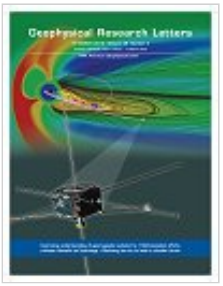


Volume 39, Issue 5

March 2012

Brief Detailed

Atmospheric Science

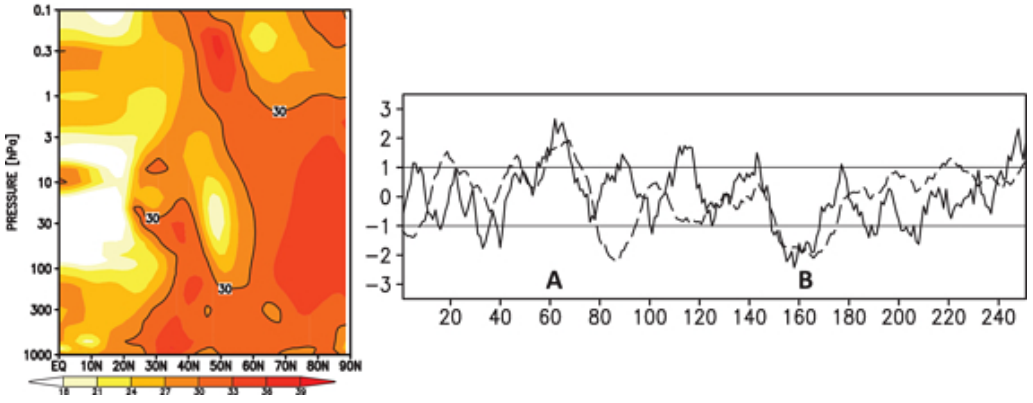
Stratosphere-troposphere coupling at inter-decadal time scales: Implications for the North Atlantic Ocean

Elisa Manzini, Chiara Cagnazzo, Pier Giuseppe Fogli, Alessio Bellucci, Wolfgang A. Müller

First Published: 1 March 2012 Vol: 39, L05801 | DOI: 10.1029/2011GL050771

KEY POINTS

- Simulated long lasting strong and weak stratospheric polar vortex anomalies
- These vortex anomalies are driven by internal dynamical proceses
- These vortex anomalies connect to Atlantic meridional overturning circulation



1 of 3

Surfactant effects in global simulations of cloud droplet activation

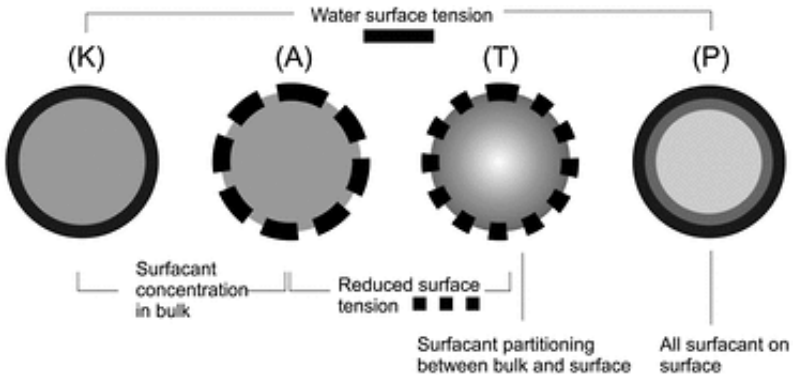
N. L. Prisle, A. Asmi, D. Topping, A.-I. Partanen, S. Romakkaniemi, M. Dal Maso, M. Kulmala, A. Laaksonen, K. E. J. Lehtinen, G. McFiggans, et al

First Published: 2 March 2012 Vol: 39, L05802 | DOI: 10.1029/2011GL050467

KEY POINTS

- Surfactant effects in global aerosol-cloud interactions were simulated

- Using only surface tension considerations may give erroneous results
- Detailed parameterizations lead to more modest changes in cloud properties



1 of 2

Changes in winter precipitation extremes for the western United States under a warmer climate as simulated by regional climate models

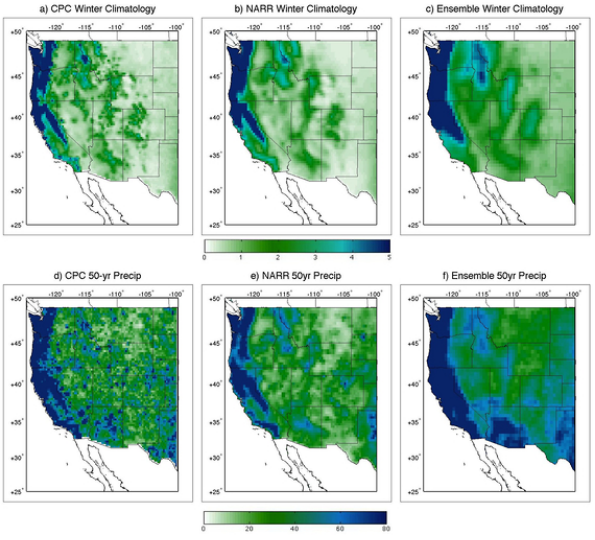
F. Dominguez, E. Rivera, D. P. Lettenmaier, C. L. Castro

First Published: 2 March 2012 Vol: 39, L05803 | DOI: 10.1029/2011GL050762

KEY POINTS

- Statistically significant increases in western US future extreme winter precipitation
- Eight dynamically downscaled GCM simulations show generalized agreement
- Spatial pattern of changes in mean precip. is different than that of extremes

Highlight



1 of 4

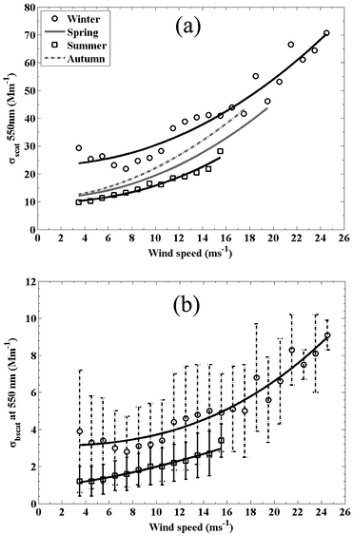
Wind-driven influences on aerosol light scattering in north-east Atlantic air

Aditya Vaishya, S. Gerard Jennings, Colin O'Dowd

First Published: 9 March 2012 Vol: 39, L05805 | DOI: 10.1029/2011GL050556

KEY POINTS

- Sea spray contributes significant scattering in marine air
- Spray scattering is power law dependent and can rival that of polluted air
- Spray scattering is 50% less in regions of high biological activity



1 of 2

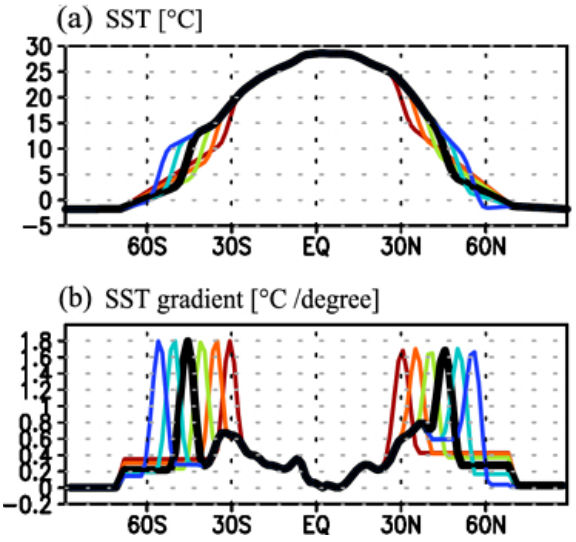
Dependence of the climatological axial latitudes of the tropospheric westerlies and storm tracks on the latitude of an extratropical oceanic front

Fumiaki Ogawa, Hisashi Nakamura, Kazuaki Nishii, Takafumi Miyasaka, Akira Kuwano-Yoshida

First Published: 9 March 2012 Vol: 39, L05804 | DOI: 10.1029/2011GL049922

KEY POINTS

- Fundamental aspects of the atmospheric circulation gaining increasing attention
- Stronger impacts by a midlatitude SST front than by a subpolar one
- Hints for understating the extratropical climate in the past, present and future



