

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
VOICES ORAL HISTORY ARCHIVES

IN PARTNERSHIP WITH
NOAA HERITAGE AND THE NATIONAL WEATHER SERVICE

AN INTERVIEW WITH DR. ELBERT “JOE” FRIDAY
FOR THE
NOAA 50th ORAL HISTORY PROJECT

INTERVIEW CONDUCTED BY
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EDMOND, OKLAHOMA
OCTOBER 14, 2020

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Molly Graham: This is an oral history interview with Dr. Joe Friday for the NOAA 50th Oral History Project. The interview is taking place on Wednesday, October 14, 2020. The interviewer is Molly Graham. It's a remote interview with Dr. Friday in Edmond, Oklahoma, and I'm in Scarborough, Maine. Well, we were talking last time about graduating from college and starting this program in meteorology. I was curious about how you negotiated your military commitment with your graduate education at that time?

Joe Friday: Well, the military commitment was something that – first of all, I only had a three-year commitment. One of those years was going to be in basic meteorology training at the University of Oklahoma. It was during that time that I also spent for my electives. During that time, I worked on a master's in nuclear engineering. I didn't finish that. I finished all but the thesis and then went on into active duty in the Air Force. Again, I had two more years to serve before I could get out. As I mentioned before, I enjoyed what I was doing so much that all of a sudden, twenty years went by, and I had completed a full career in the Air Force. But the Air Force was very good to me in several ways. Not only was it a very fun job, very challenging job, that I had in supporting the classified missions, primarily the spy satellites at the time, but other classified missions as well, including the spy aircraft, as well as other things that were being done by the military and by civilian agencies as well.

MG: You were working on this really in your first couple of years on duty.

JF: Yes. As soon as I arrived at Scott Air Force Base, I was immediately assigned to those duties and started right in. That's what trapped me into the Air Force for a twenty-year career, and also into meteorology. I saw the advantages and how meteorology could impact all sorts of things. We were dealing with very sophisticated weapon systems, not only the spy satellites, but we were dealing with brand new ideas of over-the-horizon [OTH] radar, and then how various aspects of meteorology and atmospheric sciences affected those. We were on cutting-edge activities, trying to sort through and trying to understand how things were being affected, if you would, by the weather and the like. It was an amazing and challenging time and so entertaining that, as I said, I stayed in for twenty years,

MG: Has any of that material been declassified since?

JF: All of the satellite-related activities have been unclassified. I'm not going to go into much of the other because, quite frankly, I'm not sure how much of that has been declassified. We supported, for example, the [Lockheed]U-2 and the SR-71. Those aircraft obviously exist. There have been a lot of information sets released on those. But to the exact extent it's been declassified, I'm unaware.

MG: Were you working in support of the Air Weather Service?

JF: I was in the Air Weather Service at the time. My first assignment was in the Scientific Services Division [SSD], in which we were then just beginning Numerical Weather Prediction [NWP] applied to classified missions. I was developing computer programs that would forecast cloud conditions actually over the Soviet Union and over the Chinese nation so that that

information can be fed, in very rapid real-time, into the decision-making for the spy satellite operations.

MG: So you graduated from college in 1961. In June of 1962, you went to Scott Air Force Base.

JF: That's correct.

MG: Talk to me about that year in between and the program you were doing at the University of Oklahoma.

JF: That was the basic meteorology program. At that time, the Air Force was having trouble recruiting enough meteorologists to fill the openings. So what they had done is they had worked with several universities, the University of Oklahoma being one of them, to have a short program, a one-year program, that would take someone who had a science and engineering background. They had to have an undergraduate degree in one of the science or engineering courses so that they would have the background necessary that they could do a concentrated program to come up to speed as far as the atmospheric sciences and meteorology was concerned. That one-year training then would qualify them to go out into the Air Force and meet the Air Force mission needs for meteorological activities.

MG: What was your wife doing when you were in Illinois?

JF: When I was in Illinois, she was not working. She was simply a stay-at-home wife at the time. We did not have any children at the time. This is getting a little sensitive, but I'll go ahead with just a general discussion of it. We had trouble starting our family. She was going through all sorts of medical tests and medical procedures, as was I, to try to sort out what was going on. Then finally, at the end of that first year, or the first tour at Scott Air Force Base, she became pregnant. I was reassigned to the University of Oklahoma to undergo my graduate training, which resulted eventually in both a master's and a PhD in that assignment. When we moved back to Norman, she was about six, six and a half months along. Shortly after we got to Norman, she went into labor, gave birth to a premature child, a premature boy, at seven months. The boy lived for just a little over a day. He died of Hyaline membrane disease. I'm not sure you're familiar with that, but it [means] the lung coating that wasn't fully matured, and the membrane on the lung actually prevented the oxygen from being properly absorbed and all of that. It's the same disease that killed the Kennedy baby. [Editor's Note: On August 7, 1963, First Lady Jacqueline Kennedy gave birth to Patrick Bouvier Kennedy, who died from complications from Hyaline membrane disease two days later.] Shortly after the Kennedy child died, a great deal of research was done on Hyaline membrane disease, and now there's basically an instant cure for it. There's a treatment that's given to premature children right after birth that results in a hundred percent cure rate. So we lost our first child due to that. Subsequent to that, while I was still in graduate school, she became pregnant with our oldest daughter, who was born successfully, full-term, but very low birth weight. She weighed four pounds, fifteen ounces. So that was a scary time period for us because they would not let her out of the hospital until she had gained up to five pounds. So she was at the hospital for about ten or fifteen days after birth. But everything's fine now. She's a healthy mother with two children of her own, a family, and

all of that. So that was successful. Subsequent to that, we had another child as well. So I have two daughters. I shouldn't probably tell their age, but they're now forty-nine and fifty-two years old.

