

**Government response to the House of Commons Science and Technology Committee 8th report of session 2009-10 : the disclosure of climate data from the Climatic Research Unit at the University of East Anglia / presented to Parliament by the Secretary of State for Energy and Climate Change by command of Her Majesty.**

**Contributors**

Great Britain. Department of Energy and Climate Change.

**Publication/Creation**

London : TSO, 2010.

**Persistent URL**

<https://wellcomecollection.org/works/xzqkqfdg>

**License and attribution**

You have permission to make copies of this work under an Open Government license.

This licence permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Image source should be attributed as specified in the full catalogue record. If no source is given the image should be attributed to Wellcome Collection.



Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
<https://wellcomecollection.org>



**Government Response to the House of Commons  
Science and Technology Committee 8<sup>th</sup> Report of Session 2009-10:  
The disclosure of climate data from the Climatic Research Unit at the  
University of East Anglia**

Cm 7934

£5.75

DBC Hou/C

WELLCOME  
LIBRARY

General Collections

P

6711



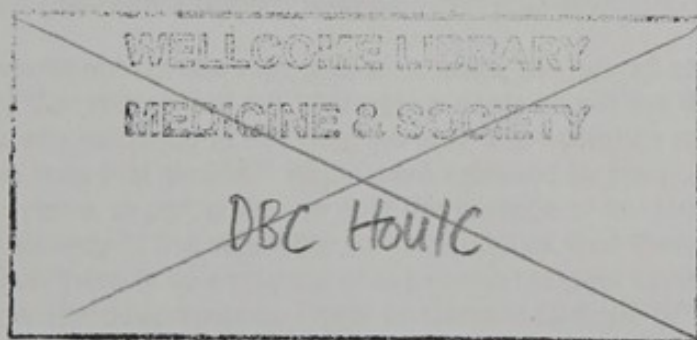
22503117258



**Government Response to the House of Commons  
Science and Technology Committee 8<sup>th</sup> Report of Session 2009-10:  
The disclosure of climate data from the Climatic Research Unit at the  
University of East Anglia**

Presented to Parliament  
by the Secretary of State for Energy and Climate Change  
by Command of Her Majesty

September 2010



**© Crown Copyright 2010**

The text in this document (excluding the Royal Arms and other departmental or agency logos) may be reproduced free of charge in any format or medium providing it is reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown copyright and the title of the document specified. Where we have identified any third party copyright material you will need to obtain permission from the copyright holders concerned.

ISBN: 9780101793421

Printed in the UK by The Stationery Office Limited  
on behalf of the Controller of Her Majesty's Stationery Office

ID P002390849 10/10

Printed on paper containing 75% recycled fibre content minimum.

## **Government Response to the House of Commons Science and Technology Committee Report 'The disclosure of climate data from the Climatic Research Unit at the University of East Anglia'**

### **Introduction**

1. In November 2009, data including emails were illegally released from a computer server at the University of East Anglia's (UEA) Climatic Research Unit (CRU). The emails, which included exchanges between climate scientists, were used by critics to allege that data had been manipulated or deleted in order to support evidence on temperature change.

2. On 31 March 2010 the House of Commons Science and Technology Committee published its report on the disclosure of climate data from the Climatic Research Unit at the University of East Anglia.

3. The Committee looked at:

- What had taken place;
- The steps that had been taken to investigate the allegations and to test the integrity of the data held and used by CRU;
- How the work of CRU has been replicated by other academics; and
- CRU's practices of data sharing and transparency.

4. The Government is grateful for the work that members of the Committee have put into this report. We also note that two further inquiries have reported into these issues at the request of the University of East Anglia. The Independent Scientific Appraisal Panel ('the Scientific Appraisal'), chaired by Lord Oxburgh, reported on 14 April 2010 and the Independent Climate Change Email Review, chaired by Sir Muir Russell ('the Muir Russell Review'), reported on 7 July 2010. We welcome the University of East Anglia's commitment to ensuring the incident was investigated, and are grateful that many distinguished minds have dedicated their time to this endeavour. While this response is primarily concerned with addressing the recommendations of the Science and Technology Committee Report, we have also made reference to findings of the two additional reviews where appropriate.

5. In considering our response, the Government is concerned that the reviews speak to the two fundamental issues of events at CRU: firstly, were CRU's data and science sound, and secondly, were the University and its scientists intentionally trying to hide information? In addition, we have considered how these events reflect more broadly on the scientific community's practices of generating and sharing data.

