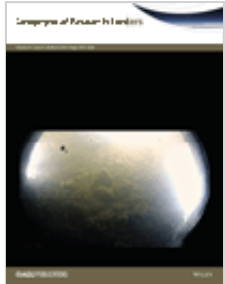


Issue Contents



Volume 39, Issue 12

28 June 2012

Brief Detailed

Atmospheric Science

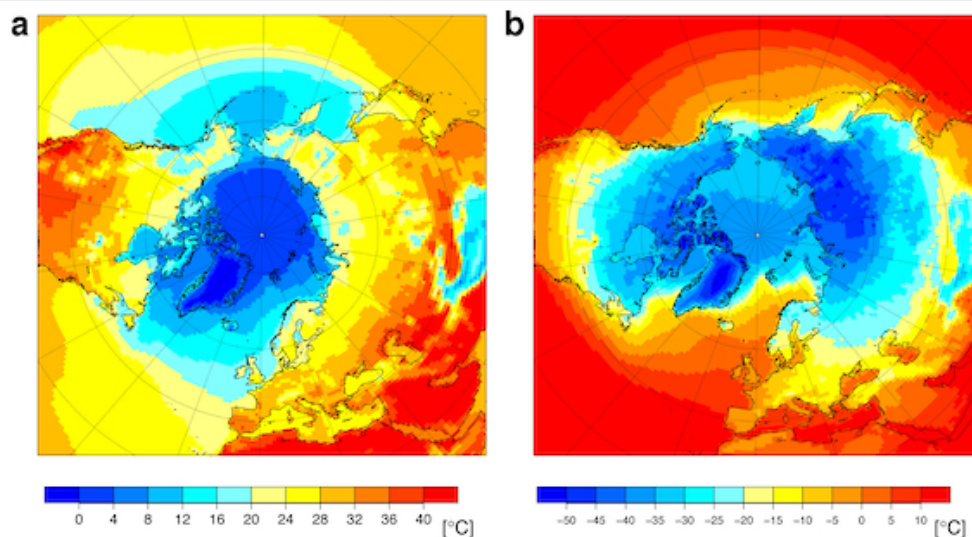
Quantifying the relevance of atmospheric blocking for co-located temperature extremes in the Northern Hemisphere on (sub-)daily time scales

S. Pfahl, H. Wernli

First Published: 30 June 2012 Vol: 39, L12807 | DOI: 10.1029/2012GL052261

KEY POINTS

- Hot temperature extremes are often associated with co-located blocking
- Linkage is strongest over the mid- to high-latitude continents
- Cold extremes typically are not related to co-located blocking



> 1 of 3

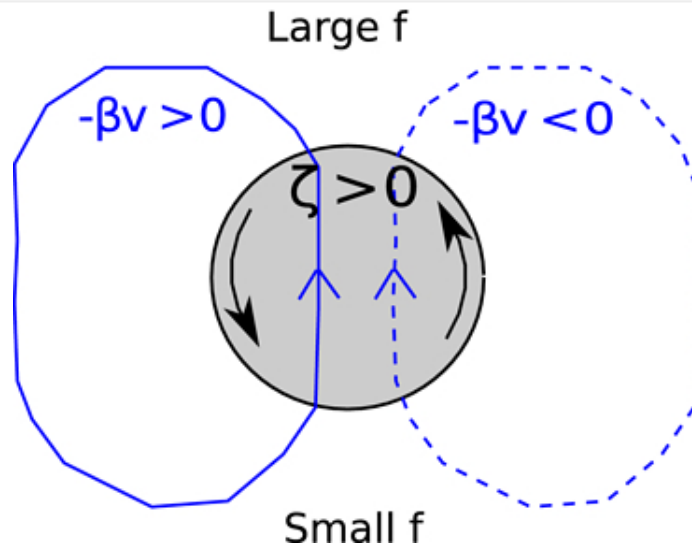
A potential vorticity perspective on the motion of a mid-latitude winter storm

G. Rivière, P. Arbogast, G. Lapeyre, K. Maynard

First Published: 30 June 2012 Vol: 39, L12808 | DOI: 10.1029/2012GL052440

KEY POINTS

- The mechanisms explaining the track of the European storm Xynthia are studied
- The mid-latitude storm motion is shown to depend on the jet stream property
- The key parameter is the vertically averaged potential vorticity gradient



> 1 of 5

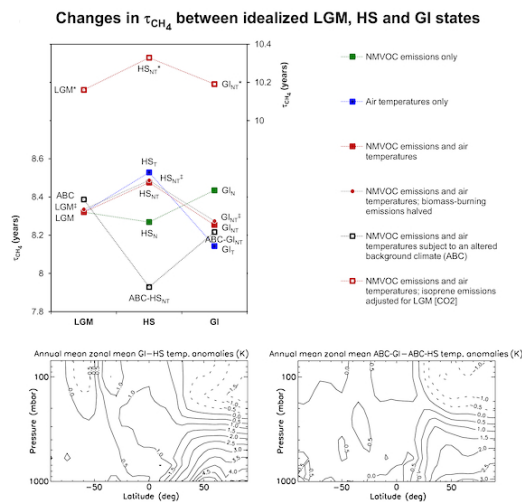
Controls on the tropospheric oxidizing capacity during an idealized Dansgaard-Oeschger event, and their implications for the rapid rises in atmospheric methane during the last glacial period

J. G. Levine, E. W. Wolff, P. O. Hopcroft, P. J. Valdes

First Published: 28 June 2012 Vol: 39, L12805 | DOI: 10.1029/2012GL051866

KEY POINTS

- This is the first process-based study re oxidizing capacity during D-O events
- The net effect of changes in air temperature and NMVOC emissions is negligible
- This implies the D-O rapid rises in [CH4] were almost entirely source-driven



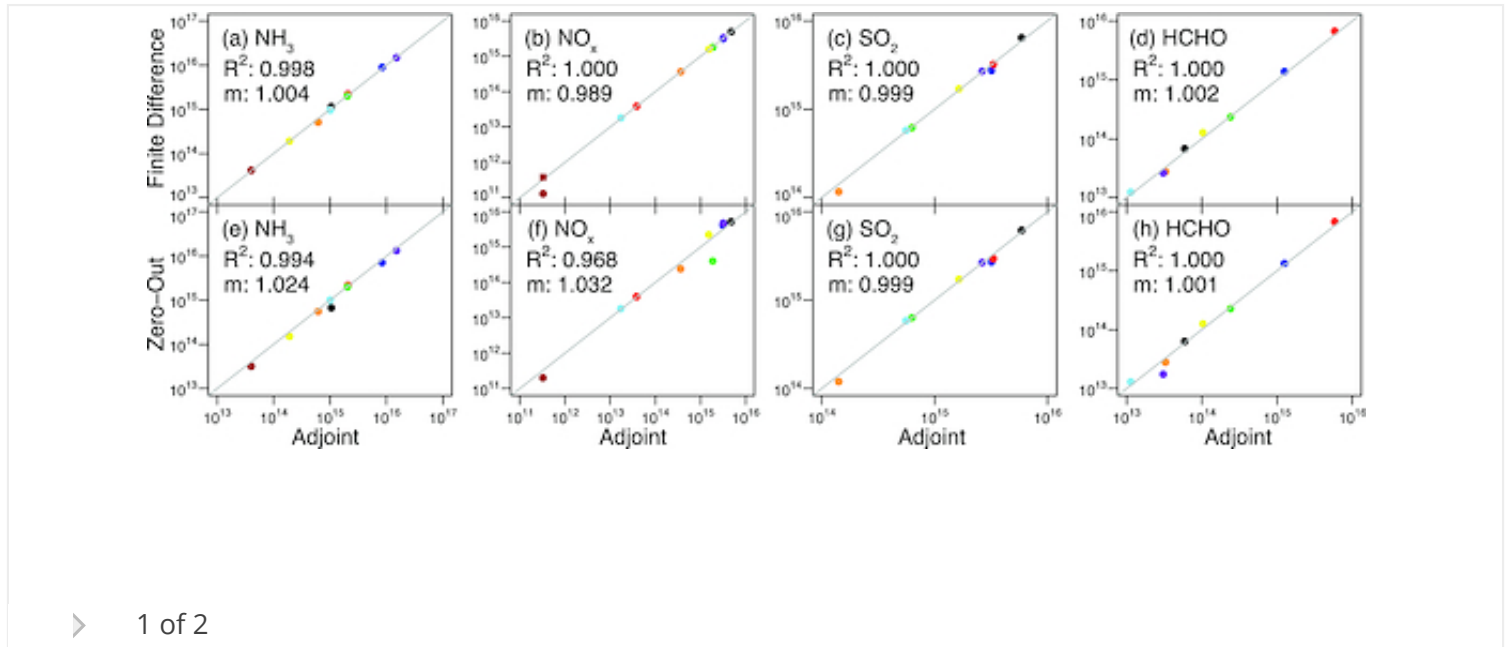
The spatial extent of source influences on modeled column concentrations of short-lived species

A. J. Turner, D. K. Henze, R. V. Martin, A. Hakami

First Published: 28 June 2012 Vol: 39, L12806 | DOI: 10.1029/2012GL051832

KEY POINTS

- Distant emissions can substantially impact short-lived species in the atmosphere
- Need to fully account for transport and chemistry when constraining emissions
- Impacts of nonlocal emissions will be exacerbated as model resolution increases



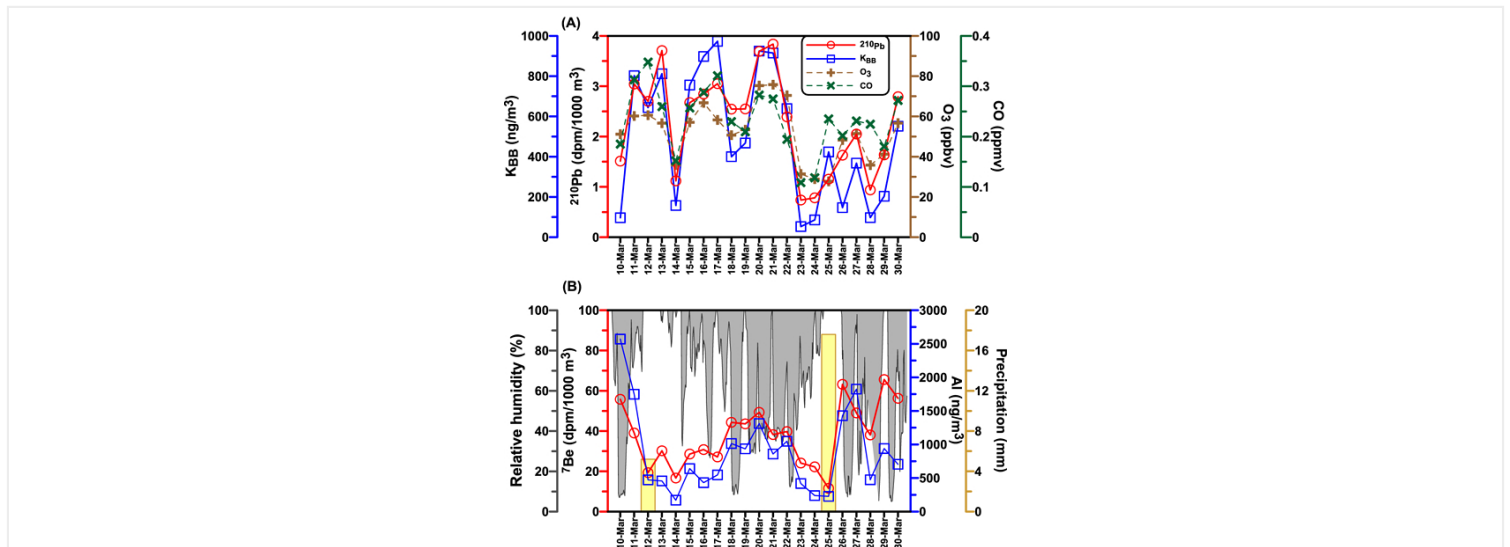
Dust transport from non-East Asian sources to the North Pacific

