

SMITH BAY WHARF

DRAFT ENVIRONMENTAL IMPACT STATEMENT

APPENDIX B

PREPARED FOR KANGAROO ISLAND PLANTATION TIMBERS BY ENVIRONMENTAL PROJECTS
JANUARY 2019

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APPENDIX B – ALTERNATIVE LOCATIONS FOR KI SEAPORT

B Desktop Visual Assessment of Locations.....





Appendix B – Desktop Visual Assessment of Locations

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1. INTRODUCTION

This report presents an overview of the physical settings identified at various locations and sites on Kangaroo Island that were considered for establishing a port to export timber products.

During 2013, Kangaroo Island Plantation Timbers Ltd (KIPT) evaluated 12 locations/sites on Kangaroo Island, with a view to establishing a suitable port facility with which to export timber products direct to the Asian market. This process was conducted in two stages, the first considered four key evaluation criteria:

- physical setting
- environmental impacts
- social and community impacts
- economic and financial impacts.

Subsequent to this, four sites were chosen for further investigation, with a location within Smith Bay identified as the most suitable, and as a result purchased in the early part of 2014.

The focus of this report is to provide a brief analysis of the physical setting of the 12 locations/sites identified in stage one of the initial review, through the interpretation of a visual data set developed by an external sub consultant, P.I Service Solutions.

2. BACKGROUND

In October 2016, KIPT submitted an application to develop a deep-water port at Smith Bay to transport harvested timber from Kangaroo Island to markets overseas.

In February 2017 the proposal was awarded major development status under section 46 of the *Development Act 1993* (SA). As a result, KIPT is required to provide detailed information in compliance with the state-based Development Assessment Commission (DAC) guidelines. KIPT must answer questions raised, assess aspects defined and develop plans specified in the guidelines and submit its responses as part of an Environmental Impact Statement (EIS).

The objectives of creating visual datasets was to:

- provide a set of standardised images which included vantage points of:
 - land side facing towards the shoreline
 - along the coastline in both directions
 - vertical view
 - topography cross-section
 - wider regional setting
 - regional bathymetry data.
- illustrate specific features of that location:
 - vegetation extent and any cleared lands
 - nearby private residences, business' or public infrastructure
 - current land use, such as commercial aquaculture facility, agriculture.

- identify topographic information for each location using cross-sectional profiling and 3-dimensional representation of coastal topography.

2.1 Locations

Ballast Head and Smith Bay have been presented with specific property boundaries, given that they are defined sites, as opposed to general locations, which are presented using a general location point identified through Google Earth Pro.

The sites/locations evaluated in stage one of KIPT's review of Kangaroo Island were:

- American River
- Ballast Head site
- Cape Dutton (east)
- De Mole River
- Kangaroo Head
- Kingscote
- Penneshaw
- Point Morrison (Norma Cove)
- Smith Bay site
- Snug Cove
- Vivonne Bay
- Western River Cove.

Refer to Figure 1.

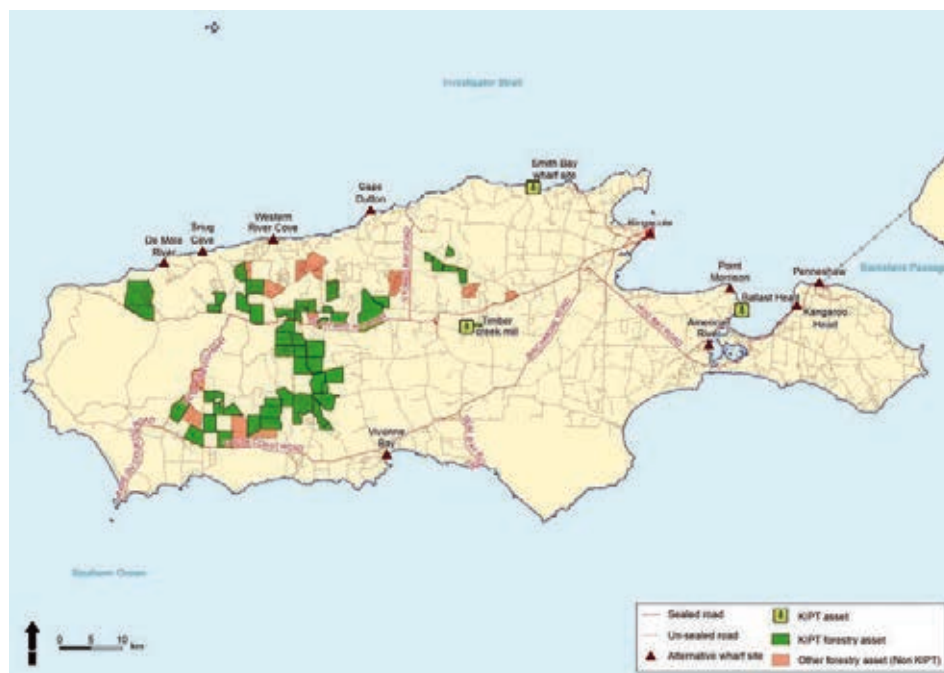


Figure 1 Proposed Site Locations, Kangaroo Island, SA

The work commissioned and presented in this report will look at the physical setting of all 12 potential project sites/locations on Kangaroo Island.

3. METHODOLOGY

Development of the image data set was conducted using primarily Google Earth Pro imagery, dated December 2015. An on-site survey was not undertaken.

Images of locations were exported from Google Earth Pro imagery and edited using a consistent process, which is outlined as:

- location was identified through Google Earth Pro search function
- standardised altitude (13 km) and view angle settings for each image were input
- scaling was standardised to 1 per cent
- cross-section information was included in the required image:
 - the cross-section used a standard length of 1.4 km
 - the cross-section ends at approximately the 10 m depth point offshore
 - each cross-section shows zero at the mean sea level.
- high-resolution imagery was exported from Google Earth Pro in PDF and JPEG formats
- ocean depth point data was sourced from Bist LLC, Marine & Navigation Charts & Fishing Maps (Bist LLC, 2018)
- final image editing occurred in AutoDesk's AutoCAD and Adobe Photoshop.

Images were then generated in both JPEG and PDF formats, reviewed and used for interpretive reporting.

4. RESULTS

Imagery for 12 locations were reviewed and interpreted. Below are the key findings from each location. Note that any distances, elevations, depths and percentages quoted are approximate numbers.

4.1 American River

Key points in relation to the American River location:

- a significant town community is established at American River (**Figure 2**, Appendix A)
- private vessels moor off this location (**Figure 6**, Appendix A)
- cleared land, potentially agricultural, exists a distance away from the location
- unconnected stands of vegetation exist adjacent to the location
- maximum bathymetry depth is 6.9 m
- **Figure 3**, Appendix A, shows a staggered decline with a small bench at 375 m, followed by slight incline, before a steep decline of 10 m in the last 170 m before the water, with a maximum slope of -17.6%, and elevation loss of 39 m.

4.2 Ballast Head (Site)

Key points in relation to the Ballast Head site:

- location of an old gypsum export facility
- historic clearing (still visible)
- vegetation abuts the site
- cleared (potentially agricultural) land and interconnected pockets of vegetation exists a distance away from the location
- private vessels moor within the protected waters south-west of the location (**Figure 5**, Appendix B)
- cross-section shows a steep decline from the top of the site, with a maximum slope of -28% and an elevation loss of 69 m (**Figure 3**, Appendix B)
- nearby oyster lease/s can be seen in shallow (3.6 m) waters just south of Ballast Head (**Figure 4**, Appendix B)
- significant amount of residential development (American River) exists to the south-west in the region, see **Figure 5**, Appendix B.

4.3 Cape Dutton (east)

Key points in relation to the Cape Dutton location:

- the coastline is banded by a strip of vegetation, with agricultural land directly behind it (**Figure 1**, Appendix C)
- consists of very steep cliffs, dropping from a height of almost 75 m down to the water's surface in just over 250 m with a maximum slope of -36.3% (**Figure 3**, Appendix C)
- marine vegetation and rock exists close to shore, before dropping to a 20 m depth (**Figure 4**, Appendix C)
- on a regional scale, the coastline vegetation is somewhat interconnected with other areas of vegetation but completely surrounded by agricultural lands (**Figure 2**, Appendix C)
- a significant decline to the water's surface exists, with a maximum slope of -36.3% and elevation loss of 75 m in just over 350 m
- majority of the coastline in this area is steeply sloping to the ocean floor, as shown in **Figure 5** and **Figure 6** (Appendix C)
- depth data shows that the coast is lined with marine vegetation and rocky outcroppings, followed by a drop to a 20 m depth (**Figure 4**, Appendix C).

4.4 De Mole River

Key points in relation to the De Mole River location:

- isolated location that has no visible infrastructure
- two possible residential dwellings in close proximity to the location
- a cleared area, with possible dam and shack dwellings to the south south-east of it, exists near the river mouth with potential access road leading towards it (**Figure 1**, Appendix D)
- cross-section data shows maximum elevation loss of 85 m and a maximum slope of -28.7%, with a steep decline beginning around 450 m and extending to approximately 850 m, before flattening out for a short distance and a final dip to the water (**Figure 3**, Appendix D)
- depth data shows direct access to deep water (18.5 m), with marine vegetation visible on both sides of the river mouth (**Figure 4**, Appendix D).

4.5 Kangaroo Head

Key points in relation to the Kangaroo Head location:

- almost completely cleared for agriculture, with some pockets of vegetation
- approximately seven private residences/structures along the northern coastline (**Figure 1**, Appendix E)
- regional view (**Figure 2**, Appendix E) shows consistent cleared agricultural lands interspersed with pockets (interconnected and unconnected) of vegetation
- area seems to be interspersed with vegetated and unvegetated gullies, with an eroded rocky entry to the water (**Figure 6**, Appendix E)
- a town community (Penneshaw) is visible to the east of the location (**Figure 2**, Appendix E)
- bathymetry depth data show almost an instant depth of 9 m (**Figure 4**, Appendix E)
- cross-section shows a swale shape in the first 0.5 km, that proceeds to a decline with a maximum slope of -27.3% and a total elevation loss of 77 m (**Figure 3**, Appendix E).

4.6 Kingscote

Key points in relation to the Kingscote location:

- significant residential and commercial development and a jetty and associated infrastructure exists (**Figure 1**, Appendix F)
- slightly sloping with a total elevation loss of 29 m and a maximum slope of -6.6%, that presents as a consistent decline from about 250 m to the 1.1km point (**Figure 3**, Appendix F)
- on a regional scale, the location is at the end of a low headland on the southern side of Bay of Shoals, with a large sand bar providing protection from ocean swell and agricultural land extending a distance away from the coast (**Figure 2**, Appendix F)
- public foreshore infrastructure such as walking tracks, ocean pool and parkland visible along the coastline.

4.7 Penneshaw

Key points in relation to the Penneshaw location:

- location of the island's ferry terminal for passenger and freight movement to/from Kangaroo Island
- significant amount of residential development
- some land, assumed to be for agricultural purposes, on the outskirts of the residential area
- some vegetated areas to the east of the location that appears to be hummocky in nature (**Figure 6**, Appendix G)
- a golf course (or similar) on the outskirts of the residential area (**Figure 2**, Appendix G)
- elevation cross-section shows a steady decline from 53 m down to just below 25 m where it levels off slightly before a final slope down to the water, with a maximum slope of -15% (**Figure 3**, Appendix G)
- depth data shows it remains below 10 m deep for approximately 350 m from shore (**Figure 4**, Appendix G).

4.8 Point Morrison (Norma Cove)

Key points in relation to the Point Morrison location:

- cleared agricultural land with two visible residential dwellings (**Figure 1**, Appendix H)

- surrounded by agricultural land, disconnected stand of vegetation (to the south-east) and vegetation can be seen adjacent to the coastline and throughout agricultural areas (**Figure 2**, Appendix H)
- cross-sectional data shows a steady decline of 63 m and a maximum slope of -11.5%, from approximately 100 m through to the 1.04 km point, where the water's surface is encountered (**Figure 3**, Appendix H)
- coastal imagery confirms the slight decline to the water's edge, with depth data showing a gradual decline in water depth to the 9.9 m mark and sand pockets marked close to the central location marker (**Figure 4**, Appendix H).

4.9 Smith Bay (Site)

Key points in relation to the Smith Bay location:

- the coastline looks to be of a rocky nature, between 40 m and 50 m wide, remnant aquaculture infrastructure, directly bounding the proposed site to the east and agricultural farmland extending away from the site in an arc, south south-west to the east (Figure 1, Appendix I)
- there is an onshore tank-based aquaculture facility established at Smith Bay to the east of the proposed site, whilst to the west there is a large interconnected stand of native vegetation and to the south is an isolated small stand of remnant native vegetation (Figure 1, Appendix I)
- the cross-section shows a total loss of 42 m in elevation, over two steps, with the first, steeper step ending at 0.6km, followed by a shallower decline through to approximately the 1.07km mark with a maximum decline of -11.6% over the profile (Figure 3, Appendix I)
- regionally, there is clear evidence of farm land interspersed with unconnected stands of vegetation and a major road (North Coast Rd) running through the area from east to west (Figure 2, Appendix I)
- Figure 5, Figure 6 and Figure 7 (Appendix I) show a shallower gradient towards the coastline at Smith Bay, than what is visible both east and west; areas of higher elevation are visible with steeper declines to the oceans edge in both directions, along with higher elevations further back from the coast
- the marine and fishing depth data used in this work, shows that the area directly offshore of Smith Bay is unsurveyed (Figure 4, Appendix I).

Smith Bay was chosen as the most suitable site and subsequently purchased. Accurate bathymetry data will be collected as part of future detailed site investigations.

4.10 Snug Cove

Key points in relation to the Snug Cove location:

- has no visible commercial infrastructure and approximately two permanent residential dwellings overlooking the location, and a further three dwellings on the second ridgeline back from the coastline (**Figure 1**, Appendix J)
- relatively cleared of vegetation, with isolated pockets of trees inland and a larger stand to the eastern side of the cove
- regional view indicates the location is surrounded by a mix of agricultural land and native vegetation
- cross-section indicates that there is a total elevation loss of 117 m and a maximum slope of -38.5%, with two clear ridgelines followed by a steep descent into the cove (**Figure 3**, Appendix J)
- depth data indicates that the cove enters directly into deep water at 27.5 m (**Figure 4**, Appendix J)
- coastline images 01 and 02 (**Figure 5**, **Figure 6** and **Figure 7**, Appendix J) show that the entire coastline along this region is steep, with sheer cliffs in some locations.

4.11 Vivonne Bay

Key points in relation to the Vivonne Bay location:

- highly vegetated coastal area with some residential development and a river entering the bay
- agricultural land beyond the vegetated coastline (**Figure 2**, Appendix K)
- large naturally vegetated areas to both the east and west of the location
- cross-section information shows a total elevation loss of 21 m with a maximum slope of -7.4%, that shows small rises in elevation at three points (**Figure 3**, Appendix K)
- depth data shows shallow marine vegetation, followed by almost immediate water depth of 9.5 m (**Figure 4**, Appendix K).

4.12 Western River Cove

Key points in relation to the Western River Cove location:

- one visible residential dwelling exists, with two located on a ridgeline further inland (**Figure 1**, Appendix L)
- some isolated pockets of vegetation surrounding the location, with the majority of adjacent land cleared
- cross-section shows two ridgelines, with a total elevation loss of 59 m and a maximum slope of -17.6% (**Figure 3**, Appendix L)
- depth data indicates that the cove enters directly into 20-metre deep water (**Figure 4**, Appendix L)
- a small river enters the cove
- a significant amount of vegetation surrounds the location at a regional scale (**Figure 3**, Appendix L)
- coastline images clearly show that the cove sits within an eroded gully formation with a small sandy beach, river mouth and rock outcroppings at one side (**Figure 5**, **Figure 6** and **Figure 7**, Appendix K).

5. SUMMARY

In summary, the visual data collected through this desktop study has shown (discounting the heavily settled areas of Kingscote and Penneshaw) that many of the locations/sites have restricting physical features including:

- limited level nearshore land area available for development
- steep slopes
- distance to required water depth
- site access difficulties
- vegetation (and native vegetation)
- potential tourism/residential conflicts.

Whilst this study is limited in its scope to assessing physical aspects associated with the various locations, it provides a visual representation of the 12 locations considered by KIPT for a proposed timber port facility.

Smith Bay was purchased in 2014 with the intent to develop a timber export facility on the site, requiring a detailed investigation into all aspects of the surrounding environment. These investigations, both offshore and onshore, will be used to inform future project development and assessment processes.

6. REFERENCES

Bist LLC, 2018, i-Boating: Free Marine navigation Charts & Fishing Maps, viewed 25 May 2018,

<<http://fishing-app.gpsnauticalcharts.com/i-boating-fishing-web-app/fishing-marine-charts-navigation.html#10.72/-35.6466/137.7461>>

