

Notice of Meeting:

I hereby give notice that an ordinary meeting of the Saddle Hill Community Board will be held on:

Date: Thursday 12 August 2021
Time: 1.00 pm
Venue: Island Park Golf Course Clubroom, Brighton Road, Waldronville

Sandy Graham
Chief Executive Officer

Saddle Hill Community Board
PUBLIC AGENDA

MEMBERSHIP

Chairperson	Scott Weatherall	
Deputy Chairperson	Paul Weir	
Members	Christina McBratney	Keith McFadyen
	John Moyle	Cr Jules Radich
	Leanne Stenhouse	
Senior Officer	David Bainbridge-Zafar, Group Manager Property Services	
Governance Support Officer	Lynne Adamson	

Lynne Adamson
Governance Support Officer

Telephone: 03 477 4000
Lynne.Adamson@dcc.govt.nz
www.dunedin.govt.nz

Note: Reports and recommendations contained in this agenda are not to be considered as Council policy until adopted.

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	Any items for consideration by the Chair.	

1 PUBLIC FORUM

At the close of the agenda no requests for public forum had been received.

2 APOLOGIES

At the close of the agenda no apologies had been received.

3 CONFIRMATION OF AGENDA

Note: Any additions must be approved by resolution with an explanation as to why they cannot be delayed until a future meeting.

DECLARATION OF INTEREST

EXECUTIVE SUMMARY

1. Members are reminded of the need to stand aside from decision-making when a conflict arises between their role as an elected representative and any private or other external interest they might have.
2. Elected members are reminded to update their register of interests as soon as practicable, including amending the register at this meeting if necessary.

RECOMMENDATIONS

That the Board:

- a) **Notes/Amends** if necessary, the Elected Members' Interest Register attached as Attachment A; and
- b) **Confirms/Amends** the proposed management plan for Elected Members' Interests.

Attachments

Title	Page
A SHCB Register of Interest	7

Saddle Hill Community Board Register of Interest - 4 August 2021				
Name	Responsibility (ie: Chairperson etc)	Declaration of Interests	Nature of Potential Interest	Proposed Management Plan
Scott Weatherall	Chair, Board of Trustees	Big Rock Primary School	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Member	Brighton Surf Life Saving Club	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Medical Responder	Brighton Fire Service	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Paramedic	St John's Ambulance	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Event Organiser	Brighton Gala Day	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
Paul Weir	Parent of pupil	Fairfield School	No conflict identified	Withdraw from discussion and voting and leave the room.
	Vice President and parent of pupil	Green Island Kindergarten	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
Leanne Stenhouse	Parent of pupil	Big Rock Primary School	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Street Contact	Neighbourhood Support	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
Christina McBratney	Owner	Residential Property	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Employer is key contributor during emergency	Civil Defence	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
Keith McFayden	President	Brighton Bowling Club	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Member	Island Park Golf Club	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Union Organiser	PSA	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
John Moyle	Board Member	Sunnyvale Sports Complex	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Owner	Freshchoice Supermarket	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	President	Green Island Cricket Club	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
	Member	St Peter Chanel Board of Trustees	No conflict identified	Withdraw from discussion and leave the table if a conflict of interest is identified. Seek advice on actual or potential conflicts of interest prior to the meeting.
Jules Radich	Shareholder	Izon Science Limited	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Shareholder	Taurikura Drive Investments Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Shareholder	Golden Block Developments Ltd	Central City Plan may create an interest	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director	Cambridge Terrace Properties Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director/Shareholder	Southern Properties (2007) Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director	Golden Centre Holdings Ltd	Central City Plan may create an interest	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director/Shareholder	IBMS Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director/Shareholder	Raft Holdings Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director/Shareholder	Otago Business Coaching Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director	Effectivise Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director	Athol Street Investments Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Director/Shareholder	Allandale Trustee Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Shareholder	Aberdeen St No2 Ltd	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Member	Dunedin Public Art Gallery Acquisitions Committee (Council appointment)	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Member	Dunedin Public Art Gallery Society (Council appointment)	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Member	Road Safety Action Plan	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	100% Shareholder/Director	Panorama Developments Limited	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Member	Tertiary Precinct Planning Group (Council appointment - alternate)	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.
	Member	Saddle Hill Community Board (Council appointment)	No conflict identified	Seek advice prior to the meeting if actual or perceived conflict of interest arises.

CONFIRMATION OF MINUTES


SADDLE HILL COMMUNITY BOARD MEETING - 10 JUNE 2021

RECOMMENDATIONS

That the Board:

Confirms the public part of the minutes of the Saddle Hill Community Board meeting held on 10 June 2021 as a correct record.

Attachments

	Title	Page
A 	Minutes of Saddle Hill Community Board meeting held on 10 June 2021	10

Saddle Hill Community Board

MINUTES

Minutes of an ordinary meeting of the Saddle Hill Community Board held in the Edinburgh Room, Municipal Chambers, The Octagon, Dunedin on Thursday 10 June 2021, commencing at 1.00 pm

PRESENT

Chairperson	Scott Weatherall	
Deputy Chairperson	Paul Weir	
Members	Keith McFadyen	Christina McBratney
	Cr Jules Radich	Leanne Stenhouse

IN ATTENDANCE David Bainbridge-Zafar (Group Manager Property Services)

Governance Support Officer Lynne Adamson

1 PUBLIC FORUM

1.2 Fairfield Community Pool Committee - Support for Funding Application

Dean Gordon (Committee Member), Fairfield Community Pool Committee and Ega Mackenzie and Ella Wright (Fairfield School pupils) provided a presentation and spoke in support of their funding application.

1.3 Brighton Rugby Club – Support for Funding Application

Nathan Hill spoke in support of the funding application from the Brighton Rugby Club.

1.4 Brighton Road Laybys

James Crooks, Graham Carse, Kiri Fraser, Vianney Santagati and Jane Schofield addressed the meeting concerning closure of Brighton Road Laybys and their preference that the laybys remained open.

2 APOLOGIES

Moved (Scott Weatherall/ Paul Weir):

That the Board:

Accepts the apology from John Moyle.

Motion carried

3 CONFIRMATION OF AGENDA

Moved (Scott Weatherall/ Christina McBratney):

That the Board:

Confirms the agenda without addition or alteration

Motion carried

4 DECLARATIONS OF INTEREST

Members were reminded of the need to stand aside from decision-making when a conflict arose between their role as an elected representative and any private or other external interest they might have.

Paul Weir advised that he had a conflict and would withdraw from discussion and consideration of the Fairfield Community Pool Funding Application.

Moved (Scott Weatherall/Leanne Stenhouse):

That the Board:

- a) **Notes** the Elected Members' Interest Register; and
- b) **Confirms** the proposed management plan for Elected Members' Interests.

Motion carried

5 CONFIRMATION OF MINUTES

5.1 SADDLE HILL COMMUNITY BOARD MEETING - 18 MARCH 2021

Moved (Scott Weatherall/Leanne Stenhouse):

That the Board:

Confirms the minutes of the Saddle Hill Community Board meeting held on 18 March 2021 as a correct record.

Motion carried

PART A REPORTS

6 FUNDING APPLICATION

The three funding applications for consideration by the Board were considered separately.

The Dunedin Group Riding for the Disabled requested \$1,935.00 towards the cost of purchase and installation of a heat pump in their parents/viewing and waiting area.

Moved (Cr Jules Radich/ Christina McBratney):

That the Board:

- a) **Approves** the funding application from Dunedin Group Riding for the Disabled for \$1,935.00 towards the cost of purchase and installation of a heat pump.

Motion carried (SHCB/2021/008)

Fairfield Community Pool

Paul Weir withdrew from discussion and consideration of the funding application.

The Fairfield Community Pool Committee requested \$2,703.00 towards upgrade of safety equipment such as matting at the pool.

Moved (Christina McBratney/Leanne Stenhouse):

That the Board:

- b) **Approves** the funding application from Fairfield School Board of Trustees - Community Pool Committee for \$2,703.00 towards the cost of upgrading safety equipment at the community pool.

Motion carried (SHCB/2021/009)

Brighton Rugby Club

The Brighton Rugby Club requested \$1,000.00 to replace two broken external doors at the rugby club rooms.

Moved (Paul Weir/Cr Jules Radich):

That the Board:

- c) **Approves** the funding application from the Brighton Rugby Club for \$1,000.00 for the replacement of two broken doors.

Motion carried (SHCB/2021/010)

7 GOVERNANCE SUPPORT OFFICERS REPORT

A report from Civic provided an update on activities relevant to the Board area.

Discretionary Fund

There was a discussion on projects suitable for funding from the discretionary fund for consideration later in the meeting.

Westwood to Ocean View Cycleway

The Board noted the update provided and requested a specific cost to gravel the side of the road rather than have it fully formed.

Moved (Keith McFadyen/Scott Weatherall):

That the Board:

Notes the Governance Support Officers Report.

Motion carried

8 BOARD UPDATES

Board members provided updates on activities undertaken on behalf of the Board or items of interest which included:

Keep Dunedin Beautiful

Christina McBratney provided an update on Keep Dunedin Beautiful and advised that Mandy Mayhem-Bullock had been appointed Chairperson following the passing of the previous Chair, Jan Tucker. The Keep Dunedin Beautiful awards would be held in August and it was agreed that the Bennett/Brighton Pathway Community Mosaic wall was a worthy project and the Board would nominate the group responsible for this art work.

Coastal Dune Regeneration Programme

Scott Weatherall advised that there were plants available for this project.

Waldronville Food Forest

Leanne Stenhouse advised that this project was currently on hold.

Community Response Plan – Training

The Board would like another training exercise with Civil Defence when available.

Civil Defence

Scott Weatherall and Paul Weir provided an update on the Civil Defence meeting held earlier in the day.

Community Board Conference

Paul Weir provided an update on the Community Board Conference held recently in Gore.

Brighton Bowling Club

Keith McFadyen advised that the Brighton Bowling Club had recently been named the Club of the Year for Dunedin.

Moved (Scott Weatherall/Leanne Stenhouse):

That the Board:

- a) **Endorses** nomination of the Community Group responsible for the Bennett Road/Brighton Road Pathway Mosaic Project.

Motion carried (SHCB/2021/011)

Moved (Scott Weatherall/Leanne Stenhouse):

That the Board:

- b) **Notes** the Board updates.

Motion carried (SHCB/2021/012)

9 CHAIRPERSON'S REPORT

The Chairperson (Scott Weatherall) provided an update on items of interest which included:

Brighton Road – Taieri Mouth Laybys

There had been communication with the surfing community on the future of the laybys with them being invited to the meeting to outline their thoughts in the public forum.

Discretionary Fund

The Board agreed to purchase two picnic tables from Cargill Enterprises at a cost of \$375.00 each for installation at the reserve opposite the Turning Tides Fish and Chip shop in Ocean View and at the Kaikorai Estuary from the discretionary fund. The last of the money from the fund would be used for installation of the tables.

Moved (Scott Weatherall/Cr Jules Radich):

That the Board:

- a) **Approves** the purchase of 2 x picnic tables from Cargill Enterprises at a cost of \$375.00 each from the discretionary fund.
- b) **Approves** payment to the Dunedin City Council for the installation of the picnic tables at:
 - The Reserve in Ocean View opposite the Turning Tides Fish and Chip Shop
 - The Kaikorai Estuary Reserve.

Motion carried (SHCB/2021/013)

Christina McBratney left at 2.05 pm and returned at 2.08 pm.

10 COUNCILLOR UPDATE

Councillor Jules Radich provided an update on the 10 year plan submissions and deliberations.

Moved (Cr Jules Radich/Scott Weatherall):

That the Board:

Notes the update from Cr Radich.

Motion carried

11 ITEMS FOR CONSIDERATION BY THE CHAIR

The Board would like updates on the following items:

- An upgrade of the Waldronville footpaths
- Martin Road footpaths
- Health and Safety assessment re Morris Road – ditch etc
- Ocean View Ditch
- Friendship Drive Ditch
- Update on Queens Street

It was agreed that the next meeting would be held at the Island Park Golf Course Clubrooms in Waldronville.

The meeting concluded at 2.24 pm.

.....
CHAIRPERSON

REPORTS

THE KEEPING OF ANIMALS (EXCLUDING DOGS) AND BIRDS BYLAW REVIEW

The Keeping of Animals (excluding Dogs) and Birds Bylaw is being reviewed. The current purpose of the bylaw is to “protect the public from nuisance and to protect, promote and maintain public health and safety by controlling the keeping of animals and birds within the residential district”. This bylaw does not extend to dogs which are regulated by the Dog Control Bylaw. Staff have had good feedback from initial consultation which will inform any proposed changes. There will be further consultation on proposed options, likely around October.

The current bylaw can be found on the following: <https://tinyurl.com/Bylaw-Update>

Staff will be in attendance to respond to questions.

TRANSPORT DELIVERY MANAGER

The new Transport Delivery Manager (Ben Hogan) will be in attendance to introduce himself to the Board.

