

New Zealand weather and climate news

MetService mentions

New Zealand heatwave: Which is the country's hottest town?

A heatwave is set to move across New Zealand this week, with temperatures expected to top 30C in some parts.

Government not stepping in to release more taxpayer-funded weather data

The Government has no intention of changing how New Zealand's two taxpayer-funded forecasting agencies work in an effort to improve access to weather data.

New Zealand heatwave - the science behind why it's so hot

ANALYSIS: Take several helpings of hot air from Australia and the sub-tropics, some long and sunny days, warm ground, New Zealand's mountains, and a nearby anticyclone accompanied by light winds, and you have the recipe for this week's heatwave.

Weather Q&A: MetService discusses temperatures and heatwaves

As the country swelters through another day of heat, MetService explains why it's so hot, what's unusual about it - and when you might get some respite.

New Zealand heatwave: Is it hot enough to fry an egg on the sidewalk?

Roasting temperatures around the country have caused a road to melt and driven many indoors or to the water, but was it really hot enough to fry an egg on the road?

With temperatures peaking at 35C in parts of Napier, making it the hottest spot in the country, we put the age old expression to the test.

NZ heatwave: Temperatures to break 30s on Thursday

MetService meteorologist Melissa Oosterwijk said we can expect much the same for Thursday. "There are going to be a number of places to break 30 again."

Heatwave breaks second 157-year record

Hawke's Bay and parts of the Upper South Island have neared 35C as temperatures continue to climb this afternoon.

Meanwhile in the Wider Nelson area, Richmond's minimum temperature of 24.3C has set a new record.

Heatwave: 'Five days of heat guys, we're only in day two'

The Wellington suburb of Kelburn has had its hottest day on record, reaching 30.3C today, following on from yesterday's record-breaking heat in Richmond.

"Kelburn has one of the longest and highest quality temperature stations in New Zealand, it's a lovely grassy enclosure on the top of the botanical gardens. It has not been modified in the 90 years of record and today it broke its all-time temperature record, recording 30.3 there today," MetService meteorologist Georgina Griffiths told Checkpoint.

Feeling hotter than the forecast? You might be right

If it's feeling hotter at your place than MetService is reporting, there's a good chance you're right.

While weather forecasting is indeed a science, that doesn't mean the MetService figures reported each night in your city are the same at your house - or even your part of town.

Māori Climate Commissioner: Current heatwave grim view of climate change future

Māori Climate Commissioner, Donna Awatere Huata, says the current heatwave that burnt Australia and is currently suffocating New Zealand is a grim view of our climate change future.

It's horribly hot: but last January was hotter

It might be hot – and abnormally so, as meteorologists keep telling us – but this month still doesn't stack up to last January's record warmth.

January 2018 finished up with a mean temperature of 20.2C, or about 3C above average, and went down as the hottest month that New Zealand had experienced in 150 years of observations.

Heatwave: Rotorua gets creative seeking to cool down in hot summer weather

MetService communications meteorologist Lisa Murray said the temperatures over the long weekend at Rotorua Airport had been a maximum of 22.6C on Saturday, 26.2C on Sunday, and yesterday's expected high temperature was 29C.

Sea breeze brings relief amidst soaring temperatures

MetService Meteorologist Lisa Murray says while this weather is not unheard of the length of the extremely warm period is unusual. Central regions and East Coast areas are expected to bake the most.

"Those central places like Taumarunui and Te Kūiti they will see temperatures that are quite unusual and prolonged over a number of days so quite unusual heat and even in Wellington here although the city itself, the maximum temperature is expected to be around 27°C up in the Hutt Valley you can expect temperatures to get close to the mid-thirties."

Heatwave set to continue after mercury soars around New Zealand

"As well as really hot daytime temperatures, we are going to have extremely muggy overnight temperatures. So we are talking 18, maybe even up to 22, 23 degrees for some places overnight which can make it really difficult when you are trying to sleep," Lisa Murray MetService meteorologist said..

Forecasters predict more sweltering summer weather for today

"Auckland is going to start to see some really hot overnight temperatures," MetService meteorologist Ravi Kandula said.

Hawke's Bay, Marlborough swelter as heatwave hits NZ

MetService meteorologist Angus Hines said the settled weather being experienced by most in New Zealand would continue this week.

"Pretty much everywhere in the country is at its average temperature, most places being above their average temperature," Hines said.

Brace for record temps as heatwave zeroes in on NZ this week, meteorologists predict

A meteorologist, Rob Kerr, said Otago is set for a week of scorching days with many towns expected to be more than five degrees above average.

"There are quite a few towns right across the region, right across much of the country that are going to get close. Places like Kaikoura, Blenheim, Nelson are also going to be pushing the boundary of what might be called a heatwave and it's going to be very warm in general."

MetOcean

New Plymouth company plans wave energy trials off Taranaki coast

A New Plymouth company that built equipment to generate electricity from wave energy for offshore customers now plans to trial sites in New Zealand, including off the Taranaki coastline.

Famous freak wave recreated in laboratory mirrors Hokusai's 'Great Wave'

Researchers have recreated for the first time the famous Draupner freak wave measured in the North Sea in 1995.

