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Vincent Santucci's NPS Oral History Project, 2016-2024

Anthony R. Fiorillo
February 26, 2021

Interview conducted by Vincent Santucci
Transcribed by Teresa Bergen
Edited by Molly Williams

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NPS History Collection
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Narrator: Anthony R. Fiorillo
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Date: February 26, 2021
Signed release form: Yes
Transcribed by: Teresa Bergen
Reviewed by interviewee: Yes

Transcript

[START OF INTERVIEW]

Santucci: Are you ready?

Fiorillo: Yes. Absolutely.

Santucci: Today is Friday, February 26, 2021. And my name is Vincent Santucci, the senior paleontologist for the National Park Service Paleontology Program. Today we are interviewing vertebrate paleontologist Dr. Anthony Fiorillo, who is a senior fellow at the Institute for the Study of Earth and Man at Southern Methodist University. An important part of Tony's research portfolio involves field work and studies related to paleontological resources from a number of National Park Service areas. This work has spanned nearly three decades. And today we're going to conduct an interview by telephone from Tony's office in Texas. And I am participating from my home in Gettysburg, Pennsylvania. So first of all, welcome, and thank you, Tony.

Fiorillo: Thanks for having me, Vince.

Santucci: So we're going to start with the easiest question. They'll get more difficult from here. (Fiorillo laughs) First question is when and where were you born?

Fiorillo: I was born in—I don't actually remember the moment—but I was born in Connecticut back some time ago.

Santucci: Great.

Fiorillo: And we'll come back to that date a little later in this conversation.

Santucci: Perfect. Okay. And then growing up, did you move around a lot? Or did you remain in New Haven for a while?

Fiorillo: I was really born and raised in the New Haven area. I spent very little time living in the city itself. Probably about three years old when we moved out to the suburbs. And then we bounced around a little bit, but it was always in the New Haven area.

02:08

Santucci: Okay. And then growing up, and looking at that period before you began college level education, were there any influences on your life that directed you towards science, towards natural history, towards paleontology? Anything that you can recall?

Fiorillo: Again, it's a little bit young in my memory, but my parents credit my grandmother with taking me to the Peabody Museum at Yale when I was very, very young. And I guess I had my parents recently confirm that my grandmother took me there several times. And I am sure that being – walking through the grand galleries and seeing those magnificent dinosaur skeletons at such an early age left some kind of an imprint on me at a primal level where I decided that paleontology would be a cool career for me to pursue.

Santucci: Very good. Thanks to your grandmother.

Fiorillo: Absolutely.

Santucci: And did you have any coursework in high school, or any particular teachers that helped to motivate you towards science?

Fiorillo: Well, I think one of the clearest memories I have was in eighth grade, where my teacher's name was Mr. Sacramone. And eighth grade curriculum was earth sciences. And I remember that vividly. And in part it was because it was clear, toward the, in the spring sometime, we were not going to get through the entire remaining part of the book or books that we were going through. So he broke the class up into projects. And one of them was life in the past. And I remember as we broke into groups, we were going to draw out of a hat as to which group was going to get which chapter to cover. And I remember that was probably one of the few times I actually asked for divine intervention. And I really, really wanted that project. And sure enough, we got it. So I had this great plan that some of the work we were going to do was going to involve a little group to have a day field trip by ourselves to really dial in to the Peabody exhibits. So I managed to talk my eighth grade teacher into letting a small group of I think four of us go to the Peabody Museum. Take pictures, take notes. And we created this project that I guess blew his socks off. Because he had every single student in the junior high come through and see all the things we had created describing life in the past. And like I said, I remember it vividly because again it was one of those moments it's like "Hmm, I think this might be a career for me".

05:19

Santucci: Nice. Very nice. So, when you applied for university, did you have a particular area of study, a major in mind of what you wanted to pursue?

Fiorillo: Interestingly, you know, coming through high school, some of that love of science sort of faded because we all go through certain things growing up. And it usually involves hormones and athletics. So somewhere in high school, those started to blur my vision. So when it came time to apply for college, I had actually started to lose track of my interest in geology and paleontology. And so I applied to a bunch of the state schools in Connecticut, because my parents insisted I would go to college, and I would go to the best college that I could afford. And it was interesting because I actually started college in a different discipline. And I floundered. And then I went on a one-day field trip with a friend of mine who was majoring in geology, or who had taken a geology class. And it was a beautiful Saturday. I'm standing on one of the Triassic Jurassic lava flows in the Connecticut valley. And I thought, this is the coolest thing I can think of. And I never looked back.

And I graduated from the University of Connecticut. Oddly enough, that was the only college application I put geology in as my intended major. So even though I wandered off the path, I guess convergence brought me back to geology as my major at University of Connecticut.

Santucci: Excellent. And so what year did you graduate?

Fiorillo: I graduated from UConn in 1979. Before their basketball program was worth anything.

Santucci: (laughs) Okay. From there, did you go directly into graduate school? Or did you take some time away from school?

07:38

Fiorillo: No, I hadn't really thought about graduate school seriously. And so I managed to find a job with the US Geological Survey. At the time, they had hopes that there were significant oil reserves off the east coast of the US. And so they were hiring people right out of school with just the bachelor's degree. And so I worked in the DC area, offshore oil and gas. And that was fascinating at one level. But it clearly wasn't speaking to me. And through a number of connections, I was able to get some volunteer time at the Smithsonian. And so before I would go to work, I would get up pretty early and spend about two, three hours in the prep lab at the Smithsonian talking to vertebrate paleontologists. And from there, they got to know my interests. And they helped steer me towards the University of Nebraska, which is where I went for my master's degree.

Santucci: Excellent. And then your association with the Smithsonian as a volunteer. Was there anybody that helped to mentor you, or that you worked closely with?

Fiorillo: Well, the person that took me under his wing was Nick Hotton. And Nick was a spectacular human being. He was, he was full of personality. And it was unassuming. And he is to this day the only person I have ever met who could wear – he had a crushed red velvet sport coat. He's the only person I know who could pull off wearing that thing. And so he is the one who introduced me to the lab. And I worked with a guy named Arnie Lewis, who was Romer's preparator. And he was really a terrific mentor. And he let me work with some of his staff. And so the very first fossils I worked on as a preparator were from the Karoo Formation in South Africa.

Santucci: Fantastic. So you made your way to University of Kansas then.

Fiorillo: University of Nebraska.

Santucci: I'm sorry. Why did I write Kansas down? Nebraska.

Fiorillo: You don't confuse those two.

Santucci: Yes, definitely. (laughter) And so you moved off to the University of Nebraska. What year did you begin your graduate career?

Fiorillo: So, I was working for the USGS from ’79 to ’81. And so in 1981, that fall I was enrolled at the University of Nebraska. And I was a student of Mike Voorhies. Because of the things that he was famous for, taphonomy, how you go from living organisms to the fossil record. That was something he was strong in, and that was something I was interested in. So I was a Voorhies student.

Santucci: Perfect. So, let’s see. Did you have a research focus at that time? And was that the basis for your master’s thesis?

Fiorillo: Yeah. I was, given the conversations I had with Mike, he had an interest in working in this place in southwestern Nebraska. And it was Hitchcock County. And it’s someplace that Cope actually had done some collecting some time ago. And so the timing worked out that that was where I did my first field work, excavating Miocene mammals. And Hazard Homestead Quarry was the actual quarry name. And that’s the basis of my master’s thesis on the taphonomy of the quarry.

Santucci: Very good. And how did that experience in your education and career help to define other work that you would do later on?

Fiorillo: Well, I knew that I wanted to apply some of these tools in taphonomy to the Mesozoic. Because at the time, Mike was one of the, he would probably not give himself this level of credit, but he was one of the real leaders in the study of taphonomy. So I wanted to learn the tools, working with, sorry, a Cenozoic locality, Miocene in particular, because that’s where people were developing an understanding of taphonomic bias. And then I wanted to see about taking these tools and applying them to something in the Mesozoic. So I would say a great deal of my toolkit formed when I was in Nebraska. And it really, those couple of years I was in Lincoln, I look back favorably on. Because it also, by the luck of the draw, I came in with a very dynamic group of other graduate students. And I honestly don’t remember very many moments when we weren’t talking about earth sciences. We just all seemed to be driven with a passion. And it just took the educational experience to a whole different level.

