MetService Presentation - 6th New Zealand Aviation Meteorological Symposium

MetService
TE RATONGA TIRORANGI

TELARC REGISTERED ™
Quality
ISO 9001


CAA

Aviation Meteorological Service Certificate

This is to certify that

Meteorological Service of New Zealand Limited

is authorised to operate the following services

Forecast Service
Information Dissemination
Meteorological Briefing
Meteorological Reporting
Meteorological Watch

as defined in the organisation's exposition

This certificate is not transferable, and shall come into force on the 16th day of December 2010 and remain in force until the 16th day of December 2013 unless otherwise suspended or revoked.

Granted this 9th day of December 2010

Manager Aeronautical Services
for Director of Civil Aviation

Hau mai Tāwhiri

Hau mai Tāwhiri

Kia piki ake au,

kia kake ake au,

kia puta ake au,

ki te whai ao, ki te ao marama e!

Hui e! Tāiki e!

I call upon you Tāwhiri

To raise me up

To lift me up

To propel me forward

into the new world, the world of light!

I commit! I am ready!

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Aviation overview FY23 – FY26

Ray Thorpe - General Manager Aviation Business

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Te Pae Tawhiti — Our Future

MetService TE RATONGA TIRORANGI · MetraWeather · MetOcean SOLUTIONS

Aviation Mission

Strong strategic relationships with customers and regulators, reshaping services through ongoing collaboration, ensuring long term sustainable aviation services, that contribute to a safe and efficient New Zealand aviation system

Our Strategic Objectives

- Change the way we work with and **engage more effectively with Māori** to build trust and relevance.
- **Lead on weather impacts**, supporting the safety and resilience of New Zealanders in a changing climate.
- Deliver a **customer centric operating model** that supercharges value creation.
- #1 Achieve business growth through **overcoming our legacy debt and maximise value** from our capabilities.

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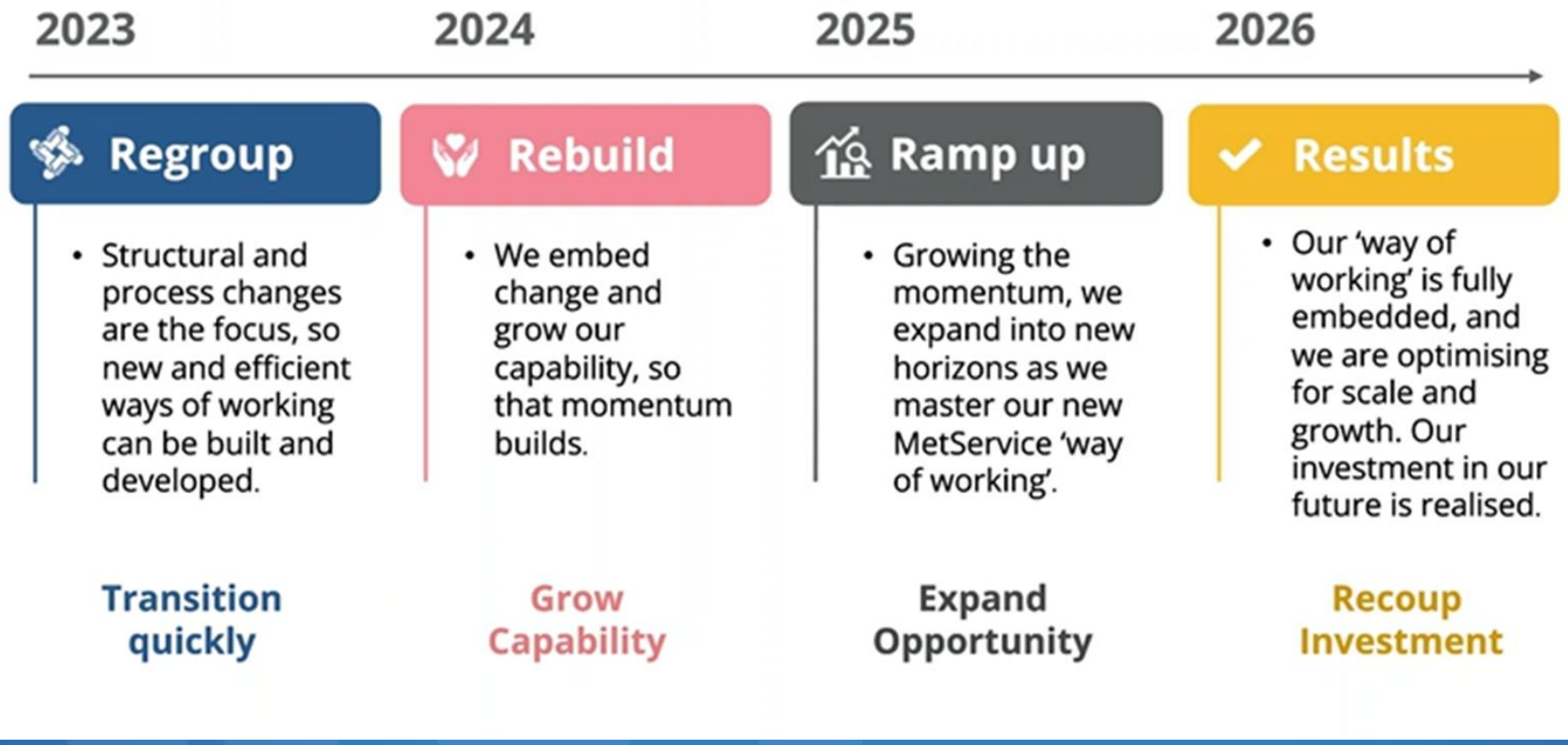
Te Pae Tata is a four-year journey...



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Encompassing key principles of the Treaty of Waitangi into our Aviation Business

- **RELATIONSHIPS**
- **Reciprocity (Equitable and Mutual Benefits for both Parties)**
  - Recognising equal status
  - Authentic Partnerships
  - Equality and Mutual Outcomes

Strategy to Regroup FY22/23

Sustain strategic relationships & collaborative partnerships

- Sustain strategic relationships with customers and regulators and develop collaborative partnerships that contribute to a safe and efficient New Zealand aviation system

Innovation through active engagement with industry

- Active engagement with industry to demonstrate agility and innovation in delivering fit-for-purpose solutions.

