US Policy and Capabilities on SSA

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ORGANIZATIONAL HISTORY

Military origins

- SSA was originally part of the North American Aerospace Defense (NORAD) mission
  - Located in Cheyenne Mountain, Colorado
- In 1985, United States Space Command (USSPACECOM) was created to take over the Unified Command for the space mission
  - In 1989 mission was given to the 1st Command and Control Squadron (1 CACS)
  - Still located in Cheyenne Mountain
- In 2002, USSPACECOM merged with United States Strategic Command (USSTRATCOM)
  - 1 CACS renamed 1st Space Control Squadron (1 SPCS)

Transition to JSpOC

- In 2007, the SSA mission was transferred to the 614th Air Operations Center (614 AOC)
  - Vandenberg Air Force Base, California
  - 614th AOC became the nucleus of the Joint Space Operations Center (JSpOC)
  - JSpOC mission was to do command and control for all US military space activities

- In 2010, USSTRATCOM given authority to provide SSA services to commercial and foreign actors
  - Begin negotiating SSA Sharing Agreements with other governments

Towards Combined Space Operations

- In 2016, the JSpOC mission is broken up
  - Space threat assessment, battle management, and C2 mission transferred to the National Space Defense Center (NSDC) at Schriever Air Force Base, Colorado
  - SSA mission was transferred back to the 18th Space Control Squadron (18 SPCS), still located at Vandenberg

- In 2018, the JSpOC was renamed the Combined Space Operations Center (CSpOC)
  - Integrating of allies and commercial partners
  - Refocus on providing space support to theater warfighters

