



# CLASS OF 2013

## DEPARTMENT CATALOG & GUIDE TO ACADEMIC PROGRAMS

DEPARTMENT OF GEOGRAPHY & ENVIRONMENTAL ENGINEERING  
UNITED STATES MILITARY ACADEMY



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ENVIRONMENTAL ENGINEERING**  
UNITED STATES MILITARY ACADEMY



**COLONEL THAYER,  
FATHER  
OF THE  
MILITARY ACADEMY**



DEPARTMENT CATALOG AND GUIDE TO ACADEMIC PROGRAMS

FOR THE CLASS OF 2013

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Department Web Site External to USMA:

**<http://www.dean.usma.edu/departments/geo/>**

Department Web Site Internal to USMA:

**<http://www-internal.dean.usma.edu/departments/geo>**

Department Academic Counselor: **MAJ Jennifer Thibeault**



## MESSAGE TO CADETS

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The mission of the Department of Geography and Environmental Engineering is to enhance the intellectual, character, and military development of all cadets within the context of a core course in physical geography, a three-course engineering sequence, five distinct majors, and an assortment of elective courses. We offer studies in geography, environmental engineering, environmental science, and geospatial information science—disciplines that have unquestionable relevance for our Army and nation.

The Department's overarching theme is to better understand the world in which we live. We offer a diverse group of majors and honors programs, which prepare cadets for service in the Army and encourage a lifetime of intellectual growth. These include:

1. **Human Geography:** the spatial study of people, their activities, and the places they inhabit.
2. **Environmental Geography:** the study of the interactions between people and the natural environment.
3. **Environmental Science:** a broad, integrative science-based study of how humans affect the planet with the goal of creating a sustainable future for all.
4. **Environmental Engineering:** the application of science and engineering principles to minimize the adverse effects of human activities on the environment and to protect human health by providing clean air and clean water.
5. **Geospatial Information Science:** the integration and analysis of satellite, GPS, and map intelligence information.

Our majors and honors programs will prepare cadets for lifelong professions that are personally rewarding and important to our nation. Despite the continual changes in our Army and throughout the world, there are several constants that continue to serve as guideposts for our profession:

- ★ Understanding weather and terrain will always be among the keys to victory in battle and success during other military operations.
- ★ Understanding other people is necessary to preserve peace.
- ★ Understanding our Earth is critical for our future health and well-being.

These imperatives describe what we in the Department of Geography and Environmental Engineering offer to you, first in our core course in physical geography and continuing with our exciting majors, honors programs, and environmental engineering sequence. In some respects, our mission is the same as every academic department at West Point: to prepare cadets for a career in the Army and a lifetime of service to the nation. Each academic course has the objective of developing you as a self-learner, problem solver, and critical thinker; all of which are attributes critical for success as a leader in the Army. In choosing a major, you select a subject to investigate in depth. Both the knowledge gained and the learning skills developed in this process prepare you to contribute to the Army and the nation. Your task in selecting a major is to find the subject that excites you and inspires a vision for your future. We have much to offer - let us tell you more!

Geography programs flourish in more than 275 universities across the country. Geography is an exciting discipline with great variety and tremendous relevance for future Army officers. Our program at West Point teaches cadets about the Earth as the home of humanity. We offer studies focused on the diverse peoples of the Earth. Our **Human Geography** major examines the spatial differentiation and organization of people, their activities, and lifestyles. Majoring in **Environmental Geography** enables the student to comprehend the processes - natural and human - that form and change the Earth and to understand how people interact with the natural environment. In our capstone course, the Army is used as a laboratory to demonstrate how understanding geography informs military operations across the spectrum from peacetime to war. Geography majors have opportunities for advanced studies that literally take cadets around the world.

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The world's population of over 6 billion people places a serious burden on the sustainability of the Earth. The effects are now visible everywhere and include negative impacts on the air we breathe, water we drink, and soils that we depend on for growing food. Environmental Scientists and Engineers are at the tip of the spear in trying to solve environmental dilemmas. It is critical that we find ways to coexist with our natural environment. **Environmental Science** majors develop an understanding of the physical, chemical and biological processes that govern the Earth's activities. Cadets can choose to study in depth any of the ecological processes or methods that we use to analyze and protect the environment. Majoring in **Environmental Engineering** enables cadets to develop the skills needed to control human pollution of the air, land, and water. The major is an ABET-approved engineering program that prepares you to clean and sustain the environment, protecting all of us from the adverse impacts of human activity. Our graduates well exceed the national average pass rates on the Fundamentals of Engineering Exam, the first important step in becoming a licensed professional engineer.

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In our **Geospatial Information Science** program, you learn to analyze, describe, and visualize the features of the Earth in remarkable detail. The newest and best computer hardware and software are used to instruct you in remote sensing, surveying, computer cartography, and geographic information systems, just to highlight a few areas. Army applications of this technology for analyzing the battlefield are obvious, but there is much more ongoing in this field. If you have interest in this area, visit the instructors and let them tell you about this area of study and show you our state-of-the-art Geospatial Science Laboratory.

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Regardless of your major, the **Environmental Engineering Sequence** will enhance your West Point experience. This sequence accomplishes two goals in preparing you as an educated leader. First, it develops your ability to solve complex problems by introducing you to a decision-making process that is applied to current environmental issues. Second, the sequence provides an understanding of the key environmental issues threatening the well-being of the world today, such as safe and sufficient water for a growing world population, clean air and global atmospheric protection, and the management of hazardous and toxic wastes. You will examine the science underlying these issues as well as the laws and regulations established to protect people and the environment. The sequence culminates

by providing cadets with the opportunity to solve a complex environmental problem with competing technical, socio-cultural, political, and economic requirements.

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Your options are exciting and the possibilities are numerous. Please look through this booklet, consider what interests you, and then visit with our faculty. They are anxious to assist you in understanding the rewarding opportunities that are available within our department. ★



EUGENE J. PALKA  
Colonel, US Army  
Professor and Head  
Department of Geography  
and Environmental Engineering





Cadets explore Constitution Marsh as part of an Engineers and Scientists for a Sustainable World (ESSW) field trip.



Honors cadets and faculty advisors pose after finishing their public defense. Topics ranged from motivations for American citizens to serve in the Israeli Defense Force to Cobalt in Africa.

# GEOGRAPHY AND ENVIRONMENTAL ENGINEERING AFTER GRADUATION

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Each of our majors is focused on preparing you for success as a leader. Successful leaders are incisive thinkers who critically evaluate and solve problems. Regardless of your major, you will develop analytical problem solving skills in our classes that will serve you well in the future. Many of the problems you will face in the Army will be examined in our classes because the Army is our laboratory and we study real world examples. You will also become a capable user of some of the most up-to-date technology in your field. The department has the best undergraduate laboratory facilities in the country, and our Geospatial Sciences Laboratory is world-class. Thus, you will learn to understand the world around you, and be prepared to solve its most complex environmental problems. Our AIAD programs will provide you with an opportunity to see how the Army uses your discipline through assignments to Army and DoD activities throughout the world.

Majoring in this department does not limit your branch opportunities – on the contrary, it expands your value in whatever branch you choose. Each branch needs leaders who understand the world, its people, and how they interact – our programs will give you those skills. All Army units must train and operate in varied operational environments and within the guidelines of established environmental regulations in a way that sustains limited training lands. Finally, the special skills learned as part of the geospatial sciences program are critical to all types of military planning and provide the critical spatial data that every Army deployment requires. ★

## • **What Geographers and Environmental Engineers do for the Army**

As a geographer or environmental engineer, you will be an asset to any branch or functional area. Your keen understanding of culture, technology, and engineering will provide you valuable insights for any mission. As our Army continues to place increased emphasis on cultural awareness and environmental issues, you will be well positioned to succeed regardless of your branch. Here are just a few examples:

**WARFIGHTING:** Geographers and environmental engineers are found in all combat and support branches. Terrain, weather, climate, and cultural landscapes are typically the decisive geographic elements common to every tactical environment and across the spectrum of Army missions. An understanding of physical geography enables the officer to judge the influence of climate, soils, vegetation, and terrain on military operations. A clear awareness of the fundamentals of cultural geography is a critical element in operational planning, given the high probabilities of low and mid-intensity conflict. Officers trained in the geospatial information sciences permit the Army to retain an advantage in maintaining information dominance on the battlefield. Environmental engineers and scientists are well suited to understanding and addressing environmental issues associated with warfare ranging between the use of environmental warfare by our adversaries to the protection of our troops from disease and other wartime environmental hazards.

**OPERATIONS OTHER THAN WAR:** As the Army's mission profile increasingly expands to include stability and support operations, the need for well-trained geographers and environmental engineers will become critical. Today's peacekeeping and humanitarian

support missions occur around the world. Likewise, humanitarian assistance has been provided in places such as Kashmir, Sumatra, Pakistan, the Democratic Republic of the Congo, Rwanda and Sudan. These examples reflect the diverse array of culture systems and physical environments with which our soldiers must contend. Officers trained in human geography understand cultural, political, and economic situations and are a valuable asset to every peacekeeping mission. Environmental geographers can assess the natural landscape, environmental resources, and human-environment interaction, thus providing useful information during peacekeeping or disaster relief operations. The environmental engineer is well suited to meet the demands of these situations by providing safe drinking water, improving sanitary conditions, and mitigating adverse impacts of military operations. Finally, all Army units rely on geospatial information to ensure accurate, successful planning and mission execution. The ability to process multiple layers of data linked to an actual location on the ground allows the mission planner to make the most informed decision, from road construction to well digging, and route planning to crime-stopping.

SUPPORTING MILITARY TRAINING: During peacetime operations, leaders are increasingly challenged to develop imaginative ways in which to provide tough, realistic training while sustaining and improving the condition of our training areas. In preparing for the unit's wartime mission, a geographer's understanding of contingency locations around the world is useful in developing realistic training conditions. Environmental scientists and engineers implement policies that support a broad range of environmental protection regulations from resource management to hazardous waste disposal. Using modern geospatial information sciences and techniques, the spatial distribution of key training area resources as well as potential hazards are accurately recorded and analyzed.



EV379 (Photogrammetry) cadet creates a Digital Orthophoto on a Aerial Photogrammetric Workstation with 3-D viewing capability.

# GEOGRAPHY AND ENVIRONMENTAL ENGINEERING AT WEST POINT

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## • Overview

The department offers some of the best undergraduate facilities in the country for the study of geography, geospatial information science, and environmental science/engineering. Each cadet's elective sequence, regardless of the program, is tailored according to personal interests and abilities. Throughout the program of study, special attention is focused on the analysis and evaluation of significant human-environment problems. This theme permeates all aspects of the academic program.

## • Opportunities for Cadets Selecting Department Majors

DEPARTMENT ACTIVITIES AND FACILITIES. Our majors are integrated into a variety of activities. Cadets are invited to attend lectures, seminars, and professional discussions on a wide array of subjects. Department facilities include a specialized library, map library, a geographic sciences laboratory, a geology laboratory, and environmental laboratories. Academic and social events are held frequently so that students and faculty can continue the interactive process of learning in a variety of forums.

INDIVIDUAL ADVANCED DEVELOPMENT. The department sponsors an outstanding summer intern program for approximately 60 upper-class cadets as a part of Cadet Summer Training. Cadets have the opportunity to work with agencies such as the Army Environmental Center, Army Environmental Policy Institute, Army Geospatial Center, National Geospatial Intelligence Agency, Army Research Institute, Environmental Protection Agency, and Defense Intelligence Agency. Cadet travel can cover the entire world, including Central Asia, Southeast Asia, the Middle East, or any of an ever-changing array of locations. These programs offer unique opportunities for cadets to broaden their education while observing the critical contributions of their discipline at high levels of government.

INDIVIDUAL RESEARCH. Each semester a number of cadets are selected to participate in individually designed research and study programs on topics of special interest. Cadets and a faculty sponsor design projects jointly. These research endeavors offer a unique opportunity to excel in an area of academic interest. Examples of recent projects include a yardage book and course guide for the West Point Golf Course using GIS, herbicide effectiveness on invasive lake species in Wilkins Pond, determining lead mobility from small arms ranges, mixing and stratification impact on water quality issues in Devils Lake, North Dakota, and an evaluation of beach erosion hot-spots along the mid-Atlantic coast.

HONORS PROGRAMS. Five of the department's six majors offer an honors program for qualified cadets. The Geography honors program begins during term seven as participants attend a research seminar. During this seminar, cadets explore salient research issues in their particular field, learn methodologies, and develop technical writing skills. As part of this seminar, each cadet will define a research topic, explore the literature, and develop a research proposal. During their final term, cadets will use the research proposal as a point of departure and conduct an independent study project. At the end of the year, cadets will present their findings to the faculty and submit a written honors thesis. The GIS and Environmental Science majors select one additional course from their respective electives list and will complete an independent research project (EV489A) during term 7 or 8 and

present their findings to their classmates and faculty. Environmental Engineering majors will complete an independent research project as one of their electives. Refer to the detailed program descriptions in this book and see your academic counselor for the specific details for each honors program as well as entry standards.

ACADEMIC AWARDS. The department recognizes its best cadets through a number of prestigious awards. The Congressional Medal of Honor Society Award is presented annually to a member of the graduating class for excellence in geography. The Order of the Founders and Patriots of America Award is presented annually to a member of the graduating class for excellence in environmental science or engineering. The National Organization of the Ladies Auxiliary Veterans of Foreign Wars of the United States Award is presented annually to a member of the graduating class for excellence in the Environmental Engineering sequence. The Environmental Systems Research Institute Award is presented annually to a member of the graduating class for excellence in geospatial information science. The BAE Systems Award for excellence in photogrammetry is presented annually to a member of the graduating class for excellence in aerial photography and photogrammetry. These honors are presented at the annual graduation awards convocation to the cadet in each respective major with the highest grade point average in the elective program.



CDT Wasilewski points out the Swiss Alps while on Spring Break in Switzerland.

# Academic Awards - Previous Awardees

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## • Congressional Medal of Honor Society Award for Excellence in Geography

10 - Nicholas Lewis-Walls	05 - Kristin Davis	00 - Joshua Schneider
09 - Trey Wheeler	04 - Charles Lewis	99 - Matthew Debiec
08 - Lauren Teal	03 - Thomas Lainis	98 - Michael Lipsner
07 - Jennifer Lichty	02 - Eric Wilkinson	97 - Aaron Ecklund
06 - Sarah McNair	01 - Matthew Sullivan	96 - Brian Gavula

## • Order of Founders and Patriots of America Award for Excellence in Environmental Science and Environmental Engineering

10 - Nathaniel Sheehan	05 - Sean Healy	00 - Jeffery Jager
09 - Tyler Bott	04 - Joe Marullo	99 - Travis Rayfield
08 - Russell Raines	03 - Sarah Williams	98 - Bradley Stoltz
07 - Brandon Woerth	02 - Stephen Lewandowski	97 - Ralph Radka
06 - Justin Sprague	01 - Paul McBride	96 - David Hernke

## • National Organization of the Ladies Auxiliary VFW of the United States Award for Excellence in the Environmental Engineering Sequence

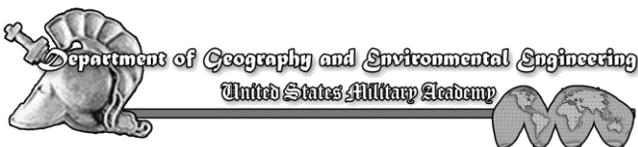
10 - Margaret Fountain	05 - Jordan Yokley	00 - Nicholas Schommer
09 - Trey Wheeler	04 - Todd Martin	99 - Stephen Mintz
08 - Zachary Miller	03 - Daniel Tran	98 - William Blake
07 - Jeremy Stratman	02 - Jose Garcia-Aranda	97 - Jacob Kramer
06 - Matthew Schardt	01 - Jeffrey Han	96 - Brian Gavula

## • Environmental Systems Research Institute Award for Excellence in Geospatial Information Science

10 - Nicholas Lewis-Walls	06 - Doug Calloway	02 - Miguel Gastellum
09 - Nicholas Dieter	05 - William Zielinski	01 - Ryan Piotrowski
08 - Jonathan Dyer	04 - Grace Chung	00 - Joshua Schneider
07 - Jeremy Stratman	03 - Jeffrey Oster	

## • BAE Award for Excellence in Photogrammetry

10 - Augustin Paulo	09 - Megan McIntosh	08 - Nicholas Dieter
		07 - Andrew Morgan



# GEOGRAPHY & ENVIRONMENTAL ENGINEERING PROGRAMS: CLASS OF 2013

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SCOPE: Our Geography, Environmental, and Geospatial Information Science programs are designed to prepare cadets for careers involving the observation, evaluation and design of human and physical systems in today's interdependent world. State of the art departmental laboratory facilities support our programs.

OPTIONS: Students desiring to complete a baseline program have six alternatives for a major. Those who desire academic enrichment in the discipline and meet academic requirements may apply to participate in an honors program in five of our six majors. The program areas are:

- ★ Human Geography
- ★ Environmental Geography
- ★ Environmental Science
- ★ Environmental Engineering
- ★ Environmental Engineering Studies
- ★ Geospatial Information Science

CORE REQUIREMENTS: You must complete or have received USMA credit for the 26 core courses as shown in the General Section of the USMA Academic Program (Redbook) for your class. You must also fulfill the Information Technology core course requirement.

ENGINEERING SEQUENCE: The **3-Course Environmental Engineering Sequence** is available to all cadets. It furnishes an engineering sequence that focuses on important environmental issues and provides cadets with the opportunity to develop viable, sustainable solutions. It offers an opportunity to learn and apply the engineering design process in the natural world, within which social, political, cultural, and economic considerations are critical factors in decision-making. The environmental engineering sequence has three important objectives:

- ★ Have cadets attain a fundamental appreciation of the most salient environmental issues and analyze their underlying causes and impacts on the natural environment.
- ★ Provide cadets with the ability to formulate and communicate practical engineering solutions to important environmental problems.
- ★ Teach cadets to develop and apply viable engineering solutions that conform to important economic, social, cultural, and political criteria.

