

Tech Tools for Public Health

By Alaina Brandenburger and Teresa L. Penbrooke, PhD, CPRE

In the past decade, parks and recreation agencies across the country have begun recognizing their vital role in community health and wellness. This aspect of parks and recreation has become a key focus of many parks and recreation planning efforts. New technologies are emerging that aid agencies in determining how their system contributes to the vibrancy and overall health of a community. Newer tools including artificial intelligence and satellite imagery can be used to measure a variety of factors that contribute to a comprehensive assessment of any parks and recreation system.

Recently Alaina Brandenburger from GreenPlay LLC interviewed leaders from two newer technologies that GreenPlay is using to delve deeper into these aspects. Jared Hanley from NatureQuant and Matthew Saponaro from A.I. Whoo discussed how they are currently leading the way incorporating technology into parks and recreation planning. Both of these companies offer tools that can help your agency assess how your parks and recreation system contributes to community health and wellness, but this is achieved by two different methods of measurement.

Improved Measurement Tools

NatureQuant is a tool that measures the quantity and quality of natural elements within your parks and recreation system using machine learning and artificial intelligence. These tools are used to create a Nature



Score that offers your agency a visual representation of natural elements in the community. Hanley said, "Nature score is a large and dynamic dataset of natural elements that we have aggregated and created. We take satellite imagery and use computer vision to parse out elements we can observe. We look at a proxy for green using infrared reflections that we also receive from satellites, and we look at the classic data sets like tree canopy, park space, impervious surfaces, as well as human modifications like densities of highways, air pollution, light pollution, and noise pollution."



A.I. Whoo also uses artificial intelligence in its process, but this technology uses video to identify activities that people are doing within the parks. Saponaro said, "Essentially what we do go to different locations and deploy standard trail cameras. We collect the videos for a week or so. And then process those videos through our software to see how people are using the trail and how it impacts their health."



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GreenPlay's GRASP® Active analysis complements both of these tools. Instead of merely evaluating the quality of parks and recreation assets in a system, GRASP® Active evaluates potential energy expenditures associated with each asset. Using a feature list developed by the North Carolina State Cooperative Extension Service and a simplified low, medium and high rating for energy expenditure, each GRASP® component "has a relative value in terms of its effectiveness at generating physical activity within the population" (Layton, 2016).

Access to Nature and Contributions to Public Health

One of the ways in which Hanley and NatureQuant can determine how natural areas contribute to public health is to compare heat maps of natural assets to overall longevity rates in an area. He states, "Everything falls in line with it longevity – cancer rates, asthma rates, heart disease, etc. We have a nature score by longevity which is predictive of community health, and we've mapped out almost every city in the US. Agencies can look at that heat map and understand what areas of their city are nature deficient or nature abundant, and that will help them focus on those areas that are deprived to put more nature in those regions and presumably make that population healthier."

