

The following was presented at DMT'09
(May 10-13, 2009).

The contents are provisional and will be
superseded by a paper in the
DMT'09 Proceedings.

See also earlier Proceedings (1997-2008)

<http://ngmdb.usgs.gov/info/dmt/>



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

Applied geoscience for our
changing Earth

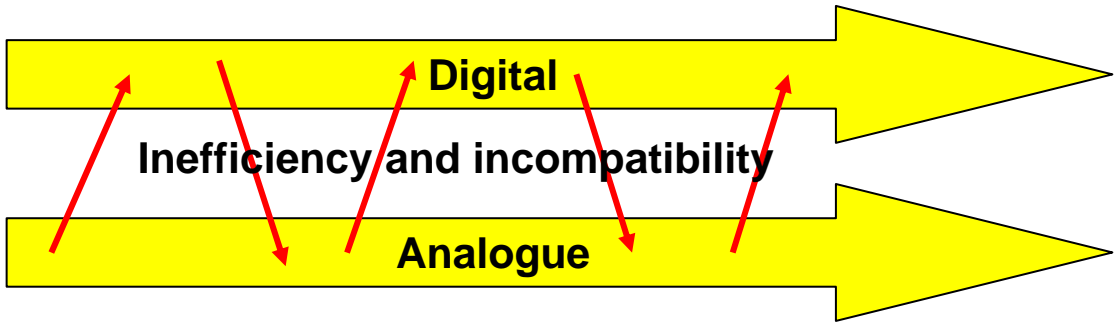
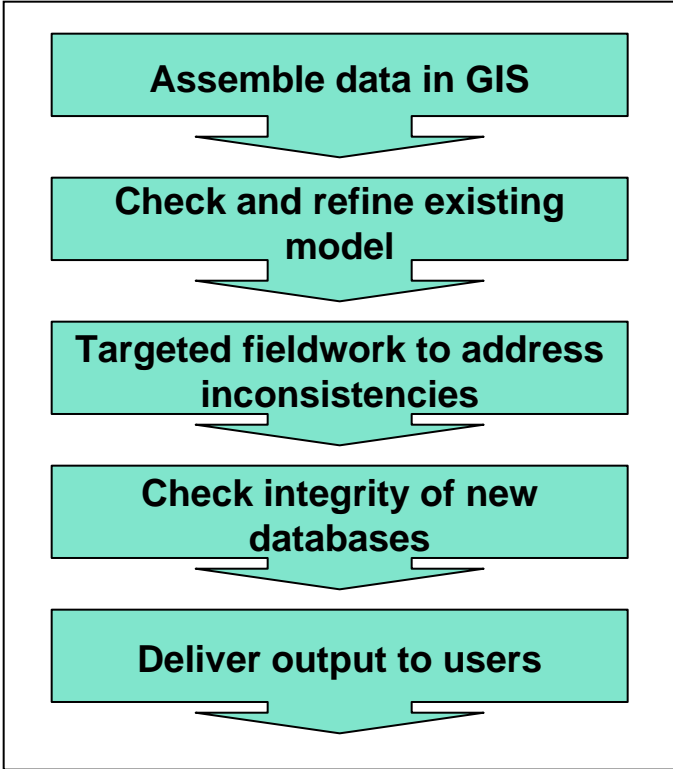
BGS-SIGMAmobile; the BGS digital field mapping system in action... *in the United Arab Emirates*

Colm Jordan




Σigma

System for Integrated **Geoscience Mapping**


SIGMA System for Integrated Geoscience Mapping



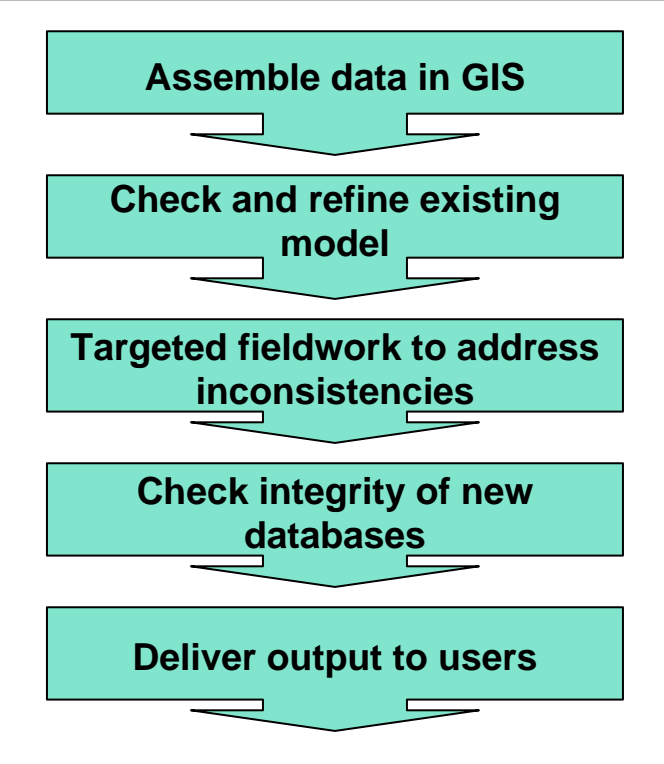
Integrated digital workflow including:

-  **Sigma** • **DESKTOP**
System for integrated Geoscience Mapping
-  **Sigma** • **MOBILE**
System for integrated Geoscience Mapping
-  **Sigma** • **PUBLISHER**
System for integrated Geoscience Mapping

VFR (Virtual Field Reconnaissance incl GeoVis)
SOCET (Digital stereo airphoto interpretation)
GSi3D (3D Geological modelling)



SIGMA System for Integrated Geoscience Mapping



Σ igma

System for Integrated Geoscience Mapping

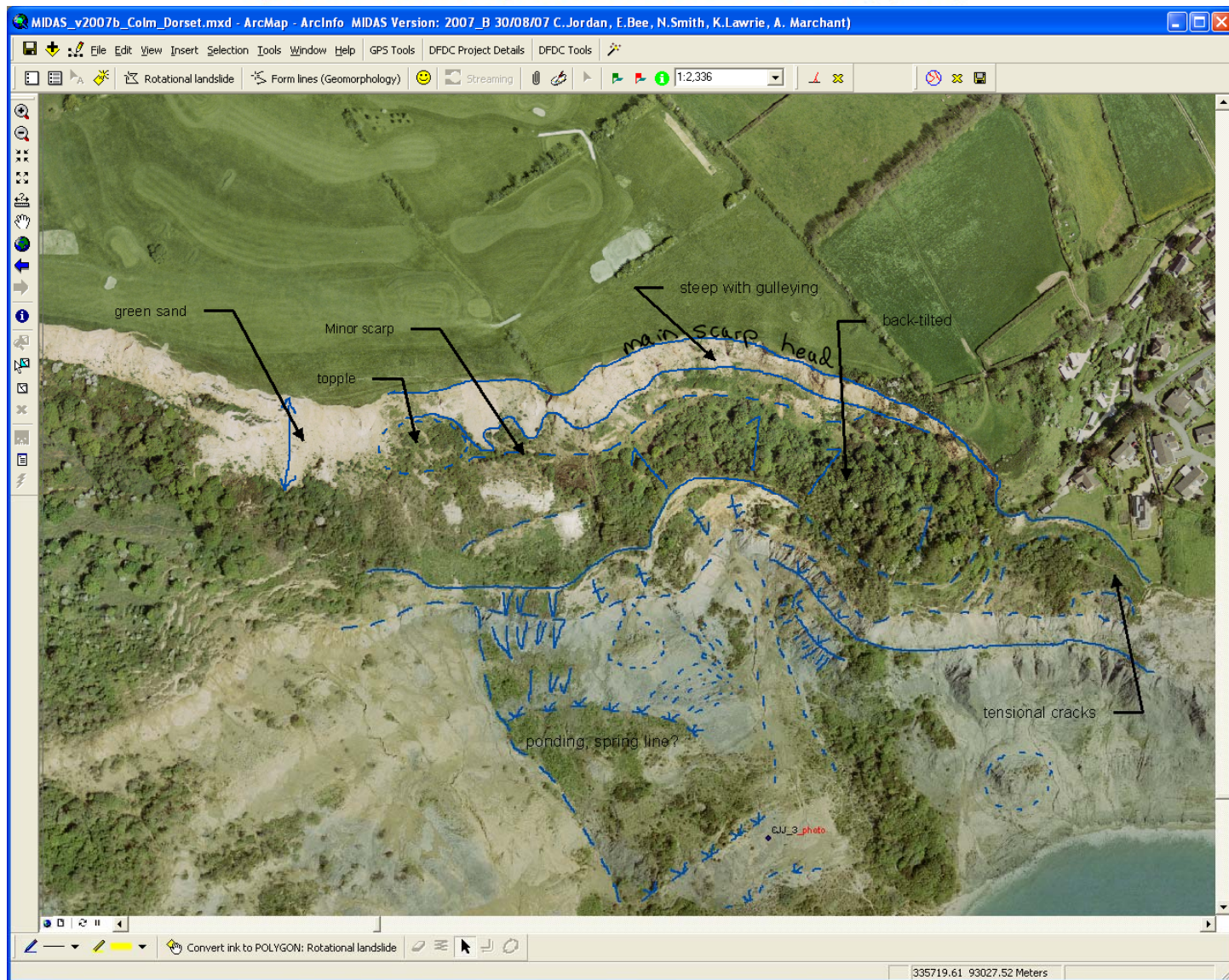


- 1. Using data in the field & capturing new data**
- 2. Runs on rugged Tablet PCs with integrated GPS**
- 3. Heavily customised ArcGIS, MS Access & InfiNotes**



