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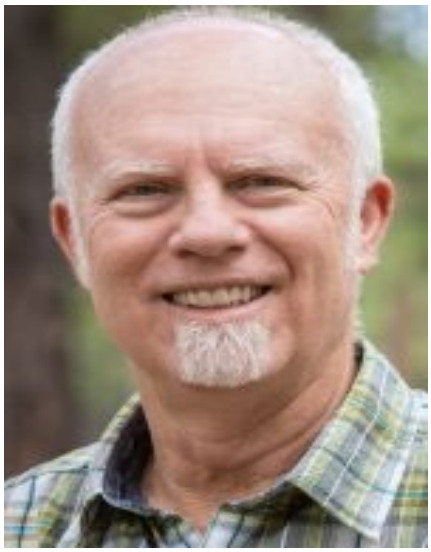

R. Scott Anderson
May 20, 2020

Interview conducted by Vincent Santucci and Justin Tweet
Transcribed by Teresa Bergen
Edited by Molly Williams

This digital transcript contains updated pagination, formatting, and editing for accessibility and compliance with Section 508 of the Rehabilitation Act. Interview content has not been altered.

The release form for this interview is on file at the NPS History Collection.

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Narrator: R. Scott Anderson
Interviewers: Vincent Santucci and Justin Tweet
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Transcript

[START OF INTERVIEW]

Anderson: Hello.

Santucci: Hey, Scott. Vince Santucci from the National Park Service. Thanks so much for joining us.

Anderson: Hi, Vince, yeah. Nice to talk to you.

Santucci: Likewise.

Anderson: You, too, Justin.

Santucci: I opened your resume and I was just amazed how many national park areas you've worked in.

Anderson: (laughs) Yeah, it's been kind of a specialty of mine. I mean, there are lots of them that I haven't worked in, obviously. But I really enjoyed working in park properties. Because I enjoy working with, often with the managers. The managers are really, really good. They're appreciative of science and so it makes it a joy in most cases to work in those parks.

Santucci: Glad to hear that.

Anderson: And I'm super happy that you have this ongoing sort of program to summarize all the paleontological remains in the parks. I think it's fantastic. I didn't even know that was happening. So I was very pleased to hear that.

Santucci: Well, thanks very much. I started in the National Park Service in 1985 at Badlands National Park. And the fall of that year, the first federal paleontology conference was hosted at Dinosaur National Monument. And we had somebody from the Washington office come out as sort of a keynote. And he talked about how proud he was that we had twelve national parks that had fossils. (Anderson laughs) And a lot of us looked at each other and thought, what grade is he? Is he an SES? He doesn't know that it's got to be much wider than that. And so we've sort of, from that point on we began trying to do data mining. And our list has grown steadily. We're currently at 276 units of the National Park Service that have documented paleontological resources.

Anderson: Wow. That's fantastic.

Santucci: Thanks. The whole spectrum. All the way from Precambrian, early life, all the way through Pleistocene, Holocene remains in caves and lakes, etcetera.

Anderson: Right. Yeah. Yeah. No, this is great. And I think I sent you, I don't know, I appreciate being asked to comment on the work in Channel Islands. I learned a lot, actually, from doing that. And also, it's nice for me to kind of summarize my thoughts on my own work, even though much of that stuff is unpublished. And in fact, a lot of the work that I've done in national parks is partially published. I've got a fair amount of sites that have not been published yet. But that's the reason for retiring. (laughter) I can finally get to my stuff.

03:23

Santucci: Well, very good. One piece of business at the beginning. Because Justin and myself, when we took a look at your CV and all your work, we said we should have been talking to you for twenty-five years. So today might be the beginning of a longer conversation. But the one thing is that we had a series of questions we wanted to ask you today if that would be okay. Do you mind if I record the conversation so we can develop a transcript and capture the information accurately?

Anderson: Yeah. No problem. No problem.

Santucci: I appreciate that very much. One of the questions we wanted to ask you is because you've got that broad understanding of working with the National Park Service and working in so many different parks, we wanted to get a sense of what you thought of the inventory report, its organization, its content, things that we could do to improve on it. We always like to do a better job. And in many cases when we're working with parks—not necessarily at Channel Islands—but many parks, our first conversations with them are, "Why do you want to do fossil surveys here? We don't really have much in the way of fossils." And the first time I experienced that was at Yellowstone National Park, where you're dealing with some of the best people in the National Park Service in the upper level. And when I first interviewed them, that was their question to me. You know, "Why are you here at Yellowstone? You should be at Petrified Forest or John Day. We don't have much in the way of fossils, because we're covered by volcanic or glacial surficial deposits." (laughs)

Anderson: Right.

Santucci: So when I pointed out Trilobite Point on Mount Holmes, then they kind of recognized okay, well, let's see what you get. So after our initial inventory, you know, twenty-seven stratigraphic units that have paleontological resources, they were shocked. And from our perspective—are you familiar with our inventory and monitoring program?

Anderson: Only tangentially. Yeah. Really not in any detail. From what I've been able to kind of glean from our conversations with Justin and some of the emails. But I don't know about it in detail. Yeah.

Santucci: Well, back in 1998, after an initiation of a program called the Natural Resource Challenge, which was the result of a book that was published by a National Park Service historian named Dick Sellars, the title of this book was *Preserving Nature and the Natural*

Parks: A History. And it wasn't necessarily a very positive portrayal of how the National Park Service has managed these world-renowned natural resources. Things like feeding grizzly bears in Yellowstone, and suppressing fires, leading to the 1998 fire, and other sorts of things. They weren't really based on the best science. And so the Natural Resource Challenge went forward. And Congress appropriated 750 million dollars to the National Park Service in 1998. More than the collective amount of funding than ever came to the Park Service for natural resource work. And they basically said, "Create this scheme to inventory natural resources in parks, so you'll know what you have. And figure out what are the important vital signs in terms of the health of these resources, and we'll fund you in perpetuity."

And so in 1998, we began this inventory and monitoring program. How do you manage? How do you protect? How do you interpret? How do you make decisions if you don't have good baseline natural resource data? So we've applied it to paleontology. And hence, you know, you had a chance to look at the Channel Islands report.