Attachments

There are no attachments for this report.

FUNDING APPLICATION

Department: Civic

EXECUTIVE SUMMARY

- 1 There is one funding applications for consideration by the Board.
- 2 The Island Park Golf Club has requested \$2,651.91 towards the cost of upgrading the lighting to the club room, kitchen, toilets and bar area.
- 3 There is \$10,00.00 remaining in the discretionary fund.

RECOMMENDATIONS

That the Board:

- a) **Approves/declines** the funding application from the Island Park Golf Club.

Signatories

Author:	Lynne Adamson - Governance Support Officer
Authoriser:	

Attachments

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Application for Funding from the Saddle Hill Community Board

Date: 30-7-21

Name of Group Applying for Funds: Island Park Golf Club

Contact person: Brent Young Position Held: House manager

Phone Number: [REDACTED] Email: [REDACTED]

Address: 336 Brighton Road, Waldronville
Dunedin Post Code 9018

*** Please note: the above fields are compulsory

If the person responsible for the project differs from the contact, please provide details including name, contact phone number and email address.

Details of the project you are seeking funding for: _____

Upgrade of lighting to club room, kitchen, barlets
and bar area. Outside security lighting is also due
for replacement at a cost of around \$800.00.

Please attach any additional information including any quotations which may be useful in explaining the project. **Clubs and other groups should include a copy of their last financial statement with their application.**

Amount sought from the Saddle Hill Community Board: \$ 2651.91

Total cost of project: \$ 3454.91

Amount already raised: \$ 800.00

How will the rest of the project cost be funded including any funding sought from any other Dunedin City Council source?

Club savings

Project completion date: Mid September

The funding must be used within one year of the grant application or it must be returned to the Board unless you have provided a report and request for an extension of time.

Is the project a one-off /annual/ biennial /other event? If other, please detail:

The current lighting was installed over 20 years
ago, so replacing with Eco LED lights, we expect
to get another 20 years of service

Detail the benefits to your organisation and/or the wider community which will result from this project:

The upgrade will be more energy efficient, therefore saving in power costs, electrically safer and will brighten up all areas making it a more enjoyable environment. We also allow other organisations to use our club rooms free of charge for meetings

Has your group made an application to the Board for funding support within the last five years? Yes ☐ No ☒ *Not to my knowledge.*

If yes, how much was granted, and what was that money used for? _____

All approved funding is subject to the following:

The organisation/group must report back to the Board within six months of the project completion or six monthly until the project is completed.

Do you agree to provide a report back on the project should you have funding approved: Yes ☒ No ☐

You may either use the form attached or provide your own written report, however it must include the points covered on the form.

**** Any funds approved MUST be paid directly into the organisation's bank account, please supply a copy of the bank account name and number separately. ****

- Applicants are encouraged to attend the Community Board meeting to speak to their application and answer any questions the Board may have.
- Applications will be considered on their own merits.

If you would like to attend a Board meeting to speak to your application, please contact Governance Support on 474-4000

The application form is also available on www.dunedin.govt.nz and should be returned to Governance Support, Dunedin City Council, P O Box 5045, Dunedin 9058 or governance.support@dcc.govt.nz

Please contact either Scott Weatherall (Chairperson) or one of the other Community Board members with any queries you may have.

GUIDELINES FOR ALLOCATIONS FROM THE BOARD'S DISCRETIONARY FUND

Each of Dunedin's six community boards has a discretionary fund of \$10,000 per annum, funded from the general rate.

The Saddle Hill Community Board will make allocations from its fund based on the priorities set in its Community Plan, and may make allocations in accordance with the following criteria:

Category A: Community Initiated Projects

A pool of **\$5,000 p.a.** will be available for community initiated projects.¹ Non profit making groups and/or organisations wishing to apply for funds from Category A will be required to complete the *Application for Funding from the Saddle Hill Community Board* form. Applications must be lodged no less than one calendar month before the community board meeting at which it is to be considered.

Category B: Board Initiated Projects

A pool of **\$3,000 p.a.** will be available for Board initiated community projects. Some previous examples of such projects are allocations which were made to the Fairfield Beautification Project and the Kaikorai Estuary – Installation of Post and Chain Project. The Board will make allocations under Category B as the need arises.

Category C: Board Activities

A pool of **\$2000 p.a.** will be available for Board related activities, which may include such items as attendance at conferences or training workshops, advertising and communication, producing newsletters, undertaking community surveys/questionnaires, and hosting functions. The Board will make allocations under Category C as the need arises.

Note:

All allocations from the discretionary fund will be supported by a resolution passed at a formal meeting of the Board.

As Keith McFadyen is a member of our club,
we were hoping he could represent us at the
meeting.

I will be happy to attend if required





QUOTE

Island Park Golf Club

Reference
lighting upgrade

Date
26 July 2021

Expiry Date
25 August 2021

Quote Number
QT00241-2

0274277390
charlie@harrexelectrical.co.nz
13 Cleaveland Close
Fairfield
Dunedin

Quote to upgrade lighting to LED

Thankyou for allowing Harrex Electrical the opportunity to price on your requirements.
Please review the following breakdown.

Inclusions:

- Remove and dispose of 25 existing florescent fittings.
- Install new LED Pierlite Eco LED batons
- Carry out testing and provide COC upon completion

Exclusions:

- No allowance for any repair/replacement of ceiling tiles if found to be damaged

We trust this quotation is to your satisfaction and look forward to your response.
If you have any queries regarding the above please do not hesitate to contact me.

Kind regards

Charlie Harrex.

Subtotal	2,306.00
Total GST	345.91

Total NZD	2,651.91
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SOUTH OTAGO COAST - SEDIMENT TRANSPORT

Department: 3 Waters

EXECUTIVE SUMMARY

- 1 The purpose of this report is to update the Community Board on coastal work planning and assessments in the Saddle Hill Community Board area.
- 2 The Dunedin City Council and Otago Regional Council are working together to complete a district-wide screening of coastal hazards. This initial screening will be used to identify areas that require more detailed technical assessments, monitoring and management planning. This screening will provide a greater understanding of what areas are at greatest risk, and will inform future work on priority sites.
- 3 The district-wide coastal hazard screening process has begun and is expected to be completed in early 2022. Lidar information (aerially-derived surveys) will be available in late 2021, and are required before the coastal hazard screening process can be completed.
- 4 Another relevant area of work is on sediment transport. The attached report summarises numerical modelling undertaken to further understand the sediment transport regime along the southern Otago coast. The report relates to the stretch of coast between Molyneux Bay (In the south) and Cape Saunders (in the north). It represents one of several pieces of work which have been undertaken to support the development of the St Clair – St Kilda Coastal Plan.

RECOMMENDATIONS

That the Board:

- a) **Notes** that an update on the coastal hazard screening process will be presented in 2022
- b) **Notes** the South Otago Coast – Sediment Transport report.

Signatories

Author:	Tom Simons-Smith - Coastal Specialist
Authoriser:	Zoe Moffat - Planning Manager David Bainbridge-Zafar - Group Manager Property Services

Attachments

Title	Page
A South Otago Coast - Sediment Transport Numerical Modelling	25

SUMMARY OF CONSIDERATIONS
Fit with purpose of Local Government

This decision enables democratic local decision making and action by, and on behalf of communities.

Fit with strategic framework

	Contributes	Detracts	Not applicable
Social Wellbeing Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic Development Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Environment Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arts and Culture Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 Waters Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spatial Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integrated Transport Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parks and Recreation Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other strategic projects/policies/plans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This work fits within our 3 Waters and Environment Strategies.

Māori Impact Statement

This work is of interest to our mana whenua partners.

Sustainability

This work relates to environmental sustainability.

LTP/Annual Plan / Financial Strategy /Infrastructure Strategy

There are no LTP implications.

Financial considerations

There are no financial implications.

Significance

This report is for noting only. There is no decision to be made.

Engagement – external

This work has involved external engagement with Otago Regional Council and other partners.

Engagement - internal

There has been no internal engagement.

Risks: Legal / Health and Safety etc.

There are no identified risks.

Conflict of Interest

There are no conflicts of interest.

Community Boards

This work will be of particular interest to Community Boards on the southern coast.

South Otago Coast Sediment Transport: Numerical Modelling

Prepared for:



South Otago Coast Sediment Transport: Numerical Modelling

Report Status

Version	Date	Status	Approved by
V1	19 Aug 2020	Draft for Client Review	SDG
V2	4 September 2020	Updated Draft for Client Review	EAA
V3	16 September 2020	Approved for Release	EAA

It is the responsibility of the reader to verify the version number of this report.

Authors

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S. Otago Coastal Sediment Transport: Numerical Modelling

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S. Otago Coastal Sediment Transport: Numerical Modelling

Figures

Figure 1.1. Annotated aerial photo showing: the depth of material in the modern sand wedge of Carter and Carter (1986 - white lines); the seaward limit of the modern sand facies (Carter <i>et al.</i> , 1985 (dashed red line); Carter and Carter, 1986 (solid redline)); offshore wave climate time series extraction point (white dot); and prominent locations within the study site. Insert: illustration of the Tasman and Southland Currents around the southern tip of the South Island of New Zealand, and approximate study site (green box).	3
Figure 2.1: Transect locations (red lines) at 250 m intervals along the coast.	6
Figure 2.2: Model domains (grids). Red: course resolution NZ scale mode; blue: 500 m sub regional grid; pink (A grid), orange (B grid) and green (C grid), 100 m resolution local grids. With representative wave conditions extract points (green stars).	7
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1 Introduction

This report represents one of several pieces of work commissioned by the Dunedin City Council (DCC), which are being undertaken to develop a Coastal Plan for the St Clair to St Kilda coast (Figure 1.1). While the St Clair to St Kilda coast is the focus of the overarching project, an understanding of the larger coastal sediment transport system is imperative, not only to inform decision making in the development of the St Clair to St Kilda Coastal Plan, but also support public consultation. This project considers coastal sediment transport along the southern Otago Coast from Tokatā (Nugget) Point to Kaimata (Cape Saunders) (Figure 1.1).

This report is preceded by a literature review that provides additional detail for the same study site (Atkin *et al.*, 2020), and has been undertaken following a Synopsis of Understanding for the St Clair to St Kilda beach system (Serrano, 2019), that identified a gap in the current understanding of the larger sediment transport system in which St Clair to St Kilda beach sits. This report summarises numerical modelling undertaken to further understand the sediment transport regime along the southern Otago coast. This has been achieved by constructing an uncalibrated long-term wave climate model, and post processing the data to infer inner Depth of Closure, develop boundary conditions; and, implement modelling of longshore sediment transport flux.

1.1 Study Site

The coastal area from Tokatā Point to Kaimata (~110 km of coastline) comprises Molyneux Bay to the south and Taieri Bight in the north, divided by Quoin Point. The shoreline is characterised by sandy beaches backed by dunes, and delineated alongshore by exposed cliffs and headlands, with rocky reefs scattered along the shoreline. The modern sand facies described by Carter *et al.* (1985) is light olive-grey, fine-very fine, moderately to well sorted with a mean grain size of 0.088 - 0.23 mm. Hodgson (1966) and Dyer (1994) report mean grain sizes for St Clair to St Kilda coast of 0.26 mm and 0.30 mm, respectively. Hodgson (1966) also reports median grain sizes of 0.24 mm and 0.26 mm for Sandfly Bay and Allens Beach.

Sediment transport is predominantly south to north. Temporary reversals in the sediment transport system do occur (Carter *et al.*, 1986; Smith, 2007); transport to the south also occurs locally at Tokatā Point. This southerly transport is associated with a circulation of water, or anticyclonic mesoscale eddy, that occurs adjacent to Tokatā Point. The Clutha River is by far the largest source of sand and gravel for the Otago coastline. Associated with this is the modern sand wedge (Carter and Carter, 1986), an extensive “store” in the south Otago



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sediment transport system (see Atkin et al., 2020 and references therein). This is a large body of sand that extends from Tokatā Point, where the sand is ~35 m thick, to the north where the width and thickness of the sand store diminish (Figure 1.1).

Sediment budgets were developed by Smith (2007) and T&T (2000), both of which leverage the earlier work of Carter (1986), and Smith (1999; 2000a,b). In terms of material moving through the sediment transport system, from Tokatā Point to Karitane, Smith (2007) quotes Gibb's (1973) sediment flux of 588,888 m³yr⁻¹. Carter *et al.* (1985) quotes Kirk (1980) at 450,000 m³yr⁻¹ and Gibb (1979) at 1,000,000 m³yr⁻¹. Johnson *et al.* (2010) estimated an approximate sediment transport flux for the St Clair to St Kilda embayment of 200,000 m³yr⁻¹

1.2 Depth of Closure

The depth along a beach profile at which sediment transport becomes negligible or ceases is referred to as the Depth of Closure (*DC*). The theoretical concept of *DC* was developed by Hallermeier (1981) and has been used for coastal engineering design, particularly for nourishment projects. *DC* is a function of both wave height and period. *DC* calculations use the effective wave height, that is the wave conditions that are exceeded for 12 hours per year, or with a yearly occurrence probability exceedance of 0.137%. Hallermeier's (1981) equation for *DC* is:

$$DC = 2.28H_s - 68.5 \left(\frac{H_s^2}{gT^2} \right) [1]$$

where, H_s is the effective wave height, T is the associated wave period and g is acceleration due to gravity.