Santucci: While you were working in Nebraska, did you have the opportunity on your own or with Mike Voorhies to visit any of the national park areas, or areas that would later become national parks? Or even the Ashfall Fossil Beds, which is now a national natural landmark.

14:13

Fiorillo: Well, in fact, one of the things that I did when I was working as an RA, research assistant, for Mike, was I was working on Ashfall material. And that was, I was preparing that. And that was pretty fascinating to get through. And then of course the other vertebrate paleontologist there was Bob Hunt. And he was doing, he was really engaged with opening up the original quarry’s agate. And so I had an exposure to, through Bob Hunt, who I really didn’t work that closely with, about the goings on at Agate. But I was more intimately attached to the Ash Fall site.

Santucci: Very good. And what year did you defend your thesis and graduate from University of Nebraska?

Fiorillo: Well that, that's a bit of an embarrassing question. But I'll answer it anyway. Which was, Mike and I were working very closely on getting my thesis in working order. He said, if I was interested in doctoral work to go ahead and apply. And so I had started to apply. And I was accepted into the University of Arizona. So I had started that process of moving to Arizona when he came back to me and said my thesis is not in enough shape to defend. It needs more work. And so I went to the University of Arizona, started my project there. Had an opportunity to travel overseas, do some work in other places. But I was still in the Cenozoic and I wasn't very happy with where my program was going.

So I started communicating with Peter Dodson in Philadelphia. And one thing led to another. And before I knew it, I was a doctoral student at Penn, working with Peter Dodson. And that was probably 1984 I moved to Philadelphia. And Peter and I, we worked on a project together. He introduced me to Careless Creek Quarry and the Judith River Formation of central Montana. And I just started rocketing. And once the end of my dissertation work started to come into view, it's sort of like, wait a minute. People usually get a master's degree before they get a PhD. I talked to Peter. He agreed. I could pause my PhD work, finish my master's work, and then go back and resume completing my PhD. So I actually graduated from the University of Nebraska in 1987, even though that's four years after I left Lincoln. And then I got my PhD in 1989. So if you look at my CV, it looks a little weird.

Santucci: Well, very good. (laughs) Well, thanks for that. That's an interesting twist. But congratulations on being able to accomplish both of those tasks at the same time. So in terms of your PhD, your defense of your dissertation occurred in what year? Hello?

18:02

Fiorillo: Can you hear me?

Santucci: You were on mute. I'm sorry. So I think you were able to, you finished up your discussion about getting your master's completed. And then I had asked the follow-up question. Did you hear my question?

Fiorillo: What year did I graduate from Penn?

Santucci: Correct. Yes.

Fiorillo: Yes. And it was 1989. And I actually defended my dissertation in, I believe it was, February.

Santucci: Okay. After completing your dissertation, you had been involved in a postdoctoral fellowship?

Fiorillo: Yes. At the Carnegie Museum. And that really was my introduction into the Jurassic, the Morrison Formation. And through Peter, I was introduced to a guy named Dan Chure, who was a paleontologist at Dinosaur National Monument. And I was able to get involved with a little project at Dinosaur.

Santucci: Can you tell us a little bit more about that?

Fiorillo: Well, this was after my PhD work. And so, this is all part of the postdoc. And I was curious, again, thinking about taphonomy. I was trying to think about how long it took for the Carnegie Quarry at Dino to have formed. So I applied some taphonomic thinking and tried to bracket how much time was represented by that really spectacular quarry face that most visitors see. And so I wrote a little, Dan took me on a tour of the bone bed. And basically a bone by bone tour, which was really pretty cool. And then I wrote a little paper about that sometime around 1995, I think. Might be a little earlier. I don't really remember now.

Santucci: Through that experience, did you begin to get a sense of the different world of the federal management of paleontological resources at Dinosaur and elsewhere?

Fiorillo: I did enjoy the experience. And it did help open my eyes to the opportunities that were out there within a, within national park units in particular. So it seemed like, if you will, it was a bit of a candy store out there. And it was, if you can partner with the right—

Santucci: I think I lost you again, Tony.

21:12

Fiorillo: Sorry. I think I muted myself. How much of that did you hear?

Santucci: You were just cut off for just a few seconds.

Fiorillo: Well, what I think maybe the last I said was partnering with the right people, that there was opportunity to get into the candy store.

Santucci: Yes. I got that. I think you were cut off right after that.

Fiorillo: Okay.

Santucci: Excellent. So, you're at the Carnegie. You were introduced to Dan Chure at Dinosaur. And so how, when did you start and when did you end your fellowship at Carnegie?

Fiorillo: That was '89 to '91. And somewhere in there, I met this guy named Vince Santucci. And we'll get back to him a little later.

Santucci: (laughs) Okay. Very good. And so we did meet while you were at Carnegie, I think, a few times. And then we met again later when you came to Arizona and met [unclear] at Petrified Forest National Park in '91.

Fiorillo: Yes.

Santucci: So how were you tied with Berkeley at that time?

22:32

Fiorillo: Well, after my postdoc, I was still trying to find gainful employment. And Berkeley had a position come open, which was soft money. You could call it another postdoc. And that actually lasted about four years. And there I worked with a guy named Kevin Padian, who knew

quite a bit about the Triassic, the early rise of dinosaurs, let's put it that way. And we did some work together on a very famous Triassic locality in Arizona called Placerias Quarry. And while we were doing that work, we paid a visit to Petrified Forest, where I ran into this guy Vince Santucci again.

Santucci: (laughs) Very good. So how long were you at Berkeley?

Fiorillo: It was about four years. And that ended in 1995. And that's the time that I came to Dallas.

Santucci: All right. Very good. So, you were involved with some paleontological work at Curecanti National Recreation Area. Can you give us some background on how that came to be, and what time period you began to do work at Curecanti?

Fiorillo: Sure. I, while I was at Berkeley, there was Dan Chure and a few people from the USGS managed to work within the Rocky Mountain Region and look at the Morrison Formation, which is of course that dinosaur material exposed at Dinosaur National Monument. And tried to look at sort of the big picture ecosystem look at really what is the premiere late Jurassic snapshot of life on the planet. And you know, the Morrison Formation, which crops out from Montana all the way down to New Mexico. And when most people think of Jurassic dinosaurs, usually what comes to mind is a dinosaur from the Morrison Formation. So that being said, and there was a pretty massive project put together. And I was invited into it. And my project was nicknamed the Little Morrison project, as opposed to the big one. The big one had a massive team coordinated, visiting all the park units that contained Morrison Formation exposures. Documenting and reexamining what we thought we know. The Curecanti/Black Canyon study, which was really focused on those two units, was with a woman named Kathleen May, and myself. And we were supposed to dial in deeply into the Morrison Formation. More deeply than the other team. And so that was, I think the summers of '94, '95 and '96 when I was working in the Morrison of Curecanti. And we found part of an apatosaurus skeleton. We found termite, fossilized termite, nests. We found a few other things, an incredible invertebrate trace fossil collection.

And one of the things that ire ally enjoyed about that work was I worked closely with the resource manager, a guy named Rick Harris, who I am still friends with. I probably talked to him last week. And through Rick, I learned a great deal about the workings within the National Park Service system. And he took some of the paleontological reporting that I created. And when I attended a public hearing, for example, on Black Canyon of the Gunnison National Monument, should it become a park, and that was a fascinating experience. And so Rick introduced me to a great deal. And some of the work that I produced for him, when Black Canyon of the Gunnison National Monument became a park, there was some land swapping with the BLM and they were able to negotiated additional potential fossil-bearing rock units within the new national park boundaries. So I was pretty happy about how my work was used in perhaps nontraditional ways for pure paleontology.

Santucci: Very good. And so was there anything of particular interest that resulted from your work at Curecanti? Paleontologic-wise?

27:51

Fiorillo: Well, we had a three-year project. And it was almost like right out of Hollywood. Within the first couple of hours of the project, on the very first hike out to the outcrop, or the closest outcrop, we came on about six cervical vertebrae of apatosaurus. And it was like, oh my God! (laughs) You know, the pressure is off. We found what we needed to find.

And I have to say that when I briefed the administrative team at Curecanti, there was a very mixed response. There were some people that were truly excited by it. And some people who took a deep breath. Because I also mentioned that what we had found was exactly what had been found in the first discovery at Dinosaur National Monument. And they thought, oh, no, what kind of administration is ahead of us?

