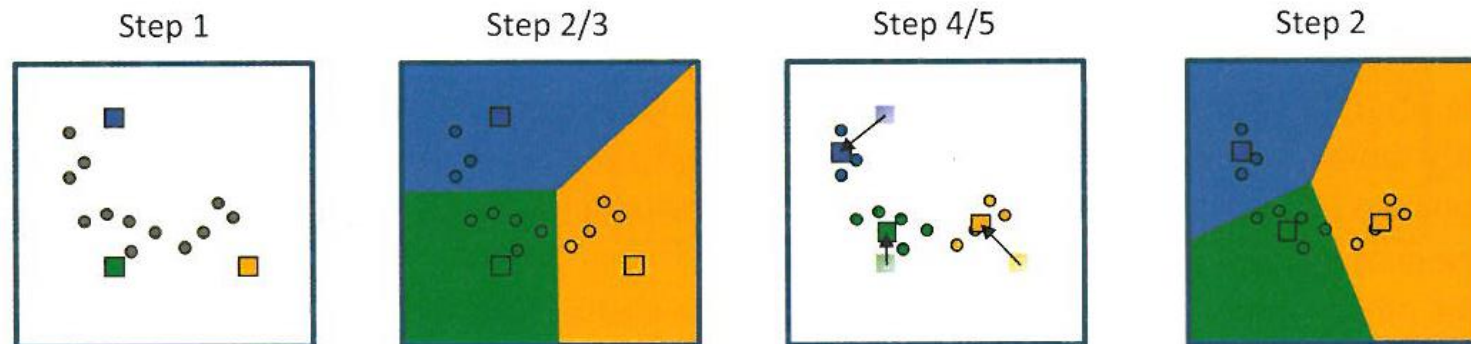


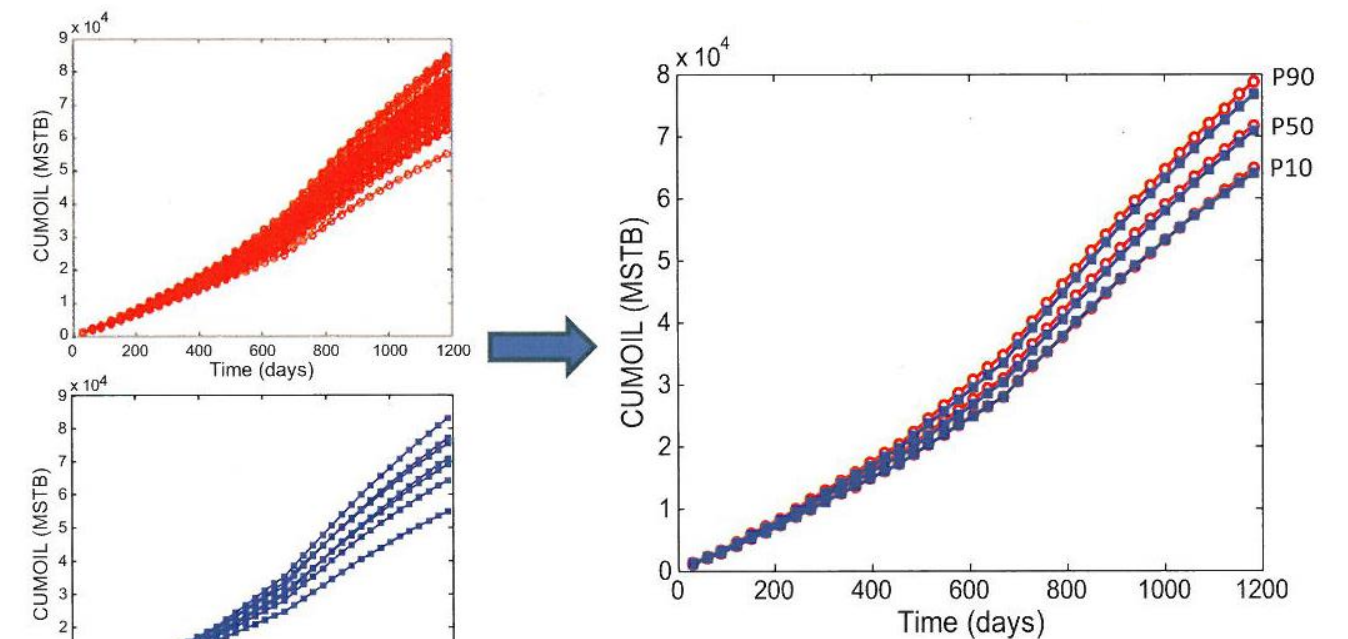
Distance methods and clustering for model post-processing

Contributor: Richard Oxlade & Mark Bentley, TRACS Training

Distance-based cluster offers a simple means of selecting a representative sub-set of models from a large number of model runs. Two general ways of approaching this: **unsupervised** or **supervised**



Unsupervised clustering is described by Jeff Caers in his book 'Modelling Uncertainty' and is graphically illustrated here as 12 models are represented by 3 models, taken to reflect P90, P50 and P10 cases

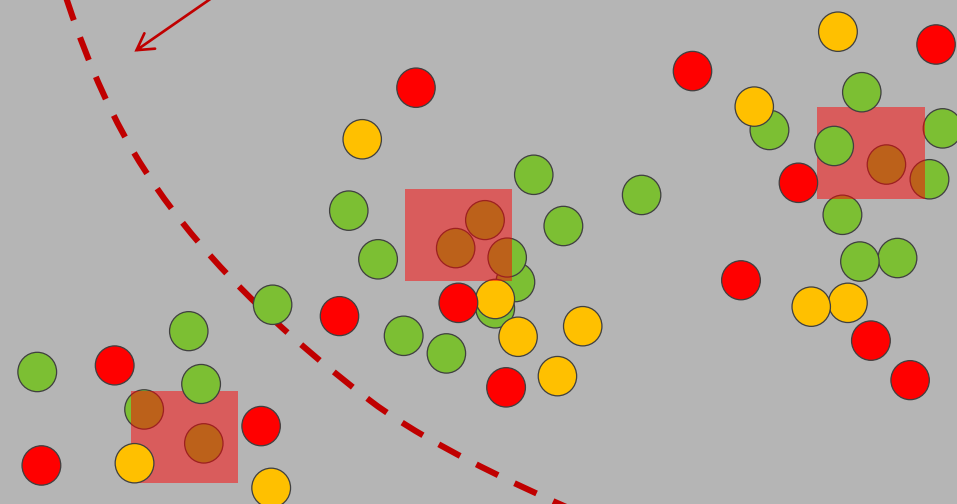


UNSUPERVISED CLUSTERING

J. Caers 2011, Modelling Uncertainty

Commercial threshold

Production (stb/d)



Recovery (MMstb)

SUPERVISED CLUSTERING

'Supervised' clustering is simply a manual way of analysing model results vs. key outputs parameters, in this case ultimate recovery and production rate.

Each dot is a static/dynamic model pair, cases generated from a probability tree. The quality of the history match is represented by traffic lights (green=best).

The models are broadly clustered around three chosen nodes, two of which are commercial projects and one is not. The follow-on discussion is:

- Are the failure cases models valid?
- If valid can they be mitigated?
- If not possible to mitigate, is the associated project risk acceptable?