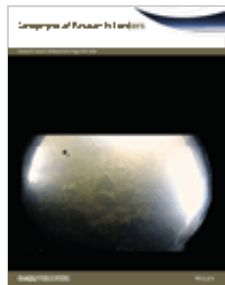


## Issue Contents



## Volume 39, Issue 18

September 2012

Brief  Detailed 

## Atmospheric Science

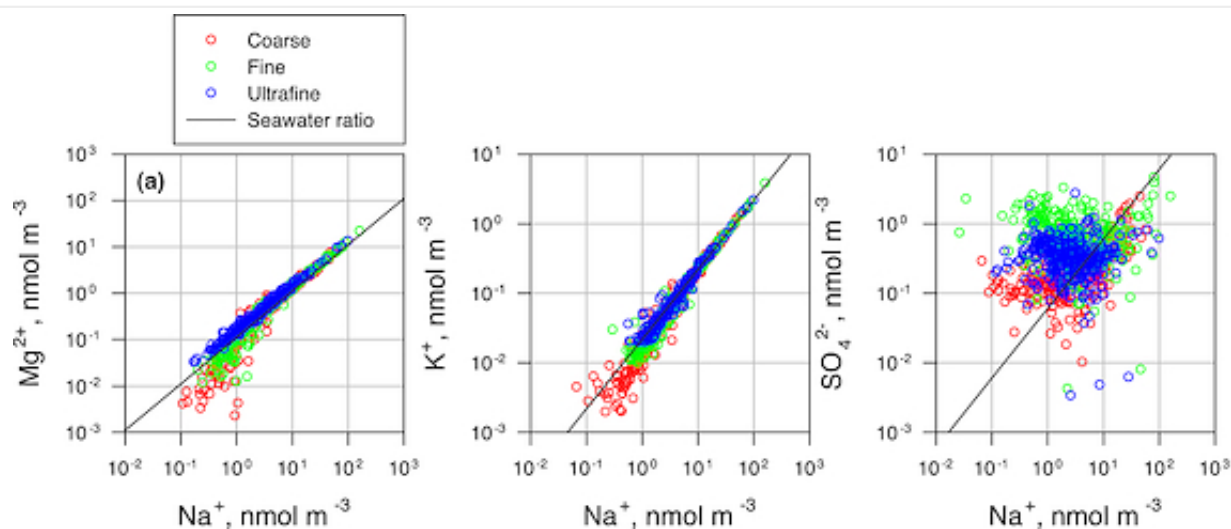
## Seasonal variation of fractionated sea-salt particles on the Antarctic coast

K. Hara, K. Osada, M. Yabuki, T. Yamanouchi

First Published: 18 September 2012 Vol: 39, L18801 | DOI: 10.1029/2012GL052761

## KEY POINTS

- Sea-salt ratios in ultrafine - coarse modes in aerosols
- Temperature dependence of sea-salt ratios
- Occurrence of sea-salt fractionation in the Antarctic coasts



&gt; 1 of 3

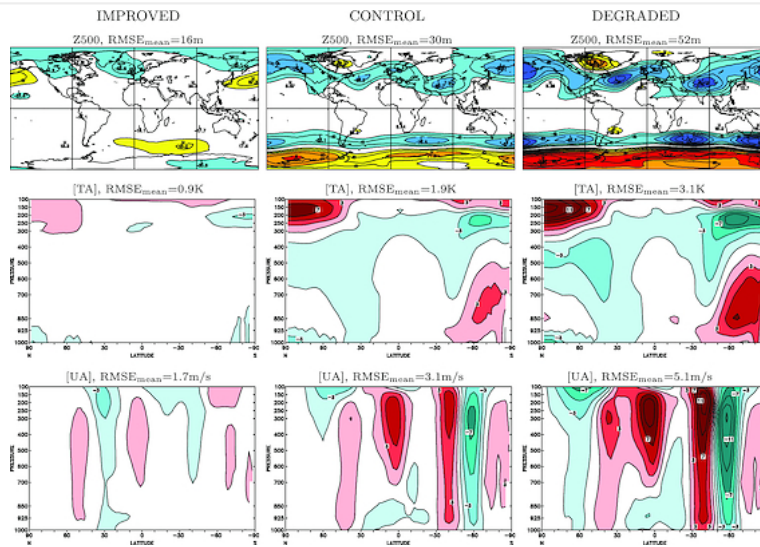
## The impact of model fidelity on seasonal predictive skill

V. V. Kharin, J. F. Scinocca

First Published: 22 September 2012 Vol: 39, L18803 | DOI: 10.1029/2012GL052815

## KEY POINTS

- Introduced run-time empirical corrections improve model bias
- Interannual variance is also improved
- Improvements in bias are associated with improvements in seasonal skill



➤ 1 of 4

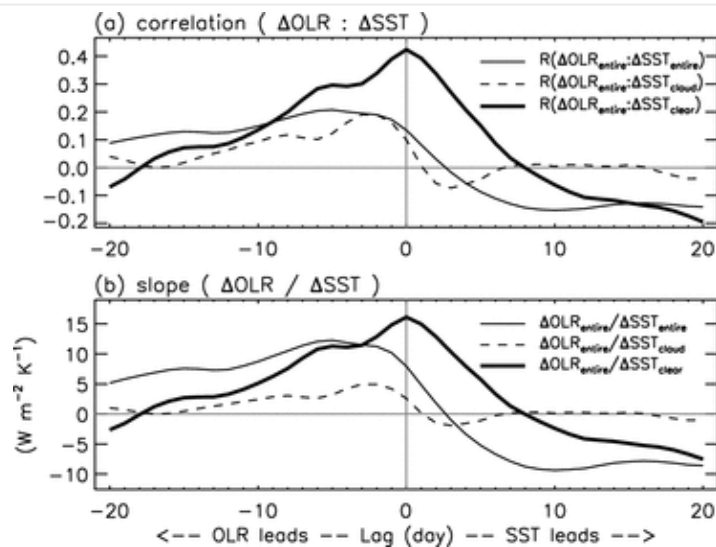
## The observed variation in cloud-induced longwave radiation in response to sea surface temperature over the Pacific warm pool from MTSAT-1R imagery

Heeje Cho, Chang-Hoi Ho, Yong-Sang Choi

First Published: 22 September 2012 Vol: 39, L18802 | DOI: 10.1029/2012GL052700

## KEY POINTS

- Cloud's noise effect on SST hinders estimation of the radiative feedback
- Clear-sky SST helps meaningful estimation of the longwave response to SST change
- Clouds over the Pacific warm pool have longwave cooling effect for increased SST



➤ 1 of 2

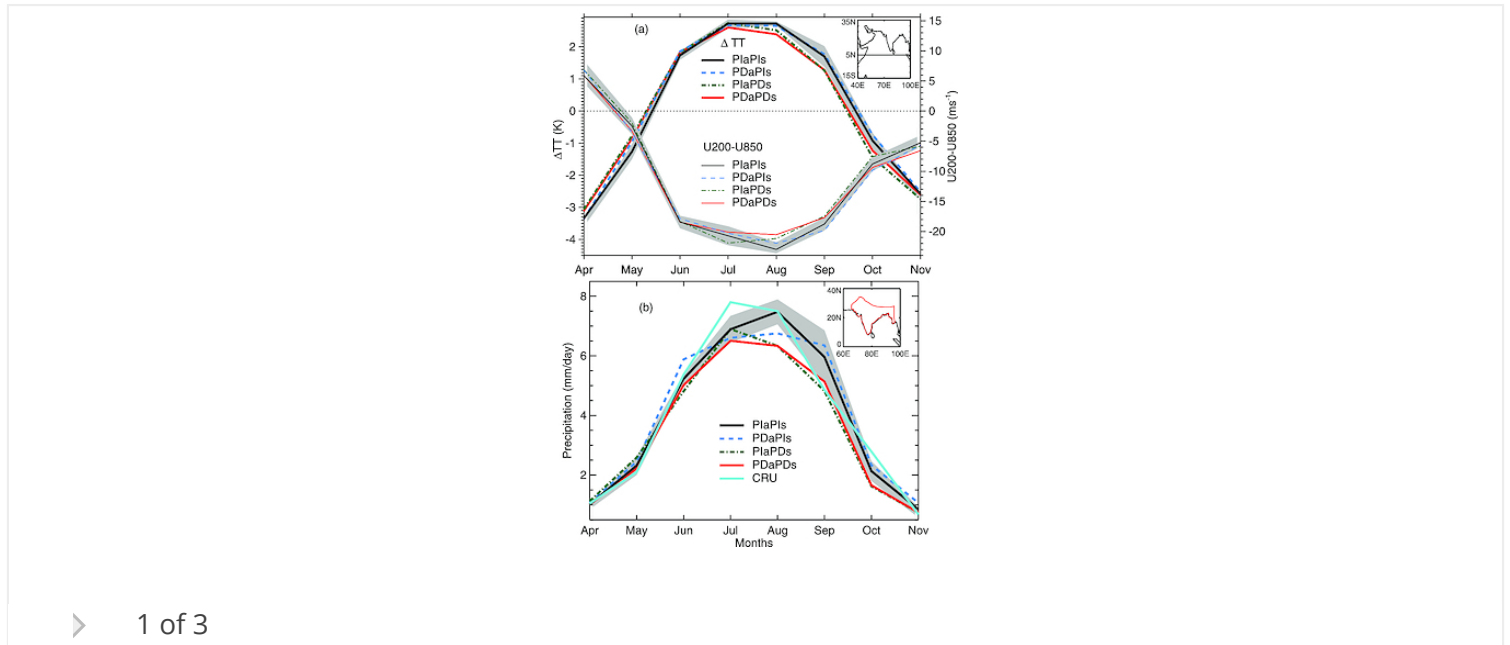
# Fast and slow responses of the South Asian monsoon system to anthropogenic aerosols

Dilip Ganguly, Philip J. Rasch, Hailong Wang, Jin-ho Yoon

First Published: 25 September 2012 Vol: 39, L18804 | DOI: 10.1029/2012GL053043

## KEY POINTS

- SST change by aerosols is crucial than their direct impact on radiation & clouds
- Aerosol induced responses via the EHP mechanism are masked by the slow component
- Aerosols increase moisture transport into South Asia in west & decreases in east



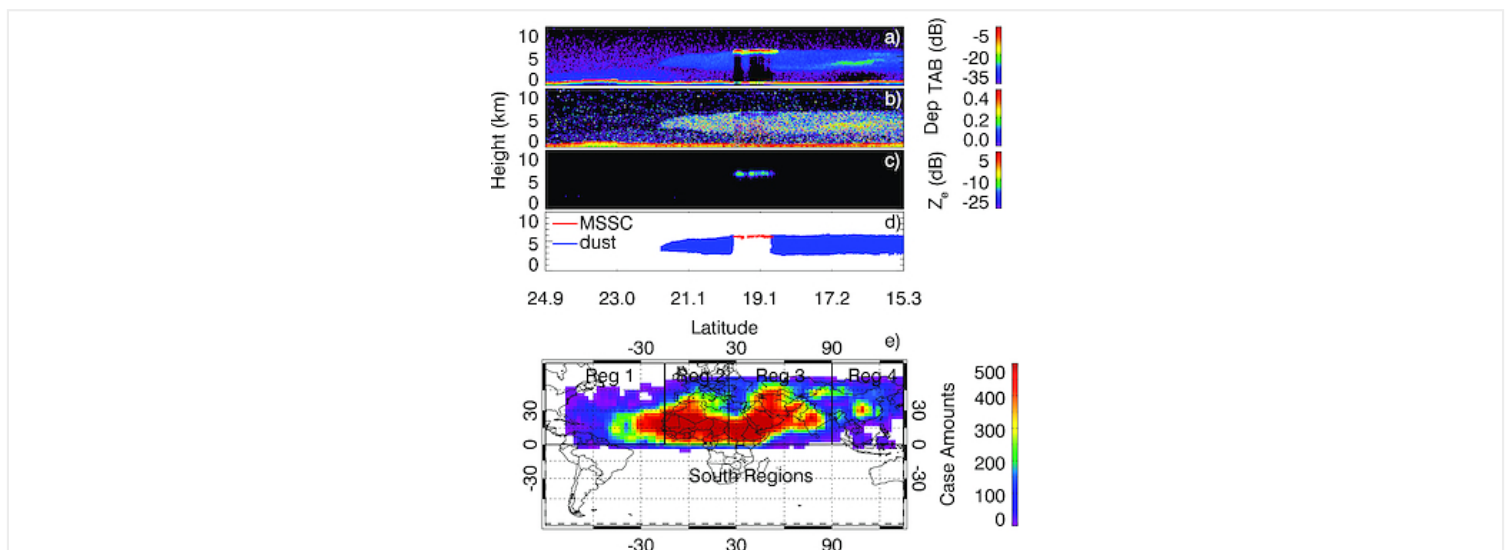
# Quantifying the impact of dust on heterogeneous ice generation in midlevel supercooled stratiform clouds

Damao Zhang, Zhien Wang, Andrew Heymsfield, Jiwen Fan, Dong Liu, Ming Zhao

First Published: 26 September 2012 Vol: 39, L18805 | DOI: 10.1029/2012GL052831

## KEY POINTS

- Dusty MSSCs have 20% higher mixed-phase cloud occurrence
- Dust enhance ice concentration by a factor of 2 to 6
- The enhancements are strongly dependent on the temperature and dust properties



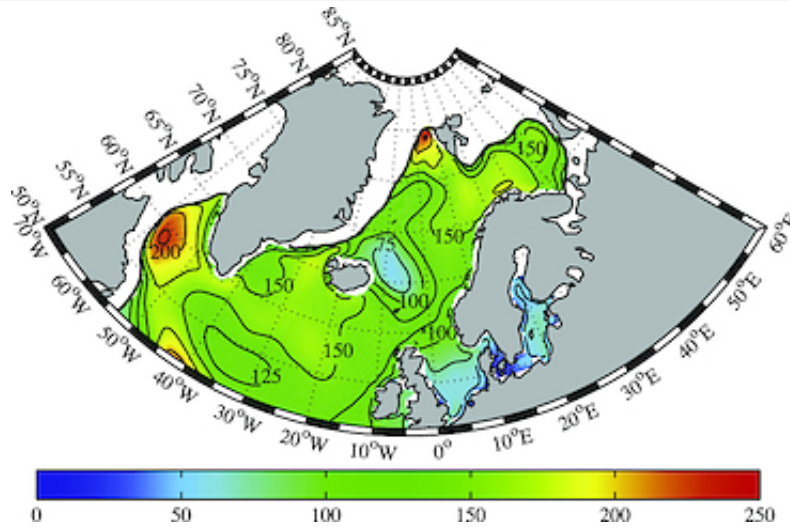
## Spatial distribution of air-sea heat fluxes over the sub-polar North Atlantic Ocean

G. W. K. Moore, I. A. Renfrew, R. S. Pickart

First Published: 27 September 2012 Vol: 39, L18806 | DOI: 10.1029/2012GL053097

### KEY POINTS

- We present a new climatology of air-sea fluxes over the sub-polar North Atlantic
- We identify new features that play a role in water-mass transformation
- Teleconnections other than the NAO play a role in the region's air-sea fluxes



