ANTARCTIC CLIMATE & ECOSYSTEMS COOPERATIVE RESEARCH CENTRE
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MEDIA ALERT

25 FEBRUARY 2010

Embargoed Until 7:00 AM 26 February 2010 (Australian Eastern Daylight Time)

A media event, including graphics presentation, will be held at ACE CRC, Level 2 Centenary Building, Grosvenor Crescent, Sandy Bay, Hobart, Tasmania at 10.00am Friday 26 February

LARGE ICEBERG BREAKS OFF THE MERTZ GLACIER IN THE AUSTRALIAN ANTARCTIC TERRITORY

A joint Australian – French study has discovered the calving of a large iceberg from the Mertz Glacier in the Australian Antarctic Territory. The iceberg, 78 kilometres long with a surface area of 2,500 square kilometres, broke off the Mertz Glacier after being rammed by another iceberg, 97 kilometres long.

The joint Australian - French study, undertaken at the Antarctic Climate and Ecosystems Cooperative Research Centre (ACECRC) in Hobart, and in France, was initiated in 2007 during the International Polar Year to study the 'tongue' of the Mertz Glacier and the 'calving' of icebergs from it. The Mertz Glacier had a large crack in it for two decades. A second crack developed opposite the first in the early part of the 21st century. The collaboration studied whether these two cracks would eventually meet, and the processes that would lead to the calving of an iceberg.

More information on this discovery is in the Media Release from LEGOS (France) attached (next page).

Pictures and Vision available at: ftp://ftp.aad.gov.au/Public/News_Media_Files/MertzGlacier/

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French Scientist working on this study: Dr Benoit Legresy, LEGOS (CNRS-UPS-CNES-IRD), TOULOUSE, FRANCE, benoit.legresy@legos.obs-mip.fr

Backgrounder

The ACE CRC is a unique collaboration between core partners the Australian Antarctic Division, CSIRO Marine and Atmosphere, the University of Tasmania, the Bureau of Meteorology and a consortium of supporting partners. It is funded by the Australian Government's Cooperative Research Centre Program. The ACE CRC's mission is to understand the crucial role played by Antarctica and the Southern Ocean in global climate, and the impacts of climate change on Australia and the world, and to inform governments, industry, the community and scientists about climate change to guide our future.

The ACE CRC's core partners are the Australian Antarctic Division, the Australian Bureau of Meteorology, CSIRO Marine and Atmospheric Research, and the University of Tasmania. Supporting partners are the Alfred Wegener Institute for Polar and Marine Research (Germany), the Australian Department of Climate Change, the Australian National University, the National Institute of Water and Atmospheric Research (New Zealand), Silicon Graphics International, and the Tasmanian Department of Economic Development. Established and supported under the Australian Government's Cooperative Research Centre Program.

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CRAC !!! IN THE MERTZ GLACIER, ANTARCTICA.

Benoit LEGRESY(1), Neal YOUNG(2), Lydie LESCARMONTIER(1,2), Richard COLEMAN(4), Robert MASSOM(2,3), Barry GILES(2), Alexander FRASER(2), Roland WARNER(2,3), Ben GALTON-FENZI(2), Laurent TESTUT, Marie-Noelle HOUSSAIS(5) and Guillaume MASSE(5).

The 22nd February 2010.

(1) LEGOS (CNRS-UPS-CNES-IRD), Toulouse, France ; (2) ACE CRC, (3) AAD, (4) IMAS U Tas, Hobart, Tasmania, AUSTRALIA ; (5) LOCEAN (CNRS-UPCM-IRD-MNHN), Paris, FRANCE

A massive iceberg has just calved from the Mertz Glacier Tongue in East Antarctica. This calving event was detected by a joint French-Australian team working on a project called “CRACICE” (Cooperative Research into Antarctic Calving and Iceberg Evolution). The iceberg has an area of about 2550 square kilometers, an overall length of 78 kilometers, width of 33 to 39 km, and represents about half the length of the glacier tongue. Satellite imagery shows the iceberg separation occurred on 12 / 13 of February.

The CRACICE team is carrying out a long-term study on how fractures developing in the Mertz Glacier Tongue lead to iceberg calving, and the fate of the icebergs and remaining glacier tongue. Their work involves surveys using satellite data and GPS beacons deployed on the glacier to measure the evolution of the rifts and the calving process. The team has followed the development of two major rifts cutting across the tongue, from opposite sides, over many years. The rifts had almost joined, when a similarly massive iceberg, B9B, collided with the eastern flank of the tongue leading to the final separation.

