HiRes P-Cable Data from Shallow Reservoir Mapping and Geohazard Predictions
Case Examples from the Barents Sea

Frode N. Eriksen, Muhammad Assad, Ola K. Eriksen, Henrik H. Stokke, Sverre Planke

P-Cable 3D Seismic AS and ¹VBPR AS

Oslo Science Park, Norway

Athens, 15.09.14
25 P-Cable 3D cubes acquired in the Barents Sea 2004 by academia (UiT) and industry (2012/2014)

Goals: Gas seepage, oil and gas reservoirs, geomorphology, slides and mud volcanoes
What is P-Cable?

Top View

Simplified sketch of a 16 streamer P-Cable 3D system
What is P-Cable?

Top View

Simplified sketch of a 16 streamer P-Cable 3D system (Norway Pat. No. 317652, UK Pat. No. GB 2401684, US Pat. No.7.221 .620 B2.)

Typical System Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of Streamers</td>
<td>12 - 24</td>
</tr>
<tr>
<td>Streamer Spacing</td>
<td>6 - 12 m</td>
</tr>
<tr>
<td>Bin Size</td>
<td>3 x 3 m or 6 x 6 m</td>
</tr>
<tr>
<td>Streamer Length</td>
<td>25 - 50 m</td>
</tr>
<tr>
<td>Source-Receiver Distance</td>
<td>25-150 m</td>
</tr>
<tr>
<td>Frequency Content</td>
<td>5 - 350 Hz</td>
</tr>
<tr>
<td>Horizontal Resolution</td>
<td>3 - 6 m</td>
</tr>
<tr>
<td>Deployment/Recovery</td>
<td>1 - 1.5 hr</td>
</tr>
<tr>
<td>Vertical Resolution</td>
<td>1 - 1.5 m</td>
</tr>
<tr>
<td>Acquisition Efficiency</td>
<td>8-16 km²/day</td>
</tr>
</tbody>
</table>
Conventional 3D

Seafloor

URU

Top Jurassic

Flat Spot ?

Data from TGS and WGP Survey
P-Cable 3D

Seafloor

URU

Top Jurassic

Flat Spot

Broadband Clarifi processing by TGS
P-Cable 3D vs 2D

Area A, Barents Sea: 2D line

www.pcable.com
Conventional seismic

- Mercury well PL614
- Drilled summer 2014
- 10 m gas-filled reservoir
- Stø Fm. Realgrunn sub-group
- Gas find not commercial
- Well plugged and abandoned

Data from TGS and WGP Survey
The crossing P-Cable data line show

- Looks like one base reservoir hard kick

- Reality is an interference between many thin hard's
- Next two tw north is a real hard kicks or flat spots
Shallow Reservoir

Data from WGP Survey

- Trapped Gas
- Gas chimneys
- Flat spot
- Paleocene
- Spill point?
- Plio-Pliocene
- Cretaceous
- Jurassic

www.pcable.com
Shallow Gas (URU)

Data from WGP Survey, URU = Upper Regional Unconformity
Shallow Gas | Bright Spots

Data from WGP Survey

www.pcable.com
Gas seepage from URU to seafloor suggested from P-Cable data.
Inline from the Barents Sea;
glacial deposits (1), URU (2), westward dipping Paleogene sediments (3) and shallow gas (4)
Data from UiT, active fluid leakage on the Vestnesa Ridge, Svalbard Barents Sea.
Conclusions

P-Cable has been successfully used in the Barents Sea for 10 years by academia and industry

This HiRes 3D technology is useful for Shallow Reservoir Mapping and Geohazard Predictions by the industry and Academia in the Barents Sea

- Seafloor and shallow geomorphology
- Shallow reservoir and source rocks
- Hydrocarbon seep anomalies
- Site surveys and geohazards
- New insights into shallow geology
Thank You!