Santucci: Oh, no.

Fiorillo: But anyway, that's neither here nor there. That's probably the most significant discovery that came out of the work was the apatosaurus material.

Santucci: Very good. And the collections, do you know where the collections wound up going?

Fiorillo: Well, they ended up in a number – they traveled. Maybe more than the apatosaurus did. They went from, the excavation project was spectacular. And it was a lesson I learned that I was able to use again. Which was, we worked with the maintenance team at Curecanti. And because Blue Mesa's a reservoir, they know the water level. It's a predictable height. And so working with them, they brought a barge in. And it was just clockwork. I was so amazed by working with these people who know how to use the big toys to get a multi-ton jacket out of an outcrop and into a storage unit.

From there, they, I believe, they stayed there for a while because my time at Berkeley was drawing to a close. They did spend time in Philadelphia, at the Academy of Natural Sciences. Where a great deal of preparation occurred. They also spent some time at the Museum of Western Colorado, which is I think where those bones are now. So they bounced around a little bit before finally settling down.

Santucci: Okay, great. And you have a couple of publications related to that work?

Fiorillo: Yes. There was, the primary one, the one that's about the apatosaurus per se. And what it was able to determine was that it was a carcass that was swept away by a flood event. And the rocks told me that. And so there was a publication out of the Museum of Northern Arizona on the Jurassic. And that paper is in that volume.

Santucci: Great. So before you departed Berkeley and went to Texas, was there any other Park Service work that you were involved in?

Fiorillo: It was really the Jurassic stuff. Stuff related to Dinosaur Monument. The stuff related to Curecanti. The stuff related to Black Canyon.

There is a sad story, before we jump from Black Canyon, though. We were going out to look at the north rim of Black Canyon. And a cliff face had fallen. There were some, let's call them copier box, copier paper sized box on the road. And so you had to drive around them. We

thought we'd better take a look. And sure enough, there were some more sauropod vertebrae there. And so we were driving back late enough that we couldn't contact anyone. And so the next day we went out to try to salvage these blocks that clearly had bone in them. And we missed our window because somebody in the highway team had cleared the road of the debris—

Santucci: Oh, no.

32:36

Fiorillo: —and somewhere down in the canyon are these blocks with more sauropod bones. But oh well, you can't win them all.

Santucci: Interesting. Do you have photographs of those before they were collected, so there's some record of them?

Fiorillo: I'm sure I do. But finding them would be a task.

Santucci: Sure. Okay, so you moved to Texas and began work there. Was that your gateway to Big Bend National Park? Or how did you get involved with Big Bend?

Fiorillo: Yeah. That was again looking at a map, knowing what had been done in Big Bend and what my toolkit could offer. And so the old Dinosaur Society gave me a grant to go do some work in Big Bend. And that's where I met a number of people. And some of them are still at the park. But that's where I developed the long-term relationship with Big Bend.

Santucci: And since you were involved with Big Bend long-term, your work, I assume has evolved over that time period. Was there an initial focus that you had related to fossils at Big Bend? And if so, what was that? And then how did it change over time?

Fiorillo: Well, I was really interested in dinosaur-bearing rock units. So I was looking at the Aguja Formation, Javelina Formation. And I was also – it was an opportunity to learn yet again you know, Big Bend is not Dinosaur National Monument, for example. That even though I was [unclear] or Black Canyon. And so even though I was learning some of the ropes around national park management as a whole, I was also discovering, shall we call them quirks, of individual parks. So it took a little while to ramp up to Big Bend. And because of my interest, I knew where other people had worked. So I didn't want to just cannonball off the diving board into a pool. I had to be pretty selective about where I might want to go. And then I developed a connection, the Park Service helped steer me towards an individual at UT Dallas, Homer Montgomery, who we seemed to hit it off. And I think that conversation also, that first meeting came about with Wann Langston present at UT. And we thought this was an opportunity for a partnership to really start to form. So I worked with UT Dallas on my sauropod work, anyway, in Big Bend.

Santucci: Very good. Hey, I'm just making some notes here. What year did you move from Berkeley to Texas?

Fiorillo: I started in my position at the museum in Dallas in October of '95.

36:06

Santucci: Okay. And then, how much after that did you begin doing some work at Big Bend?

Fiorillo: I think by ’96.

Santucci: By ’96? Okay.

Fiorillo: I’m pretty sure ’96 is the date.

Santucci: Okay. I think it would be worth asking you this question to see how you respond. If you were talking to a general audience of, not necessarily paleontologists or scientists, how would you characterize the paleontological resources? Particularly the dinosaur record from Big Bend National Park. What would you consider its significant aspects?

Fiorillo: Well, that’s a good question. I think geologically or paleontologically, one of the strong points of significance for working in Big Bend is that it is one of the best places to understand what’s going on during the Cretaceous some 65 to 70 million years ago at the south end of the land mass we call Laramidia. It’s really, you know, you don’t have to go very far before you cross into Mexico, which also has Laramidia. But the record there is pretty spotty. So Big Bend is really the best place to understand what’s going on back then.

With that being said, Big Bend is also a little bit frustrating in the sense that there’s, the fossil record is not as robust as one might like. It’s not a place that you’re going to find lots of complete skeletons of anything. So it does take a fair amount of work.

Santucci: Great. Are you still doing any work today at Big Bend?

Fiorillo: I just yesterday was on a phone call with a colleague where we were, you know, any paleontologist develops a backlog of projects. Because you’re always, when opportunity arises to go out and go look at rocks and do something out in the field, you do that. And so we were just talking about trying to wrap up a project that got started as a result of the work in Big Bend. So there’s something on the horizon, but it’s not very well-focused yet.

Santucci: Okay. Very good. Before we shift to Alaska, is there any other National Park Service-related work that you’ve done once you arrived in Texas?

Fiorillo: I would say that, I would say no. I mean, there’s certainly plenty of times that as a person, as a trained paleontologist I visited a park because it had paleontological resources and I was curious about seeing them. You know, for example, when I was in, go back to Berkeley for just a moment, Point Reyes National Seashore. There was an area of the park that had a number of fossil whale bones. It’s not a commonly visited place. But it’s a place that I went to look at just because I’m a paleontologist and there’s fossil bones there. But there was no formal work there. So, there’s a number of places like that that I would visit, but not formal work.

Santucci: Very good. So, I know your history with paleontological work in Alaska is pretty extensive. And so, what I’m going to do is just give you the liberty to just tell that story as you’d like. And then I’ll come back and maybe ask some specific questions. Is that okay with you?

Fiorillo: Sure. That's fine. Well, so, I had an invitation to go to the North Slope of Alaska to work on some BLM and Native lands along the Colville River in 1998. And that invitation came to me through a now retired colleague, Roland Gangloff. And he was a curator at the University of Alaska Museum in Fairbanks. So, at that point, I really thought wow, this is an amazing experience. This is a chance to do something that very few people, if anybody, has ever done. I think this is where I'm going to try to make my career.

And so, at that point, I've fallen in love with Alaska. I've always enjoyed the north, ever since I was a little boy and saw some probable Walt Disney movie about, I'm sure they called them Eskimo, but nobody really uses that word anymore. And so, I was fascinated by the north. I was fascinated by dinosaurs. It just seemed like a great coming together of a number of interests.

So I think it may have been the GSA meeting, Geological Society of America meeting that fall, I'm still starry-eyed over Alaska, that I may have had this conversation with this guy Vince Santucci. And I think maybe Vince, you had just started making inquiries into some work within parks. you know, paleontological inventory kind of work. And we just got to talking. And because I'd been in Alaska—it might have been '99, I really don't remember now—but we thought that there was an opportunity to work together. And really, Vince, you're the one who opened the door for me with the Alaska region.

