



Volume 39, Issue 17

16 September 2012

Brief Detailed

Atmospheric Science

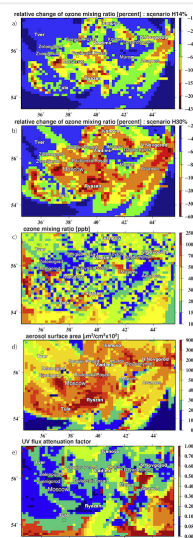
Significant light induced ozone loss on biomass burning aerosol: Evidence from chemistry-transport modeling based on new laboratory studies

I. B. Kononov, M. Beekmann, B. D'Anna, C. George

First Published: 14 September 2012 Vol: 39, L17807 | DOI: 10.1029/2012GL052432

KEY POINTS

- Photo induced ozone loss on biomass burning aerosol is a significant process
- Aerosol is a self-inhibiting agent of the heterogeneous light induced ozone loss
- Uncertainties in reactivity of biomass burning aerosol call for new studies



▶ 1 of 2

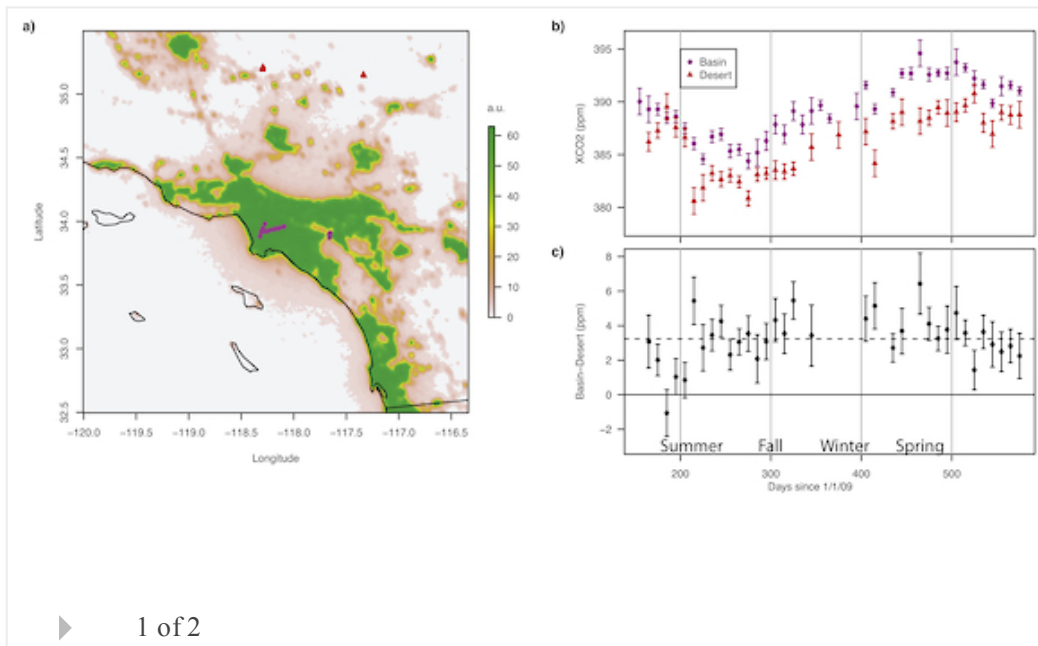
Space-based observations of megacity carbon dioxide

Eric A. Kort, Christian Frankenberg, Charles E. Miller, Tom Oda

First Published: 14 September 2012 Vol: 39, L17806 | DOI: 10.1029/2012GL052738

KEY POINTS

- Existing satellite observations can detect megacity CO₂ enhancements
- These observations can be used to track anthropogenic emissions trends in time



▶ 1 of 2

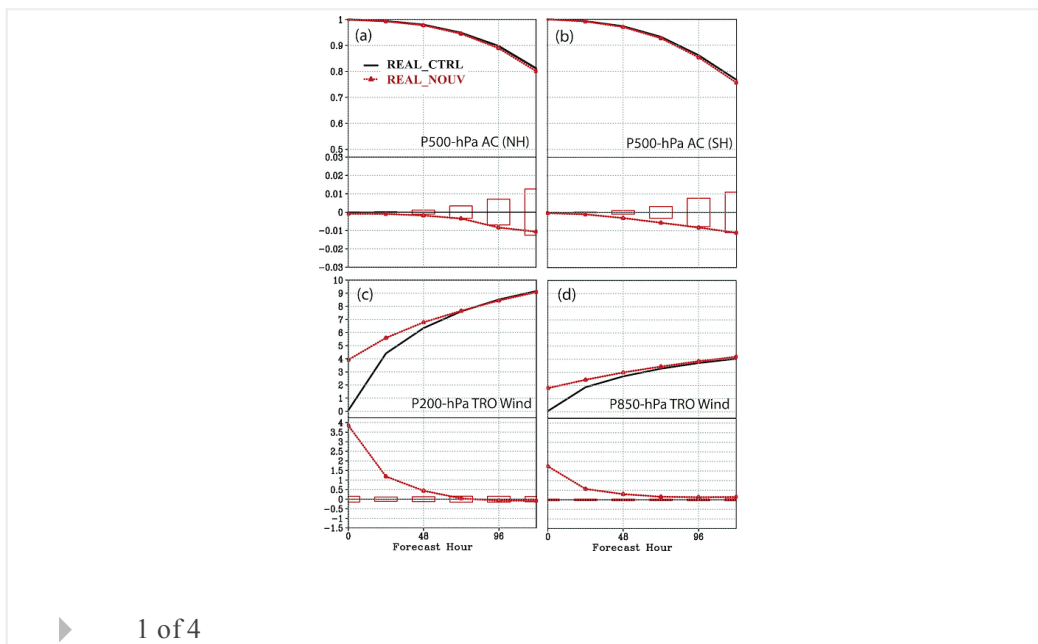
Observation system simulation experiments for a global wind observing sounder

Lars Peter Riishojgaard, Zaizhong Ma, Michiko Masutani, John S. Woollen, George D. Emmitt, Sidney A. Wood, Steven Greco

First Published: 13 September 2012 Vol: 39, L17805 | DOI: 10.1029/2012GL051814

KEY POINTS

- This OSSEs support the idea that wind observations are important for NWP skill
- Hypothetical wind lidar provides a important contribution to NCEP forecast skill
- Impact on skill is largest in tropics but is sustained longer in extratropics



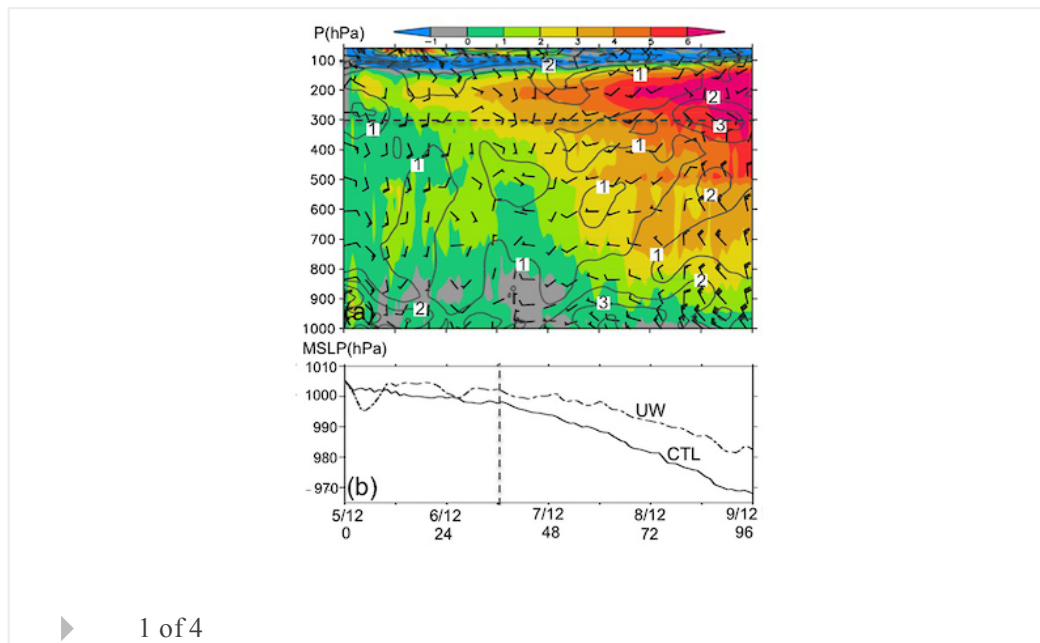
▶ 1 of 4

Roles of upper-level processes in tropical cyclogenesis

Da-Lin Zhang, Lin Zhu

KEY POINTS

- Tropical cyclogenesis is triggered as the upper-level warming increases
- Upper-level flow and shear are detrimental to tropical cyclogenesis
- The upper- and low-level processes play different roles in tropical cyclogenesis



Correction to “Co-variation of temperature and precipitation in CMIP5 models and satellite observations”