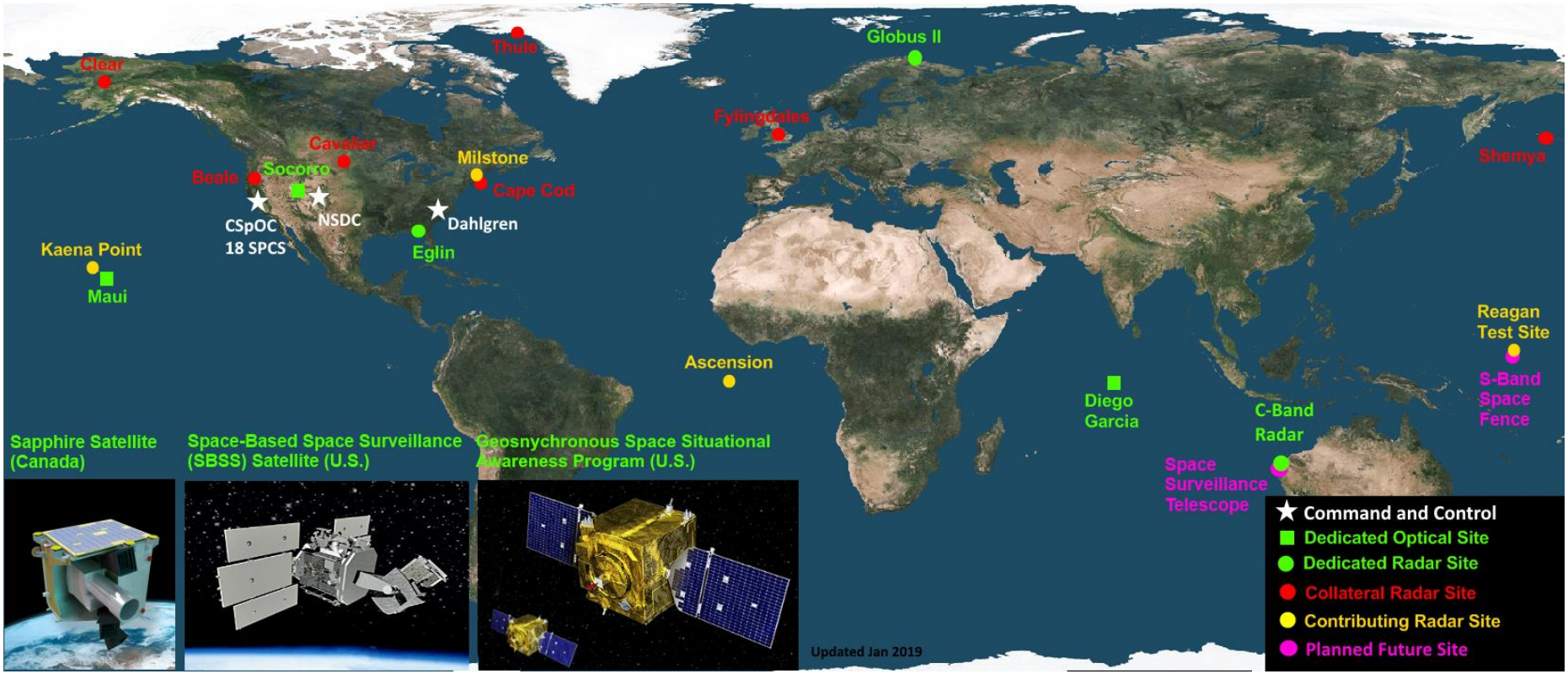
US SSA CAPABILITIES & SERVICES

Current U.S. capabilities

- United States military has the best set of government SSA capabilities, although not ideal
  - Operates global network of 30+ ground based radars and optical telescopes, plus 6 satellites in orbit
  - Maintains the most complete tracking database of 23,000+ space objects bigger than 10 cm
  - Provides a range of data and services for US government, satellite operators, and public

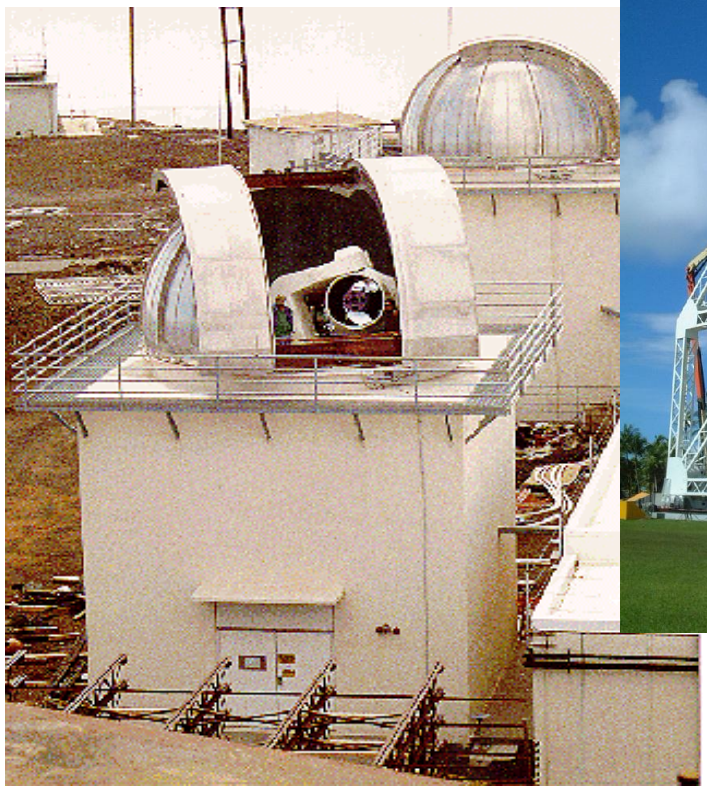
- Limitations
  - Outdated hardware and software
  - Challenges with ingesting data from non-DOD sources
  - Very little coverage in the Southern Hemisphere or Asia, Africa, and South America

U.S. Space Surveillance Network



Source: SWF Fact Sheet on SSA

Typical ground-based SSA sensors



GEODSS

ALTAIR

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Recent/planned upgrades

- $1B contract award for S-Band Space Fence
  - Located on Kwajalein Atoll
  - Track objects as small as 5 cm at altitudes of up to 40,000 km
  - Expected to have initial operating capacity in 2019

