

Lansdowne

oil & gas

The North Celtic Sea Basin: A Resurgent Proven Hydrocarbon Province

Ireland Oil & Gas Summit
2013



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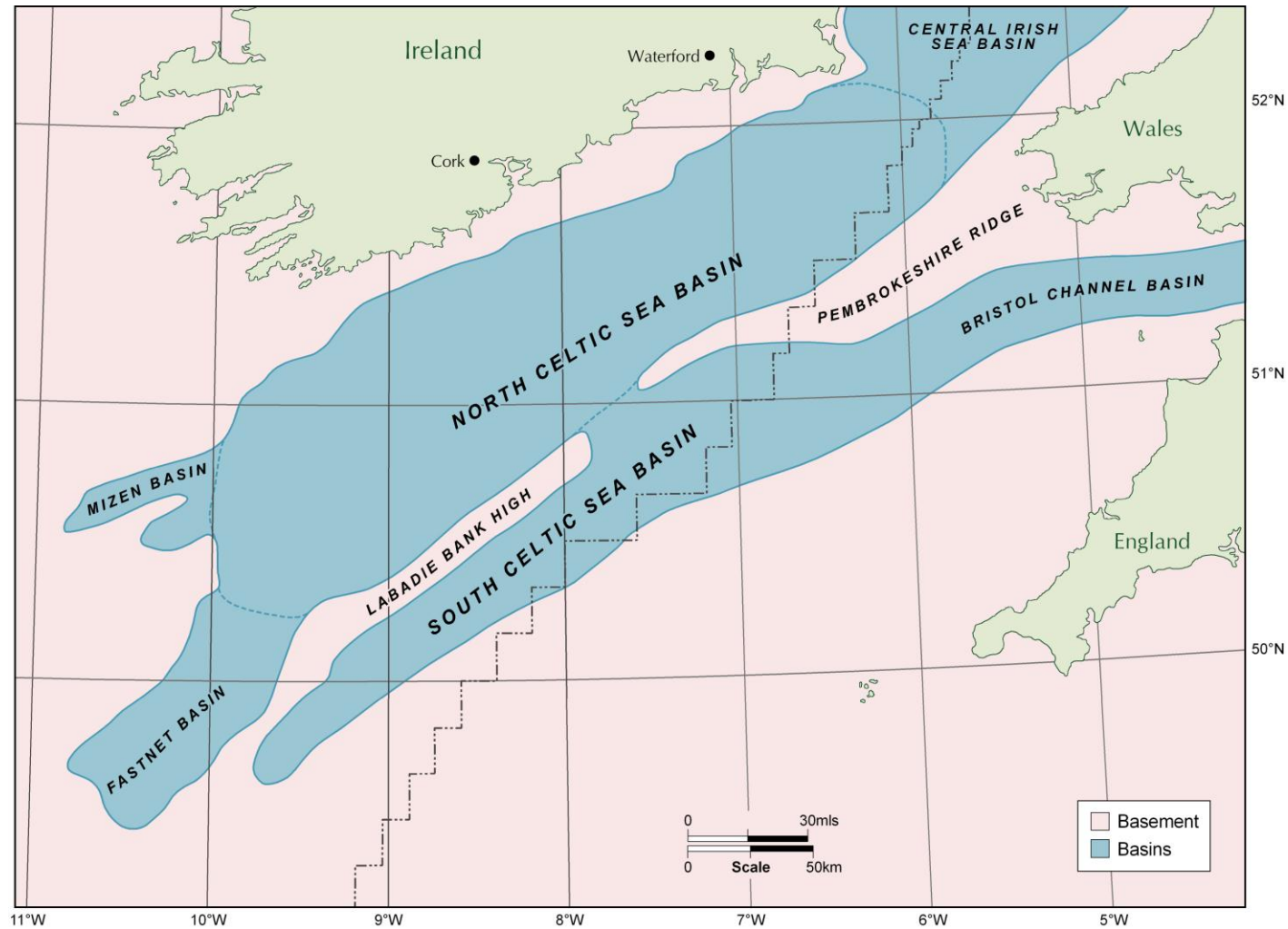
Key Points

- Proven Petroleum Systems
- Underexplored
- Resurgent Activity

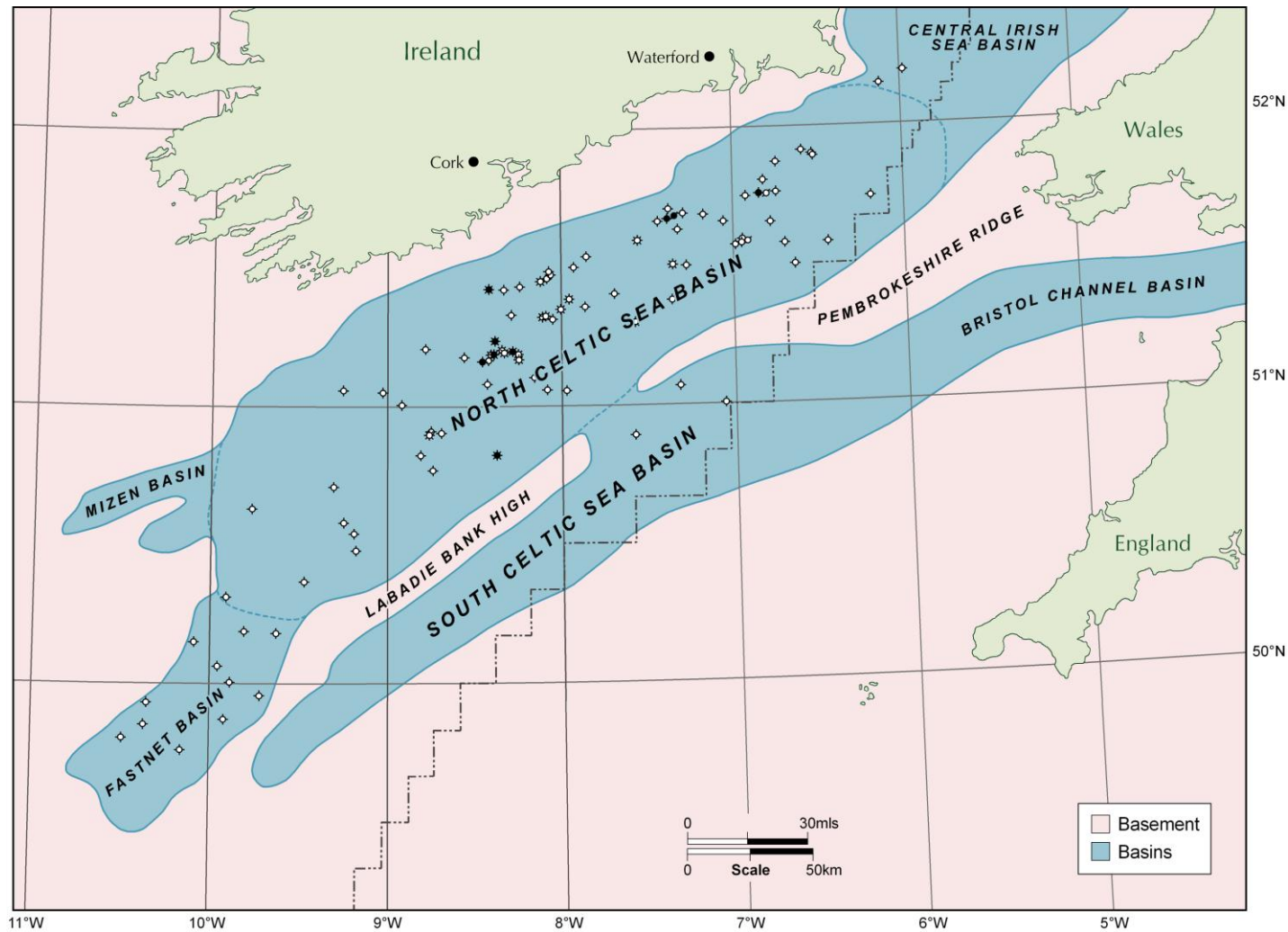
Key Points

- Proven Petroleum Systems
 - Basin Definition
 - Stratigraphy
 - Source rocks
 - Reservoir rocks
 - Petroleum Systems


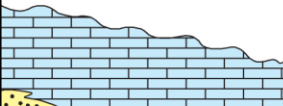
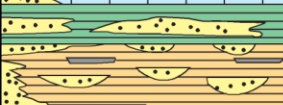
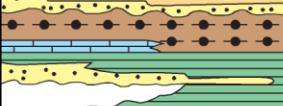
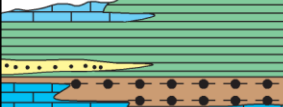



