

## Karen A. Mulcahy, Ph.D.

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### Areas of Expertise

Cartographic design and production, applied and theoretical Geographic Information Science, software training, technical writing, map projections and datums, graphical design and university instruction.

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### Education

1999	Ph.D. in Earth & Environmental Sciences	Graduate School and University Center, City University of New York	Dissertation: Spatial Data Sets and Map Projections - An Analysis of Distortion
1992	M.A. Geography	Hunter College of the City University of New York: Department of Geography, New York, NY	GPA 4.0/4.0. Geospatial emphasis.
1990	B.A. Geography major, Mathematics minor	Hunter College of the City University of New York: Department of Geography, New York, NY	Summa Cum Laude, GPA 3.88/4.0, class rank 26/751, elected Phi Beta Kappa Departmental Honors in Geography

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### Employment

8/2006 - present	<b>Teaching Assistant Professor</b>	Department of Geography, East Carolina University, Greenville, NC.
	<ul style="list-style-type: none"><li>• <i>Teaching and Advising</i> – Development and delivery of undergraduate and graduate courses in cartography and Geographic Information Systems, the Global Positioning System, spatial data management, map reading, and introductory geography, in classroom and online settings. Advising activities include directing or participating on Master of Arts degree research projects and theses, undergraduate advising, and supervision of internship projects.</li><li>• <i>Departmental Service</i> – <i>Co-Director, Center for Geographic Information Science at ECU</i>, consulting on cartographic design and production and GPS for ECU faculty, staff, and the eastern NC community, cartographic design and production, GIS spatial database development, poster workshops to assist students with designing for professional presentations, maintenance of GPS equipment and software, GPS support as needed, logistical support for GISci center training courses. – Alumni relations and production of Alumni Newsletter: <i>Vectors</i>, member of departmental social committee, faculty advisor to GeoClub and Gamma Theta Upsilon, the Geography Honor Society.</li><li>• <i>University Service</i> – <i>Committee member</i>. Faculty Council on Retention, participation in the development of NCEC the continuously operating reference station (CORS) that is currently included within the NC and national CORS system.</li></ul>	

2003 - present	<b>Sole Proprietor</b>	KAM Mapping, Kinston, NC
	<ul style="list-style-type: none"> <li>• Serving as cartographer and GIS Specialist to provide custom mapping services. Sample projects include development of spatial databases, cartographic design and production for the towns of Maysville, Grifton, and Kenansville NC planning projects. Development of the Official Parking regulations map, GPS data collection and integration, and training services for Nags Head, NC.</li> <li>• Mapping &amp; GIS Team Leader for Clark Planning and Associates.</li> </ul>	
10/2004 – 8/2006	<b>GIS Manager &amp; Planner</b>	County of Greene, Snow Hill, NC
	<ul style="list-style-type: none"> <li>• <i>GIS Responsibilities</i> – Sole support for all mapping and GIS activities in Greene County. Applications include: property mapping, E911 Dispatch Support, emergency services mapping and support, custom mapping, data dissemination.</li> <li>• <i>Planning Duties</i> - subdivision administrator, review officer, Greene County planning board meeting organization and support.</li> <li>• <i>Other duties</i> – Grant writing, development of tourism resources and promotional materials.</li> </ul>	
1997 - 2003	<b>Assistant Professor</b>	Department of Geography, East Carolina University, Greenville, NC.
	<ul style="list-style-type: none"> <li>• <i>Teaching and Advising</i> – Coursework included both undergraduate and graduate courses in digital cartography and Geographic Information Systems, spatial data management, map reading, and introductory geography. Advising activities include directing or participating on Master of Arts degree research projects and theses and undergraduate general advisement.</li> <li>• <i>Research</i> – Developed independent research projects in the area of spatial data quality and map projections. Participated in research projects in evaluating and modeling flooding in Eastern North Carolina. Co-PI for shoreline monitoring project at Ft. Raleigh National Historic Park. Preparation of proposals, reports, journal articles and presentation of results at professional conferences.</li> <li>• <i>Service</i> - A wide variety of duties from departmental to national professional service. <i>Departmental</i> – member of undergraduate committee and search committees; lab coordinator for departmental computer facilities, certificate coordinator for the Undergraduate Certificate Program in Geographic Information Science, Faculty advisor for student activities, and other organizational and initiating activities. <i>University</i> – an alternate representative to the faculty senate, member of the university teaching grants committee, representative to the Arts and Sciences Curriculum committee, co-organizer of the media room for Floyd: A Conference and organizer of the East Carolina GIS/Mapping Users group. <i>Professional</i> – editorial board member of the North Carolina Geographer, co-organizer of a professional seminar on map projections, Rapporteur at the 1997 Global Spatial Data Infrastructure Conference and from 1995 the creation and maintenance of the “Map Projection Home Page”. Reviewing of various journal articles.</li> </ul>	
1992 - 1997	<b>Member of Technical Staff, GIS Group</b>	NYNEX Science & Technology Inc., White Plains, NY.
	<ul style="list-style-type: none"> <li>• Primary assignment was to support NYNEX (New York and New England Telephone) Mobile in its cellular telephony bidding processes. Created digital spatial databases from a variety of sources for numerous cities worldwide: Taipei, Taiwan; Amman, Jordan; four major Indian cities; Jakarta, Indonesia; etc.</li> <li>• Created the request for proposals (RFP) for analog to digital conversion of map data, evaluated responses, supervised the data conversion process, and evaluated data for quality assurance and quality control. Digitized data as necessary. Designed and built spatial databases. Performed analyses of systems using in-house modeling software and prepared maps and reports for bid submissions.</li> <li>• Other assignments include software coding, software documentation, research on spatial data topics and the preparation of technical reports.</li> </ul>	

