SCRF

22nd Annual Meeting

April 30-May 1 2009
Research Overview

CD annual report with papers

Presentations
Modeling Uncertainty

Distance based modeling of uncertainty

- Model selection
- Inverse modeling
- Upscaling and History Matching
- Multiple-point geostatistics
Distance Based Modeling

Modeling uncertainty in metric space
Jef Caers, Kwangwon Park, and Céline Scheidt

Defining a random function from a given set of model realizations
Céline Scheit, Kwangwon Park and Jef Caers

Stochastic simulation of patterns using distance-based pattern modeling
Mehrdad Honarkhah and Jef Caers

Bootstrap confidence intervals for reservoir model selection techniques
Céline Scheidt and Jef Caers

Direct construction and history matching of ensembles of coarse-scale reservoir models
Céline Scheidt, Jef Caers and Yuguang Chen
Hybrid Models

- Process based
- Surface based
- Geostatistical

Stratigraphic modeling

Leiva

Bertoncello
Hybrid Models

A combined process-based and geostatistical methodology for simulation of realistic heterogeneity with data conditioning
H.A. Michael, H. Li, A. Boucher, T. Sun, S. Gorelick, and J. Caers

Construction of hybrid geostatistical models combining surface based methods with multiple-point geostatistics: use of flow direction and drainage area
Alejandro D. Leiva and Tapan Mukerji

Combination of stratigraphic forward modeling and geostatistical algorithms to simulate conditional stratigraphic surfaces
Antoine Bertoncello and Jef Caers
Carbonates

A methodology for generating training images from carbonate and clastic databases, **Jef Caers** (presentation)

A reservoir-oriented database for carbonate systems, **Andre Jung** *(University of Tubingen)* (presentation)

A hierarchical, extendable, object-based boolean training-image generation methodology, **Alexandre Boucher** (presentation)
Integrating Data and Models

Scaling issues

Different types of data

Different types of models
Integrating Data and Models

Scaling

Seismic attributes ↔ fine-scale facies

Stright & Boucher
Integrating Data and Models

![Diagram showing power spectrum with bands labeled EM and SEISMIC, and arrows indicating the relationship between CSEM data and Seismic data.]

- CSEM data
- Seismic data

![Diagram showing the relationship between Basin & Petroleum Systems modeling and Geostatistics with arrows indicating the interplay between the two fields.]

- Basin & Petroleum Systems modeling
- Geostatistics
Integrating Data and Models

Integrating geology, EM geophysics, MP-geostatistics and flow simulation to address aquifer vulnerability

Trainor & Caers
Integrating Data and Models

Curvelet transforms:
scale and angle dependent seismic attributes

Haugen
Integrating Data and Models

Obtaining local proportions from coarse-scale soft attributes through a multi-scale, multi-attribute calibration (abstract)
Lisa Stright and Alexandre Boucher

Multi-point modeling of clay lenses and its impact on aquifer vulnerability
Whitney Trainor and Jef Caers

Estimating low frequency spatial trends for reservoir characterization using multiscale data and models
Tapan Mukerji, Carmen Gomez, and Bin Jia

Seismic velocity tomography with co-located soft data
Mohammad Maysami

Linking geostatistics with basin modeling: assessment of structural uncertainties
Bin Jia and Tapan Mukerji

Statistical modeling of seismic reflectivities comparing Lévy stable and Gaussian mixture distributions
Tapan Mukerji, Partha Routh, and Vaughn Ball

Curvelet transforms and filtering of seismic attributes for reservoir modeling
Matz Haugen and Tapan Mukerji
History Matching

Multi-scale inverse flow modeling

A multiscale method for large-scale inverse modeling: single-phase transient flow
Jianlin Fu, Jef Caers, and Hamdi Tchelepi

A multiscale adjoint method for large-scale sensitivity computation in subsurface flow simulation
Jianlin Fu, Hamdi Tchelepi and Jef Caers
History Matching

Metric Ensemble Kalman filter:
Brugge synthetic data

Seismic time-lapse modeling:
Norne field
History Matching

Uncertainties in rock pore compressibility and effects on time lapse seismic modeling – an application to Norne field
Amit Suman and Tapan Mukerji

Direct construction and history matching of ensembles of coarse-scale reservoir models
Céline Scheidt, Jef Caers and Yuguang Chen

Analysis of the pattern correlation between time lapse seismic amplitudes and saturation (proposed work)
Darkhan Kuralkhanov and Tapan Mukerji
Guest Speakers

Michel Bakalowicz, University of Montpellier, France, Editor, Hydrogeology Journal

Juan Fernandez-Martinez, Oviedo University, visiting Prof. Berkeley University

Andre Jung, University of Tubingen

Darryl Fenwick, Streamsim Technologies

Gregoire Mariethoz, University of Neuchatel
News and People
News and People

SGeMS Book

Applied Geostatistics with SGeMS
A USER'S GUIDE
Nicolas Remy, Alexandre Boucher and Jianbing Wu
News and People

IAMG 09 at Stanford, Aug 23-28, 2009
http://iamg09.stanford.edu/

Theme: Computational Methods for the Earth, Energy and Environmental Sciences
News and People

New students

Darkhan Kuralkhanov
Matz Haugen
Jing Wang
Bin Jia
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