MG: It must have been so heartbreaking to lose your son.

JF: It was devastating because we had been trying for so long to have a child. I remember that it was right at the beginning of my graduate program, so not only was it a very intense time getting started in graduate school, working on your masters and PhD, I was trying to do it all in one time period. I was successful in doing it in that one time period. But the first two or three weeks, I was just so depressed as a result of that, I almost gave up. Then it's about time. You suddenly realize that if you're going to accomplish this, if you're going to do it, you've got to get over this. You've got to get over it not only for yourself but also for your wife, who's also in a state of depression. So she started working. As a matter of fact, she started working for a professor at the meteorology department, doing data transfer. In those days, there was a lot of data entry by punch cards, manually entered into datasheets, and then the old punch cards to put into the computer. So that's what she was doing, and that occupied her time as well during that time period.

MG: When you moved to Norman, were you still working on the spy satellite work, or had the nature of your work changed?

JF: No, I was still working on it until I got the assignment. The assignment was an Air Force Institute of Technology Program, in which they looked for people that wanted to go on for more academic degrees and had the qualifications to do so. There was a hook to that. Every year that you spend in school meant an additional three years that you're obligated to spend in the Air Force. So I spent two years in graduate school. That meant that I now had a six-year [obligation] after I got out. I had a six-year obligation to complete. But I felt it was worth it, and indeed, it was. Later on, when I went to Air War College, it was the same thing. By going Air Command and Staff [College] first, and then Air War College later, each time I did that, a one-year program, there was a three-year commitment afterward to continue in the Air Force. So I spent a total of five years in education in my twenty-year Air Force career. I incurred basically fifteen years of obligated tour as a result of that, but again, it was worth it.

MG: You were moving up the ranks fairly quickly. Were you promoted when you were assigned to Norman?

JF: When I started in graduate school, I was a first lieutenant. No, I'm sorry. When I started in basic meteorology, I was a second lieutenant. I was a captain when I went back to Norman. Shortly before I finished my PhD, I was selected for major three years ahead of schedule, which I was absolutely shocked at. But it was in recognition for being in the right place at the right time, being in support of that very highly sensitive program at the time, and getting recognition for doing so because we made a significant difference. The work that we did, and it wasn't just me; it was a group of several of us. But the work that we did in support of the spy satellites literally tripled the amount of intelligence that they were able to obtain because they were able to take pictures of cloud-free areas, as opposed to taking pictures of cloudy areas. When you did

the statistical analysis, they received three times as much clear photography as they would have if they had just been shooting at random. It was a major accomplishment. So I made a major at the time. It was an interesting time period when I did that. I went in to take my final oral exams for my PhD work. I went through the period. It was about a three-hour oral drilling, if you would, by my committee. After it was over, they congratulated me and said I had satisfied all of that. They signed all the paperwork and said, "Take this over to the graduate college for processing." So I took it over to the graduate college. I asked him, "Is there anything else I have to do?" He said, "No, just finish up your existing coursework." Well, my existing coursework was my research on the dissertation, so I had literally finished it up. So I walked out, getting ready to head back to the house where we lived, and it was amazing. I walked outside, and there was no parting of the clouds. There was no angelic revelation. It didn't seem like there was any change since I was now a PhD. I went back to the house. I picked up, at that time, my six-month-old daughter, who had been born while we were there, and she peed over me. So I kind of recognized the true meaning of life at that time. It wasn't the title that was important. It was the family, and it was the child and so on. Anyway, I finished that job and went back--from there, I went back to Scott Air Force Base to continue in the work that I had been doing. But then, because I had been selected for major as early as I had, I was put on another fast-track list and got picked for the Air Command and Staff College, which is the equivalent of a master's level as far as the military education is concerned. That was a one-year tour at Maxwell Air Force Base, Montgomery, Alabama. So it was a fun time down there, immersion in a lot of things. It was not just military strategy; it was management techniques. It was geopolitics. It was really a very broad-based educational structure. I was very impressed with the content and quality of that education there. It was from there that I got reassigned to Vietnam. I thought I was going to make it through a military career without ever going to Vietnam, but it turned out that I was the last US weatherman in Vietnam. I went there in 1972 and served for one year, eight months in Vietnam and four months in Thailand to fill out my one-year period,

MG: Can you tell me a little more about your dissertation? What was the topic?

JF: The dissertation was on the rotating thunderstorms. It was a computer simulation of a rotating convective element, a thunderstorm if you would--a model thunderstorm, not a real thunderstorm, obviously. I looked at the thunderstorm with three different means of investigation. I looked at it from just some fundamental physics analysis, physical analysis. I looked at it from a computer model. We also looked at it from a physical model. We had a huge, and I really mean huge, plexiglass tank, three-foot in diameter and about six feet high, full of water. We would inject, in a nozzle in the bottom of that tank, a cloud, if you would, of soap bubbles, and they would rise. It just would grow as a convective element, as a rising element. We take that entire tank, which weighed several hundred pounds, and we would rotate that at varying speeds to see what the impact of rotation would do as far as the growth and the effect of that is concerned. As we had expected beforehand and verified there, the rotation significantly affected the change in the dynamics of that thunderstorm. As we know now, that rotation basically is the mesocyclone that eventually will produce the tornado and cause that very, very severe thunderstorm activity. But we also did a computer model then. Bear in mind computers were pretty crude in those days. The computer model that we did, it occupied, I think, about four cartons of cards, and each carton of cards had two-thousand cards in it. So again, this was in the days where everything was on punch cards. So you would punch the cards, and you would

