

INVERLOCH SURF BEACH EROSION REPORT

JUNE 2025



INTRODUCTION

The following report contains an engineering assessment of the work required to obtain a satisfactory permanent solution to the erosion of the Inverloch Surf Beach.

The Inverloch surf beach faces southwest and is directly exposed to Bass Strait. Consequently, it is subject to rising sea levels, high tides, high winds, severe swells and storms. When these events coincide extremely powerful wave forces are created. The result is steady erosion of the dunes which has become evident over the last 12 years. There is no reason to expect any change in their frequency or severity.

The fact is that the sea has caused severe erosion to the Inverloch Surf Beach and shows no sign of stopping. **Urgent permanent remedial work must be carried out immediately.**

ABOUT THE REPORT'S AUTHOR

This report was prepared by Inverloch Foreshore Action Group committee member, Keith Godridge. Keith's career spans 32-years in local government engineering and he is experienced in calculating earthwork volumes and road design together with practical experience of road construction.

EXTENT OF THE EROSION

The erosion starts at the Flat Rocks escarpment and extends easterly to 100 metres east of Ozone Street, a total length of approximately 2,100 metres. In width It has taken part of the sand dunes for at least 70 metres. The height reduction of the dunes varies between 3 and 5 metres.

The volume of sand lost between Flat Rocks and 100 metres east of Ozone Street is in the order of 500,000 cubic metres.

The area of foreshore vegetation lost is in the order of 10 hectares or 25 acres.

There are **five locations** experiencing severe erosion problems:

- **Flat Rocks:** Severe erosion of 750 metres of foreshore between the RRV rocks and the escarpment has occurred along the beach known as Flat Rocks. The erosion is evident by the loss of 80-year-old coastal banksias and large cypress trees.
- The remnants of a former camping ground toilet block and its septic tanks have been exposed by the erosion. The toilet block was situated well away from the tidal zone.
- At one point on Cape Paterson Road there is only 10 metres between the erosion and the road. At the boat ramp there is 30 metres. At the present rate the road will be breached within five years.



Caption: The exposed septic tanks at Flat Rocks

- **Intersection of Surf Parade and Cape Paterson Road:** In 2020 the erosion almost breached the Cape Paterson / Surf Parade intersection. Last minute action by Rural Roads Victoria [RRV] in placing rocks saved the road. Sand buildup has completely blocked a large pipe culvert at the intersection. Heavy rainfall could now cause flooding of Cape Paterson Road. This problem could have been avoided by a small rock revetment. It will now require an extension of the RRV revetment and flood gates.
- **Wreck Creek Outlet:** The outlet of Wreck Creek has eroded severely, changing its course. It is vulnerable and will threaten Surf Parade unless it is remedied.
- **The Inverloch Surf Lifesaving Clubhouse:** The ISLSC is perilously close to being swept away having lost 70 metres of dunes to erosion.
- **East of the ISLSC:** The beach east of the ISLSC has lost much of the dunes separating Surf Parade and the surf beach. Unless the erosion is arrested Surf Parade will be lost closely followed by the properties fronting Surf Parade.



