Transcript for "Jan Null, forensic meteorologist and Certified Consulting Meteorologist at Golden Gate Weather Services in Half Moon Bay, California"

Clear Skies Ahead: Conversations About Careers in Meteorology and Beyond

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Kelly Savoie:

Hello, Clear Skies Ahead listeners. This is Kelly Savoie, and I'm hoping you can take a moment of your time to rate and review our show wherever you listen to podcasts. We have produced over 60 episodes, and you can help us reach even more individuals that will benefit from the diverse experiences shared by our guests. Thanks so much for listening, and I hope you enjoy this new episode.

Welcome to the American Meteorological Society's podcast series, Clear Skies Ahead: Conversations about Careers in Meteorology and Beyond. I'm Kelly Savoie, and I'm here with Emma Collins, and we'll be your hosts. We're excited to give you the opportunity to step into the shoes of an expert working in weather, water, and climate sciences.

Emma Collins:

We're happy to introduce today's guest, Jan Null, Forensic Meteorologist and Certified Consulting Meteorologist at Golden Gate Weather Services in Half Moon Bay, California, and the 2023 recipient of the Henry T. Harrison Award. Welcome, Jan. Thanks so much for joining us today.

Jan Null:

Thanks for inviting me.

Kelly Savoie:

Jan, could you tell us a little bit about what sparked your interest in atmospheric science and how it influenced your educational path?

Jan Null:

Sure. So, unlike a lot of meteorologists that I've worked with, anyway, over the years, who began taking rainfall readings when they were seven years old or so, I was more of a science generalist. I was always interested in math and science. Those were certainly always my favorites in school. And actually in my high school yearbook, I'd put that I wanted to go on and get a degree in physics and become a physics teacher. I had a very inspirational physics teacher in high school, and that led me on that path.

That morphed into, in my freshman year in college, I became interested in astronomy, and so I sort of bent off in that direction. I was actually working part-time at a local Chabot Observatory in Oakland, California giving tours and explaining the telescope and was really enamored with that, not realizing that that was a fairly narrow career path. At the beginning of my third quarter of my freshman year, my life took a hard right turn, and I began three years in the army, including a all-expenses-paid trip to Southeast Asia, 1969. The big takeaway meteorologically for that was I did get to experience my one and only typhoon.

Kelly Savoie:

Oh, wow.

Jan Null:

And so I got out of the army, came back to school, was going to transfer to University of California at Davis, and I happened to see a flier for the atmospheric science program at Davis. So I contacted them, went up and did a visit, chatted with them, and it really seemed to fit into the sorts of things that I liked. I liked the fact that was very much in... Lot of meteorology was in real time, very synoptic scale stuff that they were looking at at the time. And so that is how my trajectory got into meteorology.

Kelly Savoie:

And so you have to tell us about the typhoon. What was that like, experiencing that?

Jan Null:

In some ways, it was a blessing, because it meant that basically all activity stops. Everyone sort of hunkers down. I was in aviation and helicopters at the time, so we were all grounded. And actually some of our helicopters were flown out of the area to be in a safer part of the country. So, lots of wind and rain and just hunkering down. It was actually, from that point of view, it was a good thing, as opposed to some of the day-to-day stuff.

Emma Collins:

So, what opportunities did you pursue inside and outside of school that you knew would be beneficial to securing a job in your profession?

Jan Null:

Probably the best one was between my junior and senior years, there was a job announcement for a student trainee at the National Weather Service River Forecast Center in Sacramento, which is about 15 miles away from Davis. And I and just about everyone else in the department had applied for it, but I had veteran status, and it was a federal job, and actually that ended up being the deciding factor. Hopefully it was some of my other attributes as well. But it was a great job, it got my foot in the door. After that summer, when you're a student trainee like that, you actually remain on the National Weather Service roles on leave without pay. So, I was generally guaranteed a job when I graduated, some place within the National Weather Service. It could have been any place. Basically, as long as I graduated and didn't commit any felonies in the interim, I had a job. And so that was really a big thing coming out of school, knowing I was going to go to work in my chosen field.

Kelly Savoie:

So tell us, did you end up having a professional job in the National Weather Service, or did you start doing something else?

