



Volume 39, Issue 13

July 2012

Brief Detailed

Atmospheric Science

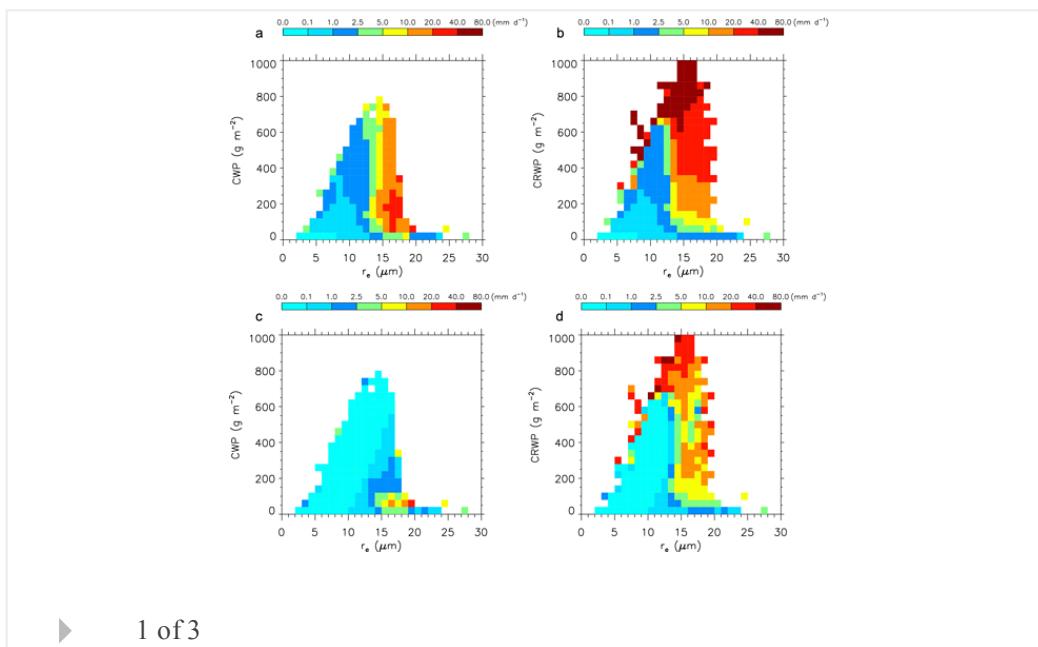
The roles of cloud drop effective radius and *LWP* in determining rain properties in marine stratocumulus

Daniel Rosenfeld, Hailong Wang, Philip J. Rasch

First Published: 4 July 2012 Vol: 39, L13801 | DOI: 10.1029/2012GL052028

KEY POINTS

- Numerical simulations show how aerosols and cloud depth control rain initiation
- Rain is initiated when drops r_{eff} reach 14 μm regardless of cloud water path
- This can explain the control of aerosols on change between closed and open cells



Size dependence of wet removal of black carbon aerosols during transport from the boundary layer to the free troposphere

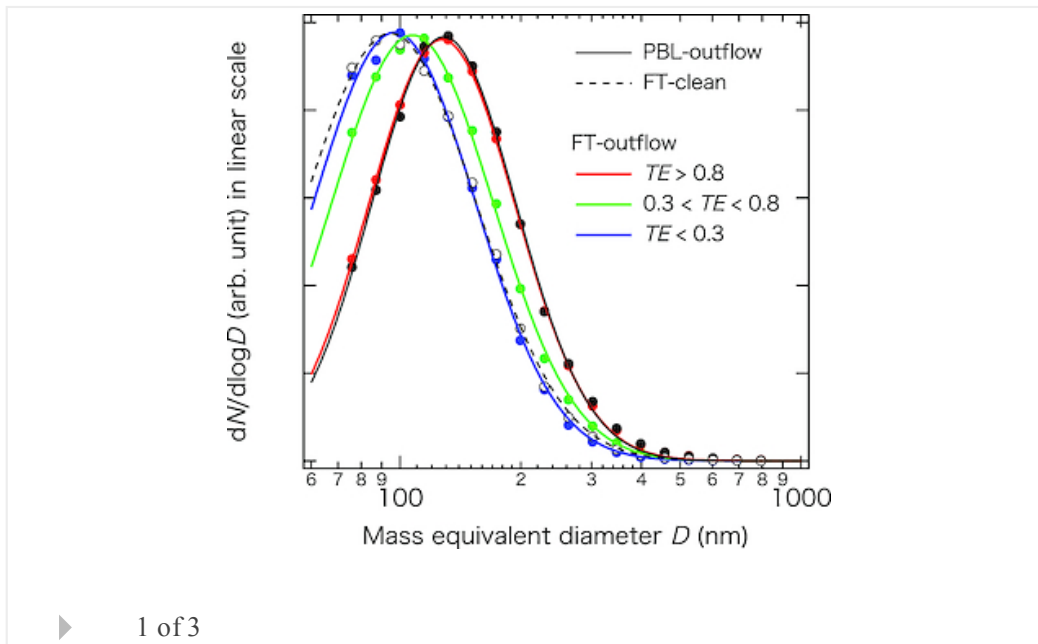
N. Moteki, Y. Kondo, N. Oshima, N. Takegawa, M. Koike, K. Kita, H. Matsui, M. Kajino

First Published: 4 July 2012 Vol: 39, L13802 | DOI: 10.1029/2012GL052034

KEY POINTS

- Wet removal efficiency of aerosols tightly correlates their particle size

- Wet removal process is a regulator of the size of tropospheric aerosols
- We use chemically inert black carbon aerosols to show above propositions



▶ 1 of 3

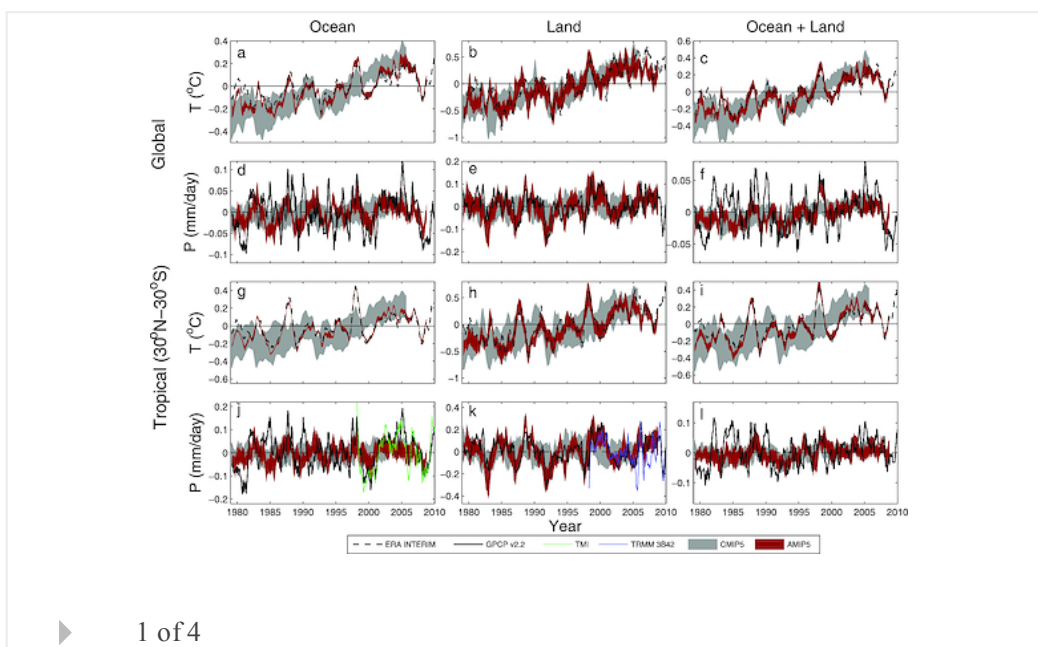
Co-variation of temperature and precipitation in CMIP5 models and satellite observations

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

First Published: 4 July 2012 Vol: 39, L13803 | DOI: 10.1029/2012GL052093

KEY POINTS

- Robust precipitation response to temperature in CMIP5 models and observations
- Agreement of land precipitation changes in AMIP5 simulations and observations
- Wet area becomes wetter and dry area becomes drier with warming



▶ 1 of 4

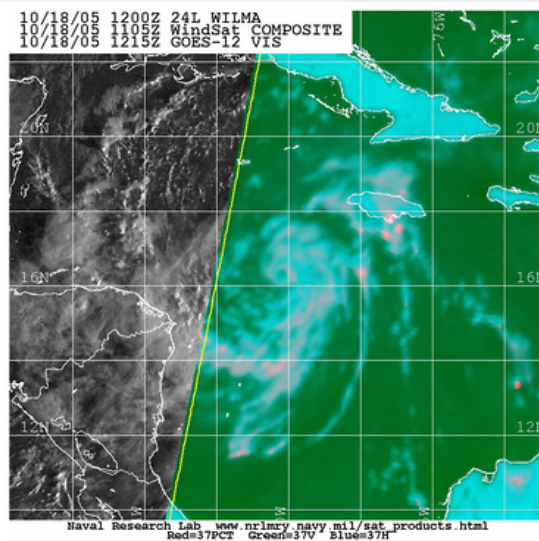
Predicting tropical cyclone rapid intensification using the 37 GHz ring pattern identified from passive microwave measurements

