April 25, 2016

Honorable Jeff Miller
Chairman
House Committee on Veterans’ Affairs
336 Cannon House Office Building
Washington, D.C. 20515

Re: Use of Water Barges in the Republic of Vietnam to supply potable water for deployed United States Navy ships

Dear Mr. Chairman:

I have been provided a copy of your recent letter to the Secretary of Defense concerning whether or not water barges were used to furnish potable water to ships anchored in Vietnamese waters. As you know, Military-Veterans Advocacy (MVA) has a significant interest in HR 969, the Blue Water Navy Vietnam Veterans Act, which would extend the presumption of Agent Orange exposure to the ships in the bays, harbors and territorial seas of the Republic of Vietnam. The bill currently has 317 co-sponsors.

Under current regulations, the VA has determined that ships in “inland waters” are eligible for the presumption. Over 340 ships have been identified as covered under the existing regulation, representing approximately 84,000 veterans. In April of 2015 the Court of Appeals for Veterans Claims in Gray v. McDonald, found the exclusion of bays and harbors from the VA definition of “inland waters” to be irrational and ordered them to rewrite the regulation concentrating on probabilities of exposure. Instead of including the harbors in their revised definition of “inland waters,” the VA arbitrarily and captiously chose to “double down” on their earlier policy. They continued to exclude the bays and harbors from the presumption of exposure. Several law suits questioning this action have been brought by MVA and are pending in the Court of Appeals for the District of Columbia, the Court of Appeals for the Federal Circuit and the Court of Appeal for Veterans Clams.

While the Gray court properly concentrated upon the effects of the discharge plume from the heavily sprayed Vietnamese river system, your question concerning water barges is indeed germane. Although MVA has raised this issue with your staff and with the Deputy Secretary of the Department of Veterans Affairs, it has not received the emphasis that it deserves. Consequently, MVA conducted an analysis of that issue with very interesting results.

Most Navy ships had limited potable water reserves. The potable water was used for drinking, laundry, cooking, cleaning and hygiene for the crew and other embarked personnel.
When anchored in the harbors, ships tended to distill mainly to reserve feed water, used for the boilers,¹ because of sanitation issues. Solid waste permeated the harbor both from the ships themselves, the shore establishment and indigenous residents of the area. Accordingly distillation to potable water was discouraged. As a result, reserve potable water levels often fell below acceptable limits. This required periodic replenishment from military and commercial potable water barges.

At least three self-propelled water barges YW 101, 126 and 128 were deployed to Vietnam.² These barges were used frequently in Qui Nhon and Da Nang harbors. Their efforts were supplemented by commercial water barges.

In their monthly report, Commander Naval Forces Vietnam noted millions of gallons of potable water being delivered to anchored ships in any given month. These reports are available from the Naval Historical Command. Excerpts from the June and July reports are produced as Exhibits A and B, attached hereto.³

I have attached as Exhibit C, the analysis completed by Mr. Ed Ball, who is currently the Shelby County (Ohio) Veteran’s Service Officer and is a retired Navy Chief Petty Officer (Surface Warfare). Chief Ball has reviewed numerous Monthly Summaries from Commander Naval Forces Vietnam and corroborates the fact that potable water was provided to ships in Da Nang. He notes that Naval Support Facility Da Nang serviced two-thirds of the 713 ships deployed to Vietnamese waters. He also identified the source of the water as Monkey Mountain, located near Da Nang, which was heavily sprayed. The use of water from Monkey Mountain has been verified by Mary Ellen McCarthy, the former staff director of the Senate Veterans Committee in Exhibit D, Notably this water was not only provided to anchored ships, but to ships moored to the piers.

¹ Since the same intake distillation and discharge system was used for reserve feed and potable water distillation, the entire system was contaminated by Agent Orange dioxin discharged into the harbors via the rivers. Emulsified Agent Orange that sank to the sea bed but would be disturbed and rise to the surface due to the cavitation effects of ships entering and leaving the harbor and due to the anchorage evolutions.