Caption: Unearthed vegetation

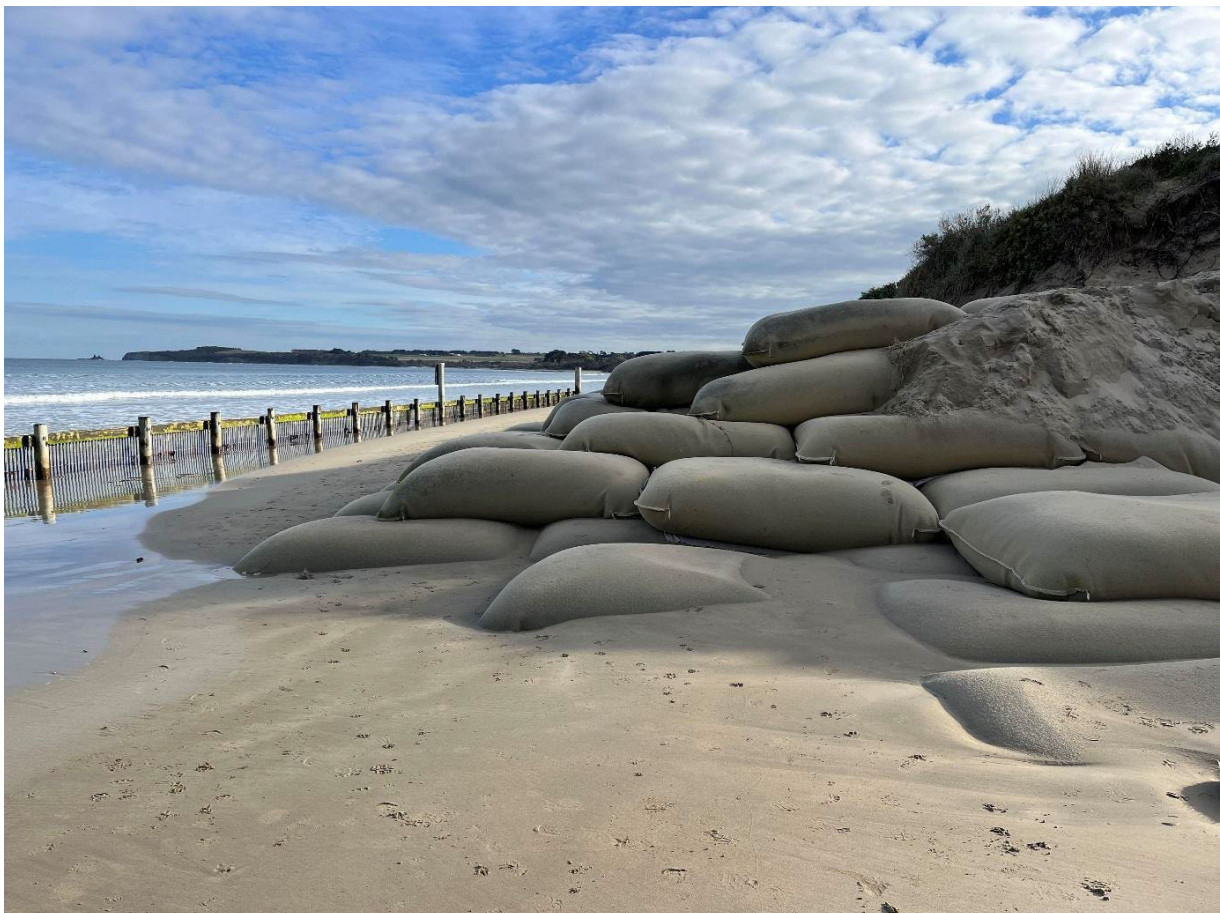
SUMMARY: The erosion presents immediate threats to the ISLC, Cape Paterson Road, Surf Parade, 35 homes, and critical infrastructure. A permanent and effective solution to prevent further erosion is now urgent.

PREVIOUS EROSION CONTROL WORKS IN INVERLOCH

Inverloch has a long history of coastal erosion. A variety of control works have been used:

- **Andersons Inlet:** Brick Sea wall. Built in the 1930 s between Venus Street and Grove. Approximately 600 metres in length. Effective and still in good condition.
- **Andersons Inlet:** Steel post and timber seawall approximately 200 metres in length. Built about 1960. Timbers were replaced in 2021. Fully effective.
- **Rock revetment** about 100 metres in length east of Veronica Street. Constructed circa 1980 to save a toilet block together with some of the foreshore.
- **Rock revetment** east of the jetty. Approximately 200 metres long. Completely satisfactory.
- **Rock Bags at The Esplanade** between Grandview Grove and Pymble Avenue. Approximately 60 metres long, recently installed, completely satisfactory.
- **Rock revetment between the jetty and The Esplanade.** Approximately 60 metres in length. Installed in 2024. Completely satisfactory.

