Joel Schwartz
Visiting Fellow
American Enterprise Institute

January 24, 2007

Catherine Witherspoon
Executive Officer
California Air Resources Board

Via E-Mail: cwithers@arb.ca.gov

Re: Agenda Item #07-1-7: Report to the Board on Recent Scientific Findings from Climate Change Studies, CARB Board Meeting, January 25, 2007,

Dear Ms. Witherspoon:

I'm writing in reference to the presentation CARB Staff will give at the board meeting tomorrow on "Recent Scientific Findings from Climate Change Studies." CARB frequently deals with issues of great scientific complexity, and climate change is perhaps the most complex of all. Thus, it makes sense for Staff to provide the Board with an understanding of the latest research in this rapidly developing field.

Nevertheless, I couldn't help noticing that from among the wide range of scientific results reported in the climate literature, the research papers that Staff plans to present to the Board include only papers that suggest the Earth's climate is changing in ways that pose serious risks for humankind and that human greenhouse gas emissions are the main cause of these climate changes.

Staff excludes from its presentation any research results that contradict this "alarmist" view of climate change. As I discuss below, Staff's selective approach to the evidence creates the appearance that climate change is more serious, more certain, and more influenced by human greenhouse gas emissions than suggested by the underlying scientific research literature.

Staff plans to discuss Pierce et al. (2006), which discusses the observed warming of the oceans during the last few decades and claims via modeling to have detected an "anthropogenic warming signal" in the oceans. Yet Staff fails to mention Lyman et al. (2006), which reported that from 2003-2005 the top 750 meters of the Earth's oceans lost about 20 percent of all of the excess energy they had accumulated during the last 50 years. While this is only two years of data, it represents a large, real cooling of the upper ocean that is not predicted by any climate model.

Lyman et al. (2006) also provides evidence that contradicts the analysis in Hansen et al. (2005), another paper Staff plans to present to the Board. Hansen et al. (2005) claim their climate model output is confirmed by "precise measurements of increasing ocean heat content over the past ten years." But as Lyman et al. (2006) show, ocean heat content began a sharp decrease after 2003. As Colorado State climate scientist Roger Pielke, Sr. recently wrote, "There is a clear mismatch between the model predictions reported in [Hansen et al. (2005)] and the observational results in [Lyman et al. (2006)]" (Pielke Sr. 2006). Pielke Sr., along with John Christy of the University of Alabama also wrote a letter to the journal *Science* pointing out problems with the Hansen et al. (2005) analysis, but *Science* elected not to publish it (Pielke Sr and Christy, 2005).

On the subject of modeling, Staff should also make it clear to the Board that a number of researchers have provided evidence that climate models don't come close to matching measured parameters of the Earth's actual climate. Just to give one important example, Zhang et al. (2005) showed that 10 different climate models failed by a large margin to accurately represent various aspects of cloud cover, cloud type, and seasonal and latitudinal cloud cover. A model that doesn't get clouds right isn't going to get climate right. And none of the models come close to getting clouds right.

Staff plans to present articles that suggest accelerating ice mass loss in Greenland (Chen, et al. 2006; Velicogna and Wahr. 2006). Presenting only these results creates the impression that melting of polar ice is accelerating and is rapidly raising sea levels. Furthermore, presenting these data without any other context creates the impression that the melting is unprecedented and due to human greenhouse gas emissions. Yet all of these implications are false.

For example, why not also present the results of Chylek et al. (2006), which shows that Greenland was hotter during every decade from 1915 to 1965 than it was from 1995-2005. A half-century of high (compared to current) temperatures did not result in catastrophic melting of Greenland's ice during the 20th Century. Furthermore, Greenland cooled from the 1930s to the mid-1990s, even though anthropogenic greenhouse warming would be expected to have its largest effect in polar regions. These results suggest that, whatever the rate of Greenland ice melting, current temperatures are not particularly high by recent standards, and the temperature trend is not consistent with anthropogenic greenhouse warming. CARB's Board will not be aware of any of this, because Staff is excluding this evidence from its presentation. Staff also fails to mention recent research on Antarctica suggesting that the continent is gaining ice, as reported by Wingham et al. (2006).

Staff should also put the polar ice results in context by mentioning what the estimated ice gains and losses mean for future sea level. For example, Chen et al. (2006) estimated that Greenland is losing 239 cubic kilometers of ice each year. This sounds like a lot. But it amounts to a sea level rise of less than 2 inches per century. There are also other recent estimates of Greenland ice loss that Staff fails to mention. For example, Luthke et al. (2006) estimate Greenland ice loss to be about 100 cubic kilometers per year, or less than half the Chen et al. (2006) estimate.