Appendix A

American River

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore





Figure 3-Cross-section

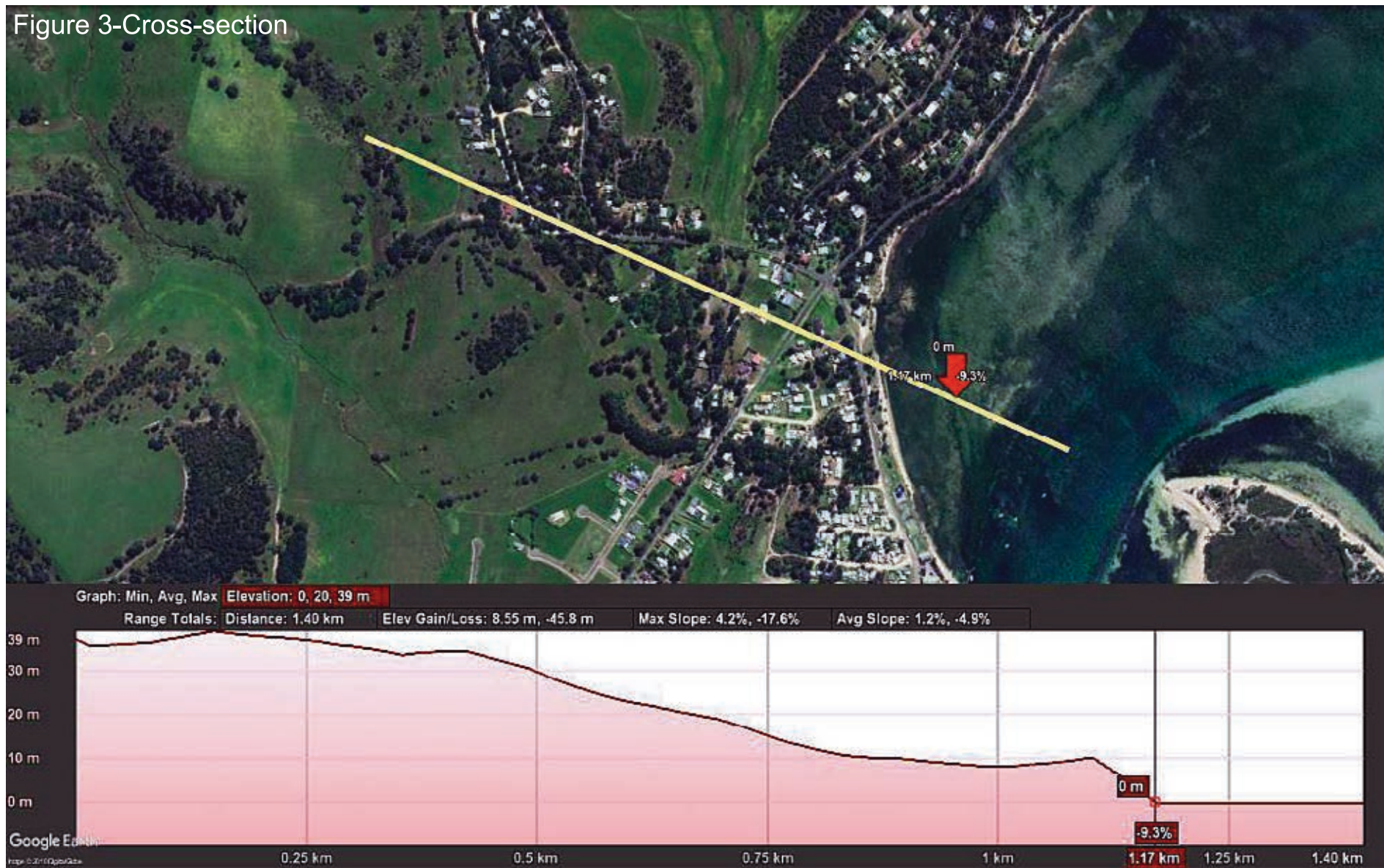


Figure 4-Depth Data



Figure 5-Coastline-01



Figure 6-Coastline-02





Appendix B

Ballast Head Site

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

Figure 1-Plan View





Figure 3-Cross-section

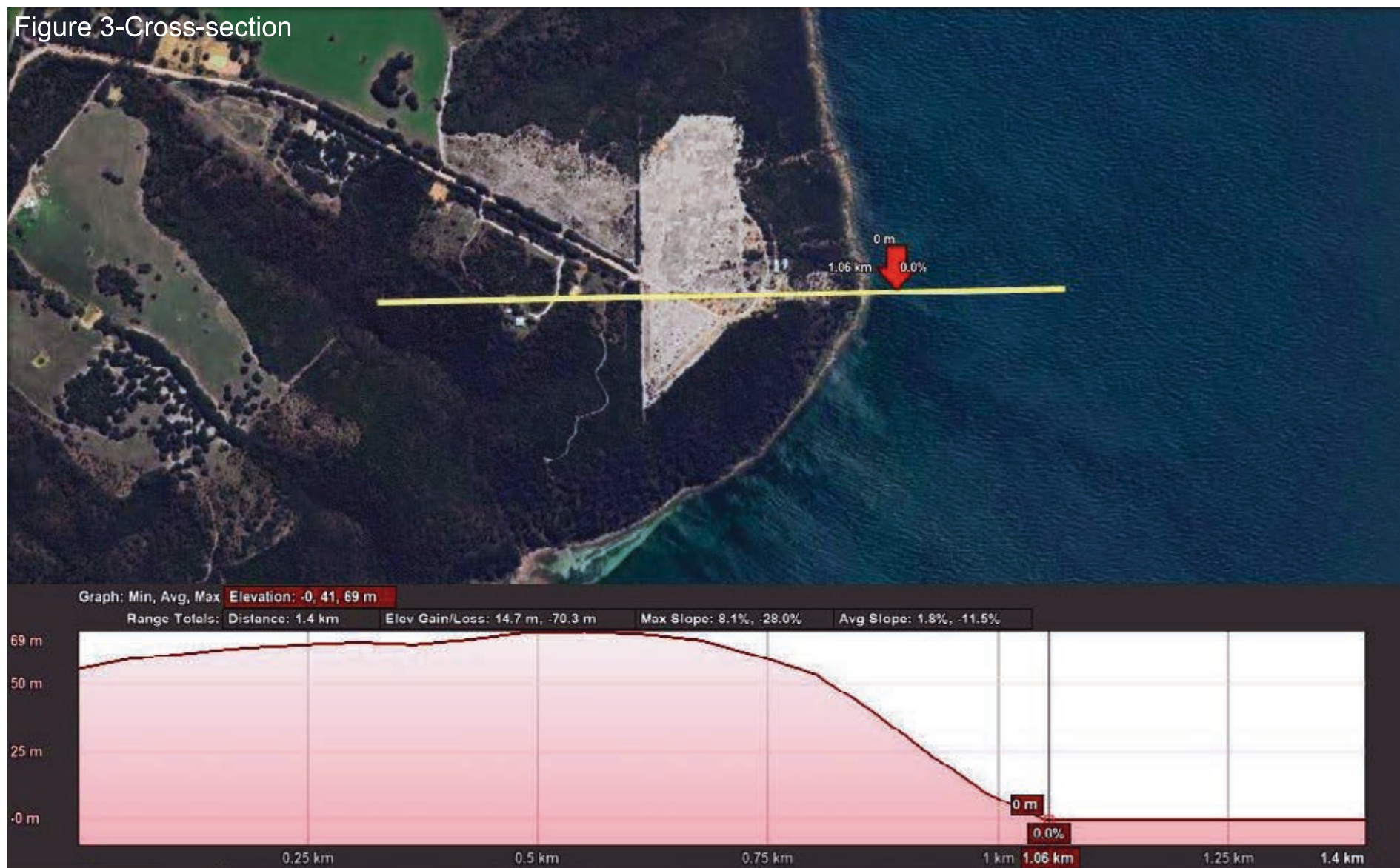


Figure 4-Depth Data



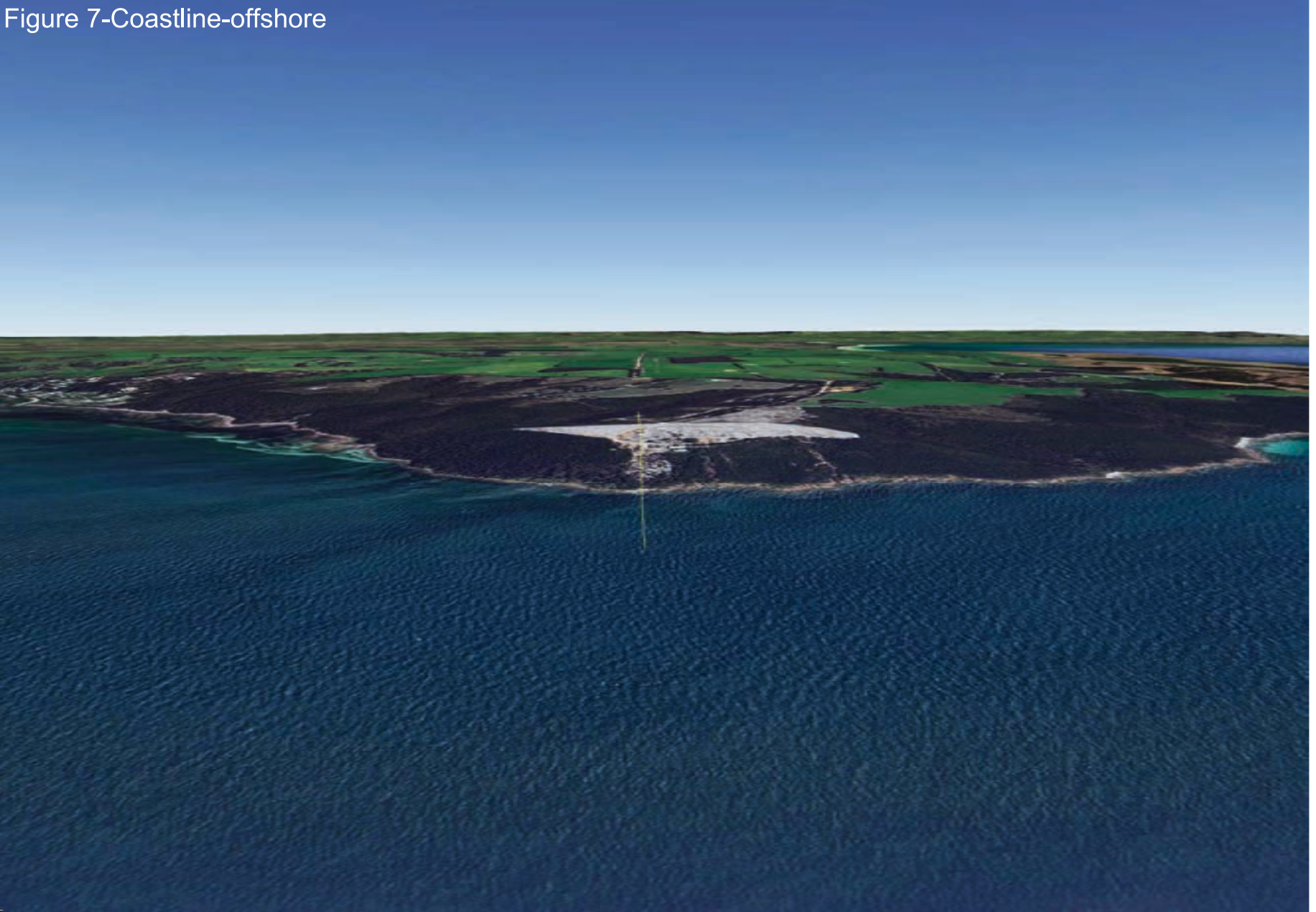
Figure 5-Coastline-01



Figure 6-Coastline-02



Figure 7-Coastline-offshore



Appendix C

Cape Dutton (east)

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

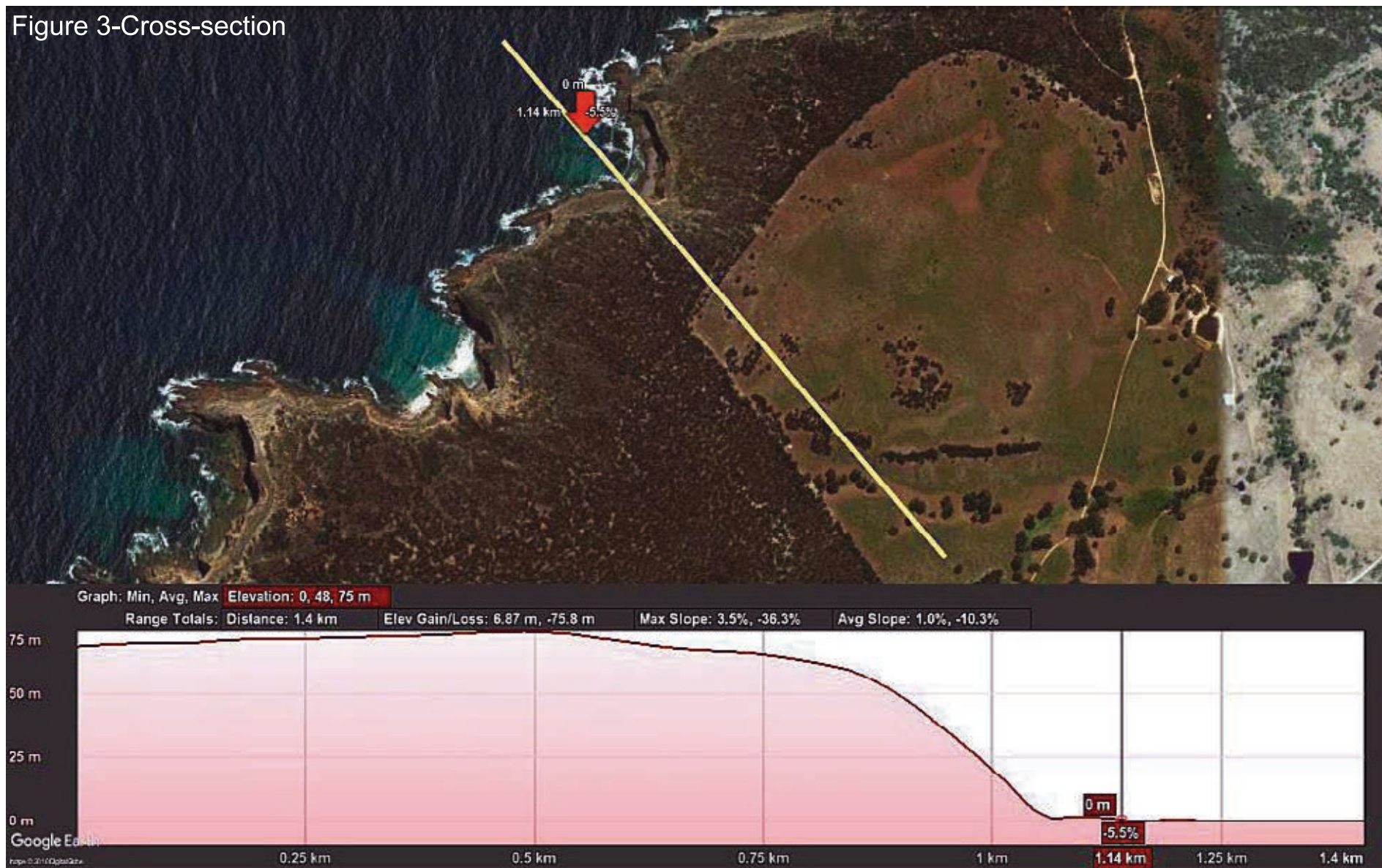


Figure 1-Plan View

Figure 2-Regional View



Figure 3-Cross-section



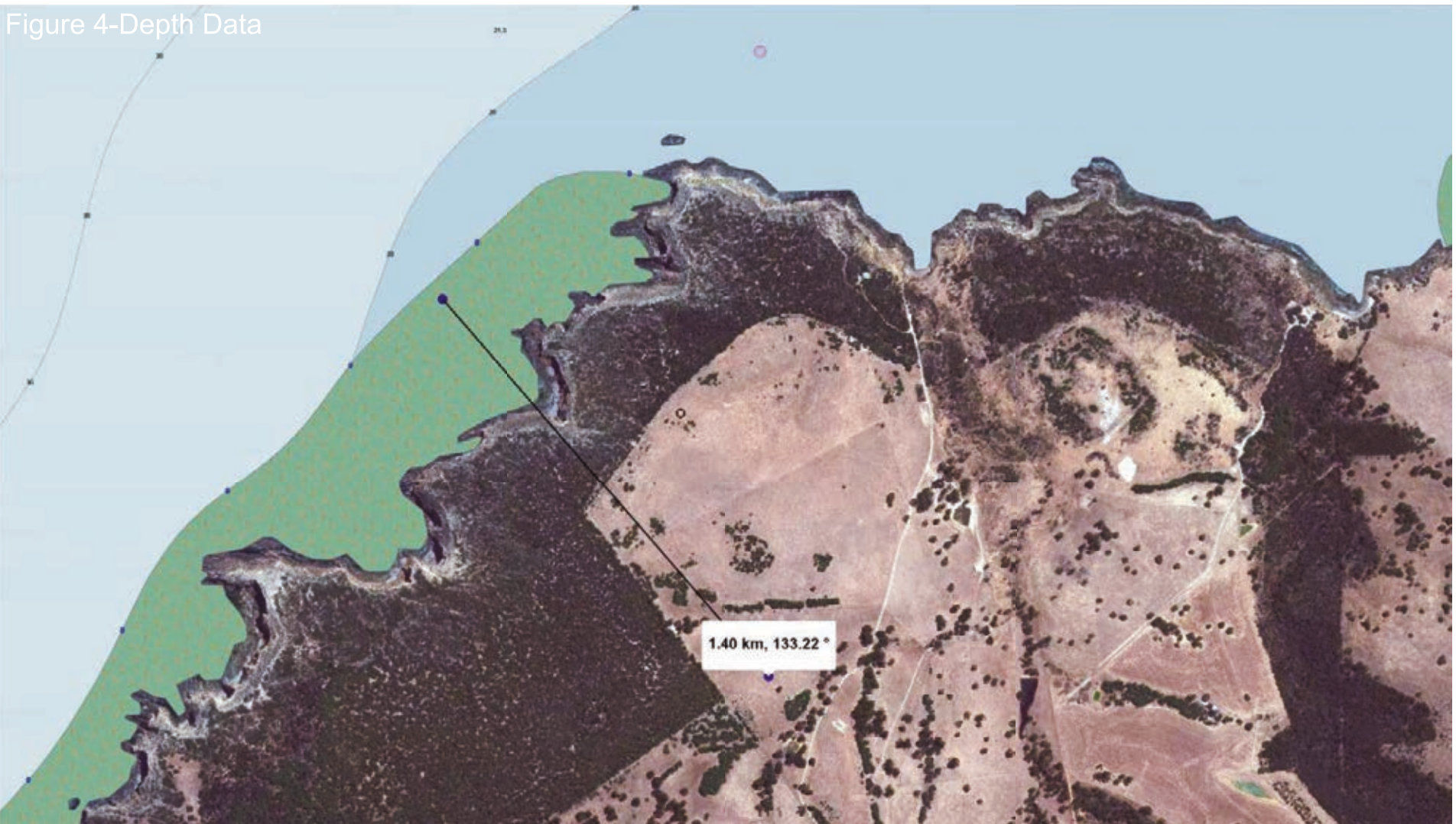


Figure 5-Coastline-01



Figure 6-Coastline-02

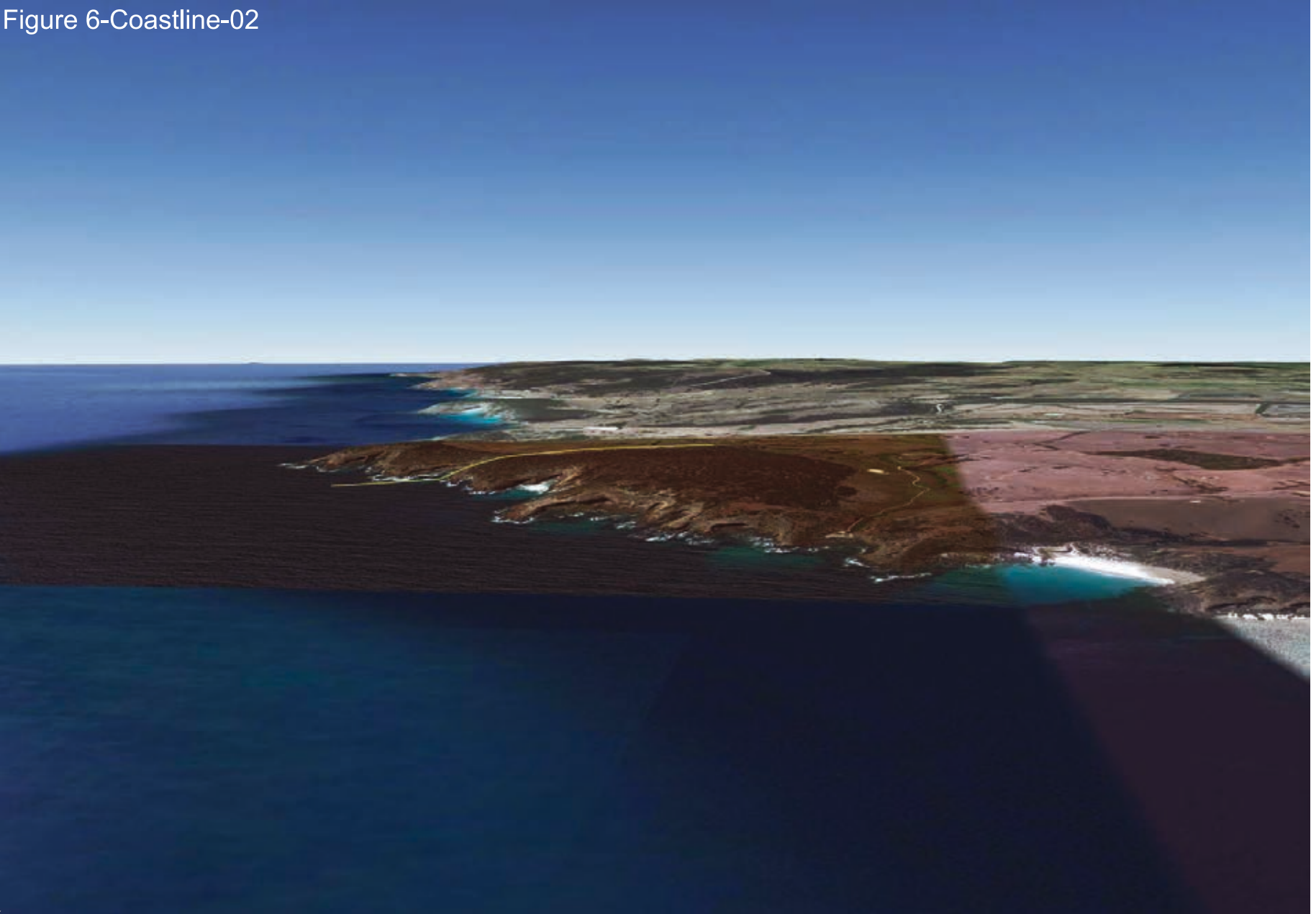
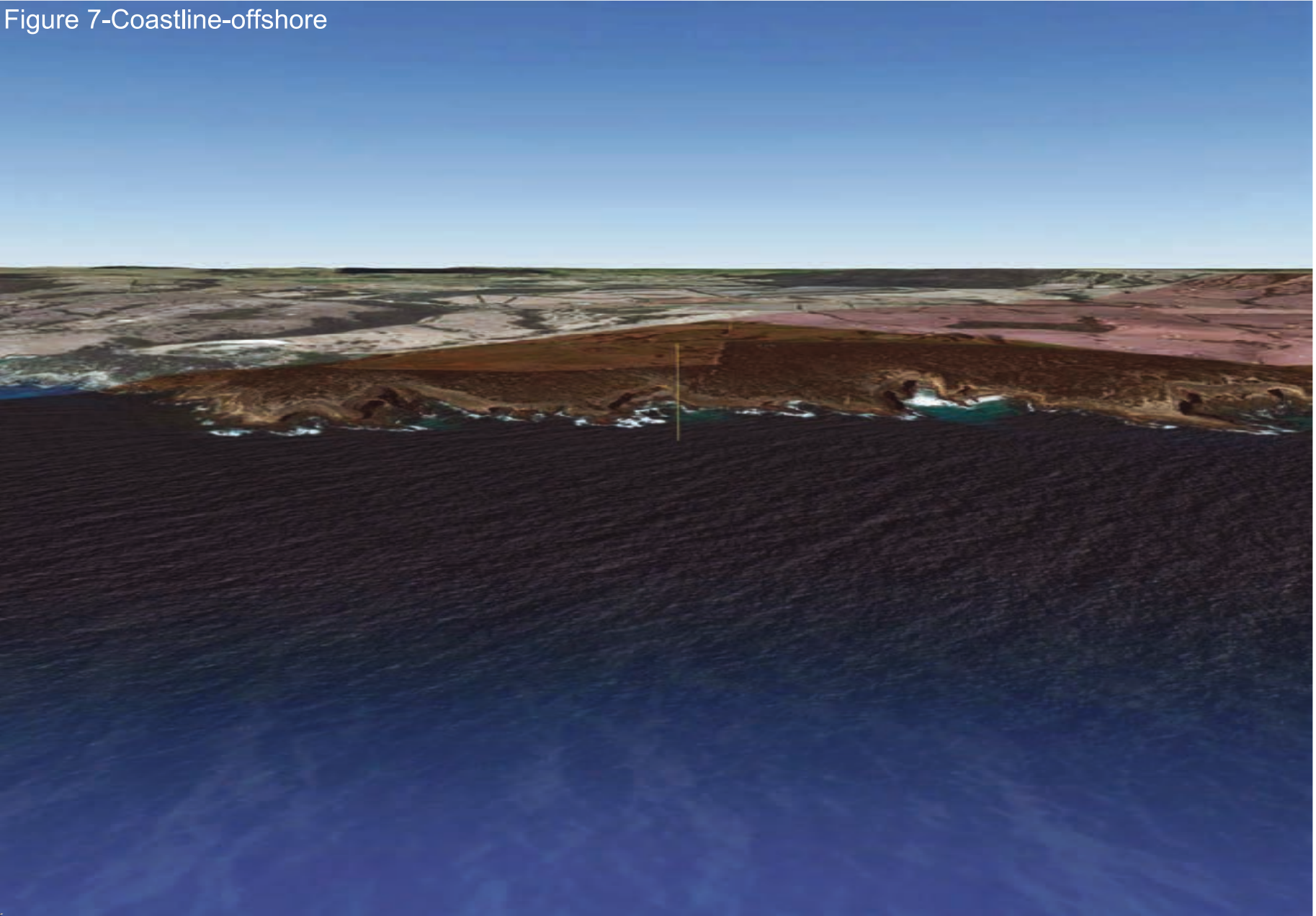