- **Wet sand fencing at the surf beach.** Constructed in 2019 at a reported cost of \$219,600. Timber stakes placed vertically between posts and strung together with nylon ropes. Dismal failure. Everything was washed into Bass Strait.
- **Wet sand fencing 2.0 at the surf beach.** Constructed later in 2019. Timber piles and hardwood rails supporting vertical hardwood stakes. Fifty metre lengths at the ISLSC and at the Cape Paterson Road intersection. Elaborate and expensive construction proved to be ineffective. The Cape Paterson Road installation is now derelict.
- **Sandbags.** Seventy metres of sandbags were installed by DEECA in front of the SLSC. The work was finished in May 2020. It had a budget of \$ 450,000. The sandbags have saved the clubhouse to date. They were expected to last 10 years but are rapidly deteriorating and are unlikely to last another year. The 70-metre length was insufficient to fully protect the clubhouse. Sand has now built up and covered the bottom courses of the sandbags.
- **Sacrificial Sand.** Used as a final effort to provide emergency protection to the clubhouse. Funded by Bass Coast Council. Loose sand with no hope of resisting tides let alone swells and minor storms. Ongoing, temporary and a waste of money.
- **Rock Revetment.** RRV installed 160 metres of rock revetment at the Cape Paterson / Surf Parade intersection in April 2020. Completely effective. Sand has now built up and around the base rocks.



Caption: Sandbags at the ISLSC and sacrificial sand.

DEECA PROPOSAL

Cape to Cape Study

A State Government Committee was set up around 2018 for the purpose of examining a wide range of issues affecting coastal erosion under the heading “The Cape-to-Cape Resilience Project”. The Committee has operated under the auspices of the Department of Energy, Environment, and Climate Action [DEECA].

To date no recommendations for permanent erosion control have been made by the Committee. The focus of the Committees work has been to adopt a strategy of Retreat and Adapt to the erosion.

- *Project Update # 1: April 2025 from DEECA advises that DEECA is now intending to arrange for dune reconstruction by pumping approximately 110,000 cubic metres of sand from within Andersons Inlet to the surf beach between the RRV rocks and Ozone Street. This would involve hiring a marine dredge, sailing it to Inverloch, crossing the bar at the Inlet entrance, anchoring it in the Inlet, and setting up a 3,000-metre-long pipeline to the RRV rocks.*

The design provides for larger dunes west of the ISLSC than those east of the ISLSC to cater for higher sand drift from west to east.

The Project Update states that the consulting firm of Coastal Engineers Water Technology have been engaged “to prepare initial dune and beach nourishment concept designs for Inverloch Surf Beach”. The Update fails to advise whether that firm recommended the pumping of sand from the Inlet. No expected life of the proposed dune and beach nourishment work has been provided.

Beach renourishment is a continuation of the sacrificial sand method used by Bass Coast Council. No protection by any form of solid barrier to prevent tidal and storm action washing away the soft pumped sand is intended. On completion the surf beach would have 110,000 cubic metres of loose sand dunes spread over 1,000 metres with no protection from tides and storms. It is absurd to expect dunes made of pumped sand to resist tides and storms where old dunes with significant trees and established vegetation have been lost.

SOLUTIONS

Design Objectives

There are two possible design objectives:

A – Temporary: Replacing some of the lost sand by trucking or by pumping. Sand cannot be compacted mechanically and any sand imported would be less dense than that of dunes established over many years. The pumped sand would then be washed away at high tides and storm events. Past attempts have demonstrated that replenishing sand is only a temporary measure and a waste of money. At the absolute best it has a use as a short-term measure.

B – Permanent: Installing a solid protection barrier to resist all tidal and storm events. Local examples are the installations at Inverloch [Section 3] and the rock walls at Cowes and Walkerville North.