Company developing self charging batteries to power Argo weather floats

Argo floats measure ocean temperatures. But they have a big problem: limited battery life. CGTN's Phil Lavelle talked with the founder of a company that is creating batteries to address the problem.

Ocean temperature data shows warming is accelerating faster than we thought

The rate of ocean warming today has accelerated significantly since 1991, and is increasing much faster than previously recorded, according to a new study of ocean temperature research.

NIWA

Listen: Niwa scientist converts weather patterns into music

A Niwa scientist has created what he says is a music score written by nature.

Research station setting for dance

Clear skies and scientific research at Lauder have merged with the arts for the filming of a dance work this summer.

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

At least 12 people killed as floods wreak havoc in Saudi Arabia

Heavy downpours hit country's western and northwestern parts with 271 people rescued by authorities.

Thailand: Hundreds of schools closed as toxic smog chokes Bangkok

More than 400 Bangkok schools closed until Monday to protect children from hazardous air pollution.

Extreme weather (and other news) – Americas and Europe

Extreme cold to hit 55 million people in the US as polar vortex brings life-threatening temperatures

A polar vortex is bringing life-threatening temperatures to the US, with 55 million Americans set to experience below-zero temperatures

Tornado kills at least three, injures many more in Havana, leaving Cuban capital looking 'like a horror movie'

A rare and powerful tornado has ripped through a number of working class districts of Havana, leaving at least three dead and scores injured.

International news and research

Better living through improved weather forecasting

On the eve of the American Meteorological Society's centennial anniversary, Richard Alley and colleagues highlight the advances in our weather and environmental forecasting ability and the many societal benefits they provide. According to Alley et al., these benefits greatly outweigh the costs, and continued investment in weather forecasting will ensure that these important improvements to human wellbeing continue, they say.

Meteorologists give cold shoulder to 'feels like' wind chill system

Some say subjective, inaccurate and misleading numerical expression ought to be replaced

The Art Of 'Tone Deaf' - Wilbur Ross And His Weather Service Meteorologists

I sat down with every intention of writing about potential hidden ways that the National Weather Service may be suffering from the government shutdown. These include possible lapses in repairs to radars or depleted supplies of gas for weather balloons. However, Secretary of Commerce Wilbur Ross changed my plans.

Major northeastern U.S. snowstorms expected to continue with climate change

Even though climate change is expected to reduce the total amount of US snowfall this century, it's unlikely to significantly rein in the most powerful nor'easters that pummel the East Coast, new research indicates.

15-years of satellite imagery shows snow's comings and goings

Winter snows in the Sierra Nevada Mountains create the snowpacks that serve as a primary water source for the western U.S. Due to rising average temperatures, snowpacks in the Great Basin appear to be transitioning from seasonal (predictable amount and melt rate), to "ephemeral," (short-lived, less predictable). Ephemeral snow has been poorly tracked and understood.

Magnetic north pole moving by 40km per year

Rapid shifts in the Earth's north magnetic pole are forcing researchers to make an unprecedented early update to a model that helps ships, planes and submarines in the Arctic navigate, scientists say.

The father of climate science, my Foote!? A mystery revealed

Who was the extraordinary Eunice Foote, and why did she disappear from the history books?

What exactly is a wind chill and how is it calculated?

You've probably heard us meteorologists use the term "wind chill" or maybe "feels like" temperature. Well what exactly does this mean and how exactly are these values calculated?

Upper-ocean warming is changing the global wave climate, making waves stronger

Sea level rise puts coastal areas at the forefront of the impacts of climate change, but new research shows they face other climate-related threats as well. Scientists found that the energy of ocean waves has been growing globally, and they found a direct association between ocean warming and the increase in wave energy.

Breakthrough in ice-repelling materials

Icy weather is blamed for multibillion dollar losses every year in the United States, including delays and damage related to air travel, infrastructure and power generation and transmission facilities. Now researchers have reported creating a durable silicone polymer coating capable of repelling ice from any surface.

Reliable tropical weather pattern to change in a warming climate

Posted: 28 Dec 2018 06:16 AM PST

As human activities cause the Earth's temperature to increase, reliable, well-studied weather patterns like the Madden-Julian Oscillation will change too, say researchers.

Melting ice sheets release tons of methane into the atmosphere

Posted: 03 Jan 2019 08:03 AM PST

The Greenland Ice Sheet emits tons of methane according to a new study, showing that subglacial biological activity impacts the atmosphere far more than previously thought.

Forecasters may be looking in wrong place when predicting tornadoes

Posted: 21 Dec 2018 09:37 AM PST

Weather forecasters may be looking in the wrong place when working to issue tornado warnings, new research has demonstrated.

Climate change reshaping how heat moves around globe

Posted: 28 Jan 2019 09:53 AM PST

The Earth's atmosphere and oceans play important roles in moving heat from one part of the world to another, and new research is illuminating how those patterns are changing in the face of climate change.

