

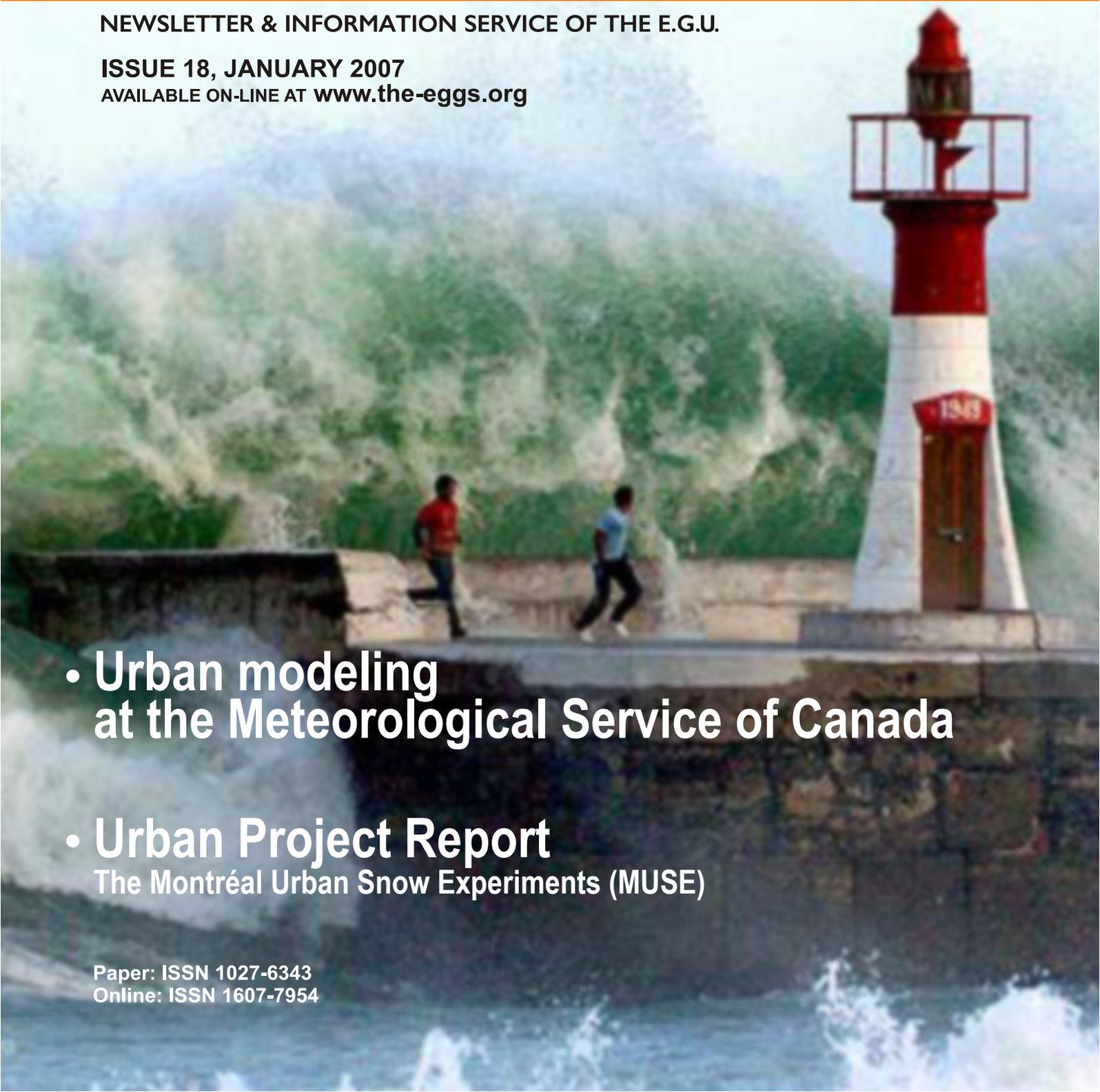
# the eggu. NEWSLETTER



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- **Urban modeling  
at the Meteorological Service of Canada**
  - **Urban Project Report  
The Montréal Urban Snow Experiments (MUSE)**

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Cover photo: A wave over 9 m washed two people off the breakwater in Kalk Bay on 26 August; photo by P. Massie (Hunter: <http://www.weathersa.co.za/Pressroom/2005/2005Aug31ExtremeWaves.jsp>, 2005). The photo is from a recent article in NHESS (see the Journal Watch section in this issue).

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# EGU Council Election

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## Results of the 2006/2007 EGU Council election

Please find the outcome of the EGU Council Election 2006/2007 on:

<http://www.copernicus.org/EGU/info/news.html>

EGU wants to thank all those members that have participated in this election. The Division Presidents will serve on Council from 2007-2009.

The other Division Officers as well as the summary of the tasks and responsibilities for Division Officers can be found on:

[http://www.copernicus.org/EGU/info/present\\_officers.html](http://www.copernicus.org/EGU/info/present_officers.html).

Please click the corresponding title of the Division to find further details. If you should be interested in serving as a Division Officer, you should contact the respective Division President. Applications will be discussed at the forthcoming public Division Meetings at the General Assembly in Vienna, 15-20 April 2007, with an approval by Council afterwards.

*Arne Richter*  
*EGU Executive Secretary*

# Career's fare at EGU 2007

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## The forthcoming EGU meeting in April could provide an opportunity for potential employers to meet potential employees and to communicate in general the opportunities in your sector.

The EGU spring meeting will draw up to 8000 scientists of whom roughly one third will be PhD students and post-doctoral fellows who are looking for employment in all sectors of the geosciences. We feel that this meeting could provide an opportunity for potential employers to meet potential employees and to communicate in general the opportunities in your sector. Therefore, we would like to invite your department, institute or organization to participate in the Careers' Fare (Job Posting) or even in the Exhibition of the meeting or to organize a separate Short Course or Workshop. For details please visit the home site of the Assembly <http://meetings.copernicus.org/egu2007/>.

In the future, we would like to be able to address institutes and organizations directly that may be interested to participate in the careers' fare. We depend on your cooperation in order to compile a respective mailing list. If you have any suggestions, please contact [egu.meetings@copernicus.org](mailto:egu.meetings@copernicus.org).

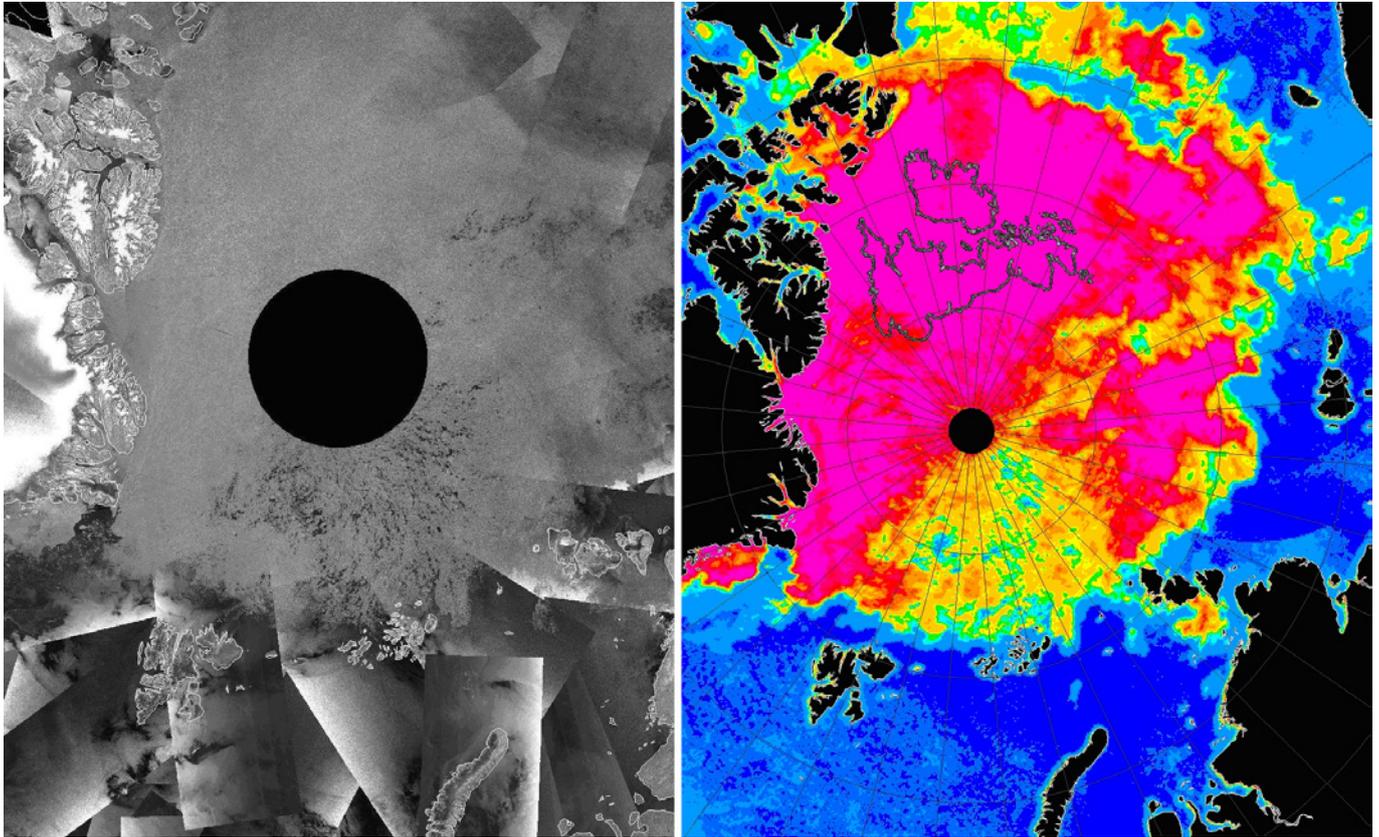
Thank you for your cooperation and support.

*Arne Richter*  
*EGU Executive Secretary*



## Arctic summer ice anomaly

Dramatic openings in the Arctic's perennial sea ice pack north of Svalbard, and extending into the Russian Arctic all the way to the North Pole.



*The image on the left is an Envisat ASAR mosaic of Arctic ice acquired on 23 August 2006. (Courtesy: Polar View) The right image is an EOS Aqua AMSR-E ice concentration acquired on 24 August 2006. (Courtesy: Leif Toudal Pedersen). There is a significant extent of leads – fractures and openings in the sea-ice cover – just below the pole in both the ASAR image, seen as splashes of dark grey and black, and the AMSR-E image (with British Isles shown for scale), seen by the high concentration of yellow, orange and green colours, signifying low ice concentrations.*

19 September 2006.- Satellite images acquired from 23 to 25 August 2006 have shown for the first time dramatic openings – over a geographic extent larger than the size of the British Isles – in the Arctic's perennial sea ice pack north of Svalbard, and extending into the Russian Arctic all the way to the North Pole.