Figure 7-Coastline-offshore



Appendix D

De Mole River

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

Figure 1-Plan View



Figure 2-Regional View

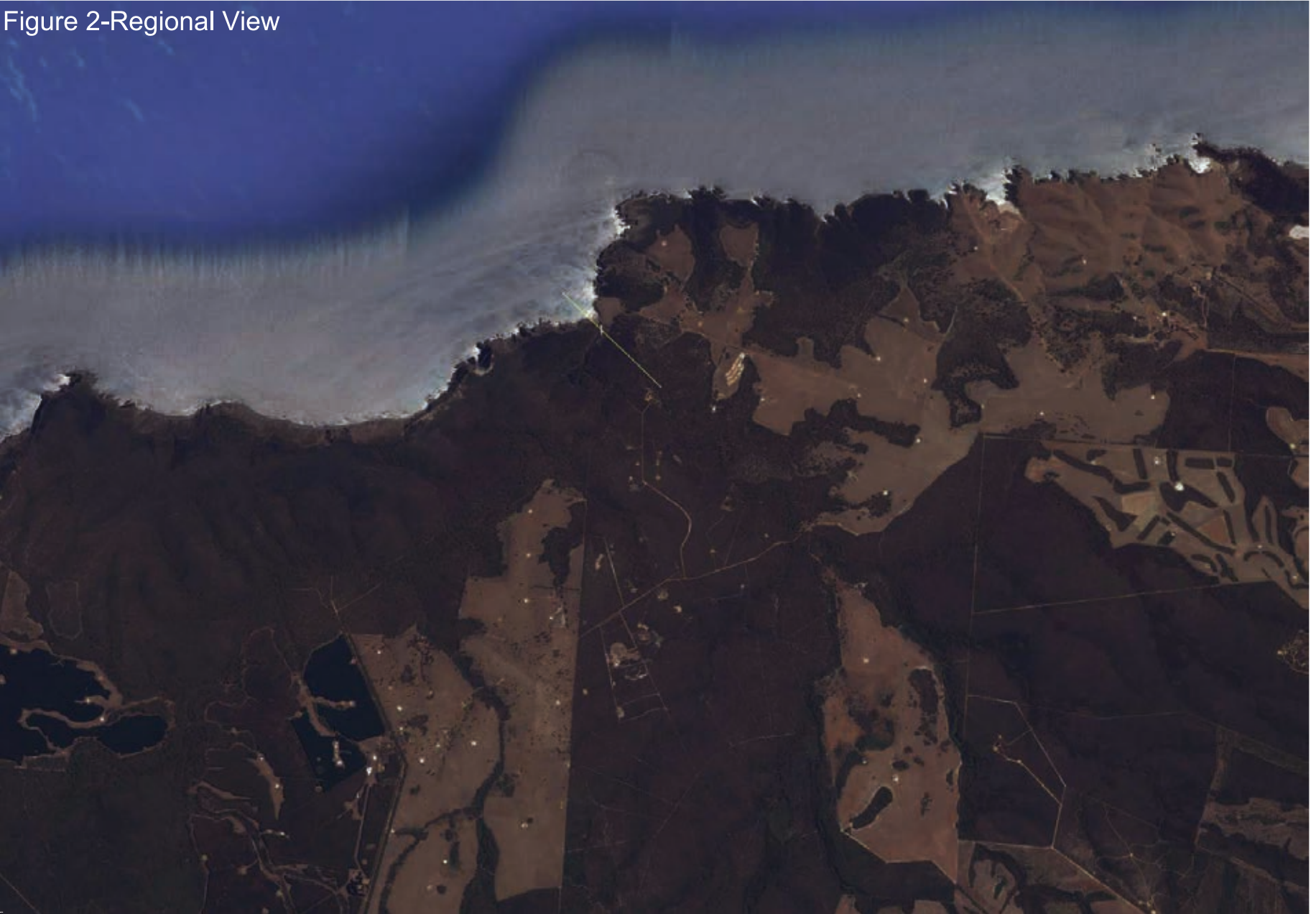


Figure 3-Cross-section

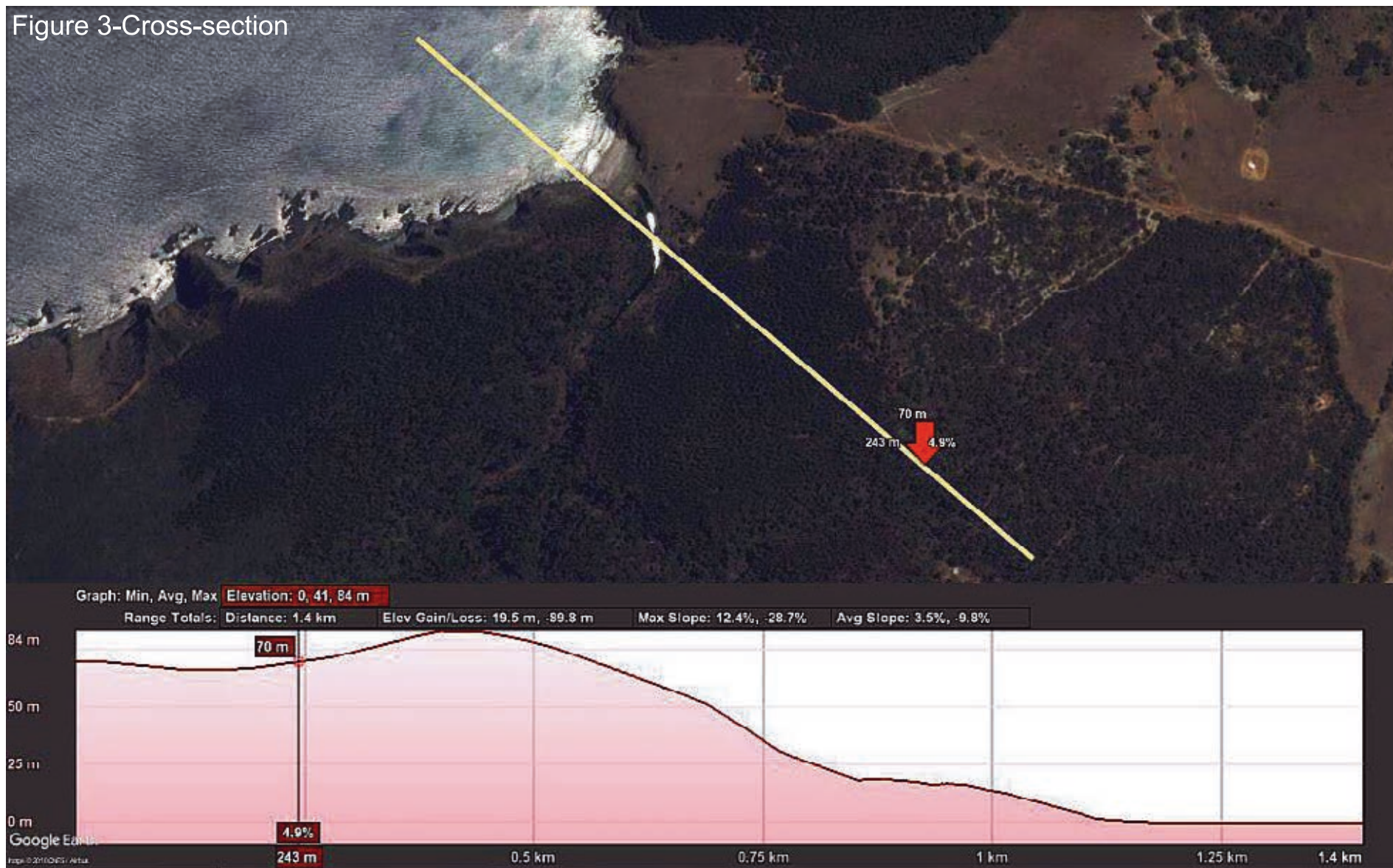




Figure 5-Coastline-01

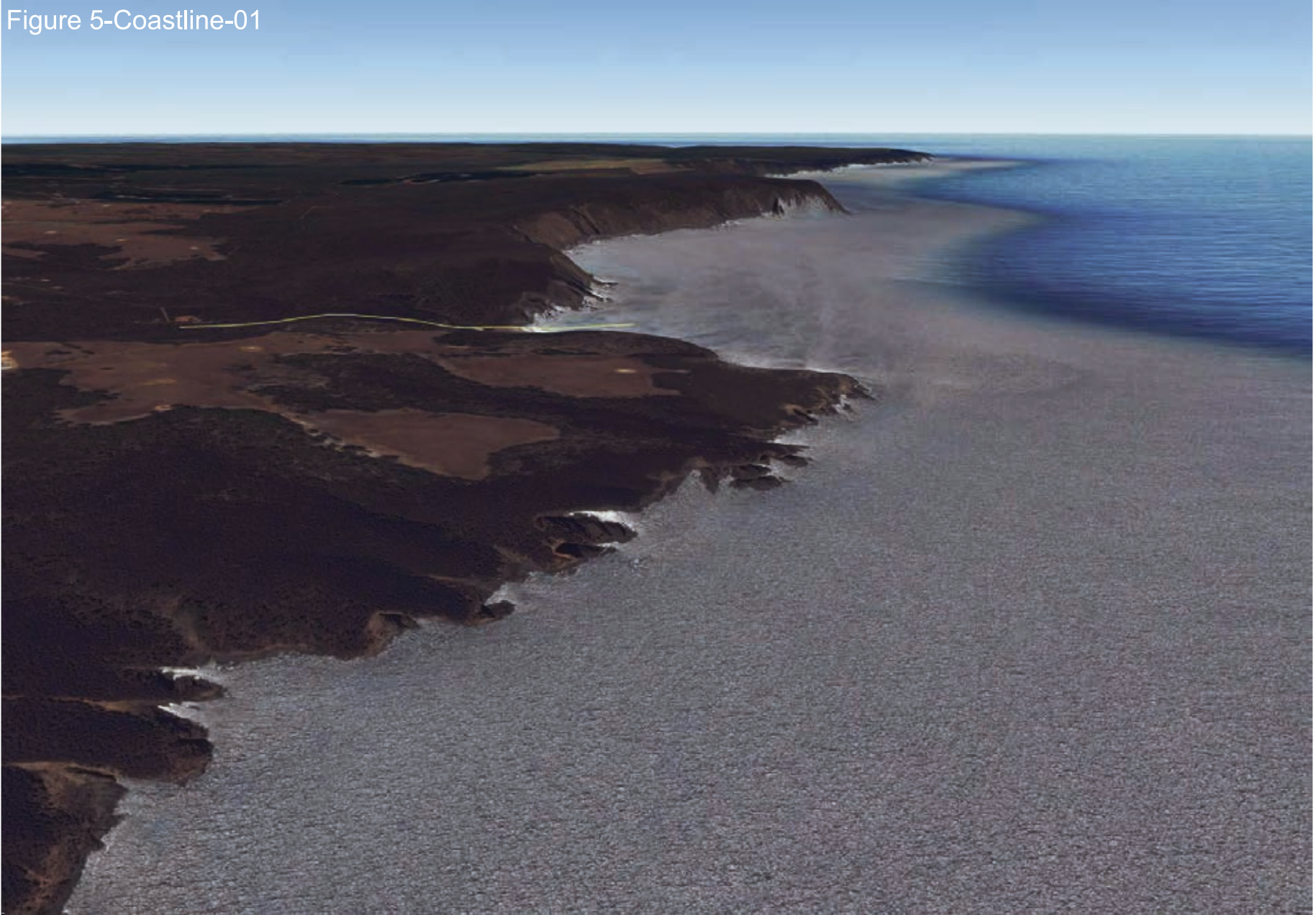


Figure 6-Coastline-02

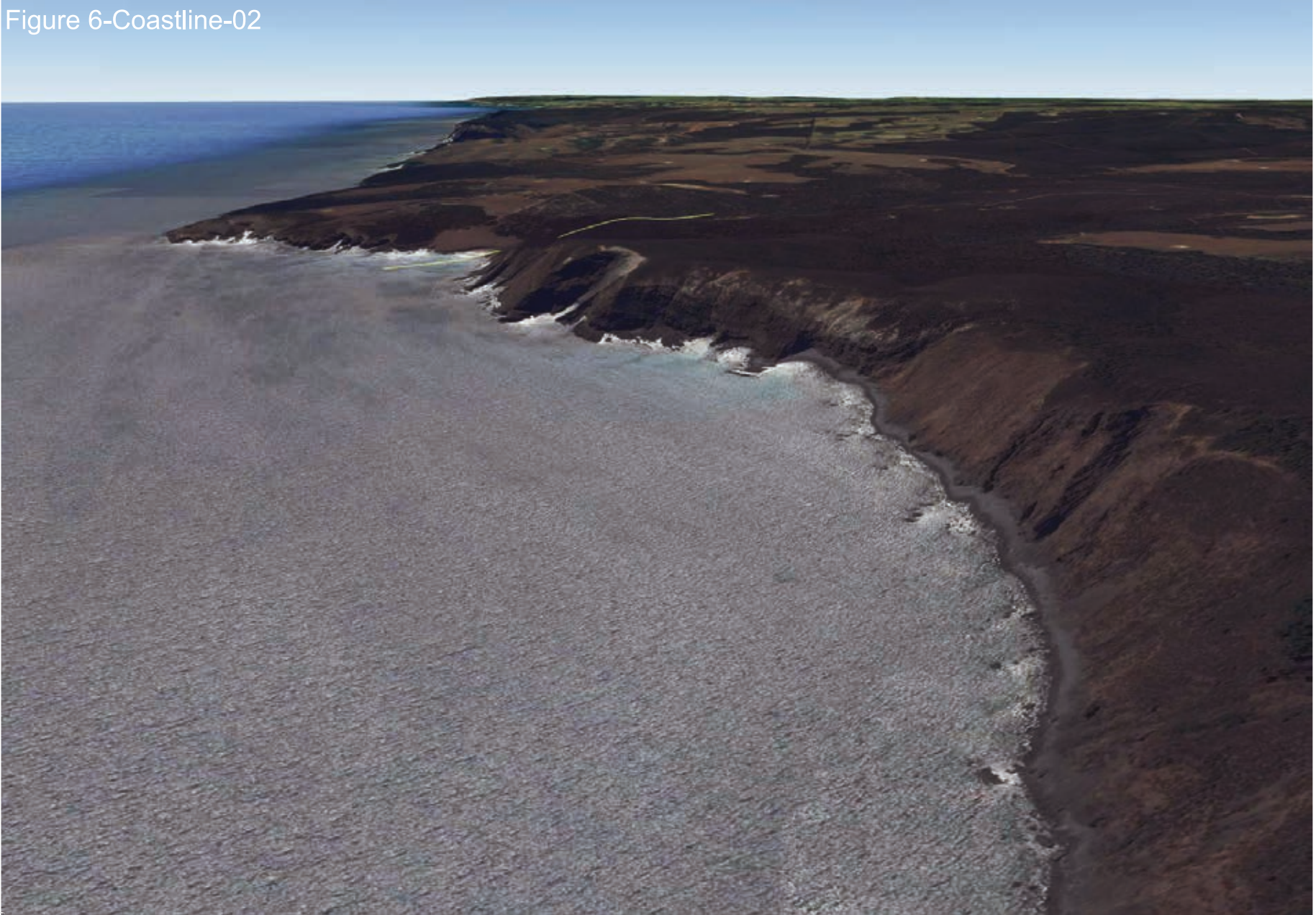
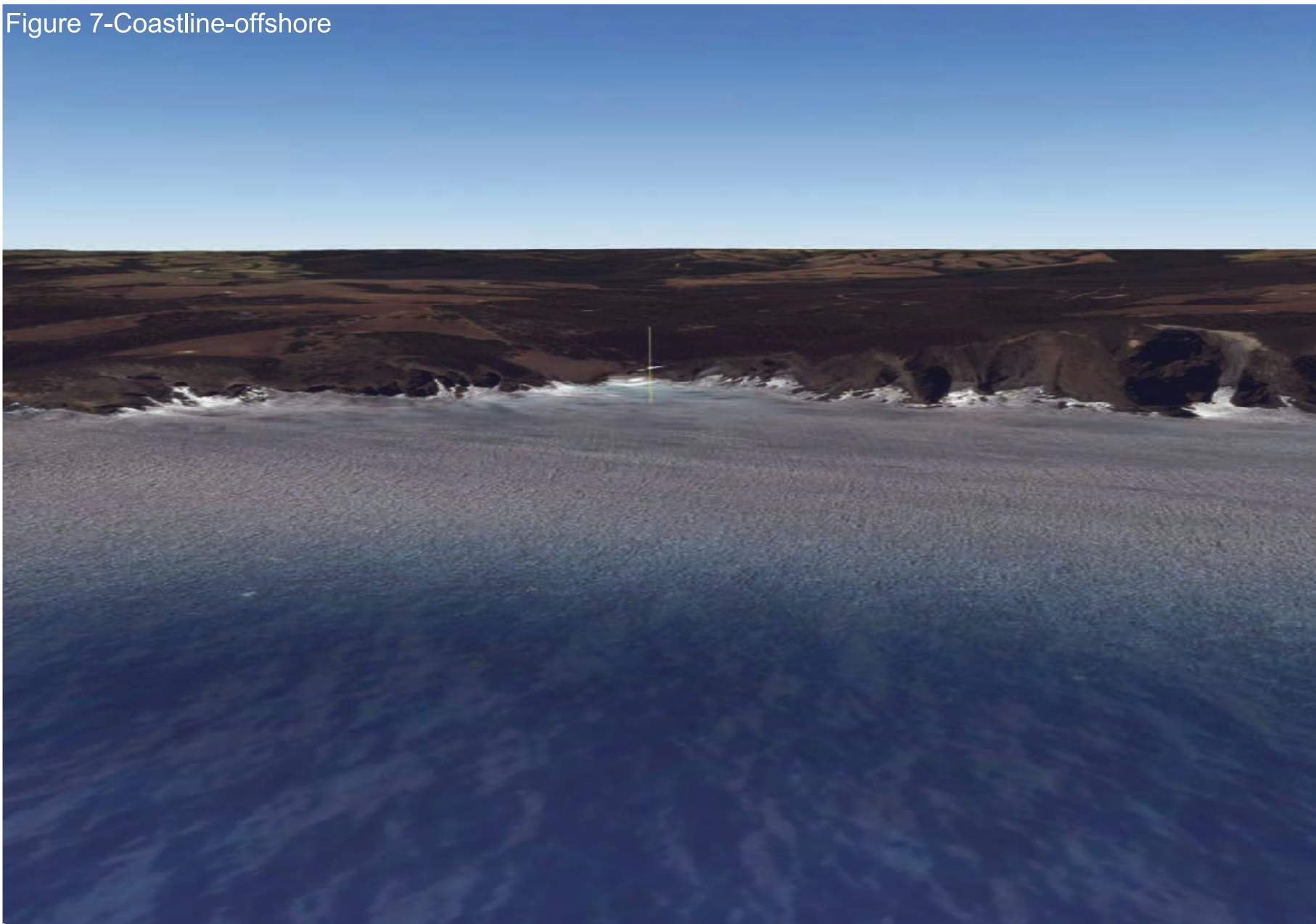


