

The Use of Ground Models for the Integration of Geomorphological, Geoenvironmental and Engineering Geological Data

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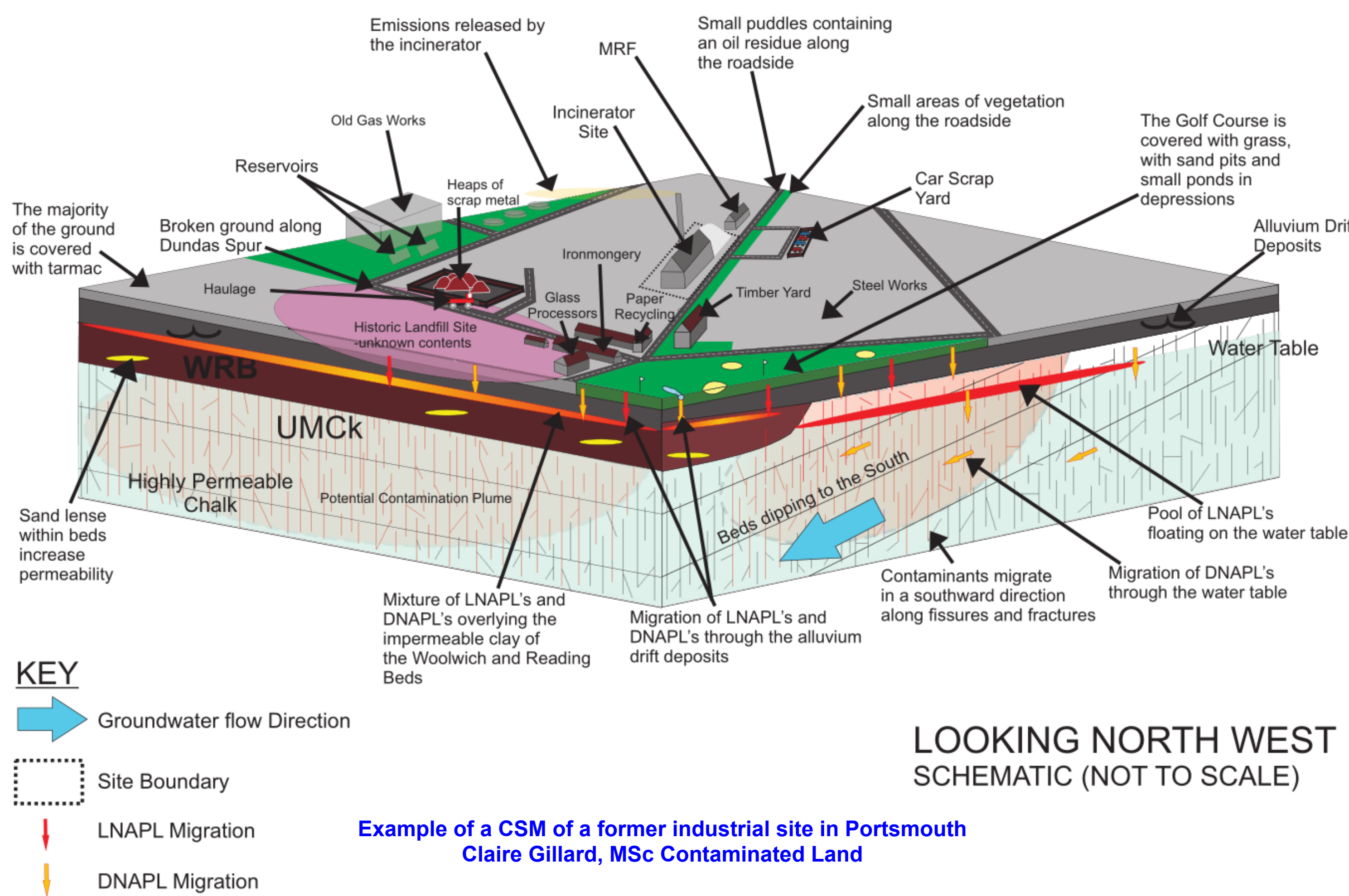
Abstract: The use of conceptual ground models (CGM) together with conceptual site models (CSM) is becoming an increasingly important tool for the characterisation and interpretation of engineering sites and in particular as part of the investigation and redevelopment of potentially contaminated Brownfield sites. The key data sets of geomorphology, solid and superficial geology, hydrogeology and site history which are necessary for the investigation, interpretation and risk management of a particular site can be complex to present together. The use of a visualised ground model allows for a clear interpretation of these data to be made in a format that is readily accessible by an end user.

A visualised ground model provides the geomorphologist and engineering geologist with a simple and easily understood vehicle to aid in the understanding of the three and often four dimensional variability of a given site. Complex interactions and potential geohazards, whether geomorphological or geological, can be identified and emphasised by the use of such models.