And of course, we were invited up to Anchorage. We sat down with a guy named Russ Kucinski, who is in charge of the physical resources group in the Anchorage regional office. We talked and we talked, and we talked about how—again, it's not that we were big used car salesmen. I think GPRA had been passed, and so there was a certain pressure for parks to start being responsible for their resources. And we made an argument that the parks should know what the resources are if they're going to be responsible for it. So, we likened what we wanted to do to the grand old surveys of the American West that, you know, Hayden and Clarence King and those guys had done. And there was a real opportunity. And Russ, thankfully, was the right set of ears to make that pitch. We were invited back for a resource management seminar or workshop, multiday thing, in Anchorage. Russ got us on the schedule. And it was honestly, I don't know how well you remember it, but it was the, we had the pretty much last slot of the third day, the last afternoon. We walked in there to make our presentation, you, me, Roland Gangloff, and I think zombies had more life in them than (Santucci laughs) what that group did at that point in the process. So, I thought oh, no, this isn't going anywhere.

And when it was all over, we were, you and I, in particular, were talking about, well, maybe nothing's going to come out of this. And I vividly remember two things. One was the geologist at Denali coming up to us, Phil Brease, to talk to us briefly. But Phil wasn't really offering anything. And then I went to use the—we'd been in that room for a little while, so I had to go use the men's room. And somebody else walked in and had the same need I did. And that person was Peter Armato, who was the Chief of Resources at Kenai Fjords. And he said, "That was an interesting presentation". And basically, somebody was nibbling at our hook. And those conversations kept going. And Russ, Russ was one of those people who suggested doing something by networks. Doing some basic work. And Peter is the one who came up with a funding plan.

And before I knew it, I think you and I went on some grand tour of some parks that Russ paid for. But the real work started when Peter and I figured out how to get some funding to go work in the Southwest Alaska Network and go looking for fossils in Kenai Fjords, Lake Clark, Katmai and Aniakchak. And that work was, started, I believe in, you and I did the Russ-funded tour in 2000. But I think the SWAN work started, the funding for that started in '01 and ran through '04.

Santucci: Correct. So, I have the dates available just so we can get those accurately into the record. So, it was May 18 to 20 that you and myself were together in Alaska. There was a resource management meeting that you had referenced. And we also did a law enforcement refresher for some of the law enforcement staff. So that was where we met with Phil and several others, along with Russ that sort of planted the seeds for the initiation of the project. And it was between July twentieth and August eleventh that we began to do field work. Katmai, Lake Clark and then in early August of 2000, that's when we went up for the first time to Yukon-Charley Rivers. So that's what I have in my log here. And you're correct, then. It was the next year in August where there was field work at Aniakchak and elsewhere. Does that coincide with your thinking?

48:04

Fiorillo: Yeah. And I'm sure that if I pull out my field notebooks, my dates would correspond to yours. So, I'm glad that my memory coincides with the information that you have written down.

And you know, there were some critical people involved here. Vince, you are one of the people. I mean, you are the one who took the lead in really tutoring me on how the Alaska Region works and where, you know, there might be some funding opportunities. And basically, you weren't saying apply for things, but you were tutoring me with the proper jargon. So that later if I walked into somebody's office, I wasn't speaking Italian while they were speaking Russian. You know, and that was really a huge boost in getting this vision focused and spread across a number of stakeholders within the region. And we just, in some ways I think we just happened to hit it where the right people at the right time were willing to listen. Because there's no way I would have been able to do what I did in the subsequent years without their help. And their help came about because I knew the terminology. So, it all came together very nicely.

Santucci: And just a couple of other notes here that I have that I thought are related to this discussion. Of course, Bob Higgins was a key and enthusiastic supporter of a lot of these discussions. So, I remember in 1999 Bob saying, "Okay, what are we going to map out as a work plan for 2000?" And among the many things that Bob had suggested is that he said, "The Geologic Resource Division doesn't do a lot of work on Alaska. It would be nice to reach out there." So, I think that that's when your name came up. Because Bob knew you and so things came together in a very busy year in 2000 because if you recall, prior to Alaska, prior to the May workshop that we attended and presented in Anchorage in May 2000, in March of 2000 and early April 2000, you assisted us in a paleontology scoping meeting at Big Bend where Wann Langston and Tom Lehman and Don Corrick and Gorden Bell and others were there. So I imagine that we had a lot of discussions when we were together at Big Bend about forthcoming trip to Alaska.

Fiorillo: I suspect you're right. And that was, again, a great learning tool. Very satisfying. The conversations were dynamic, obviously, with relation to Big Bend. It was an opportunity to visit, I felt like it was such a golden opportunity to be in Big Bend with Wann Langston. And I think we all stayed in Castolon, didn't we?

Santucci: Yes. Mm hmm.

51:33

Fiorillo: And I remember one later afternoon, early evening, watching the sunlight on some of the cliffs and just thinking wow, this is just so amazing. And Wann came out and he was talking to me. And I felt like wow, this was a moment to bond. And I remember thinking—and I loved Wann for several reasons, but this was one of those little dings on the shining armor when he said he never actually liked working in the park. And I thought, how could you not like it? And then he went on and on, complained about it was always too hot and too bureaucratic and so on and so on. And I thought well, I'm glad you kept working here anyway, Wann. So that's always one of my favorite memories.

And you mentioned Bob Higgins. I'm sure that if Bob brought up my name, it's because going back to that time I worked for the USGS in DC, Bob and I worked together. I mean, we were in offices right next door to each other. So, I knew Bob from some earlier time.

The work in Alaska needed a proof of concept for it to really take off. And you and I made that first trip to Aniakchak, where we were able to get a C-Air was the outfit. And fly out and land on the beach and go look at some rocks. And whatever it was I saw in those rocks convinced me that this place might have something.

So going back to the right people at the right time, there's a guy who's still with the park, Troy Hamon, who's Chief of Resources for Katmai, Aniakchak and Alagnak. And he was game for arranging a raft trip down the Aniakchak River in '01. And that was something, again, where I suppose the fossil gods were smiling. Because that trip was supposed to be a couple of Park Service people, me, Roland Gangloff and Judy Parrish, who is now retired from the University of Idaho. But a substantial storm had built up—and the weather's never good down there—and I was delayed out of King Salmon for five days. And one by one, first Judy dropped out, then Roland gave up. And on the fourth day, I was by myself. I still wanted to go, because it was sort of like this whole thing is going to ride on the results of this particular raft trip. The Park Service people in King Salmon told me if there's not a window the following day, they're just going to scrub the whole project and call it off.

And on the fifth day, the clouds parted, literally. The choir sang, figuratively. And off we went. And so, we flew into the caldera. Landed on Surprise Lake. And started this magnificent whitewater trip down the Aniakchak River to the coast, where literally in the last two hours of the project, I found the first record of a dinosaur in any national park in Alaska. And I remembered, I told, I grabbed everybody, had them look at it, know where it is, so on and so on, in case [unclear] the project. The find was so important that if some bear came and ate me, somebody would be able to tell the outside world there's dinosaurs in this park. (laughter)

And I remember when we got picked up by the float plane, the pilot's girlfriend was in the copilot's seat. And she could not keep her hands off the pilot. And I just kept remember thinking to myself, please don't make us crash, please don't make us crash. This is important. Somebody's got to know. (laughter)

So anyway, and from there, the rest is history, as they say. And a number of other parks started to welcome me in to look at things. The one that really made me laugh was Denali, which seemed to be throwing roadblocks in front of me the whole time. Because the idea of dinosaurs in the park was silly to them. But once I talked to Phil Brease, showed him pictures and so on, Phil's quote to me was, "Well, we can't let a little park like that get all the attention. Why don't you come to Denali and look for dinosaurs?". And of course Denali has just been—I've managed to go there for fourteen or fifteen years. And there was a reason for that because it's so rich with dinosaur tracks.

Santucci: Very good. So, before we get into more in-depth questions for Denali, or venture off to Yukon-Charley or Wrangell-St. Elias or elsewhere, I wanted to go back to 2000 and again how remarkably quick things came together based on that and the meeting that we had in May with Russ Kucinski and how immediately supportive he was of the idea that you and I had proposed to him. Although we had been communicating with him prior by phone, this was our first time meeting. So, between May of 2000 and July, end of July, that Russ was able to get funding for us to go back up, and to fly out to King Salmon for the first time, and actually take a plane out to Aniakchak for the first time. When we were there in Anchorage, you know, we had a lot of bad weather, a lot of rain that prohibited us. So, we had to find things to do. And I remember sitting in the motel with you. And one of the things that I thought was, it was an incredible conversation, is that talking to you about your love and passion of looking at maps. And then taking that and actually getting out in the field. And so, we did that exercise, looking at maps. And then finally flew out to Aniakchak for the first time and landed along the coastline there. Do you recall that?

