

Protect St. Andrews Shoreline

Today's Wharf: Free-Flowing Tidal Currents

- No fill: water passes under on pilings

Proposed Infill Plan

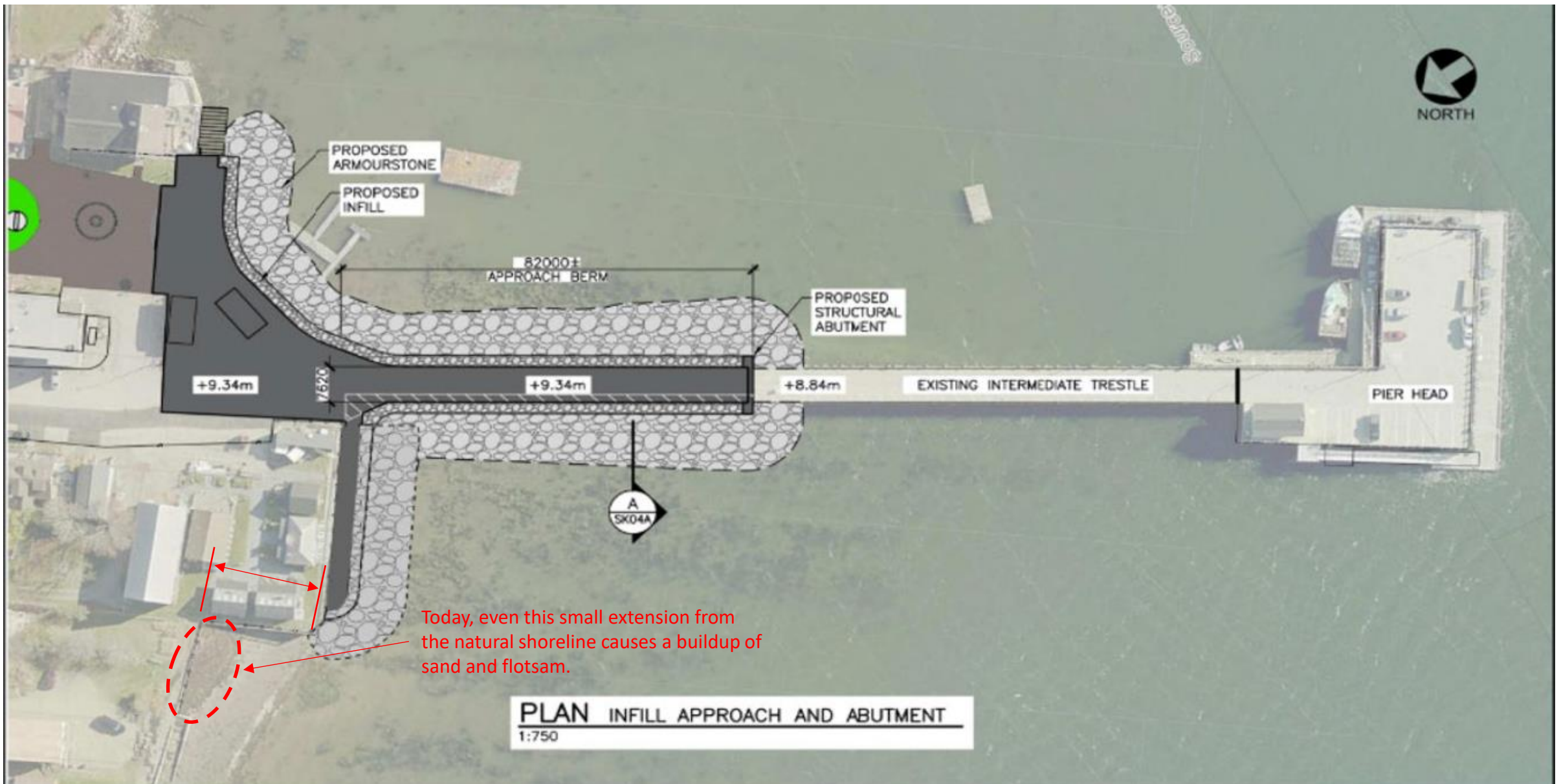
- Concrete-topped trestle on granular fill & steel piles
- 41 m long × 7.6 m wide (~4 545 m²)

