NIWA
Taihoro Nukurangi

Risk Forecasting: Weather & Psa

Dr. Michael J. Uddstrom (on behalf of the team)

Principal Scientist: Environmental Prediction

Manager, EcoConnect

michael.uddstrom@niwa.co.nz

EcoConnect Forecasting System

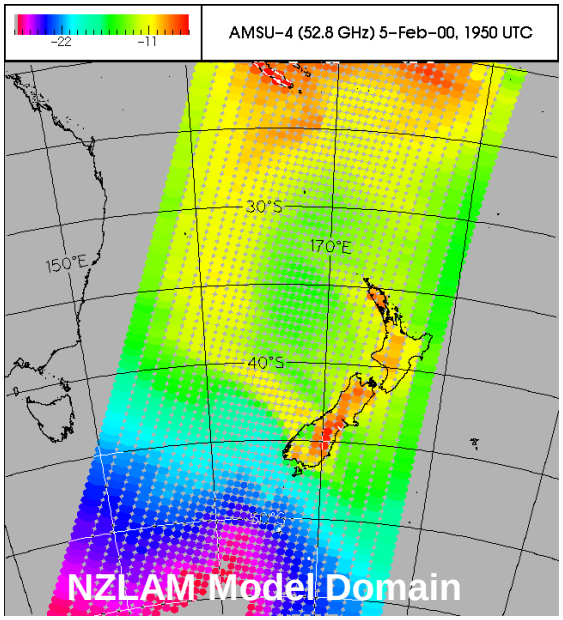
- New Zealand Limited Area Model (NZLAM):
  - State of the art, data assimilating (NIWA):
    - 12 km resolution, 2 day range, hourly, 4× daily
    - "Down scaled" to specific sites;
    - Temperature, relative humidity, rain, wind, cloud, etc.
- Global Unified Model:
  - Leading global weather prediction model (UK Met Office):
    - 25 km resolution, 6 day range, 3 hourly, 1× daily
    - Temperature, relative humidity, rain, wind.
- Ensemble long range forecasts:
  - Based on global ensemble (US Weather Service)
    - Down scaled to specific sites, 15 day range, daily, 1× daily;
    - Min/Max temperature, wind speed, probability of rain > n mm..
    - Probabilistic
- Seasonal Forecast (3 months)

NZLAM: Weather Prediction

- New Zealand Limited Area Model:
  - 12 km grid, 70 levels (to 80km);
  - Based on UK Met Office Unified Model;
  - Forecasts every hour to 48 h;
  - 4 × daily.

NIWA Supercomputer

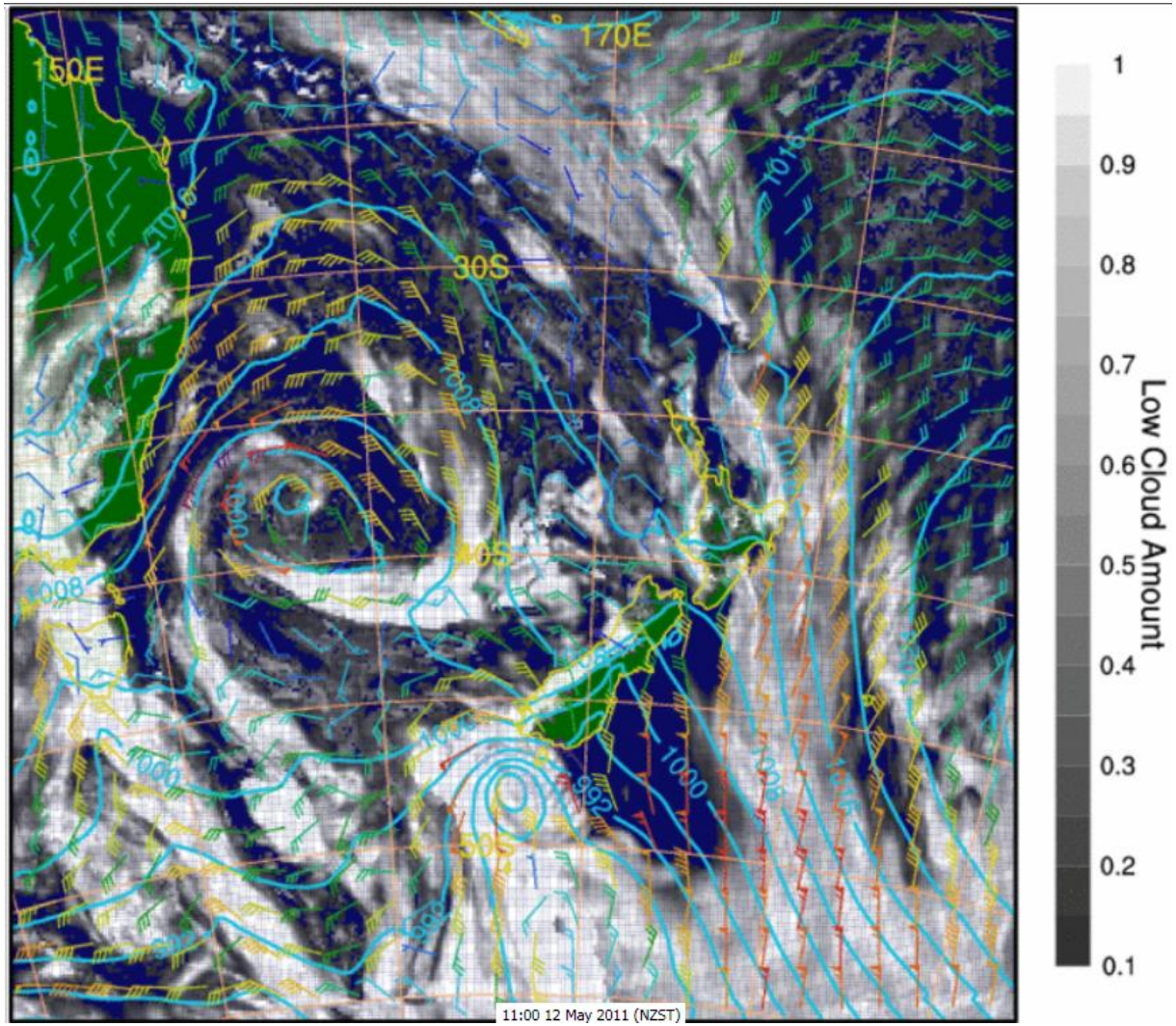
- Data Assimilation:
  - Weather prediction is an initial value problem;
  - Uses data from Ships, Buoys, Land, Balloons, Aircraft, Satellites.
- Large model domain:
  - Accurate forecasts to 48 h.
- Forecasts verified against obs;
- Unified Model now adopted by BoM KMA,SAWS, US Air Force, Norway.