6. The Government agrees with, and welcomes, the overall assessment of the Science and Technology Committee that the information contained in the illegally-disclosed emails does not provide any evidence to discredit the scientific evidence of anthropogenic climate change. We note that similar findings were returned by both Lord Oxburgh's and Sir Muir Russell's reviews. In particular, we note the findings of the Muir Russell Review: that the rigour and honesty of the scientists are not in doubt; that there is no evidence of bias in data selection; that there is no evidence of subversion of peer review and that allegations of misusing the Intergovernmental Panel on Climate Change (IPCC) process cannot be upheld.

7. We note that the University's response to Freedom of Information requests have been criticised by all three independent reviews. We urge all Universities and public scientific bodies to ensure that their responsibilities under Freedom of Information law are properly understood, communicated and implemented.

8. The Science and Technology Committee report acknowledges the importance of transparency and openness in climate science. The Government welcomes these findings, and agrees with the principle that data associated with publicly-funded research should be made available where possible. In addition, we note that the review teams considered that the emails show a real reluctance to share information with perceived critics. The Muir Russell Review in particular proposes that scientists find ways to engage critics—including those active in the 'blogosphere'—and we support the climate science community in exploring these areas.

9. We note that Norfolk Police are still investigating the process by which the emails were originally released and continue to condemn any illegal activity involved.

10. The Committee's recommendations are shown in bold and the paragraph references at the end of each recommendation correspond with those in the Committee's report. The Government's response is given beneath each recommendation or group of recommendations.

### **Datasets**

**We recognise that some of the e-mails suggest a blunt refusal to share data, even unrestricted data, with others. We acknowledge that Professor Jones must have found it frustrating to handle requests for data that he knew—or perceived—were motivated by a desire simply to seek to undermine his work. But Professor Jones's failure to handle helpfully requests for data in a field as important and controversial as climate science was bound to be viewed with suspicion. He was obviously frustrated by other workers in the field trying to "undermine" his work, but his actions were inevitably counterproductive. Professor Jones told us that the published e-mails represented only "one tenth of 1%" of his output, which amounts to one million e-mails, and that we were only seeing the end of a protracted series of e-mail exchanges. We consider that further suspicion could have been allayed by releasing all the e-mails. In addition, we consider that had the available raw data been available online from an early stage, these kinds of unfortunate e-mail exchanges would not have occurred. In our view, CRU should have been more open with its raw data and followed the more open approach of NASA to making data available. (Paragraph 38)**

**We are not in a position to set out any further the extent, if any, to which CRU should have made the data available in the interests of transparency, and we hope that the Independent Climate Change Email Review will reach specific conclusions on this point. However, transparency and accountability are of increasing importance to the public, so we recommend that the Government reviews the rules for the accessibility of data sets collected and analysed with UK public money. (Paragraph 39)**

**The conspiracy claims were fuelled by CRU's refusal to share the most detailed aspects of its methodologies, for example, the computer codes for producing global temperature averages. We note that the research passed the peer review process of some highly reputable journals. However, we note that CRU could have been more open at that time in providing the detailed methodological working on its website. We recommend that all publicly funded research groups consider whether they are being as open as they can be, and ought to be, with the details of their methodologies. (Paragraph 45)**

**It is not standard practice in climate science and many other fields to publish the raw data and the computer code in academic papers. We think that this is problematic because climate science is a matter of global importance and of public interest, and therefore the quality and transparency of the science should be irreproachable. We therefore consider that climate scientists should take steps to make available all the**

data used to generate their published work, including raw data; and it should also be made clear and referenced where data has been used but, because of commercial or national security reasons is not available. Scientists are also, under Freedom of Information laws and under the rules of normal scientific conduct, entitled to withhold data which is due to be published under the peer-review process. In addition, scientists should take steps to make available in full their methodological workings, including the computer codes. Data and methodological workings should be provided via the internet. There should be enough information published to allow verification. (Paragraph 54)

Reputation does not, however rest solely on the quality of work as it should. It also depends on perception. It is self-evident that the disclosure of the CRU e-mails has damaged the reputation of UK climate science and, as views on global warming have become polarised, any deviation from the highest scientific standards will be pounced on. As we explained in chapter 2, the practices and methods of climate science are a key issue. If the practices of CRU are found to be in line with the rest of climate science, the question would arise whether climate science methods of operation need to change. In this event we would recommend that the scientific community should consider changing those practices to ensure greater transparency. (Paragraph 132)

11. The Government accepts that reputation and perception are important and the main question is whether CRU's data handling and scientific processes were robust. The Scientific Appraisal concluded that CRU was not guilty of scientific malpractice but called for better data management.