Permanent Solutions

Sandbags: Sandbags are strictly not permanent with an expected life of about 10 years. They are extremely difficult to fill and place and as a result, expensive.

The sandbag wall at the ISLC was completed in May 2020. The sandbags have saved the clubhouse for now but are now failing. Due to their rigidity, they are prone to disintegrate when handled for replacement.

- **Rock Revetment:** Rock revetments are the most used method of coastal erosion control worldwide as they have an unlimited lifespan. Because of the high energy wave forces at the Inverloch Surf beach the rocks would need to weigh an average of three tonnes. They are unlikely to be available in the weights and volumes required for use at the Inverloch surf beach. Limited supplies may be available from quarries in the Latrobe Valley area.

Footnote: I have been informed that the RRV rocks came from the Werribee area as did the rocks for the Cowes revetment.

- **Rock Bags:** Rock bags comprise a net made of high density polyethylene with a lifting ring at the top. They are filled with 80- 120 mm sized rocks. A lifting ring enables easy movement and placement by excavator or crane.

The bags were invented in Japan in the 1970's and are now used worldwide, including at Cowes and Inverloch. They are stated to have a 60 + year lifespan and come in a variety of sizes up to 4 tonne capacity.

Because of their gaps between their filling, they dissipate the energy of the tides and or storm waves. The bags are flexible and can move to conform to uneven surfaces.

They are suitable for the establishment of vegetation.

Rock Bags are the ideal solution for permanent erosion control at the Inverloch Surf Beach:

1. Long life - 60+years
2. The rocks are available from local quarries at Leongatha South and Leongatha.
3. Far cheaper and faster construction than sandbags
4. Flexible and can be relocated if necessary
5. Attractive to marine life and plants

SOURCES OF FUNDING

Victorian State Government: The Victorian State Government has primary responsibility for the protection of the State's coastlines. To date no specific funds have been provided by the State Government for the Inverloch Foreshore although Inverloch is included together with five other sites for a share of \$ 10M allocated in the 2025/26 budget.

It would be reasonable for the State Government to match the \$ 3.3 M provided by the Federal Government. A compelling argument for the matching contribution can be made to the State Government.

Federal Government: In 2022 the Federal Government provided \$3.3 M to the Victorian Government for erosion work at the Inverloch surf beach. A funding acknowledgement sign at the

Inverloch Surf Beach Erosion Report: Author: Engineer, Keith Godridge

Cowes revetment states that the Federal Government funded that project in conjunction with Bass Coast Council. It is possible that the Federal Government will provide additional funds for the Inverloch Surf Beach erosion.

Bass Coast Council: A contribution from Bass Council toward safeguarding properties and the ISLC clubhouse would not be unreasonable. The Council has previously funded part of the Cowes revetment and the cost of the sacrificial sand at Inverloch.

The Council has budgeted for the completion of the shared path to the ISLC clubhouse for years but has not yet produced an acceptable design. It could be put to Council that the shared path funds are better used at this time toward a permanent solution for the surf beach erosion.

Staging: Completion of the permanent work will require significant funds. It will need to be carried out in stages as funds allow with the most urgent sections prioritized.

PUBLIC CONSULTATION

DEECA: Despite DEECA announcing it would hold public consultation meetings in January and May 2025 no meetings have eventuated. The Department has only engaged with a committee known as I* CAN [Inverloch Coastal Advisory Network]. This Committee comprises representatives from DEECA, Inverloch Traders and Tourism Association, the Inverloch Conservation Society and the ISLSC. A report in the Sentinel Times 4/6 details the decision of the Department, endorsed by I* CAN to implement the pumped sand project. This highly questionable project would then proceed without any input from the public of Inverloch.

LINE IN THE SAND RALLY: A Line in the Sand rally was held in January 2022. The rally was organized by The South Gippsland Conservation Society. It attracted a large audience including the then Bass Coast Council Mayor. Despite demonstrating the Inverloch community's plea for action on the erosion nothing eventuated.

