



HISTORY OF NAVY ENTOMOLOGY

1941-2011

The field of military medical entomology originated in 1900 with Major Walter Reed's work examining transmission of the Yellow Fever virus to humans by the mosquito *Aedes aegypti*. Just 40 year later, fighting in the Pacific Theater during World War II would clearly demonstrate the importance of military entomology to the success of the U.S military and mark the beginning of Navy Entomology.



Marine stricken with malaria in the South Pacific

"This will be a long war if for every division I have facing the enemy I must count on a second division in the hospital with malaria and a third division convalescing from this debilitating disease!"

Gen. Douglas MacArthur May 1943

By 1940 much of the world was at war. The Japanese had built a formidable force positioned to challenge the United States and their allies in the Pacific. A war with Japan would mean committing troops to remote locations with numerous diseases, including malaria, causing unacceptable casualties. Successful response to this threat would require establishing an effective medical force to include professionals from allied medicine fields, including entomology. As result, the Navy Medical Department created the Hospital Volunteer Specialist Group, H-V(S) in 1941 including LTJG William K. Lawlor and LT Paul Woke as the first commissioned Navy entomologists.



US military training material used in campaigns to combat malaria. Additionally, cartoons were produced to provide critical disease prevention information to US forces. For example, Private Snafu demonstrates what not to do while at war. Access the following to watch Private Snafu and Malaria Mike <http://www.archive.org/embed/PrivateSnafuvsMalariaMike-welcome>

In April 1942, Navy entomologists would be called on to support a battalion of Marines that occupied Efate Island in the New Hebrides. Malaria was proving to be more of a threat to the Marines than the advancing Japanese, reaching a peak case rate of 2600/1000/year. Recognizing the impact on combat effectiveness and inability to efficiently reinforce units, the Navy developed field laboratory teams or Navy Epidemiology Units (NEU) to control this disease.



A Marine applying pesticide in a fighting position somewhere in the Pacific during WWII. The Navy deployed field laboratories staffed with entomologists that would provide needed relief for vector-borne disease



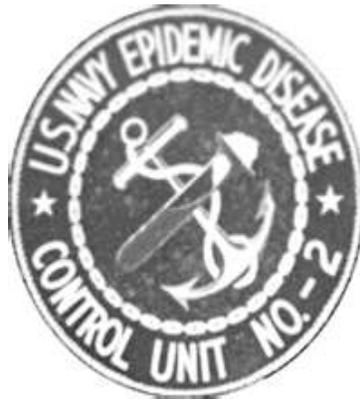
Navy Epidemiology Units (NEU) conducting malaria surveillance and control in the South Pacific

In August 1942, Ensign Kenneth L. Knight (the first navy entomologist to work in a combat zone and would later become Officer in Charge of Preventive Unit No.1) deployed to Efate as part of a NEU. Within a year the malaria case rate had declined to essentially nothing. Each Marine division was provided with a larger navy malaria control team (called an epidemiology unit) of 3 officers (a malariologist, an entomologist, and a parasitologist) and 12 enlisted men. By 1944, there were 122 epidemiology units and by the end of the war there were approximately 150 units with 900 personnel and 200 entomologists.

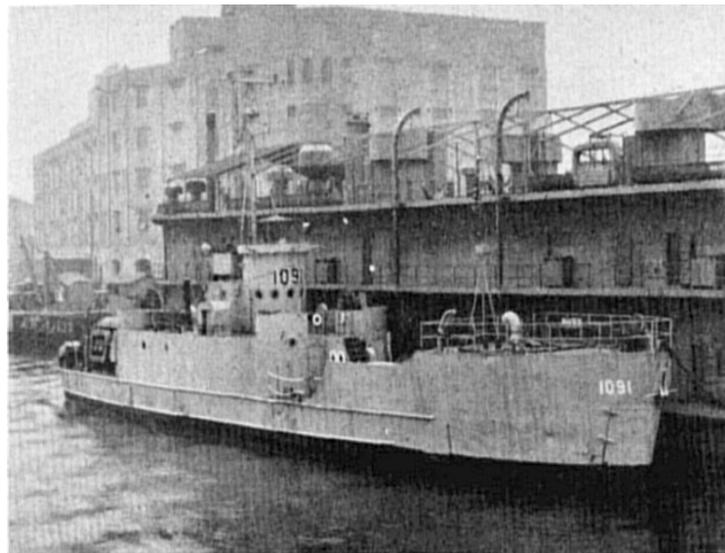
In addition to the South Pacific, Navy entomologists served in China, North Africa, the Caribbean and Central America. Their mission was extremely challenging and certainly not without risk. Two would lose their lives during the conflict. LT William M. Gordon was killed by mortar fire on Los Negros (Admiralties) on 5 March 1944 and LT John D. Maple died in an airplane crash while directing aerial spray operations on Okinawa in April 1945. Following the conflict, Navy entomologists were recognized for professional excellence and mission dedication earning the Soldiers Medal for Heroism (1), Legion of Merit (1), Bronze Star (3), and Purple Heart (1).

Following World War II many Navy entomologists would leave the service. Those that remained would soon be called to provide support during another conflict. On 25 June 1950, the Democratic People's Republic of Korea Army (DPRK - North Korea) artillery opened fire on Republic of Korea (ROK - South Korea) Army positions south of the 38th Parallel, the line serving as the border between the two countries. North Korea formally declared war marking the official start of the Korean War. Once again, vector-borne disease was responsible for many casualties. Malaria, louse-borne typhus and relapsing fever were prevalent. Five entomologists saw duty in Korea from 1950-1955, and a sixth was there for a short time on temporary duty. LT William B. Hull was the first Navy entomologist to see duty in Korea serving with Fleet Epidemic Disease Control Unit, 1st Marine Division. LCDR H. S. Hurlbut was the first Navy

entomologist assigned to sea duty serving aboard LSIL-1091 (Laboratory Ship) with Fleet Epidemic Disease Control Unit #1 tasked with supporting combat operations.



A Fleet Epidemic Disease Control Unit investigating a disease outbreak in a Korean Village



Fleet Epidemic Disease Control Unit #1 embarked on LSIL-1091 (Laboratory Ship), supporting combat operations in Korea

There was a ten year gap (1955-1965) before Navy entomologists were once again called upon to help reduce the disease non-battle injury (DNBI) rate during a time of war in Vietnam. Malaria, plague, encephalitis and hemorrhagic fever threatened force health and combat readiness. The first Navy entomologist to serve in Vietnam was LT Frederick J. Santana, who was assigned to Preventive Medicine Unit, Danang in 1965. From 1965 to 1970, a total of 14 entomologists served tours of duty in Vietnam. Eight were stationed at PMU Danang.



The following article describing the activities of the PMU vector-control personnel by YN1 Howard Geiger, USN, appeared in the November 1966 edition of ALL HANDS:

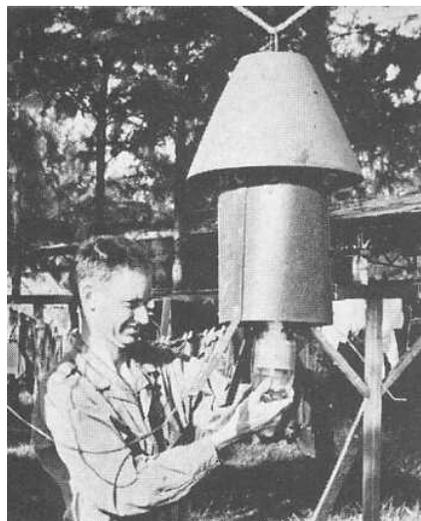
“THERE ARE 38 Navymen at PMU Da Nang. In their personal war the Viet Cong are a nuisance and disease is the enemy. Their greatest worries are the mosquitoes. And the rats.

