



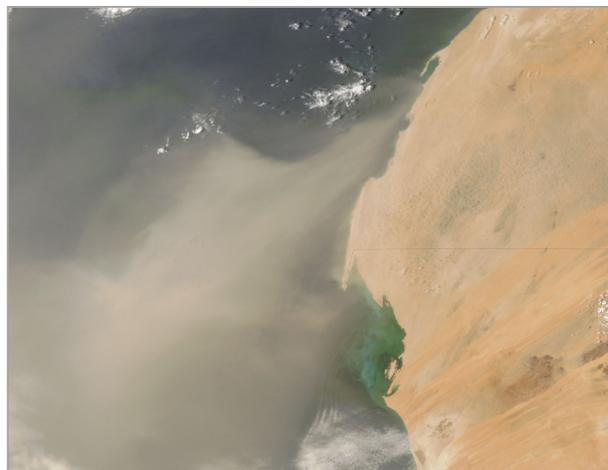
## Atmospheric Chemistry and Physics (ACP)

### Mapping the physico-chemical properties of mineral dust in western Africa: mineralogical composition

Recently, several ground-based and airborne field campaigns have allowed the exploration of the properties and impacts of mineral dust in western Africa. This paper explores these observations to provide a quantitative view of the mineralogical composition and its variability according to source region and time after transport.

#### Reference

Formenti, P. et al.: [Mapping the physico-chemical properties of mineral dust in western Africa: mineralogical composition](#), *Atmos. Chem. Phys.*, 14, 10663–10686, doi:10.5194/acp-14-10663-2014, 2014



Dust plume off western Africa. (NASA image courtesy of Jeff Schmaltz, MODIS Rapid Response Team, Goddard Space Flight Center)

### Constraining CO<sub>2</sub> emissions from open biomass burning by satellite observations of co-emitted species: a method and its application to wildfires in Siberia

A method to constrain carbon dioxide (CO<sub>2</sub>) emissions from open biomass burning by using satellite observations of co-emitted species and a chemistry transport model is proposed and applied to the case of wildfires in Siberia.

#### Reference

Konovalov, I. B. et al.: [Constraining CO<sub>2</sub> emissions from open biomass burning by satellite observations of co-emitted species: a method and its application to wildfires in Siberia](#), *Atmos. Chem. Phys.*, 14, 10383–10410, doi:10.5194/acp-14-10383-2014, 2014

### Molecular corridors and kinetic regimes in the multiphase chemical evolution of secondary organic aerosol

Based on molecular identification of secondary organic aerosol (SOA) oxidation products, the authors show that the chemical evolution of SOA from a variety of volatile organic compound precursors adheres to characteristic 'molecular corridors' with a tight inverse correlation between volatility and molar mass.

#### Reference

Shiraiwa, M. et al.: [Molecular corridors and kinetic regimes in the multiphase chemical evolution of secondary organic aerosol](#), *Atmos. Chem. Phys.*, 14, 8323–8341, doi:10.5194/acp-14-8323-2014, 2014

### Tropospheric ozone increases over the southern Africa region: bellwether for rapid growth in Southern Hemisphere pollution?

Increases in tropospheric ozone based on ozonesonde records (early 1990s to 2008) over subtropical stations in Irene (South Africa) and Réunion have been reported. Over Irene a large increase in the urban-influenced boundary layer (BL) was also observed. This paper shows that the Irene BL trend is at least partly due to a gradual change in the sonde launch times.

#### Reference

Thompson, A. M. et al.: [Tropospheric ozone increases over the southern Africa region: bellwether for rapid growth in Southern Hemisphere pollution?](#), *Atmos. Chem. Phys.*, 14, 9855–9869, doi:10.5194/acp-14-9855-2014, 2014

### Quantification of ice nuclei active at near 0 °C temperatures in low-altitude clouds at the Puy de Dôme atmospheric station

In this study, cloud water was collected aseptically from the summit of Puy de Dôme (1465 m a.s.l., France) within contrasted meteorological and physico-chemical situations. Total and biological (i.e. heat-sensitive) ice nuclei were quantified by droplet-freezing assay between –5 °C and –14 °C.