First detection of rain over the ocean by navigation satellites

In order to analyse climate change or provide information about natural hazards, it is important to gather knowledge about the rain. Better knowledge of precipitation and its distribution could, for example, help protect against river flooding. A new approach uses, for the first time, information contained in radar signals from navigation satellites to detect rain over the sea. The technology could help to monitor atmospheric precipitation better than before.

Extratropical volcanoes influence climate more than assumed

Posted: 28 Jan 2019 09:22 AM PST

The eruption of Mount Pinatubo in 1991 had a significant impact on climate, decreasing global mean temperature by about 0.5°C. Like the famous eruptions of Krakatau (1883) and Tambora (1815), Pinatubo is located in the tropics, which has been considered an important factor underlying its strong climate forcing. New research shows that explosive extratropical eruptions can have a strong impact on the climate too.

Extreme weather and geopolitics major drivers of increasing 'food shocks'

Posted: 28 Jan 2019 08:17 AM PST

Global food production is suffering from an increasing number of 'food shocks,' with most caused by extreme weather and geopolitical crises. An international study looked at the incidence of land and marine food shocks -- sudden losses in food production -- between 1961 and 2013.

OU meteorology professor redefines idea of tornado formation

ana Houser, assistant professor of meteorology at Ohio University, has found data that supports the theory tornadoes form from the ground up.

Why Canadians value mobile banking and weather apps so much

Sunday, January 27, 2019, 9:15 PM - Managing finances and staying prepared for any type of weather are two constant factors for Canadians. So it's no wonder that a recent survey conducted by RBC shows that the majority of Canadians say their weather (60 per cent) and mobile banking apps (63 per cent) are two of the most useful and valuable apps on their phones.

WMO

Near-term climate prediction 'coming of age'

Bridging the gap between shorter-term seasonal forecasts and long-term climate projections has long been a dream of climate scientists.

Argo ocean floats achieve 2 million profiles in 20 years

An international effort delivering an unsurpassed look at changes occurring in the ocean worldwide has achieved a major milestone as it marks its 20th anniversary. The Argo programme, which...

Andorra joins WMO

The Principality of Andorra has become the 192nd Member of WMO. The small, landlocked nation, situated between France and Spain in the Pyrenees mountains, will become the 51st country in WMO's...

World Adaptation Science Programme launched

The World Adaptation Science Programme was officially launched at COP24 at an event sponsored by UN Environment, WMO, the UN Framework Convention on Climate Change secretariat, Intergovernmental...

RSMC Tokyo for Nowcasting began operation - Japan Meteorological Agency

RSMC Tokyo for Nowcasting, which was designated at the sixty-ninth session of the Executive Council of the WMO, began its operation establishing the following website on 20 December 2018 to supply...

Business/Insurance

Extreme weather affects key commodity areas

SPONSORED: By Matthew White, Chair of the University Caterers Organisation (TUCO) and Director of Catering, Hotel and Conferencing at the University of Reading

Communications/social media

Asian College of Journalism add weather reporting elective after getting tripod-like Personal Weather Station

Students will be exposed to weather forecasting and weather reporting by tapping into expertise from meteorologists, climate experts and journalists.

Research reveals strategies for combating science misinformation

Nowhere has the impact of scientific misinformation been more profound than on the issue of climate change in the US, where a well-funded network has coalesced around the goal of undercutting the legitimacy of climate science. But as a new paper illustrates, an emerging field of research is providing new insights into this critical dynamic.

Link Between Media Coverage, Posttraumatic Stress in Natural Weather Events Examined

Disaster-related media exposure may increase the association between forecasted posttraumatic stress and psychological outcomes following a hurricane or large storm. Findings from this study were published in JAMA Network Open.

Energy and Mining

Future-proofing energy systems

The UK has experienced a year of seasonal changes, facing both very cold and hot weather patterns within the last twelve months. Last March, the 'Beast from the East' swept the

country with blizzards and freezing temperatures. In comparison, last summer saw us basking in a heatwave, bringing with it sweltering work and learning environments.

Health

'Particularly powerful pollen season' exacerbates hay fever symptoms, expert says

A "powerful pollen season" is to blame for a hay fever season that is bogging down many Wellingtonians.

Heat Health Plans

Kiwi-led international report says obesity, climate change, and malnutrition are actually all the same issue

Obesity, malnutrition, and man-made climate change, are three of the biggest issues facing the planet, with no simple solution to any of them. But now a major international report led by a Kiwi researcher is suggesting that the three issues might actually be one and the same - three separate crises, all interconnected and feeding into each other.

History

NZ's hottest ever day: Melted roads, striking workers and 26,000 dead chickens

What's that? Bit hot this week? Before you complain too loud, spare a thought for the people of Rangiora who suffered through February 7, 1973.

The North Canterbury town registered 42.4 degrees Celsius that day, still the hottest temperature ever recorded in New Zealand.

Hydrology / Flooding

W4CCA: Building a Flood Early-Warning Network

Posted: 12 Oct 2018 04:56 PM PDT

The Asia Foundation's Paula Uniacke and Aditya Pillai participated in Global Climate Action Summit events across San Francisco in September. Among Foundation programs they discussed are ones that improve resilience to extreme weather events.

