New Zealand weather and climate news

Thanks to MetService Library for these clips

MetService

Heavy rain in Auckland, stormy weekend could bring more heavy snow

Stuff.co.nz

"The line of rain there at the moment looks like it will be easing off this morning," MetService meteorologist Karl Loots said shortly before 6am on ...

Six metres waves forecast for Northland's west coast

Meteorologist Tamara Buksa said winds from the southwest were rising to 40 knots, 75km/h, for a time today but would drop later this evening.

After the snow comes the rain and wind

Stuff.co.nz

"It looks like the next round of severe weather will have quite a different flavour compared to the last round," said MetService meteorologist Angus ...

'Very unsettled' weather expected to hit parts of New Zealand

MetService meteorologist Andrew James said "very unsettled" was weather set to affect parts of the country.

Landing aborted as gusts of more than 100km/h hit Hawke's Bay

New Zealand Herald

MetService meteorologist Lisa Murray cautioned that winds could be even worse in the early hours of tomorrow morning, and could kick off again at ...

Let it snow! Antarctic blast hits Bay of Plenty, snow falls in Mamaku near Rotorua

New Zealand Herald

Metservice meteorologist Peter Little said it was unusual for it to snow in Rotorua but it was also unusual that the cold snap had come so late in the ...

Snow, wind and rain - then comes the sun as colder-than-average temperatures set to give way by ...

New Zealand Herald

MetService meteorologist Peter Little said by Wednesday temperatures would return to normal for this time of year. "Tomorrow it is still chilly but things ...

New Zealand West coast beaches battered by huge storm waves and king tides

Huge waves battered New Zealand's west coast over the weekend, during a severe weather front headed northwards across the country.

Short-lived snow flurries will live long in the memory for Coasters

Snow last settled on the ground in Greymouth 15 years ago – or closer to 70, depending on which chapped-lipped resident you believe.

Either way, the short-lived flurry on Sunday was enough to warm the hearts of people in the West Coast town and send them skittering down to the beach in delight.

Heavy dumping of snow closes roads across the country

MetService meteorologist Matthew Ford said initial reports suggested snow was heaviest in Southland, the West Coast, and and the higher parts of the North Island.

Avalanche at Remarkables mountain range prompts stand-by crew

The Mountain Safety Council urges novices to wait until conditions have settled before heading into the backcountry.

Snow falls to sea level; swell lifts 1.5-tonne blocks

A weekend of extraordinary weather that brought snow down to sea level on parts of the West Coast, also whipped up ferocious seas that sent residents fleeing in northern Buller and crashed down a sacrificial bund built to protect Jellyman Park in Cobden.

More balmy weather and rain in store for Northland

New Zealand Herald

He said the region had the second warmest July on record after 1998's 1.8C above average temperatures just as that year's devastating El Nino ...

MetOcean

$11.5 million project to revolutionise ocean forecasting launches

A bold new project that will revolutionise New Zealand’s ability to comprehensively measure, monitor and predict the state of our oceans, was launched on Tuesday [30 July].

Revolutionising ocean forecasting project launches

newsie.co.nz

General manager MetOcean Solutions Dr Brett Beamsley says New Zealand's ocean are very poorly understand, and with rising ocean temperatures ...

NZ launches $7.5m ocean research project

Undercurrent News

MetService's chief Executive Peter Lennox said the launch marked the initiation of the five-year research project, which is funded through the ministry ...

Aquaculture experts drawn to Nelson for open ocean expo

Stuff.co.nz

Research and development into farming shellfish around New Zealand is ... challenge to moving fish farming into the open ocean, balancing structures ... The majority of New Zealand's 6 million square kilometres of territory is ocean.

Ocean temperature 'surprises' becoming more common

Around the world, periods of rapid ocean warming are happening more often than we thought. In order to thrive in the future, marine communities need to make decisions based on climate trends rather than historical data.

Alone in a wild ocean, New Zealand gets smashed by some of the world's biggest waves

Far from any other piece of land, and sitting among some of the wildest waters on the planet, New Zealand has some of the world's biggest waves.

Massive seas hitting the south and west of the country this weekend show what can happen when conditions are right. And as is most often the case, it's the south and southwest of the country that's taking the biggest pounding, followed by the west coast.