Figure 7-Coastline-offshore



Appendix E

Kangaroo Head

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

Figure 1-Plan View

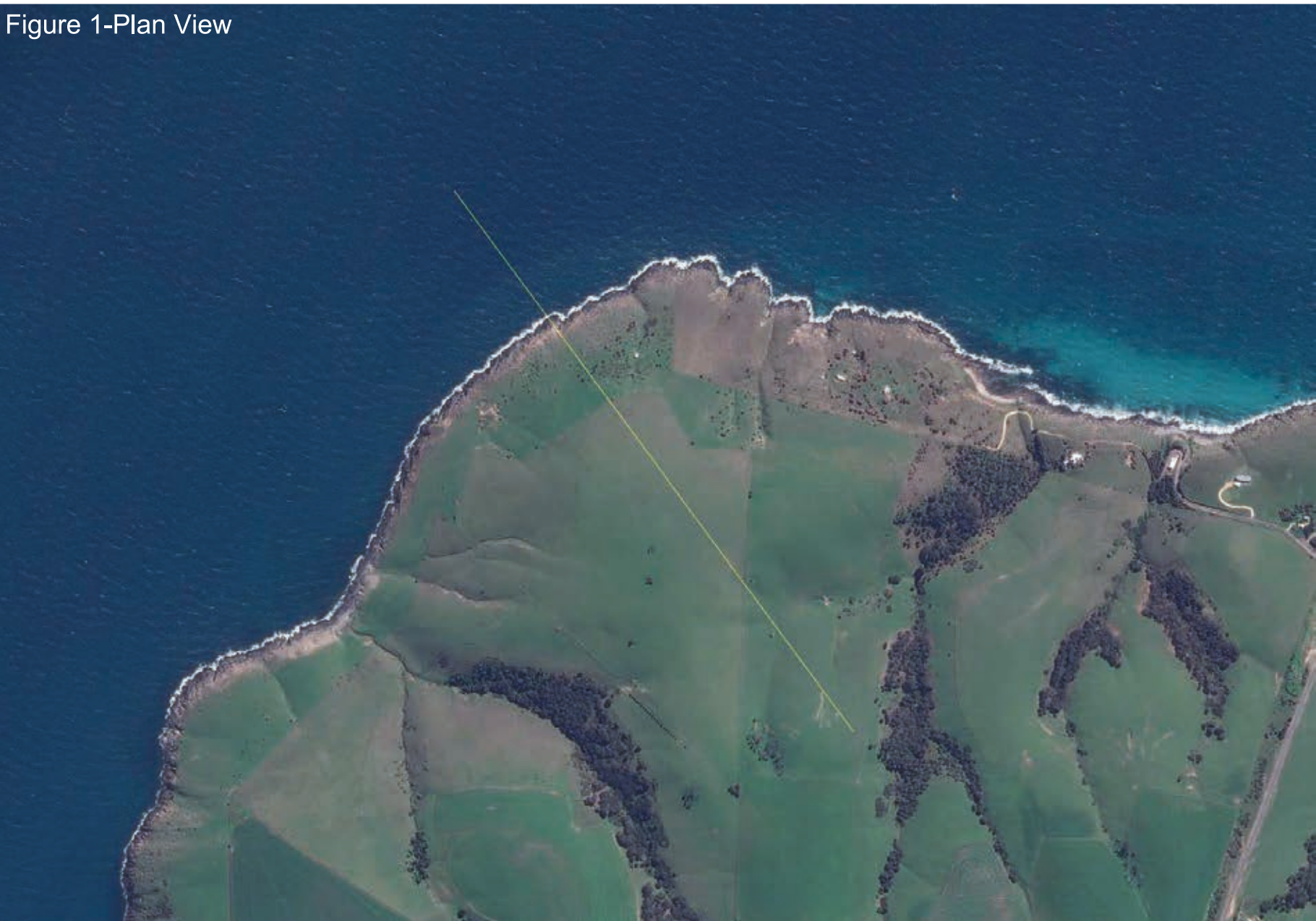


Figure 2-Regional View



Figure 3-Cross-section

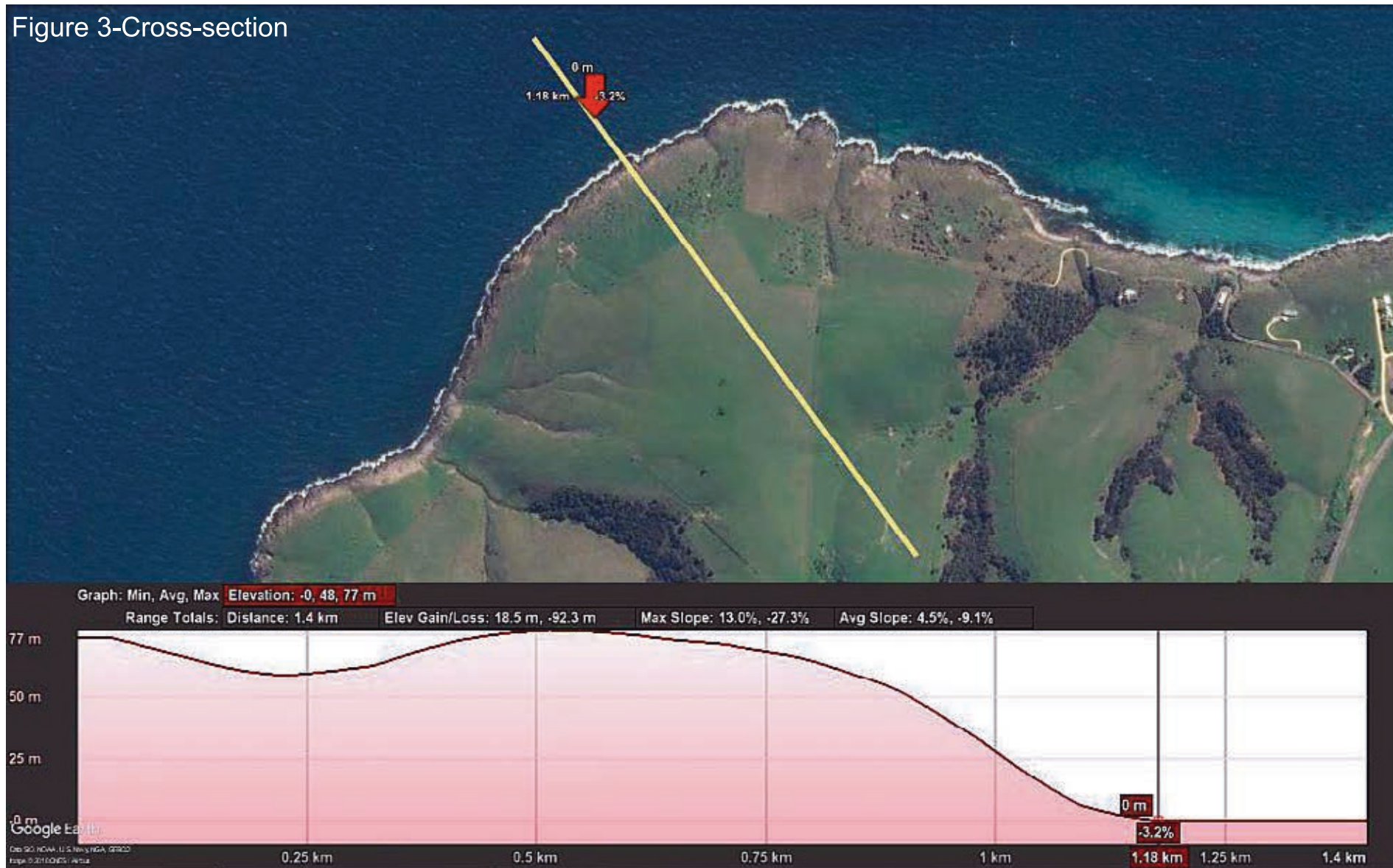


Figure 4-Depth Data



Figure 5-Coastline-01



Figure 6-Coastline-02

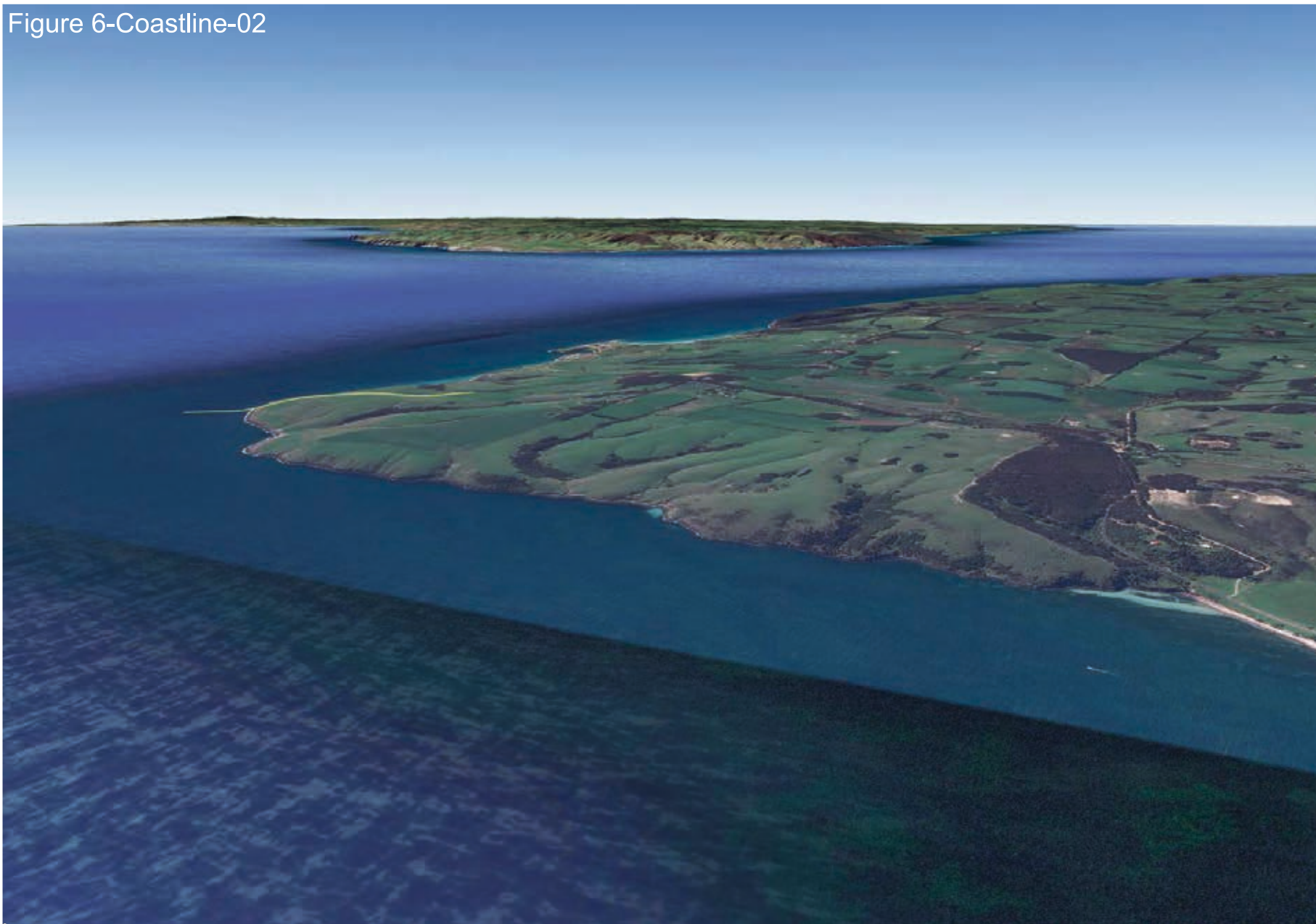


Figure 7-Coastline-offshore



Appendix F

Kingscote

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore



Figure 1-Plan View







Figure 5-Coastline-01



Figure 6-Coastline-02

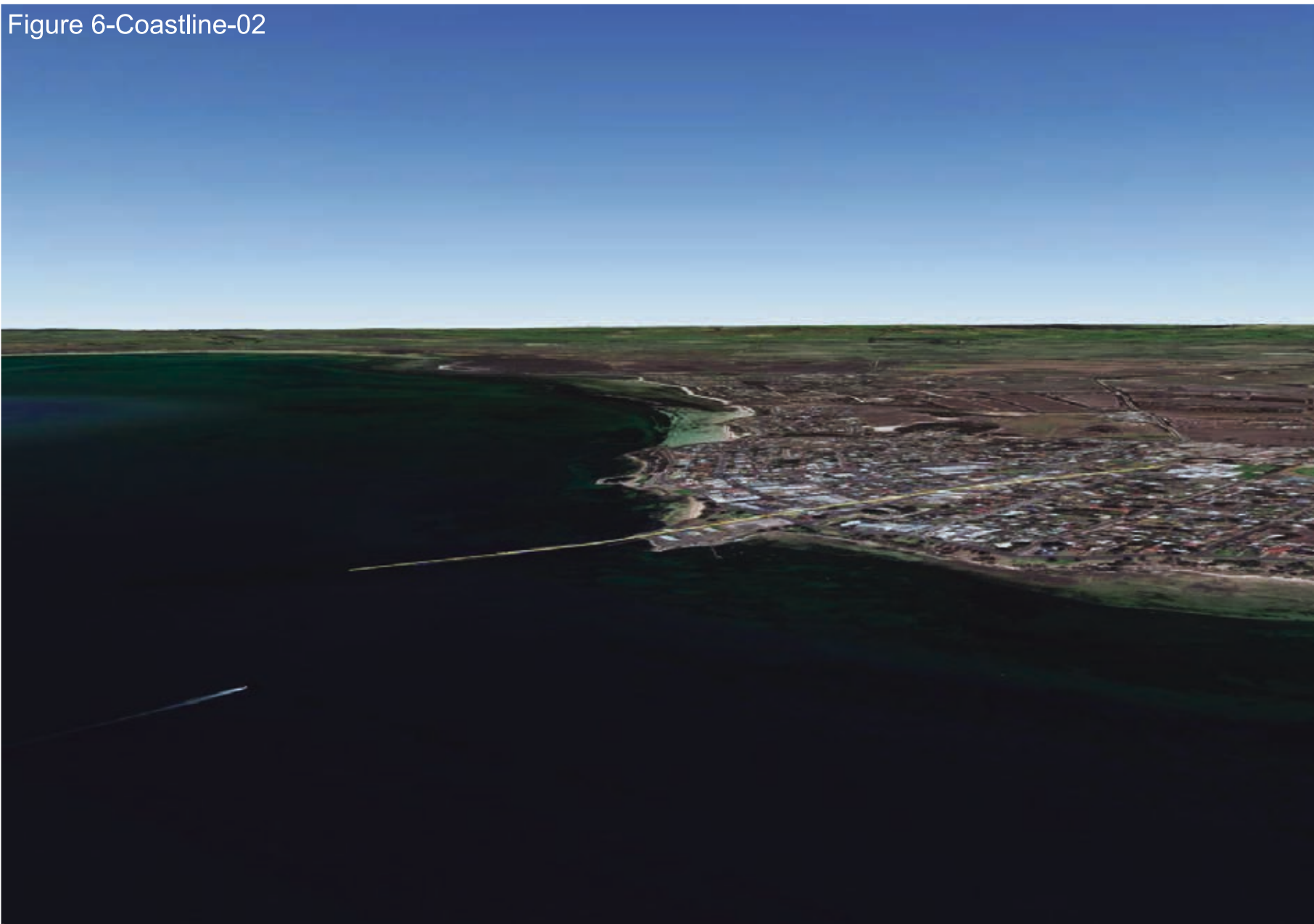
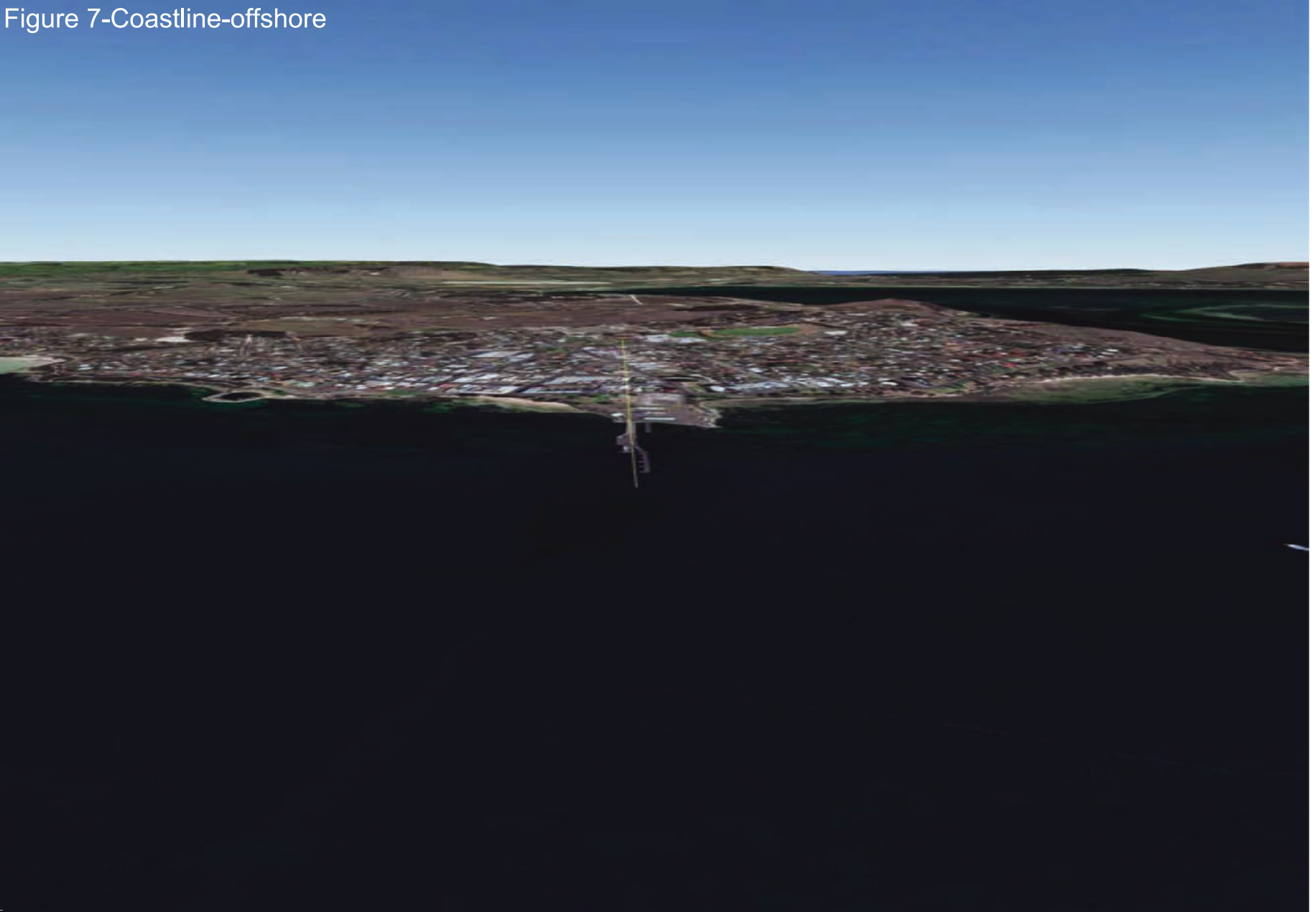


