April 2018

NSSC This Month

U.S. Army Garrison Natick Public Affairs Office

Brushing Up!

Natick's Human Research Volunteer Soldiers Maintain Land Navigation Skills

U.S. Army photo by Jeff Sisto, NSRDEC

Installation Management Command
Maj. Gen. Keith L. Ware Awards, 2017
First Place, 2017, PDF Publication

Publisher's Note

John Harlow
USAG Natick Public Affairs

We're Back!

This is the latest edition of NSSC This Month.

While we were re-tooling the staff, NSSC This Month earned 1st Place in the U.S. Army Installation Management Command Keith L. Ware Journalism competition. This publication has won an award at the IMCOM level every year since 2011.

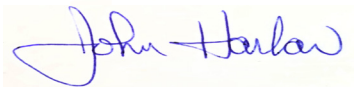
It was due to a great deal of effort from Jane Benson, Jeff Sisto, Dave Kamm and former Natick employees Bob Reinert and Tazanyia Mouton that this publication continued to earn awards.

2018 brings new members to the team. Vannessa Josey joins us from First Army Public Affairs at Rock Island, Illinois and Houston Waters joins us from the USAG-Fort Riley PAO shop. Vannessa also serves as an Army Reserve Soldier and is the first U.S. Army Reservist to earn the 46S MOS. Houston served in the U.S. Navy and I am excited about the skill sets they bring to the team.

If you have a story to tell, please let us know and we can share it with the world.

Contact Vannessa at Vannessa.l.josey.civ@mail.mil or at ext. 5032.
Contact Houston at Kenneth.h.waters4.civ@mail.mil or at ext. 5659.

I am excited to see the great products that will continue to be put out by the Public Affairs professionals on our little installation.



John Harlow
Chief of Public Affairs/Legislative Liasion
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NSSC This Month

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About this newsletter
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To subscribe to *NSSC This Month*, please contact Houston Waters at Kenneth.h.waters4.civ@mail.mil

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Cover photo: Brushing Up! by Jeff Sisto, NSRDEC

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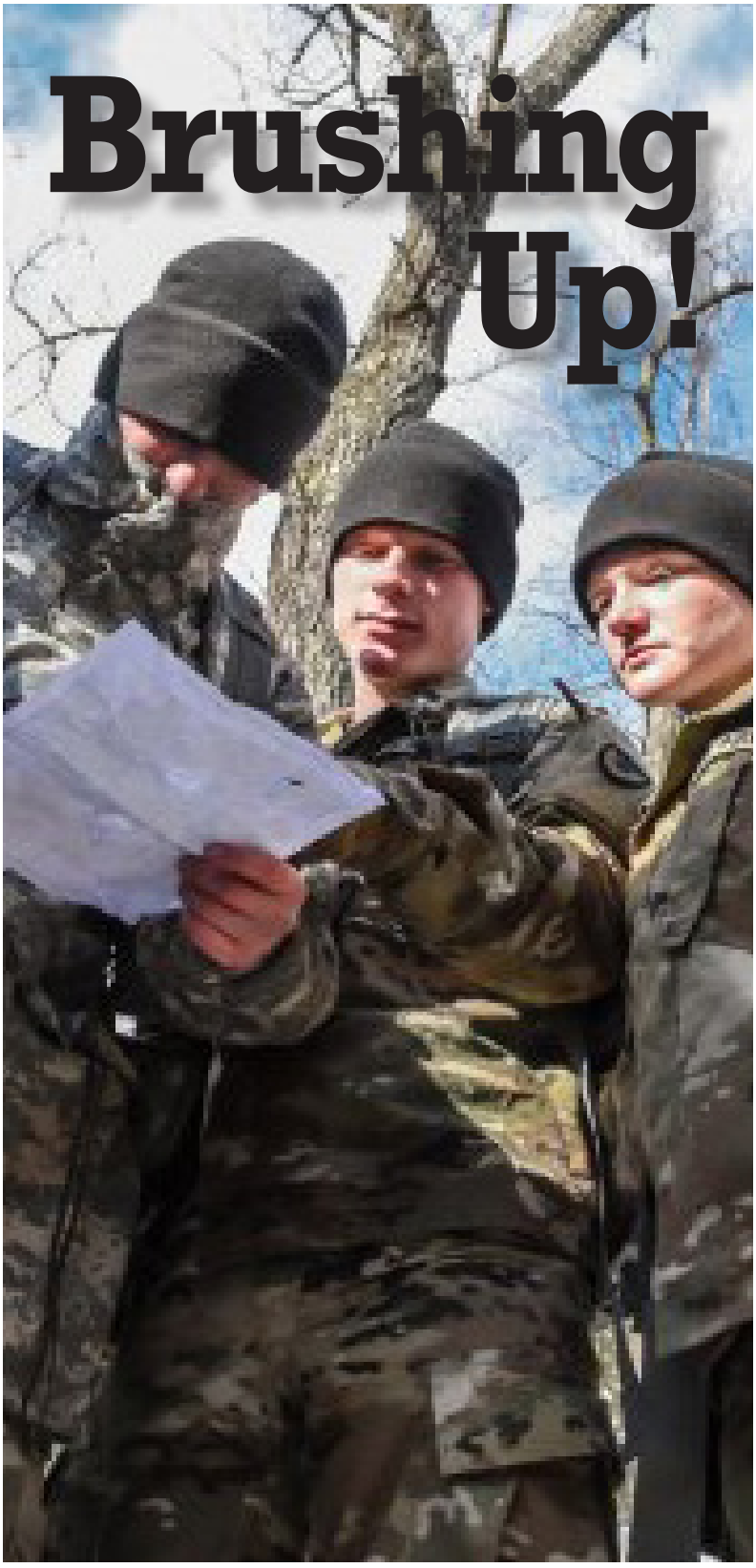


NSSC This Month

A Holocaust Survivor's Story

Stephan Lewy Speaks about the Legacy of Perseverance

By Vannessa L. Josey USAG Natick Public Affairs/NATICK, Mass. (April 10, 2018)

