

FIELD NOTES

School of Civil and Environmental Engineering

Georgia Institute of Technology

Ep. 3: Impact, From Bolivia to Atlanta

Segment 1: Spring Break in Bolivia

RACHEL BRASHEAR: [00:00:00] I kind of had in my head this, like, a chain of events. This is what I was going to do: I was going to graduate and work, live in America, do this stuff. And all of sudden, that little box just kind of got all shaken up.

JOSHUA STEWART: [00:00:12] Students return from a spring break in Bolivia with very different ideas about their futures. In a very literal sense this go-round this is Field Notes.

<THEME MUSIC>

JOSHUA STEWART: [00:00:32] Welcome to Field Notes, the podcast of conversations and ideas from the School of Civil and Environmental Engineering at Georgia Tech. I'm Joshua Stewart. A little later, we'll talk with students who've been receiving scholarships to support their studies at Tech as well as the alumni who fund those scholarships. They recently got to meet and have lunch together, and we'll hear their stories.

But first, spring break in Bolivia. Four of the travelers are with me to talk about the research they did and its impact on Bolivia — and on them. Donald Smith, Riley Poynter, and Rachel Brashear are all civil engineering majors. Ann Johnson is majoring in biology. And they're all taking Joe Brown's Environmental Technology in the Developing World class. Their trip to Bolivia focused on testing water quality in Cochabamba. It's the third year that Joe Brown has traveled to Bolivia with a group like this to do meaningful research, to collaborate with local scientists, and to give students a taste of what it's like to really be an engineer. It's good to have you all here. Welcome home.

RILEY POYNTER: [00:01:31] Thank you so much.

DONALD SMITH: [00:01:32] Great to be back Josh.

RACHEL BRASHEAR: [00:01:32] Thank you.

JOSHUA STEWART: [00:01:33] So how was the trip?

RACHEL BRASHEAR: [00:01:34] Awesome.

RILEY POYNTER: [00:01:36] It was phenomenal.

ANN JOHNSON: [00:01:37] Yeah, I would say that it was probably one of the best weeks of my life, especially at Georgia Tech, just because it allowed us to learn so much. And I really feel like, not only did we get to work with people there, and maybe teach them some things, but I feel like we got to learn a lot about the culture and about engineering as well from the people we were working with.

JOSHUA STEWART: [00:01:55] And Ann, you're a biology major, so you're a little bit of the

outlier among this group. What was the trip like for you working with engineers and applying your skill set in this arena?

ANN JOHNSON: [00:02:07] Well, I think interdisciplinary work is really important, and that's one of the reasons I love being a biology major at Georgia Tech. And the reason I was passionate to go on this trip is I want to work in global health, and working with water and engineering is a really important way to do that. I've been working in Dr. Brown's lab for a while now building a water quality measuring device, and he wanted me to come along on the trip so I could test that in the field in Bolivia.

JOSHUA STEWART: [00:02:29] Yeah we're going to talk about research in a second, and we'll talk about your device that you built. Donald, what have you been thinking about since you got back last week?

DONALD SMITH: [00:02:40] Well first of all, it was an honor to be there, even for just a week, to be able to work with other students that are so intelligent. It's an honor for them to invite us over to their country and to help work on these critical problems in their community. I love any opportunity like that. It's still a little hard adjusting back to Tech Life.

JOSHUA STEWART: [00:03:00] Rachel, you said you've been, finally a few days removed now, to think a little bit about what the trip meant and what the experience was like. What's been running through your mind?

RACHEL BRASHEAR: [00:03:10] Currently in my head is that I decided I have to learn Spanish.

JOSHUA STEWART: [00:03:17] Because you want to go work in Spanish speaking countries?

RACHEL BRASHEAR: [00:03:21] That's the plan. This trip really inspired me to look past corporate America for at least a couple of years as soon as I graduate and maybe looking to some nonprofit organizations and fellowships and such that I could go do in Spanish-speaking countries, and maybe put this engineering degree into a different kind of use for a little bit before coming back to the U.S. and doing some things like that. So it's definitely made me think about opportunities like that, and learning Spanish, and trying to do all that I can until then.

JOSHUA STEWART: [00:03:51] Was that something you had considered before?

RACHEL BRASHEAR: [00:03:53] Honestly, no. I never really truly considered it. I always considered just graduating from school, going to work somewhere in the U.S. or maybe for a construction management firm or something like that. And then, honestly, working with the Cochabamba students and doing the work we did just completely shifted that mindset.

JOSHUA STEWART: [00:04:11] Riley, I see you nodding over on the other side of the table.

