FACING UP THE INCREASING RISK OF SEVERE COASTAL STORMS
MANGAWHAI MATTERS -BRIEFING NOTE

May 2026

Background: Following completion of the Sustainable Mangawhai Project we have refined our analysis of the risk of damaging coastal inundation within the next three decades. The full report is on our web site.[1]

Purpose of this note: Summarise key findings from the Northland cyclone analysis and outline immediate planning implications for Mangawhai.

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1. Situation Overview

Mangawhai faces rising exposure to extreme storm-driven inundation. Recent events—Gabrielle (2023), Tam (2025), Vaianu (2026)—demonstrate a shift toward more frequent, moisture-laden subtropical systems capable of producing severe coastal flooding. The protective sandspit remains a critical vulnerability: a breach would expose the harbour to direct ocean wave energy and permanently elevate future inundation levels.

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2. Key Findings from the 1968–2026 Storm Catalogue

Storm Frequency and Type

- Five direct-impact storms occurred between 2022–2026—the most compressed cluster in the 58-year record.
- Recent storms increasingly retain tropical structure at higher latitudes due to warming sea surfaces.
- Seasonal clustering is common; paired storms often cause cumulative damage.

Drivers of Coastal Hazard

- **Track geometry is the dominant risk factor.** East-coast tracks place Mangawhai in the "dangerous semicircle," generating strong onshore winds, heavy rainfall, and large waves.
- **Wave set-up is the largest contributor** to open-coast water levels (0.6–2.4 m), exceeding pressure and wind surge combined.
- **Tidal phasing is a critical multiplier:** the difference between low tide and perigean spring high tide is up to 1.8 m.
- Slow-moving or stalling systems (e.g., Bola-type events) can deliver multi-day wave exposure.

ENSO Influence

- La Niña is the highest-risk phase: 43% of La Niña storms reached Major severity.
- All three of Northland's most damaging storms—Bola, Wilma, Gabrielle—occurred during La Niña.

Extreme Weather on the Northland Coast:, The Implications for Mangawhai (May 2026)
www.mangawhaimatters.com/...etc

3. Inundation Probabilities for Mangawhai

2.0 m Harbour Inundation

- **18–28% probability within 10 years**
- **33–49% within 20 years**
- **46–64% within 30 years**
  A 2.0 m event is a **near-term risk**, not a distant scenario.

2.5 m Harbour Inundation

- **14–26% probability within 30 years** under mid-range emissions (SSP2-4.5)
- **26–46%** under higher emissions (SSP3-7.0)
  By 2060, 2.5 m becomes a near-routine extreme event under high-emissions pathways.

Above 2.5 m

- Not a near-term risk under current climate but becomes credible within 30 years under high emissions.
- **A 2.0 m event could breach the spit**, after which even moderate storms could produce >2.5 m inundation.

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4. Implications for Mangawhai

Immediate (0–10 years)

- Prioritise sandspit protection and monitoring.
- Upgrade stormwater capacity and outfalls.
- Restrict development in high-risk zones.
- Improve tide-surge forecasting and community alerts.

Medium Term (10–20 years)

- Strengthen lifeline infrastructure (roads, utilities, wastewater).
- Evaluate hybrid soft-and-hard coastal defences.
- Plan for cumulative impacts from clustered events.

Long Term (20–30 years)

- Integrate sea-level rise into zoning and consenting.
- Consider strategic retreat for the most exposed areas.
- Develop long-range harbour and spit management plans.

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5. Core Message

The probability of damaging inundation within the next two decades is **meaningful and rising**. Early investment in resilience is significantly cheaper—and more effective—than post-event remediation. The decisions made now will determine whether Mangawhai remains a functional, resilient coastal community.
