A physical property model of the Chalk of southern England

Geology and Regional Geophysics Programme

Open Report OR/15/013

BRITISH GEOLOGICAL SURVEY

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A physical property model of the Chalk of southern England

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Chalk Group, Southern England, Facies, Structure, Model, GOCAD SKUA.

Front cover

Chalk cliffs between Beachy Head and Birling Gap, Sussex.

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Foreword

This report describes the procedures undertaken in construction of a new model of the Chalk of southern England (as far north as The Wash). The model integrates data on formational stratigraphy, lithofacies, marker-beds and structure. The aim of the model is to provide a comprehensive, basin-wide overview of variations in stratigraphy and facies in relation to basin architecture. The model is aimed at understanding depositional processes that control the distribution of different Chalk volumes and lithofacies, and applying these insights to make predictions about subsurface Chalk geology in data-sparse areas, and to derive regional-scale characterisations of Chalk physical properties (e.g. mud content and hardness) that are of value for hydrogeological modelling and engineering geology.

Acknowledgements

We are grateful to Prof. R N Mortimore (Chalk Rock Consulting Ltd), and Dr H Bailey and Dr L Gallagher (Network Stratigraphic Consulting) for discussion and feedback during the course of this project.

Contents

FIGURES

TABLES

Summary

This report describes the rationale and procedure for the construction of a new high-resolution stratigraphical and physical property model of the Chalk Group of southern England. The model integrates bedrock mapping data for the Chalk, with structural data and interpretations of formational and sub-formational (marker-bed) stratigraphy in boreholes (predominantly from geophysical logs and cored boreholes) and outcrops. A range of simple facies data (e.g. hard chalk, hardground, marl, marly chalk) are coded for the boreholes and outcrops using WellCad™ software, interpreted directly from geophysical logs, core logs, borehole video logs, or outcrop logs. The results of this work are modelled in SKUA-GOCAD 2013.2 software, using statistical algorithms to project the likely distribution of physical property data.

1 Modelled volume, purpose and scale

This model covers the Chalk of Southern England, as far north as The Wash (Figure 1). Conventional geological modelling work within the BGS concentrates on capturing formational surfaces, and is unable to capture geographical and stratigraphical variation of the physical properties that define formational units. For the Chalk and many other geological units, abundant observational evidence from boreholes and outcrops shows that whilst the lithostratigraphy may be traceable over wide areas, there may be significant variability in the development of key physical properties (in the Chalk, particularly hardness and muddiness). This variability largely reflects the variable effect of basin architecture and palaeogeography on the range of environmental processes that acted to create the set of geological conditions responsible for the deposition of a particular geological formation. In some cases, predominantly north of The Wash and outside the scope of this project, post-depositional processes (e.g. pressure solution) may also affect the hardness and thickness of Chalk successions.

This model aims to:

1) Capture Chalk physical property variability where it is known
2) Use geostatistical packages to model Chalk physical property variability where it is poorly known
3) Integrate modelled thickness, facies and structural data to understand the geological processes that explain the development of variability in Chalk volumes and facies
4) Identify geographical areas with distinct Chalk physical property characteristics

The Chalk is the major aquifer for southern England, but with dense population and industrial development, it is also vulnerable to pollution. Many major civil engineering projects occur wholly or partly within the Chalk (e.g. Channel Tunnel, Cross-Rail). Understanding the nature of intra-formational variation in physical properties is key at two levels: 1) it potentially identifies broad geographical regions (domains) across which the physical properties of a unit might differ in one or more ways from adjacent regions; 2) it identifies local regions where a unit has atypical features. Academically, such information is valuable for understanding geological processes that produced particular facies types, and the model will function as an engine for generating testable hypotheses about the depositional development of the Chalk. From an applied perspective, understanding site-specific and larger (domain-scale) variation in Chalk physical properties is hugely valuable for developing more sophisticated hydrogeological models of the Chalk, and particularly for understanding the role of stratigraphy and structure on near- to deep-subsurface fluid movement and solute transport. For engineering geology applications, understanding site specific variability within a geological formation is crucial, particularly the extent to which a given site conforms to or departs from the median predicted characteristics.

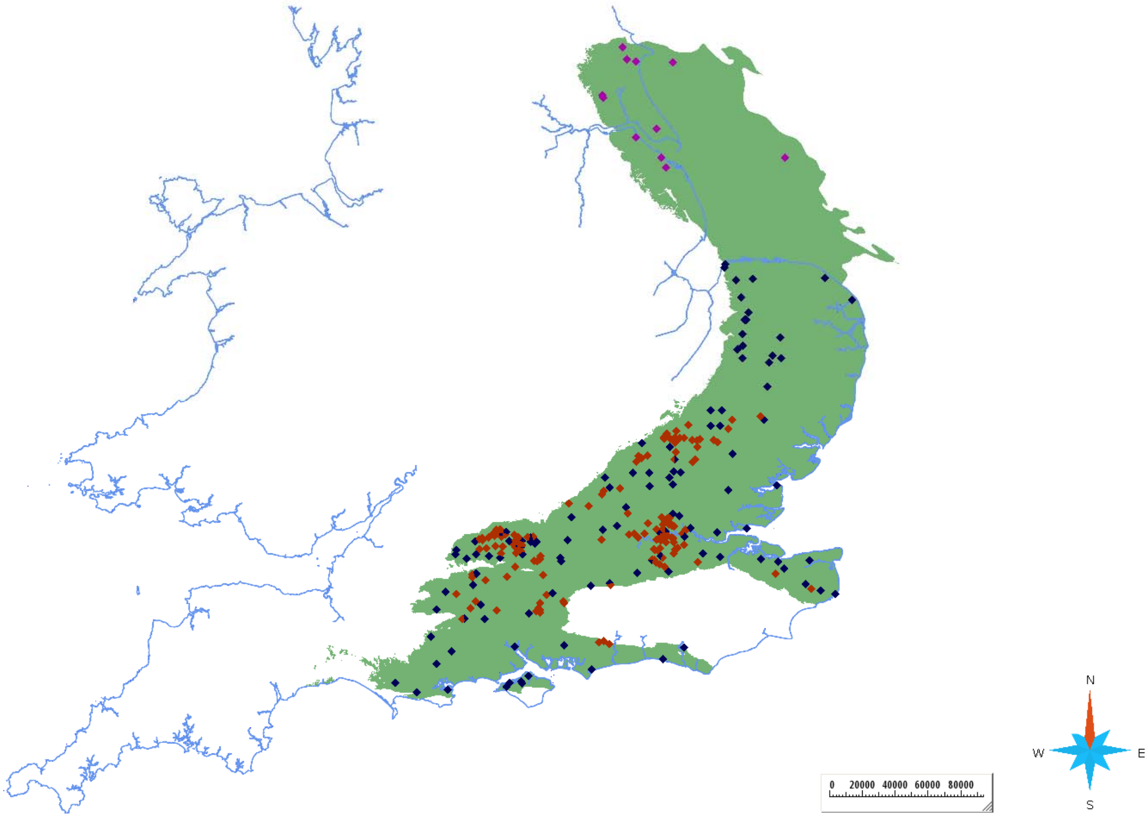

Figure 1 Map showing the study area (green) which corresponds to the outcrop and subcrop of the Chalk Group. Coloured dots indicate borehole control points: most of the modelling effort so far has been south of The Wash.

2 Modelled surfaces/volumes

Although well picks have been made for all Chalk lithostratigraphical boundaries and many other marker beds, for reasons of simplicity and time availability, horizon modelling has been limited to four lithostratigraphical boundaries (Table 1). A priority for future work is to generate model surfaces for all the units listed below, as well as for key marker-beds.

ORDER	LEX_D	LEX	MAIN_GOCAD_HORIZON_NOMENCLATURE
11			TopChalkUnconformity
10	PORTSDOWN CHALK FORMATION	PCK	TopPortsdownChalkFormation
9	CULVER CHALK FORMATION	CUCK	TopCulverChalkFormation
8	NEWHAVEN CHALK FORMATION	NCK	TopNewhavenChalkFormation
7	SEAFORD CHALK FORMATION	SECK	TopSeafordChalkFormation
6	LEWES NODULAR CHALK FORMATION	LECH	TopLewesNodularChalkFormation
5	NEW PIT CHALK FORMATION	NPCH	TopNewPitChalkFormation
4	HOLYWELL NODULAR CHALK FORMATION	HCK	TopHolywellNodularChalkFormation
3	ZIG ZAG CHALK FORMATION	ZZCH	TopZigZagChalkFormation
2	WEST MELBURY MARLY CHALK FORMATION	WMCH	TopWestMelburyMarlyChalkFormation
1			BaseChalkUnconformity

Table 1 Formation tops which have been modelled (highlighted in green) and their correspondence to standard BGS lexicon descriptions and codes.

The Base Chalk and Top Chalk unconformities encapsulate the Chalk Group, while the Top Zig Zag and Top Lewes Nodular Chalk formations provide internal control on the alignment of grid cells within the main body of the Chalk. Note that the Top Chalk Unconformity is a complex polygenetic horizon that includes, (1) subaerially exposed Chalk eroded to all stratigraphic levels, (2) Chalk that has been eroded to all stratigraphic levels and covered by Quaternary deposits (e.g. head and alluvium), and (3) Chalk that has been eroded to relatively shallow stratigraphic levels and covered by *in situ* Palaeogene deposits. Additional horizons can be incorporated at a later stage if they are deemed necessary to add further control to the alignment of grid cells or the proportion of lithofacies within modelled regions.

The modelled horizons were selected largely because of, (1) their distribution across the full thickness of the Chalk, (2) each has a relatively high number of borehole picks and (3) they enclose regions within the Chalk of broadly similar lithology (Figure 2). Thus the Base Chalk to Top Zig Zag Chalk interval contains many marls and marl-rich chalks, the Top Zig Zag to Top Lewes Nodular Chalk interval contains common nodular chalks, and the Top Lewes to Top Chalk is dominated by soft marl-free chalks. These lithological regions provide broad constraints on the proportion of lithofacies at different stratigraphical levels within the model during the interpolation process.

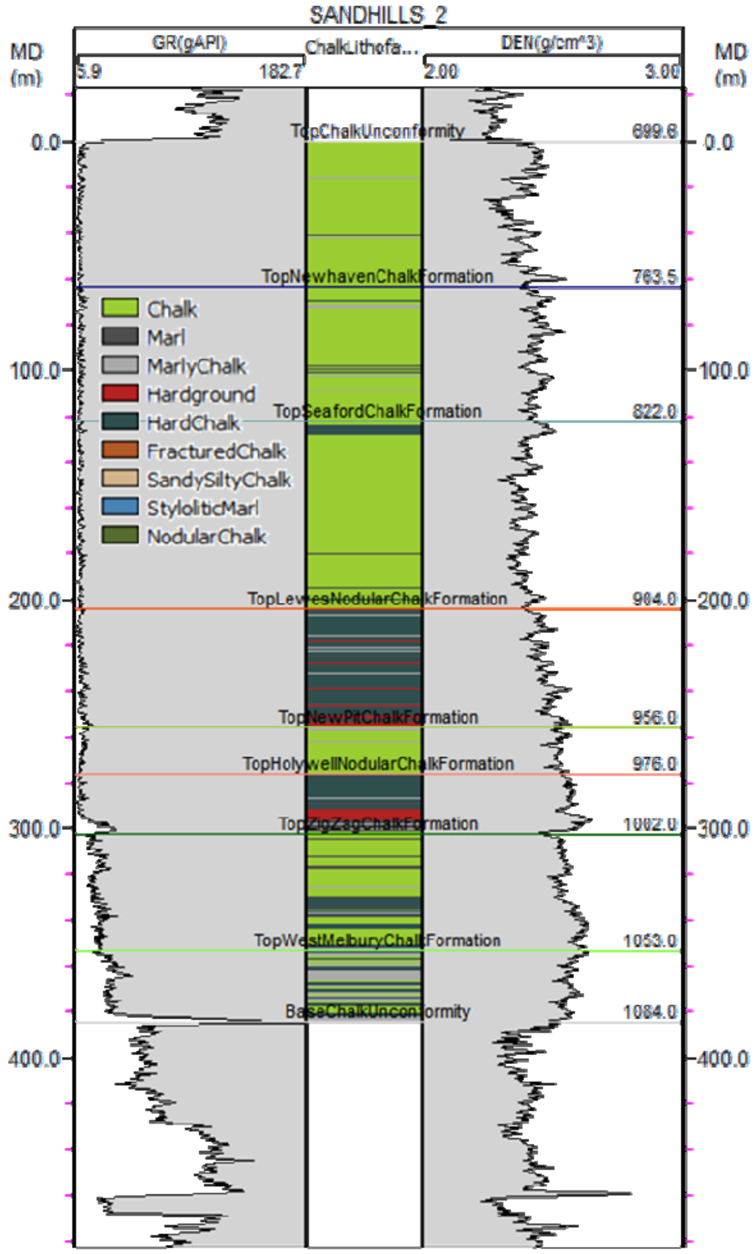

Figure 2 The Sandhills 2 well on the Isle of Wight, southern England, as an example of the how the four modelled horizons (Table 1) subdivide the Chalk into three broad lithological regions.

