Jesse Johnson CONFLUENCE INTERVIEW Transcript

Jake Downs: He respects creativity in others. And so, he won’t necessarily impose his vision on you. He’ll help you, kind of, develop your own ideas.

Rosie Leone: He likes to, like, debate. We debated about whether Frozen was a good movie or not. Something like that is very distinctly Jesse.

Fred Bunt: He’s one of my favorite professors I’ve ever had. Having him just be there to talk to and make me at home really made me feel like I belonged.

ASHBY KINCH: This is Confluence: where great ideas flow together, a podcast of the Graduate School of the University of Montana. On Confluence, we explore the scenic rivers of knowledge that flow through our beautiful mountain campus. You just heard the voices of Jake Downs, Rosie Leone, and Fred Bunt, graduate students in Computer Science talking about our featured guest for this episode, Dr. Jesse Johnson, Chair of the Department of Computer Science, who has a great reputation as a mentor of graduate students. Every episode, we pick a poem or short passage about rivers for our guest to read and for Jesse, we’ve chosen a famous passage from V.S. Naipaul’s award-winning novel A Bend in the River, which tells the story of Salim, an Indian Muslim trader who grows up on the east coast of Africa in an unnamed village.

JESSE JOHNSON: Always sailing up from the south, from beyond the bend in the river were clumps of water hyacinths, dark floating islands on the dark river, bobbing over the rapids. It was as if the rain and river were tearing away the bush from the heart of the continent, and floating it down to the ocean incalculable miles away. But the water hyacinth was the fruit of the river alone. The tall, lilac colored flower had appeared only a few years before, and in the local language there was no word for it. The people still called it "the new thing" or "the new thing in the river", and to them it was another enemy. It's rubbery vines and leaves form thick tangles of vegetation that adhered to the riverbanks and clogged up the waterways. It grew fast, faster than men could destroy it with the tools they had. The channels to the villages that had to be constantly cleared night and day. The water hyacinth floated up from the south, seeding itself as it traveled.

KINCH: The passage might seem a strange match for a computer scientist, but Jesse has spent several years in Africa, where he witnessed at close quarters the complicated legacy of Western colonialism and some of its contemporary variants: first as a Peace Corps volunteer, then twice on sabbatical in South Africa and Namibia, where he worked with colleagues on projects to improve the lives and educational prospects of Africans. Naipul’s novel explores the lingering effects of colonialism, which in Naipul’s extended metaphor links the “water hyacinth”—that “new thing in the river”—with the invading forces of Western colonialism and modernity, “fruits of the river,” which brought trade and commerce, but also violence and cyclical poverty. It’s a complex metaphor for a complex personality. Jesse’s a wry, sarcastic fellow with a wide range of interests that reflect his diverse training: his PhD is in Physics, for example, and he works on quantitative modeling with colleagues in a number of adjacent fields—like Geosciences. Jesse has won numerous research grants, and worked on a wide range of projects that apply his quantitative models to a variety of problems in the natural world: like the flow of glaciers, and more recently, the behavior of fires. In the episode, we talk about the big ideas that underlie his work, the importance of mentoring graduate students, and the value of thinking across disciplinary boundaries. Welcome to Confluence. We hope you enjoy the float!

KINCH: Welcome to Confluence.

JOHNSON: Thanks, Ashby. I'm happy to be here.

KINCH: So, tell us a little bit about your journey. How did you end up at University of Montana? How long you've been here?

JOHNSON: How far back would you like me to go?

KINCH: As far back as is relevant.

JOHNSON: All right. Let's start at birth. No, I don't know if people are interested in that, but I came to the University of Montana 16 years ago having just finished a PhD in geophysics and a master's degree in computer science. I finished up with that training in Maine where I'd gone after having been a Peace Corps in Central Africa. I came here primarily because I have a brother who came here and failed out of school. Spent most of his time drinking and skiing and, uh.