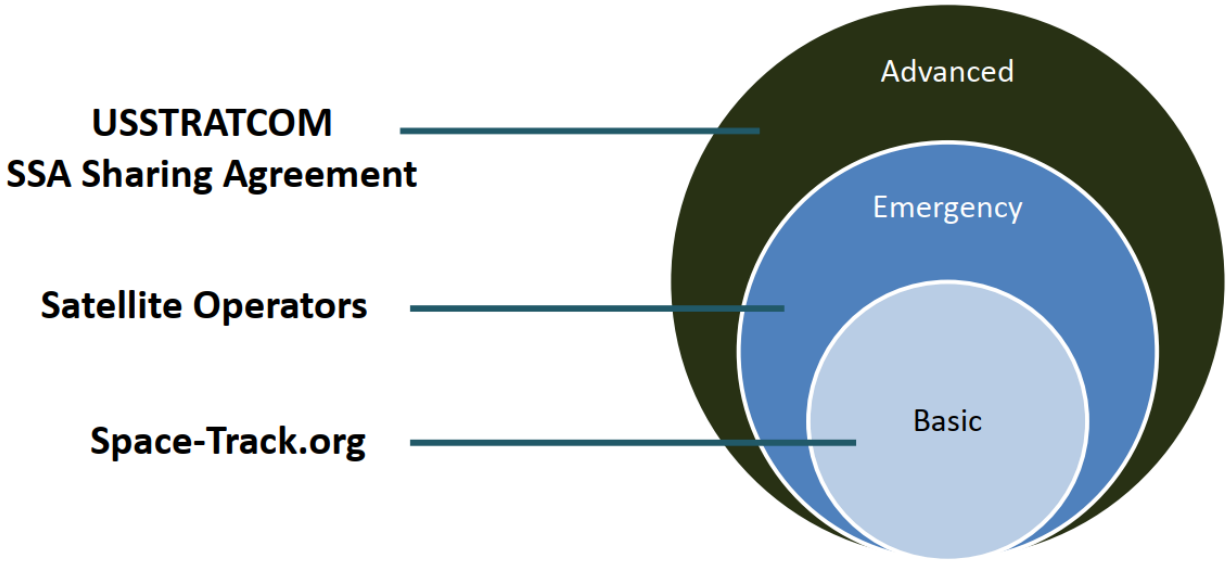
- Moving two existing sensors to northwestern Australia
  - C-Band radar from Antigua
  - Space Surveillance Telescope (SST) from New Mexico

- Geosynchronous SSA Program (GSSAP)
  - 2 pairs of satellites orbiting above/below GEO to do close-up inspection of satellites

USSTRATCOM SSA Sharing Program

USSTRATCOM SSA Sharing Program

- **The Joint Functional Component Command for Space (JFCC SPACE) executes USSTRATCOM's SSA Sharing Program, which promotes the responsible use of space, advances spaceflight safety, and enhances space situational awareness (SSA) through the exchange of SSA information with the global space community.**