Surfaces have been modelled using SKUA-GOCAD 2013.2 software, which following petroleum-industry conventions, models the top of formational units. Although this departs from some BGS practice which models the bases of geological units, there is no practical impact on model outputs. The rationale for the SKUA approach is that it is the tops of geological formations that are modified by processes before later geological units are deposited.

In addition to the above formational surfaces, a large number of intra-formational marker-beds have been coded in boreholes and outcrop successions. A list of these is provided at Appendix 1. These are not currently modelled, but the intention is that these surfaces will be capable of being generated in future model versions. These marker-beds include flints, marl seams and hardgrounds. In many, although not all cases, they form isochronous surfaces that divide up formations, allowing detailed analysis of thickness and facies variation within parts of formations, and in the future, perhaps also including stratigraphical analysis of fracture data when this becomes available. Planned future incorporation of outcrop scan data (i.e. chalk cliff sections) will use the marker-beds as high resolution tie points to facilitate linking with modelled formational surfaces.

One of the major aims of this work has been to not only model formation boundaries but to model the internal distribution of facies within the Chalk Group. At present we use a simple sevenfold classification of Chalk facies, with the aim of creating a uniform and consistent subdivision across the UK Chalk. The facies scheme must reflect the limited data that are often available from geophysical logs and simple borehole descriptions. The main facies types recognised for modelling are:

- Chalk
- Marl (stylolitic marl)
- Marly Chalk
- Hardground
- Hard Chalk (Nodular Chalk)
- Faulted/Fractured/Channelised Interval
- Sandy/Silty Chalk

Terms in parenthesis indicate additional terms recognised in facies coding of outcrop sections that have been combined with more generic terms for the purpose of facies modelling (see 4 below). The facies term “Chalk” is a default used when there is no data to indicate the presence of other facies types.

3 Modelled faults

Structural datasets are still being worked on for inclusion in the model, and will form a component of future model versions.

The following is a brief summary of how structural data are being analysed for future inclusion in the model.

3.1 FAULT CATALOGUE

This comprises a shapefile containing fault polylines. The dataset was established from DiGMap50 data and the digitisation of published fault interpretation. Each fault has been attributed with the original source and the line to reflect the throw on the faults as published (where available). Only major bounding features were included as the scale of modelling prohibited the inclusion of minor faults. The faults included are typically over 10km in length. No information is currently held on the fault dip or amount of throw on a fault. The dataset does not distinguish between basement faults or faults that cut the chalk.

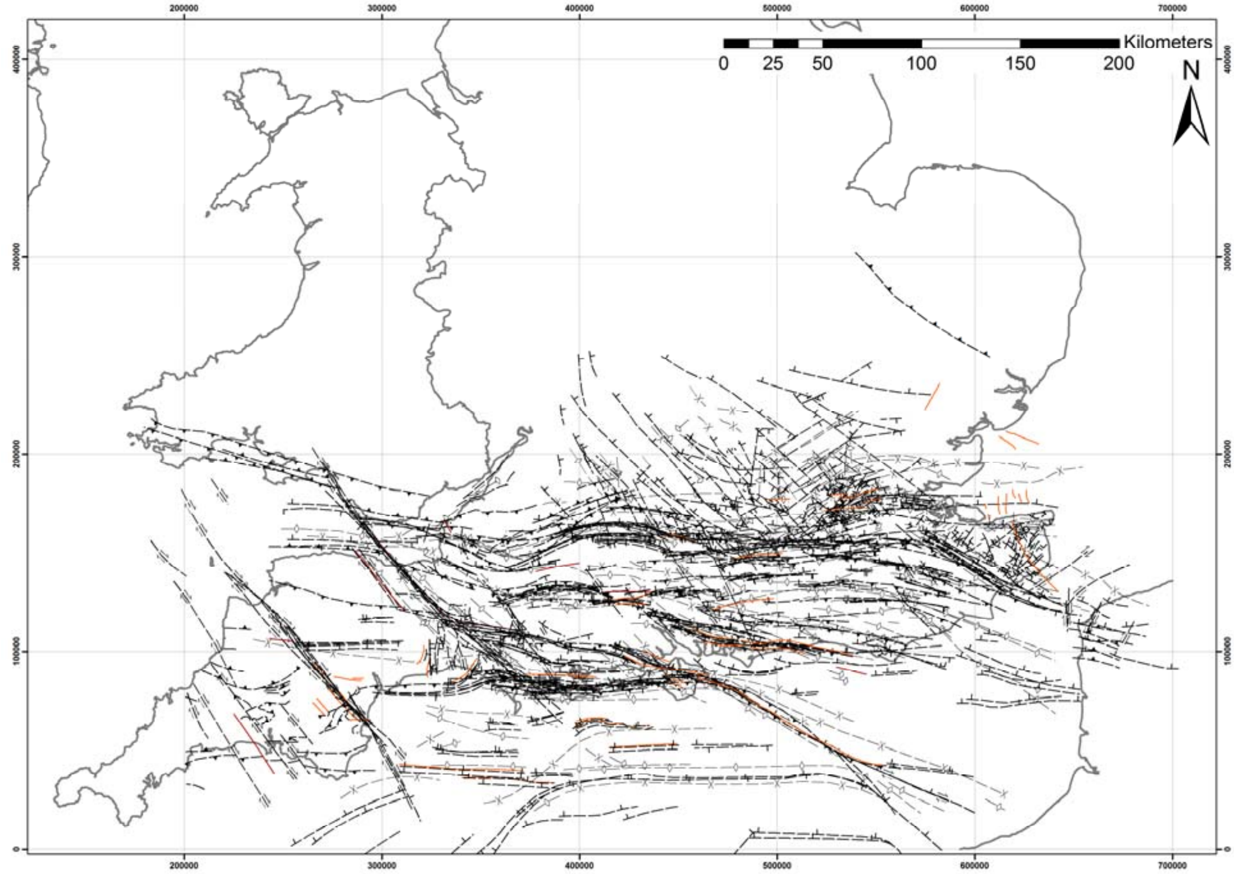

Figure 3 Digitised fault catalogue

3.2 GEOPHYSICAL DATA

The regional gravity was reprocessed for this project by David Beamish using the upward continuation method on the first vertical derivative data. These data are stored digitally in Keyworth at:

W:\Teams\GLE\Chalk_Facies_Model\Data\ChalkModelMetaDataReport\Gravity_Data_Chalk_Model

This was carried out by frequency matching and at set intervals. The data highlights linear features from which a gravity lineament map was produced.

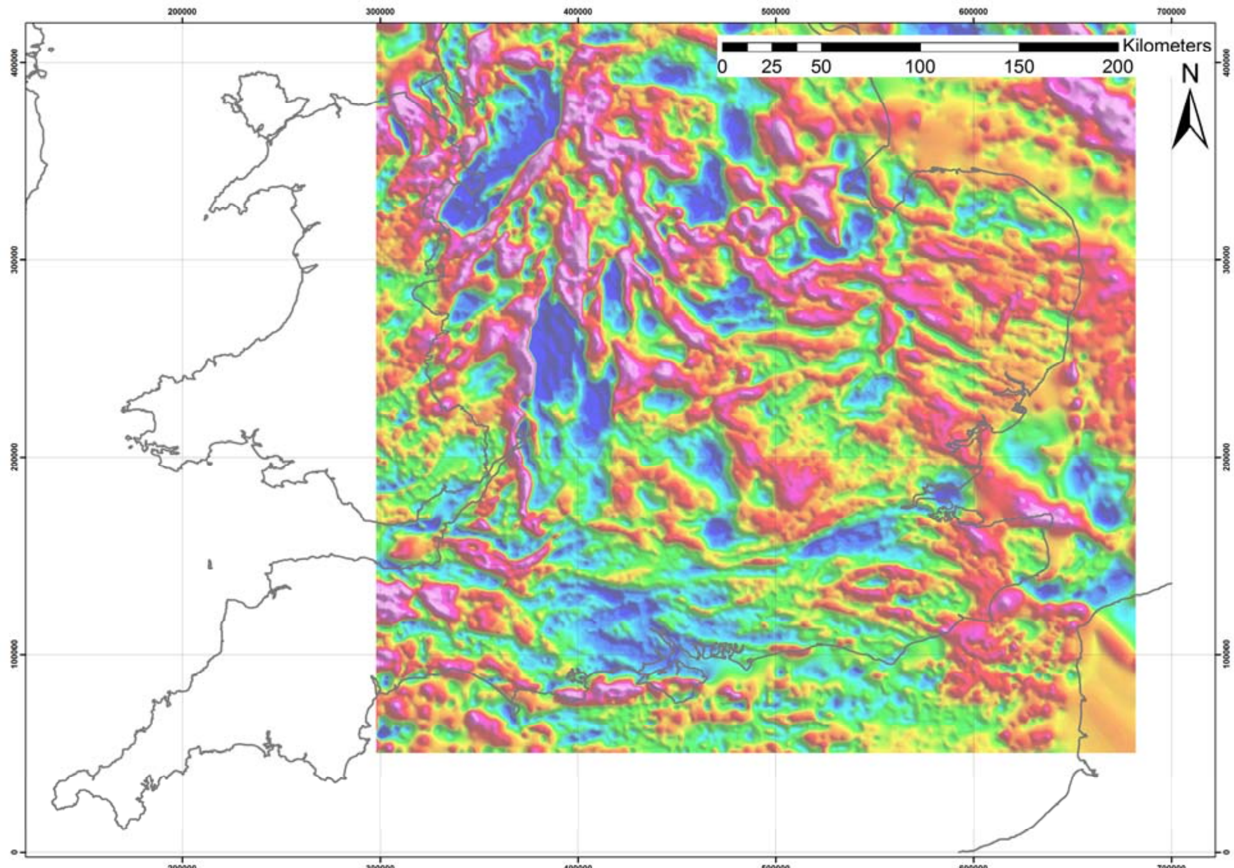

Figure 4 Reprocessed geophysical data showing the 2km upward continuation first vertical derivative map of the gravity.

3.3 FAULT INTERPRETATION

Base on the fault catalogue and the geophysical data a proposed structural model was produced as a GIS shapefile. This was primarily based on the model in Chadwick et al. (1996) and represents one interpretation of possibly many. However with the available data it is considered to best fit the observations and the structural history of the region. It should be kept in mind that this interpretation has identified possible large deep structures within the region and not all these structures will cut or influence the chalk. However faults will preferentially reactivate rather than initiate new faults and therefore these large structures are likely to have an influence on the deposition of the Chalk.

