continued today. The resumption of operations aboard the Ewing may resume by Saturday if aircraft support can be arranged and the line scouted prior to then. Lines 2 and 4 have been cancelled and the Ewing will operate only in >200 m of water within the Gulf of California. A new transect, line 5, has been proposed to run between Cabo San Lucas and Puerto Vallarta.

Friday 4 October 2002 - Day 20

OBS's Recovered Today: 7 Total Recovered: 78
OBS's Deployed Today: 2 Total Deployed: 94 Total Down: 16

Station 1-13 was recovered at ~2:30 a.m., leading off the recovery of the last 7 stations on line 1. Station 1-01 was aboard just after 2 p.m. and we made way for transect 3. While en route, we received locations for the two additions perpendicular lines on transect 3 (3PE and 3PW) and we changed course for the westernmost station on 3PE (3-41). Stations 3-41 and 3-42 were deployed before midnight.

Saturday 5 October 2002 - Day 21

OBS's Deployed Today: 28 Total Deployed: 122 Total Down: 44
CTD Casts Today: 2 Total CTD Casts: 12

Deployment of transect 3 continued as follows: the western side of line 3PE (3-43), followed by the southern portion of line 3 (3-30 to 3-39), followed by the eastern side of line 3PE (3-48 to 3-44), followed by the central part of line 3 (3-29 to 3-18). The southernmost position planned for line 3 (3-40) and the two easternmost positions planned for line 3PE (3-49 and 3-50) were dropped due to the presence of the shrimping flotilla in the shallow waters here.

CTD casts were made at stations 3-24 to 1500 m and 3-18 to 1750 m.

Sunday 6 October 2002 - Day 22

OBS's Deployed Today: 27 Total Deployed: 149 Total Down: 71
CTD Casts Today: 4 Total CTD Casts: 16

Deployment of transect 3 continued as follows, the central portion of line 3 (3-17 to 3-11), the western side of line 3PW (stations 3-55 to 3-51), the northern portion of line 3 (stations 3-01 to 3-10) and the eastern side of line 3PW (stations 3-56-3-60.)

CTD casts were made at stations 3-11 to 1500 m, 3-52 to 575 m, 3-04 to 825 m and 3-60 to 850 m. The last CTD was completed just after midnight and we made way for Guaymas for our port call.

Monday 7 - Saturday 12 October 2002 - Days 23 through 28

Port Call in Guaymas, Sonora

Our arrival in Guaymas proceeded smoothly. Due to the early completion of work the night before, we ended up waiting at the harbor entrance for a few hours before the pilot came on board. We were docked at a grain terminal (Almacenes Nacionales de Deposito S.A.) shortly after noon and then went through the normal customs and immigration procedures. By 1:30 p.m. we were ready to checkout the surrounding city.

Security in the port is high. Customs officials with drug dogs came through the ship the day after we arrived and there was a checkpoint to drive/walk through about a km down the road every time we left or returned to the ship. Happily, the dock area is also one of the cleanest and tidiest places in town.

The natural setting of Guaymas is gorgeous. The bay is ringed by cacti-covered red mountains and from the sea it looks very attractive. Besides the port, shrimp fishing appears to be the dominant industry in town. (Unfortunately, that does not help the natural odors in town.) There is a pleasant old plaza full of trees, park benches and a central gazebo and there are lots of drinking establishments showing baseball and hockey!

The resort town of San Carlos - about 20 km over the hill and along the coast to the northwest - was an interesting diversion for a couple of days. Most of the people there are American and the town actually advertises itself as Arizona's beach. The economy of the entire region appears to be depressed. We walked along a gorgeous km-long beach one day framed on either side by big rock promentories covered in million-dollar houses.

However, backing onto the beach was a huge condo / hotel complex that was derelict. The down side for San Carlos is that it has many characteristics of American suburban culture, and a car really is necessary for getting around. Most businesses advertised in American dollars. The hotels, bars and restaurants are spread along ten miles or so of coastline and walking around was not all that easy.

During the port call, the science party lost seven members (Gary Austin, Jeff Babcock, Natanya Black, Mark Gibaud, Carlos Huerta, Jeff Nealon, Fiona Sutherland) and gained four (Adam Agundes, Nacho Méndez, Donna Shillington, David Willoughby).

Our port call was extended due to political problems with Pemex (the Mexican national oil company) involving the inability of foreign-flagged vessels to obtain and/or export fuel in/from Mexican ports. After two days of waiting, we finally obtained fuel from a secondary supplier and made way at 4:30 p.m. on 12 October.

Saturday 12 October 2002 - Day 28

OBS's Recovered Today: 3 Total Recovered: 81 Total Down: 68

Shifts for the science party during the second half of the cruise were assigned as follows:

Noon - 8 p.m.: Crispin Hollinshead / Steve Swift / Donna Shillington

8 p.m. - 4 a.m.: Dave DuBois / David Willoughby / Adam Agundes / Sang Kim

4 a.m. - Noon: Andrew Gorman / Paul Georgief / Nacho Méndez

Recovery of transect 3 began just after 8 p.m. with station 3-60. By midnight, the easternmost three stations (3-60 to 3-58) on line 3PW had been recovered

Sunday 13 October 2002 - Day 29

OBS's Recovered Today: 18 Total Recovered: 99 Total Down: 50

Recovery of transect 3 continued. Line 3PW (plus stations 3-11 and 3-10 from line 3) were recovered from east to west first. Then, after a transit to the northwest end of line 3, stations 3-01 to 3-09 were recovered prior to midnight.

We saw a great pod of dolphins (numbering 1000 to 2000) near station 3-01 just after lunch.

Monday 14 October 2002 - Day 30

OBS's Recovered Today: 17 Total Recovered: 116 Total Down: 33

Recovery of transect 3 continued. The central portion of line 3 (stations 3-12 to 3-28) was recovered with no remarkable events.

Tuesday 15 October 2002 - Day 31

OBS's Recovered Today: 17 Total Recovered: 133 Total Down: 16
CTD Casts Today: 4 Total CTD Casts: 20

Recovery of transect 3 continued. Lines 3PE (stations 3-51 to 3-58) and line 3 (from station 3-29 to 3-37 were recovered prior to midnight. During the day, CTD casts were made at stations 3-41 to 1400 m, 3-30 to 1000 m, 3-46 to 375 m and 3-37 to 366 m.

Wednesday 16 October 2002 - Day 32

OBS's Recovered Today: 10 Total Recovered: 143 Total Down: 6

The last two stations of line 3 (3-38 and 3-39) were recovered by 1:15 a.m. followed by a transit to line 2. The 8 stations that we had left in the deep-water section of line 2 were recovered between 05:30 and 18:00. We then made way for Cabo San Lucas and the deployment of lines 5 and 6.

Thursday 17 October 2002 - Day 33

OBS's Deployed Today: 14 Total Deployed: 163 Total Down: 20

Shortly after 1 a.m., we arrived at station 1-19 for one last effort to recover the OBS stuck there. Four burns of release #1 were sent and confirmed and two burns of release #2 were sent and confirmed without liftoff. The range to the instrument was recorded from various locations around the drop site so that we could triangulate a bottom position. It does not appear that the instrument has moved on the seafloor since deployment.

Shortly before 8 a.m., we received the new co-ordinates for deployments 5 and 6. Since we had already overshot the ten deployments on lines 5PWE and 6W, we came about and returned to deploy these locations. This resulted in a 15 nautical mile back track. Line 5PWE (stations 5-49 and 5-50) and line 6W (stations 6-01 to 6-08) were deployed first. We then transited to line 5 to deployed the six northwesternmost OBS locations before heading out to the Pacific side of the Baja California Peninsula. Stations 5-06 to 5-03 were deployed before midnight.

Friday 18 October 2002 - Day 34

OBS's Deployed Today: 9 Total Deployed: 172 Total Down: 29

The two northwesternmost stations on line 5, stations 5-02 and 5-01 were deployed shortly after midnight and then we transited (8.5 hours) around Cabo San Lucas to line 5PWW. Stations 5-45 to 5-48 were deployed between 09:30 a.m. and 1:30 p.m. and then the return transit (9 hours) to line 5 was made. Prior to midnight, three more stations on line 5 (5-07 to 5-09) were deployed.

In a conversation with Dan Lizarralde on the Ewing this evening, it was decided that we would not be running any more CTD casts as the Ewing has been making XBT measurements along lines 5 and 6.

Saturday 19 October 2002 - Day 35

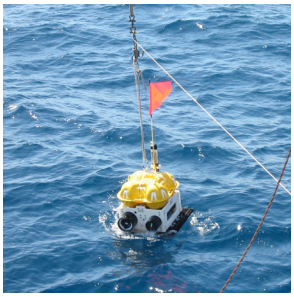
OBS's Deployed Today: 27 Total Deployed: 199 Total Down: 56

Deployment of line 5 continued with stations 5-10 to 5-33 and the western portion on line 5PE (stations 5-37 to 5-39). During the 7 p.m. phone conversation with Dan Lizarralde, it was decided that we would finish laying out line 5 and 5PE and then wait to hear word of the lawsuit that the Center for Biological Diversity has filed in the San Francisco federal circuit court. An initial court date of Wednesday 23 October has been set. This means that we will hold back from deploying line 6E for the time being and just wait at sea for a day or two after the deployment of transect 5.

Sunday 20 October 2002 - Day 36

OBS's Deployed Today: 8 Total Deployed: 207 Total Down: 64

Deployment of transect 5 was completed by 10 a.m. with stations 5-34 to 5-36 from line 5 and stations 5-40 to 4-44 from line 5PE. We then killed the engines and went into waiting mode for the Ewing.



Monday 21 October 2002 - Day 37

Most of the day was spent waiting near the junction of lines 5 and 5PE. At ~7:30 p.m. we made way for the northwest end of line 5 to begin pickup.

Tuesday 22 October 2002 - Day 38

OBS's Recovered Today: 4 Total Recovered: 147 Total Down: 60

Much of the day was spent in transit to station 5-01. Recovery of line 5 started at ~7 p.m. and by midnight, stations 5-01 through 5-04 had been recovered.

Wednesday 23 October 2002 - Day 39

OBS's Recovered Today: 10 Total Recovered: 157 Total Down: 50

Recovery of line 5 continued with stations 5-05 to 5-14. At ~8 p.m. the decision was made to stop recoveries on line 5 because of evidence of good signal on stations 5-13 and 5-14 from shots made by the Ewing today from line 5PE. This indicates that there is good signal being transmitted through the ridge in this location.

Due to the proximity and expected path of Hurricane Kenna, the decision was made to hold off deploying line 6E once again. Instead, we set a course for the western end of line 5PE to start recovery of that line early tomorrow morning. The Ewing is planning to shoot the southeastern end of line 5 tomorrow and after that we will have to make a decision about what to do about line 6E in light of the oncoming hurricane.

Thursday 24 October 2002 - Day 40

OBS's Recovered Today: 3 Total Recovered: 160 Total Down: 47

The western portion of Line 5PE was recovered. A leap-frog recovery method was executed on the first two stations due to their extreme depths (>4200 m). We arrived at station 5-37 at ~6:15 a.m., released the instrument, then steamed to station 5-38 and released it. We then returned to 5-37 in time for the first instrument to surface. Finally we returned to 5-38 within ten minutes of it surfacing. After recovering station 5-39 we crossed line 5, within sight of the Ewing, and shortly after that (at ~12 noon) made the decision to suspend recoveries and head north away from the path of Hurricane Kenna.

The Ewing also headed north at about the same time, bound for the Guaymas Basin where she planned to avoid the storm while shooting additional MCS data. Unfortunately, 50 km of transect 5, immediately west of the Islas Marias, have not been shot by the Ewing. The New Horizon headed for the vicinity of lines 5PWE and 6W.

Friday 25 October 2002 - Day 41

OBS's Recovered Today: 7 Total Recovered: 167 Total Down: 40

The difficult decision to drop line 6W and 5PE was made by the principal investigators aboard the Ewing and on land. This was done for several reasons. The primary decision was based on weighing the merits of acquiring data in the southern rather than the central

Gulf. However, the PI's also had to deal with the issue of the ongoing lawsuit involving the alleged link between airgun source points and the beaching of two beaked whales in September in Bahía de la Paz. The investigators decided that it would be prudent to stay away from the shore near Cabo San Lucas so that we could not be blamed for any additional co-incidental beachings, especially since the chance of beachings may have been increased by the presence of numerous Mexican Navy vessels (with active sonar) during the ongoing Asia-Pacific Economic Conference in Cabo San Lucas, and the proximity of Hurricane Kenna. The decision was made to take the opportunity to acquire needed MCS data in the Guaymas Basin; unfortunately, there was not enough time remaining in the schedule for the New Horizon to transit there and contribute OBS instruments to this transect.

Recovery of lines 5PWE and 6W commenced at ~12:30 p.m. By midnight, stations 5-49, 5-50 and 6-01 to 6-05 had been recovered.

Saturday 26 October 2002 - Day 42

OBS's Recovered Today: 7 Total Recovered: 174 Total Down: 33

Recovery of line 6W was completed with stations 6-06 to 6-08 by ~7:15 a.m. High winds (>20 kt) caused an hour's delay during the early hours of the morning when recovery operations were suspended to wait for the winds to die down.

After a 12-hour transit to line 5PWW recovery started with station 5-48 at ~ 7:30 p.m. By midnight, all stations on 5PWW (5-48 to 5-45) had been recovered. During transit, everal Mexican Navy vessels were sighted in the vicinity of Cabo San Lucas, likely related to the Asia-Pacific Economic Conference underway there.

Sunday 27 October 2002 - Day 43

OBS's Recovered Today: 5 Total Recovered: 179 Total Down: 28

Recovery of line 0WW commenced at ~5:45 a.m. at station 0-05. Stations 0-05 through 0-01 were recovered by 1 p.m. and the transit back to line 5 commenced.

Station 0-05, which was located in only 27 m of water near the shore was carpetted in biomatter when recovered.

Monday 28 October 2002 - Day 44

OBS's Recovered Today: 2 Total Recovered: 181 Total Down: 26

The transit to station 5-15 ended at ~1:30 p.m. We then held position awaiting word from the Ewing and from court in San Francisco. At 7 p.m. we got the disappointing word from Dan Lizarralde that a temporary restraining order had been issued by the federal court in San Francisco and as a result the Maurice Ewing would be stopping airgun operations.

Recovery of the last 28 stations of transect commenced at once. By midnight, we had recovered stations 5-15 and 5-16.

Tuesday 29 October 2002 - Day 45

OBS's Recovered Today: 12 Total Recovered: 193 Total Down: 14

Recovery of line 5 continued with stations 3-17 through 5-28. All of these stations were deep (> 2800 m) which necessitated a long wait for each instrument to rise to the surface.

Wednesday 30 October 2002 - Day 46

OBS's Recovered Today: 13 Total Recovered: 206 Total Down: 1

The remainder of line 5 (5-29 to 5-36) was recovered by ~7:15 a.m. After a 2.5 hour transit to the east end of line 5PE the five stations (5-44 through 5-40) remaining on that line were recovered. Our transit back to San Diego commenced at ~2:30 p.m.

Thursday 31 October - Sunday 3 November 2002 - Days 47 to 50

Transit to San Diego. The cruise report was finalized during this time with help from many of the scientists on board. Thanks especially to Donna Shillington for work on data plots, Steve Swift for making the maps with GMT, Paul Georgief for creating SEG-Y datasets from the raw data, Geoff Ravenhill for compiling the CTD data, and Dave DuBois and Donna Shillington for help in copying data from hard disks to CD and DVD.

We arrived at the Scripps Nimitz Marine Facility at 11:55 a.m. on 3 November, speedily dealt with customs, immigration and agriculture inspections, and were off!

L-CHEAPO Deployments and Recoveries

The procedure for deployment and recovery of the ocean bottom seismometers and hydrophones is now well established and flowed smoothly for this entire experiment. The general procedure is laid out here, but for details of the procedure and particular instrument components not mentioned here, please refer to the OBSIP website at http://www.obsip.org.

Testing Acoustic Units

The first procedure executed was to test the acoustic units under pressure. This was done by lowering them to the seafloor in specially designed racks 12 at a time, and then confirming acoustic communication with the units. No problems were encountered during this procedure.

Deployments

All of the various components of the L-CHEAPO instrument were stowed on deck or in the wet lab immediately adjacent to the staging area. Deployments involved the following components.

• Preparation of data logger.

Prior to assembly, data loggers were brought into the lab for preparation in order to:

- test the power supply.
- synch the data logger's clock to a GMT signal.
- select the recording window and other recording parameters.

• Assembly of unit.

The main components of the L-CHEAPO units, in the order that they were assembled, are:

- anchor (a flat iron mesh)
- instrument rack containing:
    - data logger. This was loaded into the instrument rack while in the assembly area, after preparation (as described above.)
    - acoustic unit for communication with the ship. This was tested at every assembly of an instrument by enabling and disabling the ranging capabilities of the instrument.
    - hydrophone
    - seismometer
    - release mechanism which connects the instrument rack to the anchor. Upon receiving an acoustic signal from the ship, burn wires in the release mechanism cause the instrument to break away from the anchor and float to the surface. This was tested at every assembly of an instrument by shorting out the burn wires with a testing box to ensure that the mechanism was receiving appropriate signals from the acoustic unit.
- float unit. The float is composed of four glass spheres in a yellow plastic frame.
- radio (attached to the side of the float unit). The radio is activated by low pressure so that it will come on when the instrument returns to the surface.

- strobe light (attached to the side of the float unit). The strobe light is activated by low pressure and light so that it will light during the night at the surface.
- a bright orange flag for extra visibility (attached to the top of the float unit).

During deployments, instruments were assembled on deck immediately after each launch in preparation for the next launch. Assembly took about 5 minutes.

• Launch of instrument.

The crane of the R/V *New Horizon* was used for launches and recoveries. The resident technician, Geoff Ravenhill, was the primary crane operator with Gary Austin assisting in the first half of the cruise and Dave DuBois in the second half. The science party assisted in the launch of the instruments by holding tag lines to keep the instrument from swinging and pulling the launch line once the instrument was in the water. One member of the deployment team stayed in the lab and watched the deployment on closed circuit television. At the time of deployment, several readings were recorded in the log:

- water depth
- time
- GPS location.

After a successful launch, the watchstander's final responsibility was to disable the acoustic unit and then to notify the bridge that we were ready to proceed to the next station.

Recoveries

• Contacting and releasing the instrument.

The ship returned to the location of deployment using on-board GPS navigation. Once the surface distance to the drop location narrowed to approximately 4 km, the science party would start to attempt communication with the instrument. Success at communication depended on a number of factors: water depth, surface noise level, seafloor topography. With a few exceptions, the ship needed to be as close to the drop location as the water was deep for contact to be made.

Contact was made by sending an enable signal (which then allowed the ship to ping the instrument) and hearing the acknowledgement from the instrument. A second acoustic signal was then sent to trigger the burn wire. A second burn wire could be triggered if the first failed, but this was only needed once on this cruise - for station 1-19, which never resurfaced anyway.

Once a release signal had been acknowledged by the instrument, the watchstander would calculate an anticipated time for the instrument to surface and notify the bridge. The time needed for recovery was composed of a burn time, which ranges from about 3 minutes on the surface to about 7 minutes at depths of 3000 m, and a rise time which is roughly 46 m per minute.

• Bringing the instrument on board.
When the instrument package surfaced, the radio beacon - and at night the strobe light - would be enabled. The captain or mate on the bridge would positioned the ship such that the instrument floated along the starboard side of the ship where it would be hooked by the science party, attached to the crane and lifted on board. The science party would then wash the instrument with fresh water, disable and stow the radio and light beacon, stow the flag, remove the data logger, stow the float assembly, disable the acoustic unit, and stow the instrument rack. Breaking apart an instrument took approximately 5 minutes.

• Downloading data.
Downloading data involved:

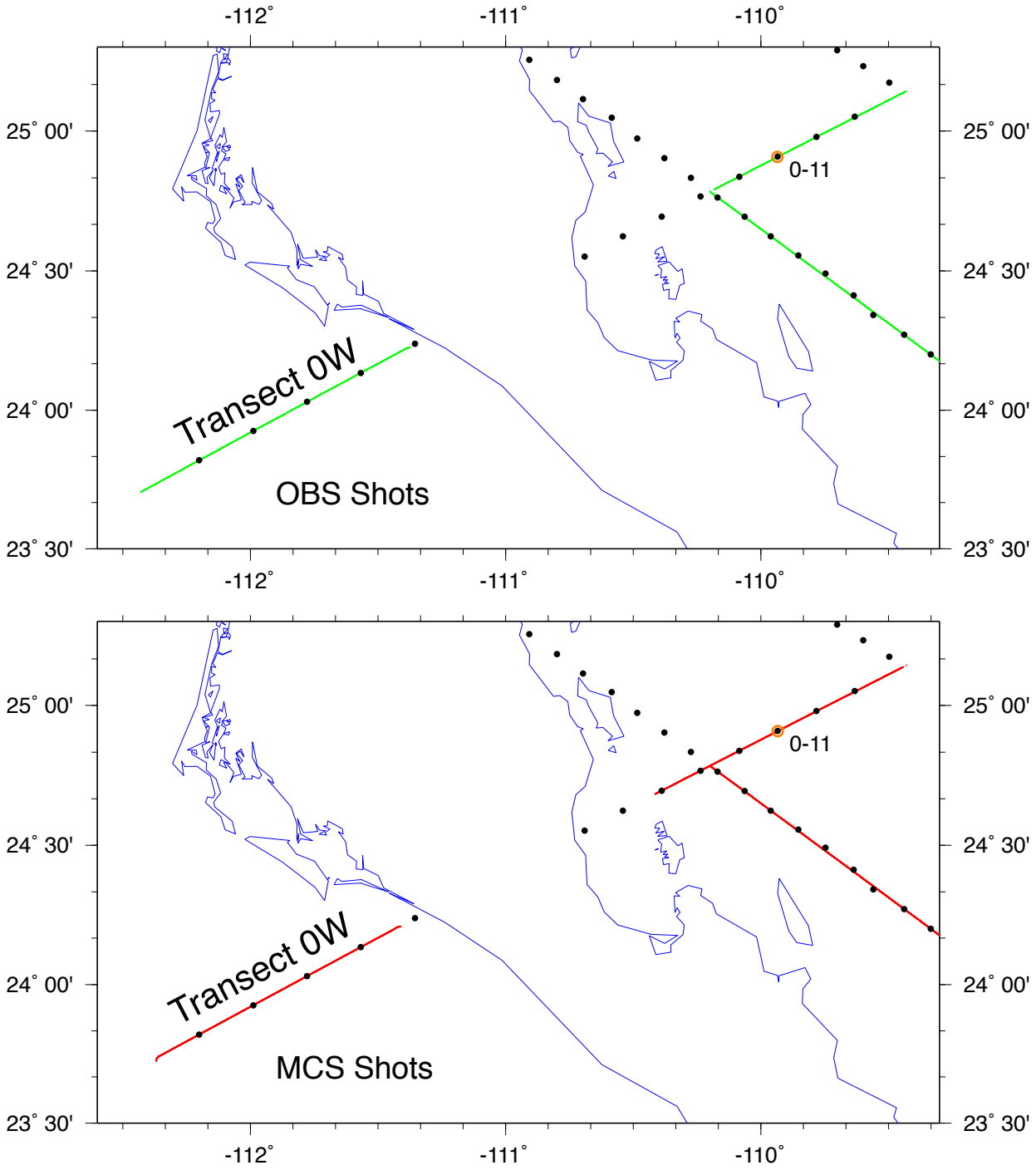
- testing the electronics
- synching the data logger clock to the GPS clock to determine clock drift
- downloading the data logger to the hard disk
- copying the data to CD or DVD
- stowing the data logger back in the racks on deck.

In all but three cases, the downloads went smoothly. Station 1-43 and 2-20 (instrument numbers 65 and 64) appeared to have passivation problems and no data were recovered from the units. Stations 2-23 had been programmed with an incorrect start time (the year was set to 2000) so the unit never started to record. In addition, during QC, it was found that stations 3-01 and 3-02 had no data in their files. A few instruments had poor signals (especially seismometer signals) which may be indicative of tilt in the seafloor. Even though this was the case, instruments 25 and 59 were taken out of circulation to check the seismometers out.

SEG-Y Conversion

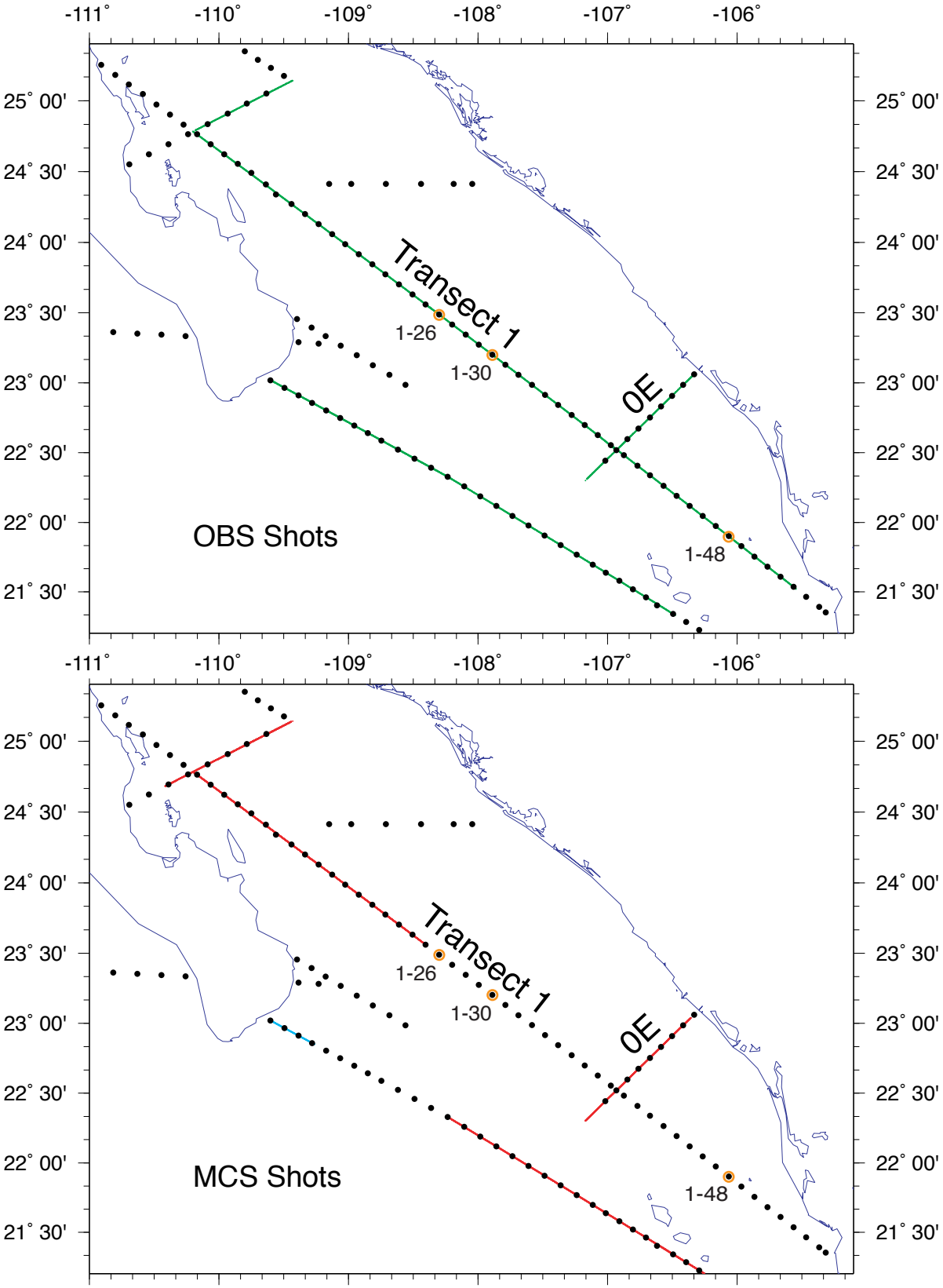
Once shot times and positions were received from the Ewing, the raw data collected from the L-CHEAPO units was "cut" into SEG-Y files using a series of PERL scripts. Data were then backed up on CD in preparation for distribution to the various universities.

Transect 0W
Shot Locations



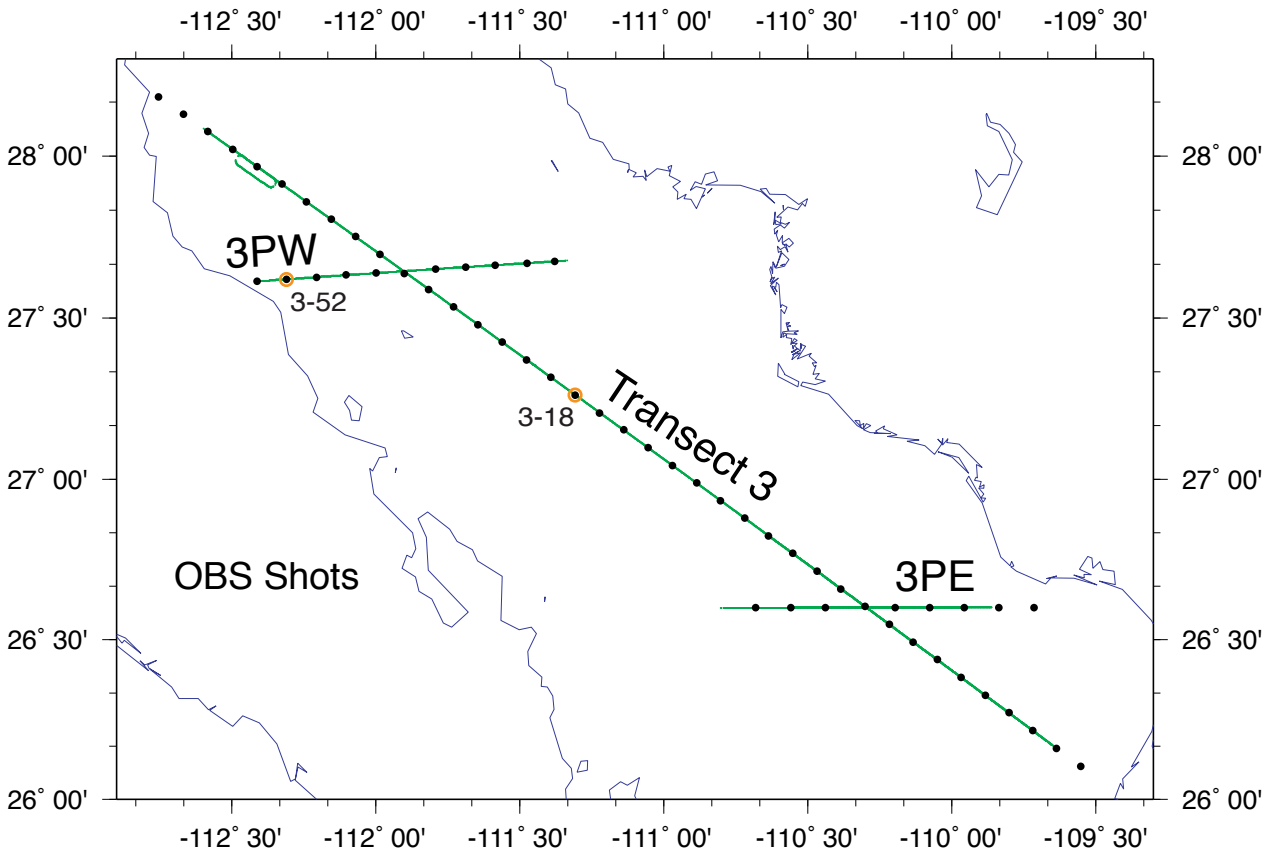
Shot locations used for the creation of SEG-Y stations gathers. OBS stations are indicated by black dots. The OBS shot spacing (along green line) is roughly 150 m (approximately 60 s between shots) and the MCS spacing (along red line) is roughly 50 m (approximately 20 s between shots.) Data from annotated station are included in this report.