North Celtic Sea Basin Definition



North Celtic Sea Basin Definition

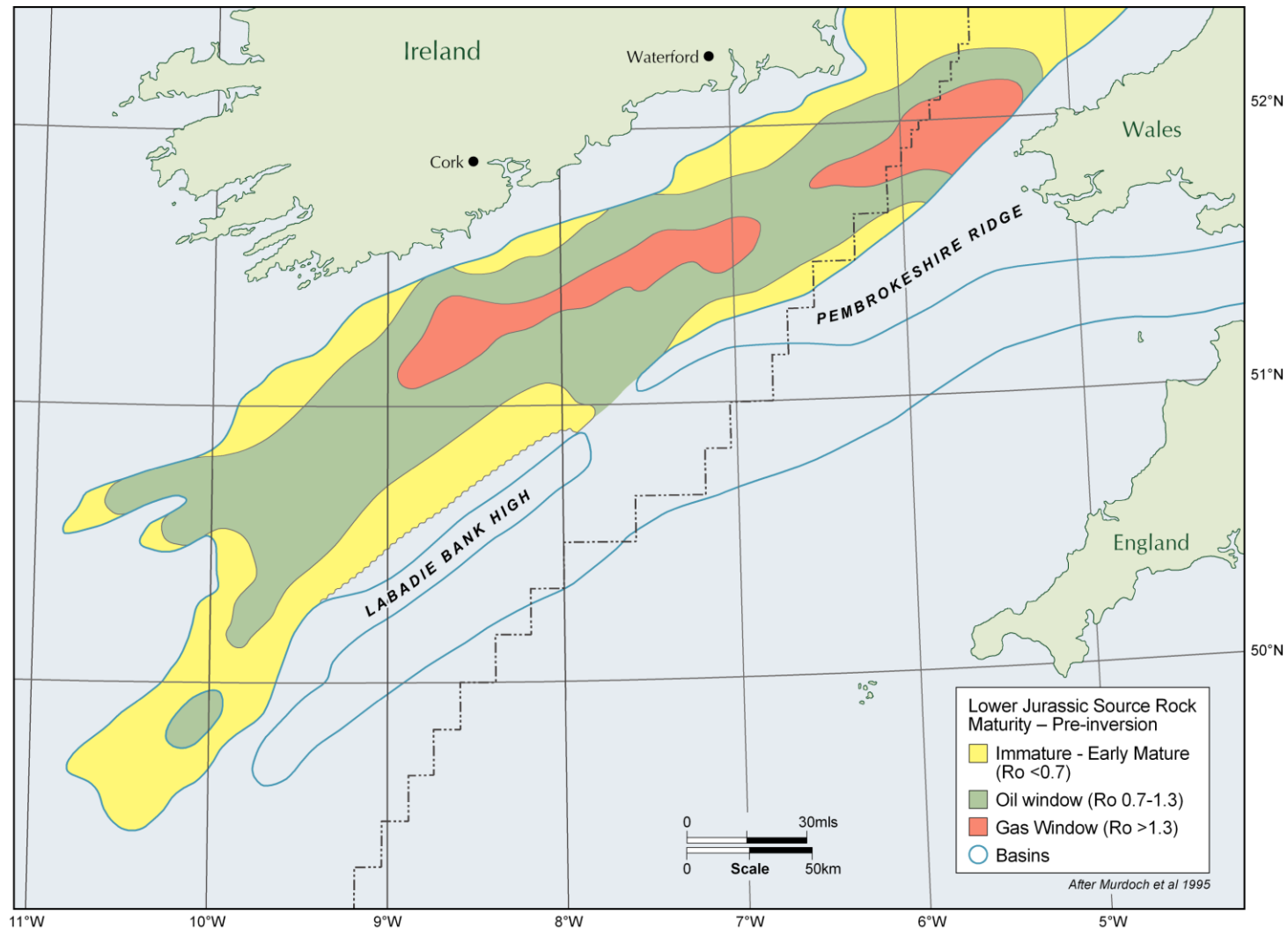


Stratigraphy and Source Rocks

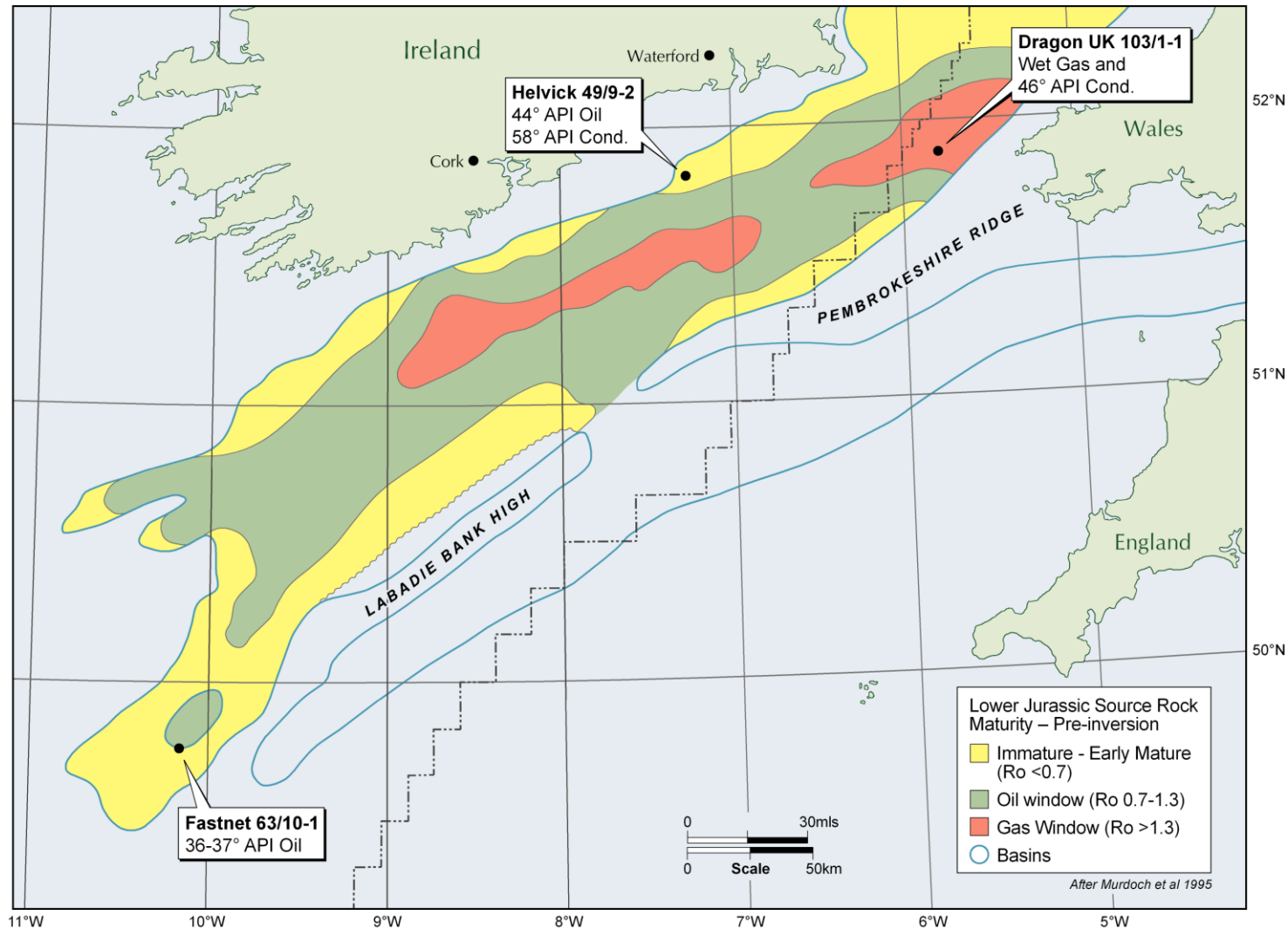
Age		Generalised Lithostratigraphy	Source Rocks	Hydrocarbon Type	Discoveries
TERTIARY					
CRETACEOUS	Upper				
	Lower		Wealden Coals	Biogenic dry gas	Kinsale Head, Ballycotton, Seven Heads Galley Head, Carrigaline, Old Head, Schull
JURASSIC	Upper		Purbeck – Kimmeridgian Lacustrine Shales	Waxy oil	Barryroe, Hook Head, Baltimore, Nemo, 49/9-4
	Middle				
	Lower		Lower Jurassic (Liassic) Marine Shales	"Normal" low wax oil and wet gas / condensate	Helvick Dragon
TRIASSIC					
PALAEOZOIC					

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

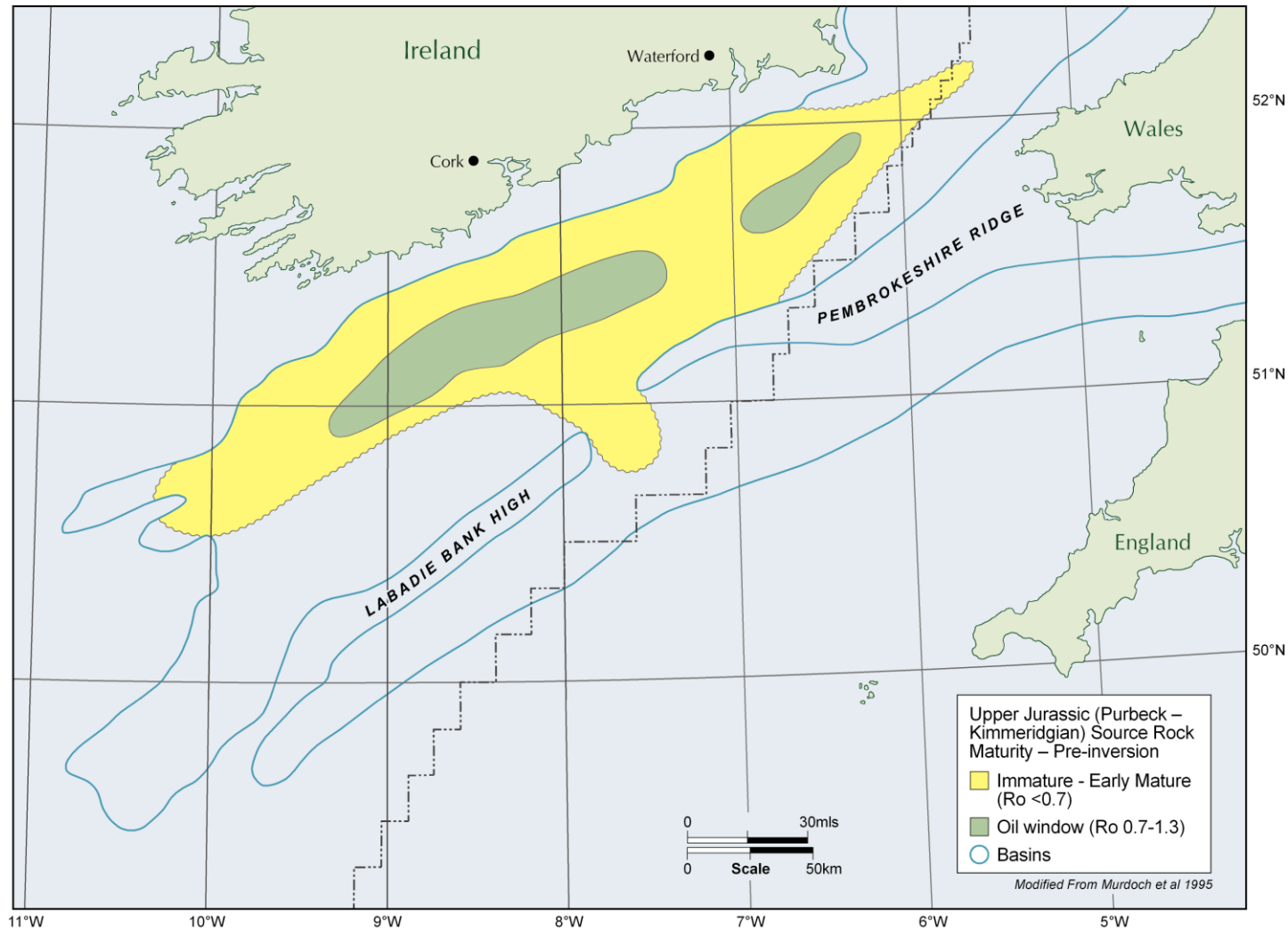
Lower Jurassic Source rocks



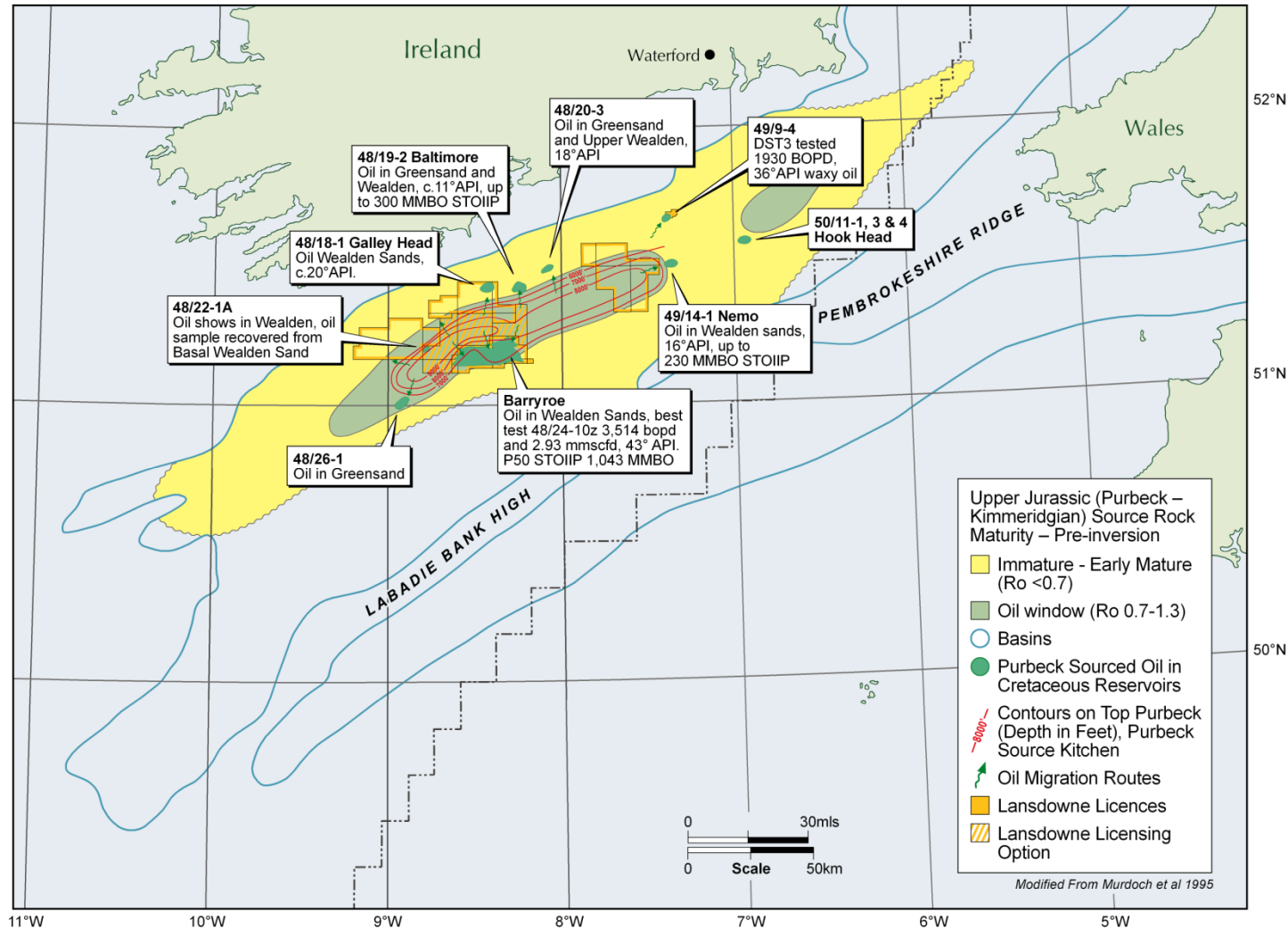
Lower Jurassic Source rocks



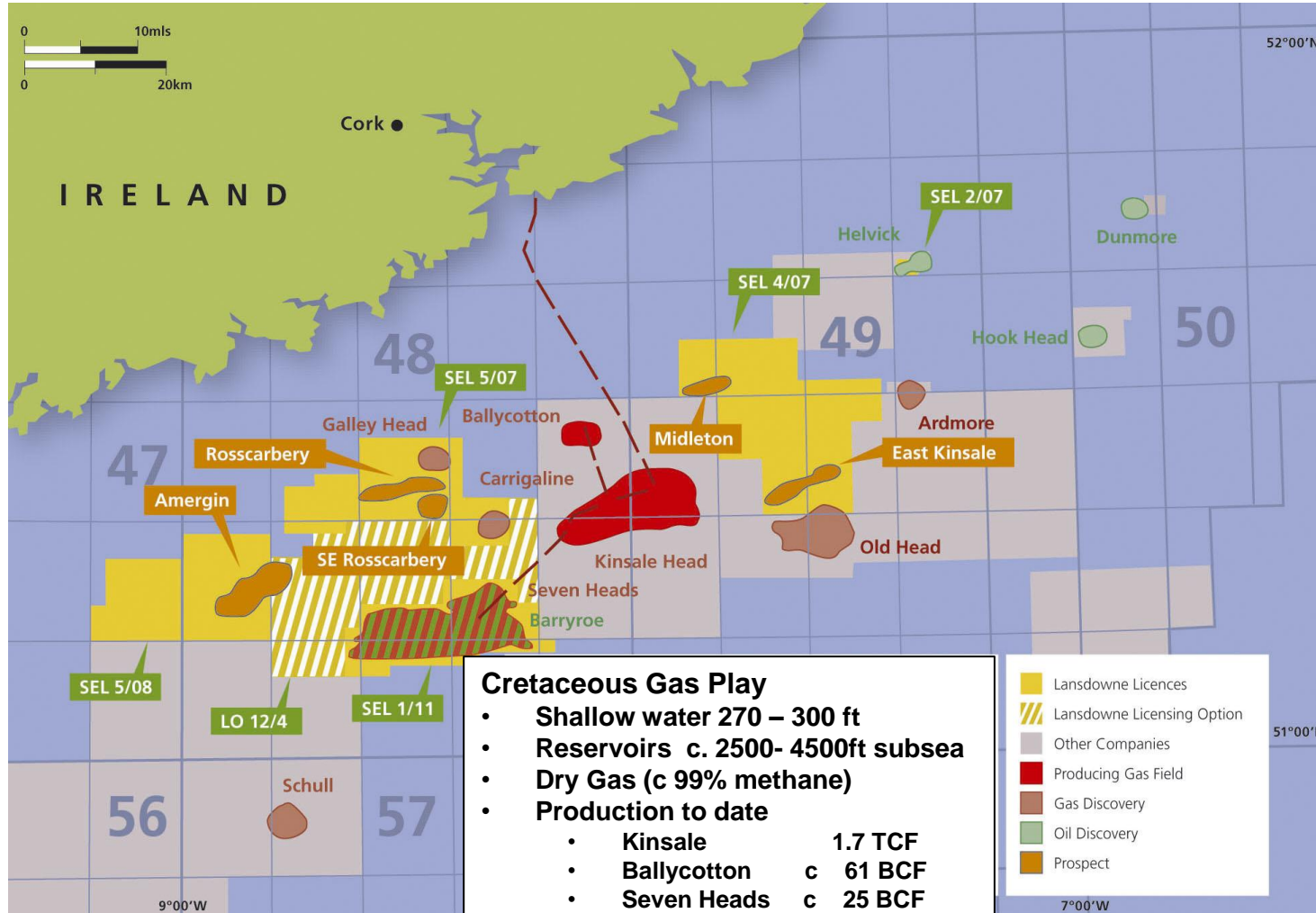
Upper Jurassic Source Rocks




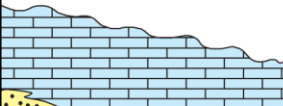
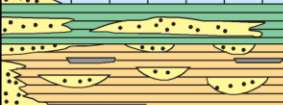