A series of images from the ESA ENVISAT satellite with its radar imaging instrument ASAR shows the well developed crevasses from each side of the glacier and the B-9B iceberg approaching from the right side of the glacier flow (East) and pushing the glacier tongue to break at the rift line.

A number of scientific programs in the area are ongoing and will study the impact of such a major environment turnover in the region.

CRACICE has partners from LEGOS (Toulouse, France), and the University of Tasmania, Antarctic Climate and Ecosystems Cooperative Research Centre [ACE CRC] and Australian Antarctic Division (Hobart, Australia). The project is supported by INSU/CNRS, IPEV, CNES, the ARC, University of Tasmania and the Australian Antarctic Division, and various space agencies through the provision of satellite data.

Contact :

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Images and Background information-SAR Images from the ENVISAT Satellite:

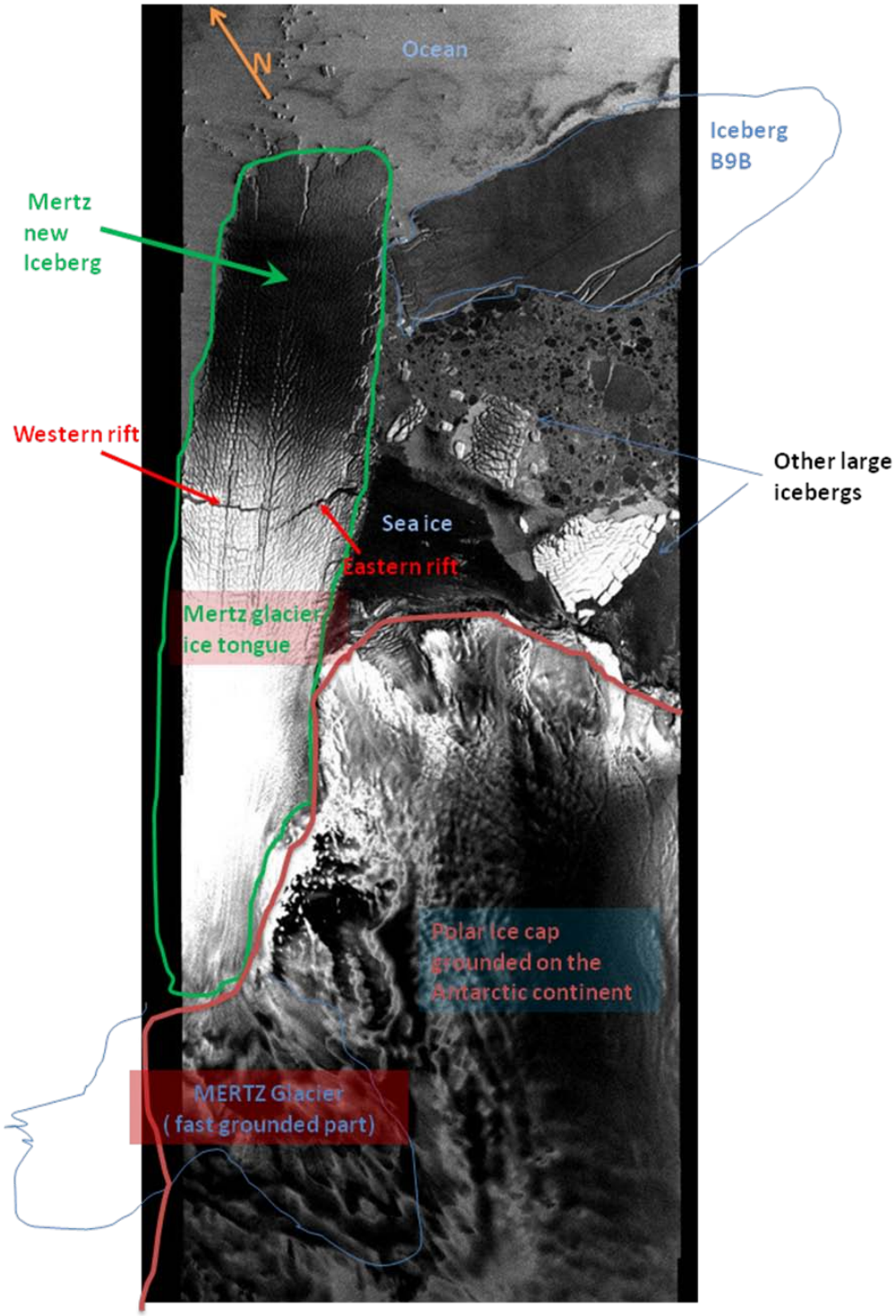

Figure ASAR-1 : ESA© ASAR image from February 7th 2010 showing the B9B iceberg approaching the Mertz glacier tongue. The ice tongue is rifted from each side but still attached to the glacier in the middle. The image is 100 km wide and 200km long.

