



Volumetric calculations using historical aerial photographic archive: moving beyond shoreline extraction in coastal Victoria

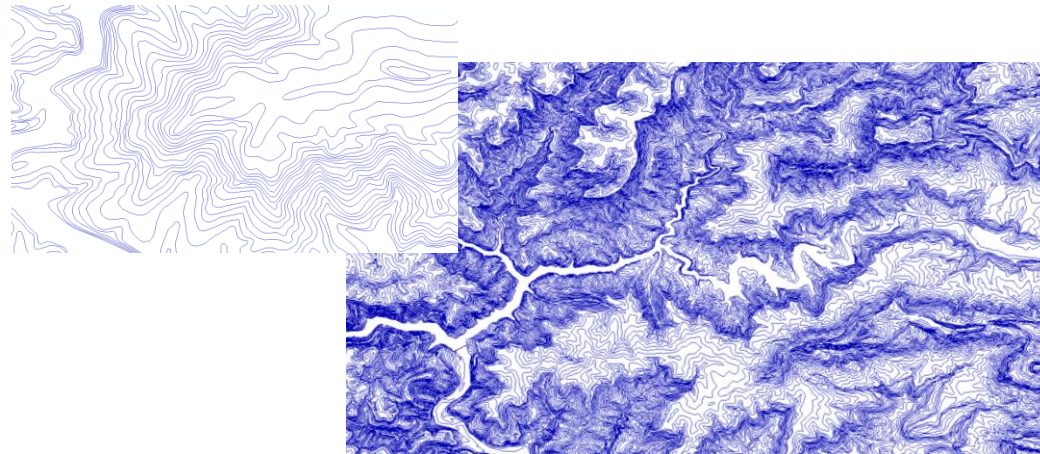
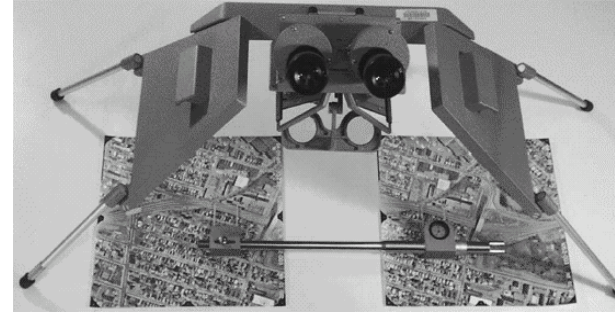
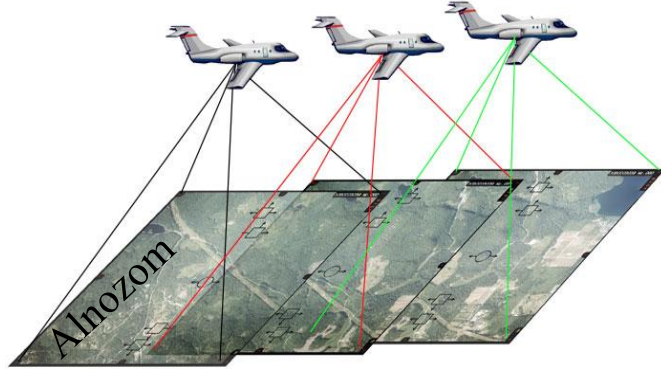
Rafael C. Carvalho¹, Nicolas Pucino¹, Blake Allan¹, David Kennedy²,
Daniel Ierodiaconou¹

