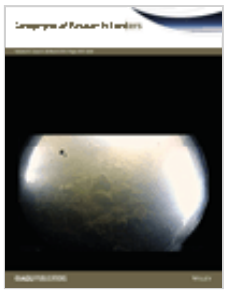
Issue Contents



Volume 39, Issue 3

February 2012

Brief Detailed

Atmospheric Science

Total and monomethyl mercury in fog water from the central California coast

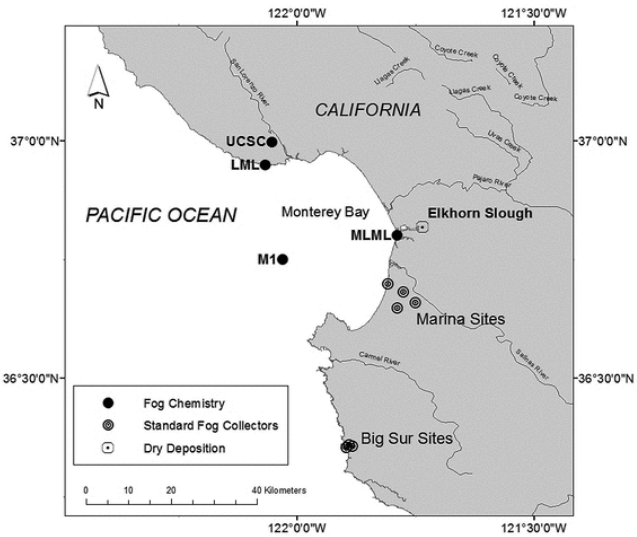
Peter S. Weiss-Penzias, Cruz Ortiz Jr., R. Paul Acosta, Wesley Heim, John P. Ryan, Daniel Fernandez, Jeffrey L. Collett Jr., A. Russell Flegal

First Published: 11 February 2012 Vol: 39, L03804 | DOI: 10.1029/2011GL050324

KEY POINTS

- Mercury in coastal fog water was elevated compared to that observed in rain
- Monomethyl mercury concentrations were especially elevated
- MMHg in fog may be formed biotically from oceanic upwelling

Highlight



1 of 3

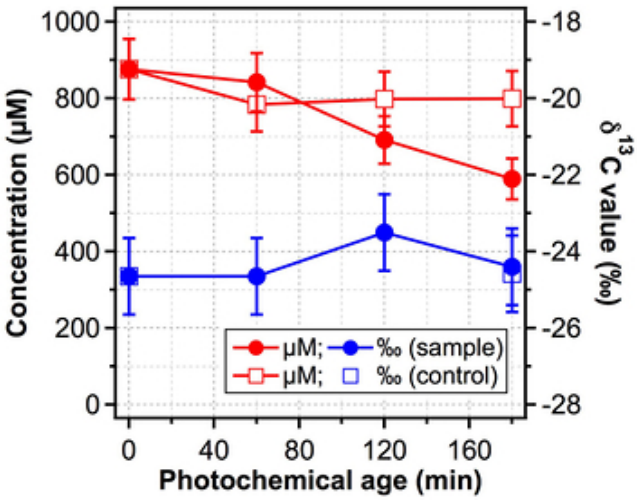
Evidence for 13-carbon enrichment in oxalic acid via iron catalyzed photolysis in aqueous phase

Chandra Mouli Pavuluri, Kimitaka Kawamura

First Published: 9 February 2012 Vol: 39, L03802 | DOI: 10.1029/2011GL050398

KEY POINTS

- Photolysis of oxalic acid under H2O2-Fe-UV system in aqueous phase
- The 13C enrichment in oxalic acid with photochemical aging in presence of Fe species



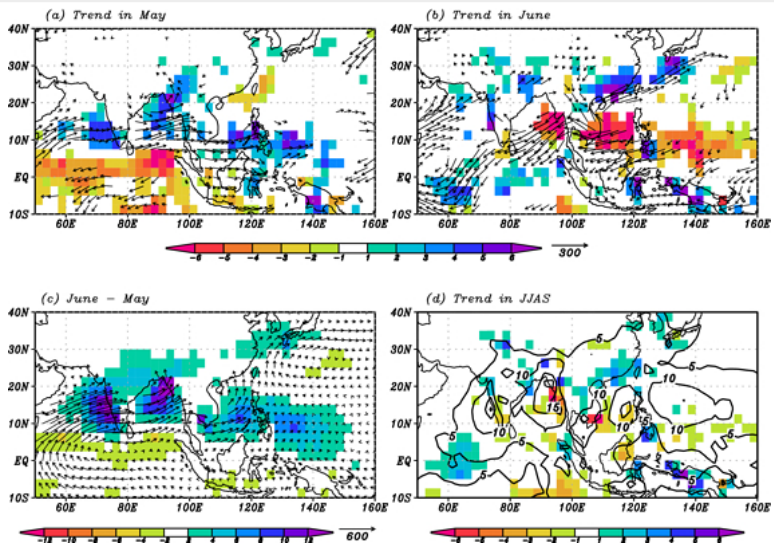
1 of 3

Advanced Asian summer monsoon onset in recent decades

Yoshiyuki Kajikawa, Tetsuzo Yasunari, Shuhei Yoshida, Hatsuki Fujinami
First Published: 9 February 2012 Vol: 39, L03803 | DOI: 10.1029/2011GL050540

KEY POINTS

- Seasonality in the long-term monsoon trend
- Advanced monsoon onset
- New sight on the interpretation of the long-term change in seasonal mean



1 of 4

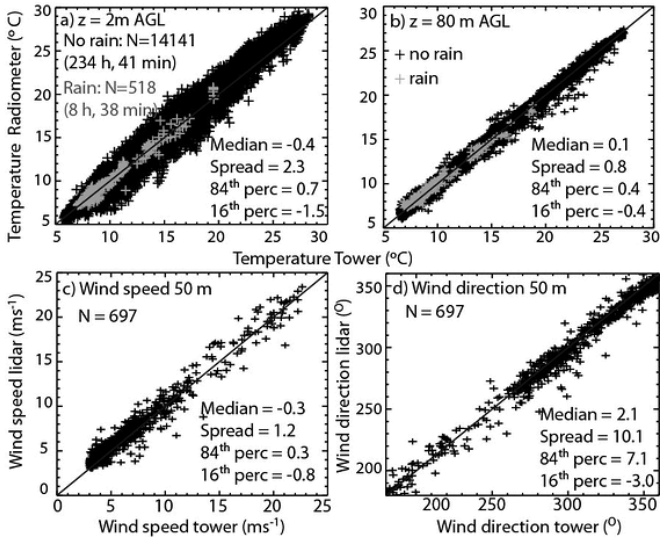
Stability and turbulence in the atmospheric boundary layer: A comparison of remote sensing and tower

observations

Katja Friedrich, Julie K. Lundquist, Matthew Aitken, Evan A. Kalina, Robert F. Marshall
First Published: 8 February 2012 Vol: 39, L03801 | DOI: 10.1029/2011GL050413