58:25

Fiorillo: Now that you've brought it up, yes, I do. But I have to say that I had forgotten about it.

Santucci: Yeah. We're not going to be able to reconstruct exactly what you said. But it was one of the most passionate things I've ever heard you say. And it had to do with your love of maps and how it translated into why you are such a field-oriented individual in paleontology. Any way that you can dig back in and share your love and passion for looking at maps, geologic maps?

Fiorillo: Well, I would probably, you're right, I can't recall the exact conversation. But there is the great conservationist Bob Marshall, who wrote a book called *Arctic Village.* And I feel like I bonded to Bob Marshall in reading the first sentence of that book. Which says, "Blank spaces on maps had fascinated me." And I could not have said that better. And so, I love looking at geologic maps and the idea that, you know, what's out there really, really appealed to me. And looking at maps was the key to ending up in Aniakchak. There was just something about the remoteness. And the geology was so, it was beckoning, if you will. Corny, I know, but that's the way I felt.

Related to national park stuff in talking about maps, another example of how maps have helped was in 2004, I was supposed to go to Yukon-Charley. And I don't know if you had much dealing with Alaska at that particular year. But I believe 2004 still ranks as the worst fire year in the history of the state. There were some over seven million acres burned in interior Alaska. Smoke was everywhere. And they did close Yukon-Charley. And so there I was getting ready to go to Yukon-Charley. And again, Russ was the right guy. And I pulled out maps, looked where the smoke maps were. I had the money to go somewhere. Where was a national park unit that wasn't covered in smoke?

So, I talked to Russ about going out to Unalaska, to the historic site out there. Because that was a place that was smoke-free and I knew that there were fossils out there. Not very well-documented fossils. And so I went out there and let the Museum of the Aleutians know I was coming. I gave a public talk. And that actually served a vital purpose, was it connected me to the community. And the community, when they built their school—so it wasn't actually on the Park Service property, per se, but the rocks are the same, it's just down the street—they had uncovered some fossil material. And this was not dinosaurine material. It was something called demostylian, which is a marine mammal group that was only around for a very short window of time from the early Oligocene to the late Miocene. And then they go extinct. And they kind of look a little bit like manatees, but not too much.

That material I brought back to Dallas. We worked on it. And it turned out that that was another new animal to science. And so we were able to name something after the, taking advantage of the local native culture, and named Ounalashkastylus, which is a demostylian that we would not have found had there been no fires that year.

Santucci: Very good. So, I wanted to shift back to 2000, sitting in a motel, courtyard motel in Anchorage, waiting for the weather to improve. Looking at maps. Dreaming about what these places are going to look like in person. But we kept very busy. So, we went to the USGS—

1:03:01

Fiorillo: Right.

Santucci: —and we purchased as many publications and maps as we could. And we went into the collections for Lake Clark and Katmai and looked at these impressive ammonite specimens for Katmai. And we found those collections of plant material. Where I showed them to you right away and you took great interest. And when we were back in the room, you found the locality on the map where you thought, you suspected that those plants may have come from. And so when we eventually were able to get out, and took the otter into Katmai, into Brooks Camp, and stayed there for a couple of nights, one of the things that was the first thing to happen was that you were able to navigate us out to the point where we actually found more plant material, right? Some of it submerged under shell or water along the shoreline. Do you recall that? And do you have any additional thoughts about that?

Fiorillo: Sure. I've got a picture that I've shown quite often is a picture of you and the law enforcement person, Pavia somebody or another. And it was the benefit of letting people know

ahead of time that we were coming. And Pavia was, I think we started calling it Pavia's plant locality. Because I think she's the one who found the very first plant material. And so, it was not a resource person at all. It was a law enforcement person. It worked out very well. We were able to recover a number of fossil plants. And, as it turned out, the plant material was clearly flowering plants. The map showed this to be a Triassic area, so obviously something was wrong. And we, the following year went back with Judy Parrish and we did the appropriate mapping. And we ended up publishing a paper in 2010 where we named a rock unit. People are familiar with paleontologists naming fossils. But this was an opportunity to actually name a rock unit. Which, when the new geologic map of Alaska came out, we're in the bibliography. The outcrop itself was too small of a scale to make it to a map of that size. But that was kind of a neat discovery that came out of that work that we did.

Santucci: Great. Yeah. I mean, I think that's testament to that we were able to take advantage of the time that we could not get out into the field. And used our skillsets to data mine for things that wind up turning out to be very important.

1:06:00

Fiorillo: Yes. You know, there's an element of discipline to all of this. But there's also an element of being flexible. Because you're never quite sure what might be in the next specimen drawer, what might be around the next bend, whatever. So those are sort of two things that seem to be, not necessarily in sync with each other, but those are two things that you have to have in mind every time you go out there is an element of discipline but yet also an element of flexibility.

Santucci: And while we were at Brooks Camp, then we had the opportunity to hike around a little bit and get to see the park in general, documenting a few fossils. The one that stood out to me were some of those belemnites that were preserved in, I guess, Jurassic rock, that underlie a lot of the more recent volcanic material.

Fiorillo: Yes.

Santucci: Do you recall having breakfast in the little restaurant café they had there? And there were mammoth tusks hanging over our head?

Fiorillo: Absolutely. Absolutely. And you know, being able to go out to Valley of Ten Thousand Smokes and take a look at the Naknek Formation out there. That was really pretty special.

Santucci: Yeah. Once you received funding, and the funding was a challenge cost share proposal that you took the lead on and prepared and was successfully funded for multiple years. You were later able to take a plane out to the coast of Katmai, is that correct?

Fiorillo: Yes, we, because the Naknek Formation, and specifically those ammonites, there was an area of Katmai called Hallo Bay. And we needed to go get a sense as to what Hallo Bay was all about. Because it seemed like so much of the ammonite material was coming from there. And you were part of that trip. You remember, don't you?

Santucci: So, I didn't fly out to the coast. I didn't, I wasn't on that particular trip.

Fiorillo: Oh, okay. Then it was just Roland and me.

Santucci: Yes. I was on the original reconnaissance flight in 2000 when we went to Katmai. We went into King Salmon, went into Katmai. And then we took that plane, our first plane ride out to Aniakchak. Which was a terrifying ride because of the low ceiling, cloud ceiling.

Fiorillo: Sure.

Santucci: Do you recall that, the plane dropping suddenly?

1:08:32

Fiorillo: You know, every ride out to Aniakchak is an adventure. (laughs) I mean, I've had some that it's like oh my God, how did we not crash on that one?

Santucci: Yeah.

Fiorillo: But I don't fly the plane, and I'm glad I don't. But the Katmai thing, when we went out to Hallo Bay, so then I guess it was Roland and me. And maybe there was a bear watching guy out there who ran a trust thing. Because I thought there were three people. But I remember on Hallo Bay we had to go through, we had to go cross country for a bit. And we were on a trail—again, this was a humbling experience that in late May, that working in Alaska is very different—where the grasses were my head or higher. And we're following this trail. Roland's in front of me. Pretty much it's green to my left, green to my right, and Roland's plaid shirt. And it finally occurred to me—well first I thought why is there this really nice trail right here? And then it occurred to me as we walked by some bear droppings, that we're on a bear trail. And I can't see anything except Roland's plaid shirt. And I think maybe that wasn't the smartest thing I did that day. (laughter)

Santucci: One other thought, again, that's sort of funny. Do you remember Russ giving us some funding, a credit card, to go ahead and purchase some items from REI for the field work?

Fiorillo: Yes, I do.

Santucci: Yeah, that was fun.

Fiorillo: Yeah. And you know, Russ was, I just think Russ was a super individual.

Santucci: Yeah.

Fiorillo: Where he used certain commonsense principles to maximize the impact of a fiscal contribution. And what do I mean by that? If there was a chance to, you know, loan me a federal vehicle that wasn't being used, instead of me having to go out and rent a vehicle, Russ did the paperwork to get me officially listed as a volunteer or what have you so that it was okay for me to have keys to a government vehicle. And what it ultimately did was it stretched our budget out so we could do more. So, I think, again, Russ was absolutely the right guy in the right place at the right time.