07:41

Anderson: Right. Right. No, I was unaware of this. I don't know why I was unaware of this, but I was. I think maybe because I'd been working with other individuals that have been more interested in fire history and things like that. And that's sort of a different, a different line. But the way we get these long-term fire histories is to look at the paleontological remains. So we used late Pleistocene and Holocene. So, no, this sounds great. So you have funding to continue this inventory and monitoring program in perpetuity, then?

Santucci: We're hoping so. We've been successful in gaining money over about the last fifteen years. However, it's not base funding. It's funding we have to compete for every year. But because we've been productive, we've been able to continue to sustain funding. One thing just to share with you is that in 2009, the Paleontological Resource Preservation Act was enacted. It was signed into law. So we are just finishing up the rule making process for that. The Paleontological Resource Preservation Act is equivalent to other kinds of legislation, like the Archeological Resource Protection Act, etcetera. So we've been told that once we get the final regulations published in the federal register, which may occur in a couple of weeks, that they would look at more permanent funding for NPS paleontology. So who knows if that will ever come or not, but we've been able to successfully get funding annually to sustain these efforts.

Tweet: Yeah, we're kind of a small operation. There's Vince and then there's me. And I'm not technically, I'm kind of in a weird space between an inside and an outside employee. And then we have people who work with us in the Geologic Resources Division for maps and things. And then we often have interns and things like that.

Anderson: Uh uh. Yeah. I was going to ask you about that. Are you based in Saint Paul or Minneapolis?

Tweet: I am. Vince is out in Gettysburg.

Santucci: I'm actually – my office is actually in the main Interior building.

Anderson: Uh huh. Okay. I see. I see. Okay. Very interesting.

Santucci: So your general impression about the Channel Islands Paleontological Resource Inventory Report, it's sort of a robust example of one of our park-specific paleontological inventories. Any general comments now that you've looked at it?

Anderson: Yeah. I was very impressed with the, with the thoroughness of the report. And I think it's probably a little bit different than you might do for other locations, because it's based upon what's happening under individual islands. So I really like the way that the islands are, the fossils are cross-referenced from one island to another. That was very helpful. But other than that, these sections at the end, which have to do with more policy and things like that, I think that that was super. I really don't have any substantial comments to make that would change the format. I felt that my role in looking at that was to just sort of add into your report the kinds of things that I knew about, maybe some additional references. But the format, I thought, was very thorough. And I especially, since I'm kind of a history of science buff anyway, I particularly like the sections on discussion of investigators through time and what they found. And I think that this is a really important part of any science is looking at how an area develops in terms of its research. I know I try and, well, I don't try, I do, I force this upon my students in every class that I teach to get them to try and understand the history of investigation. Who did what and why they did it and maybe some of the backstories there. Because science, science develops as science develops. But it's also very much tied to personal interests and rivalries and things like that. So I really enjoyed reading specifically that kind of section, and I hope that that continues on all of your, as much as you can do that, continues on all of your projects. But other than that, I'd have to go back over my notes to see if there was anything specific about, that I could suggest. But my impression was that I really thought that it was very thorough and covered a lot of ground. And frankly, it was much more than I thought was out there. So for most people that are involved in paleontology, or paleoecology, I think that they would be, I think maybe even the Park Service, would be really amazed to see how much work has been done and how well it's been tied to former environments from the Channel Islands. And certainly, and I've been involved in many, many conclaves and whatnot with members of the Park Service and other people that are interested in the Channel Islands. And I had no idea, really, how much had been done on certain, certainly on various fossil lines. So I'm always happy to contribute pollen. (Santucci laughs) [unclear]

14:55

Santucci: We definitely want to talk about that a little bit more with you as well. I did want to also offer to you that anytime in the future, either for yourself or if you have students working on projects, we have a huge data set of information in our archives for at least the 270 national parks that we've identified paleontological resources. And if there's a student project that they're working in a particular park, we'd be happy to share anything we have with them. Much of that is unpublished material. You're family with E&R reports. So you know, we have E&R reports that we've data mined for individual parks that represent information that, you know, it's hard to come by because it's unpublished.

Anderson: Right. Right. That's exactly right. But truly, because throughout most of my career I've dealt a lot with archeologists. And some of my money has come directly out of archeological sites and sort of salvage archeology and things like that. And it's always bothered me that there's this great body of knowledge that ends up in the gray literature in somebody's

cabinet. Then there's never any effort to try to synthesize that or put it together. But the fact that you all are doing this for the paleontological records I think is superb. And I just wish that archeologists could do the same thing. But, you know, maybe I'm not familiar with what's in the Park Service as much as sort of outside the Park Service. That's a big black hole that tons of money has gone into producing some really interesting data. But you know, ends up in a report that nobody sees. So I commend you on having this big database on all the unpublished stuff.

Santucci: Well, thanks.

Tweet: And I've noticed that even if it is in the archeological literature, it doesn't often overlap with the geological issue. So if somebody is doing a report on such and such a park, if they don't think to look in the archeological literature, they'll miss those.

17:29

Anderson: Yes. Exactly.

Tweet: We find all sorts of interesting little things. Like a lot of the parks out west, when we do excavations, they often turn up with brachiopods and crinoids that people brought in from somewhere. There's some really nice brachiopod [unclear] from, I think it's [unclear Pueblo] 17:50 Somebody had taken some of these big Permian Pennsylvanian brachiopods and was carving them into bird effigies.

Anderson: Mm hmm. Right. Interesting. Yeah. For sure I can verify that and expand on that, too, with my work in California and other places with archeologists. People collect these things and they trade them through time. And I think it's really important. That's probably another database to mine. There are different museums in California, for instance, would have lots of that kind of stuff. Not necessarily from parks. But in general. Just the paleontological information that ends up in museums in archeological context, for sure.

Santucci: Well, listening to you, I'm going to probably send you a couple of PDFs of some articles that we've done that may resonate exactly with what you're talking about. Fossils in a cultural resource context is something we've published on and that we include in our reports when they occur. We just completed what I think is probably our biggest project ever. And that was the inventory for Grand Canyon National Park as part of its centennial. And to me, the best chapter in that entire report is the history of paleontology at Grand Canyon that Earle Spamer put together for us with Charles Walcott's early work on the Cambrian section all the way up through the recent. So I'll send you a copy of our Grand Canyon report. I'll send you a couple of our other papers as well.

