

Most of the studied responses, show relatively a higher sensitivity to aggradation, progradation and faulting. Low aggradation angle keeps the flow restricted in a limited space. In cases with low rock quality in injection layers, pressure builds up in the well-bore. Injecting in down dip progradation, normally ends up in a higher pressure buildup and lower injectivity. In the down dip progradation, the majority of the region around injection point is made of low quality rock. Faults change the geometrical structure of the medium and they put different layers in contact. Pressure disturbance can leak through faults to larger distances from injection point. Closed faults can significantly reduce the injectivity quality.

The work-flow of pressure study demonstrated here can be used in a specific studies in the context of geological uncertainty. The work-flow can be used for other depositional systems and different values for operational limits can be used, which might lead to outcomes different than the results reported here.

## References

- [1] M. Ashraf, K.A. Lie, Nilsen, and A. Skorstad. Impact of geological heterogeneity on early-stage CO<sub>2</sub> plume migration: Sensitivity analysis. In *ready for submission*, 2012.
- [2] M. Ashraf, K.A. Lie, H.M. Nilsen, J.M. Nordbotten, and A. Skorstad. Impact of geological heterogeneity on early-stage CO<sub>2</sub> plume migration. In *CMWR*, 2010.
- [3] B. Cailly, P. Le Thiez, P. Egermann, A. Audibert, S. Vidal-Gilbert, and X. Longaygue. Geological storage of CO<sub>2</sub>: A state-of-the-art of injection processes and technologies. *Oil & Gas Science and Technology*, 60(3):517–525, 2005.
- [4] A. Cavanagh and N. Wildgust. Pressurization and brine displacement issues for deep saline formation CO<sub>2</sub> storage. *Energy Procedia*, 4:4814–4821, 2011.
- [5] J.A. Howell, A. Skorstad, A. MacDonald, A. Fordham, S. Flint, B. Fjellvoll, and T. Manzocchi. Sedimentological parameterization of shallow-marine reservoirs. *Petroleum Geoscience*, 14(1):17–34, 2008.
- [6] T. Le Guenan and J. Rohmer. Corrective measures based on pressure control strategies for CO<sub>2</sub> geological storage in deep aquifers. *International Journal of Greenhouse Gas Control*, 2010.
- [7] T. Manzocchi, J.N. Carter, A. Skorstad, B. Fjellvoll, K.D. Stephen, J.A. Howell, J.D. Matthews, J.J. Walsh, M. Nepveu, C. Bos, et al. Sensitivity of the impact of geological uncertainty on production from faulted and unfaulted shallow-marine oil reservoirs: objectives and methods. *Petroleum Geoscience*, 14(1):3–11, 2008.
- [8] J.D. Matthews, J.N. Carter, K.D. Stephen, R.W. Zimmerman, A. Skorstad, T. Manzocchi, and J.A. Howell. Assessing the effect of geological uncertainty on recovery estimates in shallow-marine reservoirs: the application of reservoir engineering to the SAIGUP project. *Petroleum Geoscience*, 14(1):35–44, 2008.