Chuniel Liu, Richard P. Allan, George J. Huffman

First Published: 8 September 2012 Vol: 39, L17803 | DOI: 10.1029/2012GL053452

Free

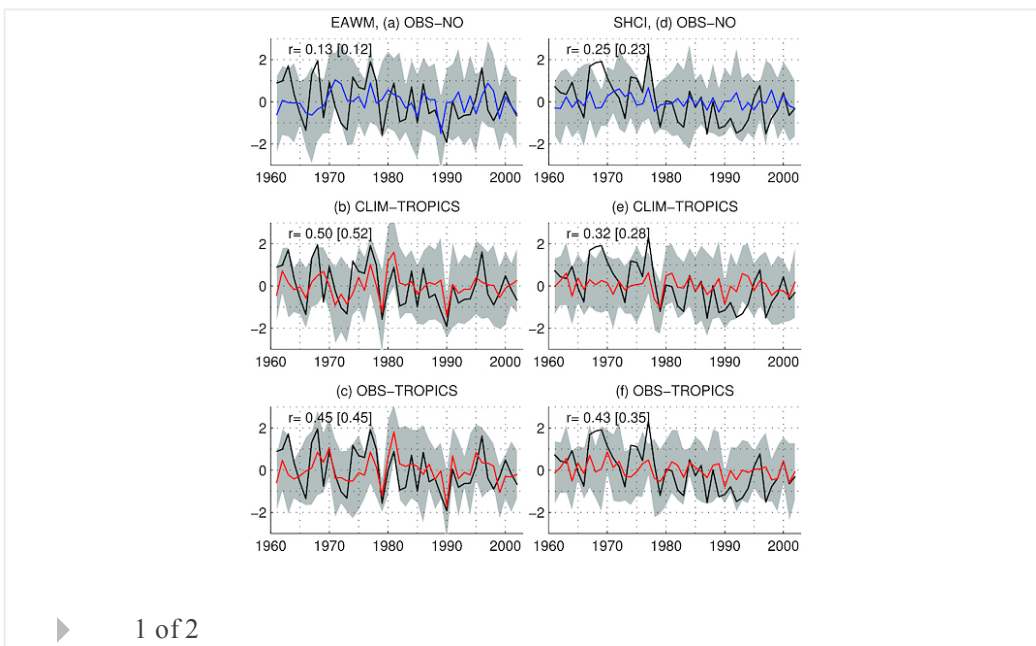
Tropical impact on the East Asian winter monsoon

G. Gollan, R. J. Greatbatch, T. Jung

First Published: 5 September 2012 Vol: 39, L17801 | DOI: 10.1029/2012GL052978

KEY POINTS

- Tropical impact on interannual variability of the East Asian winter monsoon
- Tropical influence and extratropical SST and sea-ice matter for the trend
- AGCMs driven only by observed SST and sea-ice give poor results



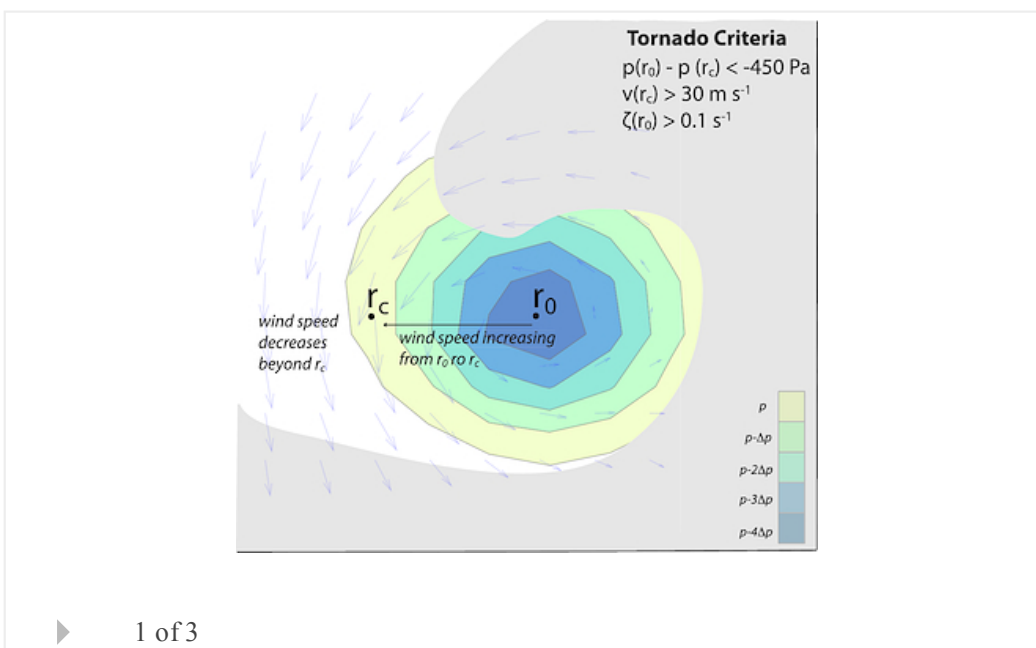
Environmental factors influential to the duration and intensity of tornadoes in simulated supercells

Jason Naylor, Matthew S. Gilmore

First Published: 5 September 2012 Vol: 39, L17802 | DOI: 10.1029/2012GL053041

KEY POINTS

- The 0-3 km SREH is strongly related to tornado duration
- The 0-3 km SREH also strongly related to tornado intensity
- Relationships are even stronger with a multiple linear regression



Climate

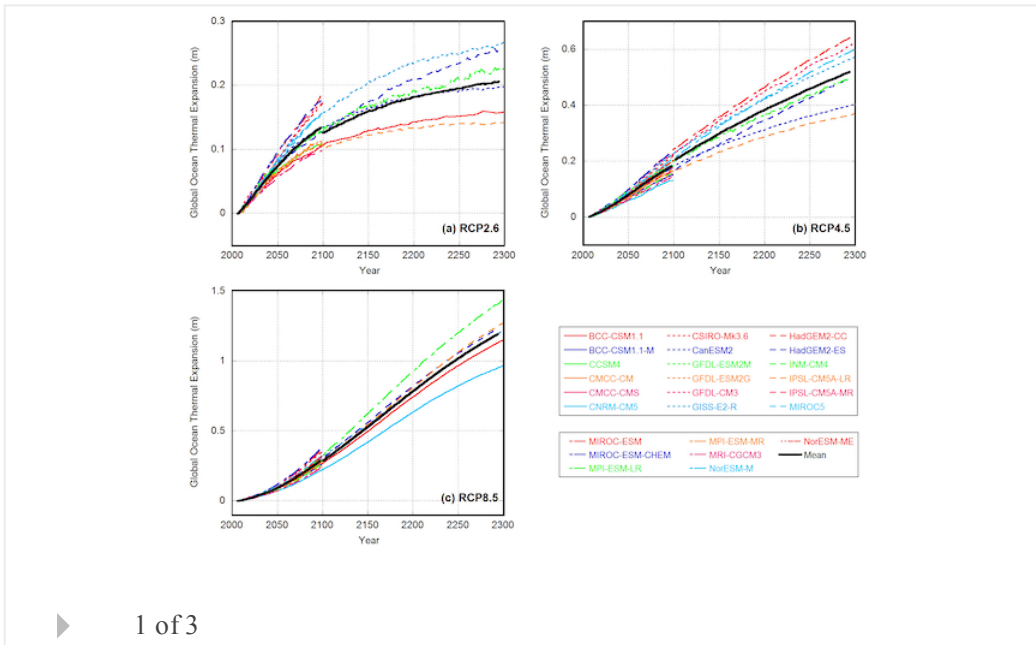
Century to multi-century sea level rise projections from CMIP5 models

Jianjun Yin

First Published: 15 September 2012 Vol: 39, L17709 | DOI: 10.1029/2012GL052947

KEY POINTS

- Thermal expansion and the dynamic sea level change are highly scenario-dependent
- The CMIP5 results are generally consistent with those of CMIP3
- Models still show uncertainty in the dynamic sea level projection



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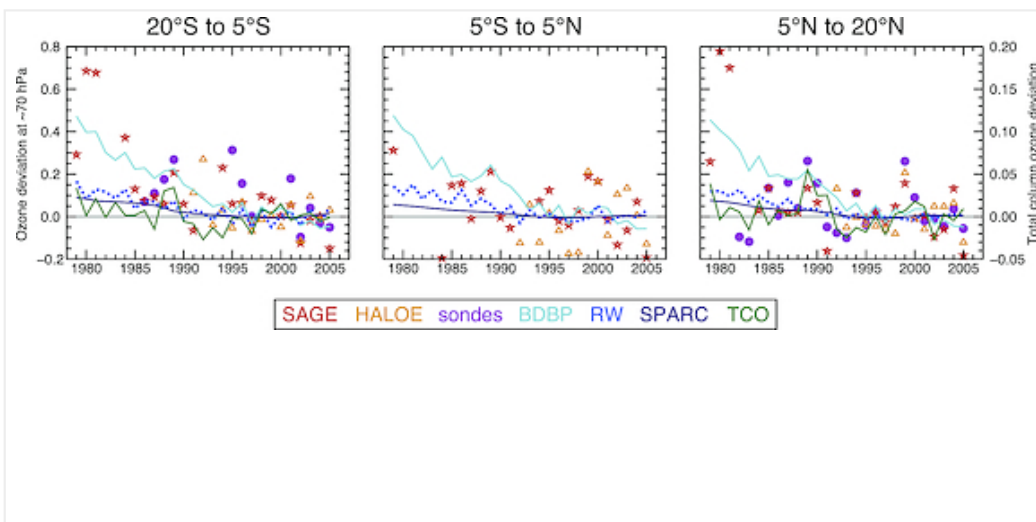
Uncertainties in the evolution of stratospheric ozone and implications for recent temperature changes in the tropical lower stratosphere

Susan Solomon, Paul J. Young, Birgit Hassler

First Published: 14 September 2012 Vol: 39, L17706 | DOI: 10.1029/2012GL052723

KEY POINTS

- Tropical stratospheric ozone displays large interannual variability
- Available databases differ in fits to tropical stratospheric ozone trends
- Uncertain stratospheric ozone implies large uncertainties in temperature trends



How much do precipitation extremes change in a warming climate?

