

Our good wishes to those attending Our Annual Conference 25-27 November at VUW, Wellington.

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From Kevin Trenberth

News release issued today: New research reveals insights into ocean heat flows. (no links available yet)

Please note that I will be talking about this work on Monday next at the NZ Meteorological Society Conference .

<https://conference-nzmetSOC-2019.lilregie.com/booking/attendees/new>

Enjoy

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New Zealand weather and climate news

These clips are courtesy of MetService Library, thanks

MetService

Thunderstorms set to wallop South Island as cold front hits NZ

Newshub

... Wednesday afternoon. The good news is that they won't be as severe as they were on Monday, according to MetService meteorologist Claire Nixon.

Giant hail stones hammer Timaru as storm moves up the country

Timaru has been hammered by a hail storm causing damage to buildings, closing some businesses and stretching emergency services

.

Lightning and thunder hits Canterbury 'like a sledgehammer'

More than 1500 lightning strikes hit the South Island during a six-hour storm that pelted Canterbury with damaging hailstones.

Two injured after tornado strikes Christchurch causing roof to collapse

A violent storm has torn up the east coast of the South Island causing damage and injuries.

Two people sustained moderate injuries after a mini tornado caused a roof to cave in at the Savemart in the Christchurch suburb of Sydenham, St John says.

Destructive Christchurch tornado very weak, could have been worse

Stuff.co.nz

MetService meteorologist Lewis Ferris said the thundercloud was 12 kilometres tall, right up to the top of the troposphere, the lowest level of the ...

12km-tall thunderstorm cloud 'spawned' destructive Christchurch tornado

Stuff.co.nz

MetService meteorologist Lewis Ferris said the thundercloud was 12 kilometres tall, right up to the top of the troposphere, the lowest level of the ...

House reportedly struck by lightning in Palmerston, Otago

A house in Palmerston, Otago has reportedly been struck by lightning, blowing fuses and power plugs off the walls.

Firefighters were called to a property on Hampden-Palmerston Rd on State Highway 1, just north of the township, about 1.10pm on Monday.

Nights After Dinner Speaker

Nights Meteorology expert Erick Brenstrum has the stratosphere on his mind! He joins Bryan to discuss that particular part of the atmosphere, typhoons, hurricanes and wildfires. He also has a review of The Collapse of the Eastern Mediterranean by Ronnie Ellenblum.

Hawke's Bay summer won't be marred by a few spots of showers and rain

New Zealand Herald

Cloud cover, a southerly change, and a few spots of rain will not spoil the warm weather being experienced by Hawke's Bay residents. MetService ...

Risk of avalanches as fronts bring wild weather

A series of fronts bringing wild weather is increasing the risk of avalanches this week.

Sunshine captured in analog at mall

Otago Daily Times

The Burn Time exhibition has been in Dunedin for the past two weeks and its centrepiece is a replica of a Victorian meteorological machine called the ...

MetOcean

Historical and Future Storm Surge around New Zealand

MetOcean Solutions' physical oceanographer, Dr Jorge Perez, was part of the team led by the University of Auckland (Giovanni Coco and Laura Cagigal) that, together with the University of Cantabria (Spain), developed a new storm surge database for New Zealand.

Going with the floe: Sea ice movements trace dynamics transforming the new Arctic

Scientists have used MODIS satellite imagery to understand long-term ocean movements from sea ice dynamics. The engineers used image-processing algorithms to remove clouds, sharpen details, and separate individual floes. Image analysis algorithms mapped the floe movement over a period of days. The resulting ocean current maps were about as accurate as maps made using traditional methods. Tracking sea ice will help scientists better understand the sources driving sea ice transport.

NIWA

Climate scientists from NIWA will clean up beaches during strike

Weather forecasters and environment scientists from National Institute of Water and Atmospheric Research (NIWA) will strike on Thursday saying management has "backed them into a corner".

WMO

Workshop calls for more investment in Flash Flood Guidance System

Flash floods cause more than 5,000 deaths worldwide annually, exceeding any other weather-related event. As the global population increases, especially in urban areas, and societies continue to...

Volcano alert/watch

Volcanic alert level rises on White Island

The volcanic alert on Whakaaro - White Island in the Eastern Bay of Plenty - has been raised due to increased activity.

White Island volcano (New Zealand) activity update: background activity increases further

VolcanoDiscovery

Volcanic unrest continues at Whakaari/White Island and some monitored parameters show further increases in activity. Hazards on the island are now ...