² See: http://www.navsource.org/archives/14/17idx.htm

I have also attached as Exhibit E, an e-mail from Navy veteran Charles Minor, from Jacksonville Florida, who states that his ship, the *USS Davidson* (DE 1045)\(^4\) and others received potable water from a water barge. In Exhibit F, Retired Senior Chief Petty Officer (Surface Warfare) A. Jojo, remembers that his ship, the *USS Mobile* (LKA 115) received supplies brought from shore and water from water barges while in Da Nang harbor. In Exhibit G, Navy veteran Carl Hagen confirms water was received onboard the hospital ship *USS Sanctuary* (AH-17) While in Da Nang harbor. In Exhibit H, Navy veteran Robert Chavez says that his ship, the *USS Harry E. Hubbard* (DD 748) received potable water from a barge in Qui Nhon. He also included a picture of the barge approaching his ship for an alongside transfer and pictures of the *Hubbard*’s crew on swift boats which were obviously heavily sprayed while operating in the river. In Exhibit I, Navy veteran Gil Devault has attached a photo of a commercial barge alongside his ship, the *USS Neches* (AO 47), which he believes was in Da Nang Harbor.

Notably Exhibits A and B also refer to deliveries of mail, freight and courier services from Da Nang harbor. All deliveries through Da Nang and other areas of Vietnam were susceptible of being sprayed. Virtually all mail sent via the Fleet Post Office system to deployed ships was staged in the heavily sprayed Da Nang area. Finally, Exhibit J, an affidavit from James May of the *USS Sanctuary* (AH 17) confirms spraying over the harbor, contrary to the claims of the Secretary.

We do understand that HR 969 does exceed the scope of this information. However when coupled with the documented proof of Agent Orange in the bottom sediment of Nha Trang Harbor, twenty years after the war,\(^5\) and the hydrologists affidavit reflected in Exhibit K, there is overwhelming evidence of dioxin exposure of shipboard veterans in the bays, harbors and territorial seas of Vietnam. MVA met with the CBO in January of 2015 and as a result of that meeting the projected ten year mandatory spending for HR 969 was reduced from $2.74 billion to $930 million. We have identified offsets that have been provided to your staff. Accordingly, we would appreciate it if you would hold a hearing on HR 969 and forward the bill to the floor. I will be more than happy to testify at any such hearing.

I will be in Washington DC the week of May 15th. We frequently see each other informally but I have not had the opportunity to sit down with you and discuss this topic at length I would look forward to doing so should your schedule permit. I am also willing to come to your District office in Pensacola should that be more convenient.

\(^4\) The *Davidson* was later redesignated FF-1045.

I hope that you find this information helpful. Military-Veterans Advocacy is prepared to be your resource on this issue. Should you have any further questions, please feel free to contact us.

Sincerely,

[Signature]

John H. Wells
Commander, USN (Retired)
Executive Director
transiting the Cua Viet from the LST ramp to Dong Ha. The sandbars had presented the only natural obstacles to an unrestricted transit of the Cua Viet by lighterage.

The Port of Danang was visited 100 times by U.S. SEVENTH Fleet ships during June. The ships were provided with over 1,000,000 gallons of diesel fuel and almost two million gallons of potable water, in addition to mail, freight, courier, transient billeting and disbursing services.

The Naval Support Activity's C-47 aircraft made 15 flights during June, transporting 444 passengers and 29,911 pounds of cargo.

On 30 June the Naval Support Activity's personnel level was 7,947. That day the number of United States and other Free World Military Assistance Forces supported by NAVSUPPACT was 130,300.

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The aircraft transported 425 passengers and 25,000 pounds of cargo during the remainder of the month.

On 16 July, two LCM-8s assigned to the NAVSUPPACT detachment at Chu Lai assisted in retrieving the enemy trawler driven aground and captured on 15 July by units of Operation MARKET TIME. The trawler was pulled free from a reef and towed approximately 15 miles to Chu Lai.

The Port of Danang was visited 134 times by SEVENTH Fleet ships during July. The ships were provided with almost one and one-half million gallons of diesel fuel and over three million gallons of potable water, in addition to mail, freight, courier, transient billeting and disbursing services.