1 of 3

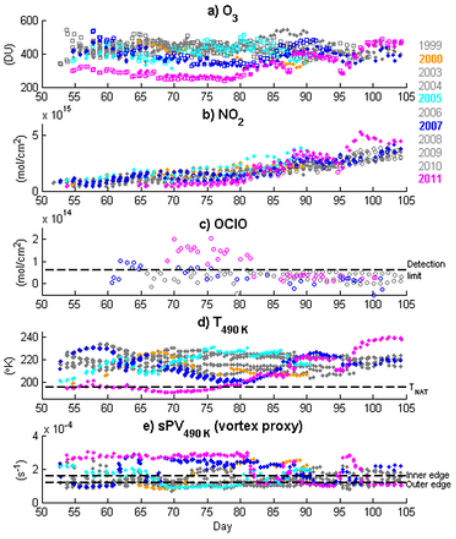
Severe 2011 ozone depletion assessed with 11 years of ozone, NO_2, and OClO measurements at 80°N

C. Adams, K. Strong, X. Zhao, M. R. Bassford, M. P. Chipperfield, W. Daffer, J. R. Drummond, E. E. Farahani, W. Feng, A. Fraser, et al

First Published: 13 March 2012 Vol: 39, L05806 | DOI: 10.1029/2011GL050478

KEY POINTS

- Unprecedented low ozone and NO2 columns were observed in 2011
- Low ozone and NO2 columns are attributed to dynamics as well as chemistry
- 47% maximum column ozone loss observed, the largest loss in the 11-year record



1 of 3

Cloud ice water content retrieved from the CALIOP space-based lidar

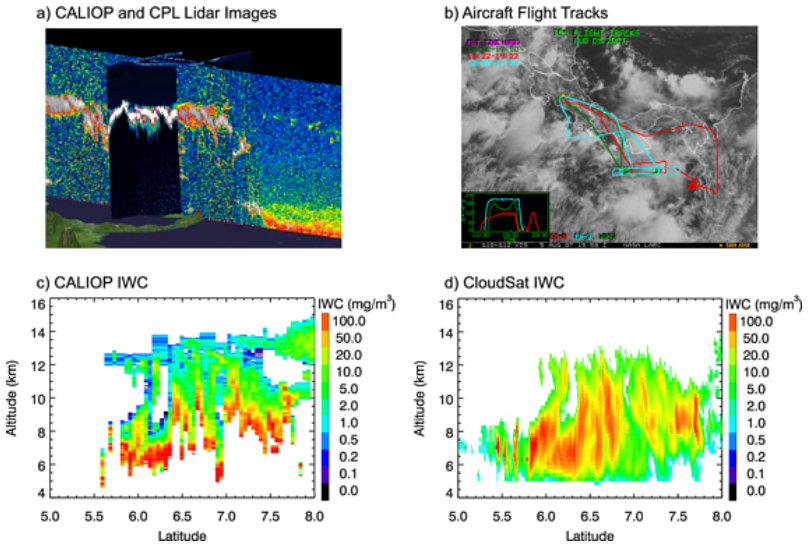
Melody Avery, David Winker, Andrew Heymsfield, Mark Vaughan, Stuart Young, Yongxiang Hu, Charles Trepte

First Published: 13 March 2012 Vol: 39, L05808 | DOI: 10.1029/2011GL050545

KEY POINTS

- A new cloud ice water content product from the CALIOP lidar is described
- CALIOP IWC is compared with MLS, CloudSat and in situ IWC
- CALIOP IWC is global, vertically resolved data for climate model evaluation

Free



1 of 3

Does a theoretical estimation of the dust size distribution at emission suggest more bioavailable iron deposition?

Akinori Ito, Jasper F. Kok, Yan Feng, Joyce E. Penner

First Published: 13 March 2012 Vol: 39, L05807 | DOI: 10.1029/2011GL050455

KEY POINTS

- Larger soluble iron deposition under clean atmospheric conditions
- Invariant to the size distribution at emission under polluted conditions
- These contrasting results have important implications for future projections

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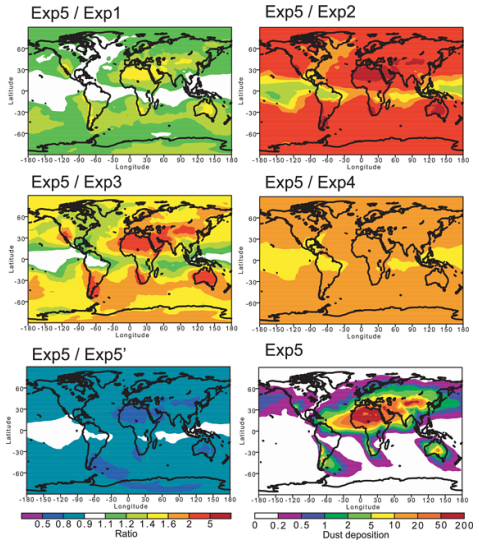


1 of 2

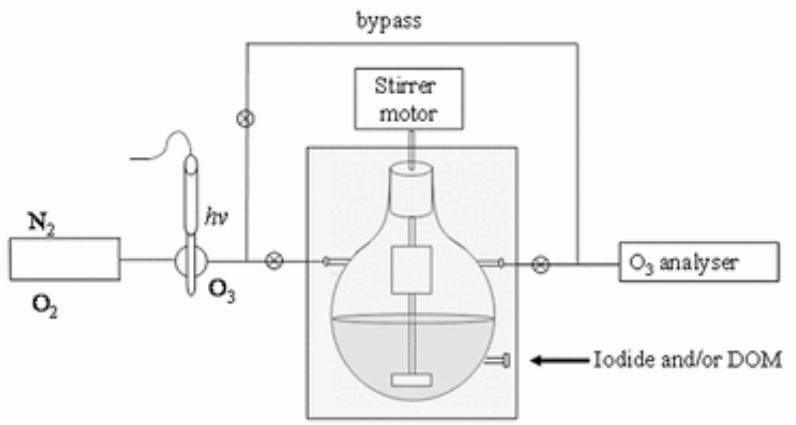
Chemical controls on ozone deposition to water

Manuela Martino, Bertrand Lézé, Alex R. Baker, Peter S. Liss

First Published: 15 March 2012 Vol: 39, L05809 | DOI: 10.1029/2011GL050282

KEY POINTS

- Ozone uptake by seawater is affected by both iodide and organics in the sea
- Iodide and organics play an approximately equal role
- The reactivity of ozone needs to be included in tropospheric models



1 of 4

Can Asian dust trigger phytoplankton blooms in the oligotrophic northern South China Sea?

Sheng-Hsiang Wang, N. Christina Hsu, Si-Chee Tsay, Neng-Huei Lin, Andrew M.

Sayer, Shih-Jen Huang, William K. M. Lau

First Published: 15 March 2012 Vol: 39, L05811 | DOI: 10.1029/2011GL050415

KEY POINTS

- First study on dust-triggered phytoplankton bloom in northern South China Sea
- Synergy of satellite/ground data to correlate dust deposition and chlorophyll
- Heavy dust events containing bioavailable iron can trigger chlorophyll blooms

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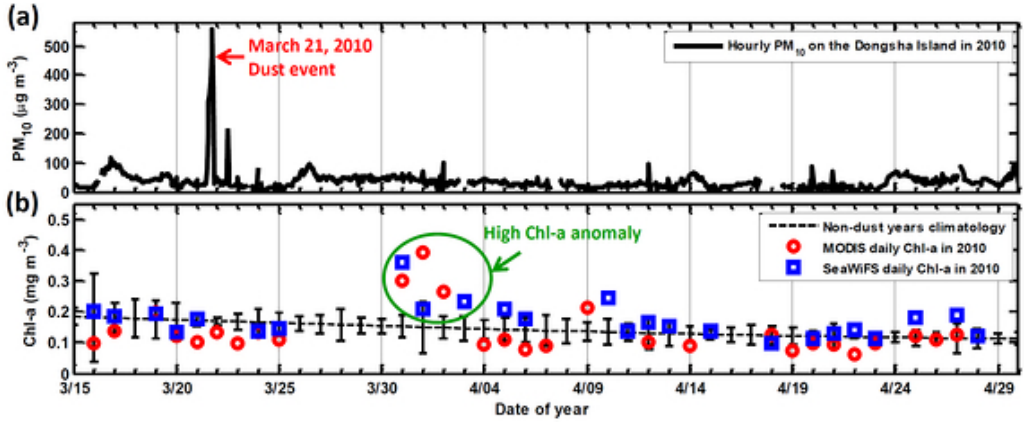


1 of 3

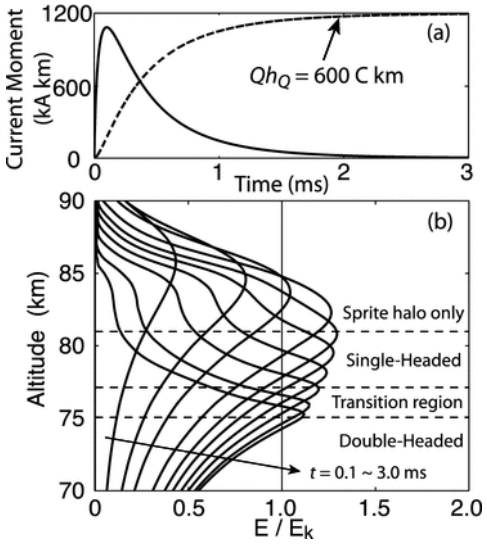
Formation of single and double-headed streamers in sprite-halo events