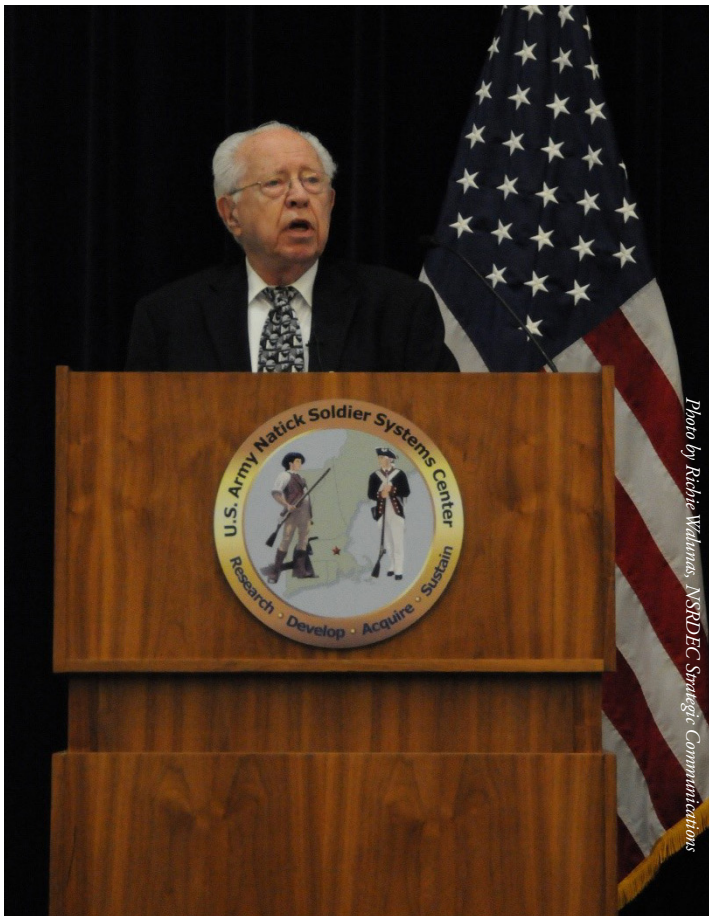


Photo by Richie Walunas, NSRDEC Strategic Communications

The numbers of Holocaust survivors grows smaller every day. And, soon, we will no longer hear the voices of those who lived history. Those who are still alive today share the events with all who will listen. We will only read it in a book or online, or we see a video or a movie.

Stephan Lewy served as the guest speaker for Holocaust Remembrance Day "Legacy of Perseverance" ceremony in the Hunter Auditorium.

The Natick people were given a glimpse of the strength of persecuted people who were targeted for extermination by the Nazi's.

Lewy, a Holocaust survivor and World War II veteran, spoke about his time as an orphan at the Baruch Auer Bach orphanage which cared for Jewish children through the time he made it to the United States.

"Though I was never sent to a death camp, I suffered many indignities as a child." Said Lewy.

About 100 children survived attempted murder during Kristallnacht, "Night of Broken Glass," when the Nazi's raided Lewy's orphanage. This was one of many atrocities Lewy survived until he arrived in the United States on June 25, 1942 at the age of 17.

Before the Nazi takeover of power in 1933, Europe had a vibrant and mature Jewish culture. By 1945, that culture had been devastated spurring a large emigration to the United States.

The U.S. government gave Lewy the choice of returning to Germany or joining the military when he turned 18 in 1943.

Lewy trained in Military Intelligence in Maryland, specifically psychological warfare. Many Nazi's were captured due to Lewy's interrogation skills. Lewy served in six campaigns, including the Battle of the Bulge alongside Gen. George Patton.

Holocaust survivor Mr. Werner Gossels speaks with Soldiers following a Holocaust observance. Gossels introduced the keynote speaker of the event, titled the "Legacy of Perseverance," which was held at Natick Soldier Systems Center (NSSC) April 11, 2018. (Photo Credit: Mr. Richie Walunas, NSRDEC Strategic Communications)

Focal Point

U.S.ARMY SHARP℠ SEXUAL HARASSMENT/ASSAULT RESPONSE & PREVENTION

Lord Community Center

April 18, 2018

"Small acts, by a lot of people, make a big impact."

Jersouk Troy, SARC
Hanscom AFB

U.S. Army photos by John Harlow & Houston Waters, USAG Natick Public Affairs

Photo by David Kamm, NSRDEC

Making the Move

CW5 Transfers from Natick to Pentagon

By John Harlow, USAG Natick Public Affairs/NATICK, Mass. (April 9, 2018)

Chief Warrant Officer Five (CW5) Hal Griffin III has been selected to be the seventh Command Chief Warrant Officer of the U.S. Army Reserve Command (USARC) and the Senior Warrant Officer Advisor to the Chief of the Army Reserve.

For the past 10 years, Griffin has also served as a Department of the Army civilian at the Natick Soldier Systems Center (NSSC) with the Integrated Logistics Support Center (ILSC).

In his new position, he is responsible for developing and synchronizing warrant officer related policy initiatives and advising the USARC Commander and staff on the life cycle of warrant officer talent management that includes force modernization, recruiting, training, utilization, education, and career enhancement - with the focus on growing the future force.

Griffin reflected on his time at Natick serving with ILSC and the balance between his duties as a DA civilian and as an Army reservist.

"It's tough balancing the two different jobs and you can add in a third one, a well-balanced life with my family," said Griffin. "What makes it work is a great relationship with my boss here at ILSC. The only reason I can step up to the new position with the Army Reserve is because of the leadership I have had here at Natick."

"I've deployed twice during my time here at Natick and at times it limited what I could do as a civilian," said Griffin. "There was always the possibility that I could deploy so that limited what I could do at ILSC. It was a huge tradeoff trying to balance work as a civilian and being a reservist."

As a DA Civilian, Griffith used his role as a logistician to ensure the development of equipment that went to Soldiers was what they needed.

"When equipment is in development, a logistician is required by DoD regulations to be involved from the very beginning," said Griffin. "Logisticians help the engineers make sure it is most practical for Soldiers to use."

Griffin enlisted in the Army in 1985 and became a warrant officer in 1990, graduating flight school with honors at Fort Rucker, Alabama.

While serving in the reserves had challenges for Griffin at Natick, it was also vital to the job he did.

"My time in uniform hugely complimented my work here," said Griffin. "Having a perspective that helps orient people who are doing research and development so they understand what a Soldier needs to have is important," said Griffin. "We get the feedback from Soldiers in forums, but having someone on hand while equipment is being developed is vital to stopping problems before they happen."

Griffin deployed in support of Operation Iraqi Freedom in 2006 and in support of Operation Enduring Freedom in 2013.

Driving through the gate each morning, Griffin is reminded of what NSSC and ILSC is all about.

"If there is one thing I take away from my time at Natick it is that Soldiers are our credentials," said Griffin, referring to the statue everyone passes as they drive onto Natick. 'I have been a beneficiary of the work performed here at Natick during my 31 years as a Soldier."