Meanwhile, the Naval Support Activity's small-craft repair facility completed the overhaul of 13 diesel engines, one LCM-8 engine bank, and seven outboard motors in July. The facility also completed interim hull repairs to USS COCONINO COUNTY (LST 603), installed a new port engine in USS ASHVILLE (PGM 84) and replaced the port screw of an MSTS ship, LST-276. In addition, the floating dry dock—AFDL-23—handled 56 diverse craft during the month.

On 31 July the Naval Support Activity, Danang personnel level was 8,082. That same day the number of United States and other Free World Military Assistance Forces supported by NAVSUPPACT was 131,500.

*****
John Wells

From: Ed Ball <edball@bizwoh.rr.com>
Sent: Tuesday, April 19, 2016 10:39 AM
To: Richard.Hulver@navy.mil
Cc: 'John Wells'
Subject: RE: [Blue Water Navy Awareness] Sent the following to Senator Rob Portman's...

Good morning Dr. Hulver,

I’ve been graciously invited to chime in on this issue by CDR John Wells. I’ve been a County Veteran Service Officer going on 17 years here in Shelby County, Ohio. During the course of this period, numerous Blue Water Navy veterans have expressed their concern with presumptive exposure to Agent Orange.

Admittedly, according to Institute of Medicine (IOM), there are no relevant samples of dioxin taken from the Vietnam era to create the model studies they could utilize to present conclusive data based upon scientific evidence. Now just because the evidence doesn’t exist, doesn’t mean it didn’t happen. The DOD were not apprised of the health risks and or hazards presented by dioxin during its usage in the Vietnam Area of Operations. The scope of IOM investigative efforts, were based upon relevant questions submitted by the Secretary of the VA. Much has been said of the ability of the Navy’s shipboard Water Distillation plants ability to enrich dioxin once entered into the system. IOM duplicated Australia’s test that initially found this to be true.

As a fellow Chief Petty Officer, Enlisted Surface Warfare Specialist, having missed Vietnam by one year, I am well versed in various classes of naval vessels capabilities to include fuel and water transfer via CONREPs and Hotel Logistic support provided to ships moored pier-side and or at anchorage while inport. Based upon my service performed on aircraft carrier, fast frigate, guided missile cruiser, landing amphibious dock ship, amphibious cargo ship, mine sweepers, and communications ships. As a Radioman, I processed the message traffic as part of Unrep Requirements and Port Services/Hotel Requirements and know the capabilities existed and were heavily utilized.

My initial investigative efforts began in Da Nang, by going through declassified COMNAVFORV Monthly Summaries in hopes of identifying pieces of the puzzle that would further substantiate claims by veterans to their presumptive exposure while inport, without having traversed an inner waterway, and or stepping “boots on soil”. What I found was startling. Navy Seabees, working for Public Works Center (PWC) at Naval Supply Facilities (NSF) Da Nang designed and implemented a lagoon through use of a dam, and an 8 inch water pipeline, capable of 1.9M gallons of water for a water treatment plant at Camp Tien Sha. You may know this young Seabee better as a past 20 year Chairman of the Pasadena Rose Parade, Mr. John Morris and currently resides in the Pasadena area. He was aware of the water treatment plant at Camp Tien Sha, but although he was instrumental in briefing headquarters, he was not aware of water transfer to naval vessels. Obviously contaminated by spray
mist from Operation Ranch Hands missions in and around the NSF Da Nang area. (Utilizing the same spray mist model that the VA has used in their studies) No chemicals in water treatment would have removed the hazards of dioxin from further dissemination to U.S. Armed Forces, ashore and afloat. PWC advised 30 water treatment plants were in the area, and capable of 7M gallons of water per day at NSF DaNang AOR.

Then my focus began on the amount of water that was being provided to visiting ships each month. I then found that in July 1967 over 3M gallons of potable water was provided to 85 visiting ships. Future months showed NSF Da Nang routinely provided visiting ships millions of gallons of potable (fresh) water each month, until such time COMNAVFORV quit tracking water transfers in their monthly summaries.

