C. GEOLOGY

Field Note C2b. TMG - Agulhas outcrops

In the Study Area, the Table Mountain Group Formations crop out in four areas, namely (from SW to NE): Agulhas, Bredasdorp, Arniston and Potberg (Figure 1). This Field Note is about the outcrops along the Agulhas shores (Suidestrand to Struis Bay) (Figure 2).

Figure 1. Satellite image showing the locations of the four TMG outcrops in the Study Area: 1 – Agulhas; 2- Bredasdorp; 3 – Arniston; 4 – Potberg.

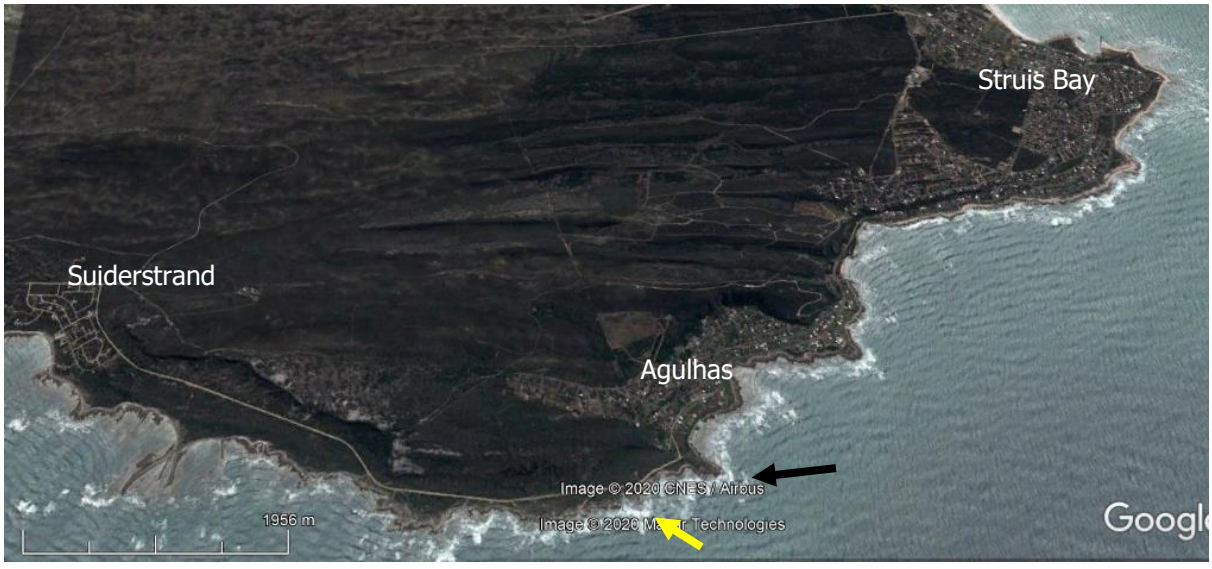


Figure 2. Satellite image of the shore from Suiderstrand to Struis Bay. Black arrow points to the Cape Agulhas Promontory. Yellow arrow points to the southern tip of Africa.

Five of the six TMG Group Formations, namely the Peninsula, Pakhuis, Cedarberg, Goudini and Skurweberg Formations are exposed along the shore from Suiderstrand, west of Cape Agulhas Promontory, to Northumberland Point at Struis Bay, forming a rugged, rocky and pebbly belt (Figures 3, 4 and 5).

Figure 3. Topography maps (top - 3420CC; bottom- 3420CC_06_07) of the shores of the coastal towns of Agulhas and Struis Bay. Box in the top figure is enlarged in the bottom figure.