Jan Null:

No, literally the week after I graduated, I started with the National Weather Service, and I was able to get a job with the National Weather Service in the San Francisco Bay Area, which is where I'm a native of. Which, I'm sure you've talked to lots of other National Weather Service people, they have to relocate and move around all through their careers. I started out at home and literally stayed my entire career in the San Francisco Bay Area.

Kelly Savoie:

That's lucky.

Jan Null:

There were just lots of little things that happened along the way. I became an intern in 1974. And yes, those with your calculators, that's 50 years, coming up on 50 years ago. Seems like it was just yesterday, sometimes. I worked up through the intern program and became a journeyman forecaster at the National Weather Service Office in Redwood City. At that point, to advance to the next level, which would've been a GS 12. There were no GS 12s in the local area, so I was looking to have to move. In 1980, they opened the Center Weather Service Unit at the Air Traffic Control Center at Oakland Center, and I was selected as a meteorologist in charge at opening up this new office. And it was actually when I was working in Redwood City, it was like a thirty-minute commute across the Bay. This was a ten-minute bicycle ride from where I was living at the time.

Kelly Savoie:

Oh, nice.

Jan Null:

Yeah, lots of things just kind of kept falling along the way. So, I worked at the Center Weather Service Unit for three years, and then a lead forecaster job at the next promotion level opened up back in Redwood City. So, in 1983, I became a lead forecaster at the National Weather Service. And so going all the way from GS 5 to GS 14 without moving is certainly rare. I don't know if unheard of, but doesn't happen very often. As a lead forecaster, besides obviously the shift in operational duties, you become a program leader in lots of different things, and over the years I was hydrology focal point, a disaster preparedness meteorologist, I was an AFOS systems manager. So I got to learn lots of different moving parts, which would all come into play with the second part of my career, which I'm sure we will chat about.

I also developed one of the first National Weather Service websites back in 1994. The other thing that happened in 1994 though, was that they moved the National Weather Service Office from the Bay Area down to Monterey. So, I commuted there for about three and a half years, about an hour and a half commute each way, and that was getting kind of old.

And what happened though, at the end of 1997, they were trying to do some downsizing in government, and they were offering early retirements to people who had met certain criteria. I had worked for the National Weather Service for more than 20 years at the time, 23 and a half, something like that. And so I qualified for an early retirement, so I decided to take that option to leave the federal government. I can mention that overlaid on top of 20, almost 24 years of working rotating shifts, I had gone back to school and gotten my master's. It took me 13 years. Again, that might be a record. Usually they kick you out after five years or so.

Kelly Savoie:

Five or six, yeah.

Jan Null:

But I kept getting extensions. I was working with a great professor who... I was doing a lot of El Nino research and stuff like that that dovetailed with what he liked, and so he understood my situation, with doing shift work, raising a family, all those other things.

I also, in 1987, began teaching one night a week, part-time, at San Francisco State, one night a week teaching an intro to meteorology class, and I did that for 25 years there, and then another five years at San Jose State. The great advantage of... So this gave me feet in two of the three sectors of the enterprise, in education and public, and then I was going into the private. So, I had lots of different skill sets and things that I could bring into the job of being a forensic meteorologist.

Kelly Savoie:

Yeah, I was going to say, you'd be an incredible mentor to someone. So any listeners here, Jan is on our career advising portal as a career advisor, so I recommend you get in contact with him. No, that's incredible though.

Jan Null:

Thank you. And I'm more than happy with talking to people. It's really important for people who have mentors at all levels of their careers, not just when they're starting out, even people in mid or late careers. I've been fortunate to be a mentor with other people starting up consulting businesses, and wanting to know how do you get started? What are some of the tools you use? And things like that.

Kelly Savoie:

Yeah, we're going to ask you all about that.

Jan Null:

Okay, let's keep going.

Kelly Savoie:

Yes. So, you left the National Weather Service early, and that's when you started your consulting business, right?

Jan Null:

Yes, I started Golden Gate Weather Services.

Emma Collins:

What are some of the daily duties of a forensic meteorologist? Do you have daily duties?

