



Mount Katahdin

The TIEMS USA 2017 Annual Conference
Emergency Management, Homeland Security, and
Computing
University of Maine
June 12-16, 2017
Compact Final Program

George Markowsky

June 13, 2017

Contents

1	Introduction	3
1.1	Welcome	3
2	Monday – June 12, 2017	4
2.1	Location: 107 DPC – Business Building	4
2.2	Schedule	4
2.3	Cybersecurity Tutorial	4
2.4	Virtual Reality Tutorial	5
3	Tuesday – June 13, 2017	6
3.1	Location: 100 Neville Hall	6
3.2	Schedule	6
3.3	Abstracts	6

3.3.1	Introduction to the TIEMS Academy	6
3.3.2	Panel Discussion	7
4	Wednesday – June 14, 2017	8
4.1	Location: 100 Neville Hall	8
4.2	Schedule	8
4.3	Abstracts	8
4.3.1	Cybersecurity Challenges in the Public Sector	8
4.3.2	Overview of Crisis Management Software – Open Source and Commercial	9
4.3.3	InfraGard: An Alliance to Improve your Cyber Defenses and a Case Review	9
4.3.4	The Role of the Maine Information and Analysis Center in Responding to Emergent Events	9
5	Thursday – June 15, 2017	10
5.1	Location: 100 Neville Hall	10
5.2	Schedule	10
5.3	Abstracts	10
5.3.1	Improvise, Adapt and Overcome: One State’s Plan for Mutual Aid Coordination	10
5.3.2	Augmented Reality Applications and First Responders	11
5.3.3	Cyber Attacks on Power Grids	11
5.3.4	The Metric at the End of the Rainbow	11
5.3.5	Deception in Web Application Honeypots	12
5.3.6	Tabletop exercises should be interesting and realistic?	12
5.3.7	Developing a Risk Assessment Model to Quantify Distribution and Uptake of Persistent Organic Pollutants in Glacial Outflows	12
6	Friday – June 16, 2017	14
6.1	Schedule	14
7	Speaker Bios	15
7.1	Frank Appunn	15
7.2	Randall Berry	15
7.3	Charles Carter	15
7.4	Kåre Harald Drager	16
7.5	Matthew P. Dube	17
7.6	Tony Enerva	17
7.7	Marc Glasser	18
7.8	Kay Goss	19
7.9	Tora Johnson	19
7.10	Michael Johnston	19
7.11	Troy Jordan	19

7.12	Wayne M. Maines	20
7.13	George Markowsky	20
7.14	Vilma Schifano Milmoe	20
7.15	Jeffrey J. Morrissette	21
7.16	Banyatsang Mphago	21
7.17	W. Vince Quintana	22
7.18	Thomas Robertson	22
7.19	Ray Soucy	23

1 Introduction

1.1 Welcome

Homeland security events often lead to emergency management situations. As with many other disciplines, computing is playing an ever more important in emergency management. Different aspects of computing, such as cybersecurity, modeling, and virtual reality are important both for protecting critical assets, for preparing for disasters, and for training.

This year, the TIEMS USA Annual Conference is dedicated to the theme Emergency Management, Homeland Security, and Computing. Presentations from US and international leaders will provide unique insights on these important topics, and interactive sessions will create an exceptional opportunity to discuss local and international perspectives. Please join us and add your ideas to the discussion. Learn, network, and enjoy beautiful Maine in the summer!

The talks are free and open to the public. The lunches, receptions, dinner, and excursion are available if space is available and for a fee. Please check with Prof. George Markowsky if you are interested in participating in these other activities.

I would like to acknowledge the sponsorship of this conference by the University of Maine System and the University of Maine Cybersecurity Lab.

2 Monday – June 12, 2017

2.1 Location: 107 DPC – Business Building

2.2 Schedule

8:30 AM - 9:00 AM Registration DPC Lobby

9:00 AM - 10:20 AM **Cybersecurity Tutorial** Part 1 by George Markowsky

10:20 AM - 10:40 AM **Coffee Break**

10:40 AM - Noon **Cybersecurity Tutorial** Part 2

Noon - 1:30 PM **Lunch** – Hilltop Cafeteria

1:30 PM - 2:50 PM **Virtual Reality Tutorial** Part 1 by Chuck Carter

2:50 PM - 3:10 PM **Coffee Break**

3:10 PM - 4:30 PM **Virtual Reality Tutorial** Part 2

4:30 PM - 6:00 PM **Reception at the Hudson Museum – Non-Registered Participants talk to G. Markowsky**

2.3 Cybersecurity Tutorial

This tutorial will be divided into three parts. The first part will deal with cyberwarfare and cybercrime, the second part will survey some of the tools and techniques used for cyberoffense and cyberdefense. The third part will show how to set up your own cybersecurity lab.

In the first part of this tutorial, we will show that cyberwarfare can be thought of as the latest embodiment of military intelligence. The ubiquity of computing devices has blurred the distinction between kinetic and non-kinetic forms of warfare. This tutorial will survey the precursors of cyberwarfare, the current state of cyberwarfare and some scenarios for how it might develop in the future. We will discuss how cyberwarfare relates to cybercrime, terrorism, hacktivism, and citizen action. We will also name the most active parties in the cyberwar space and what their strategies are. Cyber warfare is a real phenomenon and is a major force in the political landscape. Cyber warfare has the capability to engage the individual citizen. We will discuss how people can avoid being collateral damage in the constant cyber warfare that is taking place on the Internet.