Jianqi Qin, Sebastien Celestin, Victor P. Pasko

First Published: 15 March 2012 Vol: 39, L05810 | DOI: 10.1029/2012GL051088

KEY POINTS

- Single-headed sprite streamers are initiated inside the main sprite halo
- Double-headed streamers are initiated at the lower edge of the sprite halo
- Upward streamers start from high-density previous streamer channels



1 of 2

Climate

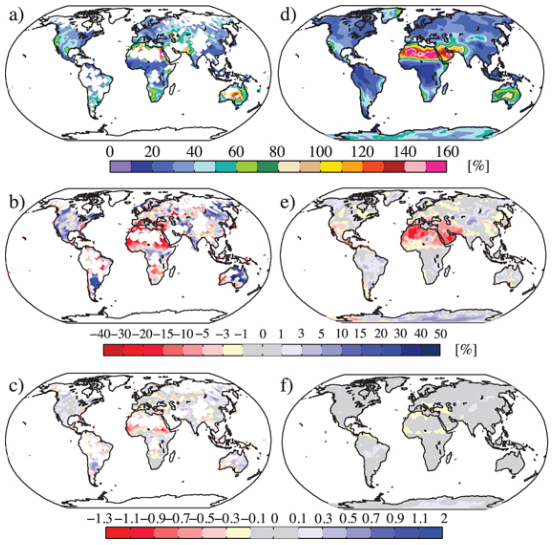
Perceptible changes in regional precipitation in a future climate

Irina Mahlstein, Robert W. Portmann, John S. Daniel, Susan Solomon, Reto Knutti
First Published: 2 March 2012 Vol: 39, L05701 | DOI: 10.1029/2011GL050738

KEY POINTS

- Global overview of when precipitation changes will become significant
- First perceptible changes not before 2040
- Models agree well with observations during wet season

Highlight



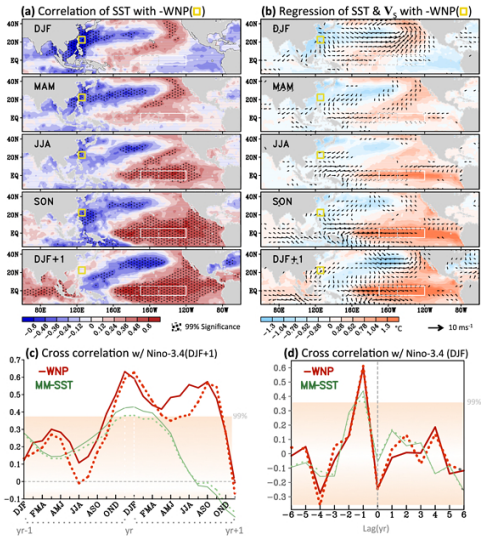
1 of 3

ENSO prediction one year in advance using western North Pacific sea surface temperatures

Shih-Yu Wang, Michelle L'Heureux, Hsin-Hsing Chia
First Published: 8 March 2012 Vol: 39, L05702 | DOI: 10.1029/2012GL050909

KEY POINTS

- Identification of the western North Pacific (WNP) region for SSTA
- Winter SSTA in WNP is a skillful predictor for ENSO development
- WNP SSTA initiates equatorial winds that influence oceanic Kelvin waves



1 of 4

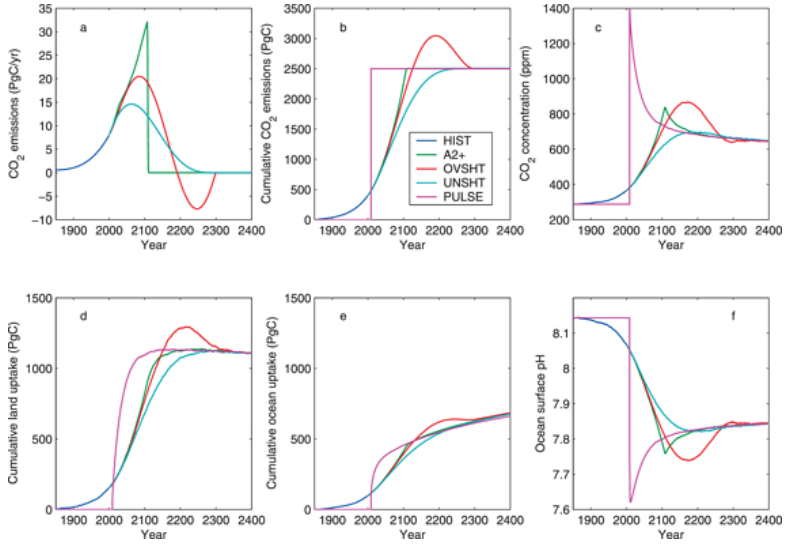
Is the climate response to CO_2 emissions path dependent?

K. Zickfeld, V. K. Arora, N. P. Gillett

First Published: 9 March 2012 Vol: 39, L05703 | DOI: 10.1029/2011GL050205

KEY POINTS

- The century-scale climate response after emissions cease is path independent
- The peak climate response is approximately path independent
- Changes in several climate variables are proportional to cumulative emissions



1 of 3

A cloudier Arctic expected with diminishing sea ice

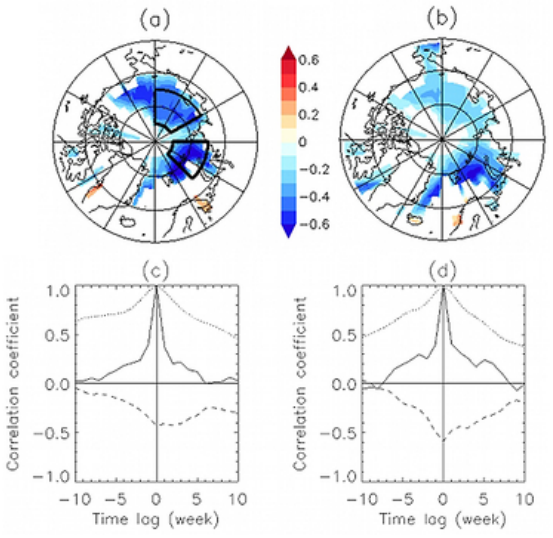
Yinghui Liu, Jeffrey R. Key, Zhengyu Liu, Xuanji Wang, Stephen J. Vavrus

First Published: 13 March 2012 Vol: 39, L05705 | DOI: 10.1029/2012GL051251

KEY POINTS

- EFA method is valuable in providing quatitative assessment of feedback
- Decrease in sea ice leads to increase in cloud
- Further decline in sea ice will likely result in cloudier Arctic

Highlight



1 of 3

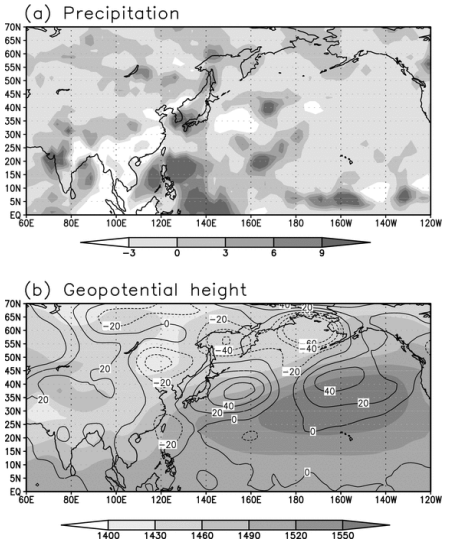
Mechanisms of an extraordinary East Asian summer monsoon event in July 2011

Kyong-Hwan Seo, Jun-Hyeok Son, Seung-Eon Lee, Tomohiko Tomita, Hyo-Seok Park

First Published: 15 March 2012 Vol: 39, L05704 | DOI: 10.1029/2011GL050378

KEY POINTS

- Mechanisms of the extraordinary northward intensification of the NPSH
- The summertime NAO in the polar region affects the EASM
- The simultaneous forcing by the SNAO and WNP heating leads to the NPSH changes