KEY POINTS

- Shows advantages of remote sensing instruments for wind farm applications
- Emphazises importance of humidity profiels for Richardson number
- Shows accuracy of wind and temperature from remote sensing instruments



1 of 3

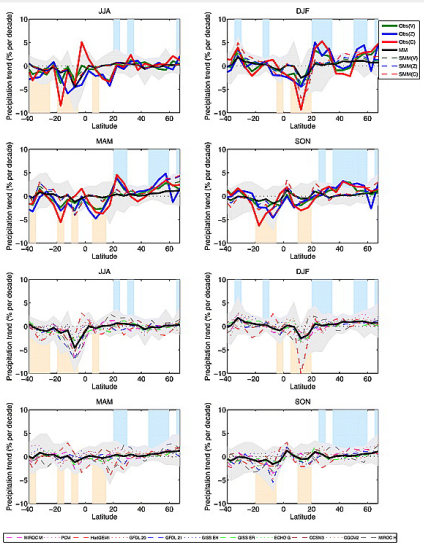
Climate

Changes in seasonal land precipitation during the latter twentieth-century

K. Noake, D. Polson, G. Hegerl, X. Zhang
First Published: 15 February 2012 Vol: 39, L03706 | DOI: 10.1029/2011GL050405

KEY POINTS

- Seasonal precipitation changes can be attributed to external climate forcing
- Pattern of change is consistent across 3 independent observational datasets
- Multi-model mean trends tend to underestimate the observed trends



1 of 3

1 of 3

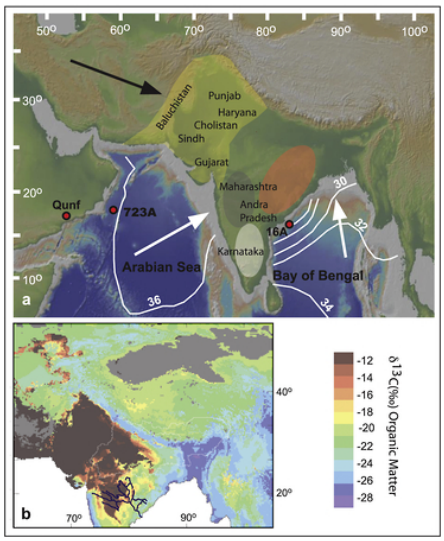
Holocene aridification of India

Camilo Ponton, Liviu Giosan, Tim I. Eglinton, Dorian Q. Fuller, Joel E. Johnson, Pushpendra Kumar, Tim S. Collett

First Published: 14 February 2012 Vol: 39, L03704 | DOI: 10.1029/2011GL050722

KEY POINTS

- Under low insolation, central India was as arid in late Holocene as during LGM
- High salinity events in Bay of Bengal suggest dry episodes during late Holocene
- Late Holocene cultural changes in India coincide with steps in aridification



1 of 3

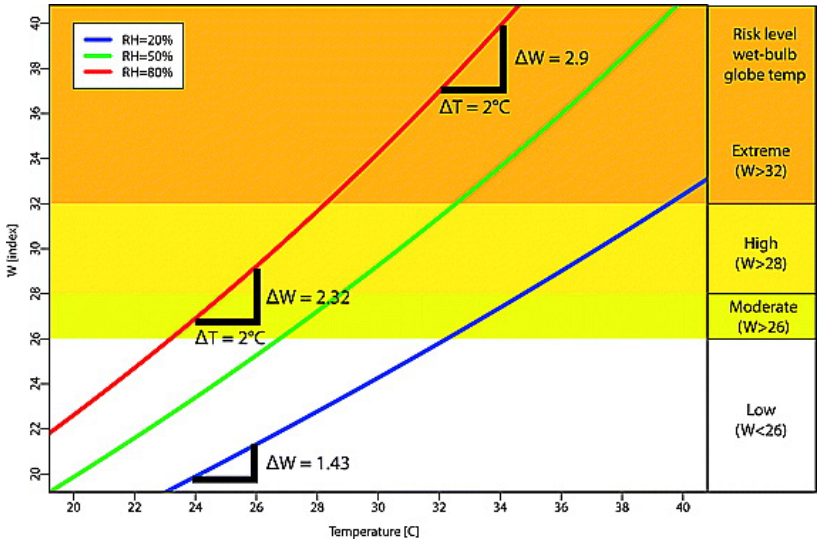
Contrasting urban and rural heat stress responses to climate change

E. M. Fischer, K. W. Oleson, D. M. Lawrence

First Published: 14 February 2012 Vol: 39, L03705 | DOI: 10.1029/2011GL050576

KEY POINTS

- Urban heat stress is ampflied particularly at night and in the hottest episodes
- Occurrence of high-heat-stress nights increases particularly in urban areas
- The tropics are impacted most despite a relatively weak warming



1 of 4

Atmospheric forcing of the Eastern Mediterranean Transient by midlatitude cyclones

Joy Romanski, Anastasia Romanou, Michael Bauer, George Tselioudis

First Published: 8 February 2012 Vol: 39, L03703 | DOI: 10.1029/2011GL050298

KEY POINTS

- Meridional temperature advection controls turbulent fluxes from the Aegean
- Cyclones in the eastern and central Med control meridional temp advection
- Cyclone patterns changed during the EMT, enhancing turb fluxes from the Aegean

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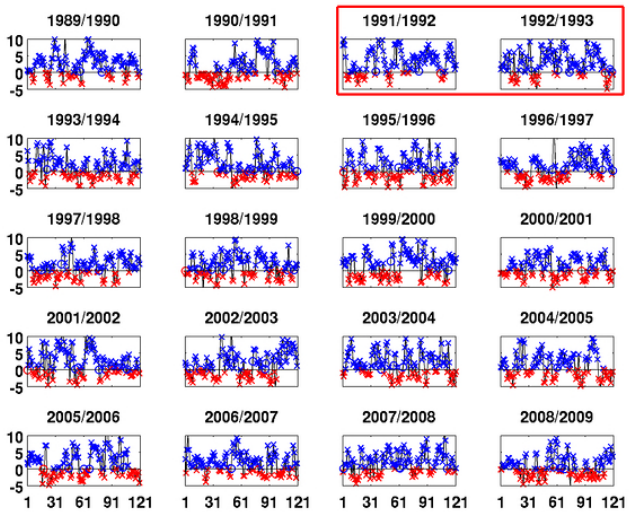


