

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
VOICES ORAL HISTORY ARCHIVES
IN PARTNERSHIP WITH NOAA HERITAGE AND THE NATIONAL WEATHER SERVICE

AN INTERVIEW WITH DR. EDWARD JOHNSON

FOR THE

NOAA 50th ORAL HISTORY PROJECT

INTERVIEW CONDUCTED BY

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SILVER SPRING, MARYLAND
SEPTEMBER 25, 2019

TRANSCRIPT BY

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Molly Graham: This begins an oral history interview with Dr. Edward Johnson. The interview is taking place on September 25, 2019, in Silver Spring, Maryland. The interviewer is Molly Graham. I'm wondering if we can start at the beginning. Can you tell me where and when you were born?

Edward Johnson: I was born on August 4, 1950, in Columbus, Georgia.

MG: I was curious about how your family settled there. Could you trace the family history starting on your mother's side?

EJ: [laughter] We can be at this a while. I'll cut it short. All of my relatives go way back into the South. My mother's side was, let's just say, more country folk. She was born in the panhandle of Florida. Her father married an older woman who was a widow. So my mother is his only child. She had half-brothers and half-sisters. That's that side of the family. When I say they were country, my grandfather on that side was a true outdoorsman. He made a living hunting and fishing. He read the woods in ways that are rare these days. He could see where the game went and tell you. When I was out in the woods with him, he would show me things I could just barely perceive. So it was pretty incredible. I don't think he could read – not sure about that – but he could certainly read the woods. Later in life, I was always a little sad that I didn't spend more time with him with his kind of wisdom. I used to go down and work on their farm. He was still working his land with a mule in the '50s when I was a little kid. So I've actually picked cotton by hand, which was rare even in the '50s. I went down there one summer when I was in high school and worked a month or two for four bucks a day picking tomatoes.

MG: What kind of farm did he have?

EJ: He had forty acres in Southern Alabama, and did mostly truck farming. He and his stepson, my uncle, farmed together with some level of stress. But they raised, like I said, cotton early but when I was really little. Later on, it was vegetables, truck farming for tomatoes and eggplant and watermelon and cucumbers and beans and things like that. I think he had about forty or fifty acres. That's mother's side of the family, the Spences. Her father, my grandfather, was Richard Spence. My father's side is a little more upper class. I'm named for my grandfather on that side, Albert Edward Johnson. He went to college at Georgia Tech [Georgia Institute of Technology] in the first year or two of Georgia Tech, and he got a degree there. His grandfather, my grandfather's grandfather, was James Johnson. He was a judge and opposed the secession, sat out the Civil War, and was appointed – I think the right title is – Provisional Governor of Georgia to reconstitute the state government after the Civil War. He's buried in an unmarked grave. He was not highly regarded by the then powers that be. [laughter]

MG: How did you learn about this?

EJ: From listening to my father. My dad eventually found where James Johnson was buried and told me that he did not want to have a grave marker and that dad thought he should honor that. I can't tell you exactly where he's buried. The family farm, the Johnson Family farm, was about eight hundred acres or so in what is now Fort Benning, and I have been on that property. But to go there, you have to – I don't know. My brother knows how to get there, but you have to talk to

the range officer and make sure they're not firing artillery. They have to open up gates that are locked and all that kind of stuff. All the buildings are gone. The Army maintains the family cemetery, though. So that's still there.

MG: Do you know what his reasons were for not supporting the succession?

EJ: I don't. I don't. I understand it was a bit of a close vote in Georgia, but no, I don't. I haven't really looked into – because frankly, I don't want to know – I assume they were slave owners because they were working a big piece of land. I mentioned the Army “maintains the cemetery.” Well, that's where the white folks are buried. My dad pointed out where the black cemetery was, and it doesn't have a fence around it. It's not marked. It was there. Back to the history of the old South – so I grew up in the Jim Crow South. I guess we could talk about that a little bit if you want to.

MG: Please.

EJ: One of the things I remember is in the little town I grew up in – Newnan, Georgia is where most of my childhood memories are from. I remember going into the courthouse and seeing the water fountains marked “white” and “colored,” and then restrooms marked “men,” “women,” [and] “colored,” and wondering, “Wait a second, how does that work?” Based on my age, I was there for some of the beginnings of the school desegregation. Like I said, I grew up in the Jim Crow South.

MG: How was segregation explained to you, the separate bathrooms and water fountains?

EJ: As a fact of life. [laughter] Didn't need an explanation. I was the one asking, “What? That doesn't make any sense.” I was also a Catholic in a town that had very few Catholics. There are a few places in the South that have a significant Catholic population, but I was not in one of them. Our little church had a circuit rider priest, and actually had one or two black families in the church. So having an integrated church was a very odd thing in the South. They took a pretty high moral stand in the church about that. So that was a contributor to my views if you will.

MG: In what way? How did they advocate for or support integration?

EJ: This will get complicated. It's not so much that they advocated politically. It's that they lived up to their standards of the only thing that actually matters about people is the fact that they have a soul, which eventually led me to leave the church because they really don't care about how people live in this world.

MG: Did you or your family face any discrimination for being Catholic?

EJ: Discrimination would be too hard a word, I'd say. That's back in the days when the Catholics didn't eat meat on Fridays, so that was a little weird in Cub Scouts or Boy Scouts. I'd be with the Cub Scout troop, and they'd have hot dogs, and I wouldn't eat hot dogs on Friday.

It's just being the outsider, rather than any active prejudice. When you're a kid, people make fun of kids for lots of reasons.

MG: You said you were born in Columbus, Georgia. Did your family live there before moving to Newnan?

EJ: My dad met my mother in Columbus. Columbus is the biggest town near where his family lived when he was born. Fort Benning is most of Chattahoochee County. It grew really fast right at World War II. My dad [and], especially his father, was bitter about how the government took the land for what he considered to be a pittance. I think dad really wanted to just – he grew up on a farm and wanted to be a farmer.

MG: You had started to say how your parents met.

EJ: I don't know a whole lot about it. Mom was a telephone operator. They met when she was in Columbus, as I understand it. So they got married and started having kids. She wanted to have a lot of kids. [laughter] She eventually gave up at five. So I'm the oldest of five kids. Then, Dad had a variety of different jobs. My sister was born in St. Louis, which I think was the next city. Then I think they moved – I get them out of order, but they lived in South Carolina and Sylacauga, Alabama, where my brother was born. Then dad moved to Madras, [Georgia] – I remember that old place, which is near Newnan, and then into a house in Newnan. Then into another house in Newnan. So by the time I was in first grade all the way through high school, we were in the same house, which I just recently visited by the way. It was fun.

MG: Tell me more about that experience.

EJ: Well, dad grew up on a farm, so he was willing to do anything. We did all kinds of work around the house that most people wouldn't take on now. We put a new roof on when I was in high school. Dad's shoulder got – they used to call it bursitis; they now call it impingement, shoulder impingement syndrome. He got bursitis so he couldn't swing a hammer. So me and my brother had to finish the roof after he got it going. We took out a chimney, re-shingled the roof, replaced the hole where the chimney was. Dad jacked up the roof of the garage because it was settling and pushing the sides of the garage out. So he jacked it up and reinforced it. It was cool to go see the old place because it brought back memories of those times, which is nice.

MG: Any memories in particular?

EJ: We had pecan trees in the back. They made a real bumper crop one year; all the pecan trees in the area did. I remember going out there with my brothers and sisters. I was the biggest, so I was the one that would climb the tree and shake the tree so the pecans would all fall out.

[Telephone rings.]

MG: Should I pause?

TAPE PAUSED

EJ: Alright.

MG: You were talking about your father's work and the farm. We can pick up there. Also, did your father serve in World War II before you born?

EJ: Well, sort of. My understanding is that he got out of basic [training] on V-J Day or something close to that. [Editor's Note: V-J Day was declared on August 14, 1945, in the United States and August 15, 1945, in the Pacific.] So he volunteered as soon as he possibly could without his parents' help because he really wanted to serve. Then the war ended. They brought him back in for the Korean Conflict, but he trained troops for the Korean Conflict. So he served in the military, but he didn't see action as they say.

MG: He was in the Army.

EJ: Army, yes. Well, here's a fun story. I understand that he really wanted to – he was trying to get into this program – in my memory, it was in the Navy, but they were trying to train doctors. He thought he had a chance of getting into it. That's when he discovered he was colorblind, so he didn't qualify for the program. [laughter] Oh, well.

MG: When would he have been training troops for the Korean War?

EJ: That would have been at about the time I was born. I think he was engaged in that at Fort Benning when my parents met – I'm not positive of that – and, perhaps, for a while after I was born before he got out of the Army and then on to the business world.

MG: I was curious about that transition and how he got into business.

EJ: I just don't know. He had a degree from the University of Georgia. Here's a little interesting [sidebar]: he rode a motorcycle when he was at the University of Georgia. My brother rode – actually, both of my brothers rode. I had one when I was at college that got stolen, I would say luckily. I probably would have gotten killed driving around in Boston in a BSA 500. Then, when my brother passed away, he wanted me to have the bike. I said, "Okay. I guess he's right." Shipped it from California, took it down to the frame, and rebuilt it – that was a fun project – and rode it for years. Then, of my three sons, one of them rides. Pete ended up with that motorcycle until it – I'll just put it this way: Pete's view of motorcycle maintenance was: drive it until it breaks and then call dad. Dad's view was: this is getting old. [laughter] You either need to learn how to fix your own motorcycle or not have a motorcycle. In the end, he got rid of it.

MG: Do you know what kind of motorcycle your father had?

EJ: I don't. He might have told me once. It might have been an old Indian. He did say he had an accident on it once; got what's called a high-speed wobble and just came off the top, and took a lot of skin off. That's pre-helmet days. So he just slid along the pavement and lost a lot of skin to road rash. He also told me once he was riding home from – so he lived in Cusseta, which is –

how far is it? It's got to be at least a hundred, maybe a hundred and fifty miles from Athens where the university is. This is way long before the Interstate. So he was driving home one night, and he told me he came over a hill, and there was a mule in the road. He ducked under the head of the mule, so he didn't get killed.

MG: [laughter] And he studied business administration at the University of Georgia.

EJ: I believe that's true. He has some kind of business degree. He worked in a number of different businesses. I don't know about the ones when I was really little. I just don't know. The first one I remember was called the Richardson Corporation in Newnan, and they made Formica. I don't know if it was tradename Formica, but they made laminated stuff. I remember going and seeing the inside of the factory; it was a pretty cool place. Formica is this treated paper, and then they put it in a press, and they heat it and put it under high pressure. The press itself was amazing. It has to be super strong because it really has to push big stacks of paper really hard. I can still remember this. It's held together with bolts and nuts. The nuts are about – my memory – something like twelve feet flat to flat. They're so big that the nut is actually held together with a bolt. I still remember that. They had all kinds of dangerous stuff in there.

MG: He spent most of his career with Goodman and Sons.

EJ: Yes. Then the Richardson Corporation shut down. It was bought out by some local business group, and it was called the Newnan Corporation, and they still made the same stuff for a while. Dad didn't get along well with the owners. He just thought they were taking advantage of the workers. They hired the cheapest workers they could and just rotated through them, and he didn't like that. So he got a job with Goodman, who had opened a manufacturing plant in Manchester. So when I was in high school, he commuted from Newnan to Manchester – country roads, about a good forty miles or so. He was one of the first people I knew that bought a VW Bug, and he drove that thing. I drove it around. We put over a hundred thousand miles on that.

MG: Can you talk a little bit more about Newnan, Georgia, and what the town is like?

EJ: Yes, I guess. Well, it's the county seat of Coweta County. When I was there, they had about fifteen-thousand people in the town. I don't know exactly why – you'd need a real historian to tell you this – but, it had a lot of old homes in there, and some of which survived the Sherman's March to the Sea. [Editor's Note: Union General William T. Sherman's March to the Sea occurred during the American Civil War. After taking Atlanta, Georgia, General Sherman decided to march his forces to Savannah, Georgia, and destroy every building, crop, and livestock in his path.] So they weren't burnt out. A lot of the “antebellum” homes in a big swath of Georgia were destroyed when Sherman went through. I think Newnan was a little far west of the march path. That was part of the reason. It was a completely segregated city. So there was the black side of town, the white side of town. It had some manufacturing base, which supported the economy. When I was in high school, they built the interstate that goes by there from Atlanta, and it boomed after that – boomed. So it's now an Atlanta bedroom community. Atlanta grew more towards the north of Atlanta than toward the south, so it was not the main growth area up in Cobb County, which is where my wife's from. When I was in high school, Atlanta was the big city, and people didn't get up there very often. It was a big deal to go to

Atlanta and go shopping. The town was dry in the typical southern sense of the alignment between the moonshiners and the Baptist preachers. Moonshiners like dry towns because they can sell moonshine there. Speaking of moonshine, my Grandfather Spence actually made moonshine. He didn't own the still; he worked at one for a while, he told me. Anyhow, Newnan was small. It felt elitist and small to me. I really, really desperately wanted out of that town when I left. Going back there for my high school reunion – I went back for the – it must have been the fiftieth reunion – was weird. I was one of the nerdy kids with big glasses, not one of the “in-crowd.” Although you eventually figure out that everybody feels awkward in high school and junior high. Even the “in-crowd,” they’ve got their own issues. But it felt like an odd place. It felt like the society was still cramped, and the country club was a center of white privilege, and that’s where we all met for the [reunion] to play oldies music and tell stories.

MG: At your reunion?

EJ: Yes.

MG: Was your school always segregated?