1 of 5

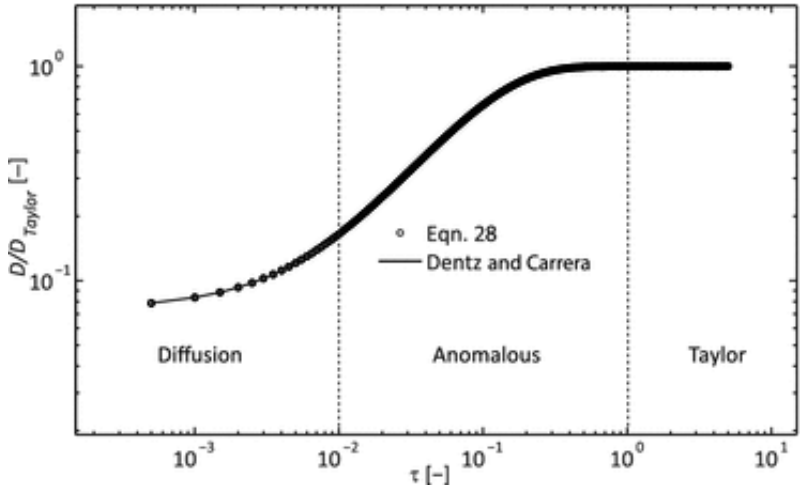
Hydrology and Land Surface Studies

Theory for dynamic longitudinal dispersion in fractures and rivers with Poiseuille flow

Lichun Wang, M. Bayani Cardenas, Wen Deng, Philip C. Bennett
First Published: 3 March 2012 Vol: 39, L05401 | DOI: 10.1029/2011GL050831

KEY POINTS

- We present a closed-form expression for dynamic dispersion coefficient
- Dispersion theory captures diffusive, anomalous, and Taylor dispersion
- Asymptotic time and length scales are determined



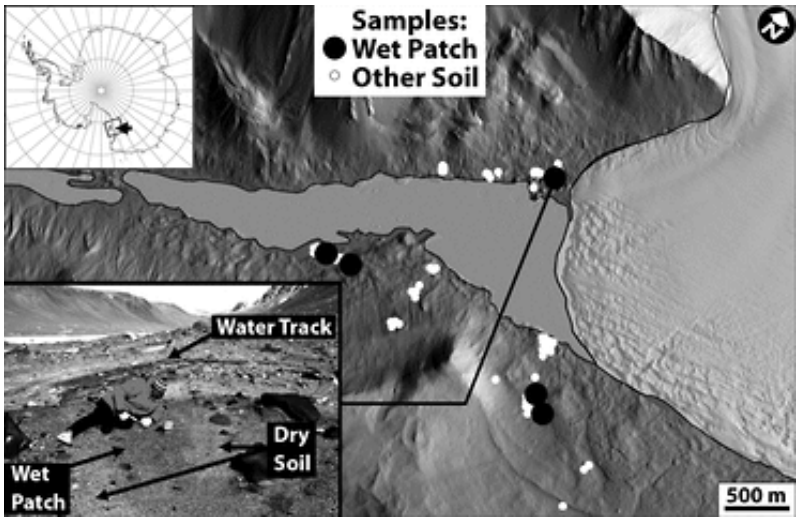
1 of 3

Hypersaline “wet patches” in Taylor Valley, Antarctica

Joseph S. Levy, Andrew G. Fountain, Kathy A. Welch, W. Berry Lyons
First Published: 6 March 2012 Vol: 39, L05402 | DOI: 10.1029/2012GL050898

KEY POINTS

- Unusual, isolated soil
- This mechanism generates bulk soil water in the absence of precipitation



1 of 1

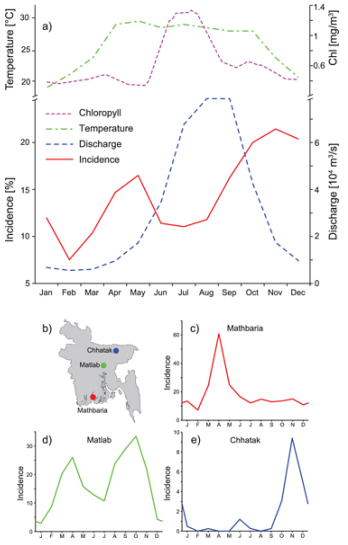
Hydroclimatology of dual-peak annual cholera incidence: Insights from a spatially explicit model

E. Bertuzzo, L. Mari, L. Righetto, M. Gatto, R. Casagrandi, I. Rodriguez-Iturbe, A. Rinaldo

First Published: 10 March 2012 Vol: 39, L05403 | DOI: 10.1029/2011GL050723

KEY POINTS

- A novel spatially explicit epidemic model that integrates a hydrological model
- The model reproduces dual-peak cholera epidemics typical of the Bengal region
- We analyze the range of conditions under which dual-peak epidemics are expected



1 of 3

Turbulent flow structures and aeolian sediment transport over a barchan sand

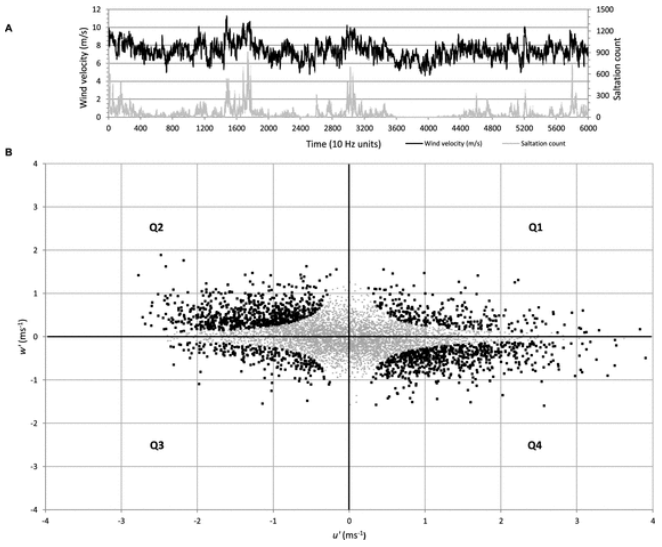
dune

G. F. S. Wiggs, C. M. Weaver

First Published: 13 March 2012 Vol: 39, L05404 | DOI: 10.1029/2012GL050847

KEY POINTS

- The quadrants of turbulence are affected by topographic forcing over a dune
- Sweeps and ejections are prevalent at the toe; outward interactions at the crest
- Most sand transport events are associated with sweeps and outward interactions



1 of 2

Effects of native forest restoration on soil hydraulic properties, Auwahi, Maui, Hawaiian Islands

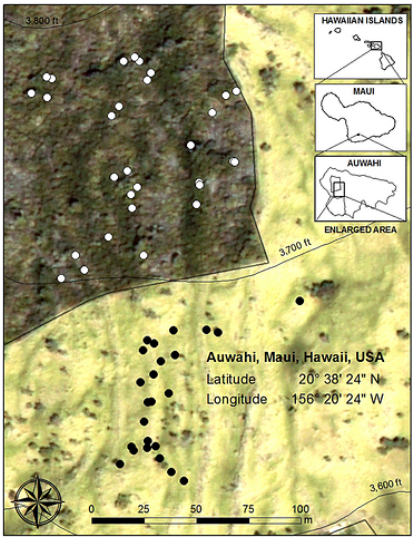
K. S. Perkins, J. R. Nimmo, A. C. Medeiros

First Published: 14 March 2012 Vol: 39, L05405 | DOI: 10.1029/2012GL051120

KEY POINTS

- Reestablishemnt of native species rapidly and siginificantly alters hydrology
- Vegetation effects water availability, organic matter, & preferential flow
- Soil changes act to distribute infiltrated water faster and deeper

Highlight



1 of 2

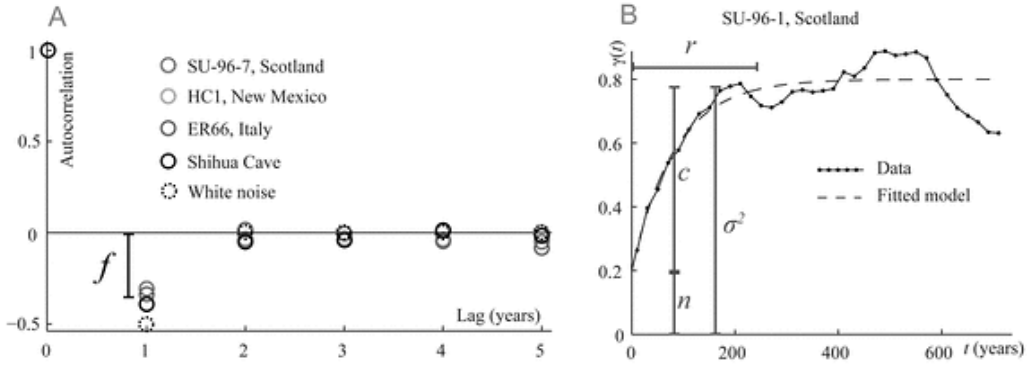
Quantifying the value of laminated stalagmites for paleoclimate reconstructions

Gregoire Mariethoz, Bryce F. J. Kelly, Andy Baker

First Published: 15 March 2012 Vol: 39, L05407 | DOI: 10.1029/2012GL050986

KEY POINTS

- Quantification of noise in stalagmite laminae data.
- Classification of stalagmites as potential climate proxies.
- Separation of hydrological and climatic influences.