Finding maps of Da Nang Harbor, I then began to question, how that much water got to ships at anchorage? Through deductive reasoning, Cargo and Ammunition ships would have had the majority of their time pier side. While the Navy’s man-o-war ships would have been at anchorage while conducting business import. Then it dawned on me, “water barges”, and sure enough I found YW-101 and YW-128 both permanently assigned to NSF DaNang 1967-1972 per NAVSOURCE.org. Navy veterans have since concurred, yes they took on water. (And that’s coming from Machinist Mates who would have been responsible for such an evolution.)

Taking the next step, how about replenishment ships? I then found USS Sacramento (AOE-1) in a Navy All Hands magazine article, they did in fact transfer thousands of gallons of fresh water to Blue Water Navy ships at sea. When I provided a briefing to the Ohio State Association of County Veterans Service Commissioners one member greeted after the presentation and informed me he was a crewmember onboard during the All Hands article. (Small World)

NSF Da Nang’s claim to history is in that of the 713 ships that provided support in Vietnam during the war, two thirds of that inventory was provided support by them. Only 344 are currently on the Veteran Affairs ship list for presumptive exposure, and that listed is under revision.

Looking at the Armed Forces Class of Supplies we find water at the top of the list in Class I:

Class I - Food, rations, and water
Class II - Clothing
Class III - Petroleum, oils, and lubricants
Class IV - Fortification and barrier materials
Class V - Ammunition
Class VI - Personal Items
Class VII - Major End Items
Class VIII - Medical supplies, minimal amounts
Class IX - Repair Parts
Class X - Miscellaneous supplies

If I may be of any further assistance, please don’t hesitate to call or email, it’d be my pleasure and honor.

Best regards,

Ed Ball, RMC(SW), USN, Ret. 1976-1997

Veterans Service Office
Dr. Hulver

Great talking to you this morning. Thanks for taking my call.

Please see below an email from Ed Ball (copied in this email) re: water barges.

I would appreciate the opportunity to provide any assistance on this matter.

Thanks.

Commander J. B. Wells U. S. Navy (Retired)
Attorney at Law
Executive Director
Military-Veterans Advocacy, Inc.
PO Box 5235
Slidell, LA 70469-5235
985-641-1855
985-649-1536 (fax)

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Evidence That Ships Afloat in Vietnam Received Water Supplied by Pipe From Monkey Mountain Vietnam

During a recent hearing there was no discussion the water provided to ships afloat obtained from Monkey Mountain Vietnam. The evidence for this information is as follows

(1) in the Texas Tech Virtual Vietnam Website “Naval Forces Vietnam “Monthly Historical Summary August 1966 Appendix III

"In addition to the normal maintenance of facilities, several minor construction and reconstruction projects were accomplished by Maintenance Division. Included in these . . . The running of two 4-inch water lines from Monkey Mountain to Camp Tien Sha.” (this camp was located at the bottom of Monkey mountain. See, Navy Historical map at http://www.history.navy.mil/our-collections/photography/numerical-list-of-images/nhhe-series/nhs-series/NH-74000/NH-74488.html

“Service craft:

(4) Rate of flow of water from the Monkey Mountain Site decreased from 6,000 gallons/hour to 3,000 gallons/hour. Efforts are now underway to build a dam on the beach and pump water to the TW. This should bring the combined flow back to approximately 6,000 gallons/hour."

(2) The Naval Historical and Heritage Command Highlights for July 1966 reported

"In June the water available from the Monkey Mountain, South Vietnam, source for the forces afloat, was significantly reduced. On 7 July, CINCPACFLT directed that Sasebo based YW128 be transferred temporarily with crew to the custody of NAVSUPPACT Danang. YW 128 arrived on 30 July and appreciably relieved the critical situation."


I hope that this information is useful to you.

Mary Ellen McCarthy
Charles Minor <chasminor@gmail.com>

Charles Dean Minor STG-2
B21-86-09
3200 Hartley Rd. #272
Jacksonville, Florida 32257
904-415-8166

Thank you so much for your reply Commander Wells. Chief Pat Stroud had mentioned to me that you were working with this situation. My experiences occurred during the WEST PAC 69-70 on board The U.S.S. Davidson D.E. 1045.

