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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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, November 4, 2020. The interviewer is Molly Graham. It's a remote interview with Dr. Friday in Edmond, Oklahoma, and I'm in Scarborough, Maine. I think we can probably wrap up today, although I'll miss these conversations. Was there anything else about the MAR [Modernization and Associated Restructuring] specifically that we forgot to talk about, or I forgot to ask about?

Joe Friday: I'm sure there was, but I can't think of it really at the moment. You covered most of the major ideas. The philosophy there was to try to provide some quality uniform service across the country. That dictated where the offices would be. We started along the coast of the country first so that we could cover all of the marine weather and, particularly on the East Coast and the Gulf Coast, cover the hurricanes as they were approaching. Then we built in across the country after that, so that we could have good coverage with the radars and good coverage as far as support to the emergency management communities and to the local populations was concerned. We tried to take advantage of where we were currently located because of the connections that had been made, but in some cases, we couldn't do that. So we relocated offices to different locations. For example, we used to have one at the Baltimore [Washington International Thurgood Marshall] Airport and one at the [Ronald Reagan] Washington National Airport. We relocated our major office for the Baltimore Washington area to Dulles [International] Airport. It had better area coverage for the radar, and it did provide coverage for that entire region, just east of the Appalachians there.

MG: I wanted to ask about other major projects or even weather events that took place during your tenure that were memorable.

JF: Probably the most memorable weather events were the hurricanes – Hurricane Andrew, which did absolute devastation on southern Florida, [and] Hurricane Hugo, which did devastation in the Charleston region. There are also the tornado situations. Viewing some of the extreme tornadoes in Texas, for example, where the tornado literally ripped from the foundation, not only the homes but even the plumbing. You can see the strength of that. But I think overall, probably the most memorable thing about being the Weather Service director was witnessing the dedication of the employees. I remember one case – I don't remember the year, but I remember the case very well. We had tornadoes moving through the Erie, Pennsylvania area. Our Erie office was watching on the radar and issuing all the warnings, and trying to make sure the emergency management community was fully aware as well as the public. They watched as the radar showed a fairly significant tornado going directly over the area where one of our employees lived. But he stayed on-site to be able to finish and continue to provide the weather support when he didn't know exactly what was going on with his own family. That's the kind of dedication you have with that. I saw that in Hurricane Andrew in Florida, in which the [National]Hurricane Center was affected, and you saw people operating by candlelight to try to keep as much information flowing as possible. Amazing dedication. Amazing dedication to the job. If severe weather was approaching, you would have people come into the office even though it wasn't their time on shift to volunteer so that they could help out with the situation. We'd have people camp out for days in severe snowstorm events, for example. These are our government employees that we tend to take for granted. But the fact is, is they're dedicated professional

employees, dedicated to their mission, dedicated to the public, and trying always to do the best possible job they can.

MG: Were there other major projects or areas of focus for you during this time?

JF: The modernization was almost all-consuming. Of course, that modernization was a lot more than just a single item. It was the radar program. It was the AWIPS [Advanced Weather Interactive Processing System] program. It was the ASOS [Automated Surface Observing Systems] program. It was the COMET [Cooperative Program for Operational Meteorology, Education and Training] program for education and training. It was the facilities program, trying to acquire the proper land and go through all of that process, and all the myriad of things that we had to do to make sure that all came together at the appropriate time. Sometimes it didn't work quite as smoothly as we'd like to have it. We had just designed and just built our new facility at Dulles Airport at Sterling, Virginia, for the Washington/Baltimore office. We got ready to move the equipment in, and we were still moving in old equipment at the time because the AWIPS wasn't online yet. So we were moving in our old AFOS [Automation of Field Operations and Services] equipment, which was our first networked mini-computer system. And it was too wide for the doorways. All the planning that we had done, we didn't check on that particular area. Fortunately, the only thing we had to do is to take down the door facing. We didn't have to tear down the wall, and that gave us the extra inch or two we needed to get the equipment in. So we quickly modified the design for the rest of the units that were going in around the country so that we wouldn't have that problem again. So the best-laid plans can be thwarted by the fact that the equipment was about an inch too wide to go in through the door. There were numerous things like that. With a project as detailed and as complicated as the MAR was, you learned. So the latter part of it was much easier than the first part. But that first part was exciting. You never know exactly what was going to happen. Sometimes you were pulling your hair out over things that shouldn't be associated with the type of technology we were putting in, like the size of the door, for example, but they were. But we had a group of people that were running that program that had an attitude that they'll get it done, they can get it done, and they did. They did a fantastic job of it.

MG: Did you expect to be reassigned when you were, or was that a big surprise?

JF: I had actually volunteered earlier. I remember about a week or two before when all the conflict was going on over the budget and everything else; I asked our examiner from the Office of Management and Budget, who was pushing from that side of it. I said, "Look, I don't want to be a focal point of all this conflict." I said, "Would it be better if I were to resign?" And she told me, she said, "No, not at all. You are directing the modernization of the weather service, which is vitally important, and so you shouldn't resign." But I had thought about it because it seemed like we were always in a conflict, and I worried about the fact that it was me versus the overall situation. I thought I was always doing the right things. But sometimes, when conflict is circling all around, you wonder what the cause of it is and if it could possibly be your own approach and your own attitude that's causing the major problem. But I will admit that I was surprised when it actually occurred. I will also admit that when I was called down to the administrator's office, Jim Baker's office, the person that called me down was a friend of mine. He said, "I want to give you a head's up. You're going to be reassigned." So all the way driving down from Silver

