CENTER FOR
Global Resilience & Security
at NORWICH UNIVERSITY

Center for Global Resilience and Security

Launch Event, March 3, 2017

Summary of Roundtable Discussions

NORWICH UNIVERSITY
158 Harmon Drive, Northfield, VT • *norwich.edu*

INTRODUCTION:

Norwich University President Richard W. Schneider welcomed over 100 attendees, representing State of Vermont leadership, business and community leaders, representatives from the non-profit sector, etc., and Norwich University faculty and students, to the official launch of the Center for Global Resilience and Security (CGRS) on March 3, 2017. He explained how resilience is a human issue and how CGRS is dedicated to advancing the interrelations between human resilience and security in the context of global challenges in the areas of water, energy, infrastructure, and large scale environmental impacts.

President Schneider informed the audience that CGRS is in keeping with Norwich University's founder Capt. Alden Partridge's vision for applying critical thinking and classroom learning to address and solve real-world problems with creativity and innovation, being mindful of sustainability principles. President Schneider emphasized that adaptation is essential to our evolutionary success.

He outlined the major upcoming initiatives of CGRS, including stepping into the role of coordinating the Resilient Vermont Network (RVT), hosting a educational networking event for the Community Resilience Organizations (CROs) in April, and launching the Academic Research Collaborative (ARC) to serve as the research arm of CROs. He then introduced General Gordon R. Sullivan, USA (Ret.) '59, Norwich University's first Distinguished Leader in Residence, and Trustee Emeritus.

General Sullivan, who served as the 32nd Chief of Staff of the U.S. Army, as a member of the Joint Chiefs of Staff and as Acting Secretary of the Army, offered a few thoughts on the CGRS mission, its role in Vermont's roadmap to resilience, and on the national and global ecosystem relative to climate and national security. He concluded with a poem by Vermont poet Robert Frost, "The Sound of the Trees."

CGRS Director, Dr. Tara Kulkarni, introduced the members of the CGRS Advisory Board: Col. (Ret) Albert "Albie" Lewis, Dr. David Roswosky, Ms. Rebecca Sanborn Stone, and Dr. Kate White . Dr. Kulkarni provided an overview of the launch event activities, including an introduction to the roundtable discussion questions and to the table scribes.

Student scribes were charged with recording the highlights of each table's conversations and presenting a summary of their table's discussion for the larger group following the discussion. Remarks from the Dean of the College of Professional Schools, Aron Temkin, concluded the event along with an expression of appreciation to attendees from Dr. Kulkarni.

"Resilience means: staying power."

"Get everyone thinking about these questions."

Scribes for all ten tables ready to present their discussion summaries.

ROUNDTABLE DISCUSSION OVERVIEW AND SUMMARIES:

There were 10 roundtables, with 10-12 people at each table. The participants included students from disciplines ranging from communications, geology, environmental science, and engineering to computer security and information assurance. Other participants were invited external guests from Vermont state agencies, local businesses, and non-profits, and Norwich university faculty and staff representing various departments and academic units.

Over 100 people participated in the conversation sharing their experiences and viewpoints.

Each table was provided with the same two questions:

Question 1
From your perspective, where is Vermont currently at, in terms of resilience and security, in the areas of water, energy, infrastructure, and the impacts of climate change?

Question 2
Where do you think Vermont needs to be in order to be resilient and secure in the areas of water energy, infrastructure, and climate impacts?

Highlights from the discussions on these two questions follow. Please note that the data and statistics have not been verified by CGRS with an intent to remain true to the conversations that occurred at the event, and may include some inaccuracies:

Defining resilience: Assertions of "Resilience means: staying power" and "prevention: standing power" echoed through the room. Economical, physical, and social considerations were labeled the three core aspects of resilience. The US Army Corps of Engineers definition of resilience as "preparedness, absorption without failure, recovery, adaptability" was cited and discussed. A common theme throughout the room may be summed up with a specific statement coined at one of the tables "We need to take a look at what is around us and how we can utilize this to our advantage as well as to help the environment".