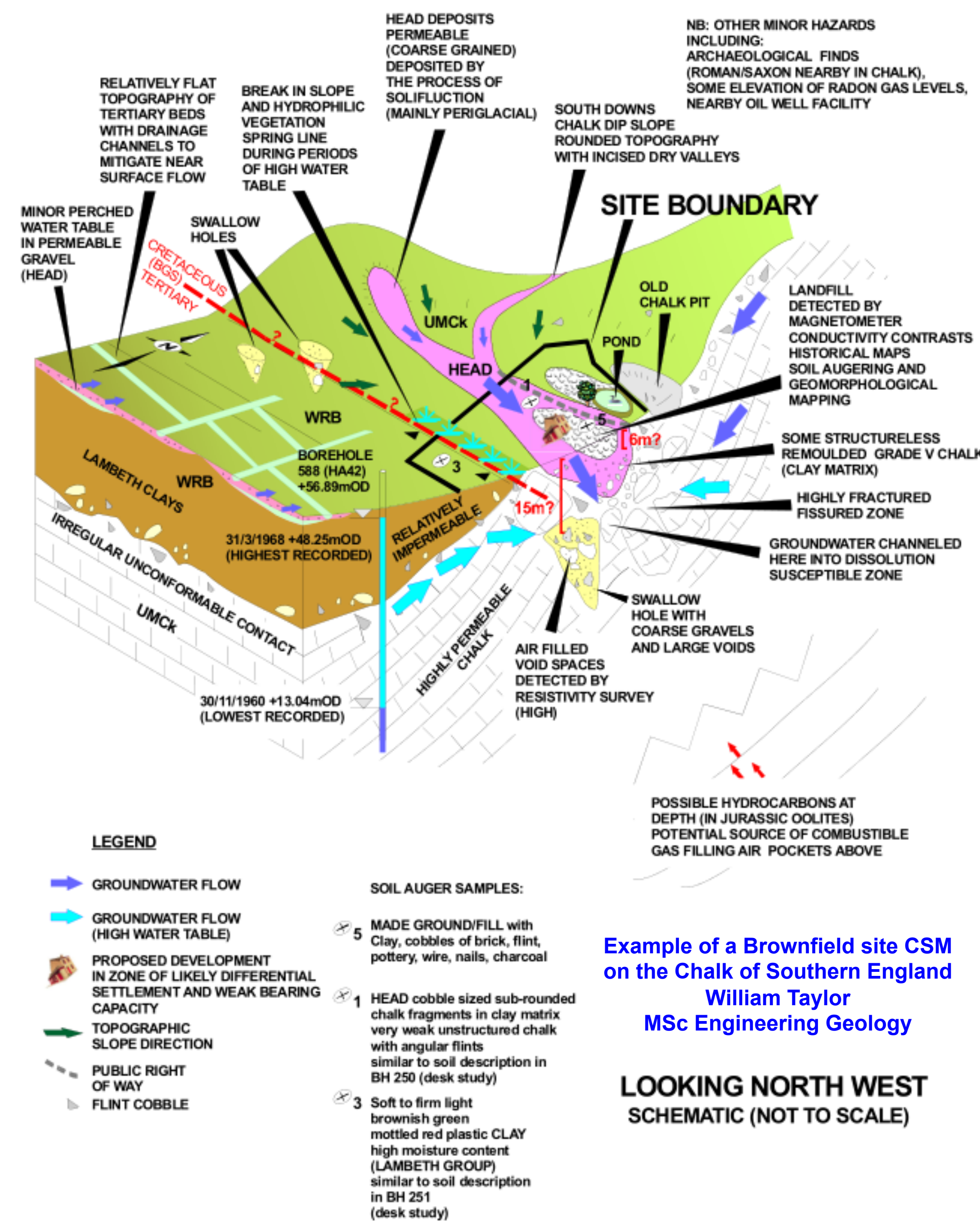
This poster will review the current approaches to ground model design and will highlight the need for geomorphological data to be integrated within them. Various examples will be presented of the different approaches that are available, particularly with regard to contaminated former Brownfield sites.

What are Conceptual Ground / Site Models?