Spring, Maryland, down there to the Department of Commerce, I had an opportunity to think about how I was going to handle it. I'm glad I had that heads up. I think it gave me a much better opportunity. It was a fascinating conversation with Dr. Baker. He and I had been at loggerheads over the budget quite a bit. I had told him just point blank that there was no way I could satisfy the law and do what he was asking me to do as far as the office closures were concerned. He came in, and he said, "We've got a situation in our research area that is absolutely critical, and we need somebody to run that program, and we think you're an ideal person to do it." So he looked at it from that standpoint. I said, "Cut the crap out, Jim. What the hell are you trying to say?" He said, "You're being reassigned. The Secretary of Commerce has made that determination." The Secretary of Commerce had the perfect right to do. As a senior executive in the federal government, there are benefits, and there are liabilities. One of the benefits is you get to accumulate more leave than you would ordinarily. That's because you're usually working too hard to take leave. But you can keep it and get paid for it eventually. Your pay is good, not great, but it's very good. But you have two-week job stability. If your appointing officer decides to reassign you, he or she can do that, basically, with a two-week notice. If you choose not to accept that, then you're resigning. So he had the perfect authority to do that. As I indicated before, it was at the same level of a position – assistant administrator. Instead of the Weather Service, it was the research arm of NOAA [National Oceanic and Atmospheric Administration]. It was physically located in the same subway stop in the Washington, DC area, except that I had to walk another sixty yards or something to get to my new office. And it was the same salary, so there was no negative impact from that standpoint. But it was clear that I was being reassigned because of the difficulty of that. As I indicated the last time we spoke, the review of the budget situation afterward indicated that instead of the forty-two-and-a-half million dollars I said I was short and absolutely had to have in order to proceed with the legal restructuring of the organization, I only needed forty-two million. So, in essence, it was verified that I was correct in the budget analysis. That money was provided. So my getting fired actually provided the money that we needed to continue to do the job and to continue to complete the modernization in an effective fashion and not take the type of shortcuts that they really wanted to take. So from that standpoint, it solved the problem. And quite frankly, it kind of eased the stress on me because I was under quite a bit of stress during that time period. The research arm of NOAA was a fun organization. They were doing wonderful things, wonderful technology. One interesting incident that happened right afterward – this was a time period in which we were having a major El Nino event off of the West Coast of the United States and the Pacific Ocean, stronger than anything we had ever seen before. I recall the head of the Climate Prediction Center coming into my office while I was still in National Weather Service and saying, "Hey, our forecast indicates that we're going to have a major event – very, very significant. We think we ought to be notifying people." I said, "Well, that's what we've been trying to do. We've been trying to understand, and you guys have been trying to work on ways of better predicting. So I think it's time to get together a press announcement as to what our outlook is supposed to be, and we inform the public because it can have some very significant impact on the public with the change in the storm patterns and intensification of wrong?" I said, "Well, if we're wrong, we admit the fact that the forecast wasn't a good one, and we'll continue to do research on it to do a better job in the future." But we were right. It was going on – just beginning – when I actually then took over as head of OAR [Oceanic and Atmospheric Research]. It gave us a wonderful experiment because we needed to take measurements, not just of the weather, not just of the ocean temperature, which was some of the major manifestations,

but we need to take measurements of the marine life and all of the fish and everything else along that line to see what the total impact on the ecosystems was of this major, major event. It turned out to be arguably the strongest El Nino that we'd ever seen on record. So Mother Nature was providing us with an extremely good basis for an experiment. So I quickly reprioritized things that we were doing, reprogrammed about a million and a half dollars in the various elements of our research community. It aggravated a few people because it hurt a few pet projects. But most people were very happy because of what we were able to do, and a tremendous amount of research work resulted from that so that we better understood the impacts and effects for the future. However, after it became apparent what I was doing because I reprogrammed about a million and a half dollars, I got called back into Jim Baker's office, who yelled and screamed at me for having the audacity to go ahead and mess up some research programs that had been going on for some times. I said, "Jim, what would you have done in my situation? Would you have just ignored Mother Nature's offering of a tremendous research opportunity?" He kind of quieted down, and he said, "Don't ever do this again unless you tell me first." I said, "Okay. I understand." We got along fine. It was he actually that that obviously made the recommendation to the Secretary to get rid of me. I think everybody knew that. Actually, it was a member of his staff, who shall remain nameless, who we'd had a lot of problems with. But that was fine. He had the perfect authority to do so. I didn't like it. But in the long term, it turned out fine. The Weather Service finished the modernization, was funded adequately to do, and I enjoyed my year at OAR before I went over to the National Academy of Sciences. I thoroughly enjoyed my time at the National Academy. I would have been able to stay there for a little while longer, but several things happened. The real driving factor for that was the fact that my first wife became sick with cancer, and there was no way that I was going to be able to continue on a full-time job and take care of her at the time. Fortunately, I was in a situation with the retirement pay from NOAA, from the Air Force, and the federal government, and everything else that I didn't need to. So I could literally retire and take care of that. I still did some consulting but not much. So I stayed home most of the time. Looking back, it's been an interesting career. One of the things – and I may have said this to you – but I feel really very, very blessed because I have really enjoyed every job I've ever had. I don't think you can ask for much more than that of your career. It was really a blessing to be able to have that kind of experience. I even enjoy this silly job I've got now with the homeowners' association and being the treasurer. Even though I've got all of these stacks of material here – I'm trying to go back over the books and get everything squared away, as I'm taking this over, but I'm even enjoying that.

