

New Zealand weather and climate news

Courtesy of MetService Library—now on leave until end of Sep.

MetService

Weather: 'Shock to the system' as temperatures set to drop, rain and wind, too

New Zealand Herald

... of weather watch or warning because of a low-pressure system making its way up the South Island, MetService meteorologist Andrew James said.

Big winds for central areas, heavy rain in the mountains, low-ish snow

Stuff.co.nz

MetService is warning of the risk of severe gales gusting to 120kmh in exposed places from Monday evening through to Tuesday morning in ...

Chains needed for snowy alpine passes

Otago Daily Times

MetService said about 2cm of snow fell on Arthur's Pass overnight, but the road was clear on Sunday. Snow has now stopped falling on the three high ...

Strong wind warning issued for Canterbury High Country

Stuff.co.nz

Strong wind warnings have been issued for the Canterbury High Country on Sunday and Monday, MetService said. MetService has predicted a ...

Showers the only dampener for mostly warm Hawke's Bay week ahead

New Zealand Herald

A fine week of weather is ahead for Hawke's Bay, with only the fear of a few small showers to put a dampener on the week. MetService Meteorologist ...

Severe weather warnings issued around New Zealand

Newshub

MetService warns heavy rain is on the way for the west coast of the South Island on Monday, and most of central and southern New Zealand is under ...

Weather: Monster cloud system shrouds New Zealand

Newshub

MetService says a system in the Tasman Sea will bring showers to the upper North Island on Sunday afternoon - some could be heavy in Northland.

MetOcean

MSI Provides Metocean Data to Support Construction of Breakwater

Hydro International

MSI, a company that provides meteorological and oceanographic (metocean) measurement services, recently was contracted to install a range of ...

Extreme weather (and other news) – Australia and Pacific

NZ launches Tai a Kiwa programme to support Pacific parliaments

New Zealand's parliament is expanding its support to its counterparts in the Pacific with a new programme - Tai a Kiwa.

Bureau of Meteorology finds new CISO

iTnews

The Bureau of Meteorology has a new chief information security officer following the departure of Suthagar Seevaratnam to Australian National ...

Extreme weather (and other news) – Asia and the Middle East, Africa

Qatar- Prime Minister inaugurates Mukaynis Meteorological Center

MENAFN.COM

Qatar- Prime Minister inaugurates Mukaynis Meteorological Center ... the most modern in terms of technologies and capabilities, and will contribute to ...

Extreme weather (and other news) – Americas and Europe

Major flooding washes away cars, closes schools in eastern Spain

AccuWeather.com

... rainfall totals will average of 75-150 mm (3-6 inches) in these areas with an AccuWeather Local StormMax™ of 450 mm (18 inches), mainly across ...

International news and research

Urban growth, heat islands, humidity, climate change: the costs multiply in tropical cities

Some 60% of the planet's expected urban area by 2030 is yet to be built. This forecast highlights how rapidly the world's people are becoming urban. Cities now occupy about 2% of the world's land area, but are home to about 55% of the world's people and generate more than 70% of global GDP, plus the associated greenhouse gas emissions.

Weatherwatch: the Prussian polymath who founded modern meteorology

The Guardian

Tomorrow marks 250 years since the birth of the Prussian polymath, whose travels and observations laid the foundation for modern meteorological ...

#ShareYourSunset and prove this weather model right or wrong

The Weather Network

Ask Canadians for a tell-tale sign that summer is coming to an end, and you'll probably hear at least one person say "It gets dark earlier." The sun ...

'This isn't just a stupid story, it's a big story': An oral history of Sharpiegate

Washington Post

A hurricane's path may seem erratic at times, but modern forecasting has turned the chaos of weather into data, patterns, probabilities. No such But you know, it's not about me, it's about the integrity of weather forecasting. WALSH: ...

Science should dictate future of weather modification programs

Minot Daily News

Furthermore, Langerud reported that a study on the economics of cloud seeding found 5% precipitation enhancement provides an extra \$21.12 million ...