1 of 4

The Pacific-Atlantic seesaw and the Bering Strait

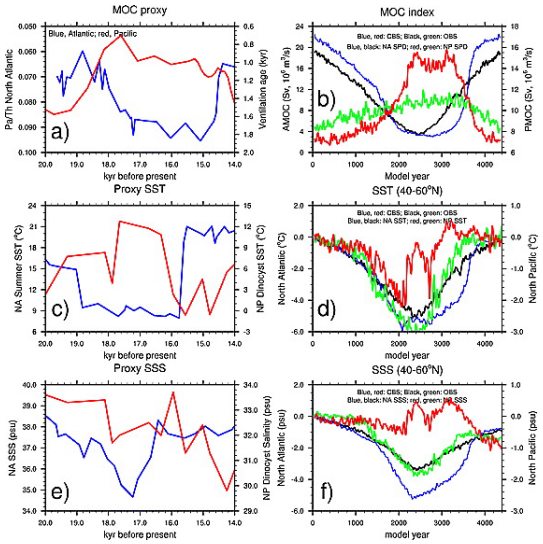
Aixue Hu, Gerald A. Meehl, Weiqing Han, Ayako Abe-Ouchi, Carrie Morrill, Yusuke Okazaki, Megume O. Chikamoto

First Published: 3 February 2012 Vol: 39, L03702 | DOI: 10.1029/2011GL050567

KEY POINTS

- Pacific-Atlantic seesaw-like climate change can only occur during glacial time
- The closure of the Bering Strait made this seesaw climate change possible
- The Bering Strait transport depends on the strength of the AMOC

Highlight



1 of 3

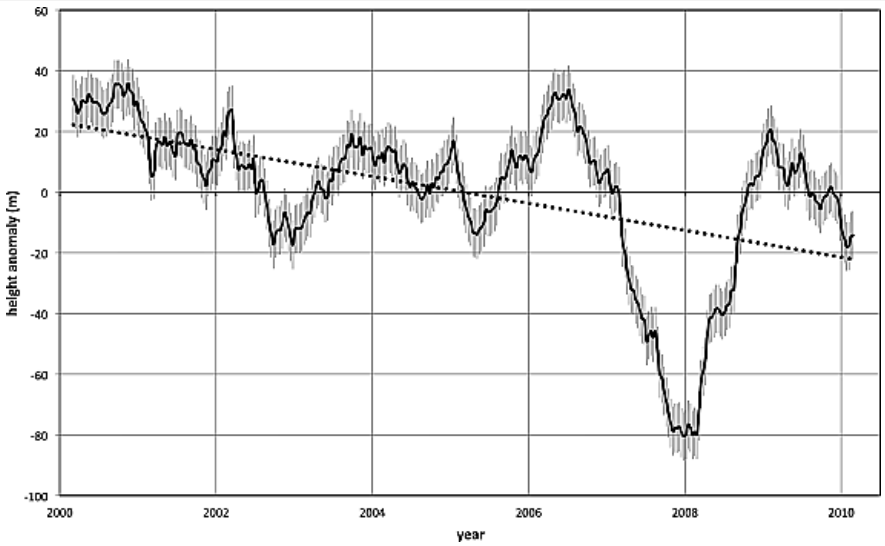
Global cloud height fluctuations measured by MISR on Terra from 2000 to 2010

Roger Davies, Matthew Molloy

First Published: 3 February 2012 Vol: 39, L03701 | DOI: 10.1029/2011GL050506

KEY POINTS

- MISR measures global effective height with an annual sampling error of 8 m
- Regional height changes correlate well with ENSO showing global teleconnections
- Decreasing global cloud heights suggest negative feedback over the last decade



1 of 5

Hydrology and Land Surface Studies

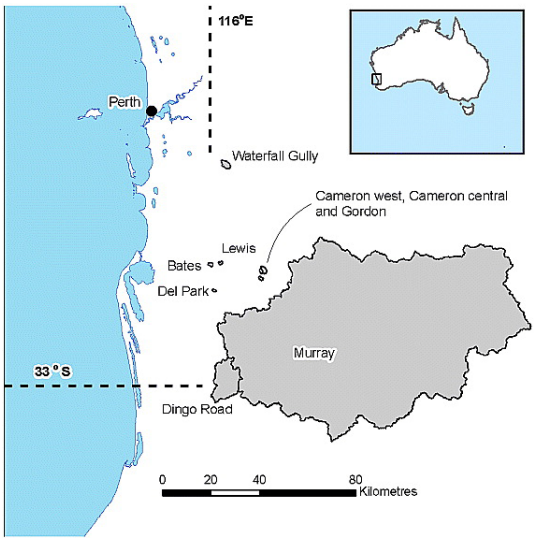
Drought, groundwater storage and stream flow decline in southwestern Australia

J. D. Hughes, K. C. Petrone, R. P. Silberstein

First Published: 15 February 2012 Vol: 39, L03408 | DOI: 10.1029/2011GL050797

KEY POINTS

- Groundwater storage is falling rapidly in south-western Australia
- Groundwater storage is a major influence on the volume of runoff produced
- Groundwater storage is influenced by rainfall at decadal timescales



1 of 4

Impact of vegetation die-off on spatial flow patterns over a tidal marsh

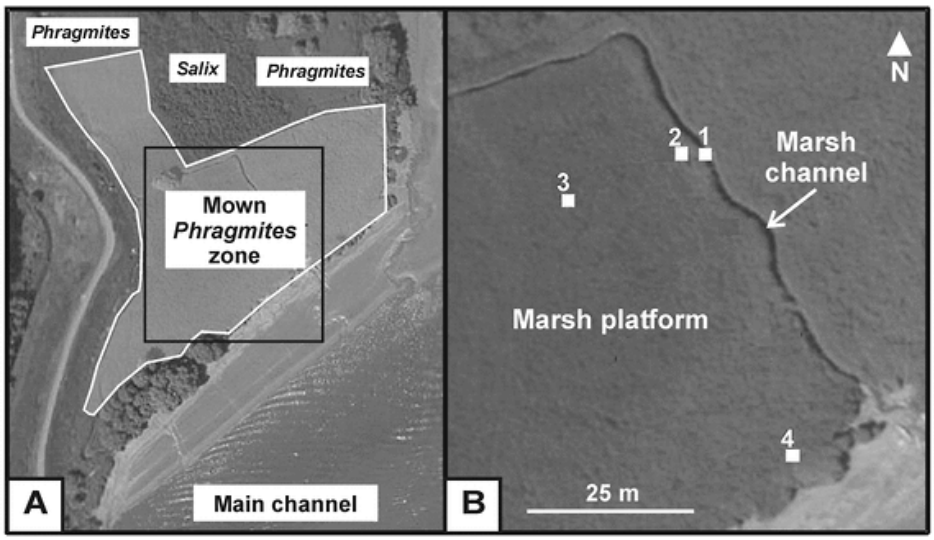
Stijn Temmerman, Pieter Moonen, Jonas Schoelynck, Gerard Govers, Tjeerd J. Bouma