Observing data from Envisat's Advanced Synthetic Aperture Radar (ASAR) instrument and the AMSR-E instrument aboard the EOS Aqua satellite, scientists were able to determine that around 5-10 percent of the Arctic's perennial sea ice, which had survived the summer melt season, has been fragmented by late summer storms. The area between Spitzbergen, the North Pole and Severnaya Zemlya is confirmed by AMSR-E to have had much lower ice concentrations than witnessed during earlier years.

Mark Drinkwater of ESA's Oceans/

Ice Unit said: "This situation is unlike anything observed in previous record low ice seasons. It is highly imaginable that a ship could have passed from Spitzbergen or Northern Siberia through what is normally pack ice to reach the North Pole without difficulty. "If this anomaly trend continues, the North-East Passage or 'Northern Sea Route' between Europe and Asia will be open over longer intervals of time, and it is conceivable we might see attempts at sailing around the world directly across the summer Arctic Ocean within the next 10-20 years."

During the last 25 years, satellites have been observing the Arctic and have witnessed reductions in the minimum ice extent – the lowest amount of ice recorded in the area annually – at the end of summer from around 8 million km<sup>2</sup> in the early 1980s to the historic minimum of less than 5.5 million km<sup>2</sup> in 2005, changes widely viewed as a

consequence of greenhouse warming.

Satellite observations in the past couple of years have also shown that the extent of perennial ice is rapidly declining, but this strange condition in late August marks the first time the perennial ice pack appears to exhibit thinner and more mobile conditions in the European sector of the Central Arctic than in earlier years.

In the last weeks, what was open water has begun to freeze, as the autumn air temperatures over the Arctic begin to fall. Although a considerable fraction of darker leads can still be seen in the area using ASAR, the AMSR-E sensor no longer shows openings.

Though the reason for the considerable change in the ice pack configuration is still unknown, it is likely due to the stormy weather conditions in August that characterised the month.

**Source: ESA**

## El Niño established and expected to continue

The latest El Niño/La Niña Update from the World Meteorological Organization (WMO), published today, says a “moderate” El Niño event is now established across the tropical Pacific basin and is expected to continue until at least the first quarter of 2007.

Geneva, 1 December 2006.— The latest El Niño/La Niña Update from the World Meteorological Organization (WMO), published today, says a “moderate” El Niño event is now established across the tropical Pacific basin and is expected to continue until at least the first quarter of 2007.

El Niño is a term used to describe an extensive warming of the surface waters over the central and eastern equatorial Pacific Ocean which can be responsible for unusual and sometimes severe weather events and patterns, not only in the immediate area, but also around the world – even during “moderate” examples.

Sea-surface temperatures in the region were between 1° and 1.5°C

warmer than usual for October, measurements typical of many El Niño events in the past.

These conditions are expected to slightly intensify over the next three months, but experts agree that the event is unlikely to exceed the “moderate” category in this period.

Impacts have already been, and continue to be, severe in the western equatorial Pacific, the islands therein and surrounding continental regions, including Australia and Indonesia which are suffering severe drought conditions.

This is also believed to be partly attributable to a particularly strong pattern of unusually cool ocean temperatures in the equatorial western Pacific Ocean and eastern Indian Ocean.

Along with the current warm temperatures in the western Indian Ocean, these cooler conditions are expected to continue to reinforce the effects of El Niño in the tropical western Pacific Ocean and Indian Ocean as well as neighbouring continental regions including eastern equatorial Africa – the latter region has already experienced extremely heavy rainfall in recent weeks.

Elsewhere, over the coming months, characteristic El Niño climate patterns are now more likely to occur across the Americas, the tropical Atlantic Basin, parts of Africa and South Asia.

*WMO Press release No. 765*

## WMO Statement on the Status of the global Climate in 2006

The global mean surface temperature in 2006 is currently estimated to be + 0.42°C above the 1961-1990 annual average (14°C/57.2°F), according to the records maintained by Members of the World Meteorological Organization (WMO), making 2006 the sixth warmest year on record.

Geneva, 14 December 2006.— The global mean surface temperature in 2006 is currently estimated to be + 0.42°C above the 1961-1990 annual average (14°C/57.2°F), according to the records maintained by Members of the World Meteorological Organization (WMO). The year 2006 is currently estimated to be the sixth warmest year on record. Final figures will not be released until March 2007.

Averaged separately for both hemispheres, 2006 surface temperatures for the northern hemisphere (0.58°C above 30-year mean of 14.6°C/58.28°F) are likely to be the fourth warmest and for the southern hemisphere (0.26°C above 30-year mean of 13.4°C/56.12°F), the seventh warmest in the instrumental record from 1861 to the present.

Since the start of the 20th century, the global average surface temperature has risen approximately 0.7°C. But this rise has not been continuous. Since 1976, the global average temperature has risen sharply, at 0.18°C per decade. In the northern and southern hemispheres, the period 1997-2006 averaged 0.53°C and 0.27°C above the 1961-1990 mean, respectively.

### Regional temperature anomalies

The beginning of 2006 was unusually mild in large parts of North America and the western European Arctic islands, though there were harsh winter conditions in Asia, the Russian Federation and parts of eastern Europe. Canada experienced its mildest winter and

spring on record, the USA its warmest January-September on record and the monthly temperatures in the Arctic island of Spitsbergen (Svalbard Lufthavn) for January and April included new highs with anomalies of +12.6°C and +12.2°C, respectively.

Persistent extreme heat affected much of eastern Australia from late December 2005 until early March with many records being set (e.g. second hottest day on record in Sydney with 44.2°C/111.6°F on 1 January). Spring 2006 (September-November) was Australia's warmest since seasonal records were first compiled in 1950. Heat waves were also registered in Brazil from January until March (e.g. 44.6°C/112.3°F in Bom Jesus on 31 January – one of the highest temperatures ever recorded in

Brazil).

Several parts of Europe and the USA experienced heat waves with record temperatures in July and August. Air temperatures in many parts of the USA reached 40°C/104°F or more. The July European-average land-surface air temperature was the warmest on record at 2.7°C above the climatological normal.

Autumn 2006 (September-November) was exceptional in large parts of Europe at more than 3°C warmer than the climatological normal from the north side of the Alps to southern Norway. In many countries it was the warmest autumn since official measurements began: records in central England go back to 1659 (1706 in The Netherlands and 1768 in Denmark).

### Prolonged drought in some regions

Long-term drought continued in parts of the Greater Horn of Africa including parts of Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Somalia, and the United Republic of Tanzania. At least 11 million people were affected by food shortages; Somalia was hit by the worst drought in a decade.

For many areas in Australia, the lack of adequate rainfall in 2006 added to significant longer-term dry conditions, with large regions having experienced little recovery from the droughts of 2002-2003 and 1997-1998. Dry conditions have now persisted for 5 to 10 years in some areas and in south-west Western Australia for around 30 years.

Across the USA, moderate-to-exceptional drought persisted throughout parts of the south-west desert and eastward through the southern plains, also developing in areas west of the Great Lakes. Drought and anomalous warmth contributed to a record wildfire season for the USA, with more than 3.8 million hectares burned through early December. Drought in the south of Brazil caused significant damage to agriculture in the early part of the year with losses of about 11 per cent estimated for the soybean crop yield alone.

Severe drought conditions also affected China. Millions of hectares of crops were damaged in Sichuan province during summer and in eastern China in autumn. Significant economic losses as well as severe shortages in drinking water were other consequences.

### Heavy precipitation and flooding

As the 2005/2006 rainy season was ending, most countries in southern Africa were experiencing satisfactory rainfall during the first quarter of 2006. In northern Africa, floods were recorded in Morocco and Algeria during 2006 causing infrastructure damage and some casualties. Rare heavy rainfall in the Sahara Desert region of Tindouf produced severe flooding in February damaging 70 per cent of food stocks and displacing 60 000 people. In Bilma, Niger, the highest rainfall since 1923 affected nearly 50 000 people throughout August. In the same month, the most extensive precipitation in 50 years brought significant agricultural losses to the region of Zinder, Niger. Heavy rain also caused devastating floods in Ethiopia in August, claiming more than 600 lives. Some of the worst floods occurred in Dire Dawa and along the swollen Omo River. Again in October and November, the Great Horn of Africa countries experienced heavy rainfall associated with severe flooding. The worst hit areas were in Ethiopia, Kenya and Somalia. Somalia is undergoing its worst flooding in recent history; some places have received more than six times their average monthly rainfall and hundreds of thousands of people have been affected. This year's floods are said to be the worst in 50 years in the Great Horn of Africa region. The heavy rains followed a period of long-lasting drought and the dry ground was unable to soak up large amounts of rainfall.

Heavy rainfall in Bolivia and Ecuador in the first months of the year caused severe floods and landslides with tens of thousands of people affected. Torrential rainfall in Suriname during early May produced the country's worst disaster in recent times.

After 500 mm of torrential rainfall during a five-day period in February, a large-scale landslide occurred in Leyte Island, the Philippines with more than 1 000 casualties. Although close to average in total rainfall, the Indian monsoon season brought many heavy rainfall events with the highest rainfall in 24-hours ever recorded in several locations.

Only months after the destructive summer flooding in eastern Europe in 2005, heavy rainfall and snowmelt produced extensive flooding along the River Danube in April and the river reached its highest level in more than a century. Areas of Bulgaria, Hungary, Romania and Serbia were the hardest hit with hundreds of thousands of hectares uninun-

dated and tens of thousands of people affected.

Persistent and heavy rainfall during 10-15 May brought historic flooding to New England (USA), described as the worst in 70 years in some areas. Across the US mid-Atlantic and north-east, exceptionally heavy rainfall occurred in June. Numerous daily and monthly records were set and the rainfall caused widespread flooding which forced the evacuation of some 200 000 people. Vancouver in Canada experienced its wettest month ever in November with 351 mm, nearly twice the average monthly accumulation.

### Development of moderate El Niño in late 2006

Conditions in the equatorial Pacific from December 2005 until the first quarter of 2006 showed some patterns typically associated with La Niña events. These however, did not lead to a basin-wide La Niña and, during April, even weak La Niña conditions dissipated. Over the second quarter of 2006, the majority of atmospheric and oceanic indicators reflected neutral conditions but, in August, conditions in the central and western equatorial Pacific started resembling typical early stages of an El Niño event (see WMO Press Release 765). By the end of the year, positive sea-surface temperature anomalies were established across the tropical Pacific basin. The El Niño event is expected by global consensus to continue at least into the first quarter of 2007.

### Deadly typhoons in south-east Asia

In the north-west Pacific, 22 tropical cyclones developed (average 27), 14 of which classified as typhoons. Typhoons Chanchu, Prapiroon, Kaemi, Saomai, Xangsane, Cimaron and tropical storm Bilis brought deaths, casualties and severe damage to the region. Landed tropical cyclones caused more than 1 000 fatalities and economic losses of US \$ 10 billion in China, which made 2006 the severest year in a decade. Typhoon Dorian affected some 1.5 million people in the Philippines in November/December 2006, claiming more than 500 lives with hundreds still missing.