Improve resiliency

- Continue our focus on resiliency to ensure we can provide accurate and reliable solutions to meet customer safety objectives.

Forecaster transition to high value work

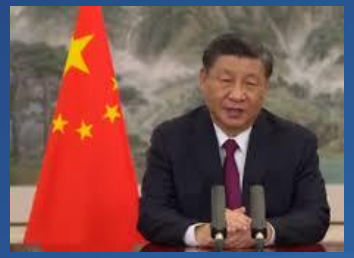
- Continue to identify where forecaster efficiency can be gained to allow use of forecaster expertise, combined with scientific innovation, to provide high-value forecast information

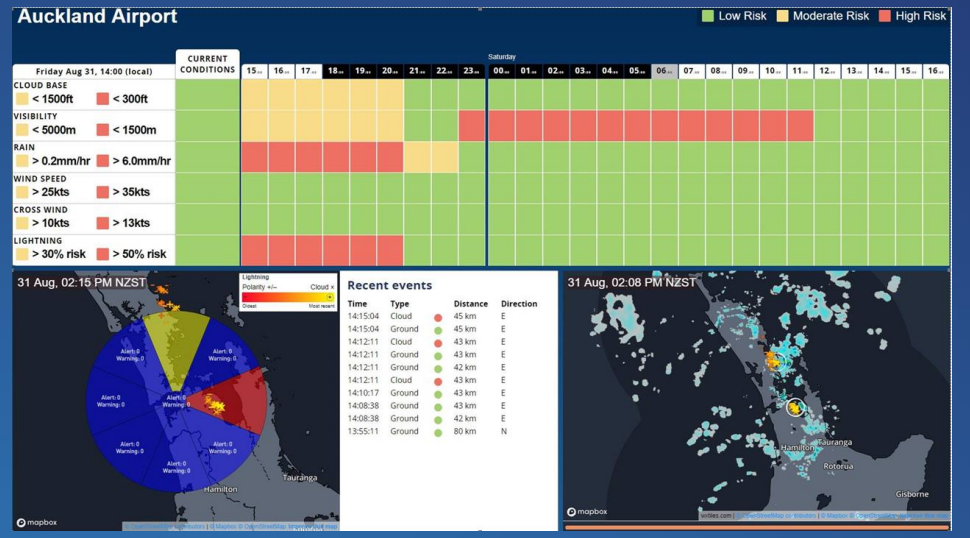
Sustainable aviation business

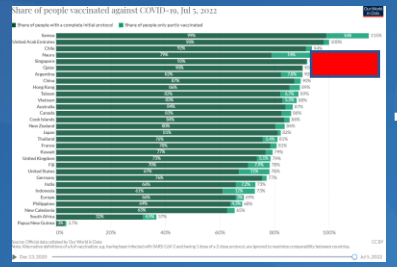
- Sustainable aviation business by ensuring charging models and supporting CAA Rules fit with the shift to a data driven environment in the aviation industry

Aviation Industry recovery – trends & drivers

HE AROTAKE I TE PŪNAHA TERE-RANGI
AIR NAVIGATION SYSTEM REVIEW







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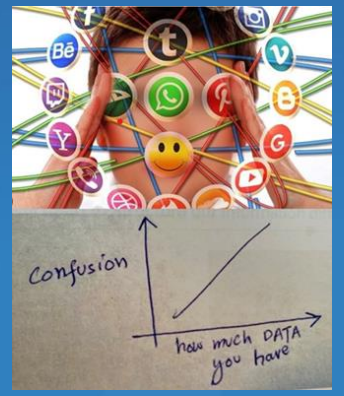
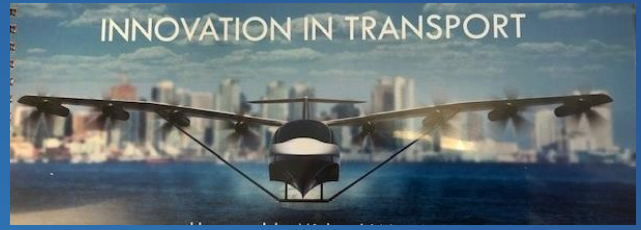
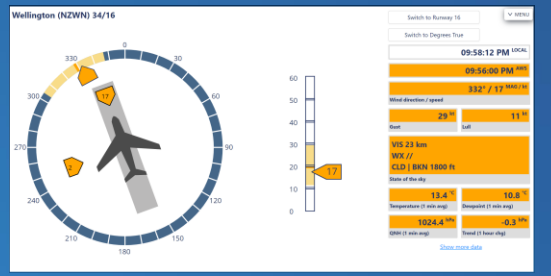


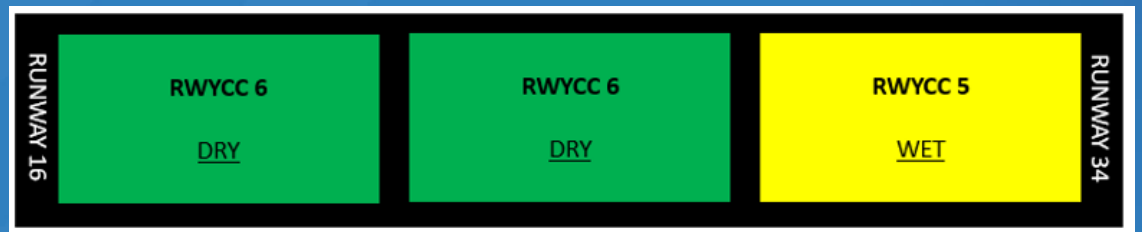




"Let's make this decade the moment of decisive change in the fight against climate change

