



Whose Environment Are We Conserving? Inclusively Quantifying the Potential Benefits of Land and Water Conservation

6 October 2021



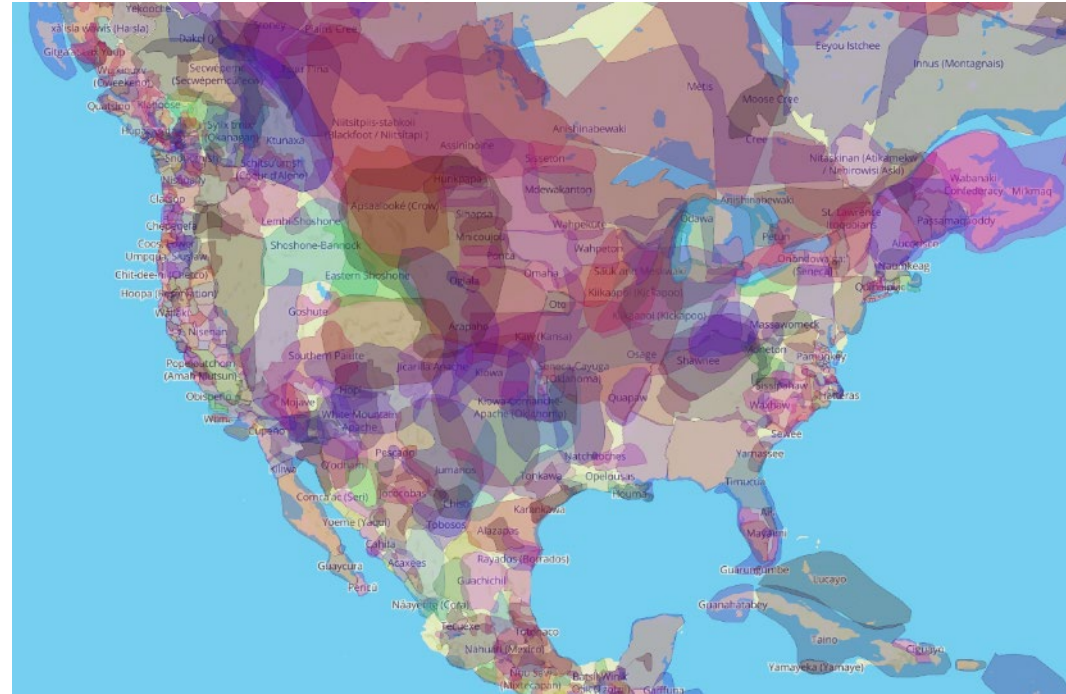
Photo credit: Gerardo Brucker

Land Acknowledgement

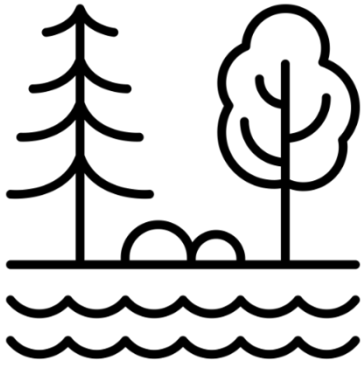
- Arapahoe
- Cheyenne
- Ute

RTI Acknowledgements

- Michele Eddy – Hydrologist, Modeler, Lead Developer
- George Van Houtven – Hydro-Economist
- Jay Rineer – GIS specialist

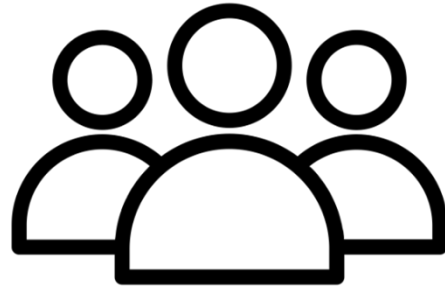


[Source: Native Land](#) is a tool that maps out Indigenous territories, treaties, and languages. It does not represent or intend to represent official or legal boundaries of any Indigenous nations



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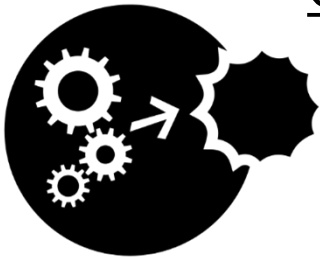
Environmental
Injustices

