GSA Data Repository 2019400

Riera, R., et al., 2019, Discovery of a 400 km^2 honeycomb structure mimicking a regional unconformity on three-dimensional seismic data: Geology, v. 47, https://doi.org/10.1130/G46484.1

FIGURE CAPTIONS

Figure DR1: 2D line s136_136_04 (A) and horizon slice extracted from the Minden 3D seismic volume (B) showing the correlation between the well Ramillies 1 and the time-transgressive HS forming a pseudo-unconformity along 2D seismic lines. Biostratigraphic zonation is after Rexilius (1991).

Figure DR2: Arbitrary 2D line and horizon slice extracted from the Vincent 3D seismic volume showing the correlation between the well Pyrenees 1 and the HS. The location of the 2D line is shown in the small horizon slice extracted from the Vincent 3D seismic volume in the corner of the figure. The location of the cutting Pyrenees1-822.5, which is illustrated on the Fig. DR4A, is indicated by the black dot on the Pyrenees 1 well.

Figure DR3: Arbitrary 2D line (A) and horizon slice (B) extracted from the Minden 3D seismic volume showing the correlation between the well York 1 and the HS. The location of the cutting York1-1420, which is illustrated on the Fig. DR5, is indicated by the black dot on York 1.

Figure DR4: Thin sections of the clay-rich carbonate mudstones forming the deeply submerged prograding clinoforms. A. sample 822.5 mRT from Pyrenees 1, illustrating the composition of the clinoform bottomsets; B. sample 1250 mRT from Ramillies 1, showing the composition of the clinoform topsets. Gy: Gypsum, Qtz: quartz, PlF: planktonic foraminifera, HF: small hyaline foraminifera, Do: dolomite rhomb.

Figure DR5: Scanning electron microscope (SEM) image of a cutting from the offshore well York 1 (cutting 1420 mRT) from the clinoform topsets. Note the presence of dolomite rhombs (Do) and of a quartz grain (Qtz) in a carbonate matrix (Mtx). Image is of an uncoated sample taken on a Hitachi TM3030Plus benchtop SEM under low vacuum conditions at accelerating voltages of 15 kV.

Figure DR6: Time-slice of the LF seismic volume (see Figs. 4B, 4B'), which is filtered with a FFT Hann filter with low cut at 14 Hz, low pass at 26 Hz, high pass at 29 Hz and high cut at 44 Hz so only low frequencies are displayed. Note the variation of apparent amplitude in the cells and ridges: in the south-western and north-eastern part of the image the cells have an apparent positive amplitude and the ridges have an apparent negative amplitude; whereas in the central part of the image cells have an apparent negative amplitude and ridges have an apparent positive amplitude. When the time-slice is shifted up or down, it cross-cuts the undulating reflector forming the HS in a different way in which cell and ridge apparent amplitudes can reverse.

TABLE CAPTIONS

Table DR1: Characteristics of the seismic surveys. The estimated vertical resolution was calculated with the following formula: vertical resolution threshold in an interval = velocity / (dominant frequency in this interval x 4). The average velocity in the upper studied interval is 2000 m/s according to the time-depth relationship in well Beg 1.