In the second part of the tutorial, we will discuss some key concepts necessary for understanding cybersecurity. These include some basic networking concepts such as IP addresses, protocols, scanning and packet captures. Exercises will include reading and understanding simple scanning results and packet captures.

The third part of the tutorial will discuss the building of a cybersecurity lab based on Kali Linux. From 2006 through 2012, a group called Offensive Security put out a series of collections of hacking tools that were called BackTrack. BackTrack Version 5

was released on August 13, 2012 and contained over 300 penetration testing (“hacking”) tools. Offensive Security decided to revise their entire approach and on March 13, 2013 the first version of their revised toolkit, Kali 1.0, was released. We will discuss the use of virtual machines in building a cybersecurity lab and experimenting with some of the material presented in the first two parts of the tutorial. All the tools discussed in this tutorial are open source and available free of charge. No prior cybersecurity experience is required to attend this tutorial.

OBJECTIVES

To survey the cyberwarfare, cybercrime and cybersecurity landscape and to a better understanding of what is happening out in cyberspace. To provide basic knowledge of some key concepts in cybersecurity. To provide basic knowledge that can be used for protection in cyberspace. To provide instruction on how to set up a comprehensive, personal cybersecurity lab that can be used for further study.

INTENDED AUDIENCE

Anyone interested in cybersecurity who would like to gain some understanding of what is happening behind the scenes. The tutorial contains a lot of valuable information that is accessible to people who do not have a technical background, as well as technical information that can help people get started exploring this fascinating area on their own.

2.4 Virtual Reality Tutorial

(VR - What is it?) In this portion of the conference Chuck Carter from Eagre Games will discuss how new off the shelf game software can be used by literally anyone desiring to make VR products, games and experiences with little to no knowledge of programming or art. Software like Unreal Engine leads the way for the vast majority of immersive and real time gaming and VR movie making projects. The ease of use for early adopters looking to make VR based content is opening the door to virtually anyone who has a fast computer and one of the many commercial headsets readily available. Carter will show why this is important and just how easy it is to make your own VR projects.

3 Tuesday – June 13, 2017

3.1 Location: 100 Neville Hall

3.2 Schedule

8:00 AM - 8:30 AM Registration Neville Hall Lobby

8:30 AM - 9:25 AM Opening Session

- Welcome to the University of Maine–Provost Hecker
- Welcome by TIEMS President Harald Drager
- Welcome by TIEMS USA President Kay Goss
- Logistics, Overview of the Conference George Markowsky

9:25 AM - 10:10 AM Harald Drager – “The International Emergency Management Society – Focus on more Resilient Societies Worldwide”

10:10 AM - 10:30 AM **Coffee Break**

10:30 AM - 11:15 AM Kay Goss – “The Future of Emergency Management: Technology, Training, Standards, Certifications, and Accreditation”

11:15 AM - Noon Vilma Schifano Milmoie – “New Perspectives on Emergency Management”

Noon - 1:30 PM **Lunch** – Hilltop Cafeteria

1:30 PM - 1:40 PM Introduction to Session 2

1:40 PM - 2:25 PM George Markowsky – “Introduction to The TIEMS Academy”

2:25 PM - 3:10 PM Tony Enerva – “Terrorism, Active Shooter and Premises Liability Claims Resulting from Work Place Violence”

3:10 PM - 3:30 PM **Coffee Break**

3:30 PM - 5:00 PM Panel Discussion–Spatial Information and Emergency Management – Randall Berry, Matt Dube, Tony Enerva, and Tora Johnson

5:00 PM - 6:30 PM **Reception at the VEMI (Virtual Environment and Multimodal Interaction) Lab** – Non-registered participants please talk to G. Markowsky.

3.3 Abstracts

3.3.1 Introduction to the TIEMS Academy

The TIEMS Academy is designed to collect resources world-wide that are helpful to emergency management personnel. This presentation will outline a proposed structure, and some early steps.

3.3.2 Panel Discussion

Geospatial technologies are revolutionizing the field of emergency management with new applications emerging every year that make planning, response and recovery more effective and efficient. Panelists will discuss a variety of applications of geospatial technology in emergency management. Randy Berry from Androscoggin County Unified EMA will talk about how they have been using GIS analysis and online GIS applications to support emergency planning and response for chemical hazard assessment, emergency response and mutual aid plans, and more. Tora Johnson from the University of Maine at Machias will be speaking about flood scenario building for emergency planning and resilience efforts in Downeast Communities. Tony Enerva of the University of Maine at Fort Kent will be discussing GIS applications in public safety. Matt Dube of the University of Maine will be talking about emerging new geospatial technologies that will aid in emergency response and planning.