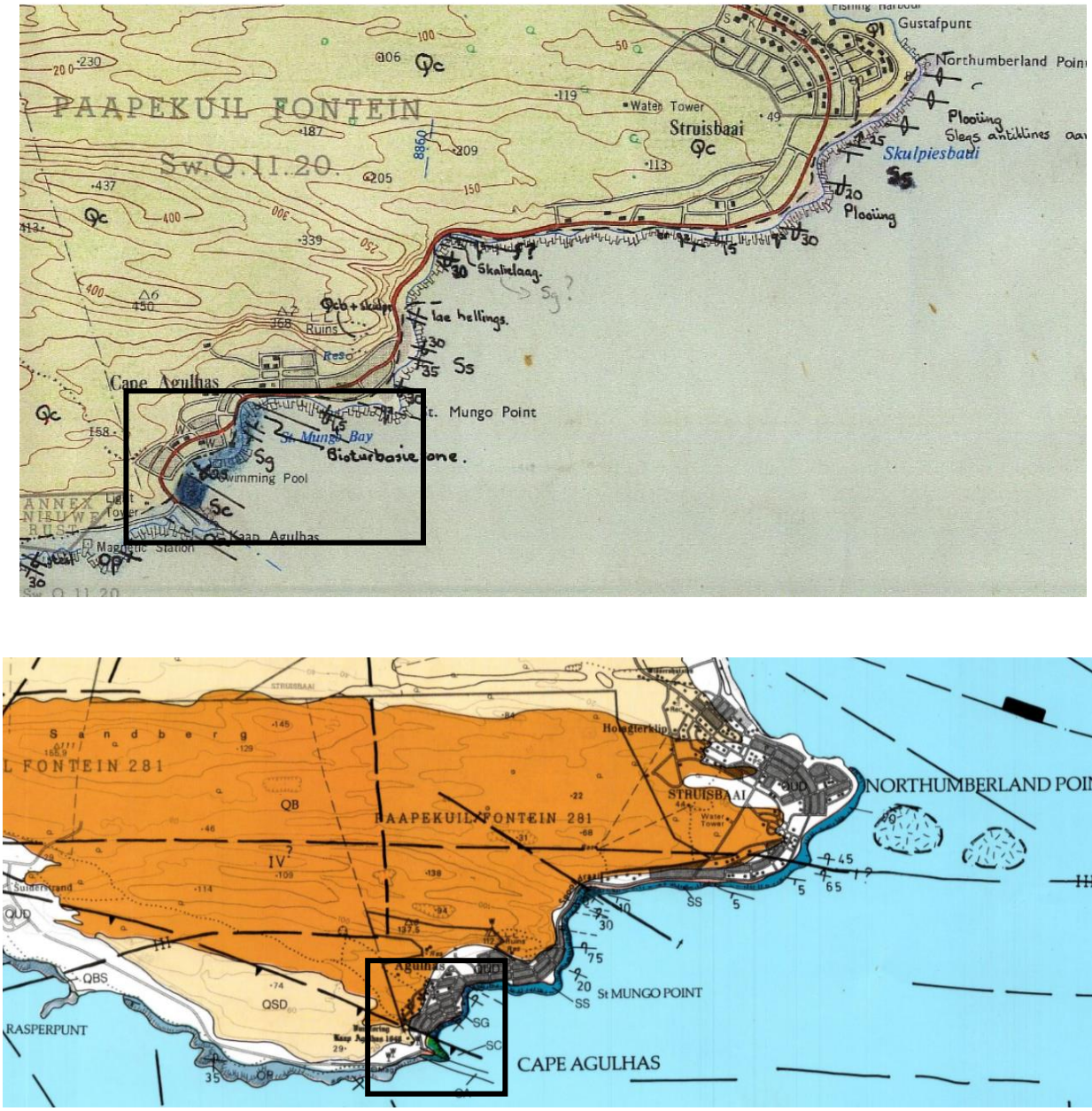
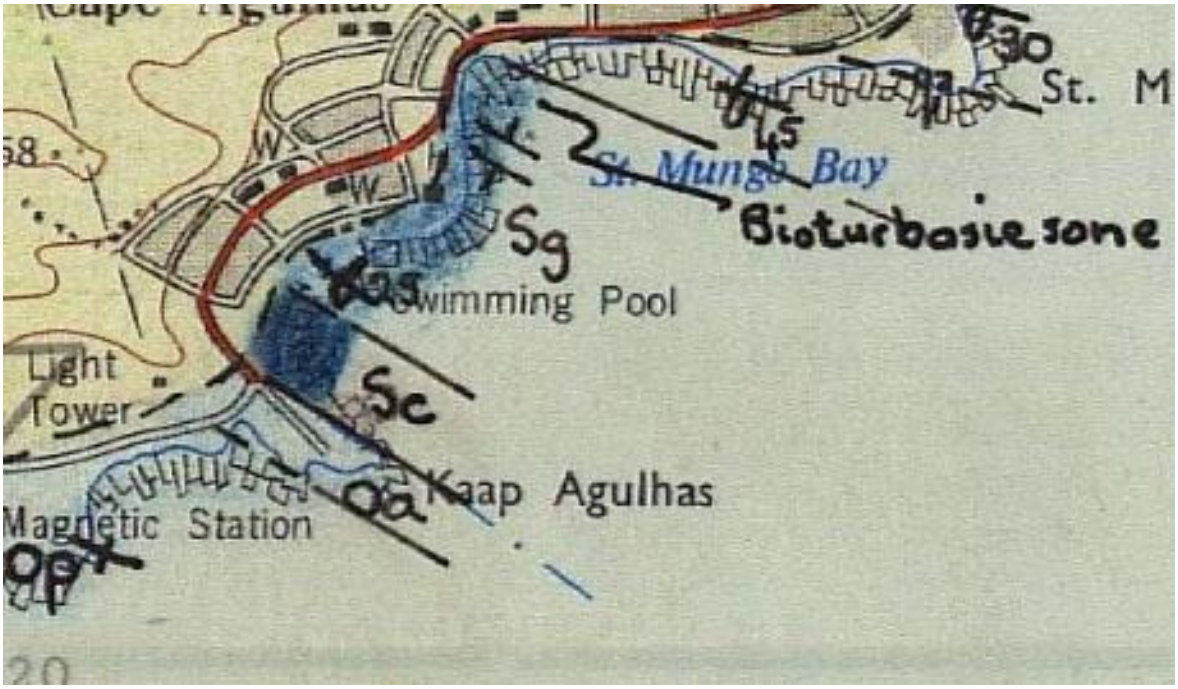


