

Overview of the Apache Forties data set

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ABSTRACT

I present a dataset acquired in 2010 by Apache North Sea and made available to the Stanford Exploration Project (SEP). The dataset is composed of three surveys acquired with four-component ocean-bottom nodes placed under production platforms in a close pattern. Active shooting was performed in a spiral geometry around the platforms at short offsets. The goal of this acquisition was to identify gas pockets at shallow depths and possible geo-hazards. This acquisition configuration can be advantageous for multi-component data processing such as elastic Reverse Time Migration (RTM).

INTRODUCTION

Seismic acquisition is an essential tool in both the exploration and exploitation phases in the oil & gas industry. During production, it can be used for 4D monitoring, by observing seismic response changes in the reservoir and overburden, in order to improve the production strategy. Seismic data can also be used to identify geo hazards at shallow depths, which create a risk for drilling and other operations during production (Heggland, 2004).

ACQUISITION GEOMETRY

The data provided to SEP by Apache North Sea were recorded using four-component ocean bottom nodes (4C OBNs). The nodes were arranged at each of the production platforms in the survey area in a hexagonal array. Sources were shot in a coil pattern around the platform. The total survey time for each field resulted in a few days of passive data. From the passive data, active data was extracted in 9-second traces.

DATASETS

Bravo data

Data for the Bravo survey was acquired using 10,108 shots. There were 52 nodes laid out in a hexagonal pattern. Figure 1 shows the source and receiver configuration.