Boris Johnson, UK Prime Minister

UN CLIMATE CHANGE CONFERENCE UK 2021
IN PARTNERSHIP WITH ITALY



NZWN 04121607 16 6/6/5 100/100/100 NR/NR/02 DRY/DRY/WET

Status of the Observation Network

Kevin Alder – Manager MetData Services

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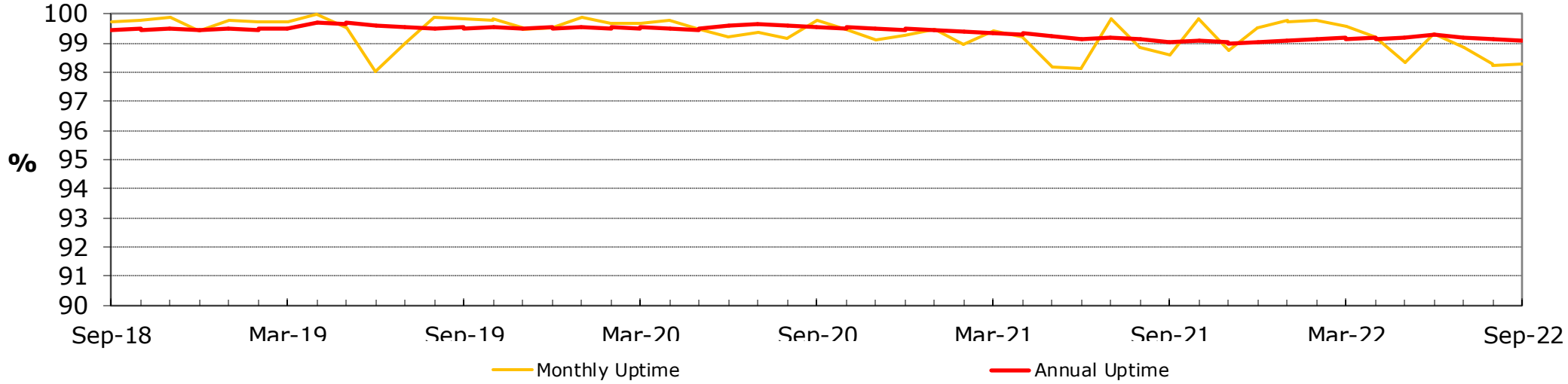
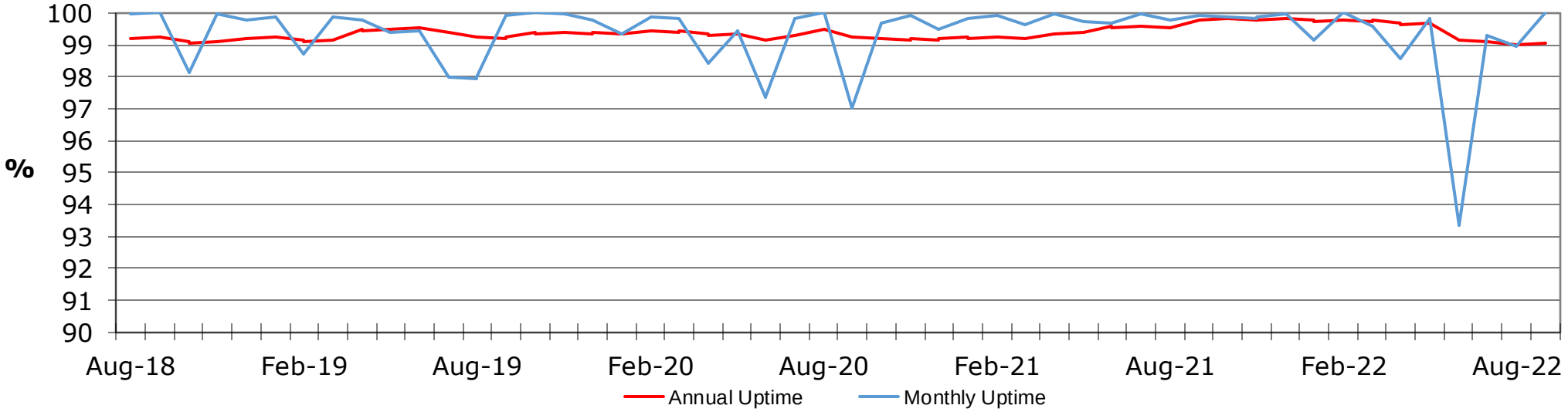
AWS Network



Weather Radar Network



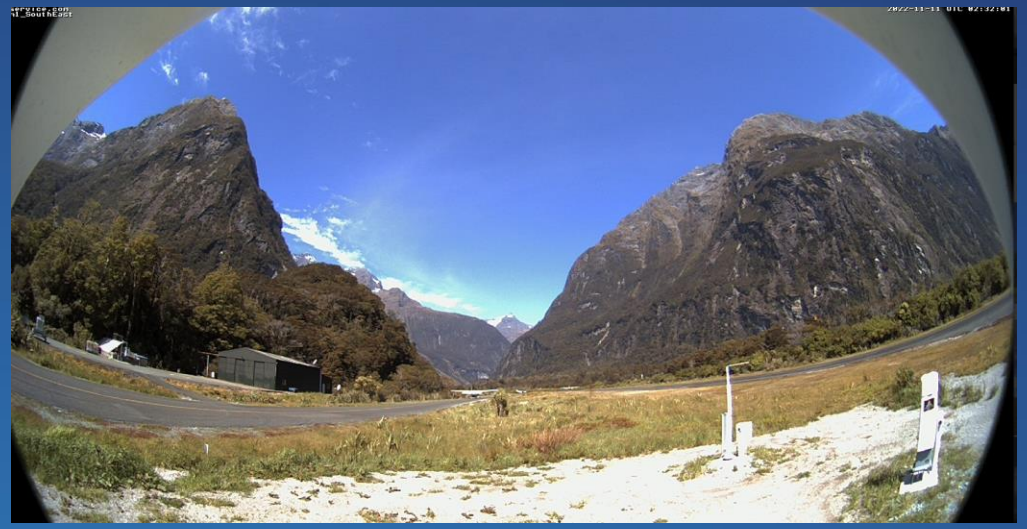
Aerodrome Weather Reporting

Completed

- Milford Sound - AWS upgraded in March 2022 with aviation sensors
- METAR AUTO now available outside FIS watch
- Webcams provide round the clock imagery to forecasters and Aviation portals.

