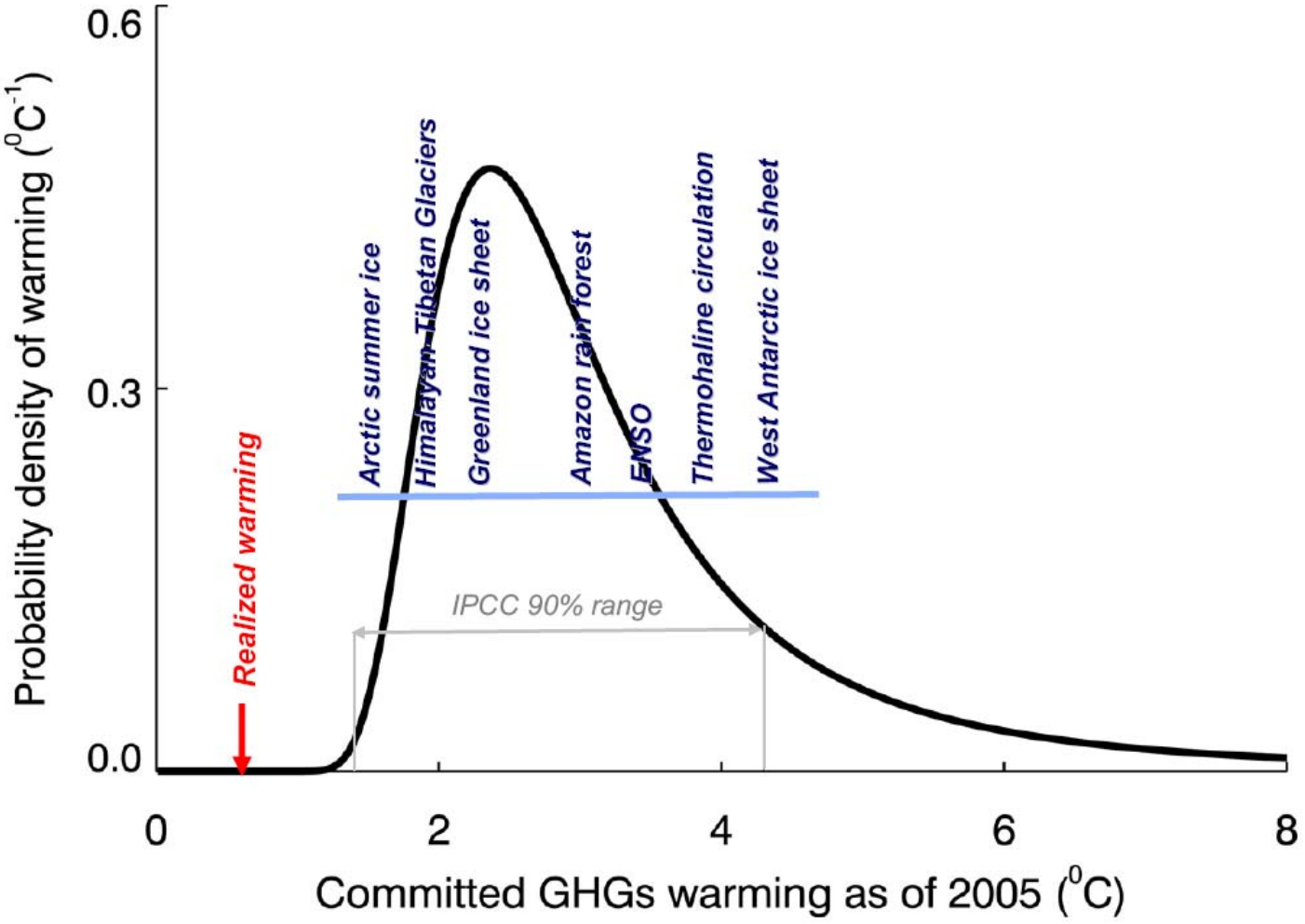
