

T. R. Carter and A. C. Castillo, Petroleum Resources Centre, Ministry Of Natural Resources

The Petroleum GIS – Three-Dimensional Geological Mapping in the Subsurface of Southern Ontario, Canada

The Petroleum Resources Centre of the Ontario Ministry of Natural Resources collects and manages a large quantity of subsurface resource and geological data at its Oil, Gas and Salt Resources Library in London. The Library maintains an extensive collection of drill cuttings samples representing 13,000 wells and drill core from over 1,000 wells. Hard-copy reports are available for over 20,000 wells and includes data on well location, well status, operator identification, drilling dates and depths, well construction, geological formation top depths and elevations, oil/gas/water intervals, geophysical well logs, core analyses, analyses of oil, gas and water samples, subsurface pressures and production volumes. The data is principally acquired from the drilling and operation of petroleum wells by industry clients. Digital data derived from the well records and samples are maintained in an Oracle relational database known as the Ontario Petroleum Data System (OPDS). The Centre has recently developed a “Petroleum GIS” application using Arcview 3.2 for viewing and querying of well data from OPDS. The petroleum well theme is generated by a dynamic link to the Oracle data tables in OPDS. Elevation data for the tops of subsurface bedrock formations can be extracted from the Oracle data tables using the application, gridded and contoured using specialized software and displayed as a new data theme in the GIS. Three-dimensional maps created from the gridded data are particularly useful for visualization and mapping of subsurface structures such as faults, reefs, salt dissolution and collapse features, regional dip, structural closures, bedrock topography and more. Selected examples from southern Ontario are presented. Basic well data including corrected geographic co-ordinates are available at www.ogsrlibrary.com and clients are able to purchase data on subsurface geological formation top picks, oil, gas and water intervals and enhanced well data. MNR digital base maps are available to corporate members of the Library under the terms of a data sharing agreement with the Ministry of Natural Resources.