Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions

March 27, 2007

Open Letter to Canadian Prime Minister Stephen Harper

Rt. Hon. Stephen Harper
Office of the Prime Minister
80 Wellington Street
Ottawa ON K1A 0A2 Canada

Dear Prime Minister Harper,

I am writing to call your attention to a critical issue that requires the action of the international community: banning the testing and use of destructive anti-satellite (ASAT) weapons.

The testing or use of these weapons to destroy satellites creates dangerous amounts of space debris that can threaten the future use of space. The recent test of such an anti-satellite weapon by China has highlighted concerns about this issue.

Fifty years ago this October, humans put their first object into orbit with the Soviet Union's launch of Sputnik. Since then, there have been more than 4,000 space launches. Today there are more than 800 active satellites in orbit, but human space activity has also placed in orbit more than a half million pieces of debris large enough to cause severe damage to a satellite in a collision.

Because of their very high speed in orbit, even relatively small pieces of orbiting debris can damage or destroy satellites. Since debris can stay in orbit for decades or longer, it accumulates with time as more is produced. As the amount grows, the risk of collisions with satellites also grows. If the amount of debris becomes sufficiently large, it can make parts of space unsuitable for use by satellites.

Since debris cannot be effectively removed from orbit, controlling its production is essential for preserving the long-term use of space.

A draft set of debris mitigation guidelines has been developed by the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), and will be sent to the U.N. 4th Committee and then to the General Assembly for approval. Adoption of these guidelines is an important step for controlling the production of debris during routine space activities.

However, these guidelines do not go far enough: they do not specifically address the issue of banning destructive ASAT weapons, and they are not legally binding. Banning the destruction of satellites is crucial to preserving the sustainable use of space because of the tremendous amount of debris such destruction can create. Our calculations show that the destruction of a single large satellite, similar to many of the current military reconnaissance and surveillance satellites, could

have a significant impact on the space environment.

In particular, there are currently an estimated 200,000 pieces of debris with size greater than one centimeter throughout low earth orbit (*i.e.*, at altitudes up to 2,000 kilometers), where over half of existing satellites operate. The destruction of a single 10-ton satellite in low earth orbit could create 250,000 additional pieces of debris of this size—more than doubling the total population of large debris in low earth orbit. Debris greater than one centimeter in size is particularly important because it can cause significant damage to satellites in a collision, and it cannot be effectively shielded against at such high speed.

This much debris would be equivalent to that generated in 70 to 80 years of space activity under a regime of strict debris mitigation measures of the kind currently being discussed internationally.

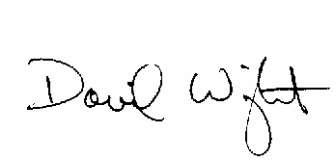
The January 2007 Chinese test was conducted against a relatively small, defunct weather satellite, and yet that test resulted in a 20 percent increase in low earth orbit debris with size greater than one centimeter. Because it was created at high altitude (850 kilometers), more than half of the debris created in that test will remain in orbit for several decades.

Banning destructive anti-satellite weapons would also have important implications for international security by reducing the chance that the failure of a satellite during a time of tension would be interpreted as a deliberate attack—an interpretation that could result in a further escalation of tensions or lead to retaliation.

Because many aspects of modern life—civil, economic, scientific, and military—rely heavily on satellites, ensuring the sustainable use of space must be a high international priority. One of the most important steps in this direction is developing a legal regime that bans the testing and use of debris-creating anti-satellite weapons. International leadership is urgently needed to put such a regime in place. Canada, with significant space assets to protect and an international reputation for promoting space security, is in an excellent position to provide such leadership.

I appreciate your attention to this issue.

Respectfully,



David Wright, PhD
Co-Director and Senior Scientist
Global Security Program
Union of Concerned Scientists