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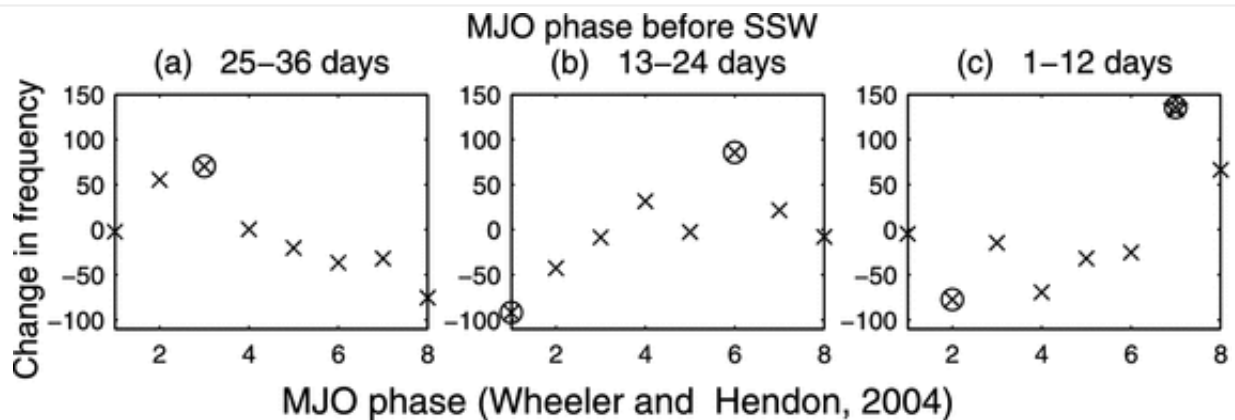
## Observed connection between stratospheric sudden warmings and the Madden-Julian Oscillation

Chaim I. Garfinkel, Steven B. Feldstein, Darryn W. Waugh, Changhyun Yoo, Sukyoung Lee

First Published: 27 September 2012 Vol: 39, L18807 | DOI: 10.1029/2012GL053144

### KEY POINTS

- Certain MJO phases lead to SSW
- Teleconnections of MJO can lead to more wave driving of vortex
- Effect comparable to that of ENSO and QBO



## Climate

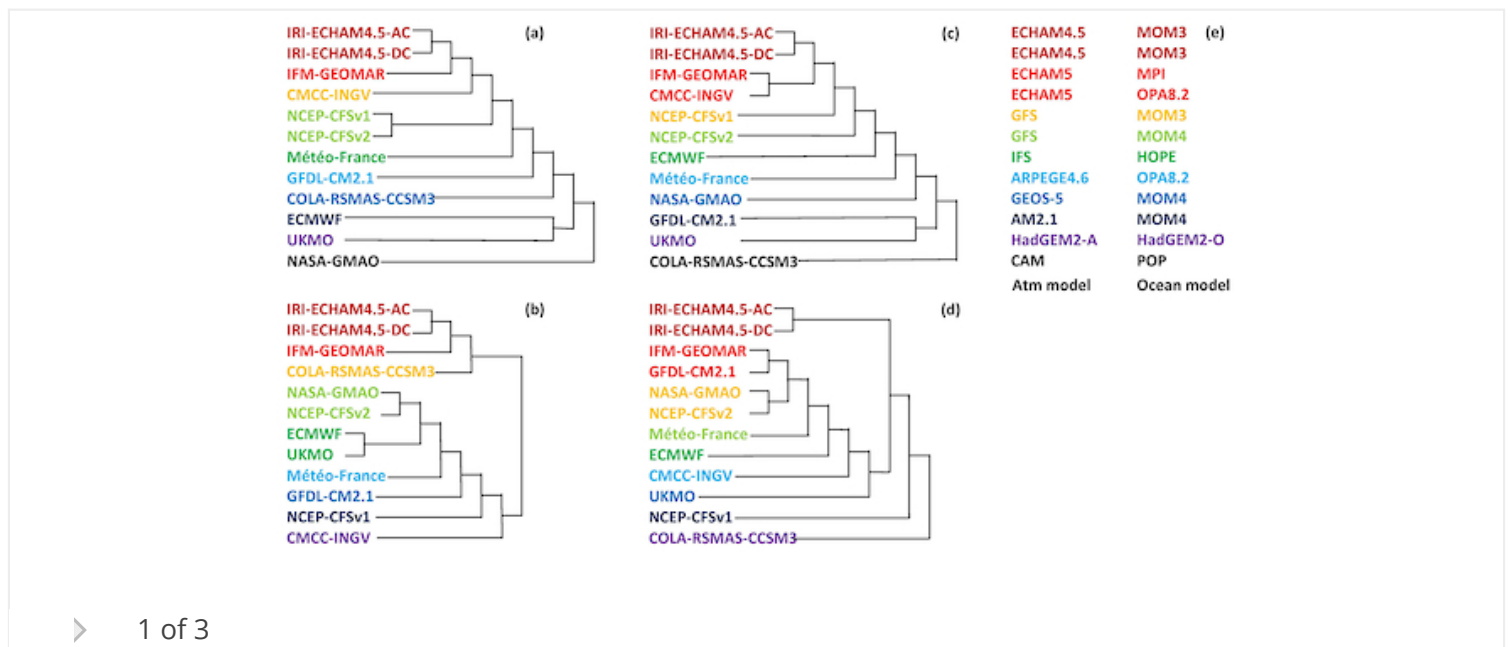
### On the clustering of climate models in ensemble seasonal forecasting

Xing Yuan, Eric F. Wood

First Published: 19 September 2012 Vol: 39, L18701 | DOI: 10.1029/2012GL052735

#### KEY POINTS

- Clustering is complicated in terms of different forecast leads and variables
- Cluster ensemble retains predictability and probabilistic forecast skill
- American and European models are more independent from each other



### Tropical cyclone and extreme rainfall trends in East Asian summer monsoon since mid-20th century

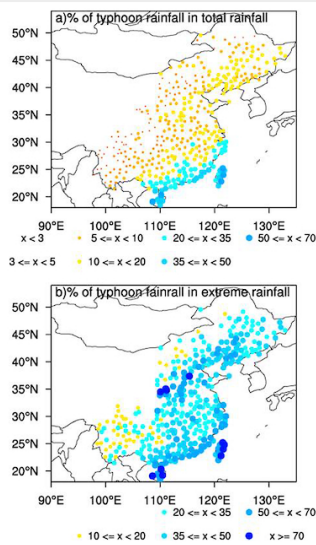
Chih-Pei Chang, Yonghui Lei, Chung-Hisung Sui, Xiaohong Lin, Fumin Ren

First Published: 19 September 2012 Vol: 39, L18702 | DOI: 10.1029/2012GL052945

#### KEY POINTS

- TCs caused underestimate of extreme rainfall trend in East Asian summer monsoon
- Underlying mechanisms are crucial to correctly interpret extreme rainfall trends
- Frequency decrease offsets intensity increase to cause less TC rainfall in China

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> 1 of 4

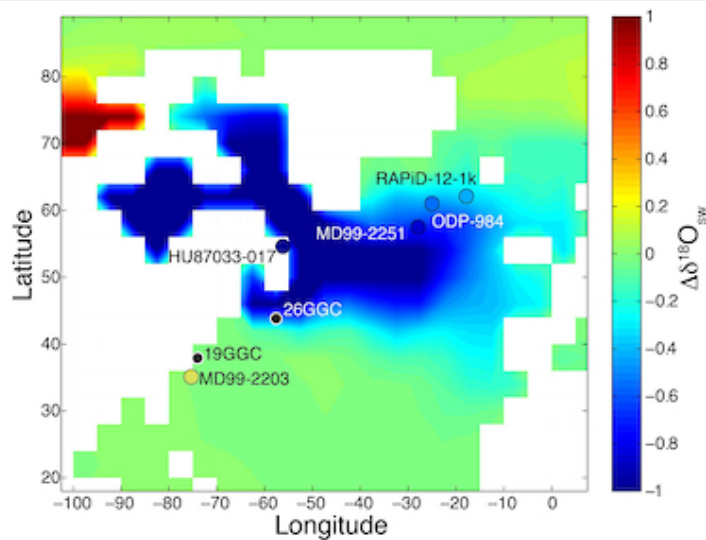
## Linking the 8.2 ka event and its freshwater forcing in the Labrador Sea

Jeremy S. Hoffman, Anders E. Carlson, Kelsey Winsor, Gary P. Klinkhammer, Allegra N. LeGrande, John T. Andrews, Jeffrey C. Strasser

First Published: 20 September 2012 Vol: 39, L18703 | DOI: 10.1029/2012GL053047

### KEY POINTS

- The Labrador Sea cooled ~3 C during the 8.2 ka event
- The cooling masked a large  $\delta^{18}\text{O}$  decrease that reflects Lake Agassiz discharge
- Lake Agassiz discharge therefore caused the 8.2 ka event



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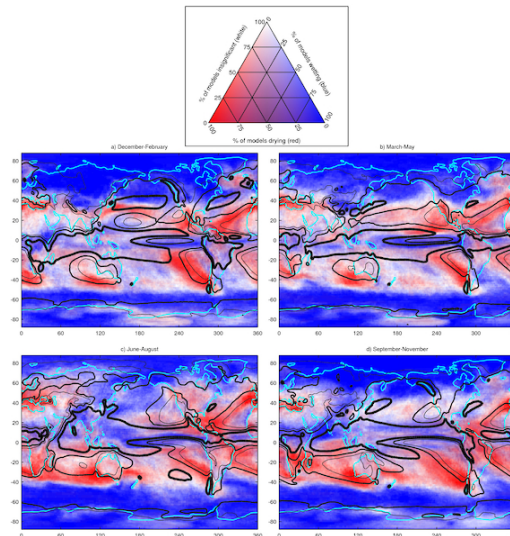
## Robust future precipitation declines in CMIP5 largely reflect the poleward expansion of model subtropical dry zones

Jack Scheff, Dargan M. W. Frierson

First Published: 21 September 2012 Vol: 39, L18704 | DOI: 10.1029/2012GL052910

### KEY POINTS

- New climate models expand their subtropical dry zones poleward with warming
- Poleward retreat of midlatitude precipitation explains most multimodel drying
- The extent of robust drying has strong spring-fall and wavenumber-1 asymmetries



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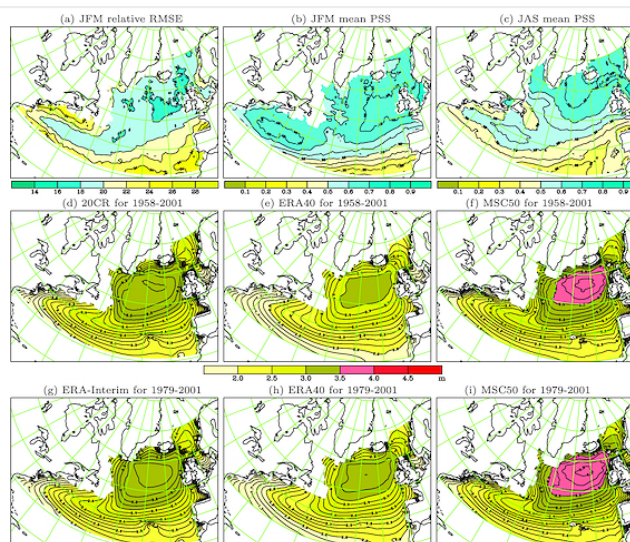
## North Atlantic wave height trends as reconstructed from the 20th century reanalysis

Xiaolan L. Wang, Yang Feng, V. R. Swail

First Published: 22 September 2012 Vol: 39, L18705 | DOI: 10.1029/2012GL053381

### KEY POINTS

- The reconstructed trends are consistent with those in wave reanalysis data sets
- Trend magnitudes are greater over the last half century than over the 140 years
- There are seasonal variations in the trend patterns of extreme Hs



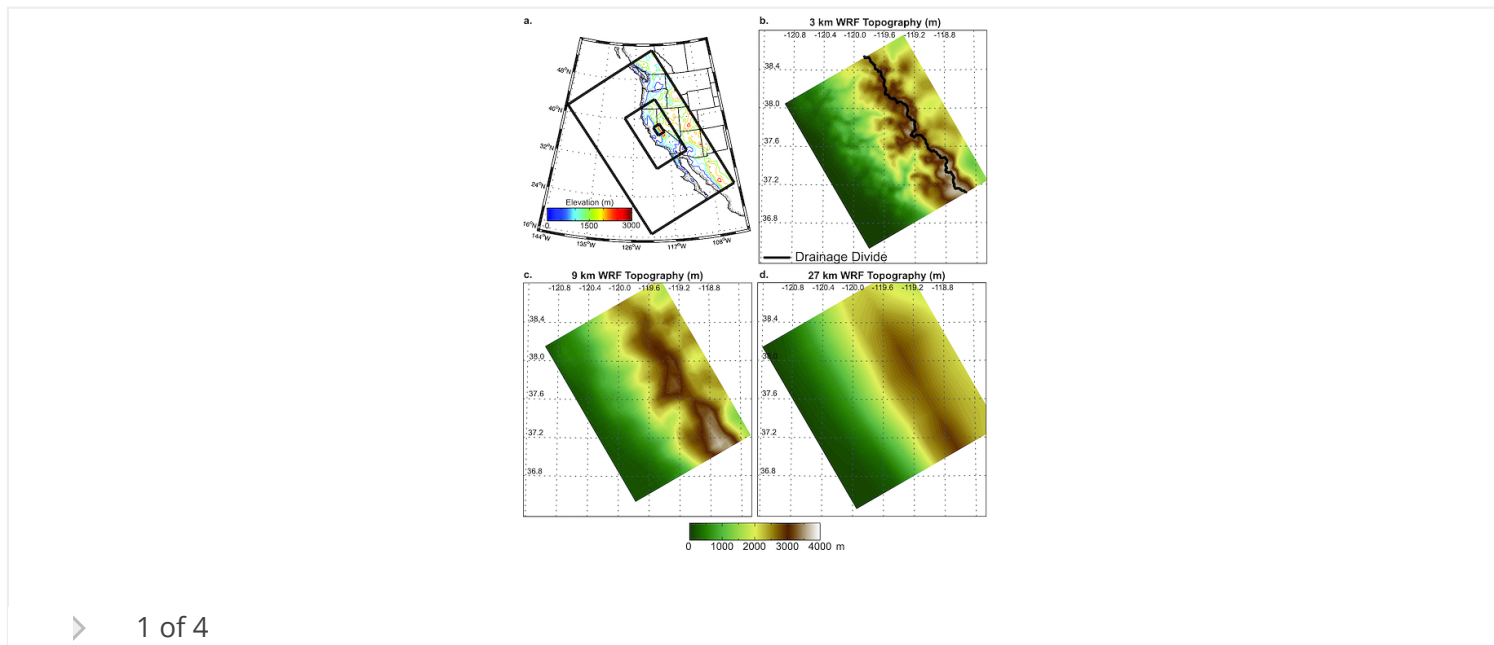
➤ 1 of 2

## Changes in orographic precipitation patterns caused by a shift from snow to rain

Tamlin M. Pavelsky, Stefan Sobolowski, Sarah B. Kapnick, Jason B. Barnes

### KEY POINTS

- A shift from snow to rain alters precipitation patterns in the Sierra Nevada
- New precipitation patterns would impact water resources and natural hazards
- Detecting altered precipitation patterns requires a model run at high resolution



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## How large are projected 21st century storm track changes?