Shoreline Erosion Risk

- Alters longshore currents
- Creates recirculation zones
- Cuts into shoreline

Take Action

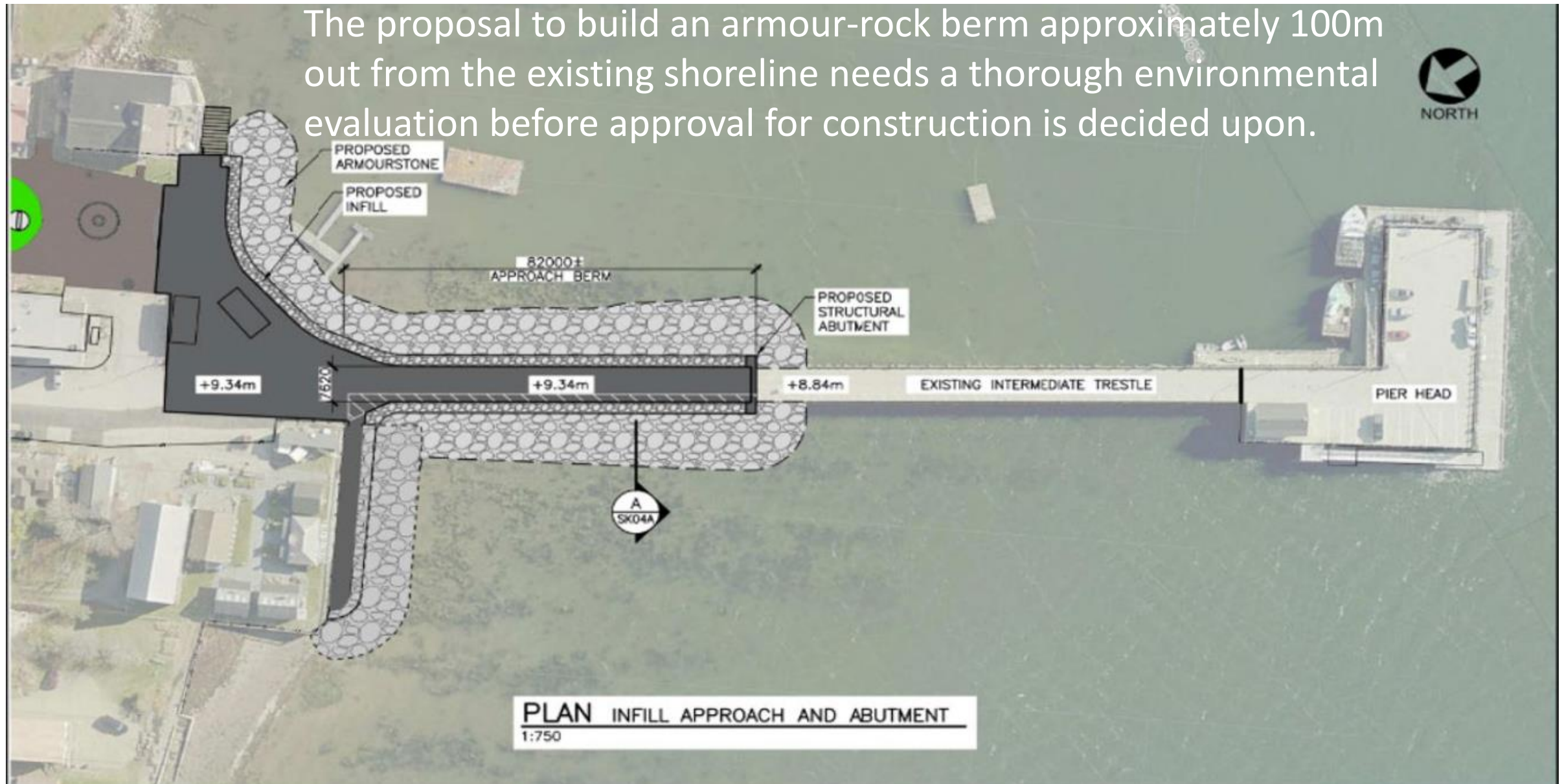
1. Demand a full environmental impact study
2. Write to your councilors & MLA
3. Share & tag @TownOfStAndrews







The proposal to build an armour-rock berm approximately 100m out from the existing shoreline needs a thorough environmental evaluation before approval for construction is decided upon.



