UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Record sections for multichannel seismic-reflection data in the area of the Charleston South Carolina 1886 earthquake

by

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Plates

Introduction

In 1979 the U.S. Geological Survey acquired 140 km of multichannel seismic-reflection data along ten profiles designated SC1 through SC10 (fig. 1) by contract from Geophysical Services Incorporated. Figure 1 also shows the localities where other data collected by the Consortium for Continental Reflections Profiling (COCORP) discussed by Schilt and others, 1982. The profiles discussed in this paper were located to obtain regional coverage in and around the meizoseismal area of the Charleston, S.C. 1886 earthquake and to investigate features delineated by other geophysical and geologic studies. An important consideration in choosing the locations of the lines was that the trucks could not vibrate within 180 m of a building or well because of possible damage; this limitation accounts for the lack of coverage in part of the area of recent seismicity.

The vibration points (fig. 2) were in the middle of the geophone group 120 m away, with 60 m between groups. Thus, with a total of 48 groups, the geophone spread reached as much as 1500 m from the vibration point. Three vibrator trucks generated a seven-second sweep from 10 to 60 Hz at alternate geophone groups, and made 15 sweeps at each vibration point. The trucks moved about 3 m along the line between sweeps. The data sample rate was 4 ms. Standard data processing yielded the 12-fold stacked sections presented here with specific parameters listed on the sections. Velocity analyses provided stacking velocities at intervals of about 3 km.

Interpretations of these data have been published by Behrendt and others, 1981 and Hamilton and others, 1982.

References

Behrendt, J. C., Hamilton, R. M., Ackermann, H. D., and Henry, V. J., 1981, Cenozoic faulting in the vicinity of the Charleston, South Carolina, 1886 Earthquake: Geology, v. 9, p. 117-122.

Hamilton, R. M., Behrendt, J. C., and Ackermann, H. D., 1981, Land multichannel seismic-reflection evidence for tectonic features near Charleston, South Carolina, in Gohn, G. S., ed., Studies related to the Charleston, South Carolina, earthquake of 1886--Collected Abstracts: U.S. Geological Survey Open-File Report 82-134.

Schilt, F. S., Brown, L. D., Oliver, J. E., and Kaufman, S., 1982, New evidence of COCORP reflection profiling in the Atlantic Coastal plain in Gohn, G. S., ed., Studies related to the Charleston, South Carolina Earthquake of 1886--Collected Abstracts: U.S. Geological Survey Open-File Report 82-134.

