

Mapping Conservation Opportunities to Increase Human Access to Open Spaces

Ardath Dixon | Duke Nicholas School of the Environment | April 2021

Human Access to Open Spaces in the Chesapeake Bay Watershed

Increased access to trails, forests, waterways, and vistas can improve nearby residents' physical and mental health (Mears et al., 2019; Plumer, 2020). Outdoor recreation space provides direct benefits to human health and can mitigate urban heat island effects (Jennings, 2015; Plumer, 2020). Specifically, exposure to protected and undeveloped land areas has been linked with stress reduction, psychological restoration, social cohesion, space for physical activity, reducing exposure to harmful environmental conditions, and immune system modulation (Mears et al., 2019; Boone et al., 2009).



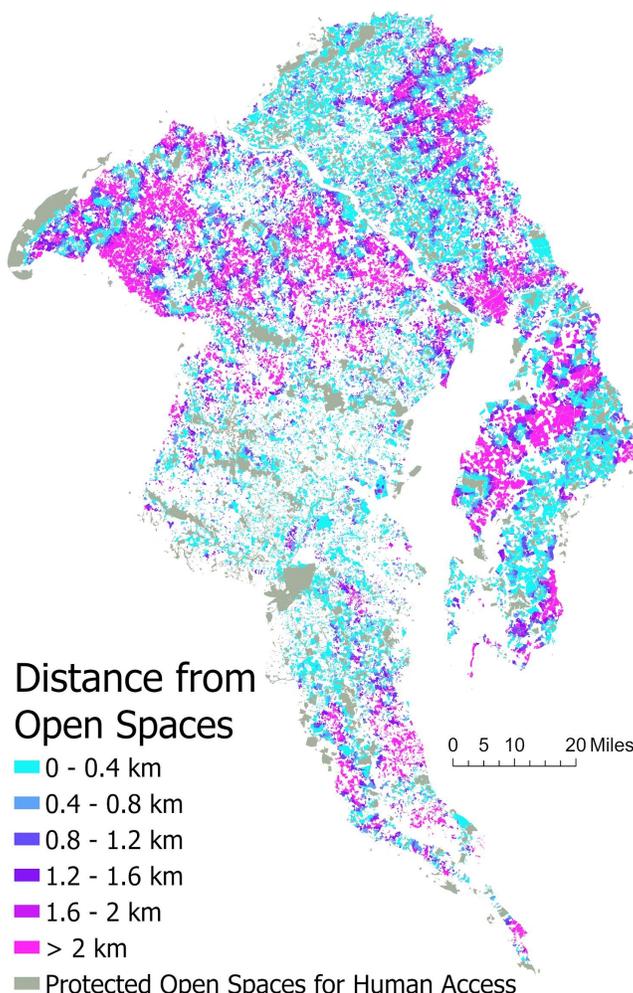
Hikers in Patapsco Valley State Park, near to Baltimore.
Credit: Will Parson / Chesapeake Bay Program

The Role of Conservation to Increase Access to Open Spaces

Open space access is one measurable characteristic that can quantify social imbalances, highlighting those areas lacking green spaces. Highlighting areas with low access to publicly available open spaces shows where restoration can have both environmental and social benefits. The 30 by 30 conservation goals provide the opportunity to complement this dire need for public green space with conservation and restoration.

Spatial Analysis to Support Conservation of Areas with Co-Benefits

We defined open space as lands with federal or state protection that were neither private easements nor Federal proclamations such as military bases. Since travel time can vary widely depending on mode of transportation (walking, biking, driving, or public transportation), we calculated every parcel's distance to public open spaces as-the-crow-flies. Parcels with the highest scores are farthest away from publicly available green spaces (>2 miles), and therefore have high urgency for land protection or restoration. Conversely, parcels adjacent to open spaces were given a value score of 0. The remaining parcels were given value scores between 0 and 1 with a linear transformation.



References

- Boone, C.G., Buckley, G.L., Grove, J.M., Sister, C. (2009). Parks and People: An Environmental Justice Inquiry in Baltimore, Maryland. *Annals of the Association of American Geographers*, 99:4, 767-787.
- Jennings, V. and Gaither, C. J. (2015). Approaching environmental health disparities and green spaces: an ecosystem services perspective. *International journal of environmental research and public health*, 12(2), 1952-1968.
- Mears, M. and Brindley, P. (2019). Measuring Urban Greenspace Distribution Equity: The Importance of Appropriate Methodological Approaches. *ISPRS Int. J. Geo-Inf.* Vol. 8, 286.
- Plumer, B. and Popovich, N. 24 Aug 2020. "How Decades of Racist Housing Policy Left Neighborhoods Sweltering." *The New York Times*, www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html.

Author contact: Ardath Dixon (she/her)
ardath.dixon@duke.edu | ardath.dixon@gmail.com