EJ: When I was in high school, they had – and this was all about avoiding integration – they instituted a form of school choice. There were a few, I thought, brave black kids that came to my high school. By a few, I mean literally a few – six maybe. After I left, they actually integrated the school. So they closed down the traditionally black high school. They adopted as the school mascot the cougar of the black school, not the tiger of the white school. So the Newnan High School Tigers are no more. It became a powerhouse school for sports and academics, and all kinds of stuff like that. It’s now huge. It’s a two-thousand-person high school with all the growth in the area and the like. Oddly enough, one of the absolute least likely persons imaginable in my high school class ended up being the principal at Newnan High School. So he showed us around the high school at the reunion. It was an odd experience. Some of the things I learned in high school were important through my whole career, though. I really should say that. I had a drama and debate teacher who I learned a lot from. I enjoyed the drama stuff, really enjoyed it. She was determined to at least break most of the worst of my Southern accent for debate. If you speak slowly and with a drawl, you’re considered stupid. That’s cross-cultural, by the way. There are jokes about the Finns and the Norwegians about the slow-talking Finns I think it is. In any case, she stood on top of my Southern accent in debate in high school. I had a really good English teacher, too, and that was important because, later on, it’s a lot about communications. I was the science-y kid. I escaped my little Southern town and got a good scholarship. It was actually cheaper for me to go to MIT [Massachusetts Institute of Technology] than Georgia Tech. Those are the only schools I applied to. It was all I was really interested in. I got a better financial offer from MIT and was delighted to get the heck out of the South. Wow. Was that an eye-opening experience.

MG: Yes, I’m curious about what led up to that decision. What were you interested in studying? How did you choose MIT? When did you get interested in hydrology?

EJ: When I say I was a science-y kid, I started reading *Scientific American* in, I think, the fourth grade – the third grade or fourth grade. I skipped the fourth grade. I was an explosive reader;

read every book that my teacher had in the second grade. They didn't use to teach kids to read as early as they do now, which was really a shame. They had some kind of standardized test they gave all the third graders, which apparently I just blew the absolute top out of – scared my parents, scared the teachers. They sent me off to some child psychologist, and I had a full Stanford-Binet IQ test. There was this backroom conversation about what are we going to do with this kid. They decided that they would skip me past the fourth grade to the fifth grade just for intellectual reasons, which made me a young kid for the rest of my life. So when I graduated from high school, I was still sixteen. I hadn't turned seventeen yet. I turned seventeen in August, went off to college to MIT. You were asking about how did I find out about MIT. I mentioned the non-science teachers, but I had a really good biology teacher in high school, and a really also important to me chemistry and physics teacher, Mr. Pitts. One of the two of them mentioned MIT to me. That's why I just looked it up and applied there. I was confident I could get into Georgia Tech, and so MIT was my stretch school, and Georgia Tech was the one I was pretty sure I could get into, and I eventually got into both of them. But yes, I was reading – I remember in third grade reading a book about atomic physics. They're talking in there about atomic reactions and that sort of thing, and how they use cesium to moderate the neutron flow in reactors because it absorbs neutrons. So I asked my father, "Dad, why does cesium absorb neutrons?" [laughter] He looked at me – my parents were really great about all that stuff. I remember them lighting into, if you will, the librarian at the town library, and telling the librarian that I was most certainly allowed to check out any book in that library. [laughter] I think that was in fifth grade. I got one of those human body books, so it was skeletons and all this stuff, and written at a public level. I thought it was interesting. I still don't really quite understand exactly how all the muscles work around your hip joint. You can rotate your foot like that, and that's done with a little muscle, but I don't know exactly how that works.

MG: I don't either.

EJ: [laughter] So I went in and tried to check out *Gray's Anatomy*, which is this tome. It's like fifteen-hundred pages of anatomy stuff. The librarian said, "You got to be kidding me. I'm not giving you that. You just want to look at the dirty pictures," which I was interested in that too, but it wasn't just that. So yes, I would just take anything that looked interesting. I read about bees. Again, it was the adult stuff about bees. I didn't have much money. I was thinking of making a beehive, but I just couldn't figure out how to get enough money together to get that going.

MG: When you skipped a grade, did you feel a little off socially being younger than everybody?

EJ: More than a little off. Way off. It was tough, really tough. I don't think I really established or got my feet back under me in a social sense until way into high school. I was always a little bit awkward and weird. Maybe I still am. It made it hard. That made it hard. I had an August birthday, so I was already at the young end, and then I skipped a grade, and it just put me way – for example, I really wanted to play football, which was the sport. It was the only one people even cared about, but it was all done by grades, not by age group. So I was profoundly disappointed that they wouldn't let me on the junior high football team because I was pretty sure I was just as fast and as tough as several of the kids that made it on there. I think in retrospect, they were just worried about having a kid that small on the team. I don't know that for sure, but

that'd be my guess. Who knows? Maybe I maintained eight or ten IQ points for not playing football. I played tennis in high school, and eventually was the top seeded tennis player on the high school team, but it was a small high school back then. It's not that big a deal. We had a girl player who was really good. She played with the boys. She advanced to the state tournament. She was really quite good. I wasn't that good. I just had a good backhand, and nobody expected a good backhand. They all got in the habit of hitting to the backhand, and I had a better backhand than forehand, and I just used that. [laughter]

MG: In high school, I know you wanted to get out of Georgia, but did you know what you want to do or study then?

EJ: Well, there was a summer program for high school kids that I went to called the Governor's Honors Program, which is where I met my wife when I was – it would have been between freshman and sophomore years. I would have been, I guess, fourteen – something like that.

MG: Did you start dating then?

EJ: Dating? Dating would be a little too formal, but we stayed in touch. She lived about sixty miles away from me. So we dated in high school when I got old enough to be able to drive. I used to drive up there when I was sixteen as a senior. Then I went off to school at MIT, and she went to William and Mary. That stuff never works. [laughter] We got together years later. So it wasn't a high school romance all the way straight through. I went off to MIT thinking that I would like to get into metallurgy, so I took one of the intro metallurgy classes and discovered that there are people who can visualize in three dimensions in ways that I couldn't do. I felt like I needed to be able to do that to really be into metallurgy because it's all about the three-dimensional structure of metals, and the inclusions and how the sheer planes go through it and everything. I just couldn't quite do that in my head the way that other people could. Frankly, I ended up – so I had an undeclared major, which they would put up with for quite a while at MIT, and eventually declared in civil engineering because they had this build-your-own bachelor's degree program that let me take classes in the more social side of things. I took a class in public expenditure theory, which was mostly focused on how you do benefit-cost analysis and formalized planning in mostly capitalist economies. A little bit of it was about Marxist economies – centralized planning in Marxist economies. So then I cross-registered in a class at Harvard on Marxist economics. So I was interested in the social side of water – water management, water resources engineering. When you do a really big water project, you actually change the society. So it is not just about the engineering of the dams and irrigation systems. It's also about how people are going to make a living, how many people are going to live there, [and] all the infrastructure that's going to be needed. You make big, big changes. I just thought that was really interesting. I also had a more artistic side. I had some interest in being a creative writer. I took a class from – this is name dropping now, shameless name dropping. I took a class from Lillian Hellman, who you may know of, in creative writing. Probably the best thing I wrote was the thing I wrote to get into the class, and that's when I discovered that I might have had some talents in that regard, but I was nowhere near the level of talent of the folks that were in that class. It was incredible.

MG: Was that at MIT?

EJ: Yes. I think she knew the provost. She's a really interesting lady. You might want to, on your own, read a little bit about Lillian.

MG: Yes.

EJ: She wrote *The Little Foxes*. She was one of Dashiell Hammet's love interests, got tied up in the McCarthyism Red Scare stuff. [Editor's Note: The Red Scare is the hysteria associated with the perceived threat of communists within the United States in the post-World War II Era. Historians also refer to this era as the McCarthy Era as Senator Joseph McCarthy accused many people of being communists and adding them to blacklists.] [She's] an East Coast intelligentsia person, and a tough old bird. She probably smoked four packs a day. She smoked continuously in the class, just absolutely chain-smoked all day long. [laughter]

MG: She sounds like a character.

EJ: Yes, she was something. She was really something. The class was really amazing. I think they had a quota for MIT students because it was taught by MIT, but half the class was cross-registered from everywhere – Harvard and Radcliffe and BU [Boston University] and BC [Boston College], and all around there because they heard that she was in town. I don't know. We wrote five to eight-thousand words a week. She would read them all, critique them, pick one, hand it out, and the whole class would read through the critique – read the work and then [critique]. So it was a tough classroom exercise. One guy I remember in particular, I think he was from Venezuela, but he was definitely from South America somewhere, writing in his second language, and just stunning work. We had exercises like rewrite Joseph Conrad's *Heart of Darkness* using [Ernest] Hemingway's style. [laughter] It was almost impossible. It was so hard. That turned me aside from my – I'm going to make a living being a creative writer.

MG: How many women were in your class at MIT?

EJ: While I was going to MIT, I think they got close to fifty percent, and were really proud of that. I think my freshman class was about – I don't think it was up to twenty [percent] by then. So it was in the teens, I believe. By the time I left there, the undergraduate population was close to fifty-fifty. I don't know if they were quite there, but they were getting there. It wasn't just gender diversity; it was country diversity, especially the grad student population is half foreign. Or was half foreign; who knows with what's going on now with things like not letting Harvard students into the country. In any case, I got my MIT degree in 1971, which is an interesting time to be going to college.

MG: I wanted to ask you more about that, and the movements of the time.

EJ: [laughter] How about: "Get off your ass. Get out of class. End war research." [laughter] Yes. It was a wild and crazy time. It was hard, too. It's hard to be in a place where there are genuine dialogues about whether the government is legitimate or not, and that's where people were. It was also rapid changes going on. I joined a fraternity. Like I said, I turned seventeen in August, went up there, joined a fraternity, moved into this place, and they had twice a week

deliveries of liquor at wholesale prices because they had a wholesale contract. They had a beer machine. They had a coke machine and a beer machine. They were a quarter for a beer, a dime for a Coke if I remember right. So you were really on your own. You could drink yourself into oblivion if you wanted to. But there was other stuff. The fraternity had been a male bastion. They had very limited hours where women were even allowed in the building. Even at that, they were only allowed in the common areas on the first floor. So there was this whole uproar about increasing the number of hours where women were allowed in the place, and all the old upperclassmen arguing that they wanted to be able to just throw a towel over their shoulder and walk back from the shower. That all changed over the span of just a few years. There was the drug culture stuff, and the crazy rock music. I vaguely remember some of the things. Anybody that was really participating in the '60s and remembers everything, they're lying; they just don't.

MG: Some of your memories are vague.

EJ: In that sense, yes, I'd say. I used to get in touch with my parents and tell them I didn't have enough money to come home for Christmas, and then hitchhike and use the money for Christmas presents.

MG: What did the Civil Rights Movement look like in Boston? How different was it from where you were in the South?

EJ: Well, I was not a full participant in the student radical movement. I knew people that were, for example, in the SDS [Students for a Democratic Society]. [Editor's Note: SDS, or Students for a Democratic Society, was a student organization with many chapters across American colleges and universities. It was a leader in the anti-war movement during the Vietnam War.] The Students for a Democratic Society and the Black Panther party worked together. The Black Panthers were in Roxbury, which now you can't even afford to live there. Then it was the black ghetto of Boston. They were running a hot breakfast and lunch program for kids, and things like that. There was a cross-connection between the antiwar world and the civil rights world, but a lot more energy around the antiwar stuff on campus because it was literally personal, life and death, for people. Hard to convey the level of chaos that was – the sense was that anything could happen, including an absolute explosion of violence was certainly a possibility.

MG: You must have been a freshman or sophomore when the shootings at Kent State happened. [Editor's Note: On May 4, 1970, Ohio National Guardsmen fired on students at Kent State University, killing four and wounding nine others. Some of the students had been protesting the United States entry into Cambodia, while others had been passing nearby or observing the demonstration]

EJ: Yes. I have not been to Kent State, but I have been on the campus of Jackson State, which most people don't remember, but it was part of the whole thing. [Editor's Note: On May 14 and 15, 1970, students at Jackson State College protesting against racial harassment were fired upon by state and city police, resulting in two deaths and a dozen injuries.]

MG: Right, another shooting.

EJ: Another shooting. Cathy and I have a friend, went to their wedding, she was on the campus at Kent State when the shooting happened. MIT essentially shut down. In fact, that particular semester, there were no finals. The school shut down if you can imagine such a thing. Hard to believe these days, isn't it? But yes, it just didn't seem important anymore. When Cambodia was invaded, and the schools just went crazy, your education was no longer the important thing at all for many people.

MG: Were you able to receive a deferment for service in Vietnam because of your education?

EJ: Yes, yes. So I was deferred. I had the college deferment until – I forget exactly how all the rules changed, but I was part of the draft lottery. I still remember my number was a hundred and forty-five, my lottery number. They kept saying they were going to draft somewhere between a hundred and twenty-five and a hundred and sixty. So I was on the bubble. They didn't get as high as mine. Of course, I had fraternity buddies, some of whom were drafted. There were kids from my high school that went. Some of them got ruined. Some of them got dead. I have never gone to the Vietnam Memorial and not cried. I can't imagine going there and not crying.

MG: Yes, I understand.

EJ: So that was that. I got my degree in '71. I thought I might get drafted, so I didn't go after a professional job. I just kept working at the night job at the bank. I worked at New England Merchants National Bank.

MG: As a teller?

EJ: No. Nightshift, running check sorting machines and proving out the bank's books, and that sort of thing. I've got stories of that place, too.

MG: Tell me some good ones.

EJ: Some good ones. I made a hundred million dollar mistake one night. [laughter] Is that a good one? That one's not really serious. The adding machines we had only went up to \$99,999,999.99. That's all the digits they had. So I was the chief proof clerk, adding up all of the bank's books for the day from all three shifts, and then proving out the bank's books for the night. One of the things that I had to do that particular night was they had an internal clearing account that was used to move things from one place to another. So when you wrote out an ICA, internal clearing account, ticket, you always wrote a debit half and a credit half. So they always added up to zero eventually. It was just used to move paper from one place to another. It's not "real money." They only balanced it once or twice a month. So when they balanced it, they would have hundreds of millions of dollars of this stuff. You couldn't add them up by just adding them up. So you could get all the digits except the top digit. But the top digit you had to estimate, and I just guessed it wrong. I thought there were 653 million blah, blah, blah, and there was actually 753 million blah, blah, blah. So it was off by a hundred million dollars, not a big deal. You just write up, "Oops, made a mistake," and they fix it the next night. That one's not a big deal. I did see them once write up an unknown difference for six hundred dollars. They took all of the paperwork – I spent forever trying to find it. They took all the paperwork, saved it, and

worked on it the next night and still couldn't find it. This was a big deal. Then they reran all the computer runs for the paperwork, and it balanced. They eventually figured that it probably was a printer error. So, literally, the printer simply printed the wrong digit when they first ran it. They don't do that often, but it does happen. So that's what happened. Last story. Some of the people that I knew there went to jail for defrauding the bank – idiots. [laughter] They had what they thought was a system that just couldn't fail for betting on the horses. It just needed some money to get it going. Of course, it never worked. They thought they were going to be able to pay all the money back, and they got caught. Oops.

