

Dear Sir or Madam,

Please accept this comment on spectrum policy, ET Docket No. 02-135, for the Spectrum Policy Task Force.

I am the Director of the University of Wisconsin Trout Lake Station, a field research station operated by the Center for Limnology, University of Wisconsin-Madison. I appreciate this opportunity to discuss how current spectrum policy influences and restricts our ability to do field science, particularly in the critical area of environmental monitoring. My comments appear most directly relevant to questions 3b and 5 in the Public Notice released 6 June 2002.

Careful, near real-time monitoring of the environment for climate, hydrology, air and water chemistry, and biota has become an increasingly important activity for many Biological Field Stations in the past decade. For the past several years, researchers at the UW Trout Lake Station have placed instrumented buoys on lakes to monitor various physical, chemical, and biological properties of lakes in near real-time. These data have been transferred from the buoys to our field station (and then made available on the internet) using unlicensed Part 15 rule radios operating in the 915mhz and 2.4ghz bands. Under current rules these radios are limited to a very modest maximum power regardless of location. This power restriction severely limits our ability to monitor the environment because the range of these radios is quite small in our setting.

The Trout Lake Station is located in the forested Northern Highlands Lake District in rural northern Wisconsin. This lake district contains about 2500 lakes in an area roughly bounded by a circle 100 miles in diameter. Using Freewave spread spectrum radios operating at full, legal power in the 915mhz band we find that we can communicate a maximum distance of 3 miles from a 130-foot tower at our base station to instrumented buoys on lakes. The limited ability of our radios to penetrate through vegetation requires us to use an unwieldy and expensive system of relays to collect data in near real-time from lakes as close as 5 miles from the field station. This situation currently inhibits our federally-funded scientific research into such areas as effects of climate change, land-use change, and spread of exotic species on aquatic resources. This lack of radio range is unacceptable logistically and, we believe, unnecessary from a policy perspective.

A simple change in FCC policy could help greatly. In this rural environment, interference in these unlicensed bands is not an issue, but range most certainly is. It seems reasonable to provide for different power maxima in rural vs. urban areas. For example, we believe that doubling or tripling the effective radiating power in rural areas would allow our radios to punch much further through trees and brush, without detrimental effects to other users.

Because lower frequencies penetrate through trees, brush and walls more effectively, making lower frequencies available in the unlicensed spread spectrum bands would also greatly facilitate field science in rural areas.

In the future, whether for homeland security or informed public policy on pressing resource management issues, environmental measurements made at scientific field stations in rural areas will become more and more important. State-of-the-art environmental monitoring requires the use of remotely-deployed sensors attached to data loggers and radios. As these sensors become smaller, smarter, and cheaper their use and importance will only increase. There are several currently-funded or proposed large-scale programs of the National Science Foundation that will greatly benefit from more effective use of wireless communication with remotely-deployed sensors. These programs include the Long Term Ecological Research program (which currently funds research at 25 mostly rural locations across the U.S and Antarctica) and the proposed National Environmental Observatory Network. It is crucial that the FCC implements spectrum use policy that allows reasonable communication from field stations to field-deployed sensors in rural areas.

Thank you for consideration of these comments.

Sincerely,

Tim Kratz, Ph.D
Director, University of Wisconsin Trout Lake Station