¹Deakin University; ²University of Melbourne

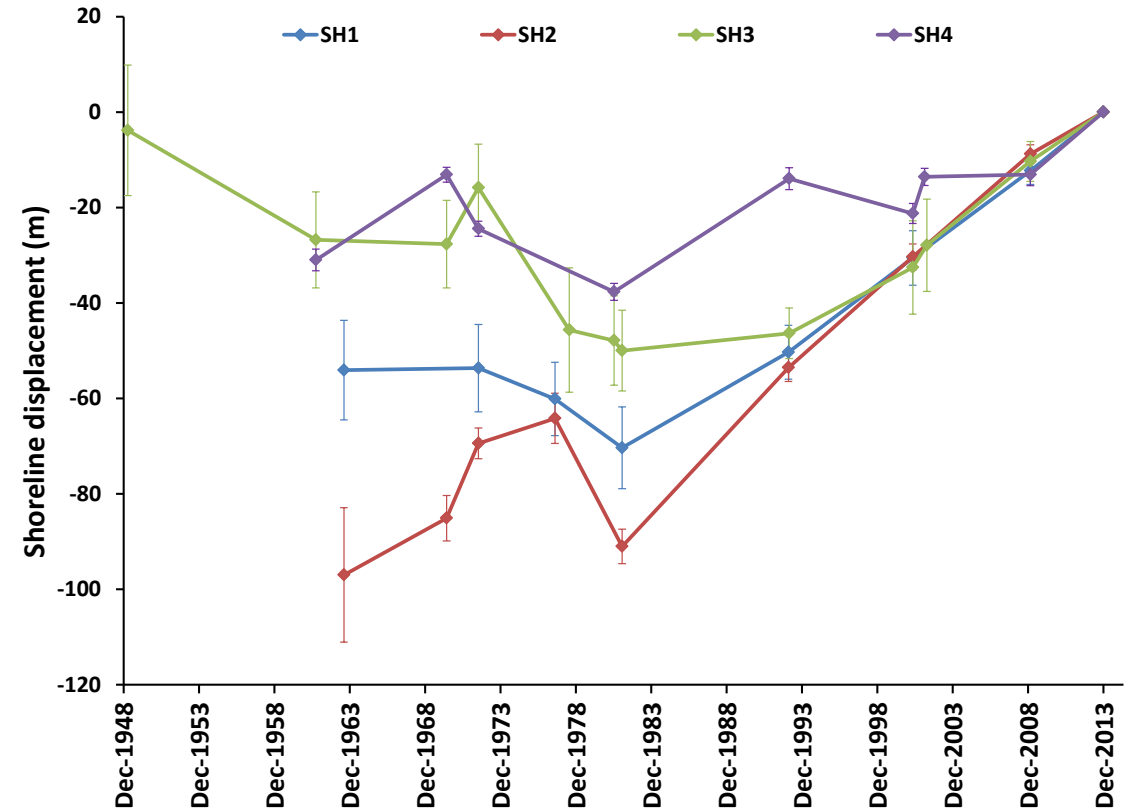


18th Biennial ANZGG Conference 4-8 Feb 2019 - Inverloch, VIC

Aerial photographic archive -> photogrammetry



Traditional shoreline extraction from photogrammetry



Torquay 20 Dec 1970



2459_002_1_15um
_20121970



