

MARCH 2021

POINT OF BEGINNING

POB

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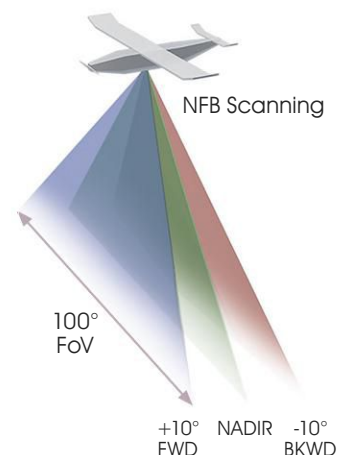
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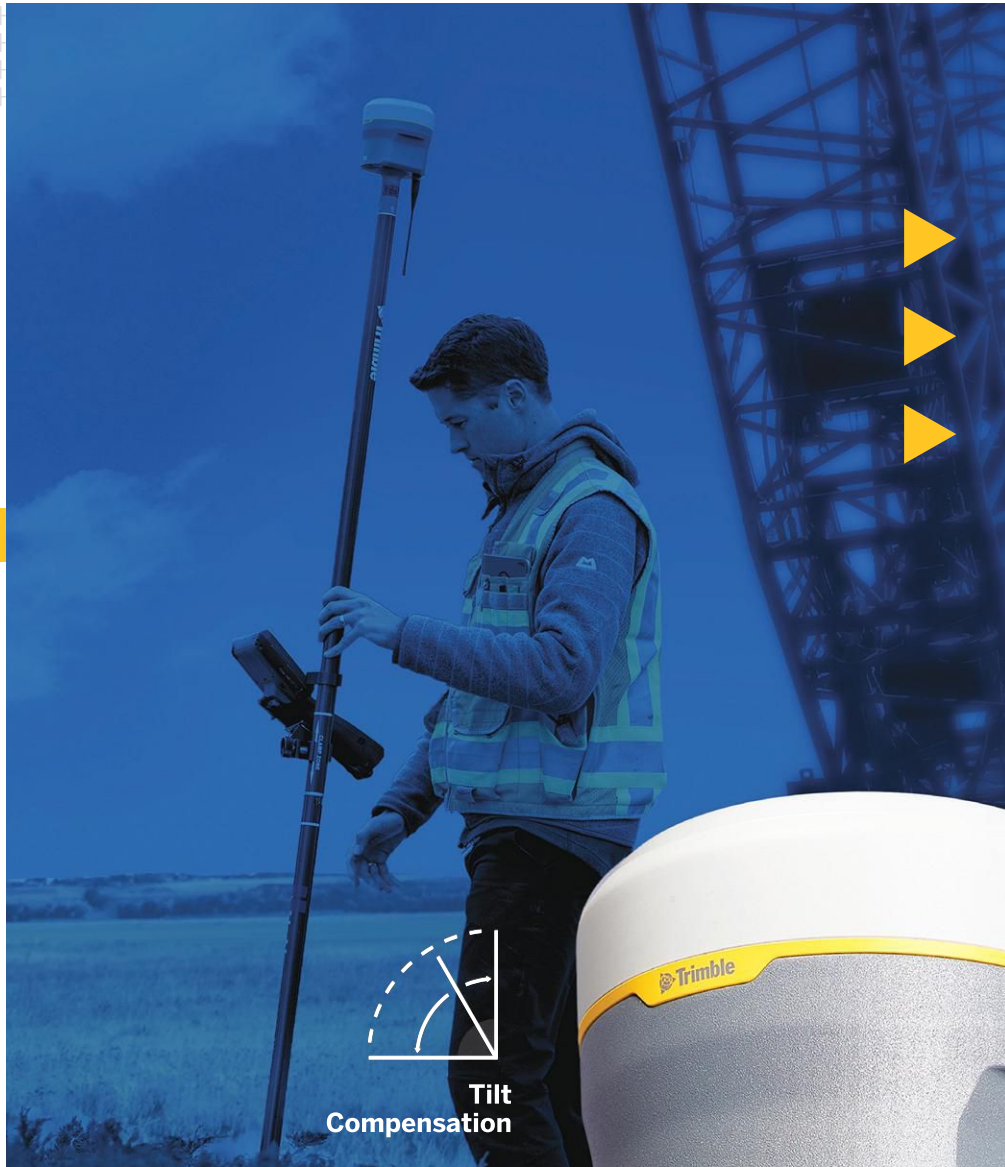
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Christine Gayron, LS, president of GdB, at the company's office in Melville, New York. Photo by Amel Puric. Visit POBonline.com to watch an exclusive interview with her on women in leadership in land surveying.



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Is Land Surveying A Man's Profession?

If we have to ask the question, we know the answer.

In this very special issue of POB, you will read the stories of land surveyors, GIS students and educators, consultants, professionals and beginners, making careers for themselves in markets around the globe. They hold impressive titles such as PLS, PE and Dr., and they are highly ranked in the workforce as CEOs, founders executive presidents and managers. Yet what you will see — and what the world sees as their most defining characteristic — is that they are women.

Breaking Ground

Although the world has come a long way in recognizing women's rights and capacity in the workplace, the stories shared in our pages clearly illustrate that we have much further to go. In the land surveying and geospatial professions, women like Ruth Trujillo, PLS, (page 23) and our cover star, Christine Gayron, LS, are helping us get there.

"I have witnessed the following," shares Gayron in a video interview at pobonline.com, "when a woman is direct, she's a bitch. When a man is direct, he is confident."

It's a harsh reality, but a reality all the same that too many women still must face in the workplace today. Although the women in our pages have managed to rise above to find success, their sto-

ries are also a reminder of the struggles we often don't see on the rise to the top of any profession.

As the publisher of POB, and a woman, I am admittedly not a fan of the Top Women lists magazines trot out once a year to show they care about women's issues. It's old. It's tired. And I've made a point to make sure POB won't go there. But with the help of POB Premium members like you, together we can get somewhere new.

In the next few months, POB will be launching an initiative to help characterize the features that make a company a welcoming place for women to work. We are assembling a female team of advisers to do so, and if you know anyone who will be great for the job, please send their name, title and contact information to adolphuse@bnpmedia.com.