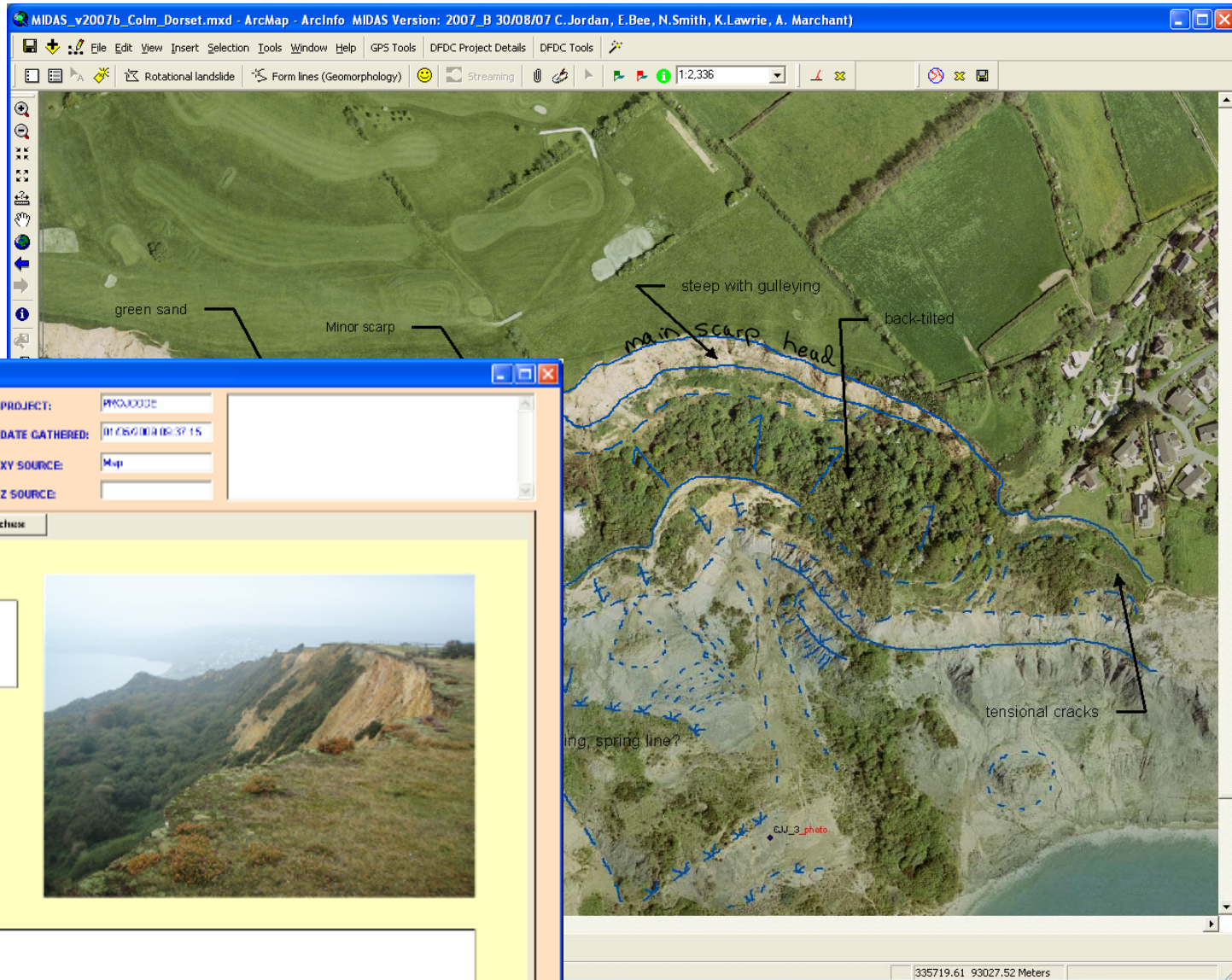
Sigma • MOBILE

System for integrated Geoscience Mapping




Sigma • MOBILE

System for integrated Geoscience Mapping




Precis Tool Version 1.0




| | | | |
|-----|---------------|----------------|---------------------|
| ID: | CUL_ | PROJECT: | PROJ0002E |
| X: | 492334.22 | DATE GATHERED: | 01/06/2014 08:37:15 |
| Y: | 531835.540375 | XY SOURCE: | Map |
| Z: | | Z SOURCE: | |