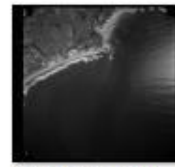
2459_003_1_15um
_20121970



2459_004_1_15um
_20121970



2459_005_1_15um
_20121970



2459_006_1_15um
_20121970



2459_012_1_15um
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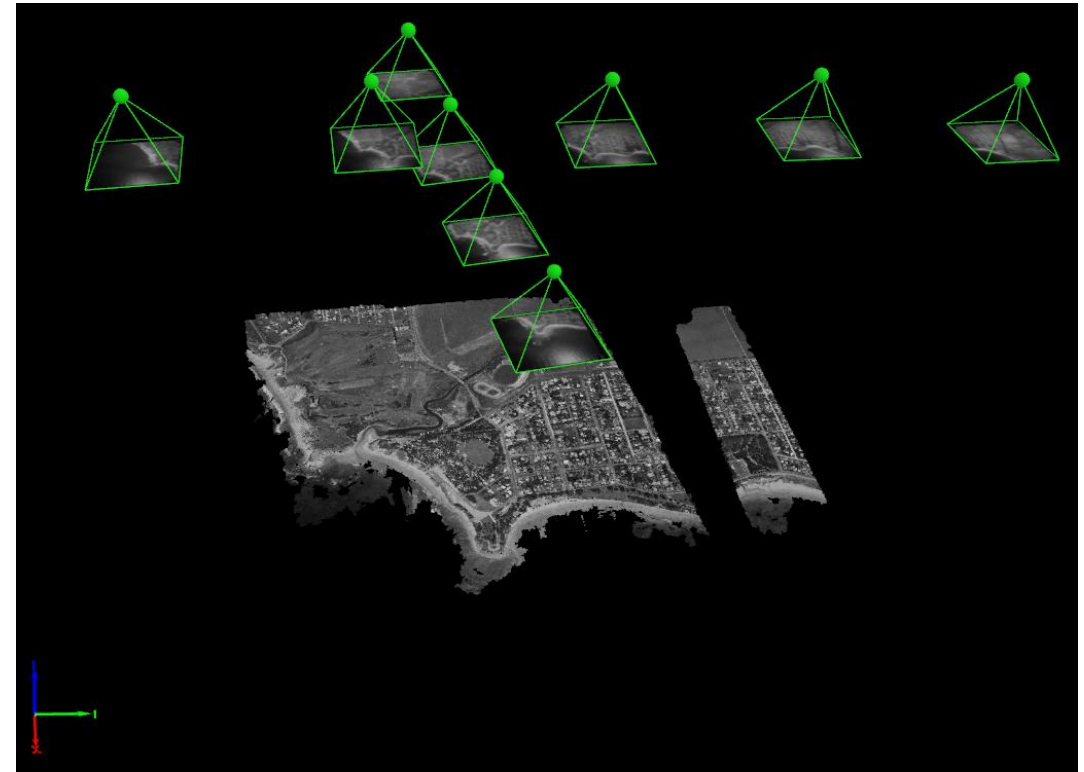
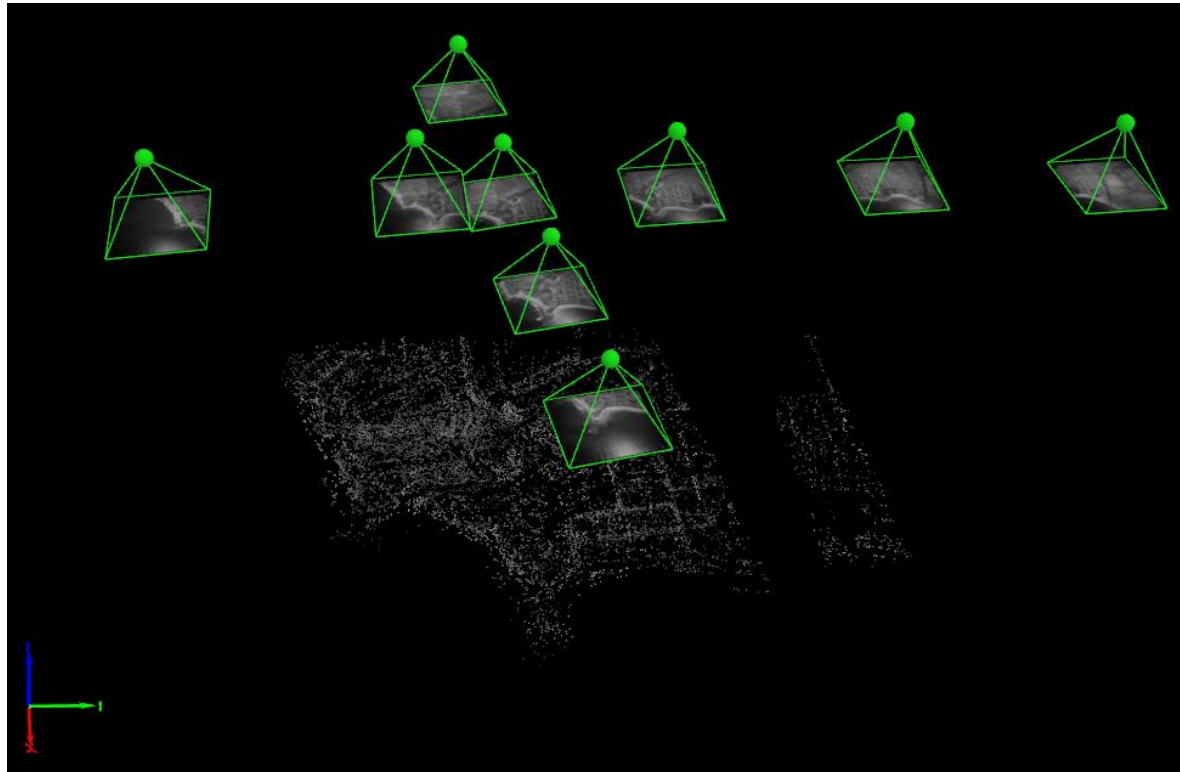
2459_013_1_15um
_20121970