MG: Were you literally given two weeks' notice? Did you have two weeks to wrap things up and transition to Robert Winokur, who took over temporarily before Jack Kelly?

JF: Bob Winokur took over, yes. I had to accept the assignment within two weeks. Two days later, from the time that I was reassigned, we were having the dedication of the last NEXRAD radar installation in Fort Wayne, Indiana. So I asked Jim Baker – I said, "I've got plane tickets to go to that since it's kind of an important thing in our modernization. May I go?" He said, "Yes, you may." So I went to that, the last dedication for the last NEXRAD radar installation, and when they were raising the dome. So that was kind of bittersweet, realizing that was the last official act that I would have as the director of the National Weather Service. I basically went over to the new office almost immediately. I had the opportunity to take my secretary with me, and she wanted to go so that we had that kind of continuity. Although, the deputy that was there

had been in an acting capacity because the director for OAR, the administrator for OAR, had passed away a few months before, and they had not permanently filled that position. I went into a position there that was available, and I basically started working right away in that new capacity. Technically, I think I had about two weeks to actually sign the piece of paper accepting the position; otherwise, I was out.

MG: I just was curious how you handed things off to the next guy, your successor.

JF: My deputies and my senior directors stayed, although four of them threatened to leave. I said, "Don't do that. For the good of the service, don't do that." They agreed to stay. Within a few months, they left, but they didn't leave right away, and they made sure that the transition to Bob – and Bob had been there for a while. He'd been heading NESDIS [National Environmental Satellite, Data, and Information Service] up, and he was a part of the troika. He was one of those three people that was involved in helping manage the overall technological thrust of the modernization. He was very good at using his people as opposed to trying to do everything himself. He would delegate, and he would depend on expertise. Some people come into a job, and the first thing they want to do is change everything. I never looked at a job that way. I always came into a job and didn't want to do a thing until I understood how it worked, and not only how the formal organization worked but how the informal organization worked. That's also very critical. How does work really get done? Where are the real communications channels, not the ones on paper, but the real communications channels? I always found out it was very effective to get to know the administrative staff because that's where all the communications channels really were as opposed to the very formal meetings. After I was there for a while, then I would make a value judgment on what I needed to do and what I needed to change. I remember when I came in as deputy director of the National Weather Service in 1981. The secretary for the deputy director was there – wonderful, wonderful lady. She asked me – she said, "Now, would you like to change anything in your office. We can get you a different desk, chair, or whatever you want." I said, "This worked fine for Bill. I think it will work for me." "Do you want to change any of the practices? Do you want to change your staff meeting times or anything of that nature from what he was doing?" I said, "Well, not really." She said, "Well, is there anything that you want me to do specifically?" And I said, "Yeah, keep me out of trouble. She said, "What?" I said, "You know what's going around here, (Audra?). You know what's going on. You know everything that's there. Keep me informed on what's going on and keep me out of trouble. If I'm getting ready to walk over the edge of a cliff, tell me if I'm getting ready to walk over the edge of a cliff. Don't let me do it." She said, "Okay, you're kind of a different type of person than I'm used to." [laughter] But it worked out fine. It worked out beautifully. Bob was very similar to that. He wasn't going to change everything. First of all, he knew he was only going to be there temporarily. He turned out to be there, I think, about nine months if I recall. Then Jack Kelly. Jack Kelly was the head of the committee that reviewed the Weather Service budget issues to determine how much money we really needed to continue along and all that sort of stuff. I think he knew enough about the organization by the time he had done all that because he really dug into it. He dug into tremendous depth. What he was trying to do was to prove that we really didn't need all that money, and he kept digging to try to find it. Of course, we needed all that money, and he came to that conclusion. But he had studied the organization well enough. I think he really wanted to go ahead and do it at the time. The modernization was basically concluded under his watch. The last part of the AWIPS installation

was the major part. He didn't change anything about it. It kept going along the way it had been designed and that we had set in motion. It just took a little longer than we had anticipated, and it had a little bit of a cost overrun. But our cost overruns on the whole program were measured in a few percentage points as opposed to hundreds of percent, as occurs with some government programs. One of the things that I noted – when we started our modernization, the FAA [Federal Aviation Administration] National Airspace [System] modernization program was well underway. When we finished our modernization, the FAA's National Airspace modernization program was still well underway. They had restarted so many times. First of all, there was a little bit of difficulty. I think I mentioned before, but one of the things that made the modernization successful was the fact that the leadership in the National Weather Service was not political in your appointments. So they didn't change every time there was an administration change. So we kept the strategic goals. We kept the strategic concepts and the plan in place, and continued along on that, and didn't have to worry about changing it because a different political philosophy came in that wanted to move one way or the other. It caused some turbulence, needless to say, but in the long term, that's one of the ways I think that that was very, very important. You're seeing some of that type of problem reflected today, for example, in the Food and Drug Administration [FDA] and the Center for Disease Control [CDC] with respect to the handling the coronavirus. The political pressure to change the science or to twist science is sometimes incredibly powerful. I mean, just as we had political pressure to try to change the size of the Weather Service, and yet we were able to contend with it – if the head of the Weather Service had been a political appointee, it would have been done, and we would have ended up with a Weather Service that would not be capable for this nation. I'm so worried about the CDC and the FDA and all of that as we move forward with trying to really come to grips with this pandemic, of being made ineffective because of the political pressure. You're finally seeing now with Dr. [Deborah] Birx and Dr. [Anthony] Fauci, a rebellion against that political pressure in speaking out against it. But you're not seeing that yet with the head of FDA and the head of CDC, although they're starting to get their spine a little more erect, I think. But it's a balancing game in our government, how you balance the political pressure with the scientific directions, particularly with the science agencies. NOAA I'm worried about right now with the fact that they've had to take down every reference to climate change, even though the national climate activities in NOAA are so important for so many things. They provide the engineering basis for literally everything, all of the building. If you start to impact that science – it's one thing as far as the climate change and whether or not we're a part of the Paris [Agreement] protocol. But it's another thing about whether or not we have the fundamental engineering data to continue to build infrastructure, or is that going to be destroyed, too, because you can't keep competent scientists on board in the federal government to continue to provide that kind of support? That's really fearful to me. It really bothers me.