4 Wednesday – June 14, 2017

4.1 Location: 100 Neville Hall

4.2 Schedule

8:00 AM - 8:30 AM Registration Neville Hall Lobby

8:30 AM - 8:40 AM Introduction to Session 3

8:40 AM - 9:25 AM Tom Robertson – “Communicating with the Public During Emergencies: Old and New Challenges in the Digital Age”

9:25 AM - 10:10 AM Marc Glasser – “Technology, Opportunity & Emergency Management”

10:10 AM - 10:30 AM **Coffee Break**

10:30 AM - 11:15 AM Ray Soucy – “Cybersecurity Challenges in the Public Sector”

11:15 AM - Noon George Markowsky – “Overview of Crisis Management Software – Open Source and Commercial”

Noon - 1:30 PM **Lunch** – Hilltop Cafeteria

1:30 PM - 1:40 PM Introduction to Session 4

1:40 PM - 3:10 PM TIEMS USA Annual Meeting

3:10 PM - 3:30 PM **Coffee Break**

3:30 PM - 4:15 PM Frank Appunn “InfraGard: An Alliance to Improve your Cyber Defenses and a Case Review”

4:15 PM - 5:00 PM Michael Johnston – “The Role of the Maine Information and Analysis Center in Responding to Emergent Events”

5:00 PM - 7:30 PM **Reception and Lobster/Steak Dinner at the Wells Conference Center** – Non-registered participants talk to G. Markowsky

4.3 Abstracts

4.3.1 Cybersecurity Challenges in the Public Sector

Networks within the public sector represent a set of unique challenges in cybersecurity. The reality at the state and local levels is that many of the networks lack even basic controls necessary to protect against cyber threats. In this talk, we’ll focus on the current landscape, the conditions that got us here, and possible steps to improve cybersecurity in this space.

4.3.2 Overview of Crisis Management Software – Open Source and Commercial

There are many programs, both commercial and open source, that are available for crisis management. This talk surveys some of the most popular programs and gives a brief introduction to them. It addresses such factors as ease-of-use and comprehensiveness. This talk does not assume any prior experience with such programs.

4.3.3 InfraGard: An Alliance to Improve your Cyber Defenses and a Case Review

This presentation provides a brief background regarding the InfraGard Alliance and its partnership with the FBI. It then provides the benefits to organizations through the membership of the alliance by key security and cyber personnel. The presentation then reviews an elaborate incident where US general purpose technology was stolen to establish low cost competitors overseas and how you might protect your organization.

4.3.4 The Role of the Maine Information and Analysis Center in Responding to Emergent Events

MIAC 101 – Maine State Police Sergeant Michael Johnston, Supervisor for the Maine Information and Analysis Center (MIAC), will discuss the role of MIAC in Maine's response to emergent events that threaten Maine's citizens and infrastructure. Both vertical and horizontal communication streams are critical to the successful recognition, response and mitigation of today's threats. MIAC's role is to get the right information to the right people at the right time.

MIAC Mission Statement:// As Maine's designated fusion center, it is the mission of the Maine Information and Analysis Center (MIAC) to collect, analyze and appropriately share intelligence between the federal government and the State of Maine. The MIAC also provides analytical and investigative support for crimes of a complex, organized or statewide nature. The MIAC accomplishes this task through processes of intelligence collection, contextual analysis, and dissemination to our federal, state, county, and municipal public partners as well as relevant private sectors. The MIAC is also a resource to help Maine citizens do their part in helping to keep Maine safe. Citizens are encouraged to contact us when they observe or learn of suspicious persons, incidents or activity that may arouse their concerns. The information will be evaluated and referred to the appropriate agency if warranted

5 Thursday – June 15, 2017

5.1 Location: 100 Neville Hall

5.2 Schedule

8:00 AM - 8:30 AM Registration Neville Hall Lobby

8:30 AM - 8:40 AM Introduction to Session 5

8:40 AM - 9:25 AM Jeffrey J. Morrisette – “Improvise, Adapt and Overcome: One State’s Plan for Mutual Aid Coordination”

9:25 AM - 10:10 AM Vince Quintana – Augmented Reality Applications and First Responders

10:10 AM - 10:30 AM **Coffee Break**

10:30 AM - 11:15 AM Troy Jordan – “Cyber Attacks on Power Grids”

11:15 AM - Noon George Markowsky – “The Metric at the End of the Rainbow”

Noon - 1:30 PM **Lunch** – Hilltop Cafeteria

1:30 PM - 1:40 PM Introduction to Session 6

1:40 PM - 2:25 PM Banyatsang Mphago – “Deception in Web Application Honey-pots”

2:25 PM - 3:10 PM Wayne M. Maines – “Tabletop exercises should be interesting and realistic?”

3:10 PM - 3:30 PM **Coffee Break**

3:30 PM - 4:15 PM Kimberly Miner – “Developing a Risk Assessment Model to Quantify Distribution and Uptake of Persistent Organic Pollutants in Glacial Outflows”

4:15 PM - 5:00 PM Closing Session

5:00 PM - 6:30 PM **Reception at the Page Farm and Home Museum Barn** – Non-registered Participants talk to G. Markowsky

5.3 Abstracts

5.3.1 **Improvise, Adapt and Overcome: One State’s Plan for Mutual Aid Coordination**

For one state that typically does not experience large scale and frequent natural disasters mutual aid coordination was typically focused on fire related events and handled on a local level – community by community. With a heavy reliance upon volunteer fire services it became evident that a more formal and centralized coordination was necessary.