"Direct" women are encouraged to apply. ◀



Sarah Harding
Publisher, POB



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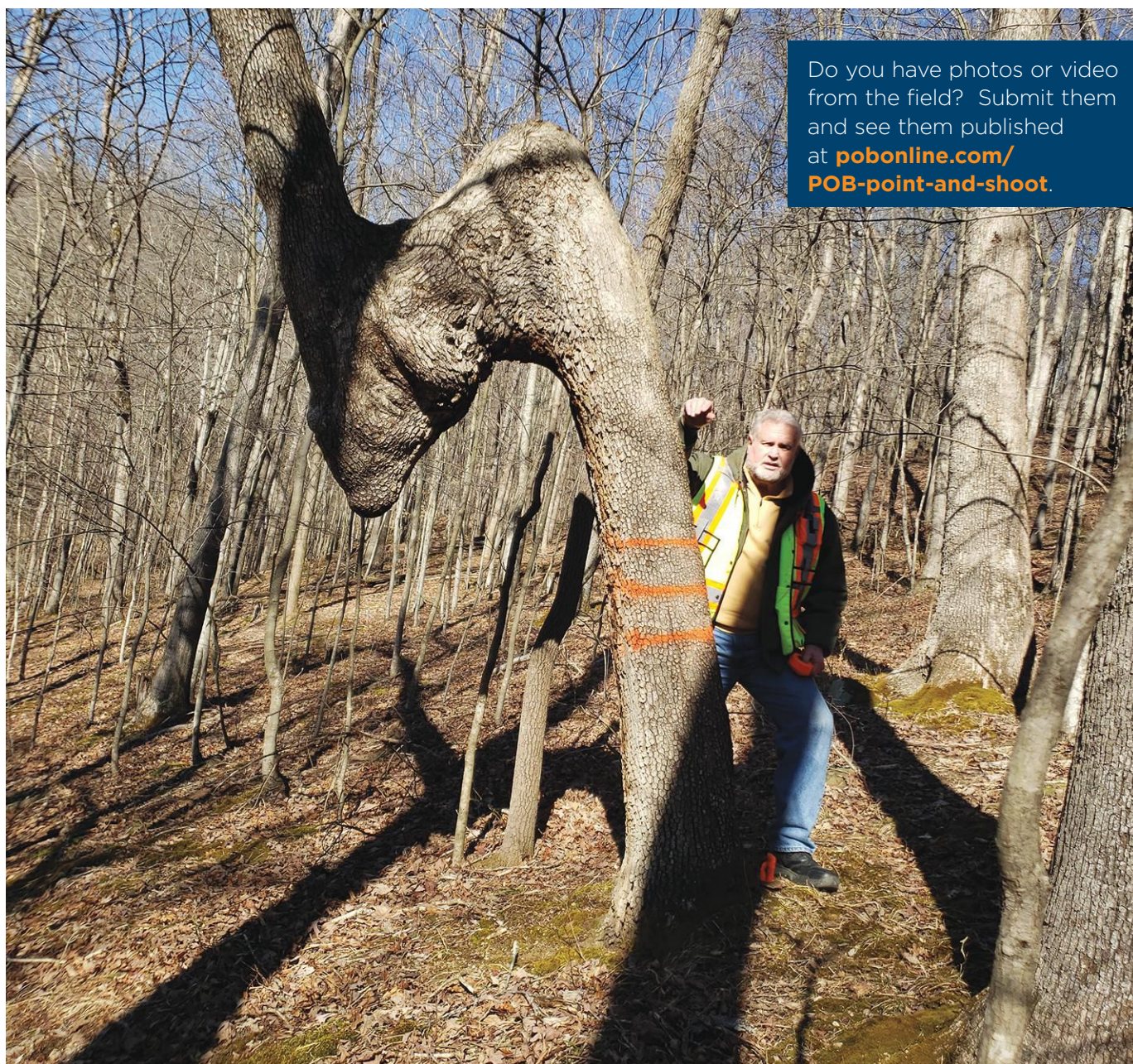
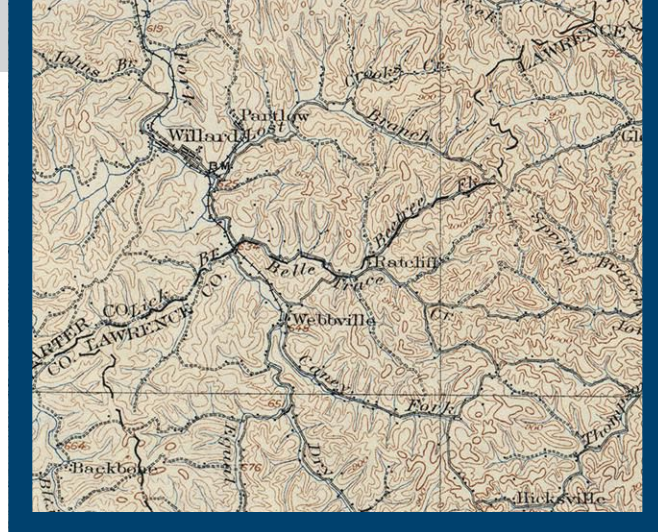


Jason Stoker, Ph.D.,
USGS

Natural Mark

Webbville, Kentucky

“Large rural boundary retracement, consisting of several deeds with calls from the turn of the century. One tract had a call for a ‘stooped oak.’ I found a tree that may have fit the bill within 50 feet of the calculated spot.” — submitted by J. Michael Shapaka, Jr., PE, RLS ◀



Do you have photos or video from the field? Submit them and see them published at pobonline.com/POB-point-and-shoot.

TOP: Webbville, Kentucky, located in Lawrence County, c1901. COURTESY PERRY-CASTAÑEDA LIBRARY MAP COLLECTION

Initial Launch

Land surveying courses at Kennesaw State University prepare students for life as geospatial professionals.

BY STACEY WINCONEK

Georgia's Kennesaw State University made a big change at the beginning of the 2020-21 school year that impacts those who hope to become geospatial professionals. It merged its Bachelor of Science degree program in GIS with its Bachelor of Science degree program in surveying and mapping into a geospatial sciences (GSS) program, which is housed within the Department of Geography and Anthropology.

"The GSS program aims at producing high caliber graduates who are well trained in the theory and application of geospatial technologies, including GIS, remote sensing and land surveying," says Allen Roberts, the director of Kennesaw State's Geospatial Sciences program.

Through the newly formed program, students receive a fundamental knowledge of geospatial skills, in addition to



ABOVE and BELOW: Students practicing the use of a total station at a pumpkin patch.

PHOTOS COURTESY OF KENNESAW STATE UNIVERSITY.

content geared at one of three concentrations, which include human-environment systems, information systems or land surveying. During their time in the program, students learn how to manipulate, analyze, assess and visualize data, he adds.

A degree is not required in the state of Georgia in order to become a licensed land surveyor. For those who are interested in land surveying but do not wish to obtain a Bachelor of Science degree, the university offers two certificate programs: the land surveying certificate program and the GIS certificate program.

"The land surveying certificate program is designed to prepare surveyors with the basic education necessary to take the Fundamentals of Land Surveying exam





ABOVE and BELOW: GIS students receive hands-on experience from the field and the classroom. PHOTOS COURTESY OF KENNESAW STATE UNIVERSITY.

and meets Georgia's academic registration requirements to become a professional land surveyor," he says. "The GIS Certificate considers fundamental questions related to the use of GIS can be completed in-class or online."

During their time in the program, students will be taught by faculty that have decades of theoretical and hands-on experience in land surveying, GIS and remote sensing, Roberts notes.

"We began as a teaching university and that DNA is still prevalent within how we approach our courses and students," he says. "Students will receive every opportunity to succeed within the pro-

See below for the core land surveying courses needed for the GSS program:

- SURV 2221: Surveying I
- SURV 2221L: Surveying I Lab
- SURV 3222: Surveying II
- SURV 3222L: Surveying II Lab
- SURV 4465: Legal Aspects of Land Surveying
- SURV 4470: Land Development Design
- SURV 4475: Land Surveying Practice

See below for the core courses for GIS and remote sensing:

- GEOG 3305: Introduction to Cartographic Processes
- GEOG 3315: Introduction to Geographic Information Systems
- GEOG 4405: Advanced Geographic Information Systems
- GEOG 4410: Introduction to Remote Sensing
- SURV 3320: Photogrammetry and Drone Analysis
- SURV 3451: Terrain Analysis

gram and we pride ourselves on going the extra mile for our students."

The program is growing quickly at Kennesaw State University, he adds, and beginning to gain national exposure — in addition to being locally and regionally recognized.

