

AAG Geography and Military Study Committee

Final Report on

**Geography and Engagement with the Military:
Issues, Status, Findings**

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Geography and Engagement with the Military: Issues, Status, Findings

By

AAG Geography and Military Study Committee¹

I. Introduction

From the imperial conquests of the past to the high-tech warfare of the twenty-first century, there is a long history of engagement between geographers and the military (Woodward, 2004, 2005, 2017; Galgano and Palka, 2011). While geography has played a significant role in supporting military and intelligence activities (Barnes and Farish, 2006; Barnes, 2016), there is also a strong tradition of anti-militarist sentiment in the discipline, which has called into question the complicity of geography in promoting military agendas (Gregory, 2011; Bryan 2016).

Although the historical associations between geography and the military are longstanding, the level of engagement between geographers and the U.S. military and intelligence communities has increased considerably in the aftermath of the terrorist attacks of September 11, 2001 (hereafter, 9/11). The military's growing interest and engagement with the academic discipline of geography has occurred at a time when the role of the U.S. military is itself changing. Traditional strategies of boots on the ground have given way to counterinsurgency warfare with advanced technology, escalating defense budgets that are not sustainable, the dropping of gender restrictions for duty, the increasing use of special operations forces, and the mounting need for post-service medical and mental health care for veterans (*Christian Science Monitor*, 2011). At the same time, military installations—domestic and overseas—are experiencing a range of environmental considerations from toxic contamination requiring

¹ Appointed by the AAG Council in Fall 2017, the Committee members are Andrea Brunelle, Susan Cutter (Chair), Roger Downs, Chris Hair, Andrew Lohman, Adam Moore, Tom Mote, Geraldine Pratt, Sue Roberts, Reuben Rose-Redwood, Rickie Sanders, and Dan Shrubsole.

remediation to climate change and sea level rise affecting coastal facilities (Hamilton, 2016; Center for Climate and Security, 2018; Copp, 2018).

The increasing need and desire for geographical knowledge and skills by the U.S. military and intelligence agencies after 9/11 resulted in more direct engagement with colleges and universities especially in the recruitment of students, research funding, and indirectly through curriculum development. While some academic geographers and geography departments have embraced these developments, a number of geographers have raised concerns about the implications of such engagements on the future direction of the discipline as a whole. In February 2017, the Network of Concerned Geographers presented a petition to the President and Executive Director of the American Association of Geographers (AAG) expressing concern about the growing involvement of the U.S. military in the discipline of geography (see Appendix 1 for a copy of the petition). The petition was later presented to the AAG Council in its Spring 2017 meeting.

In response to this petition and the controversies that surrounded the American Geographical Society's Bowman Expeditions (see Voosen, 2016), the AAG Council established a special committee to study and report on the engagement and implications of interactions between the military and intelligence agencies with geographers and their departments and universities. The committee's charge was to:

1. Document and analyze the U.S. and NATO partners military and intelligence community's interest in geography (both physical and human geography), and in the universities in which geographers work;
2. Document and analyze specific classes of engagements between the military and associated intelligence communities, and the academic discipline of geography and in the universities in which geographers work;
3. Develop and present a report to Council and the Membership on these matters in relationship to the six concerns expressed in the petition (see Box 1); and

4. Make recommendations agreed to by the committee for further study, monitoring or actions by the AAG and geographers in terms of engagement by geography with the military and associated intelligence agencies.

BOX 1 Petition Concerns Regarding of Geography-Military Engagements

1. Nature of research, education and employment interaction among geographers and the military
2. Risks to civilian geographers conducting educational and research work with the military and those serving in the military
3. Geography curriculum and impacts thereon
4. Academic freedom
5. Specific ethical issues raised by engaging with the military or not engaging with the military in terms of research and educational activities
6. General moral and ethical issues for academics of advising or not advising the military in a democratic society

Source: AAG Council Charge to the Committee

The committee first met in January 2018 at the AAG Central Office to review the charge and to develop an approach for completing the report. We employed a five-pronged strategy for documenting engagements and presenting our findings.

- (1) A survey of Geography Departments in the U.S. and in several NATO countries regarding their military-related activities.
- (2) A review of available information from government sources (e.g., research grants, employment, university-military affiliations), and other literature familiar to committee members.
- (3) An analysis of trends in military-funded research published in academic journals.
- (4) A review of information about the experiences of other academic organizations that we know have dealt with this type of issue.
- (5) Invitations to geographers who have an interest in this issue to make a written contribution and/or participate in a series of focus groups held during the AAG meetings in New Orleans in April 2018 (four held over a two-day period). The majority of the Committee members attended the AAG meeting and were able to attend at

least one of the focus group meetings (see Appendix 2 for a detailed explanation of our methodological approach).

We begin our report with a brief contextual background to geography's engagement with the military drawn extensively from published literature. Next we discuss military-funded university research, university reliance on Federal R&D funding, and workforce development. Then we present findings related to documenting the military's interest in geography (Task 1) and the types of engagement between academic departments and universities and the military (Task 2). The next section describes the broader implications of these engagements including academic freedom, directional changes in departments in terms of funding and curriculum, ethics in engagement, and the AAG's role in fostering best practices/principles of ethical engagement with the military. We conclude with recommendations.

The interactions and associated ethical implications between the military and geography departments' curricula and research activities are complex and involve national security, weapons systems development, peacebuilding and conflict resolution, and humanitarian crises (Hersh, 2017). Our goal in writing this report is to document the use and application of geographic knowledge, conduct among academic geographers, and institutional practices of the AAG as a professional association with respect to engagements between the military and geography professionals and to make recommendations regarding ethical considerations surrounding such engagements.

II. Current Context and Origin of Concerns

Common definitions of ethics include statements regarding basic concepts, principles, rules and/or standards of human conduct for the good of society. In science, ethics "typically involves reflection upon moral questions that arise in research, publication and other professional activities" (Proctor, 1998, p. 9-10). While many professional associations (including the AAG) have a code of ethics for their members, members themselves vary greatly in their personal beliefs and practices.

Ethical Concerns in the Social Sciences: The Particularity of the Military

As the military and intelligence communities' interest in and engagement with academia over the past decade has increased, scholars and researchers, particularly in the social sciences, have raised ethical concerns about such collaborative research. The two most noteworthy and discussed examples are the American Anthropological Association (AAA) and the American Psychological Association (APA), whose members and leadership raised significant concerns about how engaging in research with the military potentially compromises the rules or standards of conduct that their members are expected to abide by. A brief summary of those concerns, and the steps those associations took, illustrates the broader concerns and potential implications across the social sciences.

Prior to the Bowman Expeditions, the American Anthropological Association (AAA) advised its members to stay at arm's length from military work after some members of the profession collaborated with the U.S. Army and Marine Corps in their Human Terrain Systems (HTS) projects. The discussion moved beyond the question of the morality of war and the contribution of anthropology to achieve morally worthy ends and foregrounded the question of whether the core values of the discipline were being compromised. The well-organized and highly vocal resistance by members of the Network of Concerned Anthropologists (NCA) and the wider American Anthropology Association to working alongside military personnel engaged in armed conflict complicated the military's relationship with anthropology and made it difficult to recruit top quality anthropologists to engage with them.

In response to members' criticism of the publication of an advertisement for Central Intelligence Agency (CIA) employment on the official American Anthropological Association's job site in 2006, the AAA created the Commission on the Engagement of Anthropology with the U.S. Security and Intelligence Communities (CEAUSSIC). This research body was to research, educate and advise the Executive Board and the Association on the following:

- (1) roles that anthropologists currently assume within intelligence and national security entities;
- (2) guidelines on the involvement of anthropologists in intelligence/national security-related activities; and

(3) ethical, methodological, and other challenges faced by the discipline and its association in its engagement in intelligence/national security.

The CEAUSSIC was also tasked with creating an ethics Casebook to provide illustrative questions, issues, and responses raised by anthropological engagement with the military, security, and intelligence communities. The CEAUSSIC stressed that constructive engagement between anthropology and the military is possible but found the HTS program in particular to be incompatible with disciplinary ethics. Key conclusions include:

- 1) "given the lack of a well-defined ethical framework of conduct for the program and inability of HTT researchers to maintain reliable control over data once collected, the program places researchers and their counterparts in the field in harm's way";
- 2) "ethnographic investigation is determined by military missions, not subject to external review, where data collection occurs in the context of war, integrated into the goals of counter-insurgency and in a potentially coercive environment—all characteristic factors of the HTS concept and its application—it can no longer be considered a legitimate professional exercise of anthropology."²

In November 2014, the American Psychological Association's (APA) Board of Directors engaged attorney David Hoffman to conduct an independent review "to consider and answer whether APA officials colluded with the DoD, CIA, or other governmental officials 'to support torture'" (Hoffman, 2015:1). In response to the 542-page Hoffman report, the APA Council of Representatives voted unanimously to prohibit psychologists from participating in national security interrogations or working in detention centers that violate the U.S. Constitution or international law (APA, 2015). In 2016, the APA amended its code of ethics to include a direct prohibition against participating in torture.³

Ethical Concerns about Geography and the Military

The growing connections between academic geography and the military and intelligence communities has raised ethical concerns, similar to those voiced by the anthropology and

² For an overview of CEAUSSIC, see <http://www.americananthro.org/ParticipateAndAdvocate/Content.aspx?ItemNumber=2591> and the final report at https://s3.amazonaws.com/rdcms-aaa/files/production/public/FileDownloads/pdfs/cmtes/commissions/CEAUSSIC/upload/CEAUSSIC_HTS_Final_Report.pdf (Quote is from page 3).