In coastal engineering parlance, these structures are called groynes. After over a century of mis-use, groynes have been banned in many jurisdictions.*



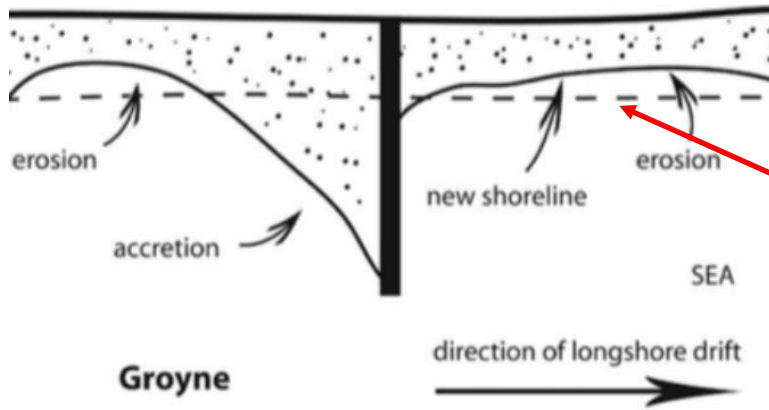
* References on following page

Here's what U.S. coastal states have to say about Groyne usage:

- Maine Department of Agriculture Conservation and Forestry – *“Groynes are prohibited in the state of Maine.”*
- North Carolina – *“State law G.S. 113A-115.1 prohibits the use of groynes.”*
- South Carolina – *“Groynes may only be permitted after thorough analysis demonstrates that the groyne will not cause detrimental effect on adjacent or downdrift areas.”*
- The U.S. Army Corps of Engineers' Coastal Engineering Manual (2008) describes groynes as:
“...probably the most misused and improperly designed of all coastal structures...”

And closer to home...

Canada's Department of Fisheries and Oceans says this in its document, [Canadian Technical Report of Fisheries and Aquatic Sciences No. 2443 \(2003\)](#) – *“Groynes can contribute to erosion and to beach loss in adjacent areas which is at least as serious as what they were designed to prevent.”*



The properties on either side of the wharf are what would be at greatest risk during a storm event.

A groyne interferes with longshore currents thereby disturbing natural movement of sand and sediment.

Presently, St. Andrews wharf has open space for longshore currents to pass through.

