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Old Tax-Credit Subsurface Data and New Analytics: Implications for Improved Subsurface Interpretation and Skilled Workforce Development

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ABSTRACT

The North Slope and Cook Inlet basins of Alaska have been producing hydrocarbon for many decades. Although hydrocarbon production from the state has been declining over the years, the recent discoveries in the Nanushuk and other formations on the North Slope are expected to reinvigorate it and reverse the trend. Over the years, many geophysical surveys have been acquired in Alaska and made available to the public. In recent years, a trove of previously collected 2D/3D seismic and well data have been released from the State of Alaska, Department of Natural Resources through the tax-credit program.

In this talk, I will show the application of new geophysical techniques and predictive data analytics on some of these old datasets to glean the subsurface information to the extent as much as possible. The talk will primarily focus on the shallow and deep hydrocarbon reservoirs on the North Slope. The preliminary results show the complexity of the subsurface, in terms of structure, stratigraphy, and rock properties. Advanced machine learning and deep learning techniques can be used on these datasets to predict the approximate location and extent of the prospective features. These datasets have been of immense value in meaningful and applied geosciences education.

BIOGRAPHY

Dr. Shuvajit (Jit) Bhattacharya is currently an assistant professor in the Department of Geological Sciences at the University of Alaska Anchorage. He teaches courses in integrated subsurface mapping, applied geophysics, and petrophysics. His broad research themes are energy geosciences, quantitative rock property analysis, and big data analytics. Prior to joining UAA, he worked with EOG Resources, Talisman Energy (now Repsol), and Battelle. He completed multiple projects for unconventional energy resources exploration, enhanced oil recovery, and carbon storage in North America, Australia, and South Africa. He received awards from AAPG and SPWLA for best presentations. Currently, he is engaged in multiple research projects focused on the improved subsurface analysis of multiple hydrocarbon source and reservoir rocks in northern and south-central Alaska.