



Application of Wind Atlas for South Africa

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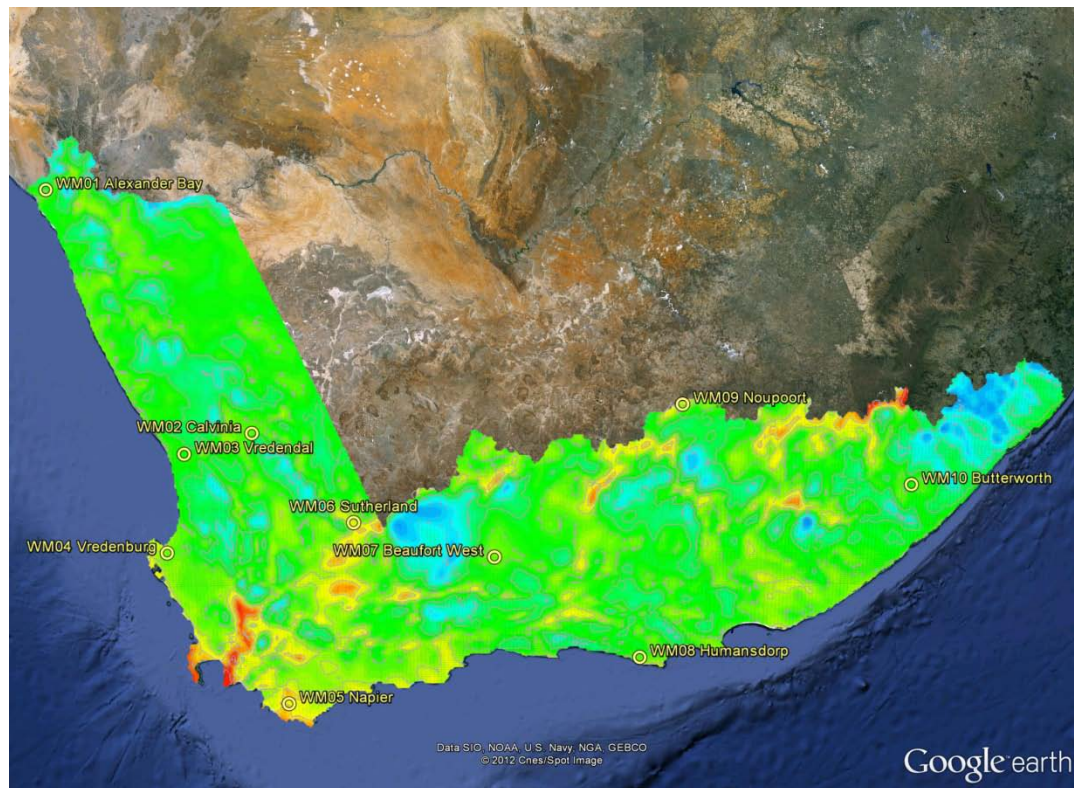
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Application of Wind Atlas for South Africa

Niels G Mortensen and the WASA team



Outline

Application of Wind Atlas for South Africa

- How to use the Wind Atlas for South Africa?
 - WASA web sites, Tadpole, WAsP data, guidelines
 - Wind farm case studies and examples
 - Resource mapping in sample areas
 - Phase II microscale modelling
- Q&A
- Questionnaire introduction and feedback (*Eugene, CSIR*)
- Take a look at the information available!

Software clinic

- Attendees are invited to use the “First Verified Numerical Wind Atlas for South Africa”

WASA project web sites

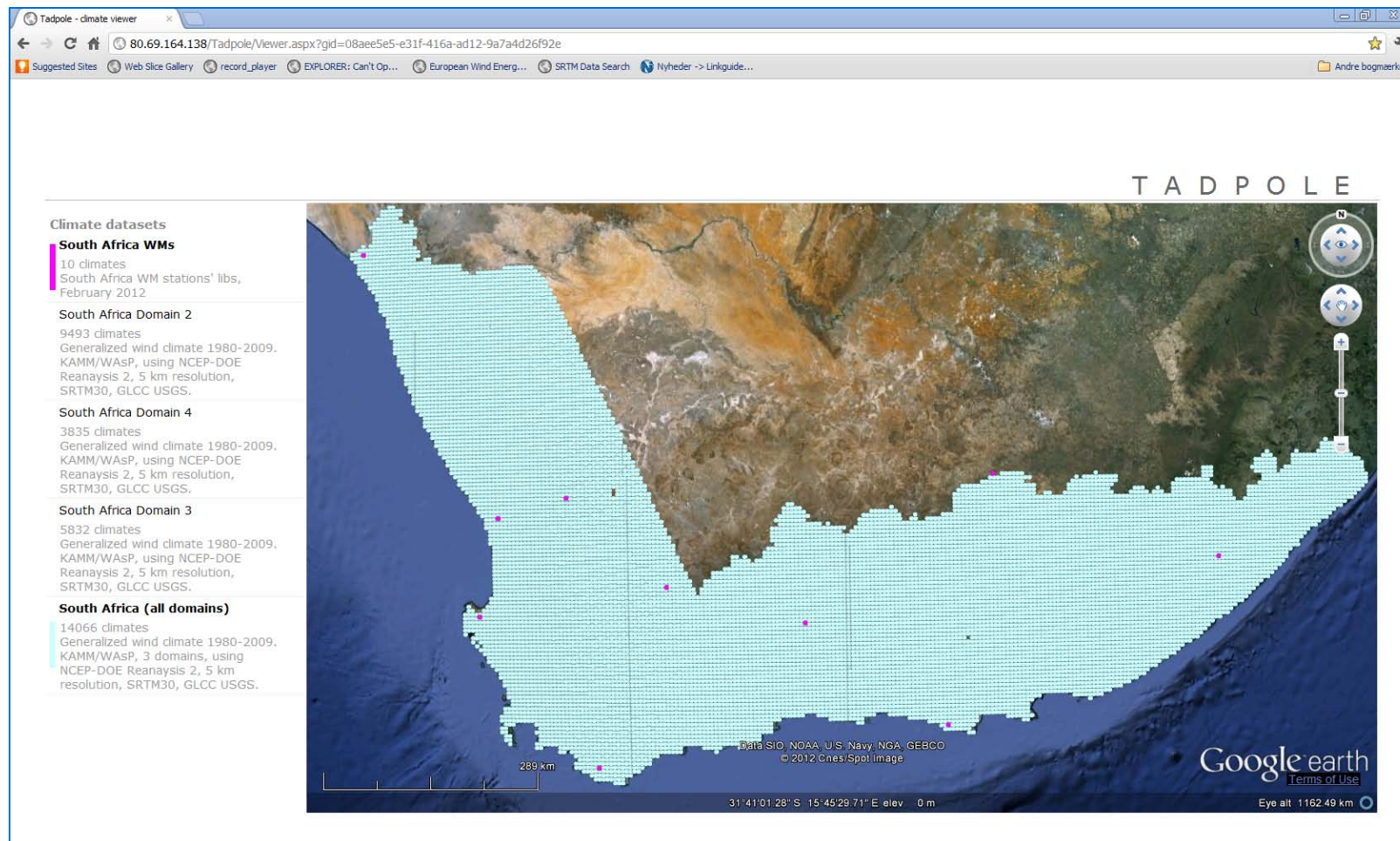
- General information about WASA project
 - www.wasaproject.info
 - www.saneri.org.za/wind_atlas.htm
- WRF wind forecasts are available on
 - veaonline.risoe.dk/wasa
- CSIR online – display of measured data
 - www.wasa.csir.co.za
- WASA met. data download site (monthly files)
 - wasadata.csir.co.za/wasa1/WASADData
- WASA wind atlas download site **NEW!**
 - wasadata.csir.co.za/wasa1/WASADData

WASA Wind Atlas download site

- First Numerical Wind Atlas – Tadpole
 - The Tadpole web interface uses the Google Earth plug-in
 - Google Chrome 1.0+, Internet Explorer 7+ (32-bit) and Firefox 2.0+
- Observational Wind Atlas
 - WAsP data and workspaces
- Case studies
 - Wind farm and wind resource mapping examples
- Reports and guidelines
 - WASA reports and general WAsP guidelines
- Map data and tools
 - SRTM 3 elevation data, SWBD water body data, Google Earth
- Software
 - Using WAsP as a data viewer (reader) and for microscale modelling