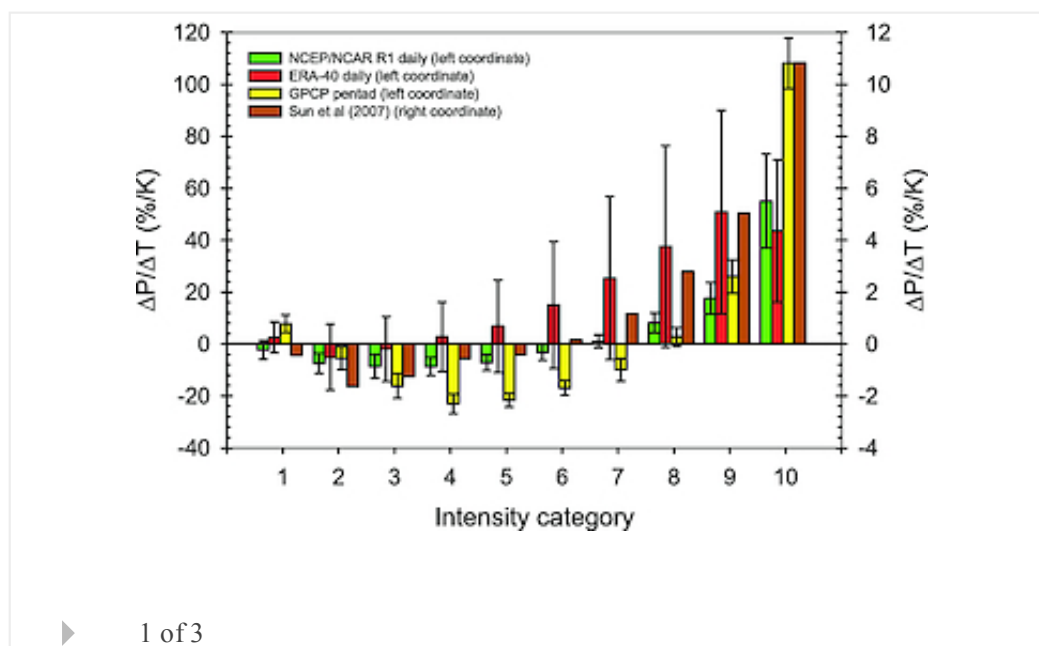
Chein-Jung Shiu, Shaw Chen Liu, Congbin Fu, Aiguo Dai, Ying Sun

First Published: 14 September 2012 Vol: 39, L17707 | DOI: 10.1029/2012GL052762

KEY POINTS

- Large increase in precipitation intensity derived from the GPCP is credible
- Reanalysis models can simulate the change of precipitation intensity
- Climate models can simulate the shape of intensity change but not the magnitude

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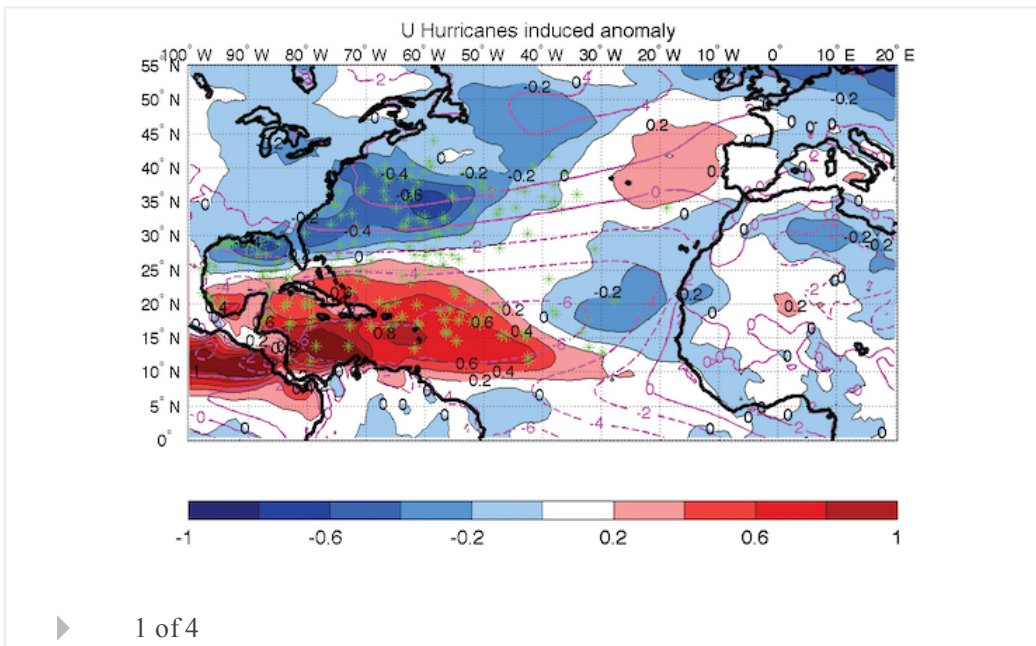
Tropical cyclone effects on Arctic Sea ice variability

Enrico Scoccimarro, Silvio Gualdi, Antonio Navarra

First Published: 13 September 2012 Vol: 39, L17704 | DOI: 10.1029/2012GL052987

KEY POINTS

- Atlantic hurricanes composite effect links the tropics to the Arctic basin
- Hurricane induced anomalies in sea level pressure impact the Arctic circulation
- A correlation between Atl TC activity and sea ice cover and motion is found



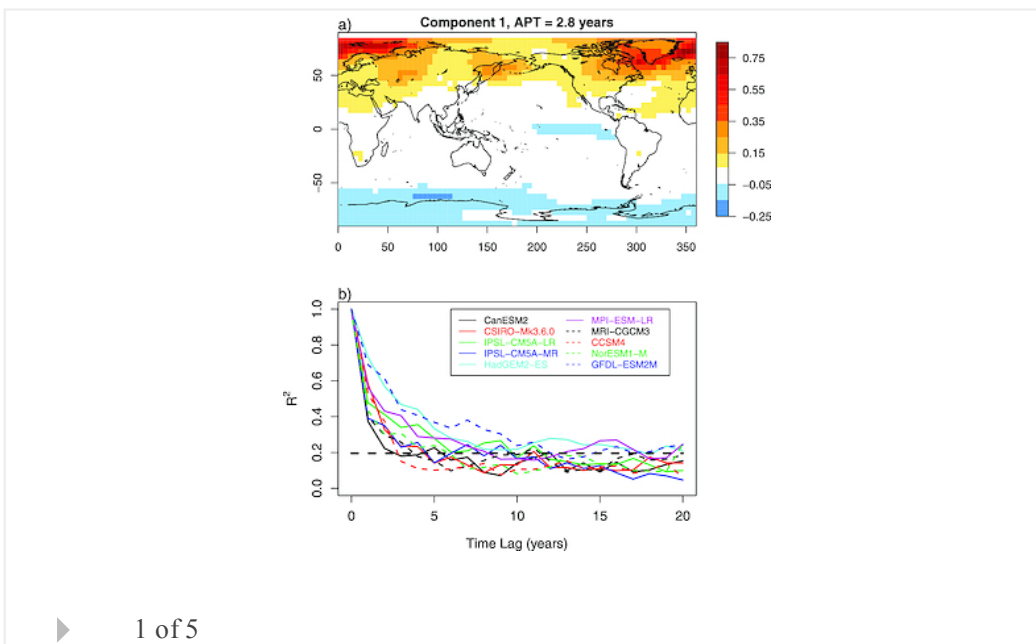
Multi-year predictability of temperature and precipitation in multiple climate models

Liwei Jia, Timothy DelSole

First Published: 13 September 2012 Vol: 39, L17705 | DOI: 10.1029/2012GL052778

KEY POINTS

- This study identifies spatial patterns that are predictable on multiyear scales



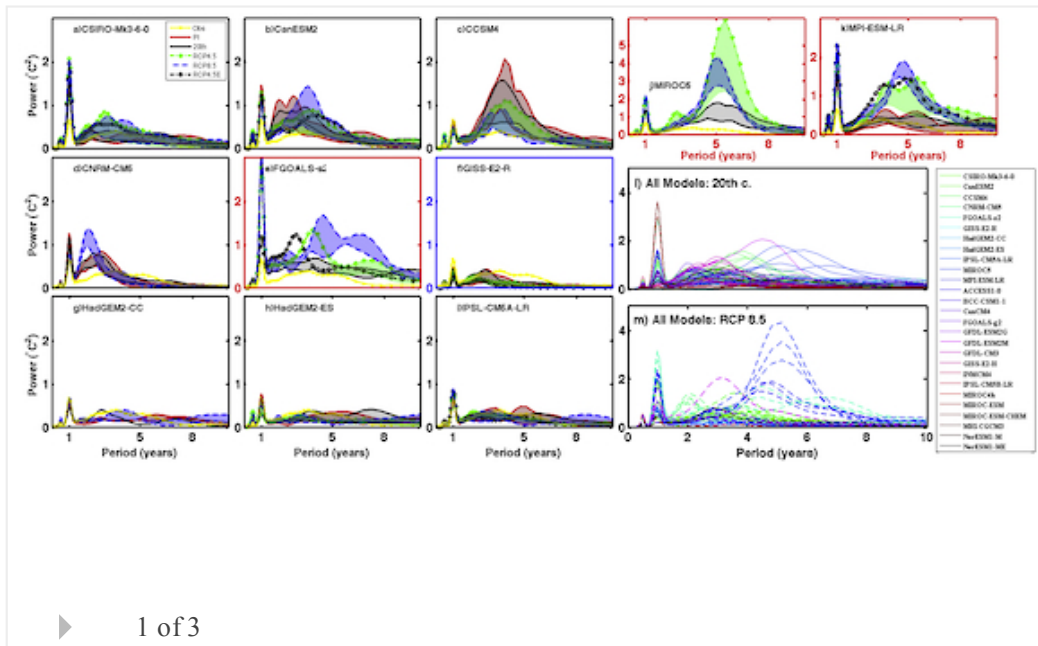
Significant changes to ENSO strength and impacts in the twenty-first century: Results from CMIP5

S. L. Stevenson

First Published: 12 September 2012 Vol: 39, L17703 | DOI: 10.1029/2012GL052759

KEY POINTS

- ENSO amplitude is insignificant in the majority of IPCC-class models
- ENSO amplitude change is not due to mean state or seasonal cycle changes
- The teleconnection response is sensitive to the ENSO amplitude change



