ENHANCING YOUR INTELLIGENCE AGENCY INFORMATION RESOURCES IQ:

PT. 4: NATIONAL GEOSPATIAL INTELLIGENCE AGENCY (NGIA), NATIONAL INTELLIGENCE UNIVERSITY (NIU), AND NATIONAL RECONNAISSANCE OFFICE (NRO)

Professor Bert Chapman
Purdue University Libraries
FDLP Academy
November 6, 2018

Graphic design contributions by Aly Edmondson, Purdue University Libraries

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NATIONAL GEOSPATIAL INTELLIGENCE AGENCY: SELECTED HISTORICAL HIGHLIGHTS

- Understanding physical terrain has been important component of U.S. civilian and military history and policymaking since Colonial Era.
- Aug. 1, 1818-Topographic Bureau established within Army Engineer Dept.
- July 5, 1838-Congress establishes Corps of Topographical Engineers with responsibility for civil engineering works. Military engineering handled by Army Corps of Engineers.
- 1847 Navy's Matthew Maury publishes *Wind and Current Chart of the North Atlantic*
- June 21, 1866-Navy's Hydrographic Office assumes responsibility for publishing maps, charts, and nautical books for safe navigation.
- 1910 Army Engineer School establishes map printing plant at what is now Fort McNair, DC
- March 31, 1913-Army aviators make first aerial map from an aircraft in flight across Texas
- 1918 Army Corps of Engineers establishes School of Surveying, Map Production, & Ranging at what is now Fort Belvoir, VA.
- 1941 Army Air Force and Navy, in concert with British, shift use of aerial photography from mapping and strategic planning to photographic analysis

NATIONAL GEOSPATIAL INTELLIGENCE AGENCY: SELECTED HISTORICAL HIGHLIGHTS

- May 1942-Army Map Service created. Produces 500 million topographic maps during World War 2.
- June 1943-Army Air Force aeronautical chart plant begins operating in St. Louis.
- August 1952-CIA establishes Photo Interpretation Unit
- January 1, 1972-Defense Mapping Agency (DMA) consolidates multiple mapping agencies. Assumes responsibilities for producing and distributing maps, charts, and geodetic products and services to combat services, federal agencies, Merchant Marine, and mariners.
- Nov. 1974-Defense Dissemination Program Office (DDPO) established within Air Force to provide electronic dissemination of national digital imagery. Gives functional and geographic commanders almost instantaneous access to high quality overhead imagery facilitating rapid targeting and assessment of strategic threats.
- 1975-More than 300 million topographic maps and charts produced during Vietnam War.
- 1983-Following Soviet shoot-down of KAL 007, President Reagan announces U.S. will make GPS available for international civilian use once development is completed.

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NATIONAL GEOSPATIAL INTELLIGENCE AGENCY: SELECTED HISTORICAL HIGHLIGHTS

- 1987 DMA Headquarters moved from Naval Observatory to Merrifield, VA. Provides 1st liaison officer to Strategic Air Command in Omaha.
- 1992 Earth Science Research Institute (ESRI) develops ArcView and ArcData to promote commercial off-the-shelf and high quality data sets to facilitate GIS applications.
- Oct. 1, 1996-National Imagery and Mapping Agency (NIMA) established-integrates mapping, charting, imagery, and geospatial information to military and government.
- Nov. 24, 2003-NIMA becomes NGA reflecting changing role of technology and uses.
- Dec. 25, 2004-*Notice to Mariners*, published since 1869, becomes fully digital.
- Oct. 8, 2005-NGA provides Pakistan with maps, imagery, and charts to assist earthquake disaster relief.
- May 1, 2011-NGA cooperates with intelligence and military agencies in mission to kill Osama Bin Laden.

NGA MISSION & VISION

- Providing products and services decision-makers, warfighters, and first responders need.
- Exploiting and analyzing imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on Earth to achieve mission success.
- Welcoming and embracing emerging information resources and leveraging exquisite and specialized classified sources.
- Investing in personnel to develop their skills and perspectives and enhance tradecraft.

- Statutory authorities: 50 USC 3045 and 10 USC 441-467.
- Headquartered in Springfield, VA with other locations in St. Louis and Arnold, MO.
- 14,500 civilian military and contractor employees with 2/3 at Springfield. Budget is classified.
- Collects foreign intelligence consistent with Executive Order 12333. Provides intelligence support for domestic disaster relief and special security events.
- NGA ensures safety of navigation in the air and on the seas by maintaining the most current information and highest quality services for U.S. military forces and global transport networks.
- NGA defends the nation against cyber threats by supporting other intelligence agencies with in-depth analysis of cyber networks.

NGA LEADERSHIP

Robert Cardillo

(Director (Bio

Justin Poole

Deputy Director (Bio)

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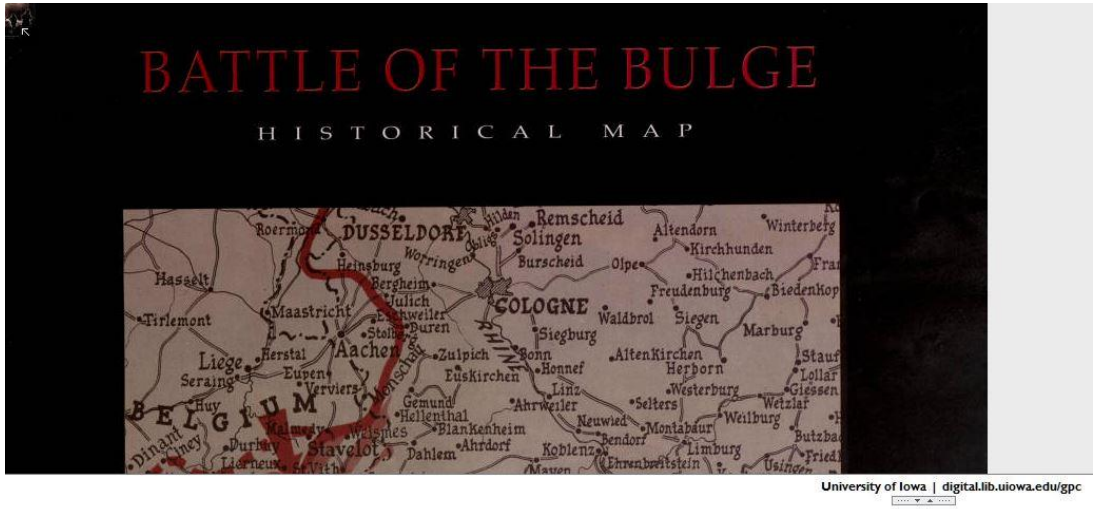
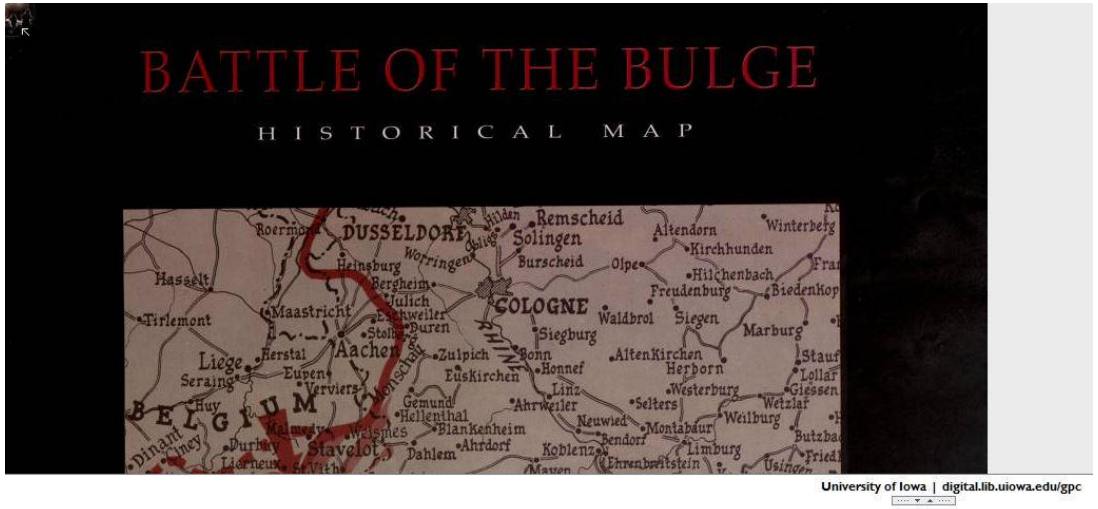
SELECTED HISTORIC MAPS-COURTESY: U. IOWA LIBRARY





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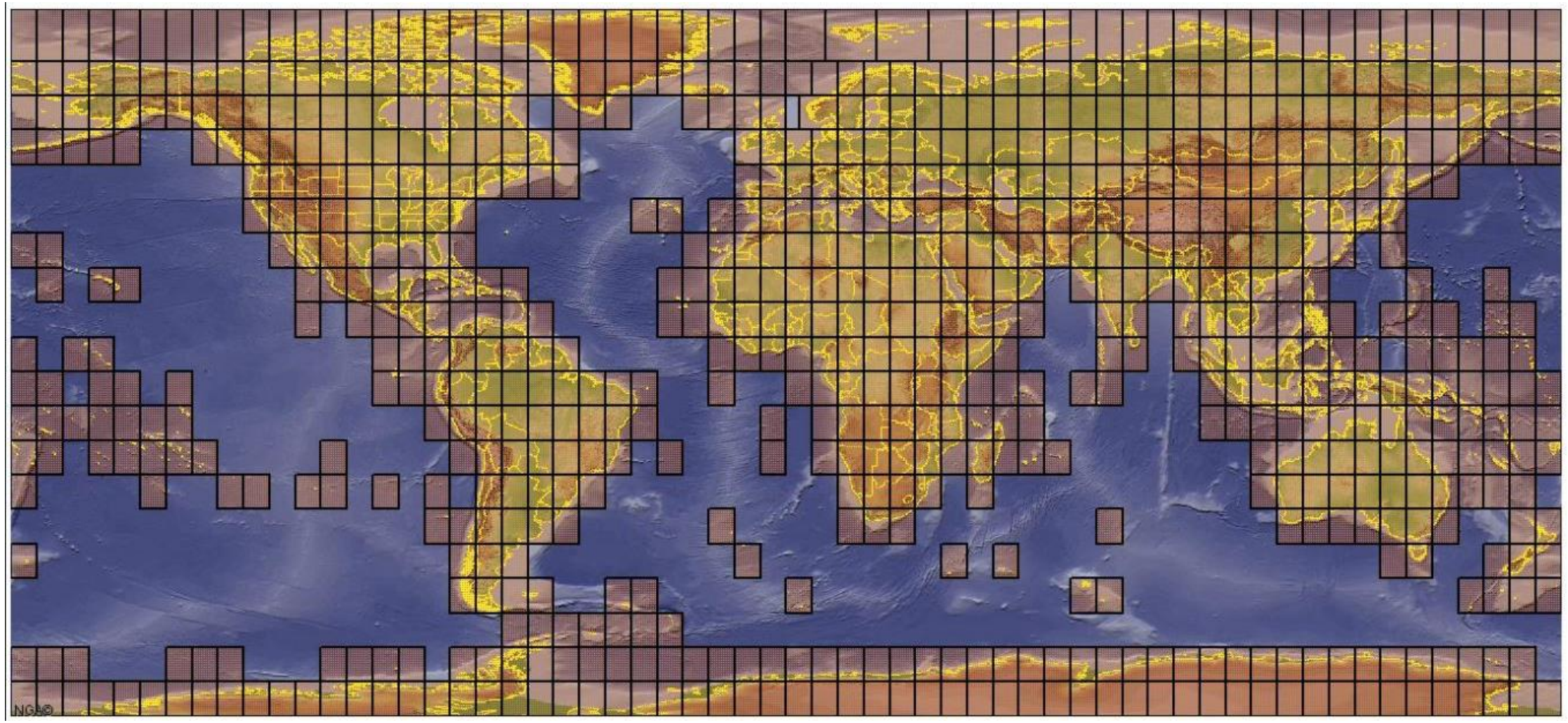

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NGA, partners complete 2-meter resolution map of Arctic

10/5/2018

SPRINGFIELD, Virginia – The National Geospatial-Intelligence Agency and its partners in academia and industry released the final planned 3-D digital elevation models of the Arctic in 2-meter resolution Sept. 28.

Release 7 of the ArcticDEM Project is a mosaic of time-stamped DEM strips that cover the entire Arctic and fills gaps from previous releases.