2459_014_1_15um
_20121970

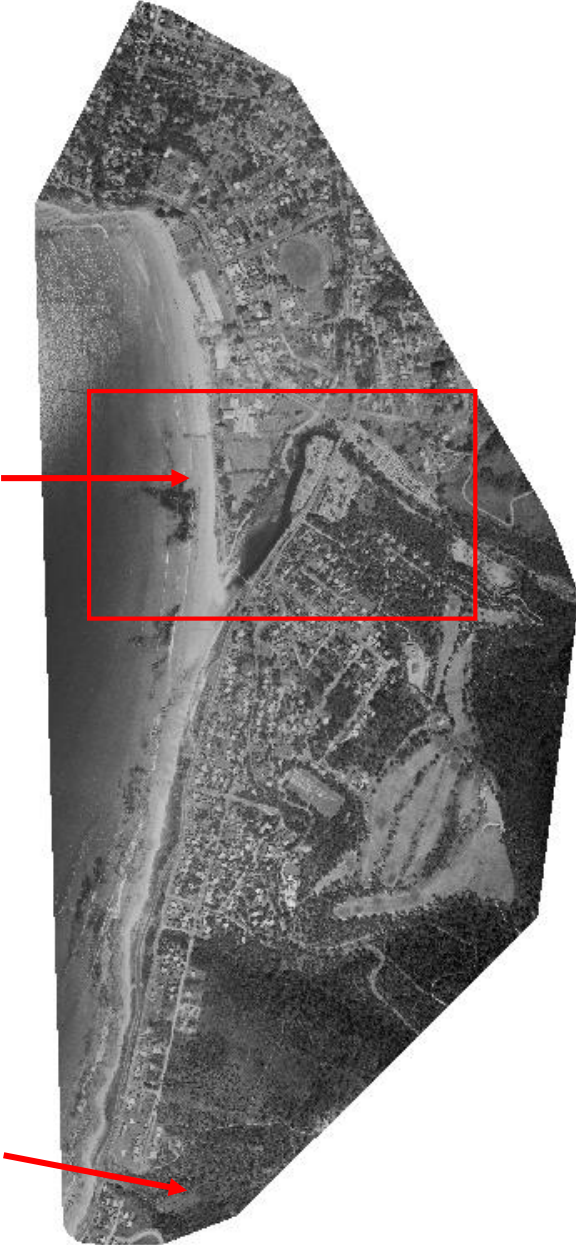


2459_015_1_15um
_20121970

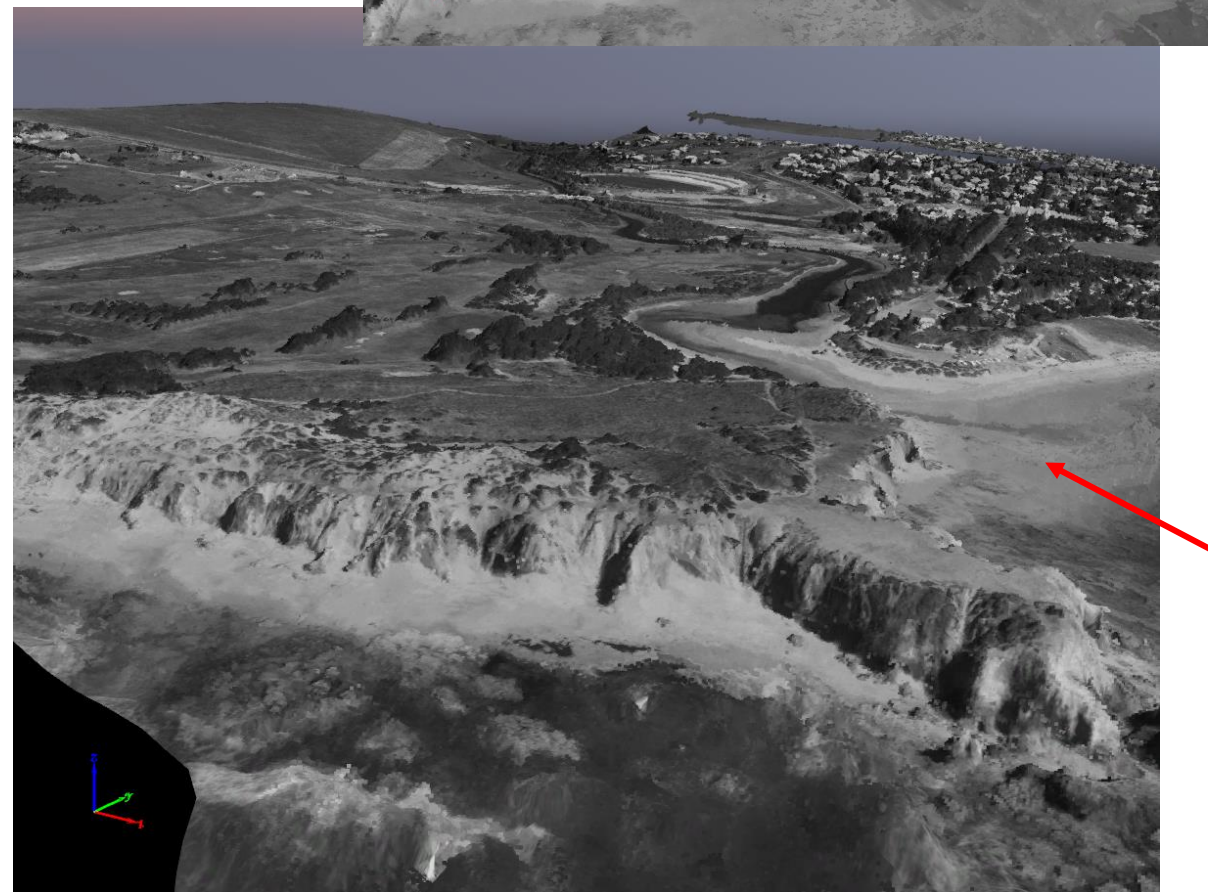
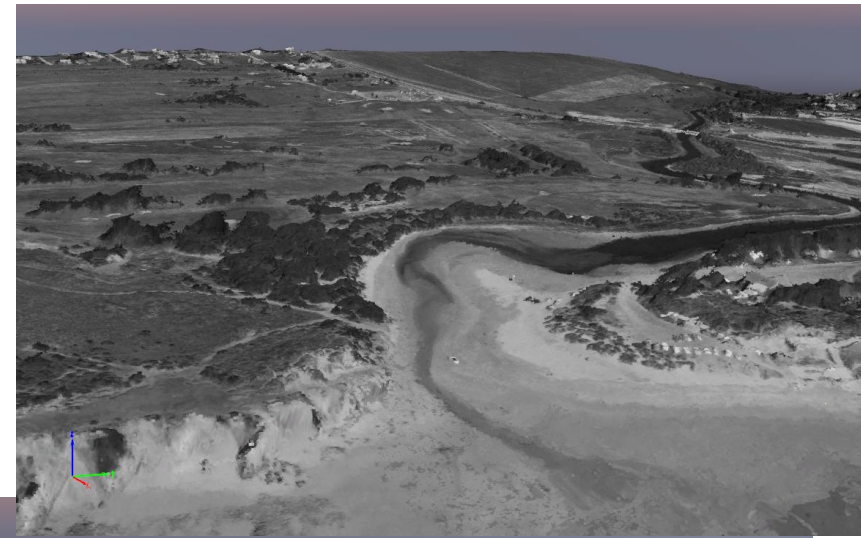
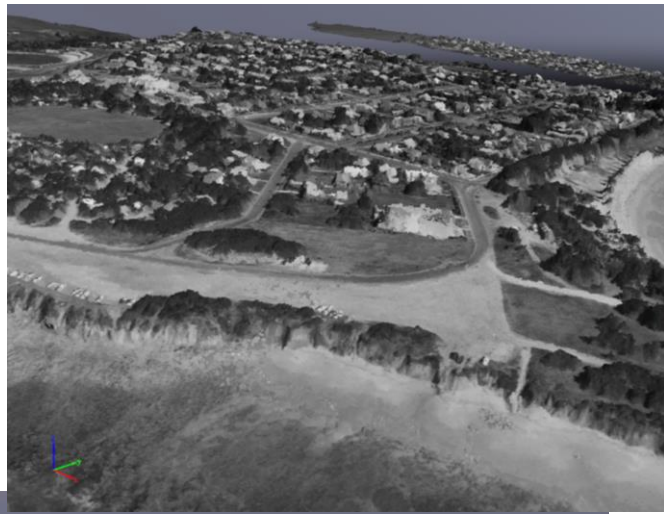