Transects 1 and 0E Shot Locations



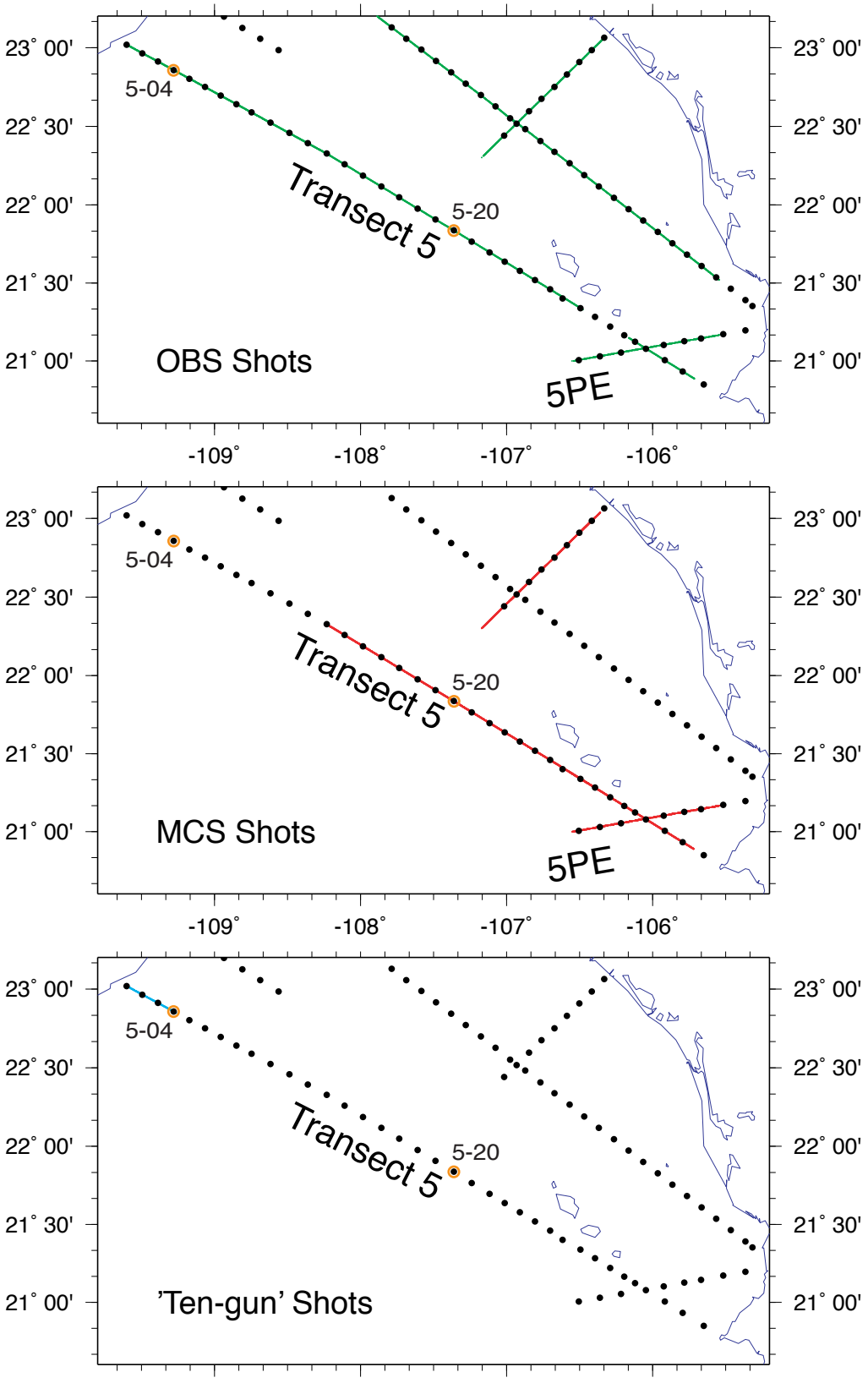
Shot locations used for the creation of SEG-Y stations gathers. The OBS stations are indicated by black dots. The OBS shot spacing (along green line) is roughly 150 m (approximately 60 s between shots) and the MCS spacing (along red line) is roughly 50 m (approximately 20 s between shots.) Data from annotated stations are included in this report.

Transect 3
Shot Locations

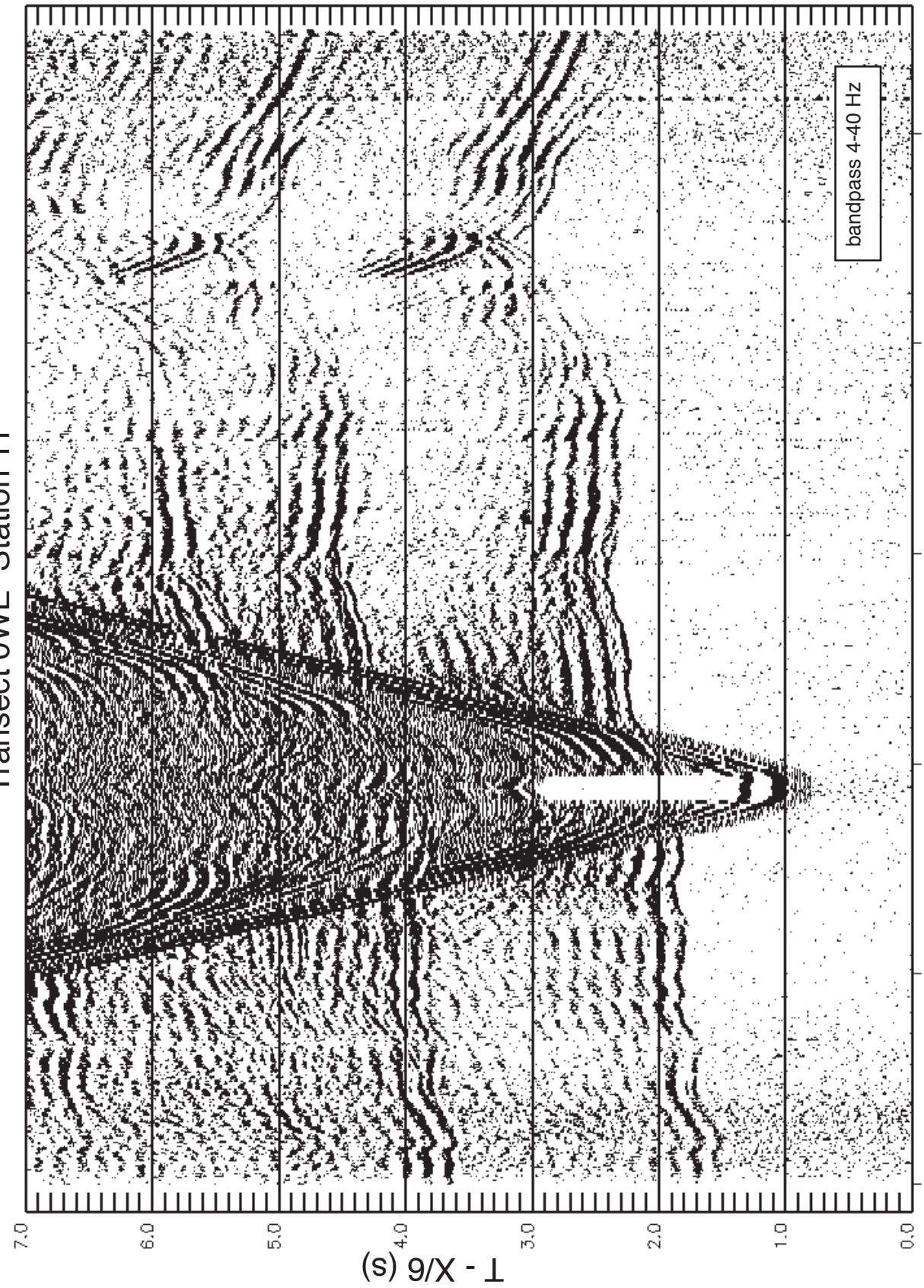


Shot locations used for the creation of SEG-Y stations gathers. OBS stations are indicated by black dots. The OBS shot spacing (along green line) is roughly 150 m (approximately 60 s between shots). No MCS shooting was done for line 3. Data from annotated stations are included in this report.

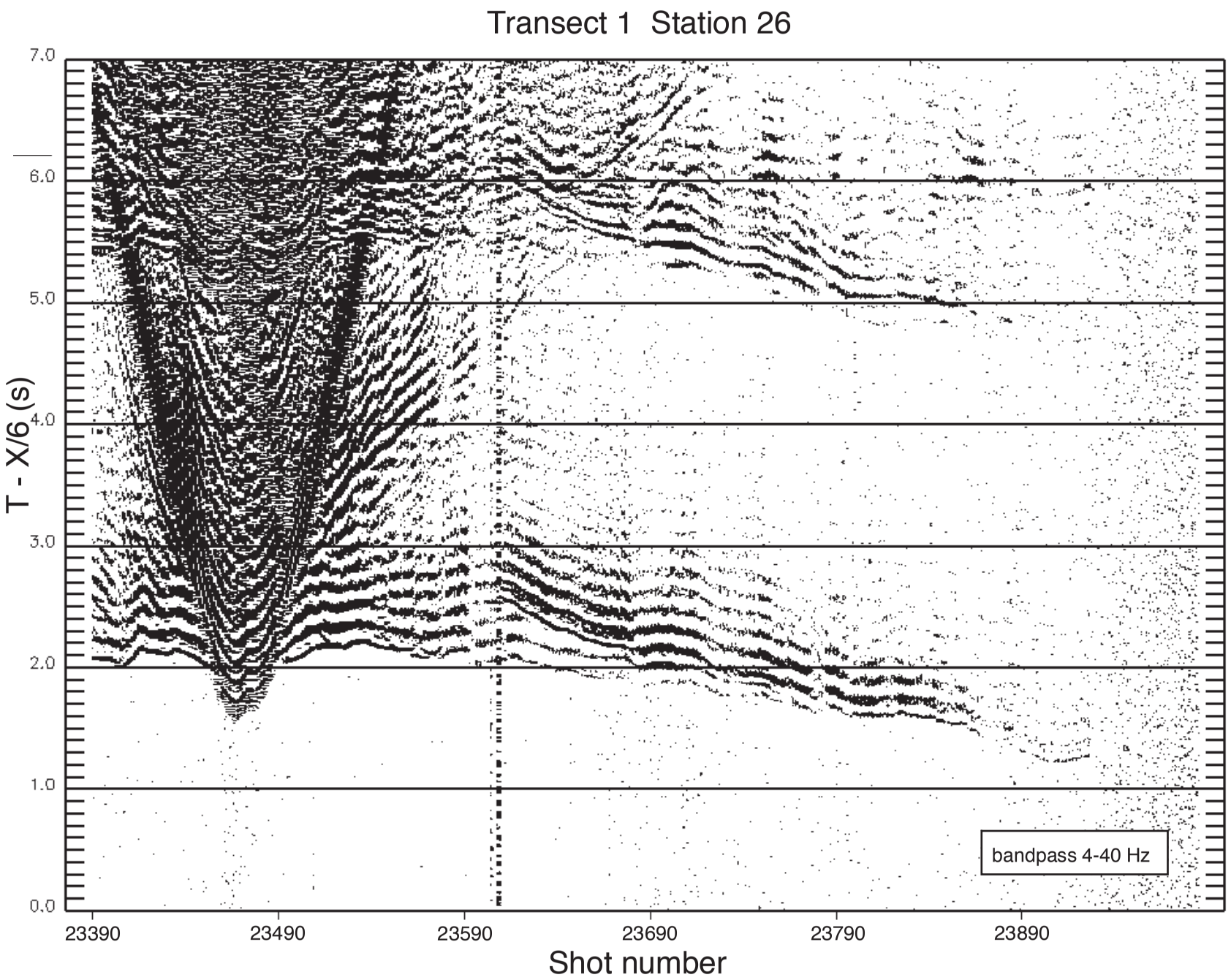
Transect 5 Shot Locations



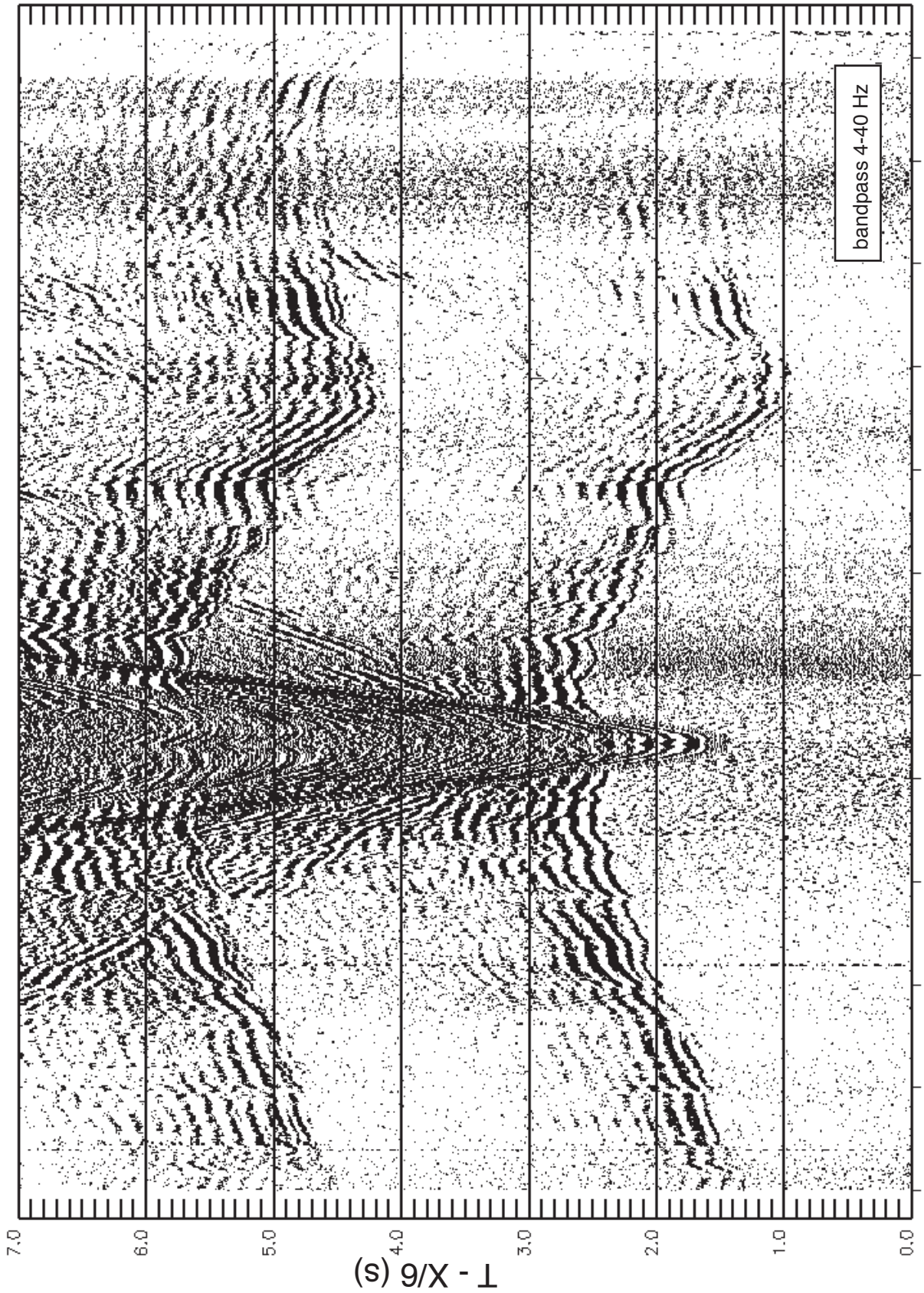
Shot locations used for the creation of SEG-Y stations gathers. OBS stations are indicated by black dots. The OBS shot spacing (along green lines) is roughly 150 m (approximately 60 s between shots), the MCS spacing (along red lines) is roughly 50 m (approximately 20 s between shots), and the "ten-gun" spacing is 100 m (40 s between shots.) Data from annotated stations are included in this report.



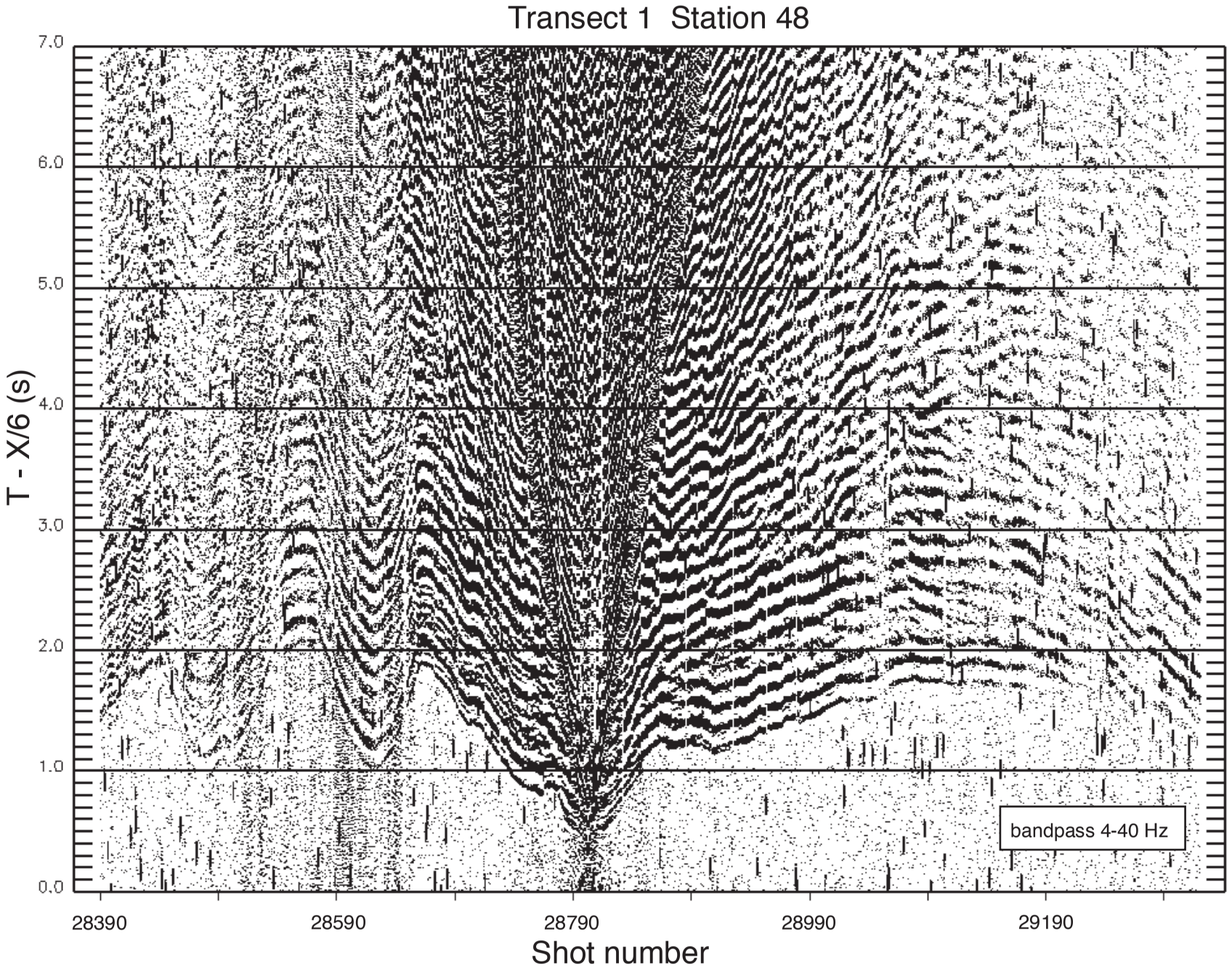
Shotgather acquired at the base of the continental slope on the eastern margin of the Baja peninsula. The triplification at shot number 15300 is probably due to either seafloor or basement topography. Asymmetry in phase patterns on either side of the instrument results from the location of the instrument, between Baja continental material and crust in the "transition" zone. The apparent velocity of the crustal refraction (Pg) to the left of the instrument is ~6.5-7 km/s. To the right, the crustal refraction (Pg) has an apparent velocity <6 km/s.



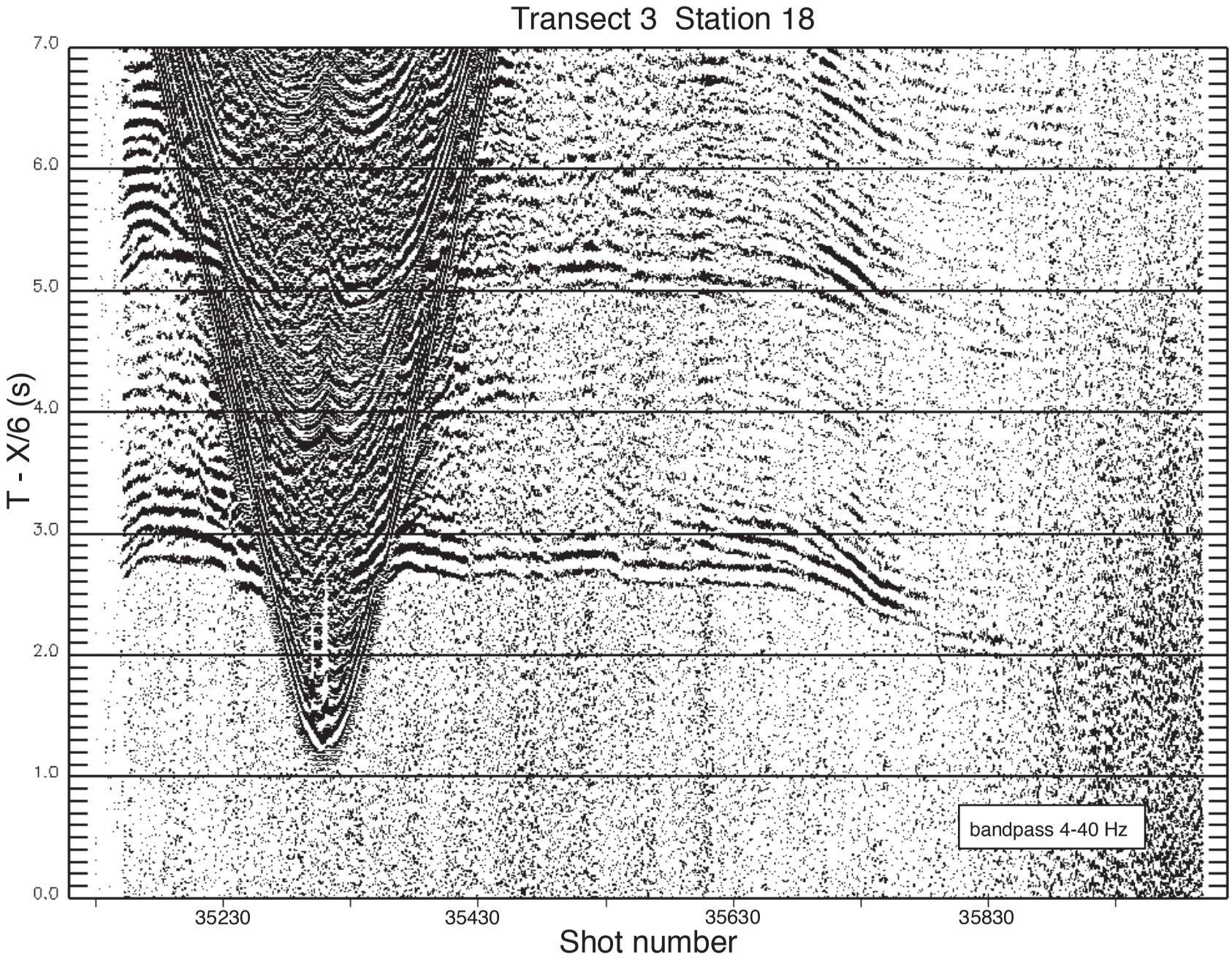
Shotgather acquired over oceanic crust 7 nautical miles southeast of the ridge on Transect 1. Two primary crustal refractions (Pg) are observed; one has an apparent average velocity of ~5 km/s and apparently high velocity gradient, and the second has a relaitvely constant apparent velocity of~6.5 km/s. A prominent reflection between shots 23590-23790 at 2-2.5 s appears to be PmP. Pn is also observed with a slow apparent mantle velocity of ~7.5 km/s.



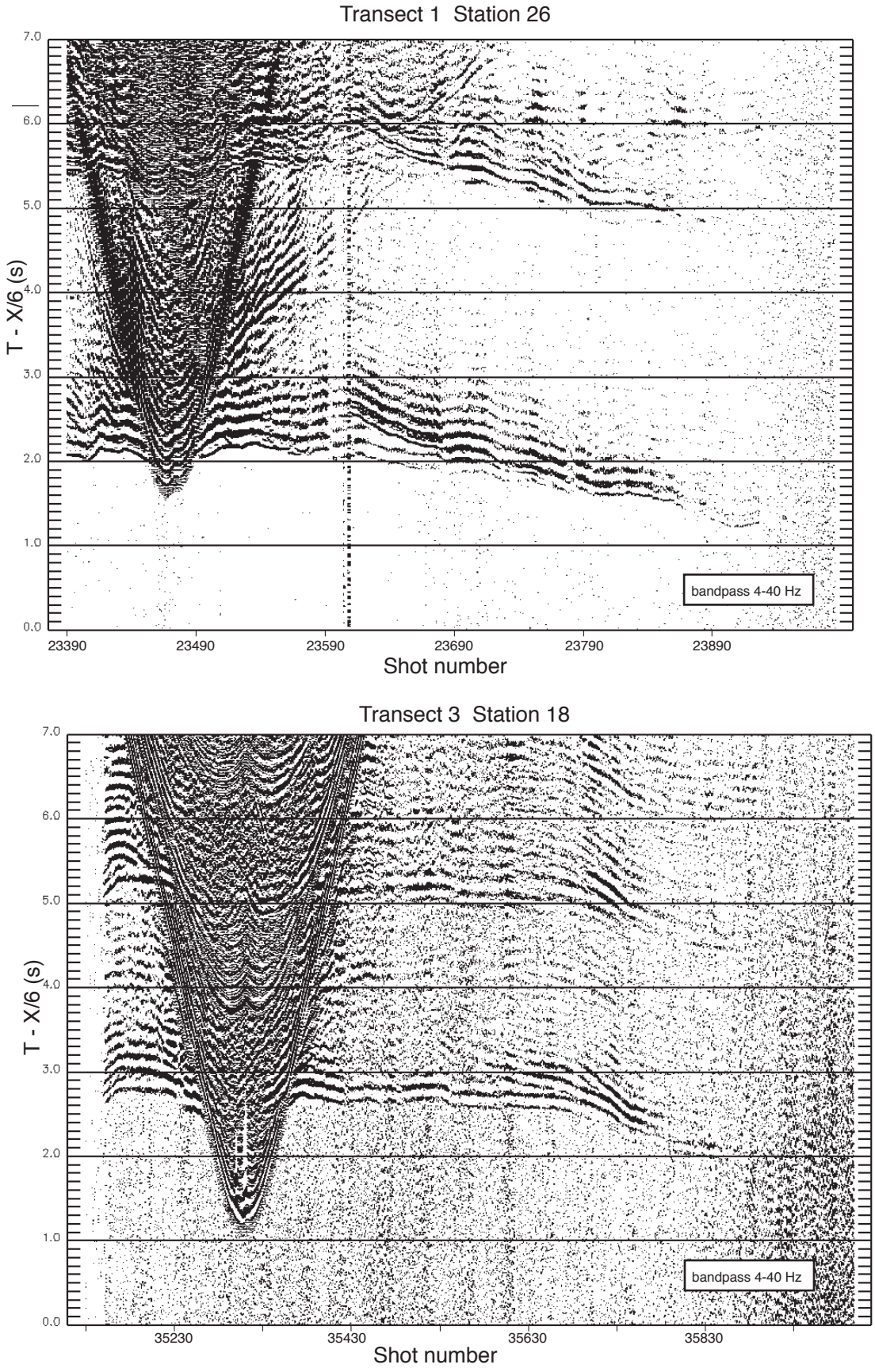
Shotgather acquired 20 nautical miles northwest of the shelf break between what appears to be continental crust and normal oceanic crust. Spreading center parallel ridges are not present in bathymetry in this region. Here, the crust appears to be very thin, with a high velocity gradient. Prominent Pn phases are observed with apparent velocities of ~8 km/s.



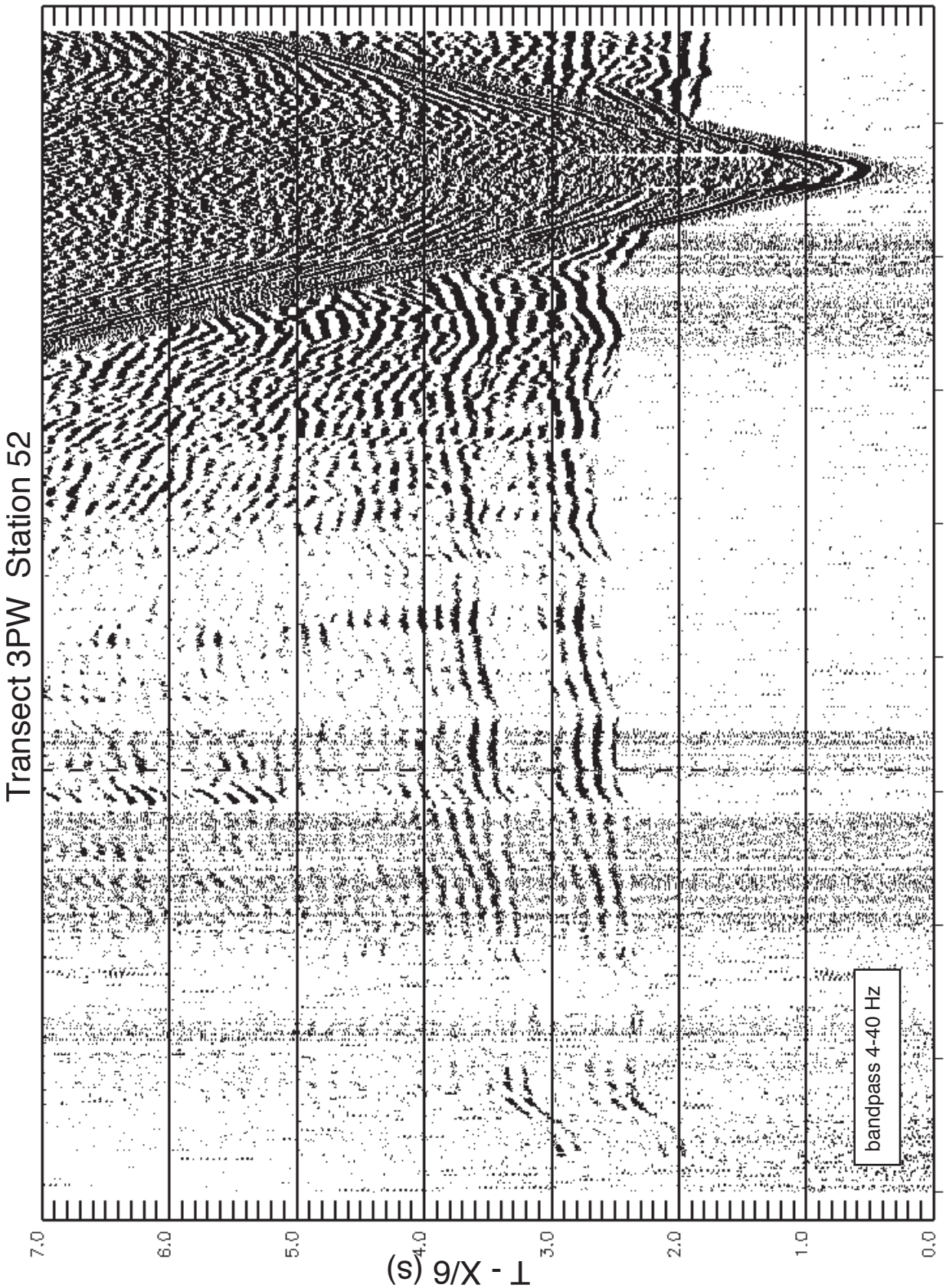
Shotgather aquired on the continental shelf of mainland Mexico. Prominent sedimentary refractions have velocities of ~2.5-3 km/s. Crustal refractions (Pg) have apparent velocities that increase from <5 km/s to >7 km/s. The western Pg branch is effected by significant overlying seafloor or basement topography.