Structure | Comments | **Photos** | Sketches

Description of current photo:
Dorset landside






Rotate Left



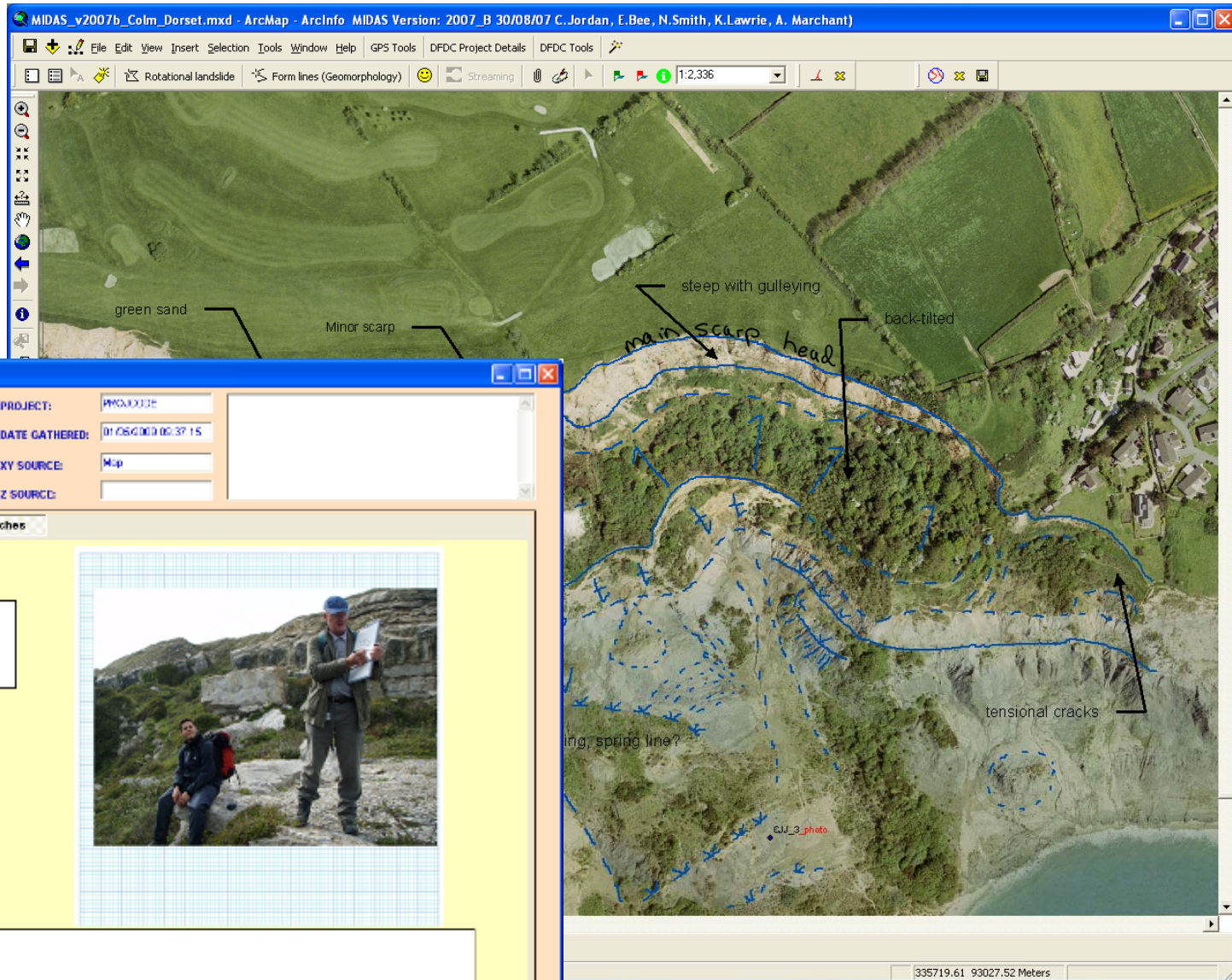
Rotate Right

Click on a thumbnail image to view a photo

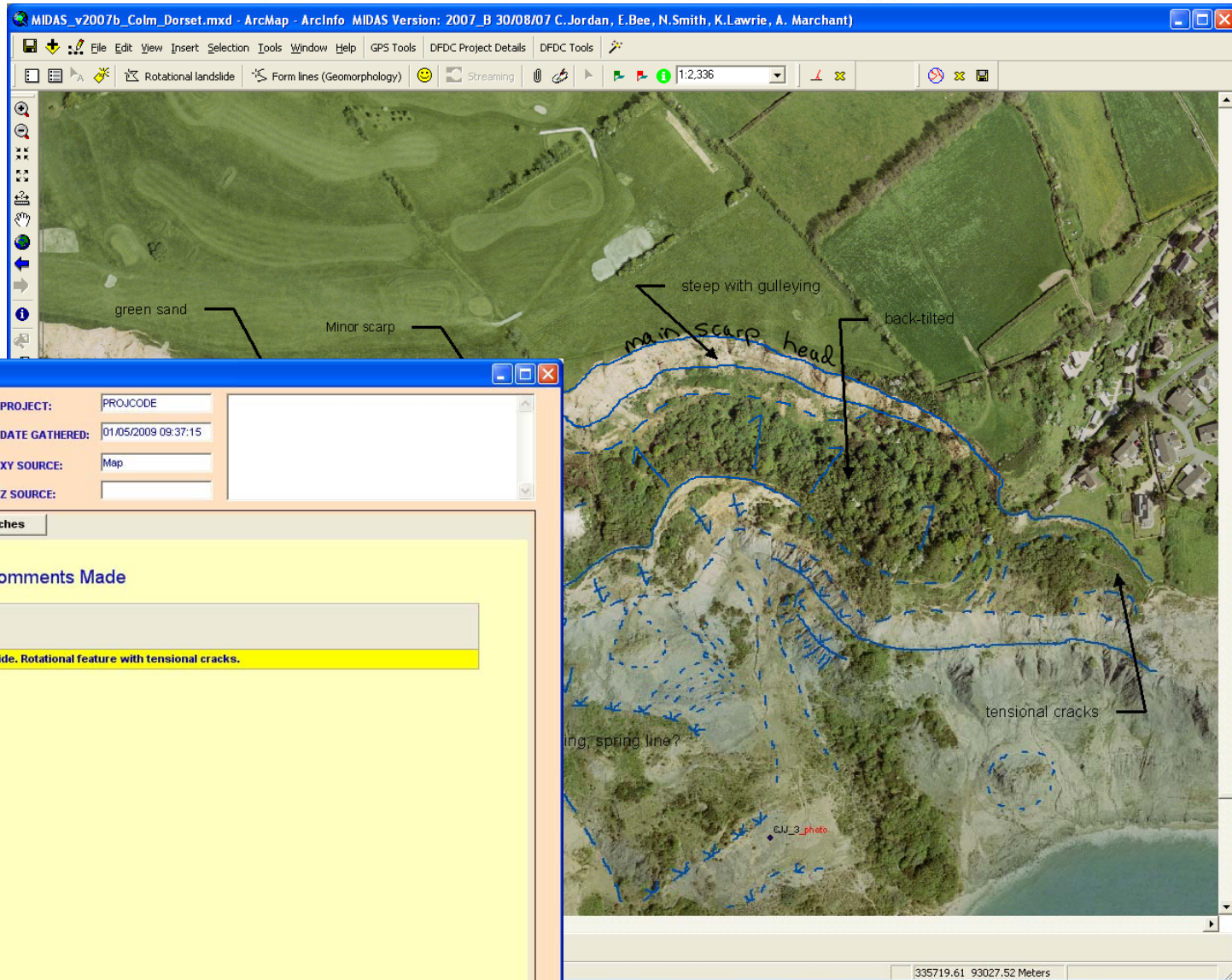
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Precis Tool Version 1.0



ID: PROJECT:

X: DATE GATHERED:

Y: XY SOURCE:

Z: Z SOURCE:

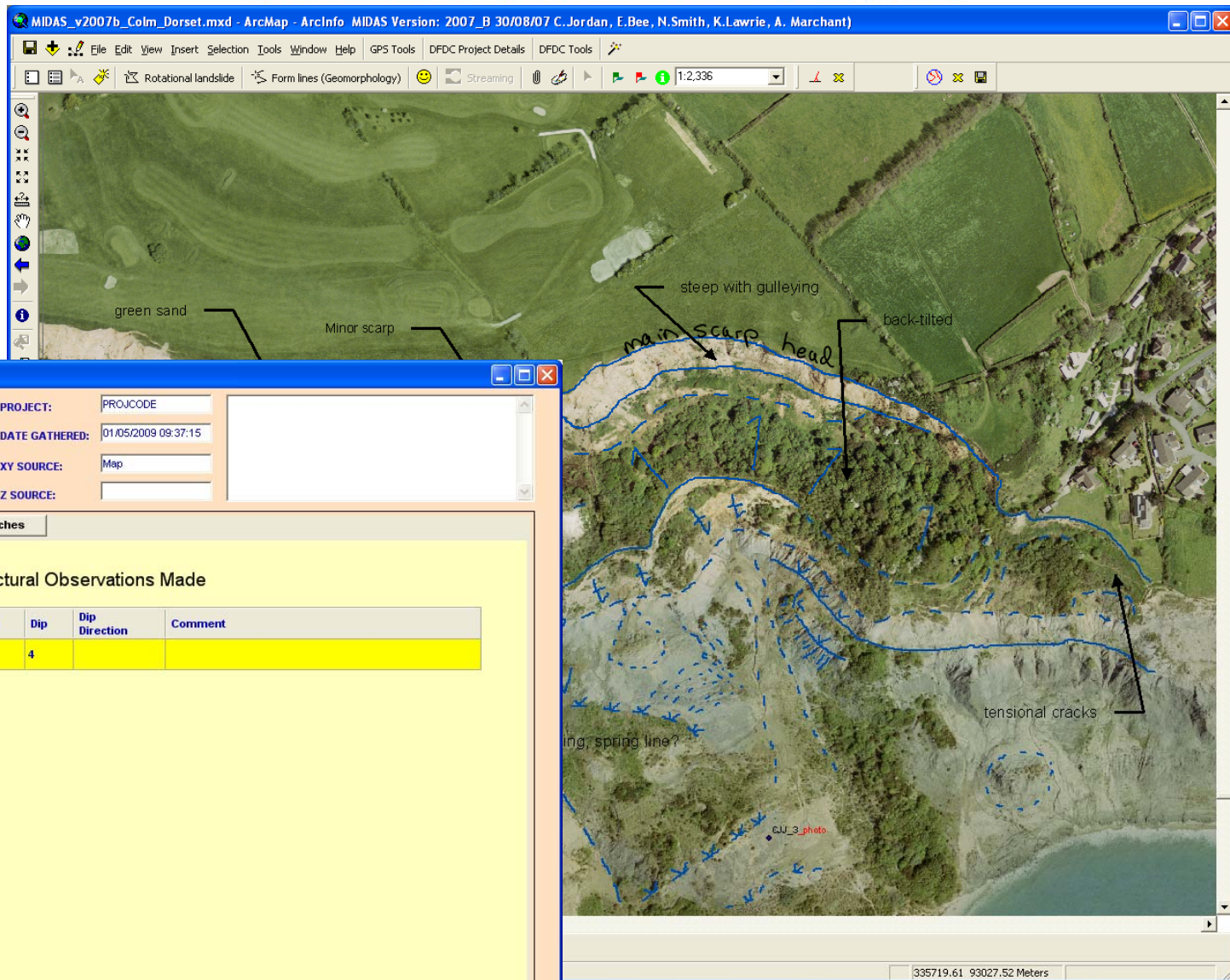
Structure Comments Photos Sketches

Comments Made

| Comment ID | Comment Originated From | Comment |
|------------|-------------------------|----------------------------------------------------------------|
| 1 | FOP | A coastal landslide. Rotational feature with tensional cracks. |

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System for integrated Geoscience Mapping



Precis Tool Version 1.0



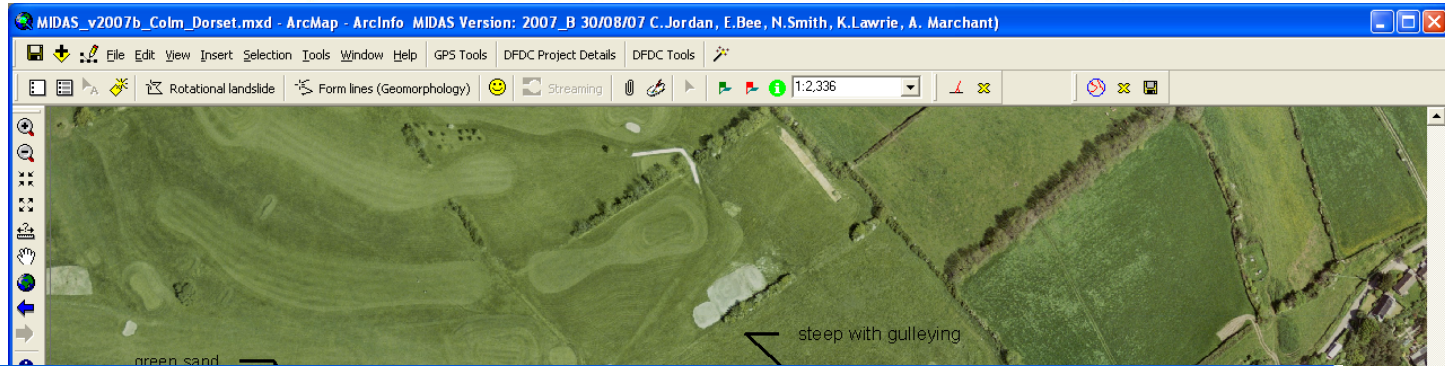
ID: PROJECT:
 X: DATE GATHERED:
 Y: XY SOURCE:
 Z: Z SOURCE:

Structure | Comments | Photos | Sketches

Structural Observations Made

| Feature Type or Class | Observation Type | Azimuth | Dip | Dip Direction | Comment |
|-----------------------|------------------|---------|-----|---------------|---------|
| Bedding Measurement | bedding surface | 200 | 4 | | |

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Landslide Observation

Landslide ID: Survey Number: ObjectID: UUID: LS_ID: Loc no:

Landslide Name: Survey on by:

Grid Reference X: XA: Y: YA: Provenance:

Location Details:
 Additional Comments:
 Dom. Slide Mat.: Move. Style: Aspect: Activity: Est. Age:

| Movement Type, Order, Comments | Causal Factor, Nature, Comment | Damage Landuse, Class, Rel Posn, Comms |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <input type="button" value="▶"/> <input type="text"/> <input type="text" value="1"/> <input type="text"/> <input type="text"/> | <input type="button" value="▶"/> Cause: <input type="text"/> Nature: <input type="text"/> <input type="text"/> <input type="text"/> | <input type="button" value="▶"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> |

Record:

Record:

Record:

Record: of 1

Precis Tool Version 1.0

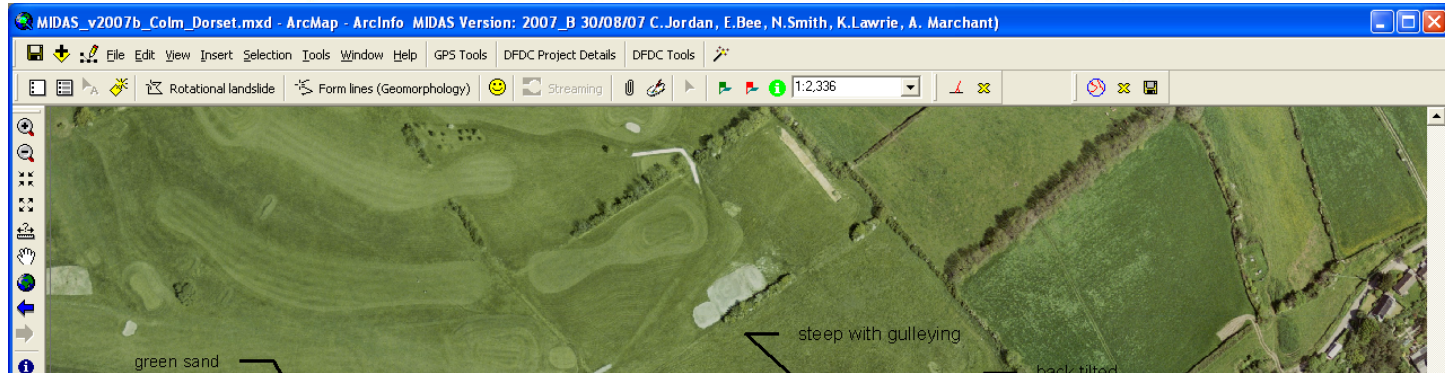


ID:
 X:
 Y:
 Z:

| Feature Type or Class | Observation Type | Az |
|-----------------------|------------------|-----|
| Bedding Measurement | bedding surface | 200 |

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Microsoft Access - [FOP Database Version 2009A_12-03-2009]

File Edit View Insert Format Records Tools Window Help Adobe PDF Type a question for help

Field Observation Entry Locality No **CJJ_1** AZ CJJ01052009093715 FOP

Locality Desc and Summary Label X Y and Z values Project Scale Field Slip Management Fields Housekeeping Geologist Info

Loc Desc. Sum. Lbl.

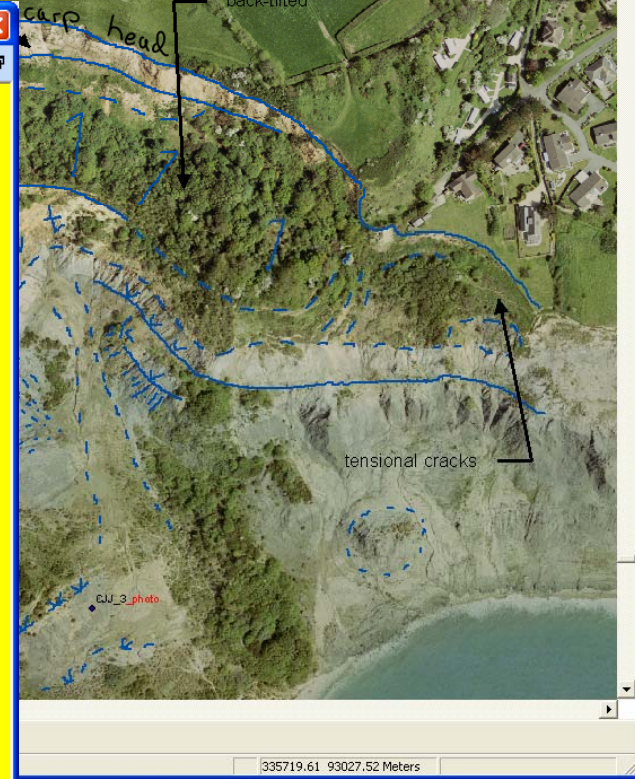
Observation Type

-
-
-
-
-
-
-

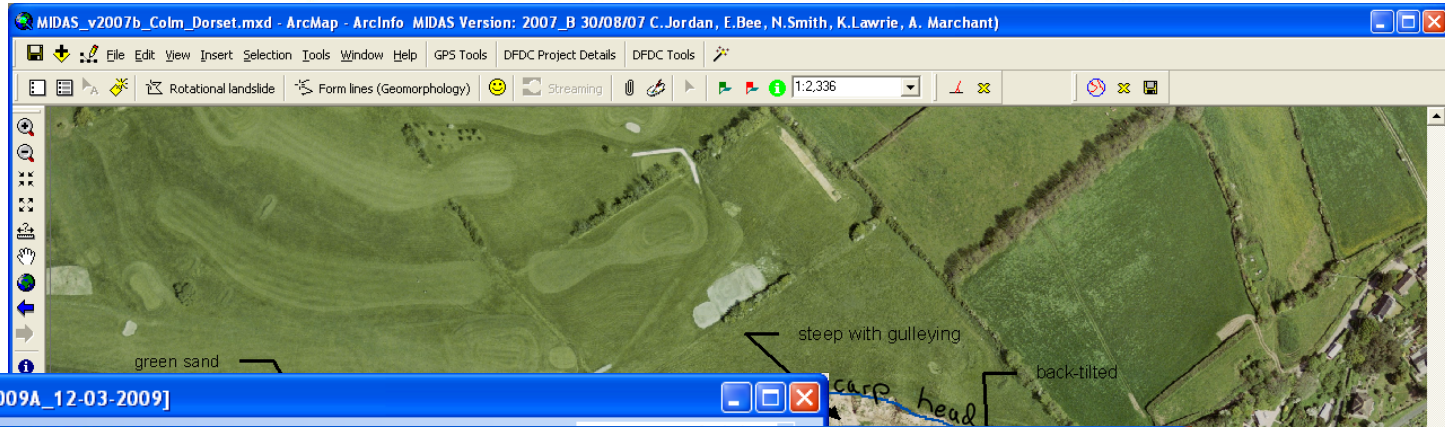
General Tools

-
-
-
-
-

Comments
Sketch
Photo
Sample



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Microsoft Access - [FOP Database Version 2009A_12-03-2009]

Field Observation Entry Localities

Locality Desc and Summary Label X Y and
 Loc Desc.

Observation Type

Spot Observation

Structure

Landform

Log/Section

Log/
(co

Karst Observations

Geodiversity

Landslide

Structural Observations

STRUCTURE_ID: [amber] OBJECT: [3] UUID: [CJJ22102007172908] LOC_NUMB: [CJJ_3]

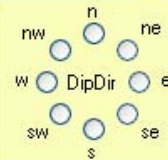
Feature Type: [Bedding Measurement]

Measurement Type:

Enter Strike and Dip and Dip Direction the system will calculate and populate the correct Azimuth and Dip when you select a Dip Direction! Only the final Azimuth and Dip will be stored!

Strike [] Dip []

Dip Method: [Measured]



Dip-Azimuth Dip

[] / []

Enter Azimuth and Dip Direction directly here

Way up: [WAY UP NOT KNOWN]

GSD Comment

Notes on Entry

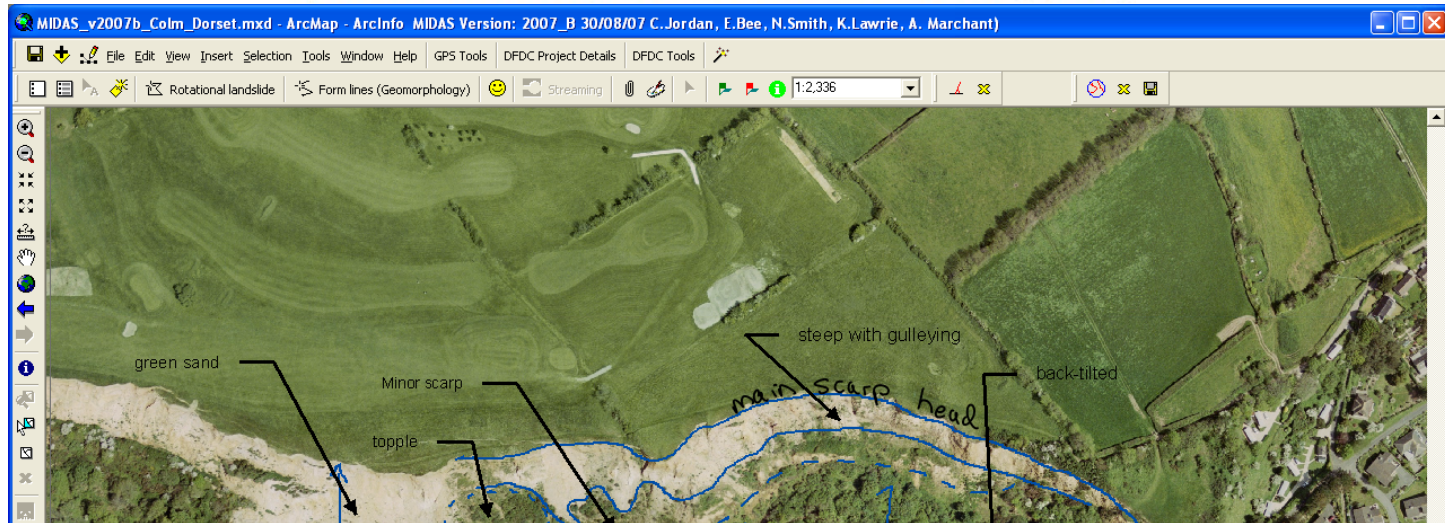
If Younging evidence is visible, please record separately as a YOUNGING/FACING Feature Observation!
 If Planar structure is vertical enter dip as 90 and Dip Azimuth can be either available value