KINCH: We've heard that story before.

JOHNSON: He mentioned to me as I was looking for a job, "You know, Montana was pretty nice," and I had come to visit him when he was here and I agreed it was nice. And so, I put in an application here and managed to get an interview and a job and moved here in 2002. And I've been here ever since.

KINCH: So, quality of life brings a lot of people here. And that's part of the story you're telling there. Right. But then it's come to be the case. The two key focal areas of your research are kind of Montana type things, right? You look at avalanches, you look at forest fires. We don't have, of course, any ice sheets up here, but we have glaciers.

JOHNSON: We have the glaciers, yeah.

KINCH: And a lot of that is the focal point of your research, especially lately. Big idea being the ways in which natural systems store energy and then how it's released. So, tell us a little bit more about that. What's, what is the kind of central idea underlying your research?

JOHNSON: Well, yeah, it’s tough to unite areas of interest as different as, as the flow of glacial ice and forest fires. And some of it, I have to confess, is just convenience. Some of the best researchers in the state of Montana are studying fire effects and behavior, and I'm lucky enough to be working with them. So, I mean, that's almost like a social thing, not a science thing. But I think there is a legitimate basis for me being credible in both areas, and it has to do with the way I approach the problem. And so, let me, let me spend some time trying to explain that. But most listeners are probably familiar with the second law of thermodynamics, and it's pretty simple idea. The entropy of this universe is always increasing. Sometimes it's easy to say that as time's arrow only flies in one direction and it's, it's, it's one of these areas of science that is organizing principle for the vast majority or all of the matter that is known in the universe. And it's one of those things you learn as a student. You can repeat back to your instructor in a superficial way, but you can spend the rest of your career contemplating the nuance and the meaning of it, so anyway, let's start there. You got the second law. We know the entropy is increasing. What does that mean? It means that high organization, high potential energy flows from the sun out to the planets where we're at and is converted into waste heat. Sort of a depressing thing to contemplate is the.

KINCH: Depressing except for it makes flowers.

JOHNSON: Well, right? But, and, I think you just hit it there is the remarkable thing is that when we consider the process, it's not an equilibrium process so that it isn't as simple as a photon comes and it turns to a long wavelength photon. A photon comes and it turns to waste heat. There are these structures that emerge along the way as the photon comes to the earth and becomes waste heat. These intermediate structures are what are so fascinating to all of us. That's what life is, right. We are a puzzle in the sense that we have this lower state entropically. The molecules in your body are extremely organized and orchestrated and well-structured and doing amazing things all the time. But somehow this leads to more entropy in the universe. Anyway, let's bring this back a little bit to my own research. Well, life is contrary to our understanding of entropy, but only temporarily. But there are other structures that function in a similar way. And those are the structures on this planet that accumulate usually potential energy in some form. So, let's talk about one of the easiest. It might be snow falling on a hillside. The winter goes on. More snow accumulates. Eventually, that snow releases its potential energy in the form of an avalanche. And, uh, but until it does, it's, it's, this kind of curiosity in the sense that it's not working in the direction of increasing entropy. It's lowering the entropy. And more potential energy is there. And then it releases. Well, if we think about that more deeply, I think there's a lot of things like that that are physical, but are contrary to our superficial understanding of entropy. And two of them are the ice sheets in Antarctica and Greenland and the chemical energy that is stored in the vegetation that grows on this planet. And both represent a sort of a pool of energy that long term can't be there because we know the second law is true. They're just an intermediate state of those photons that came down onto this planet. And the big question is how they're going to release their energy. Are they going to release it all at once?

KINCH: Yeah.

JOHNSON: And sea level next year is going to be a meter higher than it is today. Are they going to release it all at once, like the Camp Fires that burned through California and killed so many people this summer? Or is it going to be a slow, consistent loss of that energy? That's the big issue that I'm interested in, is in these, these systems that emerge as, uh, as, as well-organized and concentrated energy moves to waste heat. How quickly will they release their energy? I think that's the easiest way to say what I do and that's the easiest way to unite ice sheets and fire, which are the two areas that I'm active in right now.