The resolution is more than five times that of the original release and covers just over 10 percent of the Earth's surface. Enhancements also include improved filtering to preserve coastlines and better resolve densely-forested areas subject to seasonal variation, according to the University of Minnesota's Polar Geospatial Center.

A digital elevation model is a 3-D representation of a terrain's surface, created from terrain elevation data. Analysis can be done on DEMs to determine or detect changes in topography over time.

Reduced-resolution versions of the mosaic are also available at 10 meters, 32 meters, 100 meters, 500 meters, and 1 kilometer for cartographic uses.

ArcticDEM maps can be downloaded from maps.apps.pgc.umn.edu/id/2366 and maps.apps.pgc.umn.edu/id/2367.

KEY DOCUMENTS

NGA, partners complete 2-meter resolution map of Arctic

CONTACT

NGA Media Relations
mediarelations@nga.mil
571-557-5450

MORE NEWS RELEASES

NGA awards new Planet contract, leverages high-revisit imagery and automated processing
Oct. 2, 2018 — NGA awards new Planet

Reference Elevation Model Antarctica (REMA)

SUMMARY | ANTARCTIC DIGITAL ELEVATION DOWNLOAD TOOL | DEM REVIEWER By ESRI | HILLSHADE VIEWER | REFERENCE & RESOURCE MATERIAL

The Reference Elevation Model of Antarctica (**REMA**) is a high resolution, time-stamped Digital Surface Model (DSM) of Antarctica at 8-meter spatial resolution.

Polar Geospatial Center

University of Minnesota

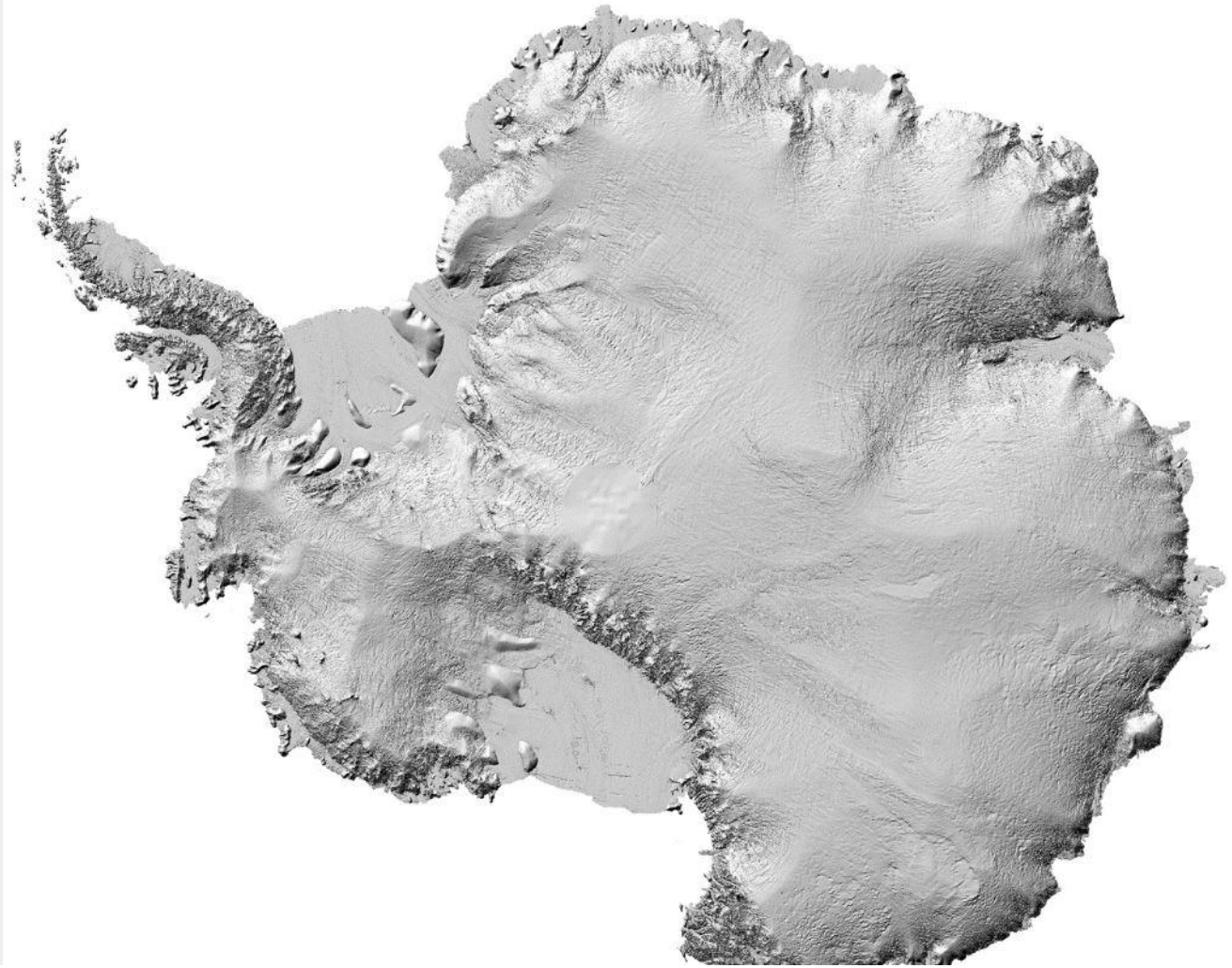
Purpose

The Reference Elevation Model of Antarctica (REMA) provides the first, high resolution (8-meter) terrain map of nearly the entire continent. Since each REMA grid point has a timestamp, any past or future point observation of elevation provides a measurement of elevation change.

REMA may provide corrections for a wide range of remote sensing processing activities, such image orthorectification and interferometry, and provide constraints for geodynamic and ice flow modeling, mapping of grounding lines, and surface processes. REMA also provides a powerful new resource for field logistics planning.

Source

REMA is constructed from hundreds of thousands of individual stereoscopic Digital Elevation Models (DEM) extracted from pairs of submeter (0.32 to 0.5 m) resolution DigitalGlobe satellite imagery, including data from WorldView-1, WorldView-2, and WorldView-3 and a small number from GeoEye-1, acquired between 2009 and 2017, with most collected in 2015 and 2016 over the austral summer seasons (mostly December



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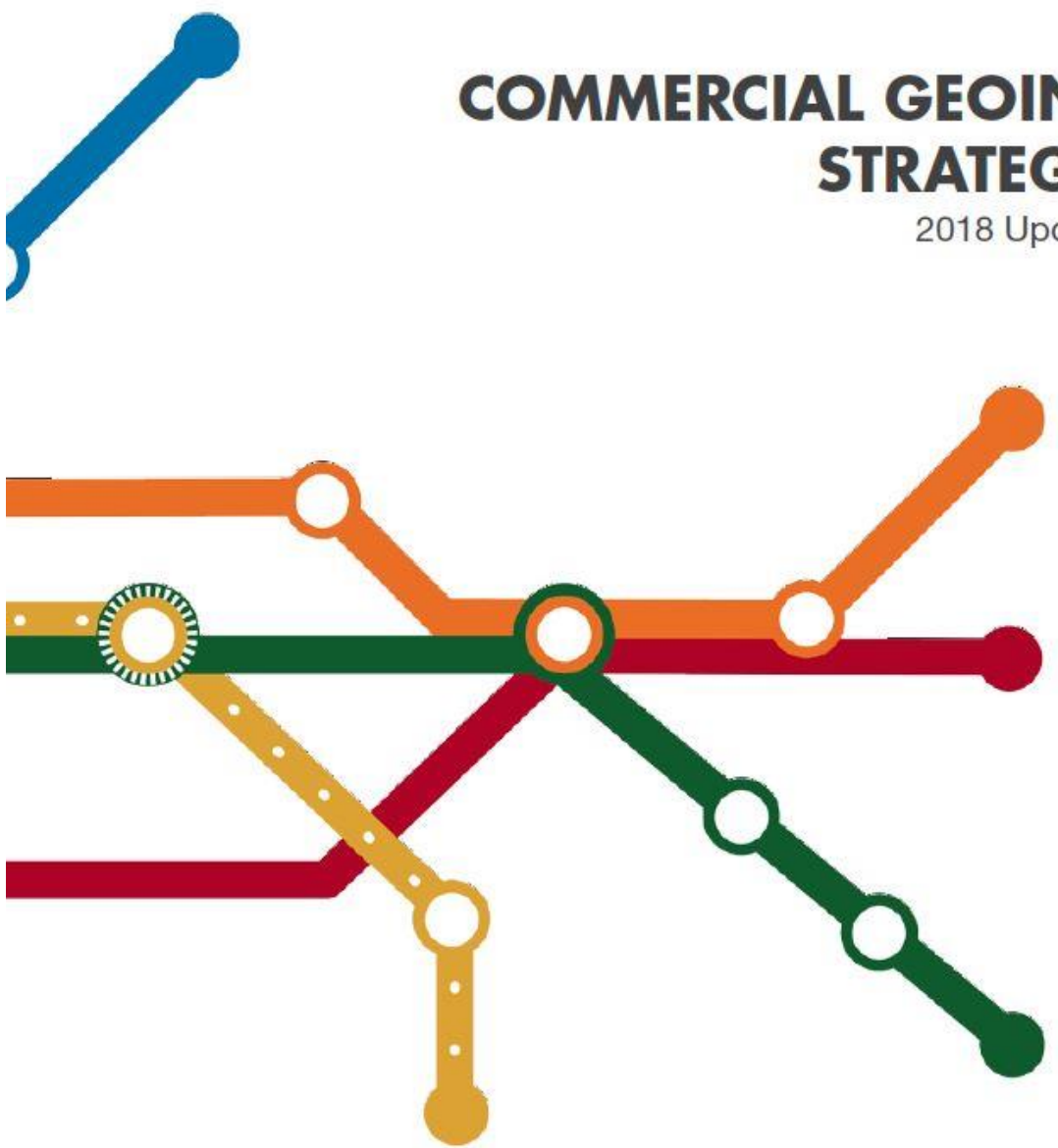
COMMERCIAL GEOINT STRATEGY

2018 Update



NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

No. 41

13 OCTOBER 2018

UNITED STATES OF AMERICA

NOTICE TO MARINERS

Published Weekly by the
National Geospatial-Intelligence Agency

Prepared Jointly with the
National Ocean Service and U.S. Coast Guard

Contents

Section I

71230 (Continued)
(Panel B)
Add Submarine cable [L30.1] joining
0°05.0′S 105°03.0′E
0°12.0′S 105°08.0′E
0°32.1′S 105°18.0′E
0°38.0′S 105°22.0′E
0°45.0′S 105°25.1′E
1°06.1′S 105°37.0′E
1°21.0′S 105°44.0′E
1°28.1′S 105°49.1′E
1°31.3′S 105°52.3′E
(6(48)13 Jakarta)

71238 1Ed. 5/30/15 LAST NM N6/18 N41/18
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1°02′42.6″N 104°08′24.1″E
1°02′40.2″N 104°08′30.7″E
1°02′15.1″N 104°09′07.0″E
1°02′12.1″N 104°09′27.3″E
1°02′08.8″N 104°09′30.5″E
1°01′50.5″N 104°09′33.8″E
1°01′48.3″N 104°09′39.8″E
Submarine power cable [L31.1] joining
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1°02′42.2″N 104°08′22.8″E
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(34(421,422)15 Jakarta)

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0°54.0′N 104°19.0′E
0°48.6′N 104°20.0′E
0°47.1′N 104°21.0′E
0°45.0′N 104°23.0′E
0°39.1′N 104°24.1′E
0°35.3′N 104°30.0′E
0°31.1′N 104°34.2′E
0°29.1′N 104°35.0′E
0°24.0′N 104°40.0′E
0°15.0′N 104°46.6′E
(6(48)13, 34(421)15 Jakarta)

71430 3Ed. 1/18/03 LAST NM 33/18 41/18
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0°05.0′N 104°54.1′E
0°05.1′S 105°03.1′E
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0°32.1′S 105°18.0′E
0°38.0′S 105°21.9′E
(6(48)13 Jakarta)