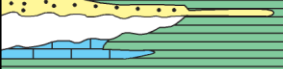
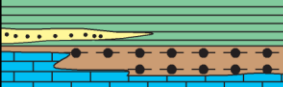
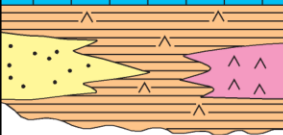

Upper Jurassic Source Rocks



Cretaceous Gas Play



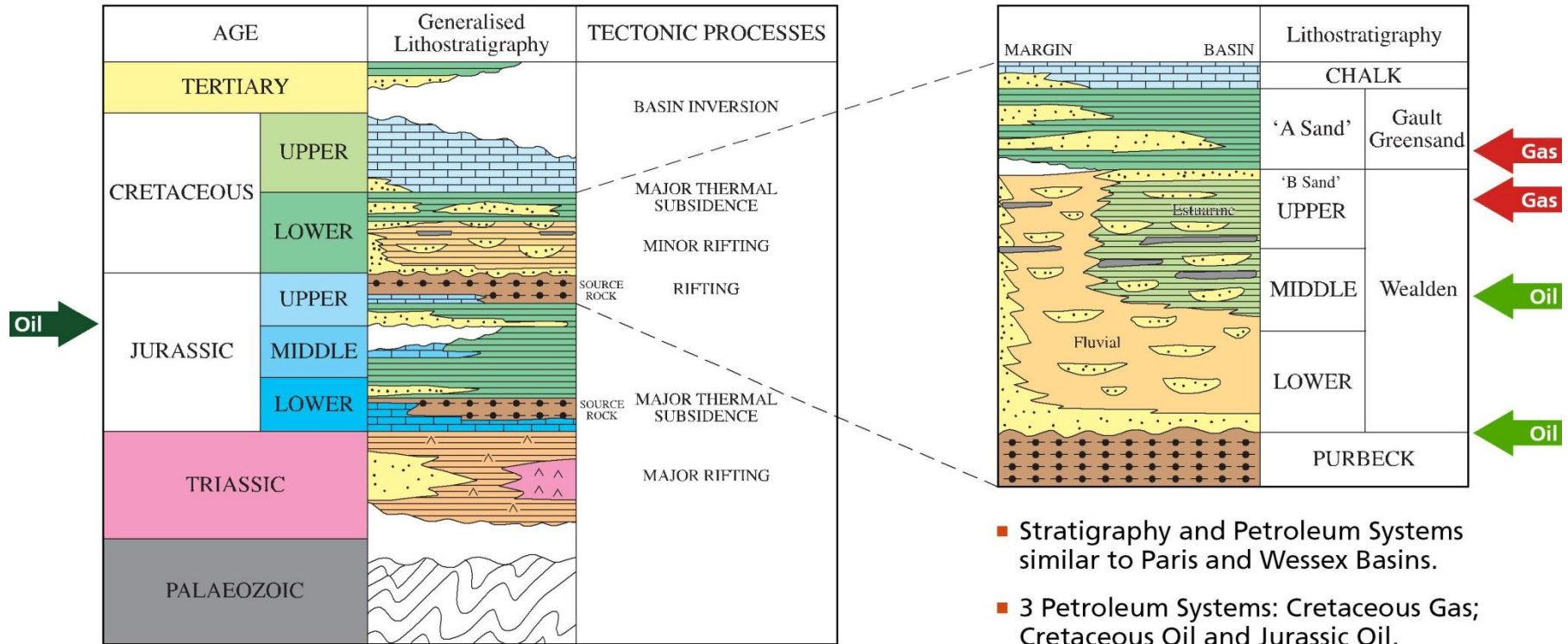
Stratigraphy and Reservoir Rocks

Age		Generalised Lithostratigraphy	Reservoir Rocks	Depositional Environment	Discoveries
TERTIARY					
CRETACEOUS	Upper		Greensand	Shallow Marine sheetsands	Kinsale Head, Ballycotton, Galley Head
	Lower		Wealden Sands	Deltaic to fluvial sands	Seven Heads, Carrigaline, Old Head, Schull
JURASSIC	Upper		Oxfordian Sands and Bathonian Limestone	Marine shoreface – fluvial Shallow marine oolites	Barryroe, Hook Head, Baltimore, Nemo, 49/9-4
	Middle		Sinemurian Sands	Shallow marine deltaic and offshore bar sands	Helvick
	Lower		Triassic Sands Sherwood Sandstone Equivalent	Fluvial braidplain	Dragon
TRIASSIC					
PALAEOZOIC					

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

Celtic Sea Petroleum Systems

Celtic Sea – Stratigraphy



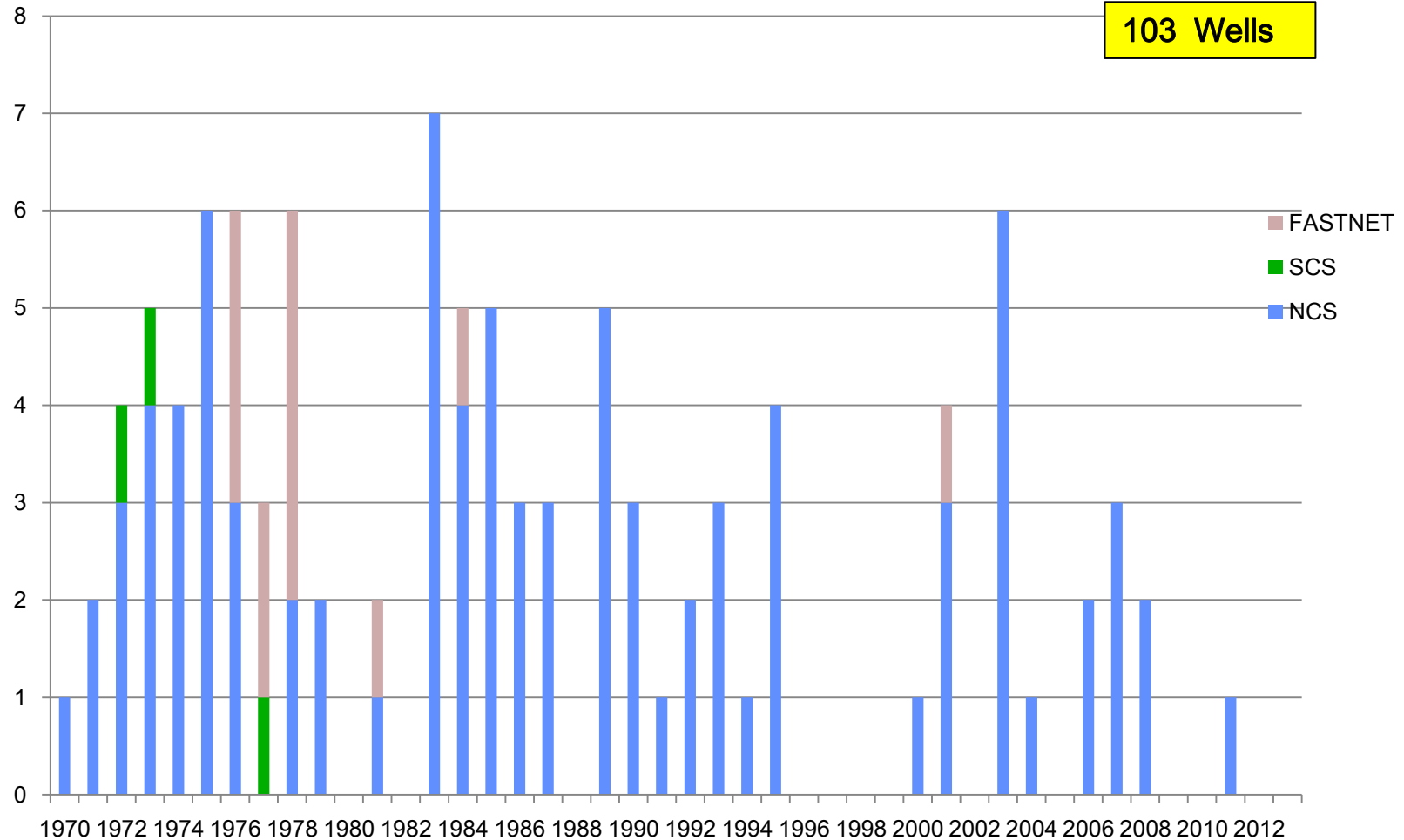
After Shannon (1991), Rowell (1995) and O'Sullivan (2001)

- Stratigraphy and Petroleum Systems similar to Paris and Wessex Basins.
- 3 Petroleum Systems: Cretaceous Gas; Cretaceous Oil and Jurassic Oil.

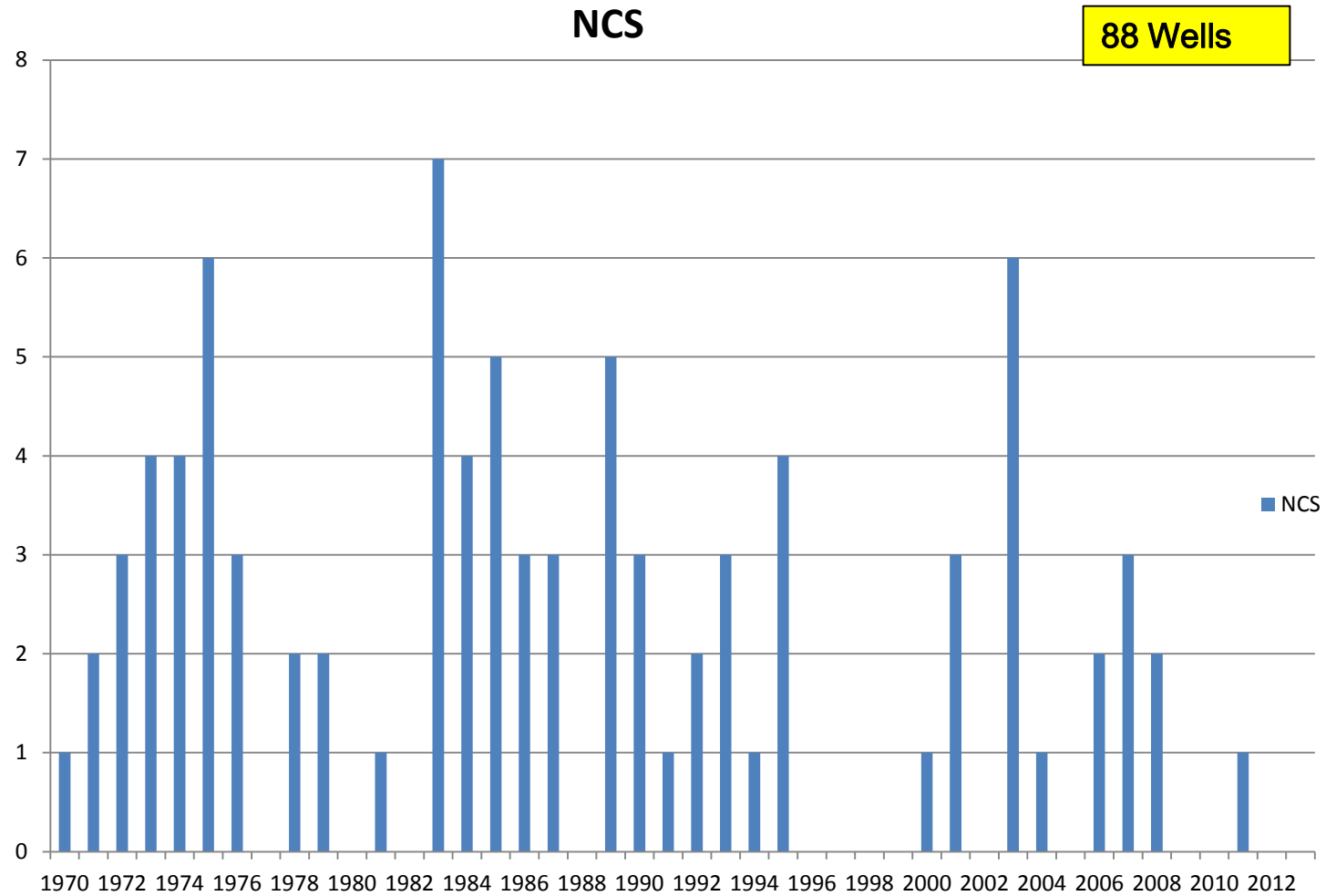
Key Points

- Proven Petroleum Systems
- Underexplored
- Resurgent Activity

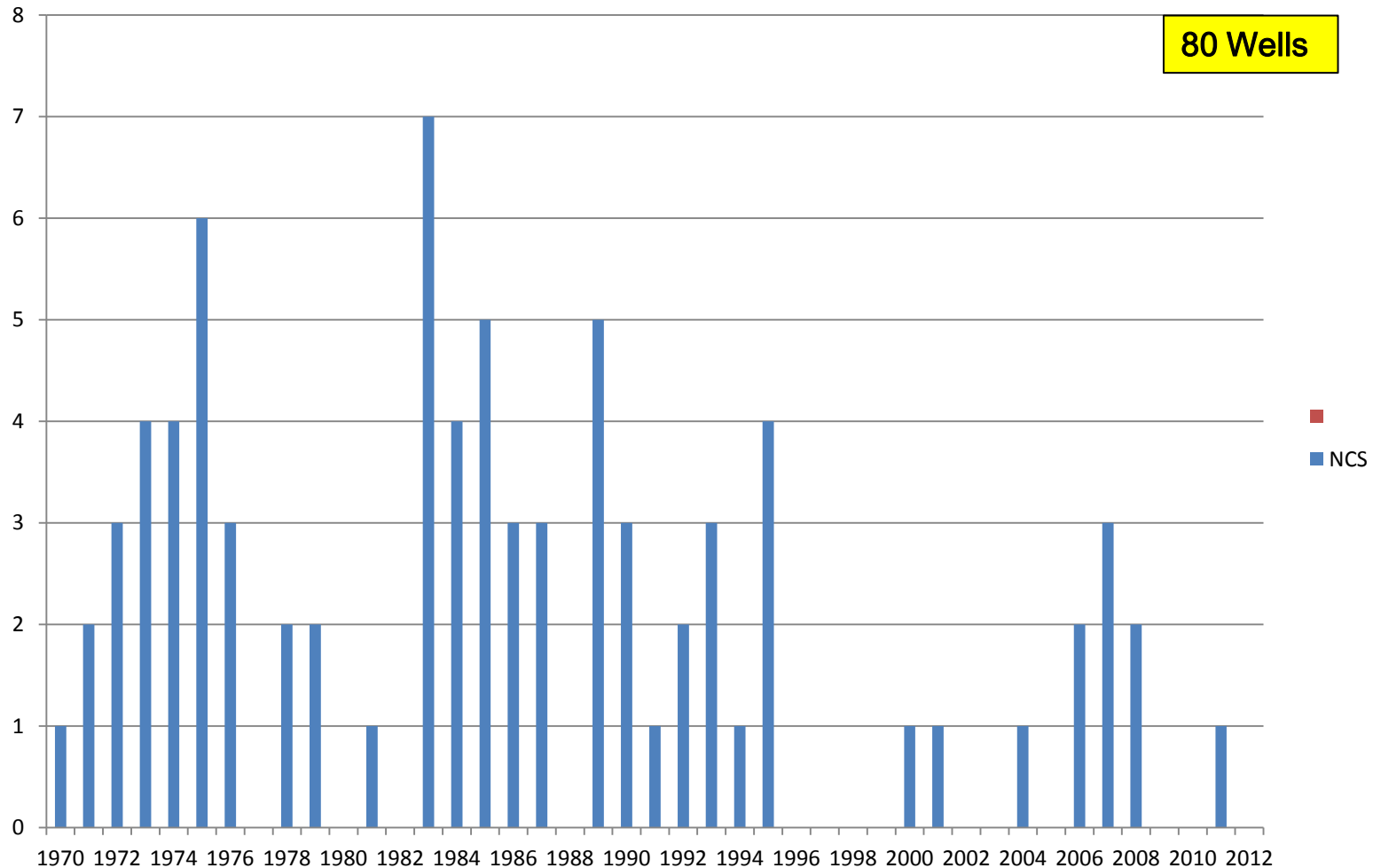
Wells Drilled off south coast of Ireland