During the 2006 Atlantic hurricane season, nine named tropical storms developed (average: ten). Five of the named storms were hurricanes (average six) and two of those were "major"

hurricanes (category three or higher on the Saffir-Simpson scale). In the eastern North Pacific 19 named storms developed, which is well above the average of 16; eleven reached hurricane strength of which six attained "major" status.

Twelve tropical cyclones developed in the Australian Basin, two more than the long-term average. Tropical cyclone Larry was the most intense at landfall in Queensland since 1918, destroying 80-90 per cent of the Australian banana crop.

### Ozone depletion in the Antarctic and Arctic

On 25 September, the maximum area of the 2006 ozone hole over the Antarctic was recorded at 29.5 million km<sup>2</sup>, slightly larger than the previous record area of 29.4 million km<sup>2</sup> reached in September 2000. These values are so similar that the ozone holes of these two years could be judged of equal size. The size and persistence of the 2006 ozone hole area with its ozone mass deficit of 40.8 megatonnes (also a record) can be explained by the continuing presence of near-peak levels of ozone-depleting substances in combination with a particularly cold stratospheric winter. Low temperatures in the first part of January prompted a 20 per cent loss in the ozone layer over the Arctic in 2006 (see WMO Press Release 760). Milder temperatures from late January precluded the large ozone loss seen in 2005.

### Arctic sea-ice decline continues

The year 2006 continues the pattern of sharply decreasing Arctic sea ice. The average sea-ice extent for the entire month of September was 5.9 million km<sup>2</sup>, the second lowest on record missing the 2005 record by 340 000 km<sup>2</sup>. Including 2006, the September rate of sea ice decline is now approximately -8.59% per decade, or 60 421 km<sup>2</sup> per year.

### Information sources

This preliminary information for 2006 is based on observations up to the end of November from networks of land-based weather stations, ships and buoys. The data are collected and disseminated on a continuing basis by the National Meteorological and Hydrological Services of WMO Members. However, the declining state of some observational platforms in some parts of the world is of concern.

It should be noted that, following established practice, WMO's global temperature analyses are based on two different datasets. One is the combined dataset maintained by the Hadley Centre of the UK Met Office, and the Climatic Research Unit, University of East Anglia, UK. The other is maintained by the US Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). Results from these two datasets are comparable: both indicate that 2006 is likely to be the sixth warmest year globally.

More extensive updated information will be made available in the annual WMO Statement on the Status of the Global Climate in 2006, to be published in early March 2007.

This is a joint Press Release issued in collaboration with the Hadley Centre of the Met Office, UK, the Climatic Research Unit, University of East Anglia, UK and in the USA: NOAA's National Climatic Data Centre, National Environmental Satellite and Data Information Service and NOAA's National Weather Service. Other contributors are WMO Member countries: Australia, Belgium, Brazil, Bulgaria, Canada, China, Denmark, India, Ireland, France, Germany, Hungary, Japan, Mauritius, Morocco, The Netherlands, New Zealand, Norway, Romania, Sweden and Switzerland. The African Centre of Meteorological Applications for Development (ACMAD) also contributed.

*Joint WMO Press release, WMO-No. 768*  
<http://www.wmo.int>

## Ocean chlorophyll anomaly product

**NASA has started producing a chlorophyll-a anomaly product, which is derived for each year, season, and month of the SeaWiFS mission.**

NASA has started producing a very useful chlorophyll-a anomaly product, which is derived for each year, season, and month of the SeaWiFS mission, based on nearly 9-years of SeaWiFS data (starting September 1997). These products are produced by subtracting the climatological averages for each time period from the averages for just the period under consideration. The differences, with respect to the climatology (in mg m<sup>-3</sup>), are logarithmically scaled and assigned colours on the positive- or negative-anomaly portion of the colour scale. The anomaly products can be reached directly at:

<http://oceancolor.gsfc.nasa.gov/cgi/anomalies.pl>

# ASEFI Meeting proposal of Atmospheric Soot Network

Experts discussed how to increase the quality of measurements with purpose to remove the great uncertainties in climate soot response – and suggested to organize the Atmospheric Soot Network

## ASEFI (Atmospheric Soot: Environmental Fate and Impact) 2006 Meeting

Carbonaceous soot in the atmosphere is a major concern with regards to its impact on health and the environment. Currently black carbon (BC) is considered one of the most important constituents of atmospheric particles by every major environmental agency. A number of significant results have been obtained recently within the emission measurements; however, as there has been limited progress in the laboratory measurements of soot, a workshop “Atmospheric Soot: Environmental Fate and Impact” (ASEFI) was organized in Arcachon (France), 18-20 October 2006, under the supports of INTROP Programme and the French Ministry of Ecology, to elucidate the current problems and to develop ideas that can address these problems. Forty invited experts have discussed how to improve the quality of soot measurements in laboratory and field observations, to remove the lack of information on the physical, optical and chemical properties of soot with respect to their emission sources and interaction with environment. Participants represented the current understanding of soot/climate interactions on all levels, from physico-chemistry on soot surfaces to soot emission impact on induced cloudiness and radiative budget, in five thematic sessions on Soot measurements in global environment, Aircraft engine emission experiments, Water-soot interactions: CCN/ IN, Laboratory and theoretical studies and Chemistry of soot. Thematic discussion clarified “What is soot?” and defined the different types of soot of atmospheric and human health issues, namely diesel, aviation, wood combustion and biomass burning soots.

Working group discussions provided a clear definition of the current state and listed the problems that must be addressed: they concern to relevance of laboratory studies to atmospheric impact, connection of laboratory surrogates to soot in the atmosphere, development of models with predictive values, lack of reference particles for calibrations, quantification by calibration methods, sampling difficulties and artifacts, and finally, required accuracy not yet met for many applications. All they limit current ability to predict environmental effects of soot exhausts. The details of presentation and discussions are presented on website <http://www.asefi2006.u-bordeaux.fr>

## Atmospheric Soot Network

Primary result of the meeting is the recommendation to form an international network, designated the Atmospheric Soot Network (ASN), whose participants would be researchers with expe-

rience in soot emissions, atmospheric measurements, and laboratory studies, and who have a mutual interest in sharing ideas and projects.

## ASN mission

ASN can serve as an organization that can promote and coordinate a variety of activities that improve our capacity to understand the impact of soot on the environment. The following are some of the objectives that could be announced for the ASN:

- 1) to build a link between engine makers, field observers, laboratory researcher and climate modelers,
- 2) to elaborate the common approach for characterization of soot exhaust from engine and laboratory combustion sources,
- 3) to elaborate the common basis for studies of soot-related atmospheric processes,
- 4) to increase the common ability to use complementary techniques,
- 5) to produce common laboratory soot for atmospheric studies, to elaborate, test and recommend Reference Soot Materials,
- 6) to organize inter-laboratory comparisons to increase soot quality measurements in the atmosphere and progress in laboratory studies,
- 7) to remove the lack in the knowledge of physico-chemical properties of soot particles generated by industrial and residential emissions, vehicular and aircraft emission, domestic home heating, and biomass burning, and
- 8) to develop a comprehensive Soot Database of laboratory - characterized soots of natural and anthropogenic sources.

## Conclusions of ASEFI 2006

All participants have supported the organization of the international Atmospheric Soot Network, between soot producers and soot experts in atmospheric measurements, modeling and laboratory studies, with the general purpose to have some real progress in the prediction of soot impact upon atmosphere.

The Scientific Committee members are O. Popovicheva, D. Baumgardner, K. Gierens, R. Miake-Lye, R. Niessner, M. Rossi, M. Petters, H. Puxbaum, J. Suzanne and E. Villenave (for their affiliations, see in <http://www.asefi2006.u-bordeaux.fr/>).

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## European space loses leading figure

Michel Bignier passed away on 12 October

13 October, 2006.- ESA and CNES announced with great regret the death of Michel Bignier, which occurred on 12 October. A leading figure in the space world, and a former Director General of CNES from 1972 to 1976, he was Director of ESA's Spacelab programme from 1976 to 1980, and then Director of Space Transport Systems at ESA until 1986.

ESA Director General Jean-Jacques Dordain said "He has been one of the main players in the long struggle to adopt a balanced European Space Programme". Michel Bignier was deeply committed to a true European space policy.

## GMES Initiative of the German EU Council Presidency 2007

The main objective of the GMES Initiative of the German EU Council Presidency 2007 is to achieve a European consensus on the way forward for the GMES long term issues

### Ensuring long-term sustainability of GMES - The Munich Roadmap

Global Monitoring for Environment and Security (GMES) is of vital importance for Europe. GMES ensures independent access for Europe to information relating to the environment, climate change and security. It pools European activities in Earth Observation with the aim to deliver global, regional and local information services for European users on a routine basis.

The course for GMES is set: Three Services are on the fast track, more are being added. Activities to develop and coordinate the necessary space and ground infrastructure are underway. Some challenges however remain and are in the focus of current activities. Most importantly, it will be necessary to implement a stable long term governance and financing scheme.

Germany considers GMES as a very important programme and supports it accordingly. The German Presidency of the European Council in the first half of 2007 provides an framework to work together with the European Commission and all other partners in Europe to shape the way forward.

The main objective of the GMES Initiative of the German EU Council Presidency 2007 is to achieve a European consensus on the way forward for the GMES long term issues - the Munich Roadmap. The aim is to adopt this roadmap at a high level conference during the German Presidency.

### The Munich Conference

The German GMES initiative includes a high level conference being held on 17 April 2007 in Munich. The objectives are twofold:

- Present the progress achieved with GMES so far and communicate a perspective on its services that will be operational from 2008 onwards.

- Address the aspects of GMES long-term sustainability and discuss the way forward - the Munich Roadmap.

During the next GMES Advisory Council Meeting on 14 February 2007, the German delegation will present a Draft Programme of the Conference.

## Future climate change in Europe will facilitate a spread of Lyme disease

according to results from a EU project

Stockholm University and World Health Organisation (WHO), within a project funded by the European Commission, reviewed the impacts of climate change and adaptation on Lyme borreliosis (LB) disease in Europe.

LB is the most common vector-borne disease in Europe. The highest incidence is reported from Austria, the Czech Republic, Germany, and Slovenia, as well as from the northern countries bordering the Baltic Sea. LB is a multi-system disorder that is treatable with antibiotics, but may lead to severe complications of the neurological system, the heart, and the joints. LB is caused by a spirochete (*Borrelia burgdorferi* s.l.),

which is transmitted to humans by ticks, in Europe mainly the species *Ixodes ricinus*. Reservoir animals are small rodents, insectivores, hares and birds.