"For a student looking to get their start or potentially continue their career within the geospatial sciences, I honestly believe that there is no better place for students to prosper and succeed," Roberts says. 📍

Visit Kennesaw State University's website for more information on its geospatial sciences program: radow.kennesaw.edu/geoanth/programs/bsgs.php





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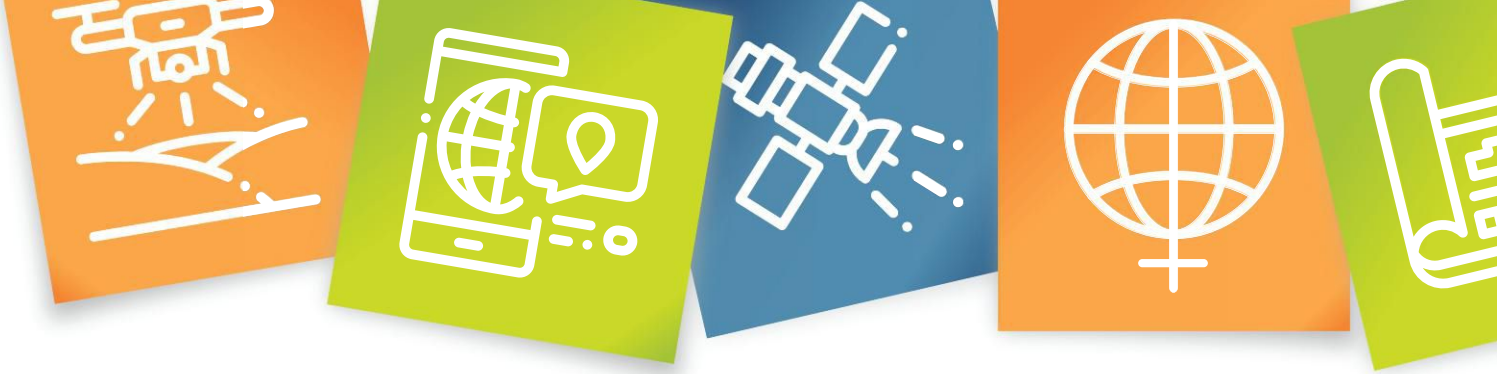
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Is Land Surveying a **Man's World?**

It doesn't have to be.

BY EMILY PIERCE

As land surveying professionals, we all want the same thing — to do the best job we can do, serving the public in an accurate, honest and unbiased way. Land surveyors don't make decisions lightly. Our decisions are based on the careful consid-

eration of legal documents, land records, and evidence we've carefully gathered from the field — all filtered through years of seasoning and experience.

When I work with a client, I strive for a peaceful solution, even when that solution isn't exactly what the client was hoping for. I want to create a mutually agreeable outcome that doesn't end up



Author Emily Pierce at work in the field. PHOTO COURTESY OF THE AUTHOR



in court, resulting in needless cost and acrimony. I am especially gratified when my expertise and insight have helped reconcile longstanding disagreements between neighbors.

Good training, careful work, hard-earned experience and the ability to put the public's interest first is not the domain of gender. It is the domain of mature, conscientious professionals. In this regard, women are just as capable as men, and it is our responsibility as professional land surveyors to open doors for the next generation of land surveyors with equal expectations for all.

My hard-earned experience includes some unique insights because I started the profession back when few women were entering the surveying world.

As with many surveyors, I didn't grow up wanting to be a land surveyor. I actually went to college to study music. While I was at college, I happened to take a geography class that turned out to be a revelation to me. Turns out I LOVED geography. And suddenly I understood that deep down I had always been drawn to it.

As a kid, I used to scour maps for hours, marveling at the unique view of the world that only a good detailed map can provide. So, from that moment on, I turned my attention to searching for a profession where my interest in geography could also build a career. Fortunately, the local tech college in

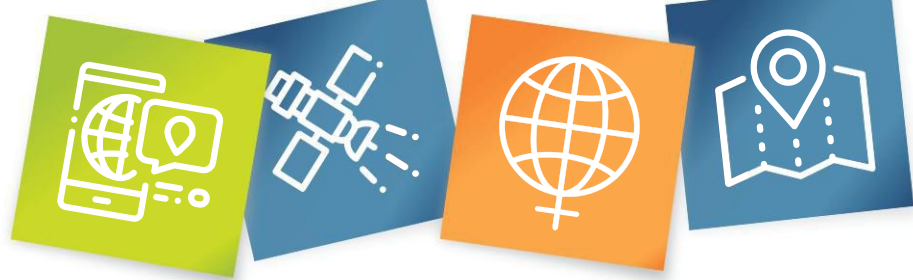
northern Wisconsin offered a two-year land surveying degree.

When I was accepted, I was thrilled. However, this excitement quickly faded after meeting a well-respected leader in my community who also happened to be a surveyor. He went into great and lengthy detail about how surveying was a male-dominated profession that demanded physical strength, endurance and superior math skills. He pointed out that, as a woman, I would find these challenges daunting and likely defeating. Little did he know that his "helpful" lecture gave me the push I needed to dive right into the land surveying profession. No one likes being told what they can't do.

From then on, it was my mission to make sure everything I was doing was top-notch. I gave it my all for the two years of the program, as well as my apprenticeships, and I finished with a 4.0 GPA.

One of the things that is highly recommended in surveying programs is to work as a survey tech for the summer. Despite my good grades and strong work ethic, finding a job was a struggle. I ultimately ended up working for a single-shingle surveyor, which gave me a great opportunity to get hands-on experience under my belt.

Admittedly, the environment wasn't the best fit, but I made the most of it. I stuck it out, working through the summer, part-time in my final year in college, and for a few months beyond. During this time, I kept applying for but not landing other



jobs. I needed greater opportunities for growth, learning, and more exposure to a wider variety of surveyors and projects.

Then, nearly eight months after my graduation, I was hired as county surveyor for Marathon County, Wisconsin.

Finally, I joined a community of land surveyors where I was able to coordinate on projects, do research and benefit from mentorship. Over time, I earned my keep as a competent and capable surveyor. My practice of working harder, faster and longer continued as I became involved in the Wisconsin Society of Land Surveyors, eventually becoming its president and

“I’ve never wanted preferential treatment. I just want to be treated equally.”

subsequently the national director for the National Society of Professional Surveyors (NSPS). My involvement in these organizations introduced me to other female land surveyors, and we shared similar paths to the profession and strengths. Because women have to work harder, faster and longer just to be considered equals, we develop a strong work ethic that is often funneled into building professional organizations.

Over the years, I have seen firsthand how the land surveying community has become more open and diverse. Yet we, of course, still have a ways to go. There’s a wage gap and needless roadblocks tied to gender. The fact that women don’t “look the part” of a land surveyor is an idea we all must work together to change. I’ve never wanted preferential treatment. I just

want to be treated equally.

Every female surveyor that I know has had the experience of finally leading a job site, only to see a client approach a male on the crew and assume he is in charge. But it often doesn’t end there. Physical strength is also used to relegate women to supporting roles. Although it is true that I can’t heave out a 6” x 6” x 36” concrete monument out of the ground with brute strength (like some of my male surveyors can), technology now makes it so that we don’t need to anymore. Our profession has evolved so all of us can work smarter, not harder.

Is surveying a man’s world? It doesn’t have to be. And our longevity as a profession deeply depends on changing this narrative.

We certainly are capable, and I don’t know of any other profession where it’s possible to build such enduring and deep friendships at work. When surveyors go to meetings, it is more like a family reunion than a business meeting. We have had the time to get to know and care about each other, and we all feel united representing the profession to the best of our abilities.

Over the many learning experiences of a rewarding career, I’ve made land surveying my world and my hope is to inspire other women to do the same in any way that they can. ◀

Emily Pierce is Berntsen’s business development manager and a member of the POB Editorial Advisory Board.

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‘Nice Apples’

An interview with New York State Association of Land Surveyors president, Daniel Marvin, LS.

BY EMELL DERRA ADOLPHUS

New York’s rural and urban areas offer two vastly different environs for a career in land surveying. For aspiring surveyors, it’s the perfect mix of experience, says Daniel Marvin, LS., president of the New York State Association of Professional Land Surveyors (NYSAPLS). “Salaries are higher than many other areas of the country,” he explains. “There is also a diverse landscape from the rural areas upstate to the unique aspects of New York City and its surrounding dense suburbs.”

Knowing the state is full of great opportunities for those interested in land surveying, NYSAPLS has recently stepped

up its marketing efforts to connect aspiring surveyors in high schools and local colleges to available opportunities. “No objective measurement,” Marvin says, “but for the last two years, we have been large enough to be able to afford a public relations campaign that is raising awareness of the surveying profession in New York.”