1996	<b>Adjunct Lecturer</b>	Department of Geography, Hunter College, New York, NY.
	<ul style="list-style-type: none"> <li>• Taught sections of <i>Introduction to the Mapping Sciences</i> and <i>Introduction to Computing for the Geosciences</i>.</li> </ul>	
1993	<b>GIS Consultant</b>	New York City Department of City Planning.
	<ul style="list-style-type: none"> <li>• Contract work consisting of the digitization of the entire New York City shoreline from enlarged aerial photography including the coding for all shoreline types and georegistration of the shorelines with existing digital database.</li> </ul>	
1991-1992	<b>Research Systems Analyst</b>	New York City Districting Commission.
	<ul style="list-style-type: none"> <li>• Member of technical team charged with districting New York City. In 1992 NYC more than tripled its number of City Council districts and employed Geographic Information Systems to evaluate proposed plans from a variety of public sources, as well as developing plans based upon a complex series of criteria. In addition to the development of districting plans; responsibilities also included preparation of detailed analyses of the plans, map design, and preparation of US Department of Justice submissions.</li> </ul>	
1990	<b>Adjunct Lecturer</b>	Department of Geography, Hunter College, New York, NY.
	<ul style="list-style-type: none"> <li>• Taught laboratory sections of <i>Weather and Climate</i> course.</li> </ul>	
1989-1990	<b>Computer Laboratory Technician</b>	Spatial Analysis & Remote Sensing Laboratory, Department of Geography, Hunter College. New York, NY.
	<ul style="list-style-type: none"> <li>• Assisted with maintenance of UNIX based computer laboratories and provided software and hardware support.</li> </ul>	
1990	<b>Cartographic Intern</b>	National Geographic Society, Washington, D.C.
	<ul style="list-style-type: none"> <li>• Researched the effective scales for digital databases used for National Geographic locator maps using ESRI ©ArcInfo software. Updated digital spatial databases as needed. Produced Antarctic base map employed for National Geographic Kids magazine.</li> </ul>	
1989	<b>GIS Consultant</b>	Toxics Targeting, Ithaca, NY.
	<ul style="list-style-type: none"> <li>• Created proof of concept for a digital spatial database for the development of a service based firm specializing in the identification of environmental toxins for residential customers. Required self-training on ESRI ©ArcInfo software, intensive reformatting and manipulation of a variety of data formats obtained via Freedom of Information requests, development of database in ©ArcInfo and the design and production of maps and reports.</li> </ul>	

## Publications

Forthcoming

Mulcahy, K. A. "Tissot's Indicatrix" in *The History of Cartography, Volume 6: Cartography in the Twentieth Century*. Ed. Monmonier, M., Assoc. Eds. Cook, K. and Morrison, J. University of Chicago Press.