Photo by PA1 Robert Simpson, U.S. Coast Guard


Photos by U.S. Army


Photo by Staff Sgt. Vanessa L. Josey


Photo by PA1 Robert Simpson, U.S. Coast Guard

What's it Like Being First? Stronger, More Effective

Army Reservist First to Convert

By Vannessa L. Josey USAG Natick Public Affairs/NATICK, Mass. (April 10, 2018)

"Ms./SSG Josey, attached is your approved 4187 for the 46S convergence for your records. Congrats on being the first USAR Soldier to get it done! V/r MSG Licea." I continued to read this a few more times before it actually hit the part of my brain that allows me to understand the written word. How did that happen? I haven't ever been first.

Throughout my career, I have focused on making positive changes and improvements that apply to my life. The courses I have taken both in my military and civilian career have provided me the tools and knowledge to become the public affairs professional that I am.

We are here for the service members and our commanders. We storytellers. We are communicators.

Public affairs professionals have an impact on our soldiers who raise their right hand and swear to protect and defend the Constitution of the United States. We also have an impact on the American public, by sharing the stories of their sons and daughters doing heroic things.

The foundation of our profession starts at the Defense Information School at Fort George G. Meade, Maryland. The education provided to public affairs professional has evolved to keep up with the 24-hour news cycle.

Gone are the typewriters and betacams. Tablets and smart phones are the new communication technology.

A public affairs professional in the 21st Century needs to be well-rounded and tell the story of our Soldiers in multiple platforms.

The 30-second YouTube video is the new thousand word story.

These trends of how the public receives information led the Army to combine the print and broadcast journalism military occupational skill into Mass Communication Specialist.

I stood in front of the camera, created news segments, and wrote stories with one goal in mind . . . tell the Soldiers story and do it faster, better and more efficiently.

The hands on training with still and video cameras, electronic news gathering, a completely different style of writing and editing software was pretty intense for this dinosaur.

Change is good. Because of the training I received, I am confident representing my command on camera. I know that a 30-second You Tube video can reach a larger audience than the best written Keith L. Ware winning feature.

As the first Army Mass Communications Specialist, it is an honor with great responsibilities.

I have the opportunity to teach, coach and mentor my soldiers at 362nd Mobile Public Affairs Detachment, Londonderry, New Hampshire and use as a as a public affairs specialist at the Natick Soldier Systems Center, Natick, Massachusetts.

So, I'm the first Mass Communications Public Affairs Specialist. I'm no big deal. The men and women veterans of the world are the most important of what I do. It's an honor to serve as the conduit to tell their stories. They're a really, really big deal.


Photos by U.S. Army

Honoring Women

Natick Celebrates Women's History Month

By Jane Benson, NSRDEC Public Affairs/Natick, Mass. (Mar. 23, 2018)

The achievements and the voices of women were expressed in full force during a Women's History Month observance hosted by the Natick Soldier Research, Development and Engineering Center, Office of the Director, on March 20. The event, which was held in Hunter Auditorium, was open to the Natick Soldier Systems Center workforce.

Maj. Gen. Tammy S. Smith, Headquarters, Department of the Army, Deputy G-1, Pentagon, was the esteemed guest speaker at the event. The event also included a performance by the Boston Skyline Chorus, an all-women a cappella group known for their singing talent and infectious enthusiasm. The program also featured a slide-show/musical montage that included quotes from some of the women of Natick's workforce, who recounted what it is like, as women, to work at Natick and what Women's History Month means to them.

U.S. Army photo byDavid Kamm, NSRDEC

Douglas A. Tamilio, director of NSRDEC, introduced Smith, noting her significant accomplishments and emphasizing that she had commanded at all levels, touching many Soldiers throughout her career.

During her talk, Smith pointed out that the first piece of Army equipment that was specifically designed for women was a bicycle, which weighed the same as the men's bike, but was made to accommodate women wearing skirts. The bike was designed for members of the Women's Army Auxiliary Corps, or WAAC, which was created as an auxiliary unit that would later become the active-duty Women's Army Corps, or WAC.

The Major General said that as far as she knew the World War II bicycle and 2012's women's body armor, outer tactical vest, are the only two items made specifically for women. NSRDEC played a key role in developing the OTV.

Smith said that we have to recognize physical differences and work to improve equipment "to optimize performance and that is what you do here."

The Army has made great progress in reducing its structural exclusion, a term that refers to exclusion through law, policy, as well as rules and regulations. The Army has also made great progress in reducing cultural exclusion, a term that refers to the cultural expectations of what women can do, or should be allowed to do, rather than laws, rules, or policies.

Smith said that the members of the Women's Army Corps "started to put cracks in that glass ceiling," and that we all benefit from their actions today.

The Major General's Army career started almost by accident. She was a member of the Future Farmers of America and one day she was reading the organization's magazine. The magazine included a coupon that you could fill out and request information on how the Reserve Officers' Training Corps, or ROTC, can help pay for college. She then applied for, and was awarded, an ROTC scholarship.

"That coupon was not meant for me," said Smith. "I was reading a boy's magazine. It was just random that I happened to see that particular coupon because I was involved in an organization that was mostly for boys, even though they included young women."

Smith eventually became the Eighth's Army first female Deputy Commanding General - Sustainment. The Eighth Army is the commanding formation of all United States Army forces in South Korea.

She said that for the Army to go from an organization where women rode bicycles while wearing skirts to an organization where a woman could become a deputy commander of the Eight Army underscores how the Army is becoming more and more inclusive.

"We are making tremendous progress and I'm so proud to have been able to see it," said Smith.

Douglas A. Tamilio, director of the Natick Soldier Research, Development and Engineering Center, presents Maj. Gen. Tammy S. Smith with a plaque of appreciation. Smith visited NSRDEC on Mar. 20 and was the esteemed guest speaker at NSRDEC's Women's History Month celebration. (Photo Credit: David Kamm, NSRDEC)

"We are making tremendous progress and I'm so proud to have been able to see it."

MG Tammy S. Smith

Worth the WEIGHT

Redesigned Rucksack Slated for Distribution

Photo by David Kamm, NSRDEC

By K. Houston Waters, USAG Natick Public Affairs/Natick, Mass. (April 16, 2018)

The latest iteration of the Army's airborne rucksack, the Modular Lightweight Load-Carrying Equipment (MOLLE) 4000, has been designed, tested, and is now slated for limited distribution. Initially formatted to address the needs of the 82nd Airborne Division, the mid-sized rucksack, fabricated with both sewn-on and removable pouches, should be versatile enough for Army-wide utilization of the system.

"The beauty is, we designed a rucksack specifically for the airborne community, however, non-airborne units can use this rucksack just as effectively by just not being issued the airborne harness components, " said Rich Landry, Individual Equipment Designer with Load Carriage Systems, Product Manager, Solider Clothing and Individual Equipment.