Record: [1] of 1

Current Location

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Structure Contour Tool (Version 2.0)

Structure Contour Tool

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

DTM
 Select layer as DTM: Multiple Layers as DTM

Calculation Method
 Single Observation Point **Three Points**

Observation Point
 Enter Easting and Northing or click on map

Easting: Elevation (m):

Northing: Switch to Small Inputs Form Get Elevation from DTM

Dip:

Azimuth:

Tool Parameters

Tolerance (m):

Sample Resolution:

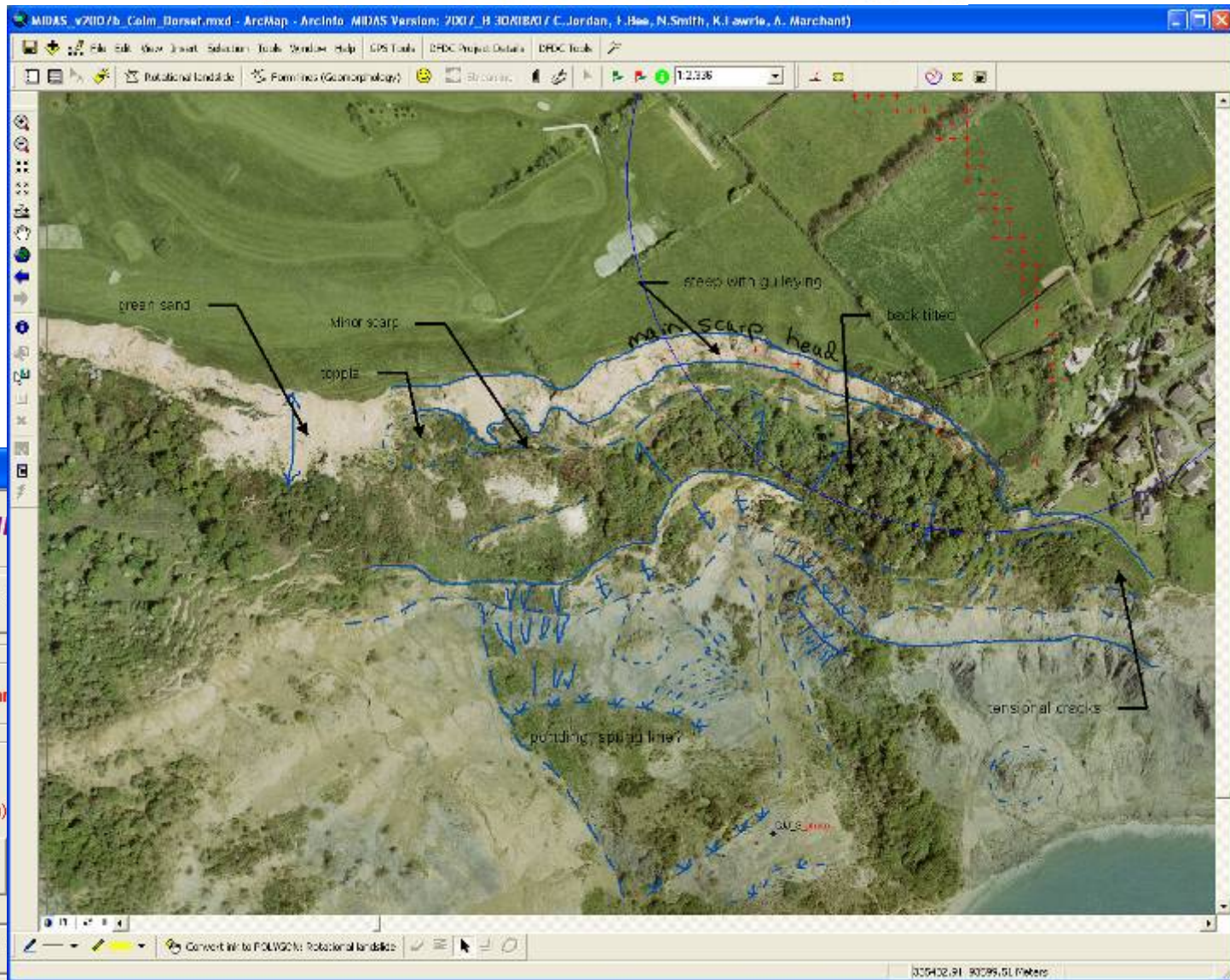
Point Colour:

Search Area
 Enter centre point and radius for search area

Easting: Use Observation Point or Centre of Three Points

Northing: Radius (m):

MOBILE System for integrated Geoscience Mapping



Structure Contour Tool (Version 2.0)

Structure Contour

DTM

Select layer as DTM

Calculation Method

Single Observation Point The

Observation Point

Enter Easting and Northing or click on map

Easting Elevation (m)