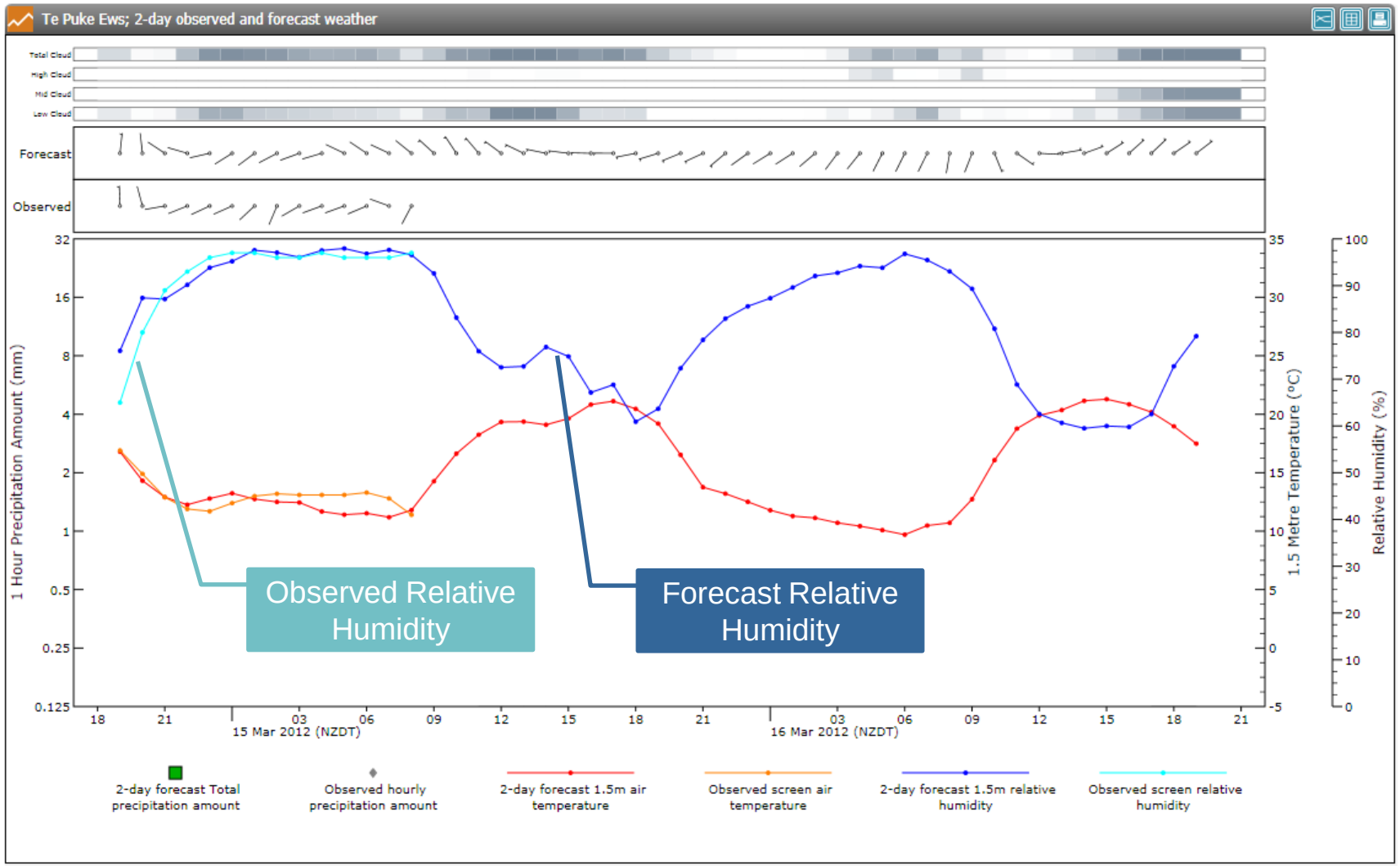
NZLAM Model Domain

Wind Event: 12 May 2011 1000 NZST

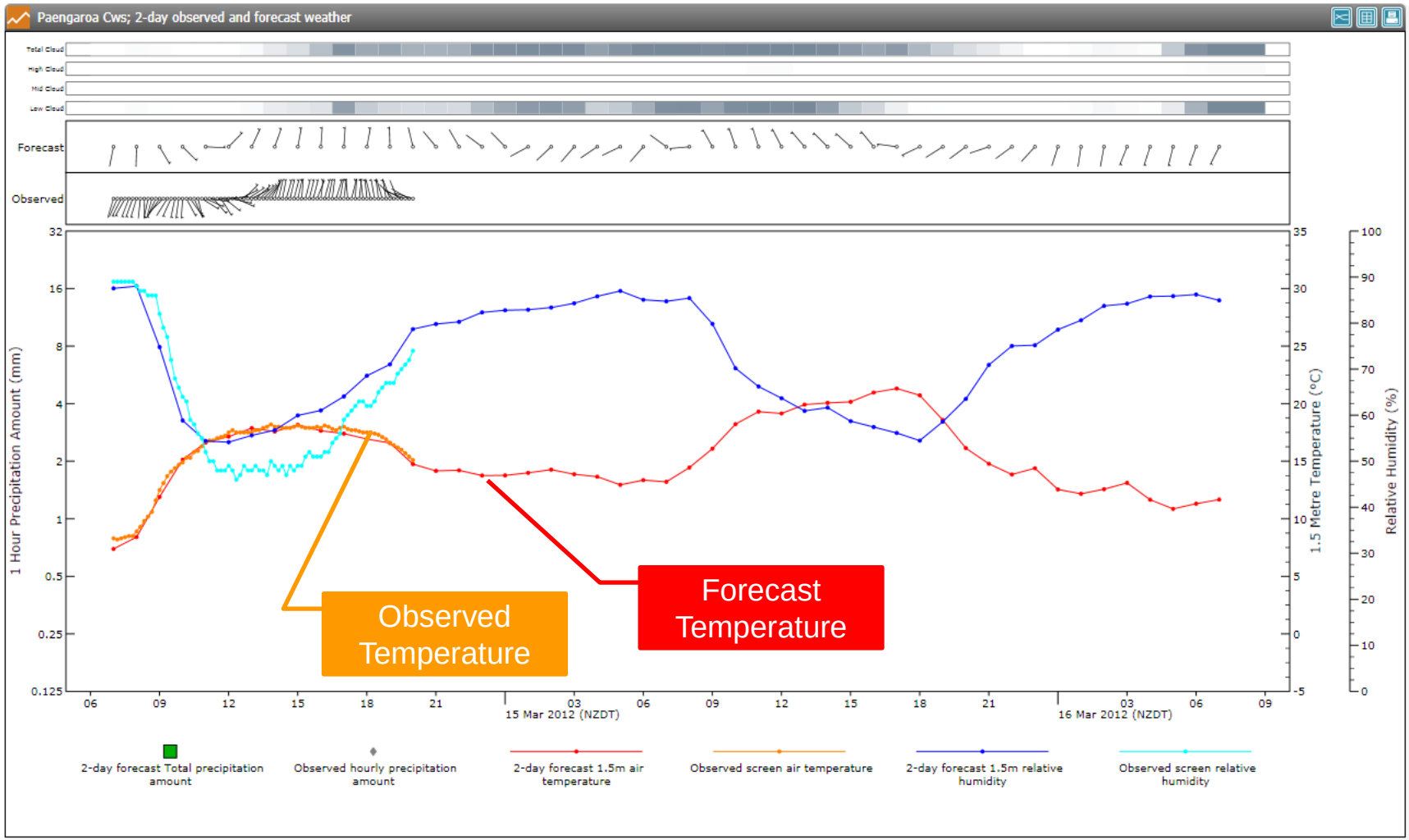
- NZLAM 17 h forecast:
  - VT 1100
  - Low cloud
  - 10 m winds
- Terra MODIS passes:
  - 1000 NZST
  - 1138 NZST