Technical Process Overview



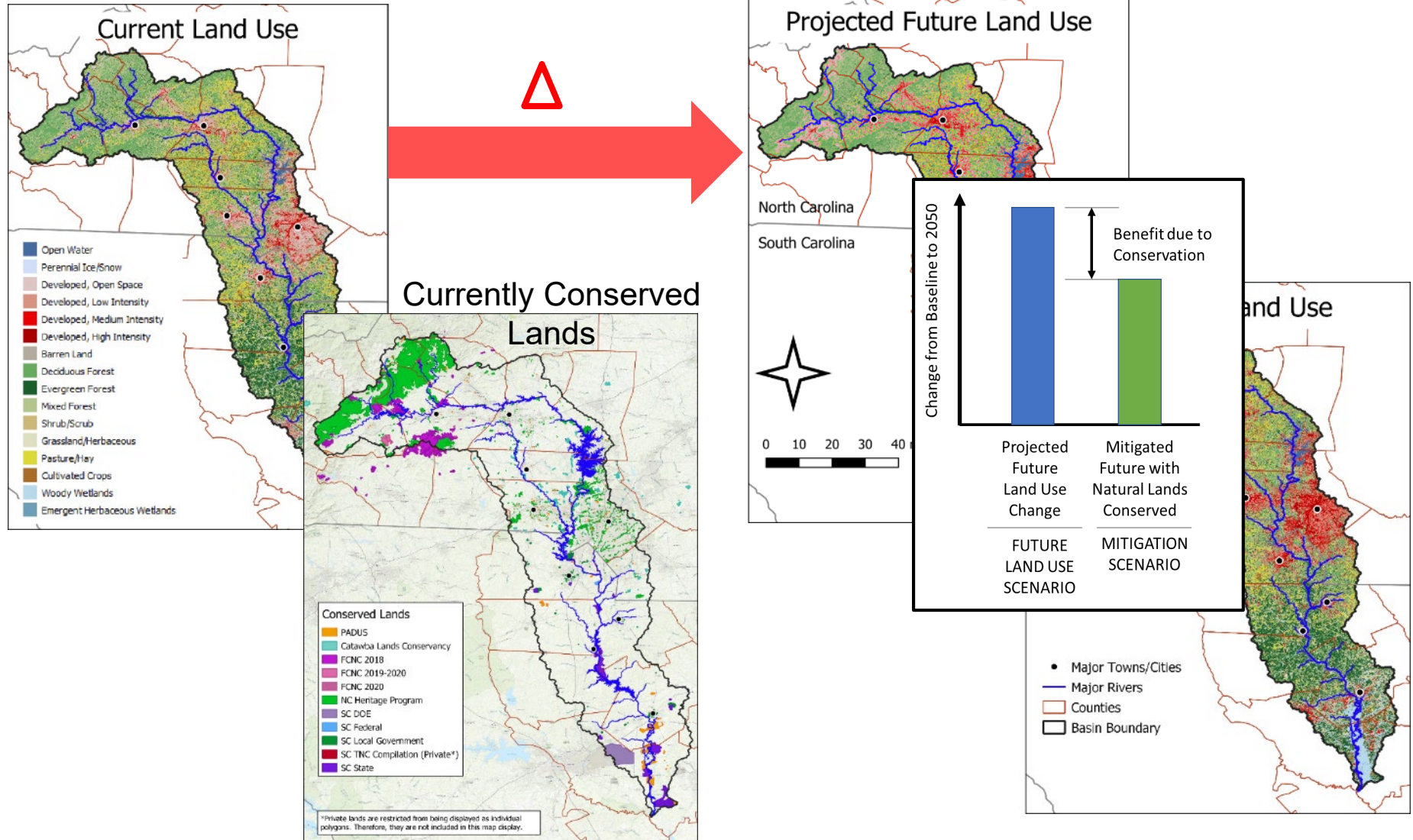
- Hydrologic model + sediment simulation
- Future projections
- Change metric spatial analysis
- Mitigation assessment
- Benefit calculations
- Economic evaluation of benefits

Outcomes



- Framework to compare the costs and benefits of protecting natural lands
- Prioritizes land conservation decisions and investments

Baseline and Projected Future Land Use



Conservation Prioritization for Source Water Protection

- Equal Weight
- Mitigated Equal Weight
- Drought Protection**
- Sediment Loading/Supply
- Flood Mitigation
- Erosion / Scouring Risk
- Water Supply
- Increasing Extremes
- Economic Benefits



A dry streambed in Union County, NC.

Drought conditions exposed a drinking water intake facility.

