



APPLIED ECOLOGICAL SERVICES, INC.

21938 MUSHTOWN ROAD, PRIOR LAKE, MN 55372

PHONE: (952)447-1919 FAX: (952)447-1920

email: info.mn@appliedeco.com

Bringing the science of ecology to all land use decisions

M E M O R A N D U M

DATE: December 29, 2008

TO: Steering Team, Vermillion EPA Watershed Partnership Grant

FROM: Steven J. Taff (University of Minnesota, Dept. Applied Economics), Theresa Nelson and Kim Chapman (Applied Ecological Services)

RE: Maps for Targeting Heat-Mitigation Practices Based on Land Values and Heat Contribution

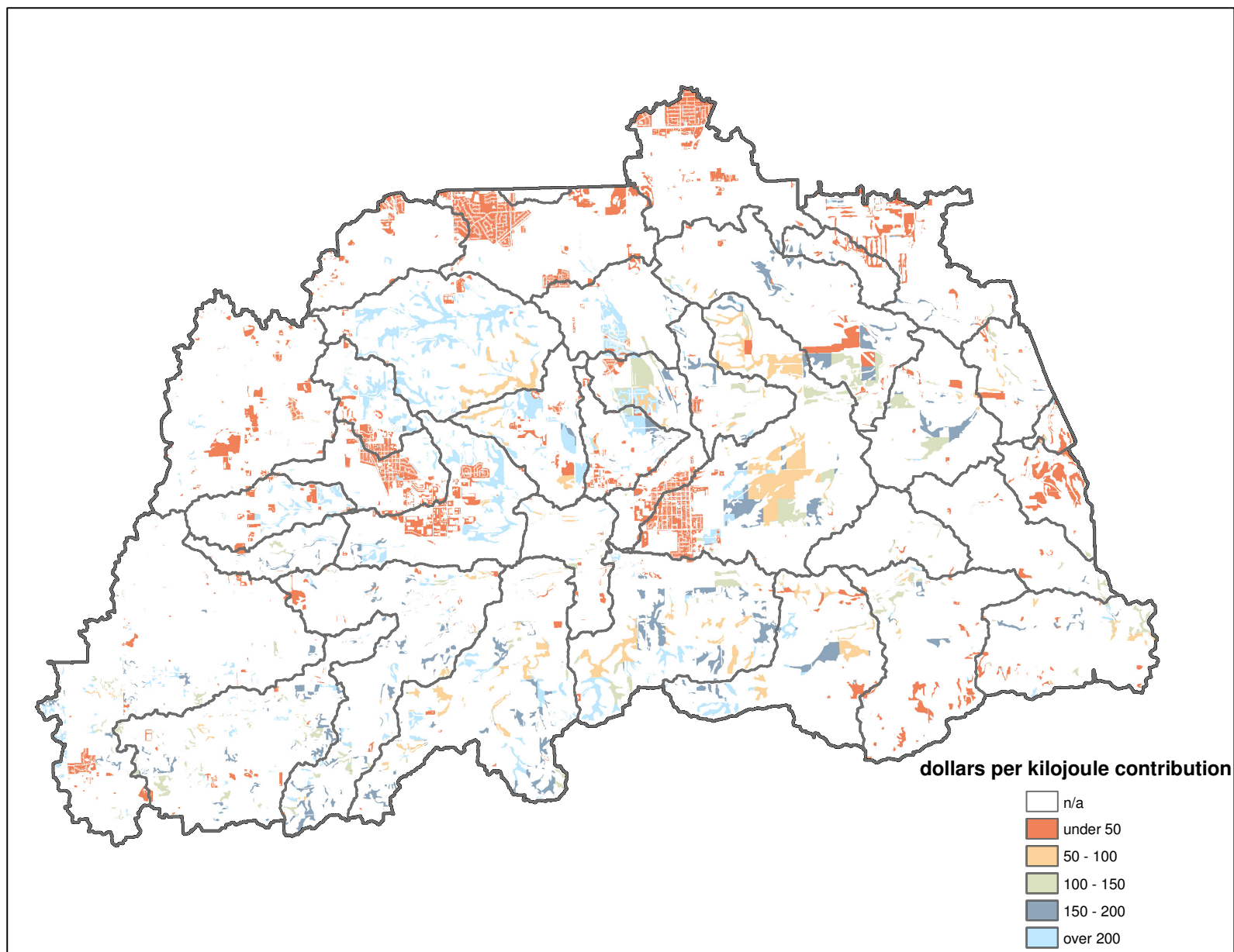
We created two maps that could be used for targeting purposes. The first, which shows land acquisition cost per kilojoule contribution, is useful for potential thermal credit trading market participants who want to know where the “cheapest credits” might be obtained. The second, which shows kilojoule contributions per dollar invested, is useful for government agencies who want to know where the most effective heat-reduction investment might be placed.