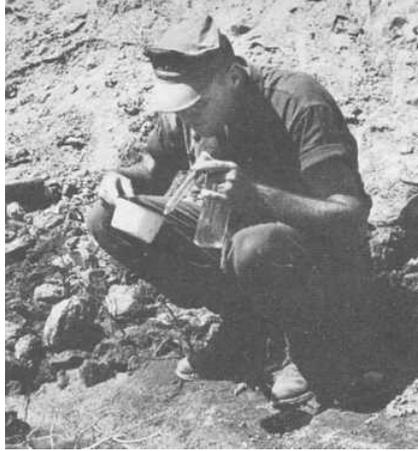
PMU stands for Preventive Medicine Unit. The Navymen combat cholera, typhus, plague, encephalities, dengue and malaria in the 66,000 square miles of the First Corps area between the 17th parallel and Quang Ngai.

One of the unit's five sections operates a laboratory at the Force Logistics Support Group in an area west of the Da Nang Air Base. The lab is equipped specifically to perform bacteriological tests.

When someone in the area is afflicted with an infectious disease, it is often this lab which makes the positive identification of the specific bacterium or parasite which is causing the illness. Early diagnosis is essential for proper treatment of the patient and, in certain situations, for prevention of spread of the disease.

The Medical Service Corps officer and his three enlisted assistants at the lab also examine biological specimens collected by other members of the PMU.





COLLECTORS - PMU men get insects from trap, dip mosquito larvae from stream and identify species of a mosquito.

THE UNIT also has an entomology section - a mobile bug group, to be nontechnical. An MSC officer and five enlisted men keep track of insects, especially mosquitoes.

When there is an outbreak of malaria, the entomology group is sent to the location where they collect mosquito specimens and decide which of the many varieties is the culprit.

Once the carriers are identified, chemicals are used to kill them. A survey of the mosquito population is made before spraying and is matched with a later one to determine the effectiveness of the spraying. The region is then watched carefully for any sign of return of the problem.

In the course of their work, the entomology group has classified more than 3600 insect species. Their collection of insects prevalent in Viet Nam is one of the world's most extensive.

When spraying the area to kill the mosquitoes is indicated, the assignment goes to Lieutenant Berlin Taylor, a former hospital corpsman who is now an MSC officer. He and his vector control team of a dozen men use a helicopter which has been modified for insecticide dispersal.

The airborne spraying apparatus is often used to clear areas of insect pests. Locations such as Camp Tien Sha, the main berthing cantonment for the Naval Support Activity, Da Nang, and other areas within the city are frequent targets for spraying. An overabundance of pesty insects, even though they do not carry disease, can have unsettling effects on morale.



CHEMICAL SPRAY is spread over jungle via helicopter to kill mosquito larvae.

ANOTHER SPECIALTY of the Preventive Medicine Unit is mammalogy. A five-man team collects and identifies the various local species of mammals, and watches them carefully for indications of disease. This team has collected over 250 rats in 14 species alone, not to mention a long and varied list of snakes, squirrels and shrews.

The mammalogy group occasionally makes a spectacular find. Hospital Corpsman Third Class Thomas J. McIntyre and Hospital Corpsman First Class Paul F. Ryan recently returned to headquarters with a doulangur, a rare primate which, according to one source, has not been found in a zoo since 1880.”

Members from the Navy Disease Vector Control Center (DVCC) Jacksonville also provided support in Viet Nam as evidenced by the following article which appeared in Navy Times in February 1966:

JAX CENTER AIDS IN ‘FOGGING OUT’ ANOTHER VIET PEST-THE MOSQUITO

Jacksonville, Fla. – A two-man team from the Naval Air Station’s Disease Vector Control Center here spent 20 days in Vietnam recently teaching preventive medicine personnel and Marines attached to Helicopter Squadron 263 how to fight a different war.

The enemy is the small but deadly mosquito which creates the malaria problem. The method of combat is air to ground fogging.

A Navy entomologist predicted an increase in malaria cases in the tropical climate, last July, due to the influx of more servicemen and the oncoming rainy season. A request for aerial application of insecticides was made to the Armed Forces Pest Control Board.

The board referred the project to the center here, which, with funds from the Bureau of Weapons, had already developed equipment for fogging by helicopter.

The equipment, which uses the exhaust of the helicopter to spread the insecticide, was developed and tested by D. L. Hayden, entomologist and L. Branson, biology technician and W. V. Weeks, Jr., and C.E. Woodson, aircraft loftsmen from the metals division of the Overhaul and Repair Department.

The system had been demonstrated in nearby Tampa last March to members of the American Mosquito Control Association and has since proven effective in killing both larval and adult mosquitoes simultaneously.

After additional testing, the equipment was airlifted to Vietnam. Hayden and Weeks accompanied the equipment.

The equipment in no way affects the combat capability of the helicopter and can be dismantled in about 10 minutes.

The Vietnamese had been notified of the testing but were still frightened by the fog from the helicopter on the first few flights. Later they accepted it as just another necessity brought by war.

At present there is only one helicopter equipped for the fogging, but plans to equip others are in the discussion stage. This is the only American aerial insecticide dispersal capability in Vietnam.

In addition to PMU Danang, two Navy entomologists served with the Preventive Medicine Section of the 3rd Marine Division, three served with the Preventive Medicine Section of the 1st Marine Division, and one served with Preventive Medicine Section, Naval Forces Vietnam (Saigon). Three other Navy entomologists were in Vietnam for a short period of time on temporary duty. Navy entomologists were recognized for their accomplishments during the war with the following decorations; Bronze Star (3), Navy Commendation Medal (8), Air Medal (1), and Combat Action Ribbon.



1st Marine Division



3rd Marine Division



US Naval Forces Viet Nam

From 1982 through 1984, Navy entomologists were called to support the war-fighter as members of Mobile Medical Augmentation Readiness Teams (MMART) supporting U.S. "peacekeeping forces" in Beirut, Lebanon. LCDR Herbert Bolton was the first Navy entomologist deployed followed by 3 others each serving 90-180 day tours in support of the Marine Corps amphibious units ashore.

On the morning of 23 October 1983 in Beirut, a suicide bomber detonated a truck filled with explosives in front of a building used for barracks by the 1st Battalion, 8th Marines under the 2nd Marine Division killing 243 Marines and sailors. Eric Hammel, in his 1985 book, "The Root: The Marines in Beirut, August 1982-February 1984" described the scene in graphic detail:

"The force of the explosion initially lifted the entire four-story structure, shearing the bases of the concrete support columns, each measuring fifteen feet in circumference and reinforced by numerous one-and-three-quarter-inch steel rods. The airborne building then fell in upon itself. A massive shock wave and ball of flaming gas was hurled in all directions."

Immediately following the attack Navy entomologist LCDR Gary Breeden was the senior surviving medical department officer at the scene. His actions in particular and Navy entomology's reactions to the Beirut mission in general, marked a most profound change in the approach to combat support readiness.



Marine barracks in Beirut following terrorist bombing

A result from that experience, the Navy developed readily deployable Mobile Medical Augmentation Readiness Team (MMART) blocks of equipment and supplies that could be task-organized, loaded and shipped anywhere in the world at a moment's notice. The MMART would eventually be replaced by Forward Deployable Preventive Medicine Units (FDPMU), including a highly capable and robust disease vector control block.

