

Lansdowne

oil & gas

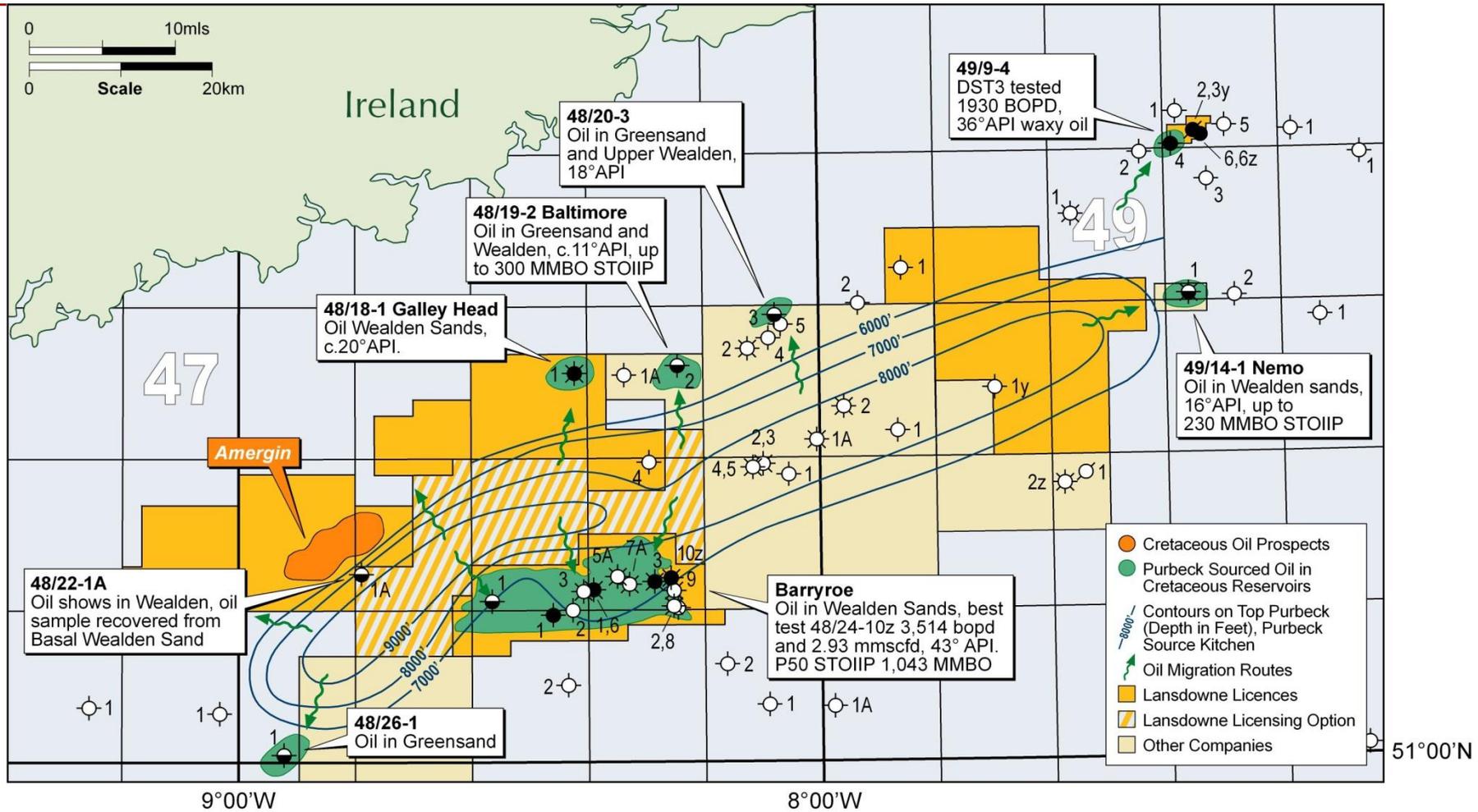
Dr Tim Wright

Improved Seismic Imaging in the
North Celtic Sea Basin



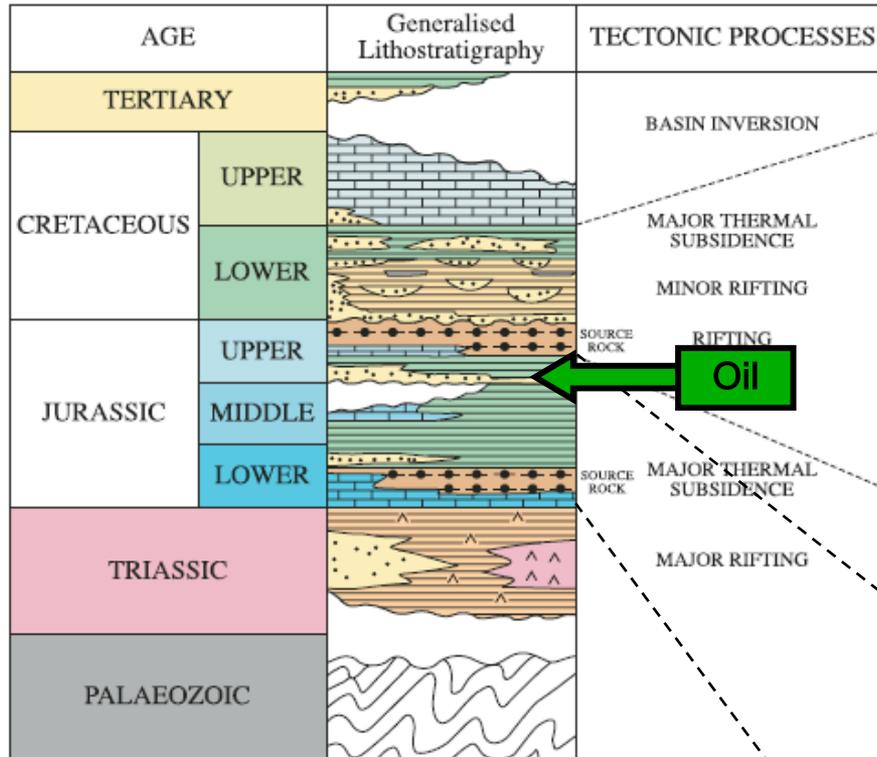
Lansdowne
oil & gas

North Celtic Sea Basin Cretaceous Oil Fairway



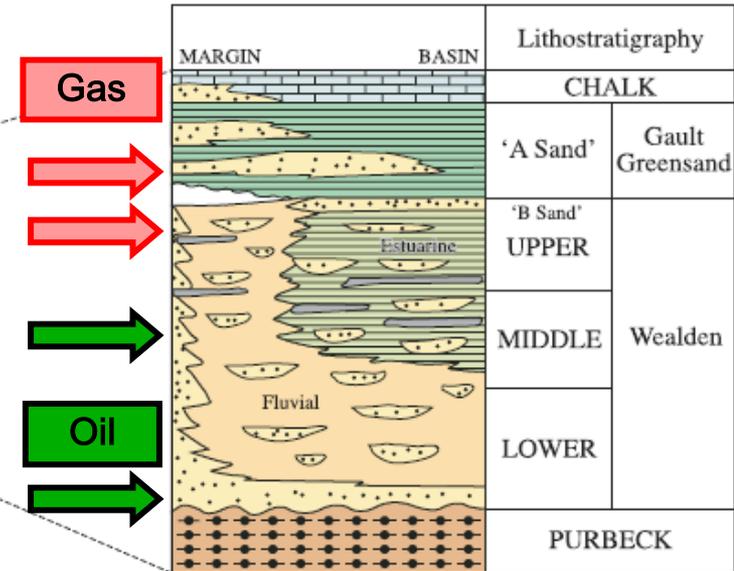
Celtic Sea – Proven Petroleum Systems

Celtic Sea Stratigraphy



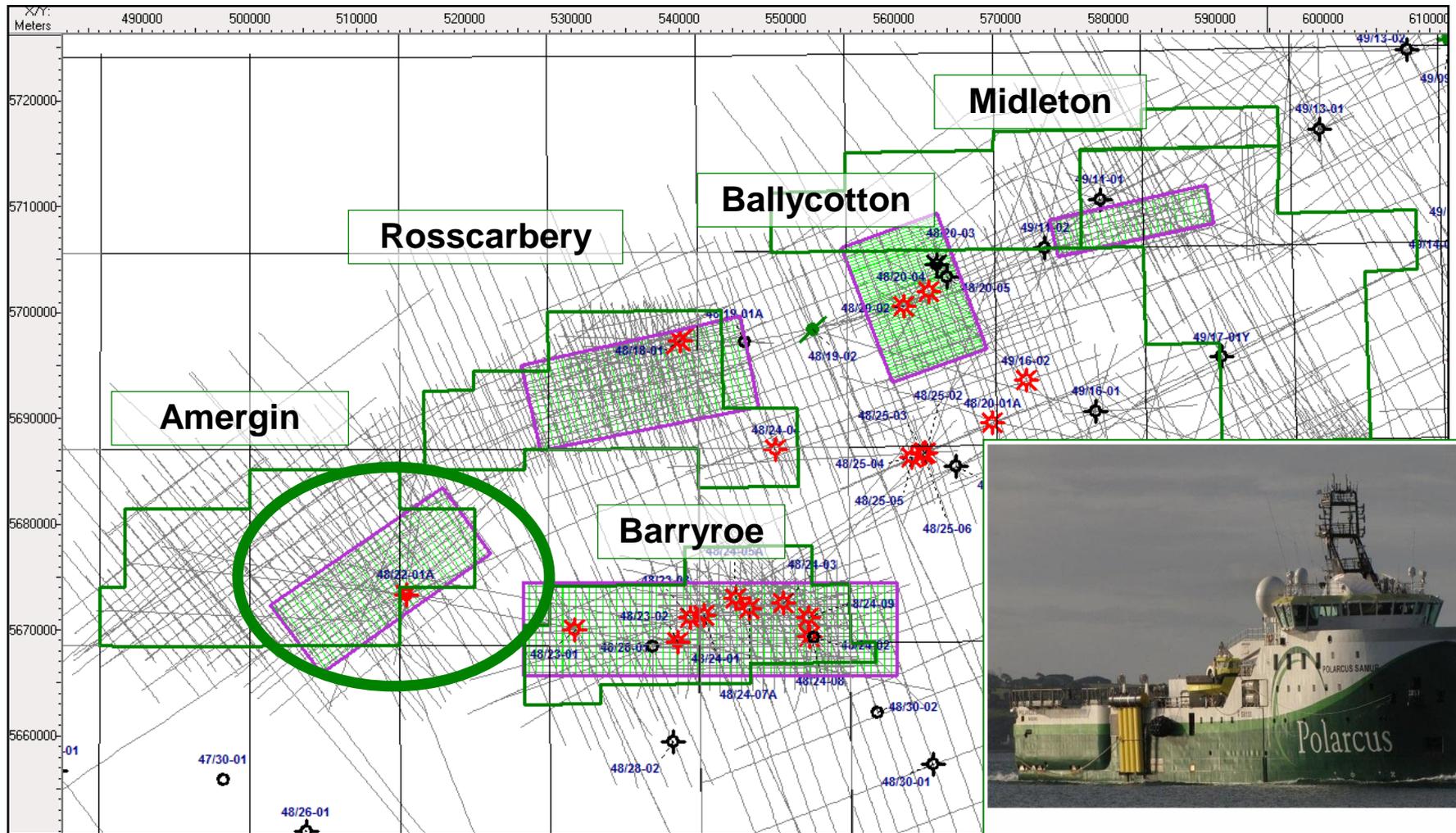
After Shannon (1991), Rowell (1995) and O'Sullivan (2001)

