

History of the Military Geology Branch of the U.S. Geological Survey

Joseph M. Duracinsky



Purpose

- To provide an overview of the history of the Military Geology Branch of the U.S. Geological Survey from its inception during World War II until the present.

References

- “Military Geology Unit of the U.S. Geological Survey during World War II,” Maurice J. Terman, in Military Geology in War and Peace, 1998.
- “Military Geology Branch of the U.S. Geological Survey from 1945 to 1972,” Maurice J. Terman, in Military Geology in War and Peace, 1998.
- “Recent Activities in Military Geology at the U.S. Geological Survey,” William Leith and John R. Matzko, in Military Geology in War and Peace, 1998.

Outline

- Birth of the Military Geology Unit of the USGS
- The MGU's Role in World War II
- Post World War II into the Cold War
- Recent Activities in Military Geology at the USGS
- Concluding Comments

Birth of the Military Geology Unit of the USGS

- Important Dates:

- *February 1942* - Board of Economic Warfare requested information from the USGS.

- *Spring 1942* - Wilmot H. Bradley and Charles B. Hunt of the USGS experimented with pilot projects on the application of geoscience to military needs. Pilot projects were provided to the U.S. Army Corps of Engineers (USACE).

- *24 June 1942* - The USGS formalized a Military Geology Unit (MGU).

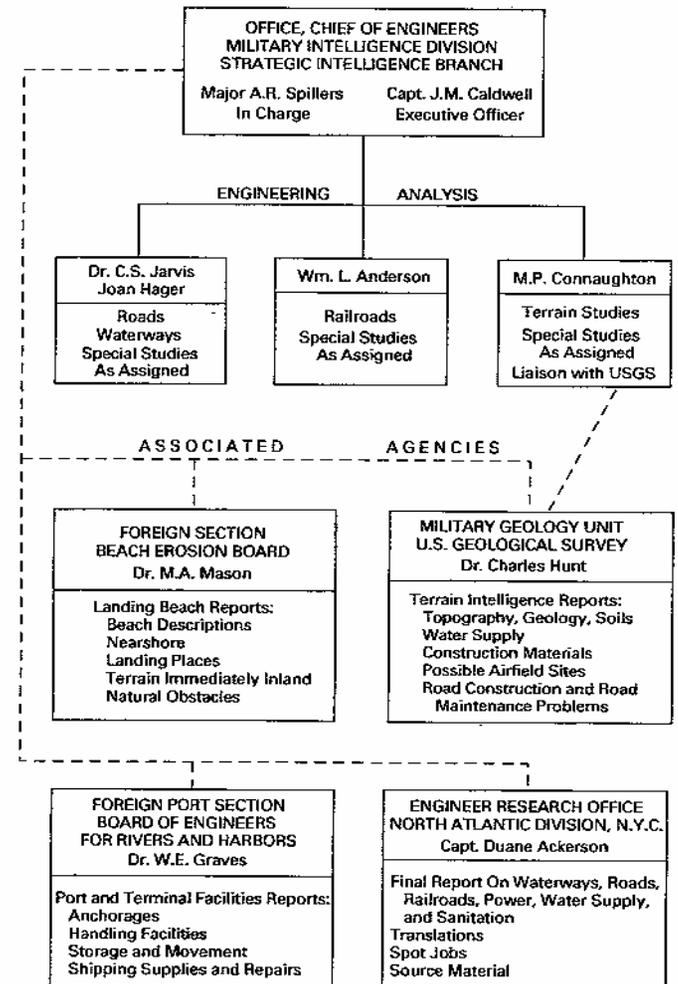


Figure 1. Organization of the intelligence units at the Office of the Chief of Engineers, U.S. Army Corps of Engineers, during World War II.

Birth of the Military Geology Unit of the USGS

- Personnel:

- The initial MGU roster included 10 geologists, one typist, and one illustrator.
- Grew steadily throughout WWII, peaking in 1945 (about 100 personnel at any time).
- Ratio of professionals to staff members at any one time was about 3:1.
- MGU recruited professionals from various sources with broad-ranging competencies.