82367 4Ed. 12/19/98 LAST NM 17/99 41/18
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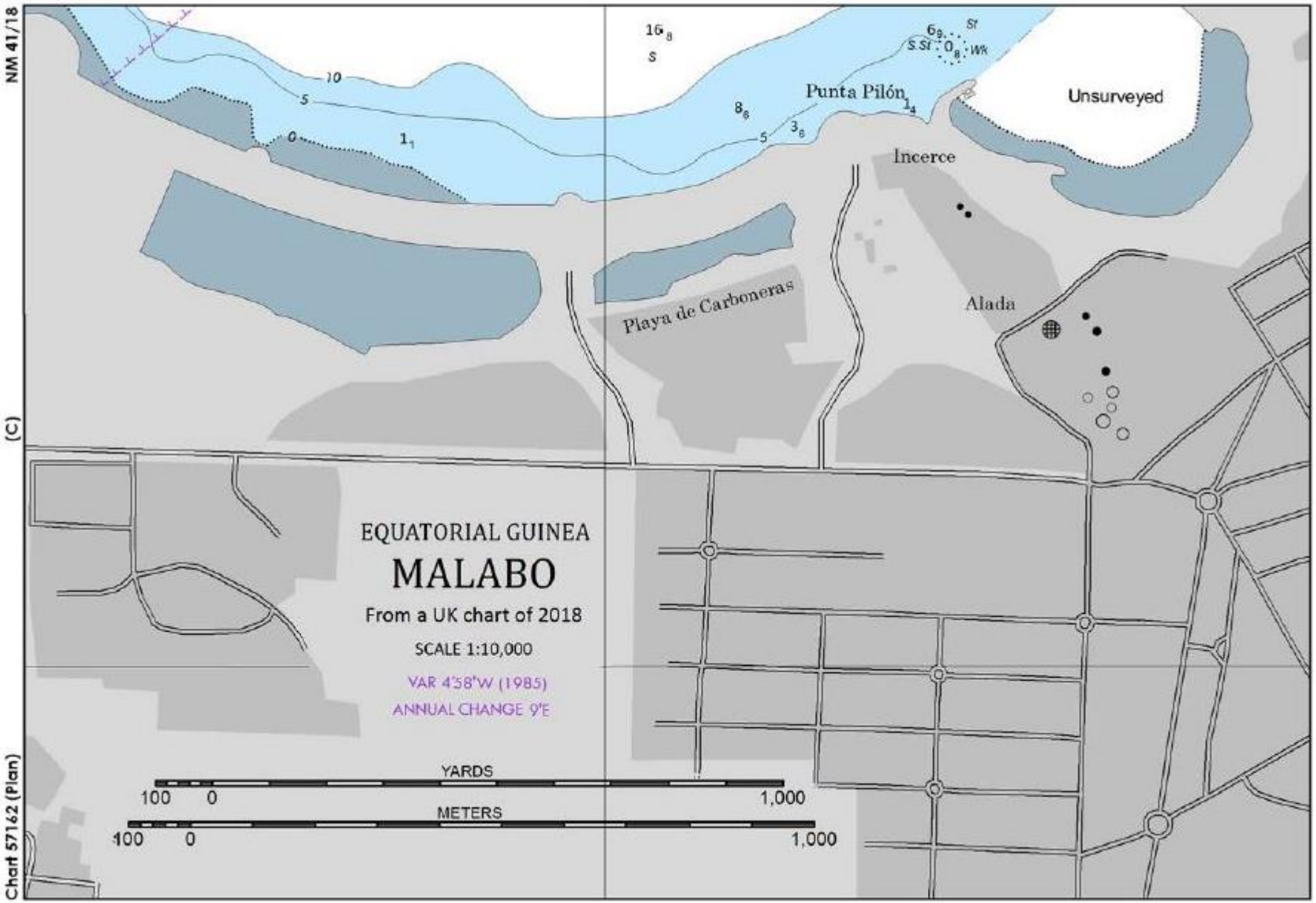
Light to Fl 5s 8m 5M 9°05′56″S 160°10′12″E



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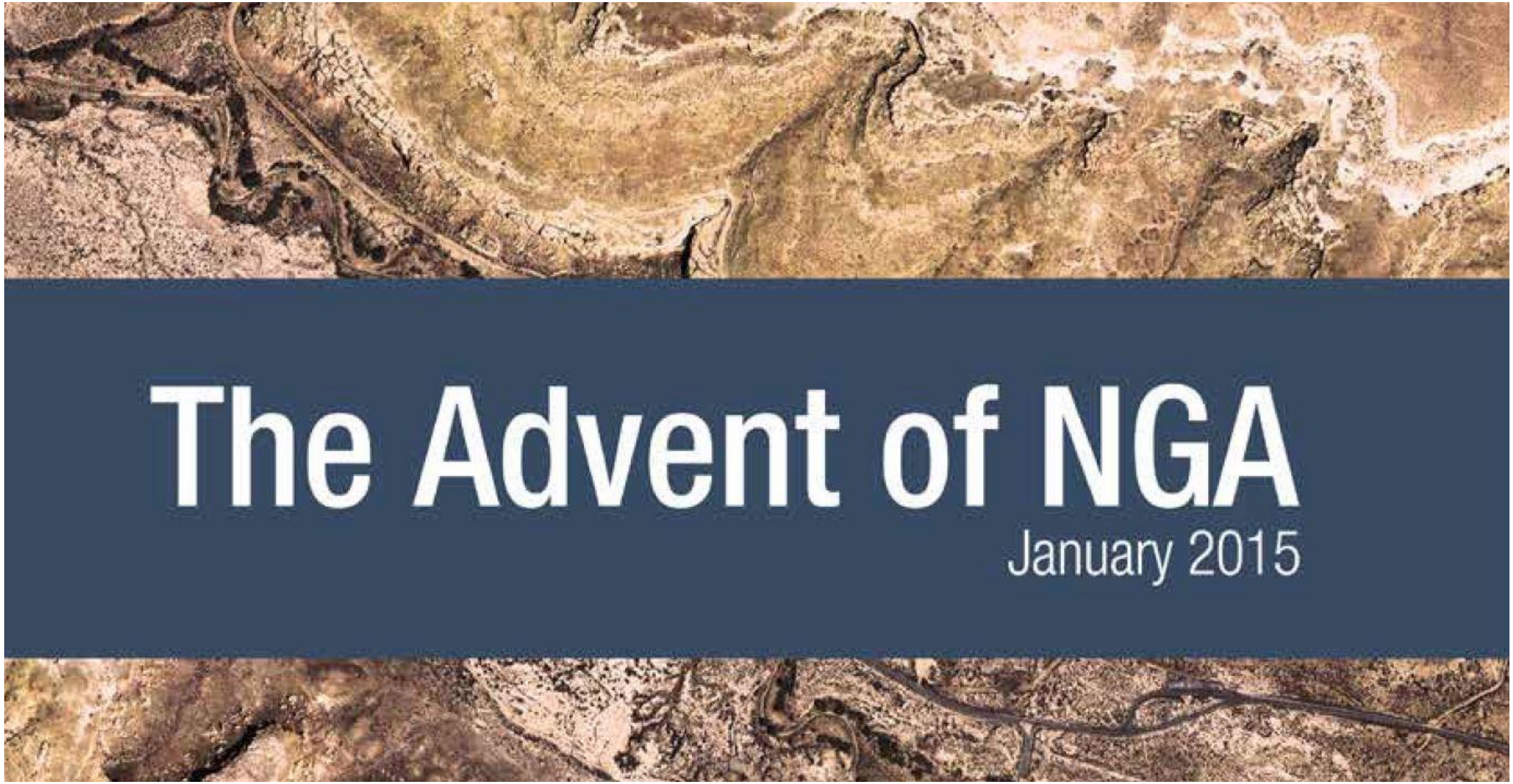

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percent of the desired results. Furthermore, gathering comparable data by traditional means would have taken at least twenty years. As program manager Thomas Hennig indicated,

From a cost perspective, it's a fourteen-to-one ratio. From a time perspective, it's a four- or five-to-one ratio. From an accuracy perspective, it's at least twice as accurate as the DTED® Level 1. From the density perspective, it's at least nine times more data per cell—they're phenomenal numbers that make it easy to talk about a project like that. (Oral history with Thomas A. Hennig, SRTM program manager, June 5, 2003, NGA Historical Research Center.)

The project's managers donated the shuttle arm, itself a marvel of technical sophistication, to the Smithsonian Institution. It currently resides in the Steven F. Udvar-Hazy Center of the National Air and Space Museum near Washington Dulles International Airport in Virginia.

1995 Dayton Peace Accords. The accords demonstrated convincingly the value of digital map compilation and revision, as well as the utility in diplomatic negotiation of the three-dimensional moving terrain simulations known as "fly-throughs." During the late 1990s, NIMA brought these new capabilities to other regions of global concern, including the decades-old border dispute between Peru and Ecuador. The new agency supplied the products used in negotiations between Peruvian President Albert K. Fujimori and Ecuadorian President Jamil Mauad. That half-century-old conflict came to a conclusion on May 14, 1999, with the ceremonial laying of a boundary stone in a disputed area of the Amazon jungle.

In Bosnia-Herzegovina, NIMA's support of peacekeeping efforts was more effective, although the agency's contribution involved the revelation of atrocities. The Dayton Peace Accords placed a Zone of Separation between

Joint Publication 2-03

Geospatial Intelligence in Joint Operations

5 July 2017

TABLE OF CONTENTS

Overview of Geospatial Intelligence

Geospatial intelligence (GEOINT) operations include the tasks, activities, and events used to collect, manage, analyze, generate, visualize, and provide the imagery, imagery intelligence, and geospatial information necessary to support national and defense missions as well as international arrangements.

Geospatial intelligence (GEOINT) is defined in Title 10, United States Code, Section 467, as "the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence (IMINT), and geospatial information." Any one or combination of these three GEOINT elements may be considered GEOINT. The full utility of GEOINT comes from the integration and use of imagery, IMINT, and geospatial information, enabling customers to gain a more comprehensive perspective, an in-depth understanding, and a cross-functional awareness of the operational environment (OE). GEOINT collection encompasses all aspects of literal, infrared (IR), and synthetic aperture radar (SAR) imagery; overhead persistent IR capabilities; and geospatial information and services. GEOINT includes the exploitation and analysis of electro-optical, IR, and radar imagery, as well as the exploitation and analysis of geospatial, spectral, laser, IR, radiometric, SAR phase history, polarimetric, spatial, and temporal data.

Geospatial Intelligence in Joint Operations

NRT Feeds

- Message (AMHS, Freetext and USMTF)
- RSS
- Weather

Intelligence Layers

- Threats
- AOB/GOB/NOB
- Collections
- Assessments
- Targeting
- Cyberspace order of battle

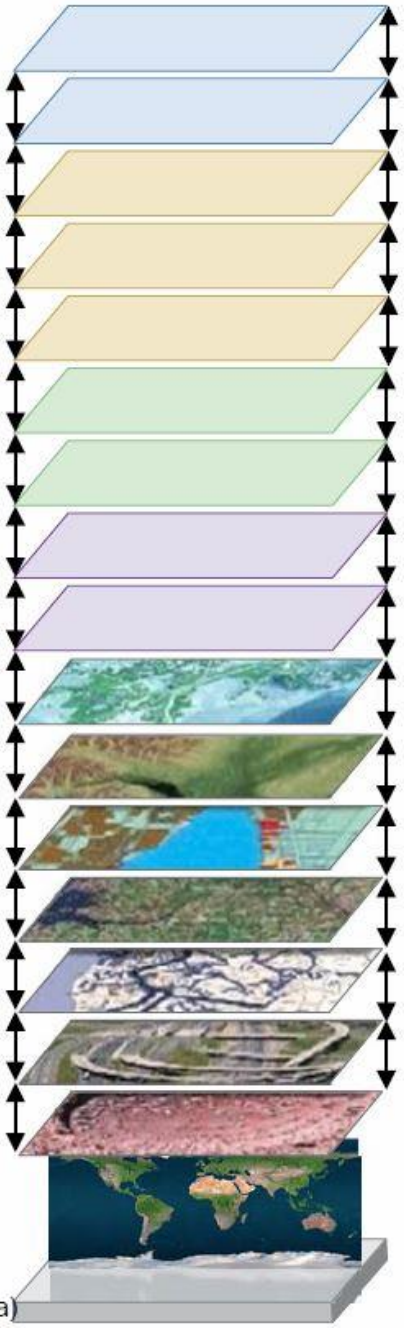
Cross-Functional Data Layers:

- UN, host nation, NGO
- Regional cooperation relationships
- Climate, ecosystem applications
- Water and land management
- Demographic, human geography
- Population, refugees, and migration
- Logistics plans and operations
- Medical
- Operation/concept plans
- Checkpoints, MSRs, LOCs

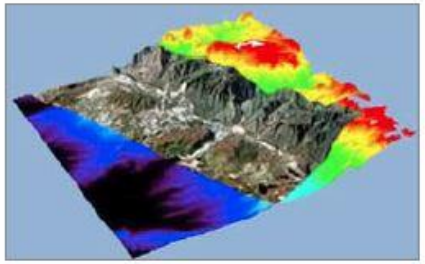
Shared Foundation Geospatial Database

- Map data
- Imagery data
- Elevation data
- Infrastructure
- Cyberspace data

(Notional Layers –
Can be any geospatially enabled data)



Common, Service-Enabled Access to Authoritative Information Across all Domains Viewed Using Standards-Based Applications



Imagery, Imagery Intelligence, Geospatial Information

Geospatial capabilities enable cross-functional information fusion, visualization, analysis, production, and sharing activities.