The need for greater coordination has further been exacerbated by ever shrinking fiscal and personnel resources. This presentation will review the development and continued evolution of efforts to improve fire and emergency service coordination through the development of the Statewide Fire Rescue Disaster Response Plan and its integration it into the State Response Framework thereby limiting the need to improvise, adapt and overcome.

5.3.2 Augmented Reality Applications and First Responders

The current ubiquitous computing paradigm is one in which the use of small portable devices, cheaply manufactured and rapidly deployed, has become the chief driver of technology development. For First Responders, the development of technology needs to get away from the iPad/Speedo model, and more realistically provide human and team performance enhancements that increase situational awareness, and response immediateness. We need national attribution protocols and standards that provide REAL augmenting applications and devices that are survivable, use-able, and relevant....in other words serious machines, serious applications and sensor enhancements that are real-time and provide significant performance enhancement without the vagaries of commercial considerations..... realizing that this will not come cheaply.

5.3.3 Cyber Attacks on Power Grids

In the last 18 months, two high-profile cyber-attacks successfully disrupted the Ukrainian power grid. The first, in December 2015, knocked out power to thousands of homes for several hours. It was the first successful attack of its kind. In December 2016, a shorter duration outage occurred when attackers disrupted a high-voltage transmission facility in the same power grid. In this talk, we'll look at some of the public details of these attacks: how they were carried out and what technologies were leveraged. We'll look at some of the contributing factors, such as the inadvertent blending of administrative and control system networks. Finally, we'll exchange ideas on what positive steps can be taken to improve grid security for all of us.

5.3.4 The Metric at the End of the Rainbow

It is common to see statements such as the following which come from <https://www.dhs.gov/science-and-technology/csd-elsmu>.

Defining effective information security metrics has proven difficult, even though there is general agreement that such metrics could allow measurement of progress in security measures and, at a minimum, rough comparisons of security between systems. ...

However, general community agreement on meaningful metrics has been hard to achieve. This is due in part to the rapid evolution of IT, as well as the shifting focus of adversarial action.

However, this page neglects to state the real reason that agreement on meaningful metrics has been hard to achieve: **it is not possible to construct a reasonable metric!** This talk, which is based on results that have been known for a long time will demonstrate that under reasonable requirements for a reasonable metric, it is not possible to construct a metric that meets these reasonable requirements. Hence searching for such a metric is like searching for a pot of gold at the end of the rainbow.

5.3.5 Deception in Web Application Honeypots

Honeypots are special tools designed to help track and understand attacker's motives and their attack methods. In web applications, several honeypots have been developed and some have since been abandoned by their developers. But as honeypots are deployed more and more within computer networks, malicious attackers also devise techniques to detect and circumvent these security tools and thereby exposing limitations in most web application honeypots.

Dynamic honeypots however, are believed to be the future of honeypots due to their abilities to adjust to the changing environments. Glastopf is one of the more popular if not the most, dynamic web application honeypot currently released to the public. But Glastopf has its limitations too. Once deployed, Glastopf can be easily identified by the attackers due to its performance and appearance, and as such become less useful to the security community. This research describes some of the limitations inherent in Glastopf, and then proposes possible ways to make it more deceptive and more attractive to attackers.

5.3.6 Tabletop exercises should be interesting and realistic?

As we all continue to expand our emergency management planning, training and response efforts we need to make it REAL. One of the most cost effective and practical tools that we utilize is the tabletop exercise. In today's climate both time and money are shrinking resources. It is essential that we use our limited resources wisely. This presentation will review a sample tabletop exercise and demonstrate some of training techniques that can be incorporated to make it real, fun and help engage the audience in an active participatory manner. Wayne will also discuss how to prepare a tabletop lesson plan and provide examples of support materials. Striving to include formal procedures and practical exercises to help bring both new and sometime reluctant partners, to the table. Using these simple techniques you can create a foundation for building new and stronger partnerships in your community.

5.3.7 Developing a Risk Assessment Model to Quantify Distribution and Uptake of Persistent Organic Pollutants in Glacial Outflows

Pollutants released by industrialized nations between 1960 and 2004 have been transported northward through atmospheric processes and deposited into glaciated alpine ecosystems. Many of these chemicals retain their original structure and are absorbed

into the biota thousands of miles away from where they were originally utilized. With a warming climate increasing the melt of alpine glaciers, these glaciers may be introducing growing amounts of toxins into the watershed. While studies have demonstrated the existence of resident pollutants within glaciated ecosystems, no one has used standard toxicological testing methods to assess the risk posed by these compounds when released in glacial outflows. Therefore, the goal of this study is to develop a framework to assess the conditions under which glacial release of persistent organic pollutants are a risk to the health of downstream communities. In order to get an understanding of the potential risks, multiple disciplines must be integrated to set a baseline for the current state of the problem and test future risks based upon modeled scenarios. Combining toxicology, hydrology, glaciology and climate models this study seeks to understand chemical movement through the glacial watersheds and potential human impacts. Testing glacier outflow to establish a current baseline, and then modeling future discharge as a function of glacier morphology, will allow us to better understand the risk that varying rates of increased melting will pose. Ultimately, a better understanding of the potential for release of stored toxins in glacier watersheds will allow development of relevant management strategies.

6 Friday – June 16, 2017

All Day Excursion to the Coast of Maine and Acadia National Park.