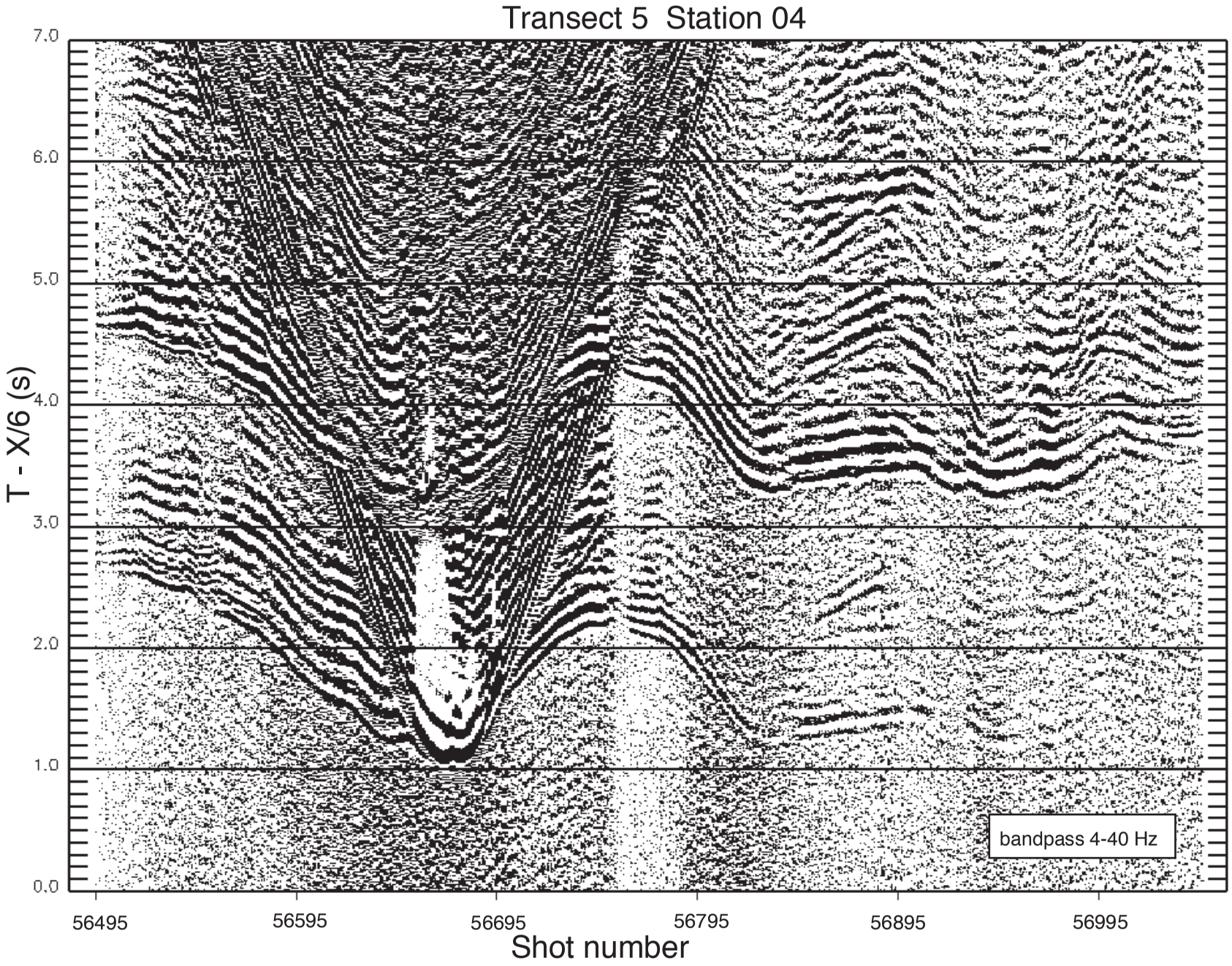
Shotgather acquired on instrument in the center of Transect 3. This shotgather shows relatively thin crust with two crustal phases (Pg), which have apparent relative velocities of 5 km/s and ~6.5 km/s, respectively. A prominent reflection is observed between shots 35630-35750, which might correspond to PmP. The phase patterns observed on this instrument are remarkably similar to those of shotgathers collected on oceanic crust near the spreading center on Transect 1.



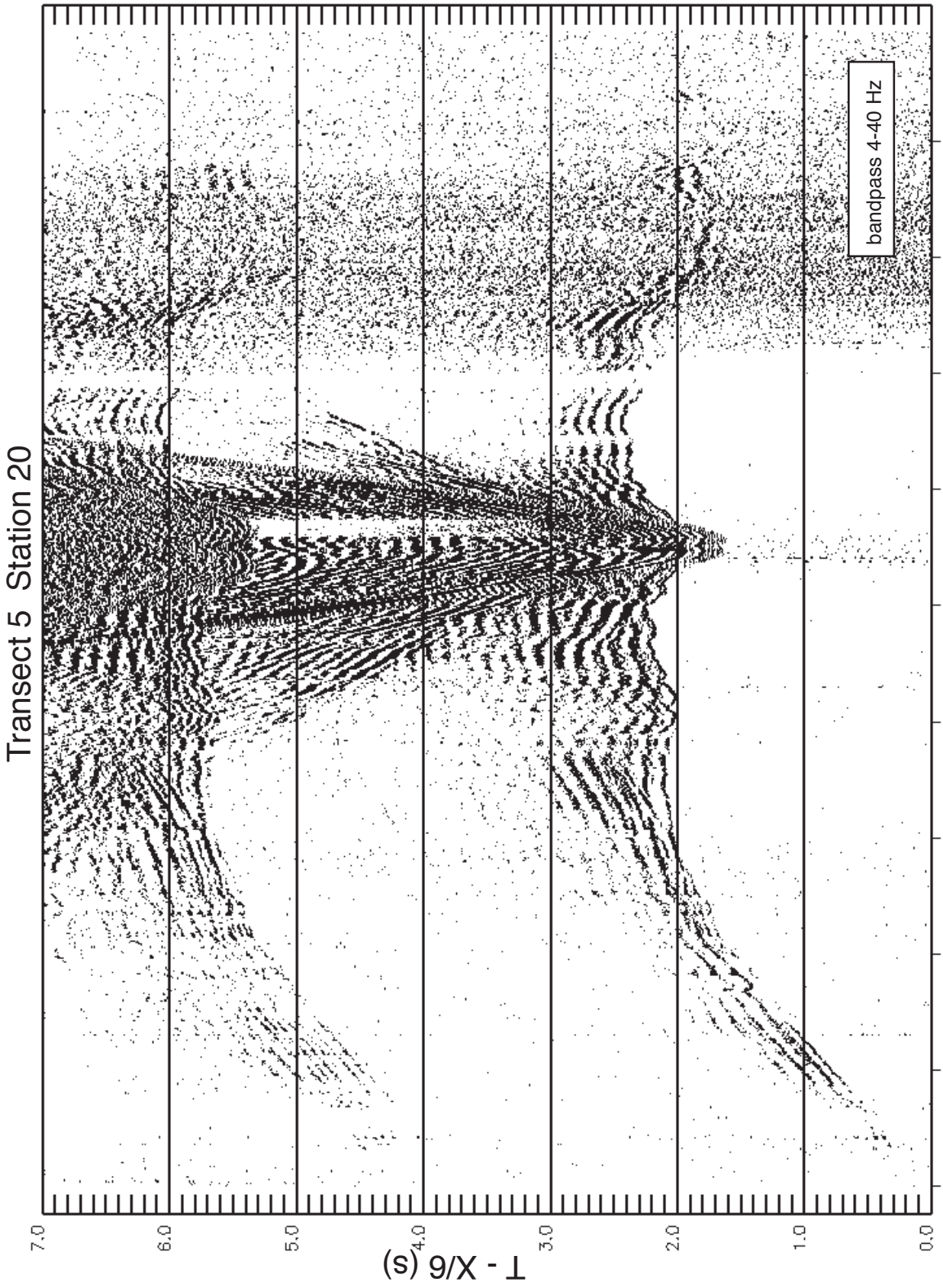
Comparison of shotgathers from oceanic crust on Transect 1 (above) and from crust in the center of Transect 3 (below). Note the similarity in phase patterns on these two instruments. Both have two crustal phases with similar apparent velocities and strong PmP and Pn.



Shotgather acquired on the continental slope of the Baja peninsula. Note the asymmetry of Pg to the west and east. The majority of Pg observed on the eastern side of the instrument has an apparent velocity of ~6.5-7 km/s. Two shallower portions of Pg have velocities of 5 km/s and 6 km/s, respectively. A prominent reflection between shots 30400-30550 might correspond to PmP.



Closeup of a shotgather collected on the eastern continental slope of the Baja peninsula, near Cabo. Phase patterns are significantly modified by seafloor or basement topography, so apparent velocities from refractions would be very inaccurate.



Shotgather acquired over crust close to the center of Transect 5, apparently oceanic in origin. Two crustal phases are apparent on both sides of the instrument. The shallower phase has an apparent velocity of ~4.5-5 km/s, and the deeper crustal phase has an apparent velocity of ~6.5 km/s. Prominent reflections between shots 58000 and 58200 and between 58450 and 58550 appear to be PmP. At larger offsets, Pn is identified, with an apparent velocity of 8 km/s.

Appendix A - Summary of OBS Deployments

Site	Programmed Latitude	Programmed Longitude	Distance (km)	OBS Unit	Name	Date Deployed	Depth (m)	Deployed Latitude	Deployed Longitude	Recovered
	Line 0W-W (5 Instruments)									
0-01	23.8200	-112.200	0.00	AA	Acaponeta	18-Sep-02 10:12	1640	23 49.145 N	112 11.979 W	27-Oct-02 12:50
0-02	23.9251	-111.989	24.40	AC	Agua Caliente	18-Sep-02 11:54	354	23 55.500 N	111 59.313 W	27-Oct-02 10:40
0-03	24.0299	-111.778	48.81	AL	Altar	18-Sep-02 13:32	213	24 1.793 N	111 46.688 W	27-Oct-02 8:59
0-04	24.1345	-111.567	73.22	AS	Algodones	18-Sep-02 15:12	318	24 8.082 N	111 34.027 W	27-Oct-02 7:29
0-05	24.2387	-111.355	97.63	BA	Bateques	18-Sep-02 16:48	28	24 14.326 N	111 21.294 W	27-Oct-02 6:01
	Line 0W-E (8 Instruments)									
0-06	24.5525	-110.690	0.00	EN	Ensenada	20-Sep-02 7:21	70	24 33.149 N	110 41.413 W	26-Sep-02 8:05
0-07	24.6241	-110.539	17.21	EM	El Medano	20-Sep-02 6:11	868	24 37.442 N	110 32.348 W	26-Sep-02 9:23
0-08	24.6955	-110.388	34.43	EL	Elota	20-Sep-02 5:05	889	24 41.718 N	110 23.258 W	26-Sep-02 11:07
0-09	24.7667	-110.237	51.64	DE	Desemboque	20-Sep-02 1:59	520	24 46.000 N	110 14.210 W	25-Sep-02 19:30
0-10	24.8378	-110.085	68.85	CA	Compostela	19-Sep-02 23:36	1140	24 50.262 N	110 5.090 W	26-Sep-02 13:30
0-11	24.9088	-109.933	86.07	BK	Bahío Kino	19-Sep-02 22:23	1550	24 54.552 N	109 55.983 W	26-Sep-02 15:16
0-12	24.9795	-109.782	103.28	BH	Benjamin Hill	19-Sep-02 21:10	1675	24 58.804 N	109 46.920 W	26-Sep-02 17:01
0-13	25.0500	-109.630	120.45	BC	Becabache	19-Sep-02 19:23	1840	25 3.092 N	109 37.858 W	26-Sep-02 18:56
	Line 0E (9 Instruments)									
0-14	22.4424	-107.017	0.00	VU	Villa Union	23-Sep-02 13:27	1995	22 26.541 N	107 1.035 W	30-Sep-02 22:32
0-15	22.5201	-106.931	12.32	VI	Villa Insurgentes	23-Sep-02 11:16	1450	22 31.208 N	106 55.863 W	30-Sep-02 20:35
0-16	22.5978	-106.845	24.64	TE	Tecate	23-Sep-02 1:55	1100	22 35.865 N	106 50.718 W	30-Sep-02 18:50
0-17	22.6755	-106.759	36.96	TJ	Tijuana	23-Sep-02 2:43	1100	22 40.543 N	106 45.534 W	30-Sep-02 17:28
0-18	22.7532	-106.673	49.28	TO	Topolobampo	23-Sep-02 3:32	960	22 45.209 N	106 40.372 W	30-Sep-02 16:04
0-19	22.8309	-106.588	61.60	TP	Tepic	23-Sep-02 4:18	617	22 49.881 N	106 35.263 W	30-Sep-02 14:33
0-20	22.9085	-106.502	73.92	TS	Todos Santos	23-Sep-02 5:03	171	22 54.510 N	106 30.110 W	30-Sep-02 13:13
0-21	22.9861	-106.416	86.24	VC	Villa Constitucion	23-Sep-02 5:56	85	22 59.170 N	106 24.948 W	30-Sep-02 12:07
0-22	23.0636	-106.330	98.56	VG	Vincente Guerrero	23-Sep-02 6:42	27.8	23 3.824 N	106 19.767 W	30-Sep-02 11:08
	Line 1 (56 Instruments)									
1-01	25.2535	-110.906	0.00	EO	El Oasis	20-Sep-02 12:01	464	25 15.259 N	110 54.394 W	4-Oct-02 14:06
1-02	25.1838	-110.800	13.15	ER	El Rosario	20-Sep-02 13:15	783	25 10.987 N	110 47.950 W	27-Sep-02 13:07
1-03	25.1140	-110.695	26.30	ES	Escuinapa	20-Sep-02 14:23	70.9	25 6.860 N	110 41.725 W	4-Oct-02 12:18
1-04	25.0442	-110.589	39.46	GE	Guasave	20-Sep-02 15:14	73.1	25 2.845 N	110 35.079 W	27-Sep-02 15:40
1-05	24.9743	-110.484	52.61	GL	Guamuchil	20-Sep-02 16:01	774	24 58.435 N	110 29.005 W	4-Oct-02 10:37
1-06	24.9043	-110.379	65.76	ED	El Descanso	20-Sep-02 3:39	~1140	24 54.231 N	110 22.680 W	27-Sep-02 18:05
1-07	24.8342	-110.274	78.91	DO	Don	20-Sep-02 2:42	670	24 50.041 N	110 16.427 W	4-Oct-02 8:41
1-08	24.7641	-110.169	92.07	CU	Culiacan	20-Sep-02 1:26	~500	24 45.844 N	110 10.157 W	27-Sep-02 20:28
1-09	24.6939	-110.064	105.22	CO	Ciudad Obregon	20-Sep-02 0:30	920	24 41.630 N	110 3.838 W	4-Oct-02 6:51
1-10	24.6236	-109.960	118.37	GN	Guerrero Negro	20-Sep-02 19:19	930	24 37.405 N	109 57.595 W	27-Sep-02 22:53
1-11	24.5532	-109.855	131.52	GU	Guaymas	20-Sep-02 21:07	405?	24 33.356 N	109 51.216 W	4-Oct-02 4:59
1-12	24.4828	-109.751	144.68	HE	Hermosillo	20-Sep-02 22:15	1140	24 29.500 N	109 44.827 W	28-Sep-02 1:24
1-13	24.4123	-109.646	157.83	HU	Huivulai	20-Sep-02 23:18	840	24 24.730 N	109 38.179 W	4-Oct-02 2:59
1-14	24.3417	-109.542	170.98	LC	La Cieneguita	21-Sep-02 0:05	1430	24 20.484 N	109 33.506 W	28-Sep-02 3:54
1-15	24.2711	-109.438	184.13	LI	Ligui	21-Sep-02 0:56	1570	24 16.255 N	109 26.272 W	28-Sep-02 5:37
1-16	24.2004	-109.334	197.29	LM	Los Mochis	21-Sep-02 1:43	1495	24 12.015 N	109 20.022 W	28-Sep-02 7:09
1-17	24.1296	-109.230	210.44	LO	Los Pocitos	21-Sep-02 2:30	950	24 7.765 N	109 13.767 W	28-Sep-02 8:36
1-18	24.0587	-109.126	223.59	LP	La Paz	21-Sep-02 3:16	1550	24 3.511 N	109 7.551 W	28-Sep-02 10:05
1-19	23.9878	-109.023	236.74	LR	Loreto	21-Sep-02 4:06	1950	23 59.254 N	109 1.358 W	Abandonned
1-20	23.9168	-108.919	249.89	LV	Las Varas	21-Sep-02 4:56	19460	23 55.003 N	108 55.112 W	28-Sep-02 14:43
1-21	23.8457	-108.816	263.05	MA	Mazatlan	21-Sep-02 5:47	~1100	23 50.723 N	108 48.942 W	28-Sep-02 16:53

Site	Programmed Latitude	Programmed Longitude	Distance (km)	OBS Unit	Name	Date Deployed	Depth (m)	Deployed Latitude	Deployed Longitude	Recovered
1-22	23.7746 -108.713	23 46.476 N -108 42.7798 W	276.20	ME	Mexicali	21-Sep-02 6:41	1109	23 46.478 N	108 42.774 W	28-Sep-02 20:17
1-23	23.7034 -108.609	23 42.204 N -108 36.5401 W	289.35	MS	Masiaca	21-Sep-02 7:35	1130	23 42.199 N	108 36.533 W	28-Sep-02 22:35
1-24	23.6321 -108.506	23 37.926 N -108 30.3598 W	302.50	MU	Mulege	21-Sep-02 8:29	1050	23 37.914 N	108 30.374 W	29-Sep-02 1:03
1-25	23.5608 -108.403	23 33.648 N -108 24.1800 W	315.65	NA	Navajoa	21-Sep-02 9:21	780	23 33.638 N	108 24.167 W	3-Oct-02 8:00
1-26	23.4894 -108.300	23 29.364 N -108 18.0002 W	328.81	ON	Ojos Negros	21-Sep-02 10:13	985	23 29.358 N	108 18.004 W	3-Oct-02 6:18
1-27	23.4179 -108.198	23 25.074 N -108 11.8799 W	341.96	PE	Pericos	21-Sep-02 12:41	880	23 25.058 N	108 11.891 W	3-Oct-02 4:29
1-28	23.3464 -108.095	23 20.784 N -108 5.7001 W	355.11	PI	Pichilingue	21-Sep-02 13:03	915	23 20.761 N	108 5.688 W	3-Oct-02 2:34
1-29	23.2748 -107.993	23 16.488 N -107 59.5798 W	368.26	PO	Pitiquito	21-Sep-02 13:50	830	23 16.482 N	107 59.567 W	3-Oct-02 0:51
1-30	23.2031 -107.890	23 12.186 N -107 53.4000 W	381.42	PP	Puerta Penasco	21-Sep-02 14:36	810	23 12.177 N	107 53.365 W	2-Oct-02 23:10
1-31	23.1314 -107.788	23 7.884 N -107 47.2801 W	394.57	PR	Punta Prieta	21-Sep-02 15:24	885	23 7.861 N	107 47.241 W	2-Oct-02 21:22
1-32	23.0596 -107.686	23 3.576 N -107 41.1598 W	407.72	PV	Puerto Vallarta	21-Sep-02 16:10	585	23 3.558 N	107 41.121 W	2-Oct-02 19:25
1-33	22.9877 -107.584	22 59.262 N -107 35.0400 W	420.87	QU	Quitovac	21-Sep-02 16:57	~1600	22 59.252 N	107 35.023 W	2-Oct-02 17:44
1-34	22.9157 -107.482	22 54.942 N -107 28.9201 W	434.03	RM	Rosa Morado	21-Sep-02 17:43	1560	22 54.928 N	107 28.895 W	2-Oct-02 16:13
1-35	22.8437 -107.380	22 50.622 N -107 22.7998 W	447.18	RO	Rosario	21-Sep-02 18:31	1390	22 50.619 N	107 22.783 W	2-Oct-02 15:04
1-36	22.7717 -107.278	22 46.302 N -107 16.6800 W	460.33	RT	Rosarito	21-Sep-02 19:18	1210	22 46.294 N	107 16.657 W	2-Oct-02 13:34
1-37	22.6995 -107.176	22 41.970 N -107 10.5602 W	473.48	RU	Rumoroso	21-Sep-02 21:37	~1500	22 41.972 N	107 10.548 W	2-Oct-02 12:03
1-38	22.6274 -107.075	22 37.644 N -107 4.4998 W	486.64	SA	Santa Ana	21-Sep-02 22:26	1870	22 37.642 N	107 4.495 W	2-Oct-02 10:12
1-39	22.5551 -106.973	22 33.306 N -106 58.3800 W	499.79	SB	San Blas	21-Sep-02 23:20	1465	22 33.273 N	106 58.389 W	2-Oct-02 8:30
1-40	22.4828 -106.872	22 28.968 N -106 52.3201 W	512.94	SC	San Carlos	22-Sep-02 0:49	1420	22 28.962 N	106 52.316 W	2-Oct-02 6:52
1-41	22.4104 -106.771	22 24.624 N -106 46.2602 W	526.09	SF	San Felipe	22-Sep-02 1:37	1350	22 24.565 N	106 46.156 W	2-Oct-02 5:15
1-42	22.3379 -106.670	22 20.274 N -106 40.1999 W	539.24	SG	Santiago	22-Sep-02 2:31	1000	22 20.271 N	106 40.196 W	2-Oct-02 3:30
1-43	22.2654 -106.569	22 15.924 N -106 34.1400 W	552.40	SH	San Hilario	22-Sep-02 3:20	900	22 15.926 N	106 34.127 W	2-Oct-02 2:17
1-44	22.1929 -106.468	22 11.574 N -106 28.0801 W	565.55	SI	San Ignacio	22-Sep-02 4:06	190	22 11.544 N	106 28.037 W	2-Oct-02 1:01
1-45	22.1202 -106.367	22 7.212 N -106 22.0198 W	578.70	SJ	San Jose de Caba	22-Sep-02 5:16	472	22 7.160 N	106 21.957 W	1-Oct-02 23:36
1-46	22.0475 -106.266	22 2.850 N -106 15.9599 W	591.85	SL	San Lucas	22-Sep-02 6:04	91.8	22 2.822 N	106 15.926 W	1-Oct-02 22:25
1-47	21.9748 -106.166	21 58.488 N -106 9.9600 W	605.01	SN	San Antonio	22-Sep-02 7:22	56.3	21 58.422 N	106 9.902 W	1-Oct-02 21:17
1-48	21.9019 -106.065	21 54.114 N -106 3.9001 W	618.16	SO	Sonita	22-Sep-02 8:08	50.9	21 54.081 N	106 3.881 W	1-Oct-02 20:20
1-49	21.8291 -105.965	21 49.746 N -105 57.8998 W	631.31	SQ	San Quintin	22-Sep-02 8:54	50.9	21 49.714 N	105 57.921 W	1-Oct-02 19:15
1-50	21.7561 -105.865	21 45.366 N -105 51.8999 W	644.46	SR	Santa Rosalia	22-Sep-02 9:51	48.6	21 45.334 N	105 51.853 W	1-Oct-02 18:14
1-51	21.6831 -105.765	21 40.986 N -105 45.9000 W	657.61	ST	Santo Tomas	22-Sep-02 10:45	48.1	21 40.901 N	105 45.849 W	1-Oct-02 17:11
1-52	21.6101 -105.664	21 36.606 N -105 39.8401 W	670.77	SU	San Luis	22-Sep-02 11:34	46.5	21 36.603 N	105 39.825 W	1-Oct-02 16:08
1-53	21.5369 -105.564	21 32.214 N -105 33.8402 W	683.92	SV	San Vincente	22-Sep-02 12:23	43	21 32.202 N	105 33.803 W	1-Oct-02 15:00
1-54	21.4638 -105.465	21 27.828 N -105 27.8998 W	697.07	SX	Santiago Ixcuintla	22-Sep-02 13:08	46.6	21 27.813 N	105 27.870 W	1-Oct-02 13:55
1-55	21.3905 -105.365	21 23.430 N -105 21.8999 W	710.22	SZ	Santa Inez	22-Sep-02 13:53	40.9	21 23.427 N	105 21.860 W	1-Oct-02 12:48
1-56	21.3172 -105.265	21 19.032 N -105 15.9000 W	723.38	TA	Tajito	22-Sep-02 14:26	33	21 21.176 N	105 18.837 W	1-Oct-02 12:07
	Line 2 (line cancelled) (9 Instruments deployed)									
2-17	25.5966 -110.160	25 35.796 N -110 9.6002 W	176.11	BC	Bacabache	27-Sep-02 5:27	2050	25 35.812 N	110 9.513 W	16-Oct-02 6:31
2-18	25.5336 -110.075	25 32.016 N -110 4.4998 W	187.12	BH	Benjamin Hill	27-Sep-02 4:26	2090	25 32.060 N	110 4.512 W	16-Oct-02 8:00
2-19	25.4705 -109.991	25 28.230 N -109 59.4598 W	198.13	EL	Elota	27-Sep-02 3:19	2075	25 28.214 N	109 59.457 W	16-Oct-02 9:36
2-20	25.4050 -109.903	25 24.300 N -109 54.1800 W	362.13	CA	Compostela	27-Sep-02 2:10	3275	25 24.278 N	109 54.174 W	16-Oct-02 11:30
2-21	25.3473 -109.801	25 20.838 N -109 48.0602 W	350.06	BK	Bahia Kino	27-Sep-02 0:49	2350	25 20.826 N	109 48.045 W	16-Oct-02 13:12
2-22	25.2895 -109.700	25 17.370 N -109 41.9998 W	337.99	DE	Desemboque	26-Sep-02 23:32	2330	25 17.301 N	109 42.007 W	16-Oct-02 14:52
2-23	25.2317 -109.598	25 13.902 N -109 35.8800 W	325.92	EN	Ensenada	26-Sep-02 22:07	2250	25 13.986 N	109 35.867 W	16-Oct-02 16:35
2-24	25.1738 -109.496	25 10.428 N -109 29.7601 W	313.85	EM	El Medano	26-Sep-02 20:58	2100	25 10.430 N	109 29.755 W	16-Oct-02 18:09
2-37	24.4148 -108.186	24 24.888 N -108 11.1598 W	156.92	GN	Guerrero Negro	29-Sep-02 19:02	548	24 24.885 N	108 11.166 W	3-Oct-02 14:56
	Line 2PE (line cancelled) (5 Instruments deployed)									
2-51	24.4148 -109.150	24 24.888 N -109 9.0000 W	126.56	ED	El Descanso	29-Sep-02 9:22	3125	24 24.907 N	109 8.997 W	3-Oct-02 23:42
2-52	24.4154 -108.980	24 24.924 N -108 58.8000 W	109.35	ER	El Rosario	29-Sep-02 12:44	1698	24 24.929 N	108 58.771 W	3-Oct-02 21:27
2-53	24.4160 -108.710	24 24.960 N -108 42.6000 W	82.01	GE	Guasave	29-Sep-02 14:28	1725	24 24.962 N	108 42.563 W	3-Oct-02 19:19