NATIONAL INTELLIGENCE UNIVERSITY

The Center of Academic Life for the Intelligence Community

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MAIN CAMPUS-BETHESDA, MD-PART OF DEFENSE INTELLIGENCE AGENCY (DIA)

- Additional sites-Molesworth, UK; Quantico, VA; Tampa, FL; St. Louis, MO; Dayton, OH; Fort Meade, MD; and Fort Gordon, GA.
- Founded 1962-by DOD Directive 5105.25 Has gone through various name changes. Been NIU since 2011.
- Accredited by Middle States Commission on Higher Education
- Degrees Awarded: Bachelor of Science in Intelligence, Master of Science of Strategic Intelligence, and Master of Science and Technology Intelligence
- 2017-2018 Full-Time Enrollment: 665
- Average Class Size: 13
- Quarterly Academic Calendar

- Faculty 88 total; 77 full-time
- Scott Cameron NIU President

Dr. J. Scott Cameron, President

- Eligibility criteria: U.S. citizen; armed forces member or federal government employee; meet university security requirements.

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ADDITIONAL NIU ELIGIBILITY REQUIREMENTS

- Bachelor of Science in Intelligence (BSI)
- Possess a high school diploma or GED
- Have a cumulative GPA of 2.5 or higher on a 4.0 scale
- Have a minimum of 80 semester hours of undergraduate coursework complete including:
- 20 upper division (300-400) level hours
- 30 hours earned through a regionally accredited institution
- 9 hours in communication skills, 6 of which must be earned in English composition courses
- 12 hours in Mathematics and Science, 3 of which must be earned in Mathematics
- 15 hours in Humanities, Social Sciences, or Fine Arts
- Interested candidates are encouraged to request a credit evaluation from NIU Admissions before applying to ensure they meet the BSI prerequisite course requirements.

- Master of Science of Strategic Intelligence (MSSI)
  Possess a baccalaureate degree from a regionally-accredited institution.
  Competitive applicants have a cumulative undergraduate GPA of 3.0 or higher on a 4.0 scale
- Competitive applicants score in the 50th percentile or higher in verbal and quantitative and 3.5 or higher in analytical writing portion of the Graduate Record Exam (GRE).
  Master of Science and Technology Intelligence (MSTI)
- Possess a baccalaureate degree from a regionally accredited institution
- Competitive applicants score in the 50th percentile or higher in verbal and quantitative and 3.5 or higher in analytical writing portion of the Graduate Record Exam (GRE)
- Competitive applicants have a cumulative undergraduate GPA of 3.0 or higher on a 4.0 scale
- Ideal candidates for the MSTI program should have academic exposure to science, technology, engineering or math (STEM) coursework during their undergraduate years.
- A science or engineering degree is not required, but it will better prepare students for success in class.

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FACULTY

- National Intelligence University faculty come from across the intelligence, military, government and academic communities. Expertise exists on this faculty to address virtually all issues of concern to the Intelligence Community from regional concerns to cyber security to the transfer of weapons of mass destruction.
- All faculty members possess at least one graduate degree with 40% of the faculty holding terminal degrees. The NIU faculty possesses expertise in strategic languages including Arabic, Pashtun, Russian, and Chinese and represents a healthy mix of academic expertise, intelligence experience, and military service

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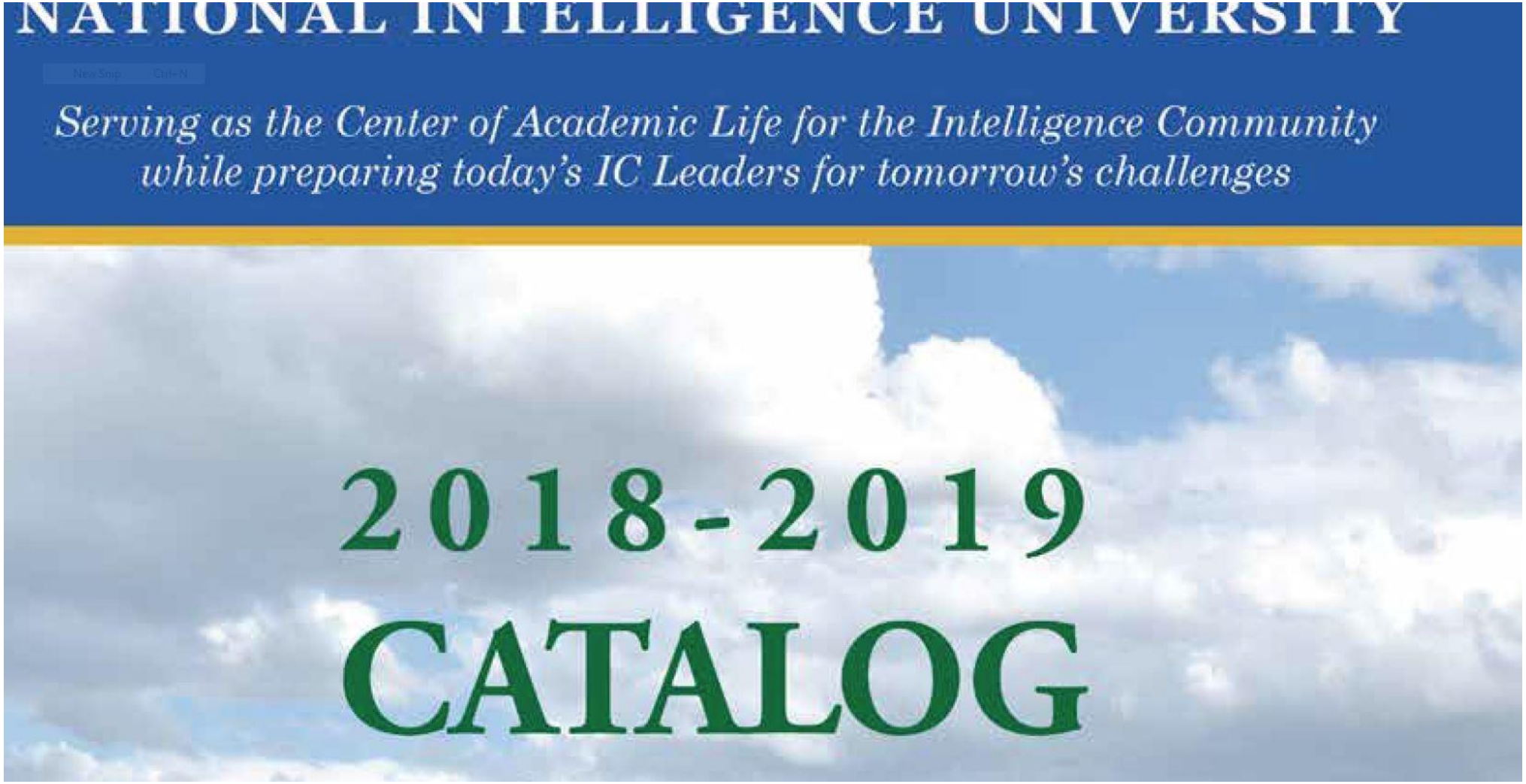

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Regional Security and Intelligence Concentration Learning Outcomes

MSSI Regional Security and Intelligence learning outcomes include:

- Knowledge of Applicable Scientific Literature—discuss and critically appraise the various interdisciplinary theoretical frameworks or models for social action from the literature that apply to the broader categories of regionally based strategic security issues.
- Contextual and Substantive Knowledge—critically discuss and evaluate each of the region's complex strategic security issues, as well as the local, regional, and global contextual factors and strategies of the various agents that shape, enable, and constrain them.
- Application and Synthesis—for each of the region's strategic security issues, demonstrate the ability to combine the relevant sociological conceptual frameworks and other analytical concepts, as well as knowledge of relevant contextual and substantive factors to evaluate potential threats, estimate their future trajectory, and assess the strategic and operational opportunities for the national security and intelligence communities.

Academic Freedom at NIU

Academic freedom is a cornerstone of NIU core values and principles. NIU defines academic freedom as the pursuit of truth and knowledge, regardless of where that leads, and bases its academic freedom policy on the "1940 Statement of Principles on Academic Freedom and Tenure," as put forth by the American Association of University Professors and the Association of American Colleges and Universities. As an institution accredited by the MSCHE, NIU upholds the Commission's principles that "Academic freedom, intellectual freedom, and freedom of expression are central to the academic enterprise. . .Academic and intellectual freedom gives one the right and obligation as a scholar to examine data and to question assumptions."

NIU embraces the principle, as stated by the Board of Directors of the Association of American Colleges and Universities in their publication "Academic Freedom and Educational Responsibility," that faculty, staff, and students have the "[a]cademic freedom to explore significant and controversial questions . . . [as] an essential precondition to fulfill the academy's mission of educating students and advancing knowledge."

NIU faculty, staff, and students have freedom of inquiry and research, freedom of teaching and discussion in the classroom, and freedom of expression and publication.

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University Library

The University Library, consisting of the main library located at ICC-Bethesda and the branch library located at DIA-HQ, serves as the all-source research and information resource for NIU and the analytical staff of DIA. The Library staff guides patrons through the library's many all-source print and electronic resources to quickly and easily access the exact information needed. The library plays a key role in enhancing the competence of intelligence professionals by providing patrons with all-source academic research assistance, instruction, and comprehensive collections and tools that support the curriculum of the University and the all-source intelligence requirements of DIA. The library is committed to building its collections and services to align with the University's future-focused curricula and the broader mission of DIA.

Location

The main branch of the library is located inside Roberdeau Hall at ICC-B; a smaller branch is located at DIA-HQ. The library's staff operating hours are 0700–1630, Monday through Friday. However, the library is accessible to users 24 hours a day, 7 days a week.

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MSI 629 **Strategic Crisis Exercise**

This course explores the application of intelligence to operational and strategic crisis planning.* Six weeks of classroom instruction prepares students to participate in exercises hosted by the Services' war colleges, a CCMD and, or combat support agency. Students enhance the intelligence value of the exercise by role-playing in BLUE (friendly), RED (adversary), or WHITE (control) functions. Students are challenged by time-constrained decisionmaking as they evaluate policy and strategy options, assess the effects of threats, resolve conflicting information, and develop and revise intelligence estimates in a rapidly evolving crisis situation. Simulations and gaming help students understand the challenges inherent in effective intelligence planning across a broad spectrum of scenarios: regional wars, military contingencies, homeland defense, humanitarian assistance, and peacekeeping operations.

* This course is mandatory for students seeking JPME I credit.

MSI 639 **Intelligence and National Security Law**

Constitutional issues, such as separation of powers, preservation of civil liberties in light of rapidly evolving surveillance and other collection technologies, and U.S. obligations to other nations under treaty and custom all play critical roles in creating effective national security legislation and in trying to anticipate and avoid unintended consequences of such legislation. While a solid grasp of intelligence-related statutes and regulations is essential to today's strategic intelligence professional, the underlying Constitutional issues continue to inform ongoing national debate about the balance—for those who avow that such a balance exists—between national security and civil liberties.

Students analyze and evaluate the Constitution and a range of national security-related statutes, case law, treaties, and commentaries, in light of their own experiences as intelligence professionals (both actual and potential). Post-9/11 legislation and subsequent court challenges form the basis for an examination of how national security law is developing and how strategic intelligence professionals can—or should—attempt to predict, if not influence, its path.