The first course in the sequence, **EV300 (Environmental Science)**, provides cadets with a broad understanding of what the term "environmental issues" encompasses and how influences, especially human, cause changes in the balance of Earth's natural and biological cycles. The second course, **EV350 (Environmental Engineering Technologies)**, builds on the EV300 experience through the application of science-based engineered solutions to common environmental issues. Finally, in **EV450 (Environmental Decision Making)** cadets learn to balance engineered solutions with economic, social, political, and ecological considerations. Using many aspects of water resources such as hydropower, navigation, drinking water supply, fish habitat, recreation, as a teaching model, cadets learn decision-making and policy development realities. ★

## PROGRAM DESCRIPTIONS

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### • GEOGRAPHY

Geographers examine the spatial arrangements, processes, distributions, and organization of natural and human landscapes. Geography is a broad, integrating discipline with methodologies and analytical foundations that span engineering, science, and the humanities. Majoring in geography requires persistent curiosity and inquiry into human-land-environment interfaces: how natural systems function; how physical landscapes evolve; how human populations adapt; and how humans shape the environment. Two majors allow cadets to explore geography either from a natural or social science perspective. The Environmental Geography program emphasizes the study of the natural landscape, anthropogenic influences on the environment, and natural hazards. The Human Geography program enables cadets to explore cultural diversity, population trends, and political systems from a global and regional perspective. Both programs integrate the use of geographic skills such as computer cartography, remote sensing, and geographic information systems. Geography is the ideal discipline for an Army officer in a changing world. ★



**POC: Dr. Jon Malinowski, WH5323, x4673, [jon.malinowski@usma.edu](mailto:jon.malinowski@usma.edu)**

### • ENVIRONMENTAL SCIENCE

Environmental science is a broad, integrative, science-based discipline which focuses on the interrelationships between people and the environment. Environmental scientists conduct investigations to analyze these interrelationships and to identify, abate, or eliminate human-caused pressures on the environment. The ultimate goal of these investigations is to create a sustainable balance between humans and the natural world that minimizes environmental degradation. This major develops expertise into the processes that sustain our environment by expanding upon the West Point core science education by adding studies in the natural sciences such as biology, ecology, geology, and meteorology, and in the integrative studies of environmental decision making and environmental security. This broad academic background is excellent preparation for challenges faced by a military leader who must balance resource and human requirements. The program seeks to (1) enhance your curiosity about natural processes and your ability to study such processes as a scientist and (2) deepen your knowledge of human influences on the environment and foster evaluation of our individual and collective responsibilities as environmental stewards. ★



**POC: Dr. Marie Johnson, WH5416, x4855, [marie.johnson@usma.edu](mailto:marie.johnson@usma.edu)**

## • ENVIRONMENTAL ENGINEERING

Environmental engineers face a range of issues from disasters like air pollution from the terrorist attack on the Twin Towers or drinking water contamination following the earthquake in Haiti. Environmental engineers use chemical, biological, and physical processes to engineer systems that address these issues. This discipline is evolving to face new challenges resulting from rapid growth in human population and technology. Environmental engineers work in multinational teams to develop methods to combat global climate change; find alternative sources of energy; and to recover materials from discarded products. It is not surprising that a report in *Fortune* Magazine identified environmental engineering as the fastest growing profession for the period 2002 to 2012. Our program provides you with an active learning experience designed to develop your knowledge of math, science, and engineering science and your ability to use this knowledge to be an active problem solver for complex environmental issues. This skill has been invaluable to our graduates in the Army as they work environmental projects in Iraq and Afghanistan and improve the welfare of their soldiers. The objectives of the Environmental Engineering Program identify what our graduates can accomplish after graduation. Graduates of the Environmental Engineering Program can:



- Analyze and solve complex problems. Graduates can apply their knowledge of mathematics, science, engineering, and the humanities to analyze and solve practical problems to include those in Environmental Engineering. They can evaluate, mitigate, and communicate risk. They can use appropriate technologies to formulate effective, context-based courses of action; adapt methods and strategies to overcome incomplete or imperfect information; and recommend or choose a best course of action. Graduates can creatively adapt problem solving strategies and solutions to a rapidly changing and/or potentially life threatening situations. Problem solving is not bounded by disciplinary expertise. Graduates may encounter problems within the environmental engineering discipline, or within the broader context of officership in the profession of arms.
- Lead, manage, and execute. Graduates can lead people, manage resources and programs, prioritize activities, and execute projects within constraints to successfully complete the mission within the environmental field and the Army. Graduates must be able to execute an array of missions efficiently while minimizing environmental impacts. Potential missions include actions in combat, homeland security, disaster relief, humanitarian aid, and other operations under austere conditions.
- Communicate effectively. Graduates have the ability to listen to, understand, and assess varying viewpoints and can, based on this assessment, communicate pertinent information to stakeholders and the general public in such a manner as to bridge their differences and strengthen relationships among them.
- Recognize their roles as a professional. Graduates have internalized their professional responsibilities to society, the profession of arms, and the practice of engineering. They demonstrate internalization through participation in professional societies, continuing education, progression in assignments, community outreach, and other activities. ★

**POC: Dr. Marie Johnson, WH5416, x4855, [marie.johnson@usma.edu](mailto:marie.johnson@usma.edu)**

• **GEOSPATIAL INFORMATION SCIENCE**

Fundamental to understanding our environment and the geography of the Earth is our ability to locate, measure, and quantify geographic phenomena. The discipline of geospatial information science (GIS) is concerned with the measurement of the Earth and of all that is on it--natural and manmade. Cadets develop expertise in subjects ranging from traditional methods of land surveying to satellite imaging and positioning systems. The GIS curriculum builds on a firm math, science, and geography foundation with specialized courses in surveying, cartography, photogrammetry, remote sensing, and geographic information systems. Both the civil and military sectors of our society are placing an ever-increasing reliance on the ability to build and query geospatial information to support a myriad of social/economic and engineering issues. The cadet at USMA has a rare opportunity to pursue an integrated field of study that is commonly spread over several separate disciplines at other institutions. This major has applicability for the future military officer regardless of branch. Cadets majoring in GIS receive a 3Y (Space Activities) Skill Identifier on their official military record. The curriculum prepares cadets for advanced civil schooling in any of the specialized fields of GIS. ★



**POC: Dr. John Brockhaus, WH5302, x2063, [john.brockhaus@usma.edu](mailto:john.brockhaus@usma.edu)**

**GEOGRAPHY AND ENVIRONMENTAL ENGINEERING  
FACULTY COUNSELORS FOR AY 10-11**

<b><u>PROGRAM</u></b>	<b><u>PROGRAM COUNSELOR</u></b>	<b><u>OFFICE</u></b>	<b><u>PHONE</u></b>
Geography	Dr. Jon Malinowski	WH5323	4673
Environmental Engineering/Science	Dr. Marie Johnson	WH5416	4855
Geospatial Information Science	Dr. John Brockhaus	WH5302	2063
Counseling and Scheduling	MAJ Thibeault	WH5319	0207

## DEPARTMENT COURSE DIRECTORS

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<u>COURSE</u>	<u>TITLE</u>	<u>COURSE DIRECTOR</u>	<u>OFFICE</u>	<u>PHONE</u>
EV203	Physical Geography	Lt. Col. Rios	WH5411	4869
EV300	Environmental Science	LTC Timmes	WH5415	4658
EV301	Environmental Science for Engineers and Scientists	Dr. Johnson	WH5416	4855
EV303	Foundations in Geography	Dr. Malinowski	WH5323	4673
EV350	Environmental Engineering Technologies	MAJ Thibeault	WH5319	0207
EV365	Geography of Global Cultures	LTC Lohman	WH5320	2930
EV371	Geography of Russia	Dr. Wolfel	WH5100	8198
EV372	Geography of Asia	Dr. Malinowski	WH5323	4673
EV373	Geography of Latin America	MAJ Fuhrman	WH6003	3509
EV374	Geography of the Middle East and Africa	LTC Lohman	WH5320	2930
EV377	Remote Sensing	Dr. Brockhaus	WH5302	2063
EV378	Cartography	COL Fleming	WH5414	3124
EV379	Photogrammetry	LTC Edson	WH5311	3531
EV380	Principles of Surveying	MAJ Wright	WH5414	3124
EV384	Geography of North America	LTC Thompson	WH6001	4035
EV385	Introduction to Environmental Engineering	MAJ Cook	WH5318	4135
EV386	Geography of Europe	Dr. Krakowka	WH5412	3735
EV387	Meteorology	Maj. Spicer	WH5400	3986
EV388A	Physical Geology	MAJ Patterson	WH5321	3540
EV388B	Geomorphology	MAJ M. McGunegle	WH5409	3094
EV389B	Climatology	Dr. Kalkstein	WH5410	3403
EV390B	Urban Geography	Dr. Wolfel	WH5100	8798
EV391A	Principles of Land Use Planning and Management	MAJ Culpepper	WH5332	2679
EV391B	Environmental Geology	LTC Smith	WH5424	3136
EV394	Hydrogeology	Dr. Butkus	WH5317	2820

<u>COURSE</u>	<u>TITLE</u>	<u>COURSE DIRECTOR</u>	<u>OFFICE</u>	<u>PHONE</u>
EV396	Environmental Biological Systems	MAJ Rayfield	WH5315	4265
EV397	Air Pollution Engineering	CPT (P) Pfluger	WH5400	4400
EV398	Geographic Information Systems	COL Hendricks	W5303B	4869
EV400	Environmental Engineering Seminar	MAJ Rayfield	WH5315	4265
EV401	Physical and Chemical Treatment	LTC Powell	WH5414	4620
EV402	Biochemical Treatment	LTC Timmes	WH5415	4658
EV450	Environmental Decision Making	MAJ Sugrue	WH5312	3093
EV471	Ecology	LTC Smith	WH5324	3136
EV477	Advanced Remote Sensing	Dr. Brockhaus	WH5302	2063
EV478	Military Geospatial Operations	COL Fleming	WH6006	2326
EV480	Honors Seminar in Geography	Dr. Krakowka	WH5412	3735
EV481	Water Resources Planning and Design	MAJ Cook	WH5318	4135
EV482	Military Geography	MAJ Culpepper	WH5332	2679
EV485	Special Topics in Geography and the Environment	Program Directors		
EV486	Environmental Geography	Dr. Krakowka	WH5412	3735
EV487	Environmental Security	Dr. Johnson	WH5416	4855
EV488	Solid and Hazardous Waste Treatment and Remediation	LTC Timmes	WH5415	4658
EV489A	Advanced Individual Study I	Dr. Johnson	WH5416	4855
EV489B	Advanced Individual Study II	Dr. Malinowski	WH5323	4673
EV490	Advanced Environmental Engineering Design	Dr. Butkus	WH5317	2820
EV498	Advanced Geographic Information Systems	COL Hendricks	W5303B	4869
XS391	Principles and Applications of Environmental Chemistry	MAJ Rayfield	WH5315	4265



Members of the 2010 Intercollegiate Champions Orienteering Team, sponsored by the G&E Department.



EV481 (Water Resources Planning and Design) cadets on a New York Harbor field trip.

# HUMAN GEOGRAPHY

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## HUMAN GEOGRAPHY MAJOR (GEO)

## HUMAN GEOGRAPHY MAJOR WITH HONORS (GEOH)

### CORE CURRICULUM AND ENGINEERING SEQUENCE:

- Complete the 26-course core curriculum
- Complete any 3-course core engineering sequence
- Complete **one** of the following courses:

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

### FOUNDATION COURSES

- Complete the three courses listed below:

Course #	Course Title
EV303	Foundations in Geography
EV365	Geography of Global Cultures
EV398	Geographic Information Systems

### REGIONAL GEOGRAPHY

- Complete **one** of the eight Regional Geography courses listed below:

Course #	Course Title
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV375	Geography of Africa
EV376	Geography of the Middle East
EV384	Geography of North America
EV386	Geography of Europe

### PHYSICAL GEOGRAPHY

- Complete **one** of the four courses listed below:

Course #	Course Title
EV388A	Physical Geology
EV388B	Geomorphology
EV389B	Climatology
EV391B	Environmental Geology

### GEOGRAPHY TOOL

- Complete the course listed below:

Course #	Course Title
LX ____	Third Semester of Language

GEOGRAPHY ELECTIVE

- Complete **two** of the three courses listed below:

Course #	Course Title
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV3XX	Any Regional Geography Course (see list on previous page)

GENERAL ELECTIVE

- Complete **one** of the seventy courses listed below:

Course #	Course Title
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV375	Geography of Africa
EV376	Geography of the Middle East
EV377	Remote Sensing
EV378	Cartography
EV384	Geography of North America
EV386	Geography of Europe
EV387	Meteorology
EV388B	Geomorphology
EV389B	Climatology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV397	Air Pollution Engineering
EV478	Geospatial Military Operations
EV483	Colloquium in Geography
EV485	Special Topics in Geography and the Environment
EV486	Environmental Geography
EV487	Environmental Security
EV489A	Advanced Individual Study in Geography
EP333	Cultural Studies
EP392	Ethnic Literature
HI337	China – C. Kingdom to Communist Rule
HI339	The Modern Middle East
HI340	Colonial America
HI341	The Age of Exploration
HI342	The British Isles Since 1688
HI343	Modern Germany
HI345	Modern Africa
HI346	Modern South Asia
HI347	Asian Warfare and Politics
HI349	The Middle East to 1798
HI360	History of the Classical World

<b>Course #</b>	<b>Course Title</b>
HI361	History of Medieval Europe
HI362	History of Early Modern Europe
HI363	Europe in Transition and Revolution
HI364	Modern Western Europe
HI365	The Ancient World
HI367	History of Imperial/Soviet Russia
HI368	Mod. Central and E. Europe 1896-1989
HI369	American Frontiers
HI372	History of US Foreign Relations, 20 <sup>th</sup> Century
HI390	Early National America
HI391	History of World Religions
HI394	Revolutionary America
HI395	History of Civil War America
HI396	Making of Modern America
HI398	Society & Culture in American History
LW481	International Law
LX400	Fourth Semester, Foreign Language
MA376	Applied Statistics
MS360	Low Intensity Conflict
MS455	Comparative Military Systems
PL361	Research Methods
PL377	Social Inequality: Race, Gender, and Ethnicity
SS360	Political Analysis
SS366	Comparative Politics
SS368	Econometrics
SS372	Politics and Gov. of China
SS374	Politics & Gov. of Korea & Japan
SS375	Politics and Governments of Russia & Neighbors
SS377	Politics & Gov. of Europe
SS381	Political and Cultural Anthropology
SS383	Politics and Governments of the Middle East
SS384	Politics and Governments of Latin America
SS385	Comparative Economic Systems
SS485	Politics and Development in Sub-Saharan Africa

**INTEGRATIVE EXPERIENCE**

- Complete the following course:

<b>Course #</b>	<b>Course Title</b>
EV482	Military Geography

**HONORS PROGRAM IN HUMAN GEOGRAPHY**

• Cadets pursuing the honors program in Human Geography must meet the entry-level requirement of having a 3.00 grade point average in the core curriculum, an APSC of at least 3.5 in the major, and approval by the Geography Program Director. Cadets approved for participation in the honors program must complete the following courses:

<b>Course #</b>	<b>Course Title</b>
EV480	Honors Seminar in Geography
EV489B	Advanced Individual Study II

Note: These courses are not restricted to honors cadets.



CDT Saxby explores the Vietnamese coast during a G&EnE sponsored AIAD.



Cadets on a Department AIAD to Israel pose at the Western Wall in Jerusalem.

# ENVIRONMENTAL GEOGRAPHY

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## ENVIRONMENTAL GEOGRAPHY MAJOR (EGE) ENVIRONMENTAL GEOGRAPHY MAJOR WITH HONORS (EGEH)

### CORE CURRICULUM AND ENGINEERING SEQUENCE:

- Complete the 26-course core curriculum
- Complete the Environmental Engineering Sequence
- Complete **one** of the following courses:

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

### FOUNDATION COURSES

- Complete the three courses listed below:

Course #	Course Title
EV303	Foundations in Geography
EV398	Geographic Information Systems
EV486	Environmental Geography

### PHYSICAL GEOGRAPHY STEM

- Complete **one** of the courses listed below:

Course #	Course Title
EV388B	Geomorphology
EV389B	Climatology

### PHYSICAL GEOGRAPHY ELECTIVE

- Complete **one** of the five courses listed below:

Course #	Course Title
EV387	Meteorology
EV388A	Physical Geology
EV388B	Geomorphology
EV389B	Climatology
EV391B	Environmental Geology

### GEOGRAPHY TOOLS AND LANDSCAPE ANALYSIS

- Complete **one** of the three courses listed below:

Course #	Course Title
EV377	Remote Sensing
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management

### CULTURE STEM

- Complete the following course:

Course #	Course Title
EV365	Geography of Global Cultures

REGIONAL GEOGRAPHY ELECTIVE

- Complete **one** of the eight Regional Geography courses listed below:

<b>Course #</b>	<b>Course Title</b>
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV375	Geography of Africa
EV376	Geography of the Middle East
EV384	Geography of North America
EV386	Geography of Europe

GENERAL ELECTIVE:

- Complete **one** of the thirty courses listed below:

<b>Course #</b>	<b>Course Title</b>
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV375	Geography of Africa
EV376	Geography of the Middle East
EV377	Remote Sensing
EV378	Cartography
EV379	Photogrammetry
EV380	Principles of Surveying
EV384	Geography of North America
EV386	Geography of Europe
EV387	Meteorology
EV388A	Geology
EV388B	Geomorphology
EV389B	Climatology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV394	Hydrogeology
EV397	Air Pollution Engineering
EV483	Colloquium in Geography
EV485	Special Topics in Geography and the Environment
EV487	Environmental Security
EV489A	Advanced Individual Study in Geography
LX300	Third Semester Foreign Language

MA376	Applied Statistics
SS368	Econometrics I
SS385	Comparative Economic Systems
SS485	Politics & Development of Sub-Saharan Africa

INTEGRATIVE EXPERIENCE

- Complete the following course

Course #	Course Title
EV482	Military Geography

HONORS PROGRAM IN ENVIRONMENTAL GEOGRAPHY

• Cadets pursuing the honors program in Environmental Geography must meet the entry-level requirement of having a 3.00 grade point average in the core curriculum, an APSC of at least 3.5 in the major, and approval by the Geography Program Director. Cadets approved for participation in the honors program must complete the following courses:

Course #	Course Title
EV480	Honors Seminar in Geography
EV489B	Advanced Individual Study II

Note: These courses may be taken as additional electives by any cadet; it is not restricted to those in the honors program.



**Left:** CDTs Brant and Whitler measure glacial ablation in Alaska during a summer AIAD.

**Right:** CDT Carillo points out the North American - Eurasian plate boundary in his Goode's World Atlas while on Spring Break in Iceland.



# ENVIRONMENTAL SCIENCE

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## ENVIRONMENTAL SCIENCE MAJOR (ESC) ENVIRONMENTAL SCIENCE MAJOR WITH HONORS (ESCH)

### CORE CURRICULUM AND ENGINEERING SEQUENCE:

- Complete the 26-course core curriculum
- Complete the Environmental Engineering Sequence
- Complete **one** of the following courses:

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

### FOUNDATION COURSES

- Complete the five courses listed below:

Course #	Course Title
CH375	Introduction to Biology
EV365	Geography of Global Cultures
EV388A	Physical Geology
EV471	Ecology
EV487	Environmental Security

### ATMOSPHERE COURSE

- Complete **one** of the following courses:

Course #	Course Title
EV387	Meteorology
EV389B	Climatology

### TOOLS ELECTIVE

- Complete **one** of the three courses listed below:

Course #	Course Title
CH385	Introduction to Cell Biology
EV377	Remote Sensing
EV398	Geographic Information Systems

### DEPTH ELECTIVES

- Complete **two** of the seven courses listed below:

Course #	Course Title
CH383	Organic Chemistry I
CH384	Organic Chemistry II
EV391A	Land Use Planning and Management
EV391B	Environmental Geology
EV396	Environmental Biological Systems
EV398	Geographic Information Systems
XS391	Principles and Applications of Environmental Chemistry

FIELD ELECTIVE

- Complete **one** of the thirty-eight courses listed below:

<b>Course #</b>	<b>Course Title</b>
EV377	Remote Sensing
EV378	Cartography
EV380	Principles of Surveying
EV384	Geography of North America
EV386	Geography of Europe
EV387	Meteorology
EV388B	Geomorphology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV394	Hydrogeology
EV396	Environmental Biological Systems
EV397	Air Pollution Engineering
EV398	Geographic Information Systems
EV401	Physical and Chemical Treatment
EV482	Military Geography
EV488	Solid and Hazardous Waste Management
EV489A	Advanced Individual Study I
XS391	Principles and Applications of Environmental Chemistry
CE302	Statics and Dynamics
CE380	Hydrology/Hydraulic Design
CH357	Microbiology
CH383	Organic Chemistry I
CH384	Organic Chemistry II
CH385	Introduction to Cell Biology
CH387	Human Physiology
CH481	Physical Chemistry I
EP386	Philosophy of Science
LW481	International Law
MA363	Vector Calculus and ODE
MA366	Vector Calculus and Introduction to PDE
MA391	Mathematical Modeling
MA396	Numerical Methods for the Solution of DE
MA476	Mathematical Statistics
MS350	Military Communications
EM381	Engineering Economy
SS479	Environmental Economics
SS480	Public Policy Making Process

Cadets pursuing the honors program will complete two additional courses:

- 1) EV489A (Advanced Individual Study), and 2) an additional course from the field electives list. Cadets also must graduate with an APSC of at least 3.0 in the USMA core curriculum and an APSC of at least 3.5 in the major.

# ENVIRONMENTAL ENGINEERING

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## ENVIRONMENTAL ENGINEERING MAJOR (EVE)

- Complete the 26-course core curriculum
- Complete the following fourteen courses:

Course #	Course Title
EV301	Environmental Science for Engineers and Scientists
EV388A	Physical Geology
EV394	Hydrogeology
EV396	Environmental Biological Systems
EV397	Air Pollution Engineering
EV400	Environmental Engineering Seminar
EV401	Physical and Chemical Treatment
EV402	Biochemical Treatment
EV481	Water Resources Planning and Design
EV488	Solid and Hazardous Waste Treatment and Remediation
EV490	Advanced Environmental Process Design
MA366	Vector Calculus and Introduction to PDE
ME311	Thermal Fluid Systems I
XS391	Principles and Applications of Environmental Chemistry

- Complete **one** of the following two options:

### OPTION A:

- Choose three electives from the ENVIRONMENTAL ENGINEERING FIELD ELECTIVES list. The sum of Engineering Science (ES) and Engineering Design (ED) credits for the three chosen field electives must total **7** or greater, **AND** complete the following course:

Course #	Course Title
EE301	Fundamentals of Electrical Engineering

### OPTION B:

- Choose two electives from the ENVIRONMENTAL ENGINEERING FIELD ELECTIVES list. The sum of the Engineering Science (ES) and Engineering Design (ED) credits for the two chosen field electives must total **6** or greater, **AND** complete the following two courses:

Course #	Course Title
IT305 or IT355	Theory and Practice of Military IT systems
MC302	Statics and Dynamics

ENVIRONMENTAL ENGINEERING FIELD ELECTIVES:

Course #	Course Title
EV377	Remote Sensing
EV380	Surveying
EV398	Geographic Information Systems
EV485	Special Topics in Geography and the Environment
EV489A	Advanced Individual Study I
EV489B	Advanced Individual Study II
CE380	Hydrology and Hydraulic Design
CH362	Mass and Energy Balances
EE301	Fundamentals of Electrical Engineering
EM381	Engineering Economy
EM411	Project Management
MC302	Statics and Dynamics
ME312	Thermal-Fluid Systems II
SE375	Statistics for Engineers
SE385	Decision Analysis

- Cadets pursuing the honors program must complete Advanced Individual Studies I (EV489A) as one of their field electives, and attain an APSC of at least 3.0 in the USMA core curriculum and an APSC of at least 3.5 in the major.



CDT Andrew Zapcic measures the needle length of pines while his classmates test water samples during an EV471 (Ecology) field trip.