Shih-Chieh Hsu, Chih-An Huh, Chuan-Yao Lin, Wei-Nai Chen, Natalie M. Mahowald, Shaw-Chen Liu, C. C. K. Chou, Mao-Chang Liang, Chuen-Jinn Tsai, Fei-Jan Lin, et al

First Published: 26 June 2012 Vol: 39, L12804 | DOI: 10.1029/2012GL051962

KEY POINTS

- Non-East Asian sources dominate dust deposition in the North Pacific
- Long-range, free tropospheric transport controls global dispersal of eolian dust
- The first data-based study of dust from non-East Asian sources to North Pacific



Sources and dynamics of turbulence in the upper troposphere and lower stratosphere: A review

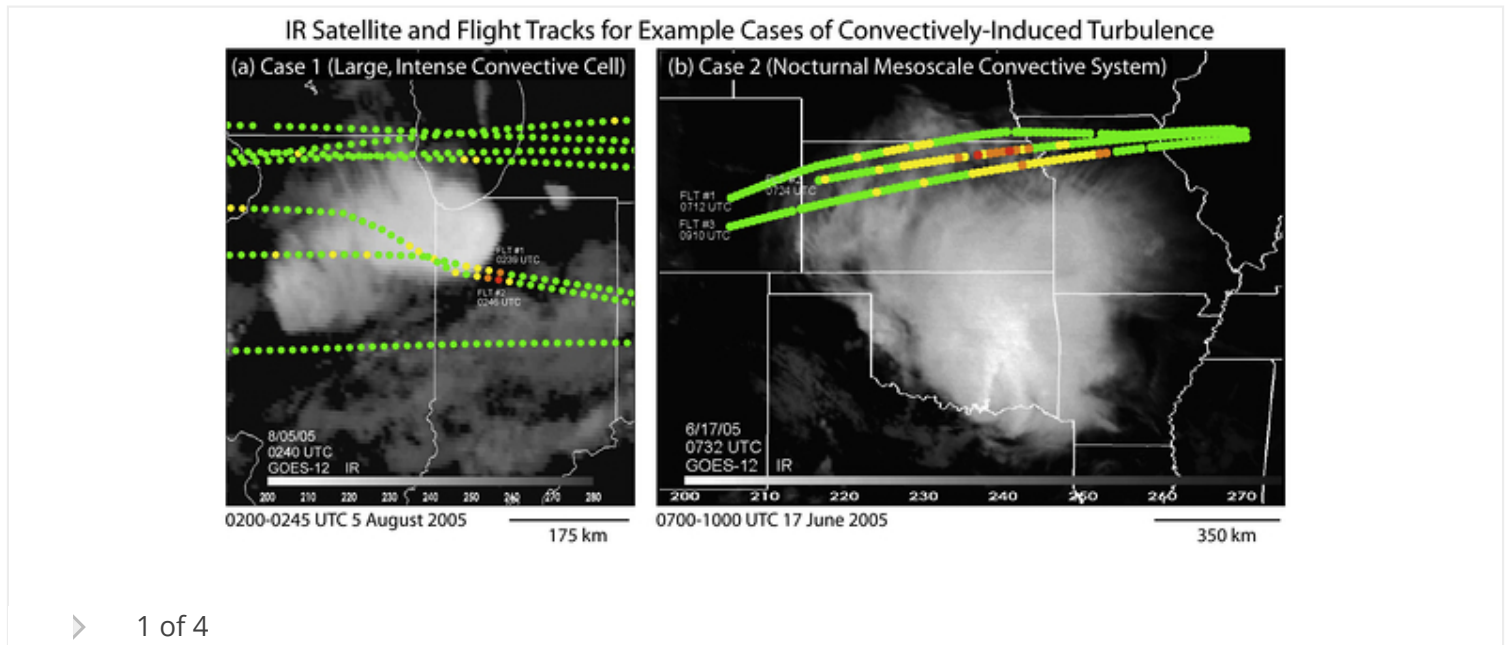
R. D. Sharman, S. B. Trier, T. P. Lane, J. D. Doyle

First Published: 23 June 2012 Vol: 39, L12803 | DOI: 10.1029/2012GL051996

KEY POINTS

- Progress had been made due to better observations
- Progress has been made due to mesoscale modeling
- Progress has been made in forecasting

Highlight



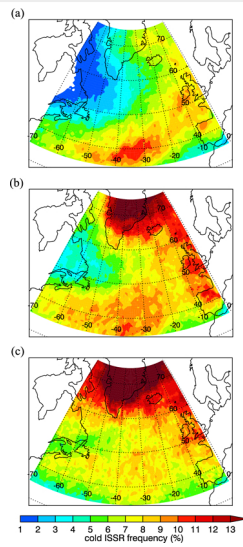
The dependence of contrail formation on the weather pattern and altitude in the North Atlantic

E. A. Irvine, B. J. Hoskins, K. P. Shine

First Published: 23 June 2012 Vol: 39, L12802 | DOI: 10.1029/2012GL051909

KEY POINTS

- Contrail formation depends strongly on weather pattern, altitude and route
- Flying higher does not always produce fewer contrails
- Using great circle routes can overestimate contrail coverage by over 50%



> 1 of 3

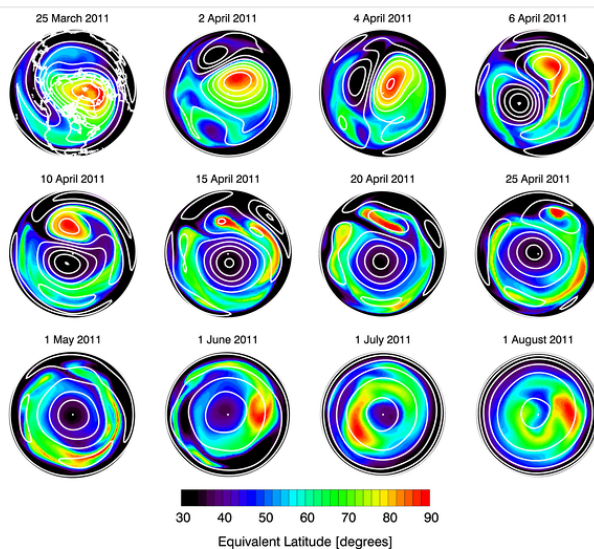
Tracer transport during the Arctic stratospheric final warming based on a 33-year (1979-2011) tracer equivalent latitude simulation

Douglas R. Allen, Anne R. Douglass, Gerald E. Nedoluha, Lawrence Coy

First Published: 20 June 2012 Vol: 39, L12801 | DOI: 10.1029/2012GL051930

KEY POINTS

- The 2011 final warming was unusual, with a large anticyclone covering the pole
- Similar large-scale Frozen-In Anticyclones (FrIACs) observed in 1982, 1994, 1997
- Correlation established between FrIACs and zonal wind after the final warming



> 1 of 4

Climate

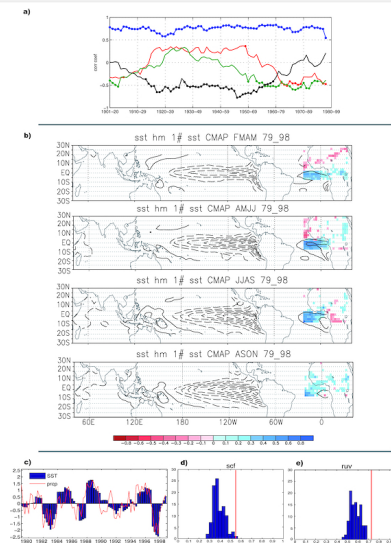
Tropical SST and Sahel rainfall: A non-stationary relationship

T. Losada, B. Rodriguez-Fonseca, E. Mohino, J. Bader, S. Janicot, C. R. Mechoso

First Published: 30 June 2012 Vol: 39, L12705 | DOI: 10.1029/2012GL052423

KEY POINTS

- Atlantic and Indo-Pacific SSTs add their effects in a linear way on WA rainfall
- This leads to the disappearance of the anomalous rainfall summer dipole in WA
- This interannual global mode is observed every other 45 years



➤ 1 of 4

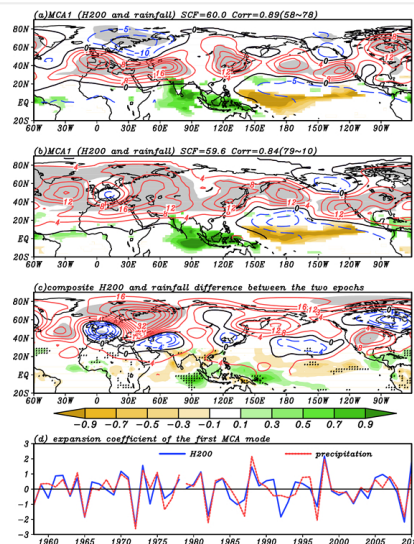
Interdecadal change of the boreal summer circumglobal teleconnection (1958–2010)