Margaret E. Kieper, Haiyan Jiang

First Published: 6 July 2012 Vol: 39, L13804 | DOI: 10.1029/2012GL052115

KEY POINTS

- A ring pattern in the 37 GHz microwave image is related to TC RI
- The ring is usually associated with the highest intensity increase
- High POD and low FAR are found for the RI event-based verification



▶ 1 of 2

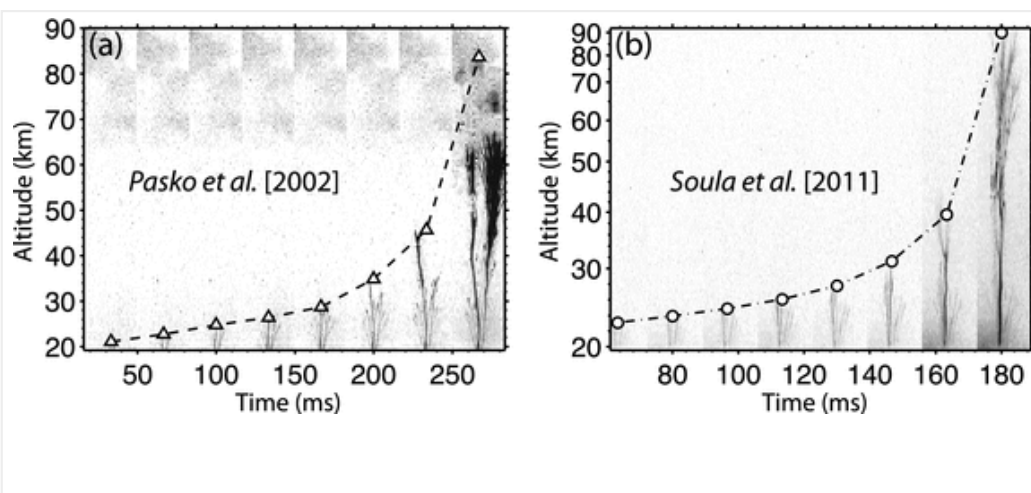
Simulation of leader speeds at gigantic jet altitudes

Caitano L. da Silva, Victor P. Pasko

First Published: 10 July 2012 Vol: 39, L13805 | DOI: 10.1029/2012GL052251

KEY POINTS

- Scaling of streamer-to-leader transition process with pressure
- Calculation of gigantic jet speeds
- Assessment of gigantic jet currents



▶ 1 of 3

Solar and thermal radiation profiles and radiative forcing measured through the atmosphere

Rolf Philipona, Andreas Kräuchi, Emmanuel Brocard

First Published: 11 July 2012 Vol: 39, L13806 | DOI: 10.1029/2012GL052087

KEY POINTS

- Measurements of radiation profiles with upper-air radiosondes
- Show the radiation budget through the atmosphere
- How radiative forcing increases at the surface and the top of the atmosphere

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Boundary layer ozone pollution caused by future aircraft emissions

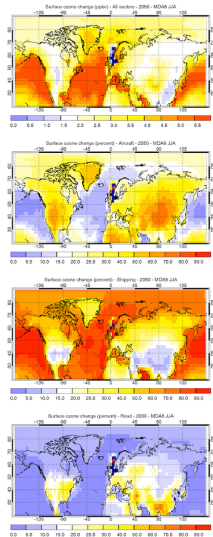
Didier A. Hauglustaine, Brigitte Koffi

First Published: 12 July 2012 Vol: 39, L13808 | DOI: 10.1029/2012GL052008

KEY POINTS

- Impact of aircraft on future ozone pollution
- Impact of ship emissions on future ozone pollution

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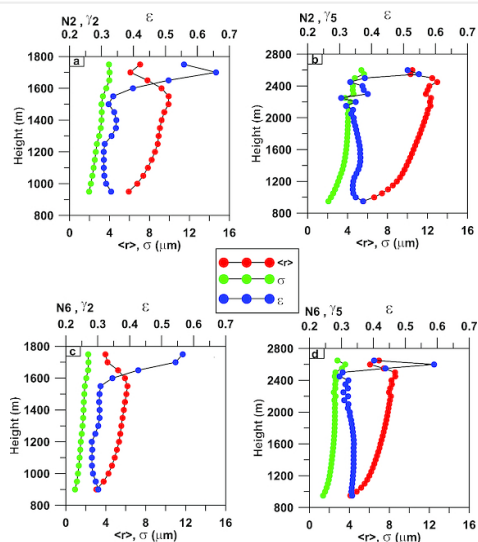
On the sensitivity of droplet size relative dispersion to warm cumulus cloud evolution

E. Tas, I. Koren, O. Altaratz

First Published: 12 July 2012 Vol: 39, L13807 | DOI: 10.1029/2012GL052157

KEY POINTS

- Different pattern of epsilon for different cloud evolutionary stage
- New parameterization of epsilon based on rv in BSMs
- Dominant effect of microphysics and entrainment on droplet size distribution



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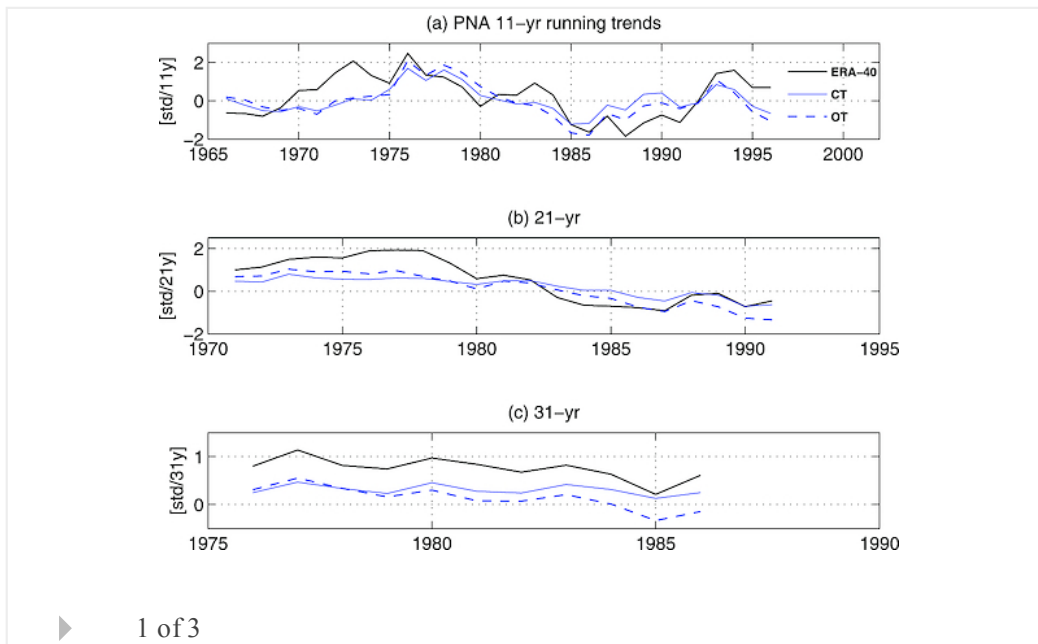
An analysis of trends in the boreal winter mean tropospheric circulation during the second half of the 20th century

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

First Published: 13 July 2012 Vol: 39, L13809 | DOI: 10.1029/2012GL052243

KEY POINTS

- Trends in the SAM are influenced by the tropics
- No clear role for stratospheric forcing of the trends in the SAM
- 11 and 21 year trends of the NAO are consistent with internal variability