# ENVIRONMENTAL ENGINEERING STUDIES

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## ENVIRONMENTAL ENGINEERING STUDIES MAJOR (EES)

- Complete the 26-course core curriculum
- Complete the following eleven courses:

Course #	Course Title
IT305 or IT355	Theory & Practices (or Advanced Theory) of Military IT Systems
EV301	Environmental Science for Engineers and Scientists
EV388A	Physical Geology
EV396	Environmental Biological Systems
EV397	Air Pollution Engineering
EV401	Physical and Chemical Treatment
EV402	Biological Treatment
EV481	Water Resources Planning and Design
EV490	Advanced Environmental Process Design
ME311	Thermal Fluid Systems I
XS391	Principles and Applications of Environmental Chemistry

- Complete **two** of the five Environmental Engineering directed electives:

Course #	Course Title
CE380	Hydrology and Hydraulic Design
MA366	Vector Calculus and Introduction to PDE
MC302	Statics and Dynamics
EV394	Hydrogeology
EV488	Solid and Hazardous Waste Treatment and Remediation

- Complete **one** of the twenty courses from the Environmental Engineering field electives list:

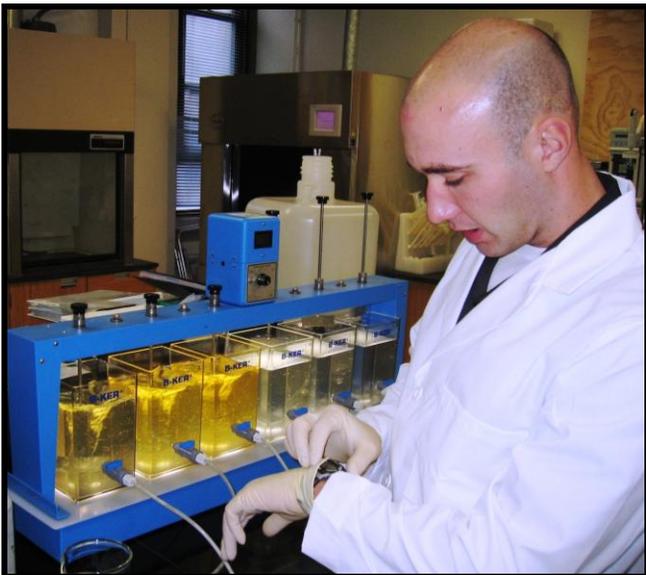
Course #	Course Title
CE380	Hydrology & Hydraulic Design
CH362	Mass and Energy Balances
EE301	Fundamentals of Electrical Engineering
EM380	Engineering Materials
EM381	Engineering Economy
EM411	Project Management
EV377	Remote Sensing
EV380	Surveying
EV388B	Geomorphology
EV391B	Environmental Geology
EV394	Hydrogeology
EV398	Geographic Information Systems
EV485	Special Topics in Geography and the Environment (with approval)
EV488	Solid and Hazardous Waste Treatment and Remediation
EV489A	Advanced Individual Study I
EV489B	Advanced Individual Study II
MC302	Statics & Dynamics
ME312	Thermal-Fluid Systems II

Course #	Course Title
SE375	Statistics for Engineers
SE385	Decision Analysis

**No honors program is offered in the Environmental Engineering Studies major.**



Environmental Engineering cadets work on their Chemostat Lab (above) and electrocoagulation jar testing (below) during EV402 (Biochemical Treatment).



# GEOSPATIAL INFORMATION SCIENCE

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## GEOSPATIAL INFORMATION SCIENCE MAJOR (GIS) GEOSPATIAL INFORMATION SCIENCE MAJOR WITH HONORS (GISH)

### CORE CURRICULUM AND ENGINEERING SEQUENCE:

- Complete the 26-course core curriculum
- Complete any 3-course engineering sequence
- Complete **one** of the following courses:

Course #	Course Title
IT305	Theory and Practice of Military IT Systems
IT355	Advanced Theory and Practice of Military IT Systems

- Complete all of the following Fundamentals of GIS courses:

Course #	Course Title
EV377	Remote Sensing
EV378	Computer Cartography
EV398	Geographic Information Systems

- Complete **one** of the following Spatial Data Acquisition courses:

Course #	Course Title
EV379	Photogrammetry
EV380	Principles of Surveying

- Complete the following advanced spatial data analysis courses:

Course #	Course Title
EV477	Advanced Remote Sensing
EV498	Advanced Geographic Information Systems

- Complete the following integrative experience:

Course #	Course Title
EV482	Military Geography

- Complete the following cultural immersion course:

Course #	Course Title
EV365	Geography of Global Cultures

- Select **two** of the eighteen courses from the Geospatial Information Science elective list:

Course #	Course Title
EV300	Environmental Science
EV371	Geography of Russia
EV372	Geography of Asia
EV373	Geography of Latin America
EV374	Geography of the Middle East and Africa
EV379	Photogrammetry
EV380	Principles of Surveying
EV384	Geography of North America
EV386	Geography of Europe
EV388A	Physical Geology
EV388B	Geomorphology

Course #	Course Title
EV389B	Climatology
EV390B	Urban Geography
EV391A	Principles of Land Use Planning and Management
EV391B	Environmental Geology
EV397	Air Pollution Engineering
EV478	Military Geospatial Operations
EV481	Water Resources Planning and Design

- Cadets pursuing an honors program in Geospatial Information Science must complete one of the two options below, and attain a final APSC of at least 3.0 in the core curriculum as well as a final APSC of at least 3.5 in the major.

OPTION A:

Course #	Course Title
EV489A	Advanced Individual Study I
EV__	One course From the Geospatial Information Science elective list

OPTION B:

Course #	Course Title
EV489A	Advanced Individual Study I
EV489B	Advanced Individual Study II



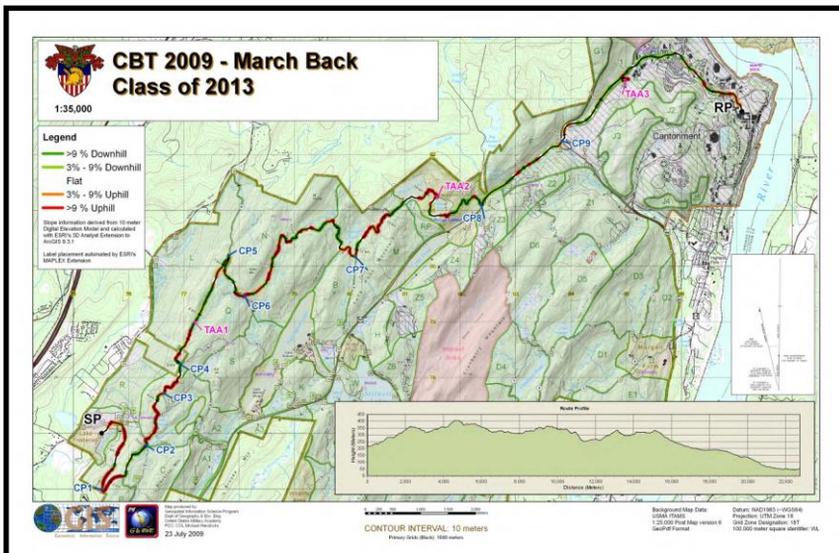
Cadets enrolled in EV379 (Photogrammetry) receive hands-on familiarization training during an Aerial Photogrammetry field trip.

## COURSE OFFERINGS

Course #	Course Title	111	112	121	122	131	132
EV203	Physical Geography (113; 123)	X	X	X	X	X	X
EV300	Environmental Science	X		X		X	
EV301	Env Sci for Engineers	X		X		X	
EV303	Foundations in Geography	X		X		X	
EV350	Env Engineering Technologies		X		X		X
EV365	Geography of Global Cultures	X	X	X	X	X	X
EV371	Geography of Russia	X				X	
EV372	Geography of Asia		X		X		X
EV373	Geography of Latin America	X		X		X	
EV374	Geography of Middle East & Africa		X				
EV375	Geography of Africa			X		X	
EV376	Geography of Middle East				X		X
EV377	Remote Sensing	X	X	X	X	X	X
EV378	Cartography	X		X		X	
EV379	Photogrammetry		X		X		X
EV380	Principles of Surveying	X		X		X	
EV384	Geography of North America	X		X		X	
EV385	Introduction to Env Engineering		X		X		X
EV386	Geography of Europe		X		X		X
EV387	Meteorology		X		X		X
EV388A	Physical Geology	X	X	X	X	X	X
EV388B	Geomorphology		X		X		X
EV389B	Climatology	X		X		X	
EV390B	Urban Geography		X		X		X
EV391A	Land Use Plan & Management	X		X		X	
EV391B	Environmental Geology		X		X		X
EV394	Hydrogeology/Hydraulic Systems	X		X		X	
EV396	Environmental Biological Sys.		X		X		X
EV397	Air Pollution Engineering		X		X		X
EV398	Geographic Information Systems	X	X	X	X	X	X
EV400	Env Engineering Seminar		X		X		X
EV401	Physical and Chemical Treatment		X		X		X
EV402	Biochemical Treatment	X		X		X	
EV450	Environmental Decision Making	X		X		X	
EV471	Ecology	X		X		X	
EV477	Advanced Remote Sensing		X		X		X
EV478	Geospatial Military Operations		X		X		X
EV480	Honors Seminar in Geography	X		X		X	
EV481	Water Resources	X		X		X	
EV482	Military Geography		X		X		X
EV483	Colloquium in Geography						

Course #	Course Title	111	112	121	122	131	132
EV485	Special Topics: Geography and the Environment	X	X	X	X	X	X
EV486	Environmental Geography	X		X		X	
EV487	Environmental Security		X		X		X
EV488	Solid and Hazardous Waste		X		X		X
EV489A	Advanced Individual Study I	X	X	X	X	X	X
EV489B	Advanced Individual Study II		X		X		X
EV490	Advanced Env Process Design		X		X		X
EV498	Advanced GIS	X		X		X	
XS391	Principles and Applications of Environmental Chemistry	X		X		X	

MAJs Wright and Didier train GIS cadets on high-accuracy survey grade Global Positioning System. This system is accurate to the centimeter level!



Map produced by GIS faculty that depicts the Beast Barracks "March Back" route for the Class of 2013.

## COURSE DESCRIPTIONS

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<b>EV203</b>	<b>PHYSICAL GEOGRAPHY</b>
	3.0 Credit Hours (BS=2.0, ES=0.5, ED=0.0)

**SCOPE:** This core course provides cadets with a fundamental understanding of scientific principles and processes of earth science, meteorology, climatology, geomorphology and environmental systems, as well as an introduction to cultural geography. Further, the course furnishes cadets with the technical skills - digital terrain analysis, image interpretation and spectral analysis, remote sensing, global positioning system, geographic information systems cartography - to delineate the geographic distribution of landforms, weather, climate, and culture systems; and evaluate their potential impact on military operations. Lessons are reinforced by extensive use of in- and out-of-class practical exercises, terrain walks and computer exercises to demonstrate the interrelationship between physical and human systems, and their impact on the environment. Historical vignettes are employed to demonstrate how the factors of weather, climate, terrain, soils, vegetation and culture are important, cogent and frequently decisive in military operations

**LESSONS:** 36 @ 55 min (2.5 Att/wk)

**LABS:** 4 @ 55 min

**SPECIAL REQUIREMENTS:** None.

<b>EV300</b>	<b>ENVIRONMENTAL SCIENCE</b>
EV CES Course	3.0 Credit Hours (BS=0.0, ES=0.0, ED=0.0) Prerequisite: EV203; Disqualifier: EV301, EV390A

**SCOPE:** As the introductory course to the Environmental Engineering Sequence, EV300 provides the cadet with a broad understanding of current global and local environmental issues. It specifically focuses on natural ecosystems processes, the effects of pollution on human health and how the level of risk associated with this pollution is assessed, the environmental effects of energy use, and air pollution concerns such as global climate change, acid rain, and smog. Discussions of anthropogenic influences are conducted with consideration of social, economic, technological and political impacts. Cadets learn to evaluate literature on environmental issues through readings and interactive debates. A course project applying the scientific method to evaluate a current environmental problem provides an opportunity to tie multiple course topics with an in-depth study of an issue of interest.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Design and conduct an environmental study.

<b>EV301</b>	<b>ENVIRONMENTAL SCIENCE FOR ENGINEERS AND SCIENTISTS</b>
	3.0 Credit Hours (BS=1.0, ES=1.5, ED=0.5) Prerequisite: EV203; Disqualifier: EV300, EV390A

**SCOPE:** This course is similar to EV300 except that the context of discussion in EV301 is appropriate for cadets who have elected to major in science or engineering. EV301 provides the cadet with a broad understanding of current global and local environmental issues. It specifically focuses on natural ecosystems processes, the effects of pollution on human health and how the level of risk associated with this pollution is assessed, the environmental effects of energy use, and air pollution concerns such as global climate change, acid rain, and smog. Discussions of anthropogenic influences are conducted with consideration of social, economic, technological and political impacts. Cadets learn to evaluate literature on environmental issues through readings and interactive debates. A course project applying the scientific method to evaluate a current environmental problem provides an opportunity to tie multiple course topics with an in-depth study of an issue of interest.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Design and conduct an environmental study, attend one field trip, in-class labs.

<b>EV303</b>	<b>FOUNDATIONS IN GEOGRAPHY</b>
	3.0 Credit Hours; Prerequisite: None

**SCOPE:** This course presents the basic concepts, theories and methods of inquiry in the discipline of geography as a foundation for advanced study in human/regional geography, environmental geography, or geospatial information science. The course includes models and concepts from the many sub-disciplinary (systematic) areas of geography to include cultural, historical, economic, urban, political and military geography. The application of concepts to real-world issues is emphasized. Research skills and techniques used by professional geographers are presented. Cadets use these approaches to spatially analyze and map the distribution of human and environmental phenomena. Several short papers will be assigned.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Requires Department Head approval for all cadets not selecting a FOS/MAJ in the Department of Geography & Environmental Engineering.

<b>EV350</b>	<b>ENVIRONMENTAL ENGINEERING TECHNOLOGIES</b>
EV CES Course	3.0 Credit Hours (BS= 0.0, ES=0.0, ED=0.0), Prerequisites: CH102 or CH152, MA205 or MA255, and EV300 or EV301; Disqualifiers: EV385

**SCOPE:** This course builds on environmental issues introduced in EV300 and further explores environmental engineering from a unit process and materials balance approach. Analyzing water (transport, quality, drinking water treatment, and wastewater treatment); air (transport, quality, and pollutant minimization); and pollutant management (solid and hazardous wastes), the cadet is exposed to the breadth of the environmental discipline. A laboratory experience is integral to the course. In the laboratory, physical, chemical, and biological quality are discussed and measured. An introductory environmental engineering design project on river water quality is developed within the semester.

**LESSONS:** 36 @ 55 min (2.5 Att/wk)

**LABS:** 6 @ 120 min

**SPECIAL REQUIREMENTS:** One design project.

<b>EV365</b>	<b>GEOGRAPHY OF GLOBAL CULTURES</b>
	3.0 Credit Hours; Prerequisite: EV203

**SCOPE:** This course provides the geographic foundation for study in interdisciplinary and management academic areas. Contemporary regions of the world political map serve as the framework within which geographic concepts and analytical techniques are applied. Each cadet will develop an awareness of the diversity and distribution of people on the Earth, human organization and exploitation of territory, and interactions among culture groups. Particular emphasis is placed on social institutions, their impact on economic development, and the subsequent identification and analysis of developed, emerging, and underdeveloped states.

**LESSONS:** 38 @ 55 min (2.5 Att/wk)

**LABS:** 2 @ 55 min

**SPECIAL REQUIREMENTS:** None

<b>EV371</b>	<b>GEOGRAPHY OF RUSSIA</b>
	3.0 Credit Hours; Prerequisite: EV365

**SCOPE:** This course examines the political, economic, and cultural geography of Russia and its adjacent neighbors; the Baltic States, East Central European region, Transcaucasus, and Central Asia. Topics covered include: the Commonwealth of Independent States; ecocide in the former Soviet Union; disposition of the former Soviet military; and ethnic rivalries. The objective of the course is to provide the student with an understanding of the recent past of the traditional Soviet system in order to understand, as well as geographically evaluate, Russia's and the other former republics' situation today.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One field trip; one research paper.

<b>EV372</b>	<b>GEOGRAPHY OF ASIA</b>
	3.0 Credit Hours; Prerequisite: EV365

**SCOPE:** The course studies the physical and cultural environment of Asia with emphasis on those geographic elements related to the region's progress, developing states, and emerging world and regional powers. Topics covered include a consideration of the physical and resource base, environmental and cultural factors, spatial organization of agricultural and industrial economies, population patterns and problems, and examination of the realm's several major subregions.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One field trip; one written report and one oral presentation.

<b>EV373</b>	<b>GEOGRAPHY OF LATIN AMERICA</b>
	3.0 Credit Hours; Prerequisite: EV365

**SCOPE:** This course studies the physical and cultural landscape of Latin America, giving special treatment to the diversity and cultural identity of the region. Topics covered include a historical geography of the region, including Pre-Columbian civilizations, Iberian, African, and European influences; the geography of transportation networks, agriculture, urbanization, and population. National boundaries, major landforms and climatic conditions are discussed to describe their effect on civilization. This course also investigates the historical relationship between the United States and Latin America, and covers recent U.S. military interventions in the region.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One oral report, one research paper.

<b>EV374</b>	<b>GEOGRAPHY OF THE MIDDLE EAST AND AFRICA</b>
	3.0 Credit Hours; Prerequisite: EV365

**SCOPE:** The course examines Middle Eastern and African landscapes to include expressions of their dominant physical and cultural forms. The variety of Middle Eastern and African peoples are studied in a geographic context--tracing their origins, dispersal, spatial organization, the intrusion of alien cultures and the diversity of human use and resource exploitation of the land. Among issues examined are the distribution and strategic significance of critical mineral and energy resources, population and food disparities, nation-building programs and prospects, and regional development plans. The course concludes with study of the changing internal geographic patterns, extraregional spatial relationships, and geostrategic implications of East-West competition in these unstable regional environments.

**LESSONS:** 40 @ 55 min (2.5 Att/wk);

**LABS:** None

**SPECIAL REQUIREMENTS:** One field trip; one oral presentation supported by a written report.

**NOTE:** This course will NOT be offered after Term 11-2.

<b>EV375</b>	<b>GEOGRAPHY OF AFRICA</b>
	3.0 Credit Hours; Prerequisite: EV365, Disqualifiers: EV374

**SCOPE:** This course examines the cultural and natural diversity of African landscapes, with an emphasis on development, population issues, disease, and the origin, dispersal, spatial organization, and interaction of important cultural groups. Africa's physical landscapes will also be introduced as the palette upon which Africa's complex human mosaic has developed. Students will explore, from a geographic perspective, why Africa has seemingly been plagued with problems of economic development, health, and political instability.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One written research report with brief oral presentation; One field trip is possible.

<b>EV376</b>	<b>GEOGRAPHY OF THE MIDDLE EAST</b>
	3.0 Credit Hours; Prerequisite: EV365, Disqualifiers: EV374

**SCOPE:** This course examines the cultural and natural diversity of Southwest Asian landscapes. The realm's cultures and ethnicities are studied in a geographic context, with an emphasis on the origin, dispersal, spatial organization, and interaction of important cultural groups. Among issues examined are the distribution and strategic significance of critical mineral and energy resources, population and resource disparities, cultural conflict, and economic development. Students will learn how geographic issues impact the prospects for peace and stability in the region.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One written research report with brief oral presentation. One field trip is possible.

<b>EV377</b>	<b>REMOTE SENSING</b>
	3.0 Credit Hours (BS=1.0, ES=2.0, ED=0.0); Prerequisite: EV203, IT105 or IT155

**SCOPE:** Remote Sensing is learning about something without touching it--the most obvious example being the use of satellites to study the Earth. EV377, a techniques course applicable to both the humanities and engineering, studies how and what types of information can be carried by the electromagnetic spectrum. Students enjoy a wide range of practical exercises which introduce them to several remote sensing systems to include conventional and color infrared photography, multispectral scanners, satellite imagery, thermal infrared, and radar. The capstone exercise offers each student the opportunity to perform real-time automated image classification using satellite data on his/her own microcomputer. The course focus is on applying remotely sensed data to solve current problems.

**LESSONS:** 32 @ 55 min (2.5 Att/wk)

**LABS:** 8 @ 55 min

**SPECIAL REQUIREMENTS:** None.

<b>EV378</b>	<b>CARTOGRAPHY</b>
	3.0 Credit Hours (BS=0.0, ES=2.5, ED=0.5); Prerequisite: EV203, IT105 or IT155

**SCOPE:** Cartography teaches the principles of cartographic communication and enables the student to apply map design principles along with computer mapping techniques to solve contemporary problems in geography, economics, international relations, and applied sciences. Cadets will study the basic cartographic design process and use mapping and analysis software in the Geographic Sciences Laboratory to produce topographic and thematic maps. A final course design project presents the opportunity for the cadets to demonstrate their ability to synthesize sound mapping principles.