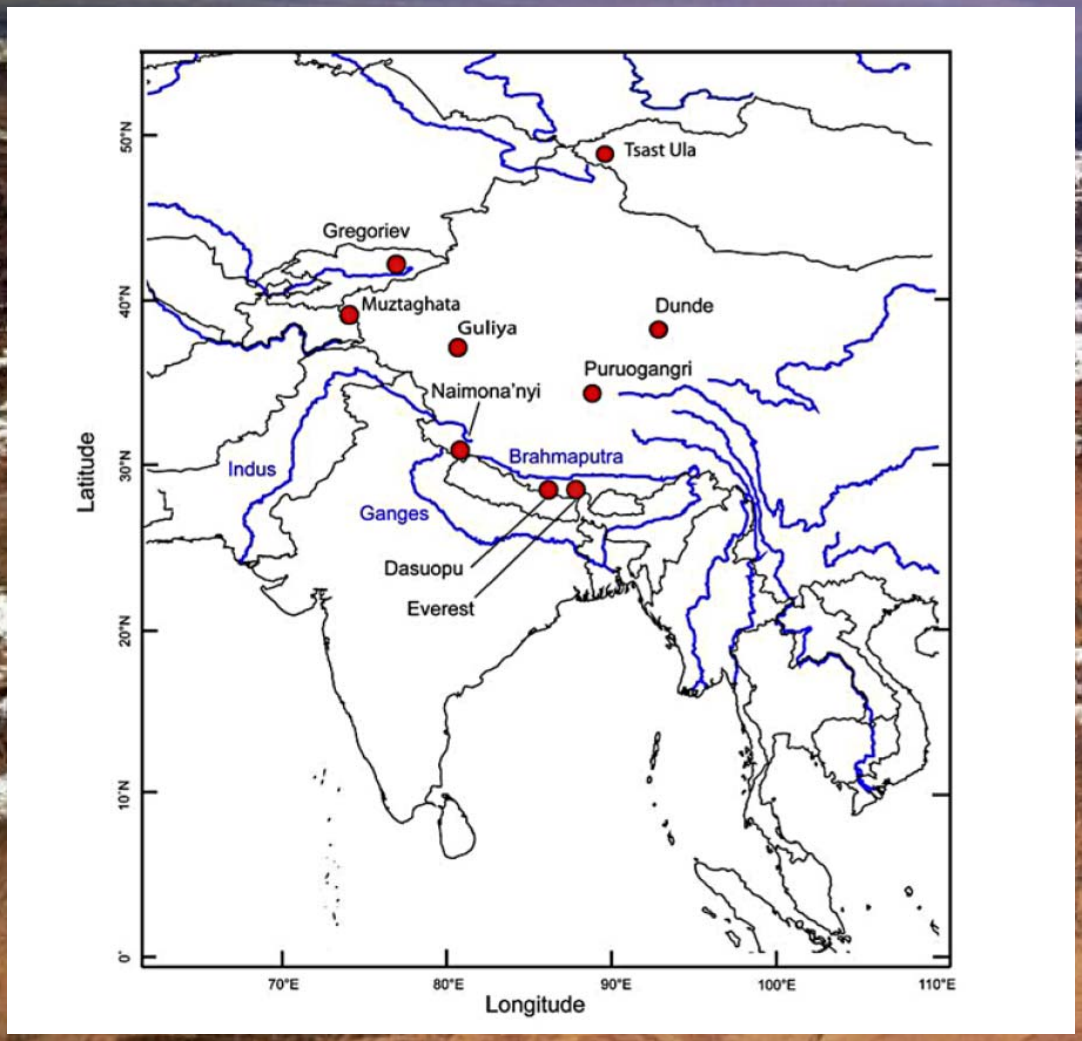
# Dangerous Warming Commitment




