

**Student Application**  
**College of Liberal Arts Technology Fund Grant**

Project title: Creating a wind map for North Eastern Minnesota \_\_\_\_\_

Duration of Project: From: 04/01/05 \_\_\_\_\_ To: 09/01/05 \_\_\_\_\_ (completion date)  
Month / Day / Year Month / Day / Year

Funds Requested: (max. \$3000): \$2660.10 \_\_\_\_\_

**Description of Project:**

(In this space or on one separate sheet, provide a descriptive plan of the work you propose to undertake.)

I intend to create a wind resource map of Northeastern, MN (Duluth and North Shore) using wind data obtained from twenty locations (using UMD's handheld GPS units and the anemometers requested in the budget) in combination with an existing wind mapping model to extrapolate between data points. There are a few regional sites with annual data (Grand Portage, Wolf Ridge, and Duluth International Airport) that will be used as our basis of comparison for the twenty seasonal data points that we gather. To expedite our research we will use ten anemometers for three month intervals, which will give us a total of twenty data points at the end of six months. I will format the wind resource data, set up the model in the GIS, and extrapolate between data points using Geostatistical Analyst for ArcGIS (Geostatistical Analyst is a GIS tool that can create surfaces based on one or more variables that are related spatially). This will require training, support, and some analysis by the GISL Director at her hourly rate. The existing wind resource map for this region published by the Minnesota Department of Commerce is too crude to usefully inform most local wind projects. In addition, I believe that it underestimates our regions wind potential. The data we gather, and the wind map we ultimately create should stimulate several new wind projects in our region. The map could be continuously updated by future students using the technology and knowledge resulting from this project. Furthermore, the CSCD would post this map and facilitate the use of anemometers and updates to the map in the future. \_\_\_\_\_

**Project Goal:**

(Provide an explanation of what the final product/goal is for the project and how/when it will be demonstrated.)

A wind resource map for Northeastern MN based on wind data collected at a much finer resolution and from more informed locations than the existing wind map produced by the MN Department of Commerce \_\_\_\_\_

**The proposal you submit with this application must include an itemized budget:**

(In the space provided or on a separate sheet, provide an itemized budget for your proposed project.)

See Attached \_\_\_\_\_

Yes \_\_\_\_\_ No X \_\_\_\_\_ Have you previously received a CLA Tech. Fund Grant? If yes, give date, project title, amount.

\_\_\_\_\_

Past award recipients must have completed a final report and evaluation for all previous projects before they will be considered for another award.

Yes \_\_\_\_\_ No X \_\_\_\_\_ Have you investigated the availability of other funds? If yes, please provide details:

Yes \_\_\_\_\_ No X \_\_\_\_\_ Does this project involve the use of human subjects? If yes, you must receive approval from the Committee on the Use of Human Subjects in Research using their *Request for Approval* form.

Please contact Peter Angelos at (218) 726-7350 or [pangelos@d.umn.edu](mailto:pangelos@d.umn.edu) if you have any questions.

Project participants must comply with all University policies, including those addressing responsible conduct of research and intellectual property.

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\_\_ Summer '05 \_\_ Fall '04 \_\_ Winter '04 \_\_ Spring '05

(Please type or print clearly)

For more information about this topic go to the *Research Subjects' Protection Programs* webpage

<http://www.research.umn.edu/subjects/index.cfm>

Date Applied: \_\_\_\_\_ Date Approved: \_\_\_\_\_

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## Creating a Wind Map for Northeastern Minnesota

Nicole Hynum

### Budget:

2 Poster Size Maps @ \$35 = \$70

15 hours of GISL Lab Use @ \$2.70/ hr = \$40.50

6 hours of GISL Consulting on Wind Model Implementation and Geostatistical Analyst Software @ \$42 = \$252

Travel throughout NE Minnesota = \$500

8 Oregon Scientific Wind Speed Direction Package (anemometer) @ \$129.95 = \$1039.60

2 Wind Watcher Data Logger #40 (anemometer) @ \$379 = \$758

Total = \$2660.10

### Budget Justification:

The major expenses are travel and the anemometers. An anemometer is a device for measuring average wind speed at a particular site. We will purchase 10 anemometers to allow a total of 20 data points (3 months of data from each site). We will also request travel funds to get to these 20 sampling sites.