Planned Improvements

- Kerikeri – relocation of the Wind sensor - this summer.
- Tauranga / Whangarei – relocation of AWS to airside – this summer.
- Gisborne - relocation of AWS to airside –next year



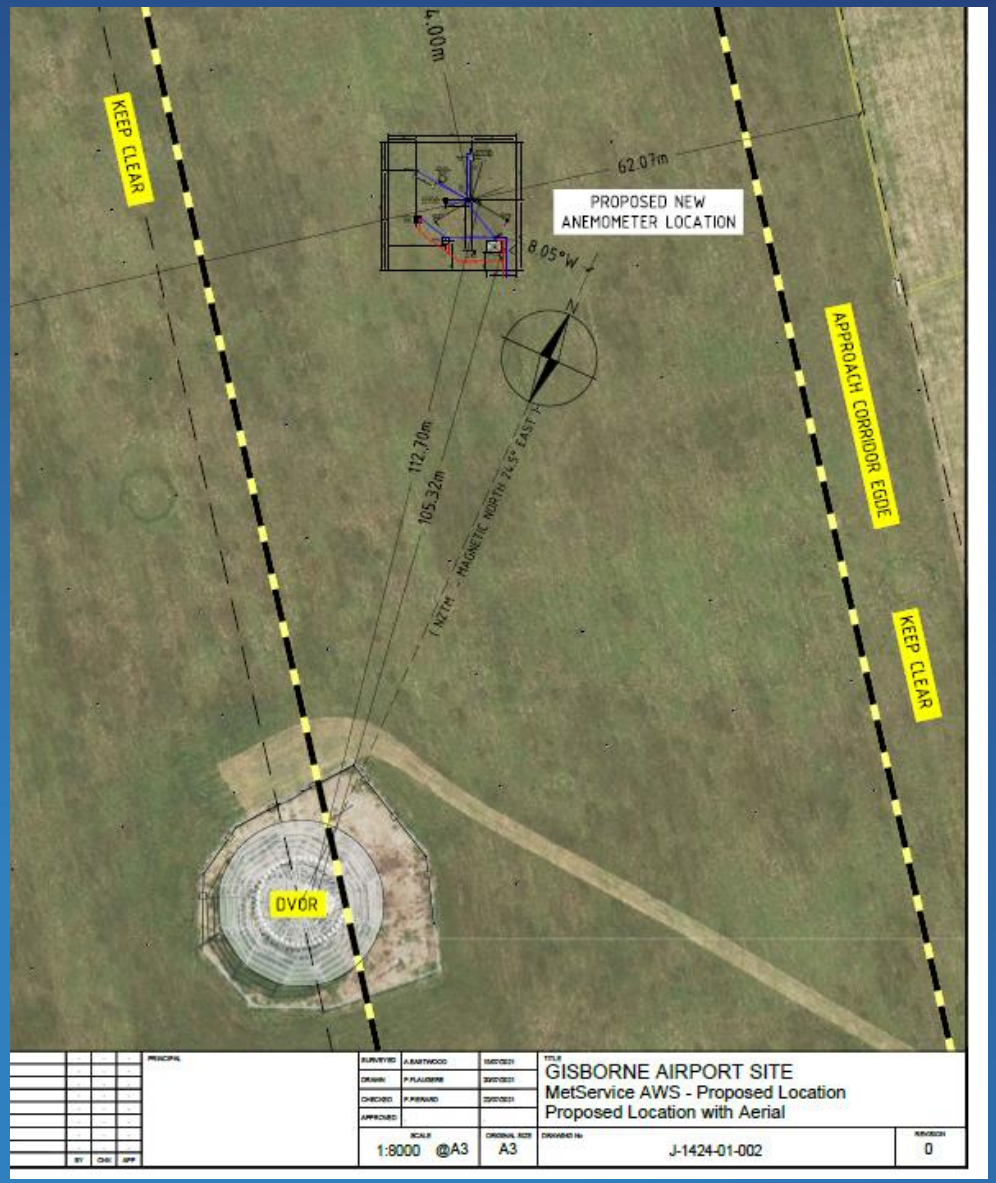
Aerodrome Weather Reporting

Challenges

- Kerikeri – agreement with airport operator for sensor locations.
- Potential impacts to representative winds along the runway and touchdown zones (ICAO Annex 3)

Tauranga / Gisborne / Whangarei

- Re-siting MET sensors near NAVAIDS.
- Liaising with Airways to make sure instrumentation does not impact the performance of existing or planned navigational aids.



Weather Radar Programme

Wellington Radar Upgrade

- The Wellington radar on Outlook Hill was installed in 1992.
- Operates on 30 year old technology.
- New dual radar hardware will be installed over February/March 2023
- The radar tower will also be strengthened to meet new seismic standards.
- Radar imagery and products will be unavailable for an estimated 8 weeks.
- Normal service is expected to return in April