KINCH: Yeah. So, when you say what you do. That's what, I want to drill down on that because I think that's one of the fascinating things that goes on in your work. I know some of the collaboration you've done with Joel Harper in Greenland where his group is doing the measurements, right. They're, they're going out and designing a study to go down and get measurements of water flow, especially underneath the ice sheet. Um, and then you're working on the analytical side of it, right. You're structuring the data and trying to. So, talk, talk, talk us through that process. In other words, you need those people in the field that are doing it. You need to attach yourself to projects that are generating that data. Are you on the front end of the designs at all with that or are you just only looking on the back end when the data comes in?

JOHNSON: Well, it's a collaborative effort, and I think Joel knows best how to get the work done in the field. And I think that places constraints on what can and can't be done. That being said, we always talk. We share office space over in the interdisciplinary sciences building. And, you know, we're very aware of one another's research efforts and exchange a lot of ideas. We write a lot of papers together. But he is as good a scientist as I am. And you know, it isn't as if I'm his crutch in the sense that I enable him to apply theory to his data. And he's not my crutch in the sense that there’s no other sources of observations for me. But I think there is a natural collaboration that occurs with him acquiring a lot of data and me and my students having a body of theory for interpreting it. And yeah, that's, that's what you see in our research group.

KINCH: Well, and then. And so then recently the pivot to the fires.

JOHNSON: Right.

KINCH: Has happened kind of organically as well. In other words, you know, scientists on campus that you work with and you're starting to get attracted to that problem. You see this connection in the intellectual theoretical structure. So, talk us through what you're working on now with fires.

JOHNSON: Yeah. So that, that's both on and off campuses. Listeners may be aware we have the fire lab out near the airport and that's a Department of Agriculture research facility that studies fire and fire behavior and they have an experimental facility there as well. And a lot of the really outstanding scientists in this community are located there. And so, it's through, through my connections there that I got, uh, involved with some of the fire science, and I suppose the thing that we're working on hardest right now is to try to characterize the rate of spread of fires. That's, that's a variable of interest gets right back to what we started talking about, which is it's just how fast these little piles of energy that nature accumulates, how fast they can dissipate. And in the case of fire, it's, it's, it's, it's how quickly they spread, how, how those fuels are consumed by the fire and released into the atmosphere. We're going at that in a number of different ways, including some that involve modern computer science, machine learning and others that involve physics and trying to describe the process of combustion from first principles in physics.

KINCH: Well, and I think this would be a good segue into discussing your work with your graduate students, because it's always kind of been an interest to me that you have the geophysics background, but you're in a computer science department. And then the flip side is you're now a mentor to graduate students in computer science, some of whom are going to head towards very practical, applied commercial, you know, jobs in, in industry doing programing. Others who might pursue a path more like yours, which is, you know, as a research scientist. So, talk a little bit about the computer science graduate program, your students. What kinds of projects they work on?

JOHNSON: Sure. I'd love to. Uh, computer science graduate program is a master's only program situated in the computer science department and the social science building. I think it's somewhat typical in the sense the students take on order eight classes and then do a thesis. It’s in those eight classes that I’ll typically meet the students. I usually recruit out of the current pool of graduate students. I like to see how they perform in my own classes before I recruit them. And, uh, yeah, I look for things like their attention to detail, their creativity and sort of their drive in the sense that do they, do they identify problems that interest them. They’ve, they've been great people to work with. I think I've graduated some 20 odd master’s students now and a couple PhD students. One in forestry, one in interdisciplinary science, and one in mathematics. But your original question that kind of coming back to is, is sort of what kind of projects do they do and how do they become computer scientists working with me who sort of sits at maybe the interface between computer science and geoscience or computer science and forestry or something like that. I guess I'd start by saying, well, I think sometimes the categories are something more convenient to the people that describe me than they are to me myself. You know, like everyone has a need for a taxonomy and they create them and they're pretty much all flawed. And I think I sit in a computer science department and I'm happy to do so and enjoy teaching the courses there. But I don't know if that really defines me. I think like a lot of researchers on campus, like I need to dabble in other areas in order to get what I do, done.