Cretaceous Oil & Gas



<i>Jurassic Oil</i>	
Trap	Extensional fault blocks
Seal	Kimmeridgian/Purbeck shales
Reservoir	Oxfordian – Callovian sandstones Bathonian Limestone and sandstones Sinemurian sandstones
Source	Liassic shales

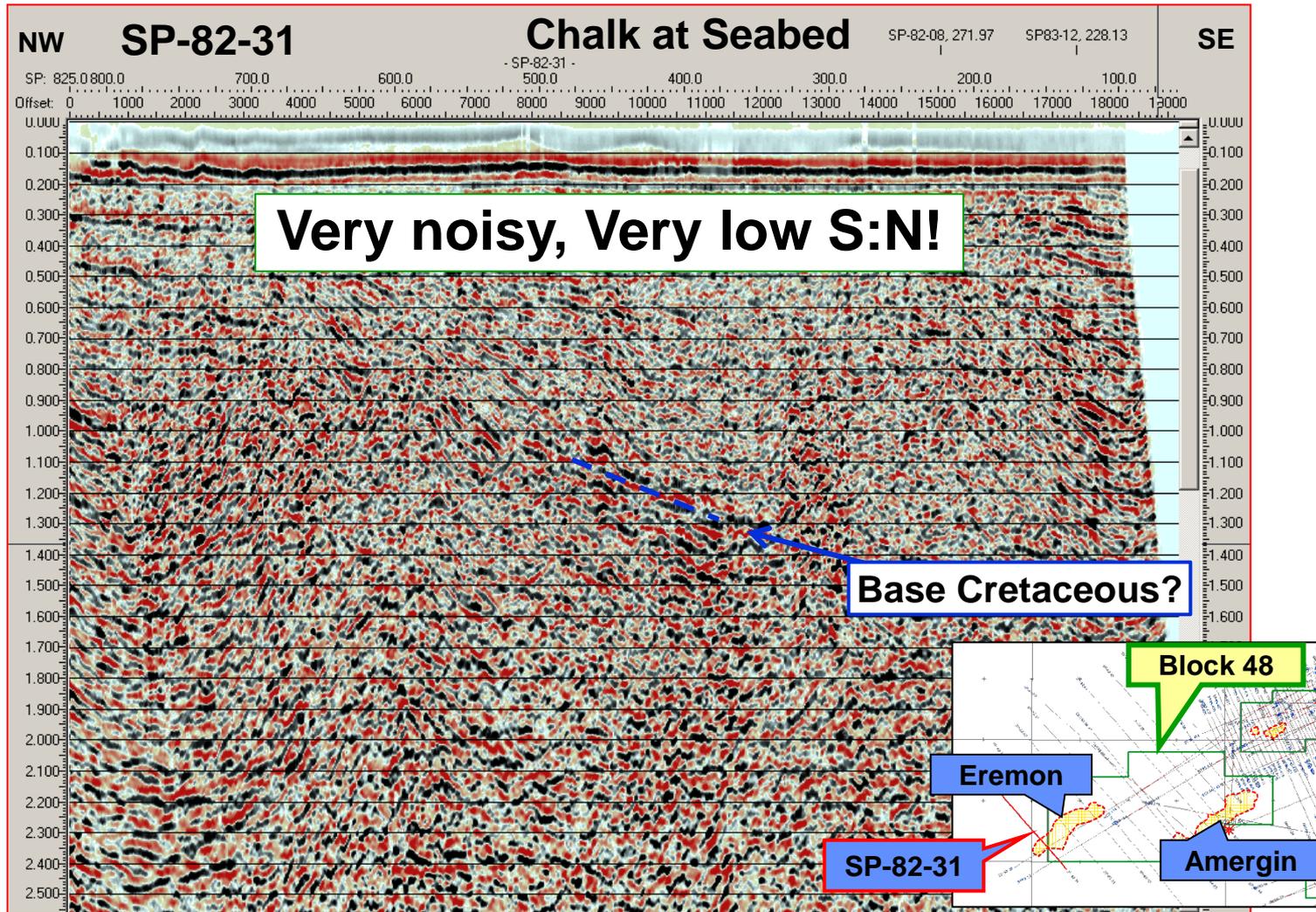
Lansdowne Seismic Database



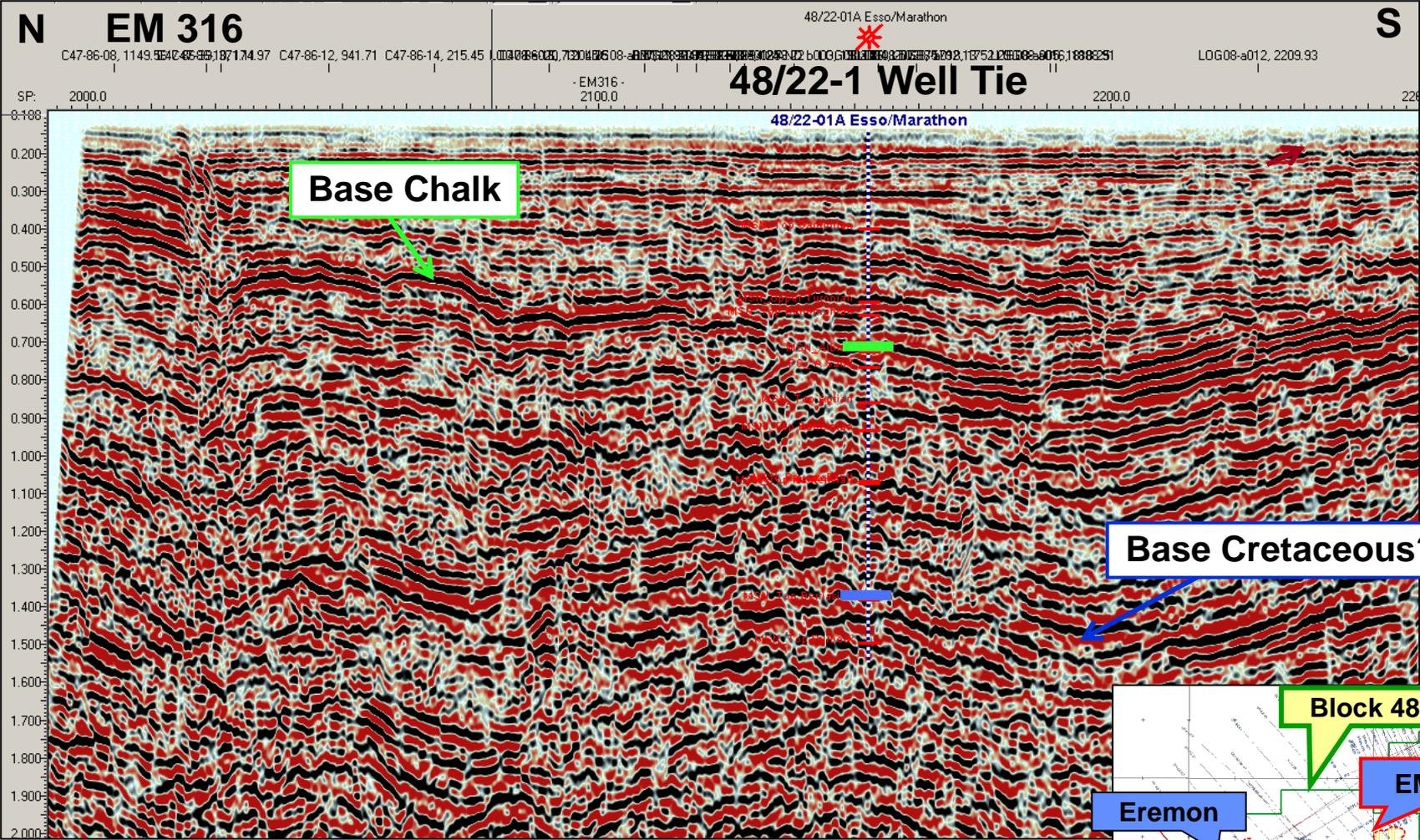
Polarcus Samur

