This is the print version of the Skeptical Science article 'Less than half of published scientists endorse global warming', which can be found at http://sks.to/schulte.

Attempts to cast doubt on scientific consensus on climate change despite 97% agreement

What The Science Says:
Schulte's paper makes much of the fact that 48% of the papers they surveyed are neutral papers, refusing to either accept or reject anthropogenic global warming. The fact that so many studies on climate change don't bother to endorse the consensus position is significant because scientists have largely moved from what's causing global warming onto discussing details of the problem (eg - how fast, how soon, impacts, etc).

Climate Myth: Less than half of published scientists endorse global warming
Klaus-Martin Schulte examined all papers published from 2004 to February 2007. Of 528 total papers on climate change, only 38 (7%) gave an explicit endorsement of the consensus. While only 32 papers (6%) reject the consensus outright, the largest category (48%) are neutral papers, refusing to either accept or reject the hypothesis. Only a single one makes any reference to climate change leading to catastrophic results. (Source: DailyTech)

Schulte's paper (going on DailyTech's account) places great emphasis on the fact that only one paper endorses 'catastrophic climate change'. This is a classic straw man argument. Oreskes' 2004 paper never refers to an imminent catastrophe. Neither do the IPCC nor do the Academies of Science from 11 countries that endorse the consensus position that most of the warming over the last 50 years is likely due to the increase in greenhouse gas concentrations.

Even more fuss is made over the large percentage of neutral studies. Ironically, Oreskes emphasised the same point in 2004 when she published The Scientific Consensus on Climate Change. Nowadays, earth science papers are rarely found explicitly endorsing plate tectonics as the theory is established and taken for granted. The fact that so many studies on climate change don't bother to endorse the consensus position is significant because scientists have largely moved from what's causing global warming onto discussing details of the problem (eg - how fast, how soon, impacts, etc).

What of the 6% of papers that reject AGW? The most appropriate approach would be to see what these papers actually say. Schulte's paper is yet to be published so the full list is not available (please contact me if you have more info). Monckton does mention several studies which one assumes are the "cream of the crop". Deltoid also has its readers categorising peer review studies since 2003. The papers purported to reject the consensus can be divided into several categories:

Non-scientific papers

Two of the papers conduct no actual scientific research but merely review social aspects of climate science. I'm baffled as to why they would be included other than to "boost the numbers":

- Leiserowitz 2005 asks the question "Is Climate Change Dangerous?" It then proceeds to "describes results from a national study that examined the risk perceptions and connotative meanings of global warming in

the American mind". In other words, it doesn't answer the question "is climate change dangerous" - instead it answers "does the public think climate change is dangerous?"
- Gerhard 2004 (published in the American Association of Petroleum Geologists Bulletin) "summarizes recent scientific progress in climate science and arguments about human influence on climate".

Papers that don't actually reject the consensus

Three papers focus on specific aspects of climate change but don't actually reject the consensus:

- Cao 2005 recommends multi-scale modelling techniques to better understand and quantify the carbon cycle. It mentions uncertainties in our understanding of the carbon cycle but doesn't refute the consensus position at all.
- Lai 2004 suggests internal processes in the ocean may be causing global warming. Paradoxically, it concludes by recommending we "reduce carbon dioxide emissions to the atmosphere, thus reduce global warming". More on the ocean...
- Moser 2005 studies the uncertainties of the impact of rising sea levels in 3 US states. The emphasis is on society's ability to adapt to rising sea levels and contributes no research on the cause of global warming.

Bonafide scientific papers rejecting the consensus

There are some papers that conduct original research and reject the consensus. It's useful to look at the actual arguments they present to reject AGW:

- Shaviv 2005 claims cosmic rays are causing global warming. While the link between cosmic rays and clouds are still under question, the more serious problem is that the correlation between cosmic rays and temperature ended in the 1970's when the modern global warming trend began. More on cosmic rays...
- Zhen-Shan 2006, performs statistical analysis on the temperature record and finds temperature doesn't linearly follow CO2. Looking at global cooling from 1940 to 1970, they conclude "The global climate warming is not solely affected by the CO2 greenhouse effect". Ignoring aerosol cooling and solar forcing while failing to recognise that temperature's relationship with CO2 is logarithmic, not linear, are serious failings. More on mid-century global cooling...

UPDATE 20 Sep 2007: paper not to be published. Apparently, the news that Schulte's paper would be published was grossly exagerated as editor Sonja Boehmer-Christiansen has confirmed Energy and Environment will not be publishing the paper:

> "His survey of papers critical of the consensus was a bit patchy and nothing new, as you point out. it was not what was of interest to me; nothing has been published."

UPDATE 24 Mar 2008: Apparently Energy and Environment have reversed their policy and published the Schulte paper.

UPDATE 25 Mar 2008: Chris Monckton posts his side of the story on DeSmogBlog. in response to John Mashey's critique of Schulte's paper.

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Skeptical Science explains the science of global warming and examines climate misinformation through the lens of peer-reviewed research. The website won the Australian Museum 2011 Eureka Prize for the Advancement of Climate Change Knowledge. Members of the Skeptical Science team have authored peer-reviewed papers, a college textbook on climate change and the book Climate Change Denial: Heads in the Sand. Skeptical Science content has been used in university courses, textbooks, government reports on climate change, television documentaries and numerous books.

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