2008 Mulcahy, K. A. Digital Data Collection and Analysis of Neuse Subbasin 07 for Water Quality Improvements and Linear Park System. Final Report. North Carolina Clean Water Management Trust Fund Grant 2005B-810.

2002 Seong, J. C., Mulcahy, K. A. and Usery, E. L, [The Sinusoidal Projection: A New Importance in Relation to Global Image Data](#). *The Professional Geographer*, 54: 218–225

- 2002 Wang, Y., Colby, J. D., and Mulcahy, K. A. An efficient method for mapping flood extent in a coastal floodplain using Landsat TM and DEM data. *International Journal of Remote Sensing*. 23(18), 3681-3696.
- 2001 Mulcahy, K. A. "[Two New Metrics for Evaluation of Pixel Based Change in Data Sets of Global Extent due to Projection Transformations.](#)" *Cartographica*. Vol. 37, No. 2. Summer 2000. Published October 2001.
- 2001 Mulcahy, K. A. and K. C. Clarke. "[Symbolization of Map Projection Distortion: A Review.](#)" *Cartography and Geographic Information Science*. Vol. 28, No. 3, pp. 167-181.
- 2001 Mulcahy, K. A. "Map projections; how maps are made; new technologies." *Encyclopedia of World Geography*. Salem Press, Inc.
- 2001 Wang, Y., Colby, J.D., and Mulcahy, K. A. "[An Efficient Method for Mapping Floodplain Extent in a Coastal Floodplain Integrating Landsat TM and DEM Data.](#)" *International Journal of Remote Sensing*.
- 2001 Wang, Y, Colby, J. and Mulcahy, K. A. "Mapping Flood Extent in Tar River Basin within Pitt County of North Carolina by River Gage and Topographic Data." *In the Aftermath of Hurricane Floyd: Impact in the Coastal Plain*. Maiolo, J.R., Johnson, J.C., and J.C., Whitehead, eds., Wilmington: Coastal Carolina Press.
- 2000 Colby, J. D., Mulcahy, K. A., and Wang, Y. [Modeling flooding extent from Hurricane Floyd in the coastal plains of North Carolina.](#) *Global Environmental Change Part B: Environmental Hazards*. 2(4), 157-168.
- 2000 Mitchelson, R. and Mulcahy, K. A. "The North Carolina Atlas: Portrait for a New Century." A Review. *The North Carolina Geographer*. Vol. 8.
- 1999 Mulcahy, K. A. "A Brief Commentary: Floyd's Frustrations." Statistical Review of the State. *The North Carolina Geographer*. Vol. 7.
- 1999 Colby, J.D., Mulcahy, K.A., and Wang, Y., Documenting Flooding Extent due to Hurricane Floyd using Landsat 7 TM Satellite Imagery. Field Report to the Natural Hazards Research Center, University of Colorado.
- 1999 Mulcahy, K. A. "[Spatial Data Sets and Map Projections: An Analysis of Distortion.](#)" Ph.D. Dissertation. Graduate School and University Center, City University of New York, New York, NY. DAI-A 60/01, p. 210.
- 1998 Mulcahy, K. A. "Who, Where? North Carolina Demographics." Statistical Review of the State. *The North Carolina Geographer*. Vol. 6, Summer.
- 1997 Mulcahy, K. A. "[Map Projections and Spatial Referencing for Global Data Sets.](#)" University Consortium for Geographic Information Science Annual Assembly and Summer Retreat Proceedings. <http://www.spatial.maine.edu/ucgis/testproc/mulcahy/mulcahy.html>. Bar Harbor, ME.
- 1995 Mulcahy, K. A. and K. C. Clarke. "[What Shape Are We In? The Display of Map Projection Distortion for Global Change Research.](#)" GIS/LIS '95 Annual Conference Proceedings. Bethesda, MD: ASPRS and ACSM, pp. 770-778.
- 1995 Clarke, K. C. and K. A. Mulcahy. "[Distortion on the Interrupted Modified Collignon Projection.](#)" GIS/LIS '95 Annual Conference Proceedings. Bethesda, MD: ASPRS and ACSM, pp. 175-181.
- 1994 Mulcahy, K. A. and K. C. Clarke. "[Government Digital Cartographic Data Policy and Environmental Research Needs.](#)" *Computers, Environment and Urban Systems*, Vol. 18, No. 2, pp. 95-101.
- 1993 Boguchwal, L., Krzanowski, R., Mulcahy, K. A. and Theisen, G. "Analysis of New York and New England 1993 Proposed Cell Sites." NYNEX Science and Technology, Inc. Resource Publication, NYNEX: White Plains, NY.
- 1991 Mulcahy, K. A. "[The Creation of a Digital Cartographic Database for Locator Maps.](#)" *The Geographical Bulletin*. University of Michigan, Vol. 33, No. 2, pp. 98-104.