With a NYSAPLS membership base of 1200 and counting, so far the organization’s marketing efforts seem to be working. Here, Marvin shares why.

What would you say is the majority type of work available to land surveyors in New York?

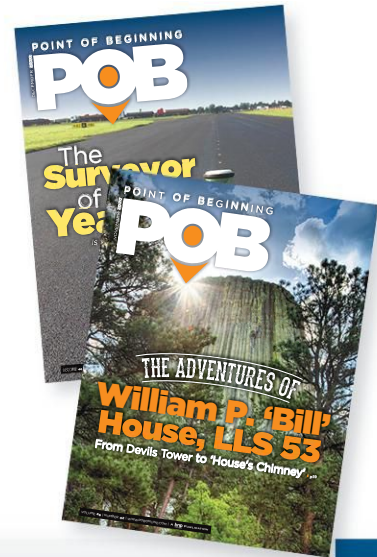
In rural areas of New York, I would say boundary and topographic surveys, and



On the job. IMAGE COURTESY OF DANIEL MARVIN

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surveying by state

in the urban areas, it is more likely work in roads, bridges, transit, and perhaps utilities.

Do survey professionals need their license to be involved with the New York Society of Professional Surveyors?

No, you do not need to be licensed in New York to be part of NYSAPLS. We have an associate and student member category. They are supposed to have an affiliation with the profession.

About how large is NYSAPLS? How many members? Compared to previous years, is membership growing or staying steady?

Currently, we have about 1200 members, which are broken down by several different categories. We have regular member, which is a licensed person, associate, student, and then we also have life and honorary members. Prior to 2020, our membership had been slowly increasing in the last few years.

If you are a surveyor in the state of New York, what kind of quality of life (salary, projects, work-life balance) would you say someone can expect?

Breaking this answer up into small firms that do mostly private work and larger firms that do commercial, utility and public work. Hours could be long for both.

Small firm owners probably have a tough time with work-life balance. The money might not be that attractive for newcomers to a small firm, but it might be the best chance to get a well-rounded boundary work experience to prepare for obtaining a license.

There is more money in the larger firms, particularly if they do public work. Public work party chiefs earn more than \$50 an hour. But it can sometimes be tougher to get boundary experience in a larger firm,



particularly if you get pigeon-holed in a segment such as construction stakeout or building interior mapping. The money is usually better in the high-tech areas (scanning, BIM, etc.) but it may be a longer path to licensure. Licensure, and ownership in a firm is where the real money is.

What do you think is affecting the growth of the land surveying profession in general the most?

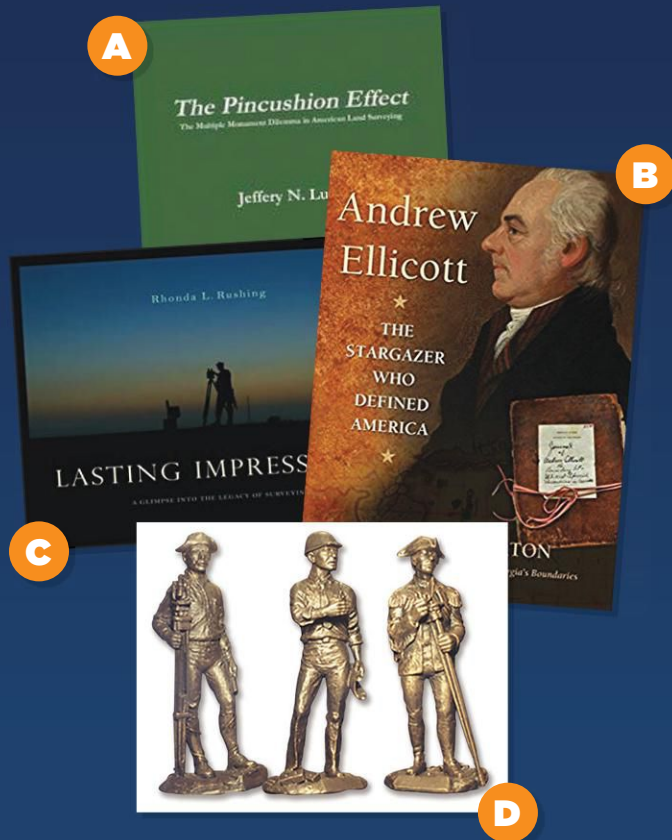
Certainly, a long history of a lack of understanding the role and the importance of land surveying is a long-term process. Also, market pressure on prices is keeping salaries lower, making it difficult to attract new talent.

What is the best way for someone to get involved in NYSAPLS?

Hopefully, there is already someone in your firm that is currently a member. More than 70 percent of the licensed professionals in the state are members of NYSAPLS. Once a member, NYSAPLS has many committees to join (visit nysapls.org for more info). Dedicate a portion of your time, talent and money to being fully involved and integrated in your chosen profession. ◀

Get involved! Visit nysapls.org to learn more about NYSAPLS. To vote for New York in our Surveying By State contest, visit pobonline.com/surveying-by-state.

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A **The Pincushion Effect: The Multiple Monument Dilemma in American Land Surveying - \$85.00**

Not only is the pincushion corner becoming a public relations disaster for the land surveying profession, it is causing those who might otherwise consider commissioning a survey of property to decide otherwise. And herein lies the dilemma; no one wants to hire the surveyor because of the way land surveying is practiced, the pincushion being emblematic of that practice. This book explores the full effect of the pincushion corner by exploring how the phenomena started and why it exists, and explores remedies to end the practices that allow the pincushion corner not only to exist, but to flourish.

B **Andrew Ellicott: The Stargazer Who Defined America, Special Edition - \$89.95**

This definitive book is about a 4 year expedition to measure and mark the first international boundary line between the United States and Spain. An integral part of the amazing story is Andrew Ellicott, the protagonist, whose perseverance to complete his assignment marked the beginning of the end of Spain's presence in the new world. This special edition includes 6 maps taken from the 1803 Journal of Andrew Ellicott.

C **Lasting Impressions, A Glimpse Into the Legacy of Surveying - \$37.95**

All good things are worth waiting for and the wait is now over. Lasting Impressions is a visually stunning compilation of fascinating stories and photos from surveyors, engineers, geocachers, history buffs and enthusiasts from across the country. The 192-page full-color, hardcover book is a fresh way to look at the history of America.

D **Surveyor Statues - \$149.00**

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Opening Doors

Shutting down stereotypes in GIS.

BY MARIA HOCHLEITNER

I never dreamed I would end up in the GIS or geospatial industry. Honestly, I didn't even know there was such a thing growing up, or that I would even have the chance to do it, or that I could do it. Girls at my school

were encouraged to become teachers or doctors ... a lawyer or even a chemist if you were really brave.

Whenever a girl wanted to ask a question, I remember that my physics teacher used to say that this was evidence that girls didn't belong in physics class. So, what did I do? I resigned. Science was not for me. Not an option. No interest.

Many years later, due to a coincidence, I started a job as a freelancer in marketing at a company that runs a platform for satellite data, software and applications. Within a few weeks, I was writing product descriptions and the topic grabbed me more and more. Five



Maria Hochleitner presenting at the SAR Analytics Symposium. IMAGE COURTESY OF SAR.



months later, I started a full-time position and canceled all of my other projects. I found it absolutely fascinating how geospatial information plays such a role in all of our daily lives and what great potential it has. It is such a diverse field, and in almost every industry there are applications based on geospatial information.

Suddenly, I was dealing with topics like 5G network roll out and how this requires highly accurate elevation models to plan the exact coverage and placement of masts and antennas. Another day, I am dealing with an application to help farmers in Africa grow cocoa more sustainably and effectively and monitor their harvests. I co-wrote a successful project proposal to the European Space Agency and later also managed the marketing part of the project. Discovering my passion for networking and explaining complex products, I went to trade fairs and events and spoke in webinars. This experience sparked my interest in sales so I could share my enthusiasm for satellite data in various projects to the outside world.