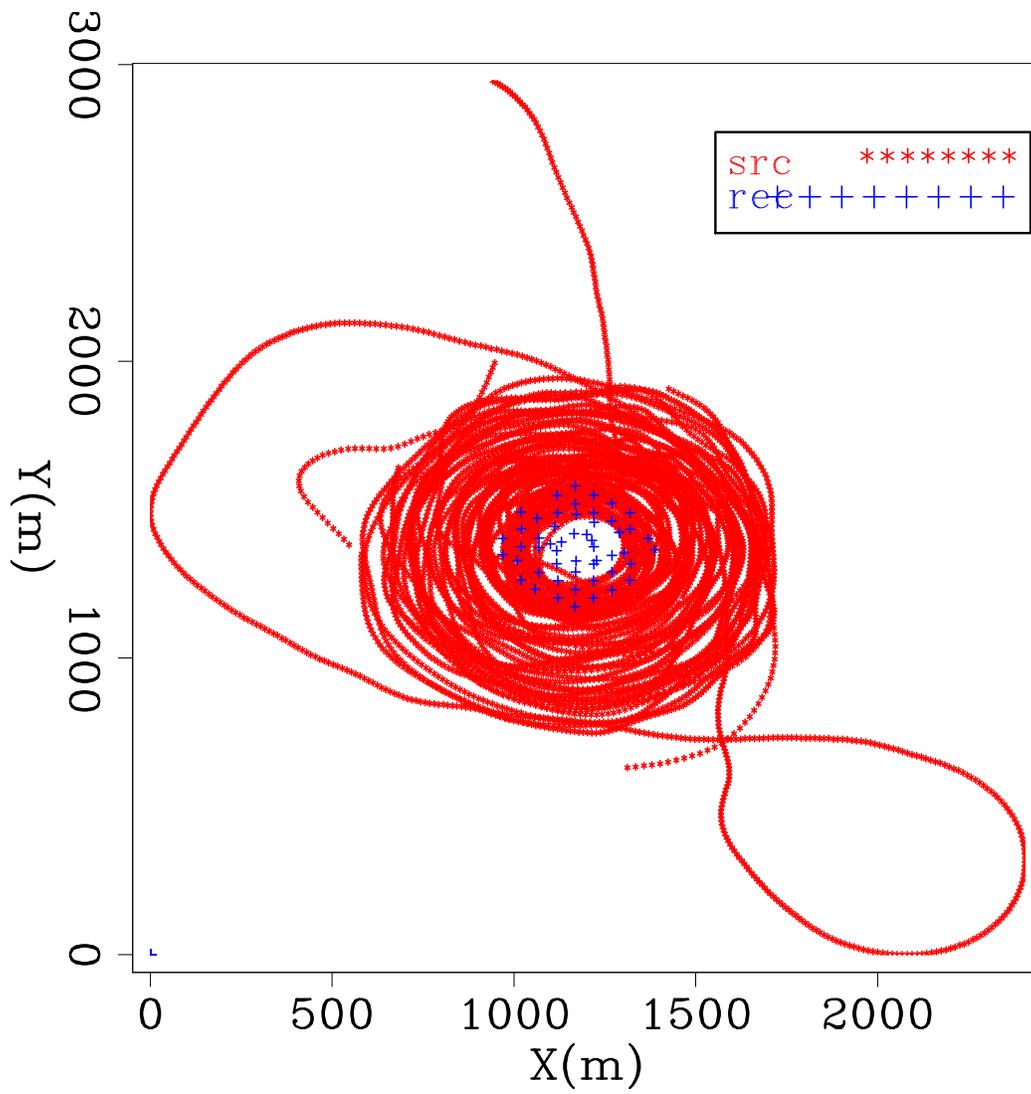


Figure 1: Shot and receiver configuration for the Bravo survey. [NR]

Charlie data

Data for the Charlie survey was acquired using 10,494 shots. There were 53 nodes laid out in a hexagonal pattern. Figure 2 shows the source and receiver configuration.

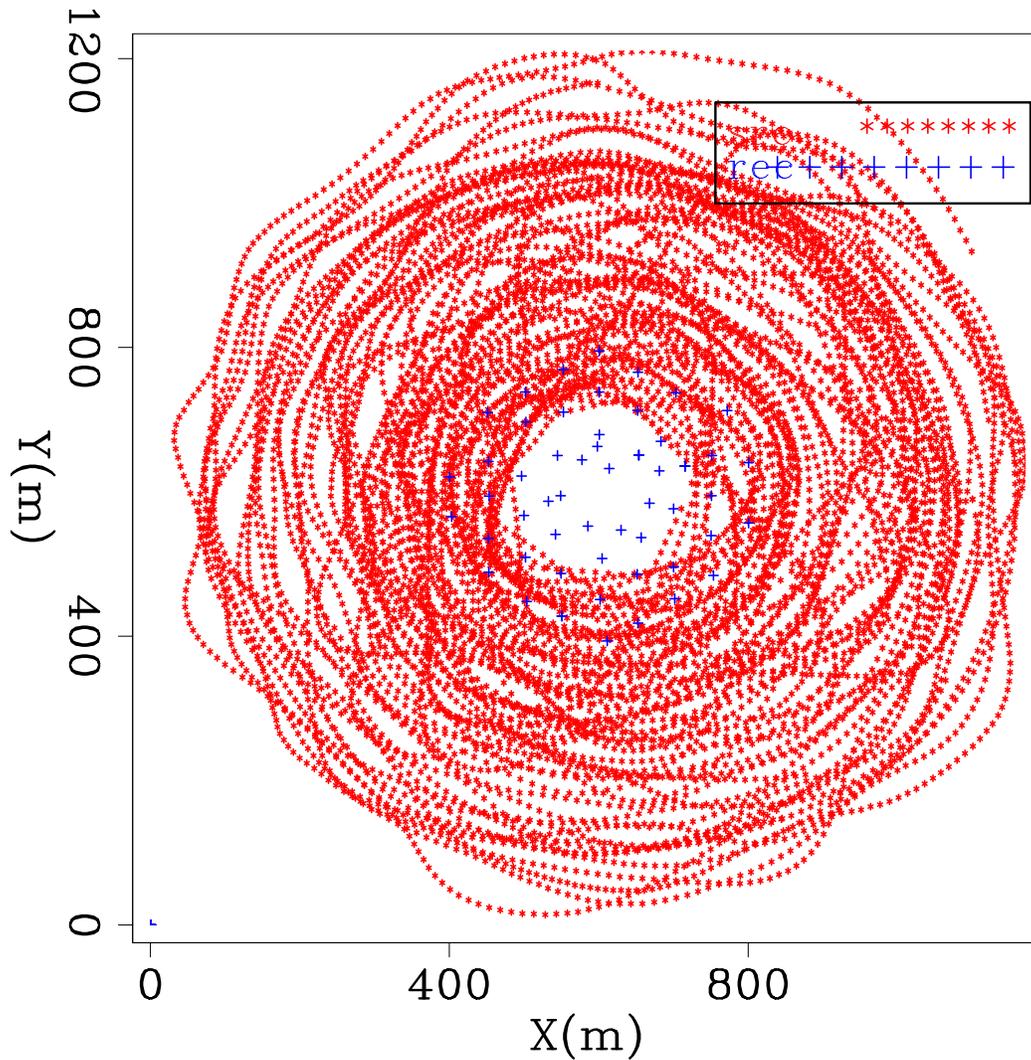


Figure 2: Shot and receiver configuration for the Charlie survey. [NR]

Delta data

Data for the Delta survey was acquired using 14,485 shots. There were 48 nodes laid out in a hexagonal pattern. Figure 3 shows the source and receiver configuration.