Site	Latitude	Longitude	Programmed Latitude	Programmed Longitude	Distance (km)	OBS Unit	Name	Date Deployed		Depth (m)	Deployed Latitude	Deployed Longitude	Recovered	
2-54	24.4161	-108.440	24 24.966 N	-108 26.4000 W	54.68	HE	Hermosillo	29-Sep-02	16:11	1275	24 24.975 N	108 26.382 W	3-Oct-02	16:57
2-55	24.4148	-107.900	24 24.888 N	-107 54.0000 W	0.00	CU	Culican	29-Sep-02	20:51	44.3	24 24.924 N	108 2.575 W	3-Oct-02	13:25
	Line 3 (40 Instruments)													
3-01	28.1840	-112.754	28 11.040 N	-112 45.2399 W	0.00		Tajito	6-Oct-02	13:41	88	28 11.035 N	112 45.265 W	13-Oct-02	14:08
3-02	28.1302	-112.668	28 7.812 N	-112 40.0800 W	10.32	SZ	Santa Inez	6-Oct-02	14:22	162	28 7.794 N	112 40.065 W	13-Oct-02	14:52
3-03	28.0764	-112.583	28 4.584 N	-112 34.9800 W	20.64	VU	Villa Union	6-Oct-02	15:04	340	28 4.571 N	112 34.945 W	13-Oct-02	15:41
3-04	28.0225	-112.497	28 1.350 N	-112 29.8201 W	30.96	TE	Tecate	6-Oct-02	15:38	920	28 1.300 N	112 29.803 W	13-Oct-02	16:46
3-05	27.9686	-112.411	27 58.116 N	-112 24.6602 W	41.28	VI	Villa Insurgent	6-Oct-02	17:04	850	27 58.112 N	112 24.657 W	13-Oct-02	17:05
3-06	27.9146	-112.326	27 54.876 N	-112 19.5598 W	51.59	ME	Mexicali	6-Oct-02	17:41	1050	27 54.875 N	112 19.558 W	13-Oct-02	19:02
3-07	27.8606	-112.241	27 51.636 N	-112 14.4598 W	61.91	MS	Masiaco	6-Oct-02	18:14	1275	27 51.634 N	112 14.433 W	13-Oct-02	20:16
3-08	27.8065	-112.155	27 48.390 N	-112 9.2999 W	72.23	MA	Mazatlán	6-Oct-02	18:49	1440	27 48.380 N	112 9.288 W	13-Oct-02	21:42
3-09	27.7524	-112.070	27 45.144 N	-112 4.2000 W	82.55	LV	Las Varas	6-Oct-02	19:24	1490	27 45.146 N	112 4.177 W	13-Oct-02	23:14
3-10	27.6982	-111.985	27 41.892 N	-111 59.1000 W	92.87	LP	La Paz	6-Oct-02	20:01	1560	27 41.896 N	111 59.101 W	13-Oct-02	5:05
3-11	27.6440	-111.900	27 38.640 N	-111 54.0001 W	103.19	SR	Santa Rosalia	6-Oct-02	5:19	1600	27 38.328 N	111 54.007 W	13-Oct-02	3:40
3-12	27.5897	-111.815	27 35.382 N	-111 48.9001 W	113.51	SO	Sonita	6-Oct-02	4:42	1590	27 35.384 N	111 48.987 W	14-Oct-02	1:44
3-13	27.5353	-111.730	27 32.118 N	-111 43.8002 W	123.83	SN	San Antonio	6-Oct-02	4:02	1715	27 32.109 N	111 43.782 W	14-Oct-02	3:06
3-14	27.4809	-111.645	27 28.854 N	-111 38.6998 W	134.14	SL	San Lucas	6-Oct-02	3:20	1775	27 28.835 N	111 38.688 W	14-Oct-02	4:33
3-15	27.4265	-111.561	27 25.590 N	-111 33.6598 W	144.46	SJ	San Jose del Cabo	6-Oct-02	2:39	1850	27 25.575 N	111 33.650 W	14-Oct-02	5:53
3-16	27.3720	-111.476	27 22.320 N	-111 28.5599 W	154.78	SI	San Ignacio	6-Oct-02	1:57	1880	27 22.308 N	111 28.559 W	14-Oct-02	7:12
3-17	27.3174	-111.392	27 19.044 N	-111 23.5199 W	165.10	SH	San Hilario	6-Oct-02	1:15	1905	27 19.036 N	111 23.518 W	14-Oct-02	8:34
3-18	27.2628	-111.307	27 15.768 N	-111 18.4200 W	175.42	SG	Santiago	5-Oct-02	23:02	1900	27 15.758 N	111 18.421 W	14-Oct-02	9:58
3-19	27.2082	-111.223	27 12.492 N	-111 13.3800 W	185.74	SB	San Blas	5-Oct-02	22:20	1860	27 12.404 N	111 13.381 W	14-Oct-02	11:18
3-20	27.1535	-111.139	27 9.210 N	-111 8.3400 W	196.06	SF	San Felipe	5-Oct-02	21:40	1775	27 9.224 N	111 8.314 W	14-Oct-02	12:40
3-21	27.0987	-111.054	27 5.922 N	-111 3.2401 W	206.38	SC	San Carlos	5-Oct-02	20:57	1750	27 5.933 N	111 3.255 W	14-Oct-02	14:02
3-22	27.0439	-110.970	27 2.634 N	-110 58.2001 W	216.70	RU	Rumoroso	5-Oct-02	20:18	1725	27 2.628 N	110 58.197 W	14-Oct-02	15:22
3-23	26.9891	-110.886	26 59.346 N	-110 53.1601 W	227.01	SA	Santa Ana	5-Oct-02	19:38	1650	26 59.345 N	110 53.163 W	14-Oct-02	16:42
3-24	26.9342	-110.802	26 56.052 N	-110 48.1201 W	237.33	RT	Rosarito	5-Oct-02	17:42	1615	26 56.046 N	110 48.135 W	14-Oct-02	18:04
3-25	26.8792	-110.718	26 52.752 N	-110 43.0801 W	247.65	RM	Rosa Morada	5-Oct-02	17:03	1525	26 52.740 N	110 43.097 W	14-Oct-02	19:21
3-26	26.8242	-110.635	26 49.452 N	-110 38.1001 W	257.97	RO	Rosario	5-Oct-02	16:24	1460	26 49.455 N	110 38.115 W	14-Oct-02	20:42
3-27	26.7692	-110.551	26 46.152 N	-110 33.0602 W	268.29	QU	Quitouac	5-Oct-02	15:43	1380	26 46.145 N	110 33.061 W	14-Oct-02	21:57
3-28	26.7141	-110.467	26 42.846 N	-110 28.0202 W	278.61	PR	Punta Prieta	5-Oct-02	15:04	1315	26 42.854 N	110 28.039 W	14-Oct-02	23:10
3-29	26.6589	-110.384	26 39.534 N	-110 23.0402 W	288.93	PV	Puerta Vallarta	5-Oct-02	14:27	1240	26 39.535 N	110 23.050 W	15-Oct-02	6:20
3-30	26.6037	-110.300	26 36.222 N	-110 18.0002 W	299.24	CO	Ciudad Obregon	5-Oct-02	1:17	1130	26 36.264 N	110 18.005 W	15-Oct-02	7:28
3-31	26.5485	-110.217	26 32.910 N	-110 13.0202 W	309.56	GU	Guaymas	5-Oct-02	1:58	980	26 32.904 N	110 13.003 W	15-Oct-02	16:45
3-32	26.4932	-110.134	26 29.592 N	-110 8.0402 W	319.88	HU	Huivulai	5-Oct-02	2:33	890	26 29.594 N	110 8.028 W	15-Oct-02	17:56
3-33	26.4379	-110.050	26 26.274 N	-110 3.0002 W	330.20	ED	El Descanso	5-Oct-02	3:10	730	26 26.277 N	110 2.987 W	15-Oct-02	18:57
3-34	26.3825	-109.967	26 22.950 N	-109 58.0202 W	340.52	ER	El Rosario	5-Oct-02	3:54	600	26 22.976 N	109 58.005 W	15-Oct-02	19:55
3-35	26.3270	-109.884	26 19.620 N	-109 53.0402 W	350.84	GE	Guasave	5-Oct-02	4:31	540	26 19.601 N	109 53.010 W	15-Oct-02	21:06
3-36	26.2716	-109.801	26 16.296 N	-109 48.0602 W	361.16	GN	Guerrero Negro	5-Oct-02	5:08	500	26 16.296 N	109 48.044 W	15-Oct-02	22:03
3-37	26.2160	-109.718	26 12.960 N	-109 43.0801 W	371.48	HE	Hermosillo	5-Oct-02	5:45	485	26 12.940 N	109 43.060 W	15-Oct-02	23:01
3-38	26.1604	-109.636	26 9.624 N	-109 38.1601 W	381.80	CU	Culiacan	5-Oct-02	6:22	150	26 9.612 N	109 38.132 W	16-Oct-02	0:23
3-39	26.1048	-109.553	26 6.288 N	-109 33.1801 W	392.11	NA	Navajoa	5-Oct-02	6:58	58	26 6.281 N	109 33.165 W	16-Oct-02	1:15
3-40	26.0491	-109.470	26 2.946 N	-109 28.2001 W	402.43		not deployed due to shrimping activity							
	Line 3PE (10 Instruments)													
3-41	26.6000	-110.680	26 36.000 N	-110 40.8000 W	0.00	EO	El Oasis	4-Oct-02	22:51	1490	26 35.994 N	110 40.805 W	15-Oct-02	1:17
3-42	26.6005	-110.559	26 36.030 N	-110 33.5400 W	12.00	GL	Guamuchil	4-Oct-02	23:39	1405	26 36.018 N	110 33.501 W	15-Oct-02	3:57
3-43	26.6008	-110.439	26 36.048 N	-110 26.3400 W	24.00	ES	Escuiugsa	5-Oct-02	0:25	1300	26 36.047 N	110 26.334 W	15-Oct-02	5:16
3-44	26.6013	-110.197	26 36.078 N	-110 11.8200 W	48.00	PP	Puerto Penaso	5-Oct-02	13:20	930	26 36.069 N	110 11.831 W	15-Oct-02	9:25
3-45	26.6013	-110.077	26 36.078 N	-110 4.6200 W	60.00	PO	Pitiquito	5-Oct-02	12:38	690	26 36.074 N	110 4.633 W	15-Oct-02	10:27
3-46	26.6013	-109.956	26 36.078 N	-109 57.3600 W	72.00	PI	Pichilingue	5-Oct-02	11:54	485	26 36.079 N	109 57.336 W	15-Oct-02	11:28

			Programmed							Date			Deployed				
Site	Latitude	Longitude	Latitude		Longitude		Distance (km)	OBS Unit	Name	Deployed		Depth (m)	Latitude		Longitude		Recovered	
3-47	26.6011	-109.835	26 36.066 N		-109 50.1000 W		84.00	PE	Pericos	5-Oct-02	11:03	130	26 36.066 N		109 50.114 W		15-Oct-02	12:49
3-48	26.6009	-109.714	26 36.054 N		-109 42.8400 W		96.00	ON	Ojos Negros	5-Oct-02	10:17	58	26 36.062 N		109 42.847 W		15-Oct-02	13:38
3-49	26.6005	-109.594	26 36.030 N		-109 35.6400 W		108.00		not deployed due to shrimping activity									
3-50	26.6001	-109.473	26 36.006 N		-109 28.3800 W		120.00		not deployed due to shrimping activity									
	Line 3PW (10 Instruments)																	
3-51	27.6143	-112.411	27 36.858 N		-112 24.6600 W		0.00	SX	Santiago Ixcuintla	6-Oct-02	10:03	220	27 36.864 N		112 24.695 W		13-Oct-02	10:10
3-52	27.6208	-112.308	27 37.248 N		-112 18.4800 W		10.20	ST	Santo Tomas	6-Oct-02	8:58	690	27 37.248 N		112 18.510 W		13-Oct-02	9:19
3-53	27.6273	-112.204	27 37.638 N		-112 12.2400 W		20.40	SV	San Vicente	6-Oct-02	8:23	920	27 37.641 N		112 12.256 W		13-Oct-02	8:19
3-54	27.6336	-112.101	27 38.016 N		-112 6.0600 W		30.60	SU	San Luis	6-Oct-02	7:47	1260	27 38.016 N		112 6.113 W		13-Oct-02	7:19
3-55	27.6399	-111.998	27 38.394 N		-111 59.8800 W		40.80	SQ	San Quintin	6-Oct-02	7:11	1550	27 38.398 N		111 59.895 W		13-Oct-02	6:10
3-56	27.6522	-111.791	27 39.132 N		-111 47.4600 W		61.20	LO	Los Pocitos	6-Oct-02	21:10	1710	27 39.137 N		111 47.453 W		13-Oct-02	2:06
3-57	27.6583	-111.688	27 39.498 N		-111 41.2800 W		71.40	TJ	Tijuana	6-Oct-02	21:50	1710	27 39.496 N		111 41.237 W		13-Oct-02	0:42
3-58	27.6643	-111.585	27 39.858 N		-111 35.1000 W		81.60	TP	Tepic	6-Oct-02	22:25	1300	27 39.846 N		111 35.090 W		12-Oct-02	23:16
3-59	27.6702	-111.481	27 40.212 N		-111 28.8600 W		91.90	TO	Topolobampo	6-Oct-02	13:02	1200	27 40.208 N		111 28.847 W		12-Oct-02	21:24
3-60	27.6760	-111.378	27 40.560 N		-111 22.6800 W		101.98	TS	Todos Santos	6-Oct-02	23:40	950	27 40.559 N		111 22.673 W		12-Oct-02	20:32
	Line 5E (41 Instruments)																	
5-01	23.0200	-109.600	23 1.200 N		-109 36.0000 W		0	GU	Guaymas	18-Oct-02	1:17	550	23 1.193 N		109 36.007 W		22-Oct-02	19:12
5-02	22.9664	-109.493	22 57.984 N		-109 29.5800 W		12.5	HU	Huivulai	18-Oct-02	0:33	400	22 58.000 N		109 29.606 W		22-Oct-02	20:21
5-03	22.9127	-109.385	22 54.762 N		-109 23.1000 W		25	EL	El Descanso	17-Oct-02	23:47	1400	22 54.770 N		109 23.125 W		22-Oct-02	21:37
5-04	22.8590	-109.278	22 51.540 N		-109 16.6800 W		37.5	ER	El Rosario	17-Oct-02	23:00	1520	22 51.545 N		109 16.690 W		22-Oct-02	22:54
5-05	22.8052	-109.171	22 48.312 N		-109 10.2600 W		50	GE	Gusave	17-Oct-02	22:12	3030	22 48.315 N		109 10.269 W		23-Oct-02	1:02
5-06	22.7513	-109.064	22 45.078 N		-109 3.8400 W		62.5	GN	Guerrero Negro	17-Oct-02	21:23	3080	22 45.074 N		109 3.837 W		23-Oct-02	2:59
5-07	22.6973	-108.957	22 41.838 N		-108 57.4200 W		75	PO	Pitiquito	18-Oct-02	22:22	3100	22 41.850 N		108 57.381 W		23-Oct-02	4:59
5-08	22.6433	-108.850	22 38.598 N		-108 51.0000 W		87.5	CO	Ciudad Obregon	18-Oct-02	23:07	3010	22 38.594 N		108 50.975 W		23-Oct-02	6:51
5-09	22.5892	-108.744	22 35.352 N		-108 44.6400 W		100	PV	Puerta Vallarta	18-Oct-02	23:54	2920	22 35.343 N		108 44.632 W		23-Oct-02	8:40
5-10	22.5242	-108.616	22 31.452 N		-108 36.9600 W		115	ES	Escuinapa	19-Oct-02	0:48	2950	22 31.456 N		108 36.942 W		23-Oct-02	10:45
5-11	22.4591	-108.488	22 27.546 N		-108 29.2800 W		130	GL	Guamuchil	19-Oct-02	1:40	2750	22 27.542 N		108 29.267 W		23-Oct-02	12:49
5-12	22.3939	-108.360	22 23.634 N		-108 21.6000 W		145	EO	El Oasis	19-Oct-02	2:36	2720	22 23.618 N		108 21.589 W		23-Oct-02	15:02
5-13	22.3286	-108.232	22 19.716 N		-108 13.9200 W		160	PR	Punta Prieta	19-Oct-02	3:34	2870	22 19.728 N		108 13.910 W		23-Oct-02	17:06
5-14	22.2588	-108.107	22 15.528 N		-108 6.4200 W		15	QU	Quitouac	19-Oct-02	4:29	2920	22 15.525 N		108 6.391 W		23-Oct-02	19:04
5-15	22.1889	-107.983	22 11.334 N		-107 58.9800 W		30	RO	Rosario	19-Oct-02	5:22	2990	22 11.328 N		107 58.941 W		28-Oct-02	21:07
5-16	22.1188	-107.858	22 7.128 N		-107 51.4800 W		45	RM	Rosa Morada	19-Oct-02	6:13	3125	22 7.115 N		107 51.463 W		28-Oct-02	23:13
5-17	22.0487	-107.734	22 2.922 N		-107 44.0400 W		60	RT	Rosarito	19-Oct-02	7:04	3120	22 2.912 N		107 44.026 W		29-Oct-02	1:24
5-18	21.9785	-107.610	21 58.710 N		-107 36.6000 W		75	SA	Santa Ana	19-Oct-02	7:56	3070	21 58.691 N		107 36.526 W		29-Oct-02	3:29
5-19	21.9082	-107.485	21 54.492 N		-107 29.1000 W		90	RU	Rumoroso	19-Oct-02	8:47	2740	21 54.472 N		107 29.085 W		29-Oct-02	5:33
5-20	21.8379	-107.361	21 50.274 N		-107 21.6600 W		105	SC	San Carlos	19-Oct-02	9:38	2740	21 50.270 N		107 21.652 W		29-Oct-02	7:34
5-21	21.7674	-107.237	21 46.044 N		-107 14.2200 W		120	SF	San Felipe	19-Oct-02	10:29	2930	21 46.034 N		107 14.208 W		29-Oct-02	9:29
5-22	21.6968	-107.114	21 41.808 N		-107 6.8400 W		135	SB	San Blas	19-Oct-02	11:18	2655	21 41.800 N		107 6.839 W		29-Oct-02	11:24
5-23	21.6379	-107.011	21 38.274 N		-107 0.6600 W		147.5	SG	Santiago	19-Oct-02	11:58	2330	21 38.267 N		107 0.642 W		29-Oct-02	13:01
5-24	21.5790	-106.908	21 34.740 N		-106 54.4800 W		160	SH	San Hilario	19-Oct-02	12:42	2530	21 34.734 N		106 54.568 W		29-Oct-02	14:46
5-25	21.5200	-106.805	21 31.200 N		-106 48.3000 W		172.5	SI	San Ignacio	19-Oct-02	13:23	2950	21 31.206 N		106 48.290 W		29-Oct-02	16:38
5-26	21.4609	-106.702	21 27.654 N		-106 42.1200 W		185	SJ	San José del Cabo	19-Oct-02	14:05	3000	21 27.651 N		106 42.101 W		29-Oct-02	18:35
5-27	21.4018	-106.599	21 24.108 N		-106 35.9400 W		197.5	SL	San Lucas	19-Oct-02	14:47	2500	21 24.110 N		106 36.921 W		29-Oct-02	20:15
5-28	21.3402	-106.493	21 20.412 N		-106 29.5800 W		210.5	SN	San Antonio	19-Oct-02	15:30	3120	21 20.418 N		106 29.592 W		29-Oct-02	22:14
5-29	21.2833	-106.394	21 16.998 N		-106 23.6400 W		222.5	SO	Sonito	19-Oct-02	16:09	2500	21 16.994 N		106 23.621 W		30-Oct-02	0:02
5-30	21.2240	-106.292	21 13.440 N		-106 17.5200 W		235	LV	Las Varas	19-Oct-02	16:51	1400	21 13.409 N		106 17.484 W		30-Oct-02	1:28
5-31	21.1670	-106.193	21 10.020 N		-106 11.5800 W		247	VI	Villa Insurgentes	19-Oct-02	21:30	470	21 10.029 N		106 11.570 W		30-Oct-02	2:30
5-32	21.1242	-106.120	21 7.452 N		-106 7.2000 W		256	TE	Tecate	19-Oct-02	22:13	290	21 7.444 N		106 7.183 W		30-Oct-02	3:18
5-33	21.0814	-106.046	21 4.884 N		-106 2.7600 W		265	VU	Villa Union	19-Oct-02	22:54	220	21 4.872 N		106 2.741 W		30-Oct-02	4:00
5-34	21.0052	-105.915	21 0.312 N		-105 54.9000 W		281	SZ	Santa Ynez	20-Oct-02	0:04	240	21 0.307 N		105 54.879 W		30-Oct-02	4:59

Site	Latitude	Longitude	Programmed Latitude	Programmed Longitude	Distance (km)	OBS Unit	Name	Date Deployed	Depth (m)	Deployed Latitude	Deployed Longitude	Recovered
5-35	20.9337	-105.793	20 56.022 N	-105 47.5800 W	296	TA	Tajito	20-Oct-02 1:03	460	20 56.022 N	105 47.562 W	30-Oct-02 6:09
5-36	20.8501	-105.650	20 51.006 N	-105 39.0000 W	313.5	SX	Santiago Ixquintla	20-Oct-02 2:21	85	20 51.006 N	105 38.981 W	30-Oct-02 7:14
	Line 5PE											
5-37	21.0080	-106.503	21 0.480 N	-106 30.1800 W	5	MA	Mazatlán	19-Oct-02 18:39	4230	21 0.480 N	106 30.173 W	24-Oct-02 7:57
5-38	21.0320	-106.360	21 1.920 N	-106 21.6000 W	20	MS	Masiaca	19-Oct-02 19:30	4410	21 1.922 N	106 21.593 W	24-Oct-02 8:56
5-39	21.0559	-106.218	21 3.354 N	-106 13.0800 W	35	ME	Mexicali	19-Oct-02 20:32	2720	21 3.359 N	106 13.041 W	24-Oct-02 10:56
5-40	21.1050	-105.924	21 6.300 N	-105 55.4400 W	66	LP	La Paz	20-Oct-02 9:47	365	21 6.290 N	105 55.436 W	30-Oct-02 14:25
5-41	21.1285	-105.782	21 7.710 N	-105 46.9200 W	81	SQ	San Quintin	20-Oct-02 8:46	470	21 7.705 N	105 46.916 W	30-Oct-02 13:17
5-42	21.1472	-105.668	21 8.832 N	-105 40.0800 W	93	SU	San Luis	20-Oct-02 7:55	480	21 8.826 N	105 40.086 W	30-Oct-02 12:18
5-43	21.1721	-105.516	21 10.326 N	-105 30.9600 W	109	SV	San Vincente	20-Oct-02 6:50	205	21 10.319 N	105 30.964 W	30-Oct-02 11:08
5-44	21.1968	-105.364	21 11.808 N	-105 21.8400 W	125	ST	Santo Tomas	20-Oct-02 5:43	55	21 11.816 N	105 21.831 W	30-Oct-02 10:08
	Line 5PWW											
5-45	23.3618	-110.814	23 21.708 N	-110 48.8400 W	19	ON	Ojos Negros	18-Oct-02 9:50	412	23 21.724 N	110 48.867 W	26-Oct-02 23:41
5-46	23.3534	-110.628	23 21.204 N	-110 37.6800 W	38	PE	Pericos	18-Oct-02 11:02	225	23 21.198 N	110 37.654 W	26-Oct-02 22:21
5-47	23.3447	-110.442	23 20.682 N	-110 26.5200 W	57	PI	Pichilingue	18-Oct-02 12:18	475	23 20.683 N	110 26.504 W	26-Oct-02 21:02
5-48	23.3358	-110.256	23 20.148 N	-110 15.3600 W	76	PP	Puerto Penasco	18-Oct-02 13:24	260	23 20.146 N	110 15.335 W	26-Oct-02 19:30
	Line 5PWE											
5-49	23.2913	-109.386	23 17.478 N	-109 23.1600 W	0	EM	El Medono	17-Oct-02 10:32	780	23 17.468 N	109 23.158 W	25-Oct-02 13:06
5-50	23.2822	-109.220	23 16.932 N	-109 13.2000 W	17	BC	Bacabache	17-Oct-02 13:11	2290	23 16.918 N	109 13.815 W	25-Oct-02 17:33
	Line 6W											
6-01	23.4552	-109.395	23 27.312 N	-109 23.7000 W	0	EL	Elota	17-Oct-02 11:39	67	23 27.304 N	109 23.698 W	25-Oct-02 14:28
6-02	23.3945	-109.286	23 23.670 N	-109 17.1600 W	13	BH	Benjamin Hill	17-Oct-02 12:25	1600	23 23.661 N	109 17.143 W	25-Oct-02 15:51
6-03	23.3337	-109.177	23 20.022 N	-109 10.6200 W	26	NA	Navajoa	17-Oct-02 13:42	2300	23 20.022 N	109 10.619 W	25-Oct-02 19:07
6-04	23.2681	-109.060	23 16.086 N	-109 3.6000 W	40	CU	Culiacan	17-Oct-02 14:31	2690	23 16.085 N	109 3.583 W	25-Oct-02 21:03
6-05	23.1978	-108.935	23 11.868 N	-108 56.1000 W	55	EN	Ensenada	17-Oct-02 15:22	2615	23 11.864 N	108 56.091 W	25-Oct-02 23:02
6-06	23.1274	-108.810	23 7.644 N	-108 48.6000 W	70	BK	Bahía Kino	17-Oct-02 16:16	2690	23 7.646 N	108 48.594 W	26-Oct-02 1:19
6-07	23.0569	-108.685	23 3.414 N	-108 41.1000 W	85	DE	Desemboque	17-Oct-02 17:11	2810	23 3.426 N	108 41.101 W	26-Oct-02 5:08
6-08	22.9862	-108.560	22 59.172 N	-108 33.6000 W	100	HE	Hermosillo	17-Oct-02 18:06	2640	22 59.181 N	108 33.593 W	26-Oct-02 7:18

Appendix B - Summary of OBS Clock Drifts and Raw Data Files

Site	Deployment Latitude	Deployment Longitude	Depth (m)	Deployment Time SyncYear	SyncJDay	SyncHour	SyncMin	Recovery Time recYr	recJDay	recHour	recMin	recMsec	Drift (ms)	Raw File Name	Mb	CD/DVD
	Line 0WW															
0-01	23 49.145 N	112 11.979 W	1640	2002	261	14	14	2002	300	19	53	0.8781500	-121.8500	Baja_sn49_AA_0-01.raw	2410.0	DVD
0-02	23 55.500 N	111 59.313 W	354	2002	261	14	33	2002	300	17	48	0.8895639	-110.4361	Baja_sn57_AC_0-02.raw	2410.0	DVD
0-03	24 1.793 N	111 46.688 W	213	2002	261	15	36	2002	300	16	11	0.0400842	40.0842	Baja_sn58_AL_0-03.raw	2400.0	DVD
0-04	24 8.082 N	111 34.027 W	318	2002	261	16	18	2002	300	14	40	0.0307750	30.7750	Baja_sn02_AS_0-04.raw	2400.0	DVD
0-05	24 14.326 N	111 21.294 W	28	2002	261	16	54	2002	300	13	33	0.1049444	104.9444	Baja_sn33_BA_0-05.raw	2390.0	DVD
	Line 0WE															
0-06	24 33.149 N	110 41.413 W	70	2002	263	10	12	2002	269	15	11	0.9907800	-9.2200	Baja_sn70_EN_0-06.raw	381.7	CD
0-07	24 37.442 N	110 32.348 W	373	2002	263	9	30	2002	269	16	26	0.0061700	6.1700	Baja_sn75_EL_0-07.raw	385.0	CD
0-08	24 41.718 N	110 23.258 W	889	2002	263	8	53	2002	269	18	15	0.9743000	-25.7000	Baja_sn68_EL_0-08.raw	390.0	CD
0-09	24 46.000 N	110 14.210 W	520	2002	263	6	59	2002	269	2	47	0.9802000	-19.8000	Baja_sn56_DE_0-09.raw	356.9	CD
0-10	24 50.262 N	110 5.090 W	1140	2002	262	20	41	2002	269	20	38	0.0073750	7.3750	Baja_sn13_CA_0-10.raw	412.8	CD
0-11	24 54.552 N	109 55.983 W	880	2002	262	20	21	2002	262	22	24	0.9985000	-1.5000	Baja_sn23_BK_0-11.raw	420.9	CD
0-12	24 58.804 N	109 46.920 W	1675	2002	262	19	52	2002	270	0	10	0.0055800	5.5800	Baja_sn06_BH_0-12.raw	428.8	CD
0-13	25 3.092 N	109 37.858 W	400	2002	262	19	18	2002	270	2	2	0.9690300	-30.9700	Baja_sn37_BC_0-13.raw	437.0	CD
	Line 0E															
0-14	22 26.541 N	107 1.035 W	1995	2002	266	12	19	2002	274	5	39	0.9532500	-46.7500	Baja_sn40_VU_0-14.raw	467.8	CD
0-15	22 31.208 N	106 55.863 W	1450	2002	266	11	28	2002	274	3	45	0.0029800	2.9800	Baja_sn24_VL_0-15.raw	465.4	CD
0-16	22 35.865 N	106 50.718 W	1100	2002	265	19	17	2002	274	1	57	0.9656100	-34.3900	Baja_sn53_TE_0-16.raw	508.2	CD
0-17	22 40.543 N	106 45.534 W	1100	2002	265	20	22	2002	274	0	35	0.0211800	21.1800	Baja_sn51_TJ_0-17.raw	474.0	CD
0-18	22 45.209 N	106 40.372 W	960	2002	265	20	47	2002	273	23	12	0.9665000	-33.5000	Baja_sn60_TO_0-18.raw	495.7	CD
0-19	22 49.881 N	106 35.263 W	617	2002	265	21	51	2002	273	21	39	0.0022700	2.2700	Baja_sn18_TP_0-19.raw	467.8	CD
0-20	22 54.510 N	106 30.110 W	171	2002	265	22	29	2002	273	20	23	0.0091700	9.1700	Baja_sn11_TS_0-20.raw	461.8	CD
0-21	22 59.170 N	106 24.948 W	85	2002	266	10	7	2002	273	19	18	0.0002800	0.2800	Baja_sn19_VC_0-21.raw	456.2	CD
0-22	23 3.824 N	106 19.767 W	28	2002	266	10	26	2002	273	18	17	0.9643600	-35.6400	Baja_sn38_VG_0-22.raw	450.9	CD
	Line1															
1-01	25 15.259 N	110 54.394 W	464	2002	263	12	50	2002	277	21	12	0.0086200	8.6200	Baja_sn77_EO_1-01.raw	890.2	DVD
1-02	25 10.987 N	110 47.950 W	783	2002	263	13	45	2002	270	20	16	0.0009500	0.9500	Baja_sn61_ER_1-02.raw	440.4	CD
1-03	25 6.860 N	110 41.725 W	71	2002	263	14	40	2002	277	19	29	0.0091900	9.1900	Baja_sn71_ES_1-03.raw	880.3	DVD
1-04	25 2.845 N	110 35.079 W	73	2002	263	15	9	2002	270	22	49	0.9926400	-7.3600	Baja_sn66_GE_1-04.raw	441.9	CD
1-05	24 58.435 N	110 29.005 W	774	2002	263	15	44	2002	277	17	45	0.9970521	-2.9479	Baja_sn81_GL_1-05.raw	870.4	DVD
1-06	24 54.231 N	110 22.680 W	1140	2002	263	8	21	2002	271	1	15	0.9411900	-58.8100	Baja_sn67_ED_1-06.raw	474.8	CD
1-07	24 50.041 N	110 16.427 W	660	2002	263	7	50	2002	277	15	48	0.0184111	18.4111	Baja_sn64_DO_1-07.raw	879.1	DVD
1-08	24 45.844 N	110 10.157 W	490	2002	263	6	6	2002	271	3	37	0.9054900	-94.5100	Baja_sn25_CU_1-08.raw	488.9	CD
1-09	24 41.630 N	110 3.838 W	856	2002	263	1	10	2002	277	14	0	0.9832573	-16.7427	Baja_sn52_CO_1-09.raw	900.2	DVD
1-10	24 37.405 N	109 57.595 W	930	2002	263	19	44	2002	271	6	2	0.9934400	-6.5600	Baja_sn72_GN_1-10.raw	455.6	CD
1-11	24 33.356 N	109 51.216 W	410	2002	263	20	47	2002	277	12	8	0.9418580	-58.1420	Baja_sn80_GU_1-11.raw	850.2	DVD
1-12	24 29.500 N	109 44.827 W	1140	2002	263	21	57	2002	271	8	33	0.0003800	0.3800	Baja_sn76_HE_1-12.raw	457.0	CD
1-13	24 24.730 N	109 38.179 W	840	2002	263	22	47	2002	277	10	15	0.9985600	-1.4400	Baja_sn63_HU_1-13.raw	840.1	DVD
1-14	24 20.484 N	109 33.506 W	1430	2002	263	23	31	2002	271	11	3	0.9845200	-15.4800	Baja_sn74_LC_1-14.raw	458.3	CD
1-15	24 16.255 N	109 26.272 W	1570	2002	264	3	6	2002	271	12	42	0.9783600	-21.6400	Baja_sn69_LL_1-15.raw	460.0	CD
1-16	24 12.015 N	109 20.022 W	1495	2002	264	5	39	2002	271	14	18	0.9951200	-4.8800	Baja_sn79_LM_1-16.raw	458.9	CD
1-17	24 7.765 N	109 13.767 W	950	2002	264	6	45	2002	271	15	45	0.9808100	-19.1900	Baja_sn78_LO_1-17.raw	460.1	CD
1-18	24 3.511 N	109 7.551 W	1550	2002	264	7	38	2002	271	17	17	0.9818600	-18.1400	Baja_sn36_LP_1-18.raw	461.5	CD
1-19	23 59.254 N	109 1.358 W	1950	2002	264	8	59	2002	-	-	-	-	-	-		
1-20	23 55.003 N	108 55.112 W	1960	2002	264	8	14	2002	271	21	52	0.9936600	-6.3400	Baja_sn39_LV_1-20.raw	468.4	CD
1-21	23 50.723 N	108 48.942 W	1100	2002	264	9	19	2002	272	0	2	0.0120600	12.0600	Baja_sn01_MA_1-21.raw	472.3	CD
1-22	23 46.478 N	108 42.774 W	1105	2002	264	10	5	2002	272	3	35	0.9951500	-4.8500	Baja_sn82_ME_1-22.raw	478.2	CD