Since the beginning of 2020, I have been working at European Space Imaging as a sales manager, selling VHR satellite imagery. The most exciting part of my job is to be in contact every day with people who use our imagery and data for different purposes and to be close to the market trends and new



applications based on geospatial data before they even enter the market. Last year, I gave a webinar on vector maps from VHR satellite data and a presentation on imagery for autonomous driving.

It all sounds great, and it is, but there were always moments when I felt like I had to fight to be taken seriously. For four years, I have been working in the geospatial industry without relevant studies and without having planned it. But I was lucky that my manager was a woman, a woman who had worked and built up a lot in the industry and who didn't have to motivate and encourage you with words. She created such an atmosphere just by being there.

You always think it doesn't matter. It shouldn't matter. But the reality is that



we need other women to look up to, achievements to take as a guidance. Only then can something become normal. The reason why in some professions we don't even think that we have the option to take up this profession is because in our world view, in our everyday life, we hardly see any women there and this shapes us from an early age.

I've been to a lot of events and conferences over the years. One thing I could always be sure of was that I would be one of the few women in attendance. People were more likely to remember me because of this, which has its advantages. But when the astonished looks come, and you step on a stage with all eyes on you, you feel as if you have to work

harder to prove your place. Then come the comments. *Oh, you are the speaker for this presentation? I would never have thought.* As if one had to justify one's mere presence and place special emphasis on revealing one's knowledge aloud to ensure that one is perceived as a thoroughly qualified conference participant.

Women think that in order to hold their own they have to appear the same as men, but that's wrong. We make up over half of the world's population. We use the same technology. We go through the same training. It is absolutely legitimate to bring a female perspective and a female wind into technology industries as well.

We are long overdue to have more women in the GIS industry who are brave enough to bring in their perspective. Make no mistake. It takes courage, courage to go into an industry where not so many women are represented.

It's about not being afraid to feel out of place. There is a place for every one of us in this industry. We just have to claim it.

I absolutely love it, when I do spot another young woman at an event, and I think that visual representation is important to make a difference. However, I also think the inner attitude plays a big role. If we always feel out of place, then we radiate that to the outside world. The moment you realize that the others also only boil with water — and your opinion and experience is just as valuable and just as competent, regardless of age, gender or studies — the moment you have found your place. I have found mine. 🍀

Maria Hochleitner is a sales manager at European Space Imaging.

Breaking Ground

Women in GIS And (Finally) in Charge

BY EMELL DERRA ADOLPHUS

Ruth L. Trujillo Rodriguez, PLS, was in her senior year of high school when she heard the term “land surveyor” for the first time. Primed to become an engineer, she weighed her degree options at local universities in Puerto Rico. “Listening to the description of all the engineering degrees this university offers, I kept reading the term ‘land surveying’ in their brochure, but the counselor did not talk about it,” Rodriguez remembers. “I was curious, so I asked.”

There are only two universities in Puerto Rico that offer a land surveying degree: the public University of Puerto Rico, Mayagüez Campus and the private Polytechnic University of Puerto Rico,

AVALON_STUDIO / E+ / GETTY IMAGES

with a main campus just a couple of blocks from where Rodriguez grew up in San Juan. Rodriguez chose the latter.

“It seemed perfect,” she says, finding appeal in a surveyor’s life in the field. “I went home and searched more about it on the internet. I asked my mentor for guidance and got his approval.”

Graduating from Polytechnic with a degree in land surveying and cartography, Rodriguez is now the president and CEO of her own land surveying business and the only woman-owned land surveying corporation in Puerto Rico. “My focus is mostly boundary and cadastral surveying,” she says. Explaining, “Many women overlook the opportunity because when you hear — if you hear — about land surveying, the image you see is an



Ruth L. Trujillo Rodriguez in the field.

PHOTO PROVIDED BY HER.

older man 'looking through a camera.' Universities and professional associations need to promote the career to everyone, regardless of age, sex or race."

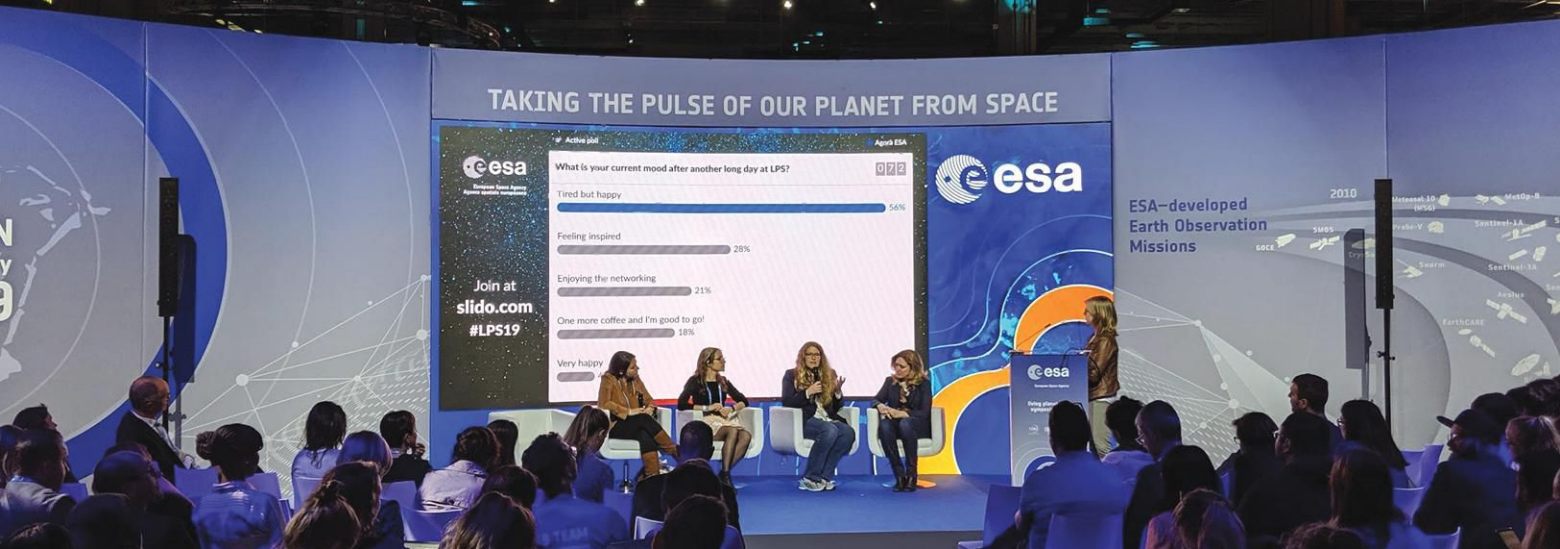
With professional paths shifting beneath their feet, many more women like Rodriguez are finding stability in leading land surveying and geospatial work — where they can steer the focus of their careers and challenge the status quo of traditionally male-dominated professions. What follows is not only her story, but the story of so many women who find themselves fighting for a place to do the work that they love.

When Hurricane Maria devastatingly hit the northeast Caribbean in 2017, reconstruction work for land surveyors skyrocketed in Puerto Rico. However, there are still to this day not enough licensed land surveyors for the jobs. The Puerto Rico Association of Land Surveyors estimates that there are around 330 professional

land surveyors to the island's population of 3 million. A much less portion of that number of land surveyors are women.