A former Pathfinder with the 82nd, Landry understands the needs of the Airborne community. Through communication with the 82nd, and other Army units, Landry obtained the feedback necessary to improve the rucksack, a critical tool for deployed Soldiers. This final design borrows elements from the old ALICE pack, and earlier versions of MOLLE. After listening to critiques of previous equipment, Landry determined adjusting weight distribution was key.

"One of the critical design issues is, you must distribute the weight onto the hips, the ideal load carrying surface on thbody. The original ALICE pack [All-Purpose Lightweight Individual

> "Then we started talking about the science of load carriage. And that's what MOLLE is all about. Getting the weight off the shoulders and onto the hips – a modular approach to the design of the rucksack."
>
> Rich Landry, PM-SCIE

Carrying Equipment] only distributed the weight onto the shoulders and lower back – which was a real problem. Then we started talking about the science of load carriage. And that's what MOLLE is all about. Getting the weight off the shoulders and onto the hips – a modular approach to the design of the rucksack."

Members of the 82nd had even more specific requests. "One of the requirements that the 82nd had was that the harness that attaches the rucksack to the parachutist be sewn directly to the pack – because they didn't want to lose any of the parts of it. This was the one requirement we didn't agree with. We decided it would be better and more practical if the harness that supports the pack to the parachutists harness is removable but can be set up in a configuration that is seamless in how it attaches, and therefore, doesn't require a long rigging process. Normally rigging a rucksack up to this type of harness can be a 5 min. or longer process, depending on the Soldier. With this, it's about a 1 min. process. But, it's still completely removable when need be," said Landry.

With a durable, yet light-weight frame, sewn-in pouches for organization of equipment, a pouch for airborne components (harness and lowering line), and MOLLE-webbing for attaching additional pouches, Landry believes the versatile MOLLE 4000 is both balanced and adaptable.

The MOLLE 4000 will begin fielding later this year. Around 6,000 packs are expected to be distributed to members of the 82nd Airborne Division. A large contingent of the conventional deployed force is also expected to receive a full-scale fielding of the rucksack in the near future.

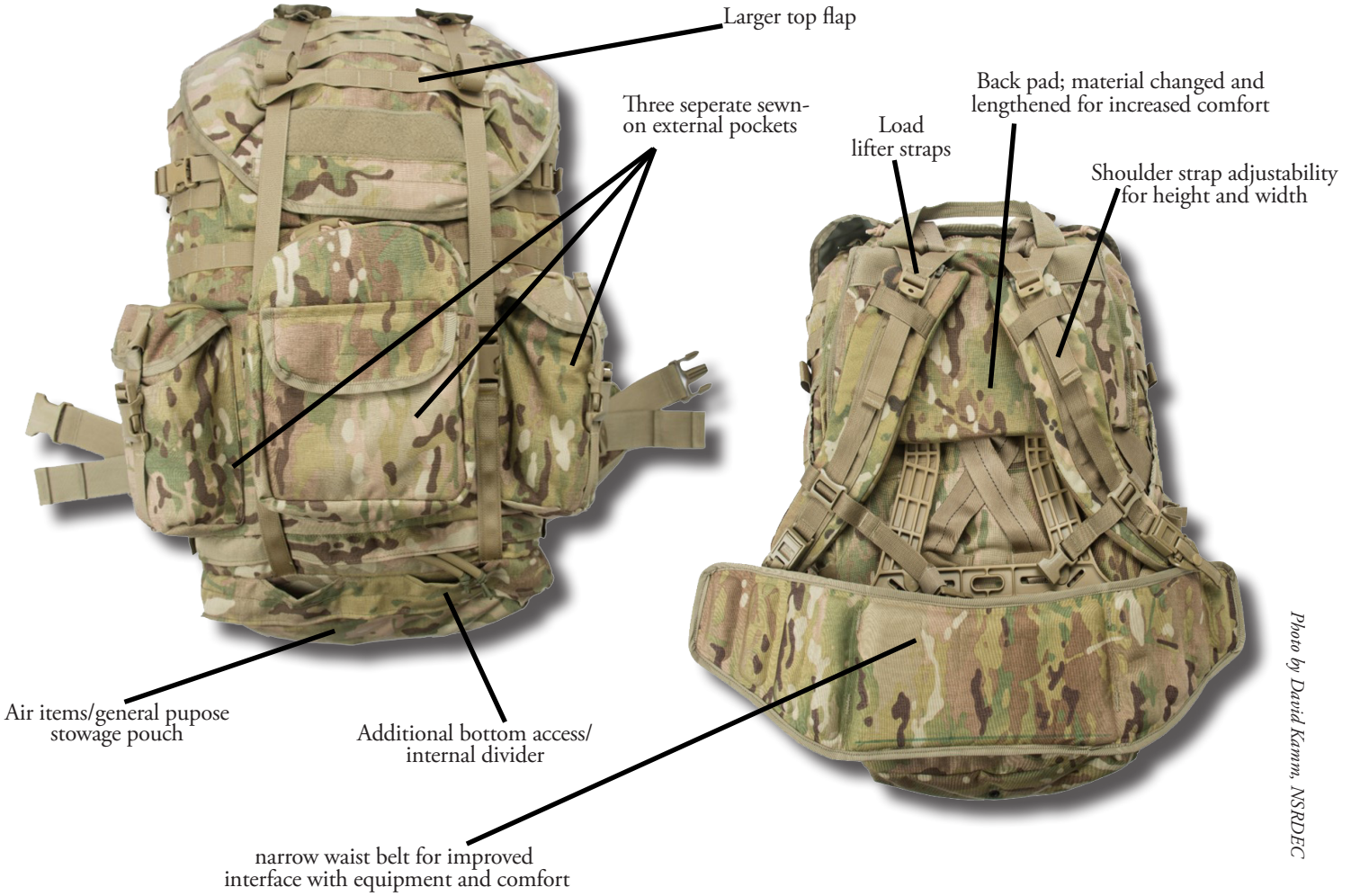


Photo by David Kamm, NSRDEC

Brushing Up!

U.S. Army photo by Jeff Sisto, NSRDEC

Natick's Human Research Volunteer Soldiers Maintain Land Navigation Skills

By Jeff Sisto, NSRDEC Public Affairs/Natick, Mass. (March 25, 2018)

Before a series of late-winter nor'easters covered New England with heavy snow, a small group of Human Research Volunteer Soldiers from the U.S Army's Natick Soldier Research, Development and Engineering Center, or NSRDEC, practiced their land navigation skills in the woodlands of nearby Fort Devens, Massachusetts.

During their voluntary, 90 day assignment to NSRDEC, Human Research Volunteer, or HRV, Soldiers spend the majority of their time supporting Army scientists and engineers with human performance-based research inside NSRDEC's unique research facilities and laboratories where they test everything from new ruck sacks and prototype ration technologies, to virtual reality-based training platforms.