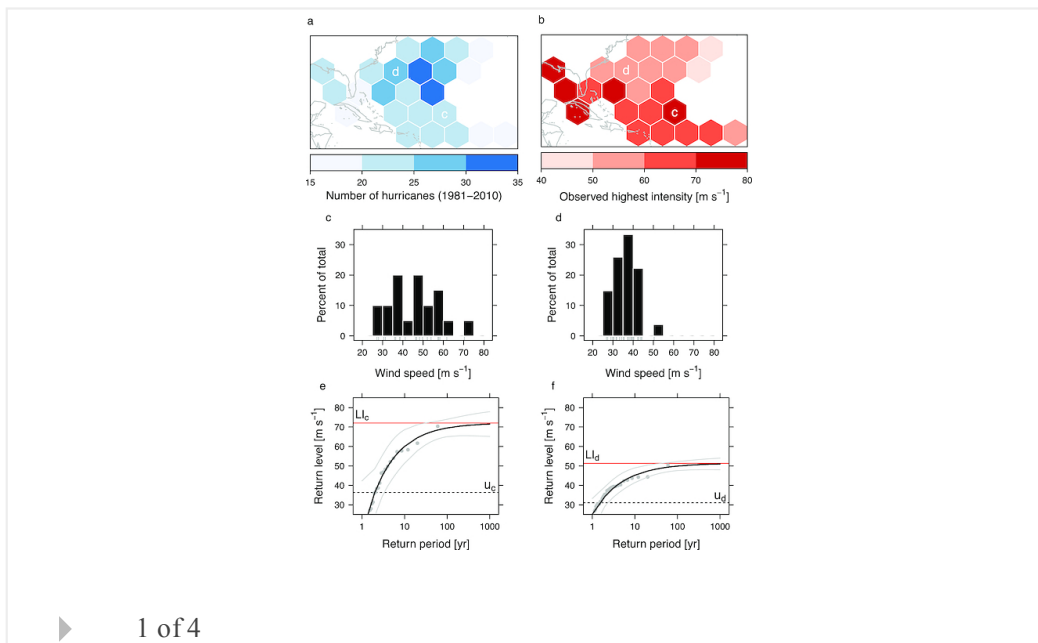
Sensitivity of limiting hurricane intensity to ocean warmth

J. B. Elsner, J. C. Trepanier, S. E. Strazzo, T. H. Jagger

First Published: 7 September 2012 Vol: 39, L17702 | DOI: 10.1029/2012GL053002

KEY POINTS

- Novel way to estimate sensitivity of strongest hurricanes to SST
- The sensitivity over the North Atlantic is about 8 m/s/C
- The sensitivity estimated from GCMs should match this value



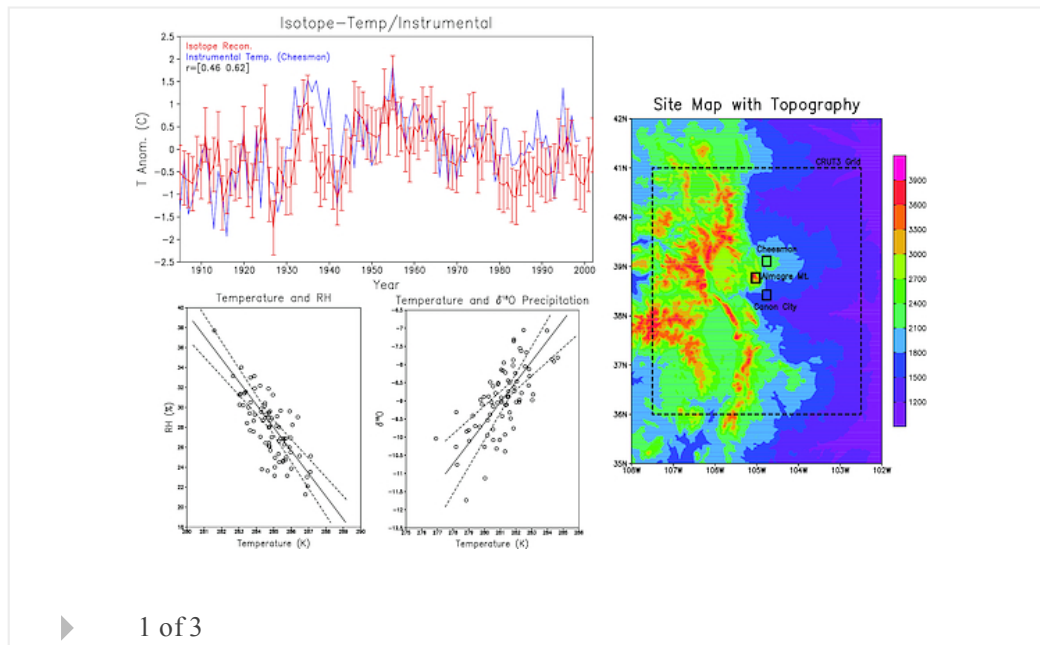
Secular temperature trends for the southern Rocky Mountains over the last five centuries

M. Berkelhammer, L. D. Stott

First Published: 6 September 2012 Vol: 39, L17701 | DOI: 10.1029/2012GL052447

KEY POINTS

- Temp. trends in the SW US can be reconstructed using isotopes in tree rings
- A process model of the proxy can be used to characterize uncertainty in proxy
- Temperature trends in SW US have been relatively stable over last 5 centuries



Hydrology and Land Surface Studies

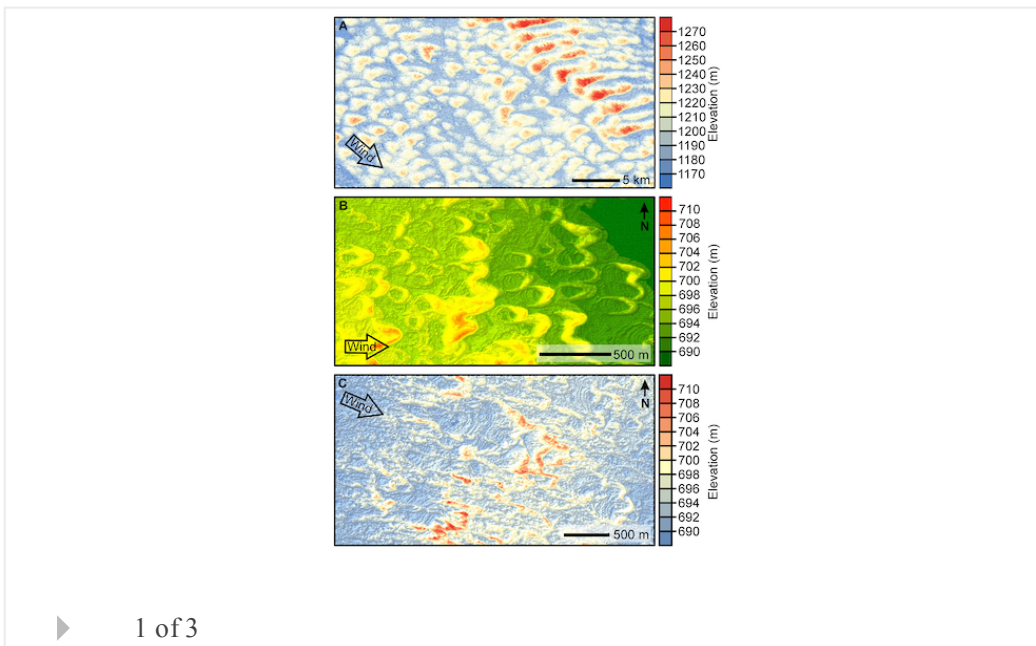
Predicting vegetation-stabilized dune field morphology

Thomas E. Barchyn, Chris H. Hugenholtz

First Published: 12 September 2012 Vol: 39, L17403 | DOI: 10.1029/2012GL052905

KEY POINTS

- Vegetation-stabilized dune fields have diverse morphology
- Ratio of deposition rate to vegetation deposition tolerance predicts morphology
- Deposition rate is related to flux, celerity, and arm angle of dunes



▶ 1 of 3

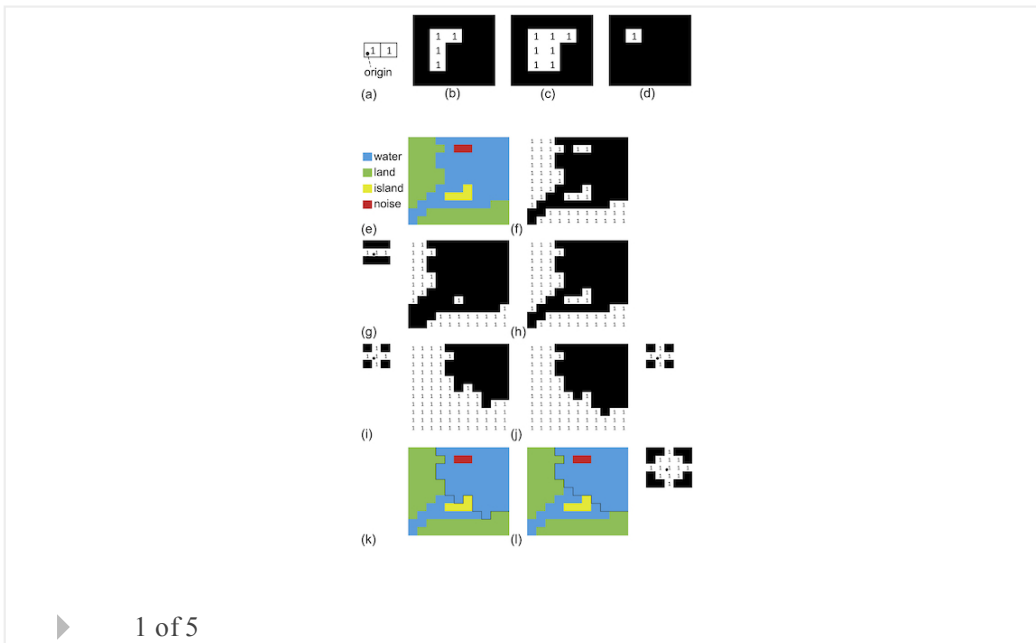
Characterization of river delta shorelines