Santucci: Absolutely. You know, people in federal government can be so bureaucratic that they stymie the success of many important projects. But he was certainly a catalyst to make things happen. So yeah, a lot of credit to Russ for sure.

Fiorillo: And one other thing I'll credit Russ with was my partner through certainly the last several years of working within the Alaska region was Linda Stromquist. He made her the point person and she just bulldogged through all of the administrative work that needed to be done so that I could do the work that I needed to do. So she was another vital partner.

Santucci: Yeah. Because I don't remember what year Russ retired, but there were quite a few years there after Russ left that Linda made good things happen.

Fiorillo: Yes, she did. She's the one who secured more funding. I think an additional six years of funding.

1:12:23

Santucci: Very good. So, let's see. Is there anything else that you want to say in general about Katmai?

Fiorillo: The thing that Katmai was so much fun, and it was very interesting to see so much important geology in the park because it did help shape my understanding of the work that I did in more detail. For example, in Aniakchak. My only regret was that I would have loved to have found dinosaur material in that park.

Santucci: There's still work to be done there. That's for sure.

Fiorillo: Yes, there is.

Santucci: Any other thoughts in regards to Aniakchak, both the more recent discoveries and what you envision for the future?

Fiorillo: Well, if our pandemic situation allows me, I will go to Aniakchak for the ninth time this summer. And why is that? It's certainly not to just look at the otters and seals out on the water. It's my belief that the coastal exposures of Aniakchak, which started this whole process in the Alaska region, may in fact have one of the most remarkably complete records for any Mesozoic ecosystem anywhere in the world. Because we have such a complete record. The rocks are like turning a page in a book. It's chock full of dinosaur footprints and other kinds of footprints. There's all kinds of information still to be gathered on what was the climate like, what was the temperature, the rainfall patterns, and so on. And there's certainly more work to be done on the fossil plants. That's a place that I feel is the cornerstone to understanding the entire state's dinosaur record. And beyond.

Santucci: Very good. Yeah. That is a remarkable story from beginning to end in terms of how that turned out be quite a surprise. It was one that a lot of people thought that even though there's some exposures there of potentially fossiliferous park, this is a volcanic park. So, the perception was that this park wasn't going to tell that story.

1:15:14

Fiorillo: Right. Right.

Santucci: Great.

Fiorillo: Troy Hamon was so helpful. I mean, he just embraced the opportunity for more research to be done in Aniakchak. So, I credit his passion for the park as helping me get out there as much as I have.

Santucci: Very good. So, after the reconnaissance field work that we did, very minimal, at Katmai and Aniakchak in late July/early August of 2000, we flew back to Anchorage. And then we headed north to Yukon-Charley Rivers. And that was our first time getting on the river there. And do you have any recollections about that experience?

Fiorillo: Well, I remembered thinking this is, you know, again, this is just the joyride continues. We, as I recall, went to Fairbanks. And Roland joined us, and we drove a pickup to get to the park. And I have the same opinion I've had since that very first trip, which is that last hundred miles or so of road from, off the main road into Eagle is the most god-awful highway road I've ever been on. But the scenery was spectacular. I don't know how much you've paid attention, but that road is even bumpier now than it was when we were there. It's washed out more than once. And I can get back to that a little bit later with some of the subsequent trips we did. But I do remember we were so looking forward to getting out there. It is, for most people, the landscape that people would think of if you said Alaska. Because influenced by Jack London's *White Fang* and *Call of the Wild.* Because where he was was not very far from that park. And the Yukon River is just magnificent. So, what an opportunity to have a boat take us up and down that river, just scoping out rocks and seeing where there were opportunities.

Santucci: And you probably recall, but there wasn't much of a visitors' center there. They had just a little area. But they had one little shelf where they had Pleistocene mammal bones, including a bison skull that I have a photograph of Roland holding at Yukon-Charley River.

Fiorillo: Was that in the Park Service little visitor center? Or was that in the judge's house is over there, too.

Santucci: So, my memory has failed me. I thought it was within the park area. But if there's another possible explanation, your memory is probably better than mine.

Fiorillo: Don't count on it. (laughs) So let's just say somewhere in Eagle is that skull.

Santucci: Correct. And it's certainly off topic, but one of the things that was disturbing to me was the family that lived under the blue tarps, that had a whole bunch of kids.

Fiorillo: Yes.

Santucci: And the paramilitary dad would parade them out when the buses came into panhandle.

Fiorillo: In that family finally got run out of town the last time I was in Eagle, which was many years ago. But that framework, and what was left of those blue tarps, was still there. Yes. It's not how I would choose to raise my family.

Santucci: Right. And then you came back later with Linda to do more work at Yukon-Charley. Anything you want to share about that?

Fiorillo: Sure. That was, actually I went to Yukon-Charley six or seven times. And we did, we're again sort of focused on the Cretaceous. We arranged, just like Aniakchak was the most convenient way to do a survey through the park, we were able to raft the Charley River. And that was, that trip was probably nine, ten days. And the idea that we would haul out when we got to an outcrop we could get to. Some of those outcrops and exposures were pretty far away from the river. But that was, that was just a spectacular trip. We went with, Steve Ulvey was the Park Service person. And he's certainly since retired. And then there was a seasonal with us as well. So, four of us. Rafting the river, having a good old time looking at rocks, making notes and so on. And that trip really served the purpose, we didn't find much of anything. But what that trip did do was serve the purpose of educating me on how to get around in that back country. Which ultimately led to the discovery of some dinosaur footprints way up one of the drainages.

Santucci: And are they Cretaceous? Or I can't remember what they were.

1:21:11

Fiorillo: Yes, they are. They're late Cretaceous. The [chrono] data suggests that they're somewhere correlative with the stuff that we found in Aniakchak. Linda and I got support from the park. It was a different kind of support. A boat dropped us off on our next trip to look at Cretaceous rocks. The trip after you went, Vince, we were camped right alongside the Yukon River. And it was just a lovely experience. And we didn't find much that time, either, other than the Cretaceous rocks had a lot of plants in them. So it told me that if we keep looking, we will find something. We worked in June, which was solstice. And that part of the world, most people don't realize, gets incredibly warm. We were hitting mid-nineties. And because it was solstice, the sun wasn't setting. So that was the temperature 24/7. And so it was kind of a miserable experience at times, combined with being next to the river, because that's the only place we could find to pitch our tents. These beavers would come up to our, swim within probably ten yards of our tents. Look at us. Get upset. Smack their tail on the water and swim downriver, only to circle back and do this. So, they were doing this probably every five to ten minutes. And they did it all night long. So not only was it hot, but we hardly slept because of the slapping of beaver tails on the Yukon River. (Santucci laughs)

But again, each trip, you learn something new about how to do what you want to do. And it was, I think it was in 2010, the FIREPRO ship, the 500, the helicopter, the park was warming up to this idea. They offered us a helicopter because there was a window of time that they didn't need the helicopter to do the fire work that the park had needed. So of course, we said yes. So, the 500 comes into our camp. So, we were able to get way off the river and into some upper stretches of some tributaries. And lo and behold, we found the footprints. We were able to date the footprints. We found some fossil trees that were spectacular. And we wrote all that stuff up in a 2014 paper.

Santucci: Very good.

1:24:09

Fiorillo: That I think made Yukon-Charley the fourth national park unit in Alaska to have any kind of a dinosaur record.

Santucci: Very good. And then how did you get involved with field work at Wrangell-St. Elias?

Fiorillo: Well after the SWAN money dried up, and that was a good four-year run. Again, Russ had said okay, now which network do we want to go for? And we did another challenge cost share proposal to the central Alaskan network. And that was Denali, Wrangell-St. Elias, and Yukon-Charley. And that was the first three years of funding. With the idea that we'd survey each park and one park per year kind of a thing. And Denali, of course, turned out to be such a jackpot that we worked to get more funding after that. But that's how Wrangell-St. Elias and Yukon-Charley got funded next. And then Yukon-Charley, just like Phil Brease said, "Well, a little park like that can't have all the attention. Come to Denali." The resource administration at Yukon-Charley said, "Well, we have a bunch of Cretaceous rocks here. Maybe we can have as many dinosaur footprints as Denali. And so, here's some money to help us prove that." And that money is what actually led to the discovery of dinosaurs. But a lot of that Cretaceous is under vegetative cover. So we weren't really as successful as I would have liked. But we did have a proof of concept.