We spent a lot of time in the DaNang Harbor of which you can verify from the ships logs. During this time I personally witnessed guys like SN Dale O. Smith going ashore in the ships whale boat. I also remember very vividly this boat also going to the U.S.S. Saint Paul CA-73 while it also came into DaNang Harbor. It was around that time frame that we also took on water from what appeared to be a barge of some sort. During the first week of October the U.S.S. Davidson was near TuyHoa and we also traveled up the river on several occasions. The Deck Logs should show this also.

Commander, I have been in front of many people at the Veterans Administration and all they have ever wanted to do was to deny me and tell me that I needed to prove to them that I had a problem that was caused by or directly linked to my time in service.

I hope that some of this helps and can help me and my shipmates that are still alive.

Respectfully,

Charles Minor

On Fri, Apr 22, 2016 at 5:34 PM, John Wells <johnlawesq@msn.com> wrote:

Charles: Please provide me any information that you can. Thanks.

Commander J. B. Wells U. S. Navy (Retired)
Attorney at Law
Executive Director
Please support Military-Veterans Advocacy through the Combined Federal Campaign. Our CFC number is 59905

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For the Law Office of John B. Wells, please visit our website at www.johnwellslaw.com www.military-lawyers.com E-mail inquiries do not establish an attorney client relationship. This information is confidential in nature and protected by the attorney-client & work product privilege. If you are not the named recipient, or have otherwise received this communication in error, please delete it from your inbox, notify the sender immediately and do not disclose its contents to any other person, use them for any purpose, or store them in any medium.
I am a plankowner of the USS Mobile (LKA-115) [Commissioned 20 September 1969, Decommissioned 25 February 1994], homeport of San Diego.

Our first deployment was April - October 1970 to Viet Nam.
We docked in Da Nang and delivered mike boats and took on supplies and water.
Were in Da Nang a couple of times where water barges provided water to our ship.
I've seen the barges along side while watching the activity on the dock.

RMCS(SW) A. Jojo, USN Ret.
51405 Green Hill Drive
South Bend, IN 46628-9336
(574) 273-9860
From: Carl Hagen <notification+kr4m24r2xsmr@facebookmail.com>
Sent: Tuesday, April 19, 2016 9:17 AM
To: US NAVY
Subject: Re: [US NAVY] URGENT If anyone remembers receiving a water...

Carl Hagen commented on your post in US NAVY.

Carl Hagen
9:16am Apr 19
I know we got water a few times from a barge while in Danang on the USS Sanctuary AH 17. I was on from Nov69 to Jan 71 not sure how many or what the barge was.

Comment History

Terry Ferguson
9:12am Apr 19
Can't tell you the number, but it wasn't in a harbor. We were in Danang twice but didn't receive any water. My I ask why you are wanting this info.

John Wells
9:09am Apr 19
Thanks. But unfortunately we need to identify barges that were used in the harbors. We think they were YW101 and 128.

Terry Ferguson
9:07am Apr 19
We received water from a barge, but it was in a river somewhere way south

Original Post

John Wells
9:00am Apr 19
URGENT If anyone remembers receiving a water barge alongside while anchored in a Vietnamese port please IM me ASAP with your phone number/email, the ship you were on and approximate dates you received the water. This is in response to a tasker from the House Veterans Affairs Committee to the Navy in support of the bill extending Agent Orange exposure to the ships in the harbors. URGENT.