1.3 Longshore Sediment Transport

Beach morphology is subject to a multitude of processes and drivers. One of the most prominent drivers though, especially on open coast settings, is Longshore Sediment Transport (LST). LST most readily occurs where waves break obliquely to the shore, but also where there are alongshore wave height gradients; both of which set up a longshore current. The dependency of waves for this process means estimations of LST are firmly based on wave climate. There are a range of models and approaches to estimating LST dating back to the early 1980's.



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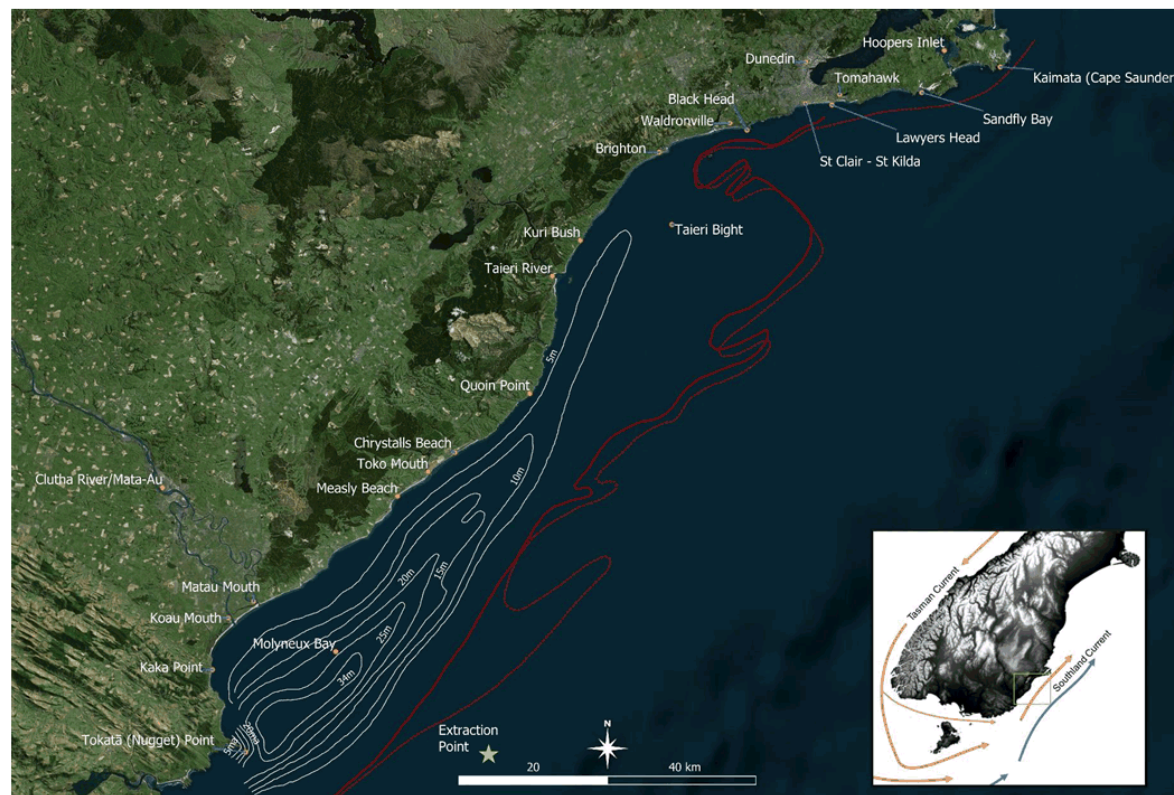


Figure 1.1. Annotated aerial photo showing: the depth of material in the modern sand wedge of Carter and Carter (1986 - white lines); the seaward limit of the modern sand facies (Carter *et al.*, 1985 (dashed red line); Carter and Carter, 1986 (solid redline)); offshore wave climate time series extraction point (white dot); and prominent locations within the study site. Insert: illustration of the Tasman and Southland Currents around the southern tip of the South Island of New Zealand, and approximate study site (green box).

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Mills-Homens *et al.* (2013) and Fernández-Fernández *et al.* (2016) provide comparisons of LST equations, with the former providing what is known as the modified-Kamphuis (after Kamphuis, 1991) formula:

$$LST = 0.15 \rho_s^a \left(\frac{H_{sb}^{2.75} T_p^{0.89} m_b^{0.86} d_{50}^{-0.69} \sin(2\theta_b)^{0.5}}{(\rho_s - \rho)(1-a)} \right) [2]$$

where: LST is volume per unit time in m^3s^{-1} ; H_{sb} is the significant wave height at the breaker line; T_p is associated peak period; m_b is the beach slope from the breaking line to the shoreline; d_{50} is median sediment grain size; θ_b is angle between the wave crests and the shoreline at the breaker line; ρ_s is the density of the sediment; ρ the density of the water; and a is the porosity index (Van Rijn, 2014). The modified-Kamphuis methodology was applied to this investigation. This study is not estimating cross shore sediment transport.



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2 Methodology

2.1 Bathymetry

In order to numerically model waves and post process model output, seafloor depths across the area of interest, or bathymetry, is required. The bathymetric data set used in this study comprises Land Information New Zealand's (LINZ) nautical chart and GEBCO (Becker *et al.*, 2009) data. These datasets were validated against two sets of survey data, one from Molyneux Bay (Williams and Goldsmith, 2014.) and another from south Dunedin (Johnson *et al.*, 2010). All bathymetric datasets were referenced to Mean Sea Level (MSL).

2.2 Transects

To present metrics along the length of the coastline of the study site, LINZ 1:50,000 coastline, which approximates MSL, was discretised at 250 m. At each discretised point, a transect that is perpendicular to the orientation of the coast was constructed. The orientation of the coast was represented by the mean of the orientation of the coastline 50 m either side of the discretized point. The shore normal transects were extended inland to the point at which the profile height reached ~3 m above MSL. The offshore extent of each transect is a function of depth, with the end point approximating 20 m deep MSL. A depth of 20 m was used as a first pass value for *DC* (Section 1.2), which was based on an estimate of the outer *DC* (offshore limit for *DC*) using mean conditions from the offshore wave climate (Hallermeier, 1981). Figure 2.1 presents the transects. Some transects were omitted because of their orientation, resulting from the dendritic nature of the South Otago coastline, which meant that calculation of any metric based on these transect would yield poor, unusable results. The areas where transects were omitted were almost entirely associated with the longer headlands that are oblique or perpendicular to the general orientation of the coast.

2.3 Wave Modelling

An industry-standard wave model, SWAN (Simulating WAVes Nearshore), incorporating the generation, propagation, and transformation of wave fields in both deep water and nearshore regions was used to simulate wave conditions at the study site. The SWAN model solves the spectral action density balance equation for frequency-directional spectra. This means that the growth, refraction, and decay of each component of the complete sea state, each with a specific frequency and direction, is solved, giving a comprehensive description of the wave field as it changes in time and space (Holthuijsen *et al.*, 2004).



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Numerical model domains were constructed by interpolating latitudinal, longitudinal and depth/elevation (XYZ), data on to rectilinear grids. The XYZ data used to construct gridded domains is described in Section 2.1. The modelling framework employs a nesting scheme to increase the spatial resolution at the study sites and areas of interest. On a New Zealand scale grid with a horizontal resolution of 0.05° (Figure 2.2), a 41-year wave hindcast was simulated. The model boundary conditions consisted of the European Centre for Medium-Range Weather Forecast's (ECMWF) ERA5 2-dimensional wave spectra with a horizontal resolution of 0.5° (Hersbach, *et al.*, 2020), and 10 m wind data sourced from the National Centre for Environmental Prediction's (NCEP) hourly global reanalysis model (Kalnay *et al.*, 1996) with a spatial resolution of 0.312° .

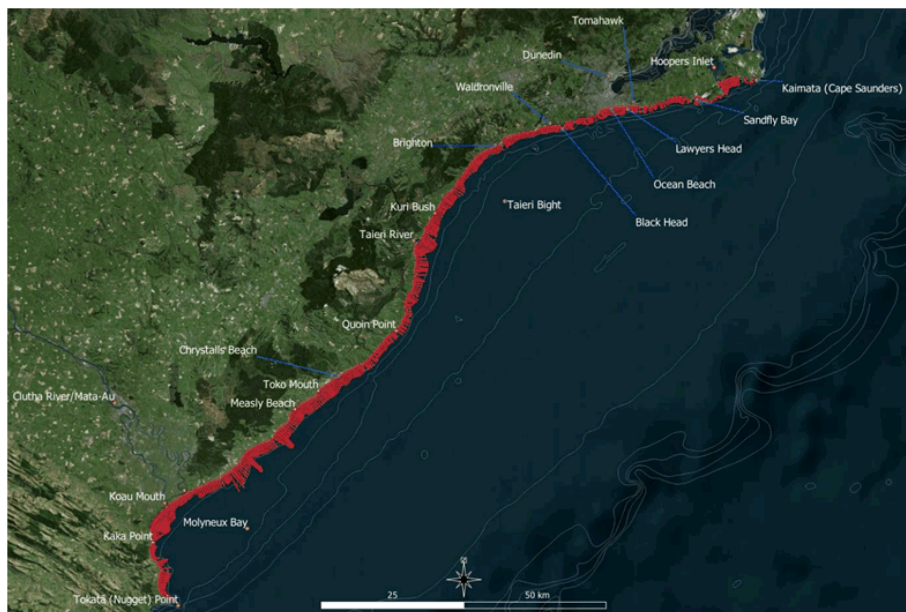


Figure 2.1: Transect locations (red lines) at 250 m intervals along the coast.

Nested within the New Zealand scale domain was a 2nd level sub-regional scale domain, with a spatial resolution of 500 m (Figure 2.2). Within the 2nd level nest are 3 local nests with 100 m resolution. The local nests, A, B and C, cover from Tokatā Point to Quoin Point, Quoin Point to Brighton, and Brighton to Kaimata, respectively. Characterised boundary conditions for each of the level 3 nested grids were constructed from a time series extracted from the level 1 hindcast at discrete locations on the boundary of the level 2 nest (Figure 2.2).



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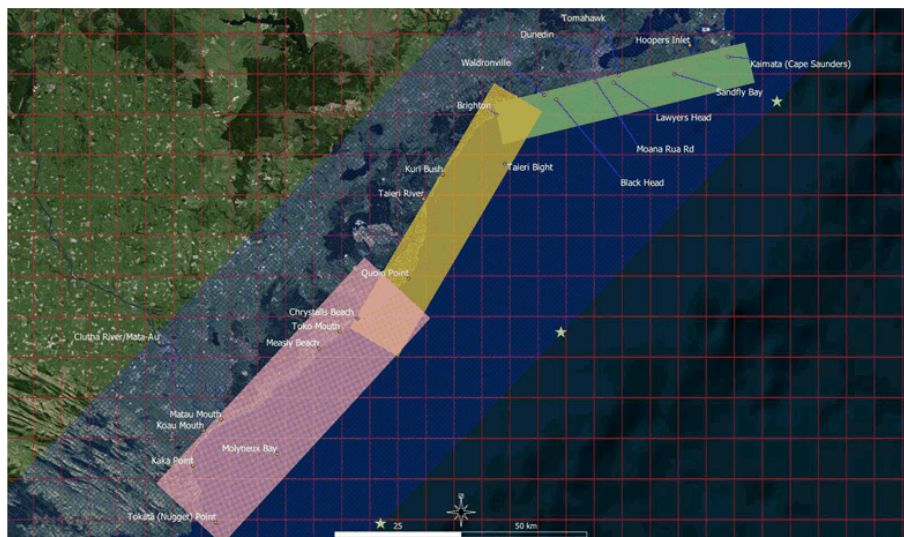


Figure 2.2: Model domains (grids). Red: course resolution NZ scale mode; blue: 500 m sub regional grid; pink (A grid), orange (B grid) and green (C grid), 100 m resolution local grids. With representative wave conditions extract points (green stars).

2.3.1 Sub-regional Boundary Conditions

Two sets of sub-regional boundary conditions were constructed. One for *DC* estimation and another for the purpose of sediment transport modelling. Boundary conditions for *DC* estimations were developed from the long term wave climate data extracted from the 3 representative wave condition extraction points (Figure 2.2) as follows:

- For each year with in the 41-year hindcast, the wave climate timeseries was divided based on wave direction into 30° bins from 50°N to 230°N.
- For each year and each bin, the instances of effective wave height, or significant wave height exceeded only 12 hours out of a single year, or the greatest 0.137% waves in a year (Brutsché *et al* 2016, Hallermeier, 1981) were identified. These instances, along with coincident wave periods and directions were then averaged.
- An additional boundary condition for each direction bin was constructed using all 41 years of data.