Figure 4. Geology maps of the area from Rasperpunt to Northumberland Point, showing the various TMG Formations exposures. Top – Geological Survey 3420CA&CC field sheet, J Malan, 1984. Bottom: AECSA Ltd, PIN 1133 – GEA 845, MAG Andreoli et al, 1988. Ordovician Formations: Op – Peninsula; Oa – Pakhuis; Oc – Cedarberg. Silurian Formations: Sg – Goudini; Sk - Skurweberg. (The only formation of the group which is missing along this shore is the youngest - Rietvlei Formation). Boxed areas are enlarged in Figures 5 to 7.

In a 1 km long section of the shore between Cape Agulhas Promontory* and St Mungo Bay, the TMG formations are overturned: walking northward along the shore is climbing up the stratigraphic column, from the oldest formation (Peninsula, in the south) to the youngest formation in this locality (Skurweberg, in the north). The annotations in the figures below, which show the formations and the contacts between them in an old-to-young order, are based on the geology maps mentioned above.

[*The author introduced the name 'Cape Agulhas Promontory' just for more calrity of these description, as the name 'Cape Agulhas' is sometimes applied to the coast from Suidestrand to Struis Bay].

Figure 5. Satellite image of the shore from the Cape Agulhas Promontory to St Mungo Bay (boxed in Figure 4), which is the main subject of this Field Note. (Arrow points to Cape Agulhas lighthouse).