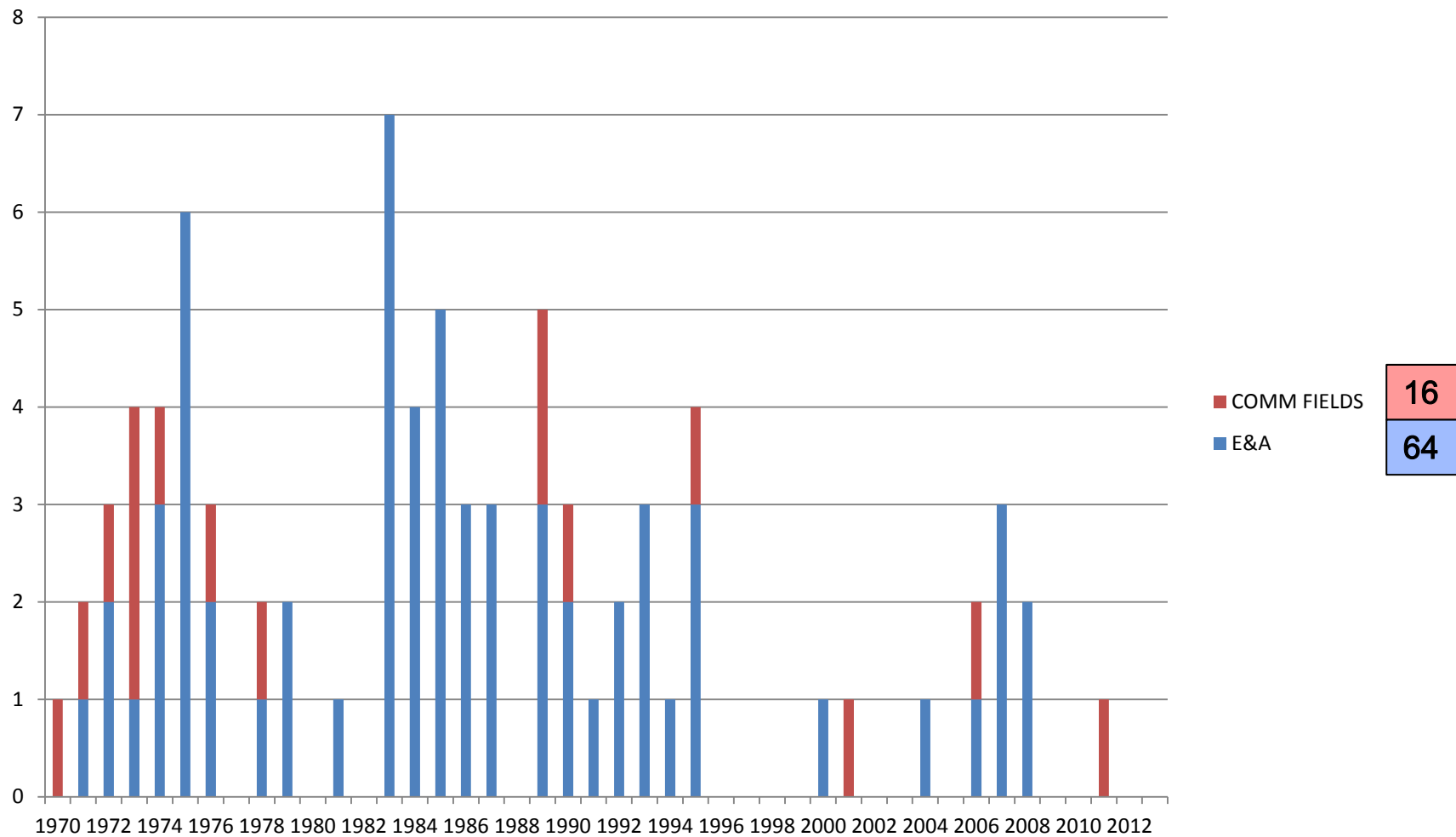
Wells Drilled - NCSB



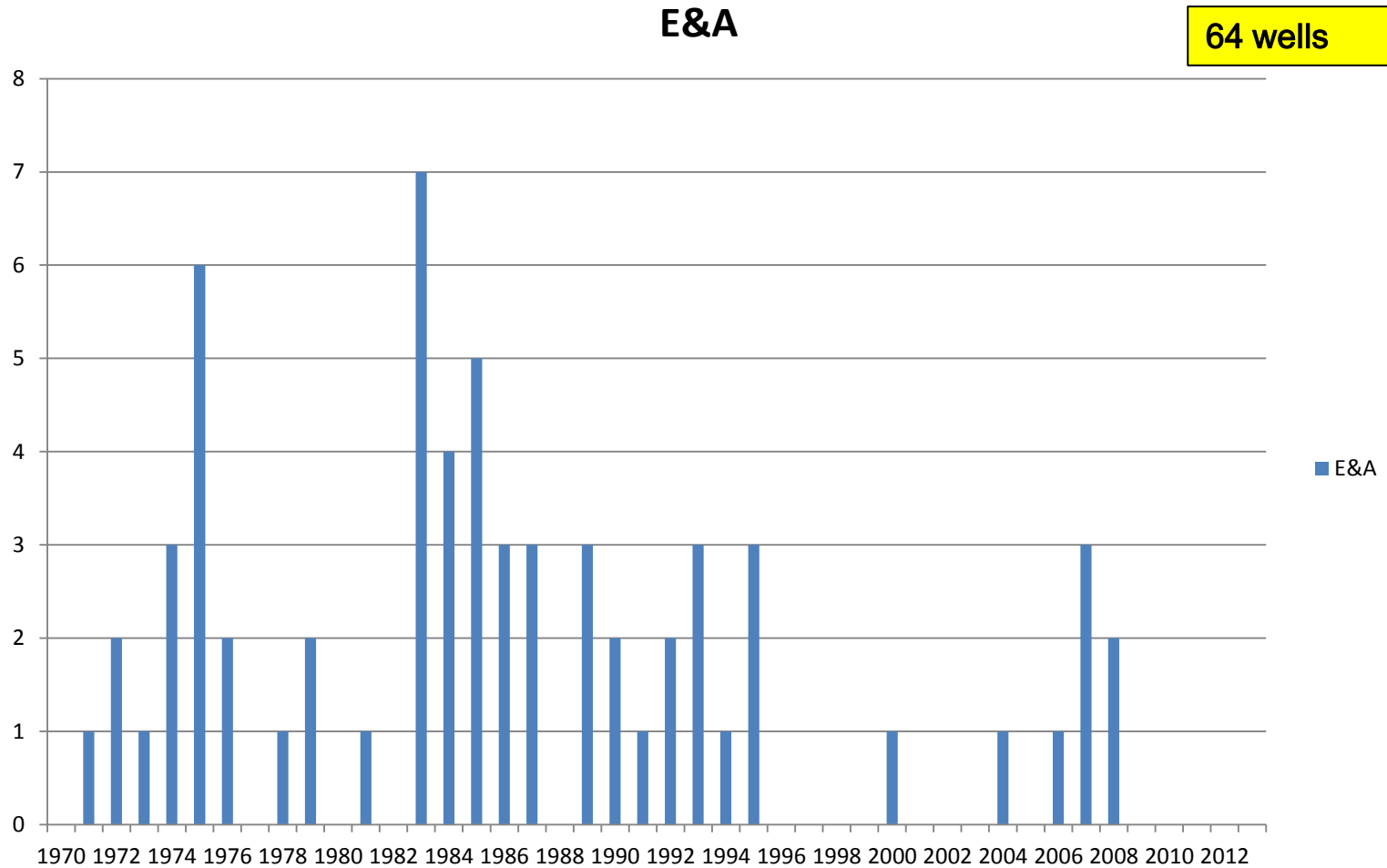
NCSB - minus development wells



NCSB - wells on KH, 7H/Barryroe and Ballycotton



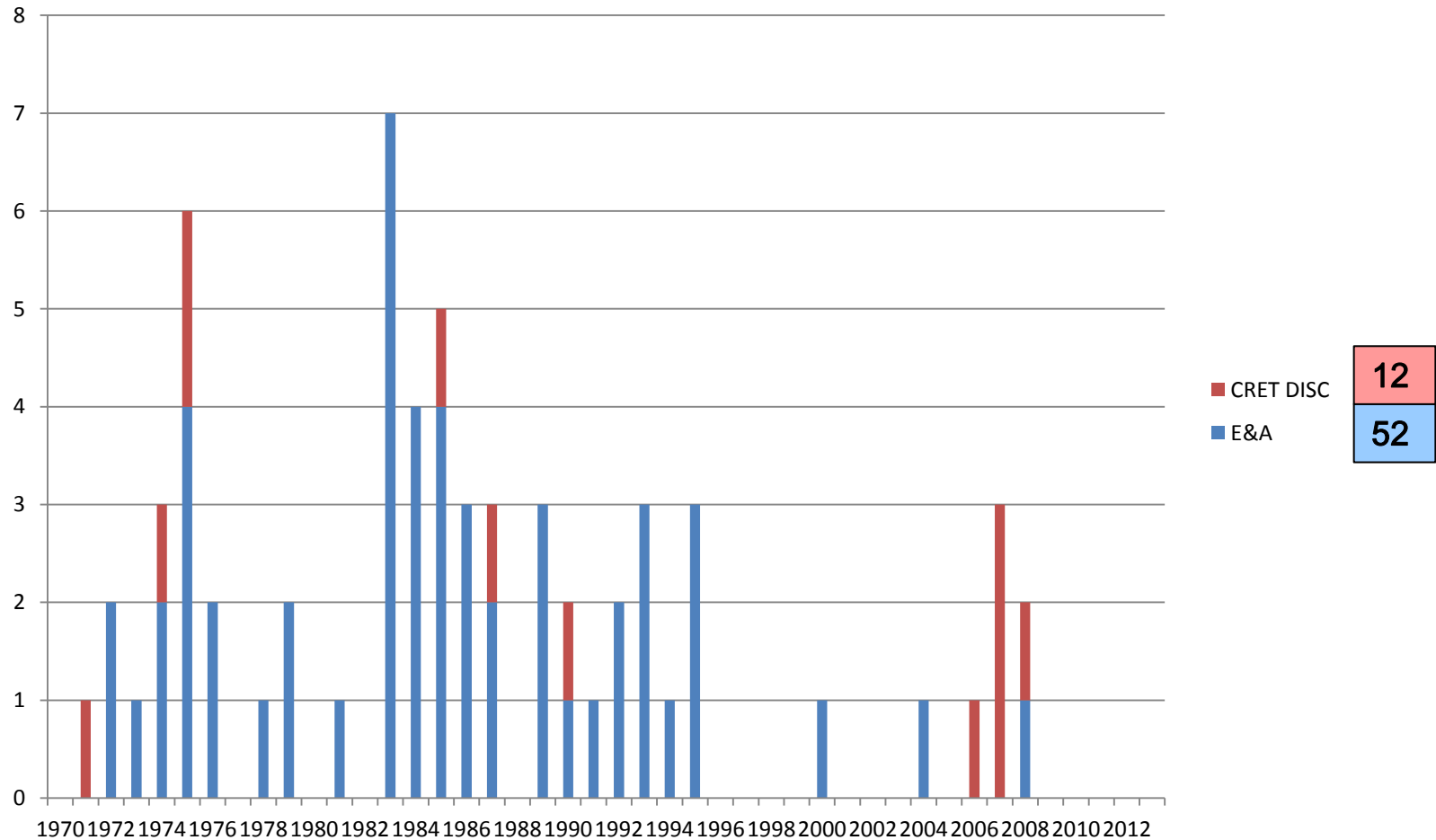
NCSB - minus wells on producing structures & Barryroe