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Educating for self-reliance: There seemed to be a general consensus that leading change starts with establishing a sense of urgency to address the issues, but not many people are aware of all the issues that currently face Vermont. Several groups stressed the importance of education in helping citizens become more self-reliant, especially during extreme weather events, and the aftermath of disasters. Awareness of locating houses correctly and influencing future land use and development, managing river corridors at a watershed level, and understanding how to reuse and recycle water were all considered to be important. One group stressed the importance of educating Vermonters about growing and storing their own food to become more sustainable.

This led to a discussion on farming and economies of scale. A group discussed the need to educate the farming community, especially smaller farmers who may be unable to afford expensive training, and high expenses involved in switching to farming practices that reflect their commitment to stewardship of their land, while helping feed our communities. There was an emphasis on involving more diverse groups (not just the experts) to address the present issues. Engaging the younger collegiate students, and exposing students to real world problems was considered to be an essential component of education.

Building resilience: Vermont's strength in helping the homeless in extreme cold was complimented. However, participants urged caution when considering a large-scale influx of refugees, including climate refugees. This is primarily because Vermont does not have the medical infrastructure to support such migrations, and the fact that our food systems are too reliant on other geographic areas (7% of Vermont's food is locally sourced) which deters from a path of resilience.

Roundtable discussions during the CGRS Launch event, March 3, 2017

Water: Discussions on water spanned several sub-topics. There was an acknowledgement by some groups that Vermont is water secure for now, despite shortages and temporary droughts in discrete areas such as Bennington. Several questioned whether this would continue being the case in light of global warming trends. It was also noted that if such changes dry up dams, hydroelectric power generation may be at risk. There were references to people looking to tap into Vermont's aquifers to sell bottled water, which may cause aquifers in the region to dry up. There was a call for individual homeowners to become educated or trained about water retention on their property, just like recycling.

On the other hand, it was suggested that Vermont's vulnerability to flooding is our number one hazard. Participants agreed that increased impervious surfaces have resulted in heavier rain amounts in shorter time periods, causing property damage, infrastructure disruption such as failed culverts, combined sewer overflows, and increased pollution of Lake Champlain and other water bodies, enhancing the growth of cyanobacteria. Several groups questioned how best to put the flood waters to use. One group noted that Vermont is a leader with regards to flood resiliency and proposed that we should create storage for extra water, mechanisms to slow down water, or use the energy of fast flowing water as a source of power production. Some groups brought up the importance of regulations such as the Safe Drinking Water Act and other surface water regulations, and to use legislation as a proactive form of tackling security concerns. These are especially relevant in the context of several emerging contaminants of concern, including PFOAs and hormones. Some advocated the use of organic and non-organic methods to filter water, especially in the Lake Champlain Basin.

Finally, some groups questioned how prepared we truly are during massive storms and the subsequent flooding incidents. Using advanced notice during storms, and being able to strategically place ground crews to manage vulnerable utilities like sewage systems, was recommended. Notice systems, including modern weather analytic systems were considered to be instrumental in protecting critical infrastructure, including water systems. A cybersecurity concern that was raised involved the failure of SCADA systems.

Infrastructure: This discussion ranged from re-arranging settlement patterns from the existing models of building in the flood plain to housing affordability. One group applauded the rise of tiny houses, while simultaneously questioning their placement in flood plains, which may pose plumbing connection concerns. Another group suggested the need for thoughtful land use and development.