³ For details of the review and the APA responses, see <http://www.apa.org/independent-review/index.aspx>.

psychology associations, for not only individual researchers but the discipline as a whole. While some geographers may view collaborative research with DoD as an opportunity to contribute geographical knowledge and expertise lacking in the military and intelligence communities, others see the possibility that such collaboration (either directly or indirectly) violates the premise of impartiality and neutrality, and the personal values by which researchers pursue their research and teaching. Examples of direct collaboration would include active participation in a specific research project, while indirect could include the use of scholarly acquired and published data by an entity in the defense or intelligence communities. Much of the debate about the Human Terrain System program emerged from concerns that any data collected and analyzed under that, or other DoD funded programs, would be used to target individuals or groups deemed 'enemies' by the DoD. Similarly, the Bowman Expeditions raised serious ethical concerns among geographers about the purpose and transparency of those research projects (Bryan, 2010; Wainwright, 2013).

Considering these perspectives, the ethical issues regarding geographers' work with the military and intelligence communities essentially revolve around two main areas of concern: (1) the purpose or use of geographic data, and (2) the methods through which data are collected. Both of these factors may have profound implications not only for researcher and subject safety, but also the ability for scholars and students to conduct research (primarily field research) in many places and regions around the world (Wainwright, 2016). Another aspect associated with both of these concerns is transparency – open and public disclosure (to all parties) of the purpose and intent of the research, and how the data will be collected and analyzed.

Regarding the first concern, many AAG members in the focus group discussions felt the purpose or use of geographic data collection in some DoD-funded research was not specifically stated or articulated, nor was the fact that the research was funded by military or intelligence agencies (Box 2). While this may primarily be an issue of transparency, it raises significant concerns about the true nature and purpose of such research projects, how the data are collected and processed data, and their ultimate use.

Regardless of whether the specific purpose of military-funded research is fully disclosed, such research conducted under the guise of Geography is a serious concern among some AAG members. It potentially sets the expectation by local communities that any subsequent (or previous) research in their communities may be (or has been) conducted not for the advancement of geographical knowledge, but for military or intelligence purposes. Non-disclosure of funding sources has the potential to close doors within local and indigenous communities to scholarly research. It may also put researchers and subjects in grave personal danger, as they may become targets for those who oppose what they may deem as collaborating with, or participating in, similar research projects. Subjects who participate in such studies are at risk as well—potentially ostracized in their local communities or even worse, threatened or targeted with violence. A number of geographers commented that in their own fieldwork they were often asked if they were working for the CIA, so such suspicions already exist in many places and regions. The lack of transparency and full disclosure on the purpose of military-funded research has the real potential to exacerbate these perceptions both at home and abroad.

The second main ethical concern involves research methods, specifically data collection and analysis. If the research conducted by or for a military or intelligence agency involves individuals or communities, does it require the same processes that govern academic institutions through Institutional Review Boards (IRB) to ensure the protections of people as human subjects? The principles that IRBs operate under are respect for persons, beneficence, and justice as found in the Belmont Report (Federal Register 1979: p. 23192). These same

Box 2: Focus Group Feedback on Ethical Concerns

“...there’s a fundamental contradiction between the motivations of the U.S. military, for instance, and the AAG code of ethics around the question of access to knowledge, ownership of knowledge, and treatment of such” (FG3:7).

“I have students that work in places...any hint of affiliation with the U.S. Army of the U.S. military puts them at risk...And many of us have been in those situations when the vulnerability has been acutely felt and my sort of job as advisor, in calling people to do that, is that we make sure... we minimize the risk of anything bad happening to any of us in the field, but also to that anything bad happening to people who interact with us...” (FG1:16).

“When the day comes when a genuine academic human geographer with no ties to the military is killed in a place like Lebanon as a consequence of a misunderstanding, what would we retrospectively wish we had done or said to prepare ethically for the potential consequences of that?” (FG3:6).

principles also appear in DoD human subjects protocols for DoD-sponsored research (DoD, 2011). Adherence to the Belmont principles highlights the need for transparency, so that the specific research methods are clearly and publicly stated, and that there are no hidden agendas or hidden techniques in data acquisition or use.

III. Trends in Military-Geography Interests

Improving Regional Competencies

Wainwright (2016) notes that the military's interest in human geography, by way of "human terrain," emerged from the DoD's admitted lack of cultural understanding, primarily in Iraq and Afghanistan, which was a pivotal component of the Army's counter-insurgency doctrine developed in 2004. However, greater emphasis was placed not only on culture (i.e., cross-cultural competencies), but also language proficiencies, and regional knowledge and expertise. To address these shortcomings, the DoD invested heavily in a wide variety of programs and initiatives at all levels, from individual soldiers to the highest level staff and decision makers. These efforts were not limited to the realm of counter-insurgency, but ranged across the spectrum of possible military operations from humanitarian assistance and disaster response to full-scale war.

In 2008, the Army's then newly revised *FM 3-0: Operations* manual codified an additional mission variable to their long-established METT-T acronym (mission, enemy, terrain, troops, and time) used in planning operations (Department of the Army, 2008). This new acronym METT-TC ("C" is for civil considerations), recognizes that any operation must take into account and plan for the wide range of civilian actors and processes that may affect, or be affected by, a military operation. As the DoD worked to implement these considerations, a variety of perspectives and approaches emerged within the different defense and intelligence agencies and organizations. As one example, the U.S. Army established Civil Affairs as a new branch (or career field) to serve as the commander's link or interface among the military and civil leaders and communities (Civil Affairs, 2018). Like many other occupational specialties in the military, these soldiers align with an emphasis on language, cultural, and regional knowledge and skills.

While the Human Terrain Systems program is one of the most widely known military research programs, numerous others such as the Bowman Expeditions were or are in place (see Box 3). In 2008, under Defense Secretary Robert Gates, the Department of Defense established the Minerva Initiative, with the goal to “improve DoD's basic understanding of the social, cultural, behavioral, and political forces that shape regions of the world of strategic importance to the U.S.” (Department of Defense, 2018). Primarily through funding grants, the research program seeks to “Leverage and focus the resources of the Nation's top universities; define and develop foundational knowledge about sources of present and future conflict with an eye toward better understanding of the political trajectories of key regions of the world; and improve the ability of DoD to develop cutting-edge social science research, foreign area and interdisciplinary studies, that is developed and vetted by the best scholars in these fields” (Department of Defense, 2018). This program is “particularly interested in proposals that align with and support the National Defense strategy,” however, it is not specific to geography.

The intent of such programs is to leverage knowledge, skills, and expertise that military and intelligence communities lack, but recognize are available in academia. These programs differ in a variety of ways. For example, the U.S. DoD is often cited as one of the largest organizations in the world (in terms of number of employees) split among the various branches of service (e.g., Army, Navy, Marine Corps, Air Force, Coast Guard). Add to this the diversity of the intelligence community, and the result is a myriad of organizations, agencies, and offices with similar but different mandates, areas of concern, and information needs or desires. To complicate this further, these offices and agencies are staffed by both military and civilian personnel and contractors, who have widely differing conceptions of what Geography is and how and in what context such knowledge may be useful or employed.

Box 3: Military Use of Geographical Information: The Bowman Expeditions

Geography has long serviced needs to protect national security and geopolitical ambitions. Mapping of spaces for conquest and control, and the practice of identifying and placing boundaries on sovereign spaces, have all required geographical knowledge and geographical techniques. Britain's Royal Geographical Society was founded in 1830 to promote the advancement of geographical science, but it also supported colonial exploration and exploitation. In the U.S., the American Geographical Society (AGS), founded in 1851, also began as an exploration and research institution, especially focused on the Arctic. Its stated mission is "... to enhance the nation's geographic literacy so as to engender sound public policy, *national security*, and human well-being worldwide . . ."^a

AGS has increasingly worked to serve national interests and responded to the needs of the U.S. government and leading business organizations and universities. The AGS Bowman Expeditions are a notable example of this collaborative service. Named for AGS's storied Director Isaiah Bowman, the organization has sponsored teams of faculty and student researchers from numerous universities to work in the Americas, Europe, and Asia to engage local and regional scholars as well as indigenous people in participatory mapping to produce comprehensive multi-scale geo-visualizations of local and regional geographical information (Dobson, 2012; Herlihy, 2010).

The Bowman Expeditions undertaken by geographers and funded by the U.S. DoD highlight the complexities, politics, and ethics of fieldwork and engagement with research subjects especially in zones of military conflict. The controversy surrounding the funding, purpose, and implementation of each expedition in the field led to significant concerns within the discipline regarding the ethics of military-funded, international fieldwork (Agnew, 2020; Bryan, 2010; Cruz, 2010; Steinberg, 2010; Wainwright, 2013) and the role of geography and geospatial tools for military applications.