MG: I feel like we should acknowledge that people who access this interview will see that it was recorded on November 4, 2020 and that the fate of the election is yet to be decided.

JF: That's right. That's right. When I woke up this morning, I turned on the TV, and I said, "Oh boy." I remember very well the Al Gore [and] George W. Bush [2000 presidential] election and all the uncertainties going on with that for literally weeks. Unfortunately, I'm afraid the same thing may happen here is that it might be taken out of the hands of the voters and put in the hands of the judicial system. I mean, clearly, the President wants that to happen. But I don't

think [Chief Justice John] Roberts wants it to happen. But whether or not it has to happen or not, I don't know. I won't get into that. I've been a conservative all my life, but boy, do I have trouble with the direction my party is going now. As one of my friends said, "Just because you're republican doesn't have to mean you have to be stupid." [laughter] Of course, I'm in the state of Oklahoma, too, which is one of the reddest states around. So when I raise some of these issues here, I get pushed aside, I think.

MG: Can you remind me what year it was that you went to work for the National Academy of Sciences?

JF: 1997, if I recall. I became the staff director for the Board on Atmospheric Sciences and Climate. So we began to look at those issues, or we were looking, at the time, on those issues of climate, climate change, observing systems, weather in general, all the various weather elements, and other aspects of the environment. We evaluated the NEXRAD program, its accomplishments, and the like. We did all sorts of things that were tied in with what I'd been doing in the Weather Service, but it was an entirely different group of people doing it. It was the academic community that was involved primarily, with some operational people also involved. A great deal of work we began, and it's still going on today. The Academy has a major program to continue to have the best information going as far as the overall science of climate change is concerned. It's world-respected. It's not necessarily respected in parts of the United States government, but it's world-respected as far as the work that they're doing. I worked there for a total of five years.

MG: What was next for you after that position?

JF: I was doing a lot of consulting work with the aerospace industry that was involved in the next generation of meteorological satellites and getting ready for the new generation of polar orbiters and geostationary orbiters. I was basically doing some consulting there. I also had a part-time position as a professor of meteorology at the University of Oklahoma. I wasn't teaching in that capacity. We were working with technology exchange and outreach. One of the things that we started at the University of Oklahoma – we had a very, very good meteorology department there. Of course, in the same location, we had several elements of NOAA. The storm forecasting center [Storm Prediction Center] was there. The National Severe Storms Laboratory [NSSL] was there. The weather forecast office for central Oklahoma. Central and western Oklahoma was located there in the same building as the meteorology department. So it made sense to try to reach out then to – we had the academic in the public sector. It made sense to reach out to the private sector to try to see if we could add private sector capacity. So that was really my role there was to reach out and try to bring in private weather entities into that community. We started off with being successful, particularly with the help of one of the major professors, who was a very good friend of the owner of a private weather firm, to bring Weathernews America into Norman, Oklahoma. Weathernews had been located in the San Francisco area, actually Redwood City, and it had been responsible for supporting a very large number of the ocean-going vessels and providing ship routing forecasts and weather forecasts for conditions at sea. So now, from Norman, Oklahoma, in the middle of the country, on a daily basis with Weathernews, we support over three-thousand individual vessels at sea every day – the weather, and the currents, and hazards. So [we] provide that. Most of the cars that are

transported from Europe and Asia come by way of those vessels that are supported out of Norman, Oklahoma. So it's kind of unique from that standpoint. But we actually now have a very large number of private sector entities that are co-located there, so that it was successful in being able to outreach and see the synergy between the academic organization, the operational organization, and then the private sector organizations that are also operational and so on. There are almost as many meteorologists in Norman, Oklahoma, as there are in Washington, DC, or in Boulder, Colorado. Those are the three major centers for meteorology now in the country. I think we have about six-hundred meteorologists in Norman. I do recognize that both DC and Boulder, Colorado, have some things to offer that might be a little better than Norman, but Norman's not a bad place either.

MG: Can you say how things changed from when you were a student at the University of Oklahoma [OU] in the early '60s to when you worked there later in your career?