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MSI 648 **Geospatial Intelligence: A Strategic Introduction**

GEOINT is the use of imagery, imagery intelligence, and geospatial information to describe, assess, and depict geographically-referenced activities and physical features on Earth. GEOINT's power to develop and support strategic intelligence resides in its ability to enhance the situational awareness of policymakers, defense planners, and military operators by gathering information and presenting complex problems in a spatial, geographical context. This course examines the historical foundations of military geography and aerial reconnaissance, then evaluates the ways in which GEOINT provides decision advantage to policymakers and military leaders. It also dissects current GEOINT collection capabilities and analytic approaches, and explores future challenges in the discipline. (Prerequisite: MCR 609)

MSI 672 **Introduction to China and East Asia Intelligence Studies**

This course identifies and analyzes the key characteristics, drivers, issues, and actors influencing stability within the strategic intelligence and security landscape comprising China and East Asia. Tracing historical, cultural, demographic, and national evolution among this region's diverse civilizations to modern nation-states, the course identifies influential variables that can be applied to analyzing competition, cooperation, and conflict between state and nonstate actors. The course pays particular focus on assessing the internal drivers and potential outcomes of China's comprehensive modernization, including myriad domestic economic reforms, internal social and ethnic instability, leadership, party-state political institutions, legal systems, natural resources, environmental challenges, and key development strategies for infrastructure, industry, services, and technology. Students contrast analysis of China's internal stability and governance challenges with China's expanding activities and influence in trade, finance, and economic cooperation, both within the region and globally.

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JOURNAL OF STRATEGIC INTELLIGENCE (ONE ISSUE PUBLISHED 2016)

Current Edition: Volume 1; Number 1

Summer 2016

View by Article

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Balochistan's Insurgency and Its Implications for Pakistan and the Region

By Jamison C. Heinkel and Richard deVillafranca

In early 2012, the Chairman of the U.S. House of Representatives' Foreign Affairs Subcommittee on Oversight and Investigations convened a hearing on Balochistan[1] and, in a Sense of Congress resolution, called on Pakistan to recognize the ethnic minority Baloch right to self-determination.[2] Despite the

Pakistan security official stands guard at the border with Afghanistan in Chaman, Balochistan province (Akhter Gulfam/EPA)

Former Dependent Territories

Although Balochistan, the largest and poorest province in Pakistan, historically has been a strategic backwater, its importance could change with the emergence of several factors. Rich in largely untapped mineral and energy resources and adjoining the Arabian Sea with access routes to Afghanistan and Iran, the province has chafed against centralized Pakistani control since the end of British rule in 1947. Since then, it has waged a low-level insurgency against the Punjab-dominated Pakistani government that has periodically resulted in periods of more intense armed conflict, including from 2005 to the present. Baloch nationalists seek greater autonomy, more control over revenues from Baloch natural resources, greater funds for development, and an end to extrajudicial killings and human rights violations. Some call for Balochistan's complete independence from Pakistan. The central government, fiercely committed to maintaining the integrity of the Pakistani state, has generally circumvented Baloch demands with divide-and-rule tactics; when necessary, it has suppressed the insurgency with overwhelming military power.

Although the Pakistani military has constrained the Baloch insurgency, the constraints could weaken along with the Pakistani state itself. Since 2006, Pakistan has drifted between the 9th and 13th positions on the Fund for Peace annual list of the world's most fragile states–well within the "high alert" range.[9] Pakistan's problems include growing Islamic extremism and ethno-sectarian violence, a lack of human and civil rights enforcement, an increasingly dysfunctional economy, underdeveloped government insti-

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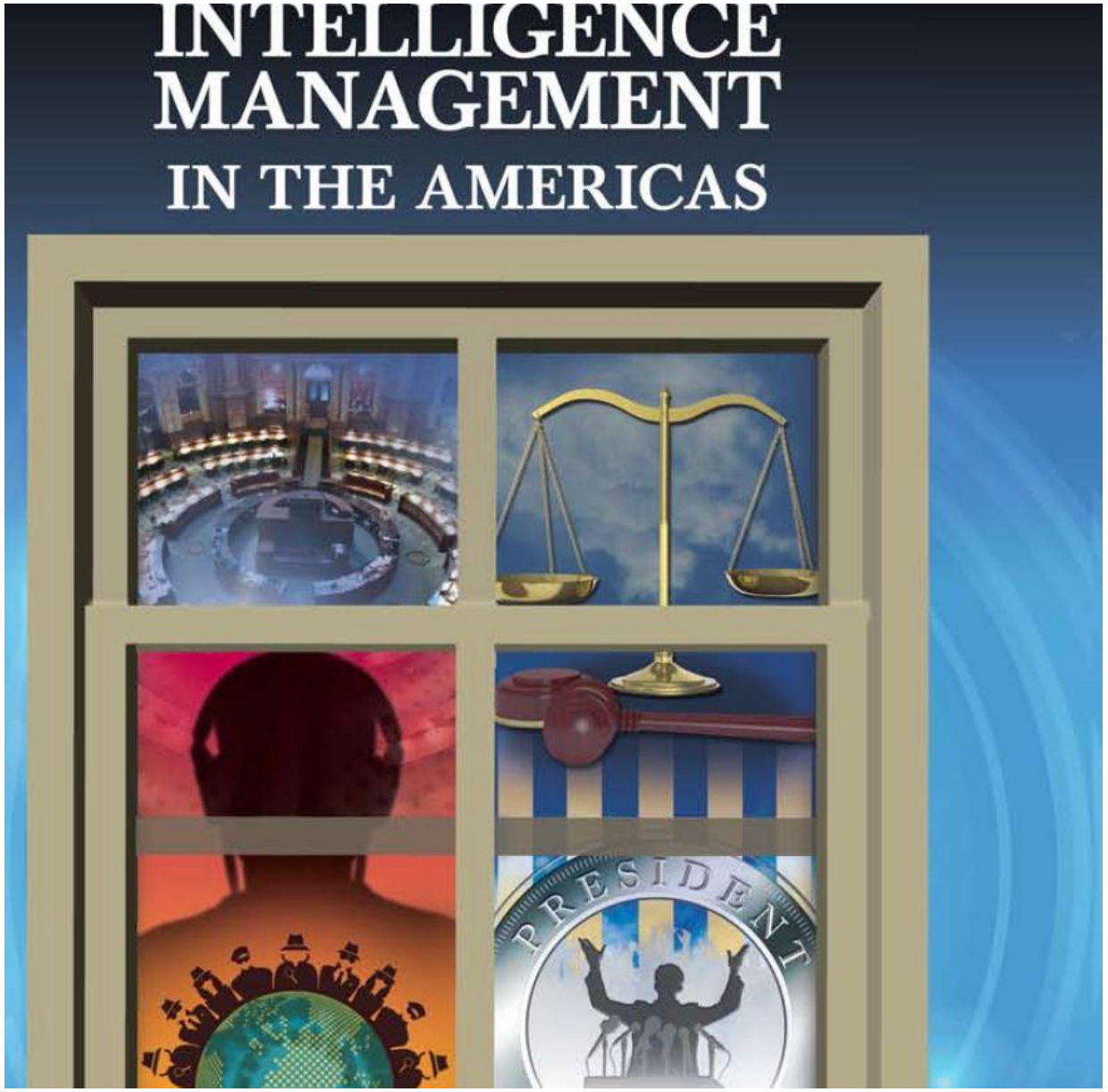

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Table of Contents

Intelligence Laws in Peru and Latin America—Historical, Legal, and Institutional Evolution

Andres Gomez de la Torre Rotta
with
Arturo Medrano Carmona

"The third article [by Luis Iberico] highlights the communitarian promise of a society that takes its destiny into its own hands by reinventing the State and its services."[62]

—Fernando Cocho Perez

Prologue

As of 27 January 2012, the Peruvian National Intelligence Service (SIN) would have been in place for 52 years as the country's principal, civilian, high-level political/strategic organization. However, on 14 September 2000, it was dismantled because it had performed or subcontracted intelligence services for partisan political ends.

Introduction

This essay examines the origins and evolution of Peru's successive national intelligence laws and their shortcomings. It also highlights parallel legal developments in Panama, Colombia, Ecuador, Uruguay, Venezuela, and Bolivia, as these countries move toward the oversight and control typical of a democratic intelligence framework. This typical framework features three types of external control: congressional or legislative,[63] judicial,[64] and economic or financial.[65]

Table 2 – Intelligence Laws of North, Central and South America (continued)			
1. Countries with an Intelligence Law and Intelligence System			
Country	Law	Legal Definition of Intelligence	Principal Organizations
Canada		Regardless of the source of intelligence, it provides value in addition to what can be found in other government reports or in news stories. Intelligence conveys the story behind the story.	for Public Security. Other agencies: Bureau of Intelligence Analysis and Security and Bureau of Economic Intelligence within the Department of Foreign Affairs and International Trade, Communications Security Establishment, Canadian Forces Intelligence Branch, Criminal Intelligence Service, Financial Transactions and Reports Analysis Centre, Royal Canadian Mounted Police, Canada Border Services Agency, Chief of Defence Intelligence.
Chile	National Intelligence System Law 19974, 27 September 2004, created the National Intelligence Agency.	The systematic process of collection, evaluation, and analysis of information for the purpose of producing useful knowledge for decision making (Law 19974, Article 2).	a) National Intelligence Agency; central organization subordinate to the Minister of the Interior and Public Security. b) Defense Intelligence Directorate of the National Defense Staff. c) Intelligence Directorates of the Armed Forces. d) Directorates or Headquarters of Intelligence of the Forces of Public Security and Order.
Colombia	Law 1621, enacted 17 April 2013. National Intelligence Law.	Intelligence and counterintelligence develop specialized organizations, using human or technical means, to collect, process,	The Joint Intelligence Council (JIC) is responsible for producing intelligence estimates for the national government. This Council is made up of:

NATIONAL INTELLIGENCE UNIVERSITY

USING INDUSTRY ANALYSIS FOR STRATEGIC INTELLIGENCE

Capabilities and Strategic Intent

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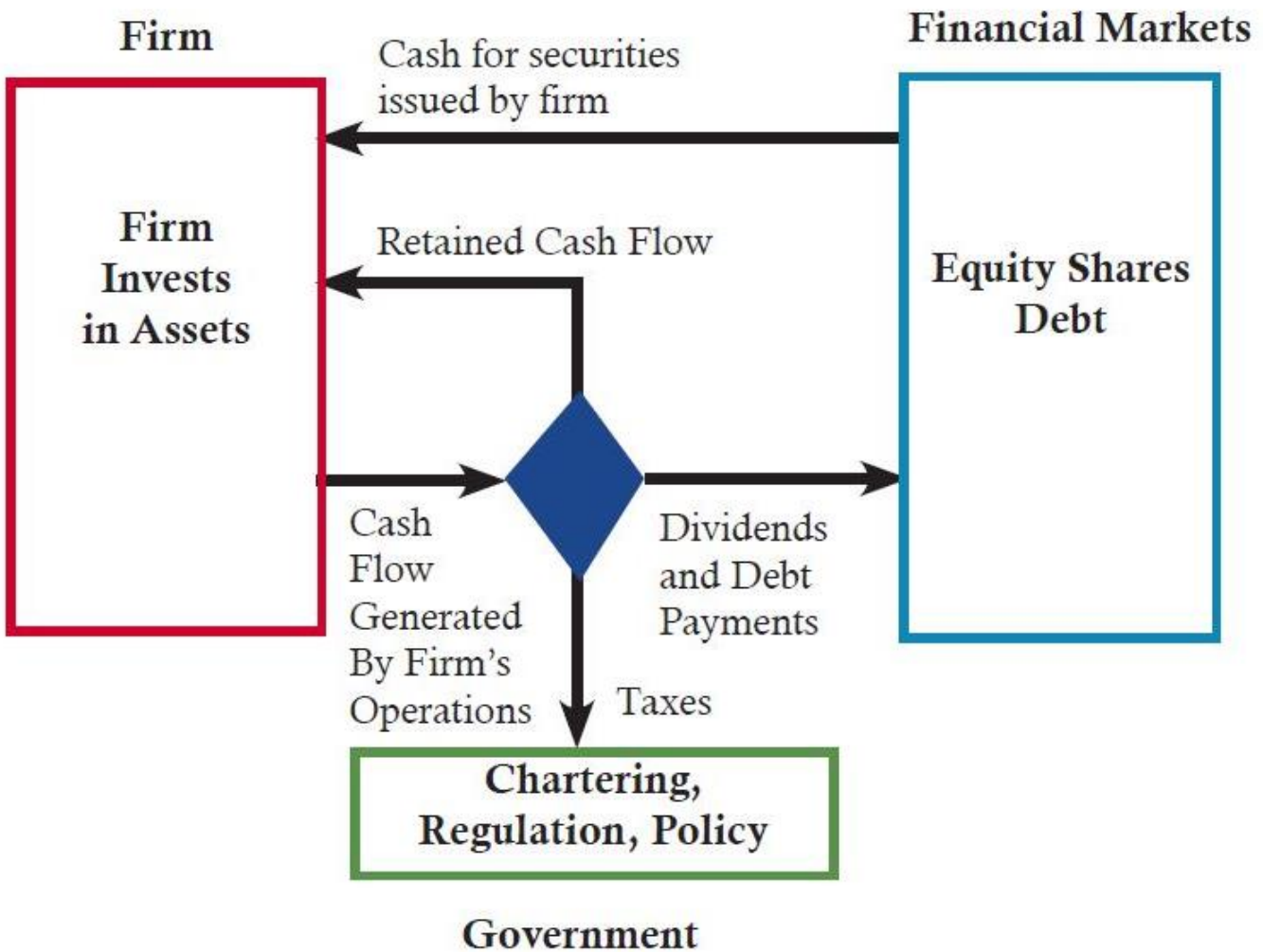
Contents

Overview of the Financial Activity of a Firm

A firm's performance has two components—survival and profitability.[20] The measure of survival is obvious, but the profitability component is measured by profit maximization, whereby a firm determines the price and quantity of output that delivers the greatest profit. Figure 2.1 provides a top-level view of a firm's financial activity.