Hong Wang, Bin Wang, Fei Huang, Qingua Ding, June-Yi Lee

First Published: 26 June 2012 Vol: 39, L12704 | DOI: 10.1029/2012GL052371

KEY POINTS

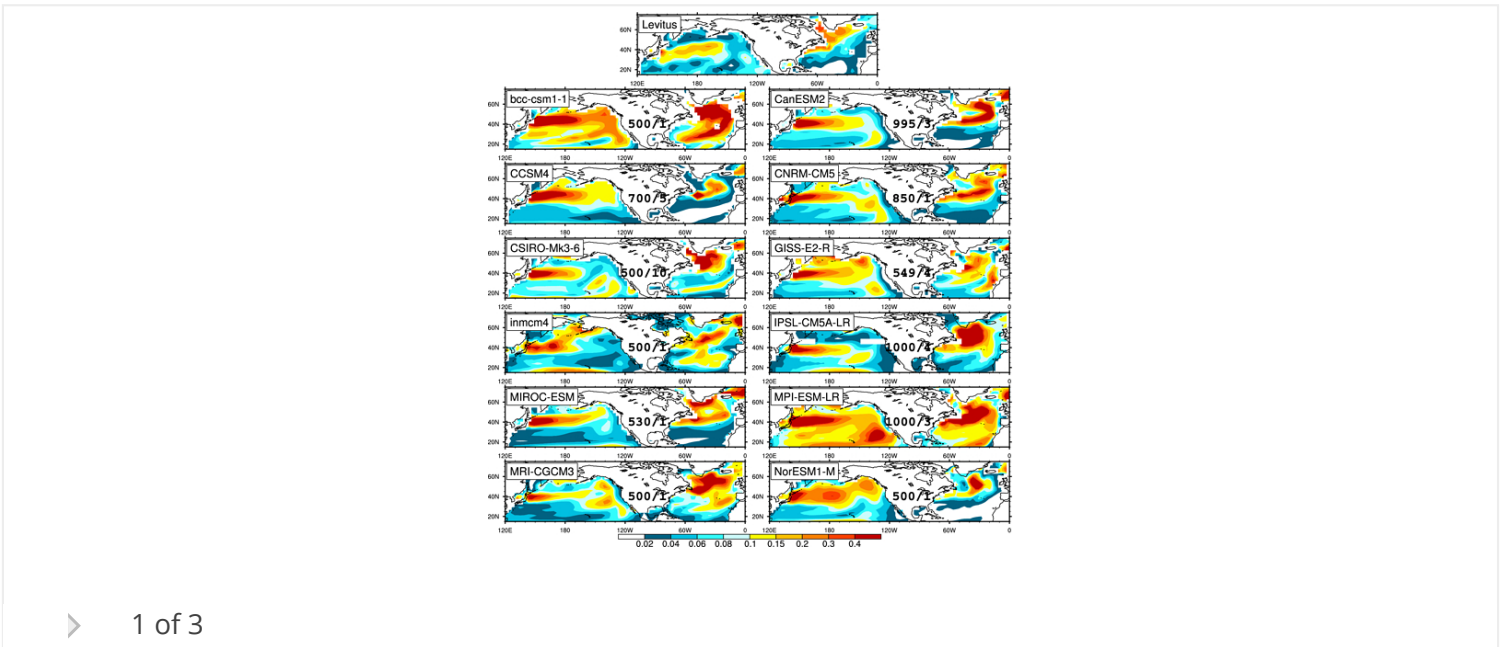
- CGT experienced a significant change around the late 1970s in the last 60 years
- The change of Indian summer monsoon rainfall has a global impact on the CGT
- Weakened coupling between ISM and midlatitude circulation led to the CGT change



➤ 1 of 4

KEY POINTS

- Initialization can potentially improve ocean predictions for about a decade
- Initialization impacts forecasts more than greenhouse gases for about a decade
- The feasibility of decadal prediction varies widely from region to region



Attribution of the summer warming since 1970s in Indian Ocean Basin to the inter-decadal change in the seasonal timing of El Niño decay phase

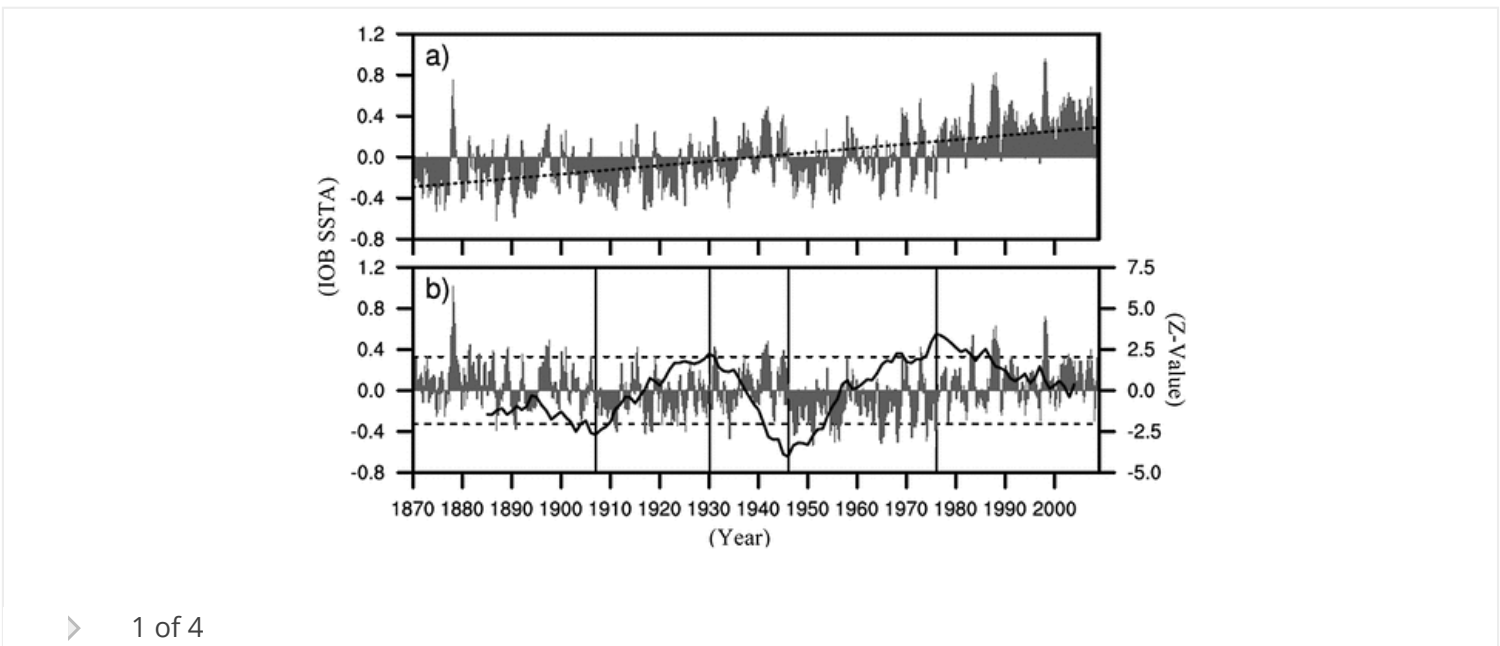
Qian Li, R.-C. Ren, M. Cai, G. X. Wu

First Published: 21 June 2012 Vol: 39, L12702 | DOI: 10.1029/2012GL052150

KEY POINTS

- The IOB warming in recent decades exhibits a stronger warming in summer season
- Seasonal timing of El Niño decay phase has been delayed since 1970s
- The 'delayed warming effect' of El Niño on IOB is then lengthened into summer

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Improving GPS Radio occultation stratospheric refractivity retrievals for climate benchmarking

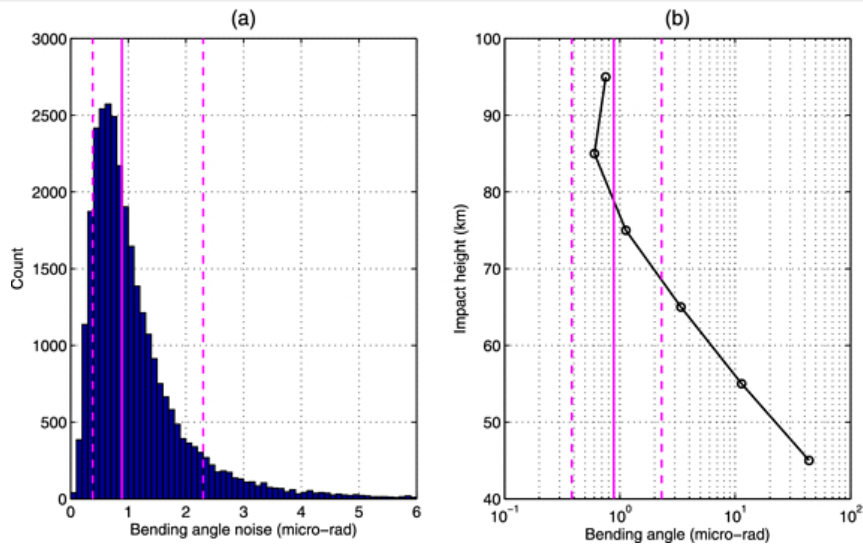
Chi O. Ao, Anthony J. Mannucci, E. Robert Kursinski

First Published: 20 June 2012 Vol: 39, L12701 | DOI: 10.1029/2012GL051720

KEY POINTS

- Averaged refractivity can be computed as Abel inversion of the averaged bending
- Our method extends useable bending measurements to 80 km
- Our method substantially reduces systematic refractivity errors in stratosphere

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> 1 of 4

Hydrology and Land Surface Studies

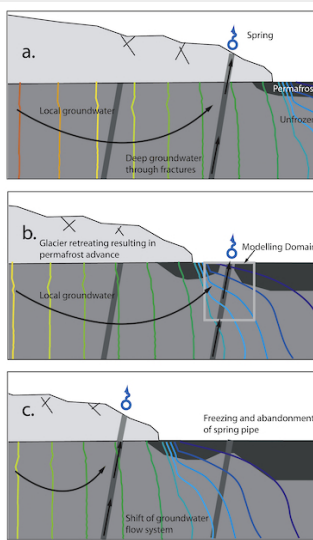
Transient nature of Arctic spring systems driven by subglacial meltwater

J. M. Scheidegger, V. F. Bense, S. E. Grasby

First Published: 28 June 2012 Vol: 39, L12405 | DOI: 10.1029/2012GL051445

KEY POINTS

- Springs surrounded by thick permafrost are of transient nature
- Springs in permafrost can persist for millennia
- Glacier meltwater fed springs provide a possible analog for springs on Mars



> 1 of 4

Disproportionately high rates of sulfide oxidation from mountainous river basins of Taiwan orogeny: Sulfur isotope evidence