In two flood-prone regions along the India-Bangladesh border, The Asia Foundation is working with local women to build flood early warning networks in their communities. The Women for Climate Change Adaptation project (W4CCA), funded by the Foundation's Lotus Circle, trains them to develop local flood-response plans and helps them engage with local institutions to improve emergency decision-making and resilience. Currently, government

flood warnings in the region are not location specific and can be difficult for communities to interpret. This makes it hard to respond quickly and effectively when floodwaters threaten, increasing flood damage and risking people's lives.

Lightning

Colorado Company's Lightning Detection Device Helps Meteorologists Worldwide

LOUISVILLE, Colo. (CBS4) – Thanks to technology developed by a Colorado-based company, meteorologists can have a better understanding of lightning and how it relates to storms around the globe. Vaisala, a weather technology company in Louisville, created a lightning detection device that monitors the skies across the world.

Transport/roading/shipping/freight

Keeping roads in good shape reduces greenhouse gas emissions

Keeping road pavement in good shape saves money and energy and reduces greenhouse gas emissions, more than offsetting pollution generated during road construction, according to a new study.

Innovation and technologies (inc data and new products)

10 Best Weather Apps and Weather Widgets for Android

Smartphones are smart and help us with different things. One of the good use of smartphones is to check the latest weather. You can just take your smartphone and get the latest weather information. There is no need to open the local weather report on TV or search for this on the Internet using your computer. There are many weather apps for Android and these apps are growing with improved information. Few of these apps also offer weather widgets. So, you can quickly get weather information directly from the home screen. In this article, we are listing few best weather apps.

Climate change / global warming / sea level rise

Climate change tipping point could be coming sooner than we think

A new study confirms the urgency to tackle climate change. While it's known that extreme weather events can affect the year-to-year variability in carbon uptake, and some researchers have suggested that there may be longer-term effects, this study is the first to actually quantify the effects through the 21st century and demonstrates that wetter-than-normal years do not compensate for losses in carbon uptake during dryer-than-normal years, caused by events such as droughts or heatwaves.

TV meteorologists can make more people take climate change seriously

The author, Jeff Berardelli, has more than 22 years' experience as a broadcast meteorologist. He recently left his job as the main meteorologist in West Palm Beach to pursue a climate and society master's degree at Columbia University. He continues in broadcasting as a climate change contributor for CBS News and part-time television meteorologist in New York.

Climate change is the most important issue facing mankind. It is a challenge so colossal that it will affect every living creature on Earth. Unchecked, it will destabilize the entire world order, bringing hardship to many.

The Next Climate Frontier: Predicting a Complex Domino Effect

Motivated by events like Hurricane Harvey, researchers are trying to determine how climate change interacts with agriculture, energy, transportation and other human systems

Climate model uncertainties ripe to be squeezed

The latest climate models and observations offer unprecedented opportunities to reduce the remaining uncertainties in future climate change, according to a new article.

Sea level rise could cost NZ \$8b in damaged infrastructure

Rising seas are threatening \$8 billion worth of New Zealand's roads, pipes, and other infrastructure, a report shows.

'This moment will not come again' - councils' \$8b climate change warning

Local councils are facing a \$5-8 billion bill to replace vital infrastructure lost to climate change in the next half-century - and they want a national war chest to pay for it.

Measuring rates of present-day relative sea-level rise in low-elevation coastal zones: a critical evaluation by Molly E. Keogh and Torbjörn E. Törnqvist <https://www.ocean-sci.net/15/61/2019/>

Short Summary: Relative sea-level rise is traditionally measured with tide gauges, but we question the reliability of tide-gauge data in low-elevation coastal zones. Benchmark data show that tide gauges typically do not record subsidence in the shallow subsurface and thus underestimate rates of relative sea-level rise. We present an alternative method of measuring relative sea-level rise and conclude that low-elevation coastal zones may be at higher risk of flooding than previously assumed.

West Coast council rejects government climate change bill

The West Coast Regional Council wants more scientific evidence to prove human-driven climate change is happening before it will commit to reducing emissions.

Emergency preparedness / disaster planning / resilience

The worst natural disasters that New Zealand faces

What's the risk of a major earthquake, volcanic eruption, tsunami or wildfire in New Zealand – and how might it play out?

Journal and articles online

Quarterly Journal of the Royal Meteorological Society

Accepted Articles

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

Optimization of Urban Monitoring Network for Emergency Response Applications: An Approach for Characterising Source of Hazardous Releases

P. Ngae, H. Kouichi, P. Kumar, A.A. Feiz, A. Chpoun

First Published: 16 January 2019

Meteorological Applications

Accepted Articles

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

A Study on the Changing Climate in the U.S-Affiliated Pacific Islands using Observations and CMIP5 Model Output

Md. Rashed Chowdhury, Pao-Shin Chu

First Published: 14 January 2019

Quarterly Journal of the Royal Meteorological Society

Accepted Articles

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

All-sky satellite data assimilation of microwave temperature sounding channels at the Met Office