Questions were raised about different components of infrastructure - *What happens when bridges fail? What kind of legislation and inventory do we have on dams? How often are they updated?* Several groups agreed that even though Tropical Storm Irene isolated and wiped out entire towns, the rebuilding efforts are worth applauding. Municipalities rebuilt roads with larger culverts which increased our resilience

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of infrastructure following Irene. Groups said of municipalities "after Irene they took their time, made people take detours on their way (diverged traffic) to create better replacement roads. If you're going spend the money to replace it [bridges and culverts], might as well do it right and spend a little more." It was noted that most of the infrastructure in the state is old, and replacing old infrastructure is important, but funding seems to be prioritized for post disaster rebuilding efforts. Therefore, a strong argument was laid out for pre-disaster improvements to prevent extreme consequences (hazard mitigation) from occurring in the first place, with a note that deferred maintenance creates more problems, and results in more spending.

Other interesting highlights from the infrastructure discussions included:

- Consider fluvial geomorphology, i.e. how things will move through material and the effects that will occur.
- Consider secondary effects during all infrastructure projects.
- Consider minimizing the negative impacts on the environment, even as we build new and retrofit existing infrastructure
- Use communication infrastructure to disseminate the risk to specific areas such as health and housing, specifically, mobile homes.
- Do not over-engineer infrastructure.
- Be ready for climate and related migrations to challenge our infrastructure.

While we had a relatively resilient recovery from Tropical Storm Irene, migration from populations

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outside Vermont may challenge our resilience and security in the key areas of water and energy, as we do not have the infrastructure to support a large scale external flux.

Energy: In many teams, discussions on energy initiated by laying out the basic energy facts as pertinent to Vermont. Participants opinionated that Vermont is two-thirds renewable at present, with a goal of reaching 90% by 2050. One group asserted that Vermont is an energy trendsetter with solar farms and wind energy installations. They commented that to millennials, wind turbines, solar panels, anything of the sort are viewed as a symbol of progress. This was contrasted with discussions where participants brought up concerns regarding the "Not in my Backyard (NIMBY) mentality when it comes to installation of renewable energy projects, or of projects that are regarded as "eyesores" by people.

While electricity is 20 cents per KWH for individuals selling to the grid, several communities struggle with energy affordability. One group suggested that using more renewable energy and reducing reliance on fossil fuels may not be great if all your eggs are in the same basket. There were conversations with reminders that most transportation by train and trucks uses fossil fuels. It was stated that while hydroelectric power is one of the most efficient ways to create renewable energy, using backup sources of power, should be considered,

so we have reliable energy sources during emergencies. One group also indicated that when energy sources are external to Vermont, for example Hydro-Quebec, security issues may be harder to control.

Other discussion highlights included micro grids and their capability to forecast energy demand, considering renewable energy installations when rebuilding infrastructure (for example, solar panels on roofs of new buildings), moving to electrical vehicles, and taking advantage of Vermont's high percentage of woodland to shift to biomass.

One major theme through the conversations was to develop a mix of energy sources, with emphasis on renewable sources and to continue to be proactive in our energy leadership. One group said "Resilience means adaptation-decentralized and distributed energy. Make power distribution more secure." There was also a push to increase energy education for the next generation, even as we expand on our investment in renewables. Encouraging people to put back into the grid, or for companies to exchange credits, were also included in some group discussions.

Climate change: Groups largely stated that unpredictable, extreme weather changes, including drought, will challenge even Vermont's naturally resilient communities. On the global stage, extreme weather events will impact several sectors. For example, one group said "most people don't realize this but to send goods to China things need to be sent down and across. But years from now we'll be able to send it right across the Pacific with the current climate change issues. This can cause many issues with national security, transport of goods, etc."

Groups acknowledged that while not as dire as coastal areas, climate impacts in Vermont will challenge our security economically, impacting our ski industry for example, and affect tourism. One group said "tourism will be affected, skiing on ice or grass is no fun for people, if people do not have fun they won't come back." Some groups noted that negative effects are already occurring (for example with regards to conifers, maple trees, birds), extreme precipitation events, frost heave fluctuations getting worse (longer mud seasons), making it more difficult to maintain roads, and creating vulnerabilities in our electrical systems.