RILEY POYNTER: [00:04:14] Yeah, Rachel and I have actually had a lot of conversations this week about what we think our future might hold now after this trip and the experiences that we've had and reflecting on the experiences that we've had. And I think it's just really cool how much this trip has opened my eyes to all the opportunities that we have graduating from

Georgia Tech and as we go out into the world in the coming years and just realizing that, I don't know, that the world is really big, and that there's so many places that our engineering degrees can be put to use outside of the U.S. Also inside the US for sure. Yeah, I'm just really excited to see what kind of like development opportunities there might be post-graduation.

JOSHUA STEWART: [00:05:01] Well let's talk about what you guys were trying to accomplish in your 10 days abroad. In addition to experiencing a culture, traveling abroad, putting some of your classroom learning into use, there was also a research agenda for this trip. And so, Ann, maybe we'll start with you since you designed a key piece of this. Tell me a little bit about what the research part of this trip was and what you guys were trying to accomplish.

ANN JOHNSON: [00:05:24] So there are two aspects to the research part of this trip. We were working with the 200 cities project, which is a project at NYU where they're trying to look at 200 cities that are very diverse around the world and compare the ways that they're developing over the years. So we were piloting a water quality aspect of that project. So that was one aspect of our trip, going around to 80 sites in Cochabamba, sampling water, and taking surveys about water in order to see if this is something that can work for all 200 cities, like, how this can be changed to better fit the rest of the project as well. Another aspect of the project, I'll actually go over to Rachel because she did a little bit more work on that part.

RACHEL BRASHEAR: [00:06:00] Me and another group member were focused on Fundacion Abril, which is a nonprofit organization, and we were mainly focused on one of the communities they've been working with called the San Pedro corporativa. They essentially have two wells that they manage themselves to supply the whole community, and then the cool thing about this community is, they came together and decided that they wanted to create a waste treatment plant. Almost none of the communities in Cochabamba have a waste treatment plant. So they just like dump their sewage straight to the river. And these people decided they want to be better than that. And so they are super proud of this beautiful waste management treatment plant that they've created. And so they brought us out there to show it off and basically ask us for any recommendations. And so we took a lot of water samples and and did what we could and are trying to get back to them.

JOSHUA STEWART: [00:06:57] So is the idea that you'll sort of help them improve their systems?

RACHEL BRASHEAR: [00:07:01] That was the idea. It's definitely what we would consider a horizontal learning plane. They're trying to pick our brain and we're trying to pick their brains. I wouldn't say like we're just there necessarily, like, just helping them. It was very much like a mutual, how can we help each other situation, which was totally cool and very humbling. Essentially we had more resources to test water than they have. And so that's what they want to do. They wanted to show how they put it together, how they came together to do it, and how they didn't need a private company to do it for them. And it was so cool to see such pride that they're treating their water. It was a really cool community.

JOSHUA STEWART: [00:07:37] So why was this an interesting trip for you guys?

RILEY POYNTER: [00:07:41] I think for me it was really cool. Just like the framework of working with 200 cities project is really cool to see like the purpose of our trip. It wasn't like we were coming into Cochabamba to try to fix water problems, because we can't. Because the problems are really complex and so much greater than we as undergrad students can

handle. But just being able to come in and to observe and to still provide important data to the 200 cities project as they are making this database of information.

ANN JOHNSON: [00:08:17] Yeah I think that coolest part of the trip for me was that we got to partner with a local university in Cochabamba. So we weren't going, when we went and did surveys in the city, it wasn't just a bunch of Georgia Tech students from far away who were coming up to people's doors to ask them questions. We had had two Georgia Tech students partner with two students who are at university there, and we were a cohesive unit. At the end of the week we were best friends with students we were working with. And they taught us a lot about their culture, and surveying, and the types of water collection things that they knew, and we taught them about the test that we brought. And we just really got to work together on that and partner. So we built some really cool friendships that way.

JOSHUA STEWART: [00:08:55] The trip was really, it sounds like the data collection part of this. You're out interacting with communities, learning what's going on. What's next? What happens now with all of the stuff you brought back?

DONALD SMITH: [00:09:08] Time to process data. We need to get this into all into an organized paper that we can present at a conference at NYU in late April. So we are actually flying up to New York City in less than a month's time. We need to get everything together, make it look pretty, make it presentable, because this is the pilot test for for all of the 200 cities projects. So we need to start off at a high level, set a good example for the next 200 projects to follow, or 199, or whatever the case may be.