Appendix B

Semiconductor Industry Tutorial

The purpose of this appendix is to provide a brief tutorial on semiconductors, the key activities involved in their development, and the size and composition of their market. Chapter 2 introduces three models to use in industry analysis, and Chapter 3 describes a methodology for selecting an industry for analysis, which, for the purposes of this book, is the semiconductor industry. The next step is to define the selected industry, which in this case requires developing a broad understanding of the semiconductor industry. This understanding will first be put to use in developing a value chain for the industry. The development of a value chain is an iterative process; it reflects and reinforces your understanding of the industry. It is quite possible that a value chain is already available from open sources. If so, it can be used as a guide for sorting out the key activities and processes involved in producing semiconductors. Following the industry definition step, the value chain will be put to further use during the collection and analysis of information on the semiconductor industry.

Since the technology behind semiconductors is over 60 years old, there is a wealth of open-source information on the semiconductor industry, both in print and on the Internet. What will become readily apparent is how far that technology has progressed, especially in process development and applications. There are useful glossaries of industry-related terms available on the Internet. This appendix will cite several for definitions so the analyst has a choice of sources in case a website becomes unavailable.[146] To understand an industry, a basic understanding of its products and markets is necessary. For the semiconductor industry, product knowledge equates to a basic understanding of semiconductors and their development into integrated circuits.

ABOUT NATIONAL RECONNAISSANCE OFFICE (NRO)

- Established in DOD as a classified agency in 1961. Existence declassified in Sept. 1992.
- Headquarters-Chantilly, VA. Maintains ground stations at Buckley, AFB, CO, Fort Belvoir, VA, White Sands Missile Range, NM; Joint Defence Facility Pine Gap, (near Alice Springs, NT, AU) (above); and Royal Air Force Base Menwith Hill Station, UK. (Harrogate, North Yorkshire)(below)
- Launch offices at Cape Canaveral AFB, FL and Vandenberg AFB, CA.
- 3,000 employees including armed services members, CIA employees, and DOD civilian employees.
- Funded through National Intelligence Program and Military Intelligence Program consistent with priorities and processes established by DNI and Undersecretary of Defense for Intelligence

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NRO PROVIDES INTELLIGENCE COMMUNITY AND POLICYMAKERS WITH:

- Global Situational Awareness
- Real-time engagement support
- Signals intelligence and near real-time imagery
- Agile Systems
- Access to Denied Areas
- Monitoring the proliferation of weapons of mass destruction
- Tracking international terrorists, drug traffickers, and criminal organizations
- Developing highly accurate military targeting data and bomb damage assessments
- Supporting international peacekeeping and humanitarian relief operations
- Assessing the impact of natural disasters, such as earthquakes, tsunamis, floods, and fires.
- Predict climate change
- Assess crop production
- Map endangered species habitats
- Track oil spills
- Study wetlands
- Depict and assess devastation in areas affected by climate disasters.
- NRO innovation has contributed to advances in medical imaging, global communications, high-definition television, cellular phones, GPS, and other areas.
- Governing authorities: 10 USC 424 et. seq.;50 USC 3041a, 50 USC 3143, and DOD Directive 5105.23

Betty J. Sapp

Director of the NRO

Betty Sapp was appointed the 18th Director of the National Reconnaissance Office (DNRO) on July 6, 2012. The DNRO provides direction, guidance, and supervision over all matters pertaining to the NRO and executes other authorities specifically delegated by the Secretary of Defense and the Director of National Intelligence.

Ms. Sapp began her government career as a United States Air Force officer in a variety of acquisition and financial management positions, including: business management positions in the NRO; Program Element Monitor at the Pentagon for the MILSTAR system; Program Manager for the FLTSATCOM program at the Space and Missile Systems Center in Los Angeles; and manager of a joint-service development effort for the A-10 engine at Wright-Patterson Air Force Base in Dayton, Ohio.

Frank Calvelli

PRINCIPAL DEPUTY DIRECTOR, NRO

Mr. Calvelli was appointed the Principal Deputy Director, National Reconnaissance Office (PDDNRO) on July 6, 2012. As the PDDNRO he provides overall day-to-day management of the NRO, with decision responsibility as delegated by the Director, NRO (DNRO). In the absence of the DNRO, he acts on the Director's behalf on all matters.

Mr. Calvelli has held a variety of senior positions within the NRO including satellite and ground system acquisition, systems engineering, and mission operations.

Mr. Calvelli has a Bachelor's Degree in Computer Science from the State University of New York at Potsdam, and a Master's in Business Administration from Loyola College in Baltimore.

FOR IMMEDIATE RELEASE
Sept. 5, 2018

Contact NGA:
Erica Fouché, Chief of News and Information
(571) 557-5450
MediaRelations@nga.mil

Contact NRO:
Loretta DeSio, Director of Public Affairs
(703) 808-5050
publicaffairs@nro.mil

National Geospatial-Intelligence Agency and National Reconnaissance Office transition commercial imagery acquisition contract

The National Reconnaissance Office and the National Geospatial-Intelligence Agency transitioned the EnhancedView commercial imagery acquisition contract from NGA to NRO.

As part of the transition, on August 29, 2018, NRO awarded DigitalGlobe, a Maxar Technologies company, the EnhancedView Follow-On (EVFO) contract to provide the U.S. Government with continued access to DigitalGlobe's WorldView-1, 2, and 3 satellite constellation, as well as access to the company's image archive. The EVFO award includes a one-year base contract, with one option year, valued at $300 million annually.

NRO Director Betty Sapp and NGA Director Robert Cardillo said the commercial imagery produced under EnhancedView will continue to contribute to the U.S. defense and intelligence communities, as well as to federal civil agencies, humanitarian organizations and international partners.

Statement for the Record

Ms. Betty Sapp

Director, National Reconnaissance Office

Before the House Armed Services Committee

Subcommittee on Strategic Forces

3 April 2014

I would like to begin with a few words about the current state of the NRO. We are committed to smart acquisition investments and practices to ensure the continued coverage and availability of our vital National Security systems and we work tirelessly to continue to deliver these systems on time and within budget. To that end, last year our acquisition programs successfully delivered and launched two new satellites into orbit, and just last week we successfully launched yet another critical capability for our nation. In addition to our primary missions, one of our launches also carried 12 university and government CubeSat payloads for the NRO and the National Aeronautics and Space Administration (NASA). Our CubeSat program allows us to demonstrate new technologies at an affordable cost while also strengthening our ties with university Science, Technology,

NRO Mission

The National Reconnaissance Office (NRO), a joint Intelligence Community and Department of Defense organization, is responsible for developing, acquiring, launching, and operating America's reconnaissance satellites, as well as operating their related data processing facilities, that collect intelligence information in support of national security.

CubeSat Overview

The NRO is committed to innovative, mission-driven space acquisitions that ensure our systems – from large to small – continue delivering invaluable intelligence for the nation. CubeSats are uniquely qualified to support this goal by providing more frequent on-orbit opportunities to demonstrate, apply, and mature technologies that help our nation's leaders and policymakers stay ahead of emerging threats to the national security mission.

Historical Facts

Efficiencies & Benefits

- Risk reduction: For the NRO, CubeSats offer an effective technology risk reduction pathway for developing innovative new capabilities for the nation's overhead architecture. CubeSats' lower costs allow the NRO to take a reduced-risk approach to prove new technologies before transitioning them to major systems.
- Rapid development: CubeSats can have a short development life cycle. This rapid development cycle can present an innovative way for the NRO to quickly introduce and mature technology to provide a wide range of customers with timely and relevant overhead intelligence data.
- Enhancing capabilities: CubeSats can sometimes be used in conjunction with the NRO's traditional large satellite systems to put innovative capabilities on orbit quickly.
- Decrease costs: CubeSats can be developed, launched, and controlled at a fraction of the cost of a typical satellite system due to a variety of factors, including:
    - Standardized interfaces between the payload, the launch mechanism and a small, standardized cube-shaped bus that can be easily deployed.
    - Opportunities for CubeSat rideshare launches aboard NRO, NASA and Air Force launches on a variety of vehicles (e.g., Antares, Minotaur I/V, Falcon 9, Delta II, Taurus XL, Atlas V) achieve cost savings and accelerate the delivery of on-orbit capabilities.

Center for the Study of National Reconnaissance

Advancing the understanding of the discipline of National Reconnaissance...

Through history, lessons learned, analytical studies, and outreach programs, the Center for the Study of National Reconnaissance supports NRO Leadership and the Intelligence Community and they shape our national security.

Vision

Our vision in the Center for the Study of National Reconnaissance is to have a mission-oriented influence on NRO decisionmaking by sharing the CSNR's research-based insight into the discipline of national reconnaissance.

Mission

Our primary mission is to advance and shape the Intelligence Community's understanding of the discipline, practice, and history of national reconnaissance. Our objective is to ensure that NRO Leadership has the analytical framework and historical context to make effective policy and programmatic decisions. We focus on social science and historical research, with a goal to enable the NRO to meet its mission objectives.

- Organizational and Program Histories
- Articles, Symposia and Lessons Learned
- Leaders, Pioneers and Artifacts
- The CORONA Program
- The GAMBIT and HEXAGON Programs
- NRO 50th Anniversary Archive

Contact the **NRO Center for the Study of National Reconnaissance** by phone at 703-227-9368 or email CSNR@nro.mil

PROJECT CORONA

- Satellite surveillance survey program from 1960-1972. Inspired by 1957 Sputnik Launch
- Consisted of Keyhole (KH) satellites.
- Took over 800,000 images from space.
- Imaging resolution improved from 8 meters (25 feet) to 2 meters 6 (feet)
- Individual images covered an area of 10 x 120 miles
- Collection includes 2.1 million feet of film in 39,000 cans.
- 1st photo-reconnaissance satellite in the world
- 1st mid-air recovery of vehicle returning from space
- 1st mapping of earth from space
- 1st stereo-optical data from space
- 1st multiple reentry vehicles from space
- 1st reconnaissance program to fly 100 missions
- 1st reconnaissance program to be declassified
- February 24, 1995 Executive Order 12951 declassifies Corona
- May 24, 1995 Ceremonies held at CIA and National Air and Space Museum to commemorate declassification.