S. Migliorini, B. Candy

First Published: 07 January 2019

Meteorological Applications

Volume 26, Issue 1

Pages: i-iv, 1-170

January 2019

ISSUE INFORMATION

Issue Information

Pages: i-iv | First Published: 15 January 2019

RESEARCH ARTICLES

On statistical nowcasting of road surface temperature

Zhicong Yin, Jasmina Hadzimustafic, Alexander Kann, Yong Wang

Pages: 1-13 | First Published: 23 September 2018

In independent testing, the models showed better prediction skill, with daily root-mean-square error around 1°C. The multiple linear regression (MLR) models could reproduce the correct diurnal variation and could forecast road surface temperature (RST) below freezing point better than that above 0°C. Four case studies, i.e. snowy, cold front, cloudy and sunny, were diagnosed in detail. The predicted RSTs were close to the measurements and depicted the trend well, including persistent and rapid cooling (warming) and correct diurnal variation. The percentage of predictive errors from MLR UP prediction in winter 2015,

averaged over three sites for (a) 01 hr, (b) 02 hr, (c) 03 hr, (d) 04 hr, (e) 05 hr and (f) 06 hr, were calculated and shown. The mean correlation co-efficient (mcc) is shown at the top of each plot. The percentages for the interval ± 1 and $\pm 2^\circ\text{C}$ are plotted as lines with circles and squares, respectively.

Wind energy assessment over the Andhra Pradesh and Telangana regions

G. Ch. Satyanarayana, R. H. Lucy Supriya, D. V. Bhaskar Rao

Pages: 14-29 | First Published: 23 September 2018

(a) Geographical map of Andhra Pradesh and Telangana. Districts are identified with a number on the map and elaborated on the right side along with areal extent. An asterisk indicates the locations of automatic weather stations. (b) Spatial distribution of the annual mean wind speed (m/s) at the 10 m level.

Flip-Flop Index: Quantifying revision stability for fixed-event forecasts

Deryn Griffiths, Michael Foley, Ioanna Ioannou, Tennessee Leeuwenburg

Pages: 30-35 | First Published: 23 September 2018

Revised forecasts lead to revised plans. The stability of forecast-revision sequences is a characteristic of interest. A Flip-Flop Index was developed to allow a quantified comparison of this characteristic to be made between forecasts, complementing measures of forecast skill.

Impact of data assimilation and air-sea flux parameterization schemes on the prediction of cyclone Phailin over the Bay of Bengal using the WRF-ARW model

Kuvar S. Singh, Bhishma Tyagi

Pages: 36-48 | First Published: 23 September 2018

The India Meteorological Department best-fit track for the very severe cyclonic storm (VSCS) "Phailin" during October 8-14, 2013, and nested model domains used in the study.

Global Positioning System precipitable water vapour (GPS-PWV) jumps before intense rain events: A potential application to nowcasting

Luiz F. Sapucci, Luiz A. T. Machado, Eniuce Menezes de Souza, Thamiris B. Campos

Pages: 49-63 | First Published: 23 September 2018

A sharp increase in the Global Positioning System precipitable water vapour (GPS-PWV) that occurs before the more intense precipitation events has been found and termed here the GPS-PWV “jumps.” A wavelet analysis shows there are important PWV oscillations during these cases, which are on a scale from about 32 to 64 min (associated with GPS-PWV jumps) and from 16 to 34 min (associated with positive pulses of PWV). These oscillations are indicative of the occurrence of intense precipitation and, consequently, have the potential for application in nowcasting activities.

Solid snowfall rate estimation using a C-band radar

Diar Hassan, Peter A. Taylor, George A. Isaac

Pages: 64-73 | First Published: 23 September 2018

Geographical location of the King City radar (CWKR) and the Oakville site, both in Ontario, Canada. The two sites are 56 km apart; the radar beam height is about 400 m above ground level (AGL) at a 0.2° elevation angle. © Google Earth 2016

Higher contributions of uncertainty from global climate models than crop models in maize-yield simulations under climate change

Yi Zhang, Yanxia Zhao, Liping Feng

Pages: 74-82 | First Published: 28 September 2018

The uncertainty in maize-yield simulations might arise mostly from global climate models (GCMs), followed by crop models and representative concentration pathways (RCPs), the contribution of which could be neglected relative to the other factors. Therefore, the use of a multiple crop model and a GCM ensemble is advisable in order to account properly for uncertainties in crop assessments.

Performance of 12 reference evapotranspiration estimation methods compared with the Penman–Monteith method and the potential influences in northeast China

Xinyi Song, Fan Lu, Weihua Xiao, Kui Zhu, Yuyan Zhou, Zibo Xie

Pages: 83-96 | First Published: 28 September 2018

In northeast China, the H-Makkink method is the best method for a plain in a semi-humid climate and for a mountainous area in semi-arid climate; the Makkink method is favourable for hilly areas in a semi-humid climate; and the Valiantzas2 method can be selected as an alternative for other regions.

Predicting major peach yield reductions in the Midwest and Southeast United States

Steven E. A. Chun, David Changnon

Pages: 97-107 | First Published: 25 September 2018

A decision-support tool developed for the Midwest (a) and Southeast (b) regions of the United States will be used to assist the peach-growing industry to anticipate major, regional yield reductions.

