Aeromagnetic Structural Interpretation And Evaluation Of

Analyses data on the composition, structure and formation of various petroleum hydrocarbons: the alkanes, cycloalkanes and arenes. Attention is paid to biological markers, com- pounds that may have preserved the main structural features of the original biogenic molecules. Concepts of chemical classification of crude oils are reviewed with respect to the molecular mass distribution of biological markers, and the genesis and chemical evolution of petroleum hydrocarbons are discussed.

"Northeastern Washington is a geological]y complex area. ln order to contribute to our geologic understanding of the area, and to help in directing future field work, a lineament study, using Landsat, SLAR, and aeromagnetic data was completed. Overlays of linear features on separate images were constructed after several hours of map observation. The Landsat and SLAR images were then compared to a 1:250,000 topographic base map. Correlation of lineaments to geomorphic features was noted. All three lineament maps were digitized and a computer was used to summarize lineament trends and to make strike histograms. From this information rose diagrams were made for easy analysis. The Landsot and SLAR imagery were combined to maximize information and counterbalance the deficiencies

inherent with each set of imagery. Landsat ond SLAR imagery each show a dominont lineament trend to the northeast, and a secondary trend to the northwest. Although some of the dominant northeast trending lineaments could be inherited from older geologic events, most are considered to have formed during the last major tectonic episode, the Laramide orogeny, that lasted from the late Mesozoic to the early Tertiary. Of the 956 lineaments mapped 7.9% correspond to mapped faults. A high density of lineaments corresponds to areas of concentrated structural or bedrock features such as fractures, folds, or metamorphic fabric. The north-central part of the study area, within the Omineca Crystalline Belt, has the highest density of lineaments. Within this area are the Okanogan dome, the Republic graben, and the Kettle dome. Aeromagnetic lineaments, which indicate below surface structural differences, where adjacent rocks possess different magnetic characteristics, reveal moderate correlation with the trend distributions recognized uslng SLAR/Landsat imaggery. Those aeromagnetic lineaments not coincident with SLAR or Landsat lineaments rnay reveal structure that is not reflected at the surface, or structure that has been masked by subsequent events. There is fair correlation of metal mines identified from MILS data with lineaments. Eighty-nine of the 256 lineaments coincide with a MLIS location which accounts for

9.3% of the lineaments. Eighty-six of the 1486 MILS locations (5.8%) in the study area coincide with lineaments. There are 217 prospects, past producers, or developed deposits at the 86 sites. In many cases more than one mine district lies along a lineament. Only those mine locations that were within one kilometer of a lineament were mapped. Although there is not a high statistical correlation of lineaments to MILS data, the merging of the two sets of data reveals some coincidence of lineaments with intersecting mine districts. All lineaments, including those not recognized on existing geologic maps, are potential mineral investigation sites. This remote sensing analysis has limitations. lt provides a relatively rapid view of possible structural features in a large area and quickly identifies target areas. However, it does not replace detailed field work. Not every lineament has geologic signifigance, and only detailed ground and/or geophysical studies can help make that determination"--Document.

1867- includes the "Annual report of the Geological survey of India".

This combination of textbook and reference manual provides a comprehensive account of gravity and magnetic methods for exploring the subsurface using surface, marine, airborne and satellite measurements. It describes key current topics and techniques, physical properties of rocks and other earth materials, and digital data analysis methods

used to process and interpret anomalies for subsurface information. Each chapter starts with an overview and concludes by listing key concepts to consolidate new learning. An accompanying website presents problem sets and interactive computer-based exercises, providing hands-on experience of processing, modeling and interpreting data. A comprehensive online suite of full-color case histories illustrates the practical utility of modern gravity and magnetic surveys. This is an ideal text for advanced undergraduate and graduate courses and reference text for research academics and professional geophysicists. It is a valuable resource for all those interested in petroleum, engineering, mineral, environmental, geological and archeological exploration of the lithosphere.

The past fifteen years has witnessed an explosive growth in the fundamental research and applications of artificial neural networks (ANNs) and fuzzy logic (FL). The main impetus behind this growth has been the ability of such methods to offer solutions not amenable to conventional techniques, particularly in application domains involving pattern recognition, prediction and control. Although the origins of ANNs and FL may be traced back to the 1940s and 1960s, respectively, the most rapid progress has only been achieved in the last fifteen years. This has been due to significant theoretical advances in our understanding of ANNs and FL, complemented by major technological developments in high-speed computing. In geophysics, ANNs and FL have enjoyed significant success and are now employed routinely in the following areas (amongst others): 1. Exploration Seismology.

(a) Seismic data processing (trace editing; first break picking; deconvolution and multiple suppression; wavelet estimation; velocity analysis; noise identification/reduction; statics analysis; dataset matching/prediction, attenuation), (b) AVO analysis, (c) Chimneys, (d) Compression I dimensionality reduction, (e) Shear-wave analysis, (f) Interpretation (event tracking; lithology prediction and well-log analysis; prospect appraisal; hydrocarbon prediction; inversion; reservoir characterisation; quality assessment; tomography). 2. Earthquake Seismology and Subterranean Nuclear Explosions. 3. Mineral Exploration. 4. Electromagnetic I Potential Field Exploration. (a) Electromagnetic methods, (b) Potential field methods, (c) Ground penetrating radar, (d) Remote sensing, (e) inversion.

This is the revised and updated version of an established textbook. It describes the physical methods involved in exploration for hydrocarbons and minerals. These tools include gravity, magnetic, seismic, electrical, electromagnetic, and radioactivity studies.

Hydrogeology is a topical and growing subject as the earth's water resources become scarcer and more vulnerable. More than half of the surface area of continents is covered with hard rocks of low permiability. This book deals comprehensively with the fundamental principles for understanding the hydrogeological characteristics of rocks, as well as exploration techniques and assessment. It also provides in depth discussion on structural mapping, remote sensing, geophysical exploration, GIS, groundwater flow modelling and contaminant transport, field hydraulic testing including tracer tests, groundwater quality, geothermal reservoirs, managed aquifer recharge, and resources assessment and management. Hydrogeological aspects of various lithology groups, including crystalline rocks, volcanic rocks, carbonate rocks and clastic formations have been dealt

with separately, using and discussing examples from all over the world. It will be an invaluable text book cum reference source for postgraduate students, researchers, exploration scientists and engineers engaged in the field of groundwater development in fractured rocks. Applied Hydrogeology of Fractured Rocks - Second Edition is thoroughly revised and extended with a new chapter, updated sections, many new examples, and expanded and updated references.