**LESSONS:** 23 @ 55 min (2.5 Att/wk)

**LABS:** 17 @ 120 min

**SPECIAL REQUIREMENTS:** Course project included in lab periods.

<b>EV379</b>	<b>PHOTOGRAMMETRY</b>
	3.0 Credit Hours (BS=0.5, ES=2.5, ED=0.0); Prerequisite: EV203, IT105 or IT155

**SCOPE:** Photogrammetry, the art and science of making accurate measurements on photographs, is an important and fundamental discipline concerned with civilian and military mapping. Students, applying simple geometric principles to the photograph, determine object identity, size, spatial relationship, and position. An abundance of practical exercises, involving the use of sophisticated equipment, provide the opportunity to apply the fundamentals while arriving at solutions to real-world problems. An interesting field trip to a local mapping organization vividly displays how all these techniques may be blended to produce maps in the commercial business world.

**LESSONS:** 33 @ 55 min (2.5 Att/wk)

**LABS:** 7 @ 55 min

**SPECIAL REQUIREMENTS:** None.

<b>EV380</b>	<b>PRINCIPLES OF SURVEYING</b>
	3.5 Credit Hours (BS=0.5, ES=2.5, ED=0.5); Prerequisite: None

**SCOPE:** A framework for understanding and applying practical surveying methods is developed. Consideration of error theory and the concepts of precision and accuracy yields understanding of the probabilistic nature of measurements. The principles of differential leveling, taping, electronic distance measurement and angular measurement are studied and applied using state-of-the-art surveying equipment and software tools. Plane surveys are principally explored, although the fundamentals of geodetic surveys are also presented. Traverse, triangulation, trilateration, level networks and the proper adjustment of related measurements are examined. Control survey, land survey, topographic survey, horizontal and vertical curve design, computer-aided mapping and GIS applications are included. Extensive use of laboratory periods permits application of surveying fundamentals, methods and planning skills to actual field situations. The principles of the global positioning system are explored and applications in the Army and surveying are applied in the final lab exercise.

**LESSONS:** 21 @ 55 min (2.5 Att/wk)

**LABS:** 19 @ 120 min

**SPECIAL REQUIREMENTS:** None.

<b>EV384</b>	<b>GEOGRAPHY OF NORTH AMERICA</b>
	3.0 Credit Hours; Prerequisite: EV365

**SCOPE:** This course provides a regional geography of North America, with balanced coverage of the human and physical geography of the United States and Canada. Lectures are appropriately supplemented with movies, slides, and maps to facilitate understanding of important themes that are prevalent in various subregions. Emphasis is placed on cultural patterns and contemporary environmental issues.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One oral presentation.

<b>EV385</b>	<b>INTRODUCTION TO ENVIRONMENTAL ENGINEERING</b>
	3.5 Credit Hours (BS=0.0, ES=2.5, ED=1.0); Prerequisite: CH102/CH152, MA205/MA255; Corequisites: PH202/PH252, PH204/ PH254      Disqualifier: EV350, EV385B

**SCOPE:** This course introduces cadets to the study of environmental engineering from a unit process and a materials balance approach. The focus is design-oriented problem solving to protect human health and the health of ecosystems using fundamental physical, chemical, and biological processes. The concept and calculation of risk is introduced as a key factor in environmental decision-making. Through the study of contaminant removal from water and air to integrated management techniques for solid/hazardous wastes and ionizing radiation, the cadet is exposed to the breadth of the discipline. In the laboratory, the science behind physical, chemical, and biological processes are applied to the engineering discipline. A military oriented design problem allows application of engineered solutions to topical water and air quality issues.

**LESSONS:** 40 @ 55 min (2.5 Att/wk);

**LABS:** 6 @ 120 min

**SPECIAL REQUIREMENTS:** Two field trips; course design project.

<b>EV386</b>	<b>GEOGRAPHY OF EUROPE</b>
	3.0 Credit Hours; Prerequisite: EV365

**SCOPE:** The course examines European cultural landscapes, focusing on the environmental and cultural diversity exhibited among the states of modern Europe. Nationalism and the territorial imperative, long recognized as major forces in Europe, are studied from a geographic perspective to include patterns and processes of both regional continuity and change. Emphasis is given to the rapidly developing urbanization and mutual interdependence among countries of Western Europe. West and East European agricultural/industrial resource bases and developmental strategies are compared and contrasted. Specific topics are tailored to current issues and include regional conflict, economic development and trade, and problems of energy and the environment. This course concludes with a study of contemporary European extraregional spatial relationships with other major world culture regions.

**LESSONS:** 40 @ 55 min (2.5 Att/wk);

**LABS:** None

**SPECIAL REQUIREMENTS:** One field trip; one research paper.

<b>EV387</b>	<b>METEOROLOGY</b>
	3.0 Credit Hours; Prerequisite: EV203

**SCOPE:** This course introduces meteorological processes, systems, and patterns with emphasis on spatial distributions. The course begins with a comprehensive look at the structure of the atmosphere to include the energy budget, heat transfer mechanisms, as well as an examination of daily and seasonal patterns of temperature. A thorough look at atmospheric moisture and stability precedes a study of cloud and precipitation processes followed by a study of the atmosphere in motion, namely air pressure, governing forces, winds, small and local-scale wind systems and the general circulation of the planet. Specific phenomena are then examined, including mid-latitude cyclones, thunderstorms/lightning, tornadoes, severe thunderstorms, hurricanes, air pollution, and a brief look at climate and climate change. The end of the course focuses on the art and science of weather forecasting and its applicability to military operations. In-class labs.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Term project.

<b>EV388A</b>	<b>PHYSICAL GEOLOGY</b>
	3.5 Credit Hours (BS=2.0, ES=1.0, ED=0.5); Prerequisite: EV203

**SCOPE:** This course primarily emphasizes learning to identify minerals and rocks and then applying this knowledge to analyze the significant geologic processes that act on and within the earth. These processes include plate tectonics, rock mechanics, geologic mapping, ground and surface water, and elements of mining and petroleum engineering. Field trips are conducted to illustrate how local geology has influenced development and construction in the Hudson Valley. The course is capstoned by an open-ended engineering problem which requires the creative application of geology to design a practical solution to a stated need. Cadets use a geologic exploration simulation to convert given resources optimally including safety and cost factors.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** 12 @ 55 min

**SPECIAL REQUIREMENTS:** Two field trips; one design project; compensatory time provided.

<b>EV388B</b>	<b>GEOMORPHOLOGY</b>
	3.0 Credit Hours (BS=2.0, ES=1.0, ED=0.0); Prerequisite: EV203

**SCOPE:** This course studies the processes that create landforms on the surface of the earth and their regional and global distributions. The course focuses on processes and their inter-relationships with geologic structure, soils and climate. Processes emphasized include glaciers, streams, downslope motion caused by gravity, groundwater, coastlines, and eolian landscapes. Each student prepares a final report synthesizing these processes and how they relate to real-world applications.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Two field trips; one written report and one oral report; compensatory time provided.

<b>EV389B</b>	<b>CLIMATOLOGY</b>
	3.0 Credit Hours; Prerequisite: EV203

**SCOPE:** The course investigates the earth's atmospheric phenomena, giving special attention to the dynamic physical processes which produce weather and result in distinctive climates. The course focus is on how climate influences daily life and activities. Time is devoted to case studies of urban microclimates and attendant problems of atmospheric pollution and scientific efforts to alter the weather. Exercises allow the student to apply climate data and information to problem solving in the fields of engineering, agriculture, land use, and the military.

**LESSONS:** 34 @ 55 min (2.5 Att/wk)

**LABS:** 6 @ 55 min

**SPECIAL REQUIREMENTS:** None

<b>EV390B</b>	<b>URBAN GEOGRAPHY</b>
	3.0 Credit Hours; Prerequisite: None

**SCOPE:** This course examines the location, function, structure, growth and interactions of urban areas. Spatial techniques are used to explore the internal attributes of cities, as well as their connectivity to other places. While the primary focus is on urbanization in the United States, primate cities abroad are often used for comparative purposes. Emphasis is placed on contemporary urban problems, particularly environmental issues and social disparities.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One oral report.

<b>EV391A</b>	<b>LAND USE PLANNING AND MANAGEMENT</b>
	3.0 Credit Hours (BS=1.5, ES=1.0, ED=0.0); Prerequisite: EV203

**SCOPE:** An introduction to land use planning and management with focus on the land-law interfaces between the physical, cultural, and legal realms. The course surveys the policies and legislative basis for land use controls at the local, federal and regional levels to include national parks and forests, agricultural lands, rangelands, and military training areas. National resource management issues and strategies are explored. The importance of geographic concepts is emphasized in the conduct of applied case studies addressing land use conflicts and environmental strategies.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One field trip; one oral presentation; compensatory time provided.

<b>EV391B</b>	<b>ENVIRONMENTAL GEOLOGY</b>
	3.0 Credit Hours (BS=2.0, ES=1.0, ED=0.0); Prerequisite: EV203

**SCOPE:** This course focuses on natural phenomena that pose hazards to people. The cause, nature, and occurrence frequency of natural hazards such as flooding, earthquakes, hurricanes, and volcanic activity will be examined. Emphasis will also be placed on how people perceive and respond to these hazards. Land use policies and practices in these hazard areas will also receive attention. Students participate in map based laboratory exercises and have the opportunity to write a short paper advising a government official how to mitigate local geohazards.

**LESSONS:** 37 @ 55 min (2.5 Att/wk)

**LABS:** 3 @ 55 min

**SPECIAL REQUIREMENTS:** One research paper; compensatory time provided.

<b>EV394</b>	<b>HYDROGEOLOGY/HYDRAULIC SYSTEMS</b>
	3.5 Credit Hours (BS=0.0, ES=2.5, ED=1.0); Prerequisite: EV203

**SCOPE:** This course covers the principles governing the movement of subterranean water (groundwater), the interaction of this water with the porous medium, and the transport of chemical constituents (contaminants) by this flow. Lesson blocks will explore traditional background elements of hydraulic engineering to include flow systems for the conveyance of groundwater and drainage systems for groundwater and stormwater/sanitary sewer system exchange. Simulations will be used to model groundwater flow, contaminant plumes, and other engineering applications. All course material will contribute to modeling a specific situation and developing recommendations for cleaning up contaminated groundwater.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** 12 @ 55 min

**SPECIAL REQUIREMENTS:** One design problem and one course project.

<b>EV396</b>	<b>ENVIRONMENTAL BIOLOGICAL SYSTEMS</b>
	3.5 Credit Hours (BS=1.0, ES=2.5, ED=0.0); Prerequisites: CH102/CH152, EV203, and EV300/EV301 or EV385

**SCOPE:** This course will examine biology from a practical environmental engineering and environmental science perspective. The foci of the course are applied public health, microbiology and microbial energetics. Specific topics include the biological health issues associated with drinking water, microbial aspects of industrial and domestic waste treatment and protection or restoration of natural water bodies from environmental contaminants. Students are also introduced to medical geography and the spatial biological health issues associated with a deployment. Laboratory exercises are used to introduce the student to water quality analyses and practices commonly used in the fields of environmental engineering and the environmental sciences.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** 12 @ 55 min

**SPECIAL REQUIREMENTS:** None.

<b>EV397</b>	<b>AIR POLLUTION ENGINEERING</b>
	3.0 Credit Hours (BS=0.0, ES=2.0, ED=1.0); Prerequisite: EV203

**SCOPE:** This course employs a design approach to air pollution control. It begins by defining air pollution problems, to include pollutant types, sources, legislation, and effects on both local and global scales. The course then examines the design of various means of controlling particulate and gaseous air pollution from both mobile and stationary sources. Finally, students study the link between meteorology and air pollution, as well as pollutant dispersion modeling in the atmosphere. The culminating course project involves a numerical approach to dispersion modeling that incorporates modeling and solution optimization.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** none

**SPECIAL REQUIREMENTS:** Field trip(s).

<b>EV398</b>	<b>GEOGRAPHIC INFORMATION SYSTEMS</b>
	3.0 Credit Hours (ES=2.0, ED=1.0); Prerequisites: EV203

**SCOPE:** Geographic Information Systems are hardware/software systems that permit the input, storage, retrieval, manipulation, analysis, and display of geocoded data. Used by environmentalists, engineers, land-use planners, architects, managers of large land holdings, and the military, these highly intricate “decision support” systems assist managers in answering important “what if” questions. Using digitizers and microcomputers students will build a geocoded database and solve “real-world” problems.

**LESSONS:** 33 @ 55 min (2.5 Att/wk)

**LABS:** 7 @ 55 min

**SPECIAL REQUIREMENTS:** Short oral reports, one database design; compensatory time provided.

<b>EV400</b>	<b>ENVIRONMENTAL ENGINEERING SEMINAR</b>
	1.0 Credit Hours (BS=0.0, ES=0.5, ED=0.5); Co-requisite: EV490

**SCOPE:** This seminar will meet once each week and will include all first class cadets majoring in environmental engineering. The seminar topics will address a variety of fundamental engineering science, design, and professional practice topics including engineering ethics, economics, and licensing. Periodically, guest lecturers from the military, industrial, and academic communities will provide their perspective on these topics.

**LESSONS:** 13 @ 55min (1.0 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** None.

<b>EV401</b>	<b>PHYSICAL AND CHEMICAL TREATMENT</b>
	3.5 Credit Hours (BS=0.0, ES=2.0, ED=1.5); Prerequisite: XS391; Corequisite: ME311

**SCOPE:** This course takes a process approach to environmental engineering using engineering science and design of drinking water treatment systems as the primary foci. Building upon concepts gained in environmental chemistry, cadets study physical and chemical processes used in environmental engineering. Discussion includes the theories behind these processes and the design procedures involved in their application. Cadets develop comprehensive concept design of drinking water treatment processes. While the focus of the course is drinking water treatment, the processes developed are also applicable to wastewater treatment, groundwater remediation, air pollution control, and the treatment of solid and hazardous wastes.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** 12 @ 55 minutes

**SPECIAL REQUIREMENTS:** One term project, one field trip.

<b>EV402</b>	<b>BIOCHEMICAL TREATMENT</b>
	3.5 Credit Hours (BS=0.0, ES=2.0, ED=1.5); Prerequisites: EV396 and ME311

**SCOPE:** This course provides cadets with the opportunity to apply the principles of microbiology to the protection and improvement of the environment. This course builds on the concepts learned in EV396, Environmental Biological Systems, and directly applies those concepts to the treatment of wastewater, removal of nutrients from wastewater, anaerobic digestion, bioremediation, industrial waste treatment, and emerging applications of biological treatment and modeling. A comprehensive, multi-step design project serves as the design experience for this course.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** 7 @ 120 minutes

**SPECIAL REQUIREMENTS:** Engineering design project with a written report.

<b>EV450</b>	<b>ENVIRONMENTAL DECISION MAKING</b>
EV CES Course	3.0 Credit Hours; (BS=0.0, ES=0.0, ED=0.0); Prerequisite: EV350; Disqualifier: EV481

**SCOPE:** This course is the third in a three-course sequence and is concerned with the balance of engineered solutions with economic, socio-cultural, political, and ecological considerations evaluated during a decision-making process. Using management of water resources as a teaching model, the realities of decision-making and policy development for all areas of engineering, and particularly environmental engineering, are examined. The course begins with instruction on the tools available to water resource managers, to include both structural (engineered) and non-structural approaches to solve water resource problems. Elements of engineering design and the design process are introduced as well as methods of conducting tradeoff analyses. The course makes use of case studies of current water resource projects and includes a term project. Visiting speakers are employed to present views of government and concerned public interest groups.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Must be a first class cadet. Each cadet will complete a paper and oral presentation on a contemporary water resources project.

<b>EV471</b>	<b>ECOLOGY</b>
	3.0 Credit Hours; (BS=2.5, ES=0.5, ED=0.0); Prerequisites: CH385 or CH375, EV300 or EV301, EV350 or EV385

**SCOPE:** This course examines ecosystems through the study of ecological principles related to an organism's relationship to its environment, community, and ecosystem. Species, population, community, and ecosystem level interactions and dynamics are emphasized. The fundamental influences of energy flow and material cycling are examined, as well as the unique role of wetlands within ecosystems. The course includes several field trips, which lead to a culminating term project designed to integrate previously acquired environmental science technical skills and ecological principles.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** In-class labs and out-of-class field trips; term paper examining aspects of one of the world's ecosystems.

<b>EV477</b>	<b>ADVANCED REMOTE SENSING</b>
	3.0 Credit Hours; (BS=0.0, ES=2.0, ED=1.0); Prerequisites: EV203 and EV377

**SCOPE:** This course examines advanced remote sensing theory and digital image processing techniques suitable for the processing of remotely sensed data. Emphasis is on the processing and analysis of state-of-the-art high spatial and spectral resolution data gathered by airborne and satellite sensors. Topics covered include geometric and radiometric image rectification; registration and resampling techniques, image enhancements, data merging, image segmentation, and automated feature extraction. A wide range of practical exercises and in-class laboratory assignments provides hands-on experience with a variety of remotely sensed imagery ranging from multi-spectral to hyper-spectral data. The course culminates with a capstone term project that allows students to apply digital image processing skills to a scientific problem.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** In-class labs; term project. Compensatory time provided.

<b>EV478</b>	<b>MILITARY GEOSPATIAL OPERATIONS</b>
	3.0 Credit Hours; (BS=0.0, ES=2.0, ED=1.0); Prerequisites: EV203

**SCOPE:** This course is designed to teach the most current state of geospatial operations in the military. It is built to provide the student an improved understanding of the cornerstone to the digital force - the "common operational picture" or COP. This course is divided into five major blocks of instruction: (1) a linked discussion of geospatial operations' development, organizations and data systems; (2) the geographic information system (GIS) as a military tool - system input, management, data analysis and production outputs; (3) Army geospatial operations in the garrison environment; (4) Army geospatial operations in combat environments; and (5) geospatial operations for joint/coalition forces. The course includes several relevant practical exercises and laboratories, a field trip, guest lectures and one panel discussion. Due to the currency of the material discussed a secret security clearance is required for all participants.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None.

**SPECIAL REQUIREMENTS:** None

<b>EV480</b>	<b>HONORS SEMINAR IN GEOGRAPHY</b>
	3.0 Credit Hours; Must be selected for participation in the Honors Program Prerequisite: EV203

**SCOPE:** This course will examine major research initiatives in the discipline and delineate their data requirements. The primary objective of this course is to identify and outline the senior thesis, which is the culminating event for the honors program. Hence, cadets participating in this course will explore research methods and data sources used by geographers, conduct a critical analysis of seminal literature in the field, define a research problem, identify and evaluate data sources, and assemble a research proposal. The final product of this course will be a written research proposal that will define the senior thesis (written during EV489B). The cadet will make a formal presentation of this proposal to senior geography faculty. The course is conducted in a seminar and one-and-one format. Lessons and labs are established by consultation between the cadet and faculty advisor.

**LESSONS and LABS:** Established by consultation between cadet and faculty advisor.

**SPECIAL REQUIREMENTS:** Senior thesis or as determined by the faculty advisor.

<b>EV481</b>	<b>WATER RESOURCES PLANNING AND DESIGN</b>
	3.0 Credit Hours; (BS=0.0, ES=2.0, ED=1.0); Prerequisites: Standing as a First Class Cadet; Disqualifier: EV450

**SCOPE:** The course is concerned with effective use of water as a manageable natural resource. It begins with instruction on the tools required by water resource managers to make sound decisions in their field. The course assesses current needs for water and the structural (engineered) and non-structural approaches available to meet these needs. Elements of engineering design and the design process are introduced. The bulk of the course is concerned with assessment of the impacts of various water resources development activities on the economic, socio-cultural and ecological sectors of the environment. Methods for conducting tradeoff analyses among the engineered and environmental aspects of projects are developed and applied in a term project. The course makes use of case studies of current water resource projects. Visiting speakers represent the views of the Federal government and concerned public interest groups.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** Written and oral research reports on a contemporary water resources project.

<b>EV482</b>	<b>MILITARY GEOGRAPHY</b>
	3.0 Credit Hours; Prerequisite: EV203

**SCOPE:** History is replete with examples of the impact of terrain, weather and climate on military operations at all scales. National strategies are influenced heavily by geographic realities of relative location, spatial interaction, population dynamics and resource distribution. This course emphasizes the development of a geographic method for systematic analysis of the battlefield that is appropriate for platoon leader and corps commander alike. Students evaluate the elements of national power and examine their geostrategic influences, past and present. The role of the environment in shaping today's Army and its missions is discussed. Jungle, cold region, alpine, riverine, desert, temperate and urban operational environments are examined for their effect on military planning and execution. Finally, cadets review case studies of the impact of these diverse environments on military operations at the tactical level.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One oral presentation and one written research project

<b>EV483</b>	<b>COLLOQUIUM IN GEOGRAPHY</b>
	3.0 Credit Hours; Prerequisite: EV203 and EV365

**SCOPE:** The colloquium is a directed readings course using small group discussions of important literature, methodological traditions, and contemporary research trends in the field of geography. Dependent on instructor preference and individual student interest, in-depth readings will be pursued in one or more of the following areas of geographic study: cultural, political, regional or military geography. Compensatory time is given to permit extra readings.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** A research proposal and its oral presentation.