#### Reference

Joly, M. et al.: [Quantification of ice nuclei active at near 0 °C temperatures in low-altitude clouds at the Puy de Dôme atmospheric station](#), *Atmos. Chem. Phys.*, 14, 8185–8195, doi:10.5194/acp-14-8185-2014, 2014

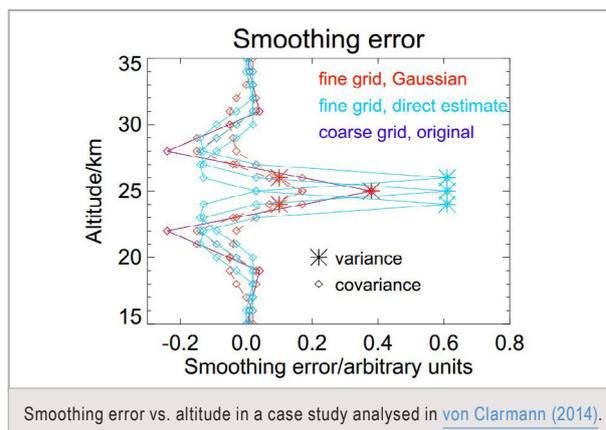
# Atmospheric Measurement Techniques (AMT)

## Smoothing error pitfalls

The difference due to the content of a priori information between a constrained retrieval and the true atmospheric state is usually represented by a diagnostic quantity called smoothing error. In this paper it is shown that the concept of the smoothing error as a component of the retrieval error budget is questionable because it is not compliant with Gaussian error propagation.

### Reference

von Clarmann, T.: [Smoothing error pitfalls](#), *Atmos. Meas. Tech.*, 7, 3023–3034, doi:10.5194/amt-7-3023-2014, 2014



# Biogeosciences (BG)

## Gas emissions at the continental margin west of Svalbard: mapping, sampling, and quantification

The authors mapped, sampled, and quantified gas emissions at the continental margin west of Svalbard in late summer 2012. They found that gas emissions occurred widespread between about 80 and 415 m water depth, which indicates that hydrate dissolution might only be one of several triggers for active hydrocarbon seepage in that area.

### Reference

Sahling, H. et al.: [Gas emissions at the continental margin west of Svalbard: mapping, sampling, and quantification](#), *Biogeosciences*, 11, 6029–6046, doi:10.5194/bg-11-6029-2014, 2014

## Release of hydrogen peroxide and antioxidants by the coral *Stylophora pistillata* to its external milieu

This paper presents a laboratory characterisation of hydrogen peroxide ( $H_2O_2$ ) and antioxidant activity release kinetics by intact, non-stressed *Stylophora pistillata*. Experimenting with bleached and non-bleached corals and different stirring speeds, the authors explored the sources and modes of  $H_2O_2$  and antioxidant release.

### Reference

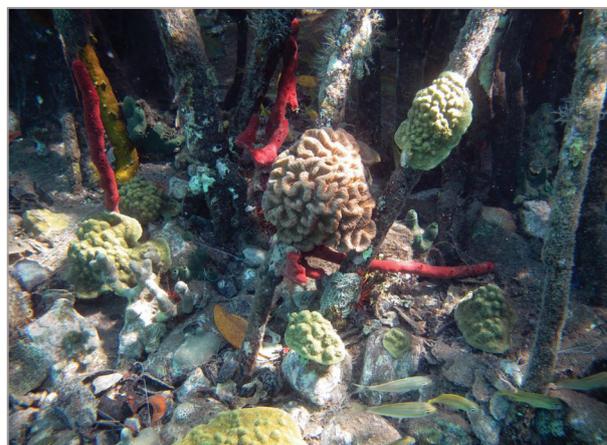
Armoza-Zvuloni, R. and Shaked, Y.: [Release of hydrogen peroxide and antioxidants by the coral \*Stylophora pistillata\* to its external milieu](#), *Biogeosciences*, 11, 4587–4598, doi:10.5194/bg-11-4587-2014, 2014