Anderson: Great. Great. Yeah. That sounds fantastic. Yeah. Well I'm happy to, certainly am happy to review these documents as they come out. Especially where I have some familiarity with them. So, going forward, you know, I'm just retiring this year, actually. I just retired from fulltime. This year I'm going to half time for the next two years. And then I'll be out the door from NAU. But my retirement looks a lot like my academic career, without the teaching. (laughter) I have lots of interesting projects that I'm working on. So I'm hoping to remain active in writing up my projects and continuing to work on the ones I'm most interested in. For the next ten years or so, anyway. We'll see how that goes.

Santucci: I appreciate that. Yeah. Thanks for all your focus on national parks. That's really beneficial to us and to those that work in those park areas. So, Justin, you had one question you wanted to ask in regards to a paperwork exercise for the review?

21:13

Tweet: Oh, yeah, yeah. We have a review form that goes with the review. And I was wondering, I think I've sent you a copy once or twice. And I can send it to you again. I was wondering if you could just fill that out for our paperwork. And everyone forgets to do it, so it's no problem.

Anderson: (laughs) Yeah. Yeah, I'm happy to. I don't recall—I must have missed it.

Tweet: Yeah, it probably got buried. I'll send that again.

Anderson: Okay. Yeah, I'm happy to do that. Yeah.

Santucci: We're required to submit that as part of the final approval process of the publication.

Anderson: Uh huh. Okay. All right. Great. And then Justin, you said you had, I shouldn't even have to ask you this. But you said you had a copy of Amanda Grant's master's thesis? A pdf?

Tweet: Yeah. One of the people we work with is a student at NAU. And so I was looking at, and said, "Oh, I'll ask her if she can get a copy of this." So she did.

Anderson: Okay. Great. Could you send that to me? It would save me some time.

Tweet: Oh, sure. I'll send you a copy.

Anderson: It's so funny because I cannot find my copy. So that would be very helpful. And Amanda and I are just now writing up, she's written up of her results for her publication. And I'm working on the introduction and some of the other things as well. But that's a document that I can't seem to find. So even though she was my student, it happens, I guess. (laughs) But, yeah. So we're hoping to finish up our work on Channel Islands and get it published in the next two years. And then my goal is, I have a whole lot of stuff. I noticed on your list, the parks that I've done a lot of work on in California are Sequoia, Kings Canyon, and Yosemite. They're not on your list. So I have, I'm working on a number of papers from those parks now. And also one from Mesa Verde. Which we published one. But I've got two other ones on late Pleistocene and Holocene records from there that are on my agenda for the next couple of years. So, hopefully, some more stuff will come out before too long.

Santucci: Perfect. So I don't know how much time you have today, but I wanted to know if I went through and started listing some of those parks, could you give us a real Reader's Digest synopsis of what you feel your main research focuses have been at each of the parks?

Anderson: Yes.

Santucci: I could just read off a park name and then you can share just a couple of—

Anderson: Yeah.

24:29

Santucci: Sure. So let's start with a small one, because Channel Islands may take up a little bit of time. So it looks like you worked at Wupatki a little bit, or you had a student working at Wupatki?

Anderson: Yes. We worked at Wupatki. We've done a couple of different things there. We have, one of my graduate students collected packrat middens. So we have a nice packrat sequence that goes back to the late Pleistocene, I believe it does. Her name is Kirsten Ironside. And then I have worked also on some sediment cores from Wupatki that are, the point that we were, the reason we were funded for that is to do some paleo-environmental analysis in two parts of Wupatki so that archeologists would have a better idea of the environmental changes that occurred during the Holocene. So we've done sediment cores in two locations. And then I had a graduate student that did a large packrat midden analysis. In conjunction with my colleague, Ken Cole, who actually was a paleoecologist in the Park Service until he got moved into USGS and then retired. But Ken and I have worked out at Wupatki on those two projects.

Santucci: Great. It looks like you were at Navajo National Monument?

Anderson: Correct. Yeah. There we have, again, we have sediment cores that we have taken. They're not really cores, they're profiles. Our intention there was to again do a paleo-environmental reconstruction to go with some kind of archeological work that might be done at Navajo National Monument at Betatakin Ruin. And that's not been published, either. Both of those are on my list because they're relatively easy publications to do. I've got reports on both of those. But it's, yeah, just reports to the park units.

Santucci: Okay. Let's see. One other one in Arizona. Organ Pipe Cactus National Monument.

Anderson: Yes. There again we, this was some time ago. We did a packrat midden sequence from Organ Pipe that goes back into the late Pleistocene. My part of that was to work on the pollen from the packrat middens. The point of that project was to sort of look at a node, a specific node, in what's now the Sonoran Desert to see how vegetation has changed in the Sonoran Desert down there.

Santucci: Great. Let's see. Looks like you've done some work at Valles Caldera?

Anderson: Yes. Yes. Right. I didn't mention that one. We have a fantastic record at Valles. We published an article in *Nature* in 2011. And my part was to do the pollen and the prior history. So we have, which I never published, which is really a shame. But again, it's on my list. It's a record that stretches back, it forks in time. It's marine oxygen-isotope stage 10 through 14. So it's somewhere around, I don't know, 300,000 to 550,000, something like that, years ago. It's a continuous record. Goes through two interglacials and three glacials. Incredibly unique, high-resolution record for the Southwest. And again, it's only been partially published. Used some of our original sort of broad-brush vegetation. Looked at vegetation from the pollen data was in that *Nature* article in 2011. But other than that, the details have never been published.

Santucci: Excellent. Mesa Verde National Park.

29:29

Anderson: Yes. Mesa Verde was originally a project funded out of the Denver office to look at fire history. It was right after a very large fire, I believe it was 2008 or 2006, I can't remember exactly, that burned into the park and burned a big section of the park in the eastern part of the park. Some money was freed up and we went in and got permission of all things to get a big drilling rig into the park. We drilled a couple of large drill holes in Crater Canyon and another canyon, and we've done like in the pollen work and the charcoal work, trying to figure out the late Pleistocene to Holocene. So that particular project, the goals were to look at the fire history, as well as to provide a paleo-environmental reconstruction that could be used for the archeologists.