MG: What was the degree you graduated with in 1971?

EJ: It's a bachelor's of science, as recommended by the Department of Civil Engineering, because I didn't take all of the standard structural engineering and transportation classes that would be part of a standard BSCE [Bachelor of Science in Civil Engineering]. I was never really interested in designing buildings. I didn't have the background to do it anyway.

MG: How did you become interested in hydrology?

EJ: Well, it was water resources and hydrology. So, hydrology is the science of what happens to water after it hits the ground. I was also interested in the social side and the economic side and the large scale system design stuff, the underlying economics.

MG: That came from a class you took?

EJ: It came from a class that I took and a few professors that I knew. I just found it really interesting stuff. So I had a broader exposure to these areas of water resources management and water resources engineering than you would be able to get with a BSCE, and accordingly, less exposure to structural design and transportation systems than you would typically get in a BSCE. It matched my interest a little better – a lot of operations research, which is optimization issues, linear programming, dynamic programming, that sort of thing.

MG: What did you hope to do with this degree?

EJ: I was just mostly driven by intellectual curiosity. It wasn't a matter of doing stuff, really, that much. I kept working at New England Merchants Bank until I was sure I wasn't going to get drafted because I couldn't see going into a professional job and then getting drafted. So then, I just wrote letters to places in the Boston area that I thought I might get a job at, and got a job at Metcalf & Eddy, which is an architect and engineering firm. They design mostly sewage treatment plants and water treatment facilities, and stuff like that. I got a job with their computer sciences group. So I wrote software. I did some fun things for them – wrote a linear programming model to help figure out how to get rid of garbage in the Southeast Michigan Council of Governments, which is the area around Detroit.

MG: Were you hired the Southeast Michigan Council of Governments?

EJ: No, I was hired by the company that had a contract with Michigan to do that. So I worked in this group. We were kind of an internal consulting group that wrote software and did applications of various kinds for the company. Since I had this operations research background and they had a contract to figure out how to get rid of the solid waste for Detroit and the surrounding counties for twenty years, I wrote out the mathematics. I then turned that into software, and eventually, wrote a mathematical model that opened landfills and built incinerators and moved garbage from one place to another, and took it to transfer stations and compressed it, and crushed it, and moved it somewhere, and got rid of all the garbage in the area for twenty years. It was fun.

MG: I'm having a hard time understanding how a mathematical model can lead these big-scale projects. What's the connection between the model you create and how the garbage is managed?

EJ: So when you build an incinerator, it costs a lot of money. So the question is, which ones should you build, when should you build them, how big should they be in order to get rid of all the garbage. So you had estimates of how much garbage of municipal and industrial and residential waste was going to be produced in the six counties around Detroit. You had potential ways of getting rid of it. So if you build one incinerator for the six counties, then all the garbage has to be moved to that incinerator, which costs money because it costs money to run trucks across the roads, and that sort of thing. So it was a classical operational research problem of what should you build, when should you build it, how big should you make it. Is it better to take all the trash and bury it, or is it better to take it to an incinerator and then bury the fly ash that comes out of the incinerator? What are you going to do with all this garbage? There was a political question as well, which was: are the six counties going to be better off if they get rid of their own garbage, or they all build one system that they all cooperate in to get rid of six counties worth of garbage. We were trying to answer those questions. A lot of it had to do with the cost of all this stuff. So I wrote out a mathematical model. Eventually, for the whole six-county model, it had – I remember this – it had about two thousand equations and twenty thousand variables. It cost about five thousand dollars to solve on the mainframe computers of the day.

MG: Wow.

EJ: I got into some trouble for that, too.

MG: What do you mean?

EJ: Well, we had been solving a county at a time with the same basic model. Then they were ready to do all six counties at once, to answer this question of are they better off if they all work together. I told the engineers that were giving me all of the data to feed the model that it was going to cost about five thousand dollars to solve this model because by then, I knew I could scale it up from the six smaller ones. I hit that one pretty close. I was pretty close to exactly how much it was going to cost. They said, "Yep, go ahead. We have to have it." They did not get clearance to spend that much money from their chief engineer. I just assumed they did. So when the chief engineer got the bill from our computer group, he hit the ceiling, called my boss, and my boss just chewed me a new one. [laughter] I didn't think I'd done anything wrong, and

he backed me up. Oopsie. One of my first exposures to the first law of the workplace – “Thy shalt not surprise thy boss.”

MG: Did they implement any part of your plan?

EJ: I don't really know. I know they finished the contract and I sent them the report. I don't know what they ever did with it. I was part of the team that designed sewers in Cleveland and almost got sent into the sewers in Boston. I got lucky – avoided that one. They wanted to do some data-gathering in the rain on the combined sewers, so they were going to send me out with an explosive gas detector, and all that stuff, and go climbing down in the combined sewers, and take data. But I ducked that one. I did some other – I've done a lot of interesting jobs. I told you about working on my grandfather's farm. The first job I had out of the family was in a service station when I was fourteen – the service station across the street. I greased cars. I put the car up on the rack, and go underneath it, and change the oil, and put in grease. They also retreaded tires. I sold tires and replaced tires on cars and stuff like that. They would no more let a fourteen-year-old do that, not in this area at least; out in the country, yes.

MG: That sounds like good experience.

EJ: It was good, yes. It was good. There was that. Then I had a drafting class in high school and got a job as a draftsman with – I think at the time they were R.D. Cole, but they got sold to a different company. They made water towers and chemical process tanks and stuff like that. They got me to draw the equipment that was in these cabinets on a hydrogen peroxide truck tank. That's one of the loudest places I ever worked. I actually had to go out in the shop – this is way before hearing protection. They were grinding tanks. I think it did hearing damage. I actually have some hearing damage. It's not real bad. I think that's part of it. That, plus things like going to rock concerts. So that was that job. Then, in college – I told you about working at New England Merchants Bank – I got a scholarship from Lockheed [Martin], so I had an in for summer jobs. I worked on the C-5 project for Lockheed Georgia. The C-5 is a big transport airplane. It was the biggest airplane in the world at the time. It was huge, just huge.

MG: What were you doing?

EJ: I was helping to write what was called the “Weights and Measures Report,” of how much did the plane weigh, and what was its center of gravity, and moments and products of inertia, and how did the weight of the airplane change from initial design to the drawings as it went through all the design stages and why all those changes happened – fascinating, absolutely fascinating. I think I can tell you this because I can't remember the exact numbers. Some of the stuff I worked on was “classified.” I forget exactly how much, but the plane had something like between a thousand and two thousand pounds of paint applied to it. They built special machines to make sure they didn't put too much paint on it because if you could get rid of a pound of airplane and still meet the specs, you could carry a pound more cargo with the same specs. So they were willing to spend – I forget what the number was, but it was something like they were willing to spend a hundred dollars to get rid of a pound of airplane. So they did all kinds of engineering to make the plane light so that it could carry big, heavy cargo. It was huge. I think it would fit six

city buses if I remember right, and take off and land. I took a tour of the first flight airplane and went up the tail. It has one of those “T” tails. Not a tail like this, but a tail like this.

MG: Capital “T.”

EJ: Capital “T” tail, and there’s a ladder inside. It’s about sixty-five feet up. The tail, that wing up there, is about as big as a business jet. So we went all the up, opened the hatch and stood sixty-five feet up in the air with nothing below you but pavement. It was ridiculous. Insane.

MG: This is the work you would do during your summers in college.

EJ: Yes. I worked on that between freshman and sophomore year. Then, between and sophomore and junior year, I looked at all of the places that Lockheed had facilities, and wrote through the scholarship office, and said, “Hey, is there any chance I could get a job at your shipyard in Seattle?” They said, “Oh, sure.” So in the summer of 1969, I worked in the shipyard at Seattle – weights and measures again. They were responsible for the tank level indicators on the ships they were building. They were also responsible for launching the ships. They have to both start and stop. So they build them on this big sliding thing called a ways. Then when they’re finished with all the steelwork and they think it won’t sink, [laughter] then they launch it, and then finish outfitting the ship after it’s afloat. So I went out on an inspection. We inspected the ways. I think it was a destroyer if I remember right. They had had to delay the launch, so they were worried that when they tried to launch it, it wouldn’t slide; that it had squeezed all the grease out, and so it just wouldn’t move. That would have been bad. So I’ve actually walked under a destroyer. They’re heavy it turns out. You just can’t help yourself. You’re underneath this steel thing that weighs hundreds of thousands of tons, and I just couldn’t help it. I put my hands on it and tried to lift it. It didn’t move. [laughter]

MG: How was this scholarship awarded to you?

EJ: It was awarded to me solely on the basis that my assessed financial need was exactly the same amount as the scholarship. That was it.

MG: But also, you were such a bright student with good grades. Did that have anything to do with it?

EJ: At MIT, they still have a need-blind admissions policy. They basically guarantee they’ll find a way for you to pay for school. If you get in, they’ll figure out how to make it where you can – they’ve got a big enough endowment to do that. My assessed financial need was tuition plus five hundred dollars, based on how much money my parents had. I got a scholarship for tuition plus five hundred dollars. Once you got it, if you didn’t flunk out or anything, that’s how much they gave you. They didn’t do any more assessments. So I just got a check for five hundred dollars a year from Lockheed, and they paid my tuition. It was great. It was really great. [laughter]

MG: The firm you were talking about earlier, did you stay on with them until graduate school?

EJ: Yes. I eventually got bored. It was sort of: I need to do something else. It was a pretty good job. It was a really very good job for me. I remember writing a – [laughter] again, it was all computer models and software development and stuff like that. So I wrote a utility program that they used for outfitting water quality labs. So you would enter all the different tests that you wanted that lab to be able to perform, and it would tell you what equipment and how much of this and how much of that you had to buy. I wrote another one that was more on the social – they had a planning job for – doggonit, I can't remember the name of the group, but a bunch of townships in Cape Cod were trying to figure out what to do about their water and sewage treatment if I recall correctly. So they had a whole big planning activity. One of the things that they were trying to figure out was, again, the secondary effects of doing development work. You're going to open up areas to water and sewer, which is going to create areas that can now be zoned residential. So you're going to build houses and people are going to move into those houses. Some of those people are going to have kids, so you're going to have to build schools. How many schools are you going to have to build? It's that sort of – so I wrote a program that built schools. It figured out how many schools you'd have to build under a variety of different planning scenarios. The work was varied enough to be interesting to me, but not infinitely so, and so I was getting bored and decided I'd look around for a different job. Eventually, I went back to MIT and got more degrees.

MG: Yes, talk about your graduate and doctoral program experience.

EJ: It was a great place. It's a fascinating place. I didn't really appreciate it as much as I should have when I was there. I appreciated it more after I was an assistant professor at Georgia Tech. So when I did my undergraduate stuff, it was the – again, I got involved in – it was more planning-oriented. It was this large-scale plan activity, again, for an area in the Cape and all the surrounding areas. For that, it was a real linear programming model that balanced different scenarios. It basically used linear programming like you'd use a spreadsheet now, but you could add things up, and do transformation surfaces between – you could map out possibilities. What are the different possibilities? [Telephone rings.] Different land use plans have different effects on infrastructure and costs.

TAPE PAUSED

MG: We're back on now.

EJ: While I was working on my master's, I got an idea, in part, driven by experiences at Metcalf & Eddy, on sewage treatment, sewer design, and the like. There was an act – I don't want to get too nerdy here. If you have sewage systems, the old ones were built as combined sewers, so that both the street drains and the sanitary sewer lines went to the same pipe. That's a combined sewer. They were cheaper to build because instead of two pipes, you just have one pipe, but they're hard to operate, and they are dirty because when it rains a lot, you end up with a whole bunch of water on the storm drain side that's trying to go to the sewage treatment plant. You end up with overflows. You just can't manage all that water, and it overflows. What they're mostly doing about that now is you have to make a choice; are you going to pay the really big bucks to separate them, dig up all the streets where all the pipes are, and put in two pipes where there used to be one pipe, and design two separate systems. Or, what they do in a lot of places is they do

deep tunneling, and they build big tunnels way deep, and they just capture all of that extra water instead of just overflowing it into the river and then treat it after the fact. That's what they're doing around here. They got a drilling machine somewhere around here that's drilling something like a fourteen-foot diameter five-mile-long tunnel just to hold water. They've done that in a bunch of cities. One of the threads of – how are we going to manage these systems and start reducing the overflows that make it where you can't swim in the water, and the fish can't grow? You can't catch the fish and eat them, and all that kind of stuff – to manage the whole system dynamically, to build storage systems that you can then pump water from place to place and not have to build these giant tunnels. To do that, you need to be able to predict how much water you were going to have in the sewers. To do that, you needed to have some ability to predict rainfall. So I took a rainfall simulation model and turned it into a predictive model for my doctoral dissertation. It was never really used all that much, so it's not like a big deal, but it was fun to work on. I wrote the NSF [National Science Foundation] proposal to get it funded. So I did that while I was a master's student. The guy that I worked with to write it took a job. The professor left and went somewhere else, and then a different professor came on board and took over as PI [principal investigator] for the NSF grant. So that's how I ended up with my doctorate. I was actually his first doctoral student. He came on board as an assistant professor at MIT – he wasn't much older than I was, but pretty close to the same age – with an already baked project paying for part of his salary and somebody working on it. That was a good deal for him. He went on to really bigger and better things. Currently, he's got an eight-figure salary as the provost at Georgia Tech. [laughter] So he went on to academic brilliance in many ways, which I didn't do.

MG: Did you encounter him later when you taught there?

EJ: No, he was at, I think, UC [University of California] Davis when I was teaching at Georgia Tech.

MG: So it was just a coincidence you both ended up at Georgia tech later in your careers.

EJ: Yes, just a coincidence. He went from assistant professor to associate professor to full professor to head of the Department of Civil Engineering to head of the School of Engineering at MIT to head of the something at UC Davis to provost at Georgia Tech.

MG: That's where he currently is.

