International Asteroid Warning Network
Report to STSC 2016

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Science Mission Directorate
NASA HQ
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UN Office of Outer Space Affairs
Committee on Peaceful Uses of Outer Space

Overview for NEO Threat Response

United Nations COPUOS/OOSA

Inform in case of credible threat

Parent Government Delegates

- Determine Impact time, location and severity
- Potential deflection mission plans

International Asteroid Warning Network (IAWN)
Observers, analysts, modelers...

Space Missions Planning Advisory Group (SMPAG)
Space Agencies and Offices
Worldwide Observing Network

Received ~20.6 Million Observations from 39 countries in 2015 (and one in space!)
Known Near Earth Asteroid Population

As of 12/31/15
13,514
Also 104 comets

1650 Potentially Hazardous Asteroids
Come within 5 million miles of Earth orbit

878
153 PHAs

All statistics available at http://neo.jpl.nasa.gov/stats/
Growth in Capability

Near-Earth Asteroid Discoveries by Survey

All NEAs (as of 2016–Jan–09)

2015
All others: 133
Total: 1560

All statistics available at http://neo.jpl.nasa.gov/stats/
Near Earth Asteroid Survey Status


*Predicted NEA Population by Size

Predicted Population

Population Number

NEA Size (km)

0.010 0.015 0.025 0.040 0.10 0.16 0.25 0.40 0.65 1.00 1.60 2.50 4.00 6.30 10.00 16.00 25.00

10,000,000 1,000,000 100,000 10,000 1,000 100 10 1
Near Earth Asteroid Survey Status

Near Earth Asteroid Survey Status (2015)

- Population Number
- NEA Size (km)
- Percentage Complete

Number Found
Predicted Population
Survey Completeness
Orbit Prediction and Assessment of Impact Risk

Parallel Websites at ESA and NASA contain all known information on discovered NEOs
Numerous blogs and web postings erroneously claimed that a large asteroid would impact Earth, sometime between Sept. 15 and 28, 2015. On one of those dates, as internet rumors speculated, there would be an impact -- "evidently" near Puerto Rico -- causing mass destruction to the Atlantic and Gulf coasts of the United States and Mexico, as well as Central and South America.

Based on the world-wide data collected through IAWN, this statement was issued:

"There is no scientific basis -- not one shred of evidence -- that an asteroid or any other celestial object will impact Earth on those dates."
2015 TB145 - Halloween Asteroid Fly-by
“The Great Pumpkin”

- Discovered by Pan-STARRS on October 10
- Close Approach of 1.3 Lunar Distance predicted for October 31
- Immediately drew some media attention – “Discovered only 3 weeks before it may hit”
- IRTF observations determined object is likely a dead comet that has shed volatiles
- Observed by Arecibo and bi-static with Greenbank receiving from Goldstone transmission
- Object is roughly spherical in shape and approximately 2,000 feet (600 meters) in diameter
- Resolution is ~4 meters
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### Initial Signatories to IAWN

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<th>National Institute of Astrophysics, Optics &amp; Electronics</th>
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<td>Peter Birtwhistle (<em>amateur follow-up observer, UK</em>)</td>
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<th>Institute of Astronomy Russian Academy of Science (INASAN)</th>
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and, NASA Planetary Defense Coordination Office (PDCO)
This new office has just been established at NASA HQ to coordinate planetary defense related activities across NASA, and coordinate both US interagency and international efforts and projects to address and plan response to the asteroid impact hazard.

**Planetary Defense Coordination Office**

**Mission Statement:**

Lead national and international efforts to:
- Detect any potential for significant impact of planet Earth by natural objects
- Appraise the range of potential effects by any possible impact
- Develop strategies to mitigate impact effects on human welfare

More information is at:  [http://www.nasa.gov/planetarydefense/overview](http://www.nasa.gov/planetarydefense/overview)

USA capabilities with IAWN is at: [http://iawn.net/usa_contributions.pdf](http://iawn.net/usa_contributions.pdf)
Newly established IAWN Website: http://iawn.net/