JF: It was night and day. When the meteorology program was put together, started in 1960 at OU, we had Dr. Walter Saucier and four of his graduate students, plus Dr. Yoshi Sasaki, who was a research assistant at the time, basically come up from Texas A&M to create the beginning of that program. I don't know what the total faculty size is now, but it's on the order of twenty. We were using an old facility that had been a dental laboratory at an old Navy hospital on the north campus of the University of Oklahoma for most of our work. That building burned down with my dissertation in it [laughter] when I was working on my PhD. We were then relegated to an old engineering laboratory on the main campus that was pretty shabby. But we were able to work. We were able to put together enough lab space, enough training space, enough office space to continue. I say, "we." I was not a part of the faculty at the time. But I certainly was a student during that time. So I saw it. But partly as a result of the tremendous Moore, Oklahoma tornado back in (1999?) that did all the damage. President Clinton came out to look at that damage. We convinced his people and convinced him, at the time, that it would be appropriate to really have a focal point for a National Weather Center at Norman, Oklahoma. We already had a foundation for a good school, and we knew that we had the National Severe Storms Lab here. In order to address these types of threats, it would be good to put that together. So the National Weather Center concept was born from a speech by Mr. Clinton when he was here, reviewing that. That was enough initiative for us to move forward on it. The National Weather Center, I think the total cost was on the order of fifty-five, sixty million dollars. Half of that money came from the federal government; half of that money came from the state government. So the University of Oklahoma and NOAA basically were major contributors to that facility, and that experiment has worked. First of all, it is a first-class facility. It is a beautiful facility. It attracts people. We are able to attract quality individuals, both as professors but also as students. I think this last year, we had more of the American Meteorological Society scholarship winners than any other school of meteorology had. Of course, we also have the ability to have all of the data now. Before, we had maps lining the walls and teletype data and so forth. It was the teletype system, by the way – a short in that that caused the fire at North Campus. But you wouldn't recognize how you could possibly have done anything with the type of technology and the type of systems that we had in 1960. I'm sure they could because the men and women that come out of the programs these days are so bright. I'm just glad I never have to compete with them any longer. They are really, really bright. But I would challenge them to be able to forecast using the tools that we had in 1960 because they were very, very primitive. No satellites

at that time. Very limited radar data. No animation of any kind. Computer models were very, very limited in their capacity. We represented the entire atmosphere by a series of points that were four-hundred miles apart. You know yourself that you don't have to go four-hundred miles to see weather change. Now, in our computer systems, we represent the atmosphere with grid points that might be as close as a mile and a half apart. So you can get some pretty good representation of what's going on. Even that, we don't do as good a job of representing clouds as we should. But it's a remarkable change. I have seen so much change in my career from that time that I first took measurements around that Duck Pond on the Oklahoma campus, and did that first plot of data, and tried to figure out what was going on.

MG: It must have been such an honor to become the founding director of this Sasaki Institute, having been a student of his.

JF: That's correct. Dr. Sasaki was an amazing individual. He was bright. I remember going in for my final exam with him. He was on my committee for the PhD. I was very nervous. I wasn't sure what he was going to ask or anything of that nature. So I walked into his office at the scheduled time. He said, "Hi, Joe, what are you doing?" I said, "I'm here for my final exam." He said, "Oh, yeah. I forgot. Look, I'm working on this problem. Let's go to the blackboard. Maybe you could help me out with it." So, for about three hours, we sit there, and I helped him figure out one of the problems he was working on. He said, "That's good. You passed." [laughter] He was a brilliant guy – a great loss. I had the privilege of speaking at his memorial service and remembering some of the early days and some of the memories that we had of him. The number of students that he had was just incredible. A former head of the National Hurricane Center was one of the students. I was one of his students – all sorts of people going out into fairly important positions. The head of Army atmospheric research was one of his students. So he had a great influence.

MG: Can you talk a little bit now about the consulting work you were doing? And this relates a little bit to your experience on September 11, 2001.

JF: Yes, it does. Consulting work. As I said, I was dealing with the aerospace industry. I did some work for Boeing. I did some work for Lockheed. But most of my work started out as TRW, which was acquired by Northrop Grumman. So most of the work that I did really was for Northrop Grumman on the NPOESS [National Polar-orbiting Operational Environmental Satellite System] program. We spent a lot of time in airplanes, a lot of time out on the West Coast. I lived in Washington, DC, at the time. We were right outside in Northern Virginia. We would end up going out for various review meetings to take a look. My job was to make sure that they weren't overlooking the importance of the operational meteorology and the impact of what they were doing on meteorology. Because engineers have a tendency of trying to do things that are better engineering-wise, but might compromise the data that you would be generating that's important for what you're trying to do, either with computer models or operational use in the forecasting process. I know my initial training was as an engineer before I went into meteorology. So my job was to make sure that we were keeping focused on what the real mission was in most of this consulting work. I was the chairman of the science advisory panel or board, I guess, it was called, for Northrop Grumman's effort. We had five leading scientists dealing with satellite meteorology and the applications of satellite meteorology, and we met to