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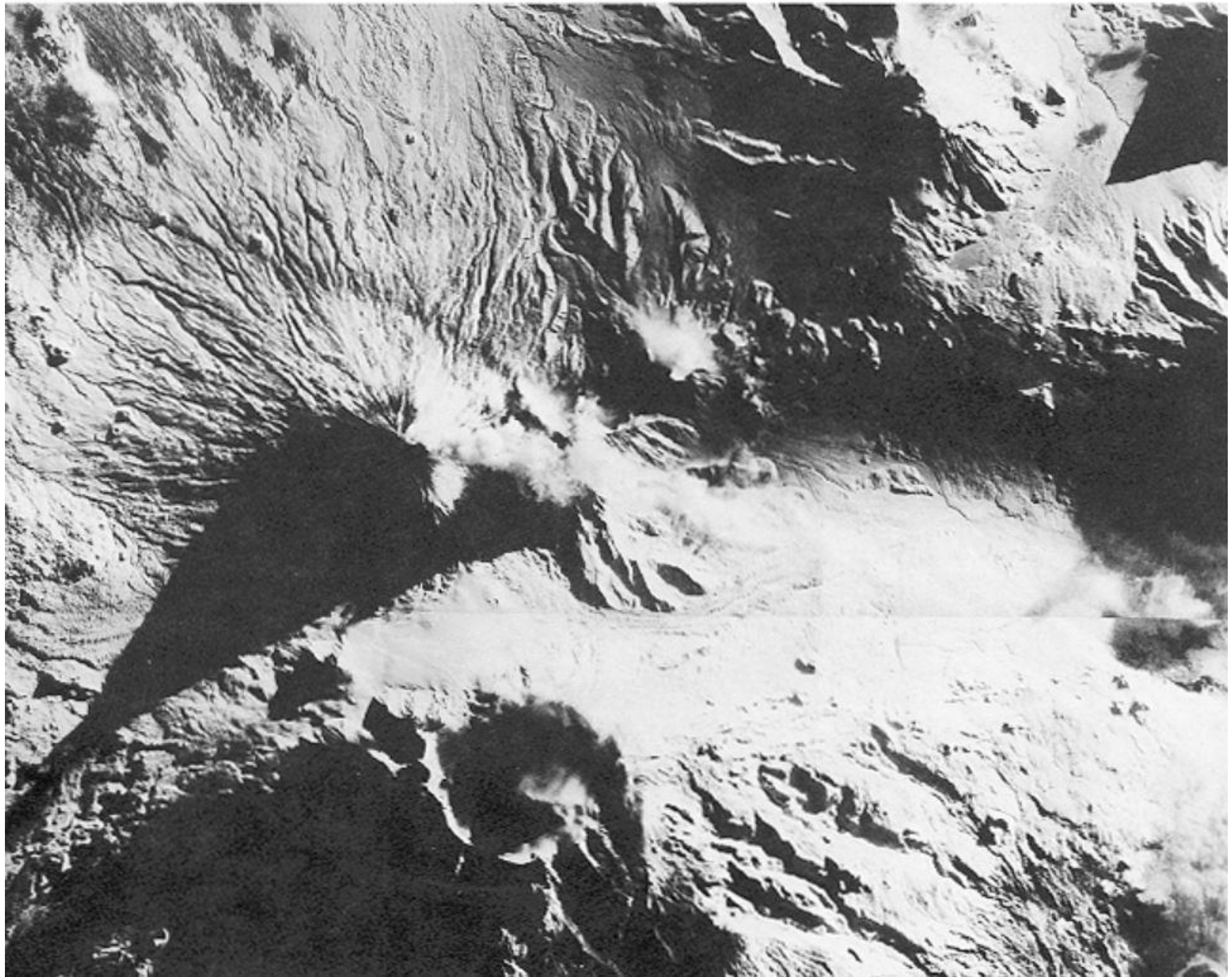
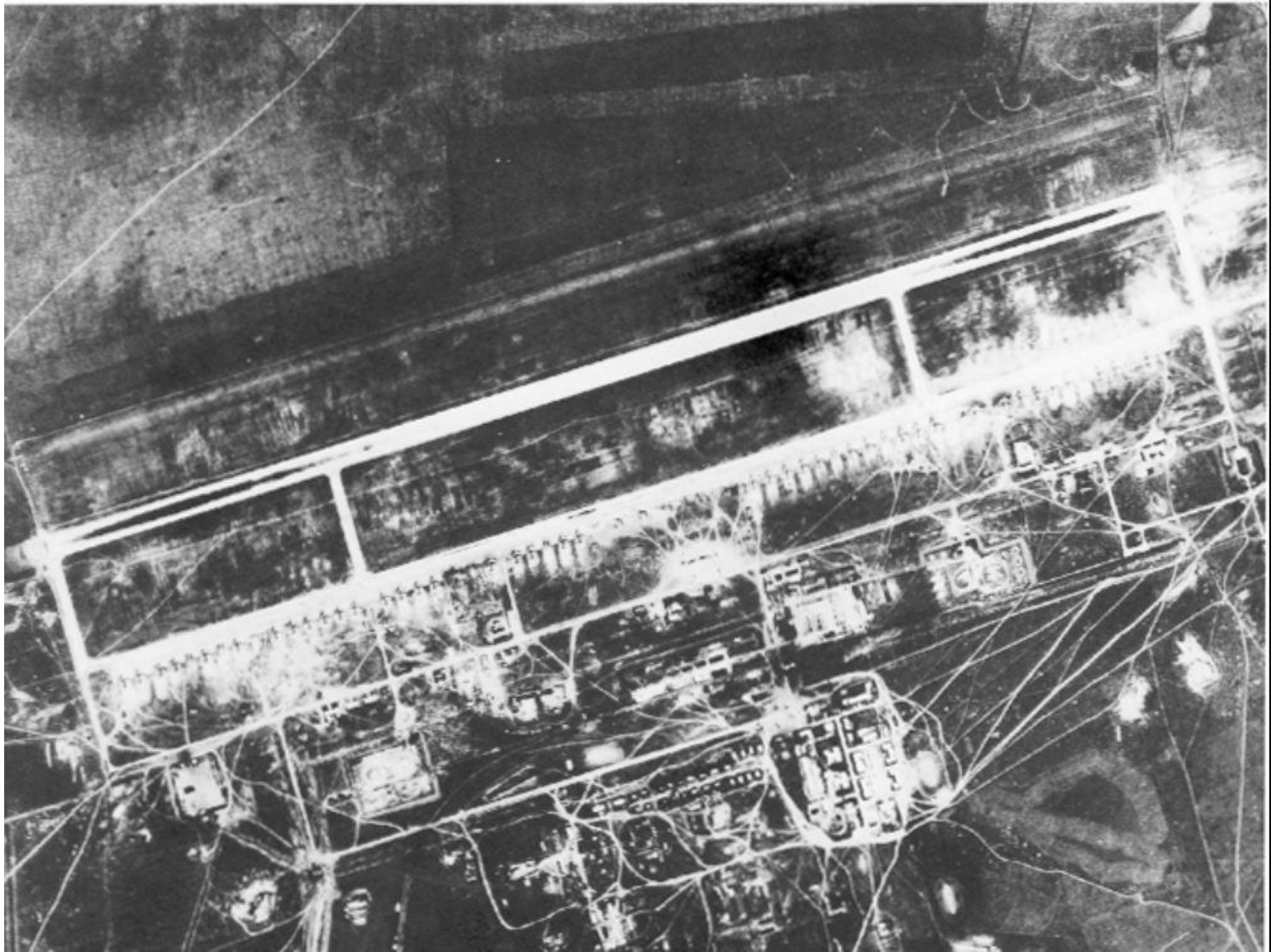
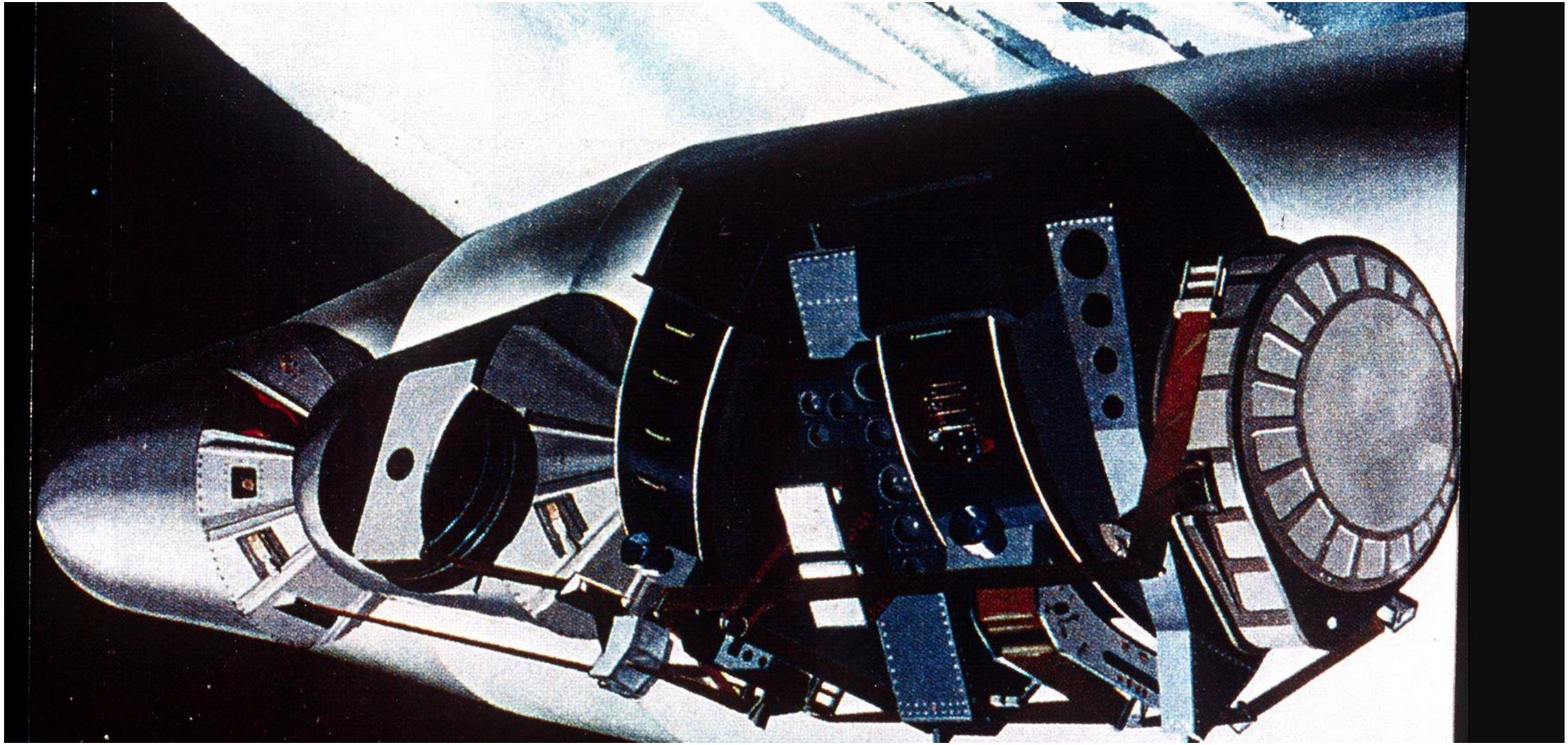
Soviet Airfield (first image), 18 August 1960