Santucci: Okay. Great. Let's see. Going north, Colorado National Monument.

Anderson: Yeah, so that was a project that never really came to fruition. We started working in Colorado National Monument, some years ago, I don't know if you, I know Larry Agenbroad's name came up a lot in the Channel Islands report. Larry was a faculty member here and you know Jim Mead because he was in the Grand Canyon. Larry Agenbroad and Jim Mead and myself had a three-year grant from the Park Service. It was in the late, let's see, it must have been in the early 1990s. And the idea was to, it was just, the idea was to go through all the parks on the Colorado Plateau and evaluate paleontological remains for the late Pleistocene. And so we get an idea to where we could best put our efforts if we wanted to do something more detailed. So it was woefully underfunded. And the goals were super lofty. Much of that we did was very cursory. So Colorado National Monument is one of those. I think I analyzed a packrat midden or two and a stratigraphic profile and then made some notes about the possibilities of future work there.

And that was the way it went for most of the parks on the Colorado Plateau. And we did work at Cedar Breaks and Zion and Pipe Springs. We really did this sort of cursory analysis. I don't know whether you have access to those reports or not. I probably still have them in the physical form. Not electronic form. But those kinds of places had a pretty minimal amount of work, actually.

Tweet: I've got scans of Larry's notes, actually. I was at Hot Springs last May to get notes from his Channel Island work. And that notebook was there as well. So I got to scan those from that period.

Anderson: Oh. Uh huh. Well do you have, I don't know whether you have those, because there were three reports that came out. And if I can dig them up, I'm happy to see if I can get somebody to get an electronic version. Because none of this was done electronically. It was all typed, you know.

Santucci: If that was possible, if it would be possible to get the scans of those, those would be extremely valuable, and we would get those into our archives.

33:53

Anderson: Yeah. I can do that. I can do that this summer. I'm just making myself a note. Because they might have some, they might have some good information that you could add to your database. But it was nice. I think we had $90,000 a year for three years for three people to travel to all the, as many properties, as many Park Service properties as we could possibly get to, just during the summertime, and do what we possibly could. But it was a very cursory analysis. There's very little—and no pun intended—very little done in depth. But I'm happy to see if I can, I'm pretty sure that I have copies of those somewhere.

Santucci: Okay. So I had Cedar Breaks on my list. So would you say that Cedar Breaks is tied in directly to this particular project? Or was there other work at Cedar Breaks?

Anderson: It was. It was tied in. But I did publish, I actually did publish the work from Cedar Breaks. That was a little pond called Alpine Pond. And I'm trying to think. I published that, I might have to go back to see where my publications are. But that was, I could send you that as well. I could send you the publication. I can't remember exactly, I think it was published in *Alpine Research,* but I don't remember. It must have been in the late '90s. So, yeah. So Cedar Breaks is one probably where I did more detail work of any of those parks on the Colorado Plateau, as part of that project.

Santucci: Okay. Great. Yeah, that's really, really useful information. Thank you. Dinosaur National Monument?

Anderson: We had a, I had a graduate student who did a master's thesis in Dinosaur. Her name is Saxon Sharpe.

Santucci: Oh, that was your student?

Anderson: Yeah. Yeah, you know Saxon?

Santucci: I do. And work at Arches, too.

Anderson: Yes. Yeah. Yes, exactly. So, yeah, that was Saxon's work. So I have a copy of her thesis, but I don't have, and again, it's a hard copy, it's not an electronic copy.

Santucci: And so then, I have Arches listed. Would that also be Saxon Sharpe's work as well, as a student?

Anderson: Yeah. Let me see. I'm going to get to look at something here. I can get you a title, perhaps. Some of this stuff goes back pretty far and I hadn't thought about it for a while. So I have to get back to the—okay, so, yes. That was work, that was actually Sharpe's work was late Pleistocene, Holocene vegetation change in Arches and Dinosaur. And, right. So, yeah. So I guess that was just Saxon. I had another student who did some work in, I believe, in Arches, or another place, I can't remember now. Janet [McVicker?]. But I don't see her work listed here. I'll check on that for you.

Santucci: Thanks very much.

Anderson: Sure. Of course.

38:14

Santucci: Let's see. Remaining on the Colorado Plateau, Glen Canyon National Recreation Area. And I see you've been at Bechan Cave as well.

Anderson: Yes. Right. Actually, sort of talking about the history, Bechan Cave was my very first work on the Colorado Plateau when I was a PhD student at the University of Arizona, back in the mid '80s. And yeah, so I've never been, I don't think I've ever been part of any publication on Bechan. But I certainly was there doing some work.

The other work that has been done at Glen Canyon, of course, was Jessa Fisher's work. She did a master's thesis, Ken Cole and I were joint advisors for her. Her master's thesis was entitled "Using Packrat Middens to Assess How Grazing Influences Vegetation Change in Glen Canyon National Recreation Area, Utah." A super, super detailed analysis of Holocene packrat middens. Very, very good. And it's come out in a couple of different publications, too, not just the thesis. There were two other publications, one in the *Journal of Arid Environments,* and another one that I can send you as well if you don't have that.

Santucci: Justin, do you—

Anderson: I'm writing myself a note here.

Santucci: Justin, do you know if we have that?

Tweet: Let me check. One moment. Yes, we've got the publications, 2006 and 2009.

Anderson: Two thousand six, 2009, okay, good. I think that the 2006 publication has all the information in it. I'm pretty sure.

Santucci: Perfect. Is it safe to assume then your work at Pipe Spring and Zion were tied with the Pleistocene project with Larry and Jim?

Anderson: Yes.

Santucci: Okay.

Anderson: Yes. Yeah, so I think I did some pollen work on a section from Zion. But it was never enough to publish. And I would totally have to go back to my notes on that, because I can't remember much about that. I remember the section, but I don't remember what I found or anything. So, that's been too long ago for me to remember. (laughs)

41:29

Santucci: Very good. Let's see. Grand Canyon.