N. Geleynse, V. R. Voller, C. Paola, V. Ganti

First Published: 7 September 2012 Vol: 39, L17402 | DOI: 10.1029/2012GL052845

KEY POINTS

- New methods for the identification of river delta shorelines are introduced
- New measures for the quantification of shorelines are proposed
- A first step is provided to partitioning of the global delta database



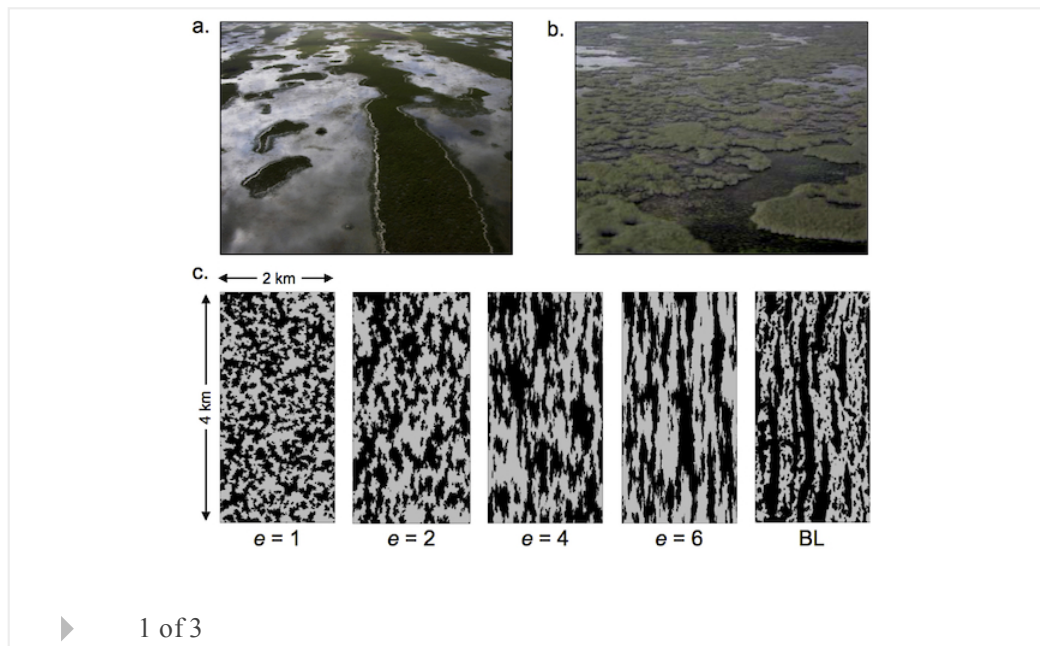
▶ 1 of 5

Orientation matters: Patch anisotropy controls discharge competence and hydroperiod in a patterned peatland

David A. Kaplan, Rajendra Paudel, Matthew J. Cohen, James W. Jawitz

KEY POINTS

- Patch anisotropy is a strong predictor of landscape hydroperiod
- Hydroperiod differences between landscapes were greatest during low-flow periods
- Landscape-scale distal negative feedback may drive anisotropic pattern formation

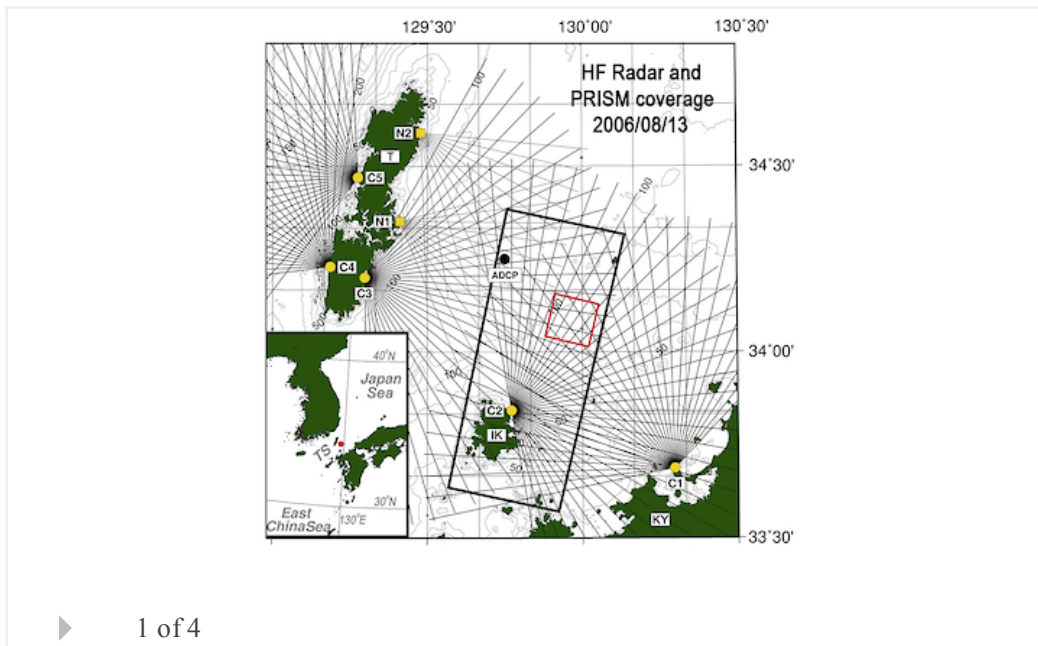
**Oceans****Synergistic surface current mapping by spaceborne stereo imaging and coastal HF radar**

John Philip Matthews, Yutaka Yoshikawa

First Published: 15 September 2012 Vol: 39, L17606 | DOI: 10.1029/2012GL052546

KEY POINTS

- Spaceborne stereo imaging provides fine-scale synoptic surface current mapping
- Synergistic stereo and HF radar approach profiles current within 2 m of surface
- Drift current e-folding depth suggests Stokes drift from observed 10-m waves



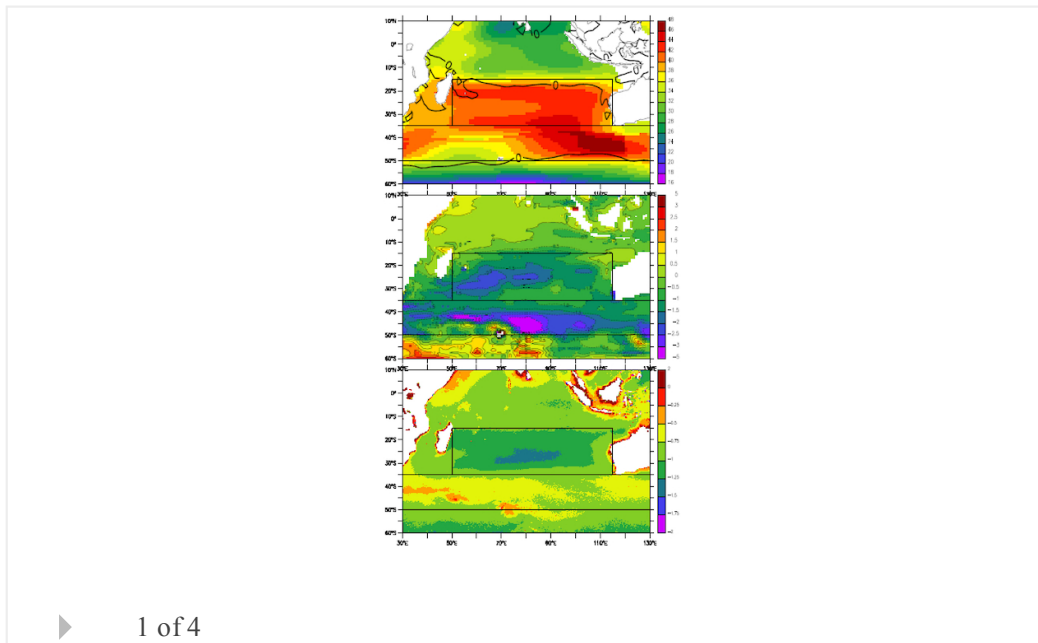
A window for carbon uptake in the southern subtropical Indian Ocean

Vinu Valsala, Shamil Maksyutov, Raghu Murtugudde

First Published: 13 September 2012 Vol: 39, L17605 | DOI: 10.1029/2012GL052857

KEY POINTS

- The variability anth-CO₂ uptake in the southern subtropical Indian Ocean
- Decadal variability of CO₂ uptake in southern subtropical Indian Ocean
- Effect of persistent atmospheric forcing on decadal scales for the uptake of CO₂

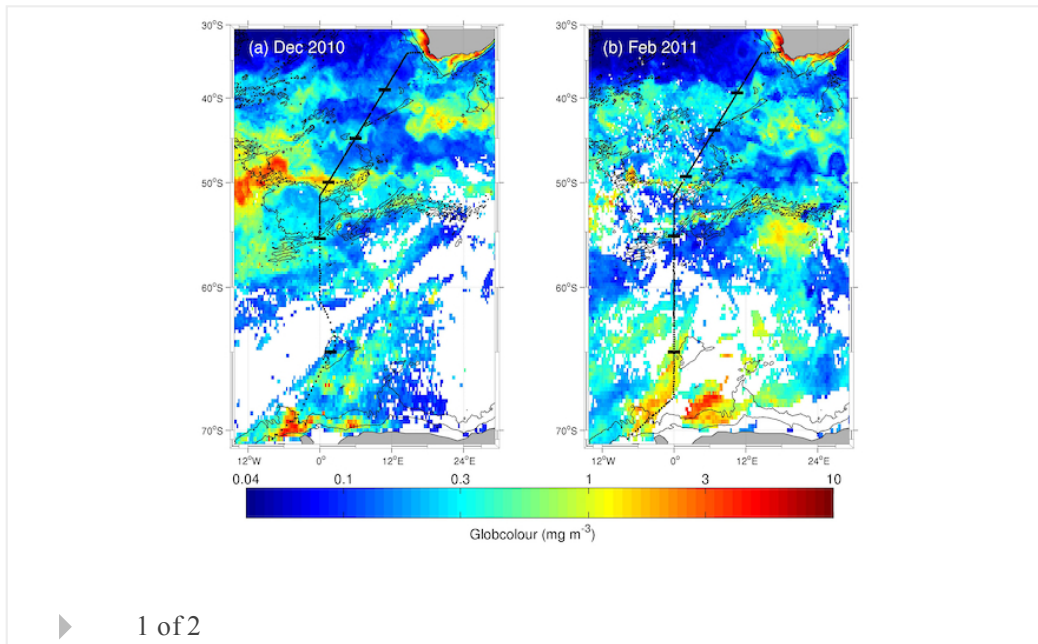


Drivers of non-Redfield nutrient utilization in the Atlantic sector of the Southern Ocean