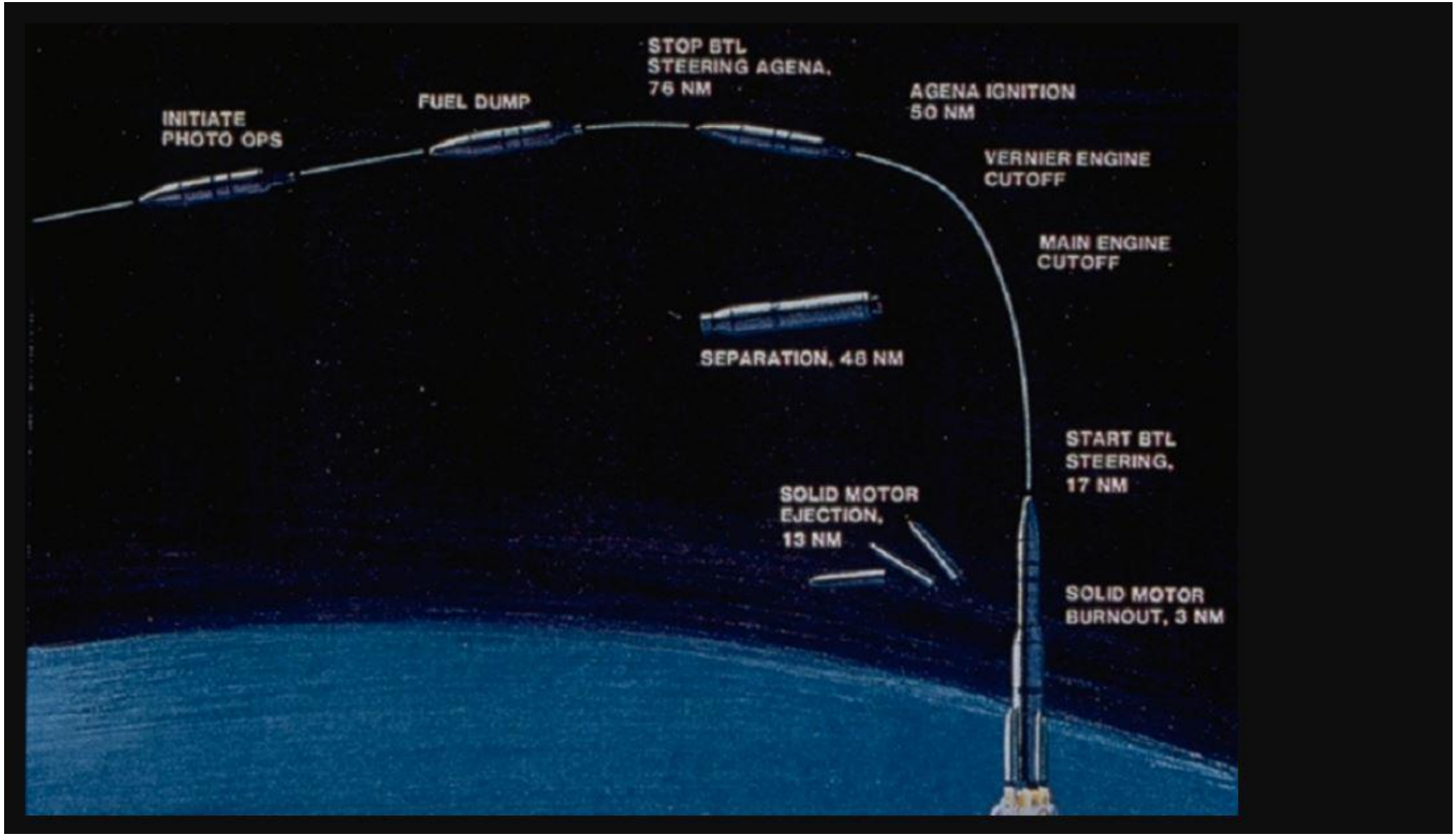
Klyuchevskaya Volcano, 24 November 1962



Soviet Long-Range Aviation Airfield, 20 August 1966







Richard R. Moore

Mr. Moore came to the CORONA Program from training with industry at Douglas Aircraft which made him a natural to oversee the Thor booster activities. Working with the Thor Program Office and Douglas, he was instrumental in getting the Thor modified and improved when greater performance was required.

William Sheppard

As General Ritland's executive and later as General Schriever's Program Director, Mr. Sheppard established the early processes and procedures that provided the transition between the unclassified Discoverer Program and the classified CIA activities. He interacted with senior Air Force leadership to maintain booster funding, and was also responsible for establishing a study to determine how conventional film could be modified to survive the space environment.

Roy H. Worthington

As a member of Colonel Battle's project team, Mr. Worthington was responsible for the Agena spacecraft development, and succeeded in the challenging task of managing development of the three-axis stabilized space vehicle, the Agena. He also later served as the CORONA Program Manager.

Paul E. Worthman

Mr. Worthman had headed an Air Force laboratory which developed aerial recovery equipment; he adapted these procedures designed for hooking and reeling in packages parachuted from a high-altitude balloon to capturing recovery systems from space. He later replaced Red Sheppard as the principal interface between the CIA and the program office. He was also the CORONA Director during the period of greatest activity.

Organizational and Program Histories

Organizational Program Histories are written as research publications exploring the history of national reconnaissance. The goal is to document the NRO's legacy and to provide a historical framework for policy and programmatic decisions.

- Bridgehead: Eastman Kodak Company's Covert Photoreconnaissance Film Processing Program
- The DORIAN Files Revealed: A Compendium of the NRO's Manned Orbiting Laboratory Documents (36.8 MB)
- Perry History
- Congress and the National Reconnaissance Office
- The National Reconnaissance Office at 50 Years: A Brief History
- GRAB and POPPY: America's Early ELINT Satellities
- A History of the Military Polar Orbiting Meteorological Satellite Program
- SAMOS to the Moon: The Clandestine Transfer of Reconnaissance Technology Between Government Agencies

BRIDGEHEAD:

EASTMAN KODAK COMPANY'S COVERT PHOTORECONNAISSANCE FILM PROCESSING PROGRAM

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ROLE IN THE PROGRESSION FROM U-2 TO SATELLITE IMAGERY

In the 1950s, the U.S. Intelligence Community (IC) endeavored to acquire good information about happenings behind the Iron Curtain. Meanwhile, the pressing intelligence demands of the Cold War promoted the development of various aerial and satellite reconnaissance systems. President Eisenhower proposed his 1955 "Open Skies" initiatve, allowing reciprocal access for reconnaissance over-flights to monitor military activities in various countries. Conversely, the USSR's Nikita Khrushchev opposed Open Skies. The U-2 program facilitated photoreconnaissance missions; however, the government anticipated a relatively short operational life for this program. In 1958, President Eisenhower set in motion a daring attempt to use unproven, but developing space technologies to counter the secrecy behind the Iron Curtain. In their study of uses of space, Project RAND, a federally-controlled research center based in California, researched the space approach to reconnaissance and concluded that "reconnaissance data of considerable value can be obtained" via use of reconnaissance satellites.

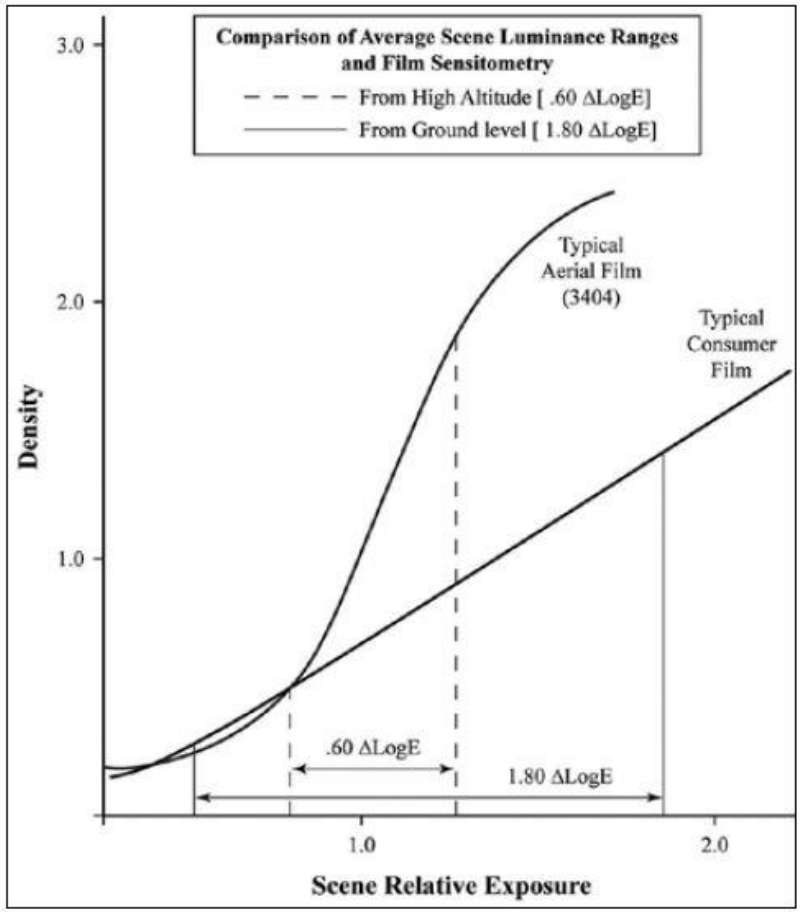

Figure 4: Comparison of Average Scene Luminance Ranges and Film Sensitometry.
Graphic by T. Havens and J. Havens.

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Corona Black & White Camera Films

Kodak routinely supplied camera films for the U-2 program by 1958, the inaugural year of CIA's Project Corona. Accordingly, the film-supply system at Kodak Park followed the same procedures established for the U-2 Project. Kodak Special Plus X Aerial Film SO-1153, coated on an acetate base, was the first Corona camera film. Slit to 70mm width, the film wound around cores supplied by the camera manufacturer. They modified B-Boxes with new foam liners to carry the carefully wound film for shipment. The SO-1153 film worked well for all ground tests, but as testing progressed to simulate space environments, the acetate-based film failed. Solvents used in the manufacture of the acetate base out-gassed in the space environment, resulting in the base losing its structural integrity. It quickly became apparent that space photography required a new film base.

ESTAR, a relatively new material, held the promise of meeting the film base requirements for space-borne films. Earlier, E. I. du Pont deNemours and Company (DuPont) had developed a strong clear flexible sheet film from polyethylene terephthalate (PET), called Mylar. Kodak had purchased a licensing agreement from DuPont to permit Kodak to manufacture the PET with the provision that Kodak limit its use to films in photographic applications. Kodak called its new film base "ESTAR." Initially, scientists used ESTAR films for applications that required rigid dimensional stability. However, Kodak engineers quickly recognized the necessity for using ESTAR base for Corona's space application. They soon modified Kodak's ESTAR manufacturing equipment to provide long lengths of film base for use on Corona. In the spring of 1960, Itek Corporation (the Corona camera manufacturer) evaluated test lengths of Kodak Special Plus X Aerographic Film coated on ESTAR base (identified as SO-102). Itek determined that SO-102 worked well and used it in the first successful Corona mission containing film. This mission, named Discoverer XIV, flew on 18 August 1960, and carried a film load limited to ten pounds of 70mm-wide SO-102 (approximately 3000 feet).

Congress & the National Reconnaissance Office

CENTER FOR THE STUDY OF
NATIONAL RECONNAISSANCE

satellite system architecture, funding, management practices, or day-to-day operations. Former Secretary of Defense Melvin S. Laird recalled, "When the office [NRO] was first established, only five members of the House Appropriations Committee were privy to its existence and funding" or "had knowledge of the extent of the program and its future." He remembered "Chairman George Mahon's admonitions concerning its secrecy in those early years," and that "President Eisenhower lectured Congressman Jerry Ford and me about the need for this classified program at breakfast with only [the] three of us present in the third floor dining room at the White House."[17]

Representative Gerald R. Ford (R-Mich.)

The U.S. Congress monitored all intelligence operations far less actively in the early years, including those of the new NRO, relying instead on the executive branch to keep it informed on a strictly need-to-know basis. It was the Intelligence Community, not Congress, which

NRO funding increases, however, coincided with growing intelligence requirements. By the late 1980s "beyond the continuing demands of traditional missions," customer requests for a variety of additional, near-real-time intelligence reports were, in the words of then Director of Central Intelligence William H. Webster, "driving a requirements explosion" that required ever more sophisticated satellite architecture to gather imagery, communications, and electronic intelligence. Meanwhile, intelligence targets had become more difficult to view easily (given improved efforts at denial and deception). And more complex, encoded signals were being encountered. National military customers nonetheless demanded more timely intelligence, which expanded the geographic scope of NRO satellite surveillance.[69] The National Reconnaissance Office, therefore, had to increase "economic, social, and political intelligence" collection efforts, and "pay more attention to force monitoring, order of battle, readiness, modernization, and

BENEFITS OF STUDYING NGIA, NIU, AND NRO INFORMATION RESOURCES

- Gaining enhanced understanding of historic and emerging U.S. intelligence collection, operations, and analysis.
- Learning about the roles played by geospatial intelligence and satellite reconnaissance in U.S. national security policymaking.
- Increasing awareness of collaboration between military, intelligence agencies, private sector businesses in intelligence gathering, analysis, and policymaking.
- Learning about the professional education of emerging intelligence policymakers and how they describe and assess their research.
- Gaining enhanced understanding of U.S. intelligence cooperation with allies and competition with adversaries.
- Gaining enhanced understanding of how continuing technological advances influence and challenge U.S. intelligence collection and analysis.
- Learning how developments in cartography, cybersecurity, data science education, intelligence analysis, photography, and numerous other multidisciplinary science and technology subjects influence U.S. national security policymaking. These areas are particularly important for using precision guided munitions and understanding adversary intentions and capabilities.
- Understanding how environmental and geographic factors influence national and international geopolitics and the responses of the U.S. and other nations to these developments.
- Understanding the importance of these agencies providing policymakers and warfighters with accurate and timely information to confront emerging national and international security requirements.

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QUESTIONS?

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