Open Data Standards and Open Source Modeling Tools: The GPL'd Release of Winds On Critical Streamline Surfaces (GWOCSS)

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Just as an **open standard** can be defined as a standard that is publicly available and has various rights to use associated with it, including various properties of how it was designed (e.g. open process), there is a similar definition for **FOSS** (or FLOSS), as in Free (Libre) & Open Source Software. As scientists, we rely not only on open standards, freely shareable data, and other information, but also on publicly supported software and analysis tools as well (and whether it comes from a public university or a federal agency such as NOAA/GSD, it's funded with taxpayer dollars). Similarly, such public funding also supports the development of more general open source software (eg, compilers, web servers, and even operating systems) as well as hardware and other useful artifacts. The main difference in the more general case is the additional support provided by a combination of individual developers/users, non-profit organizations, and tech companies. And in this more general case, there are myriad license options to choose from, some more open to abuse than others.

Some portions of the original WOCSS source code go all the way back to the ideas (and original implementation) of Roy Endlich (Endlich, R. M., 1984) and Francis Ludwig (Bhumralkar, C. M., R. L Mancuso, F. L. Ludwig, and D. S. Renne, 1980) with subsequent development by others (Bridger, A. F. C., A. J. Becker, F. L. Ludwig, and R. M. Endlich, 1994) and eventually wound up at Stanford (among other places) with Frank, in the Environmental Fluid Mechanics Laboratory. Thus, with minor variations, the WOCSS model code has been in regular use for several decades in various operational and research applications, from real-time toxic release modeling, to air quality studies, to downscaling coarse-grid forecast data.

This release of GWOCSS (now available on github) takes advantage of the GNU General Public License (GPL), to both preserve existing copyrights and to maintain the “rights-of-use” for both current and future users of the software. As such, the GPL, or an alternative such as Creative Commons, is an ideal fit for licensing scientific software and related tools, data, and more. In addition, when combined with such a license, a tool like GWOCSS can be adapted and extended for the benefit of all users, thus spurring progress in general (Arnold, S. L., 2005). This is particularly important for tools with such a wide variety of both research and operational applications.

Endlich, R. M., 1984: Wind energy estimates by use of a diagnostic model. Bound.-Layer Meteor., 30, 375±386.

Bhumralkar, C. M., R. L Mancuso, F. L. Ludwig, and D. S. Renne, 1980: A practical and economic method for estimating wind characteristics at potential wind energy conversion sites. Sol. Energy, 25, 55±65.

Bridger, A. F. C., A. J. Becker, F. L. Ludwig, and R. M. Endlich, 1994: Evaluation of the WOCSS wind analysis scheme for the San Francisco Bay Area. J. Appl. Meteor., 33, 1210±1218.

https://github.com/sarnold/gwocss

Arnold, S. L., 2005: Open Source Technologies in Science Education: What's Your Geek IQ? Presented at the Joint Session on Cyberinfrastructure to Support Atmospheric and Oceanic Education: Examples and Strategies, 14th Symopsium on Education, 85th Annual AMS Meeting, San Diego, CA.

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