KINCH: Yeah. Do you think that's common? I mean, it's interesting. You know, if everyone was dabbling at the margins, there would be no discipline. So. Some people sit at the center and you're kind of describing yourself as someone who kind of sits at the periphery. I'm like that too so I'm, I'm very familiar with the problem. Right. You know, if you're right at the core of computer science, what are you doing that's different from what you're doing? In other words, what would a computer science professor who's at the core they're just doing quantitative analysis, quantitative projects that don't have applied theoretical or scientific impact?

JOHNSON: Yeah, I think you've got it. I mean, I think someone that is unquestionably and completely a computer scientist would be focused on the development of algorithms or procedures. Really. I mean, you could write them on a piece of paper. Step one, do this (garbled). People, I think get too consumed with the idea of, well, there's this language that you use and you have to use a programing language and then these ideas are independent of language, right? You just formulate them and there might be some mathematics involved. But, uh you know. Yeah, you just write a sequence of steps for processing data and a true computer scientist is relatively unconcerned of the nature of the data.

KINCH: Yeah.

JOHNSON: Other than that, it have some relationship between the members that allows the algorithm to operate on it, but and then develops a procedure for making a transformation of that data to something that's more useful to humans.

KINCH: Right.

JOHNSON: In terms of our understanding about the universe or one another or anymore, much, much of the effort is to make computers better at thinking about computers.

KINCH: Yeah. Yeah.

JOHNSON: But yeah. So that, that would be the unquestionably computer scientist's, computer scientist.

KINCH: Right. Right.

JOHNSON: Of which there are few. And then there are many more like myself that take the development of algorithms and start to look at particular datasets and the, uh, issues that arise when dealing with particular datasets. Very rarely is a computer scientist able to anticipate every possible difficulty of dealing with every possible dataset. And practitioners like myself are necessary to sort of smooth the way, I think, and that's some of what I do.

KINCH: So, you're kind of mentoring graduate students into that perspective on the field, that it's got a broader applicability and you develop a certain set of skills and a knowledge base, but you move it around. And so, what do your students do with that? In other words, what are the outcomes for your students?

JOHNSON: Well, it's easier, easiest for me to probably talk about the current students I have because their projects are freshest in my mind.

KINCH: Sure.

JOHNSON: And so, uh, I have a PhD student that'll finish in the spring. And he's bordering on a computer science, computer scientist. So, he is developing some original algorithms, but he's doing so in service of a geoscience problem that is as follows. We can measure where the ice sheet was and when by taking rocks and determining how long they've seen the light of day. And this is done by measuring the cosmogenic nuclide content of the rock, which is to say when a rock is exposed to the light of day, high energy particles hit the rock and create radioactive nuclei. Very small number. But analytical chemistry and I don't know what you call it “Geiger-counter-ometry”.

KINCH: Sure. Just made it up.

JOHNSON: To measure those number of radioactive nuclides and say this rock is seen the light of day for the last thirteen thousand years. And before that it was dark because there was a glacier sitting on top of it. So, we have a sequence of observations that tell us the ice sheet was almost to the present ocean eleven thousand years ago. Five thousand years ago, it was halfway between the present ocean and the current ice sheet edge. Three thousand years ago, it was somewhere three quarters, et cetera. And so, we take those and then we say, what kind of climate would produce that retreat scenario of the ice sheet?

KINCH: So, the rate and time structure of, of.

JOHNSON: Of climate. Yeah. What, what would do it? And so, of all possible climates that have occurred, could have occurred. Which one makes the ice retreat the way we saw it retreat.