Example NZLAM Forecast: Te Puke EWS

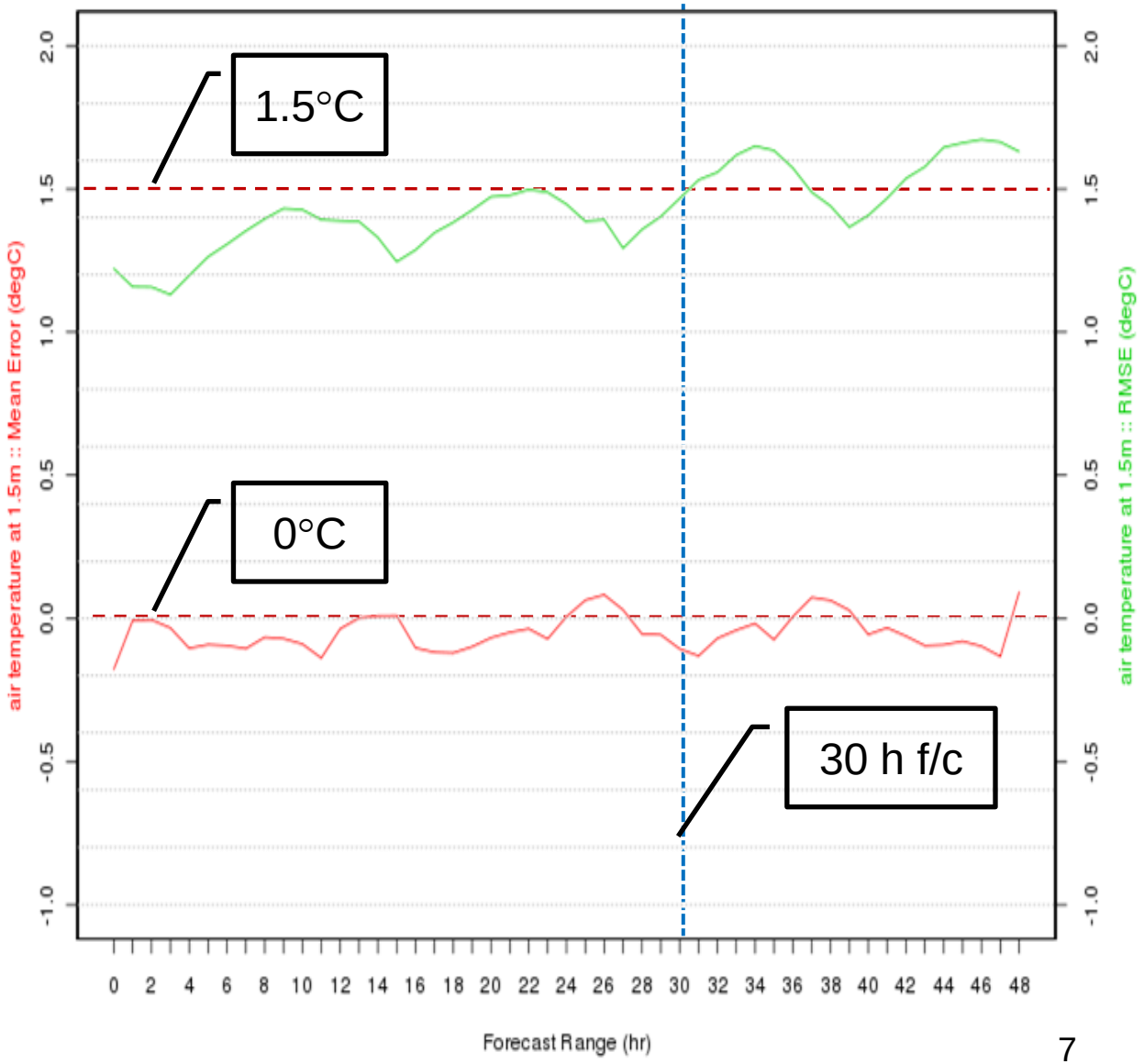


Example NZLAM Forecast: Paengaroa



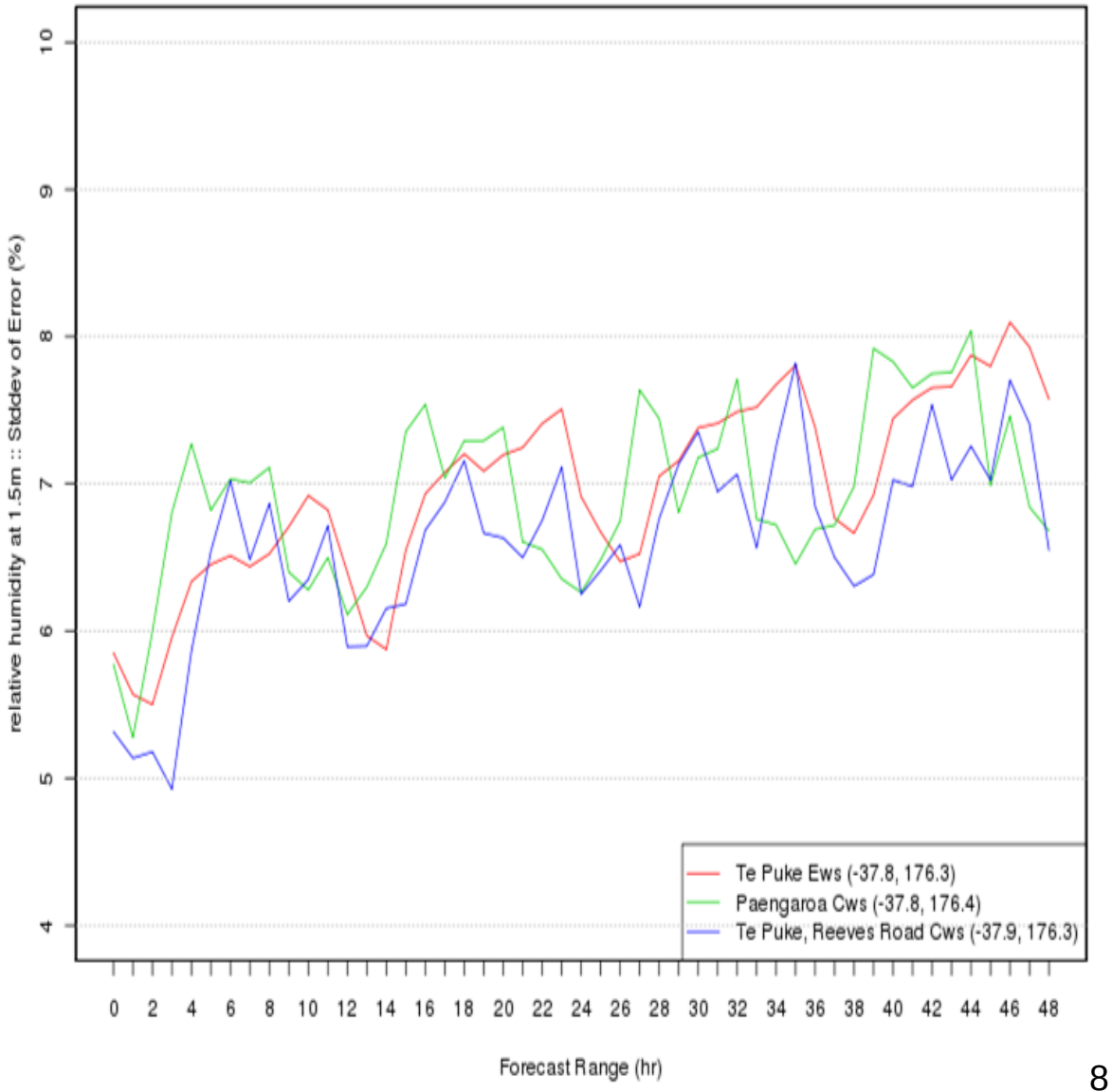
NZLAM-12 Accuracy: Temperature

- 11 Months
- Temp:
  - 1.1 to 1.6°C