12. Many of the Committee's recommendations above are broad and directed at the wider academic community. The Government is committed to increasing transparency and believes that publicly-funded research data should be made available with a presumption in favour of transparency and that researchers should be as open as possible in communicating their methodology, results and conclusions. This is compatible with the basic scientific approach, which depends on repetition and challenge of results. It is already the policy of many research funders to encourage such openness.

13. Openness and transparency should be the presumption. That said, there are a number of good reasons why it is not always possible or appropriate to make data available immediately or even at all. In the instance of the CRU, the scientists were not legally allowed to give out the data (although there is the question of whether they could have gone back to national meteorological societies to get permission to release data). Other reasons can include the need for data and methodology to be subject to the scientific peer review process prior to being made available, the need to respect commercial rights to certain data, security considerations and the need to protect personal confidentiality.

14. The Government will consider the issue further alongside its broader work on transparency and ensure that any such exemptions are fully justified and compatible with our commitment to transparency and right of access to data.

**The evidence that we have seen does not suggest that Professor Jones was trying to subvert the peer review process. Academics should not be criticised for making informal comments on academic papers. The Independent Climate Change Email Review should look in detail at all of these claims. (Paragraph 73)**

15. We agree with the Committee's comments on the rights of scientists to comment informally on academic papers, noting that the scientific method relies on constructive challenge. We also note that the Muir Russell Review team investigated CRU scientists' involvements in peer review, and concluded that none of the allegations investigated



represented subversion of the peer-review process, nor an unreasonable attempt to influence the editorial policy of journals. In addition, the Review notes:

*"It might be thought that this reflects a pattern of behaviour that is partial and aggressive, but we think it more plausible that it reflects the rough and tumble of interaction in an area of science that has become heavily contested and where strongly opposed and aggressively expressed positions have been taken up on both sides. The evidence from an editor of a journal in an often strongly contested area such as medicine...suggests that such instances are common and that they do not in general threaten the integrity of peer review or publication."*

**In our call for evidence we asked for submissions on the question of how independent the other international data sets are. We have established to the extent that a limited inquiry of this nature can, that the NCDC/NOAA and GISS/NASA data sets measuring temperature changes on land and at sea have arrived at similar conclusions using similar data to that used by CRU, but using independently devised methodologies. We have further identified that there are two other data sets (University of Alabama and Remote Sensing Systems), using satellite observations that use entirely different data than that used by CRU. These also confirm the findings of the CRU work. We therefore conclude that there is independent verification, through the use of other methodologies and other sources of data, of the results and conclusions of the Climate Research Unit at the University of East Anglia. (Paragraph 49)**

16. The Science and Technology Committee's recommendations are in line with the Government's own assessment, as expressed in the oral evidence of the Government Chief Scientific Adviser, that there are multiple sources of evidence corroborating the observed increase in the Earth's temperature during the twentieth century.

17. This warming is evident in the three near-surface data sets listed above (NCDC/NOAA, GISS/NASA and HadCRUT) as well as the two satellite datasets cited by the Committee and quoted in the written evidence of Lord Lawson of Blaby (University of Alabama and RSS). In addition, we note that the warming is evident in a number of additional data sets from instruments on weather balloons and satellites which were not mentioned by the Committee.

18. We further note that there is a wealth of evidence demonstrating that this warming is already beginning to impact the Earth's climate, including snow and ice cover, sea levels and the distribution and range of plants and animals. Such findings are summarised in the 2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change. More recently, evidence has been summarised in the US Academy of Sciences Reports, *America's Climate Choices*, 2010.

**Even if the data that CRU used were not publicly available—which they mostly are—or the methods not published—which they have been—its published results would still be credible: the results from CRU agree with those drawn from other international data sets; in other words, the analyses have been repeated and the conclusions have been verified. (Paragraph 51)**

19. This finding of the Science and Technology Committee is corroborated by the findings of the Muir Russell Review, which sought to access and analyse land station instrumental temperature data. In doing so, the review team found that the primary station data were freely accessible to any independent researchers seeking to critique CRU's work and that the steps required to create a global temperature series from the data were straightforward to implement. The team found the shape of the resulting temperature trend to be similar whether or not adjustments were made to the data.