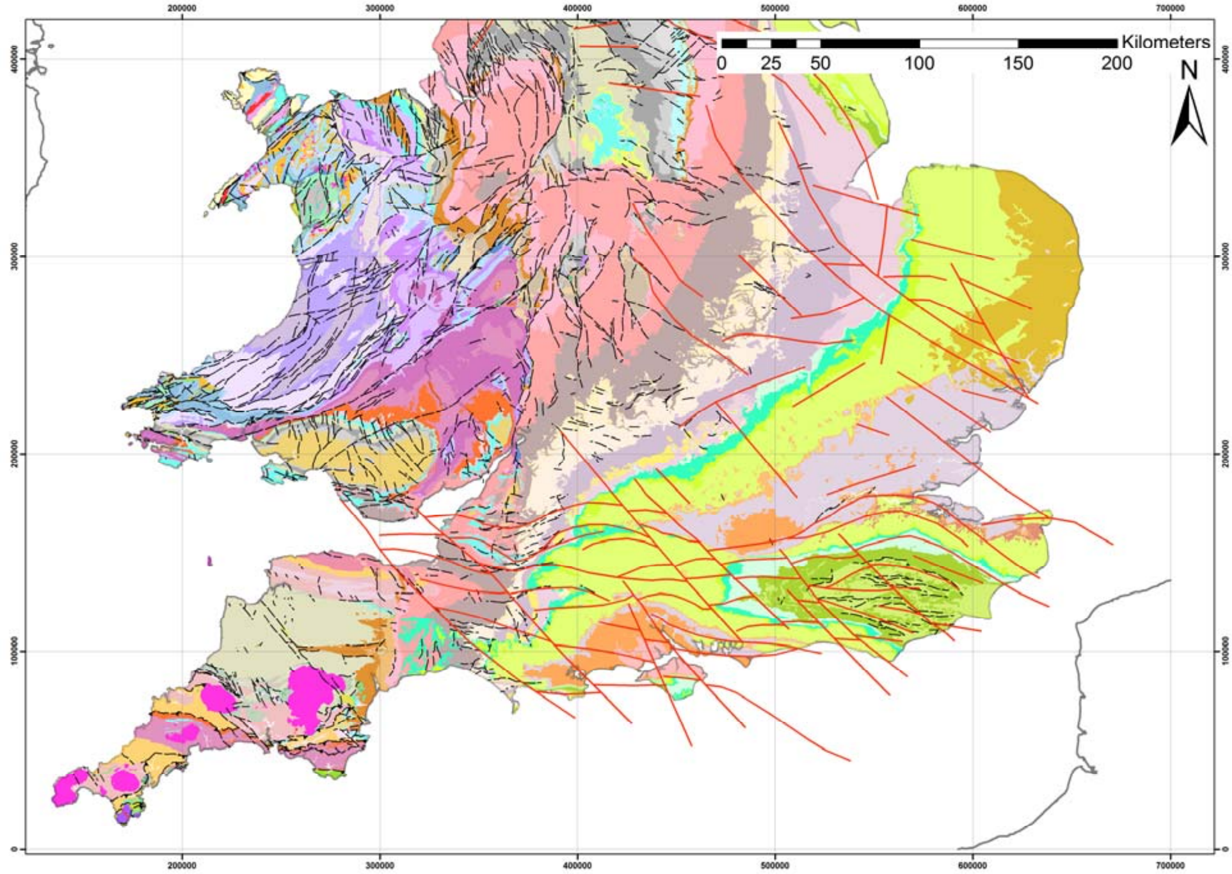

Figure 5 Revised fault network in red with the BGS DiGMap625 data.

3.4 3D FAULT MODEL

Based on the Tectonic Map of Britain, Ireland and Adjacent Areas (BGS, 1996) an initial 3D fault network was modelled to establish a work flow and test the fault interpretation. A series of cross sections were constructed and the fault shape with depth was digitised based on the structural understanding of the faults in the region. These are typically listric in nature and detach on a common horizon at depth. The total depth of the fault model was taken at an arbitrary depth of approximately 3km. The faults were then modelled using the structural workflow within SKUA and the fault network exported as triangulated surfaces. The 3D fault model however did not take into account any published sections or seismic profiles and only approximates to the true fault network with depth. The revised fault model should be based on the interpretation established above and should be modified to take into account realistic dips and published data regarding the faults shape at depth.

4 Model datasets

Datasets that have been included or created for the model comprise the following:

● Digital Terrain Model: OS Terrain 50 was used to provide elevation attribution to DigMap GB-50 geological linework. This DTM was also used during the SKUA Structure and Stratigraphy modelling process when it was variously resampled depending on the chosen grid resolution.

● Geological linework: BGS DigMapGB-50 (V7) for Chalk Group formations

● Geophysical log interpretations: These comprise interpretations of borehole geophysical logs from the BGS digital archive in RECALL as well as from the BGS Regional Geophysics paper archive in National Geological Records Centre (NGRC). A list of interpreted boreholes is given in Appendix 2. All log data were loaded into WellCad, either as depth attributed scanned images (paper records) or as .las files (digital log data). Geophysical logs (mainly combinations of gamma, sonic, resistivity) were used to interpret lithofacies, stratigraphy and marker-beds (see below).

● Interpretations of borehole digital images and core logs: Depth-attributed digital (.jpeg) files were loaded into Well Cad and used to interpret lithofacies, stratigraphy and marker-beds (see below).

● Outcrop section interpretations: Selected published sections in research papers and BGS Technical Reports were scanned, scale-attributed and loaded into WellCad. Sections were selected for their completeness, geological detail and accurate location data. Facies logs of these sections were generated in WellCad, and location, stratigraphy and marker-bed details recorded in a separate Excel pro-forma, together with source reference.

● Facies Log Data: These logs were generated by interpretation of geophysical logs, digital borehole images, core logs and published and unpublished logs of outcrop successions (see above). A simple, widely reproducible suite of facies types were created for representation on the facies logs. These comprise: Chalk, Marl, Marly Chalk, Hardground, Hard Chalk, Faulted/Fractured/Channelised Interval, Sandy/Silty Chalk, Nodular Chalk, Significant Geophysical Log Feature, Clay-filled Solution Pipe, Stylolitic Marl. Some of these facies types, relying on visual information (e.g. Nodular Chalk, Stylolitic Marl), are not applicable to borehole geophysical logs from which the bulk of facies data are derived. Whilst desirable to collect a wide range of recorded facies data, there has been some rationalisation of these terms to more widespread equivalents (e.g. nodular chalk = hard chalk; stylolitic marl = marl) for the purpose of facies modelling. Following creation of the WellCad facies files, these were exported as text files and imported into Excel, using IF factors to translate facies text data into a numerical code. In this format, the facies data can be loaded into GOCAD SKUA for modelling.

● SOBI Borehole Well Path Data: Well path data, comprising Easting, Northing and OD of log reference datum, were compiled into an Excel spreadsheet for all SOBI boreholes used in the model.

● Formational Stratigraphy Interpretations (SOBI Boreholes): The depths of the tops of formations recognised in SOBI boreholes from geophysical logs, core logs and digital core images were compiled into an Excel pro-forma for uploading into GOCAD SKUA modelling software. All borehole stratigraphy interpretations were also loaded into the BGS Borehole Geology (BoGe) database.

● Marker-Bed Stratigraphy Interpretations (SOBI Boreholes and outcrop sections): The depth references of key Chalk marker beds (e.g. named flints, marls, hardgrounds) in SOBI boreholes and outcrop sections used for modelling were compiled into an Excel pro-forma. All marker beds are assigned a unique letter code (Lex Rock codes have been used where these already exist), and equivalent names for the same horizon are shown in the pro-forma (Appendix 2). Some marker-beds define formational boundaries, and the presence of these marker beds provides the formational subdivision data for the outcrop sections.

5 Dataset integration

Borehole paths (i.e. the linear track of a borehole in three-dimensional space) were imported via normal SKUA-GOCAD 2013.2 well location import filters. SOBI well identifiers were standardised to exclude back-slash, underscore or other separators. Each borehole was tagged with additional identification information (held in Well Constant fields within SKUA-GOCAD 2013.2) including the borehole name (spaces replaced by underscores), the BGS identification number and a tag to identify specific groups of uploaded well information. Wells were imported as simple vertical paths, several of the wells are known to be deviated and these paths will be amended as deviated path information becomes available.

WELL	X	Y	KB	LENGTH	ALIAS	BGS_ID	Z	WELLSET
SP90NE9	499200	207920	105.75	73.15	WATERWORKS_BERKHAMPSTEAD	359931	105.75	SP90NE9_CHALK_FACIES_1
SP91SE14	496300	213700	149.83	205	STOCKS_HOTEL_ALDBURY	360207	149.83	SP91SE14_CHALK_FACIES_1
ST91NW26	390899	117606	219.58	110	ASHMORE_PIEZOMETER	13087378	219.58	ST91NW26_CHALK_FACIES_1
SU06NE2	405800	167440	169.41	128.93	THREE_BARROWS_BISHOPS_CANNINGS	399305	103.41	SU06NE2_CHALK_FACIES_1
SU07SE4	406080	170150	173.61	100.58	YATESBURY_FIELD_CHERHILL	399607	103.41	SU07SE4_CHALK_FACIES_1
SU16SW15A	412480	164730	199.55	193	SHAW_HOUSE_OBH_HUISH	401841	103.41	SU16SW15A_CHALK_FACIES_1
SU36NW27	432780	165530	113.9	160	SHALBOURNE_EXPERIMENTAL	407724	103.41	SU36NW27_CHALK_FACIES_1
SU37NE6	438120	175470	107.07	100.58	LAMBOURNE_P61_GREAT_SHEFFORD	407846	103.41	SU37NE6_CHALK_FACIES_1
SU37NW8	433210	179710	130.42	129.84	NORTH_FARM_LAMBOURN	407875	103.41	SU37NW8_CHALK_FACIES_1
SU46NE43	446120	167540	79.19	152.4	SPEEN_CROFT_PS_NO5_NEWBURY_BERKS	412941	103.41	SU46NE43_CHALK_FACIES_1
SU47NE9	445940	175510	114.23	141.73	CHAPEL_WOOD_PEASEMORE_P53	413513	103.41	SU47NE9_CHALK_FACIES_1
SU47SE56	445420	171640	90.6	139	WINTERBOURNE_CORED_BORING_B	413685	103.41	SU47SE56_CHALK_FACIES_1

Table 2 Format for well path information.

Facies data were imported via SKUA-GOCAD 2013.2 well property import filters. Note the necessity of a NULL entry (-99999) in the final line.

TopDepth	BottomDepth	LithoCode	FaciesCode
19.83	22.51	Chalk	1
22.51	23.29	Marly Chalk	3
23.29	25.97	Chalk	1
25.97	27.31	Marly Chalk	3
27.31	28.57	Chalk	1
28.57	29.21	Marly Chalk	3
29.21	35.78	Chalk	1
35.78	36.06	Marl	2
36.06	40.43	Chalk	1
40.43	40.73	Marl	2
40.73	43.33	Hard Chalk	5
43.33	43.67	Marly Chalk	3
43.67	47.35	Hard Chalk	5
47.35	48.27	Marly Chalk	3
48.27	50.87	Hard Chalk	5
50.87	54.26	Hardground	4
54.26	55.6	Marl	2
55.6	58.91	Chalk	1
58.91	59.19	Marly Chalk	3
59.19	64.07	Chalk	1
64.07	64.27	Marly Chalk	3
64.27	68.43	Chalk	1
68.43	-99999	NULL	-99999

Table 3 Example format for the upload of facies information

Downhole depths for formation tops and marker bed were imported using normal SKUA-GOCAD 2013.2 import filters.

Geophysical log data were imported for a selection of wells as LAS files. During batch upload LAS files were matched to well paths using file names rather than standard LAS identifiers held within the file. This necessitated renaming of LAS files (Table 4). Unfortunately BGS Recall log database exports LAS files with SOBI identifiers with back-slash characters that are not permitted in SKUA-GOCAD 2013.2.

TR35SW24.LAS	12/12/2013 12:33	LAS File	381 KB
TR35SW23.LAS	12/12/2013 12:32	LAS File	366 KB
TR34NW3.LAS	12/12/2013 12:31	LAS File	418 KB
TR24SW2.LAS	12/12/2013 12:30	LAS File	295 KB
TR24SE10.LAS	12/12/2013 12:30	LAS File	454 KB

Table 4 Naming convention for LAS files

OS Terrain 50 was converted from ESRI grid format to Zmap format for import into SKUA-GOCAD 2013.2. DigMapGB-50 were imported as shapefiles and given an elevation attribution by fitting to OS Terrain 50.

A variety of raster maps showing geological and topographical features were imported as images.

Geological linework, well markers and other stratigraphic data were assigned to their corresponding Horizon feature class (Figure 6).

Figure 6 List of Horizon feature classes used in the model

6 Model development log

The following abbreviations are used for staff members involved in model development:

AJN: Andy Newell (Project Leader, GOCAD-SKUA Modeller)

MAW: Mark Woods (Stratigraphical and facies interpretation of borehole geophysical logs)

RH: Richard Haslam (Interpretation of Chalk structural geology)

ARF: A R Farrant (Interpretation of outcrop stratigraphy)

HS: Helen Smith (Interpretation of outcrop stratigraphy)

March 2013 – April 2014:

MAW: WellCad interpretation of stratigraphy and facies in c. 130 borehole geophysical logs. Initial phase of log interpretation aimed at building a robust model framework using logs with large vertical coverage (c. +100 m) in the Chalk, providing approximate coverage of one borehole log every 20 km^2 across the Chalk south of The Wash. SOBI borehole well path, stratigraphy and marker-bed data written to Excel pro-formas. Lithofacies data compiled into WellCad files exported to text and Excel files, using IF factors to translate lithofacies data into a numerical code appropriate for modelling.

RH: Georeferencing of published map. Digitising of structural data. Filtering of the DiGMap 50k for fault data. Coding of fault attribute tables.

ARF, HS: WellCad interpretation of facies in published outcrop sections (predominantly BGS publications and data in the Geological Conservation Review of the Chalk by Mortimore et al. (2001). Compilation of marker-bed data into Excel pro-forma. Export of WellCad files to text and Excel format, using IF factors to translate lithofacies data into a numerical code appropriate for modelling.