6.1 Schedule

Non-registered participants can purchase a ticket for this event. Please see G. Markowsky.

8:30 AM - 10:00 AM Bus Travel to Bar Harbor, Maine

10:00 AM - 1:00 PM Shopping and Lunch on your own in Bar Harbor

1:00 PM - 4:00 PM Tour of Acadia National Park with Tea and Popovers at Jordan Pond House

4:00 PM - 5:30 PM Return to Orono, Maine

5:30 PM Conference Ends

7 Speaker Bios

7.1 Frank Appunn

Frank Appunn holds a B.Com. degree from the Nelson Mandela Metropolitan University, and MBA from UMaine Orono, and a Ph.D. in Technology with a dissertation related to security to circumstances in Maine. His experience started in the accounting world and moved to new technology as an entrepreneur, forming and running his companies focused on networks, systems management and security. He has spent the last decade teaching in a combination of physical and online schools integrating technology, security, and organizational value creation. He teaches in bachelor's through doctoral programs and is a dissertation chair with 10 mentees. Frank continues to consult in the financial and health area and serves as the Maine president for the Maine InfraGard Member Alliance.

7.2 Randall Berry

Randall Berry is the Assistant Plans/ Training/ Operations Officer for Androscoggin County Unified Emergency Management Agency (ANEMA) at Lewiston, Maine. He is also the Liaison for the Community Emergency Response Team (CERT). From Livermore, Maine, he served as a volunteer firefighter for 30 years, including 12 years as fire chief and 10 years as the municipal emergency management director. He served four terms in the Maine House of Representatives. His 27 year career in the paper industry culminated in a stint as a mill emergency coordinator. He holds a degree in geography from the University of Maine at Farmington and a GIS certificate from the University of Maine at Machias. At ANEMA, Randy has integrated GIS into the county chemical emergency plan; the public resource database for Fire, EMS, Police, and Public Works and created online applications to put the information into the hands of local agencies for planning and response activities. He has developed local applications to support rural communities.

7.3 Charles Carter

Once upon a time Carter helped create Myst and 26 other video games including the Command and Conquer and Red Alert franchises, Marvel Ultimate Alliance 2, Nox, Pacman World Rally, Kyrandia and many others – Carter worked on TV shows like Babylon5 (as a digital Matte Painter) as well as having contributed work on Star Trek the Experience and Disney's Mission to Mars motion rides. His illustration and animation work has been seen on the BBC, National Geographic, US Dept. of Defense, Homeland Security, Scientific American, NASA, Caltech and JPL as well dozens of additional publications and organizations.

Currently Carter is the founder of Eagre Games.

7.4 Kåre Harald Drager

K. Harald Drager, Oslo, Norway, is the founding member of the worldwide acting society TIEMS (The International Emergency Management Society - www.tiems.org), which he took the initiative to establish in 1993. He was the International Vice President of TIEMS since its inauguration until 2002, when he took over as TIEMS President, a position he was re-elected to for the 5th time in 2013. He has brought in new ideas and new people in TIEMS and succeeded the organization to span worldwide. TIEMS has under his leadership become a well recognized organization with growing activities in Asia, Europe and America and now TIEMS activity in Africa and Oceania is emerging. TIEMS has developed to a global well known organization with local chapters in many regions/countries, and TIEMS arranges each year workshops and conferences all over the world with focus on disaster risk reduction. TIEMS has also initiated development of a global education, training and certification network program, GENERATE as the fundament of TIEMS Academy, and TIEMS participates in research and development activities to improve systems, methods and equipment in emergency management for achieving better societal resilience. He has extensive experience from industry and research activity, especially in emergency and risk management, and he acts as the Managing Director of QUASAR Invest AS in Norway, a consultancy in global safety, emergency and disaster management. He has a Master's degree in control engineering from the Norwegian Technical University in 1966 and a Master's degree from Purdue University in USA in industrial engineering in 1973.

His specializations are international organizational development, emergency, disaster and risk management and project management. He has done consultancy work for numerous clients internationally amongst others the World Bank/International Finance Corporation, NATO and the European Commission, and he has been project manager of several international research and development projects for methods and software development in risk, emergency and disaster management. He was employed by Det norske Veritas, <http://www.dnv.com/> in 1967, and was a member of the Board of Directors of the company for 5 years until he left the company in 1983 and founded his own consultancy, AS QUASAR Consultants and later QUASAR Invest AS. He took the initiative to establish Safeware Quasar Ltd, <http://www.safeware-int.com/>, in 1994, a 50 % owned company of AS QUASAR Consultants until 2009, providing bespoke chemical compliance software and training solutions. He has published numerous papers internationally on emergency, risk and disaster management.

He was TIEMS representative in the EU funded NARTUS (2006 – 2009) project with the responsibility for consensus building and establishing the PSC Europe Forum, <http://www.psc-europe.eu/>, an all stakeholder forum for public safety communication. PSC Europe Forum is today a self governed sustainable organization and is a leading global advocate for standardization and research initiatives in public safety communication. He is leading TIEMS R&D teams in the EU funded projects; ASSET (2014 -2017), <http://www.asset-scienceinsociety.eu/>, which are dealing with pandemics and epidemics, and in HERACLES (2016 – 2019), <http://www.heracles-project.eu/>, which is about Cultural Heritage Resilience Against Climate Change. He has been

a member of the advisory boards of several EU projects, ACRIMAS, OPTI-ALERT, CRISMA, ARCHIMEDES, EDEN, TAWARA-RTM, PHAROS, DRIVER and TARGET.