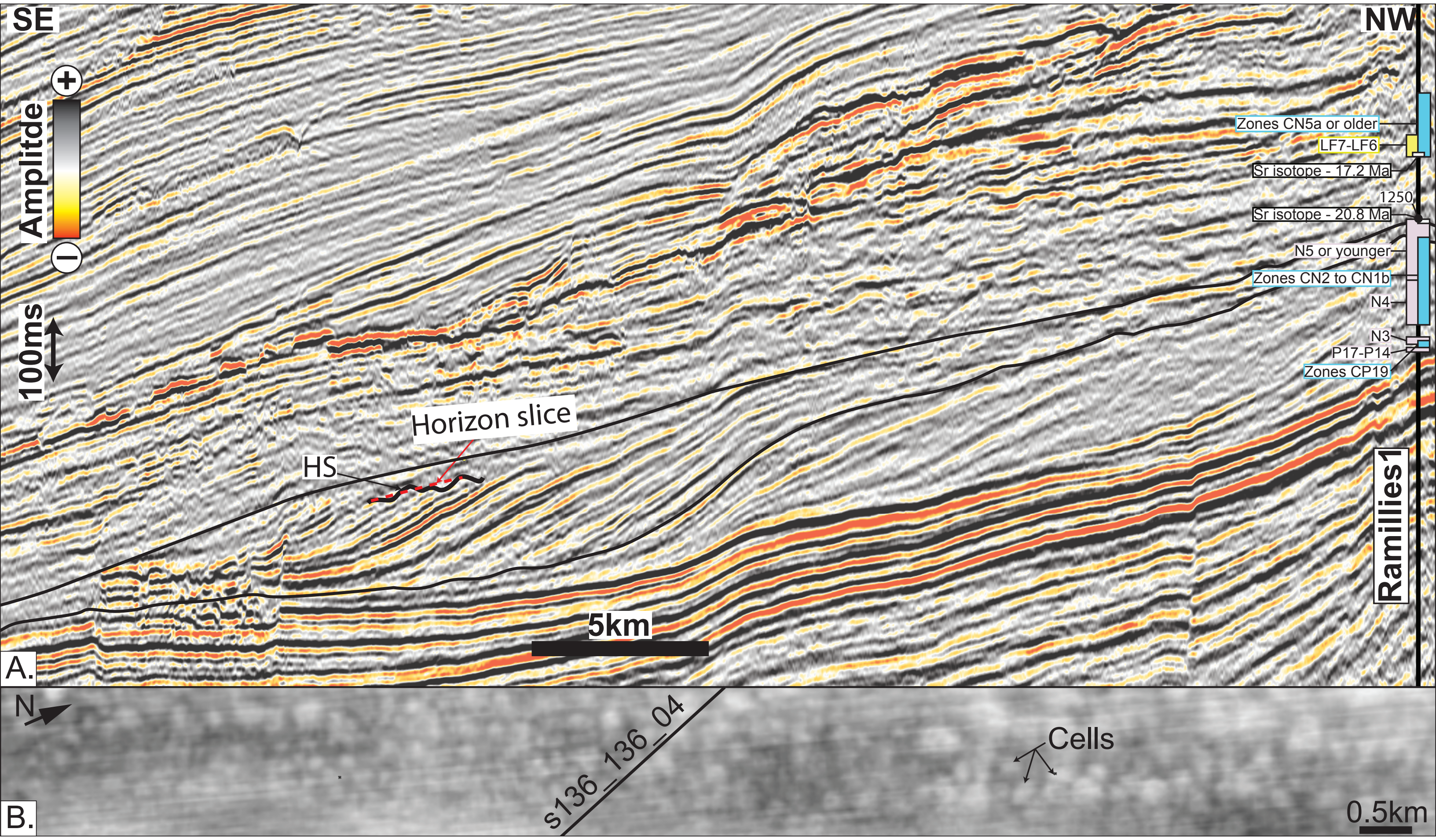

SE
NW
Amplitde
+
-
100ms
Zones CN5a or older
LF7-LF6
Sr isotope - 17.2 Ma
1250
Sr isotope - 20.8 Ma
N5 or younger
Zones CN2 to CN1b
N4
N3
P17-P14
Zones CP19
Horizon slice
HS
Ramillies1
5km
A.
N
s136_136_04
Cells
0.5km
B.