AJN: Loading first batch of borehole data into SKUA-GOCAD 2013.2, cross-section construction and initial trials and experimentation with the SKUA structure and stratigraphy and property modelling workflows.

April 2014 – January 2015:

MAW: WellCad interpretation of stratigraphy and facies in c. 175 borehole geophysical logs. These logs infill areas between boreholes interpreted in Year 1, and include logs that form the basis of previous project work on the Chalk, including London, Berkshire Downs, East Kent, North Kent, East Anglia (Thetford, Saffron Walden), Hertford, Beaconsfield, Salisbury, Marlborough. Other logs include a suite of hydrocarbons boreholes that form a component of a separate BGS project using geophysics to investigate the primary porosity of the Chalk. Lithofacies data compiled into WellCad files exported to text and Excel files, using IF factors to translate lithofacies data into a numerical code appropriate for modelling.

RH: Interpretation of the geophysical data. Interpretation of fault network. Preliminary 3D fault network model and export of fault network as triangulated surfaces.

ARF, HS: WellCad interpretation of facies in published outcrop sections, concentrating on published papers and BGS Technical Reports. Compilation of marker-bed data into Excel pro-forma. Export of WellCad files to text and Excel format, using IF factors to translate lithofacies data into a numerical code appropriate for modelling.

AJN: Loading second batch of borehole data into SKUA-GOCAD 2013.2, cross-section construction and further trials and experimentation with the SKUA structure and stratigraphy and property modelling work-flows.

7 Model workflow

Boreholes (Figure 7), a terrain model and geological linework were loaded into SKUA-GOCAD 2013.2 as described in Section 5

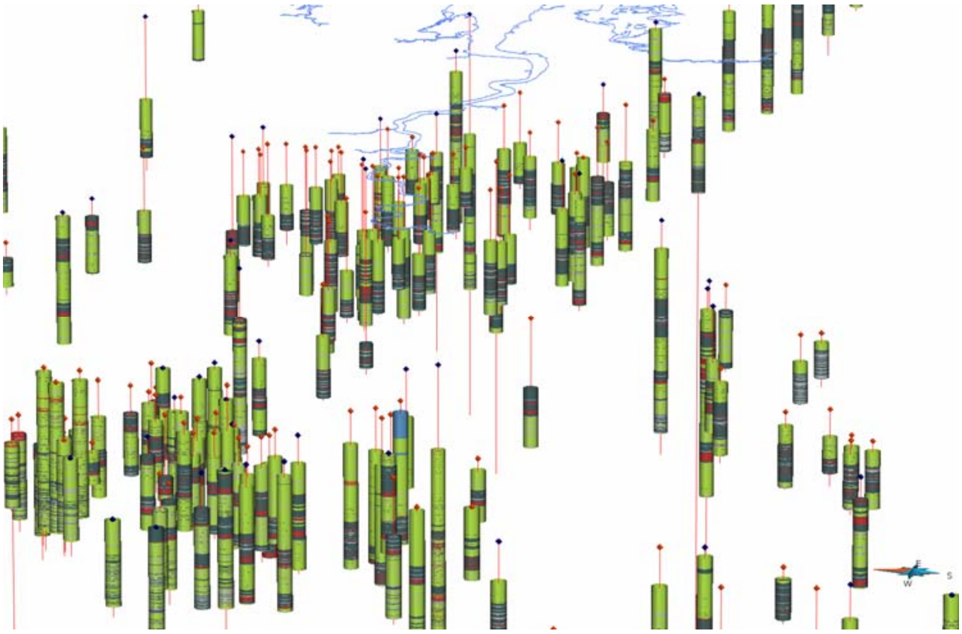

Figure 7 Selection of borehole paths with facies data displayed in SKUA-GOCAD 2013.2

Well sections were constructed to check the validity of marker picks and correlations between boreholes (Figure 8).

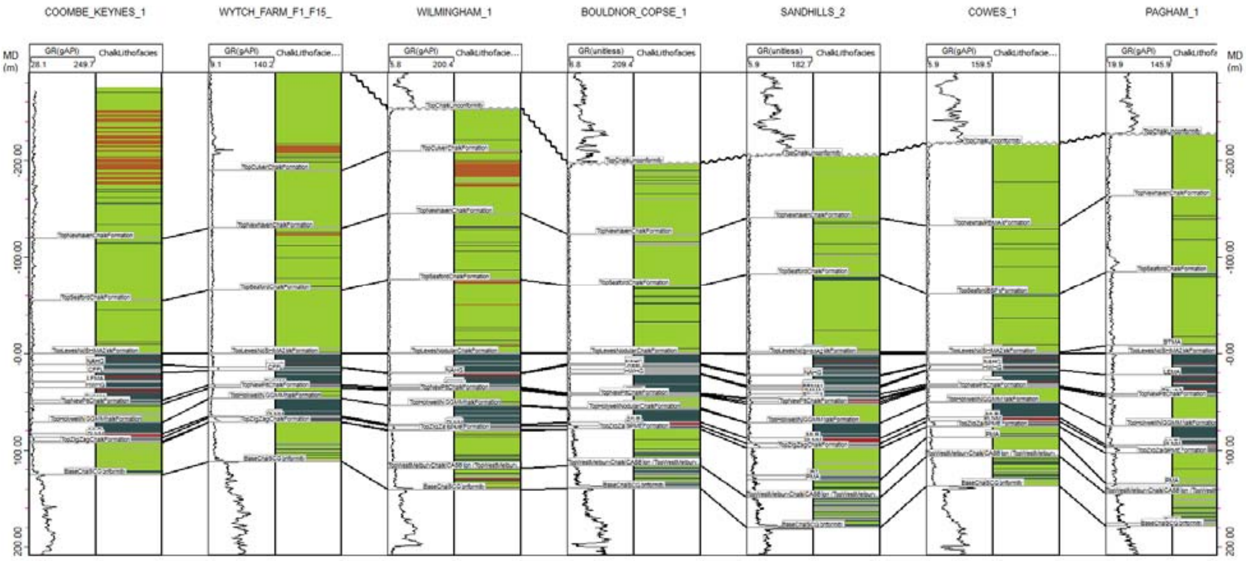

Figure 8 Example well section, this one is flattened on the Top Lewes Nodular Chalk

A structural framework for the model was established by building a series of cross-sections between boreholes (Figure 9). Cross-sections were mostly orientated perpendicular to the structural strike of the Chalk (Figure 10).

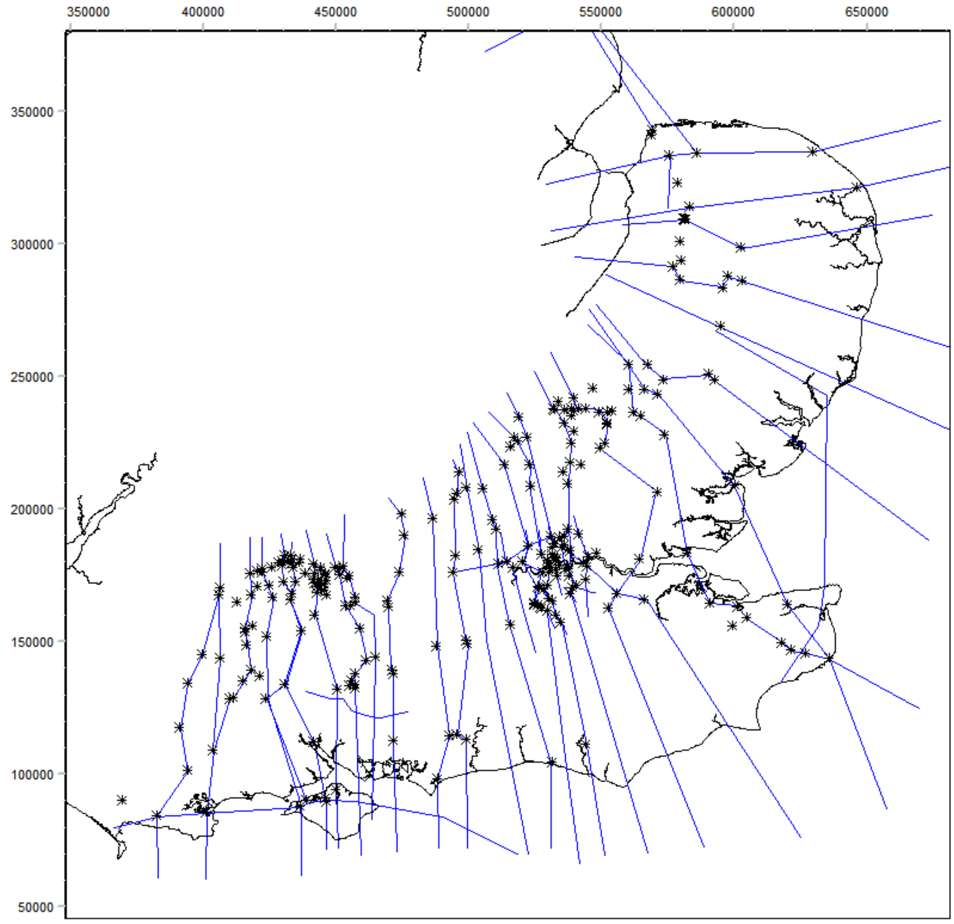

Figure 9 Location of cross-sections, stars indicate borehole positions.

Polylines linking borehole markers and Z-attributed outcrop intersections were digitised for the four selected Chalk horizons.

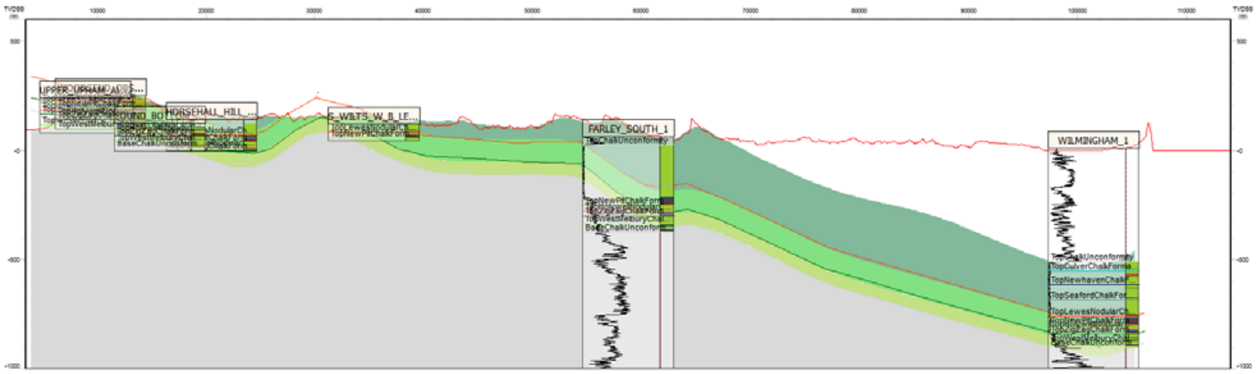

Figure 10 Structural cross-section window in SKUA-GOCAD 2013.2

For each horizon, a relatively coarse (5 km triangle size) triangulated surface was fitted to the digitised polylines from the cross-sections and to the well markers. The triangulated surfaces were locally densified in areas of tight curvature. The surfaces were not fitted directly to the Z-attributed DigMap-50 linework because this contains a large number of erroneous elevation values.

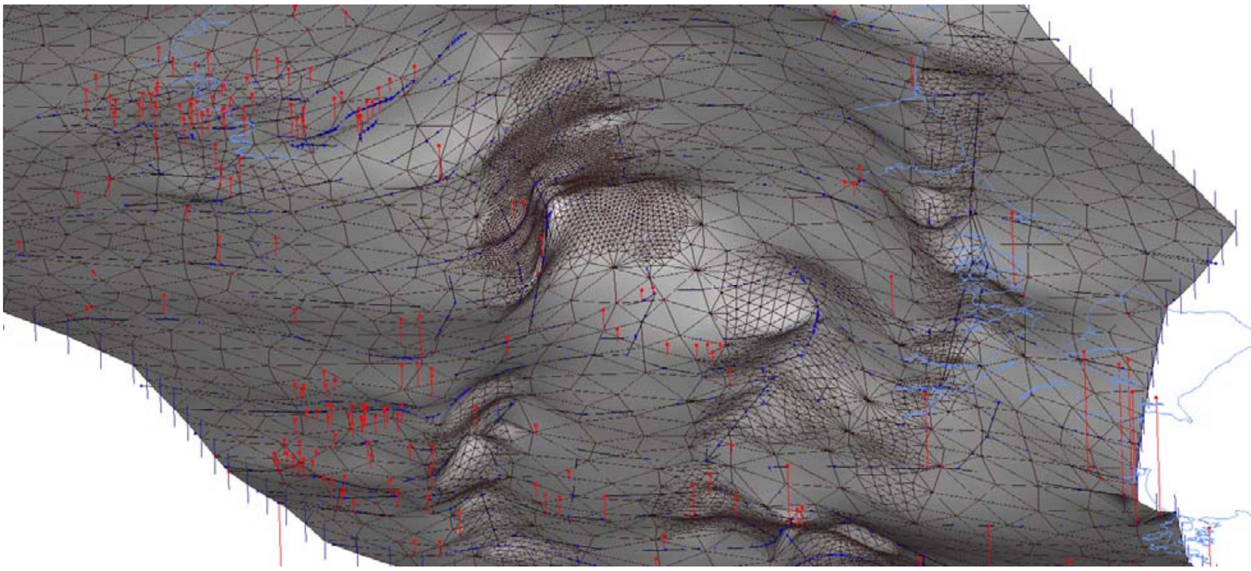

Figure 11 Triangulated surface fitted to the well markers and digitised cross-section lines.