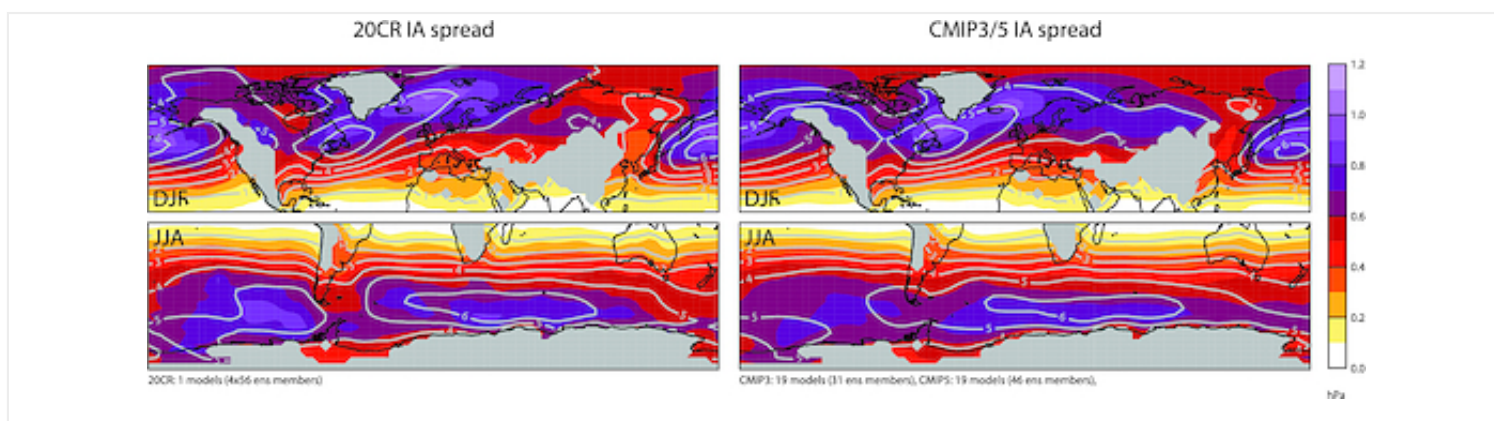
B. J. Harvey, L. C. Shaffrey, T. J. Woollings, G. Zappa, K. I. Hodges

First Published: 25 September 2012 Vol: 39, L18707 | DOI: 10.1029/2012GL052873

### KEY POINTS

- Storm track responses can be the order of inter-annual variations
- There are significant differences between the CMIP3 and CMIP5 storm responses
- Variability should be used as a measure of the size of climate change responses

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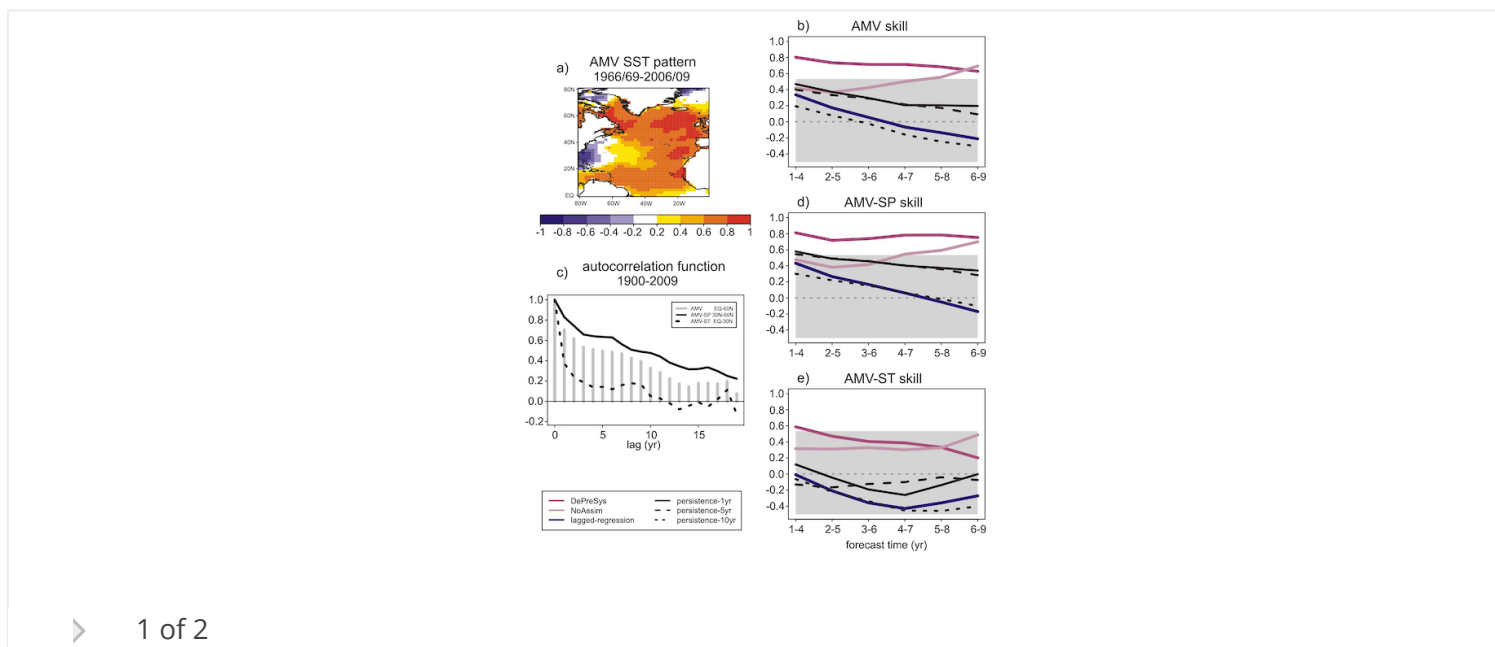
## Understanding Atlantic multi-decadal variability prediction skill

J. García-Serrano, F. J. Doblas-Reyes, C. A. S. Coelho

First Published: 26 September 2012 Vol: 39, L18708 | DOI: 10.1029/2012GL053283

### KEY POINTS

- Roles of initial conditions and external forcing on AMV skill are addressed
- Roles of the subtropical and subpolar branches on AMV skill are addressed
- An innovative diagnostic is presented, and dynamical and empirical models used



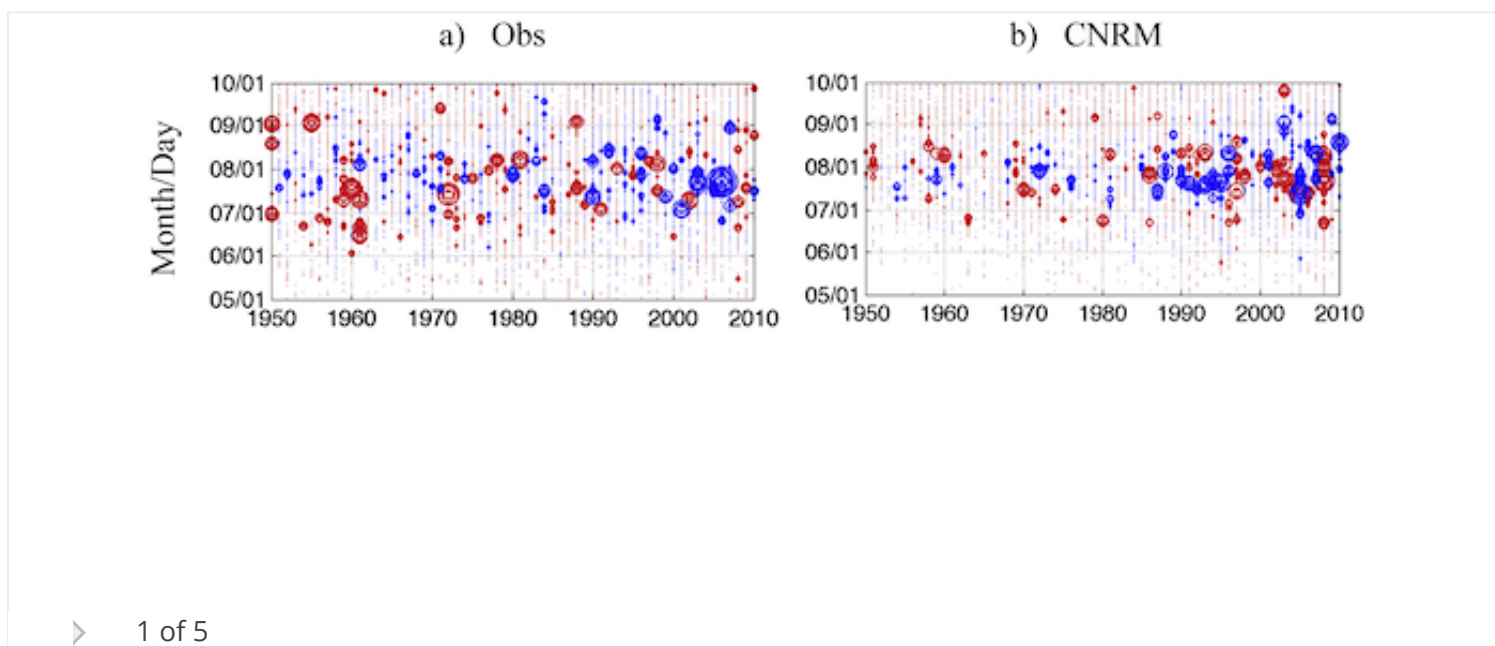
## California heat waves in the present and future

Alexander Gershunov, Kristen Guirguis

First Published: 27 September 2012 Vol: 39, L18710 | DOI: 10.1029/2012GL052979

### KEY POINTS

- The flavor of California heat waves is changing
- Coastal heat waves are projected to intensify relative to background warming
- This trend is already observed due to coastal penetration of inland heat waves



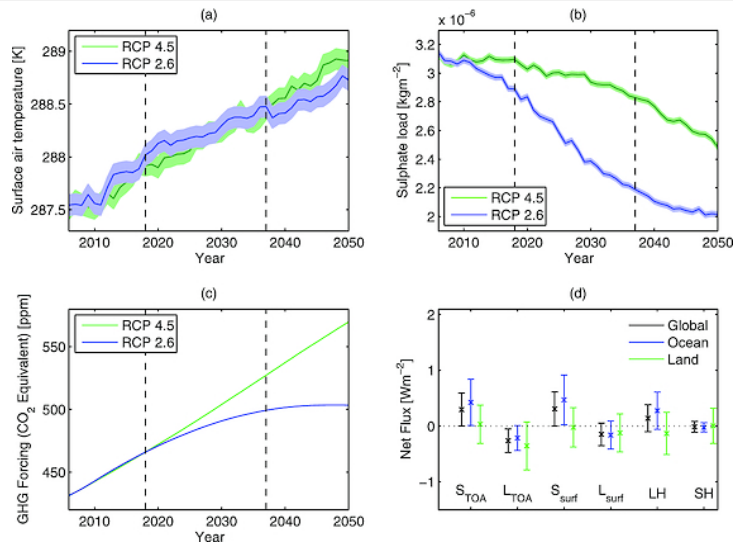
## Aerosol contribution to the rapid warming of near-term climate under RCP 2.6

N. Chalmers, E. J. Highwood, E. Hawkins, R. Sutton, L. J. Wilcox

First Published: 27 September 2012 Vol: 39, L18709 | DOI: 10.1029/2012GL052848

### KEY POINTS

- Aerosols are a key uncertainty in near term climate predictions
- Aerosol decreases in RCP2.6 produce rapid warming despite low greenhouse forcing
- Response is amplified in eastern Pacific via changes in cloud regime



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## Abrupt change in atmospheric $\text{CO}_2$ during the last ice age

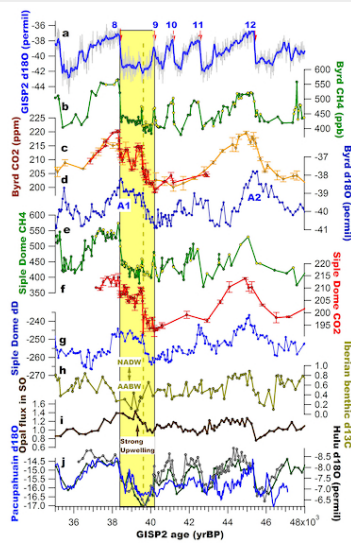
Jinho Ahn, Edward J. Brook, Andreas Schmittner, Karl Kreutz

First Published: 28 September 2012 Vol: 39, L18711 | DOI: 10.1029/2012GL053018

### KEY POINTS

- Half of  $\text{CO}_2$  increase during a 1500-year cold period occurred in < 200 yrs
- Abrupt  $\text{CO}_2$  rise is synchronous, or slightly later than, a rapid Antarctic warming
- C-cycle-climate modeling doesn't capture all of the processes for  $\text{CO}_2$  variations

Highlight



> 1 of 2

## Hydrology and Land Surface Studies

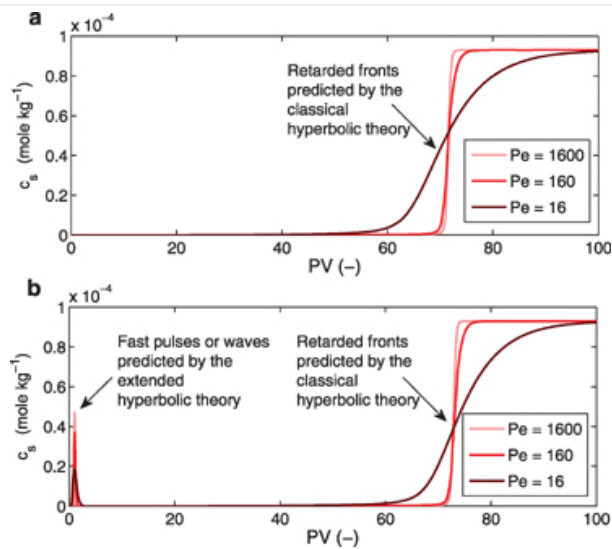
### Fast strontium transport induced by hydrodynamic dispersion and pH-dependent sorption

Valentina Prigobbe, Marc A. Hesse, Steven L. Bryant

First Published: 18 September 2012 Vol: 39, L18401 | DOI: 10.1029/2012GL053146

#### KEY POINTS

- First experimental evidence of new fast transport mechanism
- Similar phenomena expected for other radionuclides and heavy metals
- This phenomenon is a notable exception from the theory



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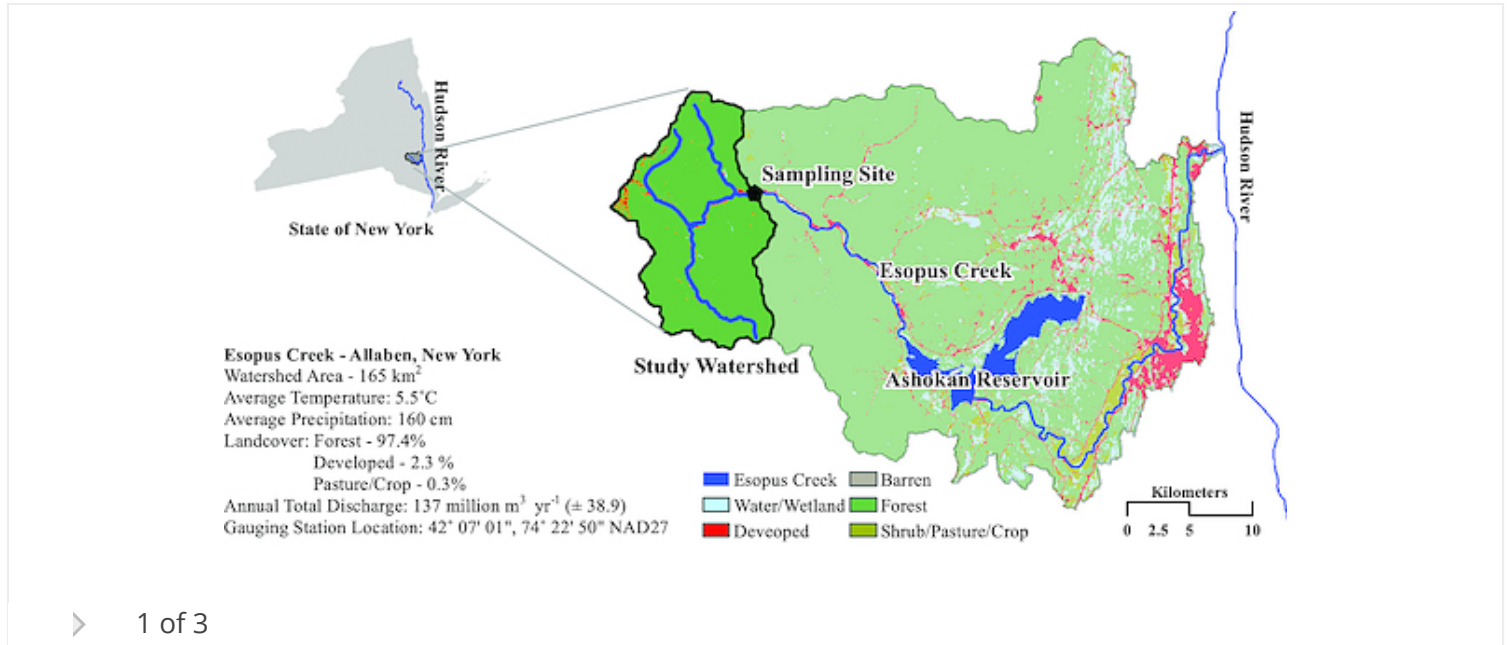
## Dissolved organic matter export from a forested watershed during Hurricane Irene