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Figure ASAR-2 : ESA© ASAR image from the 10th of February 2010 and showing the B9B iceberg next to the Mertz Glacier tongue. The glacier tongue is still attached.

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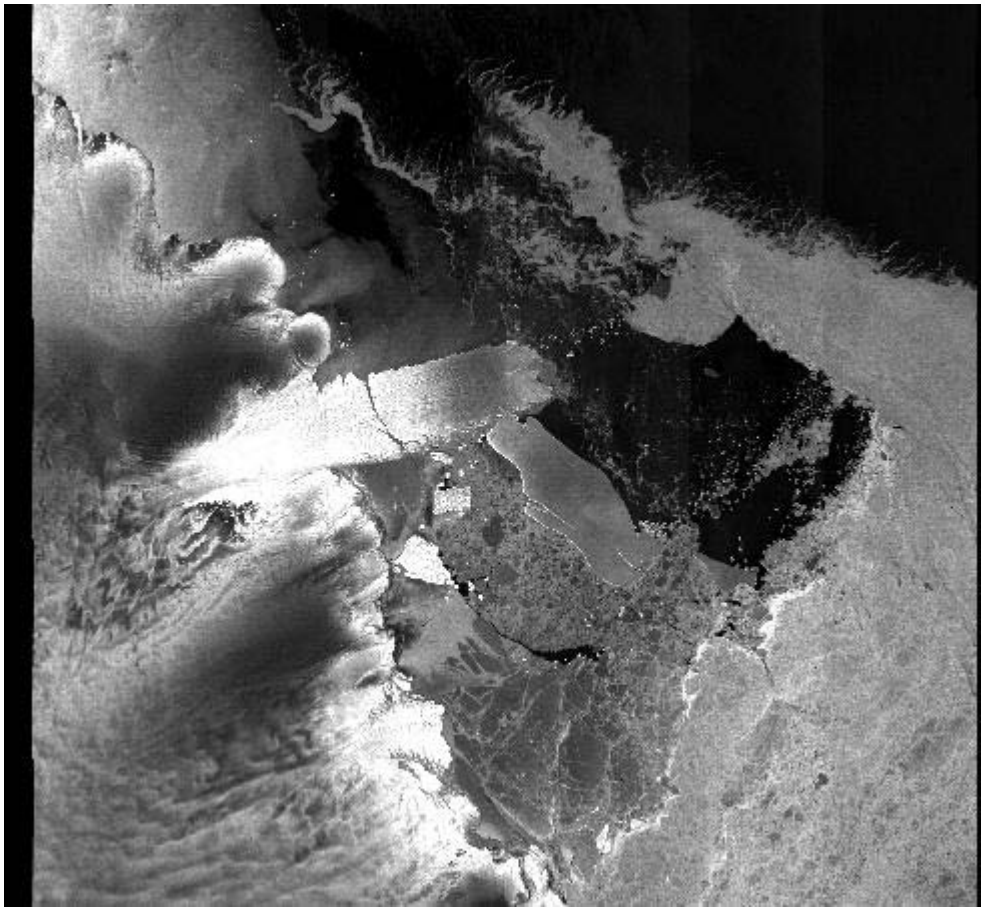

Figure ASAR-3 : ESA© ASAR image from the 13th of February 2010. The fracture is now complete across the glacier tongue and is opening.