Satellite Shows Ash Plume From Russian Volcano Streaking Across the Pacific

The Weather Channel

The Sheveluch volcano ash plume (in brighter green) was lofted as high as 33,000 feet by early Tuesday morning as it traveled over extreme western ...

White Island's volcanic alert level raised to two

Newshub

An increase in volcanic activity has led to a rise in White Island/Whakaari's alert level. The island now has an alert level of two, with an aviation colour ...

Extreme weather (and other news) – Australia and Pacific

Cyclone early warning system for Pacific goes live

The Pacific's first cyclone early warning system will go live in Fiji this week.

Weather an enduring fascination for meteorologist

The Sydney Morning Herald

For many Australians “bushfire weather” is a warning to prepare for the worst, even to evacuate their homes. For Grace Legge, too, it means dropping ...

Bushfire threat set to continue through Christmas and New Year as December is expected to be

...

Daily Mail

'The next few months until the middle of summer are forecast to be drier than average'
Weatherzone meteorologist Sam Brown told Daily Mail ...

NASA Space Image Reveals Vast Amounts of Smoke Being Produced by Devastating Australia
...

Newsweek

... including very dry air, high winds, dry lightning and hot temperatures. ... Several fires have also broken out in the state of Western Australia on the ...

Climate change will make fire storms more likely in southeastern Australia

Temperatures across many regions of Australia are set to exceed 40°C this week, including heatwaves forecast throughout parts of eastern Australia, raising the spectre of more devastating bushfires.

Australia Warned to Expect More Fire Tornadoes

Insurance Journal

Fire tornadoes are set to become a more common feature of the Australian ... The increased risk from fire tornadoes will affect Australia's capital city, ... and west coasts this week look set to worsen as lightning strikes from dry storms ...

Record-smashing heat: Melbourne temperatures set to soar towards 40C as cold front slows

It was already forecast to be blisteringly hot across southern Australia over the next few days. Now it's getting worse.

Conditions are set to deteriorate with the potential for a November temperature record that's stood for 125 years to be broken in Melbourne tomorrow.

Bushfire threat spreads to Victoria as first Code Red declared since 2010

A Code Red fire danger day has been declared in Victoria for the first time in almost a decade, as emergency services warn people in parts of the state's north to consider evacuating their homes.

Sunshine Coast hail storm declared 'catastrophe' as Insurance Council estimates \$40 million in damage

The Insurance Council of Australia has declared Sunday's hail storm on the Sunshine Coast a "catastrophe" after receiving more than 5,000 claims and a damage bill reaching \$40 million.

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

Prince Charles Visits IMD; Praises Its Weather Advisory Services

The Weather Channel

Prince Charles Visits IMD; Praises Its Weather Advisory Services ... These member nations include Thailand, Myanmar, Bangladesh, Sri Lanka, ...

'Accumulation of particulate matter' causes hazy skies, unhealthy air quality in Singapore

The Independent

In 1997 and 2015, haze intensified due to a prolonged dry period as well as the El Nino phenomenon, which sees a warming of the central and ...

Typhoon Kalmaegi to make landfall over Luzon, Philippines soon

Skymet Weather

In fact, Kalmaegi will move over to South China Sea. The system is expected to weaken into a tropical storm. After that also, it will continue to weaken ...

Extreme weather (and other news) – Americas and Europe

UK weather: More than 100 flood warnings in place with parts of country close to wettest autumn on ...

The Independent

UK weather: More than 100 flood warnings in place with parts of country be eligible for immediate relief on their council tax and business rates.

Future rainfall could far outweigh current climate predictions in UK

Posted: 14 Nov 2019 04:55 AM PST

Scientists analyzed rainfall records from the 1870s to the present day with their findings showing there could be large divergence in projected rainfall by the mid to late 21st century.

Corruption and delay drown Venice as it loses its fight against flooding

A set of barriers that could have stopped near-record floods in Venice have long been delayed, leaving the ancient city exposed to disastrous water levels

International news and research

[Beijing Meteorological Service Selects 200 Gigabit HDR InfiniBand to Accelerate New ...](#)

Yahoo Finance

SUPERCOMPUTING CONFERENCE – Mellanox Technologies, Ltd. ... the weather forecasting information needs of the China 2022 Winter Olympics.