- Testable representations of geo & environmental processes on a site & its vicinity
- Provide a vision of a site & should be developed for every site under investigation
- Allow specialists / non specialists to understand complex issues associated with a site
- Allow for clarity of thinking & interpretation through focusing on the key site issues
- Should play a key role in any site risk assessment
- Dynamic model that continually updates with new information
- About visualisation, communication & information transfer



Example of a CSM of a former industrial site in Portsmouth
Claire Gillard, MSc Contaminated Land

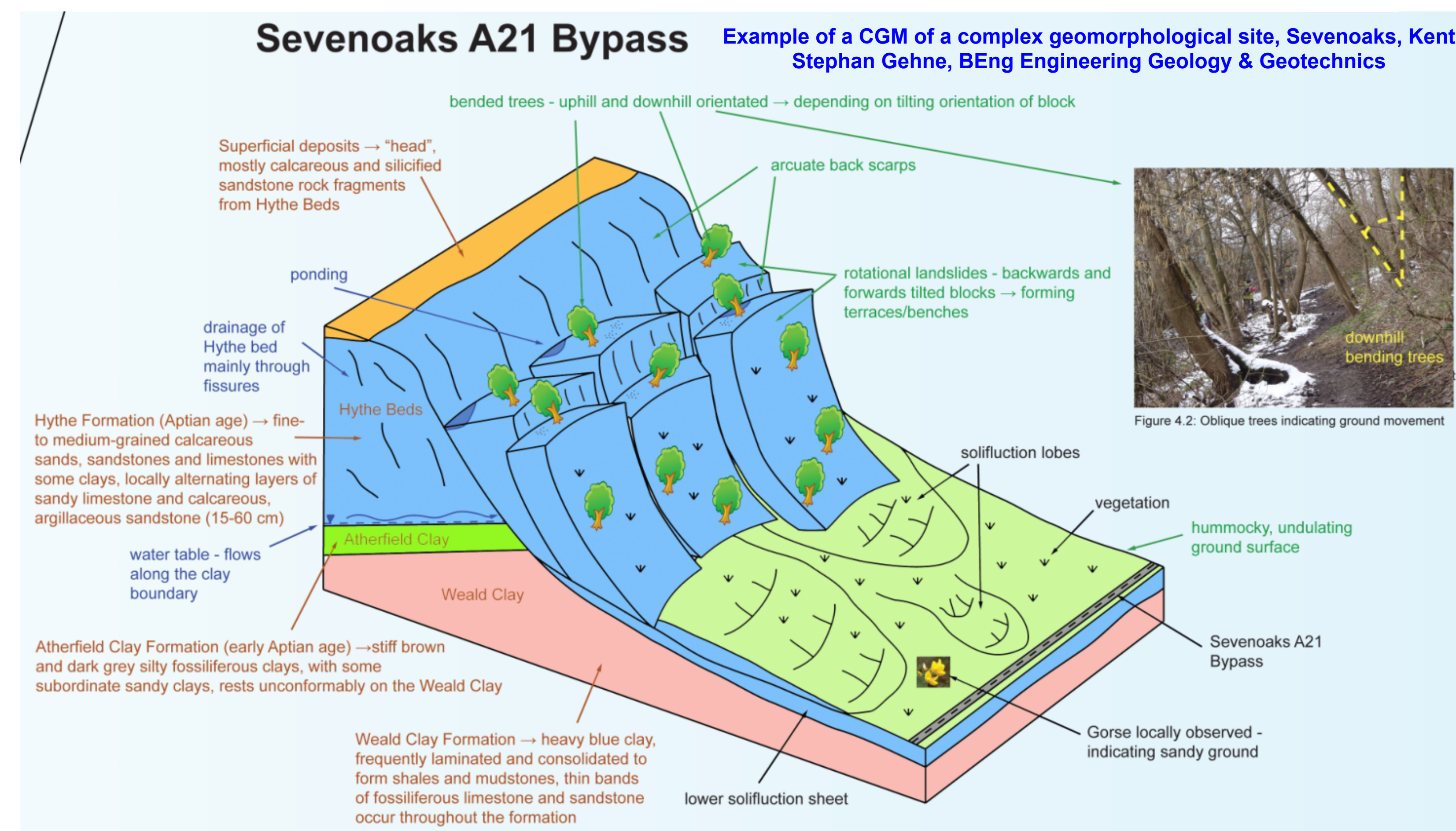


Example of a Brownfield site CSM on the Chalk of Southern England
William Taylor
MSc Engineering Geology