Since the issue of polar ice trends is mainly of concern in relation to future sea level, Staff should also present data on trends in sea level. As Cal-EPA itself has shown, tide-

gauge data from the San Francisco Bay show that sea-level rose more from 1860-1885 than from 1950-2000 (California Environmental Protection Agency, undated). Furthermore, the same dataset shows sea-level has been rising in the Bay Area since the 1920s, even though 80 percent of all human carbon dioxide emissions occurred after 1950. Holgate (2007) shows that this is a worldwide phenomenon. He shows that sea-level has been rising since at least the beginning of the 20th Century, and that sea-level rose more quickly during the first half of the 20th Century than during the second half. Both of these observations are inconsistent with human greenhouse gas emissions as a main cause of sea-level rise. Staff should make the Board aware of this in its presentation tomorrow.

Overall, CARB's Staff appears to be selecting research and data so as to create an appearance of support for an alarmist view of climate change this is not reflective of the full weight of the evidence from the scientific literature and climate data. Both in tomorrow's presentation and in future Board presentations and CARB reports, CARB should present the full range of scientific evidence on the issues it addresses, rather than only the evidence that supports CARB's pre-determined policy, regulatory, and bureaucratic goals. CARB's Board and the people of California deserve nothing less.

Sincerely,

/Joel Schwartz/

Joel Schwartz
Visiting Fellow
American Enterprise Institute

jschwartz@aei.org

916.203.6309

cc:
Bob Sawyer, Chair, CARB, rsawyer@arb.ca.gov
Eileen McCauley, Manager, Atmospheric Processes Research Section, Research Division, emccaule@arb.ca.gov
Clerk of the Board, cotb@arb.ca.gov.

References Cited

California Environmental Protection Agency. (undated). AB 1493 (Pavley) Briefing Package: Global Warming and Greenhouse Gas Emissions from Motor Vehicles. Sacramento, http://www.climatechange.ca.gov/documents/AB1493_PRESENTATION.PDF.

Chen, J.L., Wilson, C.R., and Tapley, B.D. 2006. Satellite gravity measurements confirm accelerated melting of Greenland ice sheet. *Science*. 313: 1958-1960.

Chylek, P., Dubey, M.K., and Lesins, G. 2006. Greenland warming of 1920–1930 and 1995–2005. *Geophys. Res. Lett.* 33(11): 1-5.

Hansen, J., Nazarenko, L., Ruedy, R., Sato, M., Willis, J., Del Genio, A., Koch, D., Lacis, A., Lo, K., Menon, S., Novakov, T., Perlwitz, J., Russell, G., Schmidt, G.A., and Tausnev, N. 2005. Earth's Energy Imbalance: Confirmation and Implications. *Science*. 308(5727): 1431-1435.

Holgate, S.J. 2007. On the decadal rates of sea level change during the twentieth century. *Geophys. Res. Lett.* doi:10.1029/2006GL028492.

Luthcke, S.B., Zwally, H.J., Abdalati, W., Rowlands, D.D., and Ray, R.D. 2006. Recent Greenland Ice Mass Loss by Drainage System from Satellite Gravity Observations. *Science*. 314: 1286-1289.

Lyman, J.M., Willis, J.K., and Johnson, G.C. 2006. Recent cooling of the upper ocean. *Geophys. Res. Lett.* 33(18): 1-5.

Pielke Sr, R., and Christy, J.R. (2005). Comment on “Earth’s Energy Imbalance: Confirmation and Implications” by Hansen et al. 2005 unpublished letter to Science. June 14, 2005, http://blue.atmos.colostate.edu/publications/pdf/Hansen-Science.pdf.

Pielke Sr., R. (2006). Mismatch Between Multi-decadal Global Climate Models Predictions and the Global Radiative Imbalance: Colorado State University, http://climatesci.atmos.colostate.edu/2006/08/30/mismatch-btween-models-and-observations/.

Pierce, D.W., Barnett, T.P., AchutaRao, K.M., Gleckler, P.J., Gregory, J.M., and Washington, W.M. 2006. Anthropogenic warming of the oceans: observations and model results. *Journal of Climate*. 19: 1873-1900.

Velicogna, I., and Wahr, J. 2006. Acceleration of Greenland Ice Mass Loss in Spring 2004. *Nature*. 443: 329-331.

Wingham, D.J., Shepherd, A., Muir, A., and Marshall, G.J. 2006. Mass balance of the Antarctic ice sheet. *Philosophical Transactions of the Royal Society A.* 364: 1627-1635.

Zhang, M.H., Lin, W.Y., Klein, S.A., Bacmeister, J.T., Bony, S., Cederwall, R.T., Genio, A.D.D., Hack, J.J., Loeb, N.G., Lohmann, U., Minnis, P., Musat, I., Pincus, R., Stier, P., Suarez, M.J., Webb, M.J., Wu, J.B., Xie, S.C., Yao, M.S., and Zhang, J.H. 2005. Comparing clouds and their seasonal variations in 10 atmospheric general circulation models with satellite measurements. *J. Geophys. Res.* 110(D15): 1-18.