Ticks may live for more than three years and are highly sensitive to changes in seasonal climate. Daily seasonal climatic conditions directly impact tick survival and activity. Indirectly, climate affects both tick and pathogen occurrence through effects on habitat conditions and reservoir animal density. In addition, climate-induced changes in land use and in recreational behaviour influence human exposure to infected ticks and thus disease prevalence.

A new report of WHO, authored by Elisabet Lindgren and Thomas G.T. Jaenson, presents the findings of the review. The review concludes that it is likely that climate change has already led to changes in *I. ricinus* populations in Europe. Even if existing data are in general not reliable enough to allow comparisons over time and in space of changes in tick prevalence and disease incidence on a pan-European level, some studies from specific areas have been based on particularly reliable long-term data sets. These studies have shown that recently observed increases in density and expansion in the distribution of *I. ricinus* into higher altitudes and latitudes are correlated to changes in local climate, just as observed variations in tick-borne disease incidence in places with long-term surveillance

data have been shown to be linked to variations in local climatic conditions. Based on the results of all the different studies that have been reviewed it can be concluded that future climate change in Europe will facilitate a spread of LB into higher latitudes and altitudes, and contribute to an extended and more intense LB transmission season in some areas. In other areas, where future climate change will cause climate conditions too hot and dry for tick survival, LB will disappear.

More information can be found in the WHO document

<http://www.euro.who.int/document/E89522.pdf>

*Source: WHO Regional Office for Europe*

## DLR and Kayser-Threde sign contract for German satellite EnMAP

**EnMAP, Environmental Mapping and Analysis Programme, is a hyperspectral Earth observation satellite**

13 November 2006.- In Munich today, the German Aerospace Centre (DLR) and Kayser-Threde GmbH signed a contract for the development of the EnMAP satellite. EnMAP (Environmental Mapping and Analysis Programme) is a hyperspectral Earth observation satellite. Hyperspectral instruments will record solar radiation reflected from the Earth, from visible light to near infrared. This provides information about the condition of the Earth's surface and how it is changing. The mission, which is to be launched in 2011, is scheduled to last for five years.

According to a DLR Press release, the agreement assigns overall project management of EnMAP to DLR's Space Agency. DLR will also be responsible for building the ground infrastructure. Three bodies will be responsible for controlling the satellite, receiving, archiving and distributing data, and calibration: DLR's Space Operations Centre, the German Remote Sensing Data Centre (DFD) and the Remote Sensing Technology Institute (IMF) at Ober-

pfaffenhofen. DFD will also take on project management for the ground segment. In addition, DLR will be responsible for operating the satellite over the five-year mission. For its part, Kayser-Threde GmbH will handle development of the satellite while the GeoForschungsZentrum in Potsdam will manage the scientific aspects of the mission.

The EnMAP satellite will be equipped with a 'hyperspectral' sensor that will map the Earth's surface in over 200 narrow colour channels. This will give detailed information on waterways, vegetation, land usage and surface geology.

The satellite will be sent into an orbit approximately 650 km above the surface of the Earth, overflying every point on Earth in four days. This makes EnMAP ideal for documenting changes over time and across different areas, such as processes of erosion or vegetation periods.

## Satellite data analysis finds cleaner air across eastern U.S.

**Up to 40 percent decreases between 1999 and 2005 in Ohio and nearby States due to control measures in electric power plants**

Dec. 8, 2006.- A major smog-forming pollutant is declining over the eastern United States, according to a new study by scientists at NOAA and the University of Bremen, Germany. New satellite observations mark the first time space-based instruments have detected the regional impact of pollution controls implemented by coal-burning electric power plants in the 1990s. The findings were published this month in *Geophysical Research Letters*.

High-precision instruments aboard the European ENVISAT satellite have detected a 38 percent decline in nitrogen dioxide in the Ohio River Valley and nearby states between 1999 and 2005,

according to the study. Nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO) are two gases that form a group of pollutants known as nitrogen oxides (NO<sub>x</sub>), which are created primarily through fossil fuel burning. When combined with other gases and sunlight, they form ozone, the major urban air pollutant in smog. Ground-level ozone harms human health and vegetation and is a key pollutant targeted by the U.S. Environmental Protection Agency.

*Source: NOAA ([www.noaanews.noaa.gov/](http://www.noaanews.noaa.gov/))*

# Global Forum for the Ecological Importance Of Solar Saltworks

The Global Network for Environmental Science and Technology organized the 1st International Conference on the Ecological Importance of Solar Saltworks in the Island of Santorini in Greece from 20 to 22 of October 2006.

The Global Network for Environmental Science and Technology organized the 1st International Conference on the Ecological Importance of Solar Saltworks in the Island of Santorini in Greece from 20 to 22 of October 2006.

In this Conference specialists on the above issue, from all over the world, met and presented their scientific approach. Delegates from U.S.A., China, India, Australia, Mexico, Spain, France, Egypt, Kenya, Brazil, Switzerland, Ghana, Italy, Germany, Belgium, Namibia and Greece exchanged views on the major themes of the biological process that develops in Solar Saltworks evaporating ponds and the importance this process plays on the quality of salt and the ecological value of the Solar Saltworks.

The environmental uniqueness of Solar Saltworks and particularly the modern ones is based on the fact that they are integrated coastal ecosystems, where nature experiences the coexistence of regular and hyper saline environments with high significance as shelters to wildlife.

The approach that Solar Saltworks area can be considered as constructed wetland and that it should be included in the same

bracket as wetlands, it was also discussed. Solar Saltworks have an increasing significance in safeguarding and development of the world's wetland area.

There are also many cases all over the world where the continuation of the Solar Saltworks operation is necessary for the protection of the ecological system they support and the change in the use of land is not desirable from the ecological point of view.

During the closing discussion it was decided to form a Global Forum for the Ecological Importance of Solar Saltworks, within the Global NEST, with at least one member from each country who operates Solar Saltworks. The list is open for members who will desire to join the Forum.

The participants decided to organize the 2nd CEISSA in India in two years time.

**Prof. Themistocles Lekkas and Nicholas Korovessis**  
*Conference co-Chairmen*

# EU prioritises allergic diseases in the Seventh Framework Programme

First draft of FP7 addressed only food allergies, but now respiratory ones are now also included

With the vote of the European Parliament on the Seventh Framework Programme (FP7) on 30 November, EU acknowledges allergic diseases as major chronic diseases to be addressed in European research during the coming 7 years (2007 - 2013).

The European Parliament adopted the report of Prof. Jerzy Buzek that recognises "respiratory diseases including those induced by allergies" as health priorities to be addressed by translational research.

This will allow respiratory allergic diseases (including asthma) to be covered by the research programme under the health theme. In the first drafts, only food allergies (8% of all allergies) were covered. Allergic diseases will now be tackled under both the health

and food themes of the research programme which should allow scientists to progress towards the overall understanding that is needed to help control this epidemic through effective prevention and treatment. "Allergic diseases" in all their different aspects are taking lives daily and creating huge financial costs. According to the World Health Organization, asthma kills someone in Europe every hour. One child in three is allergic today and by 2015, half of the European population may be suffering from one or more allergic condition. The European Union's next research programme known as the Seventh Framework Programme (FP7) begins on 1st January 2007 and will run for seven years until 2013 with a total budget of €54.6 billion.



## The origin of the European Medieval Warm Period

**Modelling results suggest that the warm summer conditions during the early second millennium compared to the climate background state of the 13th–18th century are due to a large extent to the long term cooling induced by changes in land-use in Europe.**

Proxy records and results of a three dimensional climate model show that European summer temperatures roughly a millennium ago were comparable to those of the last 25 years of the 20th century, supporting the existence of a summer Medieval Warm Period in Europe. Those two relatively mild periods were separated by a rather cold era, often referred to as the Little Ice Age. Modelling results suggest that the warm summer conditions during the early second millennium compared to the climate background state of the 13th–18th century are due to a large extent to the long term cooling induced by changes in land-use in Europe. During the last 200 years, the effect of increasing greenhouse gas concentrations, which was partly levelled off by that of sulphate aerosols, has dominated the climate history over Europe in summer. This induces a clear warming during the last 200 years, allowing summer temperature during the last 25 years to reach back the values simulated for the early second millennium. Volcanic and solar forcing plays a weaker role in this comparison between the last

25 years of the 20th century and the early second millennium. The hypothesis appears consistent with proxy records but modelling results have to be weighted against the existing uncertainties in the external forcing factors, in particular related to land-use changes, and against the uncertainty of the regional climate sensitivity. Evidence for winter is more equivocal than for summer. The forced response in the model displays a clear temperature maximum at the end of the 20th century. However, the uncertainties are too large to state that this period is the warmest of the past millennium in Europe during winter.

The article is available free of charge at

<http://www.clim-past.net/2/99/2006/cp-2-99-2006.pdf>

**H. Goosse, O. Arzel, J. Luterbacher, M. E. Mann, H. Renssen, N. Riedwyl, A. Timmermann, E. Xoplaki, and H. Wanner, *The origin of the European Medieval Warm Period, Clim. Past, 2, 99-113, 2006.***

## Bacteria in Himalayan glacial ice

**Seasonal variations of abundance and species diversity of culturable bacteria recovered from glacial ice in the Himalayas suggest that microorganisms in Himalayan ice might provide a potential new proxy for the reconstruction of atmospheric circulation.**

Only recently has specific attention been given to culturable bacteria in Tibetan glaciers, but their relation to atmospheric circulation is less understood yet. Here the authors present the results of culturable bacteria preserved in an ice core drilled from the East Rongbuk (ER) glacier, Himalayas. The average concentrations of culturable bacteria are 5.0, 0.8, 0.1 and 0.7 CFU mL<sup>-1</sup> for the glacier ice deposited during the premonsoon, monsoon, postmonsoon and winter seasons, respectively. The high concentration of culturable bacteria in ER glacier deposited during the premonsoon season is attributed to the transportation of continental dust stirred up by the frequent dust storms during spring. This is also confirmed by the spatial distribution of culturable bacteria in Tibetan glaciers. Continental dust originated from the Northwest China accounts for the high abundance of culturable bacteria in the northern Tibetan Plateau, while monsoon moisture exerts great influence on culturable bacteria with low abundance in the southern plateau. The numbers of representatives with different ARDRA patterns from RFLP analysis are 10, 15, 1 and 2 for the glacial ice deposited during the premonsoon, monsoon, postmonsoon and

winter seasons, respectively, suggesting that culturable bacteria deposited in ER glacier during monsoon season are more diverse than that deposited during the other seasons, possibly due to their derivation from both marine air masses and local or regional continental sources, while culturable bacteria deposited during the other seasons are from only one possible origin that is transported by westerlies. These results show the first report of seasonal variations of abundance and species diversity of culturable bacteria recovered from glacial ice in the Himalayas, and we suggest that microorganisms in Himalayan ice might provide a potential new proxy for the reconstruction of atmospheric circulation.