America's Cup (and sailing)

The Power of Wind

How will Emirates Team New Zealand's boat harness wind power to reach speeds of almost 95km/hr when the America's Cup is sailed in the Hauraki Gulf in March 2021?

Aviation

DGCA stresses meteorology role in facing severe weather

Kuwait Times

KUWAIT: Director General of the General Directorate of Civil Aviation ... the role of meteorology in facing severe weather hazards such as heat waves, ...

NOAA's Aviation Weather Center has your (Seat)back on Every Flight

WeatherNation

Aviation weather forecasting is important business: At any given time there are 5,000 aircraft crossing the skies over the U.S. According to the Federal ...

How Innovation is Changing the Aircraft Weather Radar Systems Market

The Market Plan

Aircraft Weather Radar Systems Market Insights 2018, is a professional and in-depth study on the current state of the global Aircraft Weather Radar ...

Energy and Mining

Vector and IBM partner to help keep the lights on during bad weather

Voxy

For monitoring and managing vegetation encroaching on the distribution and transmission wires, IBM's The Weather Company solution combines ..

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Health

12 books on climate change and public health

Climate change is endangering public health, but people are also learning how to adapt, recent books suggest.

How extreme weather threatens people with disabilities

'Any single disastrous event can ... really endanger people with disabilities.'

Wattle you do about hay fever, council candidates asked

While most pre-election debate meetings talk about rates and infrastructure, the town of Picton talks about sniffing out hay fever.

About 150 members of the public burst into cheers when a businesswoman asked Marlborough's mayoral and Marlborough Sounds ward candidates if they'd cull wattles at a pre-election debate at the Waitohi Whare Mātauranga/Picton Library last week.

Lightning

The Most Powerful Lightning Bolts Occur In The Weirdest Places

Gizmodo Australia

Scientists define superbolts as lightning bolts a thousand times stronger than average. And while you may associate the strongest thunderstorms with ...

Transport/roading/shipping/freight

PredictWind release Streamline graphics on all platforms

Sail World

Over the last few months at PredictWind we have been refining our new Streamline maps and after a considerable amount of development work we ...

[Spire Maritime launches weather product](#)

Delano.lu

The information generated is expected to benefit ports, ships and shipping companies by highlighting risks on specific routes. It could also help firms ...

Journal and articles online

RESEARCH ARTICLES

[Processes governing the amplification of ensemble spread in a medium-range forecast with large forecast uncertainty](#)

Marlene Baumgart, Michael Riemer

Version of Record online: 27 August 2019

One case associated with large medium-range forecast uncertainty is analysed that shows several hotspots of large ensemble variance in potential vorticity (yellow–red shading in PVU2). This study provides a quantitative view on the amplification of ensemble spread and quantifies the relative importance of individual processes. A hemispheric perspective is provided, before important flow-dependent differences are discussed.

WEATHER Magazine

Weather
[Volume 74, Issue 9](#)

Pages: 294-310, i-iv, 311-328, E1-E3

September 2019

[Cover Information](#)

First Published: 09 September 2019

[Weather news](#)

Research Articles

Community perceptions of climate change and initiatives for the conservation of endemic plants in Limpopo Province, South Africa

Sejabaledi A. Rankoana

Pages: 296-300 | First Published: 22 June 2018

The results of this study reveal that participants' perceptions of climate change are centered around changes in temperature and rainfall patterns. The negative effects of such changes on the local vegetation are poor plant growth, the withering of immature plants, and the total loss of some useful species. Members of the rural community under study conserve useful plants through the observance of cultural taboos and customs relating to the harvesting of useful plant materials. The chart pictured here summarises the various uses of indigenous plants and illustrates the contribution each category makes to the overall usage.