EJ: I think so, yes. MIT was a fascinating place. They are genuinely committed to their undergraduate students. I guess the shorthand would be if you get in there and you don't graduate, MIT thinks that they failed you. When I went to Georgia Tech, they didn't feel that way about their students at all. I found that jarring.

MG: You weren't at Georgia Tech for very long.

EJ: No. I thought I would – I had my early career – let's back it up a little bit. I got the PhD in '78. I actually started looking for a job before I graduated. I also pushed hard to finish my dissertation before graduation in June. So my wife and I had a two-month vacation.

MG: Were you married at that point?

EJ: Yes, we got married in '76.

MG: Before we get into your time at NOAA [National Oceanic and Atmospheric Administration], tell me how you and your wife came back together and got married.

EJ: She went to undergraduate at William and Mary, and then went to grad school at the University of Tennessee. Then got a position at – I wish she were here because I'm terrified I'm going to get this wrong – in a community college in Winsted, Connecticut. The program folded, so she went from Winsted, Connecticut, having a job, to I don't have a job; unemployed. So she went to Boston. Like I said, we'd had some degree of contact. Then we got back together when she was in Boston.

MG: Where did you get married?

EJ: In Smyrna, Georgia. But we were both living in Boston at the time, Boston area.

MG: Is her family from the South as well?

EJ: We are, I think it's something like eighth cousins once removed or something like that. Her family goes back into the early 1800s, just like mine, in Georgia. So if families go back that far in the same place, you're bound to be related. Her big claim to fame is that her second cousin is Jim Morrison of The Doors.

MG: Oh, wow.

EJ: She has Morrison relatives.

MG: Is she close with any of them? Was she affected by his death?

EJ: Not really in a personal way. I went to some Morrison Family reunion thing and met his parents once. He didn't get along that well with his parents, as you might guess from his music. [laughter]

MG: Did you ever attend a Doors show while growing up or living in Boston?

EJ: Oh, yes. I saw him on stage.

MG: Where?

EJ: I forget where. One of the venues in Boston, but I can't remember the venue. I also saw The Velvet Underground. My son found this amusing. What I remember most about them is they were unbelievably loud, so loud I couldn't stay in the same room. It just hurt. I got out of

the concert, and then I spent the time in the lobby. I couldn't stand it. It was probably a hundred and thirty decibels. It was just insanely loud.

MG: Too loud.

EJ: Too loud. Yes, too loud. I wasn't all that much into music. When I was out in Seattle that summer of '69, I went to an outdoor concert. I remember seeing Ike and Tina Turner.

MG: How was that show?

EJ: They were spectacular. I was chemically enhanced, shall we say. Just to give you an idea – I don't remember where this thing was. I didn't know the people that drove me there. I met them the day before or that day. We just got in the car and drove there and got in. I went back with people that I met there – went back to Seattle with some people that I met there. It was footloose and fancy-free.

MG: Wasn't it the Summer of Love?

EJ: No, Summer of Love was actually ['67] technically.

MG: Did your wife find work in Boston?

EJ: Yes. She eventually ended up as the – I love this. She was the headteacher at a small daycare center in Chinatown in Boston. By small, I mean one class. While she was there, a much larger daycare center was closed down in a scandal. It was attached in some way to a church, and apparently, the minister was putting people on the books that were actually volunteers and charging for it. They had contracts with the welfare system that would pay childcare so the parents who were on welfare could go to training classes and get off of welfare. It was a very nice sensible – but it's a government-run program, so when they found out that they were being essentially defrauded, they shut down the center. But then the community needed daycare services for the kids. [laughter] This would be interesting in and of itself. Cathy wrote a series of grant proposals and got the money necessary to triple or quadruple the size of this daycare center, including renting a new space, building a kitchen, going through all the building permits, hiring a cook – blah, blah, blah – and opened up this daycare center that was way bigger than the one she'd been at before. So she was the head of the whole shooting match. Somewhere probably stuck in our attic somewhere – I went to a trophy place and had a plaque made for her. Do you know if you go to a trophy shop, they'll make a plaque that makes anything you want it to say? They'll sell you a trophy that says anything you want it to say.

MG: "Biggest Jerk, 2019."

EJ: Yes. I have a trophy somewhere for the most outrageous song at karaoke.

MG: That sounds like another good story, too.

EJ: It was “Li'l Red Riding Hood” by Sam the Sham and the Pharaohs. It’s the B-side of “Wooly Bully.”

MG: Yes, I know both of those songs well. When you graduated with your PhD, you went on to work right away for the National Weather Service.

EJ: Yes, I did. That’s an interesting connection. One of my professors at MIT had gotten a job at the Weather Service. It’s interesting for several reasons. The Weather Service predicts the weather, but they also predict floods. Prediction in hydrology is a very small specialty in hydrology. Almost all hydrology work is design-oriented. It’s how big does a culvert have to be to only overflow once every five years, how are you going to build things that have to carry water, basically – dams and water treatment plants and sewage treatment plants and irrigation systems and hydropower, and all that kind of stuff. So the hydrology is nearly all design-oriented, not predictive. Prediction is a small subspecialty in hydrology, but it’s really interesting. It is a different challenge and one that has more immediacy. In meteorology, it’s the other way around. The biggest focus in meteorology tends to be prediction rather than design-oriented. Other parts of meteorology are smaller, less well-known subspecialties of meteorology. I thought it was fascinating. I had an in. Most hydrologists wouldn’t even think about flood forecasting. Hydrology is also a small part of the Weather Service. Now that we’re going to talk about NOAA, in NOAA, they talk about the dry side of NOAA and the wet side of NOAA. You’ve heard this?

MG: Yes.

EJ: So the dry side of NOAA is all the atmospheric guys that do weather forecasting of various kinds. The wet side of NOAA is all the folks that worry about the sea. The fisheries guys are “wet” side and the ocean service guys – “wet” side. Weather Service and NESDIS [National Environmental Satellite, Data, and Information Service] – dry side. Well, I always thought I was part of the moist side of NOAA. [laughter]

MG: Yes. I was going to say, “damp.”

EJ: Damp, moist. So it’s a bridge area, if you will, and has undergone a lot of changes while I was there.

MG: Talk to me about when you first arrived. This was 1978. Where were you based?

EJ: It’s the Hydrologic Research Lab, and it was in the Gramax Building, which is on 13th Street in Silver Spring. Hydrology in the river forecasting sense was part of the Weather Service ever since there was a Weather Service. So forecasting the rivers was an initial mission function of the National Weather Service. It’s always been part of the Weather Service.

MG: Which is almost a hundred and fifty years old. Is that right?

EJ: Well, the Organic Act is 1890, and the earlier incarnations of the Weather [Service] – it was the Weather Bureau until – I forget, somewhere in the ’60s, I think. [Editor’s Note: In 1966, the

Weather Bureau because part of the Environmental Science Services Administration, which was renamed the National Oceanic and Atmospheric Administration in 1970.] Like many pieces of NOAA, NOAA was coalesced and brought together a number of agencies, some of which had an existence that long predates NOAA. I think the first was the [United States] Coast and Geodetic Survey [founded in 1807], which T.J., Thomas Jefferson, started that one.

MG: Do you know what drove the restructure and the absorption of the various agencies fifty years ago?

EJ: I just heard a few small rumors. I wouldn't be the right person to get quoted on that. I've heard the story about how Richard Nixon moved it to the Department of Commerce. Everyone's heard that one, right?

MG: Yes, but it might be helpful to get it on the record.

EJ: Again, this predates my participation in NOAA. NOAA started shortly before I joined in '78. It existed in some form as ESSA [Environmental Science Services Administration] before that, and then became NOAA in the Nixon Administration reorg that created NOAA. I don't know all of the impetus behind pulling together the various agencies that make up NOAA. At the time, it has, in many ways, become more logical after that than it was at the time, I would say. That's because the disparate areas and disciplines that are represented by NOAA have actually grown closer to each other, which I think is one of the biggest threads of my career there that I want to definitely want to talk about at least a little bit. But the Nixon story is that they had decided that it made sense to bring together these different organizations and put them all under one umbrella. They were going to locate them in the Department of Interior, which has a certain logic to it with the other interior agencies, like the US Geological Survey and Bureau of Land Management, the big land agencies, the big hydrology agency that is science-oriented rather than engineering-oriented. [The United States Army] Corps of Engineers would be the big hydrology agency that's design-oriented. But he was upset with the then-Secretary of Interior. I understand that the actual piece of paper that was going to create NOAA in the Department of Interior was on his desk, and Nixon penciled in the change. He took his pen, like [Donald] Trump's sharpie and he just crossed out "Interior" and wrote in "Commerce," and then signed it.

MG: What would you say his motivation for that was? Wasn't there a beef with the Secretary of the Interior?

EJ: Absolutely. Yes, he was mad at the Secretary of Interior at the time. He said, "I'm not going to give this to him. That ain't happening."

MG: Do you remember who that was?

EJ: I'm not sure. Is it [William] Ruckelshaus? [Editor's Note: William Ruckelshaus was the first and fifth director of the Environmental Protection Agency during the Nixon Administration and later, in 1983, during Ronald Reagan's presidency.]

MG: I'm not sure either, but we can always correct the transcript. [Editor's Note: Walter Joseph "Wally" Hickel was the Interior Secretary during the 1970 NOAA reorganization plan.]

EJ: That was the thing. I think the first NOAA Administrator was Bob White. [Editor's Note: The first head of NOAA was Robert M. White. He served from 1970 to 1977.] I believe that's true. I am told that he had a connection to hydrology. He used to actually get on the phone and call the Director of the Office of Hydrology. That's from talking to some of the old-timers from back in the day. Of course, the Weather Service is a very different culture in the years before I was there. I was there for the end of a whole era of technology that I saw some of and is now totally gone.

MG: What do you mean?

EJ: Well, let's talk about the earliest days of the Weather Service. The earliest days of the Weather Service were driven by the telegraph. So they would have Weather Offices, which were actual residences. So the meteorologist in charge lived there.

MG: Like a lighthouse keeper?

EJ: Kind of like a lighthouse keeper. They would get all of these weather reports from around the country delivered by telegraph, and later, by teletype. I saw teletypes, but not telegraphs. [laughter] People would plot with grease pencils, the meteorological reports. Then the meteorologist would interpolate between them, and draw in – each weather office had their own set of maps, their map of where the cold fronts and the warm fronts and all the stuff. Then, based on that, they would project forward and make a forecast. They would post their forecast on the wall next to their weather office and then type a few things up. Then, eventually, they started producing their forecast as teletypes, as text messages in all caps, which survives to this day, I think, in the Weather Service. You can send all caps messages with six bits. You don't need all eight, so you can save some transmission time, which was quite valuable at the time. [laughter] So when I went to the Weather Service in 1978, they still had a teletype room, and they still had fax charts that somebody went and ripped off and punched holes in and put up on the wall. They still wrote products, typed them in at a teletype machine onto paper tape, and then queued up the paper tape for a signal to come that said, "Okay, you can transmit now." Then the paper tape would read through it and go out on the circuit to all the other teletypes that were on that circuit. So I remember the sound of teletypes going [imitates teleprinter sound]. [laughter] They still existed, but not for long. So, I worked for about a year and a half as a research hydrologist in the late '70s. I had a doctoral degree, and it got me a GS-12, I think. I think I got promoted to [GS]-13 right at the end. They were at the end of the useful life of the software system that was being used for forecasting rivers. They wanted there to be one system that all of the river forecast centers of the United States used. At the time, that wasn't true. There was a nationally supported system called Version Four of the National Weather Service River Forecast System, NWSRFS, and it didn't have a broad enough set of features for all the river forecast centers in the country to use it. So they wanted to design a system that would be ultimately used nationally by everyone in the Weather Service that did river forecasting, and I got involved in that design project. I had written a lot of software by then. I probably already coded, who knows, a hundred thousand lines of software in various languages. I think, in part,

because I was a new guy– and naïve, oh my god – I got named as the coordinator. They had to carefully choose the title because of all of the interoffice politics associated with – “Those guys in National Headquarters are not going to tell me what to do” – of the design effort for Version Five of the National Weather Service River Forecast System. It’s one of the most memorable and pleasant projects I ever worked on. The people I worked with are great. The Weather Service is – NOAA is – a spectacular organization. It is an honor to be associated with it. Everybody, just about everybody that works for NOAA, feels that way. That’s a surprise to people. It’s a surprise to people that work in NOAA that other parts of NOAA feel that way about their work. That one took a few years to learn. Some of my memories at NOAA – they have that intern program, NOAA intern program, and they would bring in a person from every line office to talk to the interns about their line office. I loved doing that. I loved it. But that’s later in my career. Let’s stick with the early days. So I worked on this design effort for NWSRFS Version Five. You could make a good case that in spite of my long career, that’s the most important thing I ever did at NOAA.

MG: And it was one of the first things you did.

EJ: It was the first significant thing that I did, yes. Because the software that I wrote, which was basically – I worked with another guy in research hydrology in the Hydrologic Research Lab, Eric Anderson. We teamed up in a way that was one of the best teams I ever worked with. He had actually developed the science behind the snowmelt model that was used. He was a scientist in hydrology. I was more at a different set of broader – “broader” is not the right word. I had a different set of skills. I was more water resources management, so I had operations research, and software development, and systems engineering and public expenditure theory, and other economic stuff, and this different set of toolkits. But he was the real scientist that had worked out the energetics of snowmelt, snow accumulation and ablation, and how it all works. So he knew about building the scientific models of hydrology, and I knew about designing computer systems to manage data and the like. So I built the framework/structure that he put the models in. We went back and forth over design features that would make it easy to add more models to it and more features to it. I won’t bore you with all the details. It’s also maybe the very first time I ever documented software before I wrote the software. I finished all the documentation before I wrote any software code at all.

MG: What were your reasons for doing that?

EJ: Well, it’s because, by the time I was really writing all the software, I knew I was leaving and going to Georgia Tech. So I knew that other people were going to have to debug it. So we wrote debugging features. It was a fun thing to work on the design stuff. Since it was a two-person design team, we had to agree on things, and we documented what we agreed to – these little papers called “Proposed Design Features,” and we would write them back and forth and edit them – “Alright, this is the way we’re going to do this.” Then, I wrote all of the file documentation and all the common variables that are used throughout the whole program. I had descriptions of all the file structures and descriptions of everything. Then wrote the subroutine descriptions for all the major subroutines and what they were supposed to do. I had all that documentation, and then I wrote the code. I handed off code that would compile but had never been run to other people, and they debugged it. It was very unusual. I understand that it worked.