Anderson: Can I say, one other thing about the Valles Caldera. I don't know whether you have access to, I have another student that did work in the Valles Caldera. Her name was Renata Brunner-Jass, J-A-S-S. Her husband Chris Jass was also a student here. He's a paleontologist, I

think had a museum in Edmonton. Edmonton, Alberta. Anyway, she did a master's thesis on a site in the Valles Caldera, a place called Alamo Bog. And you probably don't have that master's thesis. But I'm happy to send a copy of that to you if you, prior, when we did our work there, and she did her work there at the Valles Caldera, it wasn't really, it was part of the Forest Service, so.

Santucci: That would be great. Thank you. Fantastic. Grand Canyon National Park?

Anderson: Yeah. So (laughs) my work at the Grand Canyon has been in conjunction with my colleague, Ken Cole. And Ken was a student of Paul Martin's at the University of Arizona. He's a couple of years older than I am. He was a paleoecologist for the Park Service, first at Indiana Dunes and then went to work at, actually it was either Minneapolis or Saint Paul, I can't remember. I think it was in Minneapolis. And then he got transferred to Flagstaff when, it was during that whole biological survey, USGS business in which, I can't remember what part of history that was. But he ended his career as a USGS paleoecologist here in Flagstaff and is still living here in Flagstaff. Ken did his dissertation work in the Grand Canyon. I'm sure you've come across this because it's a super piece of work. So my part of that over the years has been to analyze the pollen. I don't know how many dozens of packrat middens that we have. So I have a bunch of unpublished packrat midden data from different sites in the Grand Canyon. All associated with middens that Ken has collected at, literally since the late '70s.

Santucci: Very good. Yeah, I have a short publication with Ken regarding Grand Canyon caves.

Anderson: Yeah. Yeah. Ken still works on, this is Ken in retirement. He likes to say he never finished his dissertation. (laughter) Because he's still working on that. And I don't know, I know he's working on a big publication, and these pollen data will be part of that. But I could ask him if he feels comfortable with me contributing the pollen data. But that's another possibility.

Santucci: Very good. Okay. So let's go west a little ways. I know you worked in the Mojave Desert. Did you work in the Mojave National Preserve, or Death Valley at all?

Anderson: Um, I don't think so. I don't think any of our sites were, I was looking at the boundaries of the Mojave Preserve. And most of the work that I have done, I think is probably outside of the preserve. We have a bunch of sites from the Alabama Hills, which are sort of at the base of the Sierra Nevada. And the Owens Lake region. We had a lot of middens that we have analyzed from [Impasota?] Lake region. Some, let's see, I'm trying to think. The big marine base out there, which has escaped me temporarily. Um, 29 Palms. A lot of them from 29 Palms, which are not, obviously, not part of the Park Service.

Anderson: But by the way, this is another really interesting topic. And that is paleontological research on military sites, which is pretty interesting. So, I'd have to take a look at the Mojave Preserve to see whether it encompasses any of our sites. Because I don't know specifically, to be honest with you. But not in Death Valley. I've never worked in Death Valley.

Santucci: Okay. Great. Let's see. Going up in elevation, Devils Postpile National Monument?

47:07

Anderson: Yes. Let me think. I worked on a site called the Starkweather Pond. It's either right inside Devils Postpile or it's right outside Devils Postpile. And I can't remember whether that's incorporated within Devils Postpile or not. I'd have to check on that.

Santucci: Okay.

Anderson: And of course the boundaries have changed over time. It could very well be within the boundaries of the park right now.

Santucci: Sure. Okay. Sequoia Kings Canyon National Park?

Anderson: Yes. Lots. I have had a fair amount of grant money to work in Sequoia and Kings Canyon. I probably have ten sediment records from Sequoia. Maybe more than that, over the years. Many of which, some of which have been partially published. But most of them have not been published. And I sort of made that my goal for the summer is to put together a big publication on that. And you can see I'm stacking up publications in a very short period of time, right? So, yeah, I've had lots of sites within Sequoia. Mostly concentrated, sort of associated with the giant sequoia groves. I was funded for many years in the early '90s, late '80s and early '90s to work on long-term fire history studies associated with re-instituting prescribed burns within the sequoia groves. And I don't know how familiar you are with the history of that. But in the late '80s, there was a big conference to try and understand what was needed to maintain health in the giant sequoia groves. They'd become way too, like so many places in California, they'd become way too developed. And hence, largely because of development, they excluded fire. And they were seeing essentially little to no reproduction.

So, they wanted to know more about whether fire, how important fire was. So I teamed up with some Park Service scientists, Nate Stevens and Dave Parsons and a variety of others. Tom Swetnam down at the University of Arizona, who was working on tree rings. We did, for a number of years, we did a big study looking at the fire scars from tree rings on sequoias and also fire and pollen records from different meadows in giant sequoia groves. So I probably have five or six giant sequoia groves and then maybe another five or six outside of these groves at higher elevation. So somewhere around ten or twelve sediment records. Only one of which has been partially published, actually. The Log Meadow record. But I don't generally brag about that publication because it was a publication in a Forest Service contributed volume and I've done a whole lot more work on it since then. So I could send it to you, but (laughs) it's not what I'm really proud of at this date.

Santucci: Okay. (laughs)

Anderson: But, yeah. Sequoia's been a big effort for me. And I still have lots to publish there.

Santucci: Okay. Perfect. Yosemite?

51:31

Anderson: Yeah. Yosemite, I did my dissertation work in Yosemite. And I probably got, yeah, most of those sites are published. Tioga Pass Pond was one site. Ten Lakes was another site. Let's see. Probably the best site that I have is Swamp Lake. And that's a really nice record. That

goes back 15,000 years. Again, it's a good record of pollen, macro fossils and charcoal. We originally published that with one of my graduate students, I think in 1990 or '91. But in 2000, I got a very large grant from the Yosemite Association to do a really comprehensive study from Swamp Lake. Because Swamp Lake has laminated or [vars?] sediments. So that particular project has been not finished. Unfortunately, it's twenty years ago. But the data are all there. It's a huge project. That was part of the problem. It got to be too big, and nobody knew how to write it up. So the Swamp Lake is probably the best record of all in the Sierra Nevada. And that will eventually get published.

Santucci: Very good.

Anderson: Sorry, you can see I have a lot of unpublished stuff. (laughter) It's just the way it is.

Santucci: It's amazing. Because the amount that you have published on top of it is just phenomenal.

Anderson: Oh, thank you. I really hope I live long enough to get it all published. It is what it is.

