JGR Atmospheres

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Articles from *Journal of Geophysical Research: Atmospheres* featured in Research Spotlights, Editor's Highlights, Press Releases, Blogs, and Editor's Vox

Satellite Measurements of Stratospheric Forest Fire Smoke

Editor Highlight—Intense boreal forest fires in August 2017 caused smoke plumes that reached record levels in the stratosphere; satellite measurements show that the effects rivaled a moderate volcanic eruption. Read more »

Wildfire Smoke Traps Itself in Valleys

Other—Simulations show how wildfire smoke increases atmospheric stability inside some valleys, creating a feedback loop that prevents its dispersion. Read more »

Radioactive chlorine from nuclear bomb tests still present in Antarctica

Blog—Antarctica's ice sheets are still releasing radioactive chlorine from marine nuclear weapons tests in the 1950s, a new study finds. This suggests regions in Antarctica store and vent the radioactive element differently than previously thought. The results also improve scientists' ability to use chlorine to learn more about Earth's atmosphere. Read more »

Nuclear Winter May Bring a Decade of Destruction

Eos Feature—New climate models present a grim prediction of what would happen worldwide after a nuclear war between the United States and Russia. Read more »

Scientists identify weather event behind extreme cold in Europe and Asia during February 2018

Blog—Researchers have identified a weather event that caused an unusually extreme cold wave to hit Europe and Asia during the winter of 2018, which could help atmospheric scientists better predict similar events in the future, according to a new study. Read more »

Lightning flashes illuminate storm behavior

Blog—Anybody who has ever tried to photograph lightning knows that it takes patience and special camera equipment. Now, a new study is using those brief but brilliant flashes to illuminate cloud structures and shed light on storm cell behavior, giving weather forecasters new tools for predicting lightning hazards. Read more »

Lightning 'superbolts' form over oceans from November to February

Blog—The lightning season in the Southeastern U.S. is almost finished for this year, but the peak season for the most powerful strokes of lightning won't begin until November, according to a newly published global survey of these rare events. Read more »

Hydrological Footprint of Atmospheric Rivers on Land

Editor Highlight—Atmospheric rivers that make landfall in the western United States have significant impacts on the surface water balance, sharpening the seasonality of water resources in coastal watersheds. Read more »

Radiosondes Measure Atmospheric Turbulence Over North America

Editor Highlight—Analyses of high-resolution radiosonde balloon measurements have provided a novel climatology of atmospheric turbulence parameters in the troposphere and lower stratosphere. Read more »

How the Pacific Ocean influences long-term drought in the Southwestern U.S.

Blog—The Southwest has always faced periods of drought. Most recently, from late 2011 to 2017, California experienced years of lower-than-normal rainfall. Read more »

Updating a Crucial Source of Sea Surface Temperature Data

Research Spotlight—A new version of a major sea surface temperature data set reduces systematic errors in measurements of one of the most important indicators of the state of Earth's climate system. Read more »

Decades-old pollutants melting out of Himalayan glaciers

Blog—Melting Himalayan glaciers are releasing decades of accumulated pollutants into downstream ecosystems, according to a new study. Read more »

Atmospheric rivers getting warmer along U.S. West Coast

Blog—Most of the West Coast of the United States relies on a healthy winter snowpack to provide water through the dry summer months. But when precipitation falls as rain rather than snow, it can diminish summer water supplies, as well as trigger floods and landslides. Read more »

Linking Regional Weather and Climate to Remote Events

Editor's Highlight —A new index for quantifying regional sensitivities to the influence of periodic events. Read more »

Fading Air Pollution Reduces Fog in Central Valley

Research Spotlight—The tule fog in California's Central Valley is notorious for causing delays and accidents throughout the region; however, a decrease in air pollutants is reducing the fog's frequency. Read more »

Feeling Heat on the Roof of the World

Blog—The Tibetan Plateau, also known as the "roof of the world," is getting hotter. This process is especially fast in places marked by retreating snow, according to new research by scientists from the University of Portsmouth and the Institute of Tibetan Plateau Research of the Chinese Academy of Sciences (ITPCAS). Read more »

Loss of Arctic sea ice stokes summer heat waves in southern U.S.

Blog—Continued ice loss may mean more heat waves Read more »

The Tropical Atmosphere's Balancing Act

Research Spotlight—A new study finds that the tropical atmosphere maintains radiative-convective equilibrium as a whole, but not at smaller scales. Read more »

Polar Vortex Deformations Change Tidal Weather in the Mesosphere

Editor's Highlight —Wind observations made by a high-latitude radar network shed new light on the rapid response of atmospheric tides in the upper mesosphere to stratospheric sudden warmings. Read more »

New Studies Increase Confidence in NASA's Measure of Earth's Temperature

Blog—A new assessment of NASA's record of global temperatures revealed that the agency's estimate of Earth's long-term temperature rise in recent decades is accurate to within less than a tenth of a degree Fahrenheit, providing evidence that past and future research is correctly capturing rising surface temperatures. Read more »

Low-angle Normal Fault in Papua New Guinea is Rolling Along

Editor's Highlight —Geologic and geomorphic observations of an active low-angle normal fault reveal a rolling-hinge mechanism accommodating the exhumation of a metamorphic core complex in Papua New Guinea. Read more »

Did a Volcanic Eruption in 1783 Change the Climate in Europe?

