



DAVE KRAMAR — LEARNING FROM LOONS

By Jennifer Boothroyd

Dave Kramar likes a good adrenaline rush; the kind you get from scaling a cliff or handling a really big bird. However, there are aspects of computer programming that also give him a small thrill. His sense of adventure is one of the things that brought him to Maine, and his variety of interests and experience make him a great match for the Mitchell Center.

Born in California and raised in Virginia, Dave received a Bachelor's degree in Geography and Planning from Appalachian State University. He went on to pursue a Master's degree in Geography from Virginia Tech, and his graduate research brought him to Maine. His thesis work involved employing GIS-based mapping techniques to estimate the levels of mercury found in loon blood from land cover characteristics. The project was a collaborative effort with the BioDiversity Research Institute (BRI), a non-profit research group based in Gorham, Maine. The collaboration provided Dave with some great field work opportunities; paddling around on lakes in western Maine and catching loons, ducks, eagles, and osprey to obtain blood and feather samples.

Dave has been able to build upon his master's work as a PhD student in the Ecology and Environmental Sciences Program through the Mitchell Center. His current thesis work is multivariate, and continues his collaboration with BRI of mercury contamination in piscivores at the top of the food chain (predominantly loons, eagles, and osprey). Working with advisor Kate Beard in the Spatial Information Engineering department, Dave has been developing an integrated personal digital assistant (or PDA)-based system to streamline the process of data collection from blood mercury samples. This system will enable a group of researchers to independently gather data from the field, and seamlessly link and upload the data to BRI's main database. In the future, Dave envisions this new system being used by researchers from a wide geographical area, allowing them to contribute and synthesize data remotely.

Another aspect of Dave's research involves the incorporation of water quality into his previous research on land cover and blood mercury levels. He will resample the areas that he previously studied, but will obtain water samples to test for pH, dissolved oxygen, dissolved organic carbon, and other



parameters. He will combine water quality data with the land cover data in a regression analysis, and compare the resultant blood mercury level predictions with the results from his previous research.

In an additional phase of the project, Dave will collect blood samples from osprey in his research area to test for mercury levels. The bioaccumulation of mercury in osprey should be comparable to the levels found in loons from similar areas, since both birds are high trophic level species with similar diets. Since it is far easier to obtain a blood sample from a loon than from an osprey, Dave hopes to demonstrate a method of estimating mercury levels in osprey from loon data.

The final phase of Dave's doctoral research will be the development of GIS-based models incorporating all the data collected. These models, once completed, may be used to predict mercury levels and risk in other areas.

Dave is supporting his graduate work by working on PEARL, the web-based, searchable database for Maine water resources data and information, housed at the Mitchell Center. He is currently perfecting the internet mapping component, and performs additional debugging and related programming. In his spare time, Dave enjoys rock climbing, whitewater kayaking, and back-country skiing with his wife, Laura, and their two dogs, Echo and Sadie. He says he likes being involved with the Mitchell Center because, "the work is progressive and good, and provides opportunities for all sorts of involvement". He adds, "I'm kept so busy, it keeps me out of trouble".



http://www.umaine.edu/waterresearch/outreach/waterlines_v11_n1.htm