U.S. Army photo by Jeff Sisto, NSRDEC

Essentially, the primary function of an HRV Soldier is to be the human in the Army's human performance focused research. It's an indispensable role within a growing and pivotal field of research that is laying the groundwork to modernize the Army's greatest asset -- the individual Soldier.

Yet, as newly trained Soldiers, the fundamental combat skills they learned in basic and advanced individual training can rapidly diminish if not performed regularly. To maintain their combat readiness while serving the Army S&T community, NSRDEC's non-commissioned officers responsible for their daily supervision began incorporating a condensed field training regimen into the HRV schedule with the first group of young Soldiers to arrive in FY2018.

"It's important for HRV Soldiers to be proficient in the basic Soldier skills they'll be using when they leave Natick and get to their first units" said Staff Sergeant Anthony Sandoval, the Operations NCO for NSRDEC's Headquarters Research and Development Detachment. "Part of our job as NCOs is to make sure they're ready."

To accomplish this, Sandoval's team of NCOs developed and implemented a condensed field and weapons training program around the HRVs busy schedules supporting NSRDEC research studies designed to brush up on their land navigation and marksmanship skills.

"These are critical skills for all Soldiers to have, but especially this group of HRVs because they are all 11 Bravo's [Military Occupational Specialty 11-B - Infantry] including two female Infantry Soldiers," said Sandoval. "Every Soldier needs to practice repeatedly for these maneuvers become second nature."

NSRDEC's NCOs made sure the field training didn't conflict with the HRV's obligations as research subjects.

"We started with classroom sessions for basic and advanced land navigation before bringing them out to the [Land Navigation] course at Fort Devens," said Sergeant Andrew Cochran, HRDD platoon sergeant. "We are also retraining them on the M-4 rifle/carbine and crew-served weapons to maintain their marksmanship skills."

"We also arranged for them to get some time on the EST [Engagement Skills Trainer] when it's not being used for research purposes," said Cochran.

As they help Army scientists' research and develop future Soldier performance capabilities, HRV Soldiers are honing their own lethality. And it's the NSRDEC's NCOs who make it happen.

A group of Human Research Volunteer Soldiers from the U.S. Army Natick Soldier Research Development and Engineering Center's Headquarters Research and Development Detachment consult their map during land navigation training held at Ft. Devens, Massachusetts in February 2018. (Photo Credit: Jeff Sisto, NSRDEC Public Affairs Office)

Developing Countermeasures

Army Laboratory Study Examines Impact of Military Physical Exercise on Bone Health

By Mallory Roussel, USARIEM Public Affairs/Natick, Mass. (April 5, 2018)

Two researchers from the U.S. Army Research Institute of Environmental Medicine, or USARIEM, Maria Canino, right, and Sgt. Alvin Korus monitor the physiological status of two study volunteers completing a load carriage exercise, which simulates the same exercises new recruits complete during the first days of initial military training, or IMT. (Photo Credit: Mallory Roussel (USARIEM))

The exercise physiology laboratory located within the U.S. Army Research Institute of Environmental Medicine, or USARIEM, has been bustling with activity this month with researchers collecting bone health data from 30 female research volunteers in an effort to better understand how bones, and hormones that affect bone regrowth, respond when new recruits start their first days of initial military training, or IMT.

Stress fractures and other musculoskeletal injuries not only hurt the Soldier, but, as the number one cause of medical holdovers, they also hurt Army readiness by costing the Army millions of lost or restricted work hours and dollars.

In fact, according to last year's statistics, about 20 percent of female recruits and five percent of male recruits can suffer from some form of stress fracture during IMT due to the novice warrior's inability to withstand unaccustomed, repeated stress to their bodies, such as marching with body armor. Women beginning IMT with poor vitamin D status are especially vulnerable to these injuries.

USARIEM's military performance and nutrition teams made an Army-wide impact in 2017 when it came to preventing injuries and improving readiness. USARIEM researchers conducted separate field studies that led to developing the Occupational Physical Assessment Test, or OPAT, which assesses a recruit's physical performance capabilities to determine if they should be allowed to join the Army, and the Performance Readiness Bar, or PRB, a calcium and vitamin D-fortified snack bar developed to strengthen bones.

Since the Army began administering the OPAT to all recruits in 2017 and since all Army Basic Combat Training schools began distributing the PRB in 2018, Soldiers have been able to begin their careers with a slimmer chance of experiencing career-threatening occupational injuries.

Dr. Erin Gaffney-Stomberg, the principal investigator of the current USARIEM women's bone health laboratory study, and her team realize that in order to create more countermeasures against musculoskeletal injuries, it is also important to understand how the human skeleton responds to militarily-relevant exercise, especially when a freshly recruited Soldier is completing IMT for the first time.

"We know that during IMT, that period of seven to twelve weeks when a civilian first enters the military and undergoes a series of trainings, the risk of stress fracture is higher," said Gaffney-Stomberg, a research physiologist from USARIEM's Military Performance Division. "We also know that bone turnover increases. In other words, bone formation and bone resorption markers or hormones in the blood go up with training. What we do not understand is some of the reasons why these hormones go up and whether or not these changes are beneficial or detrimental to bone."

Gaffney-Stomberg and her team have zeroed in on the parathyroid hormone, or PTH, which is secreted from four parathyroid glands in the neck. According to Gaffney-Stomberg, PTH regulates calcium

Photo by Mallory Roussel, USARIEM

levels in the blood by increasing the levels when they are too low. The hormone does this through its actions on the kidneys, bones and intestines.

"The parathyroid hormone increases during training for Soldiers and during other types of intense exercise for civilians, and it is known to stimulate the release of calcium from large calcium stores in the bones into the bloodstream, decreasing the formation of new bone," Gaffney-Stomberg said. "In this study, we are researching to understand why PTH goes up with the initiation of exercise."

Both men and women can produce PTH. However, Gaffney-Stomberg noted that targeting women as the study demographic would not only lead to gaining insight into women's bone health, but it would also provide data that Army researchers could use to prevent stress fractures in all Soldiers.

"With women being integrated into combat roles, there is a greater need for research that can help us develop countermeasures against musculoskeletal injuries," Gaffney-Stomberg said. "Once we understand what PTH does in people who are at higher risk of stress fractures, we can use this information to improve existing injury prevention guidance, including developing dietary interventions and proper exercise guidance."

"With women being integrated into combat roles, there is a greater need for research that can help us develop countermeasures against musculoskeletal injuries."