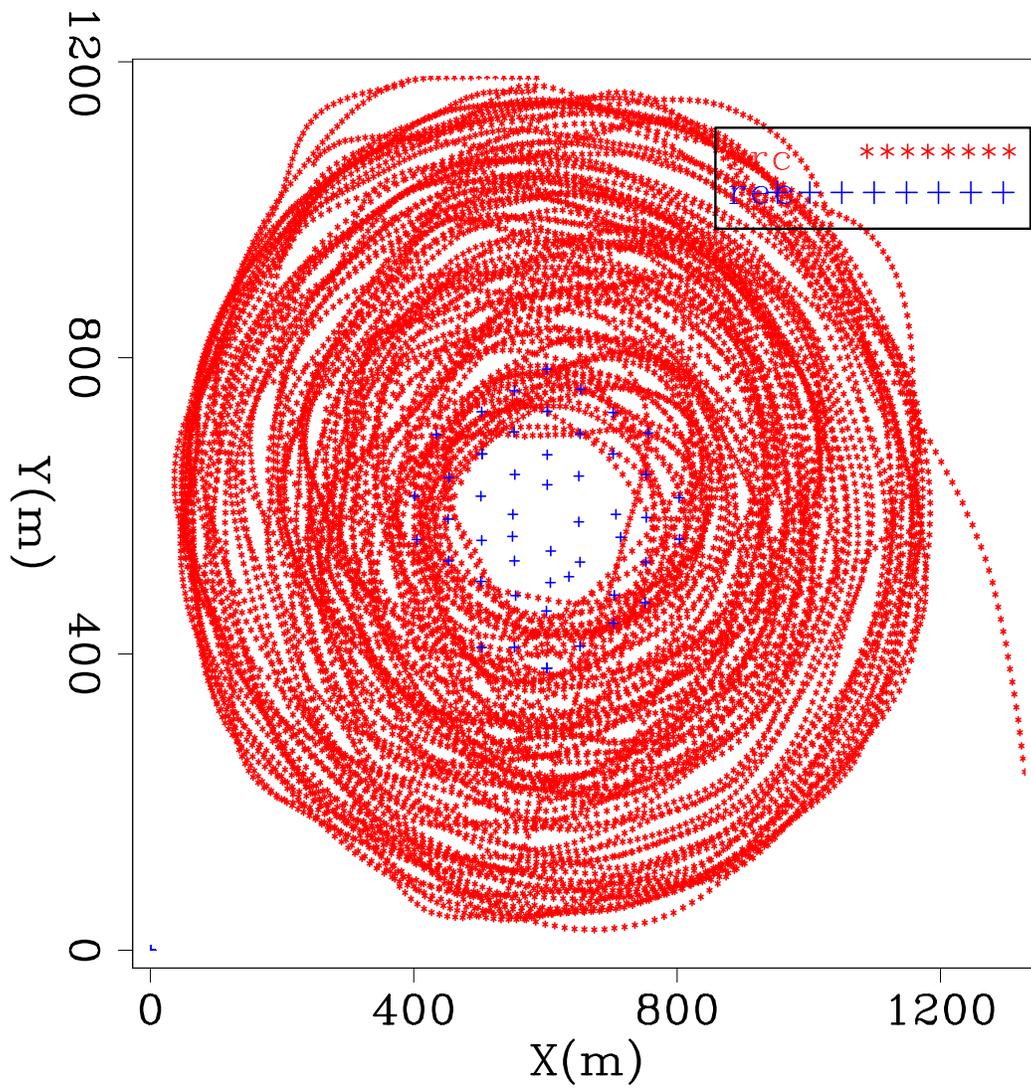


Figure 3: Shot and receiver configuration for the Delta survey. [NR]

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REFERENCES

Heggland, R., 2004, Definition of geohazards in exploration 3-D seismic data using attributes and neural-network analysis: AAPG Bulletin, **88**, 857–868.