Update on developments in Forecasting R&D team

Chris Kroger, Manager Forecasting R&D

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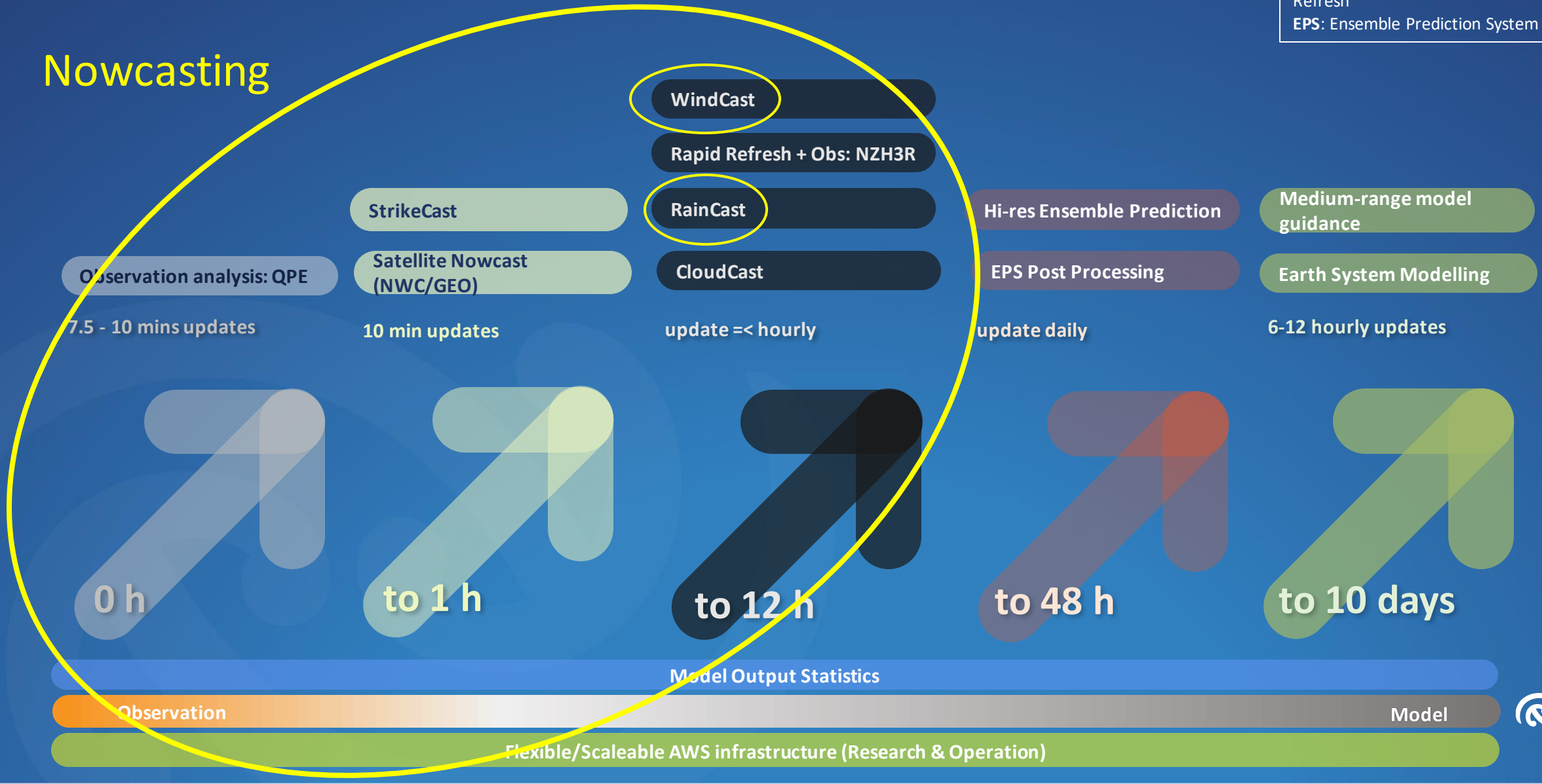
FR&D Nowcasting products

1. FR&D product suite – operational, in development and future looking
2. WindCast
3. Volcanic Ash deposition modelling

1. Product suite: Towards seamless prediction

StrikeCast: Lightning nowcasting
RainCast: Rainfall nowcasting
WindCast: Wind nowcasting
CloudCast: Cloud cover nowcasting
NZH3R: NZ High-Resolution Rapid Refresh
EPS: Ensemble Prediction System

Nowcasting



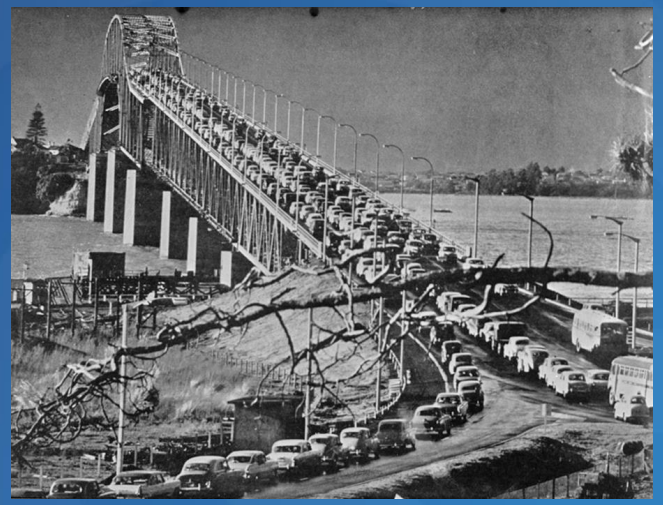
2. WindCast – in development

- **Rapidly updated wind forecasts (nowcasts) at local scales**
- **Includes high impact gust events**
- **Computationally highly efficient cf. probabilistic forecast, but**
- **Combines analytical, probabilistic, and ensemble-like elements:**
  - Selects from multiple numerical models
  - Uses Model Output Statistics output (ML)
  - Produces probabilistic and deterministic forecasts
  - Updates 2-6 times/hour using observations (rapid refresh)
  - Downscaling gridded forecast to consider local topography at resolutions of c. 300 m

2. WindCast planned products

Tier 1: Spot nowcast

Timeseries combining best QC-ed model that incorporates observation and trained model (ML)



Tier 2: 2D nowcast

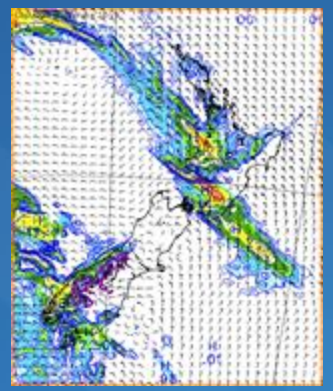
Gridded forecast that combines trained timeseries with hi-res gridded NWP model output, then ultra-hi-res downscaling