(Ramanathan & Feng 2008 PNAS)




„Mass loss on Himalayan glacier endangers water resources“ (Kehrwald et al. 2008 Geophys Res Lett)

# Extensive dynamic thinning on the margins of the Greenland and Antarctic ice sheets

Hamish D. Pritchard[1], Robert J. Arthern[1], David G. Vaughan[1] & Laura A. Edwards[2]

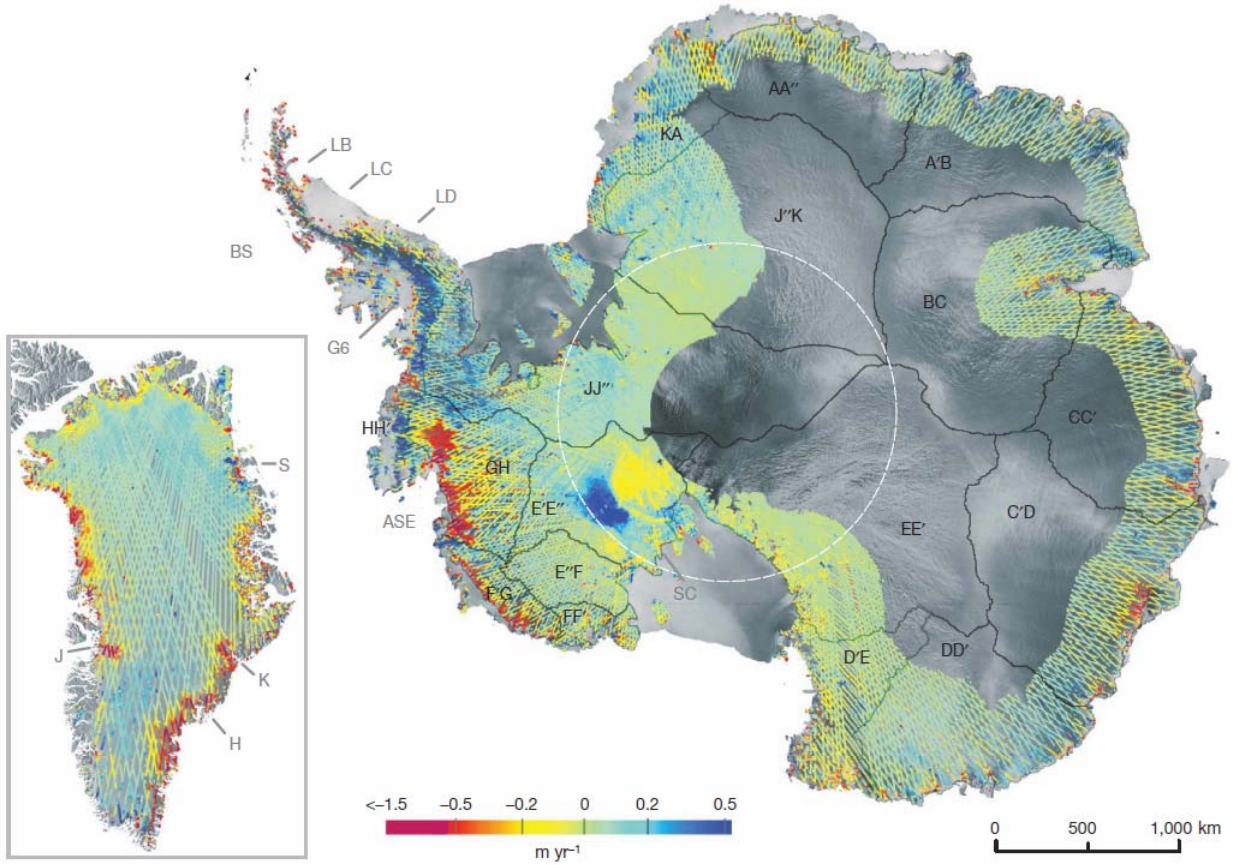



**Figure 2 | Rate of change of surface elevation for Antarctica and Greenland.** Change measurements are median filtered (10-km radius), spatially averaged (5-km radius) and gridded to 3 km, from intervals ($\Delta t$) of at least 365 d, over the period 2003–2007 (mean $\Delta t$ is 728 d for Antarctica and 746 d for Greenland). East Antarctic data cropped to 2,500-m altitude. White dashed line (at 81.5° S) shows southern limit of radar altimetry measurements. Labels are for sites and drainage sectors (see text).

Nature, 24 Sep 2009

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*In this issue*

# *Climate change and the fate of the Amazon*

*Papers of a Theme Issue compiled and edited by Yadvinder Malhi, Richard Betts and Timmons Roberts*