Horizons were initially produced as continuous, un-eroded surfaces and subsequently clipped to the digital terrain model to generate an approximation of the outcrop pattern (Figure 12).

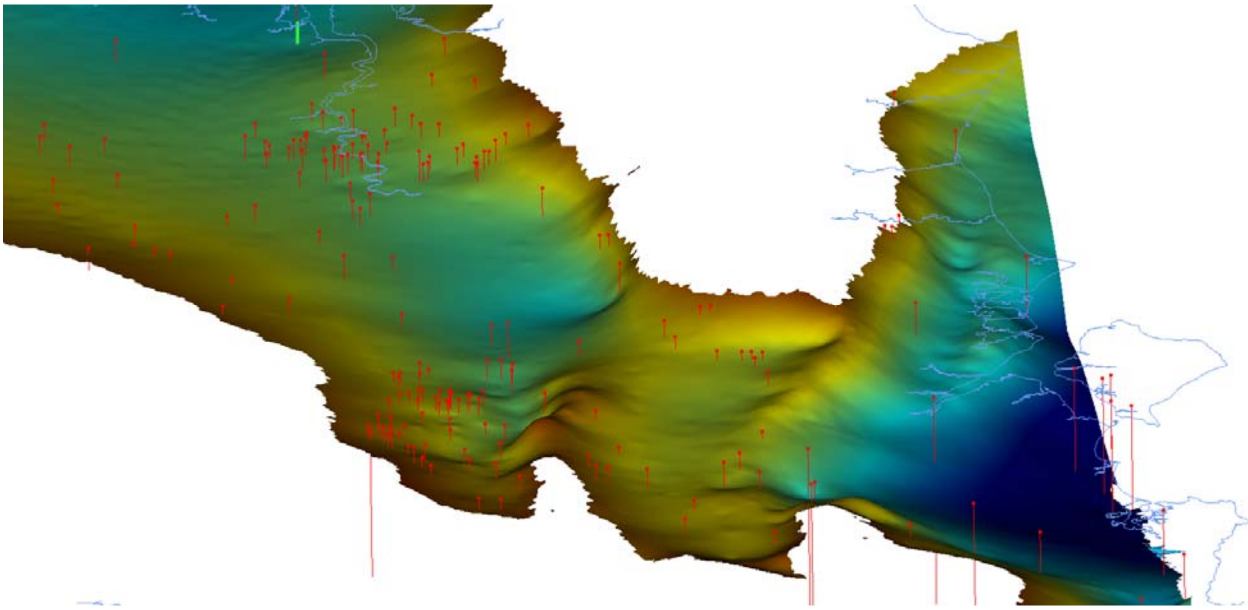

Figure 12 Eroded surface on Base Chalk

Surfaces for the four horizons of interest and well markers were used as input data for the SKUA Structure and Stratigraphy Workflow - a step-by-step process of combining datasets to obtain a comprehensive 3D geological model (Figure 13). All input data and parameters for the model are given in a document link in Appendix 3.

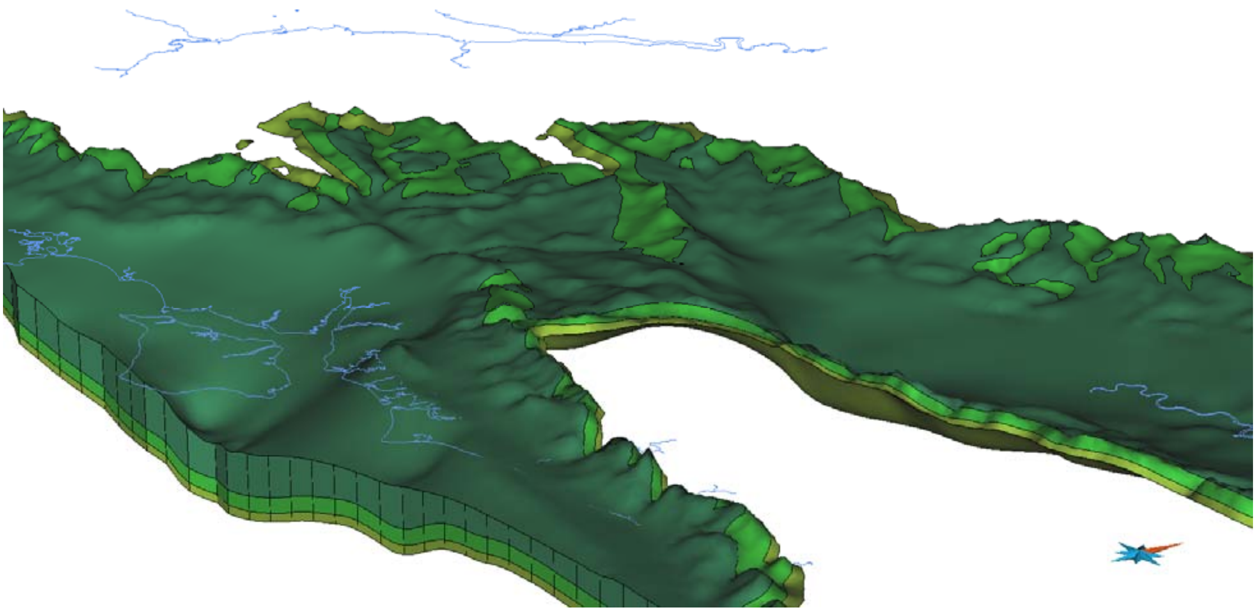

Figure 13 Solid 3D gridded model of the Chalk

Lithofacies property modelling of the Chalk was undertaken using the Reservoir Properties workflow in SKUA-GOCAD 2013.2. Appendix 4 provides comprehensive details on the inputs, parameters and methods applied in one modelling run. In summary, hard lithofacies data were transferred to the nearest grid cell in the model, upscaling where necessary by using the lithofacies closest to the cell centre. Given that cells ranged down to 0.5 m thick a good correspondence was achieved between input well data and the upscaled gridded data. Interpolation was undertaken sequentially in the three stratigraphic regions defined by Top Zig Zag Chalk, Top Lewes Nodular Chalk and strata above Top Lewes Nodular Chalk using indicator kriging with a nominal omnidirectional range of 150 km. This large variogram range produces what is effectively a well-to-well correlation of lithofacies, where the same lithofacies occurs within the same model layer. Given that most beds in the Chalk typically have lateral continuity over tens, or even hundreds of kilometres this approach seems reasonable as a starting point.

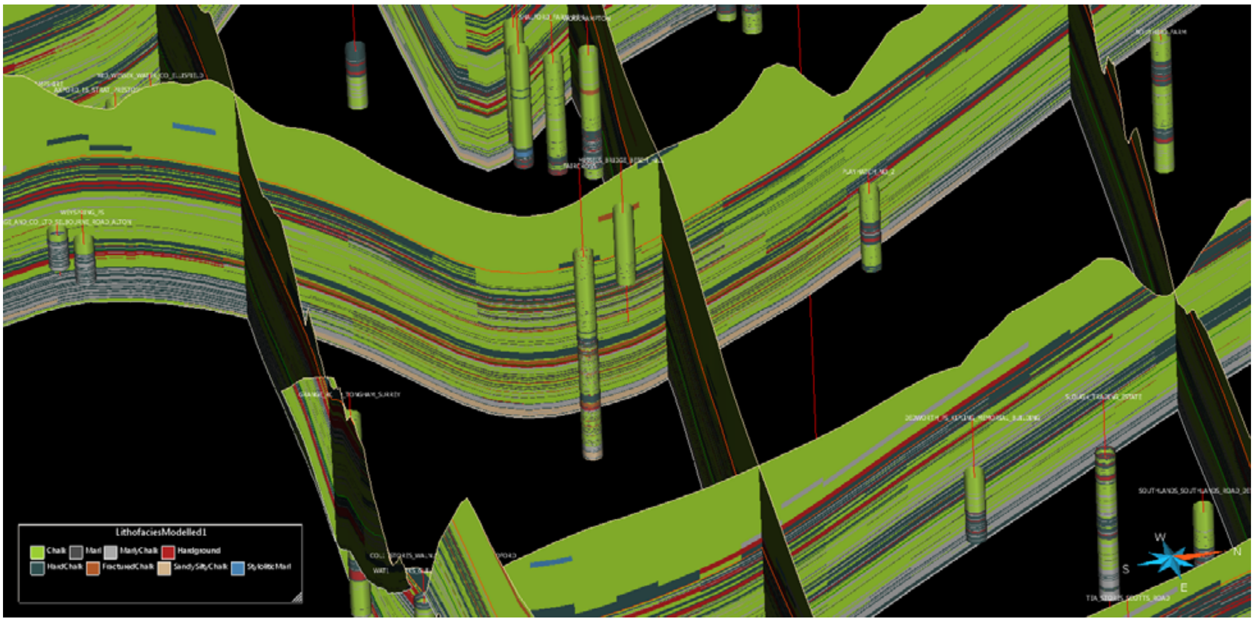

Figure 14 Well lithofacies data and selected grid sections through the modelled lithofacies output.

Multiple realisations of the model and the statistical evaluation of confidence have not been undertaken. Together with an increase in the sophistication of the geostatistical methods, these are areas for future work. At present we are satisfied that the general methodology is working based on the observations that the interpolated lithofacies mostly makes geological sense and there is a good correspondence in the observed and modelled facies proportions

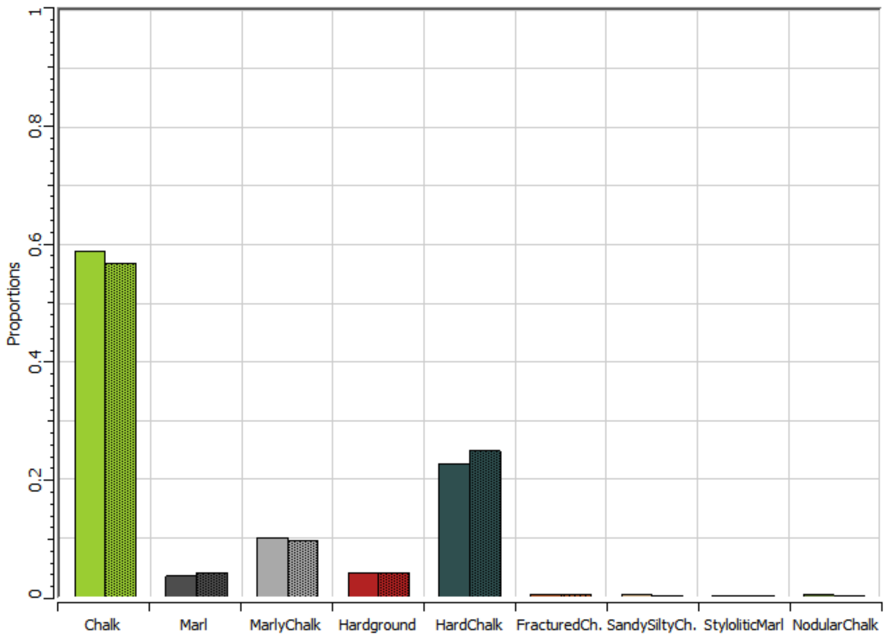

Figure 15 Observed (left) versus modelled (right) facies proportions

8 Model assumptions, limitations and uncertainty

The model is precisely fitted to well markers at borehole control points, however these are often widely (20 km or more) spaced and the model may not accurately record the geology of the Chalk in areas between boreholes. There may be folds, faults and flexures which have not been properly represented in the model. The model has not been force-fitted to the elevation-attributed DigMapGB-50 geological linework so there will only be approximate correspondence between the modelled outcrop position and that shown on geological maps. This disparity partly results from the coarse (1 km or more) down sampling of DTM grids during the SKUA model building process.