In Rodriguez's experience, seeing is believing when it comes to recruitment. "Most of the time people do not think about the importance of having role models, to see someone who looks like you do what you dream of doing," she explains. "Who better than women, who bring a superlative attention to details and a human -and skilled- approach to the profession? A couple of decades ago, maybe I would not have been recommending another woman to join the profession because most, not all, older engineers and surveyors did not see women as their equals." But times and generational attitudes are quickly changing, says Rodriguez. "I have had no issues with younger generations. They have always recognized me and treated me with respect." And with each new door she opens in her own career, she is laying the groundwork for more women to come after her.

Surveying might have once been a man's world, but women are here to stay, says Rodriguez. "I believe that the stereotype of the profession being a career for men needs to end once and for all," she says. "When younger women who are still studying or have recently become surveyors come to me and say, 'I want to be like you.' Or, 'thank you for all your help.' I feel like I owe it to them to be the best surveyor I can be." Her advice to women thinking about starting a new career: "Do not think about it for another minute. You have the skills, the abilities, and the talent to achieve anything you put your mind to and focus. Do not be afraid."



ABOVE: Julia Wagemann (at the podium) leading a panel discussion last year for the European Space Agency. IMAGE COURTESY OF JULIA WAGEMANN. BELOW: Tammy Peterson with her previous colleagues at SOLV3D Inc. IMAGE COURTESY OF TAMMY PETERSON.

Tammy Peterson's career path into GIS was anything but intentional — "It wasn't something that I was familiar with or looking for"— but there always seemed to be a place for her skills in the industry. Earlier this year, she joined CompassHoldings to lead their strategic marketing and business development initiatives for their suite of companies, which include CompassCom Software, CompassData, Inc. and CompassDrone. With previous tenures at SOLV3D Inc. and Valtus Imagery Services (now HxGN Content Program), she brings more than 20 years of experience in strategic marketing and business growth to her current role that she says is the result of everything "falling into place."

"I told many people this. I wanted — to quote, unquote the analogy — Mr.

Right. Not Mr. Right now," says Peterson. "I wanted to find a place where I knew I would not only be challenged but I would also make a positive impact, that I could go in and truly help an organization grow and achieve their objectives."

Peterson considers herself more of a professional working in GIS than a GIS professional, but she has been able to stake a claim in the industry by leaning into feelings of imposter syndrome.

"I think the only way you overcome it is by being engaged and seeing how you're making a positive impact on an organization. Because if you're just someone who talks a good game, but there is no follow through, then that's all smoke and mirrors," she says. "But if you believe, you truly believe in what you are saying to people and you are able to take action on that and achieve results, that's how you get over that feeling."

GIS consultant Julia Wagemann created the Women in Geospatial Google group (womeningeospatial@googlegroups.com) in 2019 to help women in GIS around the world combat imposter syndrome and

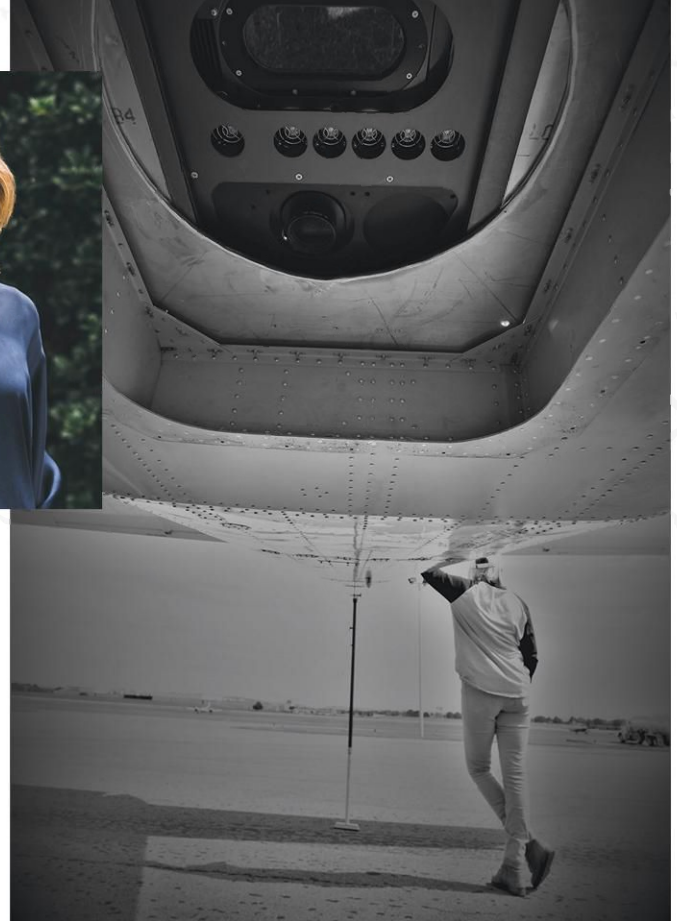


professionally connect through learning and career advancement opportunities. Like most things today, everything started with a tweet about creating the discussion group.

"I was not actually very upset that day," says Wagemann, who has a background in physical geography and conducting work based in Europe. "It was just maybe an accumulating frustration from years of work."

In no time, she had 300 responses from women in GIS expressing interest. "This was basically the starting point," she explains. Today, the group is over 2300 members and pursuing nonprofit status. Because it is a virtual group, Wagemann says the coronavirus pandemic has only increased its demand.

"At the moment it's still a grassroots organization, I would say," she says. "I think now looking back we did quite



Kimberley Denny after the Atlantic team installed a new sensor and waveform digitizer on an aircraft. PHOTO PROVIDED BY HER.

well. We are already an online community, and we are global."

Entry to the group is by invite-only, and its members include GIS students, educators and industry professionals from around the world and close to home, such as Atlantic executive vice president Kimberley Denney.

Denney is celebrating her 10th year in the GIS industry after being recruited by her father Steve Denney, chairman and founder of Atlantic, into an entry-level position.

"I remember it like it was yesterday," Denney says. "He shared with me that an entry-level account manager position was open at Atlantic and if I had any interest in learning more about what he has devoted his life career to all these years. I remember him saying, 'If you end up loving it, wonderful. If not, no



The GdB Geospatial team, led by president Christine Gayron, walks through a job in New York. PHOTO BY AMEL PURIC.

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strings attached.” The decision was “one of the best decisions I have ever made,” says Denney.

Green to GIS, her training started on the job. “Like many in our profession, my education in GIS, lidar, photogrammetry, remote sensing, etc. began on day one at Atlantic,” she says. “I always felt the expectations for me were higher than for others at our company (men or women) — right or wrong. Rather than focus on how others felt about me, I decided to turn that ‘burden’ into a strength for my growth. I felt like I needed to show up every day, work hard to learn this profession, and to earn the respect of others. My focus has always been on the positive aspects of our business and our professional community.”

She adds, “I did not know that I would be entering into a male-dominated industry, but it did not take me long to recognize there was certainly a lack of women in the field or at least on the forefront attending conferences.”

Although Denney admits that she did not have many female figureheads to look up to going into her GIS career, the industry carries a sense of awareness now that will benefit from more diversity.