Jan Null:

Again, you get to wear multiple hats. One is running a small business; doing invoicing, and attracting clients, doing social media, doing outreach. I do a lot of media interviews. And that was a carry over from working for the National Weather Service. I did a lot of outreach and interviews for them. Those same people, especially after the Weather Service moved out of the area, I still get weekly calls from the media about the topic of the day, be it tule fog or be it El Nino. And that, number one, it keeps me fresh at explaining things. It also is good free publicity. It's a really good way to maintain outreach. And again, part of the business part, I'll give brown bag lunches for attorneys. They're looking for continuing education sorts of things that they can check off. And I don't know I've ever given a brown bag lunch when I haven't come out with a referral for a new case.

And so, I have the business side, and then all this has to do with communications, finding out the sorts of things that a client really needs. They'll call up and say, "I'd like what the weather forecast was on

December 19th, 2021." And they really don't want the forecast, they want to know what the weather observations were. Or explaining to them about the different tools that you can bring to the job. It might be radar, or it might be different types of soundings, or explaining where weather measurements are taken.

And so a lot of that, again, goes back to the leg up I had from teaching. And some time within the last semester, I talked about Santa Ana winds, or El Nino, or monsoons, or different things that are relevant. So, a lot of it is being able to share that knowledge, and figure out what's important, as far as who the clients are. In a typical day, I'd say I probably work two hours on actual meteorology, of actually analyzing data and crunching data. The rest of the day is maintaining a business, and doing associated outreach things, some of the other work that I also do on the side.

Kelly Savoie:

And so do you actually have to go in a courtroom? Do you do expert witness testimony ever?

Jan Null:

Yes. So in 25-ish years, I've probably been retained in a little over 700 cases.

Kelly Savoie:

Oh my goodness.

Emma Collins:

Wow.

Jan Null:

Of those, I've had depositions in about 130, and I've testified in court about 40 times.

Kelly Savoie:

The answer is yes.

Jan Null:

Yeah, that is pretty much a yes. And the great thing about those, I love the challenges of depositions and trials. It can kind of seem a little intimidating at first. Actually-

Kelly Savoie:

I bet.

Jan Null:

... the very first time that I testified, it was in a superior court in San Francisco, and I got sworn in, and the judge turns to me and he goes, "You don't have to be a weatherman to know which way the wind blows." It was such a non sequitur, but it really relaxed me.

But in all these things, you are the expert. You know what you know, and if everyone else knew it, you wouldn't be up there. And that was something I learned pretty early on, and you need to have that self-confidence, so that you can explain things in a meaningful manner. Also, understanding the sorts of things that a jury wants to see and what they can understand. I can come up with formulas and all sorts

of other things, but if I show a weather radar like they've seen on the nightly news every night, that really resonates with them. And so you don't want to dumb it down, but you need to keep it simple. And I really advise other people that want to go into this realm of meteorology that you don't want to overcomplicate it. You don't want to write a report that's an academic paper. It will get lost along the way. Shorter is better.

Kelly Savoie:

And so what do you like most about your job as a forensic meteorologist?

Jan Null:

Oh, I think it's the challenges and the variety. Every day is different. Every case is different. Again, from all the outreach I've done, I love sharing knowledge, I love teaching, educating, whether it's explaining it to a lawyer while he's trying to retain me, at a deposition at a trial, or in other sort of outreach, talking to the media or for webinars and things like that. So, it's teaching, is the other big part of it.

Emma Collins:

You've offered some really excellent advice for experts in their fields already, but do you have any advice for individuals looking to establish their own consulting business?

Jan Null:

Probably number one is find a mentor. And there are lots of mentors out there. I'm happy to help, but you all don't have to call me.

Emma Collins:

Going to say, watch your email.

Jan Null:

Yeah! Network, network, network. Talk to people within the meteorology field, even if they're not other forensic meteorologists. Keep connected with meteorology. Do lots of outreach, as I've talked about. Have business and computer skills. I think everything is so dependent upon, now, of knowing where to find information. When I started private consulting back in 1998, if I needed information, I had to go to the library to look up old local climatological data books, and now all that's at my fingertips. But you need those skills to be able to find that information. Know more than anybody else about the data in your area, the area that you're working in.