There was one major mistake I made that they had a hard time finding. It was address computation where I was off by one, and they had a hard time finding that one. But basically they told me the first time it ran, it actually ran; it produced stuff.

MG: You didn't see this part because you had left by then?

EJ: I had gone to Georgia Tech. Georgia was my home state. Cathy wanted to go back and try living in her home town. It was hard to pass up the opportunity to get into academia. But that software that I wrote was used for river forecasting for over thirty years.

MG: That's amazing.

EJ: That's a really long lifetime for a piece of software. I would talk to people – and it got translated into Chinese. It was used globally. I've talked to some of the guys that stayed closer to it because I was out of the hydrology program eventually. They told me that it was incredibly – in their words – efficient. It ran really fast, and I'm still proud about that because it was written to run fast. It was written to be very, very efficient in the use of computer resources, especially I/O [input output], since I/O speeds were more limiting than compute speeds.

MG: Did it have a name? Was it called something?

EJ: It was called the National Weather Service River Forecast System Version Five, NWSRFS Version Five, written in Fortran, and that was one of the challenges. I used some pretty clever tricks actually to – I'll go ahead and put it in the record. So, more modern languages have facilities for managing input and output, and for managing data structures that Fortran does not have or did not have at the time. These days, you can design a data structure that mixes together all kinds of different data, and then have a pointer variable that points to where that data structure exists in a file or in core memory, and you can just move it around. Fortran didn't have anything like that, but I created something like that because of one little thing that Fortran did have, and they did a similar address computation at every subroutine call. So I could create a data management structure in Fortran as a language, which lots of other people knew how to debug, and that managed all the files in big chunks. I then could create a data structure that you could point – you could do the computer and point and put it on top of that file, and then interpret it in a subroutine, and it would work. So you could put lots of different kinds of data altogether, and keep track of the parameters of any model, the state variables of any model, the input datasets and output datasets of any model, and pass data from one model to another in a really flexible and generic way. It would still run fast because you could take all this data and put it sequentially in a file so you could access it fast – read it and write it fast, but then once you read it and wrote it, you could do it – so you could read it and write fast in a sequential way, but then access it in a random accessed way. It sort of mixed the two together.

MG: Okay. I have to admit a lot of this is over my head.

EJ: But it would be really easy to do now in a language like PL/I [Programming Language One] or C++, but it was difficult in Fortran. So I was proud of that. That's part of the reason it lasted

so long is it was so flexible so that other countries could add their forecasting models into this structure.

MG: You said it lasted for thirty years. What did it move or translate to after thirty years?

EJ: It translated to a couple of different things. I haven't stayed real close to it. One of them was that they just changed languages on a lot of stuff, so they're now running under C++ or more modern languages. But the other thing that's happened in hydrology is they've transitioned into representing the land phase of hydrology – the movement of water in the earth is now part of the land phase model of meteorological models. So it's a more integrated system. Let me back up a little bit. So when you build a meteorological model, you have to represent the atmosphere; everybody figures that out. But you also need to represent the oceans and the land. I don't know if they've quite gotten there yet, but space eventually, as well, because there's couplings into the magnetosphere. So you have these representations of different parts of the globe. Well, the very first meteorological models represented the ocean as just a wet film. It was just a wet place, and there was nothing – it didn't represent anything. All the energy flows in the ocean were just not there. But now, it's deeply coupled. When you model the atmosphere, you also model the ocean. You couldn't build a modern atmospheric model that didn't also model the ocean. The same thing's true of the land. The land used to be modeled as a damp sponge. But now it's actually modeled. As those models got more and more sophisticated, they eventually got to the point where they could represent the transfer of water from the land surface through the soil and into the streams accurately enough to use them to predict river flows. But that was not true of the land phase models that were used in atmospheric modeling when I was working in the late '70s and before that. So there were two separate model systems, and now they're much more integrated whole earth model. Since you have a fisheries background, the same thing's happening with fisheries models. As you have the capacity to actually model the whole ecosystem that is producing fish, then you could build that ecosystem model into something like a whole Earth model. The initial parts of that are happening now. So they're modeling enough of the ecosystem stuff to be able to predict harmful algal blooms because they're already modeling the ocean and they're already modeling the atmosphere. So they got ocean temperatures and salinities and currents and all that stuff, which they have to do to get the energy flows that drive the atmosphere. As you get more and more detail, more and more science, eventually you get to the point where you're able to, at least parametrically, model the outbreaks of harmful algal blooms. That thread of cooperation between disciplines is the major thread of my career. It's a social thing. It affects the way people think of themselves. [laughter]

MG: I can tell that you are so connected to your work, and it has been so meaningful to you.

EJ: Really meaningful to me. In part, it's meaningful because that internal society stuff was so fragmented and so, in some cases, nasty even. I would tell people from my early days in the hydrology program in the Weather Service that I felt much, much more comfortable in a room full of folks from the U.S. Geological Survey than in a room full of folks from the Weather Service because they were my people. They spoke hydrology. We understood each other. We grokked each other. In the Weather Service of my early days, the hydrologists were a sidebar thing. I actually heard a director of the Weather Service say, "Well, you know you're not going to really have that important a career if you stay in hydrology." [laughter] There was a certain

amount of wisdom to that at the time, but if you contrast that to now, where – I don't want to make light of any particular disciplinary area because I really think they're all important, but if you're unable to participate in a multidisciplinary effort, the number of problems you're going to be able to actually solve is getting smaller and smaller because things that matter are so complex that they can't be solved by one specialty area; they just can't. So when I say things like that, I have all this stuff ringing in my head, like the recognition that it's not just about getting the numbers right when you're making forecasts. It's also about communicating in ways that people understand. That you can make a really good forecast numerically and then blow it in the real world because people didn't understand what you were saying. That dawning of how important communication is and how hard it is and how it's not – other people don't see things the same way you see them. They don't understand things. The words that you use are going to mean different things to different people. So just being able to communicate is a discipline of extreme importance. That realization of those kinds of social sciences as an important part of what NOAA does happened in my career. When things like that happen, they start out with a few visionaries that are poo-pooed, and then, eventually, become the common wisdom.

MG: I wonder if you can keep walking me through your career.

EJ: Yes, we can do that. So off to Georgia Tech, tenure track position. I eventually figured out I had maybe a 50/50 chance of getting tenure. Academia is hard. You need a lot of help as a young starting-off assistant professor. I just didn't think I was going to make it. So the deputy director of the Hydrologic Research Lab [position] opened up, and I was ready. So I just went back. In that position, I was up from hands-on work, doing software development and the like, and into a management job. The Weather Service was in the midst of its reengineering itself in the Weather Service Modernization activity. So I ended up attached to the modernization efforts of the Weather Service, often as the only hydrology person in a room full of everyone else in the Weather Service, trying to hold on for dear life for what hydrology needed when they were trying to balance hundreds of millions of dollars of expenditures and change for the whole Weather Service. So that was an interesting time. I worked on the radar program for the hydrology – the precipitation estimation parts of the radar algorithms that became part of the NEXRAD [Next Generation Weather Radar] system. I worked on the requirement setting of the [Automated] Surface Observing System, ASOS. I worked on the full set of requirements for the Advanced Weather Interactive Processing System [AWIPS] that replaced AFOS [Automation of Field Operations and Services] and provided the computational support for all of our river forecast centers and the whole hydrology program. I worked on teams that were trying to figure out how to build staffing models that included big changes in the structure of the weather offices, including the hydrology parts of the weather offices, as well as a staffing model for all the river forecast centers. So that consumed those earlier days of my career in the hydrology program when I came back into the deputy chief job.

MG: Were these efforts part of MAR [Modernization and Associated Restructuring]?

EJ: Yes, they were all part of MAR. It was all hydrology's participation in the modernization and restructuring of the Weather Service. Since the MAR was driven by lots of things – we could have a days' long conversation, and I would be talking about my perspectives of the MAR, but I would be describing the elephant as a wall, and other people would be describing it as a

rope. It was such a huge change. As I say, I was often the hydrologist in a room full of folks that were worried about other things. Their job was really to make sure I didn't get much. [laughter] My job was to get as much as I could. That's a summary, I guess, but a reasonably accurate summary. We could certainly talk about all kinds of other things. I guess you would say I became known across the Weather Service and to some extent across NOAA, because of all of those different things I participated in, in the MAR, as the person that was there from the hydrology program – sometimes the only one and sometimes one of a few. I got to know Mary Glackin because we worked together on AWIPS requirements. We actually got a silver medal together for that. I joked about that at her retirement, which was one of the most fun things I ever did. [laughter] I think there's video of that; it was a lot of fun.

MG: The retirement party?

EJ: Yes, for Mary.

MG: I haven't seen that.

EJ: It was loads of fun. She asked me to emcee it, and I had a great time doing that.

MG: I'm not sure what I want to ask you next. I have questions about MAR.

EJ: Did we get it right? No, we didn't. [laughter] What's your biggest regret about MAR? [laughter] I don't know what would be a good leading question. There are no softball questions about the MAR. It was profoundly disruptive, incredibly difficult, insanely stressful – insanely stressful. So here's an example of what I mean by stressful. We should talk about stress, work-related stress. I can tell you about some stressful times in my career. How about that?

MG: Okay.

EJ: That might be fun. So here's one. My then-boss, who was, I think at the time, the director of the Office of Hydrology, had accepted months and months ahead of time a position at some international training thing in Indonesia regarding weather radars. He was a world expert in radar precipitation estimation. He designed the overall structure, and I worked on some of the specific algorithms that were used in the precipitation estimation algorithms of NEXRAD. We fought like crazy to get a truly modern and accurate precip estimation system accepted into the baseline program of NEXRAD, against people who wanted it to be done in a really grossly simplistic way that would have been much, much less accurate. We made the case that the improvements in precipitation estimation were a big part of the overall benefits of the whole program. He was off going to this – he had already left the country, so he was out of pocket, unavailable, off to Indonesia for two weeks or three weeks. I had been tagged as, I would argue, the lowest graded position that we could send and not break protocols in going to a WMO [World Meteorological Organization] Region IV meeting – Region IV is North America, Central America, and the Caribbean – of the hydrology program in Mexico City on Thanksgiving Week. International guys, they recognize a few – they don't schedule major meetings that involve the United States on July 4th week. But, they'll do it for Thanksgiving because Thanksgiving doesn't really count. [laughter] So I got tagged to go to this thing in Mexico City. I was already

on the road, stopping off to visit our regional office because they had some issues about cooperation between Mexico and the United States on forecasting in the Rio Grande/Rio Bravo. I wanted to be sure I understood what their issues were before I went down to Mexico City and met with the Mexican representatives and said something I shouldn't have said or said it the wrong way. So I'm in Texas when I get a frantic phone call from the office in Silver Spring that the NEXRAD program has decided to downgrade our precipitation estimation algorithm and claimed that it wasn't based on proven science. They were going to make it much more difficult for it to be installed in the final NEXRAD system – much more difficult. My boss, who was the world expert, was unavailable, and I was headed to Mexico City. So I got on the phone with the head of the NEXRAD program, and I said, "You cannot do this without at least talking to us. You cannot do this. If you think that I am wrong, that you can do this without even talking to us, I'm turning around. I will be standing on your desk in the morning, and we're going to talk this through." [laughter] So they technically agreed that they would meet with us. I went ahead and went down to Mexico City and had sushi for my Thanksgiving dinner in a sushi restaurant in Mexico City. We came back and made our case, and argued as best we could. Later on, the Weather Service director admitted that that was a bad decision. It took him years to do it. They put us basically on a second track, and we had to fight and claw for years. What they had done is they kicked us off of a gate in the development process that would have – they didn't give us a chance to be in an evaluation process that was going to evaluate the software for its maturity. They said we're just not going to include you. Instead of Build X, we were in Build X plus three or something like that.

MG: I'm sorry. Remind me who was telling you this.

EJ: The head of the NEXRAD program, the tri-agency NEXRAD program that was DOD [Department of Defense], FAA [Federal Aviation Administration], and National Weather Service. Based on arguments that we thought held no water at all. I get his political – because the FAA has no responsibilities for flooding and rainfall. The DOD has very little interest in flooding – some, but not the parts of the DOD that were funding the NEXRAD. So it was a huge stretch to get the Corps of Engineers to talk about tank trafficability and other interests that the DOD would have in rainfall estimation when this was all about the aviation side of DOD that was trying to put weather radars at their airports' sites to look at thunderstorms and clearances for flying. So that was a stressful period. That was a stressful thing.

MG: When did that happen?

EJ: God, when would that have been? I'm really bad – I mostly spent my time planning. So I spent almost all of time entire career thinking about what's going to happen. I'm really bad at historical dates. I can't even get the years right. I'm not even sure I can get the decades right. Let's see. That should have been about the early '80s, something like that. It was called the WSR-88D [Weather Surveillance Radar 88 Doppler]. So this would have been during the design phases before the first article was off of the assembly line. So it would have been mid-'80s, probably – '84, '85, something like that.

MG: What was your position at that time?

EJ: Let's see if I can remember. I get a little pissed off at this stuff. There was a fair amount of turmoil in the Office of Hydrology; they were doing reorgs and the like. I think I was still – there was a time when I was deputy chief of the Hydrologic Research Lab and acting chief of the Hydrologic Research Lab and acting chief of the Hydrologic Operations Branch, I think it was called at the time. So I was multi-hatted for some of this because there had been enough changes in the office structure. I can't remember.

MG: What was the turmoil?

EJ: The Director of OH [Office of Hydrology] left. We were in the middle of the modernization and restructuring. They had frozen positions all over the place. It was very difficult to get a permanent change in the structure, and very difficult to get positions filled at all because there was all this focus on how many people they were going to be in the whole Weather Service. The focus was mostly on the field office structure. They froze the headquarters structure of the Weather Service for years while they were – and instead of redesigning the headquarters structure of the Weather Service, they just layered a different office on top of it to manage the modernization and restructuring, called the Transition Planning Office. So there was internal tension between this "TPO" and the existing headquarters offices of the Weather Service. In the midst of all that, they didn't create a significant capacity in hydrology in TPO. TPO was off on the side making all these decisions with folks like me detailed in to work on problems in addition to our regular jobs of making sure we can still forecast floods and the like. Oh, joy. It was a high stress period.