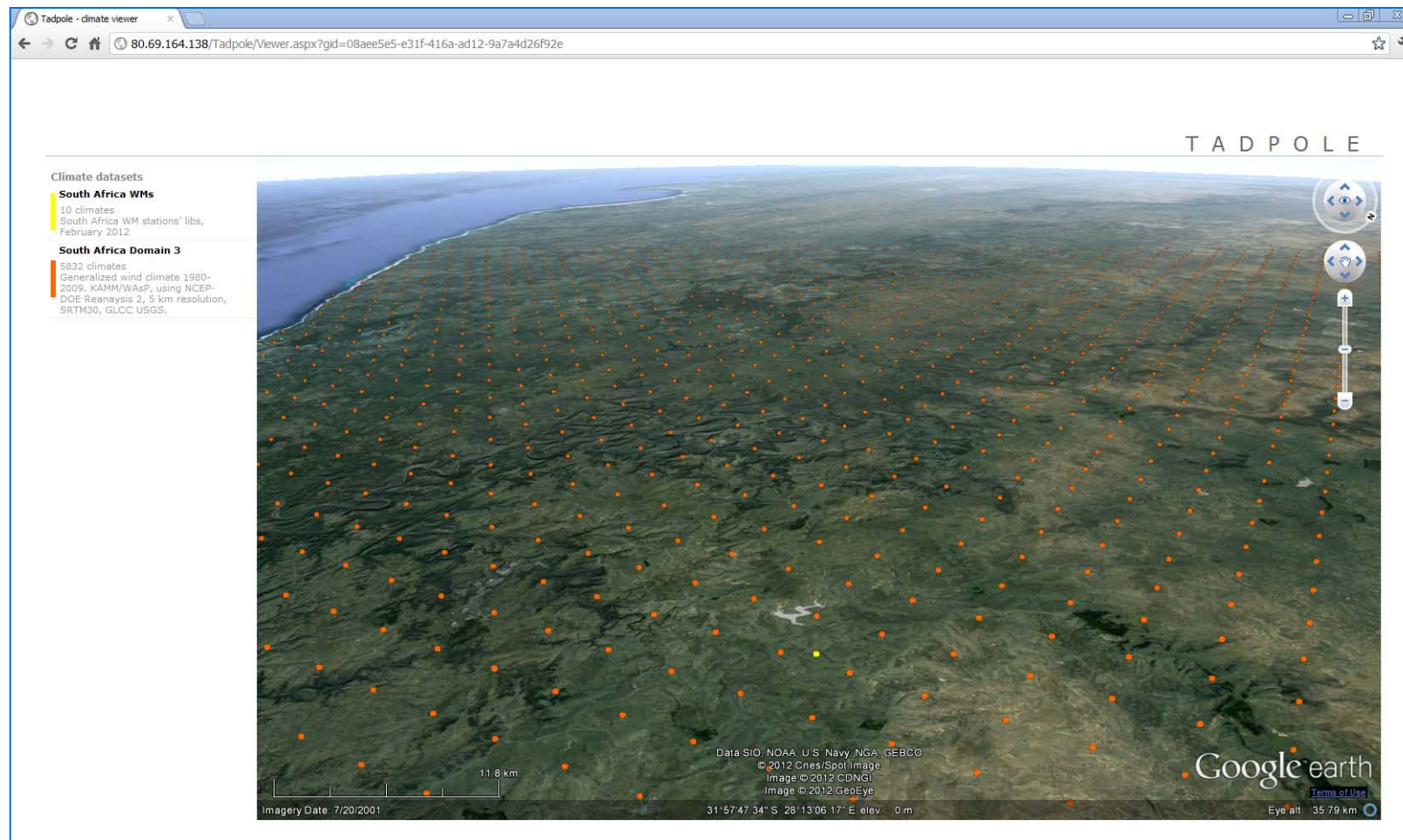
Numerical wind atlas

Tadpole: interface to wind atlas results



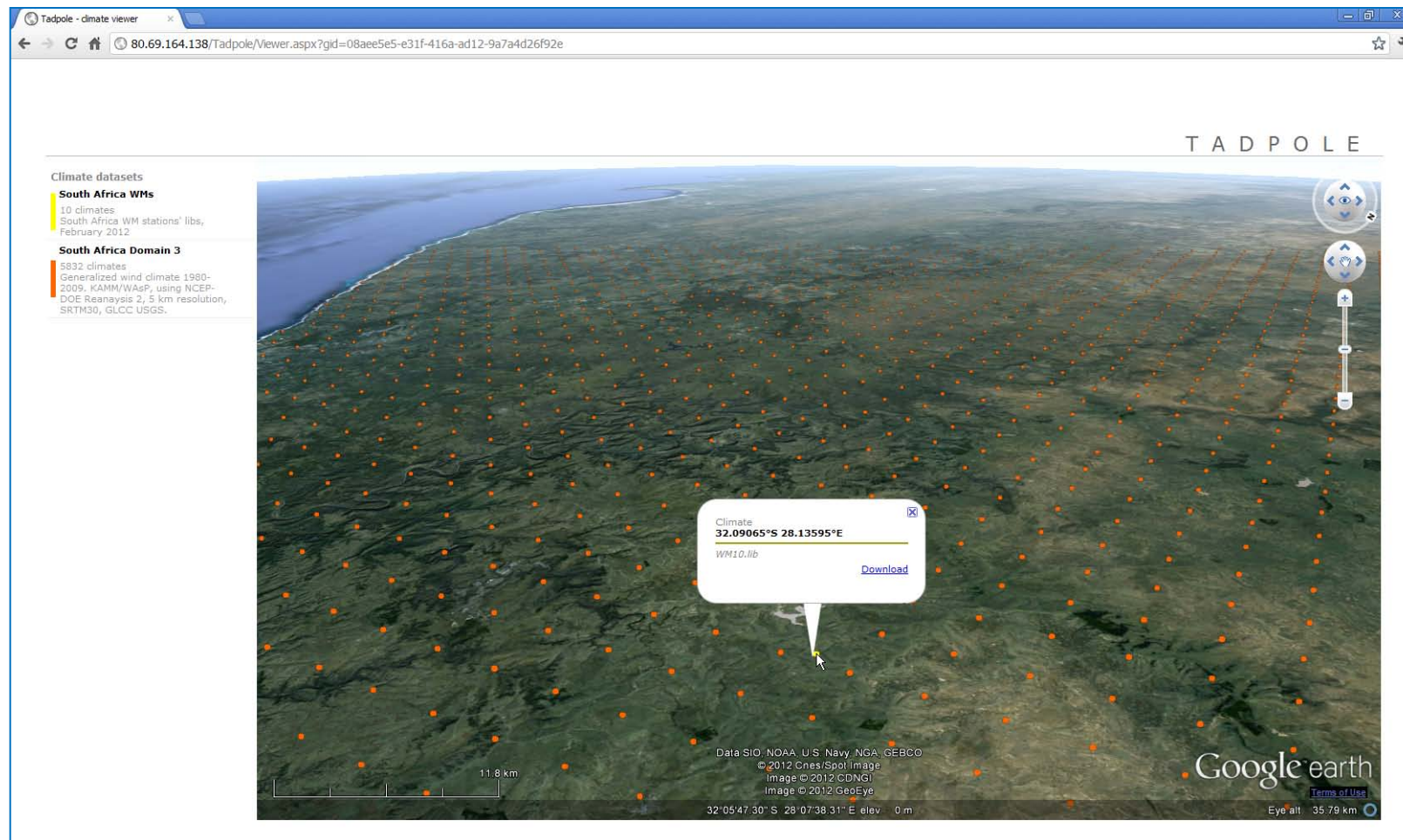
Numerical wind atlas

Tadpole: WM10 (●) and mesoscale grid points (●)