Lansdowne
oil & gas

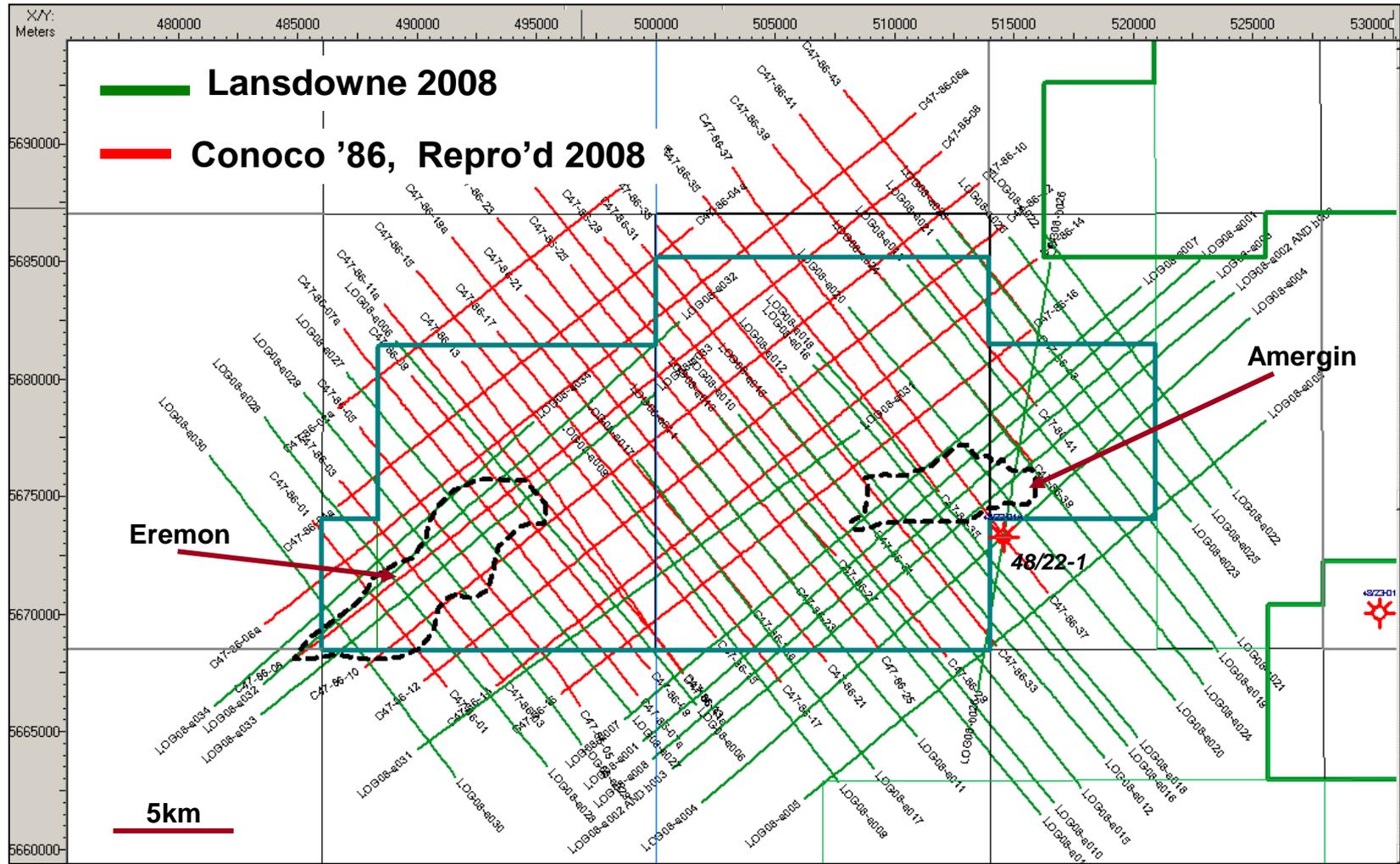
Amergin Area 1982 Vintage Dip Line (NW-SE)



Amergin Area c.1977 Dip Line (48/22-1a)

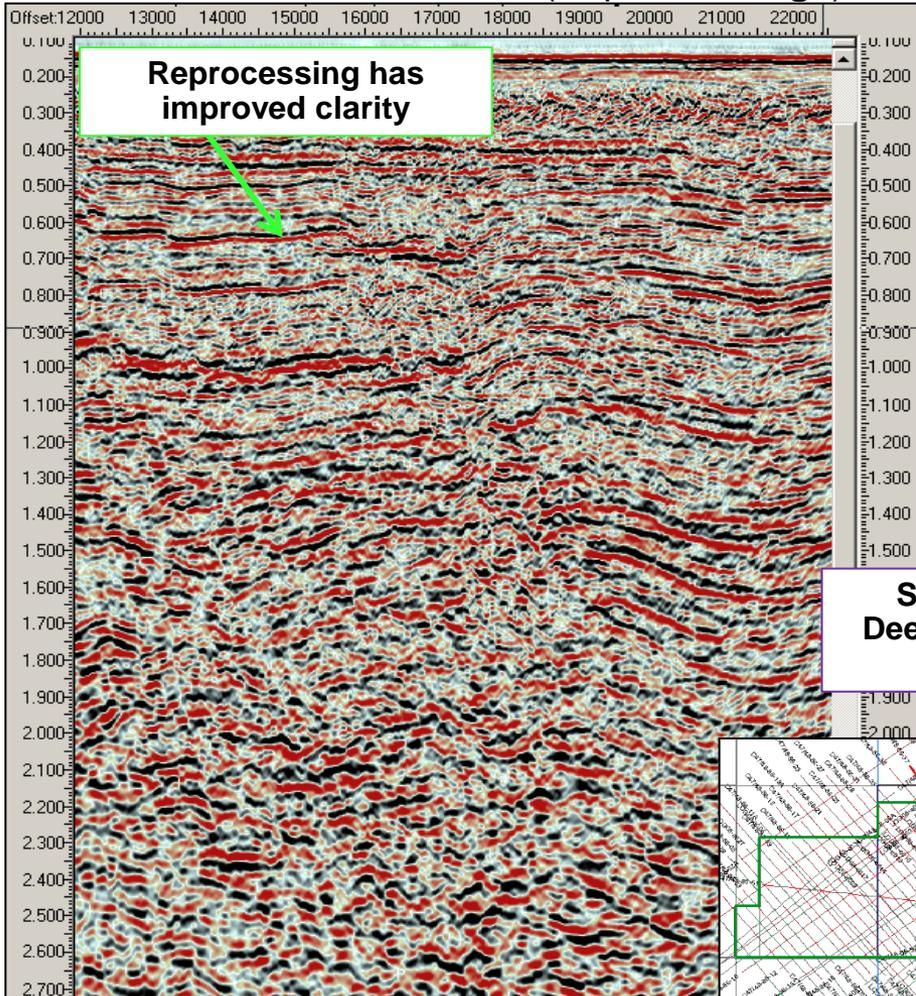


Lansdowne 2D Seismic Database (Amergin)

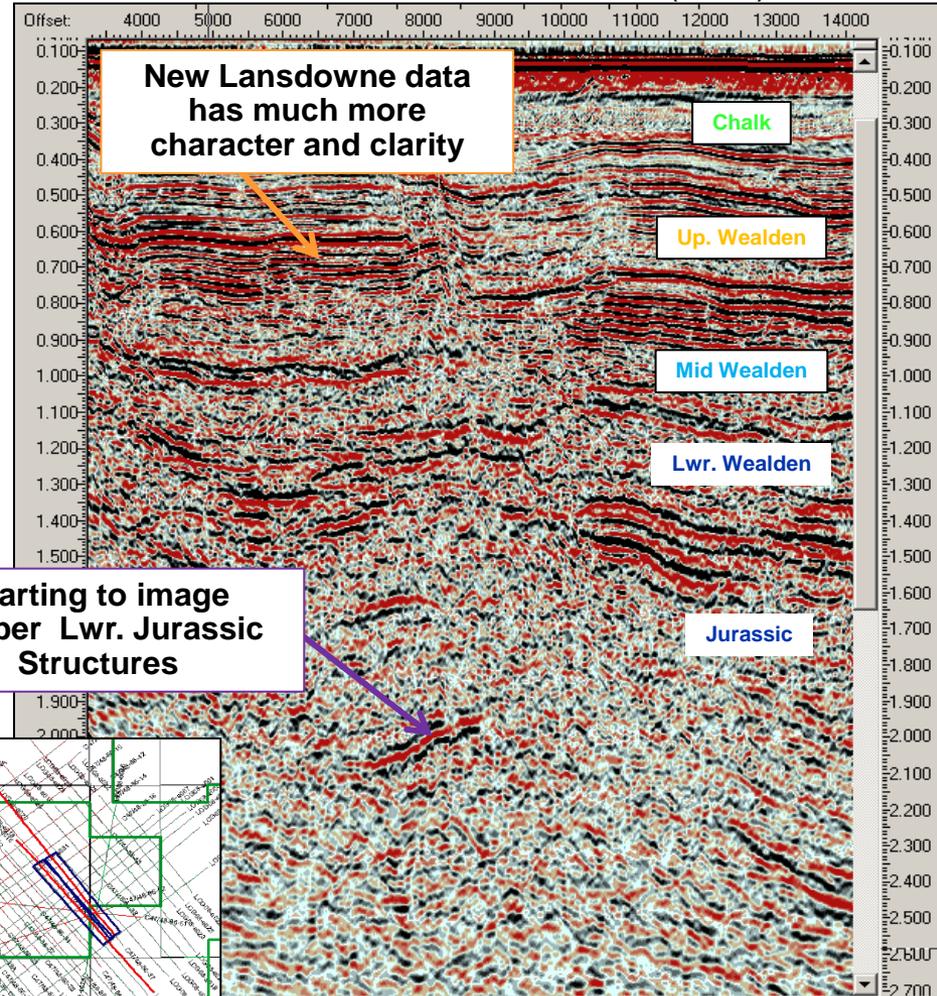


Direct Comparison 1986 vs 2008 (PSTM)

Conoco C47-48-86-37 (Repro'd Vintage)