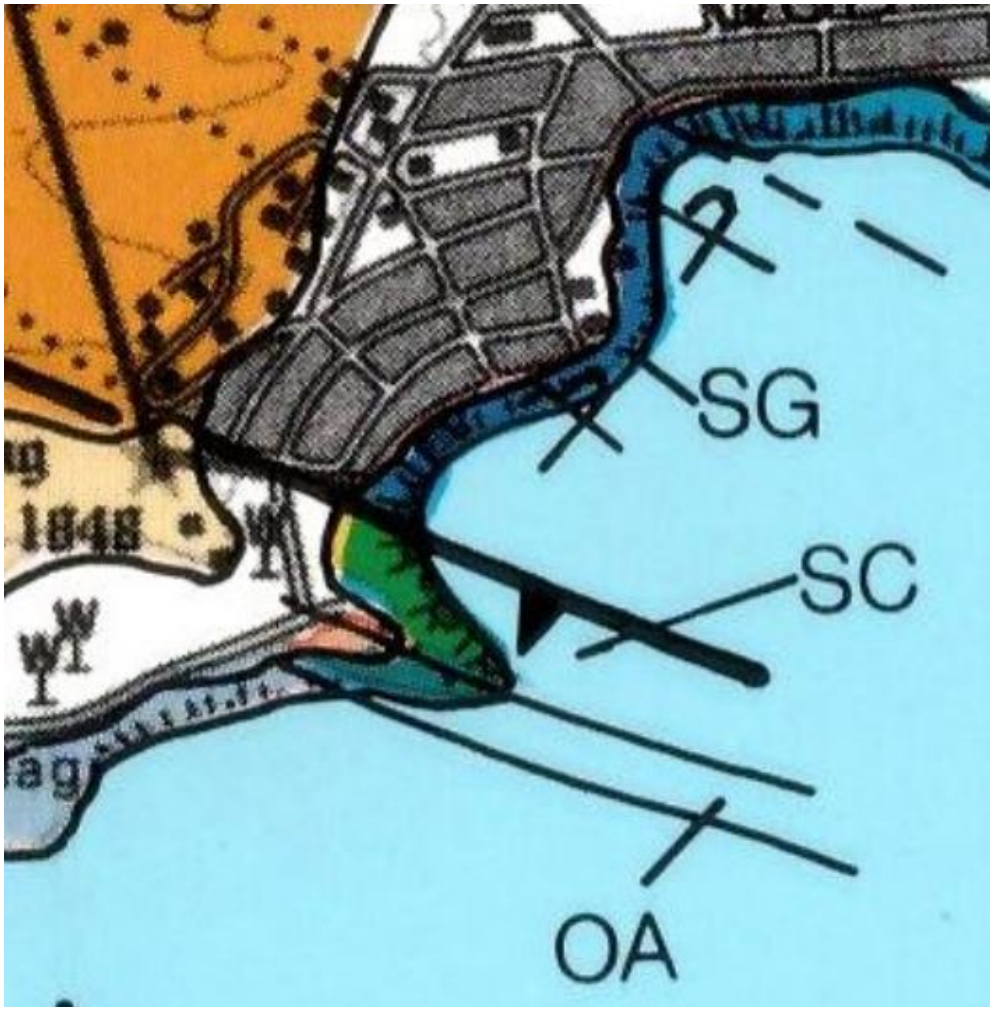


Figure 6. Geology maps of the TMG Formations in the section shown in Figure 4. Top – 1984; bottom – 1988. See geology map sources in Figure 4.