NZLAM-12 Accuracy: Relative Humidity

- 11 Months
- Temp:
  - 1.1 to 1.6 °C
- RH:
  - 5 to 7 %



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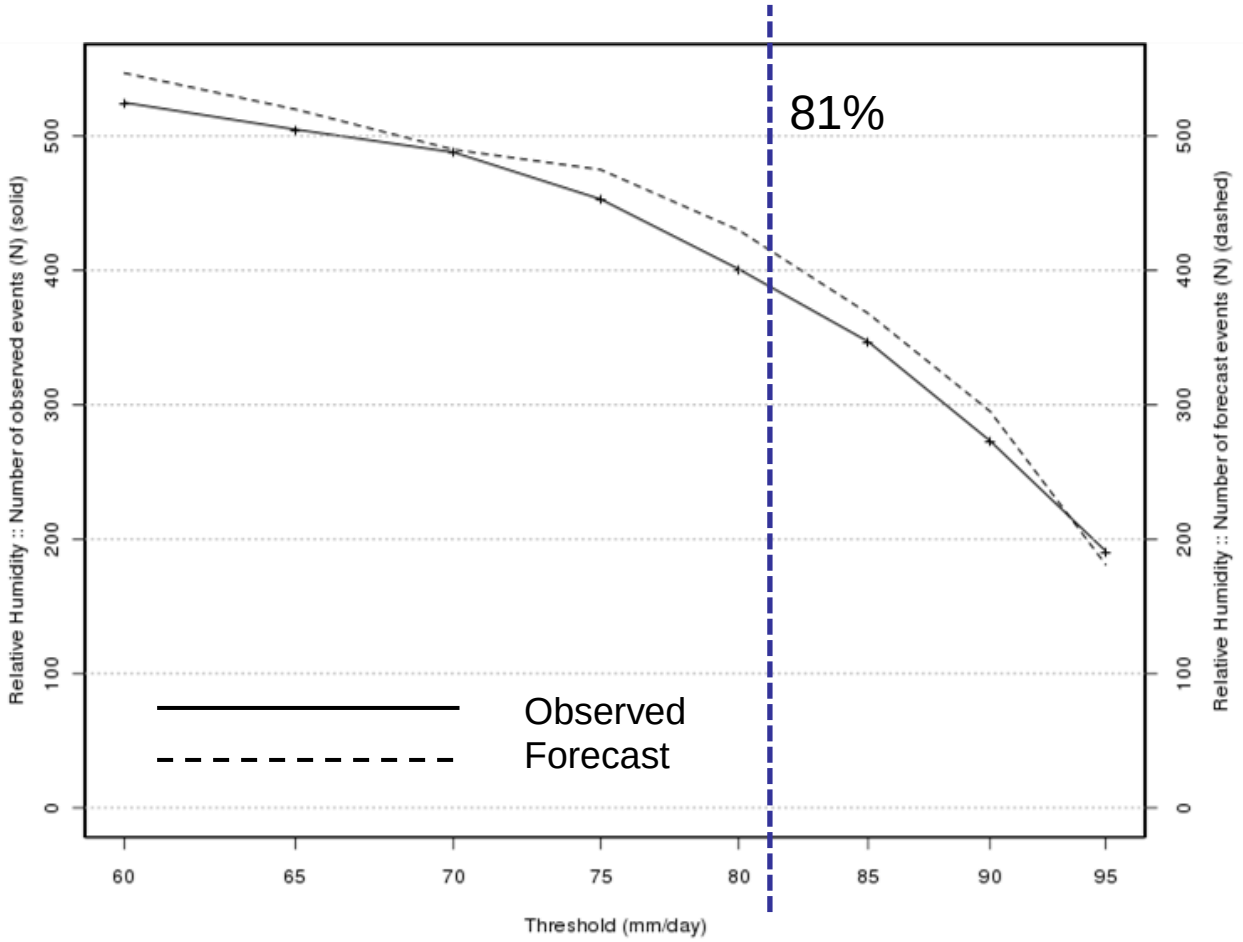
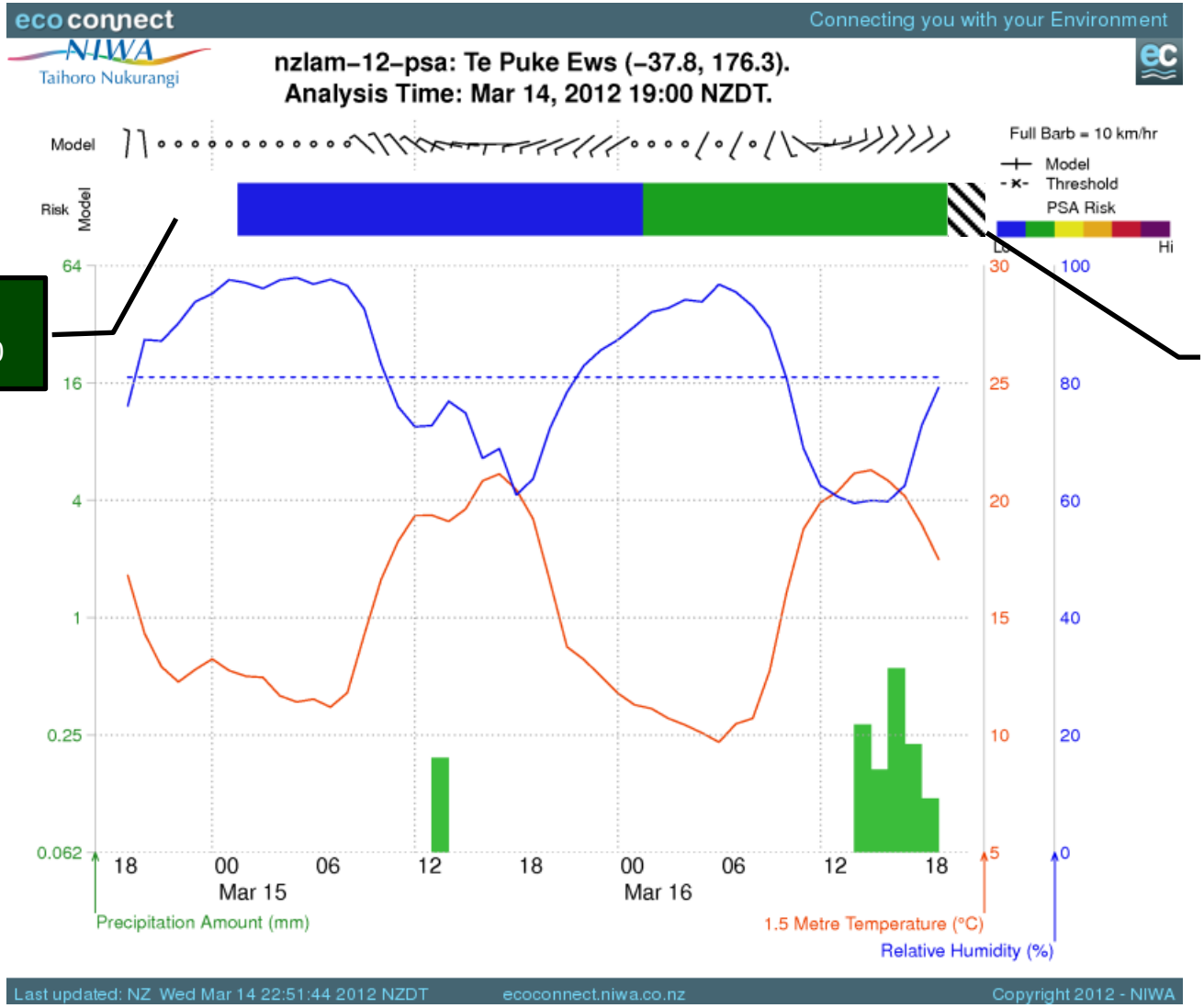