submit it to run, and it would run, and it would come back with an error in the program someplace. It would try to tell you where the error was, but it wasn't very good at telling you at the time. You would go through and correct them. But you eventually got the model to run, and you got results that agreed with the laboratory results, with the fluid model that we were using. It agreed with the simple physical model that we looked at in crude form. So the fact that we could get all three of those to agree in general with what was going on in the thunderstorm was very rewarding. The one glitch that we had in the whole process is that about ninety percent of the way through the work in finishing that dissertation, the laboratory on the North Campus at the University of Oklahoma burned down. When it burned, it contained not only the laboratory equipment, that huge plexiglass tank, [and] all of the high-speed cameras that we used; it contained all of my data. I didn't appreciate the necessity for backup at the time. So all the copies of my work, everything was gone, except for those four cartons of computer cards which had been turned into the computer center the night before for one final run. So I didn't have to go back and replicate that, but we did convince the National Science Foundation, fortunately, to fund again the replacement of that equipment so that we could complete that work. We knew all of the mistakes that we had made initially, so we weren't going down any blind alleys. It was a matter of just going through replicating what we had done before, collecting the data. By the way, it came out the same the second time, which is always good. I learned the meaning of backup. So I had copies not only at the laboratory, but I had copies at home, and I carry copies in my briefcase back and forth between the two. So I had at least two backup copies at all times from that time on. Believe me; I backup everything on my computer now. It's automatically backed up. I back it up on thumb drives as well. So I make sure that I'm not caught in that position again.

MG: That must have served you well throughout your career. It's a good habit.

JF: It's a very good habit.

MG: Tell me again what was next for you once you finished your dissertation and moved on.

JF: Well, I thought that I would be going to some exotic research place and serving in that capacity. But instead, I went back to Scott, back into the staff weather functions that I had been doing before. But they were enjoyable. I mean, I enjoyed those. So it was good from that standpoint. As I mentioned, then I got picked for the Air Command and Staff College. That was in Montgomery, Alabama, at Maxwell Air Force Base. That is where my second daughter was born.

MG: Kelly?

JF: Kelly Sue. She hates the fact that--she says, "You gave me a southern name--Kelly Sue." I said, "Well, you were born in Alabama, and don't forget, we could have named you Kelly-Bob." She doesn't appreciate that to this day, but that's okay.

MG: You mentioned your service in Vietnam. I want to get a sense of the mood of the country and on college campuses around this time?

JF: Well, when I was in graduate school--bear in mind, I was in graduate school in 1968, and I was an Air Force officer. We didn't have to wear uniforms when we were there, and it's probably a pretty good thing with the view on the college campuses there. 1968 was probably one of the major, major crises in the United States at the time, with the Democratic Convention in the riots in Chicago at the Democratic Convention. [Editor's Note: The Democratic Convention of 1968 took place in Chicago from August 26th to 29th. Thousands of anti-war protestors clashed with police in the city. The National Guard had to be used to quell the protests.] There were riots across the country. There were demonstrations at most of the colleges and universities. I remember when I was in undergraduate school, people were complaining about college students being apathetic. When I was in graduate school, I was hoping that apathy would return once more, and it would calm down on the campus, but it didn't. The University of Oklahoma didn't have nearly the opposition that places like Wisconsin and other areas had. There was a loss of lives at some of the schools. There were none at the University of Oklahoma, and not much physical damage either. But just a lot of dissent, a lot of protesting. The country was kind of divided along two lines, either absolute support of the President or absolute disapproval of the President and those actions taken. It's not very dissimilar, in some respects, to today. I guess that's one of the things that ease my mind a little bit today. We've made it through some pretty rough times before in this nation and survived, and I think we'll do it again. I hate to see all the dissension going on today, but I still think that we will make it through all of this in the long term. It may be rough ahead, but we'll make it through it in the long term. When I went to Vietnam, I came back at Christmas time for R&R [rest and recuperation]. You were given fourteen days in the middle of your one year tour to come back to your country, come back to your family. You could do it in one of two ways. They had arrangements made to have R&R in Hawaii so that your wife could meet your Hawaii, and you would come back there, or you could go all the way back home. I chose to go all the way back home to see my kids and the rest of the family members. I recall walking through in uniform--walking through the airport in Kansas City and being spit upon because I was wearing a military uniform. I am so grateful for the attitude toward the military members today [and] that they are respected and [people] understand that they are supporting the country, they're providing public service supporting the country. But the attitude there was, "The President is wrong. The military is doing all of this. They must be wrong, regardless of what they were doing." That's an attitude that fortunately doesn't exist today, and I'm hoping it doesn't recur because that is so unfair to people that are following directions from the nation, doing things that the nation has determined is important. Now, when I was in Vietnam, I have to admit the fact that it didn't take me long to realize that we didn't have a very good policy there. It was not well thought out. We had no real end motive in mind. We had no clear winning strategy. I also recognized that most of the guys at the top, including the President, understood that we couldn't win, and that's a terrible thing to put your military troops in. It really is the wrong thing for a nation to do that with its military.

MG: What year was it that you were sent to Saigon?