ANN JOHNSON: [00:09:38] And it's really important also that we can return that data to the communities we worked with. So every household that we surveyed, we gave a phone number that they could call in a month's time at the local university so that they could hear about how their water quality is. So it's really important for us to both give that back to them. And while we there we were able to present at the end of the week some of our preliminary data results of the community.

JOSHUA STEWART: [00:09:58] What did you guys find?

RACHEL BRASHEAR: [00:10:00] I can talk about what we did for the corporativa. I mainly talked about the wastewater treatment plant, but we also tested their wells and their tap water. So from directly from their source to what happened when it got to their houses. Essentially we found that the wells were clean, no E. coli. But then and I think it was 75 percent of the houses or higher, there was E. coli coming out of the tap. So essentially we found that there is a failure in the system getting it from the well to the house.

RILEY POYNTER: [00:10:32] We sampled 80 sites across the city of Cochabamba as a whole. And so from that data, we found that over a fourth of the population drinks water that has some level of E. coli in the water, which, any level of E. coli in the water, the World Health organization declares as unsafe.

ANN JOHNSON: [00:10:53] Something else we did was, we also collected air quality data around the city. We were working with Duke University and we used some of the air quality sensors they created to do that. And we actually found that the air quality was really good. We were looking at particle matters that were 2.5 micro meters or smaller, because that's what can get into your deep lungs and into your circulatory system and cause a lot of

diseases. And almost everywhere, I think there are four or five sites across the city that had particle matters in a, like a slightly dangerous zone, but most of it is was very safe.

JOSHUA STEWART: [00:11:21] Ann, before before we move on to a couple of the things, I wanted to talk for just a minute about the water quality tests that you guys were using. This was something that you helped design?

ANN JOHNSON: [00:11:28] We were using a, kind of a gold-standard of like Whirl-Pak bags and ways that have been tested a long time as being a good way to measure microbial parameters in water. But we were comparing that...

JOSHUA STEWART: [00:11:38] This is the time-consuming, expensive...

ANN JOHNSON: [00:11:40] Right. Because it involves us all being there right. And we had to process a lot of samples overnight and do things in a controlled lab setting. So it's not a lot of things that we can necessarily leave behind for people to test in their houses that could monitor water passively in the field. So I've been working in Dr. Brown's lab and creating a device that does passive, real-time water monitoring that's also looking for more thermo-tolerant coliforms in water. So those are the types of bacteria that can survive in your gut. And that means that they could be causing human diseases. So I've been working on creating a device with his lab to look for those. And Rachel help me test the same water samples that we were testing with the normal microbial test, the ones that take a long time, with a device I created.

JOSHUA STEWART: [00:12:21] So you could essentially evaluate, is this as good as the gold standard?

ANN JOHNSON: [00:12:25] Yes exactly.

JOSHUA STEWART: [00:12:26] Or, good enough?

ANN JOHNSON: [00:12:27] Yes.

JOSHUA STEWART: [00:12:28] It's an interesting experience when you travel abroad with friends or with family, but guys were with classmates. So that's a whole different experience. And I don't know how well you knew each other beforehand or you knew your other classmates. What was it, 10 of you right? Plus a couple of teaching assistants. But, I mean, you're jumping into close quarters, you're jumping into potentially what turns out to be kind of stressful situations. How did all of that pan out?

RACHEL BRASHEAR: [00:12:55] Well, we all did yoga together yesterday, so I think we're doing pretty well.

JOSHUA STEWART: [00:12:59] So you came back very very tight?

All: [00:13:01] Yeah.

RILEY POYNTER: [00:13:02] It was great. I don't think we could have asked for a better team to go with. I think all of our personalities really worked well together, and everyone I think knew what needed to be done and things got done. And it was just really great getting to

know my classmates in such a different context than I usually do and getting to know Dr. Brown in such a different context than just in the classroom.

RACHEL BRASHEAR: [00:13:26] I would say that was actually probably one of my favorite aspects of the trip as well. Just the relationships formed in just such a cool setting, to get to know people in that way.

JOSHUA STEWART: [00:13:37] Did you guys have fun while you were there? I mean it sounds like there was a lot of work.

DONALD SMITH: [00:13:46] Climbed a couple of mountains.

RACHEL BRASHEAR: [00:13:46] There's definitely a lot of work and a lot of play. Not a lot of sleep.

DONALD SMITH: [00:13:51] Here-here.

RACHEL BRASHEAR: [00:13:52] But but it was worth it. So much fun.

JOSHUA STEWART: [00:13:54] Yeah.