Investigating changes in cloud cover using the long-term record of precipitation extremes

Anoop Kumar Mishra

Pages: 108-116 | First Published: 23 September 2018

Cloud cover is examined using long-term trends in precipitation extremes. The top 10% of heavy precipitation is related to convective clouds. The bottom 5% of light precipitation is related to low cloud cover. An increase in convective clouds and a decrease in low clouds are reported.

Evaluation of the self-heating effect in a group of thermometers used in meteorological and climate applications

Carmen García Izquierdo, Sonia Hernández, Alicia González, Laura Matias, Lenka Šindelářová, Radek Strnad, Dolores del Campo

Pages: 117-129 | First Published: 01 October 2018

Variation of the standard deviation of the thermometer resistance mean with the applied electrical current, at different temperatures and with different external environments.

Impact of high resolution sea surface temperature on tropical cyclone characteristics over the Bay of Bengal using model simulations

Deepika Rai, Sandeep Pattnaik, P. V. Rajesh, Vivekanand Hazra

Pages: 130-139 | First Published: 24 September 2018

1. A high resolution sea surface temperature (SST) has a positive impact on characterizing the intensification and structure of a tropical cyclone. 2. A daily update of SST improved the storm track and intensity by 37% and 41% for SST2 and 9% and 20% for SST1 respectively in comparison to CNTL.3. With realistic SST (i.e. high resolution) inputs, the model produced a realistic tropical cyclone by restricting its natural tendency to over-intensify its intensity.

An objective verification system for thunderstorm risk forecasts

Katie Brown, Piers Buchanan

Pages: 140-152 | First Published: 25 September 2018

Verification of impact-based forecasts is challenging and using traditional weather observations to verify the forecasts is not possible. The verification system developed to assess the performance of the Met Office's thunderstorm risk forecasts takes a unique approach to identifying observed medium impact and high impact convective events using data provided by the UK Air Navigation Service Provider to verify the 5-day forecasts. Results from the 2014 and 2015 seasons of operation indicate that forecast performance is good.

Quantifying the impact of global warming on precipitation patterns in India

Anoop Kumar Mishra

Pages: 153-160 | First Published: 25 September 2018

Study focuses on examination of precipitation patterns in changing climate over India. Results report an increase in heavy precipitation and decrease in low and moderate precipitation. Impacts of ENSO and IOD have been examined separately. Seasonal variation of heavy precipitation anomaly over Indian region (I) along with global temperature anomaly. Smoothing has been done to eliminate the fluctuation.

An experimental method for evaluation of the snow albedo effect on near-surface air temperature measurements

Chiara Musacchio, Graziano Coppa, Andrea Merlone

Pages: 161-170 | First Published: 26 September 2018

Snow-covered surfaces significantly reflect solar radiation, affecting the accuracy of near-surface air temperature measurements. Solar shields of different kinds and shapes are not optimized to protect the sensors from backward overheating and differences of more than 1 °C can be observed in the case of the presence of snow below the measuring instruments. A theoretical and experimental model is presented for evaluating the several parameters that maximize the amplitude of this effect and for its inclusion in the temperature measurement uncertainty budget.

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NATURE CLIMATE CHANGE MAGAZINE

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Thinking about emissions p81
doi:10.1038/s41558-019-0411-2

Comment

Shift the focus from the super-poor to the super-rich pp82 - 84
Ilona M. Otto, Kyoung Mi Kim, Nika Dubrovsky & Wolfgang Lucht
doi:10.1038/s41558-019-0402-3

Grounding nature-based climate solutions in sound biodiversity science pp84 - 87
Nathalie Seddon, Beth Turner, Pam Berry, Alexandre Chausson & Cécile A. J. Girardin
doi:10.1038/s41558-019-0405-0

Research Highlights

Declining yield resilience p88
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doi:10.1038/s41558-019-0407-y

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More powerful tornadoes p88
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To engage or not to engage? p88
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doi:10.1038/s41558-019-0410-3

News & Views

General and specific motivations pp89 - 90
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doi:10.1038/s41558-018-0395-3

Moving to the South Pole pp90 - 91
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doi:10.1038/s41558-019-0396-x

Public lands fly under climate radar pp92 - 93

Nathan Ratledge, Steven J. Davis & Laura Zachary

doi:10.1038/s41558-019-0399-7

Perspectives

Towards operational predictions of the near-term climate pp94 - 101

Yochanan Kushnir, Adam A. Scaife, Raymond Arritt, Gianpaolo Balsamo, George Boer et al.

doi:10.1038/s41558-018-0359-7

Near-term climate predictions bridge the gap between seasonal forecasts and long-term projections. This Perspective outlines the challenges and opportunities for near-term climate prediction, highlighting the need for co-ordinated efforts to benefit society.

Taking climate model evaluation to the next level pp102 - 110

Veronika Eyring, Peter M. Cox, Gregory M. Flato, Peter J. Gleckler, Gab Abramowitz et al.

doi:10.1038/s41558-018-0355-y

Earth system models project likely future climates, however, evaluation of their output is challenging. This Perspective discusses new evaluation approaches, considering both simulations and observations, to ensure credible information for decision-making.