review the program every few months and go forward from there, provide advice and consultation to the program. But we were out at Santa Barbara, reviewing one of the sensors when 9/11 occurred. I woke up fairly early in the morning. I always wake up early in the morning. I turned on the TV, and the first tower had just been hit. I got on the phone with my secretary because I needed to tell her something about plans for the next few days. So I [was on the] phone with the secretary when that occurred. She said, "Did you see the terrible news about the accident in New York with the airplane hitting?" I said, "I did. I'm not sure that was an accident." Then the second one hit while we were on the phone. I remember I said, "That's not an accident. I'll talk to you later." I got off the phone and immediately called my wife. At that time, the Pentagon was hit. She was, needless to say, terrified because we weren't sure what all was going to happen from there on out. There were rumors about the Capitol being hit, and indeed, the flight that went down in Pennsylvania apparently was targeting the Capitol Building. So that would have been next had we not had the heroic activity on that plane that caused it to go down there, as supposed to go down over the US Capitol. I remember telling my wife, "I'll get home as soon as I can," and about that time, the line went dead because communications were so balled up." I had a cell phone, but all the cell towers were just absolutely wiped out as far as total overuse was concerned. I immediately tried to make arrangements to get back. We were out there with – we had flown out. Three of us had flown out from DC. We realized as soon as they closed down the air terminals that we weren't able to get back there. So I called Amtrak to try to make arrangements to come back, and all the Amtraks were booked for another two weeks. That was just a few hours after this happened that I was making that call. There were several senior people at the Santa Barbara office that we were visiting that were killed on one of the flights. So, needless to say, we terminated any of the activity there. The guy that had rented the rental car that all three of us were in called up National car rental and said, "Can we turn in the car at Dulles Airport?" He said, "Just turn it in wherever you want to. It's happening all across the country. Just get it back to an office, and we won't worry about the extra mileage. Just get it back to a National office." So the three of us drove back in a little over thirty-six hours, I guess, by the time it was all over. One would drive, one would talk to him, and the other would sleep, and we would rotate. I was the only one who had spent a lot of time out west on the road. So I knew the road, all this sort of thing. So we just went I-40 right through Arizona, New Mexico, Oklahoma, all that. The beauty of the country – I think in some cases, even more beautiful then. They'd never seen it. They'd always done the flyover, and they were amazed at how beautiful the country was. We came back through I-64 in Kentucky in West Virginia. I don't know if you've ever been on that road, but that is absolutely gorgeous. That is absolutely gorgeous, as are the striking sceneries out in the western part of the United States. So they were really impressed with the overall beauty of this country. They both since have taken trips out there to enjoy it. But getting back, I remember being absolutely devastated that this could happen in this country. We've been very fortunate as a nation. Other than the Civil War, we've never had major, major activities in our territory. A little skirmish here and there with the British early on, but that was about it. Anyway, I pulled most of that consulting work to a stop to take care of my wife with her cancer. Toward the end of her time, she said, "I want you to do two things for me. I want you to resume your career, and I want you to get your weight under control." Because I'd always had a problem with that. I was able to do both of those afterward. The weight goes up and down. I've got it back under control now. I'm really very happy with it right now, but I had a problem with that all my life. Again, I enjoyed the consulting. We did a lot of things. I'm disappointed with the way the government terminated the satellite program that I was working

on. It turned out that I had told the government, told my colleagues and friends at NESDIS that the science and the technology was accurate and it would work, but the budget was creeping out of bounds. It was due to the budget that they actually terminated the program. They blamed the fact that the technology was not working so well, and it would eventually cost a lot more. So they terminated the program. NASA flew the sensor that everybody was concerned about, and it performed spectacularly, just as the science board had said it was going to. It turned out that the program that NOAA now uses has cost more per satellite than if they had stayed with the original program. That, unfortunately, happens frequently. The starts and stops of a program are more costly than the potential cost overrun that you have for continuing the program, even with some problems, because you got to go back and relearn a lot of things. But the main thing is it's necessary to have that satellite data for the forecasting process, for the models, and for the manual use as well. And they have good programs now. The sensors were the same as we were developing before, and they would have flown on a Northrop Grumman satellite equally well, maybe even better, because I think it was a quality satellite. But things happen. [laughter]

MG: Around this time, there was a Senate hearing on the structure of NOAA, and you testified. It was the Subcommittee on Environment, Technology, and Standards to talk about the mission and organizational structure of NOAA. In your testimony, you talked about the most important problem facing NOAA was the credibility of the science being done, role recognition, and data stewardship. Is this ringing a bell?

JF: It is, vaguely. I can't really remember what was going on at the time that prompted that. It could very well have been issues associated with climate and climate change because that's been a constant problem between the republican part of the government and the scientists along that line. It could have been that. I think it was pretty much a standard briefing sort of thing. It wasn't anything spectacular that I did, other than point out the importance of the databases, the importance of keeping that. One of the examples that I may have used because I've used it at other times is that in 1957, there was a major multi-agency science experiment called the International Geophysical Year. Actually, it was international, the International Geophysical Year. Countries around the globe committed to putting together the resources to measure every aspect of the environment – the oceans, the atmosphere, and so on. One of the things that the United States did, at that time, the Weather Bureau did, was to put an observatory, almost at the top of Mauna Loa volcano in Hawaii, to measure carbon dioxide. They measured it for eighteen months. That was the period of time that the International Geophysical Year was committing to. They measured it for eighteen months, and they saw this curve, which was described as the lungs of the earth; the earth was really breathing. In the springtime, when the leaves would come on and start to grow, the carbon dioxide would go down because it was being absorbed and converting into cellulose in the plants. Then, in the fall and winter, when the leaves would fall off and decay, carbon dioxide would go up, and then they go down again. So this was the lungs of the earth, the breathing of the earth – the trees, the grasses, and so forth. So it was a beautiful experiment, and it did exactly what one would expect. But they were sitting out there thirteen-thousand feet up a Mauna Loa, well above any of the noise they would get from the industrial area. They were on the windward side of the mountain so that you weren't getting the output from the volcanic gases themselves that would interfere. So you had clean air that came across thousands of miles of the Pacific to measure that. So you were really getting good clean measurements of the atmosphere for the carbon dioxide. After that was over, the budget guys