He was a European Commission appointed evaluator for the EU Security Calls for FP7 2013 and the Horizon 2020 Call for Secure Societies in 2014. He was appointed Professor Chair for 4 years in 2014 at King Abdul Aziz University in Jeddah, Saudi Arabia. He was also appointed Visiting Professor at North Western University in Xian in China in 2016 for 2 years.

7.5 Matthew P. Dube

Dr. Matthew Dube (Oakland, ME) is Assistant Professor of Computer Information Systems at the University of Maine at Augusta starting in 2016 and serves on the University of Maine System Emergency Management Curriculum Development Committee. His research includes the development of foundational modeling techniques for geographic query systems, spatial simulation of political redistricting protocols, and the study various parameters related to thoroughbred racehorse health. His teaching is centered on many areas that are (or have the potential to be) major players in the emergency management field in the future, including Data Science, Database Design, Data Visualization, Data Mining, and Geographic Information Systems. His research has been presented at numerous international conferences in spatial information science (ACM SIGSPATIAL, COSIT, GIScience, QuaCon) and national conferences in political science (Midwestern Political Science Association, Northeast Political Science Association, American Political Science Association). He has participated in the NSF Sensor Science, Engineering, and Informatics IGERT program (2009-2011), the COST Young Researcher's Forum in Moving Objects and Knowledge Discovery (2011), and the Advancing Geographic Information Science Vespucci Initiative (2015). He holds a Ph.D. in Spatial Information Science and Engineering from the University of Maine.

7.6 Tony Enerva

Tony Enerva has been Program Director and Associate Professor of Rural Public Safety Administration & Criminal Justice at the University of Maine at Fort Kent since 2005. He holds a Juris Doctorate from the University of Minnesota, a Master of Science in Criminal Justice Administration and a Bachelor of Arts in Public Administration from San Diego State University. Tony's academic interests and teaching responsibilities include law, public safety, criminal justice, emergency management, homeland security and conservation law enforcement. He has been teaching in higher education for thirty years. Tony has served seven years as a part-time police officer with the Fort Kent Police Department, trained 125 part-time police officers on-campus through the Maine Criminal Justice Academy and serves as chair of the University of Maine Ad Hoc committee to development a system-wide, online bachelor's degree in homeland security/emergency management. Tony was invited to participate in the first cohort of faculty to attend the

annual higher education conference on homeland security at the Naval Post Graduate School in Monterrey, CA.

7.7 Marc Glasser

Marc Glasser, MS, CPP, CORE, FABCHS, CHS-V, CDEP (or Marc Glasser, MS, CPP)

Marc Glasser's career spans over three decades of public and private sector service including law enforcement, homeland security, emergency management, academics, research and training. Marc has worked in over 90 countries. Marc is most excited about technology and innovation. He is the founder and CEO of the recent start up Esilient™. Esilient™ is a subsidiary of the State of Washington company Alpha Green LLC. Esilient™ promotes Technology Empowered Resilience™ through innovative technology application. It is the mission of Esilient™ to advance cutting-edge technology from early stage development to industry-wide adaption resulting in "resilience best practices". Esilient™ evaluates possible technical initiative advantages and disadvantages in terms of both micro (single industry-specific) and macro (multiple-industries) in addition to innovation (new applications, combinations and relationships) perspectives.

Marc was the CEO of RM (Resilience Management) LLC. RM LLC is a security, crisis management and business continuity services company. Marc's US Government service included serving as a Special Agent with the US Department of State and US Department of Transportation. He managed the critical infrastructure branch and staff protecting the US National Air Space (NAS) for an eight state region with approximately 200 staffed and 1,100 unstaffed facilities. He managed a Federal Continuity of Operations (COOP) program involving 12 western states and the South Pacific. He served as a Federal Emergency Response Official (FERO) and Regional Emergency Transportation Representative team member in support of the National Response Framework (NRF) Emergency Support Function #1 involving Federal responses to incidents of national significance. He has supervised or conducted over 600 threat and vulnerability assessments addressing natural disasters, technical disruptions and terrorist risks. He conducted Federal criminal and civil investigations and presidential appointee-level suitability investigations. He has served in a Fusion Center and as a FBI Joint Terrorism Task Force (JTTF) and FBI Organized Crime Task Force member. He served on three US Secretary of State's Protective Details. He served as a US Department of State Diplomatic Courier ensuring the integrity of Top Secret materials. He is a graduate of the Federal Law Enforcement Training Center (FLETC), Glynco, Georgia. During college Marc served as a Texas Department of Corrections Correctional Officer and a Maximum Security correctional facility.

He has presented at national and international conferences. He participates on multiple professional associations, academic and editorial boards. His publications include industry practitioner and academic peer-reviewed journal articles. He has been a professor at six universities, teaching and developing curriculum, in over 50 different course subjects. He holds a Master of Science in Crisis and Emergency Management from the University of Nevada, Las Vegas and a Bachelor of Science in Law Enforcement and Po-

lice Science from Sam Houston State University. His professional accreditations include CPP, CORE, FABCHS, CHS-V, CDEP as well as FEMA HSEEP and COOP certified.