Northing

Dip

Azimuth

Calculate

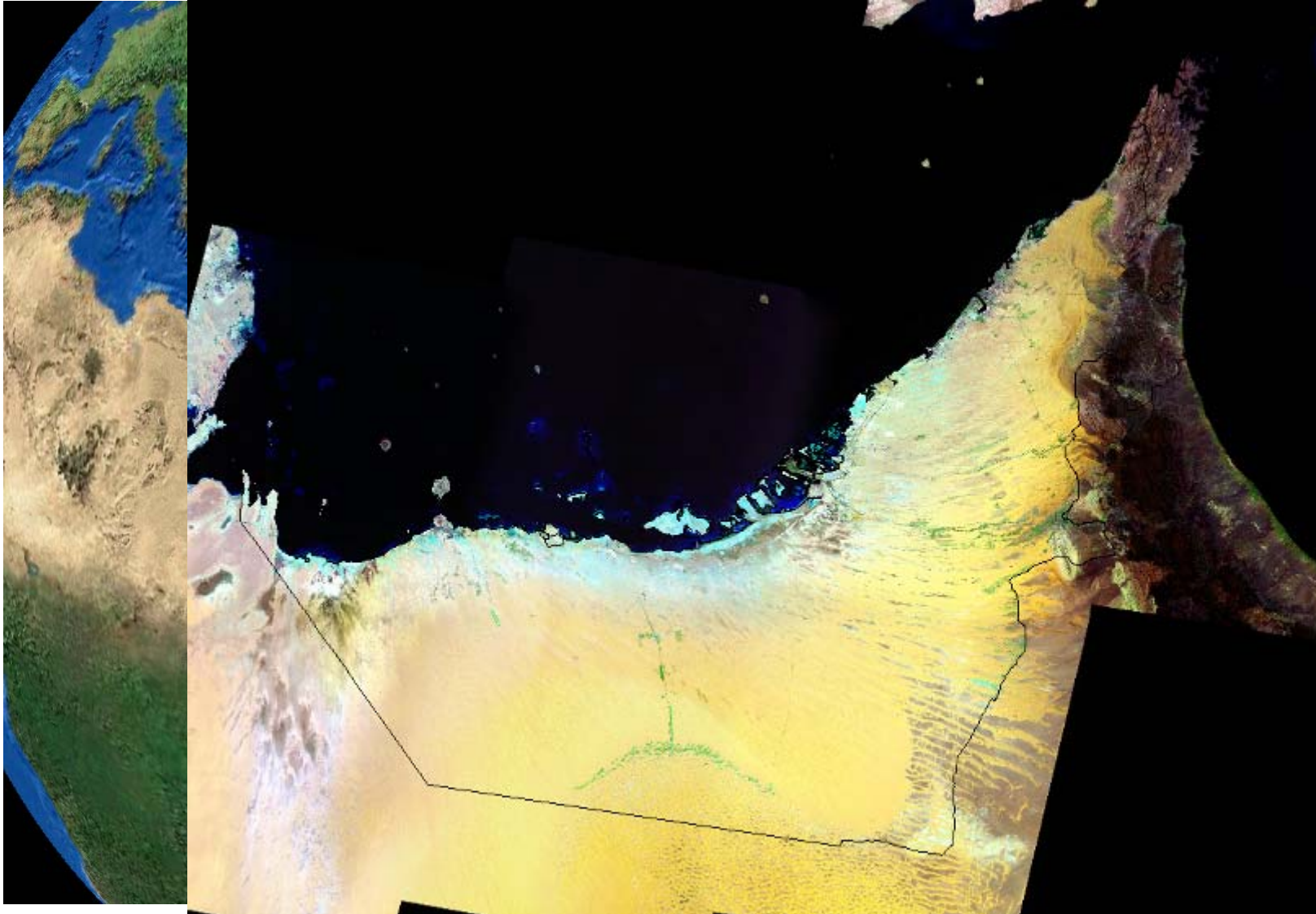
Cancel

335432.91 90295.51 Meters

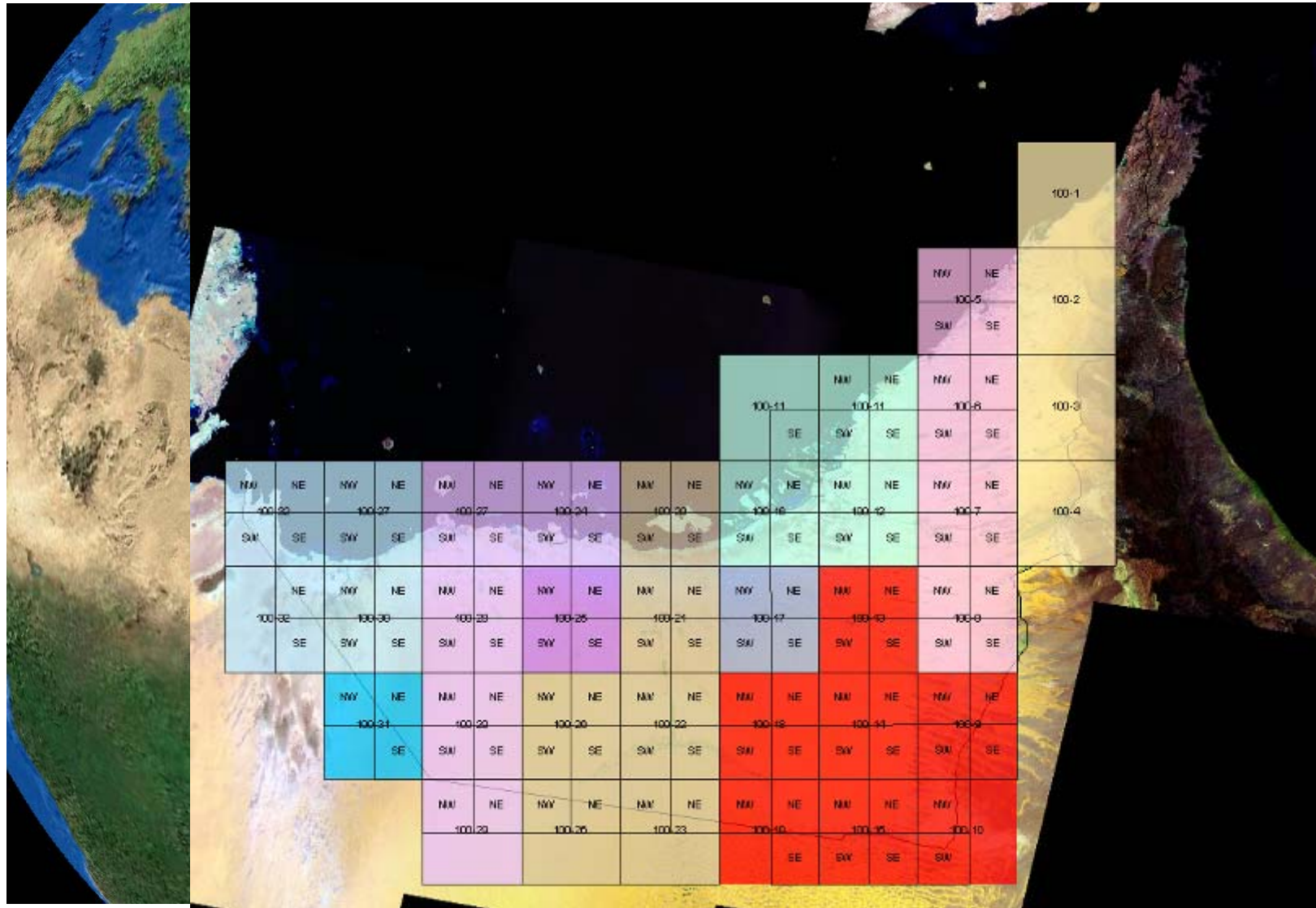
BGS-SIGMAmobile in the United Arab Emirates



BGS-SIGMAmobile in the United Arab Emirates



BGS-SIGMAmobile in the United Arab Emirates



UAE field conditions...



UAE field conditions...



UAE field conditions...



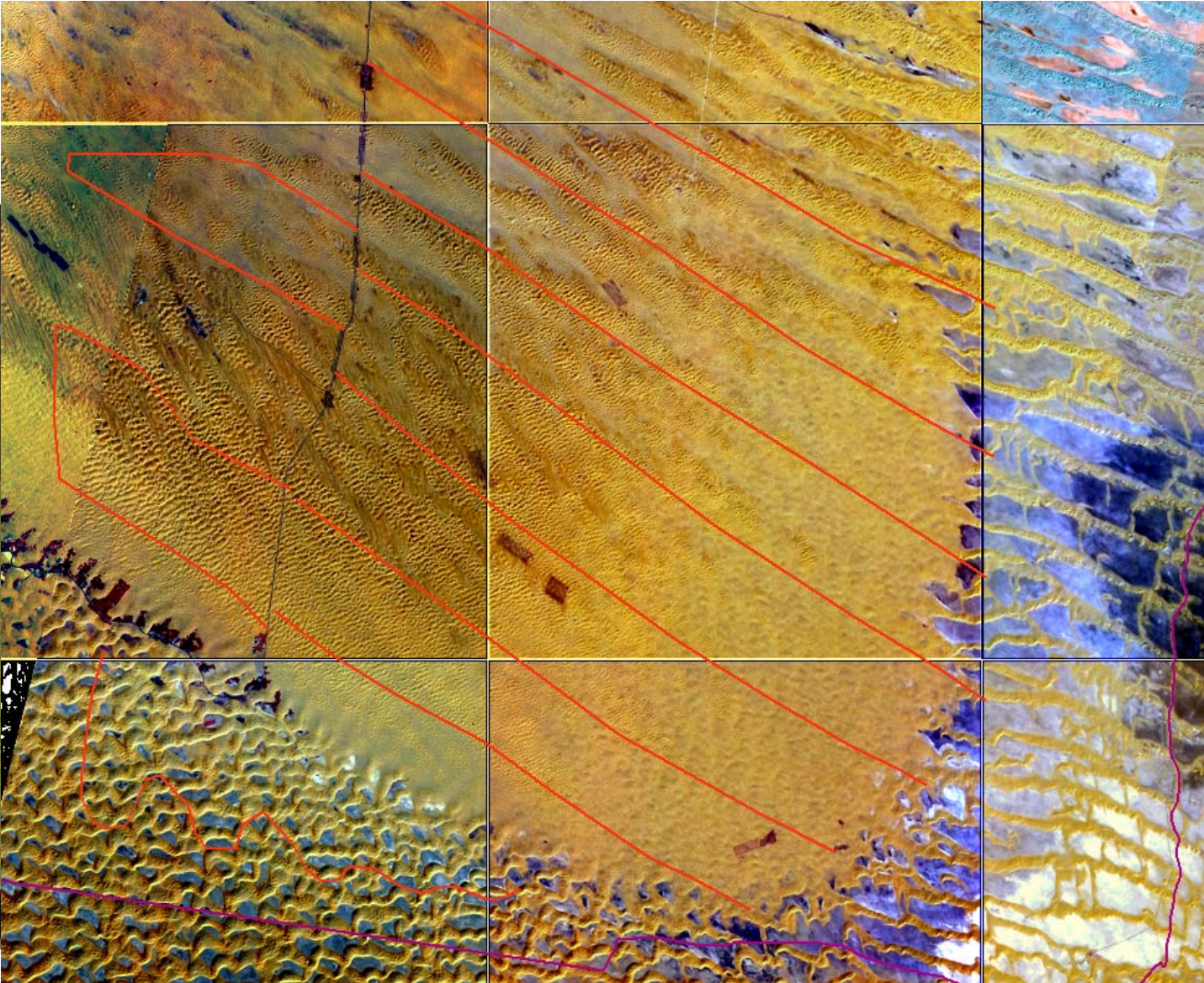
Mapping methodology, and digital benefits