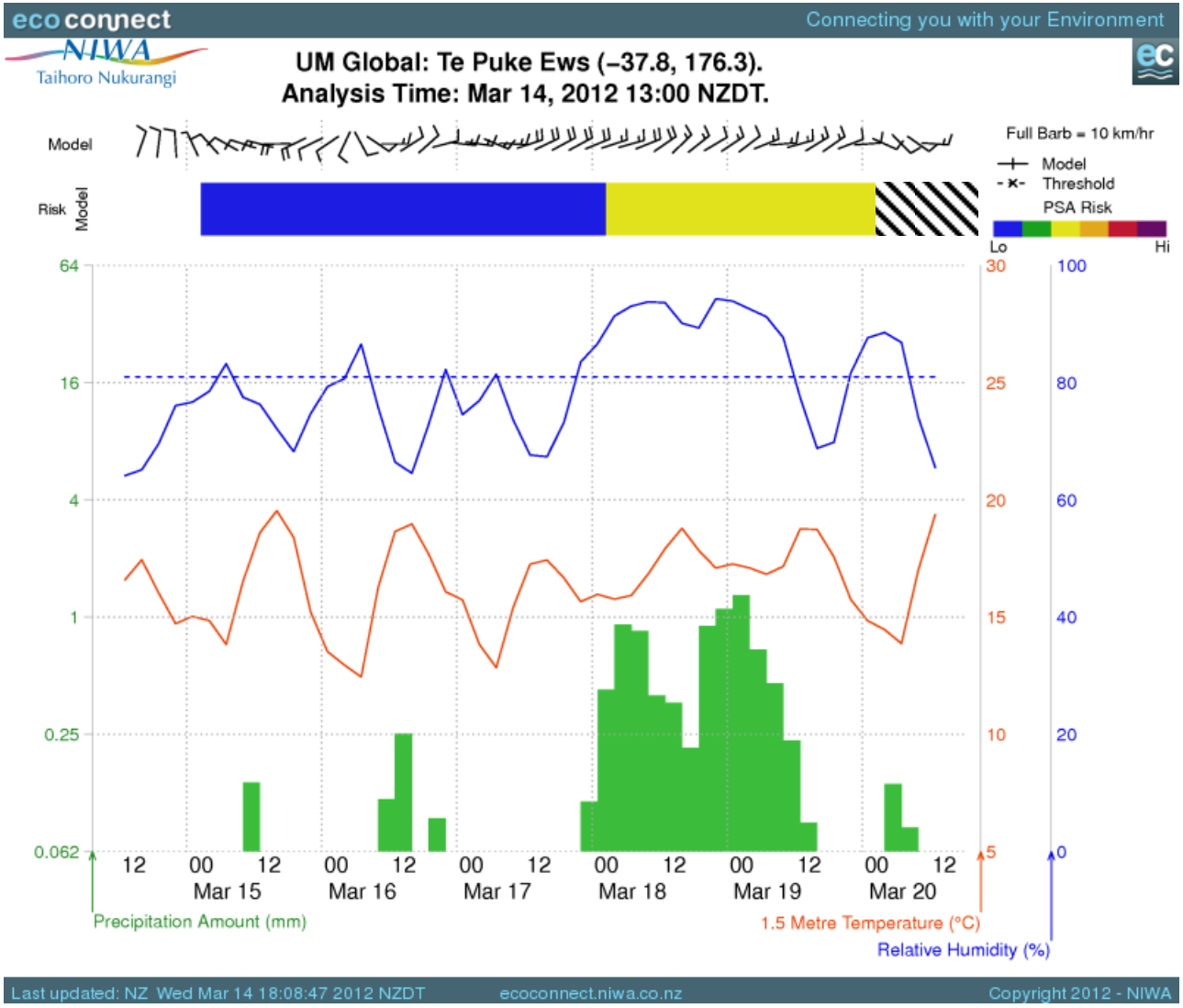
Psa Risk Forecast: Site Specific (48 h)



