

Contents

VOLUME 1

Conference Organizing Committee xii

Conference Technical Committee xii

Sponsoring Bodies xii

Foreword xiii

Jim Brooks

Opening address xiv

Jim Brooks

General Introduction xvi

J. R. Parker

New plays in established areas: the Tertiary

Introduction and review 3

B. A. Vining

Historical overview of exploration of Tertiary plays in the UK North Sea 5

J. S. Bain

Revision of North Sea lithostratigraphic nomenclature: Paleogene 15

British Geological Survey

Stratigraphic relationships of some Tertiary lowstand depositional systems in the Central North Sea 17

B. A. Vining, N. S. Ioannides and K. T. Pickering

Sedimentation and basin evolution in the Paleogene of the Northern North Sea and Faeroe–Shetland basins 31

R. Anderton

Sequence stratigraphic and depositional framework of the Cenozoic fill, Central and Northern North Sea Basin 33

W. E. Galloway, J. L. Garber, Xijin Liu and B. J. Sloan

Log-motif analysis of Paleogene depositional systems tracts, Central and Northern North Sea: defined by sequence stratigraphic analysis 45

J. M. Armentrout, S. J. Malacek, L. B. Fearn, C. E. Sheppard, P. H. Naylor, A. W. Miles, R. J. Desmarais and R. E. Dunay

Evolution of Paleogene submarine fans of the North Sea in space and time 59

D. Den Hartog Jager, M. R. Giles and G. R. Griffiths

Stratigraphic evolution of sand provenance during Paleocene deposition in the Northern North Sea area 73

A. C. Morton, C. R. Hallsworth and G. C. Wilkinson

Acquisition and processing techniques to improve the seismic resolution of Tertiary targets 85

H. Crook, J. E. Palmer, D. J. Painter and R. C. Uden

The role of Paleocene magmatism in the Tertiary evolution of basins on the NW seaboard 97

R. W. England, R. W. H. Butler and D. H. W. Hutton

Sandstone architecture of the Balder Formation depositional system, UK Quadrant 9 and adjacent areas 107

G. Timbrell

The geology of the Gryphon Oil Field 123

M. St J. Newman, M. L. Reeder, A. H. W. Woodruff and I. R. Hatton

Origin of complex mound geometry of Paleocene submarine-fan sandstone reservoirs, Balder Field, Norway 135

A. I. Jensen, D. Bergslien, M. Rye-Larsen and R. M. Lindholm

Paleocene reservoirs of the Everest trend 145

S. J. O'Connor and D. Walker

The Alba Field: evolution of the depositional model 161

S. K. Newton and K. P. Flanagan

The Cretaceous

The Lower Cretaceous chalk play in the Danish Central Trough 175

J. R. Ineson

Complex deformation and fluidization structures in Aptian sediment gravity flow deposits of the Outer Moray Firth 185

R. A. Downie and C. I. Stedman

The Jurassic: from regional models to field development; the impact of sequence stratigraphy on hydrocarbon geology

Introduction and review 191

A. J. Fraser

Jurassic exploration history: a look at the past and the future 195

W. G. Cordey

High and low resolution sequence stratigraphy in lithological prediction—examples from the Mesozoic around the northern North Atlantic 199

F. Surlyk, N. Noe-Nygaard and G. Dam

Sequence stratigraphy of a failed rift system: the Middle Jurassic to Early Cretaceous basin evolution of the Central and Northern North Sea 215

R. P. Rattey and A. B. Hayward

Sequence stratigraphic control on Middle and Upper Jurassic reservoir distribution within the UK Central North Sea 251

A. D. Donovan, A. W. Djakic, N. S. Ioannides, T. R. Garfield and C. R. Jones

Middle to Late Jurassic basin evolution and sandstone reservoir distribution in the Danish Central Trough 271

P. N. Johannessen and J. Andsbjerg

Potential reservoir and source rocks in relation to Upper Triassic to Middle Jurassic sequence stratigraphy, Atlantic margin basins of the British Isles 285

N. Morton

Triassic–Jurassic megasequence stratigraphy in the Northern North Sea: rift to post-rift evolution 299

R. J. Steel

Application of sequence stratigraphy and trace fossil analysis to reservoir description: examples from the Jurassic of the North Sea 317