Traverse
planning



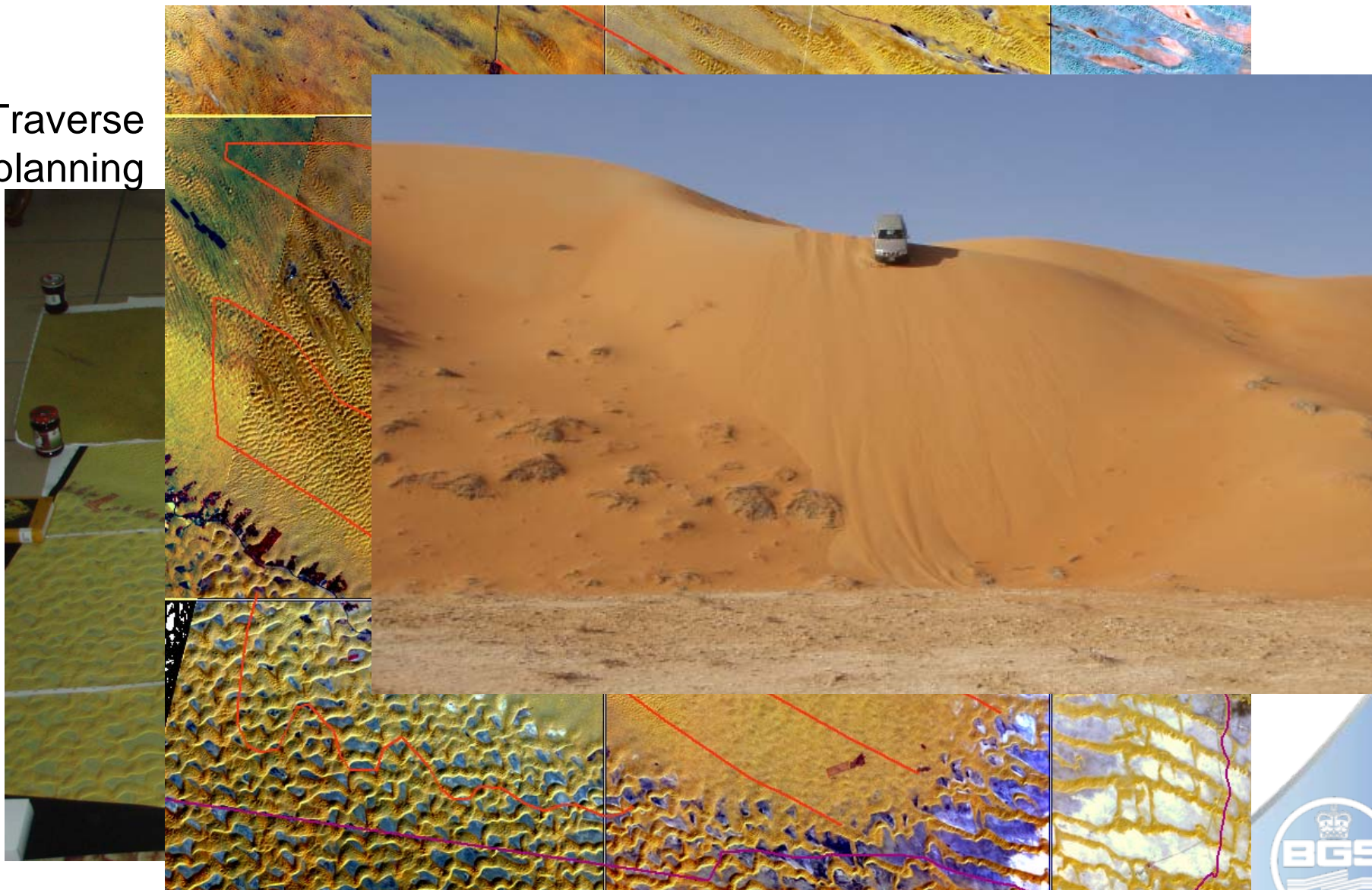
Mapping methodology, and digital benefits