View Post on Facebook · Edit Email Settings · Reply to this email to add a comment.
Good morning John
First of all I would like to thank you very much for all the work you are doing for Vietnam Veterans. There was an e-mail about ships getting fresh water from ports in Vietnam. I was on the Harry E. Hubbard DD748 and had a lot of problems with our fresh water system aboard ship. On one occasion we received fresh water from Qui Nhon in Dec of 1968. The Hubbard is not on the Agent Orange rooster so I as well as other shipmates have been denied any help from V.A. because our ship is not on this list. Here is a picture of us receiving fresh water from Qui Nhon hope this can be of some use to you. Once again Thank you very much John for your service. Robert Chavez SFP3 Navy 1966 -1969 Vietnam bobchav@ca.rr.com Phone # 562 869-9730
1. Plunging Area

Moving Forward - Condition 3

P20

Brace DeLeveEng Fresh Water

Near Qui Nhon, Vietnam

Other Ships on Patrol Vietnam
Commander this is a photo of a slide I took of a water barge along side the USS Neches AO 47 on my last tour to Vietnam 1968. I took slide photos, I would then mail them once we were in Subic Bay Philippine Islands. We never received mail while at sea other than transfer mail to other ships and ports while deployed in Market Time and Yankee Station
The slide is marked March 1968 so that means it had to be taken prior to that date. To the best of my knowledge the only ports we were in during that time frame were in Vietnam and Subic Bay. I never remember us talking on fresh water at Subic Bay in the two full West PAC cruises I made while serving on the USS Neches. It has been almost fifty years ago so I could not swear this event took place in Vietnam , but I believe it did for the reasons I gave about how I had my slides developed.

Sent by an LTE device on Consumer Cellular
From the desk of James E May
157 Northcrest Ave.
Cheektowaga, NY 14225-3433
Claim #23776364
Home PH. (716)634-6052 Cell (716)796-4817
E-mail jimmay52@yahoo.com

To whom it may concern

My name is James E May. I was on the USS Sanctuary (AH-17) starting in 1966 to 1967. I was a deckhand and was up on deck MOST of the time where I would see the planes and hello's fly over spraying from one side of the Bay to the other in Da-Nang. Every time they would do this as a deckhand I would need to have a wash down to clean the deck to wash off the residue from the spray. For as you should know that the Sanctuary was a hospital ship so we needed to keep it clean at all times. When we saw the plans fly over you could feel the spay hitting you and it smelled bad and tasted bad. The VA and the Government say that they did not Spay anything over water but that is a big line of bull and I can't say the rest of it. They are just waiting for all the Viet Nam to die. I saw spraying over the water at least once every month when I was over there from 4/10/1967 till 6/24/1967. The US Air Force needed to dump any spay or fuel they had left before landing and when landing they would come in over the water of the Bay or take off over the water. We would get supplies and the boxes would feel like they had a oil on them. I still see things when I sleep at night and must go and talk about it every two months. I will never forget watching the spray planes till I pass away. For now I think that the effects of the Agent Orange has been to one of my grandchildren. He lost his life to cancer when he was only 9 months old.

This is the truth to the best of my knowledge so help me God

James E May

Notary Public, State of New York
Qualified in Erie County
DECLARATION OF ROBINSON HORDOIR, Ph.D.

I, Robinson Hordoir, Ph.D., state and declare as follows:

1. I make this declaration subject to penalties for perjury pursuant to 28 U.S.C. § 1746.

2. I am employed as a researcher by the Swedish Meteorological and Hydrological Institute ("SMHI"). SMHI is an agency of the Swedish government. Information about SMHI can be found at http://www.smhi.se/en. I am a French national and I am fluent in English, among other languages.

3. I received by doctorate degree from the University of Caen which is located in Caen, Normandy, France. I received my Ph.D. in 2007 in Physical Oceanography. My curriculum vitae is attached to this Declaration. A significant research topic that I undertook in earning my Ph.D. degree was an investigation into the extent to which freshwater discharged from the Mekong River influences ocean water in the coastal area adjacent to the Mekong Delta. The results of this study were published in Journal of Geophysical Research, a peer-reviewed journal of the American Geophysical Union (AGU). The article is referenced as: Hordo ir, R., K. D. Nguyen, and J. Polcher (2006), Simulating Tropical River Plumes, A Set Of Parametrizations Based On Macroscale Data: A Test Case In The Mekong Delta Region, J. Geophys. Res., 111, C09036, doi:10.1029/2005JC003392 (hereafter referred to as the "Mekong Delta Plume Study").