The result is 252 boundary conditions. Sediment transport modelling boundary conditions were developed at each of the 3 representative nodes as follows:



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- The 41-year time series was binned in both wave direction and height. Directional bins were 15° wide from 0 to 359.99°. Wave height bins were 0.5 m wide ranging from 0 m to 8 m.
- To provide a more accurate representative set of conditions for each bin, wave height, period and direction populations of each bin were averaged (as opposed to traditional approach of using the bin centres).
- An occurrence weighting was assigned to each bin based on the bin's population.

Table 2.1 through Table 2.3 present the results of this process, which provides 154, 141 and 147 weighted wave conditions for level 3 nested grids A, B and C, respectively. Each characterised wave condition for both *DC* and sediment transport regime was propagated from the offshore edge of the level 2 nest, and through the local level 3 nest.

Table 2.1: Binned and weighted wave climate for the grid A.

Wave Direction (°T)	Wave Height (m)															
	0.0-0.5	0.5-1.0	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	4.0-4.5	4.5-5.0	5.0-5.5	5.5-6.0	6.0-6.5	6.5-7.0	7.0-7.5	7.5-8.0
345-360																
330-345																
315-330																
300-315																
285-300																
270-285																
255-270																
240-255																
225-240				0.004	0.009	0.003	0.006	0.002		0.001						
210-225	0.001	0.333	2.361	3.680	3.311	2.311	1.494	0.841	0.469	0.249	0.104	0.046	0.020	0.005		
195-210	0.010	1.344	6.287	7.190	5.199	3.077	1.587	0.882	0.450	0.230	0.105	0.058	0.029	0.013	0.008	0.001
180-195	0.014	1.347	4.746	4.271	2.442	1.110	0.496	0.227	0.114	0.036	0.013	0.016	0.003	0.001	0.001	
165-180	0.007	1.085	3.253	2.363	1.082	0.450	0.181	0.057	0.046	0.018	0.004	0.003	0.004			
150-165	0.003	0.796	2.372	1.660	0.726	0.249	0.094	0.043	0.024	0.009	0.003	0.003	0.002			
135-150	0.004	0.597	1.975	1.523	0.572	0.224	0.073	0.033	0.013	0.004	0.002	0.003	0.001	0.001		
120-135	0.001	0.471	1.850	1.494	0.648	0.183	0.081	0.030	0.015	0.002	0.001					
105-120	0.001	0.483	1.894	1.693	0.670	0.252	0.078	0.031	0.011	0.004	0.002	0.003	0.002			
90-105		0.426	2.006	1.747	0.754	0.237	0.081	0.022	0.007	0.006	0.004	0.003	0.002	0.003	0.002	
75-90		0.441	1.890	2.005	0.834	0.279	0.088	0.039	0.013	0.006	0.001	0.001				
60-75		0.204	0.968	1.026	0.525	0.224	0.081	0.023	0.013	0.003	0.001	0.001				
45-60		0.003	0.011	0.005												
30-45																
15-30																
0-15																

2.4 Depth of Closure

The numerical model outputted waves statistics across the nested grids. In this case, output was created for each of the 6 directional bins for each year. For each output, the wave height and period were interpolated at 1 m intervals along the length of each of the shore normal transects. Using the wave height and period from each interpolated point the *DC* was calculated (Eq. 1). The *DC* for each transect, under each of the simulated wave conditions, is the point at which the depth profile and *DC* along each transect intersect or converge (e.g. Kang *et al.*, 2018). An example of this is Figure 2.3.



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Table 2.2: Binned and weighted wave climate for the grid B.

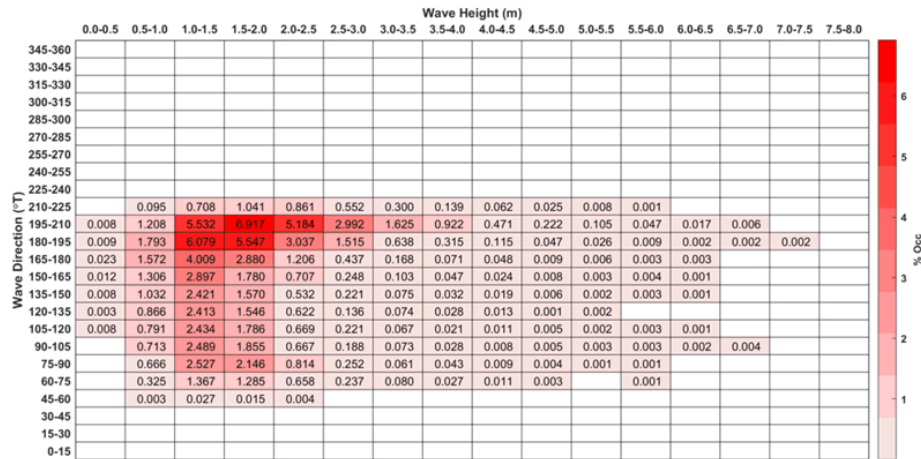


Table 2.3: Binned and weighted wave climate for the grid C.

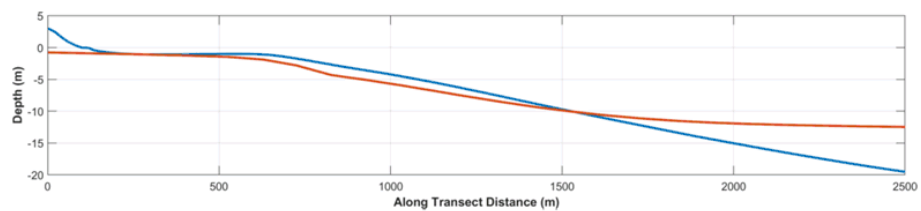
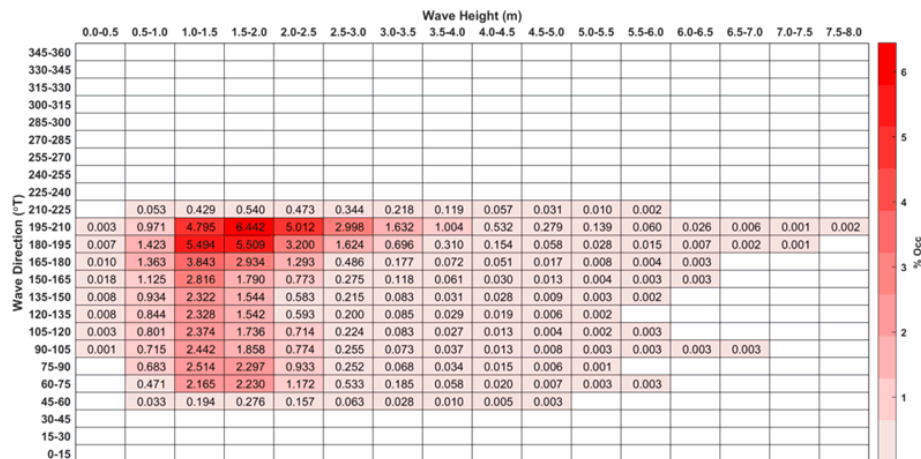


Figure 2.3: Convergence of transect depth profile (blue line) and DC values (red line) during storm conditions (~6 m at 12 s).



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A final *DC* for each year (and in the long-term case, using the whole 41-year time series) was taken as the deepest value from the 6 directional bins. From the 41-year *DC* values, statistics of maximum, minimum, standard deviation, and range of *DC*, at each transect were calculated.

2.5 Sediment Transport

For each shore-normal transect, at the location of the maximum *DC* (from Section 2.4), the transformed weighted wave conditions (Section 2.3.1) were extracted. The occurrence weighted conditions provided the boundary condition for 1-dimensional sediment transport modelling. The depth along the transect, interpolated at 1 m intervals, provided the model domain.

The modified-Kamphuis longshore sediment transport model (based on Mil-Homens *et al.*, 2013) predicts refraction and shoaling, breakpoint wave conditions and estimates longshore sediment transport on open coasts. Tuneable parameters in the sediment transport model include sediment grain size (D_{50}), and sediment density (ρ_s). The sensitivity of these tuneable parameters was explored for 2 transects in each level 3 nest. The transects were selected to account for a range in exposure and seabed slope.

Values for D_{50} in the study site are reported as 0.088-0.30 mm (Carter *et al.*, 1985; Hodgson, 1966; Dyer, 1994). This range encompass very fine sand, which is likely to be a small fraction of in the sediment distribution. The upper (Dyer, 1994) and lower (Carter *et al.*, 1985) reported limits of 0.23 mm and 0.3 mm and a mean of 0.265 are used in sensitivity testing. Sediment densities can vary greatly based on the geological setting and a value of 2670 kgm^{-3} is often assumed. Godfrey *et al.* (2001) report Haast Schist densities from 2682 kgm^{-3} to 2738 kgm^{-3} . Tenzer *et al.* (2010) report a mean Schist value of 2732 kgm^{-3} . Sensitivity testing included ρ_s values of 2670, 2704 and 2738 kgm^{-3} .

The sediment transport locations (each transect) were filtered to remove all locations when the sediment transport equations were not applicable. These locations included the rocky and cliff lined shores where longshore sand transport within the surf zone is more complex than the equations can account for, and locations where the transect is highly oblique to the bathymetric isobaths and/or the wave climate.



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3 Results

3.1 Depth of Closure

The maximum and minimum *DC* are presented in Figure 3.1 through Figure 3.4. *DC* ranges from 2 to 15 m. The shallowest *DC* values are associated with the sheltered bays close to Kaka Point. These points also have the lowest ranges in *DC* across the 41 years. The deepest *DC* values are located toward the more exposed eastern end of Kaimata, with ranges of ~6 m (study site maximum); range in *DC* is also large between Quoin Point and Taieri.

There is a general trend of increasing *DC* from Tokatā Point to Kaimata. Maximum *DC* values from ~Toko Mouth toward Kaimata are generally greater than 10 m. The mean range of *DC* around the South Dunedin coast is ~4 m, indicating a moderate amount of interannual variability. In Figure 3.1 *DC* locations are largely removed from the hashed polygon, which represented the 5 m depth of material in the modern sand wedge (Carter and Carter, 1986).

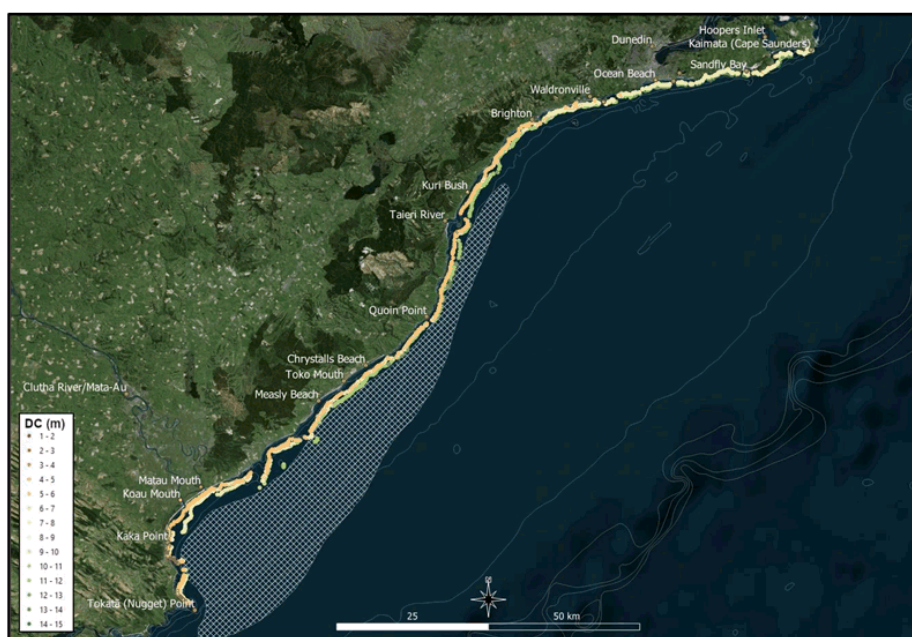


Figure 3.1: Tokatā Point to Kaimata: *DC* minima and maxima for each transect location (coloured circles), and 5 m depth of material polygon in the modern sand wedge.