Santucci: Excellent. So, Denali is another big one. So, I assume that you communicated with Phil Brease in terms of logistics to start doing work at Denali. Is that correct?

Fiorillo: Yeah. He was the point person. And we were doing things very small scale. Very small scale. And you know, it was really scratching the surface in just the most shallow of scratches. And I felt like there was so much Cantwell Formation, we needed this to ramp up. And so Phil was important, is important, to the story. And instrumental in all that happened afterwards. But other people were involved. That includes the park superintendent at that time, Paul Anderson, who I got to know through the George Wright Society, and Rick Harris, and then Philip Hooge, who was the deputy superintendent. And those guys, I don't know how I could be so brazen, but I remembered having, with the little bit of scratching that I did with Phil, I was so convinced that we would find dinosaur footprints in that rock unit. That one time when they were having a big think tank meeting to go over the development of the Murie Science & Learning Center and the new visitors complex that's there now, I was invited in for five minutes to say hi. And I remember telling the three or four of them in that room, I said, "Whatever you're planning, leave some space for a dinosaur footprint, because I will guarantee you that we'll find one."

And I walked out of there and Phil just turned to me and said, "Well you're a pretty confident one, aren't you?"

And I said, "Phil, that's how sure I am." And I just giggle about that a little bit. It's like wow, that was a little out of character for me. But the opportunity was there.

Paul was a huge asset. There were times he said the dinosaur project in Denali would be the number one project on the resource agenda for that particular summer. So I had incredible amounts of support to help me get done what I needed to do.

Santucci: And in terms of the diversity of vertebrate ichnofossils, you were able to find in addition to dinosaurs, you documented pterosaur prints as well?

1:28:42

Fiorillo: Right. There's a couple of kinds of pterosaur tracks. There's' probably over a dozen kinds of invertebrate trace fossils. And those are important because they tell us something about the paleoclimate. We wrote a paper, it came out in 2016, for example, where we argued we had found fossil crayfish burrows. And no self-respecting crayfish is going to be found anywhere near Denali now. (Santucci laughs) So that tells you that the climate was warmer then. And you know, there's a number of other invertebrate traces that tell us a number of pieces of environmental information.

And then there's, Denali, the lower Cantwell also has an incredible fossil bird track assemblage. There's at least seven different kinds of fossil bird tracks that have been found up there. Anything from smaller sparrow-size birds on up to sandhill crane-size birds. It is phenomenal.

But the reason why I made those statements about Aniakchak is the rocks in Denali are so convoluted because of the mountain-building process that you can stand on one valley wall, look across the valley, and not know where you are stratigraphically in relation to the other side of the valley. Because of all the faulting and tumbling of blocks. Whereas Aniakchak, like I said, it's like reading the pages of a book. Everything is so nice there. So when I talk about all this diversity, sometime in Denali I may not be talking about the same timeframe. We might be off 500,000 or a million years.

Santucci: Do you recall what year you began work in Denali, and what year was your first discovery of dinosaur tracks in Denali?

Fiorillo: I don't recall. It could have been 1999. It could have been 2000. I just don't remember. And it was really sporadic. And it wasn't continuous. The big thing was in 2005. And that's where the first dinosaur footprint was discovered. And I have a team that I work with still. And Paul McCarthy is the soon-to-be ex-head of the department for the geology department at UAF. And he gets credit for the discovery of the first dinosaur footprint. So, '05, I'm going to the North Slope with Paul on a project. I've been working in the parks. Phil knows who I am. He calls me up and says, "Tony, I've got some pictures I want to send you. This might interest you." And he sent me a picture of a three-toed dinosaur footprint that Paul McCarthy and his students had found. And if there was anything in the world that could distract me from going to the Arctic and dig up dinosaur bones, that was it. (Santucci laughs)

And so we had, the park arranged a press conference. We had a lot attached to it. And I really didn't go to the Coleville, I wanted to go to Denali and look at this footprint and see what else was out there. So it was kind of a weird mindset.

Now how did Paul find this footprint? There had been some bad weather. And two students, they weren't able to do something one day. So, Paul took two students and they just grabbed the nearby exposure. Vince, you've been to Denali. You see how magnificent the mountains are. Magnificent exposures of rock. It is almost hilarious that the first dinosaur footprint comes from an exposure of rock that's about, that's tiny as can be. People would drive by it and not notice it at all. And it's right off the park road. But they pull out, they pull over, they went to the outcrop, explained how dinosaur footprints may be found in this place someday. And Susi Tomsich was one of those students. And Jeremiah Drewl, I think, is the other student's name. Susi stayed with geology. I don't know what happened to Jeremiah. But anyway, as Paul is describing how we find footprints, they said, "What would a footprint look like?". And Paul described it. And they said, "You mean like that thing behind your head?". And Paul literally was standing by the footprint that we then excavated in 2005. And I think it's still on display at the Murie Science and Learning Center.

Santucci: Yes, it is.

1:34:04

Fiorillo: So, one anecdotal story related to that track, that was a high-pressure situation because we didn't know if that was the only footprint, or if that was just the tip of the iceberg. There was a lot of pressure, a lot of press, a lot of attention. So, it was the little prayer, don't let me screw this up. And to make it even more exciting, the superintendent, sorry, the National Park Service director, the political appointee in DC, Fran Mainella, was in the park at the same time we were excavating that.

Santucci: Wow.

Fiorillo: And the park had a grand adventure planned. They were going to take her out to Wonder Lake and give her the road tour back. And wouldn't it be great if we were bringing the rock across Igloo Creek just as her vehicle happened to be on the park road? So there was constant communication over radios. And sure enough, I have a very short video—because we had to cross the creek, I had sandals on, like Keens, and so my boots were, we took this piece of rock with this footprint, put it on a backboard, and carried it across the creek. And so I'm wading through this creek. My boots are off. The video has a former director of the National Park Service carrying my dirty, muddy boots.

Santucci: Oh, you're kidding! Oh, boy.

Fiorillo: And she is just giggling and laughing, and going, "I can't believe this is happening." So, it's a pretty fun memory.

But before Fran showed up, I will say that we had another visitor. And we were by the park road. And the buses were going back and forth. And one bus slowed and stopped. And we thought whoa, isn't this fun? They're watching us do something, wondering what we're doing. Well, as it turns out, they weren't necessarily just watching us. They had noticed that a wolf had curled up like your dog watching you. Our backs had been to this wolf. The wolf was watching us. I'm sure trying to figure out what on earth are they doing at this outcrop. And so the bus had stopped. People were hanging out the windows with their cameras. And there's a bunch of

people with photographs of a wolf watching us excavate the very first dinosaur footprint from Denali National Park.

Santucci: That's great. That is really great.

1:36:48

Fiorillo: I wish I had, I've got a picture of the wolf, but I don't have a picture of the whole scene.

Santucci: Oh, yeah. That's a great story. That is a really, really great story.

Fiorillo: So, one of the things that I really enjoyed about working in Denali with that administrative team, they were so welcoming to me and my team, like it was an event when we arrived. And there was a free exchange of information. And a lot of that information that we provided went into the management plans for Denali, I think through 2025. And so, if you go through their management documents, you will find dinosaurs in the Lower Cantwell Formation mentioned on several pages. So again, I really feel like there's a certain amount of pride in that we contributed to something bigger than ourselves.

Santucci: Oh, yeah. And again, your vision came true. Because the Murie Science Center now has an exhibit of many of those specimens.

Fiorillo: Right. Right. And we found many of them. And my museum background of what is a good quality display piece certainly helped me guide the park to where to fly the helicopter to go collect those pieces.

Santucci: Mm hmm. Yeah, these are good stories. They don't wind up in the scientific literature. And so capturing them to these oral history interviews, getting firsthand accounts, are tremendous.

Fiorillo: I'm glad you think so.

Santucci: Yeah. So you have to feel pretty proud of the contributions towards the story of dinosaurs in Alaska through your work. Not just within the national parks, but on the north slope as well. I think that probably is going to be one of the bigger parts of your legacy as a scientist. Do you feel that's true?