Byungman Yoon, Peter A. Raymond

First Published: 19 September 2012 Vol: 39, L18402 | DOI: 10.1029/2012GL052785

#### KEY POINTS

- Hurricane Irene exported 43% of annual DOC flux in 5 days
- This is the largest event studied for DOM export
- Climate change may be increasing the terrestrial DOM flux to coastal systems



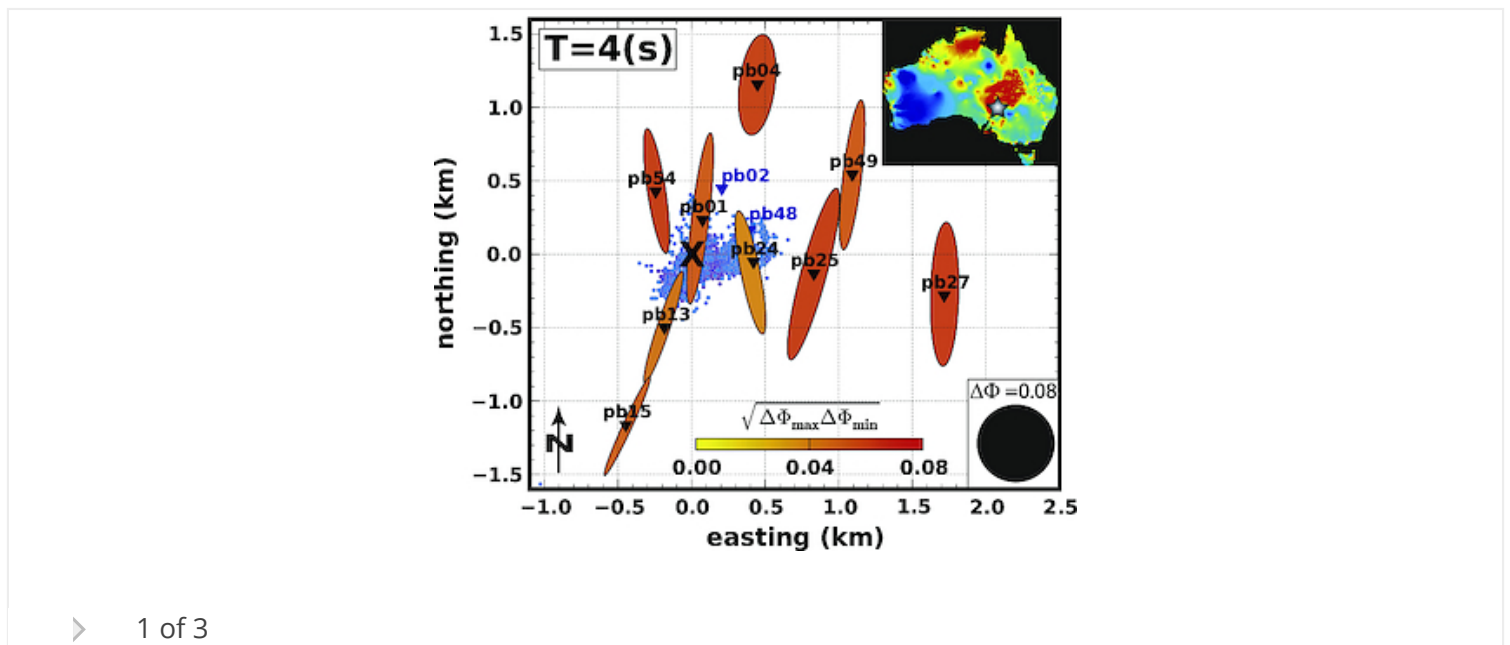
## Magnetotelluric monitoring of a fluid injection: Example from an enhanced geothermal system

J. R. Peacock, S. Thiel, P. Reid, G. Heinson

First Published: 21 September 2012 Vol: 39, L18403 | DOI: 10.1029/2012GL053080

### KEY POINTS

- Magnetotellurics can be used to monitor fluid injections at depth
- Estimating an error floor ensures an observable change above measurement error
- Phase tensor analysis provides information about reservoir spatial variation

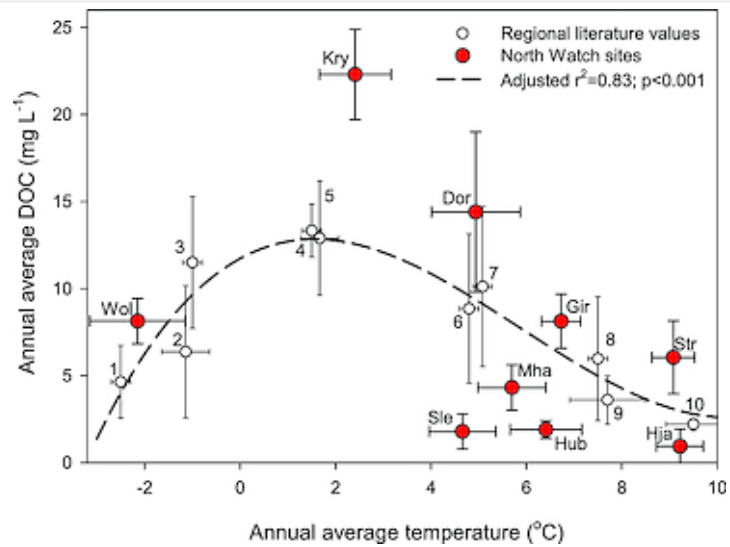


## Cross-regional prediction of long-term trajectory of stream water DOC response to climate change

Hjalmar Laudon, Jim Buttle, Sean K. Carey, Jeff McDonnell, Kevin McGuire, Jan Seibert, Jamie Shanley, Chris

## KEY POINTS

- Stream DOC on a regional scale is controlled by mean annual temperature (MAT)
- Topography is important for DOC concentration as a secondary control
- Long-term trajectory of stream water DOC to climate change is predictable



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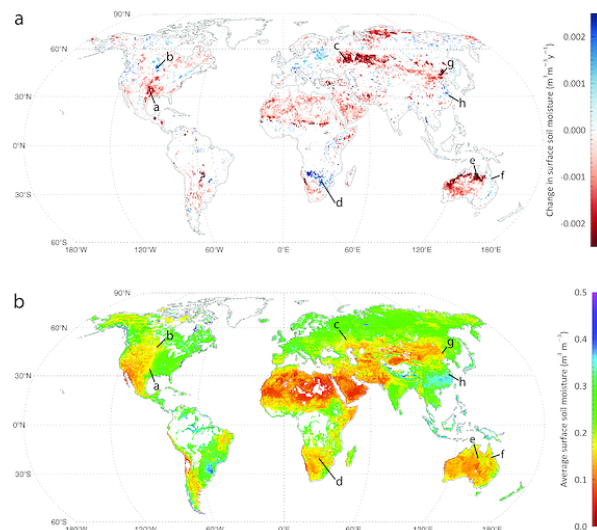
## Evaluating global trends (1988–2010) in harmonized multi-satellite surface soil moisture

Wouter Dorigo, Richard de Jeu, Daniel Chung, Robert Parinussa, Yi Liu, Wolfgang Wagner, Diego Fernández-Prieto

First Published: 26 September 2012 Vol: 39, L18405 | DOI: 10.1029/2012GL052988

## KEY POINTS

- First global trend analysis of harmonized satellite surface soil moisture
- Global trend patterns dominated by desiccation of soil surface
- Similarities with trends in modeled soil moisture, precipitation, and NDVI



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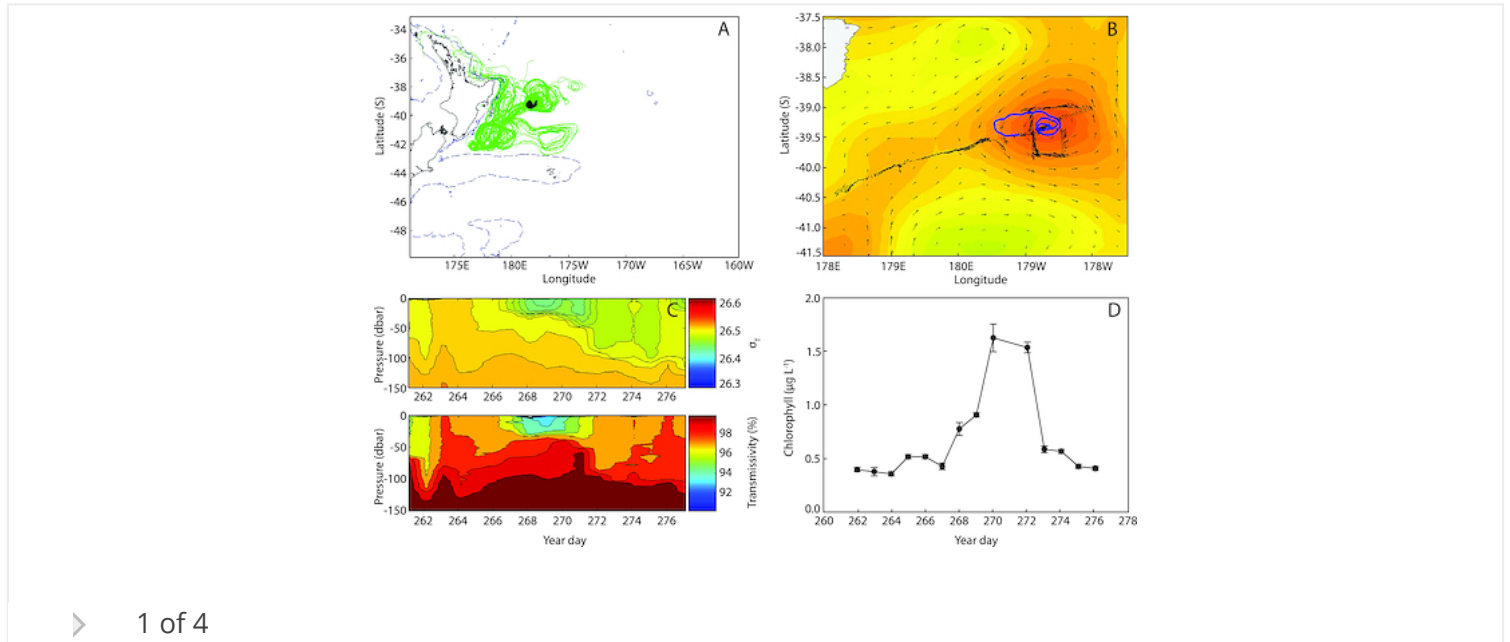
## Microbial control of diatom bloom dynamics in the open ocean

Philip W. Boyd, Robert Strzepek, Steve Chiswell, Hoe Chang, Jennifer M. DeBruyn, Michael Ellwood, Sean Keenan, Andrew L. King, Elisabeth W. Maas, Scott Nodder, et al

First Published: 19 September 2012 Vol: 39, L18601 | DOI: 10.1029/2012GL053448

### KEY POINTS

- Microbial sequestration of iron terminates the diatom bloom
- Unlike for major nutrients microbes readily access new and regenerated iron
- Microbes use both r and K strategies in resource competition for iron



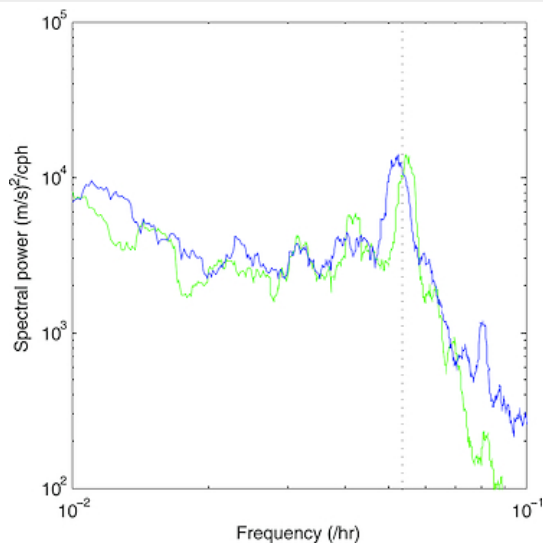
## Inertial currents in the Caspian Sea

J. Farley Nicholls, R. Toumi, W. P. Budgell

First Published: 20 September 2012 Vol: 39, L18603 | DOI: 10.1029/2012GL052989

### KEY POINTS

- First study of the Caspian Sea
- Inertial waves depend on offshore distance
- Caspian has frequent inertial oscillations and large seasonal variation



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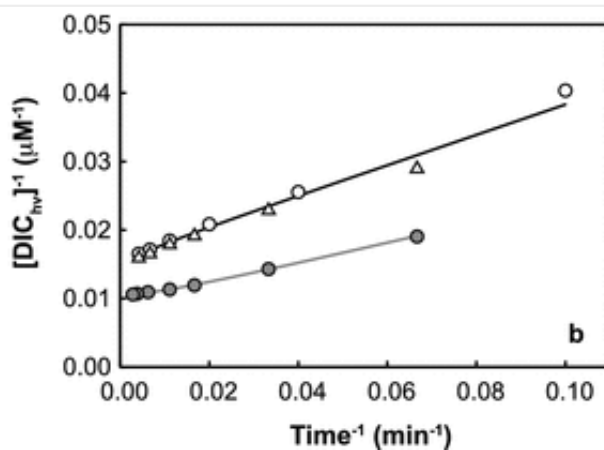
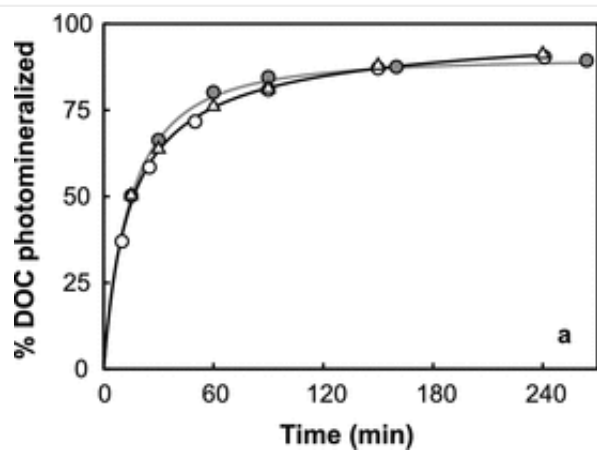
## Photochemical reactivity of ancient marine dissolved organic carbon

Steven R. Beaupré, Ellen R. M. Druffel

First Published: 20 September 2012 Vol: 39, L18602 | DOI: 10.1029/2012GL052974

### KEY POINTS

- DOC photomineralization kinetics are 2nd order under high energy UV light
- DOC photochemical reactivity and  $^{14}\text{C}$  content are highly correlated
- Photomineralization may be an important sink for ancient DOC



> 1 of 2

## A global perspective on Langmuir turbulence in the ocean surface boundary layer

Stephen E. Belcher, Alan L. M. Grant, Kirsty E. Hanley, Baylor Fox-Kemper, Luke Van Roekel, Peter P. Sullivan, William G. Large, Andy Brown, Adrian Hines, Daley Calvert, et al