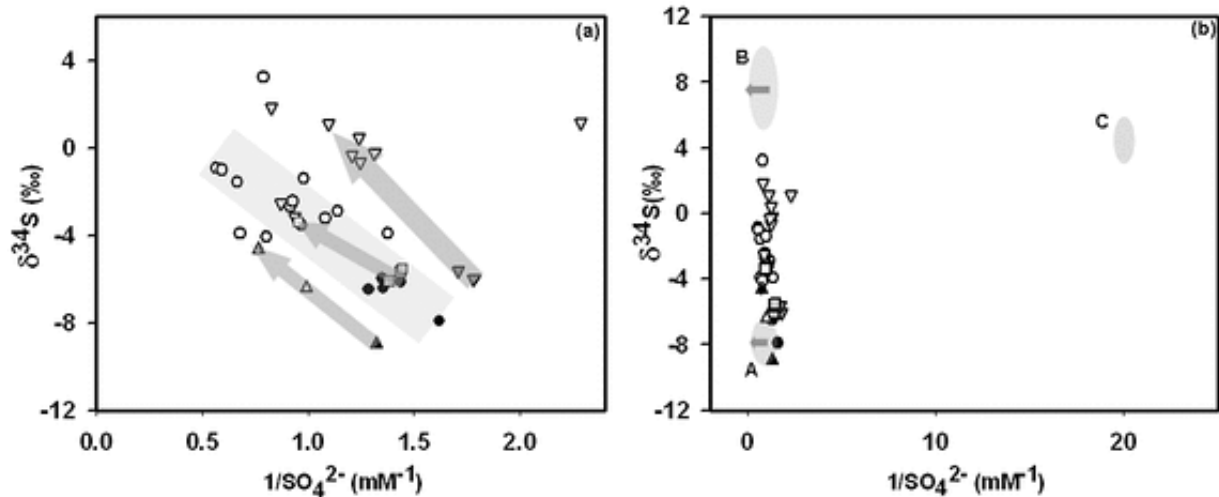
Anirban Das, Chuan-Hsiung Chung, Chen-Feng You

First Published: 22 June 2012 Vol: 39, L12404 | DOI: 10.1029/2012GL051549

KEY POINTS

- Sulfur isotope composition of sulfate is studied in rivers of Taiwan orogeny
- Disproportionately high sulfide oxidation rates are reported for them
- Physically induced chemical weathering is proposed to sustain these high rates

Highlight



1 of 1

Signatures of sea level changes on tidal geomorphology: Experiments on network incision and retreat

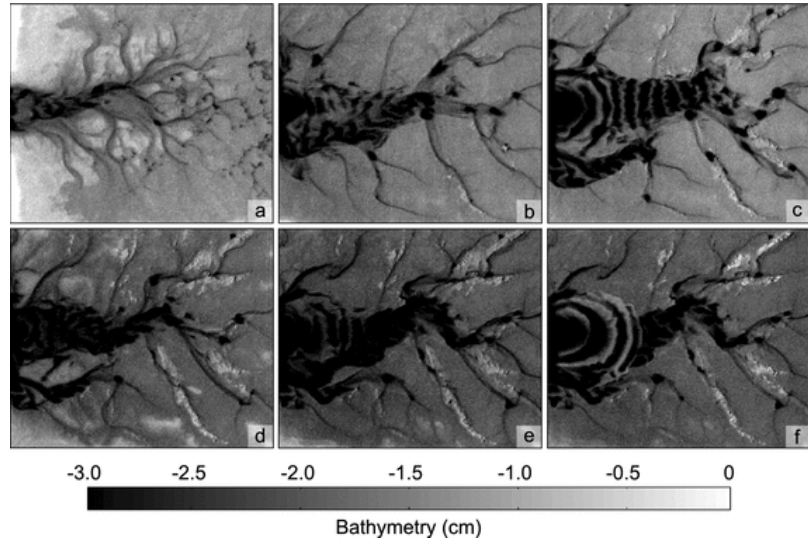
Luana Stefanon, Luca Carniello, Andrea D'Alpaos, Andrea Rinaldo

First Published: 22 June 2012 Vol: 39, L12402 | DOI: 10.1029/2012GL051953

KEY POINTS

- These are the first experiments on tidal network dynamics
- Network drainage density is related to the current tidal prism
- Our results bear significant practical implications on tidal morphodynamics

Highlight



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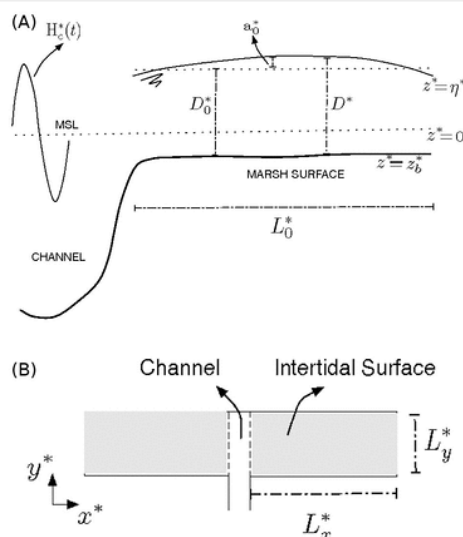
A simplified model for frictionally dominated tidal flows

T. Van Oyen, S. Lanzoni, A. D'Alpaos, S. Temmerman, P. Troch, L. Carniello

First Published: 22 June 2012 Vol: 39, L12403 | DOI: 10.1029/2012GL051949

KEY POINTS

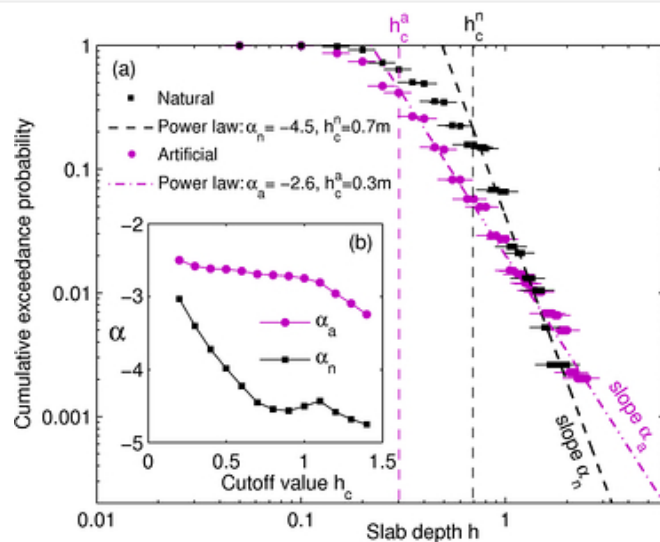
- Simple model for frictionally dominated tidal flows, common in tidal wetlands
- Impact of (vegetation induced) friction variations on the flow field
- Tool for long-term eco-morphological response of tidal wetlands to global change



> 1 of 3

KEY POINTS

- Robust coupling of mechanical and meteorological factors
- Reproducing field data with excellent accuracy
- Understanding the shape of the observed avalanche release depth distribution



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Oceans

The International Bathymetric Chart of the Arctic Ocean (IBCAO) Version 3.0

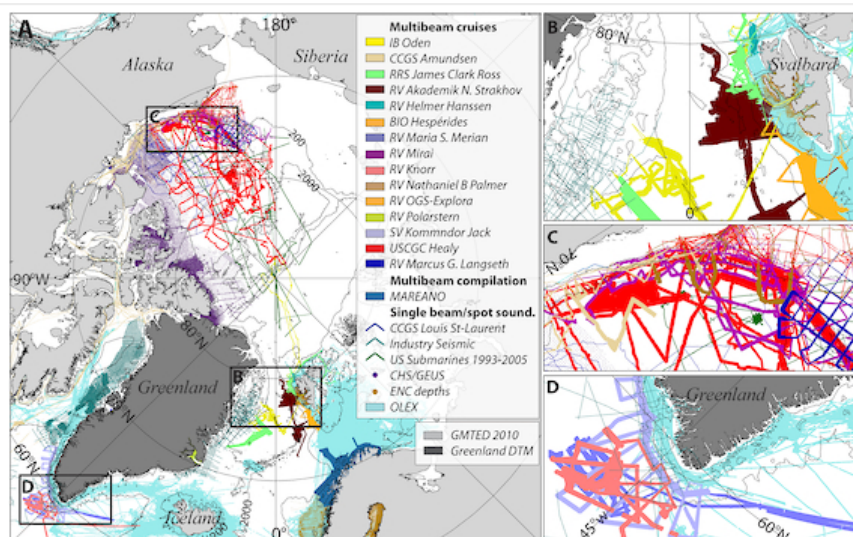
Martin Jakobsson, Larry Mayer, Bernard Coakley, Julian A. Dowdeswell, Steve Forbes, Boris Fridman, Hanne Hodnesdal, Riko Noormets, Richard Pedersen, Michele Rebecco, et al

First Published: 29 June 2012 Vol: 39, L12609 | DOI: 10.1029/2012GL052219

KEY POINTS

- New gridded bathymetric portrayal of the Arctic Ocean
- Bathymetric crowd source data shows a new potential for the mapping community

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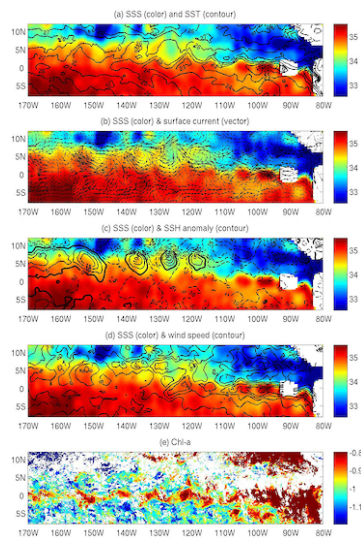
Aquarius reveals salinity structure of tropical instability waves

Tong Lee, Gary Lagerloef, Michelle M. Gierach, Hsun-Ying Kao, Simon Yueh, Kathleen Dohan
First Published: 29 June 2012 Vol: 39, L12610 | DOI: 10.1029/2012GL052232

KEY POINTS

- Provide unprecedented observations of TIW salinity structure of from space
- Observe faster TIWs speed near than away from equator (not documented before)
- We explain why TIWs SSS signal propagate faster near the equator

Highlight



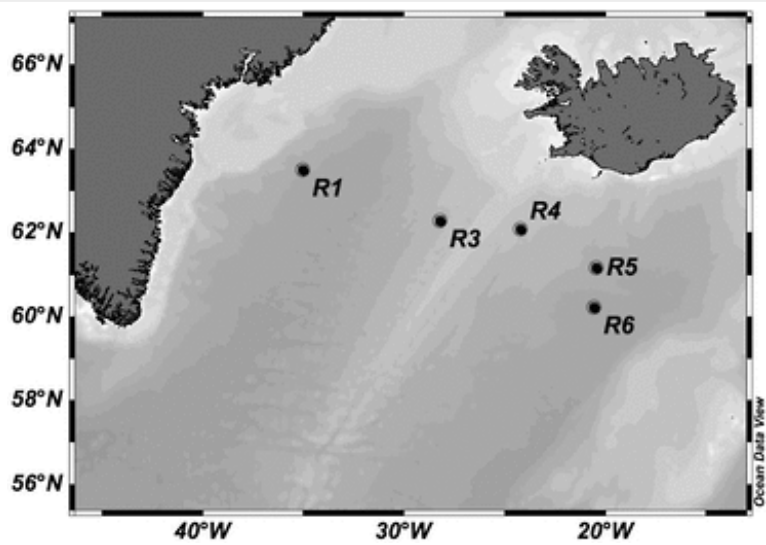
➤ 1 of 4

Elevated iron to nitrogen recycling by mesozooplankton in the Northeast Atlantic Ocean

