Characterization and Petrel 3D Modeling of Fluvio-Deltaic Sedimentary Architecture in Kentucky

Join trip leaders Dr. Huw Williams and Dr. Paul Davies in a unique experience that combines field- and classroom-based reservoir geology and modeling using the industry-leading Petrel® E&P software platform. We’ll focus on capturing the geological knowledge necessary to build realistic models of coal-bearing fluvial- and deltaic-sediment body architecture in Petrel software.

You’ll follow the typical workflow of a subsurface 3D modeling study aimed at fluvio-deltaic reservoir characterization while making realistic, predictive models of sedimentary geometries and architecture. Outcrops, cores, and well logs will be used to characterize both small- and large-scale patterns of sedimentary architecture within a sequence-stratigraphic framework in Kentucky’s Carboniferous coal-bearing fluvio-deltaic sediments.

OBJECTIVES
- Interpret diagnostic outcrops, core, and logs of coal-bearing fluvio-deltaic environments and facies to build a sequence-stratigraphic framework for reservoir modeling
- Perform deterministic modeling for coal-bearing sediments and build horizons, zones, and layers in Petrel software
- Make and use isochores to control shapes of sediment bodies
- Compare modeling results from different Petrel techniques and analyze static connectivities of different facies-modeling methods

AUARDIEN
Geoscientists interested in characterizing and modeling sedimentary architecture

DESTINATIONS
Lexington and Prestonsburg, Kentucky, USA

TRIP LEADER
Dr. Huw Williams studied geology at Oxford Polytechnic and has a PhD in Upper Carboniferous fluvio-deltaic sedimentology. He worked at Shell Research in its Geocap 3D reservoir modeling group before founding Reservoir Geology Consultants Ltd., where he currently works as co-director and principal 3D reservoir modeling consultant.

Dr. Paul Davies studied geology at Aberystwyth University before completing a PhD in Lower Palaeozoic deepwater turbidites at Keele University. He worked at Shell in its Geocap 3D reservoir modeling group until joining Dr. Williams at Reservoir Geology Consultants Ltd. as co-director and principal 3D reservoir modeling consultant.

ACTIVITIES
We’ll generally spend mornings in the field and afternoons in classroom-based modeling sessions to blend field instruction with practical exercises in building 3D models of the outcrops studied. (A working knowledge of Petrel software is necessary to obtain the maximum benefit from the class.)
AGENDA

DAY 1
KENTUCKY WELL SAMPLE AND CORE STORAGE LIBRARY
- Participate in a lecture covering geological setting, Upper Carboniferous stratigraphy, sedimentology, and core and log characterization
- Begin Petrel modeling exercises
- Attend a core workshop

DAY 2
PIKEVILLE, COAL RUN VILLAGE, JOHNS CREEK
- Engage in an overview of the Pikeville Formation
- Study marine and mouth bars
- Attend Modeling Introduction course

DAY 3
IVEL, RACCOON CREEK
- See coastal plains
- Visit the Kendrick Shale
- Attend Modeling Workshop 1 course

DAY 4
SIDNEY, ZEBULON
- Visit the Pikeville and Hyden Formations
- Explore a fossil forest
- Attend Modeling Workshop 2 course

DAY 5
BURNING FORK, ZEBULON, LEXINGTON
- Wrap up lessons from Modeling Workshops
- Study the Harold Sandstone, its valley margin, and the Pikeville Formation

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