Dr. Erin Gaffney-Stomberg, USARIEM

One of the main culprits of stress fractures is recruits completing exercises they are unaccustomed to for longer periods. In order to replicate this common incident during IMT in the lab, the researchers had study volunteers complete a load carriage exercise, which would simulate recruits marching in body armor.

For this study, the research volunteers not only had to be women. They had to be civilians.

"We are trying to understand the initial bone and calcium kinetic response to a militarily relevant exercise," Gaffney-Stomberg said. "We want someone who has not been through military training before, such that their bones are naïve or unaccustomed to that type of exercise."

During the load carriage exercise, each study volunteer wore body armor that was weighted at 30 percent of her body weight. The volunteers walked at different speeds and grades on a treadmill, exercising at about 65 percent of their maximum effort, which the researchers calculated during the beginning of the study through an aerobic fitness test. Study volunteers spent three days in USARIEM's exercise

Photo by Mallory Roussel, USARIEM

In order to track research volunteers' calcium levels during and after militarily relevant exercise, Anna Nakayama, left, and Jessica Mason, middle, both research fellows working at the U.S. Army Research Institute of Environmental Medicine, or USARIEM, collect blood samples after two study volunteers complete a load carriage exercise in USARIEM's exercise physiology laboratory. (Photo Credit: Mallory Roussel (USARIEM))

lab out of a six-day period either exercising or resting.

To understand how each volunteer's PTH levels changed during and after the load carriage exercise, the researchers needed a way to track where calcium traveled in the body. The researchers did this by giving the volunteers stable calcium isotopes both orally and through an IV on the first day of the study. Gaffney-Stomberg explained that these isotopes were non-radioactive and served as a safe way to record a person's calcium levels. The researchers recorded these hormone changes by collecting urine and blood samples from volunteers during and after the treadmill exercise.

Since diet can also affect a person's PTH levels, the researchers provided the study volunteers with all of their food, which was supposed to mirror the amounts of calcium each volunteer normally ate at home.

The researchers will continue their data collection for the rest of 2018, and they plan to publish their results by next year. Despite being a small lab, USARIEM has made a significant mark in the Army's effort to prevent injury, and they will continue to do so in the future. This study is one of several USARIEM studies focused on prevention and reduction of musculoskeletal injuries among Soldiers.

"There are multiple factors that can impact a person's risk of developing a stress fracture," Gaffney-Stomberg said. "Some of those factors are not modifiable, such as being female. There are also genetics that can place people at higher risk. Then, there are modifiable factors, such as nutrition status and physical fitness. At this point, there is guidance on what the known risk factors are, and then once a person experiences a bone fracture during training, there are clinical care guidelines for how to treat that person. Typically, that involves taking a calcium supplement, as well as some rehabilitation.

"Unfortunately, about 60 percent of male and female recruits who experience a stress fracture will drop out of the military. If we can reduce the number of people who get injured during IMT, we can reduce the number of people whose military careers have prematurely ended."

Photo by NASA

Food for Thought

Natick Food Technologist Presents at Forum Featuring Skype with International Space Station

By Jane Benson, NSRDEC Public Affairs/Natick, Mass. (Feb. 12, 2018)

Michelle Richardson, a senior food technologist at the Natick Soldier Research, Development and Engineering Center, was part of a guest panel at a recent NASA downlink. The event was hosted by the Christa Corrigan McAuliffe Center for Integrated Science Learning at Framingham State University, in collaboration with the Challenger Center's National Office.

An enthusiasm for teaching and learning and a focus on careers in science, technology, engineering and mathematics -- which are at the heart of Christa McAuliffe's legacy -- were front and center at event. The downlink gave Framingham State University students the chance to Skype with astronauts on the International Space Station. Students had the opportunity to ask the astronauts questions about living and working on the space station, as well as ask questions about astronaut training and education requirements.

The three astronauts speaking to students from the International Space Station via Skype included NASA astronauts, Joseph Acaba and Scott Tingle, a Massachusetts native, and Norishige Kanai from the Japan Aerospace Exploration Agency.

The venue for the educational Skype was particularly fitting since McAuliffe, a teacher and an FSU alum, was chosen more than 32 years ago to be the first teacher in space as part of the Space Shuttle Challenger mission. All seven people aboard the Challenger, including McAuliffe, were killed when the Challenger broke apart on January 28, 1986.

Richardson, who works in the Combat Feeding Directorate at NSRDEC, was one of several presenters at the event. Following the Skype interaction, Richardson spoke to an audience made up of FSU students and faculty, state government officials, and representatives from the Challenger Center's local and national offices.

Richardson was part of the panel of presenters that also included

U.S. Army photo by David Kamm, NSRDEC

Dan Barstow, education manager for the International Space Station National Laboratory; Tess Caswell, an engineer and geologist who participated in the simulated space station mission called HERA XI; and Frank White, author of The Overview Effect: Space Exploration and Human Evolution.

Richardson was chosen to participate due to her work on NASA projects and previous participation in STEM events at the McAuliffe Center. The senior food technologist is part of an NSRDEC CFD team that designs foods for the military and for NASA, including foods for a future space mission to Mars.

Foods developed and tested for the both the military and the space program have similar requirements. Both warfighters and astronauts need foods that have a long shelf-life and that are low-volume, low-weight, easy-to-eat, nutritious, safe and good-tasting.

"DOD and NASA have similar and unique requirements in terms of long shelf life foods, so a chance to obtain feedback from this customer on foods we are involved in developing is a priceless opportunity," said Richardson. "Speaking with and hearing from astronauts firsthand gives us a rare glimpse of this customer's experience with foods in their unique environment."

NSRDEC's Combat Feeding Directorate, a long-term partner with NASA, has been developing foods -- as well as methods for food processing and food packaging -- for the space program since the 1960s.

"CFD has long standing partnership/relationship with NASA, and events like this serve to not only strengthen that partnership but to also demonstrate to others NSRDEC's role -- through our collaboration with NASA -- in developing long shelf life foods," said Richardson.

During her talk, Richardson told the audience about the evolution of space feeding from early tube foods to modern day nutrition bars, as well how vegetables can now actually be grown aboard space stations.

One of the products that Richardson and other collaborators previously worked on for NASA is a meal replacement bar. Richardson explained that the meal replacement bar is all about reducing the mass and the volume but maintaining the calories and nutrition that astronauts need.

NASA developed the bar but they wanted to reduce its size. Natick looked at molding technologies that would squeeze the bar together as well as ultrasonic agglomeration that basically uses sound waves to actually make the food stick together and compress it. The bars that were eventually tested were developed using those two technologies.

Richardson was pleased to hear during the FSU event that Tess Caswell had actually tested and liked the meal replacement bar. Caswell served on a month-long simulated journey to help NASA research the effects of long-term isolation and confinement. Caswell said during the FSU event that the foods eaten during her simulated mission were good and that she had eaten some of the meal replacement bars.