Review Articles

The evidence for motivated reasoning in climate change preference formation pp111 - 119

James N. Druckman & Mary C. McGrath

doi:10.1038/s41558-018-0360-1

In this Review, a Bayesian framework is used to explain climate change belief updating, and the evidence required to support claims of directional motivated reasoning versus a model in which people aim for accurate beliefs, but vary in how they assess information credibility.

The role of ocean dynamics in king penguin range estimation pp120 - 121

A. J. S. Meijers, M. P. Meredith, E. J. Murphy, D. P. Chambers, M. Belchier et al.

doi:10.1038/s41558-018-0388-2

Reply to: 'The role of ocean dynamics in king penguin range estimation' p122

Emiliano Trucchi, Robin Cristofari & Céline Le Bohec

doi:10.1038/s41558-018-0390-8

Letters

A reconciled estimate of the influence of Arctic sea-ice loss on recent Eurasian cooling pp123 - 129

Masato Mori, Yu Kosaka, Masahiro Watanabe, Hisashi Nakamura & Masahide Kimoto
doi:10.1038/s41558-018-0379-3

The connections between Arctic sea-ice loss and severe Eurasian winters are complicated by differences among studies. Correcting model underestimates reveals that 44% of the central Eurasian cooling trend is attributable to sea-ice loss in the Barents–Kara Seas.

Constraining glacier elevation and mass changes in South America pp130 - 136

Matthias H. Braun, Philipp Malz, Christian Sommer, David Farías-Barahona, Tobias Sauter et al.
doi:10.1038/s41558-018-0375-7

Synthetic aperture radar interferometry reveals that 19 Gt of ice is lost per year from glaciers in South America — mostly from Patagonia — contributing 0.04 mm annually to global sea-level rise.

Global patterns and dynamics of climate–groundwater interactions pp137 - 141

M. O. Cuthbert, T. Gleeson, N. Moosdorf, K. M. Befus, A. Schneider et al.
doi:10.1038/s41558-018-0386-4

Groundwater model results and hydrologic data sets reveal that half of global groundwater fluxes may equilibrate with climate-driven recharge variations on human timescales, indicating that hydraulic memory may buffer climatic change impacts.

Krill (*Euphausia superba*) distribution contracts southward during rapid regional warming pp142 - 147

Angus Atkinson, Simeon L. Hill, Evgeny A. Pakhomov, Volker Siegel, Christian S. Reiss et al.
doi:10.1038/s41558-018-0370-z

As the southwest Atlantic sector of the Southern Ocean has warmed, the distribution of a key species, Antarctic krill, has contracted southwards. This has occurred in tandem with a decline in recruitment of juveniles, linked to increasingly positive anomalies of the Southern Annular Mode.

Physiology and iron modulate diverse responses of diatoms to a warming Southern Ocean pp148 - 152

Philip W. Boyd
doi:10.1038/s41558-018-0389-1

Climate change will alter primary productivity in the Southern Ocean, and warming and iron limitation will influence the composition of diatoms in the region. Optimum growth temperatures are wider than expected, but limited iron will affect which species flourish.

Bluetongue risk under future climates pp153 - 157

Anne E. Jones, Joanne Turner, Cyril Caminade, Andrew E. Heath, Maya Wardeh et al.
doi:10.1038/s41558-018-0376-6

Bluetongue risk to livestock across northern Europe is projected to extend further north, with a longer transmission season and larger outbreaks on average. As a result, disease detection and control measures will be increasingly important.

Articles

Meta-analyses of factors motivating climate change adaptation behaviour pp158 - 163

Anne M. van Valkengoed & Linda Steg
doi:10.1038/s41558-018-0371-y

Meta-analyses with data from 106 studies show that descriptive norms, negative affect, perceived self-efficacy and outcome efficacy are most strongly associated with climate change adaptation, whereas knowledge and experience are only weakly associated with adaptive behaviour.

Integrity of firms' emissions reporting in China's early carbon markets pp164 - 169

Da Zhang, Qin Zhang, Shaozhou Qi, Jinpeng Huang, Valerie J. Karplus et al.
doi:10.1038/s41558-018-0394-4

Accurate emissions data are required to monitor progress towards climate goals. Firms' self-reported emissions show convergence with independently verified emissions in two pilot emissions trading systems in China over several years, suggesting the effectiveness of oversight and third-party audits.

Organic matter from Arctic sea-ice loss alters bacterial community structure and function pp170 - 176

Graham J. C. Underwood, Christine Michel, Guillaume Meisterhans, Andrea Niemi, Claude Belzile et al.
doi:10.1038/s41558-018-0391-7

Arctic sea-ice melt causes a release of dissolved organic material (DOM) into the surface waters. The increased dominance of first-year ice and DOM release is impacting under-ice bacterial communities.

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Welcome to AMS News You Can Use.

Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets. Searchable archives are [available online](#).