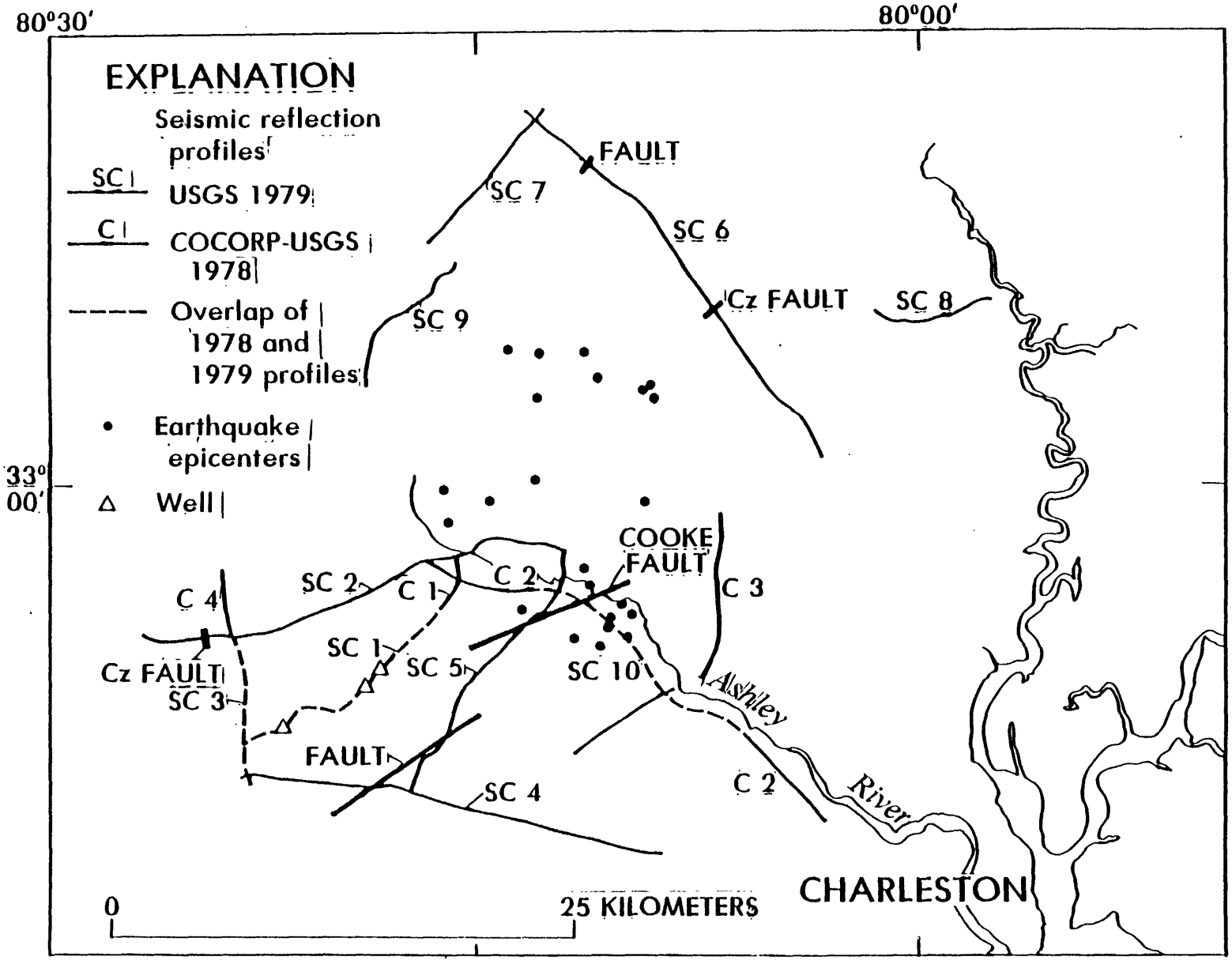

Figure 1. Map showing location of SC lines accompanying this report (pls. 1-10), C lines collected by COCORP-USGS, epicenters of modern seismicity, and a well drilled for stratigraphic control.

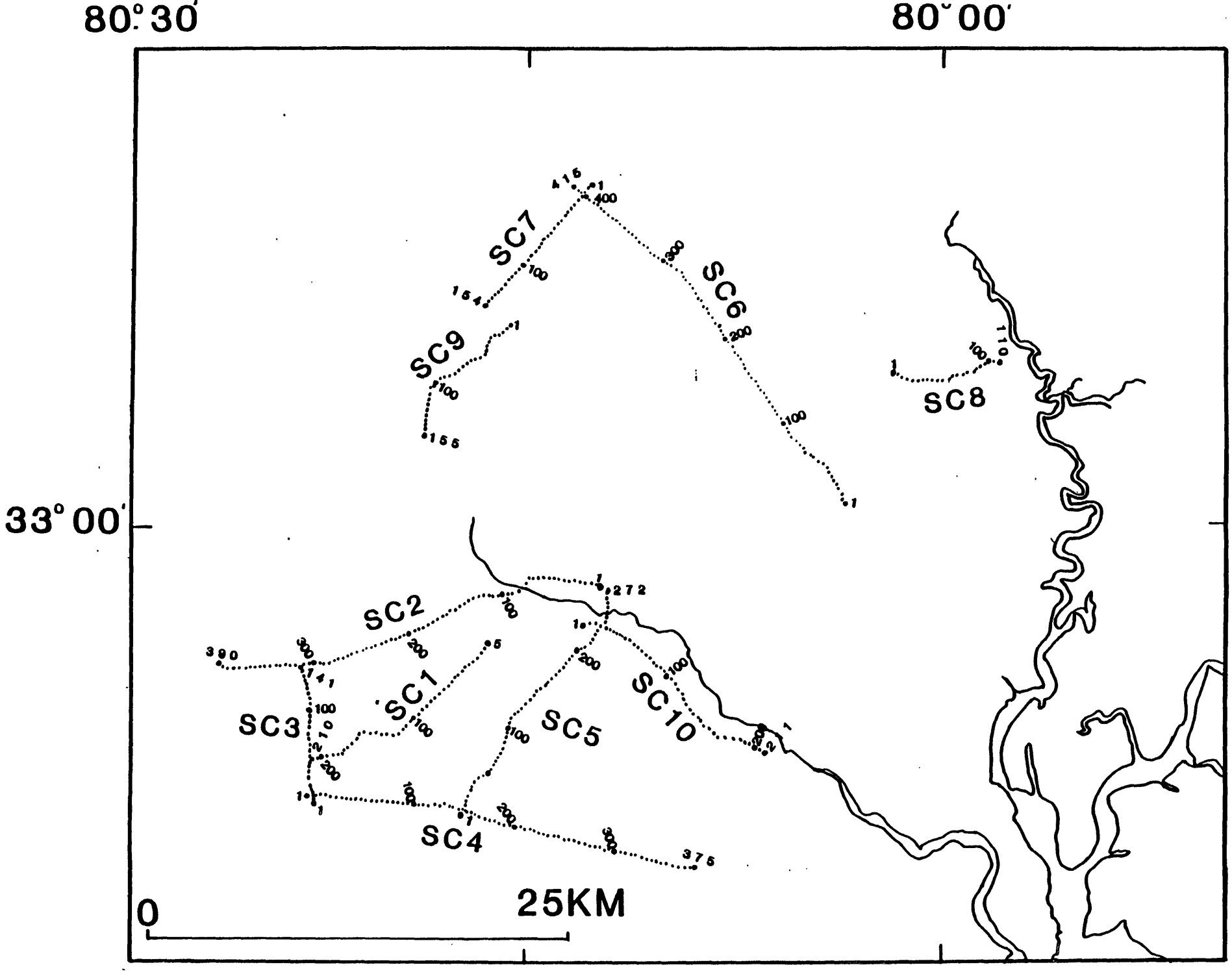

Figure 2.--Location of vibration points (SP) shown on record sections.