Sarah L. C. Giering, Sebastian Steigenberger, Eric P. Achterberg, Richard Sanders, Daniel J. Mayor
First Published: 29 June 2012 Vol: 39, L12608 | DOI: 10.1029/2012GL051776

KEY POINTS

- Mesozooplankton regenerate high amounts of dissolved iron during grazing
- DFe:N recycling ratios by mesozooplankton exceed requirements by phytoplankton
- Mesozooplankton have the potential to reduce the intensity of HNLC conditions



> 1 of 3

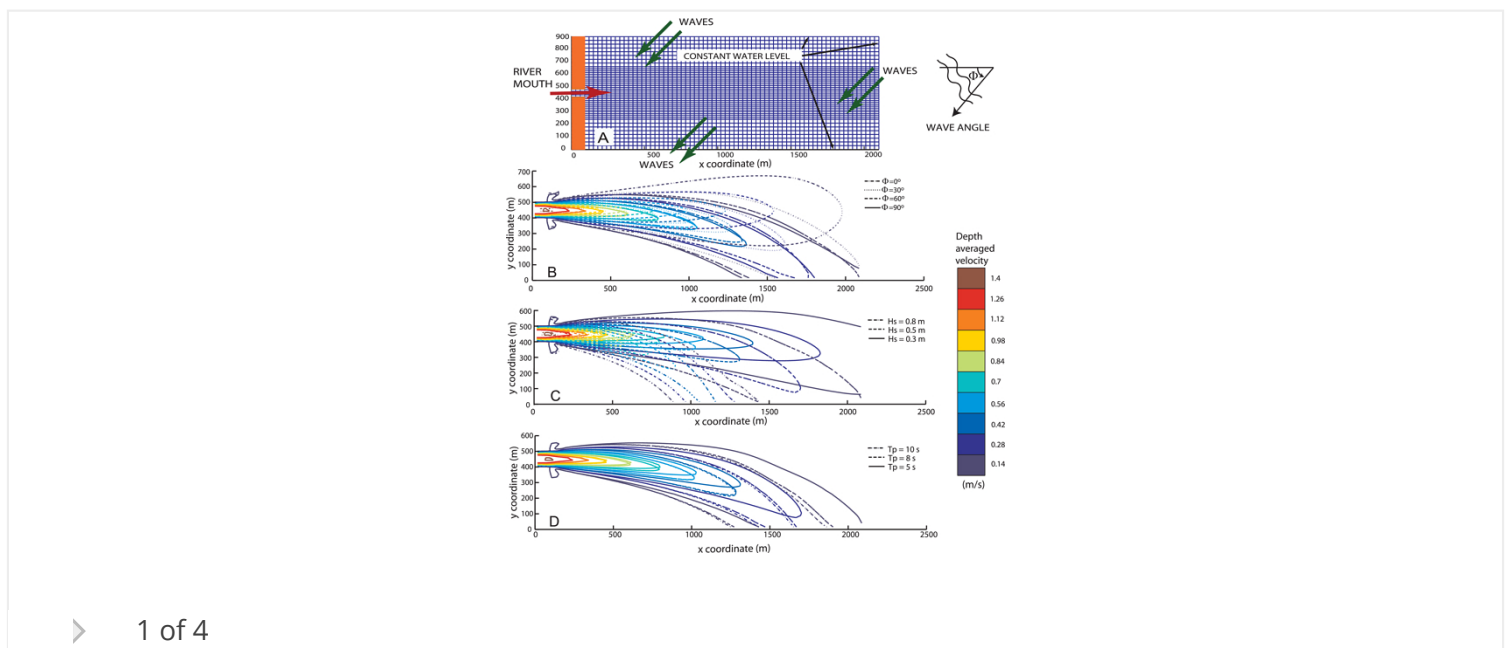
The effect of wind waves on the development of river mouth bars

William Nardin, Sergio Fagherazzi

First Published: 27 June 2012 Vol: 39, L12607 | DOI: 10.1029/2012GL051788

KEY POINTS

- Jet spreading and deflection, determine the evolution of bars



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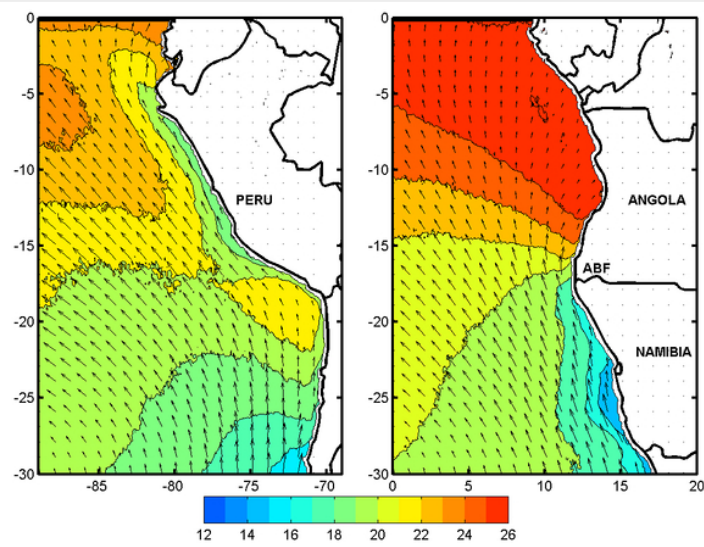
Bi-annual intrusion of tropical water in the northern Benguela upwelling

Mathieu Rouault

First Published: 23 June 2012 Vol: 39, L12606 | DOI: 10.1029/2012GL052099

KEY POINTS

- A bi-annual transport of tropical water across the Angola Benguela Front
- This transport is quasi-synchronised with SLA in the east tropical Atlantic
- Advection of tropical water is a key element for Benguela Ninos



> 1 of 6

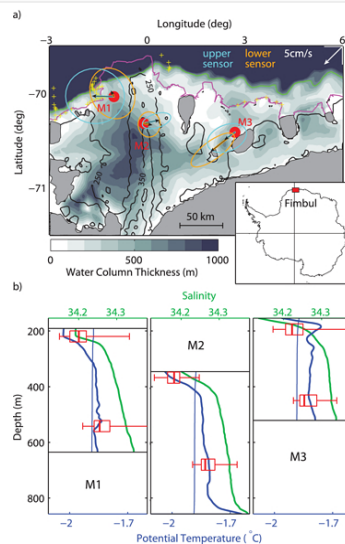
Two years of oceanic observations below the Fimbul Ice Shelf, Antarctica

Tore Hattermann, Ole Anders Nøst, Jonathan M. Lilly, Lars H. Smedsrud

First Published: 22 June 2012 Vol: 39, L12605 | DOI: 10.1029/2012GL051012

KEY POINTS

- We present two years of unique observations below the Fimbul Ice Shelf
- Cold water below the ice suggests low basal melting
- Solar heated surface water and warm pulses at depth provide heat for melting



> 1 of 3

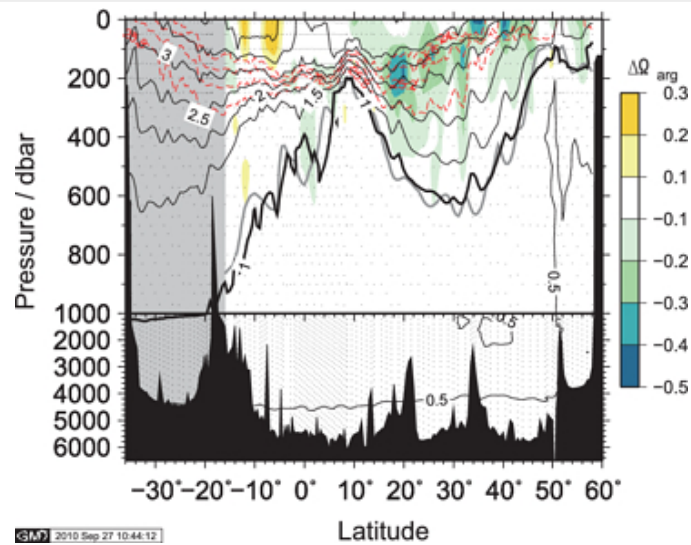
Decadal changes in the CaCO₃ saturation state along 179°E in the Pacific Ocean

Akihiko Murata, Shu Saito

First Published: 21 June 2012 Vol: 39, L12604 | DOI: 10.1029/2012GL052297

KEY POINTS

- Aragonite saturation state is decreasing at a rate of -0.034 per year
- Non-anthropogenic CO₂ contributions accelerate acidification by about 50%



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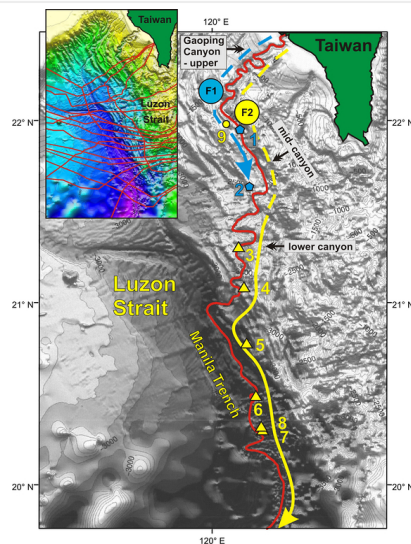
Near-synchronous and delayed initiation of long run-out submarine sediment flows from a record-breaking river flood, offshore Taiwan

L. Carter, J. D. Milliman, P. J. Talling, R. Gavey, R. B. Wynn

First Published: 21 June 2012 Vol: 39, L12603 | DOI: 10.1029/2012GL051172

KEY POINTS

- Major river flood initiates multiple sediment gravity flows
- Sediment flows formed from hyperpycnal plume and remobilised deposits
- River floods can be a natural hazard for deep ocean infrastructure



➤ 1 of 4

Does direct impact of SST on short wind waves matter for scatterometry?