*The world's longest running international science journal*

Royal Society Publishing
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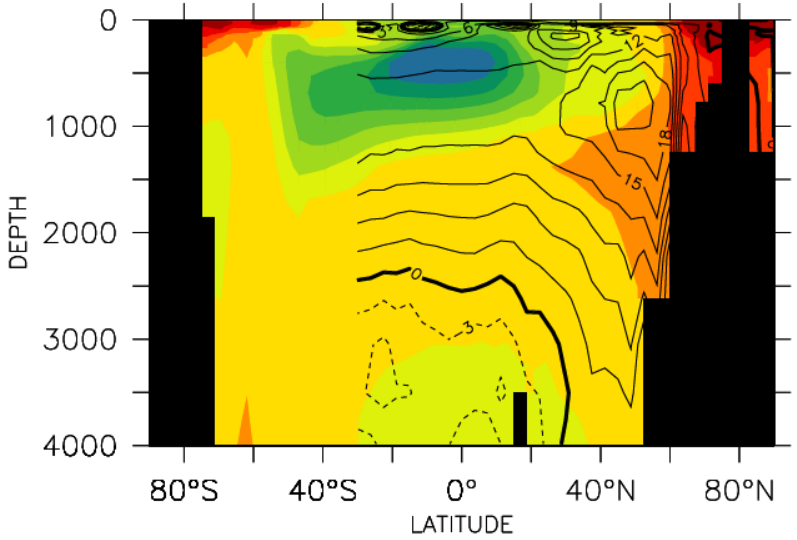
defra

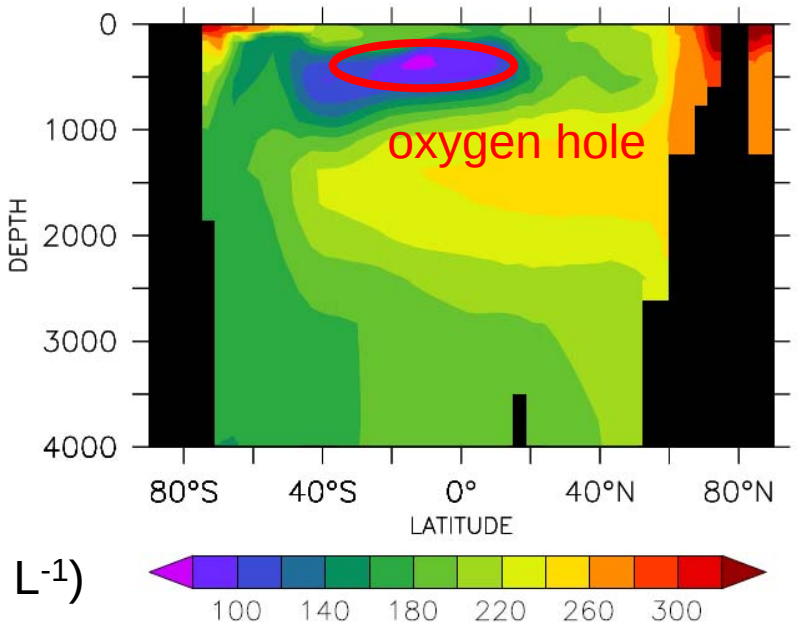
27 May 2008

# Ocean Acidification Triggers Marine Oxygen Holes

**present day**




**year 3000**
**global warming**
**+ reduced ballast**




Oxygen concentration ($\mu$mol $L^{-1}$)

Key Message 2 Synthesis Report (Hofmann&Schellnhuber 2009 PNAS)

PIK

# PNAS Special Feature on Tipping Elements, December 2009

## *Editor Hans Joachim Schellnhuber*

1. **Washington R *et al.* Dust as a tipping element: The Bodélé Depression**
2. **Malhi Y *et al.* Exploring the likelihood and mechanism of a climate-change induced dieback of the Amazon rainforest**
3. **Levermann A *et al.* Basic mechanism for abrupt monsoon transitions**
4. **Latif M *et al.* El Niño/Southern Oscillation response to global warming**
5. **Notz D The big melt: Is the loss of ice sheets and Arctic sea ice unstoppable?**
6. **Riebesell U *et al.* Sensitivity of marine carbon fluxes to ocean change**
7. **Archer D *et al.* Ocean methane hydrates as a slow tipping point in the global carbon cycle**
8. **Hofmann M *et al.* On the stability of the Atlantic Meridional Overturning Circulation**
9. **Molina M *et al.* Reducing abrupt climate change risk using Montreal Protocal and other regulatory actions to complement cuts in CO2 emissions**