JF: I went to Saigon in July 1972. In December of 1972, the ceasefire was declared. It was a two-month ceasefire period that lasted. I guess it was in January the ceasefire was declared, of '73. It was a two-month period of drawdown removal of all the troops and all that. So March the 28th, if I remember correctly the date, was supposed to be the last date that there would be

any military forces left in Vietnam from the United States. Bear in mind that there were other nations as well involved in this, the Australians, Canadians, and the like. But the United States was, by far, the bulk of the forces in Vietnam at the time. The goal was then that the POWs [prisoners of war] would be released, and the US forces would be withdrawn. Fifteen days into the ceasefire, the North Vietnamese released twenty-five percent of the POWs. This drove [Henry] Kissinger and [Richard] Nixon absolutely up the wall. They could not believe that they had been tricked this way. They were expecting all the POWs to be released on that day. So they issued an immediate order that if that's what's going to happen, then the forces themselves will not be withdrawn any faster than the same rate of speed that we received the POWs. Now, in fact, we had already drawn down more than probably fifty percent of the forces. So that meant for the next month, nobody was going to be leaving Vietnam. In the meantime, we had brought in a lot of forces from outside of the Saigon area into Tan Son Nhut. That was where they were going to basically depart from. So Tan Son Nhut Air Base, outside of Saigon, had thousands of GIs with absolutely nothing to do. That is not a good situation at all. What we did is we tried to do all sorts of very positive things. We had baseball games. We had all sorts of games. We had free hotdogs, free hamburgers, free beer, all this sort of thing, to try to keep people occupied as opposed to just let him go off and get in trouble downtown in Saigon and the like. We were only moderately successful with that. But eventually, the drawdown went ahead. I was on the next to last airplane out of Saigon. I wanted to make sure all of my guys left first. We got everybody out as soon as we possibly could. As a matter of fact, I cheated once and got caught at it. There was an aircraft coming into there that was a weather reconnaissance aircraft, and I knew that people there. So I said, "Hey, you have room for a few extra people." "Yeah, we can take ten people." So I got ten of my guys out of the country fast. The general found out about it, called me into his office, and said, "You have taken part of my quota. If you ever do that again." He told me what he would do to me, which I will not repeat on camera. As I walked out, I saluted him, and I said, "Yes, sir. I understand. It won't happen again." As I turned to walk out, he said, "If I had been in your place, I would have done it, too." [laughter] So he understood what I was trying to do for my troops. I had three hundred people working for me over there, and all up and down the country. We were in the process, as well, of turning over what we could to the South Vietnamese military meteorologist and the like. So that was reasonably successful. We turned over radars. We turned over equipment that they could use, and the like. The last three weeks in Saigon were pretty scary, in some respects, because the enemies knew we were pulling out; they knew we were leaving. There was a favorite restaurant that several of us from the weather office would go to [in] downtown Saigon. So we were heading out there one time, and we were walking the last couple of blocks to the restaurant. It was off the beaten path. And a Jeep driven by the South Vietnamese military was coming up the way, and they saw us, and they were in uniform. They tried to run us down. We managed to jump over a fence and get out of the way. At that time, I told the guys, "When you go off base, wear civilian clothes. Don't wear military uniforms any longer." Because there were going to be civilians that stayed as an assistance program to the South Vietnamese. So they wouldn't be able to tell whether these were part of the civilian crew or some of the military. The chances of getting run over were less that way. So we did that. The last day that I was there, I was getting ready. Everything I had was in one B-4 bag, one duffel-size bag. I was getting ready to go to the airport to the terminal to take off. As I was leaving, some of the Vietnamese were coming into our barracks and hauling off everything they could. So it had deteriorated very rapidly during that time period. None of us were getting in their way. We were just backing away and letting

them take whatever they wanted. It got pretty messy there toward the end. But I ended up going over to Nakhon Phanom, Thailand, and running the weather program there. We still had weather support requirements for military operations in Laos and Cambodia. We continued air operations there for another couple of years, I think, if I remember correctly. Anyway, to finish out my one-year term, I went there. It was interesting because when the ceasefire was declared, a lot of tours were shortened. Everybody that had been there longer than I had been got to go home early. The line was drawn right at me, so I got the chance to stay and spend the entire time. As a matter of fact, because of the way it worked out on the calendar, instead of 365 days, I spent 366 days in Southeast Asia. I enjoyed the work I was doing there. It was rewarding in a lot of respects. You saw immediate feedback. You knew that the pilots and the aircraft that were operating over the North depended on your forecast to make sure they were safe in their operations, that they could see their targets, and they could get out of the way of anything, and the like. If your forecast wasn't particularly good, they told you about it as soon as they got back. They would give you some instant feedback. Again, that was good because you developed a rapport. You developed a good understanding of what the mission was and what the guys were doing there. At that time, it was all guys; there were no women involved in combat in those years.

MG: I read that one of the objectives of the weather support folks was seeding clouds and weather modification. Can you talk a little about that? What was your involvement?