News

[Winter Is Hitting Its Peak, Here are 6 Sights that Prove It](#)

January 29, 2019 - The Weather Channel

Statistics prove we've officially entered the coldest time of the year in the eastern half the United States, but we've also seen many signs in the natural world in recent days that also prove winter is hitting its peak.

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[New Study Presents Surprising Explanation for Differences in Southern and Northern Lights](#)



January 29, 2019 - American Geophysical Union

New research finds the differences in aurora are likely caused by squeezing of Earth's magnetotail—a magnetic tail that extends away from our planet—by the solar wind and the Sun's magnetic field.

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[Nevada Researchers Find Public Engages with Weather Forecasts if There's Personal Risks](#)



January 29, 2019 - CarsonNow.org

A new study suggests that effective communication isn't only about sharing information on upcoming weather events, it's about building trust and common ground between forecasters and the public.

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[Good News, Pilots—the Weather's Getting Better](#)

January 29, 2019 - Air & Space

New research has found that pilots are, on average, flying under "instrument flight rules" (IFR) less frequently. That's good news for harried travelers.

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[Star Wars Has Lightsabers—NASA Has GEDI for Our Forests and Climate](#)

January 29, 2019 - Forbes

On December 5, 2018, NASA launched the Global Ecosystem Dynamics Investigation (GEDI) Lidar to the International Space Station (ISS). What is this mission and does it have the "force" to help save the Earth's forests?

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[Blistering Australian Heat Is Shattering Records and Killing Wildlife](#)

January 29, 2019 - Adios

Australia is in the grips of what has become a historic, unrelenting series of extreme heat events that have broken all-time temperature records.

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[75% of the US population will suffer below-freezing temps this week](#)

January 29, 2019 - WPMT Fox 43

The biting cold already has caused at least one death in Minnesota and another in Illinois. In many parts of the country, the coldest weather is yet to come.

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[A Grand Plan to Clean the Great Pacific Garbage Patch](#)

January 28, 2019 - The New Yorker

Can a controversial young entrepreneur rid the ocean of plastic trash?

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[Science Says: Get Used to Polar Vortex Outbreaks](#)

January 28, 2019 - US News & World Report

It might seem counterintuitive, but the dreaded polar vortex is bringing its icy grip to parts of the U.S. thanks to a sudden blast of warm air in the Arctic.

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[Tornado kills three and leaves 174 people injured in Havana](#)

January 28, 2019 - Yahoo! News

The Cuban capital was battered late on Sunday and in the early hours of Monday by powerful winds and heavy rains.

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[Love Snow? Here's How It's Changing](#)

January 28, 2019 - Scientific American

More in some places, less in others, the trends are both clear and complicated.

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[Mars Opportunity Rover May Have Perished 'Honorably' During Dust Storm, Says NASA](#)

January 28, 2019 - Tech Times

After 15 years, NASA might finally say goodbye to Opportunity, the Mars rover that discovered definitive proof that water once flowed in the Red Planet.

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[Simulating clouds over the Tibetan Plateau to improve weather forecasts](#)

January 24, 2019 - Phys.org

Because of its unique dynamic and thermodynamic forcing, the Tibetan Plateau is an active region for convective systems, with 'popcorn-like' cloud systems frequently occurring and developing over its central and eastern parts.

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[Advanced modelling techniques could improve how cities deal with floods](#)

January 24, 2019 - Phys.org

A city's ability to safeguard the public in the event of a flood could be greatly improved by using scientific practices for emergency plans and involving decision-makers in the process.

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[Fire-Induced Storms: A New Danger from the Rise in Wildfires](#)

January 24, 2019 - Yale Environment 360

Scientists are tracking an increase in a little-known phenomenon in which intense wildfires can spawn their own thunderstorms, known as pyroCbs. Lightning from these storms can spark additional blazes far away and send plumes of smoke and aerosols into the stratosphere.

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Here Are Four Weather Concepts That Confuse People—including The Polar Vortex

January 23, 2019 - Forbes

I realized that it was probably time to revisit four things about weather that still confuse the public. I could have certainly included more, but these are the ones that I notice in my personal spaces and on social media.

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Debunking the solar-cycle/North Atlantic winter weather connection

January 23, 2019 - Phys.org

Cyclic variations in the energy emitted by the sun have been thought to affect weather patterns in the North Atlantic and the likelihood of storms and floods over Europe. These influences by the sun are insignificant, and could have been due to chance, suggests a new study.

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On the Water-Starved Colorado River, Drought Is the New Normal

January 22, 2019 - Yale Environment 360

With the Southwest locked in a 19-year drought and climate change making the region increasingly drier, water managers and users along the Colorado River are facing a troubling question: Are we in a new, more arid era when there will never be enough water?

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Behind the Forecast: Planes, power plants and precipitation

January 28, 2019 - WAVE 3 News

There have been quite a few documented instances of power plants creating and enhancing snow. Another one of the most recent occurrences happened in Nebraska.

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My latest WeatherEye #298 from John Maunder

<https://www.sunlive.co.nz/blogs/12918-tauranga-annual-rainfalls-18982018.html>

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