The article is available free of charge at

<http://www.biogeosciences.net/4/1/2007/bg-4-1-2007.pdf>

**S. Zhang, S. Hou, X. Ma<sup>1</sup>, D. Qin, and T. Chen, *Culturable bacteria in Himalayan glacial ice in response to atmospheric circulation, Biogeosciences, 4, 1-9, 2007.***

## Freak waves

Information about freak wave events in the ocean reported by mass media and derived from personal observations in 2005 is collected and analysed.



*A wave over 9 m washed two people off the breakwater in Kalk Bay on 26 August; photo by P. Massie (Hunter: <http://www.weathersa.co.za/Pressroom/2005/2005Aug31ExtremeWaves.jsp>, 2005).*

Nine cases in 2005 are selected as true freak wave events from a total number of 27 mentioned. Besides rogue waves in the open sea, the problem of freak wave events on the shore is emphasized. These accidents are related to unexpected wave impact upon the coast and shore constructions or to sudden intensive flooding of the coast. Of the nine events considered reliable here, three events correspond to open-sea cases, while the six others occurred nearshore.

The article is available free of charge at

<http://www.nat-hazards-earth-syst-sci.net/6/1007/2006/nhess-6-1007-2006.pdf>

*I. I. Didenkulova, A. V. Slunyaev, E. N. Pelinovsky, and C. Kharif,  
Freak waves in 2005, Nat. Hazards Earth Syst. Sci., 6, 1007-1015, 2006.*

## Low frequency climate signal in GRACE data

The GRACE pair of satellites have been orbiting the Earth, monitoring the time variable mass distribution for more than four years.

For more than four years, the GRACE pair of satellites have been orbiting the Earth, monitoring the time variable mass distribution for scales ranging from regional to global. The GRACE data have been released for a broad scientific community and sets of gravity fields are available. This paper shows that there are evidences at interannual time scales for the presence of ENSO signal in the data, strongly correlated with the hydrological mass distribution, and also similar to the expected hydrological signature associated with the ENSO cycle. This signal dominates, at global scale, the one associated with geodynamic sources.

The article is available free of charge at

<http://www.electronic-earth.net/1/9/2006/ee-1-9-2006.pdf>

*O. de Viron, I. Panet, and M. Diament,  
Extracting low frequency climate signal from GRACE data, eEarth, 1, 9-14, 2006.*

## Impacts of management alternatives on soil carbon storage of farmland in Northwest China

Recovery of the traditional farming practices may be a feasible approach to substantially improve the soil C status in the farmland of Shaanxi.

Long-term losses of soil organic carbon (SOC) have been observed in many agriculture lands in Northwest China, one of the regions with the longest cultivation history in the world. The decline of SOC contents not only impaired the soil fertility but also increased the amount of carbon dioxide (CO<sub>2</sub>) emitted from terrestrial ecosystems into the atmosphere. However, quantifying the SOC losses at regional scale has long been remaining unsolved. A process-based model, Denitrification-Decomposition or DNDC, was adopted in the study to quantify impacts of farming management practices on SOC dynamics for a selected region, Shaanxi Province. The selected domain, with 3 million hectares of cropland across different climatic and farming management regimes, is representative for the major agricultural areas in Northwest China. The DNDC model was tested against long-term SOC dynamics observed at five agricultural sites in China. The agreement between the observed and modeled results indicate that DNDC was capable of capturing patterns and magnitudes of SOC changes across the climate zones, soil types, and management regimes in China. To quantify SOC dynamics for Shaanxi, a GIS database was constructed to hold all of the DNDC-required input information (e.g., weather, soil properties, crop acreage, and farming practices) for all the farmland in the studied domain. Sensitivity tests indicated the spatial heterogeneity of soil properties, especially initial SOC content, was the major source of uncertainty for the modeled SOC dynamics at regional scale. The Most Sensitive Factor (MSF) method was employed in the study to quantify the uncertainties produced from the upscaling process. The results from the regional simulations for Shaanxi indicated that

(1) the overall 3 million hectares of farmland in the province was a source of atmospheric CO<sub>2</sub> with 0.5 Tg C yr<sup>-1</sup> lost in 2000 under the current farming management conditions,

(2) an increase in the rate of crop residue incorporation from 15% to 50% or 90% converted the farmland from the C source to a C sink with 0.7 or 2.1 Tg C yr<sup>-1</sup> sequestered, respectively, and

(3) applying farmyard manure at a rate of 500 kg C ha<sup>-1</sup> also converted the cropland into a weak C sink with 0.2 Tg C sequestered in the farmland in Shaanxi.

In the studied domain, crop residue and farmyard manure used to be the major sources of soil nutrients during the centuries-long cultivation history but were gradually abandoned since 1950s when synthetic fertilizers became available. The results from this modeling study suggest that recovery of the traditional farming practices (i.e., residue incorporation and manure amendment) be a feasible approach to substantially improve the soil C status in the farmland of Shaanxi. The values of C gain or loss from this study for Shaanxi could vary if the modeled domain shifts to other provinces in Northwest China although the general conclusion may remain.

The article is available free of charge at

<http://www.biogeosciences.net/3/451/2006/bg-3-451-2006.pdf>

**F. Zhang, C. Li, Z. Wang, and H. Wu,**  
*Modeling impacts of management alternatives on soil carbon storage of farmland in Northwest China, Biogeosciences, 3, 451-466, 2006.*

## Distribution of N<sub>2</sub>O in the Baltic Sea during transition from anoxic to oxic conditions

Hydrographic aspects are decisive factors determining the final release of N<sub>2</sub>O produced to the atmosphere.

In January 2003, a major inflow of cold and oxygen-rich North Sea Water terminated an ongoing stagnation period in parts of the central Baltic Sea. In order to investigate the role of North Sea Water inflow in the production of nitrous oxide (N<sub>2</sub>O), the authors measured dissolved and atmospheric N<sub>2</sub>O at 26 stations in the southern and central Baltic Sea in October 2003.

At the time of the cruise, water renewal had proceeded to the eastern Gotland Basin, whereas the western Gotland Basin was still unaffected by the inflow. The deep water renewal was detectable in the distributions of temperature, salinity, and oxygen concentrations as well as in the distribution of the N<sub>2</sub>O concentrations: Shallow stations in the Kiel Bight and Pomeranian Bight were well-ventilated with uniform N<sub>2</sub>O concentrations near equilibrium throughout the water column. In contrast, stations in the deep basins, such as the Bornholm and the Gotland Deep, showed a clear stratification with deep water affected by North Sea Water. Inflowing North Sea Water led to changed environmental conditions, especially enhanced oxygen (O<sub>2</sub>) or declining hydrogen sulphide (H<sub>2</sub>S) concentrations, thus, affecting

the conditions for the production of N<sub>2</sub>O. Pattern of N<sub>2</sub>O profiles and correlations with parameters like oxygen and nitrate differed between the basins. Because of the positive correlation between ΔN<sub>2</sub>O and AOU in oxic waters the dominant production pathway seems to be nitrification rather than denitrification.

Advection of N<sub>2</sub>O by North Sea Water was found to be of minor importance. A rough budget revealed a significant surplus of in situ produced N<sub>2</sub>O after the inflow. However, due to the permanent halocline, it can be assumed that the N<sub>2</sub>O produced does not reach the atmosphere. Hydrographic aspects therefore are decisive factors determining the final release of N<sub>2</sub>O produced to the atmosphere.

The article is available free of charge at

<http://www.biogeosciences.net/3/557/2006/bg-3-557-2006.pdf>

**S. Walter, U. Breitenbach, H. W. Bange, G. Nausch, and D. W. R. Wallace,**  
*Distribution of N<sub>2</sub>O in the Baltic Sea during transition from anoxic to oxic conditions, Biogeosciences, 3, 557-570, 2006.*



# Urban modeling at the Meteorological Service of Canada

by Jocelyn Mailhot et al.

Urban modelling is part of a larger project funded by the Canadian CBRN (Chemical, Biological, Radiological, and Nuclear) Research and Technology Initiative (CRTI), which aims at developing an advanced emergency response system based on an integrated, multi-scale modeling system for the accurate and efficient prediction of urban flows and atmospheric dispersion over populated North American cities.

## Introduction

The Meteorological Service of Canada (MSC) has recently launched a program to improve the representation of cities in the Canadian meteorological models. This is part of a larger project funded by the Canadian CBRN (Chemical, Biological, Radiological, and Nuclear) Research and Technology Initiative (CRTI), which aims at developing an advanced emergency response system based on an integrated, multi-scale modeling system for the accurate and efficient prediction of urban flows and atmospheric dispersion over populated North American cities. It involves collaboration between several governmental (MSC, Defense R&D Canada, Atomic Energy of Canada) and academic partners (Universities of Waterloo and Calgary). This advanced emergency response system will provide a real-time modeling and simulation tool to predict injuries, casualties, and contamination due to hazardous material releases, and to make relevant decisions (based on sound technical and scientific grounds) to minimize their consequences based on a pre-determined decision making framework. A prototype version of this system is planned for quasi-operational runs at the Environmental Emergency Response Division of the Canadian Meteorological Centre in summer 2007.

## Overview of the urban modeling system

The MSC contribution to the CRTI project focuses on the meso-g to micro-a-scale component (grid-size resolutions ranging from 20km down to about 200m). The partners will provide CFD microscale models (at the street- and building-scales) and Eulerian or Lagrangian stochastic dispersion models, which will be driven by the "urbanized" mesoscale models. The development of the MSC urban modeling system comprises several aspects: 1) extension of our turbulent diffusion scheme to 3D turbulence, 2) inclusion of urban processes with the Town Energy Balance (TEB) urban canopy scheme (Masson, 2000), 3) generation of new land covers characterizing urban types, and 4) specification of anthropogenic heat fluxes for use in TEB.

**1) 3D turbulence:** Our current 1D (vertical) turbulent diffusion scheme assumes that mixing of atmospheric properties (temperature, moisture, momentum) is mostly due to the large eddies in the boundary layer. Since high-resolution models (less than 1-km grid size) are starting to resolve those large eddies, one needs adjustments to the diffusion scheme to avoid a "double-counting" of the effects of diffusion. A modified strategy has been introduced, based on quasi-isotropic 3D diffusion. The generalization of the turbulent diffusion includes

additional terms for the horizontal ( $x$  and  $y$ ) contributions of the dynamic Reynolds stress components and of the turbulent diffusion terms. Similar terms have also been introduced in the TKE budget equation. Finally, the formulation for the mixing and dissipation length scales has been modified, using a Smagorinsky-Lilly approach, and depends explicitly on the model grid size. This more general formulation allows for a smooth transition of the intensity of the diffusion scheme as a function of the model resolution and will ease the extension to LES-type applications (with typical resolution of a few tens of meters) in the future.