[PredictWind's forecast accuracy verified in worldwide study](#)

Sail World

PredictWind has made significant improvements to their weather models. 10 years of development has culminated in the release of the most accurate ...

[Automation hasn't required high-end hardware in one NOAA office](#)

FedScoop

NESDIS, he notes, works with all the big public and private weather-forecasting services, including the National Weather Service, AccuWeather and ...

[New datasets to understand wildfires and river flows](#)

The Parliament Magazine

Francesca Di Giuseppe and Christel Prudhomme, from the European Centre for Medium Range Weather Forecasts (ECMWF), explain how new data ...

[When Will Weather Forecasting Technology Be Accurate?](#)

Now. Powered by Northrop Grumman. (blog)

Weather forecasting data comes from different sources. NASA's Earth-sensing mission AQUA and other satellite-based sensors provide water-related

[Beyond 'Siri, what's the weather?' The pocket guide to forecasting from your phone.](#)

Washington Post

With the power to predict short-term weather on the device in your pocket, it's helpful to know what your best options are for weather apps. They're not ...

Heat networks in focus as EU cities confront building emissions

Last year, the European Union embarked on a mission to decarbonise the building sector, currently responsible for 40% of the bloc's energy use. And cities with district heat networks have a head start when it comes to integrating new low-carbon energy sources.

Bacteria from the ocean floor could be influencing Arctic weather

The Ledger

“They regulate the surface and atmospheric temperatures, affecting sea ice, ecology, shipping, Arctic climate, and weather. And we just have a really ...

IBM makes higher quality weather forecasts available worldwide

Express Computer (press release) (blog)

... outages; logistics companies can plan better with on-road weather forecast for just in time needs of industry – impact of IBM GRAF is boundless.”.

Rolex And National Geographic Society Install The World's Highest Weather Station On Mount

...

Singapore Tatler

Besides installing five weather stations, Rolex and National Geographic Society collect precious scientific data during the Perpetual Planet Extreme ...

We cant change meteorology, we need to curb emissions: Forecast scientist

Hindustan Times

The model developed by Pune based Indian Institute of Tropical Meteorology (IITM) has the capability of apportioning other sources also. The team ...

Climate change expected to shift location of East Asian Monsoons

Posted: 13 Nov 2019 04:51 AM PST

More than a billion people in Asia depend on seasonal monsoons for their water needs. The Asian monsoon is closely linked to a planetary-scale tropical air flow which, according to a new

study, will most likely shift geographically as the climate continues to warm, resulting in less rainfall in certain regions.

Stalled weather patterns will get bigger due to climate change

Posted: 13 Nov 2019 04:51 AM PST

Climate change will increase the size of stalled high-pressure systems that can cause heat waves, droughts and other extreme weather, according to a new study.

Contributors needed! The newly-launched Meteorological Technology International news website (<https://lnkd.in/gpcgGK2>) is looking for industry-experts to write opinion articles for the site. Do you have something interesting to say about the latest meteorological or hydrological forecasting techniques or have an opinion on the next big trend, challenge or technology in the met world? Then get in touch! We are looking for 600-800-word articles, which will be featured on our site and in our weekly newsletter! Contact me, helen.norman@ukimediaevents.com, for more information. [hashtag#meteorology](#) [hashtag#weatherforecast](#) [hashtag#hydrology](#) [hashtag#weather](#) [hashtag#forecasting](#)

Others

Atos delivers two new BullSequana supercomputers to Météo-France to boost weather forecasting ...

GlobeNewswire (press release)

... two supercomputers based on its latest BullSequana XH2000 technology. ... it to achieve several scientific break-throughs in weather forecasting.

AV software leader teams up with weather company to beat Tesla

Digital Journal

AV innovator Renovo has partnered with Vaisala , a leading weather tech company. This partnership will help to integrate weather and road surface ...

5G network

Spark announces 5G roll out plans into 2020 and network vendors

- 5G roll out for further heartland regional and major centres in 2020
- Roster of technology vendors confirmed in line with multi-vendor strategy

Could 5G Technology Disrupt Ability To Predict Severe Storms?

CBS Denver

Weather satellites and 5G signals both use electromagnetic radiation waves. CBS4 meteorologist Dave Aguilera says the 23.8GHz spectrum is where ...

Heartland regions to get Spark's 5G broadband first

Five South Island regions will get an early Christmas present of 5G wireless broadband.

