Testimony of

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House Permanent Select Committee on Intelligence

Subcommittee on Intelligence Community Management

and

House Select Committee on Energy Independence and Global Warming

U.S. House of Representatives

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Dear Chairwoman Eshoo, Chairman Markey, Congressman Rush Holt (my Representative) and Members of the Committees:

Thank you for the opportunity to appear this morning at this joint hearing of your Committees. I am honored by your invitation to discuss briefly the national security implications of climate change and to provide you with thoughts about some steps that the Federal government can take to more specifically measure climate change indicators.

In sum, my recommendations to the Committees are two-fold:

1. The Federal government must plan seriously for the potential impact of environmental effects on both the nation's security and the security of regions around the world; and,
2. To help ensure that environmental threats are properly understood, we should use all applicable national investments and technical capabilities to measure, with specificity, when we can, the most critical physical processes of our planet.

These issues are, in my opinion, intertwined and mutually supportive. I have come to these conclusions as a result of related work in positions which I have held since 1991: Commander of the Naval Research Laboratory; Commander of the Naval Meteorology and Oceanography Command; Chief of Naval Research; Member of *MEDEA* (a group of government and cleared U.S. civil scientists, sponsored by the government, that focused on earth measurements using all sources of information) and its U.S. Environmental Task Force (ETF) and its related Environmental Working Group (EWG) within the "Gore-Chernomyrdin Program;" Member of the Military Advisory Board of the 2007 CNA Study "National Security and the Threat of Climate Change" (hereinafter the "2007 CNA Report"); President of the National Defense University; Commissioner during the full term of the U.S. Ocean Policy Commission; Member of the Joint Ocean Commissions Initiative; and presently as Vice Chair of the statutory Ocean Research / Resources Advisory Panel (ORRAP) and President of Monmouth University.

The need to focus the proper attention on environmental threats and studying the Earth's critical physical processes has only become more urgent by the climate change discussion. To explain

the reasoning behind my recommendations, I would like to discuss briefly the findings of the 2007 CNA Report and, then, opine on the power of leveraging Defense and Intelligence data to both better measure the progress (or even the non-progress) of global climate change and inform climate change policy.

I was a member of the Military Advisory Board (a group of eleven retired three- and four-star generals and admirals from each of the military branches) that sat with CNA as it developed its Report on the national security implications of climate change. I support the Report's discussion, findings and recommendations and present my own narrow view of one aspect of the Rreport as recorded on the Report's 23rd page. Further, I applaud CNA for its timely attention to this, heretofore, largely unaddressed aspect of climate change. Chairwoman/ Chairman: I would like to present the 2007 CNA Report for the record, along with my testimony.

The Report, like the new NIA on security and climate change, does not judge whether climate change is occurring, whether mankind is responsible for it or whether humans can turn it around. Rather, it points to the international and regional security consequences of climate change if the disturbing environmental signals measured in recent years continue unabated.

The CNA Report likens the threat of climate change to that of the strategic threats we endured during the Cold War, that is: while the probability of disastrous climate change cannot be determined with certainty, the effects of climate change (if current trends continue) on

international security are so great that one must prepare to deal with severe security consequences. First principle: whether one believes climate change will happen or not, the effects if it does happen are dangerous enough that security forces must plan for it.

Within the Report, we cite water and water-related issues (such as: drought, famine, flooding and disease and resultant migration of rather desperate peoples) as major threats to regional security, globally.

The CNA Report finds that the least developed nations of the world are most likely to be affected by climate change phenomena and are least likely to be able to cope with them.

In the Report we call for deliberate planning by U.S. security organizations including the Defense, Intelligence and diplomatic communities. I personally think it is most useful if the climate science community, both from inside government and outside, can be as specific as possible about regional effects. Global climate change may prove to show an overall average warming of global air and sea temperatures, but global climate change is far from average. In some regions it can be warmer, others much colder (especially if an abrupt climate change scenario occurs in the North Atlantic). Some areas could witness more rain or sea level rise; both imply flooding. In still other areas, we could see drought and inevitable famine.

I think the CNA Report correctly frames a fundamental security construct for our future: adverse environmental conditions created by climate change, if unabated, will affect the least developed nations first, and whether it is too much water or too little, the intermediate results

will be trans-national migrations of desperate peoples who are trying to survive which will lead, finally, to regional strife.