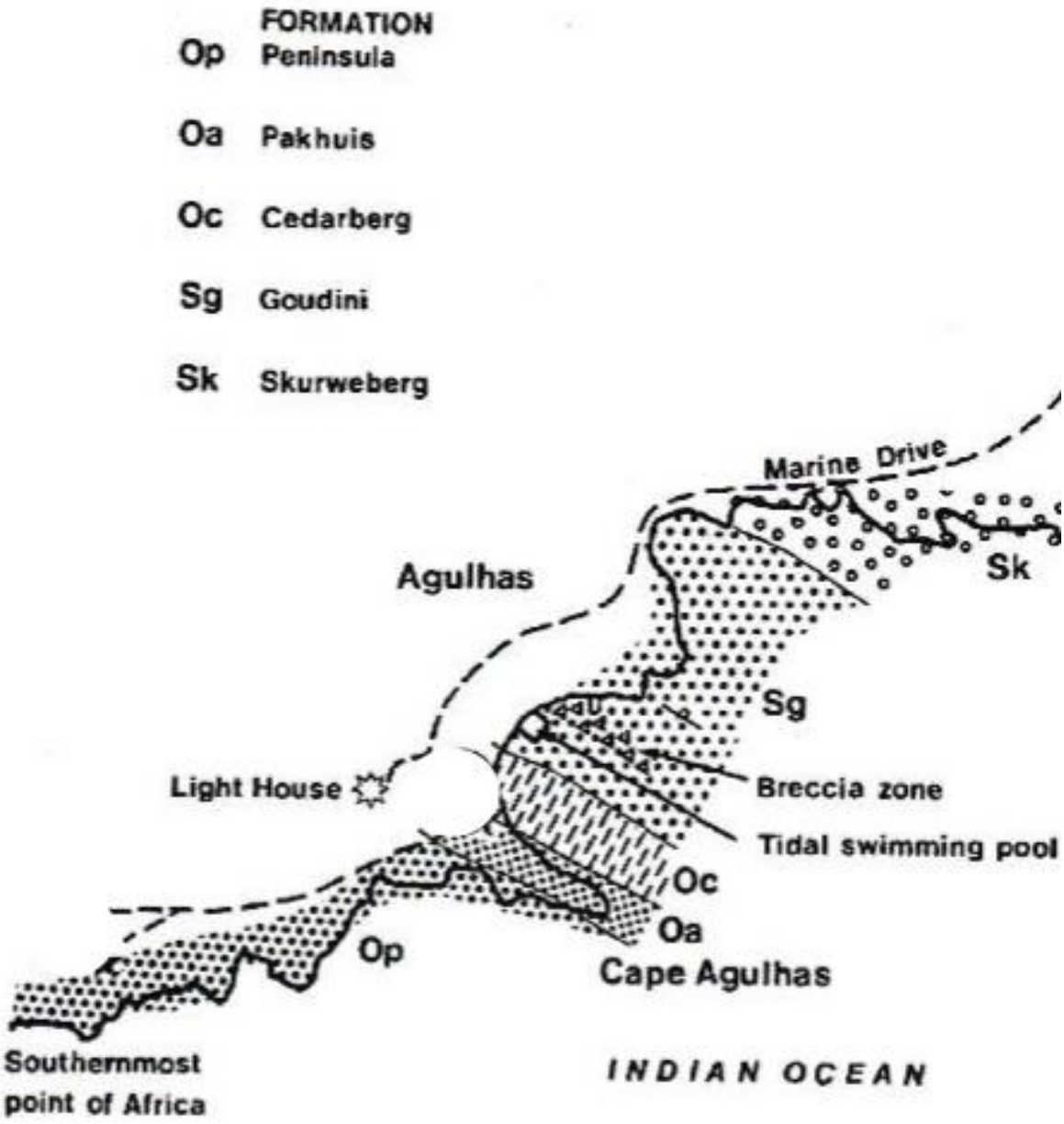


Figure 7. Geology map of the TMG Formations in the shore section in discussion. Note that the bioturbation zone, indicated in the top map of Figure 6, is not indicated on this map.
From: J Malan and J Viljoen, Field Trip Guide, 2016.

Figure 8. Satellite image of the section of the shore shown in Figures 5, 6 and 7 at low tide. The rocky belt is dry and exposed. The annotations in all figures follow the geology maps mentioned above. The yellow dashed lines represent the contacts between the formations. The white dashed line represents a fault line.

Figure 9. Top and bottom: rocks of the Peninsula Formation west of Cape Agulhas Promontory. Fish traps were built along this shore on, and from, the rocks of this formation (see Chapter U).

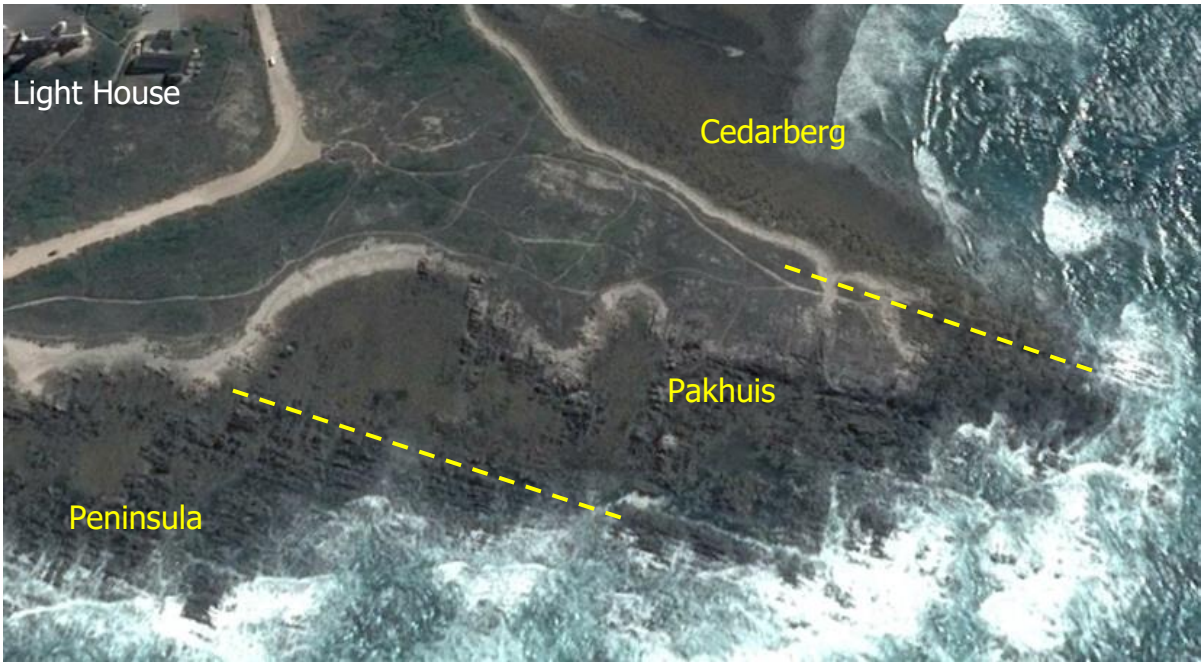


Figure 10. Satellite image of the Cape Agulhas Promontory, showing the contacts (dashed lines) between the formations. Note the greenish hue of the Cedarberg Formation.