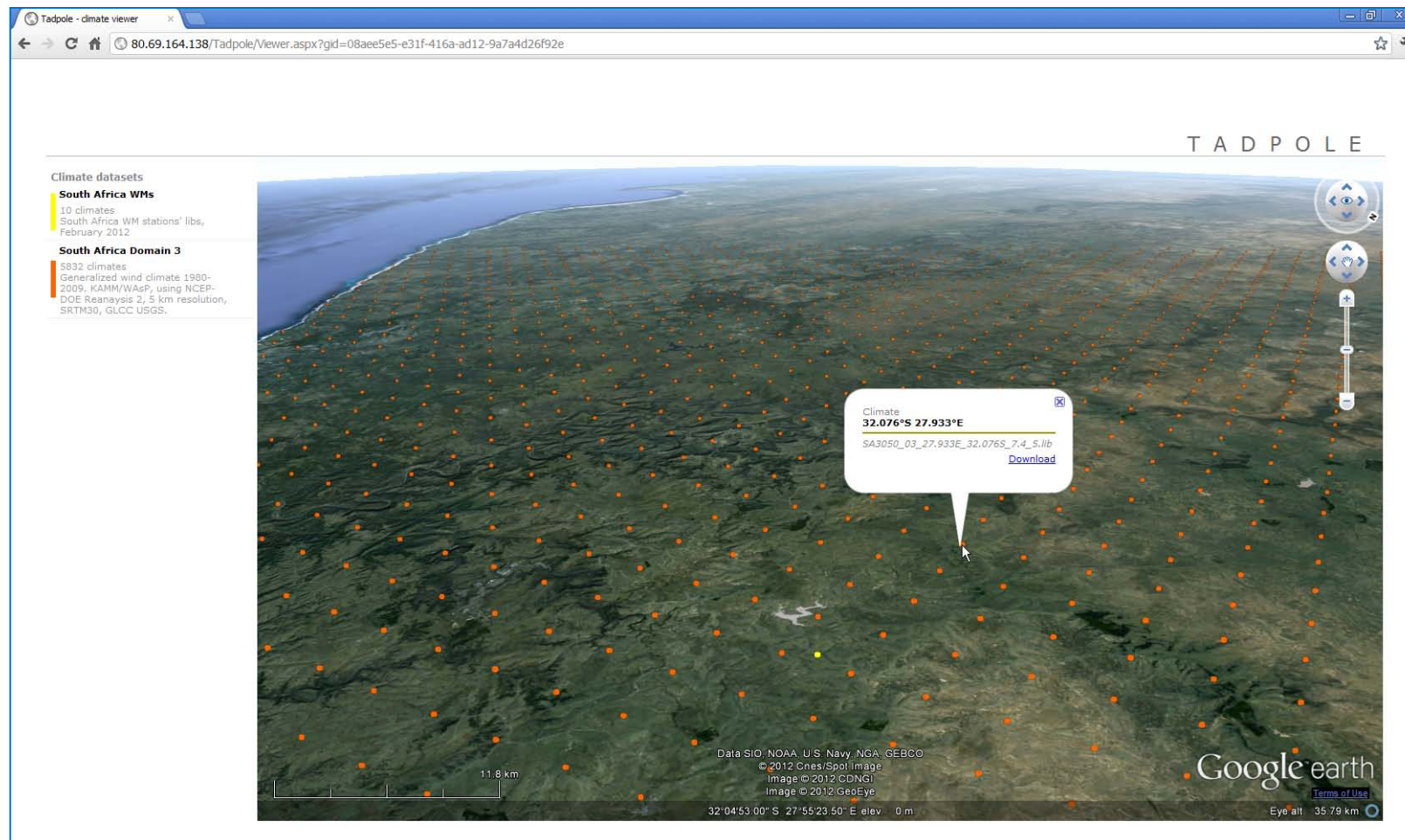
Numerical wind atlas

Tadpole: download of data from WM10 (just click!)