MG: Well, I would have been involved in it. As a matter of fact, when I got orders to go to Vietnam, it was to operate the special weather analysis program, (SWOT?), which was to take and analyze the data coming back from the, at that time, top-secret cloud seeding operation. Before I got there, just shortly before I got there, the guys seeding the clouds had decided that they might be able to provide support for actual operations in the field. During that period of time, the North Vietnamese had gotten more bold. They had left the purely guerrilla warfare tactics and started to assemble in larger military forces and to actually move towards Saigon. So the guys that were doing the weather modification said, "Hey, we can cause it to rain on those guys and slow them down." So they were given the go-ahead, and they did it. The clouds formed up, and it rained like a son of a gun on them. Then the clouds drifted over the US forces, and it rained like a son of a gun on them. I wasn't there at the time, and it may be purely apocryphal, but I'm told that the head of the weather analysis team, the one job that I would have had, was called into the general's office and had literally a telephone thrown at him. He says, "Not only do I have to fight the blank-blank North Vietnamese. I also have to fight my own blank-blank weathermen. That's the last I want to see of you. That terminated the cloud seeding program at that time, toward the end of the war. So when I got there, there was really nothing to do other than clean up all the paperwork. I had twenty-five-hundred top-secret documents that I had to either transfer or dispose of. It turned out that probably well over twenty-two-hundred of them were nothing but telegraph messages saying that so-and-so was going to be visiting the program or various things of that nature, just administrative clearance type of activities. So we ended up with an awful lot of burning. The only problem is that top-secret documents take a great deal of control to make sure that they're adequately covered or cared for. So for each one of the one-page documents I destroyed it, I had to make three copies to indicate what had happened to it because each one of those three copies went to a different place. So it was a paperwork nightmare. But that was how I spent my first couple of weeks in Saigon. Then, I

took over as operations officer for the unit. I had the job of getting ready because we knew the ceasefire was coming eventually, of doing the planning for what we were going to do to withdraw, how we were going to draw down our own forces. We had equipment that we had to take with us. At that time, the meteorological satellite program for the military was highly classified. We had a van that brought the data directly to us there in Saigon. So we had to move that over to Nakhon Phanom, where we were going to go with it. It hadn't been moved for a long time, and that was quite an effort to try to make sure we could get it, first of all, ready to move, making sure that all the parts were working as far as the wheels and brakes and everything else was concerned on the van, and that we could move it. Then we had to make arrangements to haul it over there. The only plane that could carry it was a C-5. It wouldn't fit in the smaller transport planes. The C-5 had never landed in Nakhon Phanom before. So one of the first things that we had to do was to make sure a C-5 could land and take off from Nakhon Phanom, Thailand. They had to extend the runway using PSP, pierced steel planks that they used to set up temporary runways. They put those in, and the aircraft came in, and it landed successfully on it. As a matter of fact, C-5 was pretty good at landing on unimproved airfields. But when it got ready to take off, when it was revving up, the thrust was so great before they actually released the brake that it caused part of the runway to slide and ended up damaging some of our weather equipment next to it. But we got through all of those problems. When it got time to actually transfer the van, we took it down in the morning, after the last pass of data came over the last data readout for the day. We took it down, and by the evening, we had it up in Nakhon Phanom operating, so that the next time that we had a satellite data pass, it was available to us. We didn't miss a pass once during that time period. So the guys that were working that van did a fantastic job of making sure it all worked. So I was involved with planning all of that activity as operations officer. Then, when the ceasefire occurred, everybody, as I indicated, left [that were] a higher rank than I was. They had been in there longer than I had. So, all of a sudden, I was in charge. It's always difficult when you have to execute your own plan because you don't have anybody to blame. You can always say, "I don't know why they did this because it's a problem," except that it's my problem. But things went reasonably well, except for that slowdown because our planning was to have literally everybody out, except for about five of us that were going to stay and do all of the last-minute cleanup. Instead, of those three-hundred people that I had, I had to accommodate a slowdown that we would have only twenty-five percent leave [every] two weeks. So that was the only problem we had, and we overcame that, again, with difficulty, but we overcame it.

MG: Tell me about coming home and reuniting with your family.

JF: That is always a wonderful thing to do. It was wonderful during the Christmas break that I came home for the R&R, and it was also very much wonderful when I came home after the entire assignment. I landed at Will Rogers Airport in Oklahoma City. I got out. People could wait at the gate then. They didn't have to wait outside the secure areas. They could wait at the gate then. So my wife and the two daughters were waiting at the gate. My oldest daughter came running to me, and my youngest daughter ran away because she didn't know me. She was only ten months old when I left. She was about twenty-two months old when I came back, and she didn't really know me, but she had heard about me and all that. But it was a wonderful time. I was tired from the trip, and my wife said, "Well, I'll drive." I said, "No, no. I'm ready to go. I'm ready to drive." Now one thing that you need to know is that Thailand was a British territory

for quite some time, and they drive on the British side of the street. So I started out. The first intersection I came to, I was suddenly on the wrong side of the street. My wife said, "Get out of the car. I'm going to drive." So she drove home, but it was a great time. We didn't have a lot of time there before we had to move. I had been assigned to Offutt Air Force Base, at the time, to the Air Force Global Central. During my R&R, we'd gone up and actually bought a house that we were going to move into. So we knew where we were going to go, and all this. So the move worked very smoothly from that standpoint. But it was a very rapid change getting in. So within three weeks after I'd gotten back, I'd taken leave to do all of that. Then I was back at work at Offutt Air Force Base in the special projects area, supporting classified missions.

MG: This is in Omaha, Nebraska.

JF: Omaha, Nebraska. Yes. Nobody wanted to go to Omaha, Nebraska, Offutt Air Force Base until they got there, and then nobody wanted to leave. It was one of those communities that you didn't realize how nice it was going to be until you were there and experienced the community, the attitude of everybody, the support that you got for being in the military, and all of this, much like Midwest City, Oklahoma is, or Tinker Air Force Base, where I had left my family during the time that I was in Vietnam.

MG: Can you describe your assignment there? What were your duties?