The question is: where will the effects of climate change be seen and what will those changes be so that U.S. security leaders can deliberately include expected effects in their regional plans? Second principle: Understand more specifically, through better measurements, what is going on with climate change especially in key natural environments (such as: the Arctic, desert fringe environments, low lying coastal areas, historical breadbasket regions and glaciers) and geopolitically sensitive areas (such as: the Subcontinent, sub-Saharan Africa, Middle East and China).

I have recently heard that the National Academies organization, with the personal leadership of its President, Dr. Ralph Cicerone, is working to establish indices and metrics to inform future long term requirements for measurements of change on our planet.

As I mentioned earlier, the U.S. security community, specifically, needs to understand where climate change effects have the highest potential to affect regional security. The nation, generally, needs to understand if climate change is progressing. And, if the nation takes any policy steps to stem perceived climate change, it needs to know whether those steps (policy, lifestyle or investment changes) are having any impact.

To this end I remain confident that the Defense and Intelligence communities can and should be leveraged by the U.S. civil climate science community to better understand perceived climate

change signals.

I have seen the value of leveraging the talent, sensor/analysis/computational capabilities, global presence, and data collected (or to be collected) and archived by these government agencies. I saw it during the period 1991- 2000 while *MEDEA* and its related groups were in action. Two general benefits derive for such undertakings:

1 previously un-released data and information from national security systems may help civil scientists get a fuller or clearer picture of what is going on in nature, and
2 government scientists and decision makers from the security community may get a better insight into their own mission-related challenges by conferring with top civil scientists who have received security clearances.

The following is a sample list of techniques that could be (have been) used in civil-government collaborations that are designed to cross security boundaries:

- Data can be simply released if deemed no longer classified; it may never have been classified or outlived its classification and just never been released.
- Raw data can be declassified, after very deliberate review following carefully structured processes.
- Useful unclassified information can be derived from classified, un-releasable data.
- Defense and Intelligence scientists can confer continually with appropriately (and rigorously) cleared civil climate scientists so both sides can benefit.
- Future space, ship, submarine, aircraft and *in situ* sensor collections can consider both mission-agency and environmental needs in system design, operational employment decisions and data distribution.
- "Fiducial sites" (i.e., geographic sites predetermined as scientifically important to observe) can be set up at which measurements from every possible civil, commercial and classified sensor can be made, repeatedly, over long time periods --- allowing climate change to be actually measured, not just estimated. An example is recently released sea ice imagery from the Arctic.

Certainly, the deliberate acts of releasing data or deriving unclassified products from un-releasable data sets will require additional security processing and actual environmental analysis work, but such costs will be considerably less than replicating data collection missions, perhaps too late.

This cost-benefit point is more important when one considers the stakes involved in either underestimating the effects of or over-reacting to global climate change or their security-jeopardizing regional effects. I would make the same comment about costs to appropriately clear and keep updated a few dozen of the nation's top climate scientists who would work with government scientists with all data and all talent available to both.

If national security leaders are to make actionable regional security plans that consider climate change, then they need to know, with a higher degree of specificity, the probable climate change effects for their respective regions/theaters. In those troubled parts of the world about which we worry most, indigenous populations and governments are not prepared (or not willing) to collect sophisticated, long-time-series data necessary for measuring climate change speed, magnitude or direction. We may get more precise data, incidental to other mission-related collection efforts, in the regions where it has been least collectable by "open source" means, if we leverage existing and planned Defense and Intelligence assets more fully.

Yes, the successes of *MEDEA* are about a decade old and many new sensor systems have come into being in the civil and commercial world. I have recently seen a comprehensive unclassified review of "open source collectors" that can help us monitor the environment. Yes,

again, we do have access to more "open" information, but the national security communities may have different flexibilities in satellite orbits, resolutions and undersea access, for example. The Defense and Intelligence community may also have useful archives going back generations and regional specialists who can add to specificity determinations and understanding.

I would like to close with a general comment about potential U.S. national policies and investments to stem perceived climate change. Climate change is probably occurring, as it has so many times over the geological history scale. Man may have created it or may be contributing to it. Man may be able to turn it around. May, may, may. But, if our government makes substantial policy decisions regarding climate change that substantially consume our wealth or substantially change our life quality, then we have an obligation to use every asset at our disposal to determine if those "substantial policies" are bearing fruit.