



Modelling in the Monitoring Network

- Modelling requirements of the Monitoring Network
- Where are modelling issues best addressed (current networks, new network?)
- What will this network offer that is not or could not be covered in monitoring



Modelling Network

- Modelling of CCS is a specialized area and a modelling network would be good for sharing these challenges
- Goal of network: Work flows associated with modelling
 - “Process” of modelling
- In modelling there is always issues with inversion – monitoring (of the “right” parameters) is key to this inversion. Also a recognition that no model can do everything...
- Modelling is has used (and is using) tools from the oil and gas industry that were not designed for CO₂ storage – modelling network continue GS specific model development
- Modelling could help identify appropriate, generic levels of simplicity to allow design of monitoring, area of influence, etc
- Could look at how to communicate complex simulation results to the public



Modelling Network

- 4 Areas of modelling
 - Bench Marking (can be independent)
 - Code validation
 - Analytical
 - Code comparison
 - Calibration (can be independent)
 - lab scale, small scale comparisons
 - Some inversion
 - **Validation (Needs to be integrated with monitoring)**
 - **this occurs through monitoring**
 - Long-term predictions (1,000's of years - potentially independent)



Monitoring and Modelling

- Modelling can give monitoring the questions that they need to answer
- Monitoring has traditionally not focused on modelling
- Historically there has been a lack of “projects” to demonstrate monitoring and modelling but things are changing
- Interaction between the modelling and monitoring helps define the limitation between areas



Monitoring and Modelling

- The monitoring people have to work very closely with the modellers in order to calibrate the models
 - Monitoring can help reduce the uncertainty in the models
- Integration of data is required between the monitoring and the modelling
- Monitoring and modelling are dependant
 - History matching and forward modelling
 - But issues of underlying physics, process coding, etc are specific to modelling
- Integration could be handled by planned joint meetings
- Monitoring Day 1, Mon./Mod. Day 2 and Mod. Day 3



Conclusions

- Regardless of whether the modelling network is created, the monitoring network needs increased focus on modelling and monitoring issues of CCS