- Sources of information and basic geologic data:

- *Europe* - Volumes of published sources were on hand.
- *Pacific* - Published data had to be supplemented with aerial photography.

The MGU's Role in WWII

- Principal Focus: The preparation of Strategic Engineering Studies.

- Early studies consisted of about 12 black-and-white maps and 10 tables (3 copies).

- By 1945, some studies contained more than 100 multi-colored maps and 50 tables (500+ copies).

TABLE 2. KEY COMPONENTS OF THE STRATEGIC ENGINEERING STUDIES OF THE MILITARY GEOLOGY UNIT*

INTRODUCTION AND SUMMARY	ROAD AND AIRFIELD CONSTRUCTION
Sources	Site selection
Methodology	Foundation problems
Reliability	
Terrain diagram	CONSTRUCTION MATERIALS
	Soil types
	Rock types
TERRAIN APPRECIATION	WATER RESOURCES
Topography	Surface water
Ground conditions	Ground water
Trafficability	Quality of water
Cover and concealment	
RIVERS	
Valley descriptions	
Regimen	
Barrier problems	

*Basic-data maps of soils or geology and resources were generally considered "too scientific" for easy comprehension by the military users of these reports.

The MGU's Role in WWII

- Sequential Phases and Funding of Work:

- *FY1942* - Africa - \$30,000 provided by USACE
- *FY1943* - Mediterranean Region - \$115,000
- *FY1944* - Pacific Theater and West Europe - \$223,000
- *FY1945* - Northern Pacific and West Europe - \$400,000

- Major Accomplishments:

- Produced 313 strategic reports which included:
 - 140 major terrain folios for the USACE.
 - 42 other major studies for the U.S. Army Air Corps.
 - 131 minor reports for various organizations.
- Produced a total of about 5,000 maps, 4,000 photographs and figures, 140 terrain diagrams, and 2,500 tables.

The MGU's Role in WWII

- Closing Comments from WWII:

- By the arrival of FY1945, MGU personnel were directly assigned overseas.
- The MGU gradually took over the responsibility for determining the type and scope of their strategic engineering studies.
- The MGU became a very competitive intelligence agency.
- The USGS Engineering Geology Section was created in late 1945, staffed by many experienced MGU scientists.

Post WWII into the Cold War

- Reorganization Hi-Lites:

- After WWII, the MGU transformed into the official Military Geology Section.
 - On 1 January 1949, it became the Military Geology Branch (MGB).
 - In 1963, the MGB/DoD contact shifted from USACE to the DIA.
- Principal Focus: Continue the compilation of terrain intelligence on a global scale mostly for the Department of Defense (DoD).
- The following administrative units and research programs evolved:
 1. Strategic Studies Section
 2. Pacific Field Program
 3. Alaska Terrain and Permafrost Section
 4. European Field Program
 5. Austere Landing Site Program
 6. Special Intelligence Element
 7. Nuclear Test Detection Program

Post WWII into the Cold War

- Strategic Studies Section:

- The major production unit of the MGB.
- Principal activity was small-scale studies of individual countries or geographic regions for the newly created National Intelligence Surveys (NIS).
- Other contributions included the following:
 1. Production of TM 5-545, Geology and its Military Application, for the U.S Army.
 2. Field mapping of U.S. military installations.
 3. The Pacific Engineer Intelligence Program.

TABLE 4. TYPICAL TABLE OF CONTENTS FOR THE SECTION ON TOPOGRAPHY IN NATIONAL INTELLIGENCE STUDIES

- A. General
 1. Summary
 2. Glossary
- B. Descriptive Analysis
 1. Landforms, relief, and drainage pattern
 2. Drainage characteristics
 3. Water resources
 - a. Surface water
 - b. Ground water
 4. Soils
 5. Rock types
 6. Vegetation
 7. State of ground
 8. Culture features
 9. Special physical phenomena
- C. Military Evaluation
 1. Cross-country movement
 2. Constructional aspects
 - a. Suitability for airfields
 - b. Suitability for roads
 - c. Suitability for underground installations
- D. Comments on Principal Sources

Post WWII into the Cold War

- Pacific Field Program:

- Primarily a research and mapping program in areas formerly occupied by Japan. Principal duties changed from terrain intelligence to the inventory and management of natural resources.