**2) TEB urban scheme:** The TEB scheme (Masson, 2000) is an urban canopy model, specifically dedicated to built-up covers, parameterizing the energy and water exchanges between urban surfaces and the atmosphere. It represents a city as an ensemble of idealized urban canyons (Oke, 1987) formed of roofs, walls and streets. Separate surface energy budgets are solved for each of these three different canyon surfaces. TEB takes into account the 3D geometry of the urban surfaces for radiative trapping and shadow effects, heat storage, mean wind, temperature and humidity inside the streets, and water and snow on roofs and streets. Additional assumptions are the isotropy of the street orientations, and no crossing streets. TEB has been included for several years now in the French Meso-NH atmospheric model and was recently implemented in the Canadian GEM and MC2 models. TEB has been already tested for several European cities. In particular,

summertime episodes have been simulated with Meso-NH for Paris and Marseille (e.g. Lemonsu and Masson, 2002; Lemonsu et al., 2005) and are currently studied for Toulouse, within the framework of the CAPITOUL experiment (Lemonsu et al., 2006a).

**3) Urban cover classification:** To be able to run atmospheric models with the TEB urban canopy parameterization, the land-use and land-cover classifications must include specific urban covers, which characteristics and properties are different from those of natural covers. The Canadian land cover database currently includes only water, ice, and various types of soils and vegetation covers. Therefore, a general methodology has been developed to provide urban land-use classifications in a semi-automatic way for the major North American cities, in order to represent the spatial distribution and the diversity of urban areas. This method is based on the joint analysis of satellite imagery (Landsat-7, Aster) and digital elevation models (SRTM-DEM, NED, CDED1), in order to take both the surface properties and geometric characteristics (building heights) of the urban canopy into account. The application of a decision tree model then results in the identification of 12 urban classes, allowing a satisfactory representation of urban cover variability. A preliminary methodology has been developed for Oklahoma City and refined for Montreal and Vancouver. Details of the methodology and results are given in Lemonsu et al. (2006b). As an example, Figure 1 shows the resulting urban-cover classification at 60-m resolution for the

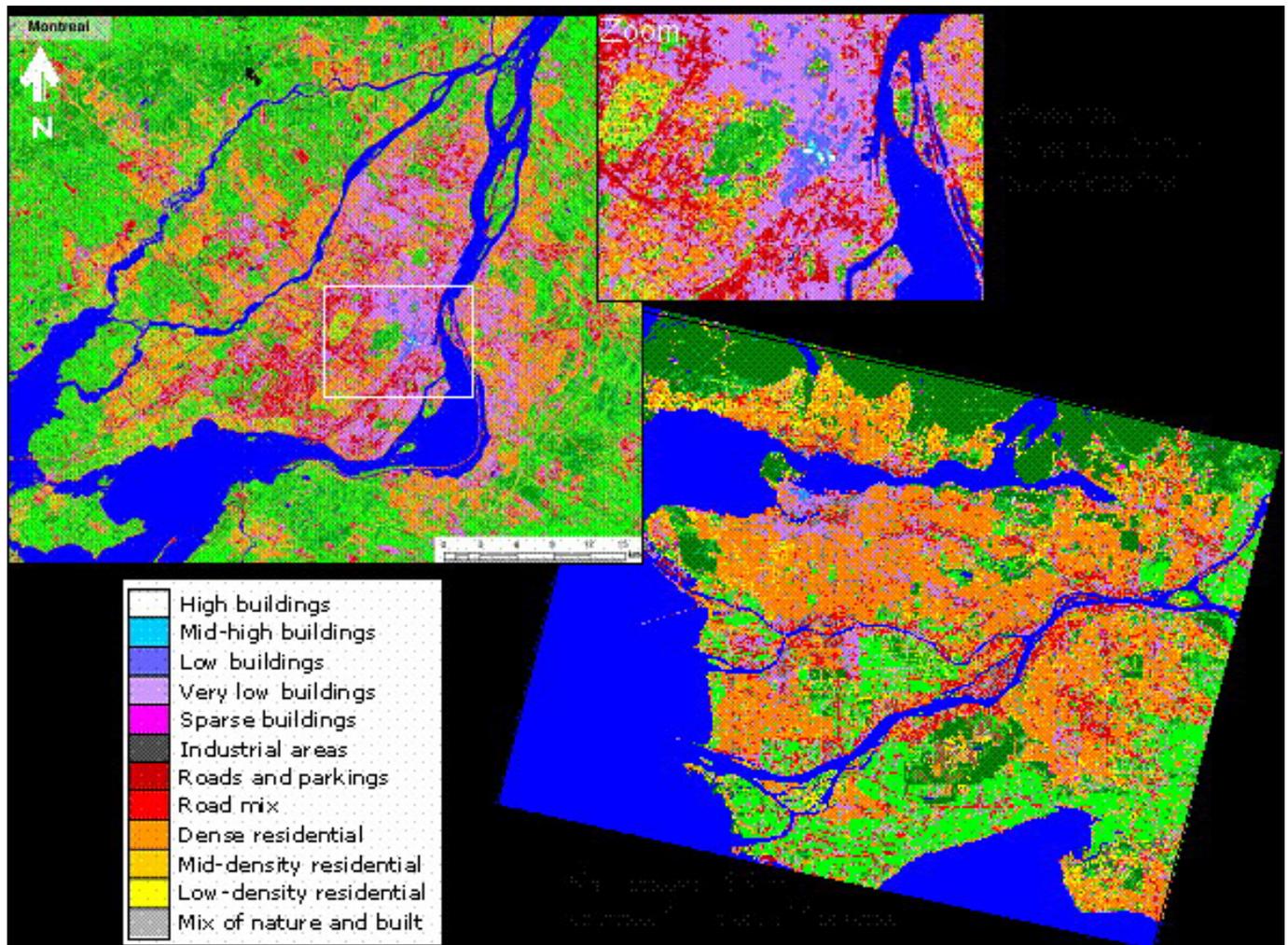


Figure 1. Land-cover classification at 60-m for Montreal and Vancouver, including 12 urban classes and 5 classes of natural covers.

Montréal and Vancouver regions, which represents in a fairly realistic way the major urban landscapes.

**4) Anthropogenic fluxes:** Another important input to the TEB urban model is the detailed specification of the emissions of heat and moisture from human activities. These anthropogenic fluxes can be of major importance in large North American cities, especially during wintertime. They include several components arising from the traffic of vehicles, energy consumption from commercial and industrial activities and, to a lesser extent, the human metabolism. In addition, the anthropogenic heat profiles must reflect the seasonal, weekly, and diurnal variations characterizing those human activities. A general and practical approach such as the “top-down” methodology proposed by Sailor and Lu (2004) is currently examined to generate the input data needed to quantify the anthropogenic heating. This method has the advantages of using easily available data sources (e.g. census data, transportation statistics, electricity and heating fuel use) and is based on a per capita formulation, non-dimensional load profiles and variability of the population density. Work is underway to apply and refine this method for the Montreal area, before it can be used to build a database for other cities across North America.

### Validation of the urban modeling system

As a first validation of the urban modeling system, high-resolution simulations are underway to examine the impact of urban processes on the surface energy budget and on the structure of the atmospheric boundary layer. The first case deals with a summertime intensive observational period of the Joint Urban 2003 campaign (Allwine et al., 2004). The Joint Urban 2003 experiment was held in Oklahoma City, OK, USA, during July 2003 and provides a wealth of detailed meteoro-



Figure 2. The 20-m telescopic meteorological tower with some of the instrumentation at the MUSE-2005 urban site in Montreal.

logical observations in a North American urban environment to assess our model simulations. In order to underline the main differences observed between North American and European cities, Lemonsu et al. (2006a) have compared modeling exercises carried out for Oklahoma City and for Toulouse, two cities with comparable populations. Preliminary results indicate that North American and European cities can generate quite different urban heat islands and microclimates, and that TEB shows relatively good performances during nighttime in both cases. However, certain aspects specific to North American city centres, such as daytime maximum air temperatures, are not correctly simulated and adjustments may be needed in TEB.

The next step will consist in simulating cases over Montréal to evaluate TEB under winter conditions, an aspect that has not been extensively examined so far. For this purpose, two field observation campaigns (MUSE - Montréal Urban Snow Experiment) have been conducted in Montréal during March-April 2005 and February-March 2006 to document the energy exchanges between the urban canopy and the atmosphere under cold, snowy situations and during the snow melting period. Figure 2 shows the 20-m meteorological tower at the MUSE-2005 urban site. Details on MUSE are given in a companion text in the Urban Project Report section.

### Outlook

The instrumentation and experience acquired during MUSE constitute an interesting starting point for a longer-term, wider effort for urban measurements across Canada that would be done with partners from various organizations, including UBC (T. Oke), UWO (J. Voogt), and KCL (S. Grimmond). This could provide the impetus for the setup of a national network of continuous urban surface and upper-air profiles measurement sites to monitor and study the urban boundary layer. The long-term goal is to provide Canadian urban residents with better weather and air quality forecasts through development of an urban modeling system optimized for Canadian urban climates. This enhanced forecasting capability would contribute to the safety, health and well being of Canadians through better understanding of heat stress and wind chill, of dispersion of air pollutants in urban environments, and to the better conservation of urban resources.

### Acknowledgements

This work was supported by the Chemical, Biological, Radiological and Nuclear (CBRN) Research and Technology Initiative (CRTI), under Project CRTI #02-0093RD.

### References

- Allwine, K.J, M.J. Leach, L.W. Stockham, J.S. Shinn, R.P. Hosker, J.F. Bowers, and J.C. Pace, 2004: Overview of Joint Urban 2003 - An atmospheric dispersion study in Oklahoma City. *Planning, Nowcasting, and Forecasting in the Urban Zone Symposium, 84th AMS Annual Meeting, 11-15 January 2004, Seattle, WA, Amer. Meteor. Soc.*
- Lemonsu, A., and V. Masson, 2002: Simulation of a summer urban breeze over Paris. *Bound.-Layer Meteorol.*, 104, 463-490.

Lemonsu, A. G. Pigeon, V. Masson, and C. Moppert, 2005: Sea-town interaction over Marseille: 3D Urban boundary layer and thermodynamic fields near the surface. *Theor. Appl. Clim.*, 84, 171-178.

Lemonsu, A., J. Hidalgo, S. Bélair, J. Mailhot, and V. Masson, 2006a: Modeling urban processes above North American and European cities: Application to Oklahoma City and Toulouse. *Preprints, 6th Symposium on the Urban Environment, 30 January-2 February 2006, Atlanta, GA, Amer. Meteor. Soc.*, J1.2.

Lemonsu, A., A. Leroux, S. Bélair, S. Trudel, and J. Mailhot, 2006b: A general methodology of urban cover classification for atmospheric modeling. *Remote Sensing of Environment*, (submitted).

Masson, V., 2000: A physically-based scheme for the urban energy budget in atmospheric models. *Bound.-Layer Meteorol.*, 94, 357-397.