1 of 4

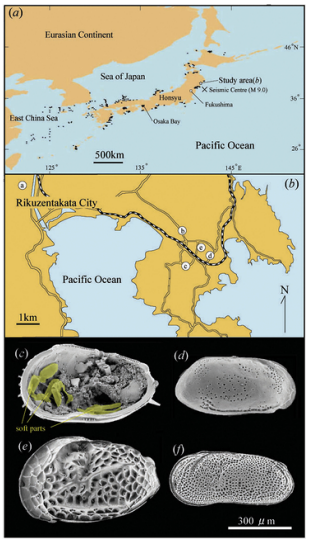
Ostracodes reveal the sea-bed origin of tsunami deposits

Gengo Tanaka, Hajime Naruse, Shota Yamashita, Kazuno Arai

First Published: 15 March 2012 Vol: 39, L05406 | DOI: 10.1029/2012GL051320

KEY POINTS

- Tsunami deposit on land were derived from seafloor
- MAT are useful for identifying tsunami deposit
- Occurrences of soft-parts preserved ostracods indicate tsunami event



1 of 1

Oceans

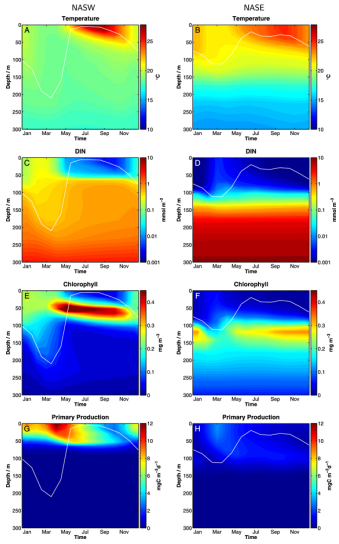
High sensitivity of ultra-oligotrophic marine ecosystems to atmospheric nitrogen deposition

Beatriz Mouriño-Carballido, Markus Pahlow, Andreas Oschlies

First Published: 2 March 2012 Vol: 39, L05601 | DOI: 10.1029/2011GL050606

KEY POINTS

- Sensitivity to atmospheric N deposition



1 of 3

On the modelling of equatorial waves

A. Constantin

First Published: 3 March 2012 Vol: 39, L05602 | DOI: 10.1029/2012GL051169

KEY POINTS

- Equatorial two-dimensional wave-current interactions are theoretically possible
- The inclusion of vorticity enables us to capture vertical flow variations
- The present approach can be extended to more general vorticities

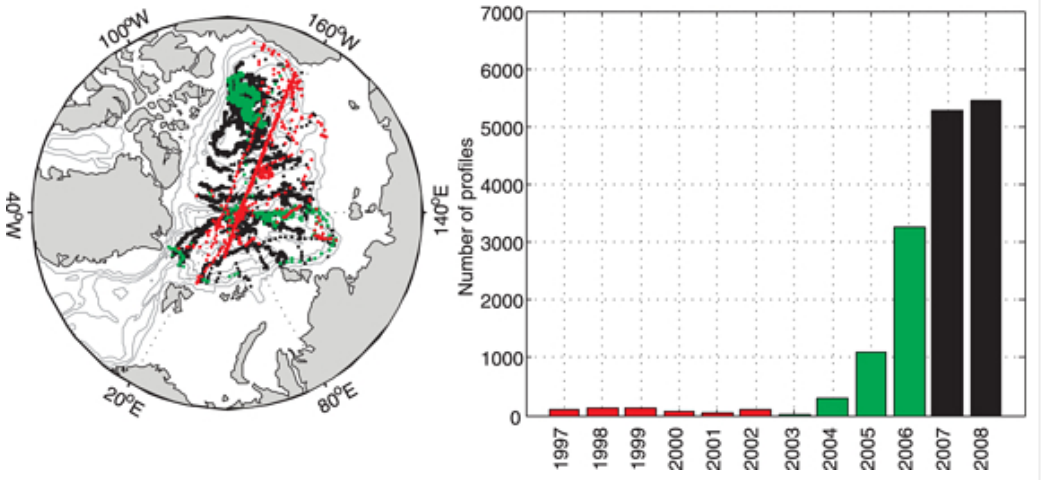
The Atlantic and summer Pacific waters variability in the Arctic Ocean from 1997 to 2008

Pascaline Bourgain, Jean Claude Gascard

First Published: 6 March 2012 Vol: 39, L05603 | DOI: 10.1029/2012GL051045

KEY POINTS

- The indices introduced are efficient tools to identify the water masses
- Presence of Atlantic water warm pulses but no warming trend
- The summer Pacific water could partly explain the Arctic sea ice reduction



1 of 5

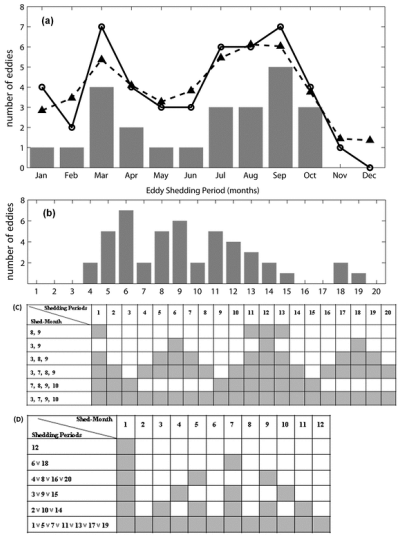
Why does the Loop Current tend to shed more eddies in summer and winter?

Y.-L. Chang, L.-Y. Oey

First Published: 7 March 2012 Vol: 39, L05605 | DOI: 10.1029/2011GL050773

KEY POINTS

- The observed seasonal preferences of Loop Current eddy shedding, more in summer
- The preference is forced, instead of the natural shedding
- It is due to the be due to a curious combination of forcing by the seasonal wind



1 of 4

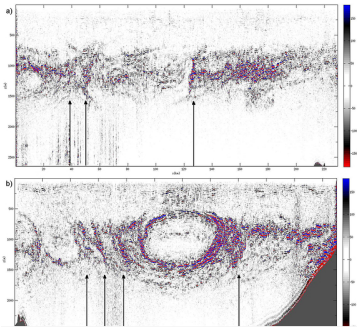
Arms winding around a meddy seen in seismic reflection data close to the Morocco coastline

C. Ménesguen, B. L. Hua, X. Carton, F. Klingelhoefer, P. Schnürle, C. Reichert

First Published: 7 March 2012 Vol: 39, L05604 | DOI: 10.1029/2011GL050798

KEY POINTS

- Arms winding around the vortex identified in a seismic dataset
- The presence of a meddy very close to the Morocco coastline



1 of 4

Merging tsunamis of the 2011 Tohoku-Oki earthquake detected over the open ocean

Y. Tony Song, Ichiro Fukumori, C. K. Shum, Yuchan Yi

First Published: 8 March 2012 Vol: 39, L05606 | DOI: 10.1029/2011GL050767

KEY POINTS

- Unpredictable tsunamis are the major challenges for responsible agencies
- Here we shown evidence of merging tsunamis that sheds light on this issue
- This finding will have immediate, far-reaching implications on tsunami prediction

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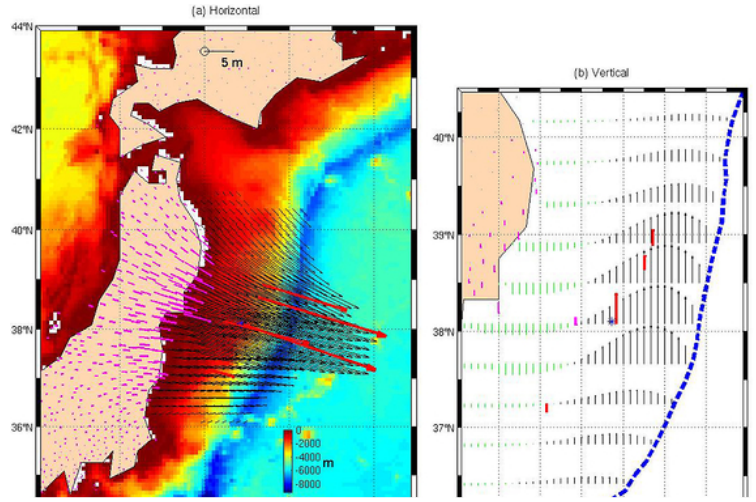