^a <https://americangeo.org/about/>

Some of these proponents may have very limited or dated conceptualizations of geography. Within the DoD and intelligence communities, many recognized that the Human Terrain Systems program was not just about cultural awareness and understanding, but that DoD lacked a profound holistic understanding of the places in which U.S. forces were deployed—that is, regional geography. Although physical geography (e.g., terrain, weather, climate, soils, vegetation) has remained relevant to military planning and operations, it was the human geography component of the regional approach that potentially offered the answers to DoD's questions about populations and places. As an example, in 2013, General Ray Odierno, Chief of Staff of the Army, responded to a question about the importance of geography during a Brookings Institution forum on the "Future of the Army." He stated, "But I would tell you that as you get around the world, you have to understand the world and its geography. But we've got to understand that, not only the geography but then the cultural aspects, religious aspects,

economic aspects, social aspects, because that all contributes to how you figure out what the right response is when you have a problem in a certain area” (Odierno, 2013).

Such a statement offers the opportunity for professional geographers to provide insights, perspectives, and knowledge to help provide and inform “the right response,” which is not always—but does not preclude—the application of force. However, the Network of Concerned Geographers raises significant and valid concerns about the military’s growing interest and involvement in academic geography programs, potentially shaping the direction of academic research and teaching.

Military-Funded University Research

The U.S. spends nearly \$80 billion (USD) annually on defense-related research and development (R&D). Of this amount, the Department of Defense (DoD) provides approximately \$4 billion each year to support university research in the U.S. However, research activities are not restricted to the U.S. Since 2000, more than 22 German universities and research institutes (University of Bremen, Munich University, University of the Saar, Marburg University, The Fraunhofer Society, Max Planck Institute, the Alfred Wegener Institute for Polar and Marine Research, Leibniz Institute, and Goethe University) have received Pentagon funding (Savabieasfahani, 2014).⁴

In FY2017, 8% of the DoD contract budget was for R&D. Over the last two decades, the share of contracting dollars for R&D has declined (\$28 billion in 2000; \$25 billion in 2017). Although total outlays for R&D did increase from 1999-2009 by 26%, the period from 2009-2017 saw a rapid decline (24%) in R&D outlays (Schwartz et al. 2018). More than half of the DoD’s R&D budget is directed to universities for basic research—research that supports curiosity-driven fundamental science and technology geared towards greater knowledge of and improved understanding of phenomena. The FY2018 Omnibus bill included \$2.3 billion for basic research—ocean and atmospheric science, materials research, computing and math, and medicine among others (Hourihan, 2018).

⁴ Doing research or teaching for military purposes is in violation of the “civil clause” of the German government, which prohibits universities from doing research or teaching for military purposes.

University Reliance on Federal R&D Funding

The federal government has historically been the major provider of research support to universities (nearly 73% in the 1960s to 54% today), and since 1990, the total amount of funding has more than doubled (\$40.9 billion) (AAAS, 2019). However, the agency distribution of the funding has dramatically changed. Since 2006, funding from traditional mission agencies such as the Environmental Protection Agency (EPA), and departments such as Commerce (which includes the National Oceanic and Atmospheric Administration) and Transportation, declined in federal research support, while the more research-oriented agencies such as National Science Foundation (NSF) and National Institutes of Health (NIH, located in the Department of Health and Human Services) showed mixed results (Table 1). What is noteworthy is the significant increase in the proportion of federal R&D funding to universities and colleges by the Department of Homeland Security (DHS) and DoD.

Table 1: Federal Support for University

R&D by Agency

Agency	Change 2006-2016
Homeland Security	44.3%
Defense	23.6%
National Science Foundation	9.0%
Energy	2.7%
NASA	-1.2%
Agriculture	-9.5%
Health and Human Services (NIH)	-10.3%
Transportation	-30.1%
Interior	-40.7%
EPA	-48.2%
Commerce (NOAA)	-52.4%
Education	-67.9%
All Others	-52.6%
Total	-5.4%

Source: <https://www.aaas.org/page/rd-colleges-and-universities>

The change in the availability of federal funding may help explain the increasing pressure on investigators and universities to participate in DoD and DoD-supporting opportunities such as the Multidisciplinary University Research Initiative (MURI), which awarded \$163 million in

2017 to 23 different university consortia teams (DoD 2017), or DoD's Minerva Initiative focused on social science research in order to "improve DoD's basic understanding of the social, cultural, behavioral, and political forces that shape regions of the world of strategic importance to the U.S."⁵ The program launched in 2008 with considerable skepticism and controversy within the social science research community.⁶

Workforce Development

As noted by U.S. Labor Department statistics, faster than average growth in openings for geographers, cartographers, geoscientists, urban and regional planners and other geographic professionals were projected in the last decade resulting in a potential increase of 15,000 employees in each of these specialized fields (Solem, 2017; Solem et al., 2013). The brightest outlook is for geographic information scientists (including cartographers, photogrammetrists, mapping technicians, remote sensing technicians, and geodetic surveyors); geoscientists (and geophysical data technicians); and planners (urban, regional, and environmental restoration).⁷

Military interest in geography spans the discipline from our geospatial tools and techniques to regional understanding and everything in-between. In their report on the workforce needs of the National Geospatial-Intelligence Agency (NGA), the National Research Council (2013) examined demand for geospatial occupations. Workforce needs distinguish between core area expertise (photogrammetry, remote sensing, cartographic science, geographical information systems, and geospatial analysis) and emerging areas of needed skills (geospatial intelligence or GEOINT fusion, crowdsourcing, human geography, visual analytics, and forecasting). Current recruitment fills most of the demand from NGA, but the emerging areas of need are enhanced through grant activities as well as the establishment of University Affiliated Research Centers (UARCs).

⁵ <https://minerva.defense.gov/Minerva/Objectives/>

⁶ See the series of critical essays published by the Social Sciences Research Council on the Minerva controversy (both pro and con) at <http://essays.ssrc.org/minerva/>

⁷ Based on 2018 data from O*Net OnLine <https://www.onetonline.org/>

IV Types of Engagements between Geography and the Military

There were many forms of measurable engagement between geography and the military ranging from research support, student training and job preparation, to curriculum development and specialized certificate programs. Appendix 3 provides the results of the AAG Department Survey as evidence of these engagements.

Research Support

The committee evaluated the extent of geographical research supported by the military using two different metrics—(1) funding levels from the AAG Departmental Survey and (2) publications acknowledging military support for geographical research. For the first metric, due to the wide range of departments in terms of research, teaching, and service, we provide the data for the entire sample (N=213) and for a subset of the sample representing PhD-granting departments (N=34).

The majority of Geography Departments in the survey (66%) replied that they had not previously received any military funding (only 44% of PhD granting departments reported no previous military funding). For the current time frame, 88% said they are not receiving military funding at present (PhD departments were slightly lower at 73%). For those departments that do have current military funding, the primary purpose is research support especially in GISc and physical geography. The primary sponsoring agencies were the National Geospatial-Intelligence Agency (NGIA) and the Department of Defense. There is no measureable difference between the entire sample and the PhD granting departments in terms of research purpose or agency sponsor.

As anticipated, the current research portfolios of universities contain funding from military or intelligence agencies, primarily the DoD (not differentiated). For PhD departments, the sources are DoD and the Office of Naval Research as the primary sponsors at the University-level. Estimates of the magnitude of the portfolios, based on our sample, range from a mean of \$6.1 million to \$14.8 million, but given that more than half the sample did not know whether their institution received such funding, we suggest viewing these estimates cautiously.

Another measure of the impact of military/intelligence agency research support is through funding source acknowledgements in peer-reviewed journal articles. Based upon an analysis of

Web of Science (WoS) bibliometric data for 2008-2017 (see Appendix 2 for methods), there were over 22,000 journal articles reporting research funded by the military. The number of articles published per year reporting funding from the “Department of Defense” across all disciplines rose from 590 in 2008 to 2,820 in 2017, constituting a nearly fourfold increase in military-funded journal publications (Figure 1). The vast majority of military-funded publications were in science and medicine-related fields, including oncology (13.9%), multidisciplinary sciences (9.2%), biochemistry/molecular biology (8.8%), cell biology (8.3%), and neurosciences (6.2%), among others.