## Diverse coral communities in mangrove habitats suggest a novel refuge from climate change

Risk analyses indicate that more than 90% of the world's reefs will be threatened by climate change and local anthropogenic impacts by the year 2030 under 'business-as-usual' climate scenarios. This paper characterises the first natural, non-reef coral refuge from thermal stress and ocean acidification and identifies resiliency factors for mangrove–coral habitats.

### Reference

Yates, K. K. et al.: [Diverse coral communities in mangrove habitats suggest a novel refuge from climate change](#), *Biogeosciences*, 11, 4321–4337, doi:10.5194/bg-11-4321-2014, 2014



Corals growing under a mangrove canopy and attached to mangrove prop roots including a colony of *Colpophyllia natans*. (Source: [Yates et al. 2014](#))

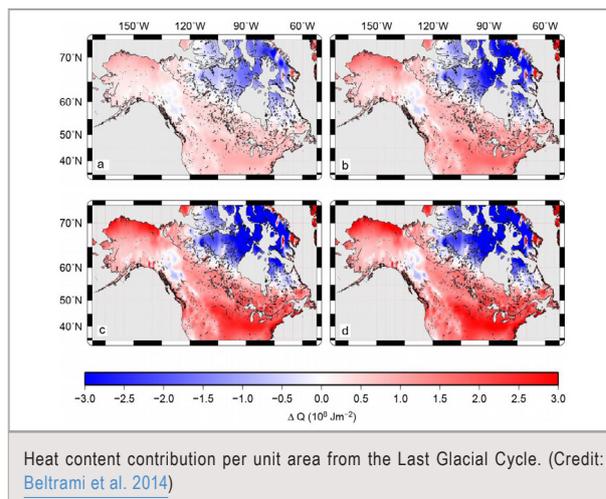
## Climate of the Past (CP)

### Numerical studies on the Impact of the Last Glacial Cycle on recent borehole temperature profiles: implications for terrestrial energy balance

In this paper, the authors provide the first estimate of the impact of the development of the Laurentide ice sheet on the estimates of energy and temperature reconstructions from measurements of terrestrial borehole temperatures in North America.

#### Reference

Beltrami, H. et al.: [Numerical studies on the Impact of the Last Glacial Cycle on recent borehole temperature profiles: implications for terrestrial energy balance](#), *Clim. Past*, 10, 1693–1706, doi:10.5194/cp-10-1693-2014, 2014



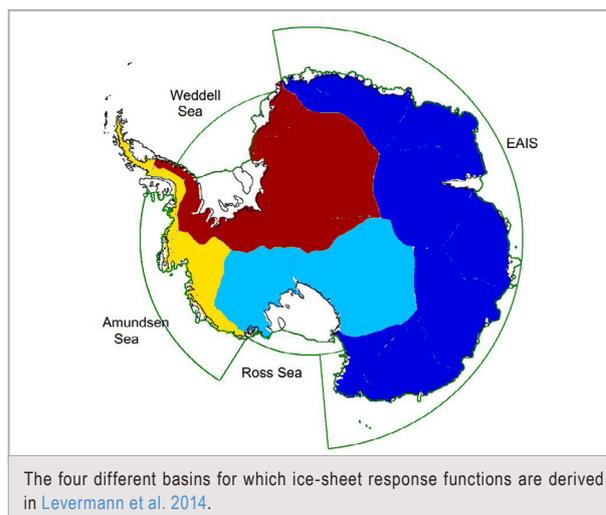
## Earth System Dynamics (ESD)

### Projecting Antarctic ice discharge using response functions from SeaRISE ice-sheet models

In this paper, the authors attempt to estimate the uncertainty range of future ice discharge from Antarctica by combining uncertainty in the climatic forcing, the oceanic response and the ice-sheet model response. The dynamic ice-sheet response is derived from functions for basal ice-shelf melting for four different Antarctic drainage regions using experiments from the Sea-level Response to Ice Sheet Evolution (SeaRISE) intercomparison project.