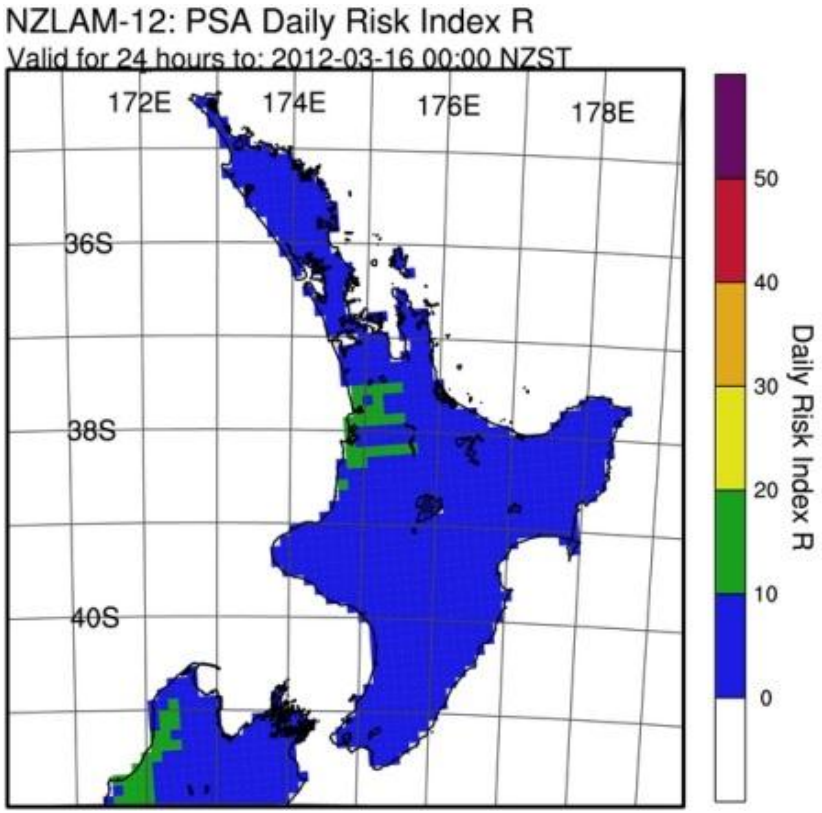
Risk Model indicates R=0

No Risk Forecast available

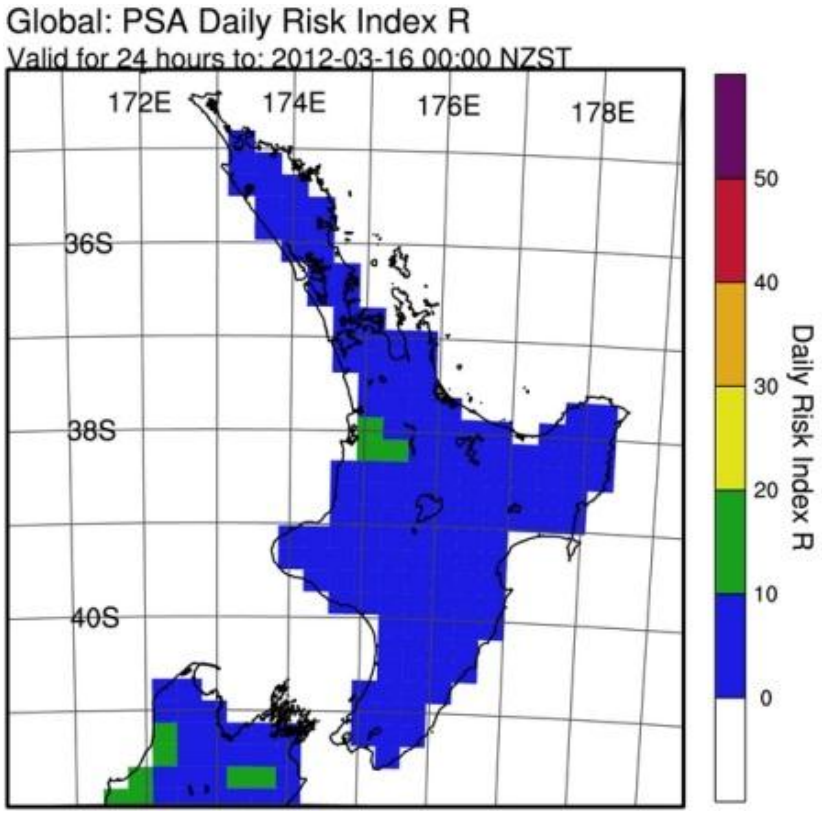
Psa Risk Forecast: Site Specific (144 h)