MG: It sounds like it. Do any of your directives, or does the MAR plan change with a new administration?

EJ: Not so much. The Weather Service has done a remarkable job of avoiding being attached to the political environment. So, in general, the change of administrations between whoever was president or who wasn't president had little to do with the internals of the Weather Service. The Weather Service has mostly been supported by both Republican and Democratic administrations and rarely been part of politics at all, which is what made the most recent flapdoodle so extraordinary and unusual.

MG: I'm curious to get your take on that since you brought it up.

EJ: Of course, all my brothers and sisters and everybody wants to talk to me because they know I'm with the Weather Service, and I knew the names of everybody who was in the news, [and] the former NOAA administrators who are writing op-ed pieces and the like. But my basic take on it, the one that I would typically tell people when they'd ask is you just don't understand what people are like who have dedicated their career to meteorological forecasting. They have thick skins. They've all made mistakes, forecasting mistakes. They've had to learn that the only way you're going to get better is to face your mistakes absolutely square in the face and figure out what went wrong and try not to do that again. They're tough and just walk-through-a-brick-wall dedicated to the mission, so if you thought that you were going to get a director of the Weather Service to cave on something like that. It was never, ever going to happen – ever. Never. Just not going to happen. That's my take on it. I talked earlier about the intern program and how

much I enjoyed going and talking to the interns. One of the things that I learned to say to the interns, the folks who were coming in and going to consider a NOAA career, is that you're coming into an organization where everybody that works here is a hundred percent committed to the mission, run through a brick wall committed to the mission. If you don't feel that way, don't work here. You won't fit in. It's not for you. Because if you don't feel that way, you're going to have to pretend that you do anyway. As I said, one of the things I learned in my career is that the people that worked in fisheries labs feel that way about their job, too. [laughter] And they should. They're doing amazing things. Just amazing things.

MG: Everyone is so passionate and feels fortunate that they've ended up where they have.

EJ: Yes. I worked in NOAA for over thirty years. I would get surprised even in the last year of my career. Several times a year, I would go, "Wow. We do that? That is so cool." [laughter] I remember meeting the guys that made all of the lab standard gases that are used globally for atmosphere composition. They're the ones that build the samples that are used to calibrate the equipment that everybody globally is using to figure out how much CO₂ [carbon dioxide] is in the atmosphere, and how much this, and how much methane, and all that stuff. I was there. I was in the lab. That's where they do it. They do it right here. We've been doing it for years. [laughter]

MG: On your survey, you wrote about when you first came to the Weather Service, and you had a lot of great conversations with the "old-timers."

EJ: Yes, yes.

MG: I was curious who they were, and when that era ended.

EJ: Well, what I was thinking about when I wrote that was that, for example, I was in the Weather Service in the late '70s, but I talked to people who were there in the '50s and '60s. The Weather Service headquarters used to have several times a year a formal dance. The people would go and dance. One of the "old-timers," who worked in a division that doesn't exist anymore in the old Office of Hydrology, met his wife there. People built their social life around their job at headquarters. Headquarters was a social thing, as well as a workplace. Now, when I was there, even in the '70s, they still had liquor at the Christmas party, and there were rumors of one that got away from – and I never did get all those rumors nailed down. [laughter] Sloppy drunks in the elevators, and [rumors] like that. I never got all those nailed down. But people did drink at work – some. So that changed. I mentioned I worked at the Gramax Building. This is before they built the NOAA complex on East-West Highway. It's just up the street on East-West Highway. I remember going and working in that building on the weekends. If I had something that I considered to be critical, I went in and worked. I pulled an all-nighter on a Saturday night to get it finished. The building had no security – literally, no security. You just walked in. I think they had a guard at the front desk, but the side doors weren't locked. That's how you got in. You just went in and walked up to your office; no security at all. It was creepy. Some years later – I forget what year it was – there was a major fire in that building, big fire – like, shut the building-down-for-two-weeks-fire. The floor that the fire was on was scary. They had a hot fire. They probably pumped two million gallons of water into that building to shut that fire down. It

burned hot enough to spall the concrete out of the slab. I went and saw that. If you get hot-enough fire, the concrete just shatters and breaks loose. You can see the rebar. They eventually gave them a clean bill of health to reopen.

MG: What was the source of the fire?

EJ: I understand it was electrical wiring. It was on the thirteenth floor of all the luck. [laughter] Water just cascaded down the building. The building just leaked water for weeks.

MG: Was a lot of data lost?

EJ: Oh, gosh. Heck, yes.

MG: That must have been devastating.

EJ: It was a mess. It was a mess. It smelled bad. Fires always smell bad. That's something people don't realize about floods. Floods smell bad.

MG: What do they smell like?

EJ: Rank and musty. In the peak flow of big floods, the water is maybe twenty-five percent debris. It's just all kinds of crap. By all kinds of crap, I mean caskets, for example. The Great Flood of '93, the Mississippi River Flood, some of the pictures are of caskets that got popped up out of the ground, the ones that are still airtight. If you put enough water in there, they're buoyant, and the flood catches them and carries them on downstream. Then you've got caskets scattered for miles downstream from the cemetery, and trying to figure out which casket goes back in which hole. Not good.

MG: Did you study that flood?

EJ: The Great Flood of '93, I had some involvement in the post-event report, but I was mostly the headquarters guy that kept things going at headquarters while the survey team was busy. The Red River Flood of 1997, which I don't know if you were around for that, but it made the national news. It flooded Grand Forks and East Grand Forks – East Grand Forks, Minnesota; Grand Forks, North Dakota – to about this deep in the middle of the city. Then one of the city blocks caught on fire. They put it out with the kind of firefighting equipment that's used in forest fires. So they actually flew and over and did airdrops of flame retardant onto the buildings. It just destroyed those towns. That's one of my other high-stress things that I thought I should talk about.

MG: Yes, tell me about it.

EJ: So they do post-event surveys. They used to call them disaster surveys, and now they call them service assessments, I think, unless they've changed it since I retired. The purpose is really to figure out what did we do right, what did we do wrong, what could we do better, are there things we did this time that were best practices that should be repeated – that kind of stuff, and

been doing it for years, and years, and years. It used to be, I think, an important part of the internal training program. Some of the younger folks would be part of the survey team, and they would get to see what it was like. Eventually, at some point in your career, you would head a survey. They would always get – and there were all kinds of rules about it. So the fox wasn't guarding the chicken coop, you'd have someone who'd run the survey from one region when the event happened in another region. So I got tagged to co-lead the post-event survey for the Red River of the North floods, and the townspeople were really mad at the Weather Service. I mean, really angry at the Weather Service. They blamed the Weather Service for what they considered to be a bad forecast that caused them to not build the levies high enough. So the levies got overtopped, and the town got flooded. It was horrific. There's no other way to put it. It was horrific. I have to take a deep breath here because I'll tear up again. I remember being out in the town – this is weeks after the peak of the flood, more than a month after the peak of the flood. There was a parking lot full of furnaces and refrigerators and washing machines. Every one of those furnaces is a home that is no longer there. They were just feeding them into crushers to crush them and scrap them. So there was a big crane picking them up. So there were neighborhoods where nobody lived there anymore. The whole neighborhood was gone. I don't know where you live, but imagine that me and all my neighbors, and all of those social connections, and all of the friends that your kids have with all of their school friends are just gone. So it's not just you've lost your family photos; you've lost your entire social network, just *whoosh*, never to be recovered – gone. That's what happened in those towns. So they were really pissed.

MG: Can you say what happened? Do you want to take a break?

EJ: Yes, let's take a little break.

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MG: We were talking about the Red River Flood.

EJ: Yes. The Red River had a historic flood in 1997. The Weather Service has been forecasting the Red River for a long time. So forecast a big year – I really don't want to digress much into the forecasting methods, but at least a little bit, I'll say. So the Weather Service had a method for producing a seasonal prediction for the river levels during the snowmelt season. As a technical matter, the method they were using, in essence, predicted the minimal level and the most likely level that the river would reach in Grand Forks. So they produced two numbers, a low number and a higher number. The community, I would say in a truly fundamental way, understood those as the minimum and the maximum that they might expect. The technology that produced them, in essence, produced an estimate of a lower bound and a most likely, not a lower bound and a maximum. So when the higher number got exceeded, and the temporary levees that people had really sacrificed their own safety to build got overtopped, and these communities got flooded out, permanently lost, they needed somebody to blame, and we were it. We had an office that was in Grand Forks, so it was a personal tragedy for the people that worked for the Weather Service that lived there. Just to give you an idea of how hot it was, [how] emotionally charged it was, the peak flood was well passed before we could reasonably get a survey team to visit there because you couldn't get a hotel room. You couldn't even get there. So we waited until we could get

enough hotel rooms to double up and put a survey team in there, and start collecting data to write a post-event report. So I went to visit that office – first time I had ever seen them – and got ambush interviewed by the local media in the parking lot with a microphone in my face, a camera. Do you want to guess what the first question was? The very, very first question I was asked? “Who are you going to fire?” [laughter] Like I said, it was high stress. Everybody knew it was going to be high stress. The leader of the survey was myself, back from Weather Service headquarters, and the co-lead was an executive from the U.S. Geological Survey so that it wouldn’t look like a whitewash or anything, and it really was not a whitewash. We just don’t do that kind of thing. So I collected data there. I actually drove down to Fargo where they had just barely avoided the same level of disaster. They came within that close (about four inches) to the top of their temporary levees, which won’t last being overtopped by any significant amount at all; they’ll just wash them away. In Fargo, we were gods because they had used our forecast and built the levees, and it all held. In Grand Forks, we were devils. [laughter] I promised the mayors of Grand Forks and East Grand Forks that I would come back in about a month and present our preliminary results for them, and honored that promise and went back, thinking I would meet with them. I do that. So we set it up. They said, “Here’s the meeting.” Then we set up a “media interaction” after that. That’s not what happened. They had a public joint meeting of both city councils with the media there. I made a presentation in front of an angry crowd of a couple of hundred people on camera for three hours. It was really tough. That was hard. Maybe it was only two hours, but it felt like a long time. If you’re on camera being recorded, that’s more stressful than doing live because if you’re live and you bumble something, you can fix it right then if you recognize it. But if you’re being recorded, they’re going to grab the worst ten seconds out of your three hours, is all that’s ever going to be seen on television. Right? So, very stressful.

MG: Is that what happened?

EJ: I thought I did pretty well. I don’t know what all the coverage was. I at least got to make the point that our people live in your community, and have been just as devastated as you have been. I also got a chance to at least talk about how much I admired their community spirit for working together and trying to save the town, which I felt good about. I mentioned earlier that sometimes, it’s all about communications. There were things we could have done better in terms of making investments to build a better forecasting system. They were actually already underway and got accelerated by the flood. I think they’ve done a lot better job. The community interactions have improved substantially, but there were definitely things that could and should have been done at the time to simply communicate better what the actual state of knowledge was. Some of it was our own people not fully understanding the limits of the forecasting technology they were using, and some of it was a lack of real social science expertise in how people were understanding what was being said.

MG: In a couple of years, you would go on to be the strategic planning – what was your title?

EJ: The director of strategic planning and policy. That’s a fun story, too.

MG: Well, am I missing anything from the Red River Flood?

EJ: No, that's good. Let's move on. A lot of my career was being the hydrology representative on these things related to the MAR and strategic issues for the Weather Service. They would want to put a balanced team together, and I had been "the hydrology person" on several of those kinds of things. So the Director of the Weather Service at the time, Joe Friday, got into hot water and got canned. He would tell you that. He got canned the way executives always get canned. He got moved aside into an "equivalent" position as the Director of the Office of Atmospheric Research, and they brought in Jack Kelly, who had the ear of the Secretary of Commerce and was a hardnosed son of a bitch. I would say he was a twenty-four-carat gold son of a bitch. I worked for him. He wanted to make another strategic plan for the Weather Service, so he brought together a team to write one. I was on that team. Then he looked at what they produced and went, "This is trash," and got rid of it, and formed another team to write another strategic plan.

MG: Was it actually "trash," or did he not agree with it?

EJ: I don't remember it that well. I'm not sure I should answer that question, but he certainly didn't agree with it. So he formed another team, and I got asked to be on that team, too. [laughter] He trashed that one, too. He finally decided that he had to be a direct participant on the actual team that was writing the strategic plan. So, he formed yet another team that he was going to lead to write a strategic plan for the Weather Service. I was on that team, too. I think I was the only person who was on all three of them. So we're trying to develop the structure and figure out what ought to be said and a strategic plan for the Weather Service, and we're on a break. I never got him to confirm that this was why this happened. You remember that I told you that they had deferred any restructuring of Weather Service headquarters. Well, Jack Kelly inherited the – okay, we now finished the MAR. We've got a structure for our field offices. Now it's time to turn our attention to headquarters. So he did a restructuring of National Weather Service headquarters and a restructuring of the regional office headquarters as well, which will become important in a minute. So we're on a break from this meeting about strategic planning, and I'm standing next to him in the bathroom. I mention to him, "I think I see what you're trying to do, but I wonder if you know how hard this is going to be for this organization." I always thought that that direct conversation with him is what lead him to think maybe I would make a good director of strategic planning and policy.

MG: In the bathroom.

EJ: In the bathroom, yes, standing next to each other at the urinals. I don't know if that had any effect or not, but I thought maybe it did. So he was determined to finish off the modernization, which had all been focused on changing the field office structure and really take a look at headquarters. So he was going to do that. The then-director of the Office of Hydrology was – and I was a division chief in the Office of Hydrology. I was, at the time, the director of the Hydrologic Operations Division. So there were three SES-ers (Senior Executive Service) in the hydrology program with the Weather Service: director of OH, the director of the Hydrologic Research Lab, and the director of the Hydrologic Operations Division. If you're a minority program – Hydrology is like, round numbers, ten percent of the Weather Service – one of the key things in the viability of your overall structure of your program is how many SES-ers you have because they are the top positions of the whole structure. So if you aspire to get promoted,

virtually no chance that you'll ever become director of the Weather Service if you're a hydrologist. It's never happened before. Who knows. Maybe it will happen someday. But it's much more likely that a woman will be director of the Weather Service than a hydrologist will be director of the Weather Service. [laughter] Let's put it that way. That will happen first, I'm pretty sure. So I knew Jack Kelly reasonably well. You remember the disaster survey of the Red River of the North? I didn't finish that before Jack Kelly came in as director. So it was not yet published in final form because there was a technical appendix that hadn't been finished. So I was the very first disaster survey that Jack Kelly was going to sign. He was incredibly nervous about that. He chewed me up one side and down the other over that disaster survey in a video teleconference where I presented the survey, and he basically cursed me and threw me out of the room. It was so bad that people called me from all over the country to ask me if I was okay. It was bad. He was a rough guy.