#### Reference

Levermann, A. et al.: [Projecting Antarctic ice discharge using response functions from SeaRISE ice-sheet models](#), *Earth Syst. Dynam.*, 5, 271–293, doi:10.5194/esd-5-271-2014, 2014



## Geoscientific Instrumentation, Methods and Data Systems (GI)

### Determining the focal mechanisms of the events in the Carpathian region of Ukraine

The paper is devoted to mathematical modelling of propagation of seismic waves in inhomogeneous media. The trial and error method for determining the angles of orientation of fault plane and earthquake mechanism has been proposed. The graphic and trial and

error approaches have been applied for determining the source parameters of earthquakes in the seismically active region of Eastern Carpathian.

#### Reference

Pavlova, A., Hrytsai, O., and Malytskyy, D.: [Determining the focal mechanisms of the events in the Carpathian region of Ukraine](#), *Geosci. Instrum. Method. Data Syst.*, 3, 229–239, doi:10.5194/gi-3-229-2014, 2014

### An autonomous adaptive low-power instrument platform (AAL-PIP) for remote high-latitude geospace data collection

This paper presents the development considerations and design for ground-based instrumentation that is being deployed on the East Antarctic Plateau along a 40° magnetic meridian chain to investigate interhemispheric magnetically conjugate geomagnetic coupling and other space-weather-related phenomena.

#### Reference

Clauer, C. R. et al.: [An autonomous adaptive low-power instrument platform \(AAL-PIP\) for remote high-latitude geospace data collection](#), *Geosci. Instrum. Method. Data Syst.*, 3, 211–227, doi:10.5194/gi-3-211-2014, 2014

### The origin of noise and magnetic hysteresis in crystalline permalloy ring-core fluxgate sensors

In certain polycrystalline permalloy fluxgate sensors, a single phenomenon may cause both fluxgate noise and magnetic hysteresis; explain Barkhausen jumps, remanence and coercivity; and avoid domain denucleation. This phenomenon, domain wall reconnection, is presented as part of a theoretical model.

#### Reference

Narod, B. B.: [The origin of noise and magnetic hysteresis in crystalline permalloy ring-core fluxgate sensors](#), *Geosci. Instrum. Method. Data Syst.*, 3, 201–210, doi:10.5194/gi-3-201-2014, 2014

### A framework for benchmarking of homogenisation algorithm performance on the global scale

The International Surface Temperature Initiative is striving towards substantively improving our ability to robustly understand historical land surface air temperature change at all scales. A key recently completed first step has been collating all available records into a comprehensive open access, traceable and version-controlled databank.

#### Reference

Willett, K. et al.: [A framework for benchmarking of homogenisation algorithm performance on the global scale](#), *Geosci. Instrum. Method. Data Syst.*, 3, 187–200, doi:10.5194/gi-3-187-2014, 2014

### Protection against lightning at a geomagnetic observatory

The Sinji Vrh Geomagnetic Observatory, built on the brow of Gora, the mountain above Ajdovščina in Slovenia, is very often struck by lightning. This manuscript analyses the formation of lightning in the area and ways of protecting the observatory.

#### Reference

Čop, R. et al.: [Protection against lightning at a geomagnetic observatory](#), *Geosci. Instrum. Method. Data Syst.*, 3, 135–141, doi:10.5194/gi-3-135-2014, 2014

## Geoscientific Model Development (GMD)

### Short ensembles: an efficient method for discerning climate-relevant sensitivities in atmospheric general circulation models

This paper explores the feasibility of an experimentation strategy for investigating sensitivities in fast components of atmospheric general circulation models.