Isabelle S. Giddy, Sebastiaan Swart, Alessandro Tagliabue

KEY POINTS

- There is seasonal variability in N/P ratios not captured in climatologies
- Species composition and flexible physiology are needed to explain the trends
- Understanding N/P changes & their climate sensitivities is key



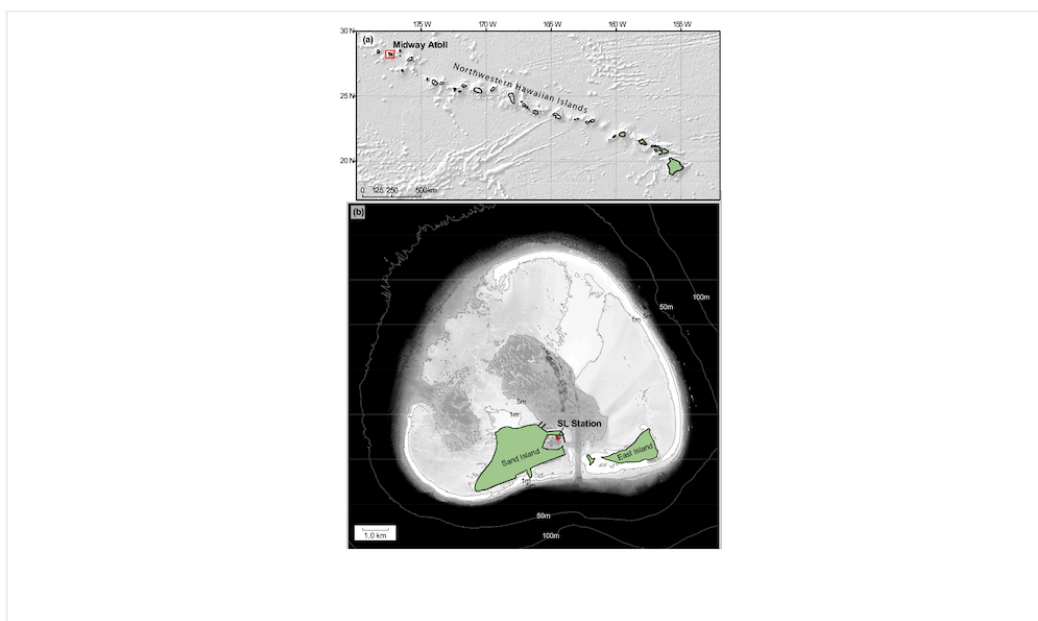
Wave-driven sea level anomalies at the Midway tide gauge as an index of North Pacific storminess over the past 60 years

J. Aucan, R. Hoeke, M. A. Merrifield

First Published: 5 September 2012 Vol: 39, L17603 | DOI: 10.1029/2012GL052993

KEY POINTS

- Sea level anomalies in Midway are wave-driven
- Sea level anomalies can be used as a proxy for storminess
- Storminess is increasing yet tightly coupled to the PDO over the last 60 years



Weighing the ocean: Using a single mooring to measure changes in the mass of the ocean

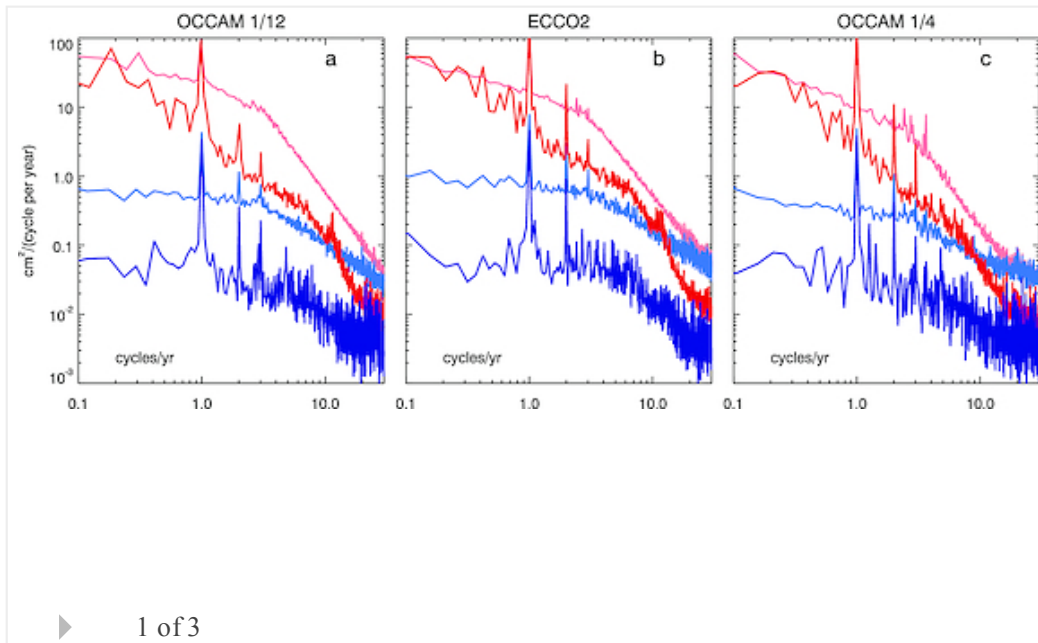
Chris W. Hughes, Mark E. Tamisiea, Rory J. Bingham, Joanne Williams

First Published: 1 September 2012 Vol: 39, L17602 | DOI: 10.1029/2012GL052935

KEY POINTS

- There is a region where ocean bottom pressure measures total ocean mass changes
- We determine the annual cycle in ocean mass from (effectively) one instrument
- A precise long-term ocean bottom pressure measurement system is highly desirable

[Highlight](#)



Seasonal inflow of warm water onto the southern Weddell Sea continental shelf, Antarctica

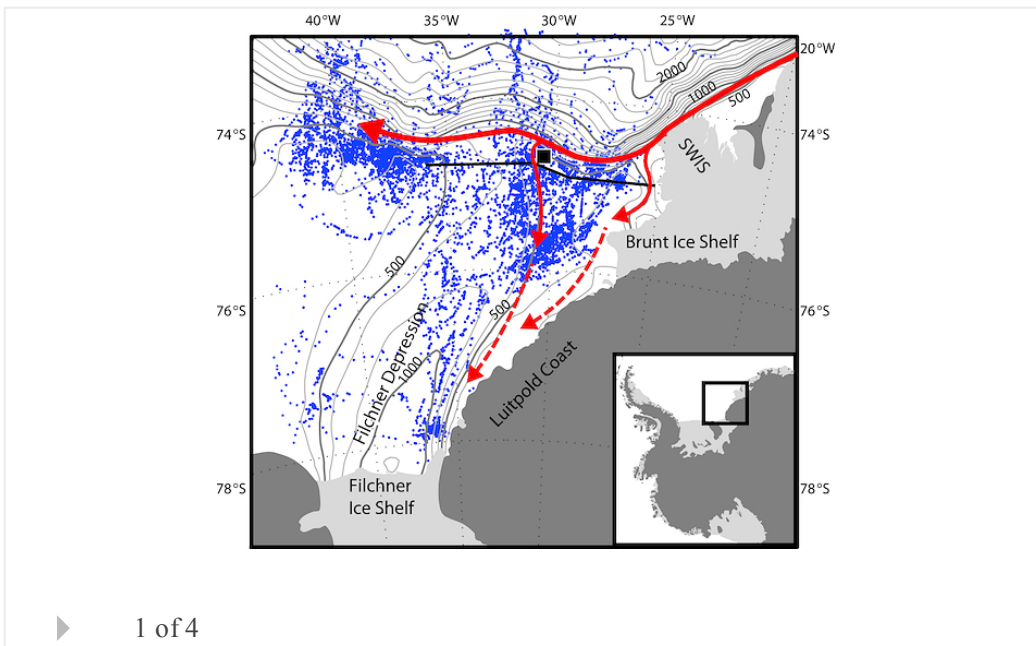
Marius Årthun, Keith W. Nicholls, Keith Makinson, Michael A. Fedak, Lars Boehme

First Published: 1 September 2012 Vol: 39, L17601 | DOI: 10.1029/2012GL052856

KEY POINTS

- Over 9000 temperature-salinity profiles obtained by instrumented Weddell seals
- Seasonality of warm inflow described
- Seasonality related to surface wind stress

[Highlight](#)