First Published: 14 February 2012 Vol: 39, L03406 | DOI: 10.1029/2011GL050502

KEY POINTS

- Vegetation die-off impacts flow patterns on tidal marsh platforms and channels
- Flow concentration and acceleration towards channels is importantly reduced
- This will result in channel infilling and further limitation of plant growth

Highlight



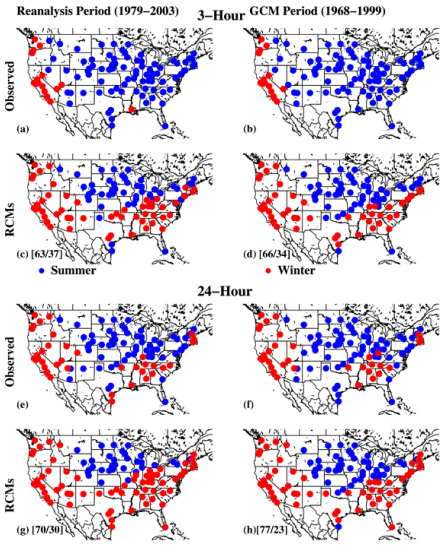
1 of 5

Urban precipitation extremes: How reliable are regional climate models?

Vimal Mishra, Francina Dominguez, Dennis P. Lettenmaier
First Published: 14 February 2012 Vol: 39, L03407 | DOI: 10.1029/2011GL050658

KEY POINTS

- RCMs show large bias in 3-hour urban precipitation extremes simulations
- RCMs with the GCM and reanalysis boundary conditions behave similarly
- RCMs reproduce seasonality of precipitation extremes at majority of locations



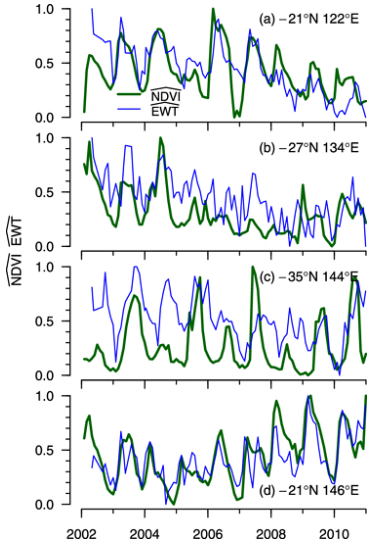
1 of 4

Tropical cyclones and the ecohydrology of Australia's recent continental-scale drought

Gavan S. McGrath, Rohan Sadler, Kevin Fleming, Paul Tregoning, Christoph Hinz, Erik J. Veneklaas
First Published: 9 February 2012 Vol: 39, L03404 | DOI: 10.1029/2011GL050263

KEY POINTS

- We identified a continent-wide drought
- Ecohydrology associated with tropical cyclone frequency
- Indian Ocean variability drives decadal-scale variability in Australia's ecology



1 of 3

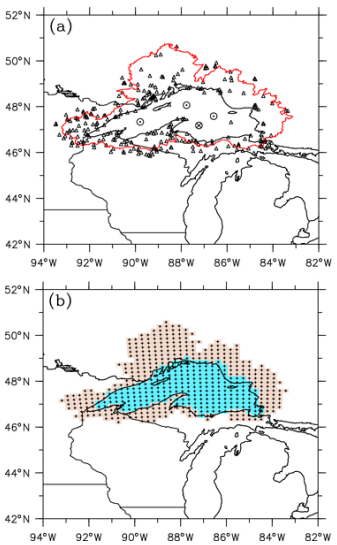
Improving historical precipitation estimates over the Lake Superior basin

K. D. Holman, A. Gronewold, M. Notaro, A. Zarrin

First Published: 9 February 2012 Vol: 39, L03405 | DOI: 10.1029/2011GL050468

KEY POINTS

- Historical precipitation estimates over Lake Superior may have seasonal biases
- Atmospheric stability affects over-lake precipitation estimates on Lake Superior
- RCMs provide alternative method to estimate over-lake precipitation on Superior



1 of 3

Permeability correction factor for fractures with permeable walls

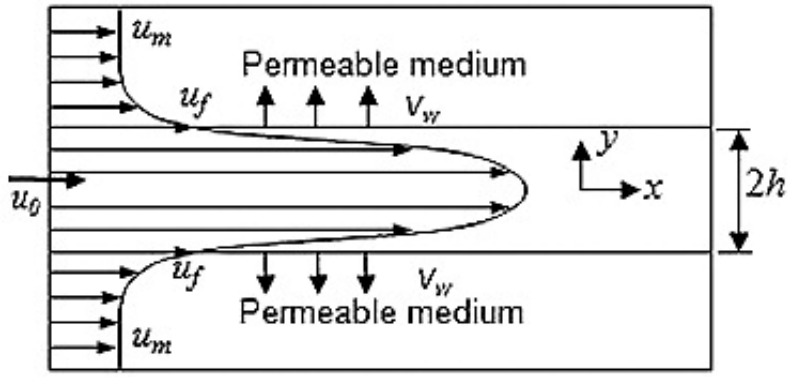
R. Mohais, C. Xu, P. A. Dowd, M. Hand

First Published: 7 February 2012 Vol: 39, L03403 | DOI: 10.1029/2011GL050519

KEY POINTS

- The cubic law is used to describe flow in fractures with impermeable walls
- Hydrofracturing of crystalline rocks may create fractures with permeable walls