1 of 4

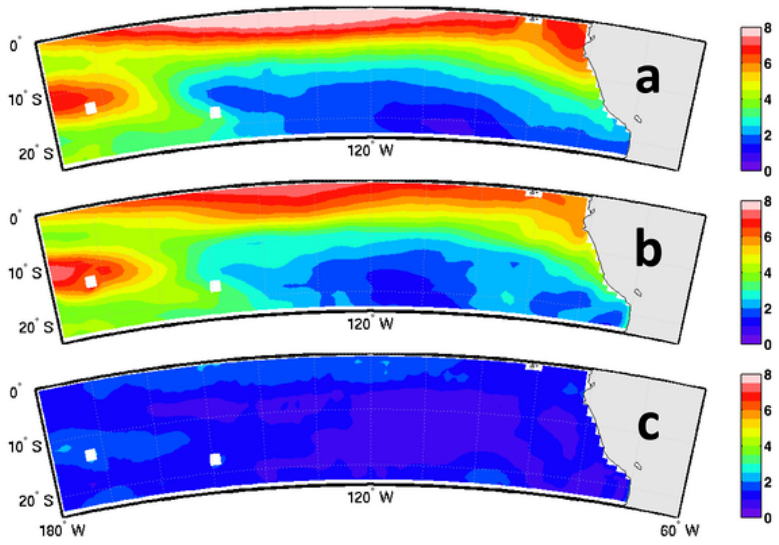
Buoyancy-driven interannual sea level changes in the southeast tropical Pacific

Christopher G. Piecuch, Rui M. Ponte

First Published: 10 March 2012 Vol: 39, L05607 | DOI: 10.1029/2012GL051130

KEY POINTS

- Southeast Pacific sea level changes cannot be explained by wind forcing alone
- Buoyancy forcing and nonlinear effects also contribute to regional variability
- Buoyancy-driven changes represent non-locally forced ocean transports



1 of 3

Planets

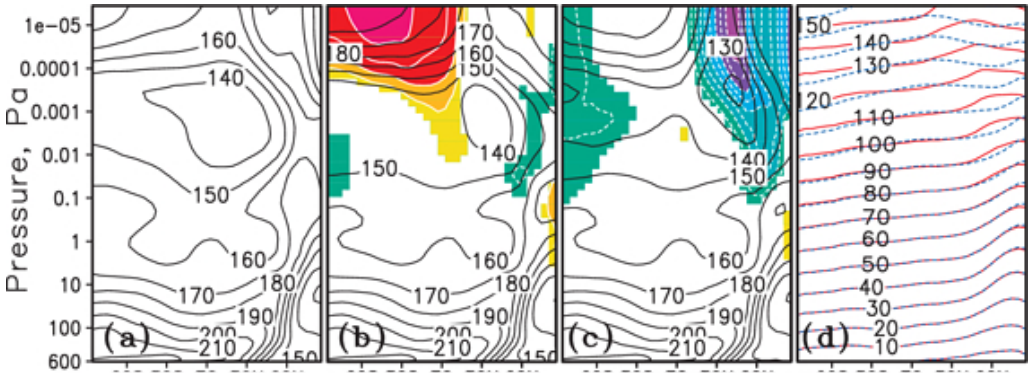
Thermal effects of internal gravity waves in the Martian upper atmosphere

Alexander S. Medvedev, Erdal Yiğit

First Published: 9 March 2012 Vol: 39, L05201 | DOI: 10.1029/2012GL050852

KEY POINTS

- Thermal effects of GWs have been parameterized in a Martian GCM
- GWs produce a significant cooling above 100 km, well in line with observations
- These effects are comparable with radiative effects of CO2 and must be accounted



1 of 3

Solid Earth

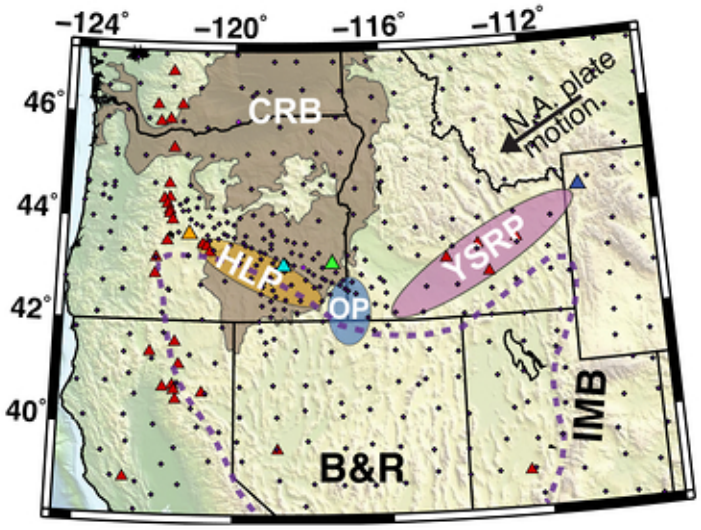
Constraints on the causes of mid-Miocene volcanism in the Pacific Northwest US from ambient noise tomography

Sara Hanson-Hedgecock, Lara S. Wagner, Matthew J. Fouch, David E. James

First Published: 1 March 2012 Vol: 39, L05301 | DOI: 10.1029/2012GL051108

KEY POINTS

- There is an absence of mantle lithosphere beneath the HLP volcanic track
- Mid crustal sills in the SRP may be more extensive than previously thought
- The Owyhee Plateau has a very stable lithospheric root and high crustal Vs



1 of 3

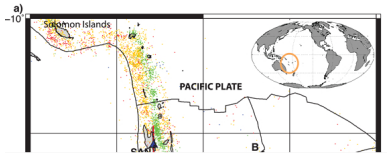
Seismic anisotropy in the south western Pacific region from shear wave splitting

Eszter Király, Irene Bianchi, Götz Bokelmann

First Published: 2 March 2012 Vol: 39, L05302 | DOI: 10.1029/2011GL050407

KEY POINTS

- Seismic anisotropy in the upper mantle has been detected
- Anisotropy shows different patterns with respect to the presence of the slab



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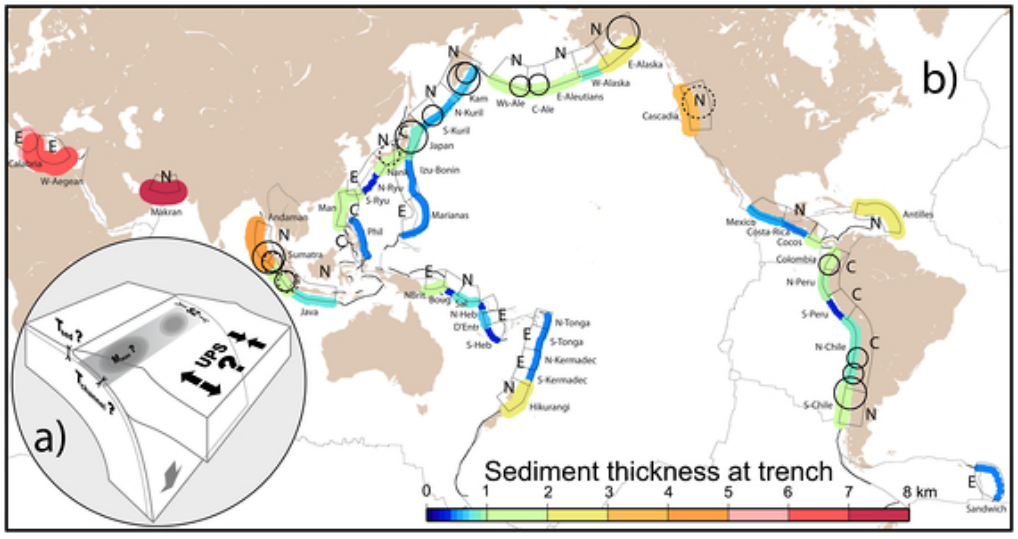
Relation between subduction megathrust earthquakes, trench sediment thickness and upper plate strain

A. Heuret, C. P. Conrad, F. Funiciello, S. Lallemand, L. Sandri

First Published: 3 March 2012 Vol: 39, L05304 | DOI: 10.1029/2011GL050712

KEY POINTS

- Defining the best subduction interface conditions for mega-events genesis
- Showing possible relation between trench sediments and upper plate strain
- Providing a global dataset for trench sediment thickness



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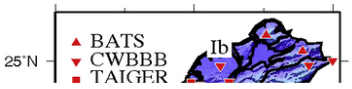
Broad-band Rayleigh wave tomography of Taiwan and its implications on gravity anomalies