Traverse
planning



Mapping methodology, and digital benefits

Traverse
planning



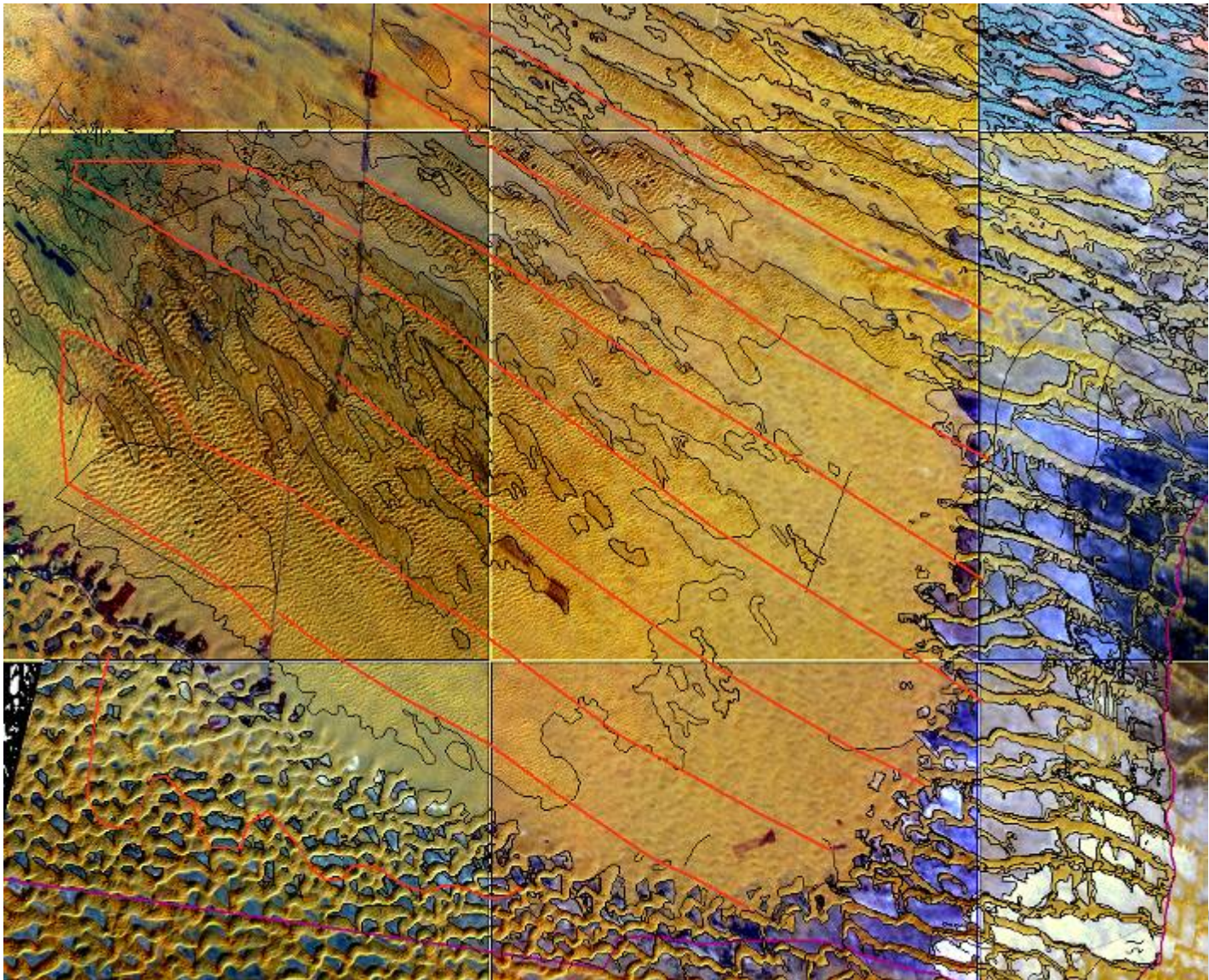
Capturing data using BGS-SIGMAmobile



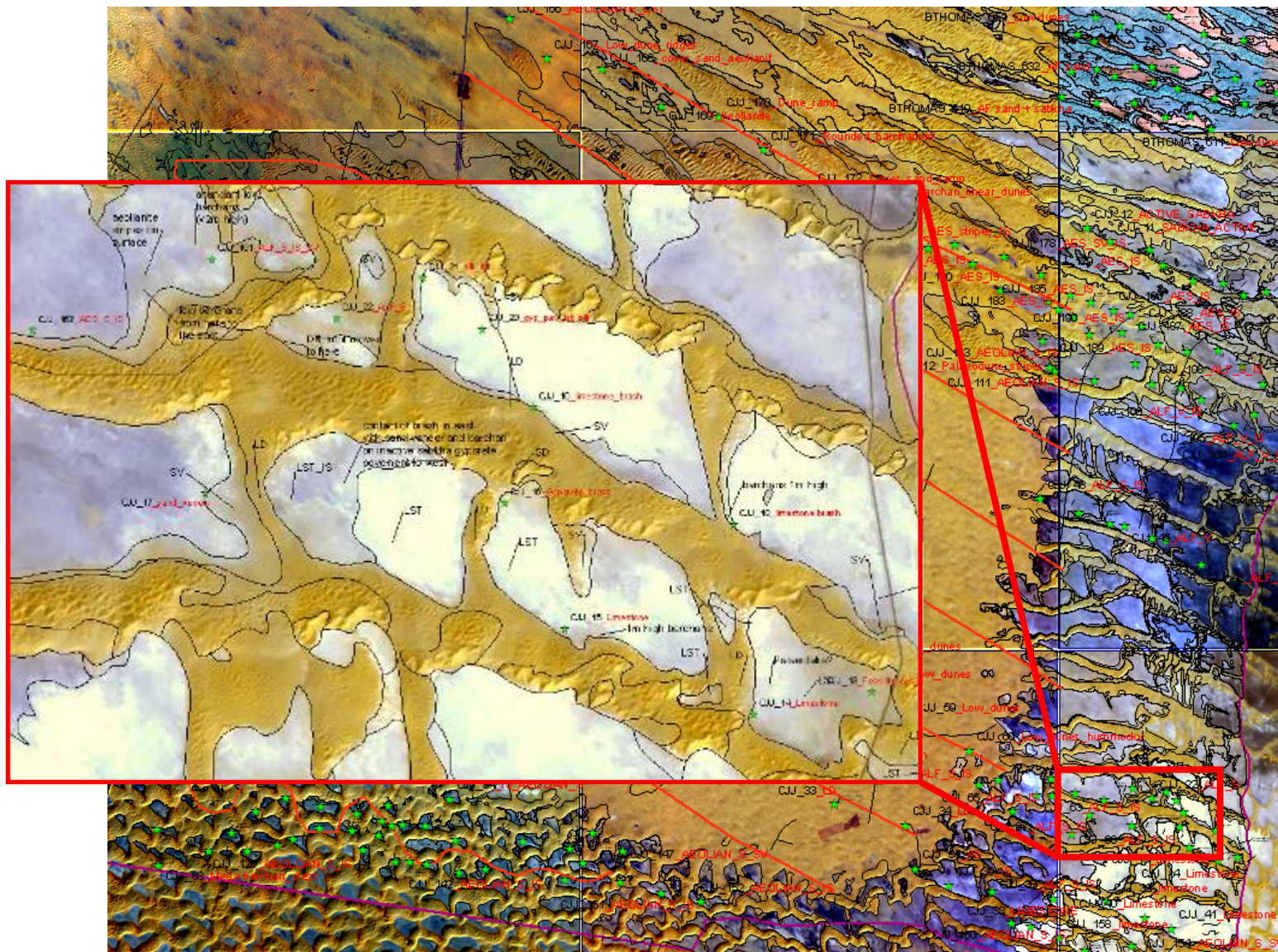
Capturing data using BGS-SIGMAmobile



The field data on BGS-SIGMAmobile



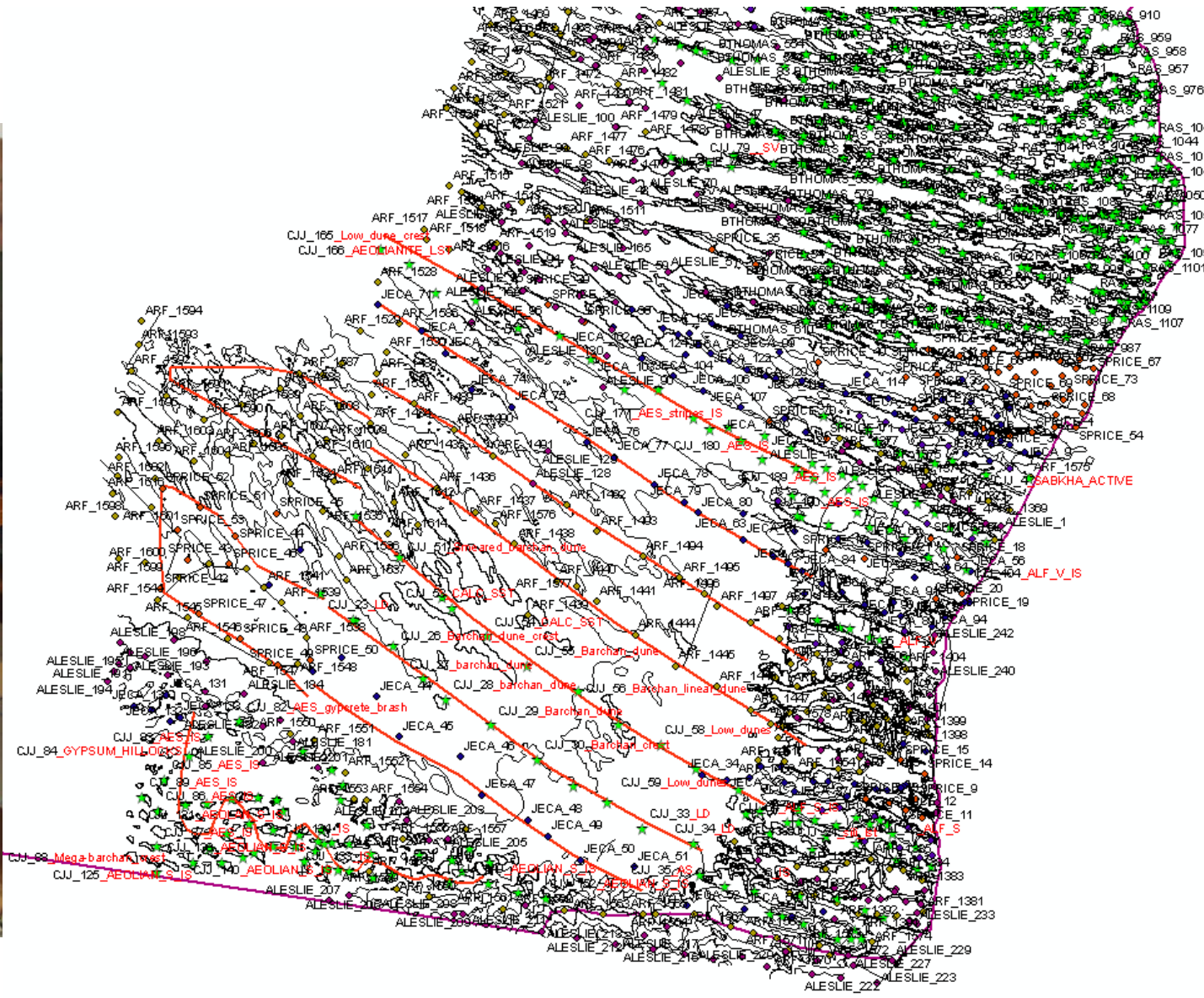
The field data on BGS-SIGMAmobile



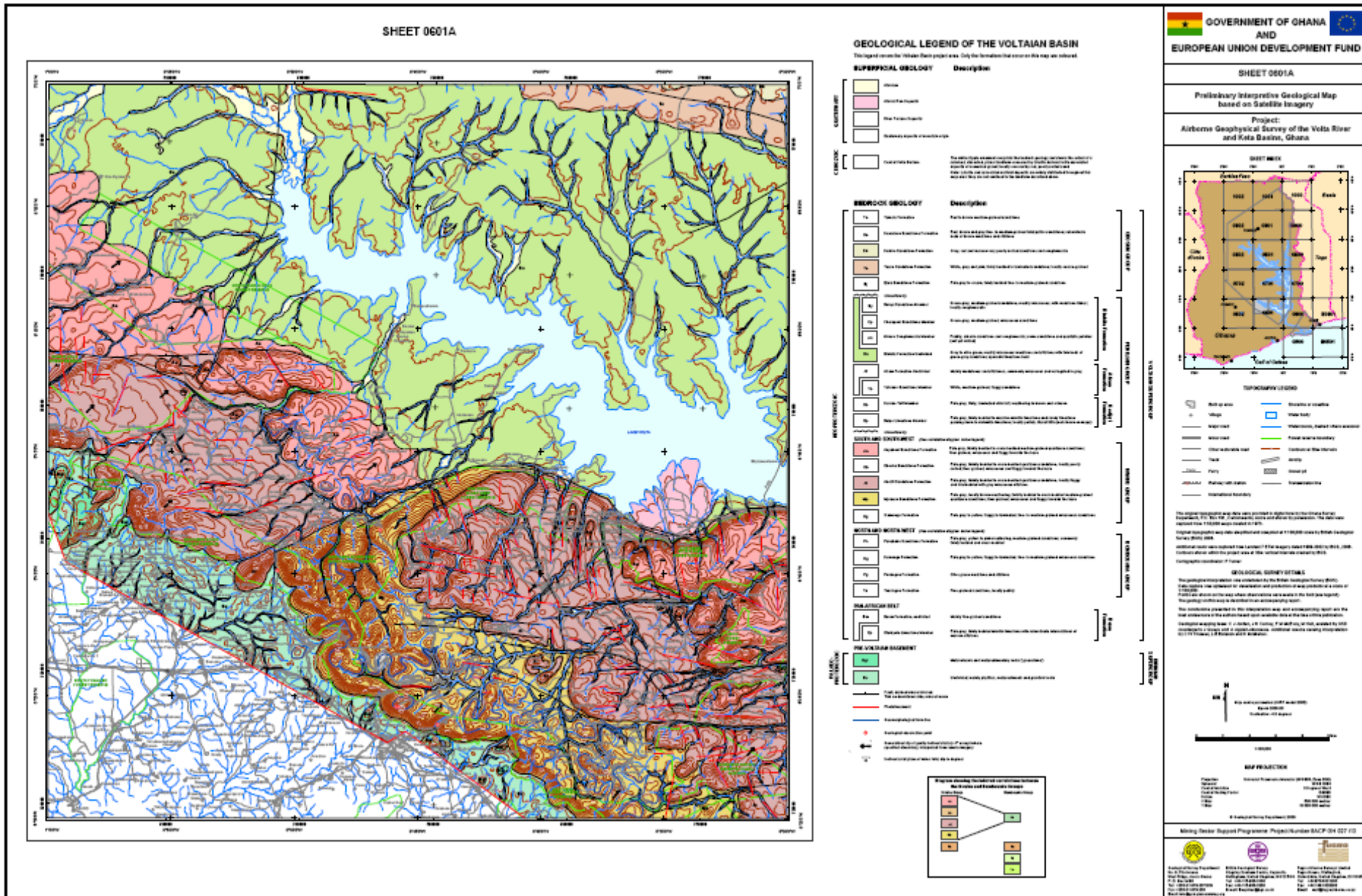
Data Integration in the field-office



Data Integration in the field-office



Map Outputs (an example from Ghana)



Conclusions

- BGS-SIGMAmobile has proven its capability in a variety of mapping domains
- Wide acceptance by BGS field staff
- Hardware now capable of withstanding harsh environments

- Available as open source from

<http://www.bgs.ac.uk/science/3dmodelling/SigmaDownload.html?src=sfb>