Appendix 1 – Chalk marker-beds and modelling codes

Formation Code	Member Code	Bed Code	Primary Marker-Bed Name represented by coding	Surfaces equivalent to Primary Marker-Bed with same code
PCK	PACK	OPHG	Base Upper Overstrand Marl	top Portsdown Chalk
PCK	BEECK	UNHG	top Un-named hardground (sponge bed in Trunch BH) at junction of Beeston and Paramoudra Chalk	
PCK	WECK	CSP	top Catton Sponge Bed (Hardground II) at top of Weybourne Chalk	
PCK		SIMA	base Shide Marl	
PCK		FAMA	base Farlington Marls (pair)	top *G. quadrata* Zone
PCK		BDMA	base Bedhampton Marls group	
PCK		SCMA	base Scratchell's Marls group	
PCK		POMA	base Portsdown Marl 1	Base Redoubt Beds
CUCK		WHFL	base Whitecliff Flint	
CUCK		WHMA	base Whitecliff Marls	Base Whitecliff Beds
CUCK		CBFL	base Cotes Bottom Flint	
CUCK		CMFL	base Charmandean Flint	
CUCK		LM2	base Lancing Marl 2	
CUCK		LM1	base Lancing Marl 1	
CUCK		LAFL	base Lancing Flint	Base Sompting Beds

NCK	PBMA	top Pepperbox Marls (highest seam)	top Newhaven Chalk Formation
NCK	CSMA	top Castle Hill Marls (highest seam)	top Newhaven Chalk Formation (in slumped sections lacking Pepperbox Marls) / base Castle Hill Beds
NCK	TEMA3	top Telscombe Marl 3	top *O. pilula* Zone
NCK	TEMA1	base Telscombe Marl 1	
NCK	MCMA	base Meeching Marl pair	base Bastion Steps Beds
NCK	NME	base Meeching Beds	base Peacehaven Marl
NCK	ONMA	base Old Nore Marl	Base Peacehaven Beds
NCK	FBMA3	base Friar's Bay Marl 3	top *U. anglicus* Zone
NCK	FBMA1	base Friar's Bay Marl 1	top *M. testudinarius* / top Santonian
NCK	NON	base Old Nore Beds	base Brighton Marl
NCK	HBFL	base Hawks Brow Flint	top *U. socialis* Zone
NCK	BUMA1	base Buckle Marl 1	top Peake's Sponge Bed / top *Micraster coranguinum* Zone / top Seaford Chalk Formation / base Splash Point Beds
SECK	REB	top Rowe's Echinoid Band	
SECK	BSP	top Barrois Sponge Bed	top Clandon Hardground
SECK	STRK	top Stockbridge Rock Member	
SECK	RBFL	base Rough Brow Flint	Whitaker's 3" Flint
SECK	FHFL	base Flat Hill Flint	Bedwell's Columnar Flint / Cladoceramus 2 Event

SECK	MDFL	base Michel Dean Flint	Pegwell Inoceramid Band / Cladoceramus 1 Event / top Coniacian / base Haven Brow Beds
SECK	SSFL	base Seven Sisters Flint	Oldstairs Bay Flint / East Cliff Semitabular Flint / base Cuckmere Beds
SECK	BTMA	base Belle Tout Marls group	base Otty Bottom Marls group
SECK	HPMA	base Hope Point Marls group	
SECK	SHMA2	base Shoreham Marl 2	East Cliff Marl 2 / top Rochester Hardground / top *M. cortestudinarium* Zone / top Lewes Nodular Chalk Formation / base Belle Tout Beds
LECH	LPHG	top Light Point Hardground	?top Corn Hill Hardground / base Beachy Head Sponge Beds
LECH	BEHG	top Beeding Hardground	?top Corn Hill Hardground 3 / base Light Point Beds
LECH	TR	top Top Rock	
LECH	CKR	top Chalk Rock	
LECH	HGHG	top Hope Gap Hardground	top Pines Garden Hardground / base Beeding Beds
LECH	CLHG	top Cliffe hardground	top Parlour Hardground / top Turonian / base Hope Gap Beds/ base Coniacian
LECH	LECF	base Cliffe Beds	
LECH	NAMA	base Navigation Marls	base Ness Point Marls / base Beer Head Marl

LECH	NAHG	top Navigation Hardground	top South Foreland Hardground / top *Plesiocorys* (*Sternotaxis*) *plana* Zone
LECH	CFFL	base Cuilfail Zoophycos	
LECH	LENA	base Navigation Beds	
LECH	LEMA	base Lewes Marl	base West Tofts Marl / base South Street Beds
LECH	HWHG	top Hitchwood Hardground	top Lewes Tubular Flints
LECH	BBFL	base Breaky Bottom Flint	base Annis Knob Flint
LECH	GGMA	base Grimes Graves Marl	
LECH	BRMA1	base Bridgewick Marl 1	base Kingston Beds; base Grimes Graves Marl
LECH	BRFL	base Bridgewick Flints	base Brandon Flint Series / top *Terebratulina lata* Zone
LECH	FFHG	top Fognam Farm Hardground	
LECH	CAMA	base Caburn Marl	base Crab Bay Marl / base Twin Marl / base Ringmer Beds
LECH	SUMA1	base Southerham Marl 1	base Fognam Marl / base ?Langdon Bay Marl 1 / base Mount Ephraim Marl / base Caburn Beds
LECH	PHG	top Pewsey Hardground	top Spurious Chalk Rock
LECH	OHG	top Ogbourne Hardground	
NPCH	GLMA2	base Glynde Marl 2	base Pilgrim's Walk Marl (lowest marl in Pilgrim's Walk Group)
NPCH	GLMA1	base Glynde Marl 1	base Glynde Beds
NPCH	NPCK	top New Pit Chalk Formation	top Beer Roads Flinty Chalk

			Member
NPCH	NPMA3	base New Pit Marl 3	? base Pounds Pool Grey Bed
NPCH	NPMA2	base New Pit Marl 2	? base Rowe's 4-ft Band
NPCH	NPMA1	base New Pit Marl 1	? base Rowe's 2-ft Band
NPCH	MSMA	base Malling Street Marls	Round Down Marl
HCK	GGMM	base Gun Gardens Main Marl	base Lulworth Marl / top *Mytiloides* spp. Zone / top Holywell Nodular Chalk / top Connett's Hole Member
HCK	MEMA4	base Meads Marl 4	approximate top Cenomanian
HCK	MLR	top Melbourn Rock	
HCK	PLNM	top Plenus Marls	
HCK	SPME	Sub-Plenus Marls erosion surface	top Zig Zag Chalk Formation / top Calycoceras guerangeri Zone / top Beer Head Limestone Formation
ZZCH	JB7	top Jukes-Browne Bed 7	top Nettleton Stone
ZZCH	PMA	base Pycnodonte Marl	
ZZCH	CASB	base Cast Bed	
ZZCH	TELM	base Tenuis Limestone	
ZZCH	STST	Sub-Totternhoe Stone erosion surface	
WMCH	TWMCH	top West Melbury Marly Chalk Formation	
WMCH	DLM	base Dixoni Limestone	base M6 Limestone
WMCH	M3LM	base Doolittle Limestone	base M3 Limestone / top *Sharpeiceras schlueteri* Subzone

WMCH	GLML	top Glauconitic Marl	Top Melbury Sandstone / top Cambridge Greensand
	SCG	Sub-Chalk Group erosion surface	

Appendix 2 – List of interpreted boreholes

SOBI	Name
SP90NE28	Hawridge_Ps_No3_Observation_Bh
SP90NE9	Waterworks_Berkhampstead
SP90SW6	Chartridge
SP91SE14	Stock'S_Hotel_Aldbury
ST90SW1	Shapwick
ST91NW26	Ashmore_Piezometer
ST93SW15	Fonthill_Bishop
ST94NE1	Chitterne
SU00NW1	Cranborne
SU02NE14	Salisbury_Racecourse_C
SU04SE4	Waterworks_Shrewton_S_Wilts_Wb
SU06NE2	Three_Barrows
SU07SE4	Cherhill
SU12NW6	Netherhapton
SU13NE1	Boscombe_Down_2
SU13NE30	Boscombe_Down
SU14NE1	Netheravon
SU15NE10	Upavon_Central_Flying_School_Wbh25A
SU15NE30	Everleigh
SU15SE1	Upavon
SU16NE16	Granham_Farm
SU16SW15A	Shaw_House_Huish
SU17NE76	Herdswickfarm
SU22NW2	Farley_South
SU23NW7	Porton
SU25SW16	S_Wilts_W_B_Leckford_Bridge
SU26NE7	Horsehall_Hill
SU27NE16	Baydon_Hole
SU27NE18	Bailey_Hill_Observation
SU27NE19	North_Farm_Aldbourne
SU27NW19	Upper_Upham_Aldbourne
SU27NW20	Woodsend_Observation
SU27NW21	Whitefield_Hill_Reservoir_Obh
SU27SE5	Eastridge_Farm_Ramsbury
SU27SW16	Rabley_Wood_Observation
SU27SW4	Sound_Bottom_Axford_3

SU28SE7	Fognam_Farm_Lambourn_Fognam_Down_Ps_3
SU33SW53	Broughton_Ps
SU35SE24	Ibthorpe_No1
SU36NW16	Hungerford_Pumping_Station
SU36NW27	Shalbourne_Experimental
SU37NE3	Poors_Furze_Eastbury_Down
SU37NE6	Lambourn_P61_Great_Shefford
SU37NE6	Great_Shefford
SU37NW13	Bockhampton
SU37NW8	North_Farm
SU37SW12	Horseclose_Copse_Thames_W_A
SU38SE9	Warren_Down
SU38SW10	Mile_End_Lambourne_Berks
SU38SW13	Maddle_Farm
SU38SW6	Longacre_Farm_Berks
SU38SW8	Upper_Lambourn_Berks
SU41SW649	Southampton_1
SU46NE38	Lambourne_46_2_Bagnor_Newbury_Berks
SU46NE43	Speen_Pumping_Station
SU46NW3	Lambourn_P60_Lambourn_Valley_Pilot_Scheme
SU46NW36	Lambourn_46_1_Lambourn_River_Bagnor
SU46SW11	Yews_Farm_Hollington_Highclere_Hants
SU47NE7	Ashridge_Wood
SU47NE8	Lambourn_47_1_Chapel_Wood_Peasemore
SU47NE9	Chapel_Wood
SU47NW19	Brightwalton_Holt_47_131
SU47NW2	Chaddleworth_Near_Newbury_Berks
SU47NW24	Leckhampstead_Abstraction_Wantage
SU47NW8	Wooley_Cross_Road_Brightwalton
SU47SE39	Lambourn_47_2_Bussock_Wood_Winterbourne
SU47SE42	Winterbourne_Stream
SU47SE56	Winterbourne_Cored
SU47SW191	Boxford
SU47SW61	Lambourn_47_4_Near_Boxford_Berks
SU47SW62	Lambourn_47_5_Near_Boxford_Berks
SU47SW63	Lambourn_47_6_Rood_Hill_Easton
SU47SW66	Lambourn_P_62_Winterbourne_Wood
SU47SW68	Lambourn_47_7_Welford_Farm_Welford
SU53NE1	Totford_Ps_Igs_Northington_Hampshire
SU53SE1	Abbotstone
SU53SE39	Fob_Down_Farm_Alresford
SU53SE5	Itchen_Valley_Watercress_Borough_Bridge_Cress_Beds_Old_Alresford
SU53SW3	Itchen_Down_Farm_A
SU53SW4	Itchen_Down_Farm_B
SU53SW70	Easton_Ps_No._1
SU55SE2	Woodgarston_Waterworks
SU56NE94	Woolhampton
SU56SE215	Shalford_Farm_Abh
SU56SE216	Hyde_End