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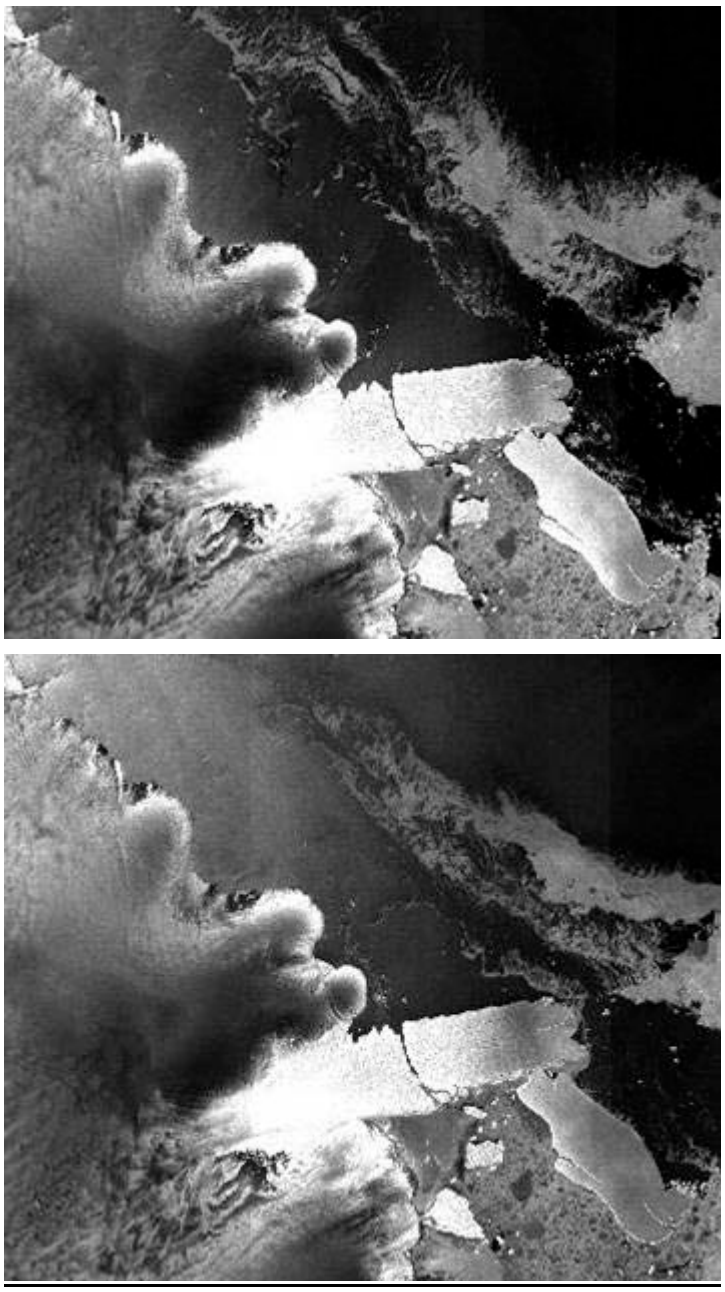

Figure ASAR-4 : ESA © ENVISAT ASAR images from the 16th and 19th of February 2010 showing the iceberg newly calved from the Mertz Glacier Tongue. The final separation did not simply occur along all the line of the two pre-existing rifts but sheared across some sections to produce a clean line. The iceberg is now turning about a point at its north-west corner which confirms our belief that is has been resting against a relatively shallow point of the sea-floor.

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Description of the calving event:

The Mertz Glacier flows into the ocean with a flux of 10 to 12 Gigatons of ice per year. The floating part of the glacier, which originally extended over 160km from the grounding line to the front, is now only 80km long. The glacier tongue which protruded 100+ km from the coastline is now about 20-25 km long. The new iceberg is 78 km long overall and 33 to 39 km wide with an average thickness of 400 m. The collision of bigger similarly large iceberg, designated B-9B, with the glacier tongue in early February apparently precipitated the calving event. The satellite images available indicate that the event occurred between the 12th and 13th of February, certainly between the 10th and 13th as one can see in the images below. The data being acquired by in situ GPS beacons (to be collected later on this year) will tell much more accurately the sequence of events.

Two large rifts cutting through the southern part of the glacier tongue have been developing over many years. Rifting progressed from the eastern margin of the Mertz Glacier in the 1990s until 2002 when another rift started to develop from the western side. Recently the two rifts had almost joined and the western rift subsequently became very active, leaving the northern part of the glacier tongue attached like a “loose tooth”. The final break when B-9B collided with the eastern flank of the glacier tongue. But it did not simply separate along the line of these pre-existing rifts. The break followed most of the western rift and the ice sheared across the section with the eastern rift to produce a clean line which is allowing the southern end of the iceberg to move freely past the remainder of the tongue.