JF: I started out in charge of the computer support activities. They'd come a long way since I had first started in that at Scott Air Force Base a few years earlier, and the computer technology had advanced a great deal. The number of missions we were supporting had increased in number, and each one of those missions had special requirements. Our job was to make sure that our computer models satisfied those particular missions. At the same time, we were trying to integrate the data from the classified defense meteorological satellite program into the support system. So we were processing the data from the meteorological satellite. We were using that with data from the general weather models. We were putting it all together to improve the overall cloud forecasting for all of the classified missions. Then you never could tell what would happen. We had a secure line coming in there, a secure phone. When that phone rang, you never knew who was going to be on the other end of it. One day, the phone rang, you pick it up, and it was Henry Kissinger wanting to know what was going on in such-and-such a place because he had seen some intelligence reports indicating that the Russians were up to something. So we were able to provide that information almost instantaneously because we had a global database. We had a database that pulled in data literally from around the world, and we also had the real-time defense meteorological satellite program. So the White House knew that. Like I said, Henry Kissinger was on the line a few times, other people from the White House would be on the line, and we would be able to provide the data that they needed to make their own decision. We didn't always know what they were talking about. We didn't know why they were doing it. We were just trying to provide the data that they required.

MG: Was it during this time that you attended the Air War College for a bit?

JF: Yes. Yes, it was. After I finished. I'd been at Offutt for about a year and a half or so, maybe two, I'm not sure, and got selected for Air War College. Now, I'd also been selected for

lieutenant colonel by that time when I came back from Vietnam. Just before I got back from Vietnam, I was selected for lieutenant colonel. So that still put me about three years ahead of the program. So, as a result of that, I was on the list to be considered for the Air War College and got selected for that after I'd been in Offutt a fairly short period of time. Now, that was the equivalent of a PhD in all those military subjects. Again, it wasn't just military strategy, although that was a part of it, but a lot of geopolitics, a lot of international economics, a lot of personnel issues, a lot of management techniques, and all of this. I learned I'm an ENTJ [Extraverted, Intuitive, Thinking, and Judging] on the [Myers] Briggs area. I won't say [who]. There's several people that were ENTJs that aren't very nice. There were a few that were okay. [laughter] That's extrovert – and I can't remember all those words. You might probably know it yourself. But the first time I took that test, I was an ENTJ, all in capital letters. The second time I took the test, in War College – I'd taken it before in Air Command and Staff. In War College, I wasn't quite as extreme on those as before. I think I had mellowed out over the years. So my views weren't quite as extreme to drive me to the extent of all of those axes. But it was, again, an excellent program. There was a personal problem that we had while we were there. When I went to the Air War College, this was during the time of the Nixon housing problem. The economy was not doing very well, and the administration was trying to do something to stimulate it. Housing is always a good thing to stimulate. So they had put in a tax law, tax change, so that anybody that bought a new house got a two-thousand-dollar tax credit, not deduction but a credit, which means your taxes went down by two-thousand dollars. Used houses didn't count. So I had a house for sale in a recession. It stayed empty the entire time I was in War College, and, of course, I was paying rent on a house in Montgomery, Alabama, and that's rough when you're paying two bills like that. The fortunate thing is I got reassigned directly back to the same place, so I had the house all waiting for me. I didn't have to worry about drapes or anything like that. We had everything outfitted for it. So we moved back in. I went into a different job at this time. I went into the general forecasting function for all of the global activities. I was managing that activity. That's when I got picked for the Pentagon assignment. The Pentagon assignment was the senior environmental position in the Office of the Secretary of Defense, which basically oversaw all of the military activities in meteorology, oceanography, geosciences, all of those environmental types of activities. In order to do that, you had to have some background in oceanography. On July 1, 1977, I was called and told that on July 5th, I was to report to Monterey, California, to the Navy Postgraduate School there to take a three-month program in oceanography. I had to take twelve hours of oceanography in order to qualify for the job in the Pentagon. What happened was the various services would put forward nominees to be selected, and then the Secretary of Defense's office would pick the person for the job. So in order to make me competitive, I had to go out to Monterey. We had all kinds of plans already made for the summer. The kids were involved in various camps and things of that nature. So there was no way I was going to try to move a family out there for a three-month assignment. I ended up spending three months at the Naval Postgraduate School, staying in the old Del Monte Hotel, which was their administration building. They have BOQ rooms there – officers' quarters rooms there. Initially, I was told that I could stay there for two weeks, but I got to know the person that was running that organization fairly well, and I got extended for two weeks until the three months were over. That was very convenient because I literally walked out the door and walked fifty feet to one classroom or two-hundred feet to another. The mess hall was very close by. There was this beautiful walking area, so you could walk around the lake, and get your exercise in. I didn't have a car with me. I did end up making

friends with quite a few of the staff around the area and ended up going to Bible study with them and church with him and things of that nature. So I really had a pretty good time there, all in all, and enjoyed Monterey, except – I don't know if you've ever been there in the morning or not, but it's always cloudy in the morning and cold. One day I woke up, and it was clear. I thought, "My gosh. I've overslept." But it wasn't. It was just the fact that that was the one day of the year it was sunny in the morning. Anyway, that was a good assignment. I took four courses in oceanography. I aced them all. I ended up then being selected for the Pentagon job. Again, I had such a long notice on that. I was told within about the middle of December that I had to report on the 2nd of January to the Pentagon. Have you ever tried to sell a house in the middle of the winter?

MG: No.