Tie Points -> Point Clouds -> Triangle Meshes

Lorne 10 Feb 1977



Torquay 20 Dec 1970



Barwon Heads 02 Apr 1966



Anglesea 10 Feb 1977



Anglesea 02 Nov 1988



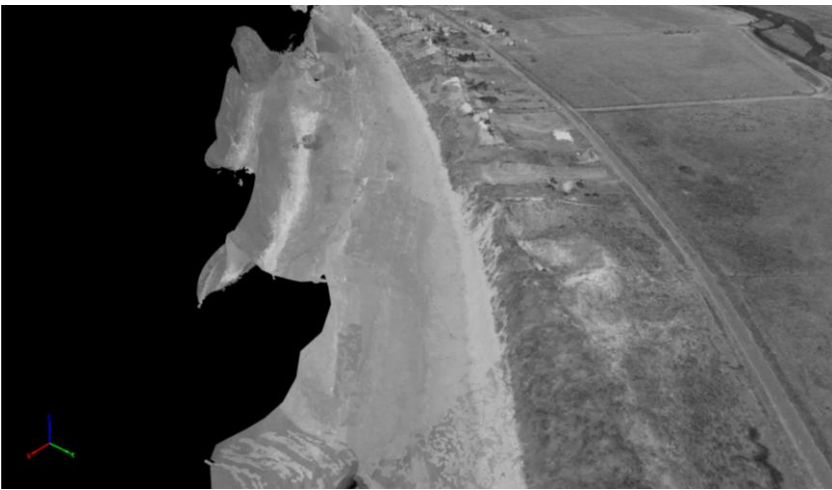
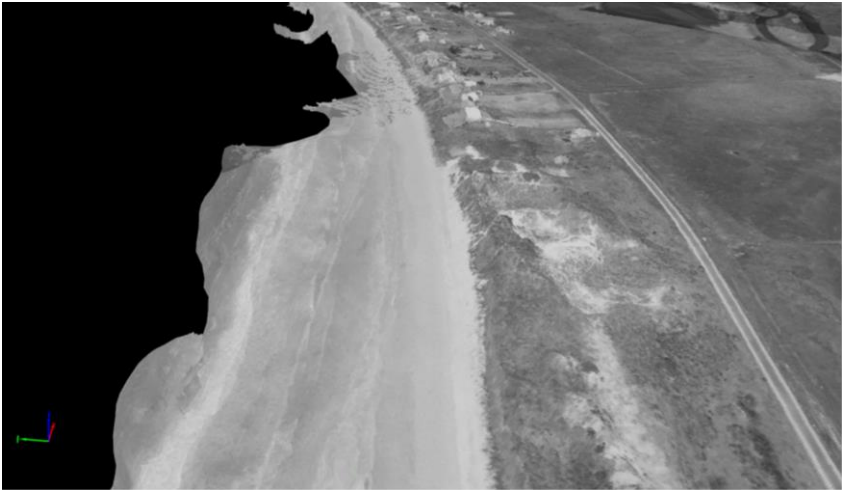
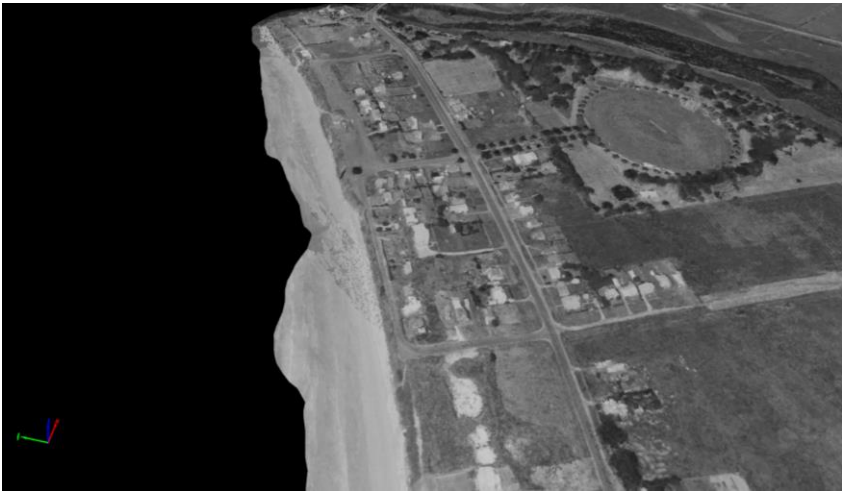
Port Fairy 01 Apr 1986