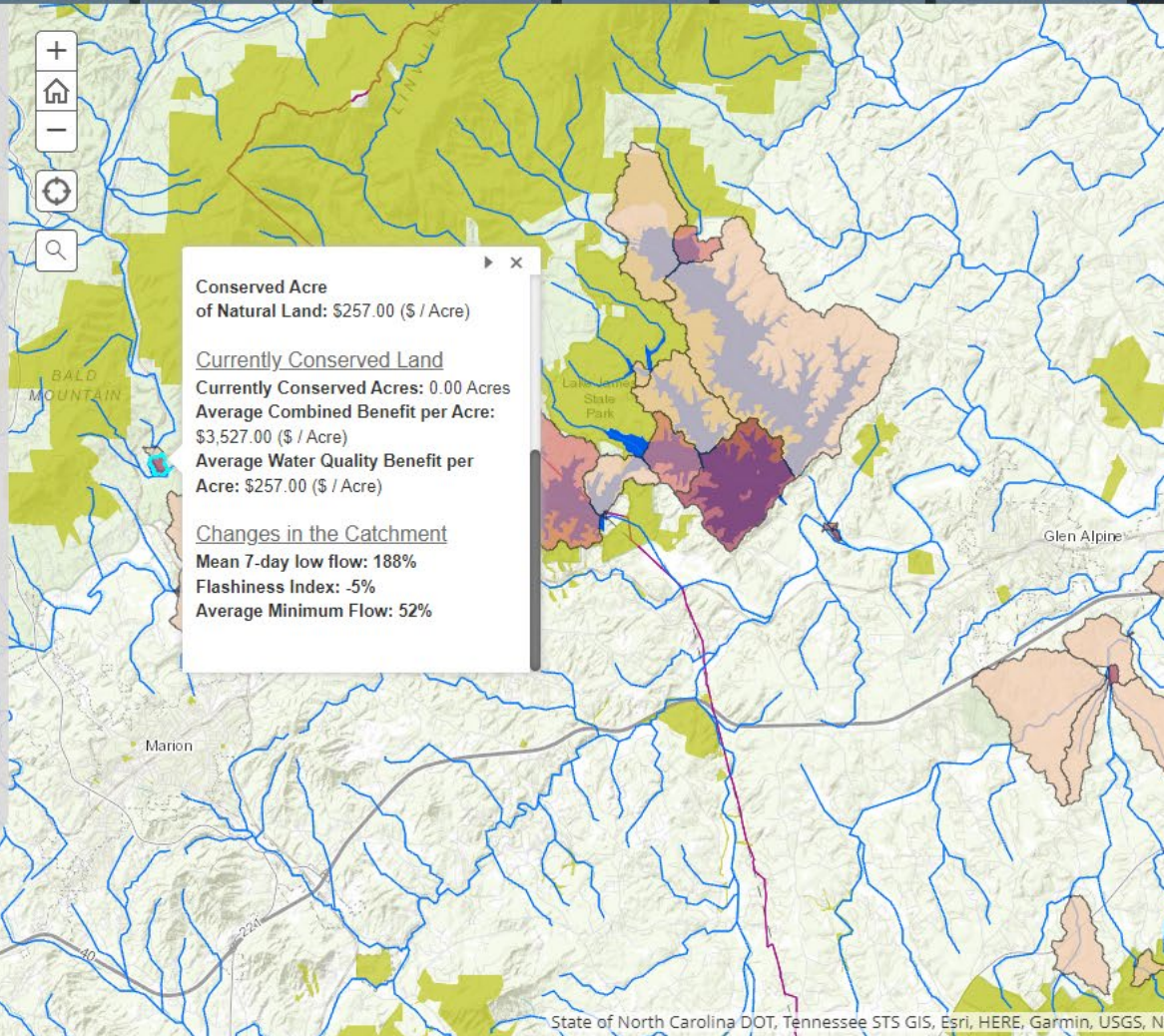
This assessment selects hot spots where there is any change to the two low flow metrics or to streamflow variability to identify hot spots for where there are potential changes to the baseflows that would support the Basin during the time of drought. No water quality concerns are included in this assessment. It uses the two minimum flow metrics (minimum and 7Q10) with weights of 0.4 and a secondary metric for variability (RBI) with a weight of 0.2. The assessment takes the absolute value of the changes in each of these metrics to examine any change from current conditions as a risk.