Fig. DR1

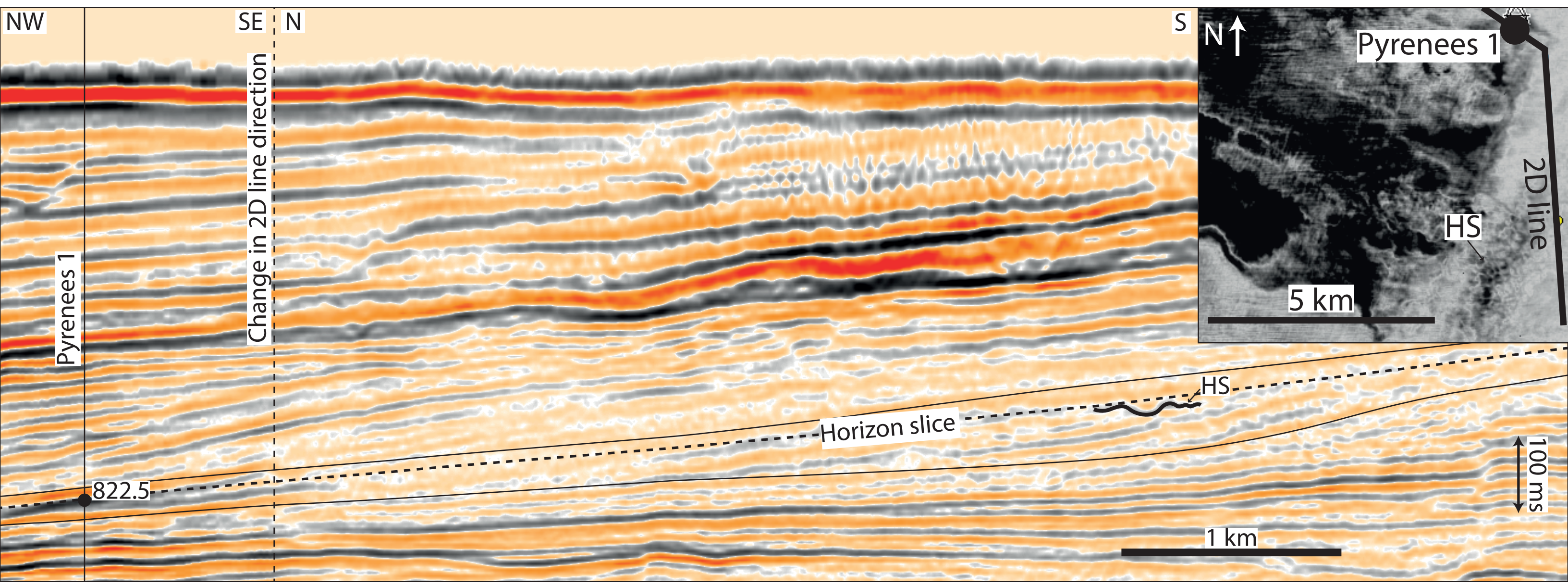