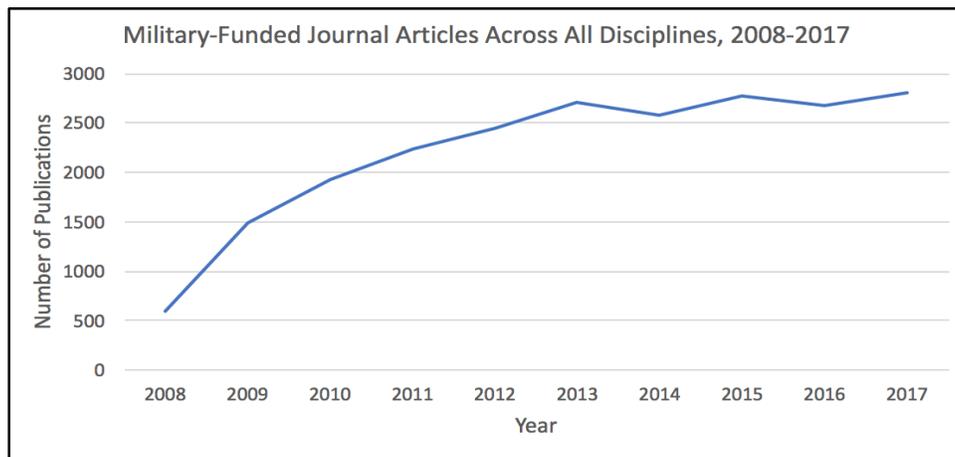


Figure 1: Total number of journal articles published per year across all disciplines listed as funded by “Department of Defense” in a *Web of Science* (WoS) keyword search by funding agency, 2008-2017.

Within the field of geography, there were an estimated 187 articles funded by military sources that were published in peer-reviewed scholarly journals between 2008-2017, or less than 1% of military-funded research publications across all disciplines. Although geography’s contribution to military-funded publications is relatively small in comparison to other disciplines, the annual number of military-funded geographical publications witnessed a two-fold increase from 2008 to 2017. Therefore, the data indicate that in the field of geography, and across all disciplines, there has been a significant increase in the volume of research publications funded by military sources over the past decade. In geography, the U.S. Army (51%) and U.S. Navy (30%), along with other Department of Defense agencies (18%), have played a leading role in funding geographical research based on funding source

acknowledgements. However, to put this in perspective, military-funded articles constituted less than 2% of all articles published in geography journals from 2008-2017.⁸

The majority of military-funded geography publications are in the subfield of physical geography (63.6%), followed by GIS/remote sensing (25.7%), biogeography (6.4%), and human-environment relations (4.3%) (Figure 2). Half of all military-funded geography articles appear in three academic journals: *Journal of Coastal Research* (26%), *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (13%), and *Geomorphology* (11%) (Figure 3). There were no publications in the subfield of human geography in the WoS data analysis. However, some GIS/remote sensing and human-environment relations articles overlap with research foci in human geography. Overall, the analysis suggests that military funding is highest in physical geography and lowest in human geography. The larger proportion of physical geography funding most likely related to support from the U.S. Army Corps of Engineers (both coastal and fluvial geomorphology) for domestic research.

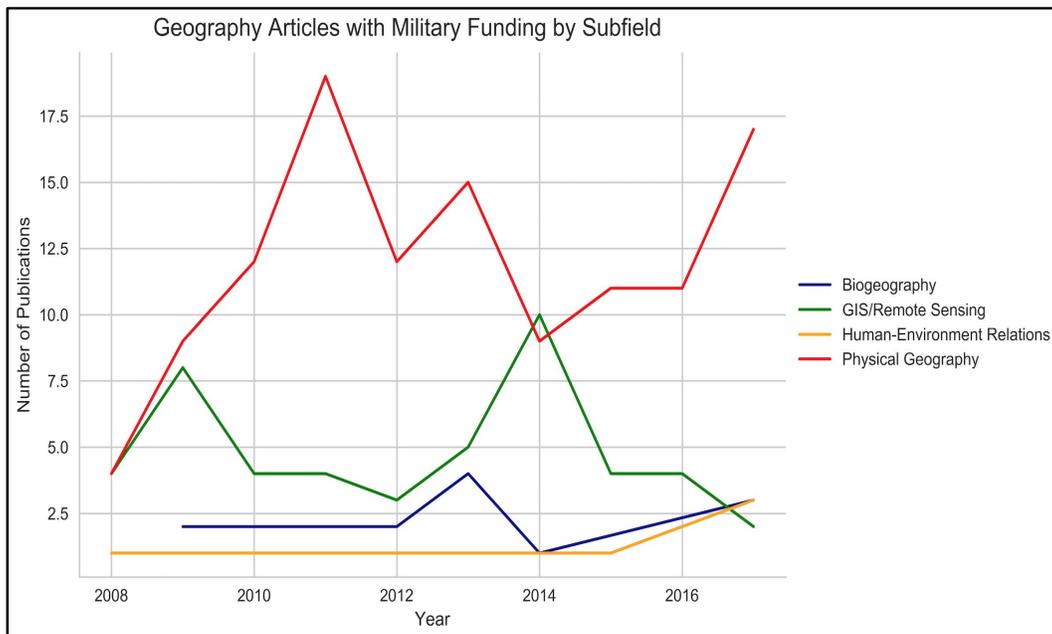


Figure 2. Geography journal articles with military funding by subfield, 2008-2017.

⁸ Based upon a Web of Science query, there were 13,496 articles with a topic-keyword of “geography,” refined to geography journals, published between 2008-2017. Therefore, the 187 military-funded geography publications make up approximately 1.4% of all articles published in geography journals during this time period.

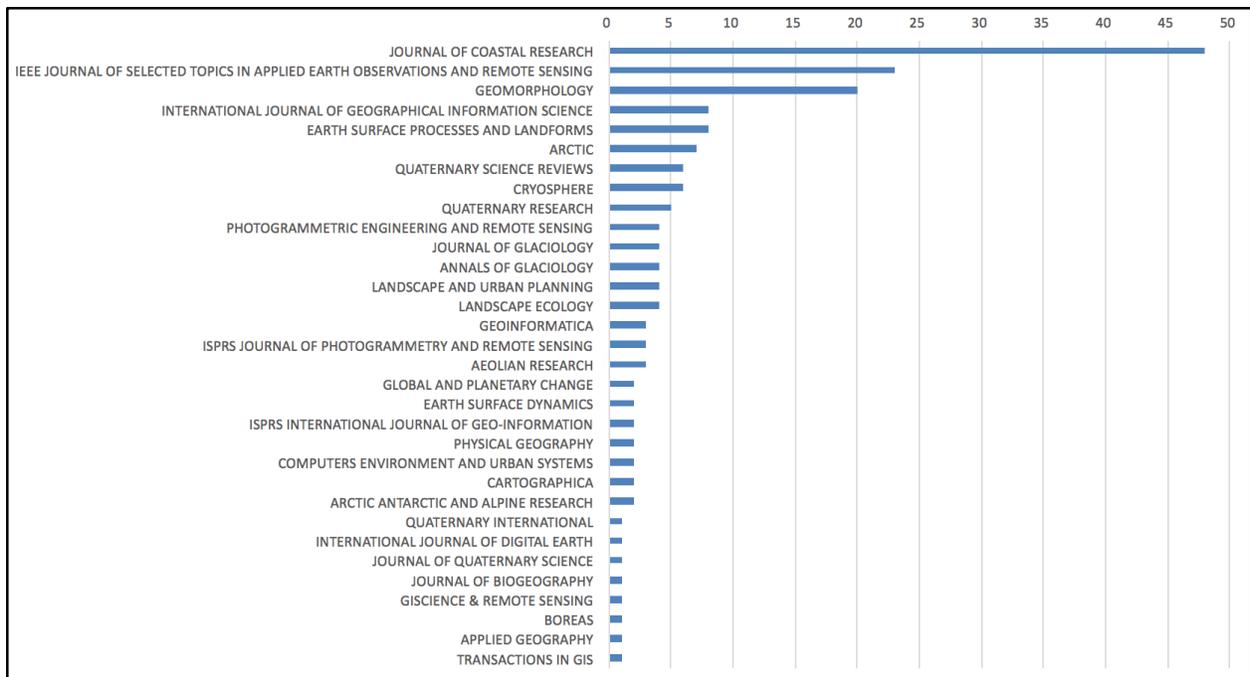


Figure 3. Ranking of geography-related journals by number of military-funded articles published, 2008-2017.

There are differing perceptions regarding the prevalence of military funding in geography departments based on differences between the Departmental Survey and our focus groups. The committee is well aware of the shortcomings in the survey and in the representativeness of the focus groups so caution in the generalizability of these results is warranted. Only 13 departments (out of the 213 in the sample) report current funding from military or intelligence agencies (Appendix 3). Yet, the focus groups showed considerable concern about the magnitude of military funding in departments potentially affecting research agendas and curriculum:

“let’s be honest, the United States military is an extraordinarily high power and high status institution. And in a context where you have, you know, academia, where there’s limited resources, if departments are bringing in funding and they’re training students to work for the NGA, for instance, or they’re doing things that their deans are excited about because they’re demonstrating practical connections to the struggle against terrorism or something like that, how in the world could it not elevate those scholars who are doing that work?” (FG3:8).

“We were approached by administration to become a National Geospatial Agency (NGA) Center for Excellence and the administration reached out to faculty in a number of departments that would have been asked to put on their sort of names on this Center

for Excellence Program. Many of us wrote back with concerns about what that would do to the broader area of research. We recognized that was a huge benefit to GIS research. But we asked questions about what that would do for other kinds of research that are done in those departments and the administration in the end decided not to pursue Center for Excellence designation from the NGA” (FG1:15-16).