NIWA

Climate scientist: It's cold now, but NZ region just saw its warmest July

A climate scientist says last month was New Zealand's warmest July on the books, going by a measure that took in more than the official number of stations.

Niwa is shortly due to release the official statistics for July, which its meteorologist Ben Noll last week said was on track to finish somewhere in the top five.

WMO

July equalled, and maybe surpassed, the hottest month in recorded history

According to the new data from the World Meteorological Organization and Copernicus Climate Change Programme, July at least equalled, if not surpassed, the hottest month in recorded history. This...
GEO-KOMPSAT-2A transition to operation - Korea Meteorological Administration

Posted:

The Geo-KOMPSAT-2A (located in 128.2°E) geostationary meteorological satellite managed by the Korea Meteorological Administration (KMA) began operation at 00 UTC on 25 July 2019, continuing the COMS...

July heatwave has multiple impacts

Posted:

For the second time in one month, Europe is witnessing a widespread and intense heatwave. Many new records have been set in countries including Belgium, France, Germany and the Netherlands as...

Weatherwatch

Storm brews as forecasters disagree

While WeatherWatch is predicting an "enormous storm" to hit the South next week, the MetService and Niwa are calling the forecast premature.

Massive storm is not heading towards New Zealand, Niwa says

There's "no need to be alarmed", a massive storm is not heading towards New Zealand, NIWA says.

Earlier in the week, the New Zealand Herald reported a "polar blast" of a "giant storm" was expected to hit the country, based on predictions from weatherwatch.co.nz.

Forecast of 'enormous storm' premature - MetService

Otago Daily Times

While WeatherWatch is predicting an "enormous storm" to hit the South next week, the MetService is calling the forecast premature. Philip Duncan of ...

Extreme weather (and other news) – Australia and Pacific

Lack of radio hampering Pacific meteorologists

The lack of radio services in some small Pacific island nations is challenging for local weather offices during extreme weather events.

Pacific Meteorological Council reminded of importance of its work

Delegates at the opening of the fifth meeting of the Pacific Meteorological Council in Samoa have been told their work helps nations meet development goals.

Tuvalu's fight to stay above the waves

Tuvalu, the canary in the coal mine for climate change, is shouting for more help as it battles rising seas and sweltering temperatures. But the small Pacific island country is refusing to be dragged down below the waves and sees plenty of hope for its people and its culture. Sally Round travelled to Tuvalu to investigate.

Business Link Pacific Portal launched across Pacific region in successful multi-country event.

Auckland, New Zealand - Business Link Pacific (BLP) officially launched the Business Link Pacific Portal today in Fiji, Vanuatu, Samoa and Papua New Guinea.

The Business Link Pacific Portal is an innovative online platform designed to connect quality business advisors with small and medium-sized growing businesses in the Pacific.

Curious Climate: How the bushfire risk will change as Australian summers get drier and hotter

ABC News

Australian summers are set to get drier and hotter as the Earth's ... "Predicting those oven-dry winds and lightning storms and getting all the ...

BOM makes last Cairns-based forecaster redundant

The Cairns Post

THE Cairns Airport Meteorological Office is set to close as the last local ... But a Bureau of Meteorology spokesman said aviation meteorologists across ...

West Pacific remains on high alert as Tropical Storm Krosa strengthens near Guam

AccuWeather.com

Tropical Storm Krosa strengthened over the waters of the West Pacific on Tuesday, and could become one of the most powerful tropical cyclones so ...

Snowfalls in Australia have a colourful history, we reminisce, as the south-east braces for a cold blast

Snow falls on the mountains every year in Australia, but only rarely does it spread down onto the plains and cities.

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

Singapore may experience haze in coming weeks and months: Met Service

CNA

SINGAPORE: There may be occasional haze in the next few weeks or months as drier conditions are expected, said the Meteorological Service ...

BMKG identifies 18895 hotspots in Southeast Asia, Papua New Guinea

ANTARA

Jakarta (ANTARA) - The Meteorology, Climatology, and Geophysics Agency (BMKG) identified at least 18,895 hotspots in Southeast Asia and Papua ...

Death toll from storm Wipha climbs to 9 in Vietnam

VnExpress International

Weather monitoring data shows that between Friday and Sunday, ... as the South China Sea, and these could affect Vietnam, weather experts have ...