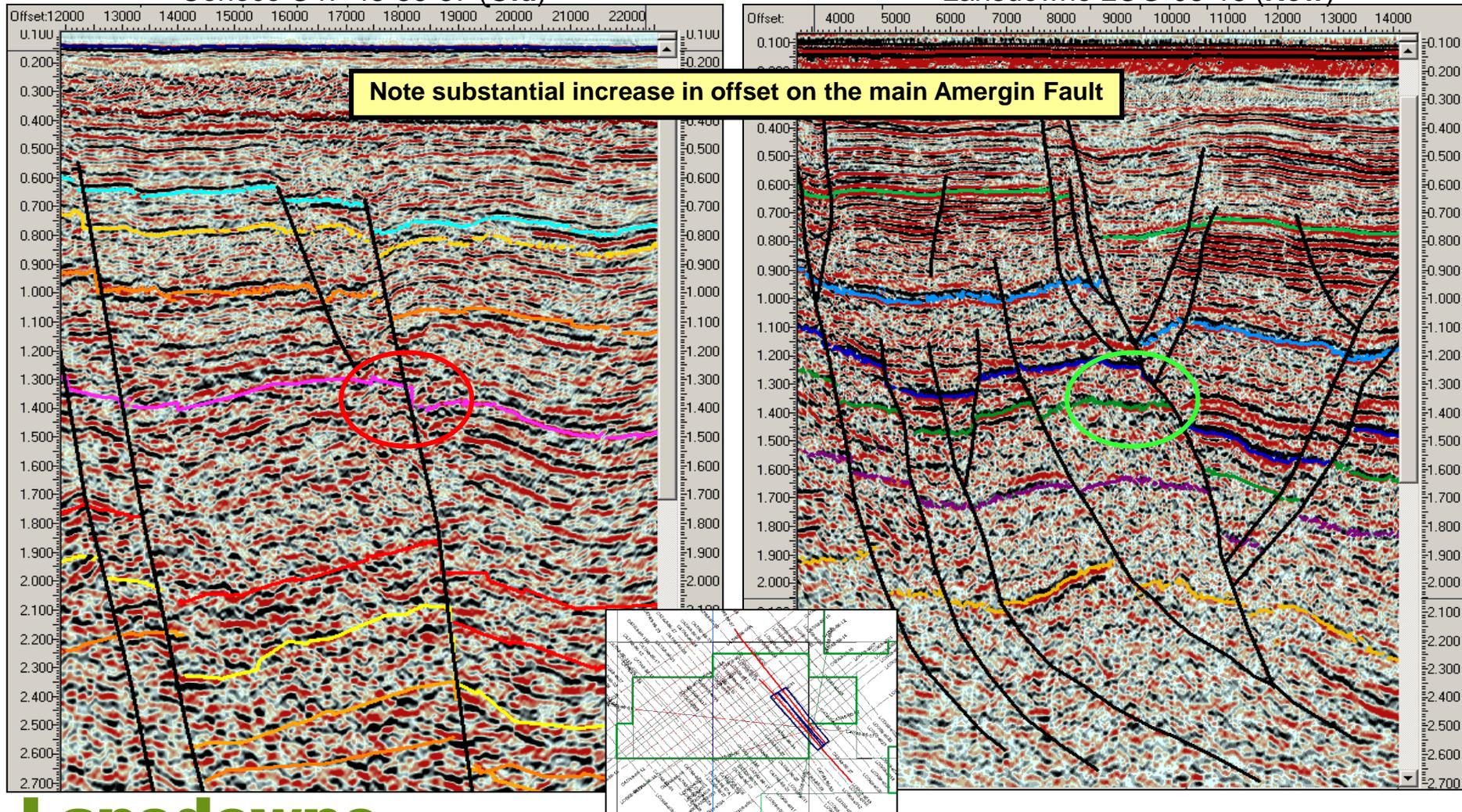
Lansdowne LOG-08-18 (New)



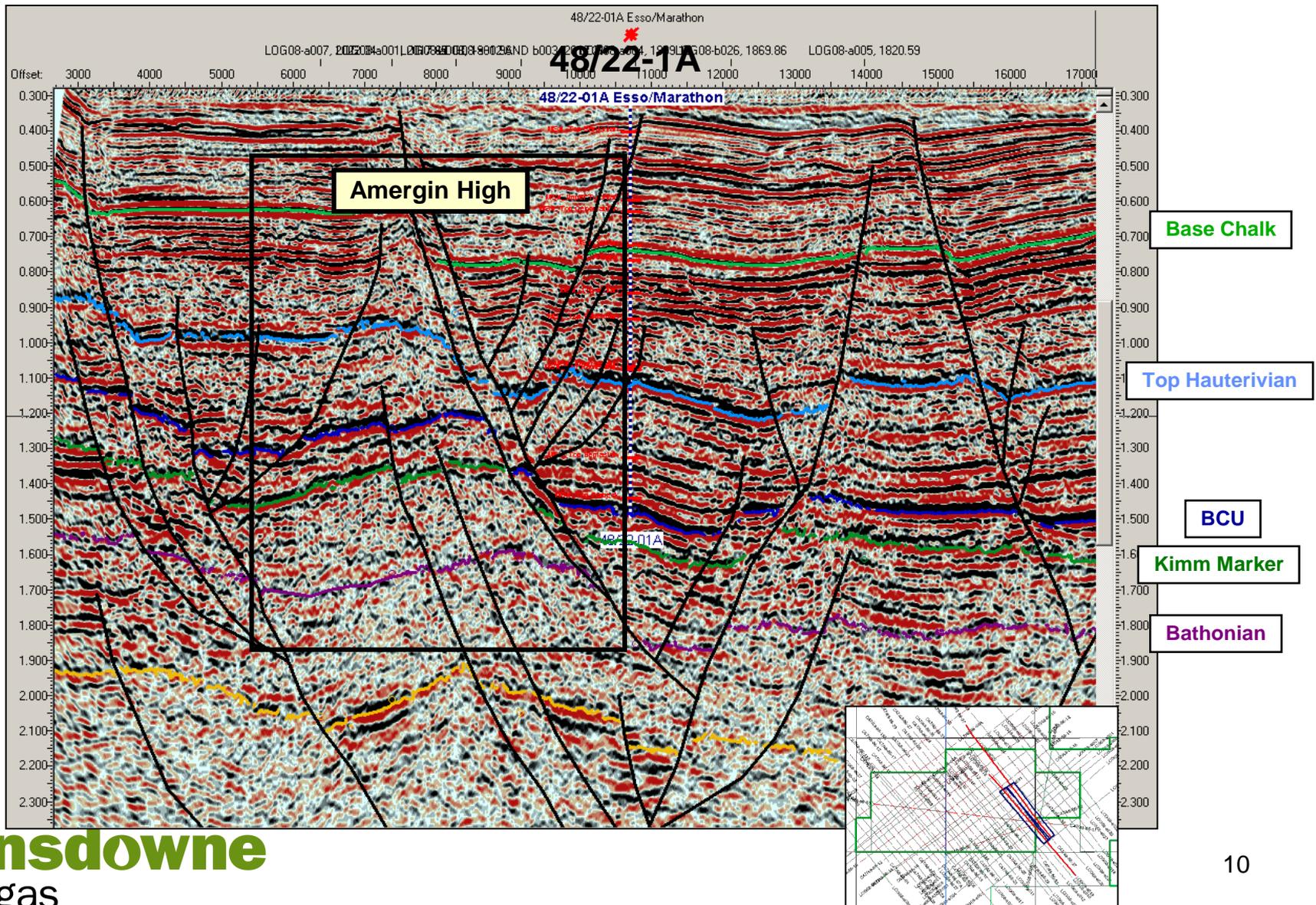
Direct Comparison-Interpreted (Lines C37 & L18)

Conoco C47-48-86-37 (Old)

Lansdowne LOG-08-18 (New)