Research Spotlight—A new model of the Laki eruption in Iceland suggests that normal climate variability was to blame for the anomalously warm summer. Read more »

Household Cooking and Heating Affect Health and Climate in China

Editor's Highlight —Black and organic particle emissions have significant impacts on both health and climate, and household cooking and heating activities may contribute substantially to these impacts in China. Read more »

New Observations of Thunderstorm Updrafts and Downdrafts

Editor's Highlight —Unique measurements of air motion within deep convective clouds offer new insights in our understanding of these storms and provide constraints for weather and climate prediction. Read more »

Previous Research Has Underestimated Black Carbon Emissions

Research Spotlight—New observational constraints suggest that U.S. emissions of this heat-absorbing aerosol were 80% higher during the late 20th century than prior estimates have indicated. Read more »

Uncovering polynya: new research unravels 43-year-old Antarctic mystery

Blog—Researchers at NYU Abu Dhabi have discovered how the Maud-Rise Polynya that was initially spotted in Antarctica in 1974, reappeared in September 2017 at the same location. Read more »

Microbes hitch a ride on high-flying dust

Blog—High-altitude dust may disperse bacterial and fungal pathogens for thousands of miles, seeding far-flung ecosystems and potentially impacting human health Read more »

Dust toll in Africa exceeds deaths from HIV

Blog—Mineral dust from the Sahara is the biggest contributor to air pollution-related premature deaths on the African continent Read more »

3D Radiation-Topography Interaction Warms Up Tibetan Plateau

Editor's Highlight —3-D radiation-topography interaction, which can increase the sunlight absorption by the surface, is missing in all climate models, causing strong cold biases over the Tibetan Plateau. Read more »

Atmospheric Gravity Wave Science in the Polar Regions

Editor's Vox—A joint special issue explores the potential of collaboration to help understand atmospheric gravity waves in the Polar Regions and their effect on global circulation. Read more »

Probing Wildfire Smoke Plumes Up Close

Research Spotlight—Direct observations from flights over coastal California reveal more about aerosol plumes released by burning biomass. Read more »

Precipitation in the Tropics: A New View

Research Spotlight—The first study to simultaneously investigate precipitation and cloud structures in tropical weather systems concludes observation systems significantly overestimate the height of raining clouds. Read more »

Improving Retrievals for Vertically Inhomogeneous Warm Clouds

Editor's Highlight —Cloud droplet size changes with height, but passive sensors are virtually blind to see it; however, combining passive with active sensors helps profile it in vertically inhomogeneous warm clouds. Read more »

What Drives Surface Winds in a Deep Valley?

Editor's Highlight —Surface winds in a Himalayan valley are found to vary daily and seasonally due to factors including pressure gradient, advection, turbulent vertical mixing, and the presence of glaciers. Read more »

How Brown Carbon and Coatings on Black Carbon Affect Absorption

Editor's Highlight —While ambient black carbon absorption is shown largely independent of coatings, distinct types of atmospheric brown carbon coexist, deriving from primary emissions and secondary processing. Read more »

Passing Aircraft Wring Extra Snow and Rain out of Clouds

Press Release —Cooling in the wake of aircraft wings and propellers freezes water droplets in supercooled clouds to tiny ice particles. The falling particles can seed heightened precipitation in underlying clouds. Read more »

Observations Show Gravity Waves Above Antarctica Dance in Winter

Research Spotlight —Year-round observations show gravity waves above Antarctica exhibit seasonal patterns that peak in winter, which could help researchers trace the source of this mysterious phenomenon. Read more »

Managing Uncertainties in Climate Engineering

Editor's Vox —Control theory and climate engineering meet in a new special issue of JGR: Atmospheres. Read more »

Improving Retrievals for Partially Cloudy Pixels

Editor's Highlight —Cloud retrievals for partly cloudy pixels might be able to be improved by using high-resolution samples in a visible to near-infrared band, which many satellite sensors offer. Read more »

Extreme Heat Increasing in Both Summer and Winter

Press Release —A new study shows extreme heat events both in the summer and in the winter are increasing across the U.S. and Canada, while extreme cold events in summer and winter are declining. Read more »

What Makes a Terrestrial Gamma-Ray Flash in Thunderclouds?