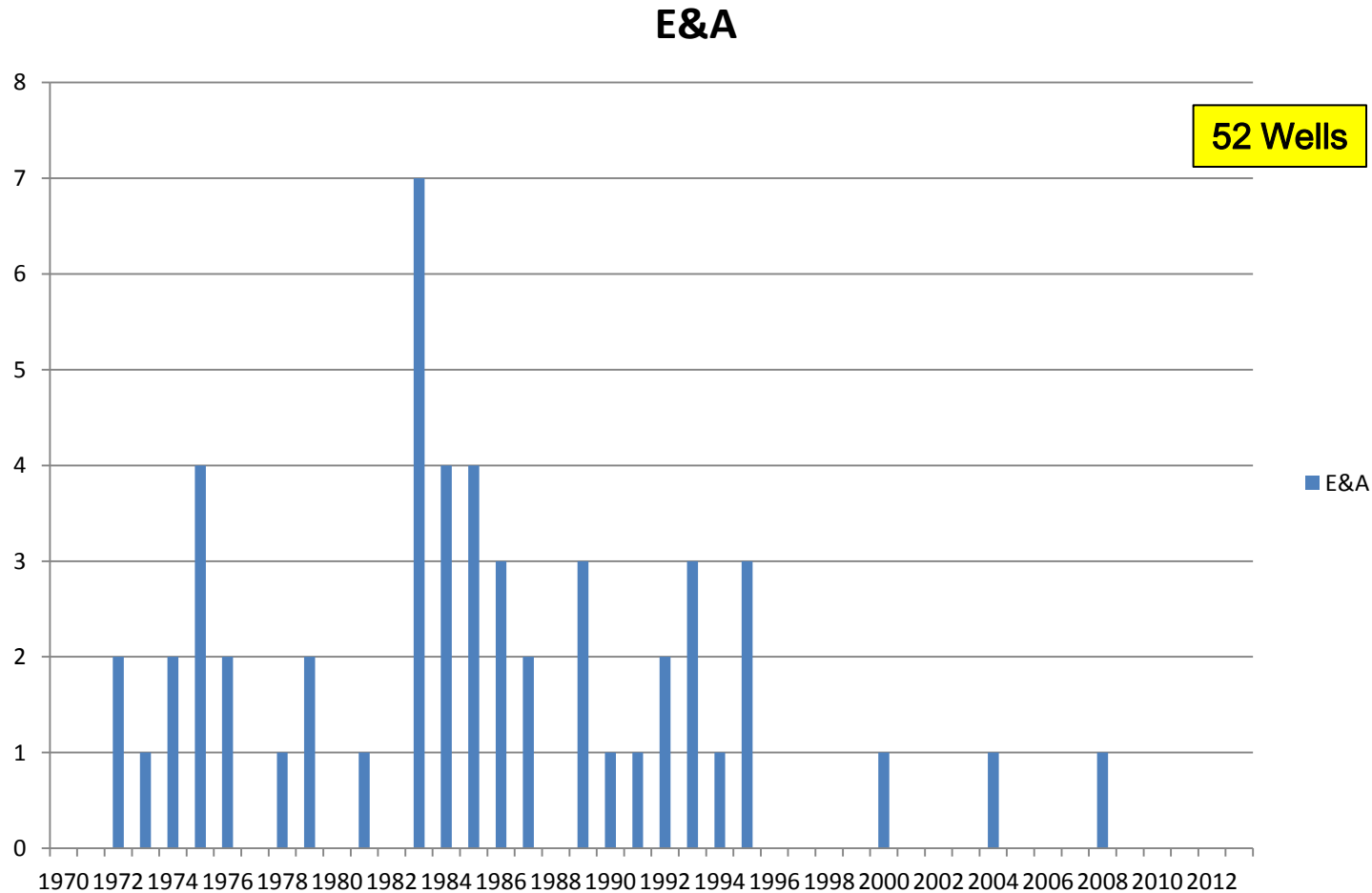
Underexplored

- 64 wells
- But a number of these are on discoveries & their appraisals
- Cretaceous
 - Hook Head – 50/11-1, 50/11-2, 50/11-3, 50/11-4
 - Ardmore – 49/14-1, 49/14-2
 - Galley Head – 48/18-1
 - Schull – 57/2-2, 57/2-3
 - Carrigaline – 48/24-4
 - Old Head – 49/23-1, 49/23-2z

NCSB - Cret. tech success structures



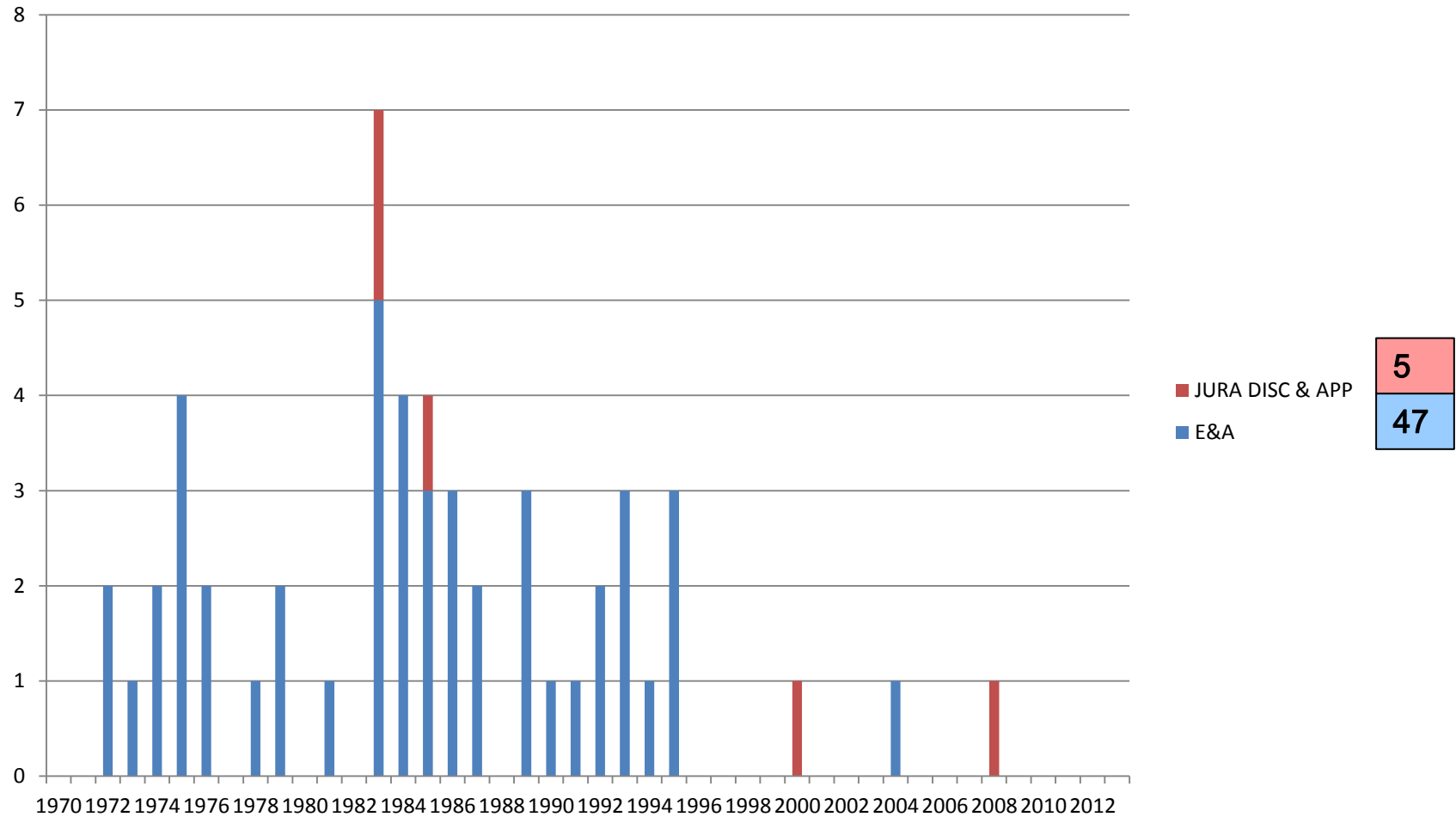
NCSB - minus producing & Cret. tech success structures



Underexplored

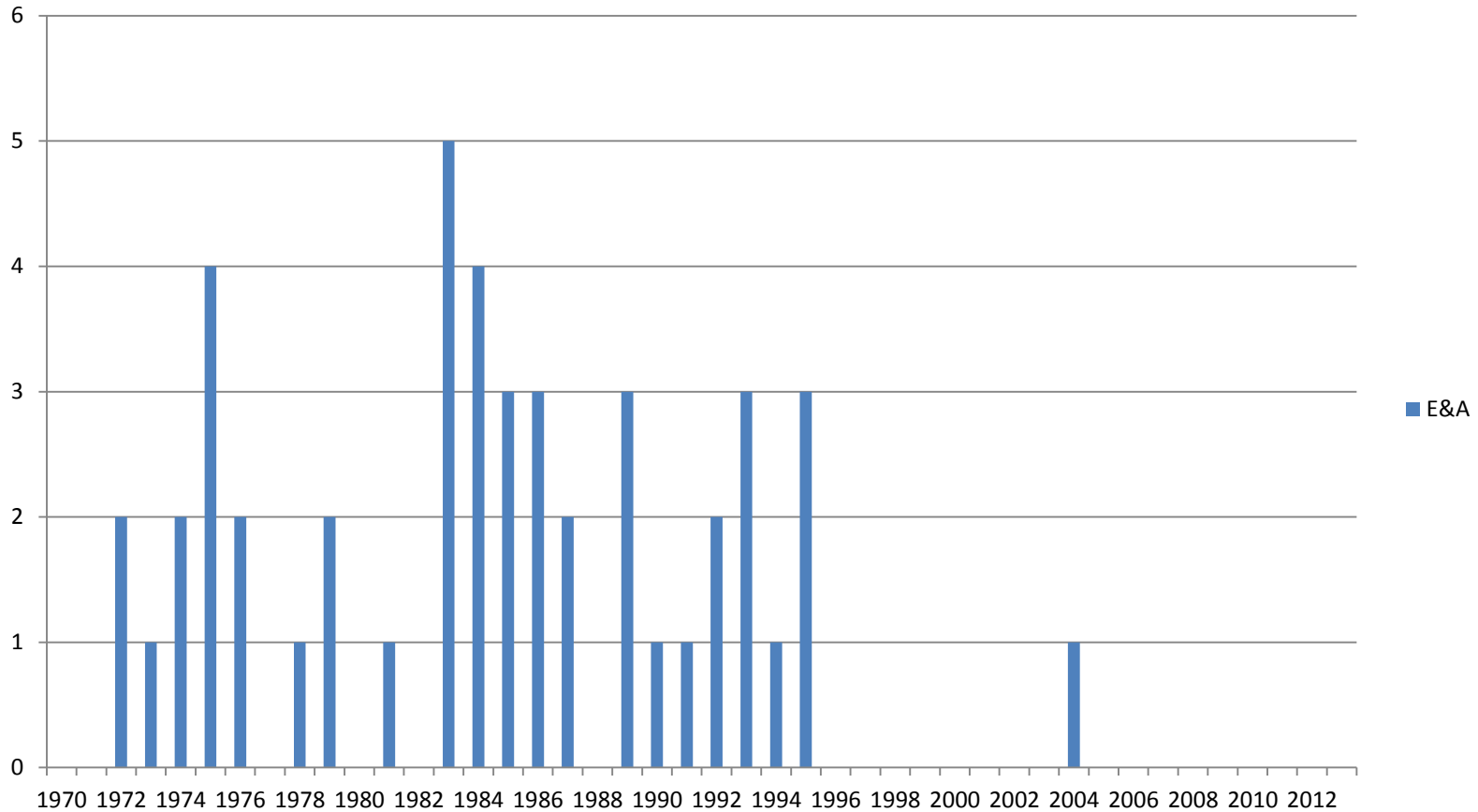
- 52 wells
- But a number of these are on discoveries & their appraisals
- Jurassic
 - Helvick – 49/9-2, 49/9-3Y, 49/9-6
 - Dunmore – 50/6-1, 50/6-4