JF: It's possible, particularly if you don't care because we had people that said, "I'll buy the house, as long as I can move in before Christmas, so my kids have a good Christmas." I said, "I can't possibly be out of here by that time. It's just not going to work." Fortunately, we didn't have that much problem selling the house, although I went by myself to DC. We had two cars. I drove one, went to DC, and got set up there. Actually, I bought a house there, even before we'd sold the one in Nebraska, but sold the one in Nebraska fairly easily at that time, as opposed to the previous time when I was in the Air War College. It worked out very well. We lived in Washington, DC, for a very long time after that. The Pentagon assignment was a good one. I was asked to take over the entire office of the Environment and Life Sciences. So not only was I responsible at that time for the environmental side of the house, but I was also responsible for personnel sciences, training programs, chemical biological warfare, and a few other programs along that line. I learned more about chemical biological warfare than I ever wanted to know. At the time, we were in the process of trying to destroy chemical weapons. There was a treaty to do that internationally. We were trying to get rid of a lot of the (old?) stuff that we had stored around the countryside, and the logistics of trying to do that were always a real issue – transporting it to storage sites without raising the ire of all the participants or all the people along the path of that. So again, a good assignment, a fun assignment, and one that, again, I thoroughly enjoyed.

MG: Maybe this is a good time to take a break if you need some water or a cough drop.

JF: Probably so.

MG: Do you want to take a fifteen-minute break?

JF: Let me take about a fifteen-minute break.

MG: Okay. That sounds good. I'll stop the recording, and we'll come right back in fifteen minutes.

JF: Okay.

[Tape paused.]

MG: Are you ready to pick back up?

JF: Yes, I am.

MG: Good. Was there anything else you wanted to say about your time at the Pentagon, the technologies you were working with, and your assignments there?

JF: As I indicated, it was basically management oversight of the programs. So I was responsible for making sure that all of the programs, all the military services in the environmental sciences, were coordinated, nonduplicative, for example, aimed at what we were trying to accomplish as far as the military is concerned, and the research was satisfying the military mission. It was a fascinating thing for me because I got a chance to see what was going on at all of the laboratories around the military. I got a chance to meet all of the players. We got a chance to significantly impact the way things were being done. I instituted a series of tri-agency research reviews, in which all of the service members that were involved in the same thing would come together, and those became very popular. First of all, the researchers would see what their peers were doing in the other organizations and end up cooperating to maybe make advances faster than they could have otherwise. That was the outcome as a result. The other thing that I tried to do is to get all of the researchers and all of the weapons developers to realize that there's a difference between the theoretical activity in a laboratory than there is in the real world, particularly in a battlefield. I remember being briefed by one of the weapons developer groups in the Pentagon about the new weapon that the Army was going to be using, which was a laser-guided shell to be shot from the main battle tank. What would happen is the shell would be fired, but somebody would be upfront illuminating the target that they wanted that shell to hit with a laser. This would track in directly on the laser spot and eliminate the target with much greater accuracy than the usual method of just firing without that kind of final targeting. I said, "When is this weapon going to be used?" "Well, it'll be used in Europe as a main defense against any particular Soviet invasion of Europe." I said, "Okay. Are you guys going to start activity?" "Oh, no. We're only in a defensive mode." I said, "Then you know when it's going to occur." They said, "What do you mean, 'when it's going to occur'?" I said, "You know the Soviets never initiate a military activity unless it's in the wintertime when they think they have the advantage." They said, "Oh." I said, "Have you ever tried this out in snow?" They said, "No, we haven't." The next year, they set out a very large program in New Hampshire, called (SNOW-1?), and I forget the fancy acronym they put together for it. But it was basically to check out laser-guided weapon systems and these new targeted weapon systems in snow. Well, it turned out that this laser beam that they were planning to use didn't go very far in snow. It would just blossom out to be obstructed by all the snowflakes. So the system that they had planned on wasn't going to work for its major purpose, which is a defensive mechanism against the Soviets invading Europe in wintertime. They were able, however, to change the frequency of the laser, to change the way the laser was pulsed, and to do other things with the weapon system to improve the capability to where it was an effective weapon. So it was these kinds of things that I was very happy to be able to do at the Pentagon – ask people those kinds of questions and get them thinking because it's a lot different than having a soldier in the field with all of the result of the battle and all that operating a weapon system versus a technician, a scientist in the laboratory operating the same weapon system. As a result of that, the Army started looking not only at snow; they also started

looking at dust and smoke in the battlefield and seeing how those were going to affect their new weapon systems as well. So they started carrying out some very significant meaningful experiments, and the results of those are the weapon systems are much better now than they would have been otherwise.

MG: How was the position of the National Weather Service presented to you?

JF: I was getting ready to retire from my Air Force career, after twenty years of service. In my capacity in the Pentagon, I sat on several interagency committees with people from all of the different agencies in the Washington area. So I knew people at NASA [National Aeronautics and Space Administration] and EPA [Environmental Protection Agency] and NOAA [National Oceanic and Atmospheric Administration] National Weather Service, Department of Energy, FAA [Federal Aviation Administration] and the like, as a result of that kind of interaction. Dick Hallgren, when he found out that I was planning on retiring soon, he said, "I've got a position, which is basically the director of operations that's going to become vacant in the fairly near future. I'd like you to consider applying for it." Well, I wasn't particularly interested at the time. I was more interested in going back to the University of Oklahoma and teaching. That's what I wanted to do as a career following my career in the Air Force. He pushed me to do that. Then, a little later on, his deputy applied for another position and was accepted for it, and his deputy position became available. He then asked me if I would be interested in applying for that. I won't go into a lot of details because there's some stuff that's still too personal to talk about with respect to another part of that activity. So let me just suffice it to say that I decided that I would apply for the deputy position and ended up applying for that and was selected to be the deputy of the National Weather Service. So I retired from the Air Force at the end of September. The 1st of October, I became the deputy director of the National Weather Service. One of the first things I did in the National Weather Service is I wanted to go out and visit the various field organizations. I wanted to let the people know that I wasn't just another retired Air Force colonel that wanted a job in the National Weather Service, [but] that I really was interested in the actual weather operations, that I was knowledgeable and the like. So, in the first few months, I visited all six of our regions, including Alaska and Hawaii. I visited Alaska in the wintertime. The only time I ever went to Alaska was in the wintertime because I wanted the guys and gals there to know that I wasn't just a Washington bureaucrat that wanted to come up for some salmon fishing and the like, that I wanted to know what their real world was like. Let me tell you, it's cold up there. I remember at Point Barrow, Alaska, when I visited there, the wind chill was about minus-eighty. The aircraft that we were in, I was afraid it wasn't going to be able to start the next day. It took forever to get it started, even though they had heaters on it the entire time that it was in overnight. But seeing the condition that the men and women in the National Weather Service work in and their dedication to the work – it was just so rewarding to see that and understand what's going on. It makes you want to really make sure that they have whatever they need to effectively operate to support them.