A. M. Taylor and R. L. Gawthorpe

Jurassic thermal doming and deflation in the North Sea: implications of the sequence stratigraphic evidence 337

J. R. Underhill and M. A. Partington

Genetic sequence stratigraphy for the North Sea Late Jurassic and Early Cretaceous: distribution and prediction of Kimmeridgian–Late Ryazanian reservoirs in the North Sea and adjacent areas 347

M. A. Partington, B. C. Mitchener, N. J. Milton and A. J. Fraser

Biostratigraphic calibration of genetic stratigraphic sequences in the Jurassic–lowermost Cretaceous (Hettangian–Ryazanian) of the North Sea and adjacent areas 371

M. A. Partington, P. Copestake, B. C. Mitchener and J. R. Underhill

The interaction of structure and sedimentary process controlling deposition of the Upper Jurassic Brae Formation Conglomerate, Block 16/17, North Sea 387

S. T. J. Cherry

Miller Field: reservoir stratigraphy and its impact on development 401

C. R. Garland

Stratigraphic, structural and depositional history of the Jurassic in the Fisher Bank Basin, UK North Sea 415

D. N. Clark, L. A. Riley and N. R. Ainsworth

Evolving depositional geometries in the North Sea Jurassic rift 425

N. J. Milton

- Effective stratigraphical subdivision of the Humber Group and the Late Jurassic evolution of the UK Central Graben 443
J. Price, R. Dyer, I. Goodall, T. McKie, P. Watson and G. Williams
- Late Jurassic plays along the western margin of the Central Graben 459
L. L. Wakefield, H. Droste, M. R. Giles and R. Janssen
- Structural controls on the Late Jurassic age shelf system, Ula Trend, Norwegian North Sea 469
I. J. Stewart
- The genetic sequence stratigraphy of the Hettangian to Oxfordian succession, Inner Moray Firth 485
K. J. Stephen, J. R. Underhill, M. A. Partington and R. J. Hedley
- Appraisal geology of the Saltire Field, Witch Ground Graben, North Sea 507
B. J. Casey, R. S. Romani and R. H. Schmitt
- Jurassic volcanic centres in the Central North Sea 519
K. Smith and J. D. Ritchie
- The Middle Jurassic Vardekløft Formation of East Greenland—analogue for reservoir units of the Norwegian shelf and the Northern North Sea 533
M. Engkilde and F. Surlyk

The Triassic: recent advances, discoveries and developments

- Introduction and review 545
M. A. Stephenson
- Salt control on Triassic reservoir distribution, UKCS Central North Sea 547
R. I. Smith, N. Hodgson and M. Fulton
- Physical modelling of North Sea salt diapirism 559
P. J. Weston, I. Davison and M. W. Insley
- Low-angle faulting in the Triassic of the South Viking Graben: implications for future correlations 569
R. K. Morgan and P. L. Cutts
- Sedimentation of Upper Triassic reservoirs in the Beryl Embayment: lacustrine sedimentation in a semi-arid environment 581
K. P. Dean
- F15-A: a Triassic gas field on the eastern limit of the Dutch Central Graben 583
J. M. Fontaine, G. Guastella, P. Jouault and P. de la Vega
- A review of the Triassic play in the Roer Valley Graben, SE onshore Netherlands 595
A. M. Winstanley
- Heavy mineral stratigraphy in the UK Trias: Western Approaches, onshore England and the Central North Sea 609
C. V. Jeans, S. J. B. Reed and M. Xing
- Clay mineral stratigraphy of Mesozoic and Paleozoic red beds, Northern North Sea 625
J. R. Glasmann and G. C. Wilkinson

Permo-Carboniferous and older plays

- Introduction and review 639
T. J. Wheatley
- Permo-Carboniferous and older plays, their historical development and future potential 641
J. Gérard, T. J. Wheatley, J. S. Ritchie, M. Sullivan and M. G. Bassett
- Geology and hydrocarbon prospects of the Paleozoic in the Baltic region 651
A. P. Brangulis, S. V. Kanev, L. S. Margulis and R. A. Pomerantseva
- Late Paleozoic plays in East Greenland 657
F. G. Christiansen, H. C. Larsen, C. Marcussen, S. Piasecki and L. Stemmerik
- The case for exploration of deep plays in the Variscan fold belt and its foreland 667
N. J. P. Smith