<b>EV485</b>	<b>SPECIAL TOPICS IN GEOGRAPHY AND THE ENVIRONMENT</b>
	3.0 Credit Hours; Prerequisite: EV203, Permission Required.

**SCOPE:** This course explores an advanced topic in Human and Regional Geography, Environmental Geography, Environmental Science, Environmental Engineering, or Geospatial Information Science. Specific subject matter will vary with the expertise of the visiting professor or senior faculty member conducting the course.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** As specified by instructor.

<b>EV486</b>	<b>ENVIRONMENTAL GEOGRAPHY</b>
	3.0 Credit Hours; Prerequisite: EV203 and EV365

**SCOPE:** Whereas physical geographers focus on the Earth's surface and atmosphere, and human geographers concentrate on the spatial aspect of human activities, environmental geographers are interested in both how people adapt to specific environments and how they alter those environments through human activities. To understand these interactions and their implications, environmental geographers must fully appreciate natural processes and landform development within and on the surface of the Earth, as well as the implications of human intervention in the natural system.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** None.

<b>EV487</b>	<b>ENVIRONMENTAL SECURITY</b>
	3.0 Credit Hours; Prerequisite: None.

**SCOPE:** This interdisciplinary seminar uses Environmental Security in a case study approach to study environmental issues potentially affecting U.S. national security. Cadets will explore environmental security topics such as water, natural resource shortages, energy use and dependency, global climate change using an interdisciplinary approach from social, political, economic, and scientific-technological perspectives. The course culminates on a student team analysis of a developing country in terms of environmental security issues and the related U.S. national security interests. The final project includes a formal brief and written paper.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** None.

<b>EV488</b>	<b>SOLID AND HAZARDOUS WASTE TREATMENT &amp; REMEDIATION</b>
	3.0 Credit Hours (BS=0.0, ES=1.0, ED=2.0); Prerequisites: EV394 and EV402

**SCOPE:** This course examines the treatment, storage, and disposal of solid and hazardous wastes. Both regulatory requirements and evolving technology associated with solving modern solid waste disposal problems are discussed. Processes for the investigation and remediation of contaminated waste sites are presented, along with design methodologies for solid and hazardous waste disposal systems. The course culminates in the application of hazardous waste engineering to the cleanup of a contaminated hazardous disposal site.

**LESSONS:** 40 @ 55 min (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One design project.

<b>EV489A</b>	<b>ADVANCED INDIVIDUAL STUDY I</b>
	3.0 Credit Hours; Prerequisite: Permission Required

**SCOPE:** The course is an individually supervised research and study program designed to provide cadets with the opportunity to pursue advanced topics within their discipline. The cadet prepares a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. If required for a specific degree, the proposal will include a justification for engineering science or design credit. Once approved, the proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet will culminate in one of two outcomes: 1) a discipline-appropriate written product (e.g., senior thesis or design project) with oral defense; or 2) enrollment in EV489B for the completion of the research and study program during the second academic term.

**LESSONS and LABS:** Established by consultation between cadet and faculty advisor.

**SPECIAL REQUIREMENTS:** Senior thesis or as determined by faculty advisor. Project dependent BS, ES, and ED credit.

<b>EV489B</b>	<b>ADVANCED INDIVIDUAL STUDY II</b>
	3.0 Credit Hours; Prerequisite: EV480 and EV489A

**SCOPE:** The course is an individually supervised research and study program designed to provide cadets with the opportunity to pursue advanced topics within their discipline. The cadet uses a research and study proposal setting forth the objectives, scope, and anticipated accomplishments of his/her efforts for the semester. If required for a specific degree, the proposal will include a justification for engineering science or design credit. The proposal serves as a basis for the cadet's research and study program. Progress in research reports and observations by the faculty advisor form the basis for grades. The program for each cadet will culminate in a discipline-appropriate written product (e.g., senior thesis or design project) with oral defense.

**LESSONS and LABS:** Established by consultation between cadet and faculty advisor.

**SPECIAL REQUIREMENTS:** Written report with oral defense. Project dependent BS, ES, and ED credit.

<b>EV490</b>	<b>ADVANCED ENVIRONMENTAL ENGINEERING DESIGN</b>
	3.5 Credit Hours (BS=0.0, ES=1.0, ED=2.5); Prerequisites: EV301 and EV385B; Standing as a First Class Cadet in Environmental Engineering or Permission of the Department Head

**SCOPE:** This is the final design course for the major in environmental engineering. Cadets experience the complete design experience including defining the project scope, identifying design constraints, comparing alternatives, development of plans and specifications, engineering economics, and project management. The course centers on a senior design project that requires the integration of concepts developed in previous courses. Working in teams, cadets examine projects through the feasibility and concept design phases to evolve and develop concepts that are not only technically feasible, but economically, socially, and politically acceptable. The evaluation of alternatives employs trade-off analysis and the use of multi-attribute decision models. The final product includes a formal oral briefing and written design specifications. In addition to project management, course lectures cover engineering ethics, engineering economics, and topical coverage of fundamental engineering topics relevant to the problems under study. The course concludes with a field data collection exercise where cadets develop collection protocols, execute the data collection plan, analyze results, and present their findings.

**LESSONS:** 40 @ 55 min a (2.5 Att/wk)

**LABS:** 12 @ 55 minutes

**SPECIAL REQUIREMENTS:** One design problem. Standing as a first class cadet is required for enrollment.

<b>EV498</b>	<b>ADVANCED GEOGRAPHIC INFORMATION SCIENCES</b>
	3.0 Credit Hours (BS=0.0, ES=2.0, ED=1.0); Prerequisite: EV398

**SCOPE:** This course examines the analytical methods used in Geographic Information systems (GIS) and provides cadets with a clear understanding of the theoretical/conceptual aspects of algorithms found in GIS software. Lectures focus on the underlying mathematical basis for widely used spatial analytical techniques. Among the topics covered are neighborhood operations, map transformation, spatial interpolation, terrain analysis, network analysis, spatial overlay, fuzzy sets, neural networks, and expert systems. In-class practical exercises and laboratory assignments complement the lectures by providing hands-on experience with a variety of advanced analytical techniques. The course culminates with a capstone term project that allows cadets to identify a scientific problem, formulate a hypothesis, use GIS to solve the problem, and then present the results of their analysis.

**LESSONS:** 30 @ 55 min (2.5 Att/wk)

**LABS:** 10 @ 55 Min

**SPECIAL REQUIREMENTS:** Term Project. Compensatory time provided.

<b>XS391</b>	<b>PRINCIPLES AND APPLICATIONS OF ENVIRONMENTAL CHEMISTRY</b>
	3.0 Credit Hours (BS=0.5, ES=2.5, ED=0.0); Prerequisites: CH102/CH152 and MA104

**SCOPE:** This course examines chemical interactions of pollutants in air, soil, and water systems. The focus of the course is problem solving with the following topic coverage: approximately 80% applied aquatic chemistry, 15% environmental organic chemistry, and 5% applied analytical chemistry. Specific topics include the chemistry applied in drinking water production and the chemical aspects of industrial and hazardous waste treatment. The fate of heavy metals and organic contaminants in soil and aqueous systems is also discussed.

**LESSONS:** 40 @ 55 min a (2.5 Att/wk)

**LABS:** None

**SPECIAL REQUIREMENTS:** One in-class lab.



MAJ John Culpepper instructs cadets on the importance of a functioning Intertropical Convergence Zone during EV203 (Physical Geography).



GIS cadets receive training on high accuracy survey equipment used for coordinate control of high accuracy aerial photogrammetry and Light Detection and Ranging.



Members of the DIRT BAND rockin' it at the Firstie Club!



CDT Augustin Paulo and two Midshipmen are welcomes to the Joint Warfare Analysis Center by Col Michael Orr, USMC, Commander, and Mr. Robert Tolhurts, Executive Director.



Dr. Houston, a former USMA instructor, speaks to cadets about how their West Point education and service as an Army officer prepares them for exciting careers in the private sector.



Cadets in EV487 (Environmental Security) visit the United Nations.

# DEPARTMENT FACULTY

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## PERMANENT MILITARY FACULTY

### **COL EUGENE J. PALKA**

Professor and Head, Department of  
Geography and Environmental Engineering

Ph.D., University of North Carolina at Chapel Hill, 1995

M.A., Ohio University, 1986

B.S., USMA, West Point, 1978

Deputy Department Head, D/G&EnE, USMA,  
2002 – 2006

C-5, 10th Mountain Division, CJTF-Afghanistan, 2002  
Geography Program Director, D/G&EnE, USMA,  
1998-2002

Deputy Commander, 16<sup>th</sup> Cavalry Regiment, Fort Knox,  
KY, 1997-98

Battalion Commander, 1-46<sup>th</sup> Infantry Regiment, Fort  
Knox, KY, 1995-97

Battalion XO, 5-9<sup>th</sup> Infantry Regiment, Fort Wainwright, AK, 1991-92

G3, Chief of Operations, 6<sup>th</sup> Infantry Division (Light), Fort Wainwright, AK, 1990-91

Instructor/Assistant Professor, Dept. of Geography & Computer Science, USMA, 1986-1989

Battalion S3, 1-501<sup>st</sup> Infantry, 101<sup>st</sup> ABN Division, Fort Campbell, KY, 1983-84

Company Commander, A/1-501<sup>st</sup> IN, 101<sup>st</sup> Airborne Division, Fort Campbell, KY, 1981-83

Platoon Leader, Aide de Camp, Company XO, 101<sup>st</sup> ABN Division, Fort Campbell, KY, 1978-81



COL Palka is an Infantryman, whose military assignments include nearly six years with the 101<sup>st</sup> Airborne Division, and more than two years with the 6<sup>th</sup> Infantry Division (Light) in Alaska. He later commanded the 1<sup>st</sup> Battalion, 46<sup>th</sup> Infantry Regiment at Fort Knox, and subsequently served as the Deputy Commander of the 16<sup>th</sup> Cavalry Regiment. In 2002, he was assigned to the 10<sup>th</sup> Mountain Division and deployed to Afghanistan to serve as the C-5, Future Plans Officer, for CJTF-Mountain, and in 2009 he deployed to Iraq as an advisor to the Commander MND-North. COL Palka is an environmental geographer, with expertise in military and cultural geography, and regional expertise in North America and Latin America. He has authored or co-authored numerous books, Instructor's Manuals to accompany college textbooks, book chapters, and professional articles. He has taught many of the geography courses offered in the department, but currently teaches Environmental Science and Geography of Global Cultures. ★

## **LTC WILEY C. THOMPSON**

Academy Professor and Deputy Head, Department of  
Geography and Environmental Engineering

Ph.D., Oregon State University, 2008

M.S., Oregon State University, 1999

B.S., USMA, 1989

Deputy Department Head, D/G&EnE, USMA,  
2009-Present

Academy Professor, Geography and Environmental  
Engineering, USMA, 2008-2009

Task Force XO, 12<sup>th</sup> Aviation Brigade Task Force,  
Bagram, Afghanistan, 2006

Task Force Operations Officer, 3-158<sup>th</sup> Aviation Task  
Force, Kandahar, Afghanistan, 2005

Battalion Operations Officer, 3-158<sup>th</sup> Aviation Battalion, Giebelstadt, Germany, 2004

Battalion XO, 3-158<sup>th</sup> Aviation Battalion, Balad, Iraq, 2003

Instructor/Assistant Professor, D/G&EnE, USMA, 1999-2002

Company XO, 571 MEDEVAC (AA), Fort Carson, CO, 1997

Troop Commander, 4<sup>th</sup> Squadron, 3<sup>rd</sup> Armored Cavalry Regiment, Fort Bliss, Texas and Fort  
Carson, Colorado, 1995-1996

Squadron S-4 4<sup>th</sup> Squadron, 3<sup>rd</sup> Armored Cavalry Regiment, Fort Bliss, Texas, 1995

Flight Operations Officer, 4<sup>th</sup> Squadron, 3<sup>rd</sup> Armored Cavalry Regiment, Fort Bliss, Texas, 1994

Platoon Leader, 4<sup>th</sup> Squadron, 3<sup>rd</sup> Armored Cavalry Regiment, Fort Bliss, Texas, 1992-1994

Platoon Leader, 2/2 Aviation, 2<sup>nd</sup> Infantry Division, Camp Stanley, ROK, 1990-1991



LTC Thompson is an Aviation officer with command and staff experience at the battalion and brigade levels. His most recent experiences include operational aviation assignments in support of both Operation IRAQI FREEDOM and Operation ENDURING FREEDOM. Academically, LTC Thompson specializes in environmental geography with research interests in large-scale disaster response, development and domestic community emergency preparedness. LTC Thompson teaches Physical Geography (EV203), Geography of Global Cultures (EV365), Geography of North America (EV384), and Military Geography (EV482). ★

## **COL LAUREL J. HUMMEL**

Academy Professor and Program Director, Geography

Ph.D., University of Colorado, 2002  
M.S.S., US Army War College, 2006  
M.Ed., University of Alaska Anchorage, 1999  
M.S., Pennsylvania State University, 1991  
B.S., United States Military Academy, 1982

Advisor, National Military Academy - Afghanistan,  
CFC-A, Kabul, Afghanistan, 2010

Geography Program Director, D/G&EnE, USMA,  
2006-2010

Academy Professor, Geography Program, D/G&EnE,  
USMA, 2003-2005

Chief, Operations Intelligence Division and  
Joint Intelligence Support Element,  
Intelligence Directorate, Alaskan Command,  
PACOM, Elmendorf Air Force Base, Alaska, 1996-2000

S-3, 102d Military Intelligence Battalion, 2<sup>nd</sup> Infantry Division, ROK, 1995-1996

Instructor and Assistant Professor, Department of Geography and Environmental Engineering,  
USMA, 1991-1994

Company Commander, S-1, and S-2, 224<sup>th</sup> Military Intelligence Battalion (Aerial Exploitation),  
525<sup>th</sup> Military Intelligence Brigade (ABN), Hunter Army Airfield, Georgia, 1986-1989

Chief, Intelligence Plans and Production, and Tactical Intelligence Officer, 24<sup>th</sup> Infantry Division  
G-2, Fort Stewart, Georgia, 1985-1986

Platoon Leader and Company XO, 124<sup>th</sup> Military Intelligence Battalion, 24<sup>th</sup> Infantry Division,  
Fort Stewart, Georgia, 1983-1985



COL Hummel has spent the majority of her military career in the fields of tactical, imagery, and strategic intelligence, in Army field units and the joint arena. She is a Joint Service Officer, and a graduate of the US Army War College and the US Army Command and General Staff College. As a member of the Geography faculty, she has taught and directed Physical Geography, Geography of Global Cultures, Geomorphology, Geography of North America, the Honors Seminar in Geography, Independent Research projects, and Population Geography. COL Hummel is primarily a human geographer with interests in demographics, landscape studies, geography in higher education, and environmental security and the formulation of national security policy. She has conducted research, lectured, and published across a diverse spectrum of interests, including: the US military's influence upon the cultural and environmental landscape, infusing geography in K-12 public education, population increase and regional instability in sub-Saharan Africa, necrogeography, and the disciplinary views of culture. As an Alaskan, COL Hummel maintains a regional interest in the geography of Alaska, and specifically the many effects of militarization on Alaska's development. COL Hummel is on sabbatical during academic year 2011. ★

## **COL STEVEN D. FLEMING**

Academy Professor, Geospatial Information Science

Ph.D., University of Georgia, 2004

M.A., Naval War College, 1999

M.A., University of Georgia, 1995

B.S., USMA, 1985

Academy Professor, Department of Geography and  
Environmental Engineering, USMA,  
2009-Present

Advisor, National Military Academy – Afghanistan,  
CSTC-A, Kabul, Afghanistan, 2008

Academy Professor, Department of Geography and  
Environmental Engineering, USMA,  
2005-2008

Advisor, National Military Academy - Afghanistan,  
CFC-A, Kabul, Afghanistan, 2005

Academy Professor, Department of Geography and Environmental Engineering, USMA,  
2004-2005

Assistant Division Air Defense Officer, 4th Infantry Division, Fort Hood, Texas 2000-2001

Battalion S-3, 1-44 ADA, 4<sup>th</sup> Infantry Division, Fort Hood, Texas 1999-2000

Aide de Camp to the Superintendent, USMA, 1997-1998

Instructor/Assistant Professor, Department of Geography and Environmental Engineering,  
USMA, 1995-1998

Battery Commander, A/1-62 ADA, 25<sup>th</sup> Infantry Division, Schofield Barracks, Hawaii,  
1992-1993

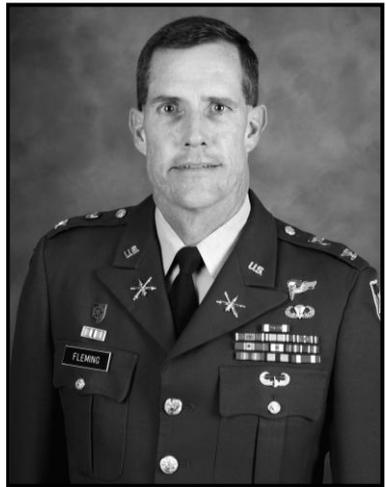
Assistant Battalion S-3/Brigade Liaison Officer, 1-62 ADA, 25<sup>th</sup> Infantry Division, Schofield  
Barracks, Hawaii, 1990-1992

Battalion S-1, 5-62 ADA, 11<sup>th</sup> ADA Brigade, Fort Bliss, Texas, 1988-1990

Assistant Battalion S-3, 5-62 ADA, 11<sup>th</sup> ADA Brigade, Fort Bliss, Texas, 1988

Platoon Leader, 5-62 ADA, 11<sup>th</sup> ADA Brigade, Fort Bliss, Texas, 1986-1988

Platoon Leader, 4-1 ADA, 11<sup>th</sup> ADA Brigade, Fort Bliss, Texas, 1985-1986



COL Fleming is an Air Defense officer with command and staff experience in short-range air defense operations at the battalion, brigade and division levels. Academically, COL Fleming specializes in geospatial information sciences with particular interest in large-scale mapping of coastal regions, terrestrial image collection and applications of geospatial technologies for homeland security and military operations. He has taught EV203 (Physical Geography), EV377 (Remote Sensing), EV379 (Photogrammetry), EV380 (Surveying), EV485 (Advanced Topics in Geography and the Environment) and EV489 (Advanced Independent Study in GIS). COL Fleming currently teaches EV377 (Remote Sensing), EV378 (Cartography), EV398 (Geographic Information Systems), and EV478 (Military Geospatial Operations). ★

## **COL MICHAEL D. HENDRICKS**

Academy Professor, Geospatial Information Science

Ph. D., University of Maine – Orono, 2004

M.S., University of South Carolina, 1994

B.S., University of Delaware, 1986

Battalion XO, 29th Engineer Battalion

(Topographic), Fort Shafter, HI 2000-2001

Geospatial Operations Officer & Detachment

Commander, 5<sup>th</sup> Planning and Control, U.S.