Aviation

Space sector contributes \$1.7 billion to NZ economy

The space sector has contributed almost \$1.7 billion to New Zealand's economy in the past financial year.

Air NZ cancels 82 international flights over Christmas period due to engines

Air New Zealand has cancelled some of its international flights due to ongoing issues with its Rolls-Royce engines.

Beyond Weather Forecasting: ClimaCell Launches Insights Dashboard That Can Predict How ...

PRNewswire (press release)

The aviation industry can use Insights Dashboard's hyper-accurate forecasts to help crews prepare for deicing events, enabling them to decide which ...

Business/Insurance

Leaders who stand out...

Gulf Digital News

One example of using technology is their focus on weather forecasting. There are 14 regions around the UK where the weather is forecast to make ...

Munich Re Syndicate to leverage ClimaCell's exclusive weather data

Reinsurance News

By utilising ClimaCell's Insights Dashboard technology, it's expected that ... AI and Weather-Of-Things data to produce accurate weather forecasting.

Energy and Mining

Natural Gas: Massive Weather Model Divergence Presents Excellent Trading Setup

Seeking Alpha

ECMWF-EPS and GFS-ENS have very different views at the moment for where the weather is trending. For GFS-ENS, the blocking pattern in Canada ...

Climate impact of hydropower varies widely

Hydropower is broadly considered to be much more environmentally friendly than electricity generated from fossil fuels, and in many cases this is true. However, a new study reveals that the climate impact of hydropower facilities varies widely throughout the world and over time, with some facilities emitting more greenhouse gases than those burning fossil fuels.

Is renewable energy too weather-dependent?

Buffalo News

Fossil-fueled power plants cause pollution and climate problems, true ... Iowa reports they now generate 40% of their energy from wind turbine farms. ... achieving a \$500,000 savings in a one-hour period during peak demand.

Fire

Australia bushfires to 'worsen' this week, says fire commissioner

National Post

MELBOURNE, Nov 17 (Reuters) — Rising temperatures, lightning strikes and erratic winds are set to fan wildfires in Australia in the week ahead, ...

Climate change-fueled US wildfires take toll on those who fight them

"You have 200 homes destroyed. Five years ago, that would have been crazy. Losing 200 now was a win. It was a victory that no one died," says one firefighter

NZ's wildfire future: which regions are most at risk?

New Zealand's fast-rising fire danger has prompted questions about how prepared our communities are for big blazes - and whether development should even be allowed in highest-risk places.

10 ways climate change can make bushfires worse

NEWS.com.au

The current fires, however, are not influenced by an El Nino event. Unmanageable intensity. Climate change not only boosts the likelihood of wildfires, ...

Health

9 ways the climate crisis is killing you (right now)

Wherever you live, the climate crisis is having an impact on your health. Here are nine charts that show how it is damaging the collective health of humanity

Consumer NZ says nine out of 20 sunscreens don't provide protection they claim

Cancer Society sunblock has failed to live up to its sun-protection claims for the second year running, Consumer NZ says.

History

D-Day: How meteorologists helped win the war

Yahoo News Canada

"No models, no satellites," Weather Network meteorologist Dr. Doug Gillham says of the methods at the time. "It just came down to an understanding of ...

Lightning strikes almost doomed the 1969 Apollo 12 Moon mission

The Weather Network

Thursday, November 14th 2019, 8:00 pm - Fifty years ago, two bolts of lightning struck Apollo 12 seconds after launch, but quick thinking saved the ...

How AI is about to take us back into NZ's weather past

A world-first project could dramatically improve what we know about New Zealand's weather, by using artificial intelligence to trawl through handwritten records stretching back more than 150 years

Hydrology / Flooding

Water rising as Lake Wakatipu's alert level looms

Twenty years almost to the day of the worst floods in Queenstown's history, Lake Wakatipu's level is nearing its "high" alert threshold.

Climate explained: Why coastal floods are becoming more frequent as seas rise

I saw an article claiming that "king tides" will increase in frequency as sea level rises. I am sceptical. What is the physics behind such a claim and how is it related to climate change? My understanding is that a king tide is a purely tidal effect, related to Moon, Sun and Earth axis tilt, and is quite different from a storm surge.

Lightning

As lightning strikes surge, Bangladesh plants a defence

Climate shifts are leading to more deadly lightning - but an effort to plant palm trees could cut the risks

This is how most bushfires in Australia start, and how we know

ABC News

As fires continue to burn in different parts of Australia, investigators work to ... "Positively charged lightning is far more likely to start a fire," he said.