Figure 7-Coastline-offshore



Appendix G

Penneshaw

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

Figure 1-Plan View

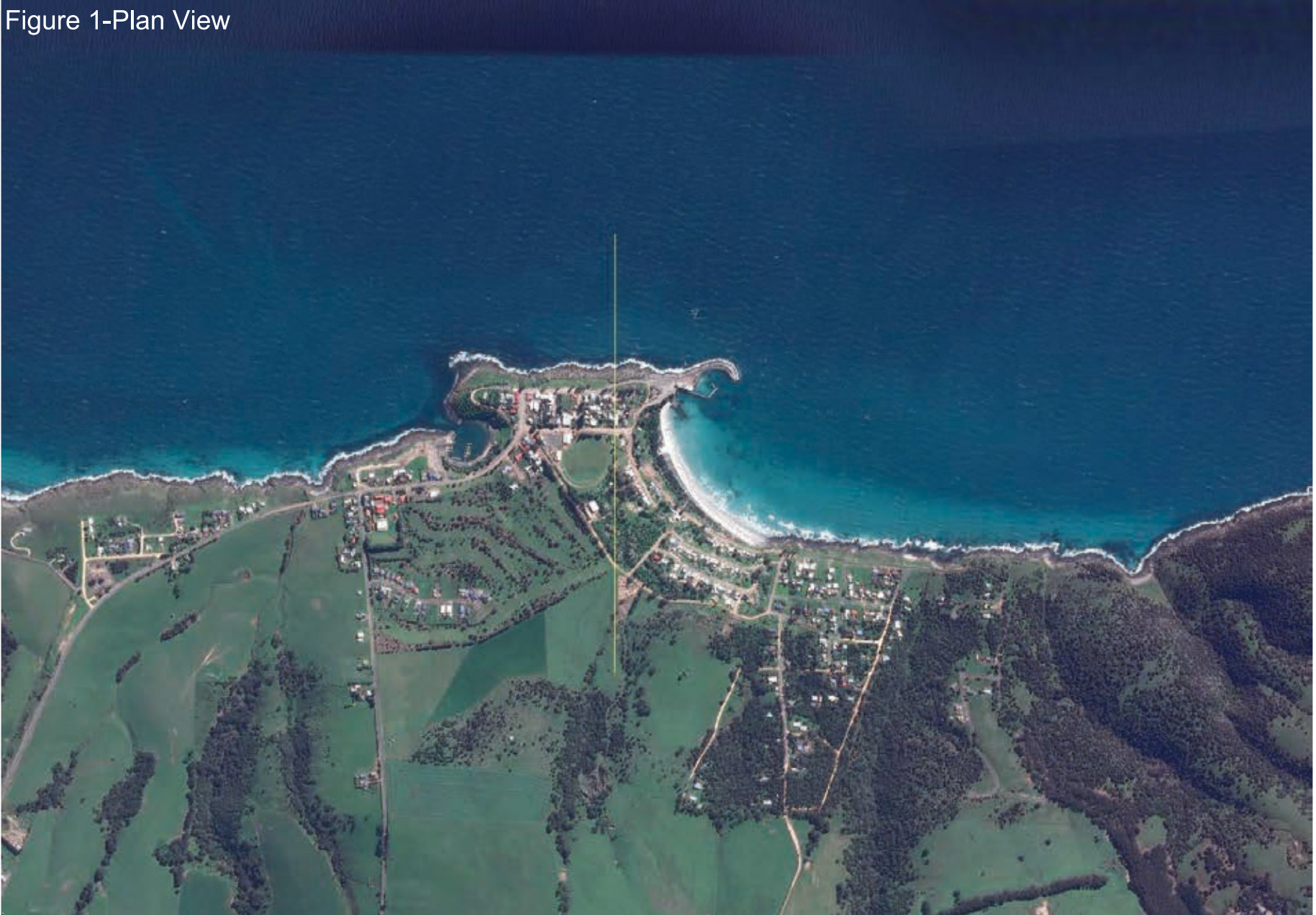


Figure 2-Regional View



Figure 3-Cross-section

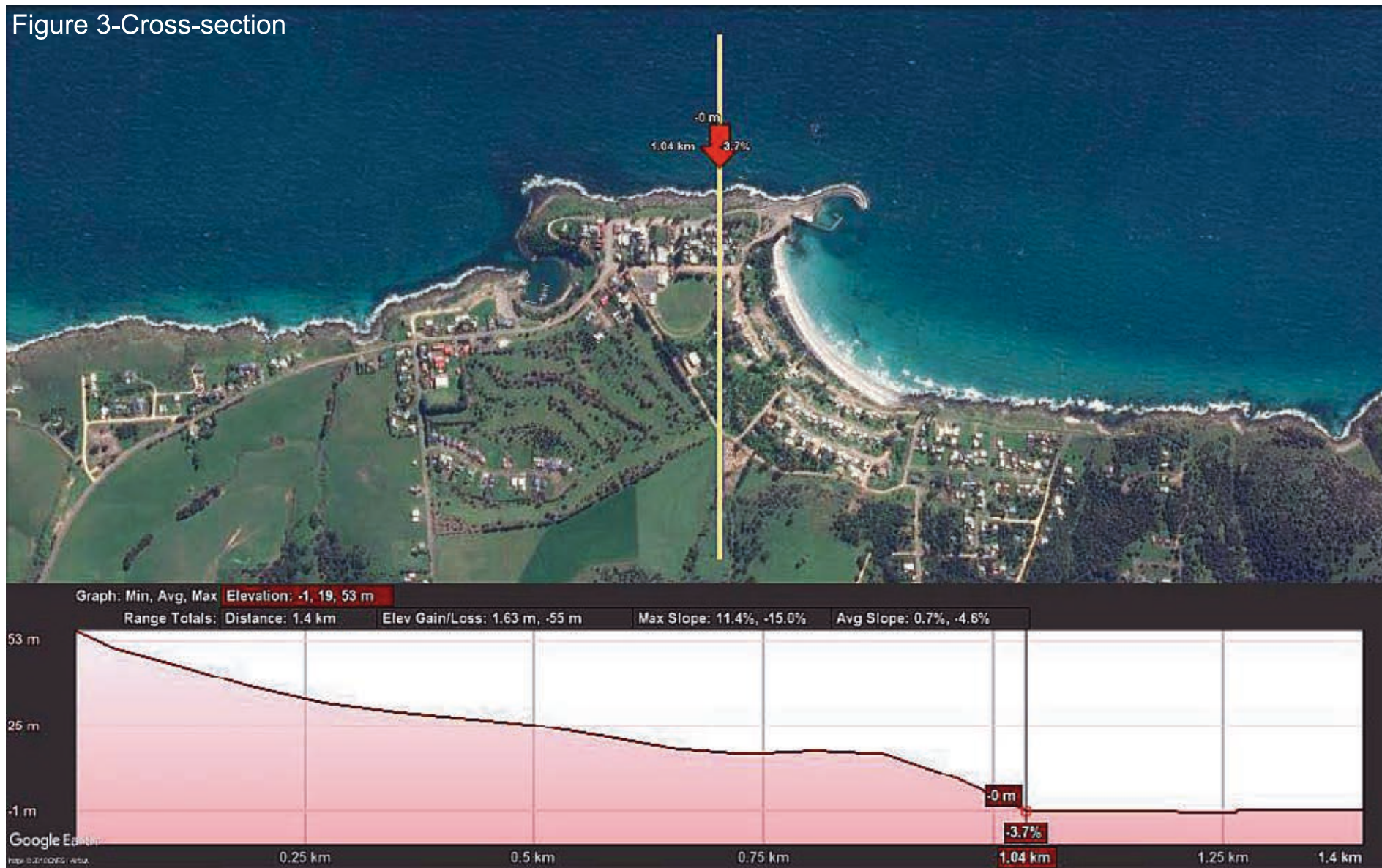


Figure 4-Depth Data

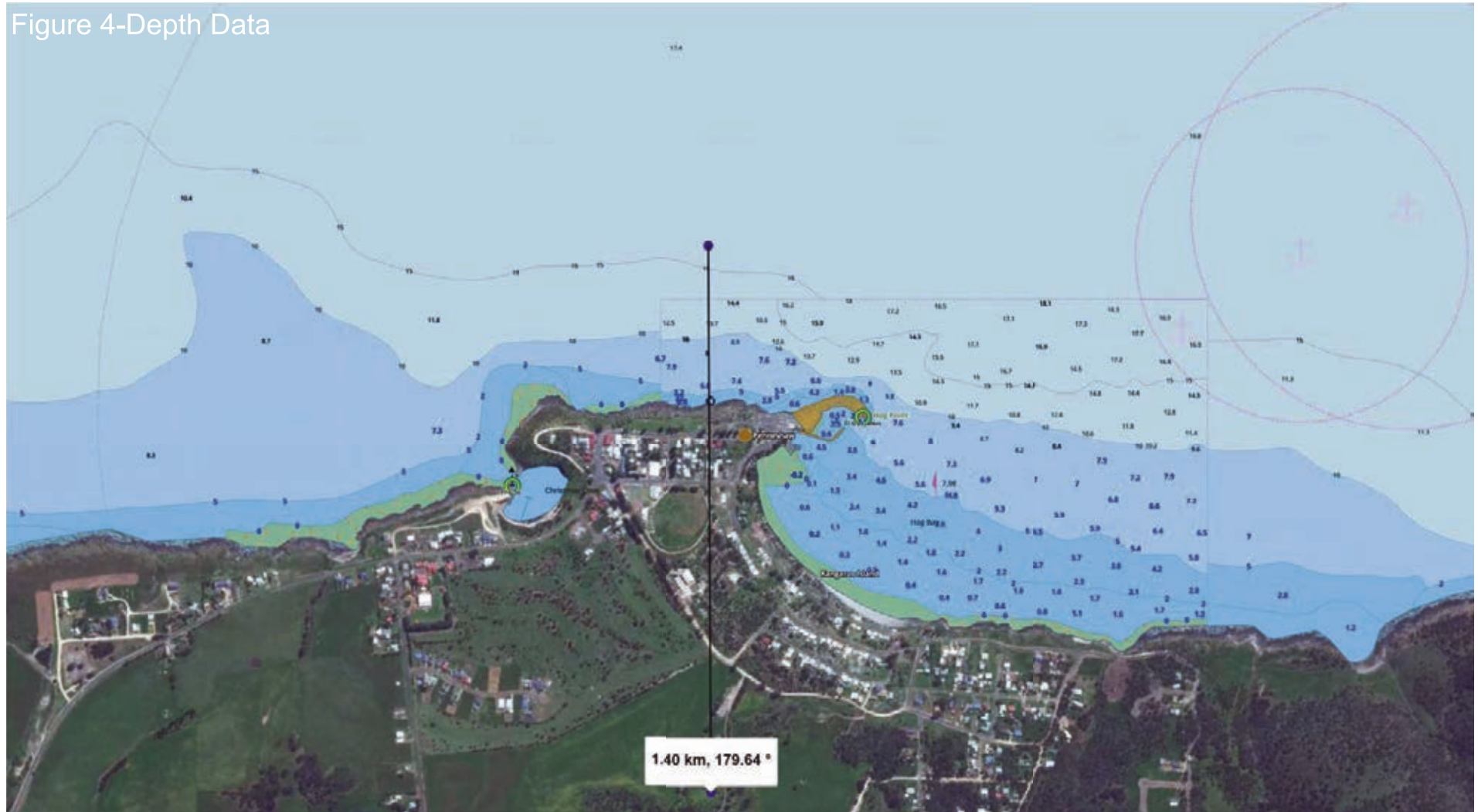


Figure 5-Coastline-01

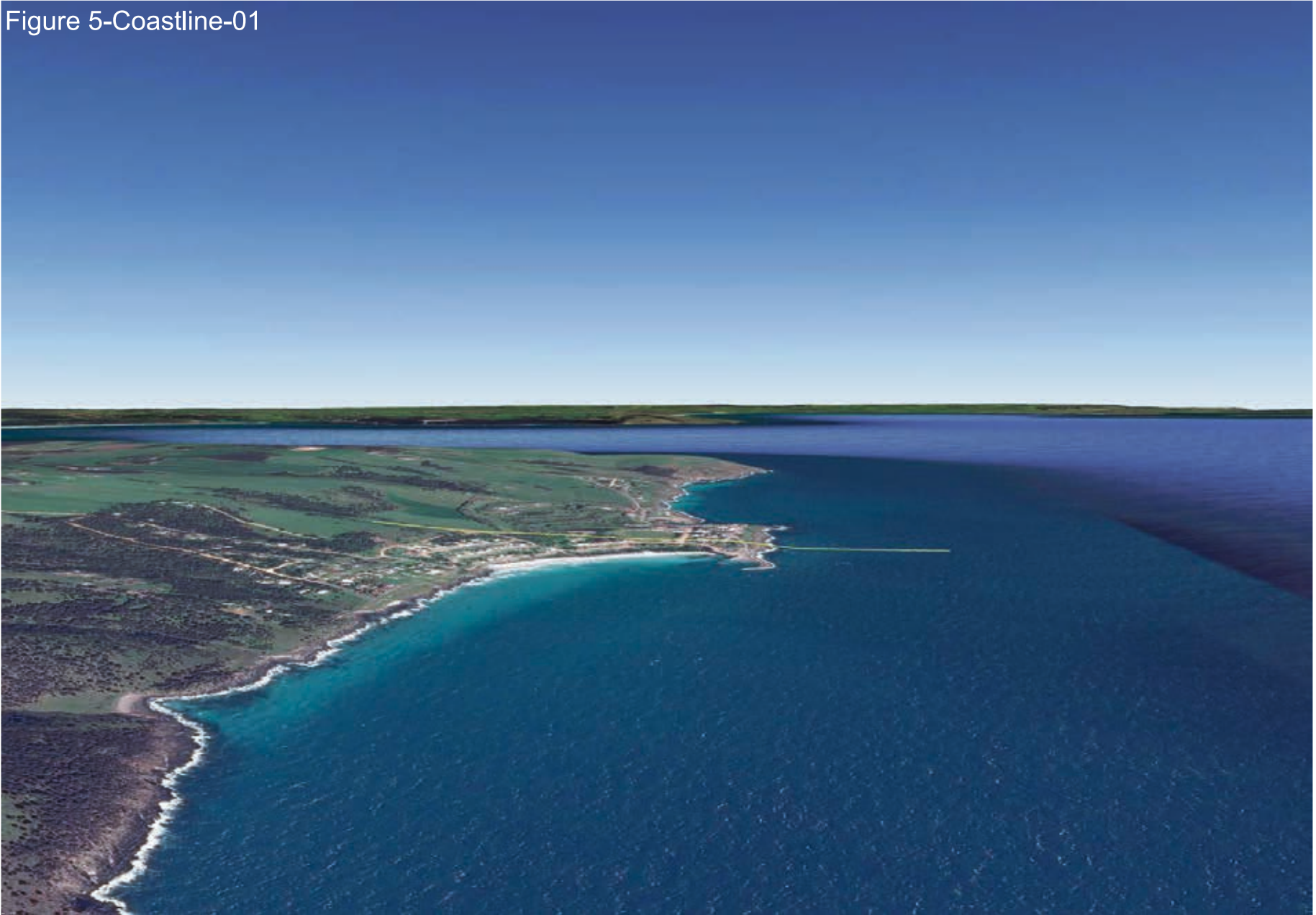


Figure 6-Coastline-02



Figure 7-Coastline-offshore



Appendix H

Point Morrison (Norma Cove)

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore



Figure 1-Plan View

Figure 2-Regional View



Figure 3-Cross-section



Figure 4-Depth Data



Figure 5-Coastline-01

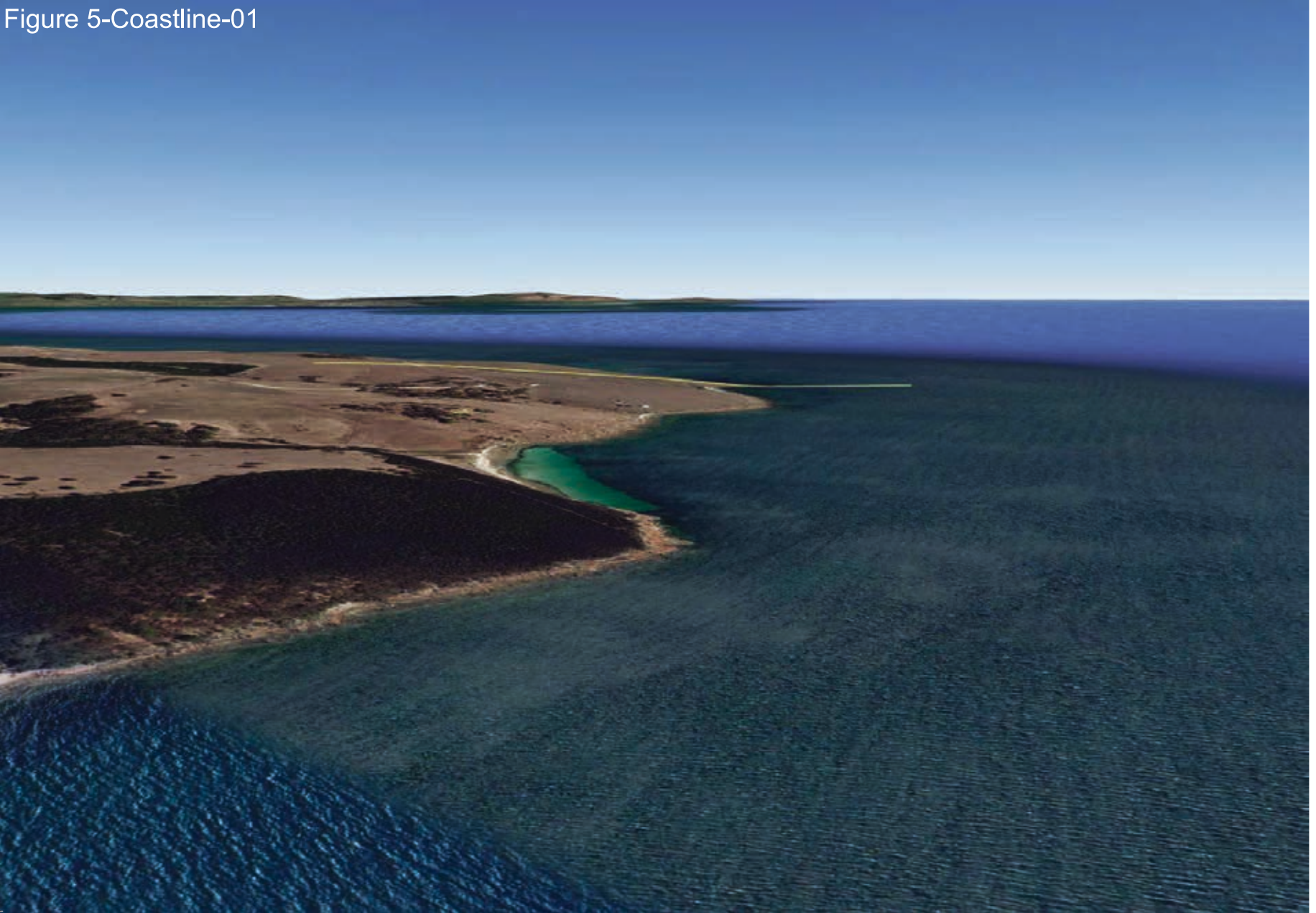


Figure 6-Coastline-02

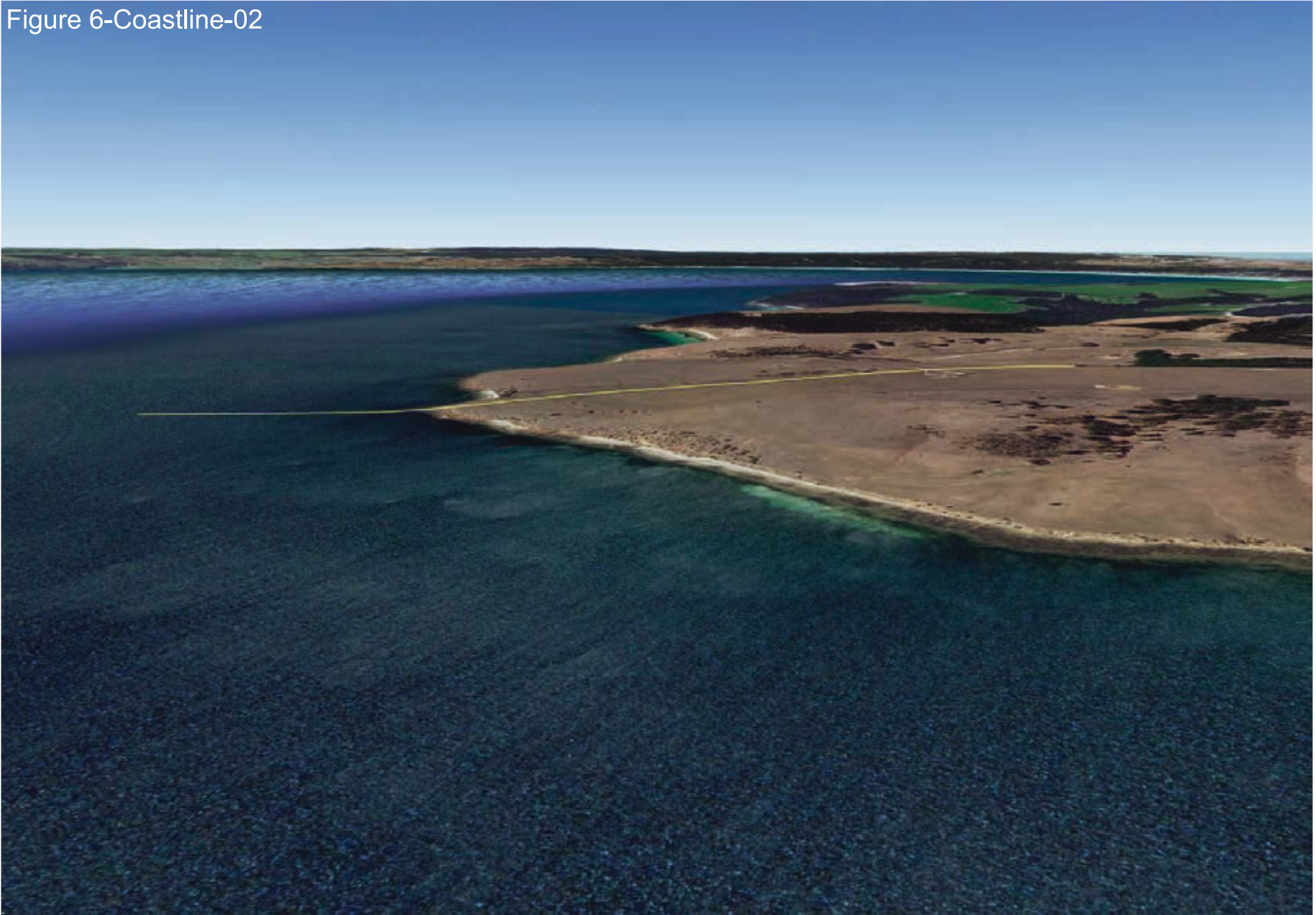
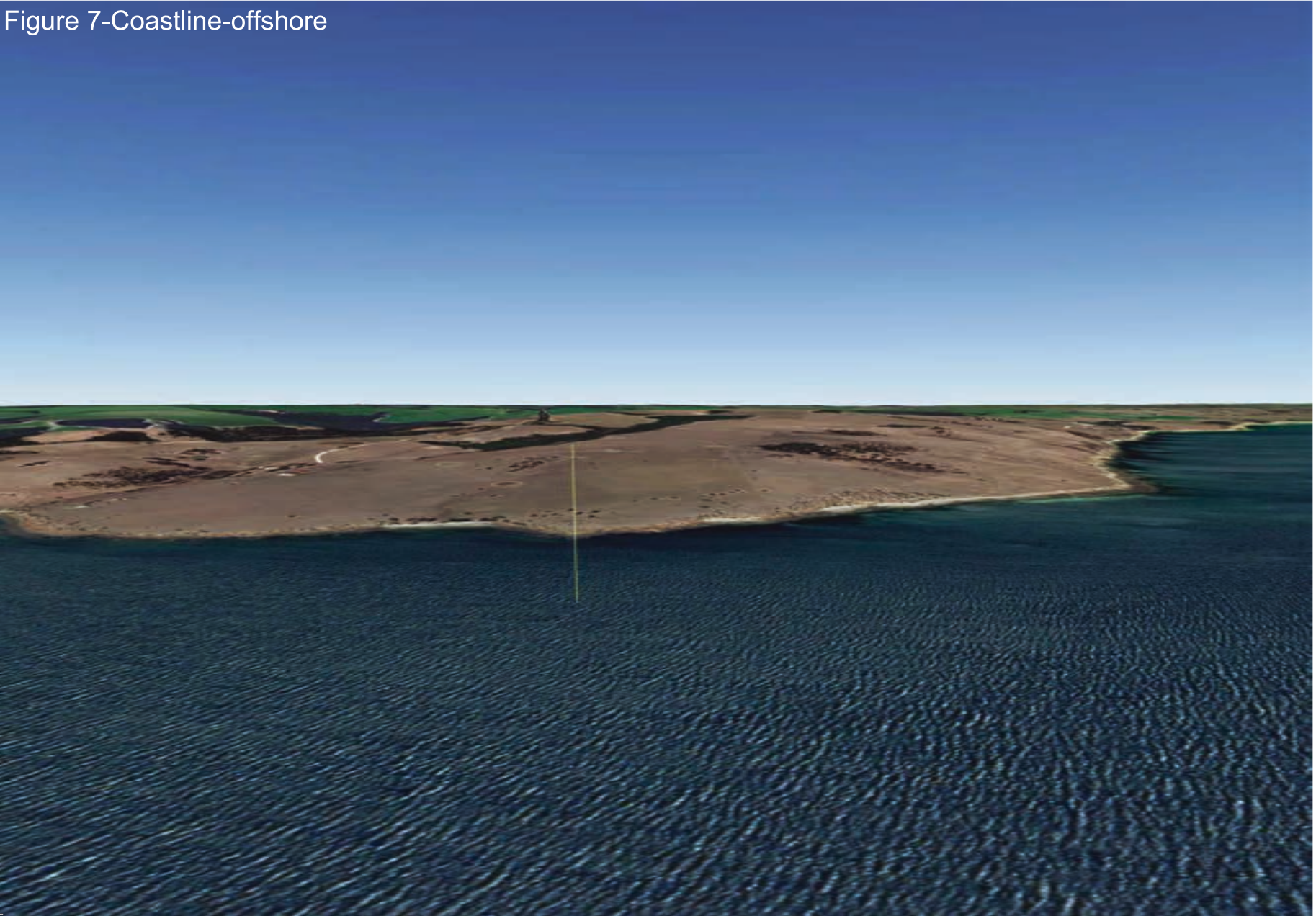