Fiorillo: I would, yes, I do. And I am enormously proud of not only the volume of work, but the quality of work. I didn't do it by myself. I had a lot of important partners, including you, who helped me get to where I thought I needed to go. And the success was driven by everybody saw the vision and everybody contributed with their own toolkits on how to make the vision happen. The quality of our scientific work is robust. And I know every scientist thinks that. But I can, you know, we've tested and retested some of the things we've written. And you know, we've had to tweak some things. But in no case have we discovered we've been way off base. But yeah, I am very pleased with that. Paul McCarthy said one time when we were sitting around, it might have been in a camp in Denali. Referring to me, particularly, he said when I first showed up a couple of decades ago, there were at best a handful of dinosaur localities in the state. And

by a handful, you might have needed two fingers to count them. And he said now I've shown that you can't take ten steps without tripping over some kind of a dinosaur fossil.

And then Guy Adema, who was also in Denali, asked me many times how is it that you knew what financial resources you had available, he's the one who used to say, how is it that you guys, the sum is greater than the parts? And again, I go back to the people buying into the vision and willing to do what they—having the right chemistry among your teammates can get you a lot farther than, you know, being a little bit self-centered, which I don't think any of us have been.

Santucci: I think a good example of that is bringing Brent Breithaupt out to do photogrammetry. You know, the application of photogrammetry for documenting in situ occurrences, particularly with fossil tracks, really started taking off around 2000. And so having him involved, I assume that his involvement was probably one of the first projects that incorporated photogrammetry in Alaska.

Fiorillo: Yes. It's exactly right. Brent had a toolkit of the photogrammetry. He was there. He was one of the participants on excavating that first dinosaur footprint. He may in fact have been that guy who took that video I mentioned earlier. He also gets credit for, we were working a different part of the park, Double Mountain, where I do believe he's the one who brought the first bird footprints to our attention. And of course, that was a spectacular find that we talked about in a 2011 paper. But it's funny to look at how photogrammetry was done in 2005 and how it's done now. And we do so much of it now, and it seems so clunky compared to the techniques of 2005. But Brent definitely gets the credit for doing the first photogrammetry in Denali with dinosaur footprints.

1:42:48

Santucci: Excellent. So, you probably already realize this, but I just wanted to bring it to your attention. So, this would be the twentieth anniversary of the discovery of the Aniakchak footprint. Is that correct?

Fiorillo: Yes.

Santucci: Yeah. So, I think we should take advantage of that. The fall 2021 issue of *Park Paleontology,* which comes out in October of each year, it's tied with *Earth Science Week* and National Fossil Day. We just decided to put together a special issue focused on dinosaurs. Because we've done so little on dinosaurs. In some ways, intentionally, to flush out the diversity of different kinds of fossils that occur in national parks that we wanted to dedicate this year to dinosaurs. So the fall issue, I wanted to, this fall issue of *Park Paleontology* is going to be dedicated to NPS dinosaurs. So I wanted to ask you, would you be willing to either be interviewed or to write a story about that twenty-year anniversary of that discovery and how the work at Aniakchak has changed everything in terms of new perspectives on dinosaurs in Alaska?

Fiorillo: I would be happy to. And I would be happy to do any and all things that you feel are appropriate. I think that as I sit here and look at the George Wright Society Natural Resource Achievement Award that they felt I should receive in 2019. So I think that these discoveries seem to have had broader impact than just what's in my head. So I would be happy to work with you on whichever way you feel is most appropriate.

Santucci: Okay. I'll follow up with you on that. And if you wanted somebody to interview, and that's how we present the story, or if you had the time to pull it together, even better. But I think that will be our top story for the fall issue. That would be a great one.

Fiorillo: Sure. And I'm flattered that you think that. I would be probably leaning towards somebody else interviewing me, rather than me present the story. Because I find it's, the way I think and the way somebody else might think, there's probably some gaps. But having an actual interviewer helps minimize gaps.

Santucci: Absolutely. And if you're writing yourself, it's hard to put quotes in when you're writing it.

1:45:40

Fiorillo: Sure. Sure.

Santucci: And you have some great quotes. And I think it would be good to capture those.

Fiorillo: Well, thank you. So, it sounds like we're wrapping up. And that's fine. But I want to go back to, you asked me my birthdate.

Santucci: Okay. (laughs)

Fiorillo: And I didn't close the loop on that. So, I will now. Which is the journey that I've been on and you are part of it in the early going, those parks in Alaska, so much of what I did was the result of Jimmy Carter and ANILCA in 1980. When he signed that. The date that he signed ANILCA was my birthday, December second.

Santucci: Oh, wow.

Fiorillo: So many times, even now, when I am in one of the national parks in Alaska, I say, "Thank you, Jimmy. You gave me what has to be the grandest birthday present I have ever received."

Santucci: That's before. I like that. That's really nice.

Fiorillo: No offense to my parents. (laughs)

Santucci: Yeah. I can't remember, did you and myself fly out to Lake Clark together and stay in that little lodge that Jimmy Carter stayed in?

Fiorillo: No. We did fly over Lake Clark. We went from Merrill Field and got a flyover. But my actual boots on the ground at Lake Clark was without you.

Santucci: Okay.

Fiorillo: I wish I had. Was that in Port Alsworth?

Santucci: Yes. Mm hmm. Yeah. Apparently Jimmy Carter for several years came back and stayed in the same little lodge. And he did fishing at Lake Clark. So I couldn't remember if we were together on that, or if I was by myself.

Fiorillo: Yeah. I missed that trip. But along the lines of famous places and people, there's a place in, very close to Gates of the Arctic. Not in it, but in Wiseman, Bob Marshall's cabin is still there and I went to visit it. It's pretty much unlivable now. But it still felt like going to a cathedral.

1:48:04

Santucci: Oh, yeah.

Fiorillo: And the other thing about Denali and that footprint, I will tell you that I did not know this at the time. But in 2005, George W. Bush was president of the United States. What I didn't know was that Laura Bush is actually a camping girl. And on her birthday, she would go on a backpacking trip with like five of her friends. And that year, I think it was the following year, she went to Denali. Fran Mainella was there. And Paul Anderson briefed her on dinosaurs found in Denali. So, at one point, this story went all the way to the White House.

Santucci: (laughs) Very good. Good stuff. I'm just going through my notes. There's only one question that I forgot to ask you. It's sort of out of context. But have you had the opportunity to see the relatively new fossil exhibit at Big Bend National Park?

Fiorillo: No, I have not. We provided a little consulting on it. But I have not been to Big Bend in years. And I'm long overdue, so I'm looking forward to it.

Santucci: Yeah. If you get the opportunity, add it to your bucket list. Because Don Corrick really did a wonderful job and was able to do fundraising with their Big Bend Association to make something happen that rarely happens in the Park Service.

Fiorillo: And Don is a real gentleman.

Santucci: Yes.

Fiorillo: He's such a nice guy. One of my regrets about not being able to get to the park recently is I've basically fallen out of contact with him.

Santucci: Mm hmm. Yeah, he's a wonderful person. With that said, have I forgotten to ask you anything?

1:50:02

Fiorillo: No, I don't think so. And I can go on and on and on. But at some point, you have to say enough is enough. (laughs)

Santucci: Well, I wanted to conclude by first of all personally thanking you for your friendship. But also thanking you for the investment of a large part of your career in making good things

happen across the National Park Service. You've really been a champion, a wonderful spokesperson. And you have a very good understanding of park operations. And you've integrated in ways that, you know, it wasn't just go out there, collect specimens and publish research. But you actually incorporated those discoveries in greater understanding for park staff, increasing and enhancing the management of these nonrenewable resources, and also allowing the public to benefit from that work. And you've done that consistently. And just very much indebted to you for that.

Fiorillo: Thank you, Vince. That's very kind. But I will go back again and say I had the right people working with me at the right time. My passion has always been there. And being able to work with so many pleasant, productive people. Yes, of course no journey is perfect. There are bumps in the road or flat-out potholes. But if you have the right people with you and the passion, you can get to where you need to go.

Santucci: Good way to end. Thank you so much. I will follow up with you on several other topics. But thanks again for your time today. I'll make sure I get you the transcript of the interview.

Fiorillo: All right. Well, thanks a lot, Vince.

Santucci: Thanks.

Fiorillo: And you have a good day.

Santucci: You too. Enjoy the rest of the weekend.

Fiorillo: All right. Bye.

Santucci: Bye.

1:42:07

[END OF INTERVIEW]