Academic Programs and Certifications

Reserve Officer Training Corps (ROTC) and similar military or officer training programs have been a hallmark of U.S. colleges and universities for a century and are in place at more than 1,700 institutions.⁹ Similar programs exist in the UK (Woodward et al., 2017). Our departmental survey found 54% of the sample had such programs on campus, with nearly 89% of doctoral departments acknowledging their formal presence on campus (Appendix 3). At the same time, however, 55% of departments suggested that there were no military science, defense or strategic studies majors or minors offered at their institution, while 14% didn’t know. Only one military science, defense, or strategic studies major/minor program resides within a Geography Department.

From the perspective of geographic education, there has been a marked increase in programmatic funding and pedagogical engagement by the U.S. military and national security agencies since 9/11, particularly in the field of geospatial intelligence. The two key vehicles for engagement are the National Geospatial Intelligence Agency (NGA) and the United States Geospatial Foundation (USGIF) (Box 4). Below is a brief description of their primary disciplinary education initiatives.

One way in which USGIF pursues this mission is through the USGIF Scholarship Program, which has awarded more than \$1.1 million in scholarships to graduate and undergraduate students since 2004. USGIF’s most important education initiative is its Geospatial Intelligence Certificate Program. Launched in 2007, the program’s aim is to support the professional education needs of the geospatial intelligence community. Accredited institutions are required to develop a curriculum that teaches what the USGIF has identified as four core geospatial intelligence competencies: GIS and Analysis Tools, Remote Sensing and Imagery Analysis,

⁹ <https://www.todaysmilitary.com/training/rotc>

Geospatial Data Management, and Data Visualization. There are currently 16 accredited Geospatial Intelligence Certificate institutions (Table 2), and in the decade since the program was established more than 820 students have earned a GEOINT certificate from accredited schools.¹⁰

In 2014, NGA announced a Centers for Academic Excellence (CAE) in Geospatial Sciences program. Though formally a collaboration with the U.S. Geological Survey (USGS), NGA is clearly driving this initiative, as evidenced by the fact that NGA is the lead agency for institutional applications and promotes the CAE program heavily online, while mention of the program is conspicuously absent from USGS's website. To gain CAE recognition, institutions are required to map their curriculum onto nine *core knowledge units* (which deal primarily with spatial data management, analysis, standards, and systems) and at least five focus areas (which consist of more traditional, substantive fields such as Remote Sensing; Cartography and Geovisualization; Photogrammetry; and GIS).¹¹ At present, 25 schools have applied for and received CAE status from NGA (Table 2).

Looking at the list of universities affiliated with either or both the USGIF and NGA programs, it is evident that the military's pursuit of increased geospatial intelligence training is broad-based. Affiliated institutions range from research intensive public universities with doctoral degree programs and regional comprehensive universities to historically black colleges and universities (HBCUs), private universities, military academies, and

BOX 4 Educational Missions of NGA and USGIF

USGIF was established in 2004 as a non-profit educational foundation, with the support of the military and intelligence communities. USGIF's mission is to: "promote the geospatial intelligence tradecraft and to develop a stronger community of interest between government, industry, academia, professional organizations and individuals who share a mission focused around the development and application of geospatial intelligence to address national security objectives"[1].

NGA (known prior to 2003 as the National Imaging and Mapping Agency (NIMA)) supports geospatial intelligence education and research through a variety of initiatives. One is the NGA Academic Grants Program (NARP). NARP provides funding for institutions (through NGA University Research Initiatives), individual faculty (through its New Investigator Program), and academic-private industry collaboration (through NGA Research Collaboration Forums) [2].

[1] <https://usgif.org/about/mission>

[2] For other NGA educational initiatives see:

<https://www.nga.mil/Partners/ResearchandGrants/Pages/AcademicResearchProgram.aspx>

¹⁰ Data on scholarships and schools participating in the certificate program taken from USGIF's 2017 annual report, http://usgif.org/system/uploads/5694/original/2017_annual_report_.pdf

¹¹ Information on the NGA-USGS CAE program, including application guidelines can be found here: https://www.nga.mil/Partners/Academic_Opportunities/Pages/CAEApplication.aspx

a community college (Roane State). There is even one foreign participating university (Universidade Nova de Lisboa).

Table 2 University Affiliations with USGIF and/or NGA Academic Programs

USGIF Certificate Programs	NGA-USGS Centers for Academic Excellence*
Fayetteville State University (HBCU)	Alabama A&M University (HBCU)
George Mason University	Arizona State University
James Madison University	Delta State University
North Carolina Central University (HBCU)	Fayetteville State University (HBCU)
Northeastern University	George Mason University
Penn State University	Mississippi State University
Universidade Nova de Lisboa (Portugal)	North Carolina Central University (HBCU)
U.S. Air Force Academy	North Carolina State University
U.S. Military Academy, West Point	Northeastern University
University of Maryland, College Park	Ohio State University
University of Missouri at Columbia	Penn State University
University of North Carolina, Wilmington	Roane State Community College
University of South Carolina	Western Michigan University
University of Southern California	U.S. Air Force Academy
University of Texas at Dallas	U.S. Military Academy
University of Utah	University of Alabama
	University of Maine
	University of North Georgia
	University of South Florida
	University of Southern California
	University of Texas, Dallas
	University of Utah

* Multiple sources indicate that as of Fall 2017 there are 25 universities with CAE status. Unfortunately we cannot find a full list online so the table lists only 22 of the programs. Source: <https://usgif.org/education/accreditation>

The departmental survey found that 15% of the respondents stated that their university had a GEOINT (Geospatial Intelligence) certificate program or something similar. Of those roughly 27 universities, the majority (18) are operated by a Geography Department or Program. The names of the certificate programs are variable, ranging from GIS Program (the most listed name) to Geospatial Intelligence Program and Geospatial Technologies. However, when asked whether the program received accreditation by the U.S. Geospatial Intelligence Foundation (USGIF), the majority replied no (61%). We found a similar response when asking respondents

whether the program was a Certified Center of Academic Excellence for Geospatial Science (81% said no).

Curriculum

An overwhelming number (87%) of the responding Departments to the survey indicated that they do not offer courses with an explicit focus on military science, defense, strategic studies, or geospatial intelligence in either content or title. Roughly 24 departments (13%) do have such courses with wide ranging content and titles. According to the survey, the median enrollment in these courses is 25.

In addition to more generalized GISc courses (Remote Sensing, Intro to GIS, Cartography, GIS Programming and Customization), other broad-based courses with some relevant content included Introduction to Physical Geography, World Regional Geography, Regional Geography of Africa, Geopolitics, Globalization, Urbanization and Urban Geography, and Globalisation. Box 5 lists more specialized courses with content covering military geography or geospatial intelligence based on title.

Box 5 Selected Geography Courses Focused on Military or Geospatial Intelligence

Geospatial Sciences in National Security
World Hotspots
Military Geography
Mapping the Effects of Weapons of Mass Destruction
Militarism: Space and Society
Global Warfare and Culture
Military and Conflict Geography
Geospatial Intelligence
Geospatial Intelligence Tradecraft
Geographic Information Systems Unmanned Aerial Systems
Geospatial Information Management
Geographic Foundations of Geospatial Intelligence
Source: AAG Departmental Survey

The Military or Intelligence Agencies as Objects of Research

Another form of engagement is also in the research realm, approaching the military as a topical area for geographic inquiry. The subfield of military geography has its own specialty group within the AAG, with approximately 129 members. Topical areas run the gamut across all the broad divisions in the discipline—regional geography, human geography, physical geography, nature-society geography, and geographical techniques, and there are a number of overviews covering military landscapes (Galvano and Palka, 2011; Woodward, 2014). Some recent examples appearing in geographical journals include mapping the logistical landscapes of the DoD (Belanger and Arroyo, 2016), the gendered work of war (Greenburg, 2017), the role of

technological innovation affecting military movements and experiences (Merriman et al., 2017), and the militarization of domestic police forces and actions (Radil et al., 2017).

Other Forms of Engagement

There are many other forms of engagement between geography departments and the military. One of these is recruitment visits from military or intelligence agencies. Such visits are common at colleges and universities (35% of the sample noted that their college or university hosts such visits, while another 38% said they didn't know). At the department level, the vast majority of geography programs do not host such visits (89%).

Another form of engagement is placing graduates in the military or intelligence agencies. There is a wide range of estimates from the survey, but the majority of programs report low numbers on an annual basis (less than 10-20).¹² Other engagements mentioned include summer internships, guest lectures, and participation in the AAG Military Specialty Group.

V. Broader Implications of Interest and Engagement

There are four primary areas of concern with broader implications for geographers and geography departments derived from the analysis. These include (1) ethical considerations and the role of the AAG; (2) need for a constructive dialogue between critical geographers and the military; (3) perceived and real undue influence of military/intelligence engagements including funding on curriculum, staffing, and programmatic decisions in departments; and (4) military research funding as it pertains to academic freedom and transparency.

