



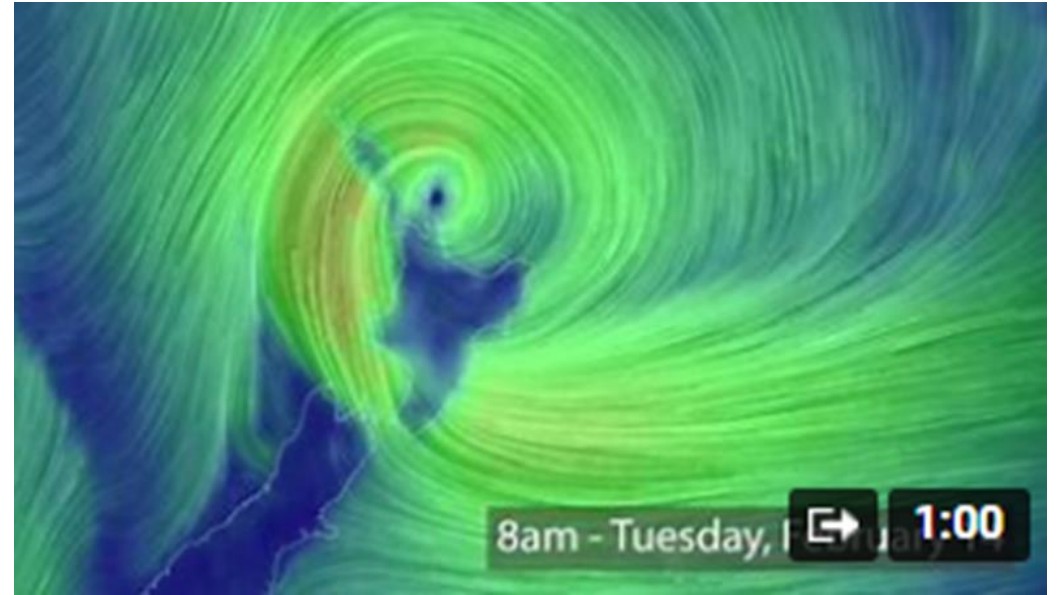
Cyclone Gabrielle and Hawke's Bay

... the HBRC response

Size and scale of the event

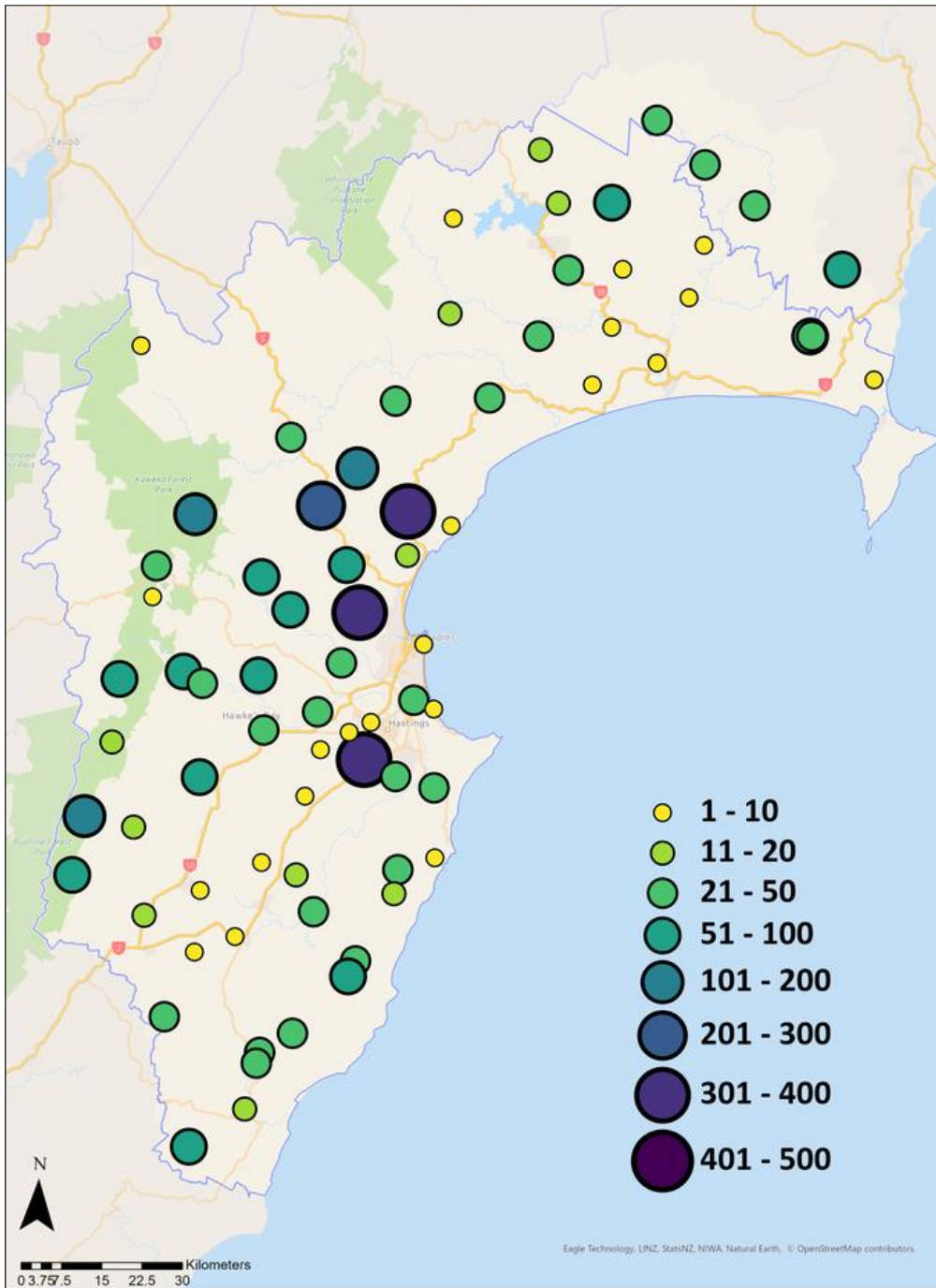
Ex-Tropical Cyclone Gabrielle left widespread and significant damage across the North Island