Looking ahead: TThe need for strong intergenerational education was emphasized. One group said "Get everyone thinking about these questions." There was a recommendation to use the tremendous resources in colleges and communities through service and service-learning opportunities. One group identified the great potential for student engagement and coursework to be utilized to reduce these problems and apply to the community. Such work may be discipline and culturally driven, but all seek to build for the future.

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There were calls to educate community members involved in making legislation. There was a recommendation to improve efficiencies of systems, and re-consider their inter-dependence, with a thought that the more complex the system, the higher its failure rate. This was especially contextualized from a cybersecurity perspective. Policy revisions, especially with regards to insurance were called for, as was the enforcement of existing legislation to hold people accountable.

It was also noted that sound education can alleviate some of the communities' greatest fears surrounding the impacts of global warming and the lack of resilience, or the feelings of insecurity. There was a call to work on the infrastructure and ideals of the community. One group said "Future is a change in culture and resources and how we live now so people understand the issues better through education and ideals."

FINAL TAKEAWAYS:

1. "Resilience means: staying power."
2. Vermont is in a strong leadership position with regards to water security and energy independence. We have committed citizens and value our natural resources.
3. Vermont's vulnerability to flooding is our number one hazard. However, Vermont should model our programs on flood resiliency and we should create storage for extra water, mechanisms to slow down water, or use the energy of fast flowing water as a source of power production.
4. Infrastructure and land development must be thoughtful, not over-engineered and mindful of secondary impacts. Hazard mitigation to prevent extreme consequences should be prioritized.
5. We should develop a mix of energy sources, with emphasis on renewable sources and continue to be proactive in our energy leadership. "Resilience means adaptation-decentralized and distributed energy. Make power distribution more secure."
6. Education is key: Increase awareness of issues, educate citizens on individual actions that can lead to improved resilience and security. Engage educational resources, including students to help solve community concerns.
7. Research Vermont-centric topics that matter to our health, economy, and community wellness, for example impacts on maple syrup production and tourism.
8. Develop programming to help communities become more self-reliant, for example workshops on growing their own food and becoming better stewards of their land.

The Sound of the Trees

Robert Frost, 1874 - 1963

I wonder about the trees.
Why do we wish to bear
Forever the noise of these
More than another noise
So close to our dwelling place?

We suffer them by the day
Till we lose all measure of pace,
And fixity in our joys,
And acquire a listening air.

They are that that talks of going
But never gets away;
And that talks no less for knowing,
As it grows wiser and older,
That now it means to stay.

My feet tug at the floor
And my head sways to my shoulder
Sometimes when I watch trees sway,
From the window or the door.

I shall set forth for somewhere,
I shall make the reckless choice
Some day when they are in voice
And tossing so as to scare
The white clouds over them on.

I shall have less to say,
But I shall be gone.

CGRS ADVISORY BOARD MEMBERS:

Col. (Ret.) Albert 'Albie' Lewis, CEM, MAEM, MASS

Albie Lewis was hired as a Federal Coordinating Officer (FCO) for FEMA in February 2007 and is assigned to Region-I. He has been appointed to over 2 dozen Presidential disasters and emergencies as the FCO and many other disasters as the DFCO to include Hurricane Sandy, Hurricane Irene, Hurricane Ike and many others. He is a former FEMA Disaster Assistance Employee and worked as a Special Assistant to the FCO for disaster responses for Hurricanes Katrina and Rita and the Texas Wildfires in 2005-2006. He was awarded his "Certified Emergency Manager" (CEM) by the International Association of Emergency Managers (IAEM). He completed the Harvard Kennedy School for the National Preparedness Leadership Initiative (NPLI) in Dec. 2009. He has been assigned as the FCO for VR-13 and evaluator for VR-16 and led the National IMAT West to Cascadia Rising in 2016. He has also served as the Chair of the Field Leadership working group, served on the IMAT Working Group, and a number of committees like clean slate and CBRNE group.