MG: Why was he so mad?

EJ: I think ultimately because it had been delayed, and he felt like it was going to be a political embarrassment for him. He didn't want to waste any of his political goodwill on such a thing. I also think that he changed the way that we did post-event surveys, which is one of the things that he did. He demanded that they get finished within three months. This was a year and a half late. They had been late for – lots of them were late. He also changed the format of how they were produced, so that they were not so much scientific pieces as they were specific recommendations or changes. We had been keeping those separate, so you would have a science-y – what went well, what didn't go well – blah, blah, blah. Then the creation of specific action items was a completely separate activity. We had been creating action items, but not publishing them. They weren't known. They didn't have a public face. He was worried about that because he demanded that we have them. So we produced them, but we weren't going to publish them. He thought they were going to be public and would be even more embarrassing. I think it was fear-driven; that's why he was chewing me out so bad. So he did the first one, and then I repeated it. I did another one. He chewed me up one side and down the other on the second one. Then for the third one, I was finally getting a little smarter. I looked at his calendar, which is public (or at least accessible to NOAA employees), picked what I thought would be a good time to actually schedule this because one of my mistakes was I scheduled it the day after he got back from an international meeting, so he was tired and grumpy. [laughter] So I scheduled it for the best possible time, which meant I had to fly back from my beach week vacation and lose three days of time with my family in order to present it, but I was going to get through this one. So I did that, at my own expense, by the way, because they won't fly you back from your vacation. [laughter] The third time I presented it, it got through, and we finally got it presented and signed and published. Jack Kelly was a tough guy to deal with. He was a brigadier general and was a kick-ass, kick-down, kiss-up type of guy. I don't care if he hears it. [laughter] So when he was looking to do a reorg, I knew that you had to be absolutely straight as the day is long with this guy. You couldn't try to hide out and hide yourself from him, but that's not how my boss felt about the Office of Hydrology. So my boss didn't take my suggestions. As a result, when Jack Kelly did the reorg, he got rid of an SES position in hydrology, which was a huge loss for us, and I was the one that he got rid of. There was no place for me in the new org chart. [laughter] *Poof*. But he did create this new office directly attached to the director of the Weather Service called the Office of Strategic Planning and Policy, and that's what I inherited. It worked out great for

me. I loved the new job, learned some whole new areas, had some fabulous people working for me. It had its own stresses. Jack wanted me to be – for a while, he wanted me to be one of his right-hand people that he met with every morning for fifteen minutes. I hated that. He was a tough guy to work for. I could have learned some things from him. Some of the things I could have learned from him, I didn't want to learn – how to be really tough-minded with people. In any case, that's how I ended up with a job. I inherited some policy areas, which I guess I will say that for me, at least, policy is a weird word. It technically means the set of procedures and guidelines that a federal agency uses to follow the law. So policy is one level below law. It is, if you will, a parallel, but at a slightly lower level than "regulations." So regulations have the force of law. So the fishery service writes regulatory things, and have to be implemented in accordance with the law itself and the OMB [Office of Management and Budget] guidelines for promulgating regulations because regulations have the force of law. Policies don't have the force of law. Policies have to work within the law. So that's one meaning of the word policy. So policy is how does this agency follow the law. You assign this office is responsible for this; this office is responsible for that. That would be a policy. There's three different laws and which office is the primary one for this, and this. That would be a policy. There's policy in that sense, but policy also has a different sense, which is: what should the law be? That reverses it. So, as a matter of policy, should the law be changed? Is there something about the law that should be written differently than it is currently written. That's a policy issue. So it has this weird – it's used below the law and above the law in the sense of preceding the law and following the law. But I loved it. To me, it was like systems engineering. Writing good policy is algorithmic, except that the things you're working with are not equations and files and data and that sort of thing; they are people and organizations and institutions, which is more challenging. But I thought of it that way. It's a different kind of systems engineering job, and I really enjoyed it.

MG: Was that the position you stayed in until you retired?

EJ: Yes.

MG: So you worked under [John L.] Jack Hayes and Louis Uccellini?

EJ: I worked under Jack Kelly directly. Technically, my rating official was usually the deputy because the director of the Weather Service has lots of people they have to rate. So technically I worked for the deputy, but on the staff of the director for Jack Kelly, and then for Jack Hayes, and then for D.L. Johnson, and then for Louis Uccellini. So that was that tenure, including Bob Winokur, who served for a little while after Jack Kelly.

MG: As an acting director?

EJ: Yes. Mary Glackin was also acting director of the Weather Service. And I've been the acting director of the Weather Service for a couple of days, including the day when a pedestrian got killed in front of the building.

MG: What happened?

EJ: He just decided he was going to run across the street, and a car hit him. I had people that were shook up in the Weather Service because they saw it. So I had to deal with that. Not a job I would want. It's a tough job. Director of the Weather Service – hard job. Director of the Fisheries Service – hard job. Director of NESDIS – hard job. These are tough jobs. Tough jobs.

MG: I also want to ask about your work around the development of the NOAA Partnership Policy.

EJ: Sure. It's arguably the top accomplishment of my career.

MG: That's in the "Fair Weather" report.

EJ: Yes. So when I took over as Director of Strategic Planning and Policy, I inherited the "partnership policy" that was written in 1981, which said – and I may not quite get it quoted, but said the Weather Service won't provide a service that can be provided by the private sector. It had words in it that were pretty much like that. I read it and went, "What? I can't live with that. That's untenable." [laughter] Yet, it was highly politicized and the like. It was written at a time when there was a significant political push to privatize the entire Weather Service, to essentially claim they should not be a government function and move it out of the government. I actually talked to one of the Weather Service directors, who had somebody schedule time, sat down with him in his office, and made him a cash offer for the Weather Service. He told me it was a pretty decent offer, too. "Work with me, and I'll buy the Weather Service from the government as a going concern."

MG: Would it have been a company like AccuWeather?

EJ: I don't know who it was. I didn't ask. He probably wouldn't have told me anyway. I don't know. It could have been AccuWeather or the Weather Channel. The Weather Channel might not have existed by then. [Editor's Note: The Weather Channel was formed in 1980 and launched in 1982.] Maybe it did. I can't remember all those different dates; I can't keep them straight. Yes, so I inherited that policy. It was so political that I couldn't just rewrite it and propose a new policy. Technically, I could, but I knew that that was never going to work politically, just never. So me and one of my treasured colleagues who's no longer with us –

MG: Who is this?

EJ: Peter Weiss, who committed suicide while he was working for me. That's a different story. [We] convinced Jack Kelly that we needed to replace this policy, and we needed enough cover to do it. Therefore, it was going to be worth the investment and worth the significant risk of commissioning a study by the Academy of Sciences of this whole policy area. That's what led to the "Fair Weather" report and their statement that the 1981 policy was untenable. The fundamental conclusion that – it doesn't say this in the report, but this is the way I like to see it. There aren't any magic words that will describe for all time who should do what. There is no such thing. The entire area of meteorological services is always going to be disrupted by new science and technology continuously. The only way you can really deal with this policy area is essentially a procedural approach that says, "Be open, be transparent, and the government should

invite comments on change in any of its products and services, including proposals to terminate them.” That change in methodology – it’s not just a change in the policy. It’s not just a change of the words of the policy; it’s a change in how you do it. This is about dialogue. It’s not magic words about who does what and with what tools – is the transition that we put in place, basically. I think we did a pretty good job. I like to say that the private meteorological companies who had been seen as a strategic threat to the Weather Service, by the time I left, were partners with it. It was always called a “partnership policy,” but they were actually an asset or could be used as an asset. The media is certainly an asset for the Weather Service in some truly spectacular ways.

MG: The other sector would be academic.

EJ: Yes, they usually talk about the “three sectors.” But, if you will, it’s actually much more complicated than that. It’s just a simplification. So at the very least, the private sector is both service providers and equipment makers. Then the academic sector is – you say that as if there’s only one research sector, but it’s actually not like that anymore. So you’ve got this increasing diversity of players. One of the things that we did in trying to make people think more broadly and constructively about the different roles that folks play is I worked to put together a short course. We made sure that the participants were about equally balanced between the private weather provider world and the government forecaster world, and put them both in the same room. Then we did a cross-cultural training program back and forth between me and John Toohey-Morales. It was what’s it like to be a forecaster in a private company, what’s it like to be a forecaster in the Weather Service, what are the kinds of issues that you deal with – back and forth, back and forth. We tried to model what we were trying to get people to do by having me talk about what’s it like to be in a private company, and having Toohey-Morales talk about what it’s like to be in the government. In the end, we had a couple of really challenging exercises where we forced people to take the other role. So we made the government people do something like, “Okay, you have been working for two years on rolling out a new product of this type, and you are now one month away from rollout. The National Weather Service has just announced that they’re going to produce this product. What are you going to do about it?” That was what we asked. Alright? For the private guys, we said, “You have proposed the following product. Here’s a sample of the comments that you received on that product. What are you going to do?” We made it just impossible. Really difficult. One of them was from a senator that said, “If you start this product up, I’m going to tear your budget apart.” Another one was from an emergency manager who said, “I desperately need this product. You finally have come out with it. It’s going to save lives.” It was that kind of tension. Just to get across that, if you’re in the government, you’re trying to make these balancing decisions between different parts of society, some of whom want you to do things, and some of them want you to not do things. If you’re in a private company, the government is this external force that can ruin your company. Just to try to get people to try to understand what are the sources of this tension between these groups, so you can at least think about it from the other person’s perspective. That was fun. It was really fun.

MG: You wrote that there was a turning point in these relationships and this tension in 2006. What was that about?

EJ: What happened was we commissioned the “Fair Weather” report. It was published, I think in December of ’03, if I remember right. I wanted to move on as quickly as I could. Just a few

months after that, we put out a draft of a proposed policy. Since this is NOAA oral history, the sharpest conflict over environmental information in NOAA has always been weather because weather information has more economic impact than other kinds of information that NOAA produces. But that's not to say that there aren't information issues, even with Fisheries. Although Fisheries is a regulatory agency, so most of their controversy is about regulations. So, the focus of the report was Weather Service, and the Weather Service commissioned the "Fair Weather" report with the Academy of Sciences. They went so far as to recommend – they recommended the Weather Service replace its policy, but they also recommended that NOAA consider adopting a NOAA-wide policy. So with that in mind, I wrote a draft policy and put it out for public comment. It was just roundly opposed by a big chunk of the meteorological services industries with AccuWeather leading the charge and AccuWeather's partner companies, many of whom they have since bought, so they're now part of AccuWeather, leading the charge. So we got something like eighteen hundred comments. About a third of them were virtually verbatim the same, about what a terrible idea this policy was. Then we wrote an analysis of all the comments that we got and wrote a more extensive policy, proposed it as a NOAA-wide policy, and it was adopted as a NOAA policy on partnership, not just a Weather Service policy. That policy was put in place by letter, and the flap continued. So it was then revised slightly to put in some "there-there" words, I would argue, without really a change in structure. It was still the same basic promise. The fundamental promise is NOAA is no longer going to make changes to our products and services without consulting everybody who's affected and at least giving them a fair response to their concerns. I used to have to tell people over and over in the Weather Service that, "No, we did not give away the farm. We didn't promise that if they don't like it, we won't do it. We just said we're going to give them an answer. So if you can write the answer, then you can put in the service."

MG: It seemed to be about coordinating more closely with the other sectors.

EJ: With everybody, supposedly. By the way, I was absolutely terrified about one piece of the policy we put in place, the terminations policy, because what we put in place was: anyone who believes that a Weather Service product should be terminated should contact me, [laughter] and I will – me by position in the Weather Service – and I will consult with whoever I need to consult within the Weather Service, and I will give you, the nominator, an answer of whether the Weather Service is willing to propose that termination. So somebody said, "I nominate hurricane warnings to be terminated by the National Weather Service; no more hurricane warnings." Then I would probably write back and say, "We've considered your recommendation, and the Weather Service is not going to propose termination of the hurricane warning as a product." I was genuinely concerned that I would have to process hundreds of proposed terminations, hundreds, by people who were pissed off at all of the things we were doing. I never ever got one that wasn't proposed by someone who worked for the Weather Service. Every one of them was a proposal by somebody in the Weather Service, who went, "This doesn't make any sense. We need to stop this." [laughter] Every one of them. That's a little sidebar. So we made some slight wording changes. It was along the lines of the National Weather Service – NOAA recognizes that cooperation rather than competition is the better way to go. It doesn't say that, but it had words like that. That seemed to be enough, along with an honest effort to look at these issues of change from multiple perspectives because they were just doing whatever the hell you want to do. If you will, the temperature level of the conflicts lowered a lot over the span of four years,

five years, something like that. We eventually got to the point where – it depends on the person. We still get people who get hot under the collar, I would say, in both directions. So that position in the sense of serving as the executive contact with the weather provider companies is a bridge position. People are mad at you from both directions. So I would have to deal with folks that were inside the Weather Service who got all hot and bothered about something. They would want me to do things that I went, “The government’s not going to do that. We are not going to comment on the bad forecast that such and such a company made because the government doesn’t do that. We don’t have a law that says we’re supposed to be making judgments about whether their services are good or bad or anything. We’re not going to do that.” [laughter] So that would be – like I said, it would go on both sides. I would be the funnel for folks in the weather companies who thought somebody in the Weather Service had done something that they shouldn’t have done. Sometimes they were right. Sometimes we had done something we shouldn’t have.

MG: I also have in my notes something about a strategic plan around a “Weather-Ready Nation.”