- Major contributions included the following:

1. Reports covering Japanese minerals and fuels, soils, agriculture, forestry, metallurgy, hydrology, and many living resources.
2. Rebuilt the Geological Survey of Korea.
3. The Pacific Geological Mapping Program.

- Alaska Terrain and Permafrost Section:

- Principal activity was conducting field studies in Alaska and other Arctic areas.

- European Field Program:

- Its Campbell Project compiled terrain studies of much of Europe.
- Its Team Europe Project produced cross country movement maps and engineering geology maps of Germany.

Post WWII into the Cold War

- Austere Landing Site Program:

- Prepared landing site studies based on ice-free land research in the Arctic and on arid lands, both inside and outside the U.S.

- Special Intelligence Element:

- Formed from volunteers from the MGB willing to serve with the DIA.

- Compiled classified studies and served as consultants to the intelligence community.

- After 1972, this was the only MGB unit to continue its operations.

- Nuclear Test Detection Program:

- With USACE, conducted studies to help with the detection of nuclear explosions.

- Later with the Advanced Research Projects Agency, assisted with interpretation of global seismic signals and compiled a five volume atlas of Asia and Eastern Europe.

Post WWII into the Cold War

- Closing Comments from this Period:

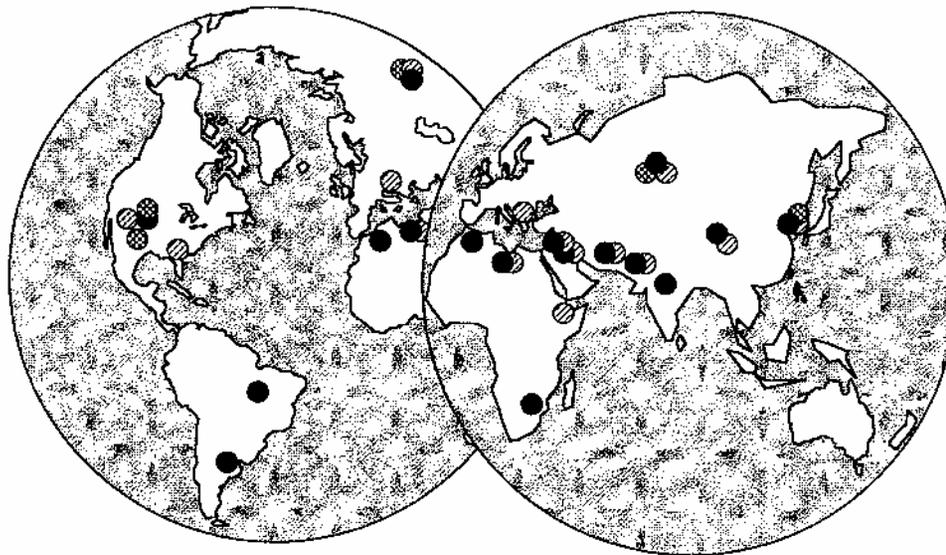
- The MGB's maximum annual budget was in FY1964 - \$1.4 million.
- By 1966, most funding had ceased for the MGB. Its functions were being taken over by other intelligence agencies.
- After 1972, only the Special Intelligence Element officially existed.
- Most geoscientists in the MGB sought only a minimum tour of duty with this branch of the USGS during this period.

Recent Activities in Military Geology at the USGS

- Principal Focus: The strategic assessment of very small areas of the Earth's surface.
- Current USGS efforts are in two broad fields:
 1. Geologic support for monitoring treaties limiting nuclear testing.
 2. Geologic assessment at the sites of underground structures.
- Effort is undertaken by the Special Geologic Studies Group of the Geologic Division.

USGS Support for Defense and National Security Programs

1990-1994



- Support for Nuclear Test Monitoring
- ⊗ Support for Military Operations or Site Characterization
- ⊘ Support for Treaty Monitoring

Concluding Comments

- What does this all mean to us? Probably not too much unless we are seeking jobs with the DIA or NIMA as geospatial intelligence officers.
- However, it is clear that much of the terrain information we use today as Army Engineer Officers originated from the USGS since WWII.