955175
Urban geology: a case study of Tongchuan city, Shaanxi Province, China
Dai Fuchu, Liu Yuhai & Wang Sijing, *Engineering Geology*, 38(1-2), 1994, pp 165-175.

Urban geology is the study of urban geologic environments to provide a scientific basis for rational land use planning and urban development. This paper examines the major geotechnical and environmental geologic problems arising from the characteristics and human engineering activities of Tongchuan city. The main factors restricting urban development are: steep slopes; landslides; the wide distribution of problematic soils; flooding; and surface subsidence caused by underground mining. Information theory has been applied to predict the slope susceptibility. The area of surface subsidence caused by mining at present and in the future is delimited using a finite element method. The factors closely related to land use planning are: slope susceptibility and landslides, flooding; collapsible soils; surface subsidence related to mining; and the low bearing capacity of a bearing layer. The result of a suitability assessment of the study area is illustrated in the form of a rational land use planning map. (from Authors)

Geophysical techniques

955176
Polar seismic surveying with towed hydrophone array
D. P. Marschall, *Sea Technology*, 35(9), 1994, pp 45-49.

Small diameter solid hydrophone arrays are being developed for marine seismic exploration. These systems are particularly suited to polar regions where ambient noise levels vary, repair is difficult, and leakage from traditional oil-filled arrays would damage the unique environment. This article describes hydrodynamics, hydrophones, turbulent boundary layer noise, bulge wave noise, overall self-noise performance, and seismic data quality. Characteristics of this new technology include lower noise, clearer signal, light weight and low volume, lower drag, lower operating costs, improved data quality and lower large-scale production costs. (J.M.McLaughlin)

955177
The application of 3-D depth migration to the development of an Alaskan offshore oil field
D. N. Whitcombe, E. H. Murray Jr, L. A. St. Aubin & R. J. Carroll, *Geophysics*, 59(10), 1994, pp 1551-1560.

Inconsistencies in fault positioning between overlapping 3-D seismic surveys over the northwestern part of the Endicott Field highlighted lateral positioning errors of the order of 1000 ft (330 m) in the seismic images. This large uncertainty in fault positioning placed a high and often unacceptable risk on the placement of wells. To quantify and correct for the seismic positioning error, 3-D velocity models were developed for ray-trace modeling. The lateral positioning error maps produced revealed significant variation in the mispositioning within the Endicott Field that were mainly caused by lateral variations in permafrost thickness. These maps have been used to correct the positions of mapped features and have enabled several wells to be successfully placed close to major faults. (from Authors)

955178
A method for determination of the three-dimensional seismic velocity structure from local earthquake data
H. Miyamachi, *Journal of Physics of the Earth*, 42(3), 1994, pp 237-260.

The paper presents an inverse method to estimate a three-dimensional seismic wave velocity structure using seismic arrival time data obtained from local earthquakes. The method is characterized by a simultaneous determination of a two-dimensional depth distribution of a velocity boundary, a three-dimensional velocity distribution, station corrections and hypocenters. The depth distributions of velocity boundaries and the distributions of the slowness perturbations for P and S waves are modeled by power series of latitude, longitude, and depth. This representation of the three-dimensional seismic structure is advantageous not only in reducing the number of unknown parameters, but also in analytically evaluating the boundary depths, velocities, and partial derivatives of travel times with respect to the unknown parameters. (from Author)

955179
4D: the next seismic generation?
D. George, *Offshore*, 54(10), 1994, pp 21-22.

Four-dimensional seismic acquisiton technology for reservoir management is described. This technology can locate hydrocarbon volumes in space and can track the movement of fluids by imaging flow regimes, sources and migration. Highly accurate data can help improve reservoir management and avoid problems. Experimental trials with 4-D seismic and field use on the Oseberg project in the Norwegian North Sea are discussed. (P.M.Taylor)

955180
The generation of near-surface-layer models from seismic reflection traveltimes
R. Bloor & K. Whaler, *Geophysical Journal International*, 119(3), 1994, pp 693-705.

In this paper, the velocity or thickness of the near-surface layer is calculated from 2-D reflection data by minimizing, with respect to a model of the surface layer, the difference between data predicted by the model and the actual data. Once a model has been produced, corrections that are dependent on the ray-path geometry through the near-surface layer can be calculated. The method is tested on synthetic data and applied to a reverse vertical seismic profile data set. The extension of the method to 3-D data is also considered. (from Authors)

955181
Variations in noise and signal levels in a pair of deep boreholes near Amarillo, Texas
C. J. Young, E. P. Chael, D. A. Zagar & J. A. Carter, *Bulletin - Seismological Society of America*, 84(5), 1994, pp 1593-1607.

It is a well-established fact that placing seismic instruments below the surface of the Earth will lead to improvements in the signal-to-noise ratio (SNR) at any given site. This is so for two basic reasons, both related to the fact that the uppermost layers of the Earth are typically very highly attenuative and low velocity. To better understand the depth dependence of improvements in signal-to-noise ratio for borehole seismic data, the authors collected and analyzed a data set recorded from a pair of high-fidelity, broadband (1 to 80 Hz) seismometers sited in two closely separated deep boreholes near Amarillo, Texas. The total decrease (surface to 1951 m) in minimum noise level is up to 30 dB; the total decrease in maximum noise level is up to 35 dB; and the range of noise values (maximum to minimum) at a given depth decreases from 30 to 10 dB. The majority of the noise reduction occurs within the first few hundred meters below the surface. (Authors)

955182
Seismic wave propagation in transversely isotropic porous media (in Chinese)
Liu Yin-Bin, Li You-Ming & Wu Ru-Shan, *Acta Geophysica Sinica*, 37(4), 1994, pp 499-514.