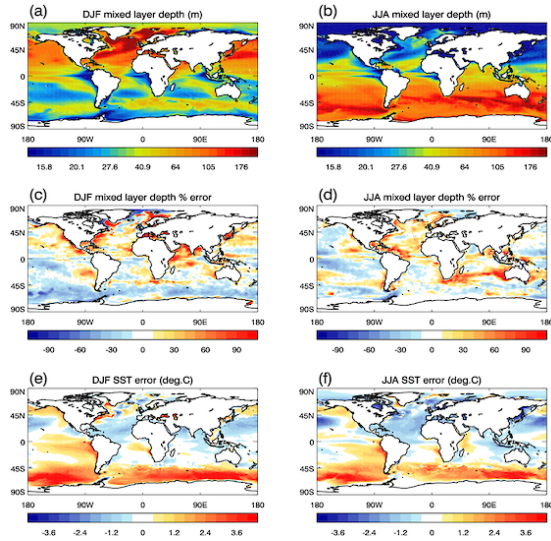
First Published: 21 September 2012 Vol: 39, L18605 | DOI: 10.1029/2012GL052932

### KEY POINTS

- Climate models have biases in the depth of the ocean surface boundary layer

- Langmuir turbulence is a key process mixing the ocean surface boundary layer
- Langmuir turbulence deepens the layer more quickly than wind-forced turbulence

Highlight



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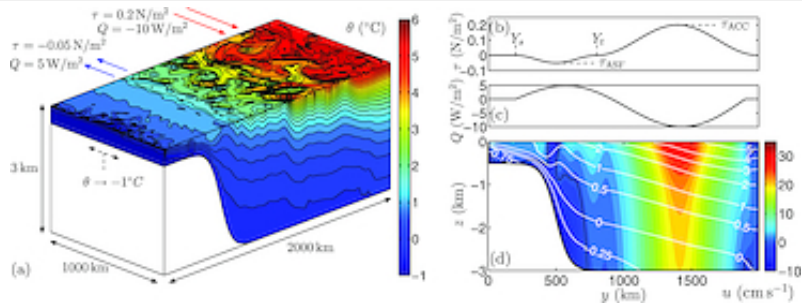
## Sensitivity of the ocean's deep overturning circulation to easterly Antarctic winds

Andrew L. Stewart, Andrew F. Thompson

First Published: 21 September 2012 Vol: 39, L18604 | DOI: 10.1029/2012GL053099

### KEY POINTS

- Simulations of wind- and eddy-driven MOC over Antarctic continental shelf/slope
- AABW exported from Antarctic shelf by both eddies and wind-driven overturning
- Deep MOC is much more sensitive to polar easterlies than mid-latitude westerlies



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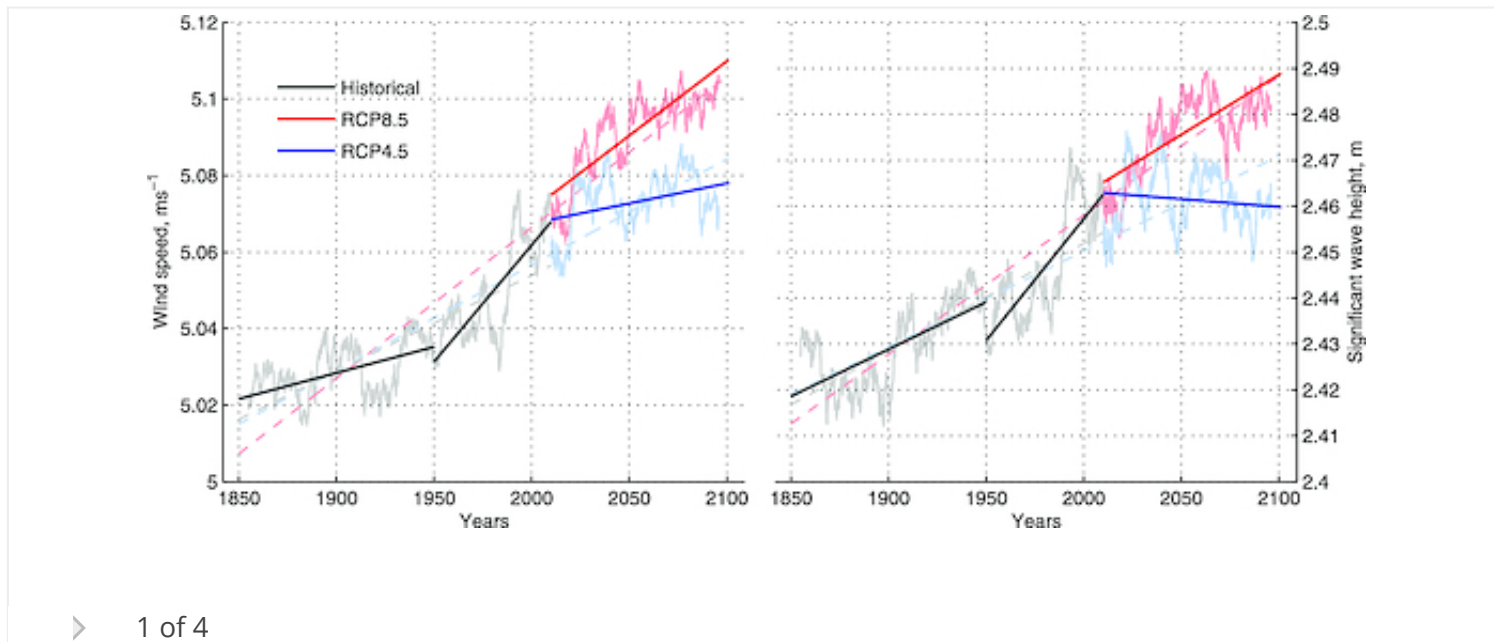
## Evolution of the global wind wave climate in CMIP5 experiments

M. Dobrynin, J. Murawsky, S. Yang



**KEY POINTS**

- Variability of wind wave climate
- Future ocean wave climate
- CMIP5



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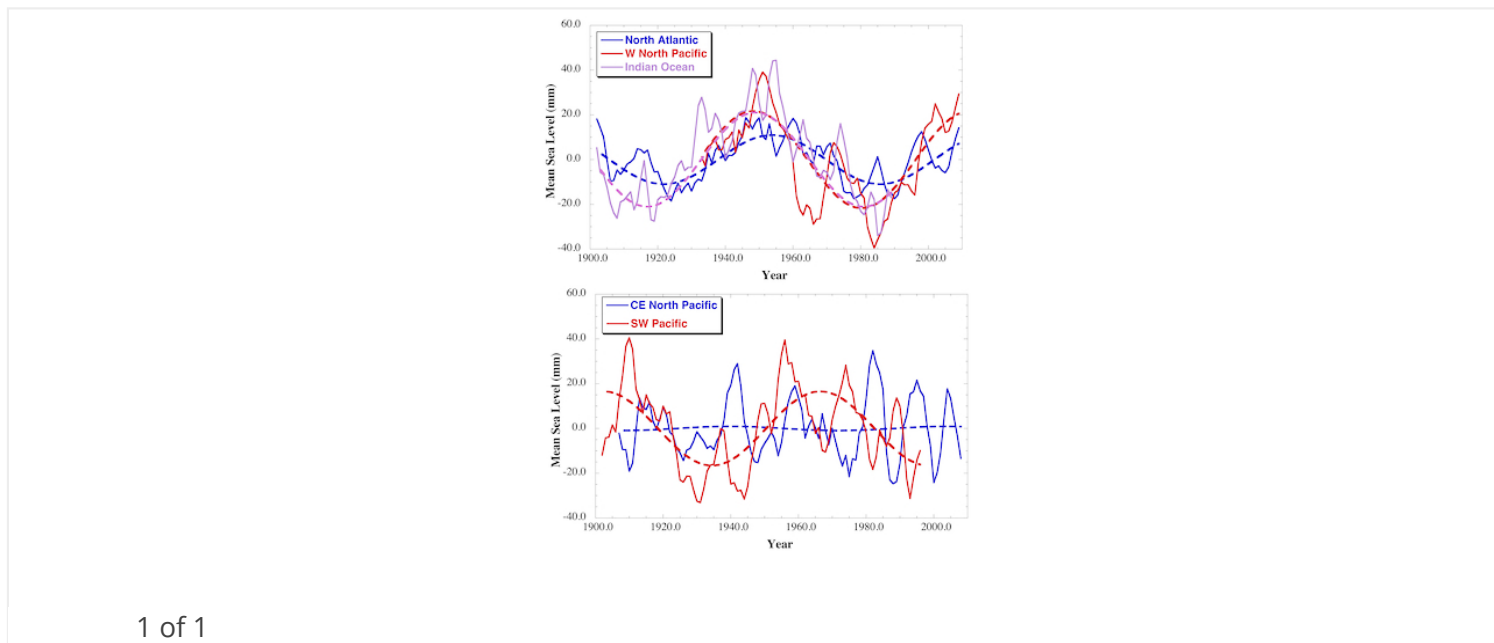
**Is there a 60-year oscillation in global mean sea level?**

Don P. Chambers, Mark A. Merrifield, R. Steven Nerem

First Published: 22 September 2012 Vol: 39, L18607 | DOI: 10.1029/2012GL052885

**KEY POINTS**

- There is a 60-year oscillation in the majority of long tide gauge records
- The signal is consistent in phase and amplitude in many ocean basins
- This has important implications for quantifying sea level acceleration



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# Ocean heat uptake and its consequences for the magnitude of sea level rise and climate change

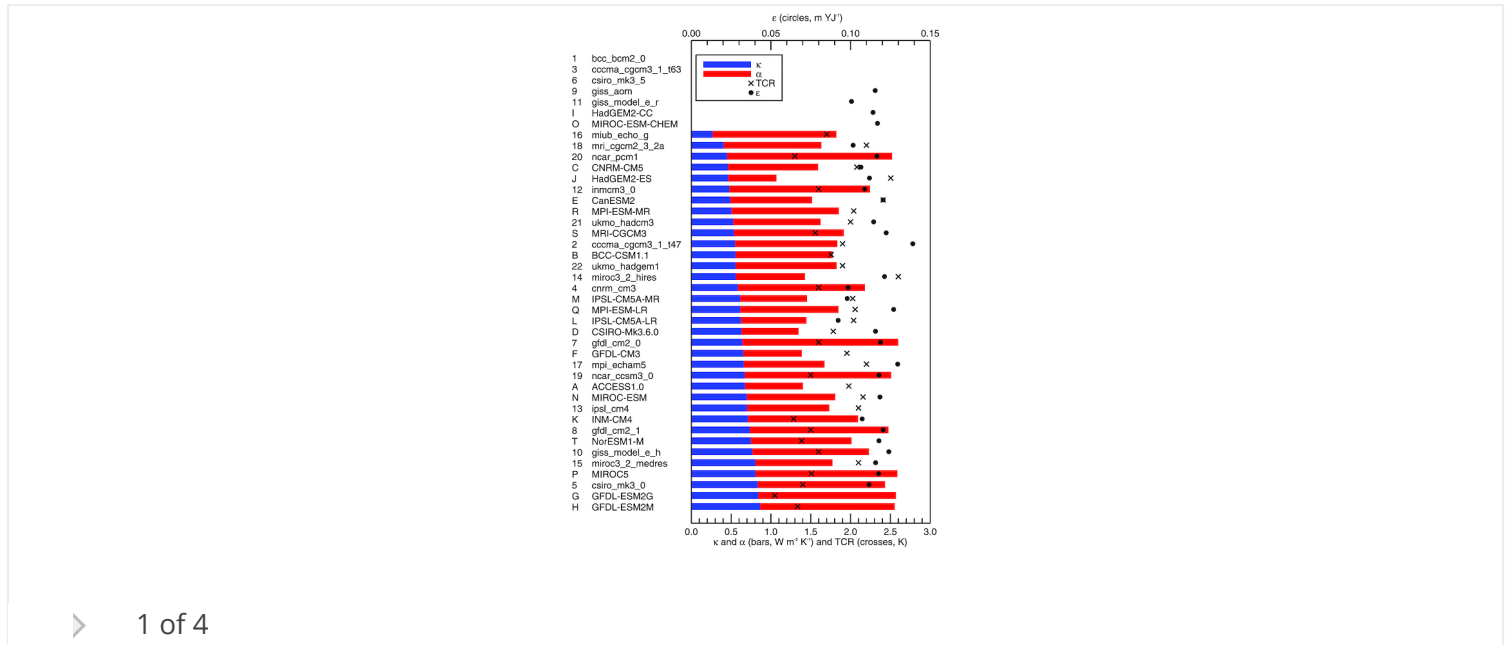
T. Kuhlbrodt, J. M. Gregory

First Published: 25 September 2012 Vol: 39, L18608 | DOI: 10.1029/2012GL052952

## KEY POINTS

- The spread of the OHU efficiency explains half of the spread in total OHU
- Most models are biased towards a too weak stratification and a too strong OHU
- The Southern Ocean and its stratification dominate global OHU in the models

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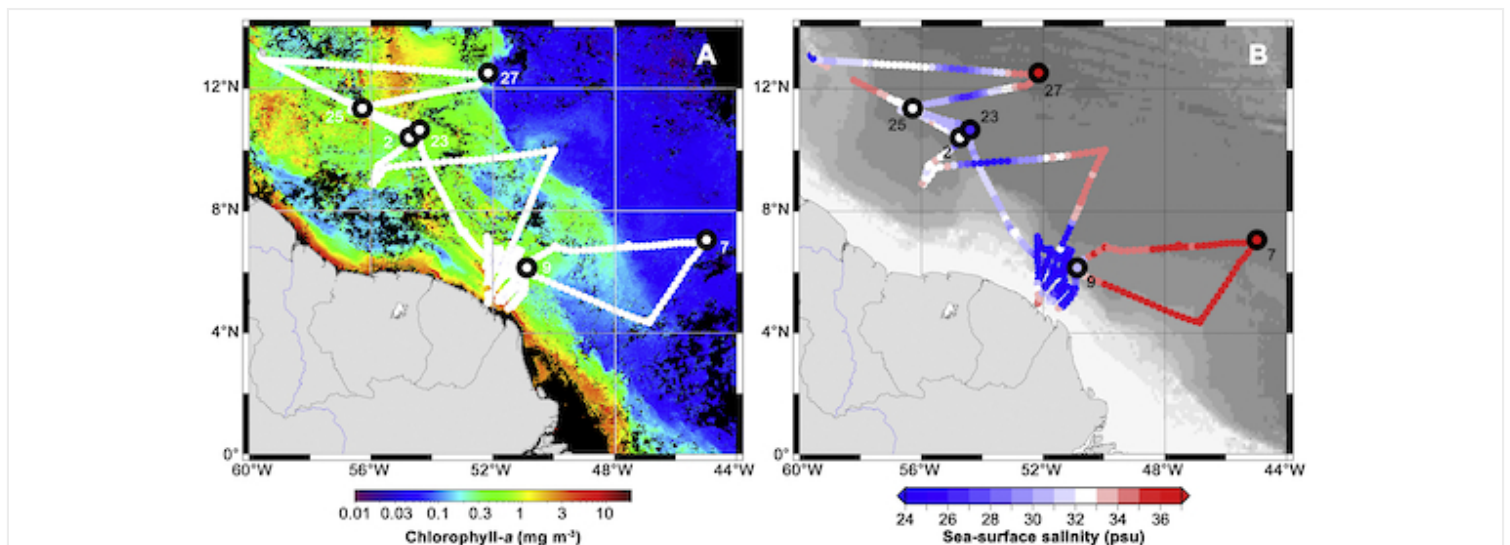
## Impact of diatom-diazotroph associations on carbon export in the Amazon River plume

Laurence Y. Yeung, William M. Berelson, Edward D. Young, Maria G. Prokopenko, Nick Rollins, Victoria J. Coles, Joseph P. Montoya, Edward J. Carpenter, Deborah K. Steinberg, Rachel A. Foster, et al