“I think awareness is key component of diversifying our industry. It has been amazing to witness in more recent years not only the steady increase in women joining our field, but also the increase in women earning and taking on leadership roles within their organizations,” she says. “As a profession, I think we really need to explore why certain racial

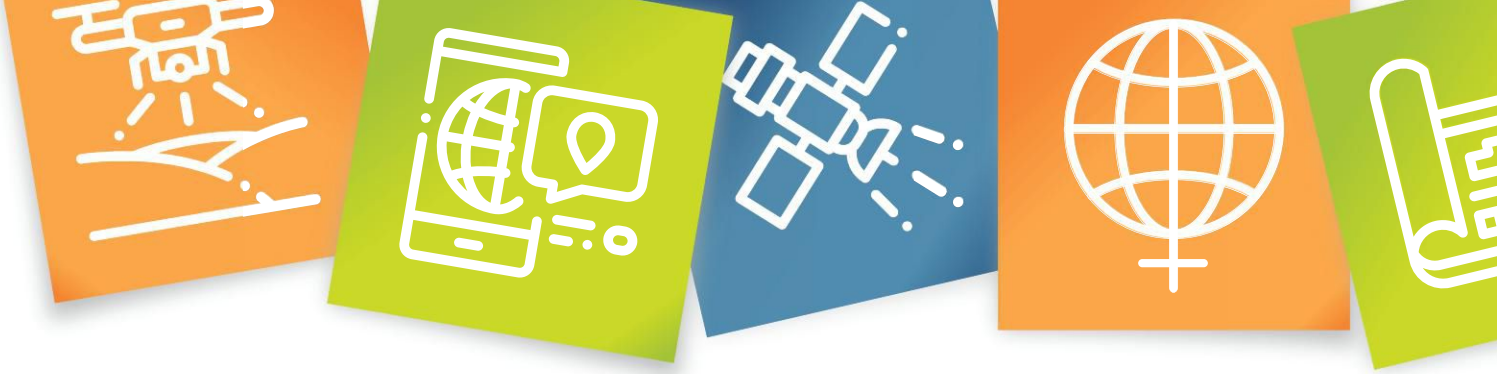
Watch our exclusive interview with GdB Geospatial president Christine Gayron on leading as a female executive:



“I’ve always looked at it as an opportunity to stand out. Honestly, I don’t feel like I was held back at all because I was a woman. There were a few occasions where I was mistaken for being the marketing person or secretary, and I was able to spin those conversations into a discussion about what it is that I really do and what I’ve learned and how much experience I have.”

For more videos and articles on women in GIS, visit pobonline.com.com.

minorities are not pursuing careers in STEAM, specifically GIS and geomatics fields. It does not seem to be enough to continue to promote just how inclusive our profession can be for everyone. What is important is that we are conscious and aware of what draws curiosity to our field while also identifying what deters (others). I do hope that it leads to something even bigger for our profession because there is so much to love and so much work to do.” ◀



A Sense of Place

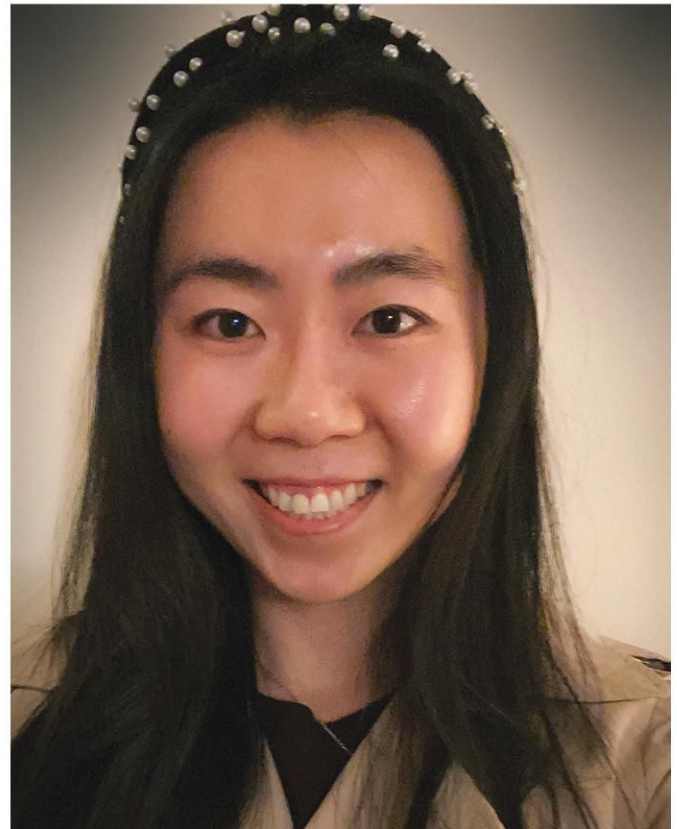
Preparing for a female future in GIS.

BY FEI JIANG

My journey in GIS started 10 years ago when I needed to decide on a college major. Growing up, I had a passion for learning about the environment and Earth. Therefore, I decided to major in Earth Science during my undergraduate year of studies. Later on, I entered a water resources and hydrogeology program in our department because I was particularly interested in interactions between soils, water and climate.

To me, the most fascinating part of my undergraduate studies were the diverse field trips and mapping activities I conducted over the summers. This marked my first experience with geospatial information and GIS techniques. With the help of GIS applications, I was amazed that I had a much clearer understanding of current and historical geology and topography.

After my receiving my bachelor's degree, I entered Penn State University's Ph.D. program in soil science and agronomy to continue pursuing my professional



interests. At Penn State, I for the first time received systematic trainings on GIS, ranging from commercial software like ESRI products to geospatial analysis in R or Python. More importantly, I applied GIS every day to conduct my thesis research projects. Without GIS, it is impossible to test the role of precision/digital agriculture in water quality improvement or to connect field-scale farming practice to watershed-scale impacts. I really enjoyed working with geospatial data, maps and coding scripts every day.

Since graduating with my Ph.D. in soil science, I have been working as a GIS and data scientist with PlantVillage at Penn



State. We, PlantVillage, are a large group of computer engineers, web developers, data scientists, biologists, agronomist, meteorologists and extension specialists who share a common goal: to help small-holder farmers all over the world achieve food security. My work ranges from international agronomic research with remote sensing to delivering hyper-localized (5km resolution) weather and agronomic advice to over 400,000 farmers in Kenya on a weekly basis via SMS. I am coordinating with teams in Malawi, Zambia, Kenya, and Ethiopia to apply machine learning and GIS techniques to combat with irregular rainfall patterns, low-fertility soils, pest

threats, and to deliver hyperlocal advice to individual farmers via SMS, TV and PlantVillage Nuru application notifications.

Working together with my amazing team, our goals are to reach millions of individual farmers across Africa with our hyperlocal advice on rainfall, crop management and pest control; utilize most advancing AI techniques to deliver most understandable and accessible help to those in need; and reduce the dependence of smallholdings on external help to achieve food security.

Looking back at my 10 years of GIS experience, I have massively grown professionally and personally. Professionally, I feel fortunate that I found a career where



Potato farmer harvesting in Kenya. PHOTO CREDIT: BOEZIE / E+ / GETTY IMAGES



I can receive a great sense of achievement every day. Gladly, my GIS skills are improving constantly. Beyond that, I am more thrilled to see that I am using my skills to help people from different regions on different problems — from excessive nutrients from cropland in Pennsylvania, impaired stream quality by livestock in Northern Ireland to climate adaption and pest control in East Africa and South Asia. To me, GIS is the component that brings many fields together to solve complex real-world problems.

“With the help of GIS applications, I was amazed that I had a much clearer understanding of current and historical geology and topography.”

Personally, I gradually built up my self-confidence by overcoming many challenges along the way. I have to admit that I was challenged a lot of times in the past years, and it was anything but an easy career path for me. I was questioned many times that my work was only ‘computer games’ or ‘mapping practices’ which had no practical applications or scientific indications. It made me frustrated and question my abilities. Still, I worked very hard to think outside the box from a user’s perspective and to make my products informative and applicable for the people who will use them eventually.

I am very lucky that I have finally found a place where I belong and have so many wonderful mentors in my professional development, such as Drs. Heather Preisendanz, Patrick Drohan

and David Hughes. They and my other team members offered me constant support and constructive suggestions to help me advance in my career. This also inspires me to give others support and advice when they need.

From the start of my education, I have always been a gender minority in my professional settings. Sometimes, the gender ratio of male to female can be as high as 5 to 1 or higher. Nevertheless, every female coworker and advisor I met was incredibly decisive, capable and supportive. Working side-by-side with them, I felt energized and motivated.

Our team at PlantVillage tried very hard to recruit undergraduate assistants and volunteers from all majors to work on various GIS and computer science projects. We gladly found that more than half of

the undergraduates at PlantVillage were women, and they did a fantastic job.