- We derived a correction factor for permeable walled fractures



1 of 2

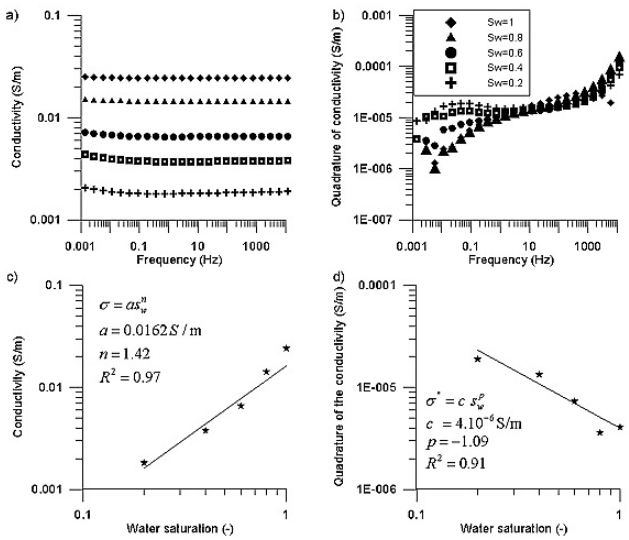
Saturation dependence of the quadrature conductivity of oil-bearing sands

M. Schmutz, A. Blondel, A. Revil

First Published: 3 February 2012 Vol: 39, L03402 | DOI: 10.1029/2011GL050474

KEY POINTS

- Strongly water repellent oils show a specific complex conductivity behavior
- New dataset for induced polarization of oil-bearing sands
- Better assessment of oil contamination with geophysics



1 of 3

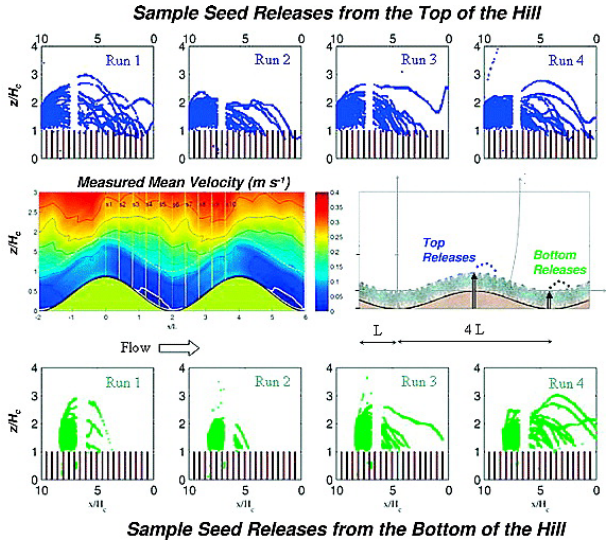
The effects of gentle topographic variation on dispersal kernels of inertial particles

G. G. Katul, D. Poggi

First Published: 1 February 2012 Vol: 39, L03401 | DOI: 10.1029/2011GL050811

KEY POINTS

- Wald kernel derived for flat terrain maintains its shape
- Complex terrain impacts mean dispersal distances by 35%
- Complex terrain impacts LDD by an order of magnitude



1 of 2

Oceans

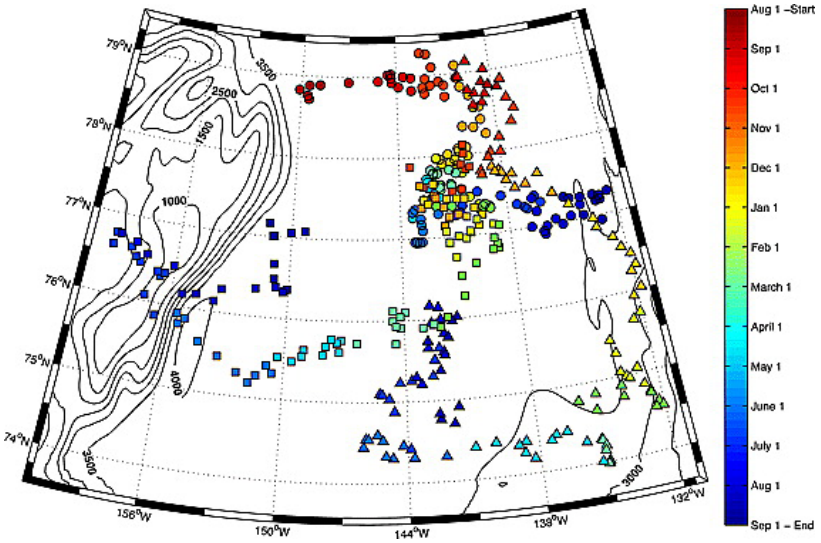
Winter sea-ice melt in the Canada Basin, Arctic Ocean

Jennifer M. Jackson, William J. Williams, Eddy C. Carmack

First Published: 15 February 2012 Vol: 39, L03603 | DOI: 10.1029/2011GL050219

KEY POINTS

- Stored solar radiation can melt sea ice during winter
- Winter storms enable the release of stored solar radiation
- Stored solar radiation delays sea ice growth



1 of 5

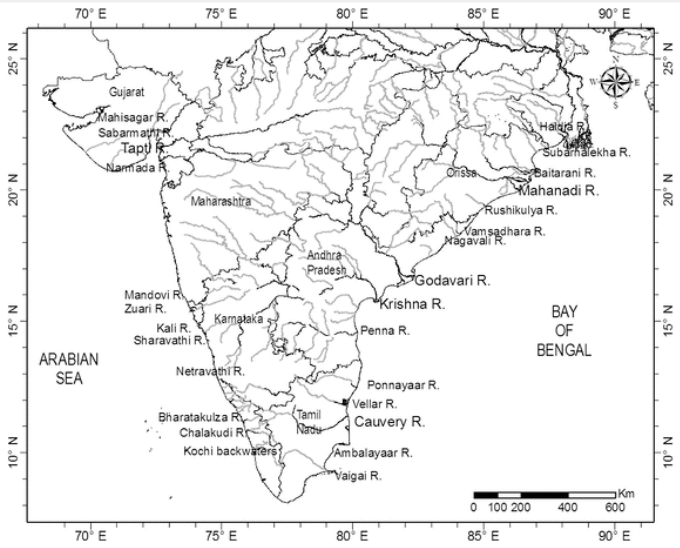
Carbon dioxide emissions from Indian monsoonal estuaries

V. V. S. S. Sarma, R. Viswanadham, G. D. Rao, V. R. Prasad, B. S. K. Kumar, S. A. Naidu, N. A. Kumar, D. B. Rao, T. Sridevi, M. S. Krishna, et al

First Published: 15 February 2012 Vol: 39, L03602 | DOI: 10.1029/2011GL050709

KEY POINTS

- Indian estuaries emits ~2TgC annually to atmosphere
- An order of magnitude high fluxes during discharge period
- Intensive microbial decomposition of organic matter is the major source