MG: Was this a new approach, going around to the different regions and offices? Had this been done before? I'm wondering if certain offices felt neglected by headquarters previously?

JF: I don't believe they had felt neglected. I don't think that at all. But I wanted to make sure that – I know how rumor mills work. There were several people in the National Weather Service

at the time that were retired military officers, and anytime you bring in a person from the outside, you're hurting the ability of somebody inside to advance in a position. I just wanted to make sure that they knew me, that they understood me, and understood that I was interested in them, that I understood them. It was amazing what you could do with a fairly small degree of resources. I remember when I visited the Pacific region, they were still using some very outdated technology that I knew that we had improvements in that in the military. So for just fifty or sixty-thousand dollars, I think it was, I was able to provide them with the resources to significantly upgrade their communications capability in the Pacific. The Pacific has always been a little bit behind because the islands are distributed all across the Pacific Ocean, and communication is fairly low frequency, low volume capacity there. I did not visit many of the Pacific Islands, just the headquarters in Hawaii. But I tried to understand what they needed to improve their operations. I did that in Alaska and Hawaii. It soon became known that I had a small amount of money, discretionary money, that I was perfectly willing to try to improve operations with some high-risk type of things. It's amazing what you can do with a little incentive and a little money like that to get people interested. Because you've got good people out there that are very bright, they can see ways of doing things probably much better than you can. So if you just make sure that you can help them out a little bit, it seemed to work very well for us.

MG: NOAA was a fairly new agency at this point. The Weather Bureau became the National Weather Service in 1970. I get the sense, from other folks I've talked to, that this was the period of the old and new timers, folks who had been with the Weather Bureau and newer people coming into the agency.

JF: Well, the Weather Bureau, [now] National Weather Service had, at that time, a very large number of people that had been former military forecasters that had come on board. At the same time, as vacancies started to occur, there were fewer and fewer military that were there to fill those vacancies. But at that time, the colleges and universities had started meteorological programs. So you started to have people come in from that activity. So there was a transition. When I got there, we were just in the process of beginning to put computer automation in the Weather Service offices. It wasn't a program I started; it was a program that had been started by my predecessor. It was in the process of going. They were having some trouble with it. As major new technology advances, it's not unusual to have issues, but they were making progress. This system, called AFOS, Automation of Field Operations and Services, caused two different approaches. The new people that had joined the organization understood the computers, and they were ready to go. Some of the older people that had been there for quite some time said, "I'm not going to have some computer tell me what to do," and they just literally rebelled at the idea of working at it. As a result of that, we had a fairly large number of retirements. People were eligible to retire, and they just didn't want to make the transition. That was a rough time because you didn't want to lose any more talent than you absolutely had to. The people that had been there all along, they were very familiar with the offices. They knew the meteorology, the local meteorology, better than some of the new people coming in. But at the same time, you had to be able to start to adapt because we were starting to link the offices together. We were starting to provide better computer models coming out of Washington, DC. It was important then to start unifying, if you would, a lot of disparate offices across the National Weather Service. This computer automation did that for us. [It] standardized the capability, standardized the operation.

It's been very successful in the long term, but it did take a while to get it started. The attitude was mixed. I'll get into some of that when I talk about the modernization efforts as well because that was some major, major issues along those lines.

MG: Yes. I'm wondering if this is a good place to stop for today because that will be a big chapter in our conversation, or do you want to start talking about the Weather Services' Modernization and Associated Restructuring [MAR].

JF: I think I'd better stop right now because my voice, even though I had that break, is pretty bad. I think we ought to probably start with that for the next time.

MG: I'm happy to do that. It'll help me sort of refocus, and then when we get back together the next time, we can dive into the MAR and really explore that.

JF: Okay, very good.

MG: All right. I'll send you an email again with my availability. I'm hoping we can do it fairly soon so that we don't lose any momentum.

JF: Okay. I've got some pretty good availability coming up. I've got some pretty good availability coming up. So we should be able to do that sometime in the near future.

MG: Well, I love these meetings, and it's such a treat to talk with you. I really appreciate the time you're spending with me.

JF: Okay, I'm delighted to do it, Molly. It brings back a lot of memories.

MG: Good. Thank you for sharing them with me. I'll send you an email shortly.

JF: Okay, very good. Thank you.

MG: Bye-bye.

JF: Bye.

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Reviewed by Molly Graham 10/17/2020

Reviewed by Joe Friday 12/3/2020

Reviewed by Molly Graham 12/19/2020