First Published: 25 September 2012 Vol: 39, L18609 | DOI: 10.1029/2012GL053356

## KEY POINTS

- Blooms of diatom-diazotroph assemblages increase the community export ratio >2x
- Net community productivity increases in DDA bloom regions by 3x-4x
- O<sub>2</sub> data suggest that DDAs drive DIC drawdown and Si uptake in this region



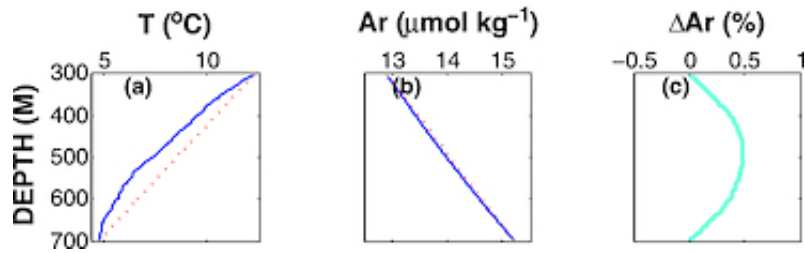
## Argon supersaturation indicates low decadal-scale vertical mixing in the ocean thermocline

Steven Emerson, Taka Ito, Roberta C. Hamme

First Published: 27 September 2012 Vol: 39, L18610 | DOI: 10.1029/2012GL053054

### KEY POINTS

- Noble gas supersaturation is a tracer for decadal-scale thermocline mixing
- Vertical mixing is not strong enough to support ocean productivity
- The ocean thermocline is formed primarily by along-isopycnal mixing processes



## Turbulence and high-frequency variability in a deep gravity current outflow

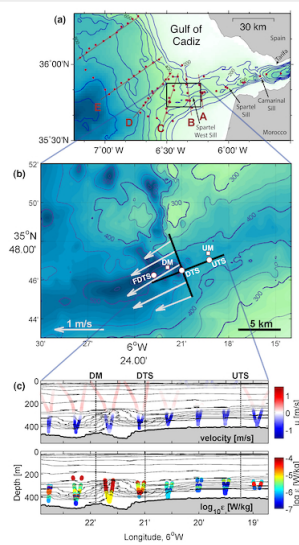
Jonathan D. Nash, Hartmut Peters, Samuel M. Kelly, Josep L. Pelegrí, Mikhail Emelianov, Marc Gasser

First Published: 28 September 2012 Vol: 39, L18611 | DOI: 10.1029/2012GL052899

### KEY POINTS

- Gravity current turbulence can be highly localized
- The regions of intense mixing in the Med Outflow are tidally-modulated
- Internal stresses are high and can be associated with topographic control

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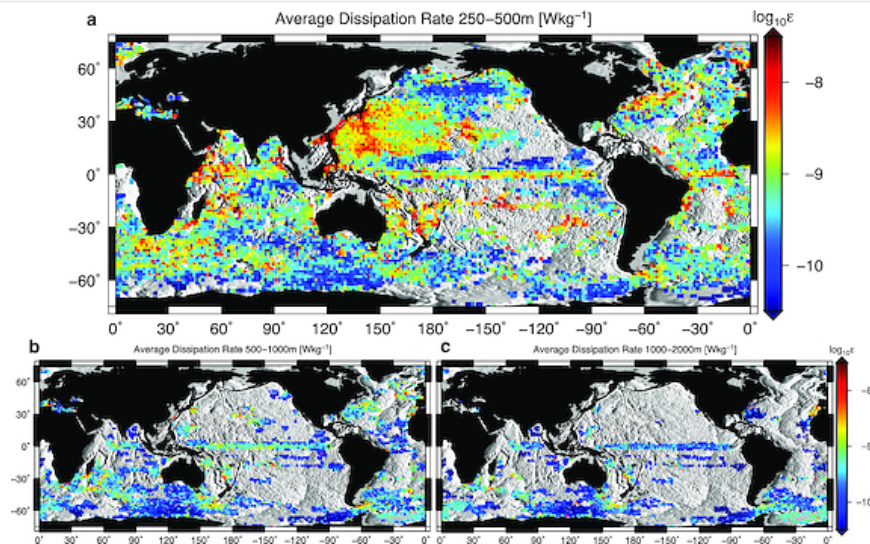
## Spatial and temporal variability of global ocean mixing inferred from Argo profiles

C. B. Whalen, L. D. Talley, J. A. MacKinnon

First Published: 29 September 2012 Vol: 39, L18612 | DOI: 10.1029/2012GL053196

### KEY POINTS

- Argo floats can be used to estimate the turbulent mixing in the global ocean
- Spatial patterns of mixing are apparent (e.g., elevation over rough topography)
- Temporal patterns of mixing are also apparent (e.g., seasonal cycles)



➤ 1 of 4

## Scaling surf zone turbulence

Falk Feddersen

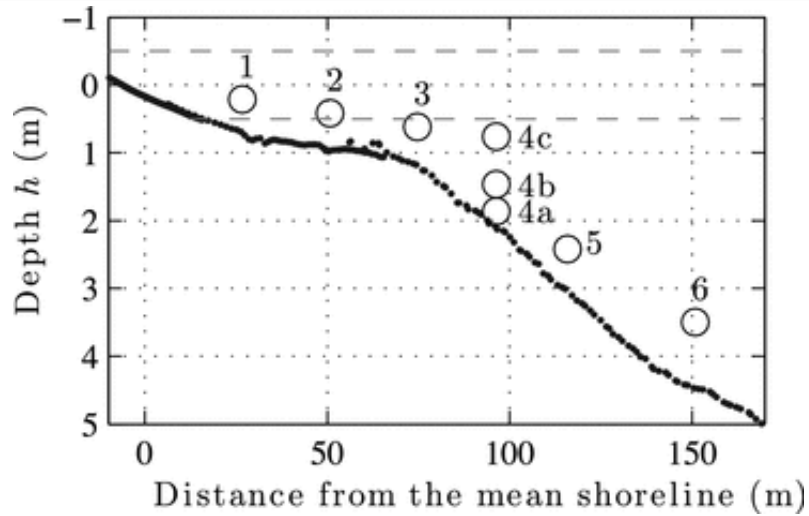
First Published: 29 September 2012 Vol: 39, L18613 | DOI: 10.1029/2012GL052970

### KEY POINTS

- A new surf zone turbulence scaling is derived that collapses observations
- With the scaling field and lab surf zone turbulence are shown consistent

- The scaling can be applied to sediment transport and biological processes

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## Planets

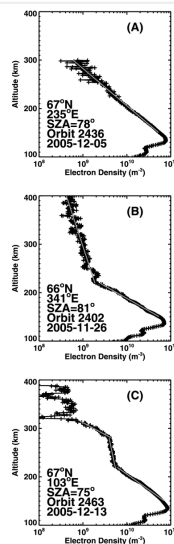
### A clear view of the multifaceted dayside ionosphere of Mars

Paul Withers, Kathryn Fallows, Zachary Girazian, Majd Matta, Bernd Häusler, David Hinson, Len Tyler, David Morgan, Martin Pätzold, Kerstin Peter, et al

First Published: 18 September 2012 Vol: 39, L18202 | DOI: 10.1029/2012GL053193

#### KEY POINTS

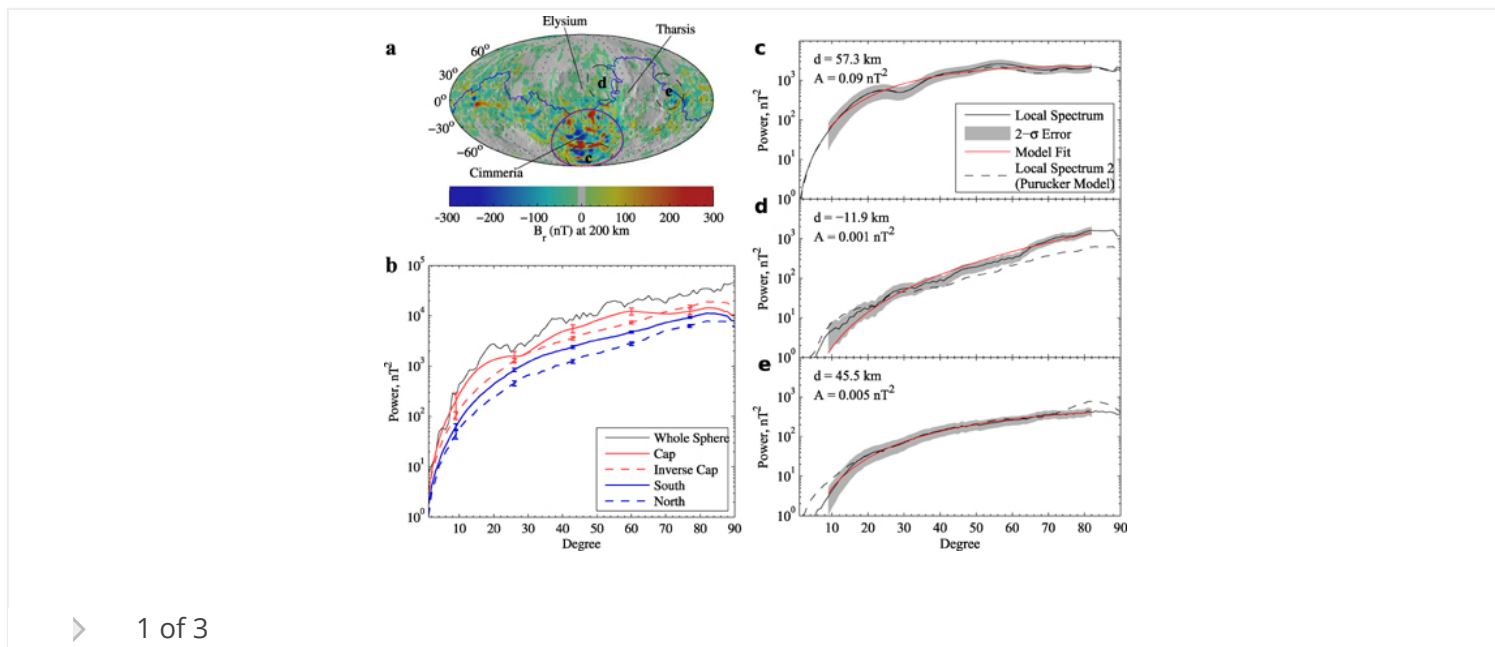
- The topside of the ionosphere can be separated into 1, 2, or 3 distinct regions
- The vertical thickness of the ionosphere varies by a factor of six
- The main layer of the ionosphere can have a highly structured shape



> 1 of 3

KEY POINTS

- The crustal magnetic field of Mars shows regional spectral variability
- Modeled magnetic source depths show a correlation with crustal thickness
- Anisotropic alignment of the field is only found within one region of the planet



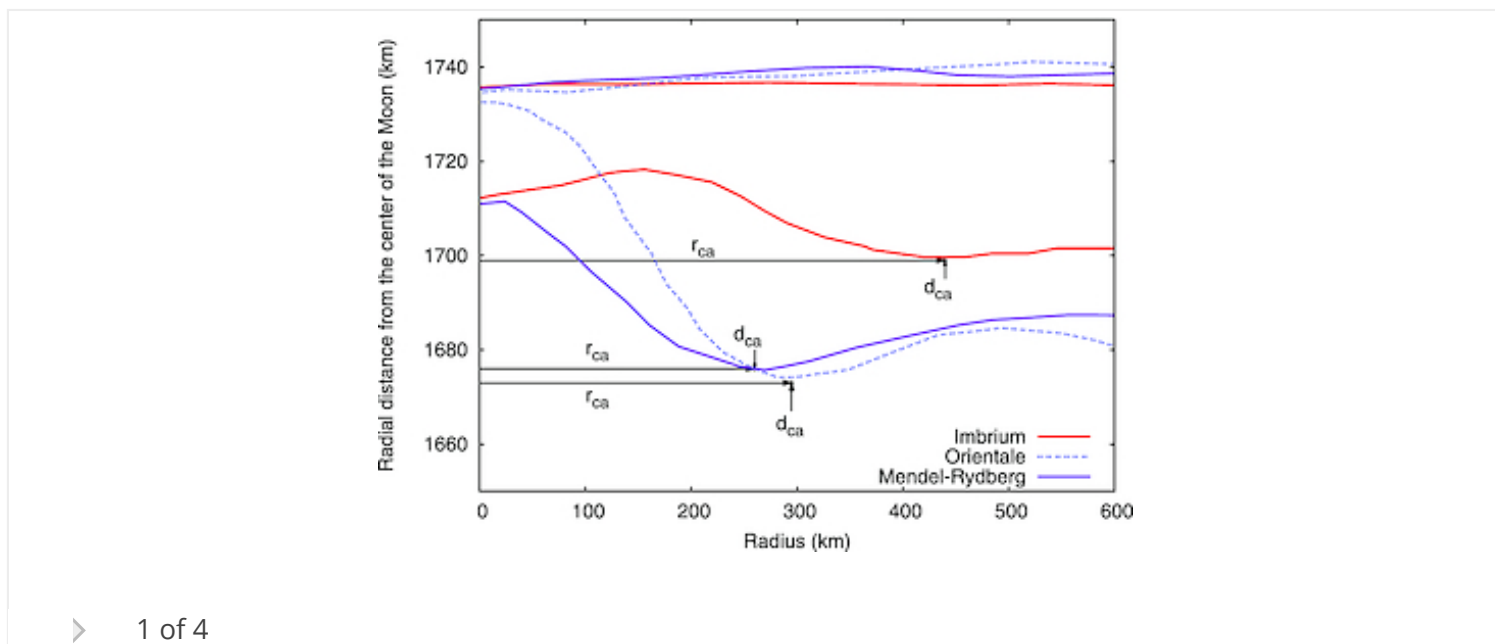
Estimating transient crater size using the crustal annular bulge: Insights from numerical modeling of lunar basin-scale impacts

R. W. K. Potter, D. A. Kring, G. S. Collins, W. S. Kiefer, P. J. McGovern

First Published: 27 September 2012 Vol: 39, L18203 | DOI: 10.1029/2012GL052981

KEY POINTS

- Numerical modeling of lunar basin-scale impacts undertaken
- Relationship between transient crater radius and crustal annular bulge produced
- Relationship dependent on lunar crust and upper mantle temperatures



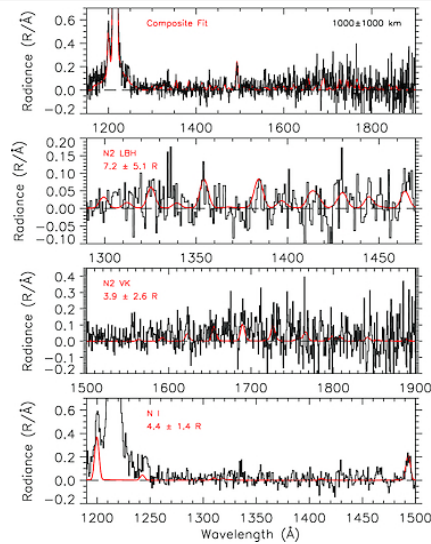
## Titan airglow during eclipse

R. A. West, J. M. Ajello, M. H. Stevens, D. F. Strobel, G. R. Gladstone, J. S. Evans, E. T. Bradley

First Published: 28 September 2012 Vol: 39, L18204 | DOI: 10.1029/2012GL053230

### KEY POINTS

- First definitive observations of Titan airglow from protons or O<sup>+</sup>
- Charged particle precipitation accounts for about 10% of Titan's UV airglow
- Discovery of airglow at visible wavelengths from within Titan's haze