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Planets

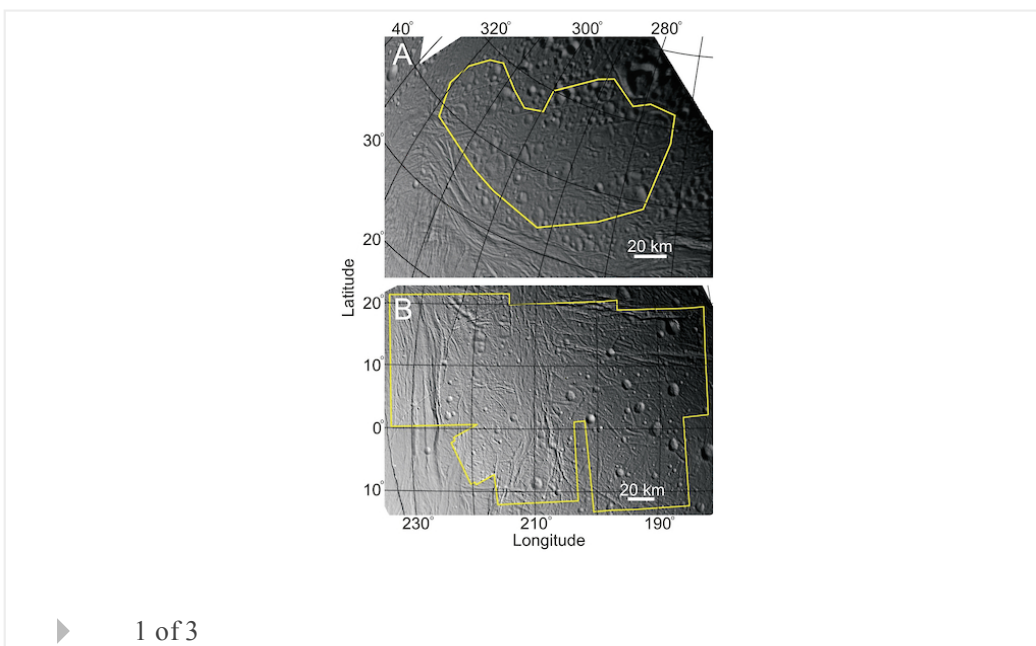
Enceladus' extreme heat flux as revealed by its relaxed craters

Michael T. Bland, Kelsi N. Singer, William B. McKinnon, Paul M. Schenk

First Published: 15 September 2012 Vol: 39, L17204 | DOI: 10.1029/2012GL052736

KEY POINTS

- Many craters (some ~2-km in diameter) on Enceladus are highly viscously relaxed
- The degree of relaxation observed requires extremely high heat fluxes
- Infilling by plume material cannot account for Enceladus' shallow craters



▶ 1 of 3

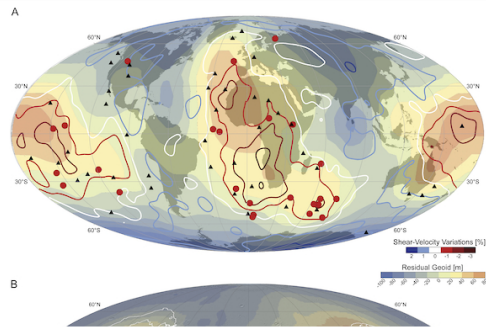
Why is the areoid like the residual geoid?

Kevin Burke, Stephanie C. Werner, Bernhard Steinberger, Trond H. Torsvik

First Published: 14 September 2012 Vol: 39, L17203 | DOI: 10.1029/2012GL052701

KEY POINTS

- Large Low Shear Velocity Provinces (LLSVPs) underly residual geoid highs
- Similar excess masses are postulated to underly areoid highs on Mars
- Formation of excess masses is attributed to the after-effects of giant impacts



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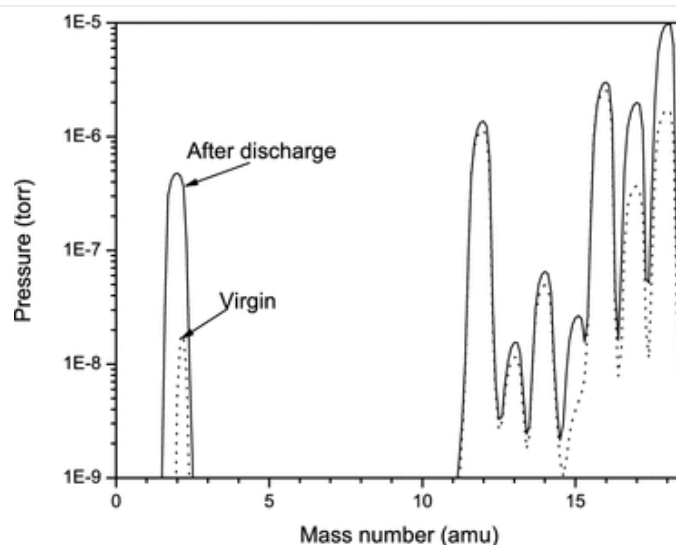
Electrical discharges as a possible source of methane on Mars: Lab simulation

A. Robledo-Martinez, H. Sobral, A. Ruiz-Meza

First Published: 8 September 2012 Vol: 39, L17202 | DOI: 10.1029/2012GL053255

KEY POINTS

- Electrical discharges can produce methane and hydrogen on Mars
- Martian dust devils induce electrical discharges at the interface ice-atmosphere
- The electric field of dust devils is amplified by the topology of the soil



Identification and mapping of dikes with relatively primitive compositions in Thaumasia Planum on Mars: Implications for Tharsis volcanism and the opening of Valles Marineris

Jun Huang, Christopher S. Edwards, Briony H. N. Horgan, Philip R. Christensen, Michael D. Kraft, Long Xiao

First Published: 6 September 2012 Vol: 39, L17201 | DOI: 10.1029/2012GL052523

KEY POINTS

- Wrinkle ridged olivine-enriched flood basalts were fed by extensive dikes
- Dikes with primitive composition were derived from the mantle or Tharsis plume
- An effective way to identify dikes fusing thermophysical and spectral data



Solid Earth

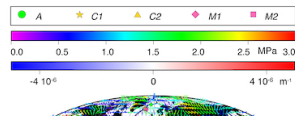
On the location of hotspots in the framework of mantle convection

L. Husson, C. P. Conrad

First Published: 15 September 2012 Vol: 39, L17304 | DOI: 10.1029/2012GL052866

KEY POINTS

- Major hotspots above positive divergence of mantle shear tractions
- Minor hotspots are unrelated to mantle flow
- Statistics indicate that mantle flow does control hotspot volcanism



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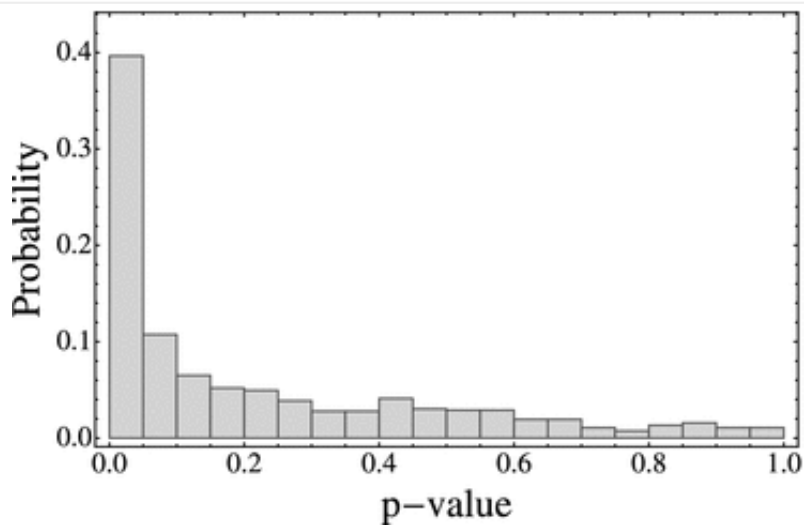
Can we trust earthquake cluster detection tests?

F. Dimer de Oliveira

First Published: 15 September 2012 Vol: 39, L17305 | DOI: 10.1029/2012GL052130

KEY POINTS

- Statistical tests may fail to detect clusters of earthquakes
- The earthquake record of large magnitude events is extremely short
- Variability of stochastic processes cannot be determined from single sample



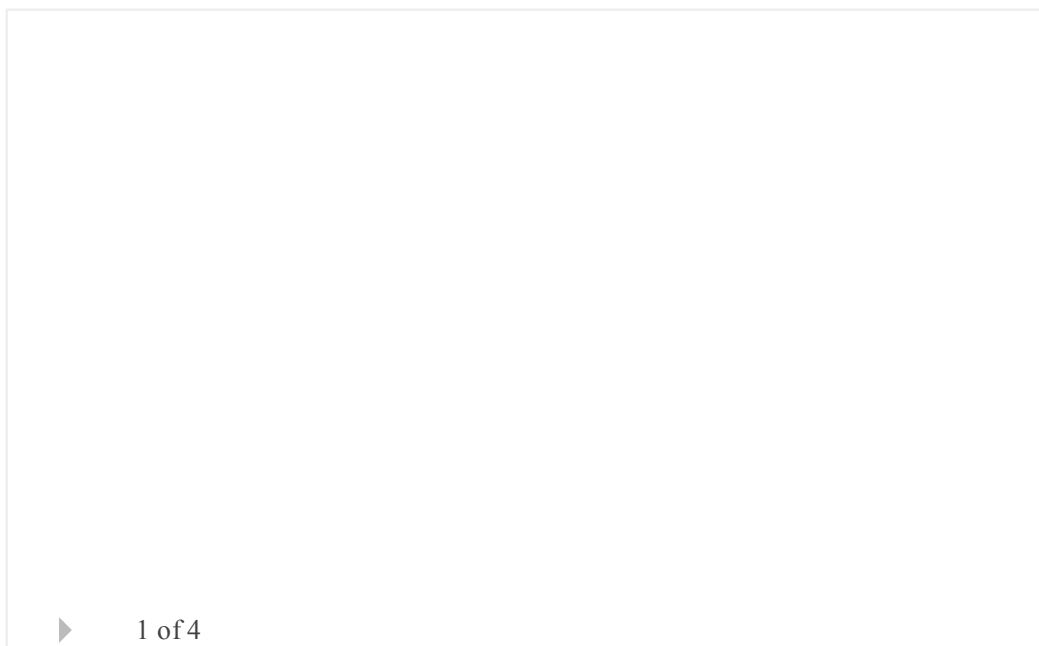
▶ 1 of 3

Evidence of sudden rupture of a large asperity during the 2008 Mw7.9 Wenchuan earthquake based on strong motion analysis