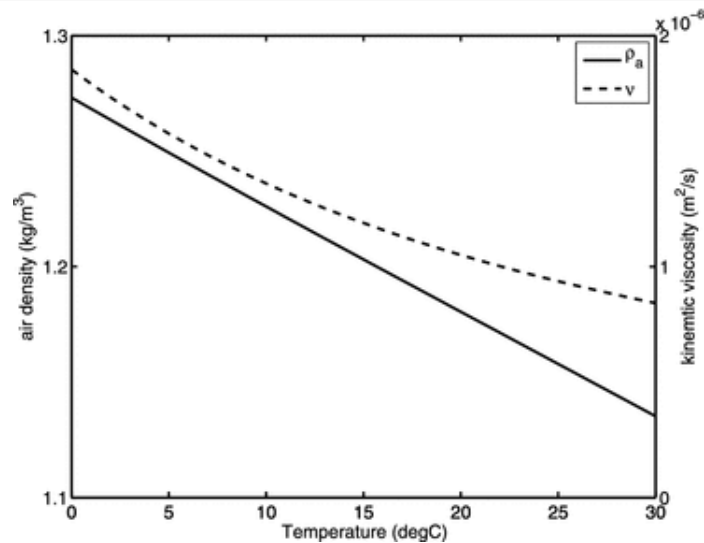
Semyon A. Grodsky, Vladimir N. Kudryavtsev, Abderrahim Bentamy, James A. Carton, Bertrand Chapron

First Published: 20 June 2012 Vol: 39, L12602 | DOI: 10.1029/2012GL052091

KEY POINTS

- Scatterometer wind retrieval doesn't account for SST

- At the same winds, the energy of centimeter scale waves depends on SST
- Temperature dependence of air density and water viscosity affect wind accuracy



> 1 of 5

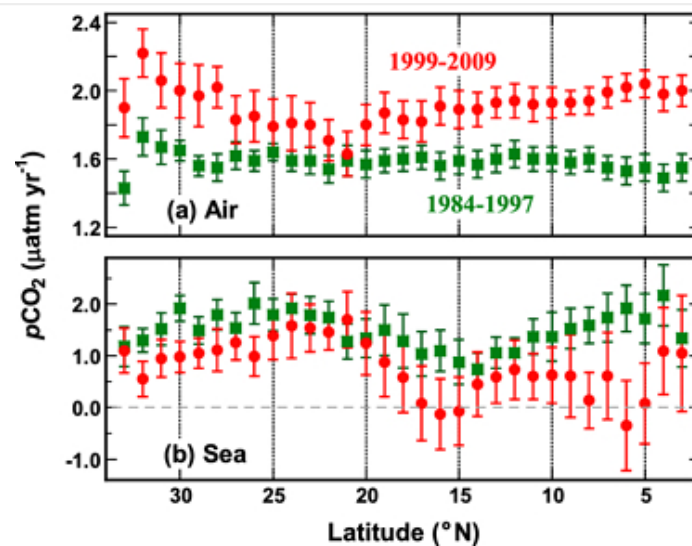
Recent deceleration of oceanic $p\text{CO}_2$ increase in the western North Pacific in winter

Takashi Midorikawa, Masao Ishii, Naohiro Kosugi, Daisuke Sasano, Toshiya Nakano, Shu Saito, Naoaki Sakamoto, Hideyuki Nakano, Hisayuki Y. Inoue

First Published: 19 June 2012 Vol: 39, L12601 | DOI: 10.1029/2012GL051665

KEY POINTS

- Decadal changes in all oceanic CO_2 parameters were determined
- Recent deceleration of oceanic $p\text{CO}_2$ increase was detected
- Its primary cause was the reduction in DIC increase



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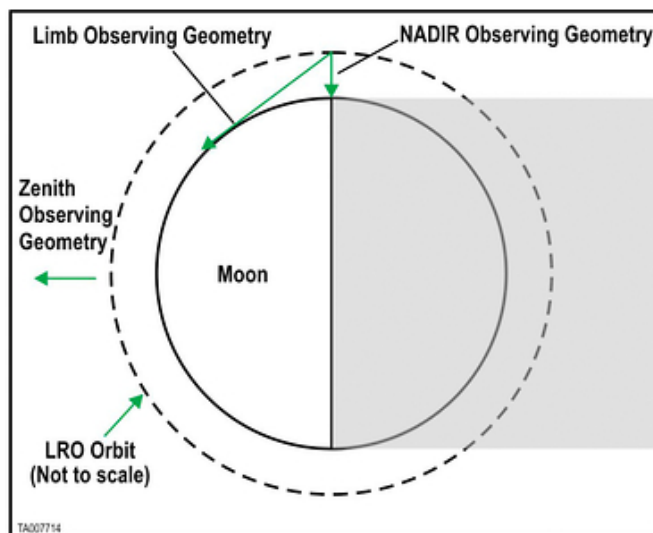
Planets

Lunar atmospheric helium detections by the LAMP UV spectrograph on the Lunar Reconnaissance

KEY POINTS

- Helium has been detected in the lunar atmosphere by remote sensing for the first
- The amount of helium is close to what was detected in situ during Apollo
- Future observations can be used to address questions about its source

Highlight



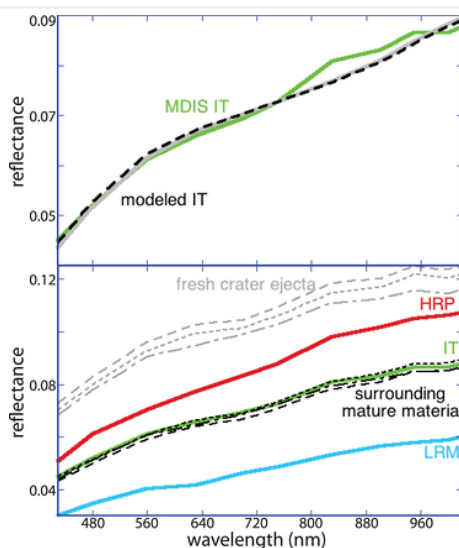
Spectral effects of space weathering on Mercury: The role of composition and environment

Miriam A. Riner, Paul G. Lucey

First Published: 21 June 2012 Vol: 39, L12201 | DOI: 10.1029/2012GL052065

KEY POINTS

- Mercury has markedly more space weathering derived iron (SMFe) than the Moon
- Mercury albedo variations are partly due to differential accumulation of SMFe
- Even immature Mercury materials have more SMFe than average lunar material



Solid Earth

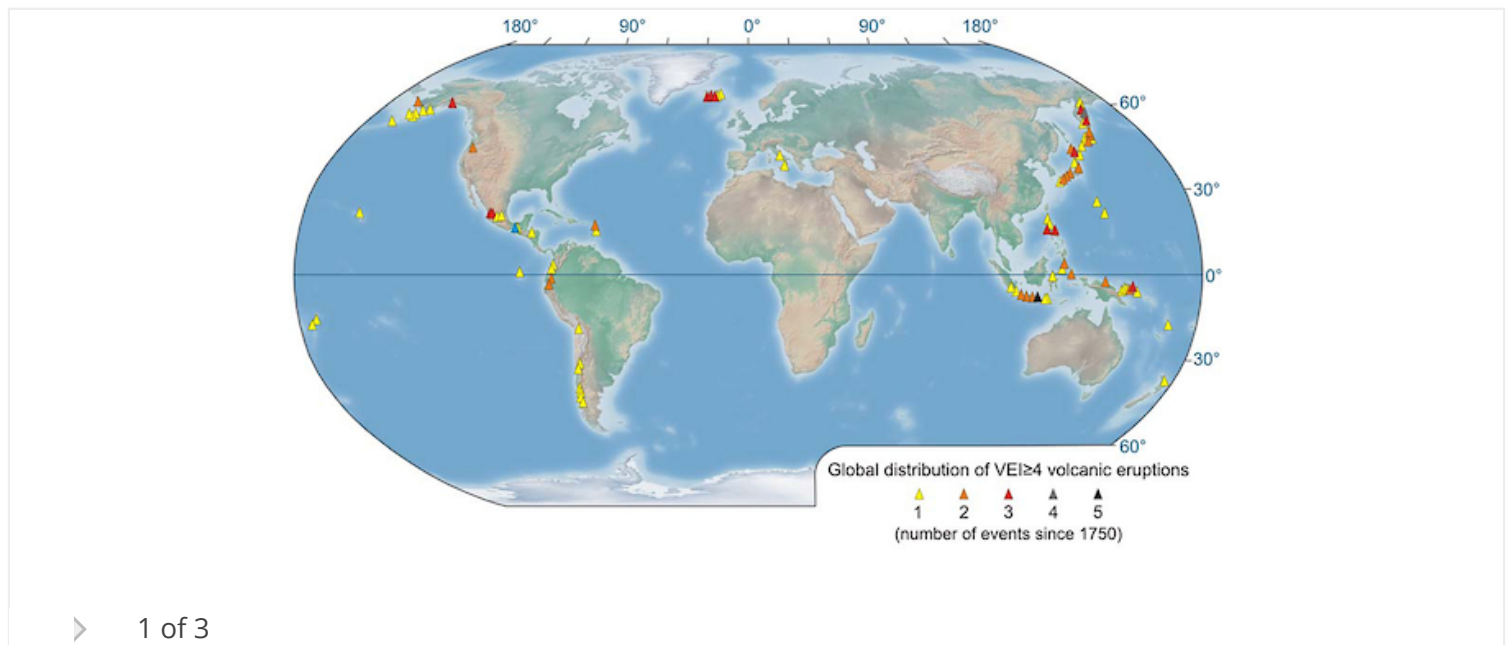
On the space-time distribution of major explosive volcanic eruptions on Earth

Danilo M. Palladino, Gianluca Sottili

First Published: 30 June 2012 Vol: 39, L12308 | DOI: 10.1029/2012GL052541

KEY POINTS

- We analyze the spatial-temporal patterns of $VEI > 4$ volcanic eruptions since 1750
- The probability distribution of successive pairs of events is clustered
- The probability analysis is relevant to hazard assessment



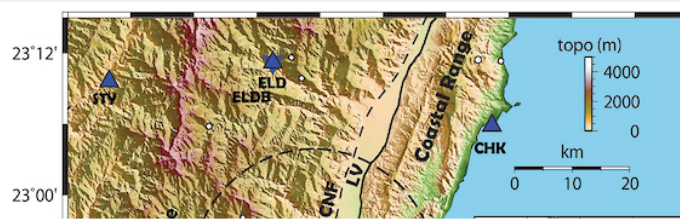
Temporal changes of seismic velocity associated with the 2006 Mw 6.1 Taitung earthquake in an arc-continent collision suture zone

Tai-Chieh Yu, Shu-Huei Hung

First Published: 29 June 2012 Vol: 39, L12307 | DOI: 10.1029/2012GL051970

KEY POINTS

- Monitor temporal change of fault zone seismic properties with ambient noises
- Intense ground shaking and fault-zone damage induce coseismic velocity reduction
- Rainfall-induced groundwater levels mainly control postseismic velocity changes