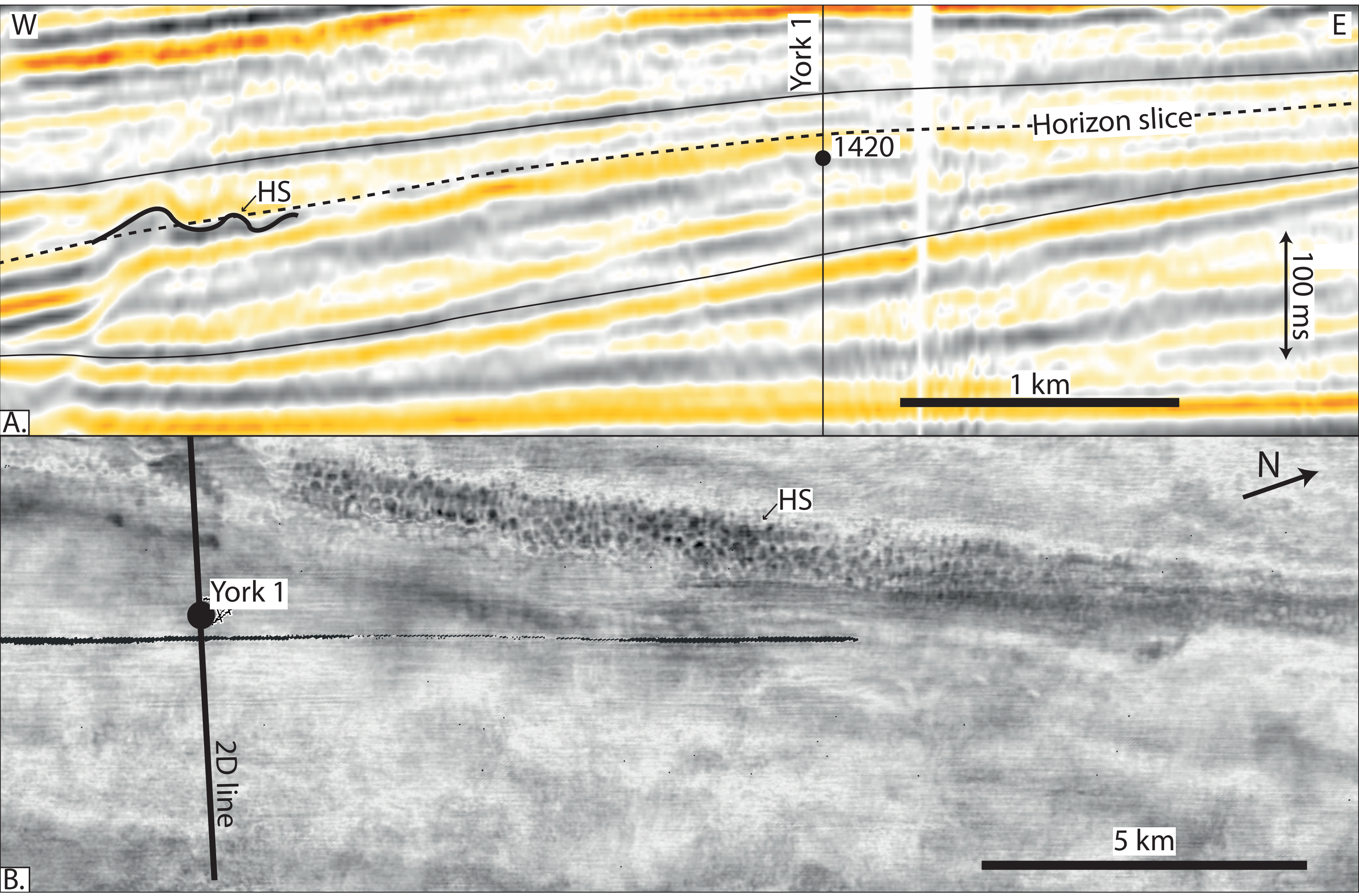