Sub synoptic scale features of the South Australia Storm of September 2016 – Part II: analysis of mechanisms driving the gusts

Nick Earl, Ian Simmonds

Pages: 301-307 | First Published: 29 September 2018

(a) Shapiro–Keyser conceptual model of the life cycle of an extratropical cyclone: stage I – open wave, stage II – frontal fracture, stage III – bent-back front and frontal T-bone, and stage IV – mature, frontal occlusion (adapted for the Southern Hemisphere). The cold and warm conveyor belts (CCB and WCB respectively) are marked, along with the low-pressure centre (L) and the cloud signature (stippled areas; adapted from Baker, 2009). (b) Conceptual model of sub synoptic-scale features within an extratropical cyclone, during transition from stage III to stage IV (adapted from Browning, 2004, for the Southern Hemisphere). The image also shows where convective cell (CC), dry slot convection (DSC), dry conveyor belt (DCB), convective line (CL) and sting jet (SJ) associated gusts can occur in relation to the cyclone.

Meeting report

Building a UK climate impacts and risk assessment community

E. Vosper

Pages: 307-309 | First Published: 09 September 2019

Weather images

Weather images

Pages: 310 | First Published: 09 September 2019

Weather log

July 2019 A quiet three weeks, then heat, thunder and torrential downpours

Pages: i-iv | First Published: 09 September 2019

Photographs

Sunsets and sunrises

Pages: 311 | First Published: 09 September 2019

Research Articles

Measuring winds from space: the European Space Agency's Aeolus mission

Barry B. McMahon

Pages: 312-315 | First Published: 29 April 2019

High resolution satellite observations give new view of UK air quality

Richard J. Pope, Ailish M. Graham, Martyn P. Chipperfield, J. Pepijn Veefkind

Pages: 316-320 | First Published: 30 January 2019

New state-of-the-art satellite measurements of tropospheric column NO₂ from the TROPOMI instrument on-board Sentinel-5 Precursor (S5P), launched in October 2017, allow for an unprecedented high resolution (sub-10km) assessment of UK air quality (AQ) from space. We present the first results from TROPOMI and compare them with its predecessor, the Ozone Monitoring Instrument (OMI), to quantify previously unresolved UK pollution hotspots (e.g. Bristol, Southampton and Liverpool). The image shows TROPOMI tropospheric column NO₂ (1015 molecules cm⁻²) for the United Kingdom for June–July–August 2018.

Public perceptions of climate change: a case study with school teachers and undergraduate students in Brazil

Gerson Fernandino, Carla Isobel Elliff, João Henrique de Oliveira Sousa, Gabriela Amado Frutuoso, Guilherme Santiago Gama, Isabela Santos Albuquerque

Pages: 320-325 | First Published: 26 March 2019

Different groups of people may have different perceptions of climate change. The majority of the Brazilian public school teachers and interdisciplinary undergraduate students assessed in this

study were aware of the threats that climate change poses to the Earth system and that humans are an important driving factor.

Climate change shorts

Attribution of extreme weather events: how does climate change affect weather?

Friederike Otto, the members of the Climate Science Communications Group

Pages: 325-326 | First Published: 09 September 2019

Quarterly Journal of the Royal Meteorological Society

Volume 145, Issue 723

Pages: i-iv, 2335-2834

July 2019 Part B

ISSUE INFORMATION

Issue Information

Pages: i-iv | First Published: 05 September 2019

REVIEW ARTICLE

Particle filters for high-dimensional geoscience applications: A review

Peter Jan van Leeuwen, Hans R. Künsch, Lars Nerger, Roland Potthast, Sebastian Reich

Pages: 2335-2365 | First Published: 22 April 2019

The standard particle filter. Left: the prior particles (dots), with one observation, denoted with the red cross. Right: the posterior particles, the larger the dot the larger its weight. Note that the particles don't move in state space, they are just reweighted.

RESEARCH ARTICLES

How organized is deep convection over Germany?