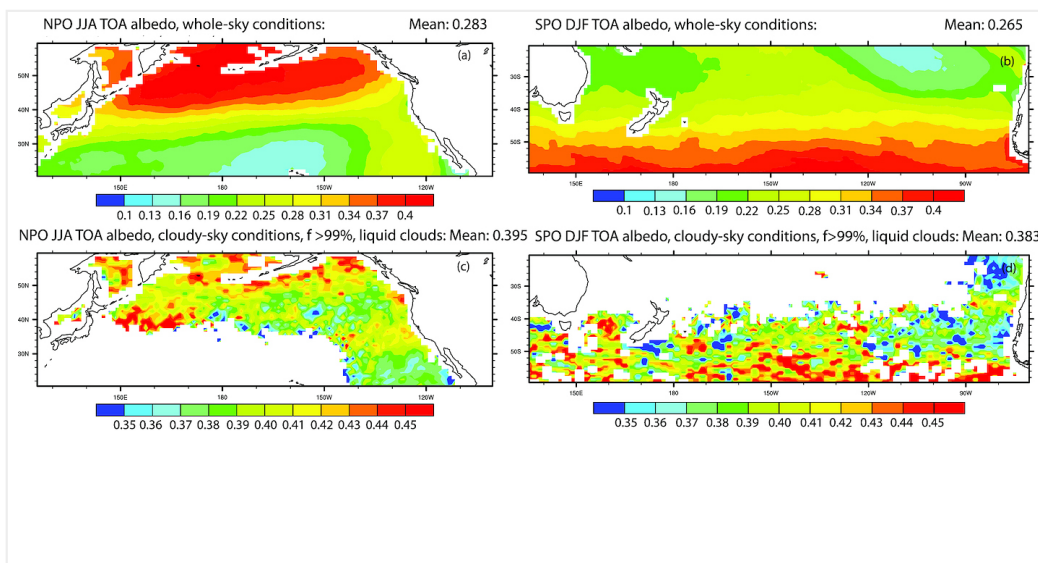
Consistent estimates from satellites and models for the first aerosol indirect forcing

Joyce E. Penner, Cheng Zhou, Li Xu

First Published: 14 July 2012 Vol: 39, L13810 | DOI: 10.1029/2012GL051870

KEY POINTS

- Satellite data from pristine regions are used to estimate forcing
- Doing so brings the model and satellite estimates into substantial agreement
- There is only one region that can be considered pristine



Climate

The Indian summer monsoon during peaks in the 11 year sunspot cycle

Harry van Loon, Gerald A. Meehl

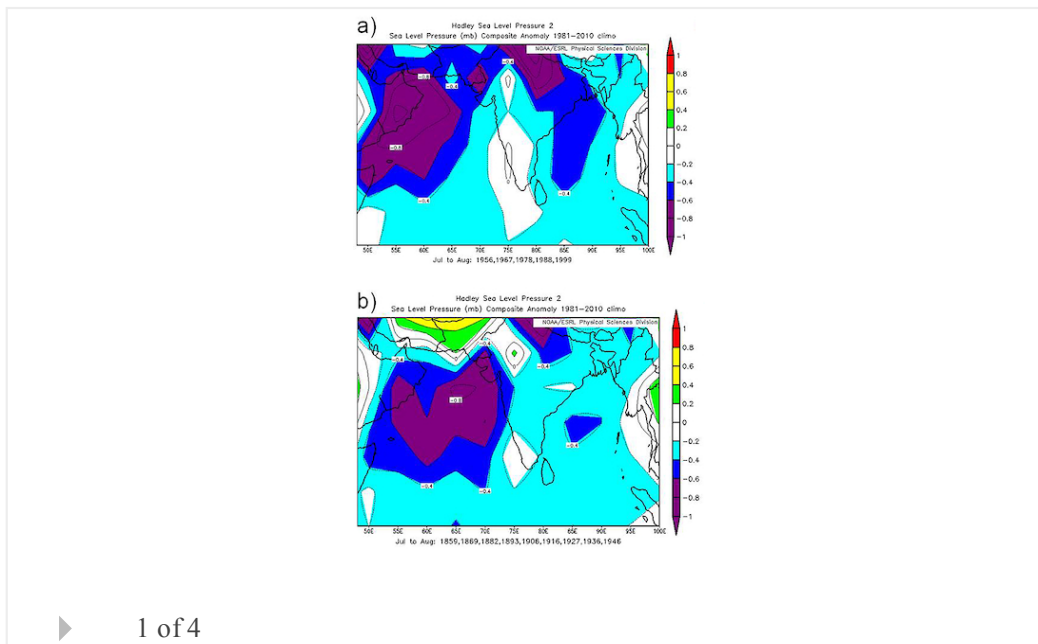
First Published: 3 July 2012 Vol: 39, L13701 | DOI: 10.1029/2012GL051977

KEY POINTS

- During peaks in the solar cycle, there is lower sea level pressure around India
- During peaks in the 11 year solar cycle, there is stronger monsoon precipitation
- During peaks in the 11 year solar cycle, there is a stronger monsoon

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Sardine biomass is poorly correlated with the Pacific Decadal Oscillation off California

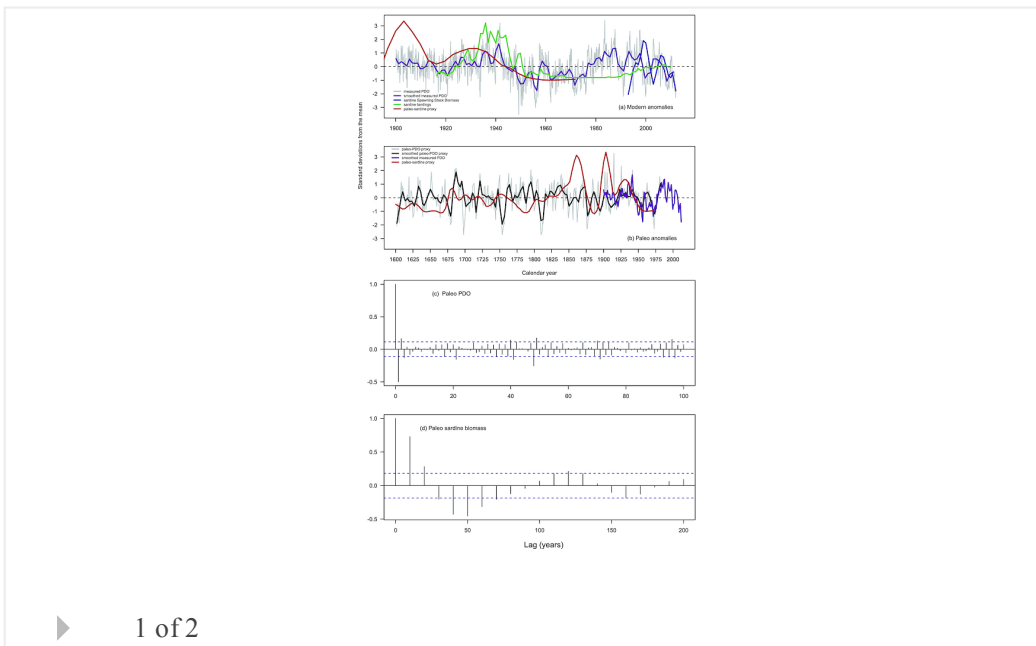
Sam McClatchie

First Published: 6 July 2012 Vol: 39, L13703 | DOI: 10.1029/2012GL052140

KEY POINTS

- The PDO is not significantly correlated with sardine biomass off California
- Short time series (order 90 years) cannot resolve low frequency fluctuations
- Analysis of short series cannot elucidate the effect of climate on fish biomass

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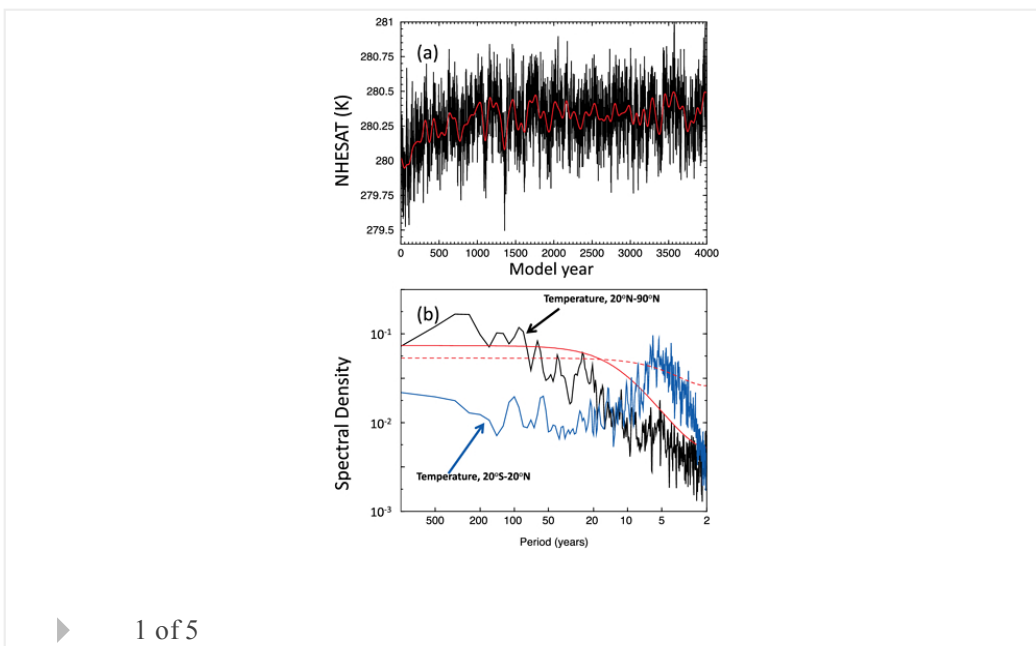
Multicentennial variability of the Atlantic meridional overturning circulation and its climatic influence in a 4000 year simulation of the GFDL CM2.1 climate model