Santucci: It's a tremendous contribution from one human being. (laughter)

Anderson: Thank you for saying that.

Santucci: I'm really impressed. Okay, let's see. Still continuing work around California. Point Reyes National Seashore?

Anderson: Yeah, yeah. Another really big project. That was also money that came from the Park Service through my friend in college, Peter Brown, who is a fire scar tree ring person. So I was a subcontractor on that. We have a number of sites that we have from Point Reyes, only one of which we've published. We've published the site called Glenmire. Which is in a publication in 2013. I'm happy to send you that if you don't have that. But I have several other sites that we've done work on, we just haven't published. One's called Wildcat Lake, which is a Holocene record. And another called Creamery Bay Bog, which is a Holocene record.

Then the longest record that I have from Point Reyes is called something Trail Pond. Coast Trail Pond. Coast Trail Pond. That goes back about fifteen or seventeen thousand years. And that, again, is unpublished at this point in time. So I have those four sites that we've done work on.

Santucci: Very good.

Anderson: And by the way, some of those, there was an old publication on Coast Trail Pond that preceded our work. And I can send you that if you're interested. And also on Wildcat Pond. Both of those have been incomplete, I mean, very incomplete data. One of the reasons why we went back to do that was because we recognized that they were really key sites in sort of our understanding of the late Quaternary in that part of the world, and we wanted to redo them. I'll probably do an article that incorporates all of them. But I'm happy to send you those original references, if you don't have Coast Trail Pond and Wildcat—

Santucci: Absolutely. Hey, Justin, are you making a list of all these things we need Scott to send us? (laughs)

56:48

Tweet: I'm making a list here.

Santucci: Okay. Yeah, I think we struck gold today. I really appreciate this. Thanks. So I guess heading over to Channel Islands, then, if you can summarize your work there.

Anderson: Yeah. So again, a little bit of history. I started working there in the late '90s. And because of my work in the Sierra Nevada, actually. A guy named Jan van Wagtendonk, who was a researcher at Yosemite, he's a good friend of mine. Retired now. But he was a fire ecologist in the park. Channel Islands wanted to institute a prescribed burning program. And so they contracted with me to come out and look for paleo-ecologic sites that I could take sediment cores from so we could do that. So that's sort of kept me there since 1995. And it's been a real joy to work on Channel Islands. And I think I pretty much told you, gave you all the information that I have from the sites that we had. On Santa Cruz Island, we have two short records that we call Pasture Pond and one called the Boneyard. When I first started working there, I believed that Pasture Pond was on the, it was on the Park Service property on the east part of the island. But Boneyard was not. The Boneyard now is on Park Service land. It was part of that trade that was made with the Nature Conservancy when the Park Service paid for all the pig hunters to come over and kill the pigs on the island. They traded the land for that.

And then further to the west, the big site that you know about is the [Cañada de La Salsa?] 59:00 site, which has been worked on for a hundred years or so. And then one just to the north of that, the [Brunas Abes?] 59:10, which is a series of dry ponds that we attempted to get a record out of. But we could only get charcoal records out of that. The pollen was not preserved. So we have pollen only from the Boneyard and from Cañada [del Salsias?]. We have charcoal records from all four of those. And not so much from Cañada [del Los Salsas?], but we do have some stratigraphic charcoal records from there. So those four sites on Santa Cruz Island.

Then on Santa Rosa Island, the big ones are the ones that we published in 2010. Soledad Pond, which is in the middle of the island. And then Abalone Rocks Marsh, which was a second core that was taken in Abalone Rocks Marsh near the same site that Ken Cole and Kimber Liu took on their – I think they published in 1994, maybe. So those records were published in I think the *Journal of Quaternary Sciences* in 2010. And then we have a bunch of records from Arlington Canyon in association with the Pleistocene/Holocene boundary there. And then a charcoal record from a place that we called, oh, geez, um, I don't know. I can't remember. Two small records, also on Santa Rosa Island that yielded only charcoal records. No pollen. It's been analyzed. But I think I sent you those names.

And the last one in the Channel Islands that we have so far is out on San Miguel Island. That's kind of an interesting story. We were working on Santa Rosa Island and we were trying to get to San Miguel Island. But the weather was not cooperating. So we finally got one morning where we had just enough blue sky to fly from Santa Rosa to San Miguel. We did, we flew and landed at the airport. We walked around the airport a little bit. I took a sediment core from right

adjacent to the airport. The clouds started coming in. Then we got on the plane and took off. So we had very little time to do anything on San Miguel Island. But I do have a small sediment core that's not been fully analyzed there. I think that's it from the Channel Islands.

Santucci: Great. Just a quick question for me. On Santa Cruz Island, the locality known as the Boneyard, any reason why that area's been named Boneyard? Is it based on fossil or recent bone?

1:02:35

Anderson: That's a good question. That was the name I gave it because it was a vernal pool, where, you know, you have water in the wintertime. And so a lot of the sheep and other sort of feral animals would congregate around there. And so there were a lot of bones of dead sheep and goats and pigs in this little area that normally had some water in it. That's why we called it the Boneyard. It wasn't because there were Pleistocene bones there.

Santucci: Okay. (laughter)

Anderson: It was because there were a lot of dead sheep. I've got a picture of us digging a pit there surrounded by, you know, sheep skulls and things like that. Good question, though.

Santucci: Very good. Thanks. So, I have three more parks on my list. I imagine I may not have all of the parks that you've worked in. But just miscellaneous. Crater Lake National Park.

Anderson: No, I've never worked in Crater Lake.

Santucci: Okay. You mention the Kenai Peninsula. Did you work at Kenai Fjords National Park at all?

Anderson: Just outside of Kenai Fjords, actually. I worked on the Kenai Peninsula a lot. But I don't think any of our sites are in Kenai Fjords. They are right outside of Kenai Fjords in the Kenai Mountains. Mostly on the refuge, on the wildlife refuge. And in the lowlands on the wildlife refuge. So I've published a number of records. I think I published four papers on work on the Kenai Peninsula. But I don't think that any of them are in the Kenai Fjords.

Santucci: Okay. So we've saved the one that we're most curious about for last. (laughs) And you probably know that Katahdin Woods and Waters National Monument was established as a unit of the Park Service a couple of years ago. And you have Mount Katahdin listed as an area you've done some research. Is it part of the monument?