Figure 7-Coastline-offshore



Appendix I

Smith Bay Site

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

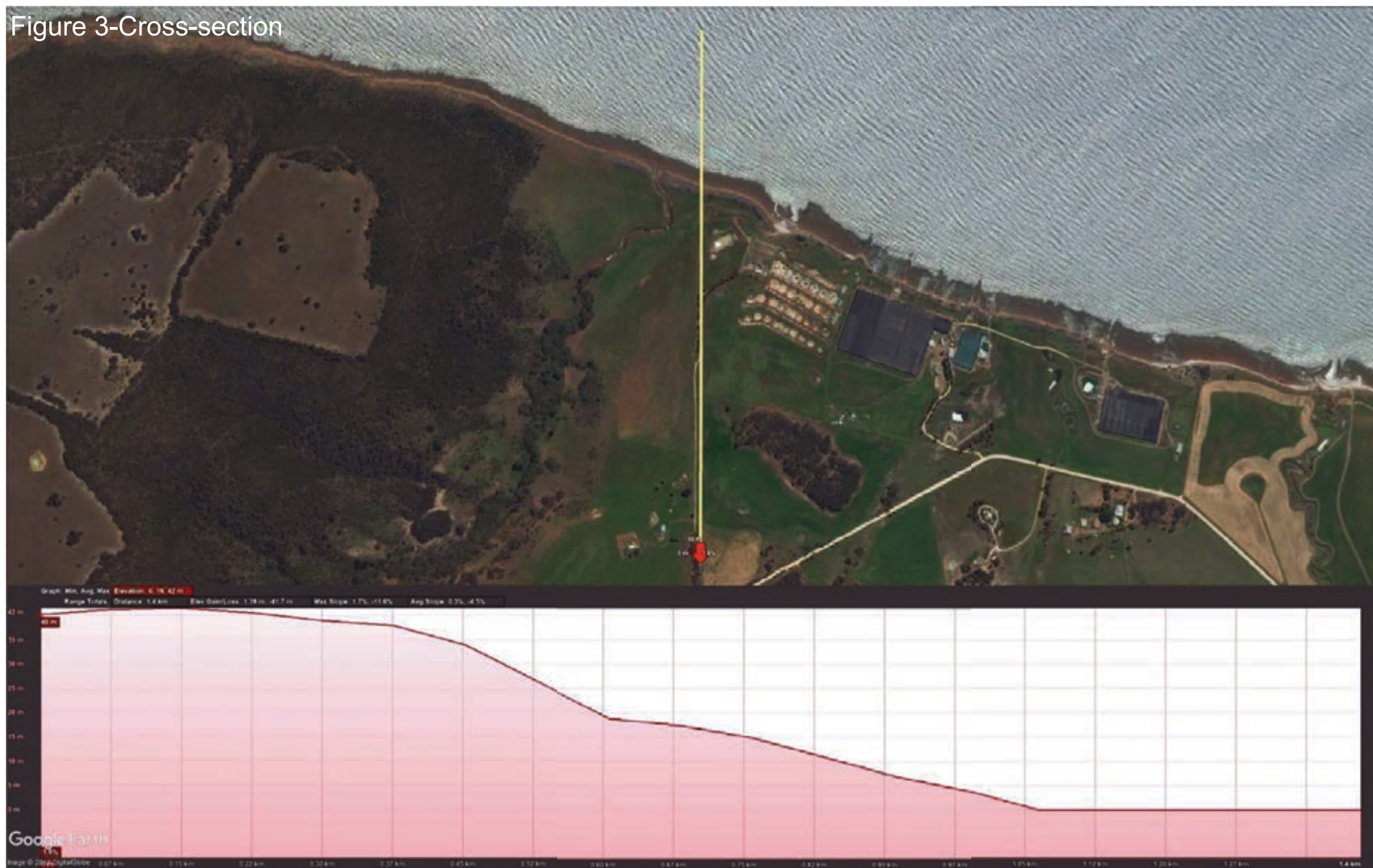
Figure 7 Coastline-offshore



Figure 2-Regional View



Figure 3-Cross-section



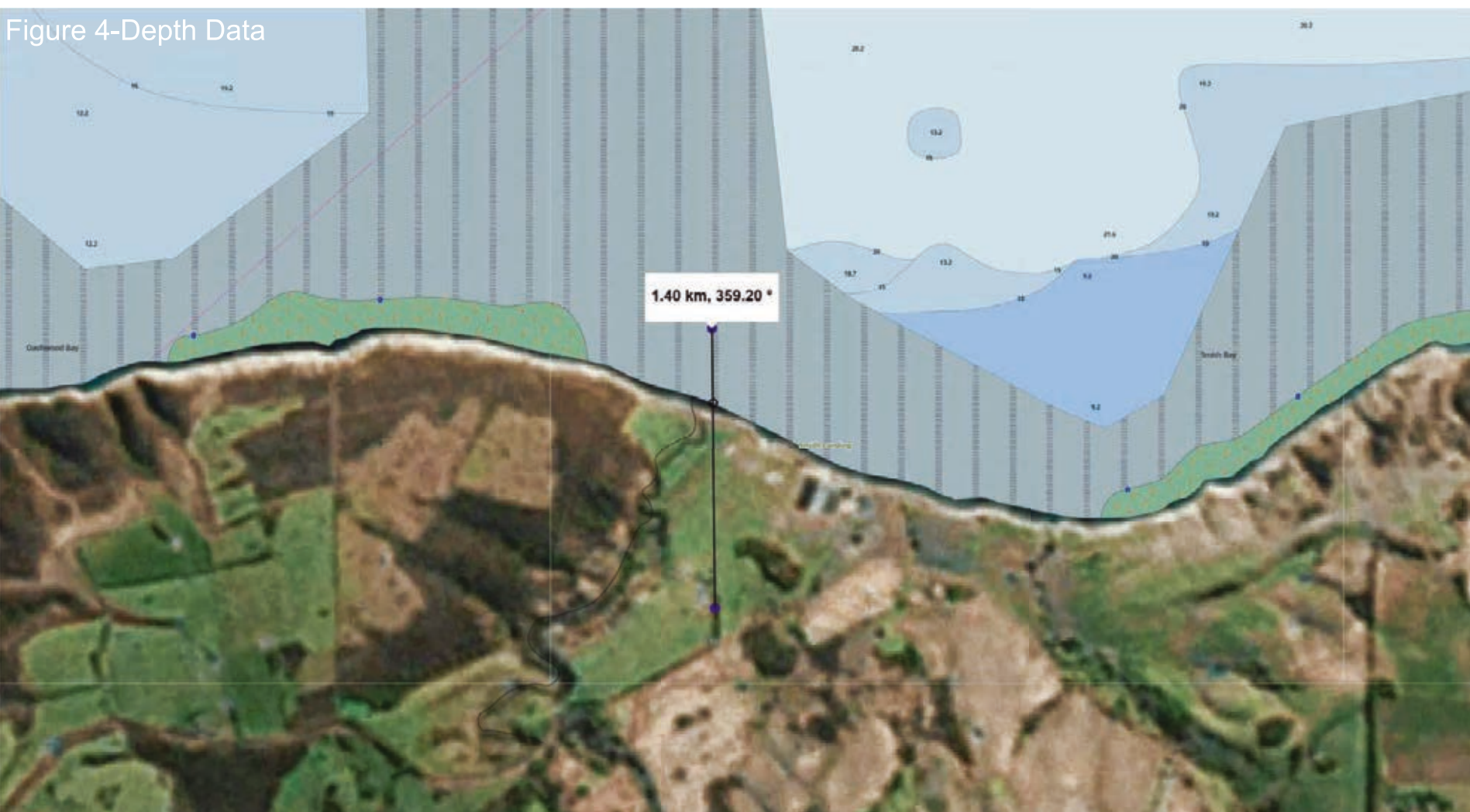


Figure 5-Coastline-01



Figure 6-Coastline-02



Figure 7-Coastline-offshore



Appendix J

Snug Cove

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

Figure 1-Plan View



Figure 2-Regional View



Figure 3-Cross-section

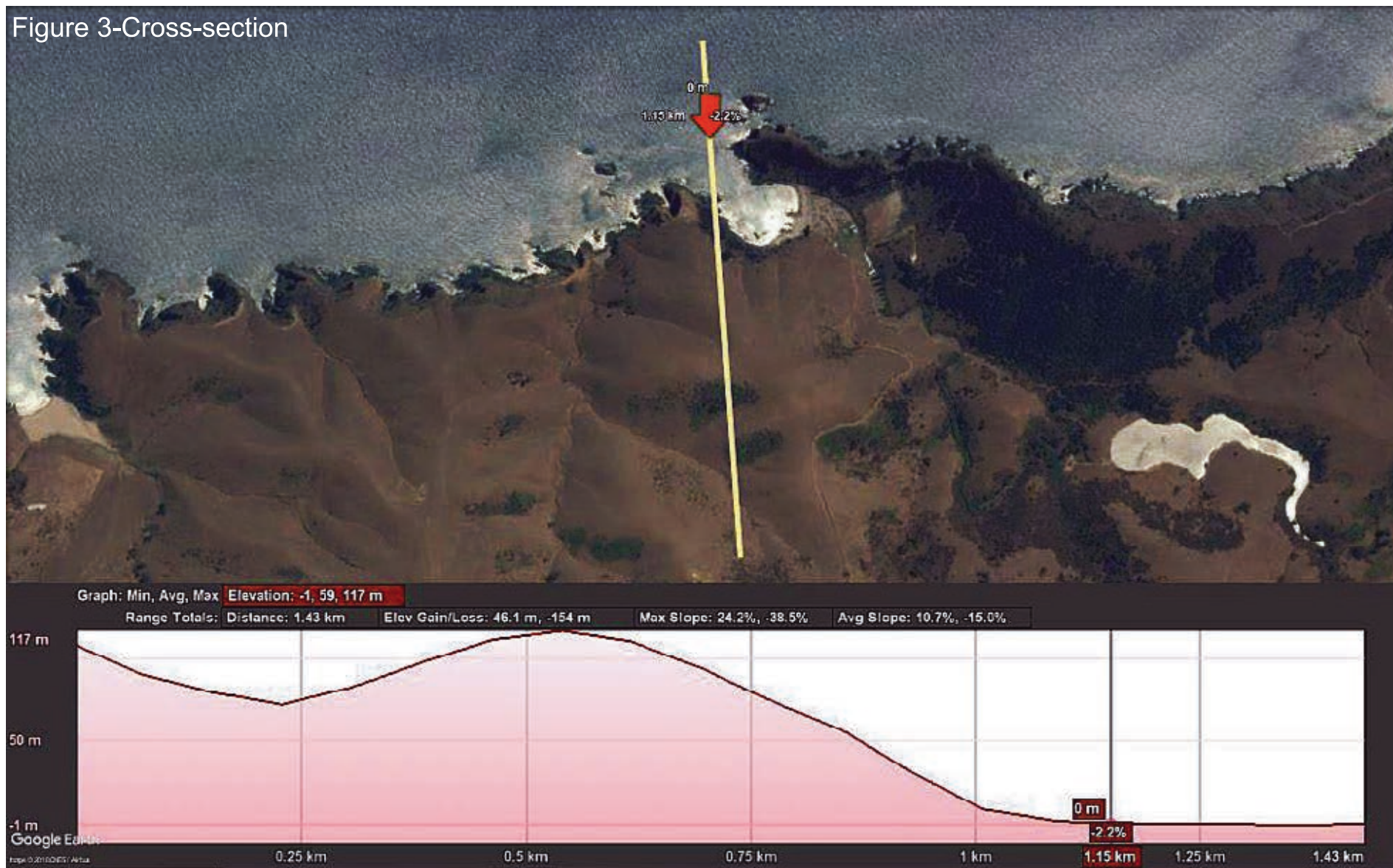


Figure 4-Depth Data