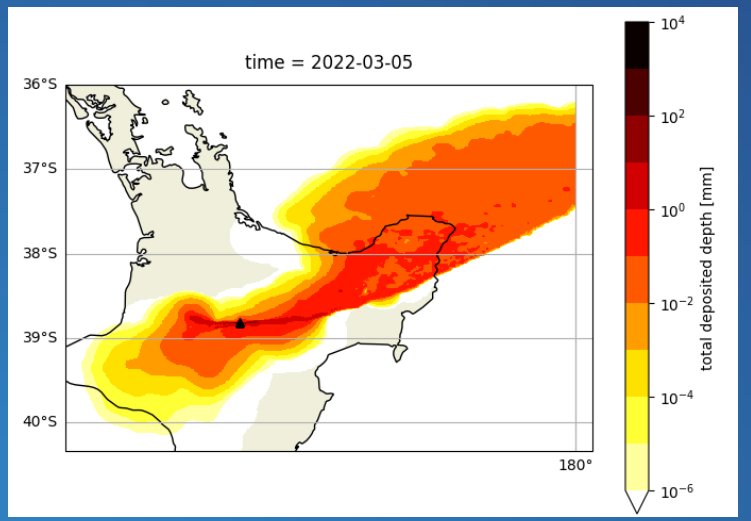
Tier 3: 3D nowcast

Gridded nowcast for multiple heights

3. Volcanic ash cumulative thickness modelling: Towards real-time probabilistic ash deposition forecasting

Currently delivering daily information on ash deposition: For ten NZ volcanic centres, each for two *discrete* eruption sizes, forced with *deterministic* hi-res model

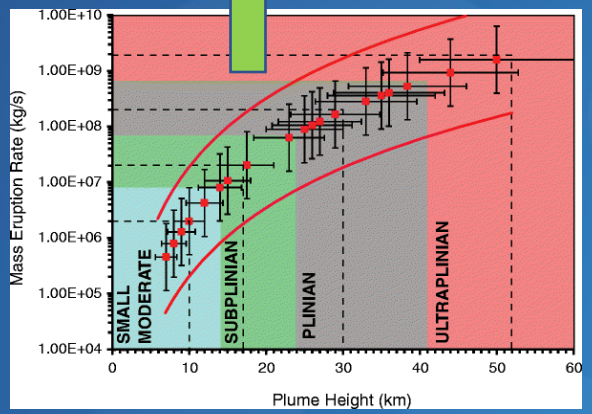


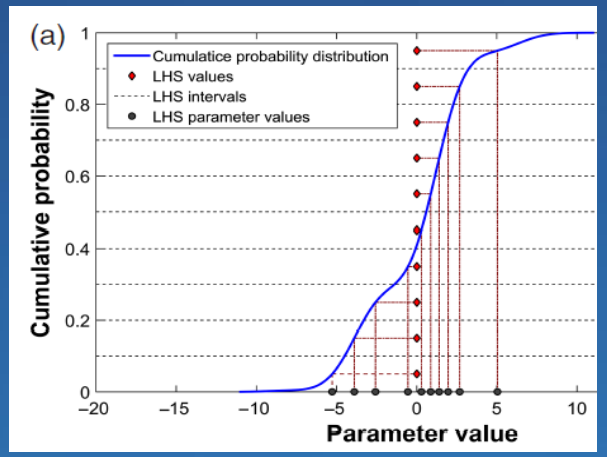


Cf. VAAC airborne ash:

Product is “airborne volcanic ash at different flight levels”
For 3-4 different eruption sizes and 2-3 different NWP forcings
Triggered on-demand (GUI or VOLCAT)

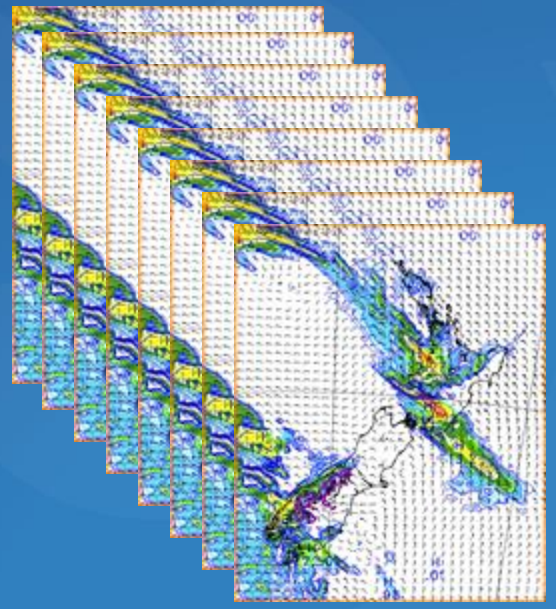
Volcanic ash cumulative thickness modelling: Towards real-time probabilistic ash deposition forecasting *cont*.



