

ResX

Reservoir Modeling and Management Software

ResX provides a broader digital, interdisciplinary framework to evaluate subsurface uncertainties and helps asset teams make better reservoir management decisions

Changing the Approach
To Building Reliable Reservoir Models



ResX

Grounded in ensemble based methods, ResX enables a robust quantification of uncertainty across static and dynamic data conditioning and modeling. Together, geoscientists and reservoir engineers can assess different concepts within a full range of geologically consistent—and equally likely—reservoir models. Through all stages of an asset's life, ResX captures information found in all available data and propagates uncertainty through repeatable processes. This ensemble of models continuously provides new reservoir insights that drive high-value decisions.

ResX is the only commercially available software tool that ties static and dynamic data conditioning with reservoir modeling in a single step, without making rough approximations or artificial compromises. Through this streamlined process, uncertainty is captured and propagated through repeatable workflows in all parts of the modeling process to ensure fidelity and consistency. As new data arrives, the automated workflow greatly simplifies the process of updating models which preserves modeling continuity, saves time, and ensures a consistent store of reservoir knowledge and insight.



Experience an environment designed to make communication between subsurface disciplines not only necessary but natural.

Succeed together using a streamlined reservoir modeling and data conditioning framework.

Improve your reservoir modeling efforts with highly efficient algorithms.

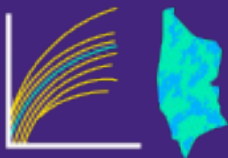


Fit-for-purpose machine learning algorithms augmenting the know-how of the subsurface team.

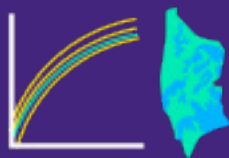
ResX generates models that honor all available data, abide by the reservoir physics, while incorporating uncertainty throughout the modeling and data conditioning process. Understanding how the information found in the static and dynamic data influences the uncertainty in parameters such as net sand distribution or reservoir thickness is key to making better decisions. This allows the team to weigh alternative strategies to meet various corporate targets and benchmarks including return on investment, production volumes, reserves replacement or growth.

ResX has been designed to enhance communication between disciplines. With workflows that allow the team to move seamlessly from data integration to the parameterization of domain uncertainties, multiple, possible reservoir models can be created to form an ensemble of models. ResX automatically generates the results of this ensemble so the team can make critical decisions that incorporate the information available in all data. With collaborative input and collective output, ResX dramatically increases the team's efficiency by ensuring models are consistent and up-to-date.

Prior



Posterior



All models are conditioned to the observed data and used to generate predictions.

Make better decisions by understanding how the information found in data influences reservoir performance.



Fast Integrated Reservoir Modeling on the Gjøa Field Offshore Norway SPE-188557-MS

Sætrom, Morell (Resoptima AS), Ravair, Le Maitre, Seldal (Engie E&P Norge AS)

CHALLENGE

- Compartmentalized, tilted fault segments
- High uncertainty in remaining hydrocarbon volumes and in the best location of infill wells
- 32 million unknown model parameters

SOLUTION

With the combination of the right algorithms and repeatable modeling workflows using ResX, it was possible to automate the process of reservoir modeling and data conditioning while accounting for all static and dynamic data in a consistent manner across the modeling chain. Adding to this the combined expertise of the subsurface team led to an improved understanding of the field.



Enhancing the Geological Models Consistency in Ensemble Based History Matching an Integrated Approach – SPE-186049-MS

Sætrom (Resoptima AS), Perrone, Pennadoro, Tiani, Rossa (Eni S.p.A.)

CHALLENGE

- Complex, channelized turbidite reservoir
- Large uncertainties in faulting and channeling
- Increased reliability in reservoir model forecast

SOLUTION

The Ensemble Kalman based method made it possible to generate multiple matched models with a comprehensive set of model parameters. It addressed the history matching challenges using repeatable workflows that allowed new data to be quickly incorporated. For Eni's complex reservoir, ResX's integrated methodology made it possible to retain the necessary geological consistency.



Consistent Integration of Drill-Stem Test Data into Reservoir Models on a Giant Field Offshore Norway – SPE-181352-MS

Sætrom (Resoptima AS), Selseng, MacDonald, Kjølsest, Kolbjørnsen (Lundin Norway AS)

CHALLENGE

- Greenfield, with limited dynamic data
- Observed thickness below seismic resolution
- Capture information in multiple Drill Stem Tests to increase subsurface understanding

SOLUTION

Using ResX, dynamic data including Drill Stem Test (DST) build up pressure derivatives were fully conditioned with static data inputs. The solution combined these data, the subsurface know-how of the asset team, reservoir physics, and machine learning algorithms to generate an ensemble of reservoir models. The results from this full suite of models provided a more reliable view of subsurface uncertainties thus reducing the risk of the chosen development strategy.

Selected Publications

JPT2018: Enhancing Model Consistency in Ensemble-Based History Matching

C. Carpenter, JPT Technology Editor. This article contains highlights of paper SPE 186049 listed above.

JPT2017: Integrated Software Tool Brings Speed, Reliability to Reservoir Modeling on Barents Sea Project

G. Halset, V. Arrigoni, P. Panfili, J. A. Tveit, SPE, Eni, J. Sætrom, Resoptima

EAGE2015: Improved History Matching and Uncertainty Quantification for Gas Condensate Fields Using an Ensemble Based Approach

A. Barliansyah, T. Skåre, Bayerngas, T. F. Munck, J. Sætrom, Resoptima

EAGE_ECMOR2016: Reservoir Modelling and Uncertainty Quantification - Why we Currently Fail and What we Can Do to Fix this

J. Sætrom, E. Morell, T. F. Munck, Resoptima

IPTC-18868-MS: Consistently Integrating Static and Dynamic Data in the Facies Model Description Using an Ensemble Based Approach

J. Sætrom, A. Phade, M. L. Vinther, T. F. Munck, Resoptima

SPE-175668-MS: Improved Reservoir Management Decisions Using Ensemble Based Methods

J. Sætrom, K. Klemens, T. F. Munck, Resoptima



Consulting

Discover how our approach to reservoir modeling can deliver value to your project's unique challenges.



Support

Contact our team of experts directly to get prompt answers to your questions and resolution to your technical issues.



Training

Talk to us about training services which can be customized to your business needs.

Resoptima: The Next Age of **Reservoir Modeling and Management**

At Resoptima we are passionate about driving value through effective reservoir management.

Through innovation we deliver a suite of scalable software and high-value services for reservoir modeling and reservoir management that change the way subsurface teams work to transform data and physics into actionable insights.



Resoptima

info@resoptima.com
www.resoptima.com

Oslo

Wergelandsveien 1
6th floor
0167, Oslo
Norway

Stavanger

Hospitalgata 6
2nd floor
4006, Stavanger
Norway

London

Stapleton House
Block A – 2nd Floor
110 Clifton Street
EC2A 4HT, London
United Kingdom

Kuala Lumpur

Suite 14.02
14th Floor, GTower
199, Jalan Tun Razak
50400, Kuala Lumpur
Malaysia