Exact weather forecasts for downtown districts

Shine News (press release)

The Shanghai Meteorological Bureau is using data from meteorological satellites, rockets, radars and drone exploration technologies as well as

Lekima and Krosa take aim for China, Japan and South Korea with more flooding and damaging ...

AccuWeather.com

"Areas from northern Taiwan to eastern China look to bear the brunt of Lekima through Sunday," said AccuWeather Senior Meteorologist Dave Houk.

Underwater Temple Revealed by Thailand's Extreme Drought

A long-lost underwater temple has reemerged in central Thailand, where extreme drought has all but dried up the region's reservoirs.

Extreme weather (and other news) – Americas and Europe

Meteorologist: Russia wildfires linked to climate change

The Mainichi

MOSCOW (AP) -- The head of Russia's meteorological service says he sees global climate change as a factor behind the wildfires blazing throughout ...

Freak rainstorm cut Oslo in two

Views and News from Norway

State meteorologists are blaming climate change for a freak rainstorm in Oslo late Saturday night. It came suddenly and forcefully, but only cut through ...

Flea epidemic set to hit Britain after numbers of parasites leaps because of the hot and humid ...

The Sun

FLEA numbers have leapt up in the hot and humid weather. ... Sales of treatments are soaring as a result, according to the pet care business.

UK weather forecast: Flood and thunderstorm warnings as August to be hit by summer deluges

The Independent

Low pressure stays in charge, further showers – heavy at times – and some longer spells of rain," Greg Dewhurst, a Met Office meteorologist, said.

US infrastructure unprepared for increasing frequency of extreme storms

Posted: 01 Aug 2019 09:02 AM PDT

Current design standards for United States hydrologic infrastructure are unprepared for the increasing frequency and severity of extreme rainstorms, meaning structures like retention ponds and dams will face more frequent and severe flooding, according to a new study.

International news and research

Watermelon snow appears in national park, experts say DON'T eat it

The Weather Network

Watermelon snow, which looks and smells like -- you guessed it -- watermelon, has been showing up on mountains along the Pacific coastlines of ...

How regular forecasts can mask the threat of dangerous weather

Washington Post

Meteorologists are taught that an accurate weather forecast conjures a vision of what Mother Nature will most likely deliver. Except that's not always ...

'Rainfall has rocketed': the remote weathermen charting the climate crisis

The Met Office team on a south Atlantic island reveal the extreme lengths they go to in order to forecast the weather

The US government is testing surveillance balloons that could track multiple vehicles from 65000 feet

Business Insider

Visit Business Insider's homepage for more stories. ... as high as 65,000 feet, and are able to track vehicles day or night, regardless of the weather.

Twelve centuries of European summer droughts

Researchers have published a study exploring the association between summer temperature and drought across Europe placing recent drought in the context of the past 12 centuries. The study reveals that, throughout history, northern Europe has tended to get wetter and southern Europe to get drier during warmer periods.

Others

Skymet welcomes 'Cyclone man' Mrutyunjay Mohapatra as new IMD chief

Skymet Weather

Acclaimed weather scientist Mrutyunjay Mohapatra also known as the ... And we expect this to get better with IMD adopting newer technologies every ...

5G network

Will 5G Satellites Undermine NOAA Weather Forecasting?

Government Technology

(TNS) — The National Academy of Sciences planned a two-day summer workshop to address a high-stakes question: Could the development of next ...

No Newshub and NIWA. Vodafone’s 5G network won’t interfere with your weather satellite images.

In what must rank as one of the most poorly researched mainstream news stories in recent times, Newshub last night told us on their 6pm news that Vodafone's soon to launch 5G network could cause problems for NIWA (New Zealand’s National Institute of Water and Atmospheric Research) who might not be able to accurately predict weather because of potential interference with weather satellites.

Aviation

Weather and ambient sensors now installed in 45 Chinese airports

International Environmental Technology

The CAAC certification means Biral's sensors are approved for all airports in China for use in aviation weather monitoring systems (AWOS) and RVR ...

Taking flight: an aviation system for the automated age

Drone integration paper

17 Jul 2019

Ministry of Transport (New Zealand)

Ministry of Transport (New Zealand)

New Zealand is a world leader in the unmanned aircraft (drones) sector due to our good reputation as a safety regulator, our ‘open for business’ mentality and our risk-based regulatory regime. We want to retain these advantages and remain at the forefront of drone development by ensuring our approach to drone operations harnesses the many opportunities they bring while addressing the challenges.