said, "Hey, that's a great experiment. Let's save that money now and shut it down." Harry Wexler, the chief scientist of the Weather Bureau at the time, said, "Don't you think it would be a good idea to see if there's any trends in this?" And after a lot of persuasion, they managed to keep the thing going for a while. Lo and behold, that breathing in and breathing out of the earth continued, but it increased a little every year. That curve, with that going up and down every year and continuing to rise, is probably one of the most recognizable measurements of the environment in the history of the world, seeing that because we now know that human activities are increasing the amount of carbon dioxide in the atmosphere. So it is important to have quality data, and it is important to continue to protect those data because you never know what kind of questions have to be answered. I'll give you another example. When I first went to the Pentagon – at that time, I was the environmental guy for the Secretary of Defense. I had a Navy gentleman come to me and say, "I'm sure glad to see you here. You understand operational meteorology. Our research program needs some real emphasis on getting to operational meteorology. We're wasting all kinds of money over here," and he named the guy. Right now, I just can't even remember his name, but I can see him. He named the guy that was doing lightning research. He said, "We're spending a hundred thousand dollars a year just taking lightning data. We don't need that anymore. We just need to get on with a better understanding of what we need to forecast the weather better." I said, "Well, let's take a look and see how this is really going. Give me a chance to really evaluate, and all this." A year later, a new Navy aircraft, which was built with (all-composite?), as opposed to the old aluminum shells, aluminum fuselage – (all-composite?) started falling out of the sky because lightning strikes nearby weren't shielded like they were when all of the electronics were inside this aluminum can. So the Navy held a big meeting to try to sort out what we're going to do about all these lightning strikes. The guy that had been doing that for years – they talked about having to put together all kinds of measurement programs to understand how lightning pulses worked – he said, "I've got that. I've got that data." So instead of putting together some multimillion-dollar program to try to get to it, the little hundred thousand dollars that he had done periodically over the years provided all the information necessary to feed into that to save the program. So they were able to make some changes to the design of the system, and the aircraft was operating safely in a fairly short period of time. Again, you never know what utility some of these fundamental data measurements are going to have until you need them. So those were some of the things I was trying to point out at the time that's very important. There's always pressure to reduce the size of organizations. There's always pressure to reduce the budget. Unfortunately, people tend to look at the short term impacts as contrasted to the long-term impacts. You need to be able to do both. You need to obviously pay attention to short-term impacts, but you also need to keep the long-term vision in mind. That's the thing that we did, I think so well in the modernization, is we set out the vision for where we wanted to go based on those Academy studies back from ten years earlier. Based on all the science input that we had, we set out the vision on the way we wanted to go, and we just kept our eye on the ball. The bottom line is don't plan so much that you can't move around an obstacle when it gets in your way.

MG: Right. Have some flexibility.

JF: Right.

MG: I'm curious to hear how your life has unfolded since Karen passed away and what your life looks like now, during the COVID-19 pandemic.

JF: Well, after Karen passed away, as I said, I went back to doing some consulting work. I went to a class reunion from Midwest City High, class of '57. There was a lady there. Actually, she came to my mother's funeral when my mother passed away in Midwest City, Oklahoma, which is very close to where I live now. So I had known her and I had talked to her on the phone a few times. But she was a classmate of mine back in 1957. Her husband had passed away a few years earlier from cancer. To make a long story short, we got married a little over a year after Karen died. It's been really a very wonderful marriage since then. It's been one that we felt it was really meant to be because everything has just worked out very, very well. She told me that she wouldn't leave Oklahoma when we were starting to get serious, and I said, "Well, that's okay." So I kept the house in Virginia, and she kept her house here, and we bounced back and forth for almost a year, depending on what was going on – either drive or fly back and forth. Then after about a year, I said, "Okay, you're right. You're not going to move." So I ended up selling my house in Virginia, and that was a little bit of a struggle because I had two daughters and five grandchildren within a few miles of me. Anyway, I sold the house in Virginia, paid hers off here, and I've been living here since. It's a lot slower here than it is in the Washington, DC area, and a lot more enjoyable in a lot of respects. There are a lot fewer issues and problems. I've settled into the community very nicely. I've been involved a great deal at the University of Oklahoma again, I guess, technically in a formal capacity. I'm on the College of Atmospheric and Geographic Sciences Advisory Board and have been for several years. We meet semi-annually. I'm working with our homeowners' association, as I said. I've actually served as president and secretary of the board in the past, and I'm now serving as treasurer, which is going to be really a full-time job. I've got a very good church just right down the street from me that [I was] heavily involved with before COVID. COVID has thrown a monkey wrench into the area. Gay, my wife, and I have spent a great deal of time on road trips. We took one international trip. On our fifth anniversary, we spent ten days in London and surrounding environments there and enjoyed it. But, for the most part, I don't like to travel by air anymore. I traveled a million miles plus when I was in the government. I remember leaving and going for a meeting in Melbourne, Australia, and turning back that evening and coming back. Now that's ridiculous, going for a five-hour meeting. It was a very important meeting. But going for a five-hour meeting and spending forty-eight hours in the air [to do] so. I used to do that a lot. I used to fly out to meetings in Los Angeles and back the same [day], you know, fly over in the morning and come back on the red-eye at night so I could be back in the office the next morning. I don't like to fly anymore. We take road trips. Some of those road trips go for five or six-thousand miles. We've seen most of the National Parks west of the Mississippi. We've seen the leaves in the fall in the East. We've been to the coasts, several coasts, all different coasts. So we do that, and COVID has really put a damper on that. We actually did go and celebrate her birthday out in Colorado Springs recently. We stayed at the Garden of the Gods resort overlooking those beautiful red rocks [with] Pikes Peak in the background. I've got a Lexus LC 500 red sports car – driving it up to the top of Pikes Peak. But it's a lot different right now because a lot of the rest stops are closed. Service station facilities are just about like they always were – somewhat questionable. [laughter] You're a little uncertain about eating out at a restaurant on the road, all those sorts of things. Here locally at home, we haven't eaten out at all since COVID started. I've had takeout orders from quite a few of the restaurants, but we're doing a lot more cooking at home now. But