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## Recent Presentations

- Mulcahy, K. A. (2008, March). *Web-based GIS and Cartography*. Invited presentation at ECU GIS Workshop, Greenville, NC. **Description:** Web-based GIS and Cartography
- Mulcahy, K. A. (2007, October). *GIS and Mapping*. Invited presentation at Hope Middle School. Ms. J. Mullins 6th grade class, Greenville, NC. **Description:** Community presentation to middle school students to enhance their studies of maps and geographic information systems.
- Mulcahy, K. A. (2007, June). *From Sputnik to GPS: A brief history of the development of the Global Positioning System and an overview of its functioning*. Invited presentation to a meeting of the Professional Engineers of North Carolina, Greenville, NC. **Description:** Presentation addressing the history, architecture and basic technology of modern GPS. Examples presented with a discussion of applications

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## Award and Grant Activities

- 2010 –11 Participation in FEMA grant to Develop and Implement a Pre-Disaster Mitigation (PDM) Planning Process for the UNC Campuses.
- 2007 Marcucci, D., Blizzard, A., & Mulcahy, K., "Mid-Currituck Bridge Toll Bridge Study - Task 1, Natural," Performing cartographic analysis and design for Task 1. North Carolina Department of Transportation. Summer & Fall 2007.
- 2007 Mulcahy, K. A. Digital Data Collection and Analysis of Neuse Subbasin 07 for Water Quality Improvements and Linear Park System. North Carolina Clean Water Management Trust Fund, (\$27,000).
- 2005 North Carolina's 2005-2006 Adopt-A-Trail Grant. \$5,000. Contentnea Creek Paddle Trail, Greene County Section. Funded & Completed.
- 2005 North Carolina's 2005-2006 Recreational Trails Grant. \$40,000. Walking Trails for Greene County Recreational Park. Funded & Completed.
- 2001 Co-PI - Shoreline Monitoring at Ft. Raleigh National Historic Park. National Park Service - SER Outer Banks Group. Q519000005. 10/1/00 - 9/30/01.
- 2001 Development of Laboratory Exercises that Teach Cartographic Theory. East Carolina Teaching Grants Committee 2000. Summer Stipend 2001. Completed.
- 1999 Co-PI. - (w/Dr. Y. Wang, and Dr. J. Colby) Documenting flooding extent due to hurricane Floyd using Landsat 7 TM satellite imagery, funded by the Natural Hazards Research and Applications Information Center, 10/01/99 - 09/30/00, \$1,400. Completed.
- 1997 Proposal for Alterations to cartographic laboratory. Campus Renovation Committee. 10/24/97. \$6,000. Funded and completed.

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## Published Maps

- 2011 "Overview," "Nogales" and "Brownsville" maps in *The Fence: Human Smuggling, Terrorists, and Public Safety along the US Mexico Border*, Robert Lee Maril, Texas Tech University Press. March, 2011.
- 2007 "Snow Hill, Hookerton, & Walstonburg" Map published in *Greene Living Magazine*. Pub. Mitchell Oakley, The Standard Laconic. Snow Hill, NC. Vol. 3. pp. 20-21. December 2007.
- 2006 Mulcahy, K. A. "Winterville", in *The Winterville Magazine. Coming of Age*. Pub. Mitchell Oakley, The Times Leader, Grifton, NC. Vol. 2, No. 1, 2005-06, pp16-17.
- 2005 Mulcahy, K. A. "Ayden", in *The Ayden Magazine. Excellence in Education*. Pub. Mitchell Oakley, The Times Leader, Grifton, NC. Vol. 2, No. 2, 2005-06, pp26-27.