Albie was previously appointed as the Director of Vermont Emergency Management. In this position he was responsible for all operations of the State of Vermont's Emergency Management system including overseeing preparation and planning for an emergency at VT Yankee Nuclear Power Plant, Electrical Power shortages and disasters, VT's Hazardous Materials Response Team, and all preparedness, response, recovery, and mitigation efforts for all hazard emergencies in the state. He was also Co-Chair of the International Emergency Management Group, a consortium of the New England States and 5 Eastern Canadian Provinces for emergency response and mutual aid. Albie left this Vermont position in 2005 to take a position with Electronic Warfare Associates (EWA), Information and Infrastructure Technologies, conducting vulnerability assessments for critical infrastructures across the United States.

Albie also served as a firefighter and Chief of the Berlin Volunteer Fire Department. His Fire service qualifications include: Firefighter, Hazardous Materials Technician, High Angle/Mountain Rescue, and Cold water/Ice rescue diver. He served with the fire service for over 25 years. He has also served as the President of the Fire Departments Corporation and as a member of the Capital Fire Mutual Aid System. He holds a US Patent for a fire fighting adapter allowing Fire Fighter air tanks to be used for Under Water Diving.

Colonel (Ret) Lewis completed his last active duty tour as the U.S. Military Liaison Team Chief for Macedonia. As the Team Chief, he oversaw the Military to Military exchange program under the Joint Contact Team Program, NATO & CINCEUR's premier peacetime engagement activity which assisted Eastern European countries with their goal of NATO membership. Additionally, in 1991 during a Special NATO/SHAPE Assignment, he developed the operational deployment plan for 3-172 IN (Mountain) Battalion as a separate Battalion in 4th Corps Alpini area of operations in Northern Italy. He was also a Planner for SEECEP (South East Europe Civil Emergency Planning) and PFP with focus on SEE Earthquake response. He participated in and assisted with the planning for the multi-national earthquake exercise in Macedonia. He participated in numerous NATO level exercises in Europe. In 2001 he was awarded a U.S. State Department Meritorious Honor Award by the U.S. Ambassador to Macedonia for his service to the U.S. Embassy.

During his hazardous duty tour, Macedonia became embroiled in an insurgent war that lasted beyond his tour of duty. His military career spanned more than 28 years primarily with the Vermont National Guard, with a concentration at the Mountain Warfare School and Mountain Infantry Battalion. He commanded the 2nd Battalion 124th Regiment, Regional Training Institute (RTI) and commanded the National Guard Weapons of Mass Destruction 15th Civil Support Team, (WMD-CST) during its stand-up. He competed as a member of the U.S. Military Pentathlon Team competing for 5 years in the NATO International Council of Reserve Officers (CIOR) and competed in the 1980 U.S. Olympic Team Trials for Modern Pentathlon. He won two silver medals in the 1980 NATO CIOR Games in Montreal, Canada. He also worked as the NGB Sports Coordinator, hosting the CISM games in VT.

Albie was born in Fort Lewis, Washington and raised in Carlisle, PA. He attended Scotland School for Veterans Children in Scotland, PA until 1968. In 1969 he graduated from Northfield High School in Northfield, VT. In 1973 he received a Bachelor's Degree in Education from Norwich University, and in 1998 received a Master's Degree in Fire Education & Emergency Management, also from Norwich. He is a graduate of the U.S. Army War College and holds a second graduate degree in Strategic Studies. He holds a TS-SCI security clearance. He is an instructor at the Emergency Management Institute, teaching state directors' and state coordinating officers' courses. He also operated a historical building business that dismantles 100+ year old post, beam barns and houses; moving these timber frames to new locations, restoring them for use as new homes and/or businesses. He has also worked on the Greenland Expedition recovering WWII aircraft out of the Greenland Icecap. COL (Ret) Albie Lewis and his wife (Honorable State Representative) Patti live in Berlin, Vermont. They have three children, Kristen, Brittany and Kaitlin.