Figure 11. Top and bottom: rocks of the Peninsula Formation on the south shore of the Cape Agulhas Promontory. Views to the south.

Figure 12. Rocks of the Pakhuis and Cedarberg Formations on the north shore of the Cape Agulhas Promontory. Top – view to the northwest; bottom – view to the southeast. Dashed lines are the contacts between the formations

Figure 13. Rocks and boulders of the Cedarberg Formation north of the Cape Agulhas Promontory (arrow). View to the southeast.

Figure 14. The contact (dashed line) between the Cedarberg and the Goudini Formations. Stone-walled fish traps were built on, and from, the rocks of these formations (see Chapter U).

Figure 15. Satellite image of the breccia* zone between the tidal swimming pools.
*Breccia is a rock composed of broken fragments of minerals or rock cemented together by a fine-grained matrix that can be similar to, or different from, the composition of the fragments. The word has its origins in the Italian language, in which it means either "loose gravel" or "stone made by cemented gravel".

Figure 16. Boulder of breccia in the breccia zone.

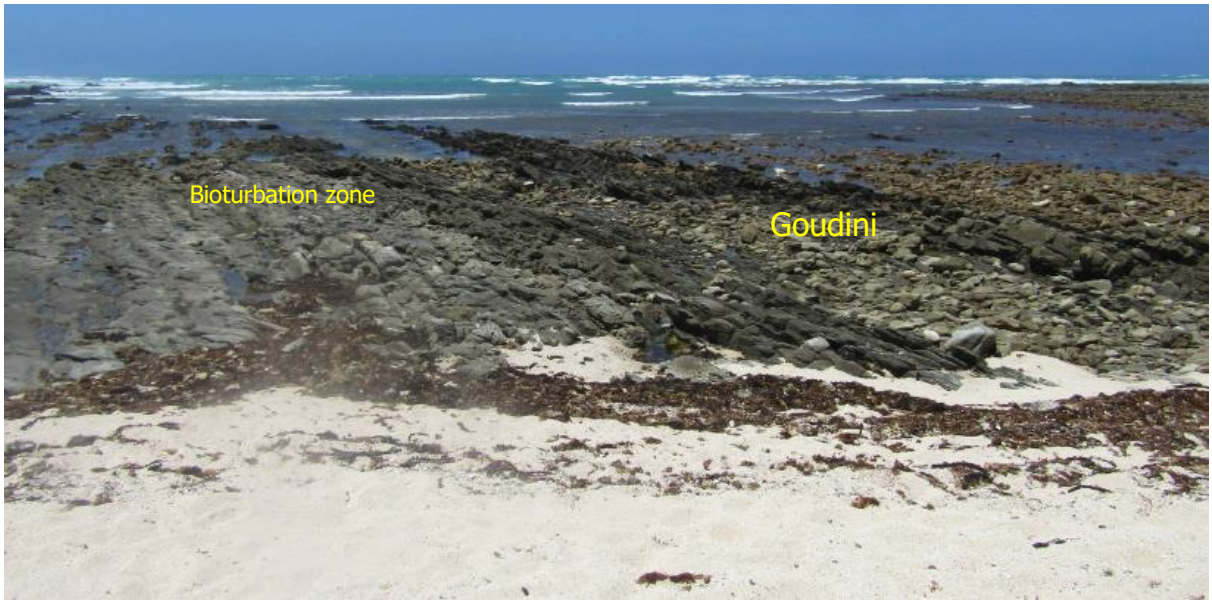


Figure 17. The rocks of the Goudini Formation in the bioturbation* zone.
* Bioturbation is the reworking of soils and sediments by animals or plants. These include burrowing, ingestion, and defecation of sediment grains. Bioturbating activities have a profound effect on the environment and are thought to be a primary driver of biodiversity.

Figure 18. Satellite image showing the contact (dashed line) between the Goudini and the Skurweberg Formations on the shore of St Mungo Bay.

Figure 19. Top (view to the sea) and bottom (view to the land): the Goudini and Skurweberg Formations at St Mungo Bay. Dashed line indicates the contact between the formations.

Figure 20. The Skurweberg Formation rocks on the shore between St Mungo Bay and Struis Bay.

Figure 21. Satellite image of Struis Bay and the rocky belt of the Skurweberg Formation around it.