1:05:02

Anderson: You know, I think it's just outside, because it's in Baxter State Park. And I don't know whether Baxter State Park is part of the monument now. But I looked at the, I got online to look at the outline of the Katahdin Woods, and it looks like it butts up against Baxter State Park. But I don't know whether that large state park is actually part of the monument or not. If you guys could tell me that. I don't know.

Tweet: They're separate. Yeah.

Anderson: So I worked in Baxter State Park. And not within the boundaries of the monument as far as I know.

Santucci: Okay. Do you think that research is tied to resources that potentially occur within the monument?

Anderson: That particular research?

Santucci: Yeah.

Anderson: That was my master's thesis. So that was in 1979 and it finally came out in, I think it was 1983 or something like that, I don't remember. So I've not had much connection actually with science in Maine for a number of years. Yeah. It's just, it's just that's where I sort of cut my teeth in paleoecology. And it's very near and dear to my heart. So I'm super glad that that's on your list.

Santucci: Very good. So we've covered twenty national park units. Did we miss any that we should chat about?

Anderson: Let me think. No. A peer in Arizona had a student. Again, Kirsten Ironside who did packrat middens in Walnut Canyon National Monument. That was with, again, co-directed with Ken Cole in her dissertation work. And that's never been published. But there's a whole series of packrat middens of, mostly of plant remains. I think there might be some animal remains in these packrat middens, but they're mostly plant remains. And that's a part of her dissertation. So it's accessible. But it's not published. I'm trying to think of anything else [that relates] 1:07:56 in my head. I think that's probably pretty much we've covered everything in California, we've covered everything in Arizona, the places I've worked in New Mexico. In Colorado, I'm trying to think if I've, the big one in Colorado I haven't worked is Rocky Mountain National Park. Which I would have loved to, but I haven't. I haven't worked in Florissant. I think we've covered everything Colorado. I'm pretty sure that we've covered everything.

Santucci: Okay. Great.

Anderson: If there's anything else I can think about today, I will certainly let you know.

Santucci: Okay. And I don't know if she worked at Walnut Canyon during the time that Kirsten Ironside did. But do you know the name Lynn Murdoch? And that might be her married name.

Anderson: No, I don't. I don't. I don't know Lynn.

Santucci: She's a graduate student of Larry Agenbroad's from NAU and her master's thesis was having to do with middens from Walnut Canyon.

Anderson: Yeah, you know, I have run across that. But I don't think I was involved, I certainly wasn't involved with that. But I do remember that when talking with Kirsten. But, yeah. So I probably have a copy of that, but I was not involved in any of that.

1:09:38

Santucci: Okay. So, and Justin may have a couple of—

Anderson: There's one other, geez, I'm trying to think of, there was another guy who did packrat midden series out at the, out at Wupatki years ago. Geez, what was his name? Steve Cinnamon. Steve Cinnamon. He did a master's thesis on a bunch of Pleistocene packrat middens out at Wupatki National Monument. And unfortunately Steve was, he was kind of an administrator out there. He got transferred, I think, to someplace out of state where he ended his career and he never published it. But there is a master's thesis on that, that I have a copy of. I could probably get you an electronic copy just by, if we can ever get back into our office, you know. And [unclear] (laughter)

Santucci: Yeah. Steve Cinnamon wound up in the Midwest Regional Office in an administrative position.

Anderson: Oh, okay. So you know of Steve then. Yeah. Yeah. Right.

Santucci: Yeah. So I have just—go ahead.

Anderson: No, I was just going to say, that's all I can think of right now.

Santucci: Okay. I have just a few more questions. And Justin may have a couple of questions as well. Do you still have a few more minutes? I don't want to impose too much.

Anderson: Yeah, I've got a couple more minutes. And then I'll have to break off. I've got a planned call with my grandkids.

Santucci: Okay. Great. So you did your PhD at University of Arizona. Did you interact at all with Vance Haynes?

Anderson: I have. Yeah. I don't know Vance Haynes well. He wasn't on my committee. But I have interacted with him. Yes.

Santucci: Okay. And then Paul Martin. Any interaction with Paul Martin?

1:12:03

Anderson: Yeah, a lot. Yeah. Paul. Paul is a real mentor of mine. I spent a lot of time with Paul. Great guy, you know. One of those unforgettable individuals. So, yeah. Yeah, he and I spent several extended trips to Mexico together. And he introduced me to Bechan Cave up in Utah and a bunch of other places when I was a graduate student. He was on my committee. He was one of my advisors.

Santucci: Yeah, I had the pleasure of speaking to him twice in his emeritus status. And he had helped us with some information regarding Carlsbad Cavern cave sites and Grand Canyon cave sites, regarding sloth dung and things like that. He was an extraordinary person. Has anybody done a history of Paul Martin, given how many people he mentored in his career?

Anderson: I don't think that's happened yet. But you know, it's, yeah, it's a remarkable, he was a remarkable person in so many ways. I mean, intellectually, of course. And personally a man of a real dichotomy, the way he would think about the world. And the fact that he was so physically broken in so many ways. Just a really, really exceptional individual.

By the way, as we're thinking about this, maybe you have Julio Betancourt's work at Chaco Canyon?

Santucci: Yes. Mm hmm.

Anderson: [unclear]

Santucci: Yes. We have that, don't we, Justin?

Tweet: Yes.

Santucci: Yeah, I thought so. Okay. Yeah, he's been very helpful.

Anderson: Yes. Yeah. Julio's great. That group of people in Tucson at that time was, I still keep in contact. They're good friends of mine ever since. It's just the way it was supposed to be, right?

Santucci: Yes. Absolutely.

Anderson: You get these colleagues in graduate school. Anyway, it's been very nice.

Santucci: Yeah, they definitely, he influenced a whole generation or more of scientists that went out and did great work.

Anderson: Absolutely. Absolutely. I totally agree with that. Yeah, he'll be ripe for a biography at some point in time. I just don't know. At this point in time, I mean, it would be really nice if somebody wants to take that on now while all these people are still around and active, his first and second generation. But I don't know. It will take a special person to write the biography, I think.