Site	Deployment Latitude		Deployment Longitude		Depth (m)	Deployment Time SyncYear	SyncJDay	SyncHour	SyncMin	Recovery Time recYr	recJDay	recHour	recMin	recMsec	Drift (ms)	Raw File Name	Mb	CD/DVD
1-23	23 42.199 N		108 36.533 W		1130	2002	264	10	50	2002	272	5	45	0.9846500	-15.3500	Baja_sn10_MS_1-23.raw	481.3	CD
1-24	23 37.914 N		108 30.374 W		1050	2002	264	12	9	2002	272	8	13	0.9902900	-9.7100	Baja_sn65_MU_1-24.raw	485.2	CD
1-25	23 33.638 N		108 24.167 W		780	2002	264	12	40	2002	276	15	8	0.9884166	-11.5834	Baja_sn73_NA_1-25.raw	754.9	DVD
1-26	23 29.358 N		108 18.004 W		985	2002	264	13	33	2002	276	13	27	0.9983347	-1.6653	Baja_sn62_ON_1-26.raw	747.9	DVD
1-27	23 25.058 N		108 11.891 W		880	2002	264	14	22	2002	276	11	38	0.9392957	-60.7043	Baja_sn46_PE_1-27.raw	740.4	DVD
1-28	23 20.761 N		108 5.688 W		915	2002	264	15	34	2002	276	9	49	0.9841700	-15.8300	Baja_sn50_PI_1-28.raw	733.0	DVD
1-29	23 16.482 N		107 59.567 W		830	2002	264	16	0	2002	276	8	5	0.8857400	-114.2600	Baja_sn47_PO_1-29.raw	725.7	DVD
1-30	23 12.177 N		107 53.365 W		810	2002	264	16	53	2002	276	6	21	0.0061425	6.1425	Baja_sn14_PP_1-30.raw	718.5	DVD
1-31	23 7.861 N		107 47.241 W		885	2002	264	17	40	2002	276	4	30	0.9207046	-79.2954	Baja_sn26_PR_1-31.raw	710.9	DVD
1-32	23 3.558 N		107 41.121 W		585	2002	264	19	38	2002	276	2	32	0.9494900	-50.5100	Baja_sn34_PV_1-32.raw	703.0	DVD
1-33	22 59.252 N		107 35.023 W		1600	2002	264	20	30	2002	276	0	51	0.9944500	-5.5500	Baja_sn09_QU_1-33.raw	695.9	CD
1-34	22 54.928 N		107 28.895 W		1560	2002	264	21	21	2002	275	23	20	0.0126900	12.6900	Baja_sn22_RM_1-34.raw	689.3	CD
1-35	22 50.619 N		107 22.783 W		1390	2002	264	22	3	2002	275	22	18	0.9477400	-52.2600	Baja_sn59_RO_1-35.raw	683.9	CD
1-36	22 46.294 N		107 16.657 W		1710	2002	264	22	53	2002	275	20	41	0.9569700	-43.0300	Baja_sn31_RT_1-36.raw	677.0	CD
1-37	22 41.972 N		107 10.548 W		2000	2002	264	23	32	2002	275	19	7	0.9834107	-16.5893	Baja_sn54_RU_1-37.raw	670.2	CD
1-38	22 37.642 N		107 4.495 W		1870	2002	265	0	29	2002	275	17	22	0.9875304	-12.4696	Baja_sn55_SA_1-38.raw	662.9	CD
1-39	22 33.273 N		106 58.389 W		1465	2002	265	1	8	2002	275	15	38	0.9851998	-14.8002	Baja_sn21_SB_1-39.raw	655.7	CD
1-40	22 28.962 N		106 52.316 W		1420	2002	265	1	59	2002	275	14	7	0.9984484	-1.5516	Baja_sn29_SC_1-40.raw	649.0	CD
1-41	22 24.565 N		106 46.156 W		1350	2002	265	2	39	2002	275	12	37	0.9718770	-28.1230	Baja_sn48_SF_1-41.raw	642.4	CD
1-42	22 20.271 N		106 40.196 W		1000	2002	265	3	12	2002	275	10	58	0.9486500	-51.3500	Baja_sn43_SG_1-42.raw	635.4	CD
1-43	22 15.926 N		106 34.127 W		900	2002	265	6	49	2002	-	-	-	-	-	-		
1-44	22 11.544 N		106 28.037 W		190	2002	265	7	1	2002	275	8	9	0.0169300	16.9300	Baja_sn45_SI_1-44.raw	622.6	CD
1-45	22 7.160 N		106 21.957 W		472	2002	265	8	55	2002	275	6	54	0.9842400	-15.7600	Baja_sn20_SJ_1-45.raw	616.7	CD
1-46	22 2.822 N		106 15.926 W		92	2002	265	9	39	2002	275	5	41	0.9570900	-42.9100	Baja_sn35_SL_1-46.raw	610.8	CD
1-47	21 58.422 N		106 9.902 W		56	2002	265	10	1	2002	275	4	37	0.0188800	18.8800	Baja_sn07_SN_1-47.raw	605.3	CD
1-48	21 54.081 N		106 3.881 W		51	2002	265	10	43	2002	275	3	29	0.0477700	47.7700	Baja_sn41_SO_1-48.raw	599.7	CD
1-49	21 49.714 N		105 57.921 W		51	2002	265	11	48	2002	275	2	24	0.0156500	15.6500	Baja_sn44_SQ_1-49.raw	594.2	CD
1-50	21 45.334 N		105 51.853 W		49	2002	265	13	22	2002	275	1	24	0.0032000	3.2000	Baja_sn03_SR_1-50.raw	588.9	CD
1-51	21 40.901 N		105 45.849 W		48	2002	265	14	5	2002	275	0	17	0.9571200	-42.8800	Baja_sn28_ST_1-51.raw	583.3	CD
1-52	21 36.603 N		105 39.825 W		47	2002	265	15	26	2002	274	23	23	0.9943700	-5.6300	Baja_sn12_SU_1-52.raw	578.2	CD
1-53	21 32.202 N		105 33.803 W		43	2002	265	16	2	2002	274	22	11	0.0018700	1.8700	Baja_sn17_SV_1-53.raw	572.4	CD
1-54	21 27.813 N		105 27.870 W		49	2002	265	16	37	2002	274	21	4	0.0010800	1.0800	Baja_sn05_SX_1-54.raw	566.8	CD
1-55	21 23.427 N		105 21.860 W		41	2002	265	17	32	2002	274	19	57	0.9594200	-40.5800	Baja_sn27_SZ_1-55.raw	561.2	CD
1-56	21 21.176 N		105 18.837 W		33	2002	265	18	21	2002	274	19	17	0.9860500	-13.9500	Baja_sn32_TA_1-56.raw	556.8	CD
	Line 2																	
2-17	25 35.812 N		110 9.513 W		2050	2002	270	8	10	2002	289	13	40	0.9141878	-85.8122	Baja_sn37_BC_2-17.raw	1170.0	DVD
2-18	25 32.060 N		110 4.512 W		2050	2002	270	7	14	2002	289	15	8	0.0116463	11.6463	Baja_sn06_BH_2-18.raw	1170.0	DVD
2-19	25 28.214 N		109 59.457 W		2075	2002	270	6	5	2002	289	16	42	0.9060068	-93.9932	Baja_sn68_EL_2-19.raw	1180.0	DVD
2-20	25 24.278 N		109 54.174 W		3275	2002	270	5	26	2002	289	18	40	0.0107056	10.7056	No data		
2-21	25 20.826 N		109 48.045 W		2350	2002	270	4	54	2002	289	20	18	0.9875100	-12.4900	Baja_sn23_BK_2-21.raw	1200.0	DVD
2-22	25 17.301 N		109 42.007 W		2330	2002	270	4	16	2002	289	21	57	0.9109900	-89.0100	Baja_sn56_DE_2-22.raw	1210.0	DVD
2-23	25 13.986 N		109 35.867 W		2250	2000	270	3	48	2002	289	23	41	0.9339500	-66.0500	No data		
2-24	25 10.430 N		109 29.755 W		2100	2002	270	3	1	2002	290	1	18	0.0128600	12.8600	Baja_sn75_EM_2-24.raw	1220.0	DVD
2-37	24 24.885 N		108 11.166 W		548	2002	273	1	33	2002	276	22	5	0.9957100	-4.2900	Baja_sn72_GN_2-37.raw	238.0	CD
	Line 2PE																	
2-51	24 24.907 N		109 8.997 W		3125	2002	272	14	51	2002	277	7	1	0.9617400	-38.2600	Baja_sn67_ED_2-51.raw	288.8	CD
2-52	24 24.929 N		108 58.771 W		1698	2002	272	15	9	2002	277	4	43	0.0003233	0.3233	Baja_sn61_ER_2-52.raw	280.1	CD
2-53	24 24.962 N		108 42.563 W		1725	2002	272	15	23	2002	277	2	26	0.9952500	-4.7500	Baja_sn66_GE_2-53.raw	271.3	CD
2-54	24 24.975 N		108 26.382 W		1275	2002	272	15	36	2002	277	0	3	0.9986000	-1.4000	Baja_sn76_HE_2-54.raw	262.3	CD
2-55	24 24.924 N		108 2.575 W		44	2002	272	1	45	2002	276	20	32	0.9612000	-38.8000	Baja_sn25_CU_2-55.raw	231.8	CD

Site	Deployment Latitude	Deployment Longitude	Depth (m)	Deployment Time SyncYear	SyncJDay	SyncHour	SyncMin	Recovery Time recYr	recJDay	recHour	recMin	recMsec	Drift (ms)	Raw File Name	Mb	CD/DVD
	Line 3															
3-01	28 11.035 N	112 45.265 W	88	2002	279	14	33	2002	286	21	19	0.9876900	-12.3100	Baja_sn32_TA_3-01.raw	445.7	CD
3-02	28 7.794 N	112 40.065 W	162	2002	279	15	24	2002	286	21	58	0.9603200	-39.6800	Baja_sn27_SZ_3-02.raw	444.8	CD
3-03	28 4.571 N	112 34.945 W	350	2002	279	15	44	2002	286	22	48	0.9676100	-32.3900	Baja_sn40_VU_3-03.raw	444.3	CD
3-04	28 1.300 N	112 29.803 W	920	2002	279	16	44	2002	286	23	53	0.9718200	-28.1800	Baja_sn53_TE_3-04.raw	444.5	CD
3-05	27 58.112 N	112 24.657 W	850	2002	279	17	22	2002	287	0	58	0.0071900	7.1900	Baja_sn24_VI_3-05.raw	442.1	CD
3-06	27 54.875 N	112 19.558 W	1050	2002	279	21	35	2002	287	2	7	0.9926100	-7.3900	Baja_sn82_ME_3-06.raw	442.5	CD
3-07	27 51.634 N	112 14.433 W	1275	2002	279	22	4	2002	287	3	26	0.9866410	-13.3590	Baja_sn10_MS_3-07.raw	443.5	CD
3-08	27 48.380 N	112 9.288 W	1440	2002	279	22	53	2002	287	4	56	0.0108285	10.8285	Baja_sn01_MA_3-08.raw	444.7	CD
3-09	27 45.146 N	112 4.177 W	1490	2002	279	23	11	2002	287	6	19	0.9943684	-5.6316	Baja_sn39_LV_3-09.raw	445.7	CD
3-10	27 41.896 N	111 59.101 W	1550	2002	280	0	40	2002	286	12	16	0.9817197	-18.2803	Baja_sn36_LP_03-10.raw	395.3	CD
3-11	27 38.328 N	111 54.007 W	1600	2002	279	9	18	2002	286	10	48	0.9960342	-3.9658	Baja_sn03_SR_03-11.raw	431.1	CD
3-12	27 35.384 N	111 48.987 W	1590	2002	279	8	39	2002	287	8	46	0.0369863	36.9863	Baja_sn41_SO_3-12.raw	489.2	CD
3-13	27 32.109 N	111 43.782 W	1715	2002	279	6	30	2002	287	10	13	0.0064204	6.4204	Baja_sn07_SN_3-13.raw	495.7	CD
3-14	27 28.835 N	111 38.688 W	1775	2002	279	5	39	2002	287	11	42	0.9544455	-45.5545	Baja_sn35_SL_3-14.raw	502.3	CD
3-15	27 25.575 N	111 33.650 W	1850	2002	279	5	7	2002	287	13	2	0.9821191	-17.8809	Baja_sn20_SJ_3-15.raw	508.5	CD
3-16	27 22.308 N	111 28.559 W	1880	2002	279	4	17	2002	287	14	20	0.0070077	7.0077	Baja_sn45_SI_3-16.raw	514.6	CD
3-17	27 19.036 N	111 23.518 W	1905	2002	279	3	41	2002	287	15	41	0.9399766	-60.0234	Baja_sn42_SH_3-17.raw	520.8	CD
3-18	27 15.758 N	111 18.421 W	1900	2002	279	3	0	2002	287	17	6	0.9545003	-45.4997	Baja_sn43_SG_3-18.raw	524.5	CD
3-19	27 12.404 N	111 13.381 W	1860	2002	279	1	16	2002	287	18	24	0.9876669	-12.3331	Baja_sn21_SB_3-19.raw	530.6	CD
3-20	27 9.224 N	111 8.314 W	1775	2002	279	0	57	2002	287	19	45	0.9749600	-25.0400	Baja_sn48_SF_3-20.raw	537.1	CD
3-21	27 5.933 N	111 3.255 W	1750	2002	279	0	10	2002	287	21	9	0.9970700	-2.9300	Baja_sn29_SC_3-21.raw	539.1	CD
3-22	27 2.628 N	110 58.197 W	1725	2002	278	23	43	2002	287	22	29	0.9853900	-14.6100	Baja_sn54_RU_3-22.raw	549.4	CD
3-23	26 59.345 N	110 53.163 W	1650	2002	278	22	22	2002	287	23	49	0.9908400	-9.1600	Baja_sn55_SA_3-23.raw	555.5	CD
3-24	26 56.046 N	110 48.135 W	1615	2002	278	21	46	2002	288	1	9	0.9645500	-35.4500	Baja_sn31_RT_3-24.raw	561.8	CD
3-25	26 52.740 N	110 43.097 W	1525	2002	278	20	41	2002	288	2	28	0.0090900	9.0900	Baja_sn22_RM_3-25.raw	567.9	CD
3-26	26 49.455 N	110 38.115 W	1460	2002	278	19	59	2002	288	3	48	0.9548884	-45.1116	Baja_sn59_RO_3-26.raw	574.1	CD
3-27	26 46.145 N	110 33.061 W	1380	2002	278	19	17	2002	288	5	2	0.9940678	-5.9322	Baja_sn09_QU_3-27.raw	580.0	CD
3-28	26 42.854 N	110 28.039 W	1315	2002	278	18	38	2002	288	6	16	0.9334969	-66.5031	Baja_sn26_PR_3-28.raw	585.9	CD
3-29	26 39.535 N	110 23.050 W	1240	2002	278	18	18	2002	288	13	25	0.9570765	-42.9235	Baja_sn34_PV_3-29.raw	606.1	CD
3-30	26 36.264 N	110 18.005 W	1130	2002	278	2	37	2002	288	14	37	0.9888862	-11.1138	Baja_sn52_CO_3-30.raw	624.4	CD
3-31	26 32.904 N	110 13.003 W	980	2002	278	3	1	2002	288	23	59	0.9424100	-57.5900	Baja_sn80_GU_3-31.raw	664.6	CD
3-32	26 29.594 N	110 8.028 W	890	2002	278	7	2	2002	289	1	44	0.9884000	-11.6000	Baja_sn63_HU_3-32.raw	666.6	CD
3-33	26 26.277 N	110 2.987 W	730	2002	278	7	52	2002	289	2	10	0.9178300	-82.1700	Baja_sn67_ED_3-33.raw	665.1	CD
3-34	26 22.976 N	109 58.005 W	600	2002	278	8	37	2002	289	3	7	0.0010758	1.0758	Baja_sn61_ER_3-34.raw	665.0	CD
3-35	26 19.601 N	109 53.010 W	540	2002	278	9	21	2002	289	4	14	0.9912564	-8.7436	Baja_sn66_GE_3-35.raw	665.3	CD
3-36	26 16.296 N	109 48.044 W	500	2002	278	9	52	2002	289	5	11	0.9861126	-13.8874	Baja_sn72_GN_3-36.raw	667.7	CD
3-37	26 12.940 N	109 43.060 W	485	2002	278	10	28	2002	289	6	7	0.9925107	-7.4893	Baja_sn76_HE_3-37.raw	667.5	CD
3-38	26 9.612 N	109 38.132 W	150	2002	278	11	18	2002	289	7	30	0.8709635	-129.0365	Baja_sn25_CU_3-38.raw	668.5	CD
3-39	26 6.281 N	109 33.165 W	58	2002	278	11	54	2002	289	8	23	0.9928327	-7.1673	Baja_sn73_NA_3-39.raw	668.2	CD
	Line 3PE															
3-41	26 35.994 N	110 40.805 W	1490	2002	278	1	10	2002	288	8	25	0.0011796	1.1796	Baja_sn77_EO_3-41.raw	633.9	CD
3-42	26 36.018 N	110 33.501 W	1405	2002	278	1	39	2002	288	11	3	0.0023803	2.3803	Baja_sn81_GL_3-42.raw	638.3	CD
3-43	26 36.047 N	110 26.334 W	1300	2002	278	2	9	2002	288	12	28	0.0104026	10.4026	Baja_sn71_ES_3-43.raw	639.3	CD
3-44	26 36.069 N	110 11.831 W	930	2002	278	17	49	2002	288	16	32	0.0128654	12.8654	Baja_sn14_PP_3-44.raw	615.7	CD
3-45	26 36.074 N	110 4.633 W	690	2002	278	17	6	2002	288	17	35	0.9037817	-96.2183	Baja_sn47_PO_3-45.raw	621.1	CD
3-46	26 36.079 N	109 57.336 W	485	2002	278	13	46	2002	288	18	34	0.9889937	-11.0063	Baja_sn50_PI_3-46.raw	626.4	CD
3-47	26 36.066 N	109 50.114 W	130	2002	278	13	9	2002	288	19	56	0.9700800	-29.9200	Baja_sn46_PE_3-47.raw	632.7	CD
3-48	26 36.062 N	109 42.847 W	58	2002	278	12	35	2002	288	20	46	0.0087500	8.7500	Baja_sn62_ON_3-48.raw	634.9	CD
	Line 3PW															
3-51	27 36.864 N	112 24.695 W	220	2002	279	12	47	2002	286	17	19	0.9997982	-0.2018	Baja_sn05_SX_03-51.raw	437.7	CD
3-52	27 37.248 N	112 18.510 W	690	2002	279	12	7	2002	286	16	28	0.9550615	-44.9385	Baja_sn28_ST_03-52.raw	438.2	CD

Site	Deployment Latitude	Deployment Longitude	Depth (m)	Deployment Time SyncYear	SyncJDay	SyncHour	SyncMin	Recovery Time recYr	recJDay	recHour	recMin	recMsec	Drift (ms)	Raw File Name	Mb	CD/DVD
3-53	27 37.641 N	112 12.256 W	920	2002	279	11	29	2002	286	15	30	0.0021808	2.1808	Baja_sn17_SV_03-53.raw	438.2	CD
3-54	27 38.016 N	112 6.113 W	1260	2002	279	10	39	2002	286	14	28	0.9981373	-1.8627	Baja_sn12_SU_03-54.raw	438.2	CD
3-55	27 38.398 N	111 59.895 W	1450	2002	279	10	1	2002	286	13	20	0.9996323	-0.3677	Baja_sn44_SQ_03-55.raw	435.1	CD
3-56	27 39.137 N	111 47.453 W	1710	2002	279	1	10	2002	286	9	15	0.9839502	-16.0498	Baja_sn78_LO_03-56.raw	384.6	CD
3-57	27 39.496 N	111 41.237 W	1710	2002	280	1	38	2002	286	7	50	0.0148025	14.8025	Baja_sn51_TJ_03-57.raw	378.2	CD
3-58	27 39.846 N	111 35.090 W	1300	2002	280	2	8	2002	286	6	20	0.0027826	2.7826	Baja_sn18_TP_03-58.raw	371.6	CD
3-59	27 40.208 N	111 28.847 W	1200	2002	280	2	50	2002	286	4	58	0.9742212	-25.7788	Baja_sn60_TO_03-59.raw	365.4	CD
3-60	27 40.559 N	111 22.673 W	950	2002	280	3	34	2002	286	3	39	0.0066000	6.6000	Baja_sn11_TS_3-60.raw	361.9	CD
	Line 5															
5-01	23 1.193 N	109 36.007 W	550	2002	291	5	4	2002	296	2	20	0.9760500	-23.9500	Baja_sn80_GU_5-01.raw	294.9	CD
5-02	22 58.000 N	109 29.606 W	400	2002	291	1	24	2002	296	3	26	0.0001634	0.1634	Baja_sn63_HU_5-02.raw	300.5	CD
5-03	22 54.770 N	109 23.125 W	1400	2002	291	0	42	2002	296	4	44	0.9614191	-38.5809	Baja_sn67_ED_5-03.raw	306.6	CD
5-04	22 51.545 N	109 16.690 W	1520	2002	290	23	37	2002	296	6	12	0.9991549	-0.8451	Baja_sn61_ER_5-04.raw	313.1	CD
5-05	22 48.315 N	109 10.269 W	3030	2002	290	22	42	2002	296	8	9	0.9955497	-4.4503	Baja_sn66_GE_5-05.raw	320.9	CD
5-06	22 45.074 N	109 3.837 W	3080	2002	290	21	48	2002	296	10	8	0.9935237	-6.4763	Baja_sn72_GN_5-06.raw	328.7	CD
5-07	22 41.850 N	108 57.381 W	3100	2002	291	19	51	2002	296	12	8	0.9540492	-45.9508	Baja_sn47_PO_5-07.raw	254.6	CD
5-08	22 38.594 N	108 50.975 W	3010	2002	291	20	31	2002	296	13	58	0.9919138	-8.0862	Baja_sn52_CO_5-08.raw	254.1	CD
5-09	22 35.343 N	108 44.632 W	2920	2002	291	20	56	2002	296	15	50	0.9787035	-21.2965	Baja_sn34_PV_5-09.raw	256.5	CD
5-10	22 31.456 N	108 36.942 W	2950	2002	291	21	20	2002	296	17	54	0.0021081	2.1081	Baja_sn71_ES_5-10.raw	259.3	CD
5-11	22 27.542 N	108 29.267 W	2750	2002	291	6	20	2002	296	19	56	0.9975500	-2.4500	Baja_sn81_GL_5-11.raw	262.0	CD
5-12	22 23.618 N	108 21.589 W	2720	2002	292	7	3	2002	296	22	10	0.0010200	1.0200	Baja_sn77_EO_5-12.raw	265.3	CD
5-13	22 19.728 N	108 13.910 W	2870	2002	292	7	28	2002	297	0	11	0.9674300	-32.5700	Baja_sn26_PR_5-13.raw	268.0	CD
5-14	22 15.525 N	108 6.391 W	2920	2002	292	8	2	2002	302	2	12	0.9972800	-2.7200	Baja_sn09_QU_5-14.raw	270.7	CD
5-15	22 11.328 N	107 58.941 W	2990	2002	292	8	57	2002	302	4	12	0.9481960	-51.8040	Baja_sn59_RO_5-15.raw	591.0	CD
5-16	22 7.115 N	107 51.463 W	3125	2002	292	9	58	2002	302	6	20	0.0102121	10.2121	Baja_sn22_RM_5-16.raw	594.0	CD
5-17	22 2.912 N	107 44.026 W	3120	2002	292	10	54	2002	302	8	30	0.9624143	-37.5857	Baja_sn31_RT_5-17.raw	597.1	CD
5-18	21 58.691 N	107 36.526 W	3070	2002	292	11	14	2002	302	10	34	0.9903553	-9.6447	Baja_sn55_SA_5-18.raw	618.4	CD
5-19	21 54.472 N	107 29.085 W	2740	2002	292	12	1	2002	302	12	39	0.9862209	-13.7791	Baja_sn54_RU_5-19.raw	621.3	CD
5-20	21 50.270 N	107 21.652 W	2740	2002	292	12	49	2002	302	14	36	0.0025872	2.5872	Baja_sn29_SC_5-20.raw	623.8	CD
5-21	21 46.034 N	107 14.208 W	2930	2002	292	13	40	2002	302	16	37	0.9728403	-27.1597	Baja_sn48_SF_5-21.raw	626.5	CD
5-22	21 41.800 N	107 6.839 W	2655	2002	292	14	31	2002	302	18	30	0.9896575	-10.3425	Baja_sn21_SB_5-22.raw	628.8	CD
5-23	21 38.267 N	107 0.642 W	2330	2002	292	15	18	2002	302	20	8	0.9446300	-55.3700	Baja_sn43_SG_5-23.raw	630.5	CD
5-24	21 34.734 N	106 54.568 W	2530	2002	292	16	7	2002	302	22	2	0.9237700	-76.2300	Baja_sn42_SH_5-24.raw	632.9	CD
5-25	21 31.206 N	106 48.290 W	2950	2002	292	17	0	2002	302	23	45	0.0086400	8.6400	Baja_sn45_SI_5-25.raw	634.8	CD
5-26	21 27.651 N	106 42.101 W	3000	2002	292	17	59	2002	303	1	38	0.9775300	-22.4700	Baja_sn20_SJ_5-26.raw	637.2	CD
5-27	21 24.110 N	106 36.921 W	2500	2002	292	18	41	2002	303	3	22	0.9366143	-63.3857	Baja_sn35_SL_5-27.raw	639.1	CD
5-28	21 20.418 N	106 29.592 W	3120	2002	292	19	21	2002	303	5	19	0.0098219	9.8219	Baja_sn07_SN_5-28.raw	641.6	CD
5-29	21 16.994 N	106 23.621 W	2500	2002	292	20	13	2002	303	7	9	0.0485979	48.5979	Baja_sn41_SO_5-29.raw	643.8	CD
5-30	21 13.409 N	106 17.484 W	1400	2002	292	21	11	2002	303	8	34	0.9926000	-7.4000	Baja_sn39_LV_5-30.raw	644.9	CD
5-31	21 10.029 N	106 11.570 W	470	2002	292	23	33	2002	303	9	35	0.0093600	9.3600	Baja_sn24_VL_5-31.raw	637.1	CD
5-32	21 7.444 N	106 7.183 W	290	2002	293	1	4	2002	303	10	23	0.9655510	-34.4490	Baja_sn53_TE_5-32.raw	636.5	CD
5-33	21 4.872 N	106 2.741 W	220	2002	293	2	0	2002	303	11	7	0.9548703	-45.1297	Baja_sn40_VU_5-33.raw	635.7	CD
5-34	21 0.307 N	105 54.879 W	240	2002	293	2	53	2002	303	12	7	0.9411564	-58.8436	Baja_sn27_SZ_5-34.raw	635.8	CD
5-35	20 56.022 N	105 47.562 W	460	2002	293	4	7	2002	303	13	13	0.9666032	-33.3968	Baja_sn32_TA_5-35.raw	636.0	CD
5-36	20 51.006 N	105 38.981 W	85	2002	293	5	3	2002	303	14	23	0.9987119	-1.2881	Baja_sn05_SX_5-36.raw	630.1	CD
	Line 5PE															
5-37	21 0.480 N	106 30.173 W	4230	2002	292	22	38	2002	297	15	4	0.0062597	6.2597	Baja_sn01_MA_5-37.raw	278.3	CD
5-38	21 1.922 N	106 21.593 W	4410	2002	292	22	16	2002	297	16	3	0.9914818	-8.5182	Baja_sn10_MS_5-38.raw	278.3	CD
5-39	21 3.359 N	106 13.041 W	2720	2002	292	23	1	2002	297	18	3	0.0178929	17.8929	Baja_sn82_ME_5-39.raw	280.9	CD
5-40	21 6.290 N	105 55.436 W	365	2002	293	10	23	2002	303	21	31	0.9771500	-22.8500	Baja_sn36_LP_5-40.raw	642.1	CD
5-41	21 7.705 N	105 46.916 W	470	2002	293	9	4	2002	303	20	23	0.0044700	4.4700	Baja_sn44_SQ_5-41.raw	641.8	CD
5-42	21 8.826 N	105 40.086 W	480	2002	293	7	52	2002	303	19	24	0.9986200	-1.3800	Baja_sn12_SU_5-42.raw	641.8	CD

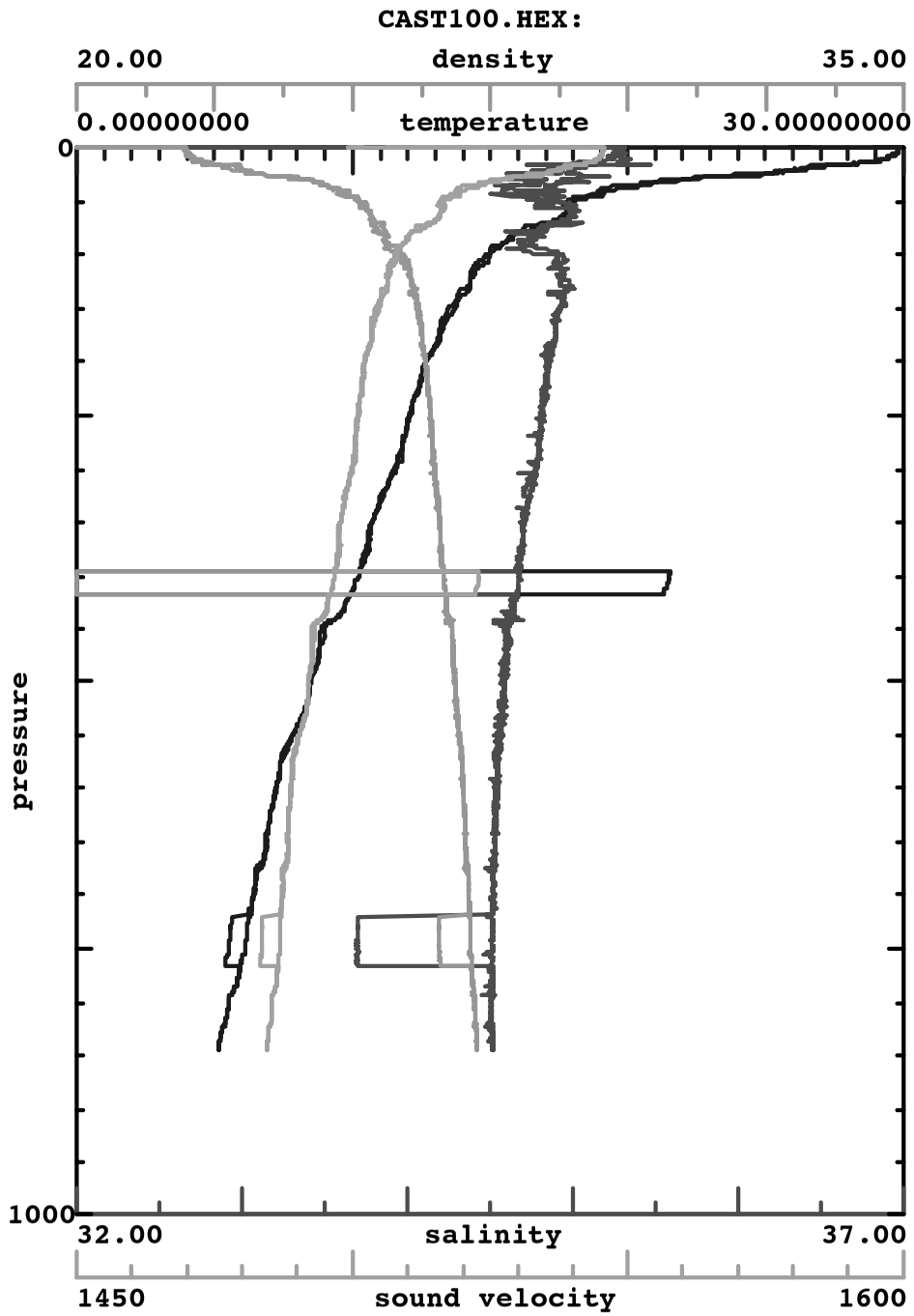
	Deployment					Deployment Time				Recovery Time								CD/DVD
Site	Latitude		Longitude		Depth (m)	SyncYear	SyncJDay	SyncHour	SyncMin	recYr	recJDay	recHour	recMin	recMsec	Drift (ms)	Raw File Name	Mb	
5-43	21 10.319	N	105 30.964	W	205	2002	293	6	44	2002	303	18	15	0.0059945	5.9945	Baja_sn17_SV_5-43.raw	641.4	CD
5-44	21 11.816	N	105 21.831	W	55	2002	293	5	48	2002	303	17	14	0.9524811	-47.5189	Baja_sn28_ST_5-44.raw	641.4	CD
	Line 5PWW																	
5-45	23 21.724	N	110 48.867	W	412	2002	291	6	13	2002	300	6	49	0.0027000	2.7000	Baja_sn62_ON_5-45.raw	542.4	CD
5-46	23 21.198	N	110 37.654	W	225	2002	291	7	26	2002	300	5	29	0.9716023	-28.3977	Baja_sn46_PE_5-46.raw	536.1	CD
5-47	23 20.683	N	110 26.504	W	475	2002	291	7	29	2002	300	4	9	0.9915649	-8.4351	Baja_sn50_PL_5-47.raw	530.1	CD
5-48	23 20.146	N	110 15.335	W	260	2002	291	8	50	2002	300	2	37	0.0104200	10.4200	Baja_sn14_PP_5-48.raw	523.3	CD
	Line 5 PWE																	
5-49	23 17.468	N	109 23.158	W	750	2002	290	16	34	2002	298	20	12	0.0061500	6.1500	Baja_sn75_EM_5-49.raw	508.9	CD
5-50	23 16.918	N	109 13.815	W	2290	2002	290	16	34	2002	299	0	38	0.9619800	-38.0200	Baja_sn37_BC_5-50.raw	512.7	CD
	Line 6W																	
6-01	23 27.304	N	109 23.698	W	67	2002	290	16	59	2002	298	21	34	0.9722000	-27.8000	Baja_sn68_EL_6-01.raw	510.0	CD
6-02	23 23.661	N	109 17.143	W	1600	2002	290	17	15	2002	298	23	1	0.0039900	3.9900	Baja_sn06_BH_6-02.raw	511.1	CD
6-03	23 20.022	N	109 10.619	W	2300	2002	290	18	11	2002	299	2	12	0.9899900	-10.0100	Baja_sn73_NA_6-03.raw	514.2	CD
6-04	23 16.085	N	109 3.583	W	2690	2002	290	18	32	2002	299	4	11	0.8863077	-113.6923	Baja_sn25_CU_6-04.raw	516.8	CD
6-05	23 11.864	N	108 56.091	W	2615	2002	290	19	7	2002	299	6	9	0.9718897	-28.1103	Baja_sn70_EN_6-05.raw	518.1	CD
6-06	23 7.646	N	108 48.594	W	2690	2002	290	19	53	2002	299	8	26	0.9964678	-3.5322	Baja_sn23_BK_6-06.raw	522.9	CD
6-07	23 3.426	N	108 41.101	W	2810	2002	290	20	30	2002	299	12	16	0.9647016	-35.2984	Baja_sn56_DE_6-07.raw	530.3	CD
6-08	22 59.181	N	108 33.593	W	2640	2002	290	21	7	2002	299	14	26	0.0010692	1.0692	Baja_sn76_HE_6-08.raw	533.4	CD

