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Technology, Trees, and Everything Inbetween

When I imagine a forest, images of a beautiful landscape that is vast with rich and thriving greenery that is home to a diverse ecosystem composed of many animals, fungi, and plants appear in my mind. For me, this forest is undisturbed by human civilizations and the destruction of their technologies. In the 21st century though, it is difficult to discover an area that has yet to be impacted by humans and our technology. As our world is becoming more reliant on technology, we have to be accustomed to them to create and manage more efficient forests effectively for our cities. There exists a variety of tools, ranging from utilizing sonic tomography to analyze tree health, GIS to map out areas that benefit from forests, and cameras that have the potential to monitor human behavior around forests. There are many benefits that arise from technology, and we as urban foresters can use them to advance our goals of a more green and healthy Earth.

One technology that is beneficial for trees is sonic tomography tools; it creates an image of an internal cross-sectional structure by recording the differences in speed of transmitted sound waves. This was used in a study by Karlinasari et al. (2018) where the images were used with visual tree assessments to make risk assessments of 345 trees in Jakarta, Indonesia. The study concluded that 83% of trees were healthy, 12% were moderately healthy, and 4% were unhealthy derived from solid wood percentage. The study left me with some unanswered questions that I

wished it discussed. It does state that sonic tomography is used when supporting information is required to come to a decision, but it does not recommend which situations may call for it. Most of the trees in the study were in a healthy state, so conducting additional testing can be exhausting on resources and overall be unnecessary. It also did not discuss any examples of the visual assessment and the sonic tomography results contradicting each other, which could persuade professionals to use technology more often. Further research can be conducted to answer these questions to enhance our understanding and care for our trees effectively.

Despite these questions, sonic tomography was shown to be a useful tool for foresters. The most reported condition was dead trees, tops, or branches at 27.4%, yet only 16% of trees were not considered healthy. It shows that even though some trees may have some decaying parts, it is still overall healthy and thus still beneficial for humans and wildlife. Instead of removing it or more intensive care measures, the tree may just require some simple management. It can help us manage these forests more efficiently since we can invest our resources in other trees and other natural areas that require more care. Sonic tomography is being used more often now, and with more advancements it will make a positive impact on our cities and our lives.

Sonic tomography does have positive impacts, though one tool that has negative impacts to some natural resource students is GIS. There were moments in GIS for Natural Resource Management that I questioned how often I would use it in my career; I was more interested in being outside interacting with wildlife, instead of inside an office trying to draw polygons on a map. Kristine Griffith's report about Canton, Ohio's Landscape Scale Restoration grant is a great example of how GIS technology is necessary for them to strategically plan tree plantings in their city. This report is directed towards their residents, as it outlined the grant's criteria, the planning

process, implementation, and future steps of the plan in a three page report. It did a great job providing the general information a concerned resident may want to read in a condense manner with graphs and tables to enhance it, without overwhelming them with technical details. Griffith highlighted GIS in the report since she used it to analyze areas outlined in the grant, such as stream corridors, census information, major road and trail corridors. She also used it to analyze areas to ensure tree longevity, such as sewer, water, and gas lines and overhead utilities. This project is a clear example of how geographic tools can be useful in designing greenspaces to improve the lives of its residents. It used multiple layers of existing information, from ecological information about the environment, to census information to identify low-income areas in need of canopy cover. It is critical for foresters to have GIS skills as it allows us to be more competitive once we enter the career field. GIS, and other related technology, is not a burden, but an essential tool to further advance our goals of a more green city.

While I have used GIS a few times in my life, I do encounter security cameras almost on a daily basis. Security cameras are becoming more prevalent in our lives in order to monitor us to ensure a safer city, and this tool could also apply to a safer park or other public green space. Steve Henn's article reports on Elk Grove, California, and how their city is becoming increasingly monitored by their police department. Proponents argued that the technology is becoming more advantageous as software is being developed that can read license plates, conduct object-based searches and facial recognition, and thus be a valuable asset in monitoring our safety and solving crimes that occur. This can relate to our urban forests, since park safety is a concern for some residents. It can be used as a tool to manage for suspicious activity, and therefore foster a more inviting space for people to enjoy nature. This raises concerns amongst

some people as it can be argued that it is an invasion of privacy. For some people, privacy is a way for them to feel safe and secure, and security cameras are seen as disrupting that. The software is becoming more popular, but the article did not describe many examples of how it has been used effectively to prevent and solve crimes. Some people would be persuaded if they read statistics regarding its use, and thus feel more comfortable with it. Despite that, the author was writing a news article and not an opinion piece. If city officials plan to install cameras in parks, there should be enough public opinion from many stakeholders as it is a more controversial technology compared to sonic tomography and GIS. More people are exposed to cameras, while arborists and foresters are the main people utilizing the latter. Urban greenspaces are meant to be enjoyed by everyone, and for that reason, their opinions matter.

There are various tools we are using to enhance and improve our forests, ranging from sonic tomography, GIS, and even security cameras. They allow us to detect decay in trees, identify areas in need, and monitor our forests to protect trees and residents alike. Our society can only improve if we embrace new technological advancements; we need to be welcoming to new ideas if we want to grow as professionals. These tools can help us foster healthier and greener cities that reflect the images of vastly beautiful and thriving forests that I imagine in my mind.

Sources

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