One of most important issues is the ethical consideration of geographers' engagements with the military. There are avenues for addressing many of the ethical concerns in human subjects research through IRB mechanisms which apply to all governmental funding including DoD. While the military has its own code of ethics (uniform code of military justice governing the conduct of members of the uniform services), it would be instructive to see how the DoD

¹² It was impossible to compute the exact number given the ambiguity in the time frame and the wording of the question itself. Some of the answers clearly reflected placements of majors in the military or intelligence agencies, while others referred to veterans who are now or were students post-separation or retirement from the service.

human subjects mechanisms and university IRBs are aligned with respect to research engagement.

Concerns over the safety of civilians doing fieldwork in conflict and non-conflict zones is a big concern as assumptions abound that such researchers may be agents of military or intelligence agencies. This compromises their ability to conduct research and not only may this endanger the researcher, but it may also put any participating research subjects at risk. As one member of the focus group stated,

“One place to start is with the AAG’s code of ethics. ...The code of ethics which was most recently revised as I understand, in 2009. That code expresses 3 fundamental principles. The principle of respect of persons and communities and for their right to be informed by the research undertaken with respect to them. The principle of equity. Of sharing those research results with those communities. And the principle of beneficence, of maximizing benefits and minimization of harm to research participants. The ethics code goes on to stress the importance of insuring the dignity, safety, and wellbeing of informants and local colleagues. That’s always having preference over any goals of a research project that you’re undertaking. And with respect to vulnerable groups of all kinds, to minimize any physical or social threat and danger to participants and threat to the viability of a group and its territory. And as I mentioned in my opening comment, my concern is that those goals do not necessarily align closely with the goals of any military, intervention by the military force in particular places, posing a genuine quandary for members of the association who are asked to abide by these principles” (FG3: p. 3).

The AAG cannot prescribe the appropriateness of research for its membership beyond instances where it violates its code of ethics. Geography has a diverse membership of both academics and professionals. This diversity not only enriches the discipline, but also necessitates leaving it up to individuals to determine whether they choose to engage with the military or intelligence agencies in their teaching or scholarship under the principles of academic freedom. As a professional association, the AAG can provide guidelines for making sources of research support more transparent, and identify under what circumstances research falls outside the boundaries of accepted geographical scholarship based on a code of professional ethics.

The ethical considerations driven, in part, by palpable increases in military funding to universities may be shifting the center of gravity within some departments. Clearly, researchers in all disciplines are pressured to secure extramural resources for research as mission agency funding in the U.S. declines (e.g., U.S. Environmental Protection Agency, National Oceanic and

Atmospheric Agency, Transportation, Health and Human Services) and basic science agencies remain static (e.g., National Institutes of Health, National Science Foundation). The infusion not only of DoD funding sources, but private philanthropy or corporate funding is increasingly desired by Deans and Vice Presidents for Research to fill the void. In all cases, such funded research comes with opportunities and constraints. The opportunities include resources for training and support of graduate students, more autonomy for principal investigators for research support for equipment, travel, and so forth. The constraints revolve around academic freedom, publication, and agenda setting. These issues are not unique to military funding as many corporate sponsors of research require non-disclosure agreements and prohibit publication and dissemination of datasets without permission. There is a real danger that donors (military and otherwise) could set or shape research agendas, and when such donors are the collective military and intelligence agencies that have a historically uneven relationship with academics, it raises additional concerns.

Academic departments have always adjusted to changes in extramural funding in terms of hiring, academic programs, and strategic programming. In many ways, the funding for new positions within units is in the hands of Deans and Provosts who often chase the “new shiny object”—either a larger funding pool (to bring in more research money), or a perceived “hot or trendy” research area. While this has been the dominant reality for the last decade, and presumably for the next, the larger implications are internal to geography programs themselves—their future visioning, composition, curriculum, and reward structures.

There was considerable concern expressed by focus groups on the political implications to geography departments of participating in DoD funding. These concerns ranged from worries about the “ecology of social relations” and privileging of those who collaborate with the military/intelligence agencies in terms of prestige and power within departments; marginalization of faculty, especially critical geographers; likely shifts in curriculum over time; and what and how research is conducted (and rewarded) within departments. As some focus group participants told us:

“The military grants that we do see coming through, especially from Minerva, are very large. Especially if you’re in the qualitative end of the social sciences. These are grants that are far larger than anything that many of the rest of us are getting from any other

sources and that money, especially at the time of tight research funding, tight funding for students, that can and does affect people's research agendas" (FG1:16).

"It's very clear that the military is taking geography research across the board very, very seriously. A lot of attention has been towards human geography but GIS is right there as well. Physical geography is there as well. A lot of my colleagues who are in climate science will all talk about how the military is the main agency taking climate change seriously in this point in time" (FG1:15).

"This is not exclusive to geography and there's a large-scale problem when universities are funding themselves or taking sponsorship or not. And how that influences academic freedom is a very pertinent question that pervades, I think, every discipline, or should, and it shouldn't just exclusively be a military question or an intelligence question" (FG2:14).

"...you could collect testimony of critical scholars who have been silenced, who have felt their work was marginalized while at the same time, others who were collaborating with the military-intelligence community were celebrated, endorsed, elevated" (FG3:8).

In some ways, these concerns are an internal social relations problem within the unit.

However, at a broader level they address the processes of marginalization of subfields not only in departments but in the profession as a whole. They harken back to a time in the discipline when quantitative methods reigned as the favored methodological approach and all others deemed inferior, or the continual tension between physical and human geography that has resulted in some geography departments disbanding or seeking realignments with other disciplines.

Some of these theoretical/conceptual/methodological tensions are solvable through a professional association such as the AAG. For example, the Healthy Departments Initiative for professional development for Chairs provides workshops (Departmental Leadership Workshop) and strategies for departmental management and quality including faculty development and enhancing diversity and participation. Others are not and remain in the purview of departmental members and administrators at the respective institutions.

Where the AAG can be of assistance is in providing more constructive dialogue between the military/critical geography divide. Opening, maintaining, and fostering a positive dialogue will help build better relationships. As one focus group member remarked,

"a positive outcome would be for the AAG to somehow incorporate an opportunity for discussion and debate about these things in a civil and across the table opportunity to

engage with scholars on both sides to address these issues directly. I think it would be a lost opportunity if the AAG didn't create the opportunity for that" (FG1:7).

This process has already begun with the formation of this committee and the publication of this report. Further enhancements such as targeted and highlighted sessions at annual meetings, improvements in our code of ethics statement, or principled statements extolling the value and importance of geographic research and knowledge that has universal utility are also seen as productive steps forward. As one focus group participant stated:

"...context of what I see as increased nationalisms everywhere, that you know making a strong statement that as a community of scholars we have a broader vision of a collective security for all in producing geographic knowledge furthers that, as opposed to helping state A over state B or whatever, which is, of course, a lot of some of the earlier history of geography is" (FG4:7-8).

In her contribution to the *International Encyclopedia of Geography*, Rachel Woodward comments on the binary engagements (or lack thereof) between the military and critical geographers,

"And while to date the engagements between those advocating serious study of military topics and those arguing for a focus on a geography centered on nonviolence and an ethics of peace have been limited, it is important to note that in its contemporary critical incarnation, military geography should not be assumed to be antipathetic to antimilitarism" (Woodward, 2017:5).

Moreover, O'Lear et al. (2016) remind us of the potential for cross-fertilization and exchanges of ideas in the classroom with the recognition that members of the services and the military academies are open to critical perspectives just like other students.

VI. Recommendations

As a professional organization, the AAG is committed to the "well-being of the peoples, places, and environments that make up our world... and to foster approaches and practices that serve that end."¹³ In a world where complex ties between militaries and geographers affect all AAG members (as documented by this report), the AAG Council has a responsibility to establish

¹³ AAG Statement on Professional Ethics, November 1, 2009.
http://www.aag.org/cs/about_aag/governance/statement_of_professional_ethics

norms of professional and ethical conduct related to geographers' engagements with military and intelligence agencies.

The recommendations below encompass the broad themes in our findings that necessitate further study, monitoring, or actions by the AAG and its membership. They are as follows:

1. The AAG as a professional organization will not initiate, develop, or participate in research collaborations or partnerships with military or intelligence agencies unless the objectives and outcomes of the research and partnership, as determined by the AAG's elected leadership, are in keeping with the AAG's code of ethics and commitment to the well-being of people, places, and environments.
2. Revise the AAG code of ethics statement and policy as it relates to the ethical issues that may arise from military-funded research. This should include comparing the AAG statement (current and proposed) with the codes of ethics related to research developed by other disciplines such as the American Anthropological Association (AAA) and the American Psychological Association (APA) as well as the Department of Defense (DoD) statement of ethics as it relates to research.
3. Update and revise the AAG Statement on Professional Ethics (every few years). With new and revised updates, encourage members of the association to read them as part of the membership renewal and meeting registration processes.
4. Establish best practices and explicit guidelines for transparency in the disclosure of funding source reporting throughout the research process from the time that informed consent is requested from research participants to the dissemination of research results in publications and presentations in geography journals generally, and in AAG journals (e.g., *PG*, *Annals*), journals of AAG Specialty Groups (e.g. *African Geographical Review*), journals of AAG Regional Divisions (e.g. *Southeastern Geographer*), or partnered journals (e.g. *Earth Interactions*)

specifically. Such transparency in the disclosure of funding source reporting should also apply to presentations of geographical research at AAG and AAG-affiliated annual meetings.