Being at the forefront means maintaining a regulatory and business environment which actively supports the beneficial and safe development and use of drones to benefit New Zealand. This requires an ability and willingness to be bold, and to take a leading role in order to develop a new industry that will help to lift productivity across a range of different sectors of the economy

This document aims to provide the sector with a clear understanding of the Government’s role, and its strategic direction and priority areas, to achieve the safe integration of drones into the aviation system and broader transport system.

Outlining a pathway to integration will provide clarity to the sector about steps the Government will take to ensure risks are addressed and benefits are realised for New Zealand and the sector as quickly as possible.

Business/Insurance

Private forecasters smell big bucks in Indian weather

Economic Times

The govt is hiring private operators like The Weather Company (WC) to cater to three main sectors — agriculture, logistics and transport. “We have ...

Communications/social media

'A shambles': John Campbell presents the weather on Breakfast

Breakfast host John Campbell proved he was a team player on Monday morning, gamely stepping in to present the news when the usual weatherman was absent.

Energy and Mining

How do different weather patterns impact wind market value?

RenewEconomy

With the rapid expansion of wind energy production in Australia, the ... summer weather pattern when high electricity demand can stress electricity ...

Together & MetService help Rockgas make the most of the weather

AUCKLAND, Today: Content production agency Wellcom, with MetService and indie media agency Together, has developed a new campaign for NZ's largest LPG retailer, Rockgas to promote a new location and real-time weather data targeting capability.

How do different weather patterns impact wind market value?

With the rapid expansion of wind energy production in Australia, the accurate assessment of wind resource variability has become of interest to project proponents and market stakeholders, with fluctuations in the availability of wind resources impacting many aspects of project development and operation, along with energy market value and system reliability.

Farming/horticulture/Aquaculture

New aquaculture rules to cut expensive 'red tape' around old marine farms

A national standard for aquaculture could save mussel and salmon farmers big money as old consents expire.

Experts call for development of forecasting model for sardine

The Hindu BusinessLine

The fluctuations of sardine are mainly influenced by unfavourable conditions due to El Nino, stunted growth, spawning disruption, migration from ...

Health

Climate: Explained - Will we be less healthy because of climate change?

Do you expect an increase in health issues due to the effects of climate change? - a question from Christine in Wellington

Some of the negative health effects of climate change are already upon us, but it's not all doom and gloom. There is a huge opportunity for better health through well designed action to reduce our emissions and by adapting to the changes we are facing.

From Townsville to Tuvalu: health and climate change in Australia and the Asia Pacific region

31 Jul 2019

Mason Littlejohn, Misha Coleman, Annette Bos, Jane Fisher

Global Health Alliance (Australia)

Most people accept that climate change is transforming the global atmosphere and environment. Yet far fewer understand the significant impacts that climate and environmental change are having on human health. In the Asia Pacific region, climate change is raising sea levels, exacerbating the severity of natural disasters, reducing nutrition levels in food and increasing disease produced by unclean water. All present substantial risks for the health of humans, including Australians.

This policy paper by the Global Health Alliance Australia highlights evidence and case studies to show how climate and environmental change will affect human health in the Asia Pacific region. It provides proposals for how Australian governments - federal, state and local - might respond to this challenge, arguing that Australia's aid, health and agricultural portfolios have an opportunity to develop policies that build resilience in our region to the impacts of climate change on human health. Such an approach would elevate Australia's standing in the region. The benefits are also closer to home, in terms of reduced health risks, and improved political, health and economic security for Australians.

Australia has longstanding commitments to the region, notably through its Official Development Assistance program, but also through a host of government and non-government initiatives. Australia has a major opportunity to build on these efforts by supporting its partner countries to develop their resilience to the health impacts of climate change. This paper identifies three areas in which climate change will have a major impact – on political, economic and health systems,

on the risk of disease, and on vulnerable populations – before proposing potential policy responses.

The paper uses the concept of planetary health to show that environmental and human health cannot be separated. It also argues that climate and environmental change will affect the health of all citizens of the Asia Pacific region, including Australians. The health effects will be different across the region and Australians are also vulnerable to many climaterelated health issues, including heat stress, air pollution, and cardiorespiratory illness caused by burning fossil fuels and fires.