The FDPMU offers specialized preventive medicine support to forward deployed U.S. forces and JTF Commanders. It is composed of highly trained personnel consisting of preventive medicine and occupational health scientists including entomologists, microbiologists, epidemiologists, medical laboratory and preventive medicine technicians. It has the flexibility to task organize to meet any contingency from small-scale humanitarian support to a major theater war within 96 hours of official notification. In addition, it is adaptable to operate from fixed or mobile land bases, and maritime platforms; typically a large deck amphibious ship. The FDPMU also integrates field laboratory analysis into the scientific assessment approach to characterize the battle space by detecting, identifying and evaluating environmental and occupational health hazards that include Toxic Industrial Chemicals / Toxic Industrial Materials (TIC/TIM), endemic disease threats as well as Chemical, Biological, and Radiological (CBR) agent contamination. Specially, the FDPMU can deliver on enhanced preventive medicine capabilities.

On August 2, 1990, the Iraqi army of Saddam Hussein attacked the Emirate of Kuwait, just north of Saudi Arabia, rapidly conquering the much smaller nation. President George H.W. Bush's administration responded rapidly by constructing a coalition of nations to protect the Kingdom of Saudi Arabia and to end the Iraqi occupation of Kuwait. Navy entomologists were in Saudi Arabia on 20



August as part of the Marine Corps' BSSG-7. The first Navy entomologists to arrive were LCDR T. Wayne Gale and LT David Claborn; however, by the end of hostilities, six others were deployed to the area. CDR Gary Breeden served as Commanding Officer of the First Medical Battalion, LT David Lavender and LT Rafael Del Vecchio deployed with the 2nd Medical Battalion out of Camp LeJeune, LCDR Joe Conlon deployed as part of a BUMED fact-finding team, and both LCDR George Schultz and LT Manuel Lluberias deployed with a Mobile Medical Augmentation Response Team out of EPMU-7 in Naples, Italy.

The initial stages of the build-up, titled Operation Desert Shield, took place primarily in Saudi Arabia and Bahrain during the extreme heat of the Arabian summer. Medical entomology issues revolved primarily around the pervasive filth fly populations associated with garbage and numerous animal carcasses. Other issues involved ophthalmomiasis associated with *Oestrus ovis*, West Nile fever, ticks, venomous snakes and scorpions. One of the larger issues addressed by entomologists and others involved a large outbreak of diarrhea probably associated with fresh vegetables imported from regional producers. The introduction of *Shigella* into the American military population, exacerbated by mechanical vectors of the large filth fly population, contributed to a significant outbreak during the early stages of the war, though by the onset of hostilities on January 17, the outbreak had subsided.

Although the Marine Corps suffered few if any cases of leishmaniasis during Operation Desert Storm, an outbreak among nearby Army troops was a significant event. The causative organism had, until that time, been associated almost exclusively with cutaneous forms of the disease; however, at least ten soldiers were subsequently diagnosed with the more dangerous visceral leishmaniasis. This finding later proved important during the subsequent Operation Iraqi Freedom.

Another issue that emerged from Desert Storm that was of some importance to Navy entomology was the issue of Desert Storm Syndrome. This controversial syndrome included a variety of symptoms, from rashes to headaches to sleeplessness. A consistent case-definition of the disease was elusive and no definitive cause was identified; however, among the many proposed causes of the syndrome was the extensive use of repellents and pesticides, some of which were acquired locally. Although many other environmental factors were also proposed as causes (including pollution from the oil fires set by retreating Iraqis, chemical warfare agents, pyridostigmine bromide used as prophylaxis for chemical warfare, soil micro-organisms, spent uranium ammunition, anthrax vaccines, insect-borne disease, and stress) much emphasis was placed by the popular media on the use of pesticides. Partly in response to these concerns, the DoD and the Armed Forces Pest Management instituted improved measures to record and monitor the use of pesticides both in deployed and in-garrison forces. These measures made significant changes in the way medical entomologists worked in deployed settings.

The final stages of the operations in which Navy medical entomologists took a large part was the agricultural washdown that was performed primarily just outside of Al Jubayl, Saudi Arabia. The lack of water available for these operations required strict supervision of the process and Navy entomologists were primarily responsible for setting up the final inspection teams in cooperation with representatives of the U.S. Department of Agriculture. This phase of the operations was supervised primarily by LT David Lavender and resulted in the inspection and clearance of over 100,000 pieces of equipment and rolling stock.



LCDR Joe Conlon surveying mosquito habitat near Al Jubayl, Saudi Arabia during Operation Desert Shield. (October, 1990)



LT David Claborn spraying a dead camel with malathion in an attempt to prevent dogs and jackals from digging up the carcass. This picture was taken about 30 miles north of Al Jubayl, Saudi Arabia in September, 1990.

The terrorist attacks on the United States September 11, 2001 had a tremendous and lasting effect on the United States and specifically the Department of Defense (DoD). The DoD would not only be called on to fight a Global War on Terrorism but support American diplomacy through providing humanitarian and disaster relief. Navy entomologists provided support for these missions resulting in over 40 deployments from 2001-2010, accounting for over 32 years of cumulative service. For example, as part of Operation Enduring Freedom in 2001, a vector control team deployed from DVECC JAX to NAVSTA Guantanamo Bay, Cuba providing vector-borne disease surveillance, prevention and control support for detainee operations.

During Operation Enduring Freedom (OEF) and eventually Operation Iraqi Freedom (OIF) in early 2003, Navy entomologists deployed to Bahrain, Kuwait and Iraq to provide preventive medicine/disease vector surveillance and control for US and coalition forces. In March 2003 the first Navy vector control team arrived at LSA Camp Viper, Jalibah, Iraq as part of the Navy's highly mobile and task organized FDPMU supporting the 1st Marine Expeditionary Force. Since then, Navy entomologists have provided disease vector control/preventive medicine support to DOD operations throughout the world including Afghanistan, Kuwait, Iraq, Indonesia, Pakistan and Haiti.



FDPMU East camp supporting Operation Iraqi Freedom– Jalibah, Iraq March 2003 (left)

FDPMU team member conducting sand fly surveillance in southern Iraq supporting Operation Iraqi Freedom 2003 (right)



LT Jim Dunford conducting tick surveillance as an individual augment supporting the Army in Afghanistan ISO OEF 2010

Entomology Commands and Units:

Following WWII, only a handful of entomologists remained on active duty. The Navy Medical Department disbanded the H-V(S) section and established the Medical Service Corps in 1947. Most of the Navy Epidemiology Units were also disestablished after the war. One that remained was the Malariology and Pest Control Unit located at Naval Air Station Banana River, Florida. Establishment of this unit would mark the beginning of over 60 years of mission growth and evolution.



NAS Banana River, FL located just north of Satellite Beach was the site of the Navy's first Malariology and Pest Control Unit

In 1947, the Malariology and Pest Control Unit was re-located to Naval Air Station Jacksonville, Florida and commissioned the Malaria and Mosquito Control Unit No. 1 on July 1, 1949 with LCDR John M. Hirst (Navy entomologist) assigned as the first Officer in Charge. In 1952, the Unit was renamed Preventive Medicine Unit No. 1 (PMU-1).



Malaria and Mosquito Control Unit N^o1, NAS Jacksonville, FL

PMU-1 became the Disease Vector Control Center (DVCC) in 1957 assigned an expanded mission and area of operation to include roughly half the world. During the same year, a sister unit was established in Alameda, California (DVCC-Alameda) and assigned responsibility for supporting the remaining portion of the globe. The accomplishments of the Disease Vector Control Center, Jacksonville, were captured in the following article which appeared in the JAX Air News documenting their 8 year anniversary.

JAX DVC Center Surveys Proud Past; Eyes Future on Eighth Anniversary

JAX Air News: 26 JULY 1956

Eight years ago in July 1949, the present Disease Vector Control Center was commissioned by the Navy as its first permanent Malaria and Mosquito Control Unit.

“Malmos No. 1,” as it became known, was not much of a unit numerically speaking. Under the direction of able Lcdr. John M. Hirst, who had fought for its existence ever since the Navy’s wartime insect control units had been generally disbanded with the close of hostilities, it consisted of a small space located in the NAS JAX Dispensary and, in addition to the Office-in-Charge, a staff of three enlisted men and a clerk-typist, Mrs. Sara F. Atlee.