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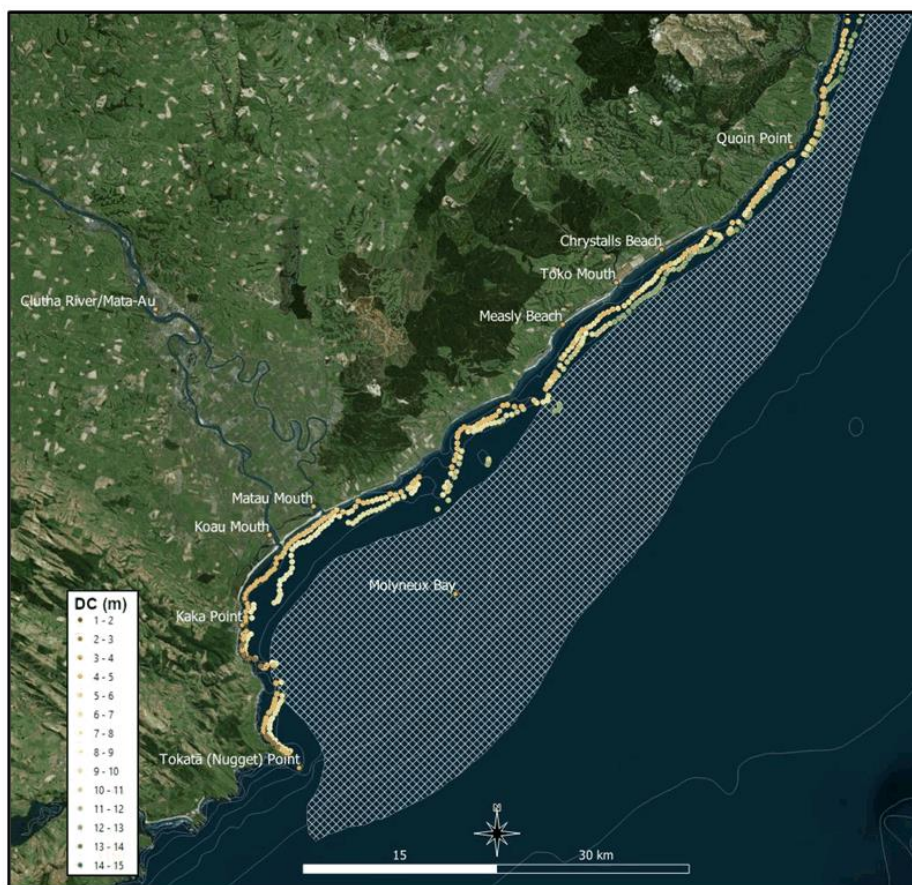


Figure 3.2: Tokatā Point to Measly Beach: *DC* minima and maxima for each transect location (coloured circles), and 5 m depth of material polygon in the modern sand wedge.



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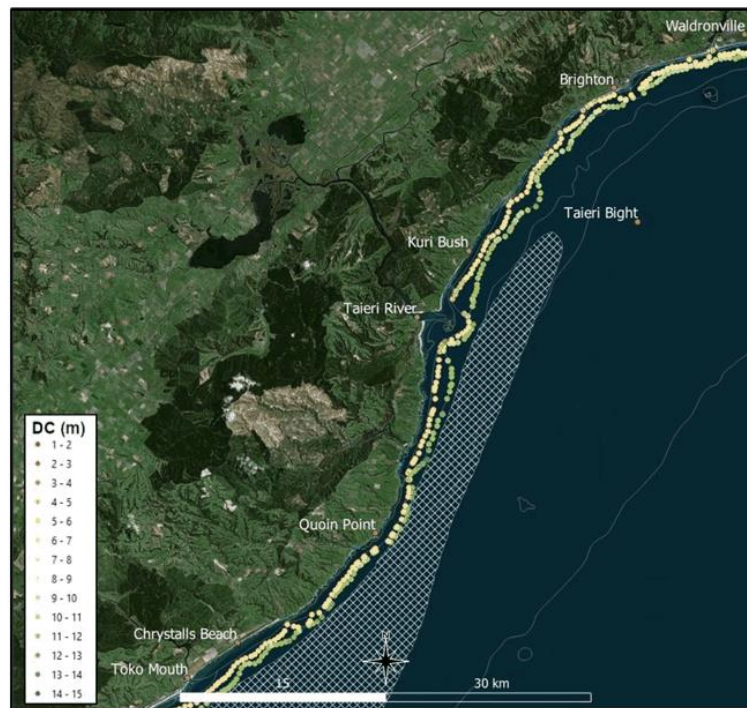


Figure 3.3: Toko Mouth to Waldronville: *DC* minima and maxima for each transect location (coloured circles), and 5 m depth of material polygon in the modern sand wedge.



Figure 3.4: Brighton to Kaimata: *DC* minima and maxima for each transect location (coloured circles), and 5 m depth of material polygon in the modern sand wedge.

3.2 Sediment Transport

Sediment transport results are presented as positive and negative potential sediment transport flux. In this study, sediment transport toward Kaimata is positive and sediment transport



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toward Tokata is negative. The main metric presented is **net** sediment transport potential, i.e. the positive transport potential weighed against the negative.

3.2.1 Sensitivity tests

Figure 3.5 presents the results from the sensitivity tests. The tests show that the percentage difference between the tested variables is the same at each transect. Noting the transect locations have different seabed slopes and wave climates. Altering the sediment grain size (D_{50}) by a standard deviation of the reported range results in 10% and 8% differences in transport potential for a grainsize decrease and increase, respectively. For an increase and decrease of 34 kgm^{-3} in sediment density (ρ_s), the difference is 1% and 2%, respectively. This indicates ρ_s has a smaller impact than sediment grain size on the outputs of the modified-Kamphuis sediment transport model. The relationships are as expected (e.g. increased grain size results in reduced sediment transport). The magnitude of potential error (up to 12%) is not excessive and provides confidence in other components of the sediment transport model (e.g. wave transformation, estimation of seabed slope). Given the scale of the study site a potential error of this magnitude is considered acceptable. The mean values (0.265 mm and 2704 kgm^{-3}) were used in the results for all transects.

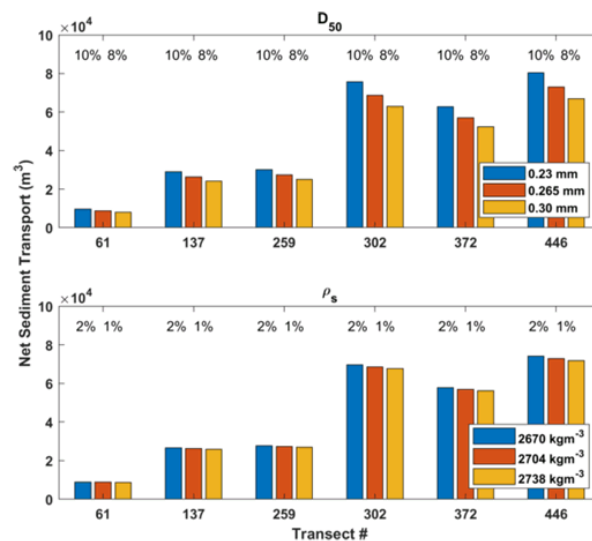


Figure 3.5: Sediment transport potential sensitivity for D_{50} (top) and ρ_s (bottom) for 6 different transects, 2 from each 3rd level nest. Values at the top of each plot indicate the percentage difference between tests.



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3.2.2 Tokatā Point to Kaimata

Mean and maximum sediment transport rates over the entire study area are provided in Table 3.1. The positive net value agrees with the predominant south to north sediment transport system reported by various authors. The maximum values for sediment transport potential estimated in this study are on the same order of magnitude as those reported in previous work (588,888 m^3yr^{-1} : Gibb, 1973 cited in Smith, 2007; and 450,000 m^3yr^{-1} to 1,000,000 m^3yr^{-1} : Gibb, 1979; Kirk, 1980; Carter *et al.*, 1985), although less by several 100,000 m^3yr^{-1} . Figure 3.6 provides a geographical overview of the sediment transport potential. Figure 3.7 through Figure 3.10 present this data in bar plot format. The reversal of sediment transport around the Clutha River mouth, described in previous studies (Carter *et al.*, 1986; Smith, 2007), is apparent.

Table 3.1: Sediment transport potential statistics.

	Mean (m^3yr^{-1})	Maximum (m^3yr^{-1})
Negative Flux	56,651	334,031
Positive Flux	91,159	334,539
Net Transport	34,508	248,464

Net negative sediment transport indicates reversal in direction relative to the overall net transport direction (from Tokatā Point to Kaimata). Prominent reversals occur at Koau Mouth, north of Wangaloa, Brighton, Westwood and Waldronville, Tomahawk Beach and Sandfly Bay. The locations of these reversals are shown in Figure 3.11. Most of the reversals collocate with, or are updrift (net) of headlands, occurring toward the north and/or east end of sandy embayments. At Waldronville, a negative sediment flux occurs in the lee of Green Island, west of the mouth of the Kaikorai Stream (Figure 3.12).

The mean net sediment transport potential between Bruce Rocks and Brighton is ~60,000 (gross ~215,000) m^3yr^{-1} . Between Brighton and Blackhead (i.e. Waldronville Beach) the mean net sediment transport potential is ~7,600 (gross ~108,000) m^3yr^{-1} ; and from St Clair Headland to Lawyers Head it is ~40,000 (gross ~115,000) m^3yr^{-1} .

In the St Clair to St Kilda embayment (Figure 3.13), there are 2 transect locations that exhibit reversals in sediment transport. One is adjacent to Moana Rua Rd, and the other at the Lawyers Head end of the beach. The negative net flux at Moana Rua Rd is ~2000 m^3yr^{-1} ; which in the scale of potential sediment transport occurring on the south Otago coast, is essentially net zero. Despite this, the gross potential transport is more than 80,000 m^3yr^{-1} , a value not dissimilar from the other positive flux values at other transects along the St Clair to St Kilda embayment.



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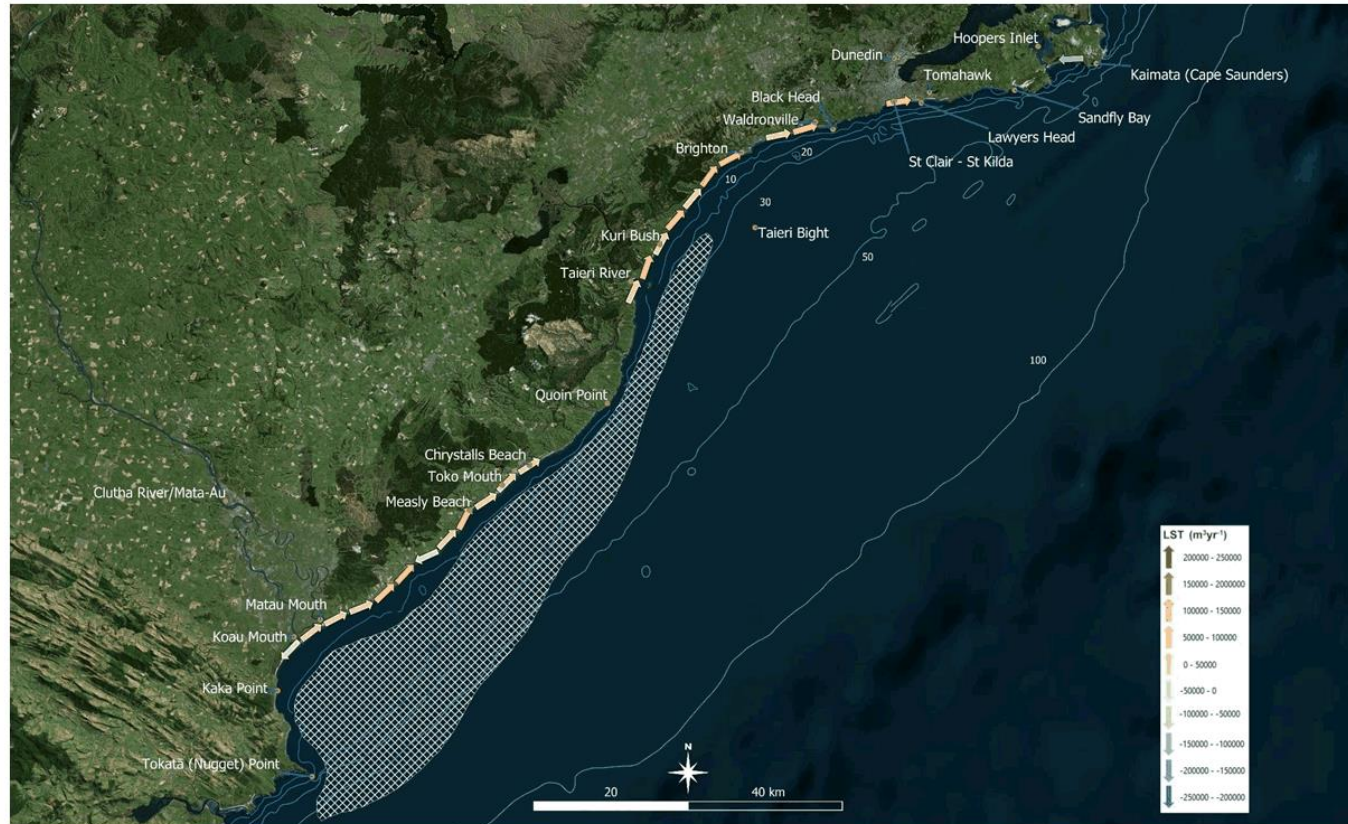


Figure 3.6: Filtered and thinned net sediment transport potential, arrows denoting net transport direction along the South Otago coast.