Army Pacific (USARPAC), Fort Shafter, HI

1999-2000

Instructor and Assistant Professor, Department of

Geography and Environmental Engineering

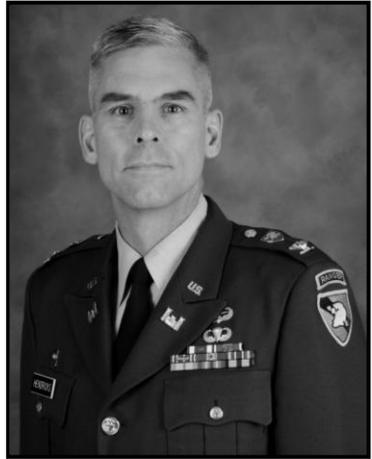
USMA, 1995-1998

Company Commander, A Co, 13th Engineer Battalion (Light), Fort Ord, CA, 1992-1993

Asst Operations Officer, 13th Engineer Battalion (Light), Fort Ord, CA, 1991-1992

Company XO, HQ Co, 317th Engineer Battalion (Mech), Germany, 1989-1990

Platoon Leader, A Co, 317th Engineer Battalion (Mech), Germany 1987-1989



COL Hendricks is an Engineer officer specializing in geospatial information operations. His recent military experience was with the 29th Engineer Battalion (Topographic) supporting PACOM, USARPAC, and numerous other organizations in the pacific region with mapping and geospatial intelligence. His research interests include; GIS education, supporting navigation and mobility analysis in dynamic and uncertain settings, and mobile mapping. In addition, he is involved in producing large-scale topographic maps for the sport of orienteering and is the officer representative to the USMA orienteering team. COL Hendricks is the course director for EV398 (Geographic Information Systems) and EV498 (Advanced Geographic Information Systems). ★

## **LTC MARK A. SMITH**

Academy Professor, Environmental Science

Ph.D., University of Wisconsin, Madison, 2002

M.S., University of Wisconsin, Madison, 1989

B.S., Oregon State University, 1985

Theater Missile Defense Officer and Balkans

Reserve Force Desk Officer, Joint Force

Command, Naples, Italy, 2002-2005

S-3, 5-7 ADA, Hanau Germany, 2001-2002

Operations and Training Officer, Extended Air

Defense Task Force, Giessen, Germany,

1999-2001

Team Leader, 432<sup>nd</sup> Civil Affairs Battalion,

Green Bay, WI, 1998-1999

Detachment Commander, 2/335<sup>th</sup> Bn, 4<sup>th</sup> Bde, Madison, WI, 1997-1998

OIC, Observer Controller Lanes Team, 2/335<sup>th</sup> Bn, 4<sup>th</sup> Bde, Madison, WI, 1996-1997

Platoon Leader, Observer Controller Lanes Team, 2/335<sup>th</sup> Bn, 4<sup>th</sup> Bde, Madison, WI, 1994-1996

Force Air Defense Officer, Allied Command Europe Mobile Force Land and S-5, Wackernheim,

GE, 1991-1994

Platoon Leader, 5/3 ADA, Wackernheim, GE, 1990-1991

Platoon Leader, 3/5 ADA, Buedingen, GE, 1990



LTC Smith is an Air Defense officer with experience in a wide variety of assignments, to include joint and combined tours with NATO and European Union forces. LTC Smith has also served two combat tours in Iraq (platoon leader during DESERT STORM, and NATO LNO to Multi-National Corps Iraq in support of the NATO training Mission in Iraq). LTC Smith holds a joint Ph.D. in wildlife ecology and zoology from the University of Wisconsin-Madison. His dissertation research and interests are about integrating military training and wildlife on military lands. He teaches EV471 (Ecology), EV301 (Environmental Science for Engineers and Scientists), EV391B (Environmental Geology), and the three courses of the Environmental Engineering Sequence: EV 300 (Environmental Science), EV350 (Environmental Technologies), and EV450 (Environmental Decision Making). ★

## CIVILIAN FACULTY

### **Dr. JOHN A. BROCKHAUS**

Professor of Geospatial Information Science and  
Program Director, Geospatial Information  
Science

Ph.D., University of Idaho, 1987

M.S., California Polytechnic State University, 1980

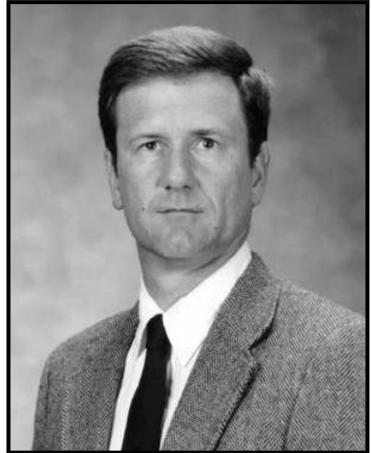
B.S., California Polytechnic State University, 1978

Research Associate, NCS University, 1984-94

Instructor, University of Idaho, 1982-84

Systems Analyst, Humboldt State University,  
1981-82

Instructor, California Polytechnic State University,  
1978-80



Dr. Brockhaus is an environmental scientist with teaching and research interests in aerial photo interpretation, remote sensing, and geographic information systems. He has expertise in the application of remote sensing and geographic information systems in the study of landscape characterization, spatial modeling of ecological processes, site degradation monitoring, and land cover change analysis. He has published numerous articles in professional journals and has presented over 50 papers at national and international conferences. His research interests include site degradation monitoring with remotely sensed data, detection and mapping of invasive plant species using hyperspectral imagery, and the use of ground penetrating radar in archeological studies. He teaches EV377 (Remote Sensing), EV378 (Cartography), EV379 (Photogrammetry), EV398 (Geographic Information Systems) and EV477 (Advanced Remote Sensing). ★

**Dr. MARIE C. JOHNSON**

Professor of Geology and Program Director,  
Environmental

Ph.D., Brown University, 1990

A.B., Harvard College, 1985, *magna cum laude*

Associate Research Scientist, Lamont- Doherty Earth  
Observatory of Columbia University, 1992-1995

Lamont- Doherty Post-Doctorate Fellow, Earth  
Observatory of Columbia University,  
1990-1992

Research Assistant, Brown University, 1986-1990



Dr. Johnson is a Geologist who applies the skills and techniques of physical chemistry to understanding geological processes. Her specific research interests include understanding fluid behavior at high pressures and temperatures inside the Earth, deducing physical conditions inside a volcano just prior to eruption, and environmental security. She is the author of many articles in professional journals, and often presents papers at national conferences. Dr. Johnson serves as the Environmental Program Director. ★

**Dr. JON C. MALINOWSKI**

Professor of Geography and Program Director,  
Geography

Ph.D., University of North Carolina at Chapel Hill,  
1995

M.S., University of North Carolina at Chapel Hill, 1993

B.S., Georgetown University, 1991, *magna cum laude*,  
Phi Beta Kappa

Teaching Fellow, UNC-Chapel Hill, 1993-95



Dr. Malinowski is a Geographer with teaching and research interests in environmental perception, spatial ability, children's geographies, summer camps, and the geography of Asia. He is the published author of several books, academic journal articles, and book chapters. He currently serves as the Geography Program Director. Dr. Malinowski serves as the course director for EV303 (Foundations in Geography) in the fall term. ★

**Dr. MICHAEL A. BUTKUS**

Professor of Environmental Engineering

Ph.D., The University of Connecticut, 1997

M.S., The University of Connecticut, 1995

B.S., The United States Merchant Marine Academy,  
1989

P.E., State of Connecticut, 1997

Research Associate and Teaching Fellow, UCONN,  
1994-97

Nuclear Plant Engineer, Knolls Atomic Power  
Laboratory, 1990-93



Dr. Butkus is an environmental engineer with research focuses on water, wastewater, and hazardous waste treatment system design. He has conducted environmental research for both the military and civilian sectors. His current research interests include remediation of lead on firing ranges, disinfection, and the development of small-scale water treatment devices for the Army. Dr. Butkus has been the course director for EV396 (Environmental Biological Systems) and XS391 (Principles and Applications of Environmental Chemistry). He also teaches EV385B (Introduction to Environmental Engineering), EV300/EV390A (Environmental Science), EV401 (Physical and Chemical Treatment), and EV402 (Biochemical Treatment). ★

**Dr. PETER P. SISKA**

Professor, Geography

Ph.D., Texas A&M University, 1995

Ph.D., Comenius University, Bratislava, Slovakia, 1984

M.S., Comenius University, Bratislava, Slovakia 1978

B.S., Comenius University, Bratislava, Slovakia 1974

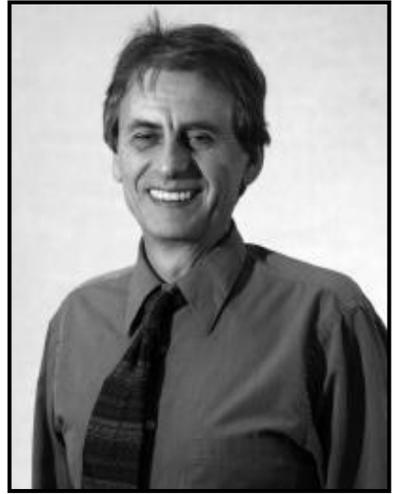
Associate Professor, Austin Peay State University  
Clarksville, TN, 2004-2007

Assistant Professor, Stephen F. Austin University,  
Nacogdoches, TX, 1999 - 2004

Research Scientist, Texas A&M University,  
1997-1999

Assistant Professor, Constantine Philosopher  
University, Nitra, Slovakia, 1995 – 1997

Assistant Professor, Comenius University, Bratislava,  
Slovakia, 1979 – 1984



Dr. Peter Siska has a diverse background in natural resource management, spatial analysis, geostatistics and geographic information systems. He participated in regional planning projects in Slovakia and in research projects in Texas, including: volumetric analysis of the total tree stem volume of the east Texas forest ecosystem, natural resource and inventory border zone project between Texas and Mexico, and developing a karst hazard prediction model on Pennyroyal Plane as well as the western Kentucky Highlands. Dr. Siska was also director of the School of Agriculture and Geosciences and published several papers in international scientific journals. He presented scientific papers in the United States and Europe and is active on the board of directors for the Applied Geography Conference. He is a member of Slovak Academy of Sciences and currently serves on the editorial board for *Geografický Časopis* (Journal of Geography), published by the Slovak Academy of Sciences and Papers of Applied Geography Conference. He teaches EV 365 (Geography of Global Cultures), EV203 (Physical Geography), and previously taught Regional Geography of Europe, the Americas and Australia, Regional Geography of Africa, Asia and Oceania, Introduction to GIS, Political Geography and graduate courses in geospatial analysis. ★

**Dr. RICHARD L. WOLFEL**

Associate Professor, Geography  
Chair, Intercultural Competence, Center for  
Languages, Cultures, and Regional Studies

Ph.D, Indiana University, Bloomington, 2001  
M.A., University of Cincinnati, 1997  
BSED, West Chester University of Pennsylvania, 1995

Assistant Professor, Southern Illinois University  
Edwardsville, 2003-07  
Assistant Professor, Salem State College, 2001-03  
Associate Instructor, Indiana University, 1997-2001



Dr. Wolfel is a cultural and political geographer with regional interests in Central Asia and Germany. His specific research interests focus on nationalism and the urban built environment, post-Soviet political development and the influence of nationalism on tourism. He is the author of several books, journal articles, reviews and book chapters. Dr. Wolfel is course director for EV 371: Geography of Russia, EV 390B: Urban Geography and directs the Cross Cultural Competence Initiative as part of the Center for Languages, Cultures and Regional Studies (CLCRS). ★

**Dr. ADAM J. KALKSTEIN**

Assistant Professor, Geography

Ph.D., Arizona State University, 2008

M.A., Arizona State University, 2004

B.A., University of Virginia, 2002, with distinction



Dr. Kalkstein is a geographer-climatologist whose research and teaching interests focus primarily on human-environment interactions. He has taught a variety of courses including: Meteorology, Climatology, Earth Science, Environmental Issues, and Environmental Policy. Dr. Kalkstein has authored or co-authored numerous articles in peer-reviewed journals covering topics as diverse as the impact of jet contrails on climate, the geography of human mortality in the United States, and the effects of heat on human health. Most recently, his research has focused on examining the role of weather on suicide and determining how climate influences influenza and winter mortality. Dr. Kalkstein teaches EV203 (Physical Geography). ★

**Dr. AMY R. KRAKOWKA**

Assistant Professor, Geography

Ph.D., Boston University, 2005

M.A., Boston University, 2002

B.S., Boston University, 2000, *magna cum Laude*

Research fellow, Boston University, 2002-2005

Teaching fellow, Boston University, 2001



Dr. Krakowka is a geographer who applies her skills to understanding the interactions between environmental resources and economic systems. Specifically, she uses statistical models, GIS, remote sensing data, and economic data to research the interactions between marketed and non-marketed environmental resources and the economy. She is the author of several articles in professional journals, is the editor of the book *Understanding Africa: A Geographic Approach*, and often presents papers at national conferences. Dr. Krakowka teaches EV203 (Physical Geography), EV386 (Geography of Europe) and EV486 (Environmental Geography). She has also taught EV365 (Geography of Global Cultures). ★

## ROTATING MILITARY FACULTY

### **LTC CURTIS B. EDSON**

Assistant Professor, Geospatial Information Science

Ph.D. Candidate, Oregon State University

M.S., University of Wisconsin, 2002

B.A., California Polytechnic State University, 1992

S3, 29<sup>th</sup> Engineer Battalion, 8<sup>th</sup> Theater Sustainment

Command, Schofield Barracks, HI, 2006-07

Geospatial Operations Officer & Detachment Commander,

5th Planning and Control, US Army Pacific,

Fort Shafter, HI, 2005-06

Instructor, Geospatial Information Science, D:\G&EnE,

West Point, NY, 2002-04

Commander, B Co, 40<sup>th</sup> Engineer Battalion (Combat), 1<sup>st</sup>

Armored Division, Baumholder, GE, 1998-00

Assistant S3, 40<sup>th</sup> Engineer Battalion (Combat), 1<sup>st</sup> Armored Division, Baumholder, GE, 1997-98

S4, Support Squadron, 11<sup>th</sup> Armored Cavalry Regiment, Fort Irwin, CA 1995-96

XO, 58<sup>th</sup> Engineer Company (OPFOR), 11<sup>th</sup> Armored Cavalry Regiment, Fort Irwin, CA 1994-95

Platoon Leader, A&O/87<sup>th</sup> En Co 177<sup>th</sup> AR Bde (OPFOR), FT Irwin, CA, 1994

Platoon Leader, A and B Companies, 44<sup>th</sup> En Bn, 2<sup>nd</sup> Infantry Division, South Korea, 1993



LTC Edson is an Engineer Officer specializing in Geospatial Information Operations. His recent military experience was in the 29th Engineer Battalion (Topographic) supporting PACOM, USARPAC, and numerous other organizations in the pacific region with mapping and geospatial intelligence. He has also served in combat engineer units and as the S-4 Support Squadron, 11<sup>th</sup> ACR. He has prior service experience serving as a supply specialist in 75<sup>th</sup> Ranger Regiment, and in the reserves with 12<sup>th</sup> Special Forces Group (Airborne). His other experiences include company command in Bosnia, several BLUFOR and OPFOR rotations at CMTC, OPFOR at NTC, and service in Korea. His research interests include LiDAR remote sensing and GPS in forest measurements, forest surveying and remote sensing change detection. He teaches EV203 (Physical Geography) and EV380 (Principles of Surveying) and EV379 (Photogrammetry). ★

## **LTC ANDREW LOHMAN**

Assistant Professor, Geography

Ph.D., University of Illinois, Urbana-Champaign, 2009

M.S., University of South Carolina, 1999

B.S., USMA, 1989

Senior Operational Detachment Bravo (ODB) Observer-  
Controller, Special Operations Training Detachment,  
Joint Readiness Training Center (JRTC), Fort Polk, LA  
Company Commander, Group Support Company, 5<sup>th</sup>  
Special Forces Group (Airborne), Fort Campbell, KY  
Company Commander, B Company, 2<sup>nd</sup> Battalion, 5<sup>th</sup>  
Special Forces Group (Airborne), Fort Campbell, KY  
Assistant Professor, Department of Geography and  
Environmental Engineering, USMA

Instructor, Department of Geography and Environmental Engineering, USMA

Operational Detachment Alpha (ODA) Commander, A Company, 1<sup>st</sup> Battalion, 5<sup>th</sup> Special  
Forces Group (Airborne), Fort Campbell, KY

Executive Officer, Combat Support Company, 3<sup>rd</sup> Battalion, 47<sup>th</sup> Infantry, Fort Lewis, WA

Rifle Platoon Leader, B Company, 3<sup>rd</sup> Battalion, 47<sup>th</sup> Infantry, Fort Lewis, WA

Anti-Tank Platoon Leader, A Company, 2nd Battalion, 2nd Infantry Brigade, Fort Lewis, WA



LTC Lohman is a Special Forces officer with operational experience as an ODA and SF company commander in the Middle East, Africa, and the Caribbean. He is a political geographer with research interests in the geography of war and conflict, with a specific focus on insurgency and civil war. His dissertation analyzed the spatial patterns of intra-state conflict through an urban network approach. He teaches EV365 (Geography of Global Cultures) and EV374 (Geography of the Middle East and Africa). ★

## **LTC RANDY POWELL**

Assistant Professor, Environmental Engineering

M.S.E, University of Texas at Austin, 1999  
B.S., USMA, 1988  
PE, Delaware 2000

Professor of Military Science, Fordham Univ., Bronx,  
NY, 2006-09

J7, JTF-76, Afghanistan, 2005-06

Construction Management Officer, 18<sup>th</sup> Engineer  
Brigade, Heidelberg, Germany, 2004-05

Deputy District Commander, United States Army  
Corps of Engineers, Wilmington NC, 2002-04

Assistant Professor, Department of Geography & Environmental Engineering, USMA 1999-2002

Battalion Assistant S3, 321<sup>st</sup> Engineer Battalion, Boise, ID, 1995-97

Commander, HHC, 11<sup>th</sup> Engineer Battalion, Ft Stewart, GA, 1994-95

Battalion S-4, 94<sup>th</sup> Engineer Battalion, Ft Stewart, GA, 1992-94

Facilities Officer, 22<sup>nd</sup> SUPCOM, Dhahran, SA, 1991

Executive Officer, D Company, 78<sup>th</sup> Engineer Battalion, Ettlingen, Germany, 1990-91

Platoon Leader, C Company, 78<sup>th</sup> Engineer Battalion, Ettlingen, Germany 1988-90



LTC Powell is an Engineer officer with experience in mechanized and combat heavy operations. He has served with the U.S. Army Corps of Engineers as the Deputy District Commander for the Wilmington District. In this capacity, he deployed to Iraq with a Forward Engineer Support Team in 2003. LTC Powell is an environmental engineer with particular interest in water and wastewater treatment. He teaches EV450 (Environmental Decision Making) and EV401 (Physical and Chemical Processes). ★

**Lt. Col. LUIS A. RIOS, US Air Force**

Assistant Professor, Geography

M.S., Texas A&M University, 1995

B.S., Rutgers University, 1989

Chief, Current Operations Division, Offutt AFB,  
2003-04

Chief, Standards & Evaluations Branch, Offutt AFB,  
2001-03

Commander, Weather Flight, Charleston AFB,  
1997-2001

Leader, Atmospheric Analysis Models, Offutt AFB,  
1995-1997

Satellite Coordinator, Lajes Airbase, the Azores,  
1992-93

Wing Weather Officer, Nellis Air Force Base,  
1989-1992



Lt. Col. Rios is an Air Force weather officer who has served in weather flights, weather squadrons and the Air Force Weather Agency (AFWA) in support of classified national programs, standardization and evaluation (Stan/Eval), Army aviation, tactical air forces and mobility air forces. His contingency/deployment history includes DESERT STORM in 1992, Operation RESTORE HOPE in 1993, and Operation ALLIED FORCE in 1999. While serving as a combat weather flight commander, he helped certify the employment of C-17A cargo aircraft for use by Army paratroopers. Lt. Col. Rios received a masters degree in meteorology with emphasis on analysis and forecasting. His academic interests include tropical meteorology, climatology, lightning meteorology and the operational applicability of meteorological and climatic techniques. Lt. Col. Rios teaches EV203 (Physical Geography) and serves as course director for EV387 (Meteorology). ★

## **LTC THOMAS TIMMES**

Assistant Professor, Environmental Engineering

Ph.D., Penn State University, 2009  
M.S.E., Johns Hopkins University, 2000  
B.S., Virginia Military Institute, 1992

P.E., The State of Maryland, 2000  
BCEE, 2005

Instructor and Assistant Professor, Department  
of Geography and Environmental  
Engineering, USMA, 2003-06  
Chief, Field Water, U.S. Army Center for Health  
Promotion and Preventive Medicine, 2001-03  
Company Commander, U.S. Army Chemical  
Activity-Pacific, Johnston Atoll, 2001  
Medical Operations Officer, Johnston Atoll, 2000  
Environmental Science Officer, 82<sup>nd</sup> Airborne Division, 1996-98  
Environmental Engineer, Fort Meade, 1994-96  
Sanitary Engineer, U.S. Army Environmental Hygiene Agency, 1992-94



LTC Timmes is a professional engineer in the Medical Service Corps who has served in a variety of field and TDA assignments. He has deployed to Macedonia, Uzbekistan, Kazakhstan, Italy, Germany, and Norway to conduct extensive drinking water system characterizations and medical threat validations. LTC Timmes commanded the Headquarters Company of the U.S. Army Chemical Activity-Pacific on Johnston Atoll during its closure as a chemical agent demilitarization site. He served as a jumpmaster with the 82d Airborne Division while in charge of the Division Preventive Medicine Section. LTC Timmes has a masters degree and Ph.D. in environmental engineering, specializing in lead and copper corrosion control and coagulation pretreatment options prior to membrane filtration. His academic and research interests include electrocoagulation, military field drinking water, water treatment plant optimization, and water system vulnerability assessments. LTC Timmes has been the course director for EV300 (Environmental Science), EV350 (Environmental Engineering Technologies), EV401 (Physical and Chemical Processes), EV402 (Biochemical Treatment), and EV488 (Solid and Hazardous Waste Treatment and Remediation). He has also taught EV203 (Physical Geography) and EV489C (Independent Research). ★

**MAJ MARC R. BAILEY**

Instructor, Environmental Engineering

M.S., University of Missouri - Rolla, 2004  
B.S., United States Military Academy, 1999  
P.E., Missouri 2005

Chief of Plans, United States Corps of Cadets, United States Military Academy, West Point, NY  
Assistance Brigade S3, 3rd BCT 101st Airborne DIV, Iraq  
Commander, HHC/626 BSB, 3rd BCT 101st ABN DIV, Iraq and Fort Campbell, KY

Assistant Brigade Engineer, 3rd BDE 101st ABN DIV, Iraq  
Humanitarian Construction Officer, JTF-Bravo, Honduras  
Battalion S1, 20th Engineer Battalion (M), Fort Hood, TX  
Company XO and Assault and Obstacle Platoon Leader, Alpha Co., 20th EN BN (M), Fort Hood, TX

Platoon Leader, Charlie Co., 20th Engineer BN (M), Fort Hood, TX Company Commander,