Mrs. Atlee, who last week won a commendation from Lcdr. Francis R. DuChanois, present Officer-in-Charge, hadn’t thought much of mosquitoes when she first joined the unit in 1948, before it was even commissioned. But she soon found mosquitoes were a fascinating subject, and the work being done by the unit of extreme importance not only to the Navy but to almost every Federal agency.

For one thing, the unit was pioneering in the development of automatic aircraft disinfection. Ultimately it succeeded in having aerial disinsection equipment, devised in its own laboratory, installed in overseas military aircraft and in hospital planes used in evacuating the wounded from Korea.

Further, a portable type insecticide dispersal gear, which could be jettisoned by the pilot if he needed to disencumber his plane for combat, was successfully tested on F4U and AD1 type aircraft operating locally from the deck of the carrier USS Leyte.

Secondly, the unit was a research center where many of the then new insecticides were first tested and tried.

Thirdly, it was a training center for Reserve entomologists, doctors and public works personnel of all military forces, who came here for refresher courses from all parts of the nation.

Shortly after Dr. Hirst was relieved in 1952 by Lcdr. Kenneth L. Knight, Malmos No. 1 was redesignated Preventive Medicine Unit No. 1, thus becoming linked with six similarly designated units supported by the Navy. However, it retained its early individual mission while carrying out additional duties within the Sixth Naval District and Caribbean areas.

In 1952, it tackled a project for converting Todd Type E smoke generators installed on the fantails of destroyers during the war for laying passive defensive smoke screens, into insecticide dispersal equipment. Resulting was a multi-purpose insecticide dispersing machine now known as “MIDA” used for residual spraying, misting and wet or dry dusting.

A second machine converted from the smoke generators is used today for both soil poisoning and surface treatments in termite control operations.

All this was achieved mainly by the Testing and Developing Section. But the Operations Section of the unit also was capturing laurels. During the Kansas City flood of 1951, personnel of the unit were sent to assist in emergency insect and rodent control.

Within 24 hours of receiving the dispatch from the Bureau of Medicine and Surgery, two planes loaded with insecticide spray equipment and men were underway to “K.C.” where stockyards and business areas were under water. Many animals were drowned, causing widespread decomposition and breeding millions of disease bearing flies.

Among those who went was Lt Joseph G. Mc Williams, now head of the operations section.

On call around the clock, the operations section is still called upon to conduct field inspections, surveys and investigation of vector problems such as recently occurred in Putnam County when it was infested with mosquitoes. On request of Senator George Smathers, the unit sent planes and men into the area to conduct aerial spraying to help relieve the situations.

In 1971, both units were renamed as Navy Disease Vector Ecology and Control Centers (DVECC). Both DVECCs and the Navy Environmental and Preventive Medicine Units (NEPMUs), where entomologists were also stationed, became Echelon 4 commands under the Navy Environmental Health Center (NEHC), Norfolk, Virginia in 1985. DVECC Alameda would move to Navy Submarine Base, Bangor Washington in 1995 and re-named DVECC Bangor. However, as part of a NEHC re-organization initiative in 2005, DVECC Bangor and NEPMU 7, Sigonella, Italy, were disestablished. DVECC Jacksonville assumed responsibility for providing disease vector control and prevention support world-wide. However, this would not be the end of change.



In 2005, the Navy Entomology Center of Excellence (NECE) was established, replacing DVECC JAX. As the only command of its kind in the Department of Defense, NECE not only provides operational support and training, but is also responsible for testing and evaluating novel pesticide application technology and techniques for efficacy and military applicability. To accomplish this mission, NECE has cultivated collaborative relationships with a variety of civilian and government agencies, including the Centers for Disease Control and Prevention (CDC), the United States Department of Agriculture, Agricultural Research Service laboratories in Gainesville, FL and College Station, TX and universities.



Marine Corps Support

As a result of the close preventive medicine support given to the Marine Corps during the Vietnam conflict and due to an identified need for continuing support of Marine Corps activities and installations worldwide, a Navy entomologist, LT Stanley R. Husted was assigned to Marine Corps Base Camp Smedley D. Butler (later 3rd Medical Battalion, 3rd Force Service Support Group) in Okinawa in 1969. In 1975, LT John H. Zimmerman became the first Navy entomologist assigned to 2nd Medical Battalion, 2nd FSSG, Camp Lejeune, North Carolina. In 1986, LT William W. Kanour was assigned to 1st Medical Battalion, 1st FSSG, Camp Pendleton, California. Duties ranged from coordinating USDA required "washdown" or quarantine operations for all rolling stock going ashore in foreign countries prior to redeployment to the United States, to supporting home base field operations, to deploying and serving with Marine Corps Amphibious Units in areas such as Egypt, Honduras, Thailand, Republic of the Philippines, Korea, Japan, Norway, and Germany.



Amphibious Assault Vehicle (AAV) on wash rack

As needs for FMF medical entomology support have grown, so too have the opportunities for greater responsibility in providing that support. In 1984 LT James T. Need became the first Navy entomologist to serve as a Medical Company Commander assigned to Alpha Company, 2nd Medical Battalion, 2nd FSSG. In 1986 CDR John H. Zimmerman became the first Navy entomologist to serve as Executive officer then Commanding Officer of the 1st Medical Battalion, 1st FSSG, Camp Pendleton. He was followed in 1989 by CDR Gary C. Breeden, who became the first Navy entomologist to command a unit during a time of war in Operation Desert Storm. Today, Navy entomologists continue to support the Marines, directly assigned to the 1st, 2nd and 3rd Medical Battalions and through the Navy's Health Services Augmentation Program (HSAP), primarily deploying from the Navy Entomology Center of Excellence.

Humanitarian Assistance/Disaster Relief



The Catastrophe Aid Bill was passed by Congress in 1950. A portion of this bill allowed for assistance in controlling insect populations, which increase following a natural disaster. Preventive Medicine Unit 1 established a Vector Control Team in order to provide quick response during natural disasters. This was the first Navy unit to provide such support being called upon to assist during the great Kansas City flood of 1951. The team was under the direction of LCDR John M. Hirst. The following 1951 article from the Jacksonville Journal provides details:

HIRST PAINTS VIVID PICTURE OF KANSAS CITY FLOOD AREA

Jacksonville Journal

August 3, 1951

"Three thousand dead sheep rotting in a 90-degree temperature don't smell like roses," was the way Lt. Comdr. John M. Hirst, USN, described the Kansas City flood area from which he returned today after 10 days spent directing emergency fly and mosquito control measures. Please see the entire article attached.

Commander Hirst, with six enlisted personnel trained in the Malaria and Mosquito Control Unit at NAS JAX and his assistant, Lt. (jg) Joseph G. McWilliams, were ordered into the disaster district on request of the Kansas City office of the U.S. Public Health Service. Flown in two Navy R4Ds to NAS Olathe, just outside the flood area, they took with them four large fogging units and four power spray units which were mounted later on 1 ½ ton trucks. The trucks were manned by teams of naval and civilian personnel who sprayed the worst sections with 1,000 gallons of chlordane each day.

When the local units arrived, they found the water had receded from flood levels, but was still high. Many sections were still under one to four feet of water or silt. Vast stores of soaked cattle feed were fermenting and insects were breeding at a dangerous rate.

Most of the damage, Commander Hirst reported, was not in the business section but in the industrial section. Besides the sheep, 27 carloads of decaying meat had been dumped, he said.

He was impressed by the unlimited consideration everyone was showing toward fellow sufferers.

There was the 10-year-old who told Commander Hirst how long he had wanted a new pillow to sleep on. He finally got it, used it three nights, and then "the darned old flood came and took it away."