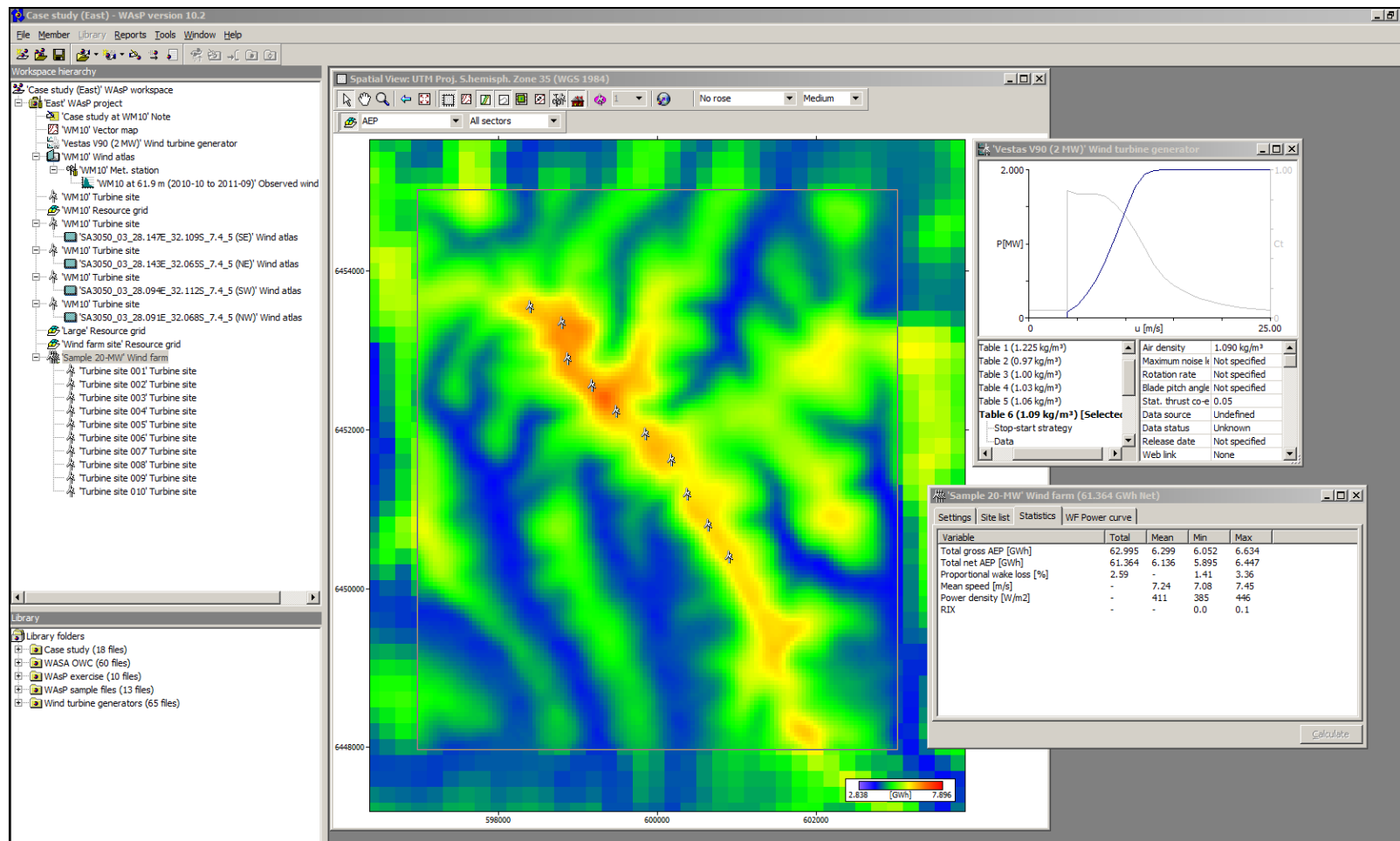
Numerical wind atlas

Tadpole: download of data from NWA grid point



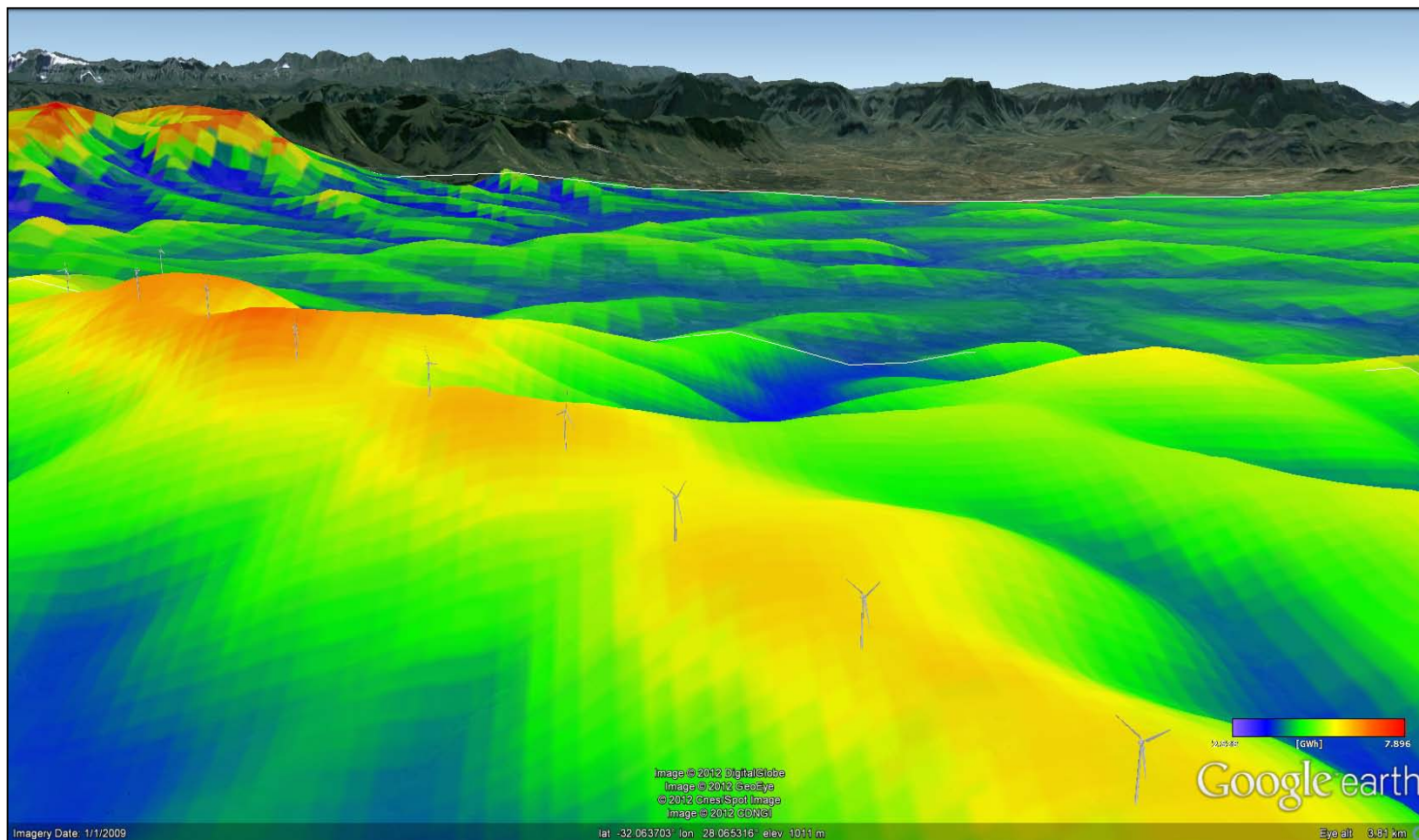
Case study 1

Sample wind farm project in WAsP



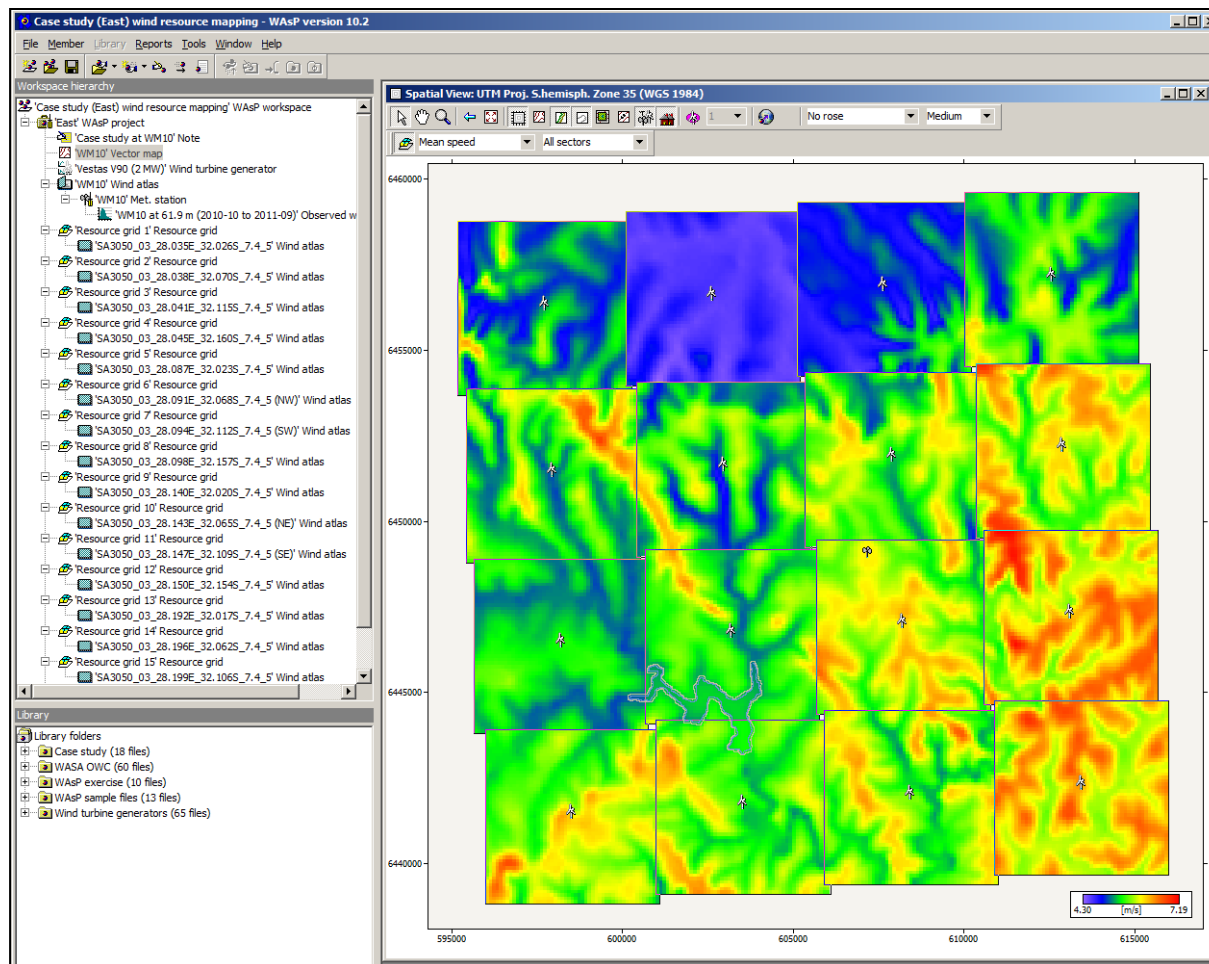
Case study 1

Sample wind farm project in Google Earth



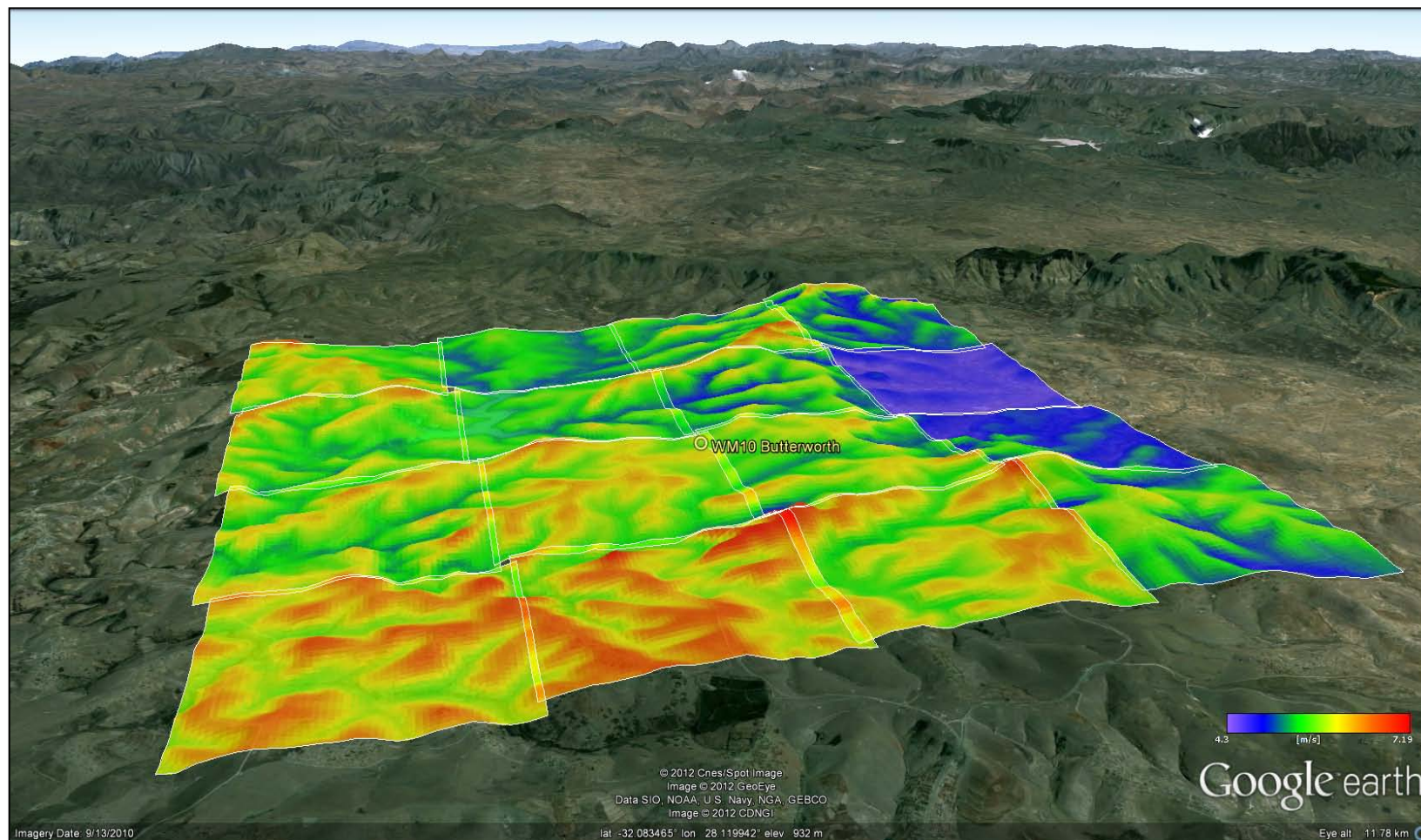