1 of 2

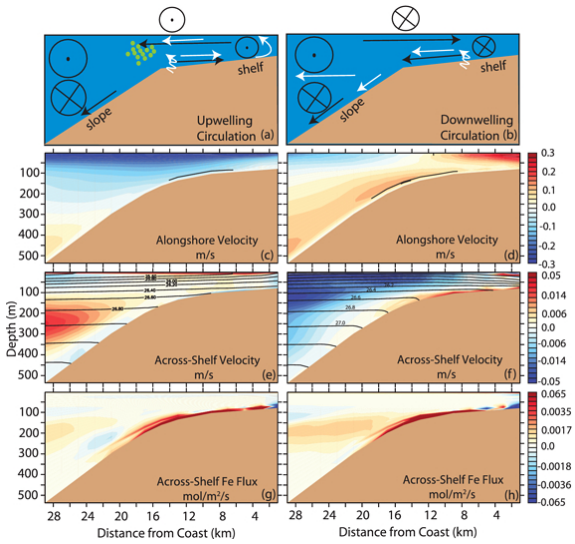
Mechanism for export of sediment-derived iron in an upwelling regime

S. A. Siedlecki, A. Mahadevan, D. E. Archer

First Published: 11 February 2012 Vol: 39, L03601 | DOI: 10.1029/2011GL050366

KEY POINTS

- Shelf-sediment derived iron is transported subsurface to the ocean interior
- The export mechanism results from oscillating wind direction and slope currents
- Export of iron from shelf sediments in upwelling regimes rivals the dust source



1 of 4

Planets

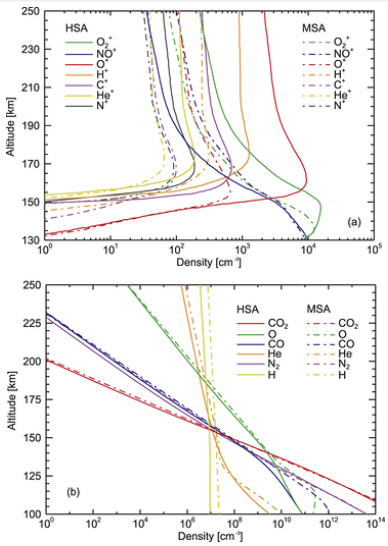
Hot oxygen atoms in the Venus nightside exosphere

H. Gröller, H. Lammer, H. I. M. Lichtenegger, M. Pfleger, O. Dutuit, V. I. Shematovich, Y. N. Kulikov, H. K. Biernat

First Published: 10 February 2012 Vol: 39, L03202 | DOI: 10.1029/2011GL050421

KEY POINTS

- Dissociative recombination of O2+ is the main source of hot O at Venus nightside
- For high solar activity, hot O density at nightside is ~10 lower than at dayside
- Our simulated nightside densities are 2-10 times higher than previous studies



1 of 4

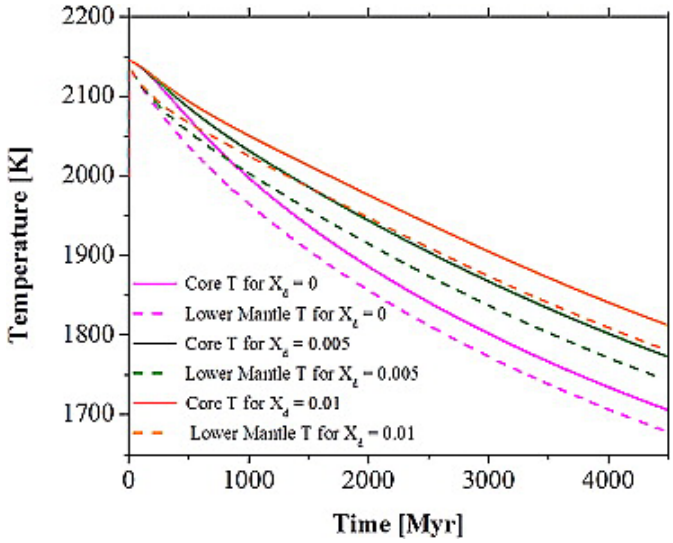
Degassing history of Mars and the lifespan of its magnetic dynamo

Constantin Sandu, Walter S. Kiefer

First Published: 2 February 2012 Vol: 39, L03201 | DOI: 10.1029/2011GL050225

KEY POINTS

- Magmatic water loss from mantle is a strong control on convective vigor
- Reduced convective vigor results in termination of Mars geodynamo around 4 Ga
- An alternative to models invoking large impacts to control dynamo history



1 of 3

Solid Earth

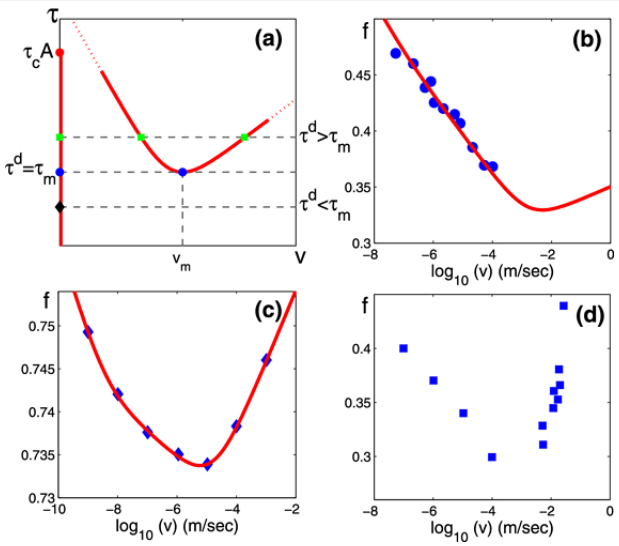
Slow rupture of frictional interfaces

Yohai Bar Sinai, Efim A. Brener, Eran Bouchbinder

First Published: 11 February 2012 Vol: 39, L03308 | DOI: 10.1029/2011GL050554

KEY POINTS

- Slow rupture is an intrinsic and robust property of rate-and-state friction laws
- A new minimal, friction-controlled, slow rupture velocity is derived
- Rupture occurs in a continuum of states and slow and fast rupture are distinct