The Review stated:

*"By performing this simple test one determines easily that the results of the CRUTEM analysis follow directly from the published description of the method, and that the resultant temperature trend is not significantly different from the other results regardless of stations used or adjustments made. The test is therefore sufficient to demonstrate that, with respect to the declared method, the CRUTEM analysis does not contain either error or adjustments which are responsible for the shape of the resultant temperature trend."*

**Critics of CRU have suggested that Professor Jones's use of the word "trick" is evidence that he was part of a conspiracy to hide evidence that did not fit his view that recent global warming is predominately caused by human activity. The balance of evidence patently fails to support this view. It appears to be a colloquialism for a "neat" method of handling data. (Paragraph 60)**

**Critics of CRU have suggested that Professor Jones's use of the words "hide the decline" is evidence that he was part of a conspiracy to hide evidence that did not fit his view that recent global warming is predominantly caused by human activity. That he has published papers—including a paper in *Nature*—dealing with this aspect of the science clearly refutes this allegation. In our view, it was shorthand for the practice of discarding data known to be erroneous. We expect that this is a matter the Scientific Appraisal Panel will address. (Paragraph 66)**

20. These quotations were taken from correspondence regarding a figure used on the front page of a World Meteorological Organization Report, *WMO Statement on the Status of the Global Climate in 1999*. This figure demonstrates a reconstruction of past temperature made by combining instrumental temperature records and proxy data from tree rings (dendroclimatology).

21. The Science and Technology Committee considered that these issues should be further investigated by later reviews, and we note that both the Scientific Appraisal and the Muir Russell Review examined these issues. The Scientific Appraisal panel examined research carried out at CRU in both dendroclimatology and instrumental temperature records and found no evidence of deliberate scientific malpractice or impropriety. The Muir Russell Review concluded that the scientific practices used to produce the WMO graph were not misleading, but that it was misleading of the team not to have communicated the methods used more clearly.

22. We welcome the findings of these reviews, and the judgement that these phrases are not linked to scientifically dishonest practices. Indeed, we note that they were taken from closed correspondence between parties to whom the intended meaning was likely not ambiguous. We agree with the findings of the Muir Russell Review, that scientists have a responsibility to communicate the uncertainties and assumptions of their research clearly when it is published either in peer-reviewed literature, or in other popularised forms.

### **Freedom of Information issues**

**We regret that the ICO made a statement to the press that went beyond that which it could substantiate and that it took over a month for the ICO properly to put the record straight. We recommend that the ICO develop procedures to ensure that its public comments are checked and that mechanisms exist to swiftly correct any mis-statements or misinterpretations of such statements. (Paragraph 91)**

23. The Information Commissioner's Office (ICO) regularly reviews procedures to ensure the public comments it makes are accurate and proportionate. Whilst organisations cannot be

held responsible for how their statements are interpreted in media coverage, the ICO pays close attention to the way in which statements are reported, and rebuts misinterpretations in the media. In this instance, the ICO responded to a specific media enquiry by issuing a statement, which was interpreted by some sections of the media as a formal ruling. The ICO did not seek publicity for the issue and responded to further enquiries reactively with accurate and up-to-date information when asked.

**There is *prima facie* evidence that CRU has breached the Freedom of Information Act 2000. It would, however, be premature, without a thorough investigation affording each party the opportunity to make representations, to conclude that UEA was in breach of the Act. In our view, it is unsatisfactory to leave the matter unresolved simply because of the operation of the six-month time limit on the initiation of prosecutions. Much of the reputation of CRU hangs on the issue. We conclude that the matter needs to be resolved conclusively—either by the Independent Climate Change Email Review or by the Information Commissioner. (Paragraph 93)**

24. The ICO is investigating a number of complaints about UEA under Section 50 of the Act, in relation to the way the University has handled specific Freedom of Information and Environmental Information requests. A decision notice on the first of these investigations was issued on 6 July (FER0238017). The decision found breaches of Regulation 5(2) and 14(2) of the Environmental Information Regulations (EIR); the ICO is unable to comment further whilst the other investigations are still live.