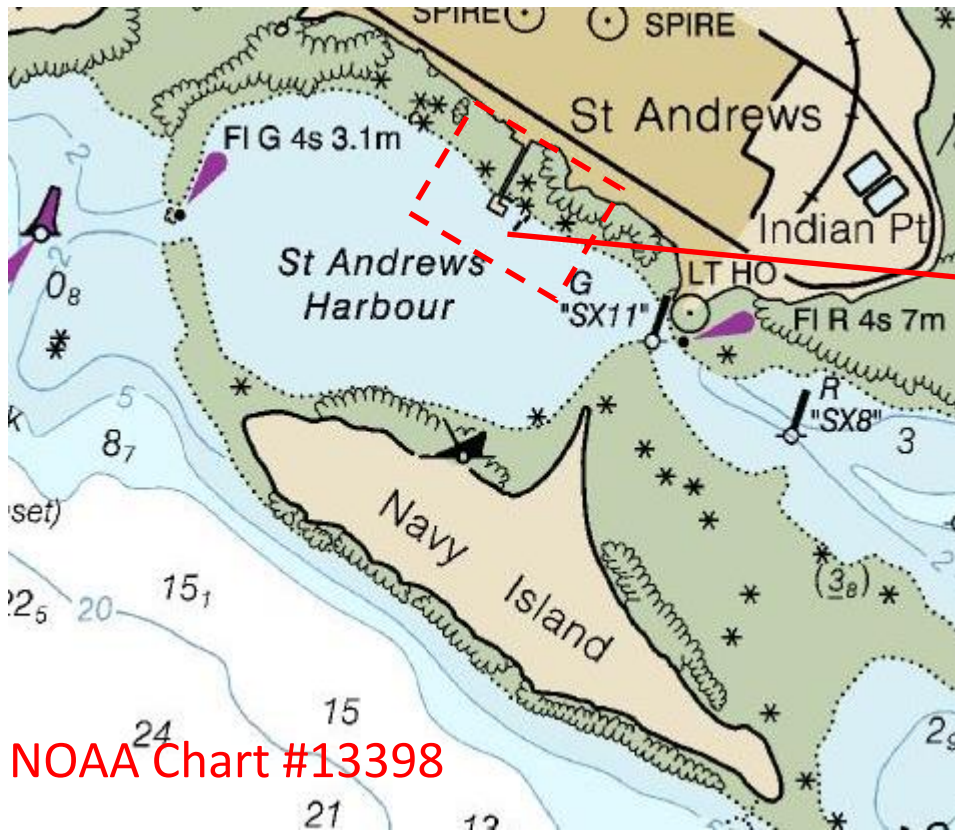




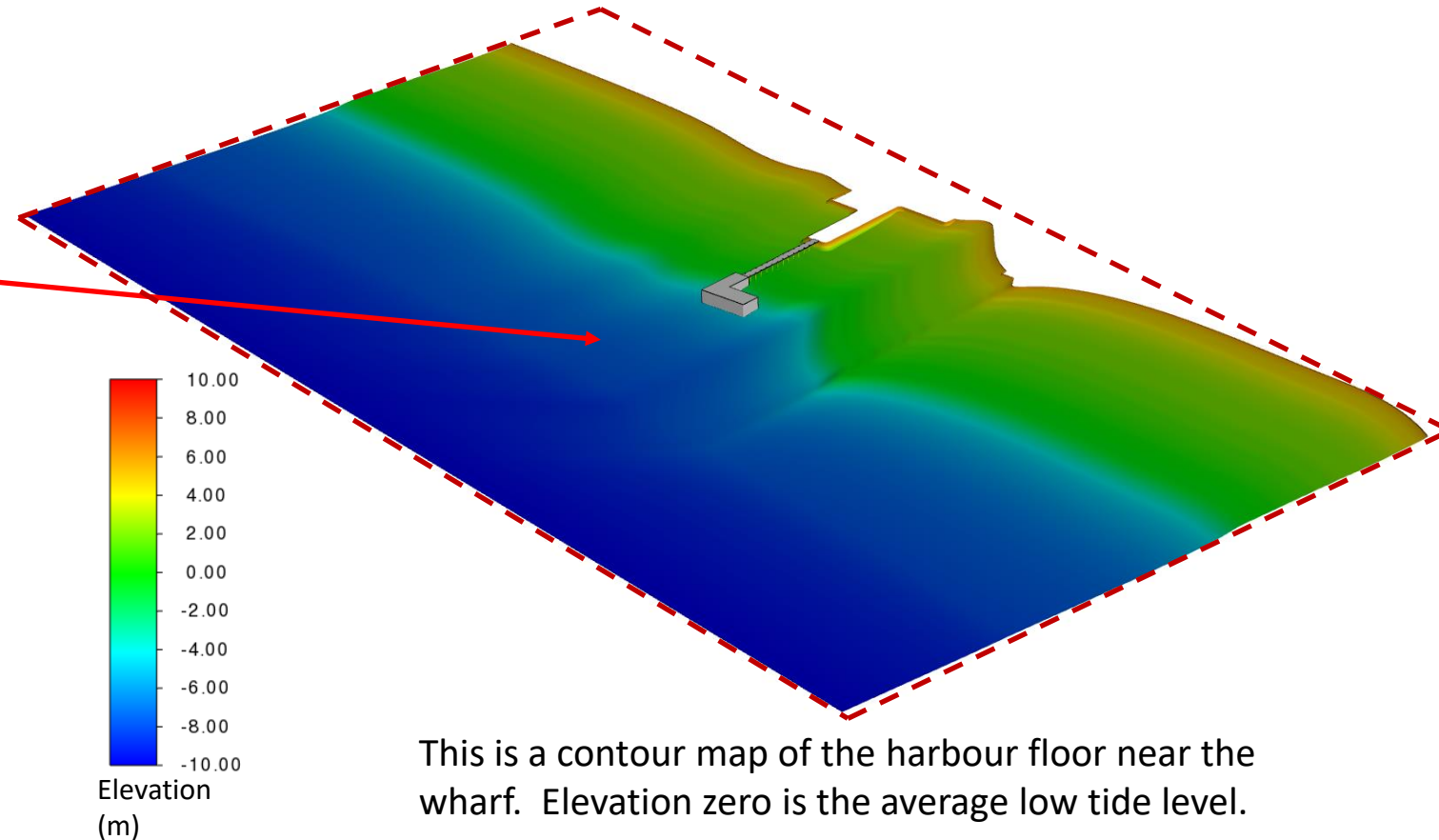
The harbourfront has significant longshore currents even on calm days. The lines of foam in this picture are wakes from the wharf pilings. This photo was taken at $\frac{3}{4}$ flood tide when the longshore current flowing from the northwest was in excess of one knot. During storm conditions, longshore currents are significantly higher.