#### Reference

Wan, H. et al.: [Short ensembles: an efficient method for discerning climate-relevant sensitivities in atmospheric general circulation models](#), *Geosci. Model Dev.*, 7, 1961–1977, doi:10.5194/gmd-7-1961-2014, 2014

### MOMBA 1.1 – a high-resolution Baltic Sea configuration of GFDL's Modular Ocean Model

This article presents a new coupled ocean-circulation–ice model configuration of the Baltic Sea. The model features, contrary to most existing configurations, a high horizontal resolution of one nautical mile (1.85 km), which is eddy-resolving over much of the domain.

#### Reference

Dietze, H., Löptien, U., and Getzlaff, K.: [MOMBA 1.1 – a high-resolution Baltic Sea configuration of GFDL's Modular Ocean Model](#), *Geosci. Model Dev.*, 7, 1713–1731, doi:10.5194/gmd-7-1713-2014, 2014

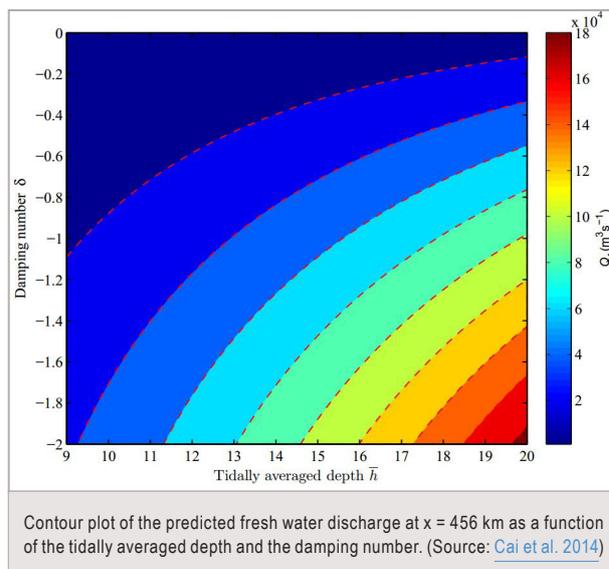
## Hydrology and Earth System Sciences (HESS)

### Analytical approach for predicting fresh water discharge in an estuary based on tidal water level observations

As the tidal wave propagates into an estuary, the tidally averaged water level tends to rise in a landward direction due to the density difference between saline and fresh water and the asymmetry of the friction. The effect of friction on the residual slope is even more remarkable when accounting for fresh water discharge. In this study, the authors investigate the influence of river discharge on tidal wave propagation in the Yangtze estuary with specific attention to residual water level slope.

#### Reference

Cai, H., Savenije, H. H. G., and Jiang, C.: [Analytical approach for predicting fresh water discharge in an estuary based on tidal water level observations](#), *Hydrol. Earth Syst. Sci.*, 18, 4153–4168, doi:10.5194/hess-18-4153-2014, 2014



## Natural Hazards and Earth System Sciences (NHESS)

### The XWS open access catalogue of extreme European windstorms from 1979 to 2012

This paper introduces the XWS (eXtreme WindStorms) catalogue, which consists of storm tracks and model-generated maximum 3 s wind-gust footprints for 50 of the most extreme winter windstorms to hit Europe in the period 1979–2012. The catalogue is intended to be a valuable resource for both academia and industries such as

(re)insurance, for example allowing users to characterise extreme European storms, and validate climate and catastrophe models. It is available at <http://www.europeanwindstorms.org>.

#### Reference

Roberts, J. F. et al.: [The XWS open access catalogue of extreme European windstorms from 1979 to 2012](#), *Nat. Hazards Earth Syst. Sci.*, 14, 2487–2501, doi:10.5194/nhess-14-2487-2014, 2014

## Ocean Science (OS)

### Changes in extreme regional sea surface height due to an abrupt weakening of the Atlantic meridional overturning circulation

As an extreme scenario of dynamical sea level changes, regional sea surface height (SSH) changes that occur in the North Atlantic due to an abrupt weakening of the Atlantic meridional overturning circulation are simulated. Two versions of the same ocean-only

model are used to study the effect of ocean model resolution on these SSH changes: a high-resolution strongly eddying version and a low-resolution version in which the effect of eddies is parameterised.