And there was the little fellow leaning against a porch post beside a heap of mud that had once been his home. "I used to live here," he said. "This is pretty hard to take, especially for a boy like me."

And then there was the old woman sitting in a broken chair, her feet buried in a foot of mud, who just sat staring into space, too stunned to know what to do.

Small businessmen were hit hard, Commander Hirst said. Few carried flood insurance, and so were completely ruined by the flood. "They appeared unable to make up their minds whether to stay and start all over, or just move on somewhere else."

For the most part, the electric power was working. Only where new lines had to be strung was power cut off. But all water had to be chlorinated, and in many areas people had to bring buckets to assigned stations to be supplied.

The polluted water affected air conditioning, which had to be inspected and approved for use lest the air be contaminated.

All sewers were clogged with mud, which increased the danger of epidemics, he said. Heavy road equipment was brought in to clear areas buried in mud, and guards were stationed to prevent looting and control sightseers, many of whom made special tours from great distances to view the damage.

"In spite of the extent of the disaster, some good can come of having destroyed with it unbelievable slum areas," Commander Hirst said. "We completed our emergency work, but it must continue for months to come. If only the people will remember what they have learned, a great good will result."

Since 1950, Navy entomologists have supported numerous humanitarian, disaster relief and special assistance operations both at home and abroad including:

- Fly control, Key West and Miami, Florida during a polio epidemic
- Fly control, Tampa, Florida following a Red Tide fish kill
- Fly control, Rongelap Atoll (Marshall Islands)
- Mosquito control prior to President Truman's dedication of Everglades National Park
- Vector/pest arthropod control during the sweeping of the Suez Canal
- Relocation of Vietnamese refugees (Operation New Life)
- Hurricane relief following Kathleen (California), David (Dominican Republic), Hugo (Charleston, SC/Puerto Rico/St. Croix), Andrew (Miami), Georges (Puerto Rico/Dominican Republic), Mitch (Guatemala), and Katrina (New Orleans)
- Plague control, California
- Rabies control, Alaska
- Mosquito control efforts during St. Louis encephalitis outbreaks in several U.S. cities
- Mosquito control during dengue hemorrhagic fever outbreak in Venezuela
- Earthquake relief (San Francisco, Haiti)
- Eastern Equine Encephalitis surveillance in central Florida
- Haitian refugee support (Guantanamo Bay, Cuba)
- Preventive medicine support/vector control Operation Restore Hope, Somalia/ Operations Fairwinds and Secure Tomorrow, Haiti
- Tsunami relief, Operation Unified Assistance, Indonesia
- Operation Unified Response, Haiti



LT Kavanaugh conducting mosquito surveillance during Operation Continuing Promise 2010.



LT Ragasa conducting mosquito surveillance supporting Hurricane Katrina relief efforts in Louisiana 2005



Contributing to American diplomatic efforts to “win hearts and minds” and DoD policy to build partner capacity, Navy entomologists have provided experience and expertise during annual humanitarian assistance missions including Operation Pacific Partnership (PACOM AOR) and Operation Continuing Promise (SOUTHCOM AOR). During each operation, Navy entomologists work with non-governmental organizations, Army, Air Force, and Public Health Service professionals to provide sustainable preventive medicine/public health support to host nations, improving their quality of life and ability to maintain effective disease reduction programs. In addition to these annual exercises, CDR Dan Szumlas and LCDR Craig Stoops were the first Navy entomologists specifically selected to coordinate entomology operations in Africa supporting the President’s Malaria Initiative (PMI). The PMI represents an historic U. S. Government (USG) commitment to fight malaria in the region most affected by the



LCDR Stoops conducting mosquito surveillance as part of the President’s Malaria Initiative - 2009

disease with the goal of reducing malaria-related deaths by 50 percent in 15 focus countries.

Training

Whether in a formal or informal setting, Navy entomologists are consistently providing training. Training in the principles of vector-borne disease control began at the Naval Medical School in Bethesda, Maryland in 1942. This school trained officers and enlisted personnel in the techniques of malaria control. The school closed its doors in 1945 after having graduated 130 officers and 397 hospital corpsmen.

The first contingency training program for reserve personnel was established in 1950 at DVCC, Jacksonville, Florida. The purpose of the course was to provide a cadre of trained professionals which could be called upon to provide assistance in vector-borne disease control in the event of war. The first military course for training civilian and military pest control operators was presented at Jacksonville in 1951. From this course has grown a one month training program which was judged by the U.S. Environmental Protection Agency (EPA) in 1977 to satisfy the federal training and certification requirement for pesticide applicators. DoD pesticide applicator

certification includes a Core phase including information about pesticide labeling, pesticide safety, pest biology, habits and recognition, and the recognition of pest damage, pesticide, formulations and their characteristics, equipment types, maintenance and calibration, application techniques; and laws and regulations. Following successful completion of Core training, individuals are able to become certified in the following; forest pest management (Category 2), turf and ornamental pest management (Category 3), aquatic pest management (Category 5), Right-or-way pest management (Category 6) and Arthropod & Vertebrate Public Health Pest Management (Categories 7 & 8).

The first shipboard Pest Control training course was taught at DVCC Jacksonville in 1957. Today, this course is offered by the Navy Environmental and Preventive Medicine Units (NEPMUs) and NECE, which serves as the Navy program manager. Training involves one day of classroom instruction followed by a visit to a ship to demonstrate surveillance and control techniques.

October - December 2003

Ship Pest Update

A Quarterly Publication for U.S. Navy Shipboard Pest Managers



Are You Ready to Deploy?

Deratting/Deratting Exemption Certificates

For entry into most foreign ports, a certificate declaring your vessel rodent-free is required. This certificate can be obtained from an officer that holds a United States Public Health Service (USPHS) seal and requires an inspection. If you do not hold a current derat certificate, contact NDVECC Jacksonville or the local NEPMU.



Featured Pest: Khapra Beetle



The Khapra beetle is one of the world's most destructive pests of grain and cereals. However, it will feed on a wide range of products. More importantly, this pest is of medical concern because the body of the larvae are covered in hairs that may cause severe intestinal distress. This is an internationally quarantined pest. Thus, if a single insect is found in a product, the product must be disposed of.

Shipboard Pest Management Certification

Medical department personnel responsible for pest control activities are required to have certification by completing a Shipboard Pest Management Course (CIN: B-322-1075). Other personnel, such as Mess Specialists, may also attend this course without receiving certification. The course consists of one day of classroom work and one-half day of on-the-job training. To learn Shipboard Pest Control Course dates, contact the Operations Department at NDVECC JAX.

Pierside Inspections

Before bringing food items aboard, it is important to check them for pests. By taking extra time to randomly sample oncoming consumables, large shipboard infestations can be minimized.



Do you have questions or need pest control assistance?

Contact the NDVECC Operations Department at opsdept@dveccjax.med.navy.mil or DSN 942-2424.



DVECC JAX Quarterly Shipboard Pest Control Newsletter - 2003 LT Mejeoumov providing shipboard assistance - 2011

In 1955, public works, maintenance and medical officers as well as civilian personnel from bases within the Sixth Naval District convened in Jacksonville for a week-long conference sponsored by Preventive Medicine Unit No. 1 to review Navy pest control programs and to

receive training in new techniques and on new equipment. The following article from the JAX Air News provided details:

6ND HOLDS PEST CONTROL CONFERENCE

JAX Air News, 8 MAR 1956

About 40 public works, maintenance and medical officers as well as civilian personnel from bases within the Sixth Naval District spent the opening day of a week-long conference reviewing progress of the Navy pest control program and trekking outlying areas of the Naval Air Station to see how control measures are applied.