25. The ICO is not pursuing an investigation into UEA under Section 77 of the Freedom of Information Act 2000 (FOIA) or Regulation 19 of the EIR. As communicated clearly by ICO, the legislation requires action within six months of an offence taking place and, as the UEA case came to light outside this time limit, the ICO has not considered taking forward a criminal investigation.

26. The ICO is also considering the findings of the investigations by Sir Muir Russell, which included a review of CRU's compliance or otherwise with UEA's policies and practices regarding requests under the FOIA and EIR. Additionally the ICO is considering evidence from its own investigations and other available information. The ICO will ask UEA further questions about the University's request handling and record keeping practices.

27. The ICO may provide advice and guidance to UEA to ensure it fulfils its information rights duties. The ICO is able, for example, to issue practice recommendations to public authorities to ensure that they conform with the statutory Codes of Practice issued under the FOIA or EIR.

**If the Minister was correct to assert in July 2009 that the Government had no evidence that the current six-month time limit presents a systemic problem, then it is now clear that such evidence exists. Irrespective of whether or not CRU breached the Freedom of Information Act 2000, we recommend that the Government review the operation of section 77 of the 2000 Act and the six month limit on the initiation of prosecutions provided by section 127(1) of the Magistrates Court Act 1980. (Paragraph 95)**

28. The Ministry of Justice will continue to work with the ICO to determine the extent to which offences have not been prosecuted as a result of the time limit currently in place. The case for any amendments to the legislation will be assessed in the light of these discussions.

**Whether or not CRU liked it, those making FOIA requests were entitled to have their requests dealt with in accordance with the legislation and, if the information sought did not fall within one of the exclusions provided by the FOIA, it should have been disclosed. We have already recommended in paragraph 54 above that in future information, including data and methodology, should be published proactively on the internet wherever possible. However, a culture of withholding information—from**

those perceived by CRU to be hostile to global warming—appears to have pervaded CRU's approach to FOIA requests from the outset. We consider this to be unacceptable. (Paragraph 103)

In the face of such an unhelpful approach we are not surprised that FOIA requests multiplied. When the surge in FOIA requests hit CRU in July 2009 UEA provided extra resources but because of their technical nature the same small group of staff at CRU had a pivotal role in handling the requests. We are not clear that the culture changed. We cannot reach a firm conclusion on the basis of the evidence we took but we must put on record our concern about the manner in which UEA allowed CRU to handle FOIA requests. Further, we found *prima facie* evidence to suggest that the UEA found ways to support the culture at CRU of resisting disclosure of information to climate change sceptics. The failure of UEA to grasp fully the potential damage to CRU and UEA by the non-disclosure of FOIA requests was regrettable. UEA needs to review its policy towards FOIA and re-assess how it can support academics whose expertise in this area is limited. (Paragraph 104)

29. The Government agrees that FOIA requests should be handled promptly and in line with the requirements of the legislation. We urge all Universities to ensure that their responsibilities under Freedom of Information law are properly understood, communicated and implemented.

### The Independent Inquiries

We accept the assurances that Sir Muir Russell has given about the independence of the Independent Climate Change Email Review and we expect him to be scrupulous in preserving its impartiality. We see no reason why the Review's conclusions and UEA's response have to be published together. Indeed, it could give the impression that UEA was being given an advantage when it comes to responding. We consider that the Review's conclusions and recommendations should not be conveyed to UEA in advance of publication. (Paragraph 113)

With regards to the terms of reference of the Review, we consider that as well as measuring CRU against current acceptable scientific practice, the Review should also make recommendations on best practice to be followed by CRU in the future. We invite Sir Muir Russell to respond formally to our Report to the extent that he sets out whether, on the basis of its contents, he finds the Terms of Reference of his inquiry need to be changed. (Paragraph 114)

It is unfortunate that the Independent Review got off to a bad start with the necessary resignation of Dr Campbell. The question of the operation of peer review is going to be a critical issue in the inquiry and the Review Team needs to take steps to ensure the insight and experience he would have brought are replaced. (Paragraph 119)

We agree that the Review must be open and transparent. We conclude that, when the Independent Review holds oral hearings or interviews, they should be carried out in public wherever possible and that it should publish all the written evidence it receives on its website as soon as possible. (Paragraph 122)

In our view, reputation has to be built on the solid foundation of excellent, peer-reviewed science. The review of the science to be carried out by the Scientific Appraisal Panel, which UEA announced on 22 March, should determine whether the work of CRU has been soundly built and it would be premature for us to pre-judge that review. (Paragraph 131)