NCSB – showing Jurassic disc/appraisal

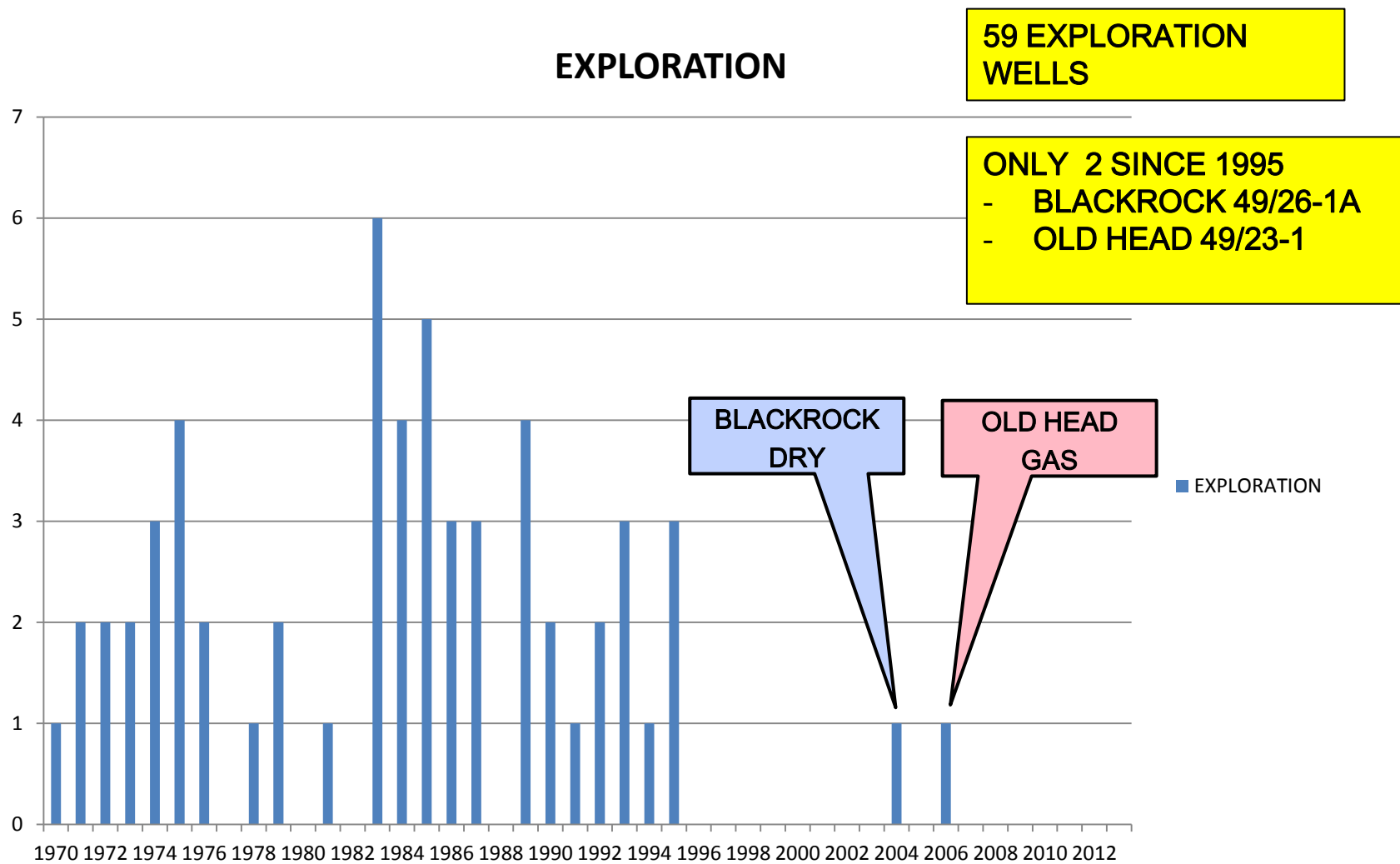


NCSB – minus Jurassic disc/appraisal

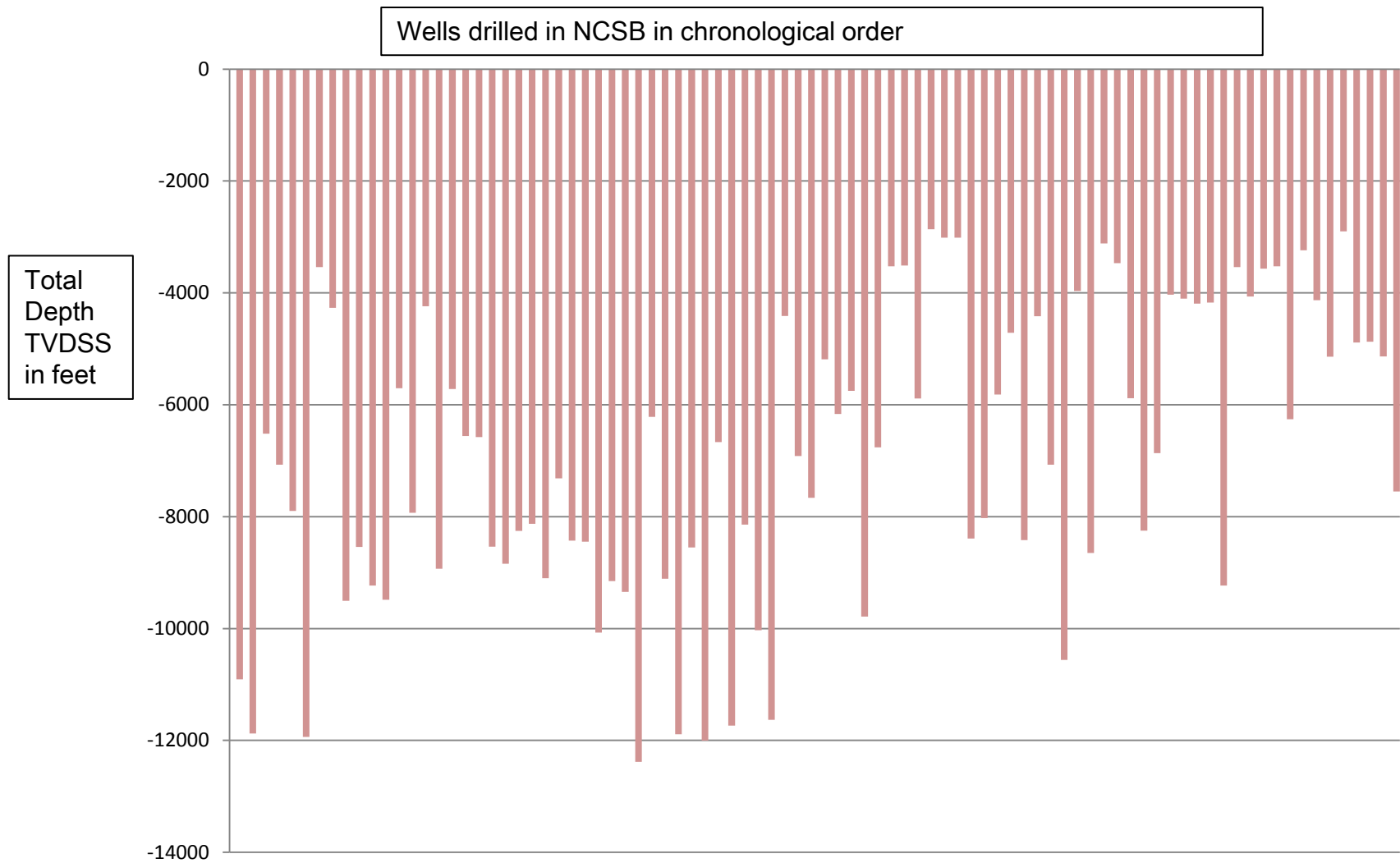
E&A



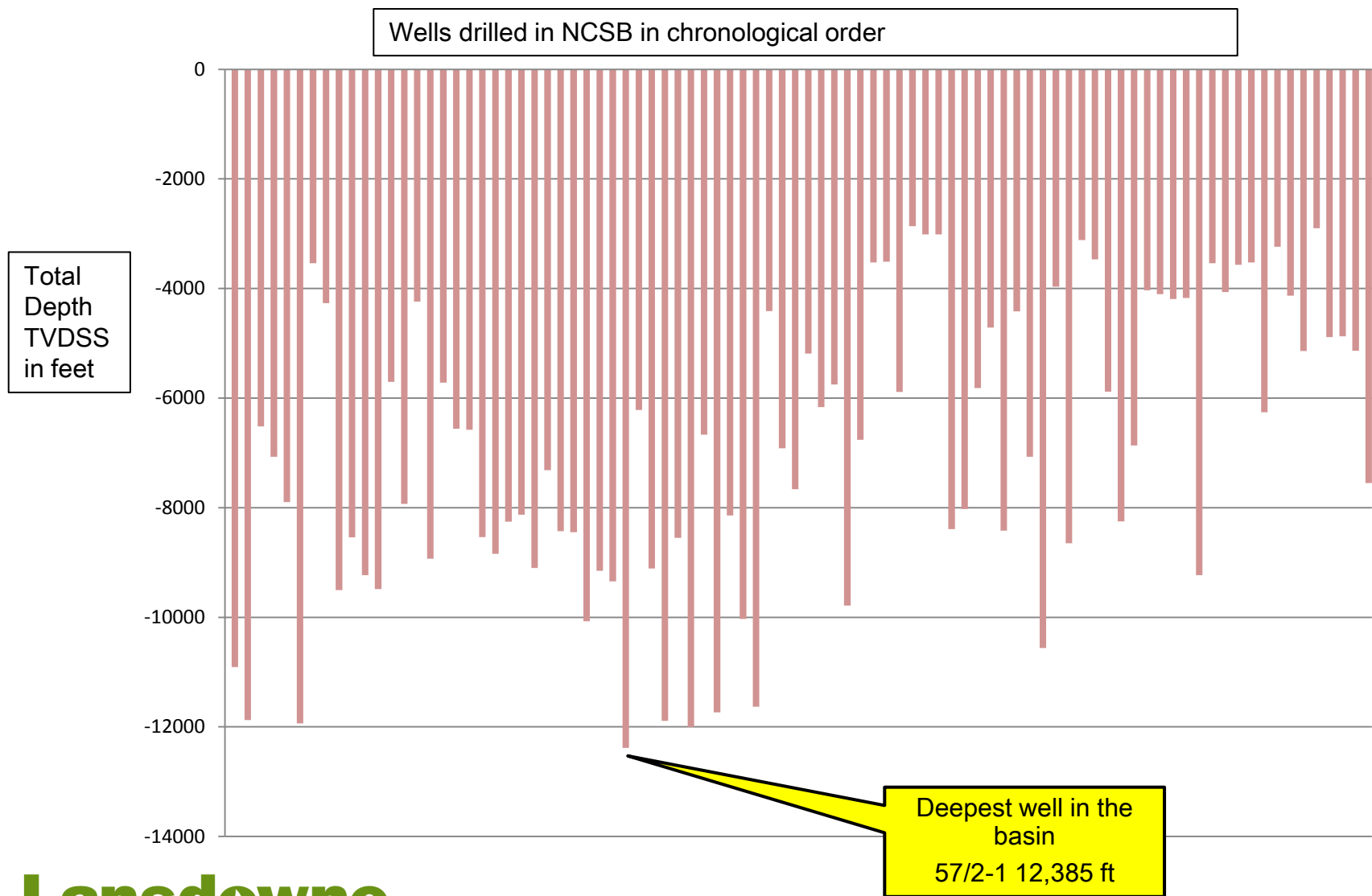
NCSB – Just Exploration wells



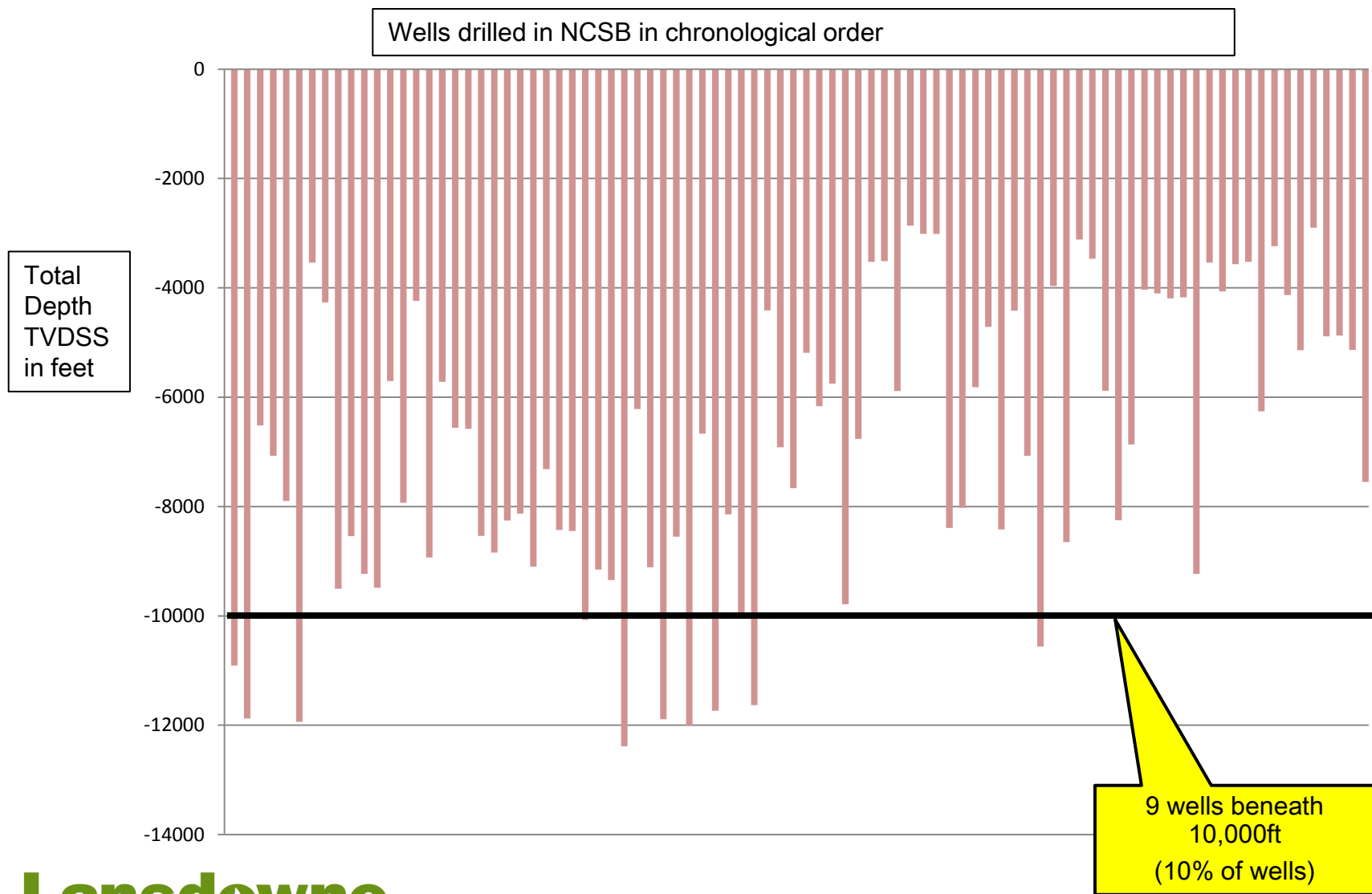
NCSB – Drilling Depth



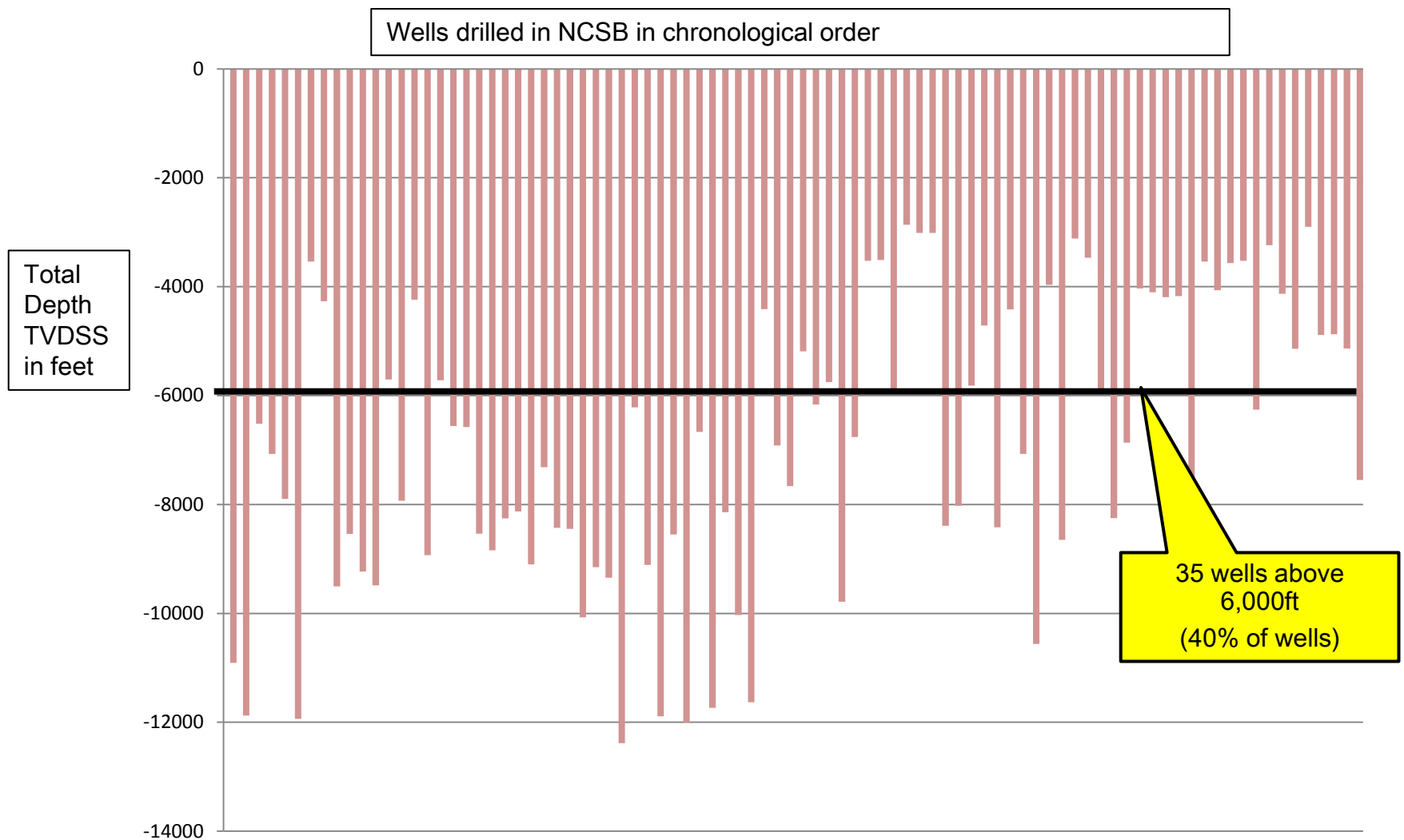