Sponsored by Preventive Medicine Unit No. 1, the program for the sixth annual conference has been planned in two divisions. The first is based mainly on problems of medical and public works personnel; the second, which begins on Wednesday, for sanitation and pest control personnel.

Lcdr. Francis R. DuChanois, officer-in-charge of the local Unit, and Dr. Clarence S. Harris, special assistant for pest control at District Public Works Office, Charleston Naval Base, S.C. have planned both programs in such a way to provide both theoretical and practical pest problems.

The Department of Agriculture and the Public Health Service have provided experts in their fields as speakers and discussion leaders.

Covered by the conference are topics such as control of flies, mosquitoes, and vegetation pests; recent advances in knowledge of the biology and control of domestic filth flies and biting flies with special reference to the Sixth Naval District; the life history, habits, damage and recognition of subterranean, dry-wood and damp-wood termites, powder post beetles, and other wood-destroying pests; and the control of rodents and nuisance pests.

Speakers include Dr. Hetrick of the University of Florida; T. Roy Young, Jr. of Young-Jones Laboratories, Inc., Tampa; Jack C. Keller, U.S. Agricultural Research Service, Orlando; George L. Hutton, Bureau of Yards and Docks, Washington, D.C.; H.J. Spencer, Wildlife Research Laboratory, U.S. Department of the Interior, Gainesville; Comdr. Kenneth L. Knight, Bureau of Medicine and Surgery, Washington, D.C.; Clyde Flynn of the Jacksonville City Health Department; Alfred H. Yoemans of the Savannah, Ga., Laboratory, Department of Agriculture Marketing Service; and Gordon Smith of the Naval Base in Charleston.

Local speakers include Lcdr. DuChanois, David L. Hayden and Lt. Joseph G. McWilliams all of the PMU No. 1 staff; and Comdr. Richard J. Martin, senior assistant flight surgeon, NAS Jax Medical Department.

About 50 sanitation and pest control personnel are expected to participate in the final section of the conference.

In 1981, a two-week Operational Entomology Training (OET) course was developed and first offered at DVECC JAX. The following year it was given at DVECC Alameda. It was designed to provide advanced training for active duty and reserve preventive medicine personnel in applied vector-borne disease control in support of disaster relief, combat, and other contingency operations. OET is now taught twice a year at NECE and has reached hundreds of preventive medicine professionals of all services.



Operational Entomology Training (OET), Camp Blanding,, FL - 2010



Operational Entomology Training (OET), Whitehouse, FL -2002

Navy entomologists have also been called on to provide training on an international stage. For example, in 2011, entomologists provided vector surveillance and control training to 35 students enrolled in the University of Florida's Emerging Pathogens Institute Certificate in Emerging Infectious Disease Research Program:

Navy Entomology Center of Excellence Instructs International Students

By Lt. Larson, Navy Entomology Center of Excellence, PAO

GAINESVILLE, Fla. The Navy Entomology Center of Excellence (NECE) instructed 35 international students as part of the Certificate in Emerging Infectious Disease Research (CEIDR) program hosted by the University of Florida, Emerging Pathogens Institute, May 23 through May 24.

One primary aim of this Certificate program is to offer world-class graduate education and training to international public health professionals sponsored by organizations such as DoD Global Emerging Infections Surveillance and Response System (DoD-GEIS), Centers for Disease Control and Prevention (CDC), US Department of State, United States Agency for International Development (USAID), and the Fogarty International Center.

As a result of this program, international public health efforts are bolstered and long-term, sustainable research collaborations are formed.

“Potential students are nominated by US government sponsors. This year DoD and Department of State funded students to attend the Certificate in Emerging Infectious Disease Research program,” said Dr. Gregory Gray, Professor, Chair of the Department of Environmental & Global Health, and Navy Capt. ret., Medical Corps.”

This was the 4th annual (CEIDR) program and it was also first time that NECE aided in instructing the class. The students benefited from NECE’s expertise in vector control, which is a result of the command’s very unique mission.

“NECE's mission focuses on two areas. Developing and evaluating novel disease vector tools and techniques through collaboration with a variety of world-class organizations and executing comprehensive and highly effective vector control programs anytime, anywhere,” said Cmdr. Eric Hoffman, NECE Officer in Charge. “The Certificate program is able to draw on this unique experience and knowledge to assist in training international public health professionals to create effective and sustainable vector control programs when they return home. We also benefit from participating in the program through cultivating professional relationships potentially leading to future opportunities.”

Six NECE personnel lectured on several subjects including: mosquito surveillance methods, mosquito identification, chemical control of ticks and mosquitoes, tick and mosquito control equipment, and performed several equipment demonstrations.

“I think there was plenty of new skills that the students learned that would be helpful for them in their countries, especially for those involved in mosquito borne disease research and control,” said Bernard Okech, Assistant Professor, Department of Environmental & Global Health.

The 35 students that attended the (CEIDR) program represented 18 nations, which made it an extremely gratifying experience for all who were involved.

“It is difficult to imagine a more rewarding public health teaching experience,” said Lt. Tony Hughes of NECE. “Their enthusiasm and thirst for knowledge were contagious. I was honored to represent the Navy in this endeavor, and am thrilled that NECE has fostered a continuing relationship with this world-class global health program.”

NECE’s involvement in the (CEIDR) program is an example of the command’s success through the many collaborations that it has formed with, state, federal, and academic organizations.

“Currently, NECE and the University of Florida share a tremendous collaborative relationship centered around work conducted through the Deployed War-fighters Protection (DWFP) program,” said Cmdr. Hoffman. “Taking advantage of any opportunity to expand this relationship, such as EPI's certificate training, will continue to strengthen an already healthy and productive association.”

More information on the Certificate in Emerging Infectious Disease Research program can be found at their website. <http://egh.phhp.ufl.edu/certificate>.



LT Hughes providing instruction in identifying medically important mosquitoes during the UF EPI Certificate Program



UF EPI Certificate Program, Class of 2011

Research/Testing and Evaluation

The first Navy entomologist assigned to a research unit was LT Richard M. Bohart who reported to Naval Medical Research Unit #2 in January, 1944. His assignment, however, was in

the U.S. National Museum in Washington, DC. The first entomologist to actually conduct field research at an overseas location was LT Bernard Y. Travis who was assigned to NAMR #2 in April of 1944. He worked at several different locations in the Pacific. Navy entomologists have been assigned to research laboratories located in Taipei, Taiwan; Cairo, Egypt; Addis Ababa, Ethiopia; Camp LeJeune, North Carolina; Manila, Republic of the Philippine; Jakarta, Indonesia; and Lima, Peru.

A research liaison officer (RLO) was assigned from one of the services on a rotational basis, at the USDA Laboratory in Gainesville, Florida. Today, the RLO is found at the Armed Forces Pest Management Board. The first Navy entomologist to fill that tri-service role was CDR Joseph M. McWilliams in 1965.

Today Navy entomologists lead disease vector research at the Navy Medical Research Unit 2 (Honolulu, HI), Navy Medical Research Unit 3 (Cairo, Egypt), and Navy Medical Research Unit 6 (Lima, Peru). The following provides a brief summary of each Unit's history:



NAMRU-3 is the oldest overseas military medical research facility and one of the largest medical research laboratories in the North Africa-Middle East region. The laboratory traces its origins to 1942, when American military scientists and technicians began working with Egyptian physicians at the Abbassia Fever Hospital, Cairo, Egypt, under the auspices of the United States of America Typhus Commission, established by President Franklin D. Roosevelt. Following World War II, the Egyptian Government invited the U. S. Navy to continue collaborative studies of endemic tropical and subtropical diseases with Egyptian scientists. NAMRU-3 was formally established in 1946, and the laboratory has been in continuous operation despite periods of political tension and a seven-year lapse in U.S.-Egyptian relations (1967-1973).