Port Fairy 09 Dec 1969

Port Fairy 11 Feb 1977

Port Fairy 01 Apr 1986



Apollo Bay

10 May 1946



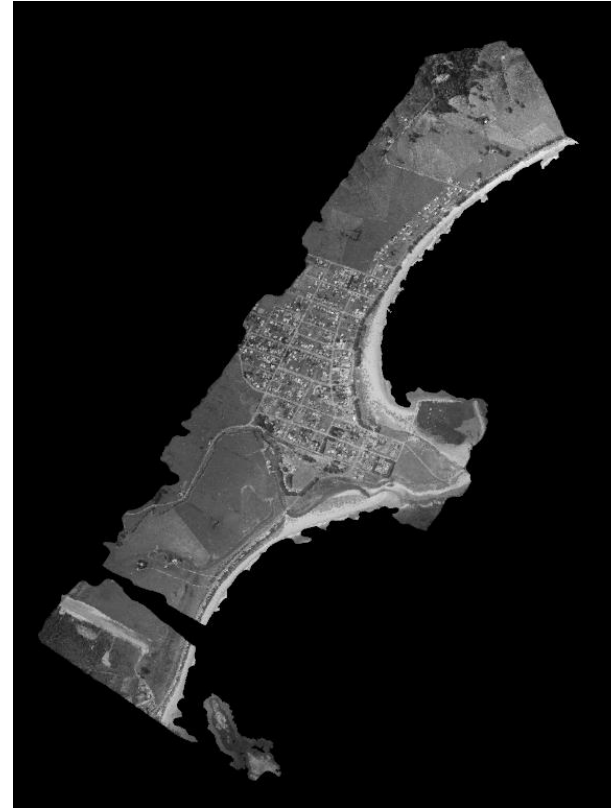
1:15.840
Runs 337 and 339

05 Mar 1966



1:7.920
Run 1921

07 Jan 1971

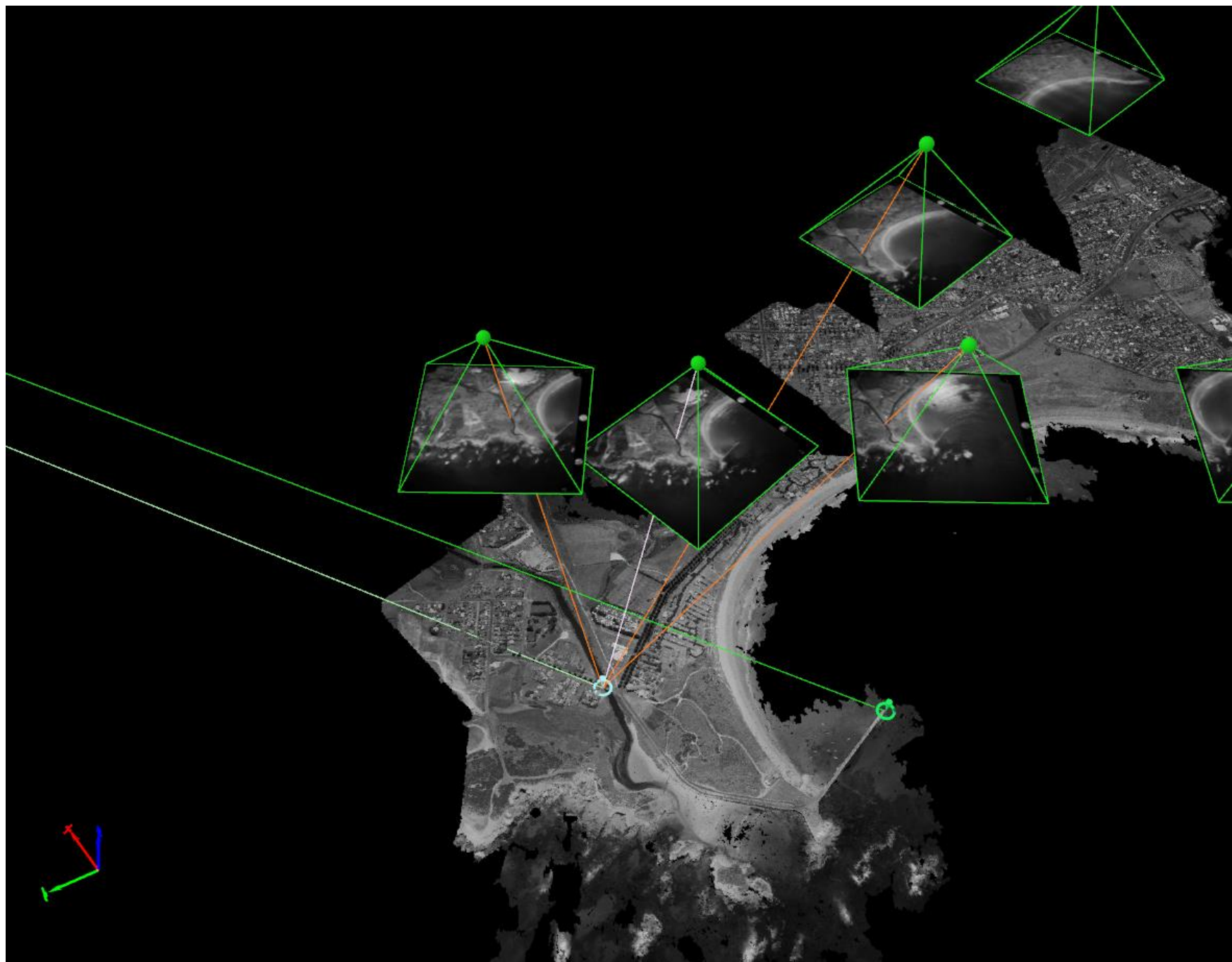


1:7.200
Runs 2464 and 2471

13 Mar 1986



1:10.000
Run 4033



Properties

▼ Selection

GCP12 (3D GCP)