5. Provide more dialogue opportunities between critical and military geographers through annual meeting program highlighting (e.g., keynote address, meeting themes). Also provide active encouragement of co-sponsorship sessions at annual meetings using available AAG Central Office incentives (preferred times, rooms, etc.).

6. Continue to lobby for increased funding for geography from non-military/intelligence sources and make alternative funding opportunities more transparent to members.

7. Update the learning outcomes associated with the Department Chairs Workshop, Young Scholars Workshop and other appropriate aspects of the AAG's Healthy Departments Initiative, by developing materials and/or activities (e.g., discussions) that better embrace the implications arising from military-sponsored research and teaching activities for individuals and departments.

8. Establish an implementation committee to assist with executing the above recommendations and foster continued dialogue on the ethical implications of engagements between geographers and the military.

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Appendix 1 Petition to the AAG from the Network of Concerned Geographers

A digital copy of the petition is located here: https://actionnetwork.org/petitions/network-of-concerned-geographers?link_id=1&can_id=22eac2610bbbc348a65beb5ff85310b5&source=email-network-of-concerned-geographers-at-the-2017-aag-meeting&email_referrer=network-of-concerned-geographers-at-the-2017-aag-meeting&email_subject=network-of-concerned-geographers-at-the-2017-aag-meeting

Appendix 2 Committee Approach to Documentation of Trends and Engagements between Geography and the Military

To document and analyze the military and intelligence community's interest and engagement with the academic discipline of geography, we adopted a mixed methods approach to data collection and analysis. These included: a survey of Geography departments in the U.S., Canada, and in NATO countries; compilation of statistical data on military funding, workforce demands, and needs; Web of Science database queries; focus groups; review of departmental websites and syllabi; and outreach to AAG Specialty Groups (especially the Military Geography Specialty Group), as well as concerned members.

One method of primary data collection was a survey of Geography departments that requested information about the military's involvement in departmental and university programs. The questionnaire, developed by the Committee (Appendix 3), was delivered via email to 885 geography programs in the U.S., Canada, and selected NATO member countries. The AAG staff administered the survey and tabulated the results. The survey launched on December 19, 2017 and closed on March 1, 2018. There were 213 completed surveys for a response rate of 24.1%. The majority of responding departments were from the U.S. (77.5%) followed by Canada (5.6%), United Kingdom (3.8%), and Germany (3.3%) (Figure A2.1). The breakdown by highest degree awarded shows 26.6% are Ph.D. granting, 23.6% are masters, 23% are baccalaureate degrees, 10.8% are associate degrees, and 15.8% are certificate only programs, courses only, or unknown.

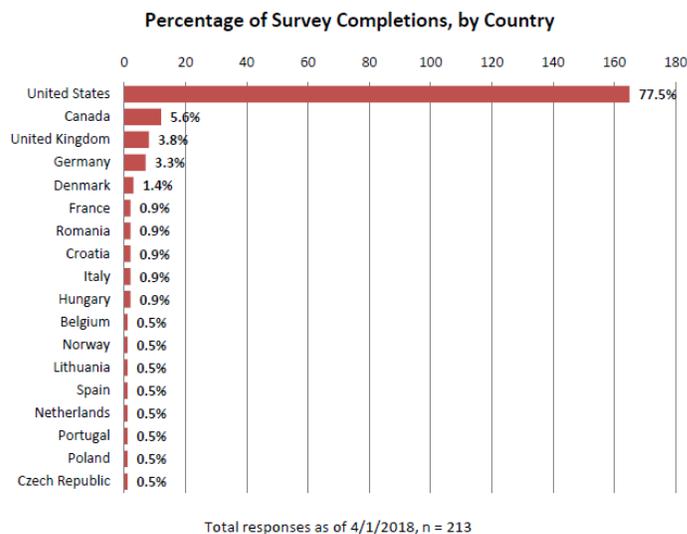


Figure A2.1 Survey completion by country

Another method of primary data collection was focus groups conducted during the AAG Annual meeting in New Orleans (April 12-14, 2018) and individual interviews. The committee initially invited individual members with expertise and/or interest in the interactions between geography and the military. The number of participants expanded with invitations for participation in the focus groups/interviews circulated to AAG Specialty Group listservs. Each focus group lasted approximately one hour and provided an opportunity for committee members and participants to discuss key issues and concerns related to different types of engagements between the military and geographers. There were four focus groups with 26 participants, with at least half the Committee members in attendance for each focus group. The focus group discussions were audio recorded (with permission of the focus group members) and transcribed to ensure the accurate representation of viewpoints in this report.

The committee also used the Web of Science (WoS) database to assess the level of military funding for scientific research generally and geographical research in particular. The Web of Science (WoS) was preferred over other databases (e.g., Google Scholar) in order to facilitate the search for peer-reviewed articles only, rather than all research, and it allows for keyword searches by funding agency. The peer review process normally requires transparency in the funding source to reduce the biasing of results and potential conflicts of interest. Keyword

search queries by funding agency acknowledgement were conducted for peer-reviewed articles published in scholarly journals. To analyze military funding across all disciplines, the keyword “Department of Defense” under the search category “Funding Agency” was used for the years 2008-2017, and the search was then refined to include peer-reviewed articles only. Additional keyword search queries used the keywords listed in Table A2.1 below.

For geographical publications, the results were then classified and analyzed in terms of the total number of articles with acknowledged military funding published per year (total and by subfield) and the prevalence of military-funded articles by journal. Although this method of data collection only examines journal articles included in the WoS database, this sample of data provides a useful means for examining key trends in the involvement of the military in research published in scholarly journals.

Lastly, departmental websites and course syllabi were examined to ascertain the types of curriculum and courses that related to geography-military engagements. These searches amplified the results of the departmental survey as well as committee knowledge of other programs.

Table A2.1: Keywords related to the military used for Web of Science search queries of geography journals, 2008-2017.

Keywords for Web of Science Search Queries of Geography Journals	
Air Force Research Laboratory	Defense Threat Reduction Agency
Air Force Reserve Officer Training Corps	Department of Defense
Air National Guard	DOD
Army Digitization Office	Information Network Project Office
Army Medical Department	Marine Expeditionary Units
Army National Guard	Missile Defense Agency
Army Research Laboratory	National Assessment Group
Army Review Boards Agency	National Geospatial-Intelligence Agency
Central Intelligence Agency (CIA)	National Guard Bureau
Central Security Service	National Reconnaissance Office
Cold Regions Research and Engineering Laboratory	National Security Agency (NSA)
Construction Engineering Research Laboratory	Office of Naval Intelligence
DARPA	Office of Naval Research

Defense Commissary Agency	Topographic Engineering Center
Defense Contract Management Agency	U.S. Air Force
Defense Health Agency	U.S. Air Force Office Special Investigations
Defense Information Systems Agency	U.S. Army
Defense Intelligence Agency	U.S. Army Corps of Engineers
Defense Legal Services Agency	U.S. Department of Defense
Defense Logistics Agency	U.S. Navy
Defense Media Activity	United States Marine Corps
Defense POW/MIA Accounting Agency	United States Military Entrance Processing Command
Defense Security Cooperation Agency	United States Naval Academy
Defense Security Service	Washington Headquarters Services
Defense Technical Information Center	Waterways Experiment Station

Appendix 3 Departmental Survey and Results

Cover Letter Soliciting Input

Dear Department Chairs and Administrative Assistants,

The AAG has established a special committee at the request of some of its members to study and report on interactions between the military and intelligence agencies with geographers and their departments and universities. The committee was asked to 1) Document and analyze the US, Canadian, and European military and intelligence community interactions with geography (both physical and human geography), and in the universities in which geographers work; and 2) Document and analyze specific classes of engagements between the military and associated intelligence communities, and the academic discipline of geography and the universities in which geographers work.

This survey will assist the committee by gathering information from Geography Departments or Programs on the nature and extent of such interactions within their units, and in the broader university context within which they operate. Such data will be of interest for universities, geography departments, students, and employers, as well as the special committee. The survey data will be aggregated and not attributable to any particular program. Together with other information, this survey will inform the special committee and its report to the Council Membership.

We appreciate as much information as you are able to share. Please complete the following short survey by January 17, 2018 if possible: [Link to Survey]

Instructions: We appreciate as much information as you are able to share. By department we mean faculty, research and teaching staff, and students within the department as well as the administrative unit itself. We ask for a contact person within each department or program in case we need to clarify information on the survey, but the name will be redacted in reporting the results. If you have questions about this survey, contact the Committee Chair Susan Cutter (scutter@sc.edu), or AAG liaison John Wertman (jwertman@aag.org).

Survey and Results Tabulations

Section I. Funding

Question 1. Has your Geography Department or program previously received funding from military or intelligence agencies?

Response	Total Sample (n=201)	PhD Department (n=34)
	%	%
Yes	12	32
No	66	44
Don't Know	21	24

Question 1a. Which Agencies provided the funding?