NAMRU-2 had its beginnings on Guam during World War II under the Rockefeller Foundation. Its primary function then, as it is now, was to study infectious diseases of potential military significance in Asia. The unit was established in 1955 in Taipei, Taiwan, where it operated for 24 years. A NAMRU-2 detachment was established in 1970 in Jakarta, Indonesia. In 1979, when politics dictated that NAMRU-2 leave Taiwan, the command turned to its collaborators in the Republic of the Philippines to identify a new site for the laboratory. The Unit was officially established in Manila on 15 April 1979. In March of 1991, the Command was transferred to Jakarta and the Manila Detachment closed in June 1994. The laboratory remained in Jakarta until 2010, when it was requested to close by the Government of Indonesia. The Unit was relocated to Pearl Harbor, Hawaii and officially opened as NAMRU-2 Pacific on 17 June 2010. NAMRU-2 Pacific currently operates a detachment laboratory located at the National Institutes of Public Health, Phnom Penh, Cambodia, and a detachment within the Office of Defense Cooperation, U.S. Embassy Singapore.



The Naval Medical Research Unit 6 (NAMRU-6), in Lima and Iquitos, Peru, was established in 1983 through an agreement between the Surgeon Generals of the Peruvian and U.S. Navies, with the concurrence of the U.S. Department of State and the Peruvian Ministry of Foreign Affairs. The agreement established a cooperative medical research program in Peru to study infectious diseases of mutual interest.

In addition to research conducted at the Navy overseas laboratories, Navy entomologists have been and are currently engaged in numerous projects evaluating the effectiveness of vector control techniques, equipment and pesticides for use by the DOD. The following JAX Air News article from 1959 provides an early example:

DVCC, O&R JOIN IN HIDAL TESTS

JAX Air News/29 October 1959

Five years ago, research began on the HIDAL program, to develop an insecticide dispersal apparatus for use on large military helicopters. 30 days ago, O&R Jax successfully converted the apparatus for use on the latest HUS-1 helicopter.

Development of HIDAL (Helicopter Insecticide Dispersal Apparatus, Liquid) began at Camp Lejeune, N.C. under the leadership of Comdr. G. S. Stains. He successfully built the prototype which was then perfected and tested by the Marine Corps at Cherry Point, N.C. and approved for operational use by BuAer.

Comdr. Stains, now Officer-in-Charge of Disease Vector Control Center at NAS Jax, says "This apparatus consists essentially of a pair of spray booms extending out on both sides of the helicopter fuselage in a delta design, with pumping assembly and reservoir mounted within the cargo department."

"The insecticide is discharged from the boom through a series of "Tee-jet" nozzles and distributed over a wide area by the turbulence provided by the helicopter rotors" continues Comdr. Stains. It is mounted and dismantled with little alteration to the aircraft.

When the tests were conducted there was a definite need for “spraying via air” and all equipment was for WWII planes fast becoming obsolete.

After the “HIDAL” tests were completed and the apparatus became a working model the need arose for this to be converted to the HUS-1 helicopter to combat a disease epidemic in the Far East.

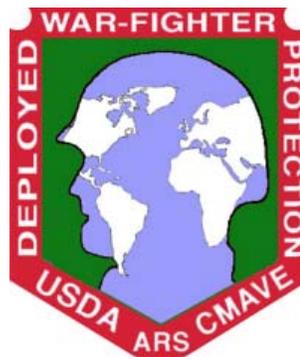
O&R Jax did this in record time, and the conversion was so successful that the new Bureau of Weapons is initiating action to use the converted apparatus for operational use.

This apparatus works like a “sprinkler system,” and has a swath of 250-400 feet. It delivers one to two quarts of toxicant per acre at an optimum altitude of 75 feet.

“HIDAL” proves its usefulness in many ways, one of them being spraying hard-to-reach areas. Another use being ease of mounting, but its most important feature is that it can be made from ordinary materials found in the Navy supply system with exception of nozzles and a few minor pieces of hardware.

At present time Comdr. Stains and his staff are working on development of apparatus for use on jet aircraft and the completion of this project seems to be in the very near future. The roto-wing adaption, however, has the greatest potential of riding areas of disease carrying insects more than any other apparatus yet invented.

In 2004, led by CAPT Gary Breeden, Director of the Armed Forces Pest Management Board (AFPMB) and in collaboration with the United States Department of Agriculture, the Deployed War Fighter Protection Program (DWFP) was launched. This \$25 million research initiative provided \$3 million/year to collaborative USDA Agricultural Research Service (ARS) laboratories and \$2 million/year to military entomologists (to include those stationed at NECE) and academia to develop novel methods and technology to protect U.S. armed forces from insects that spread dangerous diseases.



Insectaries constructed at the CMAVE complex funded by the DOD-sponsored Deployed War-Fighter Protection (DWFP) program.

To facilitate Navy participation in DWFP projects, CDR David Hoel was assigned in 2008 to the newly established Navy and Marine Corps Public Health Center Detachment, Gainesville, Florida acting as a liaison to the USDA ARS Center for Medical, Agriculture and Veterinary Entomology (CMAVE).

USDA-DOD Research Initiative to Protect U.S. Military

April 23, 2004, USDA PAO

WASHINGTON, April 23, 2004--The U.S. Department of Agriculture (USDA) and the U.S. Department of Defense (DOD) today announced a \$15-million, 5-year research program designed to develop new technologies to protect U.S. soldiers.

The initiative, the Deployed War Fighter Protection Research Program, will fund research programs at the Agricultural Research Service, USDA's chief in-house scientific research agency, to develop novel methods to protect U.S. armed forces from insects that spread dangerous diseases. Historically, more troops sent into battle are taken out of action by insect-borne diseases than are injured in combat, according to DOD.

The ARS National Program for Veterinary, Medical and Urban Entomology guides the agency's research on the prevention of human and animal diseases carried by arthropods, such as insects and ticks. Arthropod-borne diseases, which include malaria, dengue and West Nile fever, are among the most deadly in the world and are especially difficult to control during military operations.

"This program represents the largest monetary commitment provided by DOD to ARS in the past 50 years," said ARS Acting Administrator Edward B. Knipling. "The program is designed to encourage the rapid development of products that control vector-borne diseases, and for USDA to continue using its expertise to support military preventive medicine."

DOD's Armed Forces Pest Management Board (AFPMB), located in Silver Spring, Md., will oversee the research program. An internal steering committee of ARS national program leaders will allocate the funds among several specialized laboratories within the agency, where ARS scientists work to develop innovative pest-control methods.

DOD is providing funds to ARS to further the relationship between the two departments, according to Navy Captain Gary Breeden, executive director of the AFPMB. "Since the 1940s, ARS scientists working with the U.S. military have made some of the world's most important advances," he said. "Every breakthrough product in use today that was created to control disease-carrying insects was developed as a result of the relationship between USDA and the AFPMB. These products protect the military and save millions of lives every year around the world."

ARS scientists pioneered the method of treating military uniforms and bed nets with insecticides that repel and kill disease-carrying mosquitoes. Such commercially available mosquito nets have become the most common and effective malaria-preventive method used in the world today.

ARS scientists supported by DOD recently patented a compound that is now being tested as the key ingredient in a new generation of safe insect repellents. Named SS220, it could surpass DEET, a commonly used repellent developed by ARS for the military 50 years ago. Today, DEET continues to be the most widely used insect repellent in the world, available in a number of consumer products that come in varying concentrations and forms, including gels, aerosol and pump sprays, sticks and lotions.

"The goal of both departments is to enable ARS to continue its research to control vector-borne diseases that pose a risk to U.S. military troops in the field," said Knipling.