4. The object of the Mekong Delta Plume Study was to model the Mekong River plume and its impact along the coastal waters of southern Vietnam. Most rivers create plumes. A plume is formed when the outflow of fresh water from a river system empties into a larger body of water. The plume, generally speaking, is the area of the larger body that is influenced by the fresh water discharge. The existence of the plume is mostly related to the salinity difference between river water (ie. : freshwater) and that of the larger body that is the sea in most cases. Because of their density difference, river water and sea water do not mix immediately but create a density front. The presence of the front usually creates a coastal current that is influence by the Earth rotation (also known as the "Coriolis Force"). This phenomenon is extremely close, from a physical point of view, to that of "Thermal Wind" that most people also refer to as "Sea Breeze". The input of freshwater creates what is called a "baroclinic" current in the coastal area. "Baroclinic" is a term that is used both in Ocean and Atmospheric dynamics, and that refers to this density difference. This baroclinic current is made of two layers, the upper layer that is a mix of freshwater and sea water, and the lower layer that is mostly sea water. This dual system can be described as a "coastal overturning" : the input of freshwater attracts sea water below the river plume and that sea water eventually becomes mixed with freshwater when it reaches the vicinity of the river mouth. This mix of freshwater and sea water is the main body of the upper part of the plume. If wind blows in the same direction as the coastal current, or if wind can be negated, this coastal current becomes "coastally trapped". This means it flows with the coast on its right (in the Northern Hemisphere), and flows parallel to the coast. For major river systems, like the
Mekong River, or the Amazon or Mississippi, the river’s plume can be considerable. Depending on latitude, on meteorological, oceanographic and other conditions, a river's plume may extend hundreds of kilometers from the river's delta area. Some coastal currents like the Norwegian Coastal Current that flows all along the Norwegian coast, extend from the South of Norway up to the Arctic Ocean. In the case of the Norwegian Coastal Current, it is mostly explained by the freshwater outflow from the Baltic Sea. Because of their nature, the width of these currents are highly influenced by latitude. In tropical regions, such currents have a higher width because of the lower Coriolis force, whereas this width is smaller closer to the poles. Obviously, the closer the plume to the mouth of the river, the higher the percentage of river water that is mixed in the water of the receiving body. These dynamics are now quite well understood to Physical Oceanographers around the world thanks to measurements and numerical models.

5. The Mekong River is one of the world's major rivers. It is the world's 12th-longest river and the 7th-longest in Asia. Its estimated length is 4,350 km (2,703 mi), and it drains an area of 795,000 km² (307,000 sq mi), discharging 475 cu. km (114 cu mi) of water annually. The Mekong flowing southwesterly through Vietnam and empties into the South China Sea through several channels that form the very extensive Mekong Delta.

6. Ships anchored or operating off the coast and in the territorial seas of southern Vietnam would have been within the plume of the Mekong and other rivers. The phenomena would be greatest off the Mekong Delta due to the force of the river discharge and the length of the plume. Bays and harbors that were surrounded on three sides by lands, would somewhat concentrate the effect of the freshwater discharge and the water in those bays and harbor would be expected to have a lower salinity than in the area seaward of the bay or harbor.

7. In Southeast Asia and, specifically in the Mekong River basin, the month of November can be considered as the end of the wet season from a climatological point of view. During that period, I calculate the total freshwater discharge of the Mekong delta at 10,000 - 15,000 cubic meter per second (approximately 353,000 - 529,000 cu. ft per second). At that time of the years, the prevailing wind in the area of the Mekong Delta would be out of the northeast blowing southwest.

8. Based on these meteorological and hydrological elements, in November 1966, a coastally trapped baroclinic circulation of Mekong River water would be headed in a southwesterly direction. Baroclinic flow would cause Mekong River water to be transported into the area where U. S. Navy ships sailed or were anchored. Prevailing winds from the northeast contribute to the trapping of the freshwater close to the coast. This baroclinic current reaches its highest width off the southern-most point of the Mekong delta where all the freshwater from all the mouths of the delta meet to form a surface current flowing parallel to the coast. I would estimate the width of this current to be in a range from 20 nautical miles to 50 nautical miles.