EJ: Yes. Let’s see if I can do this. As Director of Strategic Planning for the Weather Service, I was the contact point with NOAA’s strategic planning community. So NOAA has a whole strategic plan. From the perspective of the requirement that federal agencies have strategic plans, the NOAA strategic plan is an adequate response to that. I know that’s a bureaucratic thing, but the Weather Service doesn’t have to have a strategic plan. The “Weather-Ready Nation” strategic plan was actually done – wasn’t my initiative. It was done by other folks in the Weather Service. I was a participant, but I was not a lead on that one. I think it’s a fabulous title. Fabulous title. I wish I’d thought of it. I can’t tell you who thought of it. I’m really bad at that. I can never remember who thinks of – because they’re usually done in some creative group, and they’re bouncing ideas back and forth, back and forth – “How about this? How about this? Oh, yeah. That’s it. Yeah. How about if we change it a little bit this way?” You can never figure out – I can never remember. So somebody gets the credit for it, and I’m perfectly okay with that.

MG: The next year, 2012, there was a MAR assessment. Did you have a role in that?

EJ: Yes, I did. I did. It always bothered me that there wasn’t an official document that evaluated the MAR. That just never happened. It was declared over. Jack Kelly was in a hot hurry to make that happen because it got us off of the – what’s it called? GAO [Government Accountability Office] has a critical government projects list or some darn thing. He wanted to get us off of that by declaring the whole thing finished, but that’s not the same as actually doing a post-event analysis, creating an official history of the MAR, and I always felt like that should happen. Then there was also, if you will, a pressure on the Weather Service to start looking in a more strategic way at what post-MAR changes should be made in the Weather Service. So we commissioned – it’s one of those backroom joint things where the language got into, I think it was, the appropriations bill. Friendly comments back and forth in the backroom about what the language is going to say and directed the Weather Service to commission a study by the Academy of Sciences on the MAR. I was one of the ones that was pushing for we should make part of this a historical record of the MAR. So they did this two-report series, the first one was a

really historic look at the MAR, which never had an official document that looked back at the MAR, so I felt like that was necessary. When it was finally done, the political world looked at it and went, “What? Why are you doing that?” Because it was all looking back at the past instead of making recommendations for the future.

MG: Is that historical look in this 2012 document?

EJ: Yes, there’s two documents. There’s one in 2012, and then there’s another one that came out later.

MG: Did you want to say anything else about this?

EJ: Well, I do want to talk about history. I would occasionally argue that the Weather Service should have a historian, and agitate for a little more attention to history in the Weather Service, not that I know a lot about the way that histories are done in other parts of the government, but my impression is that, for example, the military pays a lot of attention to history. That’s because they know that creating a really honest assessment of military engagements and battles and strategic choices and the like is super important to training programs for future military officers. So those histories make the raw material for all of the service academy training, and for lots of other things as well. I always felt like the Weather Service should be thinking of itself the same way. So the lack of a really honest and open history of all of the strategic choices that were made in the MAR is a real shortcoming. It’s a loss. The Weather Service is so connected to the society around the Weather Service and so driven by changes in science and technology and so connected to even international diplomacy that a thoughtful and accurate internal history would be an incredible asset. I would occasionally try to lobby Weather Service directors to create a historian position, and it never happened. I always thought that the Weather Service should have an annual report that wasn’t just about the weather because we got all kinds of stuff about the weather, but also about these more, if you will, bureaucratic and structural and policy decisions. That never happened either. It takes time. It takes money. It takes effort. I know you couldn’t do it without giving that person some other significant responsibility. They would have to become your focal point for records management, for example. They would have to be the person that lived up to all the responsibilities of the Records Management Act. But that would be a reasonable tradeoff, I think. It would be a useless position if they didn’t have pretty broad access to all the senior leadership. That would always be at risk. But, oh my gosh. Just think of what’s been lost, that you’re doing this with an oral history with folks like me and our limited memory, rather than with good solid records and a real foundational thing that people like you could read. You’ve asked me what year things happened, and I can’t even remember what decade it happened.

MG: It would certainly help my research because some things are a little spotty.

EJ: It is spotty. It’s all idiosyncratic and particulars. Folks like me, I was all focused on what’s the problem of today, what am I going to do, not on thinking about the historical record. Sorry about that.

MG: That's alright. You've already given me a ton of material. I'm not sure what I should ask about next or how we're doing on time. Let's take a quick break.

EJ: It's about 12:30 now.

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EJ: I had a list of things that I wanted to at least mention that I stuck at the back of my –

MG: Here's your survey.

EJ: [inaudible] I talked about that.

MG: We could talk about your retirement.

EJ: We can do that. Yes, close it out with that. So I was director of strategic planning and policy, and they went through another headquarters reorg that Louis led. I thought they did a pretty good job on the reorg, but there really wasn't a – so this office that I ran, the Office of Strategic Planning and Policy, collected up a number of things. We had as major specific policy focus the partnership policy and the private sector relations and all the things associated with that. I think maybe one of the things I should talk a little bit about is the other NOAA LOs [line offices] and their approaches. Let me do that, and spend a little time. So the Weather Service is the most procedurally based part of NOAA. That's absolutely unsurprising. The way I would explain that to people is you have to make darn sure that a tornado warning means the same thing in South Dakota that it means in South Carolina. To do that, you have to have a very procedural approach to how you're producing information. You have to have people that are cross-trained, so you have the same training programs. So it's a very procedures-oriented organization. I think they are the only one that has anything close to the Weather Service policy manuals. They had something even before that called "The Weather Service Operational Manual" that, again, collected procedures and policies. But the rest of NOAA ain't like that. They're just not. So when NOAA decided to have the NOAA partnership policy applied NOAA-wide, they weren't about to sign up to one approach to do it in all of NOAA. So it doesn't do that. It just says the directors of the line offices are the responsible parties for implementation, and the NOAA CIO [Chief Information Officer]. So they're identified in there as the responsible parties for implementation. That is a shortcoming. Not that the Weather Service does it perfectly, but the Weather Service at least supposedly has a record of all proposed changes and the comments that were received and the decisions that are made, and that sort of thing. The other LOs, no; they don't have a central recordkeeping function like that. Doesn't exist. It's not as clear exactly what they're doing there. Plus, there's not necessarily consistency in the decisions that are made. I know for a fact that NOS did some things that you would never get away within the Weather Service because of the much higher visibility. So they produced apps that they published, and you could download to your iPhone and your Android that would gain you access to a bunch of data buoys that they were running. The Weather Service would never be able to do that. We ain't doing that. I wouldn't even propose it. So there is a laudable acceptance of the overall policy framework, but there's not uniformity of application or decision making or even recordkeeping with regard to the policy framework. As a little fun sidebar – we were talking

about high-stress moments. So one of the high-stress moments was actually briefing NOAA to try to get the NOAA partnership policy accepted. I had spent months ahead of time beating on the doors trying to get appointments with the directors of all the line offices and their appropriate parties to present this decision and get their thoughts ahead of time. The one I had the most trouble getting the attention of was the Fisheries department. It became apparent when I was briefing this that that was a problem. [laughter] So I'm in front of [Conrad C.] Lautenbacher at the time at the NEC [NOAA Executive Council]. You know the NEC and the NEP [NOAA Executive Panel]. Maybe they don't exist anymore. The NEP was all the deputy directors of all the line offices in front of what they now call the COO [Chief Operating Officer] of NOAA. The NEC was the ultimate decision-making body. So all the chairs were the directors and the director of NOAA Corps and the NOAA Administrator. They made the final – they were the final aggregate body that advised the NOAA Administrator. So I'm making this presentation in this little tiny room down at Commerce, and it was getting hotter and hotter and hotter, and it was going on and on and on. There's a big projector and everything. Right as I got to the end, to the decision-making point, the screen puts a little thing on the screen that says, "Projector overheating. Will shut down now." [laughter] That was funny. But I had managed to get all the way through. I was prepared to brief from paper if I had to. What was her name, who was head of Fisheries at the time? It was pretty clear I had the agreement of almost everyone around the table, but not Fisheries because I couldn't schedule a meeting with them. I tried and tried and tried. "Oops. I guess we dropped the ball here." We put the NOAA partnership policy in place. I think that was very forward-thinking of NOAA. I've had conversations, even with Fisheries folks in the time after that about the growing importance of the information assets of the fisheries labs and the kind of stuff that the Fisheries does. Although I realize it's not at the level of economic impact as the weather forecast and warnings of hurricanes and things like that, it still is important environmental information. More and more at the NOAA-level, [there's] a recognition that NOAA is an environmental knowledge organization, and that integrating knowledge about the environment from space to the ocean is what they're all about. Enough of that. What else were we going to try to say?

MG: Your decision to retire.

EJ: Oh, yes. So they reorganized Weather Service headquarters and they took the Leg [Legislative] Affairs team that was mostly in my group and put them in one place, and they took the policy stuff that I was doing and they put it in another place, and they took the strategic planning kinds of things, and they put it in another place. So there wasn't an equivalent position anymore. The question is, is there any of those other SES jobs that are attractive to me. There was one that I thought would be of interest. Frankly, because I was a little too honest in the wrong room, [laughter] the word came down from the then-political powers that I was not going to get that job. It was time to retire anyway. I used to tell people that I was mostly paid to care. Eventually, you just get tired, and you don't care as much, and so it was time to go. I was glad to go. It was one of the easiest things to get used to. Oh my god. [laughter] I did try to set up a company. I actually set up an LLC (limited liability company), and tried to do a little consulting work. I had visions of maybe working half-time or something like that. I landed enough consulting work to pay back all the costs associated with creating the LLC and getting all the legal stuff done, bank accounts, and all that stuff – and the cost of terminating the LLC and getting the hell out. I have since occasionally gotten phone calls where people want to talk to

me. They'll find me on LinkedIn and be interested in this boundary between the private world and the government world and weather information. I've had some really interesting conversations about that. After I decided I really just didn't want to work for money anymore, I actually helped out a company. I said to the company president, "For the cost of a couple of free lunches, I'll be glad to tell you what I know about what these words mean on this NOAA proposal you're trying to read, and what I think the issues are, if you think that will help. It won't cost you much." [laughter] I got asked to talk to a group of Chinese nationals about some of these policy issues. We haven't talked about a couple of my favorite briefings. Maybe I should mention that.

MG: Sure.

EJ: When you make a presentation, you get different levels of buy-in or different levels of participation. At the top of that, which I've only achieved a few times in my whole career, you bring ideas into a room that light the whole room up. So, at first, people just listen to you politely. You can tell they're being attentive, and that's good. You might get a question or two about the thing, and that's it. At the next level up from that, you get more than a question or two; people are really enthusiastically asking them. When you're done, they want to come and chat with you and they want to go out and have you lunch with you. They're really excited and interested. It's turned them on to a new thing or a new way of looking at something, and they really want to understand it better. The next level above that is that they start arguing between themselves about things that you have lit up. I did that once in a briefing to a National Academy of Sciences panel about business models for observing systems, what I call business models for observing systems, which is really who's paying for what and what are they getting. The point I was trying to make is there's a whole area of scientific design of observing networks that's interesting. I know something about it – optimal information and how many stations and blah, blah, blah. You can set up a very interesting little science problem there. But there's a really different and, to me, much more interesting thing about institutional cooperation to observe. I had a bunch of examples of observing systems that I knew about and how they worked and how this institution did this part, and this institution did this part, and how they got a better deal that way. But if you look at each individual piece, you can't really quite see how they could justify it. But the whole thing works. I started talking about that, and it really changed the focus of that entire Academy of Sciences Panel I heard later on. It was a whole area they just hadn't thought about. They hadn't thought about it that way. I gave them a framework to think about the problem. I was super proud of that. The other one that I recall was a briefing that I gave for a deputy secretary of Commerce in the same area. It's don't just think about the science issues; think about the flows of information and money between NOAA and other federal agencies and the international community and the private weather communities and the emergency management community and the public, and here's how that all works. Here's about how much money is going from here to here. Here's what people are getting for that, and if you want to change that system, like monetize information flows that currently NOAA is giving away for free, and you want to start charging for them, here are different unintended consequences of changes like that that you're likely to see. So if you start charging for this, people are going to start charging you for that, which you're currently getting for free. You might lose money. So I had that kind of briefing in an environment where it went – people have this, "Whoa, I haven't thought of it like that." That's really rewarding when you can manage to do something like that.

That is really, really rewarding because you're making people think about the world that they're in from a perspective they hadn't thought about before, and that is really fun. That's the most fun you can have. So then I retired, and I retired because I did something that created a little bit of a political problem, and the politicals at NOAA sent the word down that I wasn't going to get that job. I kept looking at the org chart and went, "There is nowhere else I want to work." So I retired. Then I tried working and didn't want to do that. So I filled my life with other things, like writing this book.

MG: The book is about your first born granddaughter, *Adelaide Climbs a Tree*.

EJ: Which is still available on Amazon.

MG: It's very cute.

EJ: So I did that. I traded cars with one of my sons. The one he was driving shouldn't have been on the street. [laughter] So I've rebuilt the car that's out in front of my house, and that's been fun, learning about a new car and that sort of thing, working with your hands. *Adelaide Climbs a Tree* is a picture book, written about and for young girls, maybe young boys, too. Then, working on the cars, working with my hands. I just recently took a glass-blowing class. I know this is an oral thing – and there it is right there. There's the vase I made.

MG: It's a beautiful black and red vase.

EJ: I find that there are ways of filling time that feel like fun.

MG: I might want to follow up on a few things that we talked about today.

EJ: Sure.

MG: Maybe this is a good place to stop for now. I really want to thank you for all the time you spent with me today and the things you've shared with me. I'll look forward to getting together again if that's a possibility.

EJ: Yes, that should be possible at some future date. There's certainly things we could talk about. It's been fun for me, too.

MG: Good. Well, I'll listen back to this. I'll also share a CD copy with you. If there are things that come up that we left out, we can find another time to add it to the record.

EJ: Yes. We'll definitely need to talk about how you're going to use this pre-interview survey.

MG: Sure.

EJ: I still have to get some of the data checked in that to make sure it's okay.

MG: Okay. Well, let me turn this off for now.

EJ: Okay.

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Reviewed by Molly Graham 10/28/2019

Reviewed by Edward Johnson 11/12/2019