1 of 4

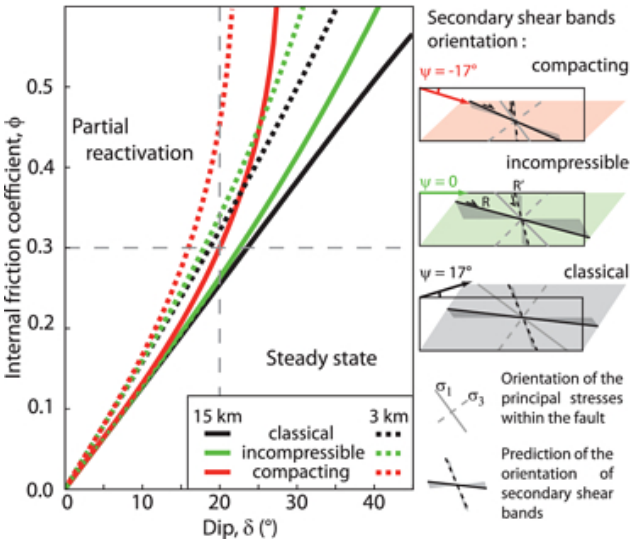
Mechanical basis for slip along low-angle normal faults

Emmanuel Lecomte, Laetitia Le Pourhiet, Olivier Lacombe

First Published: 11 February 2012 Vol: 39, L03307 | DOI: 10.1029/2011GL050756

KEY POINTS

- Slip on low-angle normal faults is possible for peak friction as high as 0.4
- Low-angle normal faults are not themselves generating earthquakes when they slip
- Slip on Riedel shears within LANFs can generate the micro-seismicity observed



1 of 4

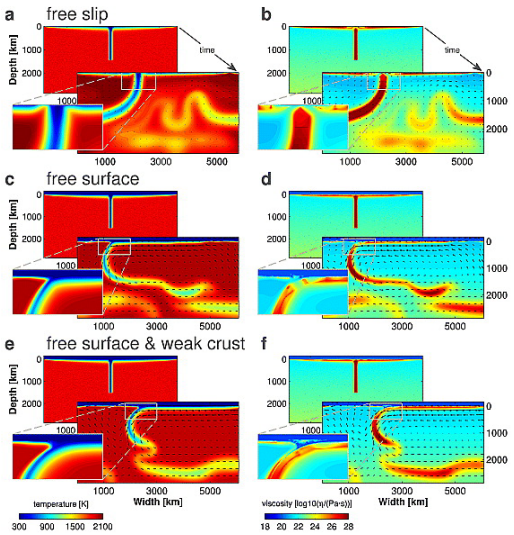
A free plate surface and weak oceanic crust produce single-sided subduction on Earth

F. Crameri, P. J. Tackley, I. Meilick, T. V. Gerya, B. J. P. Kaus

First Published: 9 February 2012 Vol: 39, L03306 | DOI: 10.1029/2011GL050046

KEY POINTS

- A free surface allows subduction to become one-sided
- Weak hydrated crust helps to stabilize one-sided subduction
- Single-sided subduction causes characteristic, arcuate trench curvature



1 of 4

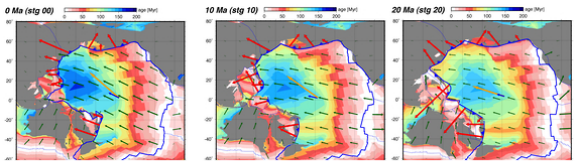
On the role of slab pull in the Cenozoic motion of the Pacific plate

Claudio Faccenna, Thorsten W. Becker, Serge Lallemand, Bernhard Steinberger

First Published: 8 February 2012 Vol: 39, L03305 | DOI: 10.1029/2011GL050155

KEY POINTS

- The Pacific plate shows sharp changes during the Cenozoic
- Slab pull torque along the Pacific subduction zone during the last 70 Ma
- Pacific plate motions can be matched varying the subduction zones configuration



1 of 2

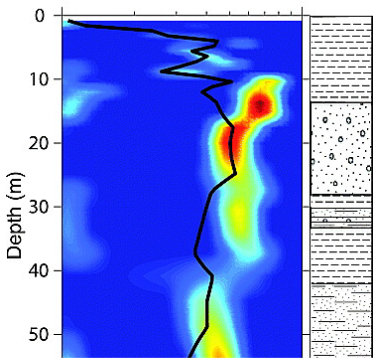
Field experiment provides ground truth for surface nuclear magnetic resonance measurement

Rosemary Knight, Elliot Grunewald, Trevor Irons, Katherine Dlubac, Yiqiao Song, Henry N. Bachman, Ben Grau, Dave Walsh, Jared D. Abraham, Jim Cannia

First Published: 4 February 2012 Vol: 39, L03304 | DOI: 10.1029/2011GL050167

KEY POINTS

- Field experiment provides direct comparison of logging and surface NMR
- Magnetic field variation and measurement time account for observed differences
- New insights into potential link from surface NMR to hydraulic conductivity



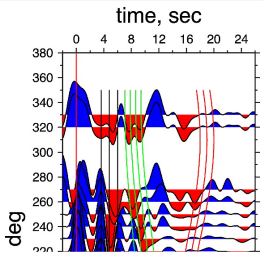
1 of 3

Correction to “Anomalous seismic structure beneath the Klyuchevskoy Group, Kamchatka”

Alex Nikulin, Vadim Levin, Ashley Shuler, Michael West

First Published: 3 February 2012 Vol: 39, L03303 | DOI: 10.1029/2012GL050850

Free



1 of 2

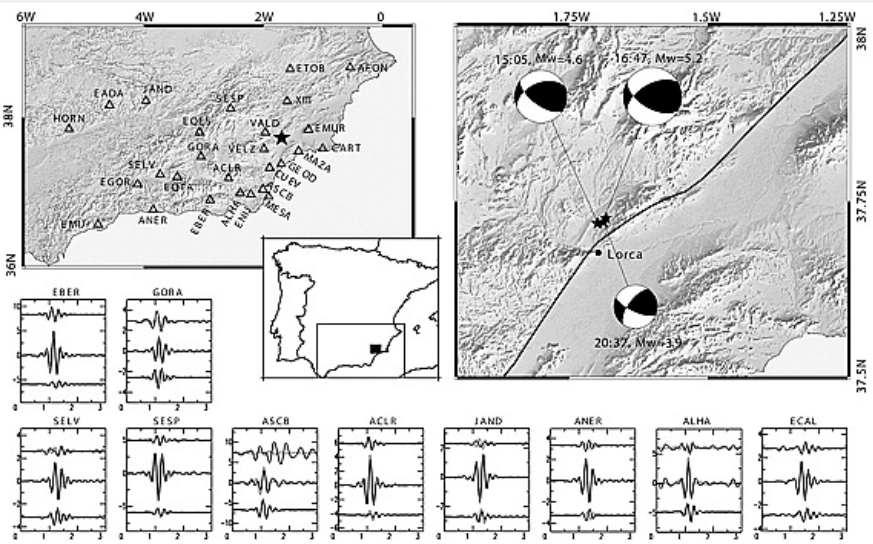
Rupture directivity of the 2011, Mw 5.2 Lorca earthquake (Spain)