RACHEL BRASHEAR: [00:13:54] Yeah.

JOSHUA STEWART: [00:13:55] How did this trip change you? Ann?

ANN JOHNSON: [00:13:57] Yeah this is Ann. I would say before this trip, I was very committed to the idea of going to medical school, because, though I really wanted to work in global development and with public health systems, I thought that being a doctor would be the best way to really have one-on-one interactions with people and become an integral part of a community. But I saw that we were able to really build a lot of relationships, even though we were there for only a short time, through the engineering work that we did. And that's made me kind of think — not that I don't want to go to medical school — but maybe considering other options now that I see there's other ways to become a really good part of the community and build relationships like that.

RILEY POYNTER: [00:14:31] Yeah, I think for me it's changed the direction of my life in that, before this trip, I had a very clear direction of where I wanted to go. I wanted to graduate. I wanted to get a job. Work on getting my P.E. license and so on and so forth. And now I think my future is a lot more unknown, and just being content with that has been really cool. I don't have any defined new plans yet or anything. I think I'm still in the process of reflecting on this trip and knowing where to go from there. But just knowing that I want to have, just like, a service attitude as I get my degree, like our CEE catchphrase of "people are our priority and the world is our laboratory" — just like really figuring out how that is true.

DONALD SMITH: [00:15:16] I'd say this trip reinforced the notion that I already had that the world is filled with lots of other young, intelligent people striving and aspiring to be engineers like we are. And I really feel like it's a privilege to work with other people like that from around the world. And it's really pushing me to try to work abroad at some point in my career.

RACHEL BRASHEAR: [00:15:38] I think mine is very similar to Riley. I just kind of had in my

head this chain of events. This is what I was going to do: I was going to graduate, going to work, live in America, do this stuff. And all of a sudden, that little box just kind of got all shaken up, and just been really exploring all the options of international things and how much I think I would love to be a part of doing work in a developing country and just really become a part of the community. I really appreciated the horizontal learning experience. I feel like it's never, you know, just somebody helping somebody else. It's definitely such a mutual experience, that I would love to be a part of that.

JOSHUA STEWART: [00:16:16] Would you guys do something like this again?

All: [00:16:18] Oh yes. Absolutely.

JOSHUA STEWART: [00:16:22] Without... no hesitation.

All: [00:16:23] No hesitation. Easy choice.

JOSHUA STEWART: [00:16:25] What about for a fellow student who's thinking about something like this but maybe is, you know, boy, I don't know what to expect. And I've got to travel with these people I don't know. And we're going to do research, and I don't know how to do that. And there are just so many reasons to not do it. What would you say to them?

DONALD SMITH: [00:16:41] That's the idea. Jumping into something you're not sure of how to tackle yet, we're at Tech, right? We're here to grow and learn. This is how you do it. This is learning in action. You might not have the answer on the way in, but you learn as you go, and you're surrounded by great, intelligent, hardworking people. You're going to get through it. We all rose to the occasion. It's an honor to be around people like this.

RACHEL BRASHEAR: [00:17:03] I think that's the coolest part, that you're part of a team. You know you're by no means alone, and it might be a little scary, but you're with so many people who are in the same boat as you and want to help you out and everybody works together. So I think that's that's what's comforting.

JOSHUA STEWART: [00:17:19] Donald Smith, Riley Poynter, Rachel Brashear, civil engineering students; Ann Johnson, a biology student, who spent their spring break doing water quality research in Bolivia. Thank you guys for telling us about your experience. It's really great to talk to you.

All: [00:17:31] Thank you so much.

JOSHUA STEWART: [00:17:36] Part of what makes that trip to Bolivia and other classes like it possible is a pool of money donated by the Mundy family to support international travel experiences for civil and environmental engineering students. We call it the Joe S. Mundy Global Learning Endowment, and it's paid for nearly 200 of our students to travel to dozens of countries and six continents. They all come back with stories like we just heard from our Bolivia travelers.

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Segment 2: Students and Their Benefactors Have Lunch Together

JOSHUA STEWART: [00:17:59] The Mundy fund is just one example of the power of financial support from our alumni and friends. Another took place on a chilly rainy afternoon recently, when the people who've given money for scholarships and fellowships came to campus for lunch with the students who are benefiting. It was the first time the School has arranged this kind of get-together, and for some, it was emotional.

LAUREN GARDNER: [00:18:21] My name is Lauren Gardner. So being out of state, it's very expensive to come here. But I knew I really wanted to come here. I knew Georgia Tech was going to give me the essential tools that I needed to be a good engineer. So this scholarship has helped me not have to take out so many loans and be a little bit more free with being able to be involved in the Georgia Tech community and kind of give back to the community. I hope one day that I can give back in the same way that this scholarship has given back to me.