➤ 1 of 3

## Large-scale troughs on Vesta: A signature of planetary tectonics

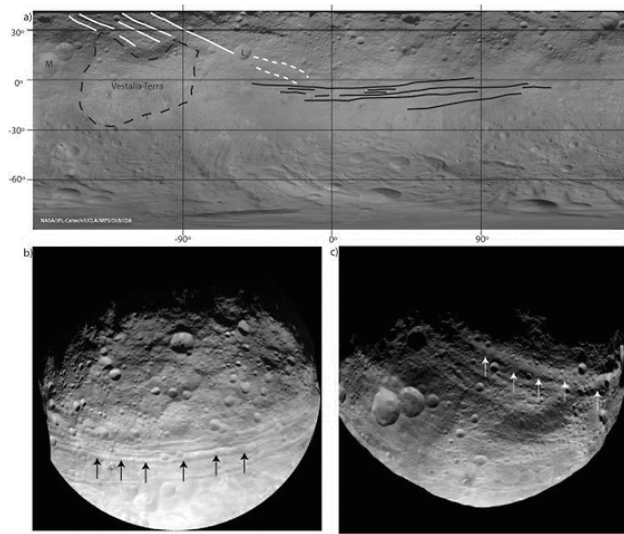
D. L. Buczowski, D. Y. Wyrick, K. A. Iyer, E. G. Kahn, J. E. C. Scully, A. Nathues, R. W. Gaskell, T. Roatsch, F. Preusker, P. M. Schenk, et al

First Published: 29 September 2012 Vol: 39, L18205 | DOI: 10.1029/2012GL052959

### KEY POINTS

- The large scale troughs on Vesta are fault-bounded graben, not simple fractures
- It is likely that the troughs formed as a result of giant impact
- Vesta's differentiated interior is likely why graben formed instead of fractures

Highlight



> 1 of 4

## Solid Earth

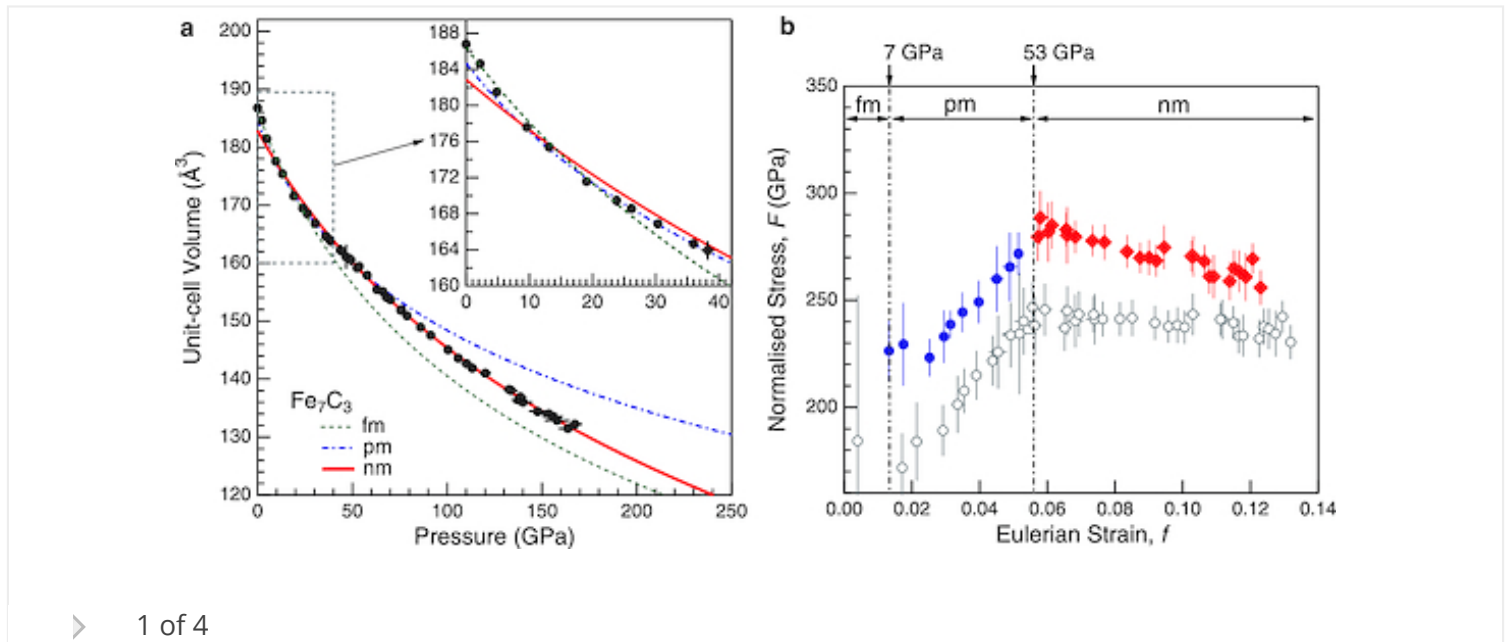
### Magneto-elastic coupling in compressed $\text{Fe}_7\text{C}_3$ supports carbon in Earth's inner core

Bin Chen, Lili Gao, Barbara Lavina, Przemyslaw Dera, Esen E. Alp, Jiyong Zhao, Jie Li

First Published: 19 September 2012 Vol: 39, L18301 | DOI: 10.1029/2012GL052875

#### KEY POINTS

- Discovery of tandem magnetic transitions in an iron carbide
- Pressure-induced Invar behavior of an iron-light-element alloy
- Our study supports carbon-rich inner core scenario



> 1 of 4

### Constraints on the centroid moment tensors of the 2010 Maule and 2011 Tohoku earthquakes from radial modes

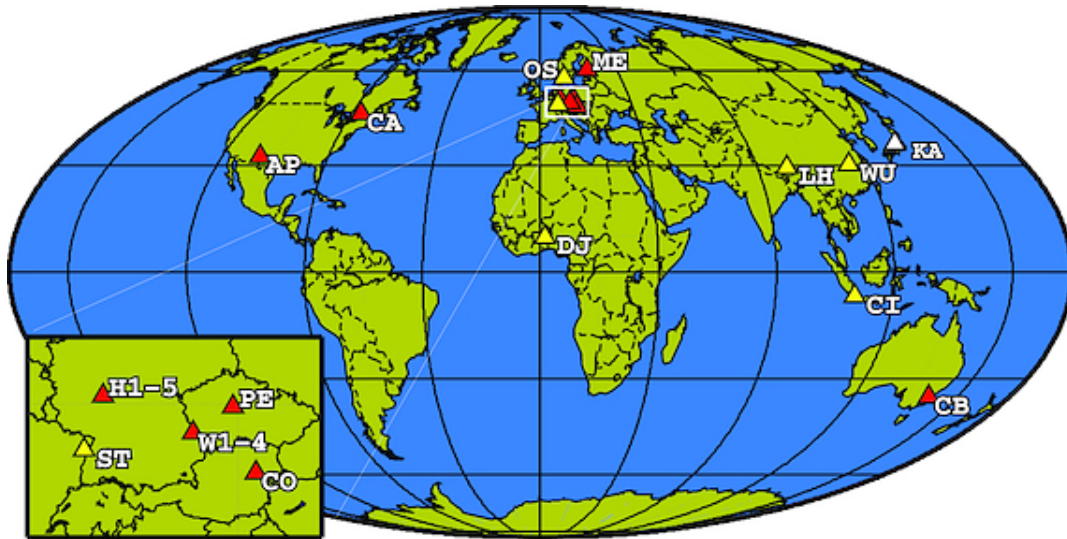
E. Zábránová, C. Matyska, L. Hanyk, V. Pálinkáš

First Published: 21 September 2012 Vol: 39, L18302 | DOI: 10.1029/2012GL052850



#### KEY POINTS

- Constraints on the centroid from radial modes
- Superconducting gravimeter data processing
- The 2010 Maule and 2011 Tohoku earthquakes



> 1 of 5

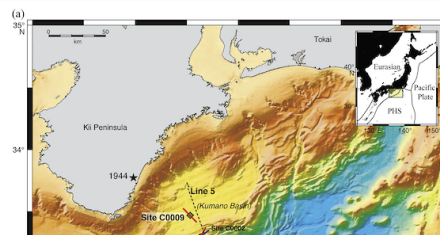
### Stress state estimation by geophysical logs in NanTroSEIZE Expedition 319-Site C0009, Kumano Basin, southwest Japan

Hung-Yu Wu, Masataka Kinoshita, Yoshinori Sanada

First Published: 21 September 2012 Vol: 39, L18303 | DOI: 10.1029/2012GL053086

#### KEY POINTS

- Stress directions estimate from the observing of images logs
- The present stress magnitude exists in forearc basin and accretionary prism
- Interpretations of the horizontal principal stresses surround the borehole



> 1 of 4

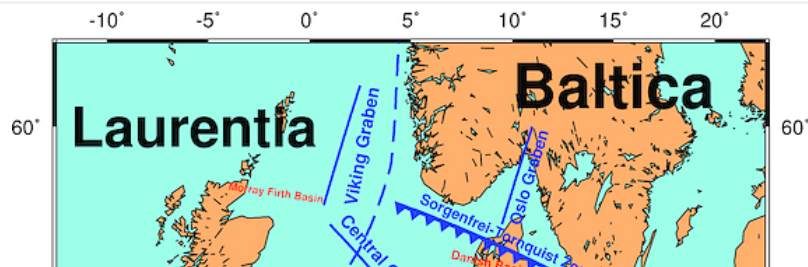
## Seismic wavespeed images across the Iapetus and Tornquist suture zones

Hejun Zhu, Ebru Bozdağ, Daniel Peter, Jeroen Tromp

First Published: 22 September 2012 Vol: 39, L18304 | DOI: 10.1029/2012GL053053

### KEY POINTS

- A new European upper mantle model EU30 based on adjoint tomography
- Two fast wavespeed anomalies beneath the Iapetus and Tornquist suture zones
- A "gap" between the lithospheres of Laurentia and Eastern Avalonia



> 1 of 4

## Small intermediate fault segments can either aid or hinder rupture propagation at stepovers

Julian C. Lozos, David D. Oglesby, James N. Brune, Kim B. Olsen

First Published: 25 September 2012 Vol: 39, L18305 | DOI: 10.1029/2012GL053005

### KEY POINTS

- Small fault geometry details can have controlling effects on rupture behavior
- Earthquake ground motion is affected by small rupture behavior heterogeneities
- Models and hazard calculations should consider effects of small fault features



> 1 of 3

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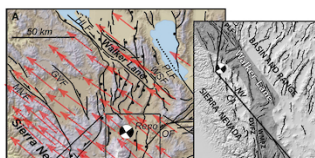
## InSAR analysis of the 2008 Reno-Mogul earthquake swarm: Evidence for westward migration of Walker Lane style dextral faulting

John W. Bell, Falk Amelung, Christopher D. Henry

First Published: 26 September 2012 Vol: 39, L18306 | DOI: 10.1029/2012GL052795

### KEY POINTS

- InSAR modeling of small magnitude earthquake can reveal tectonic evolution
- Small magnitude earthquakes successfully modeled with InSAR
- InSAR-modeled fault slip is consistent with migration of Walker Lane tectonics



> 1 of 3

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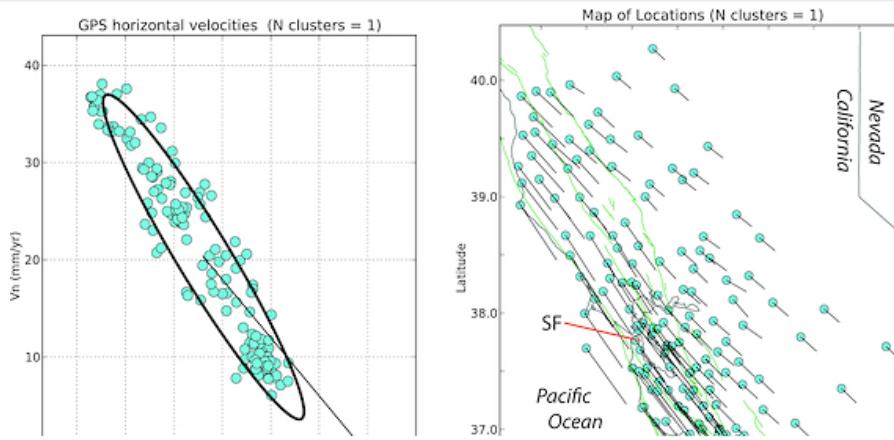
## Using cluster analysis to organize and explore regional GPS velocities

Robert W. Simpson, Wayne Thatcher, James C. Savage

First Published: 26 September 2012 Vol: 39, L18307 | DOI: 10.1029/2012GL052755

### KEY POINTS

- Cluster analysis helps visualize and organize regional GPS velocity fields
- Clustering offers an objective approach for constructing tectonic block models
- Cluster analysis finds major faults in the SF Bay region, creeping and locked



> 1 of 3

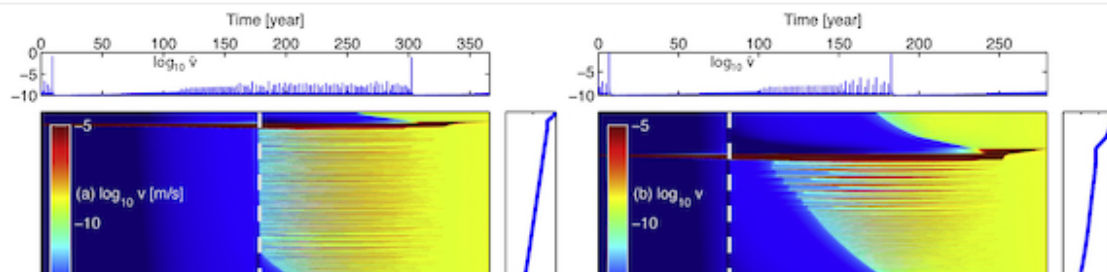
## Slow-slip evolves into megathrust earthquakes in 2D numerical simulations

Paul Segall, Andrew M. Bradley

First Published: 28 September 2012 Vol: 39, L18308 | DOI: 10.1029/2012GL052811

### KEY POINTS

- There are two distinct mechanisms by which ETS can evolve into dynamic ruptures
- No change in behavior prior to dynamic event that could serve as warning
- If occurs in nature, probability of damaging quake is elevated during ETS



> 1 of 5

## Decay and expansion of the early aftershock activity following the 2011, $M_w$ 9.0 Tohoku earthquake

O. Lengliné, B. Enescu, Z. Peng, K. Shiomi

First Published: 28 September 2012 Vol: 39, L18309 | DOI: 10.1029/2012GL052797

### KEY POINTS

- We detect previously missed events of the early Tohoku aftershock sequence
- We present evidence for a continuous decay rate of the early aftershock activity

- We show the expansion of the aftershock area in relation to the postseismic slip

> 1 of 4

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## Earthquake recurrence models fail when earthquakes fail to reset the stress field

T. Tormann, S. Wiemer, J. L. Hardebeck

First Published: 29 September 2012 Vol: 39, L18310 | DOI: 10.1029/2012GL052913

### KEY POINTS

- The b-values can act as stress-meters not only in space but also in time
- The 2004 Parkfield mainshock did not reset the stress field along the fault
- The 1989 Loma Prieta event did release most or all of the accumulated stress

