

# Managing Uncertainty in Geologic Storage

*“Measure Twice Cut Once”*

John Tombari  
Schlumberger Carbon Services



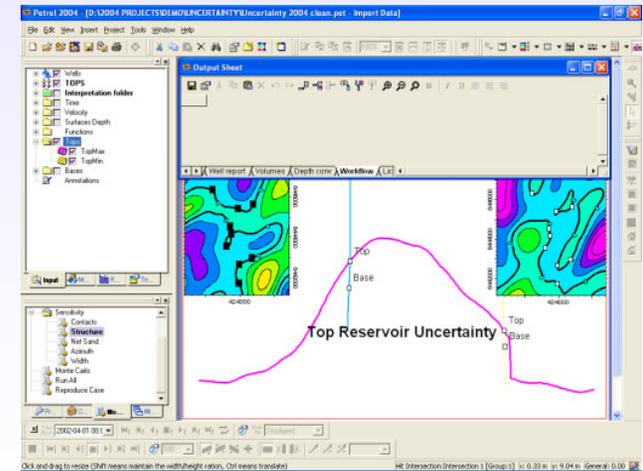
**Schlumberger**

# Challenges

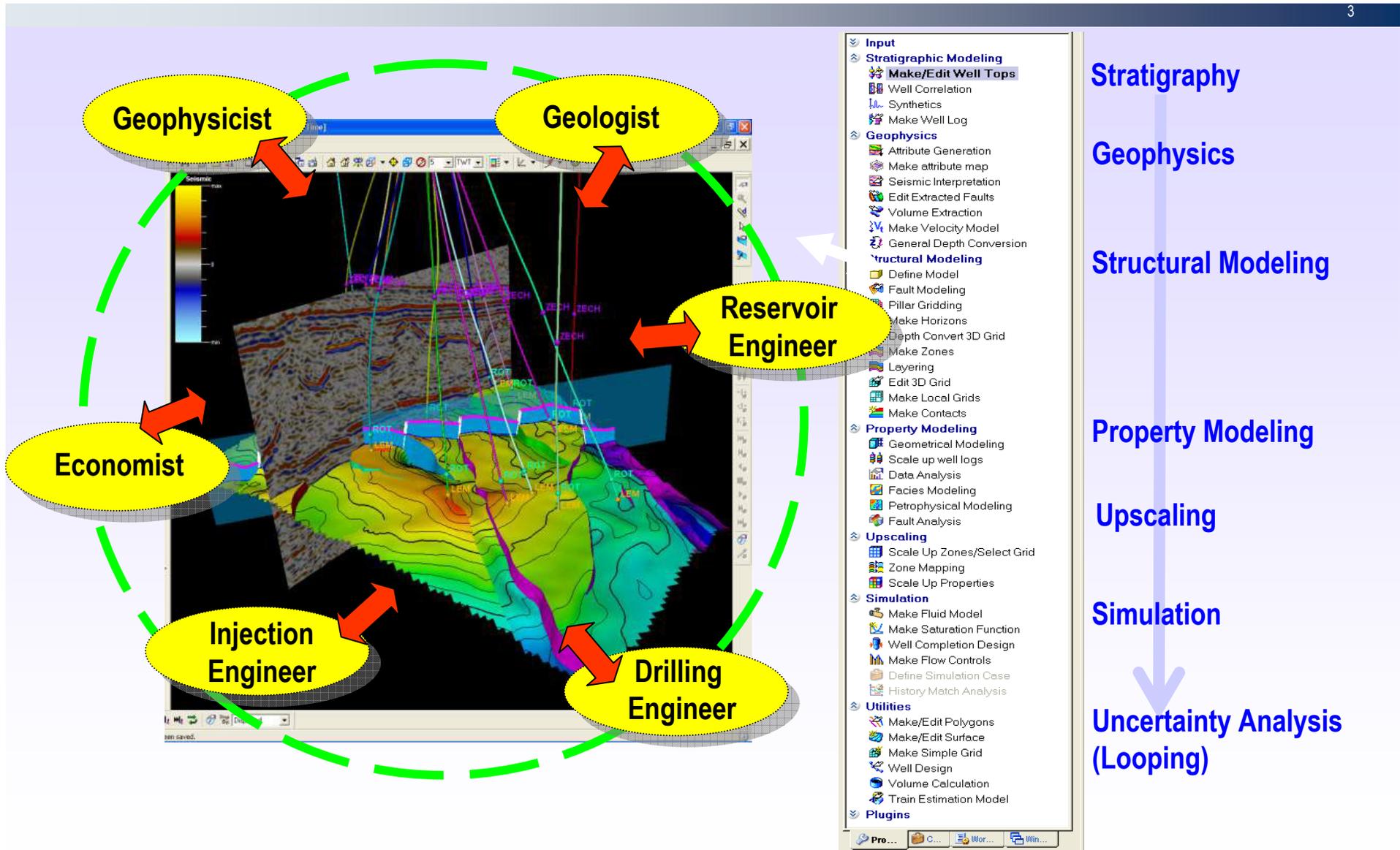
- Estimating subsurface characteristics such as capacity, injectivity & containment
  - Many examples of both over & under estimation exist
  - A single deterministic evaluation is not good enough
- Site Selection
- Assembling & enabling a multi-disciplinary workforce