José-Ángel López-Comino, Flor de Lis Mancilla, Jose Morales, Daniel Stich

First Published: 2 February 2012 Vol: 39, L03301 | DOI: 10.1029/2011GL050498

KEY POINTS

- A small magnitude earthquake (Mw 5.2) caused large accelerations (0.36g)
- Rupture directivity shows up in aftershock locations and source time functions
- Location, radiation and directivity combine to a very unfavorable scenario



1 of 4

Stress before and after the 2011 great Tohoku-oki earthquake and induced earthquakes in inland areas of eastern Japan

Keisuke Yoshida, Akira Hasegawa, Tomomi Okada, Takeshi Iinuma, Yoshihiro Ito, Youichi Asano
First Published: 1 February 2012 Vol: 39, L03302 | DOI: 10.1029/2011GL049729

KEY POINTS

- Stress change in N and SE Tohoku suggesting small differential stress magnitudes
- No stress change in C Tohoku suggesting stress magnitudes greater than a few MPa
- Remarkable induced seismicity in Kanto-Chubu caused by simple stress increase

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1 of 4

Space Sciences

Occurrence of elves and lightning during El Niño and La Niña

Y. J. Wu, A. B. Chen, H. H. Hsu, J. K. Chou, S. C. Chang, L. J. Lee, Y. J. Lee, H. T. Su, C. L. Kuo, R. R. Hsu, et al
First Published: 10 February 2012 Vol: 39, L03106 | DOI: 10.1029/2011GL049831

KEY POINTS

- Elve activity in the lower ionosphere (~90 km) is modulated by the ENSO events
- Elve and lightning both can be regarded as good indices of ENSO events

Detection of exospheric O_2^+ at Saturn's moon Dione

R. L. Tokar, R. E. Johnson, M. F. Thomsen, E. C. Sittler, A. J. Coates, R. J. Wilson, F. J. Crary, D. T. Young, G. H. Jones

First Published: 9 February 2012 Vol: 39, L03105 | DOI: 10.1029/2011GL050452

KEY POINTS

- Dione exosphere inferred via Cassini detection of molecular oxygen pick-up ions
- Column density of exosphere calculated with range 0.9 to 7 X 10^11 / cm^2
- Density of molecular oxygen ions calculated with range 0.01 to 0.09 per cc

Open Access Highlight

A chain of magnetic flux ropes in the magnetotail of Mars

J. P. Eastwood, J. J. H. Videira, D. A. Brain, J. S. Halekas

First Published: 7 February 2012 Vol: 39, L03104 | DOI: 10.1029/2011GL050444

KEY POINTS

- A chain of magnetic flux ropes was observed in Mars's magnetotail
- Modelling indicates force free structure and sequential tailward motion
- These flux ropes are likely associated with nearby crustal magnetic fields

1 of 3

Rapid acceleration of radiation belt energetic electrons by Z-mode waves

Fuliang Xiao, Sai Zhang, Zhenpeng Su, Zhaoguo He, Lijun Tang
First Published: 4 February 2012 Vol: 39, L03103 | DOI: 10.1029/2011GL050625

KEY POINTS

- A first simulation to examine effect of Z-mode waves on radiation belt dynamics
- Z-mode waves produce a substantial enhancement in electron PSD very rapidly
- Momentum diffusion rate exceeds pitch angle diffusion rates at 0.5MeV or above

1 of 5

Anomalous ISR echoes preceding auroral breakup: Evidence for strong Langmuir turbulence

H. Akbari, J. L. Semeter, H. Dahlgren, M. Diaz, M. Zettergren, A. Strømme, M. J. Nicolls, C. Heinselman
First Published: 3 February 2012 Vol: 39, L03102 | DOI: 10.1029/2011GL050288

KEY POINTS

- Evidence of natural strong Langmuir turbulence in the ionosphere
- First observation of double-peaked plasma line in the ionosphere
- Results suggest new application of ISR for investigating magnetosphere processes

1 of 5

Low-energy ions: A previously hidden solar system particle population

M. André, C. M. Cully
First Published: 1 February 2012 Vol: 39, L03101 | DOI: 10.1029/2011GL050242

KEY POINTS
- Previously hidden low-energy ions often dominate the magnetosphere
- Much of the atmospheric escape is due to low-energy ions
- The new spacecraft wake method can detect low-energy ions

Highlight

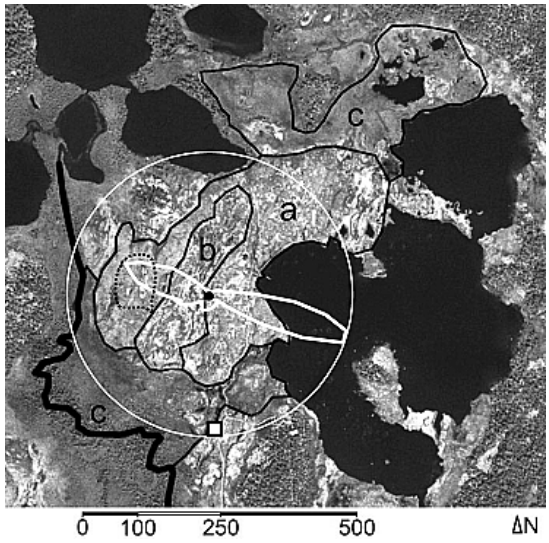
1 of 5

The Cryosphere

Net carbon accumulation of a high-latitude permafrost palsa mire similar to permafrost-free peatlands

David Olefeldt, Nigel T Roulet, Onil Bergeron, Patrick Crill, Kristina Bäckstrand, Torben R. Christensen
First Published: 1 February 2012 Vol: 39, L03501 | DOI: 10.1029/2011GL050355

KEY POINTS
- Ecosystem C balance of a palsa mire is similar to non-permafrost peatlands
- Restricted DOC and CH4 fluxes facilitate C accumulation in palsa mires
- Projections of high latitude C storage need to account for all C fluxes



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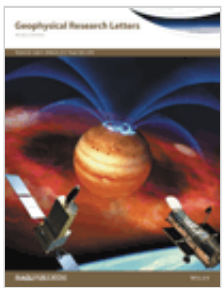
Current Issue



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14-19 June 2015
Hong Kong SAR, China

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