Appendix C - Summary of CTD Casts

Number	Cast No.	Latitude	Longitude	OBS Station	Depth (m)	Date	Time (PDT)
1	1	25 3.000 N	-109 37.7998 W	0-13	350	19-Sep-02	20:00
2	100	24 37.416 N	-109 57.5999 W	1-10	850	20-Sep-02	20:00
3	200	23 29.364 N	-108 18.0002 W	1-26	900	21-Sep-02	11:00
4	300	22 46.302 N	-107 16.6800 W	1-36	1650	21-Sep-02	20:00
5	301	22 11.574 N	-106 28.0801 W	1-44	150	22-Sep-02	4:30
6	400	22 31.206 N	-106 55.8600 W	0-15	1350	23-Sep-02	12:00
7	401	23 7.884 N	-107 47.2801 W	1-31	2450	24-Sep-02	2:00
8	500	23 50.742 N	-108 48.9601 W	1-21	2600	24-Sep-02	15:00
9	600	24 12.024 N	-109 20.0400 W	1-16	1400	25-Sep-02	0:00
10	700	24 24.888 N	-109 9.0000 W	2-51	3100	29-Sep-02	11:00
11	800	26 56.052 N	-110 48.1201 W	3-24	1500	5-Oct-02	18:00
12	801	27 15.768 N	-111 18.4200 W	3-18	1750	5-Oct-02	23:30
13	803	27 38.640 N	-111 54.0001 W	3-11	1500	6-Oct-02	5:30
14	804	27 37.248 N	-112 18.4800 W	3-52	575	6-Oct-02	9:00
15	805	28 1.350 N	-112 29.8201 W	3-04	825	6-Oct-02	16:00
16	900	27 40.560 N	-111 22.6800 W	3-60	850	6-Oct-02	23:55
17	1000	26 36.000 N	-110 40.8000 W	3-41	1400	15-Oct-02	1:30
18	1001	26 36.222 N	-110 18.0002 W	3-30	1000	15-Oct-02	7:30
19	1002	26 36.078 N	-109 57.3600 W	3-46	375	15-Oct-02	11:40
20	1003	26 12.960 N	-109 43.0801 W	3-37	366	15-Oct-02	23:15

Notes:

1. Plots on the following pages are screen dumps from Seasave software (available for free from www.seabird.com).
2. Casts are also saved on disk in raw (.hex; readable by Seasave) and ascii (.txt) files. Cast 1 was not saved to disk and its information is therefore lost.
3. Note that in the following figures, the downgoing and upgoing recordings are plotted; some casts show significant differences in the downgoing and upgoing readings, the reason for which has not been assertained.
4. The vertical scales in the following figures vary according to the depth to which the CTD was run. Note that the depth in the list above and in those calculated by the Seasave routine from pressure information differ. It is possible that calibration file for this experiment is in error.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salinity
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sound velocity
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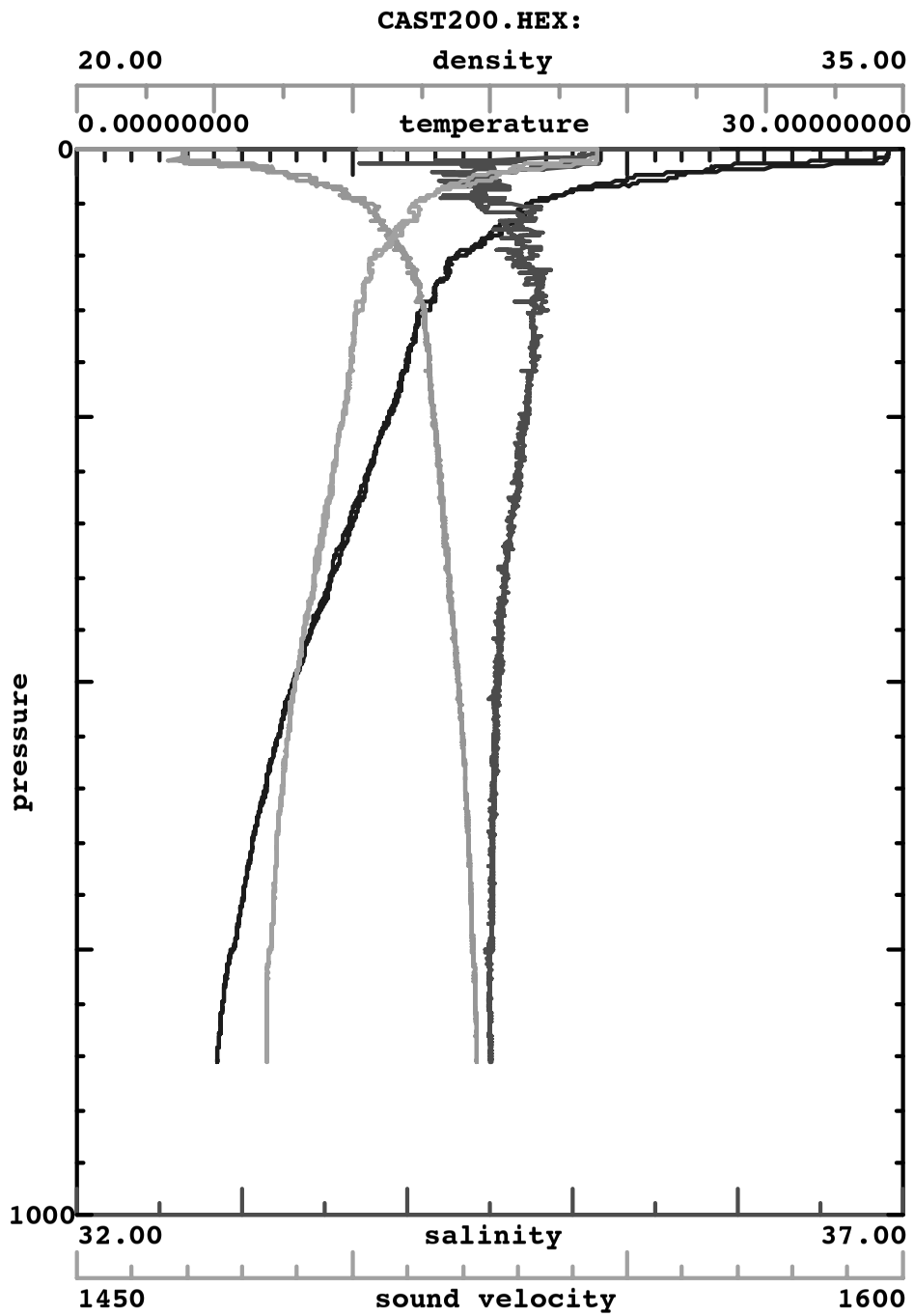
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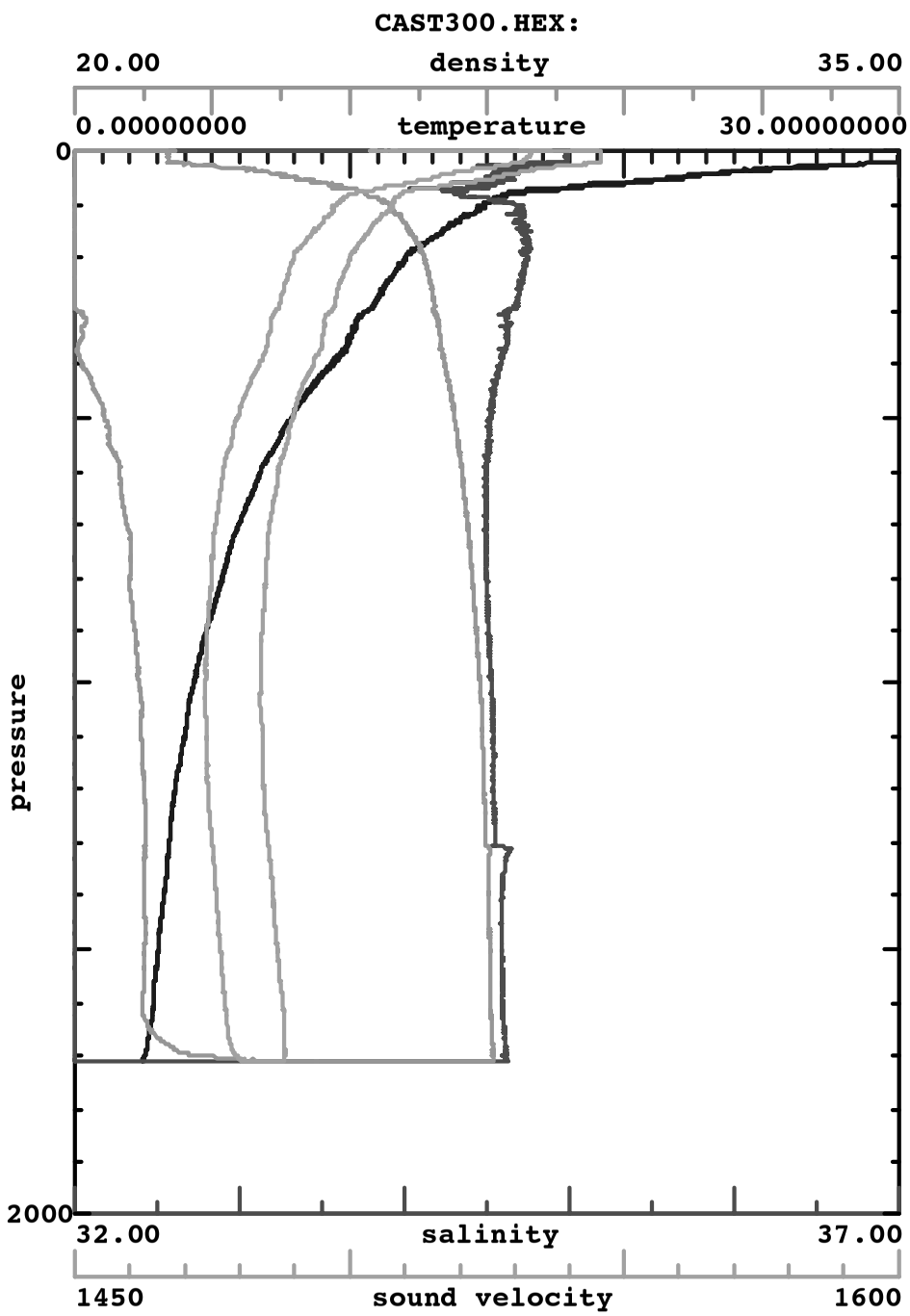
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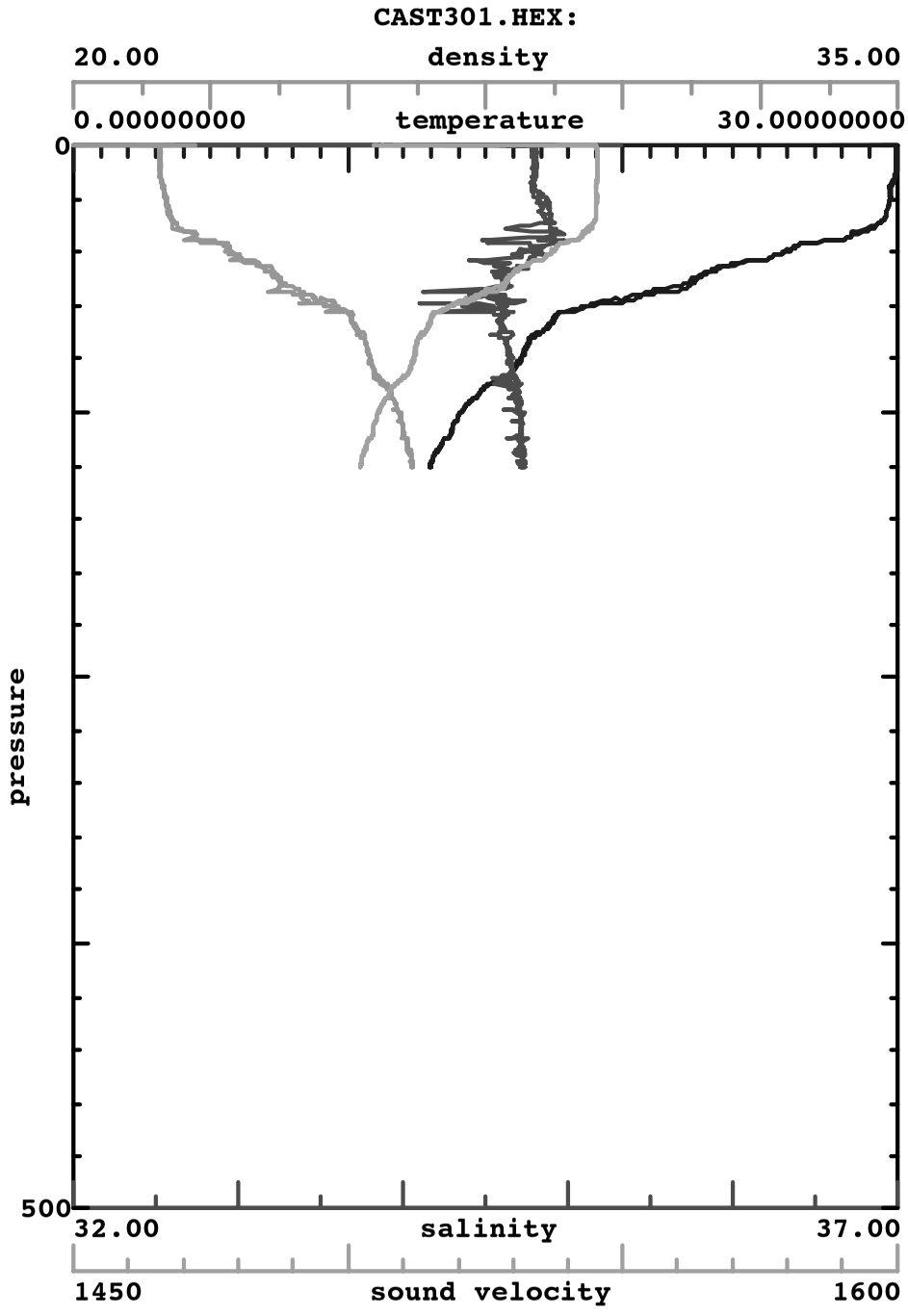
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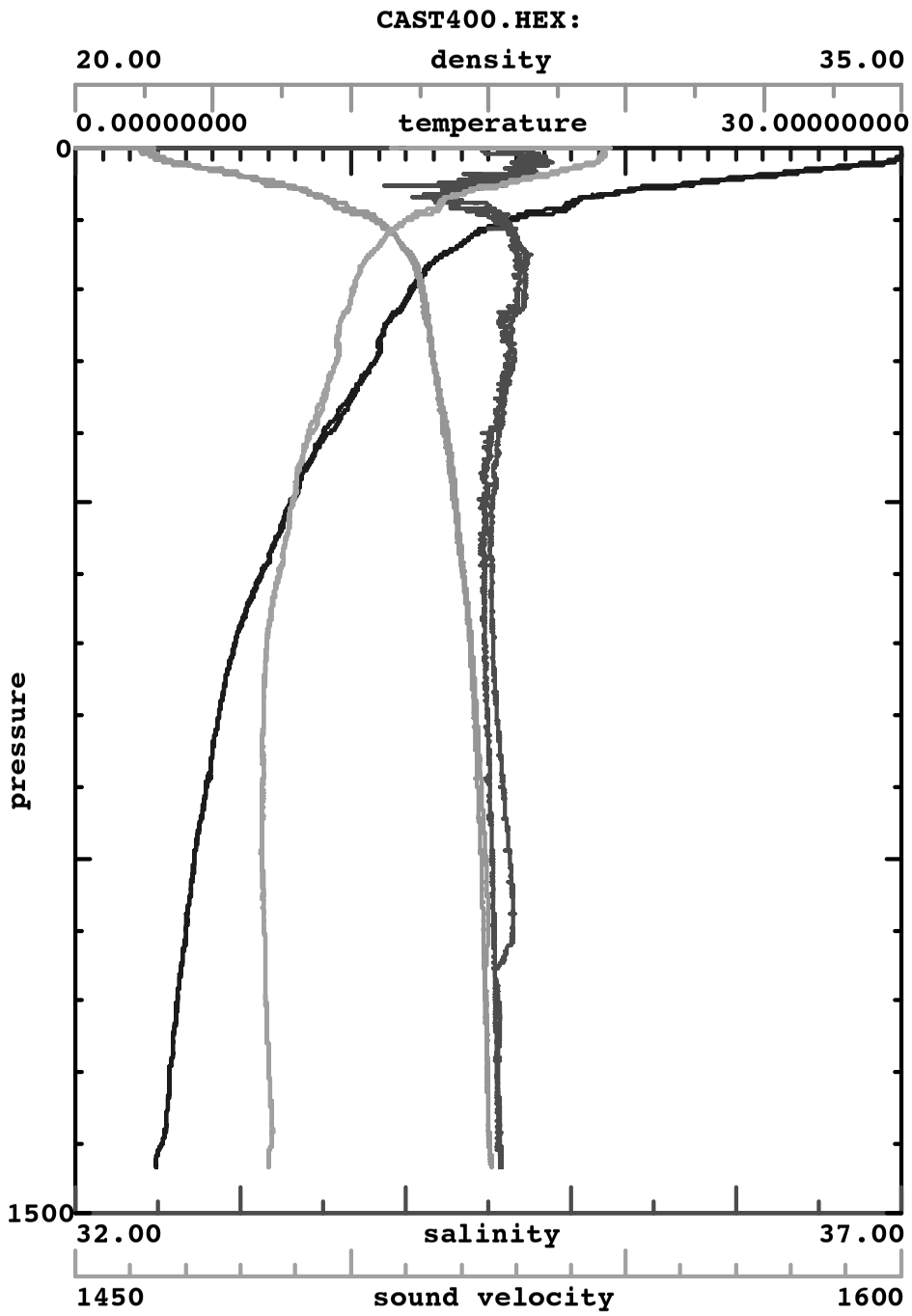
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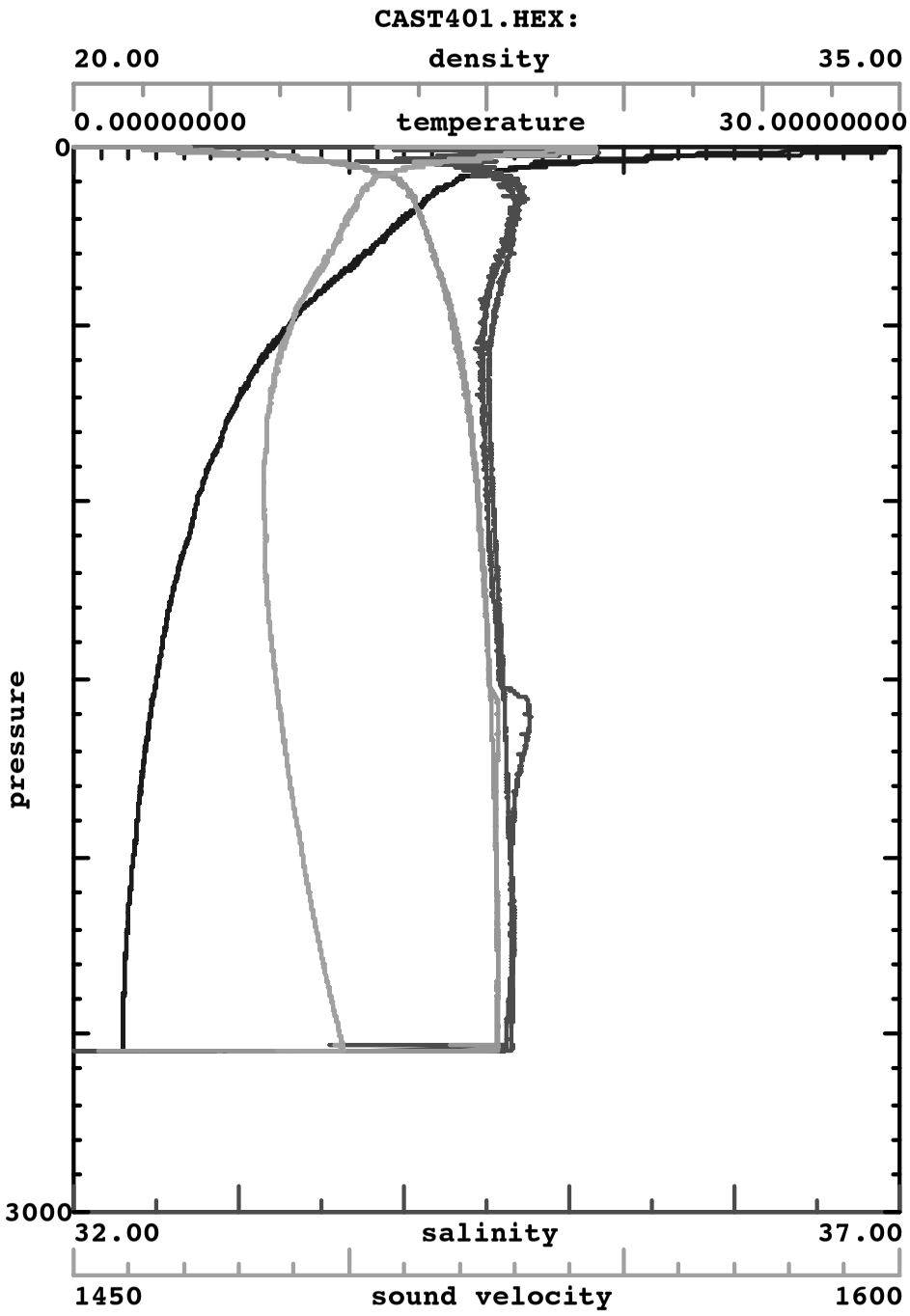
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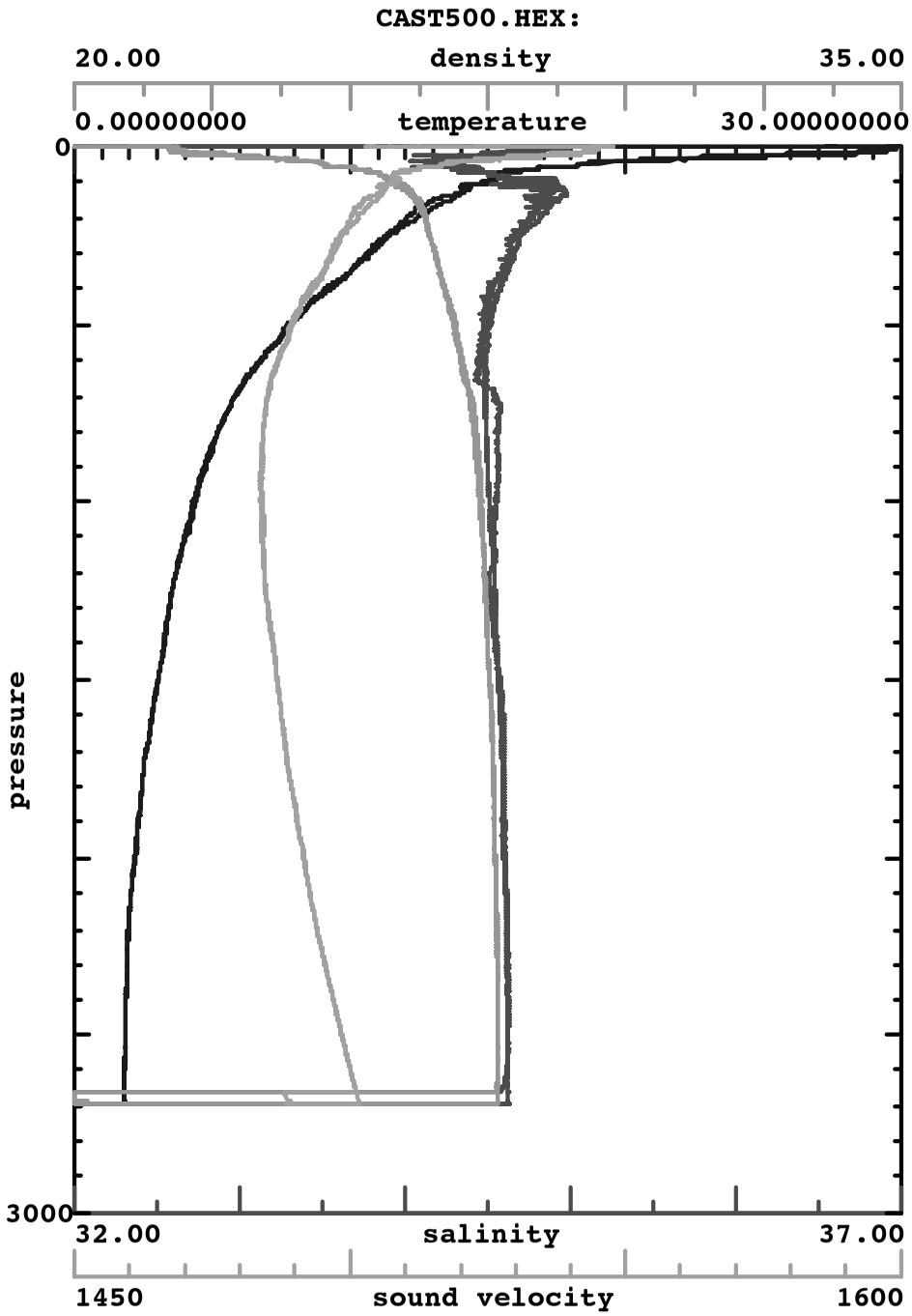
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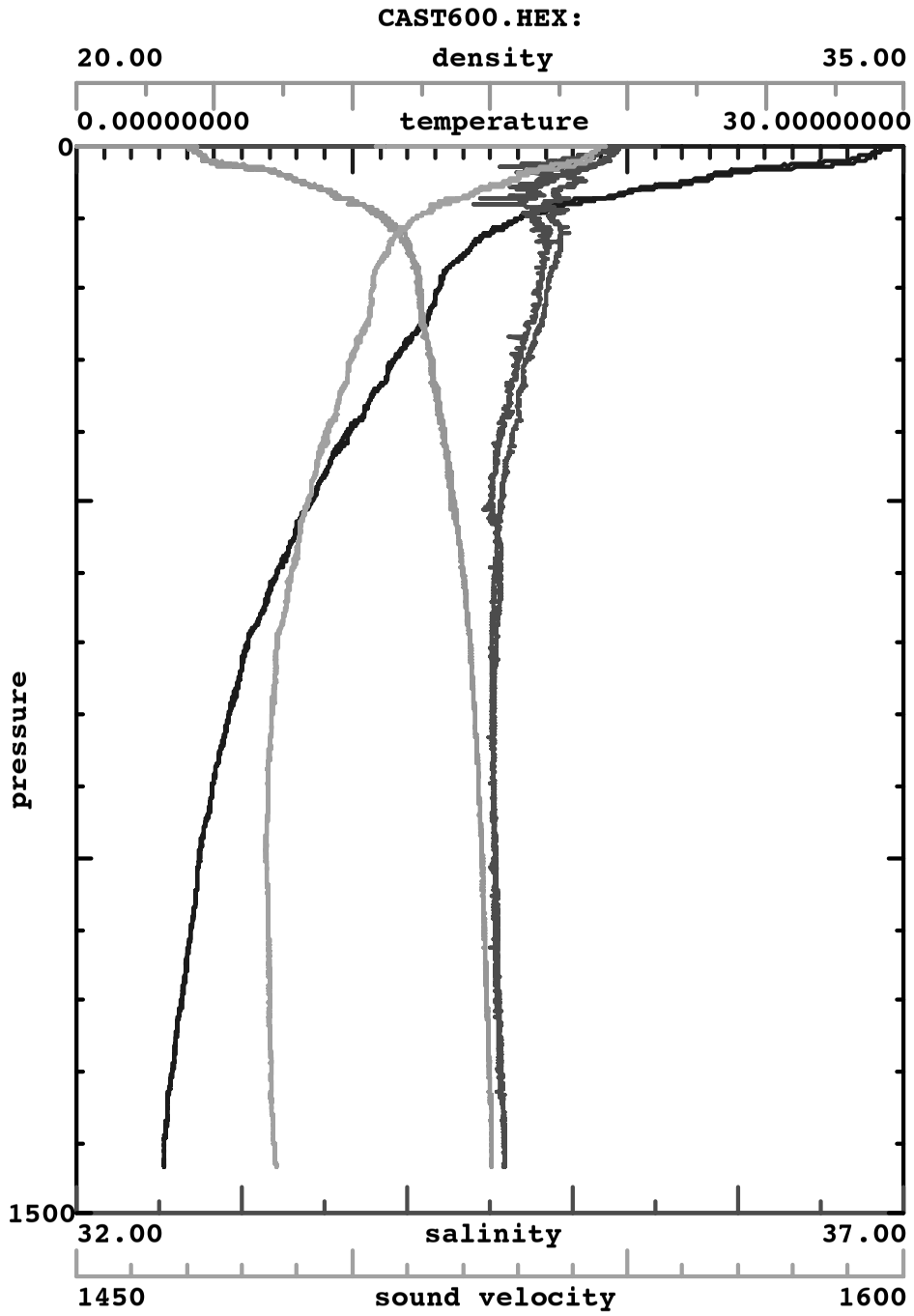
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sound velocity
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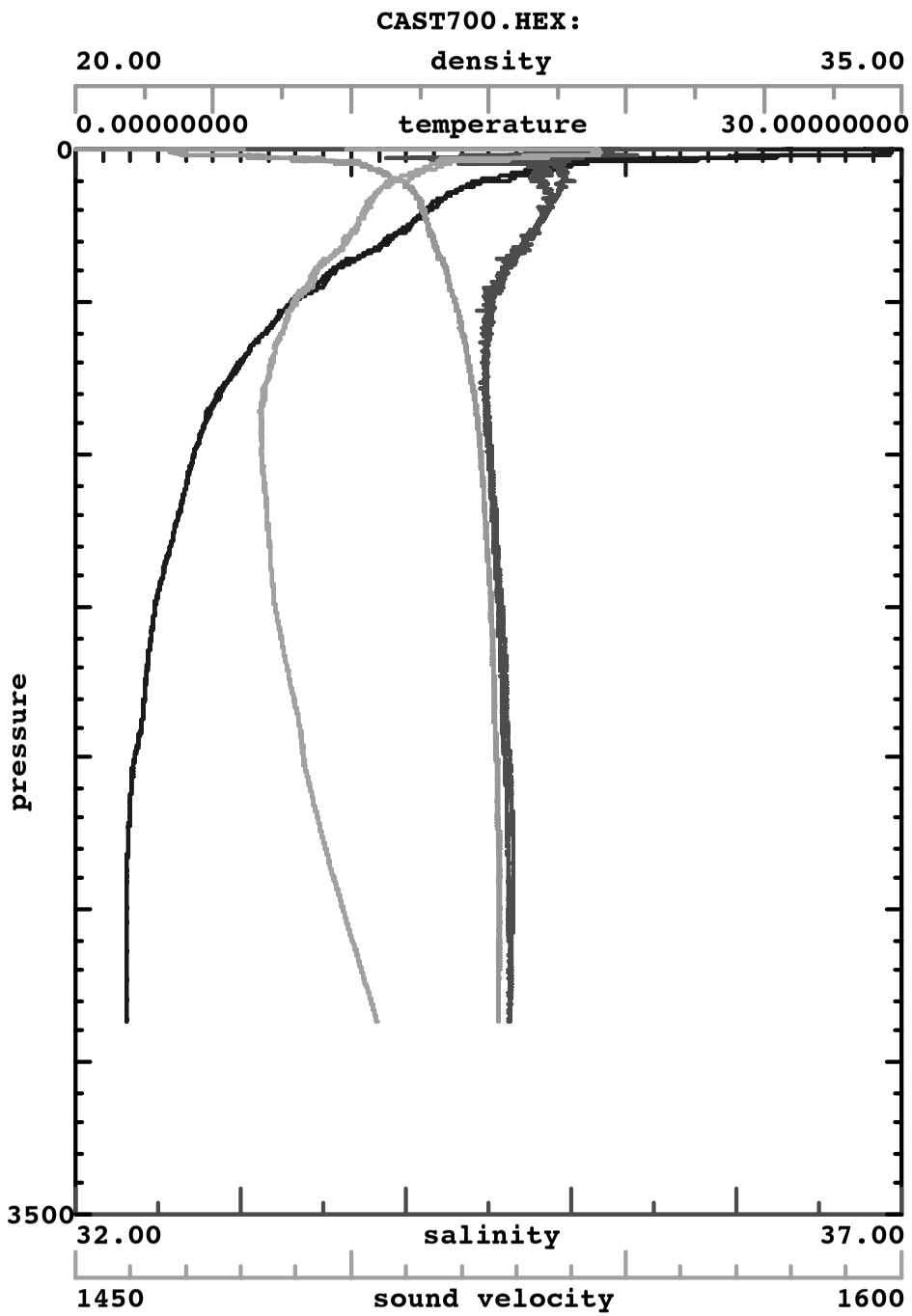
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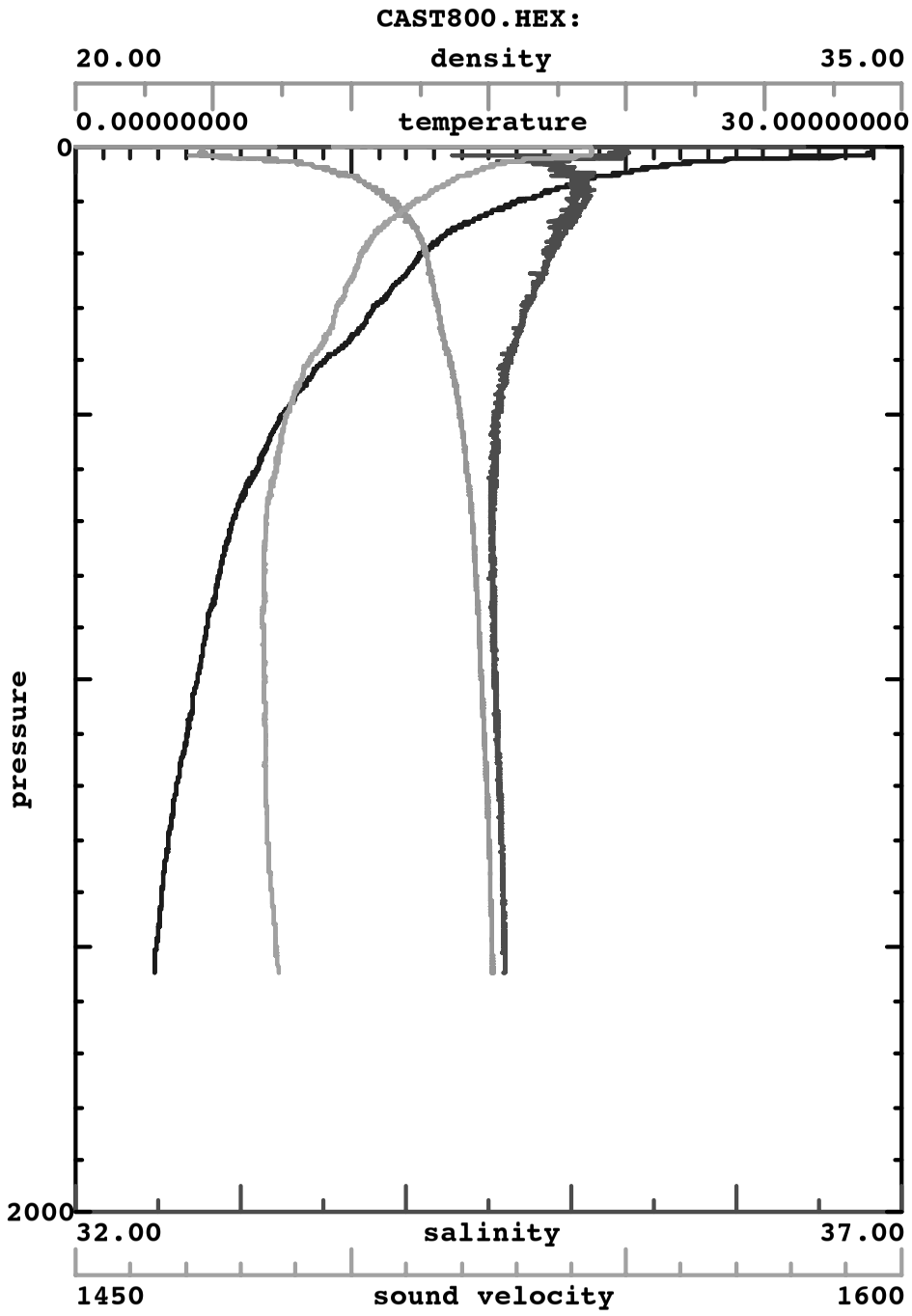
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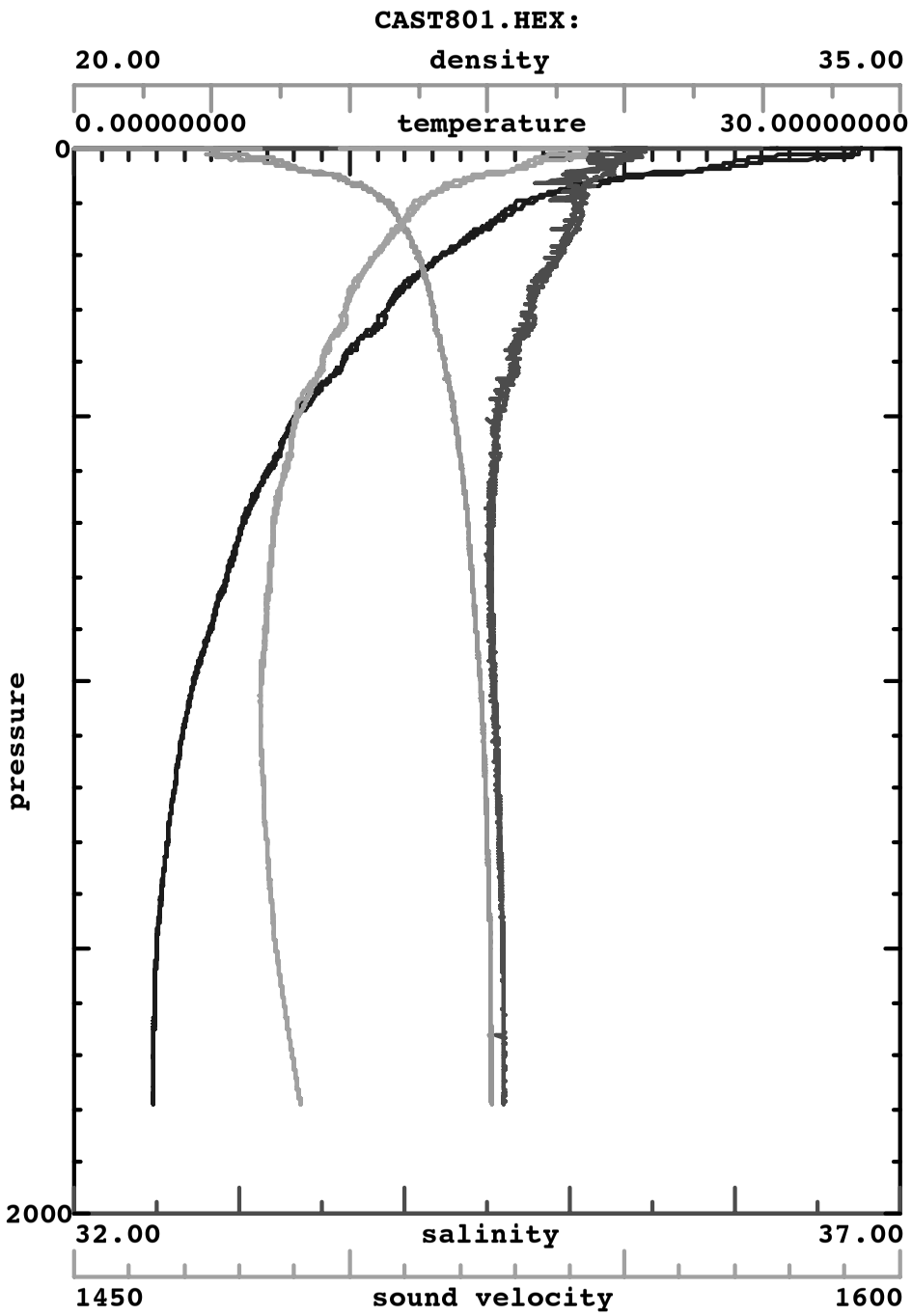
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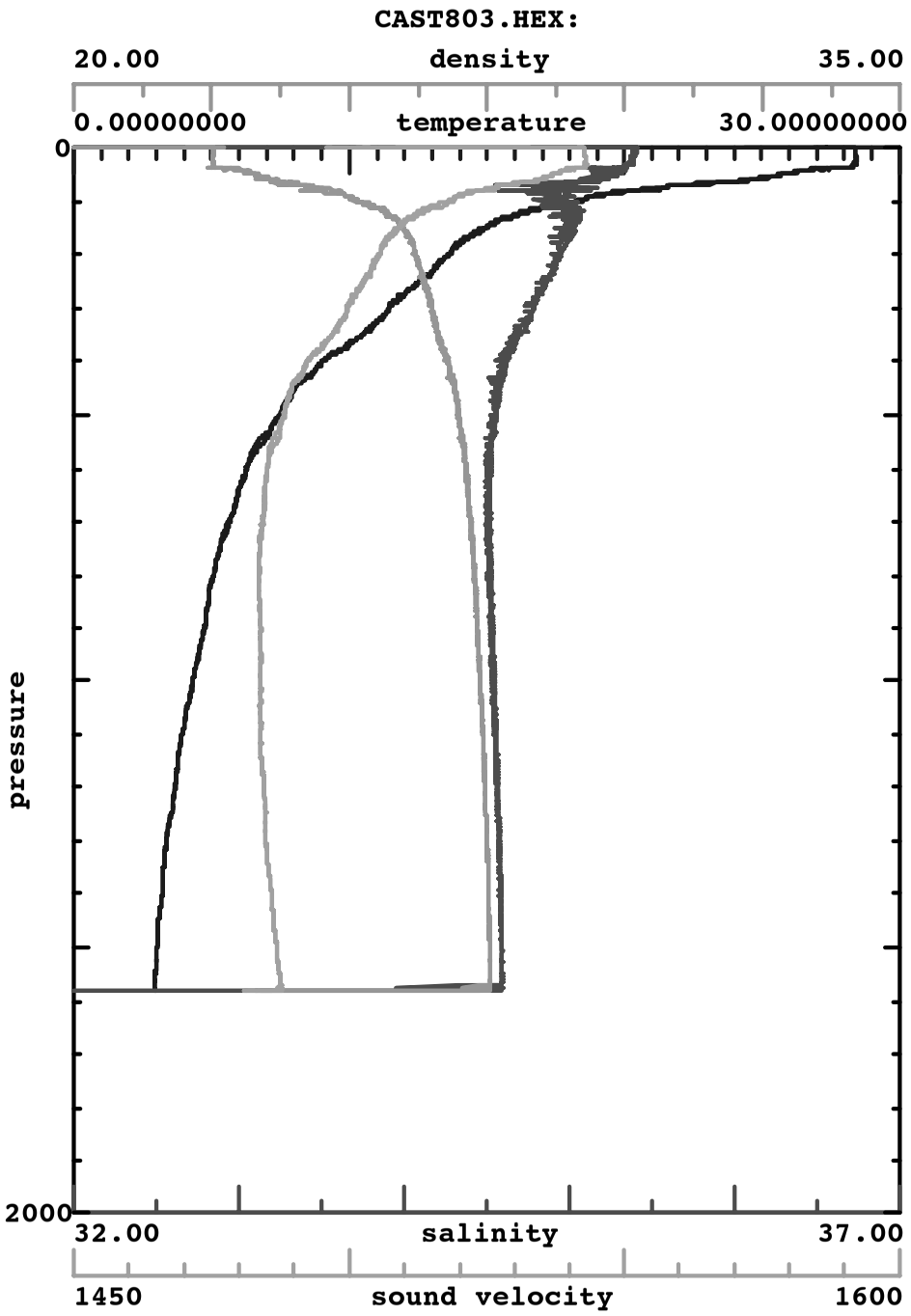
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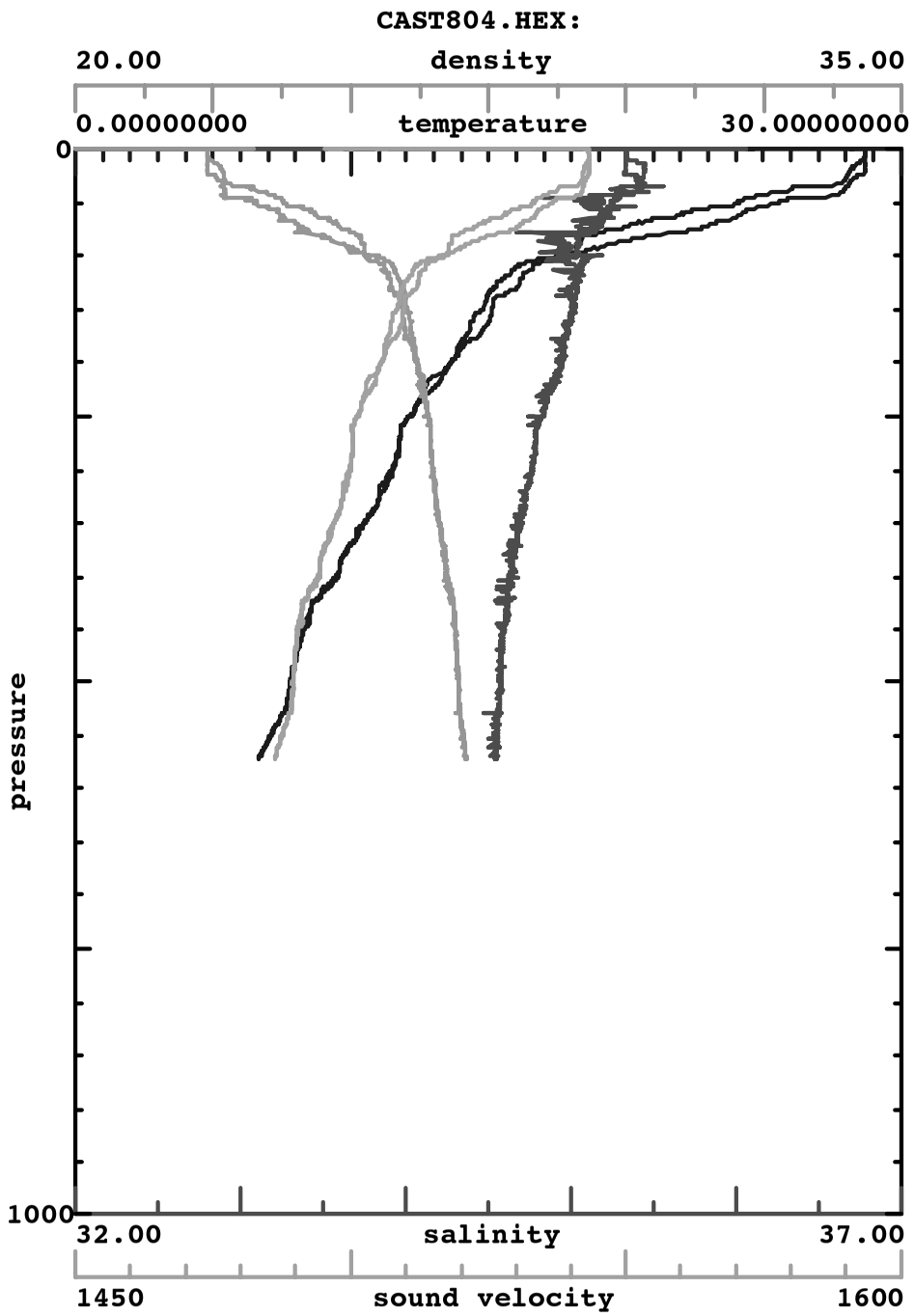
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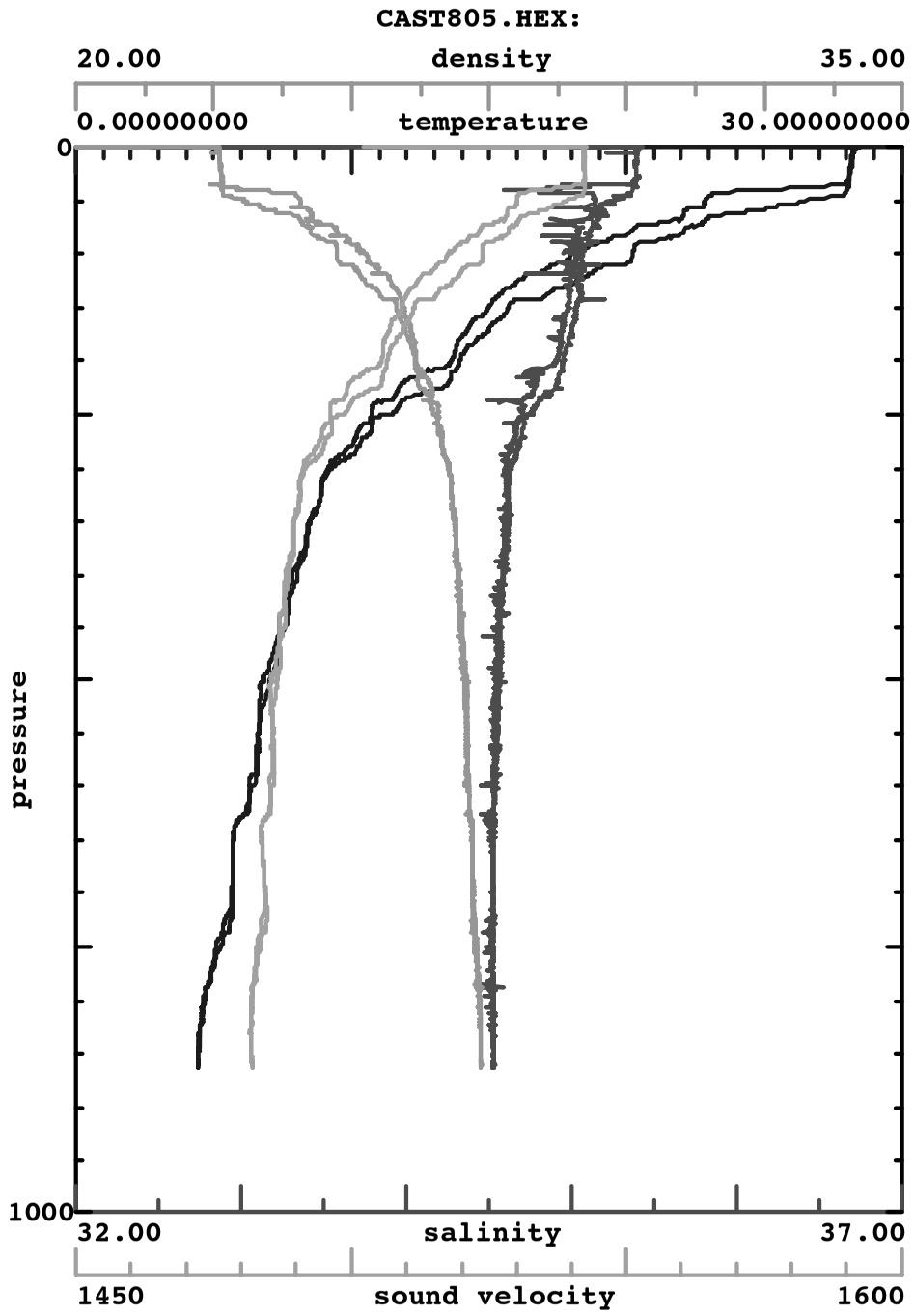
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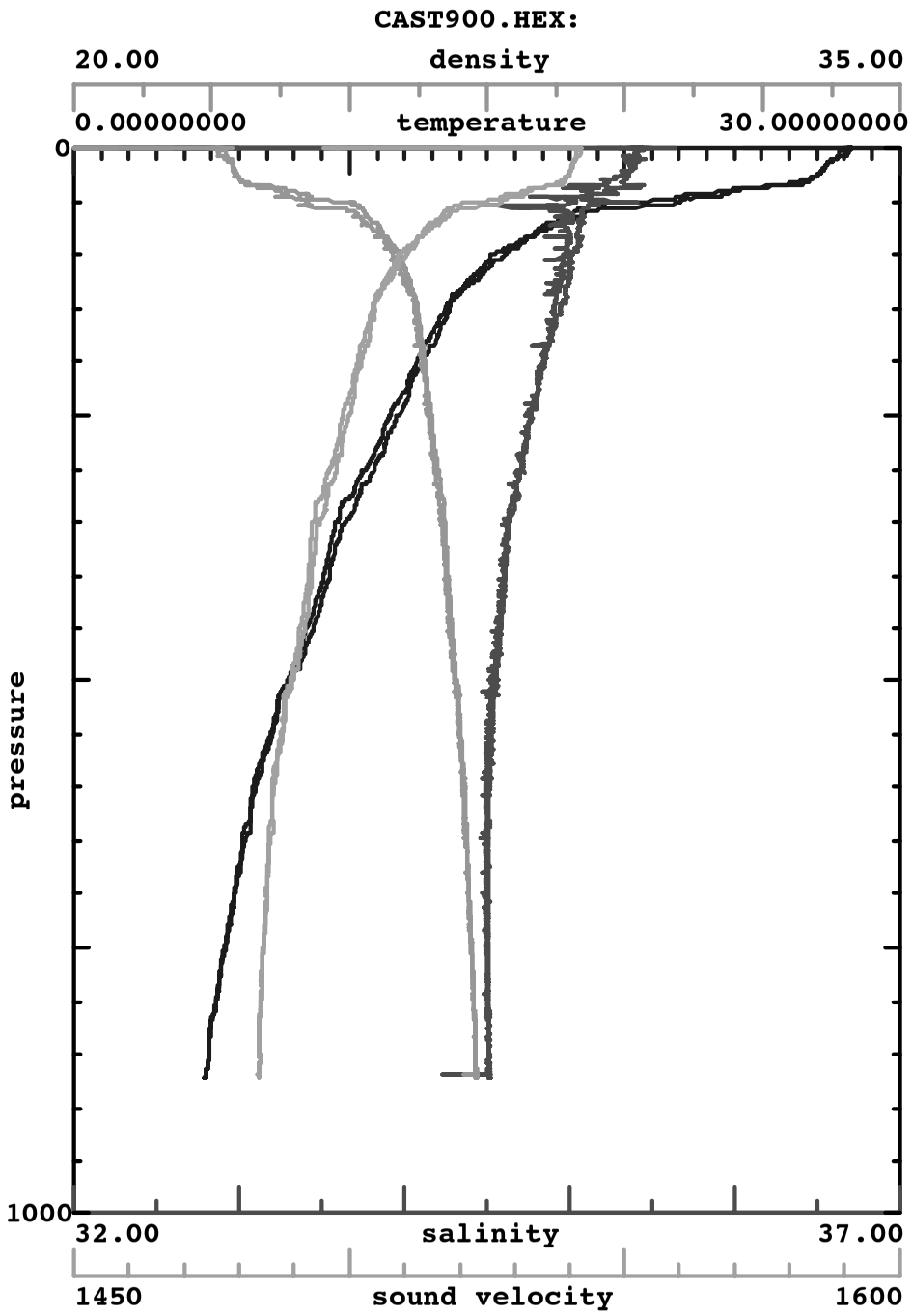
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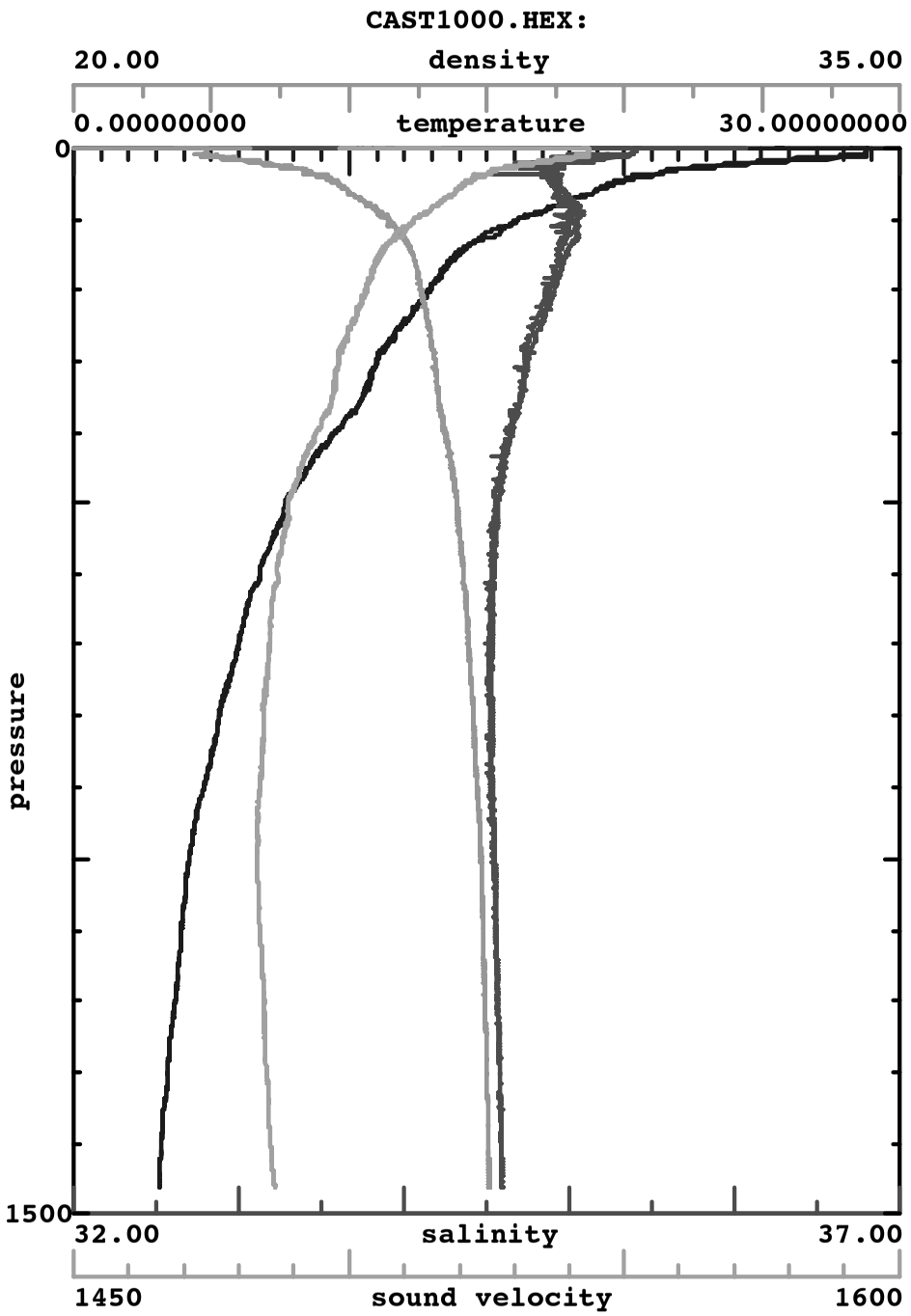
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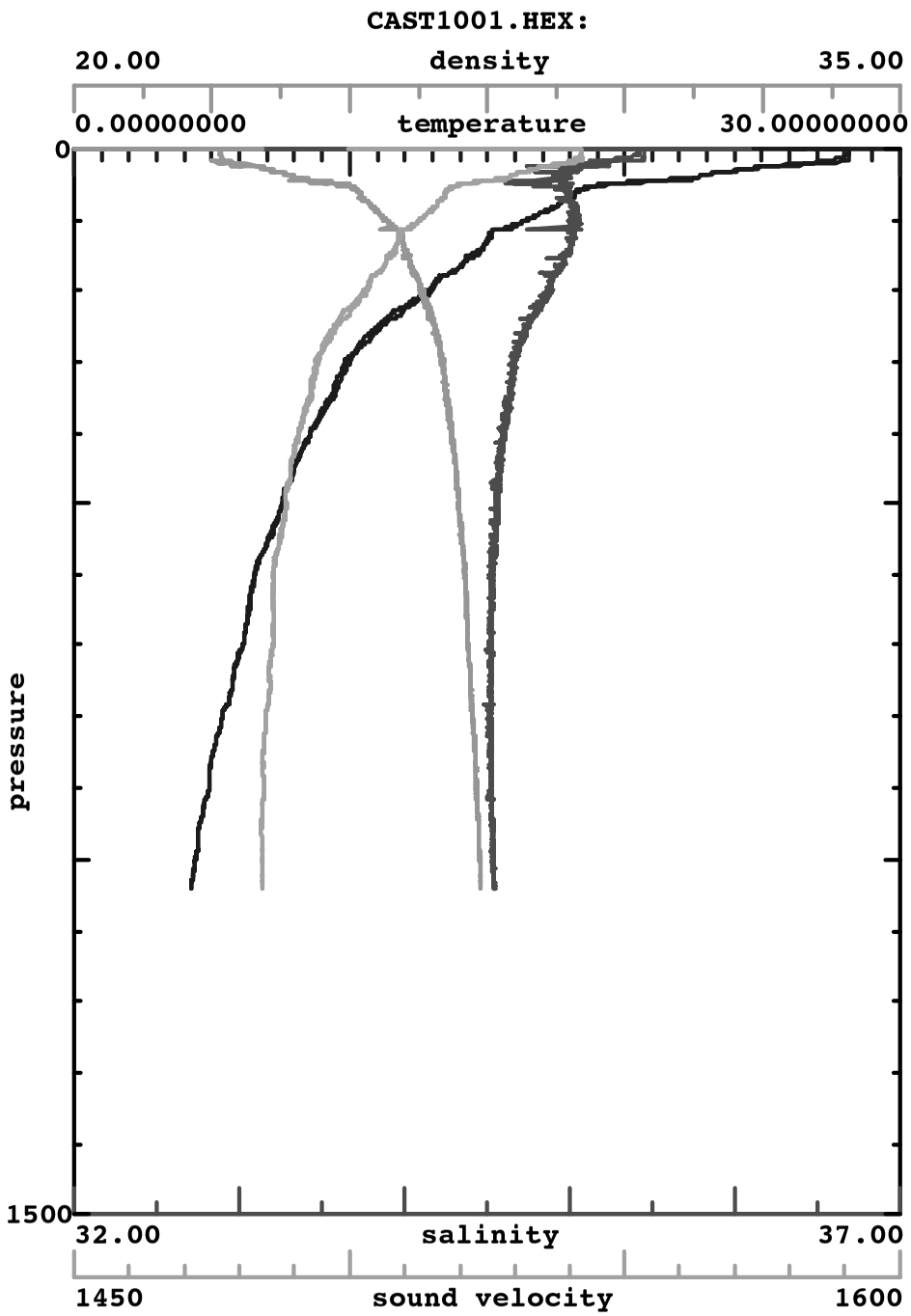
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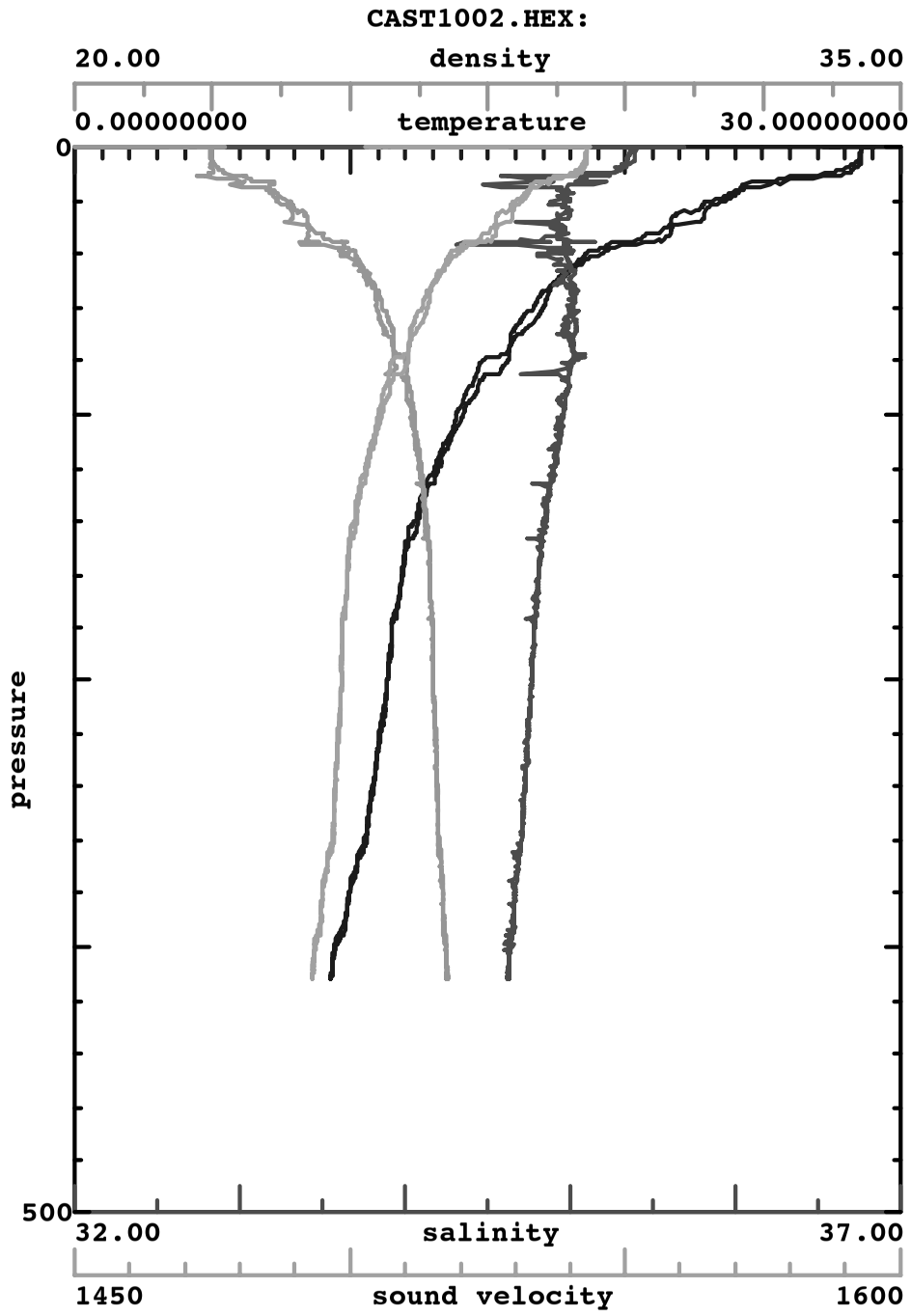
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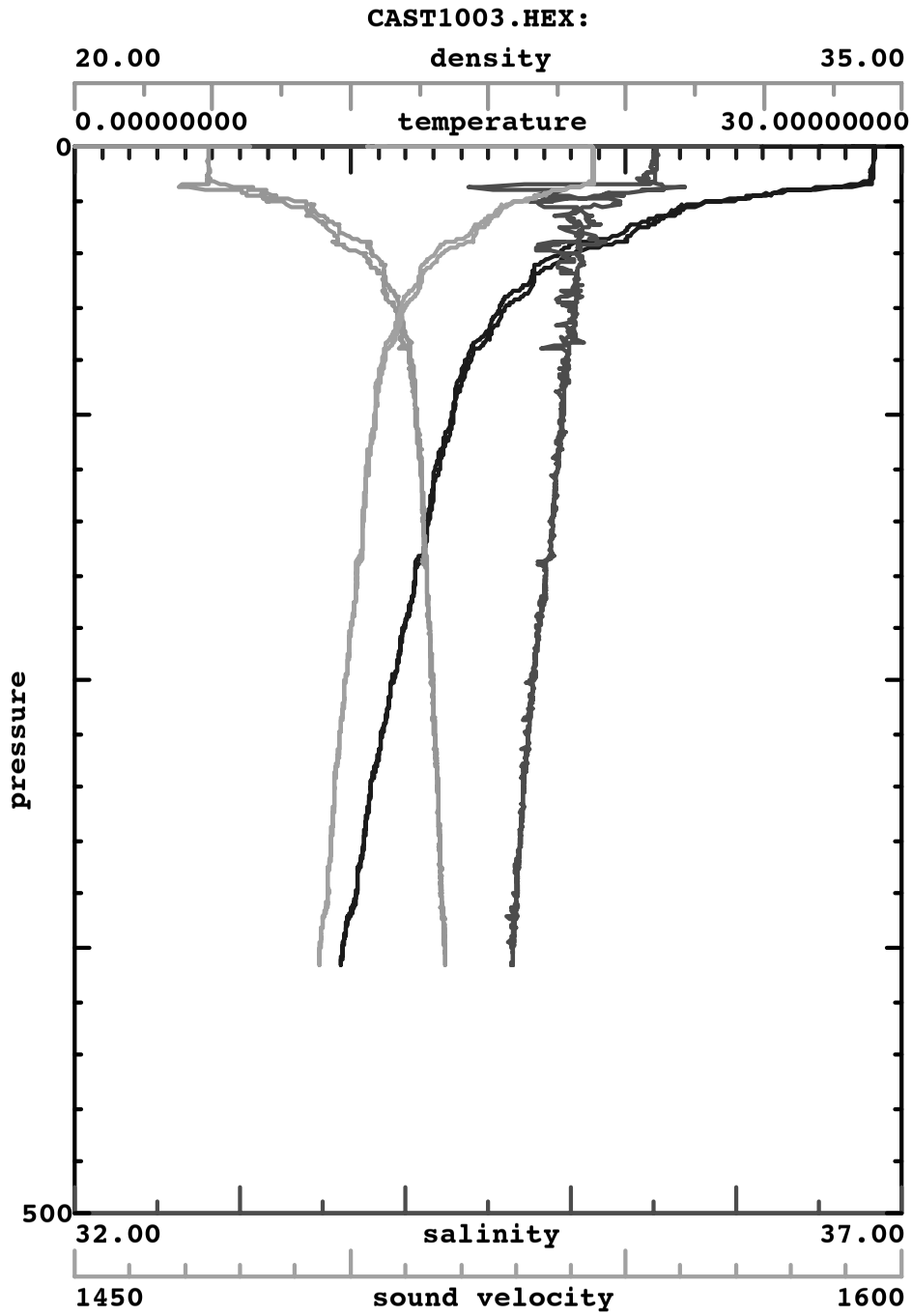
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Appendix D - OBS Stats