KINCH: Yeah.

JOHNSON: And he's answered that problem with such skill. I'm just amazed. He's used some, some really modern techniques that actually another University of Montana professor, John Bardsley, sort of suggested. And it turned out they worked really well. And he's, he's sort of converging on a solution that indicates that some nine thousand years ago, the climate was really wet in the Arctic. And this is interesting because nine thousand years ago it was warmer than it is now. This is called the Holocene Optimum. And it's probably the result of the earth orbiting on its axis or processing about its axis wobbling such that it received more solar radiation. Things warmed up and the ice sheet retreated at that time. The presence of more moisture in the atmosphere at time indicates there's a moisture source and it's really speculative, but it could correspond to an ice-free Arctic Ocean occurring nine thousand years ago. Which it's kind of here's why it's interesting. We are heading towards a climate that looks a lot like the climate nine thousand years ago. Why? Because CO2 emissions. Yeah.

KINCH: CO2.

JOHNSON: Yeah. And, if nine thousand years ago there was no sea ice over the Arctic, it seems quite reasonable to conclude that soon there'll be no sea ice over the Arctic.

KINCH: Yeah.

JOHNSON: That's such a big deal. And such a massive unknown in terms of well, what are the, what's the climate system going to do. Yeah. What happens then? And what's that mean for permafrost and precipitation and climate all through the northern hemisphere and beyond, probably.

KINCH: Uh, what about another student?

JOHNSON: All right. Yeah. Another student you'll speak to is a woman named Rosie Leone. She's a geoscience master's candidate. Joel Harper, is her primary advisor, but I talk to Rosie all the time. And I think, I think you're going to like talking to Rosie. She's got really bright, wonderful personality. Uh, her research is also heavily engaged with computer science and programing. And she is looking, she's really testing a commonly made assumption in Greenland that if you dig a hole and you take the snow, that's in the hole that represents the snow that fell where you dig the hole. But we know that the ice is flowing in Greenland and we can measure it. And it's often the case that where you dig the hole, the ice is flowing on the order of 20 to 50 meters a year.

KINCH: Wow.

JOHNSON: And so, when you dig that hole, you're really looking at something that happened 20 meters upstream, 50 meters upstream, times, however many years you dig down.

KINCH: Yeah.

JOHNSON: And in some cases, they're digging down holes that correspond to 100, 200 years of history. And so now you're talking order kilometer or more changes. And so, as you go from where you dig the hole to where the snow actually fell, you're seeing something quite different. And so, she's, she's sort of challenging the assumption that you can get an accurate portrait of local climate by digging in a particular location and looking at it where that ice and snow actually came from. In terms of flow and seeing what that means for some important modeling that's being done, we call it the firn. And that's just the sort of material that's neither snow nor ice. Right. The first layer is snow. And it starts to get compressed. And it just in time, the snowflakes turn into granular material. And that firn is super important because it, imagine it as being like a sponge. Right. In this modern climate, every year we get warm summers, the snow on the surface melts a bit. All the water produced by that melt in the summer percolates down into that sponge and sits there. And what we suspect is happening, we're pretty sure this is happening, is that sponge is filling each year, but it's not something we've come to have to deal with yet in terms of the behavior of the ice, because it is a sponge and it still has more storage.

KINCH: But, it's filling up would change its insulation qualities. It would change its kind of heat retention qualities.

JOHNSON: Yeah. And, there are markers for that, that can be sensed by satellite and other features that are just determined by digging a hole. But the reason it's critical is eventually the sponge will fill if present trends continue. That layer of snow on top of the ice sheet that some 100, 200 meters thick will fill with liquid water. Subsequent melt will run right off the ice sheet. And when water runs across an ice sheet there's, there's an exchange of heat and energy. That will. Yeah. Promote the, the decay of the ice it runs across. And also, just go right out into the ocean. And so, this is a day that many of us in this field are concerned it's going to come soon and when it comes. We don't know what's going to happen.