> 1 of 4

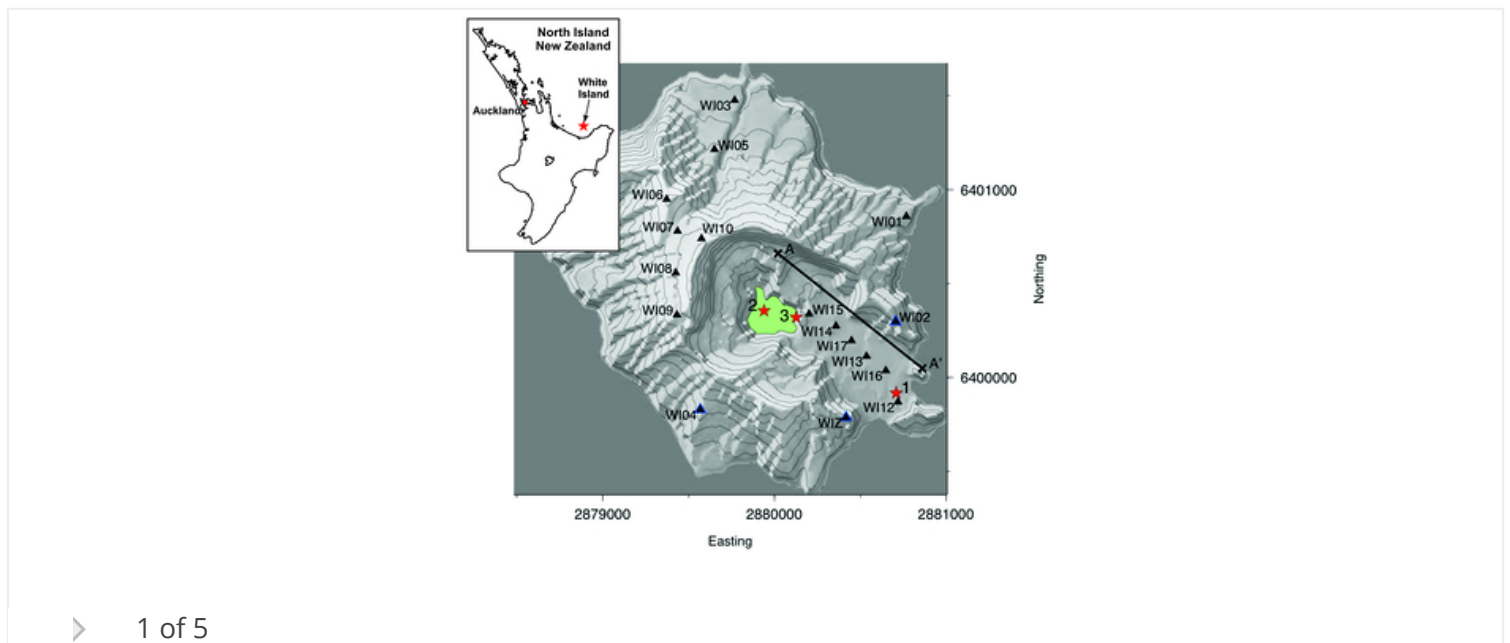
High impact mass drops from helicopter: A new active seismic source method applied in an active volcanic setting

A. D. Jolly, L. Chardot, J. Neuberg, N. Fournier, B. J. Scott, S. Sherburn

First Published: 27 June 2012 Vol: 39, L12306 | DOI: 10.1029/2012GL051880

KEY POINTS

- Vp and Q estimates are found using high impact mass drops from helicopter
- Waveform characteristics depend on source radiation pattern and impact site
- Vp and Q can be economically and safely determined in hazardous settings



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The structure of Fe-Ni alloy in Earth's inner core

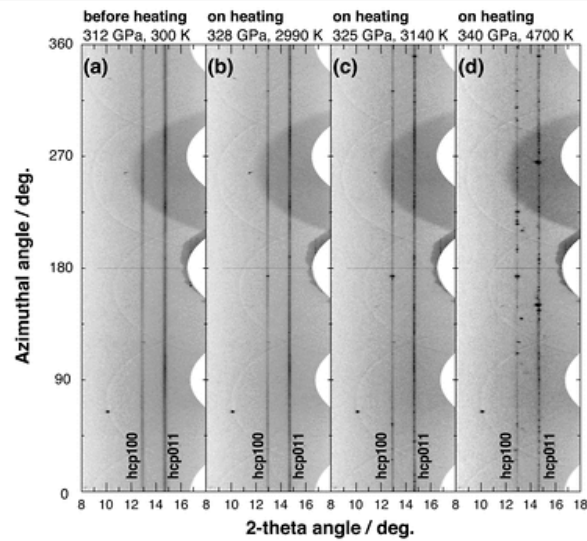
Shigehiko Tateno, Kei Hirose, Tetsuya Komabayashi, Haruka Ozawa, Yasuo Ohishi

First Published: 26 June 2012 Vol: 39, L12305 | DOI: 10.1029/2012GL052103

KEY POINTS

- Static ultrahigh P-T experiments corresponding to the inner core

- Hcp iron-nickel alloy in the Earth's inner core
- Small temperature effect on axial ratio of the hcp phase



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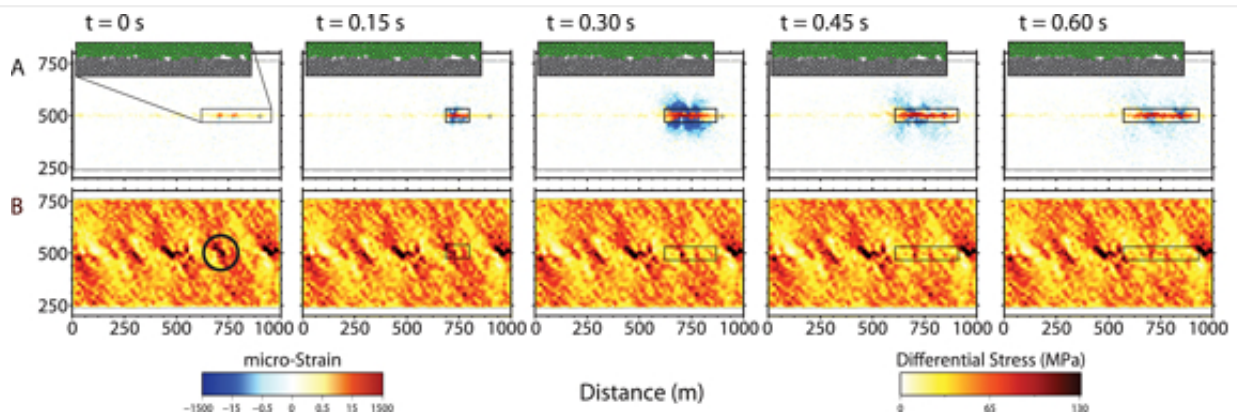
Insights to slip behavior on rough faults using discrete element modeling

Thomas Fournier, Julia Morgan

First Published: 22 June 2012 Vol: 39, L12304 | DOI: 10.1029/2012GL051899

KEY POINTS

- Slip mode is a direct response to stress on the fault
- Fault roughness is an important contributor to stress heterogeneity
- Discrete Element Method is a useful tool for examining complex fault behavior



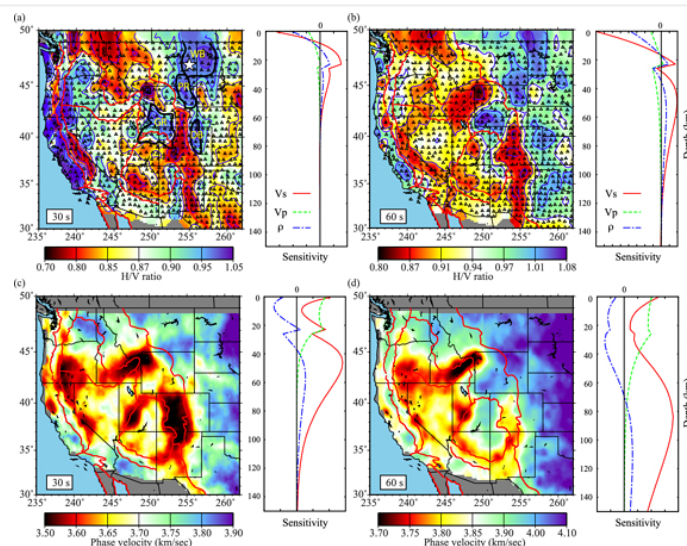
> 1 of 4

Joint inversion of Rayleigh wave phase velocity and ellipticity using USArray: Constraining velocity and density structure in the upper crust

Fan-Chi Lin, Brandon Schmandt, Victor C. Tsai

KEY POINTS

- Broadband Rayleigh wave phase velocity and ellipticity are compatible
- Upper crustal velocity and density can be constrained by the joint inversion
- The western US upper crustal model agrees well with known geological features



➤ 1 of 4

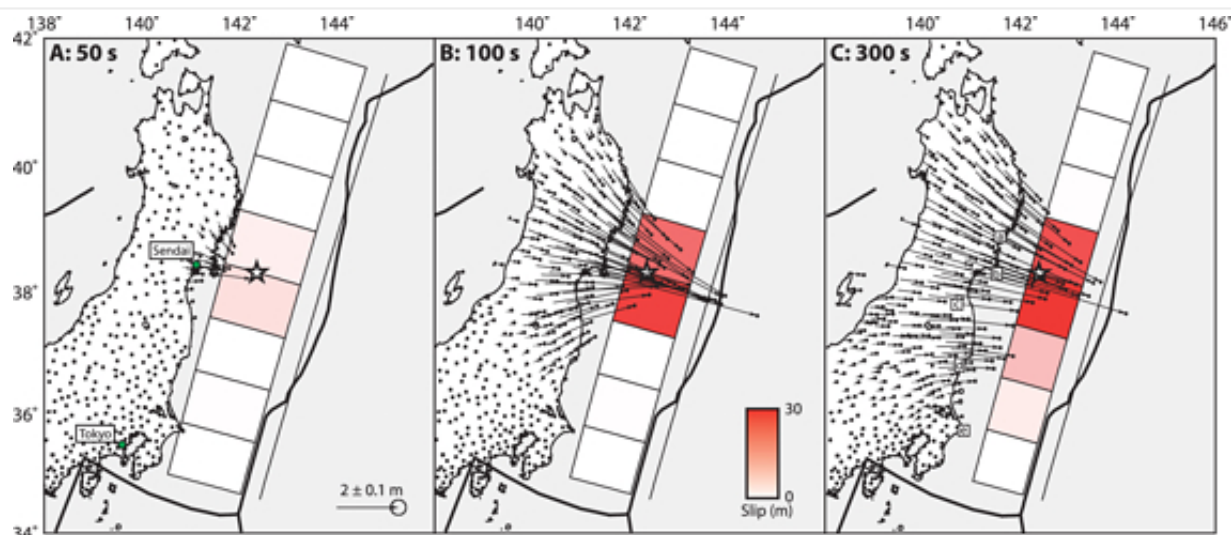
Real-time, reliable magnitudes for large earthquakes from 1 Hz GPS precise point positioning: The 2011 Tohoku-Oki (Japan) earthquake