SU56SW165	Round_Copse
SU57NW31	Woodland_Farm_Compton_Berks
SU57NW37	Banterwick
SU57NW72	Trumpletts_Farm
SU57SW104	Frilsham_Meadow
SU64SW35	Ellisfield
SU64SW45	Axford_1B_Strat_Preston_Candover
SU66NE154	Missels_Bridge
SU66SE21	Faircross
SU71SW59A	Horndean
SU73NW2	Courage_And_Co_Ltd_Selbourne_Road_Alton
SU73NW48	Weyspring_Ps
SU77NW132	Playhatch_No_2
SU78NE23	Southend_Farm
SU79NW95	Kingston_Hill_Ps_Observation
SU84NE66	Tongham
SU89NE6	Hughenden_Pumping_Station_High_Wycombe
SU91NE42	Dog_Kennel_Corner
SU91SE16	Westburton_Hill
SU91SW9	East_Dean_Oxendown
SU94NE15	Waterworks_Guilford_Surrey
SU95SE102	Cold_Stores_Walnut_Tree_Close_Guildford
SU97NW148	Dedworth_Ps_Kipling_Memorial_Building
SU98SE58	Slough
SY69SE21	Eldridge_Pope_Dorchester
SY88SW48	Coombe_Keynes
SZ08NW10	Wytch_Farm_F15
SZ38NE9	Wilmingham
SZ39SE1	Bouldner_Copse
SZ48NE55	Sandhills_2
SZ49SE3	Sandhills_1
SZ59SW17	Cowes_1
SZ89NE5	Pagham
TF64SE11	Hunstantonigs
TF64SE12	Hunstanton_No_1
TF70SE14	Hilborough
TF72SE3	Great_Massingham
TF73SE26A	Fring_Road_Bircham_Borehole_2X
TF80NW20	Swaffham_Sbh3
TF80NW21	Swaffham_Sbh4
TF80NW22	Swaffham_Sbh6
TF80NW24	Swaffham_Sbh8
TF80NW59	Swaffham_Sbh5
TF81SW14	Little_Palgrave
TF83SE8	South_Creake
TG23SE8A	Trunch
TG42SE1	Somerton_1
TL00NE18	Waterworks_Hemel_Hempstead
TL11NW9	Hyde_Mill_Harpenden

TL12NE18	Near_Hitchin_2_Pinnacle_Hill
TL12NE234	Wain_Wood_Nr_Hitchin_No_3
TL12SE48	Kings_Walden_Ps_No2
TL13SE45	Arlesey
TL20NW39	Hatfield_Station
TL21NW15	Fulling_Mill_Lane
TL22NW239	Little_Wymondley_Nr_Stevenage
TL30NE25B	Hoddesdon
TL31NE28	Thundridge
TL31SE57	Broadmead_Ware
TL32NE18B	Worsted_Lane_Pumping_Station
TL32SE101	Braughing_Hamels_Mills
TL32SE23	Harlow_Devt_Corpn_Braughing
TL33NE11	A10_Reed_221_449
TL33NE15	Gwds_47A
TL33NE16	Gwds_154_Newsells_Park_Barkway
TL33NW12	Coombes_Farm_Kelshall
TL33NW17	Odsey_Coombe_Rd_Jnctn_Tl33_42
TL33SE1	Chipping_Pumping_Station
TL33SE13	Barkway_Stw
TL34SE10	Melbourn_Royston
TL34SW14	Therfield_Regulation_Royston
TL41NW97	Hadham_Mill
TL42SE110	North_Stortford
TL43NE5	Wendens_Ambo_Pumping_Station_Arkesden
TL43NW17	Building_End_Chrishall_Essex
TL43NW18	Road_Verge_Shaftenhoe_End
TL43NW20	Shaftenhoe_End
TL43NW22	Building_End_Road_Chishall
TL44NE156	Raf_Duxford
TL52SW70D	Waterworks_Chapel_Hill_Stanstead
TL53NW54	Debden_Road_Pumping_Station_Saffron_Walden
TL53NW58	Uttlesford_Bridge_Wendens_Ambo
TL53SW75	Pumping_Station_Newport
TL53SW76	Pumping_Station_Newport
TL63NW36	Ely_Ouse_Outfall_Works
TL63NW6B	Pumping_Station_Hempstead
TL64NE14	Haverhill
TL64NW15	Westoe_Farm_Bartlow
TL65SE1	Great_Bradley
TL65SW11.	Weston_Colville
TL70NW273B	Hall_Street
TL72NW30	Codham_Mill
TL74NW4	Babel_Green_Hundon
TL74SW22	Wixoe
TL78NE6	Brandon_Waterworks
TL79SE13	Mundfordc
TL79SE7	Mundforda
TL94NW32	Lavenham

TL95SW12	Park_Farm_Lavenham_Formely_Air_Minstry
TL96NW63	Stowlangtoft
TL98NE88	East_Harling
TL98SE32	Square_Plantation
TM00NW26	Bradwell_201
TM08NW39	Kenninghall
TM09NW1	Ellingham_1
TQ08SW41	Southlands
TQ09NE87	Sun_Printers
TQ15NE4	Fetcham_Mill
TQ17NE136	Firestones_Great_West_Road
TQ17NW119	Tea_Stores_Scotts_Road
TQ18SW148	Great_Western_Industrial_Park_Southall
TQ19SW101	Raf_Station_Eastbury
TQ26NE198	Racs_Depot_Driftway_ Mitcham
TQ26SE100	Woodcote_Ps_Pilot_Borehole
TQ26SE59	Sutton_Court_Road
TQ26SE79	Langley_Park_Carshalton
TQ26SE98	Croydon_Lane
TQ26SW15	Gander_Green_Lane_Cheam
TQ26SW17	Cheam
TQ27NE118C	Latchmere_Road_Baths
TQ27SE33	Streatham_Common
TQ27SE545	Sunlight_Laundry_York_Road_Wimbledon
TQ27SE689	New_Merton_Board_Mills
TQ28NW141	Dollis_Hill_Reservoir
TQ28SE1569	Abbey_Lodge_Hanover_Gate_Regents_Park
TQ28SE856	Simpson'S_Picadilly
TQ28SW27	Acton_Public_Baths_Acton
TQ30SW3	Victoria_Gardens
TQ35NW1	Warlingham
TQ36NE73	Langley_Court_Beckenham
TQ36NW106	Croydon_Gasworks
TQ36NW380	Beddington_Farm_Road
TQ36SW20	Kenley_Ps6
TQ37NE1441	Milton_Court_New_Cross
TQ37NE1484	Greenwich_Ps_Norman_Road_Greenwich
TQ37NW100	Young_&_Co_Dunlop_Place_Bermondsey
TQ37NW1190	Well_Shaft_Hovis_Mills_Vauxhall_Bridge
TQ37NW1202	Durham_St_Vauxhall
TQ37NW2104	Savo_ Hotel_Laundry
TQ37NW2105	New_Scotland_Yard
TQ37NW2107	49_Lomond_Road_Camberwell
TQ37SE146	Ladywell_Public_Baths
TQ37SE161	Ravensbourne_Bromley
TQ37SW780	James_Allen_Girls_School
TQ38NE302	Hackney_Public_Baths
TQ38NE323	Millfield_Ps
TQ38NE324	Micanite_Insulators_Ltd

TQ38NW1	Hornsey_Gas_Works
TQ38NW310	Green_Lanes_Stoke_Newington
TQ38NW443	Western_Laundries_Ltd_Draytonp
TQ38NW451	Gestetner_Ltd_Fawley_Road_Tottenham
TQ38SE1917	80_84_Wallis_Road_Hackney_Wick
TQ38SE1931	Lner_Station_Startford
TQ38SW2142	Armour_House_St_Martins_Le_Grand
TQ38SW2816	45_King_William_Street
TQ38SW3216	Winchester_House
TQ38SW3387	New_River_Head
TQ39SE228	Chingford
TQ41SW16	Glyndebourne
TQ47NW136C	Plumstead
TQ47NW998	Store_Road_Obh
TQ47SW140	Bromley_Reservoir_Chalk_Obh
TQ47SW74	Avery_Hill_Road_New_Eltham
TQ48SE393	Beckton_Treatment_Works_1
TQ48SE489	Dagenham
TQ49SW273	Chigwell_Road
TQ56NE4	Horton_Kirby_Farningham_Kent
TQ56SW40C	Pumping_Station_Castle_Road_Lullingstone
TQ66NE9F	Luddesdown
TQ68SW151	Tilbury_B_Power_Station_Heath_Farm
TQ88SW1	Canvey_Island
TQ95NE69	Belmont_Scheme_Throwley_Site
TQ96NW308	Sittingbourne
TR05NW31	Boughton_Pumping_Station
TR06SW39	Faversham
TR14NE4	Little_Duskin
TR24NE37	Stonehall_Abh_Aka_Lydden_1
TR24NW24	Rakeshole_No8_Elham
TR26SW6	Hoath
TR34SE3	Seaview_C1_St_Margarets_At_Cliife_

Appendix 3 – Report on structure and stratigraphy modelling workflow

(html Enclosure 1 appended as text in this file (see below))

Enclosure 1 Report on Structure and Stratigraphy modelling.html

Appendix 4 – Report on property modelling workflow

html Enclosure 2 appended as text in this file (see below))

Enclosure 2 Report on Property modelling.html

References

British Geological Survey holds most of the references listed below, and copies may be obtained via the library service subject to copyright legislation (contact libuser@bgs.ac.uk for details). The library catalogue is available at: http://geolib.bgs.ac.uk.

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⊡Structure & Stratigraphy Study: SnS_2

SKUA™Structure & Stratigraphy Workflow Report
Author: ajn
Report created on: Thu 29. Jan 16:47:30 2015

The SKUA™ Structure and Stratigraphy Workflow is designed to guide the user through a step-by-step process of combining datasets to obtain a comprehensive 3D geological model. The result is a 3D structural model with faults and horizons surfaces, as well as one or several geology grids suitable for reservoir property modeling.

Table of Contents

- JBoundaries

Name	SnS_2
InterpretationSlave	false

Selecting Data: Horizons

This step consists in identifying horizons to model and their associated data.
The modeling is in depth.
The model contains 0 horizons.

Domain	Depth
StratigraphicColumn	*/user_object:CompositeTopChakUnconformity_BaseChalkUnconformity[scenario='/'][type=LocalStratigraphicColumn][user=ajn]*
HorizonFeatures	• /feature:CompositeTopChalkUnconformity[province=''][type=FeatureBoundary] • /feature:TopLewesNodularChalkFormation[province=''][type=FeatureBoundary] • /feature:TopZigZagChalkFormation[province=''][type=FeatureBoundary] • /feature:BaseChalkUnconformity[province=''][type=FeatureBoundary]
HorizonData	• /gobj:CompositeTopChalkUnconformity_tsurf[domain=Depth][scenario='/'][survey=''][type=TSurf][user=ajn] • /gobj:skua_model_horizon_TopLewesNodularChalkFormation_ts_0[domain=Depth][scenario='/'][survey=''][type=TSurf][user=ajn] • /gobj:skua_model_horizon_TopZigZagChalkFormation_ts_0[domain=Depth][scenario='/'][survey=''][type=TSurf][user=ajn] • /gobj:skua_model_horizon_BaseChalkUnconformity_ts_0[domain=Depth][scenario='/'][survey=''][type=TSurf][user=ajn]
Wells	-
WellMarkers	-
IsochoreMaps	-
Marker VSets	-
done	true
CurrentHorizons	• /feature:CompositeTopChalkUnconformity[province=''][type=FeatureBoundary]
Show Horizon Input	false
Show Horizon Output	false

Selecting Data: Faults

This step consists in identifying faults to model and their associated data.
The model contains 0 faults.

FaultFeatures	-
FaultData	-
First selection	false
changing fault type	false
do erosion	false
WellMarkers	-
Marker VSets	-
CurrentFaults	-
Show Fault Input	false
Show Fault Output	false
Show Fault Neighbors	false

Selecting Data: Seismic and Salt

This step consists in identifying seismic to use as background.

SeismicCube	-

Property	-
DipAzimuthSurvey	-
Dip	-
Azimuth	-
UseFilter	false
FilterProperty	-
FilterOperator	IgnoreHigherThan
FilterThreshold	0
SaltFeatures	-
SaltData	-

Identifying Eroded Faults

This step consists in identifying if faults should be eroded by any unconformity.

ErodedFaults

Horizon	Faults	eroding
CompositeTopChalkUnconformity	-	true
TopLewesNodularChalkFormation	-	false
TopZigZagChalkFormation	-	false
BaseChalkUnconformity	-	false

Defining the Volume of Interest

This step consists in identifying the volume of interest.