Ieda Pscheidt, Fabian Senf, Rieke Heinze, Hartwig Deneke, Silke Trömel, Cathy Hohenegger

Pages: 2366-2384 | First Published: 23 April 2019

Overview of the spatial distribution of cloud tops and precipitation cores for four days of deep convection over Germany. (a)–(d) Brightness temperature (BT) from Meteosat Second Generation, (e)–(h) synthetic BTs, (i)–(l) radar reflectivities from the Radolan RX product and (m)–(p) synthetic radar reflectivities. The synthetic datasets are generated by means of forward operators using ICON-LEM simulation outputs with grid spacing of 156 m.

Application of the Warn-on-Forecast system for flash-flood-producing heavy convective rainfall events

Nusrat Yussouf, Kent H. Knopfmeier

Pages: 2385-2403 | First Published: 17 May 2019

The NOAA National Severe Storm Laboratory's Warn-on-Forecast (WoF) project is developing a storm-scale ensemble data assimilation and prediction system to provide short-term probabilistic forecasts of high-impact weather. WoF probabilistic guidance will enhance the ability of operational forecasters to provide the public with more accurate and longer warning lead times for severe thunderstorms, heavy rainfall, flash floods, tornadoes, and other hazardous weather. This study explores the application of an experimental WoF system in 0–6-hr probabilistic forecasts of flash-flood-producing heavy rainfall events.

Possible roles of fall speed parameters of different graupel densities on microphysics and electrification in an idealized thunderstorm

Xiaoran Ouyang, Yan Yin, Hui Xiao, Fengxia Guo

Pages: 2404-2424 | First Published: 17 May 2019

Fall speed parameters of different graupel densities are crucial in defining the microphysical and electrical structure of simulated clouds. Firstly, heavy-density graupel has stronger competition to capture liquid water to form graupel, but the ratio of liquid water to ice water in heavy-density cases is greater than that in low-density cases due to higher melting rates, indicating stronger precipitation in heavy-density cases. Secondly, the charge structures in low-density cases are normally tripole structures (with a stronger upper positive region, sometimes called a positive dipole), while the charge structures in medium and heavy cases are “bottom-heavy” tripole.

The effect of atmosphere–ocean coupling on the prediction of 2016 western North Pacific tropical cyclones

Xiangbo Feng, Nicholas P. Klingaman, Kevin I. Hodges

Pages: 2425-2444 | First Published: 23 May 2019

- Our coupled models outperform their counterpart atmosphere-only global numerical weather prediction model for location predictions of 2016 tropical cyclones (TCs) in the western North Pacific (WNP).
- The improvement is associated with an enhanced Western North Pacific Subtropical High and an anticyclonic steering flow anomaly, which are caused mainly by colder initial sea-surface temperatures (SSTs) in the WNP.
- TC intensity is generally less well predicted in the coupled models, due to colder initial SSTs and also air–sea coupling in the Tropics.

Linear effects of nontraditional Coriolis terms on intertropical convergence zone forced large-scale flow

Hing Ong, Paul E. Roundy

Pages: 2445-2453 | First Published: 27 May 2019

The maximum westerly bias due to omitting the nontraditional Coriolis terms (NCTs, thin contours and shading) divided by the maximum westerly wind with NCTs (contours) is 0.120 ± 0.007 when the prescribed intertropical convergence zone (ITCZ) mimics the observed ITCZ in May over the East Pacific. This normalized zonal wind bias increases with a narrower ITCZ or an ITCZ closer to the Equator, which can be explained by a nondimensional parameter scaling the ratio of the NCT to the traditional Coriolis term.

Quantifying the role of individual diabatic processes for the formation of PV anomalies in a North Pacific cyclone

Roman Attinger, Elisa Spreitzer, Maxi Boettcher, Richard Forbes, Heini Wernli, Hanna Joos

Pages: 2454-2476 | First Published: 29 May 2019

The modification of potential vorticity (PV) by diabatic processes is assessed in an IFS simulation of a North Pacific cyclone. Hourly temperature and momentum tendencies from every parametrized physical process are used to compute their respective PV rates and subsequently traced in a Lagrangian framework. Condensation, sublimation and melting of snow, long-wave radiative cooling, convection, and turbulence all significantly affect PV along the fronts and in the cyclone centre. Turbulent mixing of temperature generally mitigates the influence exerted by the other processes.