Psa Risk Forecast: Maps

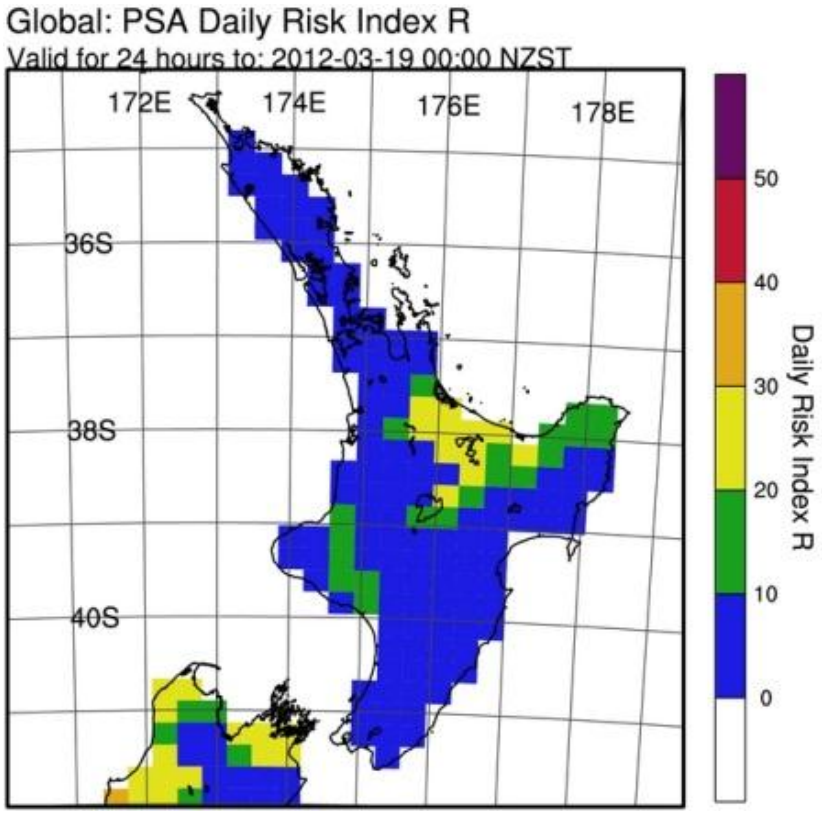


NZLAM-12

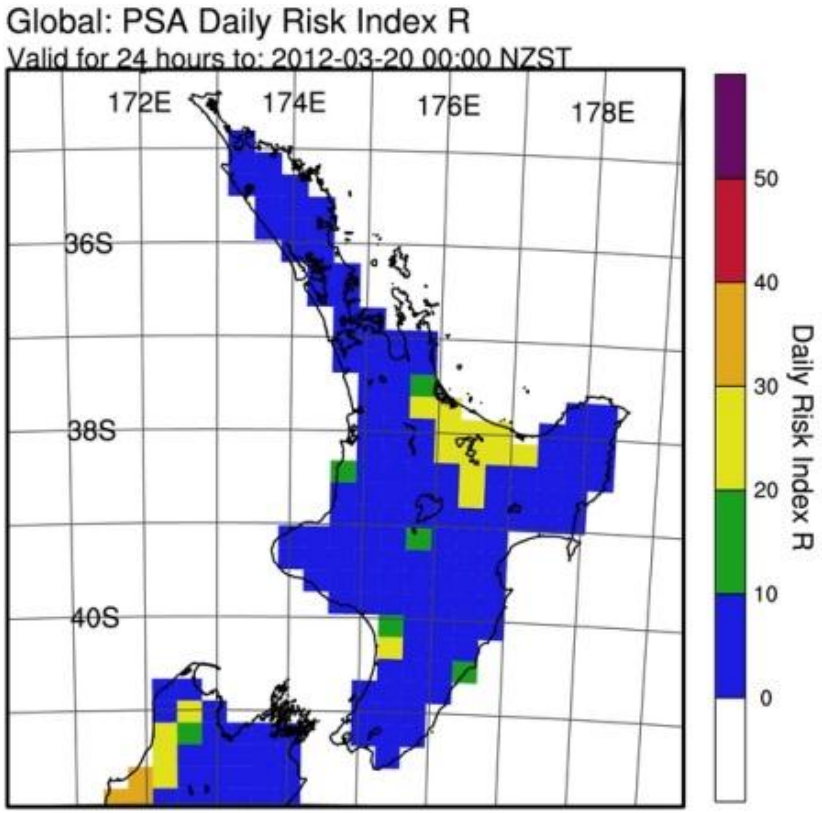


UM Global

Psa Risk Forecast: Maps

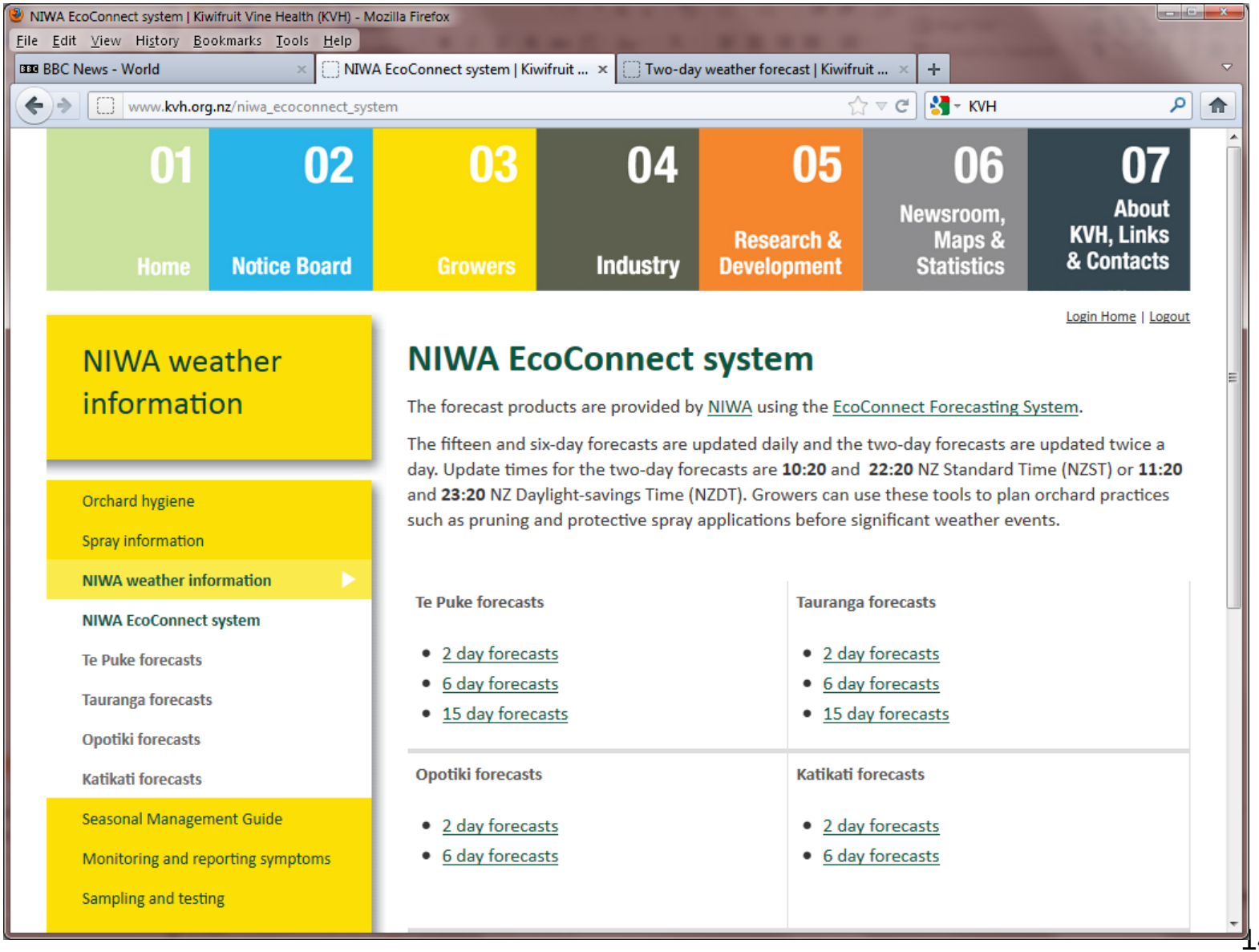


UM-Global Day 4

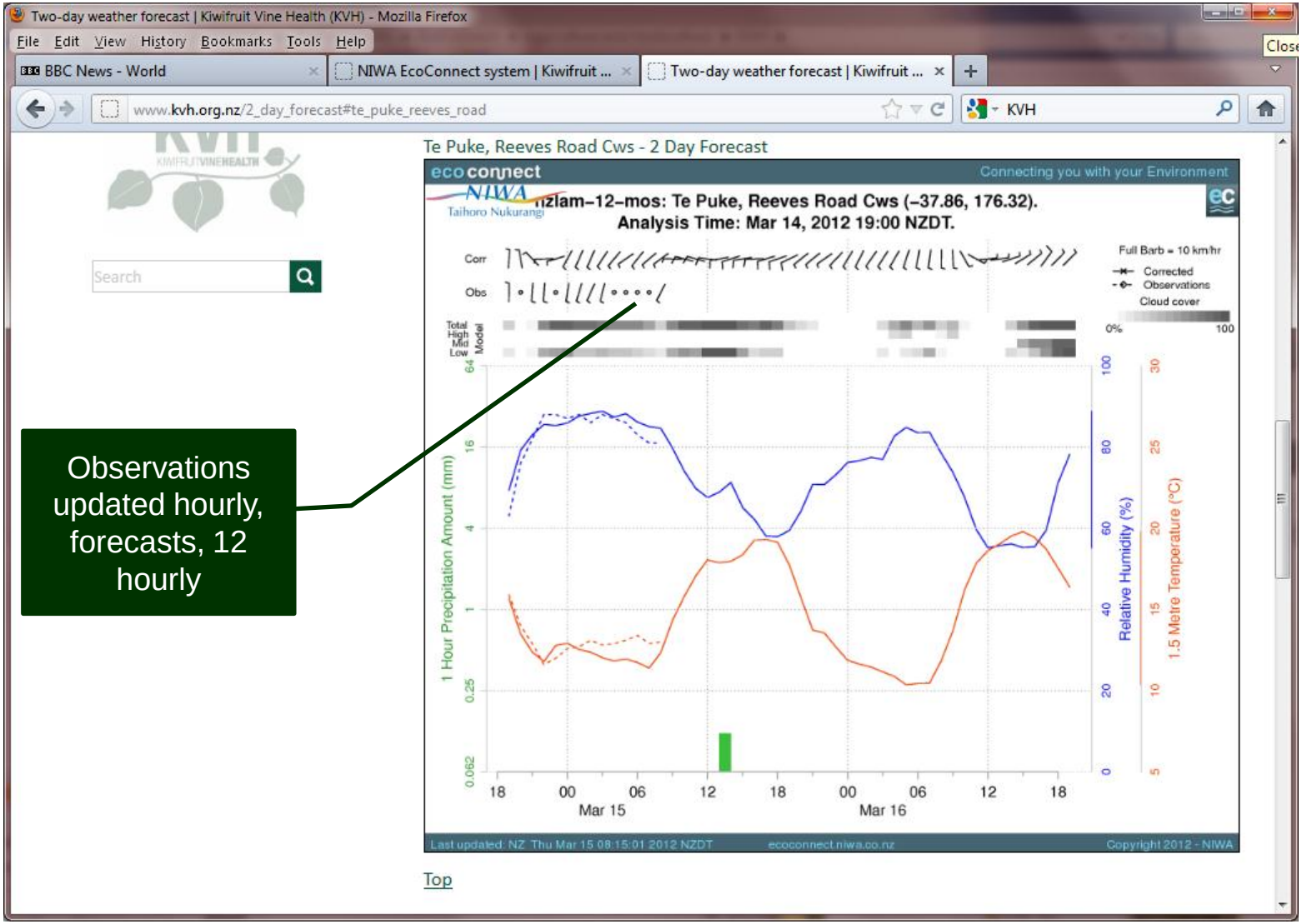


UM Global Day 5

KVH Website: Weather Forecasts