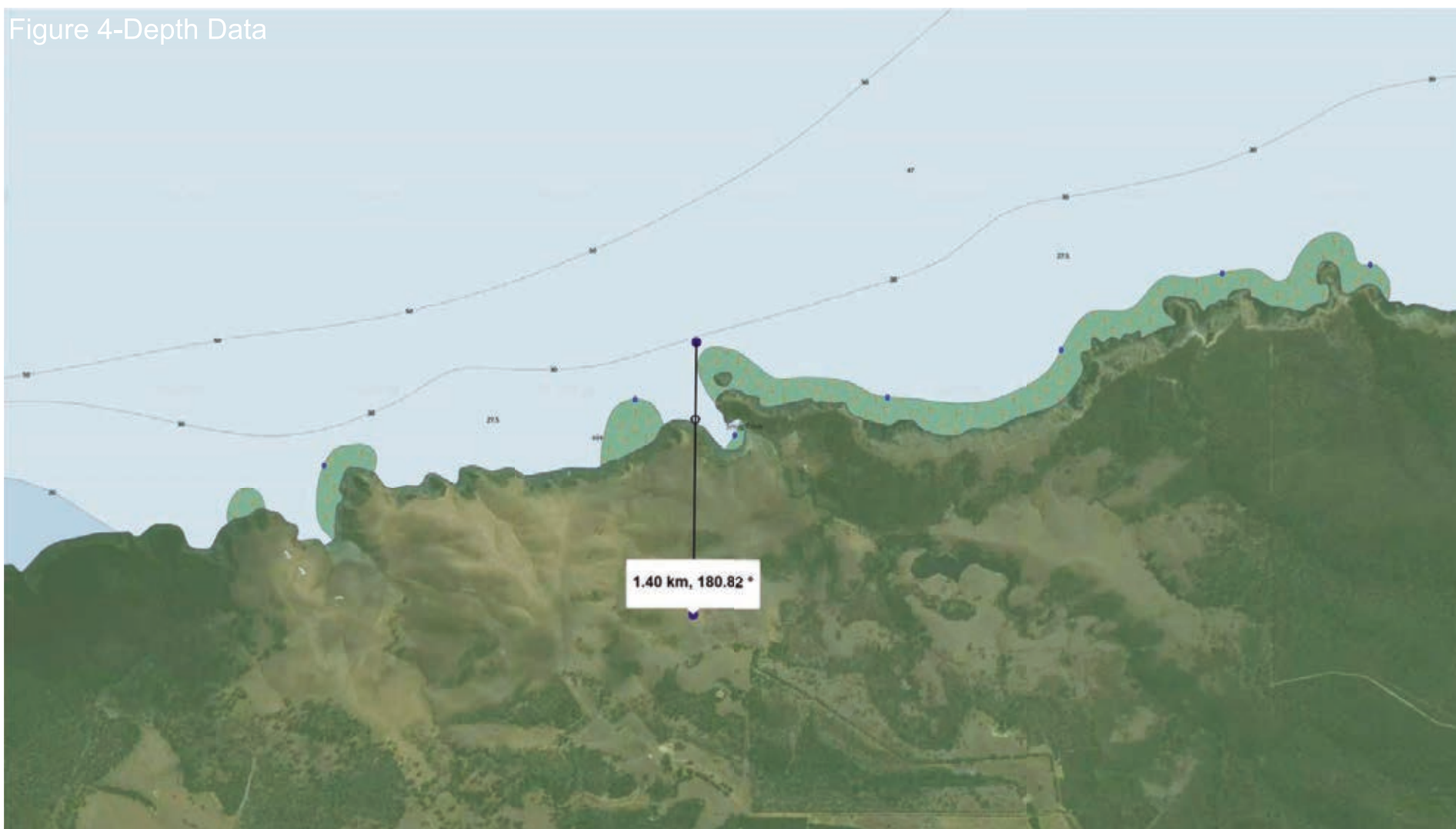


Figure 5-Coastline-01



Figure 6-Coastline-02

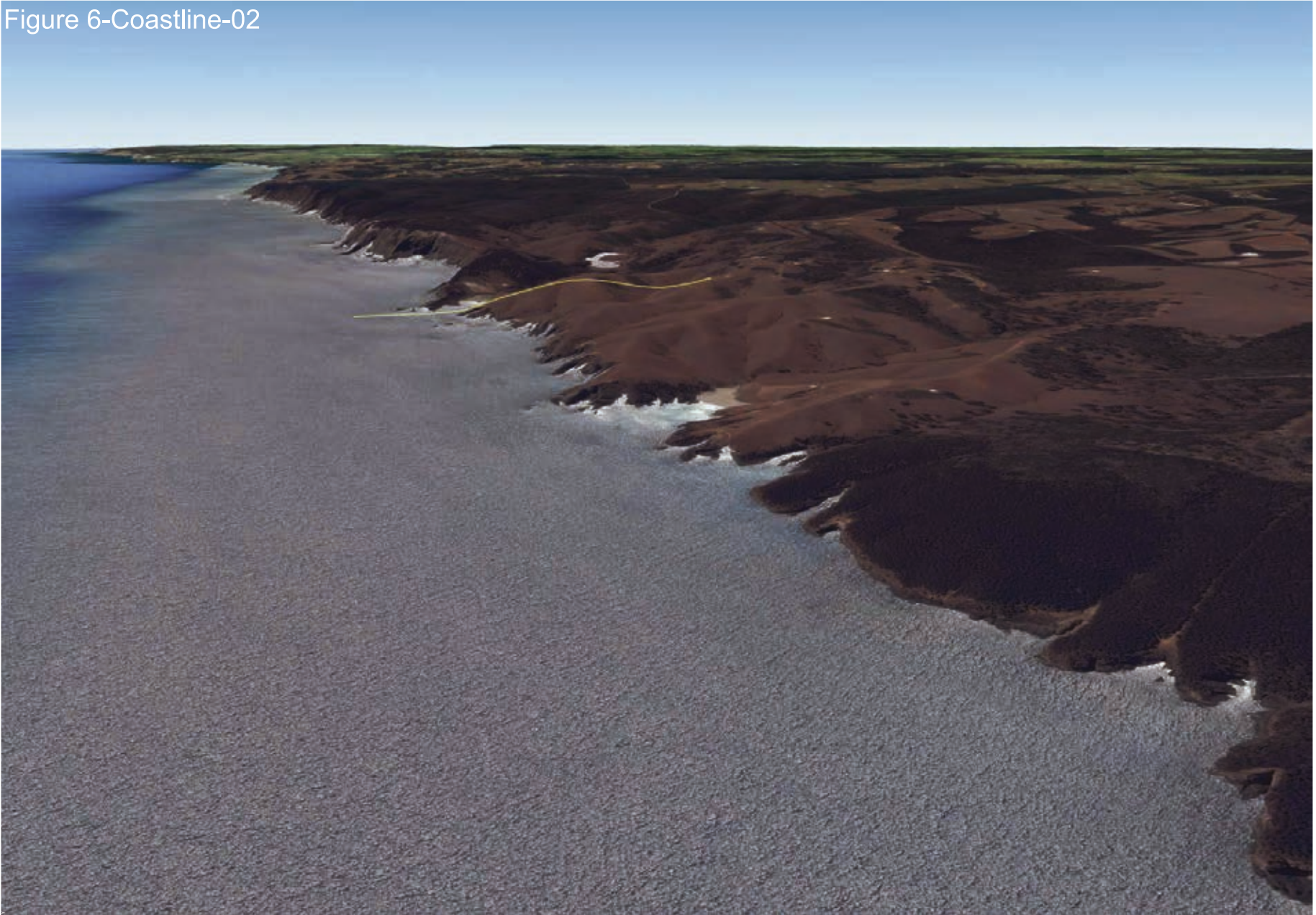
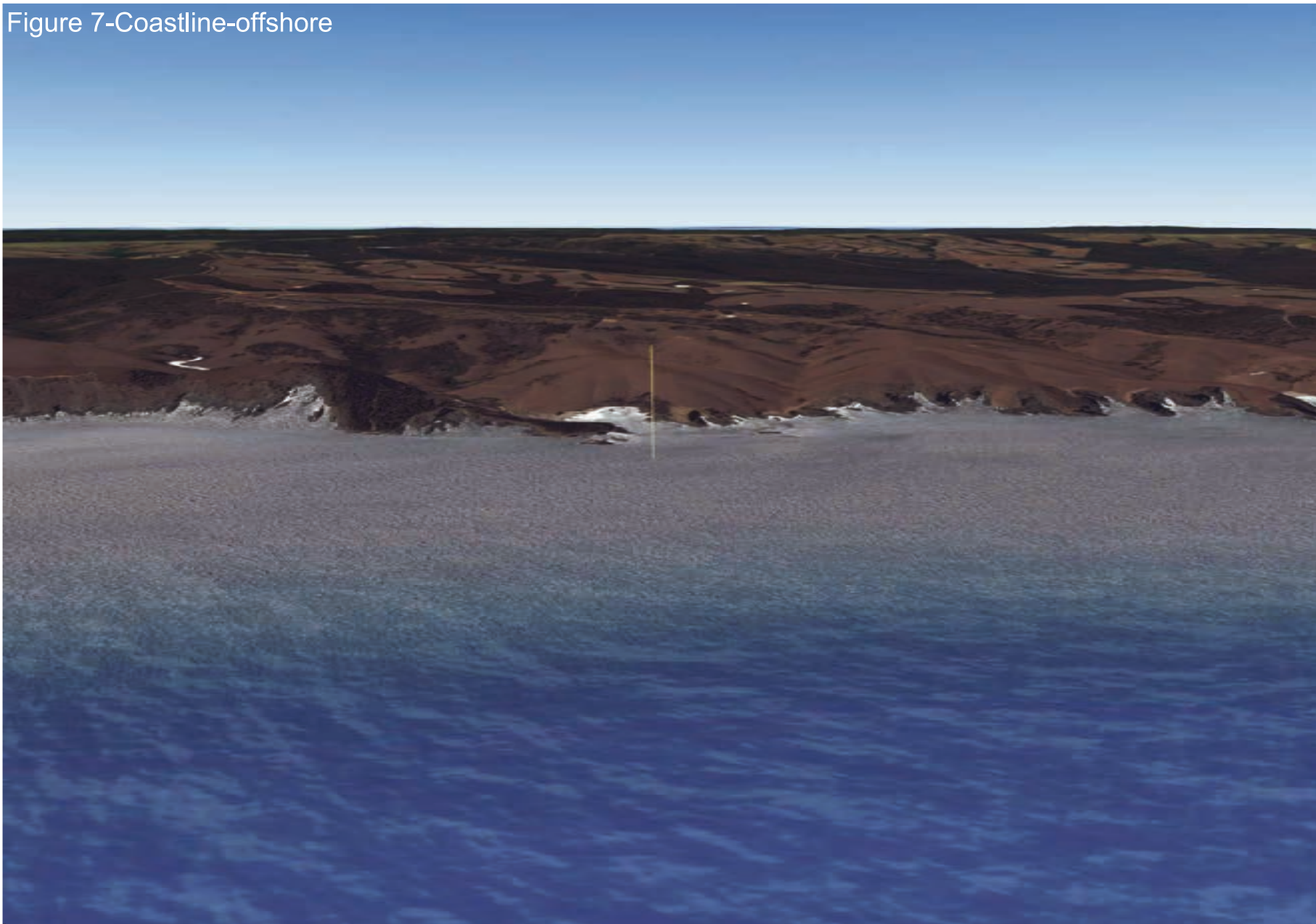


Figure 7-Coastline-offshore



Appendix K

Vivonne Bay

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

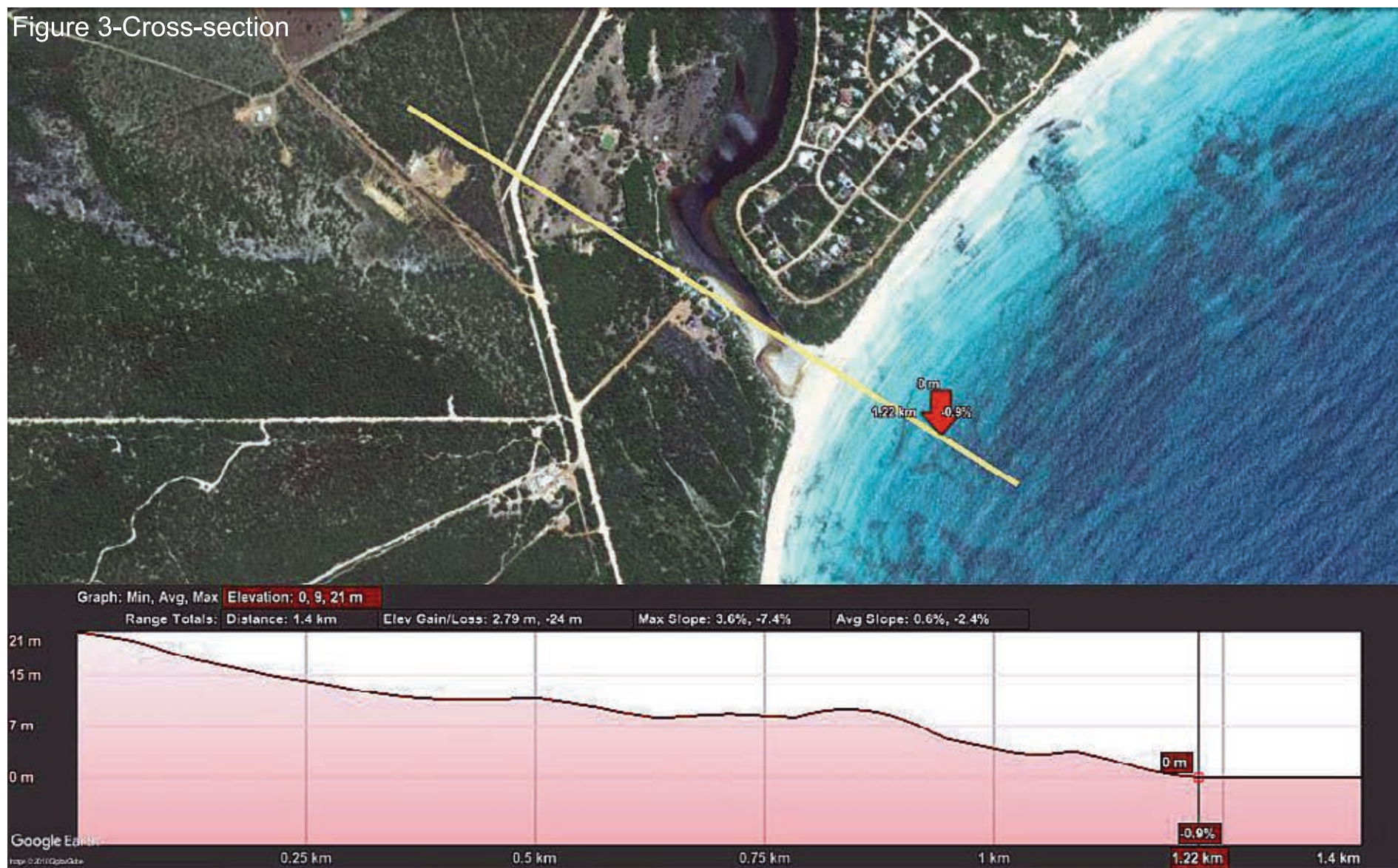
Figure 1-Plan View



Figure 2-Regional View



Figure 3-Cross-section



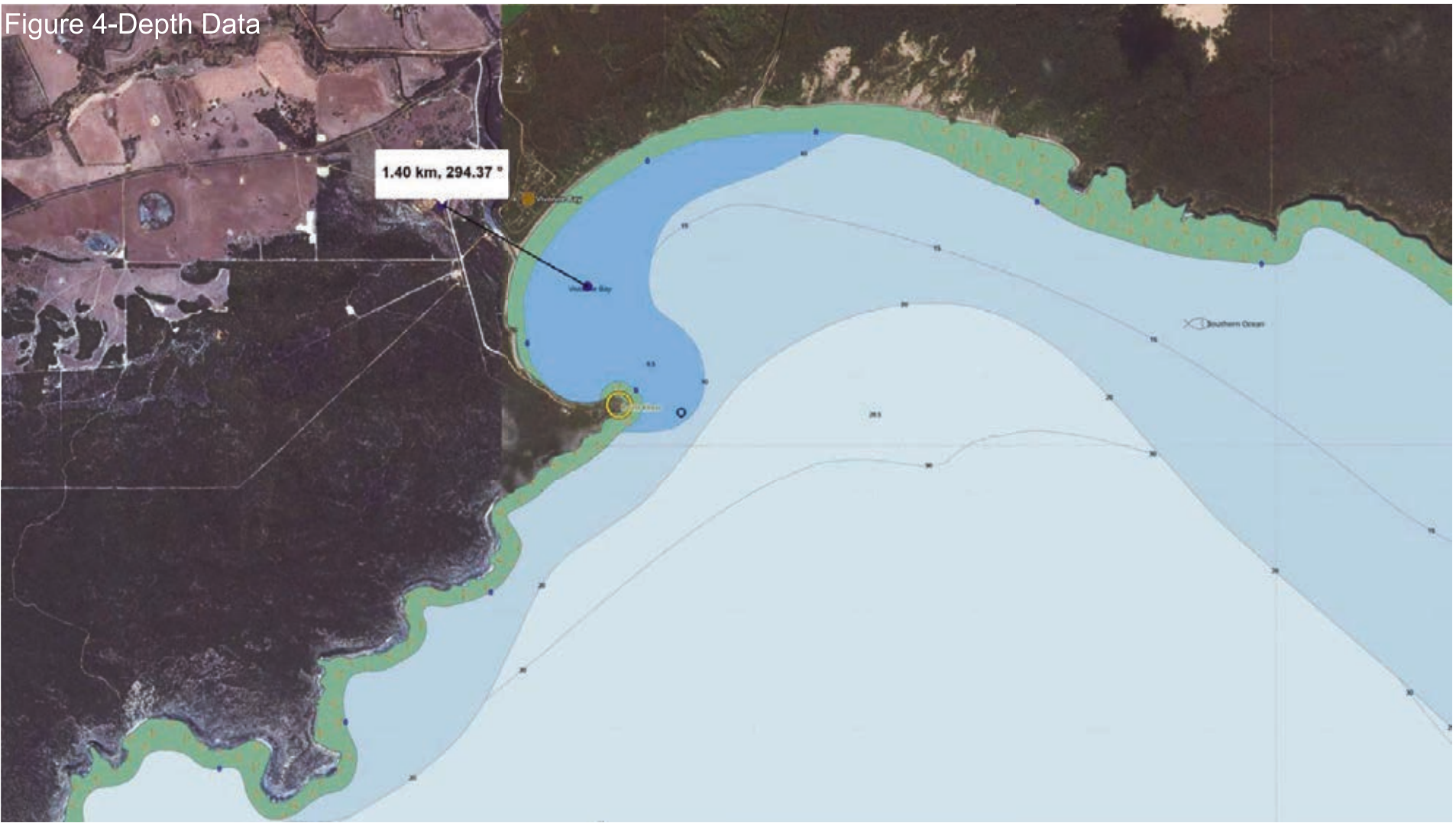


Figure 5-Coastline-01

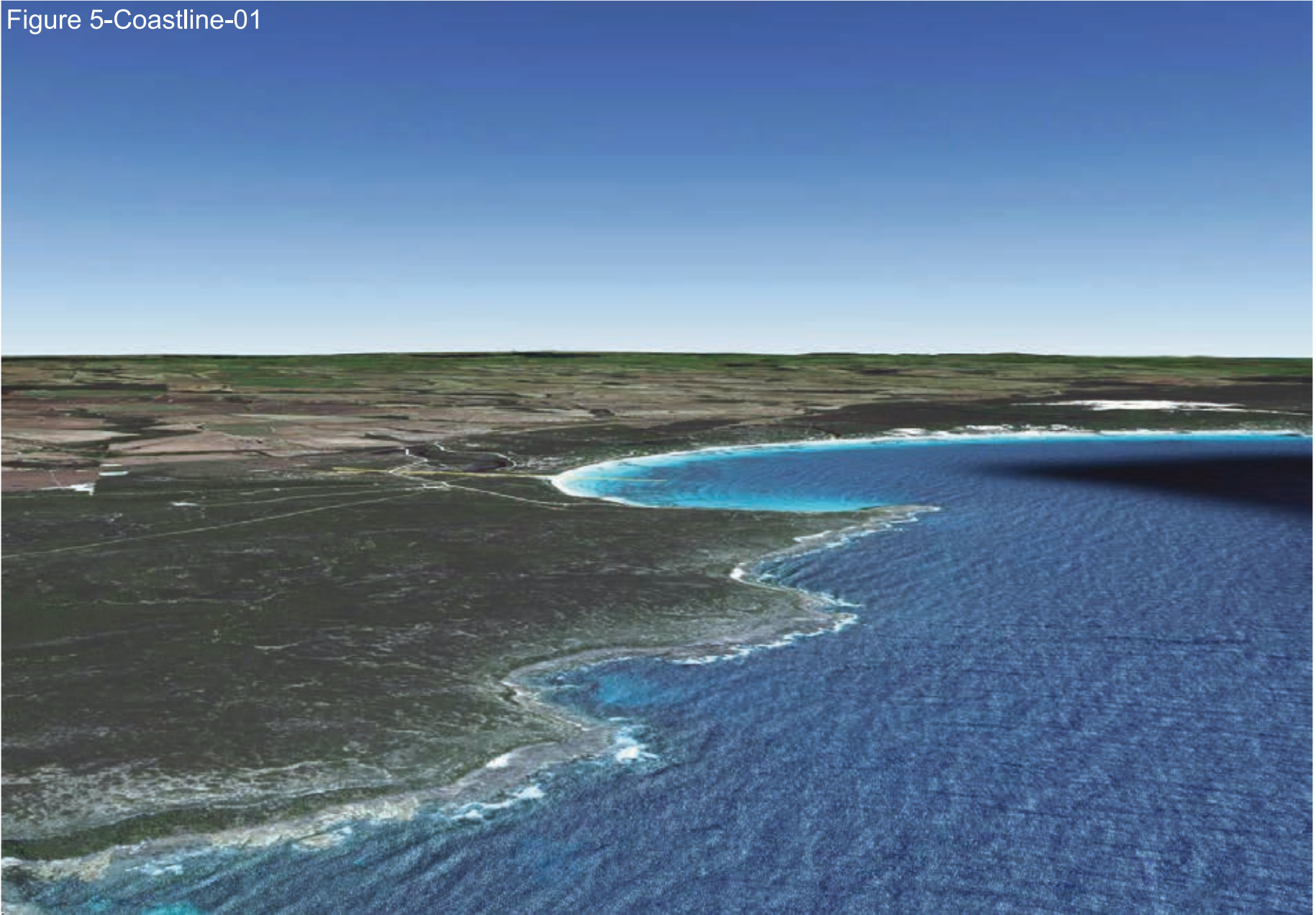


Figure 6-Coastline-02

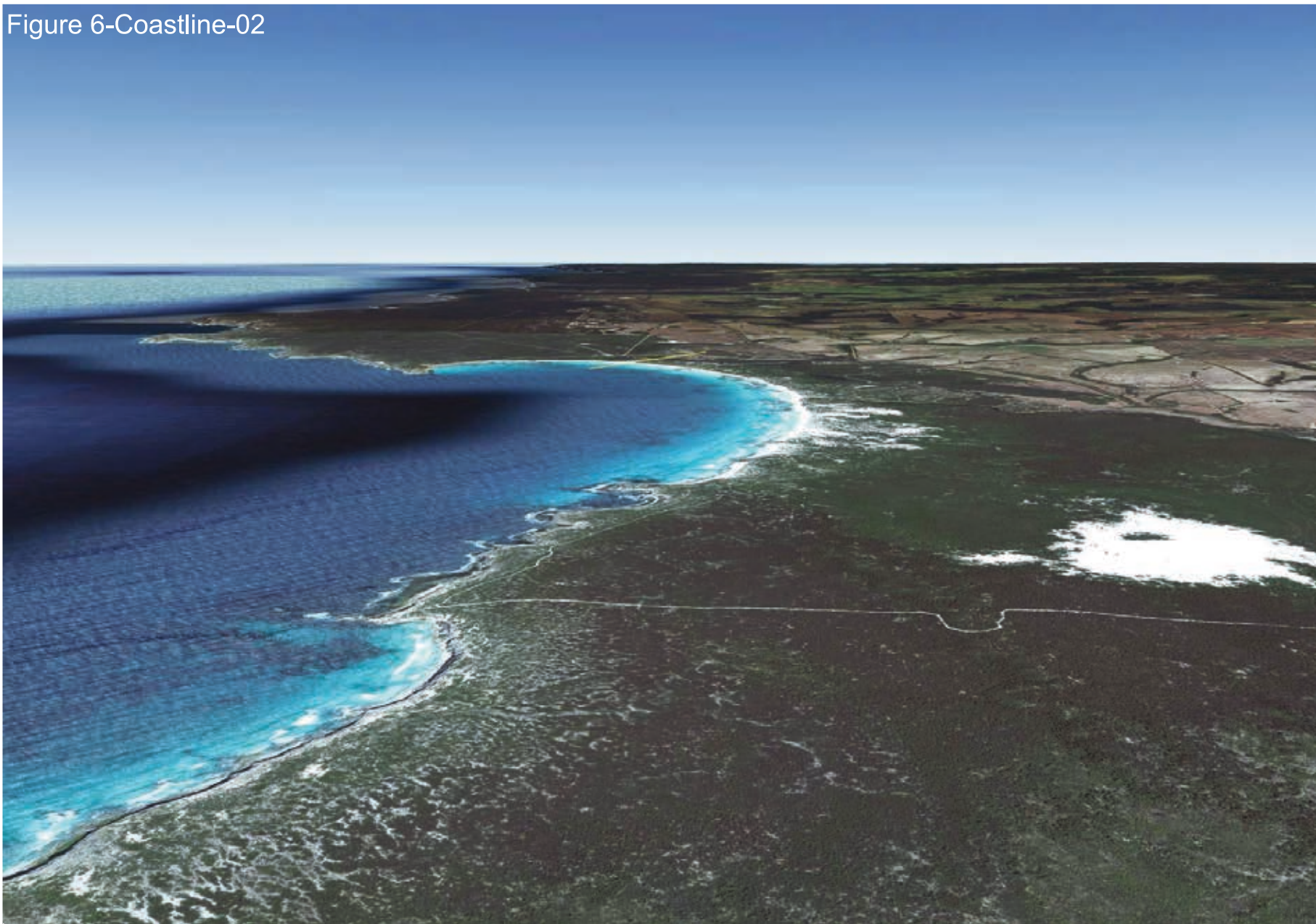
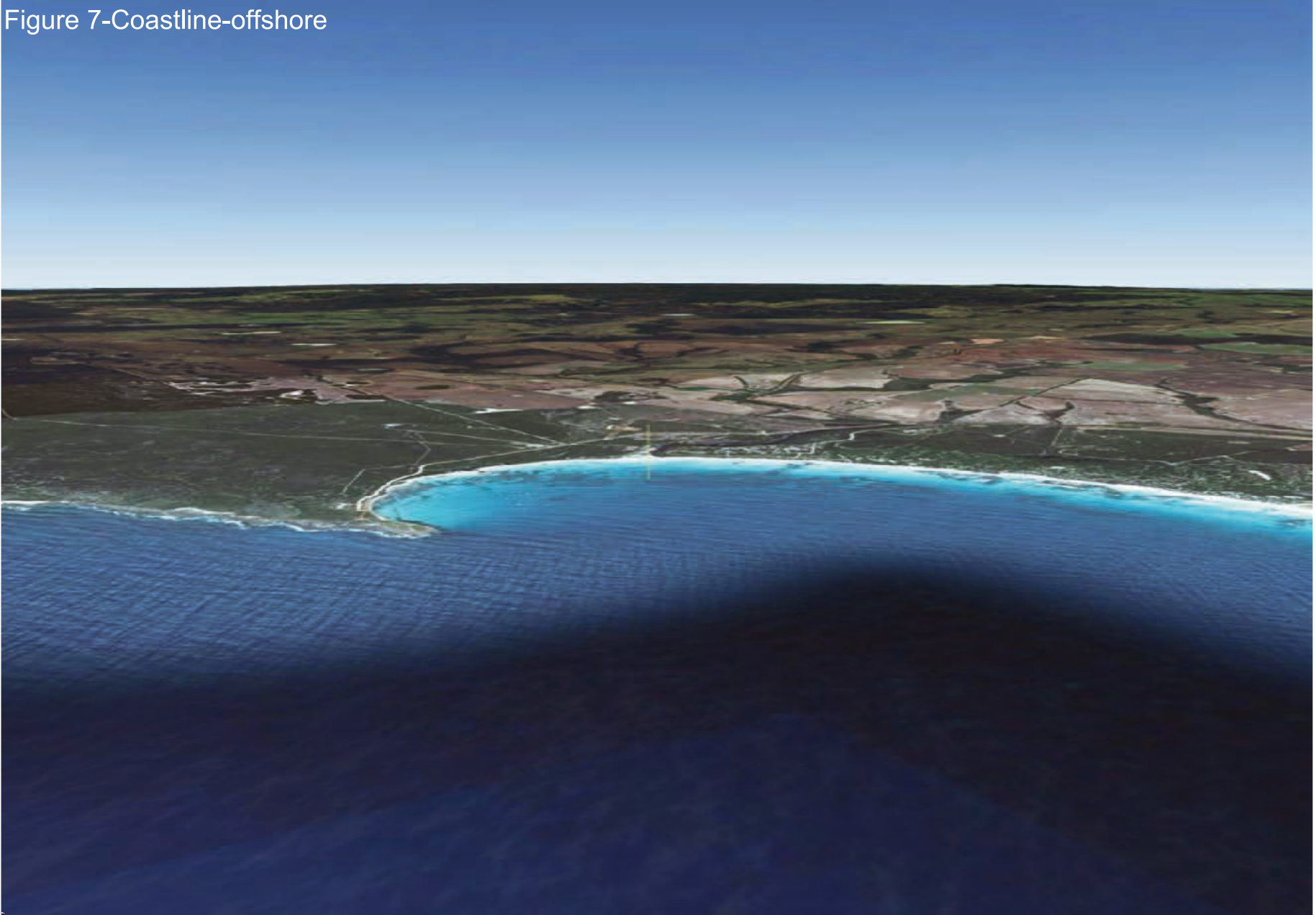