A modified nonhydrostatic moist global spectral dynamical core using a dry-mass vertical coordinate

Jun Peng, Jianping Wu, Weimin Zhang, Jun Zhao, Lifeng Zhang, Jinhui Yang

Pages: 2477-2490 | First Published: 29 May 2019

A modified nonhydrostatic moist global spectral dynamical core is presented. We show that the mass of dry air is conserved in the present dynamical core, and the modified dynamic core can simulate the splitting supercell well.

Analyses of the winter low-level jet over the southern Red Sea using the Weather Research and Forecasting model

Ahmad E. Samman, William A. Gallus Jr

Pages: 2491-2509 | First Published: 29 May 2019

The three-dimensional structure of the Red Sea Low-Level Jet (RSLLJ) that occurs over the southern Red Sea during the winter season is examined using the WRF model. The jet is a terrain-induced phenomenon that initiates as a gap flow as the jet forms north of the strait of Bab el-Mandab as a result of a hydraulic effect. The jet intensity is enhanced by the presence of the Red Sea trough over the southern Red Sea.

Efficient nonlinear data assimilation using synchronization in a particle filter

Flavia R. Pinheiro, Peter J. van Leeuwen, Gernot Geppert

Pages: 2510-2523 | First Published: 31 May 2019

A promising solution for nonlinear problems in data assimilation can be a particle filter, which provides a representation of the state probability density function (pdf) by a discrete set of particles. To allow a particle filter to work in high-dimensional systems, the proposal density freedom is explored, using ideas from synchronization theory. An efficient ensemble-based synchronization scheme is used in the implicit equal-weights particle filter, a system that avoids filter degeneracy by construction. Tests using the Lorenz96 model for a 1,000-dimensional system show successful results, where particles efficiently follow the truth, both for observed and unobserved variables. These results demonstrate the usefulness of the new methodology for high-dimensional nonlinear problems in the geosciences.

Assimilation of SMOS brightness temperatures in the ECMWF Integrated Forecasting System

J. Muñoz-Sabater, H. Lawrence, C. Albergel, P. Rosnay, L. Isaksen, S. Mecklenburg, Y. Kerr, M. Drusch

Pages: 2524-2548 | First Published: 31 May 2019

Bias-corrected (BC) SMOS brightness temperature data are assimilated in the ECMWF Integrated Forecasting System. The standard deviation after BC at 40° and X polarization is shown in the figure. Several experiments are tested assimilating SMOS data in combination with

2 m air temperature, 2 m relative humidity and ASCAT soil moisture retrievals. The impact of the analyses is evaluated for both the soil moisture and atmospheric variables in the lower troposphere.

An analytical study of the atmospheric boundary-layer flow and divergence over an SST front

Alex Ayet, Jean-Luc Redelsperger

Pages: 2549-2567 | First Published: 01 June 2019

Understanding how the atmospheric boundary layer responds to Sea Surface Temperature (SST) fronts is crucial for a number of applications. Here, this response is studied by means of an analytical model for a meridional front, as shown in the figure. The model allows us to define and explore a phase space of the different dynamical regimes occurring in the boundary layer. The depth-integrated wind divergence is analytically computed and found to be linked to different derivatives of the SST field, depending on the dynamical regimes.

Complex systems modelling for statistical forecasting of winter North Atlantic atmospheric variability: A new approach to North Atlantic seasonal forecasting

Richard J. Hall, Hua-Liang Wei, Edward Hanna

Pages: 2568-2585 | First Published: 01 June 2019

A new approach to seasonal forecasting based on complex systems modelling is presented. The focus is on North Atlantic winter atmospheric circulation, specifically the NAO. Polynomial models show greater skill than linear versions and out-of-sample forecasts show promising skill, closely matching the observed time series. Potential nonlinear interactions between predictors are identified.