NW
SE
N
S
Pyrenees 1
Change in 2D line direction
822.5
Horizon slice
HS
100 ms
1 km
N
Pyrenees 1
2D line
HS
5 km

Fig. DR2



W
E
York 1
Horizon slice
1420
HS
100 ms
1 km
A.
N
HS
York 1
2D line
5 km
B.

Fig. DR3

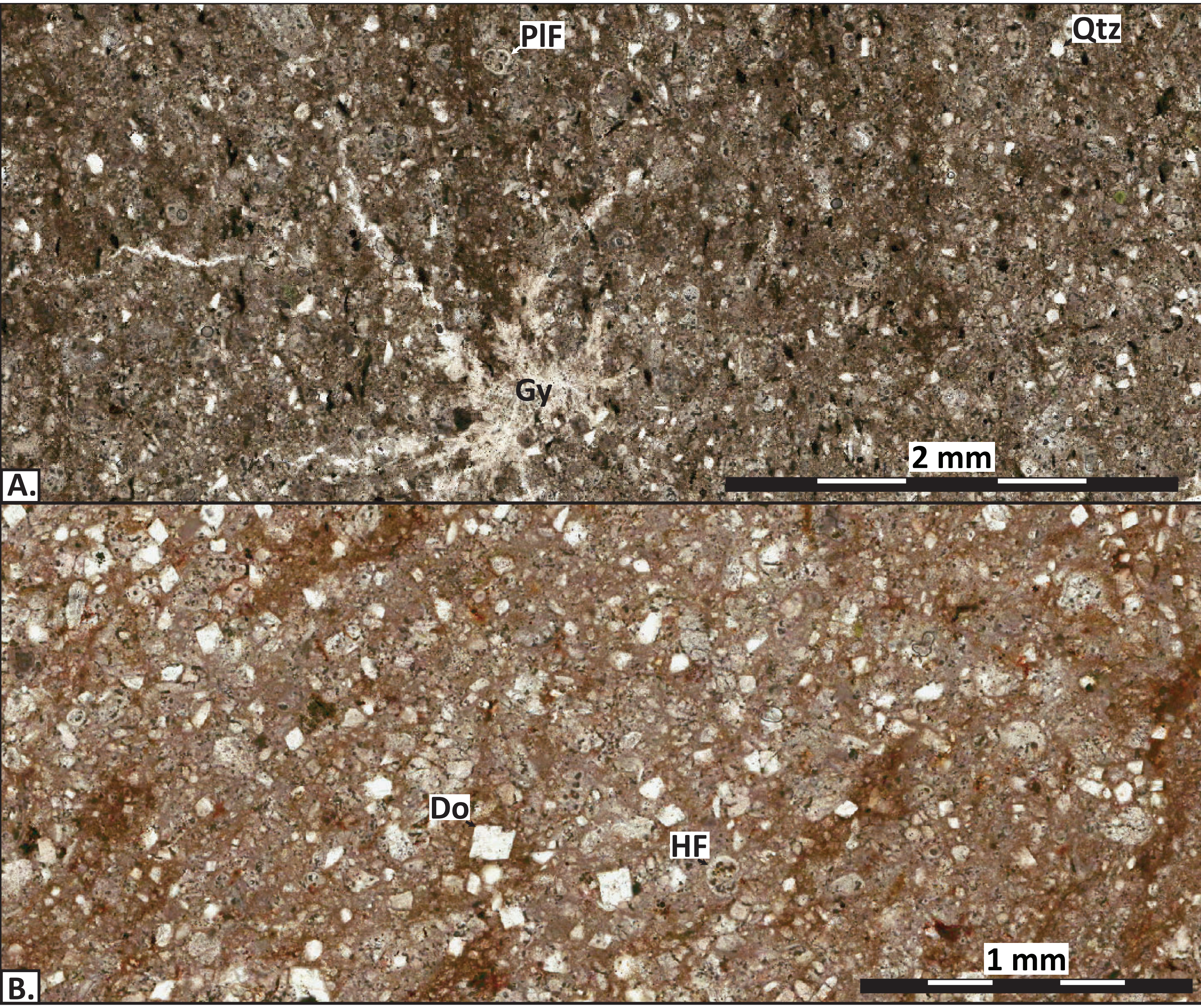


Fig. DR4

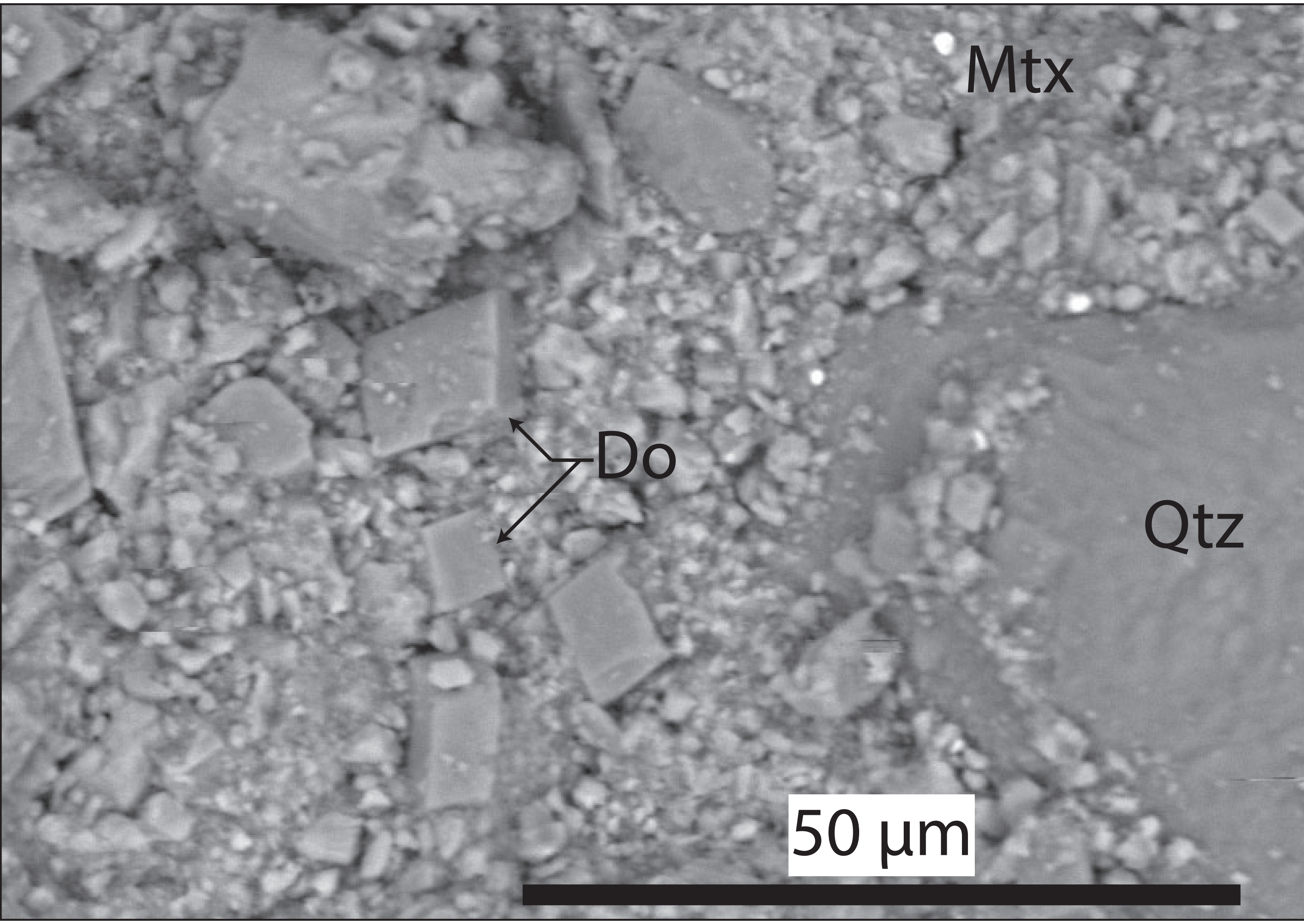


Fig. DR5

Fig. DR6

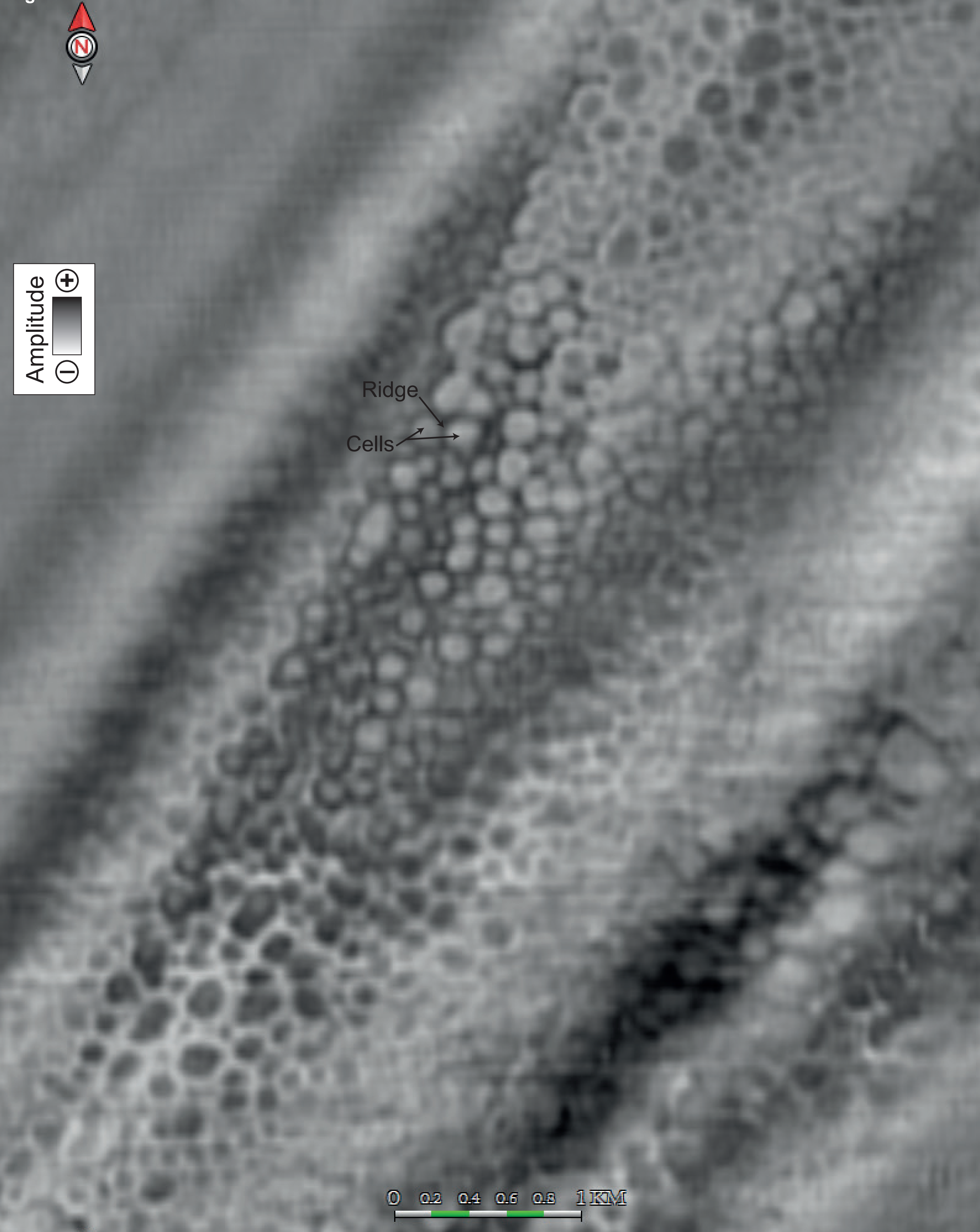


TABLE DR1: CHARACTERISTICS OF THE SEISMIC SURVEYS.

Seismic survey	Surface (km^2)	In-line bin size (m)	Cross-line bin size (m)	Sample rate (ms)	Dominant frequency (Hz)	Vertical resolution (m)
Carnarvon 3D	2844.44	28.1	12.5	3	65	7.7
Vincent 3D	1057.62	14.1	9.4	4	25	20
West Gorgon 3D	1087.06	14.1	9.4	4	40	12.5
Minden 3D	1215.62	18.7	18.7	4	30	16.7
Gorgon 3D	1385.84	20.0	25.0	4	15	33.3

The estimated vertical resolution was calculated with the following formula: vertical resolution threshold in an interval = velocity / (dominant frequency in this interval x 4). The average velocity in the upper studied interval is 2000 m/s according to the time-depth relationship in well Beg 1.