Label: GCP12

Type: 3D GCP

Latitude [degree]: -38.39632100

Longitude [degree]: 142.47152500

Altitude [m]: 1.288

Horizontal Accuracy [m]: 0.020

Vertical Accuracy [m]: 0.020

Number of Marked Images: 4

S_0^2 [pixel]: 0.1078

Theoretical Error $S(X,Y,Z)$ [m]: 0.001, 0.001, 0.004

Maximal Orthogonal Ray Distance $D(X,Y,Z)$ [m]: 0.004, -0.000, 0.000

Error to GCP Initial Position [m]: 5401673.252, 3961705.171, 1

Initial Position [m]: 5401682.957, 3961795.713, 1

Computed Position [m]: 9.705, 90.541, -101.768

Automatic Marking Apply Cancel Help

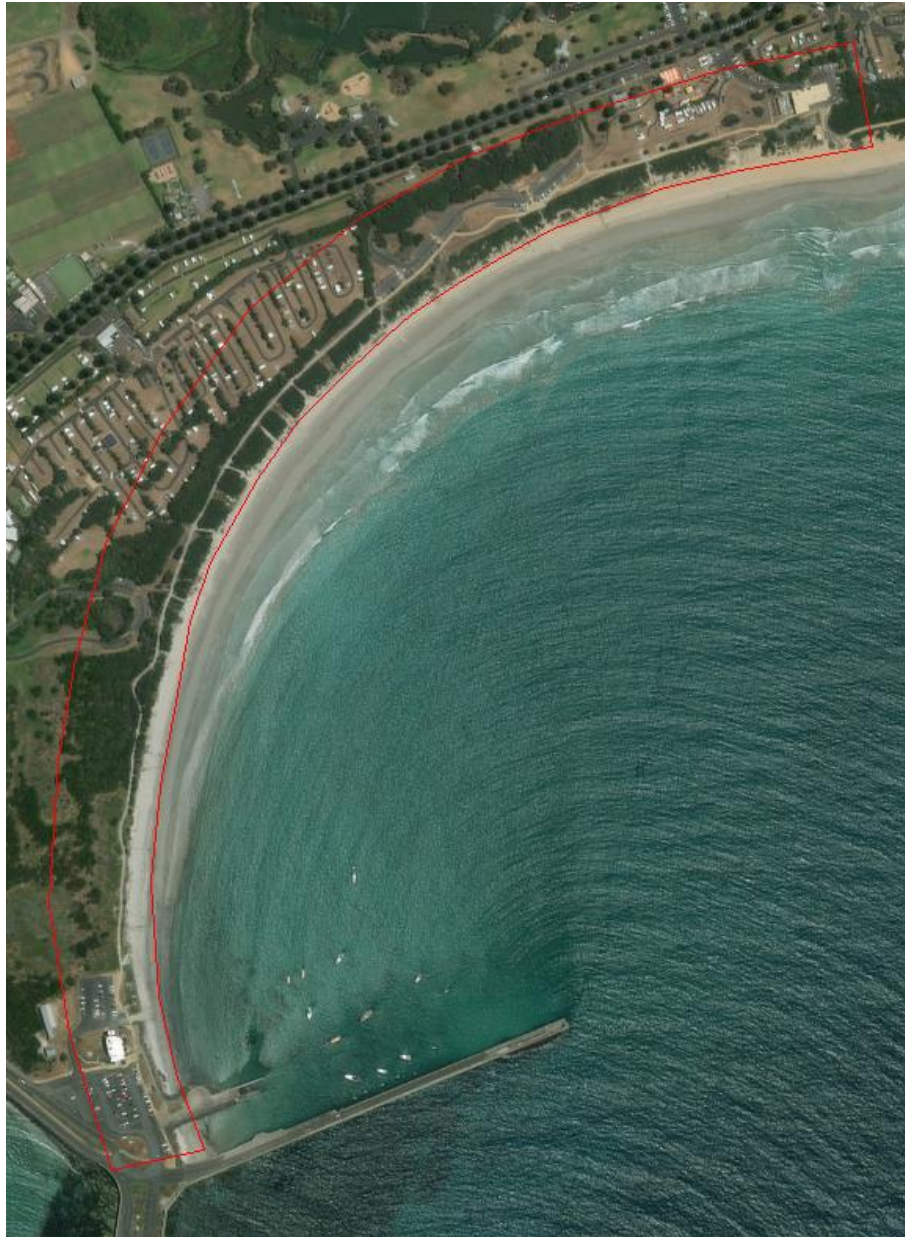
▼ Images

Image Size Zoom Level

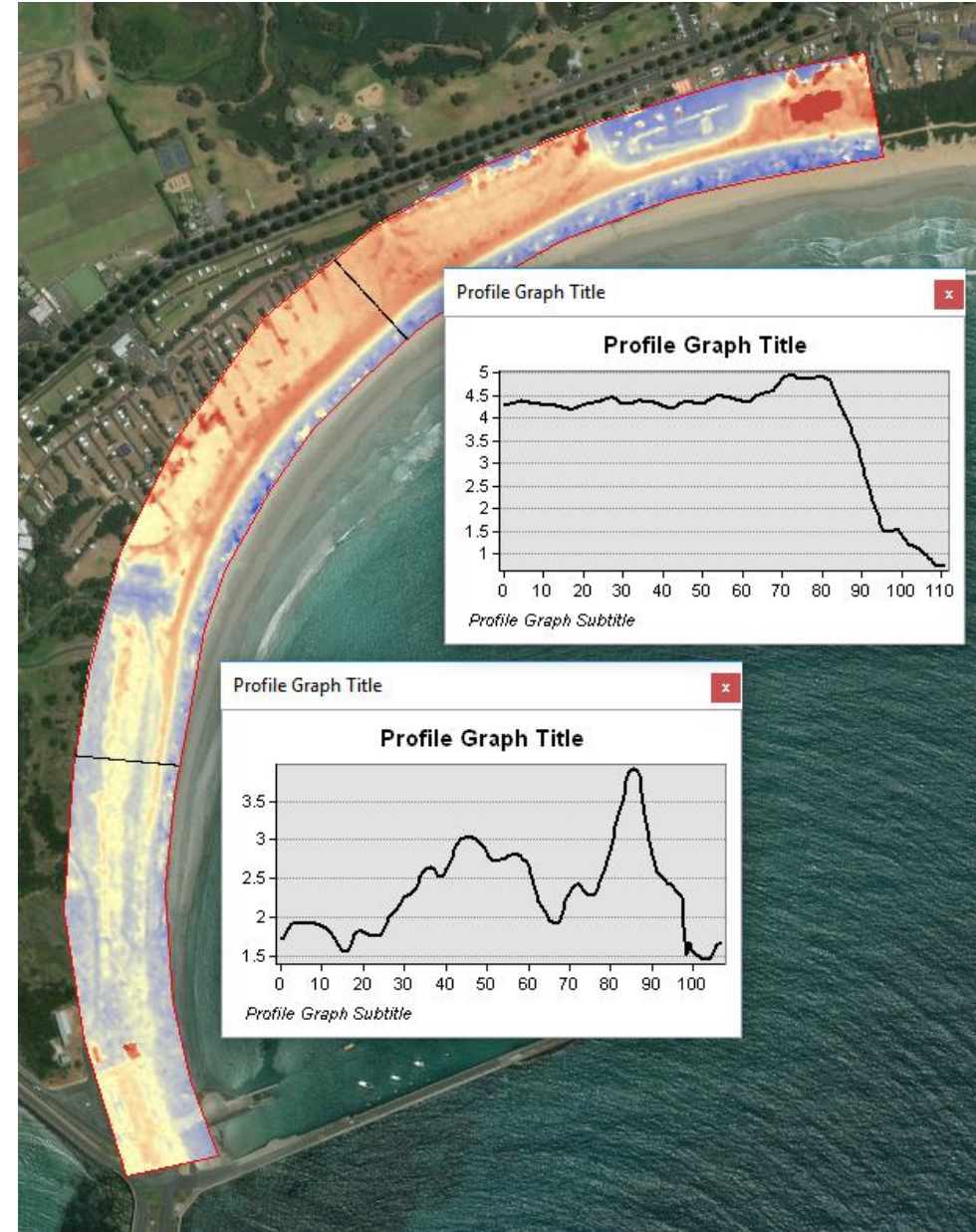
3175_004_22_15um_11021977.tif GCP: GCP12