By way of example, a 3-D computer generated current model simulating a calm day in St. Andrews is presented in the next 2 slides. The portion of the harbour represented in this model is outlined in red on the chart below.

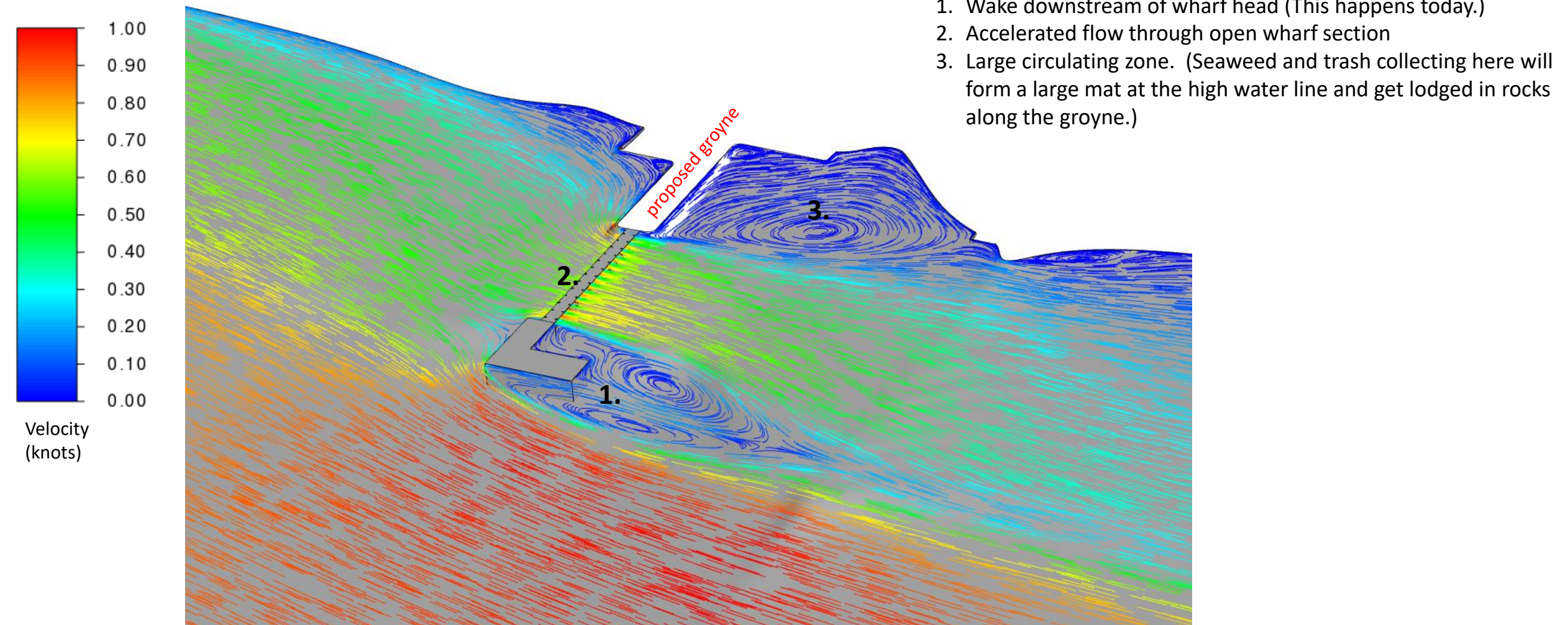


NOAA Chart #13398

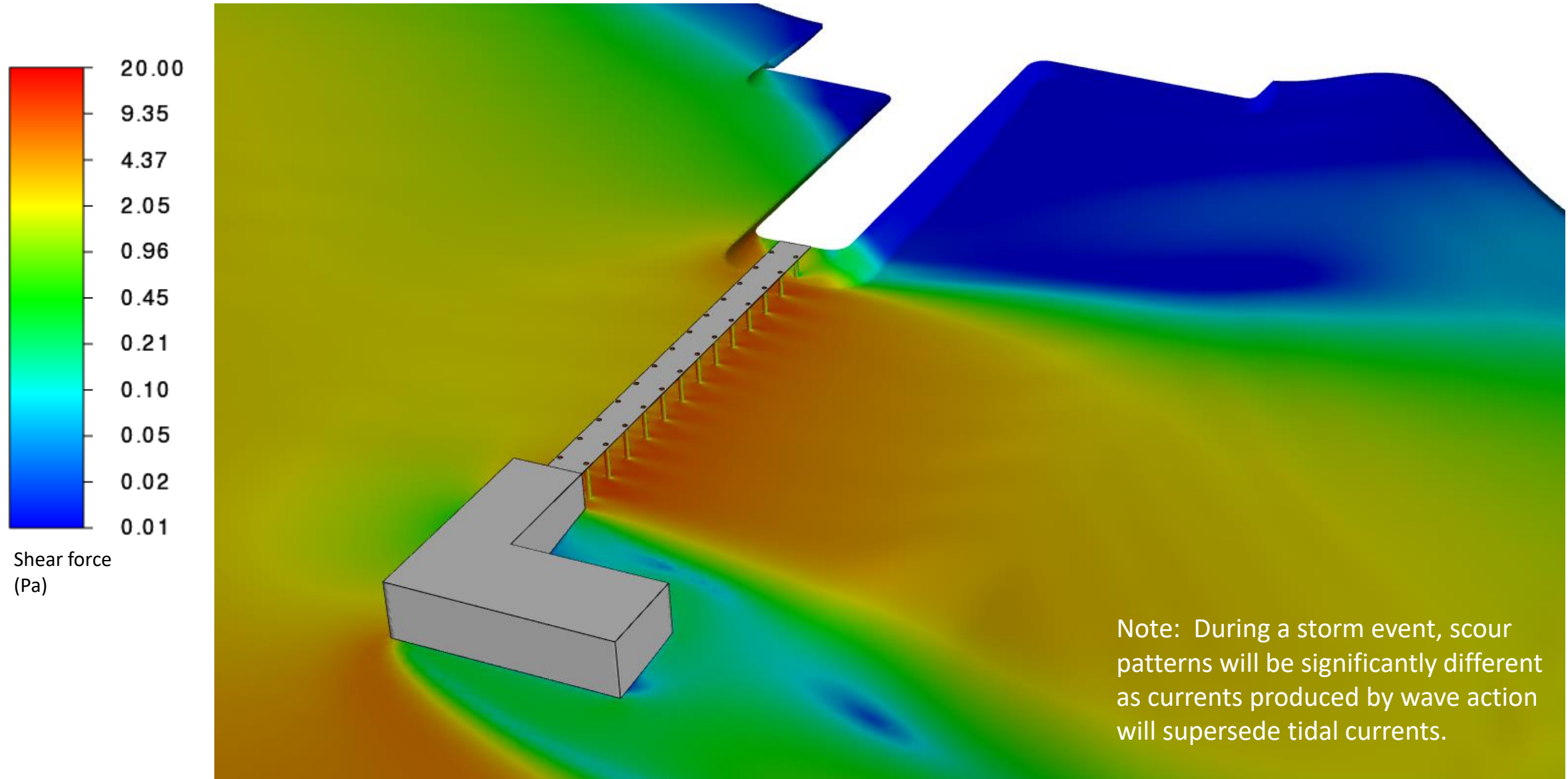


This is a contour map of the harbour floor near the wharf. Elevation zero is the average low tide level.

The streak lines in the rendering below show flow patterns on the water surface when the current in the harbour is passing the wharf head at a speed of one knot. They show a large recirculating zone (3) that will fill with trash and rotting seaweed in a line of sight from five nearby shorefront restaurants.



The illustration below is a contour map of the scouring forces acting on the harbour floor in the vicinity of the wharf. The red regions indicate zones most at risk for erosion and the blue where deposits will occur.



Takeaway items from this document:

- Building a groyne is contradictory to established contemporary coastal engineering practices.
- Any structure that significantly changes the natural shape of the shoreline needs to have a rigorous environmental impact study that includes wave and current analyses more sophisticated than the rudimentary example given here.
- A shore structure that the town was warned might imperil the properties adjacent to it could leave the town open to liability claims following a destructive storm.
- If the choice of a groyne is seen as a cost saver up front, the cost of remediation in the future may turn it into the most expensive alternative.