"They were like granola bars on steroids," said Caswell.

In addition to the meal replacement bar, Richardson and her colleagues at Natick are also investigating vitamin stabilization for a potential Mars mission. Richardson has a current project that provides high quality, irradiated entrees for the International Space Station.

Richardson said that foods being developed for a Mars mission must last five years and that the vitamin stabilization project is aimed at investigating whether the vitamins contained within foods will last five years as well.

"We wrote a proposal to evaluate vitamins that are important for astronaut health, including Vitamins A, D, E, C and riboflavin, folic acid and thiamin," said Richardson. "These vitamins are important to evaluate because they degrade over time and are needed to maintain health."

> **Speaking with and hearing from astronauts firsthand gives us a rare glimpse of this customer's experience with foods in their unique enviornment."**
>
> **Michelle Richardson**
> **Senior Food Technologist, NSRDEC**

Richardson and her CFD colleagues investigated drinks, food bars, entrees and packaging to find the best ways to stabilize vitamins.

As a strong advocate for STEM outreach, Richardson was pleased to have the chance to participate in the NASA downlink.

"STEM outreach is very important," said Richardson. "It helps students understand how the academic disciplines of science, technology, engineering and mathematics are applied and the impact they have on their world and in this case beyond."

Richardson noted that STEM education prepares today's students to be the workforce of tomorrow.

Irene Porro, director of the Christa McAuliffe Center and a strong supporter of STEM education, said that the NASA downlink event was "an incredible opportunity" for FSU students.

During the Skype session, Acaba, an educator and NASA astronaut, shared an important announcement regarding McAuliffe's STEM education legacy.

"It's been 32 years since we lost the Challenger crew," said Acaba. "One of whom was of course, Christa McAuliffe, the first teacher in space. I can't think of a better time or a better place to make this announcement than at Framingham State University, which is Christa's alma mater. I would like to announce that Ricky Arnold (an American educator and astronaut) and I, over the next several months, will be working with the Challenger Center to record several of Christa's original lesson plans that she was going to do in space. We look forward to sharing them with educators and students around the world. It is really going to be a pleasure working with you all, and we look forward to inspiring the next generation of explorers and educators."

The enthusiasm of the FSU students, the astronauts and the various speakers was infectious, with the event leaving attendees aware of the importance of hard work combined with the endless possibilities of space.

Richardson herself was once a young student dreaming of somehow becoming involved with the space program.

"I've been working at NSRDEC for over 28 years," said Richardson. "I remember when I was in school and I went to visit NSRDEC and they were showing a lot of the space foods. I thought 'oh, I want to work for NASA to design foods.' And then later I had the opportunity with some of my coworkers to write a proposal, and now I am actually collaborating with NASA developing food products for space."

Ready, Set, Dough!

Natick Delivers Pizza to the Warfighter

U.S. Army photo byDavid Kamm, NSRDEC

By Jane Benson, NSRDEC Public Affairs/Natick, Mass. (March 16, 2018)

It's ready, set, dough for the Meals, Ready-to-Eat pizza.

Scientists in the Combat Feeding Directorate at the Natick Soldier Research, Development and Engineering Center have overcome the obstacles inherent in creating and producing a shelf-stable pizza to be included in the MRE.

Most people are used to eating pizza that's fresh or frozen, but creating a pizza for the warfighter in the field, in remote areas, or in combat presents a series of unique scientific challenges. MREs must stay shelf-stable for three years in temperatures up to 80 degrees Fahrenheit. Moreover, achieving this extended shelf life with the combination of traditional pizza ingredients is particularly difficult.

Prior to NSRDEC's Combat Feeding Directorate taking on the challenge, developing a pizza that meets all these requirements had never been done before. Fortunately for the Soldier, CFD was up to the task. CFD scientists are longtime experts in developing foods for the military and NASA.

CFD used a combination of technologies involving water activity, pH levels and innovative packaging to create a shelf-stable pizza. Initial pizza prototypes developed by CFD were successful at the lab level.

Difficulties arose when the commercial food industry began larger scale production of the pizza. Foods made for the commercial market do not need to withstand the stringent requirements of foods developed for the military or the space program. CFD's expertise and experience were needed to solve the problems posed by larger scale production.

A Soldier enjoys a Meal, Ready-to-Eat pizza developed by scientists in the Combat Feeding Directorate at the Natick Soldier Research, Development and Engineering Center. CFD used a combination of technologies involving water activity, pH levels, and innovative packaging to create a shelf-stable pizza. (Photo Credit: U.S. Army photo by Michael Stepien)

"This product is a great example of using food science to meet the challenging and unique requirements for military rations."

Stephen Moody, Combat Feeding

CFD conducted three large-scale tests to make sure the pizza was producible at two different food processing plants. The tests were also carried out to verify the capability of the plants to produce pizza that adhered to the detailed military specification. CFD then updated the specification to improve pizza quality.

Combat feeding subject matter experts provided on the ground technical support during the multiple large-scale production tests to ensure the pizza's success.