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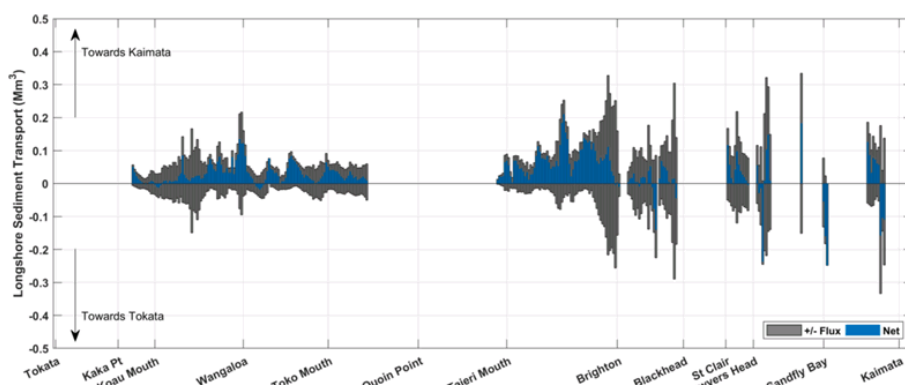


Figure 3.7: Bar plot of potential sediment transport net and flux from Tokatā Point to Kaimata.

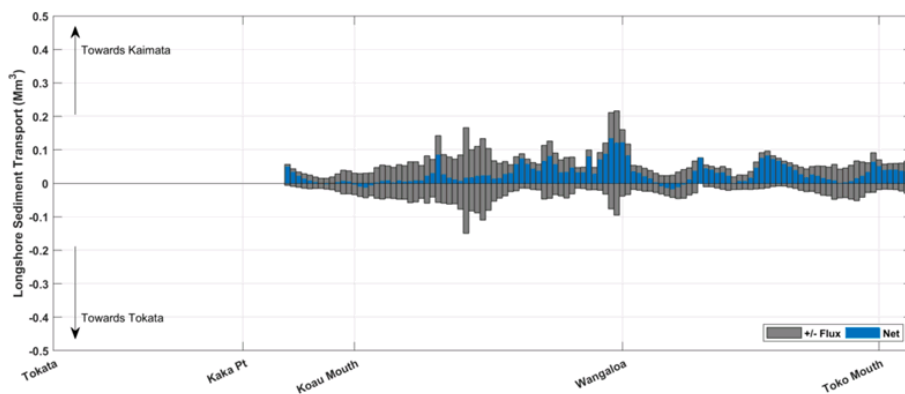


Figure 3.8: Bar plot of potential sediment transport net and flux from Tokatā Point to Toko Mouth.



S. Otago Coastal Sediment Transport: Numerical Modelling

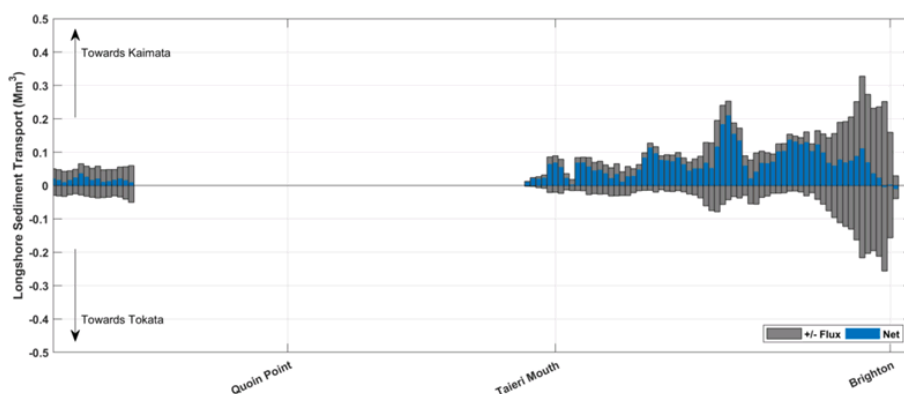


Figure 3.9: Bar plot of potential sediment transport net and flux from Toko Mouth to Brighton.

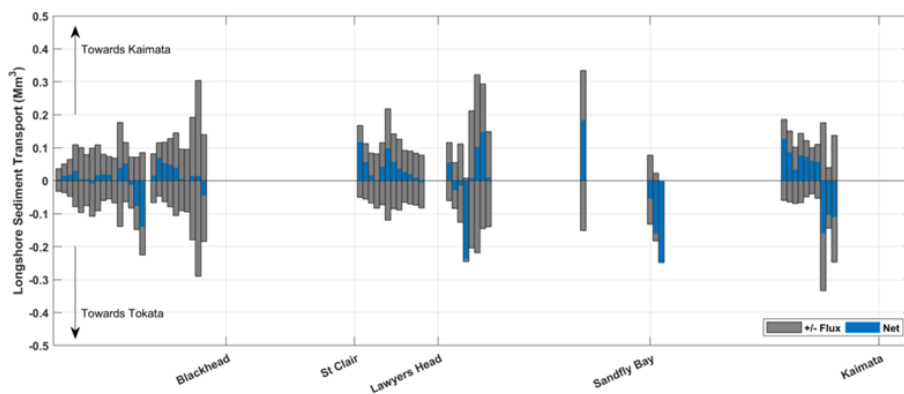


Figure 3.10: Bar plot of potential sediment transport net and flux from Brighton to Kaimata.



S. Otago Coastal Sediment Transport: Numerical Modelling

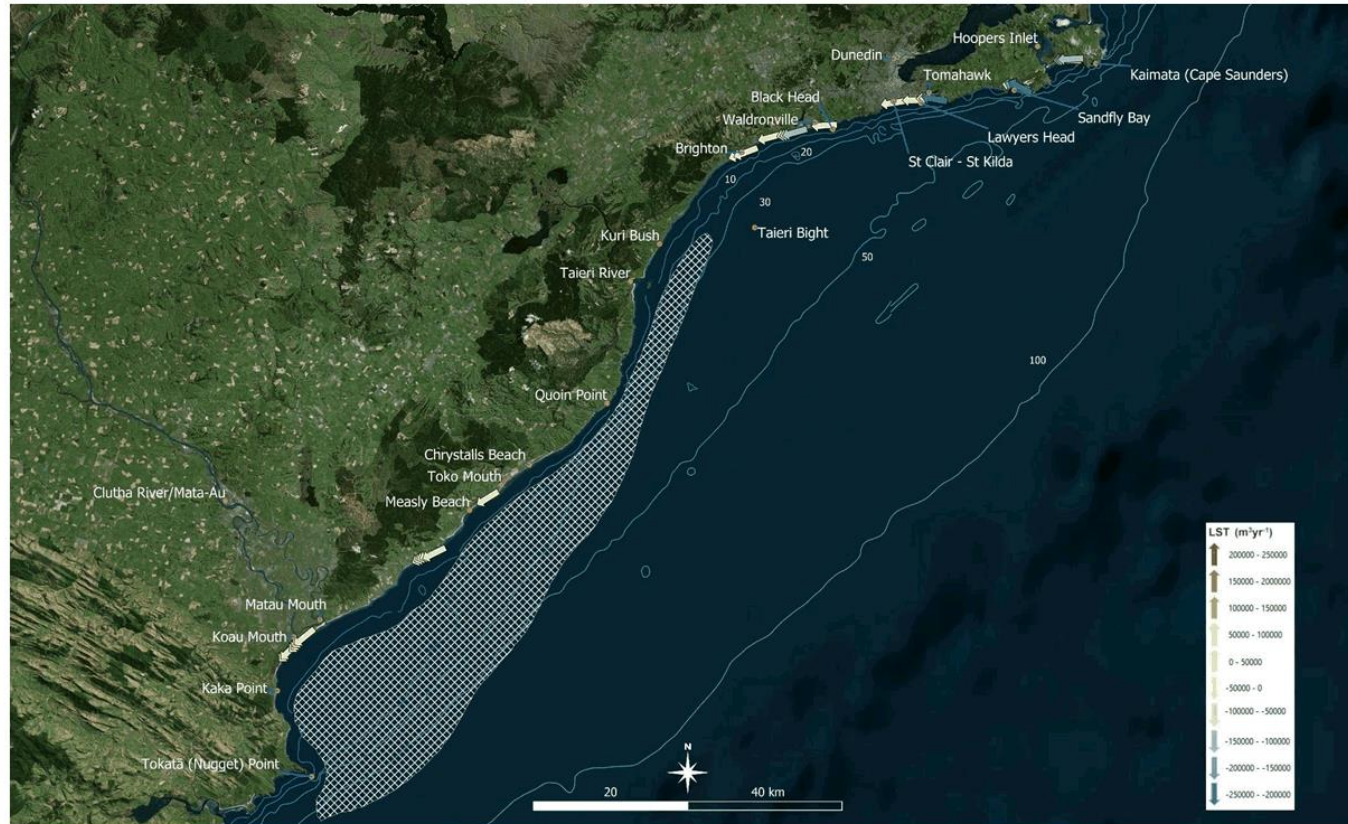


Figure 3.11: Locations of reversals in net sediment transport direction relative to the net transport regime.



S. Otago Coastal Sediment Transport: Numerical Modelling

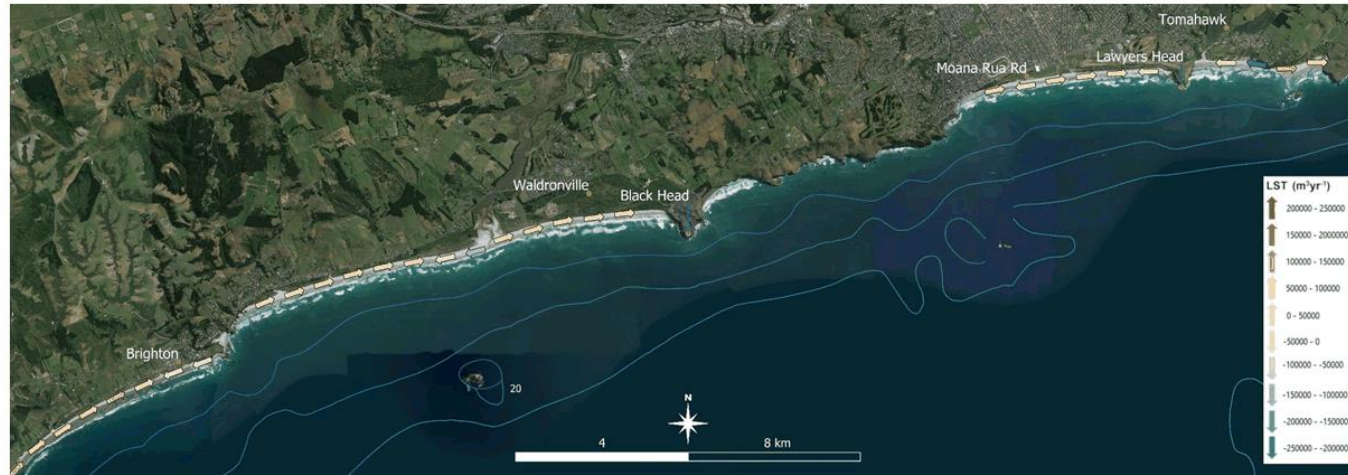


Figure 3.12: Net sediment transport potential between Bruce Rocks and Maori Head, arrows denoting transport direction.