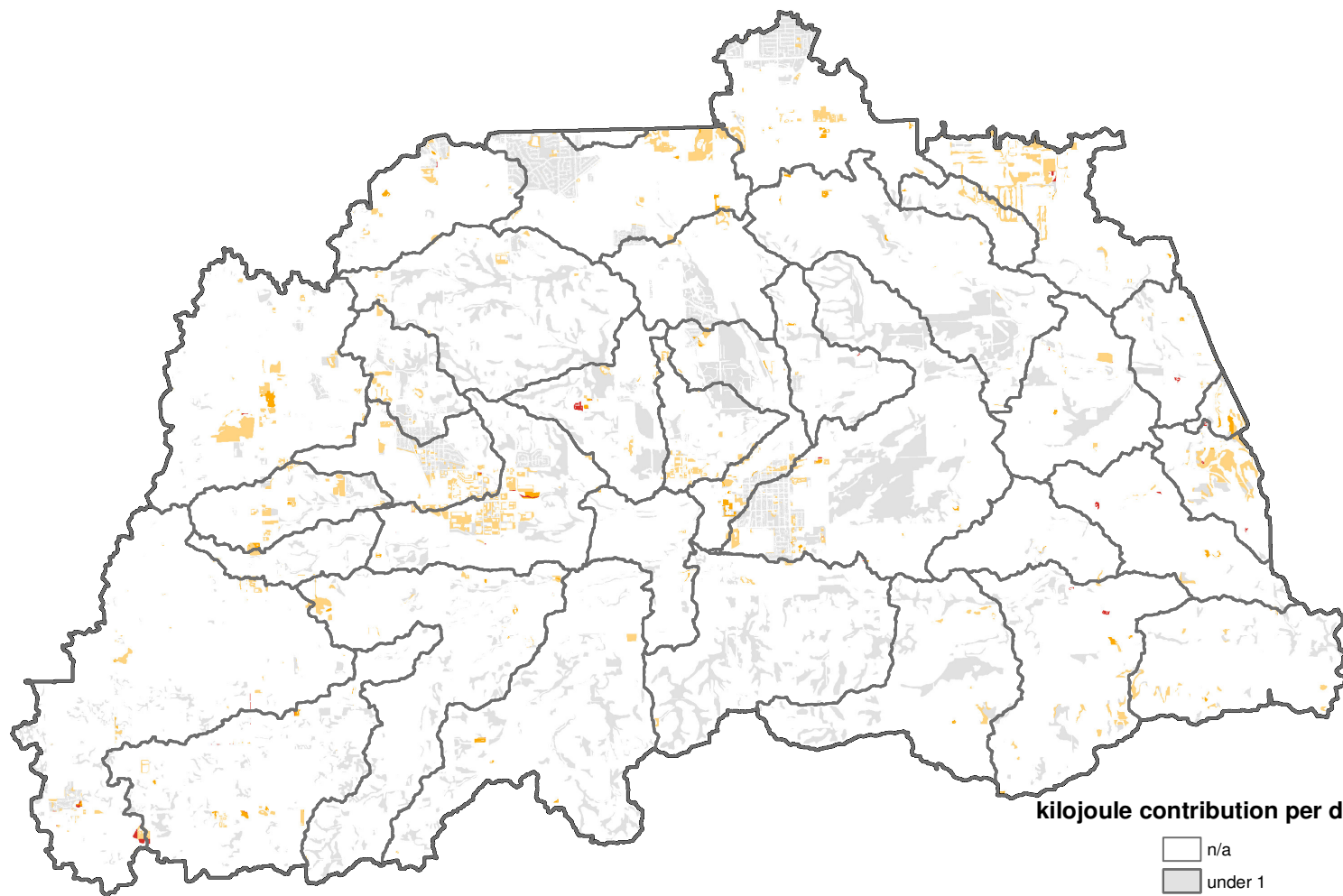
Although the thermal contributions estimates reported elsewhere under this grant include roads, we excluded these from the temperature/price maps shown here, on the argument that roads are public property and so will not be the object of a private thermal credits trading process. All buildings are excluded from these maps as well, because the value used in the calculation is that of only the land portion of a property.

This is the process used to generate the two maps. We used the file naming conventions used in the Applied Ecological Services Manuals for the AES Surface Loading Model.

1. Create a new variable in Parcels January 2007.shp: $EMV_LAND/ACRES_POLY) * (1 \text{ acre} / 4047 \text{ m}^2) * (100 \text{ m}^2 / 1 \text{ grid cell})$. This gives us a estimated land value per acre for parcel.
2. Convert the shapefile to a raster: `parcels_janu`
3. Divide the cell dollar value by the thermal contribution value for that cell (`groc_desn01`): `val-kj_cont`. This gives us estimated cost per kilojoule contribution to get the rights to that cell.

4. Divide the thermal contribution value for that cell (groc_desn01) by the cell dollar value in parcels_janu: kj_cont_val. This gives us number of kilojoules contribution for each dollar invested to get the rights to that cell.
5. Overlay each map with the thermal contributions map coded to mask underlying cells that are roads, commercial roofs, or residential roofs. The resulting maps are displayed below.





kilojoule contribution per dollar