3175_009_23_15um_11021977.tif GCP: GCP12

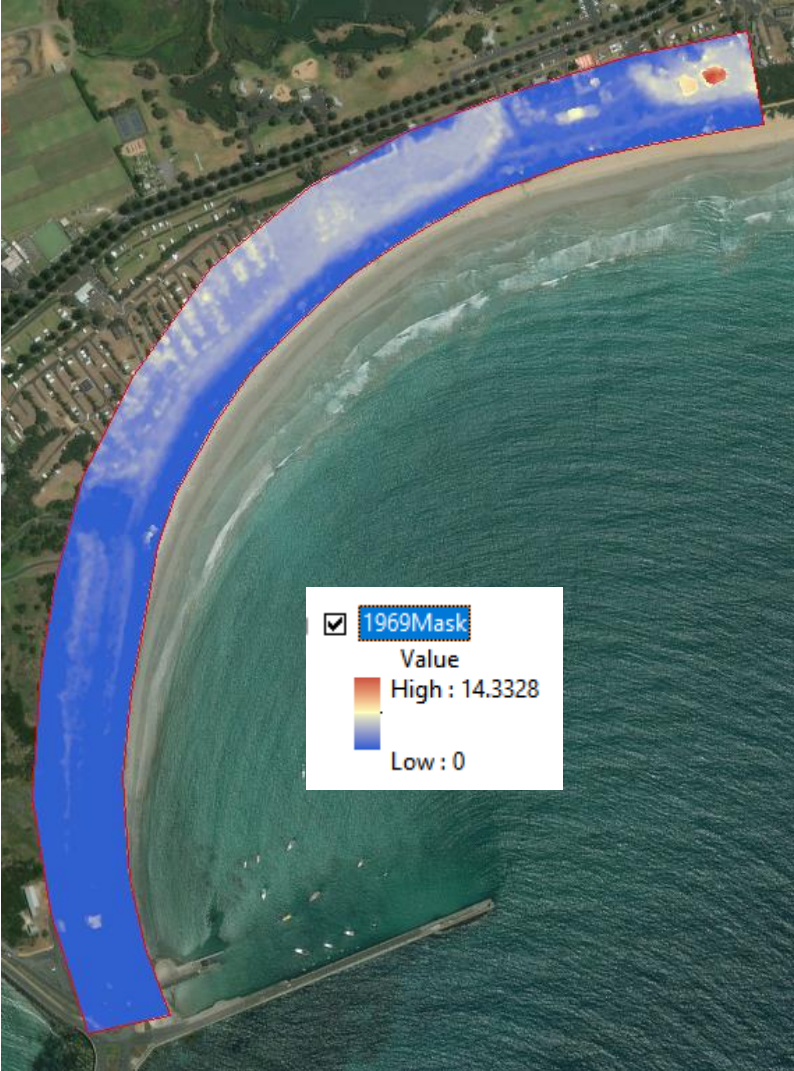
Warrnambool ~2018



Warrnambool 11 Feb 1977



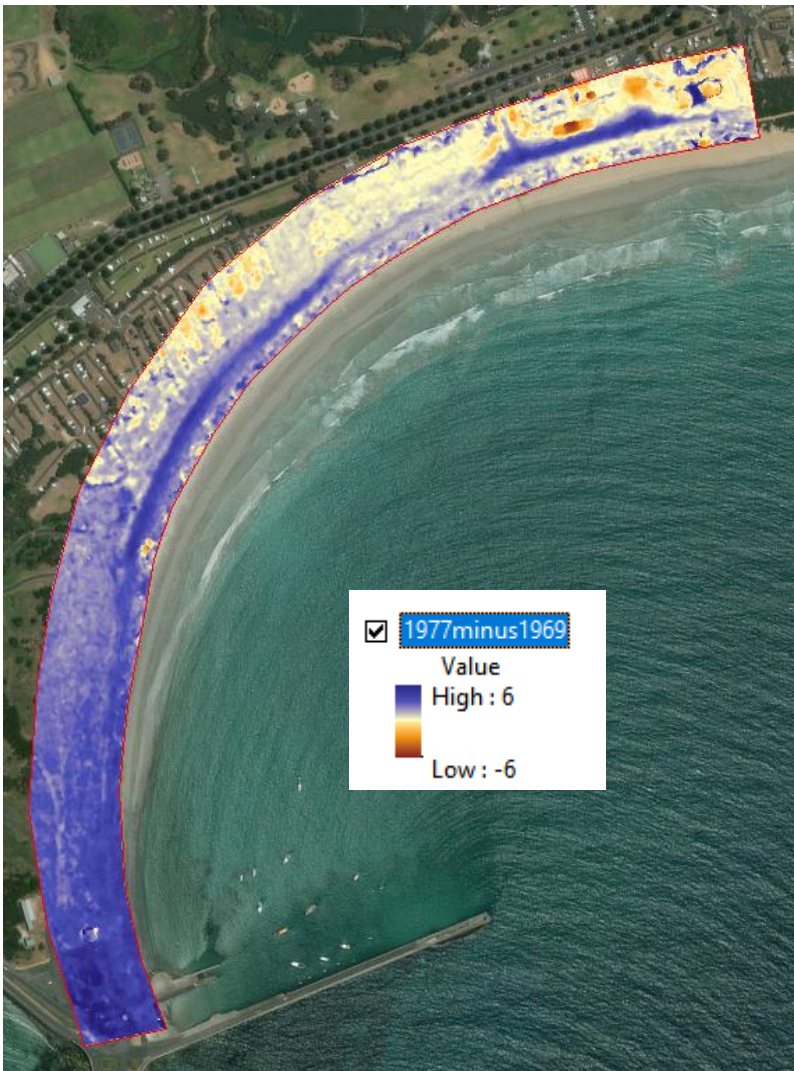
Warrnambool 27 Dec 1969



Warrnambool 11 Feb 1977



Warrnambool DoD 1977-1969



Work in progress...

- Collecting GCP at all locations
- Accuracy assessments
- Cleaning of undesirable/unreliable pixels
- Point cloud filtering (Kmeans – Callow et al. 2018)
- Exploring influence of flight characteristics on DEMs
- Exploring other Vic locations and datasets
- Exploring processing options

Acknowledgements:



Victorian Coastal Monitoring Program.

Thank you!

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