## Uncertainty Sources

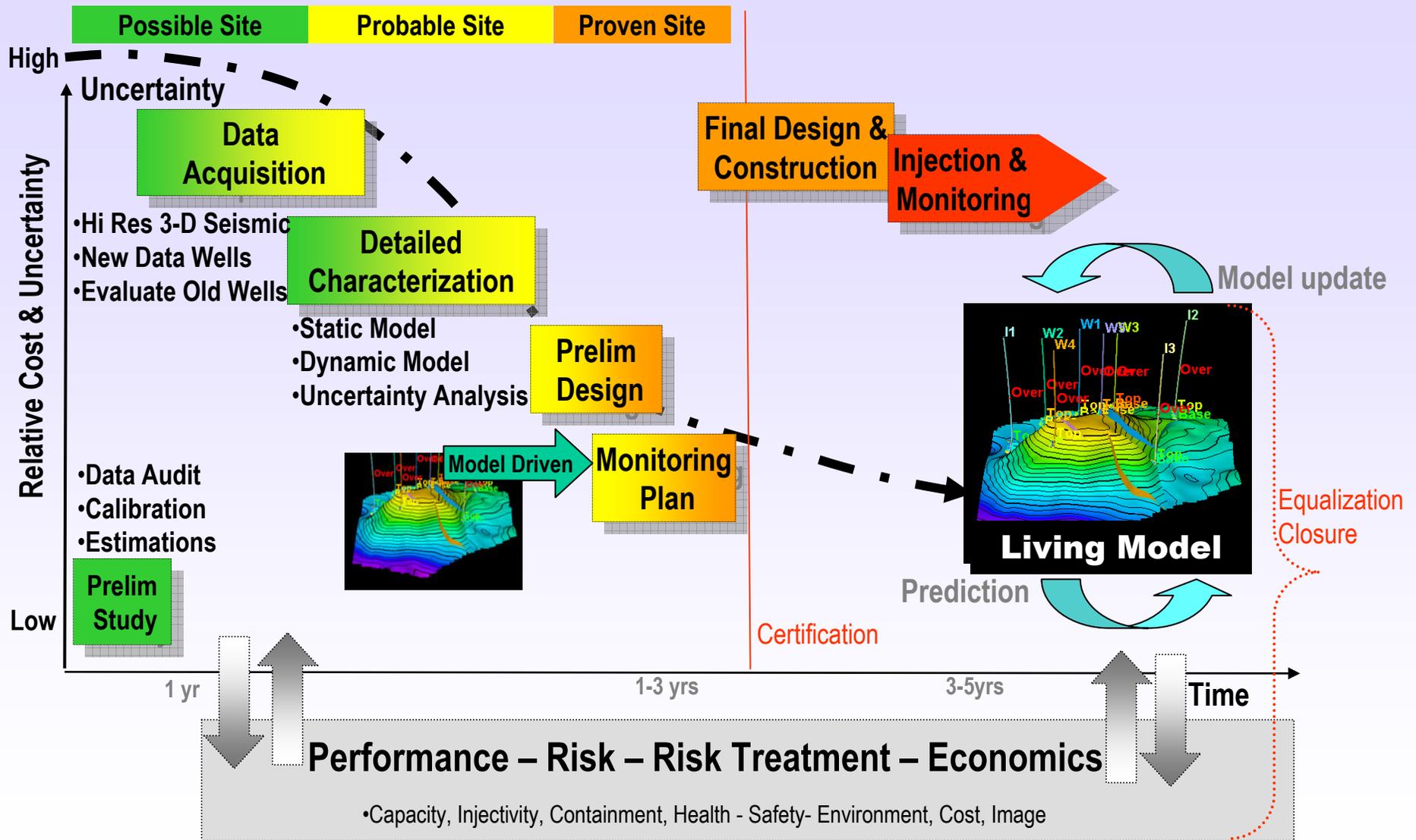
- Seismic processing
- Picking of faults and horizons
- Time to depth conversion
- Structural modeling
- Petrophysics
- Geological scenarios
- Fluid contacts
- Property / facies distribution
- Long term mineral reactions
- Fault transmissibilities
- Fluids' transmissibilities
- Upscaling
- PVT and saturation modeling
- Production and drilling scenarios
- Economic parameters
- Condition of wells



# Unified Modeling Environment



# Uncertainty During the Storage Timeline



# In Summary

- **Pick the Right Site**
  - Non-complex, depth, porosity, perm, extent, structure, caprock...
  - Some existing wells, but not many
  - Access & capability for: 3-D seismic acquisition, logs, core, fluids, background
- **Use the Right Technology**
  - Proper density, resolution, noise limits, area of review
  - Value equivalent uncertainty reduction
  - Has impact on performance & risk
- **Properly Integrate the Data**
  - Requires an experienced, skilled, multi-disciplinary team.
  - Unified modeling environment
  - Shared earth model, easily updatable - “Living”

# Thank You

John Tombari

[tombari@slb.com](mailto:tombari@slb.com)

832-216-0665



**Schlumberger**