The process of two reviews or inquiries is underway. In our view there is the potential for overlap between the two inquiries—for example, the question of the operation of

peer review needs to examine both methodology and quality of the science subject to review. The two reviews or inquiries need to map their activities to ensure that there are no unmanaged overlaps or gaps. If there are, the whole process could be undermined. (Paragraph 134)

30. The Government welcomes that UEA established two independent assessment bodies to investigate allegations arising from the data loss incident, and the key scientific publications of CRU. The Scientific Appraisal and Muir Russell Review have been carried out independently of Government and it is not for Government to respond to the above points.

## Conclusions

The focus on Professor Jones and CRU has been largely misplaced. On the accusations relating to Professor Jones's refusal to share raw data and computer codes, we consider that his actions were in line with common practice in the climate science community. We have suggested that the community consider becoming more transparent by publishing raw data and detailed methodologies. On accusations relating to Freedom of Information, we consider that much of the responsibility should lie with UEA, not CRU. (Paragraph 136)

In addition, insofar as we have been able to consider accusations of dishonesty—for example, Professor Jones's alleged attempt to “hide the decline”—we consider that there is no case to answer. Within our limited inquiry and the evidence we took, the scientific reputation of Professor Jones and CRU remains intact. We have found no reason in this unfortunate episode to challenge the scientific consensus as expressed by Professor Beddington, that “global warming is happening [and] that it is induced by human activity”. It was not our purpose to examine, nor did we seek evidence on, the science produced by CRU. It will be for the Scientific Appraisal Panel to look in detail into all the evidence to determine whether or not the consensus view remains valid. (Paragraph 137)

A great responsibility rests on the shoulders of climate science: to provide the planet's decision makers with the knowledge they need to secure our future. The challenge that this poses is extensive and some of these decisions risk our standard of living. When the prices to pay are so large, the knowledge on which these kinds of decisions are taken had better be right. The science must be impeccable. (Paragraph 138)

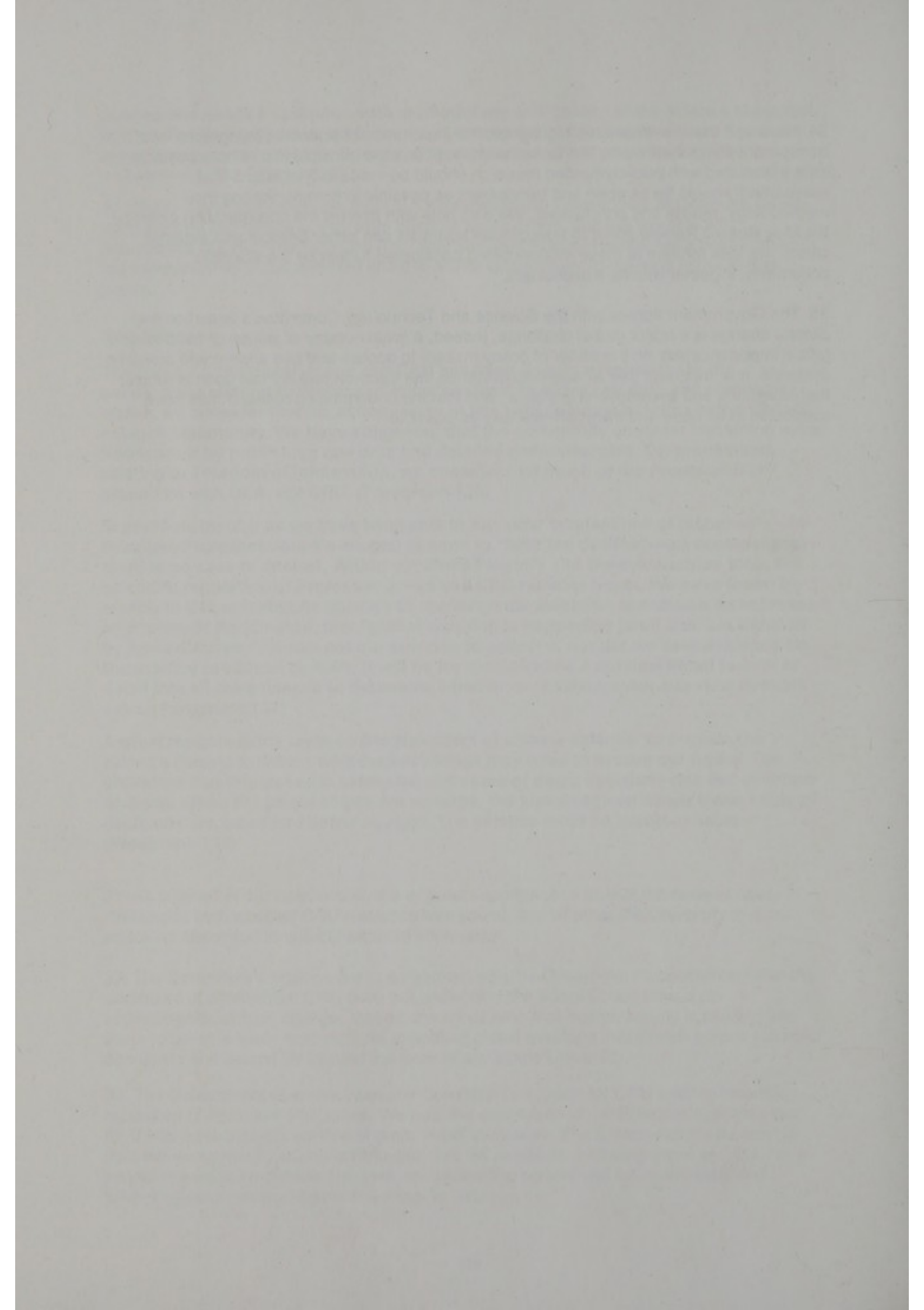
31. As outlined in our introduction, it is of great importance to us that the reviews have considered both whether CRU's science was sound, and whether the University and its scientists attempted to unfairly withhold information.