Thomas L. Delworth, Fanrong Zeng

First Published: 6 July 2012 Vol: 39, L13702 | DOI: 10.1029/2012GL052107

KEY POINTS

- Significant multicentennial NH temperature variations in a climate model
- Variability is caused by fluctuations in Atlantic Ocean heat transport
- May contribute to observed variations in paleoclimate record



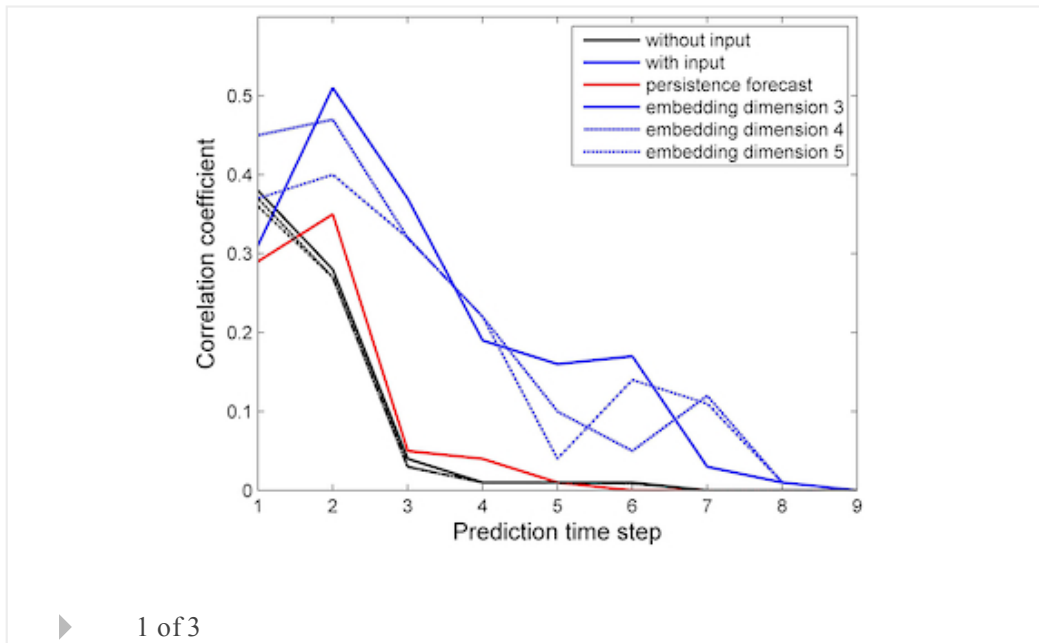
Directional influences on global temperature prediction

Geli Wang, Peicai Yang, Xiuji Zhou, Kyle L. Swanson, Anastasios A. Tsonis

KEY POINTS

- Co-variability of major climate modes affects global temperature
- Direction of causal influences established
- Granger causality introduced for the first time in a climate variability study

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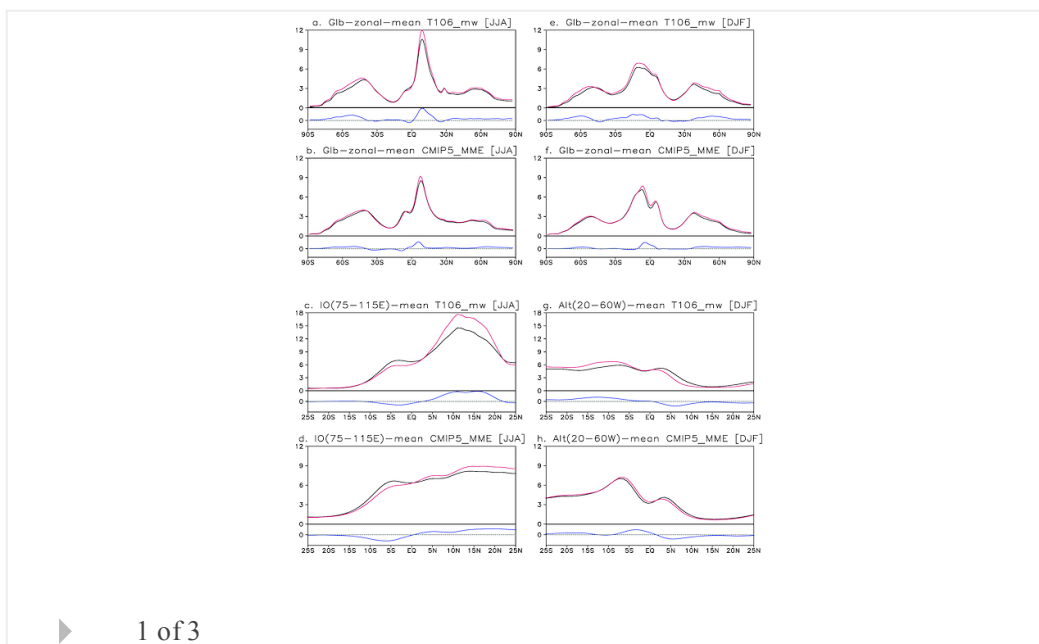
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Is “rich-get-richer” valid for Indian Ocean and Atlantic ITCZ?

Pang-chi Hsu, Tim Li

KEY POINTS

- In regions with two wet branches, only the stronger branch becomes wetter
- The dynamic effect dominates this basin-scale rainfall pattern



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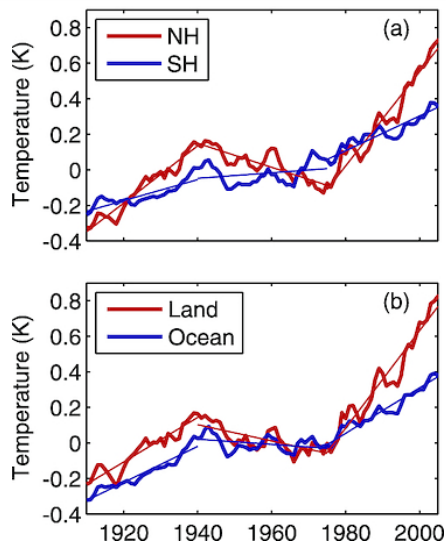
Latitudinally asymmetric response of global surface temperature: Implications for regional climate change

Yangyang Xu, Veerabhadran Ramanathan

First Published: 11 July 2012 Vol: 39, L13706 | DOI: 10.1029/2012GL052116

KEY POINTS

- South-to-north asymmetry of surface temperature response was observed
- The latitudinal asymmetry of temperature is caused by land fraction asymmetry
- The latitudinal asymmetry of future warming will change precipitation pattern



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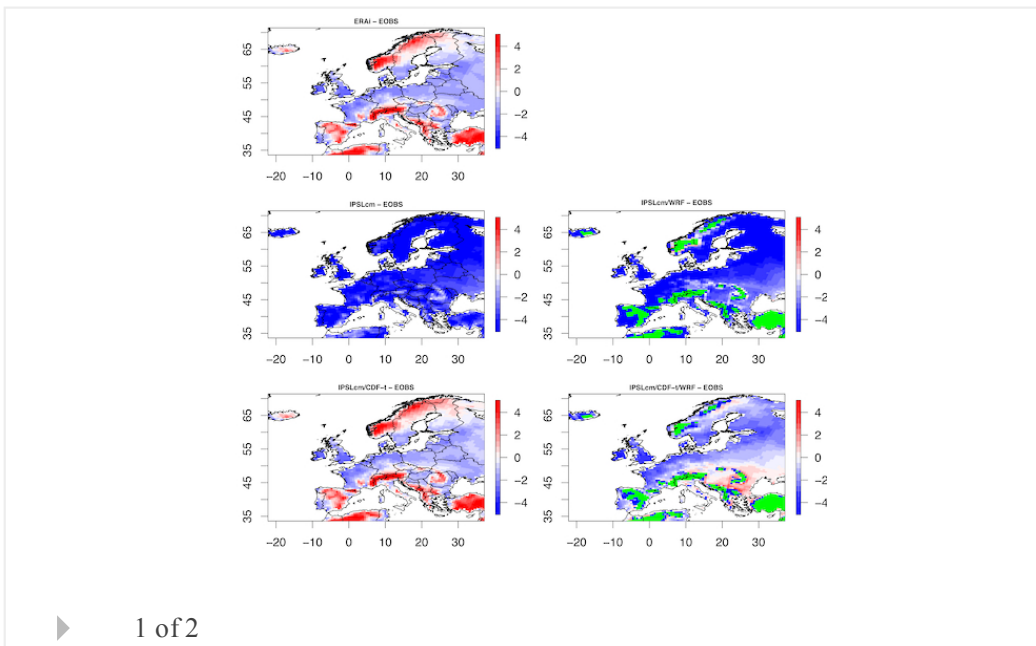
Regional climate downscaling with prior statistical correction of the global climate forcing