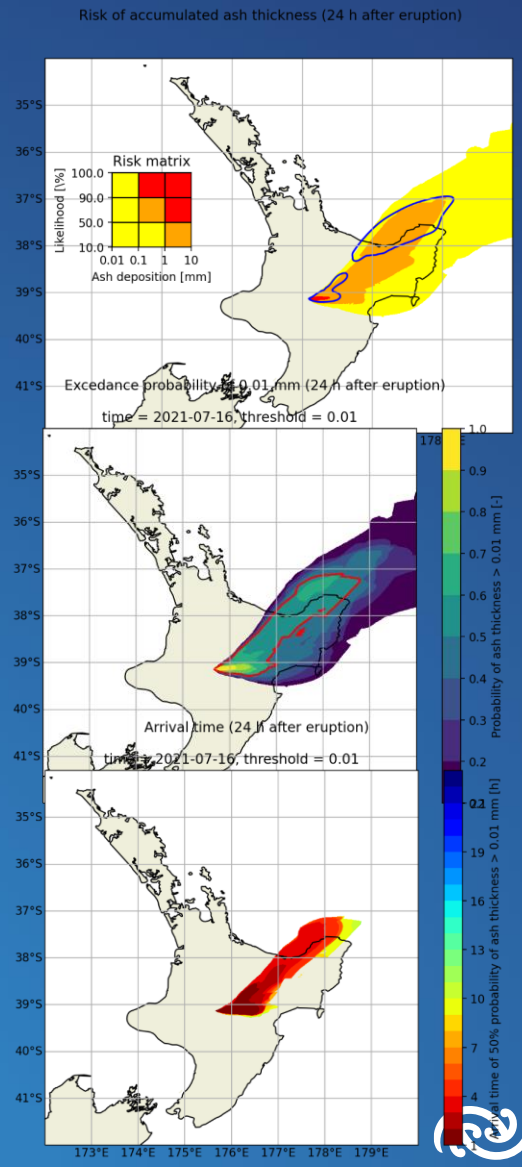


Latin Hypercube *Sampling*

Every section of parameter space sampled once



HYSPLIT
AIR RESOURCES LAB



Accepted for Publication in J. Volcanology, Trancoso et al., in collaboration with GNS Science

Product Update

Amy Dreverman - Aviation Solutions Delivery Manager

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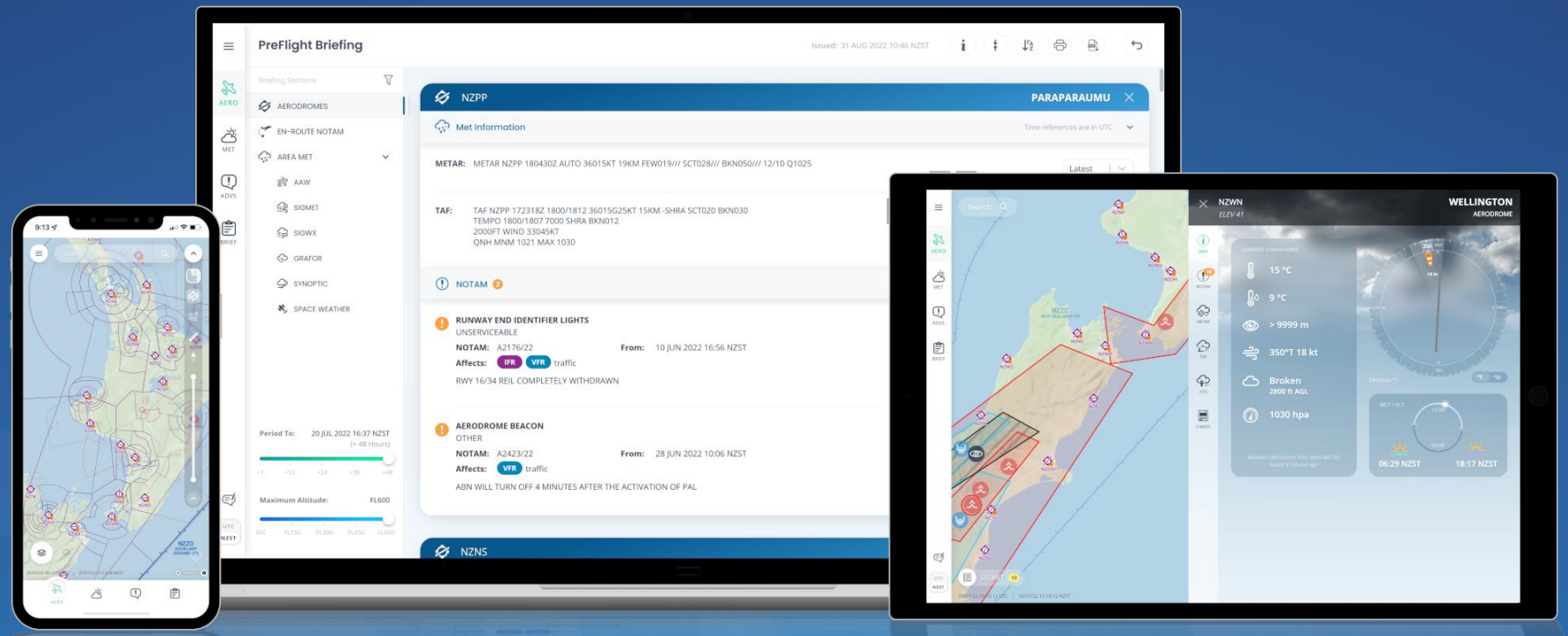
PreFlight launched with Aeropath



- Integrated aeronautical and meteorological solution
- Interactive map with weather & aeronautical overlays
- Altitude slider bar to show information relevant to you
- Desktop, tablet and mobile friendly

What are we working on now?