Total Sample (n=20): U.S. Department of Defense (7), National Geospatial Intelligence Agency (7), U.S. Army (4), Office of Naval Research (2), all others (1) U.S. Army Corps of Engineers, U.S. Department of Homeland Security, U.S. Geological Survey, Army Young Investigators Award, Danish Defense, Air Force Office of Scientific Research, NASA Jet Propulsion Laboratory, Lawrence Livermore Lab for Military Related Research, U.K. Ministry of Defense, Defense Advanced Research Projects Agency (DARPA), Dept. of Military and Veterans Affairs, Texas Air and Army National Guard, U.S. Geospatial Intelligence Foundation

PhD Department (n=10): National Geospatial Intelligence Agency (5); Department of Defense (3); U.S. Army (2), Office of Naval Research (2), all others (1) Texas Air & National Guard, Dept. of Homeland Security, Tennessee Emergency Management Agency, Army Young Investigators Award, U.S. Geospatial Intelligence Foundation, Air Force of Scientific Research, Jet Propulsion Laboratory, Lawrence Livermore Lab, Dept. of Military & Veterans Affairs, U.S. Army Corps of Engineers, Dept. of the Army.

Question 1b. What was the total approximate amount of previous funding (US\$)?

Total Sample (n=14): Mean=\$1,450,877; Median=\$425,000

PhD Department (n=7): Mean=\$1,730,000; Median=\$500,000

Question 1c. What was the purpose of that funding?

Response	Total Sample (n=20)	PhD Department (n=10)
	%	%
Research	75	80
Education	40	40
Conferences/Workshops	35	30
Travel	25	10
Other	5	20

Question 2. Does your Geography Department or Program currently receive funding from any military or intelligence agencies?

Response	Total Sample (n=192)	PhD Department (n=33)
	%	%
Yes	7	24
No	88	73
Don't Know	5	3

Question 2a. Which agencies provided the funding?

Total Sample (n=13): National Geospatial Intelligence Agency (5), U.S. Department of Defense (4), Office of Naval Research (2), and all others (1)—U.S. Army Corps of Engineers, Army Young Investigators Award, Defense Advanced Research Projects Agency, U.K. Ministry of Defense
PhD Departments (n=7): National Geospatial Intelligence Agency (3), Department of Defense (2), all others (1)—Office of Naval Research, U.S. Army Corps of Engineers, DARPA, Army Young Investigator Award.

Question 2b. What is the total approximate amount of that funding?

Total Sample (n=10): Mean=\$414,788; Median=\$286,500
PhD Department (n=7): Mean=\$610,500; Median=\$506,500

Question 2c. What was the purpose of that funding?

Response	Total Sample (n=14)	PhD Department (n=8)
	%	%
Research	88	88
Education	29	25
Conferences/Workshops	21	25
Travel	21	13
Other	14	13
Language Training	7	

Question 2d. Which broad topical areas in the discipline does this funding support?

Response	Total Sample (n=14)	PhD Department (n=8)
	%	%
GIScience	50	63
Physical	38	38
Nature-Society	29	25
Human	21	13
Area Studies/Regional	14	13
Other	14	25

Section II Funding Context

Question 3. Has your University previously received funding from military or intelligence agencies?

Question 4. Does your University currently receive funding from any military or intelligence agencies?

Response	University Previous (Q3)		University Current (Q4)	
	Total Sample (n=190) %	PhD Department (n=32) %	Total Sample (n=184) %	PhD Department (n=28) %
Yes	26	59	17	39
No	24	0	25	4
Don't Know	50	41	58	57

Question 3a. Which agencies provided the (previous) funding?

Total sample (n=35): U.S. Department of Defense (17), Unknown (6), DARPA (4), Office of Naval Research (4), U.S. Air Force (3), NGA (3), U.S. Army (3), U.S. Dept. of Energy (2), U.S. Army Corps of Engineers, others (1 each)

PhD Departments (n=12): Dept. of Defense (8), DARPA (3), Office of Naval Research (3), Air Force (2), Dept. of Army (2)

Question 4a. Which agencies provided the (current) funding?

Total sample (n=20): U.S. Department of Defense (13), Unknown (4), Air Force (2), NSA (2), Office of Naval Research (2), NGA (3), U.S. Army (3), others (1 each)

PhD Departments (n=5): Dept. of Defense (4), Office of Naval Research (2), others (1)

Question 3b. What was the total approximate amount of previous funding?

Total sample (n=27): The figures could not be computed due to the large number of unknowns, and the way the totals were listed (some as annual figures, others as total figures).

PhD Departments (n=6): Mean=\$24,887,751; Median=\$8,000,000

Question 4b. What is the total approximate amount of current funding?

Total sample (n=5): Mean= \$6,190,000; Median=\$1,000,000

PhD Departments (n=2): Mean=\$14,850,000; Median=\$14,850,000

Question 3c. What was the purpose of the previous funding?

Question 4c. What is the purpose of the current funding?

Response	University Previous		University Current	
	Total Sample (n=35)	PhD Department (n=12)	Total Sample (n=22)	PhD Department (n=5)
	%	%	%	%
Research	89	83	86	100
Education	46	33	59	20
Conferences/Workshops	23	25	14	0
Travel	14	17	14	20
Other	11	8	14	20
Language Training	14	0	23	0
Not sure	0	8	0	0

Section III Programs and Courses

Question 5. Does your University have a Reserve Officer Training Corps (ROTC) or similar military or officer training program?

Response	Total Sample (n=184)	PhD Department (n=28)
	%	%
Yes	54	89
No	36	0
Don't Know	10	11

Question 6. Is there a military science, defense or strategic studies major/minor offered by your University?

Response	Total Sample (n=184)	PhD Department (n=28)
	%	%
Yes	31	39
No	55	32
Don't Know	14	29

Question 6a. Is the military science, defense or strategic studies major/minor housed within the Geography Department or Program?

Response	Total Sample (n=55)	PhD Department (n=10)
	%	%
Yes	4	0
No	96	100
Don't Know	0	0

Question 6b. What percentage of majors in the Geography Department of Program have a dual major or minor in military science, defense, or strategic studies?

Total sample (n=41): Mean=5.7%; Median=0.05%

PhD. Departments (n=7): Mean 3.07%; Median=0%

Question 6c. What is the approximate annual enrollment in the Department’s military science, defense, or strategic studies courses?

Total sample (n=18): Mean=42; Median=17.5

PhD. Departments (n=7): Mean 29.3 Median=0

Question 7. Does the University have a GEOINT (geospatial intelligence) certificate program (or something similar)?

Response	Total Sample (n=183)	PhD Department (n=28)
	%	%
Yes	15	18
No	78	68
Don't Know	7	14

Question 7a. Is the GEOINT (geospatial intelligence) certificate program (or similar program) housed within the Geography Department or Program?

Response	Total Sample (n=25)	PhD Department (n=4)
	%	%
Yes	72	100
No	28	0
Don't Know	0	0

Question 7b. Is it accredited by the U.S. Geospatial Intelligence Foundation (USGIF)?

Response	Total Sample (n=23)	PhD Department (n=4)
	%	%
Yes	39	100
No	61	0
Don't Know	0	0

Question 7c. Is the program a Certified Center of Academic Excellence for Geospatial Science?

Response	Total Sample (n=21)	PhD Department (n=4)
	%	%
Yes	19	75
No	81	25
Don't Know	0	0

Question 7d. What is the name of the certificate program?

Various opened responses including GIS program (9), Geospatial Intelligence Program (4), Geospatial Technologies (2)

Question 8. Are there any courses offered in the Geography Department or Program that have an explicit focus on Military Science, Defense, Strategic Studies, or Geospatial Intelligence in either content or title?

Response	Total Sample (n=182)	PhD Department (n=27)
	%	%
Yes	13	19
No	87	81
Don't Know	0	0

Question 8a. Please describe the names or types of these courses.

Various open ended responses.

Question 8b. What is the approximate annual enrolment in these courses (# of students)?

Total sample (n=21): Mean=27.7; Median=25

PhD Departments (n=4): Mean 18.9; Median 18.8

Section IV Additional Questions

Question 9. Does your Department or Program host recruiting visits from military or intelligence agencies?

Response	Total Sample (n=179)	PhD Department (n=26)
	%	%
Yes	11	15
No	89	85
Don't Know	0	0

Question 10. Does your University host recruiting visits from military or intelligence agencies?

Response	Total Sample (n=177) %	PhD Department (n=27) %
Yes	35	46
No	27	12
Don't Know	38	42

Question 11. Please estimate how many of your students (in the past 10 years) have been or are currently employed by military of intelligence agencies.

Total sample (n=113): Answers ranged from 0-43,000. Because some answers were listed for only one or two years, while others answered for the whole 10-year time period, mean and medians were not calculated.

PhD Departments (n=15): Mean=12.97; Median=5

Question 12. Are there any other types of interactions between the military and intelligence communities in your Geography Department or Program? (Please elaborate).

Response	Total Sample (n=123) %	PhD Department (n=12) %
Yes	39	67
No	48	8
Don't Know	13	25