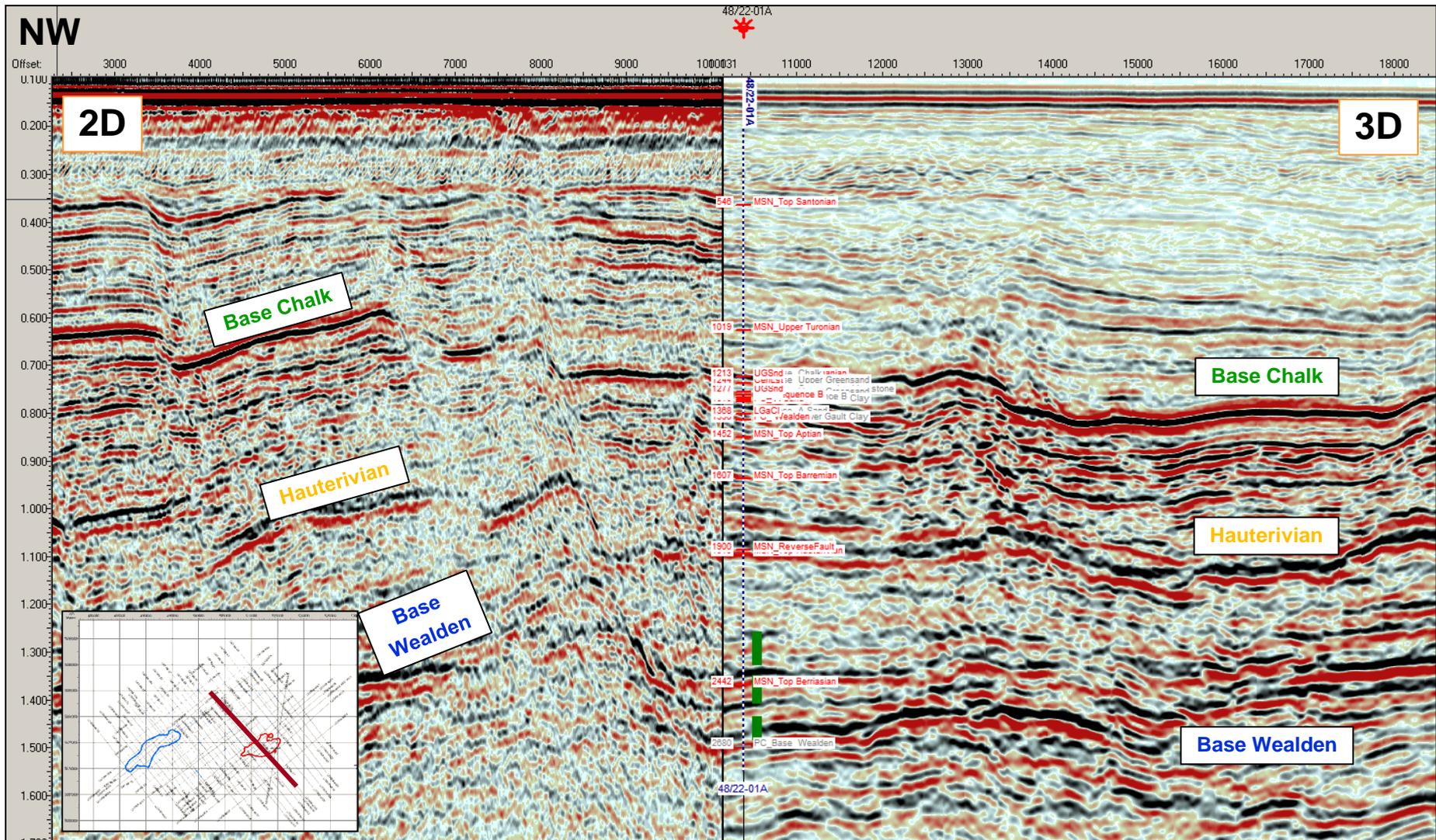


Representative LOG 2008 2D Profile



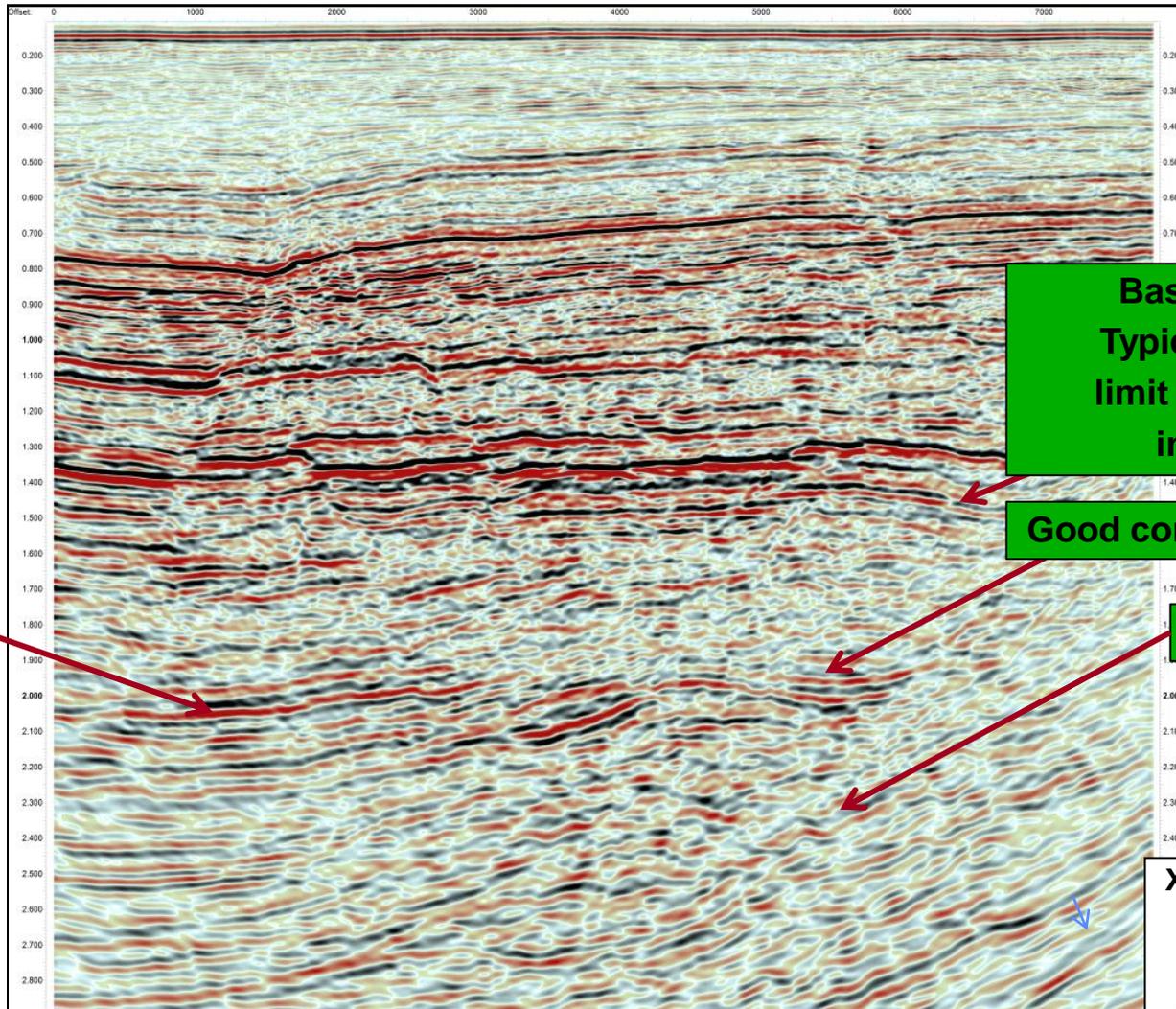
Lansdowne
oil & gas

LOG 2008 2D vs. LOG 2012 3D ties



Lansdowne
oil & gas

3D Data imaging to >2.8s TWT!

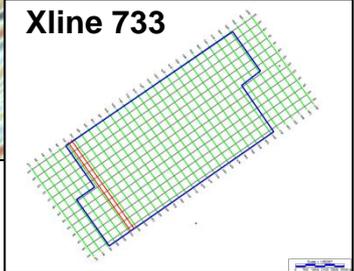


Mid & Lwr
Jurassic

Base Cretaceous
Typically the lower
limit of good clarity
in the NCSB

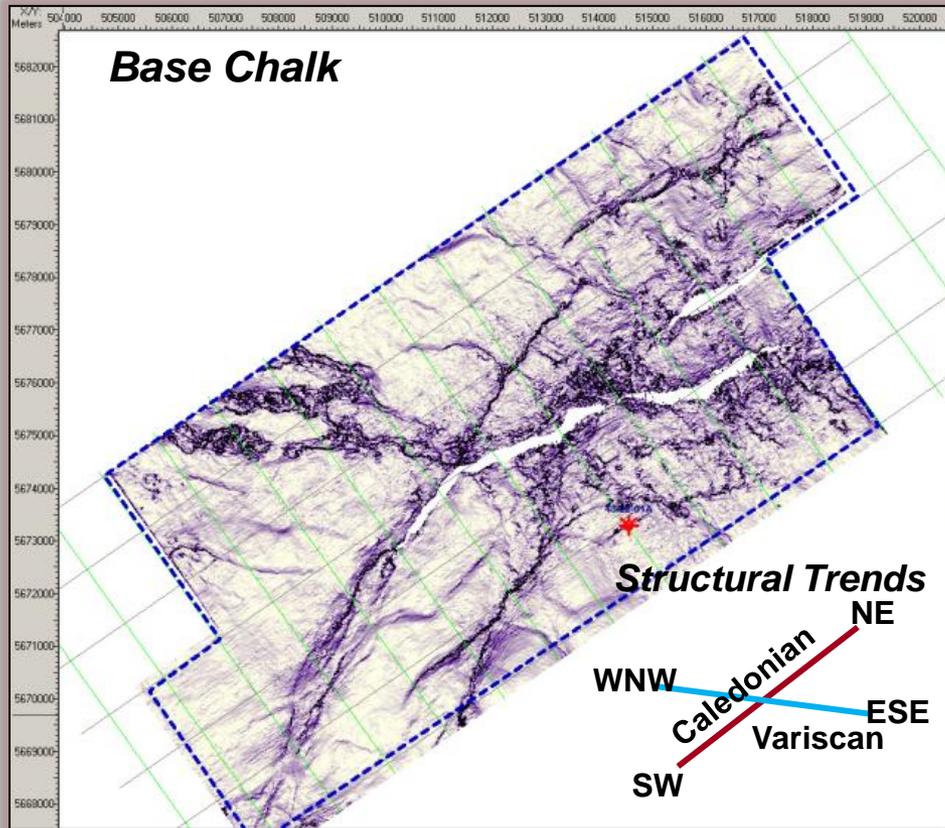
Good continuity of character

Fault



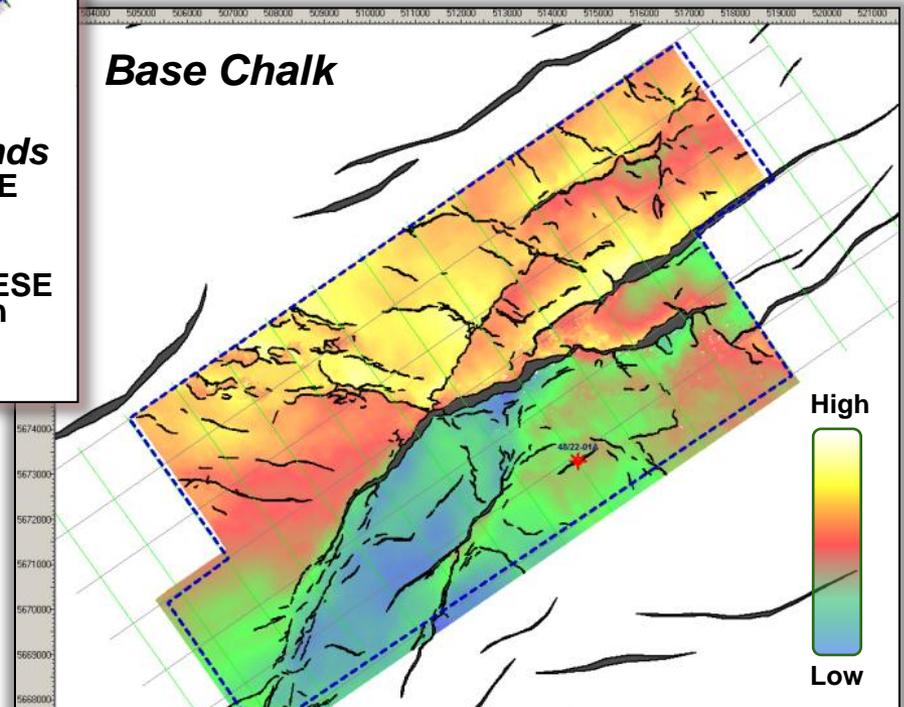
Lansdowne
oil & gas

Amergin 3D structural interpretation (2012)