# G8 and Emerging Economies Agree on 2° C Long-term Target

DECLARATION OF THE LEADERS
THE MAJOR ECONOMIES FORUM ON
ENERGY AND CLIMATE

We, the leaders of Australia, Brazil, Canada, China, the European Union, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, South Africa, the United Kingdom, and the United States met as the Major Economies Forum on Energy and Climate in L'Aquila, Italy, on July 9, 2009, and declare as follows:

1. Consistent with the Convention's objective and science:

Our countries will undertake transparent nationally appropriate mitigation actions, subject to applicable measurement, reporting, and verification, and prepare low-carbon growth plans. Developed countries among us will take the lead by promptly undertaking robust aggregate and individual reductions in the midterm consistent with our respective ambitious long-term objectives and will work together before Copenhagen to achieve a strong result in this regard. Developing countries among us will promptly undertake actions whose projected effects on emissions represent a meaningful deviation from business as usual in the midterm, in the context of sustainable development, supported by financing, technology, and capacity-building. The peaking of global and national emissions should take place as soon as possible, recognizing that the timeframe for peaking will be longer in developing countries, bearing in mind that social and economic development and poverty eradication are the first and overriding priorities in developing countries and that low-carbon development is indispensible to sustainable development. We recognize the scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2 degrees C. In this regard and in the context of the ultimate objective of the Convention and the Bali Action Plan, we will work between now and Copenhagen, with each other and under the Convention, to identify a global goal for substantially reducing global emissions by 2050. Progress toward the global goal would be regularly reviewed, noting the importance of frequent, comprehensive, and accurate inventories.

We will take steps nationally and internationally, including under the Convention, to reduce emissions from deforestation and forest degradation and to enhance removals of greenhouse gas emissions by forests, including providing enhanced support to developing countries for such purposes.

2. Adaptation to the adverse effects of climate change is essential. Such effects are already taking place. Further, while increased mitigation efforts will reduce climate impacts, even the most aggressive mitigation



RESPONSIBLE LEADERSHIP FOR A SUSTAINABLE FUTURE

Climate change and environment

Fighting climate change

63. This is a crucial year for taking rapid and effective global action to combat climate change. We welcome the decision taken within the UN Framework Convention on Climate Change (UNFCCC) in Poznan to enter full negotiating mode, in order to shape a global and comprehensive post-2012 agreement by the end of 2009 in Copenhagen, as mandated by the Bali Conference in 2007. We must seize this decisive opportunity to achieve a truly ambitious global consensus.

64. We reconfirm our strong commitment to the UNFCCC negotiations and to the successful conclusion of a global, wide-ranging and ambitious post-2012 agreement in Copenhagen, involving all countries, consistent with the principle of common but differentiated responsibilities and respective capabilities. In this context we also welcome the constructive contribution of the Major Economies Forum on Energy and Climate to support a successful outcome in Copenhagen. We call upon all Parties to the UNFCCC and to its Kyoto Protocol to ensure that the negotiations under both the Convention and the Protocol result in a coherent and environmentally effective global agreement.

65. We reaffirm the importance of the work of the Intergovernmental Panel on Climate Change (IPCC) and notably of its Fourth Assessment Report, which constitutes the most comprehensive assessment of the science. We recognise the broad scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2°C. Because this global challenge can only be met by a global response, we reiterate our willingness to share with all countries the goal of achieving at least a 50% reduction of global emissions by 2050, recognising that this implies that global emissions need to peak as soon as possible and decline thereafter. As part of this, we also support a goal of developed countries reducing emissions of greenhouse gases in aggregate by 80% or more by 2050 compared to 1990 or more recent years. Consistent with this ambitious long-term objective, we will undertake robust aggregate and individual mid-term reductions, taking into account that baselines may vary and that efforts need to be comparable. Similarly, major emerging economies need to undertake quantifiable actions to collectively reduce emissions significantly below business-as-usual by a specified year.

66. We recognize that the accelerated phase-out of HCFCs mandated under the Montreal Protocol is leading to a rapid increase in the use of HFCs, many of which are very potent GHGs. Therefore we will work with our partners to ensure that HFC emissions reductions are achieved under the appropriate framework. We are also committed to taking rapid action to address other significant climate forcing agents, such as black carbon. These efforts, however, must not draw away attention from

constitutes the most comprehensive assessment of the science. We recognise the [broad] scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2°C. Because this global challenge can only be