Carboniferous depositional systems of the Southern North Sea	677
<i>J. D. Collinson, C. M. Jones, G. A. Blackbourn, B. M. Besly, G. M. Archard and A. H. McMahon</i>	
Structural development and hydrocarbon occurrence of the Carboniferous in the UK Southern North Sea Basin	689
<i>J. M. Hollywood and C. V. Whorlow</i>	
Interpreting the Upper Carboniferous of the Dutch Cleaver Bank High	697
<i>D. G. Quirk</i>	
Permo-Carboniferous plays of the Silver Pit Basin	707
<i>J. B. Bailey, P. Arbin, O. Daffinoti, P. Gibson and J. S. Ritchie</i>	
The evolution and hydrocarbon potential of the Northumberland–Solway Basin	717
<i>R. A. Chadwick, D. W. Holliday, S. Holloway and A. G. Hulbert</i>	
The late Carboniferous ‘Barren Red Bed’ play of the Silver Pit area, Southern North Sea	727
<i>B. M. Besly, S. D. Burley and P. Turner</i>	
The Rotliegend in northwest Germany, from frontier to fairway	741
<i>P. Burri, J. Faupel and B. Koopmann</i>	
Pseudo-reefs beneath Zechstein salt on the northern flank of the Mid North Sea High	749
<i>J. C. M. Taylor</i>	
The Caister Fields, Block 44/23a, UK North Sea	759
<i>J. S. Ritchie and P. Pratsides</i>	
Structural and sedimentological controls on diagenesis in the Ravenspurn North gas reservoir, UK Southern North Sea	771
<i>P. Turner, M. Jones, D. J. Prosser, G. D. Williams and A. Searl</i>	
Appendix: A list of common abbreviations	xvii
Index	xix

VOLUME 2

Irish Sea basins

Introduction and review	789
<i>R. E. Dunay</i>	
Tectonic and stratigraphic aspects of the East Irish Sea Basin and adjacent areas: contrasts in their post-Carboniferous structural styles	791
<i>D. I. Jackson and P. Mulholland</i>	
Geochemical modelling of the East Irish Sea Basin: its influence on predicting hydrocarbon type and quality	809
<i>M. Hardman, J. Buchanan, P. Herrington and A. Carr</i>	
Controls on reservoir quality in the Triassic Sherwood Sandstone of the Irish Sea	823
<i>N. S. Meadows and A. Beach</i>	
The Fleetwood Dyke and the Tynwald fault zone, Block 113/27, East Irish Sea Basin	835
<i>G. Arter and S. W. Fagin</i>	
The Kish Bank Basin, offshore Ireland	845
<i>D. Naylor, N. Haughey, G. Clayton and J. R. Graham</i>	
The tectonic history of the East Irish Sea Basin with reference to the Morecambe Fields	857
<i>R. Knipe, G. Cowan and V. S. Balendran</i>	
The use of dipmeter logs in the structural interpretation and palaeocurrent analysis of Morecambe Fields, East Irish Sea Basin	867
<i>G. Cowan, C. Ottesen and I. A. Stuart</i>	
The geology of the North Morecambe Gas Field, East Irish Sea Basin	883
<i>I. A. Stuart</i>	

Atlantic margin exploration: Cretaceous–Tertiary evolution, basin development and petroleum geology