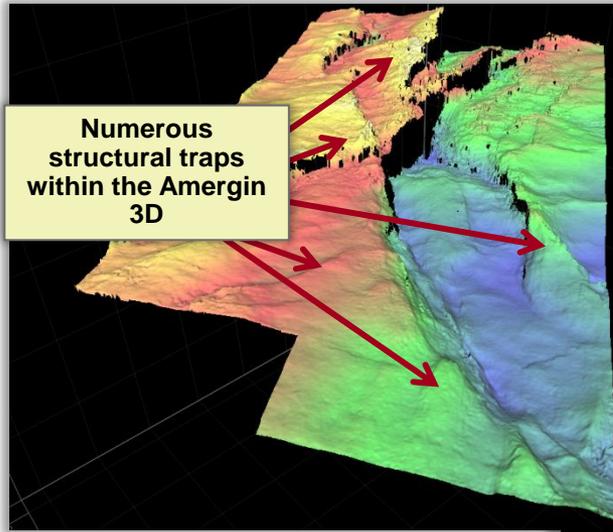


Dip maps generated from high resolution 3D horizon interpretation used to define structural boundaries)

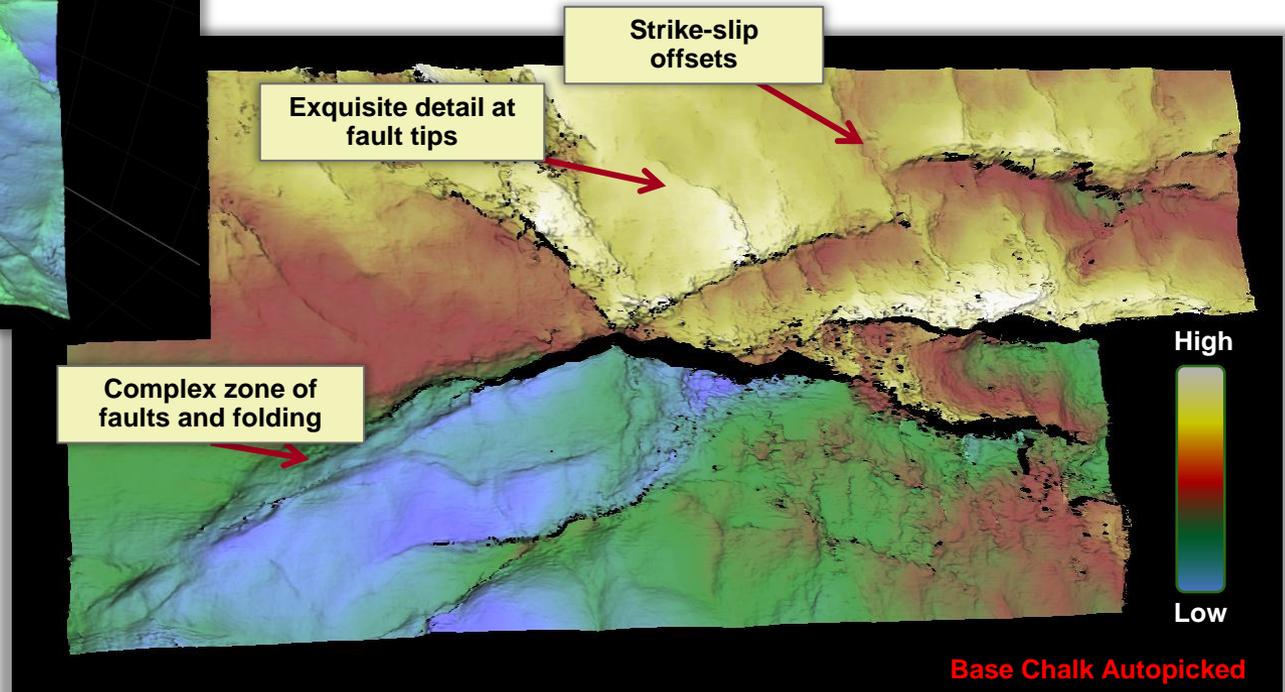
Able to produce detailed structural maps enabling greater control over spill points and gross rock volume calculations.



Example illuminated 3D Base Chalk:



Illuminated images improves appreciation of structural trends resulting in more realistic interpretation of fault networks and linkages



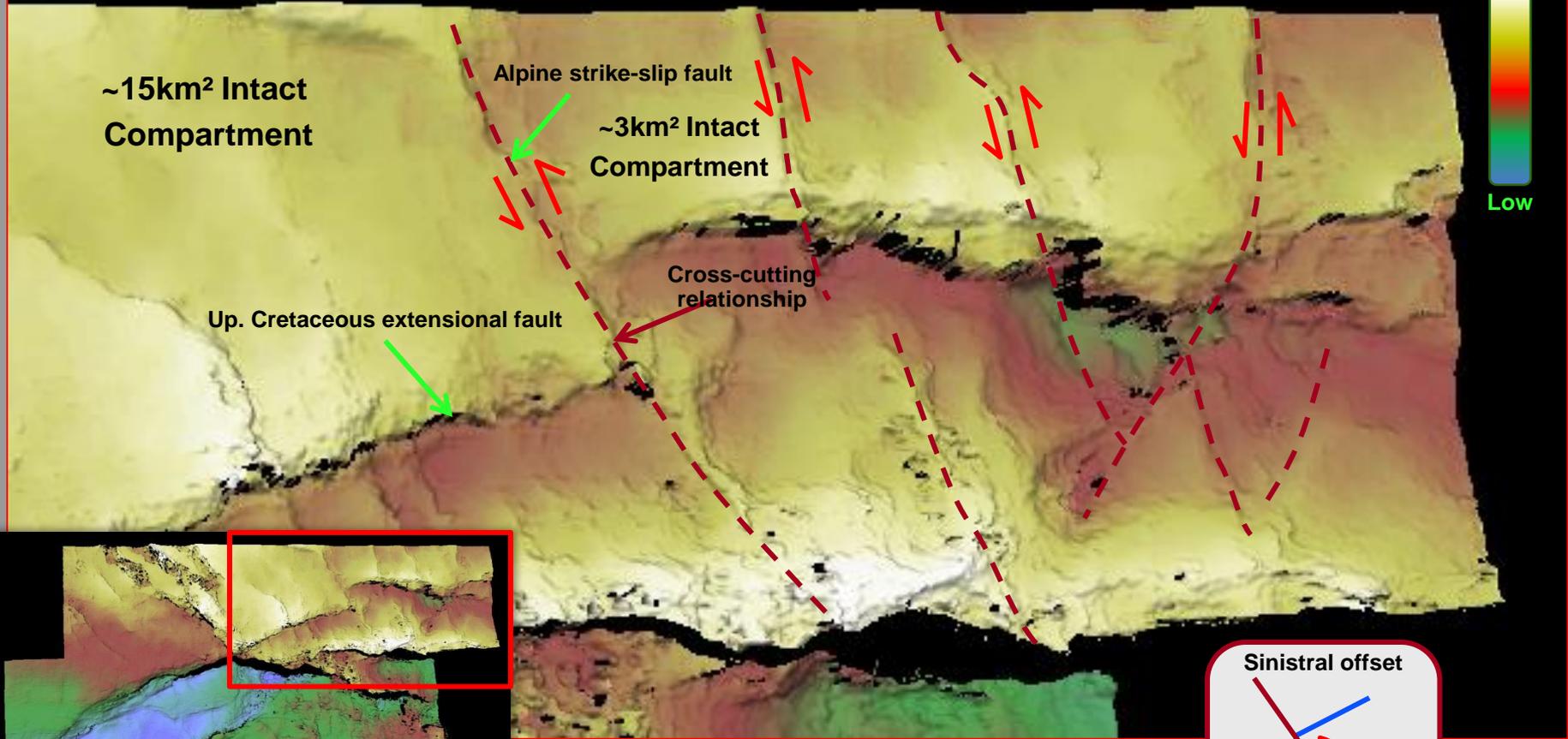
Structural Trends



Precise interpretation has revealed new details of structure in the Celtic Sea including strike slip offsets which are rarely if ever visible in 2D data