Disease knows no borders. For example, the Nipah virus, a bat-borne disease that causes fatal infections in humans and pigs in South-East Asia is largely unknown in Australia today. But climate change and loss of natural habitat are pushing it closer to human populations. By 2050 Northern Australia will be at a far greater risk of this deadly virus becoming established domestically. In addition, if neighbouring health systems prove inadequate, pressure on Australia to provide assistance, even a safe haven for climate refugees, will grow.

The link between environmental and human health has not been at the centre of Australian policymaking. This paper hopes to redress that gap, and to inspire effective policy solutions to an issue of vast and growing significance to Australia, its region, and the world.

Lightning

What Is 'Hot Lightning'? Satellites Reveal Which Strikes Are Most Likely to Start Wildfires

IEEE Spectrum

The sensors are currently orbiting Earth aboard two weather satellites that belong to the U.S. National Oceanic and Atmospheric Administration ...

Lightning strike injures two Asiana Airlines mechanics

The Korea Herald

The Aviation Meteorological Office issued lightning warnings at 6:30 a.m. that day, which were lifted at 11 a.m. only to be reissued at 11:28 a.m. as ...

Satellites and radar

NASA releases report on weather satellite failure

SpaceFlight Insider

A NASA board assigned to investigate the April 2018 failure of an infrared-detecting instrument on board a next-generation weather satellite has ...

Transport/roading/shipping/freight

More NZ roads being made safer to reduce deaths when drivers make mistakes

New Zealand Herald

The announcement was made when Prime Minister Jacinda Ardern, Transport Minister Phil Twyford and Associate Transport Minister Julie Anne ...

Innovation and technologies and AI

Not just weather prediction, IMD trying to decode how weather change will impact

Livemint

... loss of life," said Mohapatra, “that's what the target now is to set up an impact-based weather forecasting in the country, ... information system, along with other socio-economic data, including population and distribution of houses.

Machine learning in meteorology could predict blackouts caused by storms

SciTech Europa

The study, a collaborative effort between Aalto University and the Finnish Meteorological Institute, found promising early results in using machine ...

Climate change / global warming / sea level rise

Sea level rise began accelerating in the 1960s, researchers find

The rate of modern global sea level rise began accelerating in the 1960s and not the 1990s as many previously thought, according to new research.

Greenland Lost 217 Billion Tons of Ice Last Month

A staggering 217 billion tons (197 billion metric tons) of meltwater flowed off of Greenland's ice sheet into the Atlantic Ocean this July. The worst day of melting was July 31, when 11 billion tons (10 billion metric tons) of melted ice poured into the ocean.

The legal threat and the big opportunity in Māori engagement on climate change response

As local councils respond to the effects of climate change, they'll need to properly consider Māori interests, new research warns. Treaty breaches and litigation will follow if they don't. Carmen Parahi reports.

UN Climate Change News, 31 July 2019 - The UN Climate Change secretariat's Momentum for Change initiative has released an interactive, online report, showcasing shining examples of diverse climate solutions from around the world.

Emergency preparedness / disaster planning / resilience

New Zealand to have world-leading natural hazard risk modelling tool

EQC, GNS Science and NIWA have joined forces to further develop world-leading natural hazards risk modelling for New Zealand.

Integrating volunteering cultures in New Zealand's multi-hazard environment

Australian Journal of Emergency Management
July 2019 edition

In New Zealand, the social contribution of volunteers exceeds 270 million hours per year. Volunteer participation is a vital component of emergency services activities, particularly in rural settings. Fire and Emergency New Zealand is the primary rural emergency response agency with a network encompassing almost 3500 volunteers. This 'formal' volunteer capacity aids the wellbeing of communities, particularly in response to wildfire, but also other hazards. Formal organisation of volunteers is supplemented by informal volunteering, especially during response and recovery phases and is increasingly encouraged in readiness and reduction activities. Informal volunteering, evident in the 'spontaneous' mobilisation of resources during disasters, can evolve into more formal structures. Governments and volunteer organisations are being urged to plan for 'spontaneous' and 'digital' volunteers as part of their emergency preparedness to include volunteers in ways where formal and informal volunteering can work together. This paper considers the practical aspects of integrating informal and formal volunteers to identify lessons for inclusion. The papers examines how informal volunteer activities could contribute more to rural community resilience before, during and after emergency events.

