

RC-3005

Cruise Narrative

Hudson River Seismic Profiles

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Data acquisition for the Hudson River MCS profiling project represented a technical challenge of considerable magnitude, since we had never tried to work in such a narrow body of shallow (as little as 30 feet in some places) water before.

The answers to several important questions were unknown, though educated guesses had encouraged proceeding with the project. Would it be possible to keep the digital hydrophone streamer afloat in fresh water? Would the streamer follow the ship's track around corners, or would it foul itself on the river bank and tear apart? Would it be possible to keep the air guns, which normally tow at about 40 feet, shallow enough to keep from roiling PCB-laden sediments?

On the 6th of April, 1989, CONRAD left Piermont on her last scientific voyage to find out the answers and, more importantly, to gather a unique data set from which to reveal some of the Earth's secrets.

Extra personnel included a CNN news team comprising a cameraman and sound technician, and led by reporter David Monsees. Upon reaching the channel, CONRAD proceeded northward while single channel seismic (SCS) gear was readied. We reversed course north of the Tappan Zee Bridge, heading south, and SCS recording started soon thereafter. The CNN crew were offloaded near Yonkers, and their film appeared on the air a day or two later. SCS acquisition continued without incident until it was ended in the vicinity of Ambrose. Approximately 48 n.m. of SCS data were acquired on this segment and gave encouragement to the idea that the project might go off as planned.

The SCS gear was recovered, and deployment of the 96 x 25 m channel MCS array began. This took nearly 18 hours -- all lead weights were removed, floats and birds installed, and oil injected in order to lighten the streamer as much as possible. Approximately 125 gallons of streamer oil were used, exhausting the supply on board. Norwegian buoys were attached to the outer 8 air guns on 25' tethers, so as to constrain towing depth in the river channel.

MCS acquisition began south of Long Island, with 10 air guns firing at 2000 psi, with a 25 sec rep rate. The tuned airgun array consisted of one each, 350, 385, 420, 466, 500, 540, 585, 640, 700, and 760 cu. in. Bolt 1500-C air guns -- a total of 5346 cubic inches of compressed air. Despite gale warnings that had previously been posted, we proceeded towards NY Harbor in the gloom of a raw, cold night.

Luckily the gale warnings proved unfounded and we entered the Harbor under good visibility conditions. After passing under the Verrazano Narrows Bridge, a container ship inexplicably crossed the streamer about 5:30 in the morning and severed it at can #2, chopping off 8 sections and the tailbuoy. This

inexplicably occurred despite the fact that the pilots on the two ships were in voice contact at the time, and CONRAD had two chase boats in the vicinity of the tailbuoy. A legal effort to recover funds for damaged and lost equipment (and time) is ongoing. A gap of about 4 n.m. in MCS coverage resulted, as the system was revived and the damage assessed.

Considering traffic and location, we decided to restart the DSS-240 system and continue recording data, monitoring the streamer towing depths closely. It soon became apparent that the last 1/3^d of the streamer, which had been towing deep before the collision, was getting even deeper, occasionally touching the bottom. It eventually became necessary to start streamer recovery while moving northward in the vicinity of midtown Manhattan.

A few hours later, the streamer was aboard, and CONRAD headed downriver at full speed, picking up C.B. Raleigh, L. Johnson, and two Journal-News reporters on the way. Deployment of a shortened, 64-channel streamer was begun in the vicinity of Ellis Island, as the ship slowly steamed north. All remaining floats were applied to the streamer, and the remaining gallon or two of oil injected. The compass sections were removed, on account of their weight and their tendency to pull apart under excessive towing stress.

Finally, the streamer was fully deployed, the gun array was redeployed, and recording began just north of the George Washington Bridge. Unfortunately, modifying and redeploying the streamer caused a gap of about 7 n.m. in MCS coverage off of mid-and-uptown Manhattan. Raleigh, Johnson, and the two reporters debarked in the vicinity of Piermont.

CONRAD continued northward, acquiring 64-channel MCS data with 10 air guns, moving through the water at the relatively high speed required to keep the streamer at 20 ft. towing depth. At nightfall, the ship entered the dredged channel at north Haverstraw, and transited without incident. After passing West Point, we were contacted by the USCG auxiliary at Highland Falls, on behalf of the USMA security office. Apparently, the airgun source array was powerful enough to set off alarms on the military reservation.

All went well until the next morning, when a passing tanker crowded CONRAD to the inside of a curve and the tailbuoy snagged a channel marker. The buoy broke up, and pulled the plug out of the end of the streamer. Since we were within a mile or two of the point at which we'd have to pull in the streamer anyway, we ended MCS operations at that point. The total MCS mileage acquired based on the pitlog readings was 193 n.m.

After taking on fresh water, and bidding farewell to Bernie Gallagher and Anne Holmes aboard our faithful chase boat, CONRAD departed Albany, with Walter Sullivan of the New York Times aboard, and deployed the single channel seismic gear once again. Many sea stories were swapped during the night as we sailed back down the river.

Since we were about to arrive at Piermont ahead of time, we continued South past Piermont, and shot SCS back down to about 79th St., Manhattan. U-turned, and collected SCS back up to the north until just before we docked at Piermont.

A total of ca. 193 n.m. MCS, and 174 n.m. of SCS data were acquired, along

with 500 n.m. of 3.5 kHz echo sounder and total track.

The successful collection of 94% of the planned MCS mileage despite the unique and difficult circumstances of RC-3005 reflects great credit on the scientific and ship's crew. Every single member did his (or her) utmost to complete the necessary work at all times without complaint. Capt. Peterlin, particularly, worked long and hard hours, adapting his skills to the tasks at hand in a flexible and effective fashion.