- 2005 Mulcahy, K. A. "Bangladesh", in *The Geographical Journal*. Vol. 171, Issue 3, Pg. 195. September 2005.
- 2004 Mulcahy, K. A. "The Caribbean Sea" in *Southeastern Geography Special Issue*. Vol 45(2), 165-173.
- 2004 Mulcahy, K. A. "Quintana Roo, Mexico". in *Annals of the Association of American Geographers*. Vol. 95(2). Pg 314-335.
- 2004 Mulcahy, K. A. "Snow Hill, Hookerton, & Walstonburg." In *Greene Living Magazine*. Pub. Brenda Chambers, The Standard Laconic. Snow Hill, NC. Vol. 1, No. 1. pp. 18-19. June 2004.

## University Teaching (over 14 years experience)

### Graduate

Advanced Geographic Information Systems, ECU & Advanced Cartography, ECU

### Upper Undergraduate

Geographic Information Systems II, ECU  
 Advanced Cartographic Design and Production, ECU  
 Introduction to the Global Positioning System, ECU  
 Introduction to GIS in Planning, ECU  
 Independent studies in GIScience, ECU  
 Computer Mapping, ECU

### Lower Undergraduate

Peoples, Places and Environments, ECU  
 Spatial Data Management, ECU  
 Fundamentals of GIS, ECU  
 Map and Aerial Photo Interpretation, ECU  
 Introduction to the Mapping Sciences, Hunter College  
 Introduction to Computing for the Geosciences, Hunter College

## Software Trainer Activities

### Instructor

Introduction to ArcGIS. Nags Head, NC. July 5 – 6, 2007.

### Assistant Instructor ArcGIS Authorized Training

- ArcGIS II: Tools & Functionality. East Carolina University Center for Geographic Information Science. December 15-17, 2008.  
 Introduction to Geoprocessing Scripts using Python. East Carolina University Center for Geographic Information Science. October 13-14, 2008.  
 Advanced ArcGIS (ArcGIS II) East Carolina University Center for Geographic Information Science. July 14-16, 2007  
 Introduction to Geoprocessing Scripts using Python. East Carolina University Center for Geographic Information Science. May 2008.  
 Introduction to Geoprocessing Scripts using Python. East Carolina University Center for Geographic Information Science. January 7 - 8, 2008.  
 ArcGIS I. East Carolina University Center for Geographic Information Science. October 15 – 16, 2007.  
 ArcGIS I. East Carolina University Center for Geographic Information Science. June 18 –19, 2007.  
 ArcGIS I. East Carolina University Center for Geographic Information Science. March 10 –11, 2007.

## Recent Professional Development Activities

05/25/2011	ArcGIS Desktop II Tools and Functionality (3 day training for ArcGIS version 10).	Center for Geographical Information Science, East Carolina University
2011 Fall-Spring	New technology implementation: Turning Point Clicker system.	People, Places and Environment course, Department of Geography, East Carolina University
05/23/2011	Centra Training and Integration Course: A web conferencing virtual meeting environment which provides both live and recorded sessions.	Information Technology & Computing Services, East Carolina University
2011 Spring	New technology implementation: evaluation of LanSchool software for computer teaching laboratory space.	For Fundamentals of Geographic Systems and Advanced Cartography courses, Department of Geography, East Carolina University