MAJ Bailey is an Engineer officer with command and staff experience in light, mechanized, and joint engineer units. Most recently he served as the Chief of Plans for the United States Corps of Cadets. Previously, he served in both command and staff positions in 3rd BCT (187th IN Rakkasans), 101st Airborne Division during two combat rotations in Iraq. He served as a Humanitarian Projects Officer with Joint Task Force Bravo in Central America. His environmental engineering experience and interests are in water resources and management. He teaches EV300 (Environmental Science) and EV350 (Environmental Technologies). ★

**MAJ JAMES P. COOK**

Instructor, Environmental Engineering

M.S., University of Minnesota, 2009  
M.S., University of Missouri-Rolla, 2003  
B.S., United States Military Academy, 1999

Company Commander, E Company (Engineers) 2-8 Infantry Battalion, 2<sup>nd</sup> Brigade, 4<sup>th</sup> Infantry Division, Fort Hood, TX and Iskanderiah, Iraq

Current Ops Officer, Division Engineer Staff, 4<sup>th</sup> Infantry Division, Fort Hood, TX

Battalion S2 & Assistant S3, 82<sup>nd</sup> Engineer Battalion, 1<sup>st</sup> Infantry Division, Bamberg, Germany

Company XO, C/82<sup>nd</sup> Engineer Battalion, 1<sup>st</sup> Infantry Division, Bamberg, Germany  
Platoon Leader, C/82<sup>nd</sup> Engineer Battalion, 1<sup>st</sup> Infantry Division, Bamberg, Germany  
Assistant Task Force Engineer, A/82<sup>nd</sup> Engineer Battalion, 1<sup>st</sup> ID, Camp Monteith, Kosovo



MAJ Cook is an Engineer officer who has served exclusively in divisional mechanized combat engineer units. His past positions include battalion staff, platoon leader, company executive officer, and company commander. He has operationally deployed to Iraq and Kosovo. MAJ Cook is an environmental engineer with an interest in surface water quality modeling. His graduate research focused on evaluating a hypolimnetic aeration system used in a city's primary drinking water reservoir. MAJ Cook teaches EV481 (Water Resources Planning and Design). ★

**MAJ P. JOHN CULPEPPER**

Instructor, Environmental Geography

M.S., University of Utah, 2009

M.S., University of Missouri – Rolla, 2004

B.S., United States Military Academy, 2000

Company Commander, 35<sup>th</sup> Engineer Battalion (OSUT), 1<sup>st</sup> Engineer Brigade, Fort Leonard Wood, MO, 2005-07  
Brigade Adjutant, 1<sup>st</sup> Engineer Brigade, Fort Leonard Wood, MO, 2005

Battalion S-2, 10<sup>th</sup> Engineer Battalion, 3<sup>rd</sup> Infantry Division, Fort Stewart, GA, 2002-04

Platoon Leader, 10<sup>th</sup> Engineer Battalion, 3<sup>rd</sup> Infantry Division, Fort Stewart, GA, 2000-02



MAJ Culpepper is an Engineer officer with experience in both a mechanized division and initial entry training. While deployed to Iraq with the 3<sup>rd</sup> Infantry Division from 2002-2003, he served as the Engineer liaison officer to the division artillery brigade. He was responsible for terrain analysis, coordinating engineer survivability assets across three different brigades, and providing countermobility and force protection planning. His academic interests include the use of remote sensing tools to analyze and monitor geomorphic processes and emergency management planning. ★

**MAJ CHRIS FUHRIMAN**

Department Executive Officer

Assistant Professor, Geography

M.A., University of Hawai'i, 2008

B.S., United States Military Academy, 1998

Battalion S3, 1-212<sup>th</sup> Aviation Regiment, Fort Rucker, AL, 2005-06

Company Commander, HHC/1-212<sup>th</sup> Aviation Regiment, Fort Rucker, AL, 2003-05

Platoon Leader, C/2-227<sup>th</sup> Aviation Regiment, 1<sup>st</sup> Cavalry Division, Fort Hood, TX, 2001-02

Company XO, C-227<sup>th</sup> Aviation Regiment, 1<sup>st</sup> Cavalry Division, Fort Hood, TX, 2000-01

Battalion S-2, 164<sup>th</sup> Air Traffic Services Group, Republic of Korea, 1999-2000



MAJ Fuhriman is an Aviation officer who has served in general support battalions (Korea, Fort Hood) and a flight training battalion (Fort Rucker). His past positions include battalion staff, platoon leader, company commander, and UH-60 instructor pilot. MAJ Fuhriman is a cultural geographer with regional interests in East Asia and Latin America. His specific research interests are landscape studies, film geography, and social geography. His graduate research focused on cinematic representations of the Korean Demilitarized Zone. MAJ Fuhriman teaches EV203 (Physical Geography), EV372 (Geography of Asia), and EV373 (Geography of Latin America). ★

**MAJ THOMAS M. HANLON**

Instructor, Physical Geography

M.S., Oregon State University, 2010

B.A., University of Montana, 2000

Company Commander, HHC, 1<sup>st</sup> Battalion, 9<sup>th</sup> Infantry Regiment, 2<sup>nd</sup> Brigade, 2<sup>nd</sup> Infantry Division, Fort Carson, CO/ Ramadi, Iraq, 2006 – 2008

Ranger Instructor, 5<sup>th</sup> Ranger Training Battalion, Ranger Training Brigade, Dahlonge, GA, 2005–06

Training Officer, 1<sup>st</sup> Battalion, 75<sup>th</sup> Ranger Regiment, Hunter Army Airfield (HAA), GA, 2004

Ranger Platoon Leader, B Co, 1<sup>st</sup> Battalion, 75<sup>th</sup> Ranger Regiment, HAA, GA / Iraq 2003

Rifle Platoon Leader and Anti-Tank Platoon Leader, A Co and HHC, 2<sup>nd</sup> Battalion, 14<sup>th</sup> Infantry Regiment, 2<sup>nd</sup> Brigade, 10<sup>th</sup> Mountain Division, Kosovo / Fort Drum, NY, 2001-2002

Infantryman, C Co, 4<sup>th</sup> Battalion, 325<sup>th</sup> Airborne Infantry Regiment, 82<sup>nd</sup> Airborne Division, Fort Bragg, 1993-1996



MAJ Hanlon is a Foreign Area Officer assigned to the Sub-Sahara African region. He began his career as an enlisted Infantry Soldier and later commissioned as an Infantry officer. He has extensive operational experience serving in a variety of environments to include Sinai, Kosovo, Iraq and Afghanistan. His graduate research examined the effects of acid mine drainage (AMD) in critical watersheds of South Africa. His academic interests include environmental security, conflict/cooperation over water and other natural resources, and international development. MAJ Hanlon teaches EV203 (Physical Geography). ★

**CPT(P) CHEVELLE P. MALONE**

Instructor, Environmental Geography

M.S., Oregon State University, 2010

M.S., Webster University - Rolla, MO 2006

B.S., University of Oregon, 2001

Brigade Chemical Officer, 3<sup>rd</sup> Infantry Brigade Combat Team, Brigade Special Troops Battalion, 25<sup>th</sup> Infantry Division, Schofield Barracks, HI/Iraq 2006–08

Assistant S3/Plans, 1<sup>st</sup> Bn 21<sup>st</sup> Field Artillery Regiment, 1<sup>st</sup> Cavalry

Division, Fort Hood, TX/Iraq 2004-05

Company XO/Platoon Leader, 68<sup>th</sup> Chemical Co, 1<sup>st</sup> Bn 21<sup>st</sup> Field

Artillery Regiment, 5<sup>th</sup> Brigade (Provisional), 1<sup>st</sup> Cavalry Division Artillery (DIVARTY), 1<sup>st</sup> Cavalry Division, Fort Hood, TX/Iraq 2003-04

BDE Chemical Officer, 4<sup>th</sup> Combat Aviation Brigade, 1<sup>st</sup> Cavalry Division, Fort Hood, TX 2003

Squadron Chemical Officer, 1/17 Cavalry BN, 82<sup>nd</sup> Airborne Division, Fort Bragg, NC 2001-02.



CPT(P) Malone is a Chemical officer with a diverse military background having worked with Infantry, Armor, Aviation and Field Artillery. Her graduate research examined the prospects and barriers influencing a return to localized grain production in the Willamette Valley, Oregon. Her academic interests include human-environment interactions and food geography. CPT(P) Malone teaches EV203 (Physical Geography). ★

**MAJ MARGARET L. McGUNEGLE**

Instructor, Environmental Geography

M.S., The Pennsylvania State University, 2009

M.S., University of Missouri - Rolla, 2004

B.S., University of Missouri - Rolla, 1999

Company Commander, HHC, Brigade Special Troops Battalion, 1<sup>st</sup>  
Brigade, 2d Infantry Division, Korea, 2006-07

Aide-de-Camp to the Commanding General, 2<sup>nd</sup> Infantry Division,  
Korea, 2005-06

G3 Engineer Plans Officer, 2<sup>nd</sup> Infantry Division, Korea, 2004-05

Assistant S3, 52<sup>nd</sup> Engineer Bn., Fort Carson, CO/Iraq, 2002-03

Support Operations Ammunition Officer, 68<sup>th</sup> Corps Support Bn, 43d Area Support Group, Fort  
Carson, CO, 2001-02

Platoon Leader, 60<sup>th</sup> Ordnance Company, 68<sup>th</sup> Corps Support Bn., Fort Carson, CO, 2000-01



MAJ McGunegle is an Engineer officer who started her career in the Ordnance Corps. Her background in logistics and military assignments has given her a wide range of operational experience from the platoon to the division level. Her graduate research examined the effects of oil and gas development on forest fragmentation in the Allegheny National Forest. Her academic interests include land use and land planning, and geomorphology. MAJ McGunegle teaches EV203 (Physical Geography) and EV388B (Geomorphology). ★

**MAJ STEVEN B. MCGUNEGLE**

Instructor, Geography

M.S., Pennsylvania State University, 2009

M.S., Missouri University of Science and Technology, 2004

B.S., United States Military Academy, 1999

Commander, C/4-7 CAV, 1<sup>st</sup> HBCT, Korea, 2005-07

Deputy Chief of Operations G-3, 2<sup>nd</sup> Infantry Division, Korea,  
2004-05

Assistant S-3, 1/3 ACR, Fort Carson, CO/Iraq, 2002-03

Executive Officer, B Troop, 1/3 ACR, Fort Carson, CO, 2001-02

Scout Platoon Leader, B Troop 1/3 ACR, Fort Carson, CO, 2000-01

Tank Platoon Leader, A Troop, 1/3 ACR, Fort Carson, CO, 2000



MAJ McGunegle is an Armor officer who has served predominately in cavalry units. His operational experience ranges from platoon to division level positions. He is a human geographer whose interests include economic geography, industrial location theory and public policy. His regional interests include Latin America and Asia. MAJ McGunegle's research interest is the location and siting of alternative energy development projects. His thesis focused on analyzing the potential for economic profit from the expansion of ethanol production into corn deficient regions. MAJ McGunegle teaches EV203 (Physical Geography). ★

### **CPT JOHN L. MORROW**

Instructor, Human Geography

M.S., Geography – The Pennsylvania State University, 2010

B.A., Biology – Asbury University, 1997

Engineer Advisor to the 9<sup>th</sup> Iraqi (Mechanized) Division Engineer Regiment, Al-Rasheed Iraq, 2007-2008

Hotel Company Commander, 35<sup>th</sup> Engineer BN (OSUT), 1<sup>st</sup>

Engineer Brigade, Ft. Leonard Wood, Missouri, 2005-2006

Assistant Brigade Operations Officer, 1<sup>st</sup> Engineer Brigade, Ft. Leonard Wood, Missouri, 2004-2005

Echo Company Commander, 35<sup>th</sup> Engineer BN (OSUT), 1<sup>st</sup>

Engineer Brigade, Ft. Leonard Wood, Missouri, 2004

Echo Company Executive Officer, 35<sup>th</sup> Engineer BN (OSUT), 1<sup>st</sup> Engineer Brigade, Ft.

Leonard Wood, Missouri, 2003-2004

Platoon Leader, Alpha Company, 44<sup>th</sup> Engineer BN (MECH), 2ID, Republic of Korea, 2002-2003



CPT Morrow in an Engineer Officer that enlisted in the United States Army in 1997 serving as a Vietnamese linguist with Joint Task Force-Full Accounting from 1999-2001. After Commissioning, CPT Morrow served in a variety of positions from platoon through brigade in both mechanized and Initial Entry Training units. More recently, he served as the engineer advisor to the 9<sup>th</sup> Iraqi Division Engineer Regimental commander on an Iraqi Forward Operating Base in Baghdad, Iraq. He is a human geographer whose interests include the use of remote sensing and ethnographic tools to analyze and monitor land-use/land-cover change in rural populations. CPT Morrow is an instructor for EV203 – Physical Geography. ★

### **MAJ STEVEN L. PATTERSON**

Instructor, Environmental Engineering

M.S.P.H., Uniformed Services University, 2007

B.S., University of Arizona, 1994

Combined/Joint Task Force-101 (101<sup>st</sup> Airborne) Preventive Medicine Officer, Afghanistan, 2008-09

Chief, Environmental Health and Engineering Division, Center for Health Promotion and Prevention Medicine (North), Fort Meade, MD, 2003-05

Theatre Preventive Medicine Officer, NATO Stabilization Force (SFOR), Bosnia, 2004

Commander, 154<sup>th</sup> Medical Detachment (Preventive Medicine), Korea, 2001-03

Post Environmental Science Officer, Fort Gordon, GA, 1999-2001

Company XO, Charlie Company, 2<sup>nd</sup> Forward Support Battalion, Korea, 1997-99

Chief, Facility Management, Kimbrough Army Community Hospital, Fort Meade, MD, 1995-97



MAJ Patterson is a Medical Service Corps officer who has served in a variety of assignments that include positions at the division, theater, and garrison level. He has deployed as the senior theater Preventive Medicine officer to both Afghanistan and Bosnia. MAJ Patterson holds a masters of science in public health with special interest in particulate matter. His academic interest is force health protection. MAJ Patterson teaches EV300 (Environmental Science) and EV388A (Physical Geology). ★

**CPT(P) ANDREW R. PFLUGER**

Instructor, Environmental Engineering

Engineer Degree, Stanford University, 2010

M.S., Stanford University, 2009

B.S., United States Military Academy, 2001

Troop Commander, Headquarters and Headquarters Troop, 1st Squadron, 3d Armored Cavalry Regiment, Fort Hood and Qayyarah, Iraq, 2006-2008

Chief of Plans, 2/78 Training Support Brigade, Fort Drum, 2005  
S4, 1st Squadron, 3d ACR, Fort Carson, 2004

XO, C Troop, 1st Squadron, 3d ACR, Fort Carson/Al Qa'im, Iraq, 2003-2004

Scout Platoon Leader, B Troop, 1st Squadron, 3d ACR, Fort Carson/Al Qa'im, Iraq, 2002-2003



CPT Pfluger is an armor officer who has primarily held leadership positions in Cavalry units at the Squadron level and below. He has deployed twice in support of Operation Iraqi Freedom with the 3d ACR, once as a scout platoon leader and executive officer and once as a troop commander. He is an environmental engineer whose wide range of interests include environmental biotechnology, microbial ecology, and air pollution engineering. His graduate thesis examined the selective growth of type II methanotrophic bacteria in a biological fluidized bed reactor. CPT Pfluger instructs EV300 (Environmental Science) and EV397 (Air Pollution Engineering). ★

**MAJ TRAVIS J. RAYFIELD**

Assistant Professor, Environmental Engineering

M.E., University of Florida, 2008

M.S., Missouri University of Science and Technology, 2003

B.S., United States Military Academy, 1999

P.E., State of Missouri, 2003

Commander, 72<sup>nd</sup> Engineer Company (MAC), 1<sup>st</sup> Engineer Battalion, Fort Riley, KS 2004-06

Battalion S4, 1<sup>st</sup> Engineer Battalion (M), Ar Ramadi, Iraq, 2003-04  
Company XO, Bravo Company, 14<sup>th</sup> Engineer Battalion, Fort Lewis, WA, 2001-02

Platoon Leader and Support Platoon Leader, A/14<sup>th</sup> Engineer Battalion, Fort Lewis, WA, 2000-01



MAJ Rayfield is an Engineer officer with command and staff experience in corps wheeled and mechanized engineer units. Most recently, he led his company in the transformation from Charlie Company, 1<sup>st</sup> Engineer Battalion to the 72<sup>nd</sup> Mobility Augmentation Company (MAC). Previously, he deployed as a Battalion S-4 with the 1<sup>st</sup> Engineer Battalion to Ar Ramadi, Iraq, in support of Operation IRAQI FREEDOM. His environmental engineering experience and academic interests are in water quality and water resource management. As a graduate student at the University of Florida, MAJ Rayfield evaluated the use of in situ nitrate sensors to capture low nitrate levels at high temporal resolution. MAJ Rayfield teaches EV350 (Environmental Technologies), EV396 (Environmental Biological Systems), XS391 (Principles and Applications of Environmental Chemistry), EV400 (Fundamentals of Engineering), and EV450 (Environmental Decision Making). ★

**Maj CHARLES S. SPICER II, US Air Force**

Instructor, Geography

M.S., International Relations, Troy University, 2009

B.S., Meteorology, Iowa State University, 1995

Chief, JROTC Operations Support, Holm Center for Officer

Accessions and Citizen Dev, Maxwell AFB, AL, 2007-2010

Chief, Military Studies Division, AF Officer Accession and

Training Schools, Maxwell AFB, AL, 2005-2007

Chief, Strategic Plans and Program Support Division, AF Weather Agency, Offutt AFB, NE, 2005

Chief, Strategic Plans Branch, Air Force Weather Agency, Offutt AFB, NE, 2002-2005

Weather Officer (IMA), 437<sup>th</sup> Operations Support Sq, Charleston AFB, SC, 2000-2002

Commander, CONUS Operations Flight, 28th Operational Weather Sq, Shaw AFB, SC, 2000

Staff Weather Officer, 100<sup>th</sup> Operations Support Sq, RAF Mildenhall, UK, 1997-1999

Wing Weather Officer, 7<sup>th</sup> Operations Support Sq, Dyess AFB, TX, 1995-1997



Maj Spicer is an Air Force Weather Officer who has served in weather flights and squadrons, and the Air Force Weather Agency in support of strategic plans development. Maj Spicer has also developed curriculum for the Reserve Officer Training Corps and the Officer Training School. Maj Spicer has participated in Operation NORTHERN WATCH in 1998, Operation ALLIED FORCE in 1999, Operation NOBLE EAGLE in 2001, and Operation IRAQI FREEDOM in 2004. Maj Spicer teaches EV203 (Physical Geography) and EV387 (Meteorology). ★

**MAJ DENNIS P. SUGRUE**

Instructor, Environmental Engineering

M.S.E., Johns Hopkins University, 2009

M.S., Missouri University of Science and Technology, 2004

B.S., United States Military Academy, 1999

P.E., Missouri, 2004; New York, 2009

Effects Coordinator, 3-71 Cavalry Squadron, 3<sup>rd</sup> IBCT, 10<sup>th</sup> Mountain Division, RC East, Afghanistan, 2006-07

Troop Commander, HHT, 3-71 Cavalry Squadron, 3<sup>rd</sup> IBCT, 10<sup>th</sup>

Mountain Div., Fort Drum, NY/Afghanistan, 2004 - 2006

Assistant Div. Engineer staff, 41<sup>st</sup> Engineer Bn., 10<sup>th</sup> Mountain Div., Fort Drum, NY, 2003-04

Assistant BDE Engineer, 40<sup>th</sup> Engineer Bn., 2<sup>nd</sup> BCT, 1<sup>st</sup> Armored Division, Germany, 2002-03

Platoon Leader and Executive Officer, 40<sup>th</sup> Engineer Bn., 1<sup>st</sup> Armored Div., Germany, 2000-02



MAJ Sugrue is an Engineer officer who has served in mechanized and light division units.