Satellites and radar

Arianespace to launch Taiwan-developed satellite Triton in 2021

Focus Taiwan News Channel

Taipei, Nov. 15 (CNA) A locally developed weather satellite is expected to be launched by France-based Arianespace in 2021, a source said Friday.

Transport/roading/shipping/freight

Iteris ClearPath Weather Chosen by Oklahoma Department of Transportation for Road ...

Associated Press

... selected Iteris' ClearPath Weather® solution to provide weather forecasting services ... "Vital data insights from ClearPath Weather will allow Oklahoma DOT to ... application programming interfaces (APIs) to access weather data.

Innovation and technologies and AI

Deep neural networks speed up weather and climate models

Science Daily

"We used 20 years of computer-generated data from the WRF model to train the neural networks and two years of data to evaluate whether they could ...

Why are weather apps still so unreliable?

Mic

"There are many sources of potential differences," he tells Mic. "They may be caused by the use of different data sources ... quality control of the data, ...

Climate change / global warming / sea level rise

FACTBOX-Heat is on to bring cooling to 1 billion people without it

As global temperatures continue to creep upward as a result of climate change, a little over 1 billion people face threats because they lack cooling methods

For some urban areas, a warming climate is only half the threat

A new study projects that the growth of urban areas in the coming decades will trigger "extra" warming due to a phenomenon known as the urban heat island effect (UHI). According to their findings, urban expansion will cause the average summer temperature in these areas to increase about 0.5 to 0.6 degrees C -- but up to 3 degrees C in some locations.

Wildfires, disease and food loss predicted for world's climate future - research

A newborn today faces a future transformed by climate change, first by lack of food and then extreme weather, researchers say.

Climate change leaves 52 million hungry in Africa

The Southern Times

Oxfam says some areas were facing a second extreme drought in four years and worse than that sparked by El Nino in 1981. "In the south, parts of ...

Cloud seeding / Geoengineering

Royal rainmakers halt Phuket cloud-seeding operations

The Phuket News

PHUKET: The royal rainmaking division for Southern Thailand has ceased its operations to seed clouds over Phuket to fill the island's main reservoirs ...

Cloud seeding not an option for drought-ravaged Australia

7NEWS

When torrential rains flooded downtown Dubai earlier this month, the United Arab Emirates' zealous embrace of cloud seeding was blamed by some.

Journal and articles online

Downstream influence of mesoscale convective systems. Part 1: influence on forecast evolution

Samantha J. Clarke, Suzanne L. Gray, Nigel M. Roberts

Pages: 2933-2952 | First Published: 28 June 2019

Potential vorticity (PV) anomalies produced in a convection-permitting simulation of a mesoscale convective system (MCS) can persist after coarse graining to convection-parametrizing resolution. Perturbing a convection-parametrizing simulation to include these coarse-grained anomalies produces synoptic-scale forecast differences (compared to the unperturbed forecast) that cover the entire northern hemisphere after a few days and are largest at upper-tropospheric levels. Therefore, misrepresentation of PV structures associated with MCSs in convection-parametrizing simulations are a potential source of forecast error.

Downstream influence of mesoscale convective systems. Part 2: Influence on ensemble forecast skill and spread

Samantha J. Clarke, Suzanne L. Gray, Nigel M. Roberts

Pages: 2953-2972 | First Published: 12 July 2019

Perturbing convection-parametrizing simulations to include potential vorticity anomalies from convection-permitting simulations of a mesoscale convective system (MCS) produces systematic impacts on the downstream forecast in an ensemble, leading to alternate realizations of the forecast. The root mean square difference analysis shown here demonstrates that the effects of localized MCS perturbations are smaller than those of global operationally generated initial condition perturbations. Despite this, the combined ensemble spread is enhanced when including MCS perturbations, so they could be useful operationally.

Determination of automatic weather station self-heating originating from accompanying electronics

P. Pavlasek, A. Merlone, F. Sanna, G. Coppa, C. G. Izquierdo, J. Palencar, S. Duris

Version of Record online: 13 November 2019

This study focuses on the most commonly used temperature sensors within automatic weather stations, with a specific focus on evaluating the self-heating effect, which originates not only from the temperature sensor itself but also from the electrical components housed together within. The results of overall self-heating indicated a 0.07°C increase in temperature for the tested sensors when using the manufacturers' minimum recommended electric current supply. The use of elevated voltage levels up to 80% of recommended values shows a temperature increase as high as 0.32°C .