02/17/2011	2011 NC GIS Conference: Thinking Spatially, Connecting Globally (2 days)	Raleigh, NC
2010 – 2011	New technology implementation: evaluation of tablet based computer for electronic grading of student work submissions combined with evaluation of preparation of course notebooks via Microsoft OneNote and cloud-based storage.	For Fundamentals of Geographic Systems and Advanced Cartography courses, Department of Geography, East Carolina University
08/ 2010	Full day training on Trimble RTK GPS Equipment	Duncan-Parnell, Morrisville, NC
08/02/2011	Using 21 <sup>st</sup> Century Tools, Teaching with Technology (week long seminar)	Center for Faculty Excellence, East Carolina University
07/2010	GPS Training, Theoretical and Practical Application	NC Surveyor's Society
2010 Webinars	GPS for GIS Data Collection GPS Constellation & More	GPS World. MarketInsight Webinar Series
03/05/2009	Faculty Advising Training Workshop	Academic Advising & Support Center, East Carolina University
Spring 2009	Graphic Design II (semester long course)	College of Communication and Fine Arts, East Carolina University
02/19/2009 – 02/20/2009	2009 NC GIS CONFERENCE - Capitalizing on Spatial Data	Raleigh, NC
01/30/2009	Introduction to Second Life	Information Technology & Computing Services, East Carolina University
01/07/2009 – 01/08/2009	Collegiate Learning Assessment, Teaching, Learning, and Authentic Assessment in the Classroom	Center for Faculty Excellence, East Carolina University
12/15/2008 – 12/17/2008	Authorized ESRI Training Course: ArcGIS Desktop II: Tools and Functionality	Center for Geographic Information Science. East Carolina University. Scott Wade Instructor
09/02/2008	Active and Inquiry-based Learning	Center for Faculty Excellence, East Carolina University
Fall 2008	Graphic Design I (semester long course)	College of Communication and Fine Arts, East Carolina University
07/09/2008 – 07/10/2008	GPS Training – Terrasync	Duncan-Parnell, Morrisville, NC
07/11/2008 – 07/12/2008	GPS Training – ArcPad for Mobile GIS	Duncan-Parnell, Morrisville, NC
2008	5 <sup>th</sup> ECU Conference on Service Learning.	Center for Faculty Excellence, East Carolina University
2008	Threat Assessment Training for Faculty and Staff	East Carolina University
02/01/2008	Writing Your Statement of Teaching Philosophy	Center for Faculty Excellence, East Carolina University
01/07/2008	Authorized ESRI Training Course: Introduction to Geoprocessing Scripts using Python	Center for Geographic Information Science. East Carolina University. Scott Wade Instructor
10/2007	Faculty Advising Training Workshop	Academic Advising & Support Center, East Carolina University
10/15/2008 – 10/16/2008	Authorized ESRI Training Course: Introduction to ArcGIS I	Center for Geographic Information Science. East Carolina University. Scott Wade Instructor

## Awards and Honors

- 2010 Centennial Award for Excellence. As member of ECU CORS (Continuously Operating Reference Station) Site Team for Development of NCEC, ECU's CORS base station.
- 1999 Induction to the SEEK Hall of Fame. Hunter College, New York, NY.
- 1996 Helena Rubenstein Foundation Tuition Grant. Graduate School and University Center - University Fellowship.
- 1995 Summer School for Earth Sciences PROCESSES OF GLOBAL CHANGE, July 17-21  
Department of Defense National Science & Engineering 1995 Graduate Fellowship, Honorable Mention.
- 1992 NYNEX- The 1992 Chairman's Award for World Class Performance.
- 1990 Inducted to Phi Beta Kappa Honor Society. Scholarship, Scholarship & Welfare Fund of the Alumni Assoc. of Hunter College. Jewish Foundation for the Education of Women, Grant for Graduate Study, Fall 1990, S FL Chapter. AAG MS/NESTAVAL Region Graduate Student Paper Contest. Awarded NGS Internship for Summer 1990. NCGE Undergrad Award for Outstanding Scholarship in Geography. Mrs. R. D. Sterling Award, Women's National Farm & Garden Assoc.

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## Certifications & Affiliations

Phi Beta Kappa Honor Society, Phi Beta Kappa celebrates and advocates excellence in the liberal arts and sciences.

Gamma Theta Upsilon Honor Society, An international honor society in Geography.

2005 NCPMA-Sponsored Certification--Mapper NC Property Mappers Association. [ncpropertymappers.org](http://ncpropertymappers.org)

## Selected Computer Software and Hardware Proficiencies

OS – Windows XP, 7, Windows Mobile 5, 6.

ArcGIS Desktop, versions 9.3, 10

ArcGIS Online, ArcGIS Explorer, Google Earth Professional, Google Maps

Trimble Terrasync, Pathfinder Office, Survey Controller, and Geomatics Office

Adobe Creative Suite version 5

Office software (Excel, Word, PowerPoint, Outlook, OneNote)

GNSS hardware – Mapping Grade: Trimble Recon, XT Edition, GeoXT.

GNSS hardware – Survey Grade: R6 GPS Receiver, TSC2 Controller, HPB450 radio modem (for Real Time Kinematic data collection).