Geological Mapping and Modelling at the Alberta Geological Survey

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Alberta, Canada

- 661,000 km²
- Characterizing surface and subsurface geology
- Geological Framework Program

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Surface and Shallow Subsurface

Resource potential

- Metallic, non-metallic and industrial minerals, baseline environmental geochemistry

Landscape and Surficial Material characterization

- The geologic interval where resources development and societal interests meet
- Nature and distribution of surficial materials for land use planning

Geohazard mapping

- Landslide characterization, permafrost distribution

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Modelling and Machine Learning Approaches

**Surficial Geological Modelling**

- Bedrock topography
- Sediment isopach

**Machine Learning**

Spectral/Topographic/Climatic Predictors

- Spectral data
- Relative height/slope
- Topographic openness
- Temperature/precipitation/snow acc.
- Ruggedness
- Surface wetness

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Technological Developments

- Targeted/focused ground truthing
- Combination of digitization and semi-automated tools
- More accurate placement of geological boundaries
3D Geological Framework Program
3D Geological Framework Program
Supporting Data Transparency for Information Integration

- Manage and Efficiently Evaluate Well Data
  - 450,000+ wells (541,000 Km)
  - Support science-based decision making
  - Identify resource potential

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Ensuring Geologic Consistency and Credibility

Table of Formations 3D Geological Framework

Communicate accurate and credible geologic information to stakeholders

LEXICON

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Integrated and Interactive Geological Information

Table of Formations

Online Stratigraphic Unit Summaries

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Geological Framework Activities

- 3D Provincial Model
- Property Modelling
- Integrated Resources
- Virtual and Augmented Reality
- Minecraft Outreach

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Value of Integrated Resource Modelling
Disseminating 3D Model Information

Publishing our Geomodels
- top/pick datasets
- geological extents
- 2.5D surfaces

IMOD
Entire geocellular model available via free IMOD software

MINECRAFT
Downscaling and transformation of Petrel models into Minecraft worlds

VIRTUAL REALITY
360 video tours of 3D Models and Minecraft models

SUPPORT INTERACTIVE ENGAGEMENT WITH A WIDE VARIETY OF STAKEHOLDERS

SUPPORT SCIENCE-BASED DECISION MAKING AT THE AER

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Thank You

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