Sable Island, a vestige of its former self – how did it form and what preserves it?

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with contributions from:

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Sable Island
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Sable Island

- Why is it there?
- Will it last?

8-9 November 1987: wind WSW 40 knots gusting to 50
Far too rough on Northern Spur
Found some shelter in the crescent north of the island
20 ft AGC vibracorer going over the side, between the lights of Sable Island, 00:24 UTC 9 Nov 1987
Core 87042-0049
8 November (9 Nov UTC) 1987

- 5 km north of Sable Island
- water depth 33 m
- roots of spruce growing at margin of a shallow coastal wetland
What did Sable Island and the region look like when that spruce tree was growing?

Origins of Sable Island in the glacial history of the outer shelf


20 ka BP (c. 23.5 cal BP)

16 ka (c. 19 cal BP)
Ancestral Sable Island was a tidewater and subaerial morainal bank – 4 (MB) – 16-14 ka

Associated deposition of glacial outwash sand and post-transgressive marine reworking – 3 (SS)

Sable Island Conference
Dartmouth, NS, 20-21 October 2017

capelin spawned on Grand Bank & still do today

spruce forests on Sable Island

PEI and CBI were not islands


Palaeogeography courtesy John Shaw GSC
Relative sea level history for Sable Island - past 12 ka

Net sand transport pattern maintains Sable Island

- eastward transport over shore-attached ridges, but their role in feeding sand to the island remains unclear
- recirculation on East Bar and extension retains sand on the bank
- some sand loss from North Beach
- these fluxes need to be better quantified and validated

Sand is transported onshore to Sable Island, forming large dunes

- These are stabilized by marram grass
- ... and destabilized by wind, grazing, and human activities
We have a poor knowledge of the fluxes and the overall sediment budget

- LiDAR technology enables repetitive monitoring of the overall sand budget
- Beaches and dunes are highly dynamic with large short-term variability, making it difficult to tease out smaller long-term trends

- More effort needs to be directed to monitoring and modelling the sediment fluxes
Storms erode base of dunes and exploit breaches

- Taylor documented decadal-scale erosion of 2-6 m/yr 1975-1985
- Has this continued since?
- What is the island’s resilience in the face of accelerated sea-level rise?