You also have to learn when to say no. There will be times when a case will come along and you're not able to help the attorney. It's not an act of God rainstorm that's going to help their client. And even though it means saying, "Hey, I'm not able to help you here." That's valuable to them, so that they don't put resources into something that might be some sort of a non-starter.

And probably the biggest thing is integrity. I actually have a coffee mug that I've had for years that I got at a conference and it says integrity on it. And as far as working with the legal system in general and testifying, you never want anything to come back on you. You want to be able to wake up the next day and say, "I really did this right." And probably the last thing is to... You have to gain some experience, if you're going to go testify in court. You're not going to come out of school and say, "Okay, I want to be an expert witness." You have to have that credibility of having worked along the way.

Kelly Savoie:

And I'm sure that you've had to say no at times too, if it's beyond your expertise, or if it's in a field that you're not well versed at. And you wouldn't be any help if you took the job and then didn't know what you were talking about.

Jan Null:

Oh, that's an incredibly important thing, Kelly, to know what your lane is, so that you... And I often say, for example, if it's a flooding case that I'm working on, I've told more than a dozen attorneys, dozens of attorneys, that once the rain hits the ground, it's someone else's expertise, be it a hydrologist or geologist. Yeah, so you have to know where your knowledge and your skill level and what makes you an expert, where that ends. If the wind is blowing against a tree, I can tell you how strong the wind is, but it's going to be the arborist who's going to tell you were the leaves on the tree? How much wind it would take for that tree to have fallen over?

And that circles back into the networking thing, because you also want to network with other experts on a very regular basis. I'll have a case, let's say again, regarding a tree. So I'll refer them to an arborist I've worked with in the past, or a hydrologist for a flooding case. And they likewise refer people to me. They get called into a flooding case, but they say, "We're going to need to know what the rainfall is, so why don't you give Jan a call?"

Kelly Savoie:

Yeah, it works both ways.

Jan Null:

It absolutely does. It's that old networking thing.

Kelly Savoie:

So, you've been involved in ongoing research on the topic of pediatric vehicular heat stroke. Could you tell us a little bit about that? It's a tough thing to talk about.

Jan Null:

It is, and it's become my passion project. It's a way that I'm able to give back to the community. And I urge everyone along the course of their career, and I'm fortunate that this glory came to me in my second career, when I had some time and the ability to give back, but everybody should have a passion project on the side. It's these sorts of things that really are able to keep you going.

But I became involved with pediatric behavioral heat stroke, which is basically when children are in hot cars, they get overcome by the heat, they die of heat stroke, also called hyperthermia. I got involved back in 2001 when a five-month-old child, Kyle Patrick Gilbert, was left in a car by a parent in San Jose. And I got a call from the local media, saying, "Hey, Jan, how hot could it have gotten in that car?" And I go, "I can Google that. I can tell you what, give you an answer." Well, there really weren't any very good studies out there. There's one out of Louisiana from the medical association there. Number one, was poorly done, and wasn't really on point. And so I started keeping track of temperatures in my vehicle that summer, and was really astounded, number one, how hot cars got, but also how rapidly the temperature rises were. So, the next year I did a controlled study, looking at 16 different days, temperatures between 72 and 96 degrees, looking at how fast the vehicles heated up, and how rapidly that was over the course of an hour.

At that point, I had this data, and through another project, I had a relationship with the head of emergency medicine at Stanford. So I called him, I go, "I've been looking at heat stroke. Do you have any expertise in this? I'd like to look for avenues that I can share this data." He goes, "I have two great residents, third year residents, that need a project. They would probably love to work with you." So, I ended up working with them. And in 2005, we ended up publishing this in the American Academy of Pediatrics. And I believe I'm still the only meteorologist to publish in that journal. That study has become the go-to study on the topic in the United States, for sure, and possibly around the world. I see lots of citations from other places.