Figure 7-Coastline-offshore



Appendix L

Western River Cove

Figure 1 Profile Plan

Figure 2 Regional View

Figure 3 Profile Plan with Elevation Cross-section

Figure 4 Ocean Depth Data

Figure 5 Coastline 01

Figure 6 Coastline 02

Figure 7 Coastline-offshore

Figure 1-Plan View



Figure 2-Regional View

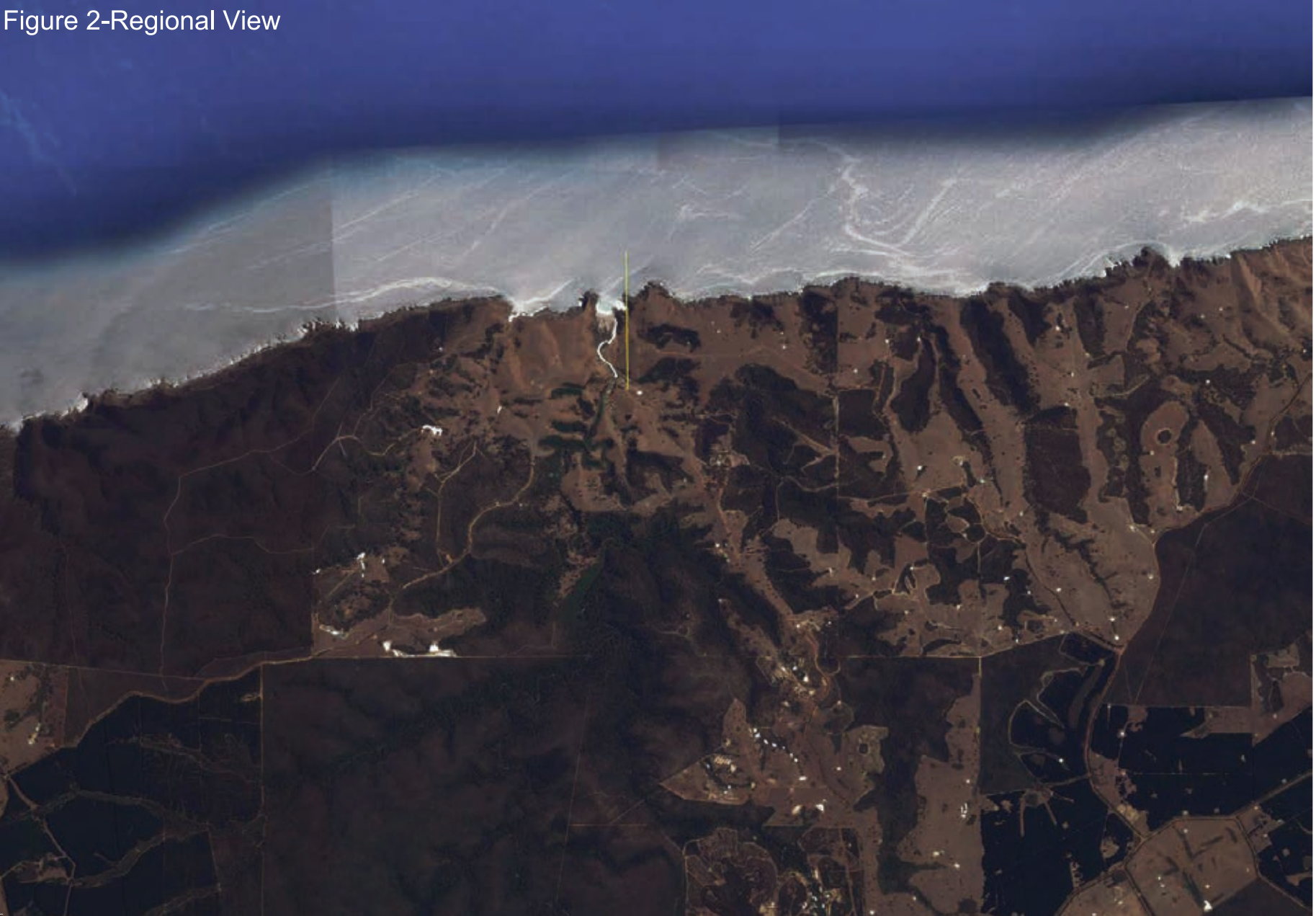
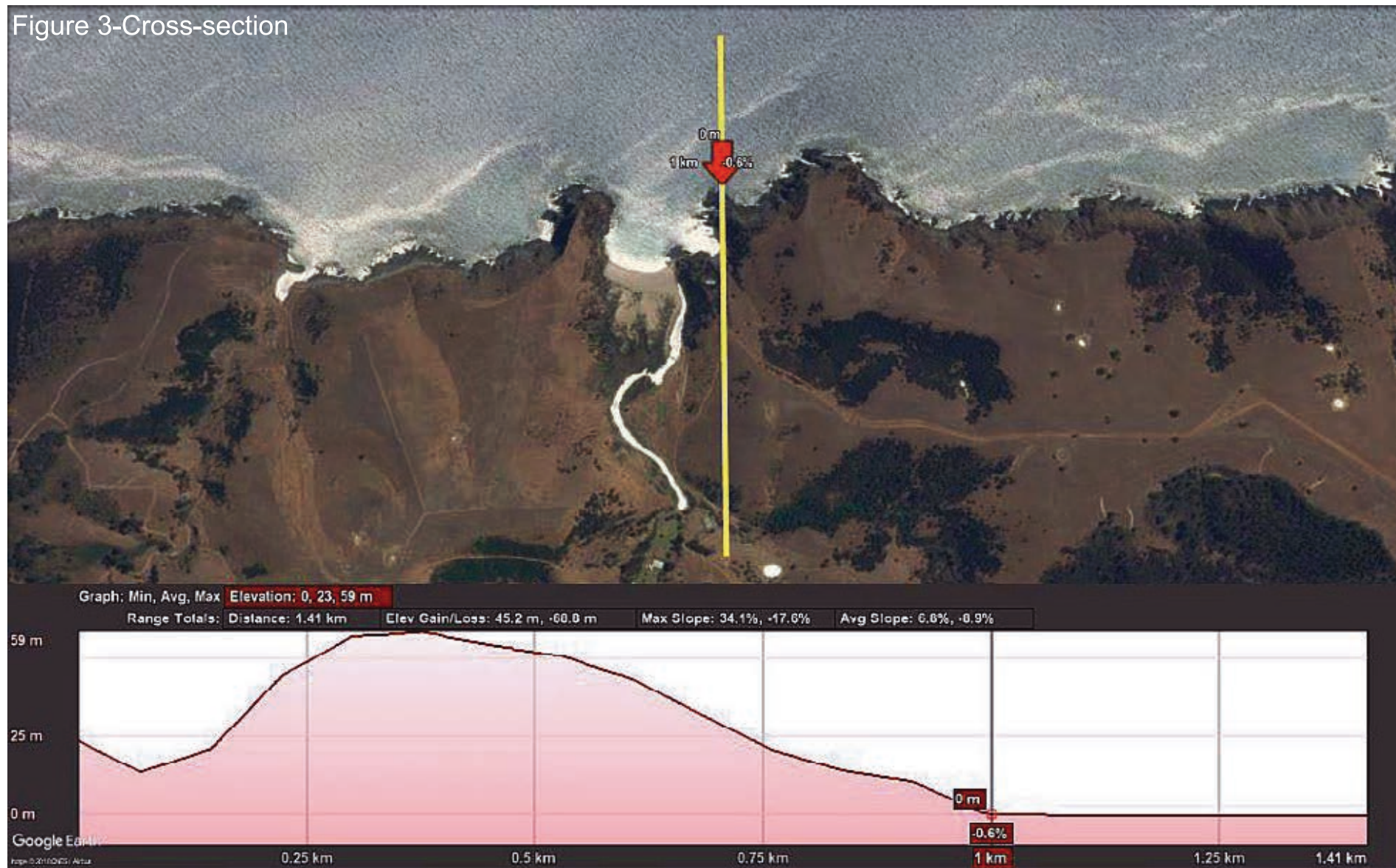


Figure 3-Cross-section



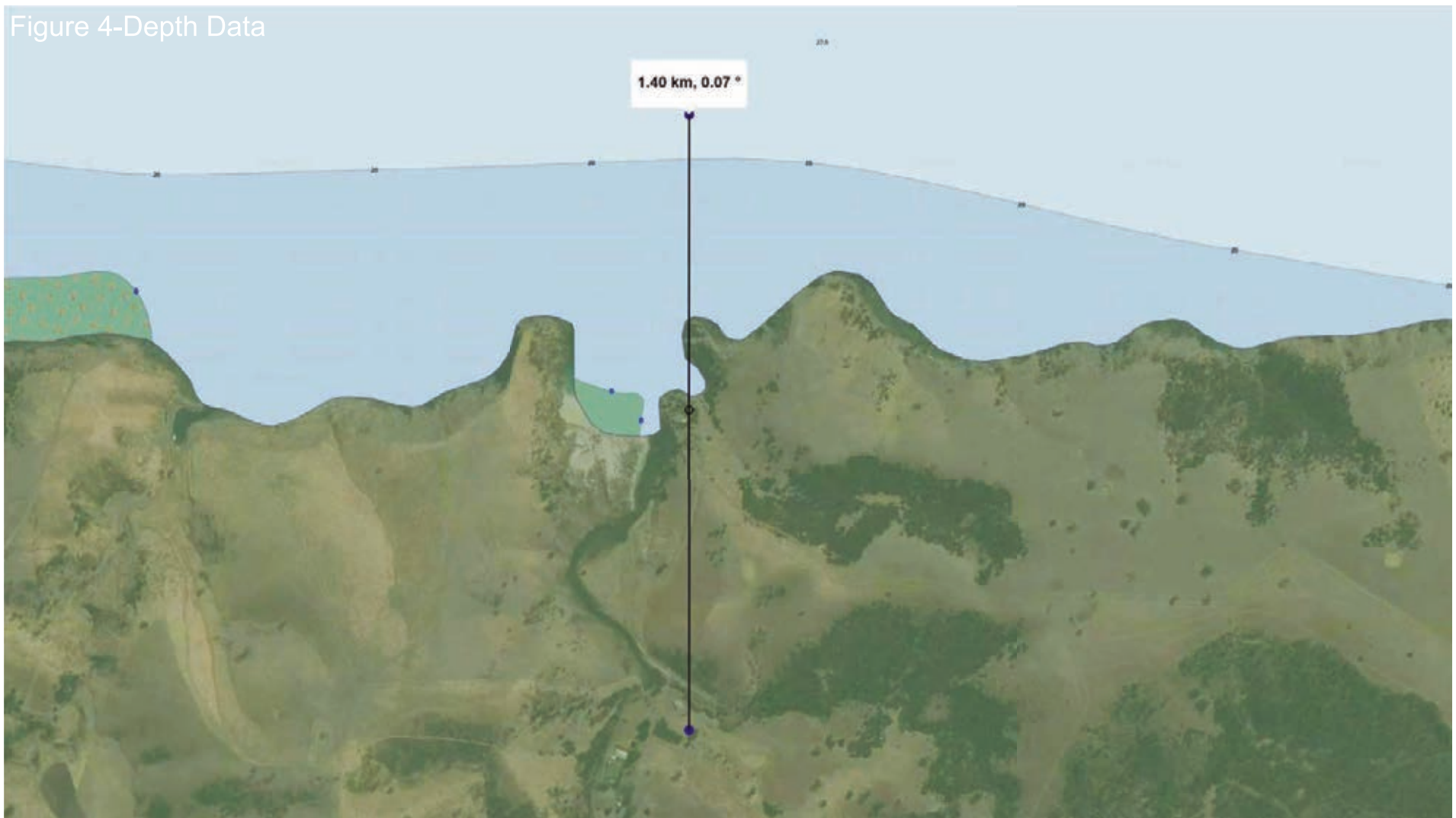


Figure 5-Coastline-01

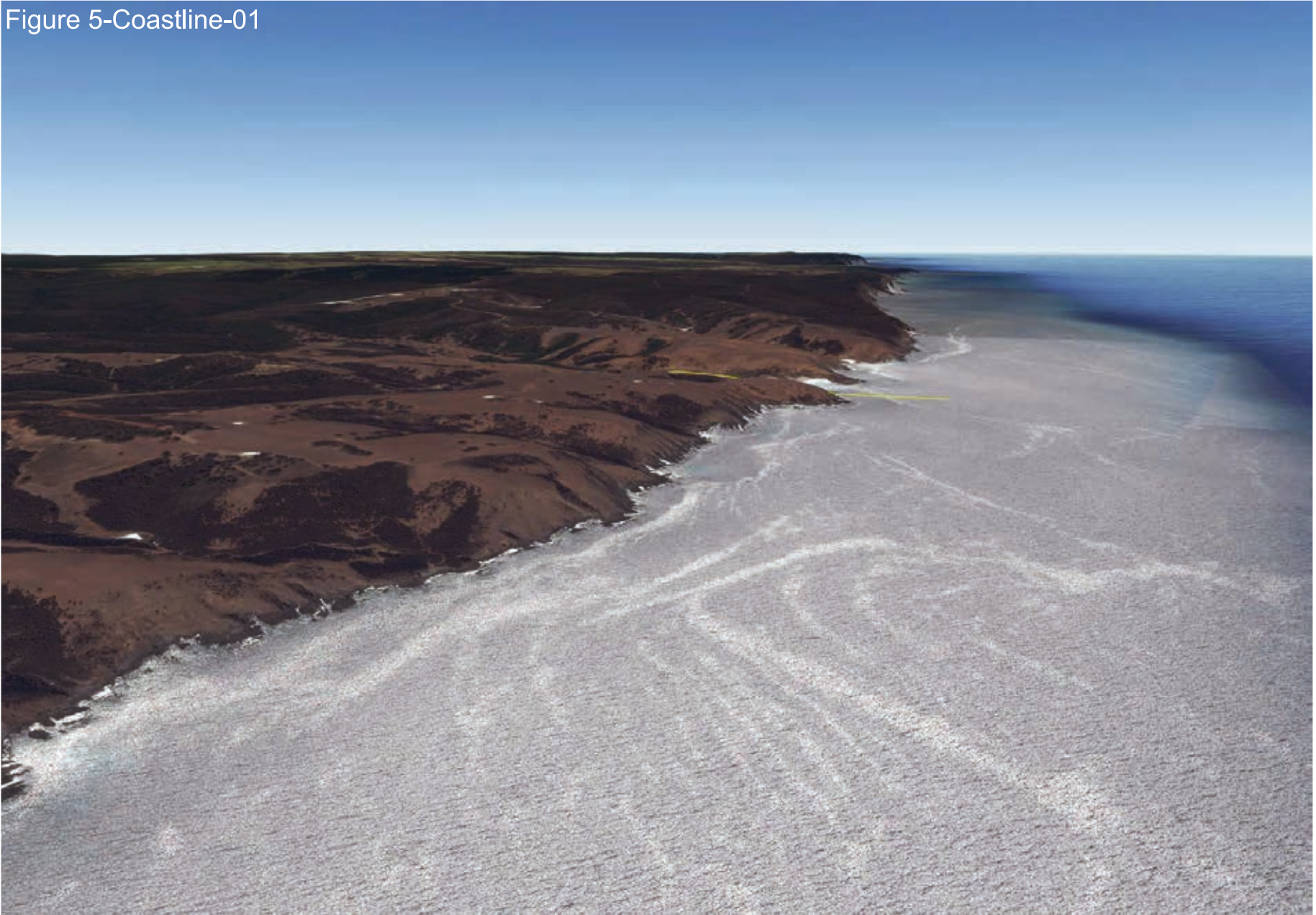


Figure 6-Coastline-02

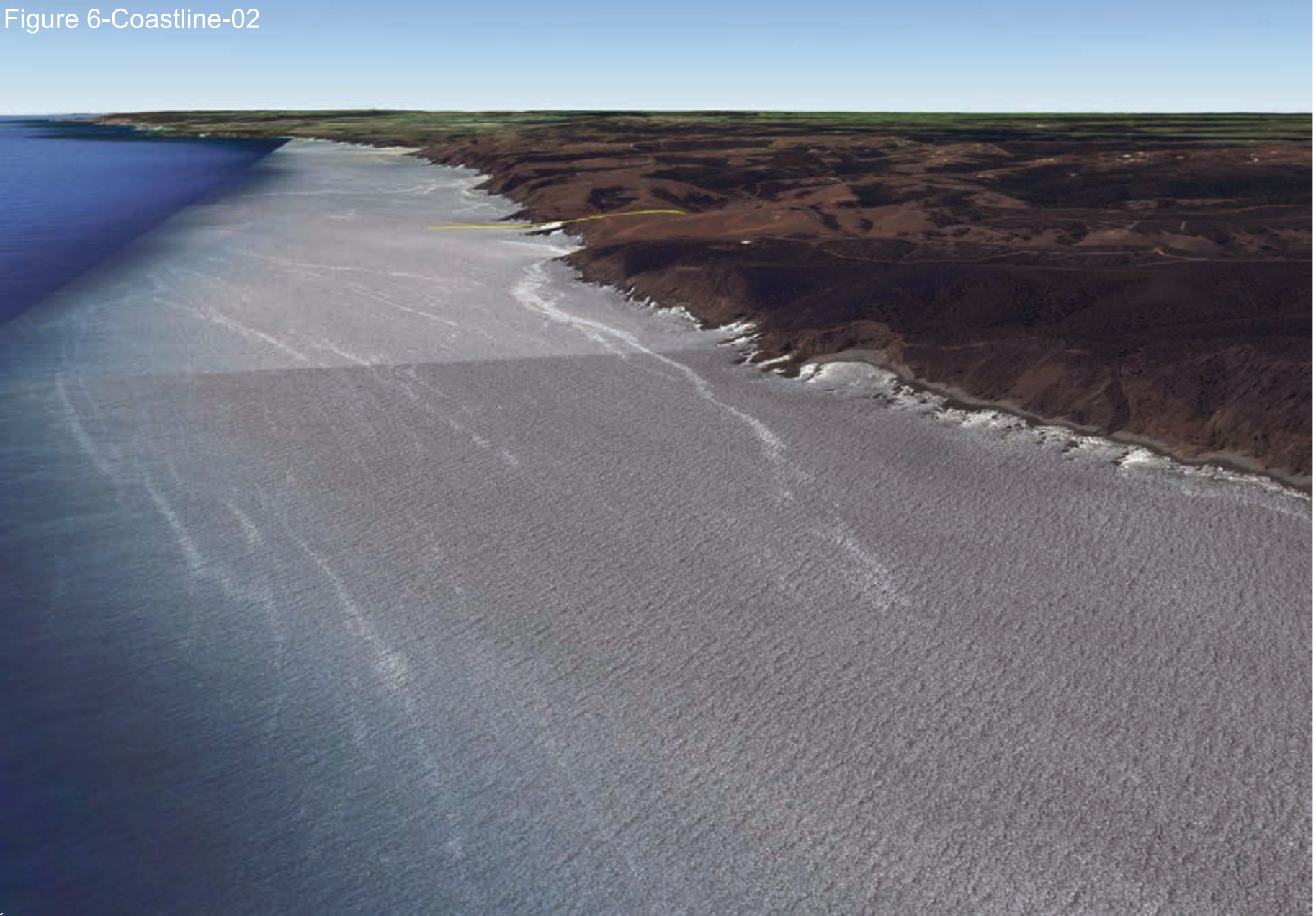


Figure 7-Coastline-offshore