A. Colette, R. Vautard, M. Vrac

First Published: 13 July 2012 Vol: 39, L13707 | DOI: 10.1029/2012GL052258

KEY POINTS

- Novel hybrid dynamical and statistical regional climate downscaling technique
- Decreases substantially temperature and precipitation biases
- Produces physically consistent unbiased 3D fields for climate impact models



Hydrology and Land Surface Studies

Multiple dust sources in the Sahara Desert: The importance of sand dunes

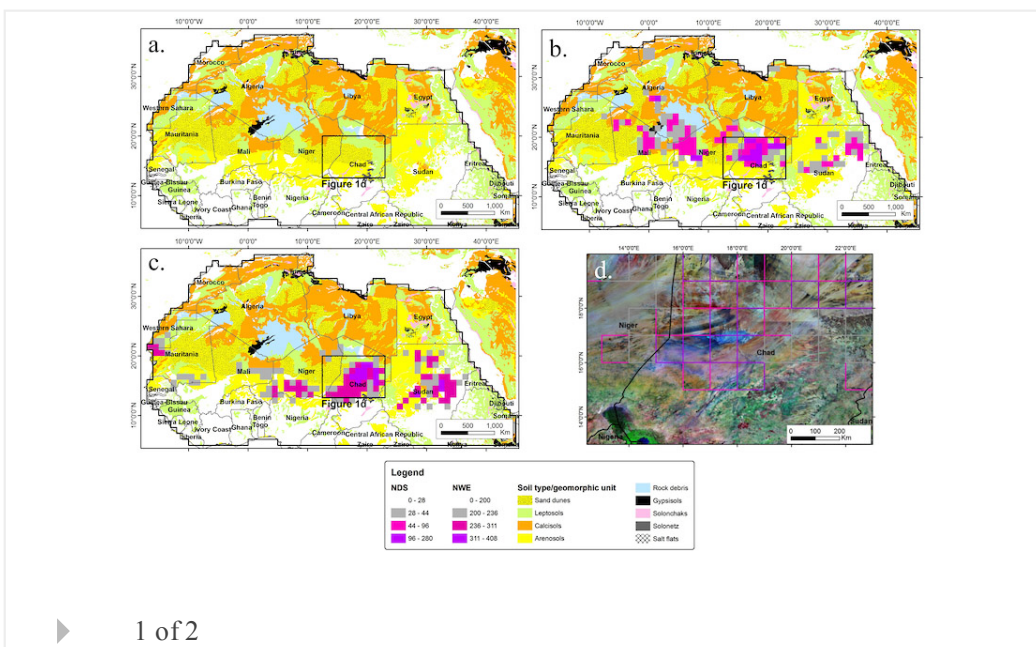
Onn Crouvi, Kerstin Schepanski, Rivka Amit, Alan R. Gillespie, Yehouda Enzel

First Published: 12 July 2012 Vol: 39, L13401 | DOI: 10.1029/2012GL052145

KEY POINTS

- Current Saharan dust sources are sand dunes, leptosols, calcisols and arenosols
- Land erodibility of sand dunes is high
- Aeolian abrasion is an important process of dust generation in the Sahara

Highlight



Topography-based modeling of large rockfalls and application to hazard

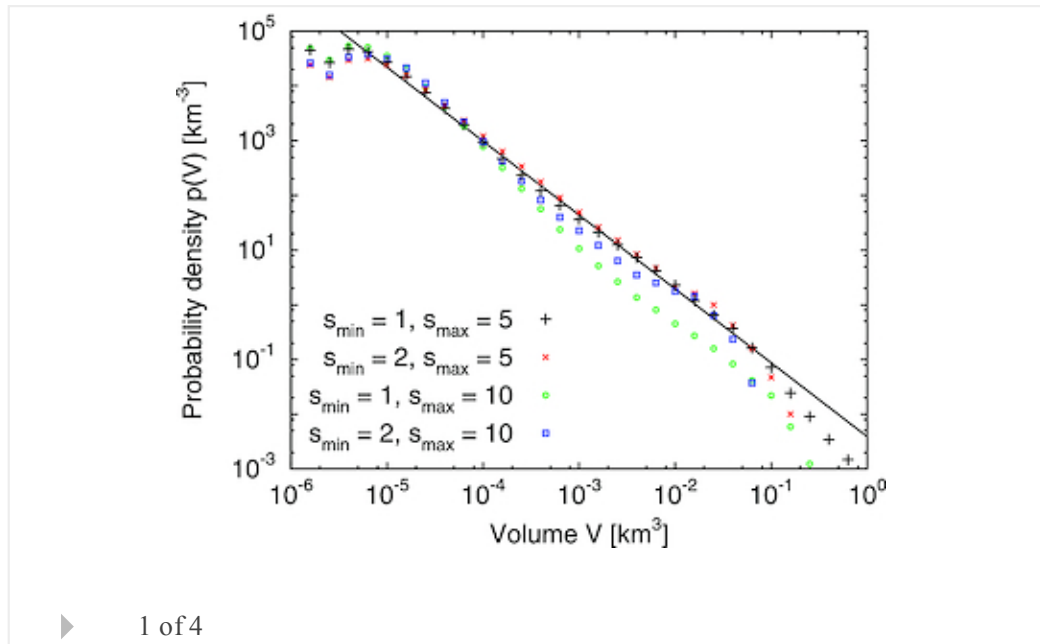
assessment

S. Hergarten

First Published: 13 July 2012 Vol: 39, L13402 | DOI: 10.1029/2012GL052090

KEY POINTS

- Rockfalls follow a power law distribution with a universal exponent 1.35
- Rockfall dynamics is governed by self-organized criticality
- Regional variations are reflected in the size of the largest events

[Open Access](#)**Post-fire changes in net shortwave radiation along a latitudinal gradient in boreal North America**

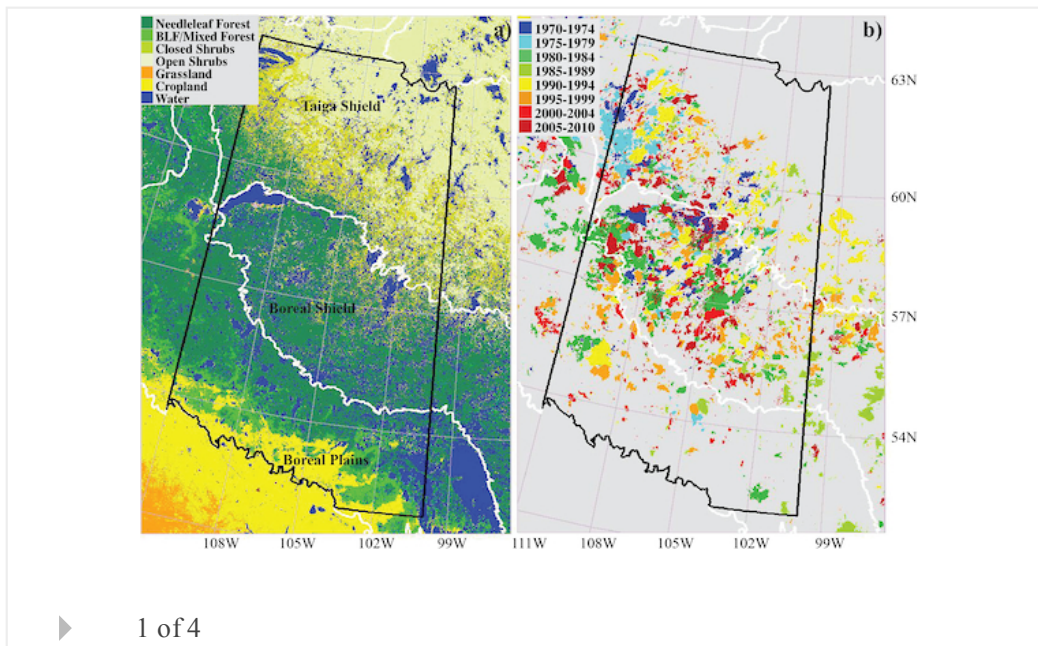
Yufang Jin, James T. Randerson, Michael L. Goulden, Scott J. Goetz

First Published: 14 July 2012 Vol: 39, L13403 | DOI: 10.1029/2012GL051790

KEY POINTS

- Fire-induced forcing is considerable and similar among the latitudinal belts
- Latitudinal trend in spring forcing offsets with those in winter and summer
- Differences in vegetation succession dominated the post-fire albedo and forcing

[Highlight](#)