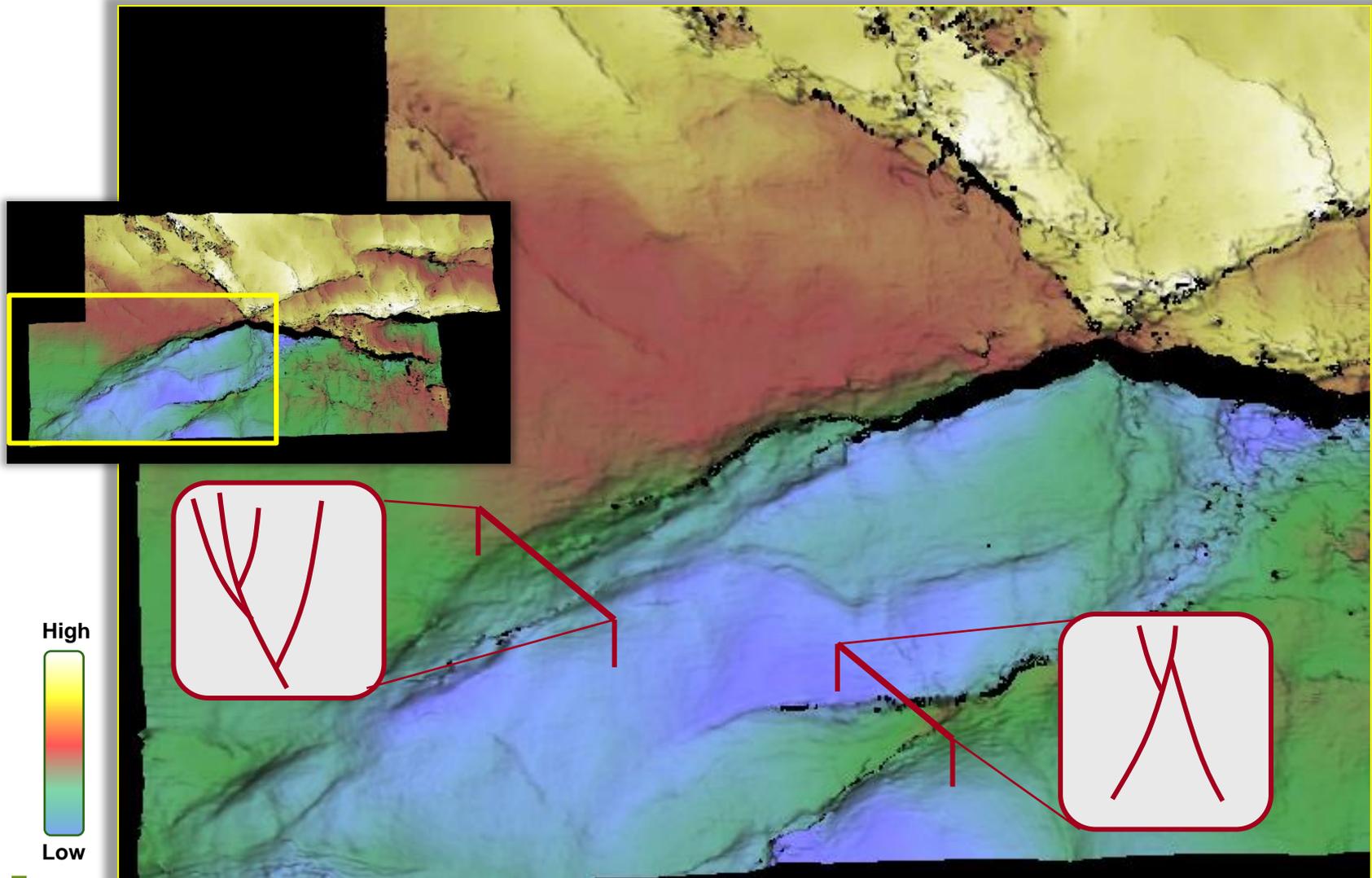
Close-up: Faulting & Folding in the Amergin 3D

Base Chalk



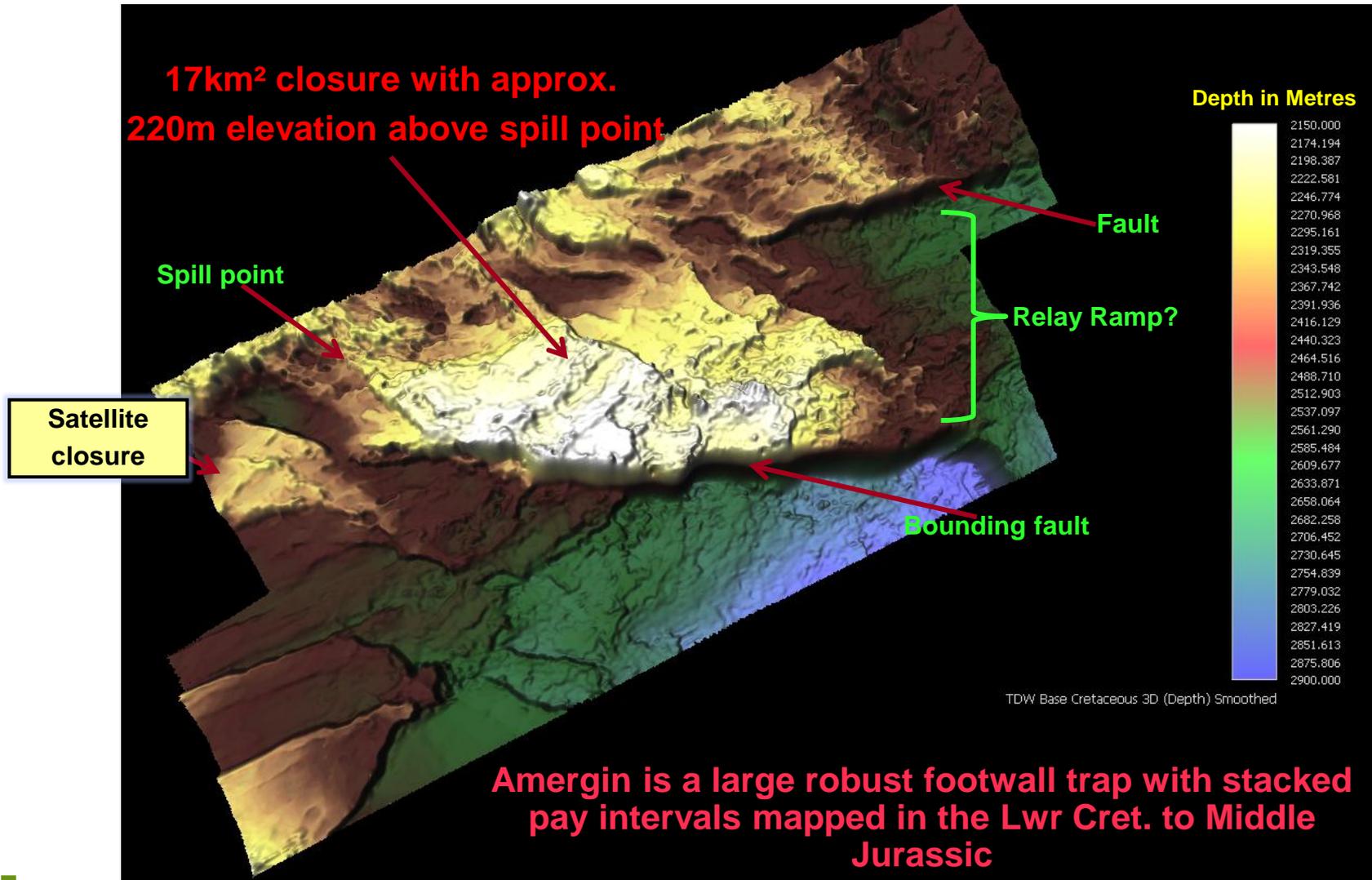
Lansdowne
oil & gas

Close-up structure (Base Chalk)



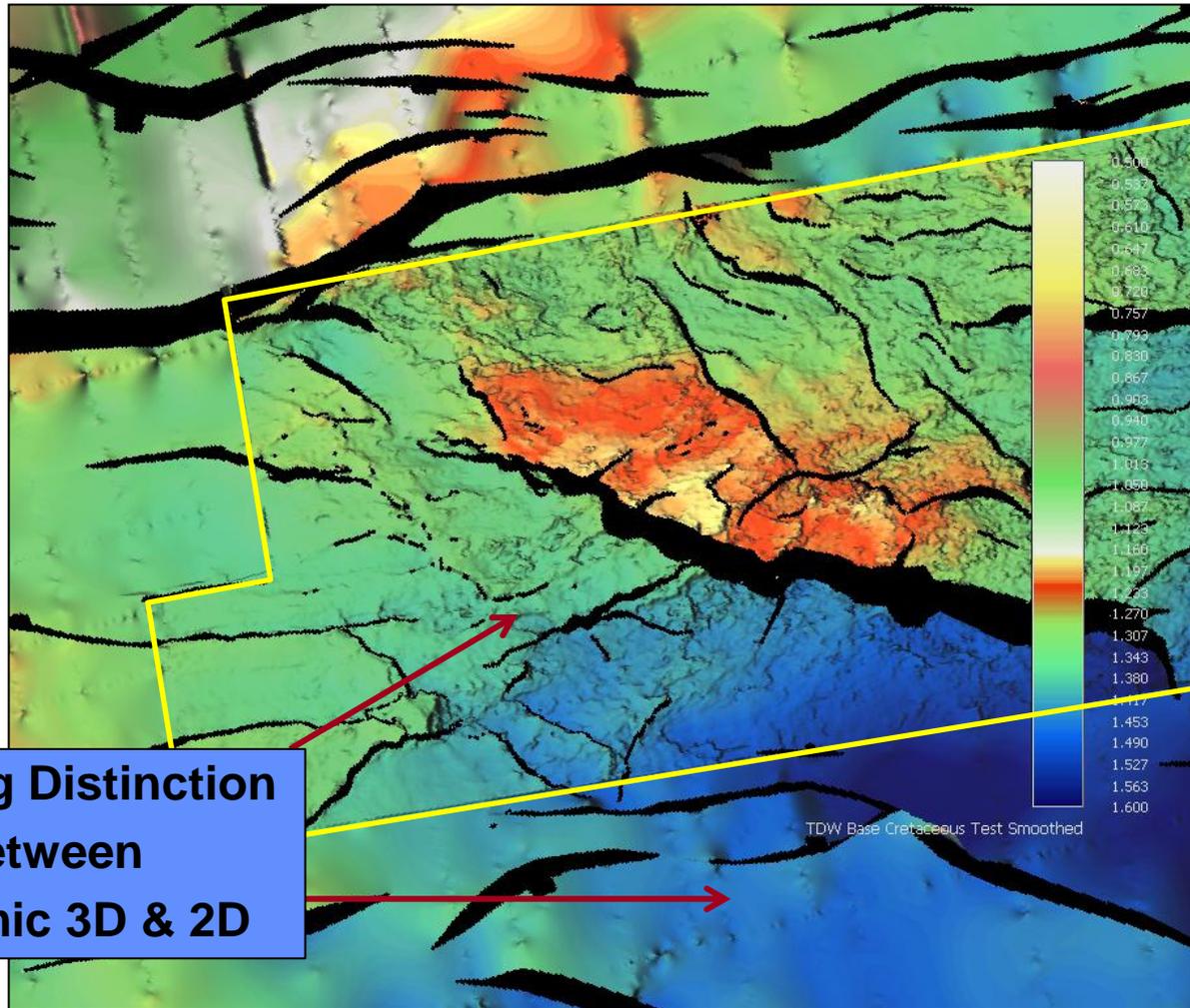
Lansdowne
oil & gas

Amergin Base Wealden Sands (2012 3D)