Scenario: Land Use Change

Statistic: Percent Difference

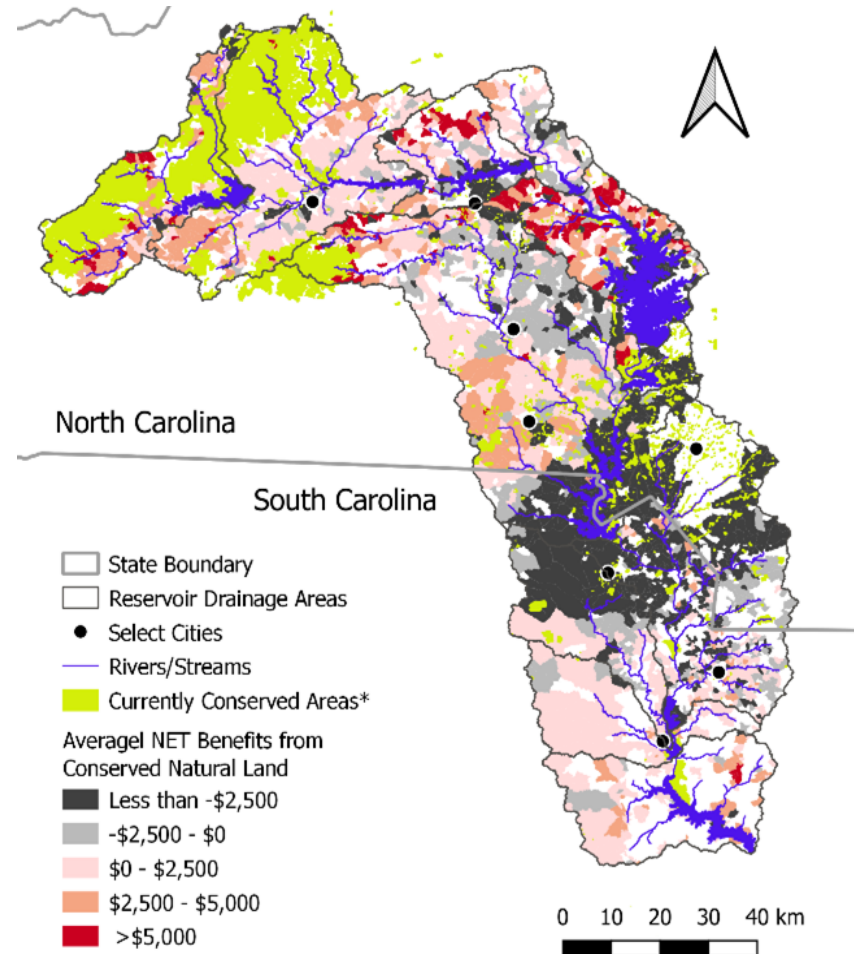
Priority Score Formula: $1 * (0.4 * ABS(MIN) + 0.4 * ABS(7Q10) + 0.2 * ABS(RBI))$

Threshold for Hot Spots: $\geq 25\%$



Results: Comparing Average NET Benefits per Conserved Acre

Results = (Water Quality + Carbon + Air Quality) Benefits per Acre - Land Costs per Acre