Impacts of future urban expansion on urban heat island effects during heatwave events in the city of Melbourne in southeast Australia

Hosen M. Imran, Jatin Kala, Anne W. M. Ng, Shobha Muthukumaran

Pages: 2586-2602 | First Published: 01 June 2019

(a) Model nested domain configuration (the boundary represents the outer domain with a resolution of 18 km, and d02 and d03 denote the boundaries of the two inner nested domains, with resolutions of 6 and 2 km respectively), (b) current distribution of urban land use, (c) high-density urban expansion according to Plan Melbourne 2050. The numbers 31, 32, and 33 represent the low-density urban, high-density urban, and commercial/industrial areas, respectively.

Persistent precipitation extremes in the Yangtze River Valley prolonged by opportune configuration among atmospheric teleconnections

Yang Chen, Panmao Zhai, Zhen Liao, Lei Li

Pages: 2603-2626 | First Published: 04 June 2019

Large-scale atmospheric teleconnections induce long-lived circulation anomalies, further leading to prolonged weather extremes. Previous analyses tend to focus on the relationship between a single teleconnection and extremes, yet with potential influences from other co-existing teleconnections overlooked, as illustrated by the figure. Thus, the established relationship actually reflects compounding effects from multiple teleconnections. By separately investigating persistent precipitation extremes during regimes of single and combined teleconnections, this study disentangles differing roles and influence pathways of three teleconnections in triggering these high-impact events.



Open Access

The effects of gravity on the climate and circulation of a terrestrial planet

Stephen I. Thomson, Geoffrey K. Vallis

Pages: 2627-2640 | First Published: 04 June 2019

The climate and circulation of a terrestrial planet are governed by many orbital and planetary parameters, but here we explore the effect of changing the Newtonian gravitational acceleration. We consider how radiative and dynamical processes are altered, with subsequent changes in water vapour found to be particularly important. The response of the zonal-mean temperatures to a doubling of gravity, shown here, has many similarities with the atmospheric response to a doubling of carbon dioxide if the sign is inverted.

Characterization of the atmospheric boundary layer in a narrow tropical valley using remote-sensing and radiosonde observations and the WRF model: the Aburrá Valley case-study

Laura Herrera-Mejía, Carlos D. Hoyos

Pages: 2641-2665 | First Published: 07 June 2019

The evolution of the atmospheric boundary layer (ABL) in a narrow valley in the Andes is studied, implementing techniques to estimate the mixed-layer height (MLH). The aerosol load allows the use of ceilometer-based MLH detection, especially under stable conditions. The multi-sensor technique is the most robust, performing better in all conditions. The amount of aerosol near the surface is influenced by the evolution of the ABL. Model simulations skilfully reproduce the observed ABL.

Monsoon depression amplification by moist barotropic instability in a vertically sheared environment

Michael Diaz, William R. Boos

Pages: 2666-2684 | First Published: 19 June 2019

Although monsoon depressions are an important component of the South Asian monsoon, there is little consensus on how they form. In this article, we use an idealized numerical modeling framework to argue that they can amplify by a variant of moist barotropic instability. This growth results from a Rossby-wave-like disturbance drawing energy from the meridional shear of the monsoon trough and interacting with latent heat release generated by precipitation.

Does monsoon gyre always favour tropical cyclone rapid intensification?

Ziyu Yan, Xuyang Ge, Melinda Peng, Tim Li

Pages: 2685-2697 | First Published: 17 June 2019

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My latest Weather Eye from John Maunder

<https://www.sunlive.co.nz/blogs/13788-tropospheric-temperatures-1979-to-august-2019.html>

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Thanks to our regular contributors

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