it's an enjoyable life. Even under COVID, it's enjoyable. Gay was afraid I was going to miss the Washington, DC environment and all the activity there. But I get enough of that kind of activity in my association with the university here. Before COVID, we had a weather committee meeting every month down at Norman, with all of the weather community invited to it, just basically trying to keep up with what's going on in all the various activities [in the] academic, private, [and] public sector, and all this. That was very, very useful. We're doing it now by Zoom; it's not quite as useful, but it's still informative – keeps you aware of what's going on. I support two scholarships now – five-thousand dollars a year at the American Meteorological Society, five-thousand dollars a year at the University of Oklahoma for undergraduate women in meteorology. I'm going to have to reconsider that now. Because when I started those scholarships a few years ago, the representation of women in the science was not very high. Now, for the first time at OU, they have about the same number of women in the undergraduate programs as they have men, which is a remarkable change. When I first started in the field, there were very, very few women in the field of meteorology. I made it a goal in the National Weather Service to try to change that. When I got there, there was one GS-15 female in the entire National Weather Service. When I left, there were several senior executives and a fairly large number of GS-14s and 15s. So I felt very successful about that. I was trying to get women involved in the sciences. I didn't succeed with my daughters. They both went into – [laughter] actually, one went into computer sciences but decided that she would much rather teach at a preschool. She does a good job at that, and she has fun with it. That's fine. The other one ended up majoring in English instead. But she's done fine. She's got a great family. It's just that I failed in my attempt to push the STEM [science, technology, engineering, and mathematics] program with my own daughters. Let's see. Any other thing? I think that's about it. It's a good life. I tell people that there is indeed life after retirement. Don't be afraid of it. You'll find things to keep you busy. As a matter of fact, I find that my schedule is pretty full, particularly since I'm talking to you about every other day.

MG: I know. I've taken up so much of your time. I only have one more question unless there's something else I haven't thought of, which is any last thoughts reflecting on your career or NOAA as it celebrates its fiftieth anniversary this year.

JF: I think NOAA is a wonderful organization. It has its faults. The National Weather Service used to be wholly self-reliant. A lot of the functions that the National Weather Service did have been basically absorbed by NOAA and moved over to NOAA as a central activity. The downside is that it actually cost me more money when I was director of the Weather Service by having it centrally out of NOAA than it did when I had it myself. Because we had an organization that worked very well, and a lot of the other organizations really needed help. So they got help from my people that went to NOAA as a centralized activity. But, in general, NOAA is a good organization. It does represent the science of our environment. It's very, very important to us. It has one regulatory function that I would just as soon not be in there. It's difficult when you've got science and the regulatory function in the same organization. That tends to be a conflict of interest, and that's the National Marine Fisheries Service. But it seems to work reasonably well. And I was very pleased with NOAA. I was more pleased with the National Weather Service. That camaraderie with the weather service organization, as somebody said, you never have to tell anybody what you do in your job when you tell them you're part of the National Weather Service because they know. You're well recognized. You're generally

well-respected. They make fun of your forecast, but they don't make as much fun as they used to because we're better now than we used to be, and we continue to improve all the time. The one thing that I really regretted in some respects is that I was never able to get the full support that we needed for improved computer modeling. We were always one generation behind, sometimes two generations behind, as far as computer capability for our computer models in the National Weather Service. The European Centre for Medium-Range Weather Forecasts in England, for example, was always ahead of us. I mean, they bought the latest supercomputers for their operation. So they were always able to run slightly better models than we were. They were able to get those points closer together to better represent the atmosphere, what was going on. So that's the one thing that I felt probably more disappointed in than anything else. I was very pleased with the modernization. We designed what we wanted to do, we set out, we did it, and it worked. The proof has been in the improved accuracies and operation of the service. We're making progress in computer modeling now, but we're not quite on that cutting edge as we should be. We should be at the very edge, and that's one of the things that I fault NOAA for, for not pushing that better in the budgeting process to make sure we stay there.

MG: Well, it was lucky to have you.

JF: [laughter] I was lucky to be there. I never really planned my career. My career just kind of happened. The only reason, as I said, that I went into meteorology is because they didn't have any other engineering program when I got my commission in the Air Force. So I had planned on getting out of the Air Force as soon as I could and going back into my engineering field in the nuclear engineering arena. So it happened differently, and that's what I'm saying. Don't be so trapped by your plans that you can't take advantage of opportunities when they arrive because that's very important. I've had opportunities offered, and I've taken advantage of those, and I've been better for it, I think.

MG: Well, that's great advice. This has been such a great experience. I really want to thank you for the time you spent with me and for the work you've done in your life. It's very impressive.

JF: Well, thank you very much. Like I said, I've enjoyed it. I've enjoyed all of it.

MG: Good. Well, it's not hard to add more to the record if we think of things that we forgot to mention or ask. But I just want to thank you again for the time you spent with me and for doing this interview.

JF: Well, I thank you for being patient with me and my voice. It seems to be better today. I've talked for over an hour, and it's still holding together.

MG: Yes. Well, I won't push it. Again, I hope we can stay in touch. If you'd like to add more to the record, it's not hard to arrange another call.

JF: Okay, very good.

----------END OF INTERVIEW----------
Reviewed by Molly Graham 11/22/2020
Reviewed by Joe Friday 12/3/2020
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