Congressional Hearing on Near-Earth Objects Brings Reassurances and "What If" Questions

Despite repeated reassurances from Obama administration officials that it is unlikely that a near-Earth object (NEO) could cause catastrophic damage on Earth anytime over the next several hundred years, members of the U.S. House of Representatives Committee on Science, Space, and Technology kept raising "what if" questions at a 19 March hearing about threats from space.

With memories still fresh about the unforeseen, 17-meter-diameter meteor that exploded above Chelyabinsk, Russia, on 15 February (see *Eos, 94*(9), 87, doi:10.1002/2013EO090004) with the equivalent energy of a 300-kiloton bomb, committee members delved into how far along NASA is in terms of identifying and tracking NEOs, how quickly an NEO deflection mission could be mounted if a much larger NEO was discovered to be on a collision course with Earth, and what could be done if a massive NEO suddenly was found to be heading for Earth 3 weeks from now. Rep. Bill Posey (R-Fla.) commented that "a good segment of the population thinks it's just a matter of calling Bruce Willis," the actor who starred in the 1998 movie *Armageddon* about deflecting a deadly asteroid.

NASA administrator Charles Bolden said that the Chelyabinsk event and the predicted close approach on that same day of the small asteroid 2012 DA14 "were a stark reminder of why NASA has for years devoted a great deal of attention to near-Earth objects and why this hearing is so timely and important."

Bolden told the committee in this first of two planned hearings that through NASA's Spaceguard survey, begun in 1998, the agency has cataloged about 95% of NEOs larger than 1 kilometer in diameter and that "none of these known large NEOs pose any threat of impact to the Earth anytime in the foreseeable future." He said the George E. Brown Jr. Near-Earth Object Survey, begun in 2005, calls for NASA to detect 90% of NEOs greater than 140 meters in diameter by 2020. Bolden said that so far, more than 9600 NEOs of all sizes have been detected and that NASA estimates that about 60% of NEOs between 300 meters and 1 kilometer have been found. With the current budget, "it will be 2030 before we are able to reach the 90% level" for detecting NEOs larger than 140 meters, he added.

John Holdren, director of the White House Office of Science and Technology Policy (OSTP), told the committee that NEOs are defined as non-man-made objects that come within about 50 million kilometers of Earth. He said that large NEO strikes are rare, noting that the probability per year of a 140-meter NEO hit is about 1 in 30,000.

Holdren said that the Obama administration supports expanded NEO detection programs, noting that the administration's proposed fiscal year 2013 budget for NASA's Near Earth Object Program would have boosted funding to $20.5 million compared to the 2009 funding level of $4 million. "The United States has an effective program for discovering larger NEOs, but we need to improve our capabilities for the identification and characterization of smaller NEOs," he said. "Specifically, with our current or near-future capabilities, both on the ground and in space, it is unlikely that objects smaller than 100 meters in diameter on collision courses with the Earth will be detected with greater than weeks of advance warning—a matter of some concern since the larger objects in this range could be city destroyers."

Holdren said that the number of NEOs in the size range of 140 meters or above is estimated to be between 13,000 and 20,000 and that the number of "undetected city killers" is in the range of 10,000 or more.

Bolden and Holdren said that other programs also would help with better understanding and tracking many NEOs. These include the president's goal of conducting a human mission to an asteroid by 2025 and the endorsement in February by a subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space to form an International Asteroid Warning Network that would also recommend criteria and thresholds for notification of an emerging impact threat.

However, officials at the House of Representatives hearing conceded that some NEOs would be very hard to detect, such as the 15 February meteor that arrived in daylight from the direction of the Sun. Even the U.S. Department of Defense (DOD) "had no insight on that [NEO] at all," testified General William Shelton, commander of the Air Force Space Command, who noted that DOD capabilities are focused on objects in Earth orbit. "We were aware of the event when it occurred, not before," he said.

Bolden said that while ground-based telescopes and other instruments are valuable for detecting and tracking NEOs, space-based assets are important. He cited a proposal by the nonprofit B612 organization for a space-based infrared survey mission to detect NEOs called Sentinel, which could cost about $500 million.

While detection is important, House committee members also questioned how to deflect a potentially catastrophic NEO. Holdren said, "Even throwing a lot of resources at it, you'd be talking about 4–5 years" before a deflection mission could be mounted.

Rep. Posey asked what would happen if a dangerous NEO were discovered that could hit Earth much sooner. Emphasizing that such an event is unlikely, Bolden said, "If it's coming in 3 weeks? Pray, if we find that out right now."

—Randy Showstack, Staff Writer