Case study 2

Resource mapping using the numerical wind atlas



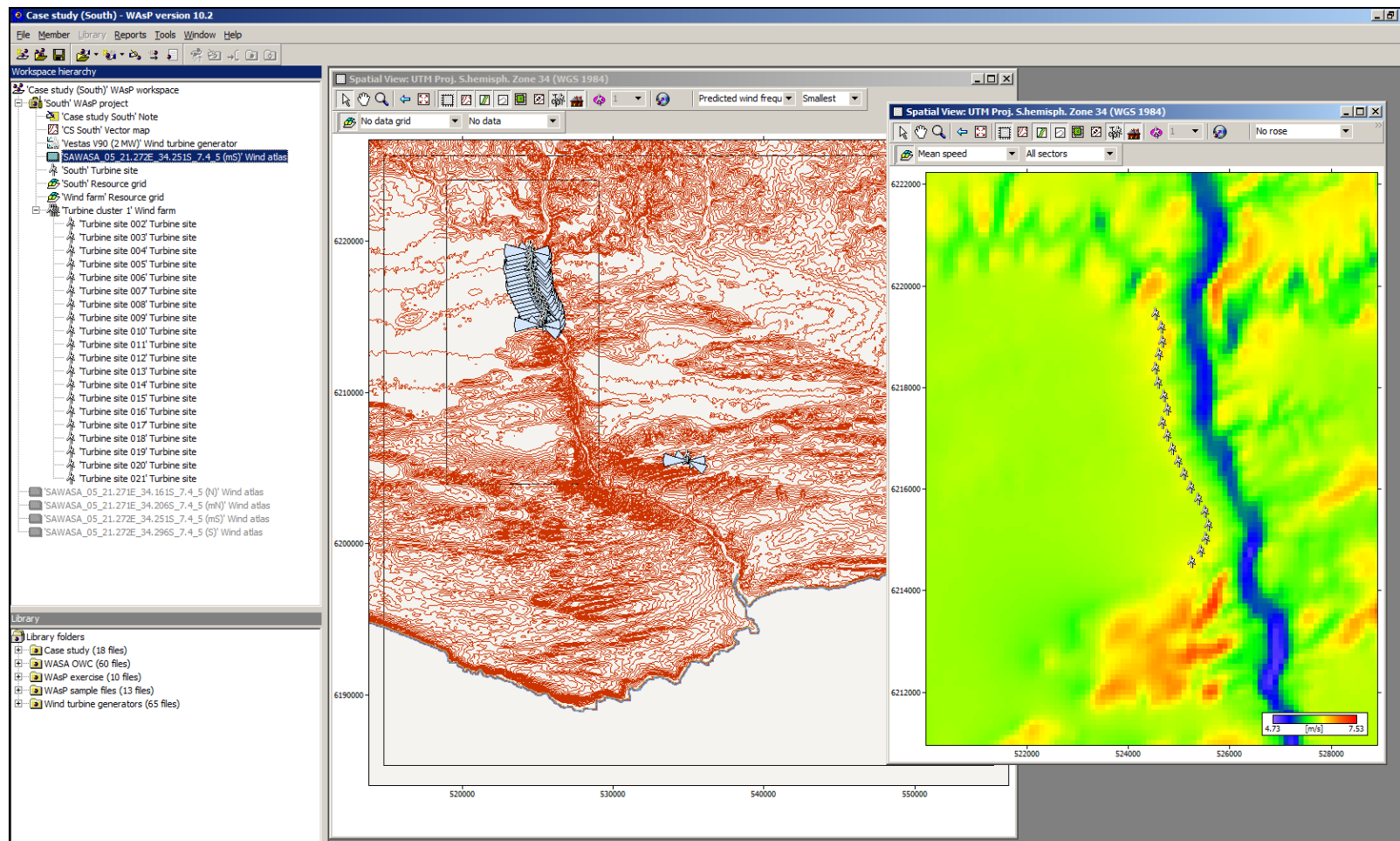
Case study 2

Resource mapping using the numerical wind atlas



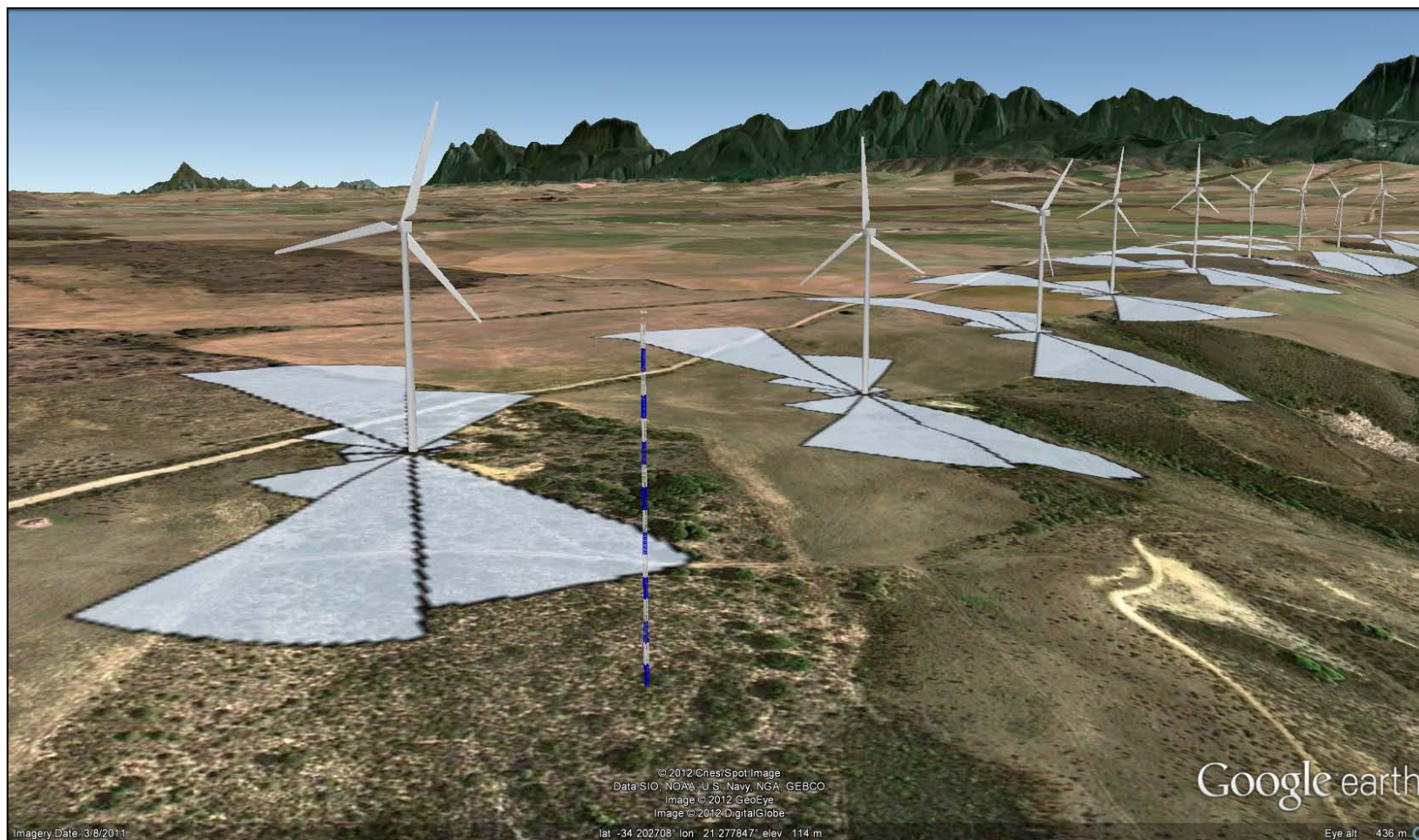
Case study 3

Designing a new project, including met. mast



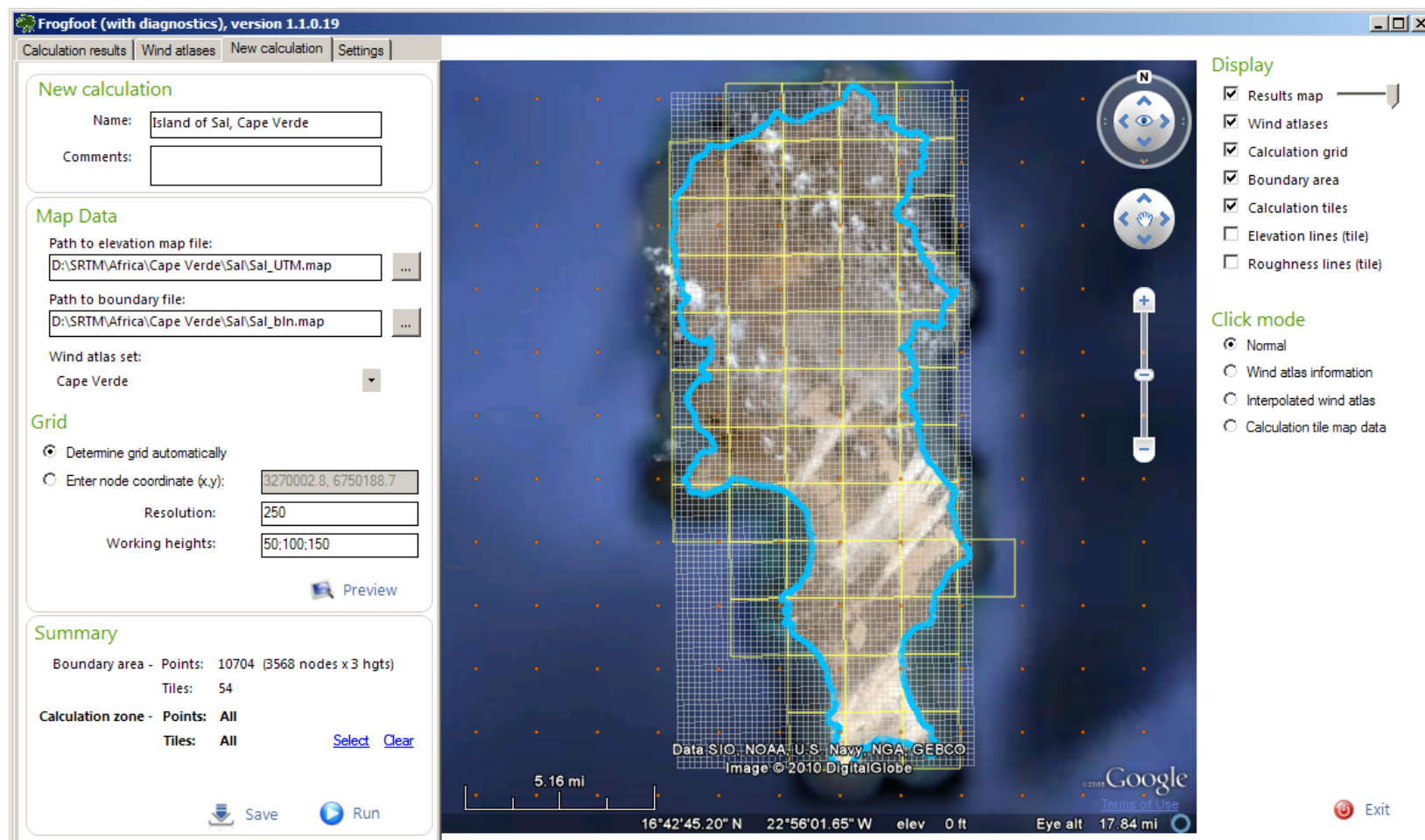
Case study 3

Designing a new project, including met. mast



Phase II

Microscale modelling over large areas



Frogfoot (with diagnostics), version 1.1.0.19

Calculation results | Wind atlases | New calculation | Settings

New calculation

Name:

Comments:

Map Data

Path to elevation map file: ...

Path to boundary file: ...