NCSB – Drilling Depth



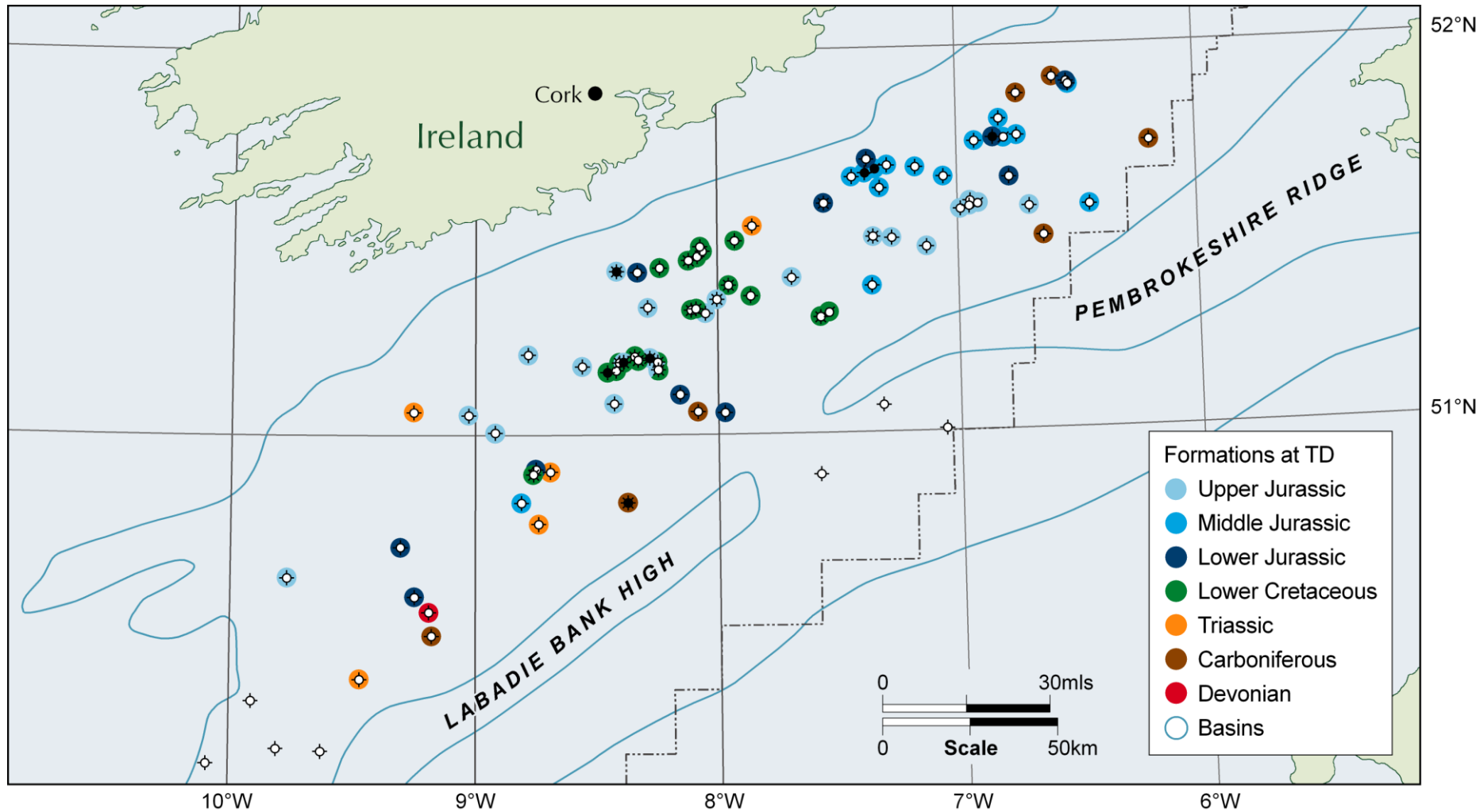
NCSB – Drilling Depth



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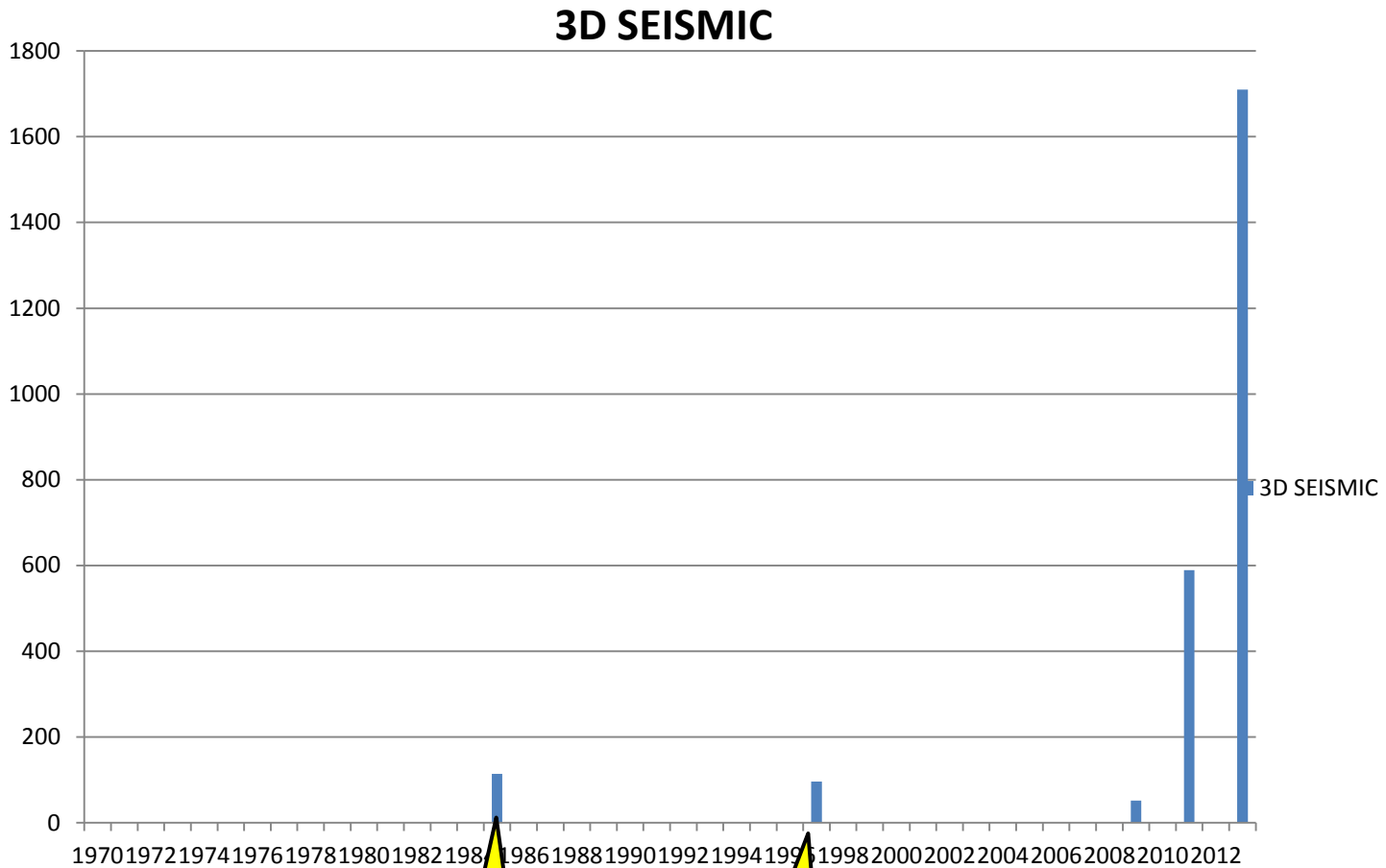
Well - Stratigraphy at TD



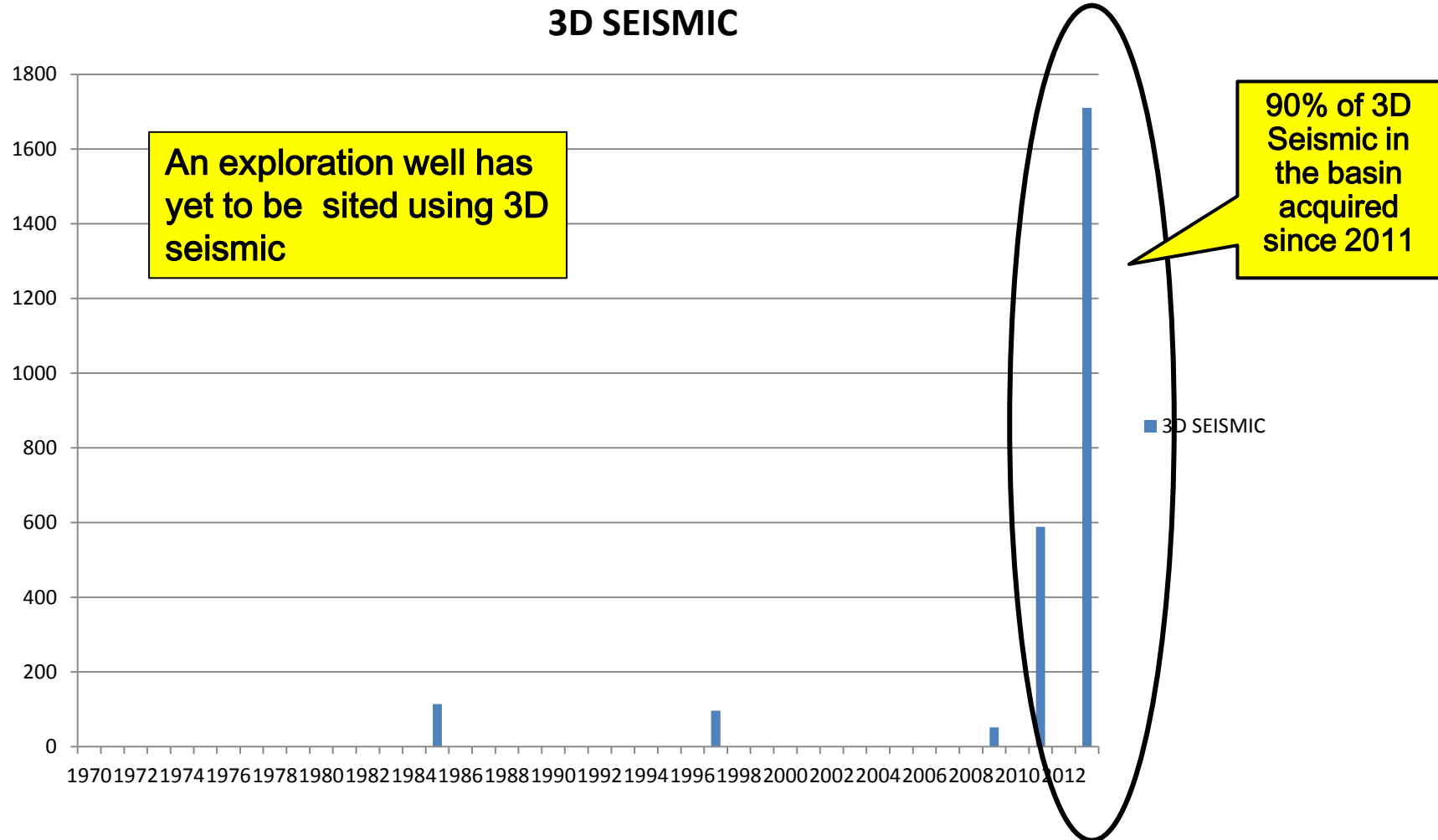
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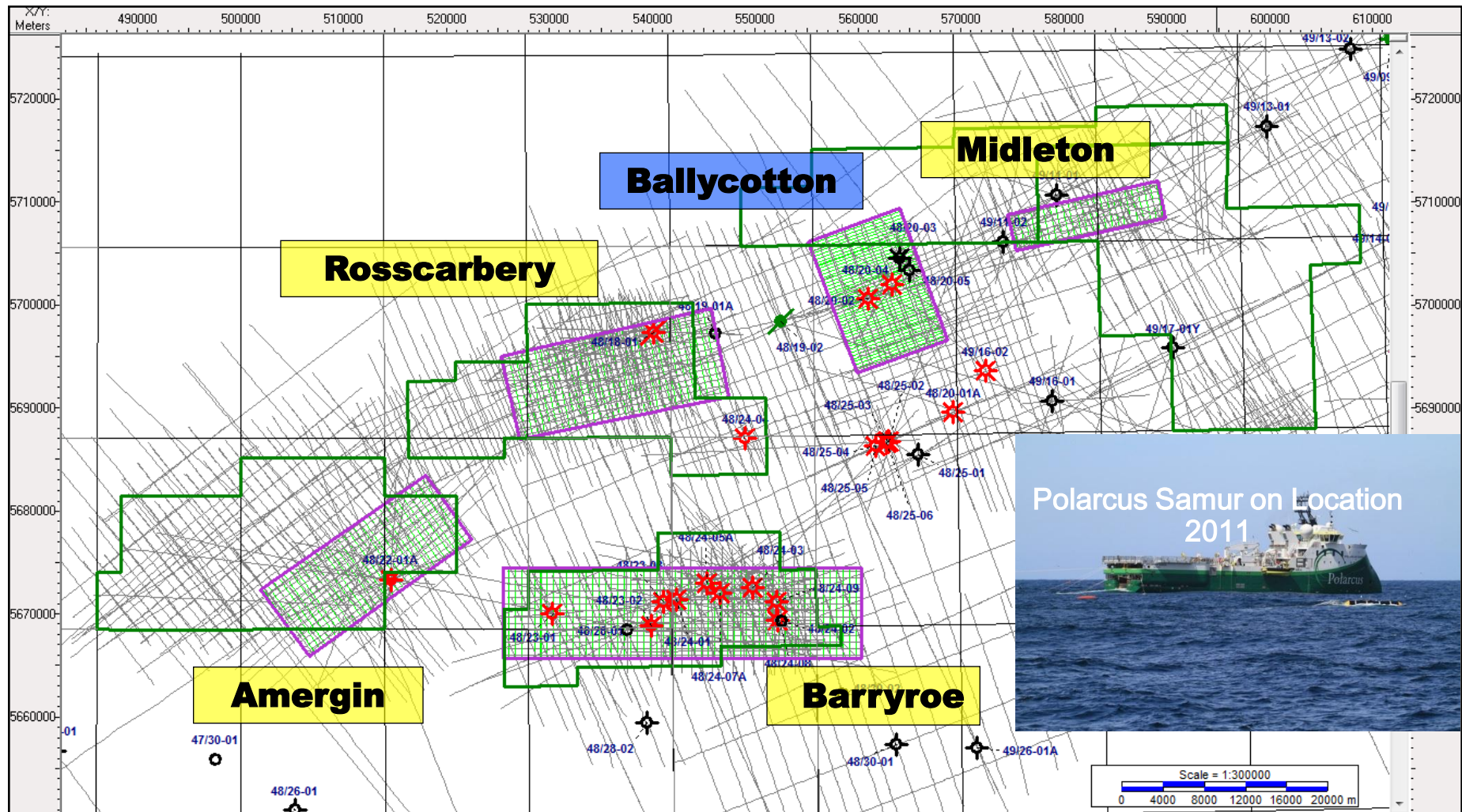
NCSB – 3D Seismic