- Level 5 National State of Emergency declared
- Rainfall well beyond forecast and previous recordings
- Stop banks breached in 22 locations
- Significant flooding
- Civil defence centres and community-led centres provided shelter, food and emergency accommodation



Observed vs predicted rain – 6am Monday to 12 pm Tuesday (30hrs total). Predicted totals are from MetService and specific to HBRC sites

site	River	Predicted (mm)	Observed (mm)	Observed Difference (mm)	% Difference
Glengarry	Esk	256.1	514.5	258.4	101%
Fairview	Wairoa	235.5	449	213.5	91%
LK4 Ngaroto Tutaekuri	Ngaruroro/Tutaekuri	228.9	415	186.1	81%
Waipoapoa	Tukituki	192.4	409	216.6	113%
Te Pohue No.2 Climate	Esk	296.3	407.8	111.5	38%
Pukeorapa Station	Wairoa	229.7	381.2	151.5	66%
Te Koau	Ngaruroro/Tutaekuri	265.6	369	103.4	39%
Ngahere HBRC	Ngaruroro/Tutaekuri	304.2	364.5	60.3	20%
Waihau Climate	Ngaruroro/Tutaekuri	251	343.4	92.4	37%
Maunganui	Esk	330.1	333.5	3.4	1%
Ngaruroro River at Kuripapango	Ngaruroro/Tutaekuri	314.3	328	13.7	4%
Te Rangī	Esk	303.9	307	3.1	1%
LK3 Burns Ngaruroro	Ngaruroro/Tutaekuri	299	302	3	1%
Parks Peak HBCB	Ngaruroro/Tutaekuri	286.2	296.5	10.3	4%
Newstead	Heretaunga	189.1	286	96.9	51%
Kopanga	Heretaunga	139.5	273.5	134	96%
LK7 Poporangi	Ngaruroro/Tutaekuri	201.2	270.5	69.3	34%
Glenwood HBRC	Tukituki	298.3	266.5	-31.8	-11%
Kohatanui	Ngaruroro/Tutaekuri	219.7	263	43.3	20%
Crownthorpe Climate	Ngaruroro/Tutaekuri	192.6	258	65.4	34%
Kotemaori	Esk	227.9	255.4	27.5	12%
Aniwaniwa Park HQ	Wairoa	262.1	246.5	-15.6	-6%
Te Kaihi	Tukituki	155	237.5	82.5	53%
Nga Tuhoe	Wairoa	186	232	46	25%
Omakere Climate	Tukituki	156.9	228.2	71.3	45%
Maraekakaho Stream D/S Tait Rd	Ngaruroro/Tutaekuri	142.9	224	81.1	57%
Gwavas HQ Climate	Ngaruroro/Tutaekuri	166.3	224	57.7	35%
Te Haroto Climate	Esk	247.4	223.8	-23.6	-10%