That led me to working with a lot of child safety organizations. I would go talk to them about how hot cars got. They had been looking for information about the science behind it, so I was able to provide that. That all kind of morphed into my tracking cases, developing a website called noheatstroke.org, which is a national database. I actually now have a small grant from the National Safety Council and NHTSA to maintain that database. But the bulk of that has been pro bono over the years, and it's one of the best things that I do, despite the sad topic. It's very much a feel-good thing, and a way that I can give back. And again, I encourage everyone to find that way that resonates with you.

Kelly Savoie:

So I have a couple of questions. The first question is, give us an example. How hot does a car get in a couple of minutes? Say it's 70 degrees out.

Jan Null:

70 degrees can lead to temperatures that can be fatal for an infant or a small child. So, in the first 10 minutes, a vehicle heats up about 19 degrees from whatever the ambient air temperature was. And that was one of the really interesting things from the study; whether you're starting at 70 or starting at 90, that first 10 minutes goes up 19 degrees on average.

Kelly Savoie:

Jeez.

Jan Null:

After a half an hour, it has gone up 34 degrees over the ambient air temperature. And after an hour, it's close to 45 degrees. So, your 70 degree day is now 115 degrees in a car. If it's a 90 degree day, you're at 135. None of these are survivable temperatures.

And unfortunately, the sets of circumstances that lead to these cases are all tragic. About half the cases are where parents accidentally leave a child in a car, they forget. They get out of the car, they forget the child is in there. We know how we all go on automatic pilot sometimes. We've all missed the exit that we always get off every day, we're thinking about something else, what the next podcast is going to be. You just keep on driving. And so there are real psychological reasons why people forget things. So, there are now lots of pushes for technology, but that takes a long time to get implemented, especially underserved community.

Another quarter of the cases are where children gain access to a car on their own. Car is unlocked in the driveway, they get in the car, they get overcome by the heat, and they don't survive. And then final about 20% are where parents knowingly leave a child in a car while they go do something else. Sometimes it's a short trip into the bank, but you get behind the person that has 17 checks to deposit and everything, and that five-minute trip becomes a 20-minute trip. Well, on an 80-degree day, that car is now at 100 degrees.

Kelly Savoie:

And so my second question is, has your research helped? Have the number of deaths gone down?

Jan Null:

No.

Emma Collins:

Oh, no.

Jan Null:

It depends how you calculate the metric. Per capita, yes, there has been a slight decline. And ironically, COVID, with more people working at home, the numbers have dropped off fairly significantly. But I'm only the first step of the process of providing this information. It needs to be the people in the safety advocacy realm doing their messaging. But I think I've given them some tools. For example, looking at the days of the week that these cases happen. It's more frequent later in the week; children more often gain access to cars on the weekends. So, if they can do their messaging toward those sorts of audiences, that can be more effective.

Kelly Savoie:

And you mentioned technology. Emma and I were just talking about that. Remember, Emma?

Emma Collins:

We were, yeah. You had mentioned how technology could catch up a little faster. Only just this year, I have a friend who recently purchased a brand new car, and it has sensors in the back seat. She just had a dog crate in the back, but when she went to get out of the car, a notification came up on the car's screen saying, "Make sure you check your back seat." And it had a little cartoon of a child's car seat. But that's just this year.

Jan Null:

Oh yeah, and there is actually, part of last year's Infrastructure Act, vehicles be mandated to have reminder systems in them, and possibly sensor systems in them, beginning in 2025. Now, that's all good, but people are keeping cars for, on average now, 12 years. And if you project it forward for the next 20 years, only about 30% of the cars with people having children will have these devices in them. So education, maybe aftermarket devices, still continue to be a very important part of the process. So, it's not all going to be an app very soon.

Emma Collins:

So, you've also earned the Certified Consulting Meteorologist, CCM, designation. What was that process like and has the credential been beneficial to you?

Jan Null:

Oh, it has certainly been beneficial, and I'll talk about that. Before I left the Weather Service, not even knowing that I was going to take an early retirement, the CCM is sort of the pinnacle of the meteorology profession. First of all, to even apply for it, you need five years of professional experience, and then it's a three-part process to be granted it. The first part, you need to have a published paper. I think now you

need to write a consulting report, you need to have a report of some sort. And then there is an extensive take-home exam. With the time I did it, I think I had 20 questions and I had to answer 16 of them. Again, this is back in 1994.

