

'THE DAY AFTER TOMORROW'
SEPARATING THE SCIENCE FROM THE SCIENCE FICTION

ANSWER SHEET - Surprised?!

1. **'True' - Realistic Science, say experts.** Large icebergs are already falling off more frequently. Some scientists believe that at a doubling of atmospheric carbon, the Western Antarctica ice sheet¹ could become unstable and fall into the ocean resulting in sea level rise of 3 metres over 1,000 years (IPCC Third Assessment Report, Synthesis p. 84). There are also concerns about the impact of Greenland's ice sheet melting. Currently, human generated greenhouse gases primarily from burning fossil fuels have increased the atmospheric concentration of carbon dioxide from a pre-Industrial Revolution level of 275 parts per million (ppm) to over 400 ppm - more than a 45% increase.

2. **'True' - Accurate description of scientific consensus.** See the United Nations Intergovernmental Panel on Climate Change website (www.ipcc.ch) and <http://www.bbc.co.uk/news/science-environment-24282150>.

3. **'True' - Accurate description of a plausible scientific theory.** These currents, called thermohaline circulation, are closely linked to atmospheric temperature and ocean salinity changes. Dr. Wallace Broecker of the Lamont-Doherty Earth Observatory, Palisades, New York, first proposed the theory that greenhouse gas build up could shut down the Gulf Stream nearly twenty years ago. In 2013, the IPCC concluded that it was very unlikely that the Atlantic ocean circulation would undergo a rapid collapse imminently. However, it is very likely that it will weaken over the 21st century.

4. **'True' - Absolutely accurate...** Vice President Cheney played the decisive role in the U.S. withdrawal from Kyoto in order to appease large industry lobby groups. The account of the Bush Administration reversal on Kyoto comes from a first hand account

from Bush's first Secretary of the Treasury Paul O'Neil (Susskind, *The Price of Loyalty*, Simon & Schuster, 2004)

5. **'True'** - **Accurate** description of scientific consensus. IPCC, *Climate Change 2013: Synthesis Report* concluded that "Several components or phenomena in the climate system could potentially exhibit abrupt changes, and some are known to have done so in the past. Examples include the Atlantic Circulation, Arctic sea ice, the Greenland ice sheet, the Amazon forest and monsoonal circulations. For some events, there is information on potential consequences, but in general there is low confidence and little consensus on the likelihood of such events over the 21st century". **'Abrupt' in this context is decades, not days.**
6. **'Maybe'** - As sea level rises, various scenarios could see New York underwater, but the scale of the tidal wave in the movie is **unrealistic**. As the ocean warms, it expands, so virtually every scenario for the coming decades includes a high level of uncertainty of sea level rise. The ocean is already rising. The 2013 IPCC consensus sets likely sea level rise at below one metre increase by 2100, but if the Western Antarctic ice sheet or Greenland's ice cap melt or break away, sea level rise could be higher. New York City is about 10m above current sea level.
7. **'True'** - but no one thinks an Ice Age could arrive **in a matter of months or days.**
8. **'True'** - **Accurate**. Although the current levels of carbon dioxide in the atmosphere exceed those that are linked to Ice Ages over the last 160,000 years.
9. **'False'** - Great special effects, but **not at all likely.**
10. **'True'** - Environmental refugees fleeing increasingly severe "natural" disasters could create political turmoil. **Absolutely**. The Pentagon concluded that climate change is a bigger threat to U.S. society than terrorism. (See *Fortune* magazine, January 26, 2004,

for more on this study.) The 2014 IPCC report concluded that "Climate change can indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks."

**Based on resource by the Sierra Club of Canada 'THE DAY AFTER TOMORROW' SEPARATING THE SCIENCE FROM THE SCIENCE FICTION*

(<http://www.sierraclub.ca/national/programs/atmosphere-energy/climate-change/index.shtml>)

NB There are many other aspects of the Day After Tomorrow which are not scientifically accurate.