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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.

November 19, 2019

[Are atmospheric rivers the reason for Northern California's extreme weather?](#)

November 19, 2019 - The Press Democrat

It's been a tough few years for Northern California, disaster-wise. The north state has been hammered in quick succession by catastrophic drought, intense flooding and rampaging wildfires. While it's reassuring to know such extreme events are historically uncommon, they're also not simply a result of bad luck.

[Read MORE](#)

[Arctic in hot water: Sea ice minimal in Chukchi, Bering seas](#)

November 19, 2019 - [Phys.org](#)

The U.S. research vessel Sikuliaq can break through ice as thick as 2.5 feet (0.76 meters). In the Chukchi Sea northwest of Alaska this month, which should be brimming with floes, its limits likely won't be tested.

[Read MORE](#)

[Renewable energy: climate crisis 'may have triggered faster wind speeds'](#)

November 19, 2019 - [MSN.com](#)

The global climate crisis could lead to more renewable electricity being generated by spurring faster wind speeds for the world's growing number of windfarms, according to research.

[Read MORE](#)

[Regional weather patterns are viewed through partisan lenses, poll finds](#)

November 18, 2019 - SFGate

People from North Carolina to Texas's Gulf Coast agree that their areas have been hard hit by extreme storms and hurricanes in recent years. But they disagree with one another on whether climate change is a major factor - and political allegiances make up the dividing line.

[Read MORE](#)

[IBM launches supercomputer-powered global weather forecasting](#)

November 18, 2019 - [Techhq.com](#)

The computing giant has launched an hourly-updating global weather model, providing accurate forecasts down to a 2-mile radius across the globe.

[Read MORE](#)

[Bacteria from the ocean floor could be influencing Arctic weather](#)

November 17, 2019 - Anchorage Daily News

Scientists have identified a surprising new mechanism that could be impacting cloud formation and weather patterns in the Arctic — bacteria from the ocean floor.

[Read MORE](#)

[Sustainable living lessons from Antarctica's first zero-emission research station](#)

November 16, 2019 - Fast Company

The Princess Elisabeth station uses 100% renewable energy supplied by the sun, the wind, and plentiful frozen water.

[Read MORE](#)

[NASA gets an eyeful of Typhoon Fengshen](#)

November 15, 2019 - [Phys.org](#)

NASA's Terra satellite captured an image of Typhoon Fengshen after its eye opened as Fengshen had strengthened from a tropical storm to a typhoon and developed an eye.

[Read MORE](#)

[A surprising answer to a hot question: Controlled burns often fail to slow a bushfire](#)

November 15, 2019 - [Phys.org](#)

As sure as night follows day, this week's bushfires prompted inevitable debate about whether fire authorities should have carried out more hazard reduction burning, and whether opposition from conservationists prevented this.

[Read MORE](#)

[New Moon-Seeking Sensor Aims to Improve Earth Observations](#)

November 14, 2019 - NASA

A new instrument with its eye on the Moon is taking off aboard a high-altitude NASA plane to measure the Moon's brightness and eventually help Earth observing sensors make more accurate measurements.

[Read MORE](#)

[NOAA releases new strategies to apply emerging science and technology](#)

November 14, 2019 - NOAA

NOAA today is announcing new strategies to dramatically expand the agency's application of four emerging science and technology focus areas — NOAA Unmanned Systems, Artificial Intelligence, 'Omics, and the Cloud — to guide transformative advancements in the quality and timeliness of NOAA science, products and services.

[Read MORE](#)

[Combining satellites, radar provides path for better forecasts](#)

November 11, 2019 - ScienceDaily

Every minute counts when it comes to predicting severe weather. Combining data from cutting-edge geostationary satellites and traditional weather radar created a path toward earlier, more accurate warnings, according to researchers who studied supercell thunderstorms in the Midwest.

Read MORE

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American Meteorological Society

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My latest WeatherEye from John Maunder

<https://www.sunlive.co.nz/blogs/14068-the-southern-oscillation-index.html>

<https://www.sunlive.co.nz/blogs/13972-tropospheric-temperatures-1979-to-september-2019.html>

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Thanks to our regular contributors

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