Marc has traveled to 100 countries and has lived in 17 cities in three countries and currently lives in the Seattle area. Marc enjoys spending time with family and friends, reading, researching, writing, culture, traveling, nature and the outdoors and supporting sustainability practices. For more information please see Marc's LinkedIn profile at www.linkedin.com/in/marcglasser or contact him at marcglasser.me.

7.8 Kay Goss

Kay C. Goss, CEM[®] is a founder and the President of the Council on Accreditation of Emergency Management Education, former Associate FEMA Director in charge of National Preparedness, Training, and Exercises, as well as serving in EM leadership positions at the state, private and nonprofit sectors. Ms. Goss is on the part-time Faculty at UNLV's Executive Master's Program in Crisis and Emergency Management. Ms. Goss is also a Fellow at the National Academy of Public Administration and President of the TIEMS USA Board.

7.9 Tora Johnson

Dr. Tora Johnson is a social scientist and the director of the Geographic Information Systems Laboratory at the University of Maine at Machias. Her research focuses on using new approaches and technologies to support rural communities as they plan for a sustainable and prosperous future. In recent years, Tora and her students have been developing online, interactive web mapping applications for rural communities to use in emergency planning and management.

7.10 Michael Johnston

In 2002, Michael Johnston graduated as valedictorian of his class from the University of Maine in Presque Isle. That year he also joined the Maine State Police and now holds the rank of Sergeant. Sgt. Johnston's accomplishments include being a two-time recipient of his Troop's "Trooper of the Troop" Award and in 2009, he was awarded the prestigious "Trooper of the Year" award by the Maine State Police. Sgt Johnston has been a primary instructor in motor vehicle law for the Maine Criminal Justice Academy, a Field Training Officer and an Evidence Recovery Technician. In 2011, UMaine Presque Isle recognized Sgt Johnston as a Distinguished Alumni. Sgt Johnston has considerable experience in patrol, field investigation, administrative investigation, instruction and is now the Supervisor for the Maine Information and Analysis Center.

7.11 Troy Jordan

Troy Jordan works as a Network Systems Security Analyst for the University of Maine System. He held positions at Tufts and MIT before joining the University in 1993 to work

for the National Center for Geographic Information and Analysis. He also volunteers his time with the US Cyber Challenge's Summer Cyber Camp program.

7.12 Wayne M. Maines

Dr. Maines is currently the Executive Director of Safety, Health Services, Transportation and Security for the University of Maine System. He also spent 10 years as the Corporate EHS Manager for a global chemical company and 4 years as the Director of The Institute for Safety and Health Training at West Virginia University. He is a nationally known speaker in the fields of emergency management, safety and civil rights. This past year Wayne helped teach Incident Command by reenacted the Battle of Little Round Top at Gettysburg National Park using modern day Incident Command. Working with forty Law Enforcement Officers and civil war experts they explored the "Fog of War." Wayne has a BS degree from Cornell University and a master and doctorate from West Virginia University. Wayne has over 800 hours of Emergency Management and Safety Training. For many years he was an instructor and responder performing; High Angle Rescues, Hazardous Materials Response, Industrial Firefighting, and Confined Space Rescue activities. He continued to conduct training at the national, regional and state level.

7.13 George Markowsky

Dr. George Markowsky is Professor of Computer Science and Director of the Cybersecurity Lab in the School of Computing and Information Science at the University of Maine. He teaches cybersecurity at the University of Maine and coaches the Cyber Defense Team. In 2013-2014 he was a Visiting Scholar in the Department of Computing Security at the Rochester Institute of Technology.

7.14 Vilma Schifano Milmo

Vilma Milmo is a 2015 Honoree to the International Network of Women in Homeland Security and Emergency Management (inWEM) Hall of Fame with 38 years as senior federal government manager. She is currently First Vice President of the international network of Women in Emergency Management (inWEM). Her vast portfolio includes leadership in disasters and implementing broad innovative programs. She has served as senior policy advisor, superintendent of a training institute, a national liaison, trainer and educator, curriculum designer and speaker on numerous topics in relation to both emergency management and adult education. She also has extensive experience in management, human capital, EEO, labor relations, financial management, congressional affairs, intergovernmental affairs, and international work, and is a recognized subject matter expert in EM and HS education, training, and exercises. She has a DHS Secretary's Award for National Continuity Work throughout 9/11; two FEMA Director's Awards for - 9/11, and for training innovations; and was a member of the National Continuity and Continuity of Operations Teams. She served on the President's Task Force for

the Los Angeles riots. Vilma received a Vice Presidential Award for her support to the Northridge Earthquake while with the Department of Justice. She received two Administrator Awards from the Department of Energy and General Services Administration, and numerous other career service awards. She served with Veterans Administration, Department of Justice, Department of Energy, and as Director of the Greater Los Angeles Federal Executive Board for Southern California, Arizona and Nevada. She served a rotation to the National Performance Review Office on National Centers of Excellence. She was a Presidential Management Intern and VISTA volunteer. She is the first female as Deputy Superintendent of the Emergency Management Institute, and led development/implementation of numerous homeland security (HS) and emergency management (EM) initiatives. She has a B.A. in political science from Wilkes University and a M.A. in public administration from Marywood University under Full Fellowship.