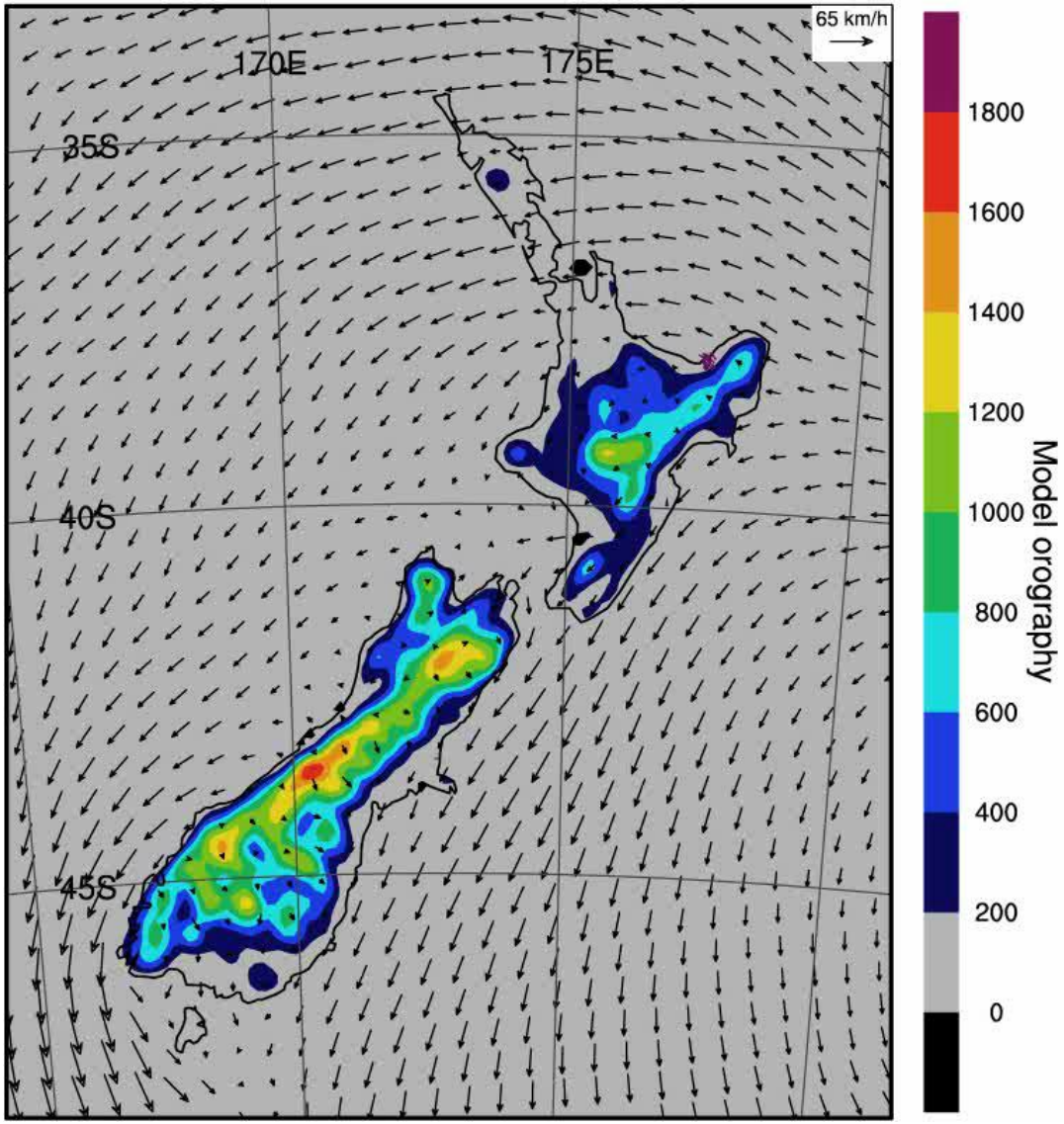


NZLAM Meteogram for Reeves Road



Observations updated hourly, forecasts, 12 hourly

Thank you

Trajectory Forecast: E. BoP Source

- Given a "source" region
  - Advects source parcels in 3 dimensional space (with *t*)
    - *x*, *y*, *z*
- Not a dispersion model
- Better than streamline plots.