Tzu-Ying Huang, Yuancheng Gung, Wen-Tzong Liang, Ling-Yun Chiao, Louis S. Teng

First Published: 3 March 2012 Vol: 39, L05305 | DOI: 10.1029/2011GL050727

KEY POINTS

- Resolve the long-lasting controversy about the largest gravity anomaly in Taiwan
- Build the first surface wave model of Taiwan with unprecedented dense data set
- Provide important implications to the tectonic evolution of Taiwan



1 of 4

1 of 4

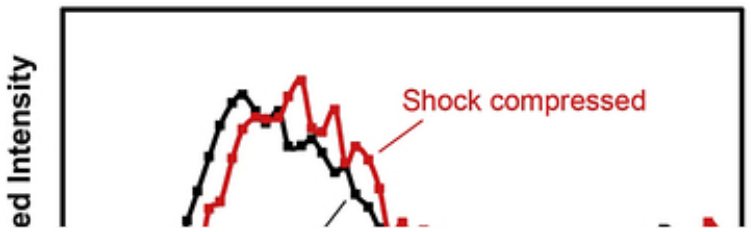
Structure of shock compressed model basaltic glass: Insights from O K-edge X-ray Raman scattering and high-resolution ^{27}Al NMR spectroscopy

Sung Keun Lee, Sun Young Park, Hyo-Im Kim, Oliver Tschauner, Paul Asimow, Ligang Bai, Yuming Xiao, Paul Chow

First Published: 3 March 2012 Vol: 39, L05306 | DOI: 10.1029/2012GL050861

KEY POINTS

- Shock-induced increase in Al coordination number in basaltic glass is revealed
- The Al site fraction in glass can be used a new shock index for impact events
- Impact event on basalts in planetary surfaces results in highly coordinated Al



1 of 4

Relating stick-slip friction experiments to earthquake source parameters

A. McGarr

First Published: 3 March 2012 Vol: 39, L05303 | DOI: 10.1029/2011GL050327

KEY POINTS

- Stick-slip friction results provide insight about earthquake rupture
- Friction experiments can be used to estimate most seismic parameters
- Rupture parameters depend mostly on maximum slip and seismic moment

1 of 2

Interlocking of heterogeneous plate coupling and aftershock area expansion pattern for the 2011 Tohoku-Oki Mw9 earthquake

Fumiko Tajima, Brian L. N. Kennett

First Published: 6 March 2012 Vol: 39, L05307 | DOI: 10.1029/2011GL050703

KEY POINTS

- We revised the concept of asperity model in terms of effective plate coupling
- We showed an anomalous zone in plate coupling by a joint tomography model
- Our approach may detect clues for future interlocked megathrust events

1 of 3

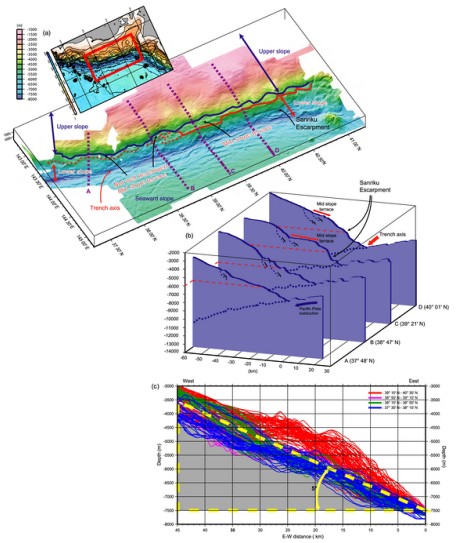
Large submarine landslides in the Japan Trench: A new scenario for additional tsunami generation

Kiichiro Kawamura, Tomoyuki Sasaki, Toshiya Kanamatsu, Arito Sakaguchi, Yujiro Ogawa

First Published: 6 March 2012 Vol: 39, L05308 | DOI: 10.1029/2011GL050661

KEY POINTS

- Tsunamis during the 1897 Meiji Sanriku Eq were excited by slump
- The tsunami source was neighboring to that of the 2011 Tohoku earthquake
- In general, rupture (tsunami) mechanism in neighboring area should be similar



1 of 3

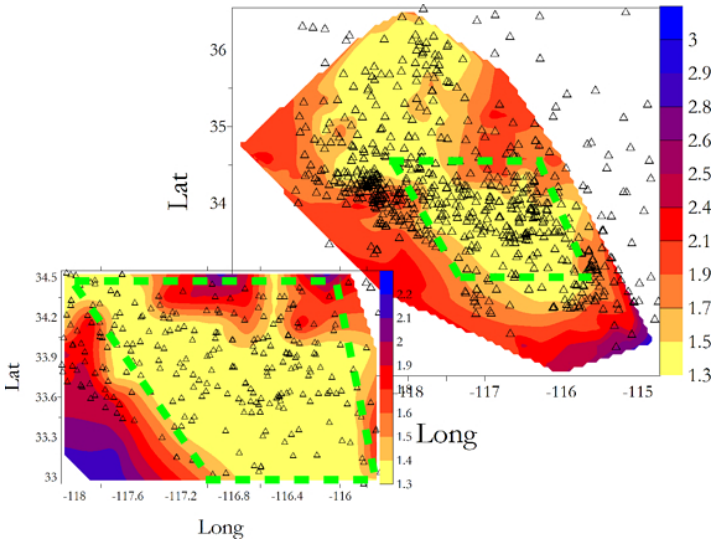
The earthquake magnitude is influenced by previous seismicity

E. Lippiello, C. Godano, L. de Arcangelis

First Published: 7 March 2012 Vol: 39, L05309 | DOI: 10.1029/2012GL051083

KEY POINTS

- The existence of magnitude correlations
- The influence of catalog incompleteness on observed magnitude correlations
- The implementation of our results in models for seismic forecasting



1 of 4

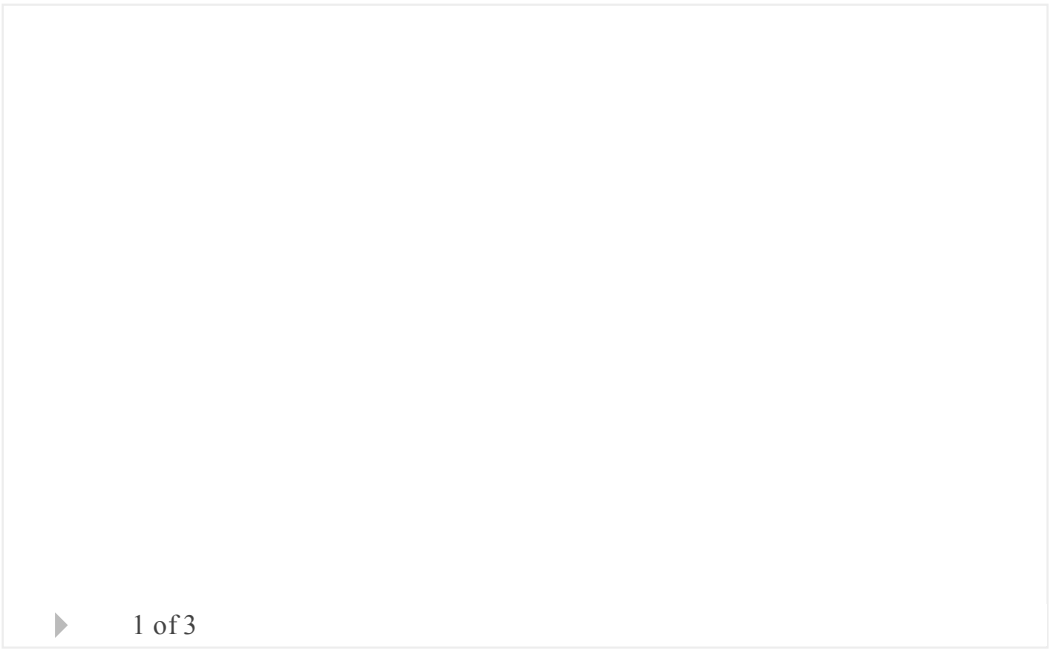
Shape of thermal plumes in a compressible mantle with depth-dependent viscosity

Wei Leng, Michael Gurnis

First Published: 13 March 2012 Vol: 39, L05310 | DOI: 10.1029/2012GL050959

KEY POINTS

- Our theoretical model shows controlling parameters for shape of thermal plumes
- Numerical results verify the validities of our theoretical model
- A thinner low viscosity zone leads to a smaller plume head impinging lithosphere