24 hour returns period


Flooding extent - Wairoa



(photo source: HBRC flight, 21/2/2023)



**Flooding
extent -
Heretaunga**



**Flooding
extent –
Central
Hawke's Bay**

Flooding extent – Central Hawke's Bay

(source: aerial view)





Wider impacts of the event

- Loss of life (8 of 11 in the Hawke's Bay region)
- Over 1,000 red- and orange-stickered properties and estimated 2,000 displaced persons
- Extensive damage to State Highways, bridges, culverts, roads, rail, substations, drinking water, wastewater treatment, public spaces
- Communication and power outages
- Extensive damage to orchards, vineyards, farms, forestry and other primary sector businesses

What we're doing...

- Repair of stop banks
- Survey of HBRC assets by air and a detailed drone inspection of critical areas for urgent repair
- 113 rain and river level monitoring sites restored across the region (99% operational)
- Repair of pump stations (currently just Brookfields non-operational)
- 40 mobile diesel pumps deployed



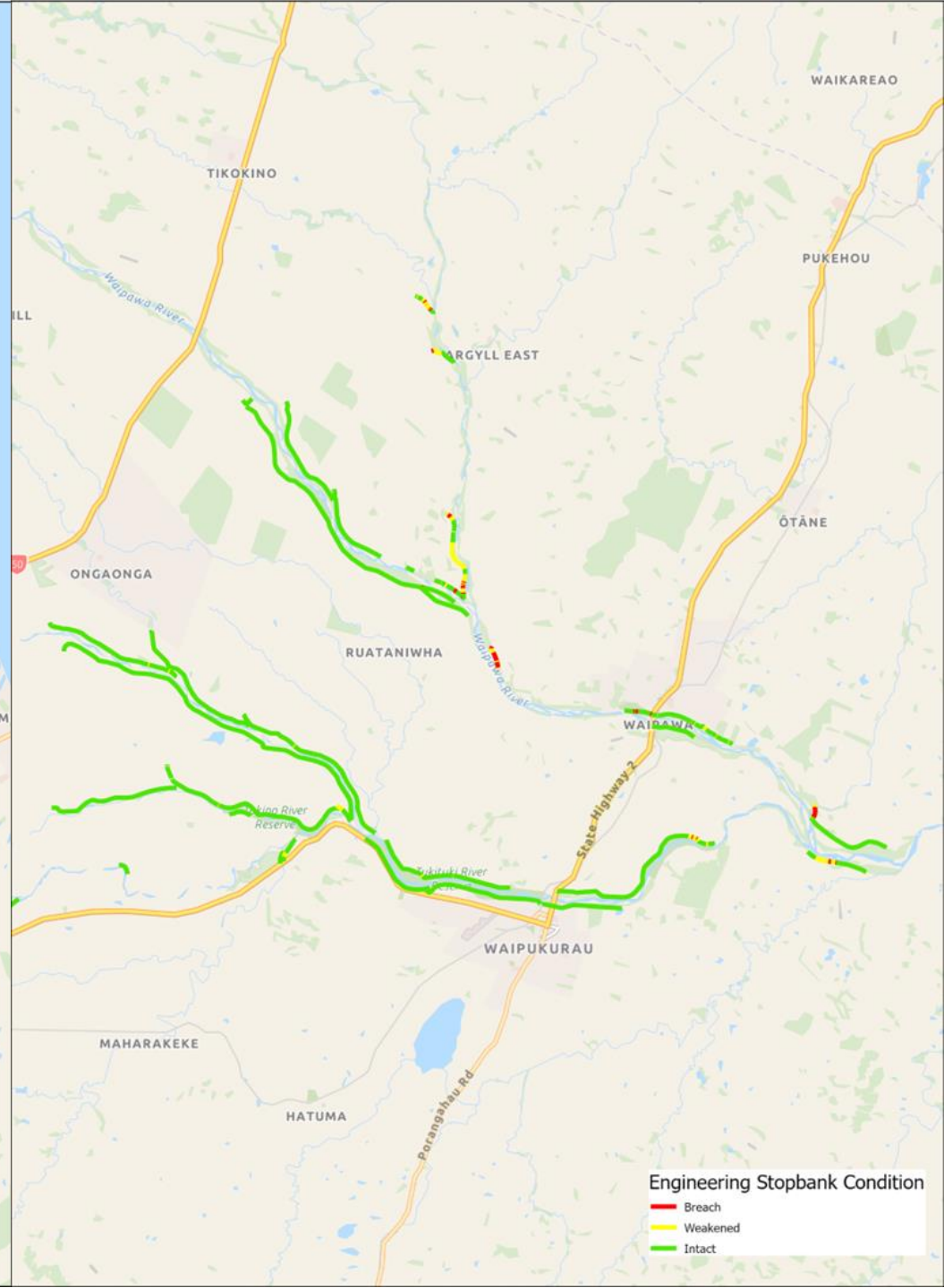
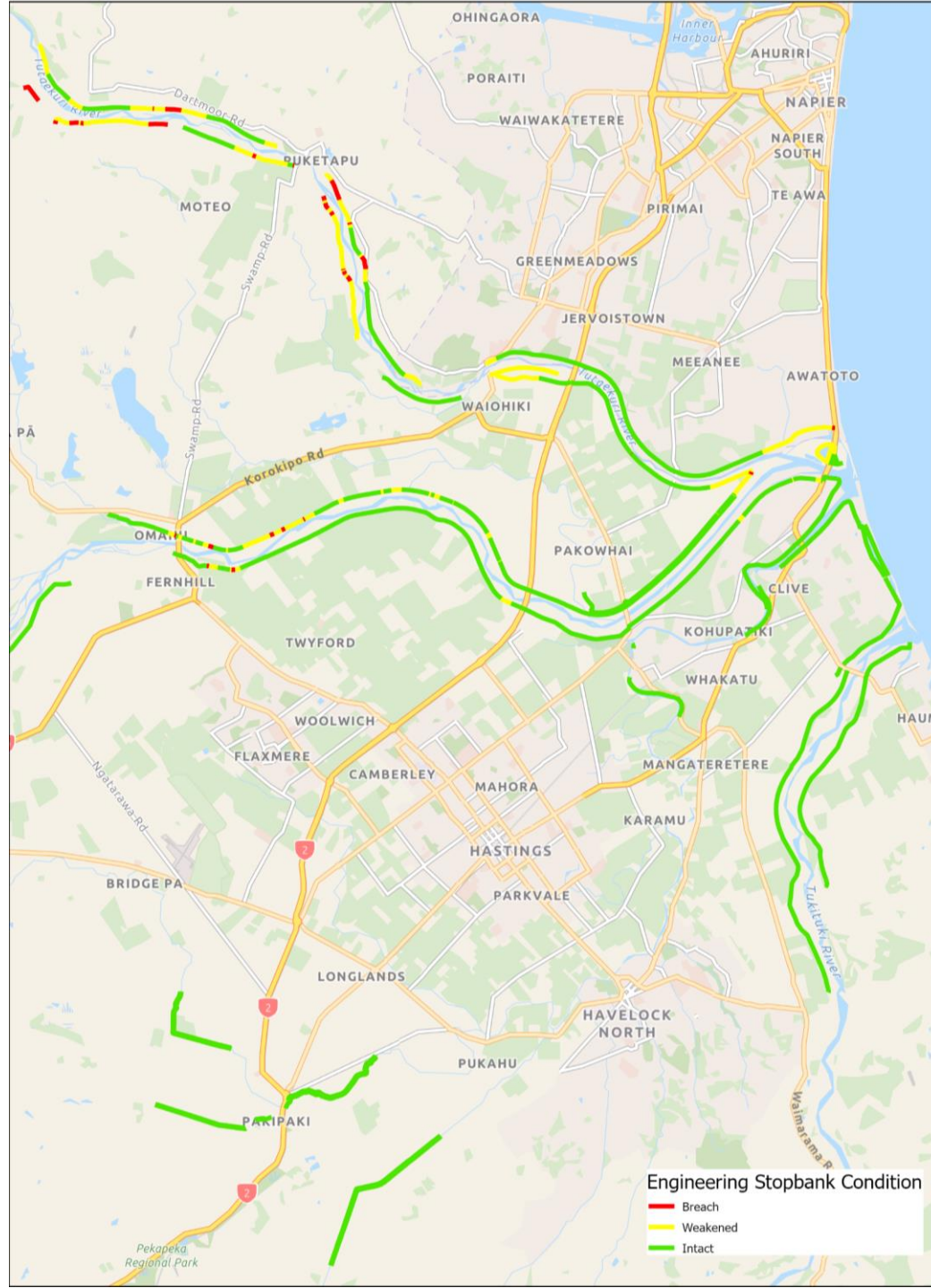
What we're doing (cont'd)