Oceans

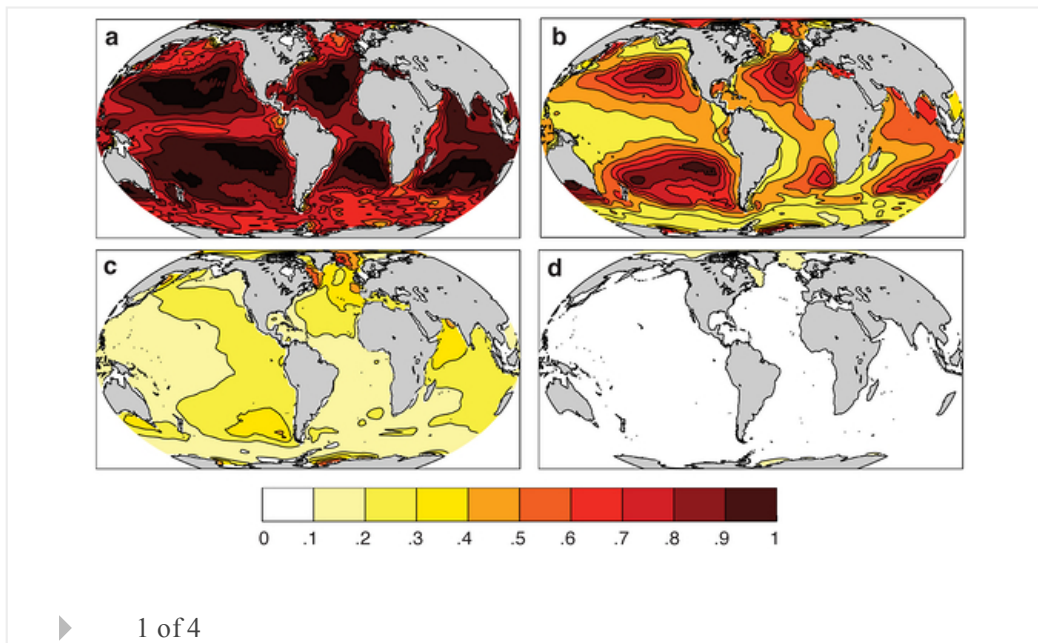
The sequestration efficiency of the biological pump

Tim DeVries, Francois Primeau, Curtis Deutsch

First Published: 3 July 2012 Vol: 39, L13601 | DOI: 10.1029/2012GL051963

KEY POINTS

- Efficiency of organic matter sequestration determines biological pump strength
- Sequestration efficiency varies spatially due to ocean circulation patterns
- Long-term operation of biological pump characterized by mean sequestration time



Multidecadal sea level anomalies and trends in the western tropical Pacific

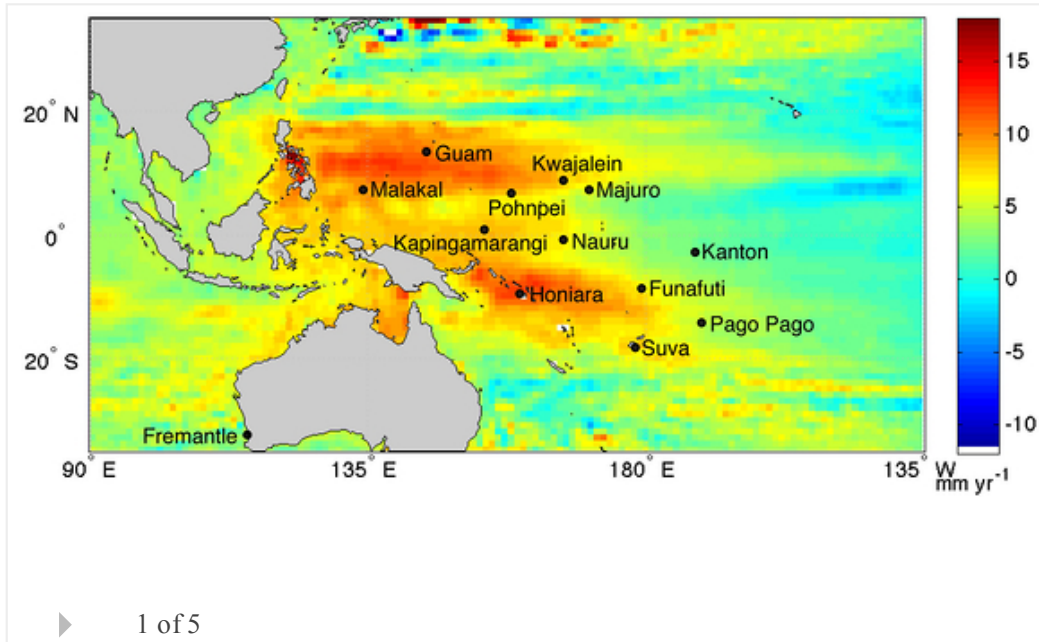
Mark A. Merrifield, Philip R. Thompson, Mark Lander

First Published: 4 July 2012 Vol: 39, L13602 | DOI: 10.1029/2012GL052032

KEY POINTS

- Climate variability and global MSL account for recent rates of W. Pacific rise
- W. Pacific rise rates are expected to converge to the global mean rate
- Linking trade wind forcing to climate modes depends on the wind product

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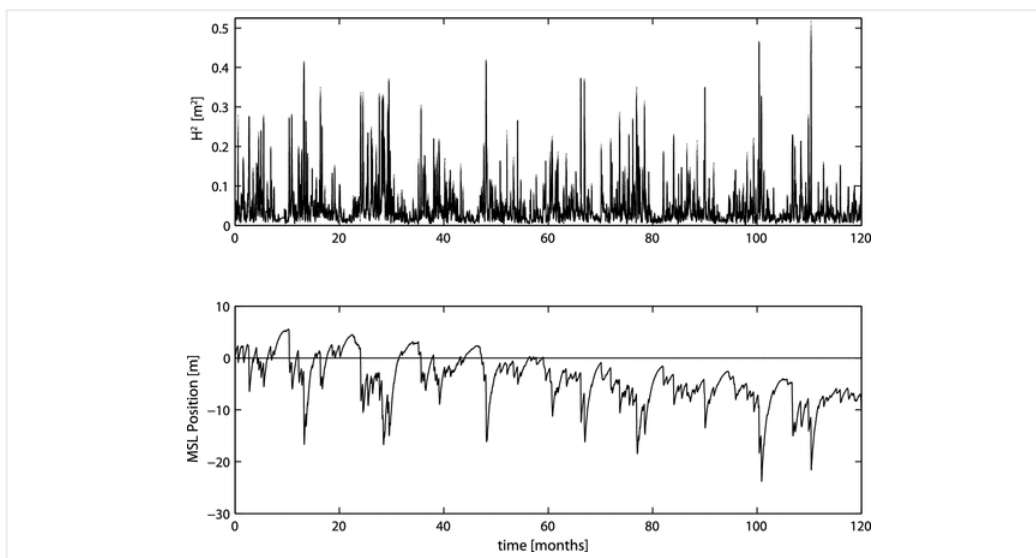
Extended Kalman Filter framework for forecasting shoreline evolution

Joseph W. Long, Nathaniel G. Plant

First Published: 7 July 2012 Vol: 39, L13603 | DOI: 10.1029/2012GL052180

KEY POINTS

- Method can separate short and long term scales of shoreline change
- Model free parameters are dynamically estimated
- Uncertainty of shoreline forecasts including model and data input are quantified



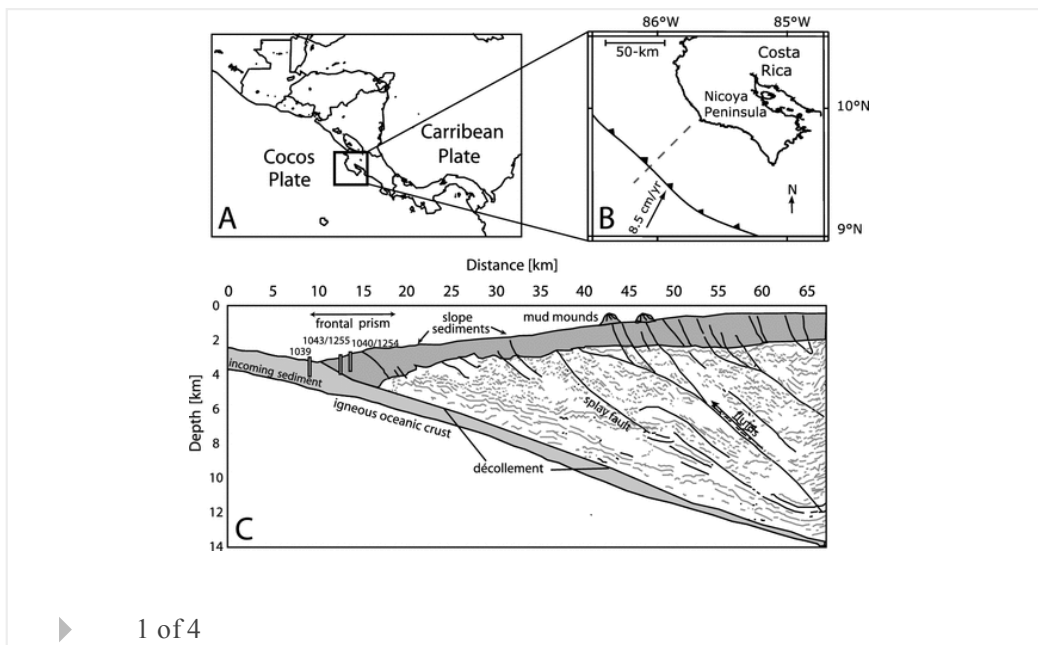
Fluid budgets of subduction zone forearcs: The contribution of splay faults