#### Reference

Brunnabend, S.-E. et al.: [Changes in extreme regional sea surface height due to an abrupt weakening of the Atlantic meridional overturning circulation](#), *Ocean Sci.*, 10, 881–891, doi:10.5194/os-10-881-2014, 2014

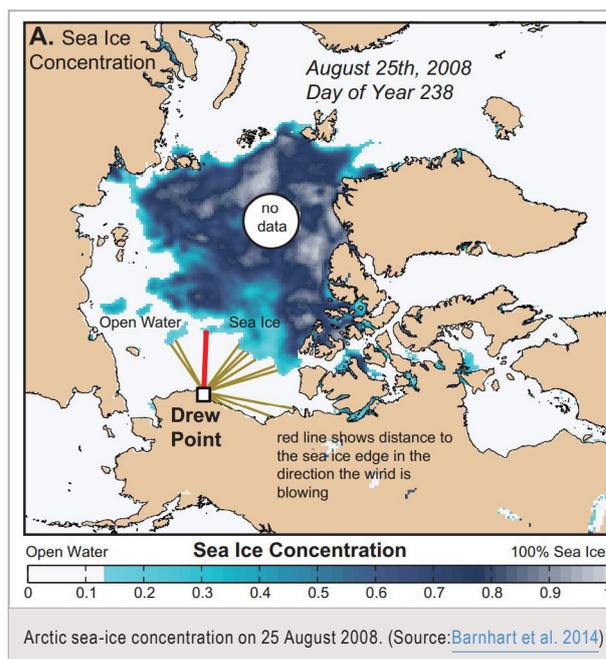
# The Cryosphere (TC)

## The effect of changing sea ice on the physical vulnerability of Arctic coasts

Sea ice limits the interaction of the land and ocean water in the Arctic winter and influences this interaction in the summer by governing the fetch. In many parts of the Arctic, the open-water season is increasing in duration and summertime sea-ice extents are decreasing. Sea ice provides a first-order control on the physical vulnerability of Arctic coasts to erosion, inundation, and damage to settlements and infrastructures by ocean water. This paper focuses on how the changing sea-ice cover has influenced coastal erosion over the satellite record.

### Reference

Barnhart, K. R., Overeem, I., and Anderson, R. S.: [The effect of changing sea ice on the physical vulnerability of Arctic coasts](#), *The Cryosphere*, 8, 1777–1799, doi:10.5194/tc-8-1777-2014, 2014



## The length of the world's glaciers – a new approach for the global calculation of center lines

Glacier length is an important measure of glacier geometry. Nevertheless, global glacier inventories are mostly lacking length data. Only recently have semi-automated approaches to measure glacier length been developed and applied regionally. In this study, the authors present a first global assessment of glacier length using an automated method that relies on glacier surface slope, distance to the glacier margins and a set of trade-off functions.

### Reference

Machguth, H. and Huss, M.: [The length of the world's glaciers – a new approach for the global calculation of center lines](#), *The Cryosphere*, 8, 1741–1755, doi:10.5194/tc-8-1741-2014, 2014

## Sensitivity of the dynamics of Pine Island Glacier, West Antarctica, to climate forcing for the next 50 years

The authors employ a 3D, higher-order model to simulate the evolution of Pine Island Glacier over the next 50 yr in response to changes in its surface mass balance, the position of its calving front and ocean-induced ice shelf melting.

### Reference

Seroussi, H. et al.: [Sensitivity of the dynamics of Pine Island Glacier, West Antarctica, to climate forcing for the next 50 years](#), *The Cryosphere*, 8, 1699–1710, doi:10.5194/tc-8-1699-2014, 2014

# imaggero

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