Number of L-CHEAPO units deployed	207
Number of units recovered	206
Recovery rate of units	99.5169%
Number of units recovered with useable data	201
Recovery rate for data	97.1014%
Number of units visited by the *R/V Maurice Ewing*	172
Percentage of units visited by the *R/V Maurice Ewing*	83.0918%
Number of anchors used	207
Number of anchors remaining	13
Number of units recovered with animals attached[1]	1
Number of units recovered with live animals attached	3
Number of units recovered with dead animals attached*	1
Number of units recovered with a modified (or unmodified) fishing rod	~4
Number of units sponsored by IN-N-OUT Burger	1
Number of units that could be smelled from the bridge (see * above)	1

[1]*one with fish eggs, one bird, one fish (dead), one with two crabs, does not include shrimp or other crustaceans.*

Appendix E - Data Summary

Current as of 3 November 2002

1. SEG-Y Data

One copy of the data will go on CD to the University of Wyoming and another copy will be on the SOCCER external drive at Georgia Tech.
In addition to SEG-Y files, there are copies of the output and input files created by the program which converted the raw data to SEG-Y.
These files are in the same locations as the SEG-Y files.
For the archived versions of the data on CD, there is additionally a copy of the shot time / location file which was used to cut the SEG-Y file from the raw data.

	OBS Data		MCS Data		10 Gun Data				
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2			
Site	Hydrophone	Seismometer	Hydrophone	Seismometer	Hydrophone	Seismometer	CD Title	Alternate CD Title	Comments
	Line 0WW								
0-01									Not yet converted from RAW data
0-02									
0-03									
0-04									
0-05									
	Line 0WE								
0-06	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	Alternate title for line 0WE MCS data files
0-07	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
0-08	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
0-09	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
0-10	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
0-11	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
0-12	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
0-13	16.4	16.4	21.5	21.5	-	-	Lines 0E and 0WE SEG-Y	Line 0WE MCS SEG-Y	
	Line 0E								
0-14	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	Alternate title for line 0E MCS data files
0-15	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-16	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-17	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-18	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-19	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-20	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-21	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
0-22	22.6	22.6	22.8	22.8	-	-	Lines 0E and 0WE SEG-Y	Line OE MCS SEG-Y	
	Line 1								
1-01	116.9	116.9	44.3	44.3	-	-	1-01 1-02 1-03 SEG-Y	0-15 1-01 TO 1-06 MCS SEG-Y	Alternate title for line 1 MCS data files
1-02	63.5	63.5	44.3	44.3	-	-	1-01 1-02 1-03 SEG-Y	0-15 1-01 TO 1-06 MCS SEG-Y	
1-03	116.9	116.9	44.3	44.3	-	-	1-01 1-02 1-03 SEG-Y	0-15 1-01 TO 1-06 MCS SEG-Y	
1-04	67.7	67.7	44.3	44.3	-	-	1-04 1-05 1-06 SEG-Y	0-15 1-01 TO 1-06 MCS SEG-Y	
1-05	116.9	116.9	44.3	44.3	-	-	1-04 1-05 1-06 SEG-Y	0-15 1-01 TO 1-06 MCS SEG-Y	
1-06	71.7	71.7	44.3	44.3	-	-	1-04 1-05 1-06 SEG-Y	0-15 1-01 TO 1-06 MCS SEG-Y	
1-07	116.9	116.9	44.3	44.3	-	-	1-06 1-07 1-09 SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-08	75.5	75.5	44.3	44.3	-	-	1-06 1-07 1-09 SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-09	116.9	116.9	44.3	44.3	-	-	1-06 1-07 1-09 SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-10	79.5	79.5	44.3	44.3	-	-	1-10 1-11 1-12 SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-11	116.9	116.9	44.3	44.3	-	-	1-10 1-11 1-12 SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-12	81.1	81.1	44.3	44.3	-	-	1-10 1-11 1-12 SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-13	116.9	116.9	44.3	44.3	-	-	1-13 1-14 1-15SEG-Y	1-07 TO 1-13 MCS SEG-Y	
1-14	81.1	81.1	44.3	44.3	-	-	1-13 1-14 1-15SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-15	81.1	81.1	44.3	44.3	-	-	1-13 1-14 1-15SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-16	81.1	81.1	44.3	44.3	-	-	1-16 TO 1-20 SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-17	81.1	81.1	44.3	44.3	-	-	1-16 TO 1-20 SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-18	81.1	81.1	44.3	44.3	-	-	1-16 TO 1-20 SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-19	-	-	-	-	-	-			No data
1-20	81.1	81.1	44.3	44.3	-	-	1-16 TO 1-20 SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-21	81.1	81.1	44.3	44.3	-	-	1-21 TO 1-24 SEG-Y	1-14 TO 1-21 MCS SEG-Y	
1-22	81.1	81.1	44.3	44.3	-	-	1-21 TO 1-24 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-23	81.1	81.1	12.2	12.2	-	-	1-21 TO 1-24 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-24	22.0	22.0	44.3	44.3	-	-	1-21 TO 1-24 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-25	116.9	116.9	44.3	44.3	-	-	1-25 1-26 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-26	116.9	116.9	44.3	44.3	-	-	1-25 1-26 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-27	116.9	116.9	44.3	44.3	-	-	1-27 1-28 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-28	116.9	116.9	44.3	44.3	-	-	1-27 1-28 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-29	116.9	116.9	44.3	44.3	-	-	1-29 1-30 SEG-Y	1-22 TO 1-29 MCS SEG-Y	
1-30	116.9	116.9	44.3	44.3	-	-	1-29 1-30 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-31	116.9	116.9	44.3	44.3	-	-	1-31 1-32 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-32	116.9	116.9	44.3	44.3	-	-	1-31 1-32 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-33	116.9	116.9	44.3	44.3	-	-	1-33 1-34 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-34	116.9	116.9	44.3	44.3	-	-	1-33 1-34 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-35	116.9	116.9	44.3	44.3	-	-	1-35 1-36 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-36	116.9	116.9	44.3	44.3	-	-	1-35 1-36 SEG-Y	1-30 TO 1-36 MCS SEG-Y	
1-37	116.9	116.9	44.3	44.3	-	-	1-37 1-38 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
1-38	116.9	116.9	44.3	44.3	-	-	1-37 1-38 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
1-39	116.9	116.9	44.3	44.3	-	-	1-39 1-40 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
0-15*			44.3	44.3				0-15 1-01 TO 1-06 MCS SEG-Y	Station 0-15 is at intersection of 1 and 0E
1-40	116.9	116.9	44.3	44.3	-	-	1-39 1-40 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
1-41	116.9	116.9	44.3	44.3	-	-	1-41 1-42 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
1-42	116.9	116.9	44.3	44.3	-	-	1-41 1-42 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
1-43	-	-	-	-	-	-			No data
1-44	116.9	116.9	44.3	44.3	-	-	1-44 1-45 SEG-Y	1-37 TO 1-44 MCS SEG-Y	
1-45	116.9	116.9	44.3	44.3	-	-	1-44 1-45 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-46	116.9	116.9	44.3	44.3	-	-	1-46 1-47 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-47	116.9	116.9	44.3	44.3	-	-	1-46 1-47 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-48	116.9	116.9	44.3	44.3	-	-	1-48 1-49 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-49	116.9	116.9	44.3	44.3	-	-	1-48 1-49 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-50	116.9	116.9	44.3	44.3	-	-	1-50 1-51 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-51	116.9	116.9	44.3	44.3	-	-	1-50 1-51 SEG-Y	1-45 TO 1-51 MCS SEG-Y	
1-52	116.9	116.9	44.3	44.3	-	-	1-52 1-53 SEG-Y	1-52 TO 1-56 MCS SEG-Y	
1-53	116.9	116.9	44.3	44.3	-	-	1-52 1-53 SEG-Y	1-52 TO 1-56 MCS SEG-Y	
1-54	116.9	116.9	44.3	44.3	-	-	1-54 1-55 SEG-Y	1-52 TO 1-56 MCS SEG-Y	

Site	OBS Data Channel 1 Hydrophone	Channel 2 Seismometer	MCS Data Channel 1 Hydrophone	Channel 2 Seismometer	10 Gun Data Channel 1 Hydrophone	Channel 2 Seismometer	CD Title	Alternate CD Title	Comments
1-55	116.9	116.9	44.3	44.3	-	-	1-54 1-55 SEG-Y	1-52 TO 1-56 MCS SEG-Y	
1-56	116.9	116.9	44.3	44.3	-	-	1-56 SEG-Y	1-52 TO 1-56 MCS SEG-Y	
	Line 3								
3-01	328.7	328.7	-	-	-	-	3-01 SEG-Y		With the exception of 3-14 and 3-17 (which
3-02	328.7	328.7	-	-	-	-	3-02 SEG-Y		were re-cut after the CD's listed here were
3-03	328.7	328.7	-	-	-	-	3-03 SEG-y		burned for the first time) all stations on
3-04	328.7	328.7	-	-	-	-	3-04 SEG-Y		transect 3 were cut with 100 s time windows.
3-05	328.7	328.7	-	-	-	-	3-05 SEG-Y		3-14 and 3-17 were cut with 60 s windows,
3-06	328.7	328.7	-	-	-	-	3-06 SEG-Y		hence the smaller file size.
3-07	328.7	328.7	-	-	-	-	3-07 SEG-Y		
3-08	328.7	328.7	-	-	-	-	3-08 SEG-Y		
3-09	328.7	328.7	-	-	-	-	3-09 SEG-Y		
3-10	328.7	328.7	-	-	-	-	3-10 SEG-Y		
3-11	328.7	328.7	-	-	-	-	3-11 SEG-Y		
3-12	328.7	328.7	-	-	-	-	3-12 SEG-Y		
3-13	328.7	328.7	-	-	-	-	3-13 SEG-Y		
3-14	197.9	197.9	-	-	-	-	3-14 SEG-Y		
3-15	328.7	328.7	-	-	-	-	3-15 SEG-Y		
3-16	328.7	328.7	-	-	-	-	3-16 SEG-Y		
3-17	197.8	197.8	-	-	-	-	3-17 SEG-Y		
3-18	328.7	328.7	-	-	-	-	3-18 SEG-Y		
3-19	328.7	328.7	-	-	-	-	3-19 SEG-Y		
3-20	328.7	328.7	-	-	-	-	3-20 SEG-Y		
3-21	328.7	328.7	-	-	-	-	3-21 SEG-Y		
3-22	328.7	328.7	-	-	-	-	3-22 SEG-Y		
3-23	328.7	328.7	-	-	-	-	3-23 SEG-Y		
3-24	328.7	328.7	-	-	-	-	3-24 SEG-Y		
3-25	328.7	328.7	-	-	-	-	3-25 SEG-Y		
3-26	328.7	328.7	-	-	-	-	3-26 SEG-Y		
3-27	328.7	328.7	-	-	-	-	3-27 SEG-Y		
3-28	328.7	328.7	-	-	-	-	3-28 SEG-Y		
3-29	328.7	328.7	-	-	-	-	3-29 SEG-Y		
3-30	328.7	328.7	-	-	-	-	3-30 SEG-Y		
3-31	328.7	328.7	-	-	-	-	3-31 SEG-Y		
3-32	328.7	328.7	-	-	-	-	3-32 SEG-Y		
3-33	328.7	328.7	-	-	-	-	3-33 SEG-Y		
3-34	328.7	328.7	-	-	-	-	3-34 SEG-Y		
3-35	328.7	328.7	-	-	-	-	3-35 SEG-Y		
3-36	328.7	328.7	-	-	-	-	3-36 SEG-Y		
3-37	328.7	328.7	-	-	-	-	3-37 SEG-Y		
3-38	328.7	328.7	-	-	-	-	3-38 SEG-Y		
3-39	328.7	328.7	-	-	-	-	3-39 SEG-Y		
	Line 3PE								
3-41	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		
3-42	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		
3-43	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		
3-30*	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		Station 3-30 is at intersection of 3 and 3PE
3-44	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		
3-45	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		
3-46	43.8	43.8	-	-	-	-	Line 3PE SEG-Y		
3-47	43.8	43.8	-	-	-	-	Line 3PE/3PW SEG-Y		
3-48	43.8	43.8	-	-	-	-	Line 3PE/3PW SEG-Y		
	Line 3PW								
3-51	50.8	50.8	-	-	-	-	Line 3PE/3PW SEG-Y		
3-52	50.8	50.8	-	-	-	-	Line 3PE/3PW SEG-Y		
3-53	50.8	50.8	-	-	-	-	Line 3PE/3PW SEG-Y		
3-54	50.8	50.8	-	-	-	-	Line 3PE/3PW SEG-Y		
3-55	30.6	30.6	-	-	-	-	Line 3PW SEG-Y		
3-11*	50.8	50.8	-	-	-	-	Line 3PE/3PW SEG-Y		Station 3-11 is at intersection of 3 and 3PW
3-56	30.6	30.6	-	-	-	-	Line 3PW SEG-Y		
3-57	30.6	30.6	-	-	-	-	Line 3PW SEG-Y		
3-58	30.6	30.6	-	-	-	-	Line 3PW SEG-Y		
3-59	30.6	30.6	-	-	-	-	Line 3PW SEG-Y		
3-60	30.6	30.6	-	-	-	-	Line 3PW SEG-Y		
	Line 5								
5-01	87.8	87.8	21.0	21.0	7.3	7.3	5-01 5-02 5-03 SEG-Y		
5-02	87.8	87.8	21.0	21.0	7.3	7.3	5-01 5-02 5-03 SEG-Y		
5-03	87.8	87.8	21.0	21.0	7.3	7.3	5-01 5-02 5-03 SEG-Y		
5-04	87.8	87.8	21.0	21.0	7.3	7.3	5-04 5-05 5-06 SEG-Y		
5-05	87.8	87.8	21.0	21.0	7.3	7.3	5-04 5-05 5-06 SEG-Y		
5-06	87.8	87.8	21.0	21.0	7.3	7.3	5-04 5-05 5-06 SEG-Y		
5-07	87.7	87.7	-	-	7.3	7.3	5-07 5-08 5-09 SEG-Y		no 50 m data
5-08	85.4	85.4	-	-	7.3	7.3	5-07 5-08 5-09 SEG-Y		no 50 m data
5-09	82.7	82.7	-	-	7.3	7.3	5-07 5-08 5-09 SEG-Y		no 50 m data
5-10	80.0	80.0	-	-	7.3	7.3	5-10 TO 5-13 SEG-Y		no 50 m data
5-11	77.3	77.3	-	-	7.3	7.3	5-10 TO 5-13 SEG-Y		no 50 m data
5-12	74.7	74.7	-	-	7.3	7.3	5-10 TO 5-13 SEG-Y		no 50 m data
5-13	72.0	72.0	-	-	7.3	7.3	5-10 TO 5-13 SEG-Y		no 50 m data
5-14	69.3	69.3	-	-	7.3	7.3	5-14 to 5-17 SEG-Y		
5-15	77.0	77.0	-	-	7.3	7.3	5-14 to 5-17 SEG-Y		
5-16	74.3	74.3	-	-	7.3	7.3	5-14 to 5-17 SEG-Y		
5-17	71.7	71.7	-	-	7.3	7.3	5-14 to 5-17 SEG-Y		
5-18	87.7	87.7	-	-	7.3	7.3	5-18 5-19 5-20 SEG-Y		
5-19	85.0	85.0	-	-	7.3	7.3	5-18 5-19 5-20 SEG-Y		
5-20	82.3	82.3	-	-	7.3	7.3	5-18 5-19 5-20 SEG-Y		
5-21	79.6	79.6	-	-	7.3	7.3	5-21 TO 5-24 SEG-Y		
5-22	77.0	77.0	-	-	7.3	7.3	5-21 TO 5-24 SEG-Y		
5-23	74.3	74.3	-	-	7.3	7.3	5-21 TO 5-24 SEG-Y		
5-24	71.7	71.7	-	-	7.3	7.3	5-21 TO 5-24 SEG-Y		
5-25	69.9	69.9	-	-	7.3	7.3	5-25 TO 5-28 SEG-Y		
5-26	66.8	66.8	-	-	7.3	7.3	5-25 TO 5-28 SEG-Y		

	OBS Data		MCS Data		10 Gun Data				
	Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2			
Site	Hydrophone	Seismometer	Hydrophone	Seismometer	Hydrophone	Seismometer	CD Title	Alternate CD Title	Comments
5-27	66.8	66.8	-	-	7.3	7.3	5-25 TO 5-28 SEG-Y		
5-28	66.8	66.8	-	-	7.3	7.3	5-25 TO 5-28 SEG-Y		
5-29	66.8	66.8	-	-	7.3	7.3	5-29 TO 5-32 SEG-Y		
5-30	66.8	66.8	-	-	7.3	7.3	5-29 TO 5-32 SEG-Y		
5-31	66.8	66.8	-	-	7.3	7.3	5-29 TO 5-32 SEG-Y		
5-32	66.8	66.8	-	-	7.3	7.3	5-29 TO 5-32 SEG-Y		
5-33	66.8	66.8	-	-	7.3	7.3	5-33 TO 5-36 SEG-Y		
5-34	66.8	66.8	-	-	7.3	7.3	5-33 TO 5-36 SEG-Y		
5-35	66.8	66.8	-	-	7.3	7.3	5-33 TO 5-36 SEG-Y		
5-36	65.0	65.0	-	-	7.3	7.3	5-33 TO 5-36 SEG-Y		
	Line 5PE								
5-37	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-38	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-39	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-40	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-41	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-42	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-43	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		
5-44	20.3	20.3	-	-	-	-	Line 5PE SEG-Y		

2. Raw Data

Please see Appendix B.
Two copies of the data are saved on CD: one which will go to Scripps then on to Georgia Tech, and the other to the University of Wyoming.
At the time that the ship returned to San Diego, there is also a copy of the data on the CatDog hard drive.

3. CTD Data

Location	Cast	Raw File	ascii File	Location
0-13	1	no data	no data	
1-10	100	cast100.hex	cast100.txt	All data are to be placed on CD at Scripps, Georgiac Tech and Uwyo.
1-26	200	cast200.hex	cast200.txt	
1-36	300	cast300.hex	cast300.txt	
1-44	301	cast301.hex	cast301.txt	
0-15	400	cast400.hex	cast400.txt	
1-31	401	cast401.hex	cast401.txt	
1-21	500	cast500.hex	cast500.txt	
1-16	600	cast600.hex	cast600.txt	
2-51	700	cast700.hex	cast700.txt	
3-24	800	cast800.hex	cast800.txt	
3-18	801	cast801.hex	cast801.txt	
3-11	803	cast803.hex	cast803.txt	
3-52	804	cast804.hex	cast804.txt	
3-04	805	cast805.hex	cast805.txt	
3-60	900	cast900.hex	cast900.txt	
3-41	1000	cast1000.hex	cast1000.txt	
3-30	1001	cast1001.hex	cast1001.txt	
3-46	1002	cast1002.hex	cast1002.txt	
3-37	1003	cast1003.hex	cast1003.txt	

Appendix F - Earthquakes

Several earthquakes were noticed during the QC of the data. This list is without a doubt incomplete.

Time (YY MM DD HH)	Instruments	Comments
02 10 03 ??	?	M6.2 south of Transect 1 on ridge.
02 10 10 11/12	Baja_su23_BK_2-21 Baja_su56_DE_2-22 Baja_su75_EM_2-24	EQ & aftershocks?
02 10 10 11	Baja_su55_SA_3-23 Baja_su31_RT_3-24 Baja_su22_RM_3-25	Shows well on hydrophone
02 10 22 20	Baja_su81_GL_5-11 Baja_su77_EO_5-12 Baja_su26_PR_5-13	P ~ 20:12 S ~ 20:40

Appendix G - Cruise Glossary

Ewing (n) the short name of the R/V *Maurice Ewing* (see Ewing, Maurice).

Ewing, Maurice (1926 - 1992) Marine geophysicist whose career was central to the development of our knowledge of the geology of the oceans. **R/V Maurice Ewing** Seismic research vessel of the National Science Foundation under the control of Lamont-Doherty Earth Observatory of Columbia University; named for Ewing, Maurice.

L-CHEAPO 2000 **l**ow **c**ost **h**ardware for **e**arth **a**pplications and **p**hysical **o**ceanography. The name given to ocean bottom seismometer and hydrophone instruments developed by Scripps Institution of Oceanography.

lizarralde (n.) 1. an amiable geophysicist from Georgia Tech. 2. a scientific experiment that goes to hell through no fault of the organizers - *The Center for Biological Diversity made a lizarralde of our research in the Gulf of California.*

lizarralde (v.t.) 1. to cause, through court action, a scientific experiment to be haulted before completion - *We hope that environmentalists won't lizarralde next year's schedule for the Ewing.*

MCS (adj.) **m**ulti-**c**hannel **s**eismic (as opposed to single channel seismic). In general this term is used to refer to data collected using the now-standard marine reflection method with an airgun source towed immediately behind the vessel and a long multi-channel streamer being towed behind the guns. The term is in fact a bit out-of-date as there is very little single channel marine reflection data collected these days.

New Horizon (or *Horizon*) (n) the short name of the R/V *New Horizon* from Scripps Institution of Oceanography; named for an earlier vessel named R/V *Horizon.*

OBH **o**cean-**b**ottom **h**ydrophone

OBS **o**cean-**b**ottom **s**eismometer (as opposed to OBH). In this document, OBS is often used as the common name of the instruments that we were deploying on the seafloor. These L-CHEAPO 2000 instruments contained both hydrophones and seismometers.

OBSIP **O**cean-**B**ottom **S**eismometer **I**nstrumentation **P**ool The pool of ocean-bottom seismometers and instruments available to the US academic community by National Science Foundation grant money. Instruments in the pool come from Scripps Institution of Oceanography, Woods Hole Oceanographic Institution, and Lamont-Doherty Earth Observatory.

SEG-Y Standard format of seismic data laid out by the Society of Exploration Geophysicists in 1971 and now so completely out of date that the standard is regularly modified by whomever feels like it.