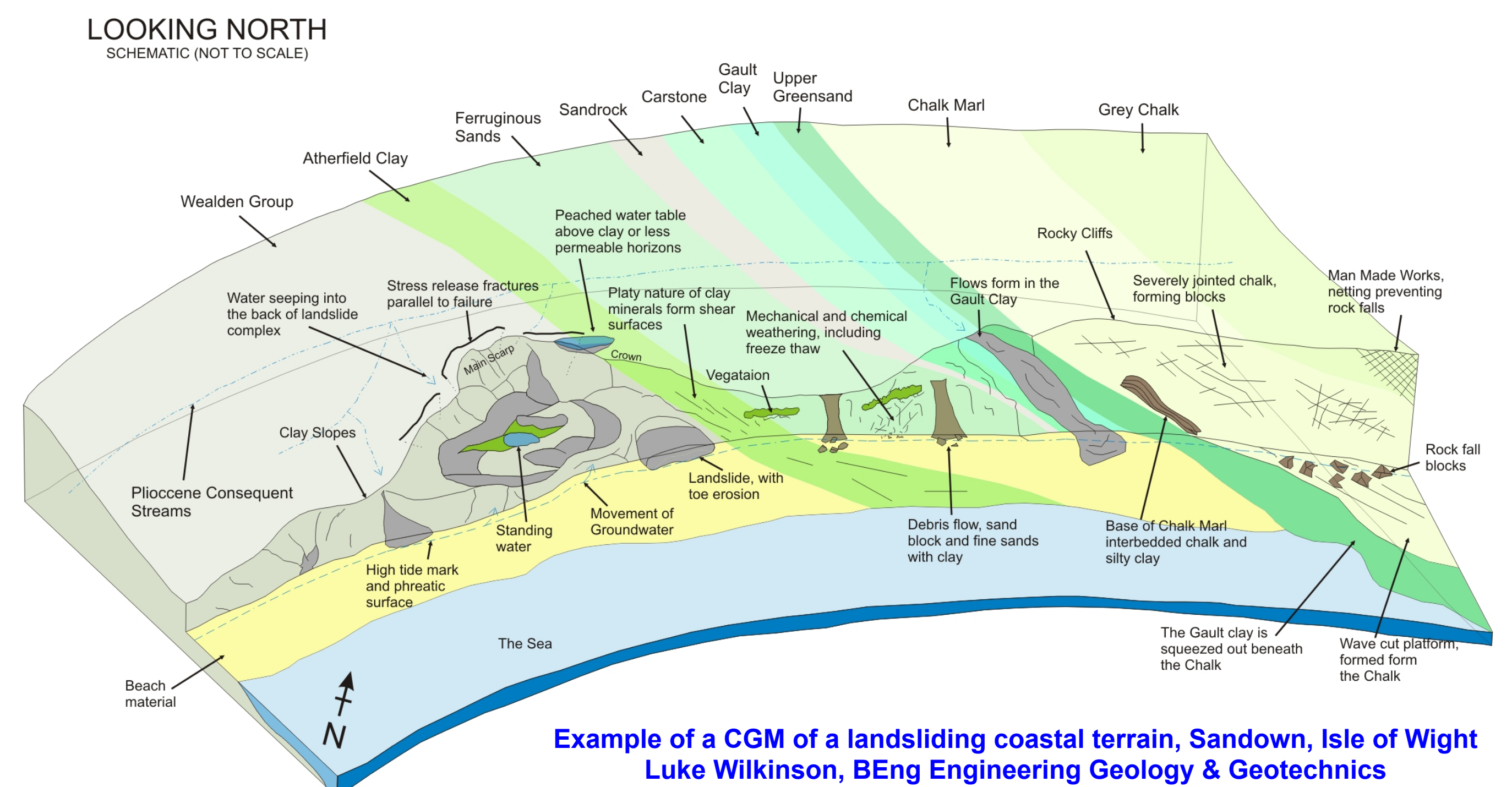
LOOKING NORTH WEST SCHEMATIC (NOT TO SCALE)

Data Sets

- **Geomorphological**
 - Topography & Surface Form, Hydrology, Terrain Units
- **Geological**
 - Solid & Superficial Lithology, Structure, Hydrogeology, Quaternary History
- **Geotechnical**
 - Rock Mechanics, Soil Mechanics, Geomaterials, Problematic Soils
- **Geohazard**
 - Subsidence, Dissolution, Slope Instability & Landslides, Seismic, Mining
- **Geoenvironmental**
 - Contamination & Pollution, Ecology, Sensitive Water Bodies / Courses
- **Site History**
 - Land Use, Industry, Demographics, Site Legacy



Example of a CGM of a complex geomorphological site, Sevenoaks, Kent
Stephan Gehne, BEng Engineering Geology & Geotechnics



Example of a CGM of a landsliding coastal terrain, Sandown, Isle of Wight
Luke Wilkinson, BEng Engineering Geology & Geotechnics

Techniques for Model Design

- **Use of Colour**
 - Structure, Readability, Meaning, Uncertainty, Emphasis, Colour Contrasts, Palettes
- **Use of Labels**
 - Font, Typeface, Orientation, Spacing, Size
- **Cartographic Tricks**
 - Enlargement, Displacement, Simplification, Merging, Selecting
- **Use of Legends and Fills**
 - Standard Universal Symbols & Patterns

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