Wind atlas set:

Grid

☒ Determine grid automatically

☐ Enter node coordinate (x,y):

Resolution:

Working heights:

[Preview](#)

Summary

Boundary area - Points: 10704 (3568 nodes x 3 hghts)
Tiles: 54

Calculation zone - Points: All
Tiles: All [Select](#) [Clear](#)

[Save](#) [Run](#)

Display

- ☒ Results map
- ☒ Wind atlases
- ☒ Calculation grid
- ☒ Boundary area
- ☒ Calculation tiles
- ☐ Elevation lines (tile)
- ☐ Roughness lines (tile)

Click mode

- ☒ Normal
- ☐ Wind atlas information
- ☐ Interpolated wind atlas
- ☐ Calculation tile map data

Data S/O: NOAA, U.S. Navy, NGA, GEBCO
Image © 2010 DigitalGlobe

5.16 mi

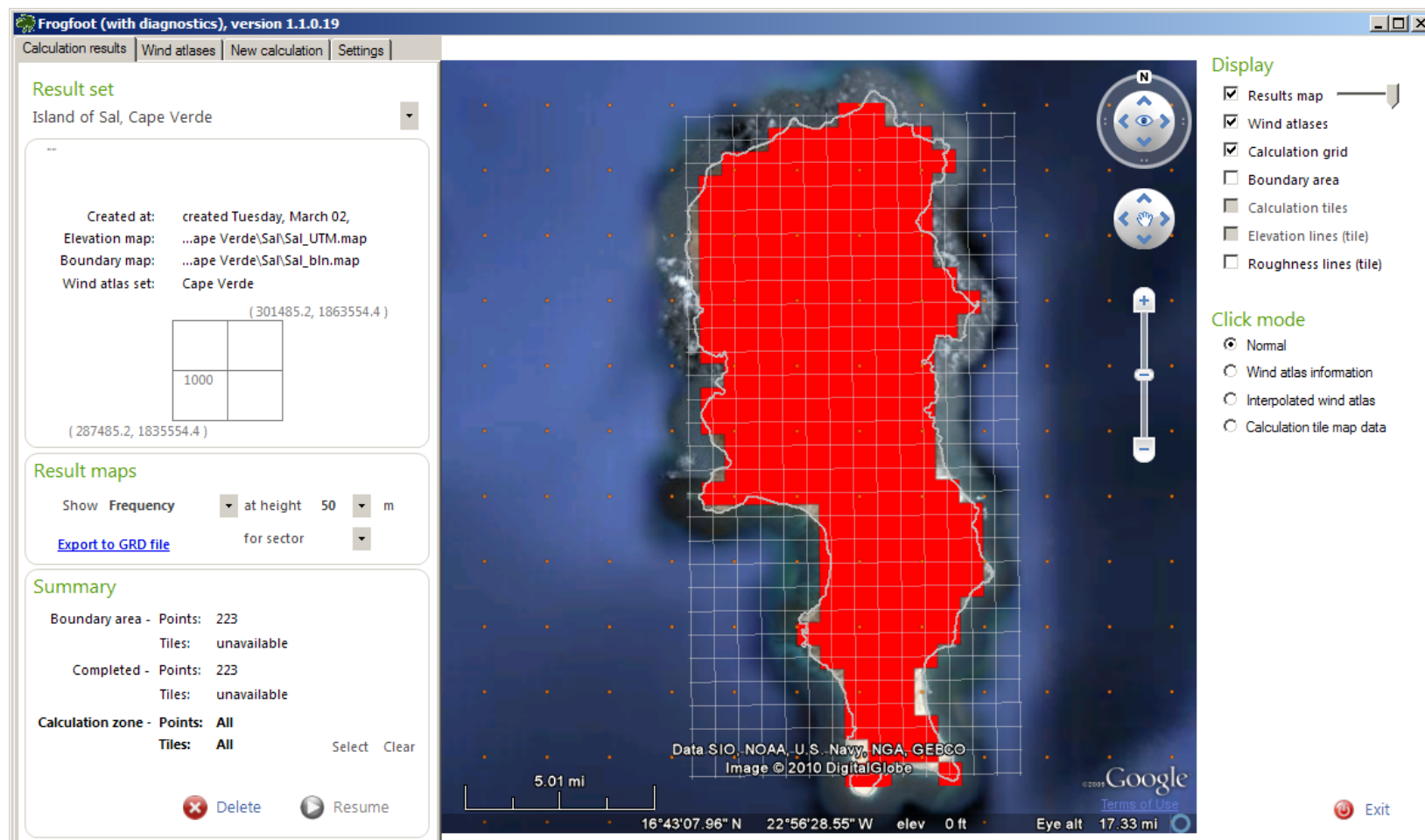
16°42'45.20" N 22°56'01.65" W elev 0 ft Eye alt 17.84 mi

Google
Terms of Use

[Exit](#)

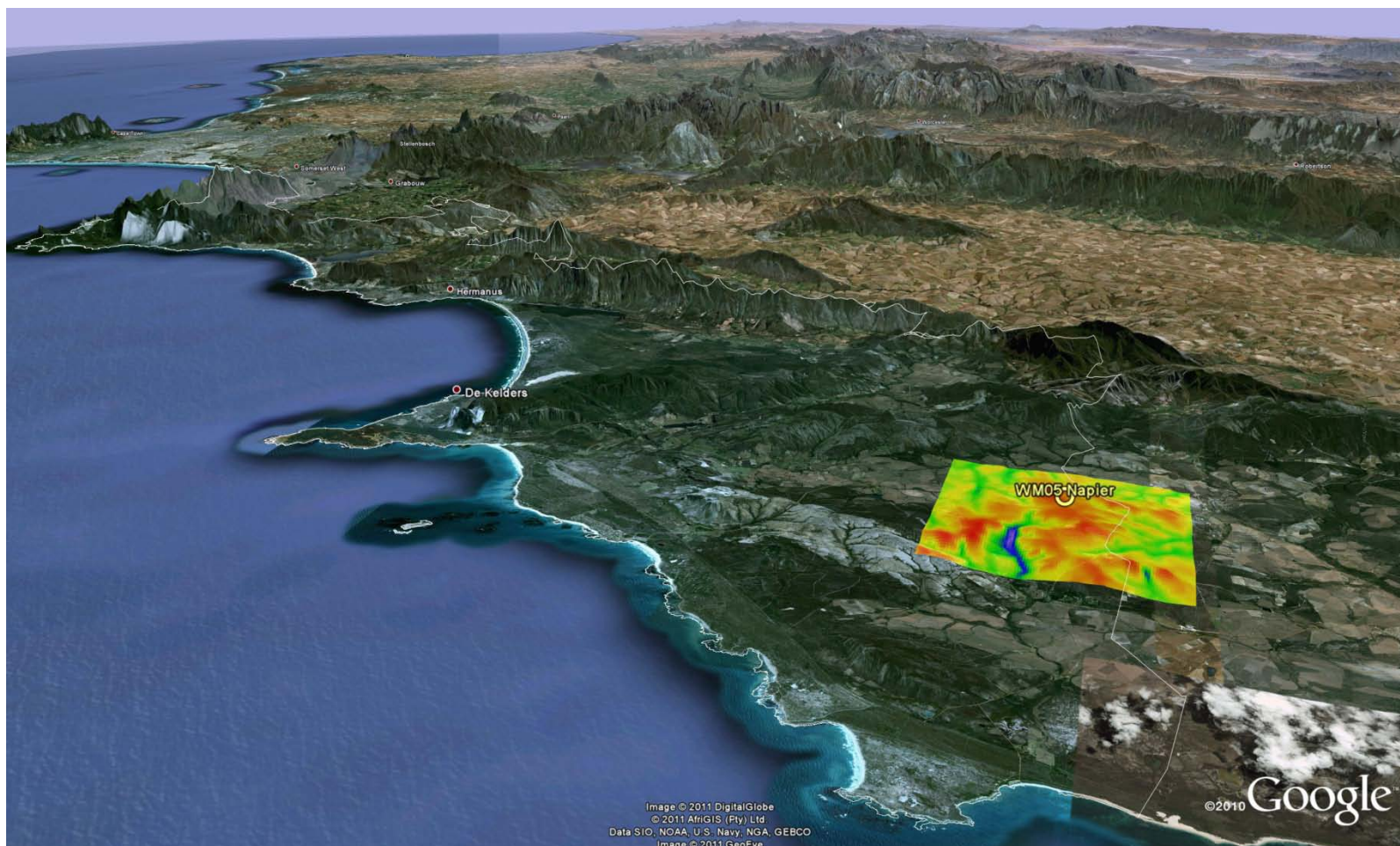
Phase II

Automated setup and modelling (Frogfoot)