- Introduction and review 899
A. M. Spencer and O. Eldholm
- Evolution of North Atlantic volcanic continental margins 901
K. Hinz, O. Eldholm, M. Block and J. Skogseid
- The southern West Greenland continental margin: rifting history, basin development, and petroleum potential 915
J. A. Chalmers, T. C. R. Pulvertaft, F. G. Christiansen, H. C. Larsen, K. H. Laursen and T. G. Ottesen
- Late Mesozoic–Cenozoic evolution of the southwestern Barents Sea 933
J. I. Faleide, E. Vågnes and S. T. Gudlaugsson
- The Norwegian continental margin from the Northern North Sea to the Senja Fracture Zone 951
B. T. Larsen, J. Skogseid, H. Brekke, P. Blystad, O. Rise and M. Larsen
- Mesozoic to Cenozoic plate reconstructions of the North Atlantic and hydrocarbon plays of the Atlantic margins 953
S. D. Knott, M. T. Burchell, E. J. Jolley and A. J. Fraser
- Subsidence patterns in western margin basins; evidence from the Faeroe–Shetland Basin 975
J. D. Turner and R. A. Scrutton
- Development of the Rockall Trough and the northwest European continental margin 985
R. S. White
- The tectono-stratigraphy of the Solan Basin, west of Shetland 987
J. Booth, T. Swiecicki and P. Wilcockson
- Structuring and transfer zones in the Faeroe Basin in a regional tectonic context 999
B. Rumph, C. M. Reaves, V. G. Orange and D. L. Robinson
- Paleogene sequence stratigraphic framework of the Faeroe Basin 1011
S. M. Mitchell, G. W. J. Beamish, M. V. Wood, S. J. Malacek, J. A. Armentrout, J. E. Damuth and H. C. Olson
- Late Paleocene to Miocene compression in the Faeroe–Rockall area 1025
L. O. Boldreel and M. S. Andersen
- Preliminary observations of Neogene–Quaternary depositional processes in the Faeroe–Shetland Channel revealed by high-resolution seismic facies analysis 1035
J. E. Damuth and H. C. Olson
- Seismic structure of the Hatton–Rockall area: an integrated seismic/modelling study from composite datasets 1047
J. Keser Neish
- Cretaceous and Tertiary basin development west of Ireland 1057
P. M. Shannon, J. G. Moore, A. W. B. Jacob and J. Makris
- Elevated palaeotemperatures prior to Early Tertiary cooling throughout the UK region: implications for hydrocarbon generation 1067
P. F. Green, I. R. Duddy, R. J. Bray and C. L. E. Lewis
- Crustal extension, subsidence and inversion in NW Europe 1075
A. H. Ruffell and M. P. Coward
- Evolution of the English Channel Basin 1077
A. H. Ruffell, M. Harvey and G. D. Wach

Structural styles and their evolution in the North Sea area

- Introduction and review 1081
I. D. Bartholomew
- Structural models for the evolution of the North Sea area 1083
G. D. Williams
- The effect of Late Caledonian and Variscan continental escape tectonics on basement structure, Paleozoic basin kinematics and subsequent Mesozoic basin development in NW Europe 1095
M. P. Coward

- Regional structural evolution of the North Sea: oblique slip and the reactivation of basement lineaments 1109
I. D. Bartholomew, J. M. Peters and C. M. Powell
- Mesozoic extension in the North Sea: constraints from flexural backstripping, forward modelling and fault populations 1123
A. M. Roberts, G. Yielding, N. J. Kusznir, I. Walker and D. Dorn-Lopez
- Tectonic evolution and structural styles of the East Shetland Basin 1137
M. J. Lee and Y. J. Hwang
- A fundamental reappraisal of the structure of the Cormorant Field and its impact on field development strategy
R. R. A. Demyttenaere, A. H. Shuijk and M. R. Bentley
- The structural evolution of the Snorre Field and surrounding areas 1159
N. Dahl and T. Solli
- Controls on the development and evolution of structural styles in the Inner Moray Firth Basin 1167
K. Thomson and J. R. Underhill
- The structural evolution of the eastern end of the Halibut Horst, Block 15/21, Outer Moray Firth, UK North Sea 1179
M. J. Hibbert and D. S. Mackertich
- Mesozoic evolution of the Jæren High area, Norwegian Central North Sea 1189
O. Høiland, J. Kristensen and T. Monsen
- Extension and salt tectonics in the East Central Graben 1197
J. Penge, B. Taylor, J. A. Huckerby and J. W. Munns
- Relationships between basement faulting, salt withdrawal and Late Jurassic rifting, UK Central North Sea 1211
D. Erratt
- Comparison of Permo-Triassic and deep structure of the Forties–Montrose and Jæren highs, Central Graben, UK and Norwegian North Sea 1221
N. H. Platt and P. Philip
- Structural styles from the Central Graben in the UK and Norway 1231
R. A. Sears, A. R. Harbury, A. J. G. Protoy and D. J. Stewart
- The structure of the Norwegian Central Trough (Central Graben area) 1245
M. B. Gowers, E. Holtar and E. Swensson
- Structural styles in the Danish Central Graben 1255
G. O. Sundsbø and J. B. Megson
- Mesozoic structural evolution of the UK Southern North Sea: insights from analysis of fault systems 1269
T. J. Arthur
- Fault reactivation and oblique-slip in the Southern North Sea 1281
B. C. Oudmayer and J. de Jager