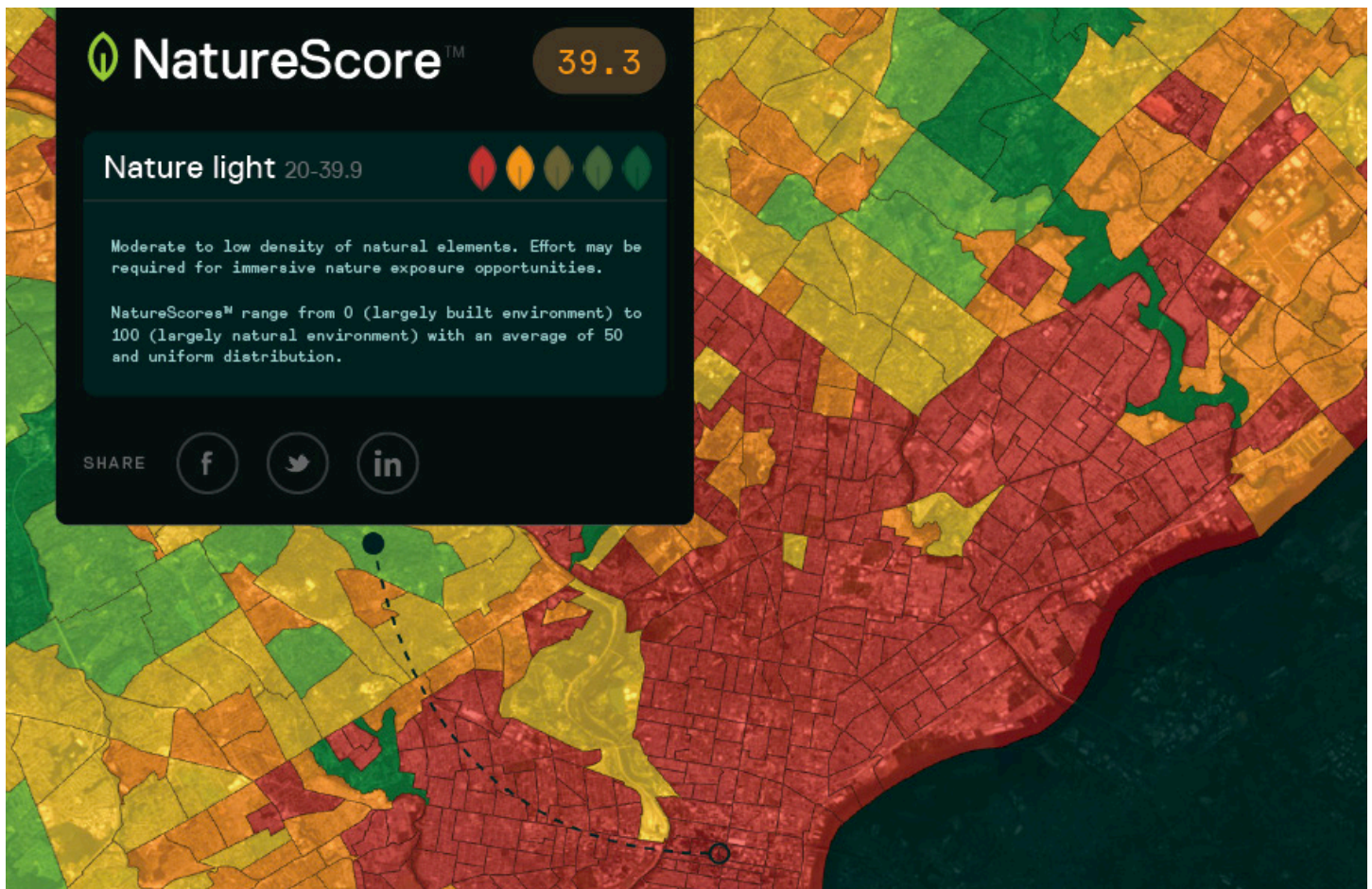
While the effects of trees and green spaces on public health has been studied and has been found beneficial, Hanley

was shocked to find that one natural element does not contribute to overall health as much as he thought it would – access to water. "I love water. I love being near a river, next to a lake, or by the ocean. So I just presumed that communities would benefit from that pleasant experience. But access to water hasn't proven to be quite as impactful as access to trees."

Using Tech to Develop Health Metrics

Software like NatureQuant, A.I. Whoo, and GRASPActive all allow an agency to develop metrics to measure how the system is impacting public health. Saponaro describes the A.I. Whoo process. "Not only can we look at activity type but we can also get long distance component. Once you have measured activity type and distance, you use it to assess different health metrics. You can get calculate and an estimated body weight from the body weight. Combining these metrics with users' speeds lets us calculate metabolic rates and calculate calorie expenditures or fat burn."

Hanley discusses how NatureQuant evaluates public health as influenced by access to nature. "Health outcomes are based on aggregated data. And we run what's called a regression analysis where we measure how tightly correlated or the presence of these natural elements and the known health outcomes. The things that are most tightly correlated give us a sense in association. It's not to



say that not being next to a tree is causing cancer, but our analysis has shown that if there are trees nearby, you seem to be less likely to get cancer. Those kinds of associations just surfaced over and over again to the point where we're confident saying there's a very demonstrative association between the presence of parks and nature and certain more positive health outcomes."

How These Tools Can Help Your Agency

By measuring public health outcomes of parks and recreation in terms of access to nature and trail and park usage, your agency might be able to secure funding from non-traditional sources. Finding out that citizens are biking on the trail to get to different areas of town could potentially be considered transportation. You may be able to use this data to apply for funding and grants pertaining to trails or alternative transit.

Showing decision-makers how parks and recreation contributes to public health may also open your agency

up to potential partnerships with medical centers, state health departments, insurance companies, and others that might not have been willing to partner before. It also lets you present a case for the importance of parks and recreation to your community. Rather than seeing parks and recreation as an ancillary service, decision makers can see how it benefits the community.

Finally, these studies help you understand where you need to allocate your resources. When you know which areas are nature deficient, you can partner with organizations like the Arbor Day Foundation to plant trees in these locations. If you use A.I. Who and find barriers to cycling on your trails, you can develop strategies to make your them more bike friendly.

If your agency is ready to utilize technology in your next parks and recreation master plan to elevate your level of service analysis beyond acreage per population, contact GreenPlay.