Journal and articles online

Quarterly Journal of the Royal Meteorological Society
Volume 145, Issue 722

Pages: i-iv, 1799-2334

July 2019 Part A

ISSUE INFORMATION

RESEARCH ARTICLES

The paper analyses the degree and type of anisotropy of turbulence in different stability regimes of the atmospheric boundary layer with different levels of influence of submeso-scale motions. The findings support the main hypothesis that the degree of influence of submeso-scale motions impacts the structure of the turbulence, characterized by the degree of anisotropy of the Reynolds stress tensor. In flow regimes under considerable influence of submeso-scale wind variability, the Reynolds stresses show a clear preference for strongly anisotropic, one-component states.

In this study, we apply the heat budget approach to the urban boundary layer using WRF simulations and a variety of observational data. In doing so, the relative importance of surface sensible-heat flux and transport processes in heating the urban boundary layer under heatwave conditions is quantified. The results have important implications for the application of one-dimensional convective boundary-layer models at the city scale.

Pages: 1832-1845 | First Published: 15 March 2019

The resolution of the European Centre for Medium-range Weather Forecast Integrated Forecast System (IFS) is expected to reach 5 km in the coming decade. Assumptions in the parametrization of deep convection, such as that all of the compensating environmental flow occurs in the grid column, i.e. the convective and environmental mass fluxes cancel each other in term of mass transport, have to be challenged. In this paper, we further develop the original concept of separating the convective updraughts from the subsiding branch of the overturning convective circulation and apply it to the global hydrostatic equations of the IFS.

Tropical cyclogenesis at and near the Equator

Sian C. Steenkamp, Gerard Kilroy, Roger K. Smith

Pages: 1846-1864 | First Published: 22 March 2019

The formation of tropical cyclones within a few degrees latitude of the Equator is investigated using European Centre for Medium-Range Weather Forecasts (ECMWF) analyses of some prominent cyclogenesis events there. In the real events investigated, vortex formation occurred within a broadscale counter-clockwise flow that encompasses a region of predominantly positive absolute vertical vorticity typically extending more than 5° south of the Equator. Patches of enhanced vertical vorticity form within this region as a result of vorticity stretching by deep convection and these patches are organized by the convection, the collective effects of which produce an overturning circulation that fluxes vorticity at low levels towards some centre within the convective region.

 Open Access

Comparison of the Moist Parcel-in-Cell (MPIC) model with large-eddy simulation for an idealized cloud

Steven J. Böing, David G. Dritschel, Douglas J. Parker, Alan M. Blyth

Pages: 1865-1881 | First Published: 28 March 2019

Detailed comparison for a rising turbulent thermal is made between a new Lagrangian-based model of moist convection (MPIC) and an established large-eddy simulation model (MONC). General features of the flow evolution compare well and converge with increasing resolution. Differences occur mostly at small scales and are a result of the different representation of mixing, which is sensitive to resolution in both models. The origin of in-cloud air is studied using MPIC's internally consistent Lagrangian diagnostics.

 Open Access

The operational global four-dimensional variational data assimilation system at the China Meteorological Administration

Lin Zhang, Yongzhu Liu, Yan Liu, Jiandong Gong, Huijuan Lu, Zhiyan Jin, Weihong Tian, Guiqing Liu, Bin Zhou, Bin Zhao

Pages: 1882-1896 | First Published: 28 March 2019

The relative error in the tangent-linear model with simple physics with respect to the nonlinear forecast model with full physics at the resolution of 1.0°. The solid line gives the 1 h forecast results, the dashed line represents the 3 h forecast results, and the dotted line shows the 6 h forecast results. (a) u wind; (b) non-dimensional pressure; (c) potential temperature; (d) specific humidity.

On the properties of ensemble forecast sensitivity to observations

Shunji Kotsuki, Kenta Kurosawa, Takemasa Miyoshi

Pages: 1897-1914 | First Published: 28 March 2019

The Ensemble Forecast Sensitivity to Observation (EFSO) is an efficient approach to diagnosing observation impacts, quantifying how much each observation improves or degrades a subsequent forecast with a given verification reference. With a global atmospheric data assimilation system NICAM-LETKF, this study demonstrates three important issues possibly leading to overestimating observation impacts: verification reference, relaxation-to-prior methods to the initial conditions of the EFSO, and deterministic baseline forecasts that represent the forecast without data assimilation.