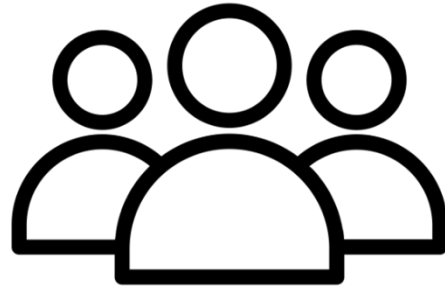




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What land to conserve ✓

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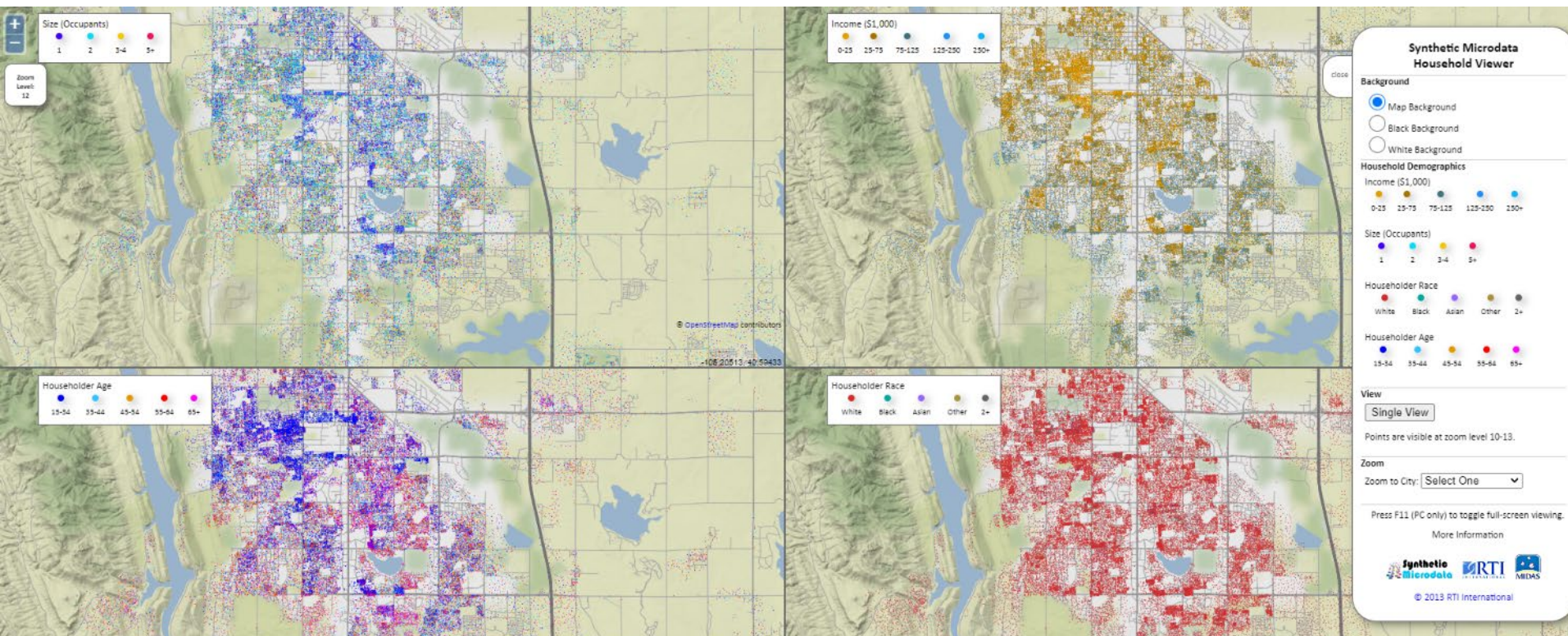
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Environmental
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U.S. Synthetic Household Population

- Households and persons as dots on a map
- Includes attributes such as:
 - age, sex, race, income, and educational attainment for each person
 - size, income, householder race, and householder age for each household
- Estimated location of workplaces for each working adult
- Estimated location of schools for each student attending primary or secondary school





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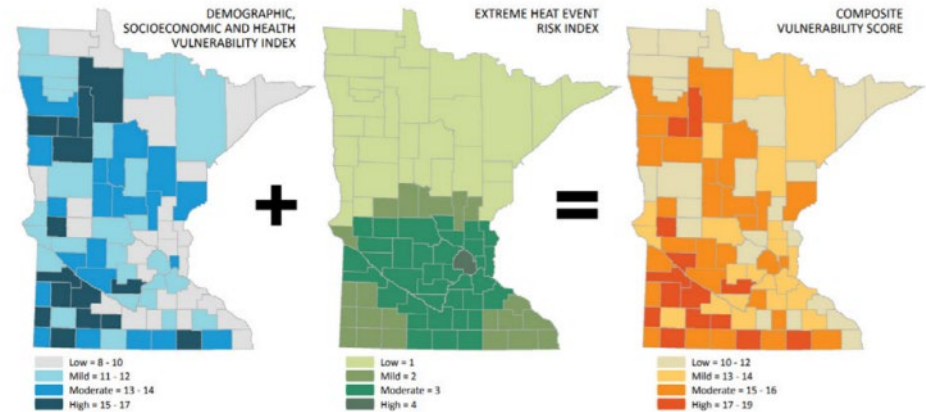
What land to conserve ✓

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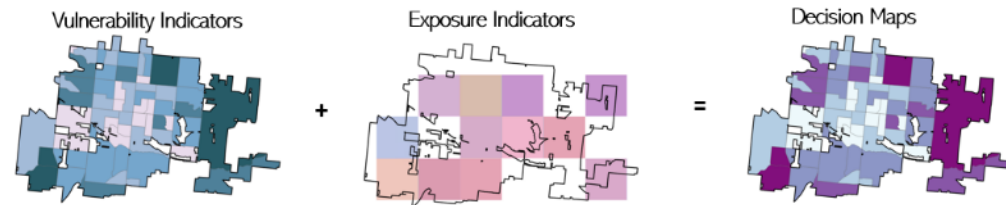
Who is on or near
that land ✓

Environmental
Injustices

- Who is near the land we are conserving?
- Whose land is not being prioritized?
- Are we equitably conserving land?
- How can we couple human health benefits of land conservation with at-risk populations?
- How can we look at environmental justice factors like access to open space as a factor in considering what land to conserve?



Source: Minnesota Department of Health³⁰¹



Go to www.menti.com and use the code 7838 2921

Questions or Comments

Colorado
Assembly



Together
LIKE NEVER | 2021
BEFORE
SUSTAINING COLORADO
WATERSHEDS CONFERENCE

Press ENTER to pause scroll



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