KINCH: Another student?

JOHNSON: Uh, well, uh, let's see. So, we got Jake and Rosie and I was gonna talk a little bit about Eric, who's a new student. He comes from a math background. He's returning to school in order to get a master's in computer science. I think he's already got a master's in math. He's working on the fire side. So, I thought he'd be fun to talk to. He's just getting started. But he's very interested in the rate of spread of the fires. Typically, in order to estimate the rate of spread of a fire, you take into consideration the wind and the slope of the land that it's on. Those, those are really the two major inputs. Eric and I are interested in, at what point in the evolution of a fire does it build its own weather? And it's no longer relevant that the wind is blowing at 15 miles an hour. That fire is pulling it, and so much air from its surrounds that it's got its own weather system and is completely independent. That, that, that's when the fire becomes dangerous. So, what we want to try to identify is a couple of different rates of spread. One, where the fire is sensitive to local conditions and second, in which the fire really has a life of its own.

KINCH: You've had several stints in Africa. Two stints or three?

JOHNSON: Three.

KINCH: Three, right. So, Peace Corps and then two subsequent sabbaticals, right.

JOHNSON: Correct.

KINCH: So, what's the attraction? Why do you keep returning there? What, what was the initial interest that took you there in the Peace Corps? And why go back?

JOHNSON: Well, I think there are loads of personal reasons for that. Maybe I'm going to push off for a minute and just say that I was drawn there in the first place by a desire to try to do good. And I find it hard to know what would be good in this world. But it seems like teaching people the things that they need to, to sort of find their own way in the world is hard to argue. Is not a good thing. So, I went there as a Peace Corps volunteer in 1996. I taught math, physics, some chemistry, and computers to high school students. I did that for two years. And I mean, it had its joys and frustrations. But that, that, that's fundamentally what I was there to do. And then I stayed a third year. I met my wife there. She had only been there a year. Would like to finish her Peace Corps service, which is two years. So, I remained for a third year and I managed a shop that sold computers and networking services, I guess. And that was that was really something interesting too. And, came back to the United States. Got a PhD. Had children. Worked here. Found a way to do a sabbatical. Went back to Cape Town, South Africa. Taught math and physics again, this time at the university level. My basic belief that, that is a good thing did not change. I, I, in the interim, which was almost ten years. I'd sort of convinced myself that if I gave it another effort, I might get it right the second time around. It was easy the second time around. Cape Town's a very elite university in Africa and so I was blessed with really good students and it was easy to feel like I was getting something done. But as any teacher will tell you, I think that the good students will do well irrespective of what you put in front of them to try to stop them. You know, they, they can't be stopped even by me. It's the bad students that you're really working on. And I went a third time, Windhoek, Namibia in 2016 and again teaching primarily computer science system. And, uh, yeah tried again at the university level and, so.

KINCH: Didn't you at one point work on an app that involved allowing farmers to predict wheat prices so that they could get their products to market.

JOHNSON: Yep. Yeah. That's.

KINCH: Talk a little bit about that.

JOHNSON: Well, you, you go—this is Namibia now—and you have the intention of sort of teaching, but you're quite an open minded. So, you show up and you talk to people about what they're doing and you see if you can help them and make what they're doing better. And so, what you're talking about, I think, stem from some of the work. When I was there was, was one of the worst droughts to be experienced by sub-Saharan Africa on, on record. And this is probably another climate change thing. And this had everything to do with agriculture and everything to do with monitoring the amount of rainfall and the moisture in the soil so that farmers could make good decisions about their crops and other things like that. And I do have some experience and it's actually experience from the ice sheets, building instruments to monitor and record data. And we applied some of what I knew from that background in order to do that.

KINCH: Is that project still up and running. Is it still going?