Modification of the convective adjustment time-scale in the Kain–Fritsch eta scheme for the case of weakly forced deep convection over the Tibetan Plateau region

Chenghai Wang, Di Wu, Feimin Zhang

Pages: 1915-1932 | First Published: 30 March 2019

General uncertainty for simulation of clouds and convective precipitation occurs in almost all models. This study proposes a new convective adjustment time-scale for the KF scheme at the high-resolution simulation. The modified convective adjustment time established a good relationship with simulated convective clouds characteristics over the Tibetan Plateau region.

Nonlinear latitudinal transfer of wave activity in the winter stratosphere

Richard K. Scott

Pages: 1933-1946 | First Published: 01 April 2019

(a) Linear wave dynamics: a small amplitude wave on the vortex edge (top line) induces a perturbation on the tropical edge of the surf zone (lower line). The perturbation decays exponentially with the width of the surf zone and is linear in the sense that the response amplitude varies linearly with the amplitude of the vortex wave and has the same zonal wavenumber. (b) Finite-amplitude effect: a large-amplitude wave on the vortex edge reduces the distance between vortex and subtropical edge locally, resulting in a local increase of response amplitude beyond linear scaling and an increase in the zonal wavenumber of the excited response

Modelling spatially correlated observation errors in variational data assimilation using a diffusion operator on an unstructured mesh

Oliver Guillet, Anthony T. Weaver, Xavier Vasseur, Yann Michel, Serge Gratton, Selime Gürol

Pages: 1947-1967 | First Published: 01 April 2019

This paper describes a method for representing spatially correlated observation errors in variational data assimilation. The method is based on the numerical solution of a diffusion equation. In order to account for the heterogeneous distribution of observations, a spatial discretization technique based on the finite element method is chosen where the observation locations are used to define the nodes on an unstructured mesh on which the diffusion equation is solved. By construction, the method leads to a convenient operator for the inverse of the observation-error correlation matrix. The method produces correlation structures that match well with theory, even in areas where there are large gaps in the data distribution.

Understanding the vertical structure of potential vorticity in tropical depressions

Varun S. Murthy, William R. Boos

Pages: 1968-1991 | First Published: 02 April 2019

Time-averaged (a) diabatic PV tendency, (b) horizontal advection, (c) vertical advection, and (d) total PV tendency (all PVU/day) during the first 2 days of the axisymmetric 2D model in response to a combination of stratiform and deep convective heating. Diabatic PV tendency includes both stretching-like and tilting-like tendencies, with the tilting-like tendency radially restricted to 10 km near the heating boundary. Negative PV tendencies are enclosed by a thin dotted line. Lowest panels depict the (e) PV (PVU) and (f) absolute vorticity ($10^{-5}s^{-1}$) on day 2. The vertical dotted line in all panels indicates the radius ($r = 250$ km) within which the heating is applied.

Object-based verification metrics applied to the evaluation and weighting of convective-scale precipitation forecasts

Laure Raynaud, Iseline Pechin, Philippe Arbogast, Lucie Rottner, Mayeul Destouches

Pages: 1992-2008 | First Published: 05 April 2019

This paper presents an object-based evaluation of precipitation forecasts from the French deterministic and ensemble high-resolution models, using a novel object detection method. Object verification metrics are then used to objectively weight ensemble forecasts based on their performance at early forecast ranges. These weights are consistent with a subjective ranking and significantly improve forecast scores at very short ranges.

Extended representation of wind–mass correlation by ensemble forecasting for data assimilation

Hyo-Jong Song

Pages: 2009-2027 | First Published: 05 April 2019

In the midlatitudes, anisotropy induced by the advection process can be covered by ensemble forecasts. Ensemble correlation explains high-frequency residuals in momentum conservation in the Antarctic. In the Tropics, the ensemble relationship explains the thermodynamic energy and mass conservation between divergent wind and temperature.