7.15 Jeffrey J. Morrissette

Jeffrey Morrissette serves as the State Fire Administrator for the Connecticut Department of Emergency Services and Public Protection having served in that capacity since 1992. The agency supports Connecticut's fire service with training (Connecticut Fire Academy), certification, public fire and life safety education, mutual aid coordination and fiscal/administrative services. Prior to appointment as Fire Administrator, he served as its Director of Certification, beginning in 1984. In addition to his duties as Fire Administrator, he serves as the Vice Chairman of the State Emergency Response Commission (SERC) and as a member of the Statewide Enhanced 9-1-1 Commission. Jeff has over 37 years of service as an active volunteer firefighter and Deputy Fire Marshal in his home community. He holds degrees in both fire protection and technical education from Oklahoma State University. His education and training include numerous state and national certifications as well as completion of course work and a management internship at the National Fire Academy. Jeff previously served on the NFPA 1000 Technical Committee on Fire Service Professional Qualifications Accreditation and Certification Systems and currently serves on the NFPA Fire Service Training Committee. In addition, Jeff has served on the International Fire Service Training Association (IFSTA) Company Officer (2nd Ed.), Essentials of Fire Fighting (4th Ed.), Introduction to Fire Cause and Origin (4th Ed.) validation committees. He chaired IFSTA's Fire Department Safety Officer (1st Ed.) and most recently chaired the Fire and Emergency Services Safety Officer committee. He was first elected to the IFSTA Executive Board in 1999, serving two terms as Chairman. In 2008 he Co-chaired the International Conference on Firefighting and Disaster Preparedness at Kangwon National University in Samcheok, Republic of Korea.

7.16 Banyatsang Mphago

Banyatsang Mphago holds an MSc in Information Security from Lulea University of Technology (Sweden), a Post Graduate Diploma in Education from the University of Botswana, a BSc in Computer Science from the University of Botswana, and a Certified

Ethical Hacker (CEHv7). He joined Botswana International University of Science and Technology (BIUST) in August 2013 as a Teaching Assistant and then became a Teaching Instructor in January 2014. He is now studying for a PhD in HoneyPot Security at BIUST.

7.17 W. Vince Quintana

Vince Quintana is currently the principal human factors test engineer at Bath Iron Works working on the US Navy's next generation DDG 1000 Destroyer. His US Navy background includes over twenty years of experience conducting operational ASW (anti-submarine warfare) in all of the world's major oceans on six different US Surface Navy tactical ASW platforms, using active and passive sonar systems in conjunction with non-acoustic sensors. As an ASW specialist and developer of training and training path systems, he was instrumental in the creation of multi-level, multi-sensor ASW training systems which encompassed every aspect of the global ASW problem across all ASW platform domains including sub-surface, surface, air and theatre level ASW surveillance systems.

He has received US Navy decorations for his work on US Navy special ASW operations, and for the development of advanced operational training methods and training evaluation methods. He has also received several patents and awards for the development of next generation mobile digital computer systems and devices at both the human computer and network level. Most recently he has been working on team dynamics to determine what permits teams to function well in difficult environments, and for determining training, training evaluation, and usability testing methods for advanced computer based command and control systems. Vince Quintana is also a Research Associate of the UMaine Cybersecurity Lab.

7.18 Thomas Robertson

Thomas Vincent Robertson, Ph.D. is Director, North American Operations for TIEMS. Dr. Robertson established the TIEMS USA Local Chapter; organized TIEMS USA Conferences in 2014, 2015, and 2016; is Technical Manager for TIEMS in the ASSET Program (Action plan in Science in Society in Epidemics and Total Pandemics), a four-year European Union funded program, and HERACLES, a three-year EU program to develop technologies to protect cultural heritage sites from the effects of climate change. He has presented papers on risk communication, communities of practice, and virtual simulation in emergency management in the US, France, Italy, China, Japan, Belgium, and Saudi Arabia. Previously he was Associate Technical Group Director of The BAE Systems Advanced Computing and Decision Systems and Senior member of the management team leading business units performing contract R&D in resilient computing, advanced compilers, adaptive system engineering, cognitive collaboration, and C2 systems. He was also Vice President and General Manager of Atlantic Aerospace Electronics Corporation where he managed the development and delivery of algorithms, hardware, software, and systems for signal and image processing, and high-speed communications.

He earned BS, MS, and Ph.D. degrees in Electrical Engineering from Purdue University. His Master's Thesis - "Modeling a Cockroach Stretch Receptor" - developed an analog computer model simulating nerve impulse generation. His Ph.D. Thesis - "Multispectral Image Partitioning" - developed techniques and software for automatic recognition of objects and land use in digital ERTS/LANDSAT satellite imagery.

7.19 Ray Soucy

Ray is a Senior Cyber Security Engineer with Networkmaine, the University of Maine System's business unit responsible for providing connectivity to Maine's research and education community. Through its Maine School and Library Network and MaineREN efforts, Networkmaine provides connectivity to nearly 1,000 public and private institutions throughout the state of Maine, ranging from elementary schools, to universities, to cutting-edge research institutions.