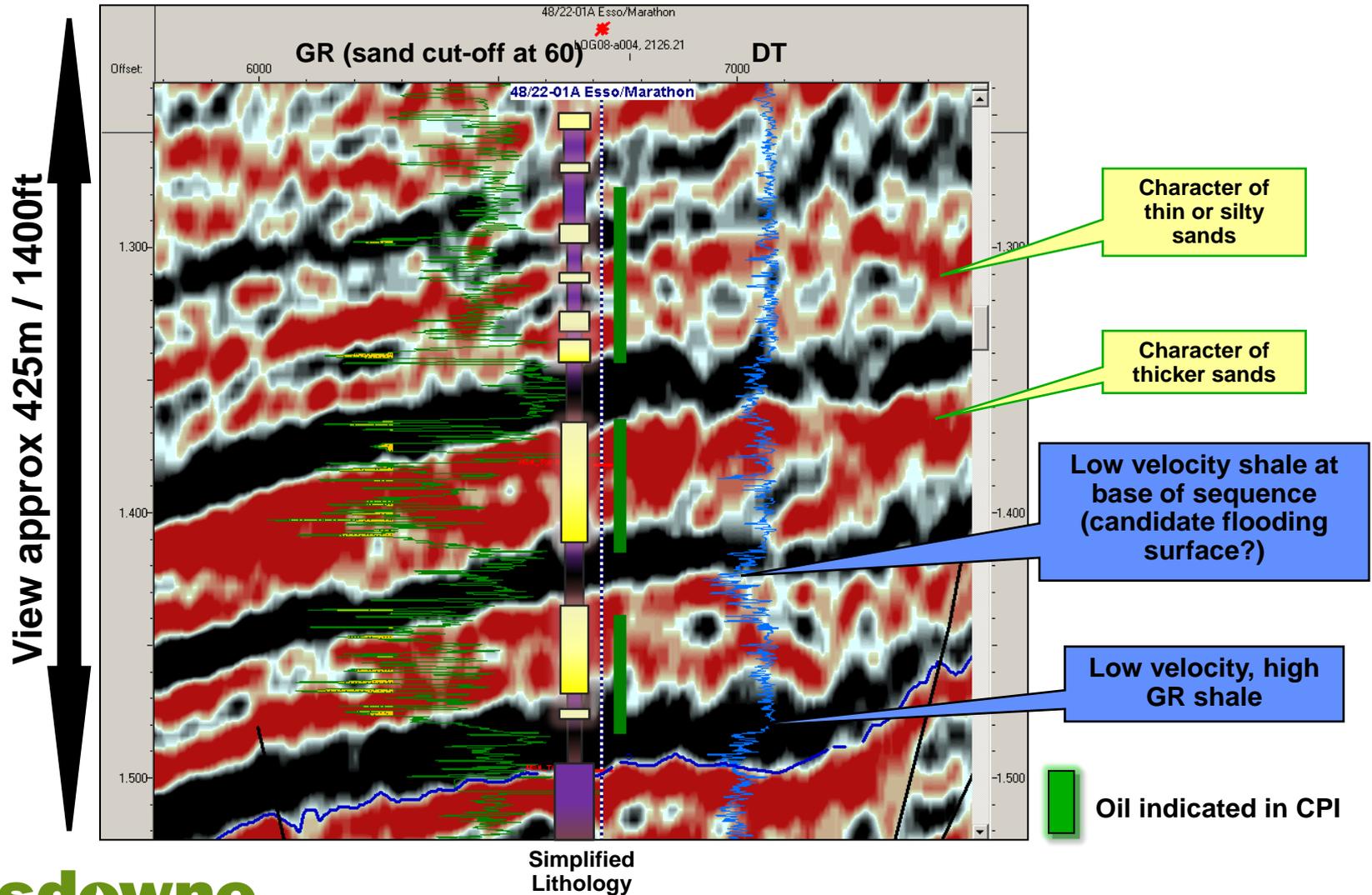


Lansdowne
oil & gas

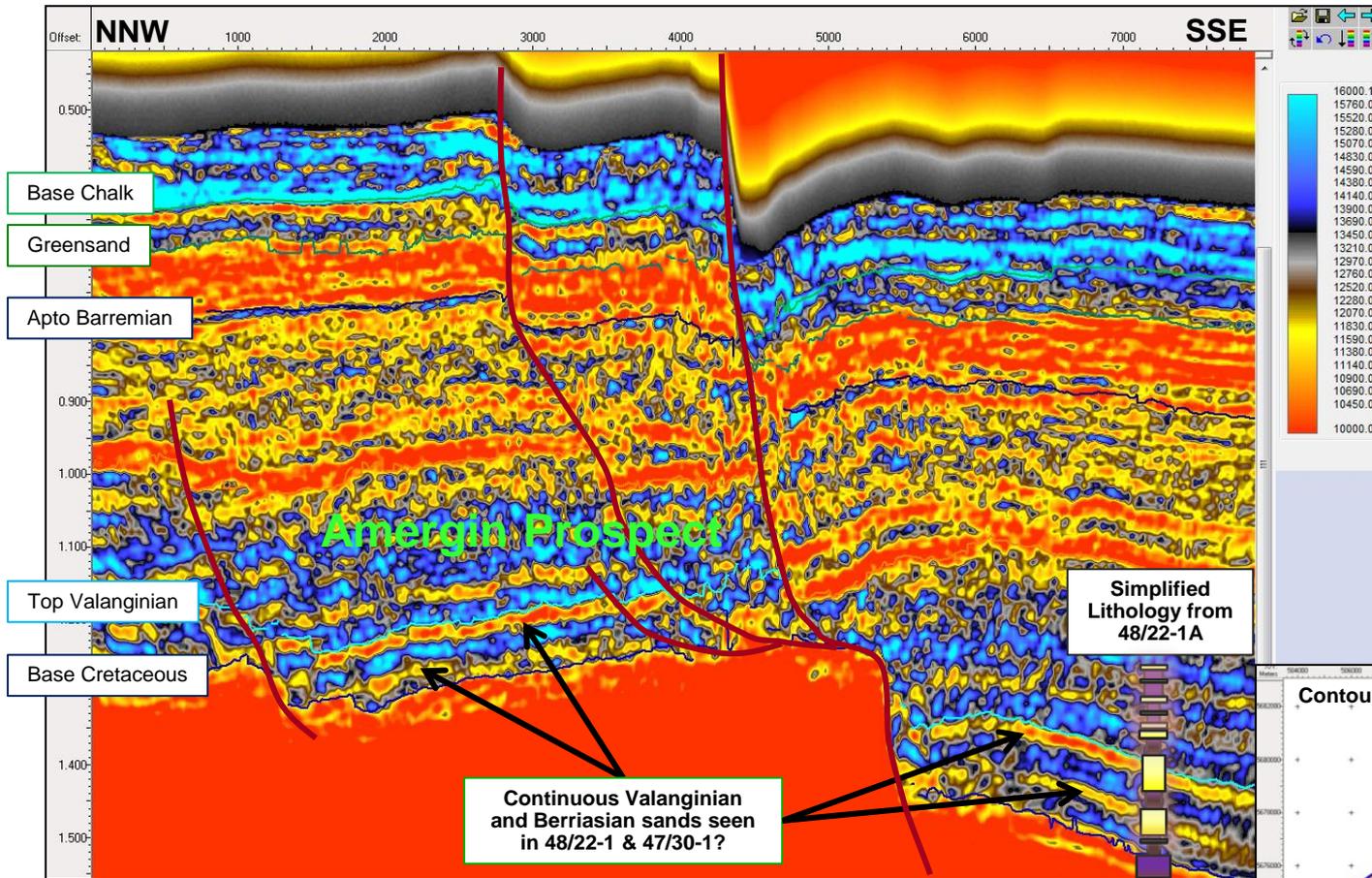
Base Wealden (2D + 3D)



Base Wealden: Close-up well tie, 48/22-1A



Amergin Inversion Ψ (-55°)

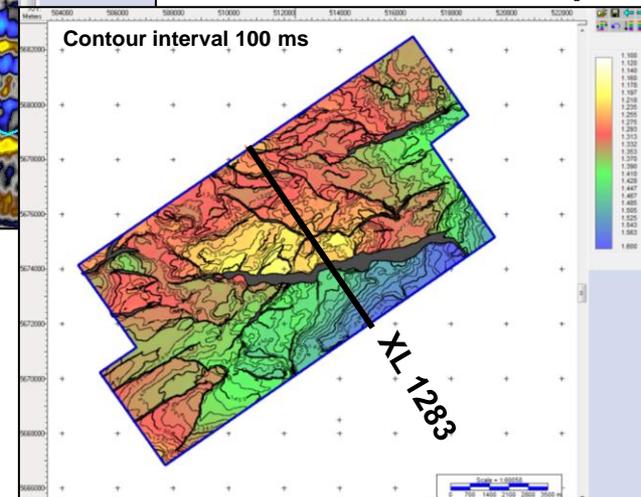


Ψ (-55°) primarily functions as a lithology indicator

(Ψ Psi is a projection in the acoustic impedance–shear impedance domain)

Lansdowne
oil & gas

Base Wealden TWT Map



Conclusions

- **Advances in acquisition and processing of seismic data in the NCSB have dramatically improved:**
 - **Seismic image quality**
 - **Structural definition at key reservoir intervals**
 - **Our ability to image deeper unexplored targets in Lower Cretaceous and Jurassic oil plays**
- **The work undertaken by Lansdowne has:**
 - **Significantly reduced exploration risk**
 - **Demonstrated the value of high quality 3D seismic in unlocking the true potential of the NCSB**