At the time, I was at the National Weather Service Radar School in Norman, Oklahoma for three weeks. Not a lot to do in Norman after dark. So, each night I would do one question, and it was a way to knock out a lot of the exam with a pretty isolated sort of environment around me, not having to do that. And again, that was all pre-internet. So that was going to the University of Oklahoma library to find a textbook with hydrologic charts in it and things like that. Then finally, there's an oral exam by a panel of other Certified Consulting Meteorologists, where they test your breadth of knowledge, both for questions that I was asked in the take-home exam, as well as your general knowledge and all. And the whole process, the CCM is based on competence, character, and experience. And so this sort of sorts out the people that are going to really be able to fit that mold. And again, I would add onto that, and sort of adjunct to that is what I mentioned before, is integrity. And that certainly falls into the competence and character part.

Kelly Savoie:

And has it helped in your court cases? Attorneys starting to know that credential as being someone that they would want?

Jan Null:

Yes, and it differentiates me, number one, between other people they might be thinking about retaining in a case, but it also really gives me a leg up when the expert on the other side of a case is not a CCM. My attorney always liked to ask, "How come you haven't tried to get this valued credential to add to your resume?" So yeah, it's a big plus. And anyone who is going to be a forensic meteorologist, that needs to be high on the bucket list.

Kelly Savoie:

So, you've had a very long career. Looking back, is there anything you wish you had done differently?

Jan Null:

There isn't a lot. I've been really fortunate that the other things that I've talked about were really great stepping stones. The teaching, the 24 years working for the National Weather Service. Not only do they look great on a resume, but they're great as far as background and tools that I've been able to use. So again, I've been really fortunate, as far as the various things that have happened for me all the way along the way. So, I really can't think of anything really definitive that I would change. I've really been blessed.

Emma Collins:

That's a great way to end it. But we also like to ask one fun question before you go. So, what is your favorite hobby?

Jan Null:

So, I am a relatively obsessive photographer. Four years ago, I moved to the California coast. There's lots of opportunities for photography here, between sunsets, doing night photography with the Milky Way, photographing lighthouses.

It has also led to my being able to capture, on a very frequent basis, photographing the green flash, which, as a meteorologist, I had looked for my entire career. And I've lived in California my whole life and traveled lots of places. "Sunset! Oh, oh! No green flash." When you look at it through a camera lens, and you can really zoom in on it so you don't burn out your eyes, and you can shoot at a really fast shutter speed, there's very few nights I go out to photograph a sunset that I don't get at least some semblance of a green flash. And I've, even now, gotten about a half a dozen times when I've gotten a blue flash, which is a really rare... Where it's just the right layers of the atmosphere, so everything but the blue has been filtered out. And last year, I was able to sort of morph some of that photography into an article for Weatherwise about the green flash.

Kelly Savoie:

That's so cool.

Emma Collins:

What was it like when you first captured it? When you first saw that green flash?

Jan Null:

I was surprised at what I was seeing. I had to go back and look at it in a little more detail. I actually popped up a histogram, which looks at what the color spectrum is of the photograph, and there is a real spike in the green layer. And so I go, "Wow, okay, maybe that is it." And then as over the last, again, four years, I've gotten so I can kind of predict which days are going to be the best days to photograph it. Again, advantage of being a meteorologist and photographer, I know when there's going to be an inversion out over the water, which is kind of the best circumstances. So, it's great to be able to tie my profession and my hobby together.

Kelly Savoie:

Thanks so much for joining us, Jan, and sharing your work experiences with us.

Jan Null:

It's been great chatting with you both.

Emma Collins:

That's our show for today. Please join us next time, rain or shine.

Kelly Savoie:

Clear Skies Ahead: Conversations About Careers in Meteorology and Beyond is a podcast by the American Meteorological Society. Our show is edited by Johnny Ley. Technical direction is provided by Peter Killelea. Our theme music is composed and performed by Steve Savoie, and the show is hosted by Emma Collins and Kelly Savoie. You can learn more about the show online at www.ametsoc.org/clearskies, and you can contact us at skypodcast@ametsoc.org if you have any feedback, or would like to become a future guest.