INVERLOCH FORESHORE ACTION GROUP [IFAG]: IFAG organized a public rally at the ISLSC on 4 January 2025. An estimated 700 residents were in attendance. Speakers included Brad Battin, Leader of the Opposition, who pledged that a State Liberal Coalition Government would provide the funding necessary for a permanent solution to the erosion.

The following motions were adopted unanimously:

THAT THE STATE GOVERNMENT:

- **PERMANENTLY PROTECT THE INVERLOCH SURF LIFESAVING CLUBHOUSE**
- **PERMANENTLY PROTECT THE INVERLOCH ROAD KNOWN AS SURF PARADE AND THE COASTAL ROAD BETWEEN INVERLOCH AND CAPE PATERSON**
- **RESTORE AND PERMANENTLY PROTECT THE DUNE FORMATION IN THE LOCALITY**

The pumped sand project as proposed fails to provide a permanent solution to the clearly expressed wishes of the public rally of 4 January 2025. The ISLC is now in danger of being lost.

SUMMARY

Scope: This report aims to collate and update the history of the erosion at the Inverloch surf beach and the actions to deal with it. The erosion began in about 2010. Since then, the lookout towers of the ISLSC were relocated twice and lost. Huge volumes of sand were washed from established dunes together with significant areas of mature vegetation. After years of study no permanent solution has been formulated.

- **Surf Parade;** The 70 homes fronting Surf Parade are the first at risk of destruction until permanent erosion control is constructed. It is possible for another 130 homes in Lohr Avenue to be affected by further erosion. Eventually the Ripple Drive residences would be at risk.
- **ISLC: The Clubhouse,** opened in 2011, is now in danger of collapse. Sandbags are the last line of defense for the Clubhouse and are themselves in danger of collapse.
- **Cape Paterson Road:** Attempts to control the erosion with wet sand fences were useless and a waste of money, particularly version 2.0. Only when it became obvious that the road would be breached action was taken by RRV to construct the rock revetment.
- **Cape to Cape Study:** The Cape-to-Cape study started around 2020. It has produced nothing of relevance toward solutions for permanent erosion protection. The study has failed to produce any recommendations to permanently stop the erosion of the surf beach.
- **Funding: Federal Government** funds of \$ 3.3M have not been used by DEECA.
- **Pumped Sand:** The current proposal is to reconstruct the dunes between the Vic Roads rocks and Ozone Street by pumping up to 110,000 cubic metres of sand. Based on experience with sacrificial sand most of the pumped sand would be eroded away within weeks. No engineering advice for it has been quoted or provided by DEECA. The original dunes were consolidated over time and had significant vegetation cover. Expecting fresh sand with newly planted vegetation to withstand erosion where the former dunes were washed away is ludicrous.
- **Progress: DEECA** has not provided possible methods for a permanent solution. Hard engineered solutions have been dismissed on the false allegation they would cause the beach to be lost. Hard engineered solutions have been constructed in Inverloch since the 1930's. At every site the beach has built up as shown by surveyed measurements.
- **Cowes:** Two permanent hard engineered protection works have been constructed in Cowes - a rock revetment complete with stairs and concrete ramp to their beach and a rock bag revetment. Both installations are completely successful with no evidence of causing any loss of the beaches. Inverloch has the same erosion problems as Cowes but is being denied the same treatment. Inverloch has had its SLSC under threat for ten years and no permanent solution has been provided.
- **Scale:** The 2,100-metre length of erosion may have influenced DEECA from formulating a permanent solution.



Caption: Rock bag revetment at Cowes – Silverleaves.

HARD ENGINEERING VS SOFT ENGINEERING

Soft Engineering: Soft Engineering includes the use of wet sand fencing and importing sand from another section of the beach or the Inlet.