S. Otago Coastal Sediment Transport: Numerical Modelling

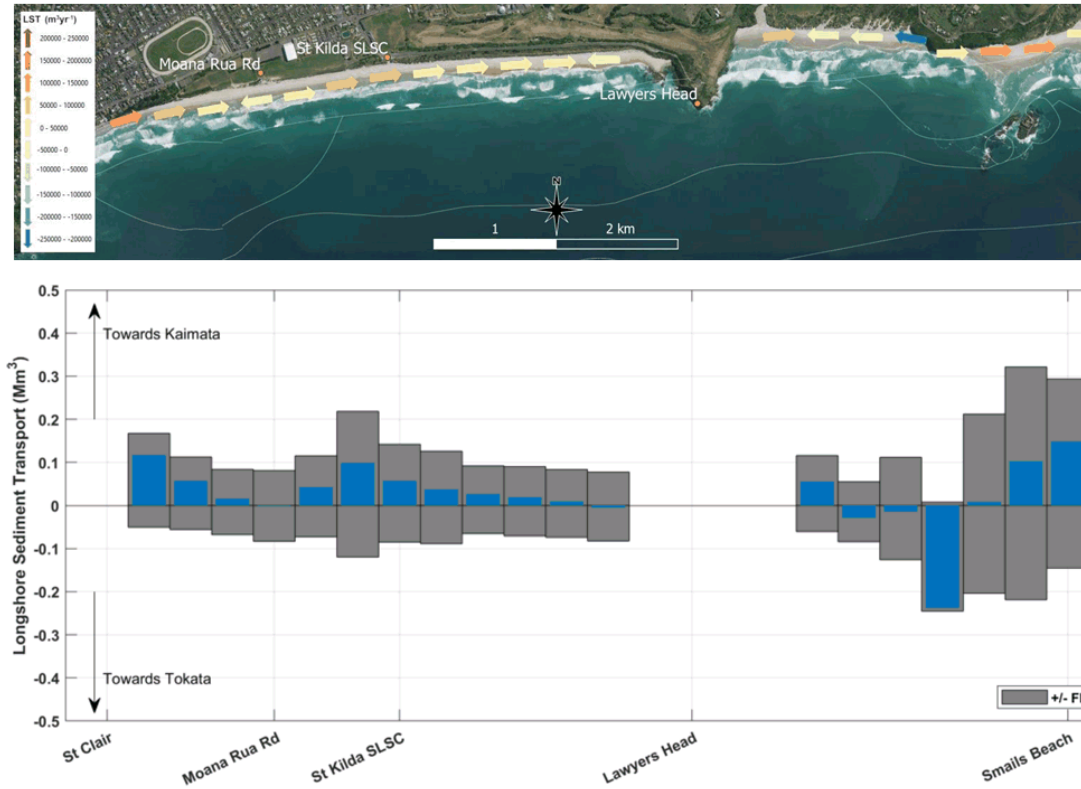


Figure 3.13: Net sediment transport potential between St Clair and Maori Head, arrows denoting transport direction.



S. Otago Coastal Sediment Transport: Numerical Modelling

4 Discussion

The sand wedge on the south Otago coast contains an exceptionally large volume of material. Whilst the sand wedge likely feeds material to the coastline, the bulk of the sand wedge is located well outside the Depth of Closure (*DC*), meaning that shoreward sediment transport from the bulk of the sand wedge may only occur during extreme events. *DC* generally increases from Tokatā Point to Kaimata, which means the active nearshore zone is much deeper. This reflects the increase in exposure to larger waves from the southern to northern end of the study site. From a management perspective, renourishment volumes are often estimated as a function of *DC*. This would mean that the required renourishment volumes would also increase along the coast. However, *DC* values are relatively consistent across the St Clair to St Kilda coast, indicating little variation in renourishment volumes across the embayment would be required.

The sediment transport potential at the proximal end of the sand wedge (i.e. Tokatā Point) is generally lower compared to the transport rate at the distal end and the area of interest (St Clair/St Kilda). The longshore sediment transport (LST) regime is therefore one of demand potential outstripping supply potential (higher net transport rates and lower transport depths at the distal end). As these beaches are largely sustained along the coast, an obvious assumption is that LST accounts for only a portion of the sediment transport system.

The Taieri River delivers 17,000 to 27,000 m³yr⁻¹ of sand/gravel to the south Otago system (Smith, 2007; T&T, 2000). Mean LST flux around the Taieri River source is ~36,000 m³yr⁻¹. Comparatively, mean LST flux northeast of Matua Mouth (Clutha River) is ~26,000 m³yr⁻¹.

At a more local level, it is estimated that the LST flux is reduced through the Waldronville Beach, relative to the net and gross values estimated for the Brighton area and St Clair to St Kilda. If we consider that Waldronville is the source for St Clair, the LST subsystem is in a net deficit.

Figure 4.1 includes the conceptual schematisation of the mean sediment transport during a southerly event theorised by Johnson, *et al.* (2010); who estimated a total sediment flux of ~200,000 m³yr⁻¹, based on a sediment flux of 500-750 m³/day (182,500-273,750 m³yr⁻¹). It should be noted that the concept represents only a snapshot of the processes occurring at the study sites. At the eastern end of the St Clair to St Kilda embayment beach Johnson *et al.* depict a pair of circulation cells. The reversal at the Lawyers Head end of the beach observed in this work collocate with circulation patterns suggested by Johnson *et al.* (2010). The transport pathway from the middle of the beach to the west estimated by Johnson *et al.* is also observed in this work, albeit not to the same extent. The arrows depicting circulation cells and



S. Otago Coastal Sediment Transport: Numerical Modelling

onshore/offshore driven pathways, which have not been determined as part of this study, were derived from the use of a 2D sediment transport model that is suited to relatively smaller study sites while considering coastal processes in more detail.

The annual sediment transport flux estimate of Johnson *et al.* (2010) is roughly double that of the gross LST estimated in this work. It is likely that this disparity can be at least partially attributed to the cross-shore sediment flux. If this is correct, cross-shore and LST sediment transport flux are roughly equivalent, or at least substantial. A number of plots depicting cross-shore and LST sediment transport flux presented by Johnson *et al.* (2010) support this assumption, as does the recent work of Davenport (2020) who has considered tracer experiments driven by a phase resolving model at St Kilda (Figure 4.1).

Reduction or reversal of LST flux associated with islands and reefs structures is observed on the south Otago coast. In terms of coastal geomorphology, the effects of offshore features are relatively well understood and have been simulated for many years in coastal engineering practice as detached breakwaters. The offshore islands and reefs influence mobile coastlines as control points and play an important role in the overall sediment transport regime. This is exemplified best in this study at Waldronville in the lee of Okaihe (Green Island); noting that Ponuihine (White Island), which comprises a relatively extensive subtidal reef structure, is situated further from the coast than Okaihe, but is considered to have a significant influence on St Clair-St Kilda coastal processes (Allen, 1999; Johnson *et al.*, 2010).

Within the St Clair to St Kilda embayment a net sediment flux of almost zero is observed at both Moana Rua Rd and at the Lawyers Head end of the beach. The former is currently subject to aggressive coastal erosion and a priority management area as there is a historical landfill site in this area. The net longshore sediment transport directions are divergent at this site, indicating that it is likely a hinge point, where sediment is transported away in both directions. The work of Johnson *et al.* (2010) indicates that during southerly storm conditions the hinge point would shift further east and likely be more pronounced. The reversal in net sediment transport direction at Lawyers Head is common at many of the headlands along this coast. Duarte *et al.* (2019) attribute this to wave crest rotation, and it is also common to most headland types under direct (rather than oblique) wave attack (George *et al.*, 2019a).



S. Otago Coastal Sediment Transport: Numerical Modelling

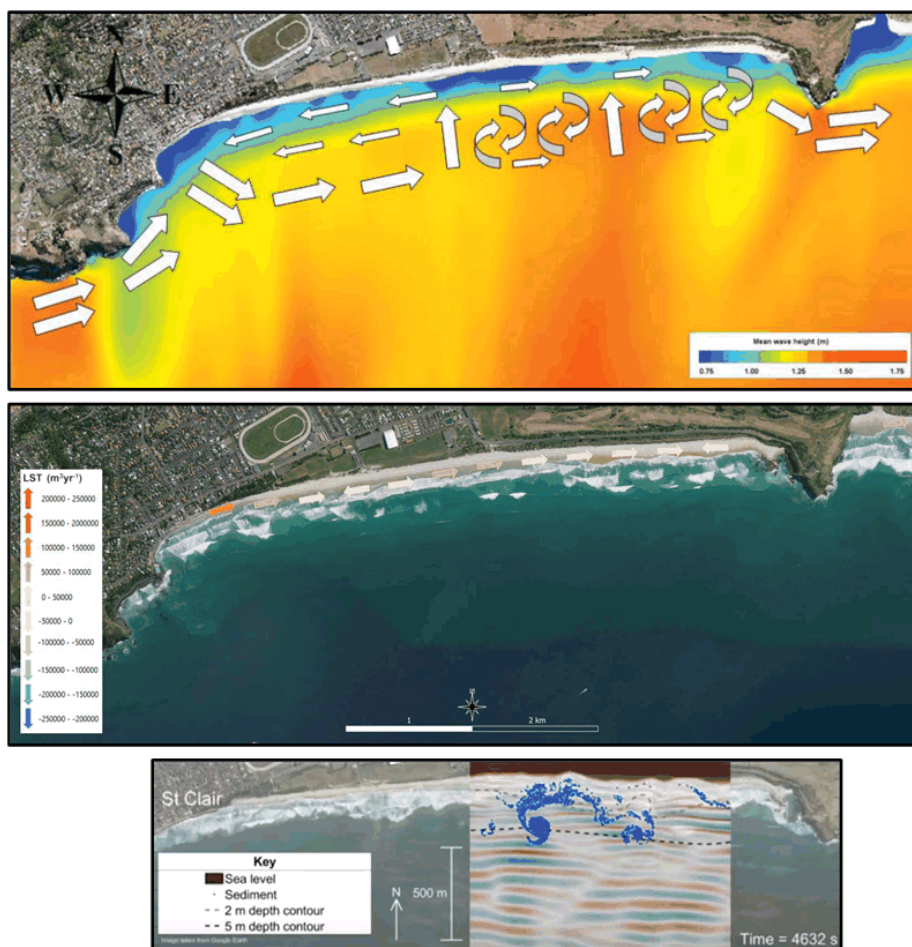


Figure 4.1: Top: Hypothesised sediment transport pathways during southerly storm conditions, along with the annual mean significant wave height (Johnson *et al.*, 2010) for St Clair to St Kilda. Middle: LST estimates for the same section of coast. Bottom: tracer experiment driven by a phase resolving model of Davenport (2020) showing cross shore processes.

4.1 Limitations

There are several limitations associated with this modelling exercise:

- This modelling exercise has been undertaken without calibration and validation against recorded *in situ* data (e.g. sediment trapping).
- Reported values for longshore sediment transport flux are valid under the assumption that the material is readily available for transport.
- This work does not account for cross shore transport.



S. Otago Coastal Sediment Transport: Numerical Modelling

- Wave modelling is dependent on low resolution bathymetric datasets.

4.2 Recommendations

Following the recommendations put forward in the counterpart literature review (Atkin *et al.*, 2020), with a view towards the development of a sustainable shoreline management plan for St Clair to St Kilda coast, recommendations for the next steps include:

- Expansion of the historical aerial analysis, including error margins, from 1946 to present to fill in the information gaps between the Toko Mouth/Measley Beach and Waldronville was recommended by Atkin *et al.* (2020). This information will help to inform and interpret the results of the alongshore sediment transport modelling by further detailing stores and sinks along the coast. While this investigation is still considered useful and would provide further information on the mechanics of the southern Otago sediment transport system, it is not considered a priority for the development of the St Clair to St Kilda long-term management plan.
- A field campaign to validate the transport quantities between Waldronville and St Clair and out of the embayment (i.e. round Lawyer's Head) to provide an understanding of inputs and losses to the beach system in the context of the present findings (i.e. there is very likely a net deficit of sediment input into the southern coast system):
 - Sediment traps/back-scatter measurements
 - Hydrographic transects
 - Wave/current meter deployment
- The sediment transport regime in the St Clair to St Kilda embayment is a function of offshore bathymetry and White Island likely plays a significant role. The bathymetry surrounding White Island appears complex, but it not well resolved, on the nautical chart data used in this study. Given the control point role that offshore islands and reefs play in the hydrodynamic and subsequent morphodynamics of the coastal system, it would be beneficial to the long term aims of developing a coastal plan to have data that justly represents the seafloor adjacent to the St Clair to St Kilda coast. To this end, a bathymetric survey of the features that play an important role in the processes occurring between St Clair and Lawyers Head should be undertaken; which at bare minimum should include verification of charted data across and adjacent to the study site, and high resolution depiction of the reefs and rocky platforms around the St Clair Headland. The latter component of which will be required for an eventual surf break impact assessment study and developing sustainable management strategies.



S. Otago Coastal Sediment Transport: Numerical Modelling

- Expansion of the existing model to accommodate for high resolution hydrodynamics capable of accounting for the distinct infrastructural and geomorphological differences between St Clair, St Kilda and the Lawyers Head end of the embayment. While a holistic approach should be taken with respect to the management, there are clearly 3 distinct areas of the beach that will likely require different management approaches:
 1. St Clair with its highly modified shoreline including the seawall, swimming pool, geotextile container protection (and associated end-effects) and surfing amenity.
 2. Moana Rua, the central stretch of beach with landfill/contaminated soil in the vulnerable dune area.
 3. The steep St Kilda dune system backed and capped by the John Wilson Ocean Drive.

Upon determining the preferred adaptation pathway, high resolution numerical modelling supported by field data collection is likely the best way to develop, refine and test long-term solutions for the situation at St Clair due to the complexity of the site. In the absence of these data and information with respect to the local coastal processes, most interventions are likely to be full-scale experiments, which are not recommended due to chance of failure and potential knock-on impacts. The findings of this present study reinforce the likelihood that different approaches will be required for the sustainable management of the different parts of St Clair to St Kilda coast. Consideration of the potential and likely impacts of sea level rise will need to be incorporated into any strategies, which can be achieved through modelling.