- Regional coordination of waste disposal
 - silt, wood, animal carcasses (completed), posts and wire
- Advice and assistance to rural landowners, recovery planning well underway
- Clearing damage to regional parks and river access areas which are all closed, and to our Hawke's Bay Trails
- Disaster Relief Trust set up and administration
- Supporting GECC with staffing, financial support and information
- Communication and outreach to rural communities



What does this mean for HBRC infrastructure?

Stop bank condition as at 9am 8 March 2023



Stop bank assessments

Breaches

RIVERNAME	BANK	Total Length (m)
Mangaonuku	Right	419
Ngaruroro	Left	421
	Right	132
Tutaekuri	Left	1233
	Right	1910
Upper Tukituki	Left	62
	Right	100
Waipawa	Left	982
	Right	78
Whirinaki Drain	Left	8
Grand Total		5346

(as at 6 March 2023)

Weakened

RIVERNAME	BANK	Total Length (m)
Maharakeke	Right	110
Mangaonuku	Right	1816
Ngaruroro	Left	3354
	Right	858
Tukipo	Left	220
Tutaekuri	Left	7266
	Right	9034
Upper Tukituki	Left	441
	Right	453
Waipawa	Left	486
WhirinakiDrain	Left	1075
Tower	Left	485
Grand Total		25598

The assessment of the stop banks (previous page) was undertaken using a combination of available data sources which include:

- Ground based photos/videos
- Helicopter photos/videos
- Drone photos/videos
- Visual reports
- SKYCan aerial photos

High level of confidence in the estimates of breach lengths and a moderate level of confidence in the estimates of weakened lengths.

Sections of stop bank categorised as weakened include sections where damage (such as scour) has been clearly identified (via the data sources above) and sections where there are signs of potential damage that need confirming through ground truthing.

Rapid Rebuild Workstream

Priority	Site/ Project Name	
1	BrookfieldsLower (Awatoto)	Execution
2	Taradale	Execution
3	Maraenui Golf course (Create new 'Found' asset)	Complete
4a	Omahu - Upstream	Execution
4b	Omahu Lower - D.S of Bridge	Execution
4c	Omahu Lower - Moffats 1	Execution
4d	Omahu Lower - Moffats 2	Execution
5	Raupere Upper (Fernhill)	Execution
6	PakowhaiOuter (TK & NG Confluence)	Planning
7	Moteo	Execution
8	Omarunui	Planning
9	Dartmoor Upper	Execution
10	Dartmoor Lower	Planning
11	Walker Road	Execution
12	PowdrellRoad stockpile (New Asset)	Execution
13	Waipawa (Town Sites)	Execution
14	Ebbetts	Investigation
15a.	Springfield Road Upper	Planning
15b.	Springfield Road Lower	Planning
16	Waiohiki Outer	Investigation
18	Scissons Road	Investigation
19	Fardon Lower	Investigation
20	Allen Road	Execution

Source: 7 March 2023
SITREP Rapid Rebuild

Solid waste workstream

Coordinated collection and disposal for rural properties with large volumes of:

- **Animal carcasses (approx. 8000 sheep carcasses - completed)**
- **Silt**
 - **HBRC, NCC and HDC are working together on SILT collection/disposal**
 - **HBRC operating a McLeod's Road site**
 - **HBRC negotiating with landowners for a large scale contractors site on Seafield Road**
 - **HDC has multiple sites**
 - **Rural landowners to ring 0800 108 838**
- **Wood waste – currently collecting and chipping**
- **Posts and wire – posts are recoverable, wire and netting and irrigation pipe/hose is the mixed waste that needs further investigation**

Key takeaways

- Cyclone Gabrielle is the biggest weather event to ever hit our region, including 1988's Cyclone Bola
- It delivered much more rain than was forecast
- We are working as fast as we can to repair stop banks
- Repairs will run into the 10s of millions of dollars
- We are still supporting the ongoing CDEM response