Oke, T.R., 1987: *Boundary Layer Climates*, 2nd edn., Methuen, London, 435 pp.

Sailor, D.J., and L. Lu, 2004: A top-down methodology for developing diurnal and seasonal anthropogenic heating profiles for urban areas. *Atmos. Environment*, 38, 2737-2748.

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# Urban Project Report

## The Montréal Urban Snow Experiments (MUSE)

The main scientific objective of these experiments is to document the evolution of surface characteristics and energy budgets in a dense urban area, in conditions typical of Canadian winters and winter-spring transition, i.e., cold with snow or snow melting. A subsequent objective of the two experiments is to use these observations to evaluate the performance of the Town Energy Balance (TEB) scheme under those conditions, an aspect that has not been extensively examined with this scheme.

Two Montréal Urban Snow Experiments (MUSE) were conducted during the cold seasons of 2005 and 2006. The first of these experiments (MUSE-2005) took place between 17 March and 14 April 2005; the second (MUSE-2006) was held between 10 February and 31 March 2006. The main scientific objective of these experiments is to document the evolution of surface characteristics and energy budgets in a dense urban area, in conditions typical of Canadian winters and winter-spring transition, i.e., cold with snow or snow melting. A subsequent objective of the two experiments is to use these observations to evaluate the performance of the Town Energy Balance (TEB) scheme under those conditions, an aspect that has not been extensively examined with this scheme.

The MUSE urban campaigns were conducted by several partners within the Meteorological Service of Canada (MSC), drawing upon the expertise of Profs. Tim Oke (University of British Columbia), Sue Grimmond (King's College London), and Jamie Voogt (University of Western Ontario) in the site selection and observation program design. The two experiments were done in the context, and with the support, of the Chemical, Biological, Radiological, and Nuclear (CBRN) Research and Technology Initiative (CRTI).

For each of the two MUSE experiments, a single site in a dense urban area was instrumented to meet the scientific objectives of the project. For reasons unrelated to science or to the quality of the observations, the location of the observation site was changed for the second year. But both sites (i.e., for 2005 and for 2006) are very closely located, and exhibit very similar characteristics (geometry of the streets, height of buildings, orientation of streets, materials of construction, etc). The two measurements sites are located in an homogeneous area with well-defined lines of closely built houses of generally two or three storeys.

The instrumentation that was deployed during the MUSE campaigns included a 20-m telescopic meteorological tower that provided observations above the urban roughness sub-

layer of radiation budgets components and of turbulent fluxes, complemented with radiative observations of roofs, walls and streets, and of snow cover properties. Figure 1 shows the instruments installed at the top of the tower, for the MUSE-2005 experiment.

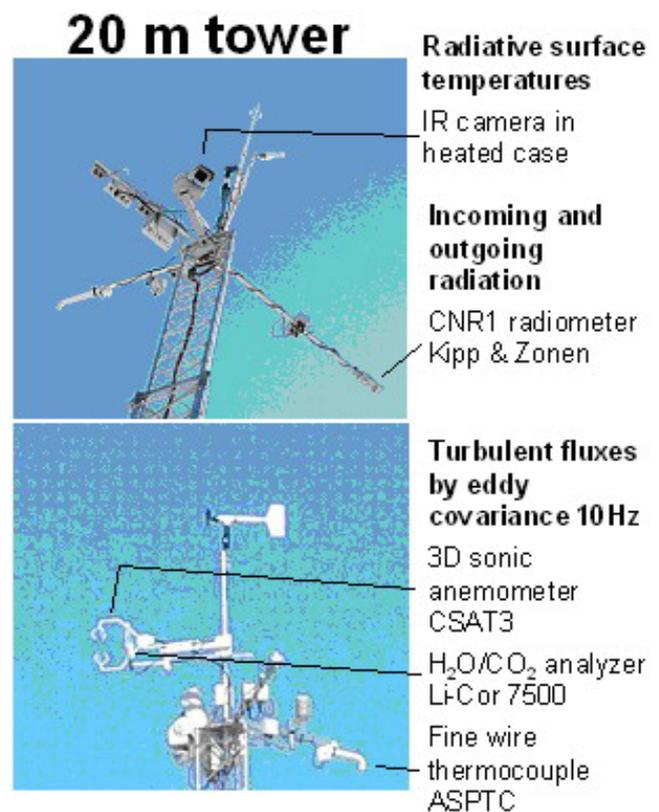


Figure 1. Instrumentation installed at the top of the 20-m tower for MUSE-2005.

In MUSE-2005, four Intensive Observations Periods (IOPs) were conducted during 24-h-periods, in which measurements of snow's main characteristics (e.g., depth, albedo, density) were obtained manually, together with observations of wall and street temperatures (also obtained manually). In MUSE-2006, all these observations were done in an automatic manner.

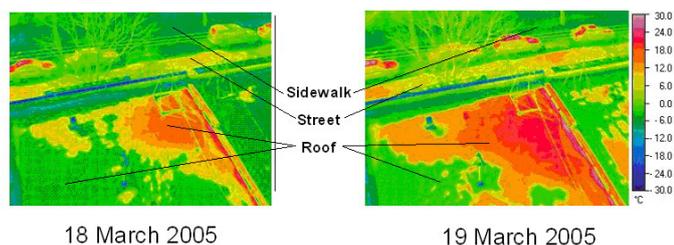


Figure 2. Images obtained from the thermal camera during the early days of MUSE-2005. They indicate a rapid decrease of snow cover on the roof (indicated by the green color) during this 24-h period.

Observations from the 2005 experiment are currently being analysed and already several interesting results have been found. The weather for the first part of the experiment was exceptional, with a continuous series of clear-sky days with a slow but steady decrease of the snow cover in the streets and alleys. Snow on the roofs disappeared rather quickly during MUSE-2005, as evidenced by the thermal image given in Fig. 2 in the first days of the field campaign. Early in the experiment, the snow cover was close to 100% on roofs, in backyards, and in the alleys. A few weeks later, the depth and fractional coverage of the snow pack were greatly reduced (see the photographs in Fig. 3). This diminution of the snow coverage had



Figure 3. Photographs showing the evolution of the snow cover during the MUSE-2005 experiment.



Figure 4. Photograph of the MUSE-2005 team, on the last day of the experiment. From left to right: Michel Jean, Bruno Harvey, Gilles Morneau, Frédéric Chagnon, Stéphane Bélair, Aude Lemonsu, Mario Benjamin, Stavros Antonopoulos, Najat Benbouda, Olivier Gagnon, Jocelyn Mailhot, and Radenko Pavlovic.

a significant impact on the energy balance at the surface. As could be expected, the albedo of the urban surfaces slowly decreased during the experiment, leading to an increase of sensible heat fluxes and of the Bowen ratio (not shown).

Numerical experiments with an off-line version of TEB are currently being prepared to examine the ability of the scheme to capture this evolution of the snow and its impact on the surface energy budget. Work is also underway concerning the parameterization and impact of anthropogenic heat fluxes during the two experiments.

### Acknowledgements

This work was supported by the Chemical, Biological, Radiological, and Nuclear (CBRN) Research and Technology Initiative (CRTI), under Project CRTI #02-0093RD.

**Stéphane Bélair, Jocelyn Mailhot, Aude Lemonsu, Mario Benjamin, Frédéric Chagnon, Gilles Morneau, and Richard Hogue**  
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## Special Edition of Advances in Geosciences

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### Earth System Science Data access, distribution and use for education and research

This special edition deals with Earth System Science Data (ESSD) collection, distribution, archival, analysis, visualization and discovery requirements for enabling distributed and scalable solutions in the Education and Research sectors.

It is a compilation of a subset of papers presented at the special session of the Educational Symposium during the 2005 European Geosciences Union General Assembly in Vienna, Austria.

The manuscripts report innovative developments and experiences with promising and well-accepted technologies that enable ESSD effective access and sharing over distributed computing platforms (e.g. the Internet, the World Wide Web, open Grid platforms, etc.).

The topics covered by this publication include: Web and grid technologies, multimedia instruction, data models, ontology, interoperability and mediation solutions, Scientific

Markup Languages, distributed computing, and digital libraries.

The editors believe that the publication of this special issue focused on ESSD will be a timely and topical contribution that will aid the geosciences community in the development

and implementation of new technologies and strategies. These are necessary to cope with the increasing availability of high-volume and disparate data and the need for appropriate data services to use this information effectively in education and research. The combination of the papers will provide opportunities for continued dialogue and interaction between data providers and consumers, including scientists, educators, planners, and operational practitioners. In addition to the discussion of issues, we believe it will also lead to initiating new areas where further research and development are needed.

We extend our sincere thanks to all of the authors who worked so hard to submit and revise their manuscripts, and special thanks to those who assisted us with the review process and in putting it all together.

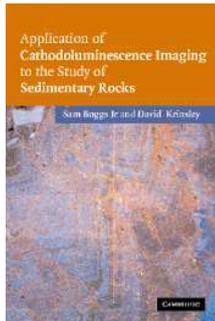
The special edition (Adv. Geosci., 8, 1, 2006) can be accessed online at

<http://www.adv-geosci.net/8/index.html>

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M. Ramamurthy, Unidata/UCAR  
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and University of Florence  
L. Miller, Unidata/UCAR  
Special Volume Editors***



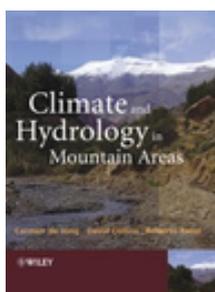
## Application of Cathodoluminescence Imaging to the Study of Sedimentary Rocks



**Authors:** Sam Boggs, Jr. and David Krinsley  
**Publisher:** Cambridge University Press  
**ISBN:** 052185878X  
**YEAR :** 2006  
**EDITION :** 1  
**PAGES :** 176  
**PRICE :** 120.00 €

Minerals in sedimentary rocks emit characteristic visible luminescence called cathodoluminescence (CL) when bombarded by high energy electrons. CL emissions can be displayed as colour images in a cathodoluminescence microscope or as high-resolution monochromatic images in a scanning electron microscope. This provides information not available by other techniques on the provenance of the mineral grains in sedimentary rocks, and insights into diagenetic changes. The book begins with an easily understood presentation of the fundamental principles of CL imaging. This is followed by a description and discussion of the instruments used in CL imaging, and a detailed account of its applications to the study of sedimentary rocks. This is the first comprehensive, easily understood description of the applications of cathodoluminescence imaging to the study of sedimentary rocks. It will be an important resource for academic researchers, industry professionals and advanced graduate students in sedimentary geology.

