



*Promoting Cooperative Solutions for Space Sustainability*

# **U.S. Policy, Programs, and Diplomatic Initiatives to Respond to Space Debris and Counterspace Threats**

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- U.S. national policy, programmatic, and diplomatic initiatives to address two major outer space threats
  - Space debris
  - Counterspace threats (anti-satellite capabilities)
- Comparison of progress made on each
  - Policy directives in the 2010 National Space Policy
  - Implementation
  - Budgetary allocations
  - Diplomatic initiatives

# Trends in perception of space threats

- 1950s – 1980s: Counterspace is the biggest threat
  - Cold War competition between the U.S. and Soviet Union
  - Nearly all the focus was on military threat posed by Soviet space and counterspace capabilities
  - Space environment was a risk, but not focused on
- 1990s – 2000s: Environment is the biggest threat
  - Collapse of the Soviet military threat, and beginning of increased international civil and commercial activity
  - Increased focus on threats of space debris and space weather to satellite operations

# Mid-2000s: Shocks to the system

- 2002/2003 Afghanistan/Iraq are the first real “space wars”
  - U.S. realizes space is the key to (and weakness of) future warfare
- 2006 Landmark NASA study on Kessler Syndrome
  - Debris population will continue to grow despite no new launches
- 2007 Chinese ASAT test
  - Destroyed defunct weather satellite with ground-based DA-ASAT weapon, created ~3,000 pieces of trackable debris @850 km
- 2009 Iridium-Cosmos Collision
  - Destroyed active U.S. commercial comsat and dead Russian military comsat, created ~2,000 pieces of trackable debris @850 km
- 2010 DARPA Catcher’s Mitt Study
  - Removal (remediation) of large debris objects only way to reduce long-term collision risk to operational satellites

# 2010 U.S. National Space Policy

- Completed fairly early in President Obama's term (compared to other administrations)
  - Only 4 years since the previous NSP
- Represents the “consensus” view of the bureaucracy
  - Created by an inter-agency committee led by the White House
- Provides presidential-level policy direction to the executive branch
  - Sets core principles and goals for U.S. space activities
  - Guidance for specific space sectors
  - Describes roles and responsibilities for Departments/Agencies



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# **POLICY, PROGRAMS, AND DIPLOMACY FOR SPACE DEBRIS**

- Preserving the Space Environment and the Responsible Use of Space
  - Continue to develop, adopt, and follow space debris mitigation guidelines
  - Increase space situational awareness (SSA) capabilities
  - NASA and DoD jointly pursue R&D of debris remediation technologies
  - Develop “space collision warning measures” to warn governmental, commercial, and international entities of close approaches between space objects

# Program/budget implementation

- Debris mitigation
  - US agencies continue to follow guidelines, stricter rules for exemptions
- Increase SSA
  - U.S. military investing around \$1 billion a year in improving SSA
  - Interagency discussions on “space traffic management”
- Close approach warnings
  - USSTRATCOM began providing warning of close approaches to all satellite operators in 2010
- Remediation
  - Minimal NASA funding (a few million dollars) for low-level R&D

- UN COPUOS Working Group on Long-Term Sustainability of Outer Space Activities
  - Expand upon the success of the debris mitigation guidelines
  - Developing voluntary guidelines across 4 broad categories
    - Using space for sustainable development on Earth
    - On-orbit space activities
    - Space Weather
    - National regulation
- Data-sharing agreements with USSTRATCOM (as of August 2015)
  - 9 foreign governments
  - 2 international organizations
  - 49 commercial entities

# Missing component - remediation

- USG considered but never implemented plan
  - Concern over dual-use perceptions
  - Didn't fall into any one agency's "job basket"
  - Cost too much money
  - Policy uncertainties/inertia
- DoD
  - Not tasked with preserving the space environment
  - Concerned about domestic/international politics of "space weapons"
- NASA
  - Competition among field centers for this new mission
  - Already struggling with budget battles between SLS, Commercial Cargo and Crew, & Planetary Science



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# **POLICY, PROGRAMS, AND DIPLOMACY FOR COUNTERSPACE**

- Assurance and Resilience of Mission-Essential Functions
  - Maintain continuity of national security space functions
  - Increase protection and resilience of key space assets
  - Develop ability to detect, warn, characterize, and attribute incidents in space
  - Prepare to operate in a degraded, disrupted, or denied space environment
  - Pursue bilateral and multilateral transparency and confidence-building measures (TCBMs)
  - Consider arms control measures that are equitable, verifiable, and enhance U.S. national security

# Program/budget implementation

- 2011 National Security Space Strategy (NSSS)
  - Promote peaceful & sustainable uses of space
  - Improve US space capabilities
  - Partner with international and commercial entities
  - Prevent and deter aggression
  - Prepare to defeat attacks and operate in degraded environment
  
- 2012 DoD Space Policy
  - Support development of norms of responsible behavior
  - Build coalitions
  - Improve resilience of US national security space capabilities
  - Develop capabilities to respond to an attack

# 2010-2015: More shocks to the system

- Chinese robotic rendezvous and proximity ops (RPO) in LEO in 2010, 2013, and 2014
- Chinese test of potential DA-ASAT that could reach GEO in May 2013
- Russia conducts robotic RPO demonstrations in LEO in 2013 and 2014
- Russian satellite shows mysterious pattern of movements in GEO, including parking next to US commercial satellites, in 2014-2015

# Further action on counterspace

- DoD initiates Space Portfolio Review (SPR) in May 2014
  - Assess national security space investments in light of counterspace threats
- Change in tone of public statements by senior military leadership
  - “Need to prepare to fight a war and defend ourselves in space”
  - “Space will become a battlefield like air, land, and sea”
- Congressional action
  - Directed several studies on space defense and deterrence and role of offensive counterspace
  - \$5-8 billion in “reallocated” spending across FY16-FY20 for “space protection”

- Creation of the Joint Space Doctrine and Tactics Forum (JSDTF)
  - Improve collaboration and cooperation between military and intelligence community on space
  - Develop tactics, techniques, and procedures (TTPs) for responding to attacks on space capabilities
- Creation of the Joint Interagency Combined Space Operations Center (JICSpOC)
  - Experiment with implementing the concepts developed by the JSDTF
- Renamed the Secretary of the Air Force from Executive Agent for Space to Principal DoD Space Advisor (PDSA)

- Participation in the Group of Governmental Experts (GGE) on Transparency and Confidence-building Measures (TCBMs) in Outer Space Activities
- Participation in consultations on the International Code of Conduct for Outer Space Security
- Engaging in a series of bilateral dialogues on space security with several countries
- Created the Combined Space Operations (CSpO) Initiative to enhance space operations planning and coordination

- “Punctuated equilibrium” holds true
  - Action comes as a response to external shocks
  - Shocks in both counterspace and space debris drove 2010 NSP
  - Additional shocks in counterspace over last 5 years may have influenced greater focus on implementation there
- Much more willingness to allocate budget for counterspace threats than space debris threats
  - Several billion USD in direct spending on counterspace, a few million in direct spending on space debris
  - Remediation: If more than one have responsibility, no one has responsibility
  - Better relationship between Pentagon and Congress than between NASA and Congress



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# Thank You. Questions?

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