1 of 3

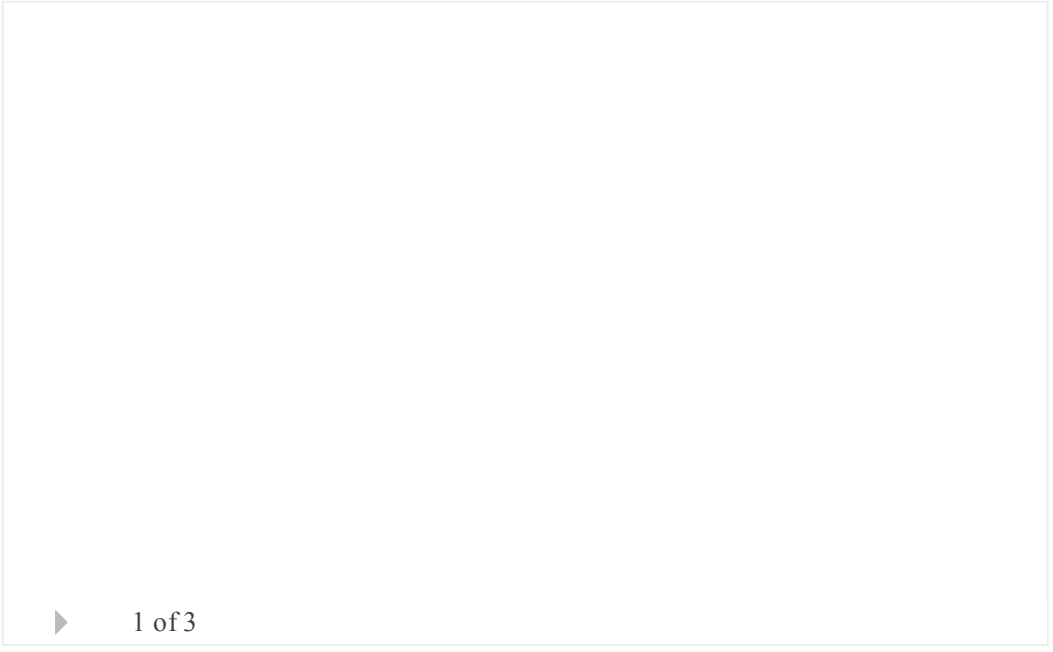
Observation of far-field Mach waves generated by the 2001 Kokoxili supershear earthquake

M. Vallée, Eric M. Dunham

First Published: 14 March 2012 Vol: 39, L05311 | DOI: 10.1029/2011GL050725

KEY POINTS

- First observation of far-field Mach waves, and of their wave amplification
- Further evidence of the existence of supershear ruptures
- Development of a simple observation approach to detect Mach waves



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Space Sciences

Recent advances in understanding substorm dynamics

V. A. Sergeev, V. Angelopoulos, R. Nakamura

First Published: 6 March 2012 Vol: 39, L05101 | DOI: 10.1029/2012GL050859

KEY POINTS

- Different processes interact to initiate the substorm onset and auroral breakup
- Multi-scale disturbances result in, possibly, multiple paths to onset
- Flow bursts as the bubbles, important role of entropy in flow burst dynamics

Open Access Highlight

1 of 1

A new method reveals more TGFs in the RHESSI data

T. Gjesteland, N. Østgaard, A. B. Collier, B. E. Carlson, C. Eyles, D. M. Smith

First Published: 7 March 2012 Vol: 39, L05102 | DOI: 10.1029/2012GL050899

KEY POINTS

- The population of detected RHESSI TGFs are doubled
- The RHESSI TGFs follow the seasonal variation of lightning activity
- The match percentage with WWLLN is coperable to pervoius results

1 of 2

Phase coupling in Langmuir wave packets: Evidence of four wave interactions in solar type III radio bursts

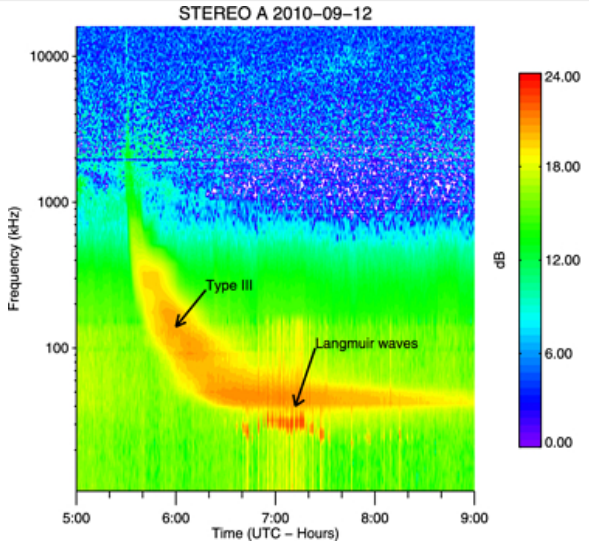
G. Thejappa, R. J. MacDowall, M. Bergamo

First Published: 7 March 2012 Vol: 39, L05103 | DOI: 10.1029/2012GL051017

KEY POINTS

- Strong Langmuir turbulence signatures: short time scales and high intensities
- Sideband spectral structure in the waveform data
- High degree of phase coherency amonst the spectral components

Highlight



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Direct three-dimensional imaging of polar ionospheric structures with the Resolute Bay Incoherent Scatter Radar

H. Dahlgren, J. L. Semeter, K. Hosokawa, M. J. Nicolls, T. W. Butler, M. G. Johnsen, K. Shiokawa, C. Heinselman

First Published: 10 March 2012 Vol: 39, L05104 | DOI: 10.1029/2012GL050895

KEY POINTS

- Volumetric imaging gives 3D distribution of plasma parameters in the polar cap
- New method to investigate the relative sources of ionospheric plasma structures

- Results show detailed characteristics of a polar cap patch event

1 of 5

The Cryosphere

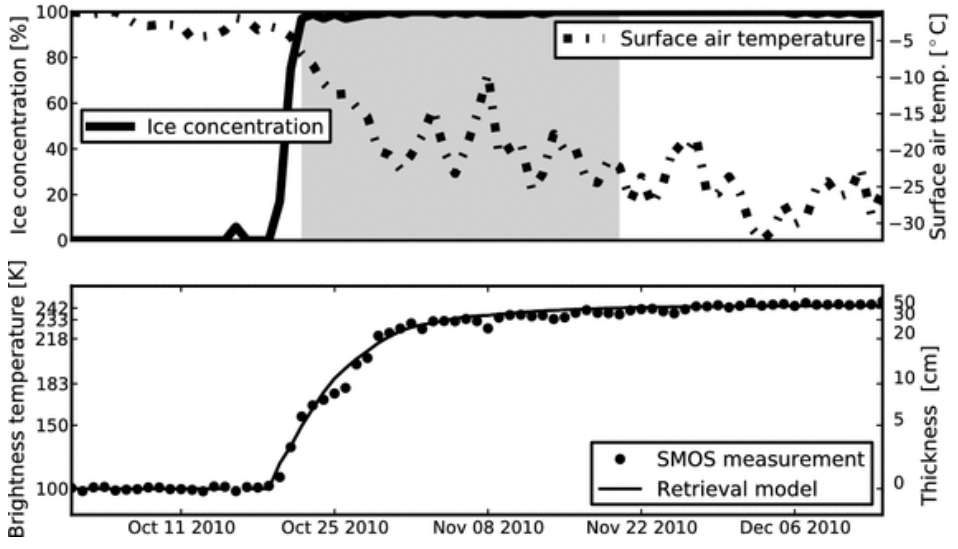
Sea ice thickness retrieval from SMOS brightness temperatures during the Arctic freeze-up period

L. Kaleschke, X. Tian-Kunze, N. Maaß, M. Mäkynen, M. Drusch

First Published: 8 March 2012 Vol: 39, L05501 | DOI: 10.1029/2012GL050916

KEY POINTS

- SMOS can be used to retrieve sea ice thickness up to half a meter in the Arctic
- SMOS sea ice thickness agrees with independent validation data
- The brightness temperature and thickness relation is justified



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The Wrangel Island Polynya in early summer: Trends and relationships to other polynyas and the Beaufort Sea High

G. W. K. Moore, R. S. Pickart

First Published: 15 March 2012 Vol: 39, L05503 | DOI: 10.1029/2011GL050691

KEY POINTS

- A hitherto unkown polynya near Wrangel Island forms in early summer
- Its size has doubled since the start of the instrumental record in 1979
- Its increase is tied to changes in the regional atmospheric circulation

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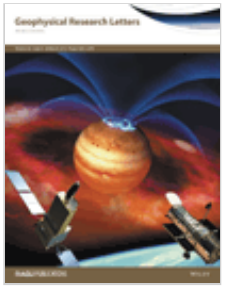
Current Issue



Volume 42
Issue 6
28 March 2015

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