TREND Removal

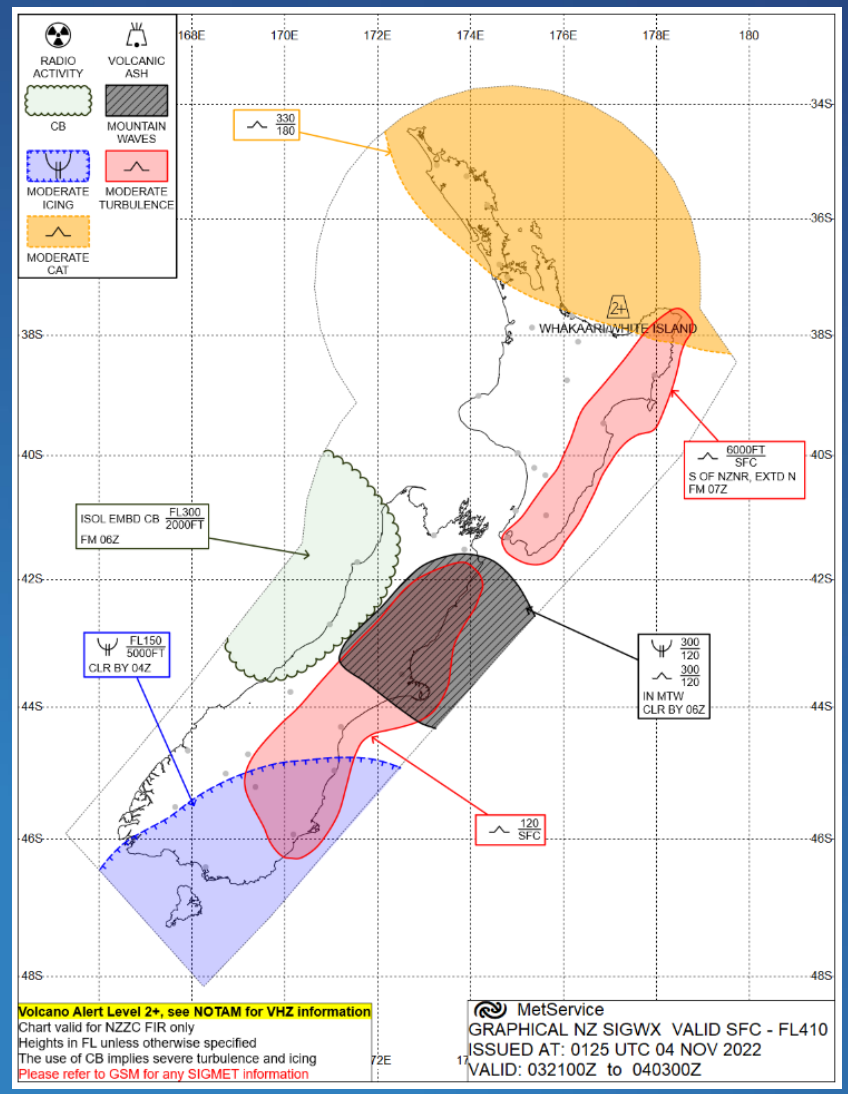
- Removing TRENDS from METARs for international and military aerodromes

3 hourly TAF issue

- 3 hourly TAF issue for international aerodromes and Ohakea

GNZSIGWX

- Increased issue frequency
- Validity period shortened
- Differentiation between CAT and Low Level Turbulence



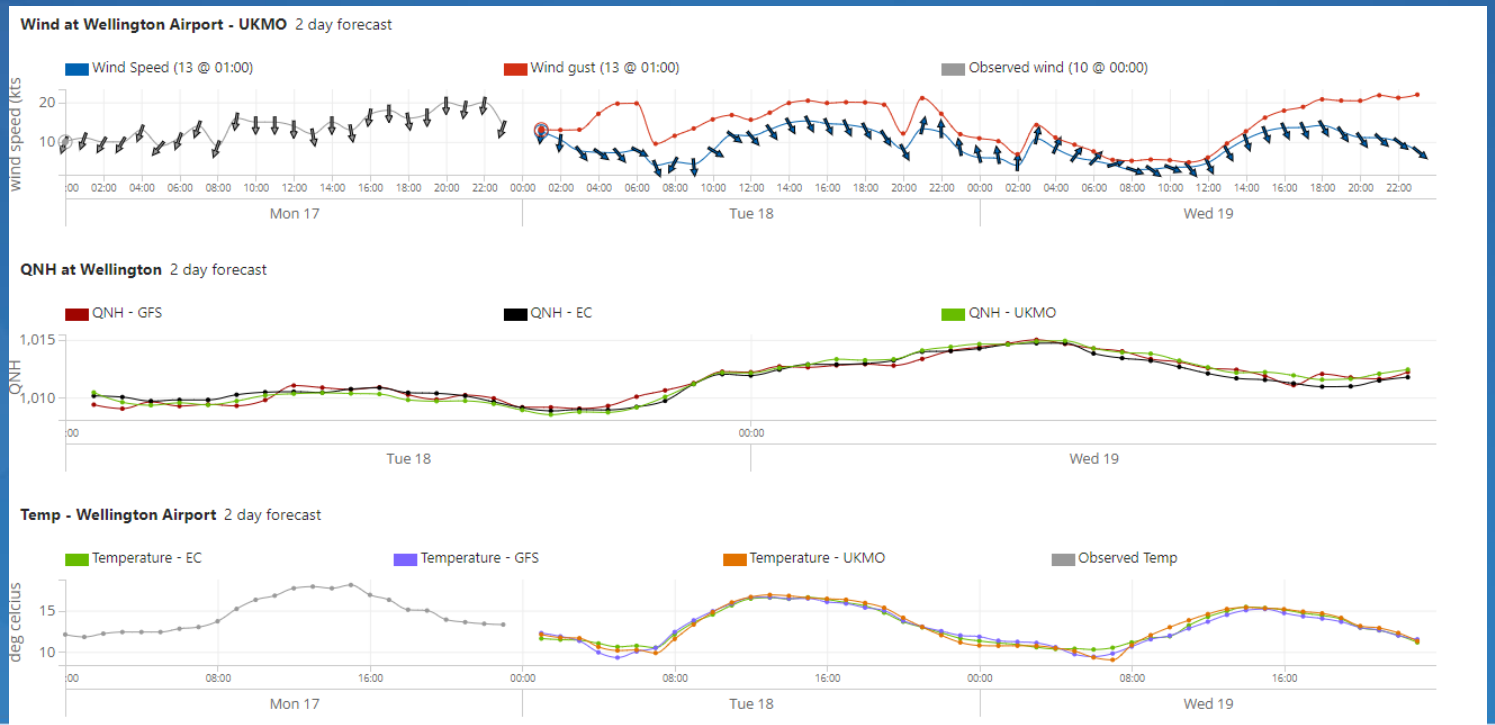
What's planned in the next 6 months?

PreFlight Enhancements

- Map overlays
  - Model data
  - Radar
  - Satellite
  - MSL pressure

Spot Forecasts

- Generating model driven forecasts for wind, temp and QNH
- Non-TAF locations
- Trial underway



How can we help?

- Have you got a met related problem that needs solving?
- Are there changes that you want to see in aviation met products?
- Are there operational problems that we can help with?

Get in touch with us at: aviation.feedback@metservice.com

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Thank you