> 1 of 2

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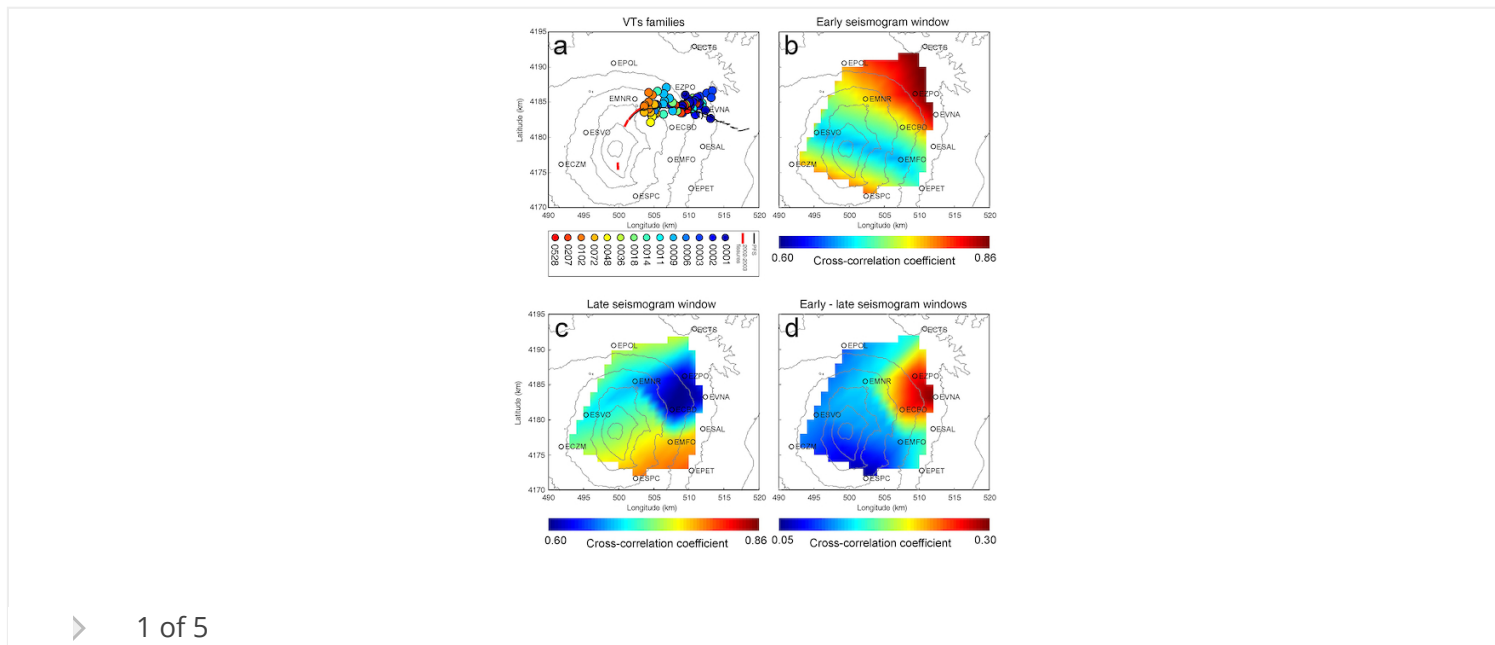
## Crustal changes at Mt. Etna volcano accompanying the 2002–2003 eruption as inferred from a repeating earthquake analysis

Andrea Cannata

First Published: 29 September 2012 Vol: 39, L18311 | DOI: 10.1029/2012GL053185

## KEY POINTS

- Waveform changes of repeating volcano-tectonic earthquakes



## Space Sciences

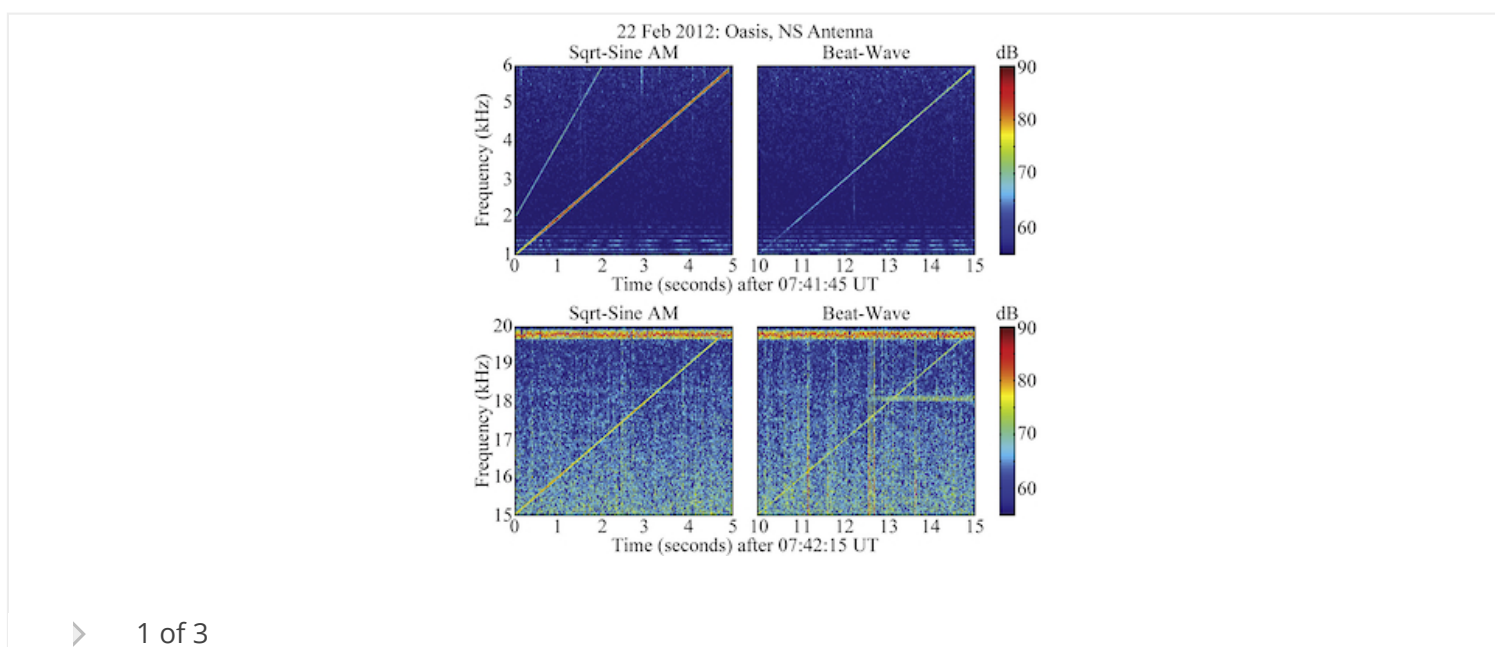
### On the altitude of the ELF/VLF source region generated during “beat-wave” HF heating experiments

R. C. Moore, S. Fujimaru, M. Cohen, M. Gołkowski, M. J. McCarrick

First Published: 18 September 2012 Vol: 39, L18101 | DOI: 10.1029/2012GL053210

## KEY POINTS

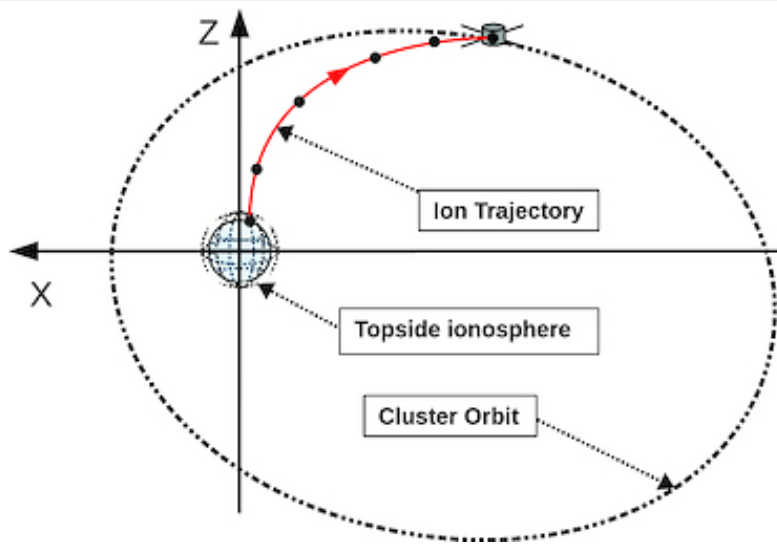
- The beat-wave ELF/VLF source is located in the D-region
- Models predicting an F-region beat-wave source are not valid
- TOA analysis is a strong experimental method to determine source heights



### On the ionospheric source region of cold ion outflow

#### KEY POINTS

- The primary source of the cold ions in magnetotail is the polar cap regions
- Elevated fluxes on polar cap during disturbed geomagnetic periods are found
- Size and intensity of the source region varies with geomagnetic activity



> 1 of 3

### Magnetospheric line radiation event observed simultaneously on board Cluster 1, Cluster 2 and DEMETER spacecraft

F. Němec, O. Santolík, M. Parrot, J. S. Pickett

First Published: 20 September 2012 Vol: 39, L18103 | DOI: 10.1029/2012GL053132

#### KEY POINTS

- Simultaneous observations of an MLR event by 3 different spacecraft
- The same wave pattern observed over large range of L-shells and MLTs
- Quasiparallel propagation close to the geomagnetic equator

> 1 of 3

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## Outward expansion of the lunar wake: ARTEMIS observations

H. Zhang, K. K. Khurana, Q.-G. Zong, M. G. Kivelson, T.-S. Hsu, W. X. Wan, Z. Y. Pu, V. Angelopoulos, X. Cao, Y. F. Wang, et al

First Published: 21 September 2012 Vol: 39, L18104 | DOI: 10.1029/2012GL052839

### KEY POINTS

- We studied the wake boundary with well-determined solar wind conditions
- We studied the wake boundary within a large range up to 11 R<sub>m</sub>
- The wake is found to expand at fast wave velocities

> 1 of 4

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## A high-resolution model of field-aligned currents through empirical orthogonal functions analysis (MFACE)

Maosheng He, Joachim Vogt, Hermann Lühr, Eugen Sorbalo, Adrian Blagau, Guan Le, Gang Lu

First Published: 26 September 2012 Vol: 39, L18105 | DOI: 10.1029/2012GL053168

### KEY POINTS

- A new way yields high-res. FAC model with R<sup>2</sup> of 0.32, giving most FAC features
- EOF2 presents systemic interhemispheric-opposite dependences on IMF-By component
- FAC density lags ~20 minutes to SW/IMF driving; FAC latitude lags 35-40 minutes



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## Characteristics of hiss-like and discrete whistler-mode emissions

W. Li, R. M. Thorne, J. Bortnik, X. Tao, V. Angelopoulos

First Published: 26 September 2012 Vol: 39, L18106 | DOI: 10.1029/2012GL053206

### KEY POINTS

- Hiss-like band and rising tones have similar polarization properties
- Falling tone is oblique, but hiss-like band and rising tone are field-aligned
- Discrete (hiss-like) emissions prefer to occur at low (high)  $f_{pe}/f_{ce}$

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## A simple model to relate ionogram signatures to large-scale wave structure

Roland T. Tsunoda

First Published: 27 September 2012 Vol: 39, L18107 | DOI: 10.1029/2012GL053179

### KEY POINTS

- Day-to-day variability of ESF is still not understood after 70 years
- The obstacle appears to be a lack of data about LSWS
- Knowledge about LSWS from ionograms should remove logjam

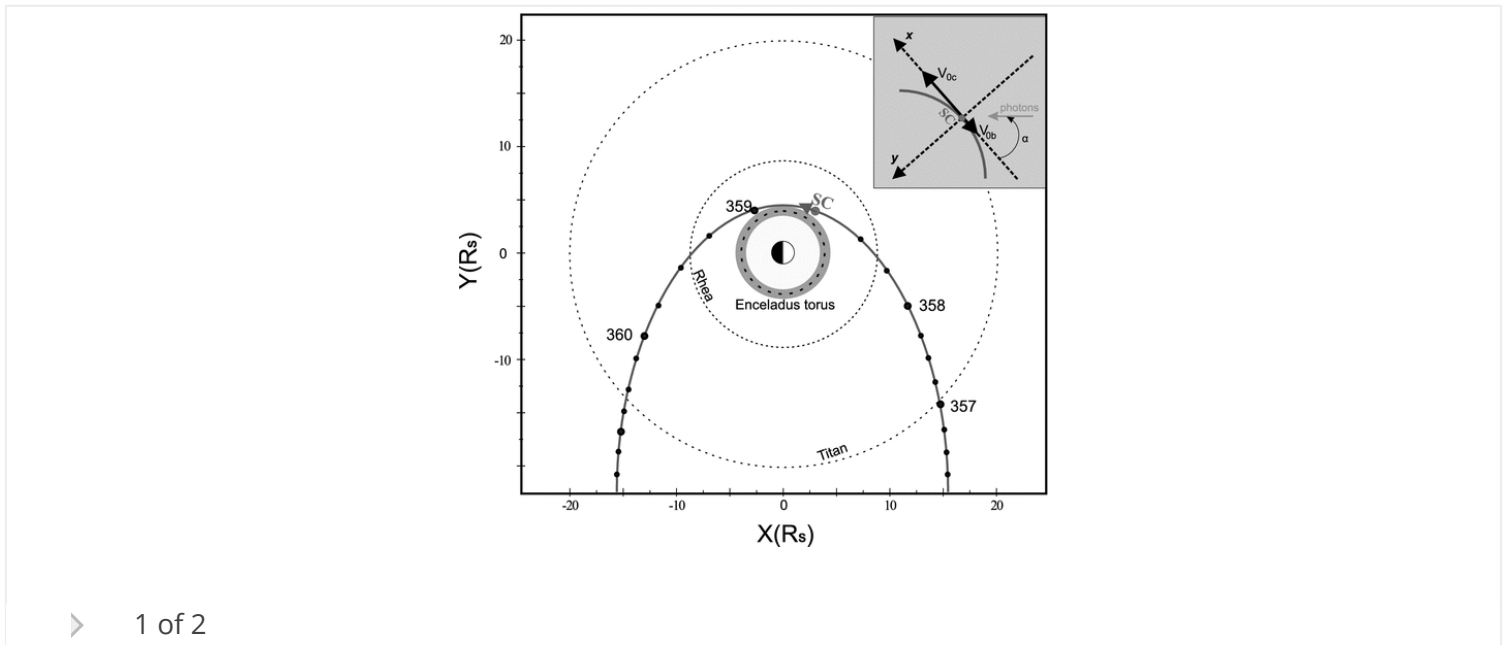
## Cassini capturing of freshly-produced water-group ions in the Enceladus torus

V. V. Yaroshenko, W. J. Miloch, H. M. Thomas, G. E. Morfill

First Published: 28 September 2012 Vol: 39, L18108 | DOI: 10.1029/2012GL053173

### KEY POINTS

- Formation of a novel type of plasma configuration around charged SC
- Plasma gradients affect Cassini plasma measurements
- The results can explain localization of the new-born ions in Enceladus wake



## The Cryosphere

### A sea ice free summer Arctic within 30 years: An update from CMIP5 models

Muyin Wang, James E. Overland

First Published: 25 September 2012 Vol: 39, L18501 | DOI: 10.1029/2012GL052868

### KEY POINTS

- A nearly sea ice free summer Arctic is projected by the 2030s
- There is little consensus on causes for spread in projections among CMIP5 models
- Arctic sea ice loss is a major indicator of local and global change

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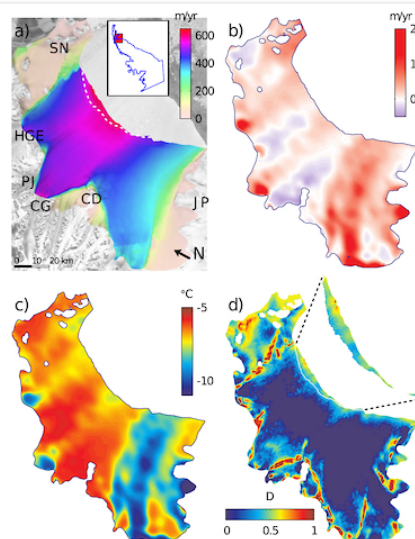
## A damage mechanics assessment of the Larsen B ice shelf prior to collapse: Toward a physically-based calving law

C. P. Borstad, A. Khazendar, E. Larour, M. Morlighem, E. Rignot, M. P. Schodlok, H. Seroussi

First Published: 28 September 2012 Vol: 39, L18502 | DOI: 10.1029/2012GL053317

### KEY POINTS

- A new calving law based on continuum damage mechanics is proposed
- Inverting for damage on Larsen B constrains the threshold damage for calving
- Damage inversion reveals weakened ice shelf prior to collapse



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