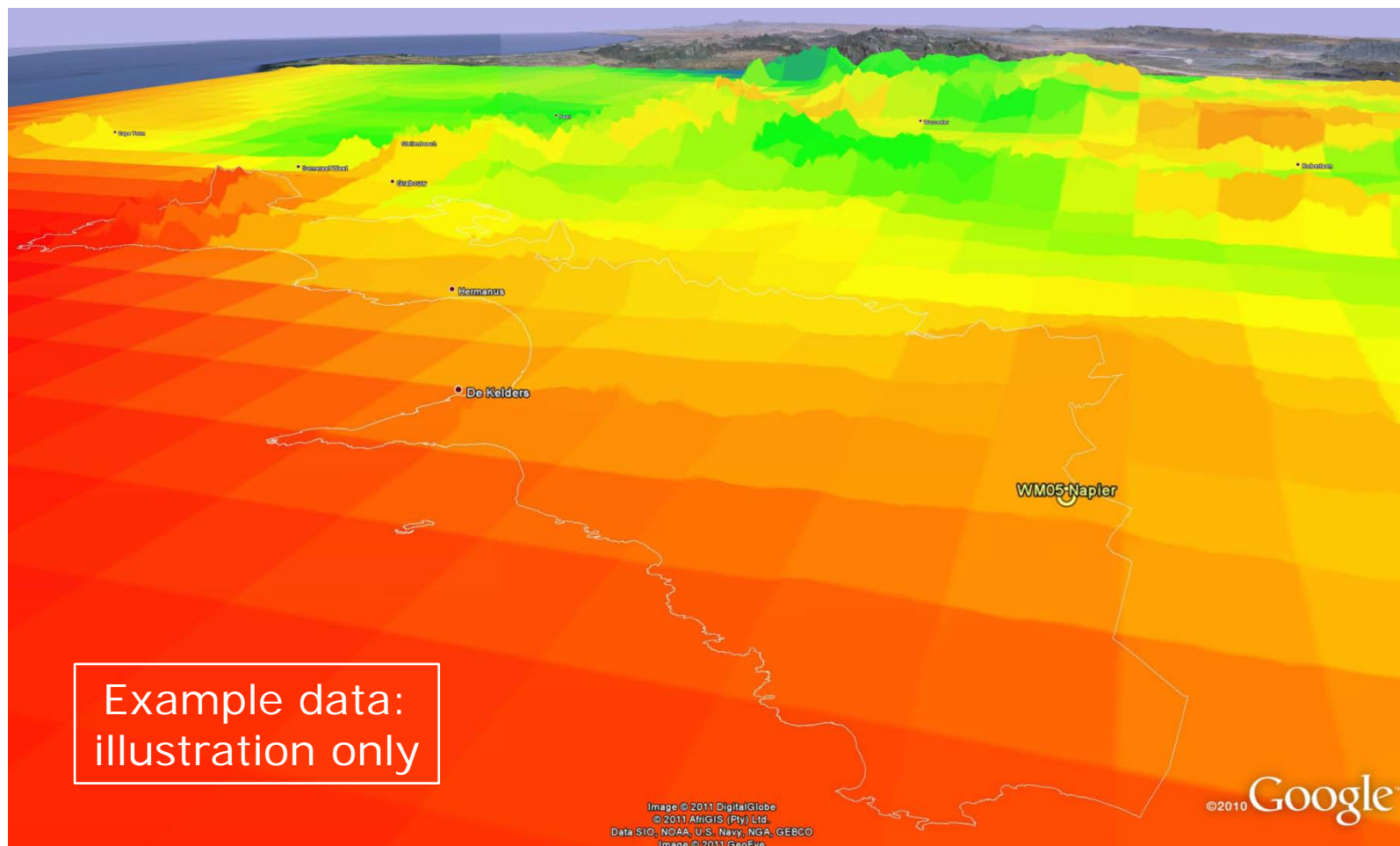
Overstrand example

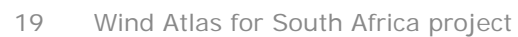
Microscale modelling results @ WM05



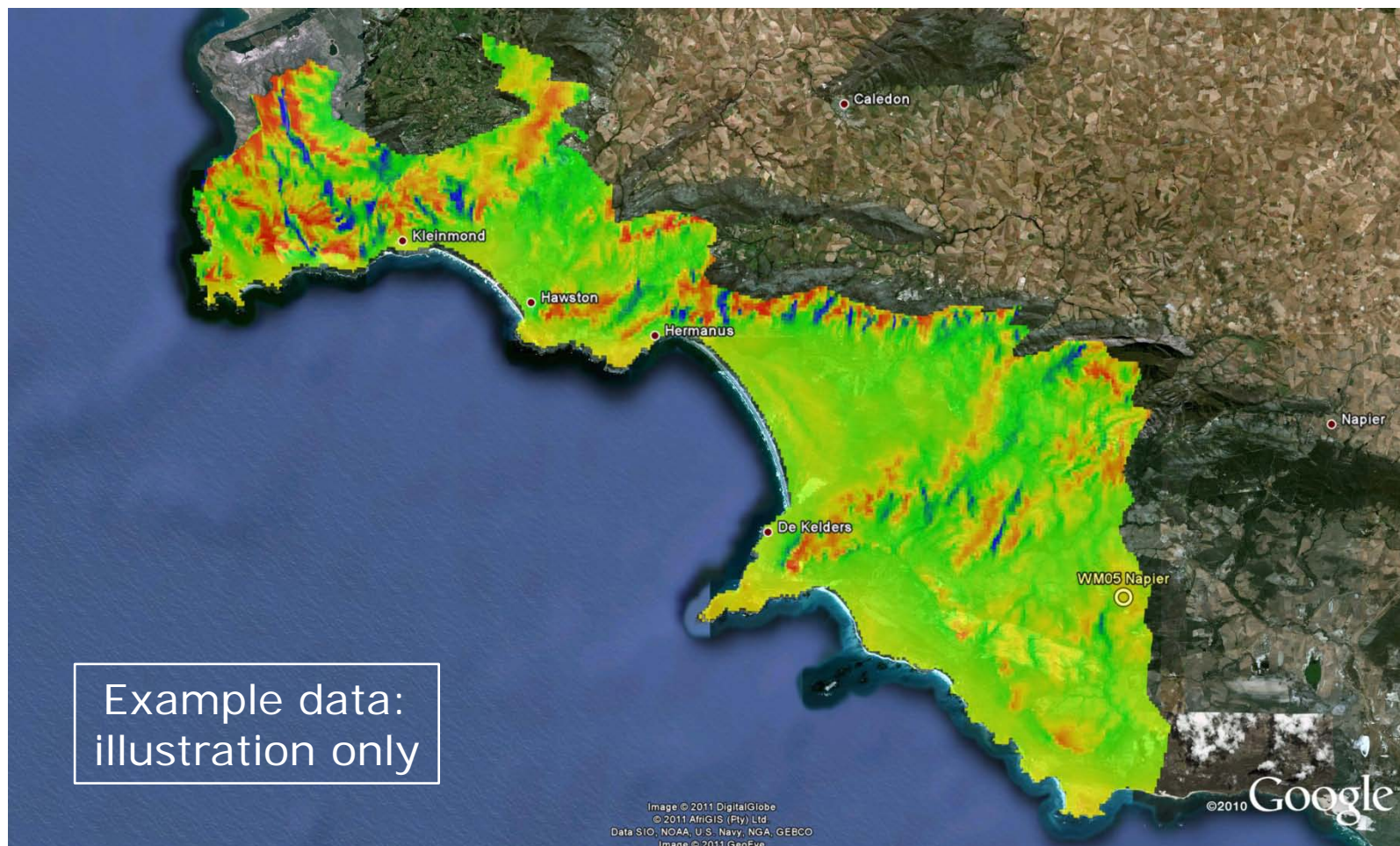
Overstrand example

Mesoscale modelling results in $5 \times 5 \text{ km}^2$ grid





Overstrand example Wind resource mapping in Phase II



User feedback is important!

- All data, model results and descriptions are available in public domain!
- WASA numerical wind atlas can provide a first estimate of the wind resource anywhere in the WASA study area.
- If and when you apply the numerical wind atlas (or the mast data), we would like to learn about your experiences.
- One way of providing feed back is to fill out the WASA Questionnaire:
 - [Questionnaire](#)