

The Thread of Logic: Climate Science Literature Review Paper  
**Source: Literature Review of Climate Science** (Moodle Week 6)

*Here is a list of the topic sentences of the literature review on climate science. (1) Before reading the whole article, read each sentence and see if you can follow the thread of logic. (2) Now read the full article. Can you see how the thread is constructed such that you can follow it from abstract to conclusions? (3) **Create a map reflecting the thread of logic of this paper.***

**Introduction:**

1. An accurate perception of the degree of scientific consensus is an essential element to public support for climate policy.
2. Surveys of climate scientists have found strong agreement (97–98%) regarding AGW amongst publishing climate experts.
3. The peer-reviewed scientific literature provides a groundlevel assessment of the degree of consensus among publishing scientists.
4. Despite these independent indicators of a scientific consensus, the perception of the US public is that the scientific community still disagrees over the fundamental cause of GW.
5. Through analysis of climate-related papers published from 1991 to 2011, this study provides the most comprehensive analysis of its kind to date in order to quantify and evaluate the level and evolution of consensus over the last two decades.

## **Methods:**

1. This letter was conceived as a 'citizen science' project by volunteers contributing to the Skeptical Science website ([www.skepticalscience.com](http://www.skepticalscience.com)).
2. We classified each abstract according to the type of research (category) and degree of endorsement.
3. Abstracts were randomly distributed via a web-based system to raters with only the title and abstract visible.
4. Upon completion of the final ratings, a random sample of 1000 'No Position' category abstracts were re-examined to differentiate those that did not express an opinion from those that take the position that the cause of GW is uncertain.
5. To complement the abstract analysis, email addresses for 8547 authors were collected, typically from the corresponding author and/or first author.

## **Results:**

1. The ISI search generated 12 465 papers. Eliminating papers that were not peer-reviewed (186), not climate-related (288) or without an abstract (47) reduced the analysis to 11 944 papers written by 29 083 authors and published in 1980 journals.
2. We examined four metrics to quantify the level of endorsement:
3. Among abstracts that expressed a position on AGW, 97.1% endorsed the scientific consensus.

4. The time series of each level of endorsement of the consensus on AGW was analyzed in terms of the number of abstracts (figure 1(a)) and the percentage of abstracts (figure 1(b)).
5. The average numbers of authors per endorsement abstract (3.4) and per no position abstract (3.6) are both significantly larger than the average number of authors per rejection abstract (2.0).
6. We emailed 8547 authors an invitation to rate their own papers and received 1200 responses (a 14% response rate).
7. Figure 2(a) shows the level of self-rated endorsement in terms of number of abstracts (the corollary to figure 1(a)) and figure 2(b) shows the percentage of abstracts (the corollary to figure 1(b)).
8. A direct comparison of abstract rating versus self-rating endorsement levels for the 2142 papers that received a self-rating is shown in table 5.
9. Figure 3 compares the percentage of papers endorsing the scientific consensus among all papers that express a position endorsing or rejecting the consensus.

## **Discussion:**

1. Of note is the large proportion of abstracts that state no position on AGW. This result is expected in consensus situations where scientists “... generally focus their discussions on questions that are still disputed or unanswered rather than on matters about which everyone agrees” (Oreskes 2007, p 72).

2. The self-ratings by the papers' authors provide insight into the nature of the scientific consensus amongst publishing scientists.
3. The process of determining the level of consensus in the peer-reviewed literature contains several sources of uncertainty, including the representativeness of the sample, lack of clarity in the abstracts and subjectivity in rating the abstracts.
4. We address the issue of representativeness by selecting the largest sample to date for this type of literature analysis.
5. Another potential area of uncertainty involved the text of the abstracts themselves.
6. Lastly, some subjectivity is inherent in the abstract rating process
7. Our sample encompasses those surveyed by Oreskes (2004) and Schulte (2008) and we can therefore directly compare the results.
8. An analysis of 539 'global climate change' abstracts from the Web of Science database over January 2004 to mid-February 2007 found 45% endorsement and 6% rejection (Schulte 2008).

## **Conclusion:**

1. The public perception of a scientific consensus on AGW is a necessary element in public support for climate policy (Ding et al 2011).
2. Contributing to this 'consensus gap' are campaigns designed to confuse the public about the level of agreement among climate scientists.

3. The narrative presented by some dissenters is that the scientific consensus is “ ... on the point of collapse” (Oddie 2012) while “ ... the number of scientific ‘heretics’ is growing with each passing year” (Allegre et al 2012).