Fluids: migration, overpressure and diagenesis

- Introduction and review 1293
A. J. Fleet and W. G. Cordey
- Distribution of sub-surface pressure in the Norwegian Central Graben and applications for exploration 1295
R. C. Leonard
- Overpressures in the Central North Sea: implications for trap integrity and drilling safety 1305
L. Gaarenstroom, R. A. J. Tromp, M. C. de Jong and A. M. Brandenburg
- Deep prospects—imaging, overpressure and associated problems in the UK Central North Sea 1315
J. A. Henderson and M. J. N. Pepper
- Source rock permeability and petroleum expulsion efficiency: modelling examples from the Mahakam delta, the Williston Basin and the Paris Basin 1317
J. Burrus, K. Osadetz, J. M. Gaulier, E. Brosse, B. Doligez, G. Choppin de Janvry, J. Barlier and K. Visser
- Submarine gas seepage in the North Sea and adjacent areas 1333
M. Hovland

- The use of natural He, Ne and Ar isotopes as constraints on hydrocarbon transport 1339
C. J. Ballentine and R. K. O’Nions
- The chemical composition of North Sea formation waters: a review of their heterogeneity and potential applications 1347
E. A. Warren and P. C. Smalley
- Models of burial diagenesis for deep exploration in Jurassic fault traps of the Central and Northern North Sea 1353
S. D. Burley
- Silicate mineral authigenesis in the Hutton and NW Hutton fields: implications for sub-surface porosity development 1377
G. E. McAulay, S. D. Burley and L. H. Johnes
- The link between petroleum emplacement and sandstone cementation 1395
J. G. Gluyas, A. G. Robinson, D. Emery, S. M. Grant and N. H. Oxtoby

Field management

- Introduction and review 1405
M. L. B. Miller and J. H. Martin
- Clair appraisal: the benefits of a co-operative approach 1409
D. Coney, T. B. Fyfe, P. Retail and P. J. Smith
- Prediction of large-scale communication in the Smørbukkk fields from strontium fingerprinting 1421
H-H. Stølum, P. C. Smalley and N-M. Hanken
- The Embla Field 1433
I. A. Knight, L. R. Allen, J. Coipel, L. Jacobs and M. J. Scanlan
- The evolution of a fractured chalk reservoir: Machar Oilfield, UK North Sea 1445
P. T. Foster and P. R. Rattey
- The Bruce Field 1453
A. Beckly, C. Dodd and A. Los
- Hyde: a proposed field development in the Southern North Sea using horizontal wells 1465
R. P. Steele, R. M. Allan, G. J. Allinson and A. J. Booth
- Estimation of recoverable reserves: the geologist’s job 1473
A. F. Corrigan
- Geological aspects of horizontal drilling in chalks from the Danish sector of the North Sea 1483
S. Fine, M. R. Yusas and L. N. Jørgensen
- Beryl Field: geological evolution and reservoir behaviour 1491
G. Robertson
- Clyde: reappraisal of a producing field 1503
P. J. Turner
- Wyth Farm oilfield: deterministic reservoir description of the Triassic Sherwood Sandstone 1513
M. J. B. Bowman, N. M. McClure and D. W. Wilkinson
- Meillon–Saint Faust gas field, Aquitaine basin: structural re-evaluation aids understanding of water invasion 1519
D. Haller and G. Hamon
- The Eakring Dukeswood oil field: an unconventional technique to describe a field’s geology 1527
M. W. Storey and D. F. Nash

Core workshop

- Core workshop and discussion forum 1541
C. D. Oakman and J. H. Martin
- Appendix: A list of common abbreviations xiii
- Index xv