He deployed to Kosovo as a platoon leader and served in Kunar and Nuristan Provinces of Afghanistan while in company command. He also served in a variety of engineer staff positions including Assistant Brigade Engineer where he integrated GIS and remote sensing into operational planning. MAJ Sugrue's graduate research focused on fine sediment stream transport modeling using LiDAR data. His academic interest is in village scale environmental projects, their lasting impacts in developing countries, and the benefit they have in counterinsurgency warfare. He instructs EV203 (Physical Geography) and EV450 (Environmental Decision Making). ★

**MAJ JENNIFER V. THIBEAULT**

Instructor, Environmental Engineering

M.S., Virginia Tech, 2009

M.S., University of Missouri-Rolla, 2005

B.S., United States Military Academy, 1999

Company Commander, C/554<sup>th</sup> Engineer Battalion, 1<sup>st</sup> Engineer Brigade, Fort Leonard Wood, MO

Instructor, General Engineering Division, U.S. Army Engineer School, 1<sup>st</sup> Engineer Brigade, Fort Leonard Wood, MO

Platoon Trainer, Engineer Officer Basic Course, A/554<sup>th</sup> Engineer Battalion, 1<sup>st</sup> Engineer Brigade, Ft. Leonard Wood, MO

Project Engineer, 360<sup>th</sup> Civil Affairs Brigade, Combined Joint Task Force-180, Afghanistan

Company XO, A/62<sup>nd</sup> Engineer BN, 13<sup>th</sup> Corps Support Command, Ft. Hood, TX

Platoon Leader, 68<sup>th</sup> CSE, 62<sup>nd</sup> Engineer BN, 13<sup>th</sup> Corps Support Command, Fort. Hood, TX



MAJ Thibault is an Engineer officer with experience in combat heavy operations and the initial and intermediate levels of officer education at the U.S. Army Engineer School. She served in horizontal and vertical construction units and in various leadership positions for the Engineer junior officer courses. During her deployment to Afghanistan in 2002, she served as the lead project engineer for the humanitarian assistance mission of the 360<sup>th</sup> Civil Affairs Brigade. MAJ Thibault is an environmental engineer with interests in drinking water treatment, groundwater remediation, and solid waste management. She teaches EV203 (Physical Geography) and EV350 (Environmental Technologies). ★

**MAJ WILLIAM C. WRIGHT**

Assistant Professor, Geospatial Information Science

M.S., University of Florida, 2008

B.S., United States Military Academy, 1999

Commander, Delta Troop, 5-15 Cavalry Squadron, Fort Knox, KY, 2004-06

Assistant G-3, Combat Training Center, JRTC, Fort Polk, LA, 2004

Assistant S-3, 3/3 ACR, Iraq, 2003

Squadron Maintenance Officer, 3/3 ACR, Fort Carson, CO, 2001

Executive Officer, K/3-3 ACR, Fort Carson, CO 2000-01

Tank Platoon Leader, K/3-3 ACR, Fort Carson, CO, 2000

Platoon Leader, Howitzer Battery, 3/3 ACR, Bosnia, 2000



MAJ Wright is an Army Space Operations officer who has held positions in cavalry units at squadron level and below. He deployed to Iraq in 2003 with 3/3 Armored Cavalry Regiment where he served as an assistant squadron S-3 and deployed to Bosnia in 2000 where he served as a peace-keeping platoon leader. His academic interests include LiDAR (specifically Airborne Laser Swath Mapping), global positioning systems, and geographic information systems. Most recently, his research was of specific interest to the Army research office where he used GPS and LiDAR data to quantify L-band signal attenuation caused by forest canopy. MAJ Wright teaches EV203 (Physical Geography), EV378 (Cartography), EV380 (Surveying), and EV398 (Geographic Information Systems). ★

## EMERITUS FACULTY

### **DIRTMAN**

Professor of Physical Geography and the Spirit of  
the Department of G&EnE

Ph.D., United States Military Academy, 1959

M.S., United States Air Force Academy, 1959  
(top graduate)

M.S., United States Naval Academy, 1845  
(top graduate)

B.S., United States Military Academy, 1802 (goat)

P.E., Commonwealth of Virginia, 1802



Dirtman is a retired department faculty member currently residing on the rooftop of Washington Hall (near the Weather Station) and is known to spontaneously rally cadets enrolled in EV203, "Dirt," to support Army athletic teams on the fields of friendly strife. As a former Army officer, he has served in every climatic regime known to man. He is an expert in geomorphology with a special interest in plate tectonics. He is currently involved in advanced studies of weather systems and enjoys the passage of wave cyclones and occluded fronts. He has personally experienced all known environmental hazards including tornadoes, hurricanes, earthquakes, tsunamis, volcanic eruptions, and williwaws. Of particular note, his volcanic encounter in 1980 in Washington State occurred shortly after he was subducted under the North American Plate. As an emeritus faculty member, he is in charge of the morale and welfare of the department faculty as well as all cadets enrolled in EV203. ★



Legendary Dirtman marches along with the West Point Band during the annual March Back for the Class of 2014.



Dr. Siska poses with cadets outside the Maison Prison in Hanoi, Vietnam. This is the facility where Senator John McCain was held as a POW during the Vietnam War.



Cadets in EV380 (Principles of Surveying) train on the Global Positioning System in preparation for a Surveying Lab.



GIS majors get hands-on practical experience on the Remote Sensing Workstations located in our state of the art Geographic Sciences Laboratory.



CDT Michael Tovo visits with minorities from the Hmong Tribe located in northwestern Vietnam.



"Water For People" AIAD in Honduras - Cadets tour a century-old coffee plantation via horseback to learn about Honduran sustainable agriculture practices.



CDT Jordan Pleasants takes an *in situ* measurement with a static cone penetrometer on a drop zone.

# FIRST REGIMENT MAJORS

## COMPANY A1

11 COPPOLA, VINCENT	GIS
11 HUGGINS, JESSICA	EV SCI
11 JOANOS, ZACHARY	GIS
11 MCALISTER, MICHAEL	EV ENG
11 MYHRE, REMINGTON	EV GEO
12 BAYER, NICHOLAS	GIS
12 JOHNSON, CHRISTINA	EV ENG
12 MCCARTHY, CONNOR	EV GEO
12 SEXAUER, JESSICA	GIS
12 WEIR, HUGH	GIS

## COMPANY E1

11 HOKENSON, MARIE	HUMAN GEO
11 KENNEDY, OLIN	HUMAN GEO
11 KLUG, JEFFREY	EV GEO
11 MORAVEC, RYAN	EV ENG
11 MULHOLLAND, PATRICK	HUMAN GEO
11 SILL, OWEN	EV GEO
12 GIRAUD, ALEXANDRA	HUMAN GEO

## COMPANY B1

11 CALLAWAY, JOSEPH	HUMAN GEO
11 KIESCHNIK, CHRISTOPHER	GIS
12 NORDT, MARCIE	EV ENG
12 ORVIK, KAYLA	EV GEO
12 OWENS, JORDAN	GIS
12 STANLEY, DEREK	EV ENG

## COMPANY F1

11 CALVERT, SAMUEL	EV ENG
11 LULL, KENRIC	EV SCI
11 MURPHY, ERIC	EV GEO
12 BAILEY, BRIANA	HUMAN GEO
12 DONOHUE, KRISTINA-NOEL	HUMAN GEO
12 MILLS, DANIEL	HUMAN GEO

## COMPANY C1

11 DE LEEUW, THEODORE	GIS
11 HELIS, CORBIN	EV SCI
11 MOORE, GUICE	EV ENG
11 OSMAN, HAIDAR	EV SCI
12 BENNETT, AUSTIN	HUMAN GEO
12 BOSWELL, AUBREY	EV SCI

## COMPANY G1

11 BOLTZ, ELLIOTT	HUMAN GEO
11 SMITH, TY	EV SCI/EV GEO
12 BAILEY, JOSEPH	EV ENG
12 ODUNZE, CHISOM	EV SCI
12 SHEETS, ASHLEIGH	HUMAN GEO

## COMPANY D1

11 AMMON, JOSEPH	EV GEO
11 COLBERT, WILLIAM	HUMAN GEO
11 FUENTES, DOMINICK	HUMAN GEO
11 WHITLER, JAMES	EV GEO
11 WILLIAMS, REGINALD	HUMAN GEO
12 GORDON, DANIEL	HUMAN GEO
12 MITCHELL, MICHAEL	GIS
12 ROSS, JARIETTA	EV SCI
12 SCHNORF, STEPHEN	HUMAN GEO

## COMPANY H1

11 DARDEN, MICHAEL	HUMAN GEO
12 BOYD, MATTHEW	GIS



Department of Geography and Environmental Engineering

United States Military Academy



## SECOND REGIMENT MAJORS

### COMPANY A2

10 VINCENT, JEFFERY	HUMAN GEO
11 COX, ALAN	EV GEO
11 DAVIS, ARYN	EV GEO
11 GINTHER, SCOTT	HUMAN GEO
11 KORMAN, AARON	EV GEO
11 MAXWELL, ANDREW	EV GEO
11 MCKEEVER, JOSEPH	GIS
11 RAY, MATTHEW	EV SCI
11 SMITH, JUSTIN	GIS
11 TEMME, JOHN	HUMAN GEO
11 YOST, THEODORE	GIS
12 BURKE, MATTHEW	EV ENG
12 JONES, AARON	GIS
12 MILLER, BRANDTEN	HUMAN GEO
12 TORO, CLIFFORD	GIS

### COMPANY B2

11 KASONY, BRENDAN	GIS
11 KING, BENJAMIN	EV GEO
11 PURYEAR, JOHN	GIS
11 SINGER, NICOLE	HUMAN GEO
12 BECKER, MICHAEL	EV SCI
12 COFFEY, TRAVIS	GIS

### COMPANY C2

11 LIESENFELT, MEGAN	EV ENG
11 NELSON, BRIAN	EV SCI
11 RISSBERGER, MICHAEL	EV ENG
12 KOSZALKA, DANIEL	HUMAN GEO
12 REILY, SCOTT	EV ENG
12 SAUNDERS, COREY	EV GEO

### COMPANY D2

11 HIRSCHHEY, TAYLOR	EV ENG
11 NELSON, EVAN	EV ENG
11 YBARRA, CHARLES	GIS
12 WORTH, MARY ELIZABETH	HUMAN GEO

### COMPANY E2

11 GROSS, DUSTIN	EV SCI
11 MATTHEWS, DAVID	HUMAN GEO
11 MCKNIGHT, BRENDAN	HUMAN GEO
11 RATH, CHRISTINA	EV ENG
11 SMITH, SHANE	HUMAN GEO
12 REDDING, DEVIN	EV SCI
12 SANTOS, CALVIN	GIS

### COMPANY F2

11 CHERE, MICHAEL	EV SCI
11 COPELAND, PATRICK	EV GEO
11 JUNG, WILLIAM	EV GEO
11 SOLOMON, ERIC	GIS
12 KIM, KLARA	HUMAN GEO
12 REITTER, JAMES	HUMAN GEO

### COMPANY G2

11 HALL, RENNER	GIS
11 MASAITIS, CHARITY	EV SCI
11 PENNINGTON, JACE	EV GEO
11 TRUMP, JASON	EV GEO
12 BAUGHMAN, DANIEL	EV SCI
12 DARSEY, JAKE	EV ENG
12 DUBE, MARK	EV GEO
12 GREAUX, MICHELLE	HUMAN GEO
12 GREENWOOD, KEMPTON	HUMAN GEO
12 JOHNSON, HALEY	EV ENG
12 LAWLER, SHANLEY	HUMAN GEO
12 MCCLELLAND, SCOTT	EV GEO
12 ROSENBERGER, LEIGH	EV SCI
12 SCHNEIDER, BENJAMIN	EV SCI

### COMPANY H2

11 BONDS, JOHN	HUMAN GEO
11 HOFFMAN, CURTIS	HUMAN GEO
11 PARK, PAUL	EV ENG
11 PEARCE, TAYLOR	EV SCI
11 TINSLEY, TIMOTHY	GIS
12 LANKFORD, ZACHARY	HUMAN GEO
12 PHAM, CHARLES	EV ENG

# **THIRD REGIMENT MAJORS**

## **COMPANY A3**

10 HASHIM, MUHAMAD	EV GEO
11 HUNKLER, CHELSEA	EV SCI
11 LAMBERT, BENJAMIN	EV GEO
11 MENDEZ, JUAN	EV ENG
11 PROPST, PARKER	HUMAN GEO
11 SIEGER, DAVID	EV GEO

## **COMPANY E3**

11 BARONE, KYRA	EV SCI
11 CLARK, JAY	EV SCI
11 CUNNINGHAM, DANIEL	GIS
11 GLEASON, JAMES	GIS
11 JENSEN, BRITTANY	HUMAN GEO
12 LEE, MARK	GIS
12 STEIMEL, JASON	HUMAN GEO
12 SUMMERLIN, LEE	GIS

## **COMPANY B3**

11 MCCARTY, HANNAH	EV ENG
11 NAGY, ANNIE	HUMAN GEO
11 WOHLERS, JOSHUA	EV GEO
12 MATHEWS, JOSHUA	HUMAN GEO
12 PLEASANTS, JORDAN	EV GEO

## **COMPANY F3**

11 LONG, LACIE	GIS
12 FORERO, LEWIS	GIS
12 MILLER, THADDEUS	HUMAN GEO
12 NIX, DANIEL	GIS
12 SCHUMAN, JEREMY	GIS
12 THOMAS, BENJAMIN	EV SCI
12 VANSICKLE, MICHAEL	EV SCI

## **COMPANY C3**

11 FLORER, SARAH	HUMAN GEO
11 OMILUSIK, CODY	EV GEO
11 PIERSON, THOMAS	EV GEO
12 BRWON, EARL	EV GEO
12 KLEVENSKIY, ALEKSANDR	HUMAN GEO
12 ZIMMERMAN, KYLE	EV SCI

## **COMPANY G3**

11 GORZELNIK, STANLEY	EV ENG
11 PATEL, AMI	HUMAN GEO
11 STALLARD, TONYA	HUMAN GEO
12 HUTCHISON, SEAN	EV ENG
12 JOHNSON, LEILAH	EV SCI
12 PRIEB, GRAHAM	HUMAN GEO

## **COMPANY D3**

12 DICKSON, ETHAN	GIS
12 OSBORNE, JACOB	EV SCI

## **COMPANY H3**

11 CHELEDNIK, RUDY	EV ENG
11 FUJINAKA, ALLEN	HUMAN GEO
11 HEARN, RHYS	GIS
11 KEIMACH, ALEXANDER	HUMAN GEO
11 PAULO, AUGUSTIN	GIS
12 BOWMAN, BENJAMIN	GIS
12 KILBY, MICHAEL	EV ENG
12 MCGINNESS, JOSEPH	GIS

## FOURTH REGIMENT MAJORS

### COMPANY A4

11 KELTON, RYAN	EV ENG
11 LENNON, ROBERT	EV ENG
11 LENNOX, MARK	EV ENG
11 PERIOLA, MATTHEW	EV SCI
11 SLOTTEN, MARIANNE	EV SCI
12 NELSON-EDWARDS, KENDAL	GIS
12 SIMPSON, RICHARD	HUMAN GEO
12 YARMIE, MICHAEL	EV GEO

### COMPANY E4

11 CAMPBELL, KEVIN	GIS
11 GULINO, KEVIN	EV SCI
11 SAUTER, CHARLES	EV ENG
12 GARCIA, NICHOLAS	GIS
12 NAVARRO, CLARA	EV GEO
12 MURPHY, HARRISON	HUMAN GEO
12 PEDERSEN, ERIK	EV GEO
12 SCOTT, ADAM	HUMAN GEO

### COMPANY B4

11 GILBERT, MATTHEW	HUMAN GEO
11 MOORE, LARRY	HUMAN GEO
11 ROBERTSON, AMBER	HUMAN GEO
12 BURGESS, HANNAH	GIS
12 CASTILLEJO, GREGORY	GIS
12 KLEIN, CHRISTOPHER	EV SCI
12 MILLER, JOSHUA	GIS
12 MYERS, MITCHELL	GIS
12 PALMIERI, ZACHARY	HUMAN GEO

### COMPANY F4

11 DIAL, JOSEPH	EV SCI
11 MADDEN, CRYSTAL	GIS
12 FREELAND, NATHANIEL	HUMAN GEO
12 LINTON, ZACHARY	EV SCI

### COMPANY C4

11 COHICK, MARTIN	HUMAN GEO
11 FLORES, CHLOE	EV GEO
11 HERNANDEZ, JESSE	HUMAN GEO
11 LAUGHLIN, JORDAN	GIS
11 MISTR, EVAN	GIS
12 BILLISITS, ANDREW	EV SCI
12 JULIANA, MEGAN	EV GEO
12 LEHARDY, GENE	EV GEO
12 SNUKIS, THOMAS	HUMAN GEO

### COMPANY G4

11 JOHNSON, THOMAS	EV SCI
11 LEEGAN, MATTHEW	GIS
11 PALESKY, THOMAS	GIS
11 THUENEMAN, DANIEL	EV SCI
12 BINKERD, JANA	EV ENG
12 KOOSHIAN, CHRISTIAN	HUMAN GEO
12 MCGOFFIN, MATTHEW	HUMAN GEO
12 WILLIAMS, CEDARIUS	EV SCI

### COMPANY D4

10 SOVIAK, SHAWN	GIS
11 BROWN, TARA	HUMAN GEO
11 BELDEN, PETER	HUMAN GEO
11 MCKAGUE, KEVIN	HUMAN GEO
11 THOMAS, SYLVIA	HUMAN GEO
12 PLAPP, BYRON	GIS

### COMPANY H4

11 HEETHER, DANIEL	EV SCI
11 MCCHRISTAL, JOSHUA	GIS
11 PYTLAR, ALEX	HUMAN GEO
12 ATANGAN, MARK	EV SCI
12 GALLAGHER, ERIC	HUMAN GEO
12 MILLER, KELSEE	EV ENG
12 POTTS, BRADLEY	EV SCI

# West Point Class of 2013 "Defending the Dream"

1:50,000,000

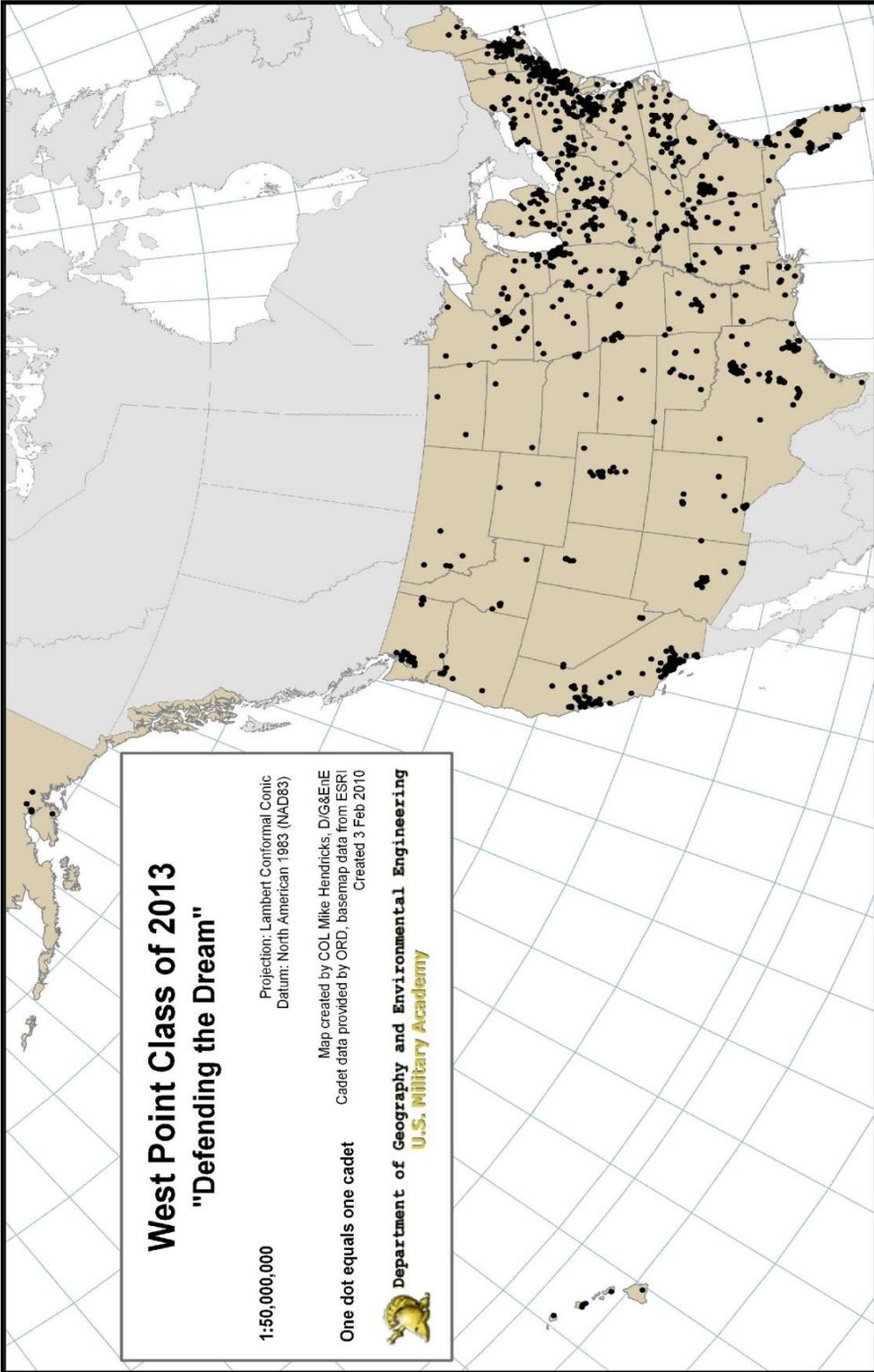
Projection: Lambert Conformal Conic  
Datum: North American 1983 (NAD83)

Map created by COL Mike Hendricks, D/G&E/E  
Cadet data provided by ORD, basemap data from ESRI  
Created 3 Feb 2010

One dot equals one cadet



Department of Geography and Environmental Engineering  
**U.S. Military Academy**



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