Four wet sand fences were installed on the Inverloch surf beach and all were dismal failures.

Importing sand from other sections of the beach to the ISLC, known as sacrificial sand, has proven to last for two weeks under normal tides.

The proposal to replenish the dunes by pumping sand from the Inlet would have a low expectancy of duration. No engineering advice has been furnished as to the expected lifespan of this proposal.

Hard Engineering: Hard Engineering is the use of solid barriers to protect the dune sand from the wave forces. At Inverloch rocks in the form of a revetment and or rock bags are the potential forms of hard engineering. Geotextile bags have been shown to fail prematurely.

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DEECA has dismissed the use of hard engineered solutions at Inverloch on the allegation that they would cause the beach to erode and be lost. That argument is totally at odds with the actual on-ground situation for the following reasons:

1. The problem of severe erosion has been occurring over the last 12 years steadily, taking the beach and showing no signs of stopping. The beaches have become flatter, allowing high tides to reach dunes and at higher speeds than previously.
2. DEECA has stated that Hard Engineering would cause scour and loss of the surf beach. It has not produced any evidence to support this assertion.
3. Examination of the locations where Hard Engineering has been used, at the ISLC and at the RRV revetment show that the beach has built up.
4. The measured slope of the beach at the centre of the ISLC sandbags is 1 in 12 or 8.3 %. At the RRV revetment the slope is 1 in 12 or 8.3 %. At the seawall on The Esplanade the slope is 1 in 6 or 16%.

The eroded non-protected slope of the beach 50 metres east of the sandbags is 1 in 60 or 1.7 %. 50 metres west of the RRV revetment the non-protected slope is 1 in 45 or 2.22 %. These surveyed levels prove that the beach is now significantly steeper at the hard engineered sites than it is at the non-protected sites. Hard Engineering treatments do not cause beach loss; on the contrary they cause the beach to build up.

As the rock revetment and the sandbags were installed in March -May 2020 i.e. five years ago they have had adequate time to show any sign of causing beach erosion as asserted by DEECA. No erosion has been caused at either location.

5. The Hard Engineering applications at Cowes Silverleaves are completely successful with no sign of them causing or adding to the erosion of their beaches.
6. DEECA to explain why rock revetment and rock bag Hard Engineering installations have been approved at Cowes Silverleaves whilst Inverloch has been offered only temporary Soft Engineering.

DEECA has also stated that Hard Engineered barriers would be subject to erosion at their ends and are therefore unsuitable. This statement overlooks the Inverloch situation for the following reasons:

- At Flat Rocks the western end of the RRV revetment would be the starting point for a Hard Engineering Solution, terminating at the rock escarpment. When finished two existing hard and stable existing ends would be joined.
- The eastern end of the RRV revetment already exists as Hard Engineering. Only the end at east of Ozone Street would be new. It can be easily transitioned into the existing low dune where wave forces are relatively mild.
- At Cowes Silverleaves there are four ends to the installations. DEECA must explain why Hard Engineering ends are acceptable at Cowes Silverleaves but not at Inverloch.

THE CLUBHOUSE- IMMEDIATE ACTION REQUIRED

The Clubhouse is currently under severe threat of being lost to erosion. It needs a rock revetment like the RRV installation in either rocks or rock bags constructed on the seaward side of the wet sand 2.0 fence for 150 metres and to a height of RL 3.6. AHD.

A plan shown below drawn from surveyed levels illustrates the need for the revetment.

Installation of the revetment would require a concrete ramp like that at Cowes Silverleaves to provide beach access for foot and lifesaving vehicles.

Topping up the eroded ends of the sandbags overnight is extremely expensive and futile. A rock revetment is the only possible method to save the clubhouse and must be implemented without any further procrastination. Without question it should be the priority for the use of the \$ 3.3 M Federal Government grant. Wasting the funds on a pumped dune renourishment program instead of saving the clubhouse would be unforgivable.