## Ecology and Applications of Benthic Foraminifera



**Authors:** John W. Murray  
**Publisher:** Cambridge University Press  
**ISBN:** 0521828392  
**YEAR :** 2006  
**EDITION :** 1  
**PAGES :** 438  
**PRICE :** 150.00 €

In this volume John Murray investigates the ecological processes that control the distribution, abundance, and species diversity of benthic foraminifera in environments ranging from marsh to the deepest ocean. To interpret the fossil record it is necessary to have an understanding of the ecology of modern foraminifera and the processes operating after death leading to burial and fossilisation. This book presents the ecological background required to explain how fossil forms are used in dating rocks and reconstructing past environmental features including changes of sea level. It demonstrates how living foraminifera can be used to monitor modern-day environmental change. Ecology and Applications of Benthic Foraminifera presents a comprehensive and global coverage of the subject using all the available literature. It is supported by a website hosting a large database of additional ecological information ([www.cambridge.org/0521828392](http://www.cambridge.org/0521828392)) and will form an important reference for academic researchers and graduate students in Earth and Environmental Sciences.



## Advanced training course on land remote sensing - (Course)

02/09/2007 - 07/09/2007 - Lisbon, Spain

An advanced training course on land remote sensing is being organized by ESA in Lisbon, Portugal, from 2 to 7 September 2007. The training course is hosted by the Instituto Superior de Estatística e Gestão de Informação, Universidade Nova de Lisboa (ISEGI-UNL), with coordination support from the Remote Sensing Unit of the Portuguese Geographic Institute (Instituto Geográfico Português, IGP).

It is targeted to the European and Canadian research and development community, in particular post-doc researchers as well as masters and PhD students.

The programme is organized around 4 main components:

1. Theoretical fundamentals;
2. EO missions and products;
3. EO land applications lectures;
4. Practicals.

All 4 components will address both SAR and Optical/Thermal remote sensing.

Acknowledging the dual nature of the audience, the theoretical fundamentals will be presented in two parallel sessions:

--One targeted to students with a SAR background will address advanced SAR theory (including advanced interferometry and polarimetry) and introduce the basics of Optical/Thermal theory;

--One for students with Optical/Thermal background, will conversely address advanced Optical/Thermal theory (including radiative transfer and surface energy balance) and introduce the basics of SAR.

The emphasis of the course is put on applications, which will be addressed through keynote lectures and dedicated hands-on sessions. Applications presented will cover GMES land thematic priorities:

- Land resources (forestry, agriculture, urban);
- Disasters (fires, floods, landslides);
- Water resources (water availability and quality).

Interested candidates can submit their application online via the website until 15 May 2007. The number of participants is limited to 60. The selection process will take place end May 2007.

### Organizer:

ESA

<http://earth.esa.int/landtraining07>

## MODOBS Summer School on Air-Sea Interaction - (Course)

11/06/2007 - 16/06/2007 - Castro Marina (Lecce) - Italy

This Summer School is intended for PhD students within the network but it is open to graduated, PhD student and Post docs interested in the field. We address current progress in the understanding of processes at the air-sea interface and in the atmospheric boundary layer in open sea and coastal area en-

vironments. It will focus on the connection between advances in our fundamental understanding of surface processes and the application of this knowledge to the largest scales that is a vital and important step forward. Consequently, the importance of satellite remote sensing and numerical modeling as bridges between the small-scale process studies and large-scale circulation of the ocean-atmosphere system will be discussed.

Organised under the "ModObs" Marie Curie Training Network. The host Organisation is the Institute of Atmospheric Sciences and Climate, (ISAC) [www.isac.cnr.it](http://www.isac.cnr.it) of the Italian National Council of Research (CNR).

<http://cassandra.le.isac.cnr.it/summerschool/index.php>

**Anna Maria Sempreviva, ModObs Coordinator.**  
**Institute of Atmospheric Sciences and Climate**  
**Via Fosso del Cavaliere 100 - 00133 - Rome - Italy**

## AsiaFlux training course on micrometeorology - (Course)

17/07/2007 - 26/07/2007 - Seoul, Korea

AsiaFlux has been investigating the carbon budget in various terrestrial ecosystems in Asian region using eddy covariance technique on a tower. Eddy covariance technique is a micrometeorological method to estimate the exchange of carbon dioxide, water vapor and heat between atmosphere and land surface by observing atmospheric turbulence. It is one of the most widely-used methods in this research field for its high accuracy. We are eager to develop our observation sites widely and enhance the network, which should result in promoting our research on elucidation of carbon budget in Asia-specific terrestrial ecosystem.

We therefore proceed holding a training course to disseminate the technology of tower flux observation. Aim of this training course is to provide expertise in eddy covariance technique, such as essential knowledge on carbon balance and micrometeorology as well as practical measurement skills to flux principal investigators in Asia.

We target the researchers who do/will actually carry out flux observation and data analysis, and particularly:

Are going to establish a local flux-network in his/her country and willing to link up with AsiaFlux, OR

Are currently members of AsiaFlux and willing to achieve a deeper understanding on flux measurement.

All lectures and class material will be given in English. A certificate of attendance will be awarded to all the participants at the end of the course.

Goal of AsiaFlux Training Course is to widen our community and establish a foundation of exchanging data. We seek applicants from various backgrounds.

### Organizer:

AsiaFlux

<http://www.asiaflux.net/tc2007/>

## Inland and Nearshore Coastal Water Quality Remote Sensing Workshop - (Meeting)

27/03/2007 - 29/03/2007 - Geneva, Switzerland

**Goal:** To bring together remote sensing data providers and expert users to improve our ability and capacity to remotely assess and monitor inland and nearshore coastal water quality. This is an exciting opportunity to collaboratively chart a course for the future of this emerging science.

**Objectives:** To assess existing and planned remote sensing capabilities; identify gaps relative to user needs in the acquisition, processing, distribution and utilization of remote sensing data and derived products for water quality research and applications; and formulate potential solutions to address these gaps and other related challenges.

**Outcomes:** Recommendations to data providers and GEO Members and Participating Organisations on short-term priorities for improving remote sensing capacity and utilization for water quality assessment and monitoring, as well as formulating short and long term strategies to identify, enable and implement enhanced capabilities.

### Organizer:

The Group on Earth Observations (GEO) Secretariat and the IGWCO (Integrated Global Water Cycle Observations Theme of IGOS-P)

<http://www.earthobservations.org/meetings/workshops/Inland/Inland01.html>

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## 1st International Summit on Hurricanes and Climate Change - (Meeting)

27/05/2007 - 01/06/2007 - Crete, Greece

We invite you to participate in the 1st International Summit on Hurricanes and Climate Change to be held at Aldemar Knossos Royal Village Conference Center on May 27 - June 1, 2007 in Crete, Greece. The meeting is designed to serve as a forum to discuss the most recent progress in hurricanes and climate change.

Sessions will convene in the mornings and early afternoons and will include lectures by invited speakers, as well as talks and poster presentations selected from submitted abstracts. Topics will cover theory, numerical models, data and observations, and impacts.

The deadline for receipt of abstracts, early registration, and hotel reservations is March 15, 2007. Please note that due to limited space, the workshop will be restricted to 100-120 participants. If you plan to attend, please fill out the pre-registration form on-line (<http://www.aegeanconferences.org/Registration/meetingregistration/hurricanes.asp>). Please note that the cost of the accommodation package is 1310 Euro. The accommodation package includes congress registration fee, 5 nights hotel accommodations at Aldemar Knossos Royal Village, all meals, meeting social events, and a city tour.

In order to encourage the participation of young scientists,

the Aegean Conferences is offering Trainee Travel Awards to offset a portion of the travel expenses to the Conference. The recipients of these awards will be selected based on the scientific merit of abstracts submitted by applicants.

Additional information will be sent only to people who respond to this announcement and pre-register on-line. For your convenience and to expedite the communication process, registration materials, including abstract and hotel reservation forms, are available on the web site at [www.aegeanconferences.org](http://www.aegeanconferences.org). Information on Crete, travel to Greece, hotel accommodations, etc. is also available on the web site. Updated information will be available through this site.

We look forward to welcoming you in Crete for a scientifically stimulating and socially enjoyable meeting.

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web: <http://www.bbsr.edu/rpi/>

PS. To download and print a full size poster for your bulletin board go to:

<http://www.aegeanconferences.org/HurricanesClimateChange/hurricanes.pdf>

<http://www.aegeanconferences.org>

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## 4th International Conference on Fog, Fog Collection and Dew - (Meeting)

22/07/2007 - 27/07/2007 - La Serena, Chile

The three main thrusts of The 4th International Conference on Fog, Fog Collection and Dew are science, technology and sustainable development. Scientists and technicians attending the Conference present the most up to date studies in the different fields that study atmospheric phenomenon. The main objective of this conference is to contribute to the environmental care and recovery, using new water resources for economic and social development, and for risk prevention caused by fog.

The use of fog water is sustainable in time, does not harm the environment and is a new source of water which should actively be considered in many developing countries.

We eagerly encourage you to participate in this conference which will be held in the city of La Serena, Chile. This old colonial city of the XVI Century of about 170.000 people is located 470 km north of the capital city of Santiago and has a modern beach resort area. Despite having only about 70 mm of annual precipitation, grapes for wine and "pisco" as well as fruit are grown in the nearby Elqui Valley. In this region you will also find the most important observatories of the Southern Hemisphere considering the pureness of the sky and the vast amount of clear skies during the year which allows the study and observation of the stars.

The topics that will be presented and discussed during the conference are:

- Fog Climatology
- Meteorology and fog modeling
- Fog forecasting
- Spatial and temporal patterns of fog
- Fog Physics and modeling

[http://www.geo.puc.cl/fogconference/html\\_en/index.html](http://www.geo.puc.cl/fogconference/html_en/index.html)

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## Glacier Fluctuations in the Asian High Mountains (UCCS Symposium hosted by IAMAS) - (Meeting)

30/09/2006 - 31/01/2007 - ITALY- PERUGIA

JMS027: Glacier Fluctuations in the Asian High Mountains (UCCS Symposium hosted by IAMAS).

The Symposium will focus on the recent changes of high elevation Asian glaciers since their mass and volume decrease are subject of increasing concern. In addition, 20th century mass loss of these glaciers is considered to contribute markedly to sea level rise.

A high variety of different climate settings from the mon-

soon regions to westerlies to very dry Inner Asian circumstances give reason to complex patterns of the glaciers' sensitivity. Effects of changing climate include mass balance variability, debris cover pattern, glacier surges, glacier terminus fluctuations, and glacier related risks.

We look for several contributions (both poster and oral ones) from different cryospheric research topics. The abstract deadline (electronic submission) is the next 31/01/07.

It will be the possibility to publish papers following symposium presentations on Annals of Glaciology.

The Symposium on high elevation Asian Glaciers is organised in the frame of the next IUGG 2007 (XXIV IUGG General Assembly), the Sponsoring Association is IAMAS in collaboration with: UCCS, IAHS, CGI, Ev-K2-CRN, ICIMOD, HKH-FRIEND, IG.

the convener is Claudio Smiraglia (Italy) and the co-convener are:

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<http://www.iugg2007perugia.it/abstracttype.asp>

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