As of 2011 this program has been hugely successful contributing to fielding new vector control equipment, insecticides and techniques including: 304 peer reviewed journal articles published and 1 technical guide, 10 patents awarded, over 100 gene bank accessions submitted, over 1800 novel chemicals tested for efficacy, and evaluation of over 30 pieces of pesticide application equipment and pesticides leading to the assignment of 6 National Stock Numbers. Of particular note was the development of a new filth fly trap in 2011 by Navy entomologist LT Joseph DiClaro, capitalizing on initial research by graduate student, LT Jeff Hertz, his immediate predecessor at the University of Florida. This product would eventually receive a patent. The project was funded by a DWFP grant. The following article, published in the JAX Air News, provides information about the trap.

Invention by NECE Entomologist Protects the War-fighter

JAX Air News

22 DEC 2011

LT Marcus McDonough – NECE PAO

An entomologist assigned to the premier U.S. Navy facility dedicated to ensuring military forces' readiness through reducing the risk of insect-transmitted diseases developed a fly trap currently available for world-wide purchase.

Navy Entomology Center of Excellence (NECE) Operational Assessment Department's LT Joseph Diclaro developed the Florida Fly Baiter, a device designed to trap filth flies, which can mechanically transmit 100 known pathogens. The trap is being commercially released by Killgerm, a British-based chemical company.

Diclaro, who conceptualized the trap while pursuing a graduate degree at the University of Florida through the Navy's Entomology In-service Procurement Program (IPP), said his initial study of neurological and behavioral responses of house flies to reflective coloring led to the design of the trap, something he said works two ways.

"The color of the trap visually attracts them [flies] from a distance," he said. "Once in close proximity to a trap, a chemical lure brings them into the device, where they can be eliminated [through chemical exposure or entrapment]."

Diclaro said his studies found that house flies were attracted to a blue background with black lines, a significant finding because previous schools of thought indicated yellow was a more attractive color to the insects.

Based on his research, Diclaro de-signed the trap and performed field studies to fine tune its workings.

"Prototypes were tested over several years," he said. "The various designs were evaluated for efficacy outdoors near dumpsters, in residential areas and livestock farms as well as indoors in restaurants and a snake farm."

After proving the concept and finalizing the design, the UF Science and Technology Department applied for and was awarded a provisional patent. Kill-germ later purchased licensure agreements to produce and sell the traps, a recognition Diclaro said represents his research, the teamwork the UF Science and Technology Department and NECE share and the success of the Navy's doctoral program for medical entomology.

"Because NECE is the only command in the DoD (Department of Defense) that solely focuses on vector control, it was fitting to continue my research here," said Diclaro. "After reporting to NECE, I was able perform evaluations to fine tune its design."

The Florida Fly Baiter received attention within the DoD after NECE Assistant Officer-in-Charge LCDR Jeffrey Stancil petitioned the Armed Forces Pest Management Board (AFPMB) to assign a National Stock Number (NSN) to the device, something which would make the trap available throughout the U.S. Armed Forces. The AFPMB equipment committee voted unanimously in favor of assigning the NSN and allowing the device to be easily procured by service members.

Diclaro, who served as a radiological technologist (HM1) before commissioning, said the relatively fast commercialization of his concept also underscored the success of the Deployed War-fighter Protection Program (DWFP), a multi-million dollar DoD initiative with the U.S. Department of Agriculture (USDA) to protect deployed war-fighters from disease-carrying insects.

The DWFP focuses on new chemistries and formulations of public health insecticides, better products for personal protection and more efficient public health insecticide application technology. NECE serves as the DoD lead agency responsible for facilitating and participating in collaborations associated with the DWFP and is the only DoD agency whose mission is dedicated to operational entomology, providing expertise on military vector control equipment, techniques and procedures.

“The Florida Fly Baiter is a tremendous example of how DWFP facilitates the development of ideas leading to commercialization of tools that, in this case, benefits both the DoD and the private sector,” said NECE Officer-in-Charge CDR Eric Hoffman. “Often a nuisance and potentially medically important pest, filth flies present a control challenge particularly in a deployed set-ting. The Florida Fly Baiter has been proven, through testing and evaluation, to be the most effective filth fly trap currently available and a welcome addition. Assignment of an NSN, adding the product to our toolbox, will clearly benefit our deployed customers.”

Also in 2008, the Navy established a new billet at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia and was filled by CDR Daniel Szumlas to collaborate with world-recognized specialists in the field of vector control. LCDR Michael Zyzak reported to the Navy Medical Research Center (NMRC), Silver Spring, Maryland, to fill a new billet responsible for facilitating collaborative efforts among other Services conducting entomology research. In 2009, LT Toby Palmer reported to the CDC as the first to fill the community’s Duty Under Instruction (DUINS) Director’s training fellowship to work with vector scientists, learning state-of-the-art control techniques.



An off-the-shelf RCAV (Remote Controlled Aerial Vehicle) evaluated for aerial application of pesticides, Cecil Field, Florida 2004 by a team lead by a Navy entomologist from the Disease Vector Ecology and Control Center, Jacksonville. This project was one of the first Deployed War-fighter Protection Program projects.

Tri-Service Role

The Army Surgeon General established the Army Committee for Insect and Rodent Control in November, 1944. The U.S. Navy had a liaison representative to that committee. Out of this beginning grew the Armed Forces Pest Control Board, originally chartered in 1956 with all three services equally represented. It was renamed the Armed Forces Pest Management Board (AFPMB) in 1979.



Original sign indicating turn off of Linden Lane onto Cassidy Street for the Armed Forces Pest Control Board offices on the campus of the former National Park Seminary for Young Women, ca. 1962-1979. Donated by Dr. Robert W. Clegern, Col, USAF, BSC, Ret., April 8, 2011 -AFPMB

The mission of the Board is to develop and recommend policy for the Department of Defense (DoD) pest management program to the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics), and to serve as a scientific advisory body to DoD. The first Navy entomologist to serve as Executive Secretary to the AFPMB was CAPT Richard T. Holway who took office in October of 1960. The Military Entomology Information Service (MEIS) was established as an information center for the Board in 1962. The first Chief of MEIS was CAPT John Decoursey. This service was renamed the Defense Pest Management Information Analysis Center (DPMIAC) in 1980 following the installation of computers for handling the information processing chores formerly done by hand. Today DPMIAC has evolved into the Information Services Division which is responsible for indexing, analyzing, summarizing and disseminating information on natural resources management; environmental biology; and the biology, ecology, geographic distribution, taxonomy and control of vectors and pests.



AFPMB Directorate Staff, November 4th, 2011



ARMED FORCES PEST MANAGEMENT BOARD

The Board is composed of the Office of the Executive Secretary (including the Information Services Division), voting members (4 from each service and the Defense Logistics Agency), and agency representatives from each of the services and many other federal agencies. Navy Entomologists have and continue to serve in Board leadership positions including Director, Deputy Director, Division Chiefs, Committee Chairs and Vice Chairs. There are currently two Navy Entomologists assigned to the Board staff. One serves as the Navy Liaison, ensuring all issues affecting the Navy are considered during decision making processes.



1954 DoD Tri-Service Workshop, 14 Oct 1954, NAS Jacksonville, FL; equipment show on NAS Jax flightline – AFPMB



From left: LT Larson, LT Hughes (4th from left) and LT Dunford (6th from left) in Navy, Marine Corps and Army uniforms, respectively, deployed ISO OEF Afghanistan demonstrating the versatility of Navy Entomologists.

Acknowledgements: The History of Navy Entomology was first compiled by CDR Robert V. Peterson in 1981. It was updated by CDR Mark T. Wooster and LCDR James T. Need in 1993. The current version was updated in 2011 by CDR Eric Hoffman, CAPT Mark Beavers, Dr. Gary Breeden and CDR (ret) David Claborn.