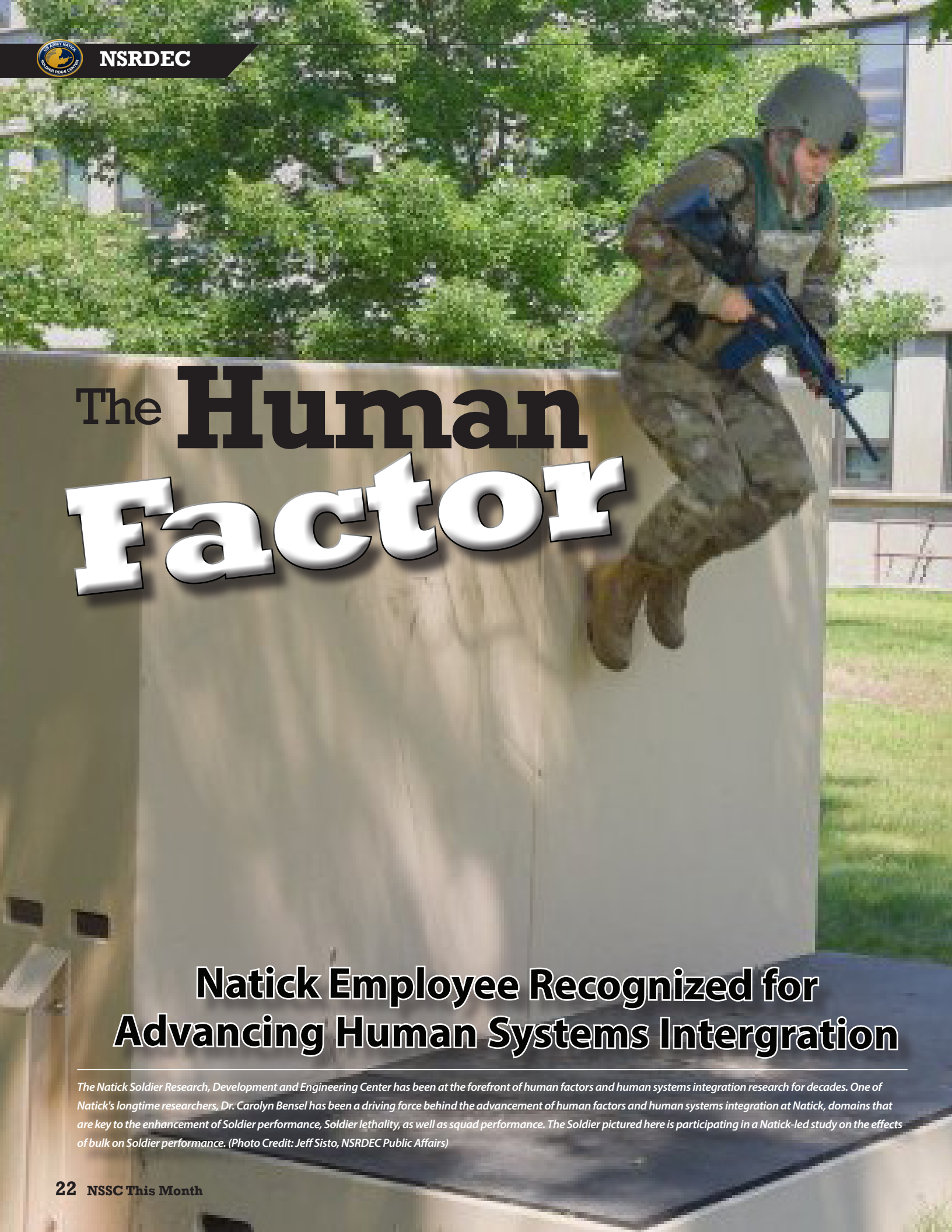
"Partnership with industry is essential to ensure that what works in government laboratories is practical and achievable in a commercial full-scale production setting," said Stephen Moody, director of NSRDEC's CFD.

CFD then conducted a user evaluation of the commercially produced item with troops. Based on positive results, CFD recommended the pizza for inclusion in the MRE.

"This product is a great example of using food science to meet the challenging and unique requirements for military rations," said Moody.

The first shelf-stable pepperoni pizza will be assembled into MREs beginning in March 2018.

Thanks to the hardworking military food experts at CFD, Soldiers will get their piece of the pie and then some, in the near future.



The Human Factor

Natick Employee Recognized for Advancing Human Systems Intergration

The Natick Soldier Research, Development and Engineering Center has been at the forefront of human factors and human systems integration research for decades. One of Natick's longtime researchers, Dr. Carolyn Bensel has been a driving force behind the advancement of human factors and human systems integration at Natick, domains that are key to the enhancement of Soldier performance, Soldier lethality, as well as squad performance. The Soldier pictured here is participating in a Natick-led study on the effects of bulk on Soldier performance. (Photo Credit: Jeff Sisto, NSRDEC Public Affairs)

U.S. Army photo byDavid Kamm, NSRDEC

By Jane Benson, NSRDEC Public Affairs (April 9, 2018)

Dr. Carolyn Bensel has dedicated her career to making sure that Soldier clothing and equipment enable or enhance, rather than hinder, a Soldier's ability to carry out his or her mission.

During her 46-year career at the Natick Soldier Research, Development and Engineering Center, Bensel led the Human Factors Group, from 1971 to 1990, and served as a senior researcher in the areas of human factors, biomechanics, and human systems integration, or HSI.

"We did a lot of work as applied research and in the development of equipment," said Bensel. "A lot of the work was prototype assessment. Our concern, then and now, was to ensure that clothing and equipment function as they are supposed to, and that the Soldier can execute his or her tasks as needed."

Bensel was the driving force behind the advancement of human factors and HSI at Natick, domains that are key to the enhancement of Soldier performance, Soldier lethality, as well as squad performance.

"The increased focus on the squad is exciting," said Bensel. "It all started with an increased awareness of the individual Soldier. From its beginning, Natick has had a human factors element of scientists and engineers, which is pretty remarkable in and of itself. Natick's early focus on developing clothing and individual equipment brought human factors into the mix."

> **"In her 40-plus years working for Natick, she [Bensel] has made a huge impact on not only the organization, but also the field of human factors."**
>
> **Blake Mitchell, Human Factors**

Currently, Bensel works as a research fellow for the Oak Ridge Institute for Science, or ORISE, and Education/Oak Ridge Associated Universities, or ORAU. She continues to mentor members of NSRDEC's Human Factors and Biomechanics Teams in research design, statistical analysis and as a subject matter expert in the areas of human factors, biomechanics, and Soldier performance.

In recognition of her extensive impact on the field of human factors, and more specifically HSI, Bensel was selected as the recipient of the 2017 Human Systems Integration Practitioner's Workshop Special Achievement Award, hosted by Dr. Beverly Knapp, acting director, Army Human Systems Integration, Office of the Deputy Chief of Staff, G-1.

"In her 40-plus years working for Natick, she has made a huge impact on not only the organization, but also the field of human factors," said Blake Mitchell, Human Factors team leader.

Bensel's research has been published in more than 75 publications and included in 50 presentations on Soldier performance, psychophysiological responses in extreme environments, injury occurrence, and equipment effects on Soldiers' biomechanical and physiological responses.

Her research has included the effects of clothing and individual equipment, or CIE, on Soldier performance, focusing primarily on boots/footwear, chemical-biological protective ensembles, body armor, cold weather clothing, military loads, and exoskeletons.

In her nomination of Bensel, Mitchell noted that "much of Dr. Bensel's early work drove the development of the methodologies still in use today for the assessment of CIE. Her research legacy continues through the mentoring of numerous scientists specifically in unique statistical and technical research methodologies relevant to the areas of HSI."

"When we look at the range of the items that a Soldier has to interface with, we have to have an empirical approach to collect reliable, valuable data," said Bensel. "So a lot of our effort has gone, and continues to go, into the development of the methodologies to apply to look at how these items work. The focus is always on the Soldier user."

Memorial Day

May 28, 2018

The annual National Memorial Day Observance to honor America's fallen military service members is scheduled for Monday, May 28 at Arlington National Cemetery. (Photo Credit: JFHQNCR/MDW Public Affairs)