9. Based on the kind of computer modeling used in the Mekong River Plume Study it is evident
that the territorial seas off the Mekong Delta are heavily influenced by the freshwater outflow
from the Mekong River.

10. Based on these salinity data, one can estimate that the percentage of Mekong river water at
the sea surface of the area in the territorial seas off the Mekong Delta in the fall of 1966, at
between 51% and 72%. To put it more simply, using our modeling techniques, about half to
three quarters of the water surrounding ships in the territorial seas off the Mekong Delta would
have been water from the Mekong River.

11. I am able to estimate that the baroclinic current of circulating Mekong River water would
have had a depth of anywhere from 5 to 10 meters, which is well within the draft of most U. S.
Navy ships operating off Vietnam. Ships operating within the ten fathom curve (18.28 meters)
would be operating primarily in Mekong River water.

12. It should be noted that during the monsoon season, the prevailing winds in the Mekong
Delta are out of the southwest blowing to the northeast. This change in wind direction results in
Mekong River water being driven away from the coast. A ship sailing miles away from the
Mekong Delta coast, would therefore sail in an area which surface water is heavily influenced by
the Mekong River. On the contrary, during that precise season, a ship anchored close to the
Vietnamese coast but a few miles south west of the southernmost delta branch, would notice the
presence of only a small percentage of Mekong river water at the surface of the sea. I say this to
make the point that it is unscientific to believe that there is a precise boundary between river
water (brown water) and ocean water (blue water) within what is referred as the "Region of
Freshwater Influence" of the Mekong river. In a system like the Mekong Delta, the flow of river
water and its mixture with sea water is complex and subject to a number of variables. I also wish
to add that in the case of the territorial sea off the Mekong river branches it is very unlikely that
the percentage of Mekong river water could have been less than 20% at the sea surface
regardless of the season. The end of the wet season (from October to December) coincides with
the highest probability of having a high percentage of Mekong river water close to the coast.
The end of the wet season is this only time of the year that makes it possible to have both a high
river discharge and wind blowing from the north East which ensure freshwater is trapped close to
the Mekong delta coast and flowing towards the southwest.

13. During the period January to September, the winds and currents will be running the opposite
direction causing the Mekong plume to drift away from the coast towards the South East. In this
precise case, the process that affects the freshwater is wind driven only from an energetical point
of view. However, the high density difference created by the freshwater close to the surface traps
the wind power in a thin layer, which causes this advection process to be very efficient into
bringing the river water very far offshore with little mixing. It is therefore possible to find
relatively high concentrations of Mekong river water close to the surface of the ocean far off the
coast of Vietnam.
14. The same effect as the Mekong plume, albeit reduced in scope, will occur throughout the territorial seas of Vietnam where rivers and streams discharge into the South China Sea. As I previously stated, the effect would contain a higher percentage river water within harbors and bays surrounded on three sides by land.

15. I have reviewed the attached chart of the South China Sea and observed the dashed line marking the presence of what is believed to be the territorial seas. It is very probably that water from the Mekong and other rivers would be discharged into the territorial seas if one considers the territorial sea of Southern Vietnam. Ships operating in that area would be very likely to encounter river water at some point during their operation. For other coastal areas, especially located on the Eastern Coast of Vietnam, and not located in the region of freshwater influence of the Mekong river, there is no river that has a flow comparable to that of the Mekong. However, this coast counts many smaller rivers and estuaries, and it is most likely that the freshwater coming from such rivers accumulate into forming a slow baroclinic motion towards the south, which effect can be measured in terms of low salinity anomaly. In harbors and bays in which such rivers end up their continental journey, their effect is of course even more undeniable.

16. Sediment is included in the river discharges and the undissolved solids would accompany the river water. Ships operating within the territorial seas would be expected to steam through this sediment. Sediment that emulsified and fell to the sea bed would be disturbed by anchoring, setting the anchor and high speed runs up and down the coast. These disturbances would cause the sediment to re-suspend.

I declare under penalty of perjury under the laws of the United States of America, that the foregoing is true and correct.

Executed this 13th day of January, 2014.

Robinson Hordoir, Ph.D.