Rachel M. Lauer, Demian M. Saffer

First Published: 11 July 2012 Vol: 39, L13604 | DOI: 10.1029/2012GL052182

KEY POINTS

- Splay faults exert a primary control on the partitioning of fluid expulsion
- Results provide a quantitative framework for interpreting seafloor observations
- Realistic permeability architecture (faults) should be included in future models



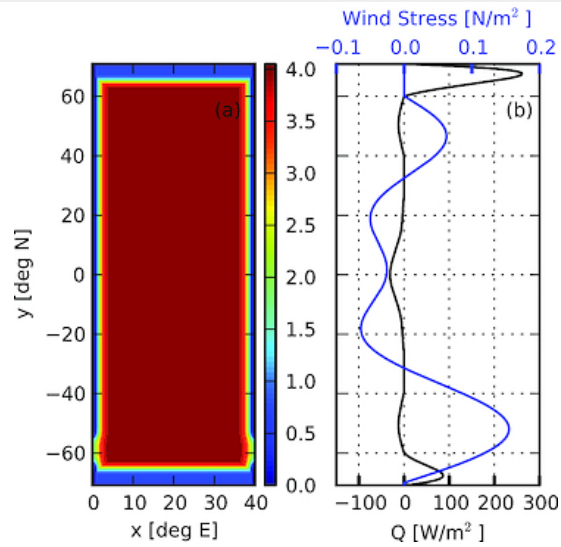
Mechanical power input from buoyancy and wind to the circulation in an ocean model

J. A. Saenz, A. M. Hogg, G. O. Hughes, R. W. Griffiths

First Published: 14 July 2012 Vol: 39, L13605 | DOI: 10.1029/2012GL052035

KEY POINTS

- Buoyancy and wind forces actively modulate the ocean energetics and circulation
- The power input from each forcing has a positive feedback on the other
- Changes in generation rate of APE lead to changes in conversion from APE to KE



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Planets

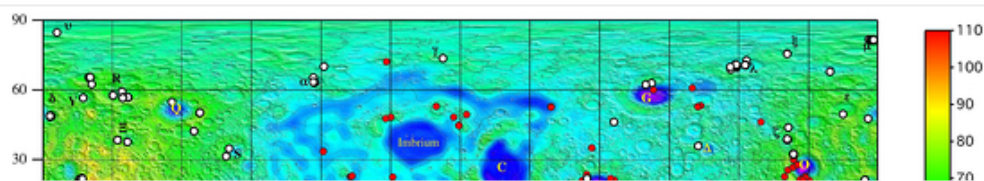
Massive layer of pure anorthosite on the Moon

S. Yamamoto, R. Nakamura, T. Matsunaga, Y. Ogawa, Y. Ishihara, T. Morota, N. Hirata, M. Ohtake, T. Hiroi, Y. Yokota, et al

First Published: 6 July 2012 Vol: 39, L13201 | DOI: 10.1029/2012GL052098

KEY POINTS

- The existence of a massive layer of pure anorthosite on the Moon
- Massive production of pure anorthosite produced during the lunar magma ocean
- Dichotomy of lunar lower crust



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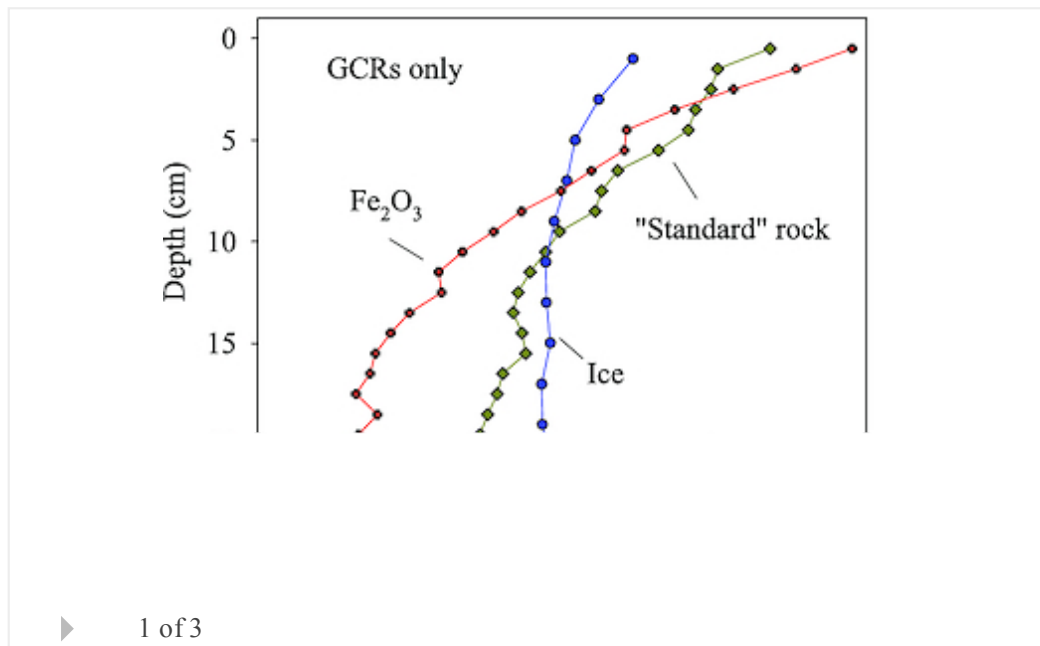
Degradation of the organic molecules in the shallow subsurface of Mars due to irradiation by cosmic rays

A. A. Pavlov, G. Vasilyev, V. M. Ostryakov, A. K. Pavlov, P. Mahaffy

First Published: 7 July 2012 Vol: 39, L13202 | DOI: 10.1029/2012GL052166

KEY POINTS

- Cosmic rays is a key factor for the degradation of organic molecules on Mars
- Solar CR are critically important for degradation in the top 2 cm of rocks
- Only 100 amu organic compounds have a good chance to survive cosmic ray exposure



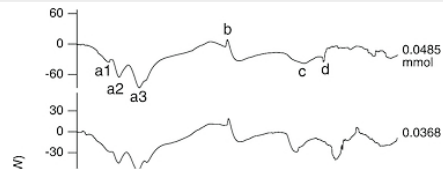
Perchlorate induced low temperature carbonate decomposition in the Mars Phoenix Thermal and Evolved Gas Analyzer (TEGA)

K. M. Cannon, B. Sutter, D. W. Ming, W. V. Boynton, R. Quinn

First Published: 11 July 2012 Vol: 39, L13203 | DOI: 10.1029/2012GL051952

KEY POINTS

- Hydrated magnesium perchlorate decomposes to release HCl gas when heated
- Evolved HCl reacts with carbonates to evolve carbon dioxide
- Carbon dioxide releases are not proof of organic molecules in Martian soils



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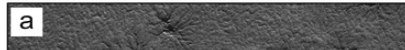
Formation of Martian araneiforms by gas-driven erosion of granular material

S. de Villiers, A. Nermoen, B. Jamtveit, J. Mathiesen, P. Meakin, S. C. Werner

First Published: 12 July 2012 Vol: 39, L13204 | DOI: 10.1029/2012GL052226

KEY POINTS

- Laboratory experiment produces Martian spider like patterns
- Convergent branched channels, meandering and braiding in a dry system
- A wide variety of morphologies can be produced by periodically erosive gas flow



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Solid Earth

Stress perturbations and seismic response associated with the 2011 M9.0 Tohoku-oki earthquake in and around the Tokai seismic gap, central Japan