JANICE WITTSCHIEBE: [00:18:55] My name is Janice Wittschiebe. Bruce was my husband, and he was really involved at Georgia Tech. He was the Reck driver. He was part of Reck Club. He was in a fraternity. So he was really involved at Georgia Tech as well as being involved with the School of Civil Engineering as well. So I was looking for something to give back in his name, and this was perfect. He would love this.

LINDA FARRELL: [00:19:21] I'm Linda Farrell. Bruce is my brother. And honestly, Bruce was all about giving back. And I think as part of his legacy it's very important to... to carry on with that because he loved Tech so much and it was so important to him and gave so much to him and he was such an amazing person and loved giving.

JAMES MAUGHON: [00:19:52] Jim Maughon. I'm '68 graduate, civil engineering department. Decided I guess about 10 years ago to get involved with the scholarship program. It came from my father. My father grew up near the campus, and he sold Cokes, popcorn during football games and would slip in and roller skate when there was no football games going on. And when I went to Tech, he told me that I needed to — he'd always want to do something for Tech, and since I was going to Tech, he wanted me to do something for Tech. And that sort of was the seed that was planted many years ago.

ZOE TURNER-YOVANOVITCH: [00:20:49] Hi, I'm Zoe Eliza Turner-Yovanovitch. I'm a fourth-year civil engineering student at Georgia Tech. I'm an out-of-state student, so it's very expensive to go here for an out-of-state student. So the opportunity, I don't think I would have come to Tech if I hadn't received the scholarship, because it was just, truthfully, financially unbearable. So making it possible for me to go to Tech, and then making it possible for me to experience the incredible civil engineering faculty and learn from them, that's propelling my career. I've already worked at GDOT this past summer. I'm going to intern with Kimley-Horn up in D.C. this next summer. I'm so excited about all the opportunities that are coming my way. And I think I owe it all to Tech, which I owe to the James Maughon Scholarship.

JIMMY MITCHELL: [00:21:36] Jimmy Mitchell.

ANGELA MITCHELL: [00:21:37] Angela Mitchell. I was fortunate enough to be a President's Scholar myself, and similar to Maya, I was an out-of-state student and it meant a lot. I

probably wouldn't have been at Georgia Tech without being a President's Scholar. And the program meant so much to me that I felt this is a better way to pay forward than to pay it back.

JIMMY MITCHELL: [00:21:53] We would have these, you know, at the beginning of our marriage, discussions about our legacy. And we didn't want to save a lot of money and then at the end of life, give it away and not be a part of that. And so we have started to give it away immediately. And one of the first things we did was to establish this endowment. And I just have had a lot of fun being a part of a couple of these students who've gotten the scholarship, and they've been amazing people and getting to know them. So it's been fun.

MAYA GOLDMAN: [00:22:24] Maya Goldmann, fourth-year graduated civil engineer and first-year master's candidate in civil engineering. Being out of state, it really, the scholarship allowed me to come to my dream school without any of the worries that a lot of my peers had, and of, you know, being unfair to my sisters for leaving a state. But since coming here, they've also provided a lot of support. They always have, during finals week, get all of their mentors together for Waffle House. You know, just kind of to de-stress. And it's nice seeing them at events like this, and just seeing how involved they are, because it kind of motivates me to be the best person I can be.

ANGELA MITCHELL: [00:23:05] It's meaningful again to see that money going to really great use right away, right? So it helps you feel more connected to the School. And even though I'm not in civil engineering, I was textiles, it gets me very excited about the things that Maya is doing and will be doing.

JOSHUA STEWART: [00:23:24] That's Angela Mitchell, who along with her husband, Jimmy, has endowed a President's Scholarship that's currently supporting Maya Goldman's studies. We also heard from Jim Maughon about his eponymous scholarship for Zoe Turner-Yovanovitch, and the family of Bruce Wittschiebe about the memorial scholarship in his name.

JOSHUA STEWART: [00:23:40] And with that, this episode of our Field Notes podcast comes to a close. We really appreciate you taking the time to listen to our stories. And we'd love to hear your feedback and your ideas. Send us a note at communications@ce.gatech.edu. You can also stay in touch with us across the web. Find us on Facebook, Twitter, and Instagram. On all of those we're at CEEatGT. That's CEEatGT. I'm Joshua Stewart. Thanks for listening. We'll see you soon.

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