Source: MGen Clint Crosier, briefing to UNCOPUOS STSC, February 2016

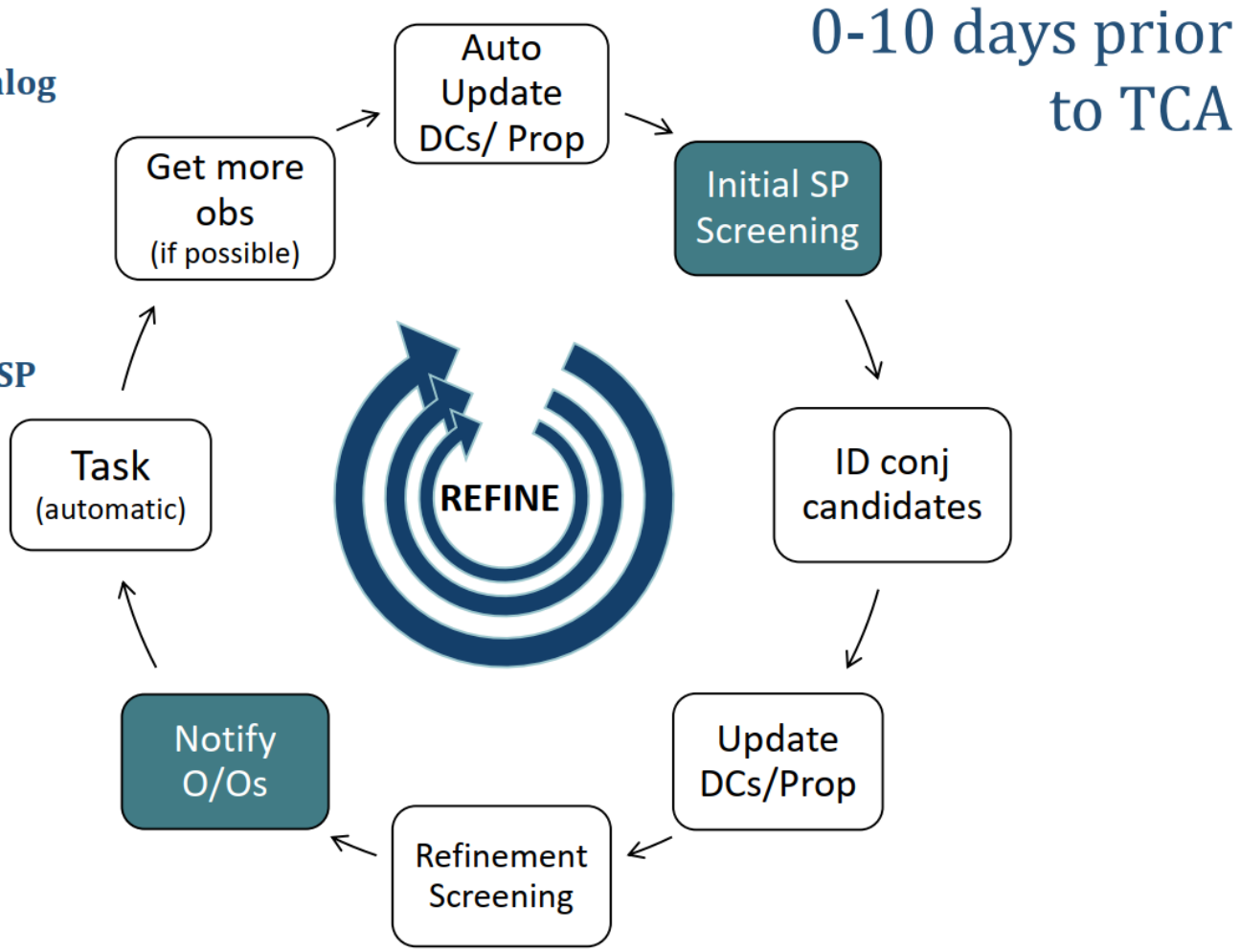
Conjunction Assessment screening process

High Accuracy Catalog (SP vs SP):

- Deep Space: Every 24 hours
- Near Earth: Every 8 hours

O/O Ephemeris vs SP (Eph vs SP) and O/O Ephemeris vs O/O Ephemeris (Eph vs Eph)