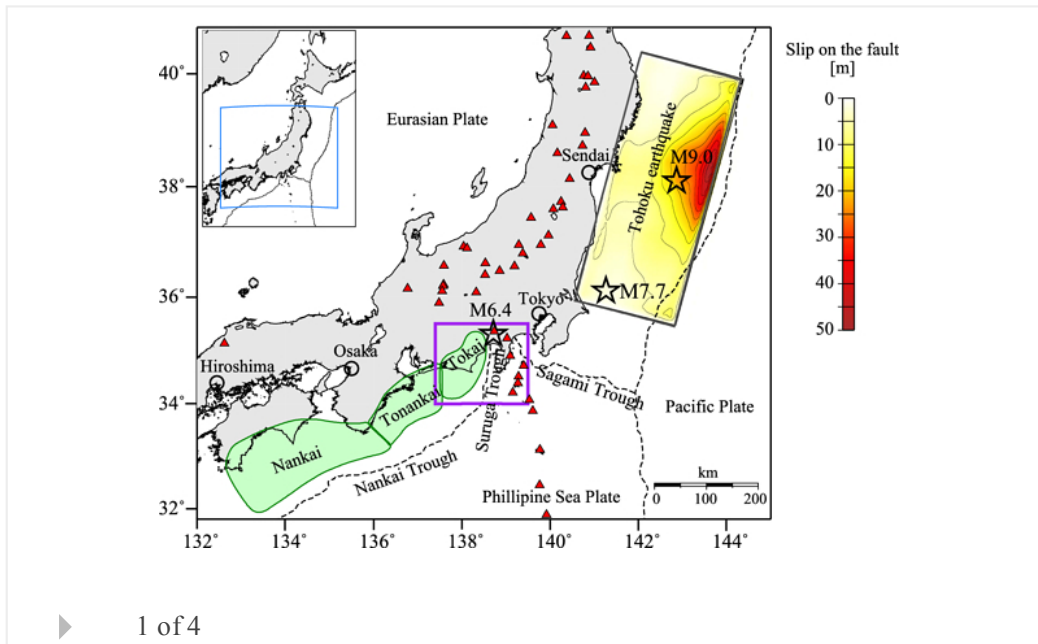
B. Enescu, S. Aoi, S. Toda, W. Suzuki, K. Obara, K. Shiomi, T. Takeda

First Published: 3 July 2012 Vol: 39, L00G28 | DOI: 10.1029/2012GL051839

KEY POINTS

- Strong evidence for static stress triggering by Tohoku quake around Tokai gap
- Positive, but small stress changes by Tohoku quake on the Tokai source
- Increased triggering hazard in and around the Tokai gap

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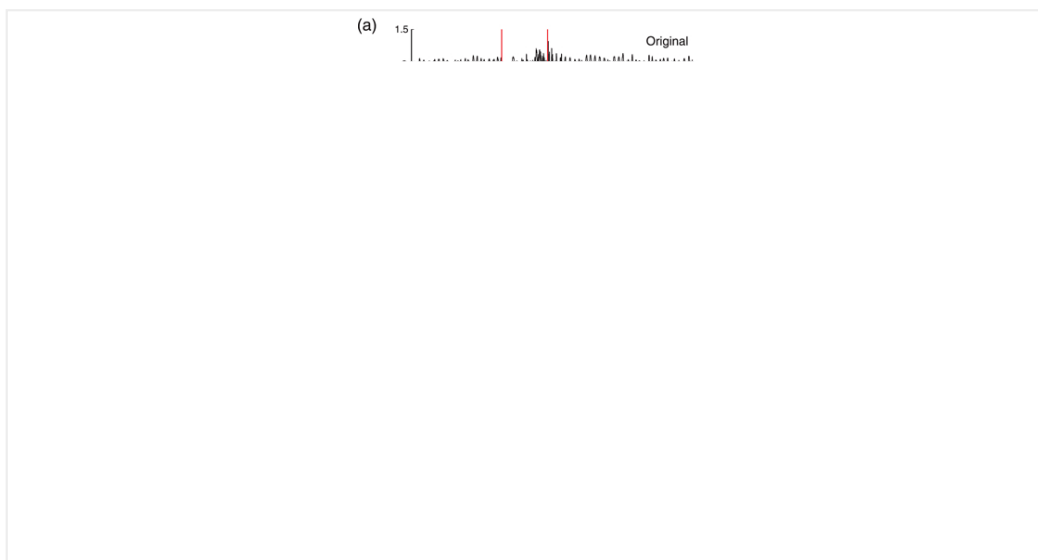
Seismic recordings of landslides caused by Typhoon Talas (2011), Japan

Masumi Yamada, Yuki Matsushi, Masahiro Chigira, Jim Mori

First Published: 7 July 2012 Vol: 39, L13301 | DOI: 10.1029/2012GL052174

KEY POINTS

- Seismic signals of landslides due to Typhoon Talas were detected
- The location of the landslides can be determined by a back projection
- Good correlations of seismic amplitudes with volumes of landslides



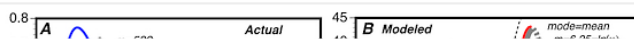
Paleoseismic interevent times interpreted for an unsegmented earthquake rupture forecast

Tom Parsons

First Published: 10 July 2012 Vol: 39, L13302 | DOI: 10.1029/2012GL052275

KEY POINTS

- Paleoseismicities are implicitly assumed to represent characteristic ruptures
- A new method is needed for when segmentation is not assumed
- A distribution-free time dependent approach is developed



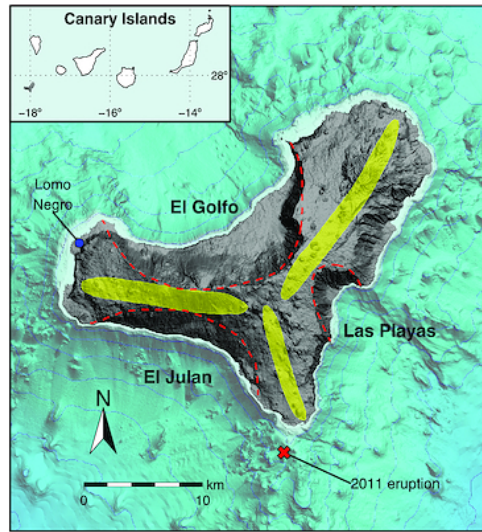
Monitoring the volcanic unrest of El Hierro (Canary Islands) before the onset of the 2011–2012 submarine eruption

C. López, M. J. Blanco, R. Abella, B. Brenes, V. M. Cabrera Rodríguez, B. Casas, I. Domínguez Cerdeña, A. Felpeto, M. Fernández de Villalta, C. del Fresno, et al

First Published: 14 July 2012 Vol: 39, L13303 | DOI: 10.1029/2012GL051846

KEY POINTS

- Five preeruptive phases based on evolution of seismicity and ground deformation
- Earthquakes and ground deformation traced horizontal magma migration



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Space Sciences

Tsunamigenic ionospheric hole

Yoshihiro Kakinami, Masashi Kamogawa, Yuichiro Tanioka, Shigeto Watanabe,
Aditya Riadi Gusman, Jann-Yenq Liu, Yasuyuki Watanabe, Toru Mogi
First Published: 1 June 2012 Vol: 39, L00G27 | DOI: 10.1029/2011GL050159

KEY POINTS

- A large depletion of ionospheric plasma appears above tsunami source area
- A tsunamigenic ionospheric hole occurs only in the large subduction earthquake
- A dense GPS network will provide the whole of the initial tsunami

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Flux estimates of ions from the lunar exosphere

M. Sarantos, R. E. Hartle, R. M. Killen, Y. Saito, J. A. Slavin, A. Glozer

First Published: 3 July 2012 Vol: 39, L13101 | DOI: 10.1029/2012GL052001

KEY POINTS

- Fluxes of ions from the lunar exosphere can exceed fluxes of ions from surface
- We could infer abundances of undetected lunar neutrals from ion measurements
- Different exo-ions map into Kaguya Mass Analyzer with different efficiencies

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Mechanism of substorm current wedge formation: THEMIS observations

Z. H. Yao, Z. Y. Pu, S. Y. Fu, V. Angelopoulos, M. Kubyshkina, X. Xing, L. Lyons
Y. Nishimura, L. Xie, X. G. Wang, et al

First Published: 11 July 2012 Vol: 39, L13102 | DOI: 10.1029/2012GL052055

KEY POINTS

- Two dimensional pressure gradient could be estimated using three satellites
- Dawn-dusk pressure gradient was generated after flow diversion
- FAC generated by azimuthal pressure gradient is enough for SCW formation

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The Cryosphere

Mass loss of Larsen B tributary glaciers (Antarctic Peninsula) unabated since 2002

Etienne Berthier, Ted A. Scambos, Christopher A. Shuman

First Published: 10 July 2012 Vol: 39, L13501 | DOI: 10.1029/2012GL051755

KEY POINTS

- Similar loss (9 Gt/yr) in 2001-2006 & 2006-2011 for major/deep Larsen B glaciers
- Rapid thinning (>30 m/yr) propagates to upper drainage basins 10 yr after collapse
- Hektoria/Green glacier system has the largest mass loss

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Holocene sea-level change and Antarctic melting history derived from geological observations and geophysical modeling along the Shimokita Peninsula, northern Japan

Yusuke Yokoyama, Jun'ichi Okuno, Yosuke Miyairi, Stephen Obrochta, Nobuhiro Demboya, Yoshinori Makino, Hodaka Kawahata

First Published: 13 July 2012 Vol: 39, L13502 | DOI: 10.1029/2012GL051983

KEY POINTS

- Sea-level observations and glacio-hydro-isostatic modeling were coupled
- Last deglaciation of Antarctica was ceased largely by 3-4 ka
- Recent acceleration of Antarctic melting is likely due to anthropogenic origin

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