JOHNSON: Yeah. The two Namibians got master's degrees in that project. And a faculty member that I worked with is still mentoring projects in that and doing similar things. There's still improvements to be made, but we have a sort of a station that's battery and solar operated that monitors rainfall, soil moisture, temperature, and it relays it across the cellular phone network to a server that latches the data and saves it.

KINCH: Fantastic.

JOHNSON: Yeah. Yeah. So, I mean, that's what I'm doing professionally. And I believe in all of that. It's my job. But, I get tremendous satisfaction out of being in a place that's a little less well established where rules are still being negotiated, where the climate is fantastic and the appreciation of life's little pleasures is maybe a little greater. So, I mean, all those things about Africa keep me going back.

KINCH: So, you're heading there again, next sabbatical?

JOHNSON: Yeah, we'll see. I've got two sons and they won't be done with high school until 2021. So, ride that out, not drag them to Africa for their final year of high school. And once that's done. I'll get back to getting back to Africa. Yeah.

KINCH: You read the V.S. Naipaul recently, even though you've done these previous three stints. What do you get from reading that book, especially after having all that experience of six, five total years in Africa? What does he get right in that book what does he get wrong?

JOHNSON: Well, there's a lot of raw feeling there that's hard to reconcile with, um, your sensibilities as a professor at the University of Montana. Just going through your normal life where situations are, are sort of settled, secure. I think for the most part we know what to anticipate in our lives every day when we wake up. There's a book now about a person going through a major transition in the history of Africa, the departure of the Belgians from the Congo and then, and then the subsequent newly independent nation and the revolutions and fighting that occurred afterward. And the situations that arise that are just so completely foreign, unsettled, threatening to your life and person. And I think, uh, for me, I read that book when I was 23 or four, first time in Africa, and it really resonated and I forgot. And it just digs up all those old feelings and those memories of being in a situation where the contours of your daily life were heavily influenced by things like having malaria or having something terrible—a crime happened to one of your friends and, and just trying to process that and the unpredictability of life. So, I think maybe that answers your question. That for me, the book took me back to those feelings and sort of validated them in a way, because when you think back on those times from the context of your relatively comfortable life, they seem dreamlike and foreign. But like a book like that can really dig them up.

KINCH: Yeah.

JOHNSON: And validate them.

KINCH: All right. So, we're gonna finish with some quick hitters. Um. Last book you read.

JOHNSON: Bringing up the Bodies, Hilary Mantel. Great book.

KINCH: What's your shadow profession? The thing you always thought you'd be good at.

JOHNSON: I don't know. I mean, as a boy, I used to think I'd be a good soldier.

KINCH: Bassist in a punk band. I mean, you know.

JOHNSON: Yeah, well there's that, that, I, that always appeals. Um, I don't know if I could pull it off or find my level of financial comfort that I look for.

KINCH: Favorite winter activity.

JOHNSON: I like, I like sleeping. It's a quiet time of contemplation. And that contemplation can take me right out of a conscious state.

KINCH: Yeah.

JOHNSON: So easily. And it feels so good.

KINCH: Um, Bitterroot or Clark Fork.

JOHNSON: Clark Fork.

KINCH: Morning or night.

JOHNSON Morning.

KINCH: Sunrise or sunset.

JOHNSON: Well, sunrise. It happens in the morning.

KINCH: Bitteroots, Pintlers, or Missions.

JOHNSON: Uh, Missions.

KINCH: Yellowstone or Glacier.

JOHNSON: Glacier.

KINCH: Winter or summer.

JOHNSON: Winter.

KINCH Thank you, Jesse, for taking some time with us.

JOHNSON: Thank you for having me. It's been a pleasure.

KINCH: We hope you enjoyed your time floating on the river of knowledge with us. If you enjoyed this episode, give us a like on SoundCloud and stop by the University of Montana Grad School website at www.umt.edu/grad for more episodes and videos highlighting our amazing graduate students.