Inference of stochastic parametrizations for model error treatment using nested ensemble Kalman filters

Guillermo Scheffler, Juan Ruiz, Manuel Pulido

Pages: 2028-2045 | First Published: 05 April 2019

We introduce a novel Bayesian approach based on hierarchical Kalman filters to infer stochastic parameters. The technique is proposed to be applied offline as part of an apriori optimization of the data assimilation system. Parameters that control the stochastic forcing variance and spatial covariances are successfully estimated. The identified stochastic parameters not only alleviate the analysis errors associated with unresolved processes, but they also optimize the ensemble spread.

Accelerating radiative transfer calculations for high-resolution atmospheric models

Howard W. Barker, Jiangnan Li

Pages: 2046-2069 | First Published: 06 April 2019

Cloud water path, cloud-top altitude, and normalized nadir visible radiance for the boundary layer ($504 \times 504 = 254{,}016$ columns with $\Delta x = 0.04$ km) and convective cloud

(1,536 × 1,536 = 2,359,296 columns with $\Delta x = 0.1$ km) domains. For the visible images, the Sun had a zenith angle of 60° and azimuth of 45° counter-clockwise from the top.

Storm surge and seiche modelling in the Adriatic Sea and the impact of data assimilation

Marco Bajo, Iva Međugorac, Georg Umgiesser, Mirko Orlić

Pages: 2070-2084 | First Published: 09 April 2019

The Adriatic Sea and its coasts. The dots show the locations of the sea level stations.

Dependence on initial conditions versus model formulations for medium-range forecast error variations

Linus Magnusson, Jan-Huey Chen, Shian-Jiann Lin, Linjiong Zhou, Xi Chen

Pages: 2085-2100 | First Published: 11 April 2019

Correlation of errors between different experiments (see legend) for 500 hPa geopotential height over Europe (a) and contiguous US (b), including confidence intervals from 5th to 95th percentile based on bootstrap method for FV3gfs versus FV3ec (green shading). While the models with the same initial conditions have the highest correlations of errors over Europe, the correlations are higher for the experiment with a similar model over contiguous US.

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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.

August 6, 2019

News

Greenland is melting at its highest elevations and that's unusual

August 6, 2019 - Forbes

The Greenland Ice Sheet is experiencing dramatic melting right now at its surface.

Meteorologists predict slight increase in hurricanes in forecast revision

August 5, 2019 - UPI.com

A team of meteorologists in Colorado revised its predictions for the 2019 Atlantic hurricane season, forecasting a slight increase in storms this year.

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Will 5G satellite deployment undermine NOAA weather forecasting? Federal officials fight it out.

August 5, 2019 - The Seattle Times

The National Academy of Sciences planned a two-day summer workshop to address a high-stakes question: Could the development of next generation 5G wireless undermine the accuracy of information gathered by weather satellites?

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FEMA Provides First Grants Since Hurricane Harvey for Houston Projects to Mitigate Flooding

August 5, 2019 - HoustonTX

Almost two years after Hurricane Harvey, FEMA has awarded the first set of federal grants to the City of Houston for a pair of large-scale flood mitigation projects in areas hit by the record-high rainfall from the storm.

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Martian Meteor Collision May Have Triggered a 1,000-Foot Tsunami

August 5, 2019 - LiveScience

An enormous asteroid struck Mars just before waves, most-likely colored red due to the copious dust on the surface of Mars, inundated the planet.

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UTA physicist improving predictions of how space weather affects satellites, radio waves

August 3, 2019 - Phys.org

A physicist at The University of Texas at Arlington is developing a space weather simulator capable of predicting how energy is distributed during events such as solar flares and magnetic storms.

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Robotic Underwater Gliders Could Improve Hurricane Forecasts

August 2, 2019 - Forbes

Intensity forecasts continue to lag track forecasting, but a new robotic underwater glider system could move the needle on improving hurricane forecasts.

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Chance, Curves, and Chaos: The New Era of SaaS Forecasting

August 2, 2019 - Medium

Data science is beginning to replace spreadsheets for entrepreneurs wrestling with uncertainty in their business models. How did we get here? What's really new? And how can founders at any stage get better at predicting their future?

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NASA-funded study aims to map air pollution in front of our faces

July 31, 2019 - University at Buffalo

The $528,000 grant, awarded to UB RENEW scientist Kang Sun, will examine levels of nitrogen dioxide, ammonia, formaldehyde.

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