Santucci: Absolutely. Yes. Let's see. I wanted to share with you just a little bit of information regarding White Sands. Had you heard about the discoveries recently of late Pleistocene megafaunal trackways in playa lake deposits, late Pleistocene?

Anderson: No, uh uh. I haven't.

1:15:42

Santucci: I'll save it for another more in-depth conversation. But we are just absolutely thrilled with the fact that over the past decade, we've documented this late Pleistocene mega track site at White Sands National Monument. Beneath the shifting gypsum sands are these late Pleistocene playa lake deposits. And a young resource manager about ten years ago started noticing these footprints in them. And they're extremely ephemeral in that once they're exposed from beneath

the shifting gypsum sand dunes that they weather very, very rapidly. But if you get out there shortly after them becoming exposed with the shifting sands, some of them are preserved however very unfortunately because of their ephemeral nature, they don't last long. Tens of thousands of footprints, mostly proboscidean, large artiodactyls, camels. Only the second occurrence of ground sloth tracks in North America. Just big cats, small carnivores, on and on. But the most amazing aspect of it, and it took us nine years to verify it, we have contemporary co-occurrence of human footprints from the late Pleistocene.

Anderson: Wow. That's amazing. I had no idea. No, I've not heard about this.

Santucci: We published it in *Nature* a year ago. We have three more publications that are coming forward. But the next publication is going to be that we not only have human footprints, but we have adult and we have toddler footprints. (laughs)

Anderson: Oh my goodness. Oh, that's fantastic. Can you send me that? I don't know how I missed that.

Santucci: Absolutely. Yeah.

Anderson: I would love to have a copy of that. Because that's so fascinating.

Santucci: And maybe another time when you have available time to chat, I can share with you in greater detail a lot of aspects of that. We're getting some incredible age dating. Are you familiar with Rupia seeds?

Anderson: Mm hmm. Yeah.

Santucci: Yeah, so we're finding large concentrations of [rupia?] in multiple stratigraphic layers that has allowed us to bracket a lot of these footprints and get age dates for them. I am prohibited from releasing the age on them because of a publication that's sequestered us, they've embargoed us from being able to share that. But anyway, more to share on that one. I'd love to talk to you about it because it sounds like one of those areas that you would be very interested in.

Anderson: Oh, definitely. Yeah. Has anybody done any work on the sediments, on the lake sediments? The pollen work?

Santucci: Yes. Well, no. In fact, that's one of the things that I was thinking if you had an interest of another Park Service project, that is the big void in our multidisciplinary team. We have lots of people involved with aspects of this. But we don't have anybody that's looking at pollen.

1:19:25

Anderson: Hmm. Interesting. I think I would like to discuss that with you more.

Santucci: Yeah. Absolutely. That sounds great. Justin, did you have any questions?

Tweet: Well, two questions. One of them is kind of a short and technical one. The other is a little longer. I'll do the short one quickly, which is as I'm preparing this, as I'm preparing my

draft, and I have you cited as a personal communication, do you prefer Scott Anderson or R. Scott Anderson? I want to make sure I get that right.

Anderson: Yeah. It's R. Scott. R. Scott Anderson, yes.

Tweet: Okay. I will make sure that it reads that way. And then as we've been going along, you've been working in parks for many years, a number of different parks. And I was just kind of wondering, sort of a logistical question, but how do you find the setup for obtaining permits and working in parks and things like that? Obviously you've been working in parks for a long time, so you've been able to make it work. I want to make sure that everything works well.

Anderson: Mm hmm. Yeah, so I've actually, I can't think of any time that I've had a problem getting a research permit. But sometimes it takes a little bit of groundwork. You know, for instance, my work on Navajo National Monument. That was maybe the most cumbersome because of the way that that monument is set up, with the administrative structure, with both the federal government and tribal entities. That was the more difficult permitting process. A longer permitting process than probably any other project that I've had. But, nevertheless, we still got the permit.

Other projects have been so easy, I don't even remember the process. You know, working in the California parks, especially the Sierra Nevada parks, that permitting process was essentially all done by the park scientists for me. A little bit more cumbersome in Channel Islands. But still, having a track record helps. So I really haven't had any problem with getting a permit in any of the parks. Except for, I guess the one time I couldn't get a permit was for work on Santa Cruz Island to look at [Cañada de los Salsas?] It's not really in the park. But there was an eagle nesting site right there at that location. And the access to that location was pretty, was limited. And we were not allowed, even though we had done work there, we were not allowed to get in there, for good reason. But other than that, no real problems with permitting.

Tweet: Okay. That's good to hear.

1:23:07

Santucci: Well this has been very enjoyable, interesting and we greatly appreciate your time. We would like to follow up with you again when your schedule permits. I think that you have a lot to offer, and you have offered a great deal to the Park Service, so we appreciate that.

Anderson: My pleasure.

Santucci: The final thing is if, I don't know if you're at liberty to share email for Ken Cole. But if you want to send Ken my email, I'd love to chat with Ken. It's been probably fifteen years since I last spoke with him.

Anderson: Okay. Yeah, sure. I can, let's see, I mean, I could do it either way. I could just give you his email—

Santucci: Okay.

Anderson: And you can just come out of the blue. I mean, I can't remember if it's ken or ken.cole or Kenneth.cole. So let me just see. I will get to this in just a moment. Okay. It is—it's funny. I think it is—hold on just a second. It's Ken.cole, K-e-n dot cole, C-o-l-e @nau.edu.

Santucci: Okay. Perfect. Yeah, I'll send him a note today.

Anderson: Yeah, he's great. He's a lot of fun to work with. And still active.

Santucci: Good to hear. Any final thoughts before you chat with the grandchildren?

Anderson: No. I look forward to talking with you more about the White Sands or anything else. We could schedule another conversation in a couple of weeks or something like that. That would be fine.

Santucci: Perfect.

Anderson: I've enjoyed our conversation. It's great to talk about science in the national parks. Again, I'm so glad that you two have been so active in this. I learned a lot myself in this whole review. So I appreciate being asked.

Santucci: We'll look forward to our next call. And thanks so much.

Anderson: Okay. Take care.

Santucci: Have a great day.

Anderson: You, too. Have a good one.

Tweet: Thank you very much. Bye.

1:25:51

[END OF INTERVIEW]