CGRS ADVISORY BOARD MEMBERS:

Dr. David V. Rosowsky

David V. Rosowsky is the Provost and Senior Vice President at the University of Vermont. Dr. Rosowsky served previously as Dean of Engineering at RPI, and as Head of the Zachry Department of Civil Engineering at Texas A&M University, where he also held the A.P. and Florence Wiley Chair in Civil Engineering. Dr. Rosowsky earned BS and MS degrees in civil engineering from Tufts University, and a PhD in civil engineering from Johns Hopkins University.

Provost Rosowsky reports to the President and serves as the chief academic officer and the chief budget officer of the University. As Provost, he is responsible for enhancing the University's intellectual climate, strengthening instruction and scholarship, advancing diversity, creating an outstanding student experience, promoting student access to success, and identifying investments and efficiencies to ensure a sustainable future.

Dr. Rosowsky maintains an active research program in wind and earthquake engineering and continues to supervise graduate students and post-doctoral fellows. He is a registered Professional Engineer and holds the rank of Fellow of the American Society of Civil Engineers and Fellow of the Structural Engineering Institute.

A recognized expert in structural reliability, design for natural hazards, stochastic modeling of structural and environmental loads, and probability-based codified design, Dr. Rosowsky has authored or co-authored more than 250 papers in peer-reviewed journals and conference proceedings. He is the recipient of the American Society of Civil Engineers (ASCE) Walter L. Huber Research Prize, the T.K. Hseih Award from the Institution of Civil Engineers (UK), and the ASCE Norman Medal.

Rebecca Sanborn Stone

Rebecca Sanborn Stone is a community planner, engagement specialist, writer and speaker with expertise in resilience, local capacity building and communications. She is a Principal at the Vermont consulting firm Community Workshop, which specializes in bringing creative engagement, planning, placemaking, and effective communications to towns, cities and non-profit organizations across North America. Community Workshop is known for creating unique, high impact programs that help communities work together and build social capital. Rebecca's recent work includes coordinating multi-stakeholder engagement efforts through Resilient Vermont and the Vermont State Hazard Mitigation Plan; capacity building and training for local teams including High Meadows Fund grantees, EPA's Local Foods, Local Places program, and the Vermont Farm to School Network. She has also recently helped to develop innovative engagement and social capital programs with the pilot Community Resilience Organizations project and Mad River Valley's Ridge to River Initiative and run local planning and visioning processes like Richmond: Our Town, Our Future. In her own community, Rebecca is a co-founder of the unique community pop-up university (Bethel University) and the Bethel Better Block project.

Prior to launching Community Workshop, Rebecca worked for seven years with the Orton Family Foundation on community planning and engagement projects and national network and capacity building efforts including CommunityMatters and the Citizens' Institute on Rural Design. She served as an adjunct professor at Massachusetts College of Liberal Arts and Southern Vermont College, and formerly was a high school biology and environmental science educator. Rebecca writes and speaks frequently on topics of community engagement and resilience. Her work has been featured in TED Books, E Magazine and numerous other publications. Rebecca holds a master's degree in Environmental Science from the Yale University School of Forestry and Environmental Studies, and a bachelor's degree from Williams College. She lives in Bethel, Vermont with her family.

Dr. Kate White

Dr. Kate White leads the U.S. Army Corps of Engineers (USACE) Climate Preparedness and Resilience Community of Practice. Dr. White holds B.S. and M.S. degrees in Civil Engineering and a Ph.D. in Civil and Environmental Engineering, is a registered professional engineer, and has 29 years of experience in the USACE. Dr. White's work includes development of policy, technical guidance, methods, and tools to support climate preparedness and resilience, with an emphasis on water resources management issues involving extreme events and natural hazards. She received a 2013 GeenGov Presidential Award: Climate Champion for her role in the interagency team that developed the Sea Level Rise Tool for Sandy Recovery. She was selected as the USACE 2014 Elvin R. "Vald" Heiberg III "Engineer of the Year," and was a 2015 Top Ten Federal Engineer of the Year by the National Society of Professional Engineers.