Editor's Highlight —Two lightning flashes were observed in the same location: One produced a bright gamma-ray flash with about 1000 counts per millisecond, but the other did not. Read more »

Greenhouse Gas Inventories Underestimate Methane Emissions

Research Spotlight —A new study in the Baltimore-Washington metropolitan area reveals prior estimates may significantly underrepresent methane emissions, particularly from landfills and natural gas systems. Read more »

Retrieving Tropospheric Ozone from Ground-based Spectroscopy

Editor's Highlight —A new technique can retrieve the profile of ozone from surface to tropopause by MAX-DOS ground-based measurements. Read more »

Dropsondes Reveal Atmospheric Boundary Layers Over Antarctic

Editor's Highlight —636 high-resolution dropsondes reveal four types of atmospheric boundary layer over the Antarctic, including well-mixed and convective types. Read more »

Polarization Measurements Probe the Physics of Lightning

Editor's Highlight —A new measurement capability can detect the polarization of the radio frequency wave of lightning sources, which reveals different forms of lightning breakdown processes. Read more »

Diurnal Variation of Rainfall over the Equator Revisited

Editor's Highlight —Radar data show an afternoon precipitation maximum in the equatorial Indian Ocean in addition to the nocturnal maximum; this occurs under light surface winds and suppressed large-scale convection. Read more »

Study finds unexpected levels of bromine in power plant exhaust

Blog—Some coal-fired power plants in the United States emit gases that may have significant effects on the atmosphere and can produce harmful compounds in drinking water, according to new research. Read more »

New Lidar Comparisons of Temperatures Near the Mesopause

Editor's Highlight —For the first time, simultaneous measurements of upper atmosphere temperatures over altitudes 80 to 110 kilometers have been made by two complementary lidar techniques. Read more »

Changes in Polar Jet Circulation Bring More Saharan Dust to the Arctic

Blog—Poleward transport of warm, moist, and dust-laden air masses from the Sahara Desert results in ice melting in southeast Greenland, NYU Abu Dhabi scientists have found Read more »

New Characterization of the Mesospheric Polar Vortices

Editor's Highlight —Polar vortices play a central role in coupling the atmosphere from the ground to the middle atmosphere. New satellite diagnostics describe mesospheric polar vortices and coupling to lower altitudes. Read more »

Wind Speed Governs Turbulence in Atmospheric Inversions

Research Spotlight —Measurements made during a field campaign in Idaho indicate that the speed of winds 2 meters above Earth's surface determines the type of turbulence present in nighttime inversions. Read more »

Brown Carbon from Increased Shipping Could Harm Arctic Ice

Research Spotlight—Emission from a ship's engine gives clues to how much light-absorbing molecules may build up on and above snow and sea ice. Such emissions are likely to increase as more ships venture into the Arctic. Read more »

Research provides new clues to origins of mysterious atmospheric waves in Antarctica

Blog—Research team finds link between gravity waves in the upper and lower Antarctic atmosphere, helping create a clearer picture of global air circulation Read more »

Researchers find an easier way to simulate cloud cover

Blog—Cloud formation and distribution follows simple thermodynamic, statistical laws. Read more »

Evaluating the Accuracy of Seasonal Climate Predictions

Research Spotlight —An analysis of historical modeling outputs is improving our understanding of the relationships between different types of seasonal forecasting skills. Read more »

Exploring a More Dynamic Arctic Icescape

Editor's Vox —A joint special issue presents new findings from a field campaign in the Arctic Ocean which highlights key processes that need to be taken into account to predict the future of the Arctic ice pack. Read more »

A bolt of insight

Blog—In the western Utah desert, the Telescope Array sprawls across an area the size of New York City, waiting for cosmic rays. The facility detects the high-energy particles that collide with Earth’s atmosphere constantly; the cosmic rays trigger the 500-plus sensors once every few minutes. Read more »

Toward More Realistic Modeling of the Mesosphere

Research Spotlight —New study reveals complex behavior of gravity waves in the atmosphere. Read more »

Improving Tropical Cyclone Predictions in the Gulf of Mexico

Research Spotlight—The National Oceanic and Atmospheric Administration's newest High Resolution Atmospheric Model captures the influence of intraseasonal oscillations on tropical cyclone activity. Read more »

Diagnosing the Warm Bias in the Central United States

Editor's Vox —A set of four papers published in JGR: Atmospheres present results from a project investigating why models predict warmer surface temperatures than are observed in the central United States. Read more »

Melting of Arctic Mountain Glaciers Unprecedented in the Past 400 Years

Press Release—Warmer summer temperatures in the Alaska Range are melting 60 times more snow today than melted during the summer before the start of the industrial period 150 years ago, according to new research. Read more »

Spectral Surface Emissivity Improves Arctic Climate Simulation

Editor's Highlight —Improving the representation of surface emissivity in the Community Earth System Model reduces its Arctic winter cold bias from 7 to 1 Kelvin degree. Read more »

What Causes Flash Floods in the Middle East?

Research Spotlight —Researchers zero in on the large-scale meteorological processes driving extreme precipitation events in the hot, arid desert region. Read more »

Continental Convection Reaches New Highs

Editor's Highlight —Ten years of high-resolution gridded NEXRAD radar data provide a new data set to quantify tropopause-overshooting convection over the continental United States. Read more »

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