32. The Committee's findings are in agreement with the Government's assessment that the disclosure of emails from CRU does not undermine the scientific consensus on anthropogenic climate change. Indeed, the conclusion that human activity is causing the Earth to warm is taken from multiple strands of global evidence that stretch across scientific disciplines and extend far beyond the work of any single University.

33. The Government also welcomes the Committee's support for CRU and the scientific reputation of Professor Phil Jones. We note the conclusion of the Scientific Appraisal that CRU has done a ‘public service of great value’ in its work. The Government is pleased to note the exceptionally strong contribution that UK scientists, including those at CRU, have played in assessing climatic changes, understanding current and future impacts, and proposing solutions to mitigate and adapt to changes.

34. However, these events have highlighted the importance of scientists being open and transparent about their work. The Government supports the principle that, where possible, data associated with publicly-funded research should be made available and that researchers should be as open and transparent as possible in communicating their methodology, results and conclusions. We also note with interest the consideration given by the Muir Russell Review panel to how climate scientists can better engage with external critics. We look forward to these matters being considered further by the scientific community, together with its stakeholders.

35. The Government agrees with the Science and Technology Committee's assertion that climate change is a major global challenge. Indeed, a great number of issues of national and global importance rely on the ability of policy makers to access and use appropriate scientific evidence. It is important that *all* scientific evidence that decision makers call upon is robust, that limitations and assumptions are clear, and that the underpinning research has been conducted in as open and transparent a way as possible.









information & publishing solutions

Published by TSO (The Stationery Office) and available from:

**Online**

[www.tsoshop.co.uk](http://www.tsoshop.co.uk)

**Mail, Telephone, Fax & E-mail**

TSO

PO Box 29, Norwich, NR3 1GN

Telephone orders/General enquiries: 0870 600 5522

Order through the Parliamentary Hotline Lo-Call 0845 7 023474

Fax orders: 0870 600 5533

E-mail: [customer.services@tso.co.uk](mailto:customer.services@tso.co.uk)

Textphone: 0870 240 3701

**The Parliamentary Bookshop**

12 Bridge Street, Parliament Square

London SW1A 2JX

Telephone orders/General enquiries: 020 7219 3890

Fax orders: 020 7219 3866

Email: [bookshop@parliament.uk](mailto:bookshop@parliament.uk)

Internet: <http://www.bookshop.parliament.uk>

**TSO@Blackwell and other Accredited Agents**

**Customers can also order publications from:**

TSO Ireland

16 Arthur Street, Belfast BT1 4GD

Tel 028 9023 8451 Fax 028 9023 5401

ISBN 978-0-10-179342-1



9 780101 793421