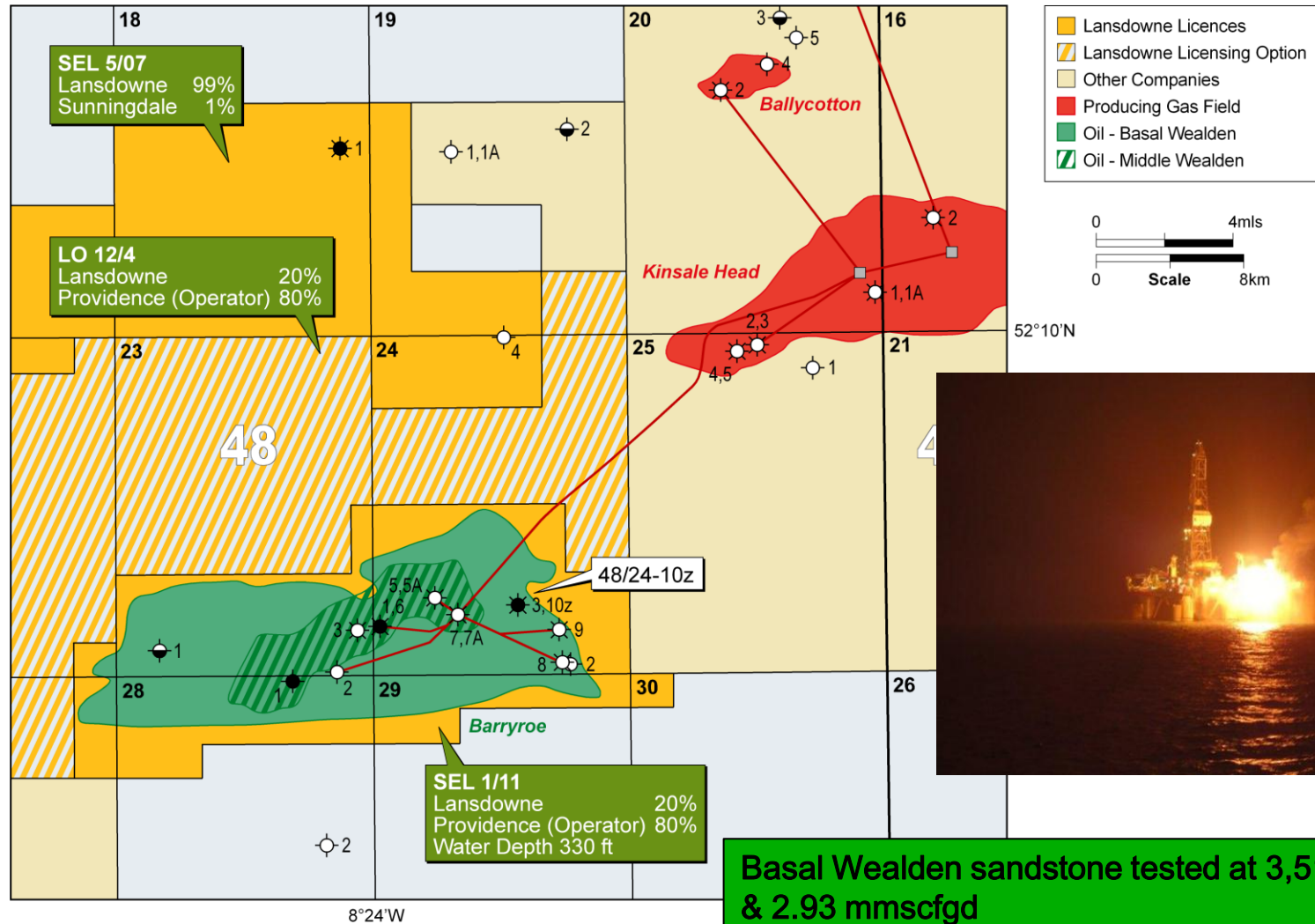
NCSB – 3D Seismic



3D Seismic

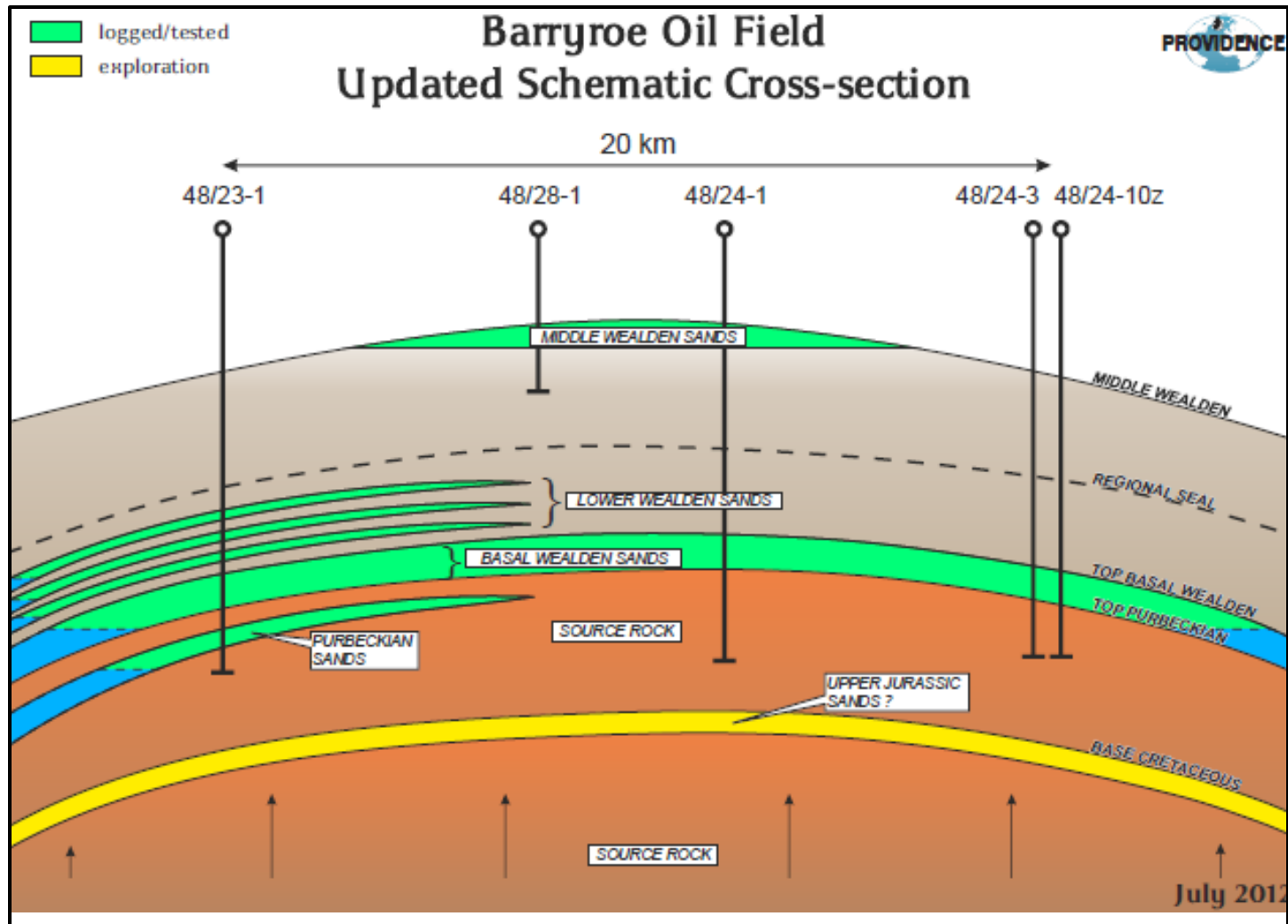


Barryroe – (Lansdowne 20%)



Basal Wealden sandstone tested at 3,514 bopd & 2.93 mmscf/d

Barryroe – Schematic Cross - Section



Source: Providence Resources

Barryroe – CPR Estimates

Reservoir Interval	1C (MMBO)	2C (MMBO)	3C (MMBO)
Middle Wealden STOIIP (RPS) Recoverable (RPS)	31 4	287 45	706 113
Basal Wealden STOIIP (NSAI) Recoverable (NSAI)	338 85	761 266	1,135 511
TOTAL STOIIP TOTAL Recoverable	369 89	1,048 311	1,841 624
LANSDOWNE (20%) NET RECOVERABLE	18	62	125

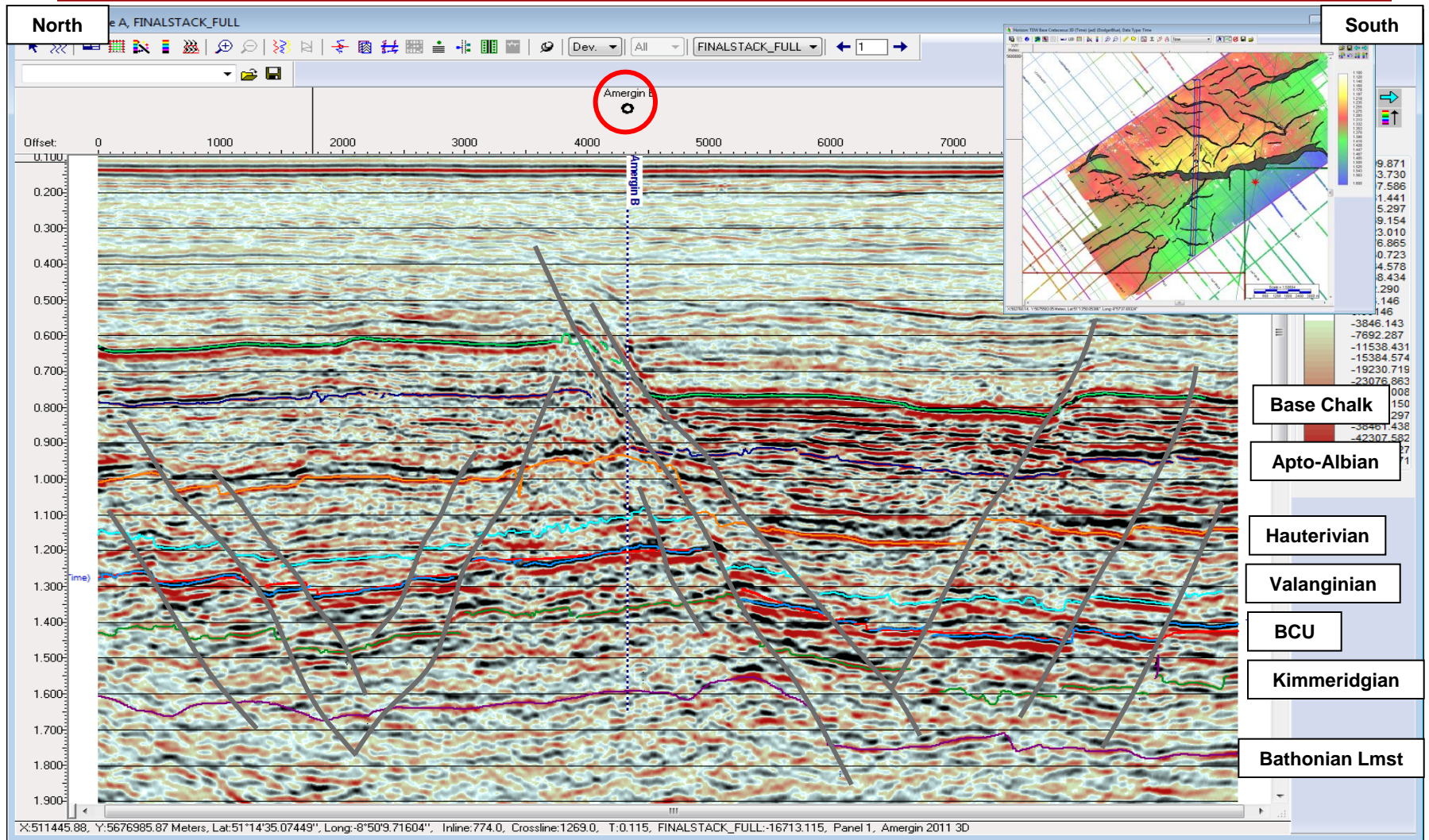
Note: The table above excludes recoverable solution gas (i.e. 207 BCF or 34.5 MMBOE in the 2C case)

Additional potential in drilled Lower Wealden and Purbeckian sandstones and in undrilled deeper Jurassic section

The Future

- Wells located on 3D seismic
- Pre-inversion structures
- Deeper targets

Amergin



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Conclusions

- Proven Petroleum Systems
- Underexplored
- Resurgent Activity

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