Guohong Zhang, Martin Vallée, Xinjian Shan, Bertrand Delouis

KEY POINTS

- The major slip area broke almost simultaneously, 25s after earthquake initiation
- Source kinematics can't be understood by simple stress release at rupture from T
- A strong asperity should be responsible for this delayed but brutal rupture

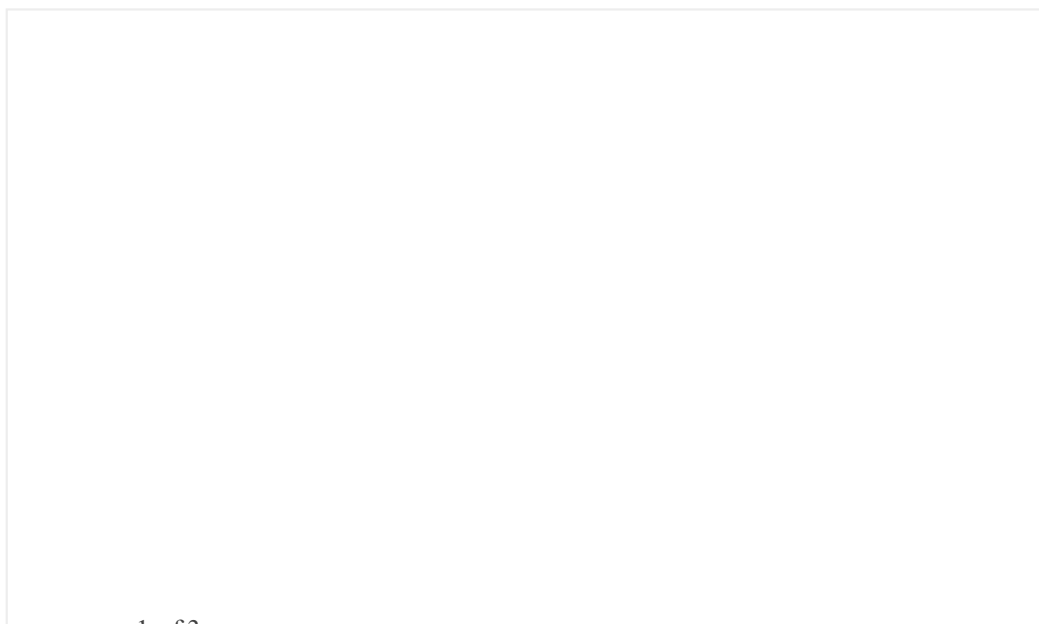
Highlight**Subduction of oceanic asthenosphere: Evidence from sub-slab seismic anisotropy**

Teh-Ru Alex Song, Hitoshi Kawakatsu

First Published: 11 September 2012 Vol: 39, L17301 | DOI: 10.1029/2012GL052639

KEY POINTS

- Link sub-slab anisotropy with observations in the oceanic asthenosphere
- Fast splitting direction depends on ray angle and anisotropy symmetry
- Orthorhombic symmetry reconciles sub-slab splitting pattern



Xenopumices from the 2011–2012 submarine eruption of El Hierro (Canary Islands, Spain): Constraints on the plumbing system and magma ascent

S. Meletlidis, A. Di Roberto, M. Pompilio, A. Bertagnini, I. Iribarren, A. Felpeto, P. A. Torres, C. D'Oriano

First Published: 11 September 2012 Vol: 39, L17302 | DOI: 10.1029/2012GL052675

KEY POINTS

- The eruption started with the fast ascent of a basanitic magma from 12–14km
- At <4km the basanite heated a stagnant trachytic magma and its hydrothermal halo
- The study of xenoliths are crucial for unravelling the dynamics of magma ascent

▶ 1 of 3

Space Sciences

ARTEMIS observations of lunar pick-up ions in the terrestrial magnetotail lobes

A. R. Poppe, R. Samad, J. S. Halekas, M. Sarantos, G. T. Delory, W. M. Farrell, V. Angelopoulos, J. P. McFadden

First Published: 15 September 2012 Vol: 39, L17104 | DOI: 10.1029/2012GL052909

KEY POINTS

- ARTEMIS observes pickup ions in the terrestrial magnetotail lobes
- Photoelectric and convection electric fields affect these ions
- These ions originate from the neutral exosphere and possibly a geologic vent

▶ 1 of 4

Spatial dependence of banded chorus intensity near the magnetic equator

N. Haque, U. S. Inan, T. F. Bell, J. S. Pickett

First Published: 12 September 2012 Vol: 39, L17103 | DOI: 10.1029/2012GL052929

KEY POINTS

- Banded chorus intensity has exponential spatial dependence near magnetic equator
- Distribution of spatial growth factor provides new boundary condition
- No chorus or only weak chorus present within 0.5 degrees of magnetic equator

▶ 1 of 6

Pc2 EMIC waves generated high off the equator in the dayside outer magnetosphere

Y. H. Liu, B. J. Fraser, F. W. Menk

First Published: 7 September 2012 Vol: 39, L17102 | DOI: 10.1029/2012GL053082

KEY POINTS

- A new generation mechanism for EMIC waves

- Minimum B pocket near noon
- Wave energy propagated alternatively along the field lines

▶ 1 of 3

Correction to “Parameterized lifetime of radiation belt electrons interacting with lower-band and upper-band oblique chorus wave”

Xudong Gu, Yuri Y. Shprits, Binbin Ni

First Published: 7 September 2012 Vol: 39, L17199 | DOI: 10.1029/2012GL053568

Free

Reflection of solar wind protons on the Martian bow shock: Investigations by means of 3-dimensional simulations

E. Richer, G. M. Chanteur, R. Modolo, E. Dubinin

First Published: 1 September 2012 Vol: 39, L17101 | DOI: 10.1029/2012GL052858

KEY POINTS

- Reflection sites of solar wind protons on BS
- Omnidirectional fluxes of reflected protons
- Local energy spectra of reflected protons

▶ 1 of 3

The Cryosphere

Projected decline in spring snow depth on Arctic sea ice caused by progressively later autumn open ocean freeze-up this century

P. J. Hezel, X. Zhang, C. M. Bitz, B. P. Kelly, F. Massonnet

First Published: 15 September 2012 Vol: 39, L17505 | DOI: 10.1029/2012GL052794

KEY POINTS

- Autumn loss of sea ice causes decline in snow depths on Arctic ice in 21st century
- Snow depths fall below threshold needed for snow caves for ringed seal rearing
- Increase in rainfall rates is likely to further diminish snow depths

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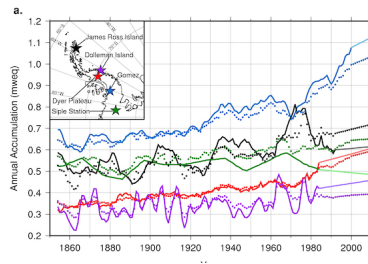
Increased ice loading in the Antarctic Peninsula since the 1850s and its effect on glacial isostatic adjustment

Grace A. Nield, Pippa L. Whitehouse, Matt A. King, Peter J. Clarke, Michael J. Bentley

First Published: 12 September 2012 Vol: 39, L17504 | DOI: 10.1029/2012GL052559

KEY POINTS

- Accumulation increase results in up to 45 m extra ice thickness over 155 years
- Model predicts GIA-related subsidence of up to 7 mm/yr which will affect GPS
- GRACE-derived rates of ice-mass change are biased low by ignoring this signal



▶ 1 of 3

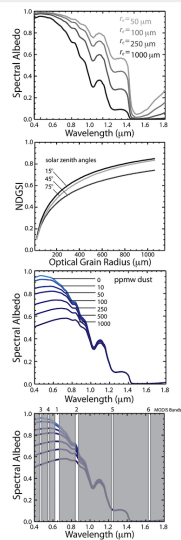
Radiative forcing by light absorbing impurities in snow from MODIS surface reflectance data

Thomas H. Painter, Ann C. Bryant, S. McKenzie Skiles

First Published: 11 September 2012 Vol: 39, L17502 | DOI: 10.1029/2012GL052457

KEY POINTS

- MODDRFS determines surface radiative forcing by dust and carbonaceous particles
- MODDRFS is validated by a 7 year record of energy balance measurements
- Bias-corrected MODDRFS has an RMSE of 32 W m⁻² and mean error of 0 W m⁻²



▶ 1 of 3

Correction to “Recent loss of floating ice and the consequent sea level contribution”

Andrew Shepherd, Duncan Wingham, David Wallis, Katharine Giles, Seymour Laxon, Aud Venke Sundal

First Published: 8 September 2012 Vol: 39, L17503 | DOI: 10.1029/2012GL053573

Free

Ice loss from the Southern Patagonian Ice Field, South America, between 2000 and 2012

Michael J. Willis, Andrew K. Melkonian, Matthew E. Pritchard, Andrés Rivera

First Published: 5 September 2012 Vol: 39, L17501 | DOI: 10.1029/2012GL053136

KEY POINTS

- Ice mass loss has accelerated
- New technique needs validation
- Loss is concentrated at lacustrine calving glaciers

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- **What Causes Sunspot Pairs?**
- **Water Beneath the Surface of Mars, Bound up in Sulfates**
- **When Predicting Drought Risk, Do Not Overlook Temperature**
- **Changing Patterns in U.S. Air Quality**

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Upcoming AGU Meetings

Triennial Earth-Sun Summit

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Indianapolis, Indiana, USA

2015 Joint Assembly

3-7 May 2015

Montreal, Canada

Chapman Conference on Evolution of the Asian Monsoon and its Impact on Landscape, Environment and Society: Using the Past as the Key to the Future

14-19 June 2015

Hong Kong SAR, China

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