- High-Interest: On demand
- Deep Space & Near Earth Routine: Every 8hrs



Source: MGen Clint Crosier, briefing to UNCOPUOS STSC, February 2016

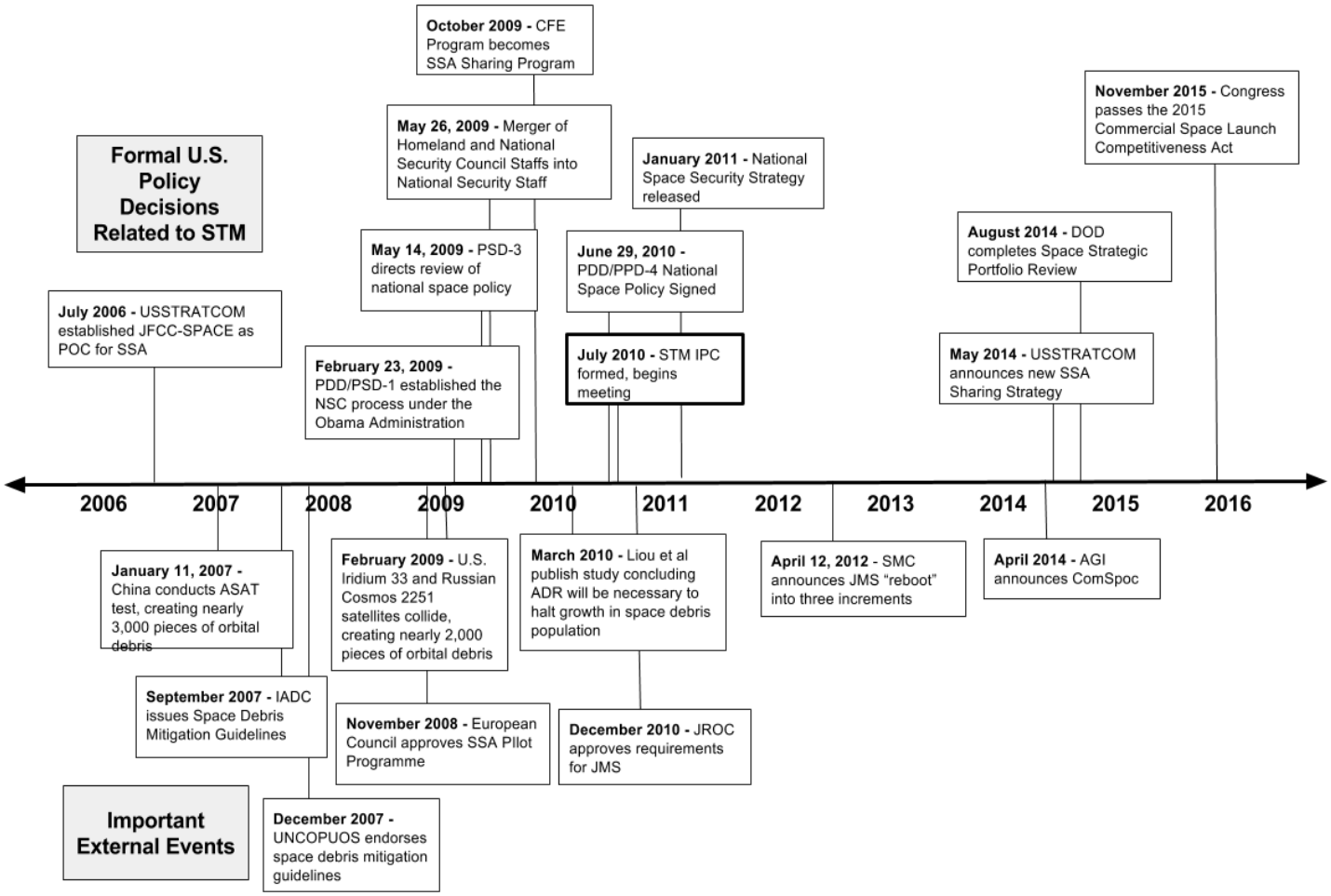
TOWARDS SPACE TRAFFIC MANAGEMENT

US Policy on SSA and STM

- US has been holding interagency discussions on SSA policy since 2011
  - Began under the Obama Administration as part of the implementation of the 2010 National Space Policy
  - Implementing Directive on Space Traffic Management
  - Efforts continued under the Trump Administration

- Key issues
  - Civil agency authority for part of the SSA mission
  - Relationship and interactions between civil agencies and DOD
  - Protection of sensitive data
  - Leveraging commercial and international sources of data

Interagency process on STM



Source: Weeden - [Case Study of the Interagency Process for Making Presidential Policy Decisions on Dual-Use Space Technology](#) (2017)

SPD-3 on Space Traffic Management

- Trump Administration issued Space Policy Directive 3 in June 2018
  - Advance science and technology research to support SSA and STM
  - Improve orbital debris mitigation with updated guidelines, practices, and international standards
  - Encourage commercial sector growth & innovation through reducing regulatory burdens
  - US govt will provide basic data and services for SSA and STM free of direct user fees, while enabling commercial enhanced data and services
  - Develop national STM standards and best practices and encourage international adoption
  - Develop policies and regulations for future US orbital operations

Shift in SSA authorities?

- SPD-3 proposes to make the Department of Commerce (DOC) the lead for safety-related aspects of SSA and STM
  - DOD will retain control of the "authoritative satellite catalog"
  - DOC will develop an Open Architecture SSA Data Repository that leverages commercial, scientific, and international data sources
  - DOC will be the "store front" for promotion & oversight of US private sector entities
  - DOC will develop national STM regime based on industry-led best practices and standards and encourage international adoption

- U.S. Congress has not yet approved this changed
  - Debate over whether it should go to Department of Commerce or Department of Transportation

International engagement

- Stronger cooperation with allies and partners
  - On-going Global Sentinel tabletop exercise (TTX) on SSA with Australia, Canada, United Kingdom, and New Zealand
  - Recent expansion to include France, Germany, Italy, South Korea, Spain, and Japan

- International discussions
  - Guidelines for long-term sustainability of space
  - Norms of behavior for space activities (governments and private sector)
  - Transparency and confidence building measures (TCBMS) to reduce risk of mistakes and misperceptions

Thank you

Questions?

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