I don’t believe that GIS is a male-dominated industry because women have some disadvantage in this aspect compared to men. I believe we simply need to do a better job at educating young women about GIS industries, including potential career paths, applications and requirements. Then we will quickly see how our industry grows and evolves for the better. ◀

Fei Jiang, Ph.D., obtained her Ph.D. in soil science from Pennsylvania State University in 2020. After that, she joined PlantVillage at Penn State as a GIS and machine learning expert. Together with her wonderful team, she works towards helping millions of small-holder farmers all over the world adapt to climate change and combat pest attacks.

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ABOVE: Leica Absolute Interferometer (AIFM) in action. RIGHT: Leica Absolute Tracker AT960.
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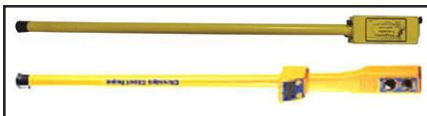
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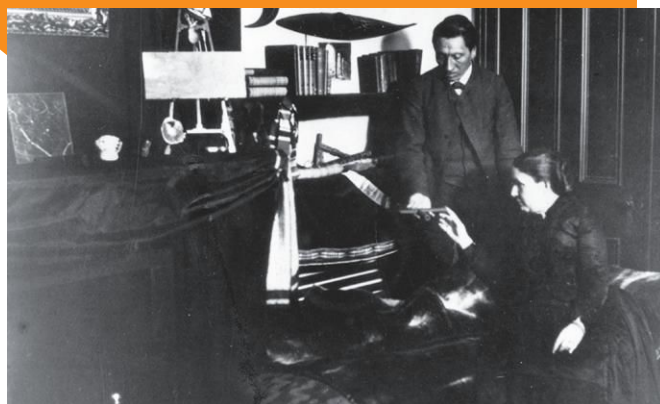
The First Lady

Excerpted from an article by Milton Denny, PLS, that originally appeared in POB Magazine.

Alice Cunningham Fletcher was born March 15, 1838, in Cuba. A driven and passionate woman, she was active in the temperance, anti-tobacco and feminist movements, and a need to earn her own living propelled her into her first career as a public lecturer and later into anthropology in her 40s. While gathering material for a lecture series, Fletcher met Frederic W. Putnam, the director of the Peabody Museum of Archaeology and Ethnology in Cambridge, Massachusetts. With Putnam, Fletcher informally studied archeology, then her interests turned to studying contemporary Native American life in Nebraska.

Putnam taught her the importance of scientific study in archeology, which to him meant painstaking and thorough excavation of bones and artifacts with detailed recordkeeping. Fletcher transferred Putnam's emphasis on facts to a new field: ethnology. Her approach to the subject came to be known as "fieldwork," and as she traveled among the Plains Indians, she participated in their life and took detailed notes on their customs and ceremonies.

Throughout the 1880s, she became a leader for the reform of the Indian reservation system. The Omaha Native Americans feared that they would be removed from their land, so they wanted legal titles to their properties just as all land owners had of the day. Fletcher took up their cause, and she lobbied in Washington, D.C., for the passage of a special act that provided for the division



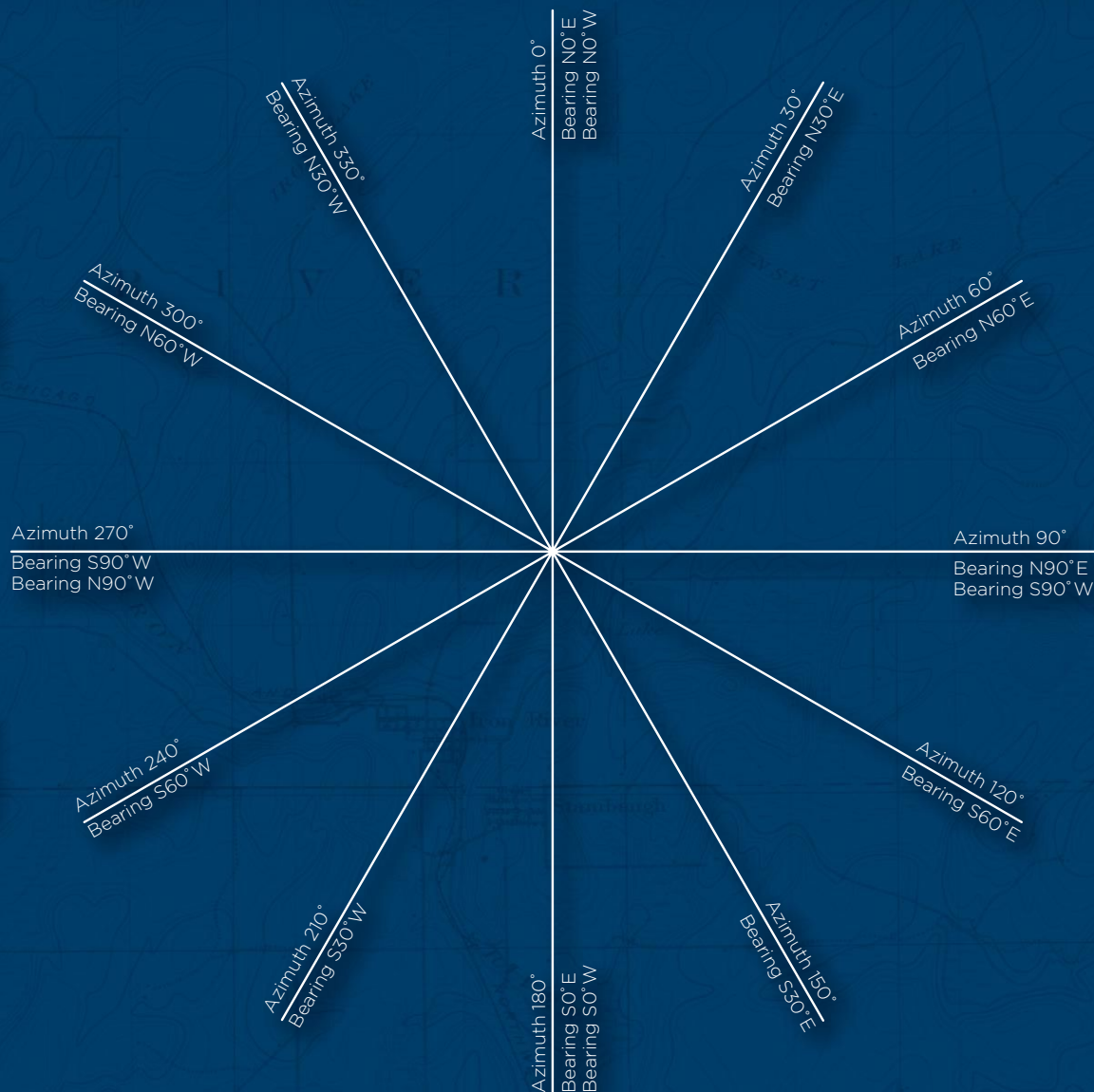
TOP: Alice Cunningham Fletcher at her writing desk. ABOVE: Omaha Indian Informant and Alice Fletcher in Macy, Nebraska. PHOTOS AVAILABLE COURTESY OF THE NATIONAL ANTHROPOLOGICAL ARCHIVES, SMITHSONIAN INSTITUTION.

of the Omaha Reservation into individual allotments of land.

When the Omaha allotment act was passed in 1882, she was sent by the Bureau of Indian Affairs to Nebraska to implement it. This experience was the start of her work in land surveying, and by 1884 she had allotted 75,931 acres in 954 allotments to 1,194 Omaha people. Her work was so thorough that the Bureau next hired her to make a nationwide survey of all the Indian reservations. Tribes came to know her as the "Measuring Woman." ◀

Read the complete story at pobonline.com.

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