Boundaries

- /gobj:VOI_boundaries_voi_bottom[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_top[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E87_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E871_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E872_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E873_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E874_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E875_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E876_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E877_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E878_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E879_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE44_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE441_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE442_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE443_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_NE444_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE445_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE446_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE447_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW5_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW51_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW52_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW53_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW54_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW55_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW56_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW57_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW58_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW59_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW510_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW511_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW512_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW513_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E86_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E861_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E862_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E863_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E864_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E865_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E866_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E867_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E868_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW53_ribbon 1[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW531_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW532_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW533_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW534_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW535_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_NW536_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW537_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW538_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW539_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW5310_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW40_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW401_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW402_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW403_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW404_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW405_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW406_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW407_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW408_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW409_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4010_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4011_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4012_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4013_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4014_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4015_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4016_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4017_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4018_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW4019_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW13_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW131_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW132_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW133_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW134_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW135_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW136_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW21_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_NW211_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW212_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW213_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW214_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW48_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW481_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW482_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW483_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW484_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW485_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW486_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW47_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW471_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW472_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W87_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W871_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W872_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W873_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW123_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1231_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1232_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW57_ribbon 1[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW571_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW572_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW573_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW180_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1801_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1802_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1803_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1804_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1805_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W75_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W751_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_NW152_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1521_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W77_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W771_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW161_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1611_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_W99_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE176_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1761_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1762_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW171_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1711_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW176_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1761_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW143_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW175_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1751_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE175_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1751_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW178_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW166_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE168_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE169_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1691_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE167_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW179_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1791_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1792_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1692_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE171_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE161_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NW1752_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE174_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_NE1741_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1742_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1743_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1744_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1745_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1746_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1747_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE179_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1791_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1792_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1793_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1794_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1795_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1796_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1797_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1798_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1799_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE17910_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE17911_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE17912_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE17913_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE17914_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE17915_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE159_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1591_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1592_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1593_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1594_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1595_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1596_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1597_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1598_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE1599_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_NE15910_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE15911_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE15912_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE15913_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE15914_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE15915_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_NE15916_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E91_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E911_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E912_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E913_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E914_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E915_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E916_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E917_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E918_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E919_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9110_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9111_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9112_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9113_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9114_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9115_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9116_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9117_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9118_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E99_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E991_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E992_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E993_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E994_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E995_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E996_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

- /gobj:VOI_boundaries_voi_E997_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E998_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E999_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9910_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]
- /gobj:VOI_boundaries_voi_E9911_ribbon[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][survey=''][type=TSurf][user=ajn]

Model3d	*gobj:VOI[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=Model3d][user=ajn]*
Model3d volume	6.06636e+13
Method	polygon
show voi	false

VoxetMethod

Voxet	-
Use probe	false
Probe	-

PolygonMethod

pline	*/gobj:SouthWashChalkOutlineNoSteepsDensified5000m_pline[domain=Depth][modeling_role=''][scenario='/'][survey=''][type=PLine][user=ajn]*
is digitized pline	false
top	320
bottom	-1080
data	-
stretch	1.2
use data	false
max nb points	10

ESurfaces

surfaces	-
closed volume	false
voi model	-

Building the Fault Network

This step consists in building the faults and their relationships.

Resolution areal	0
Resolution vertical	0
Connection distance	100
Outline method	Default method
Outline value	1
FaultNetwork	-
Dirty TSolid	false
Dirty Implicit Surfaces	true
Dirty FaultNetwork	true
Implicit Faults	-
Fit data	2

Reset Parameters	false
Rebuild Mode	false

Modeling Horizons

This step consists in building main horizons from seismic data and approximation of marker locations.

Resolution areal	1000
Resolution vertical	300
Fit data	3
Horizon Surfaces	• /gobj:CompositeTopChalkUnconformity[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridGeologyHorizonGrid][user=ajn] • /gobj:TopLewesNodularChalkFormation[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridGeologyHorizonGrid][user=ajn] • /gobj:TopZigZagChalkFormation[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridGeologyHorizonGrid][user=ajn] • /gobj:BaseChalkUnconformity[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridGeologyHorizonGrid][user=ajn]
InGrid model	*/gobj:skua_model[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridModel][user=ajn]*
Model3d	*/gobj:VOI[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=Model3d][user=ajn]*
TSolid	*/solid_model[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=MultiResolutionTSolid][user=ajn]/gobj:0[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=LightTSolid][user=ajn]*
Units	• /feature:CompositeTopChalkUnconformity[province=''][type=RockFeature] • /feature:TopLewesNodularChalkFormation[province=''][type=RockFeature] • /feature:TopZigZagChalkFormation[province=''][type=RockFeature] • /feature:BaseChalkUnconformity[province=''][type=RockFeature]
Main Horizons	• /feature:CompositeTopChalkUnconformity[province=''][type=FeatureBoundary] • /feature:TopLewesNodularChalkFormation[province=''][type=FeatureBoundary] • /feature:TopZigZagChalkFormation[province=''][type=FeatureBoundary] • /feature:BaseChalkUnconformity[province=''][type=FeatureBoundary]
Preview mode	false
Use top correlative conformities	false
Top correlative conformities	-
Fit markers	true
Remove bubbles	false
Use throw constraint	false
Use erosion curves	false
IsochoreMapsPoints	-
Geometry need computation	false
Deformation style	Minimal deformation
Azimuth	0
Resolution	121
ni	2552
nj	2197
Use throw	true
Horizons built	true
Data mismatch	-
Refinement threshold	100
Error map method	inverse distance
Radius kriging	10

Horizons:

CompositeTopChalkUnconformity

IgnorePointsRegion -
Validated false

AroundFaults

Region SnS_2_faults_proximity
Faults -
Distance -
BadPoints -

InconsistentData

Property -
Region SnS_2_inconsistent_data
Distance -

Crossings

Region SnS_2_crossing_points
Horizons -

TopLewesNodularChalkFormation

IgnorePointsRegion -
Validated false

AroundFaults

Region -
Faults -
Distance -
BadPoints -

InconsistentData

Property -
Region -
Distance -

Crossings

Region -
Horizons -

TopZigZagChalkFormation

IgnorePointsRegion -
Validated false

AroundFaults

Region -
Faults -
Distance -
BadPoints -

InconsistentData

Property	-
Region	-
Distance	-

Crossings

Region	-
Horizons	-

BaseChalkUnconformity

IgnorePointsRegion	-
Validated	false

AroundFaults

Region	-
Faults	-
Distance	-
BadPoints	-

InconsistentData

Property	-
Region	-
Distance	-

Crossings

Region	-
Horizons	-

Honoring Well Data

This step consists in fitting exactly horizons to well markers.

Data mismatch	-
Marker mismatch	-
Distance cnstr algo	true
Zone of influence radius	-
Stop at faults	false
Remove bubbles	false
Use marker dip information	false
Use well unit information	false
Include markers	false
Pointsets as trend	true
Do refine	false
Radius kriging	10
Radius well	2000
Error map method	inverse distance
isopach model computed	false

Maps

Unit	Map
CompositeTopChalkUnconformity	-
TopLewesNodularChalkFormation	-
TopZigZagChalkFormation	-
BaseChalkUnconformity	-

Checking Fault Throw

This step consists in analyzing the fault throws.

Displacement computed false

Checking Thickness and Volumes

This step consists in checking stratigraphic units thickness and volume.

Thickness method stratigraphy (TST)

Thickness map	-
Volume unit	m^3
Volume format	9

Layer info

Layer name	Volume	Build	Nb cells	Cell thickness	Thickness	Volume m3	Unit	Thickness formatted	Min U	Min V	Max U	Max V
CompositeTopChalkUnconformity	0	true	86	5	431.018	-	10^9 m^3	-	-225516	147433	76503.8	172211
TopLewesNodularChalkFormation	0	true	31	5	152.58	-	10^9 m^3	-	-225809	-34175.2	76502.5	172213
TopZigZagChalkFormation	0	true	17	5	86.4583	-	10^9 m^3	-	-226205	-34139.7	76502.9	172214
BaseChalkUnconformity	0	false	1	1292.36	1292.36	-	10^9 m^3	-	-231970	142771	76505.7	172218

Building the Geologic Grid

This step consists in building grids for property modeling.

Name	ErodedChalk_Uniform5mThickCells_62x53x134
Cell size	5007.98
Ni	62
Nj	53
GeologyGrid	*/gobj:ErodedChalk_Uniform5mThickCells_62x53x134[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridGeologyGrid][user=ajn]*
Length I	308476
Length J	265423
Min U	-231970
Min V	-93204.4
Max U	76505.7
Max V	172218

Flow Grid Workflow

Name -

Select Tasks

perform azimuth and bounding box task	true
perform surface alignment task	true

Select Units

structural workflow instance	-
skua model	-
selected boundary	-
selected horizon	-
all units	-
unit list	-
unit selection valid	false

Specify Gridding Azimuth and Area of Interest

azimuth	0
flow interpolated	false
use I min	false
use I max	false
use J min	false
use J max	false

I min

X 0
Y 0
Z 0

I max

X 0
Y 0
Z 0

J min

X 0
Y 0
Z 0

J max

X 0
Y 0
Z 0

Align Gridding Along Faults or Surfaces

I table change	false
J table change	false
Pillars table change	-
azimuth var	0
min pillar dip	30

straight pillars	false
Align cell edges on faults	true
modification warning visible	false
align using	false
validated	true
min I	-
min J	-
max I	-
max J	-

Build the Flow Simulation Grid

grid	-
gridName	flow_simulation_grid
use non uniform layering	false
Geologic grid	-
Merge cells	false
Merge length threshold	0.001
Relax fibers	true
Fit to well data	true
Relax length threshold	0
Use tartan gridding	false
Geomechanics	false
Stair step unconformities	false
IBoundariesList	-
JBoundariesList	-
TartanGridICellCount	-
TartanGridJCellCount	-

Axis

Axis	Number of Cells	Length	Cell Resolution	Honor Cell Size
I	80	800	100	true

---

1. Simulation Parameters

Global Seed	101
Grid	/gobj:ErodedChalk_154x133x325 [domain=Depth] [scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'] [type=InGridGeologyGrid] [user=ajn]
Number Of Properties	1

1.1 Property LithofaciesModelled

1.1.2 Region everywhere

1.1.3 Region /gobj:ErodedChalk_154x133x325[domain=Depth] [scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'] [type=InGridGeologyGrid] [user=ajn]/region:TopZigZagChalkFormation [scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][topo_dim=3][user=ajn]

- Algorithm used : IK
- Kriging Method : SK

Categories

Category	Proportions
1	0.565866
2	0.0342099
3	0.202705
4	0.0113823
5	0.17209
6	0
7	0.00983731
9	0.00239627
8	0

Variograms

- Category 1

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 2

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10

Azimuth	89.9842
Dip	0
Plunge	0

- Category 3

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 4

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 5

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1

Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 6

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 7

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 9

Sill	1
Nugget	0
Number Of Structures	1

- 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

- Category 8

Sill	1
Nugget	0
Number Of Structures	1

- 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	89.9842
Dip	0
Plunge	0

Search

Maximum Range	0.1
Minimum Range	0.1
Vertical Range	0.1
Azimuth	0
Dip	0
Plunge	0

1.1.4 Region /gobj:ErodedChalk_154x133x325[domain=Depth] [scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]']

[type=InGridGeologyGrid] [user=ajn]/region:TopLewesNodularChalkFormation [scenario='/ChalkLithofacies/SnS_2 [family=ingridStructuralWorkflow]'][topo_dim=3][user=ajn]

- Algorithm used : IK
- Kriging Method : SK

Categories

Category	Proportions
1	0.436441
2	0.0520724
3	0.0903489
4	0.0755926
5	0.334885
6	0
7	0
9	0
8	0.00961468

Variograms

- Category 1

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0

Dip	0
Plunge	0

- Category 2

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 3

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 4

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000

Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 5

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 6

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 7

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 9

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 8

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

Search

Maximum Range	0.1
Minimum Range	0.1
Vertical Range	0.1
Azimuth	0
Dip	0
Plunge	0

1.1.5 Region /gobj:ErodedChalk_154x133x325[domain=Depth][scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][type=InGridGeologyGrid][user=ajn]/region:CompositeTopChalkUnconformity[scenario='/ChalkLithofacies/SnS_2[family=ingridStructuralWorkflow]'][topo_dim=3][user=ajn]

- Algorithm used : IK
- Kriging Method : SK

Categories

Category	Proportions
1	0.888406
2	0.0193974
3	0.0316181
4	0.00416385
5	0.0393873
6	0
7	0
9	3.38524e-05
8	0.00120176

Variograms

- Category 1

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 2

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 3

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000

Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 4

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 5

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 6

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 7

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 9

Sill	1
Nugget	0
Number Of Structures	1

  - 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

- Category 8

Sill	1
Nugget	0

Number Of Structures	1

- 2nd Structure

Type	Spherical
Contribution	1
Maximum Range	150000
Minimum Range	150000
Vertical Range	10
Azimuth	0
Dip	0
Plunge	0

Search

Maximum Range	0.1
Minimum Range	0.1
Vertical Range	0.1
Azimuth	0
Dip	0
Plunge	0

1.Data

- Data Used

Data	/gobj:ChalkLithofacies_pline[domain=Depth][modeling_role=''][scenario='/'][survey=''][type=PLine][user=ajn]
Property	/ChalkLithofacies_pline[domain=Depth][modeling_role=''][scenario='/'][survey=''][type=PLine][user=ajn]/property:ChalkLithofaciesTrimmed[property_group=''][scenario='/'][topo_dim=0][user=ajn]
Region	everywhere
Declustering Weights	

- Data Assignment

Assignment Method	NearestCell