S. Otago Coastal Sediment Transport: Numerical Modelling

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GOVERNANCE SUPPORT OFFICER'S REPORT

Department: Civic

EXECUTIVE SUMMARY

- 1 This report is to inform the Saddle Hill Community Board on activities relevant to the Board's area including:
 - a) Discretionary Fund
 - b) Representation Review
 - c) Remuneration Update
 - d) Roadworks Schedule
 - e) DCC Consultation
 - f) Action/Updates
 - g) 2021 Planting Day
 - h) Process for written reports and board updates
 - i) Correspondence

RECOMMENDATIONS

That the Board:

Notes the Governance Support Officer's Report.

Discretionary Fund

- 2 The Board has been allocated \$10,000 for the 2021/2022 financial year.

Representation Review

- 3 The Independent Review Panel presented a report to Council on Tuesday 10 August 2021 asking Council to decide whether or not to adopt the recommendations of the panel as its Initial Proposal or make changes. Following the decision, public notice will be given of the Initial Proposal and it will be open for anyone to make submissions. It is likely that submissions

- 4 The Board will need to decide whether it wishes to make a submission and decide what its submission will include and whether to hold an extraordinary meeting to formalise the submission.

Remuneration Authority 2021 Determination

- 5 The Remuneration Authority has the responsibility for setting remuneration for local government elected members including community boards. The Authority has recently made its most recent determination and the effect for the Saddle Hill Community Board is as follows:

Chair: \$247 increase per year (total remuneration \$16,705),

Member: \$123 increase per year (total remuneration \$8,352).

The increase will be backdated to 1 July 2021.

Roadworks Schedule

- 6 Information on current notified road closures and the roadworks schedule (a weekly list of programmed works) for Council's maintained roads is available on the DCC website via these links: <https://www.dunedin.govt.nz/news-and-events/public-notice/roadworks-schedule> and <https://www.dunedin.govt.nz/news-and-events/public-notice/notified-road-closures>.

Dunedin City Council Current Consultations

The Dunedin City Council is currently consulting on the following:

- 7 **St Clair – St Kilda Coastal Plan/Whakahekeray** – Rakiātea Rautaki Tai information and the consultation process can be viewed on <https://www.dunedin.govt.nz/council/council-projects/south-dunedin-future/st-clair-to-st-kilda-coastal-plan>

District Plan changes - information and the consultation process for the 2nd General District Plan can be viewed on <https://www.dunedin.govt.nz/council/district-plan/2nd-generation-district-plan>

Actions/Updates

3 Waters Update

- 8 Staff will be undertaking a native dune planting along Ocean View.

Transport Update

- 9 The Regulatory Subcommittee will meet on 25 August 2021 to consider the speed review updates.

Waste and Environment Solutions Update

- 10 Following Council adoption of the 'four bins plus one' kerbside services option as part of the 2021-31 10 Year Plan a request for Registrations of Interest was released to the market at the end of June.
- 11 The registration period for suppliers interested in providing the new service closed at the end of July, and these registrations will be evaluated during August. Suppliers who are then selected

for the next stage of the procurement process will be asked to submit formal proposals by December 2020.

- 12 As part of the formal proposal the potential suppliers will be required to develop refuse and recycling solutions suitable non-standard collections such as multi-unit developments, private lanes, difficult to access streets, and rural properties.
- 13 These proposals will be evaluated, and the selection of a preferred supplier is expected to occur in February 2022, with the new services scheduled to begin on 1 July 2023.

Parks and Recreation Update

- 14 Fairplay Street Playground - The new concrete skate pad is 70% complete. A height adjustable basketball hoop has been ordered for installation and there will be a mark-up of the half/play court. The cycle track will then be repainted.
- 15 Sports Fields – In response to a request on the status of sports fields, staff have advised that they are in the condition expected for this time of the year. Each Sports field is different will receive the relevant inter-seasonal renovation or treatment in preparation for the change from a winter sports field to a summer sports field. This depends on the location, usage and seasonal conditions.
- 16 All sports fields are being condition assessed as part of the Sports Facilities review with a report on the findings being presented to Council towards the end of the year.

2021 Conservation Week Planting – Abbots Creek, Sunnyvale

- 17 The community is invited to participate in a community planting day which will be held on Saturday 4 September 2021 from 12.30 pm – 2.30 pm along Abbots Creek beside the Sunnyvale Sports Centre.
- 18 Information and a copy of the proposed area and meeting point is attached (Attachment A).

Process for Written Reports and Board Updates

- 19 The Chief Executive is responsible for preparing an agenda for each meeting. Written reports from staff providing advice are required when the board is required to make a decision. This is the same process for Council and Committee. These can include decisions on funding applications, recommendations on road naming, making submissions on the 10 year plan or representation review and adopting or amending the board's community plan.
- 20 Standing Orders allow the Chairperson to put a report on the board agenda.
- 21 Board updates from various projects or groups that board members are appointed to, for example Keep Dunedin Beautiful, Business Associations, and community groups do not require a board decision and are for the purposes of updating the rest of the board and members of the public who attend the meetings. These are dealt with as a verbal update, not a written report. If a report is received from an outside agency on a matter e.g. an update from the regional council or waka Kotahi NZTA, these will be attached as part of the governance support officer's report in the same way as inwards correspondence is handled.

Correspondence

- 22 A letter in response to the Saddle Hill Community Board's submission to the Dunedin City Council 10-year plan process is attached (Attachment B).

Board members (or members of the public) wishing to advise Council of any operational issues or concerns, e.g. potholes, burst pipes, overgrown vegetation etc are reminded to ring the DCC Customer Services Agency on 03 477-4000, or email on dcc@dcc.govt.nz. For non-urgent matters contact council via the online "Fix it form" <https://www.dunedin.govt.nz/do-it-online/report/fix-it-form>

If issues and concerns are not dealt with in a timely manner, Board members should contact either the Governance Support Officer or the Senior Staff Member appointed to the Board.

Signatories

Author:	Lynne Adamson - Governance Support Officer
Authoriser:	Clare Sullivan - Manager Governance

Attachments

	Title	Page
↓ A	Conservation Week Planting Day	64
↓ B	Response to 10 year plan submission	66

SUMMARY OF CONSIDERATIONS
Fit with purpose of Local Government

This decision enables democratic local decision making and action by, and on behalf of communities.

Fit with strategic framework

	Contributes	Detracts	Not applicable
Social Wellbeing Strategy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic Development Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Environment Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Arts and Culture Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 Waters Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Spatial Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Integrated Transport Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks and Recreation Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other strategic projects/policies/plans	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Māori Impact Statement

There are no known impacts for Māori.

Sustainability

There are no implications.

LTP/Annual Plan / Financial Strategy /Infrastructure Strategy

There are no implications.

Financial considerations

There are no financial implications.

Significance

This decision is considered low significance in terms of the Council's Significance and Engagement Policy.

Engagement – external

There has been no external engagement.

Engagement - internal

Internal engagement has occurred with appropriate staff members.

Risks: Legal / Health and Safety etc.

There are no risks.

Conflict of Interest

There are no known conflicts of interest.

Community Boards

This report provides information on activities in or relevant to the Board's area.

2021 Conservation Week planting, 4 September

The community will be putting native plants in the ground along Abbots Creek beside the Sunnyvale Sports Centre during a DCC public planting day.

The natives will include trees, shrubs, grasses, creepers and climbers. They will help create habitat for wildlife and improve water quality of the creek.

Planting days are an opportunity to help restore some of Dunedin's native habitat. This event is part of Conservation Week from 4 – 12 September.

Where: Abbots Creek, Sunnyvale

When: Saturday, 4 September, 12:30pm - 2:30pm

See map below for meeting point.

More information

Catherine Lea
DCC Volunteer Projects Facilitator
catherine.lea@dcc.govt.nz
03 477 4000





2 August 2021

Mr Scott Weatherall
Chairperson
Saddle Hill Community Board
PO Box 5045
Dunedin 9054



Dear Community Board Members

Submission on the DCC's 10 year plan 2021-31

Thank you for your submission on the Council's 10 year plan, and for your presentation to the Hearings meeting. Council considered the community feedback received at its deliberations meeting on Monday 31 May to Thursday 3 June 2021. A complete record of the decisions made can be found in the meeting minutes on the Council's website. Please find below, a response to your submission.

- **Kerbside waste and recycling** – your request that the DCC withdraws its resource consent application to the Otago Regional Council for a new landfill is noted, but the Council is continuing with the process to consent a new landfill at Smooth Hill.
- **Coastal erosion management** – I advise that the DCC has commenced a district-wide coastal hazard screening process with the Otago Regional Council. This work will provide a better understanding of where coastal hazards are located and what areas are at greatest risk. It will also help to identify and prioritise future monitoring, assessment and coastal management planning requirements across the Dunedin City district. This initial coastal hazard screening work is expected to continue through the remainder of 2021.
- **Brighton Road, Westwood – Ocean View** – I advise that the 10 year plan does not provide for improvements to the road verge, to enable connection of Westwood and Ocean View.
- **Community Housing** – your comments about affordable community housing are acknowledged. During the deliberations meeting, Council decided that \$20 million will be included in the 10 year plan to build more community housing, being \$2 million each year over the 10 year period. Council will continue to explore working in partnership with other housing providers.
- **Rural seal extension programme** – It is Council's policy that there is no new sealing of gravel roads. Staff are however looking at alternative options for gravel roads, for Council's consideration, during the first year of the 10 year plan.
- **Playgrounds** – drinking fountains and provision of sunshade and seats are all being considered as part of the Play Space and Open Space reviews being undertaken by our Parks and Recreation staff. Both review documents are planned to be completed during 2021. There will be an opportunity for feedback as part of that process.

50 The Octagon | PO Box 5045 | Dunedin 9054, New Zealand | T 03 477 4000 | E dcc@dcc.govt.nz | www.dunedin.govt.nz

 DunedinCityCouncil  @DnCityCouncil

- **Public Toilets** – Council has approved the following 10 year programme for new public toilets:

Year	Programme for a changing places bathroom and new public toilet locations
Year 1 2021/2022	Moray Place beside the central library. This will be a Changing Places bathroom.
Year 2 2022/2023	Central city, The Exchange area (existing toilets in Dowling Street will be removed); <i>Harbour cycleway, St Leonards*</i> ;
Year 3 2023/2024	<i>Otago Peninsula, Harwood Reserve*</i> ; South Dunedin, Navy Park;
Year 4 2024/2025	North Dunedin, close to North Ground sports ground; <i>Karitane, Truby King Reserve*</i> ;
Year 5 2025/2026	North Dunedin, Ross Creek area; <i>Waitati, Doctors Point*</i> ;
Year 6 2026/2027	<i>Green Island Memorial Park playground*</i> ; Central city, Princes Street Market Reserve;
Year 7 2027/2028	<i>Mosgiel, Brooklands park area*</i> ; <i>Otago Peninsula, Okia Reserve*</i> ;
Year 8 2028/2029	<i>Purakaunui Reserve*</i> ; <i>Otago Peninsula, Tomahawk beach*</i> ;
Year 9 2029/2030	South Dunedin, St Kilda beach; Harbour cycleway, Harbour mouth molar area
Year 10 2030/2031	<i>Waldronville, Kaikorai Estuary area*</i> ; North Dunedin, Maori Hill/Highgate area;

*- indicates Community Board area

Thank you for your submission on this 10 year plan. Your feedback has been appreciated.

Yours sincerely



Sharon Bodeker
Corporate Planner

BOARD UPDATES

Department: Civic

EXECUTIVE SUMMARY

- 1 Board members will provide updates on any activities undertaken on behalf of the Board or items of interest including:
 - Keep Dunedin Beautiful
 - Coastal Dune Regeneration Programme
 - Waldronville Food Forest
 - Community Response Plan
 - Chain Hills Cycle Tunnel
 - Delta Drive Basketball Court Project
 - Community Plan

RECOMMENDATIONS

That the Board:

Notes the Board updates.

CHAIRPERSON'S REPORT

EXECUTIVE SUMMARY

The Chairperson (Scott Weatherall) will provide an update on items of interest to the Board including:

- General state of road surfaces in particular Waldronville.
- Blackhead Road – concern in regards to the new power poles and their location to the road.
- Feedback to the 10 year plan submission
- Update from the Taieri Mouth Layby Drive around.
- Brief update from the Community Board Chairs, Mayor and Senior Staff meeting held this week.

RECOMMENDATIONS

That the Board:

- a) **Notes** the Chairperson's report.

COUNCILLOR UPDATE

Department: Civic

EXECUTIVE SUMMARY

Councillor Jules Radich will provide an update on items of interest.

RECOMMENDATIONS

That the Board:

- a) **Notes** the update from Cr Radich.