Tim J. Wright, Nicolas Houlié, Mark Hildyard, Tetsuya Iwabuchi

First Published: 20 June 2012 Vol: 39, L12302 | DOI: 10.1029/2012GL051894

KEY POINTS

- Method for real-time, rapid earthquake magnitude estimation presented
- Mw can be estimated before static displacements complete (~100 s)
- GPS station spacing of ~100 km is sufficient for magnitude estimation



➤ 1 of 3

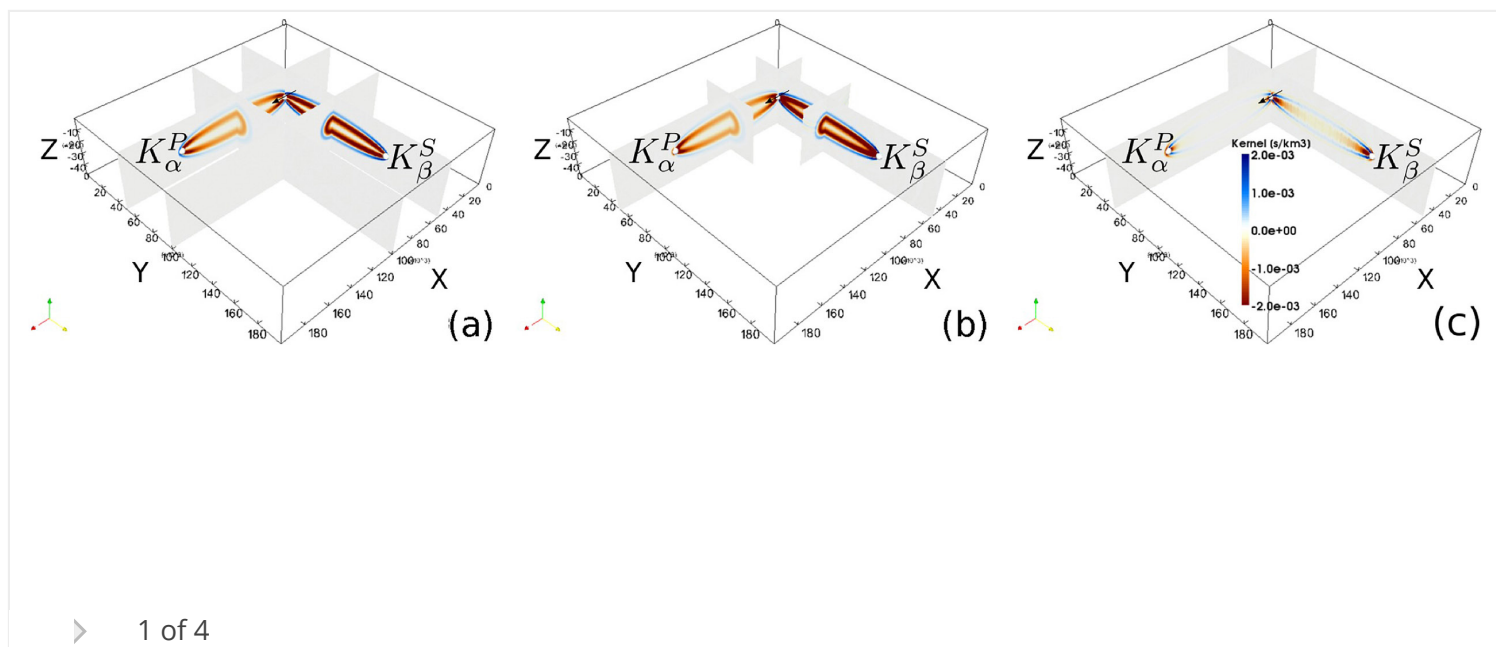
Comparison of ray- and adjoint-based sensitivity kernels for body-wave seismic tomography

E. D. Mercerat, G. Nolet

First Published: 16 June 2012 Vol: 39, L12301 | DOI: 10.1029/2012GL052002

KEY POINTS

- We compare finite-frequency and adjoint kernels for body-wave traveltimes
- Ray-based and adjoint kernels agree for homogeneous background medium
- For smooth 3D background media, differences in predicted P delays are below 10%



The Cryosphere

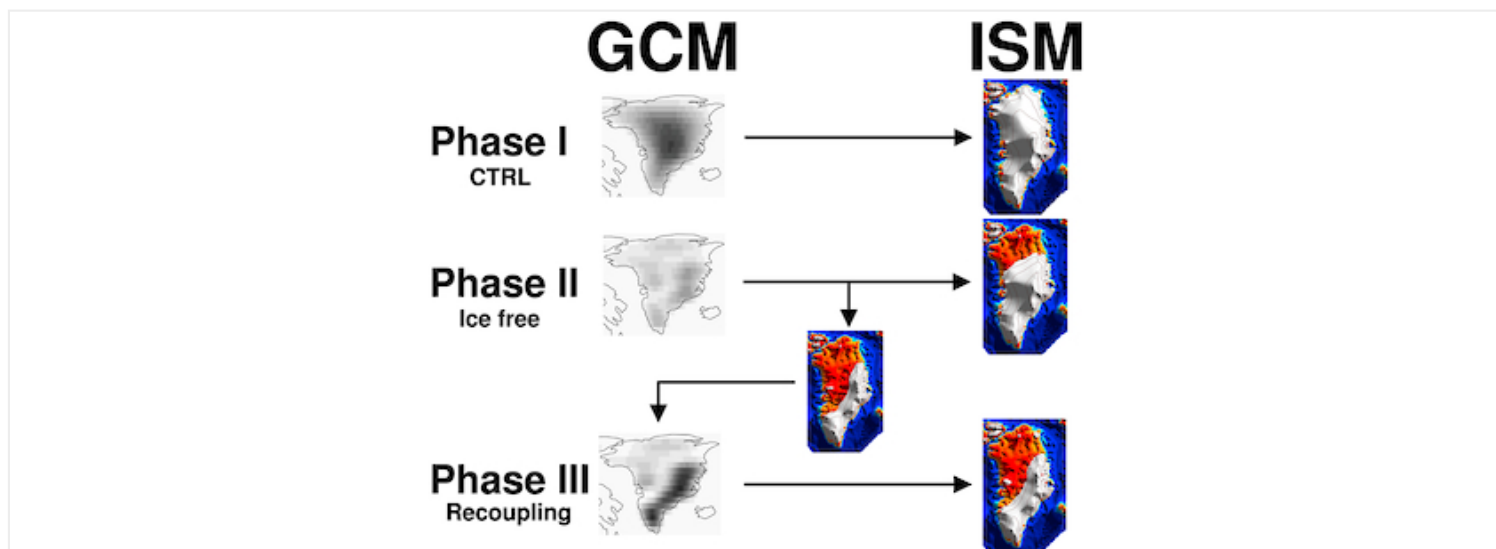
Self-inhibiting growth of the Greenland Ice Sheet

P. L. Langen, A. M. Solgaard, C. S. Hvidberg

First Published: 28 June 2012 Vol: 39, L12502 | DOI: 10.1029/2012GL051810

KEY POINTS

- Atmosphere-ice sheet coupling is important for Greenland Ice Sheet dynamics
- Atmospheric flow feedbacks can halt regrowth of the Greenland Ice Sheet
- A melt of the Greenland Ice Sheet is rendered irreversible by this effect



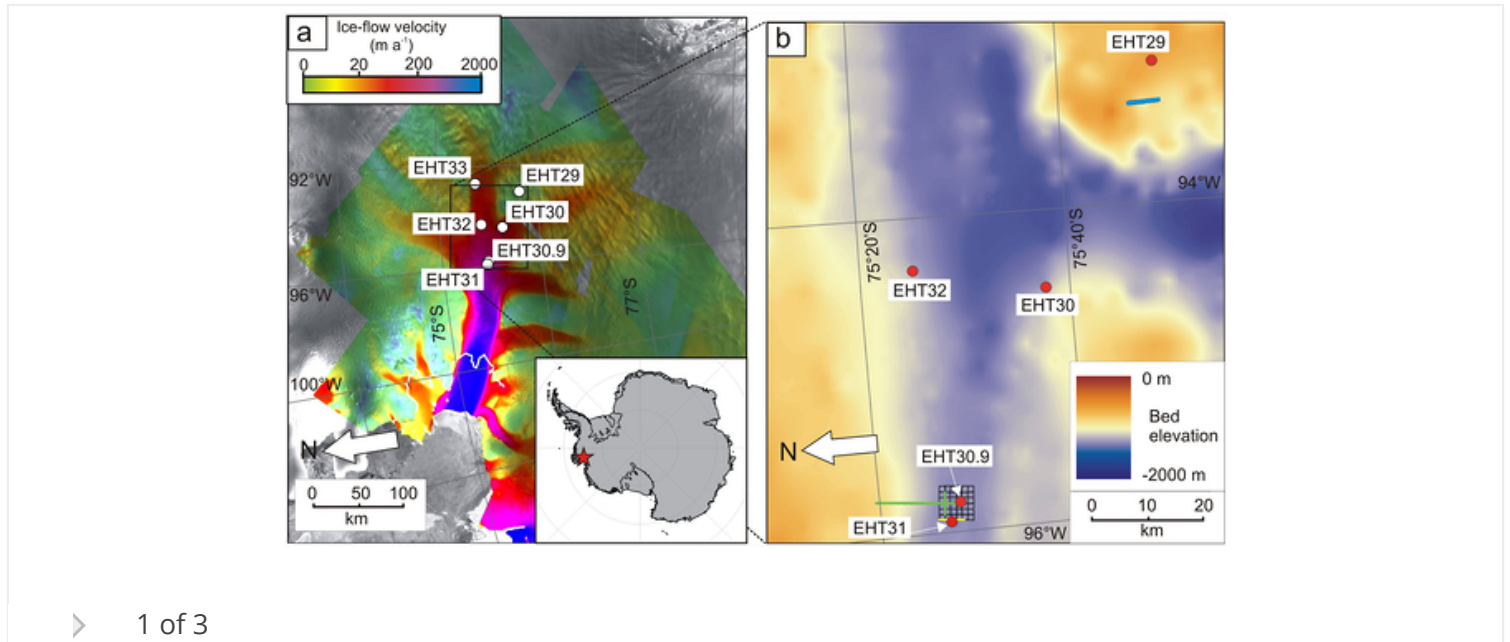
Rapid subglacial erosion beneath Pine Island Glacier, West Antarctica

A. M. Smith, C. R. Bentley, R. G. Bingham, T. A. Jordan

First Published: 23 June 2012 Vol: 39, L12501 | DOI: 10.1029/2012GL051651

KEY POINTS

- Rapid erosion at one location beneath Pine Island Glacier
- Present-day erosion rate of 1 metre per year is possible
- Subglacial erosion can be a significant component of surface lowering



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