B-9B, itself about 97 km by 20-35 km, is a large part of the B9 iceberg that calved from the Ross Ice Shelf in 1987 and drifted westwards until it ran aground in 1992 on the Ninnis Bank, less than 100 km to the east of the Mertz Glacier Tongue. After remaining in roughly the same location for about 18 years, B-9B recently ungrounded and rotated to collide with the Mertz Glacier Tongue. The Mertz Glacier Tongue originates in a 60km long fjord and had extended a further 100km into the Southern Ocean. It advanced into the ocean at slightly more than 1 km per year. The new iceberg thus represents about 70 years of glacier advance.

The future behavior of the two icebergs is of great interest. Satellite images show that the recently-calved Mertz iceberg is moving into the Adélie Depression, a coastal basin situated between the Mertz Glacier and the French Antarctic station of Dumont D’Urville to the west. This depression one of the major sites of dense water formation which drives the world’s deep ocean circulation. The dense water is formed from ocean water that circulates onto the continental shelf and interacts with the glacier tongue, and by high rates of sea ice formation within the Mertz Glacier polynya to the immediate west of the former glacier tongue. The future position of the two giant icebergs will likely affect local ocean circulation, the extent (and timing?) of the polynya, sea ice production, and deep water formation. It also has

important implications for the marine biology of this region. A number of on-going field and research activities will follow up this calving event and its impact on the local environment.

Implication on other aspects of the environment in the area spanning from the Mertz Glacier to the French Antarctic station Dumont d'Urville.

A number of scientific projects are undertaking studies of the environment of the Adélie Land – Mertz region. These projects look at the glaciology, sea level, oceanography, biology aspects. They are CRACICE, CETA, ECOPHY, ICELIPIDS, DACOTA, NIVMER, ALBION, ICOTA, OISEAUX PLONGEURS, ORNITHOECO, REVOLTA, SURVOSTRAL, details are provided in the table at the end. One can find most of them on the IPEV website (http://www.institut-polaire.fr/ipev/programmes_de_recherche/en_cours/(region)/1).

1. **On the oceanography of the polynyas potentially to be impacted by the calving and icebergs evolution :**

The Mertz Glacier Polynya (MGP), which forms each winter occupies the area immediately northwest of the Mertz Glacier Tongue (MGT) and in the neighboring coastal bays. Strong off-shore winds across this area maintain high sea ice formation rates which are crucial to the formation of very saline dense shelf water, a major ingredient of the world ocean circulation. Since 2007, a joint French-Australian IPY [International Polar Year] initiative, based on a collaboration between the French ALBION project and a research effort of the CSIRO (S. Rintoul), has allowed conducting an observational programme off the Adélie – George V Coast Land Coast in order to monitor the formation of dense water in the vicinity of the MGP and its export to the word ocean circulation. The existence of these polynyas as well as the ultimate Temperature-Salinity characteristics of the dense water heavily depend on interactions with the MGT. The future position of the two giant icebergs will likely affect the extent of the polynya, the regional ocean circulation and the dense water formation rates and properties. These effects or simply the presence of the icebergs may also have important implications for the marine biology of this region. The French-Australian collaboration is an on-going effort. In addition to regular summer oceanographic surveys, several instrumented lines have been deployed and maintained in the area, the most recent during the last cruise of the Astrolabe in January 2010. This mooring array, distributed in the Adélie Depression with one of the lines close to the calving area, will be a very useful tool to document "on-line" the drastic oceanographic changes which are expected to take place after the calving of the tongue. This calving is indeed a unique in-situ sensitivity experiment that will help to evaluate the climatic impacts of this region on the large scale ocean circulation.

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The oceanographic ALBION project (Adelie Land Bottom water formation and Ice Ocean interactions)) is a French program supported by the INSU/CNRS, the French polar agency IPEV, and the French Space Agency, CNES. It is part of collaboration with the CSIRO/AAD observational program (CASO/CEAMARC S. Rintoul). This collaboration is also part of the international SASSI project initiated during the IPY, which gathers a consortium of nations (Japan, Finland, New Zealand, China, Italy, USA, UK, Brazil, Germany, Australia, Russia and France) involved in the monitoring of the Antarctic continental margin.

2. On the biodiversity:

These polynyas constitute places of high biodiversity and food concentration for birds and marine mammals, in particular emperor penguins the only birds to reproduce during winter in Antarctica. The emperor colony at Pointe Géologie, next to Dumont d'Urville, is closely dependent on the ocean resources. Therefore significant modifications in the marine environment may have large consequences, not only on the local biodiversity but also on this emblematic penguin colony that was brought to prominence in the movie by Luc Jacquet « March of the Penguins » (Production Bonne Pioche).